



A7670 & SIM7070 Series Compatible Design

LTE Module

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Introduction

This document is targeted for customers to understand the differences between A7670 and SIM7070. Users can use A7670 or SIM7070 series module to design and develop applications quickly.



The A7670 series include A7670C, A7670E, A7670SA, A7670C-LNSC, A7670C-LAAE, A7670C-LAAL and A7670C-LAAS.

The SIM7070 series include SIM7070G, SIM7070E, SIM7070G-MN and SIM7070G-M.

1.1 Module Overview

The A7670 series module supports LTE-TDD/LTE-FDD/EDGE/GPRS/GSM. SIM7070 series module supports LTE-FDD/EDGE/GPRS/GSM. Users can choose different types of modules according to their needs to meet diversified market demands.

Table 1: Module basic information comparison

| Modules | Renderings | Package | Size | Description |
|----------|---|-------------|--------------|------------------|
| A7670X |  | 88 LGA pins | 24*24*2.5 mm | LTE CAT-1 and 2G |
| SIM7070X |  | 68 LCC pins | 24*24*2.3 mm | LPWA Module |

1.2 Features

This chapter lists the function parameters of A7670 and SIM7070, the comparison is as follows:

Table 2: Module function comparison

| Function | A7670 series | SIM7070 series |
|-------------------|--|--|
| Power | Power supply range: 3.4V~4.2V Typical value: 3.8V | SIM7070G Power supply range: 3.0V~4.6V SIM7070E Power supply range: 3.2V~4.2V Typical value: 3.8V |
| Peak current | 2A | 2A |
| Sleep current | 3mA(LTE-TDD) | 4.6 mA (LTE-FDD) |
| Frequency band | A7670C/A7670C-LNSC: GSM:DCS1800/EGSM900 LTE-FDD: 1/3/5/8 LTE-TDD:34/38/39/40/41 A7670E: GSM:DCS1800/EGSM900 LTE-FDD: 1/3/5/8/20 A7670SA: GSM:DCS1800/EGSM900/GSM850/ PCS1900 LTE-FDD: 1/2/3/4/5/7/8/28/66 A7670C-LAAE: GSM:DCS1800/EGSM900 LTE-FDD: 1/3/5/8 LTE-TDD:34/38/39/40/41 A7670C-LAAL/A7670C-LAAS: LTE-FDD: 1/3/5/8 LTE-TDD:34/38/39/40/41 | SIM7070G: GSM:DCS1800/EGSM900/GSM850/ PCS1900 LTE-FDD:1/2/3/4/5/8/12/13/18/19/20/25/26/ 28/66/71/85 SIM7070E: GSM:DCS1800/EGSM900/GSM850/ PCS1900 LTE-FDD:1/2/3/4/5/8/12/13/18/19/20/25/26/ 28/31/66/85 |
| GNSS | NA | GNSS (GPS/GLONASS/BeiDou) protocol: NMEA |
| Temperature range | Normal working temperature: -30°C ~ +80°C Extended operating temperature: -40°C ~ +85°C * Storage temperature: -45°C ~ +90°C | Normal working temperature: -40°C ~ +85°C Storage temperature: -45°C ~ +90°C |
| UART interface | Main serial port UART1: <ul style="list-style-type: none"> ● For AT command transmission and data transmission ● Baud rate supports from 300bps to 3686400bps, the default is 115200bps ● Support RTS and CTS hardware flow control Debug serial port UART_LOG: <ul style="list-style-type: none"> ● Debug port, output log information, default 115200bps Debug serial port UART3: <ul style="list-style-type: none"> ● Ordinary two-wire serial port | Main serial port UART1: <ul style="list-style-type: none"> ● For AT command transmission and data transmission ● Baud rate supports from 300bps to 3686400bps, the default is 115200bps ● Support RTS and CTS hardware flow control Debug serial port UART2: <ul style="list-style-type: none"> ● Only used in secondary software development Debug serial port UART3 <ul style="list-style-type: none"> ● Only used in secondary software |

| | | development |
|-----------------------------|---|--|
| (U)SIM interface | Support (U)SIM card: 1.8V/3.0V | Support (U)SIM card: 1.8V |
| PCM interface | <ul style="list-style-type: none"> ● For audio use, external Codec chip is required ● Support 16-bit linear encoding format ● Support short frame mode ● Only supports master mode | <ul style="list-style-type: none"> ● For audio use, external Codec chip is required ● Support 16-bit linear encoding format ● Support short frame mode ● Only supports master mode |
| USB interface | USB2.0, only supports slave mode, the maximum data transfer rate is 480Mbps | USB2.0, only supports slave mode, the maximum data transfer rate is 480Mbps |
| SD Card interface | NA | NA |
| SGMII interface | NA | NA |
| WLAN/BT interface | NA | NA |
| ADC interface | <ul style="list-style-type: none"> ● A7670C/A7670E/A7670SA/A7670C-L NSC : Provide an analog-to-digital conversion interface ● A7670C-LAAE/A7670C-LAAL/A7670C-LAAS : Provide two analog-to-digital conversion interfaces ● Voltage range: 0~1.3V ● Resolution: 12 bits | <ul style="list-style-type: none"> ● Provide an analog-to-digital conversion interface ● Voltage range: 0~1.875V ● Resolution: 10 bits |
| Network indication | NETLIGHT: Network indication | NETLIGHT: Network indication |
| Diversity antenna interface | No | No |
| Antenna interface | Main antenna interface: (RF_ANT) | Main antenna interface: (RF_ANT) GNSS antenna interface: (GNSS_ANT) |
| Software upgrade | Upgrade software via USB | Upgrade software via USB |

NOTE

In the extended operating temperature range, the module can work normally, but does not guarantee full compliance with 3GPP test specifications.

Package Introduction

2.1 Pin Assignment Overview

The following figure shows the pin assignment of A7670X and SIM7070X.

