

APPROVAL SHEET

CQM730 Micro-Power Wi-Fi Module

Halogens Free Product

P/N: RFIQM0730010IB001

Customer : _____
Customer 's Part No. : _____
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Issue Date : _____

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品名：RFIQM0730010IB001

History List

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1 Product Overview

Powered by Qualcomm game changing micro walt ultra-low power Wi-Fi technology, Qualcomm QCC730 IoT connectivity LGA module portfolio ("CQM730-1") is purposely-designed to pack processing capabilities, embedded memory, Wi-Fi connectivity, on-module flash, and most of all ultra-low power technology into a single 32-pin LGA form factor with flexible choices of Pin, PCB and U.FL antenna. All variant antenna modules are pin compatible, allowing easy swap among modules. Its 1.27mm (0.05") pitch design enables seamless LGA pad into standard 1.27mm (0.05") header conversion to allow field replaceable header module portfolio if needed. Its compact size and on-chip SRAM and RRAM (NVM) contribute to reduced costs and enhanced performance, making it an attractive choice for space- constrained IoT devices requiring battery power.

Unlike many other Wi-Fi modules on the market, CQM730-1 has integrated 60MHz Arm Cortex-M4 processor with on-chip 640KB SRAM and 1.5MB RRAM to be capable of handling all protocol stacks all the way to cloud level. It has built-in Resistive RAM (RRAM), the industry latest Non-volatile Memory (NVM) technology, eliminating need for externally attached NOR flash for more streamlined and cost- effective system. Furthermore, CQM730-1 portfolio can be powered directly by a battery with only 1.8V input, making it suitable for battery-operated devices.

CQM730-1 has a variant supporting external power amplifier both on 2.4GHz and 5GHz to extend Wi-Fi range for an improved coverage.

CQM730-1 can operate in hostless mode, capable of running both the protocol stack and applications without requiring an external MCU. It can also be used as a Wi-Fi transceiver in hosted mode, offloading all the protocol stack to enable the external MCU to concentrate on IoT applications as well as managing system power consumption.

CQM730-1 has undergone rigorous regulatory compliance testing and is certified with FCC, CE, IC, UKCA, RCM, MIC, KC, SRRC and environmentally compliant with RoHS/WEEE directives.

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CQM730-1 includes the following configurations:

Module	Form Factor	Antenna
CQM730i-1B	12.28 x 19.82 x 2.2 mm, 1.27 mm pitch, 32-pin, LGA, iPA	PCB Antenna
CQM730i-1U	12.28 x 14.82 x 2.2 mm, 1.27 mm pitch, 32-pin, LGA, iPA	U.FL Antenna
CQM730x-1B	12.28 x 22.00 x 2.2 mm, 1.27 mm pitch, 32-pin, LGA, xPA	PCB Antenna
CQM730x-1U	12.28 x 18.00 x 2.2 mm, 1.27 mm pitch, 32-pin, LGA, xPA	U.FL Antenna

CQM730-1 is graphically illustrated below:

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1.1 Internal Power Amplifier Module (CQM730i-1)

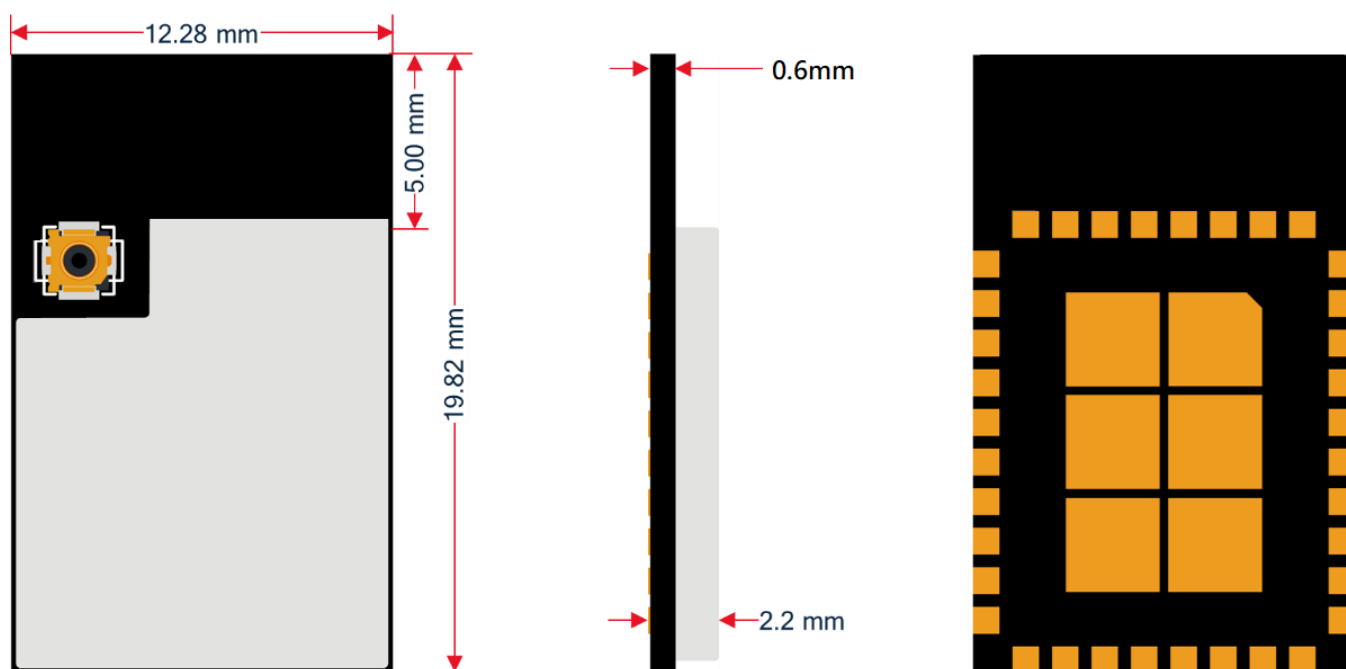


Figure 1: CQM730i-1B Module View

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1.2 CQM730-1 Development Kit

The CQM730-1 specific development kit to cover both internal PA module (CQM730i-1) and externa PA module (CQM45x-1) is provided to facilitate application software development as shown below:

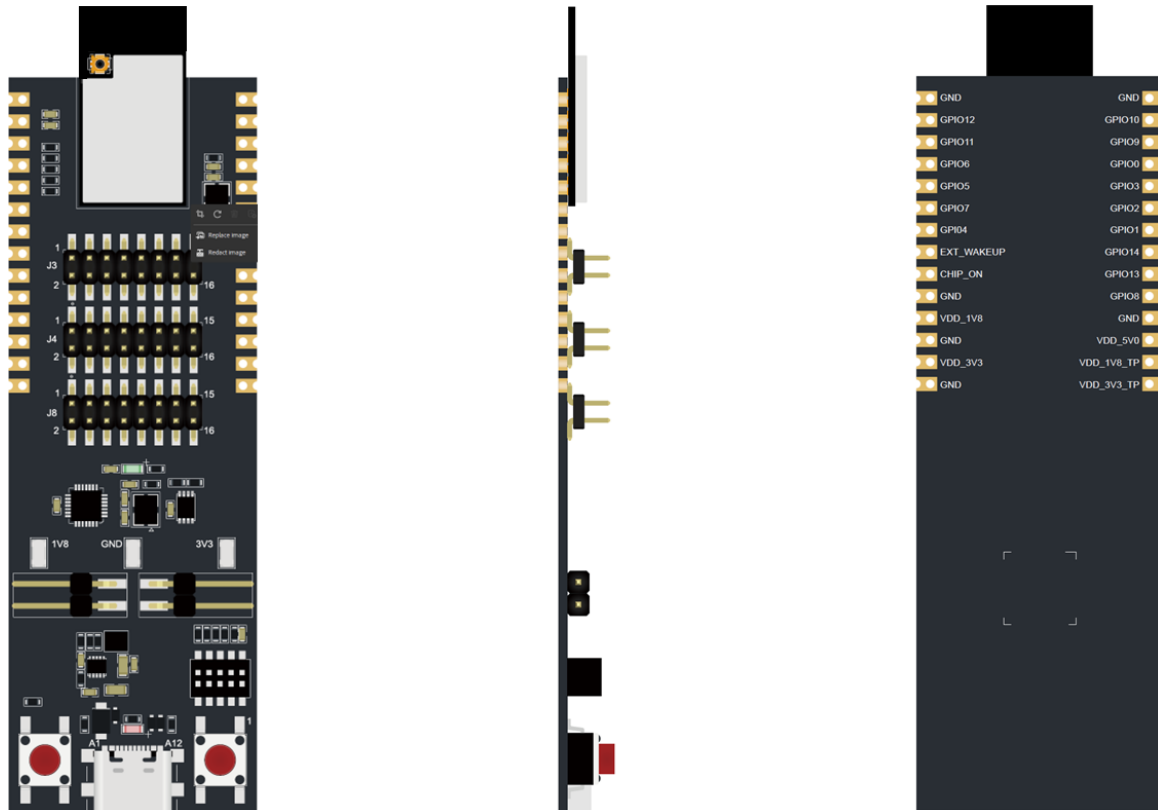


Figure 2: CQM730-1 Module Development Kit

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2 Hardware Specification

This section provides detailed hardware design and specification of CQM730-1. CQM730-1 hardware design has been optimized for small footprint and reduced RBOM cost.

