2.4GHz WiFi/BLE Chip Antenna Datasheet

Product image for illustration Purposes only

Introduction

LPRS's ceramic chip antenna is designed for use within the ISM 2.4GHz frequency bands, covering frequencies from 2400MHz ~ 2500MHz.

Perfect for applications where the antenna must be mounted internally within an product enclosure, the LPRS-MCA-2.4 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.

Applications

- Ideal for any ISM 2.4GHz applications.
- ZigBee/BLE Applications
- Wireless PCMCIA Cards or USB dingles.
- Bluetooth earphone systems.
- Handheld devices using WiFi/BLE functions e.g. Smart phones

-IEEE 802.11 b/g/n

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1. Layout Guide and Electrical Specifications

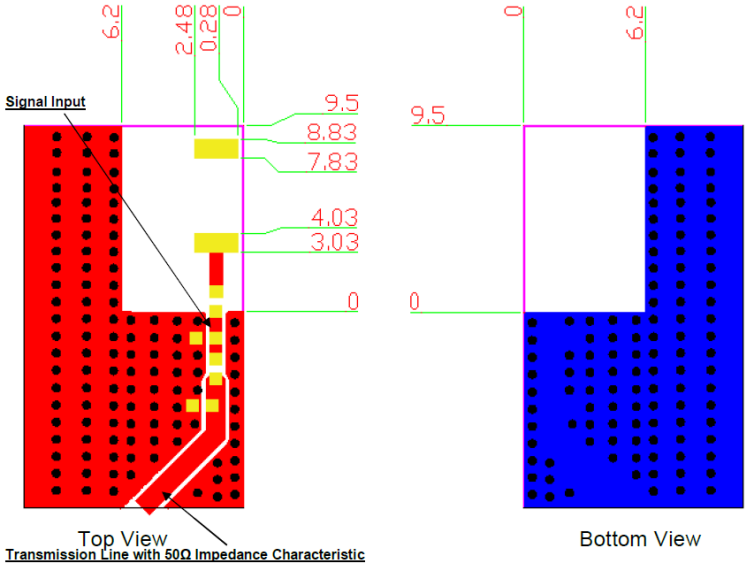


Figure 1 Layout Guide Top View (mm)

1.1 Solder Land Pattern:

The solder land pattern (yellow 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

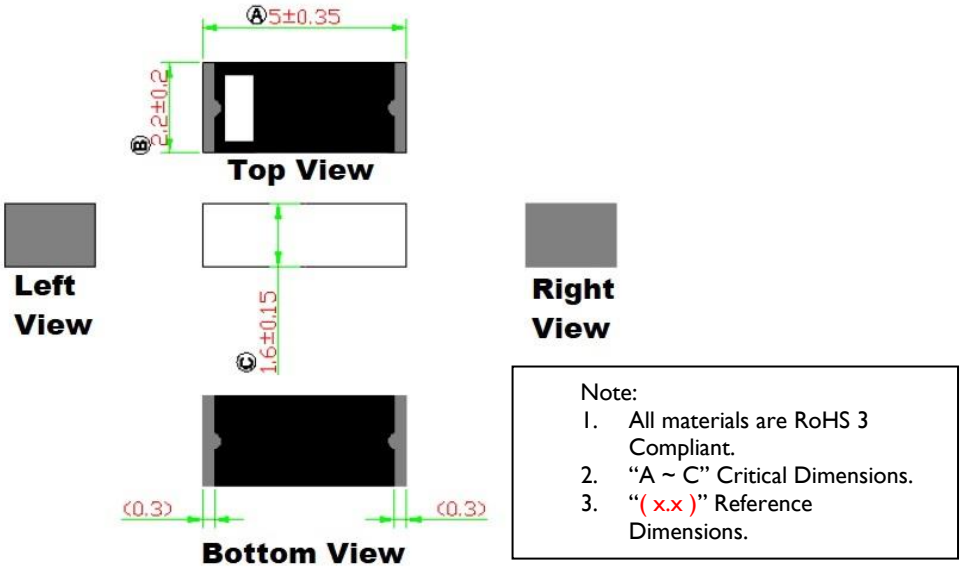


Figure 2 Physical Dimensions (mm)

2.1. Pin Definitions.

Figure 3 Pin Assignments

Pin	1	2
Soldering Pad	Signal	N/C

3. Electrical Specifications (Based on Evaluation Board Dimensions: 40 x 40 mm²)

Characteristics		Specifications	Unit
Outline Dimensions		5.0 x 2.2 x 1.6	mm
Working Frequency		2400 ~ 2500	MHz
VSWR (@ centre frequency*)		2	
Impedance		50	Ω
Polarization		Linear Polarization	
Peak Gain	(@2442 MHz)	2.2 (Typical)	dBi
Efficiency		66 (Typical)	%

