



# solutions catalogue

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THE BROADLINE DISTRIBUTOR OF ELECTRONIC COMPONENTS

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STMICROELECTRONICS is one of the world's largest semiconductor companies. Offering one of the industry's broadest product portfolios, ST serves customers with innovative semiconductor solutions by leveraging its vast array of technologies, design expertise and combination of intellectual property portfolio, strategic partnerships and manufacturing strength.

**STMICROELECTRONICS** je jedním z největších světových výrobců polovodičů. Nabízí jedno z nejširších produktových portfolií. ST přináší zákazníkům inovativní řešení polovodičů s využitím široké škály technologií, designu a odborných znalostí v kombinaci duševního vlastnictví, strategických partnerství a výrobních kapacit.

**STMICROELECTRONICS** ist einer der weltgrößten Halbleiterproduzenten. Es bietet eines der breitesten Produktportfolios an. ST versorgt die Kunden mit innovativen Halbleiter-Lösungen unter Nutzung einer breiten Skala von Technologien, Design und Fachkenntnissen in Kombination mit geistigem Eigentum, strategischen Partnerschaften und Produktionskapazitäten.

Az **STMICROELECTRONICS** a világ egyik legnagyobb félvezetőgyártója, az egyik legszélesebb termékportfólióval rendelkezik. Úgyfeleinek innovatív megoldásokat kínál a félvezetők területén a technológiák, dizájn széles skálájának és szaktudásuk kihasználásával a szellemi tulajdon, stratégiai partnereik és gyártókapacitásuk kombinálásával.

**STMICROELECTRONICS** to jeden z największych producentów półprzewodników na świecie. Dysponuje jedną z najszerszych ofert produktów. ST oferuje klientom innowacyjne rozwiązania półprzewodników z wykorzystaniem szerokiej gamy technologii, designu oraz znajomości fachowych w kombinacji z własnością intelektualną, partnerstwem strategicznym i możliwościami, produkcyjnymi.

**STMICROELECTRONICS** este una din cele mai importante companii producătoare de semiconductoare din lume. Având unul din cele mai extinse portofolii de produse din industrie, ST oferă clienților semiconductoare inovatoare, folosindu-și gama vastă de tehnologii, expertiza de proiectare și combinarea portofoliului de proprietate intelectuală, parteneriate strategice și puterea de producție.

**STMICROELECTRONICS** je jedným z najväčších svetových výrobcov polovodičov. Ponúka jedno z najširších produktových portfólií. ST prináša zákazníkovi inovatívne riešenia polovodičov s využitím širokej škály technológií, dizajnu a odborných znalostí v kombinácii duševného vlastníctva, strategických partnerstiev a výrobných kapacít.

STMicroelectronics is among the world leaders in many different fields, including semiconductors for industrial applications, power solutions, MEMS (Micro-Electro-Mechanical Systems) for portable and consumer devices, MPEG decoders and smartcard chips, automotive integrated circuits, computer peripherals and wireless.

## Why STMICROELECTRONICS?

- one of the world's largest semiconductor companies
- reliable components
- wide portfolio from classic to high-end components

## Amplifiers and Comparators



ST offers a wide range of op amps and comparators including micropower solutions, high-speed and precision devices, as well as specific current-sense amplifiers.

### Voltage Comparators

single, dual or quad voltage comparators, low-power, low-voltage, with or without strobe, rail-to-rail high-speed micropower comparators, in CMOS or in BiCMOS technology for the performances required in different applications. STMicroelectronics applies an automotive-grade policy designed to deliver products that meet the specific and rigorous demands of the automotive market. Automotive grade products are AEC-Q100 qualified and tested with certified high-reliability flow.

- LM2901/2903, TS391, LM393/339, LMV331/332/334, TS3021/3022/3011

## Power Conversion Modules



ST's portfolio of highly-integrated, high-efficiency power conversion modules include DC-DC modules, AC-DC power supply modules and switch power modules.

**ST's SLLIMM™** small low-loss intelligent molded module family of IPMs combines optimized silicon chips, integrated in three main inverter blocks:

### Power stage

- Short-circuit rugged IGBTs
- Freewheeling diodes

### Driving network

- High-voltage gate drivers
- Discrete gate resistors
- Integrated bootstrap diodes

### Protection and optional features

- Smart shutdown function
- Comparators for fault protection against overcurrent and short circuit
- NTC sensor for temperature control
- Op-amps for advanced current sensing
- Deadtime, interlocking function and undervoltage lockout

They are available in the DBC-based SDIP package offering extremely low thermal resistance with optimum quality level and cost effectiveness or in the full molded 3.5 cm, SLLIMM-nano package (NDIP) which is ideal for small, built-in motor applications up to 100 W in free air. - STGIPN3H60, STGIPS14K60, STGIPS20K60.

