HUAWEI MU509&MC509 Series LGA Module

Development Kit Guide

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About This Document

Revision History

Document Version	Date	Chapter	Description
01	2011-10-20		Creation
02	2013-02-27	All	Updated the scope of this document
		1.3	Updated components of the DVK
		2	Added Installation and Use Guide
		3.3.3	Updated the description of audio interfaces
		3.3.4	Updated Table 3-1 Functions of the LED indicators on the DVK
		3.3.6	Added Table 3-2 the duration of powering on/off and resetting the module
03	2013-10-15	2.2	Updated the UIM/USIM card of Step 1
			Updated the time of Step 7
		3.2	Updated Figure 3-2 The structure of the DVK
		3.3.9	Updated PCM Audio Interface
		3.3.11	Added Pin Socket

Scope

MU509-b

MU509-c

MU509-g

HUAWEI MU509-1

MC509-a

MC509

Contents

1 Overview

1.1 About This Chapter

This chapter provides a brief description of the HUAWEI MU509&MC509 series LGA module development kit (DVK), including:

- Introduction to the DVK
- Components of the DVK

NOTE

- In the following chapters and sections, "module" refers to the HUAWEI MU509&MC509 series LGA module; "DVK" refers to the HUAWEI MU509&MC509 series LGA module development kit.
- The PCB name of the development board is MD0MU509M.

1.2 Introduction to the DVK

The DVK provides a complete solution based on the data and audio functions of the HUAWEI MU509&MC509 series LGA module.

For designers who adopt the module in their design, the DVK facilitates their module-based programming and troubleshooting at the project development stage.

Consisting of a dedicated interface board and accessories, the DVK provides the following interfaces:

- One 5 V power supply input interface
- One Mini USB B port
- One standard RS-232 interface: COM1, only for 2 wires connect (TX and RX)
- One standard Subscriber Identity Module (SIM) card slot
- Two audio interfaces
- Three antenna connectors

The HUAWEI MU509&MC509 series LGA module is welded onto the interface board in a manner that is similar to the surface mounting of chips. The signals output from the module are transferred to the development board for secondary development.

1.3 Components of the DVK

Table 1-1 lists the components of the DVK.

Check the components and their quantities after you obtain the DVK. If any component is missing or damaged, contact your DVK supplier.

Table 1-1 Components of the DVK

| Number	Item	Quantity
1	Development kit	1
2	5 V output AC-DC power supply adapter	1
3	RS-232 serial cable	1
4	USB cable	1
5	Handset audio cable	1
6	2-pin jumper	2
7	External antenna	1

2 Installation and Use Guide

2.1 About This Chapter

This chapter describes how to install and use the LGA module's development kit (DVK).
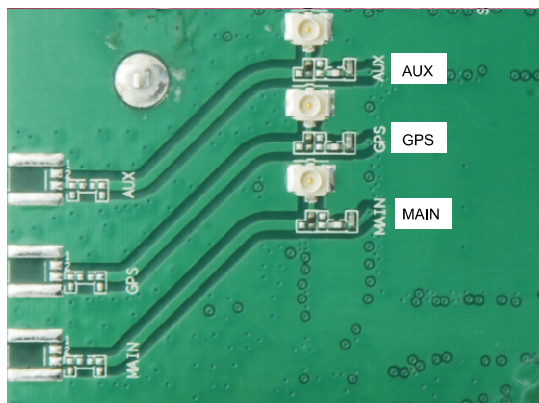
2.2 Installation and Power-on Procedure
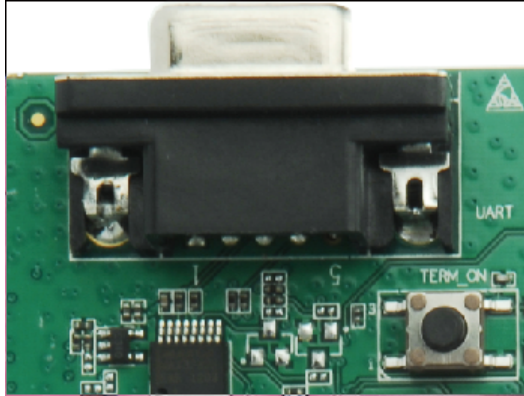
Step 1   Install the UIM/USIM card.
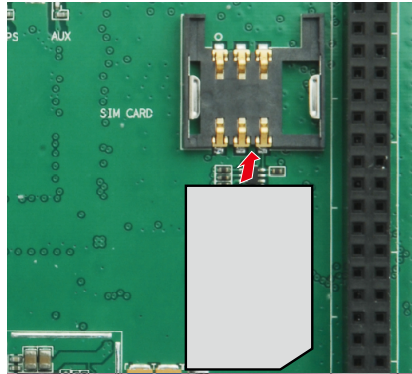
Step 2   Install the antennas.

