M10

Quectel Cellular Engine

EVB User Guide

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0. Revision history

Revision	Date	Author	Description of change
1.00	2009-06-27	Tracy ZHANG	Initial

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1. Introduction

This document defines and specifies the usage of M10 EVB.

1.1. Related documents

Table 1: Related documents

SN	Document name	Remark
[1]	M10_ATC	AT commands set
[2]	GSM_UART_AN	GSM UART port application notes
[3]	M10_HD	Hardware design

1.2. Safety caution

The following safety precautions must be observed during all phases of the operation, e.g. usage, service or repair of cellular terminal incorporating M10 module. Manufactures of the cellular terminal is recommended to pass the following safety information to users, operating personnel. If customer fails to do so, Quectel couldn't bear any liability for customer's failure to comply with these precautions.

When in a hospital or other health care facility, observe the restrictions about the use of mobiles. Switch the cellular terminal or mobile off, medical equipment may be sensitive to RF interference.

Switch off the cellular terminal or mobile before boarding an aircraft. The operation of wireless equipment in an aircraft is forbidden to prevent interference to communication system. Failing to think enough of these instructions could lead to endanger 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 anywhere blasting operation is in progress. Operation of electronic equipment in potentially explosive atmosphere could constitute a safety hazard.

Cellular terminal or mobile receives and transmits radio frequency energy while switched on. RF interference could occur if it is close to TV set, radio, computer or other electronic equipments.

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. Park the vehicle before making a call with a hand-held terminal or mobile.

