MG2639 User Manual

Version：V1.0

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Descriptions of version update

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With strong technical force, ZTE Corporation can provide CDMA/GPRS/WCDMA module customers with the following all-around technical support:

1. Provide complete technical documentation;
2. Provide the development board used for R&D, test, production, after-sales, etc.;
3. Provide evaluations and technical diagnosis for principle diagram, PCB, test scenarios;
4. Provide test environment;

ZTE Corporation provides customers with onsite supports, and also you could get supports through telephone, website, instant communication, E-mail, etc.

Preface

Summary

This document introduces MG2639 module's product principle diagram, PINs, hardware interface and module's mechanical design, which can instruct the users how to quickly and conveniently design different kinds of wireless terminals based on this type of module.

Target Readers

This document mainly applies to the following engineers:

- System designing engineers
- Mechanical engineers
- Hardware engineers
- Software engineers
- Test engineers

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Tables

1 General description of module

This chapter mainly provides a general description of the module, including basic functions and logic block diagram.

1.1 Introduction of module's functions

The maximum operating ambient temperature of the equipment declared by the manufacturer is 75℃

Table 1-1 Module's functions

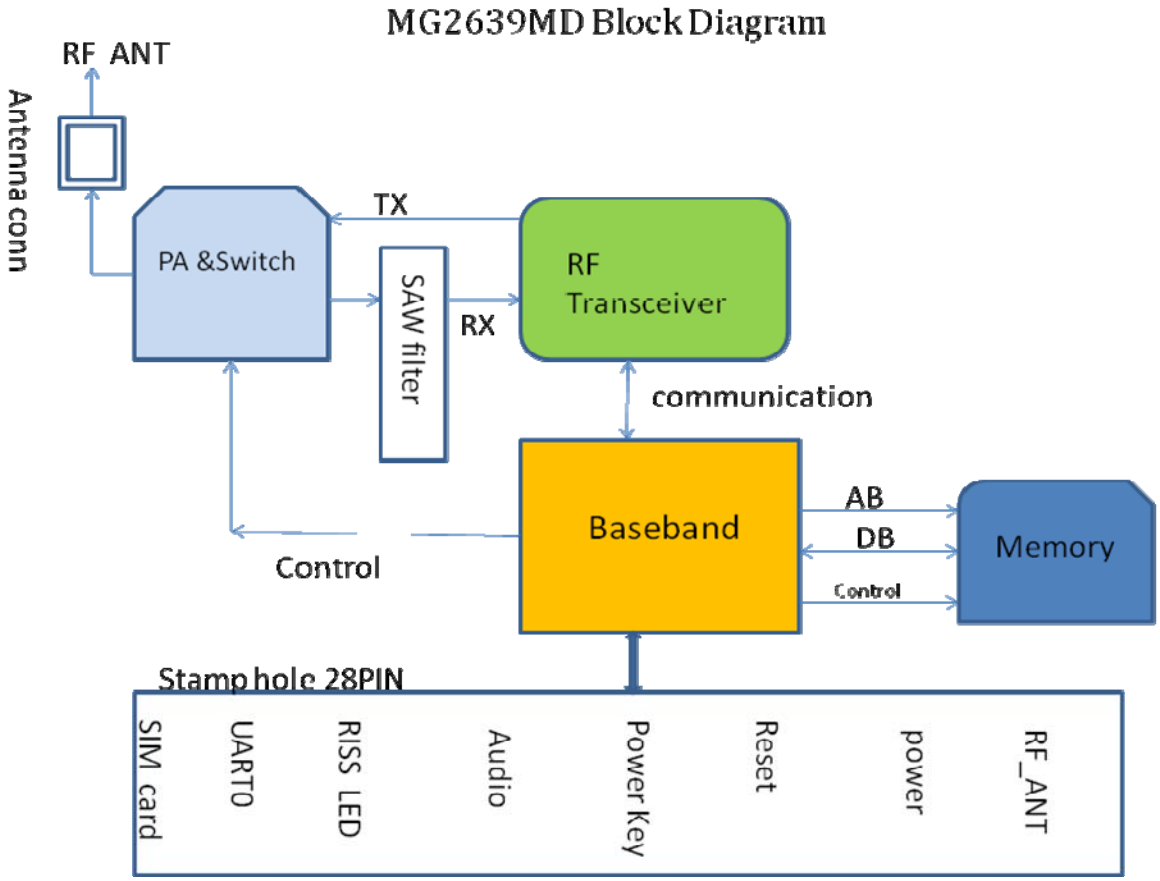
Parameter	MG2639
General Features	
Frequency Bands	GSM850/EGSM900/DCS1800/PCS1900
Dimensions	30.0×25.0x2.68mm
Weight	7g
Operating Temperature Range	-30°C~+75°C
Storage Temperature Range	-40°C~+85°C
Performance	
Operating Voltage Range	3.6V~4.2V/Typical: 3.9V
Current Consumption Typically	Idle Current: 2mA
	Call Current: 128mA
	Max Current: 300mA
TX Power	GSM850/EGSM900: Class 4 (2W)
	DCS1800/PCS1900: Class 1 (1W)
RX Sensitivity	<-106dBm
Interfaces	
Connector	28Pin Stamp Holes
Antenna	SMT 50Ω Antenna Connector
	Antenna Solder Pad
Integrated Full Duplex UART	AT/Data
SIM Card Interface	1.8V/3.0V
Data Features	
GPRS	Class 10
Mobile Station	Class B
Max Downlink	85.6kbps
Max Uplink	42.8kbps
Protocol	Internal TCP/IP&UDP
	Embedded FTP
SMS Features	

Parameter	MG2639
	Support TEXT/PDU Mode
	Point-to-point MO/MT
	SMS Cell Broadcast
Voice Features	
	Vocoders HR/FR/EFR/AMR
	Echo Cancellation/Volume Control/DTMF
AT Command Set	
	GSM 07.05/GSM 07.07/ZTE Proprietary AT Commands

1.2 Module's principle diagram

The block diagram is used to describe the module's major logic functions:

