W-LAN Module Data Sheet

P/N: CMWC1ZZABJ-xxx

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< Specification may be changed by Murata without notice >
Murata (China) Investment Co., Ltd.

Revision History

Revision Code	Date	Description	Comments
Draft	2014-1-11	Draft	
A	2014-2-25	Update pin description Update SPI flash size Update the Top view Update storage/operation temperature Add connector information Remove reference circuit to other document	
B	2014-4-29	Add description of two antenna types Add PCB antenna layout guide Update size, top view, bottom view, footprint	
C	2015-2-5	Update module height. Add recommended land pattern. Add package and MOQ. Add power up sequence Modify host mode truth table. Update SPI flash spec	
D	2015-7-23	Update RF parameters and power consumption Add FCC/IC statement	
E	2015-7-24	Update top view and block diagram. Add the description of connector J5.	
F	2015-9-15	Update FCC statement with latest standard	
G	2015-11-17	Modified description of RF connector to be compatible with two subtypes.	

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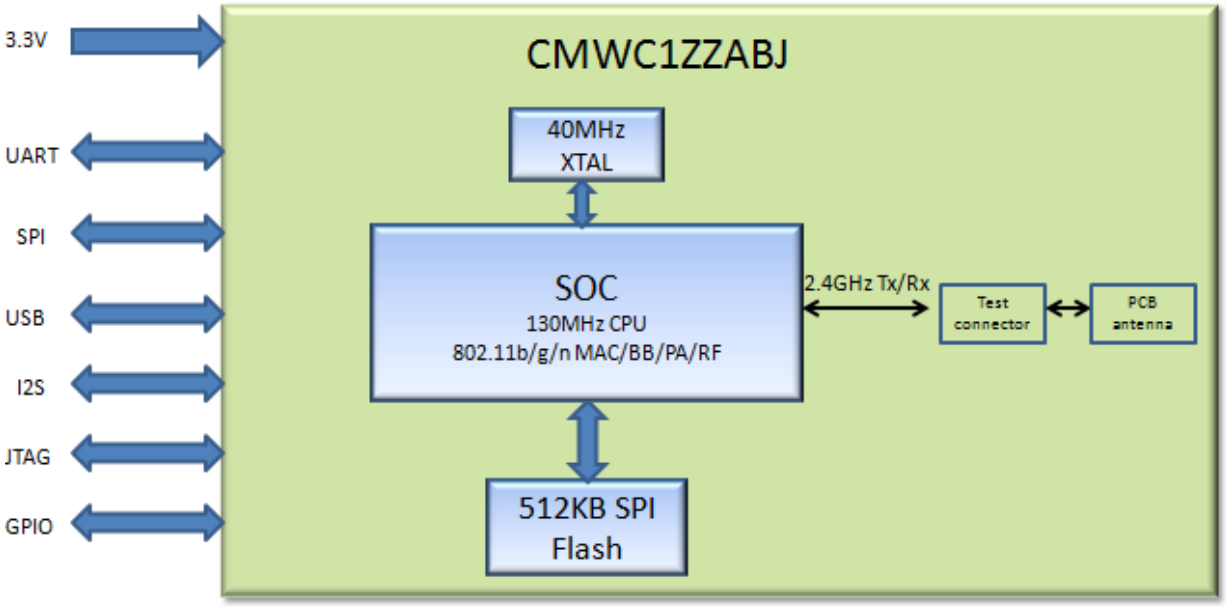
1. Feature

- Based on IEEE802.11b/g/n compliant 1x1 low power Wifi SOC.
- Host MCU optional
- 512KB SPI flash, 40MHz Xtal integrated.
- Size: 22.4*15.0*2.4(max) mm
- Internal PCB antenna
- Rich interfaces: UART, SPI, I2S, USB, JTAG, GPIO
- IEEE802.11b/g/n compliant
- Support AP mode, Station mode, and sniffer mode.
- Support WPA, WPA2 security
- Support WPS connection