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2. EVB kit introduction

2.1. EVB top and bottom view

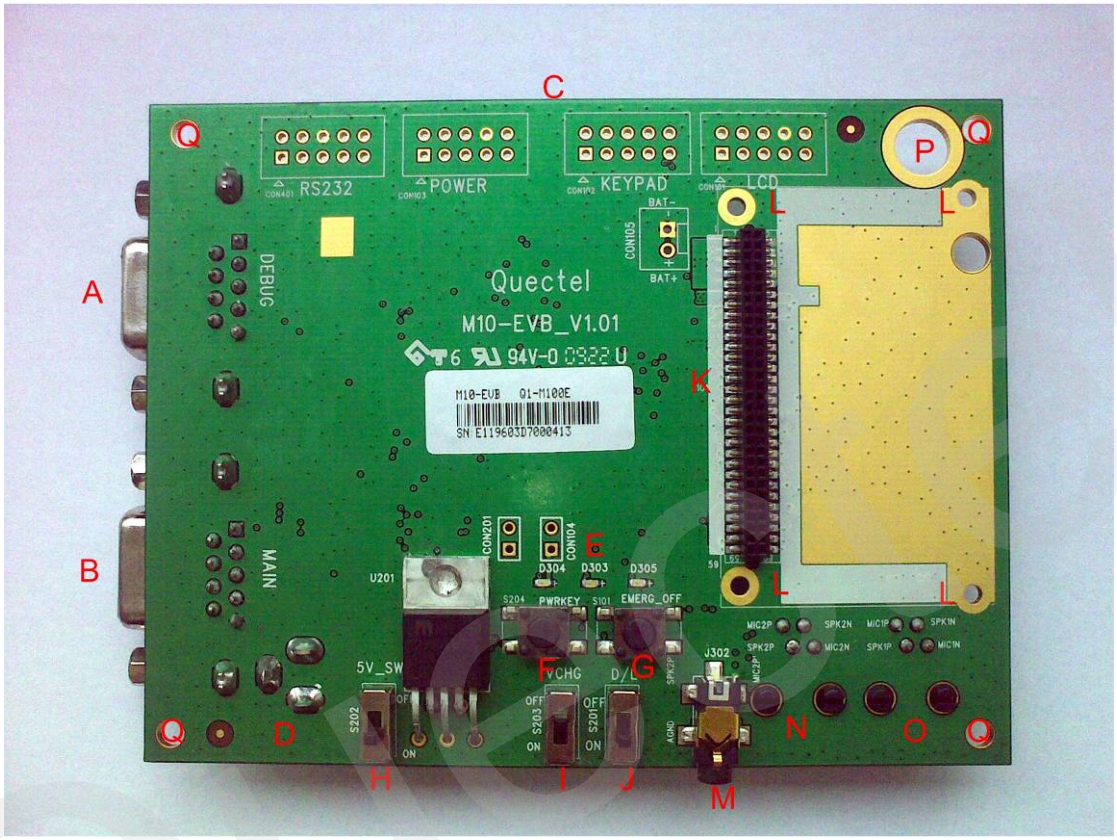

Figure 1: EVB top view

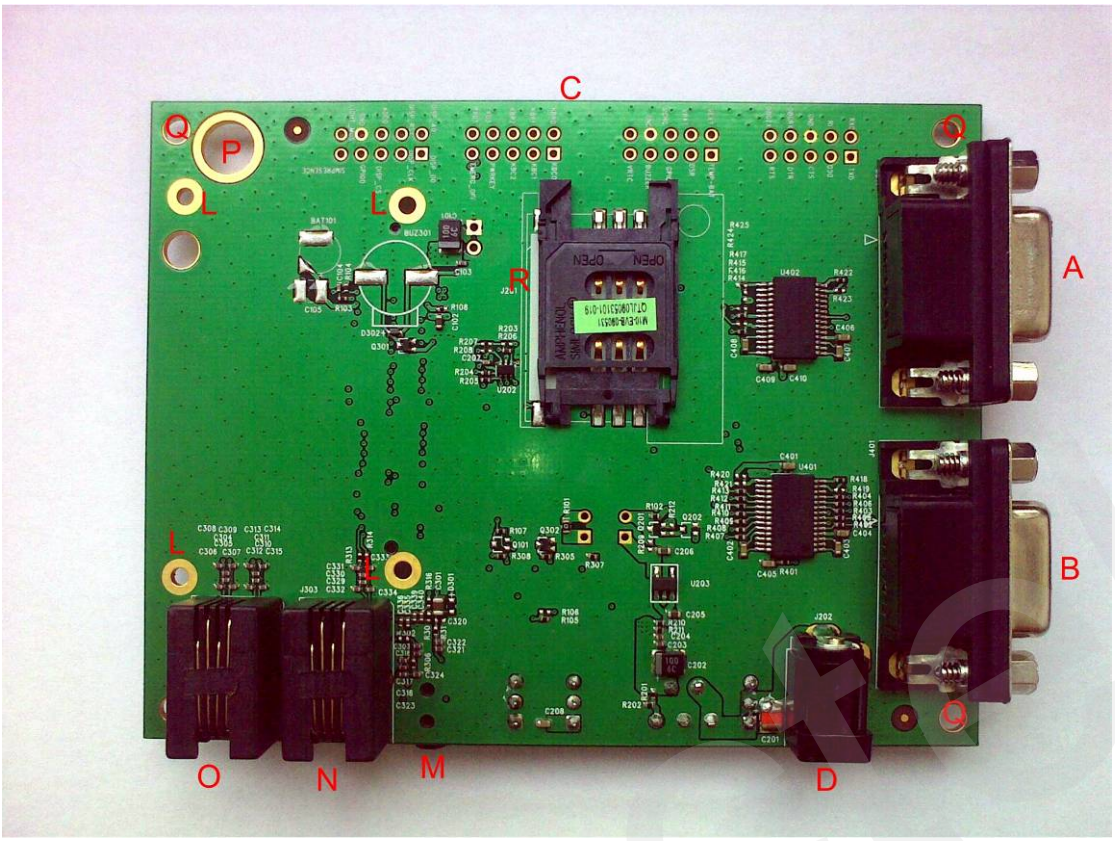

Figure 2: EVB bottom view

A: Debug port
B: Main UART port
C: Test points
D: Adapter interface
E: Module operating status indication LEDs
F: PWRKEY button
G: EMERG_OFF button
H: VBAT switch
I: VCHG switch (charge function)
J: Download switch
K: Connector for M10-TE-A board
L: Screw holes for fixing the M10-TE-A
M: Headset socket
N: Handset socket of audio channel 2
O: Handset socket of audio channel 1
P: Antenna connector fixing hole
Q: Screw holes for EVB placement
R: SIM card socket

