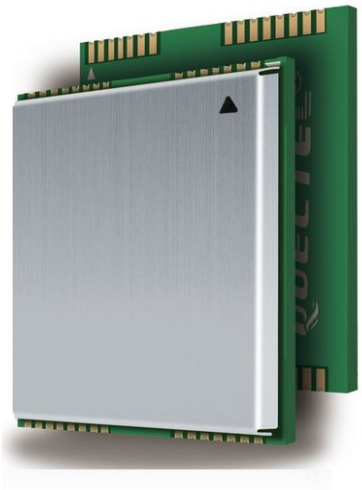
M72

Quectel Cellular Engine

EVB User Guide

M72_EVB_User_Guide_V1.0



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0. Revision History

Revision	Date	Author	Description of change
1.0	2011-05-18	Jerry YOU	Initial

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1. Introduction

This document defines and specifies the usage of M72 EVB. Customers can get useful information about M72 EVB from this document.

Note: Module M72 and M10 use the same EVB.

1.1. Related Documents

Table 1: Related documents

SN	Document name	Remark
[1]	M72_ATC	AT commands sets
[2]	GSM_UART_AN	The document of serial port application note
[3]	M72_HD	Hardware design
[4]	GSM_FW_UPGRADE_AN01	Firmware upgrade application notes

1.2. Safety Precautions

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 M72 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 operate abnormally as a consequence of 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 in order to prevent the aircraft communication system from interference. Forget to think much of these instructions may influence the flight safety or offend against local legal action, or both.

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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 using radio signals and cellular networks. Because of this, connection cannot be guaranteed 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 a 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 to make an 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.

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2. EVB Kit Introduction

2.1. EVB Top and Bottom View

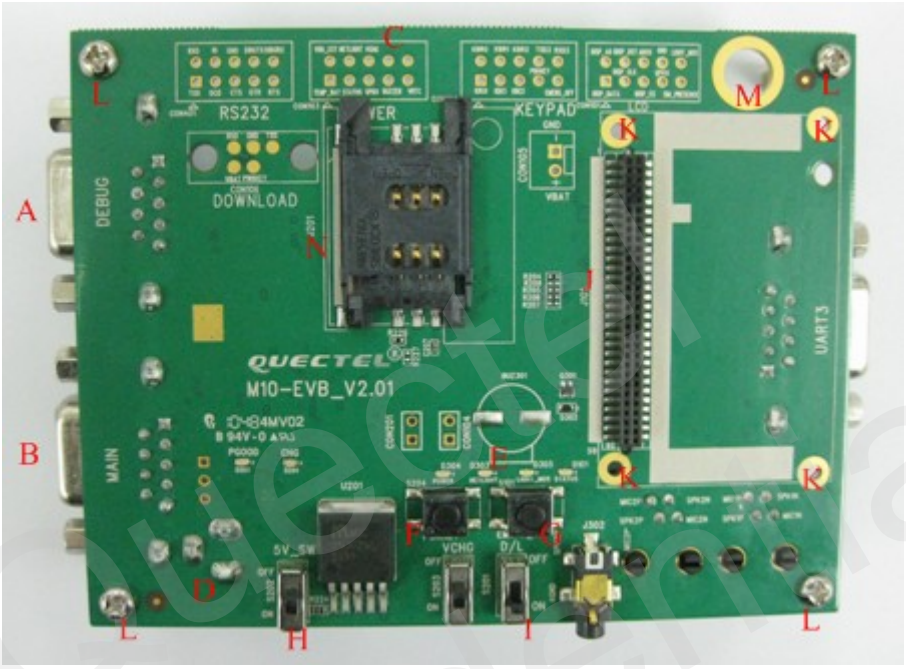

Figure 1: Top view

Figure 2: Bottom view

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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: Download switch
J: 60-pins M72-TE-A interface
K: Screw holes for fixing the module
L: Fixture holes for RF cable connector
M: Fixture holes for EVB poles
N: SIM card interface