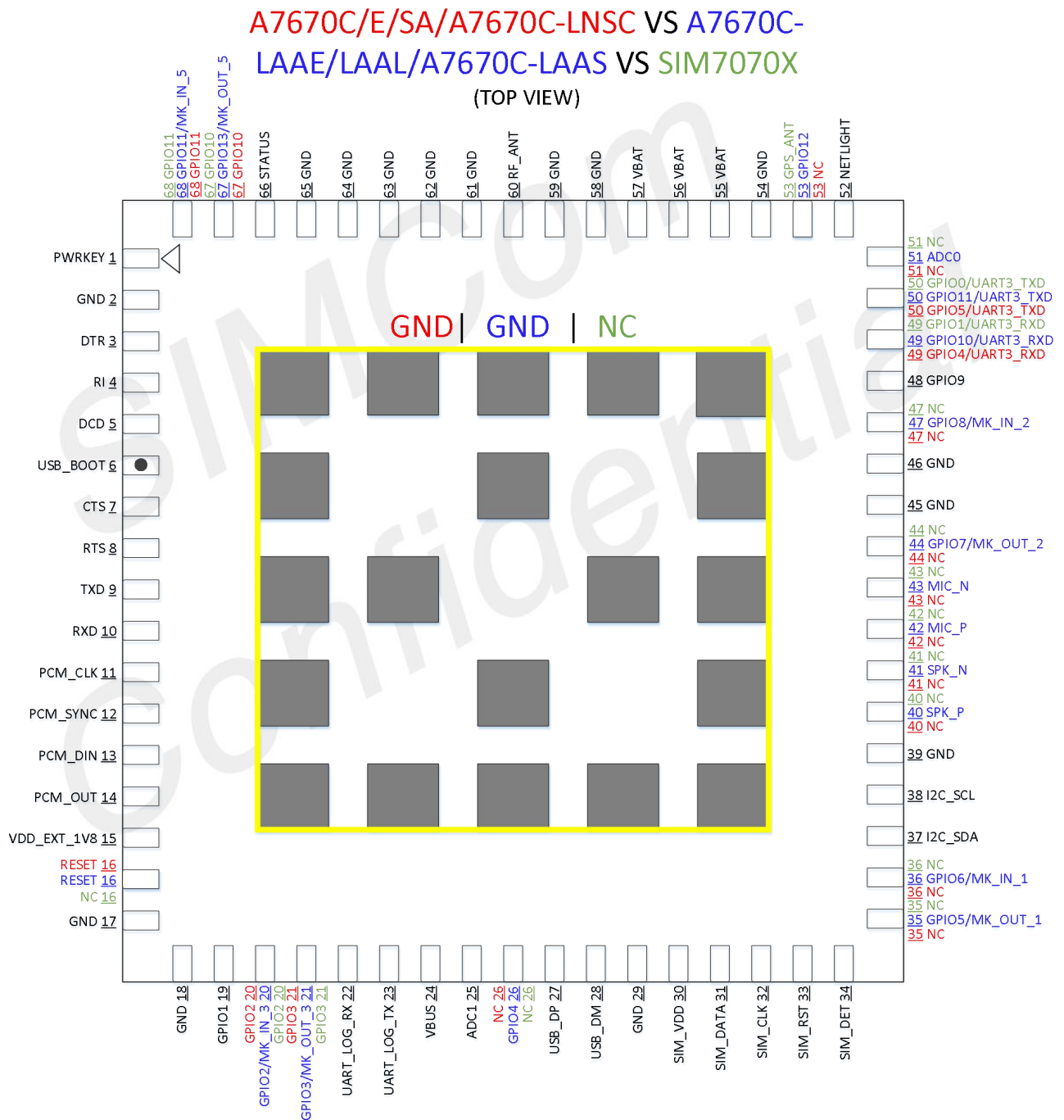


Figure 1: A7670X and SIM7070X pin assignment (Top view)

2.2 PIN definition

This chapter describes the pin definition and comparison of A7670 and SIM7070 series.

Table 3 provides the abbreviated definition of module pins:

Table 3: Pin type definition

| abbreviation | description |
|-----------------------|-----------------|
| Pin attributes | |
| PI | Power Input |
| PO | Power Output |
| AI | Analog Input |
| AO | Analog Output |
| I/O | Input or Output |
| DI | Digital Input |
| DO | Digital Output |

Table 4 lists all pin names, IO types and power domains of A7670X and SIM7070X

Table 4: Module pin definition comparison

| A7670X | | | | SIM7070X | | | |
|---------|-----------|-----|--------------|----------|-----------|-----|--------------|
| Pin No. | Pin Name | I/O | Power domain | Pin No. | Pin Name | I/O | Power domain |
| 1 | PWRKEY | DI | VBAT | 1 | PWRKEY | DI | 1.5V |
| 2 | GND | - | GND | 2 | GND | - | GND |
| 3 | DTR | DI | 1.8V | 3 | UART1_DTR | DI | 1.8V |
| 4 | RI | DO | 1.8V | 4 | UART1_RI | DO | 1.8V |
| 5 | DCD | DO | 1.8V | 5 | UART1_DCD | DO | 1.8V |
| 6 | USB_BOOT● | DI | 1.8V | 6 | BOOT_CFG● | DI | 1.8V |
| 7 | CTS | DO | 1.8V | 7 | UART1_CTS | DO | 1.8V |
| 8 | RTS | DI | 1.8V | 8 | UART1_RTS | DI | 1.8V |
| 9 | TXD | DO | 1.8V | 9 | UART1_TXD | DO | 1.8V |
| 10 | RXD | DI | 1.8V | 10 | UART1_RXD | DI | 1.8V |
| 11 | PCM_CLK | IO | 1.8V | 11 | PCM_CLK | IO | 1.8V |
| 12 | PCM_SYNC | IO | 1.8V | 12 | PCM_SYNC | IO | 1.8V |
| 13 | PCM_DIN | DI | 1.8V | 13 | PCM_DIN | DI | 1.8V |
| 14 | PCM_OUT | DO | 1.8V | 14 | PCM_DOUT | DO | 1.8V |
| 15 | VDD_1V8 | PO | 1.8V | 15 | VDD_EXT | PO | 1.8V |
| 16 | RESET | DI | VBAT | 16 | NC | - | - |
| 17 | GND | - | GND | 17 | GND | - | GND |
| 18 | GND | - | GND | 18 | GND | - | GND |

