Foreword

Foreword

The information in this catalog is correct as of September 2012.

All products listed in this catalog are RoHS compliant, a fact that will be explicitly noted in the respective data sheet. For up-to-date information concerning the background, implementation and availability of RoHS compliant products as well as conventional products, please visit our website at **http://www.osram-os.com/rohs**.

For details concerning the labeling, please refer to either our website or the section "Tape and Reel".

Please note that the product specifications list only a selection of key parameters. Unless otherwise marked, the data supplied reflects typical values, which in concrete cases will be subject to statistical variations.
Because of future technical advancements, changes in the products' properties are possible and to be expected.
For specific product evaluations we therefore strongly recommend that you obtain detailed, up-to-date information either from our website **http://catalog.osram-os.com** or by contacting one of our authorized distributors (see the "Addresses" section below).

Vorwort

Die Angaben in diesem Katalog entsprechen dem Stand September 2012.

Alle in diesem Katalog aufgeführten Produkte entsprechen den RoHS-Richtlinien, worauf im jeweiligen Datenblatt explizit hingewiesen wird. Für aktuelle Informationen bezüglich Hintergrund, Einführung und Verfügbarkeit RoHS-konformer und herkömmlicher Produkte empfehlen wir unsere Webseite **http://www.osram-os.com/rohs**.

Hinweise zur Kennzeichnung entnehmen Sie bitte ebenfalls der Webseite oder dem Abschnitt “Gurtung und Verpackung“.

Bitte beachten Sie, dass die Produktbeschreibungen lediglich einen Auszug der wichtigsten Parameter darstellen. Sofern nicht anders gekennzeichnet, handelt es sich bei den Angaben um typische Werte, die in der konkreten Ausprägung statistischen Schwankungsbreiten unterworfen sind.
Aufgrund technischer Weiterentwicklungen sind zukünftig Veränderungen in den Eigenschaften der Produkte möglich und zu erwarten.
Für konkrete Produktevaluierungen wird aus diesen Gründen dringend empfohlen, detaillierte und aktuelle Informationen entweder über unsere Website **http://catalog.osram-os.com** einzuholen, oder sich an einen unserer autorisierten Vertriebspartner zu wenden (siehe Abschnitt “Addresses“).

Foreword

General Information

Colored tabs at the right side of the pages make it easier to locate the catalog's major chapters. In our fast-moving times, the details of a catalog such as this are subject to almost constant change; OSRAM Opto Semiconductors can therefore neither guarantee their absolute accuracy, nor accept liability or responsibility for any errors concerning the content. Experience also shows that mistakes can hardly be avoided altogether.

OSRAM Opto Semiconductors continually strives to further improve the quality of its product range and to bring its contents to perfection. Our users' experience and judgement in helping us to achieve this cannot be rated highly enough. In particular, we welcome your criticism, corrections and suggestions for improvement. In this way you can help to make the next edition more up to date.
Please send all comments to

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The author would like to thank you in advance for your cooperation. All respondents will receive a small gift in appreciation of their effort. Along with your name and address, your message should indicate the title and the edition you are referring to.

Allgemeine Hinweise

Abgesetzte Streifen an den rechten Seitenrändern erleichtern das Auffinden der Großkapitel des vorliegenden Lieferprogramms. Da die Angaben eines solchen Lieferprogramms in der heute so schnelllebigen Zeit fast ständig Veränderungen unterworfen sind, kann OSRAM Opto Semiconductors weder Gewähr für die absolute Richtigkeit leisten noch die Haftung oder Verantwortung für eventuelle inhaltliche Fehler übernehmen. Auch lehrt die Erfahrung, dass sich Irrtümer kaum gänzlich vermeiden lassen.

OSRAM Opto Semiconductors ist ständig bemüht, die Qualität seines Lieferprogramms noch zu steigern und seinen Inhalt weiter zu vervollkommnen. Hierbei können ganz besonders die Erfahrungen und Urteile aus dem Benutzerkreis als wertvolle Hilfe gar nicht hoch genug eingeschätzt werden. Vor allem Ihre Kritik, Berichtigungen und Verbesserungsvorschläge sind uns stets willkommen. Sie helfen damit, die nächste Ausgabe noch aktueller zu gestalten. Bitte schreiben Sie in jedem Falle an die

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Der Verfasser dankt Ihnen im Voraus bestens für Ihre Mitarbeit. Jede Einsenderin und jeder Einsender erhält ein kleines Dankeschön. Ihre Zuschrift sollte also neben der Angabe des Titels und der Auflage, auf welche Sie sich beziehen, auch Ihren Namen und Ihre Anschrift enthalten.

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Safety Instructions
The use of new chip technologies means that OSRAM LEDs are delivering higher and higher levels of optical performance. Thus, even eye safety issues might increasingly need to be considered. In general, the EU product safety legislation requires conformity with EC directives (such as the "Low Voltage Directive") which define the "essential requirements", e.g., protection of health and safety, that goods must meet when they are placed on the market. We therefore recommend that the current version of the IEC 62471 standard is taken into account right from the outset, i.e. at the equipment development stage, and that suitable protection facilities are provided in your laboratories.

Eye Safety Information
The light output of modern High-Power-LEDs is strong enough for eye irritation and temporal blinding effects. Therefore, in general, do not stare into the light beam of any LED at close range. Optical radiation hazards by LED-based lamps, lamp systems or luminaires have to be assessed and classified according to the requirements of IEC62471 ("Photobiological safety of lamps and lamp systems").

Within the risk grouping system of this IEC standard, most LEDs specified in this catalogue fall into the "exempt" group. However, high-power "blue" LEDs and the most important "white" LEDs for general lighting may need some attention. Due to their dominating photochemical hazard potential, extensive deliberate long-term direct viewing from close distance can indeed be hazardous. Under worst case conditions of classification, these high power light sources can even be allocated to the "moderate risk group" i.e. safety bases on aversion reactions against bright light. However, under real circumstances (for exposure time, eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. This is valid for single LEDs under the mentioned conditions and operating conditions defined in the data sheet. Complex Multi-LED-designs, additional optics or extreme application conditions demand a separate evaluation of the entire system.

As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. As for any bright light source, when viewing into it (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Remarks:
User shall not reverse engineer by disassembling or analysis of the LEDs without having the prior written consent of OSRAM Opto Semiconductors GmbH. When defective LEDs are found, user shall inform to OSRAM Opto Semiconductors GmbH directly before disassembling or analysis.

The appearance and specifications of the product may be modified for improvement without notice.

Sicherheitshinweise
OSRAM LEDs erreichen aufgrund von neuen Chip-Technologien immer höhere optische Leistungen. Deshalb müssen auch Sicherheitsaspekte bezüglich Augensicherheit zunehmend in Betracht gezogen werden. Generell fordern die EU Produkt-Sicherheitsgesetze Konformität mit den EU Richtlinien (z.B. die "Niederspannungsrichtlinie"), die wesentliche Forderungen festlegen, z.B. an Sicherheit und Gesundheitsschutz, die die auf den Markt gebrachten Produkte erfüllen müssen.
Wir empfehlen daher, schon bei der Entwicklung von Geräten, die zu diesem Zeitpunkt gültige Norm IEC 62471 zu beachten und insbesondere auf den Gebrauch von entsprechenden Schutzvorrichtungen in Ihren Labors hinzuweisen.

Informationen zur Augensicherheit
Die Lichtausbeute der modernen Hochleistung-LEDs ist stark genug, um Augenreizungen und zeitliche Blindheitseffekte hervorzurufen. Daher sollten Sie generell nicht aus kurzer Entfernung in den Lichtstrahl jeglicher LED blicken.
Risiken durch optische Strahlung, die durch LED-basierte Lampen, Lampen-Systeme oder Leuchter entstehen, müssen eingeschätzt und nach der Forderungen des IEC62471 Standards ("Photobiological safety of lamps and lamp systems") bewertet werden.

Im Rahmen des Risikogruppensystems des IEC Standards fallen die meisten in diesem Katalog beschriebenen LEDs in die "exempt" (befreit) Gruppe. Jedoch sollten hochleistungsfähige blaue LEDs und die wichtigsten weißen LEDs näher betrachtet werden. Auf Grund ihres hohen photochemischen Risiko-Potenzials kann das langfristige, bewusste, direkte Ansehen gefährlich sein. Bei ungünstigsten Bedingungen der Anordnung können die Hochleistungs-LEDs sogar der "moderate risk group" (gemäßigte Risikogruppe) zugeordnet werden, d.h. die Sicherheit beruht auf Aversions-Reaktionen auf helles Licht. Unter realen Umständen (in Bezug auf Belichtungszeit, Pupillen, Betrachtungsabstand) kann jedoch angenommen werden, dass keine Gefahr für die Augen von diesen Geräten ausgeht. Dies gilt für einzelne LEDs unter den genannten Konditionen und im Datenblatt definierten Betriebsbedingungen. Komplexe Multi-LED Designs, zusätzliche Optik oder außergewöhnliche Anwendungsbedingungen fordern eine gesonderte Bewertung des ganzen Systems.

Prinzipiell ist jedoch zu erwähnen, dass starke Lichtquellen auf Grund ihrer Blendwirkung ein hohes, sekundäres Gefahrenpotenzial besitzen. Wie bei jeder hellen Lichtquelle kann das direkte Anschauen (z.B. Scheinwerfer) zur Reduzierung der Sehschärfe oder zu Nachbildern führen, was Reizungen, Irritationen und sogar Unfälle verursachen kann.

Anmerkungen:
Der Anwender darf keinen Ausbau oder Analyse der LEDs vornehmen, ohne die vorherige schriftliche Zustimmung von OSRAM Opto Semiconductors GmbH zu haben. Wenn defekte LEDs gefunden werden, soll der Anwender baldmöglichst OSRAM Opto Semiconductors GmbH informieren, bevor er einen Ausbau oder eine Analyse vornimmt.
Erscheinungsform und technische Daten des Produktes können zwecks Verbesserung ohne Benachrichtigung geändert werden.

Automotive Applications

Exterior

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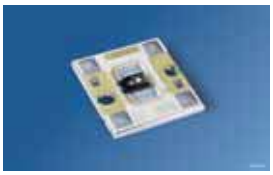
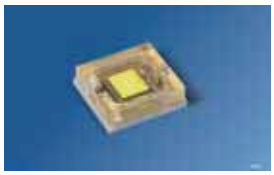


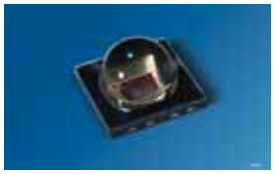
OSRAM OSTAR Headlamp



OSRAM OSTAR Compact

OSLON ECE

OSLON Black Flat



OSLON Black

Golden DRAGON

Platinum DRAGON

Advanced Power TOPLED

Power TOPLED

Power TOPLED

MULTILED

Multi TOPLED

Interior

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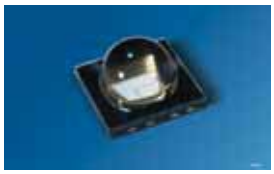
OSLON



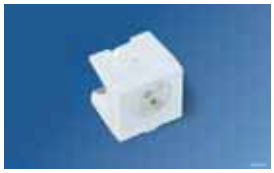
OSLON Black

Advanced Power TOPLED

Power TOPLED

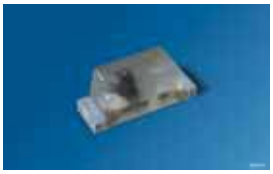
Power TOPLED

TOPLED



SIDELED

Mini TOPLED



SMARTLED

SMARTLED XR

PointLED

Micro SIDELED

MULTILED

Multi TOPLED

Consumer Applications

Mobile Applications

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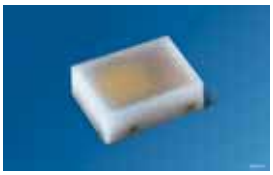

CERAMOS

FIREFLY

Backlighting

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Multi CERAMOS

Micro SIDELED

Industry Applications

Projection

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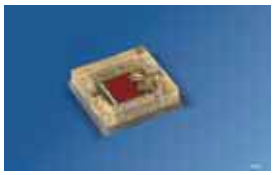
OSRAM OSTAR Projection Cube

OSRAM OSTAR Projection Power



OSRAM OSTAR Projection Compact

Signs and Signals

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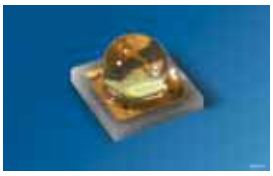
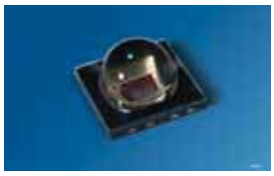
OSLON SX



OSLON Signal



OSLON Black

Golden DRAGON

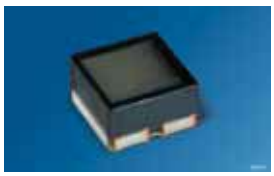
Platinum DRAGON

TOPLED

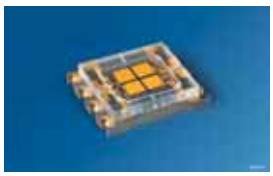
TOPLED Black

MULTILED

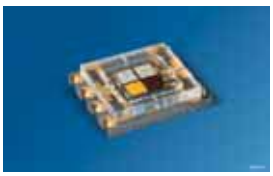
Multi CERAMOS



Multi CHIPLED



OSRAM OSTAR SMT



OSRAM OSTAR Stage

Electronic Equipment

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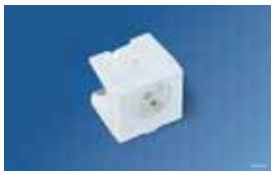
Advanced Power TOPLED Plus


Power TOPLED

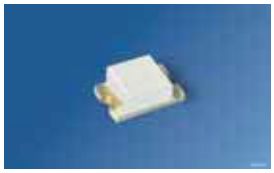

Power TOPLED

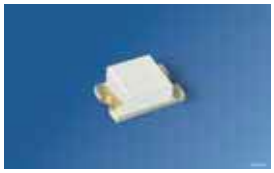

TOPLED


SIDELED


Mini TOPLED

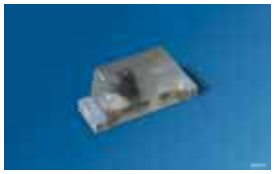

CHIPLED 1206


CHIPLED 0805


CHIPLED 0603


CHIPLED 0402


CHIPLED with lens


SMARTLED


SMARTLED XR

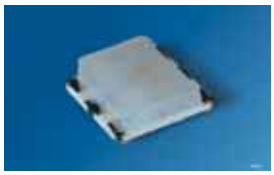

PointLED


FIREFLY


Micro SIDELED


MULTILED


Multi TOPLED


Multi CHIPLED


TOPLED Compact

White Goods

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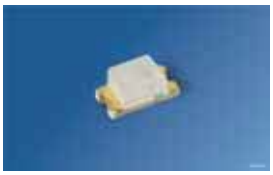
Golden DRAGON

TOPLED

SIDELED



CHIPLED 0603

Micro SIDELED

Transportation

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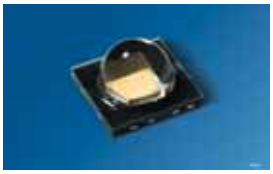
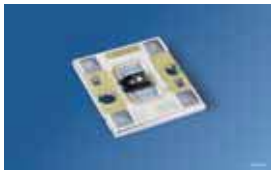


OSLON Black



OSRAM OSTAR Headlamp

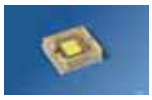
Advanced Power TOPLED Plus

Exterior

OSRAM OSTAR Headlamp

Package	Type	Emission color	Color coordinates Cx/Cy typ.	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE UW D1W1 01-5L6M-GMKM-T01	◯ ultra white	0.31 / 0.32	112 ... 224	700	120	Q65110A8591	1
	LE UW D1W2 01-7M7N-GMKM-T01			224 ... 400			Q65110A8590	
	LE UW D1W3 01-7N7P-GMKM-T01			355 ... 630			Q65110A8588	
	LE UW D1W4 01-5P6Q-GMKM-T01			450 ... 900			Q65110A8593	
	LE UW D1W5 01-7P8Q-GMKM-T01			560 ... 1120			Q65110A8589	
	LE UW U1A2 01-5P8P-ebvF68ebzB68	◯ ultra white	0.322 / 0.334	450 ... 710	1000	120	Q65111A2089	1
	LE UW U1A3 01-8P8Q-ebvF68ebzB68			630 ... 1120			Q65111A2088	
	LE UW U1A4 01-7Q6R-ebvF68ebzB68			900 ... 1400			Q65111A2087	
	LE UW U1A5 01-5R8R-ebvF68ebzB68			1120 ... 1800			Q65111A2086	

OSRAM OSTAR Compact

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE UW Q9WP-8M7N-GMKM	◯ ultra white	0.31 / 0.32	250 ... 400	1400	120	Q65110A9235	2

Exterior

OSLON ECE

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LUW CN7M-HYJY-EMKM-1	◯ ultra white	0.32 / 0.32	33 ... 61	32.9	200	90	Q65110A9509	3
	LUW CN7N-KYLX-EMKM-46	◯ ultra white	0.32 / 0.32	82 ... 130	56.2	350	80	Q65110A9810	3

OSLON Black Flat

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LUW H9QP-8L7M-HNJN-1	◯ ultra white	0.322 / 0.334	159 ... 250	67.5	700	120	Q65111A1706	4

OSLON Black

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA H9GP-JYKY-24-1	amber	617	52 ... 97	36.6	350	90	Q65111A1982	5
	LR H9GP-HZKX-1-1	red	625	39 ... 82	29.7			Q65111A1707	
	LY H9GP-HZKX-36-1	yellow	590					Q65111A1708	
	LS H9GP-HYJY-1-9B9C	super red	633	33 ... 61	23.1			Q65111A2566	

Exterior

DRAGON

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
Golden DRAGON									
	LR W5SM-HZJZ-1-1	red	625	39 ... 71	18.2	400	120	Q65111A2604	6
	LA W5SM-JYKY-24-1	amber	617	52 ... 97	24.6			Q65111A2606	
	LY W5SM-HZJZ-36-1	yellow	590	39 ... 71	18.2			Q65111A2600	
	LY W5SM-HZJZ-46-1							Q65111A2817	
	LUW W5SM-JZKZ-6P7Q-1	ultra white	0.31 / 0.32	61 ... 112	28.5	350	120	Q65111A2586	7
	LUW W5SM-KXLX-5P7R-1			71 ... 130	33.2			Q65111A2585	
	LW W5SM-JYKY-JKQL-1	white	0.33 / 0.33	52 ... 97	24.6	350	120	Q65111A2601	7
	LCY W5SM-HZJZ-5E-1	color on demand yellow	0.56 / 0.42	39 ... 71	18.2	350	120	Q65111A2605	7

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
Platinum DRAGON									
	LR W5SN-JYKY-1	red	625	52 ... 97	24.6	700	120	Q65110A6011	8
	LA W5SN-JZKZ-24	amber	617	61 ... 112	28.5			Q65110A6010	
	LY W5SN-KXLX-35	yellow	590	71 ... 130	33.2			Q65111A0327	
	LY W5SN-KXLX-46							Q65111A0328	
	LY W5SN-JYKY-46			52 ... 97	24.6			Q65110A5712	
	LW W5SN-KYLY-JKQL	white	0.33 / 0.33	82 ... 150	38.3	700	120	Q65110A8946	8

Exterior

Advanced Power TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA G6SP-DAEB-24-1	amber	617	4500 ... 11200	24600	140	120	Q65111A0336	9
	LR G6SP-CBEA-1-1	red	623	3550 ... 9000	19700			Q65111A0536	
	LY G6SP-CADB-36-1	yellow	590	2800 ... 7100	15500			Q65110A4721	
	LS G6SP-CADB-1-1	super red	630					Q65111A1078	
	LCY G6SP-CBDB-5E	color on demand yellow	0.56 / 0.42	3550 ... 7100	16700	140	120	Q65110A8813	10
	LW G6CP-EAFA-JKQL-1	white	0.33 / 0.33	7100 ... 14000	33100	140	120	Q65110A8947	10

Power TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA E67F-BACA-24-3A4B	amber	617	1800 ... 3550	8000	50	120	Q65110A9090	11
	LA E67F-BACA-24-3B5A							Q65110A9089	
	LY E67F-AABA-35-1	yellow	590	1120 ... 2240	5000			Q65110A9019	
	LY E67F-ABBB-46-1			1400 ... 2800	6300			Q65110A9018	
	LS E67F-ABBB-1-1	super red	633					Q65111A1118	
	LR E67F-ABCA-1-1	red	625	1400 ... 3550	7400			Q65111A2785	
	LR E6SF-ABCA-1-1	red	625	1400 ... 3550	7430	50	120	Q65111A0958	11
	LA E6SF-BBCB-24-1	amber	617	2240 ... 4500	10110			Q65110A6262	
	LY E6SF-V2AB-35-1	yellow	590	900 ... 1800	4050			Q65110A7525	
	LY E6SF-AABA-46-1			1120 ... 2240	5040			Q65110A6209	
	LA ETSF-BACB-24-1	amber	617	1800 ... 4500	9500	50	120	Q65110A9777	11
	LY ETSF-ABCA-46-1	yellow	590	1400 ... 3550	7400			Q65110A9779	
	LW ETSG-AABB-JKPL-1	white	0.33 / 0.33	1120 ... 2800	5900	30	120	Q65111A0196	12
	LW E6SG-AABA-JKPL-1	white	0.33 / 0.33	1120 ... 2240	5000	30	120	Q65110A8964	12

Exterior

Power TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	E_V [lux]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA E63F-EBGA-24-3A4B	amber	617	9000 ... 22400	6300	50	30	Q65110A4103	13
	LS E63F-DBFA-1	super red	633	5600 ... 14000	3900			Q65110A4105	
	LY E63F-DBEB-35-1	yellow	590	5600 ... 11200	3400			Q65110A4108	
	LY E63F-EAFA-46-1			7100 ... 14000	4200			Q65110A4107	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS E65F-BBDA-1	super red	633	2240 ... 5600	4500	50	60	Q65110A4106	14
	LA E65F-CBEA-24-3A4B	amber	617	3550 ... 9000	7200			Q65110A4104	
	LY E65F-CBDB-35	yellow	590	3550 ... 7100	6100			Q65110A6456	
	LY E65F-DAEB-46-1			4500 ... 11200	8900			Q65111A1412	

Exterior

MULTILED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LYYYG6SF-CADB-45	yellow	587	2800 ... 7100	14850	50	120	Q65110A8529	15

Multi TOPLED

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	I_V [mcd] color 2	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LAY T67F-AABB-1-1+AABA-45-1	amber yellow	617 / 590	1120 ... 2800	1120 ... 2240	50	120	Q65110A7526	16

Interior

OSLON

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA CN5M-GAHA-24-1	amber	617	18 ... 35.5	18.7	140	60	Q65111A1207	17
	LY CN5M-FAGA-36-1	yellow	590	11.2 ... 22.4	11.8			Q65110A8680	
	LT CN5M-GAHB-25-1	true green	528	18 ... 45	22.1	140	60	Q65110A9086	17
	LUW CN5M-GBHB-5P7R-1	ultra white	0.32 / 0.31	22.4 ... 45	23.6	140	60	Q65111A3434	3

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD CN5M-4Q4R-35-1	deep blue	453	100 ... 180	140	60	Q65110A8683	17
	LD CN5M-1R1S-35-1			112 ... 201			Q65110A9085	

Interior

OSLON Black

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LB H9GP-GYHY-35-1	blue	470	21 ... 39	15	350	90	Q65111A1710	5
	LT H9GP-JZKZ-26-1	true green	528	61 ... 112	43.3			Q65111A1717	
	LCW H9GP-JZKY-4R9T-1	warm white	0.42 / 0.4	61 ... 97	38.7	350	90	Q65111A0920	5
	LCW H9GP-JZKZ-4O9Q-1			61 ... 112	42.4			Q65111A0921	
	LCW H9GP-KXLX-4J8K-1			71 ... 130	49.2			Q65111A0923	
	LCW H9GP-JZLX-4L8N-1			61 ... 130	46.8			Q65111A0922	
	LCW H9GP-JZKY-4U9X-1			61 ... 97	38.7			Q65111A0919	
	LUW H9GP-KYLY-4C8E-1	ultra white	0.31 / 0.32	82 ... 150	55.7	350	90	Q65111A0924	5
	LUW H9GP-KYLY-5F8G-1							Q65111A0925	
	LUW H9GP.CE-KYLY-EMKM-1							Q65111A1881	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD H9GP-3T2U-35-1	deep blue	455	355 ... 560	350	90	Q65111A1709	5

Interior

Advanced Power TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LB G6SP-V2BB-35-1	blue	470	900 ... 2800	5800	140	120	Q65110A4678	10
	LT G6SP-CBEB-25-1	true green	528	3550 ... 11200	21900			Q65110A5874	
	LCB G6SP-DBFA-4J5L	color on demand blue	0.2 / 0.3	5600 ... 14000	30800	140	120	Q65111A0342	10
	LW G6SP-EAFA-JKQL-1	white	0.33 / 0.33	7100 ... 14000	33100	140	120	Q65110A9043	10
	LCW G6CP-DAFA-4J8K	warm white	0.42 / 0.4	4500 ... 14000	29000	140	120	Q65111A0081	10
	LCW G6CP-DAFA-4L8N							Q65111A0082	
	LCW G6CP-DAFA-4O9Q							Q65111A0083	
	LCW G6CP-DAFA-4R9T							Q65111A0079	
	LCW G6CP-DAFA-4U9X							Q65111A0080	

Interior

Power TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LO E67F-BADA-24-1	orange	606	1800 ... 5600	11100	50	120	Q65111A0963	11
	LO E6SF-ABCB-24-1	orange	606	1400 ... 4500	8850	50	120	Q65110A7524	11
	LB E6SG-T1U2-35	blue	470	280 ... 710	1485	30	120	Q65110A7883	12
	LT E6SG-AABB-35-1	true green	525	1120 ... 2800	5880			Q65111A0322	
	LCB E6SG-AABB-2J8L	color on demand blue	0.2 / 0.3	1120 ... 2800	5880	30	120	on request	12
	LCW E6SG-V1AB-4R9T	warm white	0.42 / 0.4	710 ... 1800	3765	30	120	Q65110A7737	12
	LCW E6SG-V1AB-4U9X							Q65110A7736	
	LCW E6SG-V2BA-4L8N			900 ... 2240	4710			Q65110A7734	
	LCW E6SG-V2BA-4J8K							Q65110A7735	
	LCW E6SG-V2BA-4O9Q							Q65110A7733	
	LP E675-P2R1-25	pure green	560	56 ... 140	294	50	120	Q65110A7298	18

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	E_V [lux]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LO E63B-DAEB-24-1	orange	606	4500 ... 11200	3900	50	30	Q65110A2338	19
	LB E63C-T2V2-35-34	blue	469	355 ... 1120	400	30	20	Q65110A1974	20
	LT E63C-BADB-35-1	true green	525	1800 ... 7100	2700			Q65110A1981	

Interior

TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS T676-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2153	21
	LO T676-Q2T1-24	orange	606	90 ... 355	670			Q65110A2150	
	LY T676-Q2T1-26	yellow	587					Q65110A2156	
	LA T676-Q2T1-24	amber	615					Q65110A9273	
	LS T67F-T2V2-1-1	super red	633	355 ... 900	1880	20	120	Q65110A9233	21
	LR T67F-U1AA-1-1	red	625	450 ... 1400	2780			Q65110A9232	
	LA T67F-U2AB-24-1	amber	617	560 ... 1800	3540			Q65110A9268	
	LO T67F-V1AB-24-1	orange	606	710 ... 1800	3770			Q65110A9230	
	LY T67F-U1AA-36-1	yellow	590	450 ... 1400	2780			Q65110A9231	
	LP T67F-N1Q2-24	pure green	560	28 ... 112	210			Q65111A1851	
	LP T67F-P1R2-35			45 ... 180	340			Q65111A1852	
	LG T67F-R1T1-24	green	570	112 ... 355	700			Q65111A1826	
	LB T673-L2P1-25	blue	471	14 ... 56	105	10	120	Q65111A1007	21
	LT T673-N2S1-25	true green	529	35.5 ... 224	390			Q65110A1968	
	LT T673-L2N2-35			14 ... 45	90	2		Q65110A5953	
	LCB T67S-P2R2-2J8L	color on demand blue	0.2 / 0.3	56 ... 180	355	10	120	Q65111A2936	21
	LG T676-P1Q2-24	green	570	45 ... 112	240	20	120	Q65110A2178	21
	LP T676-L1M2-25	pure green	560	11.2 ... 28	60	20	120	Q65110A2179	21
	LG T67K-G2K1-24	green	570	2.24 ... 9	16	2	120	Q65110A2184	21
	LP T67K-E1G2-25	pure green	560	0.71 ... 2.8	5	2	120	Q65110A2187	21
	LH T674-L2P1-1	hyper red	645	14 ... 56	105	10	120	Q65110A3596	21
	LW T673-P1S1-FKPL	white	0.33 / 0.33	45 ... 224	400	10	120	Q65111A2043	21
	LW T6SG-V2BA-JKPL	white	0.33 / 0.33	900 ... 2240	4710	20	120	Q65110A8982	52
	LW T6SG-V1AA-JKPL			710 ... 1400	3165			Q65110A8981	

Interior

TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA T67D-U2AA-24-1	amber	617	560 ... 1400	2940	20	120	Q65110A9889	21
	LO T67D-U2AA-24-1	orange	606					Q65110A9919	
	LR T67D-U1V2-1-1	red	625	450 ... 1120	2360			Q65110A9920	
	LS T67D-T2V1-1-1	super red	633	355 ... 900	1880			Q65110A9896	
	LY T67D-U1V2-36-1	yellow	590	450 ... 1120	2360			Q65110A9898	
	LW TTSD-U1V1-JKPL-1	white	0.33 / 0.33	450 ... 900	2030	20	120	Q65111A0300	52
	LW TTSD-U2V2-JKPL-1			560 ... 1120	2520			Q65111A0301	
	LCB TTSD-T2V1-2J8L	color on demand blue	0.2 / 0.3	355 ... 900	1880	10		Q65111A1160	
	LB TTSD-R1T2-25-1	blue	469	112 ... 450	810	20	120	Q65111A1639	52
	LT TTSD-T2V2-36-1	true green	525	355 ... 1120	2140	10		Q65111A2711	
	LW TVSG.BB-AZBZ-FBKC-1	white	0.33 / 0.34	1500 ... 2800	6500	20	120	Q65111A2884	24
	LW TVSG.BB-BXCX-LBNC-1			1800 ... 3300	7700			Q65111A2473	
	LW TVSG.CB-AZBZ-JKPL-1		0.33 / 0.33	1500 ... 2800	6450			Q65111A2760	
	LW TVSG.CB-BXCX-JKPL-1			1800 ... 3300	7650			Q65111A3555	

Interior

SIDELED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LB A673-L2P1-35	blue	470	14 ... 56	105	10	120	Q65110A1950	22
	LT A673-N2S1-25	true green	529	35.5 ... 224	390			Q65110A1962	
	LT A6SG-V1AB-36	true green	528	710 ... 1800	3765	20	120	Q65110A6030	53
	LT A6SG-V2AB-35			900 ... 1800	4050			Q65110A7884	
	LCB A6SG-U2AB	color on demand blue	0.2 / 0.3	1800 ... 560	3540	20	120	on request	53
	LG A676-P1Q2-24	green	570	45 ... 112	235	20	120	Q65110A2285	22
	LP A676-L1M2-25	pure green	560	11.2 ... 28	60	20	120	Q65110A2286	22
	LG A67K-G2K1-24	green	570	2.24 ... 9	15	2	120	Q65110A2291	22
	LP A67K-E1G2-25	pure green	560	0.71 ... 2.8	5	2	120	Q65110A2294	22
	LO A67K-K1M2-24	orange	606	7.1 ... 28	55	2	120	Q65110A4969	22
	LS A67K-J1L2-1	super red	630	4.5 ... 18	35			Q65110A2018	
	LY A67K-J2M1-26	yellow	587	5.6 ... 22.4	40			Q65110A2067	
	LP A675-N1P2-25	pure green	560	28 ... 71	150	30	120	Q65110A2310	22
	LS A67F-U1AA-1	super red	633	450 ... 1400	2780	30	120	Q65110A4723	22
	LR A67F-U2AB-1	red	625	560 ... 1800	3540			Q65110A4729	
	LA A67F-AABB-24-1	amber	617	1120 ... 2800	5880			Q65111A0513	
	LO A67F-V2BB-24	orange	606	900 ... 2800	5550			Q65110A4867	
	LY A67F-U2AB-36	yellow		560 ... 1800	3540			Q65110A4722	
	LS A676-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2261	22
	LA A676-Q2T1-1	amber	615	90 ... 355	670			Q65110A2255	
	LO A676-Q2T1-24	orange	606					Q65110A2258	
	LY A676-Q2T1-26	yellow	587					Q65110A2264	
	LW A673-P1S1-FKPL	white	0.33 / 0.33	45 ... 224	400	10	120	Q65111A2075	22
	LW A67C-T2U2-5K8L	white	0.33 / 0.33	355 ... 710	1600	20	120	Q65110A1928	22
	LW A67C-S2U2-5K8L			224 ... 710	1400			Q65110A1929	
	LW A6SG-V2BA-JKPL	white	0.33 / 0.33	900 ... 2240	4710	20	120	Q65110A8994	53

Interior

Mini TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LB M673-L1N2-25	blue	471	11.2 ... 45	80	10	120	Q65111A1010	23
	LT M673-N1R2-25	true green	529	28 ... 180	310			Q65110A5930	
	LS M676-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2364	23
	LA M676-Q2T1-1	amber	615	90 ... 355	670			Q65110A2358	
	LO M676-Q2T1-24	orange	606					Q65110A2361	
	LY M676-Q2T1-26	yellow	587					Q65110A2367	
	LG M676-N2Q1-24	green	570	35.5 ... 90	190			Q65110A2389	
	LP M676-L1M2-25	pure green	560	11.2 ... 28	60			Q65110A7809	
	LCB M67S-K2M1-2J8L	color on demand blue	0.2 / 0.3	9 ... 22.4	40	2	120	Q65111A2807	23
	LG M676-N2Q1-24	green	570	35.5 ... 90	190	20	120	Q65110A2389	23
	LP M676-L1M2-25	pure green	560	11.2 ... 28	60	20	120	Q65110A7809	23
	LG M67K-G1J2-24	green	570	1.8 ... 7.1	13.4	2	120	Q65110A2395	23
	LP M67K-D2G1-25	pure green	560	0.56 ... 2.24	4.2	2	120	Q65110A2398	23
	LS M67K-H2L1-1	super red	630	3.55 ... 14	25	2	120	Q65110A2028	23
	LO M67K-J2M1-24	orange	606	5.6 ... 22.4	42			Q65110A2055	
	LY M67K-J1L2-26	yellow	587	4.5 ... 18	33.8			Q65110A2076	
	LG M67K-G1H2-24	green	570	1.8 ... 4.5	9.5			Q65110A2393	
	LG M67K-H1J2-24			2.8 ... 7.1	14.8			Q65110A2394	
	LG M67K-G1J2-24			1.8 ... 7.1	13.4			Q65110A2395	
	LP M67K-D2F1-25	pure green	560	0.56 ... 1.4	2.9			Q65110A2396	
	LP M67K-E2G1-25			0.9 ... 2.24	4.7			Q65110A2397	
	LP M67K-D2G1-25			0.56 ... 2.24	4.2			Q65110A2398	
	LP M675-M2P1-25	pure green	560	22.4 ... 56	120	30	120	Q65110A2399	23
	LO M67F-U2AB-24	orange	606	560 ... 1800	3540	20	120	Q65110A8973	
	LS M67F-S2U2-1	super red	633	224 ... 710	1400			Q65110A8888	
	LY M67F-T2V2-36	yellow	590	355 ... 1120	2210			Q65110A8980	
	LA M67F-V1AB-24	amber	617	710 ... 1800	3770			Q65111A1848	23
	LW M673-P1R2-FKPL	white	0.33 / 0.33	45 ... 180	340	10	120	Q65111A2039	23
	LW M67C-S1T2-5K8L	white	0.33 / 0.33	180 ... 450	950	20	120	Q65110A1936	23
	LW M67C-T1U2-5K8L			280 ... 710	1490			Q65110A1937	
	LW M67C-S1U2-5K8L			180 ... 710	1340			Q65110A1938	

Interior

Mini TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LCW MTSG-U2V2-4L8N	◯ warm white	0.38 / 0.38	560 ... 1120	2520	10	120	Q65111A2101	28

SMARTLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LG L29K-F2J1-24	green	570	1.4 ... 5.6	14	2	160	Q65110A1745	25
	LS L29K-G1J2-1	super red	630	1.8 ... 7.1	18			Q65110A1757	
	LO L29K-H2L1-24	orange	606	3.55 ... 14	35			Q65110A1751	
	LY L29K-H1K2-26	yellow	587	2.8 ... 11.2	28			Q65110A1766	
	LS L296-N1Q2-1	super red	633	28 ... 112	280	20	160	Q65110A1754	25
	LA L296-P1R2	amber	615	45 ... 180	450			Q65110A3235	
	LO L296-P1S1-24	orange	606	45 ... 224	538			Q65110A1905	
	LY L296-P1R2-26	yellow	587	45 ... 180	450			Q65110A1764	
	LP L296-J2L2-25	pure green	560	5.6 ... 18	35			Q65110A3342	
	LW L283-Q1R2-3K8L-1	◯ white	0.32 / 0.31	71 ... 180	502	10	170 (horizontal) 130 (vertical)	Q65110A1647	25
	LW L283-P2R1-3K8L-1			56 ... 140	392			Q65110A1550	

SMARTLED XR

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS L196-N1R2-1	super red	633	28 ... 180	430	20	150	Q65111A0708	26
	LY L196-P1S1-26	yellow	587	45 ... 224	555			Q65111A0703	

Interior

PointLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS P47F-U1AA-1-1	super red	633	450 ... 1400	2780	30	120	Q65110A4859	27
	LR P47F-U2AB-1-1	red	625	560 ... 1800	3540			Q65110A4861	
	LA P47F-V2BB-24-3A4B	amber	617	900 ... 2800	5550			Q65110A4857	
	LA P47F-V2BB-24-3B5A							Q65110A9267	
	LY P47F-U2AB-36-4A5B	yellow	590	560 ... 1800	3540			Q65110A9266	
	LY P47F-U2AB-36-3B5A							Q65110A4860	
	LP P47F-P2S1-35	pure green	560	56 ... 224	420			Q65111A1828	
	LP P47F-P1R1-24			45 ... 140	280			Q65111A1827	
	LB P4SG-S2U1-35-1	blue	470	224 ... 560	1180	20	120	Q65110A8252	27
	LT P4SG-V1AB-36-1	true green	528	710 ... 1800	3770			Q65110A7127	
	LCB P473-P2R2	color on demand blue	0.2 / 0.3	180 ... 56	350	10	120	on request	54
	LO P476-R2T1-24	orange	606	140 ... 355	740	20	120	Q65110A7018	54
	LY P476-Q2T1-26	yellow	587	90 ... 355	670	20	120	Q65110A4881	54
	LS P47K-H1K2-1	super red	630	2.8 ... 11.2	21	2	120	Q65110A2733	54
	LY P47K-J1L2-26	yellow	587	4.5 ... 18	34			Q65110A2738	
	LG P47K-G2K1-24	green	570	2.24 ... 9	17			Q65110A2730	
	LW P473-Q2S1-FKPL-1	white	0.33 / 0.33	90 ... 224	470	10	120	Q65111A2066	54
	LW P4SG-V2AB-JKPL-1	white	0.33 / 0.33	900 ... 1800	4050	20	120	Q65110A9047	27

Interior

Micro SIDELED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS Y876-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2412	29
	LO Y876-Q2T1-24	orange	606	90 ... 355	670			Q65110A2410	
	LY Y876-Q2T1-26	yellow	587					Q65110A2415	
	LG Y876-P1Q2-24	green	570	45 ... 112	240			Q65110A8025	
	LR Y8SF-U1V2-1	red	625	450 ... 1120	2400	20	120	Q65110A8972	29
	LY Y8SF-U1V2-36	yellow	590					Q65110A8977	

MULTILED

Package	Type	Emission color	Cx/Cy	I_V [mcd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LTRBGFSF-ABCB-QKY0	white	0.31 / 0.31	1400 ... 4500	20 (T) 20 (R) 10 (B)	120	Q65110A9484	42

Multi TOPLED

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	I_V [mcd] color 2	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LOG T77K-JL-1-0+GJ-1	orange green	606 / 570	4.5 ... 18	1.8 ... 7.1	2	120	Q65110A3338	51
	LSG T77K-JL-1-0+HK-1-0	super red green	630 / 570	4.5 ... 18	2.8 ... 11.2	2	120	Q65111A0238	51
	LSY T676-P2R1-1-0+Q2S1-35	super red yellow	633 / 587	56 ... 140	90 ... 224	20	120	Q65110A2446	16
	LSG T676-P7Q7-1+N7P7-24	super red green	633 / 570	56 ... 140	35.5 ... 90	20	120	Q65110A4186	16
	LSG T676-P7R-1-0+N7P9-24			56 ... 180	35.5 ... 100			Q65111A1615	

Mobile Applications

CERAMOS

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LUW C9EP-7K6L-EG	◯ ultra white	0.31 / 0.32	90 ... 140	38	500	120	Q65111A1126	30
	LUW C9SP-8K6L-EG	◯ ultra white	0.31 / 0.32	100 ... 140	39.6	500	120	Q65111A1127	30
	LUW C9EN-N4N6-EG	◯ ultra white	0.31 / 0.32	75 ... 105	28	500	120	Q65110A9846	30
	LUW CAEP-LFLZ-G3-E	◯ ultra white	0.33 / 0.36	125 ... 180	45.8	500	120	Q65111A0768	55
	LUW CAEP.G4-MXMZ-G3-1	◯ ultra white	0.33 / 0.36	180 ... 280	69	1000	120	Q65111A2947	55
	LUW CAEP.G4-MYNX-G3-1			210 ... 330	81			Q65111A1991	

FIREFLY

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LT VH9G-Q2S2-25-1	● true green	532	90 ... 280	560	5	140 (horizontal) 165 (vertical)	Q65110A9228	31
	LB VH9G-N1P2-35-1	● blue	470	28 ... 71	150			Q65110A8083	
	LW VH8G-Q2S2-4M6N-1	◯ white	0.285 / 0.275	90 ... 280	560	5	140 (horizontal) 180 (vertical)	Q65110A8090	31
	LA VH9F-Q1R2-24	● amber	615	71 ... 180	380	5	140 (horizontal) 165 (vertical)	Q65110A8082	31
	LR VH9F-P2R1-1	● red	625	56 ... 140	290			Q65110A8088	

Backlighting

Multi CERAMOS

Package	Type	Emission color	Cx/Cy	I_V [mcd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LRTDC9TP-EAFB-GHQN	◯ white	0.28 / 0.21	7100 ... 18000	140 (R) 160 (T) 125 (D)	120	Q65110A8562	32

Micro SIDELED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LW Y1SG-AEBE-EKFM-1	◯ white	0.3 / 0.28	1000 ... 1600	3900	20	120	Q65110A9541	64
	LW Y1SG-AEBE-GKJM-1							Q65110A9542	
	LW Y1SG-AFBF-EKFM-1			1200 ... 1800	4500			Q65110A9543	
	LW Y1SG-AFBF-GKJM-1							Q65110A9544	
	LW Y1SG-BFCF-EKFM-1			1600 ... 2200	5700			Q65110A9545	
	LW Y1SG-BFCF-GKJM-1							Q65110A9546	

Projection

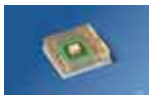
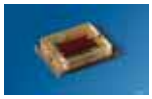
OSRAM OSTAR Projection

Package	Type	Emission color	Color coordinates Cx/Cy typ.	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
OSRAM OSTAR Projection Cube								
	LCG H9RM-KZLZ-1	converted green	0.318 / 0.642	97 ... 180	350	120	Q65111A1779	33
	LCG H9RN-MXNX-1	converted green	0.318 / 0.642	180 ... 330	700	120	Q65111A1778	33

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
OSRAM OSTAR Projection Power								
	LE A P3W-TXTZ-1	amber	617	2800 ... 4500	6000	120	Q65110A9038	66
	LE CG P3W-8U6V-1	converted green	0.318 / 0.642	6300 ... 9000	6000	130	Q65111A1846	66
	LE B P3W-GXHX-24	blue	459	18 ... 33	6000	120	Q65110A9036	66

Projection

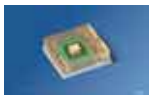
OSRAM OSTAR Projection

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
OSRAM OSTAR Projection Compact								
	LE A Q9WM-HYJY-1	amber	617	33 ... 61	350	120	Q65111A1647	35
	LE T Q9WM-JXKX-25	true green	525	45 ... 82	350	120	Q65110A9131	35
	LE A Q9WN-JZKZ-1	amber	617	61 ... 112	700	120	Q65111A1648	36
	LE T Q9WN-KZLZ-25	true green	525	97 ... 180	700	120	Q65110A9134	36
	LE A Q9WP-KZLZ-1	amber	617	97 ... 180	1400	120	Q65110A9145	34
	LE T Q9WP-MXNX-24	true green	536	180 ... 330	1400	120	Q65110A9137	34
	LE CG Q9WP-6N5P-1	converted green	0.318 / 0.642	315 ... 500	1400	130	Q65111A1356	34
	LE A Q6WP-MYNY-1	amber	617	210 ... 390	1400	120	Q65111A2071	38
	LE CG Q6WP-5Q8Q-1	converted green	0.318 / 0.642	710 ... 1120	1400	130	Q65111A2074	38

Projection

OSRAM OSTAR Projection

OSRAM OSTAR Projection Compact

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE B Q9WP-3V7A-24	blue	459	900 ... 1590	1400	120	Q65110A9144	34
	LE B Q9WM-4S3T-24	blue	460	250 ... 400	350	120	Q65111A2345	35
	LE B Q9WN-2U2V-24	blue	460	500 ... 900	700	120	Q65111A2386	36
	LE B Q6WP-5B5C-24	blue	459	1800 ... 3150	1400	120	Q65111A2073	38

Package	Type	Emission color	λ_{dom} (typ.) [nm]	color 1 Φ_V [lm]	color 2 Φ_V [lm]	color 3 Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE ATB N7WM-HYJX-1+JYKX-23+4S3T-CE	amber true green blue	617 / 525 / 460	33 ... 52	52 ... 82	250 ... 400	350	120	Q65111A0733	56

Package	Type	Emission color	λ_{dom} (typ.) [nm]	color 1 Φ_E [mW]	color 2 Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE BA Q6WM-4S3T-CE+HYJY-23	blue amber	460 / 617	250 ... 400	33 ... 61	350	120	Q65111A1646	37

Signs and Signals

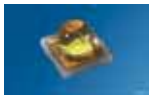
OSLON SX

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA CN5M-GAHA-24-1	amber	617	18 ... 35.5	18.7	140	60	Q65111A1207	17
	LY CN5M-FAGA-36-1	yellow	590	11.2 ... 22.4	11.8			Q65110A8680	
	LT CN5M-GAHB-25-1	true green	528	18 ... 45	22.1	140	60	Q65110A9086	17
	LUW CN5M-GBHB-5P7R-1	ultra white	0.32 / 0.31	22.4 ... 45	23.6	140	60	Q65111A3434	3

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD CN5M-4Q4R-35-1	deep blue	453	100 ... 180	140	60	Q65110A8683	17
	LD CN5M-1R1S-35-1			112 ... 201			Q65110A9085	

Signs and Signals

OSLON Signal

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LV CK7P-JYKZ-25	verde green	505	52 ... 112	48.6	350	80	Q65111A2323	39
	LB CL7P-HZJZ-3B6B	blue	0.12 / 0.16	39 ... 71	32.6	350	80	Q65111A2433	39
	LA CP7P-JUKR-34	amber	617	65.8 ... 89.2	43.1	350	80	Q65111A3124	39
	LY CP7P-JRJU-45	yellow	590	52 ... 71	34.2	350	80	Q65111A3125	39

Signs and Signals

OSLON Black

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA H9GP-JYKY-24-1	amber	617	52 ... 97	36.6	350	90	Q65111A1982	5
	LR H9GP-HZKX-1-1	red	625	39 ... 82	29.7			Q65111A1707	
	LY H9GP-HZKX-36-1	yellow	590					Q65111A1708	
	LS H9GP-HYJY-1-9B9C	super red	633	33 ... 61	23.1			Q65111A2566	
	LB H9GP-GYHY-35-1	blue	470	21 ... 39	15	350	90	Q65111A1710	
	LT H9GP-JZKZ-26-1	true green	528	61 ... 112	43.3			Q65111A1717	5
	LUW H9GP-KYLY-4C8E-1	ultra white	0.31 / 0.32	82 ... 150	55.7	350	90	Q65111A0924	5
	LUW H9GP-KYLY-5F8G-1							Q65111A0925	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD H9GP-3T2U-35-1	deep blue	455	355 ... 560	350	90	Q65111A1709	5

Signs and Signals

DRAGON

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
Golden DRAGON									
	LB W5SM-FZHX-35	blue	467	15 ... 33	7.9	350	120	Q65110A9221	6
	LT W5SM-JYKY-25	true green	528	52 ... 97	24.6	350	120	Q65110A9212	6
	LT W5SM-JXKX-36			45 ... 82	21			Q65110A8417	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD W5SM-4S4T-35	deep blue	455	250 ... 450	350	120	Q65110A9216	6

Signs and Signals

DRAGON

Platinum DRAGON

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LB W5SN-GZJX-35	blue	470	24 ... 52	12.5	700	120	Q65110A7464	8
	LB W5SN-GYHZ-25			21 ... 45	10.9			Q65110A9222	
	LT W5SN-KYLY-25	true green	528	82 ... 150	38.3	700	120	Q65110A9211	8
	LCW W5SN-KYLY-4L8N	warm white	0.42 / 0.4	82 ... 150	38.3	700	120	Q65110A7706	8
	LCW W5SN-KXLX-4O9Q			71 ... 130	33.2			Q65110A7708	
	LCW W5SN-KYLY-4J8K			82 ... 150	38.3			Q65110A7707	
	LCW W5SN-KXLX-4U9X			71 ... 130	33.2			Q65110A9713	
	LCW W5SN-KYLY-4R9T			82 ... 150	38.3			Q65110A9717	
	LV W5SN-KXLX-25	verde green	505	71 ... 130	33.2	700	120	Q65111A0320	8

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD W5SN-1U2V-35	deep blue	455	450 ... 900	700	120	Q65111A0040	8

Signs and Signals

TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LR T68F-U1AA-1-1	red	625	450 ... 1400	2780	20	120	Q65110A7321	65
	LY T686-Q2T1-26	yellow	587	90 ... 355	670	20	120	Q65110A2213	21
	LV T6SG-V1BB-25	verde	505	710 ... 2800	5270	20	120	Q65111A1658	21

TOPLED Black

	LO T66F-AACA-24-1	orange	606	1120 ... 3550	2335	20	55	Q65111A0147	57
	LR T66F-AABB-1-1	red	625	1120 ... 2800	1960			Q65111A1792	
	LY T66F-ABBB-46-1	yellow	590	1400 ... 2800	2100		55	Q65110A8570	
	LY T66F-AABA-35-1			1120 ... 2240	1680			Q65110A8569	
	LB T66G-U1BA-59	blue	470	450 ... 2240	1345	20	55	Q65111A0145	57
	LT T66G-BBDA-29	true green	528	2240 ... 5600	3920			Q65111A0146	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	E_V [lux]	I_V typ. [mcd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LO T64F-CBEB-24-1	orange	606	3550 ... 11200	6040	20	30	Q65111A0265	40
	LR T64F-BBDB-1-1	red	625	2240 ... 7100	3820			Q65111A0256	
	LY T64F-BBDA-35-1	yellow	590	2240 ... 5600	3210			Q65111A0257	
	LY T64F-CADB-46-1			2800 ... 7100	4050			Q65111A0258	
	LB T64G-V1CA-59	blue	470	710 ... 3550	1740	20	30	Q65111A0143	40
	LT T64G-DAFA-29	true green	528	4500 ... 14000	7580			Q65111A0144	
	LV T64G-BBEA-25	verde	505	2240 ... 9000	4590			Q65111A2028	

Signs and Signals

MULTILED

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	color 2	color 3	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LRTBGFUG-S5T9-1+U7V5-29+R5S7-49	red true green blue	625 / 528 / 470	201 ... 630	560 ... 1250	125 ... 355	20	120	Q65111A3098	41
	LRTBGFTG-T7AW-1+V7A7-29+R5T9-49	red true green blue	625 / 528 / 470	355 ... 1800	900 ... 2240	125 ... 630	20	120	Q65110A8177	42
	LRTBGFTM-ST7-1+VV9-29+Q5R7-49	red true green blue	625 / 528 / 470	180 ... 560	710 ... 1590	80 ... 224	10	120	Q65110A9407	42

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	color 2	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LRT GFTM-ST7-1+VV9-29	red true green	625 / 528	180 ... 560	710 ... 1590	10	120	Q65111A0439	58

Multi CERAMOS

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	color 2	color 3	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LRTBC9TP-CWD5-1+D5E7-25+A7CW-49	red true green blue	625 / 528 / 470	2800 ... 8000	5000 ... 14000	1400 ... 4500	140	120	Q65111A2182	32

Signs and Signals

Multi CHIPLED

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	color 2	color 3	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LRTBR98G-R5T-1+S7T7-35+PQ-47	red true green blue	625 / 503 / 470	125 ... 450	224 ... 710	56 ... 180	20	120	Q65111A3103	43

OSRAM OSTAR SMT

Package	Type	Emission color	Color coordinates Cx/Cy typ.	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE UW S2W-PXQX-4P7R	ultra white	0.31 / 0.32	450 ... 820	700	120	Q65111A0205	44

Package	Type	Emission color	λ_{dom} (typ.) [nm]	color 1 Φ_V [mlm]	color 2 Φ_V [mlm]	color 3 Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE ATB S2W-JWKW-1+MANA-25+2U2V-24	amber true green blue	617 / 529 / 464	45 ... 112	180 ... 355	500 ... 900	700	120	Q65111A2488	44

OSRAM OSTAR Stage

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	color 1 Φ_V [lm]	color 2 Φ_V [lm]	color 3 Φ_E [mW]	color 4 Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE RTDUW S2W	red true green deep blue ultra white	625 / 527 / 453 / 0.31 / 0.32	45 ... 112	90 ... 180	560 ... 900	140 ... 224	700	120	Q65111A0884	44

Electronic Equipment

Advanced Power TOPLED Plus

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LUW G5GP-GXHY-5C8E	◯ ultra white	0.31 / 0.32	18 ... 39	7.4	100	135	Q65110A9093	59
	LUW G5GP-GXHY-5F8G							Q65110A9091	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA G5AP-CZDZ-24-1	● amber	617	3900 ... 7100	24200	100	145	Q65111A1021	59
	LMW G5AP-7C8D-NZN6-DF-LH	◯ multiphosphor white	0.26 / 0.22	3550 ... 7100	23400	100	135	Q65110A9418	59
	LUW G5AP-5D5E-BG-P4P6-LH	◯ ultra white	0.25 / 0.2	4500 ... 8000	27500	100	135	Q65110A9419	59

Electronic Equipment

Power TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA E67F-BACA-24-3A4B	amber	617	1800 ... 3550	8000	50	120	Q65110A9090	11
	LA E67F-BACA-24-3B5A							Q65110A9089	
	LY E67F-AABA-35-1	yellow	590	1120 ... 2240	5000			Q65110A9019	
	LY E67F-ABBB-46-1			1400 ... 2800	6300			Q65110A9018	
	LS E67F-ABBB-1-1	super red	633					Q65111A1118	
	LO E67F-BADA-24-1	orange	606	1800 ... 5600	11100			Q65111A0963	
	LR E67F-ABCA-1-1	red	625	1400 ... 3550	7400			Q65111A2785	
	LR E6SF-ABCA-1-1	red	625	1400 ... 3550	7430	50	120	Q65111A0958	11
	LA E6SF-BBCB-24-1	amber	617	2240 ... 4500	10110			Q65110A6262	
	LO E6SF-ABCB-24-1	orange	606	1400 ... 4500	8850			Q65110A7524	
	LY E6SF-V2AB-35-1	yellow	590	900 ... 1800	4050			Q65110A7525	
	LY E6SF-AABA-46-1			1120 ... 2240	5040			Q65110A6209	
	LA ETSF-BACB-24-1	amber	617	1800 ... 4500	9500	50	120	Q65110A9777	11
	LY ETSF-AABA-35-1	yellow	590	1120 ... 2240	5000			Q65110A9778	
	LB E6SG-T1U2-35	blue	470	280 ... 710	1485	30	120	Q65110A7883	12
	LT E6SG-AABB-35-1	true green	525	1120 ... 2800	5880			Q65111A0322	
	LCB E6SG-AABB-2J8L	color on demand blue	0.2 / 0.3	1120 ... 2800	5880	30	120	on request	12
	LCW E6SG-V1AB-4R9T	warm white	0.42 / 0.4	710 ... 1800	3765	30	120	Q65110A7737	12
	LCW E6SG-V1AB-4U9X							Q65110A7736	
	LCW E6SG-V2BA-4L8N			900 ... 2240	4710			Q65110A7734	
	LCW E6SG-V2BA-4J8K							Q65110A7735	
	LCW E6SG-V2BA-4O9Q							Q65110A7733	
	LP E675-P2R1-25	pure green	560	56 ... 140	294	50	120	Q65110A7298	18
	LW ETSG-AABB-JKPL-1	white	0.33 / 0.33	1120 ... 2800	5900	30	120	Q65111A0196	12
	LW E6SG-AABA-JKPL-1	white	0.33 / 0.33	1120 ... 2240	5000	30	120	Q65110A8964	12

Electronic Equipment

Power TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy	E_V	Φ_V typ.	at I_F	Viewing angle at 50 % I_V 2φ typ.	Ordering Code	Package Fig.
			[nm / -]	[lux]	[mlm]	[mA]	[°]		
	LA E63F-EBGA-24-3A4B	amber	617	9000 ... 22400	6300	50	30	Q65110A4103	13
	LS E63F-DBFA-1	super red	633	5600 ... 14000	3900			Q65110A4105	
	LY E63F-DBEB-35-1	yellow	590	5600 ... 11200	3400			Q65110A4108	
	LY E63F-EAFA-46-1			7100 ... 14000	4200			Q65110A4107	
	LB E63C-T2V2-35-34	blue	469	355 ... 1120	400	30	20	Q65110A1974	20
	LT E63C-BADB-35-1	true green	525	1800 ... 7100	2700			Q65110A1981	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy	I_V	Φ_V typ.	at I_F	Viewing angle at 50 % I_V 2φ typ.	Ordering Code	Package Fig.
			[nm / -]	[mcd]	[mlm]	[mA]	[°]		
	LS E65F-BBDA-1	super red	633	2240 ... 5600	4500	50	60	Q65110A4106	14
	LA E65F-CBEA-24-3A4B	amber	617	3550 ... 9000	7200			Q65110A4104	
	LY E65F-CBDB-35	yellow	590	3550 ... 7100	6100			Q65110A6456	
	LY E65F-DAEB-46-1			4500 ... 11200	8900			Q65111A1412	

Electronic Equipment

TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS T676-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2153	21
	LO T676-Q2T1-24	orange	606	90 ... 355	670			Q65110A2150	
	LY T676-Q2T1-26	yellow	587					Q65110A2156	
	LA T676-Q2T1-24	amber	615					Q65110A9273	
	LS T67F-T2V2-1-1	super red	633	355 ... 900	1880	20	120	Q65110A9233	21
	LR T67F-U1AA-1-1	red	625	450 ... 1400	2780			Q65110A9232	
	LA T67F-U2AB-24-1	amber	617	560 ... 1800	3540			Q65110A9268	
	LY T67F-U1AA-36-1	yellow	590	450 ... 1400	2780			Q65110A9231	
	LP T67F-N1Q2-24	pure green	560	28 ... 112	210			Q65111A1851	
	LP T67F-P1R2-35			45 ... 180	340			Q65111A1852	
	LG T67F-R1T1-24	green	570	112 ... 355	700			Q65111A1826	
	LB T673-L2P1-25	blue	471	14 ... 56	105	10	120	Q65111A1007	21
	LT T673-N2S1-25	true green	529	35.5 ... 224	390			Q65110A1968	
	LT T673-L2N2-35			14 ... 45	90	2		Q65110A5953	
	LCB T67S-P2R2-2J8L	color on demand blue	0.2 / 0.3	56 ... 180	355	10	120	Q65111A2936	21
	LG T676-P1Q2-24	green	570	45 ... 112	240	20	120	Q65110A2178	21
	LP T676-L1M2-25	pure green	560	11.2 ... 28	60	20	120	Q65110A2179	21
	LG T67K-G2K1-24	green	570	2.24 ... 9	16.86	2	120	Q65110A2184	21
	LP T67K-E1F2-25	pure green	560	0.71 ... 1.8	3.765	2	120	Q65110A2185	21
	LP T67K-F1G2-25			1.12 ... 2.8	5.88			Q65110A2186	
	LP T67K-E1G2-25			0.71 ... 2.8	5.265			Q65110A2187	
	LH T674-L2P1-1	hyper red	645	14 ... 56	105	10	120	Q65110A3596	21
	LW T673-P1S1-FKPL	white	0.33 / 0.33	45 ... 224	400	10	120	Q65111A2043	21
	LW T6SG-V2BA-JKPL	white	0.33 / 0.33	900 ... 2240	4710	20	120	Q65110A8982	52
	LW T6SG-V1AA-JKPL			710 ... 1400	3165			Q65110A8981	

Electronic Equipment

TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LA T67D-U2AA-24-1	amber	617	560 ... 1400	2940	20	120	Q65110A9889	21
	LO T67D-U2AA-24-1	orange	606					Q65110A9919	
	LR T67D-U1V2-1-1	red	625	450 ... 1120	2360			Q65110A9920	
	LS T67D-T2V1-1-1	super red	633	355 ... 900	1880			Q65110A9896	
	LY T67D-U1V2-36-1	yellow	590	450 ... 1120	2360			Q65110A9898	

Electronic Equipment

SIDELED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LB A673-L2P1-35	blue	470	14 ... 56	105	10	120	Q65110A1950	22
	LT A673-N2S1-25	true green	529	35.5 ... 224	390			Q65110A1962	
	LT A6SG-V1AB-36	true green	528	710 ... 1800	3765	20	120	Q65110A6030	53
	LT A6SG-V2AB-35			900 ... 1800	4050			Q65110A7884	
	LCB A6SG-U2AB	color on demand blue	0.2 / 0.3	1800 ... 560	3540	20	120	on request	53
	LG A676-P1Q2-24	green	570	45 ... 112	235	20	120	Q65110A2285	22
	LP A676-L1M2-25	pure green	560	11.2 ... 28	60	20	120	Q65110A2286	22
	LG A67K-G2K1-24	green	570	2.24 ... 9	15	2	120	Q65110A2291	22
	LP A67K-E1G2-25	pure green	560	0.71 ... 2.8	5	2	120	Q65110A2294	22
	LO A67K-K1M2-24	orange	606	7.1 ... 28	55	2	120	Q65110A4969	22
	LS A67K-J1L2-1	super red	630	4.5 ... 18	35			Q65110A2018	
	LY A67K-J2M1-26	yellow	587	5.6 ... 22.4	40			Q65110A2067	
	LP A675-N1P2-25	pure green	560	28 ... 71	150	30	120	Q65110A2310	22
	LS A67F-U1AA-1	super red	633	450 ... 1400	2780	30	120	Q65110A4723	22
	LR A67F-U2AB-1	red	625	560 ... 1800	3540			Q65110A4729	
	LA A67F-AABB-24-1	amber	617	1120 ... 2800	5880			Q65111A0513	
	LO A67F-V2BB-24	orange	606	900 ... 2800	5550			Q65110A4867	
	LY A67F-U2AB-36	yellow		560 ... 1800	3540			Q65110A4722	
	LS A676-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2261	22
	LA A676-Q2T1-1	amber	615	90 ... 355	670			Q65110A2255	
	LO A676-Q2T1-24	orange	606					Q65110A2258	
	LY A676-Q2T1-26	yellow	587					Q65110A2264	

Electronic Equipment

Mini TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LB M673-L1N2-25	blue	471	11.2 ... 45	80	10	120	Q65111A1010	23
	LT M673-N1R2-25	true green	529	28 ... 180	310			Q65110A5930	
	LS M676-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2364	23
	LA M676-Q2T1-1	amber	615	90 ... 355	670			Q65110A2358	
	LO M676-Q2T1-24	orange	606					Q65110A2361	
	LY M676-Q2T1-26	yellow	587					Q65110A2367	
	LG M676-N2Q1-24	green	570	35.5 ... 90	190			Q65110A2389	
	LP M676-L1M2-25	pure green	560	11.2 ... 28	60			Q65110A7809	
	LCB M67S-K2M1-2J8L	color on demand blue	0.2 / 0.3	9 ... 22.4	40	2	120	Q65111A2807	23
	LG M676-N2Q1-24	green	570	35.5 ... 90	190	20	120	Q65110A2389	23
	LP M676-L1M2-25	pure green	560	11.2 ... 28	60	20	120	Q65110A7809	23
	LG M67K-G1J2-24	green	570	1.8 ... 7.1	13.4	2	120	Q65110A2395	23
	LP M67K-D2G1-25	pure green	560	0.56 ... 2.24	4.2	2	120	Q65110A2398	23
	LS M67K-H2L1-1	super red	630	3.55 ... 14	25	2	120	Q65110A2028	23
	LO M67K-J2M1-24	orange	606	5.6 ... 22.4	42			Q65110A2055	
	LY M67K-J1L2-26	yellow	587	4.5 ... 18	33.8			Q65110A2076	
	LG M67K-G1J2-24	green	570	1.8 ... 7.1	13.4			Q65110A2395	
	LP M67K-D2G1-25	pure green	560	0.56 ... 2.24	4.2			Q65110A2398	
	LP M675-M2P1-25	pure green	560	22.4 ... 56	120	30	120	Q65110A2399	23
	LO M67F-U2AB-24	orange	606	560 ... 1800	3540	20	120	Q65110A8973	23
	LS M67F-S2U2-1	super red	633	224 ... 710	1400			Q65110A8888	
	LY M67F-T2V2-36	yellow	590	355 ... 1120	2210			Q65110A8980	
	LA M67F-V1AB-24	amber	617	710 ... 1800	3770			Q65111A1848	
	LW M673-P1R2-FKPL	white	0.33 / 0.33	45 ... 180	340	10	120	Q65111A2039	23
	LW M67C-S1T2-5K8L	white	0.33 / 0.33	180 ... 450	950	20	120	Q65110A1936	23
	LW M67C-T1U2-5K8L			280 ... 710	1490			Q65110A1937	
	LW M67C-S1U2-5K8L			180 ... 710	1340			Q65110A1938	
	LCW MTSG-U2V2-4L8N	warm white	0.38 / 0.38	560 ... 1120	2520	10	120	Q65111A2101	28