2.2. EVB accessory

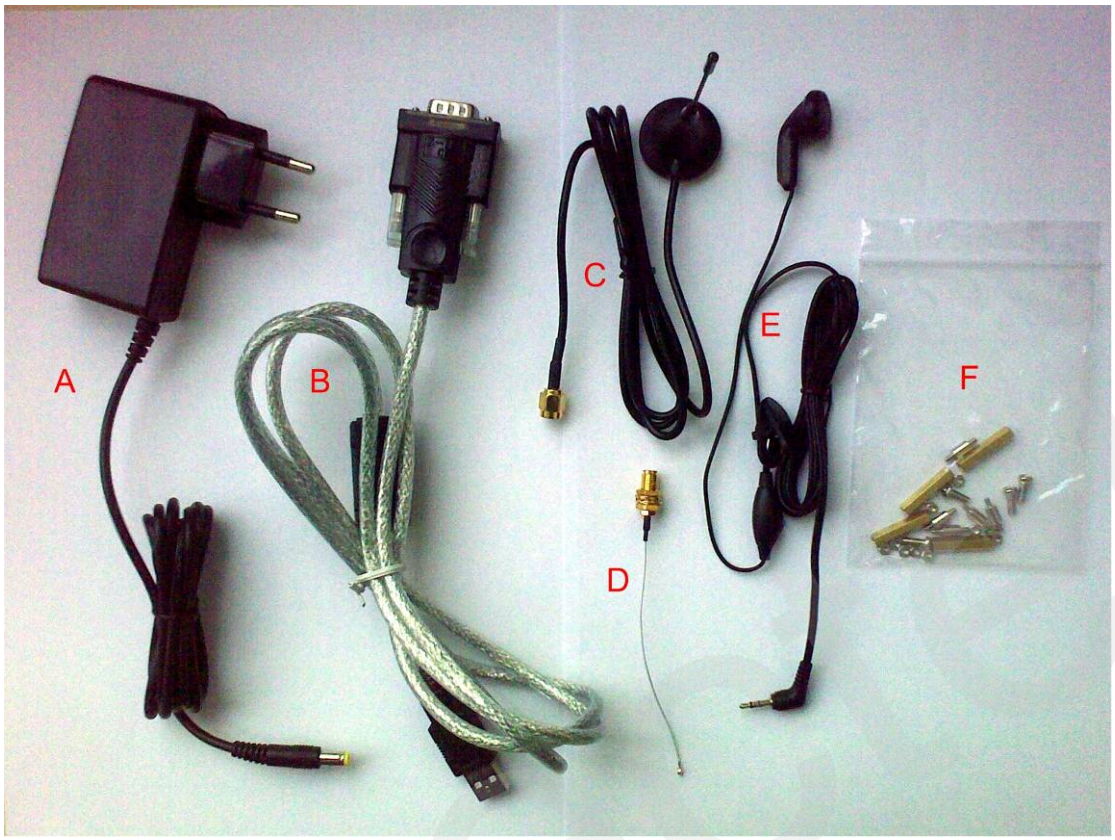

Figure 3: Accessory introduction

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

3. Interface application

3.1. Power interface

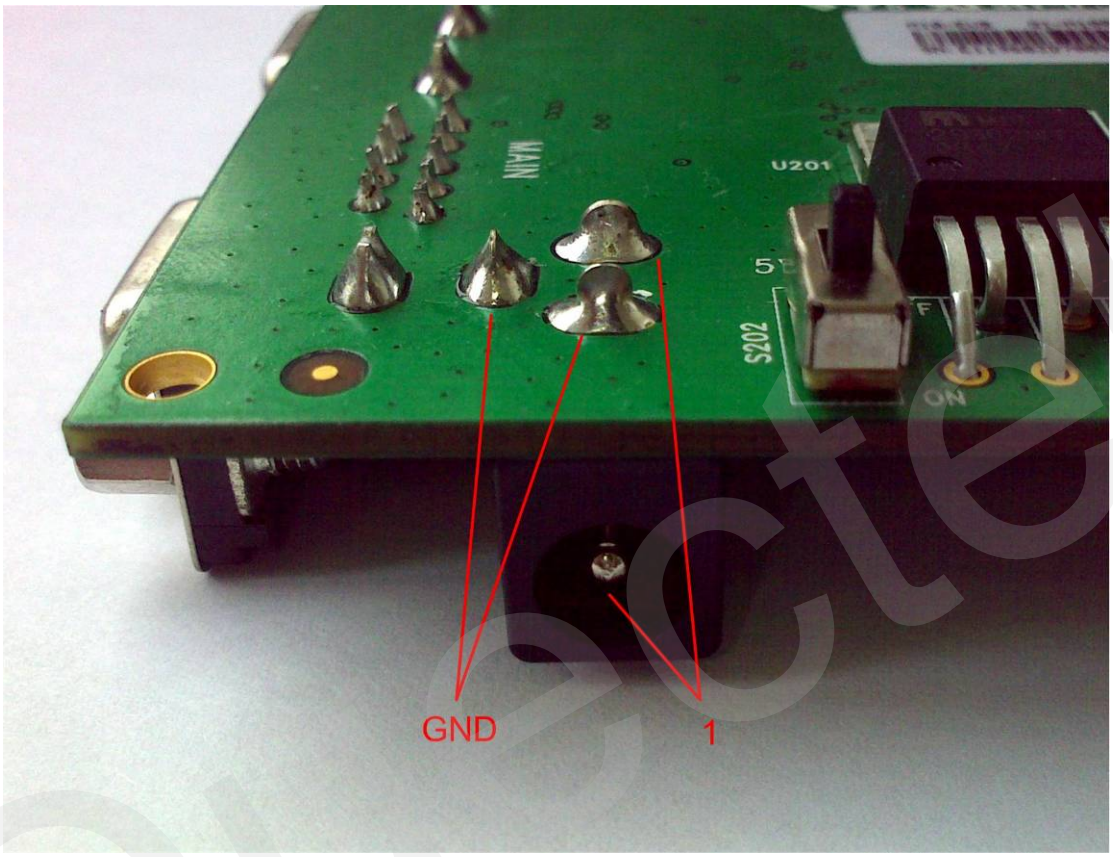

Figure 4: Power Interface

Table 2: Pin of power interface

Pin	Signal	I/O	Description
1	Adapter input	I	5V/2.5A DC source input

3.2. Audio interface

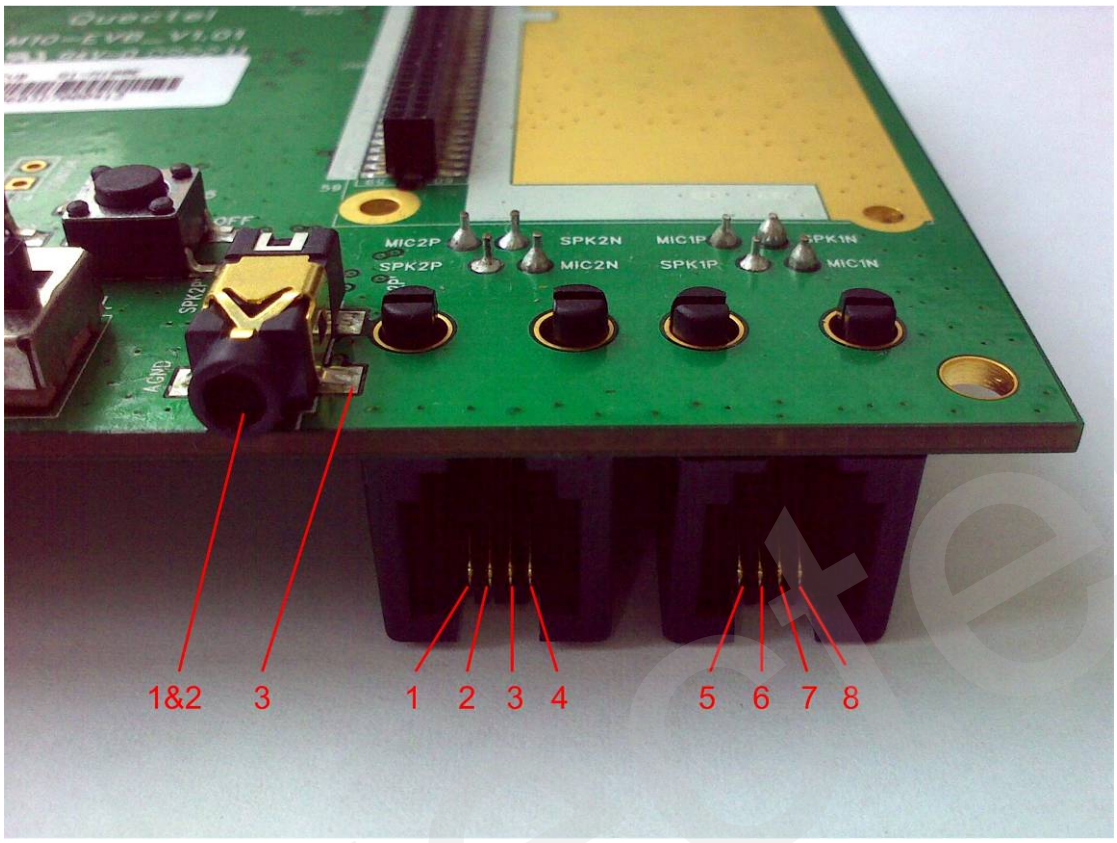

Figure 5: Audio interface

Table 3: Pins of audio channel 2

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

A headset or handset can be used in audio channel 2.

Table 4: Pins of audio channel 1

Pin	Signal	I/O	Description
5	MIC1P	I	Positive microphone input
6	SPK1P	O	Positive receiver output
7	SPK1N	O	Negative receiver output
8	MIC1N	I	Negative microphone input