| | | | | | | | |
|----|-------------------------------------|----------|------------|----|-----------|----|------------|
| 19 | GPIO1 | IO | 1.8V | 19 | GPIO1 | IO | 1.8V |
| 20 | GPIO2 GPIO2/MK_IN_3 | IO | 1.8V | 20 | GPIO2 | IO | 1.8V |
| 21 | GPIO3 GPIO3/MK_OUT_3 | IO | 1.8V | 21 | GPIO3 | IO | 1.8V |
| 22 | UART_LOG_RX | DI | 1.8V | 22 | DEBUG_RXD | DI | 1.8V |
| 23 | UART_LOG_TX | DO | 1.8V | 23 | DEBUG_TXD | DO | 1.8V |
| 24 | VBUS | AI | Typical:5V | 24 | USB_VBUS | AI | Typical:5V |
| 25 | ADC | AI | 0.1V-1.3V | 25 | ADC1 | AI | 0V-1.875V |
| 26 | NC GPIO4 | - IO | - 1.8V | 26 | NC | - | - |
| 27 | USB_DP | IO | - | 27 | USB_DP | IO | - |
| 28 | USB_DM | IO | - | 28 | USB_DM | IO | - |
| 29 | GND | - | GND | 29 | GND | - | GND |
| 30 | SIM_VDD | IO | 1.8V/3.0V | 30 | SIM_VDD | IO | 1.8V |
| 31 | SIM_DATA | IO | 1.8V/3.0V | 31 | SIM_DATA | IO | 1.8V |
| 32 | SIM_CLK | DO | 1.8V/3.0V | 32 | SIM_CLK | DO | 1.8V |
| 33 | SIM_RST | IO | 1.8V/3.0V | 33 | SIM_RST | IO | 1.8V |
| 34 | SIM_DET | IO | 1.8V/3.0V | 34 | GPIO4 | IO | 1.8V |
| 35 | NC GPIO5/MK_OUT_1 | - IO | - 1.8V | 35 | NC | - | - |
| 36 | NC GPIO6/MK_IN_1 | - IO | - 1.8V | 36 | NC | - | - |
| 37 | I2C_SDA | IO | 1.8V | 37 | I2C_SDA | IO | 1.8V |
| 38 | I2C_SCL | DO | 1.8V | 38 | I2C_SCL | DO | 1.8V |
| 39 | GND | - | GND | 39 | GND | - | GND |
| 40 | NC SPK_P | - AIO | - 1.8V | 40 | NC | - | - |
| 41 | NC SPK_N | - AIO | - 1.8V | 41 | NC | - | - |
| 42 | NC MIC_P | - AIO | - 1.8V | 42 | NC | - | - |
| 43 | NC MIC_N | - AIO | - 1.8V | 43 | NC | - | - |
| 44 | NC GPIO7/MK_OUT_2 | - IO | - 1.8V | 44 | NC | - | - |
| 45 | GND | - | GND | 45 | GND | - | GND |
| 46 | GND | - | GND | 46 | GND | - | GND |
| 47 | NC GPIO8/MK_IN_2 | - IO | - 1.8V | 47 | NC | - | - |
| 48 | GPIO9 | IO | 1.8V | 48 | GPIO5 | IO | 1.8V |
| 49 | GPIO4(UART3_RX) GPIO10(UART3_RX) | IO | 1.8V | 49 | UART3_RXD | IO | 1.8V |
| 50 | GPIO5(UART3_TX) | IO | 1.8V | 50 | UART3_TXD | IO | 1.8V |

| | | | | | | | |
|----|---------------------------|---------|----------------|----|----------|---------|--|
| | GPIO11(UART3_TX) | | | | | | |
| 51 | NC ADC0 | - AI | - 0.1V-1.3V | 51 | NC | - | - |
| 52 | NETLIGHT | DO | 1.8V | 52 | NETLIGHT | DO | 1.8V |
| 53 | NC GPIO12 | - IO | - 1.8V | 53 | GNSS_ANT | AI | - |
| 54 | GND | - | GND | 54 | GND | - | GND |
| 55 | VBAT | PI | 3.4V~4.2V | 55 | VBAT | PI | SIM7070G Power supply range: 3.0V~4.6V SIM7070E Power supply range: 3.2V~4.2V |
| 56 | VBAT | PI | 3.4V~4.2V | 56 | VBAT | PI | Same as above |
| 57 | VBAT | PI | 3.4V~4.2V | 57 | VBAT | PI | Same as above |
| 58 | GND | - | GND | 58 | GND | - | GND |
| 59 | GND | - | GND | 59 | GND | - | GND |
| 60 | RF_ANT | AIO | - | 60 | RF_ANT | AI O | - |
| 61 | GND | - | GND | 61 | GND | - | GND |
| 62 | GND | - | GND | 62 | GND | - | GND |
| 63 | GND | - | GND | 63 | GND | - | GND |
| 64 | GND | - | GND | 64 | GND | - | GND |
| 65 | GND | - | GND | 65 | GND | - | GND |
| 66 | STATUS | DO | 1.8V | 66 | STATUS | DO | 1.8V |
| 67 | GPIO10 GPIO13/MK_OUT_5 | IO | 1.8V | 67 | GPIO6 | IO | 1.8V |
| 68 | GPIO11 GPIO14/MK_IN_5 | IO | 1.8V | 68 | GPIO7 | IO | 1.8V |
| 69 | GND | - | GND | | | | |
| 70 | GND | - | GND | | | | |
| 71 | GND | - | GND | | | | |
| 72 | GND | - | GND | | | | |
| 73 | GND | - | GND | | | | |
| 74 | GND | - | GND | | | | |
| 75 | GND | - | GND | | | | |
| 76 | GND | - | GND | | | | |
| 77 | GND | - | GND | | | | |

| | | | | | | | |
|----|-----|---|-----|--|--|--|--|
| 78 | GND | - | GND | | | | |
| 79 | GND | - | GND | | | | |
| 80 | GND | - | GND | | | | |
| 81 | GND | - | GND | | | | |
| 82 | GND | - | GND | | | | |
| 83 | GND | - | GND | | | | |
| 84 | GND | - | GND | | | | |
| 85 | GND | - | GND | | | | |
| 86 | GND | - | GND | | | | |
| 87 | GND | - | GND | | | | |
| 88 | GND | - | GND | | | | |

NOTE

The PIN name highlighted in red indicates A7670C/E/SA/A7670C-LNSC.
 The PIN name highlighted in blue indicates A7670C-LAAE/LAAL/LAAS.

The PIN Marked '●' cannot be pulled up before the module powered up, otherwise it will affect the normal start-up of the module.

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3 Physical Size

This chapter introduces the external dimensions of the A7670 and SIM7070 series modules, and the recommended packaging.

3.1 Top and Bottom View

The following figures show top and bottom view of A7670 and SIM7070.