Electronic Equipment

CHIPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
CHIPLED 1206									
	LH N974-KN-1	hyper red	645	7.1 ... 45	15	20	160	Q62702P5192	60
CHIPLED 0805									
	LS R976-NR-1	super red	633	28 ... 180	330	20	160	Q62702P5178	46
	LO R976-PS-1	orange	606	45 ... 280	520			Q62702P5101	
	LY R976-PS-36	yellow	588					Q62702P5177	
CHIPLED 0603									
	LS Q971-KN-1	super red	628	7.1 ... 45	60	20	160	Q65110A4282	61
	LO Q971-JM-1	orange	606	4.5 ... 28	40			Q65110A4285	
	LY Q971-H1L2-36	yellow	587	2.8 ... 18	20			Q62703Q4699	
	LG Q971-KN-1	green	570	7.1 ... 45	60			Q62702P5189	
	LS Q976-NR-1	super red	633	28 ... 180	330	20	160	Q62702P5187	47
	LO Q976-PS-25	orange	605	45 ... 280	520			Q62702P5188	
	LY Q976-P1S2-36	yellow	587					Q62702P5276	
	LG Q976-MP-24	green	572	18 ... 71	130		130	Q65110A8842	
	LT Q39E-Q1S2-25-1	true green	530	71 ... 280	440	5	155 (horizontal) 135 (vertical)	Q65110A7998	48
CHIPLED 0402									
	LB QH9G-N1P2-35-1	blue	466	28 ... 71	150	5	155 (horizontal) 170 (vertical)	Q65110A8032	49
	LT QH9G-Q2S2-25-1	true green	525	90 ... 280	560			Q65110A9219	
	LR QH9F-P2R1-1	red	625	56 ... 140	290	5	120 (horizontal) 130 (vertical)	Q65110A8031	49
	LY QH9F-P1R1-36	yellow	590	45 ... 140	280			Q65110A8028	

Electronic Equipment

SMARTLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LG L29K-F2J1-24	green	570	1.4 ... 5.6	14	2	160	Q65110A1745	25
	LS L29K-G1J2-1	super red	630	1.8 ... 7.1	18			Q65110A1757	
	LO L29K-H2L1-24	orange	606	3.55 ... 14	35			Q65110A1751	
	LY L29K-H1K2-26	yellow	587	2.8 ... 11.2	28			Q65110A1766	
	LS L296-N1Q2-1	super red	633	28 ... 112	280	20	160	Q65110A1754	25
	LA L296-P1R2	amber	615	45 ... 180	450			Q65110A3235	
	LO L296-P1S1-24	orange	606	45 ... 224	538			Q65110A1905	
	LY L296-P1R2-26	yellow	587	45 ... 180	450			Q65110A1764	
	LP L296-J2L2-25	pure green	560	5.6 ... 18	35			Q65110A3342	
	LW L283-P2R1-3K8L-1	white	0.32 / 0.31	56 ... 140	392	10	170 (horizontal) 130 (vertical)	Q65110A1550	25
	LW L283-Q1R2-3K8L-1			71 ... 180	502			Q65110A1647	

SMARTLED XR

	LS L196-N1R2-1	super red	633	28 ... 180	430	20	150	Q65111A0708	26
	LY L196-P1S1-26	yellow	587	45 ... 224	555			Q65111A0703	

Electronic Equipment

PointLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS P47F-U1AA-1-1	super red	633	450 ... 1400	2780	30	120	Q65110A4859	27
	LR P47F-U2AB-1-1	red	625	560 ... 1800	3540			Q65110A4861	
	LA P47F-V2BB-24-3A4B	amber	617	900 ... 2800	5550			Q65110A4857	
	LA P47F-V2BB-24-3B5A							Q65110A9267	
	LY P47F-U2AB-36-4A5B	yellow	590	560 ... 1800	3540			Q65110A9266	
	LY P47F-U2AB-36-3B5A							Q65110A4860	
	LP P47F-P2S1-35	pure green	560	56 ... 224	420			Q65111A1828	
	LP P47F-P1R1-24			45 ... 140	280			Q65111A1827	
	LB P4SG-S2U1-35-1	blue	470	224 ... 560	1180	20	120	Q65110A8252	27
	LT P4SG-V1AB-36-1	true green	528	710 ... 1800	3770			Q65110A7127	
	LCB P473-P2R2	color on demand blue	0.2 / 0.3	180 ... 56	350	10	120	on request	54
	LG P47K-G2K1-24	green	570	2.24 ... 9	17	2	120	Q65110A2730	54
	LO P476-R2T1-24	orange	606	140 ... 355	740	20	120	Q65110A7018	54
	LY P476-Q2T1-26	yellow	587	90 ... 355	670	20	120	Q65110A4881	54
	LS P47K-H1K2-1	super red	630	2.8 ... 11.2	21	2	120	Q65110A2733	54
	LY P47K-J1L2-26	yellow	587	4.5 ... 18	34			Q65110A2738	
	LW P473-Q2S1-FKPL-1	white	0.33 / 0.33	90 ... 224	470	10	120	Q65111A2066	54
	LW P4SG-V2AB-JKPL-1	white	0.33 / 0.33	900 ... 1800	4050	20	120	Q65110A9047	27
	LW P4SG-V2AB-JKPL-1-F							Q65110A9048	

Electronic Equipment

FIREFLY

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LT VH9G-Q2S2-25-1	true green	532	90 ... 280	560	5	140 (horizontal) 165 (vertical)	Q65110A9228	31
	LB VH9G-N1P2-35-1	blue	470	28 ... 71	150			Q65110A8083	
	LW VH8G-Q2S2-4M6N-1	white	0.285 / 0.275	90 ... 280	560	5	140 (horizontal) 180 (vertical)	Q65110A8090	31
	LA VH9F-Q1R2-24	amber	615	71 ... 180	380	5	140 (horizontal) 165 (vertical)	Q65110A8082	31
	LR VH9F-P2R1-1	red	625	56 ... 140	290			Q65110A8088	

Micro SIDELED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LS Y876-P2S1-1	super red	633	56 ... 224	420	20	120	Q65110A2412	29
	LO Y876-Q2T1-24	orange	606	90 ... 355	670			Q65110A2410	
	LY Y876-Q2T1-26	yellow	587					Q65110A2415	
	LG Y876-P1Q2-24	green	570	45 ... 112	240			Q65110A8025	
	LW Y8SG-V1AA-3K6L	white	0.3 / 0.28	710 ... 1400	3170	20	120	Q65110A7980	29
	LB Y8SG-T1U2-35-1	blue	470	280 ... 710	1490	20	120	Q65110A8976	29
	LT Y8SG-V1AB-36-1	true green	528	710 ... 1800	3770			Q65110A8975	
	LR Y8SF-U1V2-1	red	625	450 ... 1120	2400	20	120	Q65110A8972	29
	LY Y8SF-U1V2-36	yellow	590					Q65110A8977	

Electronic Equipment

MULTILED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LYYYG6SF-CADB-45	yellow	587	2800 ... 7100	14850	50	120	Q65110A8529	15

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	color 2	color 3	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LRTBGFUG-S5T9-1+U7V5-29+R5S7-49	red true green blue	625 / 528 / 470	201 ... 630	560 ... 1250	125 ... 355	20	120	Q65111A3098	41
	LRTBGFTG-T7AW-1+V7A7-29+R5T9-49	red true green blue	625 / 528 / 470	355 ... 1800	900 ... 2240	125 ... 630	20	120	Q65110A8177	42
	LRTBGFTM-ST7-1+VV9-29+Q5R7-49	red true green blue	625 / 528 / 470	180 ... 560	710 ... 1590	80 ... 224	10	120	Q65110A9407	42

Package	Type	Emission color	Cx/Cy	I_V [mcd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LTRBGFSF-ABCB-QKYO	white	0.31 / 0.31	1400 ... 4500	20 (T) 20 (R) 10 (B)	120	Q65110A9484	42

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	color 2	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LRT GFTM-ST7-1+VV9-29	red true green	625 / 528	180 ... 560	710 ... 1590	10	120	Q65111A0439	58

Electronic Equipment

Multi TOPLED

Package	Type	Emission color	λ_{dom} (typ.) [nm]	I_V [mcd] color 1	I_V [mcd] color 2	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LAY T67F-AABB-1-1+AABA-45-1	amber yellow	617 / 590	1120 ... 2800	1120 ... 2240	50	120	Q65110A7526	16
	LOG T77K-JL-1-0+GJ-1	orange green	606 / 570	4.5 ... 18	1.8 ... 7.1	2	120	Q65110A3338	51
	LSY T676-P2R1-1-0+Q2S1-35	super red yellow	633 / 587	56 ... 140	90 ... 224	20	120	Q65110A2446	16
	LSG T676-P7Q7-1+N7P7-24	super red green	633 / 570	56 ... 140	35.5 ... 90	20	120	Q65110A4186	16
	LSG T676-P7R-1-0+N7P9-24			56 ... 180	35.5 ... 100			Q65111A1615	
	LSG T77K-JL-1-0+HK-1-0	super red green	630 / 570	4.5 ... 18	2.8 ... 11.2	2	120	Q65111A0238	51

Multi CHIPLED

Package	Type	Emission color	Cx/Cy	I_V [mcd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LTRBR8SF-8A7B-0117	white	0.267 / 0.231	1590 ... 2500	25 (T) 17 (R) 15 (B)	130	Q65111A2354	62

TOPLED Compact

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LUW JLSH-5B8B-I4Q7-EG-LP	ultra white	0.29 / 0.27	1800 ... 2800	7360	20	110	Q65111A1048	63

White Goods

DRAGON

Golden DRAGON

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LCW W5SM-JXKY-4O9Q	◯ warm white	0.42 / 0.4	45 ... 97	23.4	350	120	Q65110A9681	7
	LCW W5SM-JXKX-4U9X			45 ... 82	21			Q65110A9692	
	LCW W5SM-JYKY-4L8N			52 ... 97	24.6			Q65110A9694	
	LCW W5SM-JYKY-4R9T							Q65110A9693	
	LCW W5SM-JYKZ-4J8K			52 ... 112	27.1			Q65110A9698	

TOPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LW TTSD-U1V1-JKPL-1	◯ white	0.33 / 0.33	450 ... 900	2030	20	120	Q65111A0300	52
	LW TTSD-U2V2-JKPL-1			560 ... 1120	2520			Q65111A0301	
	LB TTSD-R1T2-25-1	● blue	469	112 ... 450	810	20	120	Q65111A1639	52
	LCB TTSD-T2V1-2J8L	● color on demand blue	0.2 / 0.3	355 ... 900	1880	10	120	Q65111A1160	52
	LT TTSD-T2V2-36-1	● true green	525	355 ... 1120	2140	10	120	Q65111A2711	52
	LW TVSG.BB-AZBZ-FBKC-1	◯ white	0.33 / 0.34	1500 ... 2800	6500	20	120	Q65111A2884	24
	LW TVSG.BB-BXCX-LBNC-1			1800 ... 3300	7700			Q65111A2473	
	LW TVSG.CB-AZBZ-JKPL-1	◯ white	0.33 / 0.33	1500 ... 2800	6450	20	120	Q65111A2760	24
	LW TVSG.CB-BXCX-JKPL-1			1800 ... 3300	7650			Q65111A3555	

White Goods

SIDELED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LW A673-P1S1-FKPL	white	0.33 / 0.33	45 ... 224	400	10	120	Q65111A2075	22
	LW A67C-T2U2-5K8L	white	0.33 / 0.33	355 ... 710	1600	20	120	Q65110A1928	22
	LW A67C-S2U2-5K8L			224 ... 710	1400			Q65110A1929	
	LW A6SG-V2BA-JKPL	white	0.33 / 0.33	900 ... 2240	4710	20	120	Q65110A8994	53

CHIPLED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
CHIPLED 0603									
	LG Q971-KN-1	green	570	7.1 ... 45	60	20	160	Q62702P5189	61
	LS Q976-NR-1	super red	633	28 ... 180	330	20	160	Q62702P5187	47
	LW Q38E-Q1S2-3K6L-1	white	0.3 / 0.28	71 ... 280	530	5	150 (horizontal) 130 (vertical)	Q65110A7210	48
	LW Q38E-Q2R2-3K5L			90 ... 180	410			Q65110A7939	
	LW Q38G-Q1S1-3K6L-1	white	0.3 / 0.28	71 ... 224	440	5	150 (horizontal) 130 (vertical)	Q65110A7209	48
	LW Q38G-Q2R2-3K5L-1			90 ... 180	410			Q65110A7584	
	LB Q39E-L2N2-35-1	blue	470	14 ... 45	70	5	155 (horizontal) 135 (vertical)	Q65110A7212	48
	LB Q39E-N1P1-35-1			28 ... 56	110			Q65110A7941	
	LG Q976-MP-24	green	572	18 ... 71	130	20	130	Q65110A8842	47

White Goods

Micro SIDELED

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LW Y1SG-AEBE-EKFM-1	◯ white	0.3 / 0.28	1000 ... 1600	3900	20	120	Q65110A9541	64
	LW Y1SG-AEBE-GKJM-1							Q65110A9542	
	LW Y1SG-AFBF-EKFM-1			1200 ... 1800	4500			Q65110A9543	
	LW Y1SG-AFBF-GKJM-1							Q65110A9544	
	LW Y1SG-BFCF-EKFM-1			1600 ... 2200	5700			Q65110A9545	
	LW Y1SG-BFCF-GKJM-1							Q65110A9546	

Transportation

OSLON Black

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LCW H9GP-JZKY-4R9T-1	◯ warm white	0.42 / 0.4	61 ... 97	38.7	350	90	Q65111A0920	5
	LCW H9GP-JZKZ-4O9Q-1			61 ... 112	42.4			Q65111A0921	
	LCW H9GP-KXLX-4J8K-1			71 ... 130	49.2			Q65111A0923	
	LCW H9GP-JZLX-4L8N-1			61 ... 130	46.8			Q65111A0922	
	LCW H9GP-JZKY-4U9X-1			61 ... 97	38.7			Q65111A0919	
	LUW H9GP.CE-KYLY-EMKM-1	◯ ultra white	0.31 / 0.32	82 ... 150	55.7	350	90	Q65111A1881	5

OSRAM OSTAR Headlamp

Package	Type	Emission color	Color coordinates Cx/Cy typ.	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LE UW D1W1 01-5L6M-GMKM-T01	◯ ultra white	0.31 / 0.32	112 ... 224	700	120	Q65110A8591	1
	LE UW D1W2 01-7M7N-GMKM-T01			224 ... 400			Q65110A8590	
	LE UW D1W3 01-7N7P-GMKM-T01			355 ... 630			Q65110A8588	
	LE UW D1W4 01-5P6Q-GMKM-T01			450 ... 900			Q65110A8593	
	LE UW D1W5 01-7P8Q-GMKM-T01			560 ... 1120			Q65110A8589	
	LE UW U1A2 01-5P8P-ebvF68ebzB68	◯ ultra white	0.322 / 0.334	450 ... 710	1000	120	Q65111A2089	1
	LE UW U1A3 01-8P8Q-ebvF68ebzB68			630 ... 1120			Q65111A2088	
	LE UW U1A4 01-7Q6R-ebvF68ebzB68			900 ... 1400			Q65111A2087	
	LE UW U1A5 01-5R8R-ebvF68ebzB68			1120 ... 1800			Q65111A2086	

Transportation

Advanced Power TOPLED Plus

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	I_V [mcd]	Φ_V typ. [mlm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD G5AP-4M4N-35-1	deep blue	457	25 ... 45	200	100	145	Q65110A8037	59
	LT G5AP-CZEX-36-1	true green	528	3900 ... 8200	26600			Q65110A8431	
	LR G5AP-BZCZ-1-1	red	623	2400 ... 4500	15200	100	145	Q65110A8036	59
	LY G5AP-CZDZ-36-1	yellow	590	3900 ... 7100	24200	100	145	Q65111A1319	59

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	I_V typ. [cd]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LCW G5GP-FZHX-5L7N	warm white	0.42 / 0.4	15 ... 33	6.4	100	135	Q65110A9081	59
	LCW G5GP-FYGY-5R8T			13 ... 24	5			Q65110A9079	

Dimensions in mm (inch)

Figure 1:

For detailed information
please contact your
OSRAM Sales partner

Figure 2: **OSRAM OSTAR Projection Compact**

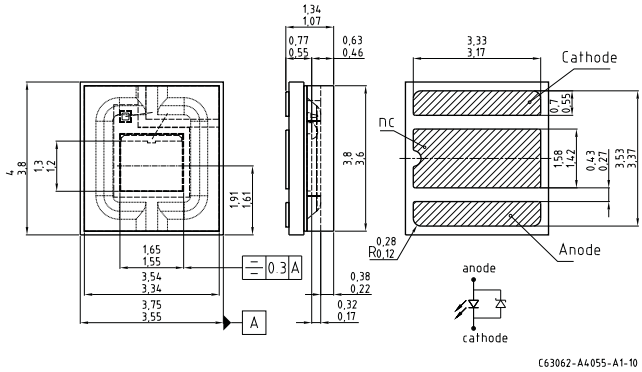


Figure 3: **OSLON SX**

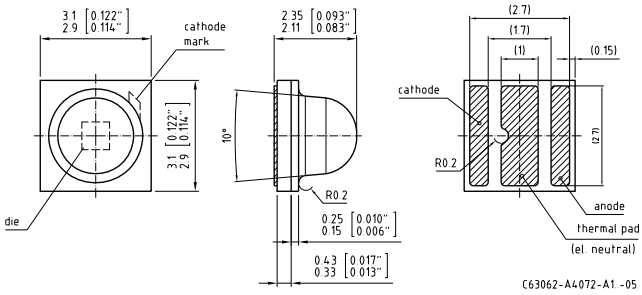


Figure 4: **OSLON Black Flat**

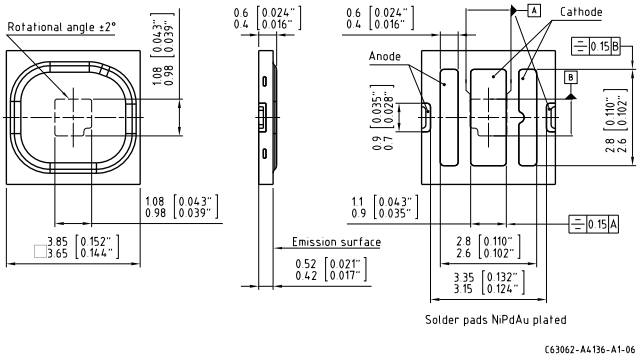


Figure 5: **OSLON Black**

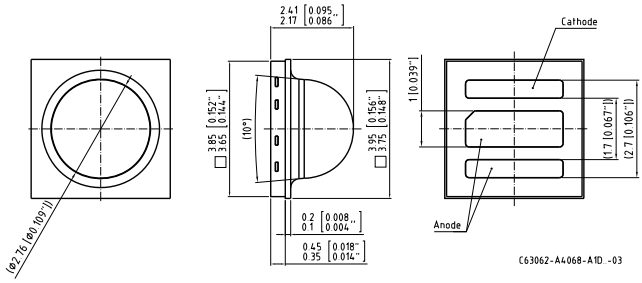
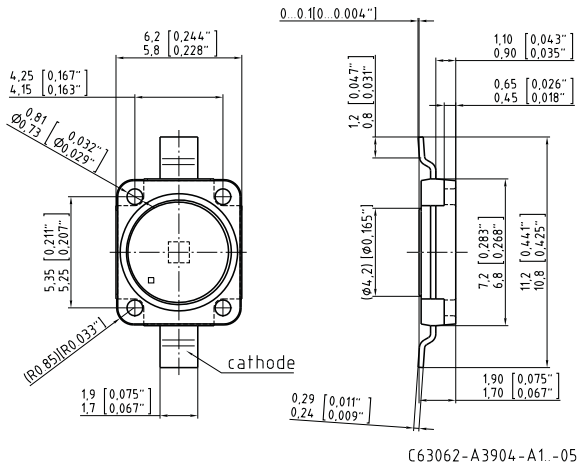


Figure 6: **Golden DRAGON**



Dimensions in mm (inch)

Figure 7: Golden DRAGON

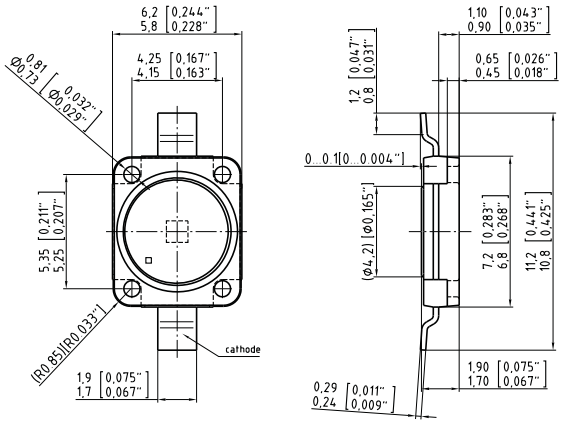


Figure 8: Platinum DRAGON

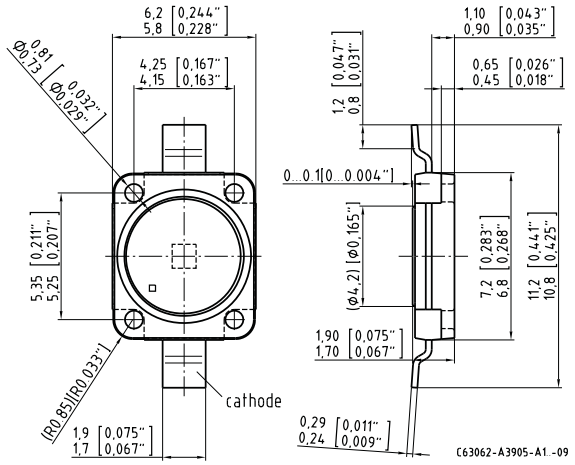


Figure 9: Advanced Power TOPLED

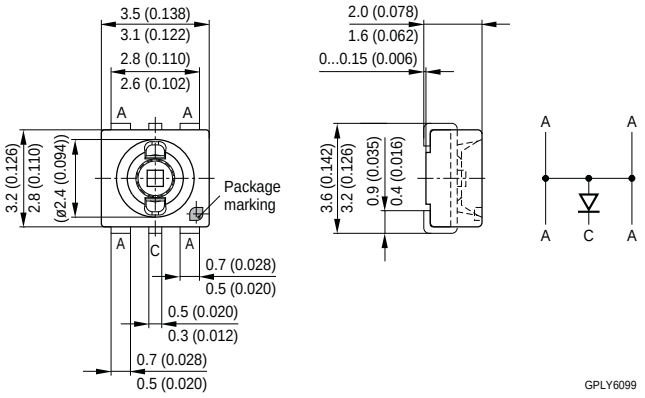


Figure 10: Advanced Power TOPLED

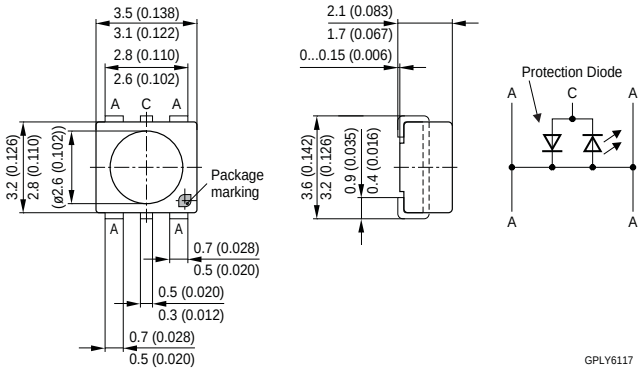


Figure 11: Power TOPLED

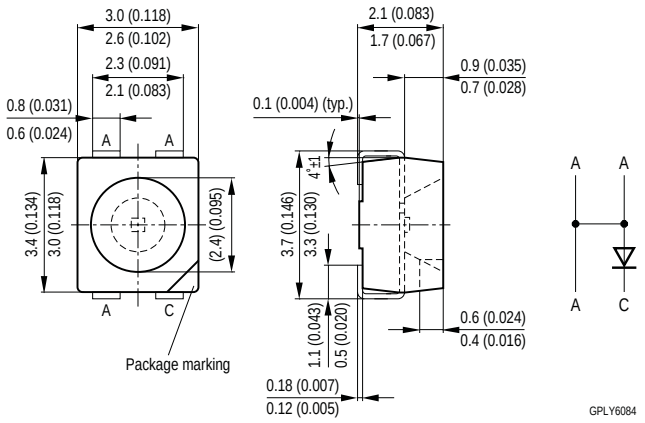
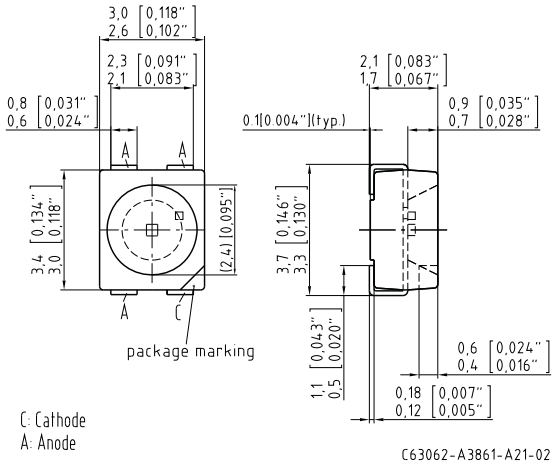


Figure 12: Power TOPLED



Dimensions in mm (inch)

Figure 13: Power TOPLED with lens

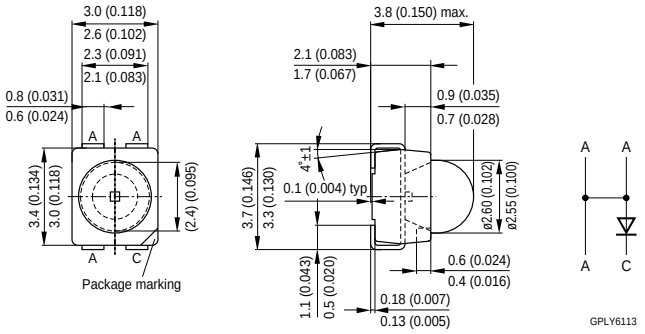


Figure 14: Power TOPLED with lens

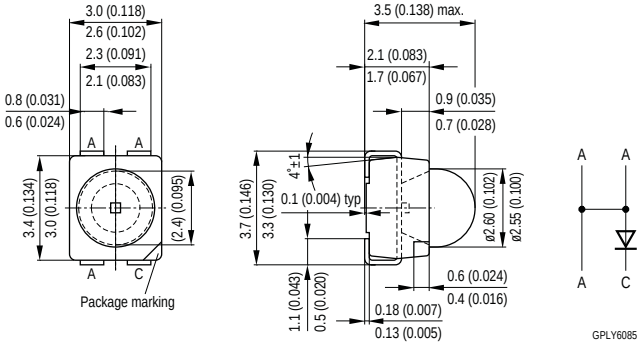


Figure 15: MULTILED

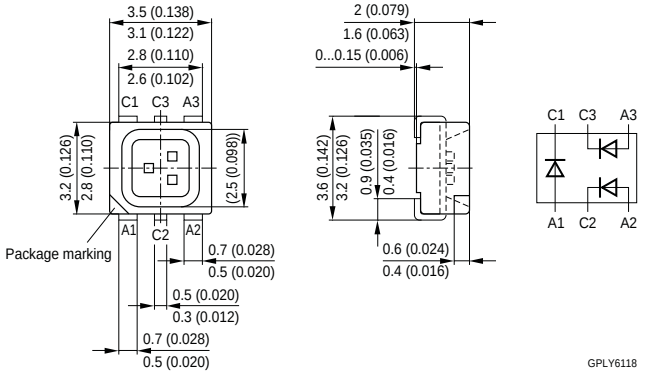


Figure 16: Multi TOPLED

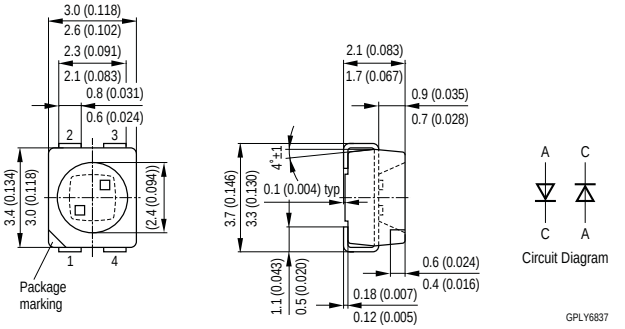


Figure 17: OSLON SX

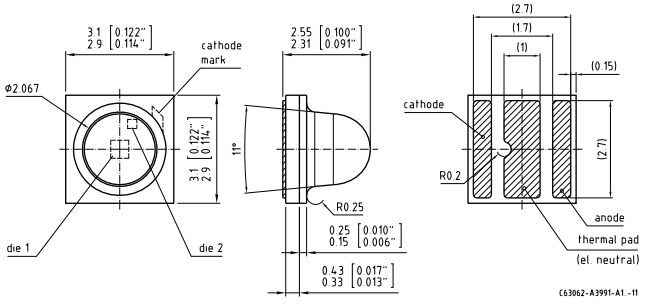
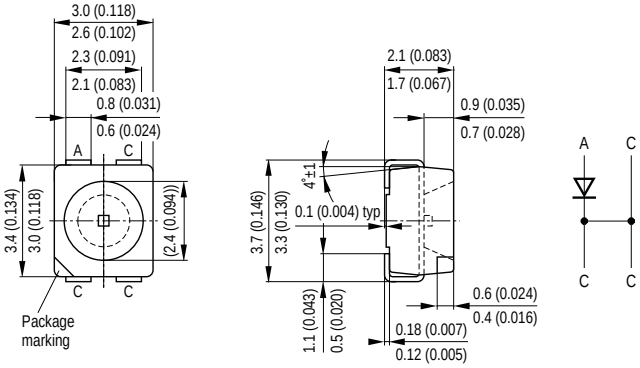


Figure 18: Power TOPLED



Dimensions in mm (inch)

Figure 19: Power TOPLED with lens

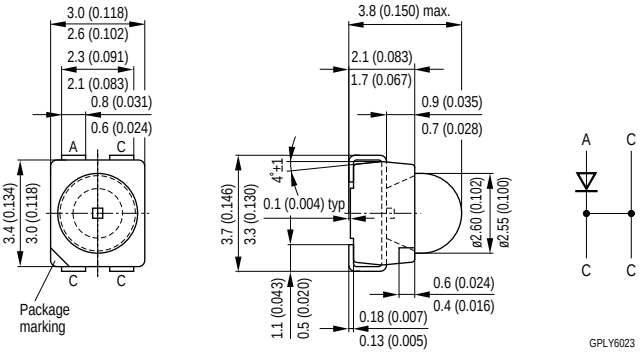


Figure 20: Power TOPLED with lens

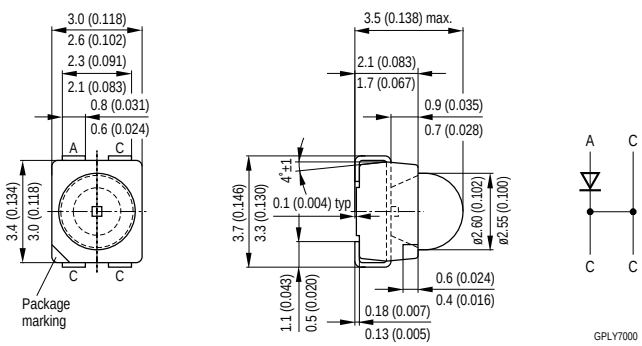


Figure 21: TOPLED

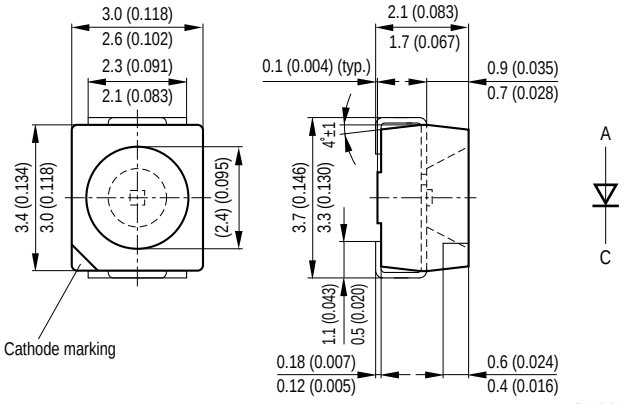


Figure 22: SIDELED

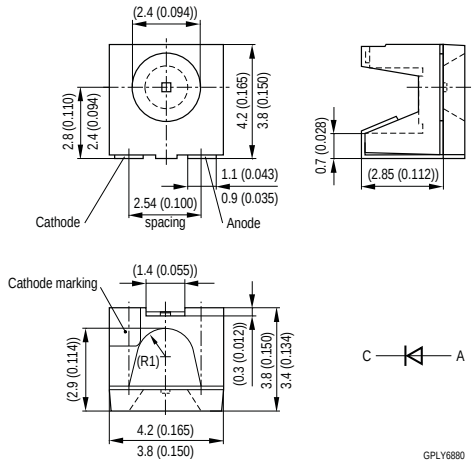


Figure 23: Mini TOPLED

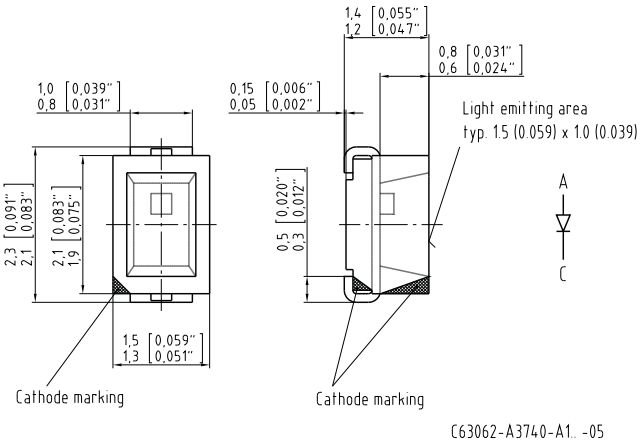
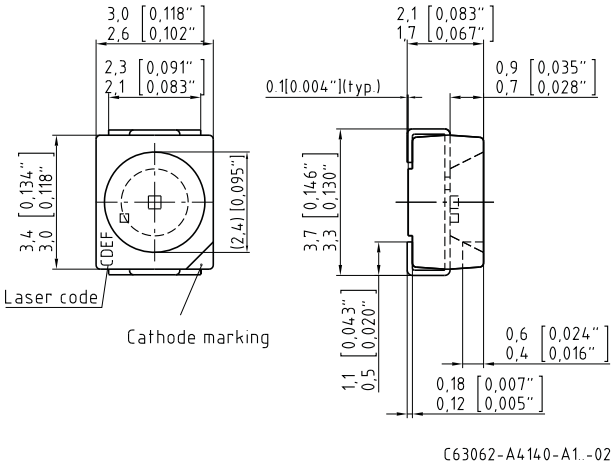


Figure 24: TOPLED



Dimensions in mm (inch)

Figure 25: SMARTLED 0603

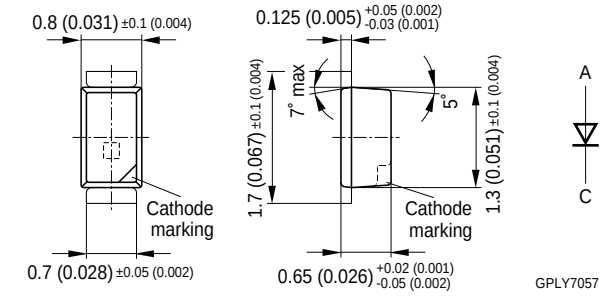


Figure 26: SMARTLED XR

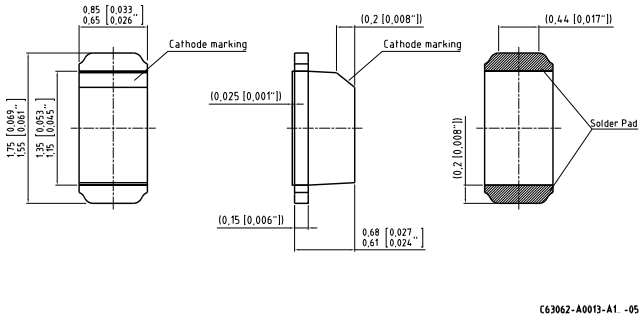


Figure 27: PointLED

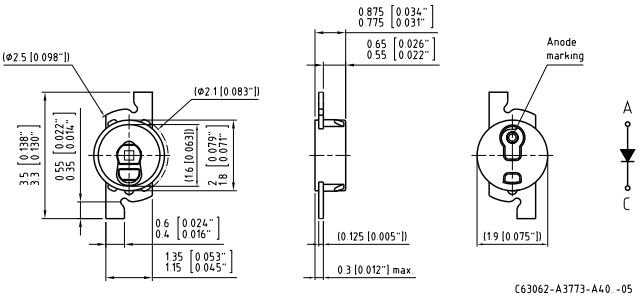


Figure 28: Mini TOPLED

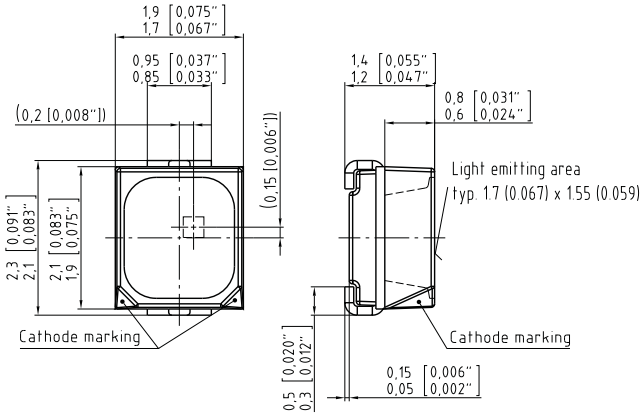


Figure 29: Micro SIDELED

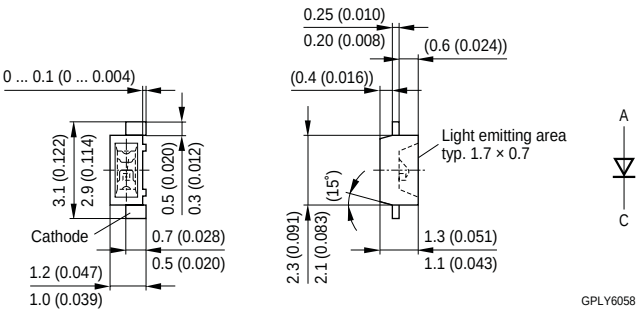
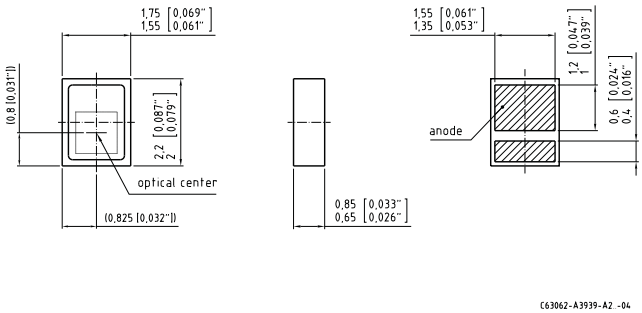


Figure 30: CERAMOS



Dimensions in mm (inch)

Figure 31: FIREFLY

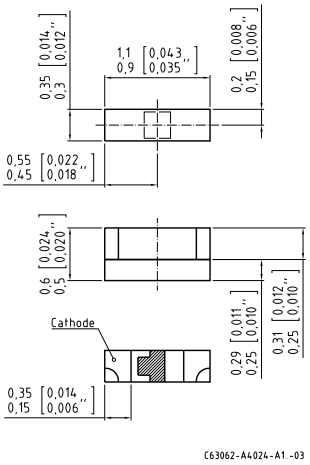


Figure 32: Multi CERAMOS

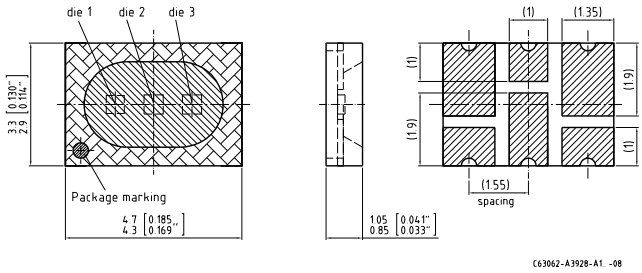


Figure 33: OSRAM OSTAR Projection Cube

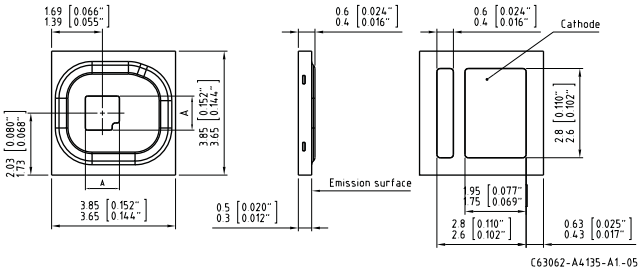


Figure 34: OSRAM OSTAR Projection Compact

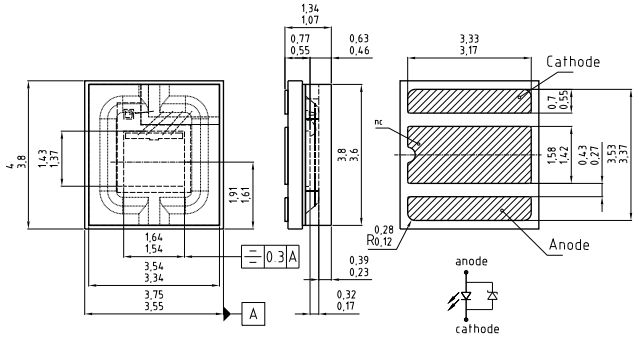


Figure 35: OSRAM OSTAR Projection Compact

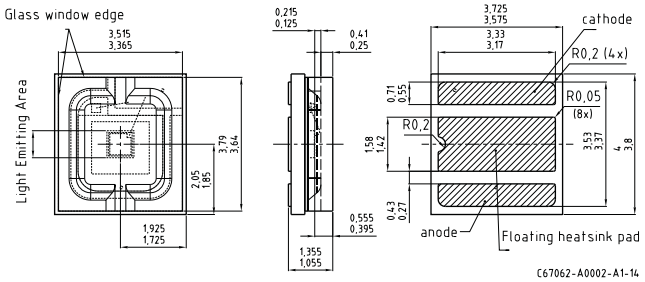
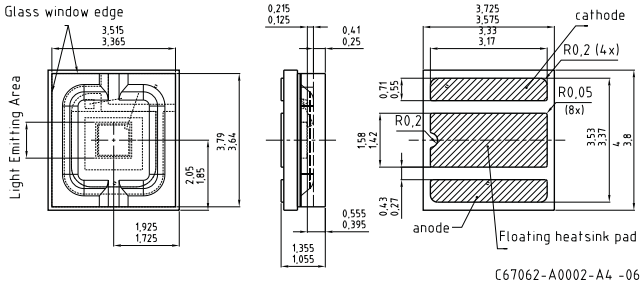


Figure 36: OSRAM OSTAR Projection Compact



Dimensions in mm (inch)

Figure 37: OSRAM OSTAR Projection Compact

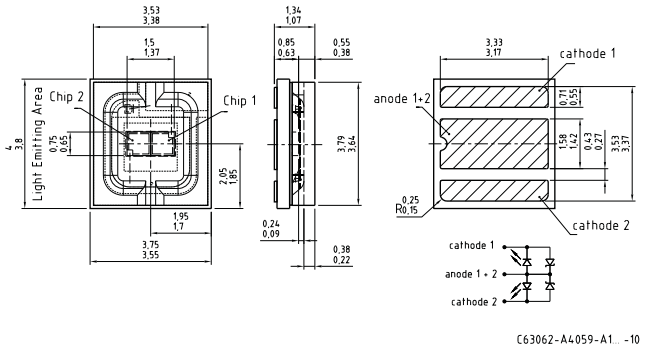


Figure 38: OSRAM OSTAR Projection Compact

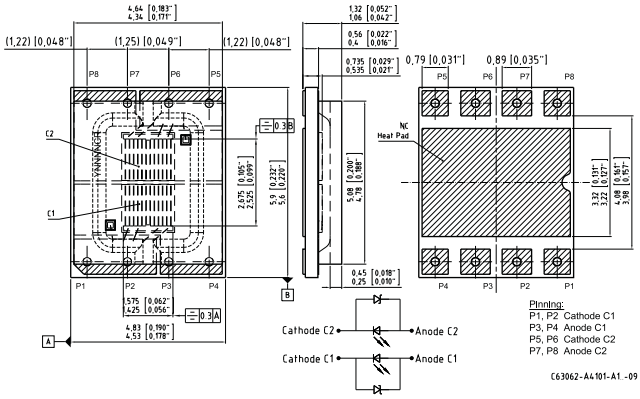


Figure 39: OSLON LX

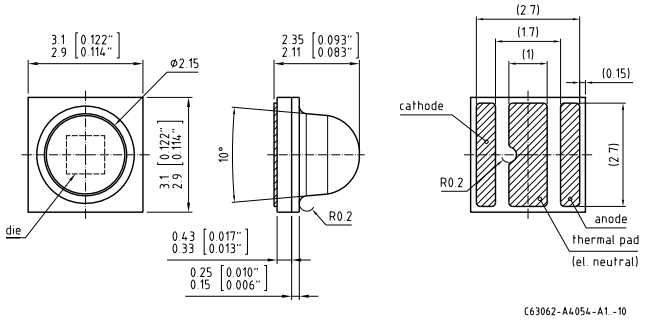


Figure 40: TOPLED Black

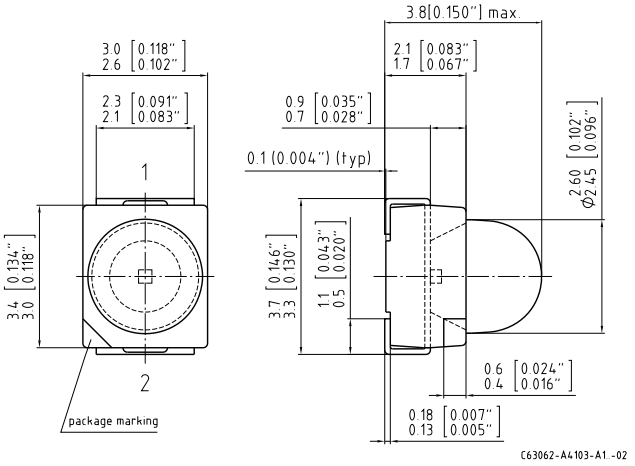


Figure 41: MULTILED

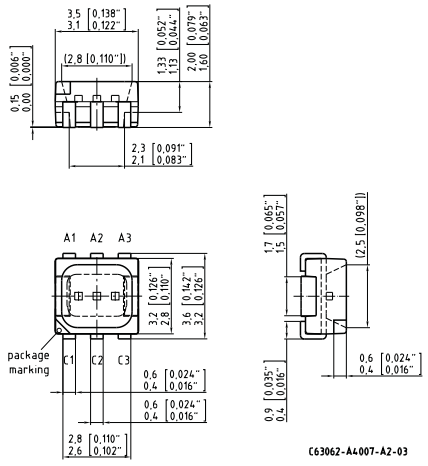
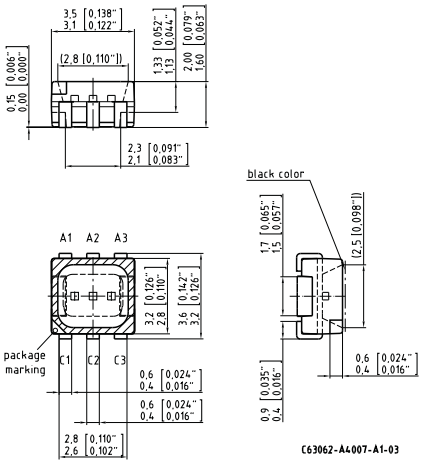


Figure 42: MULTILED



Dimensions in mm (inch)

Figure 43: Multi CHIPLED

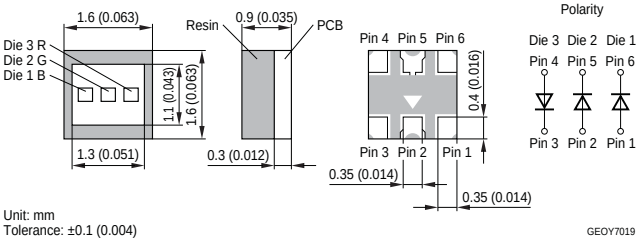


Figure 44: OSRAM OSTAR Projection SMT

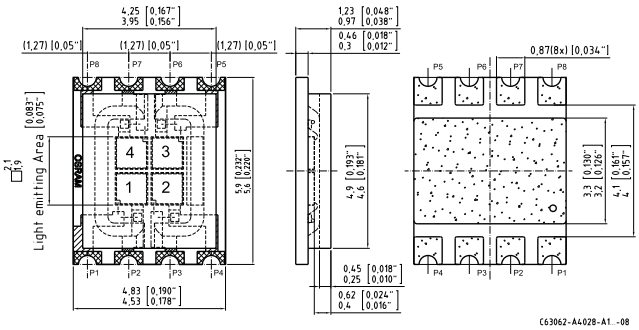


Figure 45: CHIPLED 1206

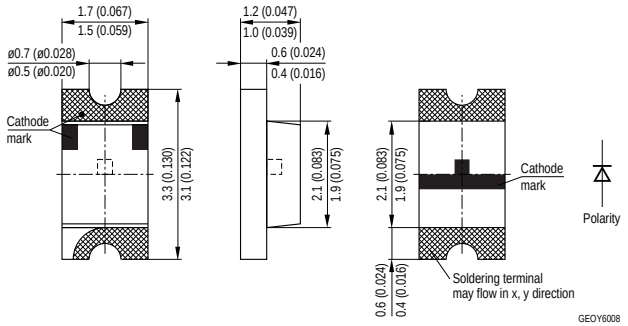


Figure 46: CHIPLED 0805

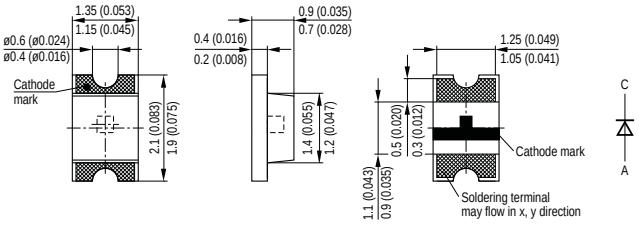


Figure 47: CHIPLED 0603

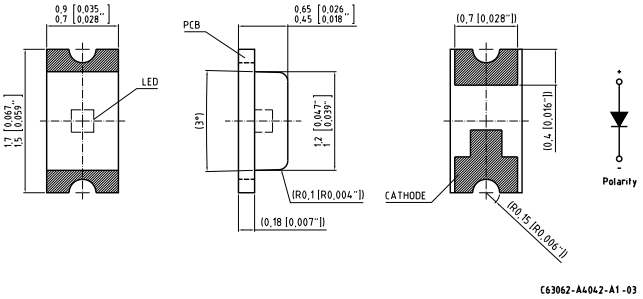
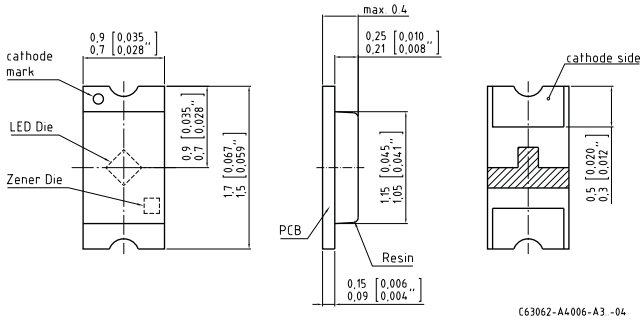


Figure 48: CHIPLED 0603



Dimensions in mm (inch)

Figure 49: CHIPLED 0402

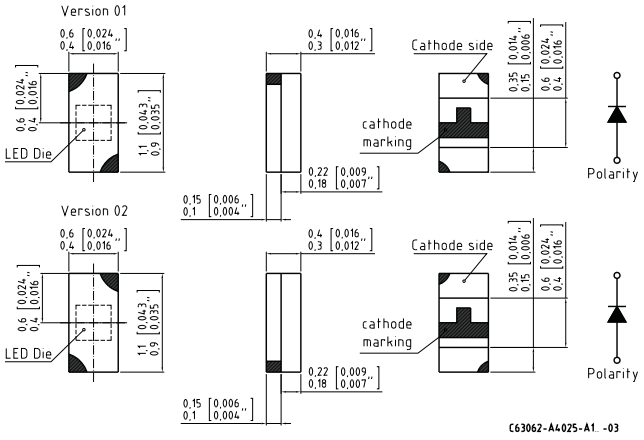


Figure 50: CHIPLED with lens

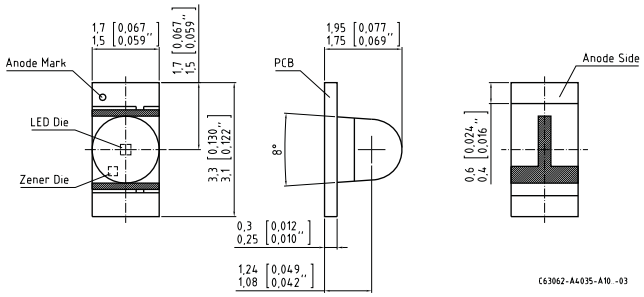


Figure 51: Multi TOPLED RG

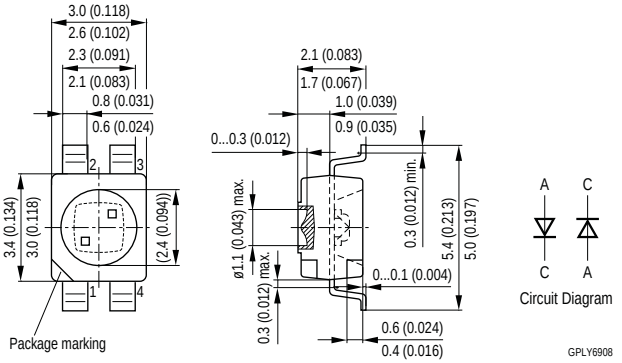


Figure 52: TOPLED

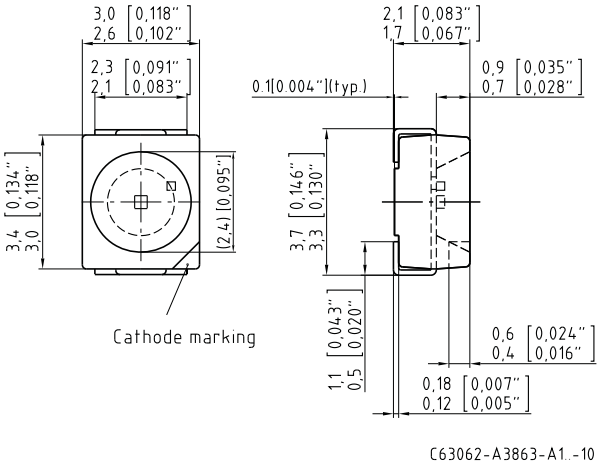


Figure 53: SIDELED

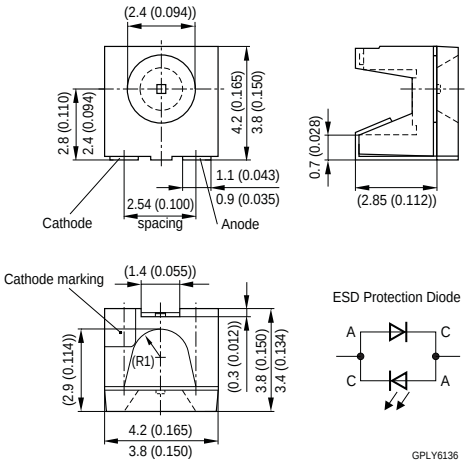
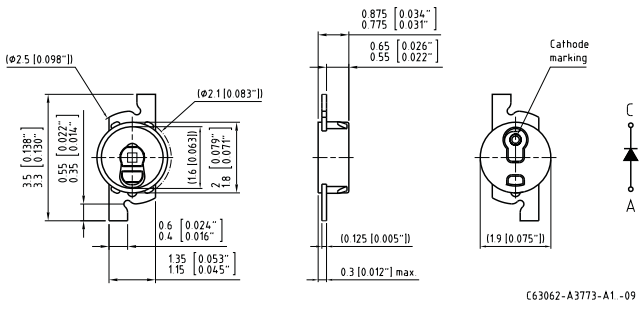


Figure 54: PointLED



Dimensions in mm (inch)

Figure 55: CERAMOS

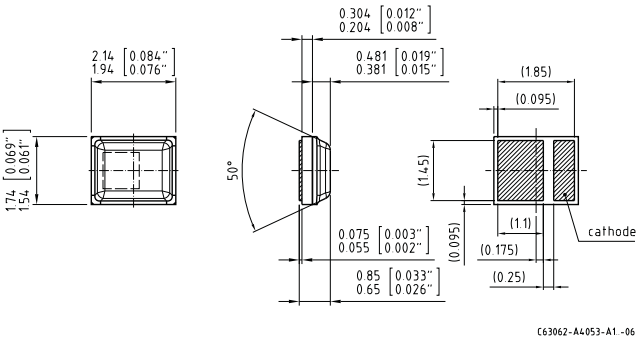


Figure 56: OSRAM OSTAR Projection Compact

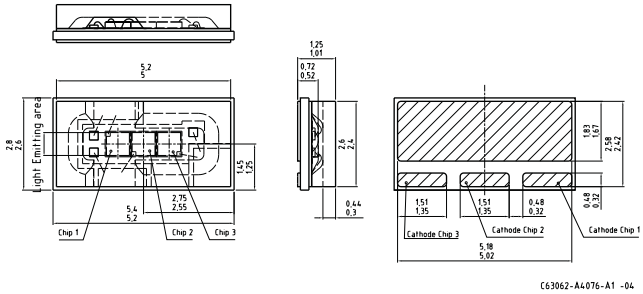


Figure 57: TOPLED Black

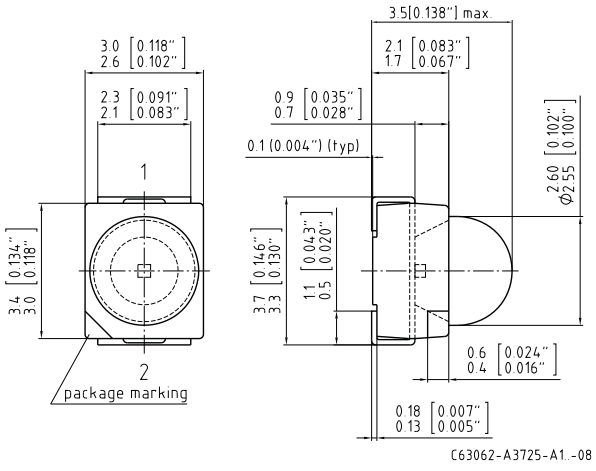


Figure 58: MULTILED

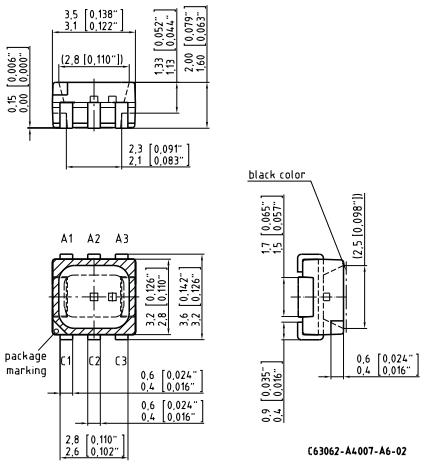


Figure 59: Advanced Power TOPLED Plus

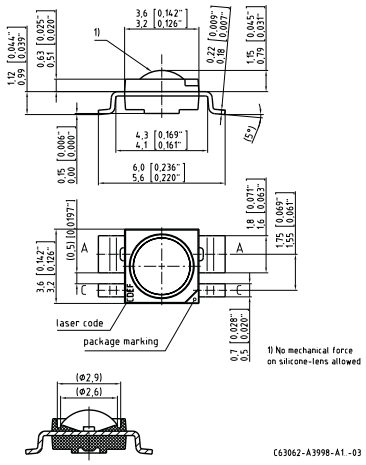
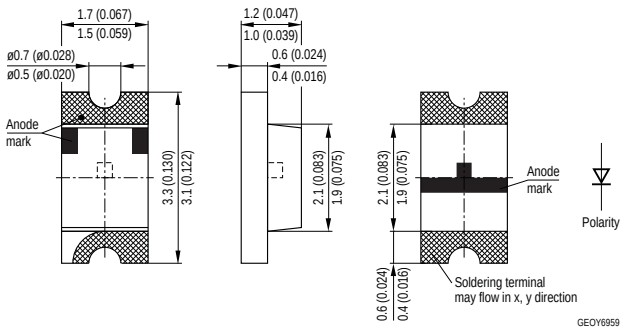


Figure 60: CHIPLED 1206



Dimensions in mm (inch)

Figure 61: CHIPLED 0603

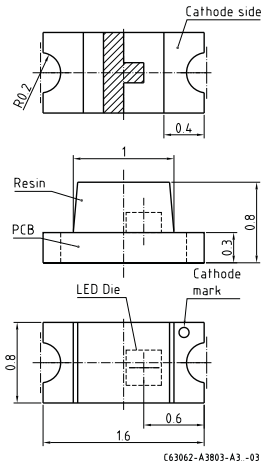


Figure 62: Multi CHIPLED

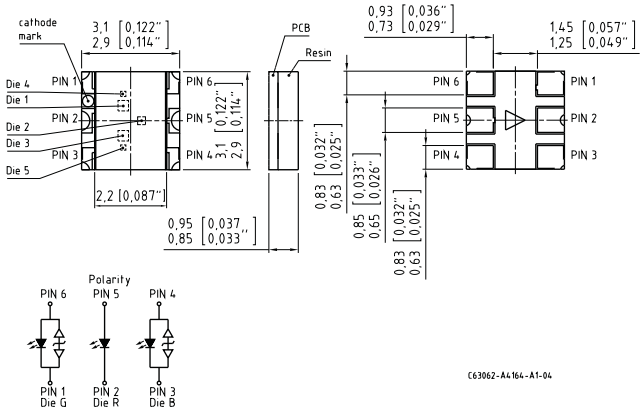


Figure 63: TOPLED Compact

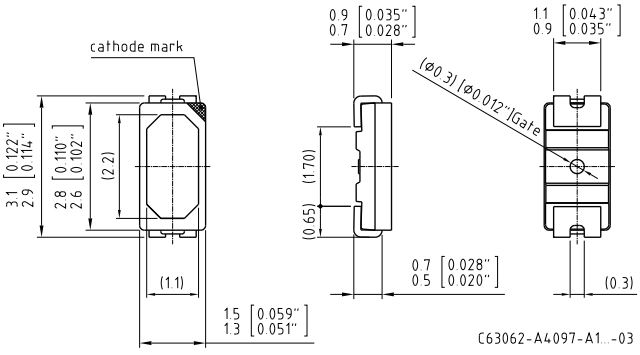
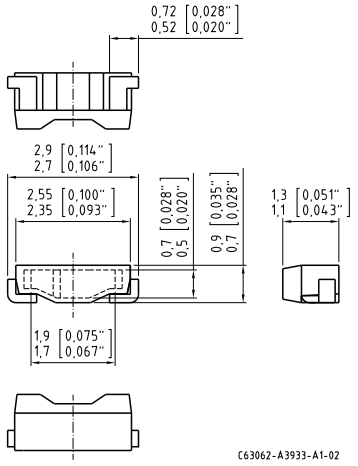


Figure 64: Micro SIDELED



Dimensions in mm (inch)