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

3.1 Return Loss & VSWR

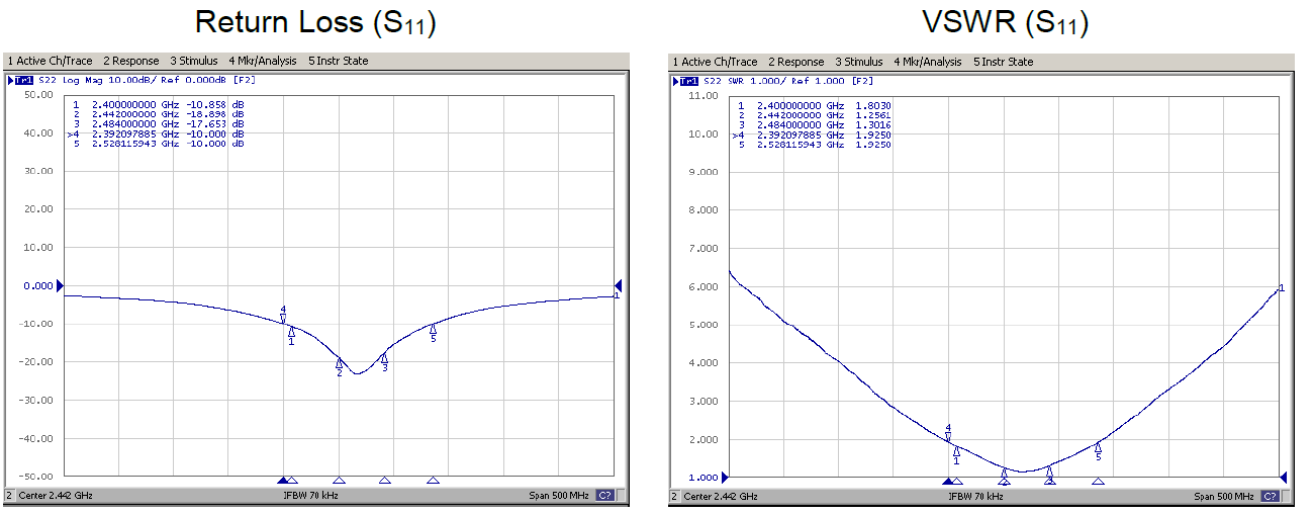


Figure 4 Pin Return Loss and VSWR graphs.

3.2 3D Efficiency Table

Frequency (MHz)	2400	2412	2417	2422	2427	2432	2437	2442	2447	2452	2457	2462	2467	2472	2484	2500
Efficiency (dB)	-2.3	-2.2	-2.1	-1.8	-1.9	-1.6	-1.7	-1.8	-1.9	-1.8	-1.9	-1.9	-1.9	-2.0	-2.0	-2.1
Efficiency (%)	59.3	60.9	62.2	66.1	64.2	68.4	67.5	66.8	65.2	65.8	64.8	65.1	64.0	62.4	63.0	61.5
Peak Gain (dBi)	1.4	1.6	1.8	2.1	2.0	2.3	2.3	2.2	2.0	2.1	1.9	2.0	1.9	1.8	1.8	1.7

