



M10

Quectel Cellular Engine

EVB User Guide

M10_EVB_UGD_V1.01



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0. Revision History

Revision	Date	Author	Description of change
1.00	2009-06-17	Tracy ZHANG	Origin
1.01	2009-11-12	Yong AN	1. Modify figure5, 6, 7, and 10. 2. Add some content how to operate module better for customer when module is set to autobauding in default in Chapter 5.2.

1. Introduction

This document defines and specifies the usage of M10 EVB. Customers can get useful information about M10 EVB from this document.

1.1. Related Documents

Table 1: Related documents

SN	Document name	Remark
[1]	M10_ATC	AT commands sets
[2]	GSM_UART_AN	The document of serial port application note
[3]	M10_HD	Hardware design
[4]	GSM_FW_UPGRADE_AN01	Firmware upgrade application notes

1.2. Safety Caution

The following safety precautions must be observed during all phases of the operation, such as usage, service or repair of any cellular terminal or mobile incorporating M10 module. Manufactures of the cellular terminal should send the following safety information to users and operating personnel and to incorporate these guidelines into all manuals supplied with the product. If not so, Quectel does not take on any liability for customer failure to comply with these precautions.



When in a hospital or other health care facility, observe the restrictions about the use of mobile. Switch the cellular terminal or mobile off. Medical equipment may be sensitive to not operate normally for RF energy interference.



Switch off the cellular terminal or mobile before boarding an aircraft. Make sure it switched off. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. Forget to think much of these instructions may lead to the flight safety or offend against local legal action, or both.



Do not operate the cellular terminal or mobile in the presence of flammable gas or fume. Switch off the cellular terminal when you are near petrol station, fuel depot, chemical plant or where blasting operations are in progress. Operation of any electrical equipment in potentially explosive atmosphere can constitute a safety hazard.



Your cellular terminal or mobile receives and transmits radio frequency energy while switched on. RF interference can occur if it is used close to TV set, radio, computer or other electric equipment.



Road safety comes first! Do not use a hand-held cellular terminal or mobile while driving a vehicle, unless it is securely mounted in a holder for hands-free operation. Before making a call with a hand-held terminal or mobile, park the vehicle.



GSM cellular terminals or mobiles operate over radio frequency signal and cellular network and cannot be guaranteed to connect in all conditions, for example no mobile fee or an invalid SIM card. While you are in this condition and need emergent help, Please Remember using emergency call. In order to make or receive call, the cellular terminal or mobile must be switched on and in a service area with adequate cellular signal strength.

Some networks do not allow for emergency call if certain network services or phone features are in use (e.g. lock functions, fixed dialing etc.). You may have to deactivate those features before you can make an emergency call.

Also, some networks require that a valid SIM card be properly inserted in cellular terminal or mobile.