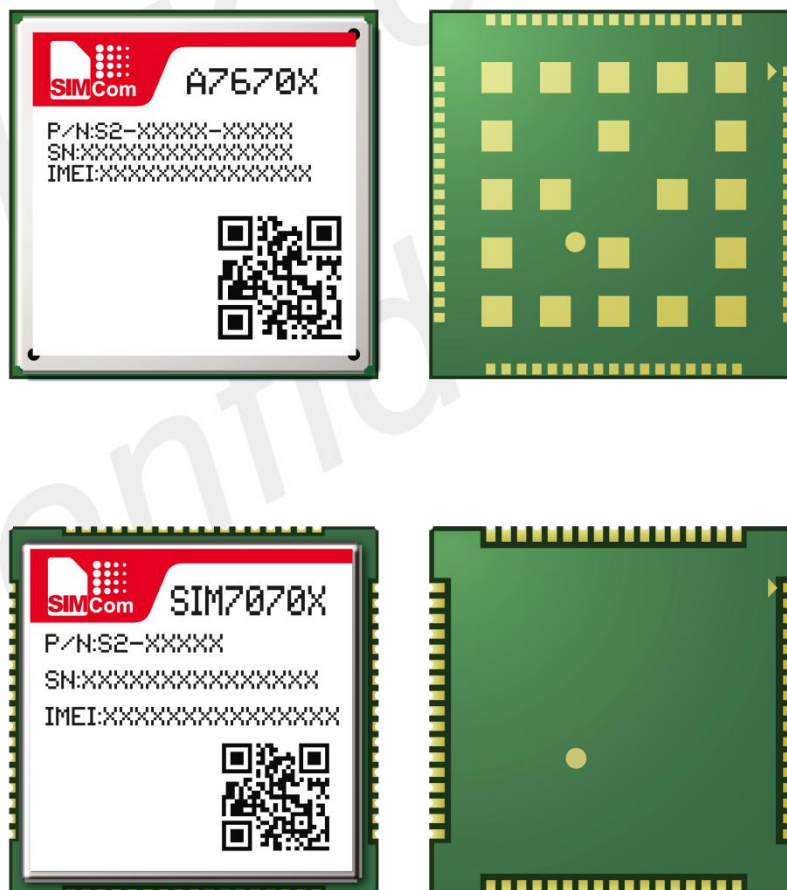


Figure 2: A7670X and SIM7070X top and bottom view

NOTE

The above is the design effect drawing of the module for reference, and the actual appearance shall

prevail in kind.

3.2 Recommended PCB footprint outline

A7670 and SIM7070 series have the same Recommended PCB footprint outline.

The recommended PCB footprint outline for A7670 and SIM7070 series is shown as below.

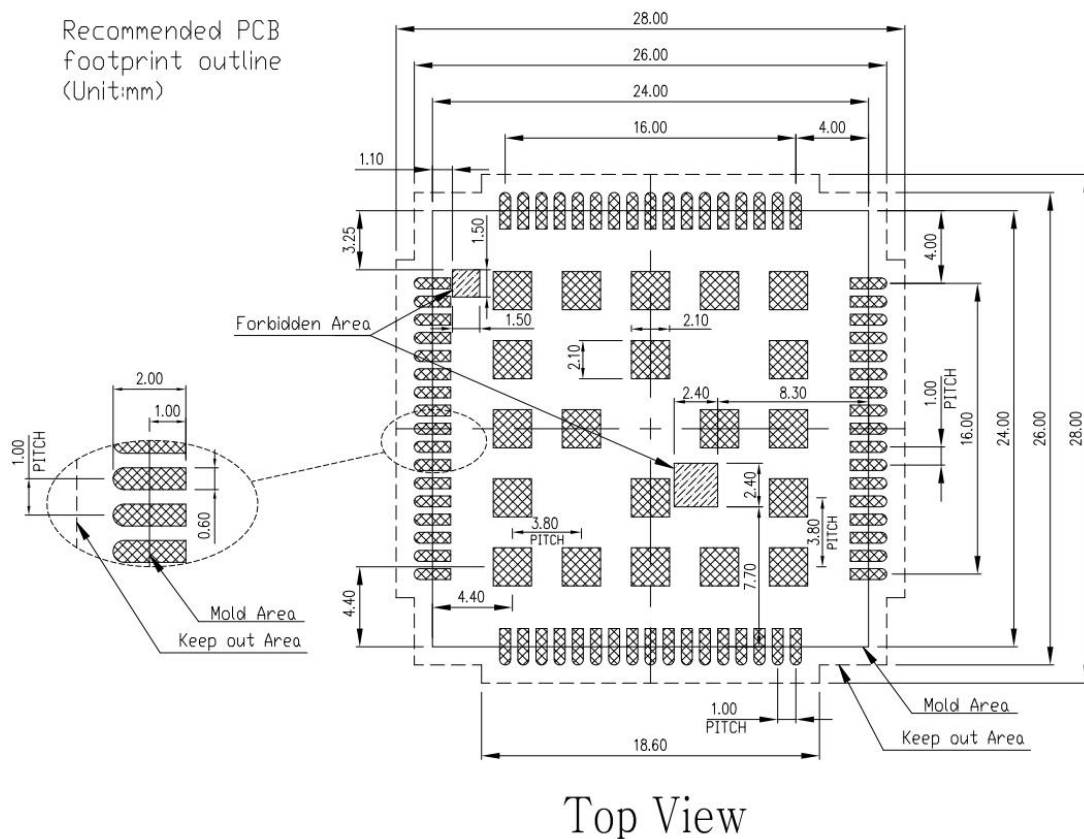


Figure 3: Recommended PCB footprint outline for A7670X and SIM7070X (Unit: mm)

NOTE

For details information, please refer to each HD guide

4 Hardware Reference Design

Users using A7670 and SIM7070 user interface can refer to the design in this chapter.

4.1 Power Supply

4.1.1 Power requirements

The following table shows the supply voltage range of A7670 and SIM7070 series:

Table 5: Module recommended supply voltage comparison

| Modules | Power Pin | Symbol description | Min | Typical | Max | unit |
|--------------|-----------|--------------------|-----|---------|-----|------|
| A7670 series | VBAT | Power supply range | 3.4 | 3.8 | 4.2 | V |
| SIM7070G | VBAT | Power supply range | 3 | 3.8 | 4.6 | V |
| SIM7070E | VBAT | Power supply range | 3.2 | 3.8 | 4.2 | V |

During 2G transmission, the instantaneous current is as high as 2A, and the battery terminal burst current and voltage drop model are shown in the figure below:

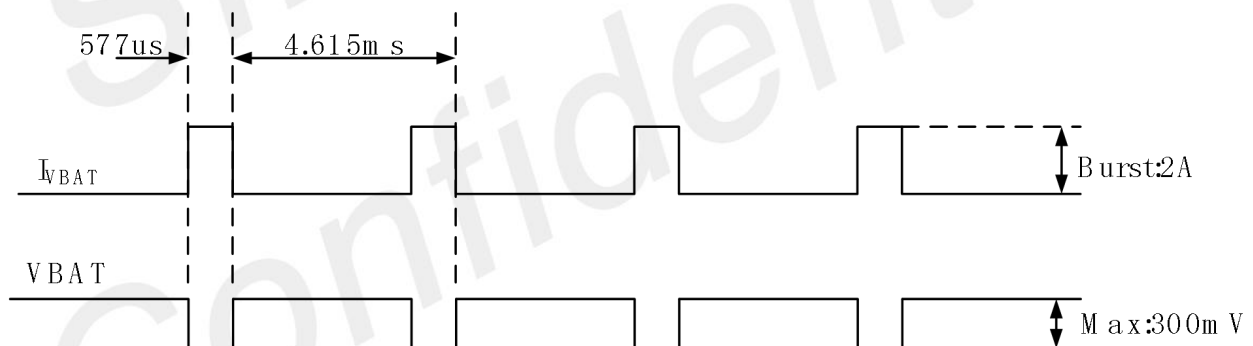


Figure 4: Burst transmission power requirements

In the user's design, special attention must be paid to the design of the power supply section to ensure that even when the current consumption of the module reaches 2A, the drop of VBAT does not fall below 3.4V. If the voltage drops below 3.4V, the RF performance of the module will be affected.

