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### Introduction

LPRS's ceramic chip antenna is designed for use within the ISM 915MHz frequency bands, covering frequencies from 902MHz ~ 928MHz.

Perfect for applications where the antenna must be mounted internally within an product enclosure, the LPRS-CCA-915 offers excellent RF performance and is fully compatible with surface mount production processes, enabling low assembly cost, improved quality and consistency.

### Features

- Stable and reliable performance.
- Low profile, compact size.
- RoHS 3 compliant.
- SMD process compatible.
- Smart Home.

### Applications

- Ideal for any ISM RF application.
- Short Range Devices (SRD).
- Wireless Sensors.
- Internet of Things.
- IEEE 802.11ah/Wi-Fi Certified HaLow Technology

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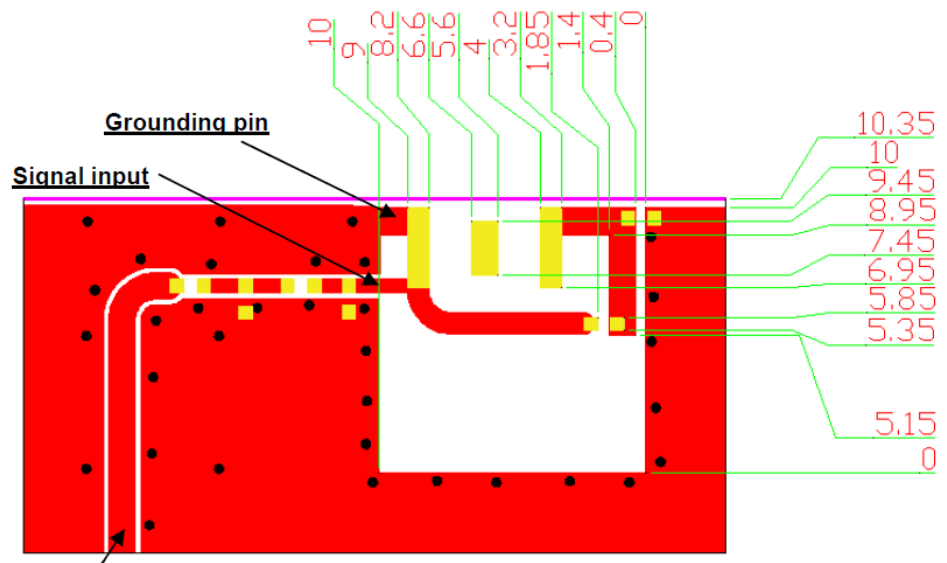
**I. Layout Guide and Electrical Specifications**

Transmission Line with 50Ω Impedance Characteristic

Figure 1 Layout Guide Top View (mm)

