WLAN Module Data Sheet

MP P/N: CMWC1ZZABR

Revision History

Revision Code	Date	Description	Comments
Draft	2015-4-27	Draft	
A	2019-11-14	1. Revised label marking	

Contents

1. Scope

This product specification is applied to the IEEE802.11b/g/n WLAN module used for consumer applications.

Module size	: 22.0 x 19.0 x 2.4 (typ) mm
Chipset	: Marvell 88MW300
Interface	: UART, GPIO
Reference Clock	: Internal (external optional sleep clock)
ROM	: SPI Flash on module (2Mbytes)
Antenna	: Integrated PCB antenna
Certification	: FCC/CE/IC
MSL	: 3
RoHS	: This module is compliant with the RoHS directive

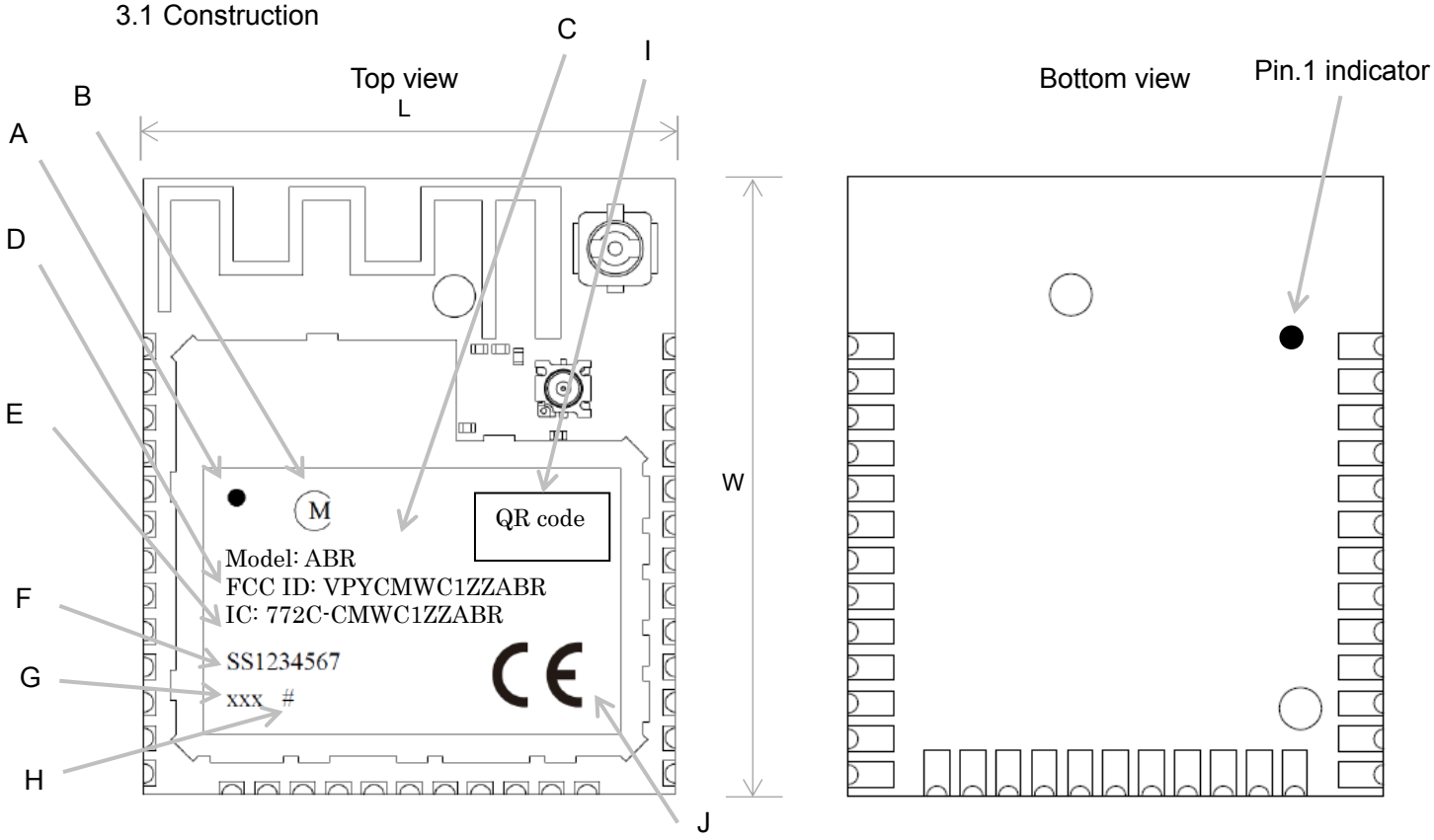
*This module delivered with pre-programmed generic software as Serial Network Interface Controller.

