

M95 Dual SIM

Application Notes

GSM/GPRS Module Series

Rev. 3.0

Date: 2013-01-29



Our aim is to provide customers with timely and comprehensive service. For any assistance, please contact our company headquarter:

Quectel Wireless Solutions Co., Ltd.

Room 501, Building 13, No.99, Tianzhou Road, Shanghai, China, 200233

Tel: +86 21 5108 6236

Mail: info@quectel.com

Or our local office, for more information, please visit:

http://www.quectel.com/quectel_sales_office.html

For technical support, to report documentation errors, please visit:

<http://www.quectel.com/tecsupport.aspx>

GENERAL NOTES

QUECTEL OFFERS THIS INFORMATION AS A SERVICE TO ITS CUSTOMERS. THE INFORMATION PROVIDED IS BASED UPON CUSTOMERS' REQUIREMENTS. QUECTEL MAKES EVERY EFFORT TO ENSURE THE QUALITY OF THE INFORMATION IT MAKES AVAILABLE. QUECTEL DOES NOT MAKE ANY WARRANTY AS TO THE INFORMATION CONTAINED HEREIN, AND DOES NOT ACCEPT ANY LIABILITY FOR ANY INJURY, LOSS OR DAMAGE OF ANY KIND INCURRED BY USE OF OR RELIANCE UPON THE INFORMATION. ALL INFORMATION SUPPLIED HEREIN ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

COPYRIGHT

THIS INFORMATION CONTAINED HERE IS PROPRIETARY TECHNICAL INFORMATION OF QUECTEL CO., LTD. TRANSMITTABLE, REPRODUCTION, DISSEMINATION AND EDITING OF THIS DOCUMENT AS WELL AS UTILIZATION OF THIS CONTENTS ARE FORBIDDEN WITHOUT PERMISSION. OFFENDERS WILL BE HELD LIABLE FOR PAYMENT OF DAMAGES. ALL RIGHTS ARE RESERVED IN THE EVENT OF A PATENT GRANT OR REGISTRATION OF A UTILITY MODEL OR DESIGN.

Copyright © Quectel Wireless Solutions Co., Ltd. 2013. All rights reserved.

About the document

History

Revision	Date	Author	Description
3.0	2013-01-22	Bob DENG	Initial

Quectel
Confidential

Contents

About the document	2
1 Introduction	4
2 Hardware Design Overview	5
2.1. Pin Description of SIM Card Interface	5
2.2. Dual SIM Card Mode	6
2.3. DCD Function Restrictions.....	7
3 Description of AT Command	8
3.1. AT+QDSIM Dual SIM Switch.....	8
3.2. Usage Examples	9
3.2.1. Initialization.....	9
3.2.2. Switch SIM Card without Restarting Module	9
3.2.3. Restart Module to Switch SIM Card.....	10

Quectel
Confidential

1 Introduction

This document mainly introduces how to use the Dual SIM function of Quectel M95 module. With this solution, M95 can manage two SIM cards and can switch between them without any external circuit. But only one SIM card can work at a time.

Quectel
Confidential

2 Hardware Design Overview

The following chapter introduces the pin definition of SIM card interface and reference circuit of Dual SIM card.

2.1. Pin description of SIM card interface

Table 1: Pin definition of SIM card interface

SIM Interface	Name	Pin No.	Function
SIM1	SIM_VDD	27	Power supply for SIM card Automatic detection of SIM card voltage. 3.0V±10% and 1.8V±10%. Maximum supply current is around 10mA.
	SIM_RST	28	SIM card reset
	SIM_DATA	29	SIM card data I/O
	SIM_CLK	30	SIM card clock
SIM1&SIM2	SIM_GND	31	SIM ground
SIM2	SIM2_DATA	16	SIM2 card data I/O
	SIM2_CLK	17	SIM2 card clock
	SIM2_VDD	18	Power supply for SIM card Automatic detection of SIM card voltage. 3.0V±10% and 1.8V±10%. Maximum supply current is around 10mA.
	DCD/ SIM2_RST	25	DCD function (Default) SIM2 card reset

NOTES

1. Recommended to use SIM1 interface by default when single SIM card is used.
2. When the SIM2 card interface is used, DCD function of serial port is disabled.