2.1 Block Diagram

CQM730-1 integrates 2/4/8MB 2x3 8-USON NOR flash as stuffing options. The design also supports PCB antenna (CQM730-1B) or simply provides antenna pin (CQM730-1U) to allow customized antenna implementation on motherboard.

CQM730-1 with internal PA (CQM730i-1) block diagram is shown below:

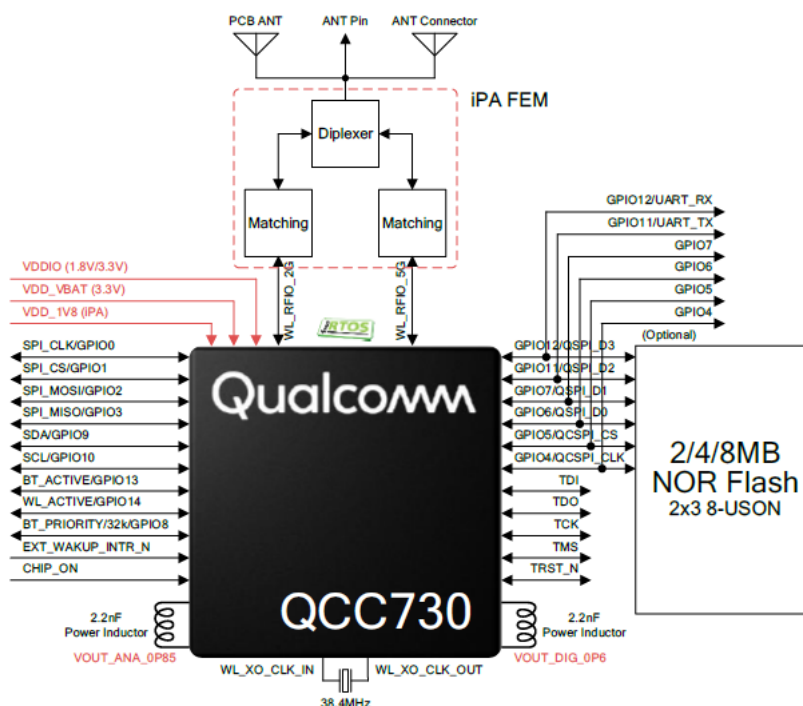


Figure 3: CQM730i-1 Module Block Diagram

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2.2 Pinout Description

In order to maintain pin compatible to allow easy drop replacement, All CQM730-1 shares the same pin map as illustrated below. CQM730x-1 will have Pin 4 as VDD_FEM to allow power supply for external power amplifier as well as Pin 2 for xPA2G (2.4GHz external PA) and Pin 3 for xPA5G (5GHz external PA) control.

2.2.1 Pin Map

CQM703-1 internal PA and external PA module pin map is listed below. Since pin antenna and U.FL antenna share the same pin definition, they are grouped together.

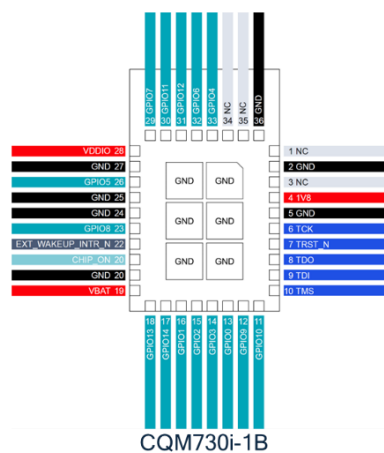


Figure 4: CQM730i-1 Module Pin Map

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2.2.2 Pin Definition

Pin definition is listed in the table below:

Pin	Pin Name	Type	Power Domain	Description
19	VBAT	PWR	-	Power input (1.8~3.6V)
28	VDDIO	PWR	-	I/O voltage input 1.8V or 3.3V
4	1V8	PWR	-	Internal PA power input
3	VDD_FEM	PWR	-	External PA power input
1	ANT or N/C	AI/AO	-	Pin antenna (1U) or N/C (1B/1U)
35	xPA2G	DI	VDDIO	2.4GHz xPA control
34	xPA5G	DI	VDDIO	5GHz xPA control
2,20,24,25,27,36	GND	GND	GND	Ground
22	EXT_WAKEUP	DI	-	External interrupt input
21	CHIP_ON	DI	-	Chip power on
7	TRST_N	DI	-	JTAG
8	TDO	DO	-	JTAG
9	TDI	DI	-	JTAG
10	TMS	DI	-	JTAG
6	TCK	DI	-	JTAG
13	GPIO0	DI/DO	VDDIO	Generic PIO
16	GPIO1	DI/DO	VDDIO	Generic PIO
15	GPIO2	DI/DO	VDDIO	Generic PIO
14	GPIO3	DI/DO	VDDIO	Generic PIO
33	GPIO4	DI/DO	VDDIO	Generic PIO
26	GPIO5	DI/DO	VDDIO	Generic PIO
32	GPIO6	DI/DO	VDDIO	Generic PIO
29	GPIO7	DI/DO	VDDIO	Generic PIO
23	GPIO8	DI/DO	VDDIO	Generic PIO
12	GPIO9	DI/DO	VDDIO	Generic PIO
11	GPIO10	DI/DO	VDDIO	Generic PIO
30	GPIO11	DI/DO	VDDIO	Generic PIO
31	GPIO12	DI/DO	VDDIO	Generic PIO
18	GPIO13	DI/DO	VDDIO	Generic PIO
17	GPIO14	DI/DO	VDDIO	Generic PIO

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2.2.3 External Power Amplifier Pin Control

xPA2G can be controlled by GPIO0 and GPIO2 while xPA5G can be controlled by GPIO6 and GPIO7. The configuration table is shown as below:

xPA2G	xPA5G	Description
GPIO2	GPIO0	No SPI interface
GPIO6	GPIO7	No QSPI (NOR Flash) support

2.2.4 I/O Pin Mux Table

GPIO	QSPI	SPI	I2C	UART	BT	PTA	xPA	FEM	Switch ANT	32k Oscillator
GPIO0		SPI_CLK					xPA5G			
GPIO1		SPI_CS		UART_RX				FEM_ENB5G	ANT_SWITCH_STATUS	
GPIO2		SPI_MOSI					xPA2G			
GPIO3		SPI_MISO		UART_TX				FEM_ENB2G		
GPIO4	QSPI_CLK							FEM_ENB2G	ANT_SWITCH_CTRL	
GPIO5 (AON)	QSPI_CS							FEM_ENB5G	ANT_SWITCH_STATUS	
GPIO6	QSPI_D0						xPA2G			
GPIO7	QSPI_D1						xPA5G			
GPIO8						BT_PRIORITY			ANT_SWITCH_CTRL	32k_IN
GPIO9 (AON)			SDA	UART_TX						
GPIO10			SCL	UART_RX						
GPIO11	QSPI_D2			UART_TX						
GPIO12	QSPI_D3			UART_RX						
GPIO13				UART_TX	WSI_CLK_BT	BT_ACTIVE				
GPIO14				UART_RX	WSI_DATA_BT	WL_ACTIVE				

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2.3 Computing Subsystem

CQM730-1 have Qualcomm QCC730 at his core which integrates Arm Cortex-M3 @60MHz, 1.5MB RRAM and 640KB SRAM as well as on-module NOR flash with size up to 32MB. The code can be executed from flash via Execution-in-Place (XiP).

