

M95 R2.0 Upgrade **Application Note**

GSM/GPRS Module Series

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

Quectel Wireless Solutions Co., Ltd.

Office 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:

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About the Document

History

Revision	Date	Author	Description
1.0	2014-08-06	Bonnie ZHAO	Initial
1.1	2014-09-12	Winter CHEN/ Jelly WANG	<ol style="list-style-type: none"> Added information of RTC Added information of IO DC characteristic Added the recording function in functions list Updated function comparison on STK summary download Updated the AT commands comparison: <ul style="list-style-type: none"> Added the comparison of AT+QBAND/AT+QPCMD/AT+QSIDET/AT+QNITZ/AT+QFOPEN Deleted the comparison of AT+QEAUART
1.2	2014-11-06	Jelly WANG / Winter CHEN	<ol style="list-style-type: none"> Updated function list: <ul style="list-style-type: none"> Support SIM Detect (DTR) function Added the function comparison on file download from FTP server Updated the AT commands comparison: <ul style="list-style-type: none"> Added the comparison of AT+QVBATT/AT+QJDCFG/AT+DS/AT+DR/AT+CRLP Deleted the comparison of AT+QSIMDET/AT+QSIMSTAT Modified RTC tolerance Added information of EMERG_OFF

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1 Introduction

This document introduces the differences between M95 R2.0 and M95 R1.0 GSM/GPRS module. It helps you to migrate from M95 R1.0 to M95 R2.0 easily.

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2 Hardware Comparison

2.1. Hardware Interfaces

The differences of hardware interfaces between M95 R2.0 and M95 R1.0 are listed as below:

Table 1: Comparison between Hardware Interfaces

M95 R2.0		M95 R1.0	
Pin No.	Pin Definition	Pin No.	Pin Definition
1	AGND	1	AGND
2	MIC2P	2	MIC2P
3	MIC2N	3	MIC2N
4	MIC1P	4	MIC1P
5	MIC1N	5	MIC1N
6	SPK1N	6	SPK1N
7	SPK1P	7	SPK1P
8	LOUDSPKN	8	LOUDSPKN
9	LOUDSPKP	9	LOUDSPKP
10	PWRKEY	10	PWRKEY
11	EMERG_OFF	11	EMERG_OFF
12	STATUS/PCM_SYNC	12	STATUS
13	NETLIGHT	13	NETLIGHT
14	DBG_RXD	14	DBG_RXD

15	DBG_TXD	15	DBG_TXD
16	SIM2_DATA	16	SIM2_DATA
17	SIM2_CLK	17	SIM2_CLK
18	SIM2_VDD	18	SIM2_VDD
19	VDD_EXT	19	VDD_EXT
20	DTR/SIM1_PRESENCE	20	DTR/SIM1_PRESENCE
21	RXD	21	RXD
22	TXD	22	TXD
23	CTS	23	CTS
24	RTS	24	RTS
25	DCD/SIM2_RST	25	DCD/SIM2_RST
26	RI/PCM_CLK	26	RI
27	SIM1_VDD	27	SIM1_VDD
28	SIM1_RST	28	SIM1_RST
29	SIM1_DATA	29	SIM1_DATA
30	SIM1_CLK	30	SIM1_CLK
31	SIM_GND	31	SIM_GND
32	VRTC	32	VRTC
33	VBAT	33	VBAT
34	VBAT	34	VBAT
35	GND	35	GND
36	GND	36	GND
37	GND	37	GND
38	GND	38	GND
39	RF_ANT	39	RF_ANT

40	GND	40	GND
41	PCM_OUT	41	RESERVED
42	PCM_IN	42	RESERVED

DC characteristics of the PWRKEY pin and EMERG_OFF pin between M95 R2.0 and M95 R1.0 are different. The table below shows the details.

Table 2: Differences on DC Characteristics of PWRKEY Pin and EMERG_OFF Pin

M95 R2.0			M95 R1.0		
Pin No.	Pin Definition	DC Characteristics	Pin No.	Pin Definition	DC Characteristics
10	PWRKEY	$V_{ILmax} = 0.1 \times V_{BAT}$ $V_{IHmin} = 0.6 \times V_{BAT}$ $V_{Imax} = 3.1V$	10	PWRKEY	$V_{ILmax} = 0.1 \times V_{BAT}$ $V_{IHmin} = 0.6 \times V_{BAT}$ $V_{Imax} = V_{BAT}$
11	EMERG_OFF	$V_{ILmax} = 0.45V$ $V_{IHmin} = 1.35V$ $V_{openmax} = 1.8V$	11	EMERG_OFF	$V_{ILmax} = 0.4V$ $V_{IHmin} = 2.2V$ $V_{openmax} = 2.8V$