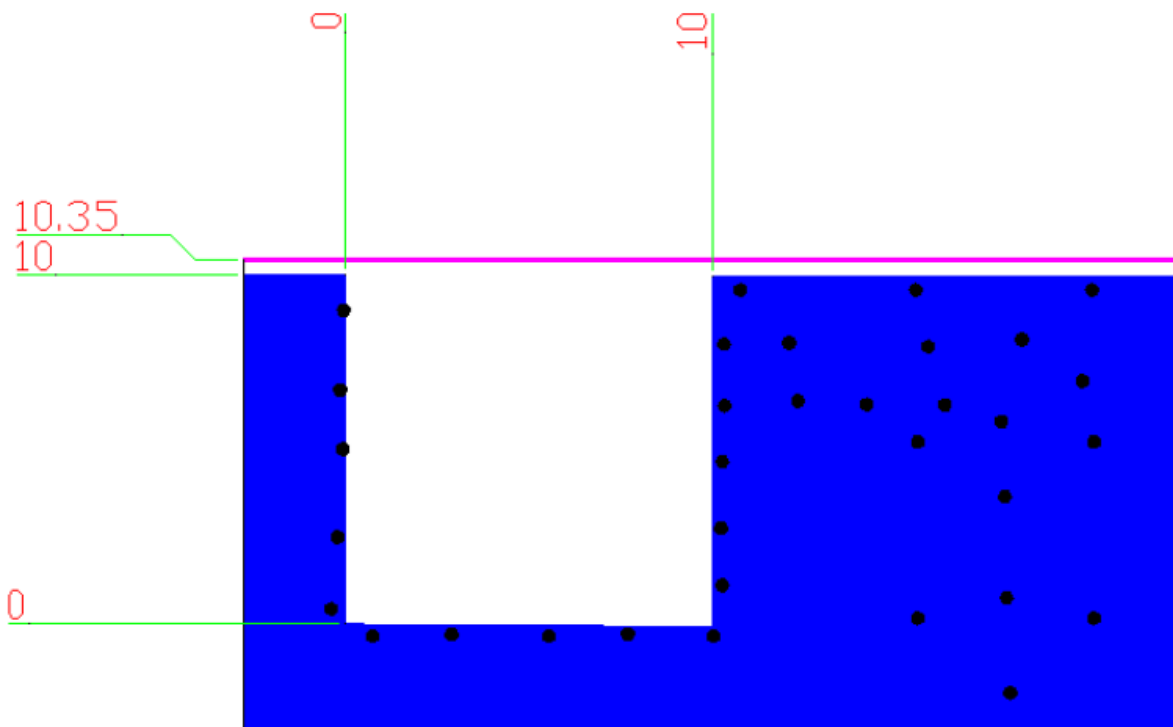


Figure 2 Layout guide Bottom View (mm)

**I.1 Solder Land Pattern:**

The solder land pattern (gold marking areas) is shown above in Figure 1. Recommendations on matching circuit will be provided according to customer's installation conditions.