2.2. EVB Accessories

Figure 3: Accessories introduction

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

3. Interface Application

3.1. Power Interface

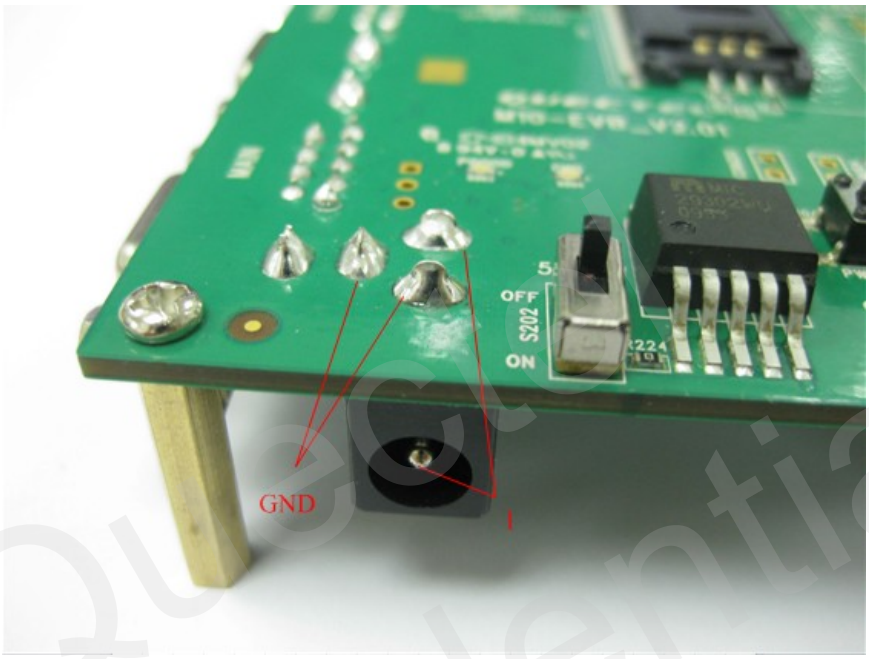

Figure 4: Power interface

Table 2: Pin of power interface

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

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3.2. SIM Card Interface

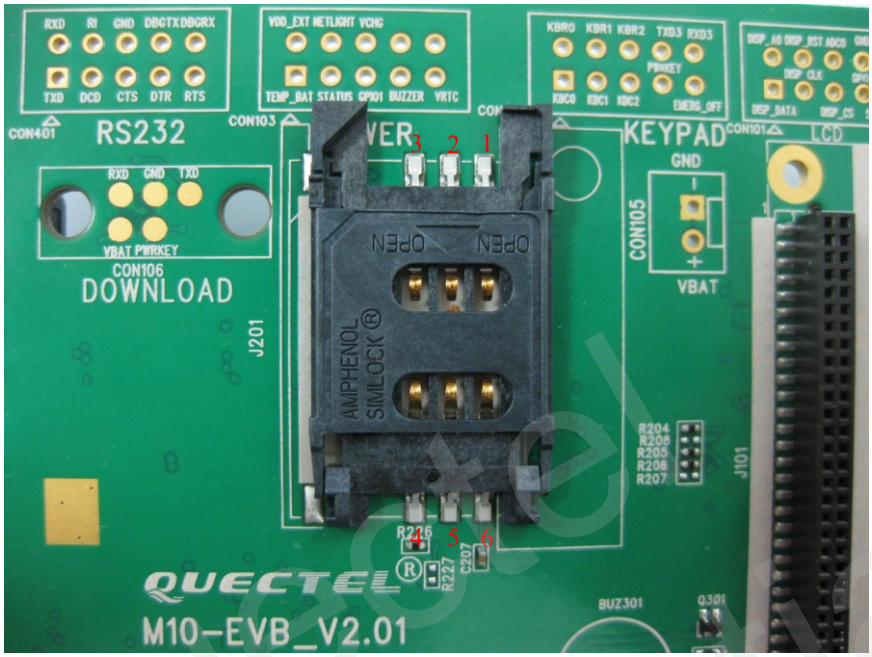

Figure 5: SIM card interface

Table 3: 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	Power supply from SIM card