The DVK provides three antenna ports to connect to RF cables or antennas.

Step 3 Install the serial cable.

Connect one end of the DVK serial cable to the DVK mother board's serial port and the other end to the computer's serial port. If you do not need to use the serial port, skip this step.

Step 4 Install an external power supply.

The external power supply can source power from a 5 V power adapter or through the USB port. Note: Do not use these two power supply methods at the same time.

When you use the 5 V power adapter, connect the pin 2 and pin 3 of the 3-pin connector using a jumper cap, as shown in the following figure.
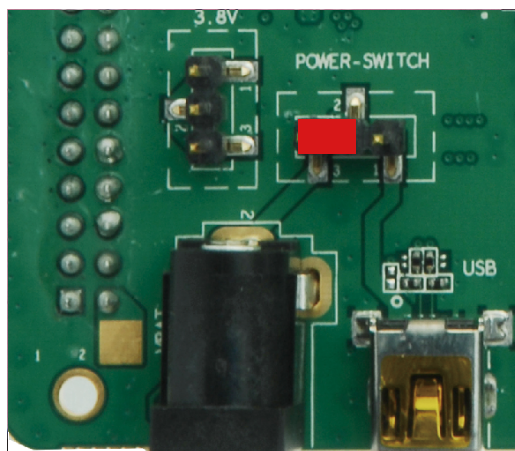
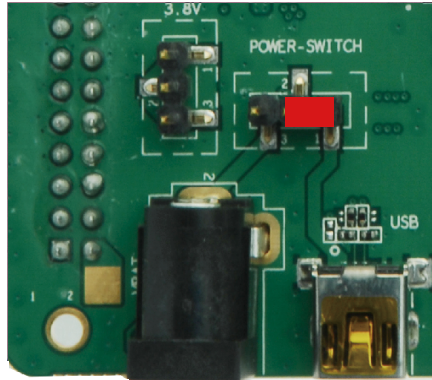When you use the USB port, connect the pin 1 and pin 2 of the 3-pin connector using a jumper cap, as shown in the following figure.

Step 5 Install the USB cable.

The USB port can be used not only to connect to an external power supply, but also for communication.

Step 6 Install the audio cable or earphones.

Connect the handset port to a handset using the blue audio cable in the DVK kit. Connect the larger port on the blue cable to the DVK HANDSET port, and the smaller one to the handset.

The headset port must be connected to two earphones simultaneously. Connect one earphone to the HEADSET port to speak and the other to the SPEAKER port to listen.
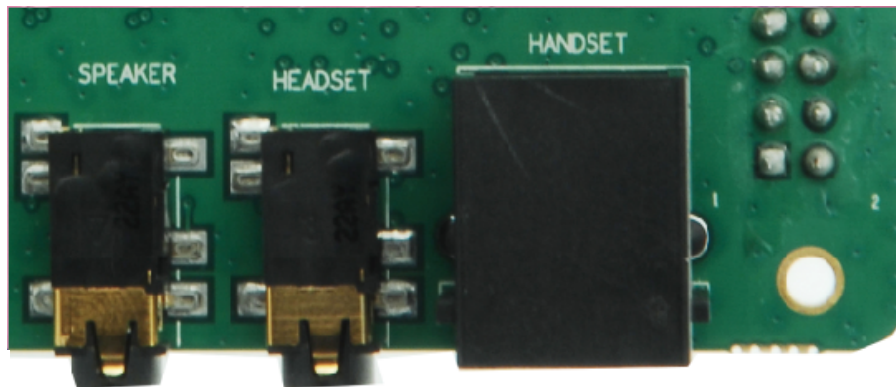
Step 7 To power on the LGA module, press and hold the TERM_ON key for at least 0.5s to 1s.
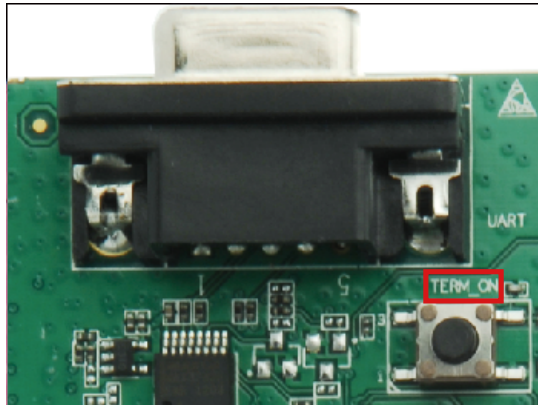
3 Overview of the DVK

