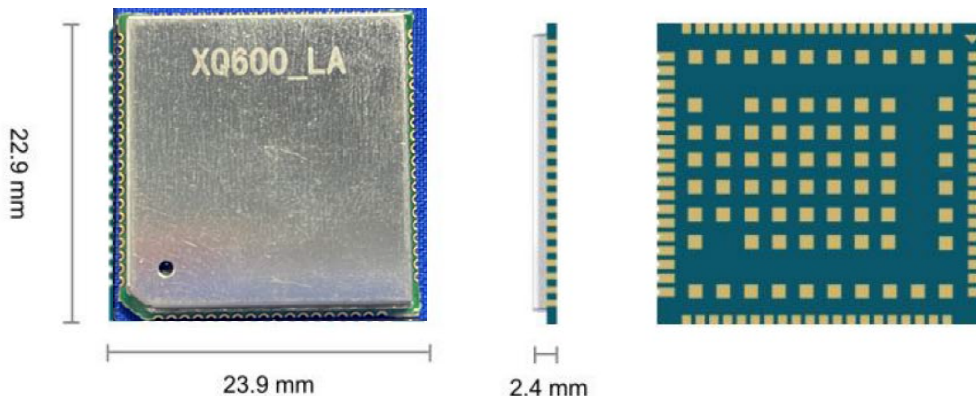


XQ600_LA wireless communication module

LTE Cat1 for M2M and IoT application



Product Introduction

XQ600_LA wireless communication module is based on ASR1603 platform, and developed as a low-cost LTE communication module supports the LTE Cat1/ EGPRS network and conforms to 3GPP specifications.

XQ600_LA supports standard functional interfaces (USB / UART / PCM / STATUS); this module can be used in various IoT applications, such as adaptive environment, attitude, gas and other sensors for various application scenarios.

Functional

- Support LTE Cat 1, GPRS/EGPRS;
- Ultra-thin LGA package;
- Baseband chip integrated RAM and ROM flash;
- support FOTA firmware update;
- support USB 2.0 High-Speed interface;
- support IOT sensor interface;

Specification

| | |
|---------------------|---|
| Operating frequency | GSM: 850/900/1800/1900; Support GPRS multi-slot class 12 and EDGE multi-slot class 12 FDD: B1/B2/B3/B4/B5/B7/B8/B28 |
| TX Frequency Range | TX Frequency Range GSM/GPRS/EGPRS 850: 824 MHz ~ 849 MHz GSM/GPRS/EGPRS 1900: 1850 MHz ~ 1910 MHz |