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3.3. Antenna Interface

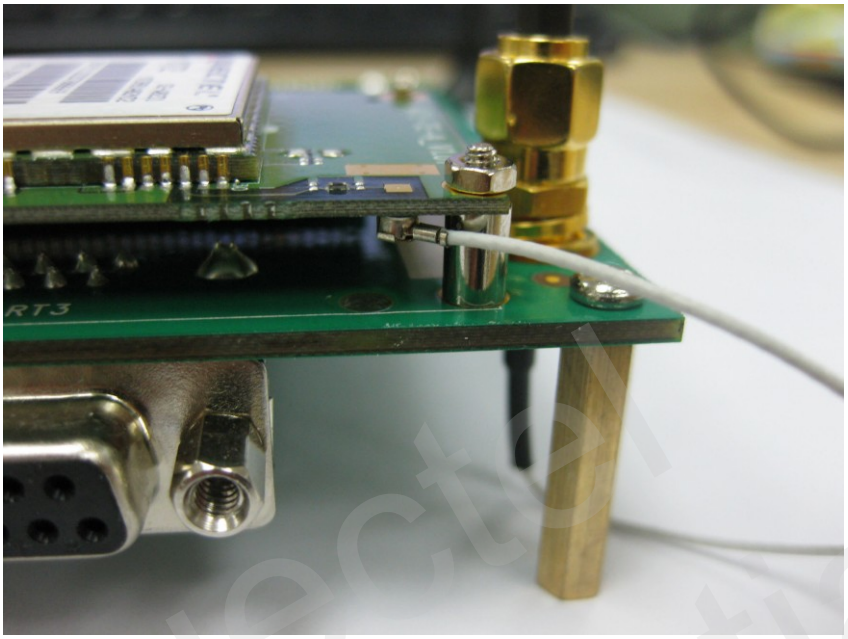

Figure 6: Antenna interface

3.4. Serial Port and Debug Port

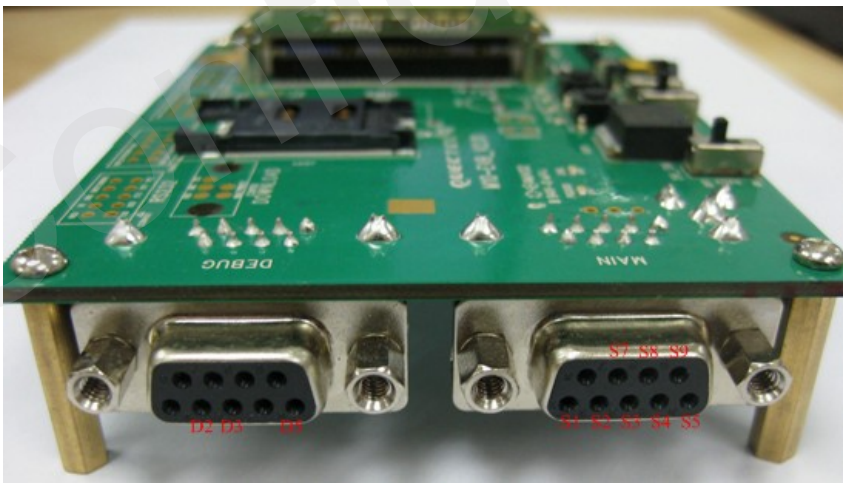

Figure 7: Serial port and Debug port

Table 4: 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

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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 5: Pins of Debug port