Figure 65: TOPLED

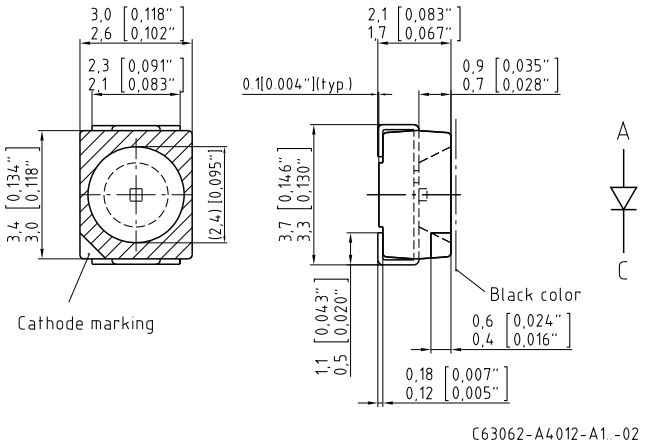
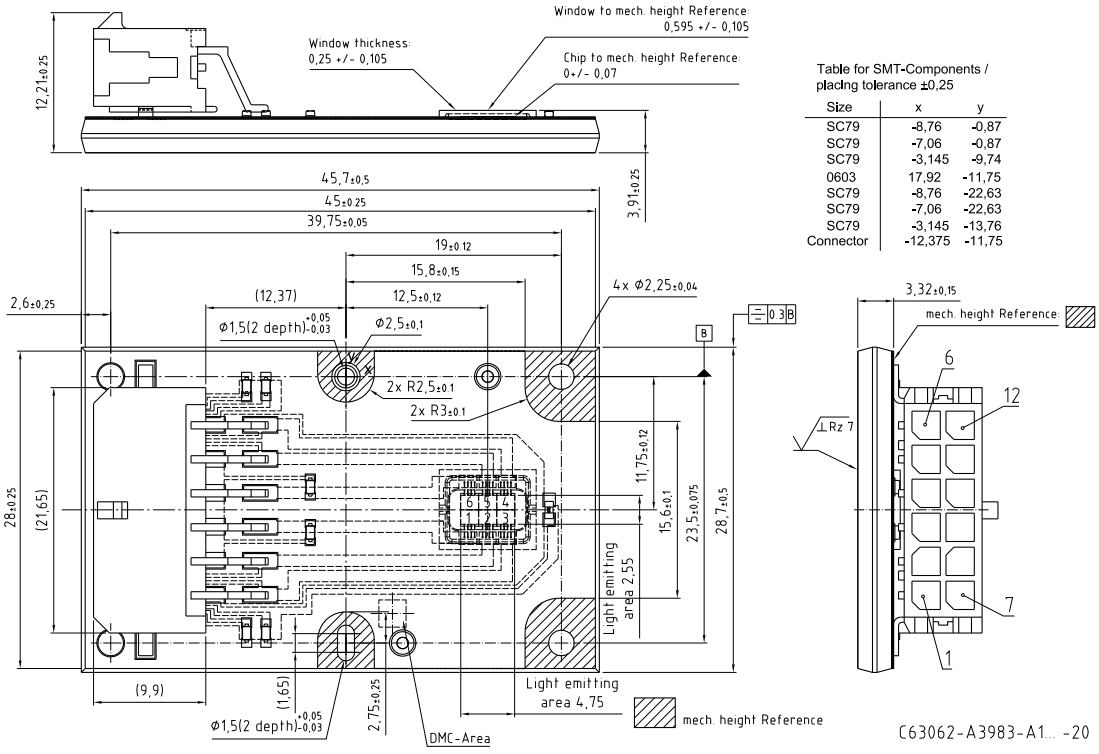
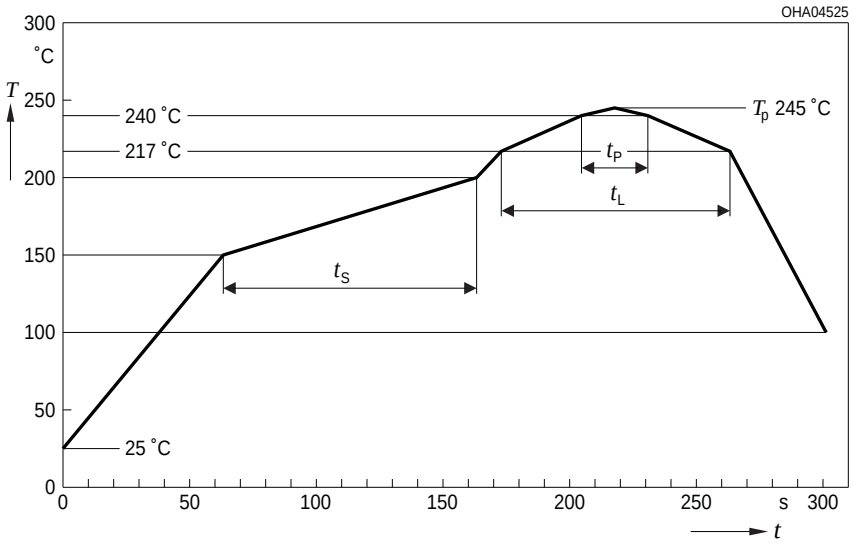


Figure 66: OSRAM OSTAR Projection Power



Reflow soldering profile acc. to J-STD-020D.01



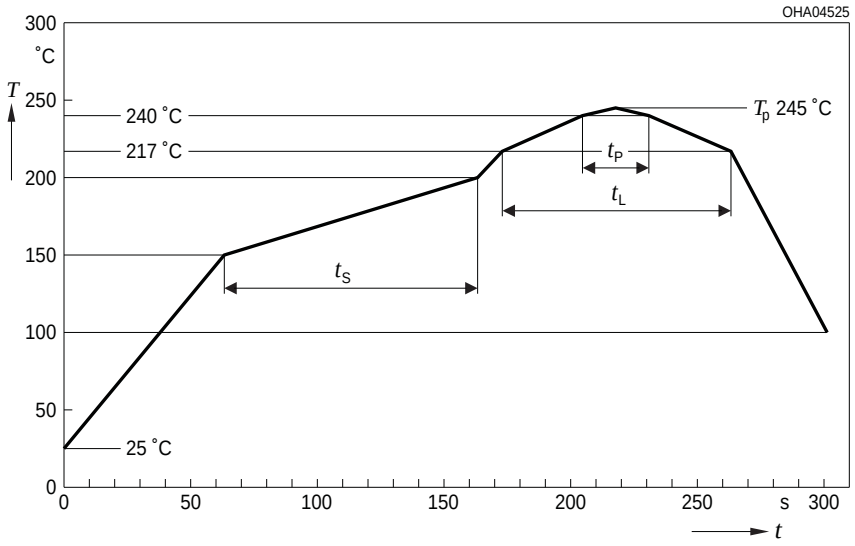
Components under 2.5 mm height

OHA04612

Profil-Charakteristik Profile Feature	Symbol Symbol	Pb-Free (SnAgCu) Assembly			Einheit Unit
		Minimum	Recommendation	Maximum	
Ramp-up Rate to Preheat*) 25 °C ≤ T ≤ 150 °C			2	3	K/s
Time from T_{Smin} to T_{Smax} 150 °C ≤ T_S ≤ 200 °C	t_S	60	100	120	s
Ramp-up Rate to Peak*) T_{Smax} ≤ T ≤ T_P			2	3	K/s
Liquidus Temperature	T_L		217		°C
Time above Liquidus temperature	t_L		80	100	s
Time 25 °C ≤ T ≤ T_P				480	s
Peak Temperature	T_P		245	260	°C
Time within 5 °C of the specified peak temperature T_P - 5 K	t_P	10	20	30	s
Ramp-down Rate* T_P ≤ T ≤ 100 °C			3	6	K/s

All temperatures refer to the center of the package, measured on the top of the component
* slope calculation ΔT/Δt: Δt max. 5 s; fulfillment for the whole T-range

Reflow soldering profile acc. to J-STD-020D.01



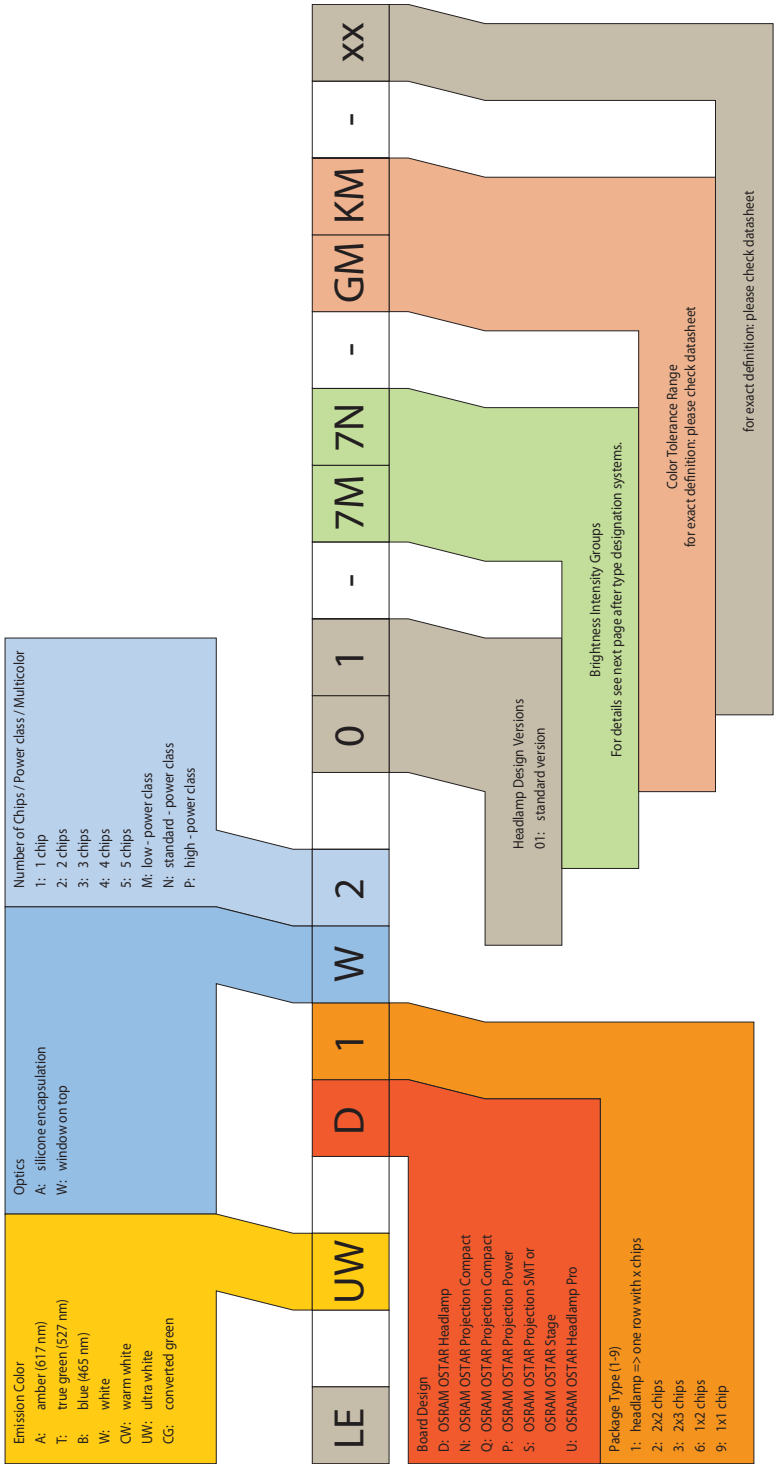
Components over 2.5 mm height

OHA04613

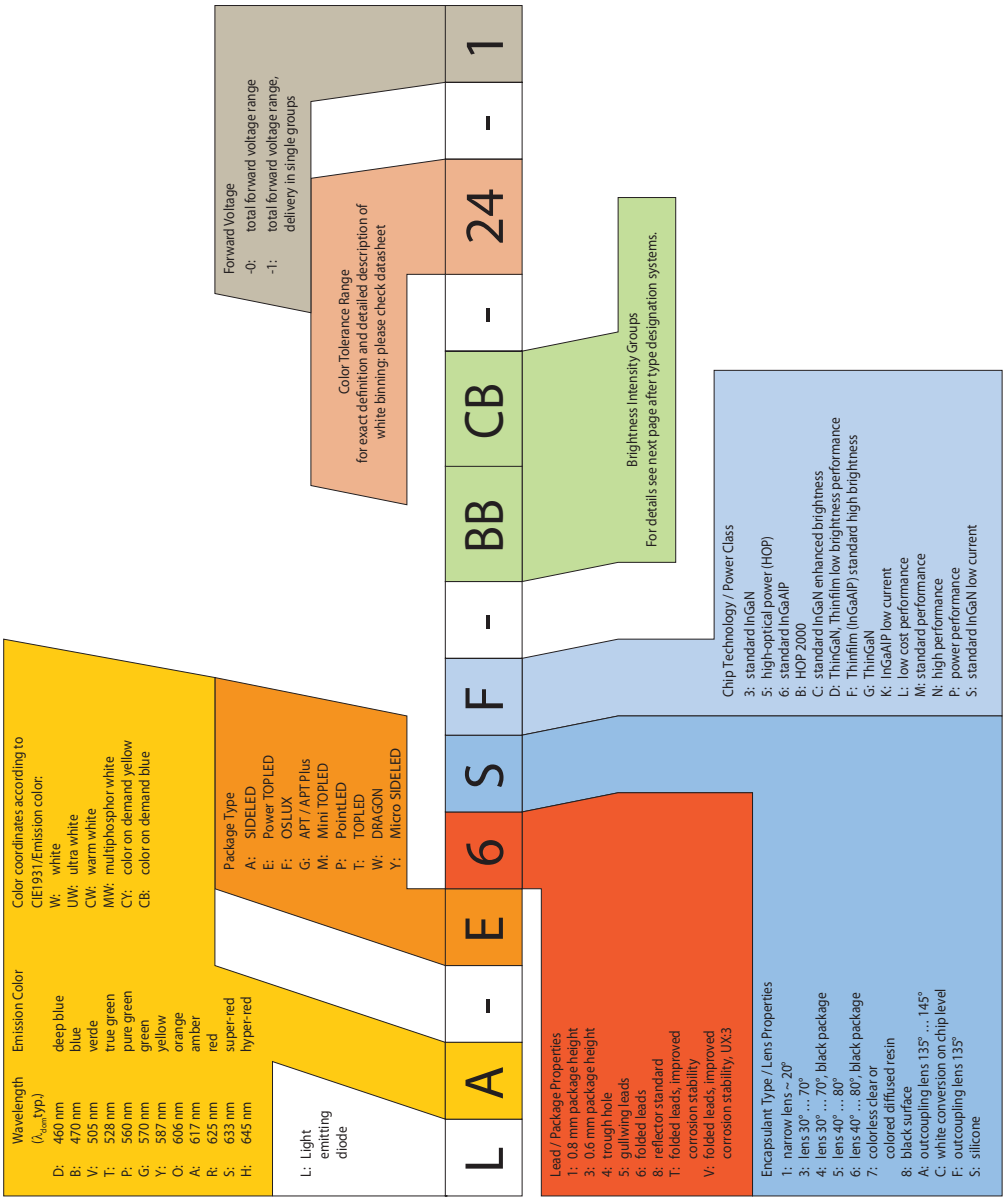
Profil-Charakteristik Profile Feature	Symbol Symbol	Pb-Free (SnAgCu) Assembly			Einheit Unit
		Minimum	Recommendation	Maximum	
Ramp-up Rate to Preheat*) 25 °C ≤ T ≤ 150 °C			2	3	K/s
Time from T_{Smin} to T_{Smax} 150 °C ≤ T_S ≤ 200 °C	t_S	60	100	120	s
Ramp-up Rate to Peak*) T_{Smax} ≤ T ≤ T_P			2	3	K/s
Liquidus Temperature	T_L		217		
Time above Liquidus temperature	t_L		80	100	s
Time 25 °C ≤ T ≤ T_P				480	s
Peak Temperature	T_P		245	250	°C
Time within 5 °C of the specified peak temperature T_p - 5 K	t_P	10	20	30	s
Ramp-down Rate* T_P ≤ T ≤ 100 °C			3	4	K/s

All temperatures refer to the center of the package, measured on the top of the component
* slope calculation ΔT/Δt: Δt max. 5 s; fulfillment for the whole T-range

OSRAM OSTAR type designation system



Premolded LED type designation system



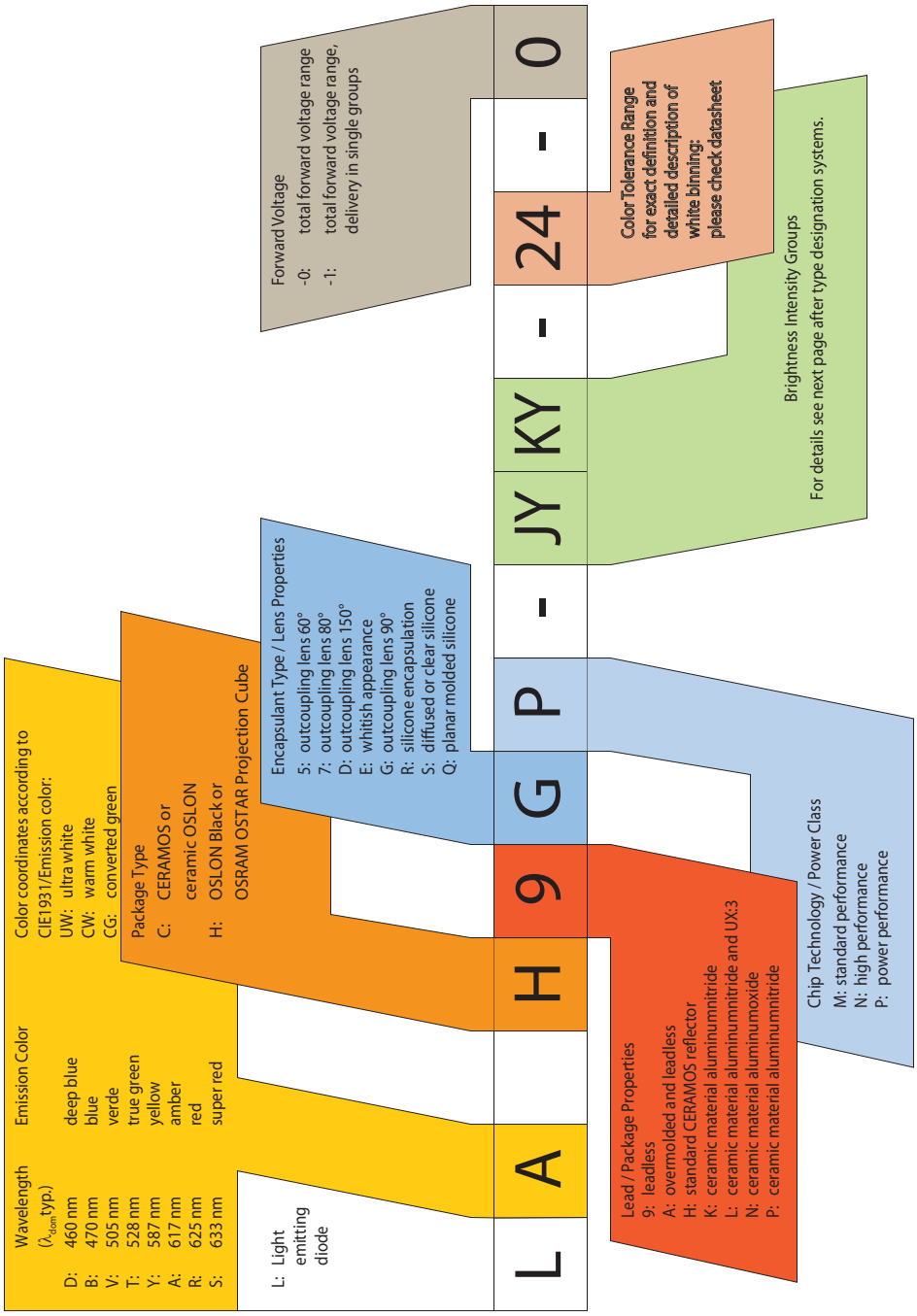
Taping of LEDs

All SMT LEDs are available in 8 mm resp. 12 mm tapes.

Gurtung von Lumineszenzdioden

Alle SMT-LED werden im 8- bzw. 12-mm Gurt geliefert.

Ceramics based LED type designation system



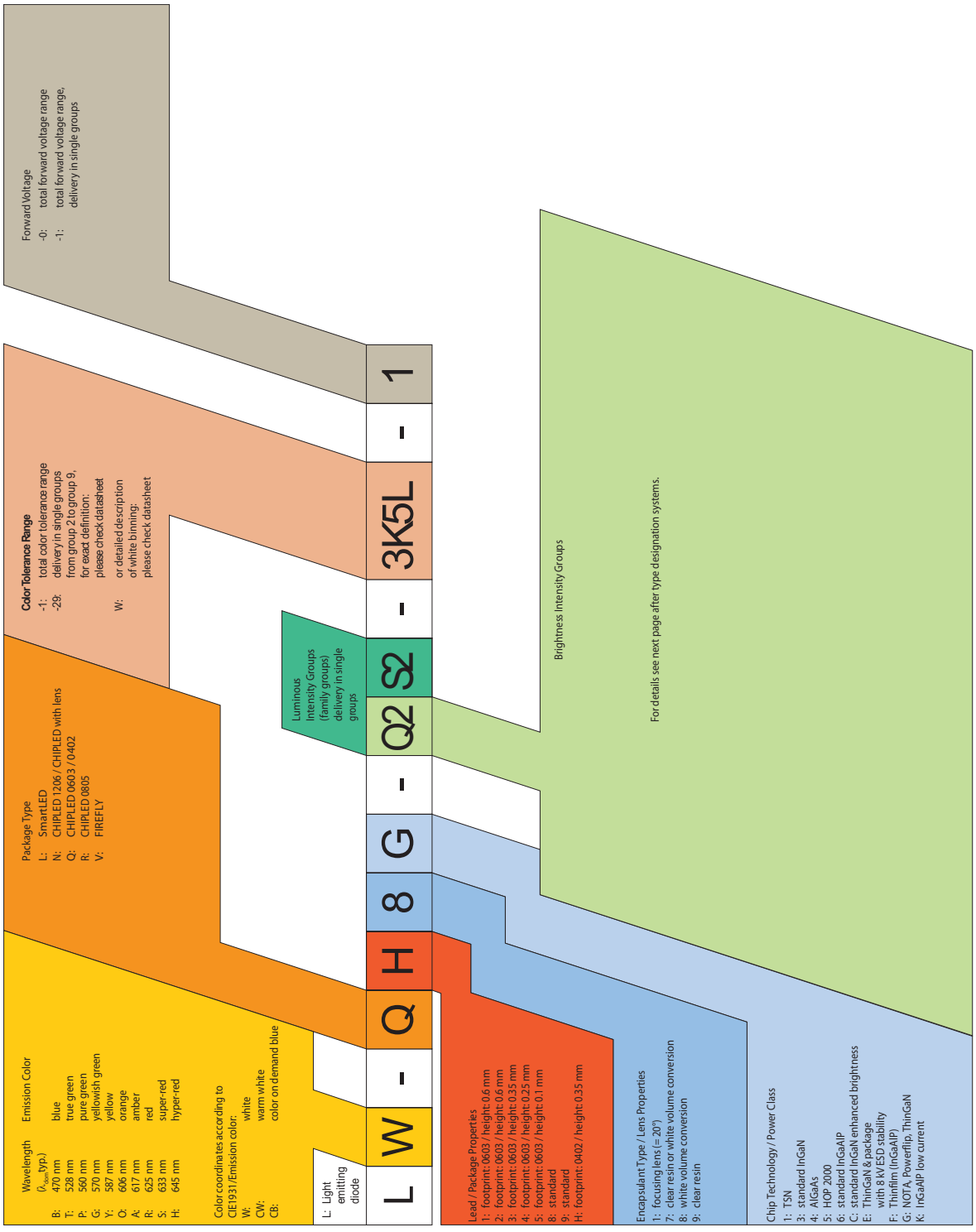
Taping of LEDs

All SMT LEDs are available in 8 mm resp. 12 mm tapes.

Gurtung von Lumineszenzdioden

Alle SMT-LED werden im 8- bzw. 12-mm Gurt geliefert.

Miniature package LED type designation system



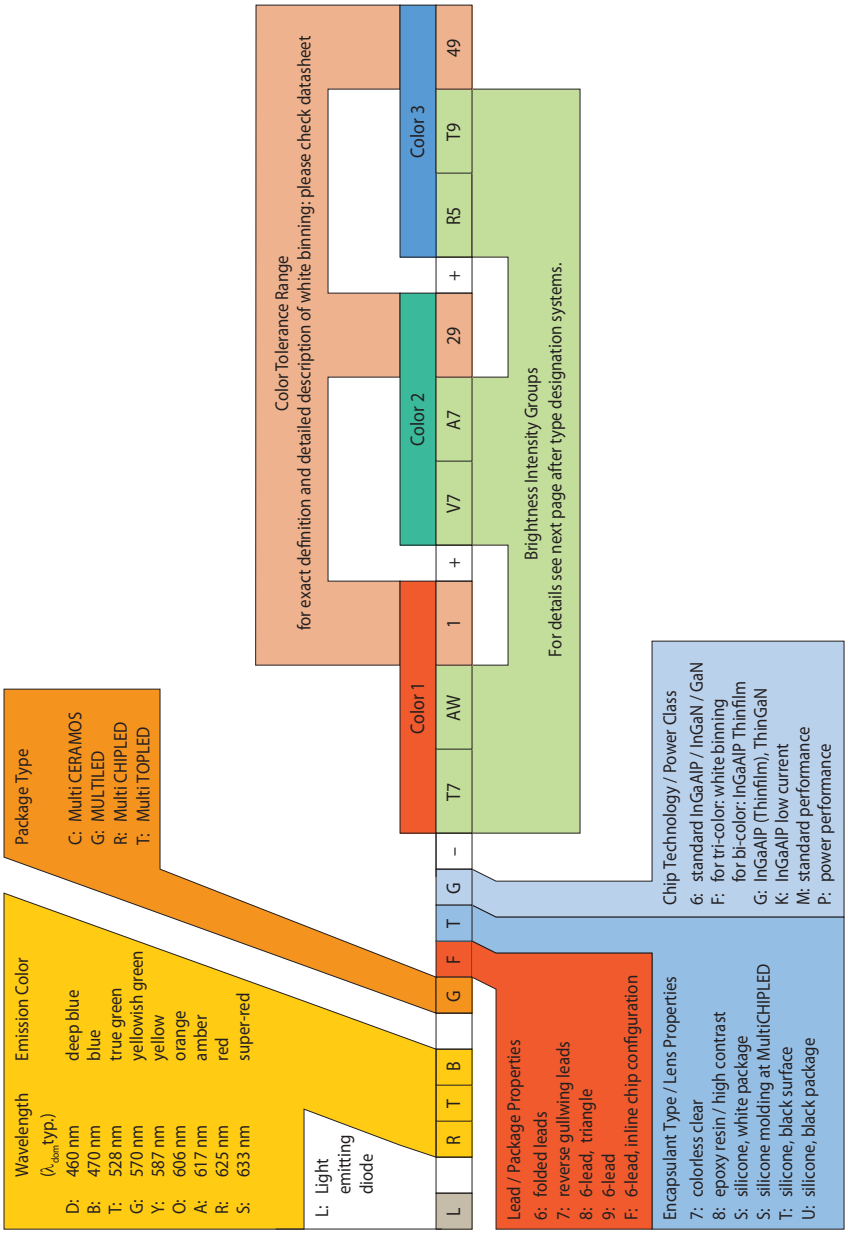
Taping of LEDs

All SMT LEDs are available in 8 mm resp. 12 mm tapes.

Gurtung von Lumineszenzdioden

Alle SMT-LED werden im 8- bzw. 12-mm Gurt geliefert.

Multi chip LED type designation system



Taping of LEDs

All SMT LEDs are available in 8 mm resp. 12 mm tapes.

Gurtung von Lumineszenzdioden

Alle SMT-LED werden im 8- bzw. 12-mm Gurt geliefert.

Brightness Intensity Groups

1/1 Grouping			1/2 Grouping			1/3 Grouping			1/4 Grouping			1/6 Grouping		
Bin	min.	max.	Bin	min.	max.	Bin	min.	max.	Bin	min.	max.	Bin	min.	max.
C	0.28	0.45	C1	0.28	0.36				1C	0.28	0.32			
			C2	0.36	0.45				2C	0.32	0.36			
									3C	0.36	0.40			
									4C	0.40	0.45			
D	0.45	0.71	D1	0.45	0.56				1D	0.45	0.50			
			D2	0.56	0.71				2D	0.50	0.56			
									3D	0.56	0.63			
									4D	0.63	0.71			
E	0.71	1.12	E1	0.71	0.90				1E	0.71	0.80			
			E2	0.90	1.12				2E	0.80	0.90			
									3E	0.90	1.00			
									4E	1.00	1.12			
F	1.12	1.80	F1	1.12	1.40				1F	1.12	1.25			
			F2	1.40	1.80				2F	1.25	1.40			
									3F	1.40	1.59			
									4F	1.59	1.80			
G	1.80	2.80	G1	1.80	2.24				1G	1.80	2.01			
			G2	2.24	2.80				2G	2.01	2.24			
									3G	2.24	2.50			
									4G	2.50	2.80			
H	2.80	4.50	H1	2.80	3.55				1H	2.80	3.15			
			H2	3.55	4.50				2H	3.15	3.55			
									3H	3.55	4.00			
									4H	4.00	4.50			
J	4.50	7.10	J1	4.50	5.60				1J	4.50	5.00			
			J2	5.60	7.10				2J	5.00	5.60			
									3J	5.60	6.30			
									4J	6.30	7.10			
K	7.10	11.2	K1	7.10	9.00				1K	7.10	8.00			
			K2	9.00	11.2				2K	8.00	9.00			
									3K	9.00	10.00			
									4K	10.00	11.2			
L	11.2	18.0	L1	11.2	14.0				1L	11.2	12.5			
			L2	14.0	18.0				2L	12.5	14.0			
									3L	14.0	15.9			
									4L	15.9	18.0			
M	18.0	28.0	M1	18.0	22.4				1M	18.0	20.1			
			M2	22.4	28.0				2M	20.1	22.4			
									3M	22.4	25.0			
									4M	25.0	28.0			
N	28.0	45.0	N1	28.0	35.5				1N	28.0	31.5			
			N2	35.5	45.0				2N	31.5	35.5			
									3N	35.5	40.0			
									4N	40.0	45.0			
P	45.0	71.0	P1	45.0	56.0				1P	45.0	50.0			
			P2	56.0	71.0				2P	50.0	56.0			
									3P	56.0	63.0			
									4P	63.0	71.0			
Q	71.0	112	Q1	71.0	90.0				1Q	71.0	80.0			
			Q2	90.0	112				2Q	80.0	90.0			
									3Q	90.0	100.0			
									4Q	100.0	112			
R	112	180	R1	112	140				1R	112	125			
			R2	140	180				2R	125	140			
									3R	140	159			
									4R	159	180			
S	180	280	S1	180	224				1S	180	201			
			S2	224	280				2S	201	224			
									3S	224	250			
									4S	250	280			
T	280	450	T1	280	355				1T	280	315			
			T2	355	450				2T	315	355			
									3T	355	400			
									4T	400	450			
U	450	710	U1	450	560				1U	450	500			
			U2	560	710				2U	500	560			
									3U	560	630			
									4U	630	710			
V	710	1 120	V1	710	900				1V	710	800			
			V2	900	1 120				2V	800	900			
									3V	900	1 000			
									4V	1 000	1 120			
AW	1 120	1 800	AA	1 120	1 400	AX	1 120	1 300	5A	1 120	1 250	AP	1 120	1 210
			AB	1 400	1 800	AY	1 300	1 500	6A	1 250	1 400	AQ	1 210	1 300
						AZ	1 500	1 800	7A	1 400	1 590	AR	1 300	1 400
									8A	1 590	1 800	AS	1 400	1 500
												AT	1 500	1 640
												AU	1 640	1 800
BW	1 800	2 800	BA	1 800	2 240	BX	1 800	2 100	5B	1 800	2 010	BP	1 800	1 940
			BB	2 240	2 800	BY	2 100	2 400	6B	2 010	2 240	BQ	1 940	2 100
						BZ	2 400	2 800	7B	2 240	2 500	BR	2 100	2 240
									8B	2 500	2 800	BS	2 240	2 400
												BT	2 400	2 590
												BU	2 590	2 800
CW	2 800	4 500	CA	2 800	3 550	CX	2 800	3 300	5C	2 800	3 150	CP	2 800	3 040
			CB	3 550	4 500	CY	3 300	3 900	6C	3 150	3 550	CQ	3 040	3 300
						CZ	3 900	4 500	7C	3 550	4 000	CR	3 300	3 590
									8C	4 000	4 500	CS	3 590	3 900
												CT	3 900	4 190
												CU	4 190	4 500
DW	4 500	7 100	DA	4 500	5 600	DX	4 500	5 200	5D	4 500	5 000	DP	4 500	4 840
			DB	5 600	7 100	DY	5 200	6 100	6D	5 000	5 600	DQ	4 840	5 200
						DZ	6 100	7 100	7D	5 600	6 300	DR	5 200	5 630
									8D	6 300	7 100	DS	5 630	6 100
												DT	6 100	6 580
												DU	6 580	7 100

Brightness Intensity Groups

1/1 Grouping (cont.)			1/2 Grouping (cont.)			1/3 Grouping (cont.)			1/4 Grouping (cont.)			1/6 Grouping (cont.)		
Bin	min.	max.	Bin	min.	max.	Bin	min.	max.	Bin	min.	max.	Bin	min.	max.
EW	7 100	11 200	EA	7 100	9 000	EX	7 100	8 200	5E	7 100	8 000	EP	7 100	7 630
			EB	9 000	11 200	EY	8 200	9 700	6E	8 000	9 000	EQ	7 630	8 200
						EZ	9 700	11 200	7E	9 000	10 000	ER	8 200	8 920
									8E	10 000	11 200	ES	8 920	9 700
												ET	9 700	10 420
												EU	10 420	11 200
FW	11 200	18 000	FA	11 200	14 000	FX	11 200	13 000	5F	11 200	12 500	FP	11 200	12 100
			FB	14 000	18 000	FY	13 000	15 000	6F	12 500	14 000	FQ	12 100	13 000
						FZ	15 000	18 000	7F	14 000	15 900	FR	13 000	14 000
									8F	15 900	18 000	FS	14 000	15 000
												FT	15 000	16 400
												FU	16 400	18 000
GW	18 000	28 000	GA	18 000	22 400	GX	18 000	21 000	5G	18 000	20 100	GP	18 000	19 400
			GB	22 400	28 000	GY	21 000	24 000	6G	20 100	22 400	GQ	19 400	21 000
						GZ	24 000	28 000	7G	22 400	25 000	GR	21 000	22 400
									8G	25 000	28 000	GS	22 400	24 000
												GT	24 000	25 900
												GU	25 900	28 000
HW	28 000	45 000	HA	28 000	35 500	HX	28 000	33 000	5H	28 000	31 500	HP	28 000	30 400
			HB	35 500	45 000	HY	33 000	39 000	6H	31 500	35 500	HQ	30 400	33 000
						HZ	39 000	45 000	7H	35 500	40 000	HR	33 000	35 900
									8H	40 000	45 000	HS	35 900	39 000
												HT	39 000	41 900
												HU	41 900	45 000
JW	45 000	71 000	JA	45 000	56 000	JX	45 000	52 000	5J	45 000	50 000	JP	45 000	48 400
			JB	56 000	71 000	JY	52 000	61 000	6J	50 000	56 000	JQ	48 400	52 000
						JZ	61 000	71 000	7J	56 000	63 000	JR	52 000	56 300
									8J	63 000	71 000	JS	56 300	61 000
												JT	61 000	65 800
												JU	65 800	71 000
KW	71 000	112 000	KA	71 000	90 000	KX	71 000	82 000	5K	71 000	80 000	KP	71 000	76 300
			KB	90 000	112 000	KY	82 000	97 000	6K	80 000	90 000	KQ	76 300	82 000
						KZ	97 000	112 000	7K	90 000	100 000	KR	82 000	89 200
									8K	100 000	112 000	KS	89 200	97 000
												KT	97 000	104 200
												KU	104 200	112 000
LW	112 000	180 000	LA	112 000	140 000	LX	112 000	130 000	5L	112 000	125 000	LP	112 000	121 000
			LB	140 000	180 000	LY	130 000	150 000	6L	125 000	140 000	LQ	121 000	130 000
						LZ	150 000	180 000	7L	140 000	159 000	LR	130 000	140 000
									8L	159 000	180 000	LS	140 000	150 000
												LT	150 000	164 000
												LU	164 000	180 000
MW	180 000	280 000	MA	180 000	224 000	MX	180 000	210 000	5M	180 000	201 000	MP	180 000	194 000
			MB	224 000	280 000	MY	210 000	240 000	6M	201 000	224 000	MQ	194 000	210 000
						MZ	240 000	280 000	7M	224 000	250 000	MR	210 000	224 000
									8M	250 000	280 000	MS	224 000	240 000
												MT	240 000	259 000
												MU	259 000	280 000
NW	280 000	450 000	NA	280 000	355 000	NX	280 000	330 000	5N	280 000	315 000	NP	280 000	304 000
			NB	355 000	450 000	NY	330 000	390 000	6N	315 000	355 000	NQ	304 000	330 000
						NZ	390 000	450 000	7N	355 000	400 000	NR	330 000	359 000
									8N	400 000	450 000	NS	359 000	390 000
												NT	390 000	419 000
												NU	419 000	450 000
PW	450 000	710 000	PA	450 000	560 000	PX	450 000	520 000	5P	450 000	500 000	PP	450 000	484 000
			PB	560 000	710 000	PY	520 000	610 000	6P	500 000	560 000	PQ	484 000	520 000
						PZ	610 000	710 000	7P	560 000	630 000	PR	520 000	563 000
									8P	630 000	710 000	PS	563 000	610 000
												PT	610 000	658 000
												PU	658 000	710 000
QW	710 000	1 120 000	QA	710 000	900 000	QX	710 000	820 000	5Q	710 000	800 000	QP	710 000	763 000
			QB	900 000	1 120 000	QY	820 000	970 000	6Q	800 000	900 000	QQ	763 000	820 000
						QZ	970 000	1 120 000	7Q	900 000	1 000 000	QR	820 000	892 000
									8Q	1 000 000	1 120 000	QS	892 000	970 000
												QT	970 000	1 042 000
												QU	1 042 000	1 120 000
RW	1 120 000	1 800 000	RA	1 120 000	1 400 000	RX	1 120 000	1 300 000	5R	1 120 000	1 250 000	RP	1 120 000	1 210 000
			RB	1 400 000	1 800 000	RY	1 300 000	1 500 000	6R	1 250 000	1 400 000	RQ	1 210 000	1 300 000
						RZ	1 500 000	1 800 000	7R	1 400 000	1 590 000	RR	1 300 000	1 400 000
									8R	1 590 000	1 800 000	RS	1 400 000	1 500 000
												RT	1 500 000	1 640 000
												RU	1 640 000	1 800 000
SW	1 800 000	2 800 000	SA	1 800 000	2 240 000	SX	1 800 000	2 100 000	5S	1 800 000	2 010 000	SP	1 800 000	1 940 000
			SB	2 240 000	2 800 000	SY	2 100 000	2 400 000	6S	2 010 000	2 240 000	SQ	1 940 000	2 100 000
						SZ	2 400 000	2 800 000	7S	2 240 000	2 500 000	SR	2 100 000	2 240 000
									8S	2 500 000	2 800 000	SS	2 240 000	2 400 000
												ST	2 400 000	2 590 000
												SU	2 590 000	2 800 000
TW	2 800 000	4 500 000	TA	2 800 000	3 550 000	TX	2 800 000	3 300 000	5T	2 800 000	3 150 000	TP	2 800 000	3 040 000
			TB	3 550 000	4 500 000	TY	3 300 000	3 900 000	6T	3 150 000	3 550 000	TQ	3 040 000	3 300 000
						TZ	3 900 000	4 500 000	7T	3 550 000	4 000 000	TR	3 300 000	3 590 000
									8T	4 000 000	4 500 000	TS	3 590 000	3 900 000
												TT	3 900 000	4 190 000
												TU	4 190 000	4 500 000
UW	4 500 000	7 100 000	UA	4 500 000	5 600 000	UX	4 500 000	5 200 000	5U	4 500 000	5 000 000	UP	4 500 000	4 840 000
			UB	5 600 000	7 100 000	UY	5 200 000	6 100 000	6U	5 000 000	5 600 000	UQ	4 840 000	5 200 000
						UZ	6 100 000	7 100 000	7U	5 600 000	6 300 000	UR	5 200 000	5 630 000
									8U	6 300 000	7 100 000	US	5 630 000	6 100 000
												UT	6 100 000	6 580 000
												UU	6 580 000	7 100 000
VW	7 100 000	11 200 000	VA	7 100 000	9 000 000	VX	7 100 000	8 200 000	5V	7 100 000	8 000 000	VP	7 100 000	7 630 000
			VB	9 000 000	11 200 000	VY	8 200 000	9 700 000	6V	8 000 000	9 000 000	VQ	7 630 000	8 200 000
						VZ	9 700 000	11 200 000	7V	9 000 000	10 000 000	VR	8 200 000	8 920 000
									8V	10 000 000	11 200 000	VS	8 920 000	9 700 000
												VT	9 700 000	10 420 000
												VU	10 420 000	11 200 000

LED for General Lighting (SSL)

Safety Instructions
The use of new chip technologies means that OSRAM LEDs are delivering higher and higher levels of optical performance. Thus, even eye safety issues might increasingly need to be considered. In general, the EU product safety legislation requires conformity with EC directives (such as the "Low Voltage Directive") which define the "essential requirements", e.g., protection of health and safety, that goods must meet when they are placed on the market. We therefore recommend that the current version of the IEC 62471 standard is taken into account right from the outset, i.e. at the equipment development stage, and that suitable protection facilities are provided in your laboratories.

Eye Safety Information
The light output of modern High-Power-LEDs is strong enough for eye irritation and temporal blinding effects. Therefore, in general, do not stare into the light beam of any LED at close range. Optical radiation hazards by LED-based lamps, lamp systems or luminaires have to be assessed and classified according to the requirements of IEC62471 ("Photobiological safety of lamps and lamp systems").

Within the risk grouping system of this IEC standard, most LEDs specified in this catalogue fall into the "exempt" group. However, high-power "blue" LEDs and the most important "white" LEDs for general lighting may need some attention. Due to their dominating photochemical hazard potential, extensive deliberate long-term direct viewing from close distance can indeed be hazardous. Under worst case conditions of classification, these high power light sources can even be allocated to the "moderate risk group" i.e. safety bases on aversion reactions against bright light. However, under real circumstances (for exposure time, eye pupils, observation distance), it is assumed that no endangerment to the eye exists from these devices. This is valid for single LEDs under the mentioned conditions and operating conditions defined in the data sheet. Complex Multi-LED-designs, additional optics or extreme application conditions demand a separate evaluation of the entire system.

As a matter of principle, however, it should be mentioned that intense light sources have a high secondary exposure potential due to their blinding effect. As for any bright light source, when viewing into it (e.g. headlights), temporary reduction in visual acuity and afterimages can occur, leading to irritation, annoyance, visual impairment, and even accidents, depending on the situation.

Remarks:
User shall not reverse engineer by disassembling or analysis of the LEDs without having the prior written consent of OSRAM Opto Semiconductors GmbH. When defective LEDs are found, user shall inform to OSRAM Opto Semiconductors GmbH directly before disassembling or analysis.

The appearance and specifications of the product may be modified for improvement without notice.

Sicherheitshinweise
OSRAM LEDs erreichen aufgrund von neuen Chip-Technologien immer höhere optische Leistungen. Deshalb müssen auch Sicherheitsaspekte bezüglich Augensicherheit zunehmend in Betracht gezogen werden. Generell fordern die EU Produkt-Sicherheitsgesetze Konformität mit den EU Richtlinien (z.B. die "Niederspannungsrichtlinie"), die wesentliche Forderungen festlegen, z.B. an Sicherheit und Gesundheitsschutz, die die auf den Markt gebrachten Produkte erfüllen müssen.
Wir empfehlen daher, schon bei der Entwicklung von Geräten, die zu diesem Zeitpunkt gültige Norm IEC 62471 zu beachten und insbesondere auf den Gebrauch von entsprechenden Schutzvorrichtungen in Ihren Labors hinzuweisen.

Informationen zur Augensicherheit
Die Lichtausbeute der modernen Hochleistung-LEDs ist stark genug, um Augenreizungen und zeitliche Blindheitseffekte hervorzurufen. Daher sollten Sie generell nicht aus kurzer Entfernung in den Lichtstrahl jeglicher LED blicken.
Risiken durch optische Strahlung, die durch LED-basierte Lampen, Lampen-Systeme oder Leuchter entstehen, müssen eingeschätzt und nach der Forderungen des IEC62471 Standards ("Photobiological safety of lamps and lamp systems") bewertet werden.

Im Rahmen des Risikogruppensystems des IEC Standards fallen die meisten in diesem Katalog beschriebenen LEDs in die "exempt" (befreit) Gruppe. Jedoch sollten hochleistungsfähige blaue LEDs und die wichtigsten weißen LEDs näher betrachtet werden. Auf Grund ihres hohen photochemischen Risiko-Potenzials kann das langfristige, bewusste, direkte Ansehen gefährlich sein. Bei ungünstigsten Bedingungen der Anordnung können die Hochleistungs-LEDs sogar der "moderate risk group" (gemäßigte Risikogruppe) zugeordnet werden, d.h. die Sicherheit beruht auf Aversions-Reaktionen auf helles Licht. Unter realen Umständen (in Bezug auf Belichtungszeit, Pupillen, Betrachtungsabstand) kann jedoch angenommen werden, dass keine Gefahr für die Augen von diesen Geräten ausgeht. Dies gilt für einzelne LEDs unter den genannten Konditionen und im Datenblatt definierten Betriebsbedingungen. Komplexe Multi-LED Designs, zusätzliche Optik oder außergewöhnliche Anwendungsbedingungen fordern eine gesonderte Bewertung des ganzen Systems.

Prinzipiell ist jedoch zu erwähnen, dass starke Lichtquellen auf Grund ihrer Blendwirkung ein hohes, sekundäres Gefahrenpotenzial besitzen. Wie bei jeder hellen Lichtquelle kann das direkte Anschauen (z.B. Scheinwerfer) zur Reduzierung der Sehschärfe oder zu Nachbildern führen, was Reizungen, Irritationen und sogar Unfälle verursachen kann.

Anmerkungen:
Der Anwender darf keinen Ausbau oder Analyse der LEDs vornehmen, ohne die vorherige schriftliche Zustimmung von OSRAM Opto Semiconductors GmbH zu haben. Wenn defekte LEDs gefunden werden, soll der Anwender baldmöglichst OSRAM Opto Semiconductors GmbH informieren, bevor er einen Ausbau oder eine Analyse vornimmt.
Erscheinungsform und technische Daten des Produktes können zwecks Verbesserung ohne Benachrichtigung geändert werden.

SOLERIQ Family

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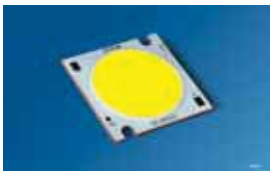
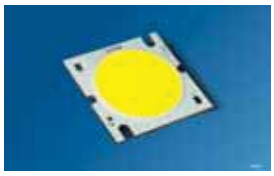


SOLERIQ E 30



SOLERIQ E 45

OSLON Family

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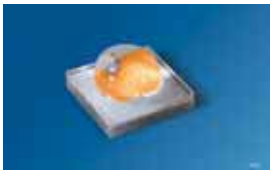
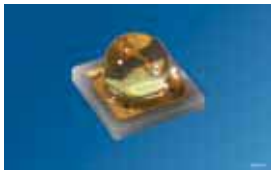
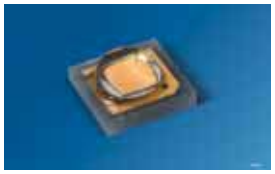


OSLON Square



OSLON SSL 80



OSLON SSL 150

Golden DRAGON Plus Family

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Golden DRAGON Plus

DURIS Family

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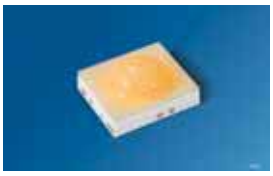


DURIS P 5

DURIS E 5

DURIS E 3

SOLERIQ Family

SOLERIQ E 30

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 80 min									
	GW KAJRB2.EM-TPTR-65H4	◯ cool white	6500	2800 ... 3590	600	120	ongoing	Q65111A2520	1
	GW KAJRB2.EM-TPTR-57H4		5700					Q65111A2519	
	GW KAJRB2.EM-TPTR-50H4	◯ neutral white	5000					Q65111A2518	
	GW KAJRB2.EM-TPTR-40H4		4000					Q65111A2517	
	GW KAJRB2.EM-SUTQ-30H4	◯ warm white	3000	2590 ... 3300				Q65111A2516	
	GW KAJRB2.EM-STTQ-27H4		2700	2400 ... 3300				Q65111A2515	

SOLERIQ E 45

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 80 min									
	GW KALRB3.EM-TUUQ-65H4	◯ cool white	6500	4190 ... 5200	880	120	ongoing	Q65111A2526	2
	GW KALRB3.EM-TUUQ-57H4		5700					Q65111A2525	
	GW KALRB3.EM-TUUQ-50H4	◯ neutral white	5000					Q65111A2524	
	GW KALRB3.EM-TUUQ-40H4		4000					Q65111A2523	
	GW KALRB3.EM-TSTU-30H4	◯ warm white	3000	3590 ... 4500				Q65111A2522	
	GW KALRB3.EM-TSTU-27H4		2700					Q65111A2521	

OSLON Family

OSLON Square

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 80 min (CRI 82 typ)									
	LCW CQAR.EC-MSMU-5H7I-1	◯ neutral white	5000	224 ... 280	700	120	ongoing	Q65111A3011	3
	LCW CQAR.EC-MRMT-5H7I-1			210 ... 259				Q65111A2866	
	LCW CQAR.EC-MSMU-5J7K-1		4500	224 ... 280				Q65111A3012	
	LCW CQAR.EC-MRMT-5J7K-1			210 ... 259				Q65111A2660	
	LCW CQAR.EC-MSMU-5L7N-1		4000	224 ... 280				Q65111A3069	
	LCW CQAR.EC-MRMT-5L7N-35			210 ... 259				Q65111A2614	
	LCW CQAR.EC-MRMT-5O8Q-35	◯ warm white	3500					Q65111A2744	
	LCW CQAR.EC-MQMS-5O8Q-35			194 ... 240				Q65111A2745	
	LCW CQAR.EC-MRMT-5R8T-35		3000	210 ... 259				Q65111A2743	
	LCW CQAR.EC-MQMS-5R8T-1			194 ... 240				Q65111A2119	
	LCW CQAR.EC-MQMT-5U8X-35		2700	194 ... 259				Q65111A2741	
	LCW CQAR.EC-MPMR-5U8X-35			180 ... 224				Q65111A2686	
	LCW CQAR.EC-MQMS-5YC8-1		2400	194 ... 240				Q65111A3016	
	LCW CQAR.EC-MPMR-5YC8-1			180 ... 224				Q65111A3013	
CRI 70 min (CRI 72 typ)									
	LCW CQAR.PC-MUMQ-5F7G-1	◯ cool white	5700	259 ... 304	700	120	ongoing	Q65111A2967	3
	LCW CQAR.PC-MUNQ-5H7I-1	◯ neutral white	5000	259 ... 330				Q65111A2867	
	LCW CQAR.PC-MTNP-5H7I-1			240 ... 304				Q65111A2541	
	LCW CQAR.PC-MUNQ-5J7K-1		4500	259 ... 330				Q65111A2889	
	LCW CQAR.PC-MTNP-5J7K-1			240 ... 304				Q65111A2869	
	LCW CQAR.PC-MTNP-5L7N-1		4000					Q65111A2684	
	LCW CQAR.PC-MSMU-5L7N-1			224 ... 280				Q65111A2428	

OSLON Family

OSLON Square

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 70									
	LUW CQAR-NPNR-JPJR-1	◯ streetwhite	5700	280 ... 359	700	120	ongoing	Q65111A3105	3
	LUW CQAR-MUNQ-JPJR-1			259 ... 330				Q65111A2739	
	LUW CQAR-NPNR-HPJR-1		6000	280 ... 359				Q65111A3106	
	LUW CQAR-MUNQ-HPJR-1			259 ... 330				Q65111A2538	
	LUW CQAR-NPNR-HPHR-1		6500	280 ... 359				Q65111A3107	
	LUW CQAR-MUNQ-HPHR-1			259 ... 330				Q65111A2736	
CRI 65									
	LUW CQAR-NPNR-MCML-1	◯ EQ white		280 ... 359	700	120	ongoing	Q65111A3109	3
	LUW CQAR-NQNS-MMMW-1			304 ... 390				Q65111A3111	
	LUW CQAR-NPNR-MMMW-1			280 ... 359				Q65111A3110	

OSLON Family

OSLON SSL 80

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 95									
	LCW CQ7P.CC-KQKS-5L7N-1	◯ neutral white	4000	76.3 ... 97	350	80	✓	Q65111A1889	4
	LCW CQ7P.CC-KQKS-5O8Q-1	◯ warm white	3500					Q65111A1891	
	LCW CQ7P.CC-KPKR-5O8Q-1			71 ... 89.2				Q65111A1890	
	LCW CQ7P.CC-KPKR-5R8T-1		3000					Q65111A1893	
	LCW CQ7P.CC-JUKQ-5R8T-1			65.8 ... 82				Q65111A1892	
	LCW CQ7P.CC-JUKQ-5U8X-1		2700					Q65111A1898	
	LCW CQ7P.CC-JTKP-5U8X-1			61 ... 76.3				Q65111A1897	
CRI 80 min (CRI 82 typ)									
	LCW CR7P.EC-LPLR-5H7I-1	◯ neutral white	5000	112 ... 140	350	80	✓	Q65111A2594	5
	LCW CR7P.EC-LPLR-5J7K-1		4500					Q65111A2705	
	LCW CR7P.EC-KULQ-5J7K-1			104.2 ... 130				Q65111A2706	
	LCW CR7P.EC-LPLR-5L7N-1		4000	112 ... 140				Q65111A3116	
	LCW CR7P.EC-KULQ-5L7N-1			104.2 ... 130				Q65111A2551	
	LCW CR7P.EC-KULQ-5O8Q-1	◯ warm white	3500					Q65111A2795	
	LCW CR7P.EC-KULQ-5R8T-1		3000					Q65111A2533	
	LCW CR7P.EC-KTLP-5R8T-1			97 ... 121				Q65111A2251	
	LCW CR7P.EC-KULQ-5U8X-1		2700	104.2 ... 130				Q65111A2964	
	LCW CR7P.EC-KTLP-5U8X-1			97 ... 121				Q65111A2534	

OSLON Family

OSLON SSL 80

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 70 min (CRI 72 typ)									
	LCW CR7P.PC-LRLT-5F7G-1	◯ cool white	5700	130 ... 164	350	80	✓	Q65111A3441	5
	LCW CR7P.PC-LQLS-5J7K-1	◯ neutral white	4500	121 ... 150				Q65111A2640	
	LCW CR7P.PC-LQLS-5H7I-1		5000					Q65111A2249	
	LCW CR7P.PC-LQLS-5L7N-1		4000					Q65111A2549	
	LCW CR7P.PC-LPLR-5L7N-1			112 ... 140				Q65111A2550	
CRI 70									
	LUW CR7P-LRLT-JPJR-1	◯ streetwhite	5700	130 ... 164	350	80	✓	Q65111A2912	4
	LUW CR7P-LRLT-HPJR-1		6000					Q65111A2506	

OSLON Family

OSLON SSL 80

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
Colors								
	LA CP7P-KQKS-W3	amber	617	76.3 ... 97	350	80	Q65111A2282	4
	LA CP7P-KPKR-W4			71 ... 89.2			Q65111A2063	
	LB CP7P-GZHX-1	blue	470	24 ... 33	350	80	Q65111A2135	4
	LB CP7P-GYHY-35			21 ... 39			Q65111A1091	
	LR CP7P-JSJU-1	red	625	56.3 ... 71	350	80	Q65111A2597	4
	LR CP7P-JRJT-1			52 ... 65.8			Q65111A2055	
	LT CP7P-KYKZ-26-0	true green	528	82 ... 112	350	80	Q65111A2267	4
	LY CP7P-JSJU-36	yellow	590	56.3 ... 71	350	80	Q65111A3360	4
	LY CP7P-JRJT-36			52 ... 65.8			Q65111A2059	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD CQ7P-2U3U-W5-1	deep blue	455	500 ... 630	350	80	Q65111A2269	4
	LH CP7P-2T3T-1	hyper red	645	315 ... 400	350	80	Q65111A2061	4
	LH CP7P-3T4T-1			355 ... 450			Q65111A2655	

OSLON Family

OSLON SSL 150

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 95									
	LCW CQDP.CC-KQKS-5L7N-1	◯ neutral white	4000	76.3 ... 97	350	150	✓	Q65111A1908	6
	LCW CQDP.CC-KQKS-5O8Q-1	◯ warm white	3500					Q65111A1911	
	LCW CQDP.CC-KPKR-5O8Q-1			71 ... 89.2				Q65111A1910	
	LCW CQDP.CC-KPKR-5R8T-1		3000					Q65111A1913	
	LCW CQDP.CC-JUKQ-5R8T-1			65.8 ... 82				Q65111A1912	
	LCW CQDP.CC-JUKQ-5U8X-1		2700					Q65111A1915	
	LCW CQDP.CC-JTKP-5U8X-1			61 ... 76.3				Q65111A1914	
CRI 80 min (CRI 82 typ)									
	LCW CRDP.EC-LPLR-5H7I-1	◯ neutral white	5000	112 ... 140	350	150	✓	Q65111A2588	7
	LCW CRDP.EC-LPLR-5J7K-1		4500					Q65111A2703	
	LCW CRDP.EC-KULQ-5J7K-1			104.2 ... 130				Q65111A2704	
	LCW CRDP.EC-LPLR-5L7N-1		4000	112 ... 140				Q65111A3115	
	LCW CRDP.EC-KULQ-5L7N-1			104.2 ... 130				Q65111A2553	
	LCW CRDP.EC-KULQ-5O8Q-1	◯ warm white	3500					Q65111A2723	
	LCW CRDP.EC-KULQ-5R8T-1		3000					Q65111A2531	
	LCW CRDP.EC-KTLP-5R8T-1			97 ... 121				Q65111A2250	
	LCW CRDP.EC-KULQ-5U8X-1		2700	104.2 ... 130				Q65111A2963	
	LCW CRDP.EC-KTLP-5U8X-1			97 ... 121				Q65111A2532	

OSLON Family

OSLON SSL 150

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 70 min (CRI 72 typ)									
	LCW CRDP.PC-LRLT-5H7I-1	◯ neutral white	5000	130 ... 164	350	150	✓	Q65111A2587	7
	LCW CRDP.PC-LQLS-5H7I-1			121 ... 150				Q65111A2261	
	LCW CRDP.PC-LQLS-5J7K-1		4500					Q65111A2638	
	LCW CRDP.PC-LQLS-5L7N-1		4000					Q65111A2546	
	LCW CRDP.PC-LPLR-5L7N-1			112 ... 140				Q65111A2547	
CRI 70									
	LUW CRDP-LRLT-HPJR-1	◯ streetwhite	6000	130 ... 164	350	150	✓	Q65111A2505	6
	LUW CRDP-LRLT-JPJR-1		5700					Q65111A3196	
EQW									
	LUW CQDP-LRLT-MJMW-1	◯ EQ white		130 ... 164	350	150	✓	Q65111A1905	6
	LUW CQDP-LQLS-MJMW-1			121 ... 150				Q65111A1904	
	LUW CQDP-LQLS-M8MI-1							Q65111A1901	
	LUW CQDP-LPLR-M8MI-1			112 ... 140				Q65111A1900	

OSLON Family

OSLON SSL 150

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
Colors								
	LA CPDP-KQKS-W3	amber	617	76.3 ... 97	350	150	Q65111A2284	6
	LA CPDP-KPKR-W3			71 ... 89.2			Q65111A1856	
	LB CPDP-GZHX-1	blue	470	24 ... 33	350	150	Q65111A2136	6
	LB CPDP-GYHY-35			21 ... 39			Q65111A0403	
	LR CPDP-JSJU-1	red	625	56.3 ... 71	350	150	Q65111A2176	6
	LR CPDP-JRJT-1			52 ... 65.8			Q65111A2056	
	LT CPDP-KYKZ-26-0	true green	528	82 ... 112	350	150	Q65111A2266	6
	LY CPDP-JSJU-36	yellow	590	56.3 ... 71	350	150	Q65111A3359	6
	LY CPDP-JRJT-36			52 ... 65.8			Q65111A2060	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD CQDP-2U3U-W5-1	deep blue	455	500 ... 630	350	150	Q65111A2268	6
	LH CPDP-3T4T-1	hyper red	645	355 ... 450	350	150	Q65111A2654	6
	LH CPDP-2T3T-1			315 ... 400			Q65111A1765	

Golden DRAGON Plus Family

Golden DRAGON Plus

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 82									
	LCW W5AM-KYKZ-4J8K	◯ neutral white	4500	82 ... 112	350	170	-	Q65111A3470	8
	LCW W5AM-KYKZ-4L8N		4000					Q65110A8828	
	LCW W5AM-JZKZ-4O9Q	◯ warm white	3500	61 ... 112				Q65110A9536	
	LCW W5AM-KYKZ-4R9T		3000	82 ... 112				Q65111A2915	
	LCW W5AM-KXKY-4R9T			71 ... 97				Q65110A8169	
	LCW W5AM-JZKY-4U9X		2700	61 ... 97				Q65110A9535	
CRI 70									
	LCW W5AM.PC-KTLP-4L8N	◯ neutral white	4000	97 ... 121	350	170		Q65111A1036	8
	LCW W5AM.PC-KTLP-4J8K		4500					Q65111A1037	
	LCW W5AM.PC-KTLP-4H8I		5000					Q65111A1038	
	LUW W5AM-KYLY-5F8G	◯ cool white	5700	82 ... 140	350	170	✓	Q65110A8833	8
	LUW W5AM-KYLX-4C8E		6500	82 ... 130				Q65110A9531	
	LUW W5AM-KZLY-6P7R	◯ ultra white	6000	97 ... 140				Q65110A8397	
	LUW W5AM-KYLX-6P7Q			82 ... 130				Q65110A7564	

Golden DRAGON Plus Family

Golden DRAGON Plus

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
Colors								
	LA W5AM-JZKY-24	amber	617	61 ... 97	400	170	Q65111A1331	8
	LA W5AM-JYKY-24			52 ... 97			Q65111A0329	
	LB W5AM-GZHX-25	blue	467	24 ... 33	350		Q65110A9163	
	LB W5AM-GYHY-25			21 ... 39			Q65110A8620	
	LR W5AM-JXJY-1	red	625	45 ... 61	400		Q65110A9310	
	LR W5AM-JYKX-1			52 ... 82			Q65111A0903	
	LT W5AM-KYKZ-35	true green	528	82 ... 112	350		Q65110A9877	
	LV W5AM-JYKY-25	verde green	505	52 ... 97			Q65110A9063	
	LY W5AM-JYKX-36	yellow	590	52 ... 82	400		Q65111A3475	
	LY W5AM-JXJY-36			45 ... 61			Q65110A9337	

Package	Type	Emission color	λ_{dom} (typ.)/ Cx/Cy [nm / -]	Φ_E [mW]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	Ordering Code	Package Fig.
	LD W5AM-1U4U-35	deep blue	462	710 ... 450	350	170	Q65111A3454	8
	LD W5AM-4T2U-35			560 ... 400			Q65111A3453	
	LH W5AM-2T3T-1	hyper red	645	315 ... 400	400	170	Q65111A3474	8
	LH W5AM 1T3T-1			280 ... 400			Q65110A9422	

DURIS Family

DURIS P 5

Package	Type	Emission color	Color Temperature [K]	Φ_V [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 80									
	GW DASPA1.EC-HQHS-5H7I-1	◯ neutral white	5000	30.4 ... 39	100	130	✓	Q65111A2353	9
	GW DASPA1.EC-HPHR-5H7I-1			28 ... 35.9				Q65111A2352	
	GW DASPA1.EC-GUHQ-5H7I-1			25.9 ... 33				Q65111A1835	
	GW DASPA1.EC-HQHS-5L7N-1		4000	30.4 ... 39				Q65111A2962	
	GW DASPA1.EC-HPHR-5L7N-1			28 ... 35.9				Q65111A2351	
	GW DASPA1.EC-GUHQ-5L7N-1			25.9 ... 33				Q65111A2324	
	GW DASPA1.EC-GTHP-5L7N-1			24 ... 30.4				Q65111A1899	
	GW DASPA1.EC-HPHR-5R8T-1	◯ warm white	3000	28 ... 35.9				Q65111A2350	
	GW DASPA1.EC-GTHP-5R8T-1			24 ... 30.4				Q65111A1834	
	GW DASPA1.EC-GUHQ-5R8T-1			25.9 ... 33				Q65111A2349	

DURIS Family

DURIS E 5

Package	Type	Emission color	Color Temperature [K]	I_V [cd]	Φ_V typ. [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 80 min										
	LUW JDSH.EC-FSFU-5C8E-L1N2	◯ cool white	6500	14 ... 18	43	120	120	✓	Q65111A2714	10
	LUW JDSH.EC-FSFU-5E8G-L1N2		5700		44				Q65111A2683	
	LCW JDSH.EC-FSFU-5H7I-L1N2	◯ neutral white	5000	14 ... 18	44	120	120	✓	Q65111A2676	10
	LCW JDSH.EC-FSFU-5L7N-L1N2		4000		43				Q65111A2737	
	LCW JDSH.EC-FRFT-5O8Q-L1N2	◯ warm white	3500	13 ... 16.4	41				Q65111A2868	
	LCW JDSH.EC-FSFU-5R8T-L1N2		3000	14 ... 18					Q65111A3299	
	LCW JDSH.EC-FRFT-5R8T-L1N2			13 ... 16.4					Q65111A2680	
	LCW JDSH.EC-FQFS-5U8X-L1N2		2700	12.1 ... 15	40				Q65111A2679	
	LUW JDSI.EC-FSFU-5C8E-L1N2	◯ cool white	6500	14 ... 18	43	120	120	ongoing	Q65111A3519	10
	LUW JDSI.EC-FSFU-5E8G-L1N2		5700		44				Q65111A3529	
	LCW JDSI.EC-FSFU-5H7I-L1N2	◯ neutral white	5000	14 ... 18	43	120	120	ongoing	Q65111A3524	10
	LCW JDSI.EC-FSFU-5L7N-L1N2		4000		42				Q65111A3526	
	LCW JDSI.EC-FRFT-5O8Q-L1N2	◯ warm white	3500	13 ... 16.4	41				Q65111A3527	
	LCW JDSI.EC-FRFT-5R8T-L1N2		3000		40				Q65111A3528	
	LCW JDSI.EC-FQFS-5U8X-L1N2		2700	12.1 ... 15	38				Q65111A3522	

