

MC90-TE-A User Guide

GSM/GPRS/GNSS Module Series

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History

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1 Introduction

In order to help customers develop applications with Quectel MC90 module conveniently, Quectel supplies corresponding development board (MC90-TE-A) to test the module. This document can help customers quickly understand MC90-TE-A interface specifications, electrical and mechanical details and know how to use it.

MC90-TE-A is intended to be used in combination with GSM EVB for MC90 module testing and evaluation. For detailed description of GSM EVB, please refer to **document [4]**.

1.1. Safety Information

The following safety precautions must be observed during all phases of operation, such as usage, service or repair of any cellular terminal or mobile incorporating MC90 module. Manufacturers of the cellular terminal should send the following safety information to users and operating personnel, and incorporate these guidelines into all manuals supplied with the product. If not so, Quectel assumes no liability for customers' failure to comply with these precautions.



Full attention must be given to driving at all times in order to reduce the risk of an accident. Using a mobile while driving (even with a handsfree kit) causes distraction and can lead to an accident. Please comply with laws and regulations restricting the use of wireless devices while driving.



Switch off the cellular terminal or mobile before boarding an aircraft. The operation of wireless appliances in an aircraft is forbidden to prevent interference with communication systems. If the device offers an Airplane Mode, then it should be enabled prior to boarding an aircraft. Please consult the airline staff for more restrictions on the use of wireless devices on boarding the aircraft.



Wireless devices may cause interference on sensitive medical equipment, so please be aware of the restrictions on the use of wireless devices when in hospitals, clinics or other healthcare facilities.



Cellular terminals or mobiles operating over radio signals and cellular network cannot be guaranteed to connect in all possible conditions (for example, with unpaid bills or with an invalid (U)SIM card). When emergent help is needed in such conditions, please remember using emergency call. In order to make or receive a call, the cellular terminal or mobile must be switched on in a service area with adequate cellular signal strength.



The cellular terminal or mobile contains a transmitter and receiver. When it is ON, it receives and transmits radio frequency signals. RF interference can occur if it is used close to TV set, radio, computer or other electric equipment.



In locations with potentially explosive atmospheres, obey all posted signs to turn off wireless devices such as your phone or other cellular terminals. Areas with potentially explosive atmospheres include fuelling areas, below decks on boats, fuel or chemical transfer or storage facilities, areas where the air contains chemicals or particles such as grain, dust or metal powders, etc.