## Protection Devices



ST's leading position in demanding markets, including the automotive, computer, consumer, industrial and telecom segments, is based on application expertise and leading-edge technologies such as: High-current crowbar protection for lightning surges, High-efficiency clamping protection for power surges and ESD, Application-specific protection: serial current limiter, thermal shutdown, CMOS and SPI interface compatibility. ST's large protection portfolio brings immunity, flexibility and reliability to our customers' electronic systems.

**USB port protection:** Ever since USB 1.0, ST has been developing specific USB port dataline and VBUS protection devices in a single package. The range now covers USB 2.0, USB 3.0, as well as the μUSB universal port. The range is compliant with the highest IEC 6100-4-2 standard and with USB 2.0 and USB 3.0 eye diagrams. For layout and assembly flexibility, ST's USB protection series are available in SOT, μQFN, or flip-chip packages. DVIULC6, ESDA-1K, ESDA14V2.

## Power Management ICs



As one of the world's leading suppliers of both integrated and discrete power conversion semiconductors, ST's power management devices enable energy-saving, high-power-density and lower-standby-power design solutions. Product portfolio includes highly integrated AC-to-DC and DC-to-DC switching, linear power conversion ICs, battery management devices, supervisors, resets, power over Ethernet, and power path management ICs.

**High Voltage Converters:** The new high-voltage converters meet the energy-saving regulations and conservation requirements inciting improvements in energy efficiency. VIPerPlus converters combine the innovative 800 V avalanche-rugged SuperMESH™ power MOSFET with state-of-the-art PWM circuitry. HVLED LED drivers, operating directly from the rectified mains with minimum external parts, provide an efficient, compact and cost-effective solution to drive LEDs: accurate all primary-current control avoids the use of secondary sensing, reducing costs and complexity of the application; internal power MOSFET and high-voltage start-up allow compact application; zero-voltage switching operation boosts efficiency. - VIPER100, VIPER53, HVLED805, UC3844/45, L6566, TSM1011/2/3/4, LK112, L4931, L6924, STM809

**Multi-output Regulators:** ST offers a complete portfolio of DC-DC multi-output converters, addressing different applications. The PM66xx family of multifunction regulators features very high efficiency in a small form factor package. The PM66xxA family has an extended VIN and temperature range. All devices are available in compact VFQFPN. PM6680, PM6612, ST2S08

**Powered Devices:** Power over Ethernet (PoE) applications should now be compliant with the recently approved IEEE 802.3 at specification, commonly known as PoE+. The design of power supply sections of all powered devices can be greatly simplified with the PM880x family, integrating a power over Ethernet (PoE) interface and a current-mode PWM controller. The PoE interface incorporates all the functions required by the communication standard, including detection, classification, undervoltage lockout (UVLO) and in-rush current limitation.

### Sensors and Mems



ST's growing portfolio of sensors includes:

#### MEMS-based sensors

accelerometers, gyroscopes, digital compasses, pressure sensors, iNEMO inertial modules and microphones

ST's state-of-the-art analog and digital accelerometers feature up to  $\pm 24g$  full scale, high resolution, smart embedded functionalities and advanced power-saving features. A set of smart SPI/I<sup>2</sup>C programmable embedded functions, such as low-power mode, auto wake-up function, free-fall and 6D-orientation detection are integrated into the LIS331DLx family. To address automotive applications, ST has designed the AISxxx accelerometers that offer extended temperature range and are AEC-Q100 qualified.

#### Analog and digital temperature sensors

STMicroelectronics' temperature sensors include both precision analog temperature sensor ICs and precision digital temperature sensor ICs. ST's digital temperature sensors feature low power consumption, up to 12-bit resolution and can operate over a temperature range as wide as  $-55$  to  $+125$  °C. LM334, STLM75, STTS75

#### FingerTip capacitive multi-touch controllers and S-Touch® resistive controllers

- STMT04, STMT07

Capacitive multi-touch controllers: The S-Touch® FingerTip controller provides true multi-touch capability supporting unlimited simultaneous touches.

