

# **VT-MOD-CELL-B48 Hardware User Manual**

**Product Version: 1.0**

**Date: 2021-11-16**

# **Vantron**

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## Change History

This table describes the version and release date.

<b>Rev.</b>	<b>Date</b>	<b>Description</b>	<b>Author</b>
1.0	2021-11-16	First release.	Zhihui Sun

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## Foreword

### Copyright

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### Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Type	Description
	Notice	Important information and regulations
	Caution	Caution for latent damage to system or harm to personnel

### Statement & Disclaimer

It is recommended to read and comply with this manual which provides important guidance and helps decreasing the danger of injury, electric shock, fire, or any damage to the device.

Vantron assumes no legal liability of accidents resulting from failure of conforming to the safety instructions.

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## **Limitation of Liability/Non-warranty**

For direct or indirect damage to this device or other devices of Vantron caused by failure of conforming to this manual or the safety instructions on device label, Vantron assumes neither warranty nor legal liability even if the device is still under warranty.

The device should be installed, debugged and maintained by professionals.

The outside antennas are not permitted to be installed or to be changed by non-professionals. To run the device normally, only specified antennas are approved to be assembled together by professionals.

Unit shall use indoor-use antenna only. No antenna for this unit can be installed outdoors.

## **Safety Instructions**


- ✧ Keep and comply with all operation instructions, warnings, and information.
- ✧ Pay attention to warnings on this device.
- ✧ Read the following precautions so as to decrease the danger of injury, electric shock, fire, or any damage to the device.
- ✧ Operations and service instructions are provided with the equipment.
- ✧ Unit shall be used with indoor-use antenna only. No antenna for this unit can be installed outdoor.
- ✧ The maximum operation temperature is 61°C.


## **Precautions**


- ✧ Pay attention to the product labels/safety instructions printed on silk screens.
- ✧ Do not try repairing this product unless declared in this manual.
- ✧ Keep away from heat source, such as heater, heat dissipater, or engine casing.
- ✧ Do not insert other items into the slot (if any) of this device.
- ✧ Ensure ventilation of the ventilation slot.
- ✧ System fault may arise if other items are inserted into this device.
- ✧ Installation: ensure correct installation according to instructions from the manufacturer with recommended installation tools.
- ✧ Ensure ventilation and smoothness according to relevant ventilation standards.

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## Safety Instructions for Power Cables and Accessories

 Use Proper power source only. Start only with power source that satisfies voltage label and the voltage necessary according to this manual. Please contact technical support personnel of Vantron for any uncertainty about the requirements of necessary power source.

 Use tested power source. This product still contains a button lithium battery as a real-time clock after its external power source is removed and therefore should not be short-circuited during transportation or placed under high temperature.

 Place cables properly: Do not place cables at any place with extrusion danger.

### **Cleaning Instructions**

- ✧ Please power off before cleaning the device.
- ✧ Do not use spray detergent.
- ✧ Clean with a damp cloth.
- ✧ Do not try cleaning exposed electronic components unless with a dust collector.
- ✧ Support for special fault: Power off and contact technical support personnel of Vantron in case of the following faults:
  - The device is damaged.
  - The temperature is excessively high.
  - Fault is still not solved after operations according to the manual.

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# 1. Overview

## 1.1 Description

This chapter has outlined the VT-MOD-CELL-B48 LTE module, including:

- VT-MOD-CELL-B48 LTE module function
- Acronym

## 1.2 Module Function

The functions and characteristics of VT-MOD-CELL-B48 LTE module are shown as follows:

- GCT chipset: GDM7243QT
- Comply to 3GPP Release10 CAT6
- Support Band48
- Support channel bandwidth of 5M/10M/15M/20M
- Provide LCC interface, interface signals include:
  - Power supply
  - 1 USIM card signal (Support 3.0v or 1.8v)
  - 1 high speed USB2.0 interface
- Provide 4 antenna interfaces
- Support standard AT instruction set
- Meet ROHS environmental requirements

Table 1-1 Key features of VT-MOD-CELL-B48 LTE module

Feature	Description
<b>Maximum Transmit Power</b>	21dBm+1/-2dBm
<b>Operating Temperature</b>	Operating Temperature: -20°C ~ +65°C
	Operating Temperature (Reduced RF performance): -30°C ~ +70°C
	Storage Temperature: -40°C ~ +85°C
<b>Power Voltage</b>	3.15V ~ 4.2V (3.3V recommended)
<b>Consumption (Current)</b>	Band48; MAX: 550mA
<b>AT Instruction</b>	Support standard AT instruction settings
<b>LCC Interface</b>	Power and Ground
	1 USIM card signal (Support 3.0v or 1.8v)
	1 high speed USB2.0 Interface
<b>External Interface</b>	4 antenna interfaces
<b>Environmental Requirements</b>	RoHS