2. Part Number / Part Composition

Sample Part Number	MP Part Number
CMWC1ZZABR-TEMP	CMWC1ZZABR

3. Construction, Dimensions, Marking and Terminal Configurations

3.1 Construction



3.2 Dimensions (in mm)

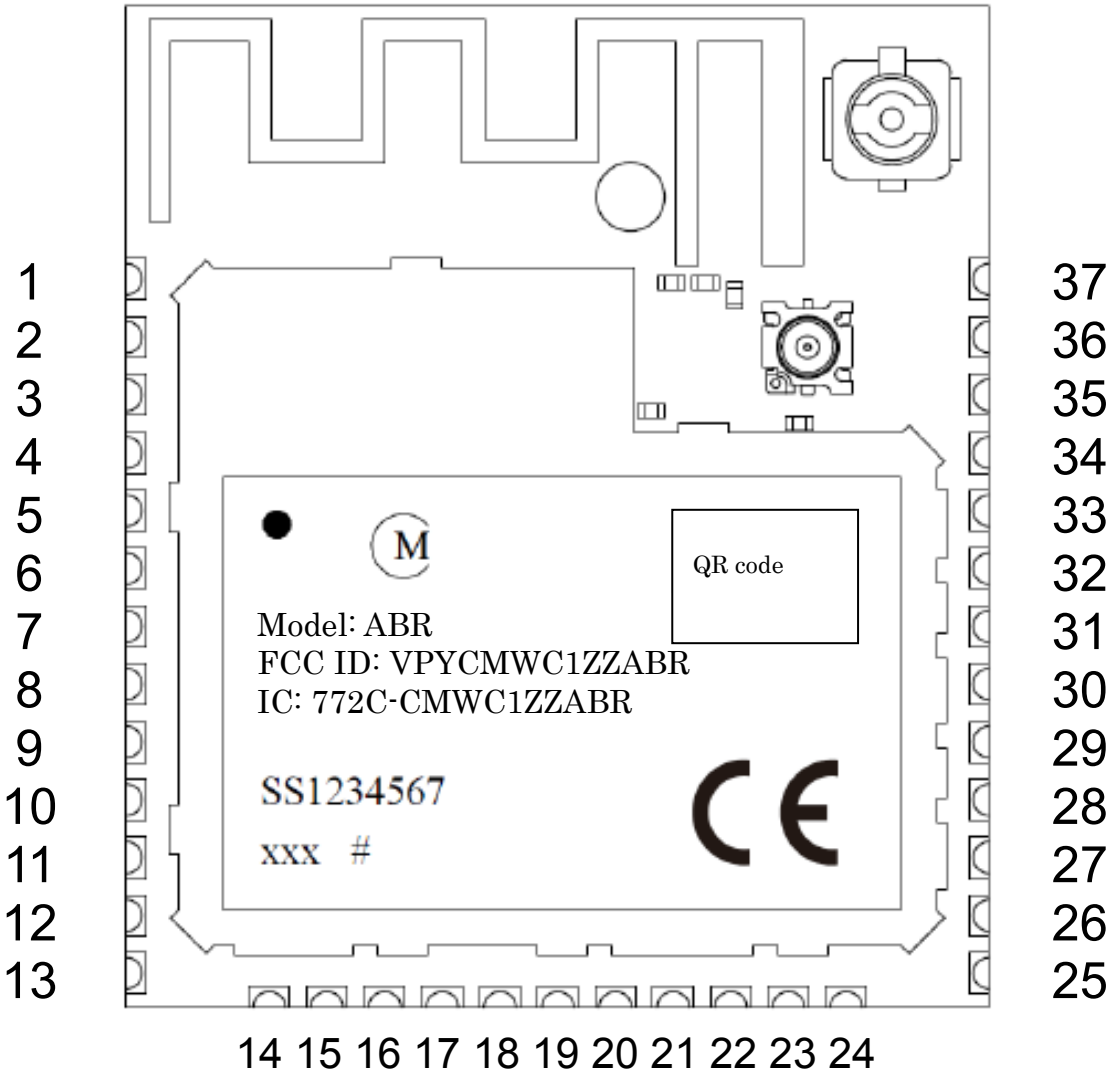
Mark	Min.	Typ.	Max.
L	21.8	22	22.2
W	18.8	19	19.2
T	-	2.4	2.55