2.2. Multiplexing Function

The multiplexing function of M95 R2.0 pins is listed as below:

Table 3: M95 R2.0 Pin Multiplexing Function Description

Pin No.	Pin Definition	Default Function	Multiplexing Function
12	STATUS/PCM_SYNC	STATUS	PCM_SYNC
20	DTR/SIM1_PRESENCE	DTR	SIM1_PRESENCE
25	DCD/SIM2_RST	DCD	SIM2_RST
26	RI/PCM_CLK	RI	PCM_CLK

2.3. Module Features

The differences of module features between M95 R2.0 and M95 R1.0 are listed as below:

Table 4: Comparison on Module Features

Function	M95 R2.0	M95 R1.0
Power Down Current Consumption	150uA	30uA
RTC Current Consumption	10uA	2.6 ~ 5uA
Class AB (AUDIO) Amplifier Power	870mW	800mW
Sensitivity	-109dBm	-108.5dBm

NOTES

1. Power Down Current Consumption: When the module is in power down mode, you can shut off VBAT to reduce the current consumption.
2. If the M95 R2.0 module is only powered by VRTC, the real time will have an error about 5 minutes a day. If you want to keep an accurate real time, please connect VBAT when module is turned off.

DC characteristics of the IO between M95 R2.0 and M95 R1.0 are different. The table below shows the details.

Table 5: Absolute Maximum Ratings

M95 R2.0				M95 R1.0			
Parameter	Min.	Max.	Unit	Parameter	Min.	Max.	Unit
Voltage at Digital Pins	-0.3	3.08	V	Voltage at Digital Pins	-0.3	3.3	V
Voltage at Analog Pins	-0.3	3.08	V	Voltage at Analog Pins	-0.3	3.3	V

Table 6: Low Level Time of EMERG_OFF

M95 R2.0				M95 R1.0			
Pin Name	Pin No.	I/O	Description	Pin Name	Pin No.	I/O	Description
EMERG_OFF	11	I	Emergency off. Pulled down for at least 40ms, which will turn off the module in case of emergency. Use it only when shutdown via PWRKEY or AT command cannot be implemented.	EMERG_OFF	11	I	Emergency off. Pulled down for at least 20ms, which will turn off the module in case of emergency. Use it only when shutdown via PWRKEY or AT command cannot be implemented.

NOTE

If the digital IO voltage between GSM module and MCU or other peripherals does not match, it may cause some unexpected abnormalities such as overvoltage warning and overvoltage shutdown. So the IO circuit design between them should comply with the DC characteristic described in the Hardware Design document. Meanwhile, you should make sure the parameters are within the range of absolute maximum ratings.

3 Function List

The following table lists the software functions of M95 R2.0 and M95 R1.0:

Table 7: Function List

Function	M95 R2.0	M95 R1.0
Data Call	Not Supported	Supported
Flow Control	Close flow control (By default)	Close flow control (By default)
QuecCell	Supported	Supported
SIM Detect (DTR)	Supported	Supported
DSSS	Supported	Supported
Jamming Detection	Supported	Supported
Phone Book	Supported	Supported
SMS	Supported	Supported
Voice Call	Supported	Supported
eCall	Supported	Supported
USSD	Supported	Supported
STK	Supported	Supported
MMS Send	Supported	Supported
RAM FILE	Supported	Supported
PPP	Supported	Supported
TCP/UDP	Supported	Supported
FTP	Supported	Supported

HTTP	Supported	Supported
HTTPS	Supported	Not Supported
SMTP	Supported	Supported
SMTPS	Supported	Not Supported
TCP SSL	Supported	Not Supported
PING	Supported	Supported
NITZ	Supported	Supported
NTP	Supported	Supported
QuecLocator	Supported	Supported
Recording	Supported	Not Supported
Audio Player (PCM Format)	Supported	Supported
DTMF	Supported	Supported
CMUX	Supported	Supported
QuecFOTA	Supported	Supported
Clock	Supported	Supported
Alarm	Supported	Supported

4 Function Comparison

4.1. QuecFOTA

Table 8: QuecFOTA Function

Function	M95 R2.0	M95 R1.0
QuecFOTA	The parameters saved automatically or by "AT&W" cannot be restored to default value after upgrading by QuecFOTA	The parameters saved automatically or by "AT&W" can be restored to default value after upgrading by QuecFOTA