Figure 1-1 Module's principle diagram



1.3 Abbreviations

A		
ADC	Analog-Digital Converter	
AFC	Automatic Frequency Control	
AGC	Automatic Gain Control	
ARFCN	Absolute Radio Frequency Channel Number	
ARP	Antenna Reference Point	
ASIC	Application Specific Integrated Circuit	
B		
BER	Bit Error Rate	
BTS	Base Transceiver Station	
C		
CDMA	Code Division Multiple Access	
CDG	CDMA Development Group	
CS	Coding Scheme	
CSD	Circuit Switched Data	
CPU	Central Processing Unit	
D		
DAI	Digital Audio interface	
DAC	Digital-to-Analog Converter	
DCE	Data Communication Equipment	
DSP	Digital Signal Processor	
DTE	Data Terminal Equipment	
DTMF	Dual Tone Multi-Frequency	
DTR	Data Terminal Ready	
E		
EDGE	Enhanced Data Rate for GSM Evolution	
EFR	Enhanced Full Rate	
EGSM	Enhanced GSM	
EMC	Electromagnetic Compatibility	
EMI	Electro Magnetic Interference	
ESD	Electronic Static Discharge	
ETS	European Telecommunication Standard	
F		
FDMA	Frequency Division Multiple Access	
FR	Full Rate	
G		
GPRS	General Packet Radio Service	
GSM	Global Standard for Mobile Communications	
H		
HR	Half Rate	
I		
IC	Integrated Circuit	
IMEI	International Mobile Equipment Identity	
ISO	International Standards Organization	
ITU	International Telecommunications Union	
L		

LCD	Liquid Crystal Display	
LED	Light Emitting Diode	
M		
MCU	Machine Control Unit	
MMI	Man Machine Interface	
MS	Mobile Station	
MTBF	Mean Time Before Failure	
P		
PCB	Printed Circuit Board	
PCL	Power Control Level	
PCS	Personal Communication System	
PDU	Protocol Data Unit	
PLL	Phase Locked Loop	
PPP	Point-to-point protocol	
R		
RAM	Random Access Memory	
RF	Radio Frequency	
ROM	Read-only Memory	
RMS	Root Mean Square	
RTC	Real Time Clock	
S		
SIM	Subscriber Identification Module	
SMS	Short Message Service	
SMT	Surface Mount Technology	
SRAM	Static Random Access Memory	
T		
TA	Terminal adapter	
TDMA	Time Division Multiple Access	
TE	Terminal Equipment also referred it as DTE	
U		
UART	Universal asynchronous receiver-transmitter	
UIM	User Identifier Management	
USB	Universal Serial Bus	
USIM	Universal Subscriber Identity Module	
V		
VSWR	Voltage Standing Wave Ratio	
Z		
ZTE	ZTE Corporation	

2 Descriptions of module's external interfaces

This chapter mainly describes the module's external interfaces, such as B2B connector, MINI PCI-E, stamp-hole connector, etc.

2.1 Definitions of module's interfaces

Table 1-1 28Pin stamp-hole definition

No.	Definition	I/O	Description	Remarks
1	GND		GND	
2	RF_ANT	I/O	RF antenna	
3	GND		GND	
4	RING	O	Ring signal indication	Level varies upon an incoming call or receipt of text message.
5	GND		GND	
6	VBAT	I	Work voltage	
7	RSSI_LED	O	Network signal indication	Internal pull-down, LED on at high level, need add triode driver externally. -power-on status: LED off; -network searching status: LED blinks at 3Hz -Idle status: LED blinks at 1Hz -Traffic status (call, data): LED blinks at 5Hz.
8	RTS	I	Request to send	

9	CTS	O	Clear to send	
10	DCD	O	Carrier detection	
11	CARD_RST	O	card reset	
12	CARD_CLK	O	card clock	
13	CARD_DATA	I/O	card data	
14	V_CARD	O	Card voltage	
15	RXD	I	Receive data	
16	TXD	O	Transmit data	
17	SYSRST_N	I	Reset signal	Valid at low level, need connect an open collector/drain switch.
18	SPK_2P	O	Headset Speaker +	
19	SPK_1P	O	Microphone speaker +	
20	SPK_1N	O	Microphone speaker -	
21	MIC_2P	I	Headset microphone +	
22	MIC_1P	I	Receiver microphone +	
23	MIC_1N	I	Receiver microphone -	
24	PWRKEY_N	I	power on-off	Valid at low level, need connect an open collector/drain switch.
25	DTR	I	Data terminal ready _WAKEUP	
26	DSR	O	Data set ready	
27	V_MSM	O	2.8V	
28	GND		GND	

