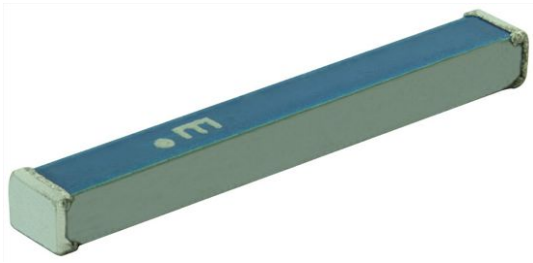
Surface Mount Ceramic Chip Antennas for 2.4 GHz



VJ5103W240GXCMT chip antenna

The VJ5103W240 series are small form-factor, high-performance chip-antennas designed to be used in wireless, bluetooth and ISM band 2.4 GHz.

The VJ5103W240 series present an excellent performance (max. gain 3 dBi) with a low profile needed in most wireless applications.

DESCRIPTION

The VJ5103W240GXCMT ceramic chip antenna is a small form-factor, high-performance, chip-antenna designed for operation at 2.4 GHz. It allows manufacturers to design high quality products that do not bear the penalty of a large external antenna, and is designed to be assembled onto a PC board using a standard reflow process.

FEATURES

RoHS COMPLIANT
HALOGEN FREE

- Small outline (8.0 mm x 1.05 mm x 0.8 mm)
- 50 Ω unbalanced tuning interface
- Omnidirectional
- Assembled onto a PCB in the standard reflow process
- Low profile for thin type terminal
- High stability in temperature / humidity changes
- High mechanical strength
- Wide operating temperature range (- 40 °C to + 85 °C)
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

APPLICATIONS

- Bluetooth
- Wireless LAN
- ISM band 2.4 GHz wireless applications

ELECTRICAL SPECIFICATIONS

Operating temperature: - 40 °C to + 85 °C

Frequency range (transmission / reception): 2450 MHz ± 50 MHz

Note

- Electrical characteristics at + 25 °C unless otherwise specified.

QUICK REFERENCE DATA

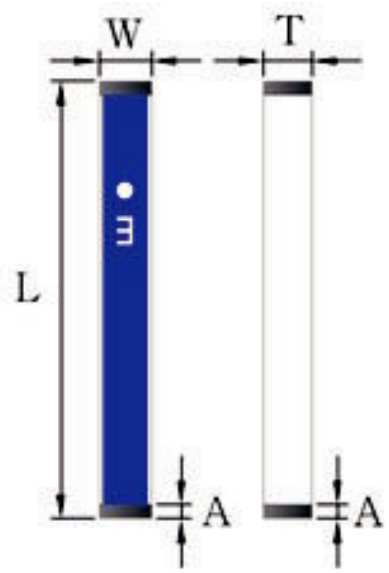
SERIES	FREQUENCY (MHz)	MAX. GAIN (dBi)	AVERAGE GAIN (dBi)	BANDWIDTH (- 10 dB) (MHz)	BANDWIDTH (- 3 dB) (MHz)
VJ5103W240GXCMT	2450	+ 3.0	- 0.60	250	570