## 1.3 Acronym

Table 1-2 Acronym list

Acronym	Full Name
CA	Carrier Aggregation
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
E-UTRA	Evolved Universal Terrestrial Radio Access
IEC	International Electro technical Commission
IMEI	International Mobile Equipment Identity
I/O	Input/output
ISO	International Standards Organization
ITU	International Telecommunications Union
kbps	kbits per second
LED	Light Emitting Diode
NTC	Negative Temperature Coefficient
PCS	Personal Cellular System
PCI	Peripheral Component Interconnect
PDU	Packet Data Unit
PPP	Point-to-point protocol
PS	Packet Switched
QPSK	Quadrature Phase Shift Keying
TCP/IP	Transmission Control Protocol/ Internet Protocol
UART	Universal asynchronous receiver-transmitter
UIM	User Identified Module
USB	Universal Serial Bus

## 2. Interface

### 2.1 Overview

This chapter mainly introduces the external interfaces of VT-MOD-CELL-B48 LTE module, including:

- LCC Interface
- Antenna Interface

### 2.2 General LCC Interface

#### Interface Signals

Table 2-1 Definition of interface pins

Pin No.	Pin Name	Direction (Refer to module)	Pin Definition	Remarks
1	Reserved			floating
2	Reserved			floating
3	SPI_CS2#	O	SPI chip selection	If not use, floating
4	SPI_MISO	I	SPI data bus (Master input, Slave Output)	
5	SPI_SCLK	O		
6	SPI_MOSI	O	SPI data bus (Master input, Slave Output)	
7	GND			
8	UART1_TXD	O	UART1 data transmit	
9	UART1_RXD	I	UART1 data receive	
10	UART0_TXD	O	UART0 data transmit	Debug interface
11	UART0_RXD	I	UART0 data receive	
12	WPS_KEY		WPS button	
13	GND			
14	SDH0_D3		SDIO0 data 3	SDIO0 interface for 2.5G Wi-Fi; if not used, floating;
15	SDH0_D2		SDIO0 data 2	
16	SDH0_D1		SDIO0 data 1	
17	SDH0_D0		SDIO0 data 0	
18	SDH0_CMD		SDIO0 data command	
19	SDH0_CLK		SDIO0 clock	
20	GND			
21	Reserved			Floating
22	WI-FI_RST#	O	Wi-Fi reset	Wi-Fi reset
23	GPIO_GPD4	O	GPIO	LTE RF Signal Strength 3
24	GPIO_GPD2	O	GPIO	LTE RF Signal Strength 1
25	GPIO_GPD6	O	GPIO	2.4G Wi-Fi_LED & WPS_LED
26	GPIO_GPD3	O	GPIO	LTE RF Signal Strength 2

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27	GPIO_GPD5	O	GPIO	LTE RF Signal Strength 4
28	GPIO_GPD8	O	GPIO	INTERNET_LED
29	GPIO_GPD7	O	GPIO	USIM status indicator
30	Reserved			Floating
31	GND			
32	RGMII_TCLK	O	RGMII TX clock	RGMII TX interface
33	RGMII_TCTL	O	RGMII TX control	
34	RGMII_TXD3	O	RGMII TX data 3	
35	RGMII_TXD2	O	RGMII TX data 2	
36	RGMII_TXD1	O	RGMII TX data 1	
37	RGMII_TXD0	O	RGMII TX data 0	
38	GND			
39	USB2.0_DM		USB2.0-	USB2.0
40	USB2.0_DP		USB2.0+	
41	USB3.0_SSTX-		USB3.0 TX-	USB3.0
42	USB3.0_SSTX+		USB3.0 TX+	
43	USB3.0_SSRX-		USB3.0 RX-	
44	USB3.0_SSRX+		USB3.0 RX+	
45	GND			
46	RGMII_RXD0	I	RGMII RX data 0	RGMII RX interface
47	RGMII_RXD1	I	RGMII RX data 1	
48	RGMII_RXD2	I	RGMII RX data 2	
49	RGMII_RXD3	I	RGMII RX data 3	
50	RGMII_RCTL	I	RGMII RX control	
51	RGMII_RCLK	I	RGMII RX clock	
52	Reserved			Floating
53	GND			
54	RGMII_MDC		RGMII manage interface clk	
55	RGMII_MDIO		RGMII manage interface	
56	GND			
57	TDO		JTAG	If not use, floating
58	TCK			
59	TDI			
60	TMS			
61	SIM_RST_O		USIM reset	Sim card
62	SIM_CLK_O		USIM clock	
63	SIM_VCC		USIM VCC	
64	SIM_DATA_O		USIM DATA	
65	Reserved			Floating
66	GND			
67	3.2V-5V_MAIN		Module Power input	Module VCC input
68	3.2V-5V_MAIN			
69	GND			
70	DCDC_1.8V		VCC 1.8V output	Can be used for IO Voltage; if not use, floating

