

# Ceramic Chip Antenna 1575MHz

**ACAG0301-1575-T**

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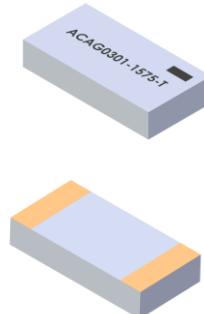
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**3.2 x 1.6 x 0.6 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Description

This miniature GNSS chip antenna delivers reliable positioning performance in an ultra-compact 3.2 x 1.6 x 0.6 mm SMD package. Featuring a low VSWR of  $\leq 2.0$ , 4.18 dBi peak gain, and 79% total efficiency, it provides robust signal reception for GNSS applications. The PCB edge-mount design enables seamless integration into space-constrained devices for asset tracking, fleet management, and industrial monitoring systems. This RoHS-compliant, MSL Level 1 antenna is engineered for smart grid infrastructure, traffic control, energy systems, and surveillance networks where compact size and dependable GNSS connectivity are essential requirements.



## Features

- Miniature Factor: 3.2 x 1.6 x 0.6 mm
- VSWR:  $\leq 2.0$
- Peak Gain: 4.18 dBi
- Total Efficiency: 79%
- Linear Polarization
- Surface Mount (SMD)
- Integration: PCB Edge Mounting
- RoHS Compliant | MSL Level 1

## Applications

- Asset Tracking & Fleet Management
- Traffic Control and Monitoring
- Energy Generation and Storage System
- Data Network Center
- Video Surveillance System
- Smart Grid System

## Ordering Information

Part Number	Description
ACAG0301-1575-T	Ceramic Chip Antenna 1575MHz on Tape & Reel

Note: Other options not listed may be available upon request via [Abracon online support](#)



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## Electrical Specification

Parameter	Specification	Unit
Operating Frequency	1575	MHz
VSWR (Typ.)	< 2.0	:1
Peak Gain	4.18	dBi
Average Gain	-0.56	dBi
Maximum Total Efficiency	79	%
Polarization	Linear	-
Impedance	50	$\Omega$
Radiation Pattern	Omni-directional	-

**Note:** All measurements were conducted on the evaluation board in free space. Performance will vary depending on the ground plane, application, and environment.

## Mechanical Specification

Parameter	Specification
Antenna Dimension	3.2 x 1.6 x 0.6 mm
Evaluation Board Dimension	90 x 50 mm
Mounting Type	Surface Mount
Mounting Location	PCB Center Mounting
Material(s)	Ceramic
Additional Resources	<a href="#">Download STEP File, Package Drawing, 3D PDF</a>

## Environmental Specification

Parameters	Specifications
Operating Temperature	-40°C ~ +85°C
Storage Temperature	-40°C ~ +85°C
Humidity	55% - 75% R.H.
MSL level	1
RoHS Compliant	Yes



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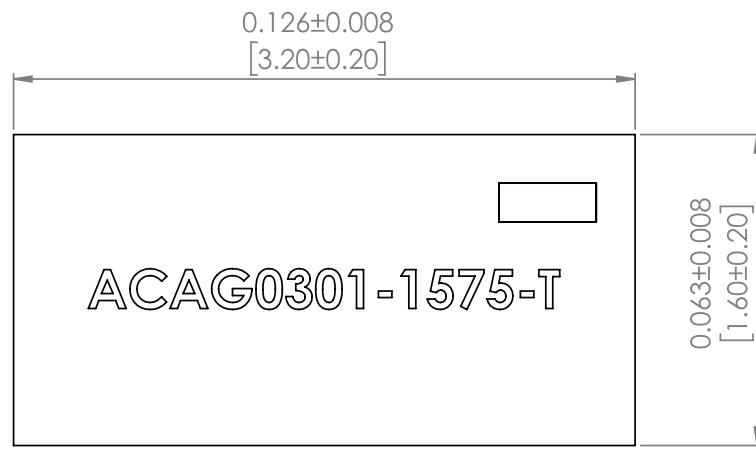


