

SPECIFICATION FOR APPROVAL

Declaration

CUSTOMER

客户名称: _____

CUSTOMER' S P/N

客户料号: _____

PART NUMBER

料号: _____

ISSUE DATE

日期: _____

CUSTOMER APPROVED

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A3216C2G42M100-02 Chip Antenna



※ Product Features:

- ◊ Overall is a surfacemounted device
Characterized by small volume, dw profile, and light weight
- ◊ **Bandwidth**
- ◊ **Pb-free Compliant**
- ◊ **Dimensions** 3.2x1.6x0.5mm

※ Application:

- ◊ **Bluetooth/ Wi-Fi / HomeRF**
- ◊ **ISM band 2.4GHz application**

Technical Indicator**S:**

Center frequency	2.42GHz
Bandwidth	100MHz(typ.)
highest gain	2.3dBi(typ.) (XZ-V)
Average Gain	0.6dBi(typ.) (XZ-V)
Voltage Standing Wave Ratio	<2
Impedance	50Ω
Power capacity	3 W(max)
Working temperature	-40 ~ +85 °C
Storage Temperature	-40 ~ +85 °C

Part Number Information:A 3216 C 2G42 M100 - 02

A	Antenna	2G42	Center frequency is 2.42G
3216	Size 3.2x1.6	M100	Bandwidth100M
C	Capacitive	02	ProductModel

Structure Description:



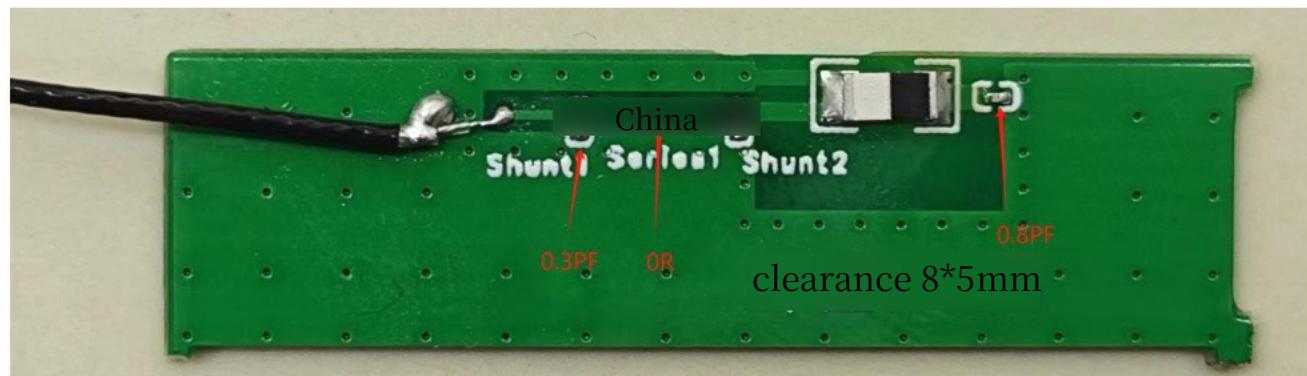
Pin No.	1	2
	Feed end	Fix end
Note: One of these pads connects to the RF signal, the other one is for mechanical fix and does not receive any signal. White is the antenna feed marking.		

Size Description:



Unit (mm)	L	W	H	A1
Dimensions	3.2 ± 0.05	1.6 ± 0.05	0.52 ± 0.05	0.35 ± 0.05

Antenna Placement and Clearance Treatment and Matching Network Scheme



Value of matching components	Shunt 1	0.3pF
ice V	Match Series 1 of the string device	0R
h Dev	Parallel device Shunt 2	NC
	Series 2 of the string device	0.8pF

Any type of antenna needs to be impedance matched to ensure that the antenna's performance meets the requirements of the impedance specification, the A3216C2G42M100-02 chip antenna also needs to add matching network to ensure that the antenna's performance meets the standard.