2 Product Concept

2.1. MC90-TE-A Top and Bottom Views

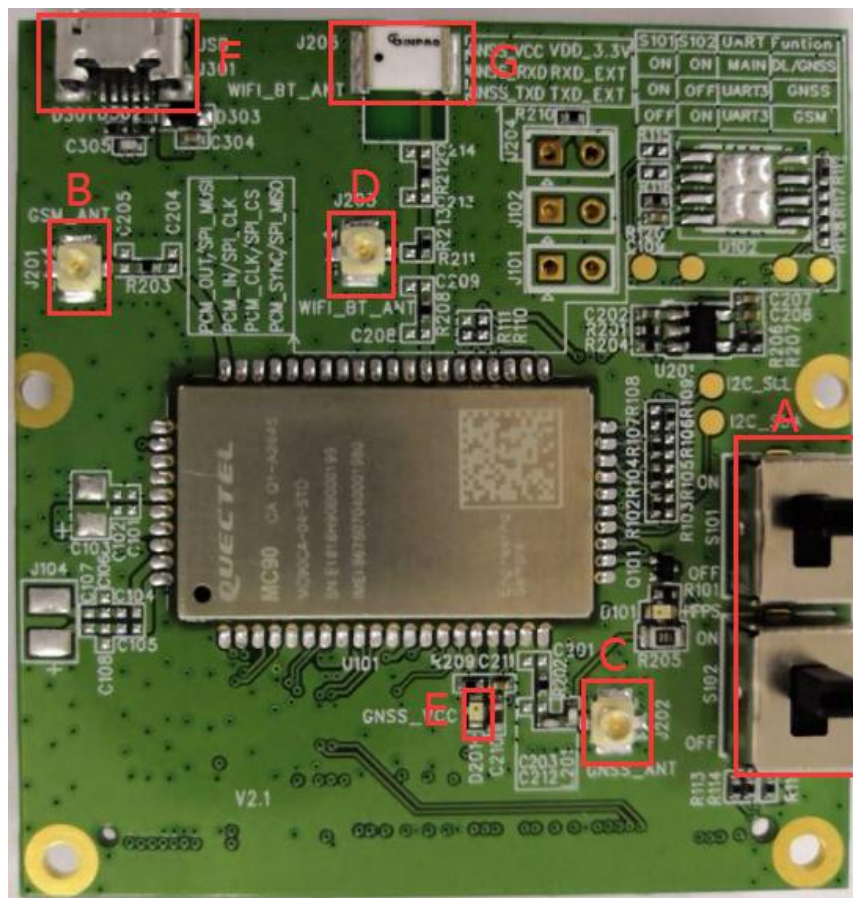


Figure 1: MC90-TE-A Top View

- A: Serial port selection switch
- B: GSM antenna interface
- C: GNSS antenna interface
- D: Wi-Fi antenna interface
- E: LED indicator
- F: USB interface
- F: Wi-Fi antenna



Figure 2: MC90-TE-A Bottom View

G: (U)SIM2 card connector

3 Interface Applications

3.1. (U)SIM2 Card Connector



Figure 3: (U)SIM2 Card Connector

Table 1: Pins of (U)SIM2 Card Connector

Pin No.	Signal	I/O	Description
1	CD1		Connect to ground
2	CD2		Reserved
3	SIM_DATA	I/O	(U)SIM card data input/output
4	SIM_CLK	O	(U)SIM card clock signal
5	VPP		Reserved

6	SIM_RST	O	(U)SIM card reset signal
7	GND		Ground
8	SIM_VDD		Power supply for (U)SIM card
9	GND		Ground
10	GND		Ground

4 MC90-TE-A Accessories Assembly



Figure 4: MC90-TE-A Toolkit Accessories

- A: GNSS antenna
- B: Driver disk
- C: RF cable (for GNSS antenna connection)

5 Illustration

MC90-TE-A kit is intended to be used in combination with GSM EVB for MC90 module testing and evaluation. The connection between MC90-TE-A and GSM EVB can refer to the following figure.