3.3. SIM card interface

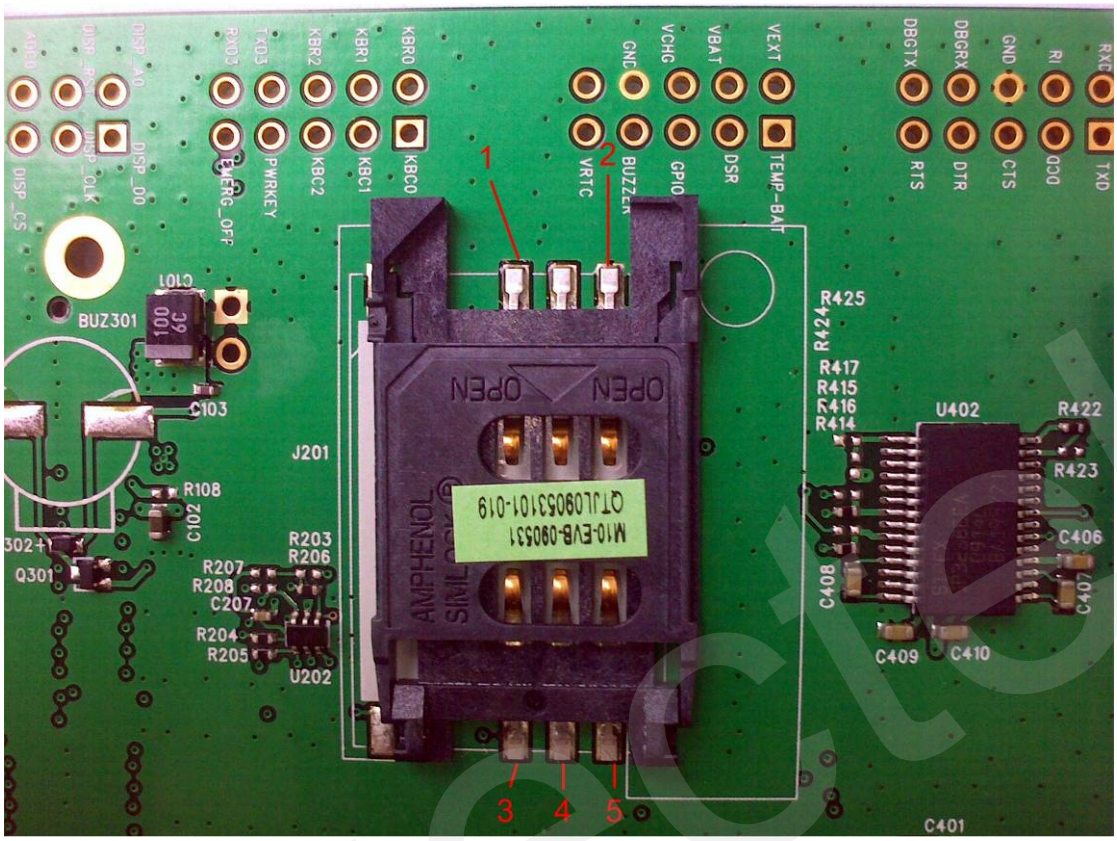

Figure 6: SIM card Interface

Table 5: Pins of SIM card interface

Pin	Signal	I/O	Description
1	SIM_DATA	I/O	SIM card data I/O
2	GND		
3	SIM_CLK	O	SIM card Clock
4	SIM_RST	O	SIM card reset
5	SIM_VDD	O	SIM card power output

3.4. Antenna interface

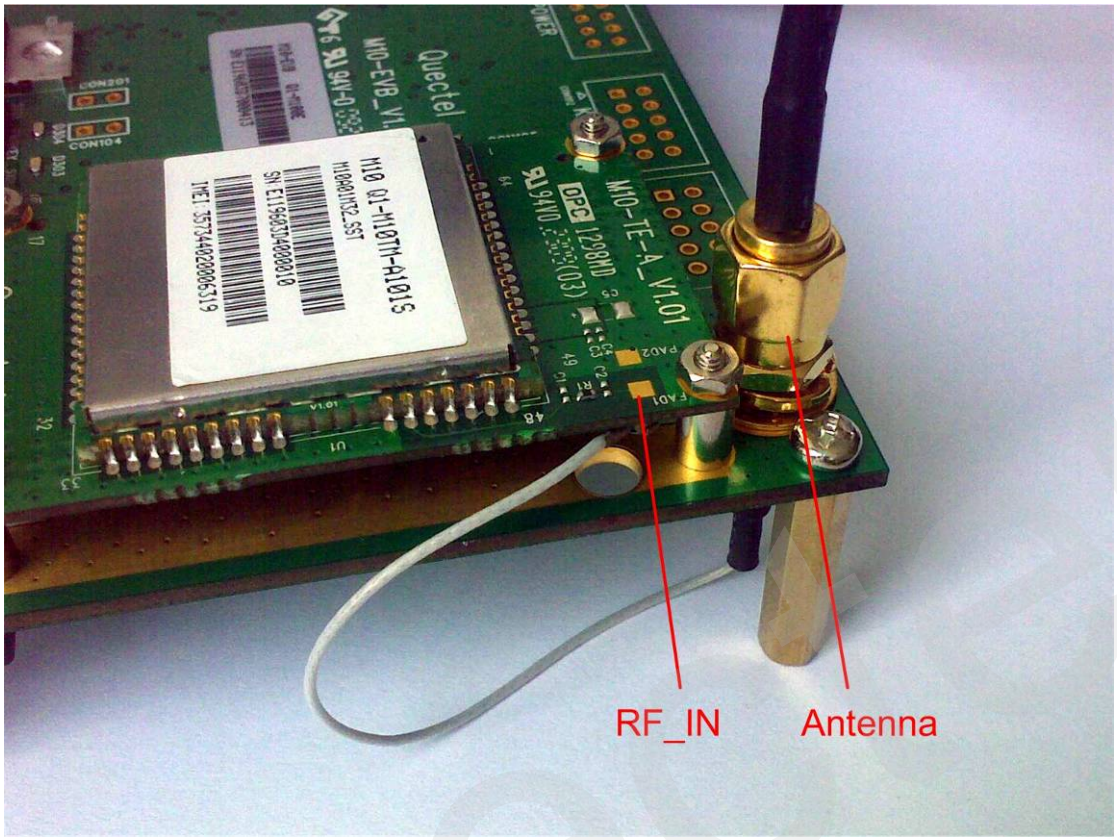

Figure 7: Antenna interface

3.5. Main UART port and debug port

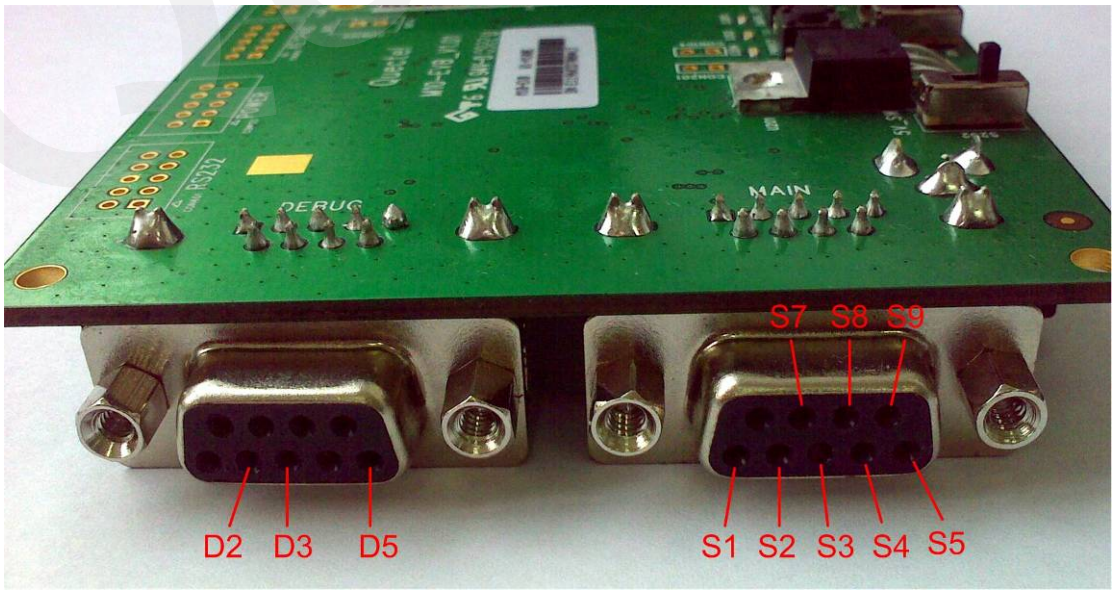

Figure 8: Main UART port and debug port

Table 6: Pins of UART 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		GND
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		GND