3.3 3D Efficiency V Frequency

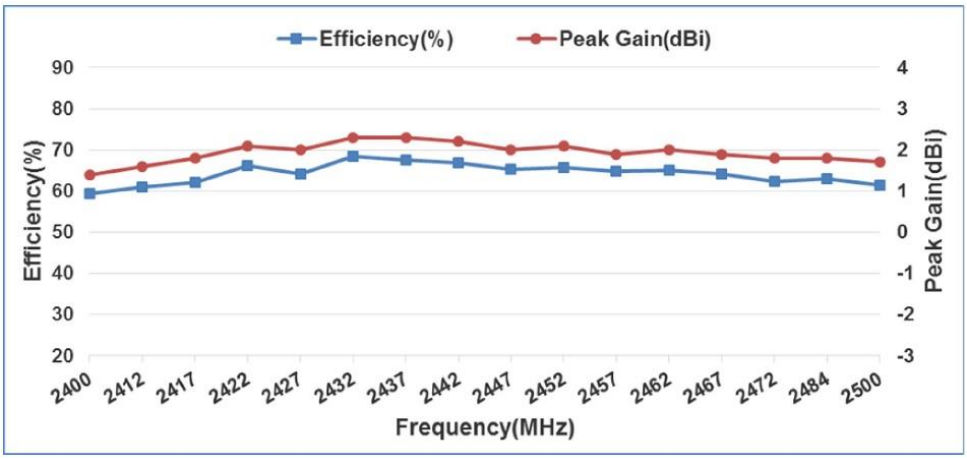


Figure 5 Efficiency vs Frequency

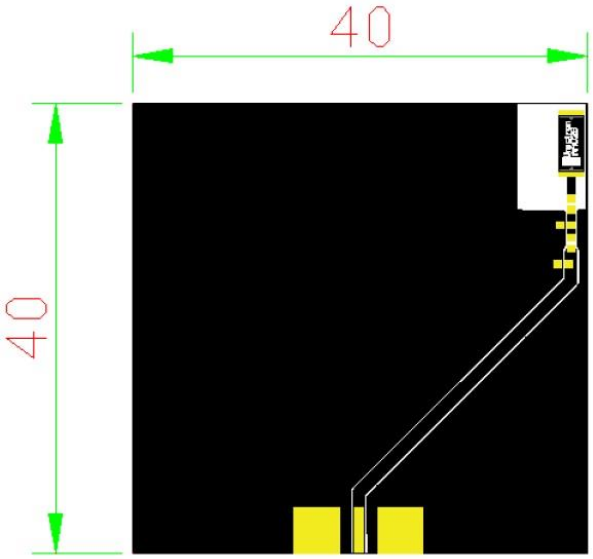


Figure 6 Evaluation Board (mm)