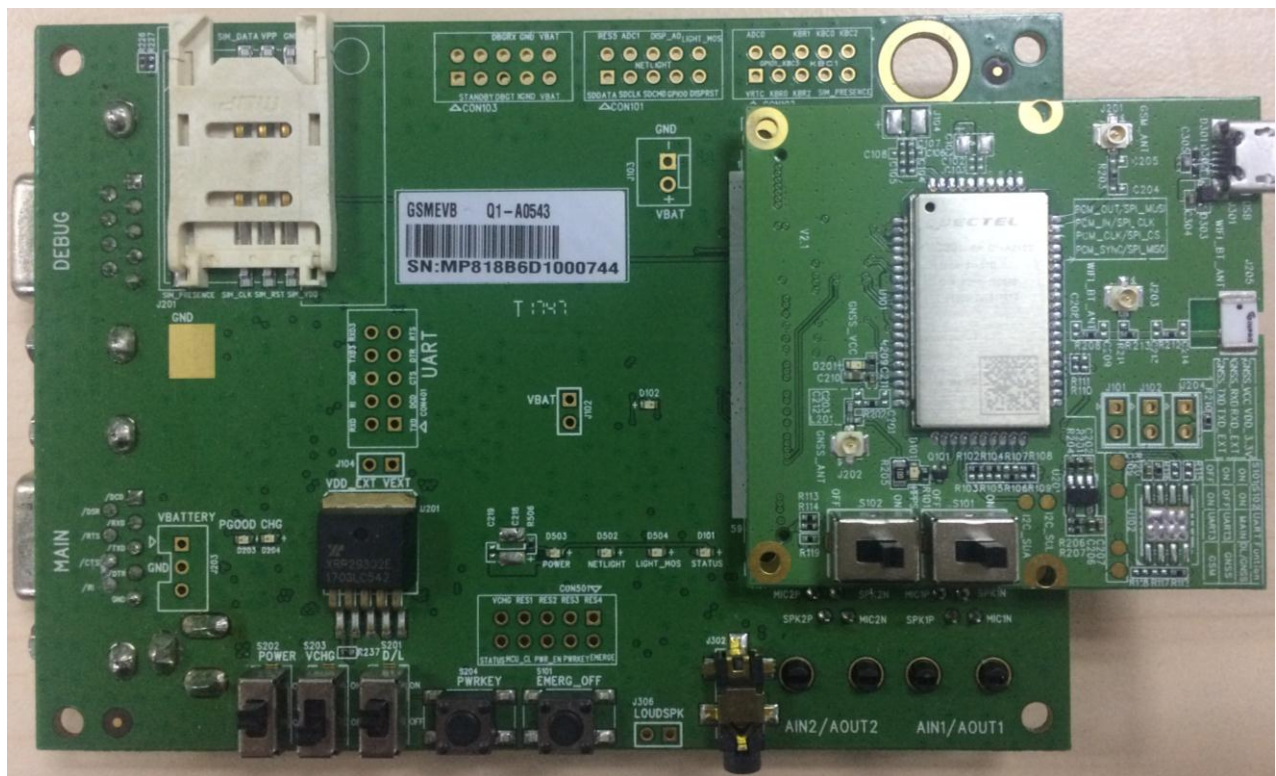


Figure 5: Connection between MC90-TE-A and GSM EVB

5.1. Power on MC90-TE-A

Power-on procedures of MC90-TE-A is controlled by GSM EVB. Please refer to **document [4]** for detailed power-on procedures.

5.2. Communicate with GSM Part of the Module

- (1) If the main UART is used for communication with GSM part of MC90 module, please turn the S101 and S102 switch to **ON** state on MC90-TE-A, and then connect the main UART of EVB to PC's USB port with the USB to UART converter cable. This is the recommended method. Switch status description is available in the following figures.

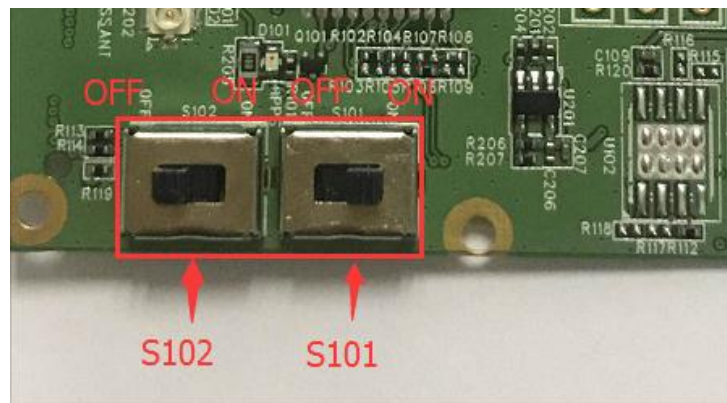


Figure 6: S101/S102 Switch Status Indication

S101	S102	UART	Function
ON	ON	MAIN	DL/GNSS
ON	OFF	UART3	GNSS
OFF	ON	UART3	GSM

Figure 7: S101/S102 Switch Status on Main UART When Communicating with GSM Part

If the UART3 is used for communication with the GSM part, please turn the S101 switch to **OFF** and S102 switch to **ON** state on MC90-TE-A, and then connect the UART3 on EVB to PC's USB port with the USB to UART converter cable. Currently, the software does not support this method.

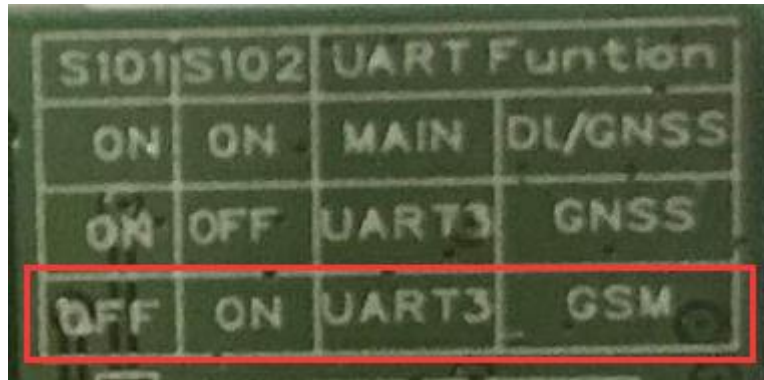


Figure 8: S101/S102 Switch Status on UART3 When Communicating with GSM Part

- (2) Open the QCOM (AT command window) on PC. Set appropriate Baud Rate (such as 115200bps) and COM number which can be checked by the Device Manager on PC.
- (3) Connect the antenna to the GSM_ANT on MC90-TE-A with an RF cable.
- (4) Insert an (U)SIM card into the (U)SIM1 card connector.
- (5) Insert earphone or handset into audio interface.
- (6) For power-on procedures, please refer to **document [4]**.
- (7) After waiting for 2~3 seconds, customers should first 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 corresponding functions will be executed.