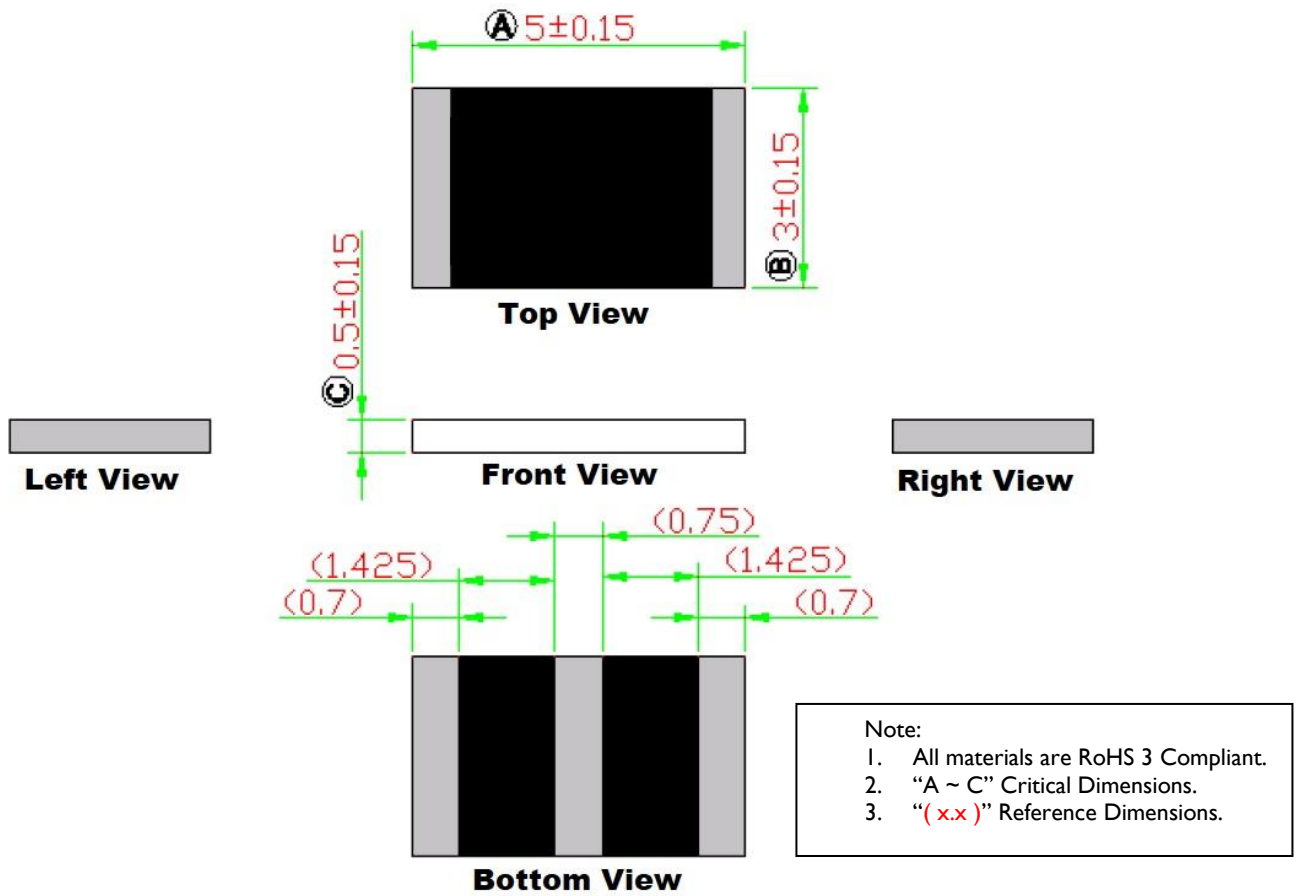
**2. Antenna Outline Dimensions**


Figure 3 Physical Dimensions (mm)

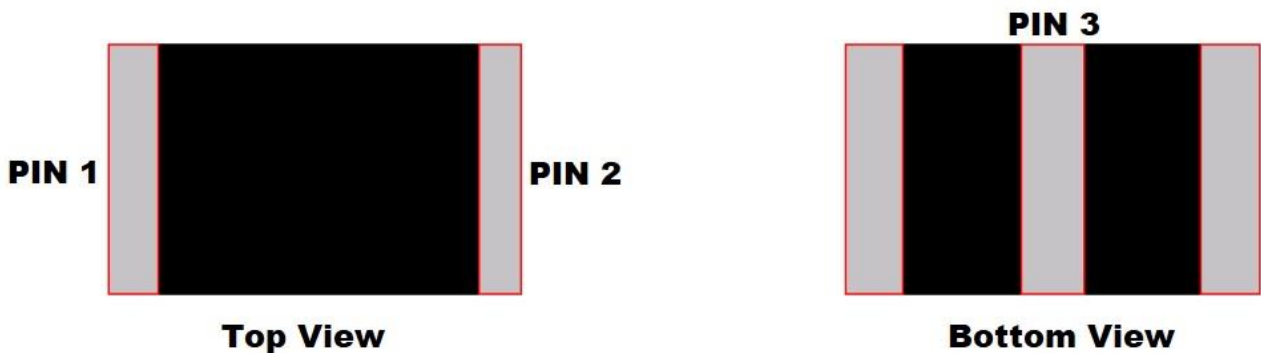
**2.1. Pin Definitions.**


Figure 4 Pin Assignments

Pin	1	2	3
Soldering Pad	Signal	Tuning / Ground	N/C

**3. Electrical Specifications (Based on Evaluation Board Dimensions: 80 x 40 mm<sup>2</sup>)**

Characteristics		Specifications	Unit
Outline Dimensions		5.0 x 3.0 x 0.5	mm
Ground Plane Dimensions		80 x 40	mm
Working Frequency		902 ~ 928	MHz
VSWR (@ centre frequency) *		2	
Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@915 MHz)	0.3 (Typical)**	dBi
Efficiency		52 (Typical)**	%

\* Centre frequency means the frequency with the lowest value in return loss of the chip antenna on the evaluation board

\*\* A typical value is for reference only, not guaranteed.