Three matching devices jointly make up the π -type matching network, which is used for the impedance matching of the A3216C2G42M100-02 SMD antenna. The specific device values of these matching devices need to be obtained after the antenna impedance matching and adjustment. The device values shown in the above picture are the values of our test circuit board and can be used as reference values. If you do not have high requirements for antenna performance, you can also directly use the above reference values.

The trace width should be designed to match a 50 ohm characteristic impedance based on the PCB material and thickness.

It is recommended that the antenna be placed at the edge or corner of the board. Do not place the antenna in the middle of the board. Do not allow the antenna to be surrounded by conductors.

Gaps are necessary near the antenna area of the circuit board. The blank areas (white areas) on the circuit board shown above are the clearance areas for the antenna. The so-called clearance area refers to the area where no laying or routing is allowed except for the antenna pad and antenna signal routing. The clearance in this area should be processed for all layers of the PCB board, not just the surface layer.

The antenna's clearance area should be as large as possible, and the antenna should be placed as close to the edge of the circuit board as possible, so that the antenna body is away from the circuit board. The larger the clearance, the better the antenna efficiency and gain performance.

For the structure of the whole device, it is suggested that there shall be no conductor in the overhead area above or below the direction of PCB when viewed from above, otherwise it will affect the antenna performance.

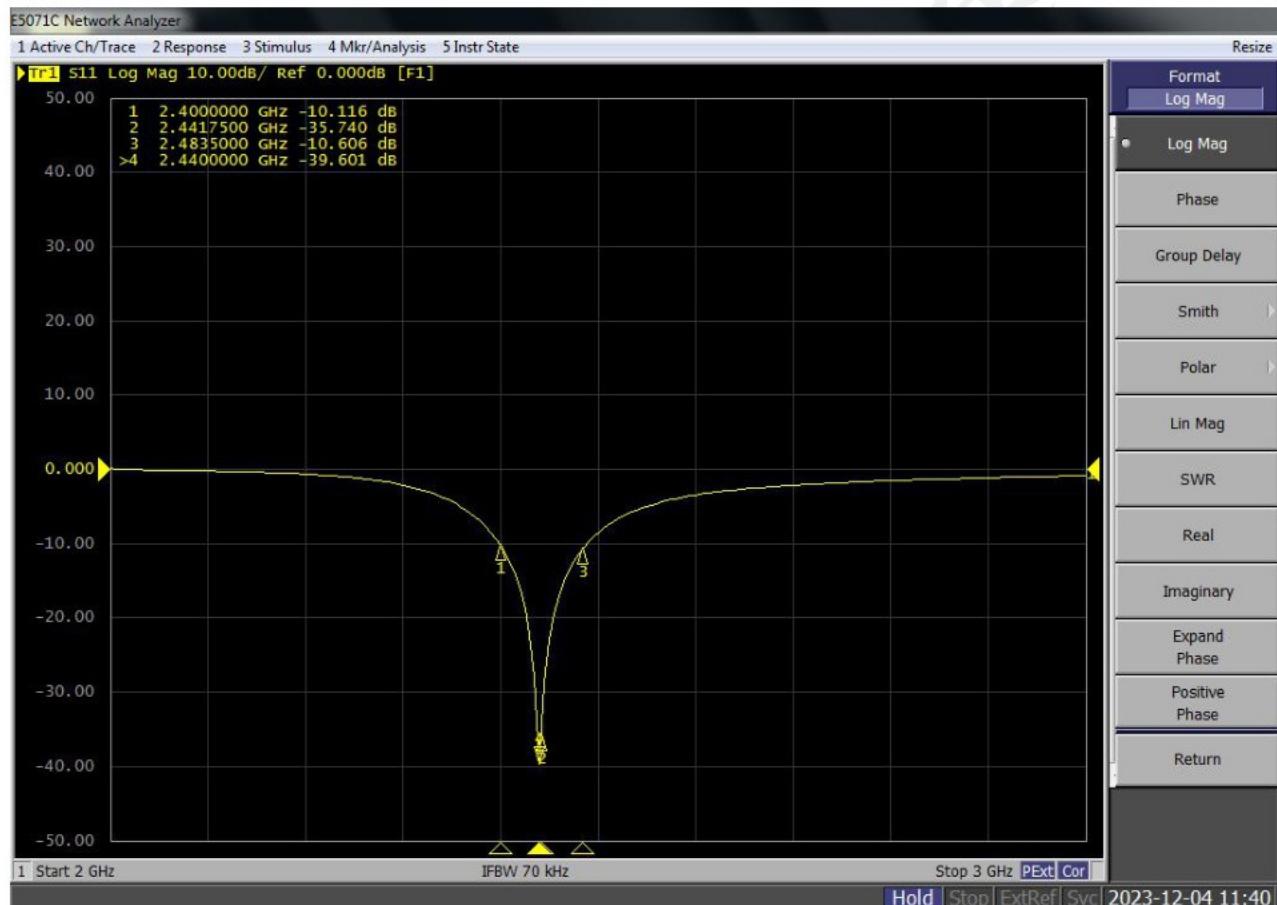
Non-clear areas shall be paved, and the layers shall be connected through holes to increase the ground as much as possible.