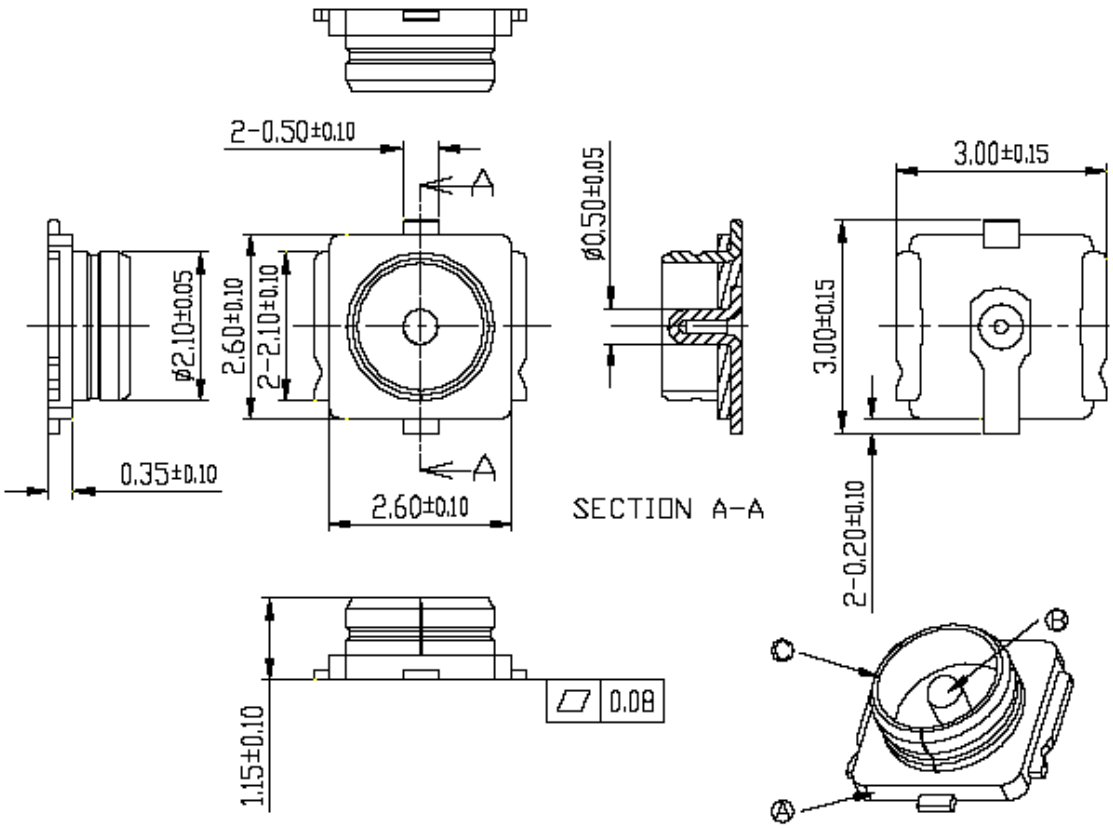
2.2 Antenna interface

MG2639 module provides two kinds of antenna interface:

- PCB welding pad
- Antenna test socket

PCB welding pad adopts 50Ω RF shield cable to connect the module and the antenna, in order to reduce the cost. However, using this method can't completely shield the electromagnets, which might have slight influence on RF signal quality. Please note that there should not be strong radiation near the welding pad. Meantime, during the welding, make sure the core of RF shield cable must connect with RF welding pad, and RF shield cable's shield metal mask must be welded to the module's GND. During the welding, the GND must be welding securely, otherwise the core is easily broken due to the shaking of shield cable. See figure 2-1 for RF welding pad antenna.

Figure 2-1 Antenna interface diagram



3 Module's electrical characteristics

This chapter mainly introduces the module's electrical characteristics, including the level, power consumption, reliability of module's interfaces.

3.1 Descriptions of levels of interface signals

It describes the MAX, MIN and typical value of the level of module's external interfaces.

3.1.1 Reset

SYSRST_N PIN is used to reset the module's main chip, and SYSRST_N signal needs to be pulled down 500ms to reset the module. Likewise, this pin is required to pull up 2.8V (Max: 2.9V, Min: 2.7V, typical: 2.8V) through 4.7K resistor inside the module, and pull down 0.1uF capacitance to GMD filtering, and it's required to externally connect dynatron driver.

MG2639 module provides 1CH serial interface, supports 8-wire serial BUS interface or 4-wire serial BUS interface or 2-wire serial interface. The module communicates with the external devices and inputs AT commands through UART interface.

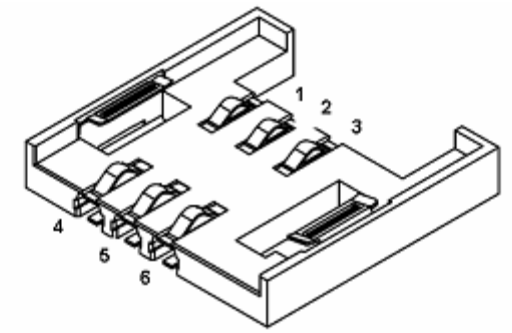
Classification	Definition	I/O	Description	Min. voltage	Typical voltage	Max. voltage
UART	RXD	I	Receive data	2.4V	2.8V	3.1V
	/RTS	I	Request to send	2.4V	2.8V	3.1V
	TXD	O	Transmit data	2.4V	2.8V	3.1V
	/DTR	I	Data terminal ready_WAKEUP	2.4V	2.8V	3.1V
	/CTS	O	Clear to send	2.4V	2.8V	3.1V
	RING	O	Ring signal indication	2.4V	2.8V	3.1V
	/DSR	O	Data set ready	2.4V	2.8V	3.1V
	DCD	O	Carrier detection	2.4V	2.8V	3.1V

3.1.2 SIM Card Interface

MG2639 module baseband processor integrates SIM card interface conforming to ISO 7816-3 standard, and it's compatible with SIM card with two voltages 1.8V/3.0V and reserves SIM card interface signal on the stamp-hole PIN.

Users should note that SIM card's electrical interface definitions are the same as SIM card socket's definitions.

Figure 3-1 Standard SIM card PIN Definitions Diagram



Classification	Definition	I/O	Description	Remarks
SIM	V_CARD	O	Card voltage	1.8V/3V; maximum output current 20mA
	CARD_RST	O	Card reset	
	GND		GND	
	CARD_CLK	O	Card clock	
	CARD_DATA	I/O	Card data	

3.1.3 Audio Interface

MG2639 module supports 2CH audio signal inputs/outputs. It features in handheld microphone, handheld receiver or hands-free speaker and earpiece microphone/receiver function. These two MIC inputs are coupled in AC domain and the offset voltage is added inside, and they should directly connect with the receiver. The two receiver interfaces SPK_1 and SPK_2 are both differential interfaces with 32Ωresistance; SPK_2 is single-ended interface with 32Ω resistance. See the audio interface signals in the table below:

Classification	Definition	I/O	Description	Remarks
AUDIO	MIC_1N	I	Receiver's Microphone-	The first differential receiver used for the default audio input/output and the second receiver used for headset audio input/output.
	MIC_1P	I	Receiver's Microphone+	
	MIC_2P	I	Headset microphone +	
	SPK_1N	O	Receiver's speaker-	
	SPK_1P	O	Receiver's speaker+	
	SPK_2P	O	Headset speaker +	

3.1.4 Network Signal Indication

RSSI_LED Internal pull-down, LED turns on at high level, and need add triode driver externally.
-Power-on status: LED off;
-Network searching status: LED blinks at 3Hz
-Idle status: LED blinks at 1Hz

-Traffic status (call, data): LED blinks at 5Hz.

SIG_LED PIN output status is defined according to the software protocol, and users could judge the module's work status according to SIG_LED status. SIG_LED PIN is common I/O port, which can't directly drive LED, and it needs to work with dynatron.

3.2 Module Power Consumption

It describes the module's power consumption under each status:

No.	Test items	Typical value（mA）
1	Power-off leakage current (Normal power-off)	50uA
2	Average standby current (no operation after power-on)	2mA
3	Average standby current (after talk)	2mA
4	Talk current	128mA

3.3 Reliability Characteristics

It describes the temperature, including working temperature and storage temperature.

