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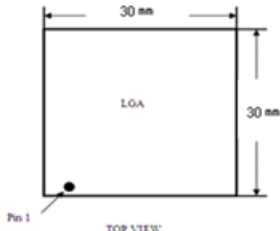
## Thank you for purchasing HUAWEI MU509-g HSDPA Module (hereinafter referred to as the MU509)

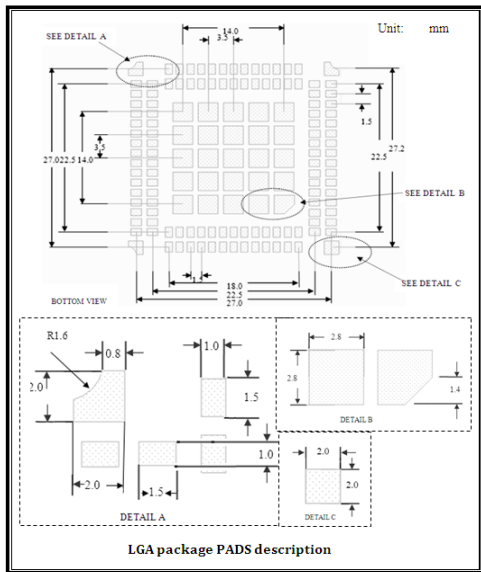
### Note:

- This manual briefly describes the preparation, the process for PCB Design, Assembly and safety precautions.
- You are recommended to read the manual before using the MU509.

## Getting to Know the MU509

The package of the LGA module is 116 pin LGA with a dimension of 30 mm × 30 mm × 2.5 mm and the pitch of 1.5 mm. It is applied to the user interface board, and can be used as a wireless terminal in a network environment.

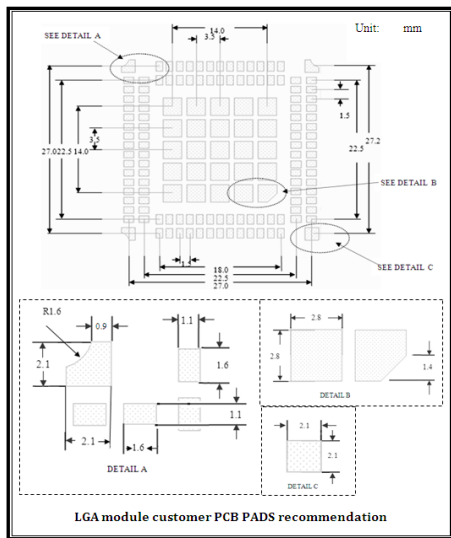




# PCB Design

## CB Pad Design

To achieve high efficiency of the production and solder joints of high reliability, it is recommended that the PCB pad size be designed as follows: the size of the middle region is the same as the pad size of the product package; other pads are 0.05 mm larger than the unilateral pad of the product package. For details, see the following figure:



## Requirements on PCB Layout

- Other devices must be located more than 3 mm away from the LGA module. It is recommended to be 5 mm. The minimum distance between the LGA module and the PCB edge is 1.5 mm.
- When the PCB layout is double sided, it is recommended that the LGA module be placed on the second side for assembly.

## **Design of Solder Mask**

The PCB pad design can be solder mask defined (SMD), or non-solder mask defined (NSMD).

NSMD is recommended. In addition, the solder mask of the NSMD pad design is larger than the pad so the reliability of the solder joint can be improved.

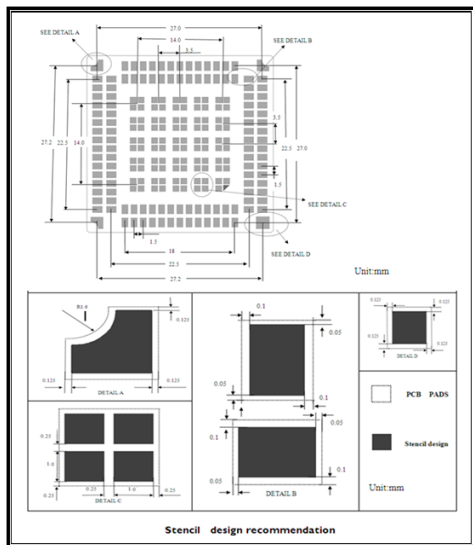
The solder mask must be 100  $\mu\text{m}$  to 150  $\mu\text{m}$  larger than the pad, that is, the single side of the solder mask must be 50  $\mu\text{m}$  to 75  $\mu\text{m}$  larger than the pad. The specific size depends on the processing capability of the PCB manufacturer.

