

## Surface Mount Ceramic Chip Antennas for 2.4 GHz



**VJ5106W240GXCMT chip antenna**

The VJ5106W240 series are small form-factor, high-performance chip-antennas designed to be used in wireless, bluetooth and ISM band 2.4 GHz.

The VJ5106W240 series present an excellent performance (max. gain 2 dBi) with a low profile needed in most Wireless applications.

### DESCRIPTION

The VJ5106W240GXCMT 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

- Ultra small outline (3.1 mm x 1.6 mm x 0.6 mm)
- 50  $\Omega$  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](http://www.vishay.com/doc?99912)

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### APPLICATIONS

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

### ELECTRICAL SPECIFICATIONS

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

Frequency range (transmission / reception): 2450 MHz  $\pm$  50 MHz

#### Note

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

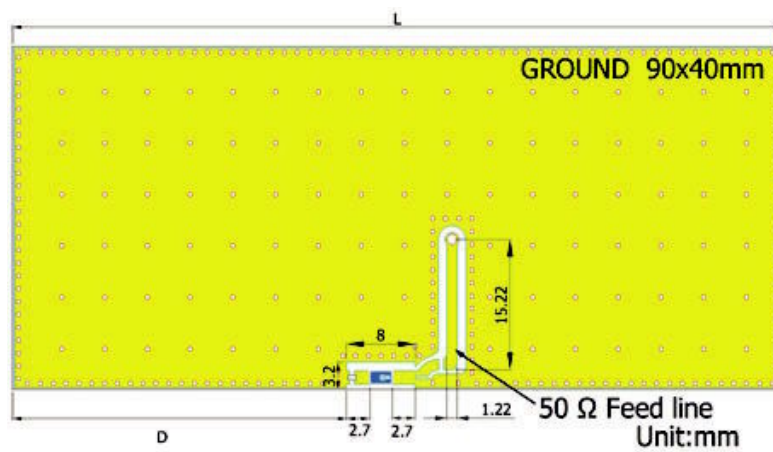
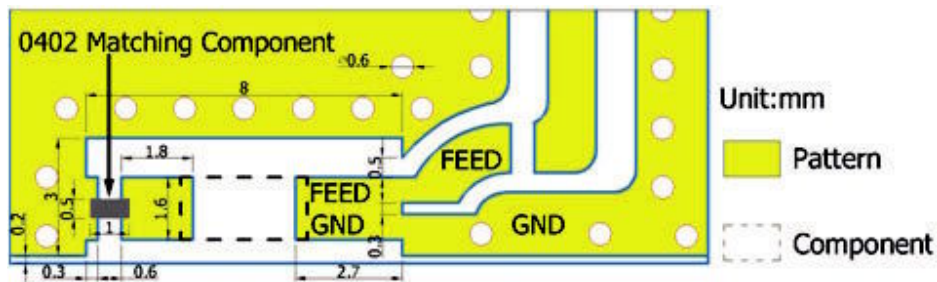
QUICK REFERENCE DATA					
SERIES	FREQUENCY (MHz)	MAX. GAIN (dBi)	AVERAGE GAIN (dBi)	BANDWIDTH (- 10 dB) (MHz)	BANDWIDTH (- 3 dB) (MHz)
VJ5106W240GXCMT	2450	+ 3.1	- 0.50	100	240

CHIP ANTENNA PERFORMANCE									
NOMINAL FREQUENCY (MHz)	NOMINAL IMPEDANCE ( $\Omega$ )	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	- 0.50	+ 3.1	< - 15 dB	< 4 %	240	50 %	100	10 %
				< 3.2 %	< 0.14 dB		3 dB		0.46 dB

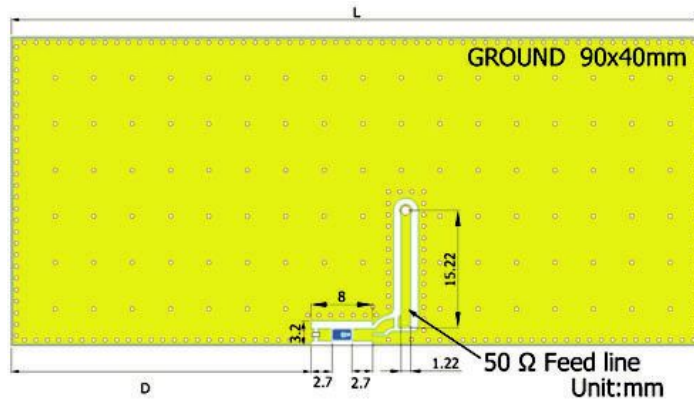
**FOOTPRINT, MECHANICAL, AND PCB DIMENSIONS**

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

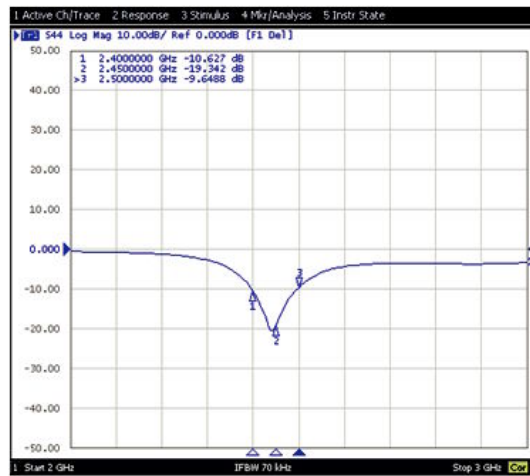
FIGURE	SYMBOL	DIMENSION (mm)
	L	$3.10 \pm 0.20$
	W	$1.60 \pm 0.20$
	T	$0.60 \pm 0.10$
	A	$0.25 \pm 0.10$