Working temperature: -30°C~+75°C

Storage temperature: -40°C~+85°C

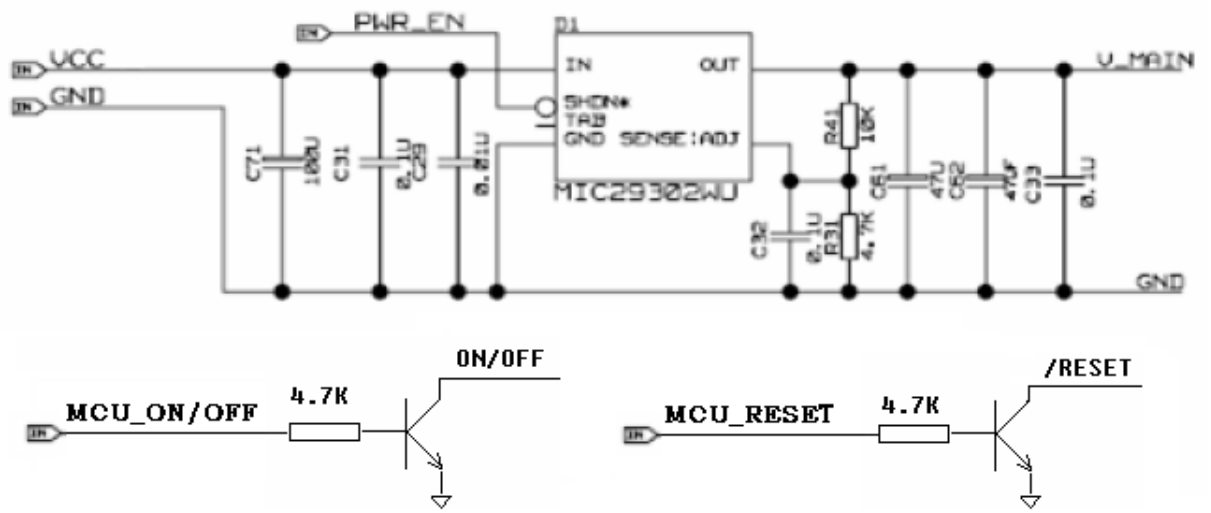
4 Interface circuit design

It provides the reference design circuit of the interface and precautions according to the module's functions.

4.1 Reset and power design

See the reference design principle of power and reset circuit in figure 4-1:

Figure 4-1 Power and reset circuit reference design principle diagram



- Power design

MG2639 module is powered by VBAT. See the voltage characteristics in table 4-1.

Table 4-1 Voltage characteristics

Classification	MIN	Typical	MAX
Input voltage	3.4V	3.9V	4.25V
Input current	2mA（average）	--	300mA（depends on the network signal）

D1 is an enabled LDO with 6V~9V input voltage. Through adjusting R31and R41, it could make V_MAIN at 3.9V to power the module, and it's required to place at least one 1000uF tantalum capacitor at V-Main input pin. The module is very strict with the requirements on power and GND, therefore it's requested that filtering must be performed to power and GND, and the power ripple must be controlled under 50Mv. Do not use LDO to power any other part in the system because it might affect the RF performance. Finally, select the power cables with at least 80mil traces during the layout and keep the integrality of ground line.
If MG2639 module uses other LDO, make sure the output current is larger than 2A.

- Power on

The module is under power-off status after it's normally powered on. To turn on the module, provide a 2s-5s low level pulse to PWRKEY_N pin when the module is OFF. If one 1K resistance is connected with PWRKEY_N, the module can be turned on after power supply.
Note: ON/OFF and /Reset need to connect an open collector/drain gate.
It's not required to operate /RESET signal upon power-on.

- Power off

To turn off the module, use AT command “AT+ZPWROFF” or provide a 2s~5s low level pulse to PWRKEY_N PIN.

- Reset

Use the above method to firstly “power-off” and then “power-on” to hard reset the module.
If the external reset function has to be used, low level pulse lasting at least 500ms should be provided to /RESET Pin within 2 seconds after the module is turned on. Before that, the external I/O signal must be kept at low level. See the reset circuit design in figure 4-1.
If SYSRST_N Pin is not used, suspend the pin.
See the module’s power-on/off time sequence in the diagram below:

Figure 4-1 Power-on/off time sequence

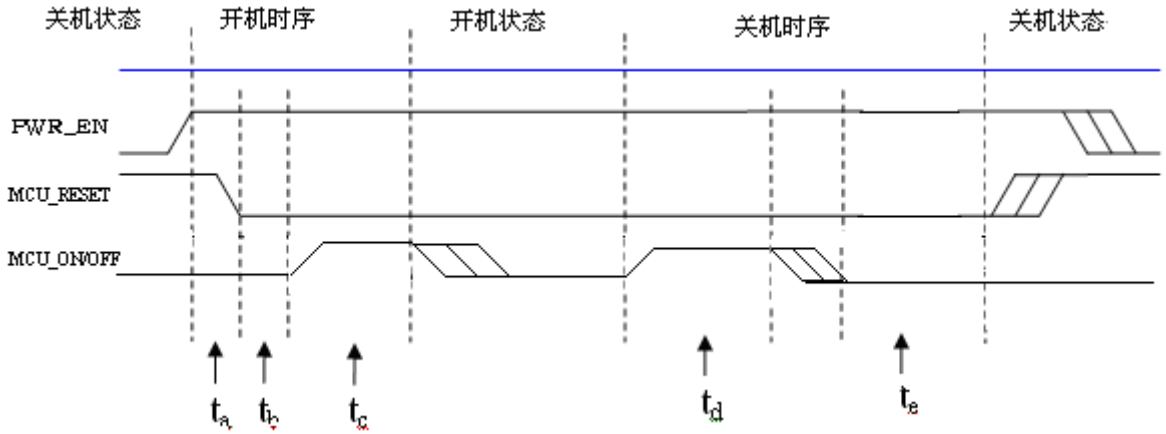


Table 4-2 Power-on/off circuit time characteristics

t_a	t_b	t_c	t_d	t_e
20ms	10ms	3s	3s	6s

- V_MSM

There is a voltage output pin with current adjuster, which can be used to supply external power to the board. The voltage of this pin and the voltage of baseband processor/memory come from the same voltage adjuster. The voltage output is available only when the module is on. The normal output voltage is 2.85V, and the user should absorb the current from this pin as little as possible (less than 10mA). Generally, it is recommended to use this pin to match the level.
When the module is off, the output voltage for this pin remains unchanged, but the impedance is rather high. Therefore, it’s not recommended to use this pin for other purposes.