3.3 Label Marking

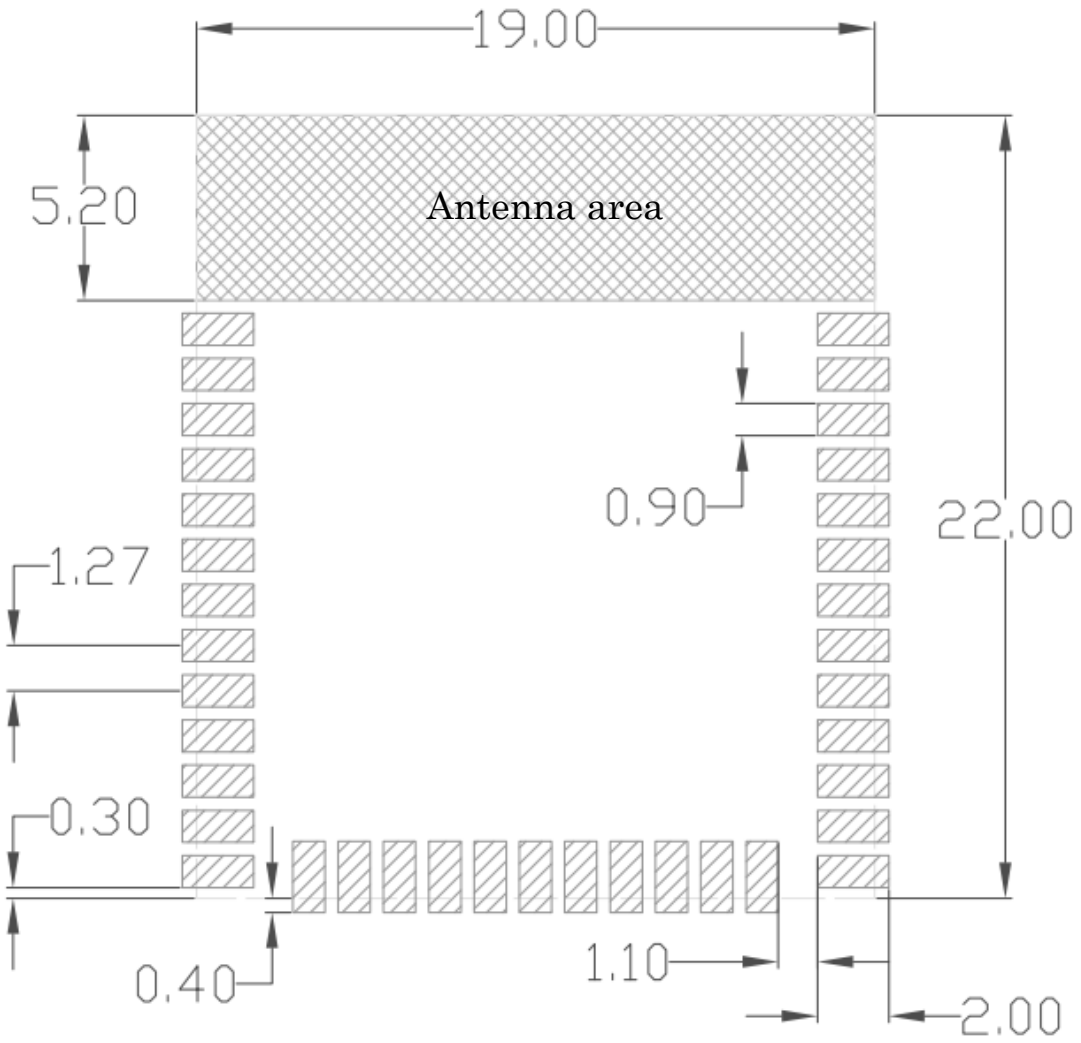
Mark	Name
A	Pin.1 indicator
B	Murata logo
C	Model Name / P/N
D	FCC certification ID
E	IC certification ID
F	Inspection code
G	Sub type number: 105
H	Version code: blank (Ver. 1.0)
I	2D barcode (MAC address)
J	CE mark

3.4 Pin assignment (top view)

4. QR code



4.1 Recommended land pattern



4.2 Pin description

No.	Name	Function	I/O	MW300 Pin No.	MW300 Pin Function
1	GPIO_16	CON[5]: Configuration Bit	I/O	30	GPIO_16
2	RESET_N	Module Reset (active low)	I	35	RESETn
3	GPIO_22	NC		36	GPIO_22
4	GPIO_23	Functional Button Pin (optional)	I	37	GPIO_23
5	GPIO_24	NC		38	GPIO_24
6	GND				
7	GPIO_25	32.768 kHz Crystal Input / Oscillator Input	I	39	GPIO_25
8	GPIO_26	32.768 kHz Crystal Output	O	40	GPIO_26
9	GND				
10	GPIO_27	CON[4]: Configuration Bit	I/O	51	GPIO_27
11	GPIO_39	NC		52	GPIO_39
12	GND				
13	VDD33	3.3V DC Power Supply	P		
14	GPIO_40	LED_1: Module Status Indication (optional)	O	55	GPIO_40
15	GPIO_41	LED_2: Link Status Indication (optional)	O	56	GPIO_41
16	GPIO_42	NC		58	GPIO_42
17	GPIO_43	NC		59	GPIO_43
18	GPIO_44	NC		60	GPIO_44
19	GIPO_45	NC		61	GPIO_45
20	GND				
21	GPIO_46	NC		62	GPIO_46
22	GPIO_47	NC		63	GPIO_47
23	GPIO_48	Debug Log (optional)	O	64	GPIO_48
24	GPIO_49	NC		65	GPIO_49
25	GPIO_0	UART CTS (optional)	I	1	GPIO_0
26	GPIO_1	UART RTS (optional)	O	2	GPIO_1
27	GPIO_2	UART Transmit	O	3	GPIO_2
28	GPIO_3	UART Receive	I	4	GPIO_3
29	GND				
30	GPIO_4	NC		6	GPIO_4
31	GPIO_5	NC		7	GPIO_5
32	GND				
33	GPIO_6	TDO: JTAG Test Data (optional)	O	8	GPIO_6
34	GPIO_7	TCK: JTAG Test Clock (optional)	I	9	GPIO_7
35	GPIO_8	TMS: JTAG Controller Select (optional)	I/O	10	GPIO_8
36	GPIO_9	TDI: JTAG Test Data (optional)	I	11	GPIO_9

37	GPIO_10	TRSTn: JTAG Test Reset (active low) (optional)	I	12	GPIO_10

4.3 Configuration pins

This table shows the pins used as configuration inputs to set parameters following a reset. The definition of these pins changes immediately after reset to their usual function. To set a configuration bit to 0, attach a 100kohm resistor from the pin to ground. No external circuitry is required to set a configuration bit to 1.

Configuration Bits	Pin name	Configuration Function
CON[5]	GPIO_16	Boot Options 00 = boot from UART 01 = reserved 10 = reserved 11 = boot from Flash (default)
CON[4]	GPIO_27	

5. Range

5.1 Absolute maximum rating (T_a=25℃, Z=50ohm)

Parameter		Condition	Rating	Units
Storage Temperature			-40 /+85	℃
Supply Voltage	VDD33	T_a=25℃	3.6	V

Note: Stresses in excess of the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability. No damage assuming only one parameter is set at limit at a time with all other parameters are set within operating condition.