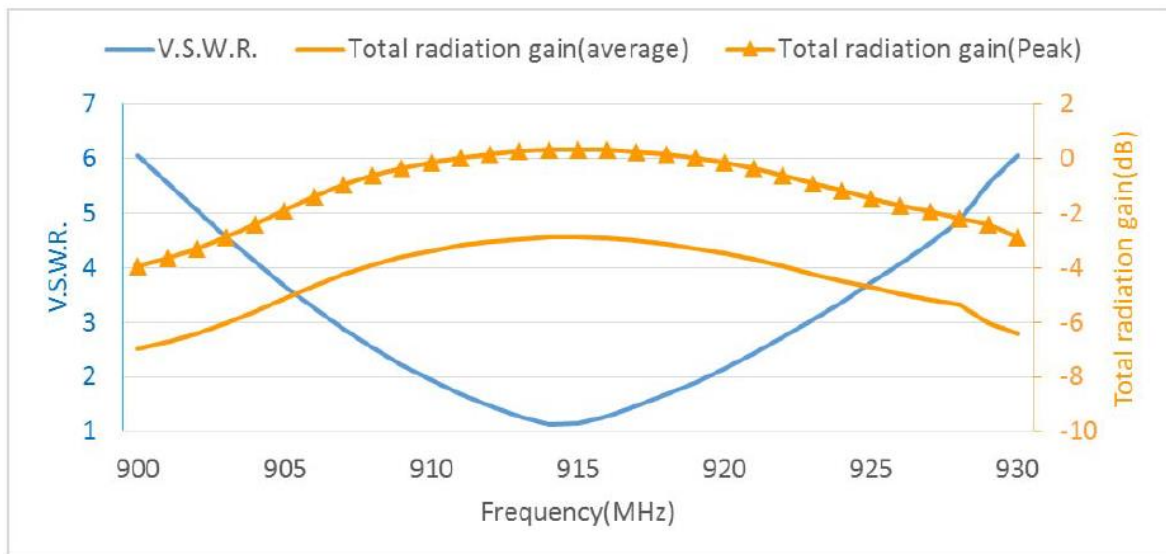
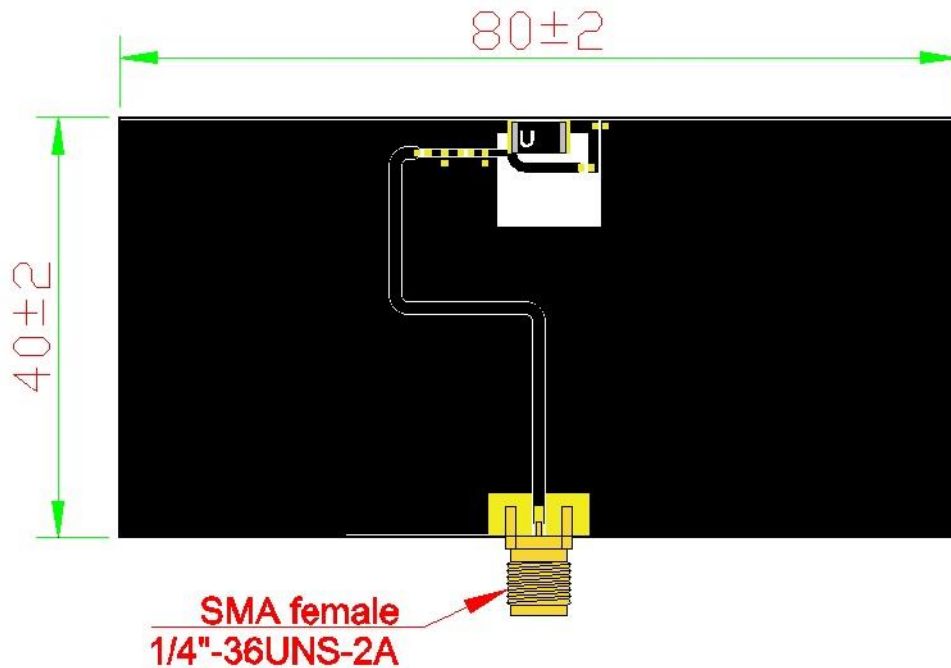


