

Orbic 5G Module

UserManual

Revision0.2

FCC ID:2ABGH-R100ML5

Jane23,2021

Doc Title	Orbic 5G Module Datasheet	Number	20210623
		Version	0.2

HISTORY

Version	Date	Description
0.1	06/18/2021	Initial version release
0.2	06/23/2021	Modify working temperature and storage temperature

Doc Title	Orbic 5G Module Datasheet	Number	20210623
		Version	0.2

INDEX

Content

1. Overview	4
1.1. Parameter	4
2. HardwareDescription	5
2.1. Description of HardwareInterface	5
<i>Pin Description:</i>	8
1. SoftwareIntroduction	26
2. Module Environmental and Package.....	28
2.1. EnvironmentalRatings	28
2.2. Electrostatic DischargeSpecifications	28
3. OrderingInformation	28
4. FCCInformation	29

Doc Title	Orbic 5G Module Datasheet	Number	2021060901
		Version	0.1

1. Overview

Orbic 5G Module is a 5G universal module, can be used for MIFI, notebook and other products. It supports both mmW bands and Sub-6bands. It integrates the low power Qualcomm SDX55 application processor that is designed for the 5G Module.

The SDX55 device is the second 5G modem from Qualcomm Technologies, Inc. (QTI). It implements the 5G NR standard for millimeter wave (mmW) bands and sub-6 GHz bands. SDX55 uses the advanced 7 nm process. SDX55 is designed as a stand-alone 5G modem for MBB.

1.1. Parameter

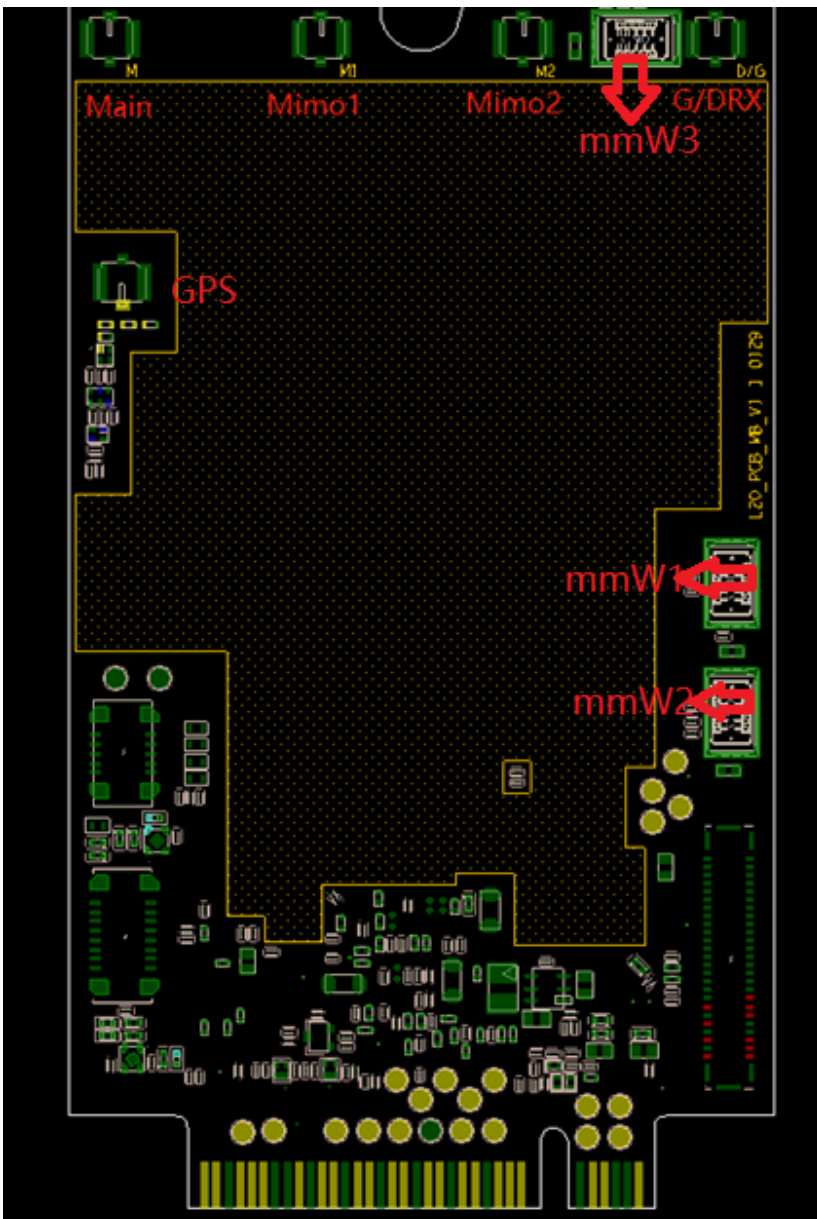
Type	Items	Performance
Hardware	WorkingVoltage	3.6-4.4V
	WorkingCurrent	200~2000mA
	StandbyCurrent	10mA
	OperatingAmbient Temperature	0°C~55°C
	StorageTemperature	-5°C~60°C