DURIS Family

DURIS E 5

Package	Type	Emission color	Color Temperature [K]	I_V [cd]	Φ_V typ. [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 70 min										
	LUW JDSI.PC-FTGP-5C8E-L1N2	◯ cool white	6500	15 ... 19.4	0.046	120	120	-	Q65111A3230	10
	LUW JDSI.PC-FTGP-5E8G-L1N2	◯ cool white	5700	15 ... 19.4	0.047	120	120	-	Q65111A3229	10
	LCW JDSI.PC-FTGP-5H7I-L1N2	◯ neutral white	5000	15 ... 19.4	0.047	120	120	-	Q65111A3232	10
	LCW JDSI.PC-FTGP-5L7N-L1N2	◯ neutral white	4000	15 ... 19.4	0.046	120	120	-	Q65111A3221	10
	LCW JDSI.PC-FSFU-5L7N-L1N2	◯ neutral white	4000	14 ... 18	0.046	120	120	-	Q65111A3220	10
	LCW JDSI.PC-FTGP-5R8T-L1N2	◯ warm white	3000	15 ... 19.4	0.045	120	120	-	Q65111A3231	10
	LCW JDSI.PC-FSFU-5R8T-L1N2	◯ warm white	3000	14 ... 18	0.045	120	120	-	Q65111A3219	10

DURIS Family

DURIS E 3

Package	Type	Emission color	Color Temperature [K]	I_V [cd]	Φ_V typ. [lm]	at I_F [mA]	Viewing angle at 50 % I_V 2φ typ. [°]	IESNA LM-80	Ordering Code	Package Fig.
CRI 80 min										
	LUW JNSH.EC-BSBU-5C8E-1	◯ cool white	6500	2.24 ... 2.8	7	20	110	✓	Q65111A1741	11
	LUW JNSH.EC-BSBU-5E8G-1		5700		6.9				Q65111A1742	
	LCW JNSH.EC-BSBU-5H7I-1	◯ neutral white	5000	2.24 ... 2.8	6.9	20	110	✓	Q65111A1684	11
	LCW JNSH.EC-BSBU-5L7N-1		4000		6.5				Q65111A1683	
	LCW JNSH.EC-BSBU-5O8Q-1	◯ warm white	3500		6.3				Q65111A3546	
	LCW JNSH.EC-BSBU-5R8T-1		3000		6.2				Q65111A3545	
	LCW JNSH.EC-BRBT-5U8X-1		2700	2.1 ... 2.59	6				Q65111A3548	
CRI 70 min										
	LCW JNSH.PC-BUCQ-5H7I-1	◯ neutral white	5000	2.59 ... 3.3	7.4	20	110	✓	Q65111A2068	11
	LCW JNSH.PC-BTCP-5H7I-1			2.4 ... 3.04					Q65111A1664	
	LCW JNSH.PC-BUCQ-5L7N-1		4000	2.59 ... 3.3	7.3				Q65111A2554	
	LCW JNSH.PC-BTCP-5L7N-1			2.4 ... 3.04					Q65111A1665	
	LCW JNSH.PC-BTCP-5R8T-1	◯ warm white	3000		6.8				Q65111A2555	

Dimensions in mm (inch)

Figure 1: SOLERIQ E 30

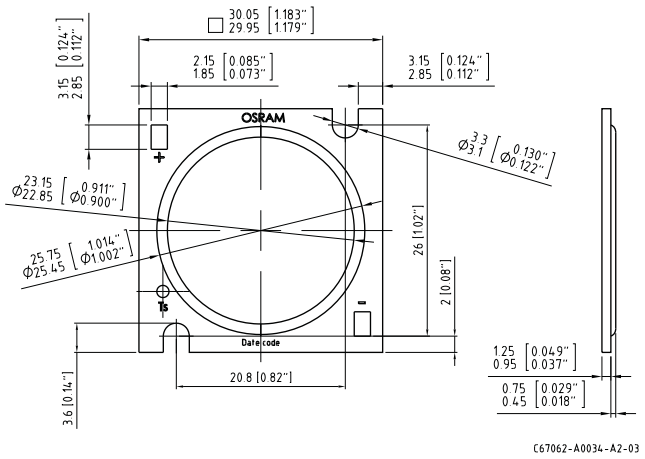


Figure 2: SOLERIQ E 45

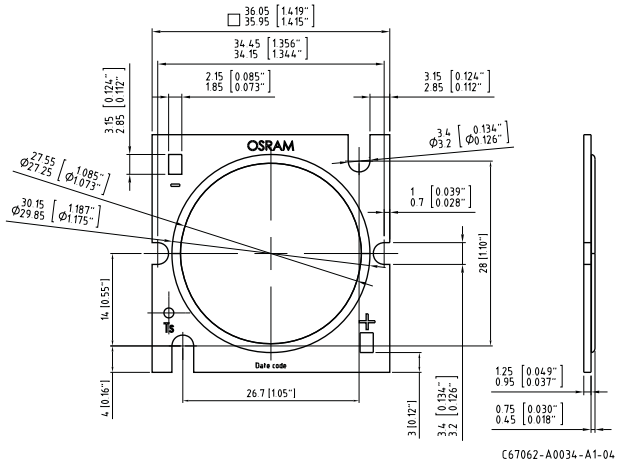


Figure 3: OSLON Square

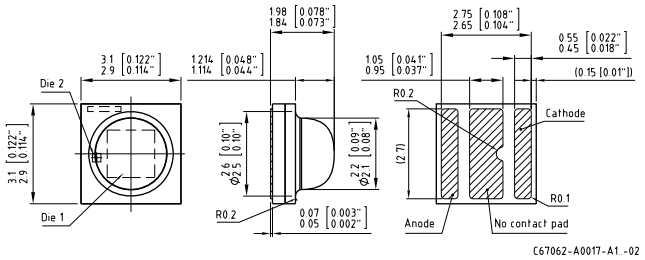


Figure 4: OSLON SSL 80

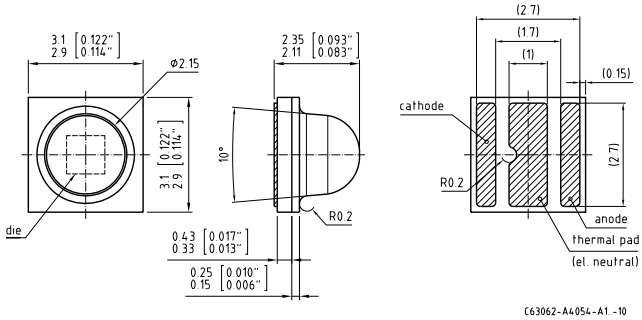


Figure 5: OSLON SSL 80

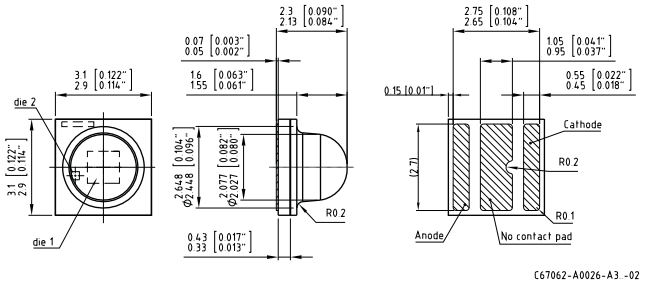
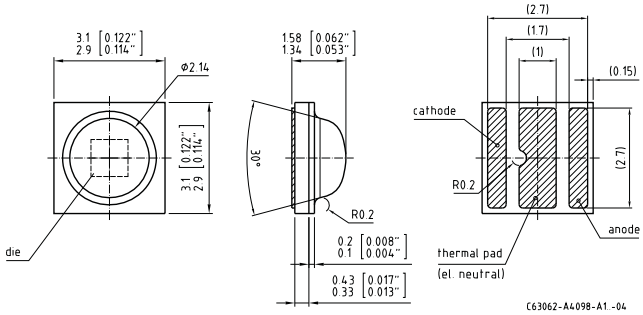


Figure 6: OSLON SSL 150



Dimensions in mm (inch)

Figure 7: OSLON SSL 150

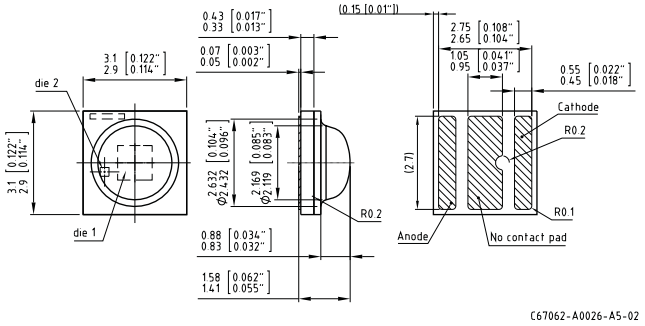


Figure 8: Golden DRAGON Plus

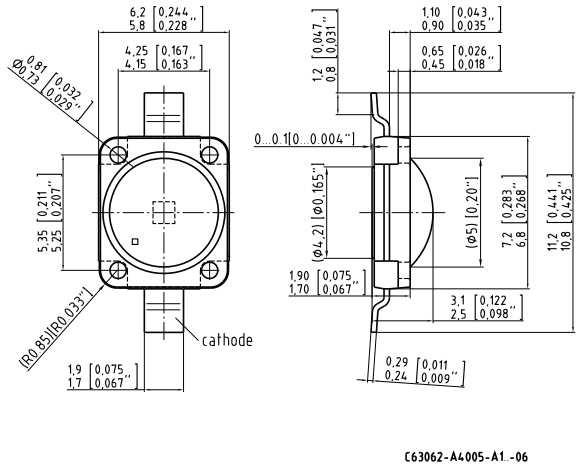


Figure 9: DURIS P 5

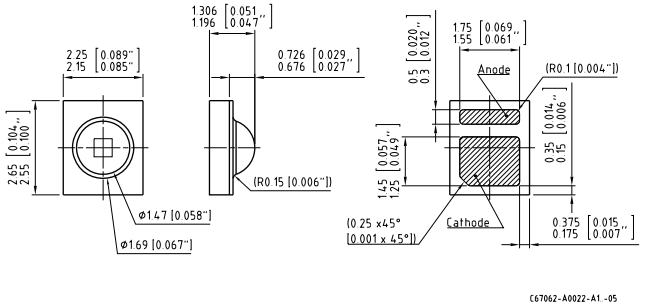


Figure 10: DURIS E 5

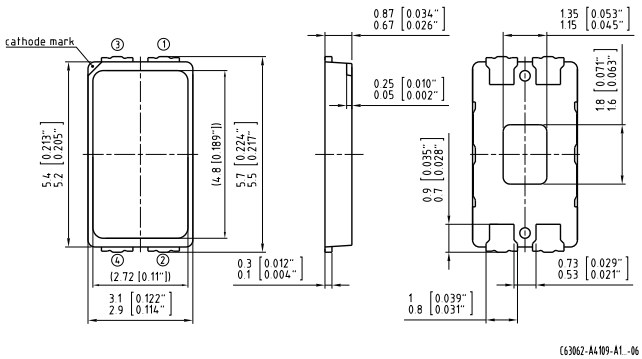
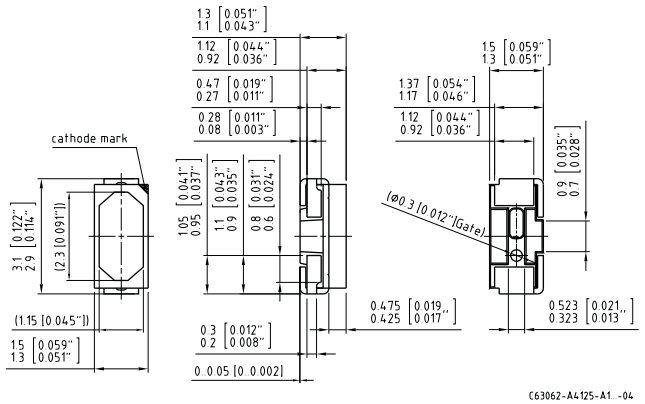
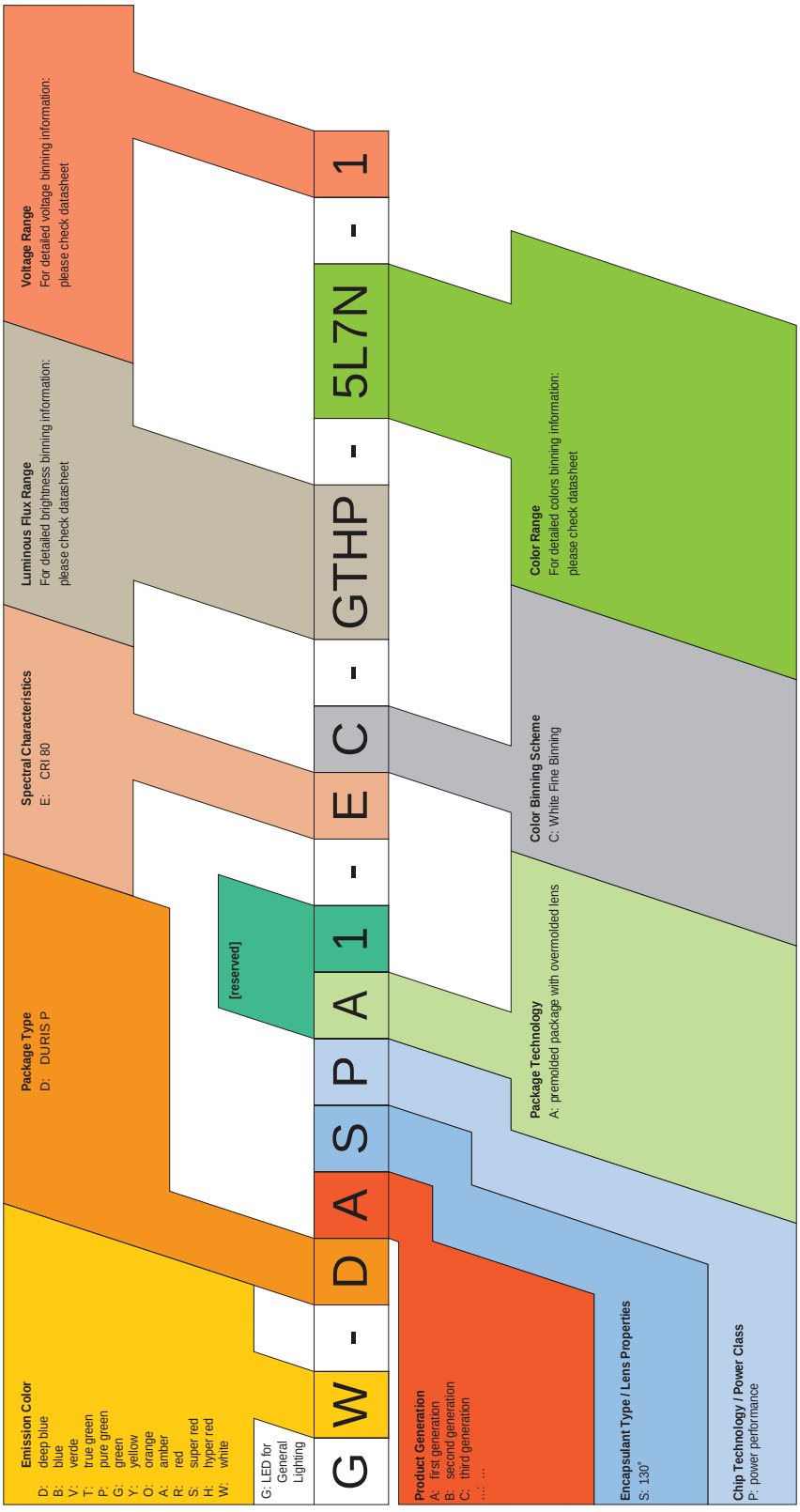


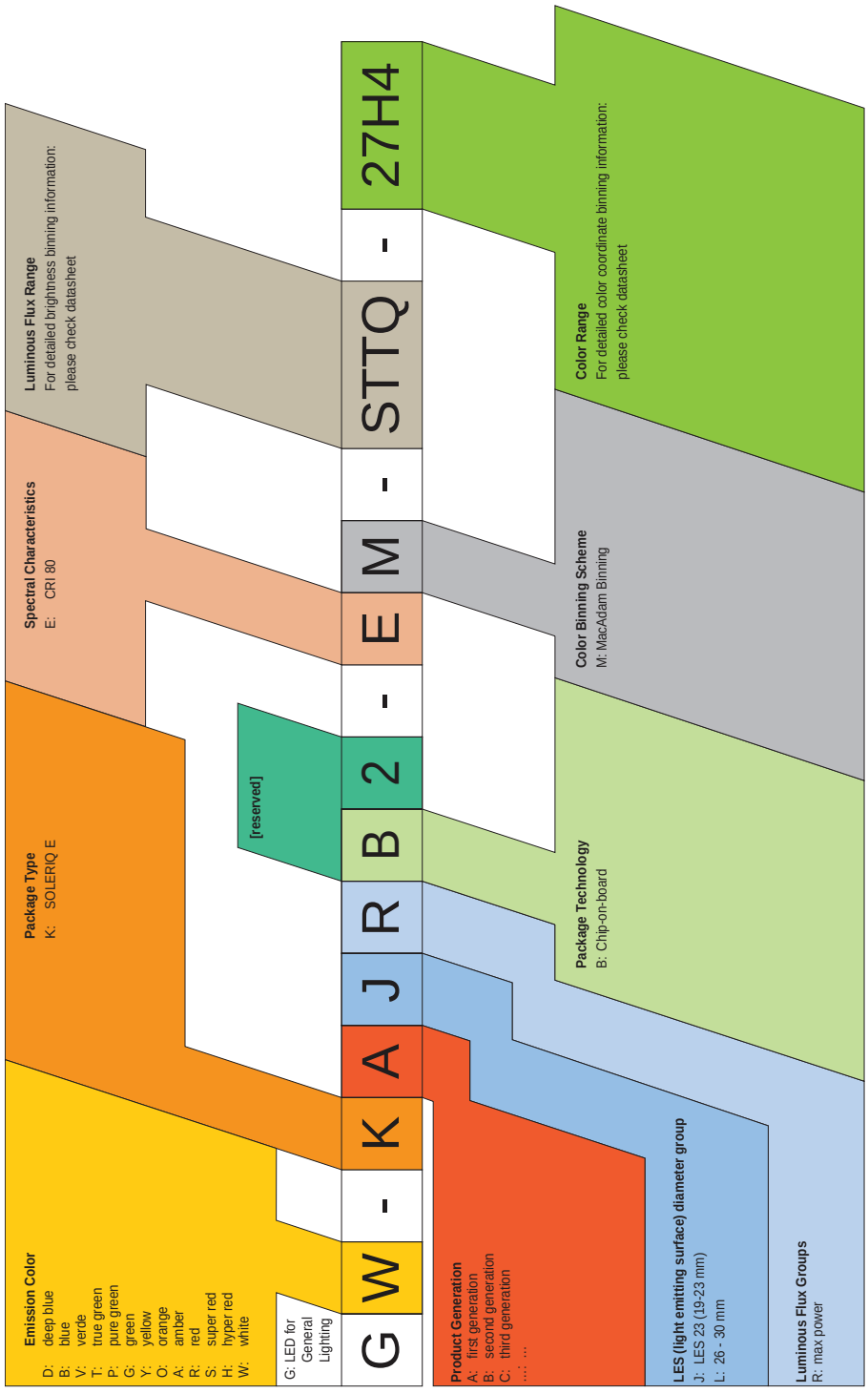
Figure 11: DURIS E 3



Single chip device type designation system



Multi chip device type designation system



Intelligent Displays (IDIS)

Ceramic Hi-rel Intelligent Displays

8-digit 5x7 Ceramic Hi-rel Intelligent Display (Parallel Input / Character Set & UDC)

Page 119

IPD213X Display
Parallel Input with a Character Set & User Definable Characters

4-digit 5x7 Ceramic Hi-rel Intelligent Display (Serial Input / Shift Register Driver)

Page 119

ISD201X Display
Serial Input with a shift register driver

ISD231X Display
Serial Input with a shift register driver

ISD235X Display
Serial Input with a shift register driver

IPD254XA Display
Parallel Input with a character set

10-digit Plastic Package Intelligent Displays

10-digit Slimline 5X5 Intelligent Display (Serial Input / Character RAM)

Page 120

SCD5510XA Display
Serial Input with a Character RAM

8-digit Plastic Package Intelligent Displays

8-digit wide body 5X7 Intelligent Display (Parallel Input)

Page 121

HDSP211XS Display
Parallel Input with a Character Set & User Definable Characters

PDSP211X Display
Parallel Input with a Character Set

8-digit Slimline 5X7 Intelligent Display

Page 121

PDSP188X Display
Parallel Input with a Character Set & User Definable Characters

SCE578X Display
Serial Input with a Character RAM

8-digit Slimline 5X5 Intelligent Display (Serial Input / Character RAM)

Page 121

SCD558XA Display
Serial Input with a Character RAM

4-digit Plastic Package Intelligent Displays

4-digit wide body 5X7 Intelligent Display (Parallel Input / Character Set)

Page 122

PD243X Display
Parallel Input with a Character Set

PD353X Display
Parallel Input with a Character Set

PD443X Display
Parallel Input with a Character Set

4-digit domino series 5X7 Intelligent Display (Parallel Input / Character Set)

Page 122

DLX1414 Display
Parallel Input with a Character Set

DLX2416 Display
Parallel Input with a Character Set

DLX3416 Display
Parallel Input with a Character Set

4-digit wide body serial interface 5X7 Intelligent Display

Page 123

SCF574X Display
Serial Input with a Character RAM

4-digit Slimline 5X7 Intelligent Display (Parallel Input / Character Set)

Page 123

SLX2016 Display
Parallel Input with a Character Set

4-digit Slimline 5X7 Intelligent Display with serial interface (Serial Input / Character RAM)

Page 123

SCE574X Display
Serial Input with a Character RAM DIP Package Pinout

4-digit Slimline 5X7 Intelligent Display with serial interface and single-inline leads (SIP)

Page 123

SCE574XP Display
Serial Input with a Character RAM SIP Package Pinout

4-digit Slimline 5X7 Intelligent Display with serial interface and 90 degree form single inline leads (Q-SIP)

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SCE574XQ Display
Serial Input with a Character RAM 90 Degree Form SIP Package Pinout

4-digit Square Format Plastic Package Displays

4-digit Square Format Intelligent Displays with straight single inline leads (SIP) (Serial Input / Character RAM)

Page 125

SCDQ554XP Display
Serial Input with a Character RAM SIP Package Pinout

4-digit Square Format Intelligent Displays with 90 degree bend single inline leads (Q-SIP) (Serial Input / Character RAM)

Page 125

SCDQ554XQ Display
Serial Input with a Character RAM SIP Package Pinout with 90 Degree Formed

4-digit Square Format Intelligent Displays with molex connector (Serial Input / Character RAM)

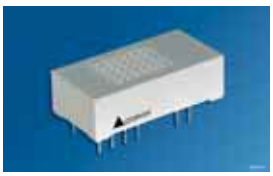
Page 125

SCDQ554XR Display
Serial Input with a Character RAM Single Row Molex Connector Interface

Single digit Plastic Package Intelligent Displays

Single digit Intelligent Displays (Parallel Input / Character Set)

Page 126



DLX413X Display
Parallel Input with a Character Set

DLX713X Display
Parallel Input with a Character Set

Features

Display devices

Intelligent displays are alphanumeric LED displays with built-in CMOS circuits. They are totally self-contained peripherals which allow a wide variety of design configurations, minimize design time and reduce design costs.

- ASCII character set for 128 and 256 characters, or user definable characters
- Bright, high-contrast LED technology
- TTL-compatible, CMOS logic
- 5 V operation
- Very high life expectancy
- Compatible with microprocessor systems
- Access time from 45 ns up to 525 ns
- Independent access to each digit
- Highly compact, flat packages
- Easily stackable for longer message lengths
- Intensity coded for display uniformity

Mounting Instructions

Handling

Observe ESD precautions

- Avoid touching the pins; handle the body only.
- Keep the devices in anti-static tubes or conductive material when transporting
- Use a conductive and grounded work area (conductive flooring, conductive work benches, individual wrist straps, etc.)

Soldering

- Max. soldering temperature: 260 °C
- Max. soldering time: 5 s
- Min. solder distance: > 1.59 mm below the seating plane

In case of wave soldering, the package temperature of Intelligent Displays is not allowed to exceed the max. operating temperature.
It is necessary to use water soluble or alcohol-free soldering flux.

Solvents

Do not use any cleaning solvents containing alcohol.

Eigenschaften

Einzelbausteine

Intelligente Anzeigen sind alphanumerische LED Displays mit eingebautem CMOS-Schaltkreis. Sie sind völlig unabhängige, anwenderfreundliche Peripheriebausteine, die eine große Vielfalt von Gestaltungsmöglichkeiten zulassen, Entwicklungszeit einsparen und -kosten reduzieren.

- ASCII-Zeichensatz für 128 und 256 Zeichen, oder frei programmierbarer Zeichensatz
- Helle, kontraststarke LED-Technologie
- TTL-kompatibel, CMOS-Logik
- Betrieb mit 5 V Versorgungsspannung
- Sehr hohe Lebenserwartung
- Kompatibel zu Microcomputer-Systemen
- Zugriffszeit von 45 ns bis 525 ns
- Direkter, unabhängiger Zugriff auf jede Stelle
- Sehr kompakte, flache Gehäuse
- Einfach aneinanderreihbar für erweiterte Textlängen
- Helligkeitscode für gleichmäßig leuchtende Anzeige

Einbauhinweise

Handhabung

ESD-Vorsichtsmaßnahmen sind zu beachten

- Vermeiden Sie, Anschlüsse zu berühren. Fassen Sie nur am Gehäuse an.
- Transportieren Sie die Bausteine nur in antistatischen Schienen oder auf leitendem Material.
- Die Arbeitsumgebung muß leitend geerdet sein (leitender Fußboden, leitende Arbeitstische, individuelle Handgelenk-Ableitbänder, usw.)

Löten

- Max. Löttemperatur: 260 °C
- Max. Lötzeit: 5 s
- Min. Lötabstand: > 1,59 mm

Bei Wellenlötbädern darf die Gehäusetemperatur die max. Betriebstemperatur nicht überschreiten.
Es muß wasserlösliches bzw. alkoholfreies Flußmittel verwendet werden.

Lösungsmittel

Zum Reinigen der Platinen keine alkoholhaltigen Lösungsmittel benutzen.

Ceramic Hi-rel Intelligent Displays

Package	Type	Emission Color	# of chars.	Char. height [mm]	Pak-kage size [mm]	Inter-face	# of dots per charac-ter	Temperature range Opera-ting / Storage [°C]	Features	Ordering Code	Package Fig.
8-digit 5x7 Ceramic Hi-rel Intelligent Display (Parallel Input / Character Set & UDC)											
	IPD2131	yellow	8	4.85	42.7 x 9.9	parallel	35 5 x 7	-55 ... 100 / -65 ... 125	• Built-in CMOS decoder, multi-plexer, memory and driver • 128 character ASCII character ROM • 16 user definable characters • Rugged ceramic package, hermetically sealed flat glass lens	Q68000A8904	1
	IPD2132	super red								Q68000A8836	
	IPD2133	high effi-ciency green								Q68000A8906	
4-digit 5x7 Ceramic Hi-rel Intelligent Display (Serial Input / Shift Register Driver)											
	IPD2545A	high effi-ciency green	4	6.4	30.48 x 12.45	parallel	35 5 x 7	-55 ... 100 / -65 ... 125	• Built-in CMOS decoder, multi-plexer, memory and driver • 128 character ASCII character ROM • Rugged ceramic package, hermetically sealed flat glass lens	Q68000A9883	2
	IPD2547A	green								Q68000A9884	
	IPD2548A	yellow								Q68000A9885	
	ISD2010	hyper red	4	3.7	17.7 x 7.87	serial shift register	35 5 x 7	-55 ... 100 / -65 ... 125	• Serial input. Easily cascaded for multiple displays • Built-in low power CMOS shift register and constant current LED row drivers • External column strobing allows use of standard and custom alphanumeric fonts • Rugged ceramic package, hermetically sealed flat glass lens	Q68000A8134	3
	ISD2011	yellow								Q68000A8135	
	ISD2012	super red								Q68000A8136	
	ISD2013	high effi-ciency green								Q68000A8137	
	ISD2310	hyper red	4	4.88	20.07 x 8.43	serial shift register	35 5 x 7	-55 ... 100 / -65 ... 125	• Serial input. Easily cascaded for multiple displays • Built-in low power CMOS shift register and constant current LED row drivers • External column strobing allows use of standard and custom alphanumeric fonts • Rugged ceramic package, hermetically sealed flat glass lens	Q68000A8138	4
	ISD2311	yellow								Q68000A8139	
	ISD2312	super red								Q68000A8140	
	ISD2313	high effi-ciency green								Q68000A8141	
	ISD2351	yellow	4	4.88	20.07 x 8.43	serial shift register	35 5 x 7	-55 ... 100 / -65 ... 125	• Sunlight viewable • Serial input. Easily cascaded for multiple displays • Built-in low power CMOS shift register and constant current LED row drivers • External column strobing allows use of standard and custom alphanumeric fonts • Rugged ceramic package, hermetically sealed flat glass lens	Q68000A8142	4
	ISD2352	super red								Q68000A8143	
	ISD2353	high effi-ciency green								Q68000A8144	

10-digit Plastic Package Intelligent Displays

Package	Type	Emission Color	# of chars.	Char. height [mm]	Pak-kage size [mm]	Inter-face	View-ing angle x/ y-axis [deg.]	# of dots per cha-racter	Tempera-ture range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
10-digit Slimline 5X5 Intelligent Display (Serial Input / Character RAM)												
	SCD55104A	high effi-ciency green	10	3.68	38.1 x 3.68	serial	typ. 65	25 5 x 5	-40 ... 85 / -40 ... 100	• Optimum display surface efficiency, • Lower Power - 30% less than 5X7 dot matrix, • High speed serial data input - 5MHz, • Readable from 6 feet (1.8 meters), • Attributes: 250 bit RAM for user definable characters, Eight dimming levels, Power down mode, Hardware/soft-ware CLEAR fucntion, Lamp test. • Internal or external mux clock.	Q68100A0992	5
	SCD55103A	green_									Q68100A0991	
	SCD55102A	super red									Q68100A0990	
	SCD55101A	yellow									Q68100A0989	
	SCD55100A	red									Q68100A0988	

8-digit Plastic Package Intelligent Displays

Package	Type	Emission Color	# of chars.	Char. height [mm]	Pak-kage size [mm]	Inter-face	View-ing angle x/ y-axis [deg.]	# of dots per cha-racter	Tempera-ture range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
8-digit wide body 5X7 Intelligent Display (Parallel Input)												
	HDSP2110S	hyper red	8	5.1	42.67 x 19.58	paral-lel	typ. 65	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, • 128 ASCII character ROM, • 16 user definable charac-ters,	Q68000A8560	6
	HDSP2111S	yellow									Q68000A8561	
	HDSP2112S	super red									Q68000A8562	
	HDSP2113S	green_									Q68000A8563	
	HDSP2114S	high effi-ciency green									Q68000A8564	
	HDSP2115S	orange									Q68000A8907	
8-digit Slimline 5X7 Intelligent Display												
	PDSP1880	hyper red	8	4.57	42.93 x 11.43	paral-lel	typ. 65	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, • 128 ASCII character ROM, • 16 user definable charac-ters,	Q68000A9105	7
	PDSP1881	yellow									Q68000A9106	
	PDSP1882	super red									Q68000A9107	
	PDSP1883	green_									Q68000A9108	
	PDSP1884	high effi-ciency green									Q68000A9109	
	SCE5780	hyper red	8	4.57	42.93 x 11.43	paral-lel	typ. 65	35 5 x 7	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters • Built-in Decoders, Multiple-xers and LED Drivers • Readable from 8 Feet (2.5 meters) • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select (12.5% or Full Peak Current), Prescaler Function (External Oscillator Divided by 16 or 1), Internal or External Clock.	Q68000A9100	8
	SCE5781	yellow									Q68000A9101	
	SCE5782	super red									Q68000A9102	
	SCE5783	green_									Q68000A9103	
	SCE5784	high effi-ciency green									Q68000A9104	
	SCE5785	soft oran ge									Q68100A0550	
	SCE5786	InGaAlP red									Q68100A1435	
8-digit Slimline 5X5 Intelligent Display (Serial Input / Character RAM)												
	SCD5584A	high effi-ciency green	8	3.68	38.1 x 10	serial	typ. 65	25 5 x 5	-40 ... 85 / -40 ... 100	• Optimum display surface efficiency, • Lower Power - 30% less than 5X7 dot matrix, • High speed serial data input - 5MHz, • Readable from 6 feet (1.8 meters), • Attributes: 200-bit RAM for user definable characters, Eight dimming levels, Power down	Q68100A1000	9
	SCD5583A	green_									Q68100A0998	
	SCD5582A	super red									Q68100A0997	
	SCD5581A	yellow									Q68100A0996	
	SCD5580A	hyper red									Q68100A0994	

4-digit Plastic Package Intelligent Displays

Package	Type	Emission Color	# of chars.	Char. height [mm]	Pak-kage size [mm]	Inter-face	View-ing angle x/ y-axis [deg.]	# of dots per cha-racter	Tempera-ture range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
4-digit wide body 5X7 Intelligent Display (Parallel Input / Character Set)												
	PD2435	high effi-ciency red	4	5.08	25.4 x 17.78	paral-lel	typ. 65	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, 128 ASCII character ROM. • 3 dimming levels plus blank • Blinking cursor, character, lamp test functions • Internal or external mux clock. • End stackable.	Q68000A3561	10
	PD2436	red									Q68000A8366	
	PD2437	green_									Q68000A3562	
	PD3535	high effi-ciency red	4	6.86	35.56 x 18.29	paral-lel	typ. 65	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, 128 ASCII character ROM. • 3 dimming levels plus blank • Blinking cursor, character, lamp test functions • Internal or external mux clock • End stackable.	Q68000A7964	11
	PD3536	red									Q68000A8365	
	PD3537	bright gre en									Q68000A7965	
	PD4435	high effi-ciency red	4	11.43	38.1 x 20.83	paral-lel	typ. 65	35 5 x 7	-40 ... 70 / -40 ... 100	• Reflector product produces large solid pixels with no cross-talk. • Built-in CMOS decoder, mul-tiplexer, memory and driver, 128 ASCII character ROM. • 3 dimming levels plus blank • Blinking cursor, character, lamp test functions • Internal or external clock • end stackable.	Q68000A8367	12
	PD4436	red									Q68000A8368	
	PD4437	bright gre en									Q68000A8369	
4-digit domino series 5X7 Intelligent Display (Parallel Input / Character Set)												
	DLG1414	green_	4	3.7	17.78 x 20.32	paral-lel	typ. 75	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, 128 ASCII character ROM. • End stackable.	Q68000A8093	13
	DLO1414	high effi-ciency red									Q68000A8092	
	DLR1414	red									Q68000A8091	
	DLG2416	green_	4	5	25.4 x 20.32	paral-lel	typ. 75	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, 128 ASCII character ROM. • End stackable.	Q68000A8096	14
	DLO2416	high effi-ciency red									Q68000A8095	
	DLR2416	red									Q68000A8094	
	DLG3416	green_	4	6.9	33.02 x 20.07	paral-lel	typ. 75	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, 128 ASCII character ROM. • End stackable.	Q68000A8099	15
	DLO3416	high effi-ciency red									Q68000A8098	
	DLR3416	red									Q68000A8097	

4-digit Plastic Package Intelligent Displays

4-digit wide body serial interface 5X7 Intelligent Display

Package	Type	Emission Color	# of chars.	Char. height [mm]	Package size [mm]	Interface	Viewing angle x/y-axis [deg.]	# of dots per character	Temperature range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
	SCF5740	red	4	6.86	33.02 x 20.07	serial	typ. 65	35 5 x 7	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters • Built-in Decoders, Multiplexers and LED Drivers • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select (12.5% or Full Peak Current), Prescaler Function (External Oscillator Divided by 16 or 1), Internal or External Clock.	Q68000A8848	16
	SCF5742	high efficiency red									Q68000A8901	
	SCF5744	high efficiency green									Q68000A8903	

4-digit Slimline 5X7 Intelligent Display (Parallel Input / Character Set)

Package	Type	Emission Color	# of chars.	Char. height [mm]	Package size [mm]	Interface	Viewing angle x/y-axis [deg.]	# of dots per character	Temperature range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
	SLG2016	green_	4	4.72	19.91 x 10.16	parallel	typ. 75	35 5 x 7	-40 ... 85 / -40 ... 100	• Optimum display surface efficiency • Very close multi-line spacing, 0.4“ centers. • 128 special ASCII character ROM • Clear function that clears character memory • True blanking for intensity dimming applications	Q68000A8642	17
	SLO2016	high efficiency red									Q68000A8641	
	SLR2016	red									Q68000A8640	
	SLY2016	yellow									Q68000A8643	

4-digit Slimline 5X7 Intelligent Display with serial interface (Serial Input / Character RAM)

Package	Type	Emission Color	# of chars.	Char. height [mm]	Package size [mm]	Interface	Viewing angle x/y-axis [deg.]	# of dots per character	Temperature range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
	SCE5740	red	4	4.57	19.91 x 10.16	serial with dual inline leads (DIP)	typ. 55	35 5 x 7	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters • Built-in Decoders, Multiplexers and LED Drivers • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select, Prescaler Function (External Oscillator Divided by 16 or 1), Internal or External Clock.	Q68100A1369	18
	SCE5741	yellow									Q68100A1370	
	SCE5742	super red									Q68100A1371	
	SCE5743	green_									Q68100A1372	
	SCE5744	high efficiency green									Q68100A1373	
	SCE5745	orange									Q68100A1374	

4-digit Slimline 5X7 Intelligent Display with serial interface and single-inline leads (SIP)

Package	Type	Emission Color	# of chars.	Char. height [mm]	Package size [mm]	Interface	Viewing angle x/y-axis [deg.]	# of dots per character	Temperature range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
	SCE5745P	orange	4	4.57	19.91 x 10.54	serial with straight single inline leads (SIP)	typ. 65	35 5 x 7	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters, • Built-in Decoders, Multiplexers and LED Drivers • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select (12.5% or Full Peak Current), Prescaler Function (External Oscillator Divided by 16 or 1)	Q68100A1483	19
	SCE5744P	high efficiency green									Q68100A1482	
	SCE5743P	green_									Q68100A1481	
	SCE5742P	super red									Q68100A1480	
	SCE5741P	yellow									Q68100A1479	

4-digit Plastic Package Intelligent Displays

Package	Type	Emission Color	# of chars.	Char. height [mm]	Pak-kage size [mm]	Inter-face	View-ing angle x/ y-axis [deg.]	# of dots per cha-racter	Tempera-ture range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
4-digit Slimline 5X7 Intelligent Display with serial interface and 90 degree form single inline leads (Q-SIP)												
	SCE5745Q	orange	4	4.7	19.91 x 10.54	serial with 90 degre e form sin-gle inline leads (Q-SIP)	typ. 55	35 5 x 7	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters • Built-in Decoders, Multiple-xers and LED Drivers • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select (12.5% or Full Peak Current), Prescaler Function (External Oscillator Divided by 16 or 1)	Q68100A1488	20
	SCE5744Q	high effi-ciency green									Q68100A1487	
	SCE5743Q	green_									Q68100A1486	
	SCE5742Q	super red									Q68100A1485	
	SCE5741Q	yellow									Q68100A1484	
	SCE5740Q	red									Q68100A1440	

4-digit Square Format Plastic Package Displays

Package	Type	Emission Color	# of chars.	Char. height [mm]	Pak-kage size [mm]	Inter-face	View-ing angle x/ y-axis [deg.]	# of dots per cha-racter	Tempera-ture range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
4-digit Square Format Intelligent Displays with straight single inline leads (SIP) (Serial Input / Character RAM)												
	SCDQ5544P	high effi-ciency green	4	3.4	19.91 x 10.16	paral-lel	typ. 55	25 5 x 5	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters • Built-in Decoders, Multiple-xers and LED Drivers • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select (12.5% or Full Peak Current), Prescaler Function (External Oscillator Divided by 16 or 1)	Q68100A1474 P	21
	SCDQ5543P	green_									Q68100A1473 P	
	SCDQ5542P	super red									Q68100A1078 P	
	SCDQ5541P	yellow									Q68100A1472 P	
4-digit Square Format Intelligent Displays with 90 degree bend single inline leads (Q-SIP) (Serial Input / Character RAM)												
	SCDQ5544Q	high effi-ciency green	4	3.4	19.91 x 10.16	paral-lel	typ. 55	25 5 x 5	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters • Built-in Decoders, Multiple-xers and LED Drivers • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select (12.5% or Full Peak Current), Prescaler Function (External Oscillator Divided by 16 or 1)	Q68100A1474 Q	21
	SCDQ5543Q	green_									Q68100A1473 Q	
	SCDQ5542Q	super red									Q68100A1078 Q	
	SCDQ5541Q	yellow									Q68100A1472 Q	
4-digit Square Format Intelligent Displays with molex connector (Serial Input / Character RAM)												
	SCDQ5544R	high effi-ciency green	4	3.4	19.91 x 10.16	paral-lel	typ. 55	25 5 x 5	-40 ... 85 / -40 ... 100	• Serial Input, Dot Addressable Display. Ideal for User Defined Characters • Built-in Decoders, Multiple-xers and LED Drivers • Programmable Features: Clear Function, Eight Dimming Levels, Peak Current Select (12.5% or Full Peak Current), Prescaler Function (External Oscillator Divided by 16 or 1)	Q68100A1474 R	21
	SCDQ5543R	green_									Q68100A1473 R	
	SCDQ5542R	super red									Q68100A1078 R	
	SCDQ5541R	yellow									Q68100A1472 R	

Single digit Plastic Package Intelligent Displays

Package	Type	Emission Color	# of chars.	Char. height [mm]	Pak-kage size [mm]	Inter-face	View-ing angle x/ y-axis [deg.]	# of dots per cha-racter	Tempera-ture range Operating / Storage [°C]	Features	Ordering Code	Package Fig.
Single digit Intelligent Displays (Parallel Input / Character Set)												
	DLG4137	green_	1	17.27	25.4 x 12.7	paral-lel	typ. 75	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, • Reflector product produces large solid pixels with no cross-talk. • 4 programmable brightness levels. • Built-in 96 ASCII character ROM. • XY stackable.	Q68000A4299	22
	DLO4135	super red									Q68000A4297	
	DLG7137	green_	1	10.92	20.32 x 17.78	paral-lel	typ. 75	35 5 x 7	-40 ... 85 / -40 ... 100	• Built-in CMOS decoder, mul-tiplexer, memory and driver, • Reflector product produces large solid pixels with no cross-talk. • 4 programmable brightness levels. • Built-in 96 ASCII character ROM. • XY stackable.	Q68000A7159	23
	DLO7135	super red									Q68000A7157	

Dimensions in mm (inch)

Figure 1: IPD 213X

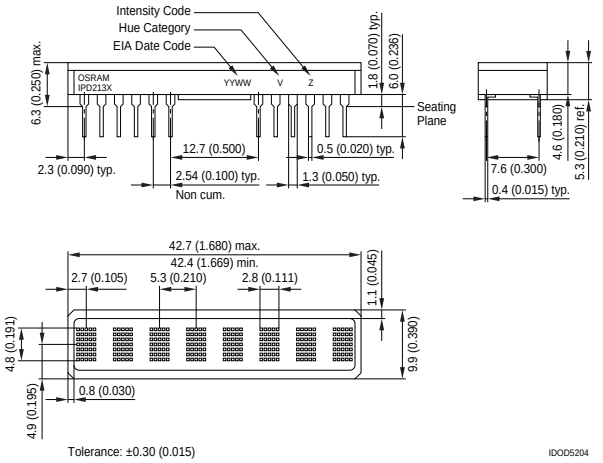


Figure 2: IPD 2545 A, IPD 2547 A

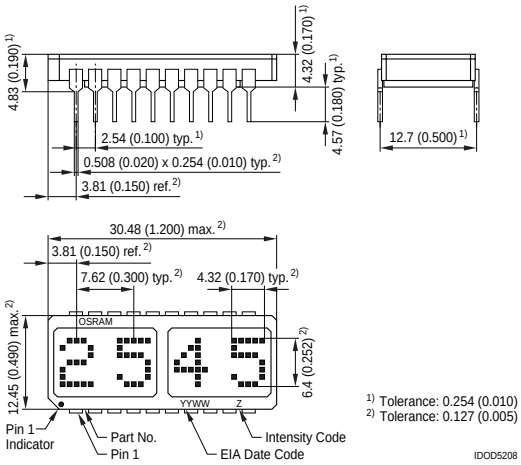


Figure 3: ISD 201X

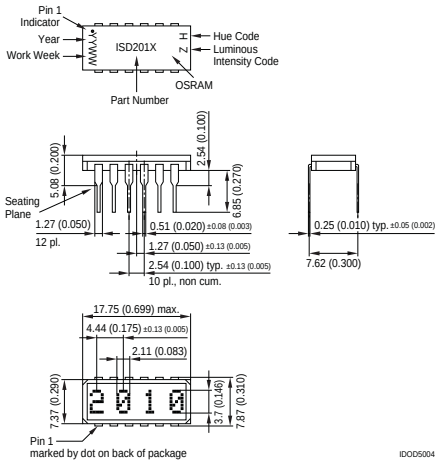
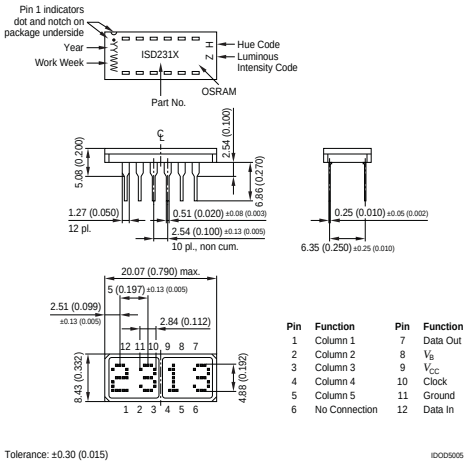
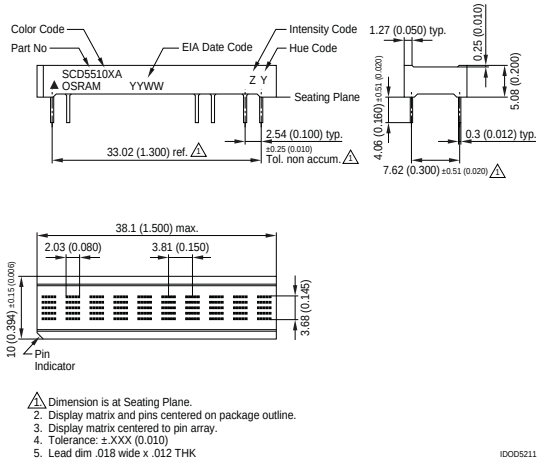


Figure 4: ISD 231X, ISD 235X



Pin	Function	Pin	Function
1	Column 1	7	Data Out
2	Column 2	8	V_B
3	Column 3	9	V_{CC}
4	Column 4	10	Clock
5	Column 5	11	Ground
6	No Connection	12	Data In

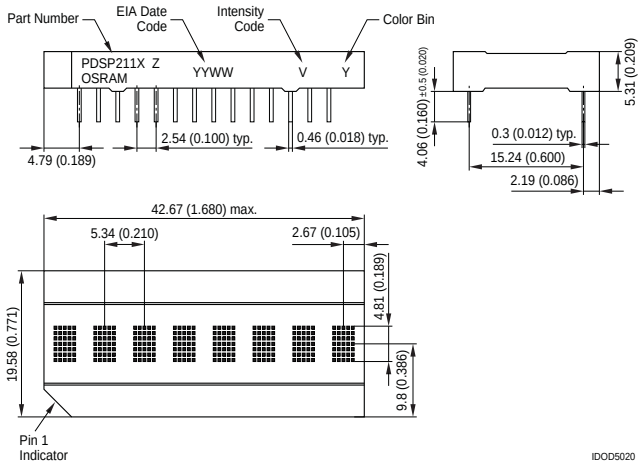
Figure 5: SCD 5510XA



⚠ Dimension is at Seating Plane.
2. Display matrix and pins centered on package outline.
3. Display matrix centered to pin array.
4. Tolerance: ±.XXX (0.010)
5. Lead dim .018 wide x .012 THK

IDOD5211

Figure 6: PDSP 211X, HDSP 211X



Dimensions in mm (inch)

Figure 7: PDSP 188X

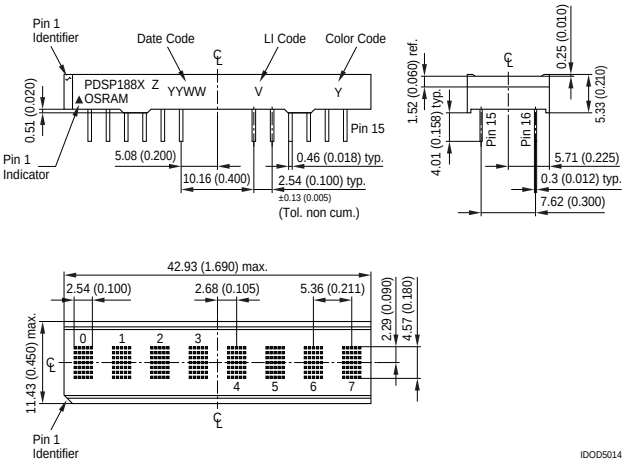


Figure 8: SCE 578X

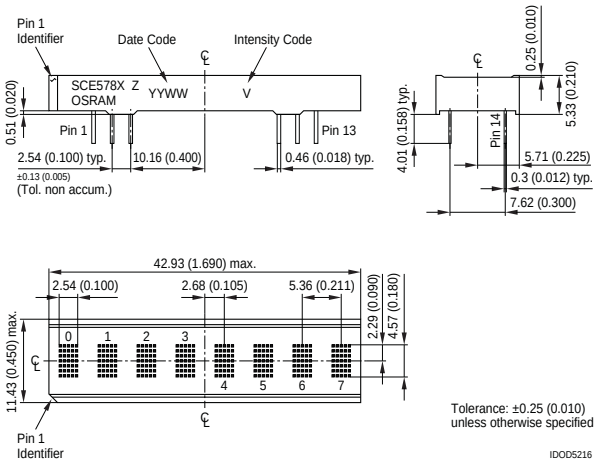


Figure 9: SCD 558XA

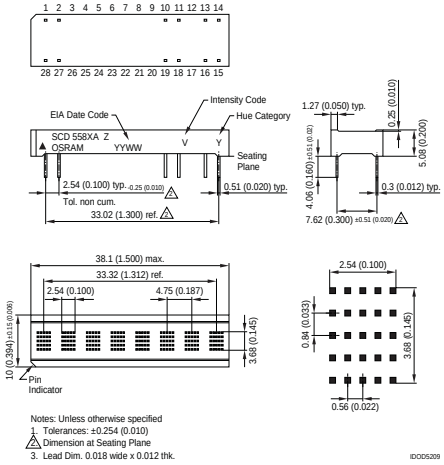


Figure 10: PD 2435, PD 2436, PD 2437

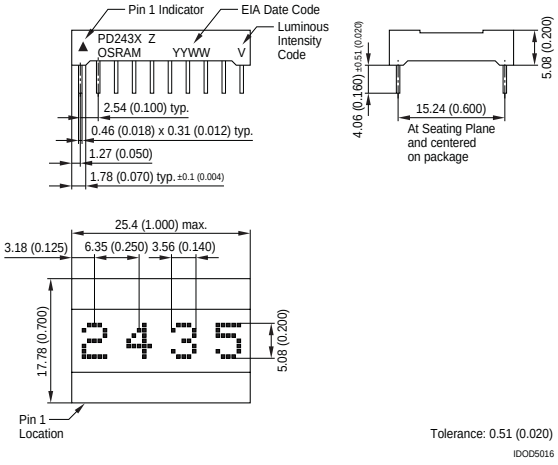


Figure 11: PD 3535, PD 3536, PD 3537

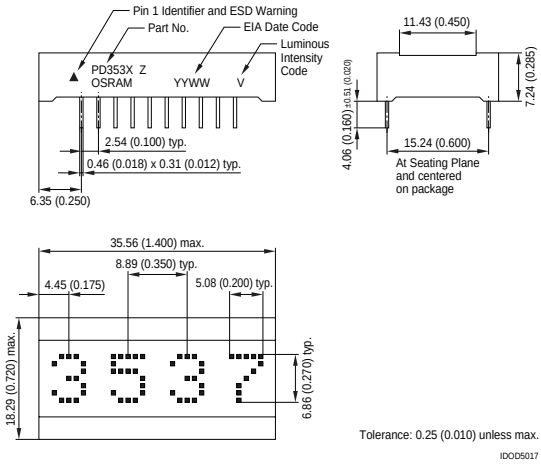
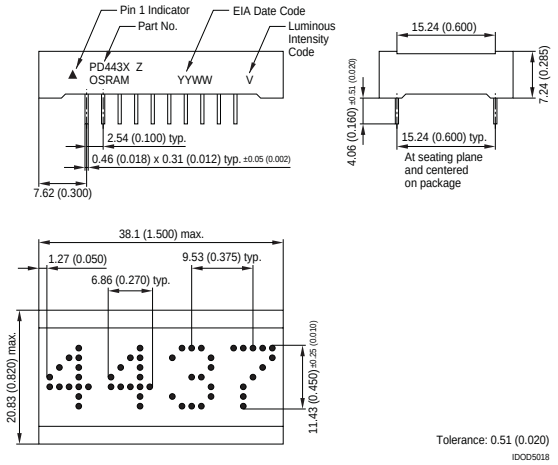


Figure 12: PD 4435, PD 4436, PD 4437



Dimensions in mm (inch)

Figure 13: DLX 1414

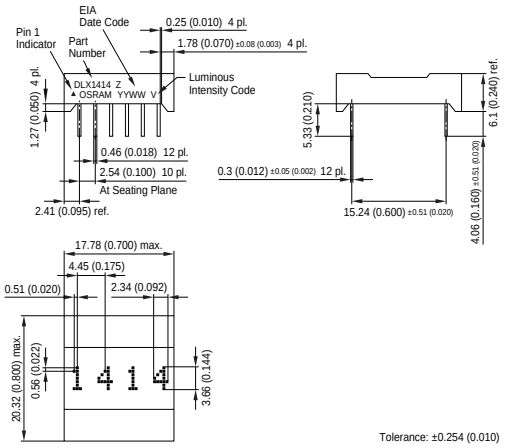


Figure 14: DLX 2416

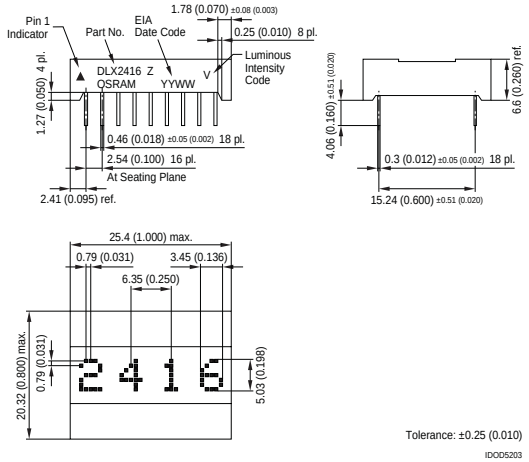


Figure 15: DLX 3416

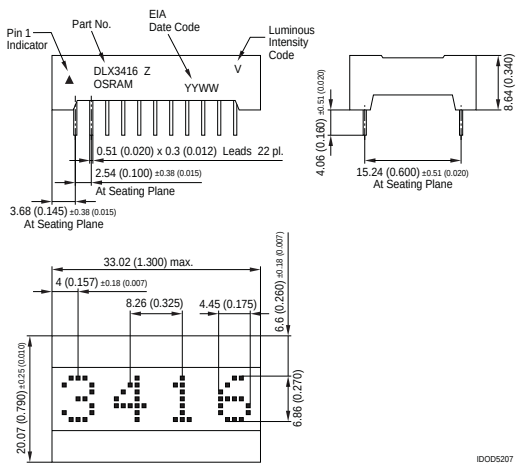


Figure 16: SCF 574X

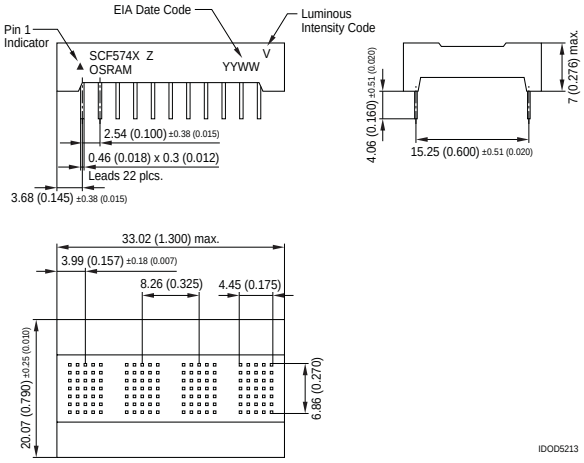
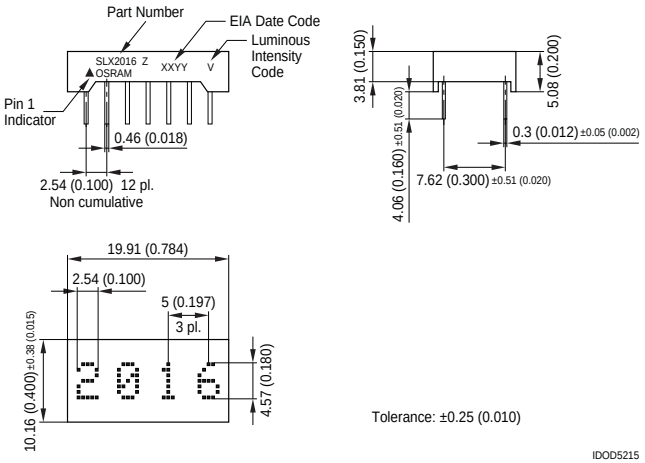


Figure 17: SLX 2016



Dimensions in mm (inch)

Figure 18: SCE 574x

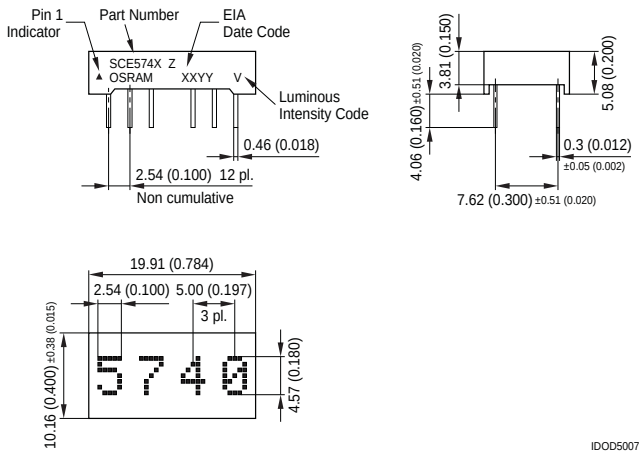


Figure 19: SCE 574xP

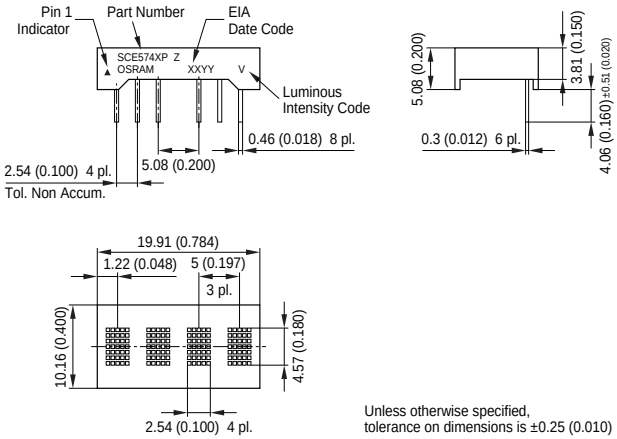


Figure 20: SCE 574xQ

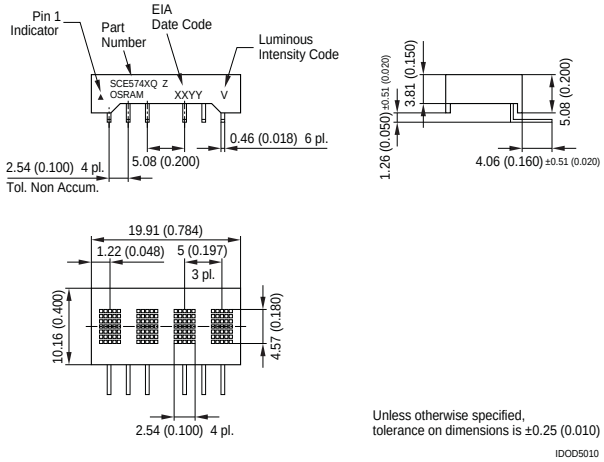


Figure 21: SCDQ 554X P/Q/R

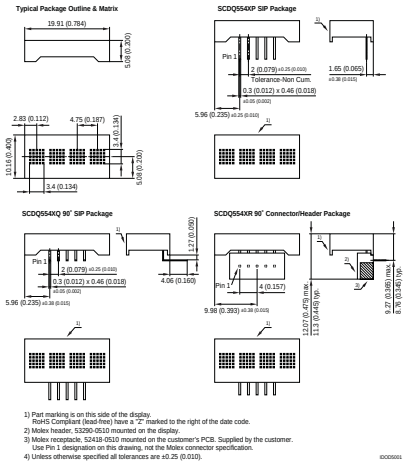


Figure 22: DLO 4135, DLG 4137

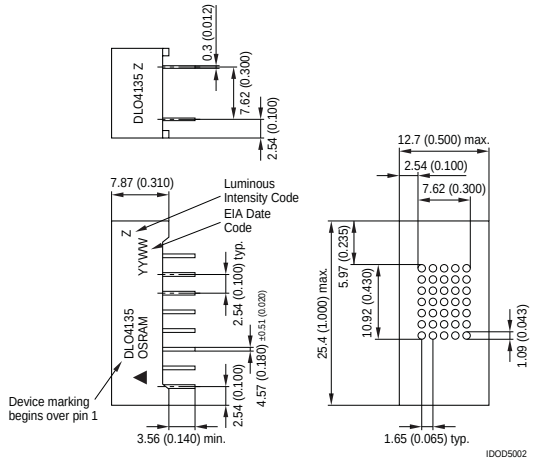
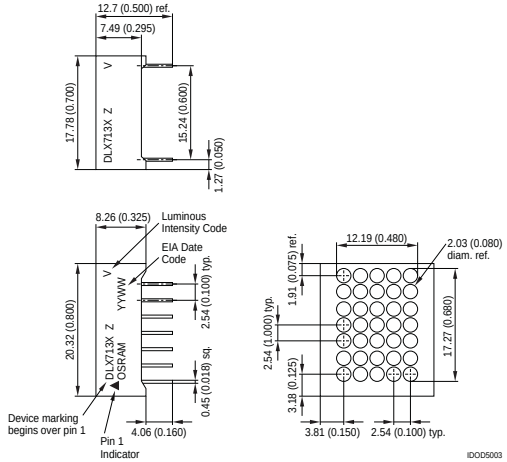


Figure 23: DLO 7135, DLG 7137

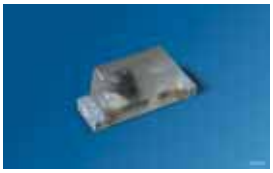


Infrared Components

Phototransistors

SMT Transistors

Page 139

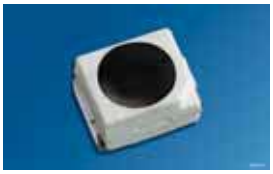


SmartLED 0603
SFH 3010

CHIPLED with lens
SFH 3015 FA

Micro SIDELED
SFH 3204

TOPLED
SFH 320



TOPLED
SFH 320 FA

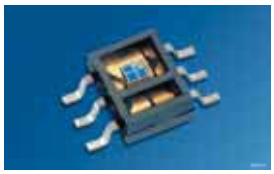
TOPLED with Lens
SFH 3219

TOPLED RG
SFH 3211 FA

SIDELED
SFH 325

SIDELED
SFH 325 FA

SmartDIL
SFH 3400 / SFH 3401



Premolded SMD
SFH 3201

SMT Transistors in low profile, narrow angle MIDLED package

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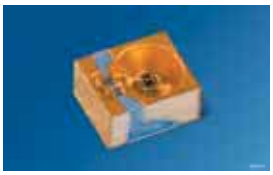