2.2. Dual SIM Card Mode

The reference circuit using a dual SIM card socket is illustrated as the following figure.

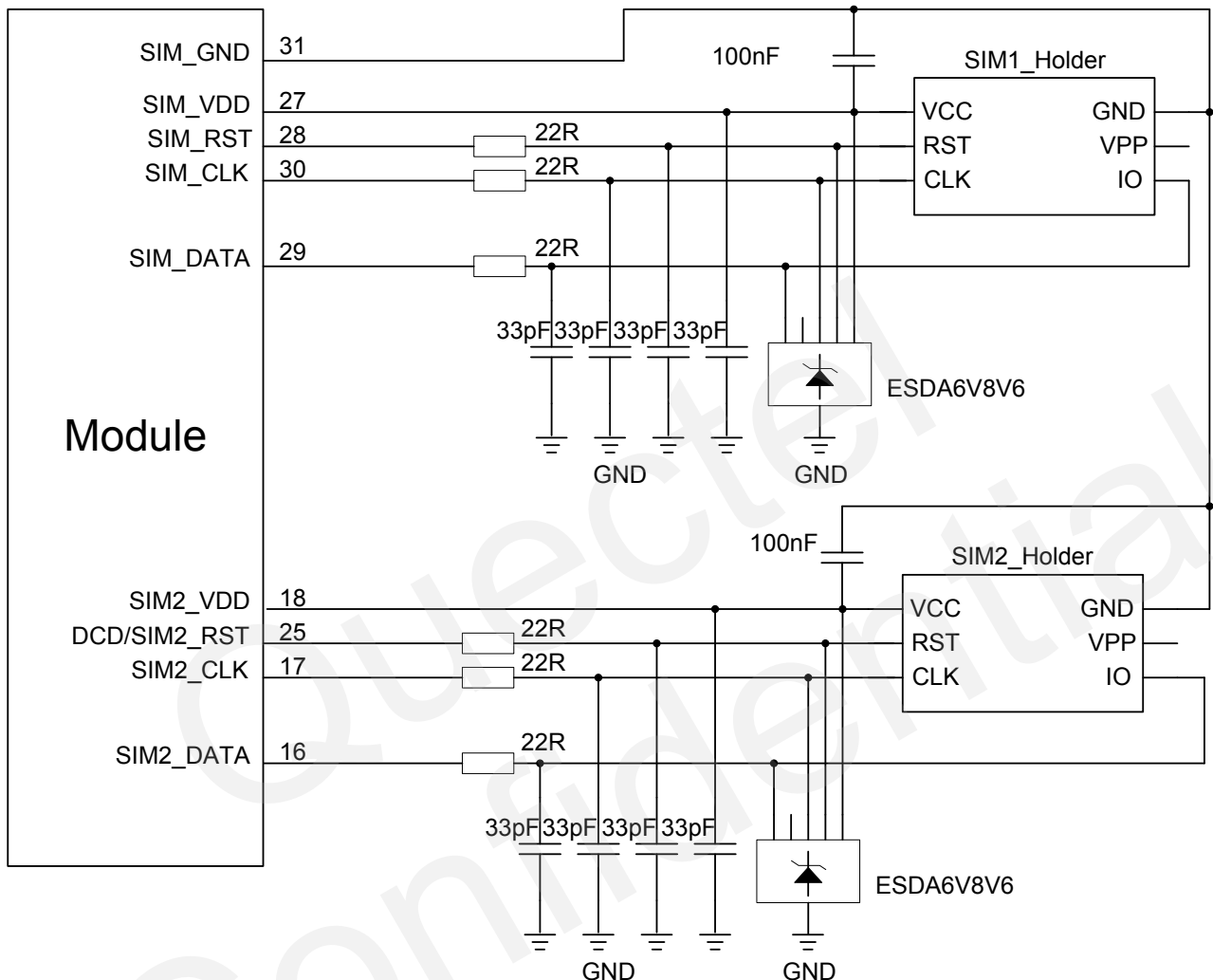


Figure 1: Reference Circuit of Dual SIM Card

In dual SIM card mode, configure **AT + QDSIM = 0,1** to use the SIM1 interface and configure **AT + QDSIM = 1,1** to use SIM2 interface.