5.2 Operating conditions

Parameter		Min.	Max.	Units
Operating Temperature		-30	+85	℃
Supply Voltage	VDD33	3.0	3.6	V

* Functionality is guaranteed but specifications require derating at extreme temperatures

6. RoHS Compliance

This component can meet with RoHS compliance.

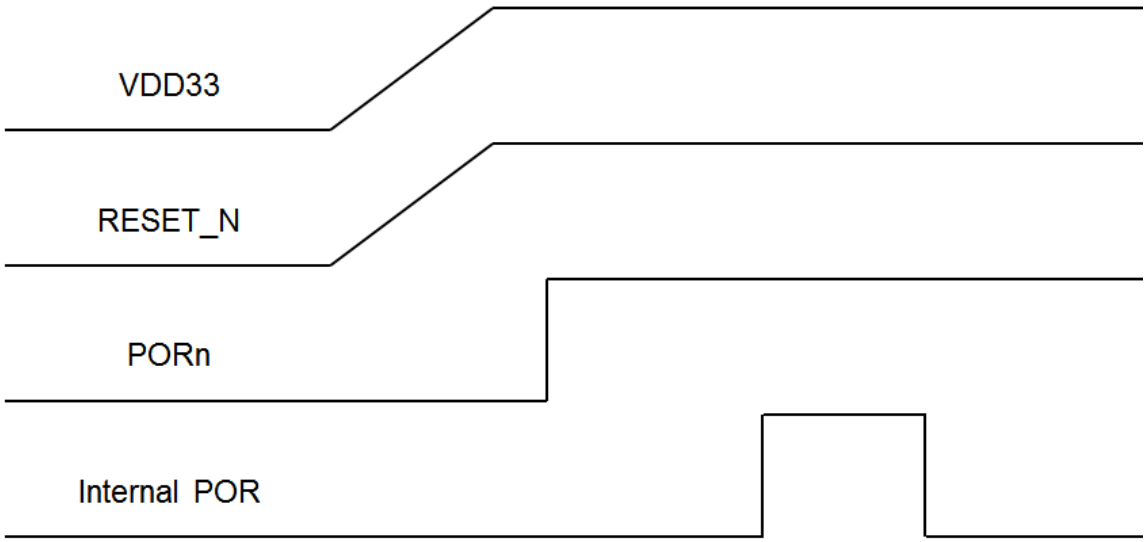
7. RF Characteristics for IEEE802.11

Conditions: 25℃, VDD33= 3.3V

Items	Contents			
	Power Levels			
Tx Power Level	Min.	Typ.	Max.	Units
802.11b (11Mbps)	-	-	20.97	dBm
802.11g (54Mbps)	-	-	23.48	dBm
802.11n (HT20)	-	-	22.17	dBm
Rx Minimum Input Level Sensitivity	Min.	Typ.	Max.	Units
802.11b (11Mbps)	-	-	-76	dBm
802.11g (54Mbps)	-	-	-65	dBm
802.11n (HT20)	-	-	-64	dBm

*Test performed through Murata RF switch connector P/N: MM8030-2610.

8. Power Up Sequence



9. Electrical Characteristics

9.1 I/O Static Ratings, 3.3V

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
V_{IL}	Input low voltage	-	-0.4	-	VDD33*30%	V
V_{IH}	Input high voltage	-	VDD33*70%	-	VDD33+0.4	V
V_{HYS}	Input hysteresis	-	150	-	-	mV
I_{OL}@0.4V	-	-	4	-	-	mA
I_{OH}@VDDIO-0.5V	-	-	3	-	-	mA
Input capacitance	-	-	-	-	5	pF
Input leakage 1	-	VDD33 is ON, 0<V(PAD)<VDD33	-	-	5	μA