MIDLED
SFH 3600

MIDLED
SFH 3605

Detector/Emitter in Multi TOPLED package

Page 141

Multi TOPLED
SFH 331 / SFH 7221

Phototransistors in clear plastic package

Page 142

T 1
SFH 309 / SFH 310

T 1
SFH 309 P

T 1 3/4
SFH 300

T 1 3/4
SFH 314

T1 3/4 SMR
SFH 3500

Sidelooker
LPT 80 A

Plastic package with daylight blocking filter for 880/950 nm IRED

Page 143

T 1
SFH 309 FA / SFH 310 FA

T 1
SFH 309 PFA

T 1 3/4
SFH 300 FA / SFH 313 FA

T 1 3/4
SFH 314 FA

T 1 3/4
SFH 303 FA

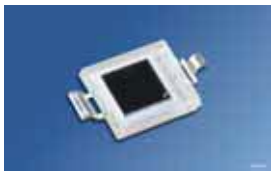
Mini Sidelooker
SFH 3100 F

Photodiodes

SMT PIN Photodiodes in clear package

Page 144

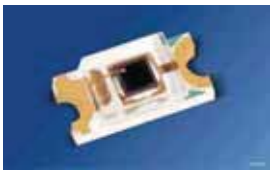
SMT DIL
BP 104 S / BPW 34 S / BPW 34 BS



SMT DIL RG
BPW 34 SR, BP 104 SR

Smart DIL
SFH 2400

T1 3/4 SMR
SFH 2505



CHIPLED
SFH 2701

SMT PIN Photodiodes with daylight blocking filter

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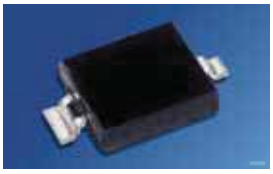
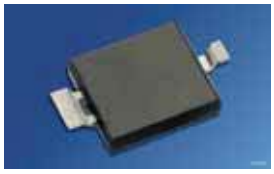
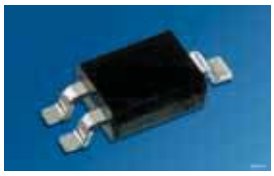


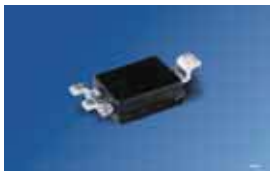
SMT DIL
BP 104 FS / BP 104 FAS / BPW 34 FS / BPW 34 FAS



SMT DIL RG
BP 104 FASR, BPW 34 FSR, BPW 34 FASR



Smart DIL
SFH 2400 FA



Smart DIL RG
SFH 2400 FAR

T1 3/4 SMR
SFH 2500 FA

T1 3/4 SMR
SFH 2505 FA

PIN Photodiodes in clear plastic package

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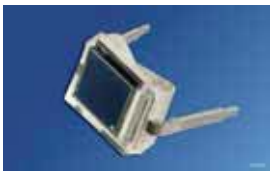


DIL
BPW 34 / BPW 34 B

T 1
SFH 229

T 1 3/4
SFH 203 / SFH 213

T 1 3/4
SFH 203 P

PIN Photodiodes in clear plastic package

Page 146

Sidelooker
SFH 206 K

PIN Photodiodes with daylight blocking filter matched for 880 nm IRED

Page 147

DIL
BPW 34 FA

TO92
SFH 225 FA / SFH 235 FA

T 1
SFH 229 FA

T 1 3/4
SFH 203 FA / SFH 213 FA

T 1 3/4
SFH 203 PFA

Sidelooker
SFH 205 FA

PIN Photodiodes with daylight blocking filter matched for 950 nm IRED

Page 148

DIL
BP 104 F, BPW 34 F

Sidelooker
SFH 205 F

PIN Photodiode with integrated Temperature Sensor

Page 148

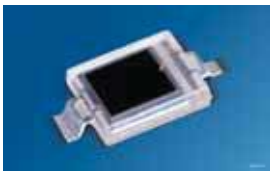
T 1 3/4
SFH 2504

Ambient Light Sensors

Photodiode Ambient Light Sensors

Page 149

TO39
BPW 21



SMT DIL
SFH 2430

TOPLED RG
SFH 2270 R

Phototransistor Ambient Light Sensors

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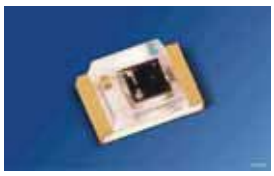
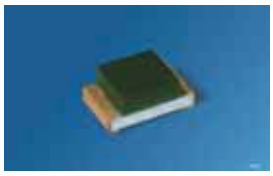
T 1
SFH 3310

Smart DIL
SFH 3410



CHIPLED
SFH 3710



CHIPLED
SFH 3711

High Accuracy Ambient Light Sensors

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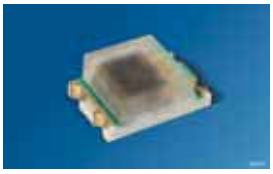


CHIPLED
SFH 5711

Ambient Light Sensors with I^2C bus interface

Page 150

CHIPLED
SFH 5712

Photodetectors for special applications

Phototransistor Arrays in plastic package

Page 151

Mini Array
SFH 305

Mini Array
BPX 81

Array
BPX 80 / BPX 82-89

Phototransistors in metal package

Page 152

TO18
BPY 62 / BPX 43

TO18
BPX 38

TO18
BP 103

PIN photodiodes in metal package

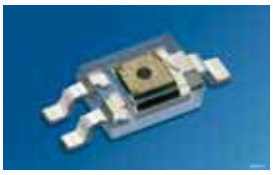
Page 152

TO18
BPX 65

TO39
BPX 61

Schmitt Trigger

Page 153



Smart DIL
SFH 5440

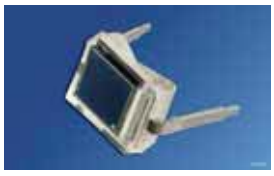
Mini Sidelooker
SFH 5140 F

SMT RLS
SFH 9240

Blue sensitive photodiode

Page 153

SMT DIL
BPW 34 BS



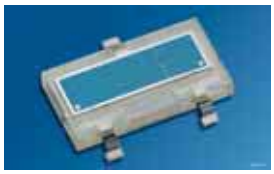
DIL
BPW 34 B

Dual photodiodes

Page 154

TO39
SFH 221

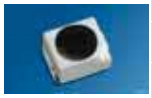
DIL
BPX 48



SMT DIL
KOM 2125

Phototransistors

SMT Transistors

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Ordering Code	Package Fig.
 SmartLED 0603	SFH 3010	± 80	0.04	≥ 25	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	15	420 ... 1100	7	Q65110A6458	1
 CHIPLED with lens	SFH 3015 FA	± 13	0.04	100 ... 800	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	15	770 ... 1090	7	Q65110A9730	2
 Micro SIDELED	SFH 3204	± 60	0.04	≥ 32	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	15	450 ... 1120	7	Q65110A2506	3
 TOPLED	SFH 320	± 60	0.038	16 ... 80	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	450 ... 1150	7	Q65110A2471	4
	SFH 320-3			25 ... 50					Q65110A2469	
	SFH 320-3/4			25 ... 80				7.5	Q65110A1781	
	SFH 320-4			40 ... 80				8	Q65110A2510	
 TOPLED	SFH 320 FA	± 60	0.038	16 ... 80	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	750 ... 1120	7	Q65110A2472	4
	SFH 320 FA-3			25 ... 50					Q65110A2470	
	SFH 320 FA-3/4			25 ... 80				7.5	Q65110A2475	
	SFH 320 FA-4			40 ... 80				8	Q65110A1836	
 TOPLED with Lens	SFH 3219	± 25	0.038	≥ 63	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	450 ... 1150	7	Q65110A2651	5
 TOPLED RG	SFH 3211 FA	± 60	0.038	16 ... 80	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	750 ... 1120	7	Q65110A2526	6
	SFH 3211 FA-3/4			25 ... 80				7.5	Q65110A2528	
 SIDELED	SFH 325	± 60	0.038	16 ... 80	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	450 ... 1120	7	Q65110A2486	7
	SFH 325-3			25 ... 50					Q65110A2488	
	SFH 325-3/4			25 ... 80				7.5	Q65110A2491	
	SFH 325-4			40 ... 80				8	Q65110A2484	
 SIDELED	SFH 325 FA	± 60	0.038	16 ... 80	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	750 ... 1120	7	Q65110A2487	7
	SFH 325 FA-3			25 ... 50					Q65110A2482	
	SFH 325 FA-3/4			25 ... 80				7.5	Q65110A2490	
	SFH 325 FA-4			40 ... 80				8	Q65110A2485	

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Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Ordering Code	Package Fig.
 SmartDIL	SFH 3400	± 60	0.55	63 ... 320	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	20	460 ... 1080	24	Q65110A2629	8
	SFH 3400-2/3			100 ... 320				29	Q65110A2634	
	SFH 3401	± 60	0.55	63 ... 320	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	20	460 ... 1080	24	Q65110A2635	9
	SFH 3401-2/3			100 ... 320				29	Q65110A2644	
 Premolded SMD	SFH 3201	± 60	0.55	63 ... 320	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	20	460 ... 1080	24	Q65110A1207	10
	SFH 3201-2/3			100 ... 320				29	Q65110A2479	

SMT Transistors in low profile, narrow angle MIDLED package

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Ordering Code	Package Fig.
 MIDLED	SFH 3600	± 20	0.04	100 ... 500	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	500 ... 1120	45	Q65110A1573	11
	SFH 3600-2/3			100 ... 320				37	Q65110A2665	
	SFH 3600-3/4			160 ... 500				57	Q65110A2666	
 MIDLED	SFH 3605	± 20	0.04	100 ... 500	λ = 950 nm, E_e = 0.1 mW/cm², V_{CE} = 5 V	35	500 ... 1120	45	Q65110A1574	11
	SFH 3605-2/3			100 ... 320				37	Q65110A2663	
	SFH 3605-3/4			160 ... 500				57	Q65110A2664	

Phototransistors

Detector/Emitter in Multi TOPLED package

Package	Type	Emitter						Ordering Code	Package Fig.
		λ_{peak} typ [nm]	Half angle φ [°]	I_V [mcd]	Measurement cond.	V_F [V]	Measurement cond.		
 Multi TOPLED	SFH 331-JK	635	± 60	6 (4 ... 12.5)	I_F = 10 mA	2 (≤ 2.6)	I_F = 10 mA	Q65110A2821	12

Detector						
Radiant sensitive area typ. [mm^2]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]
0.038	≥ 16	λ = 950 nm, E_e = 0.1 mW/cm^2, V_{CE} = 5 V	35	440 ... 1150	7

Package	Type	Emitter						Ordering Code	Package Fig.
		λ_{peak} typ [nm]	Half angle φ [°]	I_e [mW/sr]	Measurement cond.	V_F [V]	Measurement cond.		
 Multi TOPLED	SFH 7221	880	± 60	≥ 4	I_F = 100 mA, t_p = 20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	Q65110A2741	13

Detector						
Radiant sensitive area typ. [mm^2]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]
0.038	≥ 16	λ = 880 nm, E_e = 0.1 mW/cm^2, V_{CE} = 5 V	35	440 ... 1150	7

Phototransistors

Phototransistors in clear plastic package

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [mA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Ordering Code	Package Fig.
 T 1	SFH 309	± 12	0.038	0.4 ... 5	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	380 ... 1150	7	Q62702P0859	14
	SFH 309-3/4			0.63 ... 2				6.5	Q62702P3592	
	SFH 309-4			1 ... 2				7	Q62702P0998	
	SFH 309-4/5			1 ... 3.2				7.5	Q62702P3593	
	SFH 309-5			1.6 ... 3.2				8	Q62702P0999	
	SFH 309-5/6			1.6 ... 5				8.5	Q62702P3594	
	SFH 310	± 25	0.11	0.63 ... 3.2	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	450 ... 1100	9	Q62702P0874	15
	SFH 310-2/3			0.63 ... 2				7.5	Q62702P3595	
 T 1	SFH 309 P	± 75	0.038	≥ 0.063	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	380 ... 1180	6	Q62702P0245	16
 T 1 3/4	SFH 314	± 40	0.55	≥ 0.63	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	70	460 ... 1080	11	Q62702P1668	17
	SFH 314-2/3			1 ... 3.2					Q62702P3600	
 T 1 3/4	SFH 300	± 25	0.11	≥ 0.63	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	450 ... 1100	10	Q62702P1189	18
	SFH 300-3/4			≥ 1					Q62702P3586	
 T1 3/4 SMR	SFH 3500	± 13	0.55	4 ... 20	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	450 ... 1060	19	Q65110A2636	19
 Sidelooker	LPT 80A	± 35	0.11	≥ 0.25	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	30	450 ... 1100	10	Q68000A7852	20

Phototransistors

Plastic package with daylight blocking filter for 880/950 nm IRED

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [mA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Ordering Code	Package Fig.
 T 1	SFH 309 FA	± 12	0.038	0.4 ... 5	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	730 ... 1120	7	Q62702P0941	14
	SFH 309 FA-3/4			0.63 ... 2				6.5	Q62702P3590	
	SFH 309 FA-4			1 ... 2				7	Q62702P0178	
	SFH 309 FA-4/5			1 ... 3.2				7.5	Q62702P3591	
	SFH 309 FA-5			1.6 ... 3.2				8	Q62702P0180	
	SFH 309 FA-5/6			1.6 ... 5				8.5	Q62702P5199	
	SFH 310 FA	± 25	0.11	0.4 ... 3.2	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	740 ... 1100	9	Q62702P1673	15
	SFH 310 FA-2/3			0.63 ... 2				7.5	Q62702P3596	
 T 1	SFH 309 PFA	± 75	0.038	≥ 0.063	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	730 ... 1120	6	Q62702P0246	16
 T 1 3/4	SFH 313 FA	± 10	0.55	≥ 2.5	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	70	740 ... 1080	10	Q62702P1674	21
	SFH 313 FA-2/3			4 ... 12.5				11	Q62702P3597	
	SFH 313 FA-3/4			≥ 6.3				13	Q62702P5196	
	SFH 300 FA	± 25	0.11	≥ 0.63	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	730 ... 1120	10	Q62702P1193	18
	SFH 300 FA-3/4			≥ 1					Q62702P3585	
 T 1 3/4	SFH 314 FA	± 40	0.55	≥ 0.63	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	70	740 ... 1080	11	Q62702P1675	17
	SFH 314 FA-2/3			1 ... 3.2					Q62702P3599	
 T 1 3/4	SFH 303 FA	± 20	0.11	≥ 1	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	750 ... 1120	13	Q62702P0958	22
	SFH 303 FA-3/4			≥ 1.6				14	Q62702P3587	
 Mini Sidelooker	SFH 3100 F	± 14	0.11	0.4 ... 5	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	850 ... 1100	9	Q62702P5073	23

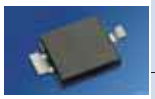
Photodiodes

SMT PIN Photodiodes in clear package

Package	Type	Half angle ϕ ± [°]	Radiant sensitive area typ. [mm^2]	I_P [µA]	Measurement cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 SMT DIL	BP 104 S	± 60	4.84	55 (≥ 40)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	400 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2626	30
	BPW 34 S	± 60	7.02	80 (≥ 50)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	400 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A1209	30
	BPW 34 BS	± 60	7.45	75	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	350 ... 1100	0.025	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2625	30
 SMT DIL RG	BP 104 SR	± 60	4.84	55 (≥ 40)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	400 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A4262	31
	BPW 34 SR	± 60	7.02	80 (≥ 50)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	400 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2701	31
 Smart DIL	SFH 2400	± 60	1.00	10 (> 6)	E_v = 1000 lx, Std. Light A, V_R = 5 V	1 (≤ 5)	V_R = 20 V	380 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q65110A2628	32
 T1 3/4 SMR	SFH 2505	± 15	1.00	100	E_v = 1000 lx, Std. Light A, V_R = 5 V	1 (≤ 5)	V_R = 20 V	400 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q65110A1203	33
 CHIPLED	SFH 2701	± 60	0.36	1.4	E_v = 1000 lx, Std. Light A, V_R = 5 V	0.05 (≤ 5)	V_R = 5 V	400 ... 1050	0.002	V_R = 5 V, R_L = 50 Ω, λ = 650 nm, I_p = 1 mA	Q65110A2960	34

Photodiodes

SMT PIN Photodiodes with daylight blocking filter

Package	Type	Half angle ϕ ± [°]	Radiant sensitive area typ. [mm^2]	I_P [µA]	Measurement cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 SMT DIL	BP 104 FS	± 60	4.84	34 (≥ 25)	λ = 950 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	800 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2627	35
	BP 104 FAS				λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V			730 ... 1100			Q65110A2672	
	BPW 34 FS	± 60	7.02	50 (≥ 40)	λ = 950 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	780 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2700	35
	BPW 34 FAS				λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V			730 ... 1100			Q65110A3121	
 SMT DIL RG	BP 104 FASR	± 60	4.84	34 (≥ 25)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	730 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A4263	36
	BPW 34 FSR	± 60	7.02	50 (≥ 40)	λ = 950 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	780 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2740	36
	BPW 34 FASR				λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V			730 ... 1100			Q65110A2699	
 Smart DIL	SFH 2400 FA	± 60	1.00	6.2 (≥ 3.6)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	1 (≤ 5)	V_R = 20 V	750 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q65110A2638	32
 Smart DIL RG	SFH 2400 FAR	± 60	1.00	6.2 (≥ 3.6)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	1 (≤ 5)	V_R = 20 V	750 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q65110A9563	37
 T1 3/4 SMR	SFH 2500 FA	± 15	1.00	70 (≥ 50)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	0.1 (≤ 5)	V_R = 20 V	750 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q65110A1202	19
 T1 3/4 SMR	SFH 2505 FA	± 15	1.00	70 (≥ 50)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	0.1 (≤ 5)	V_R = 20 V	750 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q65110A1204	33

Photodiodes

PIN Photodiodes in clear plastic package

Package	Type	Half angle ϕ ± [°]	Radiant sensitive area typ. [mm^2]	I_P [µA]	Measurement cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 **DIL**	BPW 34	± 60	7.02	80 (≥ 50)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	400 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P0073	39
	BPW 34 B	± 60	7.45	75	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	350 ... 1100	0.025	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A3126	39
 **T 1**	SFH 229	± 17	0.31	28 (≥ 18)	E_v = 1000 lx, Std. Light A, V_R = 5 V	0.05 (≤ 5)	V_R = 10 V	380 ... 1100	0.01	V_R = 10 V, R_L = 50 Ω, λ = 850 nm	Q62702P0215	14
 **T 1 3/4**	SFH 203	± 20	1.00	80 (≥ 50)	E_v = 1000 lx, Std. Light A, V_R = 5 V	1 (≤ 5)	V_R = 20 V	400 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q62702P0955	41
	SFH 213	± 10	1.00	135 (≥ 100)	E_v = 1000 lx, Std. Light A, V_R = 5 V	1 (≤ 5)	V_R = 20 V	400 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q62702P0930	21
 **T 1 3/4**	SFH 203 P	± 75	1.00	9.5 (≥ 5)	E_v = 1000 lx, Std. Light A, V_R = 5 V	1 (≤ 5)	V_R = 20 V	400 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q62702P0942	42
 **Sidelooker**	SFH 206 K	± 60	7.02	80 (≥ 50)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	400 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P0129	40

Photodiodes

PIN Photodiodes with daylight blocking filter matched for 880 nm IRED

Package	Type	Half angle ϕ ± [°]	Radiant sensitive area typ. [mm^2]	I_P [µA]	Measurement cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 DIL	BPW 34 FA	± 60	7.02	50 (≥ 40)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	730 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P1129	44
 TO92	SFH 225 FA	± 60	4.84	34 (≥ 25)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	740 ... 1120	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P1051	45
	SFH 235 FA	± 65	7.02	50 (≥ 40)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	740 ... 1120	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P0273	45
 T 1	SFH 229 FA	± 17	0.31	20 (≥ 10.8)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	0.05 (≤ 5)	V_R = 10 V	730 ... 1100	0.01	V_R = 10 V, R_L = 50 Ω, λ = 850 nm	Q62702P0216	14
 T 1 3/4	SFH 203 FA	± 20	1.00	50 (≥ 30)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	1 (≤ 5)	V_R = 20 V	800 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q62702P0956	41
	SFH 213 FA	± 10	1.00	90 (≥ 65)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	1 (≤ 5)	V_R = 20 V	750 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q62702P1671	21
 T 1 3/4	SFH 203 PFA	± 75	1.00	6.2 (≥ 3.6)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	1 (≤ 5)	V_R = 20 V	750 ... 1100	0.005	V_R = 20 V, R_L = 50 Ω, λ = 850 nm	Q62702P0947	42
 Sidelooker	SFH 205 FA	± 60	7.02	60 (≥ 45)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	740 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P1677	46

Photodiodes

PIN Photodiodes with daylight blocking filter matched for 950 nm IRED

Package	Type	Half angle ϕ ± [°]	Radiant sensitive area typ. [mm^2]	I_P [µA]	Measurement cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 DIL	BP 104 F	± 60	4.84	34 (≥ 25)	λ = 950 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	800 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P0084	43
	BPW 34 F	± 60	7.02	50 (≥ 40)	λ = 950 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	780 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P0929	43
 Sidelooker	SFH 205 F	± 60	7.02	60 (≥ 45)	λ = 950 nm, E_e = 1 mW/cm^2, V_R = 5 V	2 (≤ 30)	V_R = 10 V	800 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P0102	46

PIN Photodiode with integrated Temperature Sensor

Package	Type	Half angle ϕ ± [°]	Radiant sensitive area typ. [mm^2]	I_P [µA]	Measurement cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	Resi-stance R_{25} [kΩ]	Tolerance of resi-stance R_{tol} [%]	Ordering Code	Package Fig.
 T 1 3/4	SFH 2504	± 60	0.31	2.7 (≥ 1.9)	λ = 870 nm, E_e = 1 mW/cm^2, V_R = 5 V	0.05 (≤ 5)	V_R = 10 V	740 ... 1100	10	± 3	Q65110A3986	47

Ambient Light Sensors

Photodiode Ambient Light Sensors

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_P [µA]	Measurement cond.	I_R [nA]	Measurement cond.	$\lambda_{10\%}$ typ. [nm]	Ordering Code	Package Fig.
 TO39	BPW 21	± 55	7.45	10 (≥ 5.5)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 5 V	350 ... 820	Q62702P0885	49
 SMT DIL	SFH 2430	± 60	7.02	6.3 (≥ 5)	E_v = 1000 lx, Std. Light A, V_R = 5 V	0.1 (≤ 5)	V_R = 5 V	400 ... 900	Q65110A2673	54
 TOPLED RG	SFH 2270 R	± 60	0.16	0.0056 (≥ 0.0044)	E_e = 10 µW/cm², λ = 560 nm, V_R = 1 V	0.005 (≤ 0.15)	V_R = 1 V	480 ... 650	Q65110A9911	99

Phototransistor Ambient Light Sensors

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	Ordering Code	Package Fig.
 T 1	SFH 3310	± 75	0.29	2.5 ... 8	λ = 560 nm, E_e = 10 µW/cm², V_{CE} = 5 V	5.5	350 ... 970	Q65110A5343	16
 Smart DIL	SFH 3410	± 60	0.29	3.2 ... 25	E_v = 20 lx, Std. Light A, V_{CE} = 5 V	5.5	350 ... 970	Q65110A1211	55
	SFH 3410-1/2			3.2 ... 10				Q65110A2653	
	SFH 3410-2/3			5 ... 16				Q65110A2654	
	SFH 3410-3/4			8 ... 25				Q65110A2655	
 CHIPLED	SFH 3710	± 60	0.29	2.5 ... 12.5	λ = 560 nm, E_e = 10 µW/cm², V_{CE} = 5 V	5.5	350 ... 950	Q65110A3107	56
	SFH 3710-2/3			2.5 ... 8				Q65110A3512	
	SFH 3710-3/4			4 ... 12.5				Q65110A3511	
 CHIPLED	SFH 3711	± 60	0.29	16 ... 18	λ = 560 nm, E_e = 10 µW/cm², V_{CE} = 5 V	5.5	470 ... 670	Q65110A2362	57

Ambient Light Sensors

High Accuracy Ambient Light Sensors

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{OUT} [mA]	Measurement Conditions	$\lambda_{10\%}$ typ. [nm]	Ordering Code	Package Fig.
 CHIPLED	SFH 5711-2/3	± 60	0.16	0.027 ... 0.032	E_V = 1000lx Std. Light A	475 ... 650	Q65110A4513	58

Ambient Light Sensors with I²C bus interface

Package	Type	Half angle ϕ ± [°]	Digital out Out [counts]	Digital out resolution Out [counts/lx]	Measurement conditions	$\lambda_{20\%}$ typ. [nm]	Ordering Code	Package Fig.
 CHIPLED	SFH 5712-2/3	± 60	3 ... 65000	0.5 ... 1.6	E_V = 1000 lx (white LED)	400 ... 680	Q65110A8485	59

Photodetectors for special applications

Phototransistor Arrays in plastic package

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [mA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Ordering Code	Package Fig.
 Mini Array	SFH 305	± 16	0.11	0.25 ... 1.25	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	450 ... 1100	6	Q62702P0836	24
	SFH 305-2/3			0.25 ... 0.8					Q62702P3589	
 Mini Array	BPX 81	± 18	0.11	≥ 0.25	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	450 ... 1100	7	Q62702P0020	25
	BPX 81-2/3			0.25 ... 0.8					Q62702P3583	
	BPX 81-3			0.4 ... 0.8					Q62702P0043S003	
	BPX 81-3/4			≥ 0.4					Q62702P3584	
	BPX 81-4			≥ 0.63					Q62702P0043S004	
 Array	BPX 80	± 18	0.11	≥ 0.32	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	450 ... 1100	6	Q62702P0028	26
	BPX 82								Q62702P0021	
	BPX 83								Q62702P0025	
	BPX 84								Q62702P0030	
	BPX 85								Q62702P0031	
	BPX 86								Q62702P0022	
	BPX 87								Q62702P0032	
	BPX 88								Q62702P0033	
	BPX 89								Q62702P0026	

Photodetectors for special applications

Phototransistors in metal package

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_{PCE} [mA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Ordering Code	Package Fig.
 TO18	BPY 62	± 8	0.11	0.5 ... 4	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	400 ... 1100	8	Q60215Y0062	27
	BPY 62-3/4			0.8 ... 2.5					Q62702P5198	
	BPY 62-4			1.25 ... 2.5				9	Q60215Y1113	
	BPX 43	± 15	0.675	≥ 0.8	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	50	450 ... 1100	14	Q62702P0016	27
	BPX 43-3/4			1.25 ... 4					Q62702P3581	
	BPX 43-4			2 ... 4				15	Q62702P0016S004	
	BPX 43-4/5			≥ 2				17	Q62702P3582	
	BPX 43-5			≥ 3.2				18	Q62702P0016S005	
 TO18	BPX 38	± 40	0.675	≥ 0.2	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	50	450 ... 1120	12	Q62702P0015	28
	BPX 38-2/3			0.2 ... 0.63				11	Q62702P3578	
	BPX 38-3			0.32 ... 0.63				12	Q62702P0015S003	
	BPX 38-4			0.5 ... 1				15	Q62702P0015S004	
 TO18	BP 103	± 55	0.11	≥ 0.08	λ = 950 nm, E_e = 0.5 mW/cm², V_{CE} = 5 V	35	450 ... 1100	8	Q62702P0075	29
	BP 103-3/4			0.125 ... 0.4					Q62702P3577	

PIN photodiodes in metal package

Package	Type	Half angle φ ± [°]	Radiant sensitive area typ. [mm²]	I_P [µA]	Measure-ment cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 TO18	BPX 65	± 40	1.00	10 (≥ 5.5)	E_v = 1000 lx, Std. Light A, V_R = 5 V	1 (≤ 5)	V_R = 20 V	350 ... 1100	0.012	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62702P0027	48
 TO39	BPX 61	± 55	7.02	70 (≥ 50)	E_v = 1000 lx, Std. Light A, V_R = 5 V	2 (≤ 30)	V_R = 10 V	400 ... 1100	0.02	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q62705P0025	49

Photodetectors for special applications

Schmitt Trigger

Package	Type	Half angle φ [°]	V_{CC} [V]	$E_{e\,typ}$ [mW/m²]	Measurement cond.	$\lambda_{10\%}$ typ. [nm]	I_{OUT} max [mA]	t_{PLH} [µs]	Ordering Code	Package Fig.
 Smart DIL	SFH 5440	± 60	4 ... 18	+1700 (≤ +3200)	V_{CC} = 5V, λ = 950 nm	400 ... 1100	16	5 (≤ 15)	Q65110A1212	50
 Mini Sidelooker	SFH 5140 F	± 12	4 ... 18	+150 (≤ +500)	V_{CC} = 5V, λ = 950 nm	840 ... 1080	16	5 (≤ 15)	Q62702P5112	51

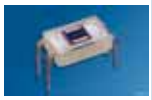
Package	Type	Features	V_{CC} [V]	$I_{F,on}$ [mA]	Measurement cond.	$E_{e,off}$ / $E_{e,on}$ [-]	Ordering Code	Package Fig.
 SMT RLS	SFH 9240	Schmitt Trigger Output, active "low"	4 ... 18	3 (≤ 10)	Kodak neutral white testcard with 90% reflection; V_{CC} = 5 V, d = 1 mm	0.6 (0.5 ... 0.9)	Q65110A2714	61

Blue sensitive photodiode

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_P [µA]	Measure-ment cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 SMT DIL	BPW 34 BS	± 60	7.45	14.8 (≥ 10.8)	λ = 400 nm, E_e = 1 mW/cm², V_R = 5 V	2 (≤ 30)	V_R = 10 V	350 ... 1100	0.025	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2625	30
 DIL	BPW 34 B	± 60	7.45	14.8 (≥ 10.8)	λ = 400 nm, E_e = 1 mW/cm², V_R = 5 V	2 (≤ 30)	V_R = 10 V	350 ... 1100	0.025	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A3126	39

Photodetectors for special applications

Dual photodiodes

Package	Type	Half angle φ [°]	Radiant sensitive area typ. [mm²]	I_P [µA]	Measure-ment cond.	I_R [nA]	Measure-ment cond.	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]	Measure-ment cond.	Ordering Code	Package Fig.
 TO39	SFH 221	± 55	1.54	24 (≥ 15)	E_v = 1000 lx, Std. Light A, V_R = 5 V	10 (≤ 100)	V_R = 10 V	400 ... 1100	0.5	V_R = 5 V, R_L = 1 kΩ, λ = 850 nm	Q62702P0270	52
 DIL	BPX 48	± 60	1.54	24 (≥ 15)	E_v = 1000 lx, Std. Light A, V_R = 5 V	10 (≤ 100)	V_R = 10 V	400 ... 1150	0.5	V_R = 5 V, R_L = 1 kΩ, λ = 850 nm	Q62702P0017S001	53
 SMT DIL	KOM 2125	± 60	4 diode A 10 diode B	40 (≥ 30) diode A 100 (≥ 75) diode B	E_v = 1000 lx, Std. Light A, V_R = 5 V	5 (≤ 30) diode A 10 (≤ 30) diode B	V_R = 10 V;	400 ... 1100	0.018	V_R = 5 V, R_L = 50 Ω, λ = 850 nm	Q65110A2703	38

Slotted Interrupters

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Interrupter
SFH 9500

SMT Reflective Sensors

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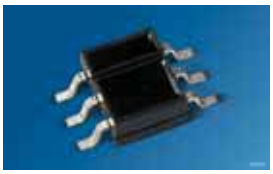

SMT RLS
SFH 9201 / SFH 9202

SMT Proximity Sensors

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COB
SFH 7741

SMT Proximity and Ambient Light Sensors

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COB
SFH 7770 E6

COB
SFH 7773

Slotted Interrupters

Package	Type	Features	Slot Width [mm]	Aperture slit width on emitter / sensor side typ [mm]	I_{PCE} min [µA]	Measurement cond.	I_{CEO} [nA]	Measurement cond.	Ordering Code	Package Fig.
 Interrupter	SFH 9500	with vertical aperture slits, SMT version, suitable for reflow soldering, locating pins	5	0.5 / 0.5	1000	I_F = 20 mA, V_{CE} = 5 V	2 (≤ 50)	V_{CE} = 20 V	Q65110A3108	60

SMT Reflective Sensors

Package	Type	I_{PCE} [µA]	Measurement cond.	I_{CEO} [nA]	Measurement cond.	V_{CE} max. [V]	V_F [V]	Measurement cond.	Ordering Code	Package Fig.
 SMT RLS	SFH 9201	250 ... 2000	Kodak neutral white testcard with 90% reflection; I_F = 10 mA, V_{CE} = 5 V, d = 1 mm	3 (≤ 200)	V_{CE} = 20 V, E = 0	16	1.25 (≤ 1.65)	I_F = 50 mA	Q65110A2708	61
	SFH 9201-2/3	400 ... 1250							Q65110A2698	
	SFH 9201-3/4	630 ... 2000							Q65110A2716	
	SFH 9202	63 ... 800	Kodak neutral white testcard with 90% reflection; I_F = 10 mA, V_{CE} = 5 V, d = 1 mm	5 (≤ 50)	V_{CE} = 20 V	16	1.25 (≤ 1.65)	I_F = 50 mA	Q65110A2712	61
	SFH 9202-2/3	63 ... 200							Q65110A2705	
	SFH 9202-3/4	100 ... 320							Q65110A2710	
	SFH 9202-4/5	160 ... 500							Q65110A2709	
	SFH 9202-5/6	250 ... 800							Q65110A2711	

SMT Proximity Sensors

Package	Type	Working distance d typ [mm]	Supply voltage V_{dd} [V]	Max LED driver current I_f [mA]	Ordering Code	Package Fig.
 COB	SFH 7741	0.5 ... 35	2.4 ... 3.6	60	Q65110A7073	62

SMT Proximity and Ambient Light Sensors

Package	Type	Working distance d typ [mm]	Supply voltage V_{dd} [V]	Max LED driver current I_f [mA]	Sensor Signal Out [counts]	Illuminance measurement range [lx]	Digital out resolution Out [counts/lx]	Measurement conditions	$\lambda_{20\%}$ typ. [nm]	Ordering Code	Package Fig.
 COB	SFH 7770 E6	0 ... 150	2.3 ... 3.1	200	0 ... 254	0.03 ... 65000	0.6 ... 1.5	E_V = 1000 lx (white LED)	480 ... 660	Q65111A3146	63
 COB	SFH 7773	0 ... 100	2.3 ... 3.1	200	0 ... 254	0.03 ... 65000	0.6 ... 1.5	E_V = 1000 lx (white LED)	480 ... 660	Q65111A1258	104

Standard Emitters (< 40 mW)

SMT Emitters

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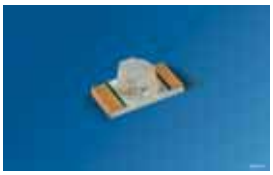


CHIPLED with lens
SFH 4058

TOPLED
SFH 420 / SFH 421 / SFH 4243 / SFH 4283 / SFH 4253

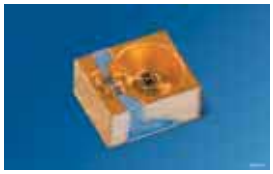
TOPLED RG
SFH 4281

Black TOPLED RG
SFH 4257 R

Black TOPLED
SFH 4257 / SFH 4271

Mini TOPLED
SFH 4247

SIDELED
SFH 425 / SFH 426 / SFH 4244



MIDLED
SFH 4641 / SFH 4651

MIDLED
SFH 4646 / SFH 4656

T1 3/4 SMR
SFH 4580

T1 3/4 SMR
SFH 4585

Emitters in plastic package

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T 1
SFH 487

T 1
SFH 487 P

T 1
SFH 409

T 1 3/4
SFH 484 / SFH 485 / SFH 486

T 1 3/4
SFH 485 P

T 1 3/4
LD 274

T 1 3/4
LD 271

T 1 3/4
SFH 4512 / SFH 4516

Sidelooker
IRL 80 A / IRL 81 A

Mini Sidelooker
SFH 4110

Power Emitters (> 40 mW)

SMT Emitters

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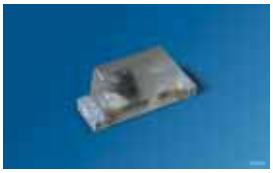
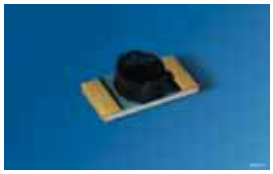


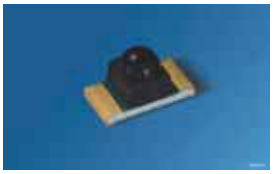
SmartLED 0603
SFH 4050

CHIPLED
SFH 4053

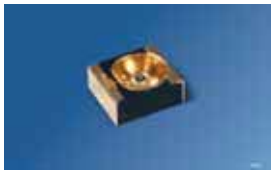
CHIPLED with lens
SFH 4045



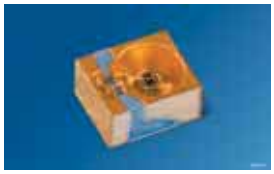
CHIPLED with lens
SFH 4056



CHIPLED with lens
SFH 4059 / SFH 4059S



Mini MIDLED
SFH 4451



MIDLED
SFH 4640 / SFH 4650

MIDLED
SFH 4645 / SFH 4655

Power TOPLED
SFH 4240 / SFH 4250 / SFH 4250S

SIDELED
SFH 4255

Power TOPLED w. Lens
SFH 4248 / SFH 4249 / SFH 4258 / SFH 4259 / SFH 4258S / SFH 4259S

T1 3/4 SMR
SFH 4542

T1 3/4 SMR
SFH 4543

T 1 3/4 SMR
SFH 4551

Emitters in plastic package

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T 1
SFH 4350

T 1 3/4
SFH 4556 / SFH 4546 / SFH 4547 / SFH 4557

T 1 3/4
SFH 4550

T 1
SFH 4341

T 1 3/4
SFH 4545 / SFH 4555

High Power Emitters (> 500 mW)

SMT Emitters

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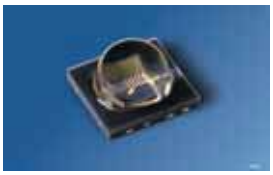
Platinum DRAGON
SFH 4232 / SFH 4233 / SFH 4235



OSLON Black Series
SFH 4715 / SFH 4715S / SFH 4725S

OSRAM OSTAR Lighting
SFH 4750

OSRAM OSTAR Observation
SFH 4740 / SFH 4761

Emitters for special applications

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Multi TOPLED
SFH 331 / SFH 7221

Array
LD 261

Array
LD 260 / LD 262-269

Array
SFH 405

T018
SFH 4850 E7800

T018
SFH 4860

T018
SFH 400 / SFH 480

T018
SFH 464 / SFH 483 / LD 242

T018
SFH 482

T018
SFH 401

T046
SFH 4881 / SFH 4811

T046
SFH 4883 / SFH 4813

Standard Emitters (< 40 mW)

SMT Emitters

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 **CHIPLED with lens**	SFH 4058	860	± 40	40	18 (≥ 6.3)	I_F=70 mA, t_p=20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A9218	66
 **TOPLED**	SFH 420	950	± 60	14	5 (≥ 2.5)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q65110A2473	67
	SFH 421	880	± 60	23	7 (≥ 4)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	500	Q65110A1218	67
 **TOPLED**	SFH 4283	880	± 60	23	7 (≥ 4)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q65110A2517	70
 **TOPLED**	SFH 4243	950	± 60	35	11 (≥ 4)	I_F = 70 mA, t_p = 20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A7515	67
	SFH 4253	860	± 60	40	12 (≥ 6.3)	I_F = 70 mA, t_p = 20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A6657	67
 **TOPLED RG**	SFH 4281	880	± 60	23	6 (4 ... 12.5)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	500	Q65110A2516	68
 **Black TOPLED RG**	SFH 4257 R	860	± 60	25	9 (≥ 6.3)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A8706	98
 **Black TOPLED**	SFH 4257	860	± 60	25	9 (≥ 6.3)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A2466	70
	SFH 4271	880		5	1 ... 3.2				500	Q65110A2521	
 **Mini TOPLED**	SFH 4247	950	± 65	35	10 (≥ 4)	I_F = 70 mA, t_p = 20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A8091	71

Standard Emitters (< 40 mW)

SMT Emitters

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 **SIDELED**	SFH 425	950	± 60	14	5 (≥ 2.5)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q65110A2463	74
	SFH 426	880	± 60	23	7 (≥ 4)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	500	Q65110A2512	74
	SFH 4244	950	± 60	35	11 (≥ 4)	I_F = 70 mA, t_p = 20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A7516	74
 **MIDLED**	SFH 4641	950	± 15	35	40 (≥ 16)	I_F = 70 mA, t_p = 20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A8098	11
	SFH 4651	860		40	45 (≥ 16)			I_F = 50 mA, t_p = 20 ms		Q65110A8396	
 **MIDLED**	SFH 4646	950	± 15	35	40 (≥ 16)	I_F = 70 mA, t_p = 20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A8099	11
	SFH 4656	860		40	45 (≥ 16)			I_F = 50 mA, t_p = 20 ms		Q65110A8395	
 **T1 3/4 SMR**	SFH 4580	880	± 15	25	55 (≥ 25)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q65110A2632	75
 **T1 3/4 SMR**	SFH 4585	880	± 15	25	55 (≥ 25)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q65110A2631	76

Standard Emitters (< 40 mW)

Emitters in plastic package

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 T 1	SFH 487	880	± 20	25	≥ 12.5	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q62703Q1095	81
	SFH 487-2				40 (20 ... 80)					Q62703Q2174	
	SFH 487-3				60 (31 ... 125)					Q62703Q2175	
 T 1	SFH 487 P	880	± 65	25	4 (≥ 2)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q62703Q0517	87
 T 1	SFH 409	950	± 20	18	≥ 6.3	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q62702P0860	90
	SFH 409-2				17 (≥ 10)					Q62702P1002	
 T 1 3/4	SFH 484	880	± 8	25	100 (≥ 50)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 20 mA, t_P = 20 ms	600	Q62703Q1092	77
	SFH 484-2				≥ 80					Q62703Q1756	
	SFH 486	880	± 11	25	70 (≥ 40)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_P = 20 ms	600	Q62703Q1094	84
	SFH 485	880	± 20	25	40 (25 ... 160)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q62703Q1093	85
	SFH 485-2				25 ... 100					Q62703Q1547	
 T 1 3/4	SFH 485 P	880	± 40	25	5 (≥ 3.15)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q62703Q0516	86
 T 1 3/4	LD 274	950	± 10	20	90 (≥ 50)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q62703Q1031	88
	LD 274-3				≥ 80					Q62703Q1820	

Standard Emitters (< 40 mW)

Emitters in plastic package

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 T 1 3/4	LD 271	950	± 25	18	15 (≥ 10)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	1000	Q62703Q0148	89
	LD 271 H				24 (≥ 16)					Q62703Q0256	
	LD 271 L	950	± 25	18	15 (≥ 10)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	1000	Q62703Q0833	41
	LD 271 LH				24 (≥ 16)					Q62703Q0838	
 T 1 3/4	SFH 4512	950	± 10	20	40 (≥ 20)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q65110A2106	102
	SFH 4516	950	± 17	20	45 (≥ 25)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q65111A0380	41
 Sidelooker	IRL 81A	860	± 12	12	25 (≥ 6.3)	I_F = 20 mA, t_p = 20 ms	1.3 (≤ 1.6)	I_F = 20 mA, t_p = 20 ms	12	Q68000A8000	91
	IRL 80A	950	± 30		≥ 0.4	I_F = 20 mA, t_p = 20 ms	1.2 (≤ 1.5)	I_F = 20 mA	500	Q68000A7851	91
 Mini Sidelooker	SFH 4110	950	± 9	2	4.7 (≥ 2.5)	I_F = 20 mA, t_p = 20 ms	1.2 (≤ 1.4)	I_F = 20 mA, t_p = 20 ms	450	Q62702P5072	23

Power Emitters (> 40 mW)

SMT Emitters

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 **SmartLED 0603**	SFH 4050	860	± 80	60	10 (≥ 4)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A6460	65
 **CHIPLED**	SFH 4053	860	± 70	40	6 (≥ 4)	I_F=70 mA, t_p=20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65111A0651	101
 **CHIPLED with lens**	SFH 4045	950	± 9	40	90 (≥ 40)	I_F=70 mA, t_p=20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A9731	2
 **MIDLED**	SFH 4640	950	± 15	55	60 (≥ 25)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A9369	11
	SFH 4650	860		60	65 (≥ 25)					Q65110A1572	
 **MIDLED**	SFH 4645	950	± 15	55	60 (≥ 25)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A9367	11
	SFH 4655	860		60	65 (≥ 25)					Q65110A1569	
 **Mini MIDLED**	SFH 4451	860	± 17	55	60 (≥ 25)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65111A2583	103
 **Power TOPLED**	SFH 4240	950	± 60	55	18 (≥ 10)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A7513	69
 **Power TOPLED**	SFH 4250	860	± 60	60	20 (≥ 10)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A2465	69
	SFH 4250S	860	± 60	70	22 (≥ 12.5)	I_F=70 mA, t_p=20 ms	3 (≤ 3.5)	I_F = 70 mA, t_p = 20 ms	15	Q65111A0128	69
 **SIDELED**	SFH 4255	860	± 60	60	20 (≥ 10)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A2467	74

Power Emitters (> 40 mW)

SMT Emitters

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 **Power TOPLED w. Lens**	SFH 4248	950	± 15	65	100 (≥ 40)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A7518	73
	SFH 4249		± 25		50 (≥ 25)					Q65110A7519	72
	SFH 4258	860	± 15	70	110 (≥ 40)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A2975	73
	SFH 4258S			80	100 (≥ 40)	I_F=70 mA, t_p=20 ms	3 (≤ 3.5)	I_F = 70 mA, t_p = 20 ms	15	Q65111A1158	
	SFH 4259	860	± 25	70	55 (≥ 25)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A2464	72
	SFH 4259S			80	60 (≥ 25)	I_F=70 mA, t_p=20 ms	3 (≤ 3.5)	I_F = 70 mA, t_p = 20 ms	15	Q65111A1159	
 **T1 3/4 SMR**	SFH 4542	950	± 10	65	230 (≥ 100)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A8093	75
 **T1 3/4 SMR**	SFH 4543	950	± 10	65	230 (≥ 100)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A8094	76
 **T 1 3/4 SMR**	SFH 4551	860	± 10	70	180 (≥ 63)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65111A0506	75

Power Emitters (> 40 mW)

SMT Emitters

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	Irradiance $E_{e,typ}$ [mW / cm^2]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 **CHIPLED with lens**	SFH 4056	860	± 22	40	6 (≥ 2.5)	I_F=70 mA, t_p=20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65111A2992	97
 **CHIPLED with lens**	SFH 4059	860	± 10	40	15 (≥ 6.3)	I_F=70 mA, t_p=20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65111A2991	100
	SFH 4059S		± 15	70	23 (≥ 10)		3 (≤ 3.5)		15	Q65111A2990	

Power Emitters (> 40 mW)

Emitters in plastic package

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 T 1	SFH 4350	860	± 13	70	200 (≥ 63)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A2091	81
 T 1	SFH 4341	950	± 11	40	80 (≥ 25)	I_F=70 mA, t_p=20 ms	1.6 (≤ 2)	I_F = 70 mA, t_p = 20 ms	12	Q65110A8092	81
 T 1 3/4	SFH 4550	860	± 3	70	1100 (≥ 630)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A1772	77
 T 1 3/4	SFH 4555	860	± 5	60	550 (≥ 160)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A7341	83
	SFH 4545	950	± 5	55	550 (≥ 250)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A8095	83
 T 1 3/4	SFH 4546	950	± 20	55	130 (≥ 63)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A8096	78
	SFH 4547	950	± 30	55	75 (≥ 40)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65111A1141	79
	SFH 4556	860	± 20	60	145 (≥ 63)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A6087	78
	SFH 4557	860	± 30	60	80 (≥ 40)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65111A1142	79

High Power Emitters (> 500 mW)

SMT Emitters

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measurement cond.	V_F [V]	Measurement cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 **Platinum DRAGON**	SFH 4232	860	± 60	530	180	I_F = 1 A, t_p = 100 µs	1.5 (≤ 1.8)	I_F = 1 A, t_p = 100 µs	7	Q65110A8754	64
	SFH 4233	950		500	170		1.4 (≤ 1.8)		10	Q65110A8901	
	SFH 4235	860		950	320		3 (≤ 3.4)		7	Q65110A8900	
 **OSLON Black Series**	SFH 4715	860	± 45	590	250	I_F=1 A, t_p=10 ms	1.5 (≤ 1.8)	I_F = 1 A, t_p = 100 µs	10	Q65111A2364	80
	SFH 4715S			1070	500	I_F=100 mA, t_p=20 ms	2.9 (≤ 3.4)		7	Q65111A1549	
	SFH 4725S	950		980	450		2.75 (≤ 3.4)		10	Q65111A2800	
 **OSRAM OSTAR Lighting**	SFH 4750	860	± 70	3500	1000	I_F=1 A, t_p=20 ms	9.5 (≤ 12)	I_F = 1 A, t_p = 100 µs	10	Q65110A8280	105

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e [W]	I_e [mW/sr]	Measurement cond.	V_F [V]	Measurement cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 **OSRAM OSTAR Observation**	SFH 4740	860	± 60	4.3	1400	I_F = 1 A, t_p = 20 ms	15.5 (≤ 19)	I_F = 1 A, t_p = 100 µs	10	Q65110A6190	106
 **OSRAM OSTAR Observation**	SFH 4761	860	± 60	4.3	1400 (≥ 1120)	I_F = 1 A, t_p = 20 ms	15.5 (≤ 19)	I_F = 1 A, t_p = 100 µs	10	Q65110A8758	107

Emitters for special applications

Detector/Emitter in Multi TOPLED package

Package	Type	Emitter						Ordering Code	Package Fig.
		λ_{peak} typ [nm]	Half angle φ [°]	I_V [mcd]	Measurement cond.	V_F [V]	Measurement cond.		
 Multi TOPLED	SFH 331-JK	635	± 60	6 (4 ... 12.5)	I_F = 10 mA	2 (≤ 2.6)	I_F = 10 mA	Q65110A2821	12

Detector					
Radiant sensitive area typ. [mm^2]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]
0.038	≥ 16	λ = 950 nm, E_e = 0.1 mW/cm^2, V_{CE} = 5 V	35	440 ... 1150	7

Package	Type	Emitter						Ordering Code	Package Fig.
		λ_{peak} typ [nm]	Half angle φ [°]	I_e [mW/sr]	Measurement cond.	V_F [V]	Measurement cond.		
 Multi TOPLED	SFH 7221	880	± 60	≥ 4	I_F = 100 mA, t_p = 20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	Q65110A2741	13

Detector					
Radiant sensitive area typ. [mm^2]	I_{PCE} [µA]	Measurement cond.	V_{CE} max. [V]	$\lambda_{10\%}$ typ. [nm]	t_r, t_f typ [µs]
0.038	≥ 16	λ = 880 nm, E_e = 0.1 mW/cm^2, V_{CE} = 5 V	35	440 ... 1150	7

Emitters for special applications

Emitter arrays in plastic package

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 Array	LD 261	950	± 15	9	5.5 (2 ... 10)	I_F = 50 mA, t_p = 20 ms	1.25 (≤ 1.4)	I_F = 50 mA, t_p = 20 ms	1000	Q62703Q0395	25
	LD 261-5/6				5.5 (3.2 ... 10)					Q65110A3337	
 Array	LD 262	950	± 15	9	5 (≥ 2)	I_F = 50 mA, t_p = 20 ms	1.25 (≤ 1.4)	I_F = 50 mA, t_p = 20 ms	1000	Q62703Q0070	26
	LD 263									Q62703Q0071	
	LD 264									Q62703Q0072	
	LD 265									Q62703Q0073	
	LD 266									Q62703Q0074	
	LD 267									Q62703Q0075	
	LD 268									Q62703Q0076	
	LD 269									Q62703Q0077	
	LD 260									Q62703Q0078	
 Array	SFH 405	950	± 16	7	2.5 (≥ 1.6)	I_F = 40 mA, t_p = 20 ms	1.25 (≤ 1.4)	I_F = 40 mA, t_p = 20 ms	1000	Q62702P0835	24

Emitters in metal package

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 TO18	SFH 4850 E7800	860	± 23	70	10 (≥ 4)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	12	Q65110A2093	82
 TO18	SFH 4860	660	± 50	3	1.3 (≥ 0.63)	I_F = 50 mA, t_p = 20 ms	2 (≤ 2.8)	I_F = 50 mA, t_p = 20 ms	100	Q62702P5053	92
 TO18	SFH 400	950	± 6	8	36 (≥ 20)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	1000	Q62702P0096	93
	SFH 480	880	± 6	12	75 (≥ 40)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q62703Q1087	93
	SFH 480-2/3									Q62702P5195	

Emitters in metal package

Package	Type	λ_{peak} typ [nm]	Half angle φ [°]	Φ_e typ [mW]	I_e [mW/sr]	Measure-ment cond.	V_F [V]	Measure-ment cond.	t_r, t_f typ [ns]	Ordering Code	Package Fig.
 TO18	SFH 464 E7800	660	± 23	11	1.5 (≥ 1)	I_F = 50 mA, t_p = 20 ms	2.1 (≤ 2.8)	I_F = 50 mA, t_p = 20 ms	100	Q62702P1745	82
	SFH 483 L/M E7800	880	± 23	23	2 (1 ... 3.2)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q62703Q4755	82
	LD 242-2/3	950	± 40	16	6 (≥ 4)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	1000	Q62703Q4749	82
	LD 242 E7800				2.5 (1 ... 3.2)					Q62703Q3509	
 TO18	SFH 482	880	± 30	12	7 (≥ 3.15)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	600	Q62703Q1089	48
	SFH 482-1/2				5.5 (3.15 ... 10)					Q62703Q4771	
	SFH 482-2/3				8 (≥ 5)					Q62703Q4754	
	SFH 482 M E7800				2.4 (1.6 ... 3.2)					Q62703Q2186	
 TO18	SFH 401	950	± 15	8	≥ 10	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	1000	Q62702P0097	94
 TO46	SFH 4881	880	± 5	12	72 (≥ 40)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	500	Q62702P5302	95
 TO46	SFH 4811	950	± 5	8	40 (≥ 25)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q62702P5300	95
 TO46	SFH 4883	880	± 35	15	8 (≥ 4)	I_F=100 mA, t_p=20 ms	1.5 (≤ 1.8)	I_F = 100 mA, t_p = 20 ms	500	Q62702P5303	96
	SFH 4813	950	± 35	8	4.5 (≥ 2.5)	I_F=100 mA, t_p=20 ms	1.3 (≤ 1.5)	I_F = 100 mA, t_p = 20 ms	500	Q62702P5301	96

Dimensions in mm (inch)

Figure 1: SFH 3010

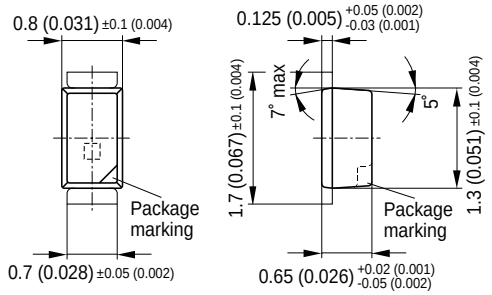


Figure 2: SFH 3015 FA, SFH 4045

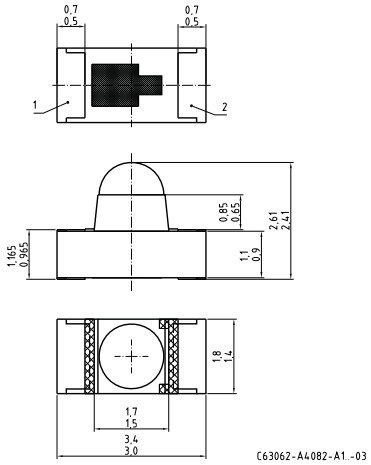


Figure 3: SFH 3204

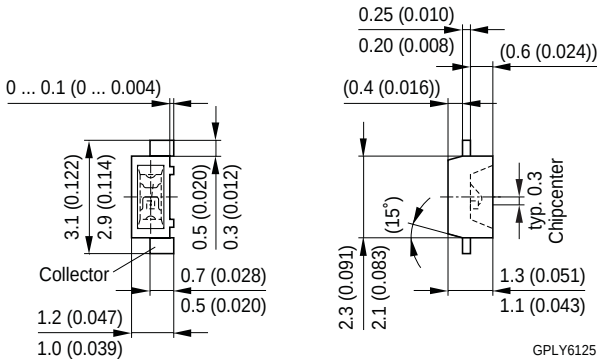


Figure 4: SFH 320, SFH 320 FA

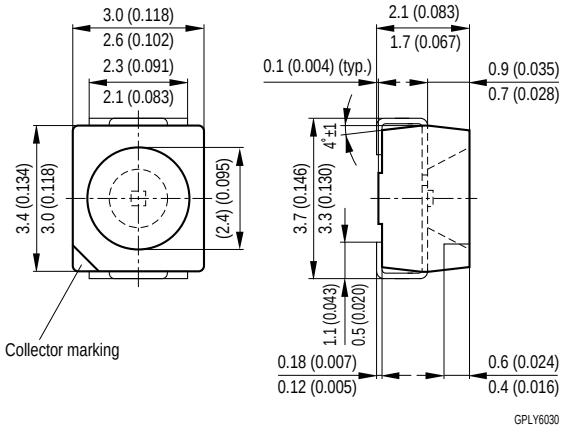


Figure 5: SFH 3219

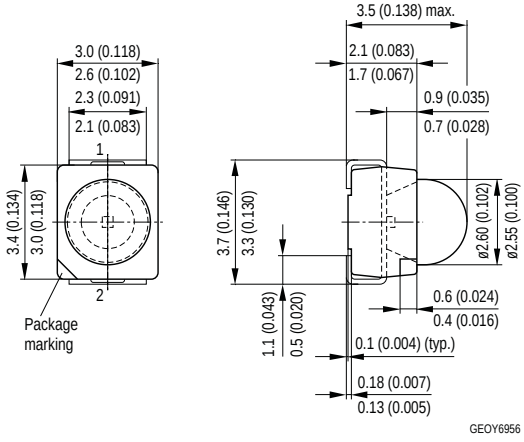
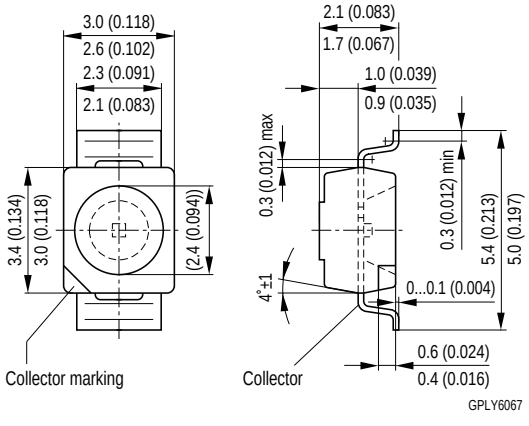


Figure 6: SFH 3211 FA



Dimensions in mm (inch)

Figure 7: **SFH 325, SFH 325 FA**

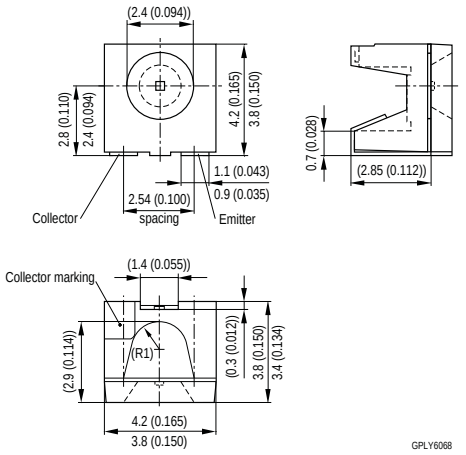


Figure 8: **SFH 3400**
Pocket dimensions not according to IEC 60286-3 due to lead length/bending tolerance of device

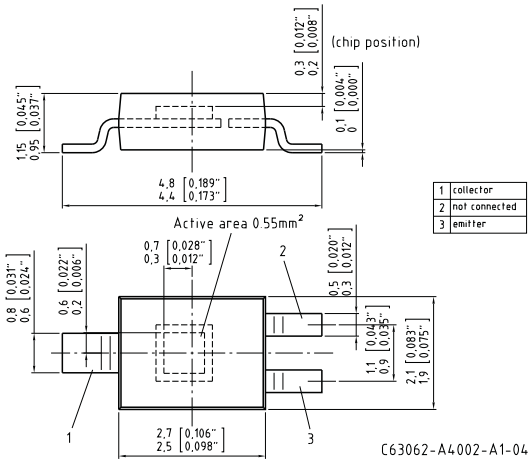


Figure 9: **SFH 3401**
Pocket dimensions not according to IEC 60286-3 due to lead length/bending tolerance of device

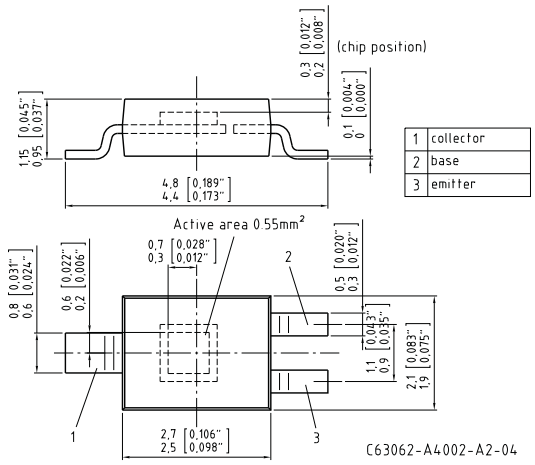


Figure 10: **SFH 3201**

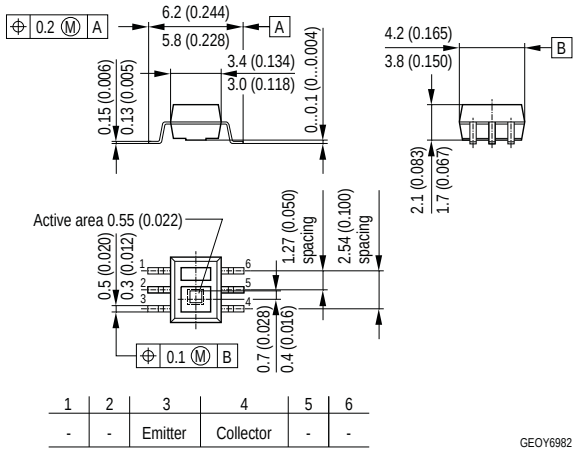


Figure 11: **SFH 3600, SFH 3605, SFH 4640, SFH 4641, SFH 4645, SFH 4646, SFH 4650, SFH 4651, SFH 4655, SFH 4656**
For polarity, please see Datasheet

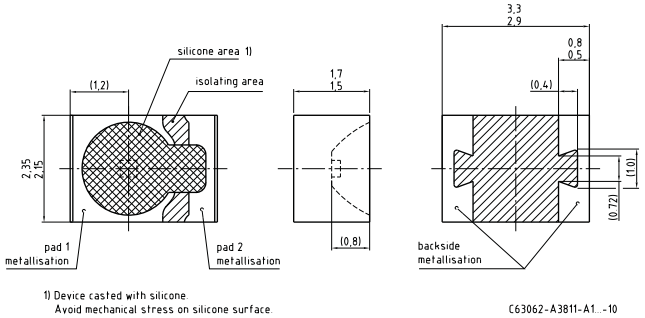
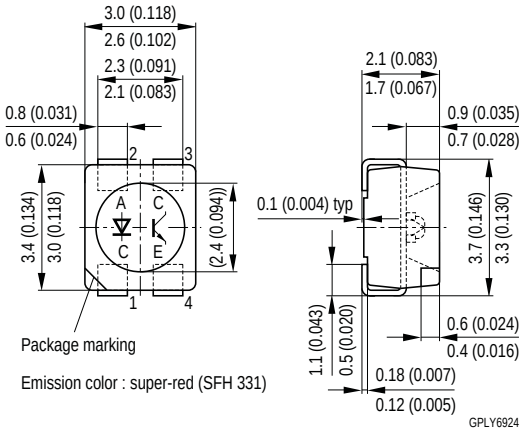


Figure 12: **SFH 331**



Dimensions in mm (inch)