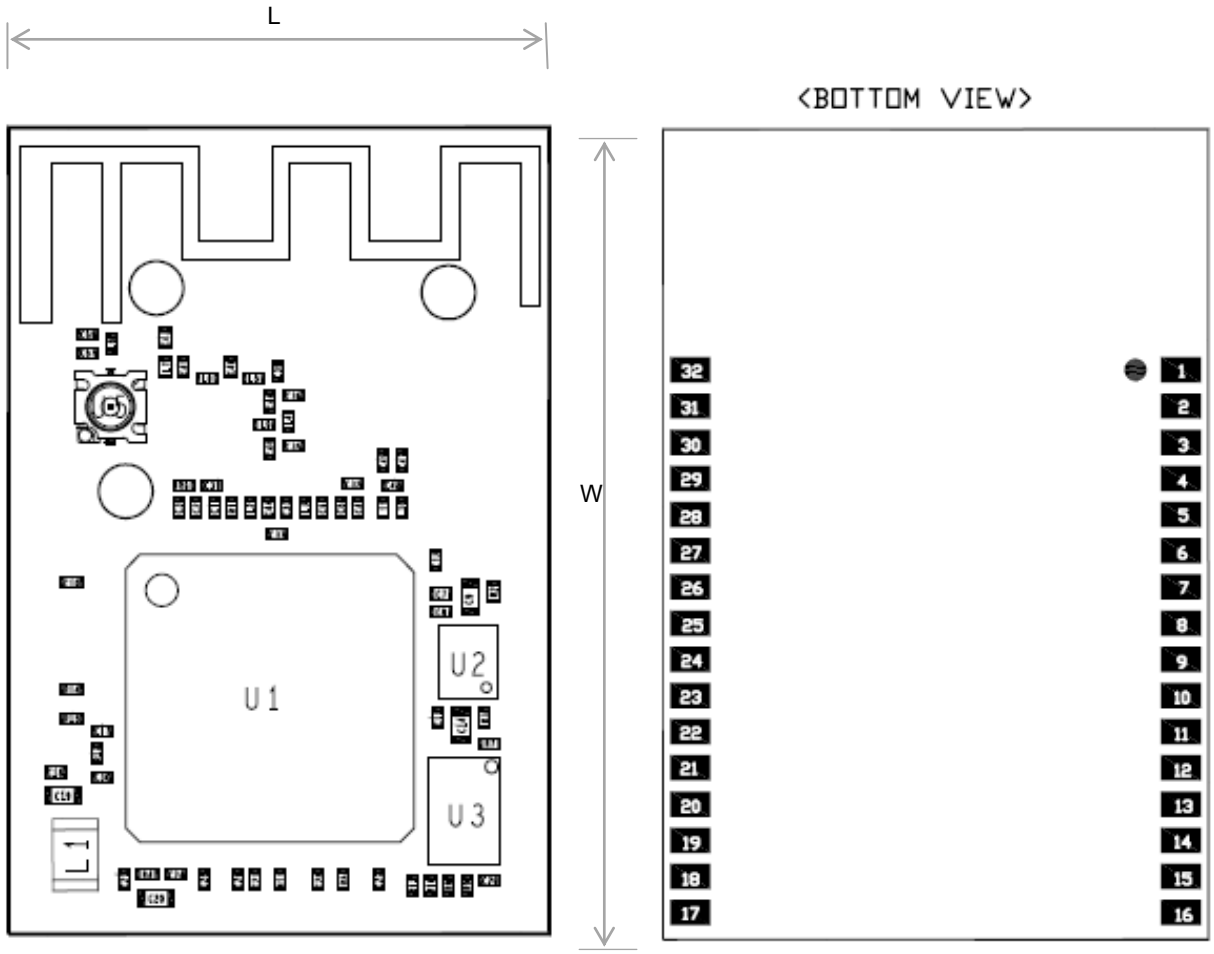
2. Part Number

CMWC1ZZABJ-xxx
(xxx will be assigned by each software in the module)