The computing subsystem software architecture is shown below:

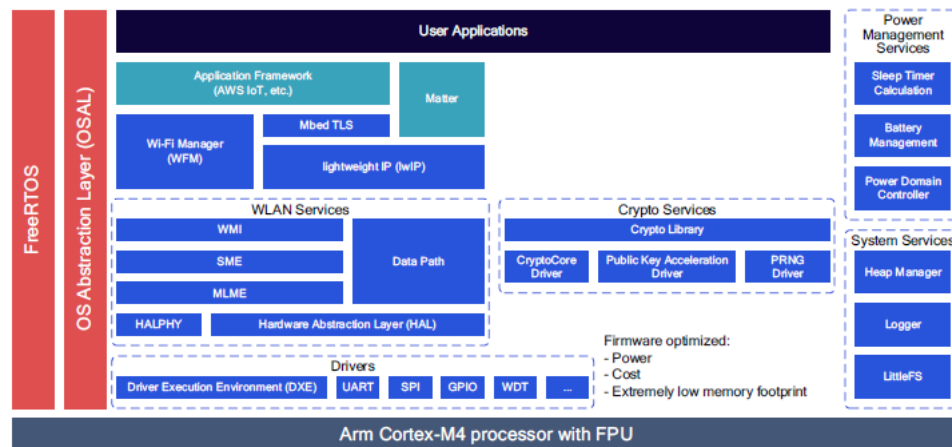


Figure 5: Computing Subsystem Software Architecture

Software SDK will be open sourced at GitHub with blocks in dot line will be offered in binary format inside software SDK package.

GitHub Download Link: To be provided later

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3 Electrical Characteristics

3.1 Absolute Maximum Ratings

The absolute maximum ratings provided in this section reflect the stress levels that, if exceeded, may cause permanent damage to the device. No functionality is guaranteed outside the operating specifications. Functionality and reliability are only guaranteed within the operating.

Pin	Parameter	Min	Max	Unit
VBATT	Power input voltage	-0.3	4.0	V
1V8	Internal PA voltage	-0.3	1.98	V
VDDIO	I/O port voltage	-	VDD+0.03	V
VDD_FEM	External PA voltage	2.0	4.6	V
Tstore	Storage temperature	-55	150	°C

3.2 Recommended Operating Conditions

Pin	Parameter	Min	TYP	Max	Unit
VBATT	Power input voltage	-	3.3	-	V
1V8	Internal PA voltage	1.71	1.8	1.89	V
VDDIO 1.8V	I/O port voltage	1.71	1.8	1.89	V
VDDIO 3.3V	I/O port voltage	-0.3	-	VDD+0.3	V
VDD_FEM	External PA voltage	2.0	3.3	4.6	V

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4 Radio Performance

The radio performance for both max transmit power and receive sensitivity on both 2.4GHz and 5GHz band is listed in the table below:

4.1.1 2.4GHz Radio Performance

Standard	Channel BW	PHY	Modulation	MCS Index	Data Rate (Mbps)	Max Tx Power (dBm)		Rx Sensitivity (dBm)	
						iPA	xPA	iPA	xPA
802.11b	22MHz	CCK (DSSS)	DBPSK	-	1				
		CCK (DSSS)	DQPSK	-	2				
		CCK (DSSS)	B/DQPSK	-	5.5				
		CCK (DSSS)	Q/DQPSK	-	11				
802.11g	20MHz	OFDM	BPSK	-	6				
		OFDM	BPSK	-	9				
		OFDM	QPSK	-	12				
		OFDM	QPSK	-	18				
		OFDM	16QAM	-	24				
		OFDM	16QAM	-	36	Not Supported			
		OFDM	64QAM	-	48	Not Supported			
		OFDM	64QAM	-	54	Not Supported			
802.11n	20MHz (HT20)	OFDM	BPSK	MCS0	7.2				
		OFDM	QPSK	MCS1	14.4				
		OFDM	QPSK	MCS2	21.7				
		OFDM	16QAM	MCS3	28.9				
		OFDM	16QAM	MCS4	43.3	Not Supported			
		OFDM	64QAM	MCS5	57.8	Not Supported			
		OFDM	64QAM	MCS6	65	Not Supported			
		OFDM	64QAM	MCS7	72.2	Not Supported			

4.1.2 5GHz Radio Performance

Standard	Channel BW	PHY	Modulation	MCS Index	Data Rate (Mbps)	Max Tx Power (dBm)		Rx Sensitivity (dBm)	
						iPA	xPA	iPA	xPA
802.11a	20MHz	OFDM	BPSK	-	6				
		OFDM	BPSK	-	9				
		OFDM	QPSK	-	12				
		OFDM	QPSK	-	18				
		OFDM	16QAM	-	24				

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Standard	Channel BW	PHY	Modulation	MCS Index	Data Rate (Mbps)	Max Tx Power (dBm)		Rx Sensitivity (dBm)	
						iPA	xPA	iPA	xPA
		OFDM	16QAM	-	36	Not Supported			
		OFDM	64QAM	-	48	Not Supported			
		OFDM	64QAM	-	54	Not Supported			
802.11n	20MHz (HT20)	OFDM	BPSK	MCS0	7.2				
		OFDM	QPSK	MCS1	14.4				
		OFDM	QPSK	MCS2	21.7				
		OFDM	16QAM	MCS3	28.9				
		OFDM	16QAM	MCS4	43.3	Not Supported			
		OFDM	64QAM	MCS5	57.8	Not Supported			
		OFDM	64QAM	MCS6	65	Not Supported			
		OFDM	64QAM	MCS7	72.2	Not Supported			

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5 Data Rate

Since CQM730-1 can support up to MCS3 on 802.11n. The max data rate at UDP/TCP level is listed below:

PAMPDU	Protocol	Rate	MCS Index	Traffic	Throughput	KPI %
No	UDP	28.9 Mbps	MCS3	DL	16.63 Mbps	92.39%
	UDP	28.9 Mbps	MCS3	UL	17.72 Mbps	98.44%
	TCP	28.9 Mbps	MCS3	DL	13.97 Mbps	93.13%
	TCP	28.9 Mbps	MCS3	UL	14.03 Mbps	93.54%
Yes	UDP	28.9 Mbps	MCS3	DL	23.5 Mbps	98.54%
	UDP	28.9 Mbps	MCS3	UL	22.58 Mbps	94.08%
	TCP	28.9 Mbps	MCS3	DL	16.02 Mbps	94.24%
	TCP	28.9 Mbps	MCS3	UL	16.17 Mbps	95.12%

UNLESS OTHER SPECIFIED TOLERANCES ON :
 X = N/A X.X = N/A X.XX = N/A
 ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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6 Power Consumption

CQM730-1 can operate in four power states as shown in the table below:

Power Mode	CPU	MEM	RTC	Wakeup Source	Description	Use Case
Active	On	On	On	N/A	Normal operation	Awake
Sleep	Off	Retained	Off	DTIM timer	- Enter When RTOS is idle, and WLAN is connected* - Maintain WLAN connection - When awake, continue to run from sleep point	WLAN DTIM
Deep Sleep	Off	Off	Off	RTC timer or EXT_WAKEUP_INTR_N	- Enter when RTOS is idle, and WLAN is disconnected* - Nothing maintained - When awake, restart from PBL	Alarm or Shutdown
Indefinite Sleep	Off	Off	Off	EXT_WAKEUP_INTR_N	Same as Deep Sleep, except not waked up by RTC timer	Shutdown

Note: Actual entering condition is complicated, such as considering sleep interval

6.1 Active Power

The active power consumption for both continuous transmitting and receiving on both 2.4GHz and 5GHz band is listed in the table below:

6.1.1 2.4GHz Active Power Consumption

Standard	Channel BW	PHY	Modulation	MCS Index	Data Rate (Mbps)	Continuous Transmit (mW)		Continuous Receive (mW)	
						iPA	xPA	iPA	xPA
802.11b	22MHz	CCK (DSSS)	DBPSK	-	1				
		CCK (DSSS)	DQPSK	-	2				
		CCK (DSSS)	B/DQPSK	-	5.5				
		CCK (DSSS)	Q/DQPSK	-	11				
802.11g	20MHz	OFDM	BPSK	-	6				
		OFDM	BPSK	-	9				
		OFDM	QPSK	-	12				
		OFDM	QPSK	-	18				
		OFDM	16QAM	-	24				
		OFDM	16QAM	-	36	Not Supported			
		OFDM	64QAM	-	48	Not Supported			
		OFDM	64QAM	-	54	Not Supported			
802.11n	20MHz (HT20)	OFDM	BPSK	MCS0	7.2				
		OFDM	QPSK	MCS1	14.4				
		OFDM	QPSK	MCS2	21.7				