Figure 13: SFH 7221

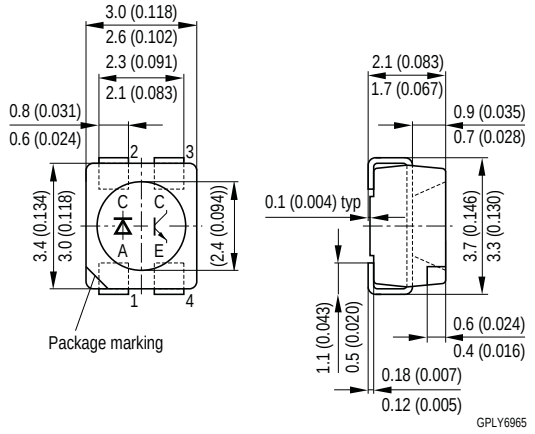


Figure 14: SFH 309, SFH 309 FA, SFH 229, SFH 229 FA

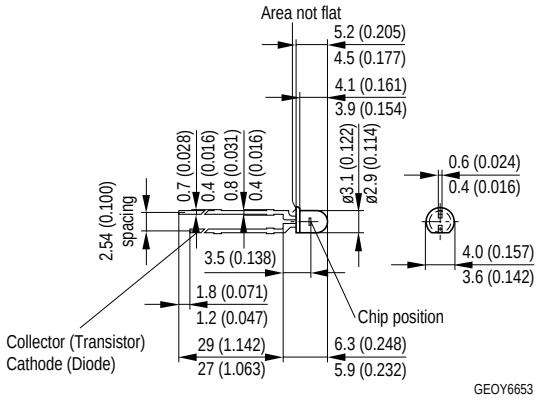


Figure 15: SFH 310, SFH 310 FA

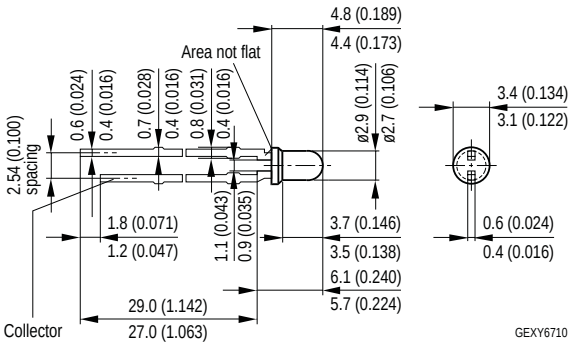


Figure 16: SFH 309 P, SFH 309 PFA, SFH 3310

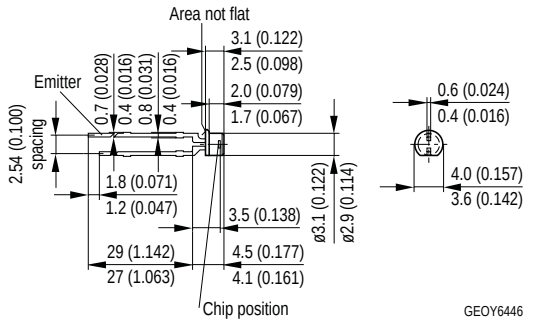


Figure 17: SFH 314, SFH 314 FA

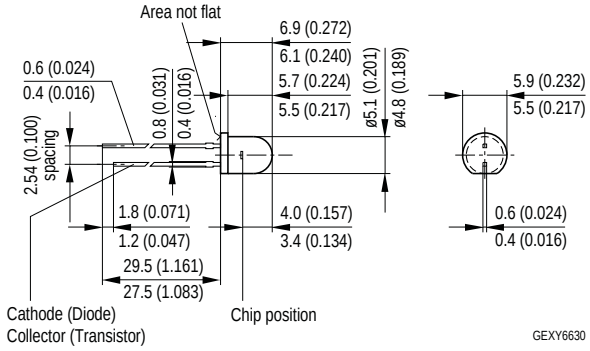
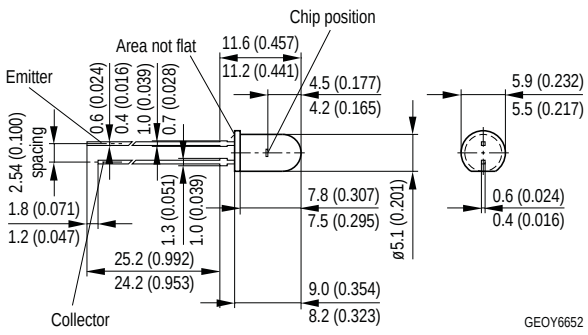


Figure 18: SFH 300, SFH 300 FA



Dimensions in mm (inch)

Figure 19: SFH 3500, SFH 2500 FA

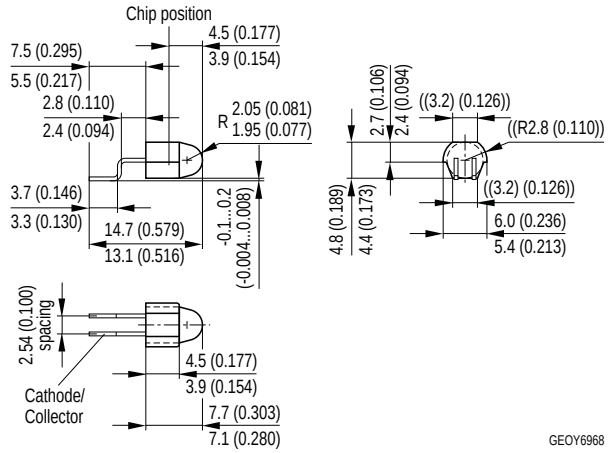


Figure 20: LPT 80 A

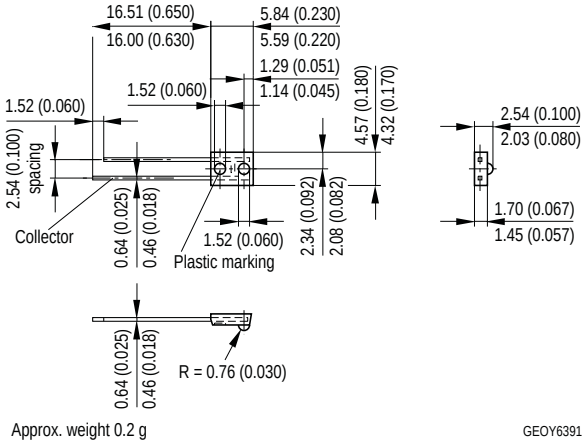


Figure 21: SFH 213, SFH 213 FA, SFH 313 FA

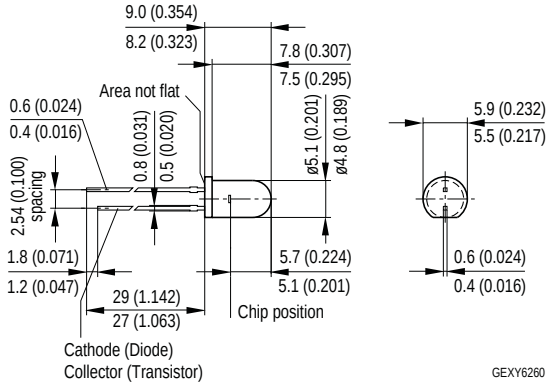


Figure 22: SFH 303 FA

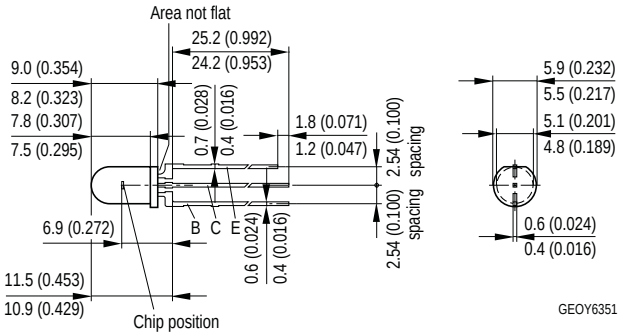


Figure 23: SFH 3100 F, SFH 4110

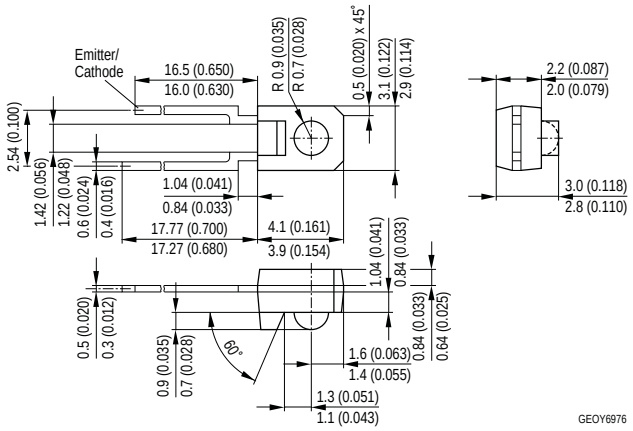
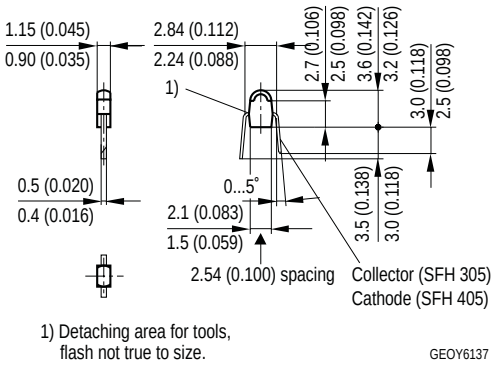
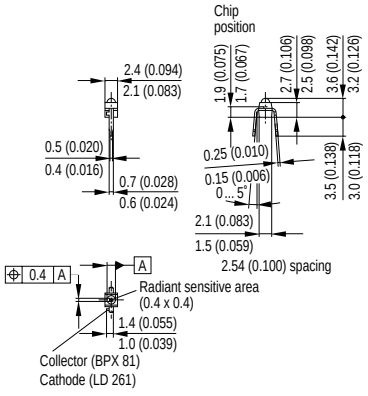


Figure 24: SFH 305, SFH 405



Dimensions in mm (inch)

Figure 25: BPX 81, LD 261



1) Detaching area for tools, flash not true to size.
Approx. weight 0.03 g

Figure 26: BPX 80, BPX 82-89, LD 260, LD 262-269

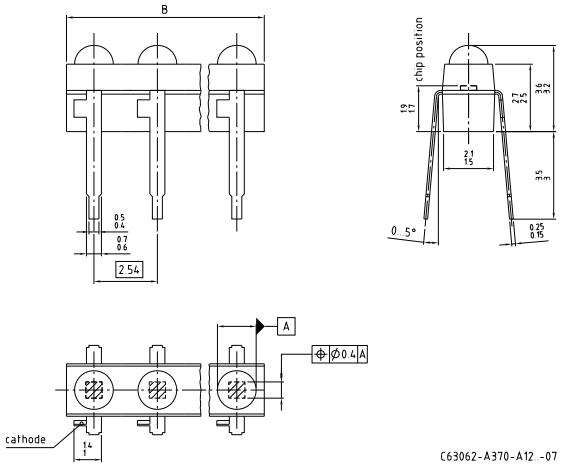


Figure 27: BPX 43, BPY 62

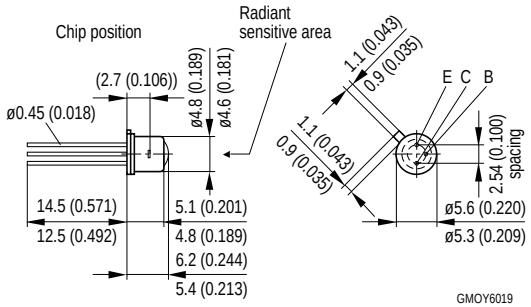
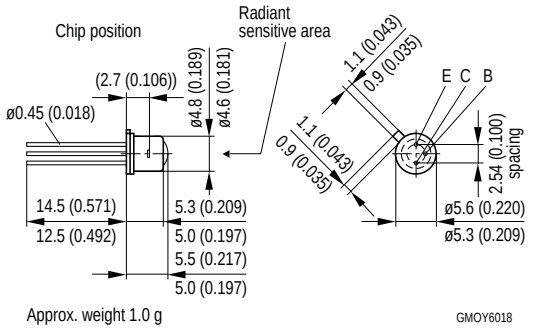


Figure 28: BPX 38



Approx. weight 1.0 g

Figure 29: BP 103

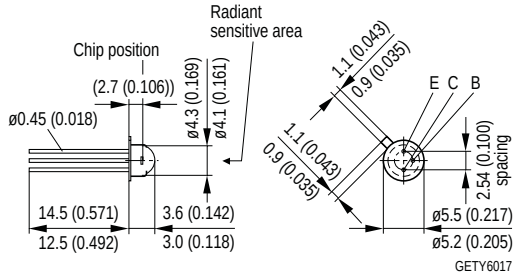
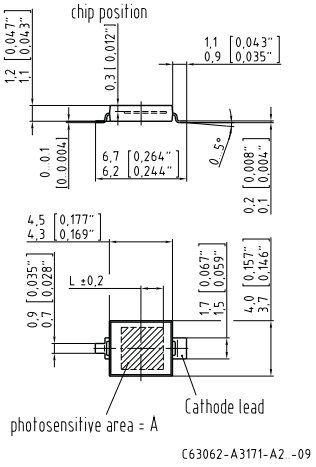


Figure 30: BPW 34 S, BPW 34 BS, BP 104 S



Dimensions in mm (inch)

Figure 31: BP 104 SR, BPW 34 SR

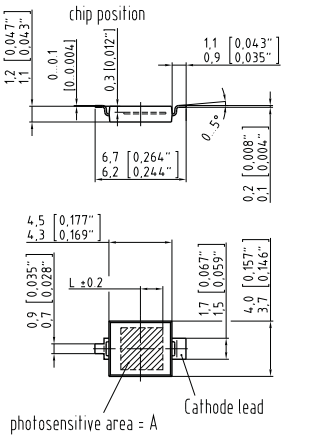


Figure 32: SFH 2400, SFH 2400 FA
Pocket dimensions not according to IEC 60286-3 due to lead length/bending tolerance of device

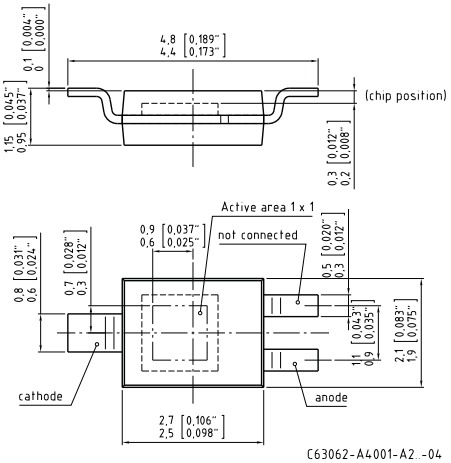


Figure 33: SFH 2505, SFH 2505 FA

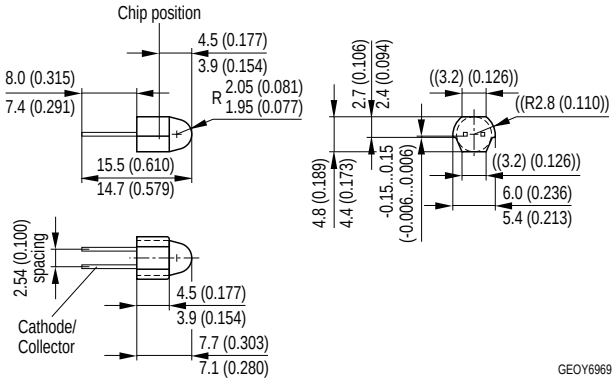


Figure 34: SFH 2701

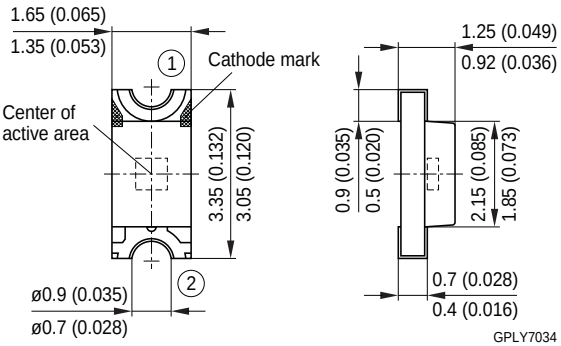


Figure 35: BP 104 FS, BP 104 FAS, BPW 34 FS, BPW 34 FAS

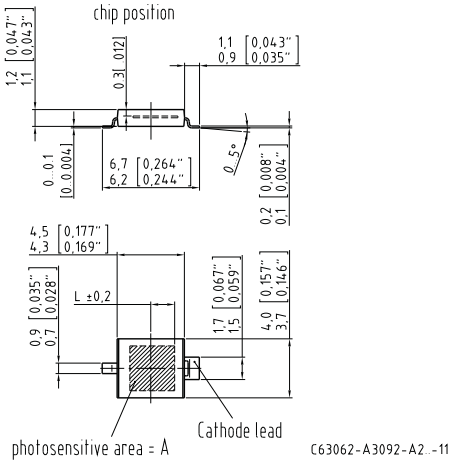
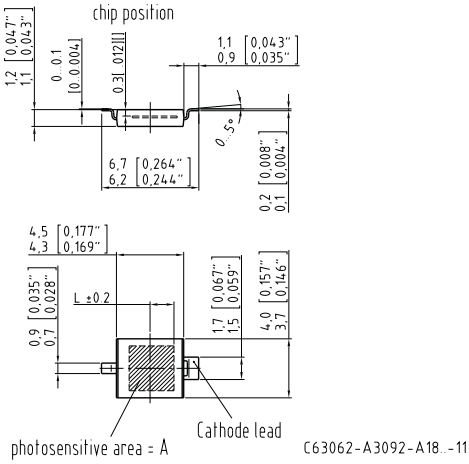


Figure 36: BP 104 FASR, BPW 34 FSR, BPW 34 FASR



Dimensions in mm (inch)

Figure 37: SFH 2400 FAR
Pocket dimensions not according to IEC 60286-3 due to lead length/bending tolerance of device

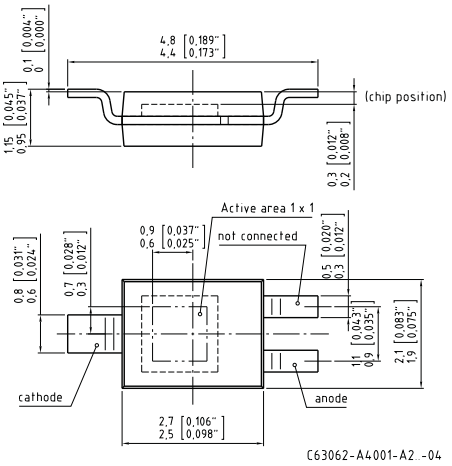


Figure 38: KOM 2125

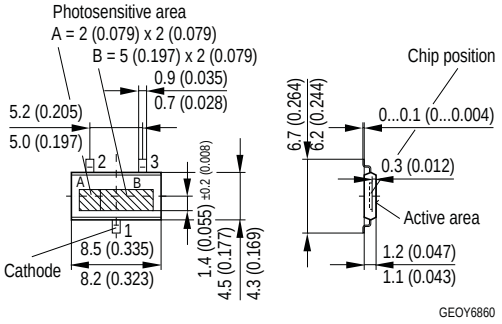


Figure 39: BPW 34, BPW 34 B

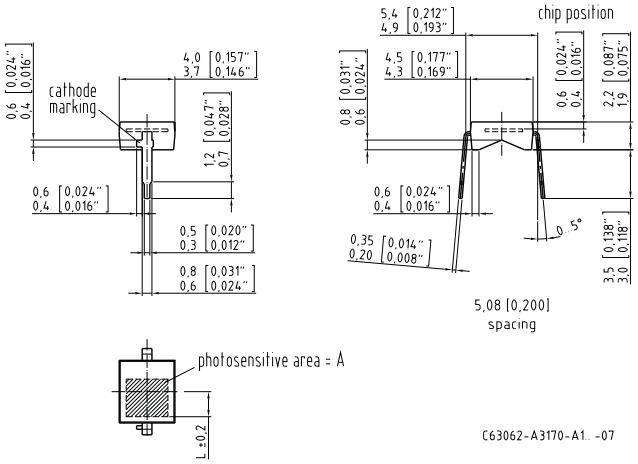


Figure 40: SFH 206 K

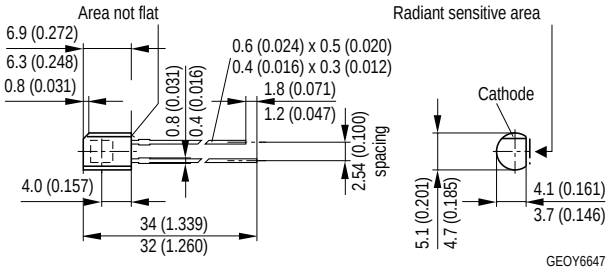


Figure 41: SFH 203, SFH 203 FA, LD 271 L/LH

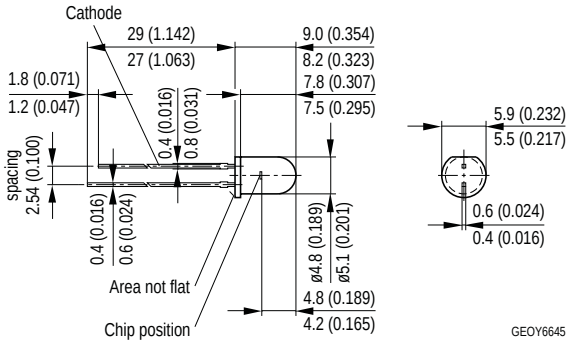
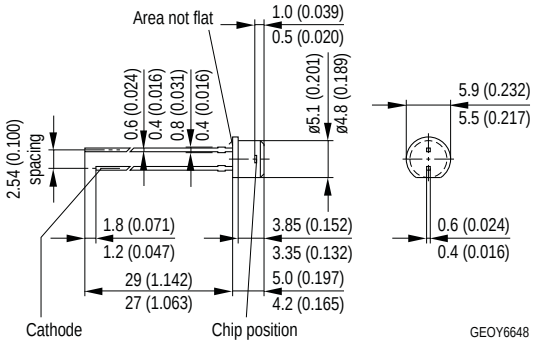


Figure 42: SFH 203 P, SFH 203 PFA



Dimensions in mm (inch)

Figure 43: BP 104 F, BPW 34 FA, BPW 34 F

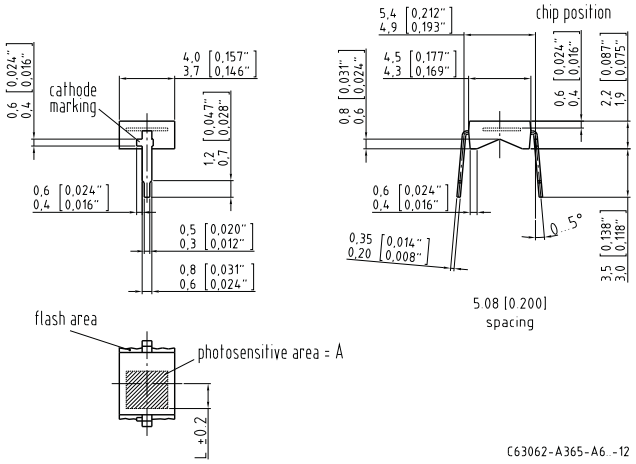


Figure 44: BPW 34, BPW 34 F, BPW 34 B, BPW 34 FA

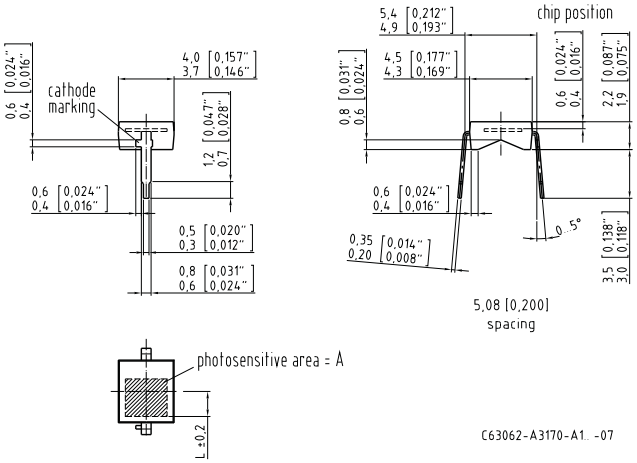


Figure 45: SFH 225 FA, SFH 235 FA

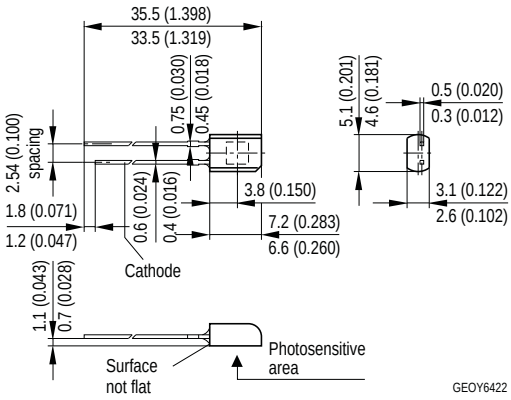


Figure 46: SFH 205 F, SFH 205 FA

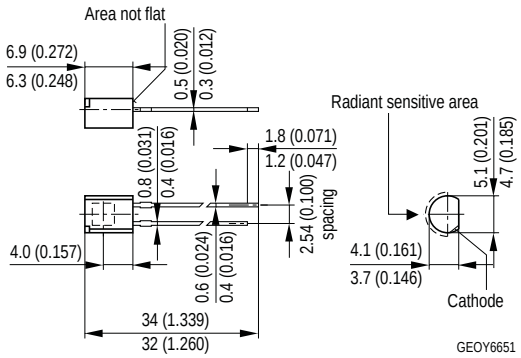


Figure 47: SFH 2504

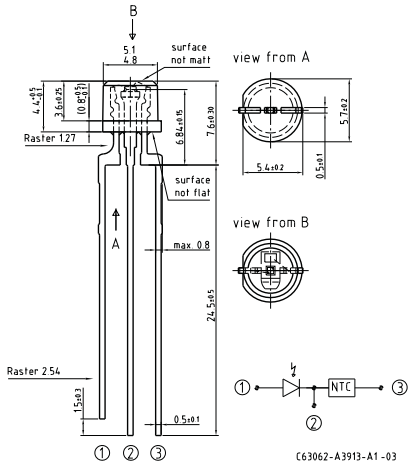
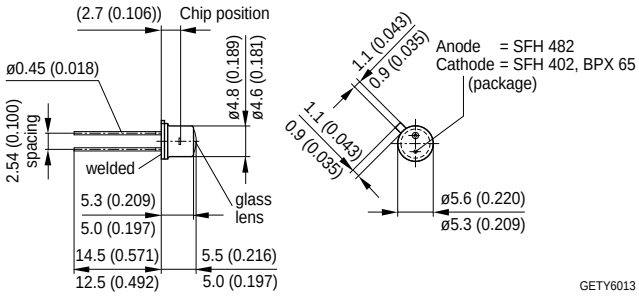
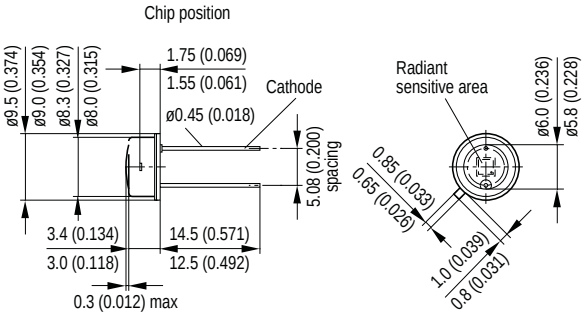


Figure 48: SFH 482, BPX 65



Dimensions in mm (inch)

Figure 49: BPW 21, BPX 61



Approx. weight 2 g

Figure 50: SFH 5440
Pocket dimensions not according to IEC 60286-3 due to lead length/bending tolerance of device

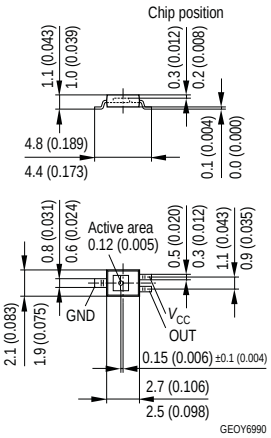


Figure 51: SFH 5140 F

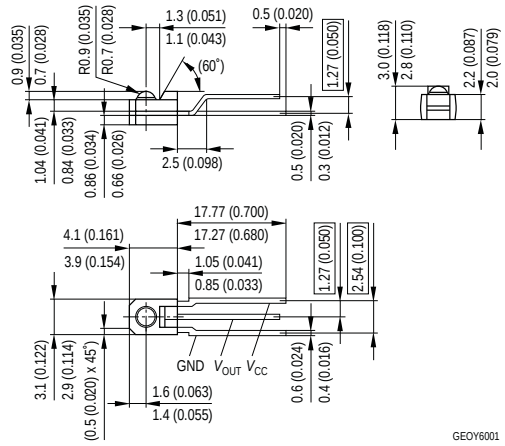
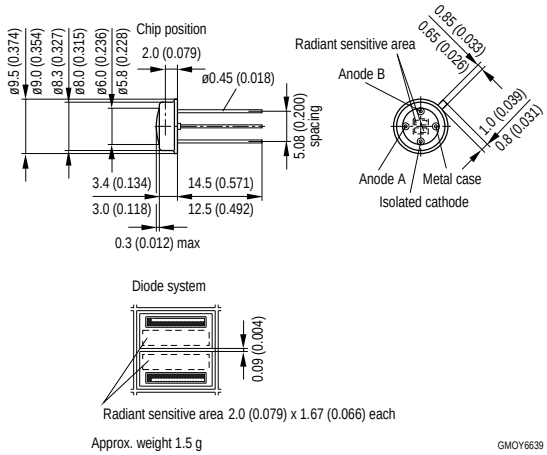
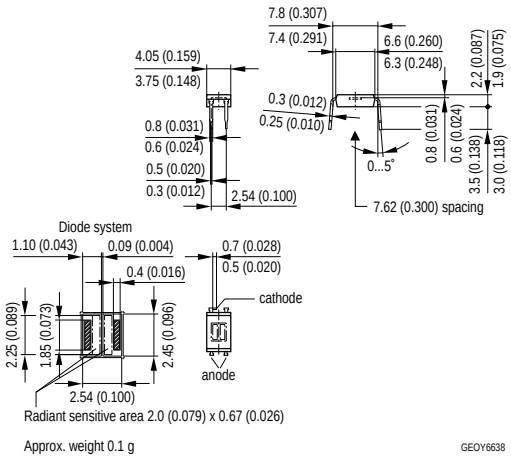


Figure 52: SFH 221



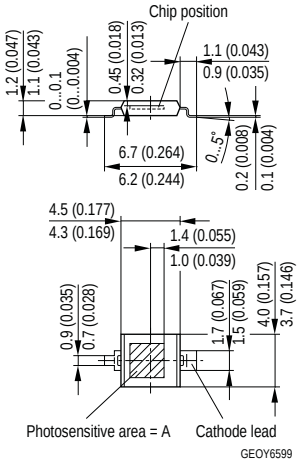
Approx. weight 1.5 g

Figure 53: BPX 48



Approx. weight 0.1 g

Figure 54: SFH 2430



Dimensions in mm (inch)

Figure 55: SFH 3410
Pocket dimensions not according to IEC 60286-3 due to lead length/bending tolerance of device

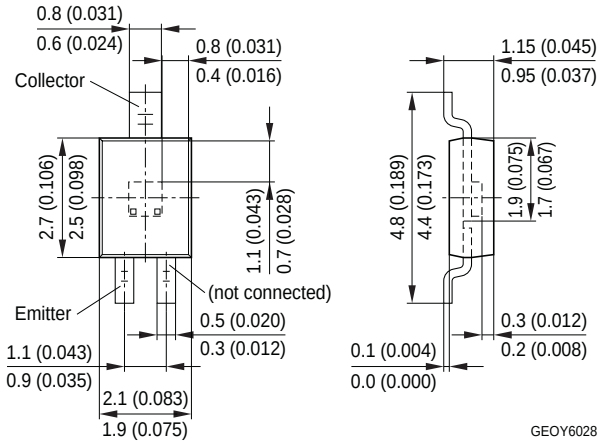


Figure 56: SFH 3710

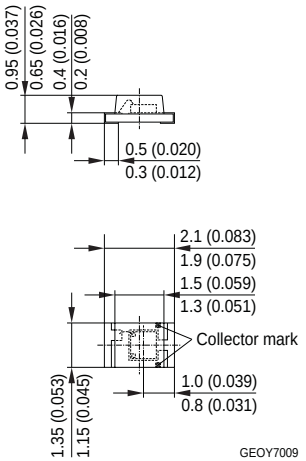


Figure 57: SFH 3711

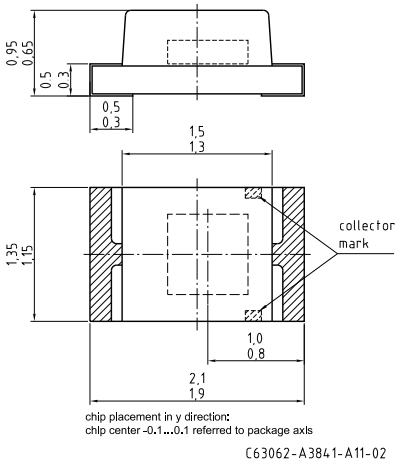


Figure 58: SFH 5711

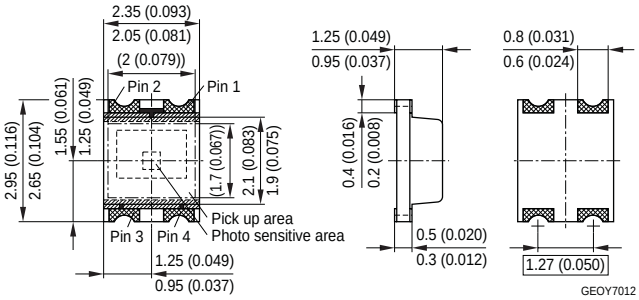


Figure 59: SFH 5712

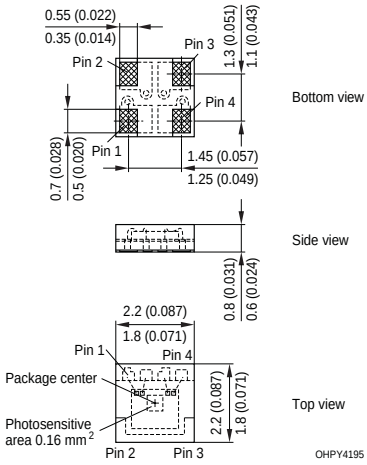
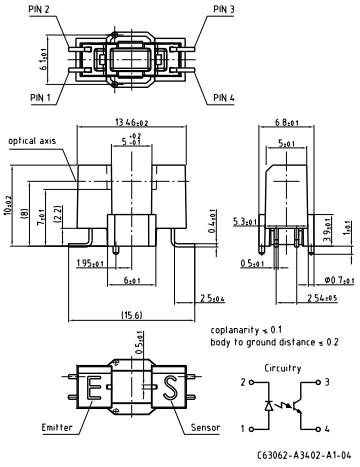


Figure 60: SFH 9500



Dimensions in mm (inch)

Figure 61: SFH 9201, SFH 9202, SFH 9240

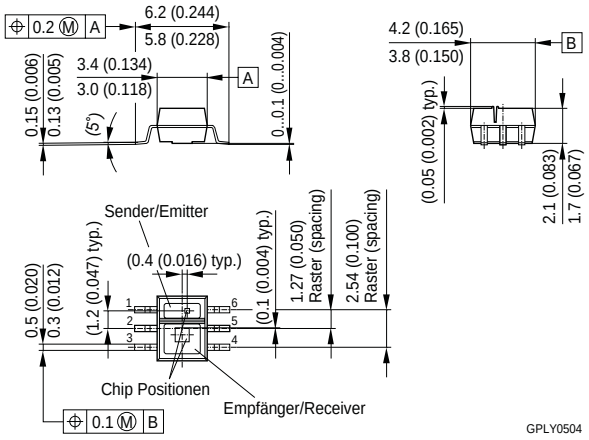


Figure 62: SFH 7741

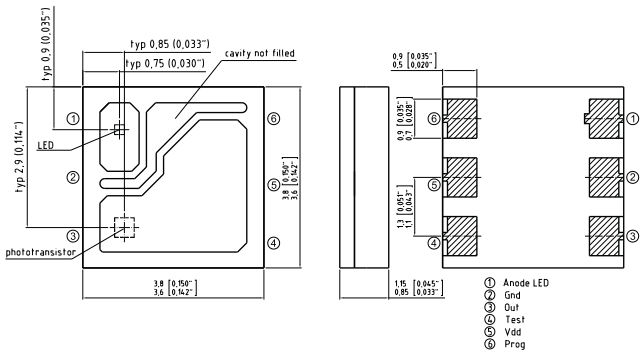


Figure 63: SFH 7770 E6

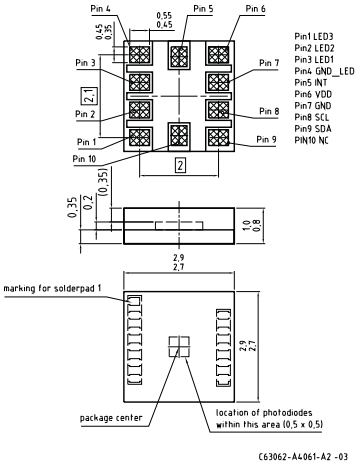


Figure 64: SFH 4232, SFH 4233, SFH 4235

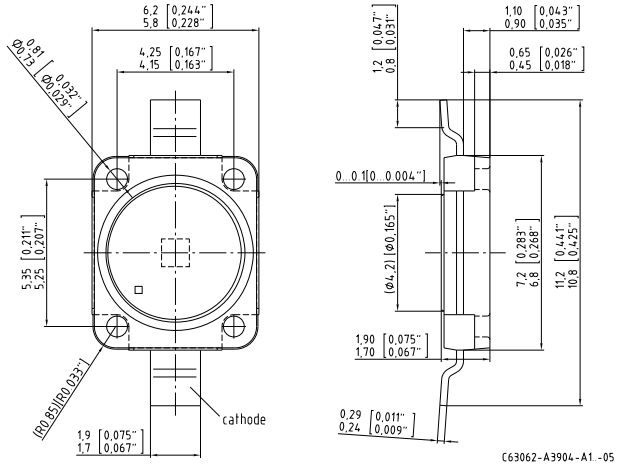


Figure 65: SFH 4050

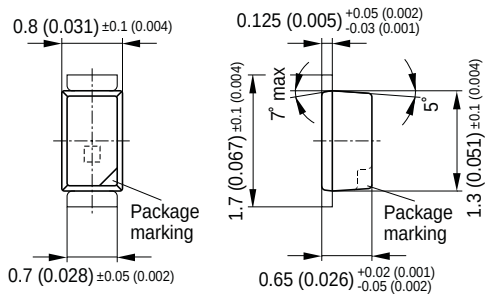
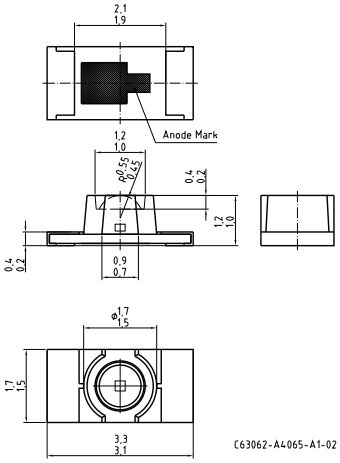


Figure 66: SFH 4058



Dimensions in mm (inch)

Figure 67: SFH 420, SFH 421, SFH 4243, SFH 4253

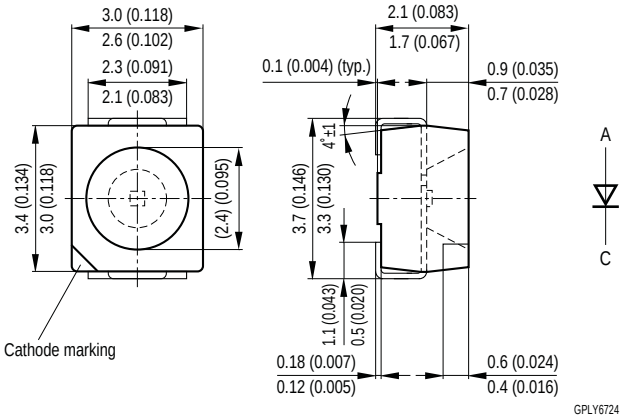


Figure 68: SFH 4281

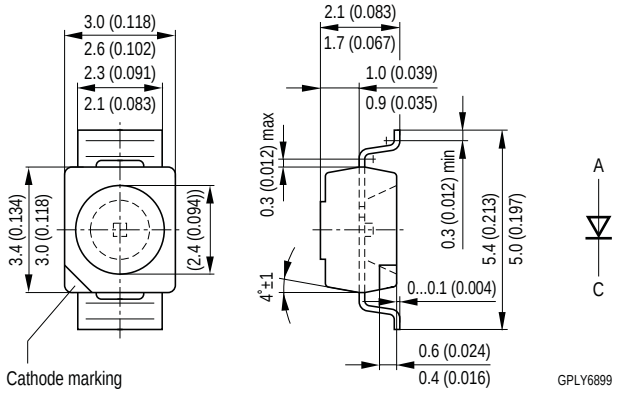


Figure 69: SFH 4240, SFH 4250, SFH 4250S

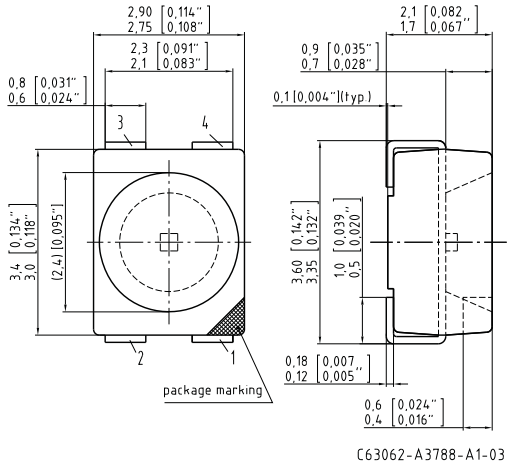


Figure 70: SFH 4271, SFH 4257, SFH 4283

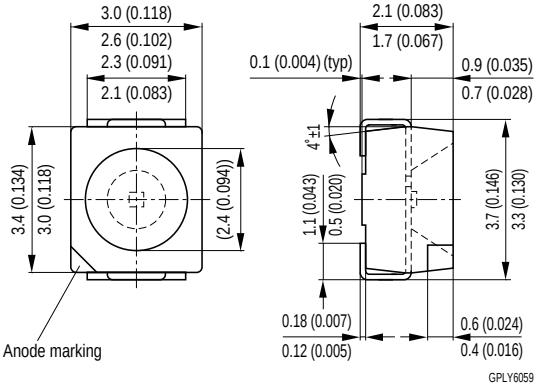


Figure 71: SFH 4247

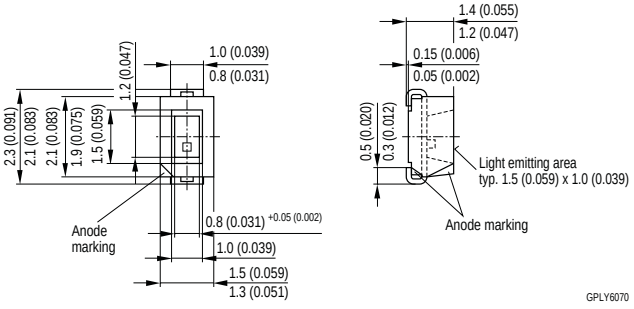
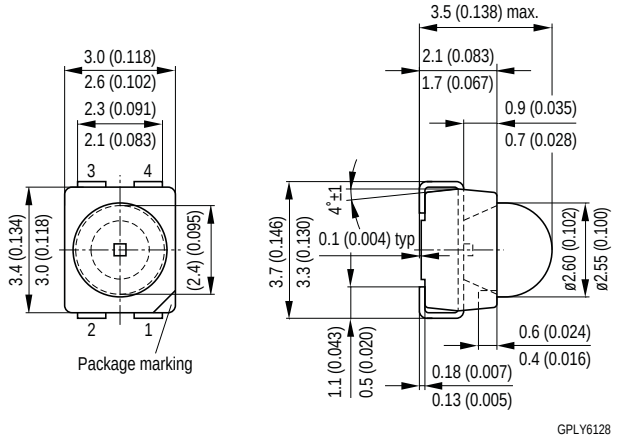


Figure 72: SFH 4249, SFH 4259, SFH 4259S



Dimensions in mm (inch)

Figure 73: SFH 4248, SFH 4258, SFH 4258S

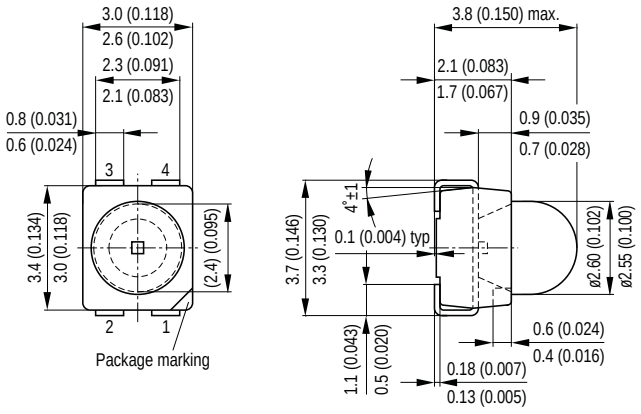


Figure 74: SFH 425, SFH 426, SFH 4244, SFH 4255

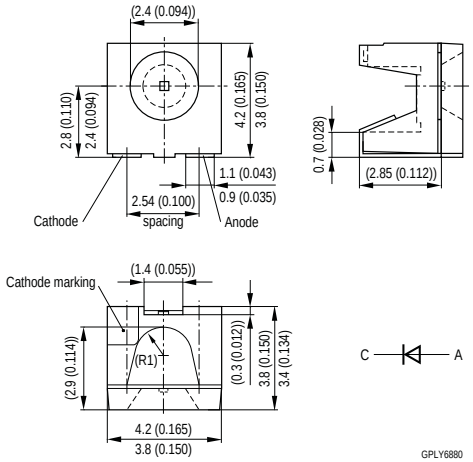


Figure 75: SFH 4542, SFH 4580

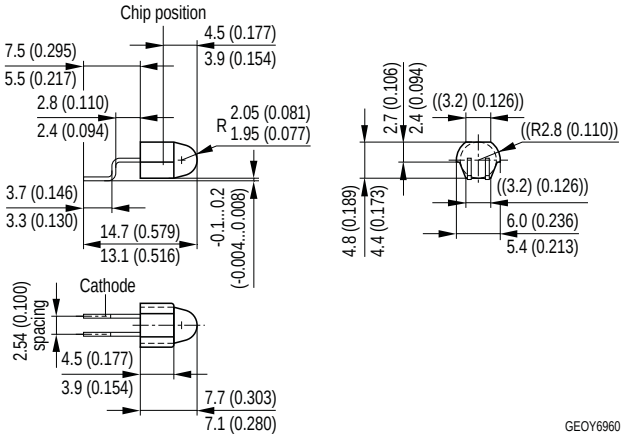


Figure 76: SFH 4543, SFH 4585

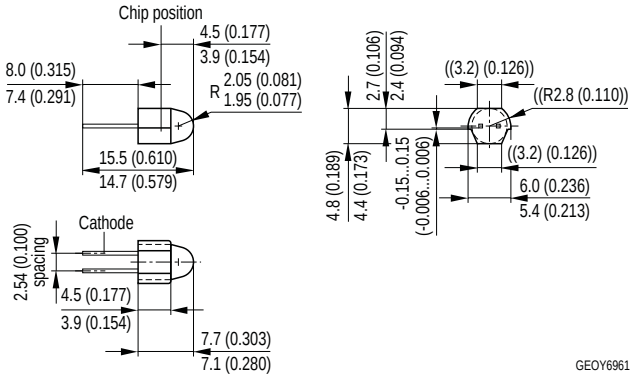


Figure 77: SFH 484, SFH 4550

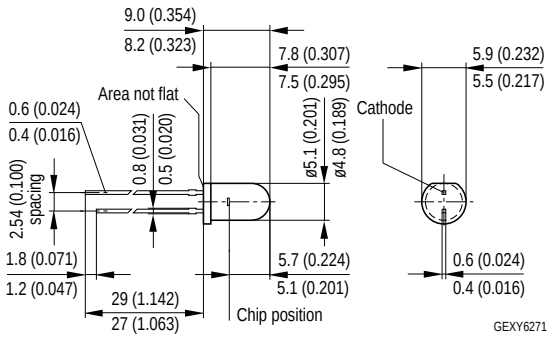
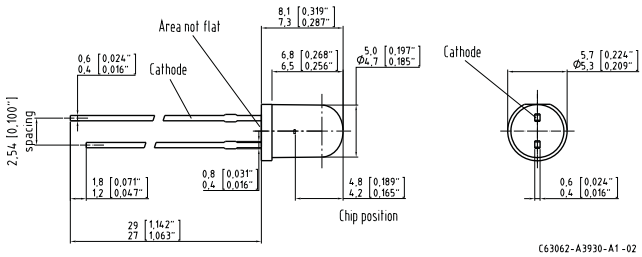


Figure 78: SFH 4546, SFH 4556



Dimensions in mm (inch)

Figure 79: SFH 4547, SFH 4557

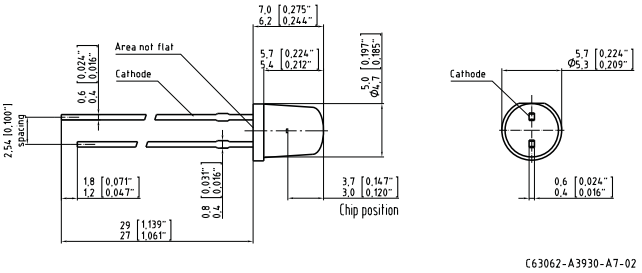


Figure 80: SFH 4715, SFH 4715S, SFH 4725S

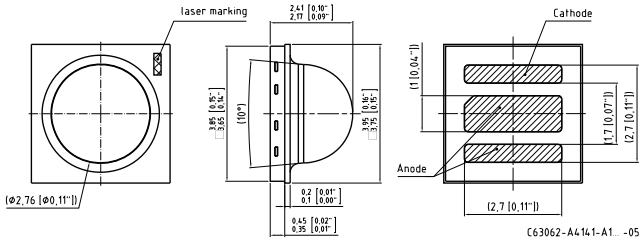


Figure 81: SFH 487, SFH 4341, SFH 4350

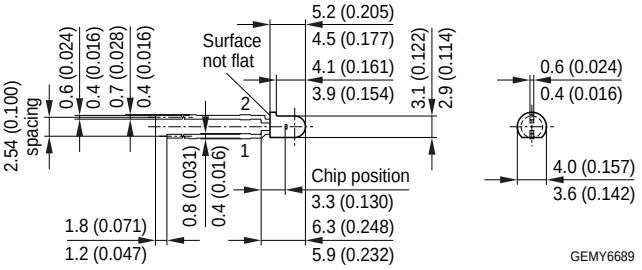


Figure 82: SFH 4850, SFH 464, LD 242, SFH 483

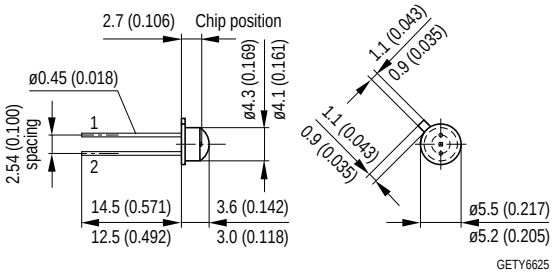


Figure 83: SFH 4545, SFH 4555

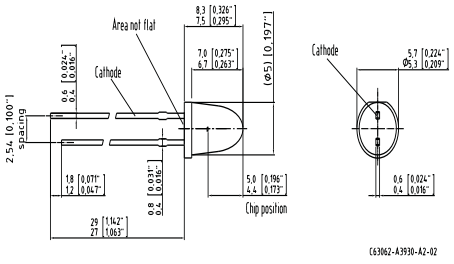
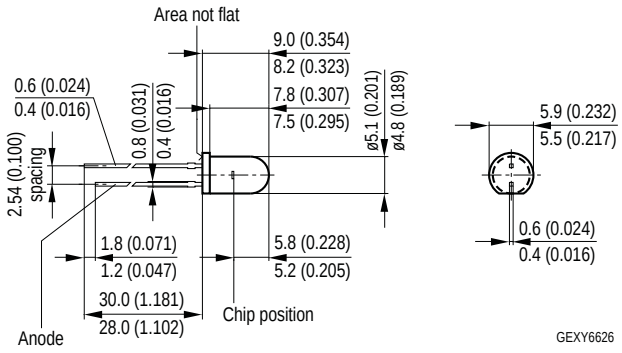


Figure 84: SFH 486



Dimensions in mm (inch)

Figure 85: SFH 485

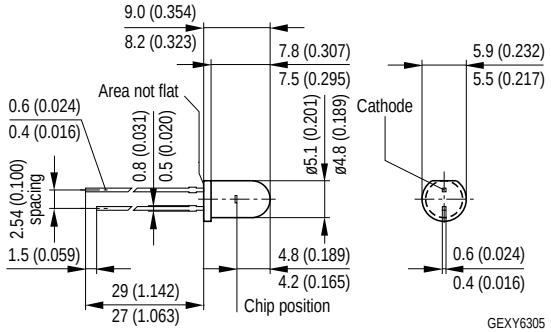


Figure 86: SFH 485 P

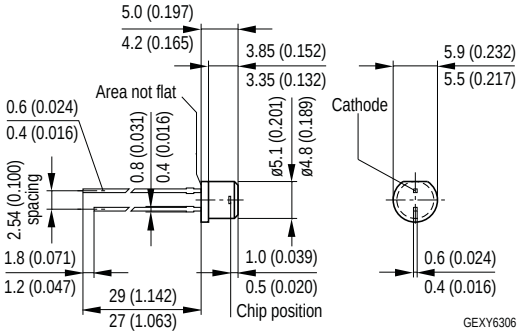


Figure 87: SFH 487 P

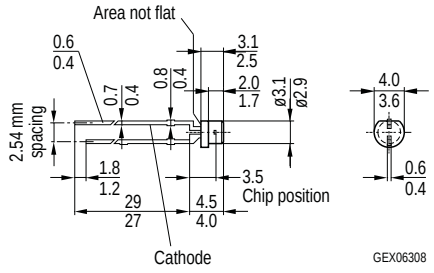


Figure 88: LD 274

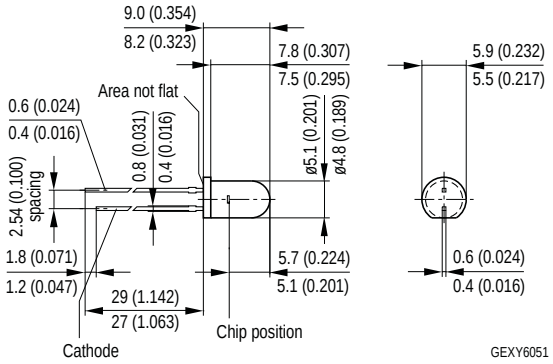


Figure 89: LD 271, LD 271 H

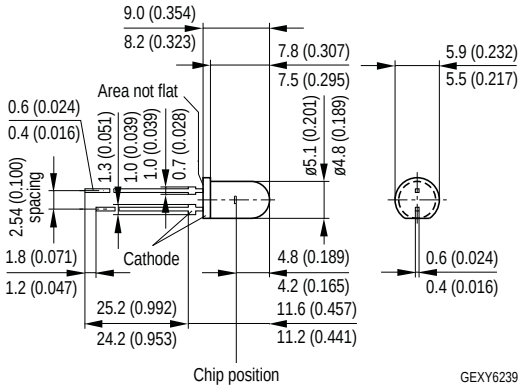
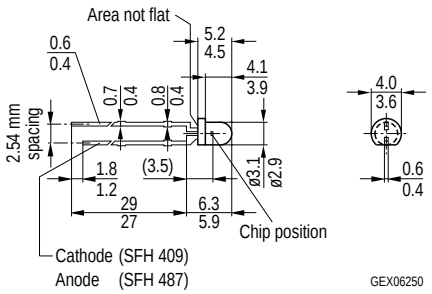
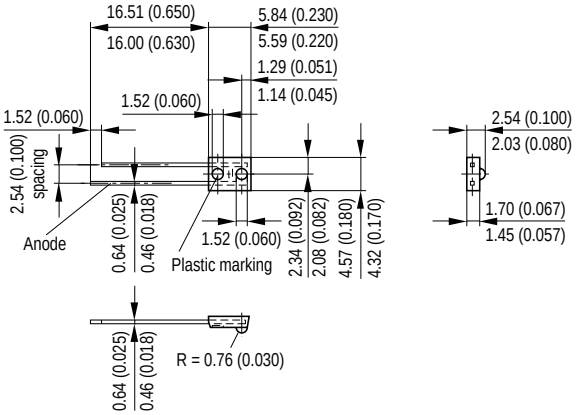


Figure 90: SFH 409



Dimensions in mm (inch)

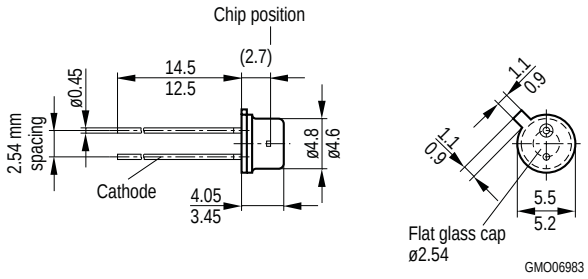
Figure 91: IRL 80 A, IRL 81 A



Approx. weight 0.2 g

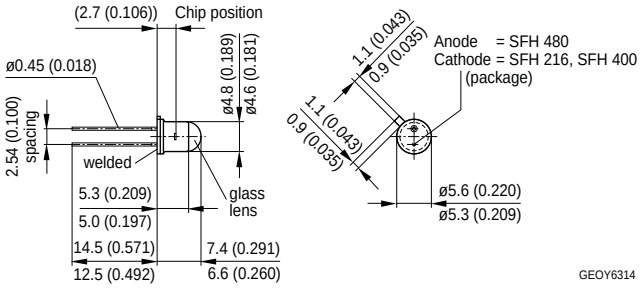
GEOY6461

Figure 92: SFH 4860



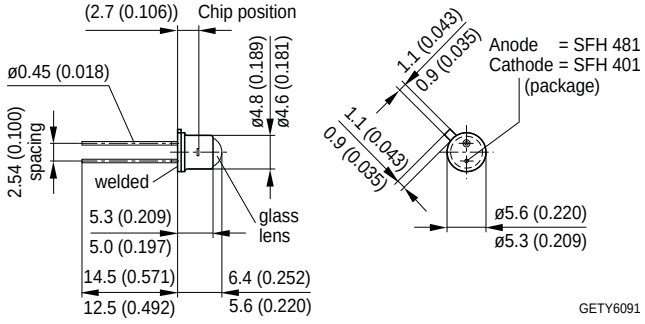
GMO06983

Figure 93: SFH 400, SFH 480



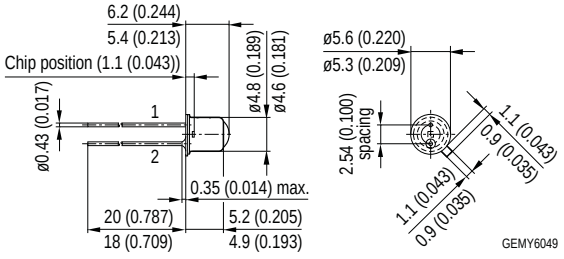
GEOY6314

Figure 94: SFH 401



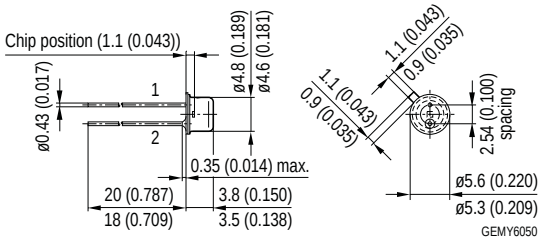
GETY6091

Figure 95: SFH 4811, SFH 4881



GEMY6049

Figure 96: SFH 4883, SFH 4813



GEMY6050

Dimensions in mm (inch)

Figure 97: SFH 4056

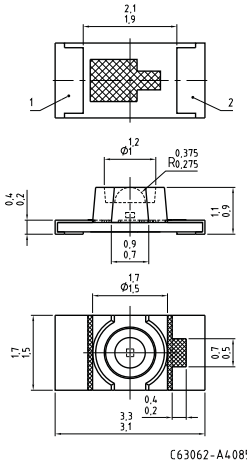


Figure 98: SFH 4257 R

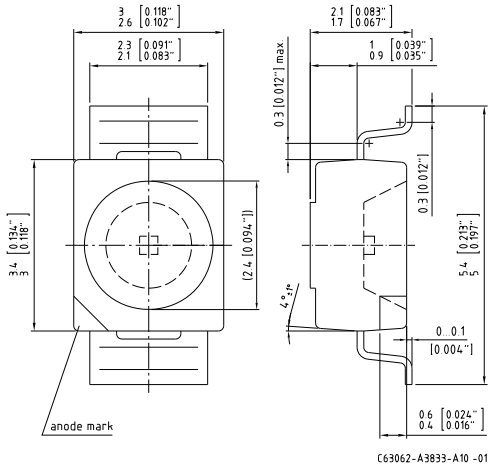


Figure 99: SFH 2270 R

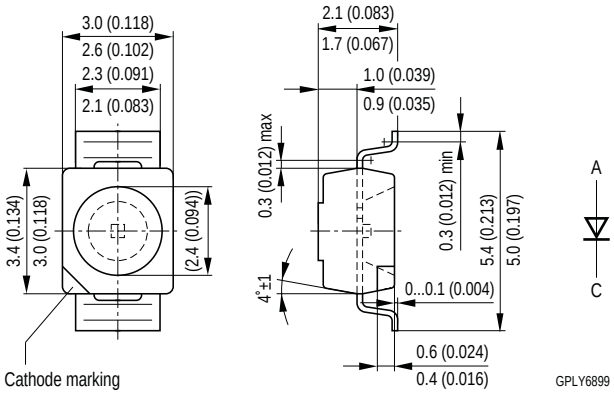


Figure 100: SFH 4059, SFH 4059S

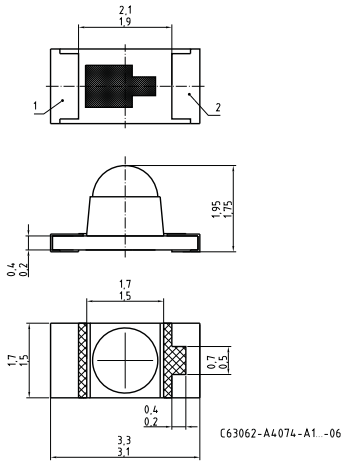


Figure 101: SFH 4053

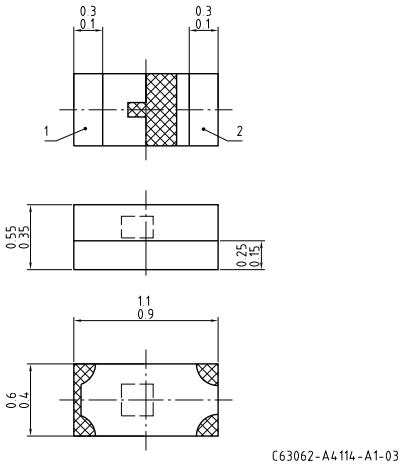
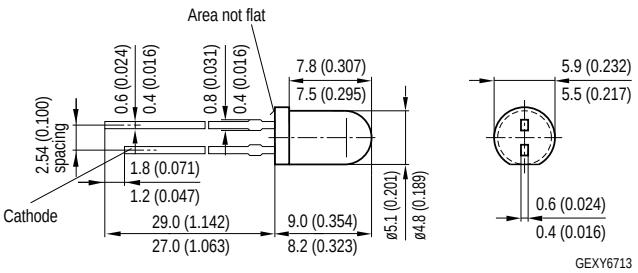


Figure 102: SFH 4512



Dimensions in mm (inch)

Figure 103: SFH 4451

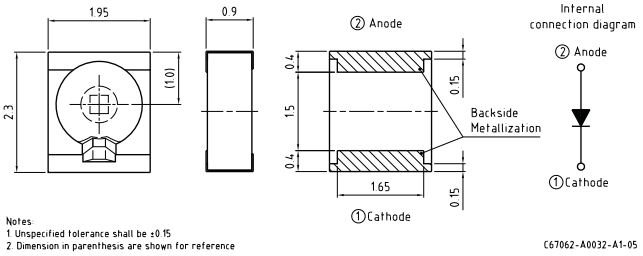


Figure 104: SFH 7773

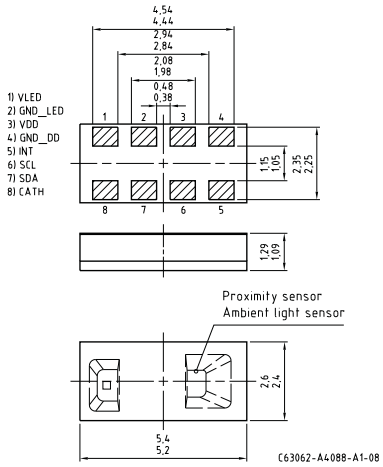
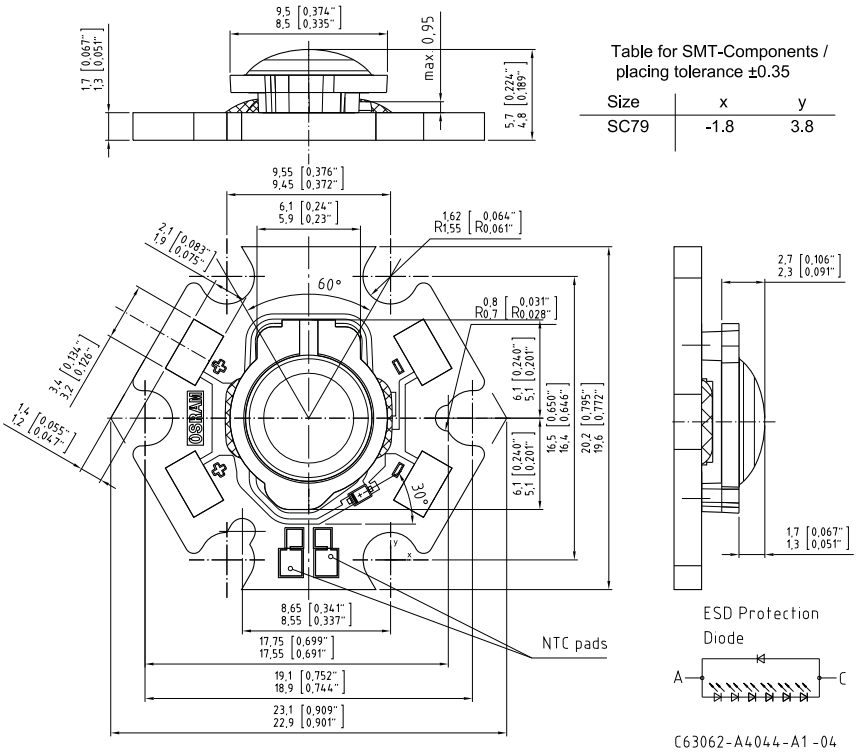


Figure 105: SFH 4750



Dimensions in mm (inch)

Figure 106: SFH 4740

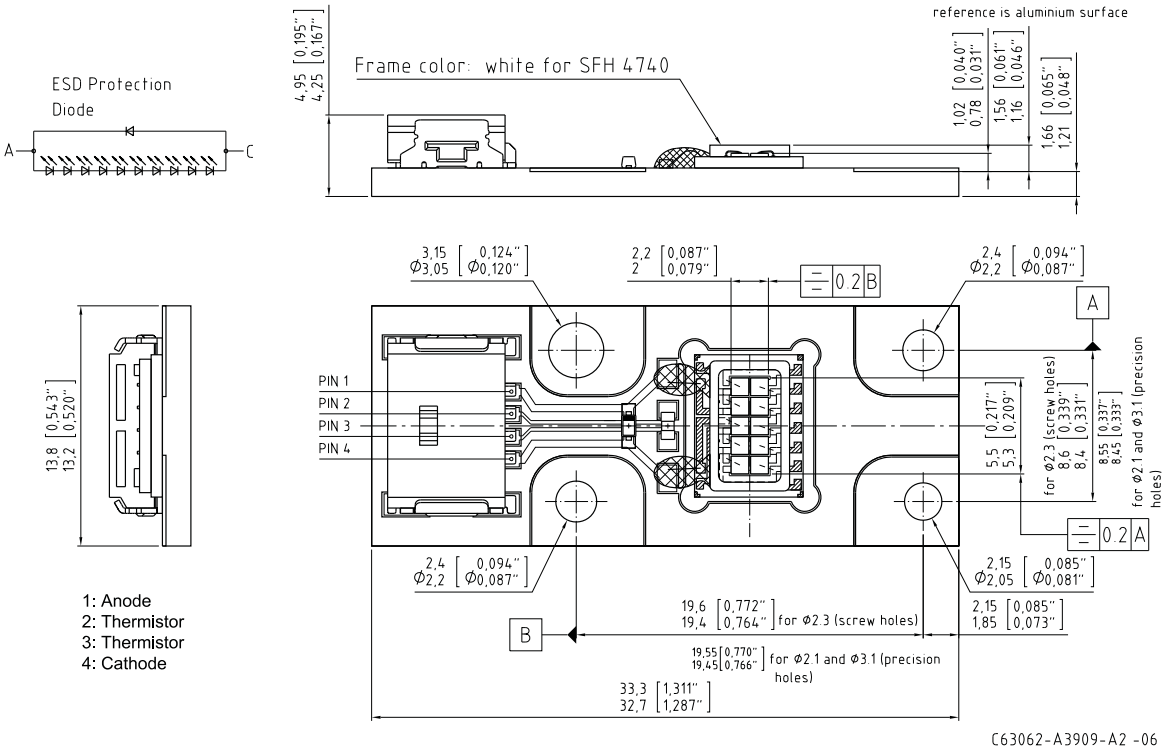
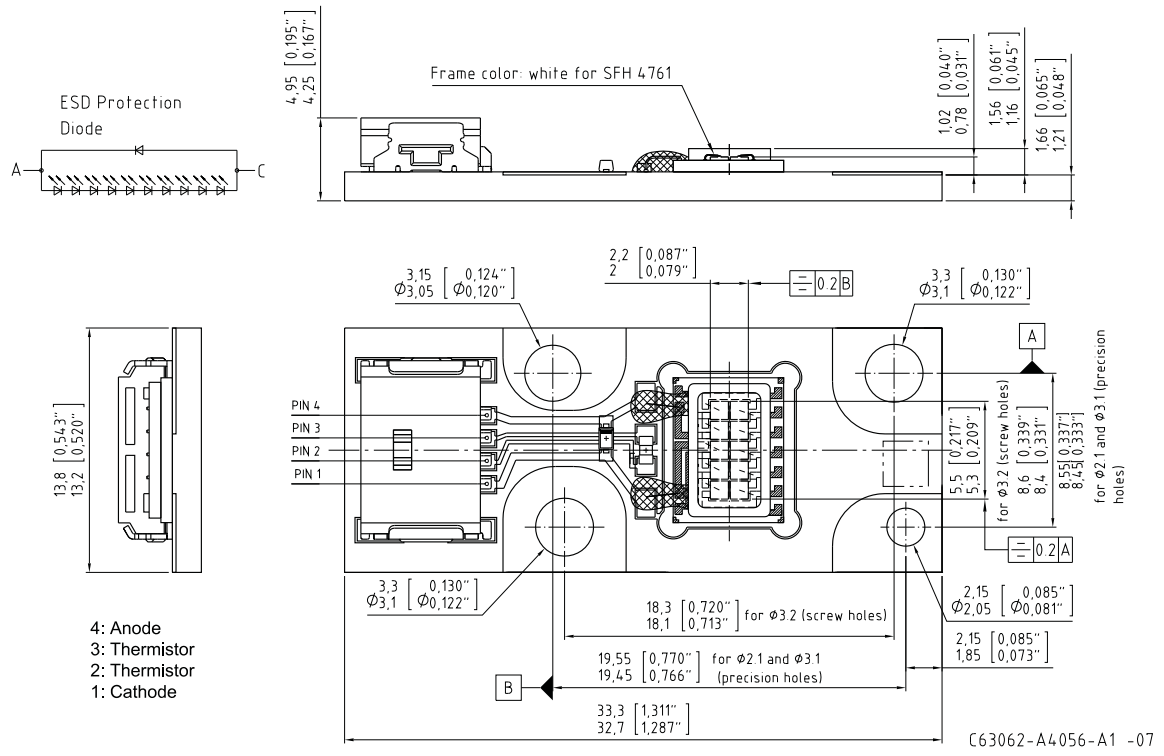


Figure 107: SFH 4761



Laser Diodes

Laser Diodes

Visible Laser Diodes

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PL 450B


PL TB450


PL 515

Pulsed laser diodes

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SPL PLxx


SPL LLxx

CW laser diodes (single emitter)

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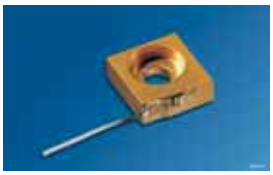
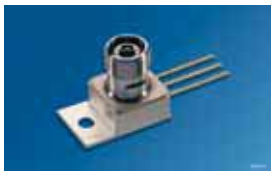

SPL CGxx


SPL 2Fxx


SPL TD85-C

Unmounted laser bars

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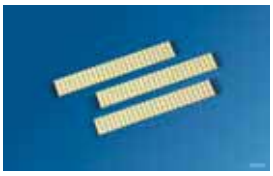
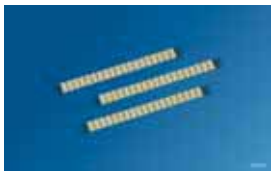

SPL BGxx / SPL BKxx


SPL BXxx


SPL BSxx

Pulsed laser dies

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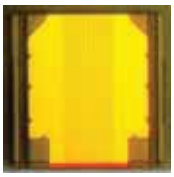

SPL DLxx

Safety Advice

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 “Safety of laser products“.