3. Block Diagram



4. Dimensions, foot print, and terminal configurations



Dimensions (unit: mm)

mark	min	typ	max
L		15.0	
W		22.4	
T(Height)	-	-	2.4

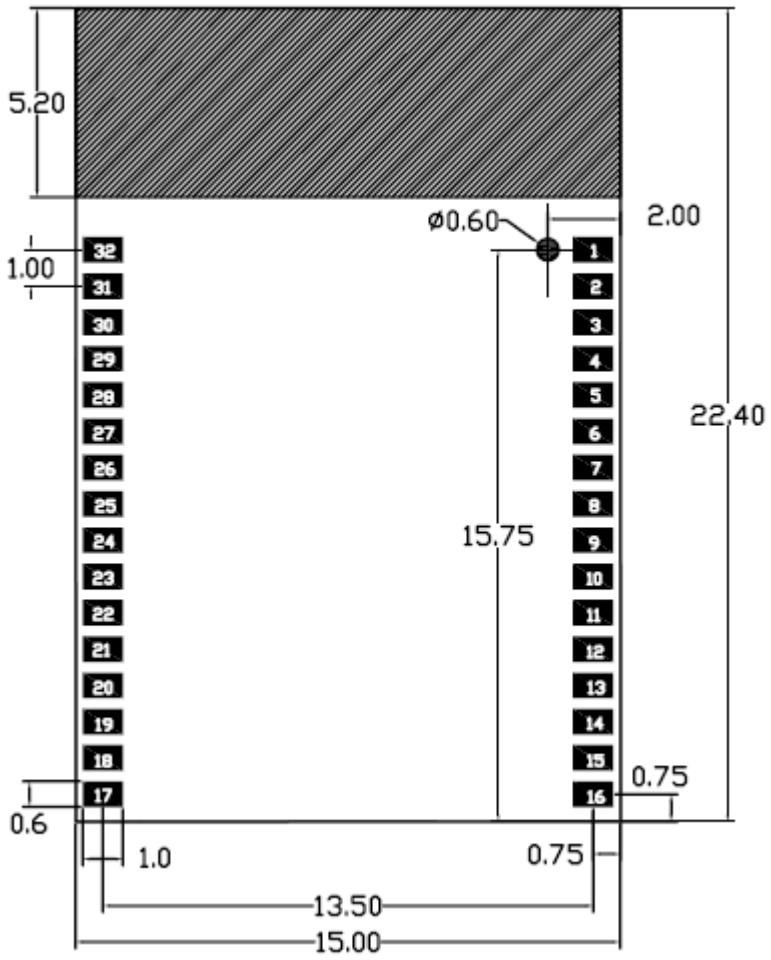
There are two subtypes to meet different applications:

Subtype 052: Adopting embedded PCB antenna.
The connector J5 is for lab/factory conducted RF test only.
Please don't use it for connecting external antenna because of the mechanical reliability.

Subtype 045: Adopting external antenna via RF receptacle.
The RF receptacle placed at J5 is used for external antenna.
Note that only reverse thread external antenna can be adopted.