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71	DCDC_3.2V		VCC 3.2V output	Can be used for IO Voltage; if not use, floating
72	GND			
73	SDH1_CLK_P CM_IN		SDIO1 clk	SDIO1
74	SDH1_D0		SDIO1 data0	
75	SDH1_CMD_P CM_OUT		SDIO1 command	
76	SDH1_D3_SLI C_RESET#		SDIO1 data 3	
77	SDH1_D2_SLI C_INT#		SDIO1 data 2	
78	SDH1_CD#_P CM_SYNC			
79	SDH1_D1		SDIO1 data 1	
80	SDH1_WP_PCM M_MCLK			
81	GND			
82	WAKEUP#_72 43		WI-FI wake up host CPU	
83	GPIO_GPD12		GPIO	
84	RESET#_KEY	I	KEY reset, low active	KEYRESET
85	PHY_RESET#	O	PHY reset , low active	PHY RESET
86	PWR_EN			If not use, floating
87	Reserved			Floating
88	Reserved			Floating
89	RESET#_OUT	O	Reset output	
90	GND			
91	GND			
92	Reserved			Floating
93	Reserved			Floating
94	GND			
95	GND			
96	Reserved		Reserved	
97	GND			
98	GND			
99	GND			
100	Reserved		Reserved	
101	GND			
102	GND			
103	NC			
104	GPIO_GPD15_ FACT#	I	GPIO	Restore to factory configuration
105	GPIO_GPD9			
106	GPIO_GPD13			
107	GPIO_GPC16			
108	NC			
109	GND			
110	GND			
111	Reserved		Reserved	

112	GND			
113	GND			
114	GND			
115	Reserved		Reserved	
116	GND			
117	GND			
118	Reserved			Floating
119	Reserved			Floating
120	GND			

Note 1: In Table 2-1, P: power supply pin; I: digital signal input pin; O: digital signal output pin; I/O: signal input/output.

Note 2: Reserved GPIO can be customized, such like LED indicator.

Note 3: For details about the description, functions and usage of each pin listed in Table 2-1, please refer to the related chapters.

### 3. Antenna Interface

#### 3.1.1 Antenna interface Connector

There are 4 antenna interfaces in VT-MOD-CELL-B48 module respectively used for 4 antennas. U.FL-R-SMT-1 RF connector made by HRS Company is used for 4 antenna interfaces in the module. The size of RF connector is shown in Figure 2-1.

Figure 2-1 RF connector size (1)

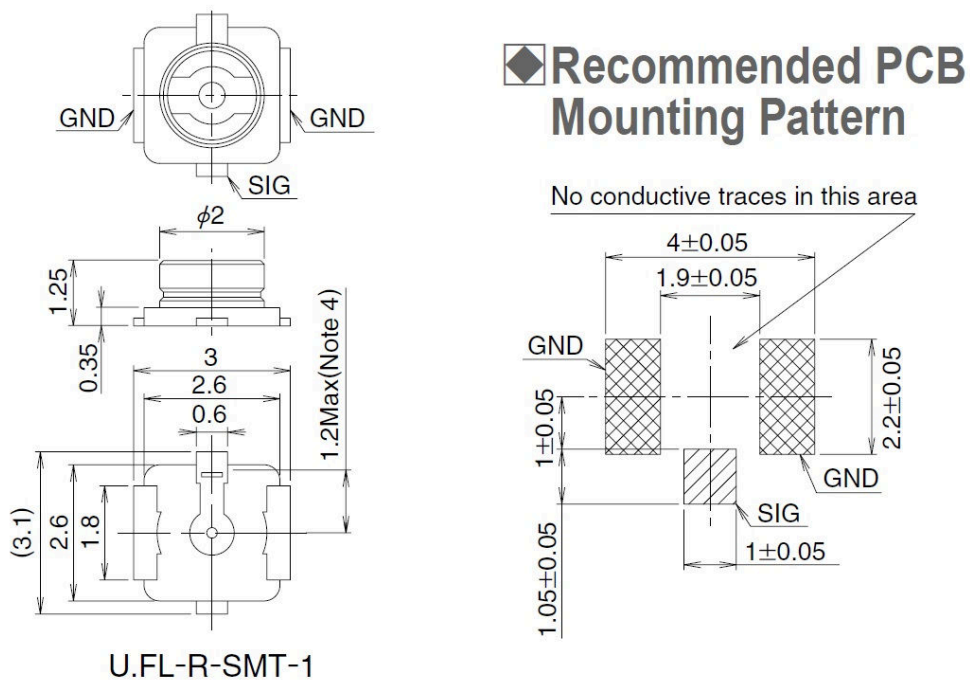
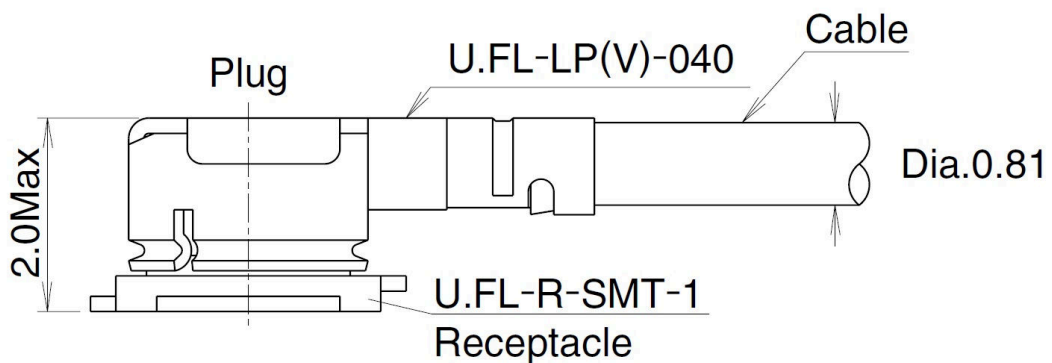