The equipment used for antenna matching debugging is a network analyzer. If you are an antenna specialist, you can use the network analyzer built into the network for antenna matching debugging. If you do not have the relevant technology, please contact us and we can provide you with professional antenna impedance debugging services. Antenna matching debugging requires the provision of the entire product (no need to open).

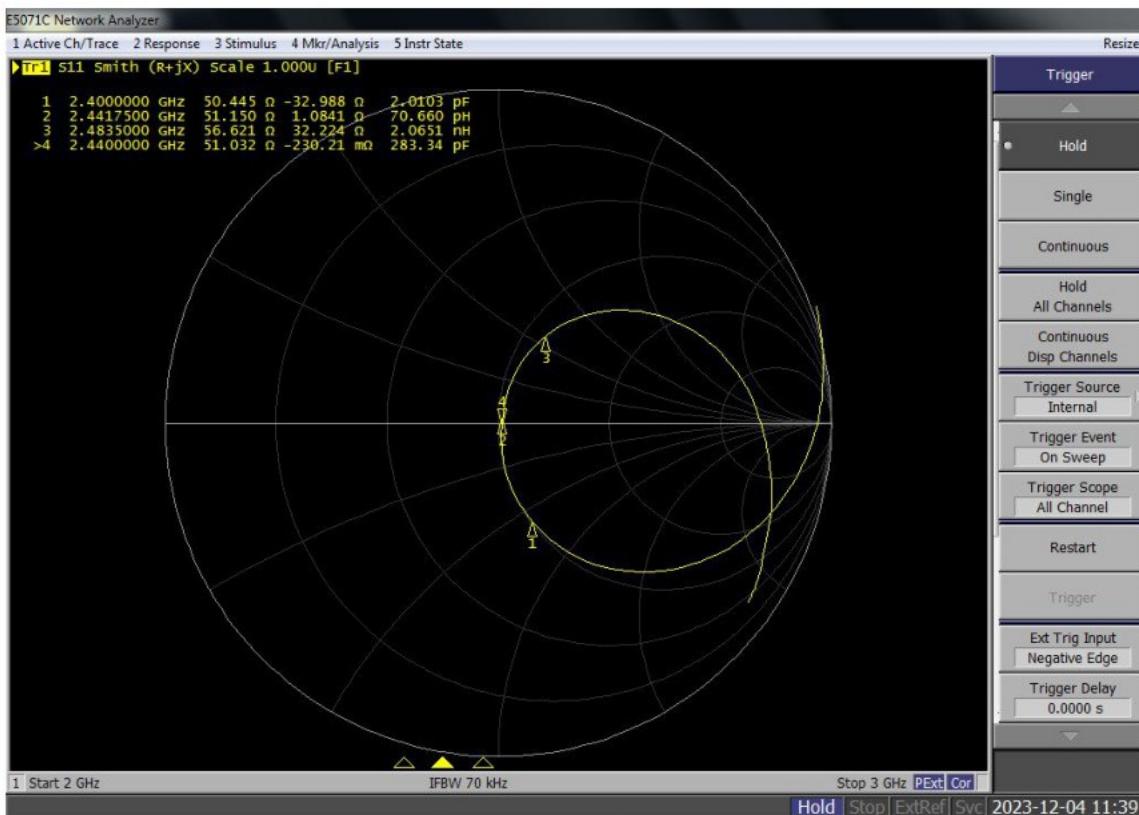
Please note that the antenna impedance matching adjustment mentioned here has nothing to do with the RF line impedance control. The RF line impedance control only adjusts the RF line wiring in the paved area, and the antenna impedance matched here is the antenna. Do not confuse the two.