9.2 Clock Specifications (optional)

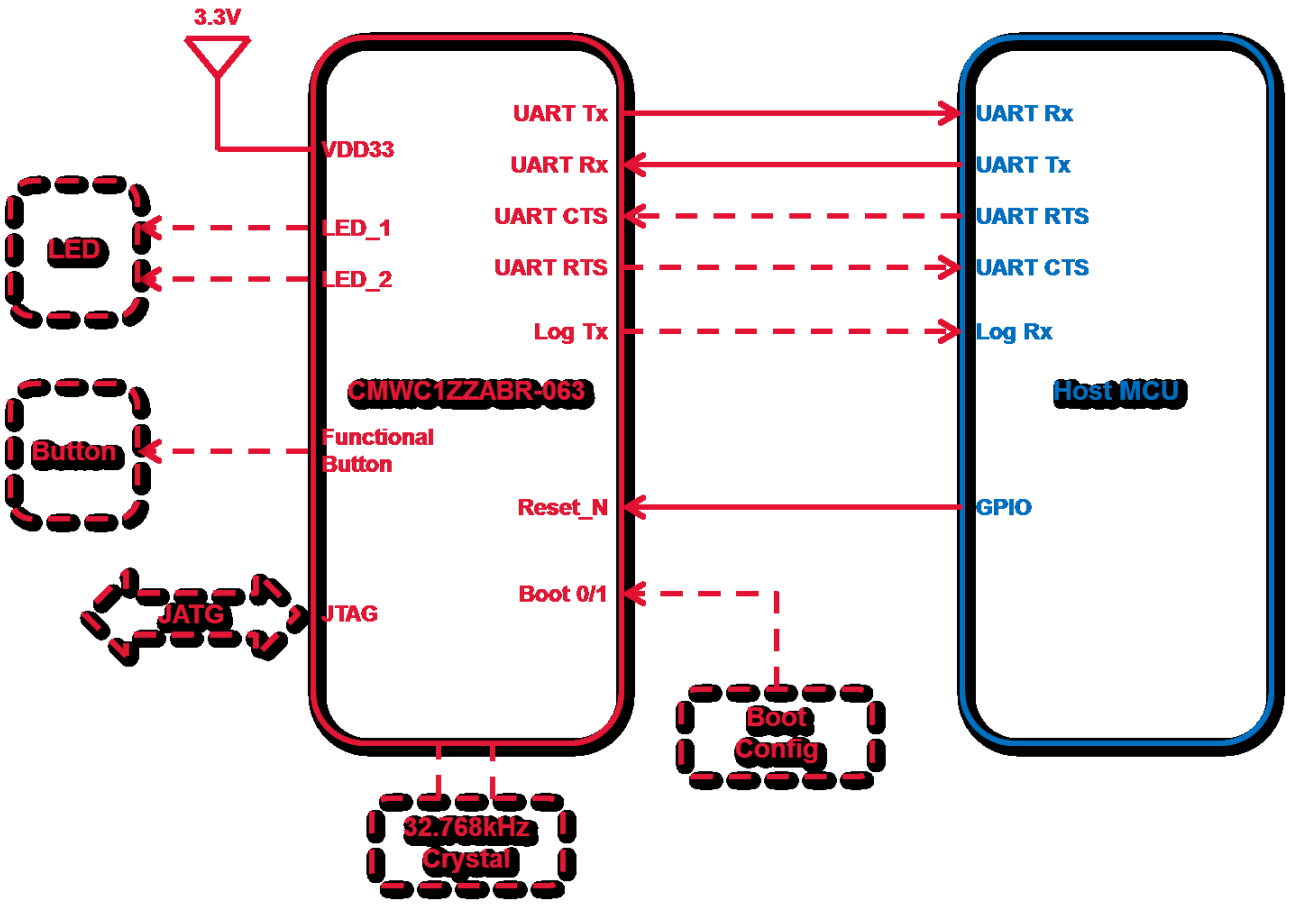
9.2.1 RC32K Specifications

Parameter	Condition	Min.	Typ.	Max.	Units
Frequency before calibration	-	18.6	31.8	39.8	kHz
Startup time	-	-	0.9	-	ms
After-calibration frequency accuracy	Use 32.768kHz crystal as reference clock	32.3	32.7	33.1	kHz
Temperature tolerance	-	-	65	-	ppm/C
Duty cycle	-	40	50	60	%

9.2.2 Crystal Specifications (32.768kHz)

Parameter	Condition	Min.	Typ.	Max.	Units
Crystal frequency	-	-	32.768	-	kHz
Frequency accuracy tolerance	-	-40	-	40	ppm
Startup time	-		-	600	ms
Duty cycle tolerance	-	-	50	-	%
Crystal load capacitance	-	-	12.5	-	pF
Crystal shunt capacitance	-	-	-	7	pF
Equivalent Series Resistance (ESR)	-	-	-	100	kΩ

10. Reference Circuit



11. OEM Guidance

OEM can only use the embedded PCB antenna to guarantee regulatory compliance. Besides that, the following guides must be followed in order to get the best antenna performance.

(1) Place the antenna area on the corner or edge of the main board.

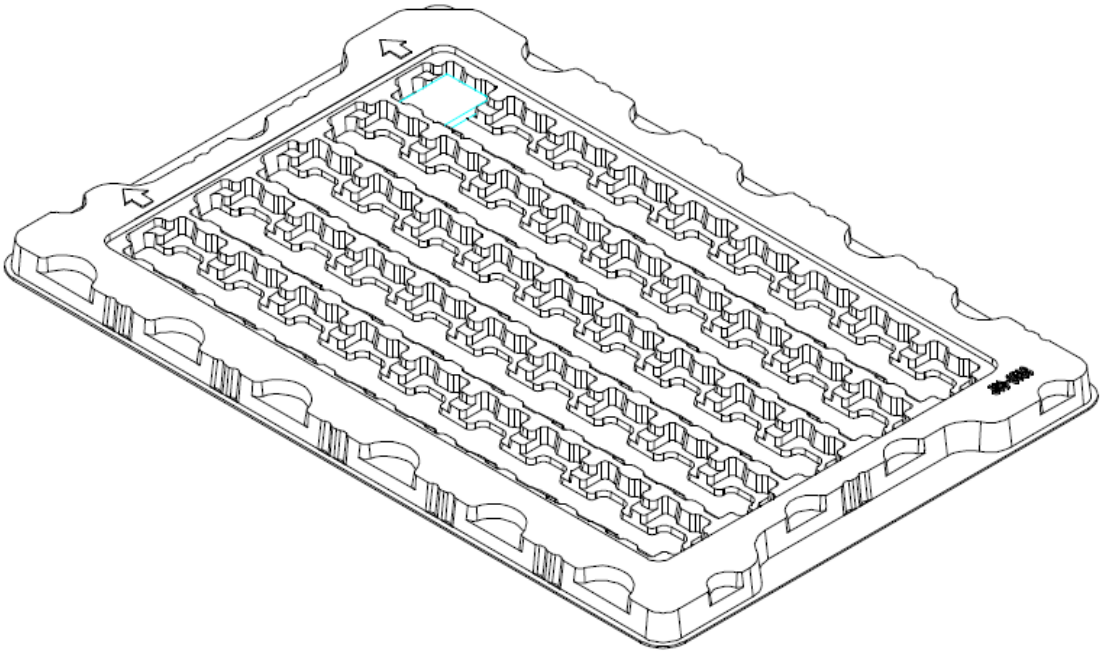
(2) No ground, circuit, component under the antenna area, including the reverse side of PCB. No ground area is as large as possible.