Figure 2-2 RF connector size (2)



#### 3.1.2 Antenna Installation

- 
- (1) The antenna must be installed such that 20cm is maintained between the antenna and users.
- (2) The transmitter module may not be co-located with any 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 antenna and/or higher gain antennas may require additional authorization for operation.

Antenna type	ANT0 Gain(dBi)	ANT1 Gain(dBi)	ANT2 Gain(dBi)	ANT3 Gain(dBi)
PIFA	1	-0.3	0	1.4

### 3.1.3 Typical RF Performance Characteristics

The typical RF performance characteristics are shown in Table 2-2.

Table 2-2 Typical RF performance characteristics

Item	Operating Band	Transmit Power (dBm)	Antenna Interface receiving sensitivity	Frequency
<b>LTE-TDD</b>	Band48	21dBm+1/-2dBm	< -98dBm @20MHz bandwidth	3550MHz-3700MHz

## 4. Interface Electrical Characteristics

### 4.1 Overview

This chapter introduces electrical characteristics of VT-MOD-CELL-B48 LTE module interfaces, including:

- Absolute Maximum Ratings
- Operating and storage temperatures
- module IO port level requirements
- Power supply features
- Reliability
- ESD

This chapter mainly describes external interfaces electrical characteristics of VT-MOD-CELL-B48 LTE module.

### 4.2 Absolute Maximum Ratings

VT-MOD-CELL-B48 maximum ratings of LTE module is shown in Table 3-1.

Table 3-1 VT-MOD-CELL-B48 LTE module absolute maximum rating

Parameter	Description	Minimum Value	Maximum Value	Unit
VCC_3V3	Module Input Voltage	-0.3	4.2	V
VIN	IO Port Input Voltage	-0.3	3.6	V

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



## 4.3 Temperature

Table 3-2 Operating and storage temperature

Parameter	Description	Minimum	Maximum	Unit
To	Operating temperature	-20	65	°C
Ta	Operating temperature (Reduced RF performance)	-30	70	°C
Ts	Module storage temperature	-40	85	°C
	Relative storage humidity	5%	95%	

## 4.4 Digital Signal DC Characteristics

It is recommended that the application conditions for VT-MOD-CELL-B48 are as follows. Wherein, VDD\_IO = 1.8V.

Table 3-3 VT-MOD-CELL-B48 Recommended application conditions

Parameter	Description	Minimum Value	Maximum Value	Unit
VIH	High-level input voltage	1.26	2.1	V
VIL	Low-level input voltage	-0.3	0.54	V
VOH	High-level output voltage		VDD_IO	V
VOL	Low-level output voltage			V

## 4.5 Power Supply and Consumption

### 4.5.1 Input Power Supply

For VT-MOD-CELL-B48, the input voltage range is 3.15~4.2 V, which is supplied from the Module connector.

Table 3-4 Power specifications

Parameter	Description	Minimum value	Maximum value	Unit
VCC_3V3	3.15	3.3	4.2	V

---

## 4.5.2 Power Consumption

The power consumption of VT-MOD-CELL-B48 is shown as Table 3-5.

Table 3-5 DC power consumption (Note 4)

<b>Parameter description</b>	<b>Min.</b>	<b>Type</b>	<b>Max.</b>	<b>Unit</b>
Band48			550	mA

Note 4: Unless specified otherwise, the data in the table are obtained in the following test conditions: VCC\_3V3 = 3.3VDC, T = 25°C.