Figure 5 Frequency Vs VSWR and Total Radiation Gain



Unit: mm

Figure 6 Evaluation Board

**4. Radiation Pattern (based on the 80 x 40 mm<sup>2</sup> evaluation board)**

3D gain pattern @ 915MHz in dBi

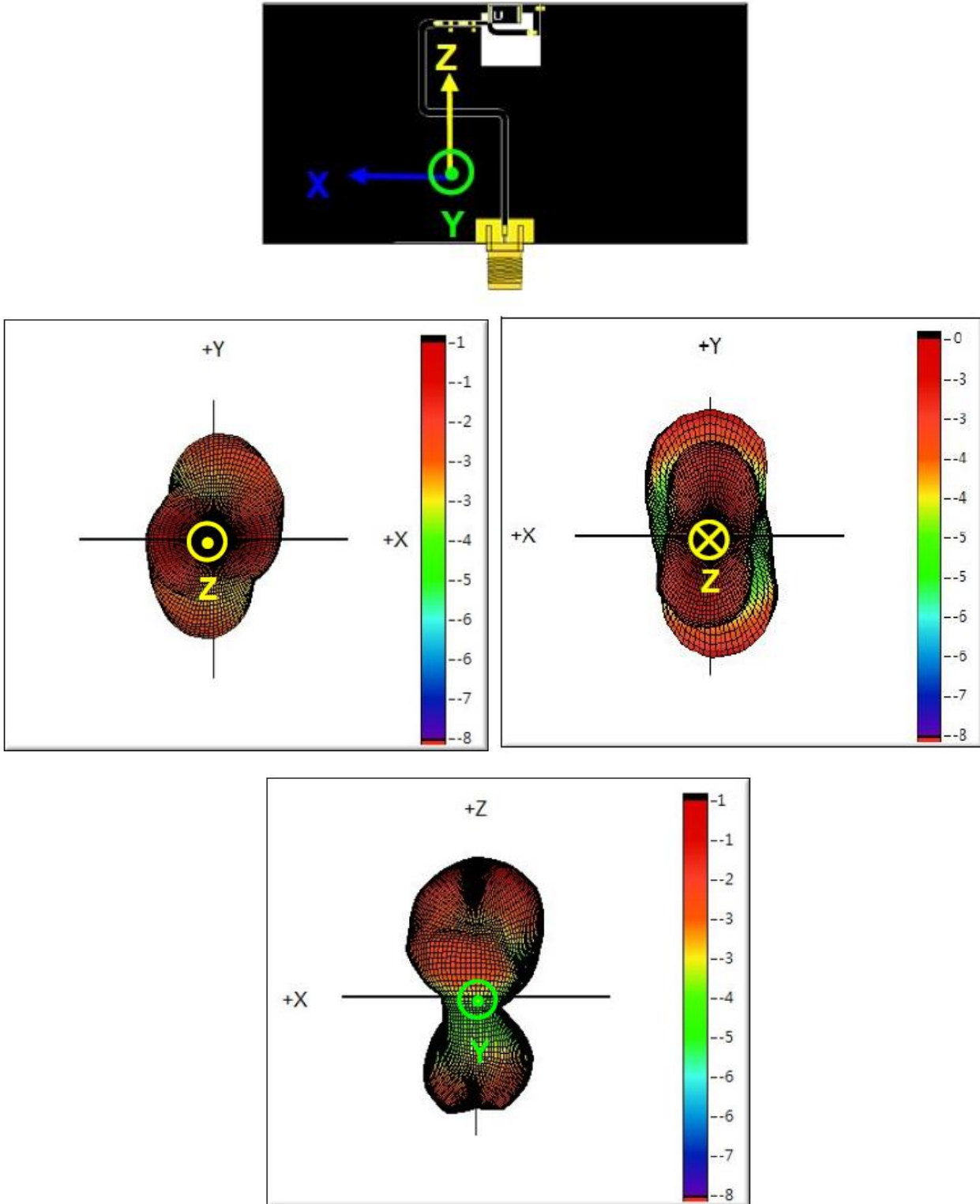


Figure 7 Radiation patterns for X, Y and Z

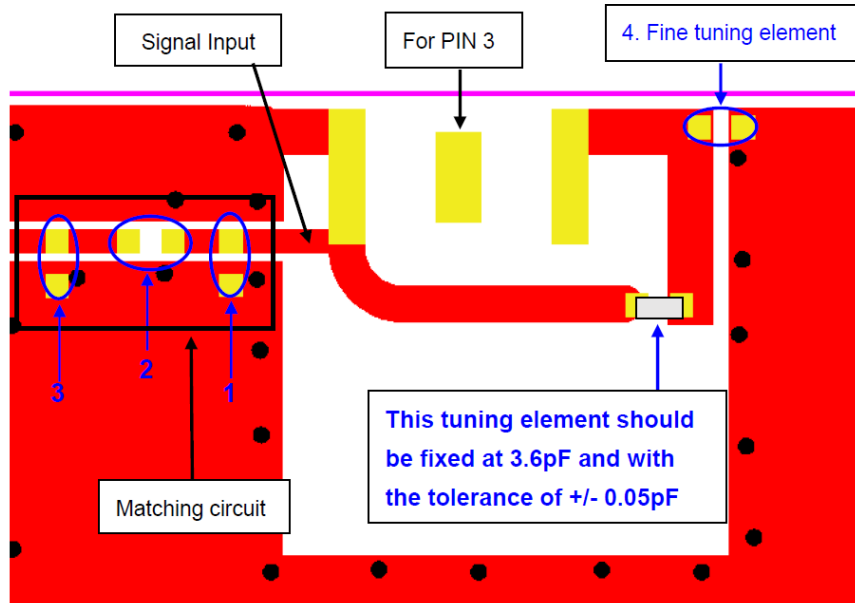
**5. Frequency Tuning and Matching Circuit**


Figure 8 Typical tuning Circuit

**5.1 Matching Circuit**

With the following recommended values of matching and tuning components, the centre frequencies will be about 915MHz using the standard 80 x 40 mm<sup>2</sup> evaluation board. However, these are typical reference values which may require changes when circuit boards are part vendors are different.