In SIM interface designing, in order to ensure good communication performance with SIM card, the following design principles should be complied with.

- Place the SIM card holder as close as possible to the module. Ensure the trace length of SIM signals is less than 200mm.
- Keep the SIM signals far away from VBAT power and RF trace.
- The width of SIM_VDD and SIM_GND trace is not less than 0.5mm. Place a bypass capacitor close

to SIM card power pin. The value of capacitor is less than 1uF.

- To avoid possible cross-talk from the SIM_CLK signal to the SIM_DATA signal be careful that both traces are not placed closely next to each other. The traces of SIM_CLK, SIM_DATA and SIM_RST are recommended to be protected with ground independently.
- In order to ensure good ESD protection, It is recommended to add TVS array such as WILL (<http://www.willsemi.com>) ESDA6V8AV6 to protect all SIM card signals. The capacitance of ESD component is less than 50pF. The 22Ω resistors should be added in series between the module and the SIM card so as to suppress the EMI spurious transmission and enhance the ESD protection. Note that the SIM peripheral circuit should be close to the SIM card socket.
- Place the RF bypass capacitors (33pF) close to the SIM card on all signals line for improving EMI.

2.3. DCD Function Restrictions

Because SIM2_RST pin is also used on DCD pin, the DCD and Dual SIM function cannot work simultaneously. DCD function is enabled and SIM2 is disabled by default. When SIM2 is used, please disabled DCD with AT+QDSIM command (See below for details). It is not recommended to use DCD function while SIM2 card is inserted.

3 Description of AT Command

3.1. AT+QDSIM Dual SIM Switch

SIM card can be selected using this command. This command also can enable or disable DCD function.

AT+QDSIM Dual SIM Switch	
Test Command AT+QDSIM=?	Response +QDSIM: (0,1),(0,1) OK
Read Command AT+QDSIM?	Response +QDSIM: <simslot>,<dcddis> OK
Write Command AT+QDSIM=<simslot>[,<dcddis>]	Response OK
Reference	

Parameters

< simslot>	SIM card slot
0	Select SIM card in slot 1, which is default configuration
1	Select SIM card in slot 2
<dcddis>	Disable DCD function
0	DCD function is enabled, which is default configuration
1	DCD function is disabled

NOTE

Parameters will be automatically saved into NVRAM after they are configured successfully.

3.2. Usage Examples

3.2.1. Initialization

When enabling Dual SIM Single Standby, the following steps must be executed when the system starts.

Example

// The module's factory default is that DCD function of SIM2_RST pin is enabled, GPIO is in high level, VSIM2 output is 2.8V.

```
AT+QDSIM?           // Query current SIM card slot.
+QDSIM: 0,0         // SIM card is SIM1, the DCD function is enabled by default.
```

OK

```
AT+QDSIM=0,1       // Configure SIM1, and disable the DCD function, close VSIM2 output voltage.
OK
```

3.2.2. Switch SIM Card without Restarting Module

The following is an example of switching SIM card without restarting the module.

Example

```
AT+QDSIM?           // Query current SIM card slot.
+QDSIM: 0,1         // The current SIM card is SIM1 and DCD function is disabled.
```

// prepare to switch to another SIM card.

```
AT+CFUN=0           // Set phone to Minimum functionality.
+CPIN: NOT READY
```

OK

AT+QDSIM=1,1 // Switch to SIM card in SIM slot 2 and disable DCD function.

OK

AT+CFUN=1 // Set phone to Full functionality.

OK

+CPIN: READY

Call Ready // Switch SIM card successfully.

3.2.3. Restart Module to Switch SIM Card

This example is for restarting the module to switch the SIM card.

Example

// The module's factory default is DCD function for SIM2_RST pin is enabled, GPIO is in high level, VSIM2 output is 2.8V.

AT+QDSIM? // Query current SIM card slot.

+QDSIM: 0,1 // The current SIM card is SIM1 and the DCD function is disabled.

OK

AT+QDSIM=1,1 // Switch to SIM card in SIM slot 2 and disable DCD function.

OK

AT+QPOWD=0 // Restart the module and switch to SIM2 in slot 2

OK