NOTE

When the power supply can provide a peak current of 2A, the total capacitance of the external power supply capacitor is recommended not to be less than 300uF; if it cannot provide a peak current of 2A, it is recommended that the total capacitance of the external capacitor is not less than 1000uF to ensure that the VBAT pin at any time The upper voltage drop does not exceed 300mV.

It is recommended to place four ceramic capacitors of 33pf/10pf/0.1/1μF close to VBAT to improve RF performance and system stability. At the same time, it is recommended that the width of the VBAT trace between the power supply on the PCB and the module is at least 3mm. The reference design recommendations are as follows:

If the VBAT input contains high frequency interference, it is recommended to add magnetic beads for filtering. The recommended models of magnetic beads are BLM21PG300SN1D and MPZ2012S221A.

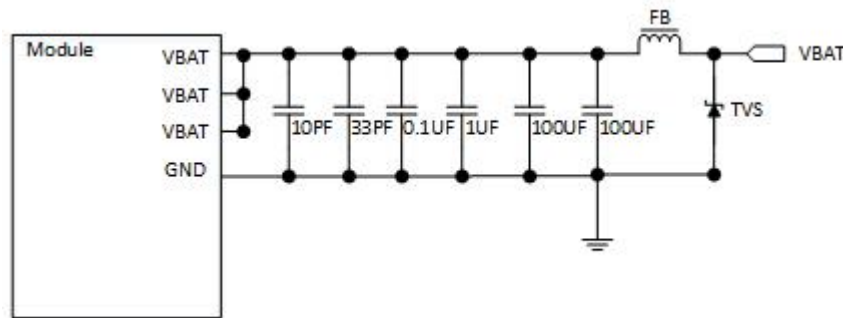


Figure 5: VBAT input reference circuit

4.1.2 Recommended external power circuit

The module power supply design is the basis for the stable performance of the module. When choosing a power supply, it is necessary to ensure that it has a load capacity of at least 3A. Users can choose LDO or DC-DC power supply according to their needs.

The recommended circuit of linear power supply is shown in the figure below:

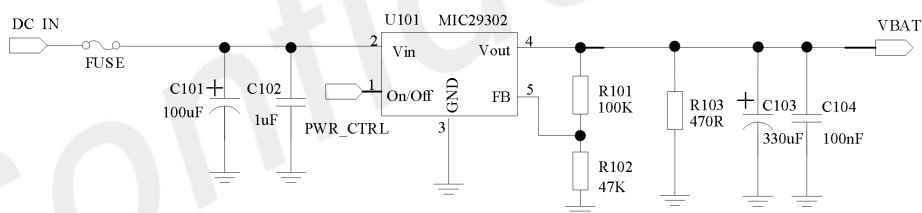


Figure 6: Linear power supply recommended circuit

The recommended circuit of switching power supply is shown in the figure below:

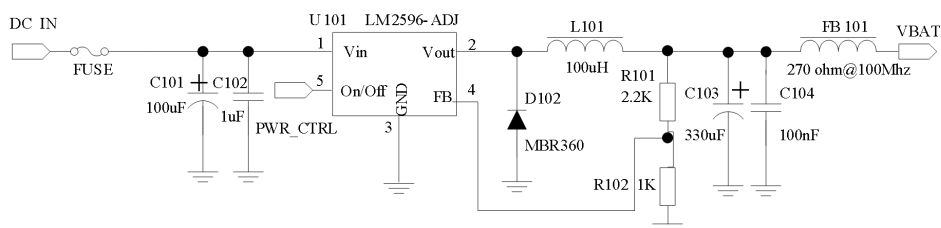


Figure 7: Recommended circuit for switching power supply

4.2 USB Interface

Both A7670 and SIM7070 series module provide a USB2.0 interface, supporting high-speed 480Mbps and full-speed mode 12Mbps, and do not support USB charging function; A7670 series does not support USB HOST mode.

USB is the main debugging port and software upgrade interface. It is recommended that customers reserve USB test points during design. If the main control chip is connected, 0R resistors should be reserved for switching external test points during design, as shown in the figure below.

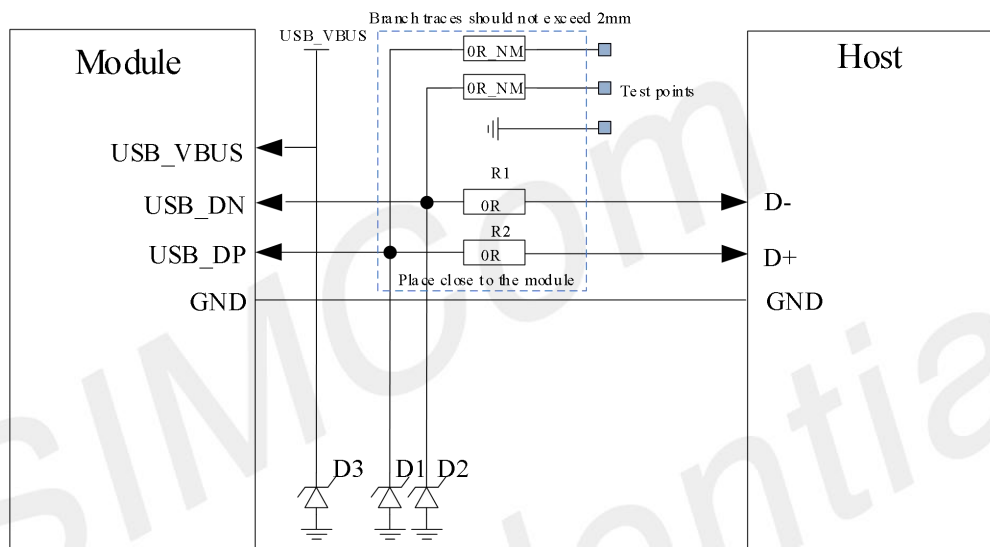


Figure 8: USB reference circuit

Customers can replace R1 and R2 with a common mode inductor to prevent EMI interference, and pay attention to the selection of D3 devices. It is recommended to choose anti-static and anti-surge two-in-one devices, and one TVS tube can be placed. Recommended model ESD5681N07. D+/D- trace impedance is controlled according to 90Ω and covered with ground; D1/D2 select TVS tube with capacitance value $<1\text{pf}$.

4.3 Network Status Indication

The NETLIGHT/STATUS pins can be used to drive a network status indicator LED. The following circuit is the reference design.