Foot print

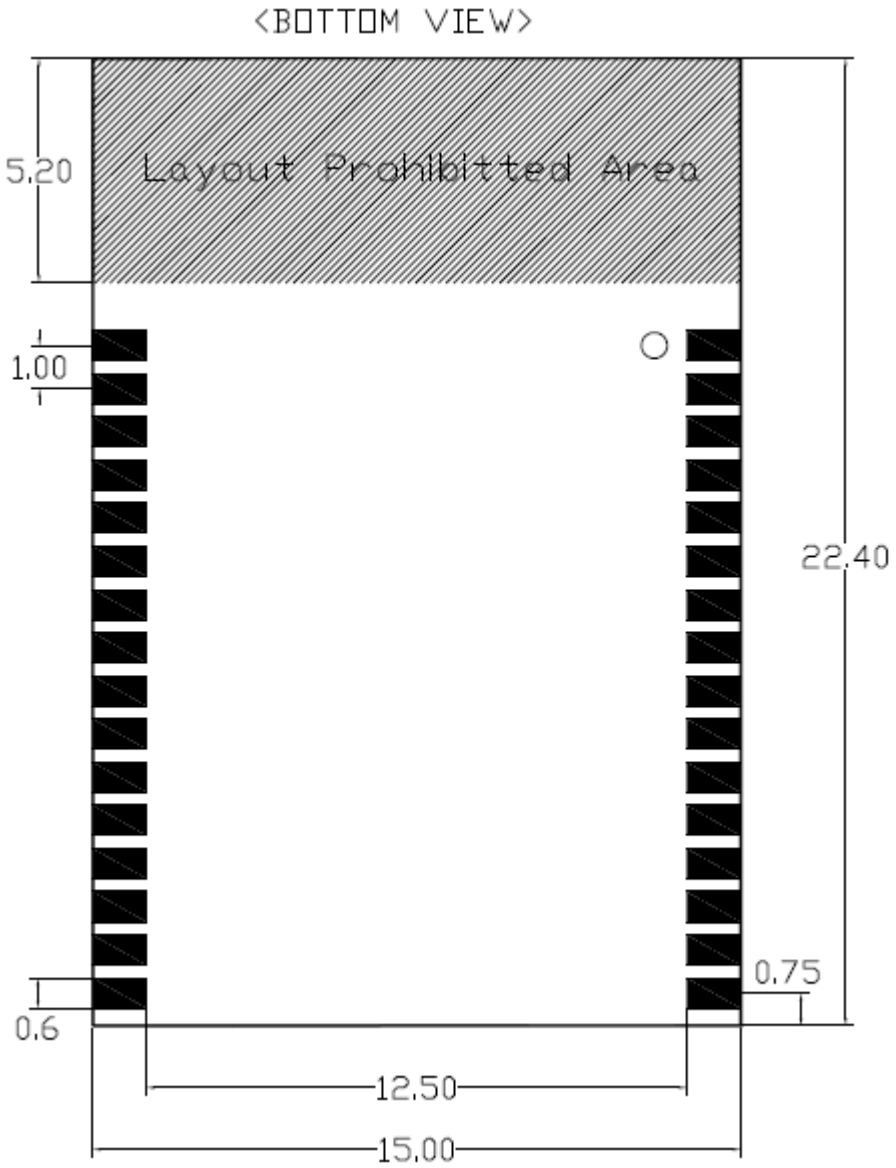
Bottom View in mm



The shadow area is PCB antenna area.
Please refer to Chapter 9: PCB antenna layout guide.

Recommended land pattern

in mm



Copper is 0.6x1.25mm and stencil is the same size.
You can design the copper length more than 1.25mm if you need.

Table 1: Terminal Configurations

No.	Terminal Name	Default function
(1)	GPIO13	Refer to Table 2 GPIO function mapping
(2)	GPIO12	
(3)	GPIO11	
(4)	GPIO10	
(5)	GPIO9	
(6)	GPIO8	
(7)	GPIO7	
(8)	GPIO6	
(9)	GPIO5	
(10)	GPIO4	
(11)	GPIO3	
(12)	GPIO2	
(13)	GPIO1	
(14)	GPIO0	
(15)	VDDIO_HOST	Connect to 3.3V host IO supply.
(16)	GND	GND
(17)	GND	GND
(18)	VDD33	VDD33
(19)	VDDIO_GPIO	Connect to 3.3V host IO supply or 1.8V peripheral IO supply
(20)	GND	GND
(21)	GPIO15	Refer to Table 2 GPIO function mapping
(22)	GPIO16	
(23)	GPIO17	
(24)	GPIO18	
(25)	GPIO19	
(26)	GPIO20	
(27)	GPIO21	
(28)	GPIO31	GPIO_31
(29)	WAKEUP_N	WAKEUP_N
(30)	CHIP_PWDn	Chip power-down control, active low
(31)	USB_DN	USB D- signal
(32)	USB_DP	USB D+ signal