3.1 About This Chapter

This chapter describes the structure, interface functions, and interface usage of the DVK.

- DVK Structure
- Interface Functions

3.2 DVK Structure

The following interfaces are supplied by the DVK:

1. 5 V power supply input interface
2. Mini USB B port
3. Speaker interface
4. Headset interface
5. Handset interface
6. Joint Test Action Group (JTAG) interface
7. Light-emitting diode (LED) indicators
8. Universal asynchronous receiver/transmitter (UART) serial port (2 wires)
9. Power button
10. Reset button
11. MAIN antenna connector
12. GPS antenna connector
13. AUX antenna connector
14. USIM/UIM card slot
15. PCM audio interface

Figure 3-1 shows the layout of the DVK.
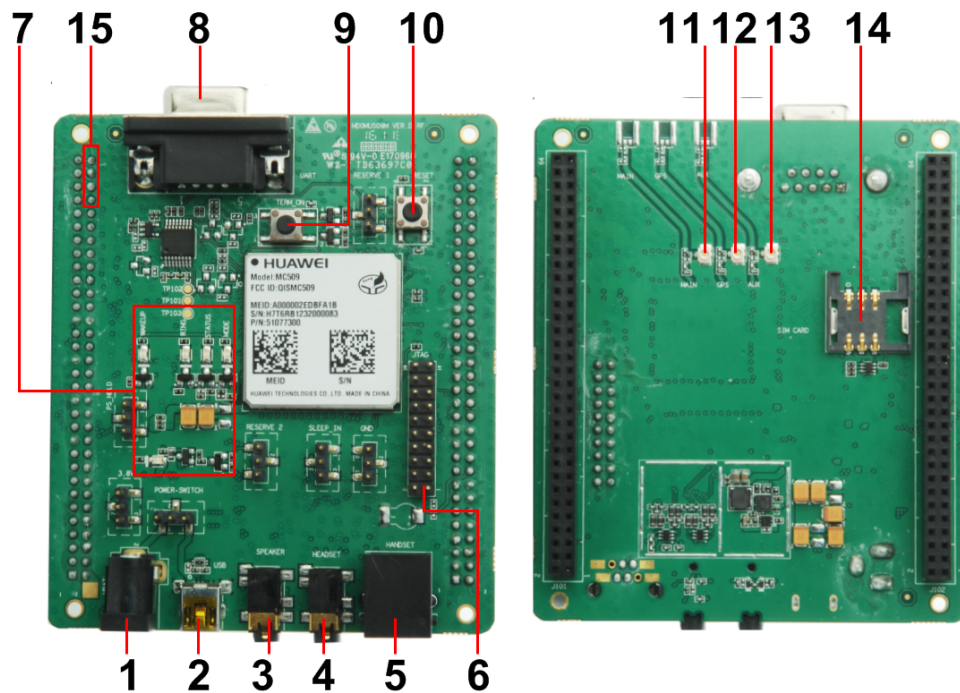
Figure 3-1 Layout of the DVK