UNLESS OTHER SPECIFIED TOLERANCES ON :
X=N/A X.X=N/A X.XX=N/A
ANGLES=N/A HOLEDIA=N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

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Standard	Channel BW	PHY	Modulation	MCS Index	Data Rate (Mbps)	Continuous Transmit (mW)		Continuous Receive (mW)	
802.11n	20MHz (HT20)	OFDM	16QAM	MCS3	28.9				
		OFDM	16QAM	MCS4	43.3	Not Supported			
		OFDM	64QAM	MCS5	57.8	Not Supported			
		OFDM	64QAM	MCS6	65	Not Supported			
		OFDM	64QAM	MCS7	72.2	Not Supported			

Note: Vbatt = 3.0V

6.1.2 5GHz Active Power Consumption

Standard	Channel BW	PHY	Modulation	MCS Index	Data Rate (Mbps)	Continuous Transmit (mW)		Continuous Receive (mW)	
						iPA	xPA	iPA	xPA
802.11a	20MHz	OFDM	BPSK	-	6				
		OFDM	BPSK	-	9				
		OFDM	QPSK	-	12				
		OFDM	QPSK	-	18				
		OFDM	16QAM	-	24				
		OFDM	16QAM	-	36	Not Supported			
		OFDM	64QAM	-	48	Not Supported			
		OFDM	64QAM	-	54	Not Supported			
802.11n	20MHz (HT20)	OFDM	BPSK	MCS0	7.2				
		OFDM	QPSK	MCS1	14.4				
		OFDM	QPSK	MCS2	21.7				
		OFDM	16QAM	MCS3	28.9				
		OFDM	16QAM	MCS4	43.3	Not Supported			
		OFDM	64QAM	MCS5	57.8	Not Supported			
		OFDM	64QAM	MCS6	65	Not Supported			
		OFDM	64QAM	MCS7	72.2	Not Supported			

Note: Vbatt = 3.0V

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

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6.2 Sleep Power

Power Mode	CPU	Internal Power Amplifier		External Power Amplifier		Unit
		2.4GHz	5GHz	2.4GHz	5GHz	
Standby	Power Down					μA
	Deep Sleep					μA
	Listen					μA
	DTIM sleep (128KB RAM Retention)					μA
	DTIM sleep (650KB RAM Retention)					μA
DTIM	DTIM 1					μA
	DTIM 3					μA
	DTIM 5					μA
	DTIM 10					μA
	DTIM 100					μA

Note: Vbatt = 3.3V

UNLESS OTHER SPECIFIED TOLERANCES ON :
 X = N/A X.X = N/A X.XX = N/A
 ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

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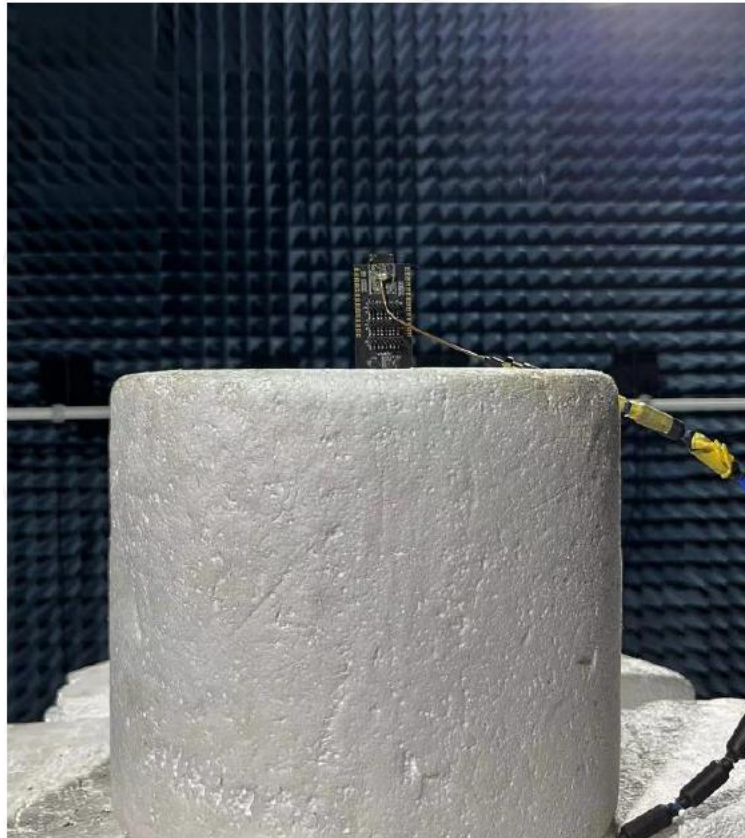
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7 Antenna Electrical specifications

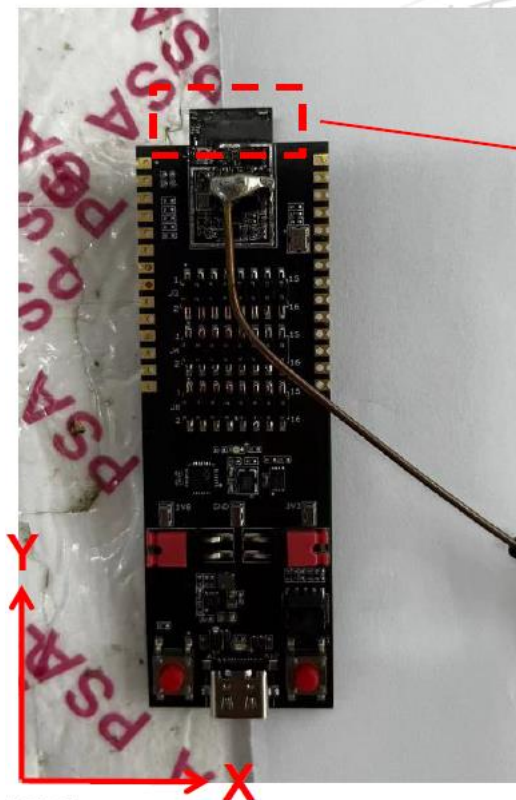
7.1 Measurement Information

7.1.1 Experimental Setup



UNLESS OTHER SPECIFIED TOLERANCES ON : X=N/A X.X=N/A X.XX=N/A ANGLES=N/A HOLEDIA=N/A			INPAQ TECHNOLOGY CO., LTD.		
SCALE : N/A	UNIT : mm				
DRAWN BY : 詹惠雯	CHECKED BY : 詹惠雯	THIS DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF INPAQ TECHNOLOGY CO.,LTD.AND SHALL NOT BE REPRODUCED OR USED AS THE BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION			
DESIGNED BY : 黃瑞郎	APPROVED BY : 陳振榮				
TITLE : RFIQM0730010IB001		DOCUMENT NO.	ENS070033780-000803518326	SPEC REV.	
				A0	

7.1.2 Antenna Solution Detail



Printed antenna design
Tiny height: 5mm
Good performance

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

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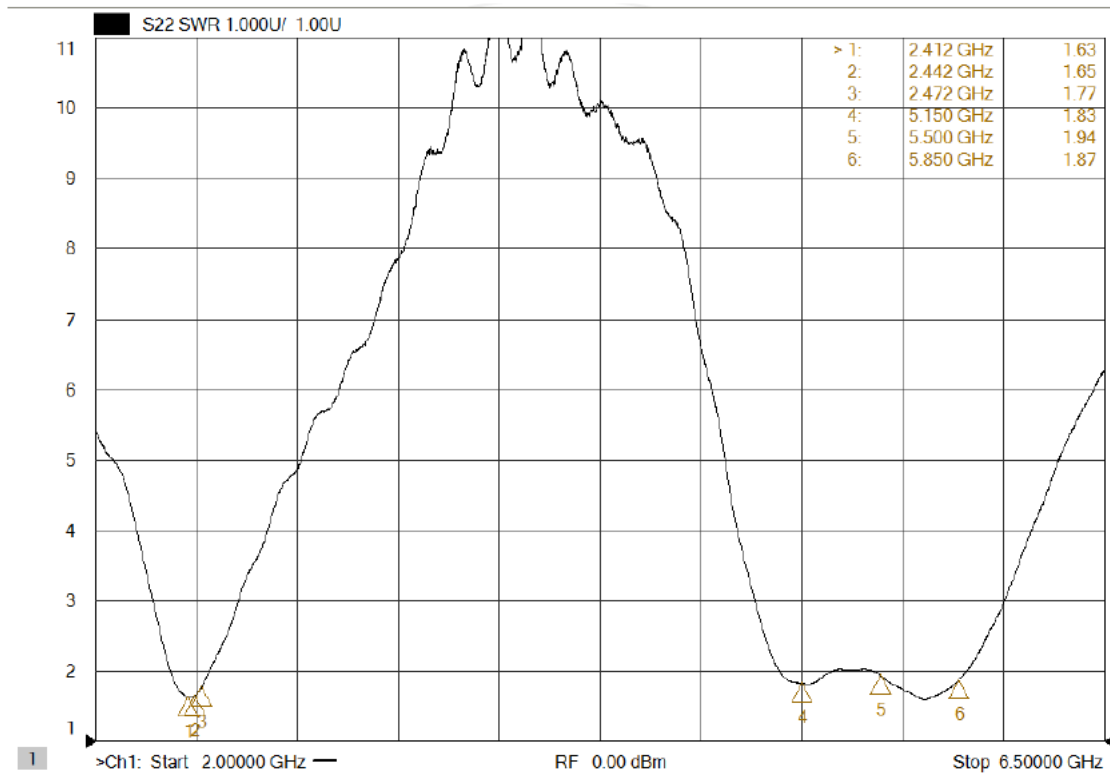
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SPEC REV.
A0