## **Assembly**

### **Stencil Design**

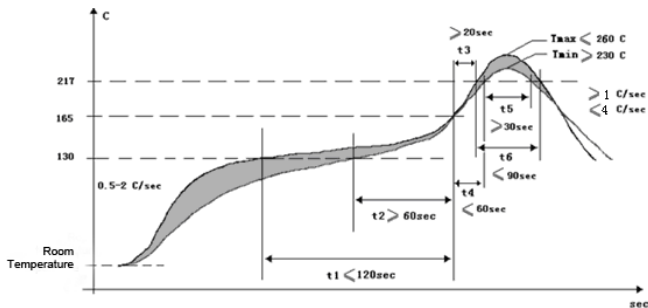
It is recommended that the stencil for the LGA module be 0.12 mm in thickness. For the stencil design, see the following figure:





## Reflow Profile

For the soldering temperature of the LGA module, see the following figure:



Reflow parameters:

Preheat zone (40–150°C)	Time: 60 - 120sec	Heating rate: 0.5–2°C/sec
Soak zone (150-200°C)	Time: 60 - 120sec	Heating rate: <1.0°C/sec
Reflow zone (> 217°C)	Time: 30 - 90sec	Peak reflow temperature: 230–260°C
Cooling zone	Cooling rate: 1°C/sec ≤ Slope ≤ 4°C/sec	

# Safety Information

Read the safety information carefully to ensure the correct and safe use of your wireless device.

## Interference

Do not use your wireless device if using the device is prohibited or when it causes danger or interference with electric devices.

## Medical Device

- Do not use your wireless device and follow the rules and regulations set forth by the hospitals and health care facilities.
- Some wireless devices may affect the performance of the hearing aids. For any such problems, consult your service provider.
- If you are using an electronic medical device, consult the doctor or device manufacturer to confirm whether the radio wave affects the operation of this device.

## Area with Inflammables and Explosives

To prevent explosions and fires in areas that are stored with inflammable and explosive devices, do not use your wireless device and observe the rules. Areas stored with inflammables and explosives include but are not limited to the following:

- Gas station
- Fuel depot (such as the bunk below the deck of a ship)
- Container/Vehicle for storing or transporting fuels or chemical products
- Area where the air contains chemical substances and particles (such as granule, dust, or

metal powder)

- Area indicated with the "Explosives" sign
- Area indicated with the "Power off bi-direction wireless equipment" sign
- Area where you are generally suggested to stop the engine of a vehicle

## **Traffic Security**

- Observe local laws and regulations while using the wireless device. To prevent accidents, do not use your wireless device while driving.
- RF signals may affect electronic systems of motor vehicles. For more information, consult the vehicle manufacturer.
- In a motor vehicle, do not place the wireless device over the air bag or in the air bag deployment area. Otherwise, the wireless device may hurt you owing to the strong force when the air bag inflates.
- Observe the rules and regulations of airline companies. When boarding, switch you're your wireless device. Otherwise, the radio signal of the wireless device may interfere with the plane control signals.

## **Safety of Children**

Do not allow children to use the wireless device without guidance. Small and sharp components of the wireless device may cause danger to children or cause suffocation if children swallow the components.

## **Environment Protection**

Observe the local regulations regarding the disposal of your packaging materials, used wireless device and accessories, and promote their recycling.

## **WEEE Approval**

The wireless device is in compliance with the essential requirements and other relevant provisions of the Waste Electrical and Electronic Equipment Directive 2002/96/EC (WEEE Directive).

## **RoHS Approval**

The wireless device is in compliance with the restriction of the use of certain hazardous substances in electrical and electronic equipment Directive 2002/95/EC (RoHS Directive).

## **Laws and Regulations Observance**

Observe laws and regulations when using your wireless device. Respect the privacy and legal rights of the others.

## **Care and Maintenance**

It is normal that your wireless device gets hot when you use or charge it. Before you clean or maintain the wireless device, stop all applications and power off the wireless device.

- Use your wireless device and accessories with care and in clean environment. Keep the wireless device from a fire or a lit cigarette.
- Protect your wireless device and accessories from water and vapor and keep them dry.
- Do not drop, throw or bend your wireless device.
- Clean your wireless device with a piece of damp and soft antistatic cloth. Do not use any chemical agents (such as alcohol and benzene), chemical detergent, or powder to clean it.
- Do not leave your wireless device and accessories in a place with a considerably low or high temperature.

