A BRAND OF AKOUSTIS

RFM Integrated Device, Inc.

PRODUCT SPECIFICATION

Part Number: ANT1047

Description:
ANTENNA,
DIELECTRIC,2450 MHz,
BW 100 MHz,
PEAK GAIN: -0.5 dBi

1 SCOPE

This specification covers the dielectric chip antenna for **WIFI**.

2 Name of the product

This product is named **“Dielectric Chip Antenna”** .

3 Electrical characteristics

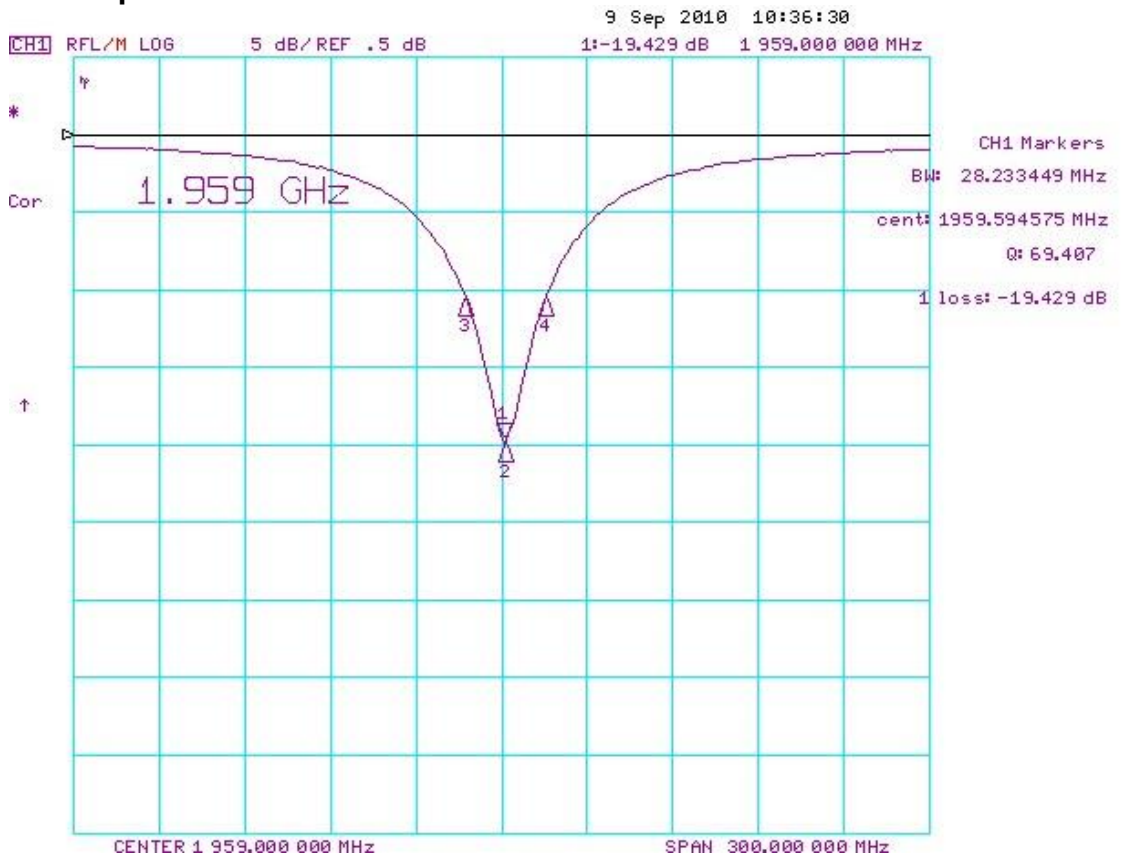
3-1 Electrical characteristics of antenna

The antenna has the electrical characteristics given in Table 1 under the standard installation conditions shown in the figure of Evaluation Board.

Table 1

No	Parameter	Specification
1	Working Frequency	2450±50MHz
2	Bandwidth	100MHz min (@ -7.5dB)
3	Dimension	7×2×2mm
4	VSWR	2.0 max* (@ Center Frequency)
5	Peak Gain	-0.5 dBi*
6	Polarization	Linear
7	Azimuth	Omni-directional
8	Impedance	50 Ohm
9	Operating Temperature	-40~85℃
10	Termination	Ag (Environmentally-Friendly Pb Free)
11	Weight	0.15g/pcs

S11 Response curve



4. Environmental conditions

4-1 Operating conditions

The antenna has the electrical characteristics given in Tables 1 in the temperature range of -40℃ to +85℃ and under the environmental conditions of +40℃ and 0-95 % r.h..