2. EVB Kit Introduction

2.1. EVB Top and Bottom View

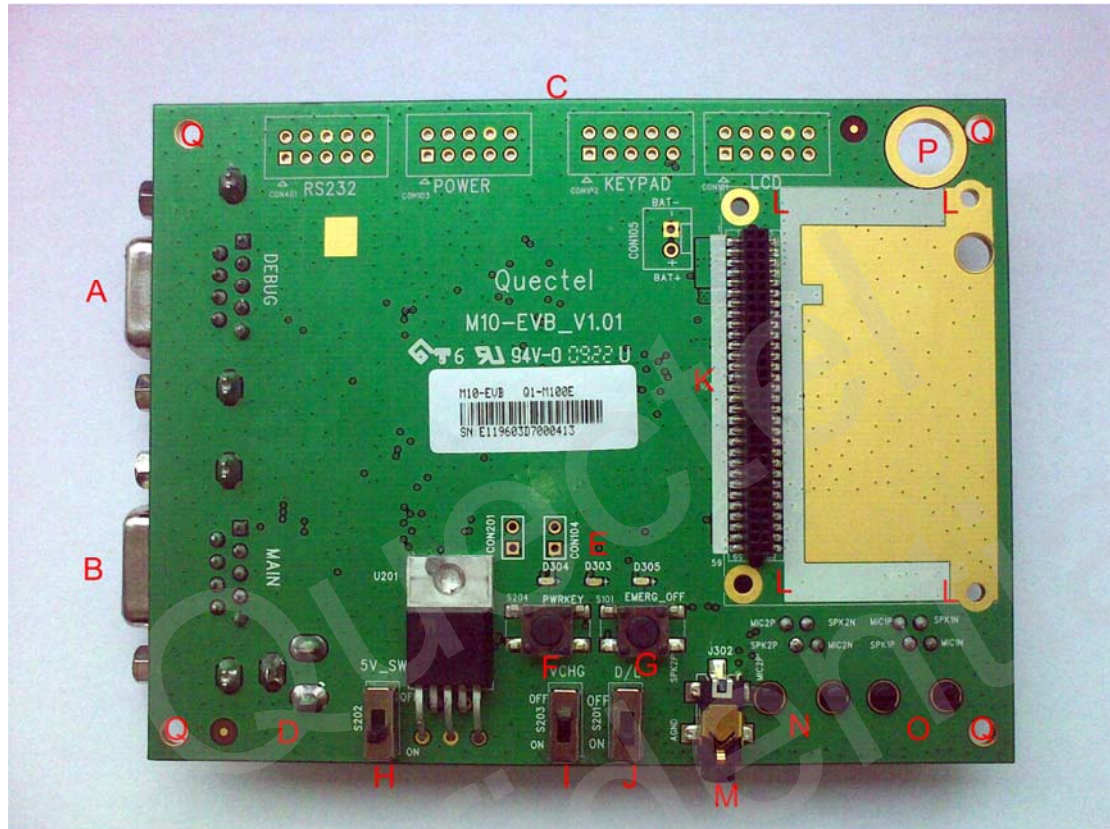


Figure 1: EVB top view

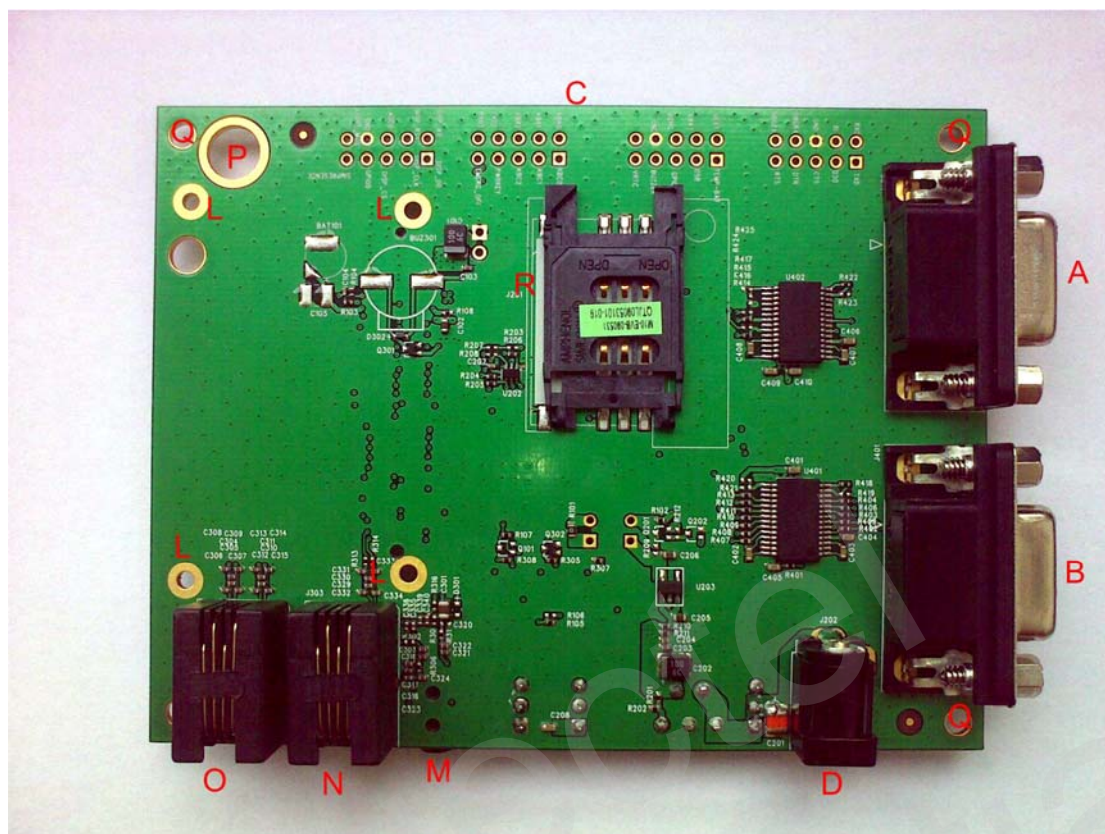


Figure 2: EVB bottom view

- A: Debug port
- B: Serial port
- C: Test points
- D: Adapter interface
- E: LED indicating module status
- F: PWRKEY button
- G: EMERG_OFF button
- H: VBAT switch
- I: VCHG switch (charging function)
- J: Download switch
- K: 60 pins M10-TE-A interface
- L: Screw holes for fixing the module
- M: Earphone interface
- N: Handset interface of audio channel 2
- O: Handset interface of audio channel 1
- P: Fixture hole for RF cable connector
- Q: Fixture holes for EVB poles
- R: SIM card interface

2.2. EVB Accessory



Figure 3: Accessory introduction

- A: 5V DC switching adapter
- B: USB to UART converter cable
- C: Antenna
- D: RF cable
- E: Earphone
- F: Bolts and nuts for fixing module and EVB