### Thyristors And AC Switches



ST offers a complete range of thyristors and AC switches with voltage ratings up to 1200 V, current ratings up to 120 A and a range of packages from miniature surface-mounted packages to high power dissipation isolated and non-isolated packages. The latest extension to the AC switch range features the SMBflat package, which is smaller than SOT-223 and is aimed at the 0.8 A device range, SCRs, Triacs and ACS types. The PCB can be designed so the SMBflat and SOT-223 are fully interchangeable for increased production flexibility. - BTW67/8/9, TS1220, TS820

Standard and sensitive-gate SCRs are invaluable when simple gate drive or mains voltage is the given environment of the system. ST's SCR devices allow a peak voltage up to 1200 V, a maximum current up to 50 A, with gate trigger current either well under 1 mA for sensitive types or  $\times 10$  mA for standard gate versions. They are available in SOT-23, SOT-223, TO-92, DPAK, IPAK, TO-202-3, TO-220, RD-91 and TO-P3 packages.

High-temperature SCRs are designed for all modes of control found in applications such as overvoltage crowbar protection, motor control circuits in power tools and kitchen aids, inrush current-limiting circuits, capacitive discharge ignition and voltage regulation circuits. Featuring a high temperature design (150 °C), the device maintains a good voltage drop, which allows high current density in the circuits or smaller heatsinks. The sensitive gate allows a current down to 5 mA to trigger IC drive. These SCRs are now available in 12 A, with two package versions. - TN1205H.

### Transistors



**Power Transistors:** Based on proprietary leading-edge low- and high-voltage technologies, ST offers a broad portfolio of power MOSFETs with breakdown voltages ranging from  $-60$  V to 1500 V. - STB50NF25, STF20NF20

ST's proprietary SuperMESH, SuperMESH 3, and SuperMESH 5 technologies are designed to minimize on-state resistance, optimize switching performance, and sustain high-energy pulses in avalanche and commutation modes. These devices are available with breakdown voltages up to 1500 V, drain current up to 40 A and on-resistance as low as  $0.18$   $\Omega$  in a wide range of compact and high dissipation packages: D2PAK, I2PAK, IPAK, ISOTOP, SOT 223, TO 220, TO 247, TO 252, TO 3PF, STD3NK80, STD7NM80

**IGBTs:** These devices supply a maximum collector current of up to 30 A and a maximum switching frequency of up to 1 kHz. ST's proprietary technology used for this voltage range is PowerMESH. They are ideal for automotive applications. The available packages range from miniature to power packages: IPAK, TO 220, TO 247, TO 251, TO 252. - STGD18N40, STGP10NB37

**High Voltage Power:** These devices are ideal for applications including lighting and power supply. They are available with collector-emitter voltages of up to 700 V, collector currents of up to 60 A and a minimum hFE of up to 70. The available packages are D2PAK, DPAK, ISOTOP, TO-3PF, DIP-8, SOT-223, SOT-32, SOT-82, TO-220, TO-247, TO-3, TO-92. ST's proprietary technology used for this voltage range is planar high voltage. - BUL742, STD616C

**Bipolar Small Signal 0.5 - 5 GHz:** These devices are ideal for applications including automatic meter reading. This device family works with a supply voltage of 3.6 V and, operating at up to 5 GHz, is capable of delivering an output power of up to 29 dBm. The available packages are SOT-343, SOT-89. ST's proprietary technology used for this voltage range is NPN RF bipolar technology (HSB3).

### Communication & Connectivity ICs



ST's mobile communications product portfolio has now moved to ST-Ericsson (www.stericsson.com). ST's communication portfolio retains solutions for ZigBee® large-scale mesh networks, and wireless tracking networks. We also continue to offer high-performance DSL solutions for customer-premise equipment (CPE), Ethernet products for LAN applications and powerline communication ICs.

**Standalone Bluetooth receivers** support the Bluetooth specification V2.1 + EDR (Lisbon) and are optimized in terms of RF performances and costs. - STA2500D.

**RF communication ICs:** Sub-GHz RF proprietary transceivers with excellent receiver sensitivity and unbeatable low current consumption. Error-free transmission in harsh-environmental or challenging-logistical conditions are guaranteed because of the supported frequency hopping, auto-acknowledgement and antenna diversity embedded algorithms. SPIRIT1, STB5701.