4-2 Storage temperature range

The storage temperature range of product is -40℃ to +85℃

5. Reliability tests

5-1. Low-temperature test

Expose the specimen to -40℃ for 400 hours and then to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

5-2 High-temperature test

Expose the specimen to +105℃ for 400 hours and then to normal temperature/humidity for 24 hours or more. After this test, examine its appearance and functions.

6. Inspection

As for the examination in the mass production, the receiving character of the ratio wave sent in a shield box from the standard antenna and VSWR are confirmed in the picking out examination.

7. Warranty

If any defect occurs form the product during proper use within a year after delivery, it will be repaired or replaced free of charge.

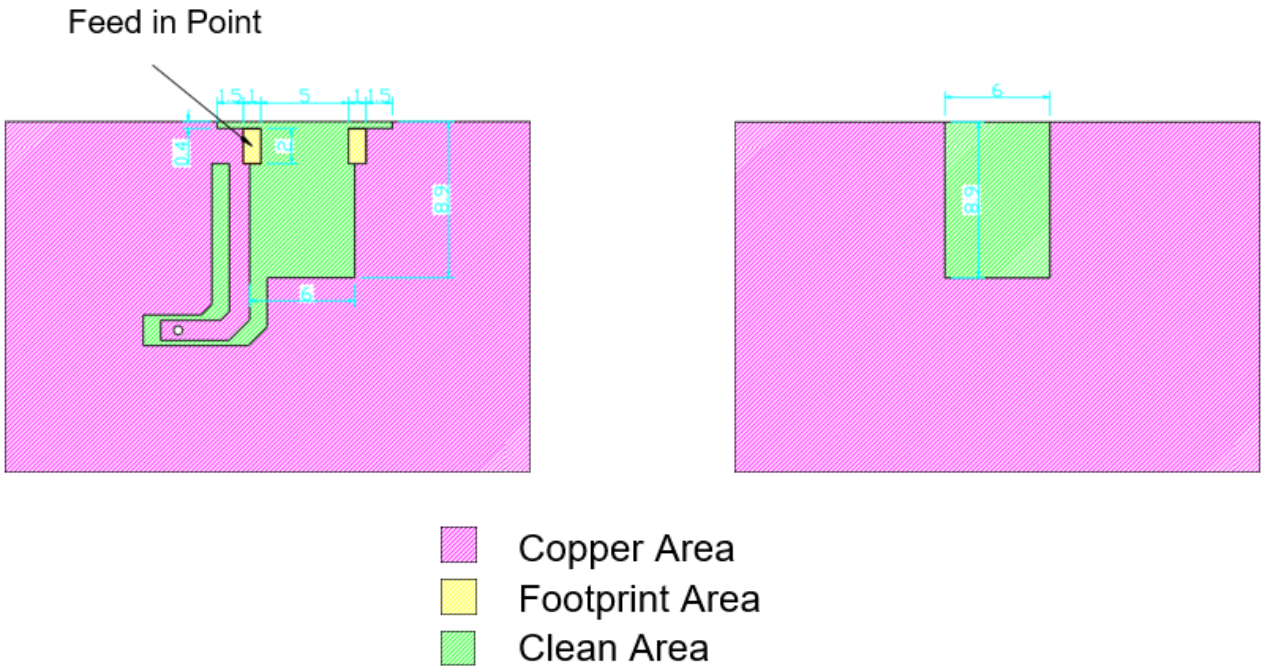
8. Other

Any question arising from this specification manual shall be solved by arrangement made by both parties.