2. The performance parameters after antenna matching commissioning are shown in the following figure:

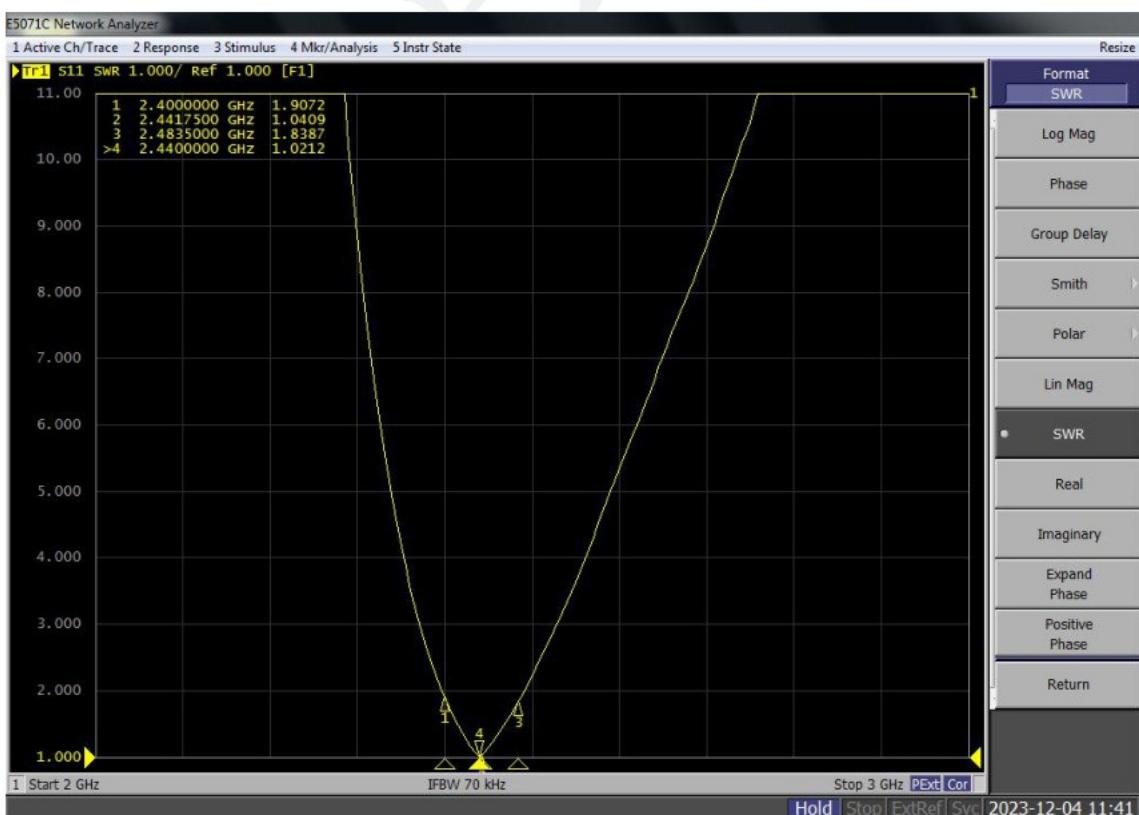
S11 Log Mag :



