

# WLAN/WIFI/BLUETOOTH COMPACT CHIP ANTENNA



AMCA31-101-2R450G-S1F-T3



3.2 x 1.6 x 1.2 mm  
RoHS/RoHS II Compliant  
MSL=MSL-1

## FEATURES

- 2450MHz, bandwidth  $\geq 90$ MHz
- Small size - 3.2 x 1.6 x 1.2mm (0.125 x 0.62 x 0.047 inch)
- Gain 0.5dBi (Peak) / -1dBi (Average)
- VSWR <2:1
- Non ground mounting type
- Power handling 3W max
- Matched to 50 Ohm
- Suitable for RoHS compliant reflow

## APPLICATIONS

- Wireless application - Bluetooth / WiFi (2.445GHz)
- IoT devices
- Bluetooth headsets or ear pieces
- Industrial automation
- Alternative to larger PCB solution

## ELECTRICAL CHARACTERISTICS

Item	Spec
Frequency	2450MHz
Bandwidth	$\geq 90$ MHz
Peak Gain	0.5 dBi typ.
Average Gain	-1 dBi typ
VSWR	<2:1
Impedance	50 Ohm
Power Capability	3W max
Operating Temperature Range	-40°C to + 85°C

## PART IDENTIFICATION

AMCA31-101-2R450G-S1F-T3



Packaging
Blank: Bulk or Cut Tape
T3 : T/R 3000pcs per reel

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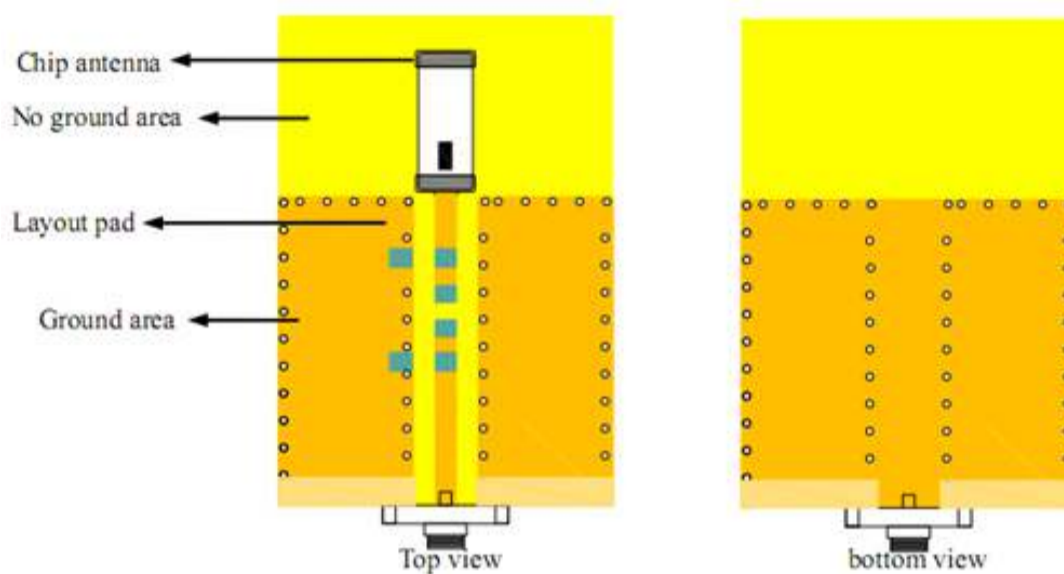
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## APPLICATION TEST CIRCUIT & PCB LAYOUTS – DEFAULT LAYOUTS

Evaluation Board PCB Layout



Shows the PCB layout highlighting the Ground and No Ground areas and trace feed line to the chip antenna.