7.2 Antenna Characteristics: Passive and Active

7.2.1 VSWR



UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

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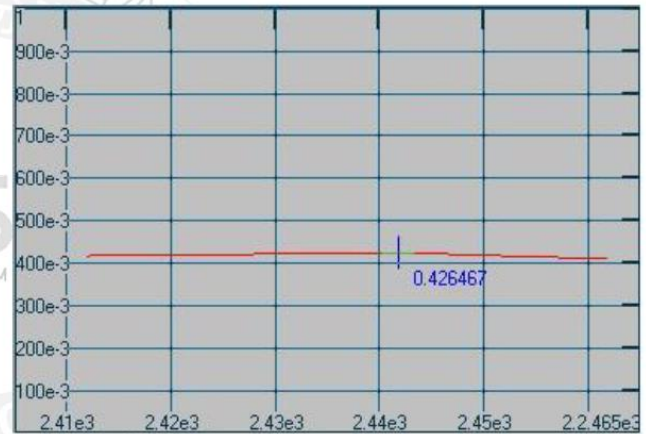
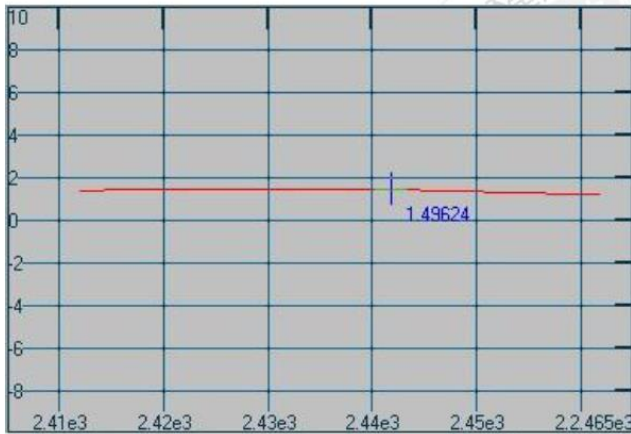
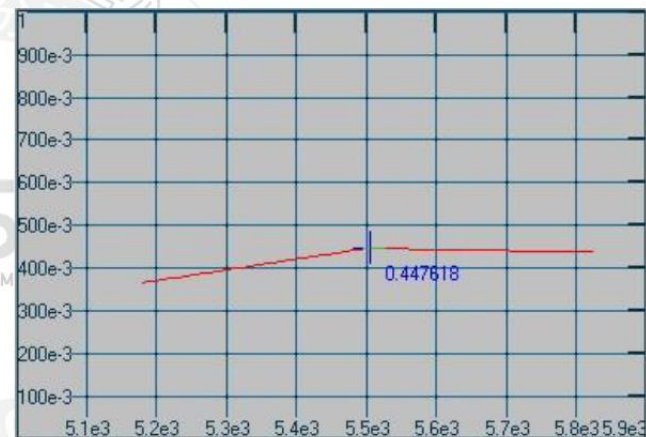
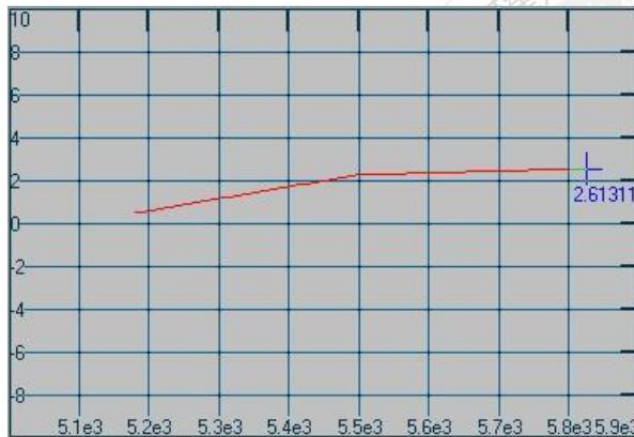
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NO.

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7.2.2 Antenna Efficiency and Peak Gain

2G**5G**

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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ANT_2.4G

Frequency(MHz)	Efficiency(%)	Peak gain(dBi)
2412	41.92	1.46
2417	42.04	1.46
2422	42.17	1.47
2427	42.29	1.48
2432	42.41	1.48
2437	42.54	1.49
2442	42.63	1.49
2447	42.26	1.43
2452	41.92	1.37
2457	41.55	1.30
2462	41.18	1.24
2467	40.82	1.18
2472	40.46	1.11
2484	40.10	1.05

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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ANT_5G

Frequency(MHz)	Efficiency(%)	Peak gain(dBi)	Frequency(MHz)	Efficiency(%)	Peak gain(dBi)
5180	36.77	0.54	5500	44.76	2.32
5190	37.10	0.61	5510	44.74	2.34
5200	37.42	0.69	5520	44.73	2.34
5210	37.59	0.72	5530	39.87	1.23
5220	37.75	0.76	5540	44.67	2.36
5230	38.08	0.83	5550	44.64	2.37
5240	38.24	0.87	5560	44.62	2.38
5260	38.73	0.98	5580	44.54	2.41
5270	39.05	1.05	5590	44.50	2.42
5280	39.22	1.09	5600	44.50	2.42
5290	39.54	1.16	5610	44.48	2.42
5300	39.71	1.20	5620	44.47	2.43
5310	40.03	1.27	5630	44.43	2.44
5320	40.36	1.34	5640	44.40	2.45

Frequency(MHz)	Efficiency(%)	Peak gain(dBi)	Frequency(MHz)	Efficiency(%)	Peak gain(dBi)
5660	44.34	2.47	5745	44.12	2.54
5670	44.33	2.48	5755	44.10	2.55
5680	44.29	2.49	5765	44.06	2.56
5690	44.27	2.49	5775	44.05	2.57
5700	44.24	2.50	5785	44.01	2.58
5710	44.22	2.51	5795	43.99	2.58
5720	44.19	2.52	5805	43.96	2.60
			5825	43.91	2.61
			5835	43.90	2.62
			5845	43.87	2.63
			5855	43.84	2.64
			5865	43.81	2.65
			5875	43.78	2.65
			5885	43.75	2.66