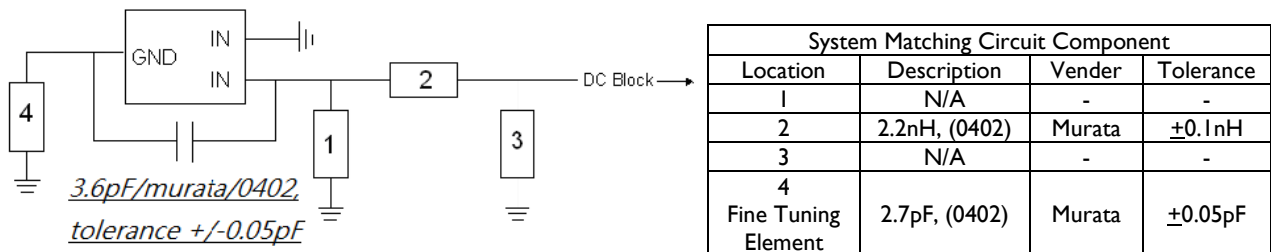


Figure 9 Matching circuit

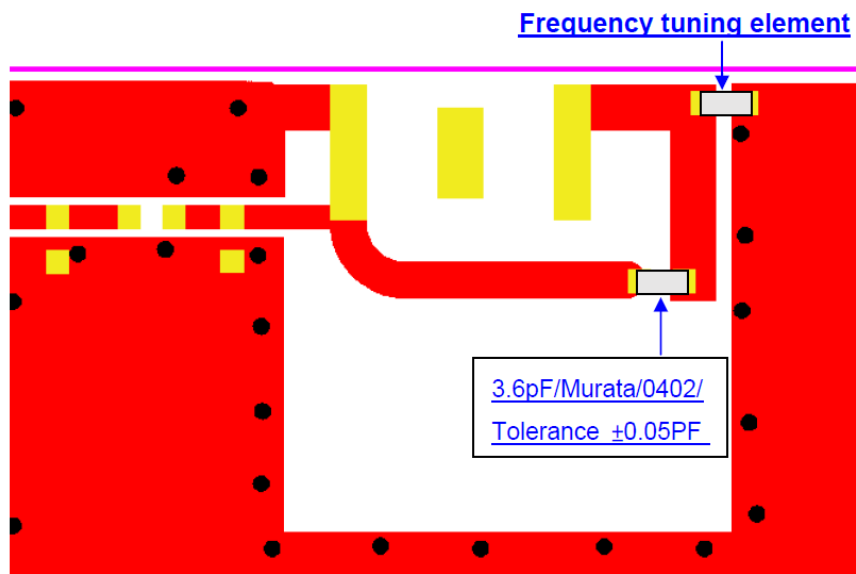


Figure 10 Frequency Tuning Element

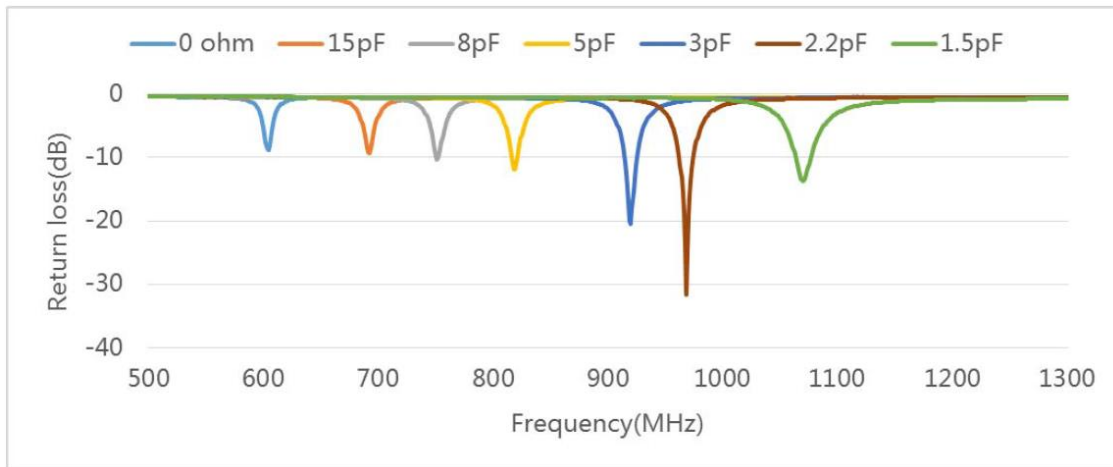


Figure 11 Frequencies vs Capacitance Frequency Tuning Element

## 6. Soldering Profile

Typical soldering profile for Lead-free process.