Informationen zur Augensicherheit

Je nach Betriebsart emittieren diese Bauteile hochkonzentrierte, nicht sichtbare Infrarot-Strahlung, die gefährlich für das menschliche Auge sein kann. Produkte, die diese Bauteile enthalten, müssen gemäß den Sicherheitsrichtlinien der IEC-Norm 60825-1 behandelt werden.

Type Designation

Bezeichnungsschema

SPL	Type	Package	Subtype	Chip Type/Opt. Output	Wavelength	nm (Center)
	P	**P**lastic package	L	Pulsed laser	81	808
	L	**L**ead frame based package	G	25 emitters, 200/400 µm, 50% Fill factor	85	850
	C	**C**-mount carrier	K	25 emitters, 200/400 µm, 50% Fill factor	90	905
	2	sealed housing (TO- **2**20)	X	19 emitters, 150/500 µm, 30% Fill factor	91	915
	B	**B**ar, unmounted	S	75 emitters, 82% Fill factor	94	940
	D	**D**ie, chip	F	Fiber connector (**F**C)	98	975
	T	TO-56	D	Single emitter with 80µm aperture		

Note:
cw = continuous wave
qcw = quasi continuous wave
xx in the type name (e.g. SPL PLxx) refers to the wavelength

Visible Laser Diodes

Package	Type	λ_{peak} typ [nm]	Opt. power P_{opt} [W]	V_F typ [V]	Measurement cond.	Beam divergence (FWHM) $\Theta_\perp \times \Theta_{||}$ [°]	Package Features	Ordering Code	Package Fig.
	PL 450B	450	0.08	5.8	I_F = 100 mA	21° x 7°	TO38 iCut package	Q65111A0518	1
	PL TB450	450	1.4		I_F = 100 mA	21° x 7°	TO38 iCut package	Q65111A2303	1
	PL 515	515		6.5	P_{op} = 30 mW	22° x 6°	TO38 iCut package	Q65111A3559	2

Pulsed laser diodes

Package	Type	Package Outline	λ_{peak} typ [nm]	Opt. power P_{opt} [W]	Beam divergence (FWHM) $\Theta_\perp \times \Theta_{||}$ [°]	Package Features	Ordering Code	Package Fig.
	SPL PL85	Plastic housing	850	10	25° x 9°	5 mm radial plastic package, pulse width < 100 ns	Q62702P1759	3
	SPL PL90_0		905	4			Q62702P5270	
	SPL PL90			25			Q62702P1760	
	SPL PL90_3			75			Q62702P5353	
	SPL LL85	Plastic housing with integrated driver	850	14	30° x 15°	Integrated laser driver circuit, plastic package, pulse width < 50 ns	Q62702P3558	4
	SPL LL90_3		905	70			Q65110A1009	5

CW laser diodes (single emitter)

Package	Type	Package Outline	λ_{peak} typ [nm]	Opt. power P_{opt} [W]	Beam divergence (FWHM) $\Theta_\perp \times \Theta_{||}$ [°]	Package Features	Ordering Code	Package Fig.
	SPL CG81-2S	Laser on submount	808	2	38° x 7°	Open heat sink (C-type)	Q65110A1832	6
	SPL CG94-2S		940				Q65110A1833	
	SPL TD85-C	TO-56	845	0.45	40° x 6°	Hermetically sealed metal package	Q65111A0232	7

CW laser diodes (single emitter)

Package	Type	Package Outline	λ_{peak} typ [nm]	Opt. power P_{opt} [W]	Fiber diameter D [µm]	Numerical aperture NA	Package Features	Ordering Code	Package Fig.
	SPL 2F81-2S	TO-220 FC (fiber coupled)	808	1.5	200	0.22	TO-220 package, FC-receptacle for efficient fiber coupling, thermistor for temperature and wavelength control	Q65110A1722	8
	SPL 2F94-2S		940					Q65110A1828	

Unmounted laser bars (other wavelengths and bar geometries on request)

Package	Type	Package Outline	λ_{peak} typ [nm]	P_{opt} typ [W]	Beam divergence full angle ($1/e^2$) $\Theta_{\perp} \times \Theta_{\parallel}$ [°]	Package Features	Chip size [mm x mm]	Ordering Code	Package Fig.
	SPL BK81-12S	unmounted laser bar	808	60	65° x 9°	50% filling factor, 25 emitters, emitter width 200 µm, emitter pitch 400 µm	10 x 1.2	Q65110A8104	
	SPL BK81-20H		803	100			10 x 2	Q65110A8725	
	SPL BK91-20HT		915	120				Q65110A8594	
	SPL BK94-20HT		940					Q65110A8595	
	SPL BK98-20HT		980					Q65110A8596	
	SPL BX81-2S	unmounted laser bar	808	40	65° x 9°	30% filling factor, 19 emitters, emitter width 150 µm, emitter pitch 500 µm	9.5 x 1.2	Q62702P5510	
	SPL BS81-9S	unmounted laser bar	808	150	65° x 9°	82.5% filling factor, 75 emitters, emitter width 110 µm, emitter pitch 130 µm for qcw applications	10 x 0.9	Q65110A2676	

Pulsed laser dies

Package	Type	Package Outline	λ_{peak} typ [nm]	Opt. power P_{opt} [W]	Beam divergence (FWHM) $\Theta_{\perp} \times \Theta_{\parallel}$ [°]	Package Features	Chip size [mm x mm]	Ordering Code	Package Fig.
	SPL DL90_3	unmounted laser chip	905		25° x 11°	emitter width 200 µm	0.6 x 0.6	Q65110A2591	

Dimensions in mm (inch)

Figure 1: PL 450B, PL TB450

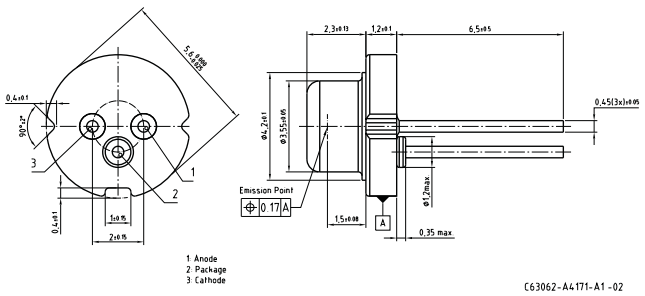


Figure 2: PL 515

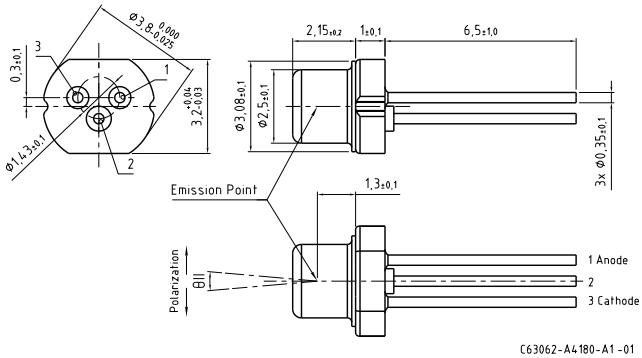


Figure 3: SPL PLxx

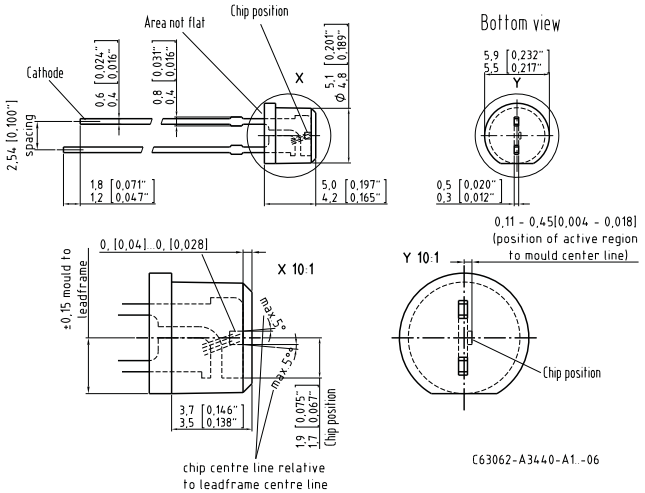
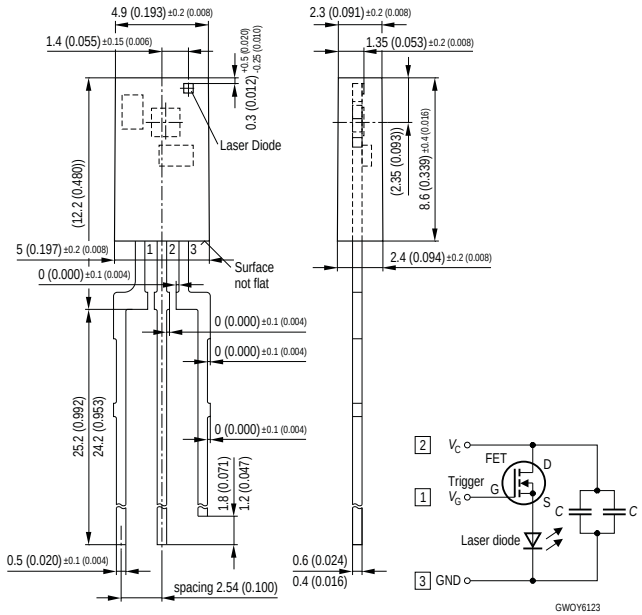


Figure 4: SPL LL85



Dimensions in mm (inch)

Figure 5: SPL LL90_3

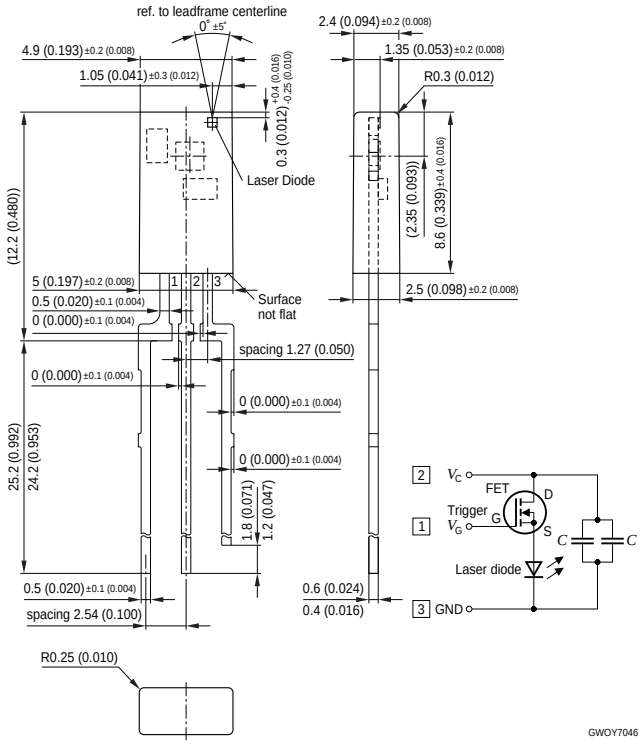


Figure 6: SPL CGxx

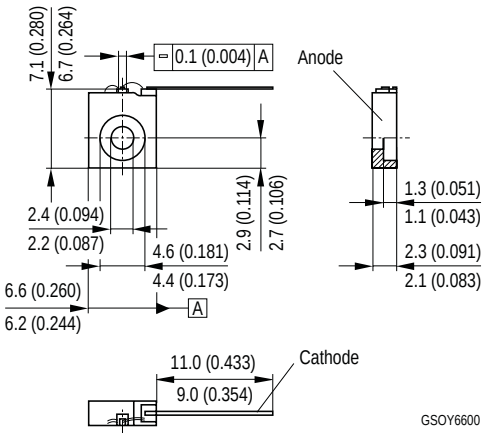


Figure 7: SPL TD85-C

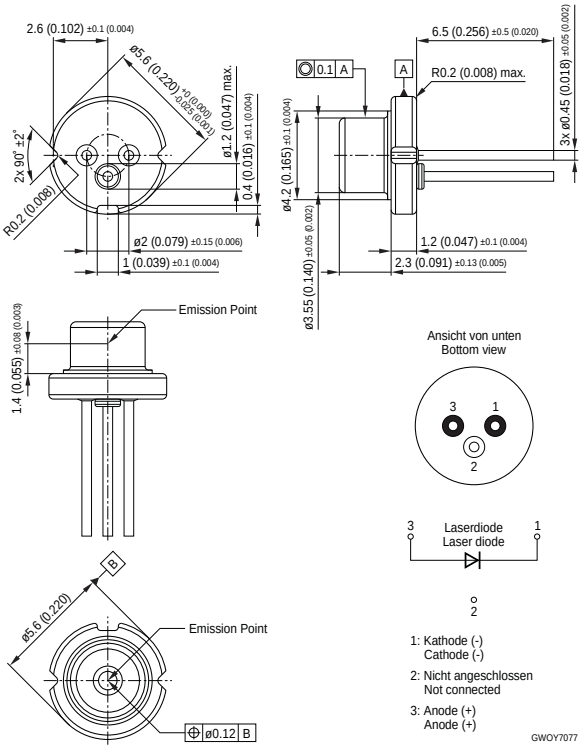
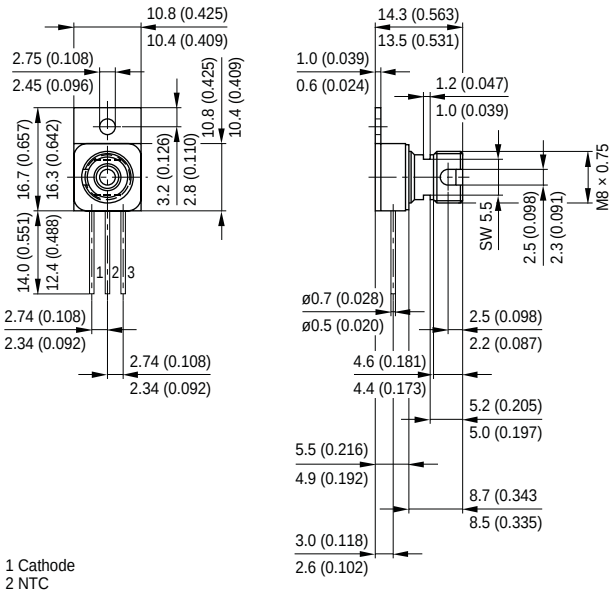


Figure 8: SPL 2Fxx



Tape and Reel

Tape and Reel

SMT Components

Tape and Reel

SMT components must be packed properly to assure perfect and economical processing. OSRAM Opto Semiconductors offers you, based on the in house experience, the packing in 8 mm-, 12 mm-, 16 mm- or 24 mm-standard tapes.

The leads are galvanic tin plated with pure tin (SN 100, thickness 4 -12 Om) for RoHS compliant devices, which ensures good solderability even after more than 2 years storage time. For the judgement of the solderability we follow the well accepted international standards IEC 68-2-20 or JESD22-B102-D.

Tape dimensions acc. to IEC 60286-3, EIA 481-D

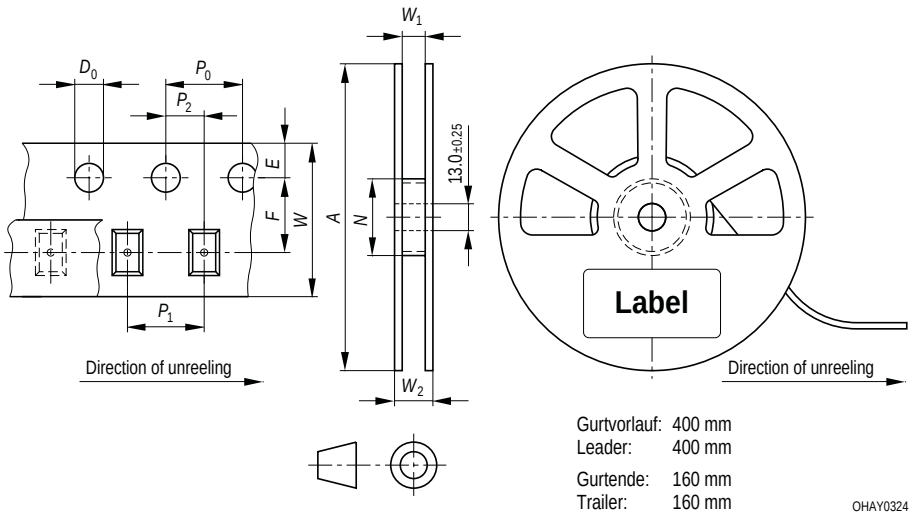
SMT-Bauelemente

Gurtverpackung

SMT-Bauelemente müssen in geeigneter Form verpackt sein, um eine einwandfreie und ökonomische Verarbeitung zu gewährleisten. Hier kann OSRAM Opto Semiconductors, basierend auf der "In-House-Erfahrung", die Verpackungen in 8 mm-, 12 mm-, 16 mm- oder 24 mm-Standardgurt anbieten.

Die galvanische Verzinnung der Anschlüsse mit Reinzinn (SN 100, Schichtdicke 4 -12 Om) bei RoHS konformen Bauteilen gewährleistet gute Löteigenschaften auch bei mehr als 2-jähriger Lagerzeit. Die Beurteilung der Lötbarkeit erfolgt nach den Kriterien der international anerkannten Standards IEC 68-2-20 oder JESD22-B102-D.

Gurtmaße nach IEC 60286-3, EIA 481-D



Method of Taping/Polarity and Orientation

Gurtausführung/Polarität und Lage

Tape and Reel

Tape dimensions in mm (inch)

W	P_0	P_1	P_2	D_0	E	F
8 + 0.3 / – 0.1 (0.315 + 0.112 / –0.004)	4 ± 0.1 (0.157 ± 0.004)	2 ± 0.05 (0.079 ± 0.002) or 4 ± 0.1 (0.157 ± 0.004)	2 ± 0.05 (0.079 ± 0.002)	1.5 + 0.1 (0.059 + 0.004)	1.75 ± 0.1 (0.069 ± 0.004)	3.5 ± 0.05 (0.138 ± 0.002)
12 + 0.3 / – 0.1 (0.472 + 0.112 / –0.004)	4 ± 0.1 (0.157 ± 0.004)	4 ± 0.1 (0.157 ± 0.004) or 8 ± 0.1 (0.315 ± 0.004)	2 ± 0.05 (0.079 ± 0.002)	1.5 + 0.1 (0.059 + 0.004)	1.75 ± 0.1 (0.069 ± 0.004)	5.5 ± 0.05 (0.217 ± 0.002)
16 + 0.3 / – 0.1 (0.630 + 0.112 / –0.004)	4 ± 0.1 (0.157 ± 0.004)	12 ± 0.1 (0.472 ± 0.004)	2 ± 0.1 (0.079 ± 0.004)	1.5 + 0.1 (0.059 + 0.004)	1.75 ± 0.1 (0.069 ± 0.004)	7.5 ± 0.1 (0.295 ± 0.004)
24 + 0.3 / – 0.1 (0.945 + 0.112 / –0.004)	4 ± 0.1 (0.157 ± 0.004)	8 ± 0.1 (0.315 ± 0.004) or 12 ± 0.1 (0.472 ± 0.004)	2 ± 0.1 (0.079 ± 0.004)	1.5 + 0.1 (0.059 + 0.004)	1.75 ± 0.1 (0.069 ± 0.004)	11.5 ± 0.1 (0.453 ± 0.004)

Reel dimensions in mm (inch)

A	W	N_{min}	W_1	$W_{2\ max}$
180 (7) / 330 (13)	8 (0.315)	60 (2.362)	8.4 + 2 (0.331 + 0.079)	14.4 (0.567)
180 (7) / 330 (13)	12 (0.472)	60 (2.362)	12.4 + 2 (0.488 + 0.079)	18.4 (0.724)
180 (7) / 330 (13)	16 (0.630)	60 (2.362) / 100 (3.937)	16.4 + 2 (0.646 + 0.079)	22.4 (0.882)
180 (7) / 330 (13)	24 (0.945)	60 (2.362) / 100 (3.937)	24.4 + 2 (0.961 + 0.079)	30.4 (1.197)

SMT Components

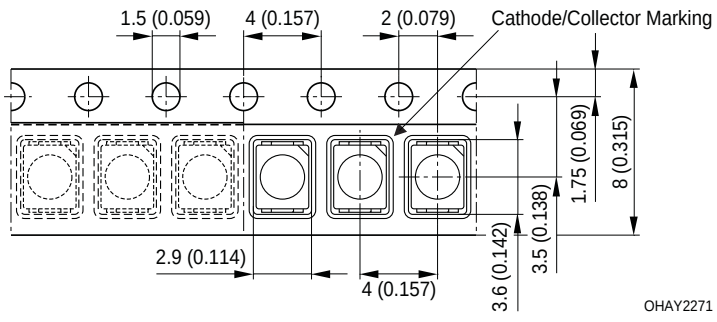
Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

SMT-Bauelemente

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Gehäuse Package	Verpackungseinheit Packing Unit	Gurtführung Method of Taping
TOPLED	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
8 mm-Gurt 8 mm-Tape	8000 / Rolle ∅ 330 8000 / Reel (∅ 13)	

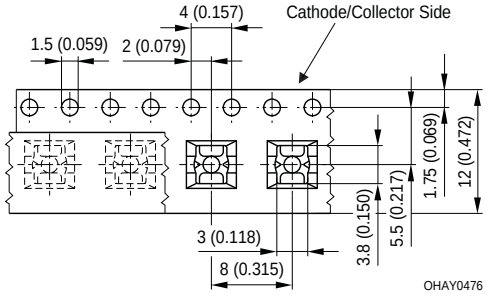
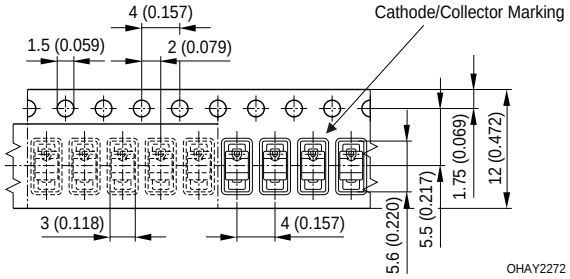
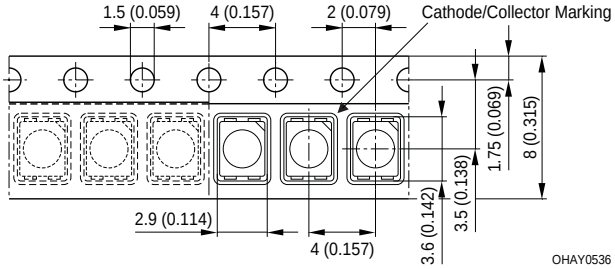
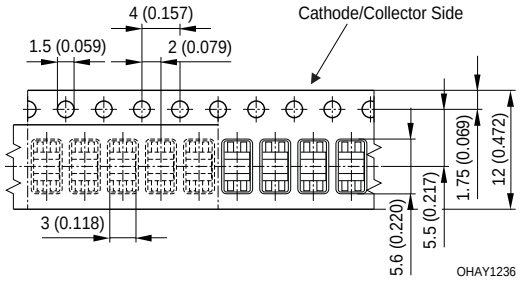
Tape and Reel

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
TOPLED with Lens 12 mm-Gurt 12 mm-Tape	2000 / Rolle ∅ 330 2000 / Reel (∅ 13)	
TOPLED Reverse Gullwing 12 mm-Gurt 12 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7) 8000 / Rolle ∅ 330 8000 / Reel (∅ 13)	
Multi TOPLED 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7) 8000 / Rolle ∅ 330 8000 / Reel (∅ 13)	 Elektrisches Ersatzschaltbild siehe Produkt-Datenblatt. For alternative electrical circuit diagram refer to product data sheet.
Multi TOPLED Reverse Gullwing 12 mm-Gurt 12 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7) 8000 / Rolle ∅ 330 8000 / Reel (∅ 13)	

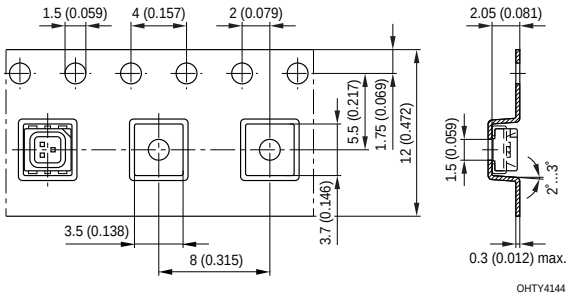
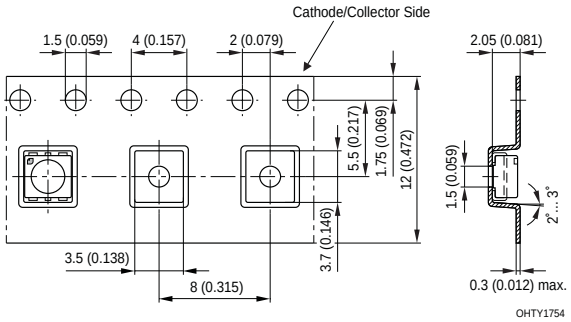
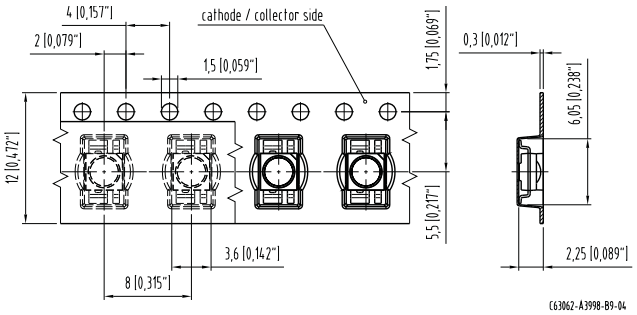
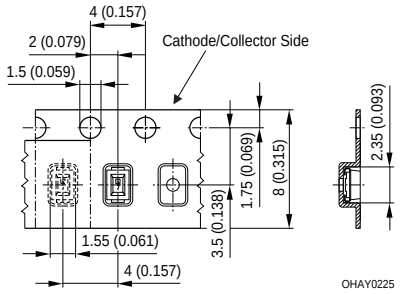
Note: The cathode identification for Multi TOPLED refers to the LED die with the higher wavelength.
Hinweis: Bei Multi TOPLED bezieht sich die Polaritätsangabe Cathode auf den LED-Chip mit der höheren Wellenlänge.

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

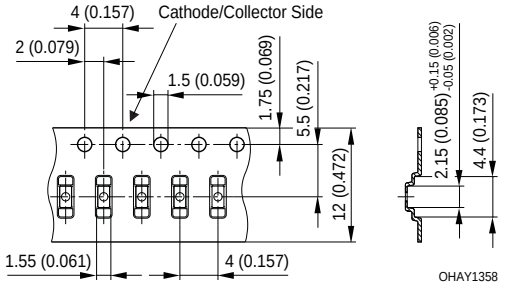
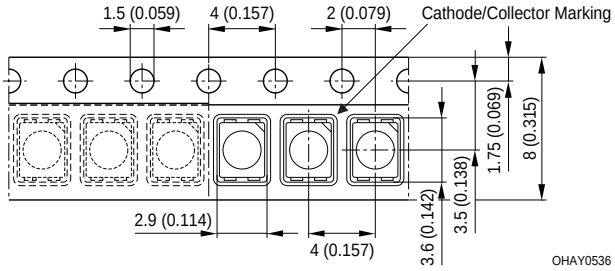
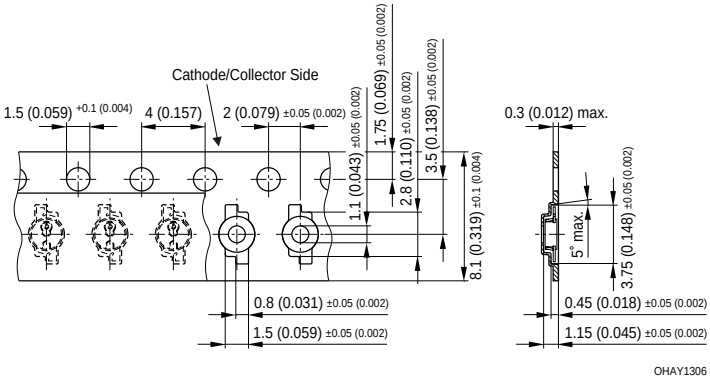
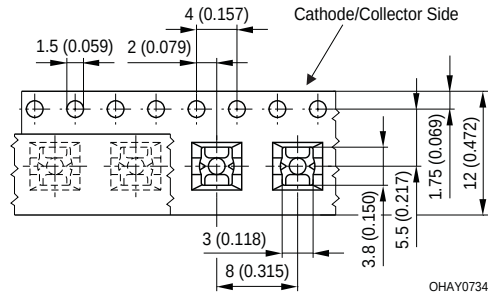
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
6-lead TOPLED 12 mm-Gurt 12 mm-Tape	1000 / Rolle ∅ 180 1000 / Reel (∅ 7) 4000 / Rolle ∅ 330 4000 / Reel (∅ 13)	 Elektrisches Ersatzschaltbild siehe Produkt-Datenblatt. For alternative electrical circuit diagram refer to product data sheet.
Advanced Power TOPLED 12 mm-Gurt 12 mm-Tape	1000 / Rolle ∅ 180 1000 / Reel (∅ 7) 4000 / Rolle ∅ 330 4000 / Reel (∅ 13)	 Elektrisches Ersatzschaltbild siehe Produkt-Datenblatt. For alternative electrical circuit diagram refer to product data sheet.
Advanced Power TOPLED Plus 12 mm-Gurt 12 mm-Tape	3500/Rolle ∅ 330 3500/Reel (∅ 13)	
Mini TOPLED (folded leads) 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7) 12000/Rolle ∅ 330 12000/Reel (∅ 13)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

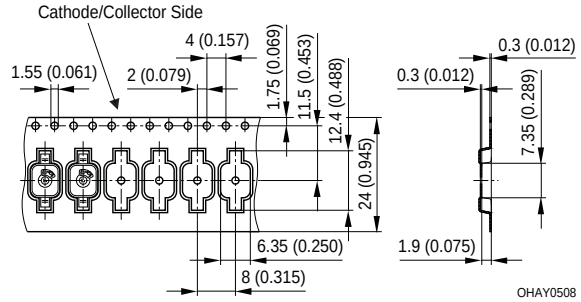
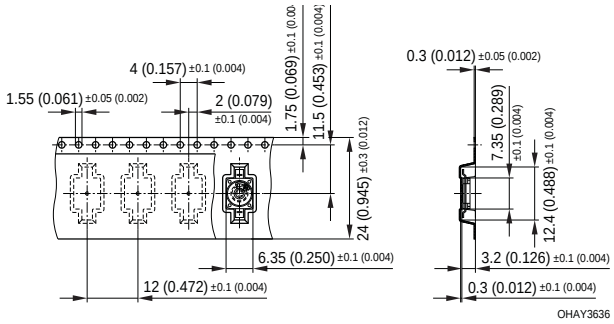
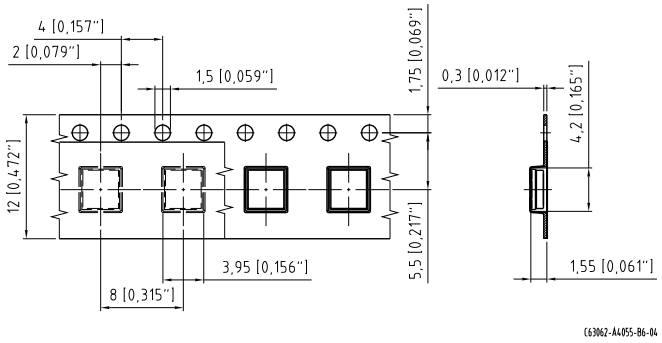
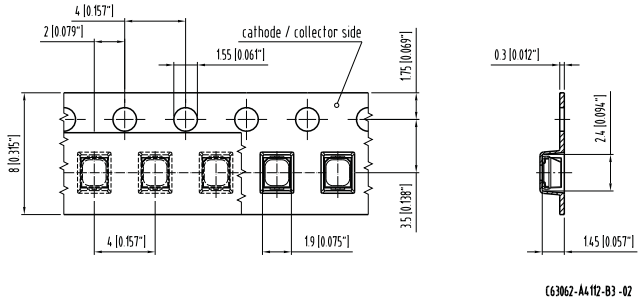
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
Mini TOPLED Santana 12 mm-Gurt 12 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7) 11800/Rolle ∅ 330 11800/Reel (∅ 13)	
Power TOPLED 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7) 8000 / Rolle ∅ 330 8000 / Reel (∅ 13)	
PointLED 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7) 10000/Rolle ∅ý 330 10000/Reel (∅ 13)	
Power TOPLED with Lens 12 mm-Gurt 12 mm-Tape	2000 / Rolle ∅ 330 2000 / Reel (∅ 13)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
Golden DRAGON 24 mm-Gurt 24 mm-Tape	800 / Rolle ∅ 180 800 / Reel (∅ 7) 3500 / Rolle ∅ 330 3500 / Reel (∅ 13)	
Golden DRAGON Plus 24 mm-Gurt 24 mm-Tape	200 / Rolle ∅ 180 200 / Reel (∅ 7)	
OSRAM OSTAR Compact 12 mm-Gurt 12 mm-Tape	500 / Rolle ∅ 180 500 / Reel (∅ 7)	
Mini TOPLED LL 24 mm-Gurt 24 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	

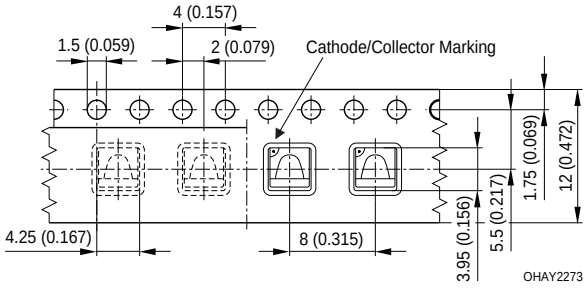
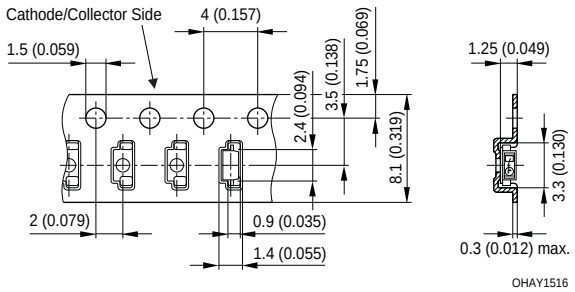
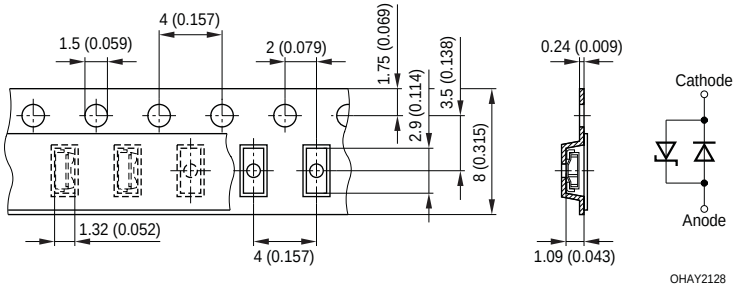
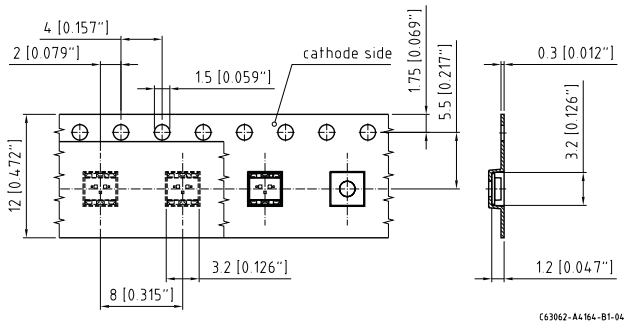
Tape and Reel

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
SIDELED Multi SIDELED 12 mm-Gurt 12 mm-Tape	2000 / Rolle ∅ 330 2000 / Reel (∅ 13)	
Micro SIDELED 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7) 10000 / Rolle ∅ 330 10000 / Reel (∅ 13)	
Micro SIDELED 0.8 Lx Y1xx 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
Multi CHIPLED 8 mm-Gurt 8 mm-Tape	1000 / Rolle ∅ 180 1000 / Reel (∅ 7)	

Note: The cathode identification for Multi SIDELED refers to the LED die with the higher wavelength.

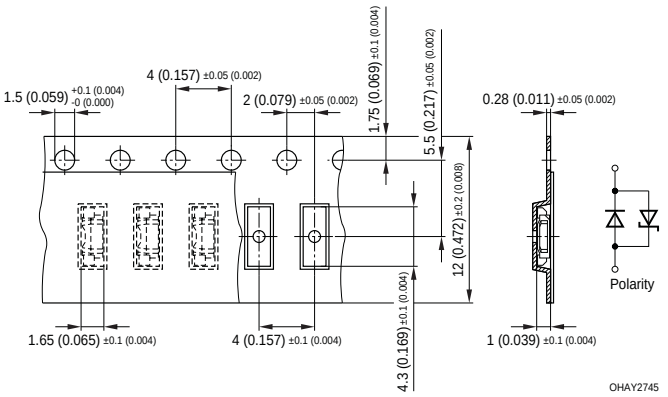
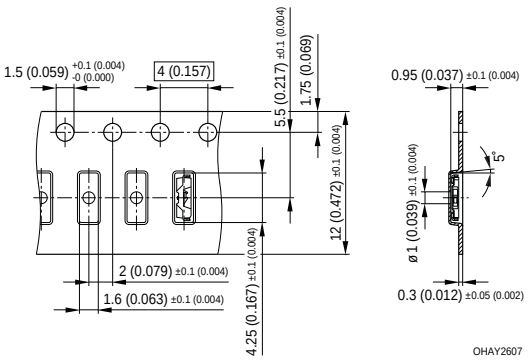
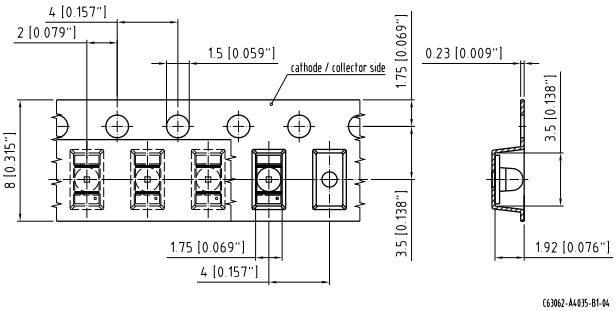
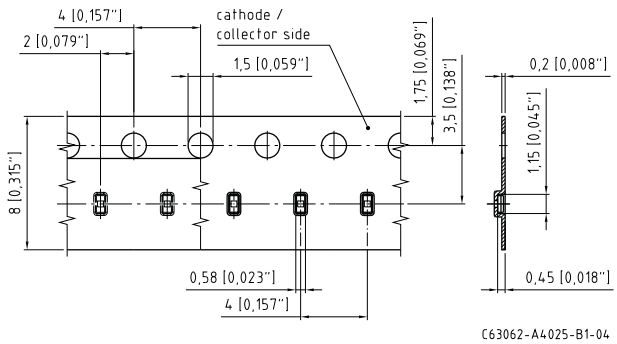
Hinweis: Bei Multi SIDELED bezieht sich die Polaritätsangabe Cathode auf den LED-Chip mit der höheren Wellenlänge.

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

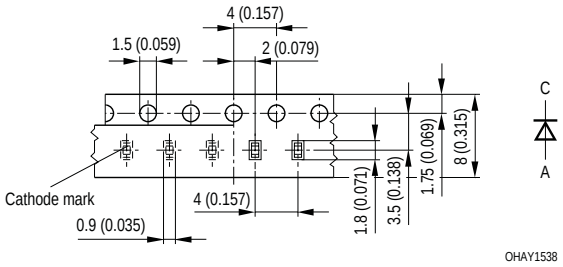
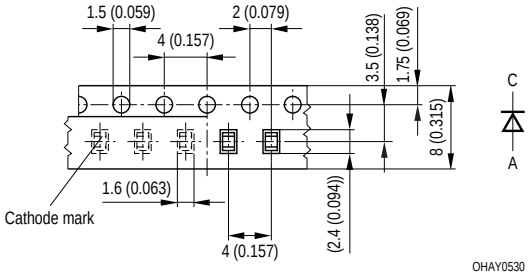
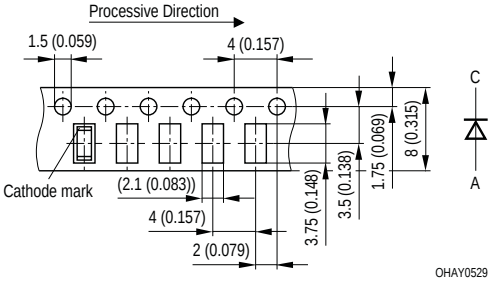
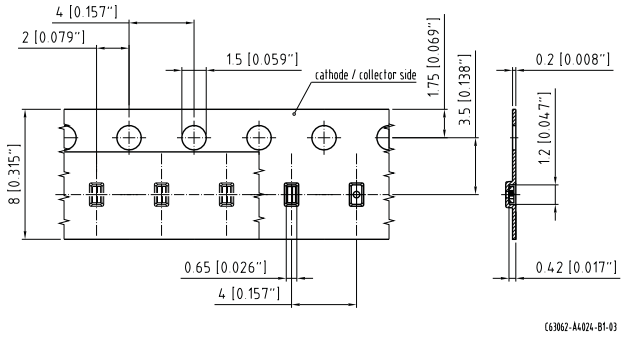
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
Micro SIDELED 0.8 Lx Y2xx 12 mm-Gurt 12 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
Micro SIDELED 0.6 12 mm-Gurt 12 mm-Tape	3500 / Rolle ∅ 180 3500 / Reel (∅ 7)	
CHIPLED with Lens 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
CHIPLED 0402 8 mm-Gurt 8 mm-Tape	4000 / Rolle ∅ 180 4000 / Reel (∅ 7)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

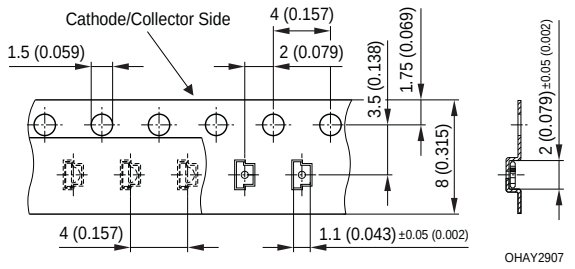
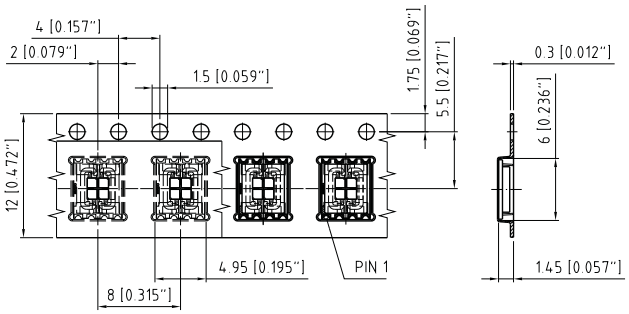
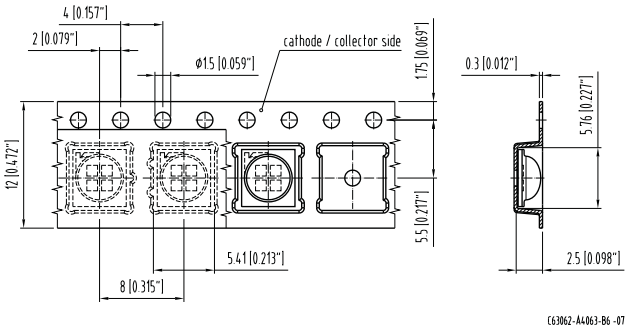
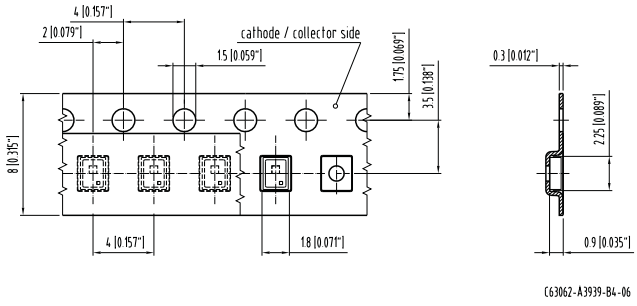
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
CHIPLED 0603 8 mm-Gurt 8 mm-Tape	4000 / Rolle ∅ 180 4000 / Reel (∅ 7)	
CHIPLED 0805 8 mm-Gurt 8 mm-Tape	4000 / Rolle ∅ 180 4000 / Reel (∅ 7)	
CHIPLED 1206 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
FIREFLY 0402 8 mm-Gurt 8 mm-Tape	4000 / Rolle ∅ 180 4000 / Reel (∅ 7)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

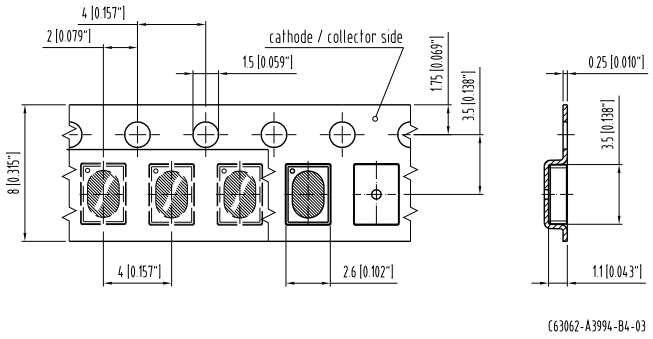
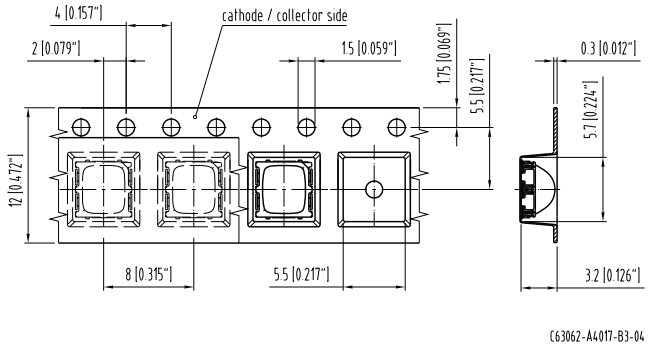
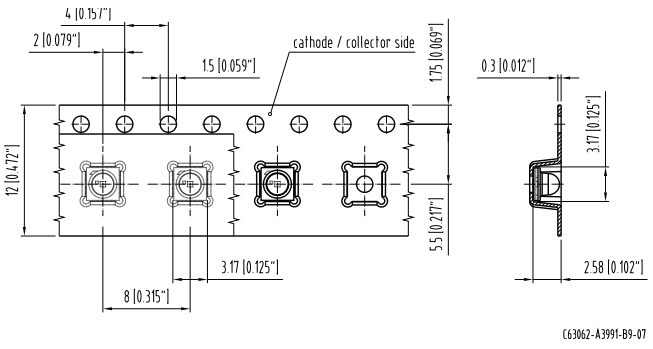
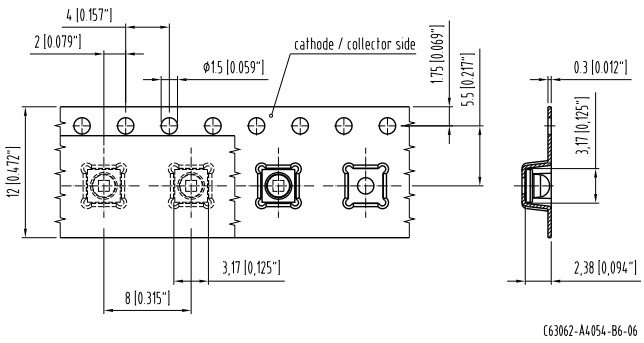
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
Firefly 0.3 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
OSRAM OSTAR SMT 12 mm-Gurt 12 mm-Tape	500 / Rolle ∅ 180 500 / Reel (∅ 7)	
OSRAM OSTAR SMT Plus 12 mm-Gurt 12 mm-Tape	200 / Rolle ∅ 180 200 / Reel (∅ 7) 3000 / Rolle ∅ 330 3000 / Reel (∅ 13)	
CERAMOS 8 mm-Gurt 8 mm-Tape	4000 / Rolle ∅ 180 4000 / Reel (∅ 7)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

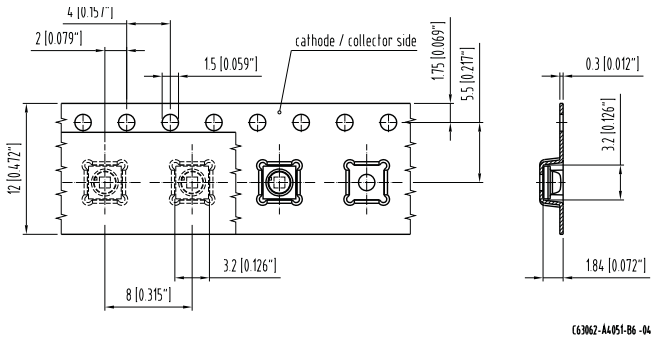
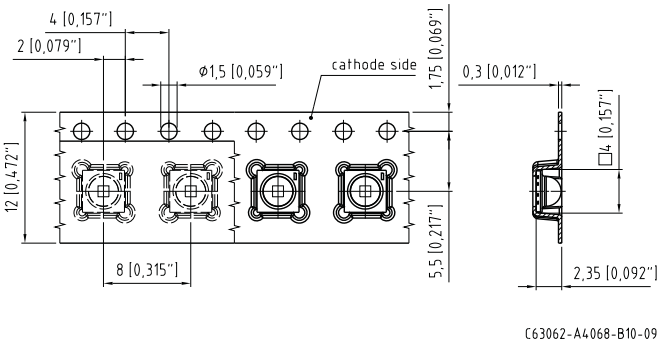
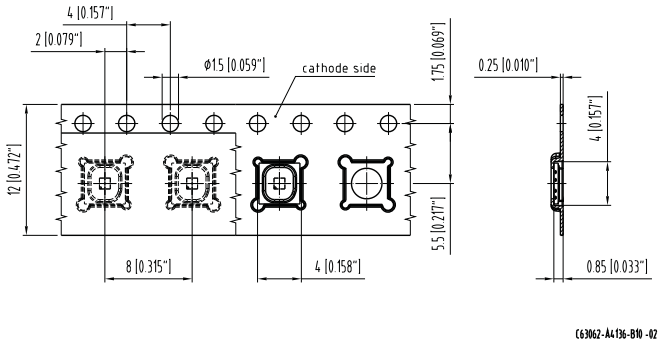
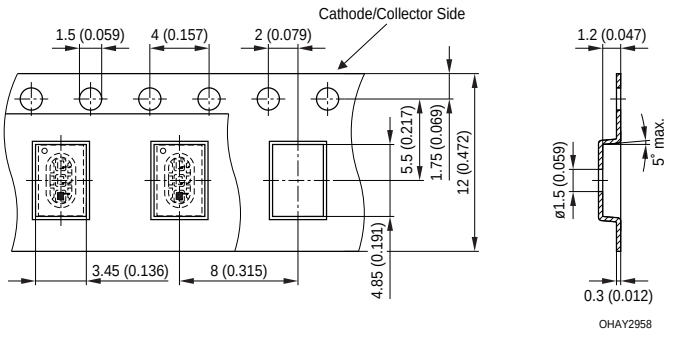
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
CERAMOS Reflector 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
OSLUX 12 mm-Gurt 12 mm-Tape	500 / Rolle ∅ 180 500 / Reel (∅ 7) 2500 / Rolle ∅ 330 2500 / Reel (∅ 13)	
OSLON SX 12 mm-Gurt 12 mm-Tape	600 / Rolle ∅ 180 600 / Reel (∅ 7) 3000 / Rolle ∅ 330 3000 / Reel (∅ 13)	
OSLON XX ECE OSLON LX OSLON SSL (80°) 12 mm-Gurt 12 mm-Tape	600 / Rolle ∅ 180 600 / Reel (∅ 7) 3000 / Rolle ∅ 330 3000 / Reel (∅ 13)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
OSLON SSL (150°)	1000 / Rolle ∅ 180 1000 / Reel (∅ 7)	
12 mm-Gurt 12 mm-Tape	4000 / Rolle ∅ 330 4000 / Reel (∅ 13)	
OSLON Black Series	600 / Rolle ∅ 180 600 / Reel (∅ 7)	
12 mm-Gurt 12 mm-Tape	3000 / Rolle ∅ 330 3000 / Reel (∅ 13)	
OSLON Black Flat	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
12 mm-Gurt 12 mm-Tape		
Multi CERAMOS	1000 / Rolle ∅ 180 1000 / Reel (∅ 7)	
12 mm-Gurt 12 mm-Tape	3000 / Rolle ∅ 330 3000 / Reel (∅ 13)	

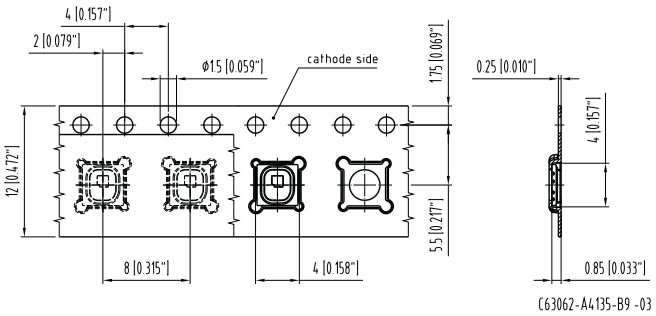
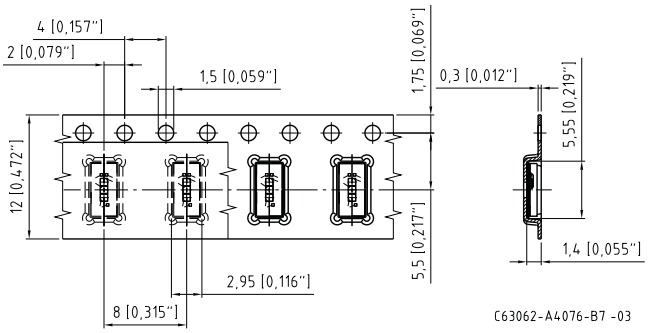
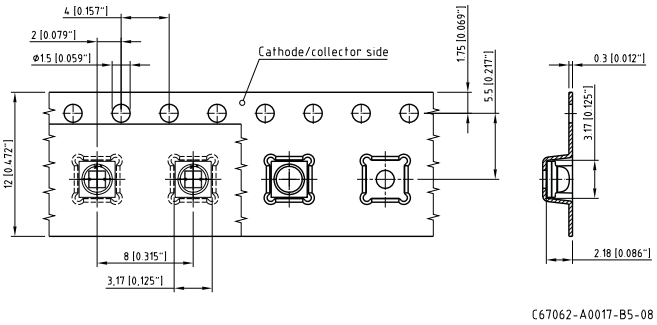
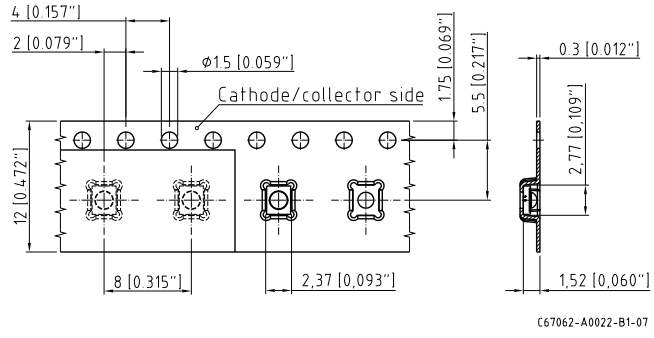
Tape and Reel

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

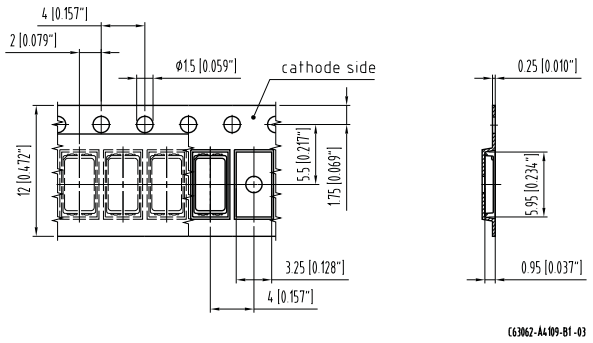
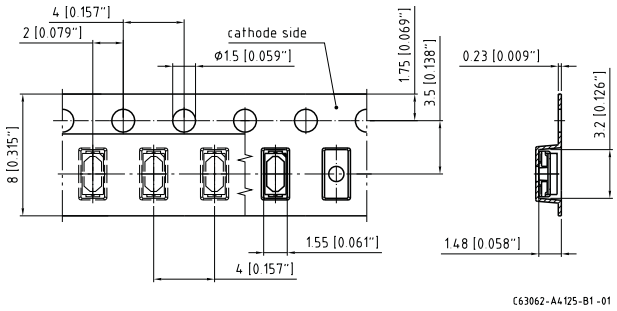
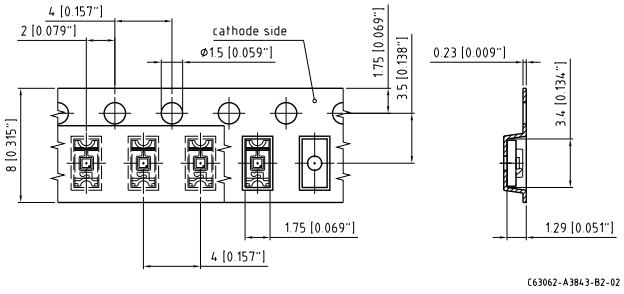
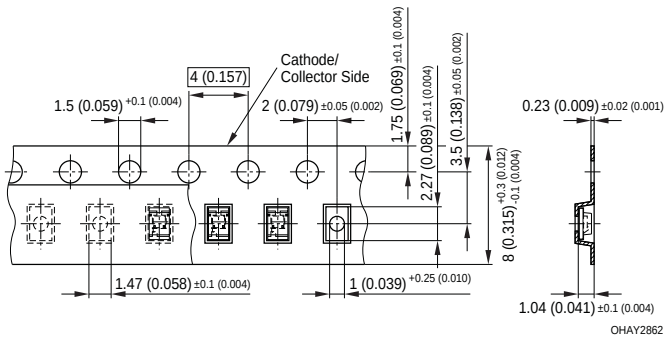
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
OSRAM OSTAR Projection Cube 24 mm-Gurt 24 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
OSRAM OSTAR Projection SMT 24 mm-Gurt 24 mm-Tape	500 / Rolle ∅ 180 500 / Reel (∅ 7)	
OSLON Square 24 mm-Gurt 24 mm-Tape	600 / Rolle ∅ 180 600 / Reel (∅ 7) 3000/ Rolle ∅ 330 3000/ Reel (∅ 13)	
DURIS P5 12 mm-Gurt 12 mm-Tape	600 / Rolle ∅ 180 600 / Reel (∅ 7) 3000/ Rolle ∅ 330 3000/ Reel (∅ 13)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