4.2. Maximum Size of RAM FILE

Table 9: Maximum Size of RAM FILE

Function	M95 R2.0	M95 R1.0
RAM FILE	About 500KB	About 550KB

4.3. RDY Time

Table 10: RDY Time

Function	M95 R2.0	M95 R1.0
RDY Time	Around 3 Seconds	Around 5 Seconds

4.4. Close the FTP Server Time

Table 11: Close the FTP Server Time

Function	M95 R2.0	M95 R1.0
Close the FTP Server Time by AT+QFTPCLOSE	1 Second Increase the linger time for 3 seconds, depends on the network	0.5 Seconds Immediately respond with +QFTPCLOSE: 0

4.5. Download File from the FTP Server

Table 12: Download File from the FTP Server

Function	M95 R2.0	M95 R1.0
Download File from the FTP Server by AT+QFTPGET	Use QFTPCFG=4,"/COM/" to set file data input or output from UART. AT+QFTPCFG supports to resume file transferred from FTP server by setting resuming point.	Use QFTPCFG=4,"/COM/" to set file data input or output from UART. AT+QFTPCFG does not support to resume file transferred from FTP server by setting resuming point.

4.6. Hardware Gain of AT+QMIC

Table 13: Hardware Gain of AT+QMIC

Function	M95 R2.0	M95 R1.0
Hardware Gain of AT+QMIC	Analog gain of microphone has 4 steps totally, and increases 6dB at each step. In software, the range of AT+QMIC is 0-15, same with M95 R1.0.	Analog gain of microphone has 49 steps totally, and increases 1dB at each step.

5 AT Commands Comparison

5.1. SIM Commands

Table 14: SIM Commands

Function	M95 R2.0	M95 R1.0
Access Generic SIM by AT+CSIM	Supported Later	Supported

5.2. Network Service Commands

Table 15: Network Service Commands

Function	M95 R2.0	M95 R1.0
Get and Set Mobile Operation Band by AT+QBAND	<p>There is a blank after match string</p> <p>AT+QBAND=?</p> <p>+QBAND:</p> <p>("EGSM_MODE","DCS_MODE","PCS_MODE","GSM850_MODE","EGSM_DCS_MODE","GSM850_PCS_MODE","GSM850_EGSM_DCS_PCS_MODE")</p> <p>OK</p>	<p>There is not a blank after match string</p> <p>AT+QBAND=?</p> <p>+QBAND:("EGSM_MODE","DCS_MODE","PCS_MODE","GSM850_MODE","EGSM_DCS_MODE","GSM850_PCS_MODE","GSM850_EGSM_DCS_PCS_MODE")</p> <p>OK</p>

5.3. Call Commands

Table 16: Call Commands

Function	M95 R2.0	M95 R1.0
Number of Seconds to Wait for Connection Completion by AT\$7	Parameter range is 1-255 AT\$7=0 +CME ERROR: 100	Parameter range is 0-255 AT\$7=0 OK

5.4. SMS Commands

Table 17: SMS Commands

Function	M95 R2.0	M95 R1.0
Store Class 0 SMS to SIM by AT+QCLASS0 When Receiving Class 0 SMS	There is a blank after match string AT+QCLASS0=? +QCLASS0: (0,1) OK	There is not a blank after match string AT+QCLASS0=? +QCLASS0:(0,1) OK
Configure SMS Code Mode by AT+QSMSCODE	There is a blank after match string AT+QSMSCODE=? +QSMSCODE: (0-2) OK	There is not a blank after match string AT+QSMSCODE=? +QSMSCODE:(0-2) OK

5.5. GPRS Commands

Table 18: GPRS Commands

Function	M95 R2.0	M95 R1.0
Select Service for MO SMS Messages by AT+CGSMS	Default value is 1, circuit switch AT+CGSMS? +CGSMS: 1	Default value is 3, circuit switch preferred AT+CGSMS? +CGSMS: 3

	OK	OK
Activate or Deactivate PDP Context by AT+CGACT	Use "," to indicate parameters AT+CGACT=? +CGACT: (0,1)	Use "-" to indicate parameters AT+CGACT=? +CGACT: (0-1)
	OK	OK

5.6. Supplementary Service Commands

Table 19: Supplementary Service Commands

Function	M95 R2.0	M95 R1.0
Set Accumulated Call Meter by AT+CACM	Not Supported	Supported
Set Accumulated Call Meter Maximum Value by AT+CAMM	Not Supported	Supported
Set Advice of Charge by AT+CAOC	Not Supported	Supported
Set Call Meter Maximum Event by AT+CCWE	Not Supported	Supported
Set Price Per Unit and Currency Table by AT+CPUC	Not Supported	Supported
Close User Group Control by AT+CCUG	<index> default value is 0 AT+CCUG? +CCUG: 0,0,0	<index> default value is 10 AT+CCUG? +CCUG: 0,10,0
	OK	OK