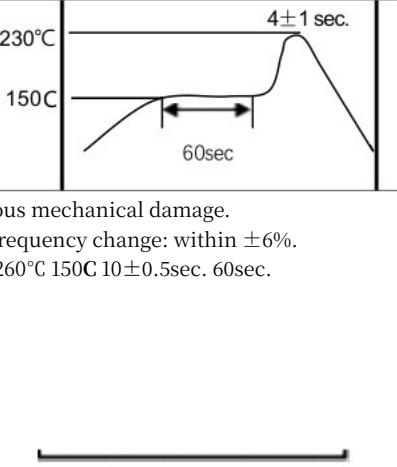
S11 Smith R+jx :



S11SWR :



3. Reliability and Test Conditions

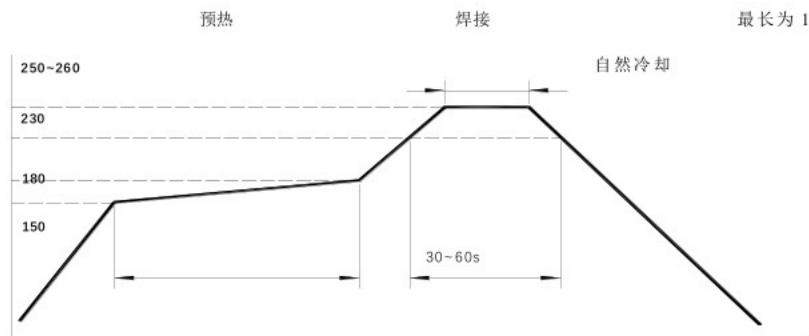
Project	demand	TEST CONDITION															
Weldability test	<p>1. Wet adhesion should exceed 90% coverage 2. No visible mechanical damage</p> <p>temperature</p> 	Heating temperature:150°C / 60 seconds. Welding temperature:230±5°C Duration:4±1 seconds. Welding: Sn-Ag3.0-Cu0.5 Lead-free solder:Rosin															
Solderability	<p>1. No obvious mechanical damage.</p> <p>2. Center frequency change: within ±6%.</p> <p>TEMP (C) 260°C 150C 10±0.5sec. 60sec.</p> 	Heating temperature:150°C / 60 seconds. Welding temperature:260±5°C Dwell time:10±0.5 seconds. Welding:Sn-Ag3.0-Cu0.5 Lead-free solder:Rosin															
Component adhesion (push-off test)	1. No obvious mechanical damage	The device should be reflow soldered (230 ± 5°C for 10 seconds) to a tin-plated copper substrate, with a force gauge applied to the side of the component. The equipment must have a -st- f 0.5 kg and not terminate connected to the component.															
Component adhesion (tensile test)	1. No obvious mechanical damage	Insert a 10 cm piece of wire into the remaining open eye loop. The two ends of the wire are evenly wound together. The terminals should not be obviously damaged.															
Heat shock	<p>1. No obvious mechanical damage.</p> <p>2. Center frequency variation: within ±6%.</p> <table border="1"> <thead> <tr> <th>Stage</th> <th>Temperature (C)</th> <th>Time (min)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+110±5C</td> <td>30±3</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>in 3 seconds</td> </tr> <tr> <td>3</td> <td>-40±2C</td> <td>30±3</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>in 3 seconds</td> </tr> </tbody> </table>	Stage	Temperature (C)	Time (min)	1	+110±5C	30±3	2	Room Temperature	in 3 seconds	3	-40±2C	30±3	4	Room Temperature	in 3 seconds	+ 110 c => 30±3 minutes-40 c => 30±3 minutesTest cycle: 10 cyclesChip is stable for 2~3 hours under normal conditions before measurement.
Stage	Temperature (C)	Time (min)															
1	+110±5C	30±3															
2	Room Temperature	in 3 seconds															
3	-40±2C	30±3															
4	Room Temperature	in 3 seconds															
Withstand high temperature	<p>1. No obvious mechanical damage</p> <p>2. Center frequency change: within ±6%</p> <p>3. No disconnection or short circuit</p>	Temperature: +110 ± 5°CDuration: 1000 ± 12hBefore measurement, the chip should stabilize in a normal state for 2~3 hours.															
Low temperature resistance	<p>1. No obvious mechanical damage</p> <p>2. Center frequency change: within ±6%</p> <p>3. No disconnection or short circuit</p>	Temperature: -40 ± 5°C Duration: 1000 ± 12 hours Wait for 2~3 hours for the chip to stabilize under normal conditions before taking measurements.															