5.3. Communicate with GNSS Part of the Module

5.3.1. Use Main UART (All-in-one Solution)

- (1) Turn the S101 and S102 switch to **ON** state on MC90-TE-A, and then connect the main UART of EVB to PC’s USB port with the USB to UART converter cable. This is the recommended method.

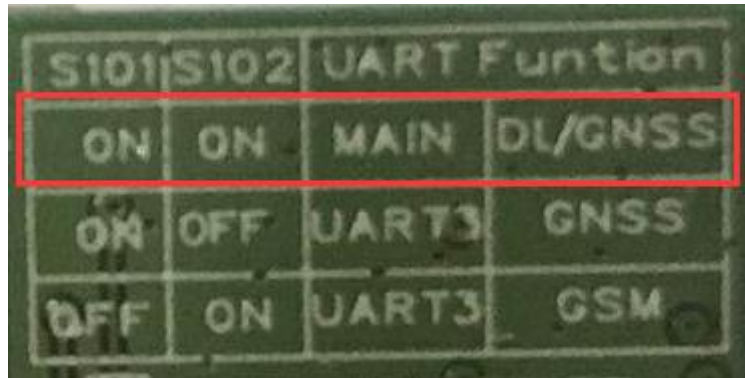


Figure 9: S101/S102 Switch Status on Main UART When Communicating with GNSS Part

- (2) Open the QCOM (AT command window) on PC. Set appropriate Baud Rate (such as 115200bps) and COM number which can be checked by the Device Manager on PC.
- (3) Connect the antenna to the GNSS_ANT on MC90-TE-A with an RF cable.
- (4) For power on procedure, please refer to **document [4]**.
- (5) After waiting for 2~3 seconds, customers should first input “AT” or “at” string once or more until receiving “OK” from the module in the HyperTerminal.
- (6) Send corresponding AT commands to turn on/off the GNSS part. When GNSS is turned on, the LED D102 on MC90-TE-A will be lighted and NMEA data will be output. For details of the corresponding AT commands, please refer to **document [1]**.

5.3.2. Use UART3 (Stand-alone Solution)

- (1) Turn the S101 switch to **ON** and S102 switch to **OFF** state on MC90-TE-A, and then connect the main UART and UART3 of EVB to PC’s USB ports with the USB to UART converter cables.

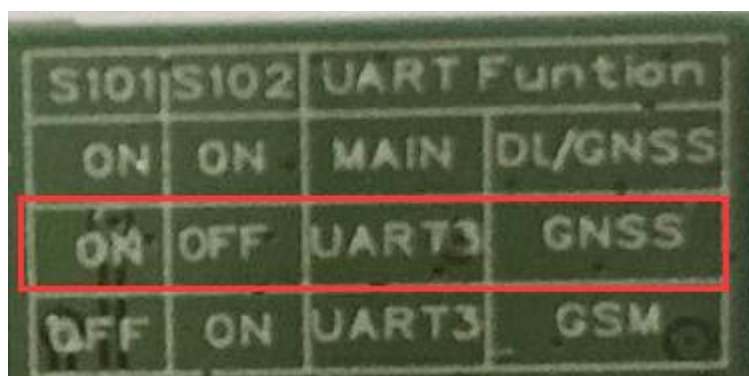


Figure 10: S101/S102 Switch Status on UART3 When Communicating with GNSS Part

- (2) Connect the antenna to the GNSS_ANT on MC90-TE-A with an RF cable.

- (3) Insert the plug of the 5V power adapter. Turn the S202 switch to **ON** state on the EVB. The LED D503 on the EVB will be lighted.
- (4) Send **AT+QGNSSC=1** command via main UART to turn on the GNSS part, and the LED D102 on MC90-TE-A will be lighted. For details of the corresponding AT commands, please refer to **document [1]**.
- (5) NMEA data will be received via UART3 and PMTK commands can be sent via UART3.
- (6) The PowerGPS tool can be used to view the status of GPS&GLONASS receiver conveniently. When the tool is opened, the user interface shown as below will be displayed.