5.7. Audio Commands

Table 20: Audio Commands

Function	M95 R2.0	M95 R1.0
Set Loud Speaker Volume Level by AT+CLVL	Default value of loudspeaker audio is 35 (AT+QAUDCH=2) AT+CLVL? +CLVL: 35	Default value of loudspeaker audio is 36 (AT+QAUDCH=2) AT+CLVL? +CLVL: 36

	OK	OK
Play PCM Stream to Call each other by AT+QPCMD	"-" indicates the parameter range, e.g.: "0-3" indicates the parameters support 0, 1, 2 and 3. While "," only indicates the parameter value, e.g.: "0,3" indicates the parameters only support 0 and 3 AT+QPCMD=? +QPCMD: (0,1)[,(0-7),(0-7),(0-3)[,(1-3)]]	"-" indicates the parameter range, e.g.: "0-3" indicates the parameters support 0, 1, 2 and 3. While "," only indicates the parameter value, e.g.: "0,3" indicates the parameters only support 0 and 3 AT+QPCMD=? +QPCMD: (0,1)[,(0-7),(0-7),(0,3)[,(1-3)]]
Change the Side Tone Gain Level by AT+QSIDET	OK There is a blank after match string AT+QSIDET? QSIDET(NORMAL_AUDIO): 80	OK There is not a blank after match string AT+QSIDET? QSIDET(NORMAL_AUDIO):80
	OK	OK

5.8. Status Control Commands

Table 21: Status Control Commands

Function	M95 R2.0	M95 R1.0
Synchronize Network Time by AT+QNITZ	Return the list of parameter range by Test Command AT+QNITZ=? +QNITZ: (0,1) OK	Do not return the list of parameter range by Test Command AT+QNITZ=? OK
AT+QVBATT Configure the Threshold of Voltage	The threshold rang of low voltage power down is 3100mV-3450mV by test command AT+QVBATT=? +QVBATT: 0,(3451-3600),(0,1) +QVBATT: 1,(3100-3450),(0,1) +QVBATT: 2,(4300-4550),(0,1) +QVBATT: 3,(4551-4730),(0,1)	The threshold rang of low voltage power down is 3230mV-3450mV by test command AT+QVBATT=? +QVBATT: 0,(3451-3600),(0,1) +QVBATT: 1,(3230-3450),(0,1) +QVBATT: 2,(4300-4550),(0,1) +QVBATT: 3,(4551-4730),(0,1)

OK

The default threshold of low voltage power down is 3100mV, the high voltage warning and high voltage power down are disabled by default

AT+QVBATT?

+QVBATT: 0,3500,1

+QVBATT: 1,3100,1

+QVBATT: 2,4500,0

+QVBATT: 3,4600,0

OK

OK

The default threshold of low voltage power down is 3300mV, the high voltage warning and high voltage power down are enabled by default

AT+QVBATT?

+QVBATT: 0,3500,1

+QVBATT: 1,3300,1

+QVBATT: 2,4500,1

+QVBATT: 3,4600,1

OK

5.9. FILE Commands

Table 22: FILE Commands

Function	M95 R2.0	M95 R1.0
	To query an open file by read command, the returned results do not have extra spaces	To query an open file by read command, the returned results have extra spaces
Open File by AT+QFOPEN	AT+QFOPEN? +QFOPEN: "RAM:1.txt",15204352,0	AT+QFOPEN? +QFOPEN: "RAM:1.txt", 15204352, 0
	OK	OK

5.10. JAMMING Commands

Table 23: JAMMING Commands

Function	M95 R2.0	M95 R1.0
Jamming Detection Configuration by AT+QJDCFG	The results in each row are +QJDCFG: by test command AT+QJDCFG? +QJDCFG: "URC",1 +QJDCFG: "PERIOD",0	The results in only the first line has +QJDCFG: by test command AT+QJDCFG? +QJDCFG: "URC",1

```
+QJDCFG: "PIN",""
+QJDCFG: "MNL",17
+QJDCFG: "MINCH",5

OK
```

```
"PERIOD",0
"PIN",""
"MNL",17
"MINCH",5
```

OK

5.11. Others Commands

Table 24: Others Commands

Function	M95 R2.0	M95 R1.0
Select Radio Link Protocol Parameter by AT+CRLP	Not Supported	Supported
Control V.42bis Date Compression by AT+DS	Not Supported	Supported
Control V.42bis Date Compression Reporting by AT+DR	Not Supported	Supported

6 Appendix A Reference

Table 25: Related Documents

SN	Document Name	Remark
[1]	Quectel_M95_AT_Commands_Manual_V1.3	M95 R1.0 AT Commands Manual
[2]	Quectel_M95_AT_Commands_Manual_V3.1	M95 R2.0 AT Commands Manual