**3.2 x 1.6 x 0.6 mm**

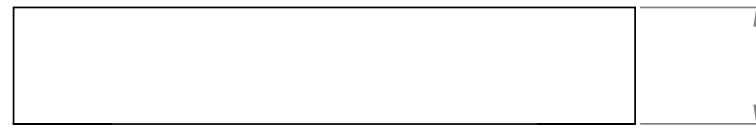
**RoHS/RoHS II Compliant**

**MSL Level = 1**

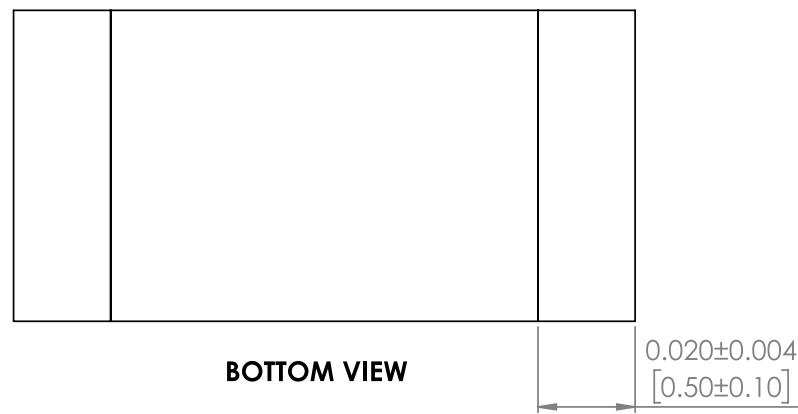
## Product Dimensions



**TOP VIEW**



**SIDE VIEW**



**BOTTOM VIEW**

*Unit: inches[mm]*



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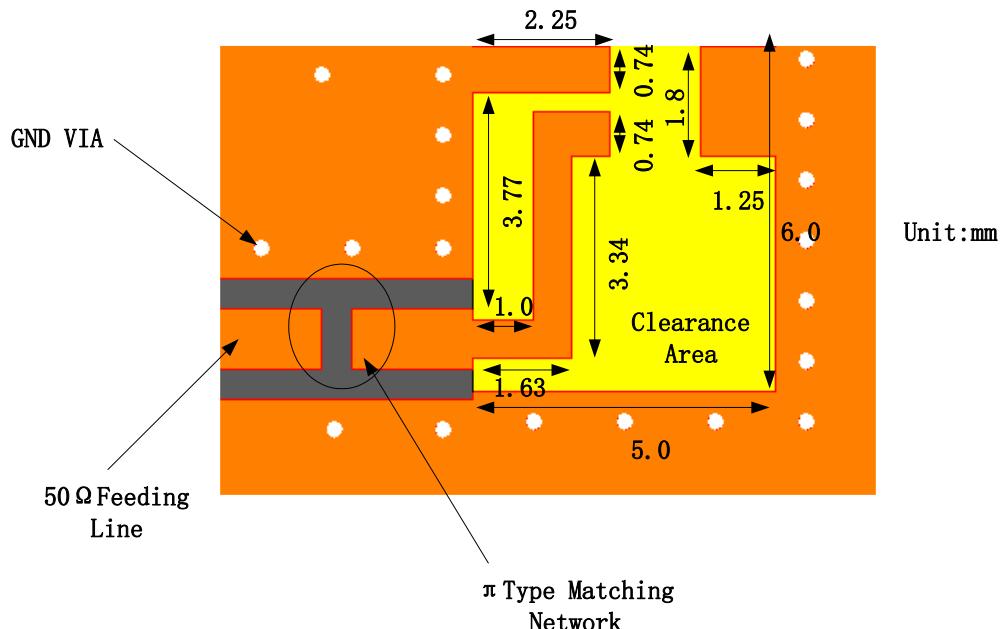
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3.2 x 1.6 x 0.6 mm  
RoHS/RoHS II Compliant  
MSL Level = 1

## Recommended PCB layout

If there are several layers in the PCB, there is an advantage to add vias for smooth interconnection of the ground areas to avoid splits in the ground plane. It is also important that ground clearance is respected through all layers of the PCB. It is recommended to implement a matching network to optimize the antenna impedance in your application.