## 4.5.3 Boot Procedure

VT-MOD-CELL-B48 LTE module is booted by loading power VCC\_3V3.

## 5. Interface Electrical Characteristics

### 5.1 Overview

This chapter mainly describes each interface application of VT-MOD-CELL-B48 LTE module, including:

- 5.1.1 USIM card interface
- 5.1.2 Power interface
- 5.1.3 USB bus
- 5.1.4 LED status indication
- 5.1.5 RESET interface

### 5.2 USIM Card Interface

USIM is a smart card for UMTS/LTE cellular applications. The USIM provides the required subscription information to allow the mobile equipment to attach to a UMTS or LTE network. The USIM also provides the subscriber's verification procedures as well as authentication methods for network authentication during the attach procedures.

A class B (3.0 V)/class C (1.8 V) USIM card can be connected to VT-MOD-CELL-B48 module. The USIM card interface signals are shown in Table 4-1.

Table 4-1 USIM pins

PIN	Name	Description	Direction to Module
8	VSIM	Power source for the external	Output
10	UIM_DATA	External USIM data signal	Input/output
12	UIM_CLK	External USIM clock signal	Output
14	UIM_RESET	External USIM reset signal	Output

Note: It is recommended that the USIM card is inserted only after the power of the module is disconnected, otherwise the USIM card can be destroyed.

### 5.2.1 USIM Interface Schematic Reference

There is no SIM card interface circuit in VT-MOD-CELL-B48, and users need to add the USIM interface circuit. Figure 4-1 shows the definition of interface signals and the typical USIM interface schematic.

Figure 4-1 USIM interface circuit schematic on user side

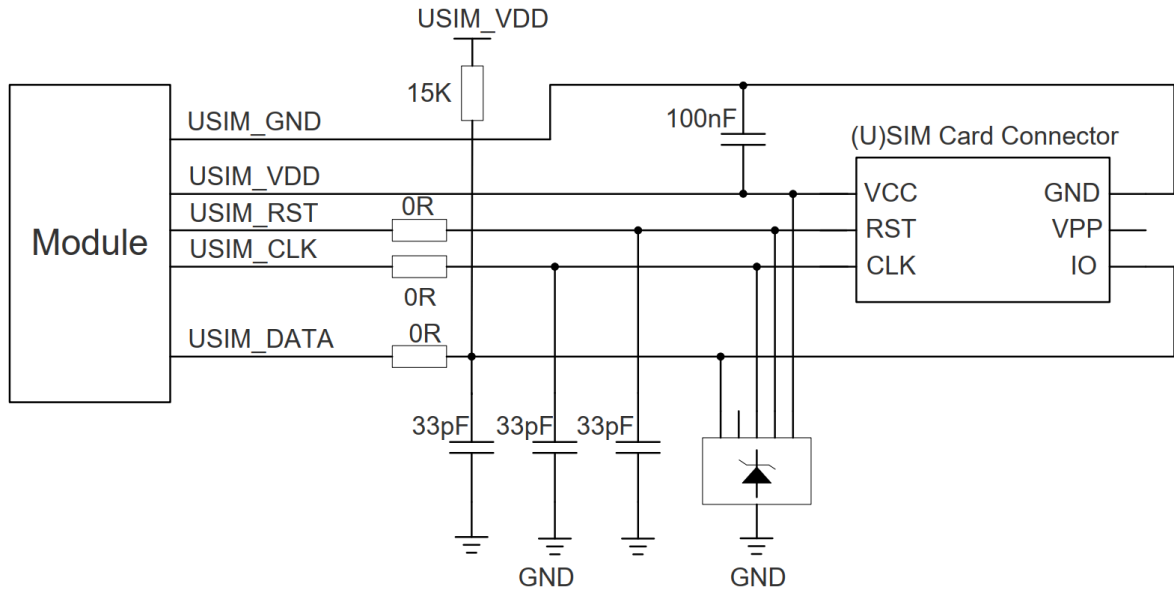
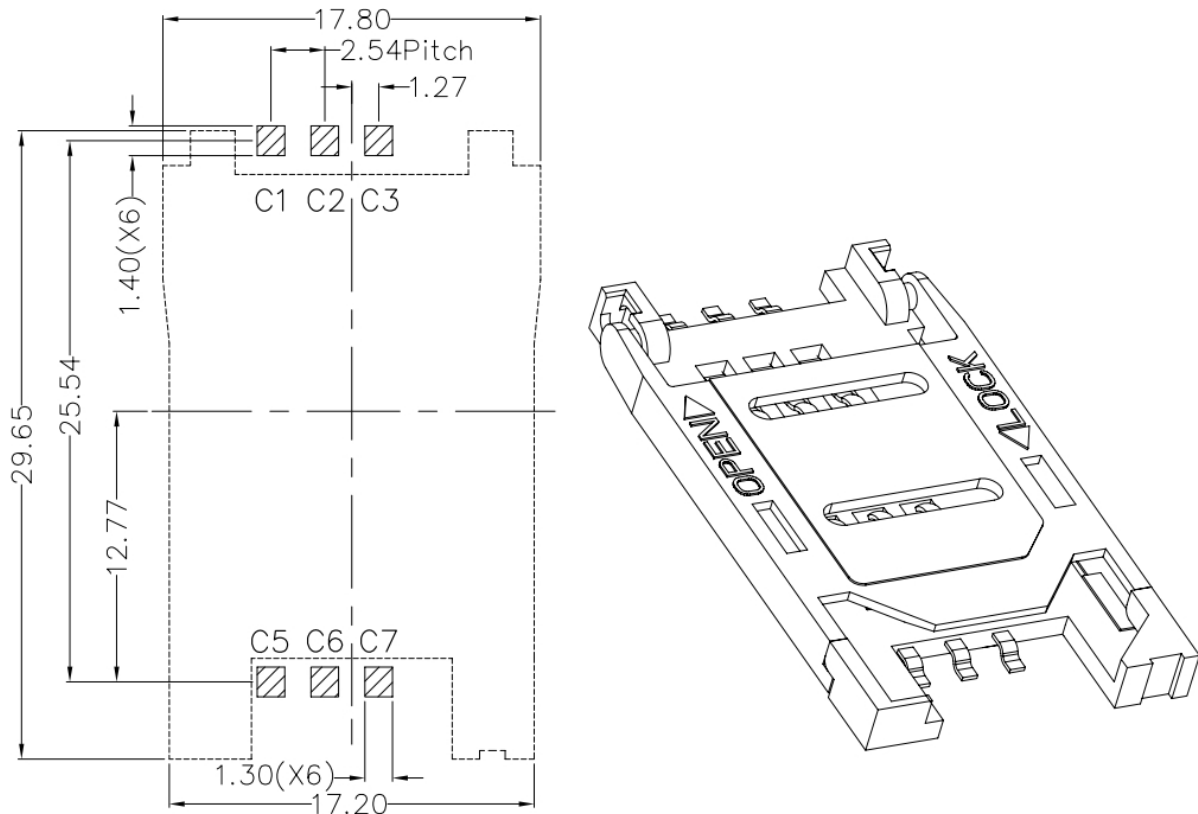