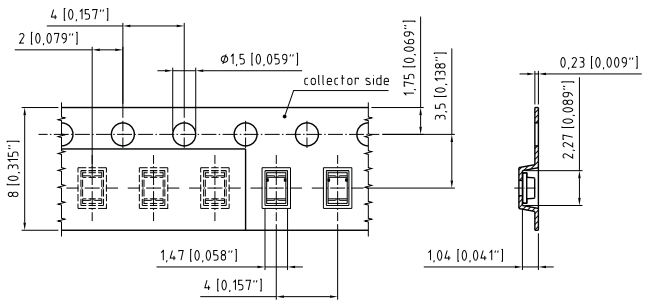
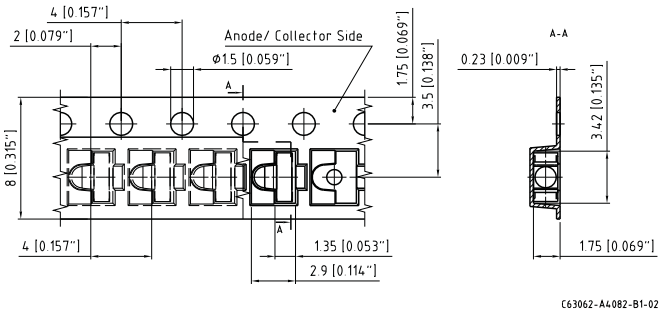
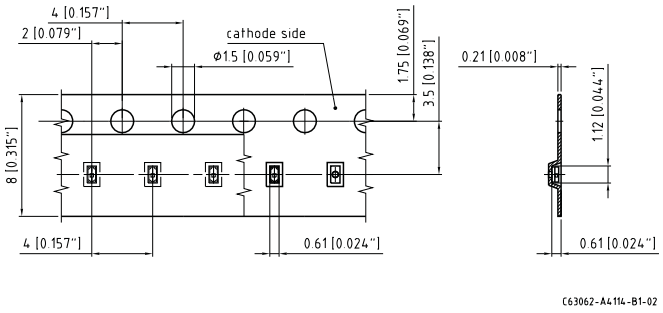
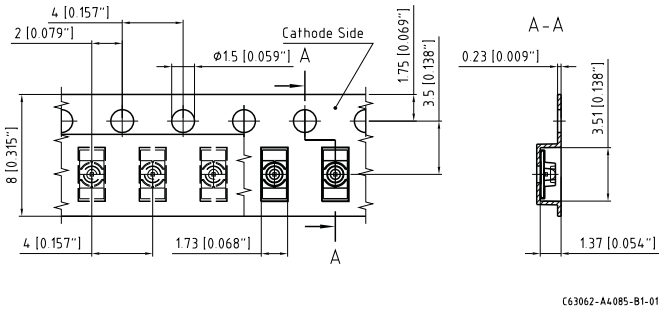
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
DURIS E5/ TOPLED Compact 5630 24 mm-Gurt 24 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
DURIS E3 24 mm-Gurt 24 mm-Tape	2500 / Rolle ∅ 180 2500 / Reel (∅ 7)	
SFH 2701	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
CHIPLED SFH 3710 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

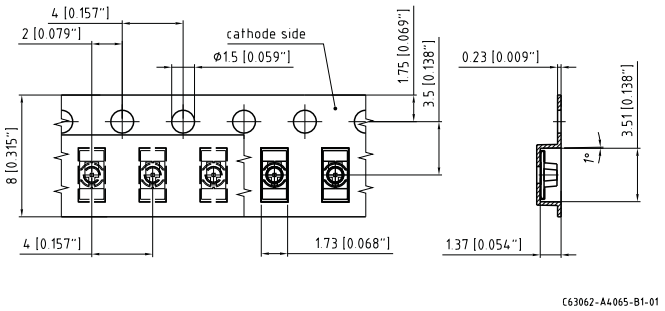
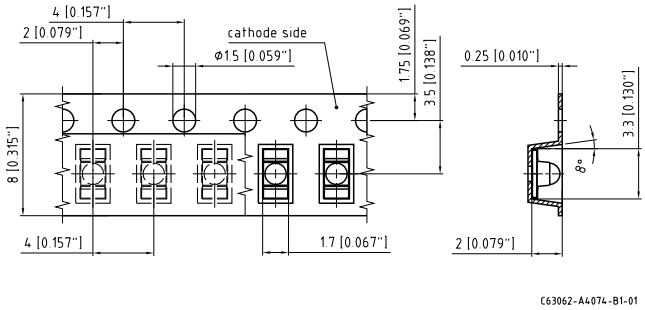
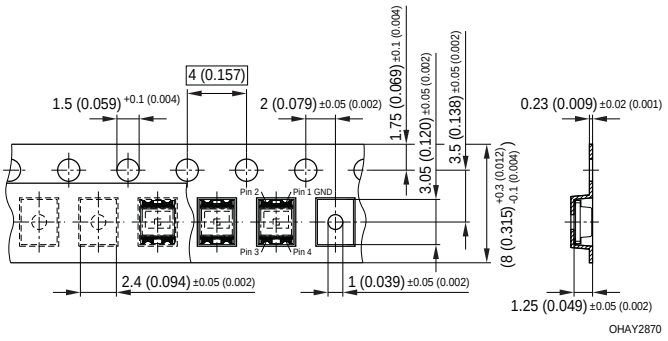
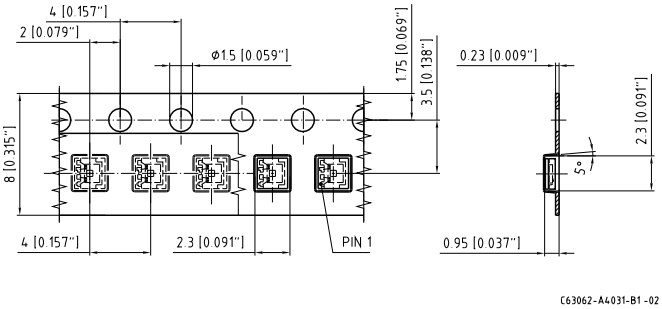
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
SFH 3711 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
CHIPLED SFH 4045 / SFH 3015 FA 8 mm-Gurt 8 mm-Tape	1500 / Rolle ∅ 180 1500 / Reel (∅ 7)	
CHIPLED SFH 4053 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
CHIPLED SFH 4056 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
CHIPLED SFH 4058 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
CHIPLED SFH 4059 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
CHIPLED SFH 5711 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	
CHIPLED SFH 5712 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	

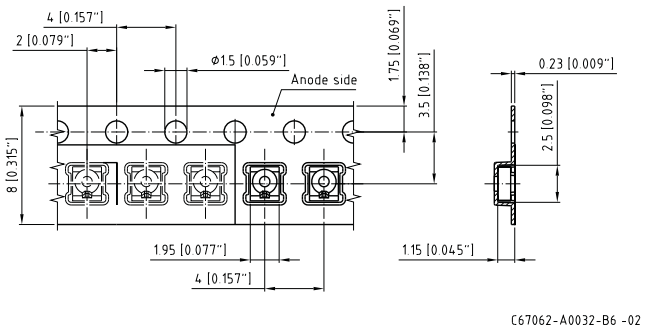
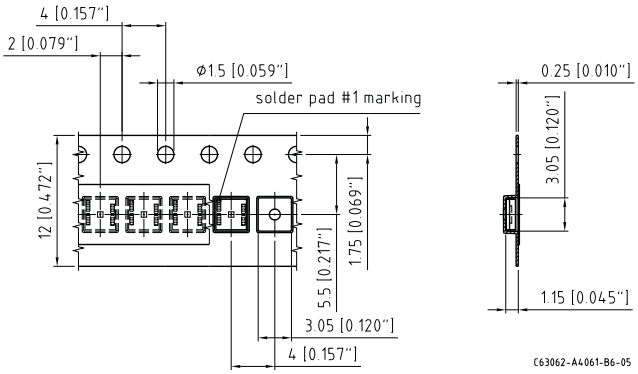
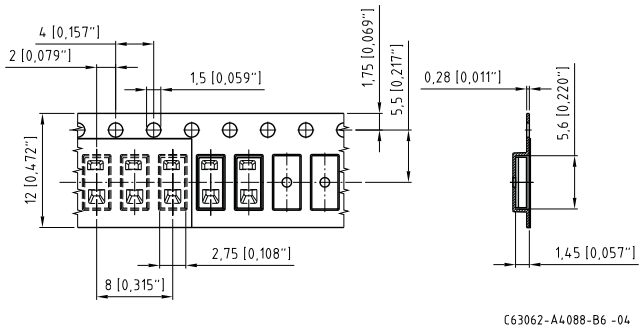
Tape and Reel

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

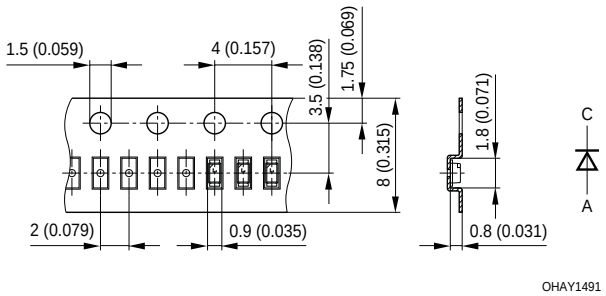
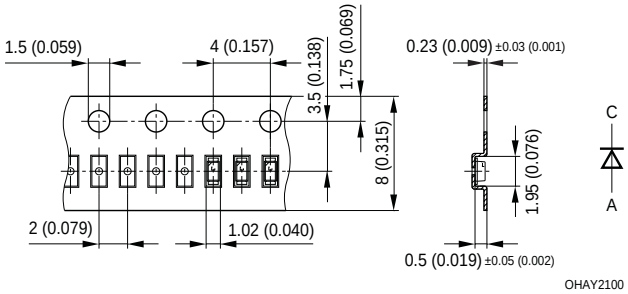
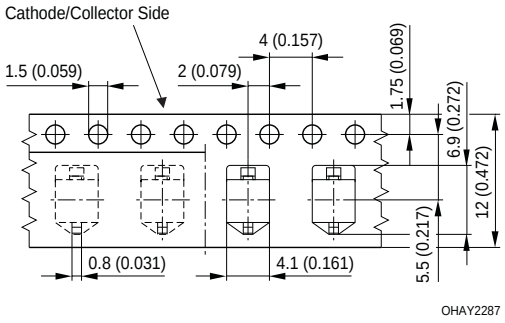
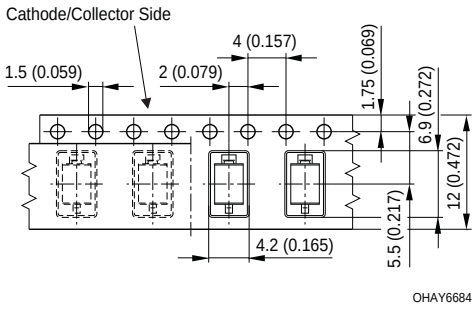
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
SFH 4451 8 mm-Gurt 8 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7)	
SFH 7770 12 mm-Gurt 12 mm-Tape	3000 / Rolle ∅ 180 3000 / Reel (∅ 7) 14000 / Rolle ∅ 330 14000 / Reel (∅ 13)	
SFH 7773 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

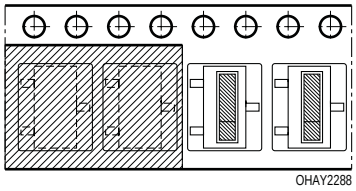
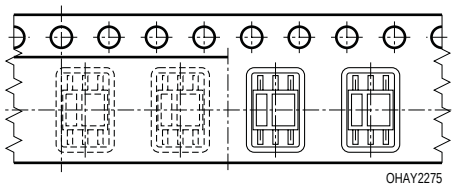
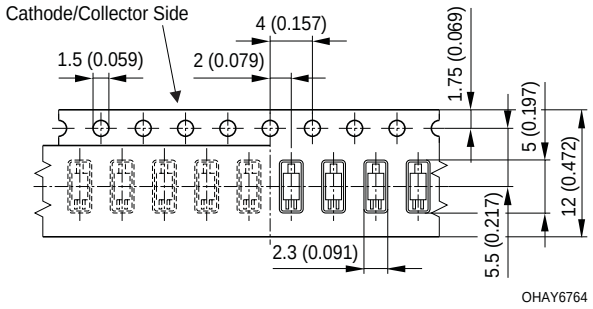
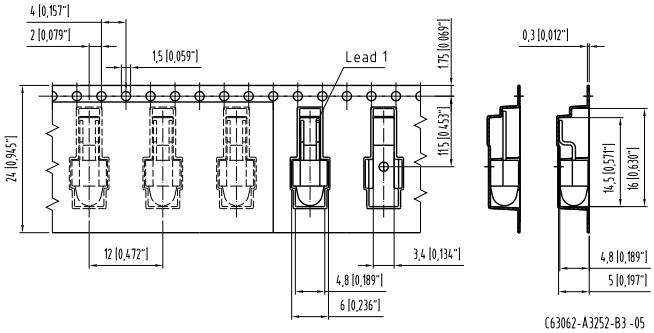
Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
SmartLED® 0603 0.6 mm 8 mm-Gurt 8 mm-Tape	5000 / Rolle ∅ 180 5000 / Reel (∅ 7) 10000 / Rolle ∅ 180 on request / auf Anfrage	
SmartLED® 0603 0.3 mm 8 mm-Gurt 8 mm-Tape	5000 / Rolle ∅ 180 5000 / Reel (∅ 7)	
SMT-Photodiode (e.g. BPW 34S) 12 mm-Gurt 12 mm-Tape	1500 / Rolle ∅ 180 1500 / Reel (∅ 7)	
SMT-Photodiode reverse gullwing (e.g. BPW 34S) 12 mm-Gurt 12 mm-Tape	1500 / Rolle ∅ 180 1500 / Reel (∅ 7)	

Method of Taping/Polarity and Orientation

Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
SMT-Photodiode KOM 2125 12 mm-Gurt 12 mm-Tape	1400 / Rolle ∅ 180 1400 / Reel (∅ 7)	
SMT-RLS 12 mm-Gurt 12 mm-Tape	1000 / Rolle ∅ 180 1000 / Reel (∅ 7)	
Smart DIL 12 mm Gurt 12 mm Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ý 7)	
SMT Radial (5 mm) 24 mm-Gurt 24 mm-Tape	1000 / Rolle ∅ 330 1000 / Reel (∅ 13)	

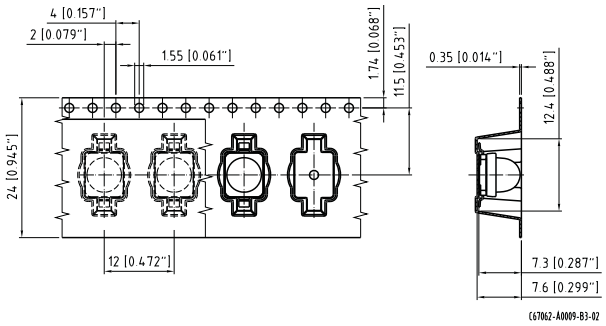
Tape and Reel

Method of Taping/Polarity and Orientation

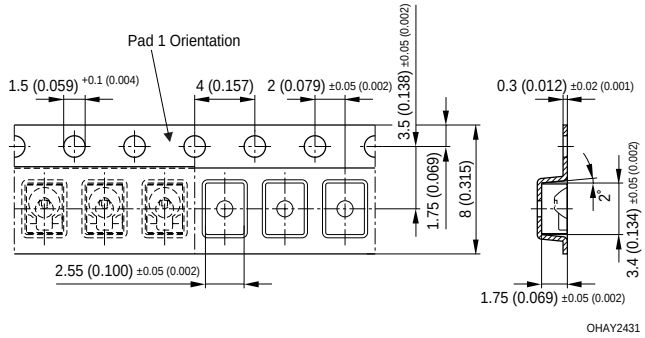
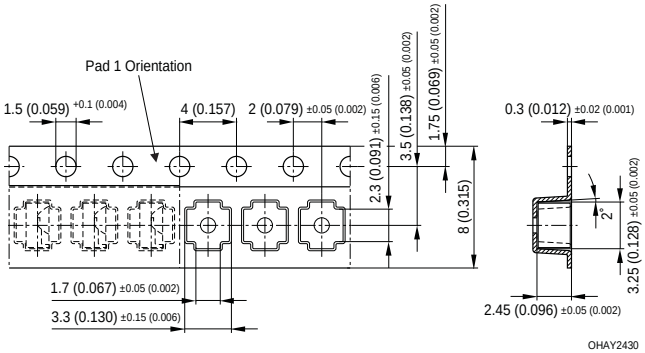
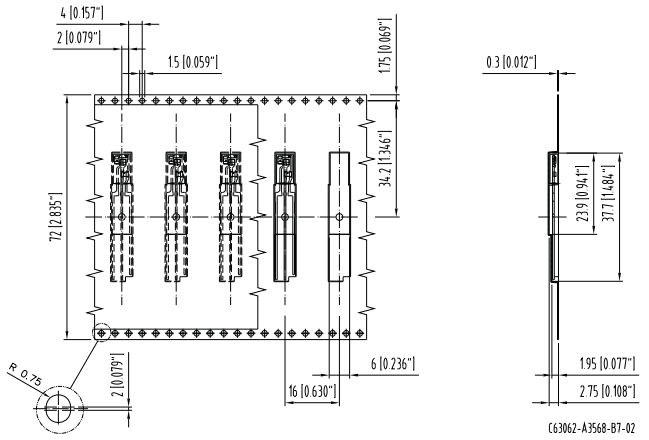
Dimensions in mm (inch)

Gurtausführung/Polarität und Lage

Maße in mm (inch)

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
SFH 4236 SFH 4239	100 / Rolle ∅ 180 100 / Reel (∅ 7)	
24 mm-Gurt 24 mm-Tape	500/Rolle ∅ 330 500/Reel (∅ 13)	

Tape and Reel

Package Gehäuse	Packing Unit Verpackungseinheit	Method of Taping Gurtführung
MIDLED Toplooker 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7) 9000/Rolle ∅ 330 9000/Reel (∅ 13)	
MIDLED Sidelooker 8 mm-Gurt 8 mm-Tape	2000 / Rolle ∅ 180 2000 / Reel (∅ 7) 7000/Rolle ∅ 330 7000/Reel (∅ 13)	
Pulsed laser diodes SPL LL90 R33 SPL LL90_3 R33 72 mm-Gurt 72 mm-Tape	1200 / Rolle ∅ 330 1200 / Reel (∅ 13)	

Radial Components

Packaging of Radial Taped Components on Reels

The taped components are wound onto reels and supplied in cartons, with two reels to a carton. With 5 mm (T 1¾) types there are 1.000 components on each reel, and with 3 mm (T 1) types there are 2.000.

Each reel and each carton is separately labeled as follows:
- manufacturer's name
- type designation
- quantity
- date code (YYWW)
- Packing Variant
- Lot number

When tapes are spliced, the splices shall be equal in strength to the original tape. The splice shall be so precise that the misalignment of the holes in each direction is no more than 0.3 mm and the total thickness of the tape no more than 1.5 mm.

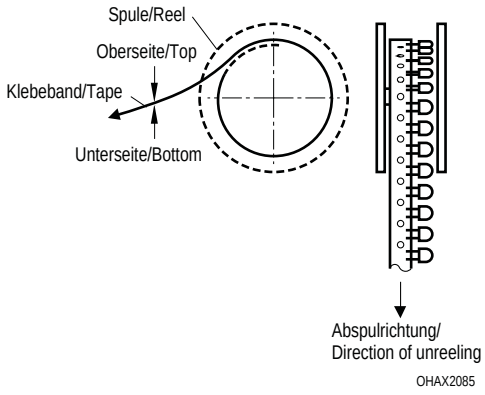
Radiale Bauelemente

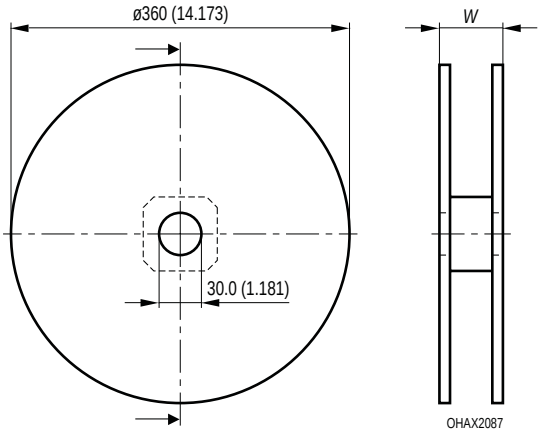
Verpackung von radialen gegurteten Bauelementen auf Spulen

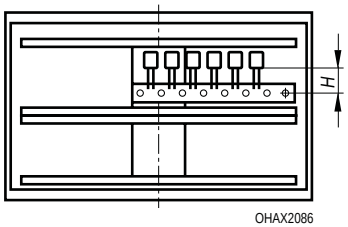
Die gegurteten Bauelemente sind auf Spulen gewickelt und werden in Kartons geliefert, die je zwei Spulen enthalten. Bei 5 mm (T 1¾)-Bauformen ist jede Spule mit 1000 Bauelementen bestückt, bei 3 mm (T 1)-Bauformen mit 2000 Stück pro Spule.

Jede Spule und jeder Karton ist mit einem Etikett gekennzeichnet, welches folgende Angaben enthält:
- Herstellername
- Typenbezeichnung
- Stückzahl
- Datumscode (JJWW)
- Verpackungsvariante
- Losnummer

Wenn Gurtbänder geklebt werden, dann weist die Verbindungsstelle die gleiche Festigkeit auf wie das Gurtband selbst. Die Gurtverbindung ist so genau, dass die Lageabweichung der Löcher in jeder Richtung nicht mehr als 0,3 mm und die Gesamtdicke des Gurtbandes nicht mehr als 1,5 mm betragen.







Dimensions in mm (inch)

Gurthöhe H Height of Tape H	Spulenbreite W Width of Reel W	
= 18 (0.709)	max. 56 (2.205)	(entsprechend IEC 60286-2) (acc. to IEC 60286-2)
> 18 (0.709)	max. 64 (2.520)	–

Radial Components

Packaging of Radial Components in Ammopacks

The component tape has a gap after every 24th component that is followed by a fold and is packed in meandering fashion into foldup cartons holding 1,500 pieces (5 mm (T 1¾) type) or 2,000 pieces (3 mm (T 1) type).

Each foldup carton is labeled as follows:
- manufacturer's name
- type designation
- quantity
- date code (YYWW)
- Packing Variant
- Lot number

Polarity identification: both sides of the foldup carton are marked with - or +. The appropriate polarity is shown in the tables on pages 228/229.

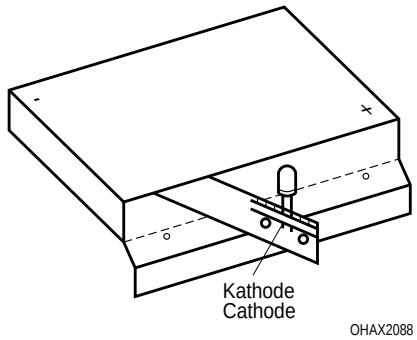
Radiale Bauelemente

Verpackung von radialen Bauelementen im Ammo-Pack

Der Bauelemente-Gurt hat nach jedem 24. Bauelement eine Leerstelle mit anschließender Soll-Knickstelle und wird mäanderförmig in Faltschachteln zu je 1500 Stück (5 mm (T 1¾)-Bauform) und 2000 Stück (3 mm (T 1)-Bauform) verpackt.

Jede Faltschachtel ist mit einem Etikett gekennzeichnet, welches folgende Angaben enthält:
- Herstellername
- Typenbezeichnung
- Stückzahl
- Datumscode (JJWW)
- Verpackungsvariante
- Losnummer

Polaritätskennzeichnung: Die beiden Schmalseiten der Faltschachtel sind mit einem Aufdruck - bzw. + gekennzeichnet. Die entsprechende Polarität ist aus den Tabellen Seite 228/229 ersichtlich.



Taping

The cardboard carrier tape is not expand-able, but the hold down tape is expandable and flexible so that it can adapt to the leads of the components during taping. The hold down tape is formed in such a way that there is no danger
- of the taped components slipping out from the leads side, or
- that the leads of the taped components are subject to chemical action e.g. corrision or oxidation
- which would result in difficulties in soldering.

Break force of the tape:	≥ 15 N
Extraction force in the tape plane vertically to the direction of unreeling	≥ 5 N

All polarized components are arranged in one direction during taping. The polarity can be seen from the following drawings and tables. There are only components of one selection group on a reel or ammopack. The total number of components missing on a reel, excluding the empty spaces on the leader and trailer, should not exceed 0.1% or one position. Directly behind there is no gap allowed.

Gurtung

Das Kartonträgerband ist nicht dehnfähig, dagegen ist das Klebeband dehnbar und flexibel, um sich beim Gurtungsvorgang den Anschlussdrähten der Bauelemente anpassen zu können. Außerdem ist das Klebeband so beschaffen, dass bei Lagerung keine Gefahr besteht,
- dass sich gegurtete Bauelemente in Richtung der Anschlussdrähte herauslösen,
- dass durch Ausdünstungen Schwierigkeiten beim Löten entstehen, oder
- dass die Eigenschaften der gegurteten Bauelemente und deren Anschlussdrähte durch chemische Vorgänge beeinträchtigt werden (z.B. durch Korrosion).

Reißfestigkeit des Gurtbandes:	≥ 15 N
Ausziehkraft in der Gurtbandebene senkrecht zur Abspulrichtung	≥ 5 N

Bei der Gurtung sind alle gepolten Bauelemente in einer Richtung angeordnet. Die jeweilige Polarität ist den entsprechenden Tabellen zu entnehmen. Auf einer Spule bzw. Ammo-Pack befinden sich immer nur Bauelemente einer Selektionsgruppe.

Radial Components

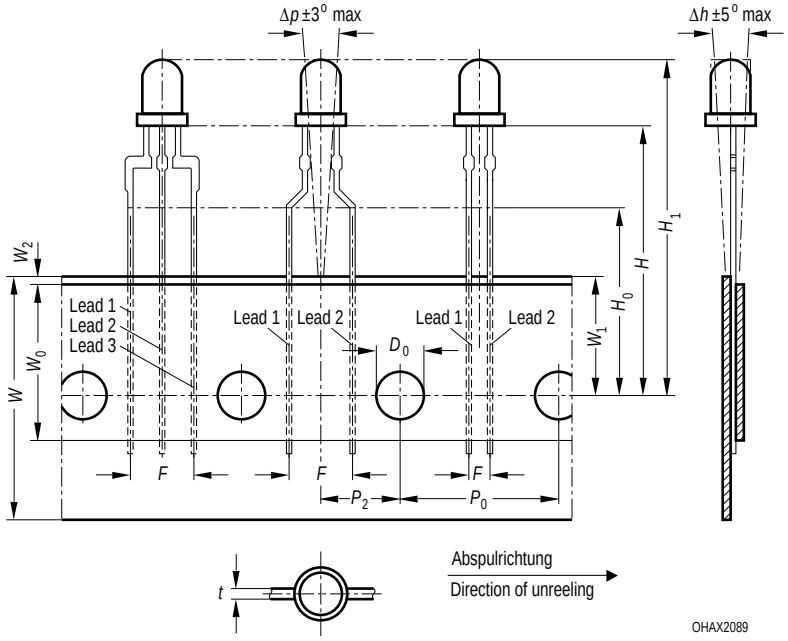
At the beginning and end (leader and trailer) of the tape there are at least five gaps to simplify threading in and out of an automatic insertion system.

Radiale Bauelemente

Die Fehlmenge der Bauelemente pro Spule darf maximal 0.1% oder eine Position betragen, wobei keine aufeinanderfolgenden Plätze leer sein dürfen.
Am Beginn and am Ende (Vor- bzw. Nachspann) des Gurtbandes sind zur Erleichterung des Ein- und Ausfädelns auf dem Bestückungsautomat mindestens 5 Leerstellen vorhanden.

Tape and Packaging Versions

Gurt- und Verpackungsvarianten



Radial Components

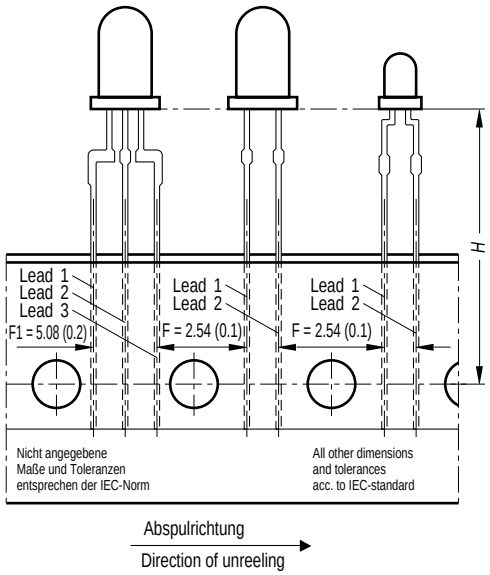
Radiale Bauelemente

Symbol	Bezeichnung Designation	Maße Dimension mm (inch)	Toleranz Tolerance mm (inch)
W	Gurtbreite Carrier tape width	18 (0.709)	+ 1 (0.039) – 0.5 (0.020)
W_0	Klebebandbreite Hold down tape width	max. 15 (0.591)	–
W_1	Abstand Lochmitte zu Bandoberkante Sprocket hole position	9 (0.354)	+ 0.75 (0.030) – 0.5 (0.020)
W_2	Lage des Klebebandes Hold down tape position	≤ 3 (0.118)	–
T	Gesamtdicke von Gurt- und Klebeband Total thickness of carrier and hold down tape	max. 0.9 (0.035)	–
D_0	Führungslochdurchmesser Sprocket hole diameter	4 (0.157)	± 0.2 (0.008)
H	Abstand Lochmitte zu Bauteilunterkante Sprocket hole center to bottom of component	je nach Eintrag depends on suffix	
H_0	Abstand Lochmitte zur Aufsetzebene Sprocket hole center of seating plane	16 (0.630)	± 0.5 (0.020)
H_1	Abstand Lochmitte zu Bauteiloberkante Sprocket hole center to top of component body	je nach Eintrag und Typ depends on suffix and type	
P_0	Führungslochabstand Sprocket hole pitch	12.7 (0.500)	± 0.3 (0.012)
P_2	Abstand Führungsloch zu Bauteilmitte Distance sprocket hole to center of component	6.35 (0.250)	± 0.7 (0.028)
F	Rastermaß Component lead pitch	2.54 (0.100) or 5.08 (0.200)	+ 0.6 (0.024) – 0.1 (0.004)

Tape and Reel

Radial Components

Radiale Bauelemente



Gurtung auf Spule
Tape and Reel

Packing Variant						H	Polarity Lead 1 2 Lead devices	Polarity Lead 1 3 Lead devices
R	N	1	8	A		$18^{+2\,1)}$ ($0.709^{+0.079}$)	Kathode/Kollektor Cathode/Collector	Anode 1/Emitter
R	N	1	8	C		$18^{+2\,1)}$ ($0.709^{+0.079}$)	Anode/Emitter	Anode 2/Base
R	N	2	1	A		$20.5_{\pm 0.5}$ ($0.807_{\pm 0.020}$)	Kathode/Kollektor Cathode/Collector	Anode 1/Emitter
R	N	2	1	C		$20.5_{\pm 0.5}$ ($0.807_{\pm 0.020}$)	Anode/Emitter	Anode 2/Base
R	N	2	3	A		$22.5_{\pm 0.5}$ ($0.886_{\pm 0.020}$)	Kathode/Kollektor Cathode/Collector	Anode 1/Emitter
R	N	2	3	C		$22.5_{\pm 0.5}$ ($0.886_{\pm 0.020}$)	Anode/Emitter	Anode 2/Base
R	N	2	5	A		$25_{\pm 0.5}$ ($0.984_{\pm 0.020}$)	Kathode/Kollektor Cathode/Collector	Anode 1/Emitter
R	N	2	5	C		$25_{\pm 0.5}$ ($0.984_{\pm 0.020}$)	Anode/Emitter	Anode 2/Base
R	N	2	9	A		$28.5_{\pm 0.5}$ ($1.122_{\pm 0.020}$)	Kathode/Kollektor Cathode/Collector	Anode 1/Emitter
R	N	2	9	C		$28.5_{\pm 0.5}$ ($1.122_{\pm 0.020}$)	Anode/Emitter	Anode 2/Base

Ammo-Pack

Packing Variant					H	Box Side	Polarity Lead 1 2 Lead devices	Polarity Lead 1 3 Lead devices
A	N	1	8		$18_{\pm 2}$ ($0.709_{\pm 0.079}$)	–	Anode/Emitter	Anode 2/Base
						+	Kathode/Kollektor Cathode/Collector	Anode 1/Emitter
A	N	2	3		$22.5_{\pm 0.5}$ ($0.886_{\pm 0.020}$)	–	Anode/Emitter	Anode 2/Base
						+	Kathode/Kollektor Cathode/Collector	Anode 1/Emitter
A	N	2	7		$27_{\pm 0.5}$ ($1.063_{\pm 0.020}$)	–	—	SFH 5110 V_{DD} SFH 5111 GND
						+	—	V_{OUT}

OHAX2296

1) Entspricht IEC-Norm 286.2
1) Acc. to IEC-Standard 286.2

Dimensions in mm (inch)

Maße in mm (inch)

Polarity identification Ammopack:

both sides of the foldup carton are marked with "-" or "+".

Polaritätskennzeichnung Ammopack:

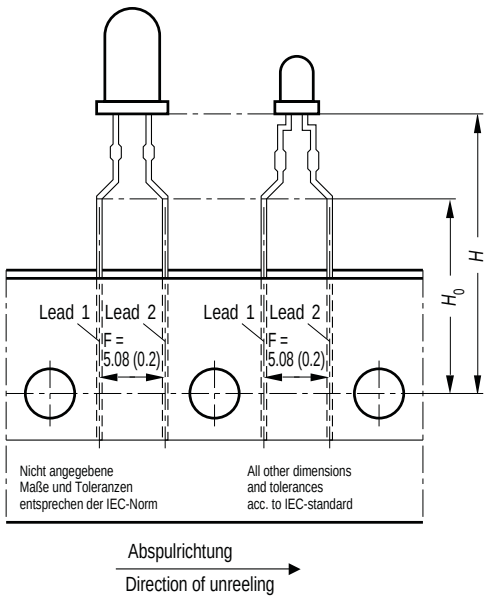
Die beiden Schmalseiten der Faltschachtel sind mit einem Aufdruck "-" bzw. "+" gekennzeichnet.

Note:
The leadmarking depends on the choice of the unreeling direction ("-" or "+").
In case of 2-color LEDs, the polarity of Anode 1 refers to the LED with the higher wavelength, resp. Anode 2 to the LED with the lower wavelength.

Hinweis:
die Leadbezeichnung ist abhängig von der Wahl der Abspulrichtung
("-" bzw. "+").
Bei 2-Farben LEDs bezieht sich die Polaritätsangabe Anode 1 auf die LED mit der größeren Wellenlänge, bzw Anode 2 auf die LED mit der kürzeren Wellenlänge.

Radial Components

Radiale Bauelemente



Gurtung auf Spule
Tape and Reel

Packing Variant						H_0	H	Polarity Lead 1
R	B	2	1	A		16±0.5 (0.630±0.020)	20.5±0.5 (0.807±0.020)	Kathode/Kollektor Cathode/Collector
R	B	2	3	A		16±0.5 (0.630±0.020)	22.5±0.5 (0.886±0.020)	Kathode/Kollektor Cathode/Collector
R	B	2	4	A		16±0.5 (0.630±0.020)	24±0.5 (0.945±0.020)	Kathode/Kollektor Cathode/Collector
R	B	2	5	A		16±0.5 (0.630±0.020)	25±0.5 (0.984±0.020)	Kathode/Kollektor Cathode/Collector
R	B	2	6	A		16±0.5 (0.630±0.020)	25.7$^{+0.7}$ (1.012$^{+0.028}$)	Kathode/Kollektor Cathode/Collector
R	B	2	8	C		16±0.5 (0.630±0.020)	28±0.5 (1.102±0.020)	Anode/Emitter
R	B	2	8	A		16±0.5 (0.630±0.020)	28±0.5 (1.102±0.020)	Kathode/Kollektor Cathode/Collector

Ammo-Pack

Packing Variant						H_0	H	Box Side	Polarity Lead 1
A	B	2	1			16±0.5 (0.630±0.020)	20.5±0.5 (0.807±0.020)	–	Anode/Emitter
								+	Kathode/Kollektor Cathode/Collector
A	B	2	3			16±0.5 (0.630±0.020)	22.5±0.5 (0.886±0.020)	–	Anode/Emitter
								+	Kathode/Kollektor Cathode/Collector

OHAX2295

Dimensions in mm (inch)

Maße in mm (inch)

Polarity identification Ammopack:

both sides of the foldup carton are marked with "-" or "+".

Polaritätskennzeichnung Ammopack:

Die beiden Schmalseiten der Faltschachtel sind mit einem Aufdruck "-" bzw. "+" gekennzeichnet.

Note:
The leadmarking depends on the choice of the unreeling direction ("-" or "+").
In case of 2-color LEDs, the polarity refers to the LED with the higher wavelength.

Hinweis:
Die Leadbezeichnung ist abhängig von der Wahl der Abspulrichtung ("-" bzw. "+").
Bei 2-Farben LEDs beziehen sich die Polaritätsangaben auf die LED mit der größeren Wellenlänge.

Dry Pack

Contents

Trockenverpackung

Inhalt

1. Introduction

This document gives an overview about the requirements for packing, labeling, handling and storage of moisture sensitive components in dry pack of OSRAM Opto Semiconductors.

2. Definitions and Abbrevations

BPL	Barcode Product Label
ESD	Electro Static Discharge
ID	Identification
OS	Opto Semiconductors
PCB	Printed Circuit Board
RH	Relative Humidity

1. Einleitung

Dieses Dokument soll einen Überblick geben über die Anforderungen für Verpacken, Etikettieren, Handhaben und Lagern von feuchteempfindlichen Bauteilen in Trockenverpackungen für OSRAM Opto Semiconductors.

2. Definitionen und Abkürzungen

BPL
ESD
ID
OS
PCB
RH

3. Normative References

JEDEC-STD-020C	Moisture/Reflow Sensitivity Classification for Plastic Integrated Circuit Surface Mount Devices
JEDEC-STD-033B	Standard for Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices
EIA – 583	Packaging Material Standards für Moisture Sensitive Items
EIA/JEP 113-B	Symbol and Labels for Moisture-Sensitive Devices
EIA/JEP 124	Guidelines for the Packing, Handling and Repacking of Moisture-Sensitive Components
MIL-B-81705 C	Barrier Materials
MIL-D-3464	Desiccants

4. Testing Products for Moisture Sensitivity

4.1 Controlling Moisture

OSRAM Opto Semiconductors in its design of packing materials and packing methods takes into consideration the susceptibility of some OSRAM Opto Semiconductors packages to moisture induced damage. The risk of this damage being greatest when naturally permeable plastic encapsulation materials are used as the moisture in the package increases or decreases with the Relative Humidity (RH) of the surrounding environment.
Such damage may include delamination between the die and the plastic encapsulation material, which may result in open connections due to broken wirebonds.
Package cracking may also occur when the components are exposed to the high temperatures and steep temperatures gradients used in reflow board assembly techniques. Moisture in the package having reached a critical level will fracture the package in order to escape. This phenomenon being known as the “popcorn effect”.
Therefore the control of moisture levels in the package body is critical to reducing the risk of moisture-induced failures.

4.2 Testing Products for Moisture Sensitivity

A procedure to define the sensitivity of a component against moisture is set out in JEDEC-STD-020C.
In this standard, moisture sensitive components are classified in eight different groups, each differing in their permissible storage time in a defined climate (characterized by temperature and relative humidity at normal pressure).

3. Normenbezug

JEDEC-STD-020C	Moisture/Reflow Sensitivity Classification for Plastic Integrated Circuit Surface Mount Devices
JEDEC-STD-033B	Standard for Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices
EIA – 583	Packaging Material Standards für Moisture Sensitive Items
EIA/JEP 113-B	Symbol and Labels for Moisture-Sensitive Devices
EIA/JEP 124	Guidelines for the Packing, Handling and Repacking of Moisture-Sensitive Components
MIL-B-81705 C	Barrier Materials
MIL-D-3464	Desiccants

4. Prüfen von Produkten auf Feuchteempfindlichkeit

4.1 Feuchtekontrolle

Mit besonderem Design von Verpackungsmaterial und durch entsprechende Verpackungsmethoden ist OSRAM Opto Semiconductors sensibilisiert hinsichtlich der Empfindlichkeit von einigen OSRAM Opto Semiconductors-Gehäusen bezüglich durch Feuchte verursachte Beschädigungen. Das Risiko ist dann am höchsten, wenn Kunststoffpressmasse verwendet wird, da Kunststoff natürlicherweise feuchteduchlässig ist. Die Feuchte im Gehäuse erhöht oder verringert sich entsprechend der Relativen Feuchte (RH) in unmittelbarer Umgebung.
Daher ist das Einhalten eines bestimmten Feuchtelevels im Gehäuse wichtig, um das Risiko einer durch Feuchte verursachten Beschädigung zu vermeiden. Solche Beschädigungen können auch als Delamination zwischen dem Chip und der umhüllenden Pressmasse entstehen, was sich in offenen Verbindungen bis zu gebrochenen Bonddrähten zeigt. Gehäusebrüche können auch hervorgerufen werden, wenn die Komponenten hohen Temperaturen und steil ansteigenden Temperaturkurven ausgesetzt werden wie beim Reflow Lötverfahren. Wenn im Gehäuse ein kritischer Grad an Feuchte erreicht würde, wird diese, um zu entweichen, das Gehäuse zerbrechen. Dieses Phänomen ist bekannt als „Popcorn Effekt“.

4.2 Prüfen der Feuchteemfindlichkeit von Bauformen

Eine Bewertung der Empfindlichkeit einer Bauform gegen Feuchte erfolgt in einem bezüglich Temperatur und Feuchte definierten Klima über eine bestimmte Zeit. Eine derartige Prozedur beschreibt die JEDEC-STD-020C.
Danach werden feuchteempfindliche Bauelemente in acht verschiedene Klassen eingeteilt, die sich durch eine unterschiedliche zulässige Lagerungsdauer in einem definierten Klima (gekennzeichnet durch Temperatur und Feuchte) bei Normaldruck unterscheiden.

5. Dry Packing Process and Materials

The first step in the dry packing process is to remove any moisture built up in the package. This is done by baking the finished product for 2.5 to 48 hours between 85 °C and 125 °C depending on package type. During baking, the product is contained in high temperature resistant device trays, aluminium trays or tubes.
Within 24 hours after baking, the product is sealed with a prescribed number of desiccant pouches and an indicator card in a dry bag under a partial vacuum.
Details of OSRAM Opto Semiconductors dry pack materials are provided in the sections that follow.

5. Trockenverpackungsprozess und Materialien

Der erste Schritt im Trockenverpackungsprozess ist, alle aufgebaute Feuchte im Gehäuse durch ausheizen des Produkts für 2.5 bis 48 Stunden, abhängig von Gehäusetyp, bei 85 °C bis 125 °C zu entfernen. Ausgeheizt wird das Produkt auf Tabletts (hergestellt aus temperaturbeständigem Material) oder Aluminium-Tabletts oder Schienen.
Nach dem Ausheizen werden die Bauteile innerhalb von 24 Stunden in Trockenbeutel verpackt und unter Vakuum verschweißt. Eine vorgeschriebene Anzahl von Trockenmittel und ein Feuchteindikator sind ebenso im Trockenbeutel beinhaltet.
Einzelheiten über das OSRAM Opto Semiconductors Trockenverpackungsmaterial werden in den folgenden Abschnitten beschrieben.

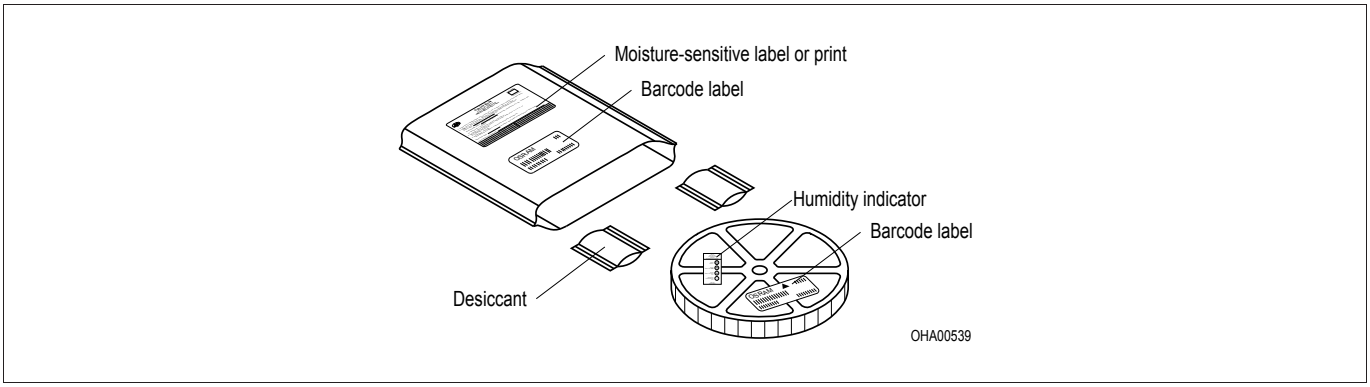


Figure 1.1: Moisture-sensitive product is packed in a dry bag containing desiccant and a humidity card

Bild 1.1: Feuchteempfindliche Produkte sind verpackt in einem Trockenbeutel zusammen mit einem Trockenmittel und einer Feuchteindikatorkarte

5.1 Dry Pack Bag

The dry pack bag (moisture barrier bag) is of a three layer laminated design and is MIL-STD 81705C, type 1, class 1 compliant. ESD protection is provided by the middle layer of aluminium metallized polyester.

5.2 Desiccant

The desiccant material used exceeds the rigid standard of the military specification D-3464 D, type II, contains Silica Gel and Active Clay which are neither acutely nor chronically harmfull, do not classify as dangerous nor special waste and can be disposed of in accordance with local and national laws.
Testing confirms that the desiccant pouches in the bag greatly reduce the presence of moisture by maintaining the environment in the bag at no greater than 10 percent RH, thus protecting the devices during shipment and storage. If shelf life is exceeded, the devices will need to be dry baked again if the RH in the bag has exceeded 10 percent RH. This RH change can be seen when the color of the 10% monitor dot on the humidy-indicator card has changed from blue to pink.

5.1 Trockenbeutel

Der von OSRAM Opto Semiconductors benutzte Trockenbeutel (bzw. Feuchteschutzbeutel) ist gemäß Vorschrift MIL-STD 81705C, type 1, class 1. und ist als 3-Schicht Verbundbeutel aufgebaut. Der ESD Schutz wird durch die mittlere aluminiumbeschichtete Polyesterschicht gewährleistet.

5.2 Trockenmittel

Das verwendete Trockenmittelmaterial für das Verpacken von oberflächenmontierten Komponenten entspricht dem strengen Standart der Militärspezifikation D-3464 D, type II. Als Trockenmittel findet Silica Gel und Aktivton Anwendung. Beide Stoffe sind nicht akut oder chronisch schädlich und nicht als Gefahr- oder Sondermüll eingestuft. Normale Entsorgung entsprechend den örtlichen und nationalen Vorschriften.
Tests zeigen, daß die Trockenbeutel umfassend die vorhandene Feuchte im Trockenbeutel reduziert.
Die damit erhaltene niedrige Luftfeuchtigkeit im Trockenbeutel von weniger als 10 % RH (die Farbe des 10 % Punktes hat sich nicht von Blau zu Rosa verändert) schützt die Bauteile während des Transportes und der Lagerung. Bei Überschreitung der Lagerzeit sind die Bauteile nur dann auszuheizen, wenn die relative Feuchte im Trockenbeutel die 10% RH (die Farbe des 10% Punktes hat sich von Blau zu Rosa verfärbt) überschritten hat, welches anhand des Feuchteindikators zu ersehen ist.

5.3 Humidity Indicator Card

Included in each dry pack bag is also a card with humidity-sensitive elements which turn from blue to pink whenever the specific RH level is exeeded (see Figure Humidity indicator card). The card may be reused provided all the sensors elements are blue.

5.3 Feuchteindikatorkarte

In jedem Trockenbeutel ist eine Karte mit feuchteempfindlichen Elementen enthalten. Diese wechseln ihre Farbe von blau zu rosa wenn der angegebene Feuchtigkeitsgrad erreicht ist. (siehe Bild Feuchteindikatorkarte).
Die Karte kann wiederverwendet werden solange alle Sensorelemente blau sind.

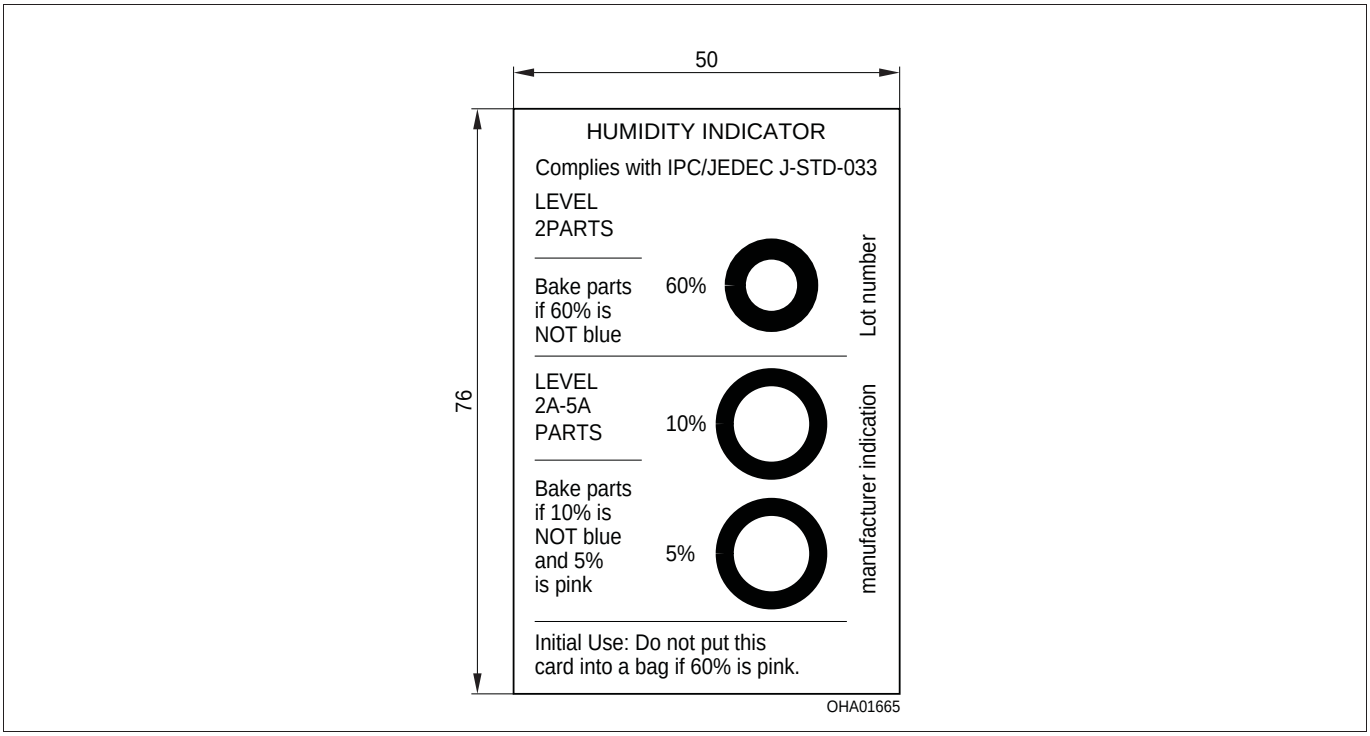


Figure 1.2: Humidity indicator card is included in the dry bag. (Note: if the 10% dot has changed from blue to pink then product should be rebaked with MSL 2A-5A before board assembly whenever a reflow method is used.)*

Bild 1.2: Feuchteindikatorkarte ist immer im Trockenbeutel ent-halten. (Bemerkung: wenn der 10% Punkt seine Farbe von blau nach rosa verändert hat, dann sollten die Bauteile mit MSAL 2A-5A ausgeheizt werden bevor sie verarbeitet werden.)*

5.4 Dry Pack Labels

The following two labels are applied to the outside of the dry pack bag:

- A standard Barcode-Product-Label (BPL), identifies the contents by: producer (OSRAM Opto Semiconductors), country of origin, product designation, lot number, date code, material number and quantity.
  The BPL also includes a reference to ESD and if necessary extra details of the Moisture Level, development designation, brightness class and laser stamp (see Figure 1.3).

5.4 Trockenverpackungsetiketten

Die folgenden zwei Etiketten befinden sich auf dem Trockenbeutel:

- Ein Standard Barcode-Produkt-Etikett (BPL), welches die Informationen über den Hersteller (OSRAM Opto Semiconductors), Ursprungsangabe, Produkt-Benennung, Losnummer, Date-Code, Materialnummer und Menge beinhaltet. Das BPL beinhaltet zudem ein Verweis auf ESD und wenn erforderlich, als Zusatzinformation, die Feuchteklasse, die Entwicklungsbezeichnung, Helligkeitsklasse und Gruppierung (siehe Bild 1.3).

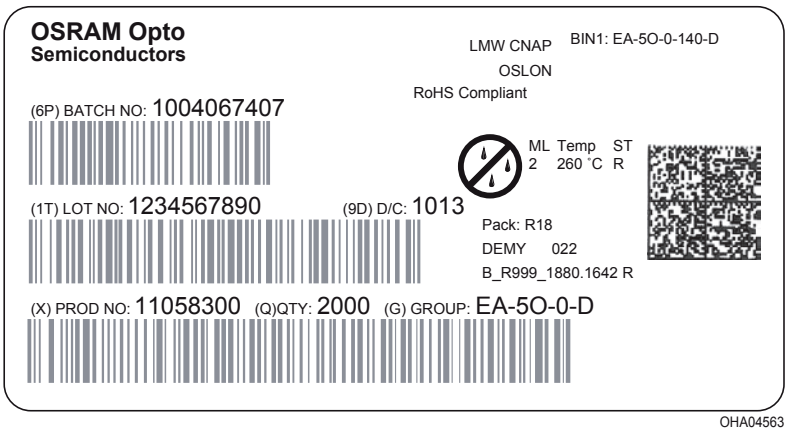


Figure 1.3: **Barcode-Product-Label is applied to the outside of the dry pack bag.**

Bild 1.3: **Ein Barcode-Produkt-Etikett (BPL) befindet sich auf dem Trokkenbeutel.**

- An Opto Semiconductor dry pack caution label, which identifies the sealing date of the bag, the moisture level, the dry pack expiration date, as well as product handling guidelines (see Figure 1.4).

- Ein Opto Semiconductor Feuchteetikett, welches Informationen über das Versiegelungsdatum, Feuchtigkeitsklasse, Lagerzeit als auch Handhabungshinweise für die Bauteile beinhaltet (siehe Bild 1.4).

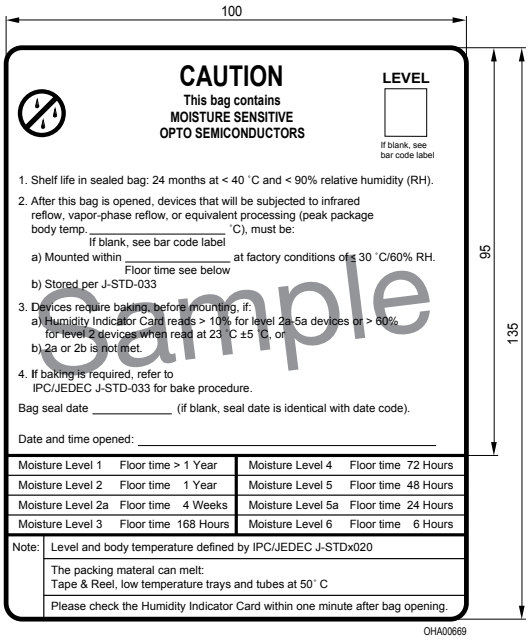


Figure 1.4: **Moisture sensitive label or print is applied to the outside of the dry pack bag.**

Bild 1.4: **Ein Feuchteetikett oder Aufdruck mit entsprechender Feuchtigkeitsklasse befindet sich auf dem Trockenbeutel.**

6. Handling Dry Packed Parts

6.1 Incoming Inspection

Moisture-sensitive components are shipped in vacuum-sealed moisture barrier bags packed with a desiccant material and a humidity indicator card.
Upon receipt, the bags should be inspected for damage to ensure that the bag integrity has been maintained. Inspection should verify no holes, gouges, tears, or punctures of any kind that may expose the contents of the bag.

6.2 Opening moisture barrier bags

To open the bag, simply cut across the top of the bags as close to the original seal as possible being careful not to damage the contents.
Before using dry packed components, it is essential that the humidity indicator be checked immediately after bag opening. Should it indicate a RH of less than 10% (the color of the 10% dot has not changed from blue to pink), the components contained are ready for use.
If the humidity indicator in the dry pack shows a RH of more than 10% (the color of the 10% dot has changed from blue to pink), the components must be rebaked**.***
In addition please check the dry pack for damage on opening or storage under too severe climatic condition.
Once the dry pack bag is opened, the desired quantity of units should be removed and the bag resealed within two hours. If the bag is left open longer than 30 minutes the desiccant should be replaced with dry desiccant. The closed desiccant pouches may be dried by baking them at 120 °C - 125 °C for 16 hours if the material of the bag is heat resistant.

*** Exception:**
Level 2 products only have to be rebaked if the 60% dot has changed the color to pink

6.3 Rebaking of Devices

If devices have exceeded the specified floor life time for exposure described below or the indicator in a dry pack shows a RH of more than 10%, they may be baked according IPC/JEDEC J-STD-033B.

Note: When baking a product at 65 °C to 125 °C, the product must be put in metal tubes or metal trays, not in the tubes or reels in which the product was shipped.

6. Handhabung trockenverpacketer Bauteile

6.1 Eingangskontrolle

Feuchteempfindliche Bauteile werden in vakuumverschweißten Trockenbeutel zusammen mit Trockenmittel und Feuchteindikatorkarte versendet.
Nach Erhalt sollten die Beutel auf Beschädigungen untersucht werden. Die Vollständigkeit der Beutel sollte ebenfalls überprüft werden. Es sollten keine Löcher, Dellen oder Risse jeglicher Art vorhanden sein, welche den Inhalt des Beutels beeinträchtigen.

6.2 Öffnen von Trockenbeuteln

Zum Öffnen des Beutels einfach vorsichtig am Ende des Beutels, entlang der Original-Siegellinie aufschneiden, damit keine Bauteile beschädigt werden.
Bevor die Bauteile verarbeitet werden, ist es unbedingt erforderlich, die Feuchteindikatorkarte umgehend nach dem öffnen des Beutels zu überprüfen. Sollte diese eine relative Feuchte von weniger als 10% anzeigen (die Farbe des 10% Punktes ist nicht von blau nach rosa umgeschlagen), so können die Bauteile verarbeitet werden.
Wenn die Feuchteindikatorkarte in einem Trockenbeutel mehr als 10% beträgt (die Farbe des 10% Punktes ist von blau nach rosa umgeschlagen), müssen die Bauteile vor der Verarbeitung getrocknet werden.***** Zusätzlich sollte der Beutel auf Beschädigungen oder Lagerung unter falschen klimatischen Bedingungen untersucht werden.
Wenn der Trockenbeutel geöffnet wurde, sollte die gewünschte Menge an Bauteilen herausgenommen und der Beutel innerhalb von 30 Minuten wieder zugeschweißt werden.
Sollte der Beutel länger geöffnet sein, ist das Trockenmittel durch ein neues Trockenmittel zu ersetzen. Die Trockenmittelbeutel können bei 120 °C - 125 °C für 16 Stunden regeneriert werden, wenn das Beutelmaterial hitzefest ist.

*** Ausnahme:**
Level 2 Produkte müssen erst ausgeheizt werden, wenn der 60% Punkt seine Farbe nach rosa verändert hat

6.3 Ausheizen von Bauteilen

Im Falle, daß Bauteile die vorgeschriebene Lagerzeit überschritten haben, wie weiter unten beschrieben, oder der Feuchteindikator in einem Trokkenbeutel mehr als 10% relative Feuchte anzeigt, können die Bauteile in den Original-Kunststoffspulen ensprechend IPC/JEDEC J-STD-033B ausgeheizt werden.
Es ist wichtig daran zu erinnern, daß Metallschienen oder Metalltabletts verwendet werden müssen, wenn das Ausheizen der Bauteile bei 65 °C - 125 °C erfolgt. Auf keinen Fall können die Schienen oder Spulen verwendet werden, mit denen das Produkt angeliefert wurde.

6.4 Resealing a Dry Pack

After the devices have completed the bake out period they should immediately be resealed in the moisture proof bags.
If not all the components from a dry pack are used, the original desiccant and humidity detector should be reinserted and the dry pack resealed by using commercially available vacuum - heat - sealing equipment. New desiccant must be added if the humidity indicator has changed color.
Once the devices are removed from the dry pack bag, the total exposure time to the factory enviroment, prior to mounting the parts onto a circuit board, should not exceed the recommended time specified on the dry pack caution label. (see item 2a in Figure 1.4). This out-of-bag time varies depending on the moisture-sensitivity rating for the product. If the cumulative out-of-bag time for the components exceeds 6 hours at 30 °C and 60% RH the allowable floor life specified by the manufacturer must be adjusted accordingly.
For example, if the manufacturer specifies Level 3 with a floor life of 168 hours and the components are out of the bag for 24 hours, then an adjusted floor life of 144 h should be written on the label.

6.5 Storing Unpacked Devices

Unpacked devices may be mounted under environmental conditions not exceeding 30 °C and humidity levels of 60% RH. Devices must be soldered on PCB assemblies within specified floor life hours.

Moisture Sensitive Level	Floor Life
1	no limit
2	1 year
2a	4 weeks
3	168 hours
4	72 hours
5	48 hours
5a	24 hours
6	6 hours

The floor life of in-process materials may be extended by the use of controlled enviroments. Packages may be stores outside the Moisture Barrier Bag independent of moisture/reflow sensitivity considerations, if the ambient relative humidity is ≤ 10% RH. The use of desiccator cabinets with dry N_2 or dry air is suggested for such storage.

6.6 Storing moisture-proof packs prior to opening

Devices packaged in moisture-proof packaging should be stored in ambient conditions not exceeding temperatures of 40 °C or humidity levels of 90% RH.

6.4 Verschließen von Trockenbeuteln

Nachdem die Bauteile die Ausheizzeit erreicht haben, sollten diese schnellstmöglich in einem Trockenbeutel eingeschweißt werden.
Wenn die Bauteile nicht verarbeitet werden, sollten diese zusammen mit dem Original-Trockenmittel und dem Feuchteindikator in einem Trockenbeutel eingeschweißt werden. Dazu ist ein im Handel erhältliches Vacuum-Folienschweißgerät zu verwenden. Neues Trockenmittel muß hinzugefügt werden, wenn sich die Feuchteindikatorkarte verfärbt hat.
Sollten die Bauteile aus dem Trockenbeutel entnommen sein, so ist diese Entnahmezeit, vorrangig um die Bauteile auf Leiterplatten zu montieren, nicht zu überschreiten. Die empfohlene Verarbeitungszeit ist auf dem Feuchteetikett angegeben (siehe Punkt 2a in Bild 1.4). Diese Verarbeitungszeit variiert entsprechend der Feuchteklasse des betreffenden Bauteils. Wenn die aufgelaufene Verarbeitungszeit des Bauteils 6 Stunden bei 30 °C und 60% RH überschreitet, muß die erlaubte Lagerzeit (festgelegt vom Hersteller) umgehend angepaßt werden.
Zum Beispiel: Wenn der Hersteller eine Feuchteklasse "3" festlegt, welches einer Lagerzeit von 168 Stunden entspricht, und die Bauteile außerhalb des Trockenbeutels 24 Stunden lang verarbeitet werden, so muß die verbleibende Verarbeitungszeit von 144 Stunden auf das Feuchteetikett geschrieben werden.

6.5 Lagerung unverpackter Bauteile

Unverpackte Bauteile können verarbeitet werden unter Umgebungsbedingungen von nicht größer als 30 °C und einem Feuchtigkeitsgrad von 60% RH. Die Bauteile müssen innerhalb der unten angegebenen Verarbeitungszeit auf Leiterplatten gelötet sein.

Feuchtigkeitsgrad	Lagerzeit
1	keine Einschränkung
2	1 Jahr
2a	4 Wochen
3	168 Stunden
4	72 Stunden
5	48 Stunden
5a	24 Stunden
6	6 Stunden

Die Verarbeitungszeit von sich im Prozeß befindlichem Material kann durch eine kontrollierte Umgebung verlängert werden. Gehäuse können außerhalb des Trockenbeutels unabhängig von der Berücksichtigung der Feuchte/Reflow - Empfindlichkeit gelagert werden, wenn die Umgebungsbedingungen ≤ 10% RH, beträgt. Die Verwendung von Trockenschränken mit trockenem N_2 oder trockener Luft wird für solch eine Lagerung vorgeschlagen.

6.6 Lagerung von ungeöffneten Trockenverpackungen

Bauteile, verpackt in feuchtedichten Verpackungen, sollten bei Umgebungsbedingungen von nicht mehr als 40 °C oder einem Feuchtegehalt von max. 90% RH gelagert werden.

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