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

3.5. Switches and Buttons

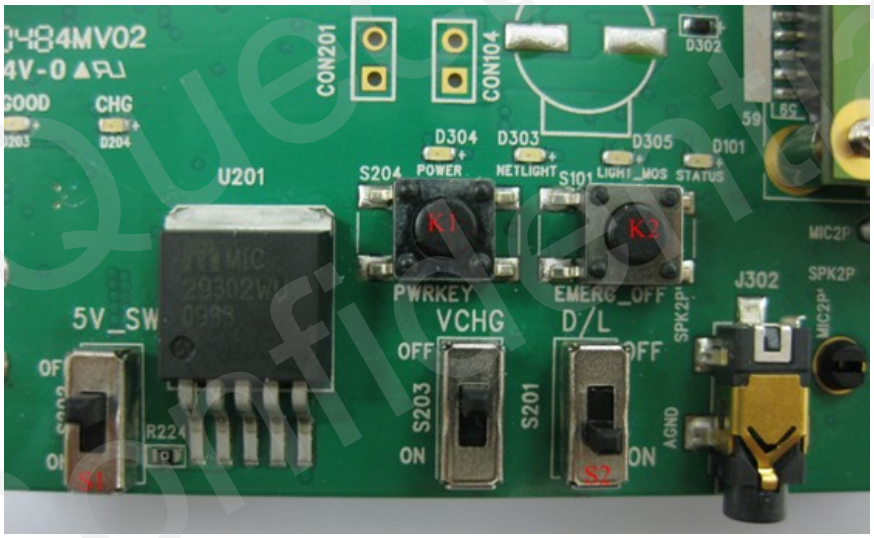

Figure 8: Switches and buttons

Table 6: Switches and buttons

Part	Name	I/O	Description
S1	VBAT	I	Control power supply via adaptor
S2	D/L	I	Pull to “ON” when downloading firmware
K1	PWRKEY	I	Turn on/off the module
K2	EMERG_OFF	I	Emergency button for shutting down the system

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3.6. Operating Status LED

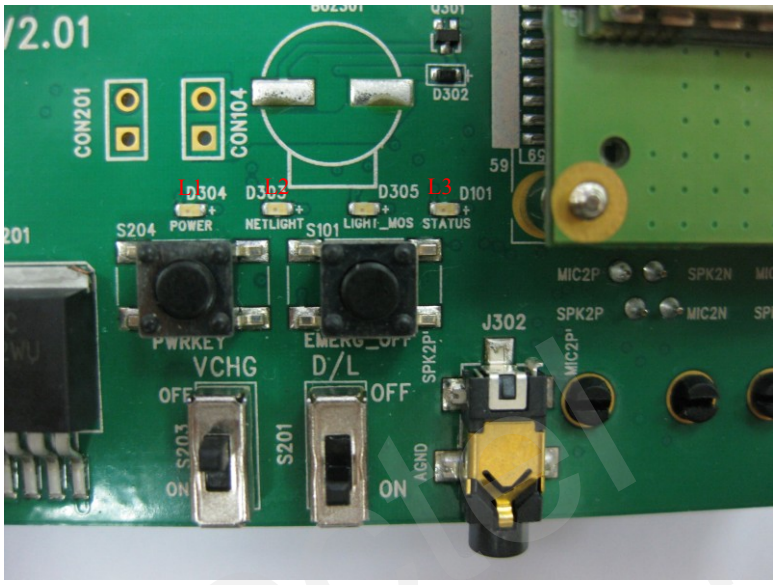

Figure 9: Operating status LED

Table 7: 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 to various GSM network status
L3	STATUS indicator	O	Indication of module operating status