3.6. Switches and buttons

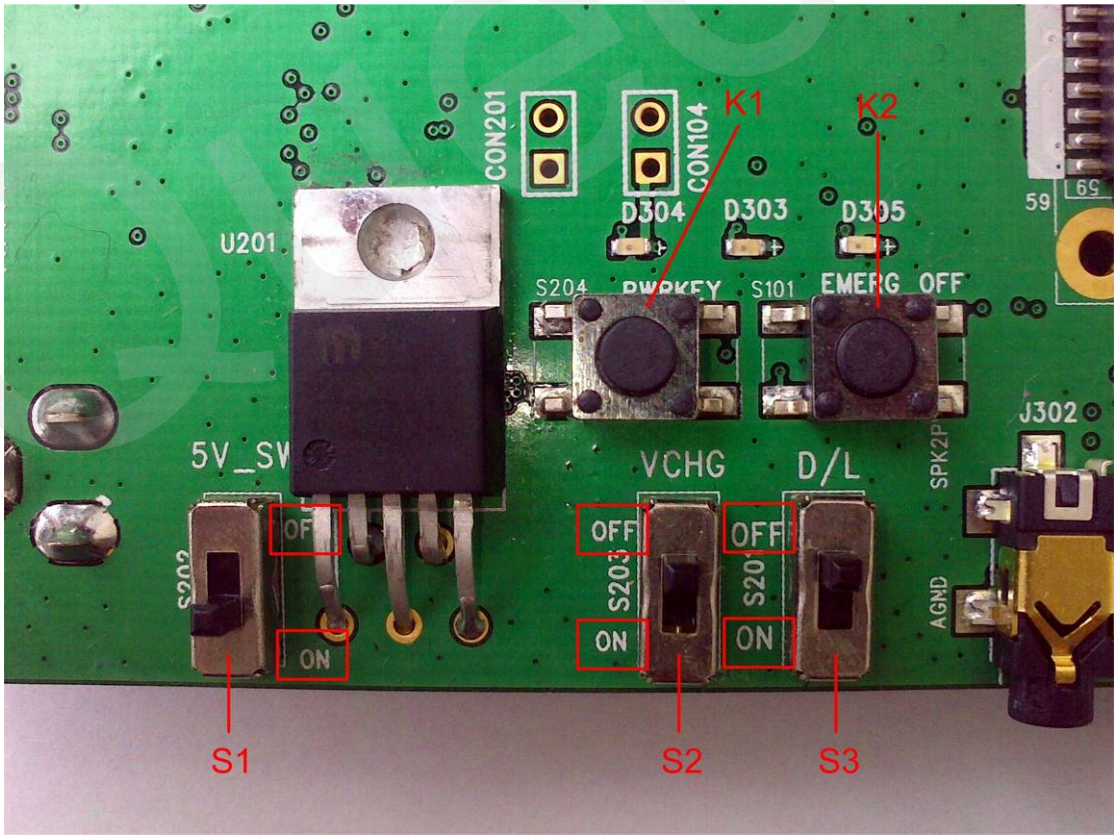

Figure 9: Switches and buttons

Table 8: Switches and buttons

Part	Name	I/O	Description
S1	VBAT	I	Control power supply from adaptor
S2	VCHG	I	Control charge to a Li-ion battery by the module. Charge function in the module is optional.
S3	D/L	I	Place to on when downloading firmware
K1	PWRKEY	I	Turn on/off the module
K2	EMERG_OFF	I	Shutdown the module in emergency. Hardware power off operation.

3.7. Operating status LED

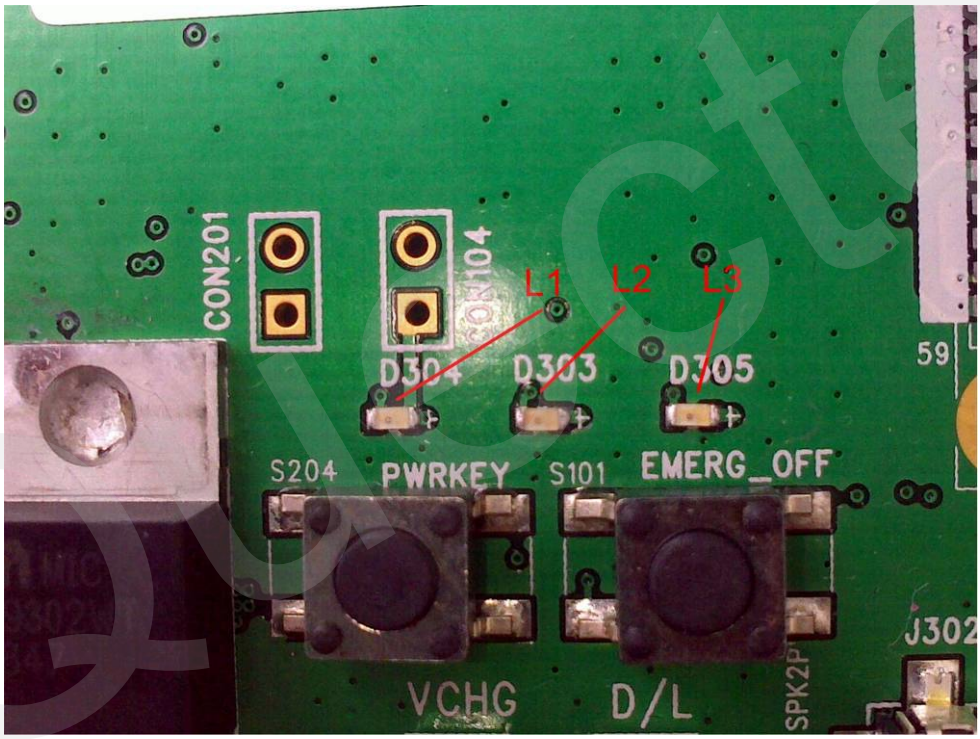

Figure 10: Operating status indication LEDs

Table 9: Operating status indication LEDs

Part	Name	I/O	Description
L1	VBAT ON/OFF indicator	O	On: VBAT ON Off: VBAT OFF
L2	GSM_NET status indicator	O	Blinking differently to indicate various GSM network status
L3	LIGHT_MOS indicator	O	Specially for LIGHT_MOS demo