Doc Title	Orbic 5G Module Datasheet	Number	2021060901
		Version	0.1

2. HardwareDescription

2.1. Description of HardwareInterface

Orbic 5G Module provides 8 RF connectors for external antenna connection. As shown in Figure 2-1, "M" is the RF main antenna, which is used for receiving and receiving RF signals. "D/G" is the Diversity antenna for receiving the Diversity radio signals, and M1 and M2 are the MIMO receiving antennas. "GPS" is the GPS receiving antenna. "mmW1"-"mmW3" are the mmW antenna connections.



P. 2-1

Doc Title	Orbic 5G Module Datasheet	Number	2021060901
		Version	0.1

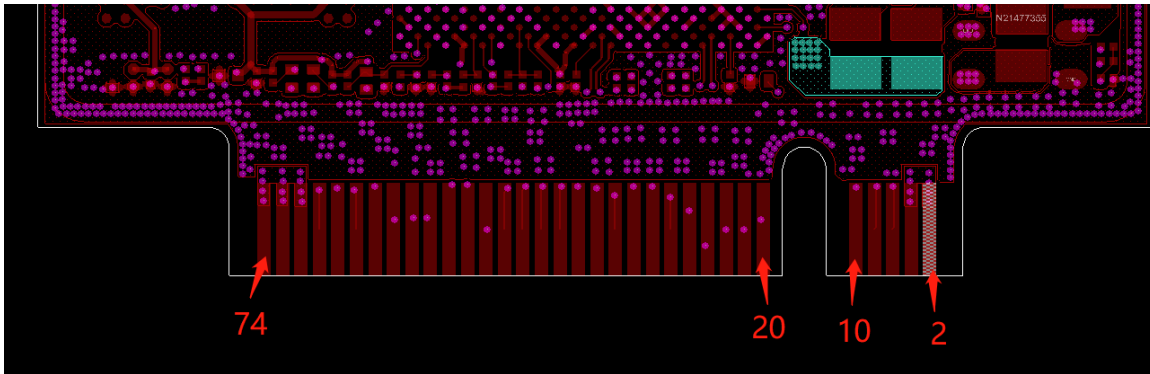
BAND	MAIN	G/DRX	MIMO1	MIMO2
LTE TRX: B2 B4 B5 B12 B13 B66 B41 B71 WCDMA TRX:B2 B4 B5 5G NR TRX: N2 N5 N66 N71 N77 N78 5G NR PRX MIMO:N41	✓			
LTE DRX: B2 B4 B5 B12 B13 B66 B41 B71 WCDMA DRX:B2 B4 B5 GNSS L1 5G NR DRX: N2 N5 N66 N71 N77 N78 5G NR DRX MIMO:N41		✓		
LTE PRX MIMO:B2 B4 B66 B41 5G NR TRX:N41 5G NR PRX MIMO: N2 N66 N77 N78			✓	
LTE DRX MIMO:B2 B4 B66 B41 5G NR DRX:N41 5G NR DRX MIMO: N2 N66 N77 N78				✓