3. Interface Application

3.1. Power Interface

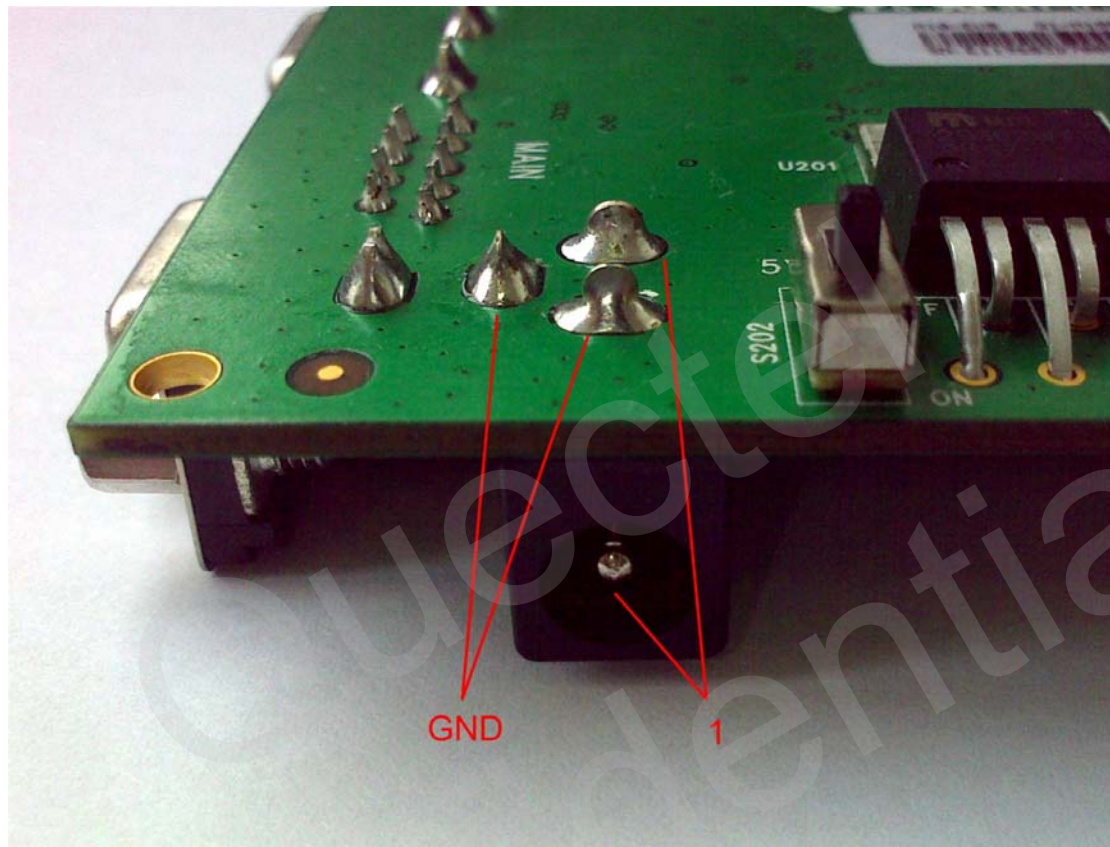


Figure 4: Power interface

Table 2: Pin of power interface

Pin	Signal	I/O	Description
1	Adapter input	I	5V/2A DC source input

3.2. Audio Interface

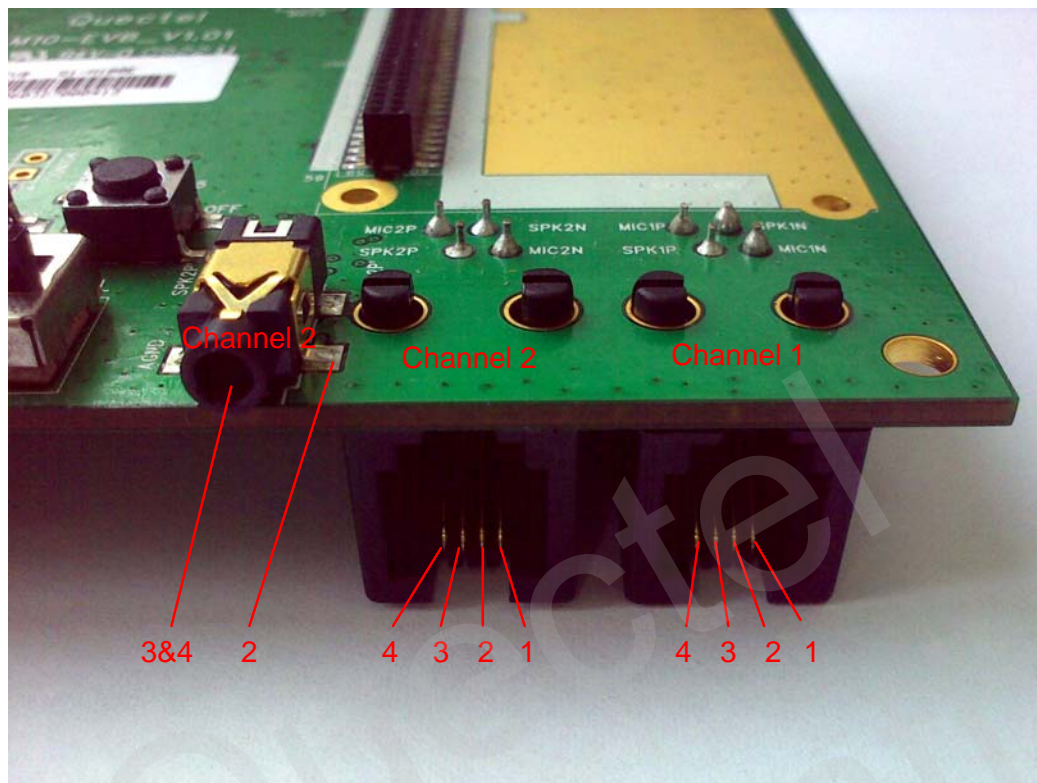


Figure 5: Audio interface

Table 3: Pins of audio channel 2

Pin	Signal	I/O	Description
1	MIC2N	I	Negative microphone input
2	AGND		AGND of audio circuits
3	SPK2P	O	Positive receiver output
4	MIC2P	I	Positive microphone input

An earphone or handset can be used in audio channel 2.

Table 4: Pins of audio channel 1

Pin	Signal	I/O	Description
1	MIC1N	I	Negative microphone input
2	SPK1N	O	Negative receiver output
3	SPK1P	O	Positive receiver output
4	MIC1P	I	Positive microphone input

3.3. SIM Card Interface

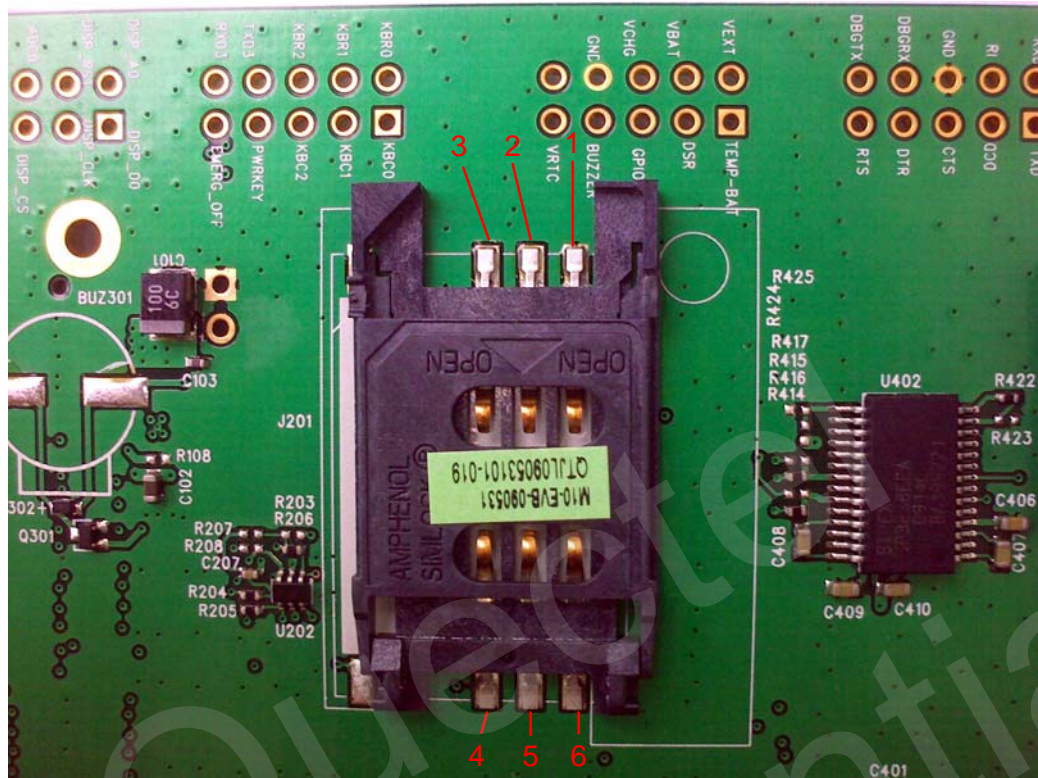


Figure 6: SIM card interface

Table 5: Pins of SIM card interface

Pin	Signal	I/O	Description
1	GND		Ground
2	VPP		Not connected
3	SIM_DATA	I/O	SIM card data I/O
4	SIM_CLK	O	SIM card clock
5	SIM_RST	O	SIM card reset
6	SIM_VDD	O	SIM card power output