Figure 3-2 The structure of the DVK.
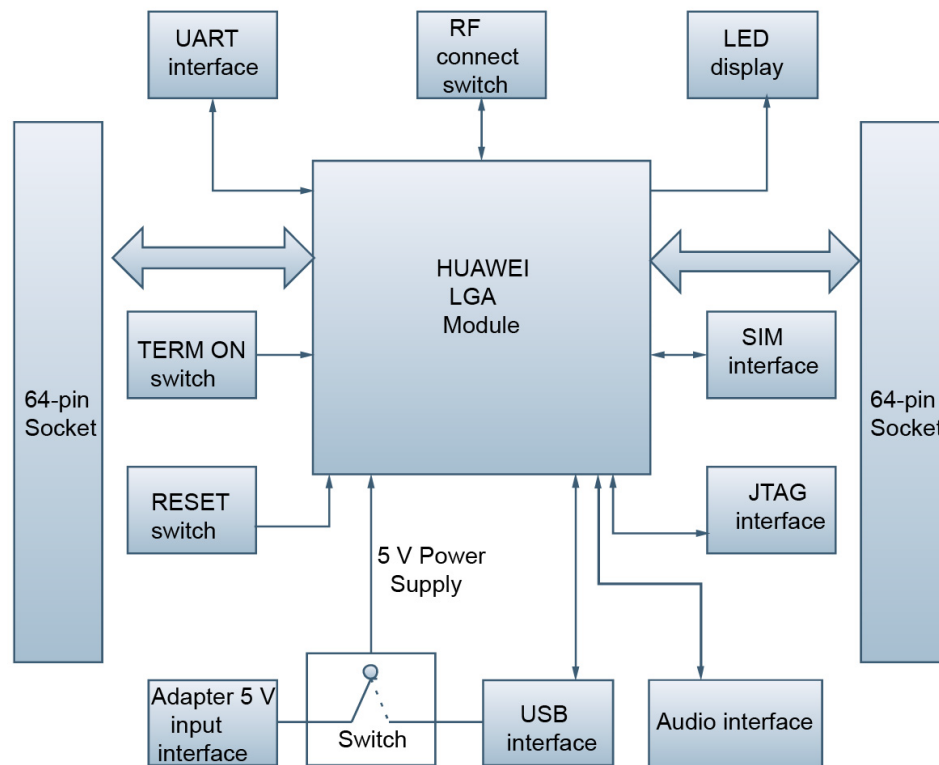
3.3 Interface Functions

3.3.1 Power Switch and Power Supply Mode

Power can be supplied to the DVK in two modes: by a 5 V AC-DC power adapter or the USB 5 V power supply.

The jump wire POWER-SWITCH is used to select a power supply mode. When pin 1 and pin 2 are connected, the USB 5 V power supply is used; when pin 2 and pin 3 are connected, the 5 V AC-DC power adapter is used. Only one mode can be selected at a time. Once the development kit is powered on, the power indicator (D302) lights up.

Figure 3-3 Power is supplied by the 5 V AC-DC power adapter
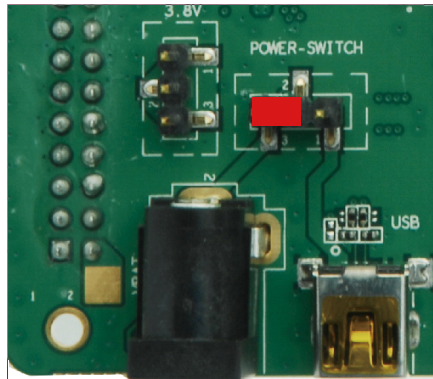
Figure 3-4 Power is supplied by the USB 5 V power supply
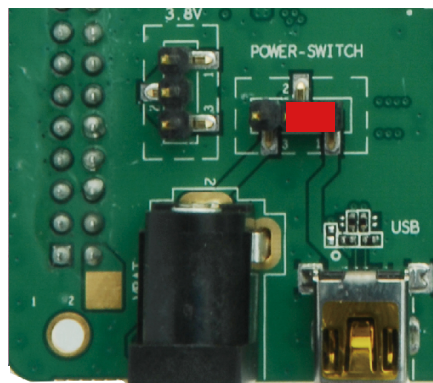
3.3.2 USB Communications Interface

The DVK provides a mini USB B-type connector. The connector implements communications between the module and a personal computer (PC) or other data terminal equipment (DTE) and supports USB analyzers.