3.7. Test Points

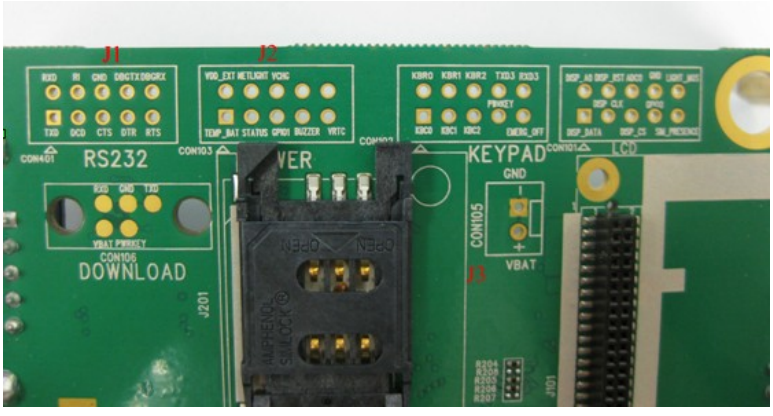

Figure 10: Test points overview

3.7.1 RS232

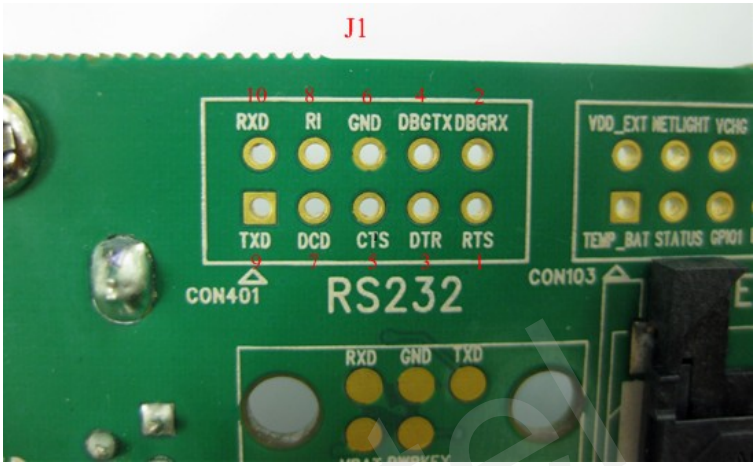

Figure 11: RS232 points

Table 8: 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		Ground
7	DTR	I	Data terminal ready
8	DBG_RXD	I	Receive data
9	RTS	I	Request to send
10	DBG_TXD	O	Transmit data

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3.7.2 POWER

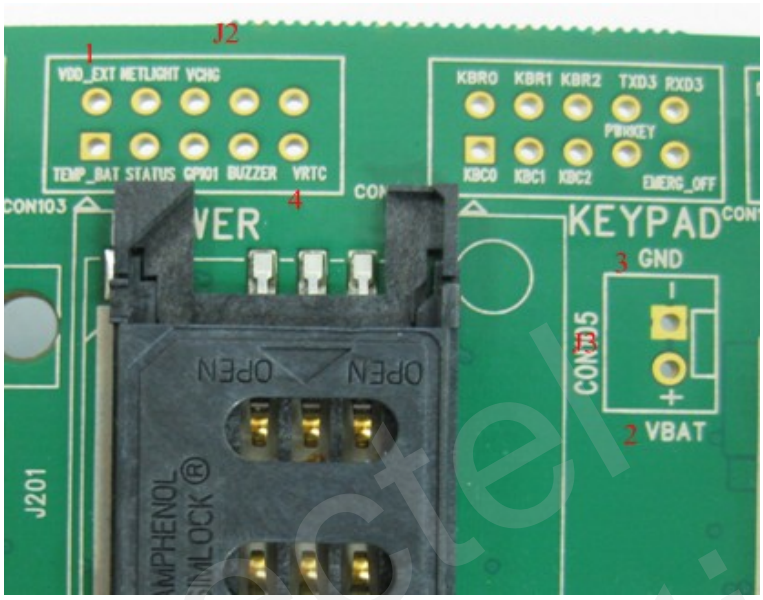

Figure 12: Power test points

Table 9: Pins of J2

Pin	Signal	I/O	Description
1	VEXT	O	External Power
2	VBAT	I	Power supply for module
3	GND		Ground
4	VRTC	I/O	RTC supply

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4. EVB and Accessories Assembly

Generally, the EVB and its accessories are equipped as Figure 13 and 14.