Figure 4-2 Pin definition of SIM Socket





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## 5.2.2 Design Guide

There is an EMI filtering and ESD protection circuit between SIM card interface and module interface on the user's board.

The SIM support clock frequencies of 3.25MHz. The SIM interface signals consist of four signals that are USIM\_PWR, USIM\_RST, USIM\_CLK, and USIM\_DATA (UIM\_Vpp isn't connected also not used in many applications). Due to the relatively low clock frequencies involved, the concern is not the degradation of the SIM signals themselves. The main concern is routing of the SIM interface signals through areas considered to be of high risk for RF noise coupling (crosstalk and RF contamination) which can desensitize the radio circuitry.

- \_ The general guidelines that should be followed are listed as follows:
- \_ It is recommended that these signals should be routed over a contiguous ground plane.
- \_ SIM interface signals should not be routed near high transient signals (power supply chokes and DC/DC switching FETs).
- \_ Avoid routing of these signals near output connectors.
- \_ Keep SIM interface signals isolated from other signals. 2x width spacing (1.5xmin) between SIM interface signals and all other signal routing is recommended.

Since the SIM is a CMOS device, ESD protection devices should be placed near to the SIM connector to provide protection before connecting to the module. In addition, all the SIM interface signals should be bypassed with a 10 pF capacitor.

## 5.3 Power Interface

Externally standard voltage from 3.15 V to 4.2 V (with the typical value of 3.3 V) is used as VT-MOD-CELL-B48 module power supply. When the network signal is very weak, the antenna emission with maximum power will happen, with 1A of transient maximum current. So, it is recommended to use LDO with more than 1A or switching power supply.

Besides considering the voltage drop when high-power launching, a large capacitance should be added to the module power supply port.

Note: Because EMC interference for switching power supply is rather big, the circuit line should not be close to the antenna part.

## 5.4 USB Signals

VT-MOD-CELL-B48 is compliant with USB 2.0 high speed specification.