- Other advice

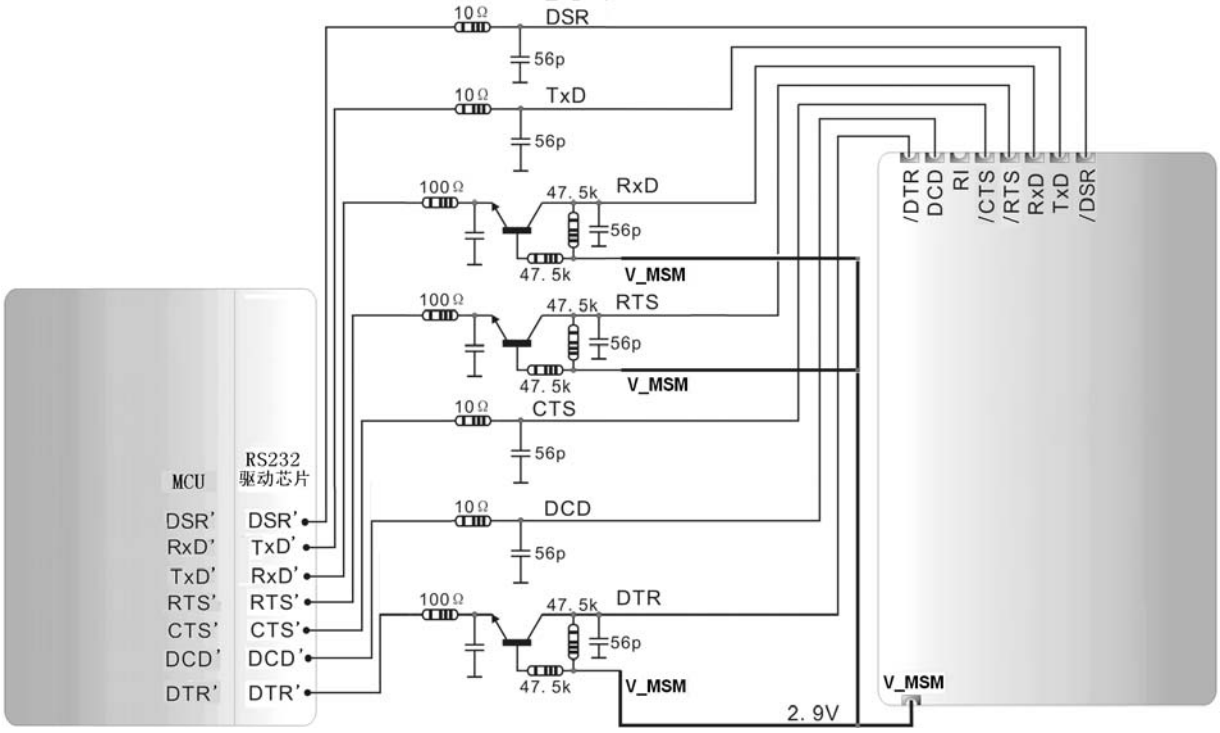
In order to make sure the data is saved safely, please don’t cut off the power when the module is on. It’s strongly recommended to add battery or soft switch like the power key on the module.

4.2 UART interface

Note: when using the module for overall design, the users should export UART for module’s software upgrade.
MG2639 module provides an integrated full duplex UART interface and an accessorial full duplex UART interface, whose maximal data rate is 115200bps. External interface is 2.8VCMOS level signal, their logic functions conform to RS-232 interface standard. These two UART could be used as serial port data interfaces, usually UART1 is used for AT commands, data transmission and updating software of module.
The module’s output IO level is 2.8V，it needs to transfer the level when connecting with standard 3.3V or 5V logic circuit（such as MCU or RS232 drive chip MAX3238 etc）, Figure 4-3 shows the COM port level transfer circuit. The converted signal should connect with MCU or RS232 drive chip

directly. Common low power switch triode should be applied as the crystal triode shown in Figure 4-3. Please note that the module won't enter sleep mode as RXD is at high level.

Figure 4-3 UART interface reference design block diagram

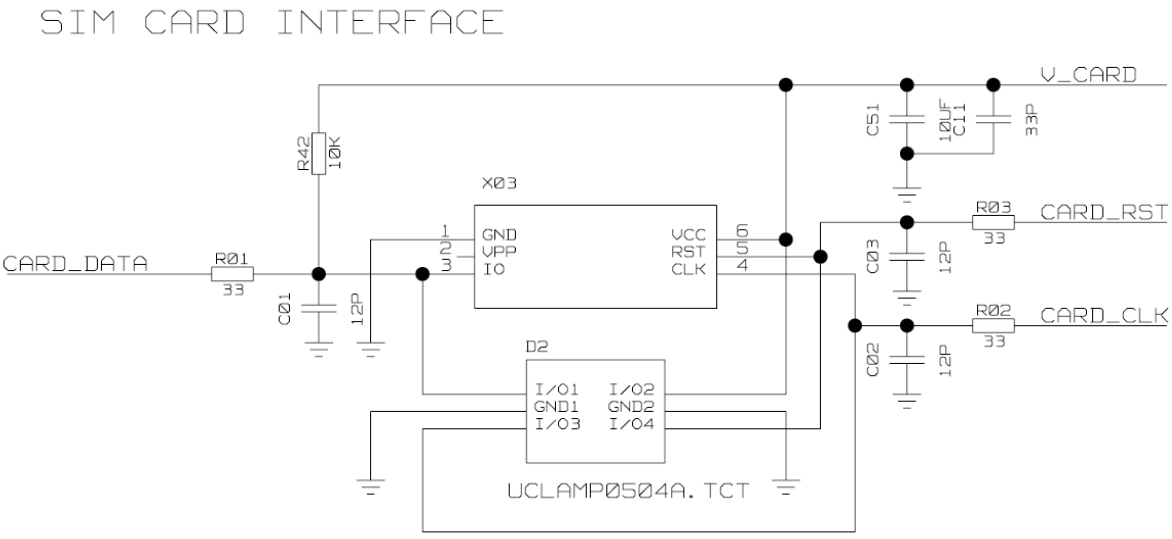


Remarks: the module doesn't support USB.