3.4. Antenna Interface

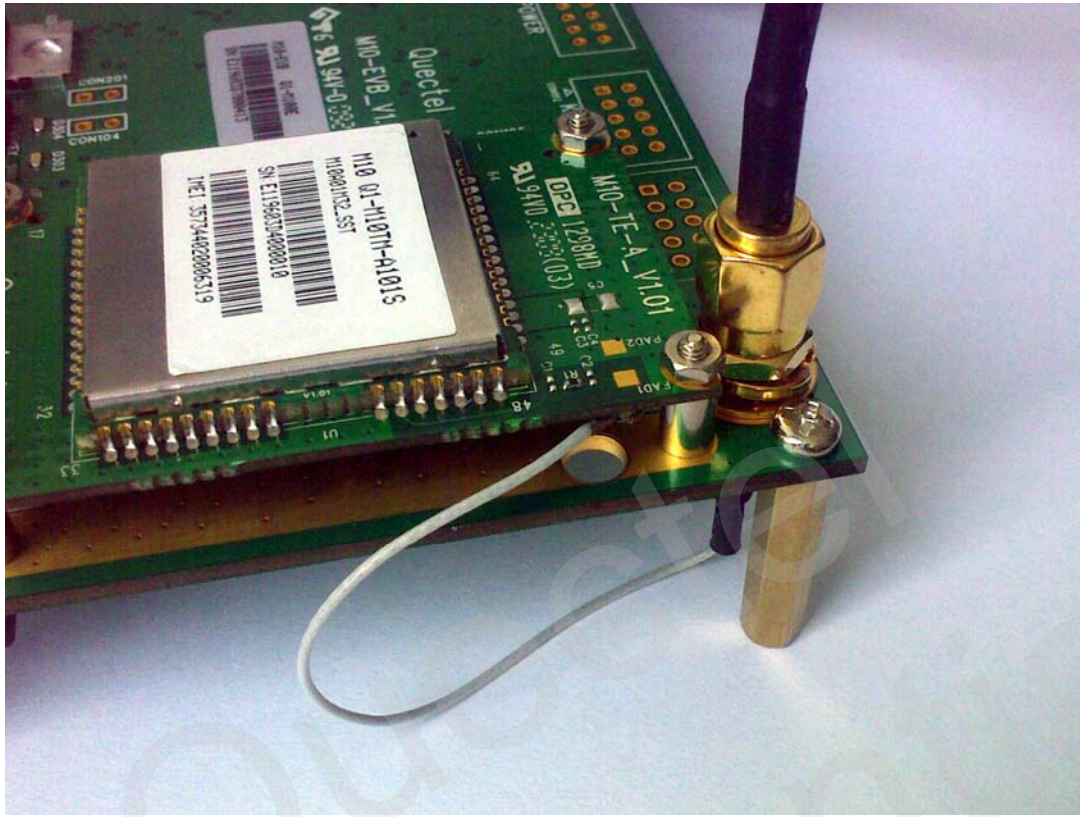


Figure 7: Antenna interface

3.5. Serial Port and Debug Port

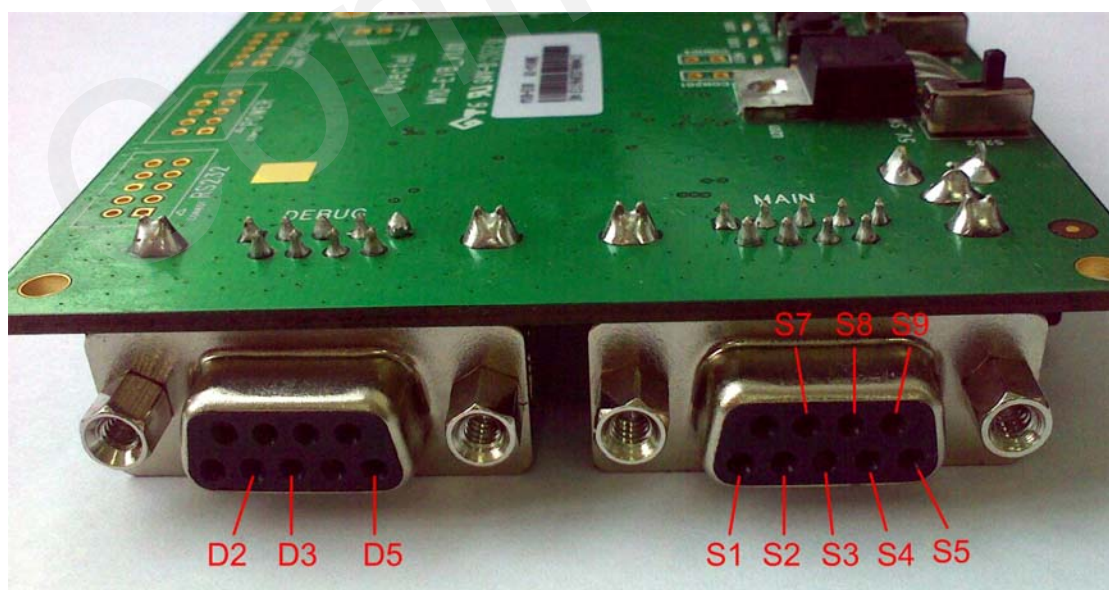


Figure 8: Serial port and Debug port

Table 6: Pins of Serial port

Pin	Signal	I/O	Description
S1	DCD	O	Data carrier detection
S2	TXD	O	Transmit data
S3	RXD	I	Receive data
S4	DTR	I	Data terminal ready
S5	GND		Ground
S7	RTS	I	Request to send
S8	CTS	O	Clear to send
S9	RI	O	Ring indicator