P2--2 RFAntenna distribution table

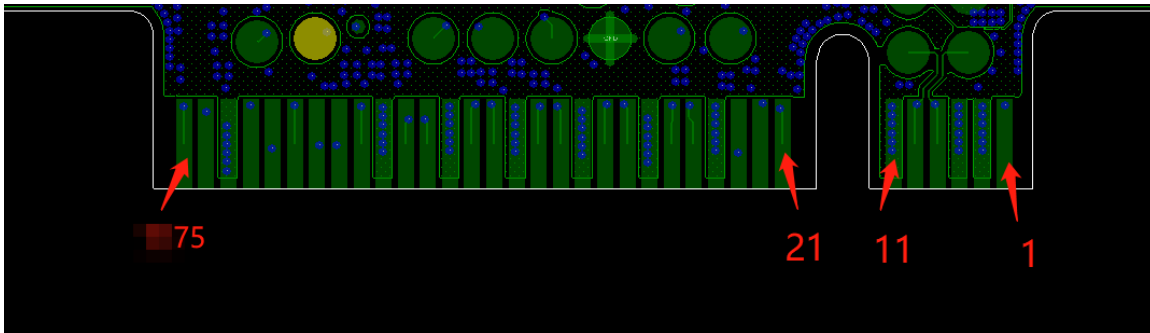
Doc Title	Orbic 5G Module Datasheet	Number	2021060901
		Version	0.1

2.2 Pin Description.

The following figures is the PIN identification of the module:



P. 2-2-1



P. 2-2-2

Doc Title	Orbic 5G Module Datasheet	Number	2021060901
		Version	0.1

Pin Description:

PIN#	PIN name	I/O	ResetValue	PIN description	characterist
1	CONFIG_3	O	NC	NC, Module internal configuration 。	1.8V
2	VCC	PI	-	Power input	Power
3	GND	-	-	GND	Power
4	VCC	PI	-	Power input	Power
5	GND	-	-	GND	Power
6	FULL_CARD_POWER_OFF#	I	PU	Module switch machine control, low level off, or high level boot.。	CMOS 1.8V
7	USB2.0+	I/O	-	USB2.0data +	0.3-3V
8	W_DISABLE1#	I	PU	NA	CMOS 1.8V
9	USB2.0-	I/O	-	USB2.0data -	0.3-3V
10	LED1#	O	T	NA。	CMOS 1.8V
11	GND	-	-	GND	Power
12	Notch	-	-	Notch	-
13	Notch	-	-	Notch	-
14	Notch	-	-	Notch	-
15	Notch	-	-	Notch	-
16	Notch	-	-	Notch	-
17	Notch	-	-	Notch	-
18	Notch	-	-	Notch	-
19	Notch	-	-	Notch	-
20	I2S_CLK	O	PD	I2S-reserve	CMOS1.8V
21	CONFIG_0	-	NC	NC	-
22	I2S_DATA0	I	PD	I2S-reserve	CMOS1.8V
23	M2_WOWWAN_N	O	PD	NA	CMOS1.8V
24	I2S_DATA1	O	PD	I2Sreserve	CMOS1.8V

PIN#	PIN name	I/O	ResetValue	PIN description	characterist
25	M2_DPR	I	PU	reserve	CMOS1.8V
26	M2_W_DISABLE 2#	I	PU	reserve	CMOS 1.8V
27	GND	-	-	GND	Power
28	I2S_WS	O	PD	I2Sreserve	CMOS1.8V
29	USB_SS-TX-	O	-	USB3.0 reserve	-
30	UIM1_RESET	O	L	SIM1	CMOS 1.8V
31	USB_SS-TX+	O	-	USB3.0 reserve	-
32	UIM1_CLK	O	L	SIM1	CMOS1.8V
33	GND	-	-	GND	Power
34	UIM1_DATA	I/O	L	SIM1	CMOS1.8V
35	USB_SS-RX-	I	-	USB3.0 reserve	-
36	UIM1_PWR	PO	-	SIM1	CMOS1.8V
37	USB_SS-RX+	I	-	USB3.0 reserve	-
38	NC	-	-	-	-
39	GND	-	-	GND	Power
40	SIM2_DETECT	I	PU	SIM2	CMOS1.8V
41	PCIE_TX0_M	O	-	PCIE	-
42	UIM2_DATA	I/O	L	SIM2	CMOS1.8V
43	PCIE_TX0_P	O	-	PCIE	-
44	UIM2_CLK	O	L	SIM2	CMOS1.8V
45	GND	-	-	GND	Power
46	UIM2_RESET	O	L	SIM2	CMOS1.8V
47	PCIE_RX0_M	I	-	PCIE	-