** The function and status of terminals are configured by specific software.

Table 2: GPIO function mapping

GPIO	Hosted	Hostless
GPIO0	SPI_CS/HM1	SPI_CS/HM1
GPIO1	SPI_MOSI	SPI_MOSI/I2S1_BCK
GPIO2	GPIO/LED	UART0_RXD/I2S1_SDI/HM0
GPIO3	SPI_INT	SPI_INT/I2S1_SDO
GPIO4	SPI_MISO	SPI_MISO/I2S1_WS/JTAG_EN
GPIO5	SPI_CLK	SPI_CLK/I2S1_MCK
GPIO6	DEBUG_UART_RXD/TDI	I2C_DATA/TDI
GPIO7	DEBUG_UART_TXD	UART0_TXD
GPIO8	UART_RTS	UART0_RTS
GPIO9	UART_CTS	UART0_CTS
GPIO10	UART_RXD/TMS	UART1_RXD/I2S0_MCK/TMS
GPIO11	UART_TXD	UART1_TXD/I2S0_BCK/TM
GPIO12	I2C_SCK/TCK	TCK/I2C_CLK
GPIO13	I2C_SDA/TDO	TDO
GPIO15	SPIM_CLK	SPIM_CLK
GPIO16	SPIM_CS0	SPIM_CS
GPIO17	SPIM_DIO0	SPIM_MOSI
GPIO18	SPIM_DIO1	SPIM_MISO
GPIO19	SPIM_DIO2	I2S0_SDI
GPIO20	SPIM_DIO3	I2S0_SDO
GPIO21	SPIM_CS1/LED	I2S0_WS/TRST

Table 3: Host mode truth table

Host mode truth table	USB	Hosted SPI	Hostless/ UART
HM0 (GPIO2)	0	0	1
HM1 (GPIO0)	0	1	0

5. Rating

	min.	typ.	max.	unit
Storage Temperature	-40	+25	+85	deg.C
VDD33	-0.3	3.3	4.0	V
VDDIO_HOST	-0.3	3.3	4.0	V
VDDIO_GPIO	-0.3	3.3	4.0	V

6. Operating Condition

	min.	typ.	max.	unit
Operating Temperature	-30	+25	+85	deg.C
VDD33	3.14	3.3	3.46	V
VDDIO_HOST	1.71	3.3	3.46	V
VDDIO_GPIO	1.71	3.3	3.46	V

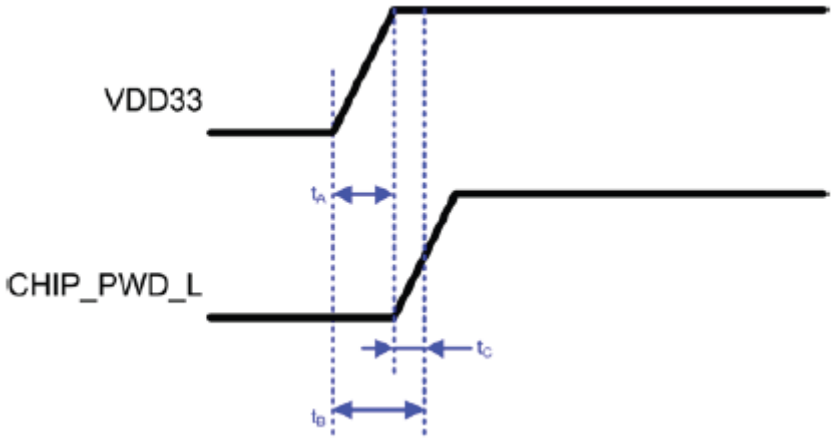
7. RF Characteristics for IEEE802.11

Conditions: 25deg.C

Items	Contents					
	Power Levels				Current consumption	
Tx Power Level	min.	typ.	max.	unit	Typ(continuous Tx mode)	Unit
802.11b (11Mbps)		17		dBm	255	mA
802.11g (54Mbps)		14		dBm	240	mA
802.11n (MCS7)		13		dBm	235	mA
Rx Minimum Input Level Sensitivity	min.	typ.	max.	unit	typ	Unit
802.11b (11Mbps)		-82		dBm	98	mA
802.11g (54Mbps)		-69		dBm		
802.11n (MCS7)		-67		dBm		

RF performance is tested at the switch connector on module.