Table 7: Pins of Debug port

Pin	Signal	I/O	Description
D2	DBG_TXD	O	Transmit data
D3	DBG_RXD	I	Receive data
D5	GND		Ground

3.6. Switches and Buttons

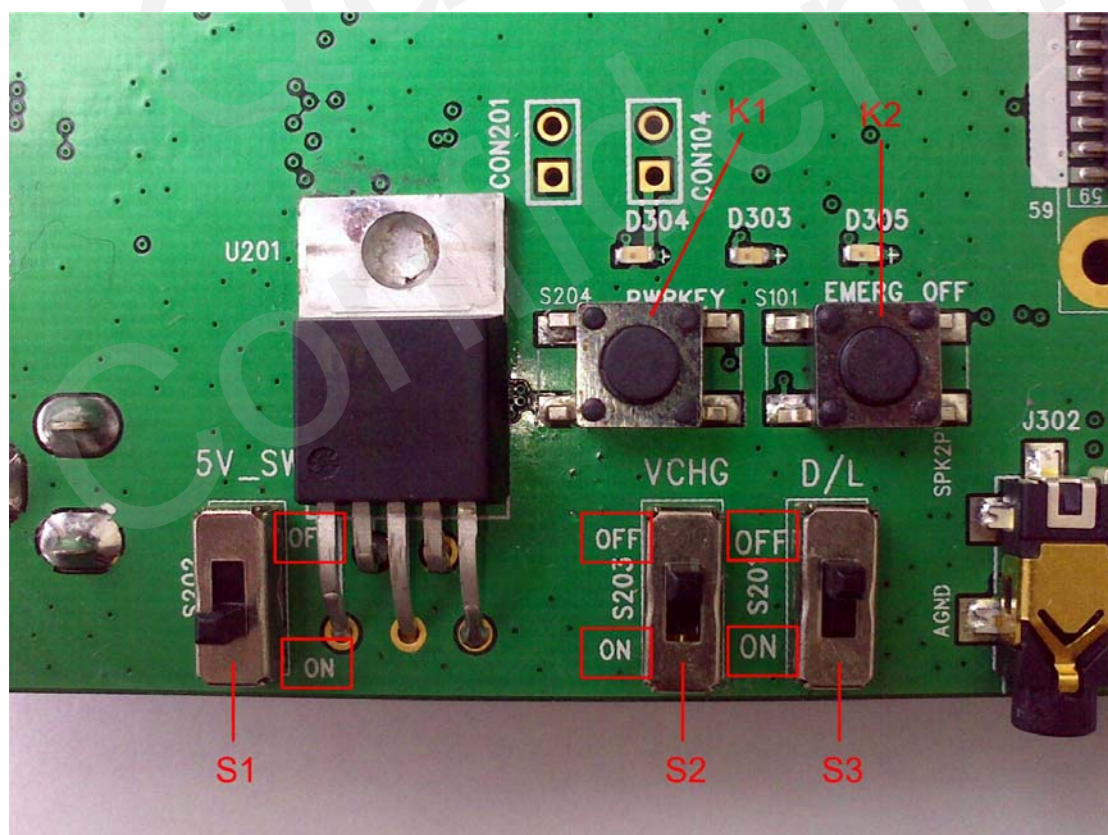
**Figure 9: Switches and buttons**

Table 8: Switches and buttons

Part	Name	I/O	Description
S1	VBAT	I	Control power supply from adaptor
S2	VCHG	I	Control charge if the module have the function
S3	D/L	I	Pull on when downloading firmware
K1	PWRKEY	I	Turn on/off the module
K2	EMERG_OFF	I	Emergency shutdown the system

3.7. Operating Status LED


Figure 10: Operating status LED
Table 9: Status LEDs

Part	Name	I/O	Description
L1	VBAT ON/OFF indicator	O	Bright: VBAT ON Extinct: VBAT OFF
L2	GSM_NET status indicator	O	Blinking at a certain frequency according various GSM network status
L3	LIGHT_MOS indicator	O	Specially for LIGHT_MOS demo