3.3.3 Analog Audio Interfaces

The DVK provides two analog audio interfaces, supporting two channels of input from microphones, one channel of output to earphones, and one channel of output to speakers.

Connect the handset port to a handset using the blue audio cable in the DVK kit. Connect the larger port on the blue cable to the DVK HANDSET port, and the smaller one to the handset.
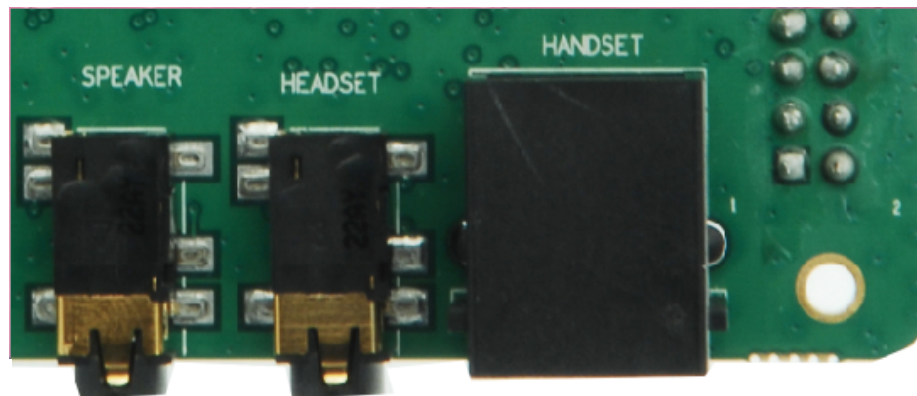
The headset port must be connected to two headsets simultaneously. Connect one headset to the HEADSET port to speak and the other to the SPEAKER port to listen.
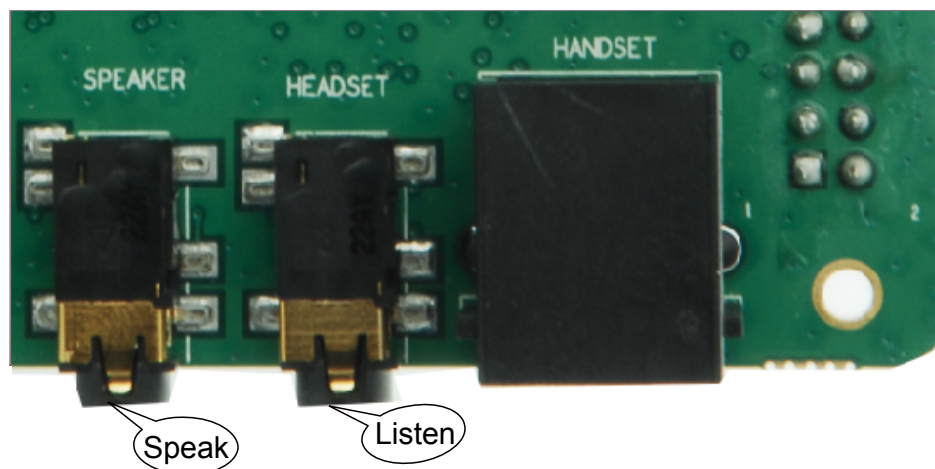
3.3.4 LED Indicators

The DVK has five LED indicators: one power indicator and four signal indicators.

The power indicator (D302) is described in section 3.3.1 . The description of the indicators is marked on the development kit. Table 3-1 lists the functions of the indicators.