- Use only accessories of the wireless device approved by the manufacture. Contact the authorized service center for any abnormality of the wireless device or accessories.
- Do not dismantle the wireless device or accessories. Otherwise, the wireless device and accessories are not covered by the warranty.

## **Emergency Call**

This wireless device functions through receiving and transmitting radio signals. Therefore, the connection cannot be guaranteed in all conditions. In an emergency, you should not rely solely on the wireless device for essential communications.

## **Regulatory Information**

The following approvals and notices apply in specific regions as noted.

### **CE Approval (European Union)**

The wireless device is approved to be used in the member states of the EU. The wireless device is in compliance with the essential requirements and other relevant provisions of the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (R&TTE Directive).

Federal Communications Commission Notice (United States): Before a wireless device model is available for sale to the public, it must be tested and certified to the FCC that it does not exceed the limit established by the government-adopted requirement for safe exposure.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.




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### Import and Export Regulations

Customers shall comply with all applicable export or import laws and regulations and will obtain all necessary governmental permits and licenses in order to export, re-export or import the product mentioned in this manual including the software and technical data therein.

## Warnings and Precautions

This section contains important information pertaining to the operating instructions of your device. It also contains information about how to use your device safely. Read this information carefully before using the device.

### Electronic Device

Do not use your device if using the device is prohibited. Do not use the device when using the device causes danger or interference with electronic devices.

### Medical Device

- Follow rules and regulations set forth by hospitals and health care facilities. Do not use your device when using the device is prohibited.
- Some wireless devices may affect the performance of hearing aids or pacemakers. For any such problems, consult your service provider.
- If you are using an electronic medical device, consult the doctor or the device manufacturer to confirm whether radio waves affect the operation of this device.

### Potentially Explosive Atmosphere

Do not use your device in any area with a potentially explosive atmosphere, and comply with all signs and instructions. Areas that may have potentially explosive atmospheres include the areas where you would normally be advised to turn off your vehicle engine. Triggering of sparks in such areas could cause an explosion or a fire, resulting in bodily injuries or even deaths. Do not use your device at refueling points such as service stations. Comply with restrictions on the use of radio equipment in fuel depots, storage, and distribution areas, and chemical plants. In addition, adhere to restrictions in areas where blasting operations are in progress. Before using the device, watch out for areas that have potentially explosive atmospheres that are often, but not always, clearly marked. Such locations include areas below the deck on boats, chemical transfer or storage facilities, and areas where the air contains chemicals or particles such as grain, dust, or metal powders. Ask the manufacturers of vehicles using liquefied petroleum gas (such as propane or butane) whether this device can be safely used in their vicinity.

### Traffic Security

- Observe local laws and regulations while using the device. To prevent accidents, do not use your wireless device while driving.
- RF signals may affect electronic systems of motor vehicles. For more information, consult the vehicle manufacturer.
- In a motor vehicle, do not place the device over the air bag or in the air bag deployment area. Otherwise, the device may hurt you owing to the strong force when the air bag inflates.
- Do not use your device while flying in an aircraft and before boarding an aircraft. Using wireless devices in an aircraft may cause danger to the operation of the aircraft and disrupt the wireless telephone network. It may also be considered illegal.

### Operating Environment

- Do not use the device in dusty, damp, and dirty places or places with magnetic fields. Otherwise, it may result in malfunction of the circuit.
- On a stormy day with thunder, do not use your device when it is being charged, to prevent any danger caused by lightning.
- While using the device, observe the local laws and regulations, and respect others' privacy and legal rights.
- Keep the ambient temperature between -20°C to +70°C for using the device.

### Safety of Children

Comply with all precautions with regard to children's safety. Letting the child play with your device or its accessories, which may include parts that can be detached from the device, may be dangerous, as it may present a choking hazard. Ensure that small children are kept away from the device and accessories.

### Accessories

Use the accessories delivered only by the manufacturer. Using accessories of other manufacturers or vendors with this device model may invalidate any approval or warranty applicable to the device, result in the non-operation of the device, and cause danger.

### Cleaning and Maintenance

It is normal that your wireless device gets hot when you use or charge it. Before you clean or maintain the wireless device, stop all applications and disconnect the wireless device from your PC.

- Use your wireless device and accessories with care and in a clean environment. Keep the wireless device away from a fire or a lit cigarette.
- Protect your wireless device and accessories from water and vapor, and keep them dry.
- Do not drop, throw, or bend your wireless device.
- Clean your wireless device with a piece of damp and soft antistatic cloth. Do not use any chemical detergent, powder, or other chemical agents (such as alcohol and benzene) to clean the device.