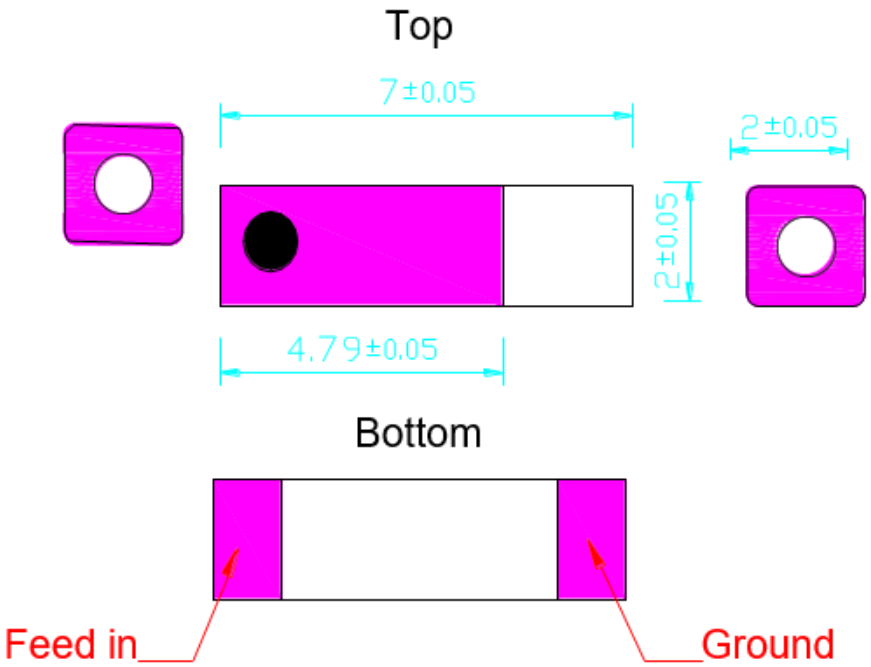
9. Precautions for use

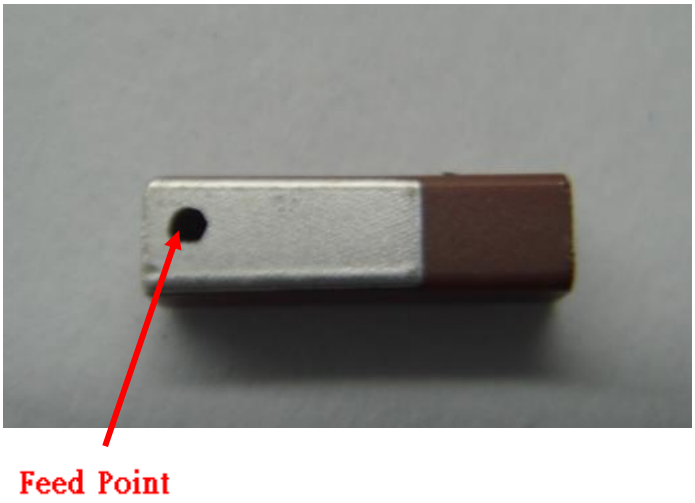
- Antenna pattern use a Ag electrode.
- Please don't use the corrosion gas (sulfur gas, chlorine gas) in the atmosphere.
- Please don't direct solder onto the sliver electrode of antenna pattern.