4. Radiation Pattern (based on the 40 x 40 mm² evaluation board)

3D gain pattern @ 2442MHz in dBi

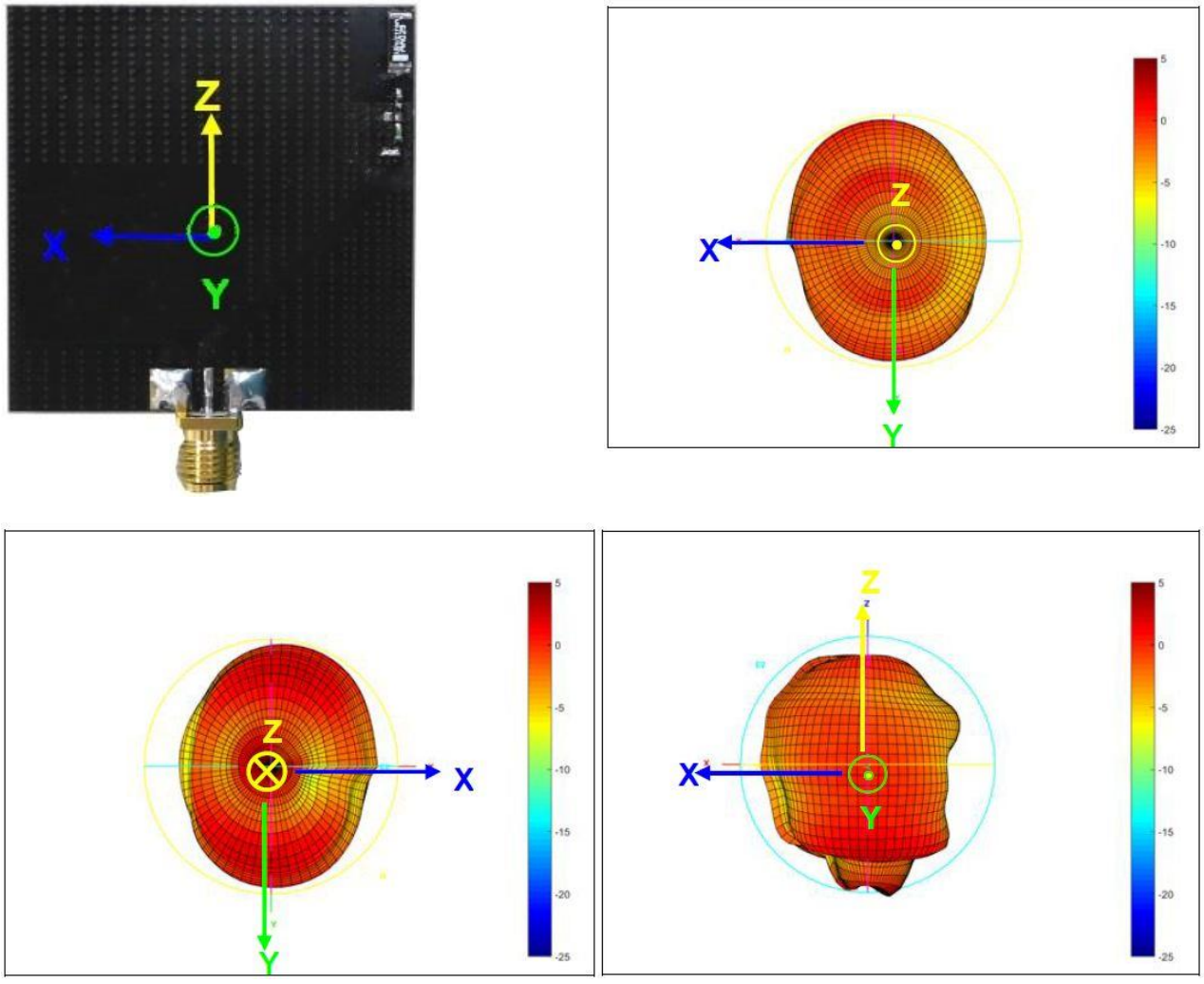


Figure 7 Radiation Gain patterns for X, Y and Z

5. Frequency Tuning and Matching Circuit

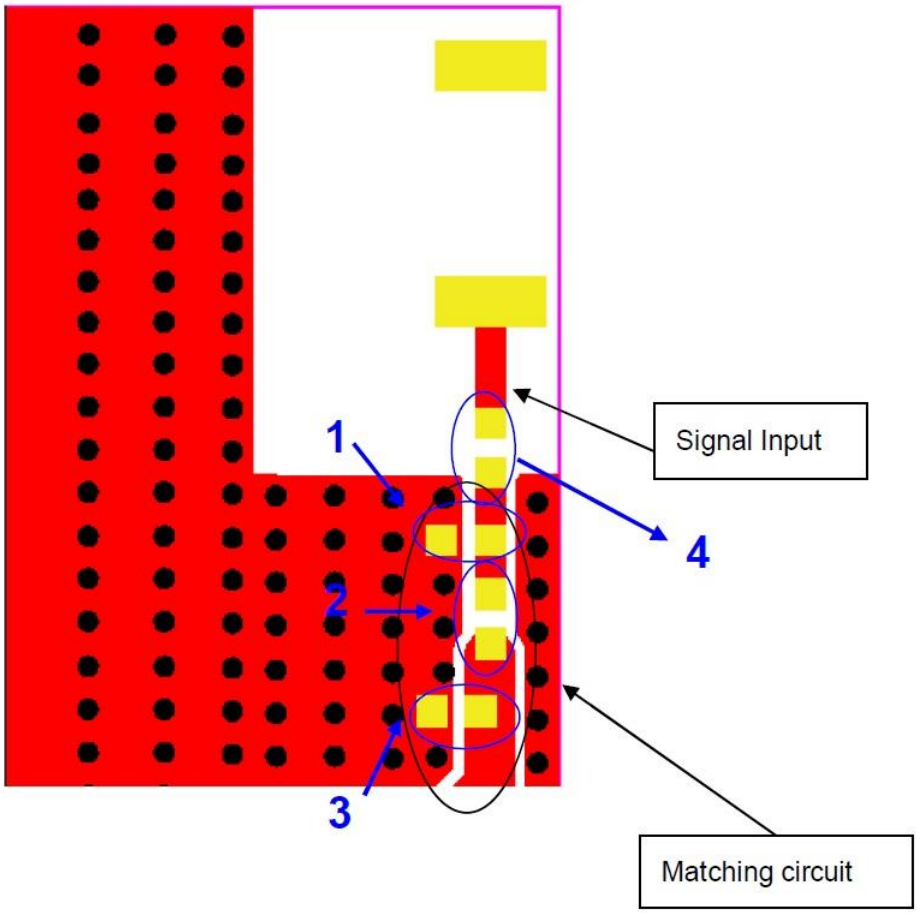


Figure 8 Typical tuning Circuit

5.1 Matching Circuit

With the following recommended values of matching and tuning components, the centre frequencies will be about 2442MHz using the standard 40 x 40 mm² evaluation board. However, these are typical reference values which may require changes when circuit boards are part venders are different.