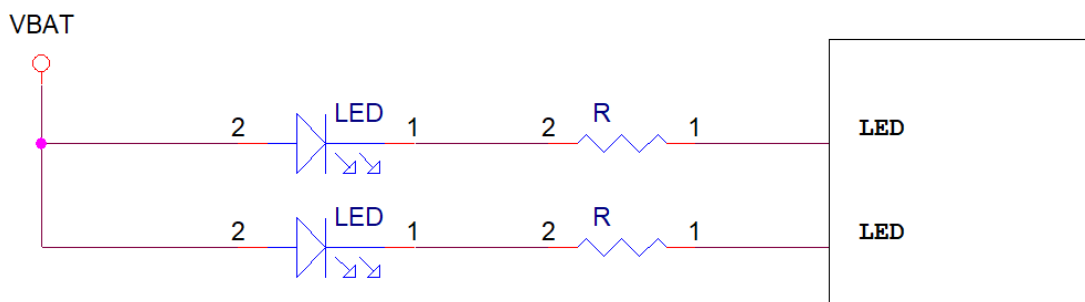
VT-MOD-CELL-B48 uses USB drive. On the PC one ports can be mapped out, respectively:

- a. 1 ACM port, carrying AT commands, is mainly used for data traffic;
- b. 1 CDC-ECM standard card, mainly for service information, the RNDIS interface can be customized.

## 5.5 Status Indication Signals

There are four GPIO pins of VT-MOD-CELL-B48 module. The mode LED functions as the network mode indicator and the status LED function as the signal strength indicator. The LEDs are controlled by a sink current source. The high voltage is the voltage of VCC3V3 (with the typical value of 3.3V). According to LED feature, you can adjust the LED brightness by adjusting the impedance of resistor R.

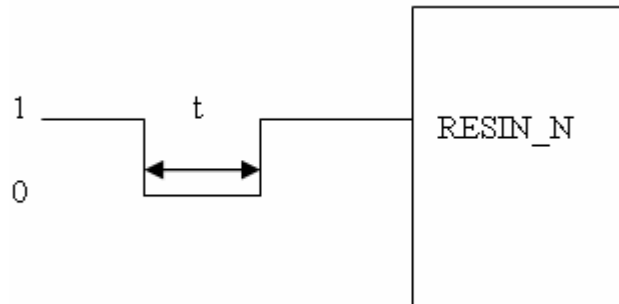
Figure 4-3 Recommended circuits of the LED pins



## 5.6 Reset Interface

A PERST\_N pin provided by VT-MOD-CELL-B48 module can RESET module through an external RESET circuit. Pull low RESET button (RESIN\_N pin) to 100 ms, the module will be reset.

Figure 4-4 RESET interface



Note:  $50 \text{ ms} < t < 200 \text{ ms}$ . In addition, because the pin is rather sensitive to interference, it is important to pay attention to the module interface board line otherwise it may bring such as interference caused by module reset.

## 5.7 Recovery Manufacture Configuration

A FACT\_RST# pin provided by VT-MOD-CELL-B48 can recover manufacture configuration through pull low button to 10s.