10. Recommend Foot Print

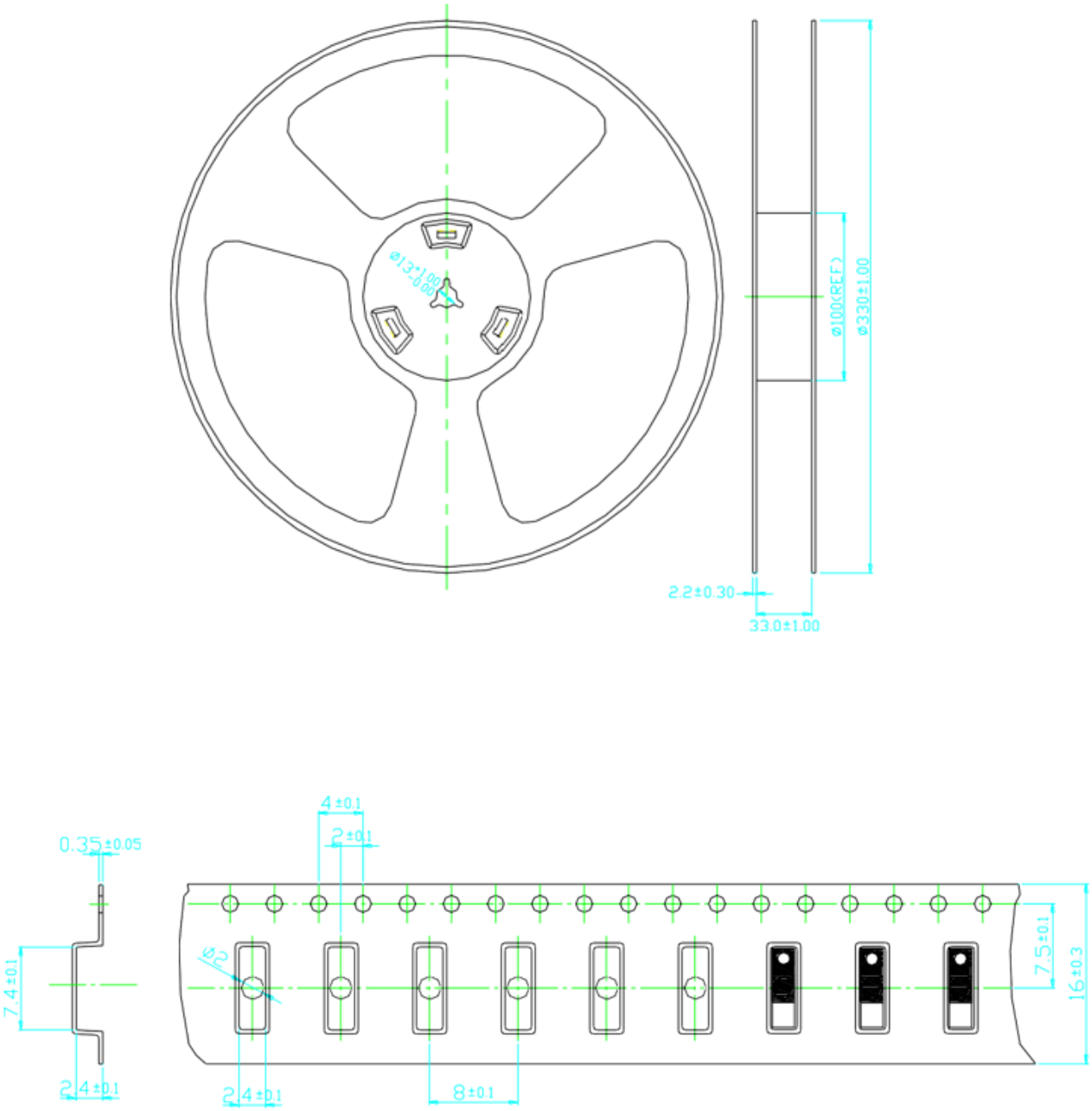


11. Shape and Dimension





12. Delivery mode



FAQ:

1.What is radio wave?

Radio waves are waves produced by the interaction of time -varying electric and magnetic fields. More properly they are referred to as electromagnetic waves. With the Wireless Telegraphy Act it was decided that all electromagnetic waves with a frequency below 3,000GHz would be called radio waves.

2. What is antenna?

An antenna converts electrical energy to radio waves and transmits them into the sky as well as collecting radio waves from the sky and converting them to electrical energy.

3.What is good antenna (1)?

As antenna serves as the electrical power conversion device between a circuit and the air, the keys to it's efficiency are as follows:
(1) Input characteristics with the contact point on the circuit side
(2) Radiation characteristics from the contact point to the air
Input Characteristics
Electric power is supplied efficiently to the antenna without reflecting back into the circuit at the feeding point
> If the impedance between the antenna and the feed line is not matched correctly, the signal will reflect back and no power will be supplied to the antenna.
Radiation Characteristics
The power supplied to the antenna is not lost within the antenna but is transmitted as a radio wave.
> If the antenna is made of high loss material (conductors and dielectrics), then the power that was supplied to the antenna will be dissipated into heat and lost.

4. What is good antenna (2)?

The characteristics of a general antenna are shown below.

(1) Input Characteristics

Frequency - Return loss chart …where the return loss is low, indicates that the antenna is Frequency – VSWR chart … …well matched at that frequency. In the same way, a low value shows a good matching of the antenna.
* Bandwidth … The antenna is good to the extent of good matching and the width of the frequency domain.