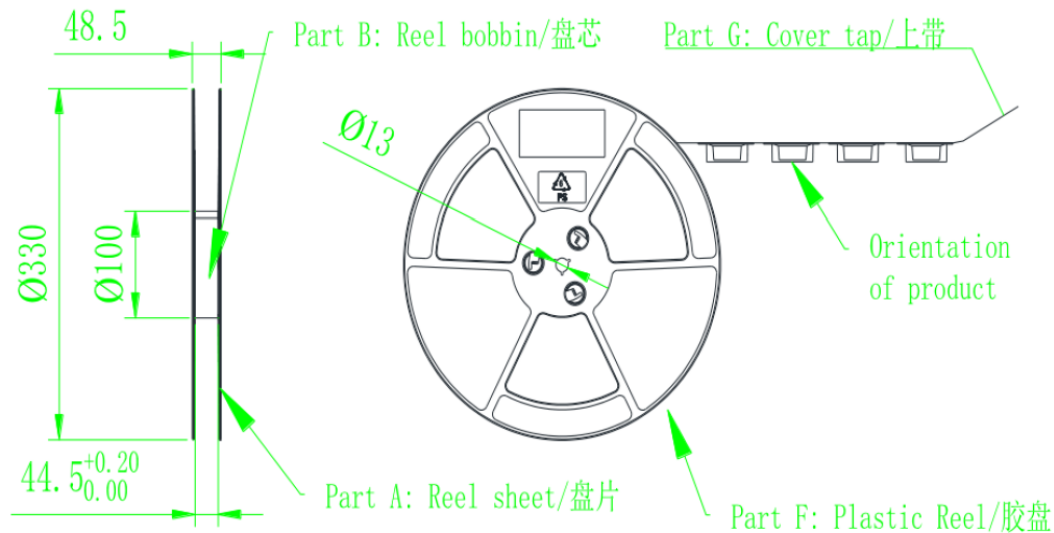
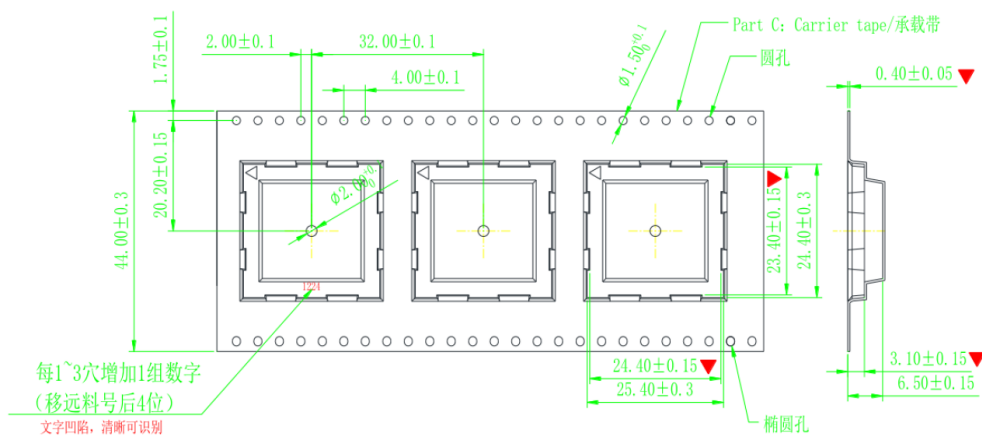
| | |
|--------------------------|---|
| | <p>FDD LTE Band 2: 1850 MHz ~ 1910 MHz</p> <p>FDD LTE Band 4: 1710 MHz ~ 1755 MHz</p> <p>FDD LTE Band 5: 824 MHz ~ 849 MHz</p> <p>FDD LTE Band 7: 2500 MHz ~ 2570 MHz</p> |
| Rx Frequency Range | <p>GSM/GPRS/EGPRS 850: 869 MHz ~ 894 MHz</p> <p>GSM/GPRS/EGPRS 1900: 1930 MHz ~ 1990 MHz</p> <p>FDD LTE Band 2: 1930 MHz ~ 1990 MHz</p> <p>FDD LTE Band 4: 2110 MHz ~ 2155 MHz</p> <p>FDD LTE Band 5: 869 MHz ~ 894 MHz</p> <p>FDD LTE Band 7: 2620 MHz ~ 2690 MHz</p> |
| Power class | <p>GSM/GPRS 850: 4</p> <p>GSM/GPRS 1900: 1</p> <p>EGPRS 850/1900: E2</p> <p>LTE-FDD Class 3 (23dBm±2dB)</p> |
| Data transmission | <p>GSM:</p> <p>Coding scheme: CS-1, CS-2, CS-3 and CS-4</p> <p>Max. 80Kbps (DL), Max. 80Kbps (UL)</p> <p>EDGE:</p> <p>Downlink coding schemes: MCS 1-9</p> <p>Uplink coding schemes: MCS 1-9</p> <p>Max. 236.8Kbps (DL), Max. 236.8Kbps (UL)</p> <p>LTE-FDD:</p> <p>Max.10(DL)/Max.5(UL);LTE-TDD:Max.7.88(DL)/Max.3(UL)</p> |
| GSM function | <ul style="list-style-type: none"> •GSM CS Voice •SMS •Point-to-point MO and MT; •SMS Cell Broadcast; •Text and PDU Mode |
| Temperature | -30°C ~ +70°C |
| Power | Dc 3.4V~4.2V, 3.8V Typ |
| | |
| Physical characteristics | <p>Package: LGA 152 Pin</p> <p>Size: 22.9mm × 23.9mm × 2.4mm</p> <p>Weight: about 2.6g</p> |
| Interface | <p>USB2.0 high-speed interface X1 ;</p> <p>UART ports X3;</p> <p>digital voice PCM interface X1;</p> <p>ADC interfaces X2;</p> <p>MIC input X1</p> <p>audio output X1;</p> <p>I2C ports X2;</p> <p>1.8/3.0V SIM port X1 ;</p> <p>LCD interface X1;</p> <p>Camera interface X1</p> <p>SDIO port X1</p> |