(3) Metal component should be at least 10mm away from PCB antenna.

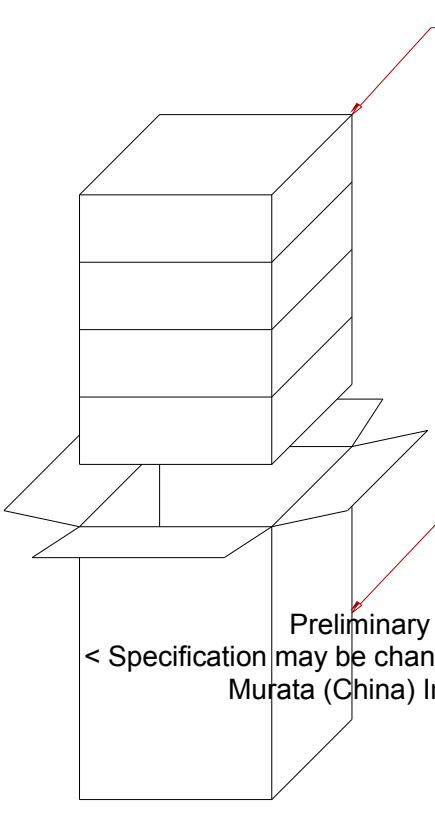
(4) Plastic case should be at least 10mm away from PCB antenna. If it's metal case, it's recommended to use external antenna.

12. Package

This module product is packaged in tray.



1 tray: 45pcs products
1 inner box: 6 trays with products
1 outer box: 4 inner boxes
MOQ: 1080pcs



NOTICE

1. Storage Conditions

Please use this product within 6month after receipt.

- The product shall be stored without opening the packing under the ambient temperature from 5 to 35 °C and humidity from 20 ~ 70 %RH.
  (Packing materials, in particular, may be deformed at the temperature over 40 °C)
- The product left more than 6months after reception, it needs to be confirmed the solderability before used.
- The product shall be stored in non corrosive gas (Cl2, NH3, SO2, Nox, etc.).
- Any excess mechanical shock including, but not limited to, sticking the packing materials by sharp object and dropping the product, shall not be applied in order not to damage the packing materials.

This product is applicable to MSL3 (Based on IPC/JEDEC J-STD-020)

- After the packing opened, the product shall be stored at <30 °C / <60 %RH and the product shall be used within 168 hours.
- When the color of the indicator in the packing changed, the product shall be baked before soldering.

Baking condition: 125 +5/-0 °C, 24 hours, 1 time

The products shall be baked on the heat-resistant tray because the material is not heat-resistant.

2. Handling Conditions :

Be careful in handling or transporting products because excessive stress or mechanical shock may break products.

Handle with care if products may have cracks or damages on their terminals, the characteristics of products may change. Do not touch products with bear hands that may result in poor solderability.

3. Standard PCB Design (Land Pattern and Dimensions) :

All the ground terminals should be connected to the ground patterns. Furthermore, the ground pattern should be provided between IN and OUT terminals. Please refer to the specifications for the standard land dimensions.

The recommended land pattern and dimensions is as Murata's standard. The characteristics of products may vary depending on the pattern drawing method, grounding method, land dimensions, land forming method of the NC terminals and the PCB material and thickness. Therefore, be sure to verify the characteristics in the actual set. When using non-standard lands, contact Murata beforehand.

4. Notice for Chip Placer :

When placing products on the PCB, products may be stressed and broken by uneven forces from a worn-out chucking locating claw or a suction nozzle. To prevent products from damages, be sure to follow the specifications for the maintenance of the chip placer being used. For the positioning of products on the PCB, be aware that mechanical chucking may damage products.