Figure 13: EVB and accessories

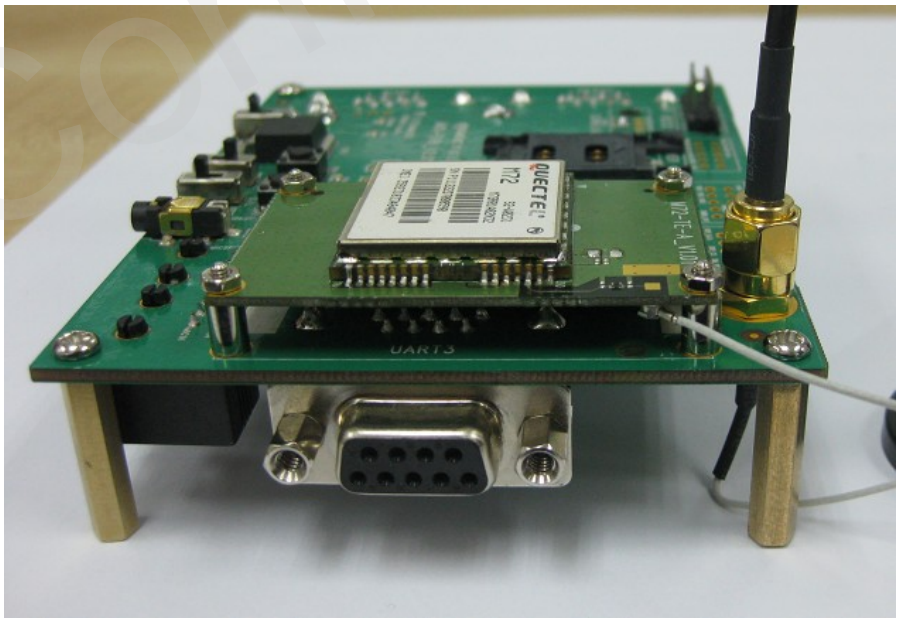

Figure 14: Side view

5. Illustration

5.1. Power on

(1) Connect M72-TE-A to the 60 pins connector on EVB.
(2) Insert the plug of the 5V power adapter.
(3) Switch S1 to **ON** state, switch S2 to **OFF** state, and switch S3 to **OFF** state. The LED L1 on the EVB will be turned on.
(4) Press the PWRKEY for about 2 seconds, and then the module begins running.
(5) 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 detailed network status indication.

5.2. Communication 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 M72-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 first input "AT" or "at" string once or more until receiving "OK" from the module in the HyperTerminal.
The module is set to auto-bauding mode in default configuration. This operation is done 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 the details of AT commands. For example, when input "ATD112", an emergency call will be established.

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.
(4) After these steps, the firmware refreshing process will be proceeding.
For more details, please refer to document [4].

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5.4. Turn Off

Press the PWRKEY button for about 2 seconds, the module will be turned off.

5.5. Emergency Off

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

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6. 60-PINs Assignment of DIP Connector

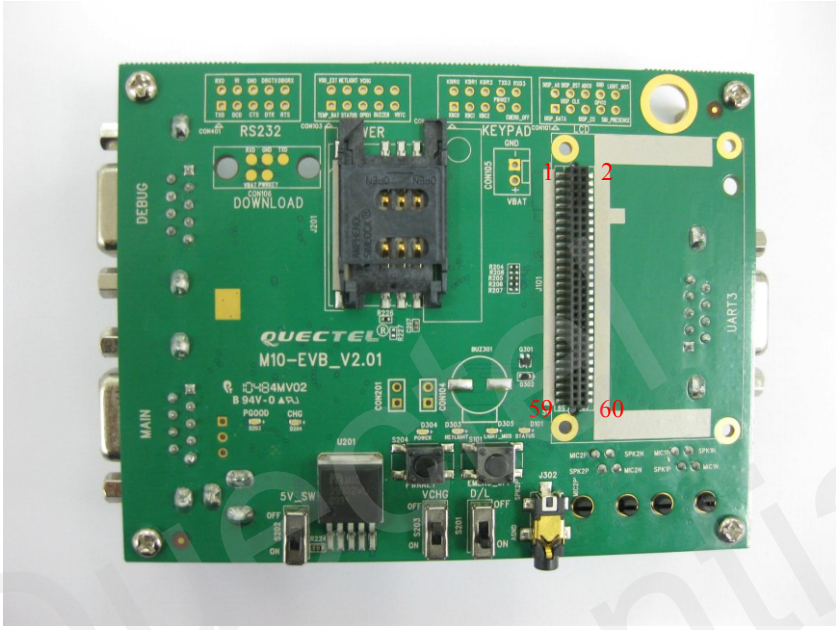

Figure 15: DIP connector of EVB

Table 10: Pin definition of the 60-pins 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	RESERVE	
13	RESERVE			14	VRTC	I/O
15	VDD_EXT	O		16	NETLIGHT	O
17	PWRKEY	I		18	RESERVE	
19	STATUS	O		20	RESERVE	
21	RESERVE			22	RESERVE	
23	RESERVE			24	RESERVE	
25	SIM_VDD	O		26	RESERVE	
27	SIM_RST	O		28	RESERVE	
29	SIM_DATA	I/O		30	RESERVE	
31	SIM_CLK	O		32	RESERVE	

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33	SIM_PRESENCE	I		34	RESERVE	
35	RESERVE			36	EMERG_OFF	I
37	DCD	O		38	RESERVE	
39	DTR	I		40	RESERVE	
41	RXD	I		42	RESERVE	
43	TXD	O		44	RESERVE	
45	RTS	I		46	RESERVE	
47	CTS	O		48	DBG_RXD	I
49	RI	O		50	DBG_TXD	O
51	RESERVE			52	RESERVE	
53	RESERVE			54	RESERVE	
55	RESERVE			56	RESERVE	
57	RESERVE			58	RESERVE	
59	RESERVE			60	RESERVE	

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