4.3 SIM card interface

MG2639 module supports 1.8V or 3V SIM card, and there are 4 pins at the terminal of the card. V_CARD is used to supply SIM card. It's strongly recommended to add ESD to protect SIM card in hostile environments.

Figure 4-4 SIM card circuit reference design diagram

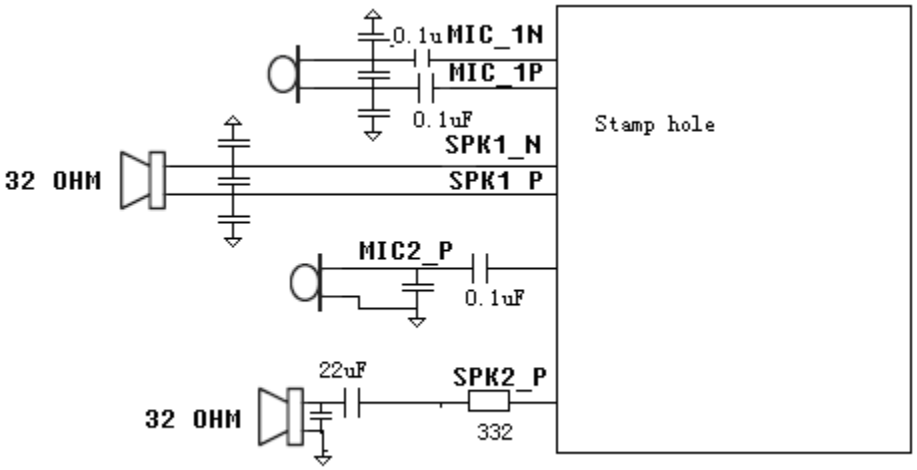


NOTE: *The SIM card PCB wiring should be laid closely around the module as much as possible to prevent the interference sources from affecting the SIM card's reading/writing. Besides, Since the SIM card needs to be designed to meet the requirements of ESD performance and avoid the damage of the SIM card caused by ESD, it's recommended to add TVS components on 4-CH SIM card signals, meanwhile, the signal wires need go through TVS component before entering the module's baseband processor during the layout.*

4.4 Audio interface

MG2639 module provides audio input and output interfaces through its PINs. There are 2 Speaker interfaces and 2 Microphone interfaces. Only one pair I/O works at the same time. See the audio interface circuit in figure 4-5.

Figure 4-5 Audio interface circuit reference design principle diagram



- **Microphone**

The system connector provides two microphone interfaces MIC_1 and MIC_2, MIC_1 is differential interface; while MIC_2 is single ended interface. These two inputs are coupled in AC domain and 2.0V offset voltage are added inside, therefore they should directly connect to the microphone.

- **Speaker**

The system connector provides two speakers, SPK_1 & SPK_2. SPK_1 is differential interface, while SPK_2 is single-ended interface. They both have 32 ohm impedance.

GSM/GPRS module audio interface is designed as below:

- Design of the audio interface on the receiver

Select the microphone with the sensitivity lower than -51.5dB since the output impedance for SPK_1 is 32 ohm and the max. gain in MIC_1 reaches 51.5dB. The level of MIC_1P PIN is about 2.2V.

Note: *if other kind of audio input method is adopted, the input signal should be within 0.5V. If the signal voltage is lower than 0.5V, then the pre-amplifier should be added. If the signal voltage is higher than 0.5V, then network attenuation should be added.*

- Design of the audio interface on the headset

Select the microphone with the sensitivity lower than -51.5dB since the output impedance for SPK_2 is 32 ohm and the max. gain in MIC_2 reaches 51.5dB. The level of MIC_2P PIN is about 2.2V. The design is just the same as that on the receiver

5 Mechanical dimensions

It introduces the module's mechanical dimensions.

5.1 Appearance Diagram

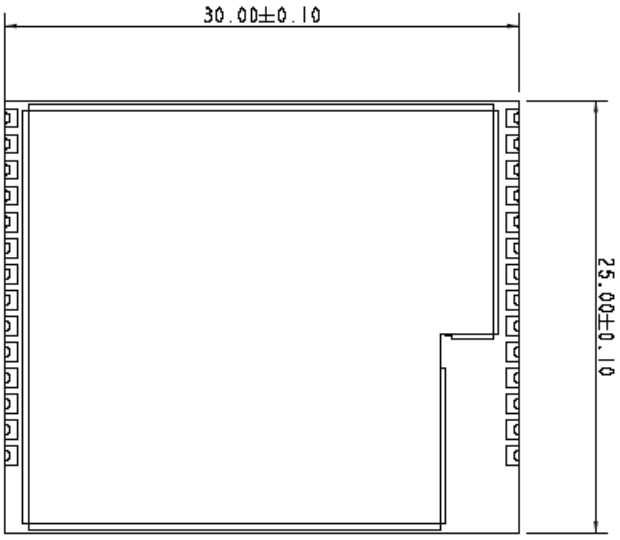
Figure 5-1 MG2639 module's appearance

- Dimensions（L×W×H）：30.0×25.0×2.68mm
- Weight：7g

5.2 Module Assembly Diagram

See the module assembly diagram in figure 5.2.