8. Power up sequence



Parameter	Description	Min	Max	Unit
tA	Rise time of VDD33 to 90% of 3.3V	-	25	ms
tC	Time from VDD33 reaching 90% of 3.3V to the level of CHIP_PWD_L going above 0.5 * VDD33	5	-	us
tB	The value of tA+tc; during this time, the level of CHIP_PWD_L should stay below 0.5 * VDD33			

9. Module placement guide

To use internal PCB antenna, some guides must be followed in order to get best antenna performance.

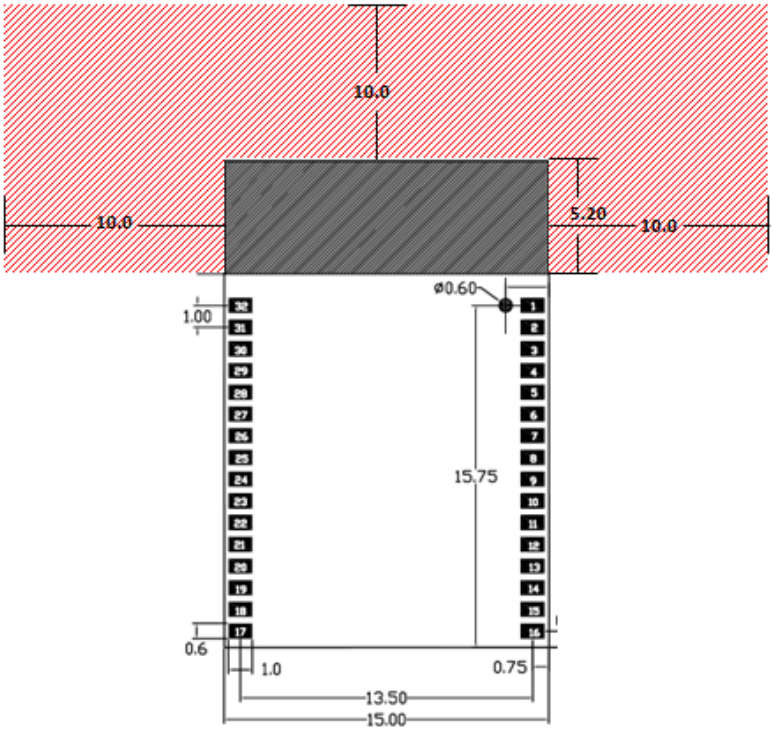
(1) Place the antenna area on the edge of the main board.

(2) NO ground, circuit, component under the antenna area (black shadow in the below picture), 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 (red shadow in the below picture)

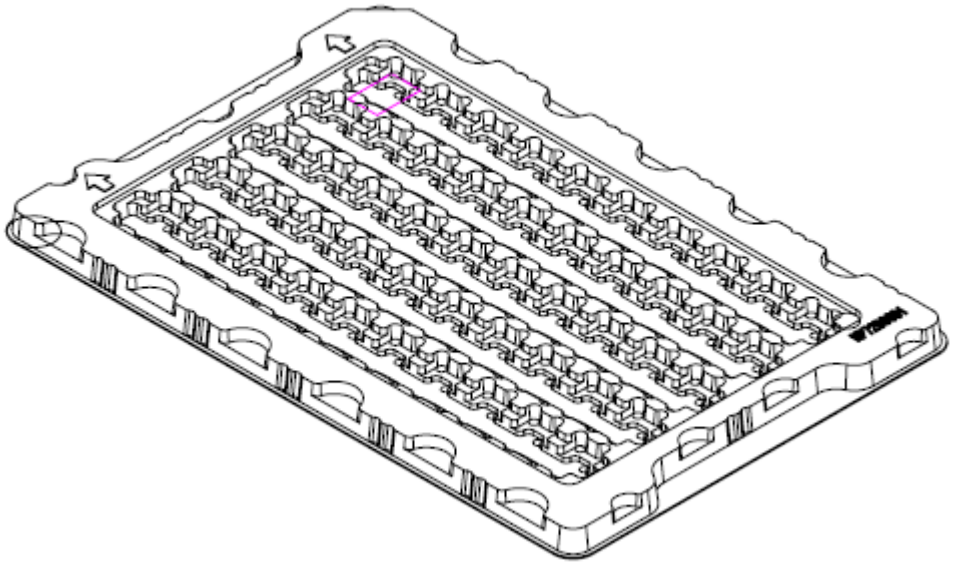
(4) Plastic case should be at least 10mm away from PCB antenna. If it's metal case, it's recommended to use external antenna.