 The minimum size for VJ5106W240 is  $L > 30$  mm and  $D > 6$  mm


Land Pattern



Antenna on Test Board (thickness 0.8 mm)



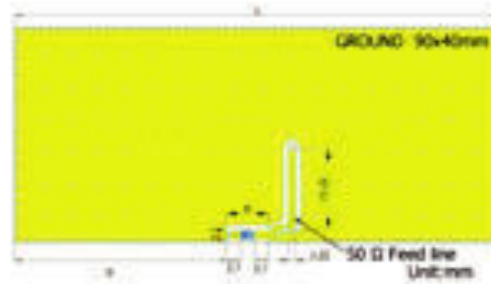
Antenna S11 on Test Board



Antenna VSWR on Test Board

**RADIATION PATTERN**

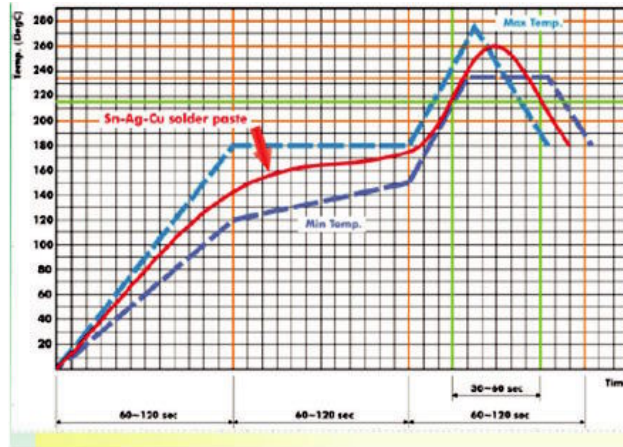
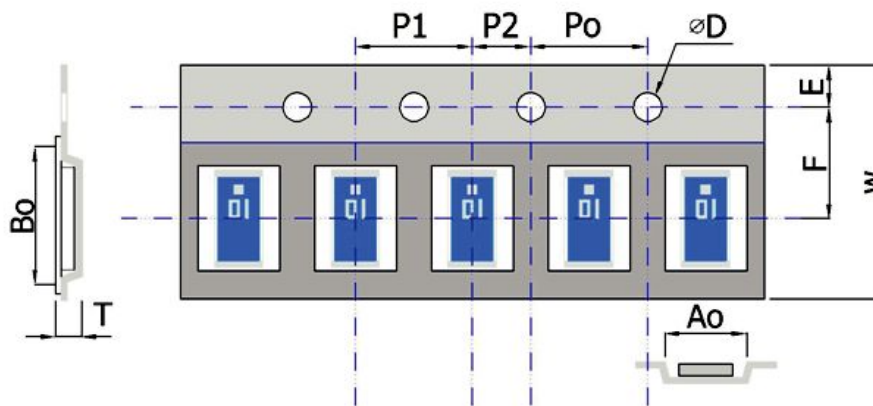
Radiation pattern and gain were dependent on measurement board design. The specification of VJ5106W240GXCMT antenna was measured based on the PCB size and installation position as shown in the below figure test board.



	VERTICAL	HORIZONTAL
<p>Y - Z Plane</p> <p>Average Gain = 0.795 dBi</p>	<p>Peak Gain = 3.14 dBi, Average Gain = 0.05 dBi</p>	<p>Peak Gain = - 0.35 dBi, Average Gain = - 7.23 dBi</p>
<p>X - Z Plane</p> <p>Average Gain = - 1.51 dBi</p>	<p>Peak Gain = - 2.29 dBi, Average Gain = - 7.03 dBi</p>	<p>Peak Gain = 1.08 dBi, Average Gain = - 2.94 dBi</p>
<p>X - Y Plane</p> <p>Average Gain = - 1.05 dBi</p>	<p>Peak Gain = - 7.02 dBi, Average Gain = - 11.95 dBi</p>	<p>Peak Gain = 3.32 dBi, Average Gain = - 1.42 dBi</p>

**SOLDERING CONDITION**

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


**PACKAGING**


<b>PLASTIC TAPE SPECIFICATIONS</b> (Dimensions in mm)									
$A_0$	$B_0$	$\varnothing D$	T	W	E	F	$P_0$	$P_1$	$P_2$
$1.95 \pm 0.10$	$3.45 \pm 0.10$	$1.55 \pm 0.05$	$1.30 \pm 0.10$	$8.20 + 0.10 - 0.30$	$1.75 \pm 0.10$	$3.50 \pm 0.05$	$4.00 \pm 0.10$	$4.00 \pm 0.10$	$2.00 \pm 0.10$

<b>ORDERING INFORMATION</b>	<b>VISHAY MATERIAL</b>	<b>PACKAGING QUANTITY</b>
VJ5106W240 Chip Antenna	VJ5106W240GXCMT	2000 pieces





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