# WLAN/WIFI/BLUETOOTH COMPACT CHIP ANTENNA



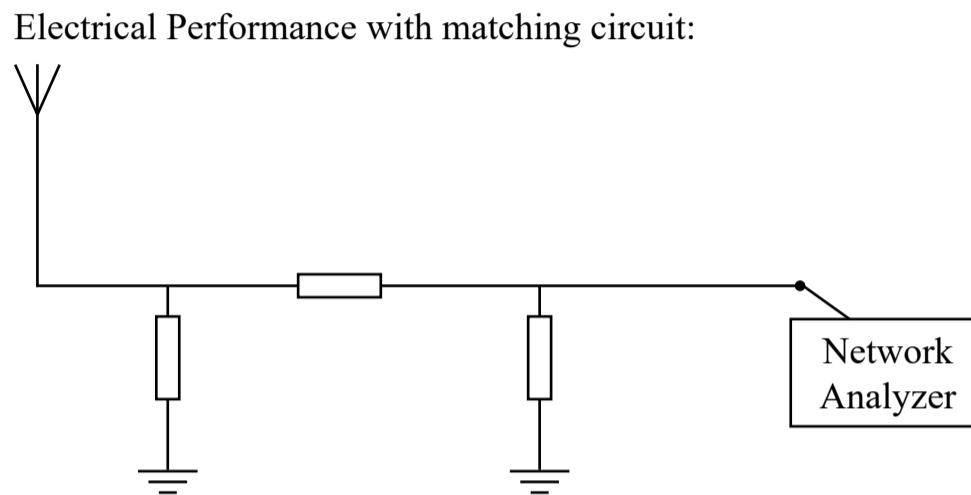
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## MATCHING CIRCUIT AND REFERENCE VALUES

Chip antenna should be matched with the environment of final products. Normally this process can be done with capacitor or inductor.



Passive Test with Network Analyzer

### Range of Matching Component Values

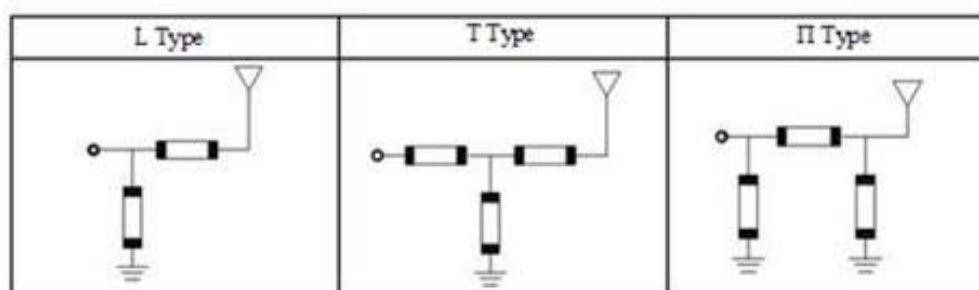
Component	Description	Value
Antenna	AMCA31-101-2R450G-S1F-T3	----
Capacitor	*Series C	0.5 ~ 10 pF
	*Shunt C	33pF, 100 pF
Inductor	Series L	1.0 ~ 6nH
	Shunt L	1.0 ~ 6nH

\*Series: Connected between antenna and feeding line in series.

\*Shunt: Connected between antenna and feeding line in parallel

Note: Recommendation is to pre-place the  $\pi$ -type circuit layout circuit which will offer full flexibility to match the antenna to 50 Ohm in the final product layout with one of the match configurations below. Depending on matching, NC will apply to certain components.