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



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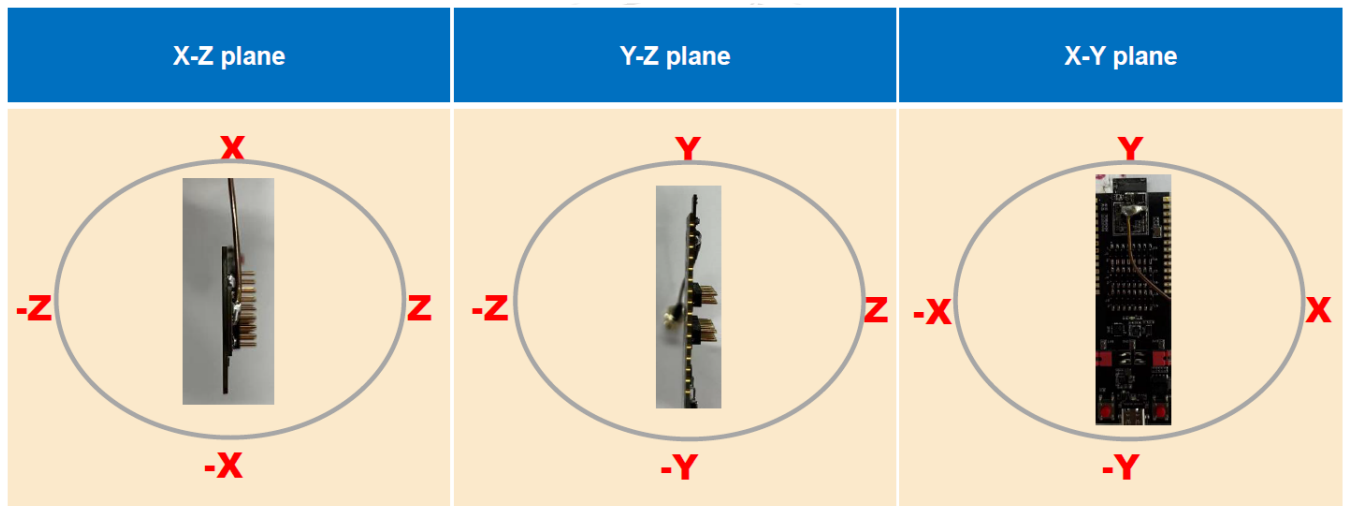
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DRAWN BY : 詹惠雯 CHECKED BY : 詹惠雯
DESIGNED BY : 黃瑞郎 APPROVED BY : 陳振榮

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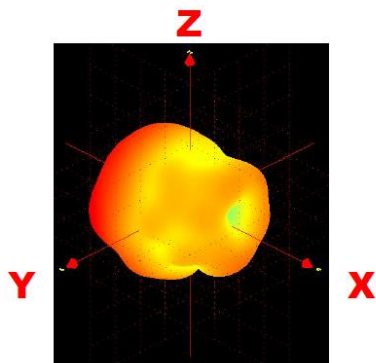
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7.2.3 3D Pattern & 3 views of antenna & 2D Radiation

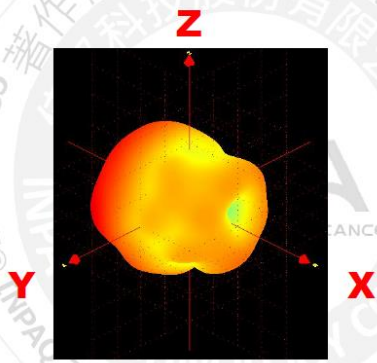


2412MHz



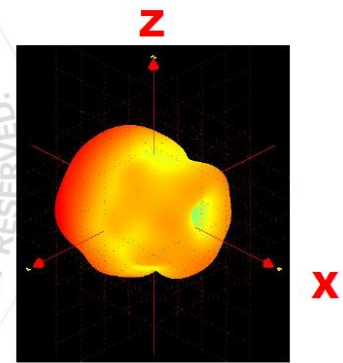
Peak gain 1.45dBi
Ave. gain -3.78dBi

2442MHz



Peak gain 1.49dBi
Ave. gain -3.70dBi

2462MHz



Peak gain 1.23dBi
Ave. gain -3.85dBi

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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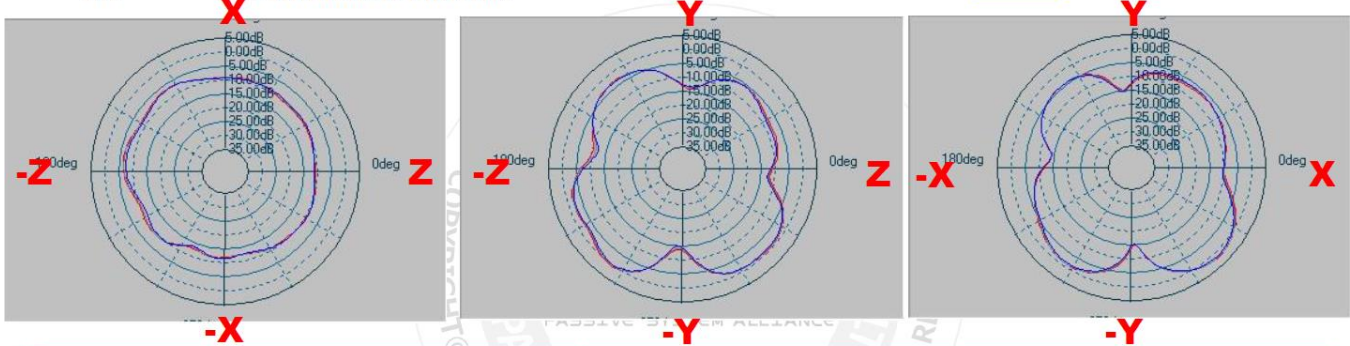
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NO.

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2G

2.3 2D Radiation Patterns



	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
2412	-4.65	-7.99	0.53	-4.79	1.24	-4.94
2442	-5.06	-8.12	0.47	-4.81	1.34	-4.83
2462	-5.68	-8.37	0.33	-4.98	1.12	-5.03

UNLESS OTHER SPECIFIED TOLERANCES ON :
 X = N/A X.X = N/A X.XX = N/A
 ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

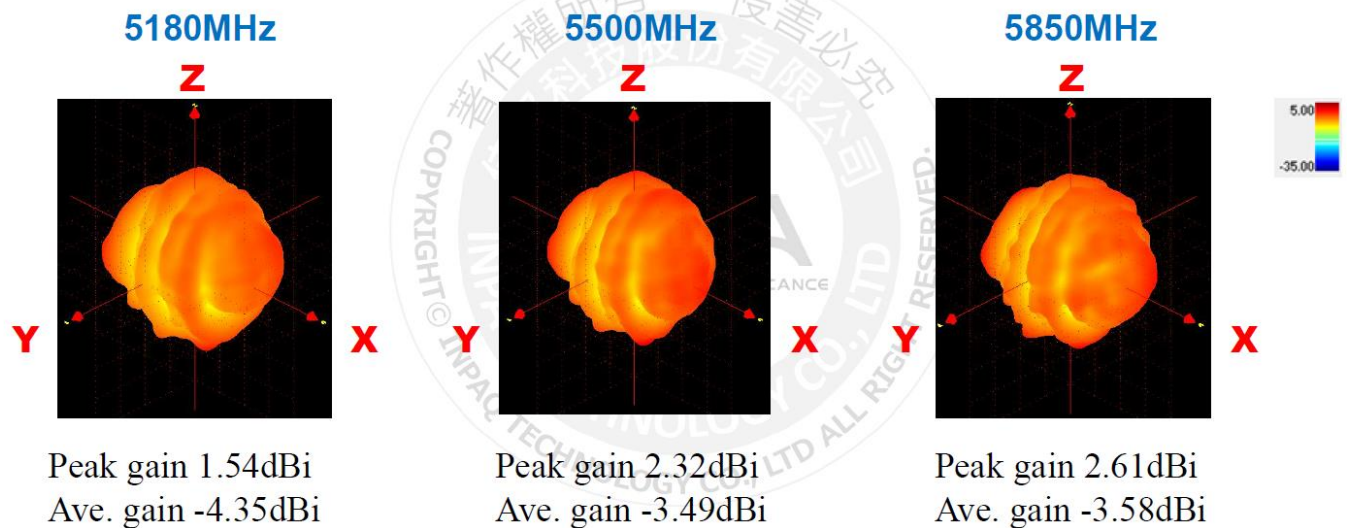
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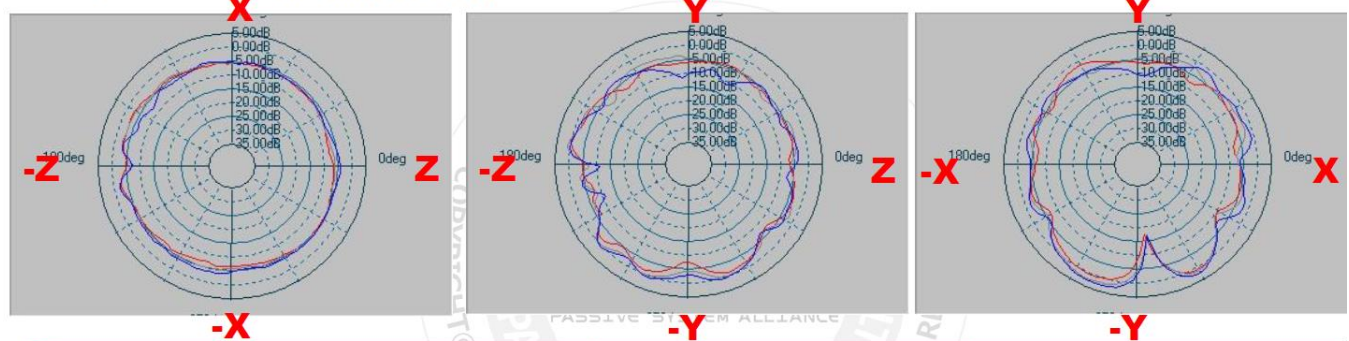
ENS070033780-000803518326