### Embedded Microprocessors



Embedded microprocessors, or eMPUs, offer powerful processing cores, can manage external memory resources and a wealth of peripherals, whilst remaining flexible enough to serve a broad range of applications. ST's SPEAr® family of embedded MPUs meet these challenges head-on with state-of-the-art architecture, silicon technology and intellectual property, targeting networked devices used for communication, display and control.

**SPEAr Embedded Microprocessors:** Highly integrated, the SPEAr® eMPU family are 32-bit ARM® ARM926EJ-S or Cortex-A9-based devices for cost-sensitive applications requiring significant processing and connectivity capabilities at lower power consumptions. - SPEAr300/310/320

#### Advantages

- Based on an industry-standard ARM® core
- Architecture includes proven IPs for connectivity, memory interfaces and high-performance internal bus system
- Full range ASSP portfolio
- Development kits are available to allow a full custom project approach
- Clear path to architecture and technology evolution
- Optional configurable embedded logic block allows selected customers to develop a customized SPEAr solution for a specific business

### Audio ICs



Worldwide leader in high-performance audio solutions, ST's have a wide portfolio of digital, analog and mixed-signal integrated circuits.

**Analog Audio Processor ICs:** Our analog audio processor ICs offer features such as digital volume control, surround sound, bass-middle-treble control, balance control - TDA7309, TDA7430, TDA7448

**Based on a VLIW DSP core** specially optimized for audio applications, the integrated MP3 decoders add voice recording/playback capabilities to personal players, with extremely low power consumption, typically 85 mW at 2.4 V. Delivered in compact SO28, TQFP44 and BGA8x8 packages, MP3 chipsets decode a 320 Kbit/s bitstream. - STA013

**Digital Audio ICs** - For the higher output power range, ST offers its latest generation of digital audio power amplifiers, based on ST's FFX technology. Combining all-digital and high-efficiency full flexible amplification, ST's audio power solutions can be used in a wide range of consumer audio products. - STA510F, STA518

### Analog & Mixed Signal ICs



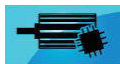
ST offers a wide range of high-performance analog and mixed-signal products. These circuits perform several functions or system sub-functions, with some being an entire system-on-chip (SoC) or system-in-package (SIP). The products include circuits for data conversion, timer functions, power switches, interfaces, multiple or single drivers and half-bridge drivers.

**Data Conversion:** ST's high performance analog-to-digital converters combine high-speed with ultra-low power dissipation. The ADC technology in  $0.25$   $\mu$ m CMOS provides a very efficient speed-to-power ratio and results in a highly cost-effective integration for the application. - TSA1203/04

**Intelligent Power Switches for Industry:** ST offers a series of intelligent power switches (IPS) for high-side and low-side configurations. These devices integrate the control section (logic interface, drivers, diagnostic and protection features) and the power stage on the same chip, with benefits in terms of compactness, increased system reliability and cost effectiveness. - L295, L6360, TDE1707



## Motor Control ICs & Modules



ST's global system approach to motion control key function greatly simplifies the design of flexible motor controllers. Ideal for driving brush DC, bipolar stepper and permanent magnet 3-phase brushless motors, ST's motor control solutions offer an open, scalable and integrated answer to the market's most demanding motion control performances.

**Integrated Motor Drive:** The SPIMD20 is a step forward in motion control. It offers a complete motor drive solution in a single, robust and reliable module, including full bridge IGBT inverter, control unit and communication interface based on real-time industrial Ethernet. It is ready to be integrated in any brushless 3-phase motor up to 2 kW (i.e. 6.4 Nm @ 3000 rpm). The flexibility of the concept allows you to use the SPIMD20 as the first brick in a motion distributed solution, implementing proprietary or open solutions. The architecture is suitable for the most common industrial safety standards. – SPIMD20

**Stepper and DC:** ST offers integrated circuits designed to sense and control the current in stepper and DC motors. When used in conjunction with dual H-bridge products, the chipset forms a constant-current drive for an inductive load and performs all interface functions from the control logic through to the power stage. – L297, L6258, L6506

**Dual H – Bridge:** Making the design of single, dual DC, and stepper motors much easier, ST's motor drivers combine control logic and the power stages on the same chip.