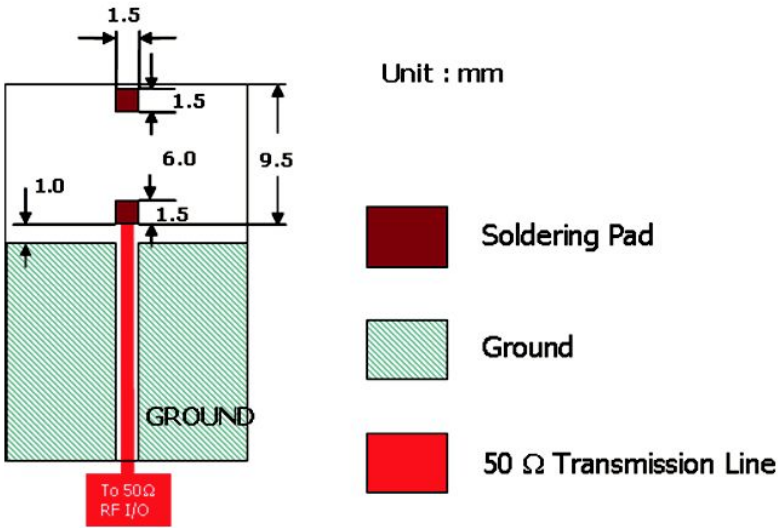
CHIP ANTENNA PERFORMANCE

NOMINAL FREQUENCY (MHz)	NOMINAL IMPEDANCE (Ω)	2.45 GHz PEAK GAIN (dBi)	2.45 GHz AVERAGE GAIN (dBi)	2.45 GHz REFLECTED POWER LOSS	2.45 GHz INSERTION POWER LOSS	- 3 dB BANDWIDTH 2.45 GHz	- 3 dB REFLECTED POWER LOSS	- 10 dB BANDWIDTH 2.45 GHz	- 10 dB REFLECTED POWER LOSS
2450	50	- 0.60	+ 3.0	< - 15 dB	< 4 %	570	50 %	250	10 %
				< 3.2 %	< 0.14 dB		3 dB		0.46 dB

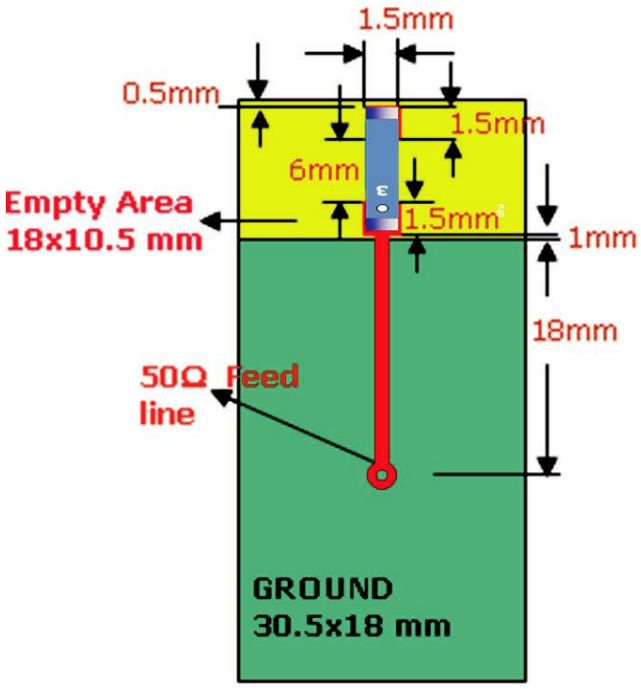
FOOTPRINT, MECHANICAL, AND PCB DIMENSIONS

The antenna footprint and mechanical dimensions are presented in figure 7. Optimal tuning is adjusted according to PCB layout.

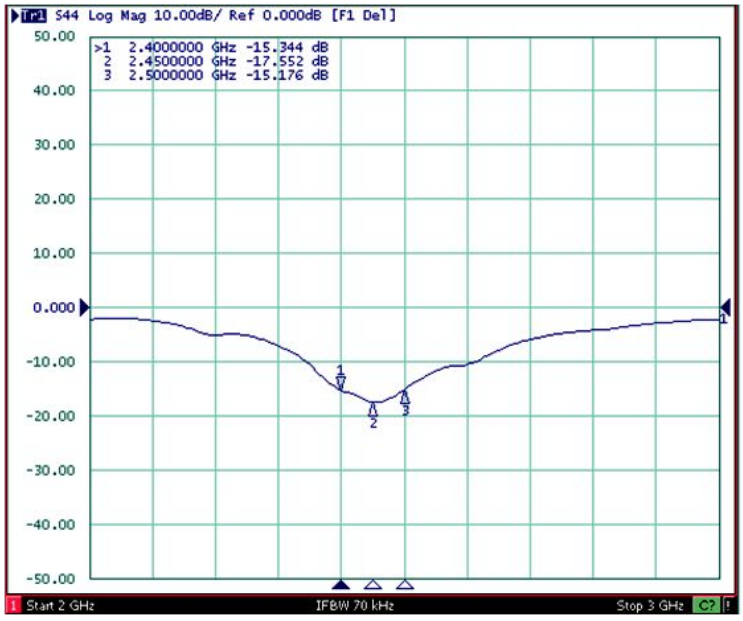
FIGURE	SYMBOL	DIMENSION (mm)
	L	8.0 ± 0.20
	W	1.05 ± 0.20
	T	0.80 ± 0.10
	A	0.30 ± 0.10