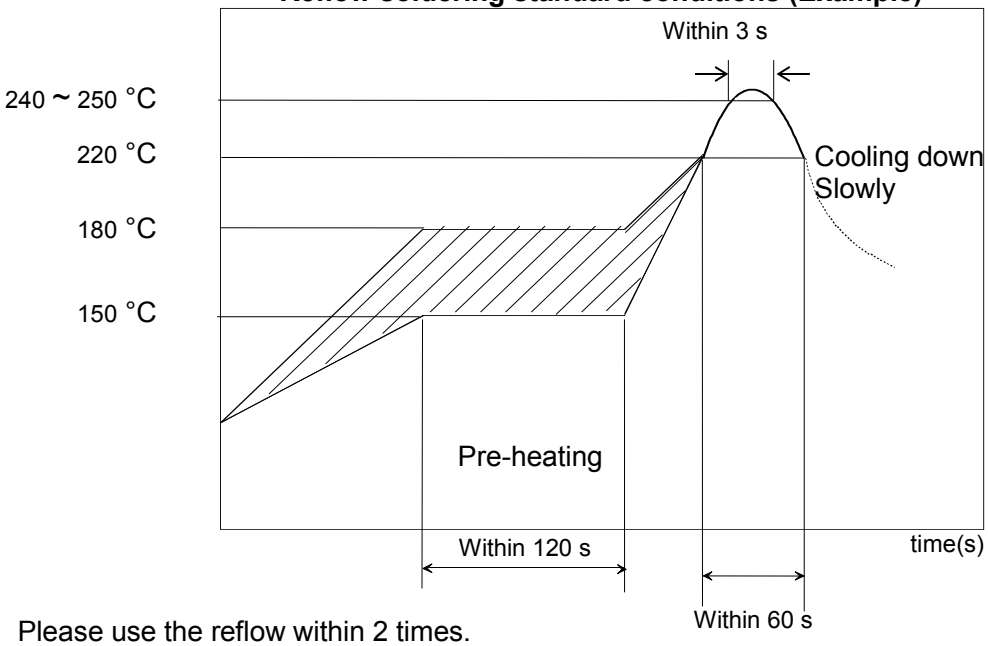
5. Soldering Conditions :

The recommendation conditions of soldering are as in the following figure.

When products are immersed in solvent after mounting, pay special attention to maintain the temperature difference within 100 °C. Soldering must be carried out by the above mentioned conditions to prevent products from damage. Set up the highest temperature of reflow within 260 °C.

Contact Murata before use if concerning other soldering conditions.

Reflow soldering standard conditions (Example)



Please use the reflow within 2 times.

Use rosin type flux or weakly active flux with a chlorine content of 0.2 wt % or less.

6. Cleaning :

Since this Product is Moisture Sensitive, any cleaning is not permitted.

7. Operational Environment Conditions :

Products are designed to work for electronic products under normal environmental conditions (ambient temperature, humidity and pressure). Therefore, products have no problems to be used under the similar conditions to the above-mentioned. However, if products are used under the following circumstances, it may damage products and leakage of electricity and abnormal temperature may occur.

- In an atmosphere containing corrosive gas (Cl2, NH3, SOx, NOx, etc.).
- In an atmosphere containing combustible and volatile gases.
- Dusty place.
- Direct sunlight place.
- Water splashing place.
- Humid place where water condenses.
- Freezing place.

If there are possibilities for products to be used under the preceding clause, consult with Murata before actual use.

As it might be a cause of degradation or destruction to apply static electricity to products, do not apply static electricity or excessive voltage while assembling and measuring.

8. Input Power Capacity :

Products shall be used in the input power capacity as specified in this specifications.

Inform Murata beforehand, in case that the components are used beyond such input power capacity range.

This module is not approved for use when being powered by AC power lines, either directly or

indirectly through another device.

9. Limitation of Applications:

Please contact Murata before using products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

- Aircraft equipment.
- Aerospace equipment.
- Undersea equipment.
- Medical equipment.
- Transportation equipment (vehicles, trains, ships, etc.).
- Traffic signal equipment.
- Disaster prevention / crime prevention equipment.
- Data-processing equipment
- Application of similar complexity and/ or reliability requirements to the applications listed in the above.

⚠ CAUTION

PLEASE READ THIS NOTICE BEFORE USING OUR PRODUCTS.

Please make sure that your product has been evaluated and confirmed from the aspect of the fitness for the specifications of our product when our product is mounted to your product.
All the items and parameters in this product specification/datasheet/catalog have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment specified in this specification. You are requested not to use our product deviating from the condition and the environment specified in this specification.
Please note that the only warranty that we provide regarding the products is its conformance to the specifications provided herein. Accordingly, we shall not be responsible for any defects in products or equipment incorporating such products, which are caused under the conditions other than those specified in this specification.

WE HEREBY DISCLAIMS ALL OTHER WARRANTIES REGARDING THE PRODUCTS, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, THAT THEY ARE DEFECT-FREE, OR AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS.

The product shall not be used in any application listed below which requires especially high reliability for the prevention of such defect as may directly cause damage to the third party's life, body or property. You acknowledge and agree that, if you use our products in such applications, we will not be responsible for any failure to meet such requirements.
Furthermore, YOU AGREE TO INDEMNIFY AND DEFEND US AND OUR AFFILIATES AGAINST ALL CLAIMS, DAMAGES, COSTS, AND EXPENSES THAT MAY BE INCURRED, INCLUDING WITHOUT LIMITATION, ATTORNEY FEES AND COSTS, DUE TO THE USE OF OUR PRODUCTS IN SUCH APPLICATIONS.

- Aircraft equipment.
- Aerospace equipment
- Undersea equipment.
- Power plant control equipment
- Medical equipment.
- Transportation equipment (vehicles, trains, ships, elevator, etc.).
- Traffic signal equipment.
- Disaster prevention / crime prevention equipment.
- Burning / explosion control equipment
- Application of similar complexity and/ or reliability requirements to the applications listed in the above.

We expressly prohibit you from analyzing, breaking, Reverse-Engineering, remodeling altering, and reproducing our product. Our product cannot be used for the product which is prohibited from being manufactured, used, and sold by the regulations and laws in the world.

We do not warrant or represent that any license, either express or implied, is granted under any our patent right, copyright, mask work right, or our other intellectual property right relating to any combination, machine, or process in which our products or services are used. Information provided by us regarding third-party products or services does not constitute a license from us to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from us under our patents or other intellectual property.