**Single H – Bridge:** ST's single H-Bridge bipolar or DMOS drivers help to reduce the number of components by combining both the gate driver and power stage on a single chip. These drivers control and drive one DC motor or one phase of a bipolar stepper motor. Offering multiple package options, including Multiwatt, these ICs are suitable for various applications. – L6201/2/3, TEA3718

**Microstepping and Multimotor:** Designing DC and stepper motors becomes much easier with the outstanding performance, features, and support of the latest motor driver families: dSPIN, FlexSPIN, and easySPIN. Key benefits of dSPIN (L6470/2) motor drivers: Fully-digital motion control allows the user to set a variety of features: target speed, acceleration/ deceleration, absolute and relative position. With the integrated motion engine and SPI interface, no need for external microcontroller or DSP, the innovative voltage mode control (available on the L6470) allows 128 microsteps per step featuring the best motion resolution ever reached in monolithic stepper motor drivers. – L6258, L6219, L6472

## Clocks & Timing Circuits



STMicroelectronics offers a portfolio including frequency timing generators, clock distribution ICs, TIMEKEEPER® devices and real-time clock (RTC) ICs. These provide best-in-class performance for accuracy and ultra-low power consumption to address battery-powered applications, communication, networking and industrial applications.

**Timer, Industry Standard:** ST's industry-standard frequency generators are circuits designed in bipolar technology. In the time-delay operating mode, the time is precisely controlled by an external RC oscillator. The circuits may be triggered and reset on the falling edge. The output can source or sink up to 200 mA. – NE555, SA556, SE555

**Timer, Low Power:** ST's low-power frequency generators are circuits designed in CMOS technology. Timing remains accurate in both monostable and astable modes. Their higher input impedance requires smaller capacitors. – TS555, TS556

**Timekeeper Supervisors:** Timekeeper supervisors are self-contained devices that include a real time clock, programmable alarms, a watchdog timer, and a square wave output which provides the control of an external low-power static RAM. The 16 TIMEKEEPER® registers offer in addition to standard date and time: calibration, alarm, century, watchdog, and square wave output data. – M48T01

**Real-Time Clock (RTC) ICs:** ST's serial real-time clock devices combine the RTC function with the supervisor functions. The features related to supervising a microprocessor include a programmable watchdog, an early power-fail warning circuit and the power-on reset/low-voltage detect. The programmable alarm with repeat mode may be used in the battery back-up mode. – M41T56, M41T60, M41T93

**Battery & Crystal Options:** These devices are detachable lithium power sources in 4-pin SNAPHAT housing designed to be snapped on after the surface mounting of the SOIC. They provide battery backup power for supervisory functions such as power-on reset/low-voltage detect, early power-fail warning, battery monitor and tamper detect for secure applications. – M4T28-BR12SH, M4T32-BR12SH

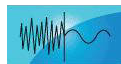
**Timekeepers:** These devices are non-volatile static RAMs with different densities together with a dedicated real-time clock circuit. A special DIP CAPHAT™ package houses the circuit with a quartz crystal and a long life lithium cell to form a highly integrated battery backed-up memory and real-time clock solution. The battery cell has sufficient capacity and storage life to maintain data and clock functionality for an accumulated time period of at least 10 years in the absence of power. – M48T08, M48T02, M48T58.

## Diodes



ST offers Schottky and ultrafast rectifier solutions for all market requirements. ST's latest developments include ULVF™ ultra-low VF diodes, improved avalanche rating, and the integration of higher currents in low-profile PowerFLAT™ packages. For power converter applications where silicon diodes reach the limits of their operating temperature and power density, ST silicon carbide devices take over with optimal reliability. – STPS0540, STPS10L40, STPS130/40.

## EMI Filtering & Signal Conditioning



Resistors, capacitors, inductors, ESD diodes and multiple other functions in a single, tiny package, to provide new solutions for the converging market. ST IPAD devices can cover many functions such as ESD protection, EMI low-pass filtering, line termination, pull-up or pull-down resistance, differential to common-mode as well as wide-band RF coupling, and high- or low-band filtering.

**Memory and SIM card IPAD:** ST has developed a complete range of IPAD™ components dedicated to memory-card interfaces such as micro-SD cards, T-Flash or SIM cards. Available in CSP or micro-QFN packages, these filters cover new standards such as SDA3.0 (SDR 104). – EMIF03, EMIF06, EMIF09

**USB IPAD:** ST has developed a complete range of IPAD™ components dedicated to USB interfaces. These devices combine EMI low-pass or common-mode filters, ESD protection, pull-up or pull-down resistors to support USB 2.0 and OTG (On-The-Go) specifications. – EMIF02, USBUF, USBDF, ECMF02

## Logic, Signal Switches



ST manufactures a broad line of standard logic devices including HCMOS standard logic devices for 3.3 V and 5 V applications, LED drivers and front-panel controllers, level translators, single, double and triple buffer circuits, analog and digital switches, power switches, pulser ICs and Xpander devices.