3.8. Test points

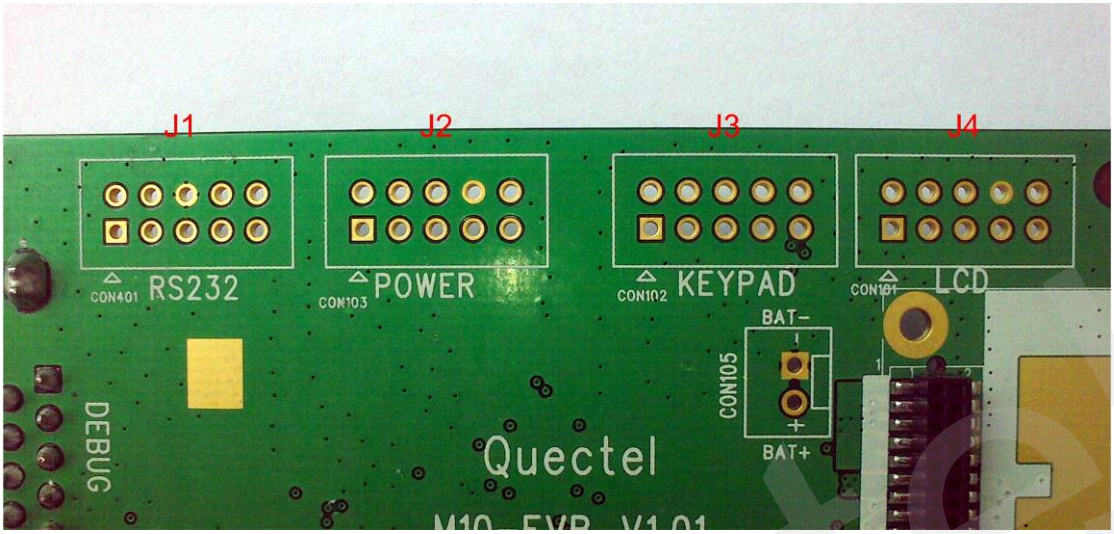

Figure 11: Test points overview

3.8.1 RS-232

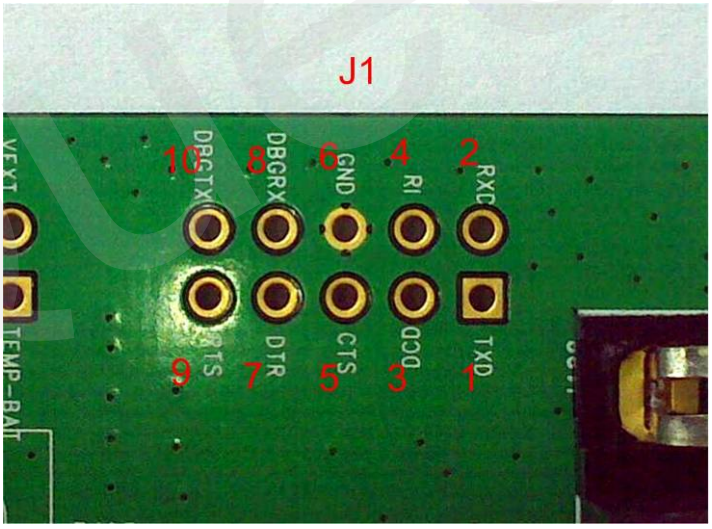

Figure 12: RS-232 test points

Table 10: Pins of J1

Pin	Signal	I/O	Description
1	TXD	O	Transmit 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		
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

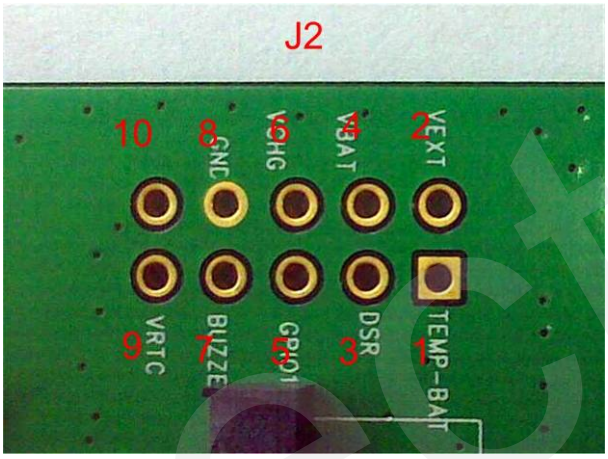

Figure 13: Power test points

Table 11: Pins of J2

Pin	Signal	I/O	Description
1	TEMP_BAT	I	For measurement of the battery temperature
2	VDD_EXT	O	Supply 2.8V voltage for external circuit
3	NC		
4	VBAT	I	Power supply for module
5	GPIO1_KBC5	I/O	Normal input/output port/Keypad interface
6	NC		
7	BUZZER	O	Buzzer output
8	GND		
9	VRTC	I/O	Module RTC
10	NC		

3.8.3 Keypad

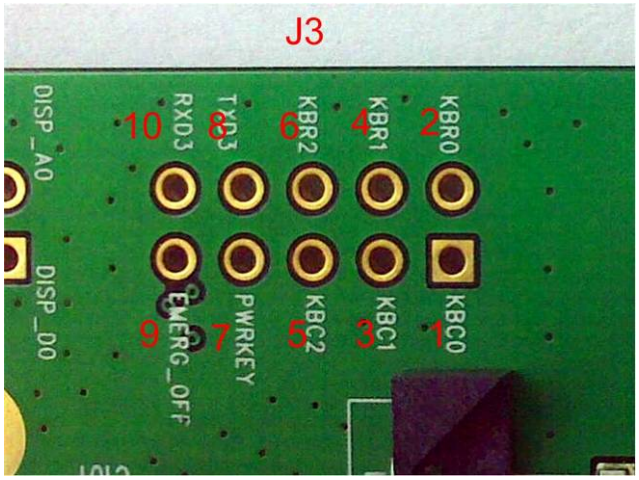

Figure 14: Keypad test points

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 power in case of emergency
10	NC		

3.8.4 LCD

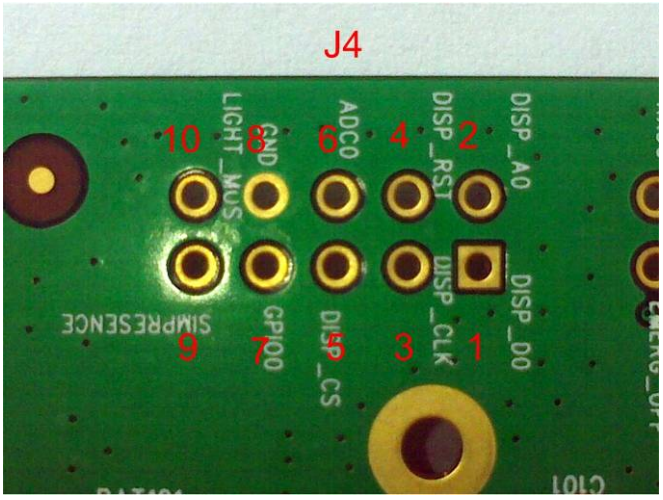

Figure 15: LCD test points

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	Turn on/off the module
8	GND		
9	SIM_PRESENCE	I	SIM card detection
10	LIGHT_MOS	O	Open drain output port

4. EVB and accessories

The EVB and its accessories are shown as Figure 16 and Figure 17.