Table 3-1 Functions of the LED indicators on the DVK
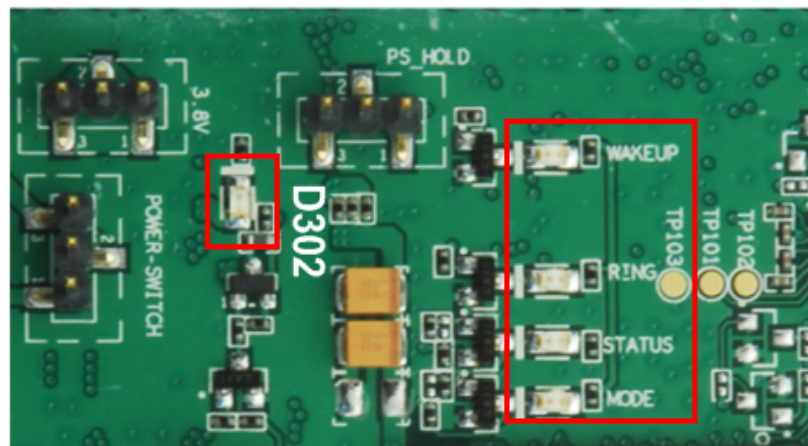
Position Number	Mark on the Development kit	Color	Function of the LED When It Lights Up
D302	-	Green	Indicates that the DVK has been powered on properly.
D306	RING	Green	The indicator blinks when a ring is coming.
D307	STATUS	Green	Indicates the network mode of the module. See the corresponding hardware guide.
D308	MODE	Green	
D304	WAKEUP	Green	Indicates that a call or short message is coming and the indicator blinks for 1s.

3.3.5 Serial Communications Interface

The DVK provides a DB9 female connector (a standard RS-232 serial communications interface), which supports 2-wire serial (UART_TX and UART_RX) communications and can be connected to a PC or other DTE through a RS-232 serial cable.

3.3.6 Buttons

The DVK has two buttons: the power button (S303) and the reset button (S302).

The power button S303 (marked as "TERM_ON" on the development kit) powers on or off the module. The power-on/power-off signal of the module is at low level when the button is pressed. The duration of the low-level signal input to the power-on/power-off signal pin of the module equals to the duration when the button is pressed.

The reset button (S302) (marked as "RESET" on the development kit) resets the module. The reset signal of the module is at low level when the button is pressed.

The duration of the low-level signal input to the reset signal pin of the module equals to the duration when the button is pressed.

Table 3-2 The duration of powering on/off and resetting the module

LGA module	Power on the module	Power off the module	Reset the module
MU509 family	0.5s–1s	0.5s–4s	50 ms–100 ms
MC509 family	0.5s–1s	3s–4s	50 ms–100 ms

3.3.7 USIM Card Interface

The DVK provides a standard USIM card slot (marked as "SIM CARD" on the development kit).

3.3.8 Antenna Connector

The DVK provides three antenna connectors for connecting the MAIN, AUX and GPS antenna of the module. The HUAWEI MU509&MC509 series LGA modules may support different RF receive character as shown in the Table 3-3 .

The antenna connector can be connected to an RF tester (CMU200 or Agilent 8960), or directly connected to an external antenna for testing the services of the existing network.
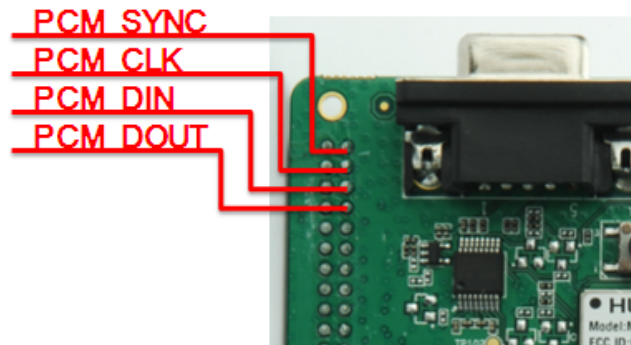
Table 3-3 Antenna connectors of LGA module

LGA module	MAIN_ANT	AUX_ANT	GPS_ANT
MU509 family	√	×	×
MC509 family	√	√	√

3.3.9 PCM Audio Interface

The DVK provides PCM audio interface as the test point on its 64-pin socket shown in Figure 3-5 .

The PCM interface can be used for PCM audio application by connecting external codec with the electrical wire.

Figure 3-5 PCM audio interface

3.3.10 3-Pin Jump Wire Configuration

The DVK has seven 3-pin jump wires, as shown in Figure 3-6 . Two jump wires need to be configured as necessary during use. Table 3-4 lists the usage and configuration method of the 3-pin jump wires.