## Mechanical Specifications

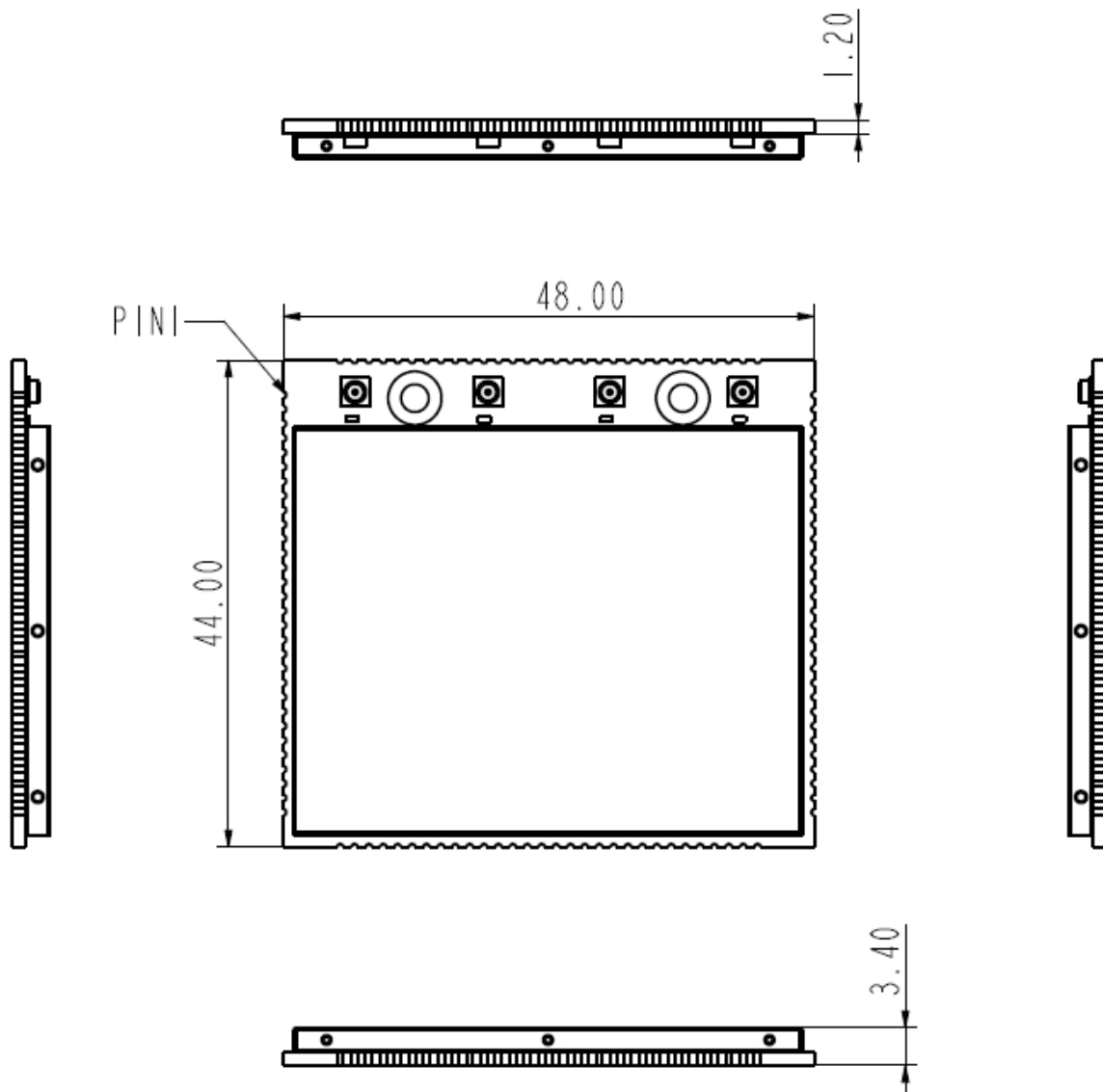
This chapter mainly describes mechanical specifications of VT-MOD-CELL-B48 module, including:

### VT-MOD-CELL-B48 Overall Dimensions

Size:  $48 \pm 0.20 \times 44 \pm 0.20 \times 3.4 \pm 0.10$  mm

Weight:  $15 \pm 0.5$  g

Figure 5-1 VT-MOD-CELL-B48 overall dimensions



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## 6. Tips

### Waste Disposal

It is recommended to disassemble the device before abandoning it in conformity with local regulations. Please ensure that the abandoned batteries are disposed according to local regulations on waste disposal. Do not throw batteries into fire (explosive) or put in common waste canister. Products or product packages with the sign of “explosive” should not be disposed like household waste but delivered to specialized electrical & electronic waste recycling/disposal center. Proper disposal of this sort of waste helps avoiding harm and adverse effect upon surroundings and people’s health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

Comply with the following safety tips:

### Do not use in combustible and explosive environment

Keep away from combustible and explosive environment for fear of danger.

### Keep away from all energized circuits.

Operators should not remove enclosure from the device. Only the group or person with factory certification is permitted to open the enclosure to adjust and replace the structure and components of the device. Do not change components unless the power cord is removed. In some cases, the device may still have residual voltage even if the power cord is removed. Therefore, it is a must to remove and fully discharge the device before contact so as to avoid injury.

### Unauthorized changes to this product or its components are prohibited.

In the aim of avoiding accidents as far as possible, it is not allowed to replace the system or change components unless with permission and certification. Please contact the technical department of Vantron or local branches for help.

### Pay attention to caution signs.

Caution signs in this manual remind of possible danger. Please comply with relevant safety tips below each sign. Meanwhile, you should strictly conform to all safety tips

for operation environment.

 Notice

Considering that reasonable efforts have been made to assure accuracy of this manual, Vantron assumes no responsibility of possible missing contents and information, errors in contents, citations, examples, and source programs.

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## 7 FCC Warning Statement

This module is limited to OEM installation only.

This module is limited to installation in mobile or fixed applications, according to Part 2.1091(b).

The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

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.

### 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: “2AAGE-B48”

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

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 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 authorization.

### Manual Information to the End User

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The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

### 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.

### Radiation Exposure Statement

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

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

## Appendix A: How to Contact Us

If you have any problem or want to know more about our products, visit [www.vantrontech.com](http://www.vantrontech.com) or contact us.

### **US Office: Vantron Technology, Inc.**

Address: 440 Boulder Court, Suite 300,

Pleasanton, CA 94566, USA

Tel: 925-621-8758

Email: [sales@vantrontech.com](mailto:sales@vantrontech.com)

### **China Office: Chengdu Vantron Technology, Ltd**

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Wu Hou District, Chengdu 610045, China

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