Top View



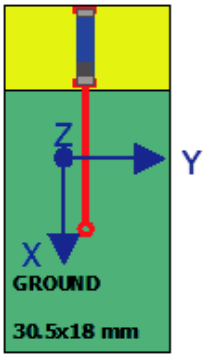
Antenna on Test Board (FRA thickness 0.8 mm)



Antenna S11 on Test Board

RADIATION PATTERN

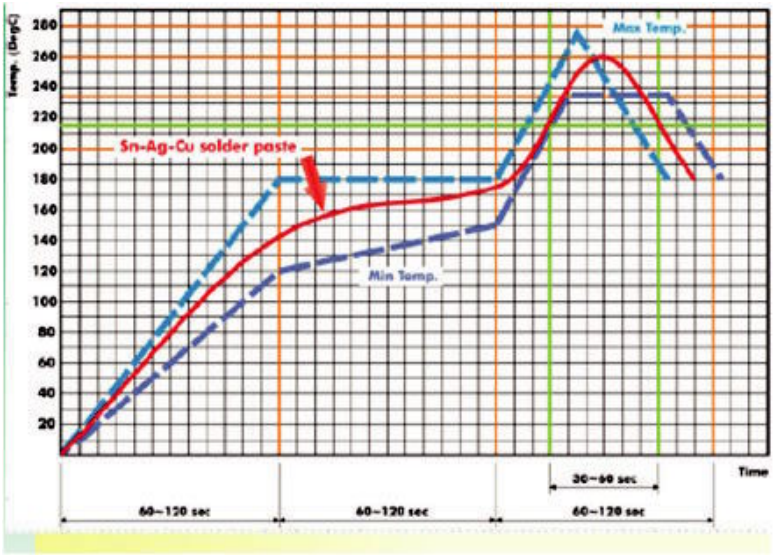
Radiation pattern and gain were dependent on measurement board design. The specification of VJ5103W240GXCMT antenna was measured based on the PCB size and installation position as shown in the below figure test board.



	VERTICAL	HORIZONTAL
Y - Z Plane Average Gain = 1.19 dBi	Peak Gain = 3.03 dBi, Average Gain = 0.71 dBi	Peak Gain = - 1.37 dBi, Average Gain = - 8.6 dBi
X - Z Plane Average Gain = - 2.91 dBi	Peak Gain = - 3.76 dBi, Average Gain = - 8.72 dBi	Peak Gain = 0.25 dBi, Average Gain = - 4.24 dBi
X - Y Plane Average Gain = - 0.95 dBi	Peak Gain = - 0.76 dBi, Average Gain = - 5.81 dBi	Peak Gain = 1.37 dBi, Average Gain = - 2.67 dBi

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in figure 2.



PLASTIC TAPE SPECIFICATIONS (Dimensions in mm)									
A_O	B_O	ØD	T	W	E	F	P_O	P_1	P_2
1.20 ± 0.10	8.20 ± 0.10	1.50 ± 0.10	1.00 ± 0.10	16.0 ± 0.10	1.75 ± 0.10	7.50 ± 0.10	4.00 ± 0.05	4.00 ± 0.10	2.00 ± 0.05

ORDERING INFORMATION	VISHAY MATERIAL	PACKAGING QUANTITY
VJ5103W240 Chip Antenna	VJ5103W240GXCMT	2000 pieces

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