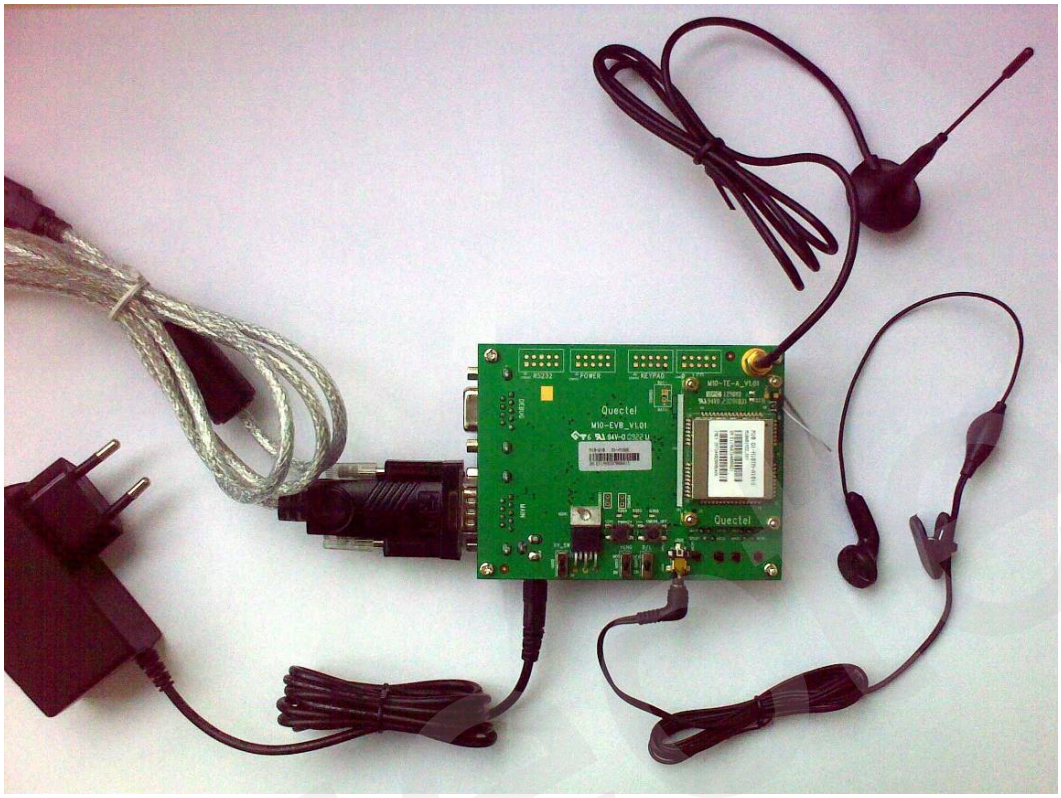

Figure 16: EVB and accessories

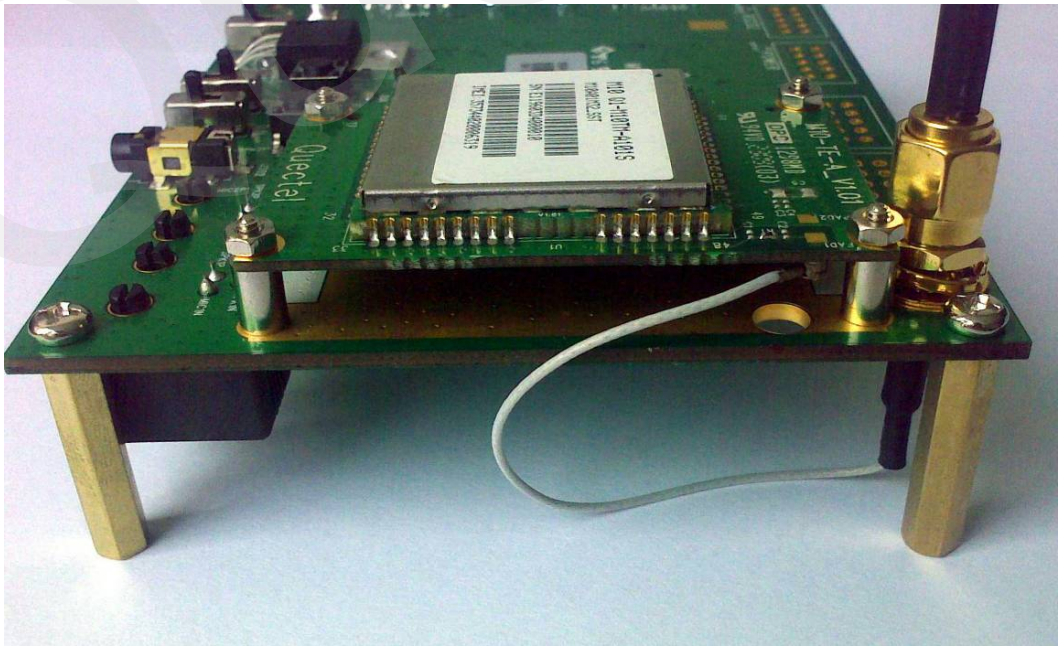

Figure 17: Bolts to support EVB

5. Illustration

5.1. Power on operations

(1) Connect the M10-TE-A with M10 module to the 60-pin connector in M10 EVB. Turn Switch S1 to **ON** state, Switch S2 to **OFF** state, and Switch S3 to **OFF** state, and then plug in 5V DC adapter;

The LED L1 on the EVB will be turned on.

(2) Press the PWRKEY button for about 2 seconds, and the module will begin to run.

The blinking mode of the LED L2 indicates the status of the module.

5.2. Communicate with the module

(1) Connect the main UART Port in EVB to PC's USB port through the USB to UART converter cable. Open the HyperTerminal (AT command dialog window) on PC. The location of the HyperTerminal tool in Windows XP is START →Program →Accessory →Communication →HyperTerminal. Set correct Baud Rate and COM port number. The default Baud Rate of M10 is 115200, and the COM port number can be checked by the Device Manager on PC.

(2) Connect the antenna to the M10. Insert a SIM card into the SIM card socket. Insert a headset or a handset into the audio interface.

(3) Power on the module. Type AT command in the HyperTerminal, and then the module will execute its corresponding function. Customer can refer to Document [1] for AT commands. For instance, typing "ATD112;" will originate an emergency call.