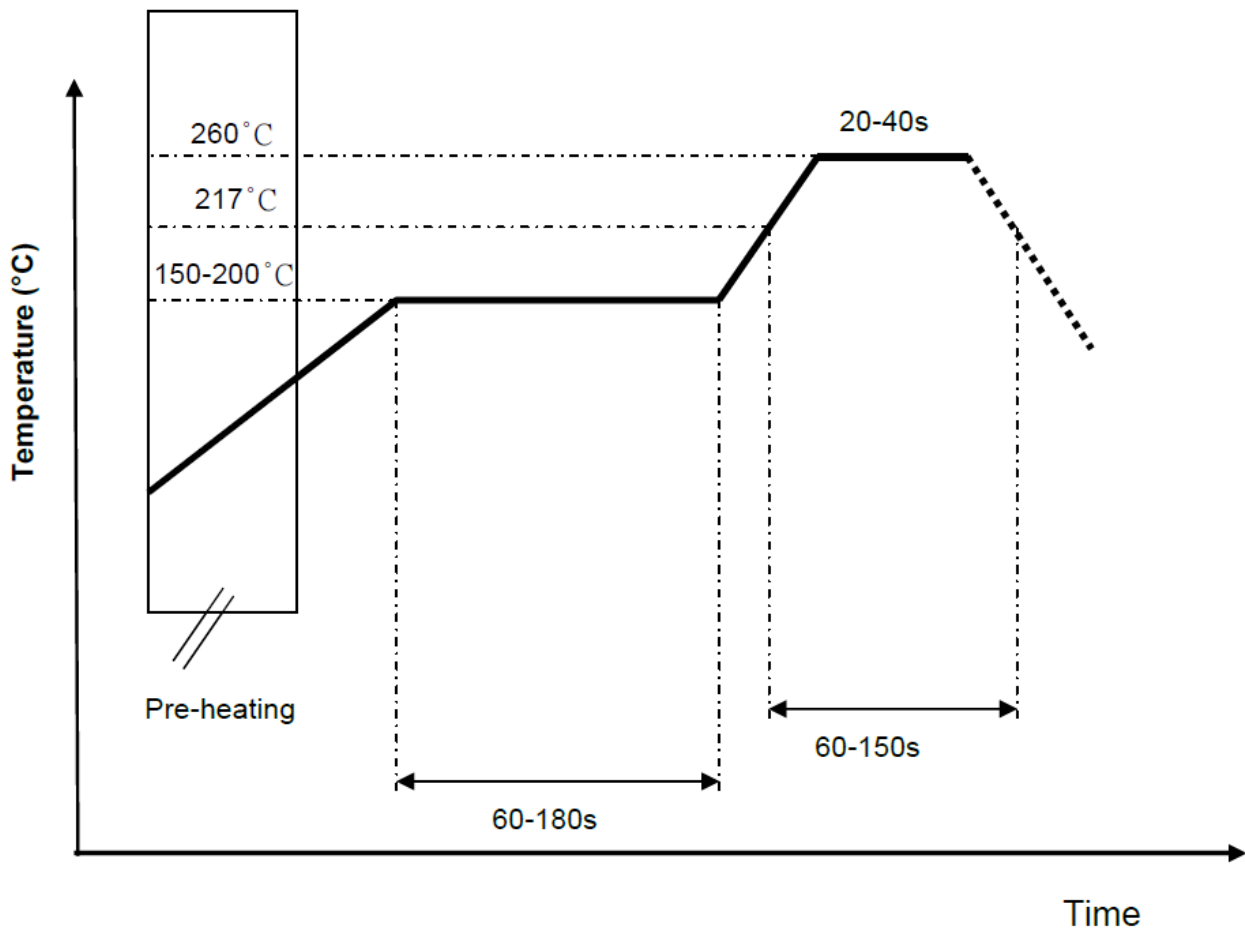


Figure 12 Typical Soldering Profile



## 7. Handling and manufacturing notes

### 7.1 Handling

This chip antenna is made from ceramic materials which are relatively more rigid and brittle compared to circuit board materials. Furthermore, the length of this antenna is quite long. Bending of the circuit board at the locations where the chip antenna is mounted may cause cracking to solder joints or to the antenna chip itself.