| | |
|------------|---|
| | <ul style="list-style-type: none"> • RESET (active at low level) X1 • PWRKEY(active low level) X1 |
| Antenna | LTE Main antenna |
| AT Command | 3GPP TS 27.007 and 27.005 |
| SIM | Support 1.8V USIM/SIM Support eSIM |

Package

The XQ600 module is packaged with tape and sealed in a vacuum bag. Each carrier is 8.64 meters long, With 250 pic modules,

The diameter of the coil is 330 mm. Specific specifications are as follows



★1pcs part B and 2pcs part A assemble to 1pcs Part F

★Part F Spec. : 13"*4"*44mm

★Part F package: Module: M1=250pcs

Cave: C1=270pcs

Length: L1=32*270=8640mm=8.64m

FCC Warning

Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).
3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations
4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part 15 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are complaint with the transmitter(s) rule(s). The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

Important Note

notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify to Shenzhen Jimi IoT Co., Ltd. that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by Shenzhen Jimi IoT Co., Ltd, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: 2AMLFXQ600-LA"

The FCC ID can be used only when all FCC compliance requirements are met.

Antenna Installation

- (1) The antenna must be installed such that 20 cm is maintained between the antenna and users,
- (2) The transmitter module may not be co-located with any other transmitter or antenna.
- (3) Only antennas of the same type and with equal or less gains as shown below may be used with this module. Other types of antennas and/or higher gain antennas may require additional authorization for operation.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID/IC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC/IC authorization.

Federal Communication Commission Interference Statement

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.

This equipment 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 equipment 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 equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

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

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

List of applicable FCC rules

This module has been tested and found to comply with part 22, part 24, part 27 requirements for Modular Approval.

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

This device is intended only for OEM integrators under the following conditions: (For module device use)

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above 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.

Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled

environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

Requirement per KDB996369 D03

2.2 List of applicable FCC rules

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.³

Explanation: This module meets the requirements of FCC part 22, part 24, part 27.

2.3 Summarize the specific operational use conditions

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.

Explanation: The EUT has PIFA Antenna

2.4 Limited module procedures

If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions.

A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval. This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.

Explanation: The module is not a limited module.

2.5 Trace antenna designs

For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces. The integration information shall include for the TCB review the integration instructions for the following aspects:

layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.

- a) Information that includes permitted variances (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna);
- b) Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency, the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered);
- c) The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout;
- d) Appropriate parts by manufacturer and specifications;
- e) Test procedures for design verification; and
- f) Production test procedures for ensuring compliance.

The module grantee shall provide a notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

Explanation: Yes, The module with trace antenna designs.

2.6 RF exposure considerations

It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person’s body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

Explanation: This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment, This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body." This module is designed to comply with the FCC statement, FCC ID is: 2AMLFXQ600-LA.

2.7 Antennas

A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an “omni-directional antenna” is not considered to be a specific “antenna type”)).

For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.

Explanation: The EUT has PIFA Antenna

2.8 Label and compliance information

Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating “Contains FCC ID” with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748.

Explanation: The host system using this module, should have label in a visible area indicated the following texts: Contains FCC ID: 2AMLFXQ600-LA

2.9 Information on test modes and additional testing requirements⁵

Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host.

Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer’s determination that a module as installed in a host complies with FCC requirements.

Explanation: Top band can increase the utility of our modular transmitters by providing instructions that simulates or characterizes a connection by enabling a transmitter.

2.10 Additional testing, Part 15 Subpart B disclaimer

The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Explanation: The module without unintentional-radiator digital circuitry, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.