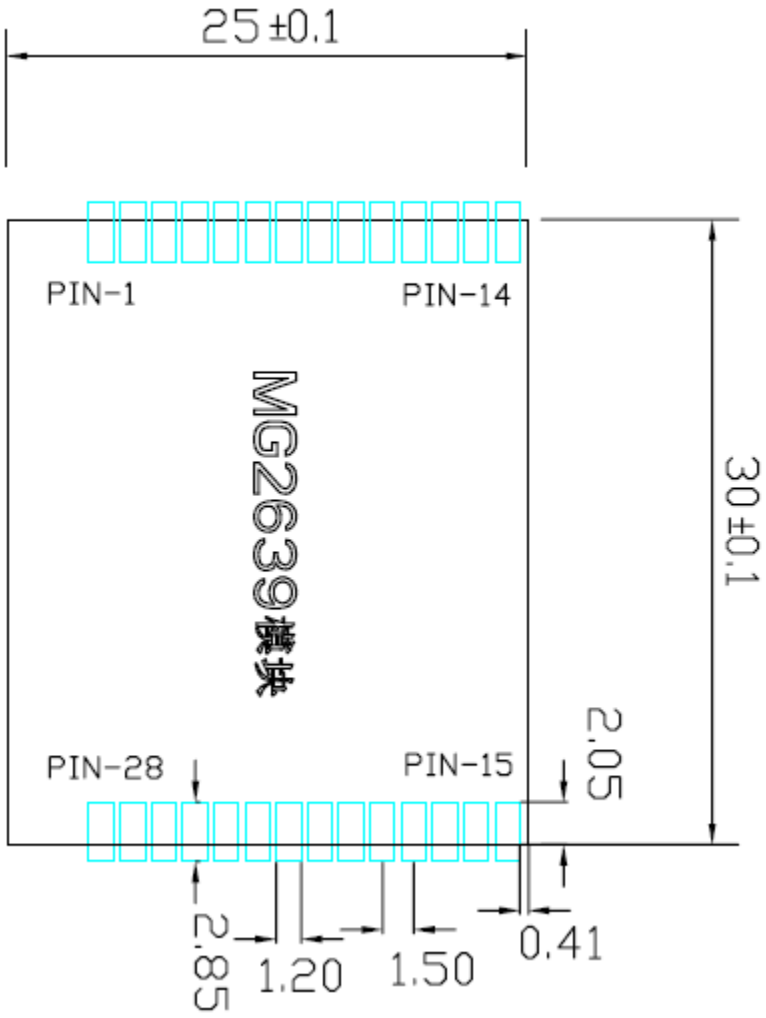
Figure 5-2 Module's assembly diagram



5.3 PCB Dimensions

See the module's PCB dimensions in figure 5-3.

Figure 5-3 Relevant PCB dimensions



Precautions while designing PCB:

1）Copper-clad and wiring are forbidden at the area below the RF test points.

2）For the convenience of testing and maintenance, it might be necessary to drill holes on the PCB.

6 Antenna Interface

The RF interface of the MG2639 Module has an impedance of 50 . The module is capable of sustaining a total mismatch at the antenna connector or pad without any damage, even when transmitting at maximum RF power.

The external antenna must be matched properly to achieve best performance regarding radiated power, DC-power consumption, modulation accuracy and harmonic suppression. Antenna matching networks are not included on the MG2639 Module PCB and should be placed in the host application.

Regarding the return loss, the Module provides the following values in the active band:

Table 6-1 Return Loss in the Active Band

State of Module	Return Loss of Module	Recommended Return Loss of Application
Receive	≥ 8dB	≥ 12dB
Transmit	not applicable	≥ 12dB

The connection of the antenna or other equipment must be de coupled from DC voltage. This is necessary because the antenna connector is DC coupled to ground via an inductor for ESD protection.

6.1 Antenna Installation

To suit the physical design of individual applications, the MC2261 offers two alternative approached to connecting the antenna:

■ Recommended approach: MM9329-2700B antenna connector manufactured by MURATA assembled on the component side of the PCB (top view on Module). See Section 4.3 for details.

■ Antenna pad and grounding plane placed on the bottom side. See Section 4.2 for details.

The MM9329-2700B connector has been chosen as antenna reference point (ARP) for the ZTEMT reference equipment submitted to type approve the MG2639 Module. All RF data specified throughout this manual are related to the ARP. For compliance with the test results of the ZTEMT type approval you are advised to give priority to the connector, rather than using the antenna pad.

Note: Both solutions can be applied alternatively. This means,if the antenna is connected to the pad, then the connector on the Module must be left empty,and when the antenna is connected to the Module connector, the pad is useless,

6.2 Antenna Pad

The antenna pad of the module is soldered to the board on the customer design to connect with RF line. For proper grounding connect the RF line to the ground plane on the bottom of the MG2639 Module which must be connected to the ground plane of the application.

Consider that according to GSM recommendations as 50Ω connector is mandatory for type approval measurements. It must be ensured that the RF line which is connected to antenna pad should be controlled on 50Ω.

Notes on soldering

■ To prevent damage to the Module and to obtain long-term solder joint properties, you are advised to maintain the standards of good engineering practice for soldering.

Material Properties

■ MG2639 Module PCB: FR4

■ Antenna pad: Gold plated pad

6.3 Antenna connector

The MG2639 Module uses a microwave coaxial connector supplied by Murata Ltd. The product name is MM9329-2700B. The position of the antenna connector on the Module PCB can be seen in Figure 6-3.