### 7.2 Punching and Cutting

Punching or cutting of the break-off tab of the PCB panel may cause severe bending of the circuit board which may result in cracking of solder joints or chip antenna. Therefore break-off tab shall be located away from the installation location of the chip antenna.

### 7.3 Ultrasonic Welding Process

Use all caution when ultrasonic welding, especially if used near the location where the chip antenna is installed. Strong ultrasonic vibration may cause the cracking of the chip antenna solder joints.

## 8. Packing

- (1) Quantity/Reel: 6000 pcs/Reel
- (2) Plastic Tape

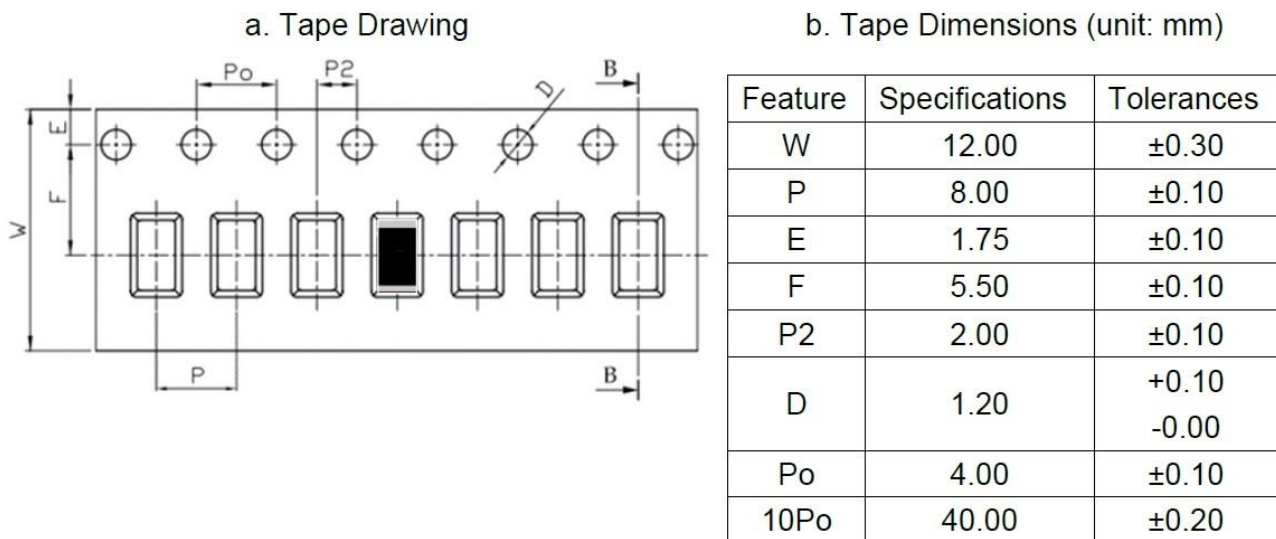


Figure 13 Tape and Reel drawing & Dimensions

## 9. Operating & storage conditions.

### 9.1 Operating

- (1) Maximum Input Power: 2 W
- (2) Operating Temperature: -40°C to 85°C
- (3) Relative Humidity: 10% to 70%

### 9.2 Storage (Sealed)

- (1) Storage Temperature: -5°C to 40°C
- (2) Relative Humidity: 20% to 70%
- (3) Shelf Life: 1 year

### 9.3 Storage (Unsealed)

Meets the criteria of J-STD-033 MSL2a

### 9.4 Storage (after mounted on Customers PCB with SMD process)

- (1) Storage Temperature: -40°C to 85°C
- (2) Relative Humidity: 10% to 70%

**10. Product Order Code**

Name	Description	Order Code
LPRS-CCA-915	Ceramic chip antenna @ 915MHz	LPRS-CCA-915

Please contact the sales office for availability of other variants of the standard product.

**11. Notice**

Installation guide

(1) Installation Guide: "General Guidelines for the installation of LPRS chip antennas (AN001)".

(2) all specifications are subject to change without notice.

**12. Document History**

Issue	Date	Revision
1.1	March 2020	Provisional datasheet

**Changes to this Document**

This data sheet has been updated to reflect changes throughout the range of LPRS modules. Specific changes are recorded in the documentation history above.

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