SPEC REV.
A0



5G

2.3 2D Radiation Patterns



	ZX plane		ZY plane		XY plane	
Frequency [MHz]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]	Max Value [dBi]	Average [dBi]
5180	-1.75	-4.82	0.31	-3.34	0.42	-4.04
5500	-1.28	-4.42	1.59	-2.36	2.27	-2.95
5850	-2.14	-4.94	0.84	-2.83	2.42	-2.74

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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8 Mechanical Specification

8.1 Internal Power Amplifier Module (CQM730i-1)

8.1.1 PCB Antenna

8.1.1.1 Dimension

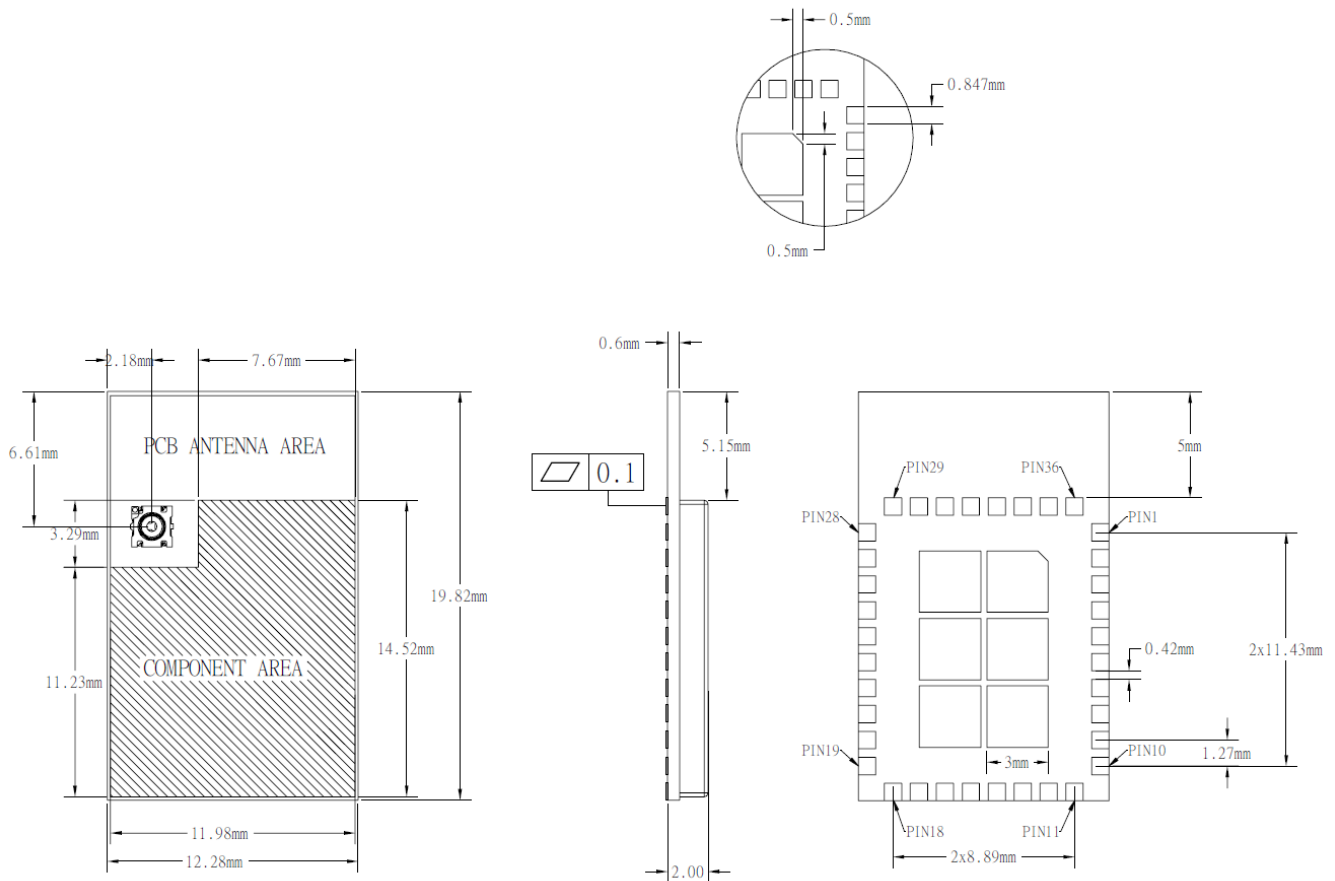


Figure 6: CQM730i-1B Module Dimension

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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8.1.1.2 Recommended PCB Landing Pattern

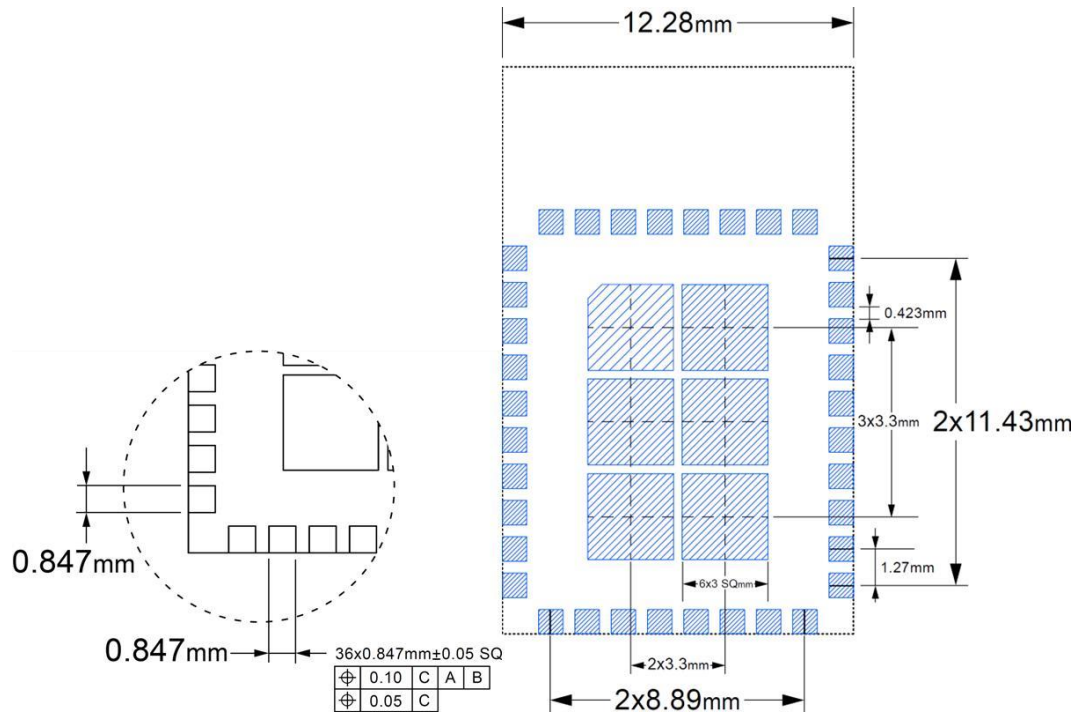


Figure 7: CQM730i-1B Module PCB Landing Pattern

UNLESS OTHER SPECIFIED TOLERANCES ON :
 X = N/A X.X = N/A X.XX = N/A
 ANGLES = N/A HOLEDIA = N/A



INPAQ TECHNOLOGY CO., LTD.

SCALE : N/A

UNIT : mm

DRAWN BY : 詹惠雯

CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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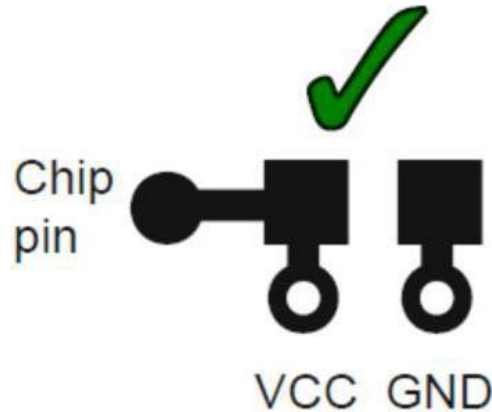
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9 Manufacturing Recommendation

9.1 Power Layout Guideline

CQM730-1 is powered by either 3V battery or DC 3.3V. Power pin connection capacitor is as close as possible to chip and pin. Decoupling the power supply from the chip using a capacitor. Use capacitors to prevent noise from coupling back to the power plane.