Figure 6-3 Specification of MM9329-2700B connector

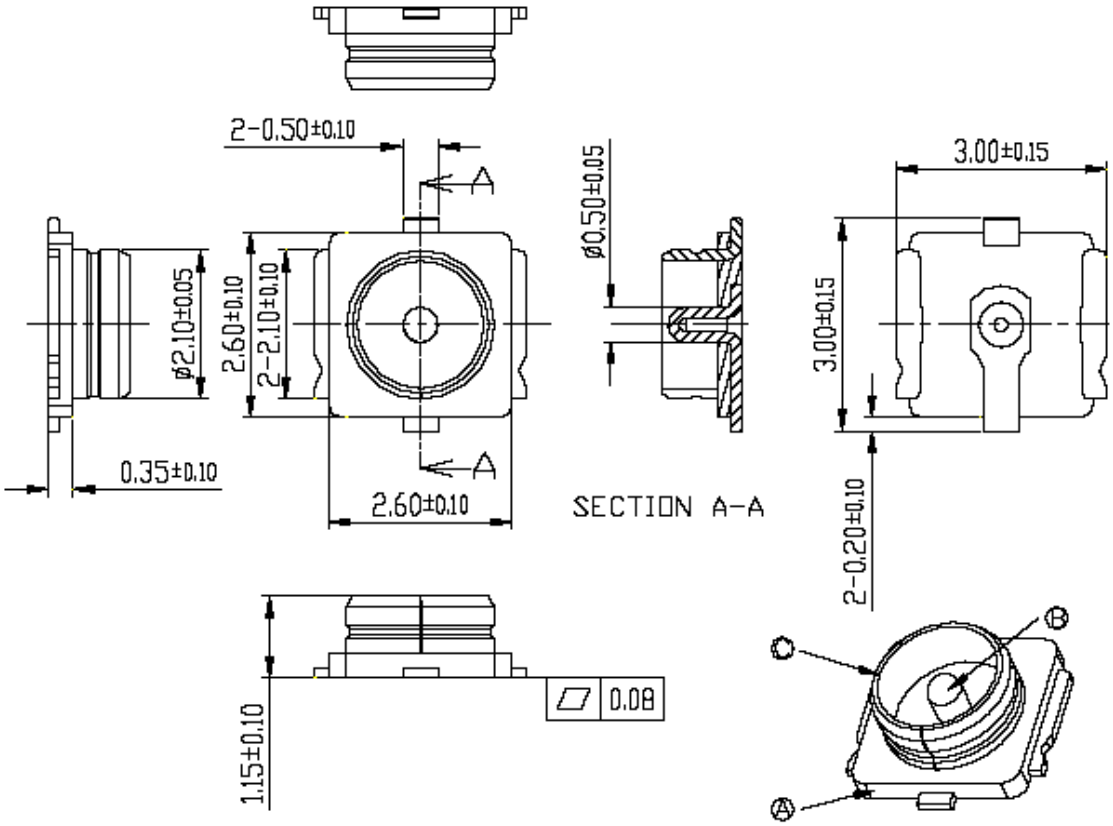


Table 6-2 Product specifications of MM9329-2700B connector

Part Number	Rated Voltage (V)	Contact Resistance (ohm)	Withstanding Voltage (rms)	Insulation Resistance (M ohm)	Durability (cycles)	Frequency Rating (GHz)	Temperature Range (degree C)	VSWR	Center Contact	Outer Contact	Insulator
MM9329-2700B	250	0.015 max.	300 (AC)	500 min.	100	DC - 6.0	-40~+90.	1.2 max. (DC~3GHz)	Copper Alloy Gold plated	Copper Alloy Silver plated	Engineering plastic

6.4 Antenna Subsystem

The antenna sub-system and its design is a major part of the final product integration. Special attention and care should be taken in adhering to the following guidelines.

6.4.1 Antenna Specifications

Choice of the antenna cable (type, length, performance, RF loss, etc) and antenna connector (type + losses) can have a major impact on the success of the design.

6.4.2 Cable Loss

All cables have RF losses. Minimizing the length of the cable between the antenna and the RF connectors on the module will help obtain superior performance. High Quality/Low loss co-axial cables should be used to connect the antenna to the RF connectors. Contact the antenna vendor for the specific type of cable that interfaces with their antenna and ask them to detail the RF losses of the cables supplied along with the antenna. Typically, the cable length should be such that they have no more than 1-2dB of loss. Though the system will work with longer (lossy) cables, this will degrade GSM system performance. Care should also be taken to ensure that the cable end
connectors/terminations are well assembled to minimize losses and to offer a reliable, sturdy connection to the Module sub-system. This is particularly important for applications where the module is mounted on a mobile or portable environment where it is subject to shock and vibration.

6.4.3 Antenna Gain Maximum Requirements

Our FCC Grant imposes a maximum gain for the antenna subsystem: 2 dBi for the GSM850 band and 2dBi for the 1900 band.
Warning: Excessive gain could damage sensitive RF circuits and void the warranty.

6.4.4 Antenna Matching

The module's RF connectors are designed to work with a 50-ohm subsystem. It is assumed that the antenna chosen has matching internal to it to match between the 50-ohm RF connectors and the antenna impedance.

6.4.5 PCB Design Considerations

• The antenna subsystem should be treated like any other RF system or component. It should be isolated as much as possible from any noise generating circuitry including the interface signals via filtering and shielding.
• As a general recommendation all components or chips operating at high frequencies such as micro controllers, memory, DC/DC converts and other RF components should not be placed too close to the module. When such cases exist, correct supply and ground de-coupling areas should be designed and validated.
• Avoid placing the components around the RF connection and close to the RF line between the RF antenna and the module.
• RF lines and cables should be as short as possible.
• If using coaxial cable it should not be placed close to devices operating at low frequencies. Signals like charger circuits may require some EMI/RFI decoupling such as filter capacitors or ferrite beads.
• Adding external impedance matching to improve the match to your cable and antenna assemblies is optional. Please contact the antenna vendor for matching requirements.
• For better ESD protection one can implement a shock coil to ground and place it close to the RF connector.

Antenna Interface

Proper measures should be taken to reduce the access loss of effective bands, and good shielding should be established between the external antenna and the RF connector. Besides, the external RF cables should be kept far away from all interference sources such as high-speed digital signal or switch power supply. According to mobile station standard, stationary wave ratio of antenna should be between1.1 to 1.5, and input impedance is 50 ohm. Different environments may have different requirements on the antenna's gain. Generally, the larger gain in the band and smaller outside the band, the better performance the antenna has. Isolation degree among ports must more than 30dB when multi-ports antenna is used. For example, between

two different polarized ports on dual-polarized antenna, two different frequency ports on dual-frequency antenna, or among four ports on dual-polarized dual-frequency antenna, isolation degree should be more than 30dB.

7 OEM/Integrators Installations

Clear and specific instructions describing the conditions, limitations and procedures for third-parties to use integrate the module into a host device.

Important compliance information for North American users

The MG2639 Module has been granted modular approval for mobile applications. Integrators may use the MG2639 Module in their final products without additional FCC certification if they meet the following conditions. Otherwise, additional FCC approvals must be obtained.

1. At least 20cm separation distance between the antenna and the user's body must be maintained at all times.

2. To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed 2dBi in the cellular band and 2dBi in the PCS band.

3. The MG2639 Module and its antenna must not be co-located or operating in conjunction with any other transmitter or antenna within a host device.

4. A label must be affixed to the outside of the end product into which the MG2639 Module is incorporated, with a statement similar to the following:·ForMG2639: This device contains FCC ID: Q78-MG2639.

5. A user manual with the end product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.

The end product with an embedded MG2639 Module may also need to pass the FCC Part 15 unintentional emission testing requirements and be properly authorized per FCC Part 15.

Note: If this module is intended for use in a portable device, you are responsible for separate approval to satisfy the SAR requirements of FCC Part 2.1093.

8. EU Regulatory Conformance

Hereby, ZTE CORPORATION declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
For the declaration of conformity, visit the Web site www.zte.com

CE 0700