潮湿测试	1. 无明显机械损伤 2. 中心频率变化: $\pm 6\%$ 以内 3. 无断开或短路	温度:40 ± 2 °C 湿度:90% ~ 95% RH 持续时间:1000 ± 12 h 测量前, 芯片应稳定在正常状态2~3小时。
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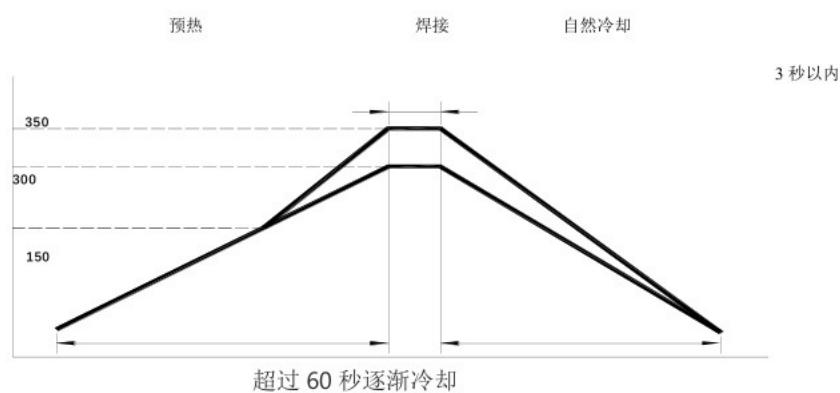
4. Welding Process

For moderate activation, rosin-based fluxes are preferred. Too little solder causes stress breaks due to different expansion coefficients between the solder, chip, and substrate. Terminals are suitable for all wave and reflow systems. If hand soldering is unavoidable, the preferred technique is to use a hot air soldering tool.

回流焊



烙铁钎焊



The recommended temperature profile for reflow soldering is shown in Fig. 1.

Due to inherent process control limitations of soldering iron connections, the use of soldering iron connections for products is discouraged. If the use of a soldering iron is necessary, the following precautionary measures are recommended.

- Pre-heat circuit and product to 150°C
- Do not touch ceramic to iron tip
- Use 20 watt soldering iron, iron tip diameter 1.0 mm
- Tip temperature (maximum) 280°C
- Pin tip diameter (maximum 1.0 mm)
- Limit soldering time to 3 seconds.

5. A3216C2G42M100-02 Ceramic Chip Antenna User Alert

1. Chip antennas are made of ceramic materials which are harder and more fragile than the PCB materials they are attached to. Application of force that flexes the PCB in the area where the chip antenna is can lead to cracks in the solder joints or in the antenna itself.
2. The antenna should be placed in the corner of the PCB, with sufficient clearance to other circuits, and no components, planes, mounting screws, or traces should be placed within the antenna's keepout area on any layer. The actual keepout area depends on the antenna used.
3. Ceramic antennas are used as embedded antennas, the influence of PCB metal and housing should be avoided as much as possible, therefore, direct use often results in performance issues, and can not be used directly, and must be debugged for your own product.
4. When performing ultrasonic welding near the chip antenna location, care should be taken. Intense ultrasonic vibrations can cause cracking of the chip antenna solder.
5. The above data was measured on the reference PCB (grounded) as shown in this specification. When the position or size of the antenna on the PCB changes, the antenna performance and the values of the matching components may be different from the data shown here.
6. The information provided in this reference is considered to be correct on the date of publication. Guangdong Dongyou Technology Co., Ltd. reserves the right to modify the reference specifications without separate notice due to technical improvements, etc. Please consult the company's engineering team for the latest information before using this product. Based on the customer's requirements, we can provide suggestions and assistance for the installation of this antenna on the customer's equipment by simulating or actually measuring the device of interest in our test facilities.