3.8. Test Points

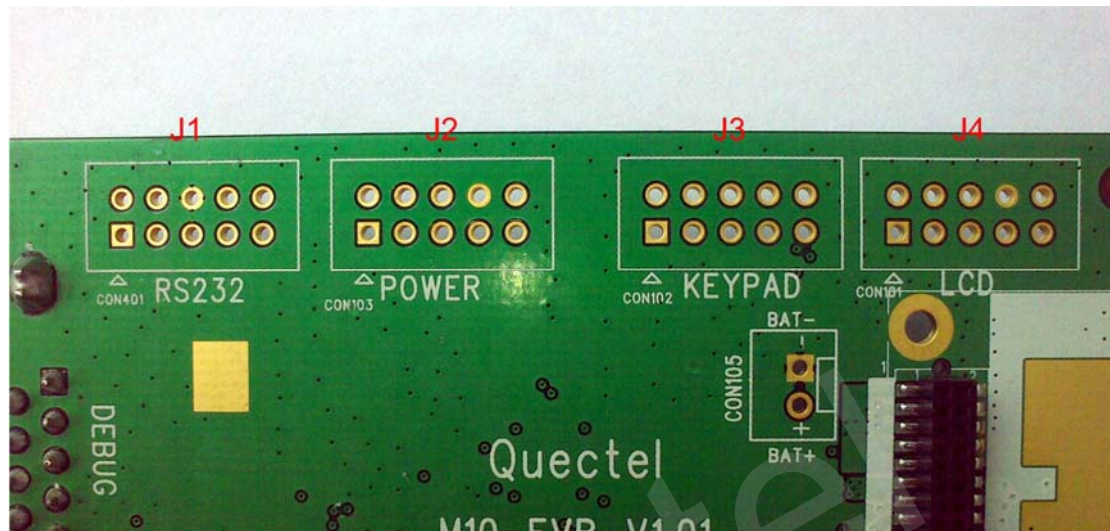


Figure 11: Test points overview

3.8.1 RS232

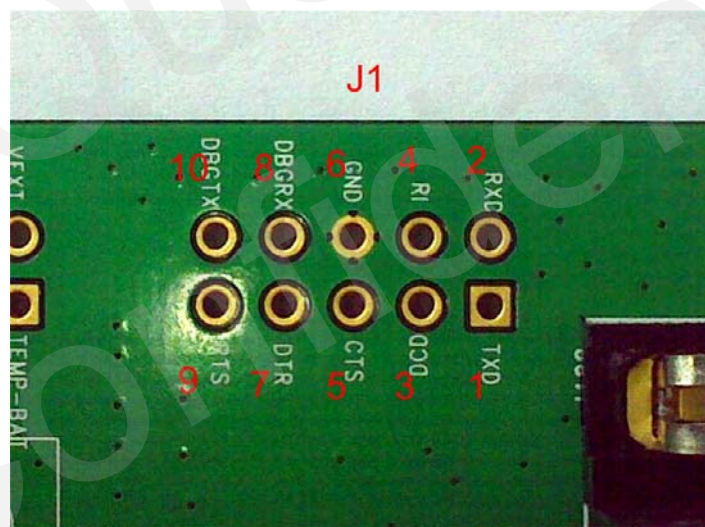


Figure 12: RS232 points

Table 10: Pins of J1

Pin	Signal	I/O	Description
1	TXD	O	Transmitting data
2	RXD	I	Receive data
3	DCD	O	Data carrier detection
4	RI	O	Ring indicator
5	CTS	O	Clear to send

6	GND		Ground
7	DTR	I	Data terminal ready
8	DBG_RXD	I	Receive data
9	RTS	I	Request to send
10	DBG_TXD	O	Transmitting data

3.8.2 POWER

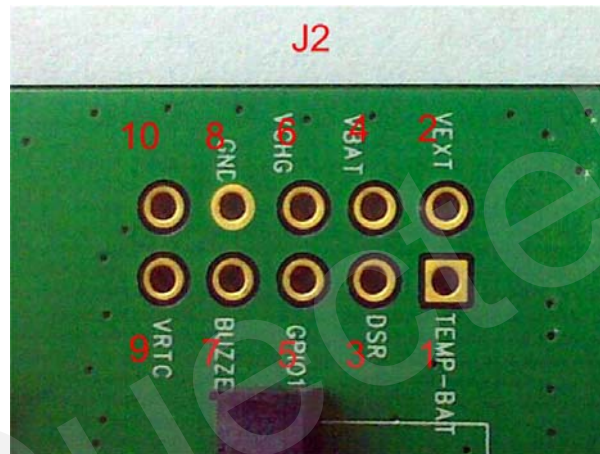


Figure 13: POWER points

Table 11: Pins of J2

Pin	Signal	I/O	Description
1	TEMP_BAT	I	For measurement of battery temperature
2	VDD_EXT	O	Supply 2.8V voltage for external circuit
3	NC		Not connected
4	VBAT	I	Power supply for module
5	GPIO1_KBC5	O	General purpose input/output port/ Keypad interface
6	VCHG	I	Voltage input for the charging circuit
7	BUZZER	O	Buzzer output
8	GND		Ground
9	VRTC	I/O	Current input for RTC
10	NC		

3.8.3 KEYPAD

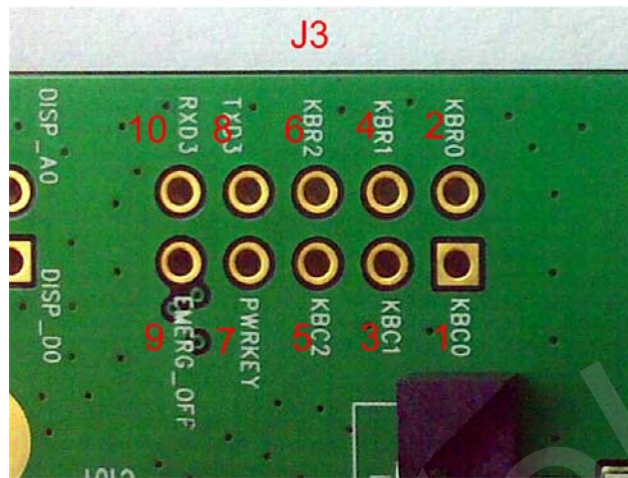


Figure 14: KEYPAD points

Table 12: Pins of J3

Pin	Signal	I/O	Description
1	KBC0	I	Keypad interface
2	KBR0	O	
3	KBC1	I	
4	KBR1	O	
5	KBC2	I	
6	KBR2	O	
7	PWRKEY	I	Turn on/off the module
8	NC		
9	EMERG_OFF	I	Shutdown the module in emergency. Hardware power off operation.
10	NC		

3.8.4 LCD

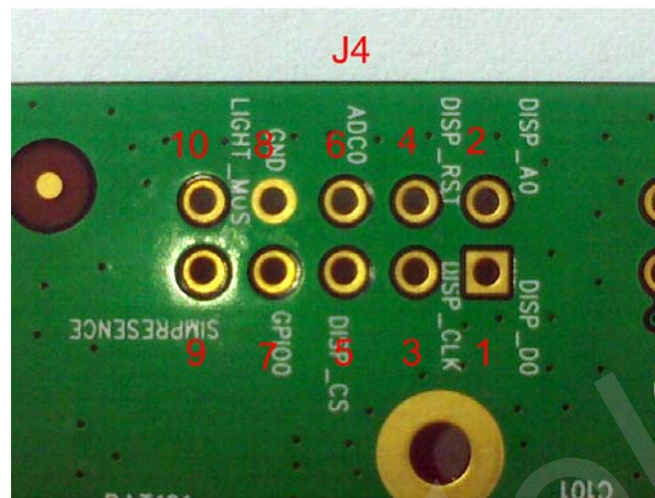


Figure 15: LCD points

Table 13: Pins of J4

Pin	Signal	I/O	Description
1	DISP_DATA	I/O	LCD display interface
2	DISP_D/C	O	
3	DISP_CLK	O	
4	DISP_RST	O	
5	DISP_CS	O	
6	ADC0	I	General purpose analog to digital converter
7	GPIO0	I	General purpose input/output Port
8	GND		Ground
9	SIM_PRESENCE	I	SIM card detection
10	LIGHT_MOS	O	Open drain output port

4. EVB and Accessory Assembly

Under normal circumstance, the EVB and its accessories are equipped as Figure 16 and Figure 17.