(2) Radiation Characteristics

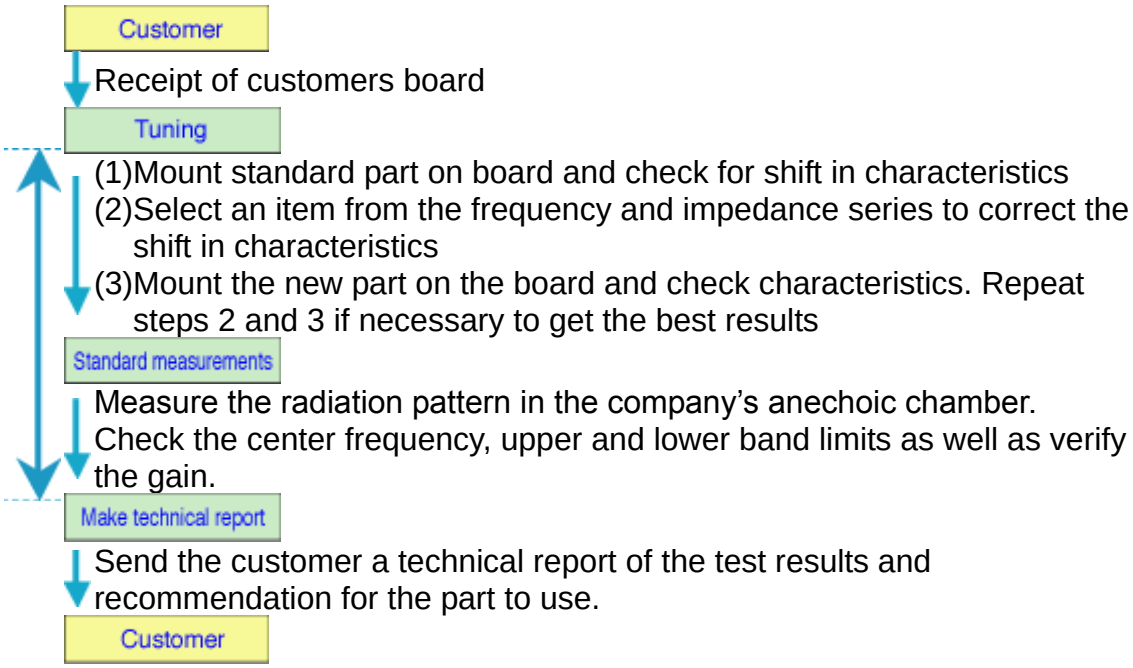
Radiation pattern …The strength of the antenna emission is displayed.
It shows that antennas emit well in their projected direction.
It is usually displayed in three planes (XY, YZ and ZX planes).
Gain [dBd] … …Given as a ratio to a standard antenna (half wave dipole).
Usually displayed as the average of the three planes (XY, YZ and ZX planes).
Designated as a combination of the vertical and horizontal polarity power gains.

5. Importance of tuning?

Because many things, such as the board shape, surrounding components and the case covering the board, can affect the characteristics of an antenna, most designs require customization of the antenna to compensate for the shift in characteristics. Correcting the shift in the characteristics of the antenna is known as tuning. For this work, having lots of experience from adjusting many items and equipment is where an antenna maker can really show their strengths.

This experience can really help the user in getting the help needed for a quick product design.

6. Our workflow for tuning?



7. Why can we response so quickly?

(1) We have anticipated the characteristic shifts and created a series of parts that match those shifts and corrects them.

- Frequency Series Parts

  When an antenna is mounted, the center frequency will shift due to surrounding elements. These parts will bring that frequency back to the proper center frequency. There are 18 values available in 29MHz steps.

- Impendence Series Parts

  The impedance of an antenna will appear different depending on the shape of the board and other items surrounding the antenna. Normally in these situations, designers will make a matching circuit by adding capacitors or inductors, we however have created antennas with 3 different impedances values, so a standard antenna can be quickly matched to the design without any modifications to the circuit.

(2) Complete Measurement Environment

Our facilities are complete with a full anechoic chamber and all required test equipment for quick and complete testing.

(3) Standard Data Reporting

Using standardized data forms, the information can quickly be assembled into a report.

* If a verbal reply is sufficient, we can reply within 2 days of receiving the customer's board.

8. How to select the correct antenna?

It is important to select the correct antenna for the application.

1) Important Information about Small Antennas!

As for chip antennas, you must consider the ground plane surrounding the area the chip is mounted. When using a small antenna it is often necessary to make a large ground plan to improve the characteristics of the antenna, the results is a larger area on the board for the antenna. Also, since small antennas typically are lambda/4 type antennas, a large GND is also important. In fact if the GND is not large enough, there are some small antennas that will not operate.

> We consider the ground plane area in addition to the area for mounting antenna as a set, and can propose the optimum configuration for both.

Also, if there is room in your design, the larger antenna you can use the better off you will be. (It has been theoretically proven that as an antenna becomes smaller the performance deteriorates.)

2) Use Directivity Appropriately!

When you know the direction of the transmission, you should choose to use a directional antenna. If you don't, you will scatter the radio waves and the power will be wasted.

Also, as seen in the recent case with SAR, directional antennas were best to effectively isolate the body.

> We have both directional and omni directional antennas, so please consider what are best for your application.

3) Pitfall of Broadband Antennas!

For return loss characteristics, the loss amount is a combination of the transmission power and the power lost. Even in the case where the power loss is great and there is no transmission at all, the antenna may be seen as having very good broadband characteristics. To best judge the band, the gain's frequency characteristics should be judged.

> The standard data we submit then is the average gain for the necessary frequency.

4) Losses for the Matching Circuit!

This circuit is used to match the impedance at the feed of the antenna. In actuality, this circuit is also the primary cause of power loss. In addition, this circuit takes up additional space on the board, adding to the total area required for the antenna. If however, the antenna's impedance is matched with the characteristic impedance from the beginning, there is no need for this circuit.

> We do not use matching circuits, but instead have the ability to tune the antenna to match the impedance.