## Transmission Line

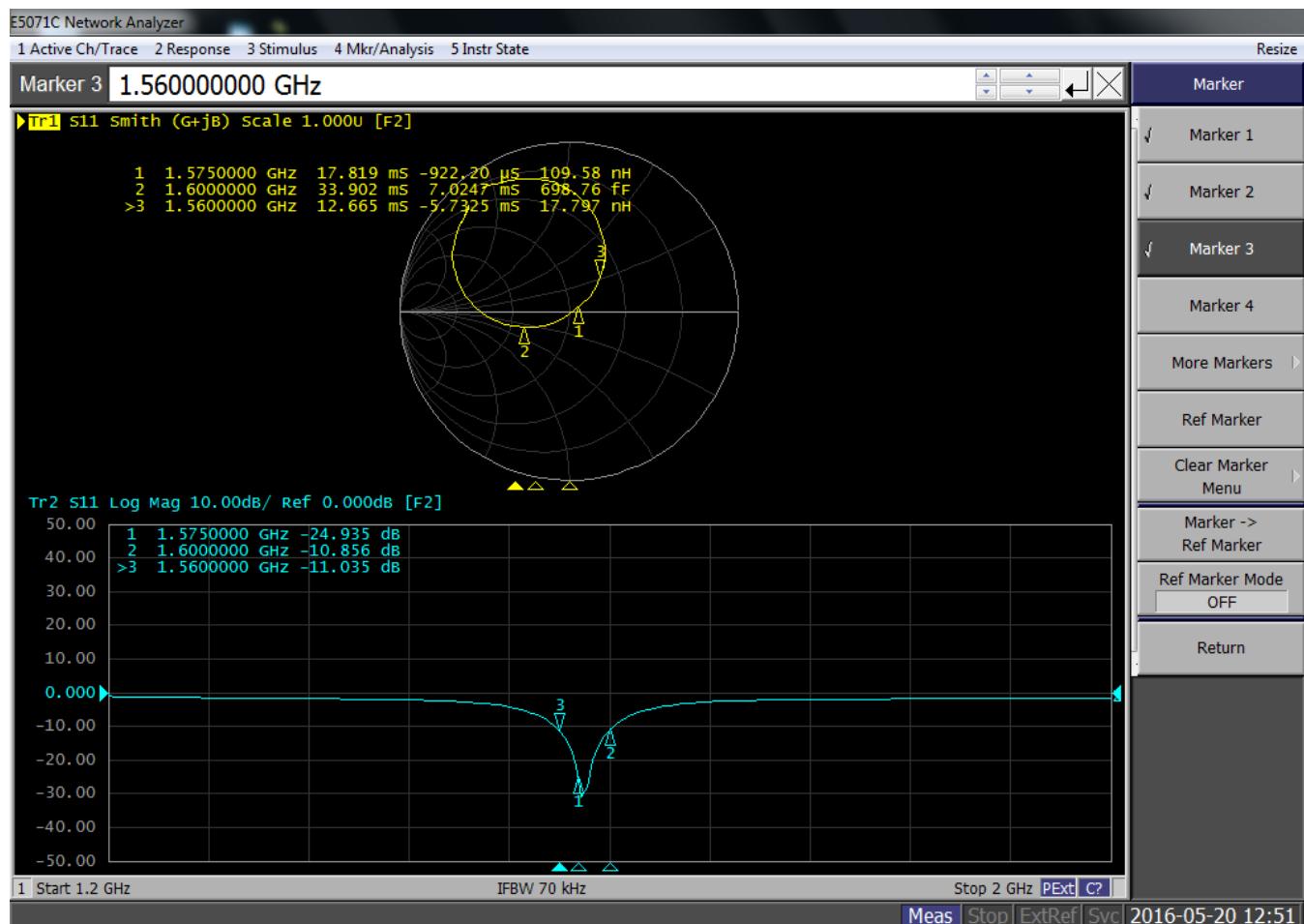
The transmission line should be kept as short as possible and be designed to have a characteristic impedance of  $50\Omega$ . Abracon recommends using a Co-Planar Waveguide with Ground (CPWG), which dimensions can be derived by any trusted calculator, using the correct input for PCB materials and layer stack-up.