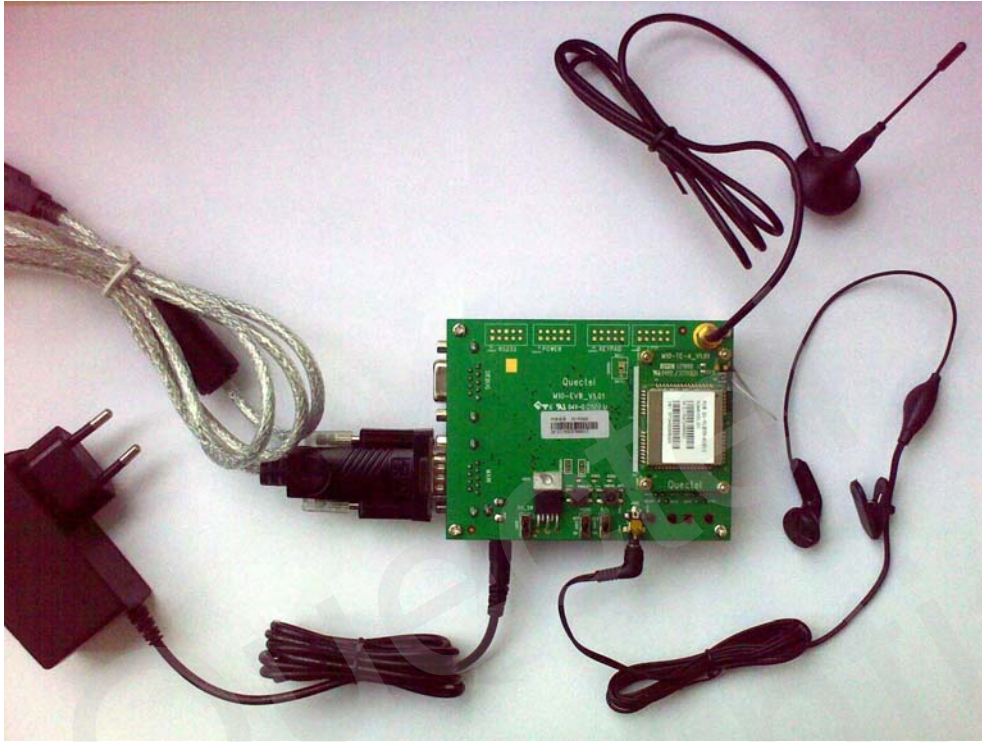


Figure 16: EVB and accessory equipment



Figure 17: Side view of EVB

5. Illustration

5.1. Power on operations

- (1) Connect the M10-TE-A with M10 module to the 60 pins connector on M10 EVB.
- (2) Insert the plug of the 5V power adapter.
- (3) Turn the Switch S1 to **ON** state, Switch S2 to **OFF** state, and Switch S3 to **OFF** state.
The LED L1 on the EVB will be bright.
- (4) Press the PWRKEY for about 2 seconds, and then the module begins running.

The LED L2 will be flashing at a certain frequency. The GSM working status of the module can be judged by the LED status. Please refer to *document [3] for network status indication details*.

5.2. Communicate with the module

- (1) Connect the Serial Port on EVB to PC's USB port with the USB to UART converter cable.
- (2) Open the HyperTerminal (AT command window) on PC. The location of the HyperTerminal in windows XP is START →program →accessory →communication →HyperTerminal. Set appropriate Baud Rate (such as 115200 bps) and COM number which can be checked by the Device Manager on PC.
- (3) Connect an antenna to the M10-TE-A with an RF cable.
- (4) Insert SIM card into the SIM card socket.
- (5) Insert earphone or handset into audio interface.
- (6) Power on the module by pressing PWRKEY button.
- (7) After waiting for 2~3 seconds, customer should firstly input "AT" or "at" string once or more until receiving "OK" from the module in the HyperTerminal.
The module is set to autobauding mode in default configuration. This operation is to synchronize the baud rate between the computer and the module.
- (8) Input AT command and the module will execute its corresponding function.
Customer can refer to *document [1] for details of AT commands*. For instance, typing "ATD112;" will make a call to the emergency number 112.

5.3. Firmware upgrade

- (1) Start the Firmware Upgrade Tool in the PC.
 - (2) Press the **START** button in the Firmware Upgrade Tool.
 - (3) Switch the S3 and S1 in the EVB to **ON** state as shown in Figure 18.
- After these steps, the firmware refreshing process will be proceeding. For more details, please refer to *Document [4]*.