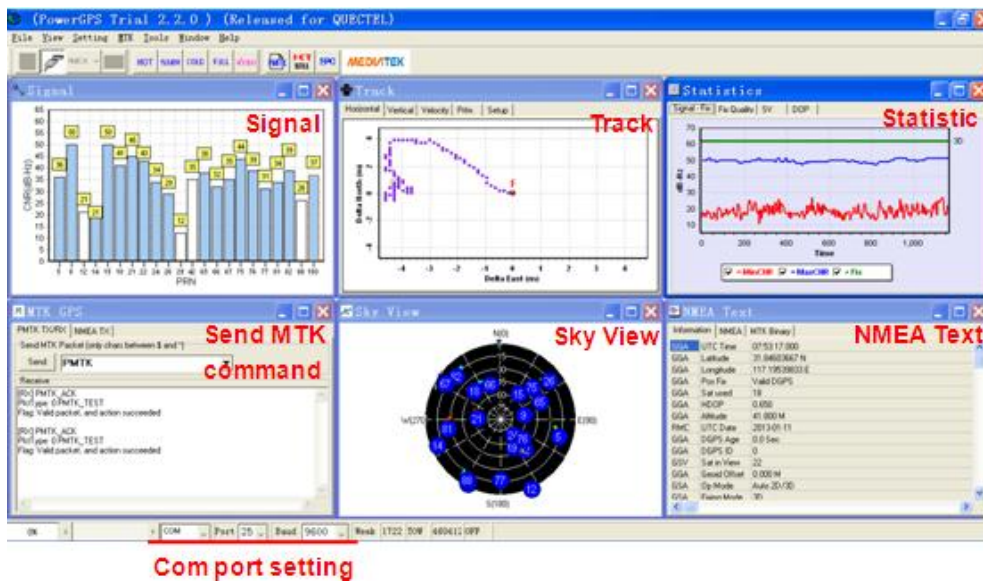


Figure 11: User Interface of PowerGPS Tool

5.4. Firmware Upgrade through Main UART Port

- (1) Switch the S101 and S102 on MC90-TE-A to **ON** state.

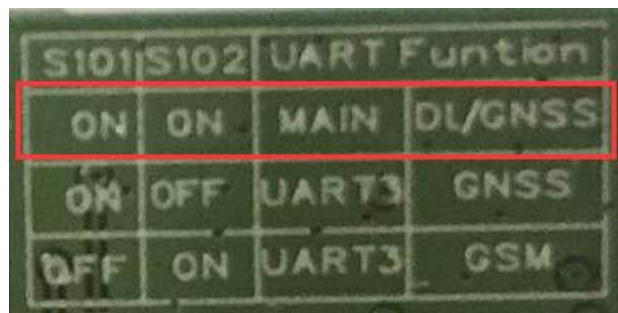


Figure 12: Switch S101/S102 to ON State

- (2) Start the firmware upgrade tool on PC.
- (3) Press the **START** button in the firmware upgrade tool.
- (4) Switch the S201 and S202 on the EVB to **ON** state. For details, please refer to **document [4]**.

5.5. Compatible Design and Applications

When testing the Wi-Fi function, a built-in Wi-Fi antenna of MC90-TE-A is recommended to be used. In this case, resistor R213 (0Ω, 0402 package) needs to be mounted, while resistor R211 (0Ω, 0402 package) does not need to be mounted. If an external Wi-Fi antenna is used, then R213 needs to be mounted and R211 does not need to be mounted.

Table 2: Resistor to be Mounted when Using Different Wi-Fi Antennas

Resistor	Use Built-in Wi-Fi Antenna	Use External Wi-Fi Antenna
R211	NM	0R
R213	0R	NM