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## Reflection Characteristics –Return Loss



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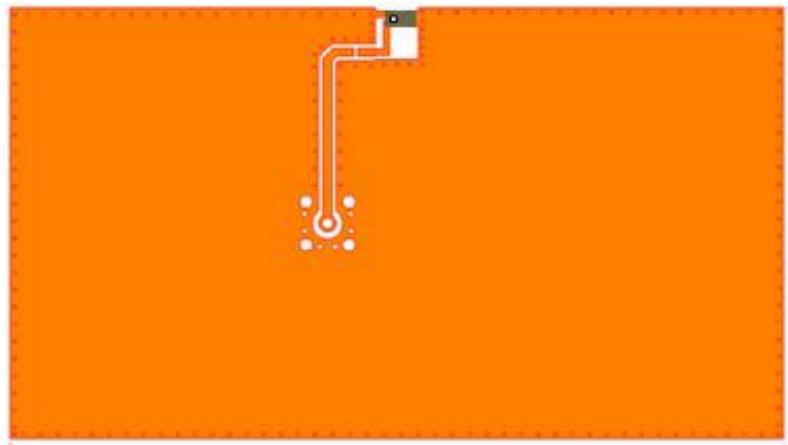
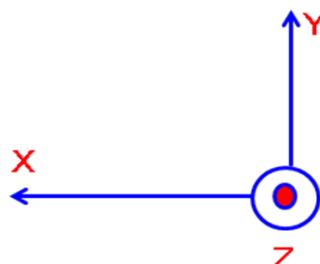


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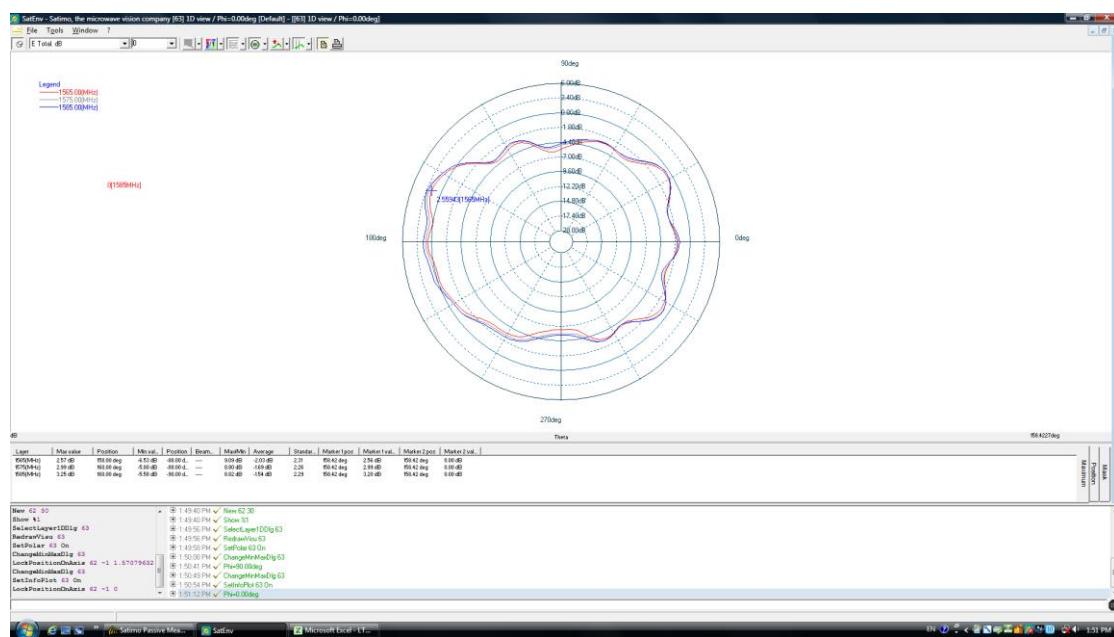