PIN#	PIN name	I/O	ResetValue	PIN description	characteristi
48	UIM2_PWR	PO	-	SIM2	CMOS1.8V
49	PCIE_RX0_P	I	-	PCle	-
50	PCIE_RST_N	I	PD	PCle	CMOS 1.8V
51	GND	-	-	GND	Power
52	PCIE_CLKREQ_N	I/O	T	PCle	CMOS 1.8V
53	PCIE_REFCLK_M	I	-	PCle	-
54	PXIE_WAKE_N	O	T	PCle	CMOS 1.8V
55	PCIE_REFCLK_P	I	-	PCle	-
56	ANTCTL5	O	PD	Antenna switch	CMOS1.8V
57	GND	-	-	GND	Power
58	ANTCTL6	I/O	PD	Antenna switch	CMOS1.8V
59	LAA_TX_EN	O	PD	NA	CMOS1.8V
60	WLAN_TX_EN	I	-	5GHz WLANswitch	CMOS1.8V
61	ANTCTL1	O	PD	Antenna switch	CMOS1.8V
62	COEX_UART_RX	I	PD	WiFi/BTUART	CMOS1.8V
63	ANTCTL2	O	PD	Antenna switch	CMOS1.8V
64	COEX_UART_TX	O	PD	WiFi/BTUART	CMOS1.8V
65	ANTCTL3	O	PD	Antenna switch	CMOS1.8V

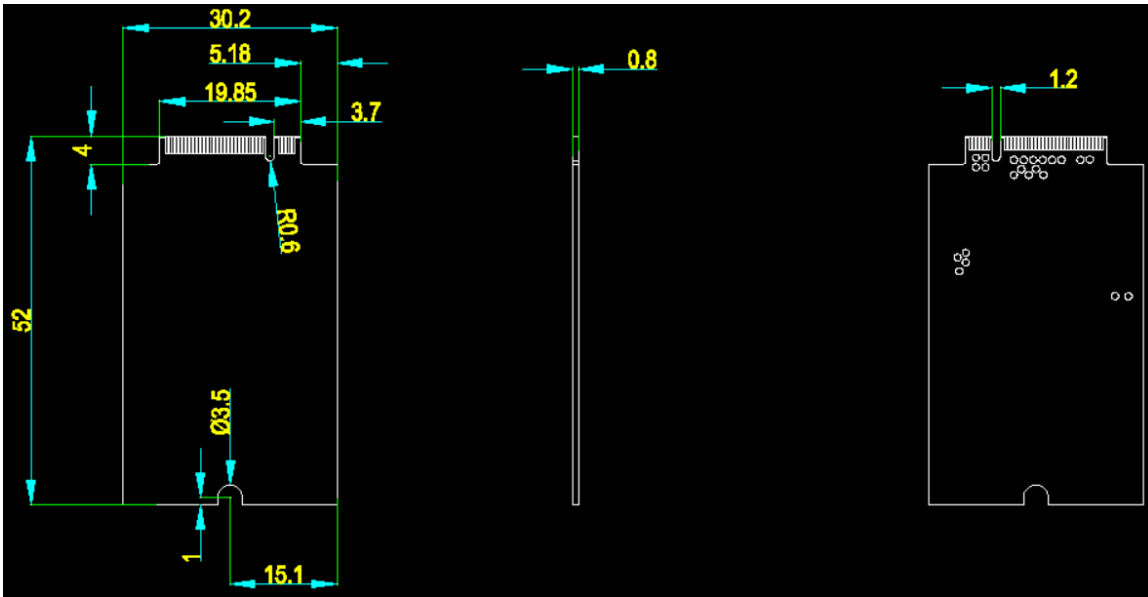
PIN#	PIN name	I/O	ResetValue	PIN description	characteristi
66	SIM_DETECT	I	PU	SIM1	CMOS1.8V
67	M2_RESET_N	I	PU	Module reset	CMOS1.8V
68	FORCE_USB_BO OT			Download mode switch	CMOS1.8V
69	CONFIG_1	O	GND	NC,	-
70	VCC	PI	-	VCC	Power
71	GND	-	-	GND	Power
72	VCC	PI	-	VCC	Power
73	ANTCTL4	-	-	Antenna switch	
74	VCC	PI	-	VCC	Power
75	CONFIG_2	O	NC	NC	