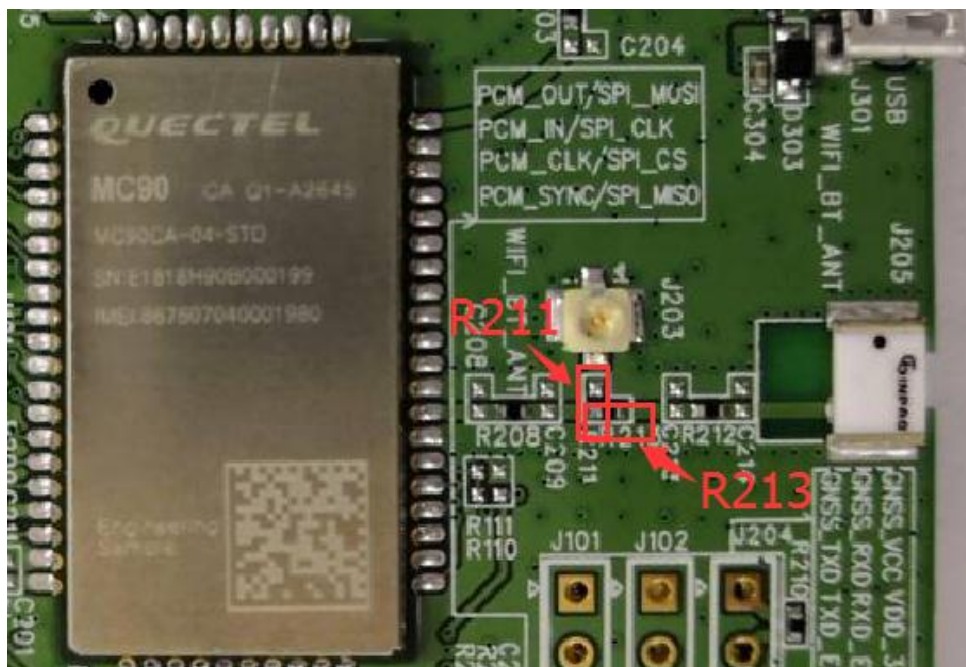


Figure 13: R211 or R213 to be Mounted when Using Different Wi-Fi Antennas

6 DIP Connector

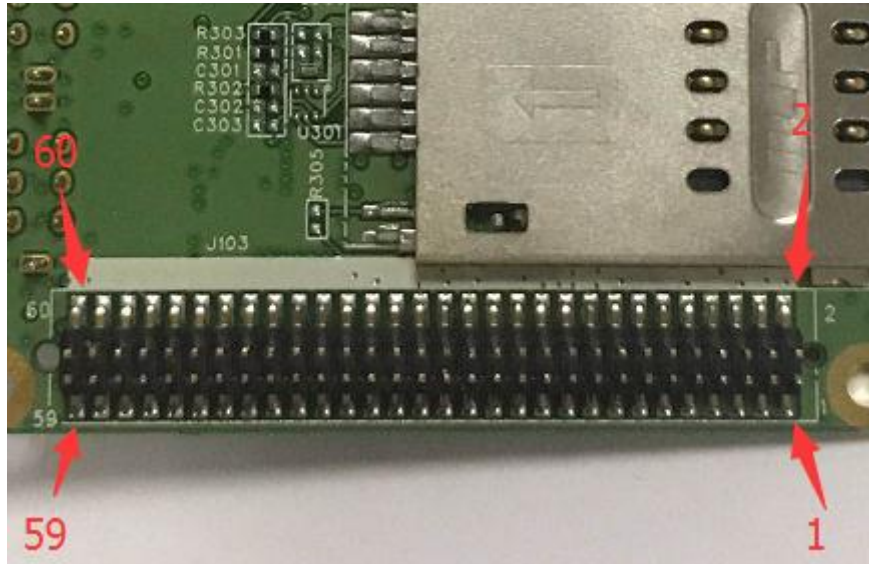


Figure 14: DIP Connector of MC90-TE-A

Table 3: 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			12	ADC	I
13			14		
15	VDD_EXT	O	16	NETLIGHT	O
17	PWRKEY	I	18	GPIO0	I/O

19			20	GPIO1	I/O
21			22	GPIO2	I/O
23			24	TXD3	O
25	SIM1_VDD	O	26	RXD3	I
27	SIM1_RST	O	28	GPIO3	I/O
29	SIM1_DATA	I/O	30	GPIO4	I/O
31	SIM1_CLK	O	32	GPIO5	I/O
33	SIM1_PRESENCE	I	34		
35			36	EMERG_RESET	I
37	DCD	O	38		
39	DTR	I	40		
41	RXD	I	42		
43	TXD	O	44		
45	RTS	I	46		
47	CTS	O	48	DBG_RXD	I
49	RI	O	50	DBG_TXD	O
51			52		
53	SPK1P	O	54	MICP	I
55	SPK1N	O	56	MICN	I
57	SPK2P	O	58	MICP	I
59			60	MICN	I

7 Appendix A References

Table 4: Related Documents

SN	Document Name	Remark
[1]	Quectel_MC60&MC90_AT_Commands_Manual	MC60&MC90 AT commands manual
[2]	Quectel_GSM_UART_Application_Note	Serial port application note
[3]	Quectel_MC90_Hardware_Design	MC90 hardware design
[4]	Quectel_GSM_EVB_User_Guide	GSM EVB user guide