**LED Driver (Power Logic):** ST's LED drivers are monolithic, low-voltage, low-current, multiple power current sources that provide 5 mA to 100 mA constant current. The balanced turn on/off improves system performances by reducing the bypass capacitance in applications where parasitic inductance generates ringing or noise in the system. The LED's brightness can be controlled by using an external resistor to adjust the output current. – STP04CM05, STP24DP05, STPIC6C595

**Single Gates:** ST's single-gate devices are designed for applications where traditional dual, quad, or hex functions are not desired. In order to meet space-constrained application requirements, ST offers these devices in SOT-23, SOT-323 and flip-chip packages. – 74V1Gxx

## Microcontrollers



ST's product portfolio contains a comprehensive range of microcontrollers, starting from robust, low-cost 8-bit MCUs to 32-bit ARM-based Cortex™-M3 Flash microcontrollers.

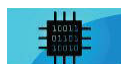
**STM32 – 32-bit ARM Cortex MCUs:** The STM32 family of 32 bit Flash microcontrollers based on the ARM Cortex™ M processor is designed to offer new degrees of freedom to MCU users. It offers 32 bit product range that combines high performance, real time capabilities, digital signal processing, and low power, low voltage operation, while maintaining full integration and ease of development. The unparalleled and large range of STM32 devices, based on an industry-standard core and accompanied by a vast choice of tools and software, makes this family of products the ideal choice, both for small projects and for entire platform decisions. STM32F10x

**STMTouch:** The STMTouch family is a user-friendly platform for fast and safe development in proximity, key, capacitive-screen and resistive-screen applications. STMTouch benefits from the industry-acclaimed STM32 and STM8 architectures combined with very-low-power technologies and low-energy oriented features. – STM8T141, STM8TL53C4

**STR7 32-bit ARM7 MCUs:** The STR7 family combines the industry-standard ARM7TDMI® 32-bit RISC core, with a comprehensive set of peripherals and ST's 0.18 µm embedded Flash technology in the STR710, STR730 and STR750 ranges. – STR712Fxx, STR715Fxx, STR736Fxx

**Ultra-low-power MCUs:** The ultra-low-power EnergyLite™ MCU platform is based on the 8-bit STM8L and 32-bit STM32L MCUs, processed on proprietary 130 nm ultra-low-leakage process technology. The EnergyLite platform enables STM8L and STM32L microcontrollers to operate at the industry's lowest power consumption with 1.3 µA with SRAM retention and full RTC running, and 300 nA in standby. – STM32L151, STM32L162

## Memories



ST offers a wide range of non-volatile memories. The serial EEPROM family ranges from 1 Kbit to 2 Mbits and offers different serial interfaces: I<sup>2</sup>C, SPI, Microwire. The innovative family of Dual Interface EEPROMs offers new features and capabilities. The EEPROM memory bank provides read and write access by either a standard I<sup>2</sup>C interface or by an ISO 15693 RF interface. This new type of wireless memory enables on-board energy savings and provides easy and convenient remote access to electronic product parameters. ST offers a wide range of RFID reader ICs and tag ICs for contactless short-range and long-range applications. The products comply with the ISO 14443 and ISO 15693 RFID standards based on the 13.56 MHz carrier frequency. They can also communicate with ISO 15693-capable NFC devices.

**Dual Interface EEPROM:** features and capabilities. The EEPROM memory bank can be accessed either by a low power I<sup>2</sup>C interface or by an ISO 15693 RF interface operating at 13.56 MHz. In addition, the family features a 32-bit password protection mechanism. Dual Interface EEPROMs are able to transmit information from the heart of the application either to an ISO 15693-capable NFC smartphone or to an industrial RFID reader. – M24LR04/16/64

**EEPROM, Serial:** The EEPROM portfolio includes devices covering compatibility with all major bus types (I<sup>2</sup>C, Microwire, SPI), a wide scale of operating voltages (from 1.7 to 5.5 V), a wide temperature range, large density and speed ranges (1 Kbit to 2 Mbits, SPI up to 20 MHz, I<sup>2</sup>C up to 1 MHz). Completing this portfolio, ST offers a build-your-own custom-EEPROM capability, enabling design engineers to achieve a higher flexibility in optimizing the system parameters. – M93S46, M95020, M24Cxx