**3.2 x 1.6 x 0.6 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**

## Radiation Characteristics – 3D & 2D pattern



X-Z Plane



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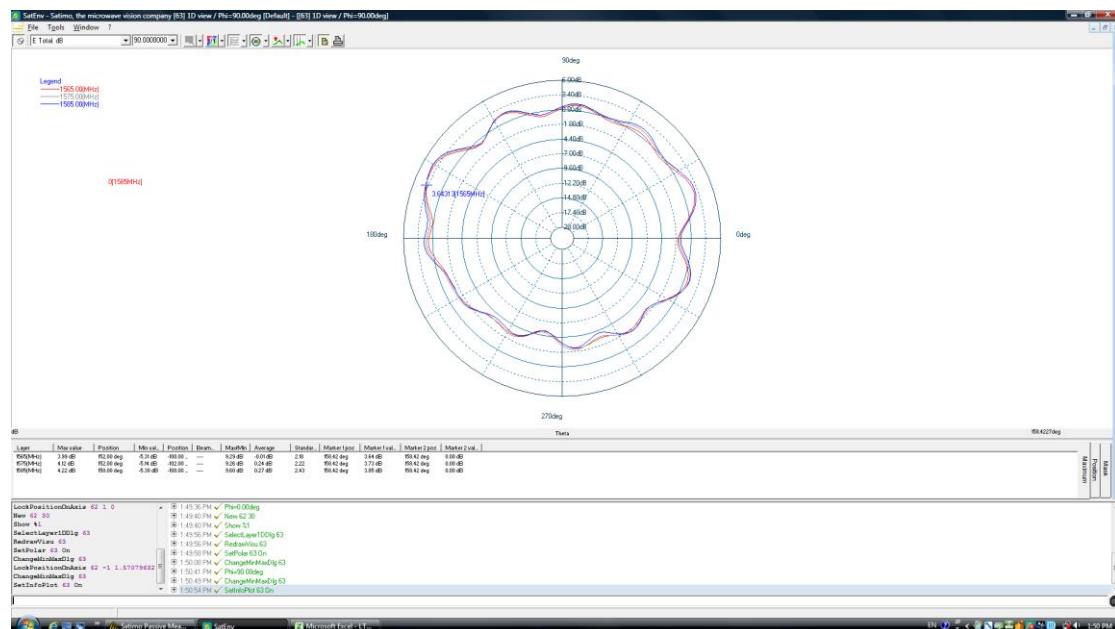


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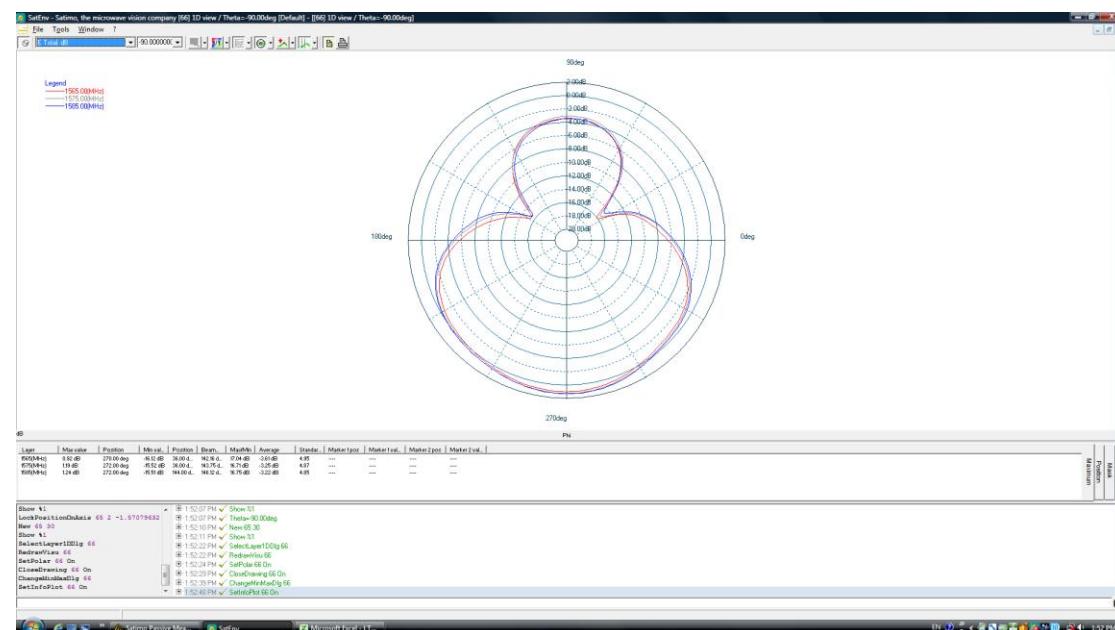