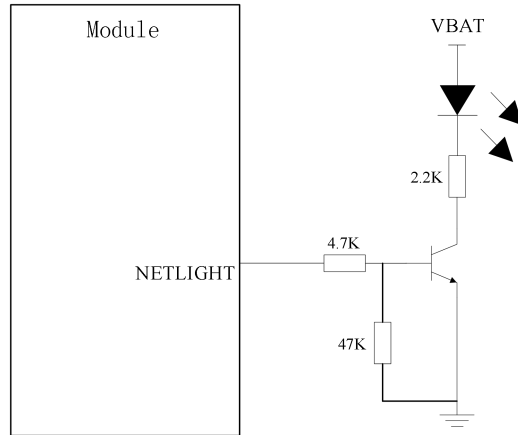


Figure 9: NETLIGHT/STATUS reference circuit

4.4 Power on/off Circuit

A7670 & SIM7070 series can be turned on by driving the PWRKEY pin to a low level for a certain time. It is recommended use an open drain or collector driver to control the PWRKEY. A reference circuit is shown below.

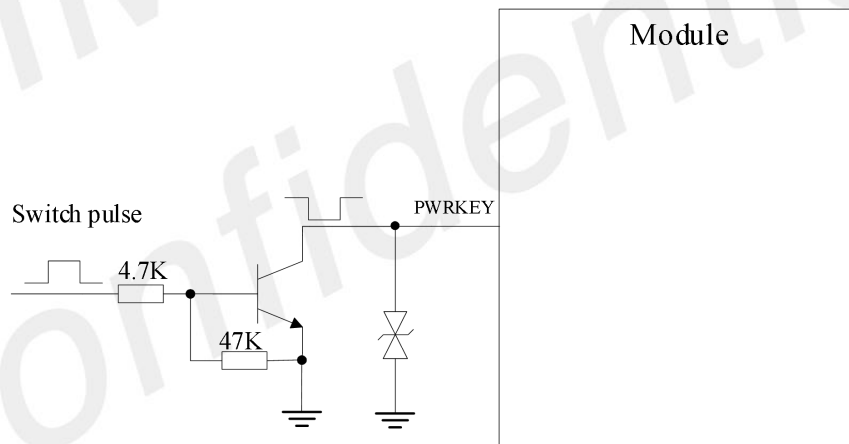


Figure 10: Power on/off reference circuit

The module has the following shutdown methods:

- Use PWRKEY pin to shut down
- Use "AT+CPOF" command to shut down
- High/low voltage overvoltage shutdown, use "AT+CPMVT" (A7670 series) to set the voltage range.
- Shutdown at high and low temperature

It is strongly recommended that customers use PWRKEY or AT+CPOF to shut down, and then power off VBAT after shutting down (especially when the module does not need to work at all). In addition, turning off the VBAT directly by disconnecting the VBAT may cause damage to the FLASH.

4.5 Reset Circuit

The A7670 series reset circuit is as follows, the user resets the module by pulling down the RESET pin. The PWRKEY pin of SIM7070 series has its own reset function. The reset time defaults to 12S. When PWRKEY is pulled low, the module will reset the system after 12S. Therefore, it is not recommended to connect PWRKEY to GND directly or to GND through a 0R resistor when designing external circuits. The recommended (A7670 series) circuit is as follows:

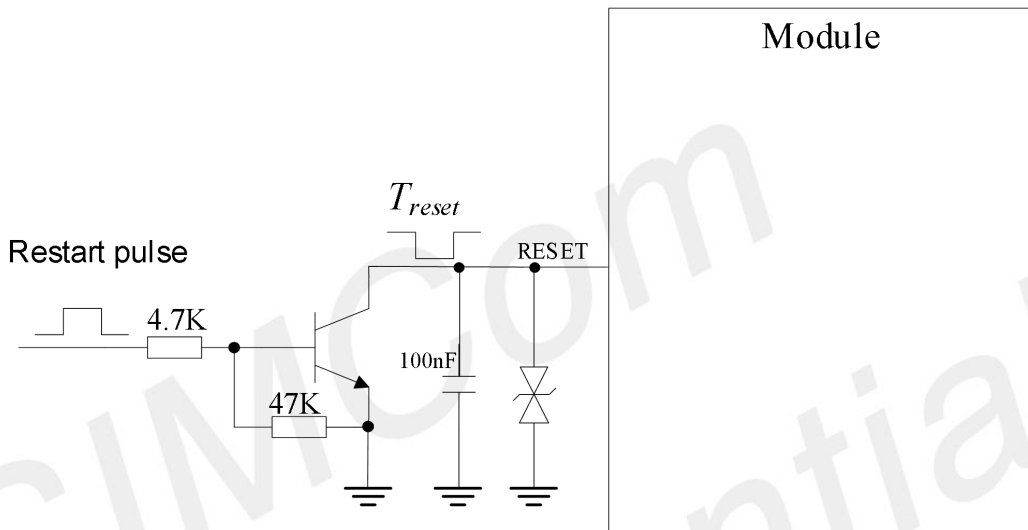


Figure 11: A7670X Reset reference circuit

4.6 USIM Interface

A7670 series supports 1.8V/3.0V (U)SIM card by default and supports hot-swappable function; SIM7070 series only supports 1.8V (U)SIM card and does not support hot-swappable function. The recommended circuit is as follows:

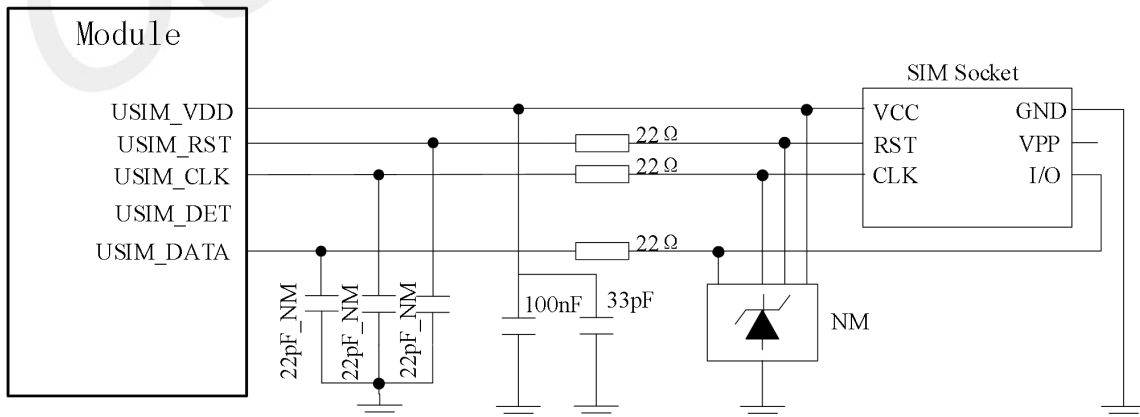


Figure 12: SIM interface reference circuit

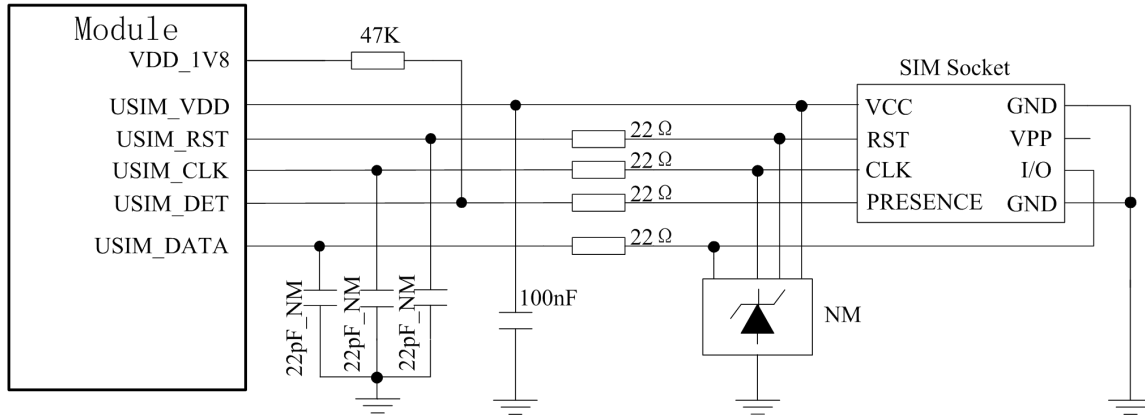


Figure 13: SIM interface reference circuit (8PIN)

NOTE

For details information, please refer to each HD guide

4.7 UART Interface

A7670 series provides 3 serial ports, 1 main full-function communication serial port UART (RTS/CTS flow control function debugging), 1 ordinary two-wire serial port, 1 print LOG serial port, and the module is a DCE (Data Communication Equipment) device.

SIM7070 series can provide 3 serial ports, 1 full-function communication serial port, 1 2-wire serial port UART3, the default function after booting is GPIO; it can be configured as UART function, this UART cannot be used for AT command communication, only used for software two UART communication during the second development, this port can also be configured as a GNSS NMEA data output port. 1 DEBUG serial port, it will output the boot log during module startup. The default function after booting is GPIO, which can be configured as UART function. This UART cannot be used for AT command communication and is only used for UART communication during software secondary development.

Below are the reference circuits.

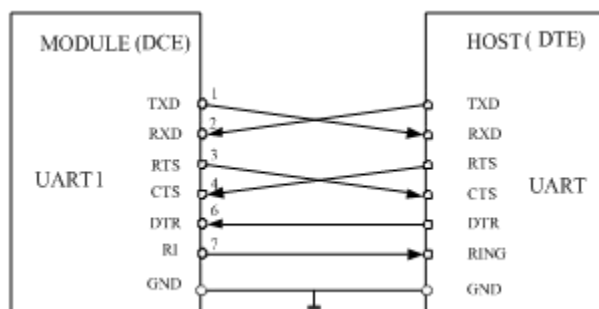


Figure 14: UART Full modem

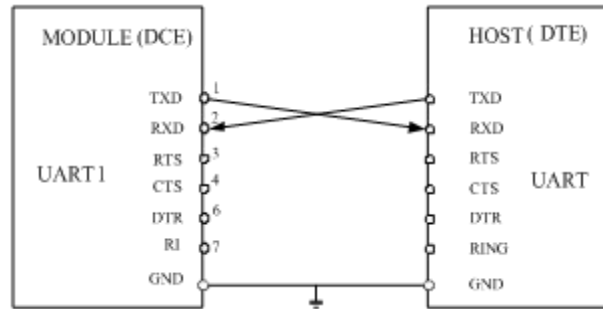


Figure 15: UART Null modem

The following figure shows the use of a transistor for circuit conversion. The circuit in the dotted line can refer to the circuit of the solid line TXD and RXD, and you need to pay attention to the direction of the signal. The recommended transistor model here is MMBT3904.

NOTE

For details information, please refer to each HD guide

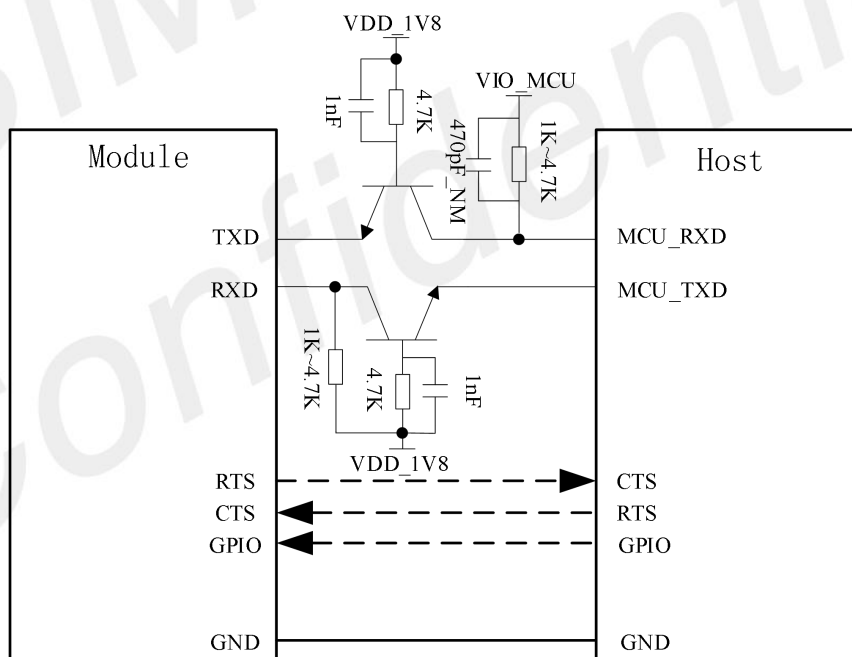


Figure 16: Triode level conversion circuit

NOTE

The VDD_1V8 (VDD_EXT) of each project in the diagram is different. For details information, please refer to each HD guide

4.8 PCM Interface

Both A7670 and SIM7070 series provide a set of PCM audio interfaces, which can be connected to an audio codec chip. Support voice function, customers can plug-in codec on PCM to make voice calls.

The following circuit is the reference design.