5.3. Firmware upgrade

Connect the main UART Port in EVB to PC's USB port through the USB to UART converter cable. Run the firmware upgrade tool in PC and press the **START** key. Switch S3 and S1 to **ON** state, as shown in Figure 18. Then the firmware upgrade operation will start.

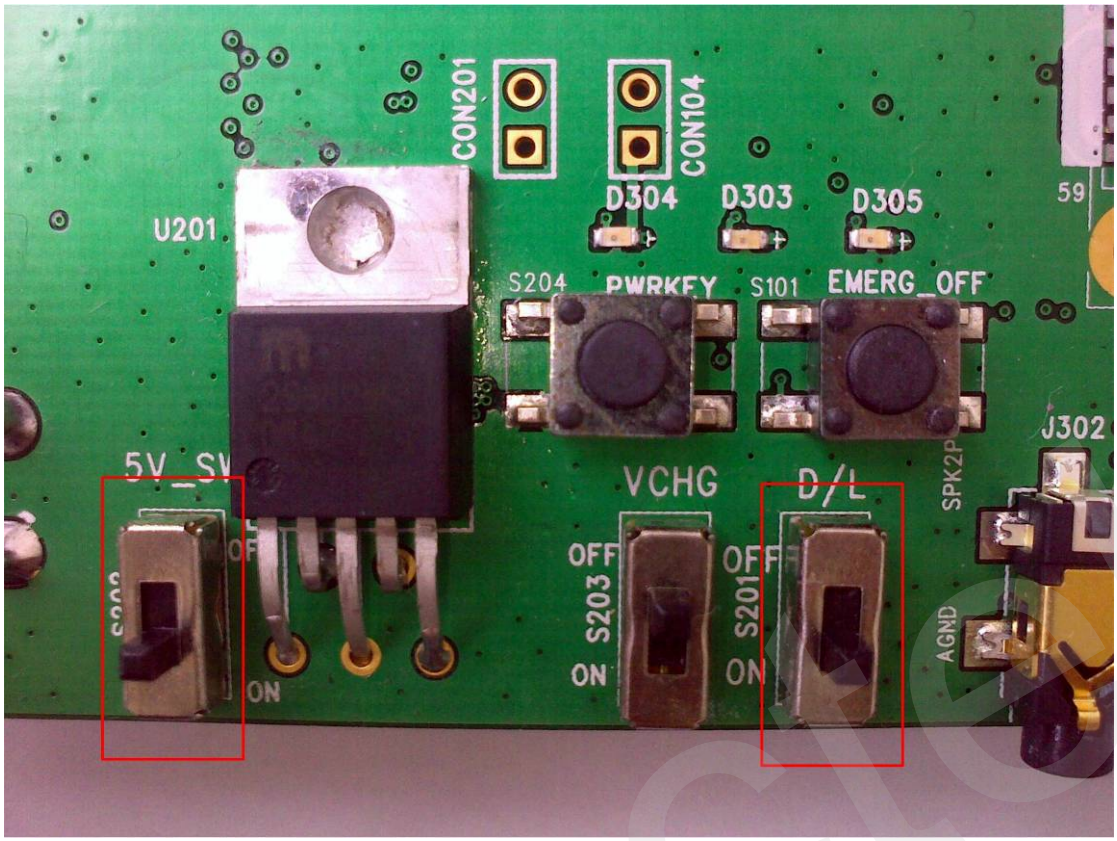

Figure 18: Switches state for firmware upgrade

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 about 0.1 second will shutdown the module immediately. After this, the module can be restarted by pressing the PWRKEY button.

6. 60 PIN assignment of DIP connector

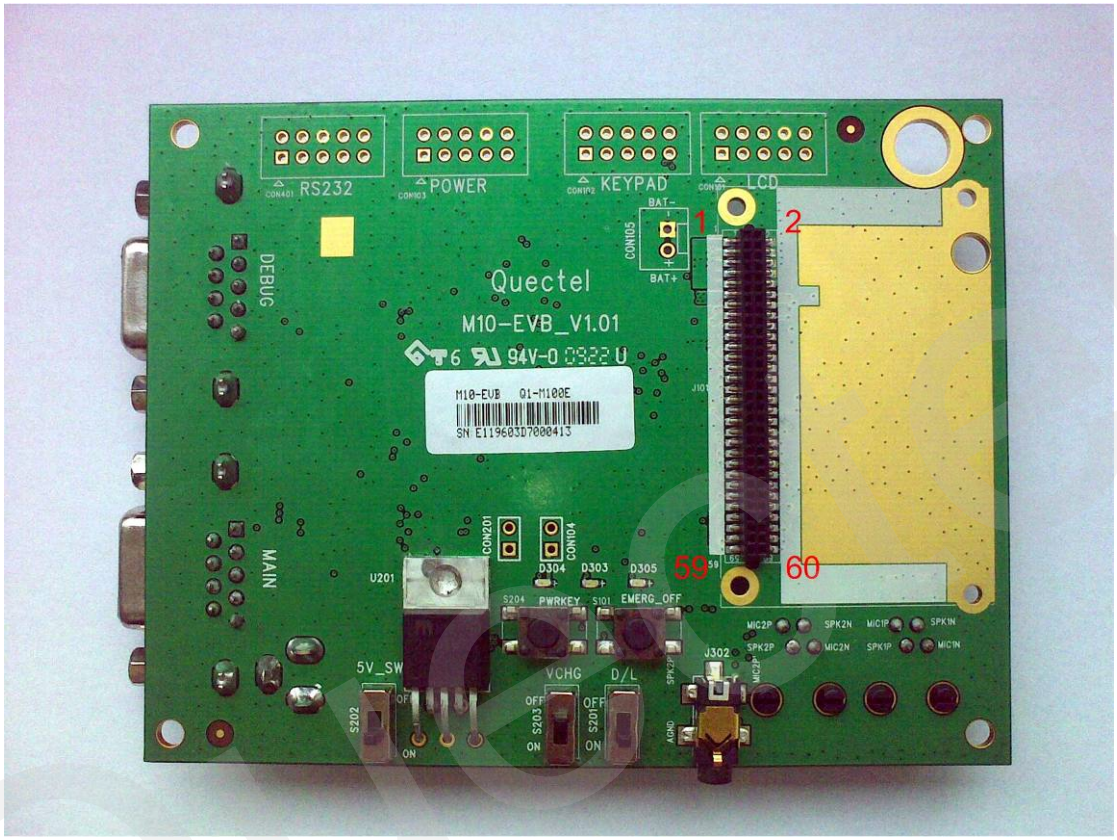

Figure 19: DIP connector of EVB

Table 14: Pin definition of 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	Reserve			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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