**3.2 x 1.6 x 0.6 mm**  
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## X-Y Plane



## Y-Z Plane



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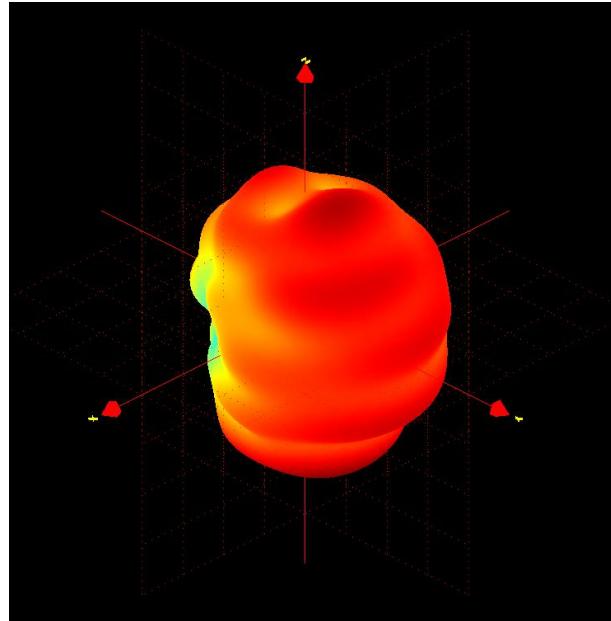
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**3.2 x 1.6 x 0.6 mm**  
**RoHS/RoHS II Compliant**  
**MSL Level = 1**



Frequency (MHz)	1565	1575	1585
Avg. Gain (dBi)	-1.26	-0.56	-1.58
Peak Gain (dBi)	3.96	4.18	4.05
Efficiency (%)	73	79	81

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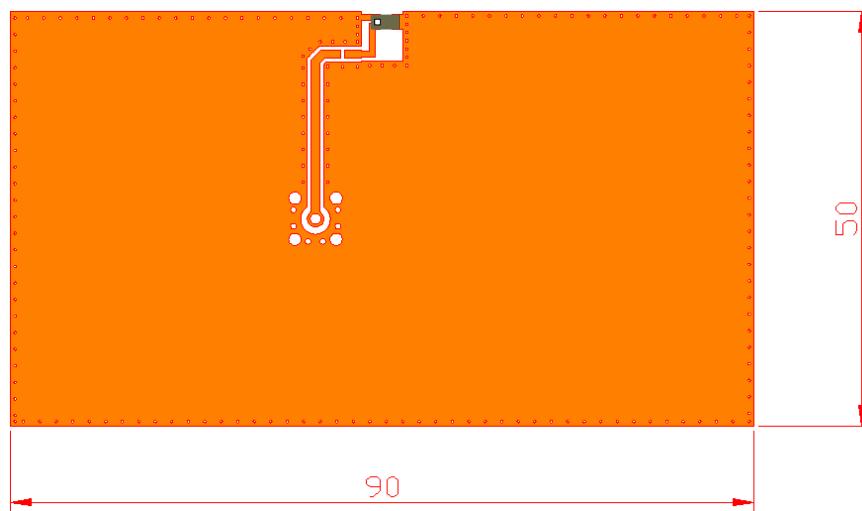
**3.2 x 1.6 x 0.6 mm**