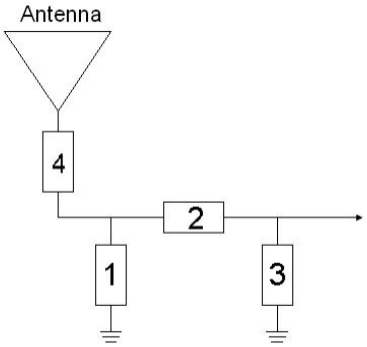


Figure 9 Matching circuit

System Matching Circuit Component			
Location	Description	Vender	Tolerance
1	N/A	-	-
2	2.7nH, (0402)	DARFON	±0.1nH
3	1 pF, (0402)	DARFON	±0.1 pF
4	0Ω, (0402)	-	-

6. Soldering Profile

Typical soldering profile for Lead-free process. Recommended solder paste alloy: SAC305 (Sn96.5 /Ag3 /Cu0.5) Lead free solder paste.

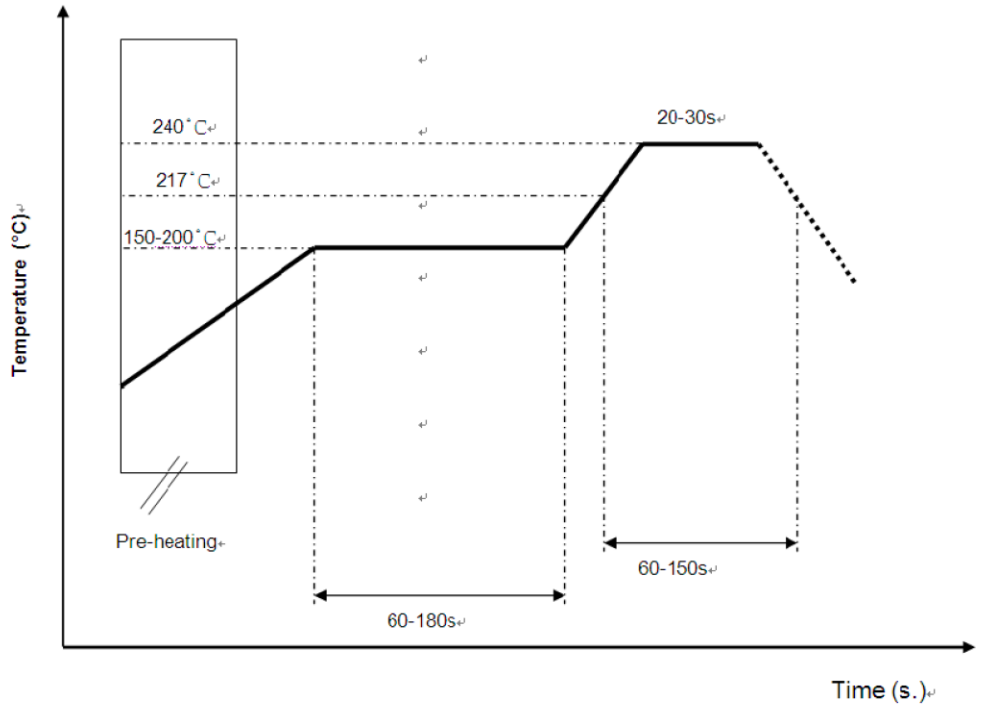
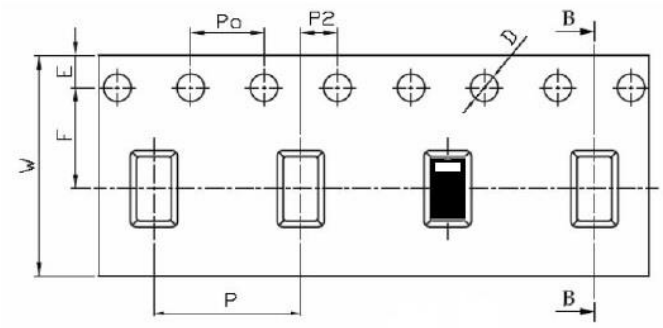


Figure 10 Typical Soldering Profile

7. Packing

(1) Quantity/Reel: 3000 pcs/Reel
(2) Plastic Tape:

a. Tape Drawing



b. Tape Dimensions (unit: mm)

Feature	Specifications	Tolerances
W	12.00	±0.30
P	8.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 -0.00
Po	4.00	±0.10
10Po	40.00	±0.20

Figure 11 Tape and Reel drawing & Dimensions

8. Operating & storage conditions.

8.1 Operating

(1) Maximum Input Power: 2 W
(2) Operating Temperature: -40°C to 85°C

8.2 Storage

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

9. Notice

(1) Installation Guide.
Please refer to the application note "General guidelines for the installation of LPRS Chip Antennas" for further information
(2) All specifications are subject to change without notice.

10. Product Order Code

Name	Description	Order Code
LPRS-MCA-2.4	Ceramic chip antenna @ 2400~2500MHz	LPRS-MCA-2.4

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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