in mm



10. Package

The module shall be packaged in below tray.



There are 50pcs modules in one tray.

Product MOQ: 1200pcs

NOTICE

1. Storage Conditions:

TBD

2. Handling Conditions :

Be careful in handling or transporting products because excessive stress or mechanical shock may break products due to the nature of ceramics structure.

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:

Carefully perform preheating so that the temperature difference (ΔT) between the solder and products surface should be in the following range. When products are immersed in solvent after mounting, pay special attention to maintain the temperature difference within 100deg.C. Soldering must be carried out by the above mentioned conditions to prevent products from damage. Contact Murata before use if concerning other soldering conditions.

Soldering method	Temperature
Soldering iron method	TBD
Reflow method	

- Soldering iron method conditions are indicated below.

Kind of iron / Item	Ceramics heater
Soldering iron wattage	TBD
Temperature of iron-tip	
Iron contact time	

- Diameter of iron-tip :
- Do not allow the iron-tip to directly touch the ceramic element.

6. Cleaning :

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 (Cl_2, NH_3, SO_x, NO_x 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 specification.
Inform Murata beforehand, in case that the components are used beyond such input power capacity range.

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.

10. FCC/IC Statement

FCC statement:
This module has been tested and found to comply with the FCC Part15.
These limits are designed to provide reasonable protection against harmful interference in approved installations.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
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.

Modifications or changes to this equipment not expressly approved by Murata Manufacturing Co., Ltd. may void the user's authority to operate this equipment.
The modular transmitter must be equipped with either a permanently affixed label or must be capable of electronically displaying its FCC identification number

(A) If using a permanently affixed label, the modular transmitter must be labeled with its own FCC identification number, and, if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: VPYCMABJ" or "Contains FCC ID: VPYCMABJ."
(B) If the modular transmitter uses an electronic display of the FCC identification number, the information must be readily accessible and visible on the modular transmitter or on the device in which it is installed. If the module is installed inside another device, then the outside of the device into which the module is installed must display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC certified transmitter module(s)."

To satisfy FCC RF Exposure requirements for mobile and base station transmission devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IC statement:
Label of the end product:
The final end product must be labeled in a visible area with the following "Contains transmitter module IC: 772C-CMABJ "

This Class B digital apparatus complies with Canadian ICES-003.
Cetappareilnumérique de la classe B estconforme à la norme NMB-003 du Canada.

This device complies with RSS-247 of the Industry Canada 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.

Ce dispositif est conforme à la norme CNR-247 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:
This equipment complies with IC 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.

Déclaration d'exposition aux radiations:
Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm

de distance entre la source de rayonnement et votre corps.

⚠ Note:

Please make sure that your product has been evaluated and confirmed against your specifications when our product is mounted to your product.

All the items and parameters in this product specification have been prescribed on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product deviating from such agreement.

We consider it not appropriate to include other terms and conditions for transaction warranty in product specifications, drawings or other technical documents. Therefore, even if your original part of this product specification includes such terms and conditions as warranty clause, product liability clause, or intellectual property infringement liability clause, we are not able to accept such terms and conditions in this product specification unless they are based on the governmental regulation or what we have agreed otherwise in a separate contact. We would like to suggest that you propose to discuss them under negotiation of contract.