**RoHS/RoHS II Compliant**

**MSL Level = 1**

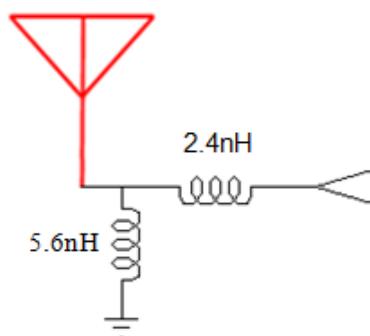
## Evaluation Board Outline & Matching Circuit

The evaluation board (Abracon ACAG0301-1575-T-EVB) is developed to simplify antenna testing and evaluation. It has an arbitrary size of 90 x 50 mm and includes an SMA connector. The purpose is to give a reference design for an optimal antenna implementation. The evaluation board can also be used to test other implementations by cutting and soldering the PCB into any device.



The evaluation board has a matching circuit implemented next to the antenna. This is aimed at enabling optimization possibilities for the user. The component positions are sized for 0402 (1005 metric) SMD components.

The antenna requires a matching circuit to fine-tune the resonant frequency and achieve optimal balance. The evaluation board is pre-tuned for optimal performance in the 2.4–2.5 GHz range using the components listed below (equivalents may be used):



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## Reflow Profile [JEDEC J-STD-020]

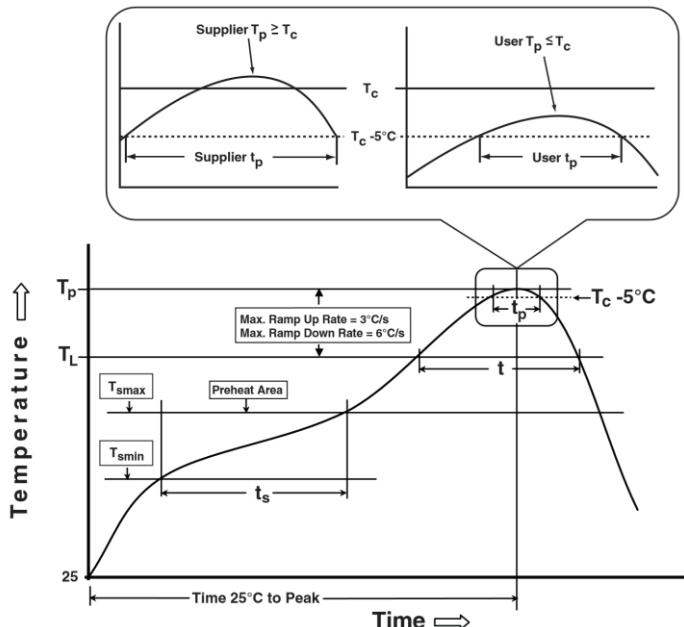


Table 1

## SnPb Eutectic Process Classification Temperatures ( $T_c$ )

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

Table 2

## Pb-Free Process Classification Temperatures ( $T_c$ )

Classification Temperatures (°C)			
Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
<1.6mm	265°C	265°C	265°C
1.6mm - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat / soak		
Temperature minimum ( $T_{smin}$ )	100°C	150°C
Temperature maximum ( $T_{smax}$ )	150°C	180°C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60 – 120 sec.	60 – 120 sec.
Average ramp-up rate ( $T_{smax}$ to $T_p$ )	3°C/sec. max	3°C/sec. max
Liquidous temperature ( $T_L$ )	183°C	220°C
Time at Liquidous ( $T_L$ )	60 – 150 sec.	30 – 40 sec.
Peak package body temperature ( $T_p$ )*	<b>See Table 1</b>	<b>See Table 2</b>
Time ( $T_p$ )** within 5°C of the specified classification temperature ( $T_c$ )	20 sec.	5 sec.
Ramp-down rate ( $T_p$ to $T_{smax}$ )	6°C/sec. max	3°C/sec. max
Time 25°C to peak temperature	6 min. max	8 min. max
Reflow cycles	2 max	2 max

\*Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\*Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.