## Comprehensive integration instructions

For proper integration of modules in the final products it is required that detailed and comprehensive instructions must be provided to the integrators so that any subsequent associated party (grantee, host manufacture, original equipment manufacturer (OEM), integrator, or end-user) can clearly understand the conditions and limitations for authorized uses of the modular transmitter. These instructions must be included as one of the Form 731 exhibits,. While modules can provide great flexibility for third parties without requiring additional compliance demonstrations, additional technical requirements may call for separate equipment authorization information for compliance demonstration (e.g. for RF exposure and hearing-aid compatibility, for devices with specific antennas, or specific host/enclosure configurations.) A transmitter module grantee is responsible for including the necessary details for ensuring compliance for RF exposure requirements and the associated usage conditions for portable, mobile and fixed-mount equipment configurations as applicable.

### FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

- Note 1: This module has been certified to comply with RF exposure requirements under portable or mobile or fixed condition, this module is to be installed only in portable or mobile or fixed applications. The system antenna(s) used for this module must not exceed 4.28dBi (850MHz) and 3.0dBi (1900MHz) for mobile and fixed or mobile operating configurations. The antenna must be installed such that 20 cm is maintained between the antenna(s) and the body of the user or nearby persons.
- The transmitter module may not be co-located with any other transmitter or antenna. The FCC ID label on the final system must be labeled with "Contains FCC ID: QISMU509G"
- As long as the above conditions are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed. To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements.
- In case the conditions specified above cannot be met, the FCC authorization would no longer be considered valid and the FCC ID could not be used on the final product. Under these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter (s)) and obtaining a separate FCC authorization. Additional tests for compliance with RF Exposure compliance (i.e. portable applications) and transmitter / host specific tests could be required.
- Note 2: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.
- Note 3: The device must not transmit simultaneously with with any other antenna or transmitter.
- Note 4: The transmitter module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the host product.

### FCC Statement

15.19

NOTICE:

This device complies with Part 15 of the FCC Rules

Operation is subject to the following two conditions:

- 1) This device may not cause harmful interference, and
- 2) This device must accept any interference received, including interference that may cause undesired operation.

15.21

NOTICE:

Changes or modifications made to this device not expressly approved by Huawei Technologies Co., Ltd. may void the FCC authorization to operate this device.

15.105

NOTE:

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by connecting or disconnecting the device to a PC, the user is encouraged to try to correct the interference by adopting one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the distance between the device and the receiver.
- Connect the device to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for help.

### Disposal and Recycling Information



This symbol on the device (and any included batteries) indicates that they should not be disposed of as normal household garbage. Do not dispose of your device or batteries as unsorted municipal waste. The device (and any batteries) should be handed over to a certified collection point for recycling or proper disposal at the end of their life.

For more detailed information about the recycling of the device or batteries, contact your local city office, the household waste disposal service, or the retail store where you purchased this device.

The disposal of this device is subject to the Waste from Electrical and Electronic Equipment (WEEE) directive of the European Union. The reason for separating WEEE and batteries from other waste is to minimize the potential environmental impacts on human health of any hazardous substances that may be present.

### Reduction of Hazardous Substances

This device is compliant with the EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation (Regulation No 1907/2006/EC of the European Parliament and of the Council) and the EU Restriction of Hazardous Substances (RoHS) Directive (Directive 2002/95/EC of the European Parliament and of the Council). For more information about the REACH compliance of the device, visit the Web site [www.huaweidevice.com/certification](http://www.huaweidevice.com/certification). You are recommended to visit the Web site regularly for up-to-date information.

### EU Regulatory Conformance

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**Italiano:** Col presente documento, Huawei Technologies Co., Ltd. dichiara che questo dispositivo è conforme ai requisiti essenziali e alle altre disposizioni applicabili della Direttiva 1999/5/CE.

**Latviski:** Ar šo Huawei Technologies Co., Ltd. paziņo, ka šī ierīce atbilst Direktīvas 1999/5/EC pamatprasībām un piemērojamajiem nosacījumiem.

**Lietuviškai:** Šiuo Huawei Technologies Co., Ltd. praneša, kad šis įtaisas atitinka Direktyvos 1999/5/EC pagrindinius reikalavimus ir taikomas sąlygas.

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For the declaration of conformity, visit the Web site [www.huaweidevice.com/certification](http://www.huaweidevice.com/certification).

Notice: Observe the national local regulations in the location where the device is to be used. This device may be restricted for use in some or all member states of the European Union (EU).

**CE 0682**

Version: V100R001\_02 Part Number: 31220974