ResetValue:

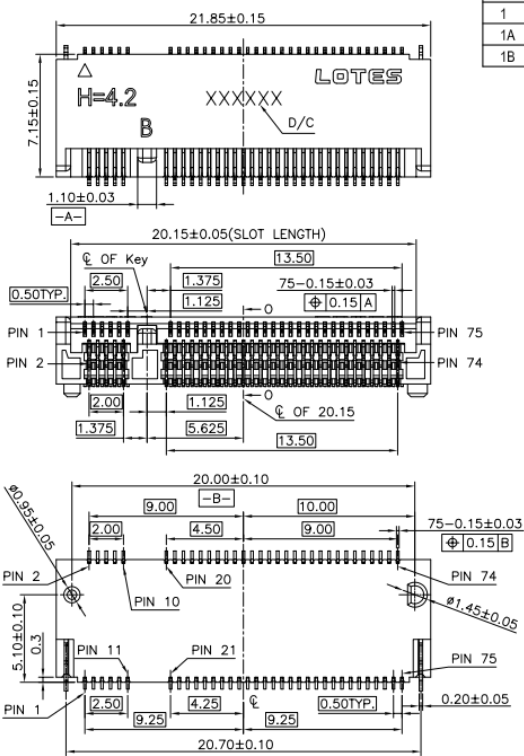
- H: High level
- L: Low level
- PD: pull down
- PU: pull up
- T: Hi-Z.
- OD: Open drain
- PP: Push-Pull
- PI: Power in
- PO: Power out

2.3 Mechanical Dimension

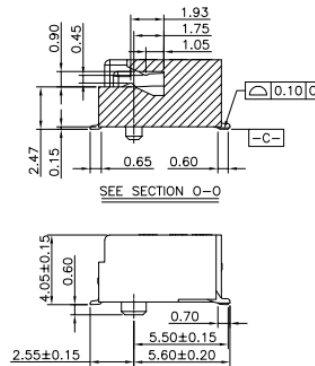
Module has the dimension of 52mm x 30.2mm. The detailed layout will be given shortly below. Unit: mm



PLUG PCB dimensions:



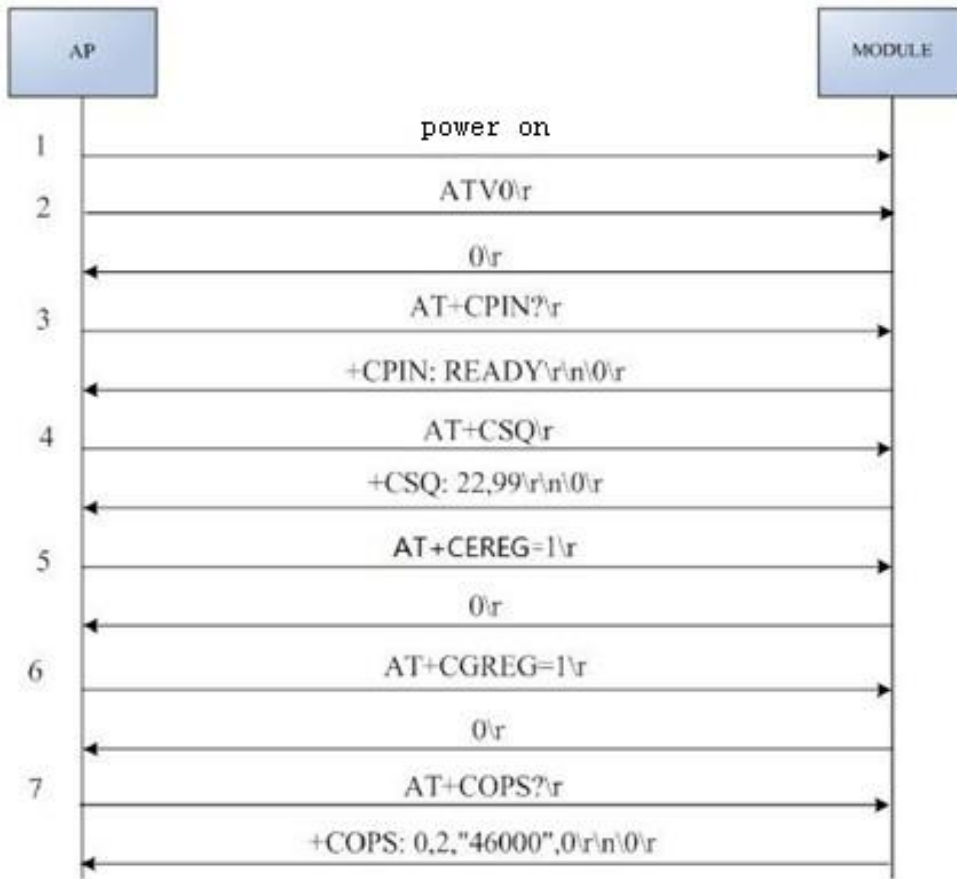
REV.	ECR/N NO./DESCRIPTION	DATE	DRAWN	CHECKED	APPROVE
1	SN14155	11/15'14	Lxh	Vito	Barney
1A	SN15***	08/28'15	Jinjia.Tu	Vito	Barney
1B	SN16***	03/22'16	Jinjia.Tu	Vito	Barney



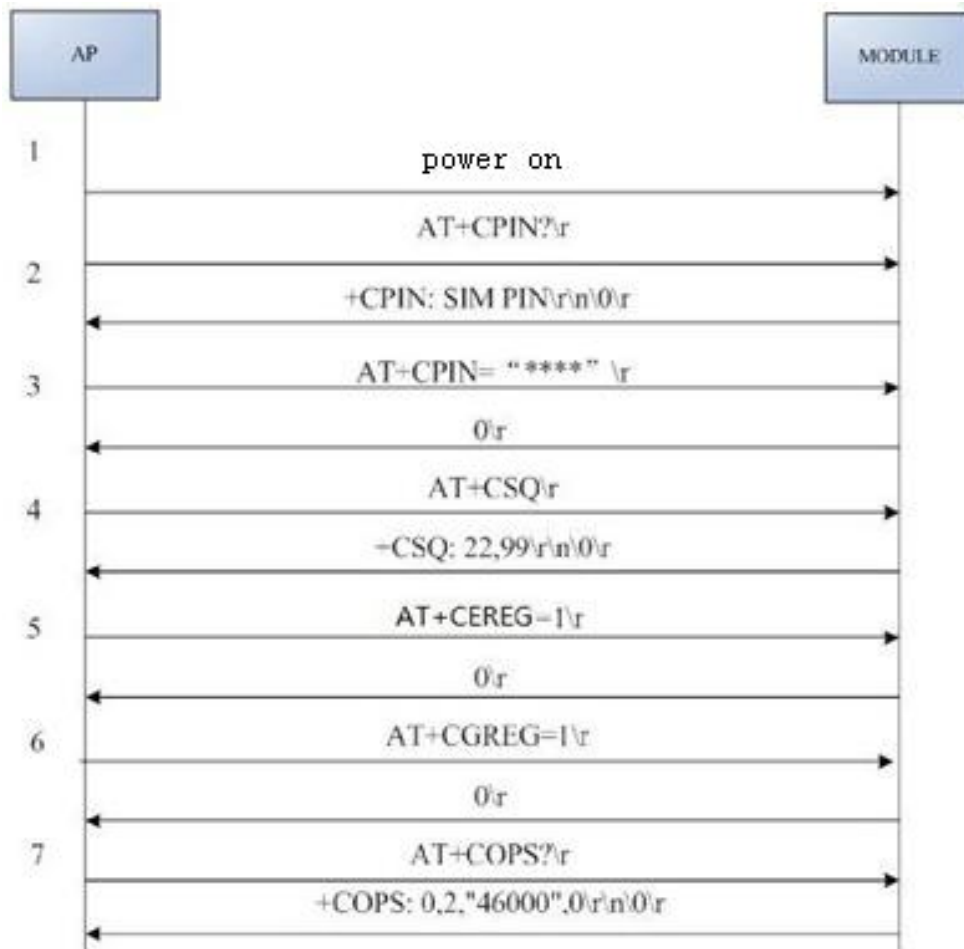
GENERAL TOLERANCES UNLESS SPECIFIED		PART NO.	GTU		
X ± 0.35	X" ± 3"	SEE TABLE			
XX ± 0.25	X" ± 2"	APPROVED BY	TITLE		
XXX ± 0.15	XX" ± 1"	Barney	0.5 PITCH M.2 H4.2 (KEY B)		
CUSTOMER DRAWING		CHECKED BY	DWG NO.		
		Vito	AP-APCI0105		
SIZE	UNITS	DRAWN BY	SHEET	SCALE	REV
A4	MM [INCH]	Lxh	1 / 5	4:1	1B