Please do not use our products, our technical information and other data provided by us for the purpose of developing of mass-destruction weapons and the purpose of military use.
Moreover, you must comply with "foreign exchange and foreign trade law", the "U.S. export administration regulations", etc.

Please note that we may discontinue the manufacture of our products, due to reasons such as end of supply of materials and/or components from our suppliers.

Customer acknowledges that Murata will, if requested by you, conduct a failure analysis for defect or alleged defect of Products only at the level required for consumer grade Products, and thus such analysis may not always be available or be in accordance with your request (for example, in cases where the defect was caused by components in Products supplied to Murata from a third party).

By signing on specification sheet or approval sheet, you acknowledge that you are the legal representative for your company and that you understand and accept the validity of the contents herein. When you are not able to return the signed version of specification sheet or approval sheet within 90 days from receiving date of specification sheet or approval sheet, it shall be deemed to be your consent

on the content of specification sheet or approval sheet.

Customer acknowledges that engineering samples may deviate from specifications and may contain defects due to their development status.
We reject any liability or product warranty for engineering samples.
In particular we disclaim liability for damages caused by
- the use of the engineering sample other than for evaluation purposes, particularly the installation or integration in the product to be sold by you,
- deviation or lapse in function of engineering sample,
- improper use of engineering samples.

We disclaim any liability for consequential and incidental damages.

If you can't agree the above contents, you should inquire our sales.

OEM Guidance

1. Applicable FCC rules

   This module is granted by Single Modular Approval. It complies to the requirements of FCC part 15C, section 15.247 rules.

2. The specific operational use conditions

   This module can be used in IoT devices. The input voltage to the module is nominally 3.3VDC. The operational ambient temperature of the module is -30 to 85 degree C. Only the embedded PCB antenna is allowed. Any other external antenna is prohibited.

3. Limited module procedures

   N/A

4. Trace antenna design

   N/A

5. RF exposure considerations

   The equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body. If the equipment

built into a host as a portable usage, the additional RF exposure evaluation may

be required as specified by 2.1093.

6. Antenna

Antenna type: PCB antenna; Peak gain: -0.1dBi

7. Label and compliance information

An exterior label on OEM's end product can use wording such as the following:
"Contains Transmitter Module FCC ID: VPYCMWC1ZZABR" or "Contains FCC ID: VPYCMWC1ZZABR."

8. Information on test modes and additional testing requirements

a)The modular transmitter has been fully tested by the module grantee on the required number of channels,modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter,perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions).
b)The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration. It is important to note that host product manufacturers should not assume that because the modular transmitter is certified that they do not have any responsibility for final product compliance.
c)If the investigation indicates a compliance concern the host product manufacturer is obligated to mitigate the issue. Host products using a modular transmitter are subject to all the applicable individual technical rules as well as to the general conditions of operation in Sections 15.5, 15.15, and 15.29 to not cause interference. The operator of the host product will be obligated to stop operating the device until the interference have been corrected .

9. Additional testing, Part 15 Sub part B disclaimer The final host / module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

The host integrator installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation and should refer to guidance in KDB 996369. For host products with certified modular transmitter, the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a)(1) through (a)(3), or the range applicable to the digital device, as shown in Section 15.33(b)(1), whichever is the higher frequency range of investigation When testing the host product, all the transmitters must be operating.The transmitters can be enabled by using publicly-available drivers and turned on, so the transmitters are active. In certain conditions it might be appropriate to use a technology-specific call box (test set) where accessory 50 devices or drivers are not available. When testing for emissions from the unintentional radiator, the transmitter shall be placed in the receive mode or idle mode, if possible. If receive mode only is not possible then, the radio shall be passive (preferred) and/or active scanning. In these cases, this would need to enable activity on the communication BUS (i.e., PCIe, SDIO, USB) to ensure the unintentional radiator circuitry is enabled. Testing laboratories may need to add attenuation or filters depending on the signal strength of any active beacons (if applicable) from the enabled radio(s). See ANSI C63.4, ANSI C63.10 and ANSI C63.26 for further general testing details.
The product under test is set into a link/association with a partnering device, as per the normal intended use of the product. To ease testing, the product under test is set to transmit at a high duty cycle, such as by sending a file or streaming some media content.

FCC Warning:
Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. 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

ISED RSS Warning:
This device complies with Innovation, Science and Economic Development Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence.
L'exploitation est autorisée aux deux conditions suivantes:
(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.
ISED RF exposure statement:
This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. Le rayonnement de la classe b repecte ISED fixaient un environnement non contrôlés.Installation et mise en œuvre de ce matériel devrait avec échangeur distance minimale entre 20 cm ton corps.Lanceurs ou ne peuvent pas coexister cette antenne ou capteurs avec d'autres.
IC Label Instructions:
The outside of final products that contains this module device must display a label referring to the enclosed module. This exterior label can use wording such as:
"Contains Transmitter Module IC: 772C-CMWC1ZZABR",or "Contains
IC: 772C-CMWC1ZZABR", Any similar wording that expresses the same meaning may be used.
Instructions d'étiquetage IC:
L'extérieur des produits finis contenant ce module doit afficher une étiquette faisant référence au module inclus. Cette étiquette extérieure peut utiliser des libellés tels que: contient le module émetteur IC: 772C-CMWC1ZZABR "ou" contient: IC: 772C-CMWC1ZZABR ", tout libellé similaire exprimant le même sens peut être utilisé.