Table 6: PCM interface parameters

| Function | A7670 series | SIM7070 series |
|---------------|---|---|
| PCM Interface | <ul style="list-style-type: none"> Support 16-bit linear encoding format Support short frame mode Support main mode Support 16K sampling rate | <ul style="list-style-type: none"> Support 16-bit linear encoding format Support short frame mode Support main mode Support 16K sampling rate |

The recommended circuit of PCM is as follows:

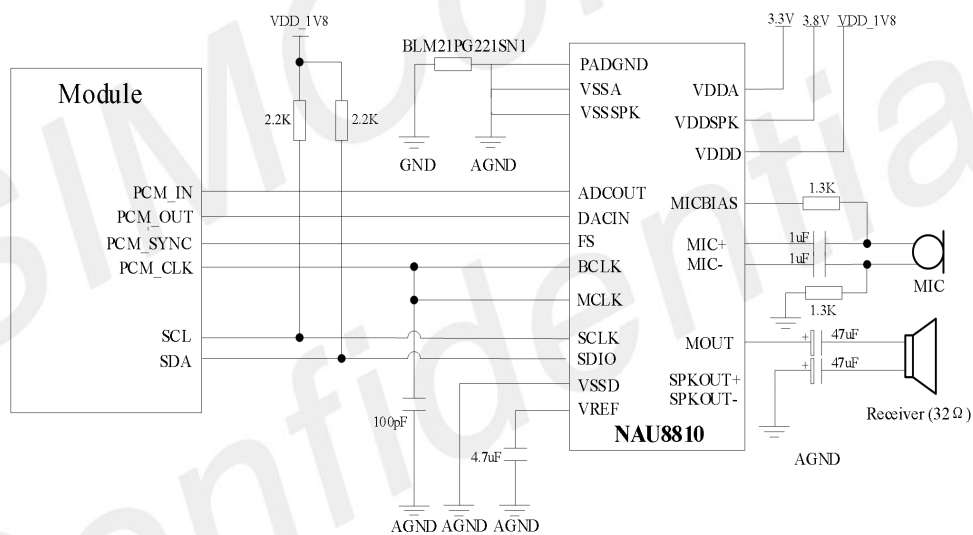


Figure 17: PCM recommended circuit

Codec supports the model number NAU8810. The audio output MOUT and SPKOUT can be switched by AT command.

NOTE

For details information, please refer to each HD guide

4.9 RF Interface

The reference circuit of ANT_MAIN antenna connection between A7670 and SIM7070 series is shown in the figure below. In order to ensure the best performance of the output radio frequency, it is recommended to reserve a π -type matching circuit, and the capacitor is not attached by default.

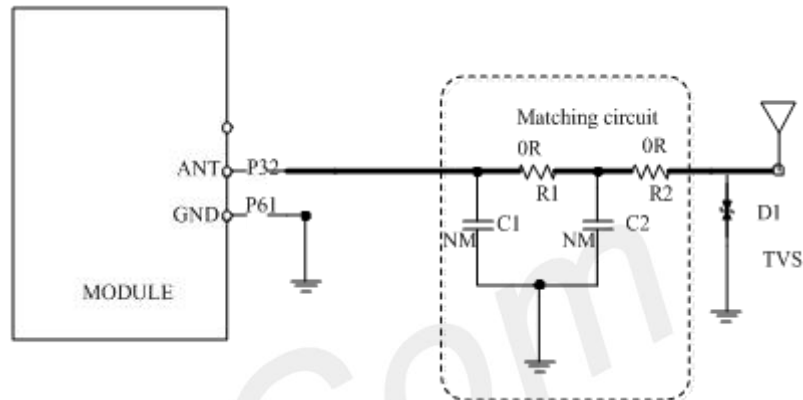


Figure 18: Antenna matching circuit

The capacitors (C1/C2) are not mounted and a 0 Ω resistor is mounted on R1 and R2 by default. The component D1 is a TVS for ESD protection, and it is optional for users according to application environment. The RF test connector is used for the conducted RF performance test, and should be placed as close as to the module's RF_ANT pin. Two TVS are recommended in the table below.

Table 7: Recommended TVS

| Package | Part Number | Vender |
|---------|---------------|---------|
| 0201 | CE0201S05G01R | SOCAY |
| 0402 | PESD0402-03 | PRISEMI |

4.10 USB_BOOT Interface

A7670 and SIM7070 series support the USB mandatory download function at the same time. The user can pull up the USB_BOOT pin to 1.8V before powering on, and press the power button to enter the emergency download mode. At this time, the module can download software through the USB port.

The reference circuit is as follows. It is recommended that users connect these two signals to test points.

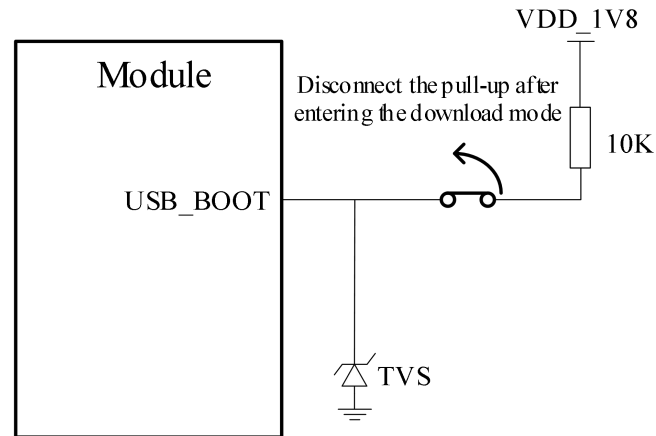


Figure 19: Forced download reference circuit

4.11 ADC Interface

Both A7670C/E/SA/A7670C-LNSC and SIM7070 series provide 1 ADC interface. A7670C-LAAE/LAAL/LAAS provide 2 ADC interfaces. The electrical characteristics are compared as follows:

Table 8: ADC interface parameters

| Function | A7670 series | SIM7070 series |
|---------------|---|---|
| ADC Interface | -Resolution: 12bits -voltage range: 0~1.3V | -Resolution: 10bits -voltage range: 0~1.875V |

5 Appendix

5.1 Related documents

Table 9: Related documents

| SN | Document name | Remark |
|-----|------------------------------|----------------------------------|
| [1] | A7670 Series Hardware Design | A7670 Hardware Design Document |
| [2] | SIM7070 Hardware Design | SIM7070 Hardware Design Document |

5.2 Terms and Abbreviation

Table 10: Terms and Abbreviation

| Abbreviation | Description |
|--------------|---|
| ESD | Electrostatic Discharge |
| GSM | Global Standard for Mobile Communications |
| I2C | Inter-Integrated Circuit |
| PCB | Printed Circuit Board |
| PCS | Personal Communication System, also referred to as GSM 1900 |
| RF | Radio Frequency |
| RTC | Real Time Clock |
| RX | Receive Direction |
| SIM | Subscriber Identification Module |
| UART | Universal Asynchronous Receiver & Transmitter |
| NC | Not connect |
| EDGE | Enhanced data rates for GSM evolution |
| HSDPA | High Speed Downlink Packet Access HSUPA |
| USIM | Universal subscriber identity module |
| UMTS | Universal mobile telecommunications system |
| SMPS | Switch Mode Power Supply |