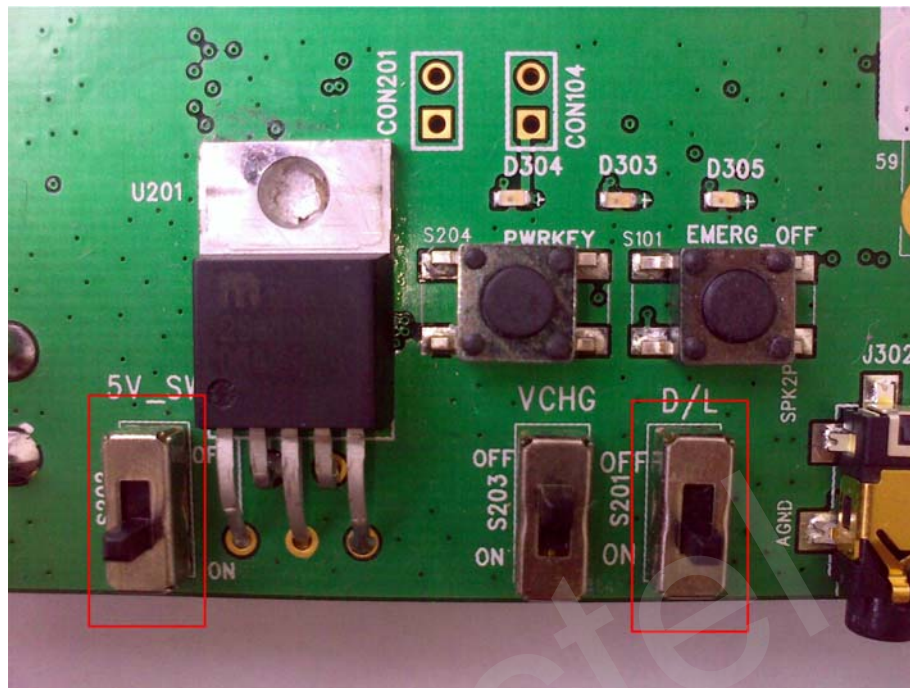


Figure 18: Switches state for firmware downloading

5.4. Turn Off

Pressing the PWRKEY button for about 1 second will turn off the module.

5.5. Emergency Off

Pressing the EMERG_OFF button for more than 0.1 second will shutdown the module immediately. After this, the module can be restarted by pressing the PWRKEY button. Please note that the operation is harmful to the whole module system and should only be done in emergency such as failing to turn off the module through the PWRKEY button.

6. 60 PIN Assignment of DIP Connector

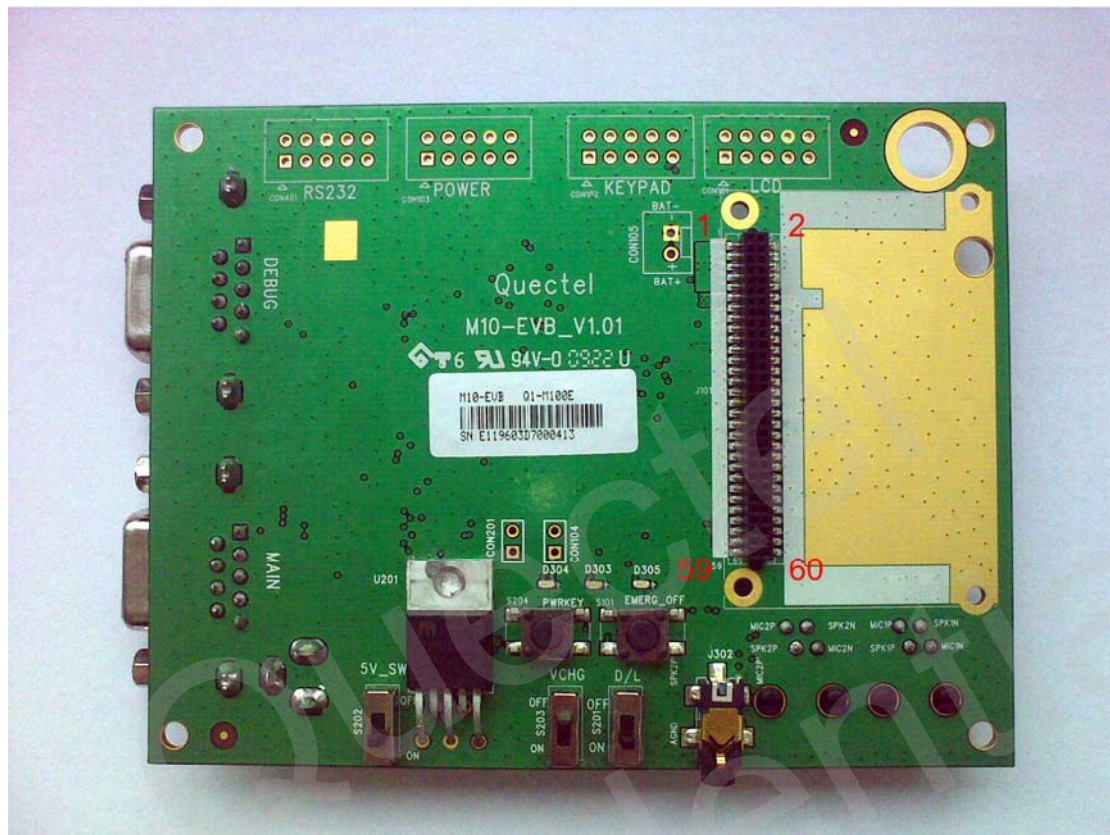


Figure 19: DIP connector of EVB

Table 14: Pin definition of the 60-pin DIP connector

PIN NO.	PIN NAME	I/O	PIN NO.	PIN NAME	I/O
1	VBAT	I	2	GND	
3	VBAT	I	4	GND	
5	VBAT	I	6	GND	
7	VBAT	I	8	GND	
9	VBAT	I	10	GND	
11	VCHG	I	12	ADC0	I
13	TEMP_BAT	I	14	VRTC	I/O
15	VDD_EXT	O	16	NETLIGHT	O
17	PWRKEY	I	18	KBR0	O
19	Reserve		20	KBR1	O
21	GPIO0	I/O	22	KBR2	O
23	BUZZER	O	24	Reserve	

25	SIM_VDD	O	26	Reserve	
27	SIM_RST	O	28	KBC0	I
29	SIM_DATA	I/O	30	KBC1	I
31	SIM_CLK	O	32	KBC2	I
33	SIM_PRESENCE	I	34	LIGHT_MOS	O
35	GPIO1_KBC5	I/O	36	EMERG_OFF	I
37	DCD	O	38	DISP_CS	O
39	DTR	I	40	DISP_CLK	O
41	RXD	I	42	DISP_DATA	I/O
43	TXD	O	44	DISP_D/C	O
45	RTS	I	46	DISP_RST	O
47	CTS	O	48	DBG_RXD	I
49	RI	O	50	DBG_TXD	O
51	AGND		52	AGND	
53	SPK1P	O	54	MIC1P	I
55	SPK1N	O	56	MIC1N	I
57	SPK2P	O	58	MIC2P	I
59	AGND		60	MIC2N	I



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