9.2 RF Layout Guideline

To optimize antenna performance, place the module in the corner of the PCB as shown below. Do not cover copper and trace the antenna clearance area. Keep the antenna area as far away as possible from the power supply and metal components. Connect all GND pins directly to a solid GND plane. Place GND vias as close as possible to the GND pin. Use a good layout method to avoid excessive noise coupling with signal lines or supply voltage lines.

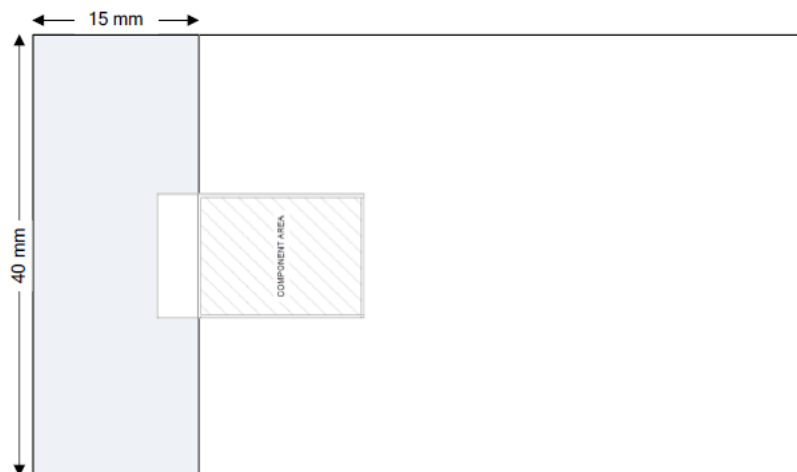


Figure 8: RF Layout Guideline

UNLESS OTHER SPECIFIED TOLERANCES ON : X=N/A X.X=N/A X.XX=N/A ANGLES=N/A HOLEDIA=N/A			INPAQ TECHNOLOGY CO., LTD.	
SCALE : N/A	UNIT : mm			
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DESIGNED BY : 黃瑞郎	APPROVED BY : 陳振榮			
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9.3 Soldering Recommendations

CQM730-1 can be SMT on the board following the temperature curve graph:

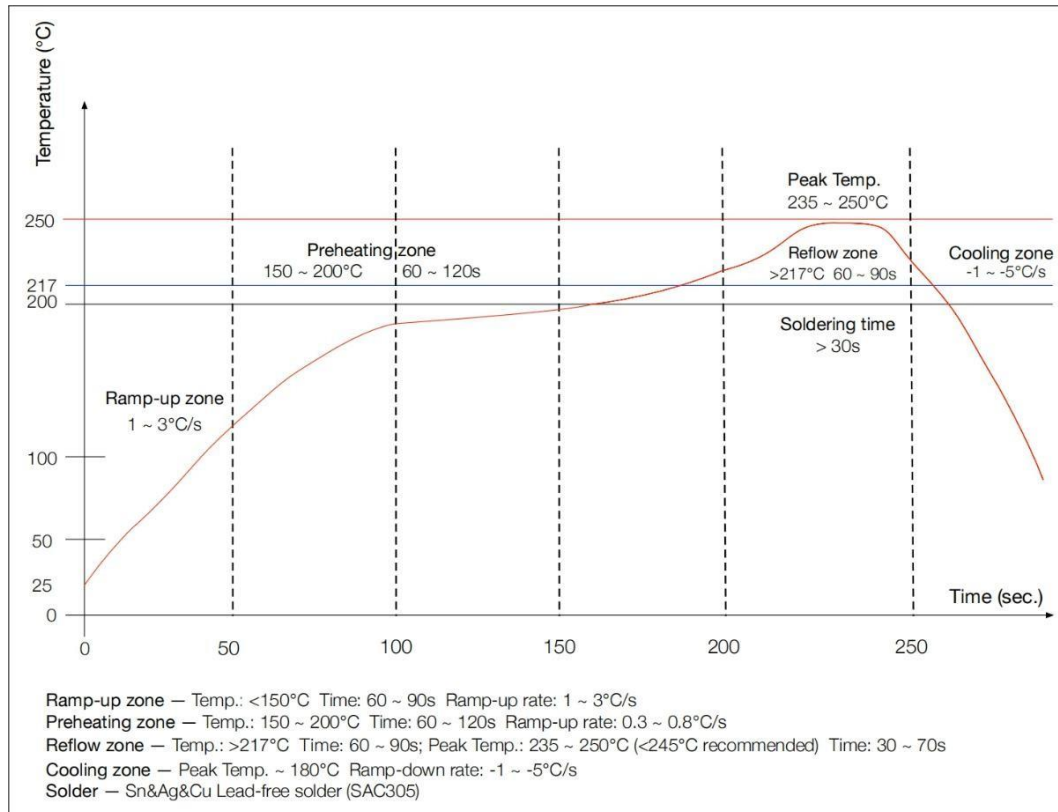


Figure 9: Soldering Guideline

UNLESS OTHER SPECIFIED TOLERANCES ON :
X = N/A X.X = N/A X.XX = N/A
ANGLES = N/A HOLEDIA = N/A



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UNIT : mm

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CHECKED BY : 詹惠雯

DESIGNED BY : 黃瑞郎

APPROVED BY : 陳振榮

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10 Packaging

CQM730-1 are packaged on reels loaded with 1000 modules. Each reel is placed in an antistatic bag with a desiccant pack and a humidity card and placed in an 36x25x12cm box. Anti-static warnings and labels adhere to the outside of the bag.

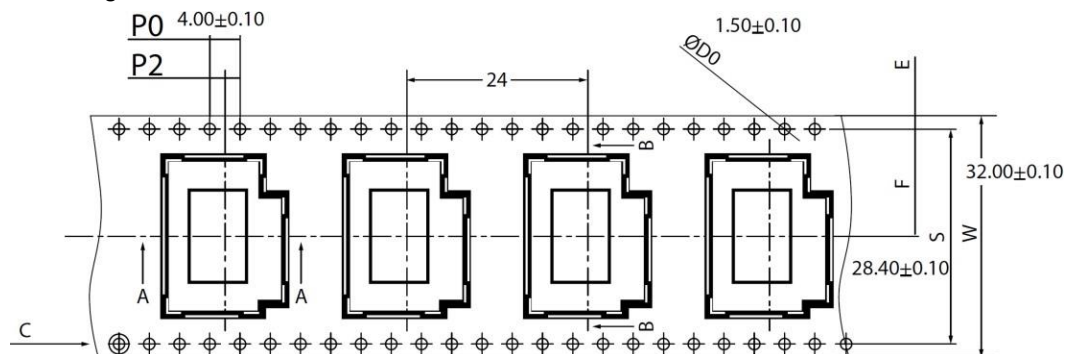


Figure 10: Module Packaging

Warning

The MeshConnect Modules contain highly sensitive electronic circuitry. Handling without proper ESD protection may destroy or damage the module permanently.

Warning

The MeshConnect Modules are moisture-sensitive devices. Appropriate handling instructions and precautions are summarized in J-STD-033. Read carefully to prevent permanent damage due to moisture intake.

Moisture Sensitivity Level (MSL)

CQM100-1 is qualified to moisture sensitivity (MSL3) in accordance with JEDEC J-STD-020

Storage

Storage/shelf life in sealed bags is 12 months at <40°C and <90% relative humidity.12.2 Packing Label

UNLESS OTHER SPECIFIED TOLERANCES ON :
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ANGLES = N/A HOLEDIA = N/A



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11 Regulatory Compliance

Country	Certification	No
USA	FCC 15C	Coming soon
Europe Union	CE	Coming soon
Canada	IC	Coming soon
Japan	MIC	Coming soon
Korea	KC	Coming soon
Australia	RCM	Coming soon
United Kingdom	UKCA	Coming soon
China	SRRC	Coming soon

UNLESS OTHER SPECIFIED TOLERANCES ON :
 X = N/A X.X = N/A X.XX = N/A
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Revision History

Revision	Description	Date
1.0	Initial draft	July 1, 2024

UNLESS OTHER SPECIFIED TOLERANCES ON :
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ANGLES = N/A HOLEDIA = N/A



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