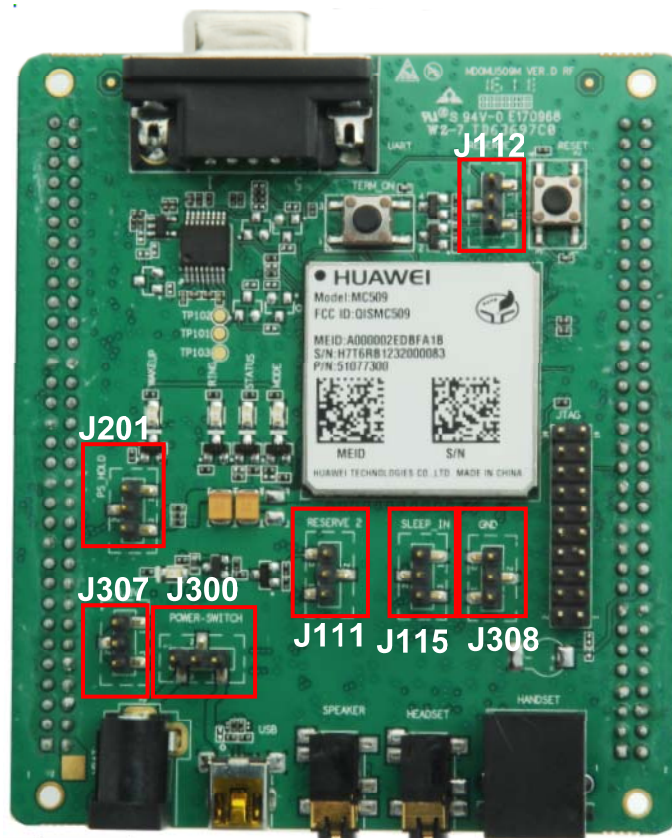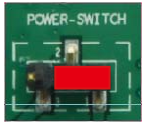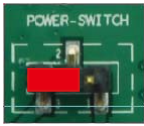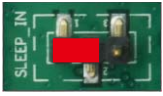**Figure 3-6** Positions of the 3-pin jump wires

Table 3-4 3-pin jump wire configuration

Position Number	Mark on the Development kit	Usage and Configuration	Figure
J307	3.8 V	All the three pins are VBAT pins. No configuration is needed. The three pins can be used for testing.	
J308	GND	All the three pins are GND pins. No configuration is needed. The three pins can be used for testing.	
J300	POWER_SWITCH	This jump wire is used to select the power supply mode. Configuration is needed. For the USB power supply mode, connect the pin 1 and pin 2.	
		For the 5 V adapter power supply mode, connect the pin 2 and pin 3.	
J201	PS_HOLD	These jump wires are used only for internal tests by research and development personnel. Please keep this pin open.	
J115	SLEEP_IN	To put the module in forced sleep mode, connect pin 1 and pin 2 to output low level signals.	
		To put the module in non-sleep mode, please keep this pin open.	
J111 J112	RESERVE 2, RESERVE 1	These jump wires are used only for internal tests by research and development personnel. Please keep this pin open.	

3.3.11 **Pin Socket**

The DVK provides two 64-pin sockets for testing in MU509 series and MC509 series respectively. The signals assignment of sockets is shown in Figure 3-7 and Figure 3-8 .