1. Software Introduction

1. Normal power on



2. PIN code needed power on



2. Module Environmental and Package

2.1. Environmental Ratings

The environmental ratings are shown as following table.

Characteristic	Value	Units	Conditions/Comments
Storage Temperature	-5~60	°C	
Relative humidity	Less than 60	%	Storage
	Less than 80	%	Operation

2.2. Electrostatic Discharge Specifications

Extreme caution must be exercised to prevent electrostatic discharge (ESD) damage. Proper use of wrist and heel grounding strap to discharge static electricity is required when handling these devices. Always store unused material in anti-static packaging.

ESD Specifications

Type	Symbol	Condition	ESD Rating	Unit
ESD Handling	ESD_HAND_HBM	Human Body Model Contact Discharge per JEDEC EID/JESD22-A114	1000	V
Machine Model (MM)	ESD_HAND_MM	Machine Model Contact	30	V
CDM	ESD_HAND_CDM	Charged Device Model Contact Discharge per JEDEC EIA/JESD22-C101	300	V

3. Ordering Information

Table 5-1 Part Ordering Information

PartNumber	Package	Description	Remark
A98M	67-PINNGFFGoldenFingers	RAM:128MB Flash:128MB	
A98M-12	67-PINNGFFGoldenFingers	RAM:128MB Flash:256MB	
A98M-22	67-PINNGFFGoldenFingers	RAM:256MB Flash:256MB	
A98MG	67-PINNGFFGoldenFingers	RAM:512MB Flash:512MB	

4. FCC Information

RF Exposure Information: To maintain compliance with FCC RF exposure requirements, use the product that maintain a 20cm separation distance between the user's body and the host.

FCC statements:

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.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications or changes to this equipment. Such modifications or changes could void the user's authority to operate the equipment.

NOTE: 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 or more 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.

This device is intended only for OEM integrators under the following conditions:

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. As long as the two conditions above are met, additional transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required for the installed module.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Federal Communications Commission of the U.S. Government (FCC) and the Canadian Government authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator shall be responsible for re-evaluating the end-product (including the transmitter) and obtaining a separate FCC authorization in the U.S. and Canada.

OEM Integrators - End Product Labeling Considerations:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains, FCC ID: 2ABGH-R100ML5". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

OEM Integrators - End Product Manual Provided to the End User:

The OEM integrator shall not provide information to the end user regarding how to install or remove this RF module in end product user manual. The end user manual must include all required regulatory information and warnings as outlined in this document.