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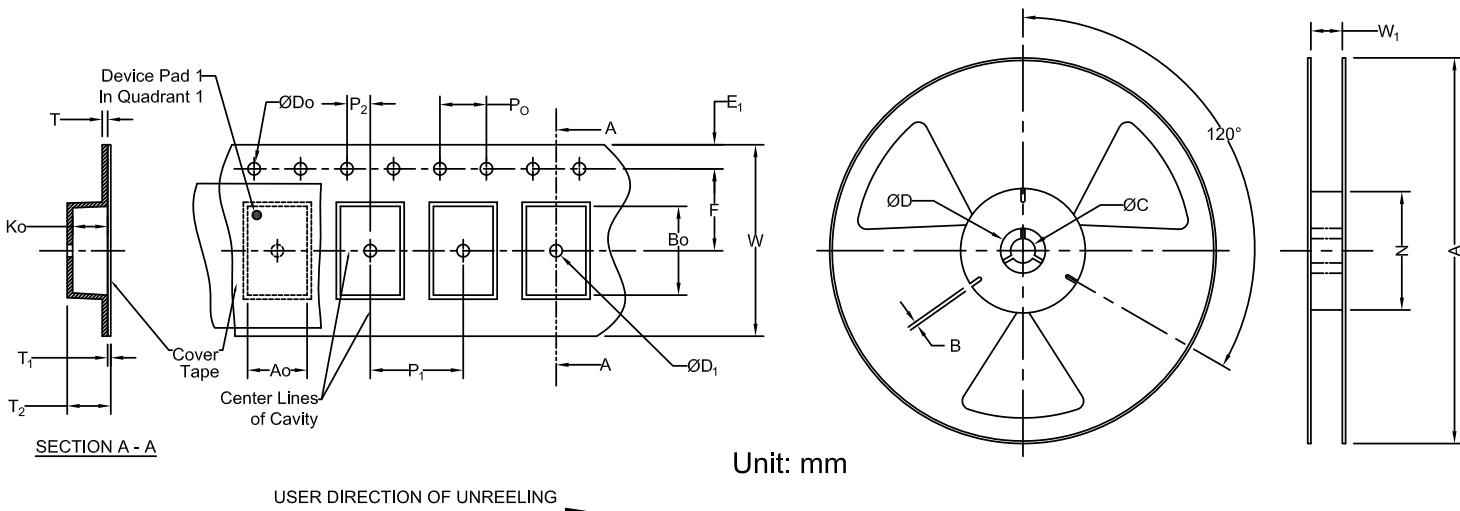
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## Packaging

Reel (3000 pcs/Reel)

Size of the carton: 404 x 206 x 250 mm

Tape & Reel Dimension



### Carrier Tape Specifications (mm)

Do	K <sub>0</sub>	E <sub>1</sub>	P <sub>0</sub>	P <sub>2</sub>	T	F	P <sub>1</sub>	W	A <sub>0</sub>	B <sub>0</sub>	Reel Qty
1.50 ± 0.1	1.3 ± 0.1	1.75 ± 0.1	4.0 ± 0.1	2.0 ± 0.10	0.22 ± 0.05	3.5 ± 0.10	4.0 ± 0.1	8.0 ± 0.10	2.0 ± 0.1	3.5 ± 0.1	3,000

### Reel Specifications (mm)

A	W <sub>1</sub>	N	C
178 ± 2.0	8.5 ± 1.0	60	13 ± 0.5

## Additional Resources

STEP File: [ACAG0301-1575-T STEP File](#)

Package Drawing: [ACAG0301-1575-T Package Drawing](#)

3D PDF: [ACAG0301-1575-T 3D PDF](#)

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