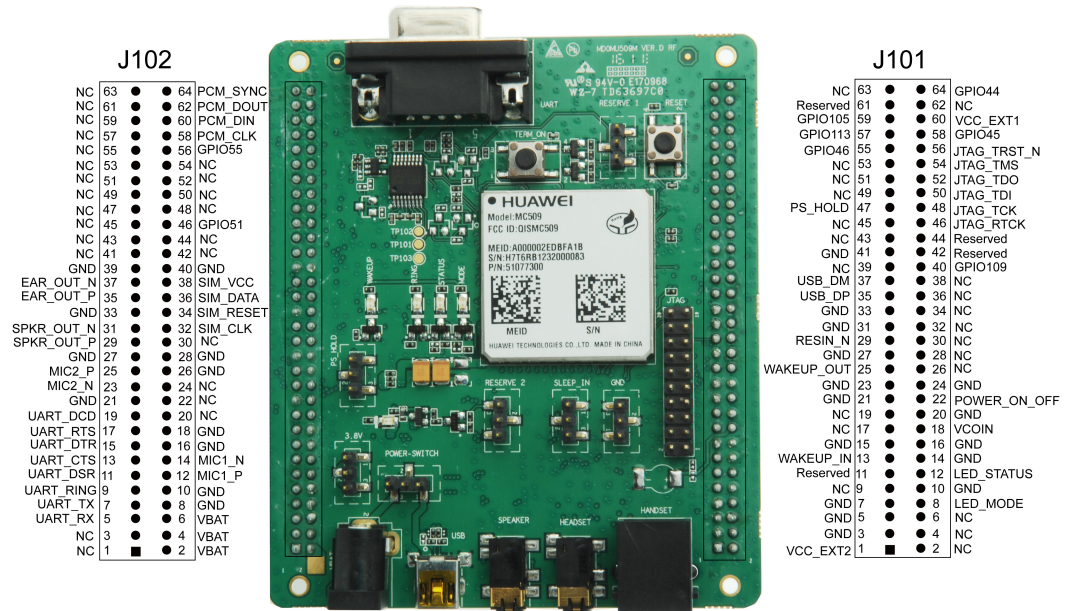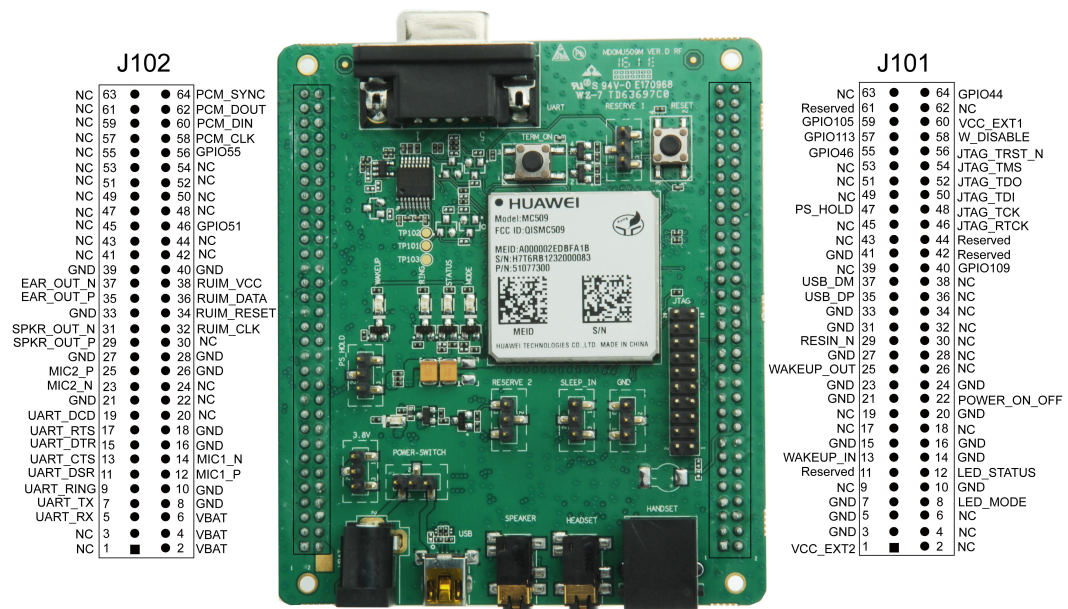**Figure 3-7** 64-pin sockets for MU509 series

Figure 3-8 64-pin sockets for MC509 series

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📖 NOTE

- There are 8 pins for GPIO in MU509 Series and 7 pins for GPIO in MC509 Series. For example:GPIO55 means the pin name is GPIO and the pin sequence is 55 in LGA interface.

- Keep NC and Reserved pins open. For more details about this information, please contact with us.

4 Acronyms and Abbreviations

Acronym or Abbreviation	Expansion
DC	Direct Current
DVK	Development Kit
GPS	Global Position System
JTAG	Joint Test Action Group
LED	Light-emitting Diode
LGA	Land Grid Array
PCM	Pulse-code Modulation
RF	Radio Frequency
UART	Universal Asynchronous Receiver/Transmitter
UIM	User Identity Module
USB	Universal Serial Bus
USIM	Universal Subscriber Identity Module