### Range of Matching Configurations



# WLAN/WIFI/BLUETOOTH COMPACT CHIP ANTENNA

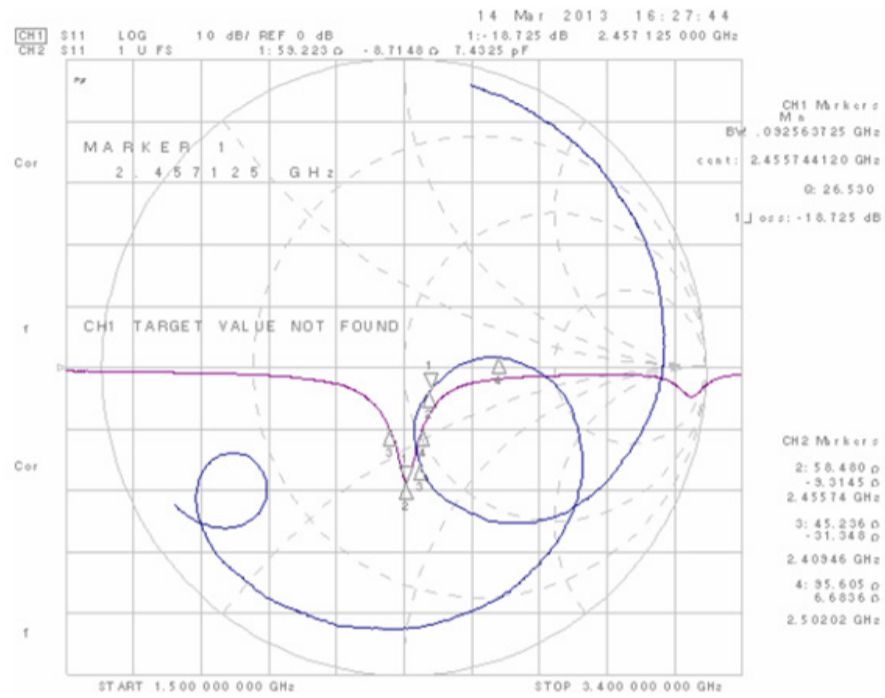


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## ANTENNA RESPONSE – SMITH CHART OF MATCH AND RETURN LOSS S11



# WLAN/WIFI/BLUETOOTH COMPACT CHIP ANTENNA

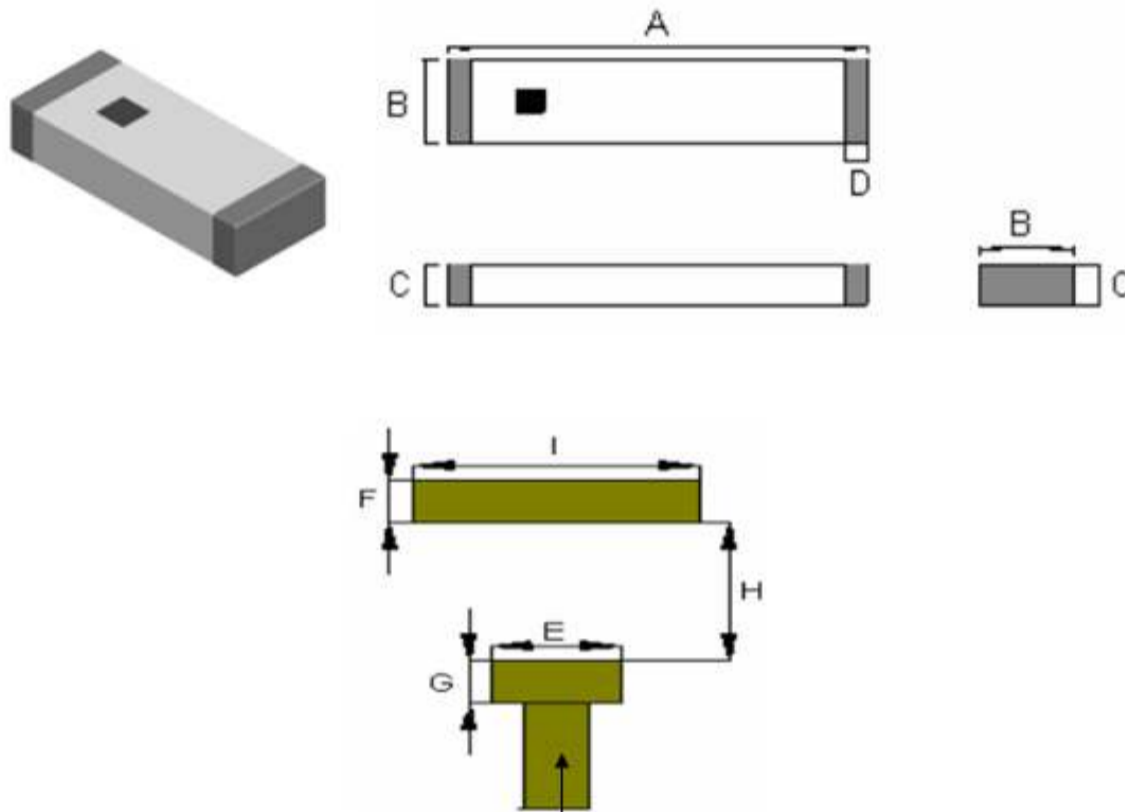


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## OUTSIDE DIMENSIONS AND PCB LAND DRAWING



(Dimensions in mm)

This is the feed-line to the Antenna and should be matched to 50 Ohms based upon the PCB dielectric parameters.

Series	A	B	C	D	E	F	G	H	I
AMCA31	3.2±0.2	1.6±0.2	1.2±0.2	0.5±0.2	1.6±0.2	0.8±0.2	0.8±0.2	2.6±0.2	3.5±0.2

## TERMINAL CONFIGURATION

Terminal identifications



Table (7.1) - Terminal Configuration

No	Terminal Name	No	Terminal Name
Pad 1	Feed Point	Pad 2	NC

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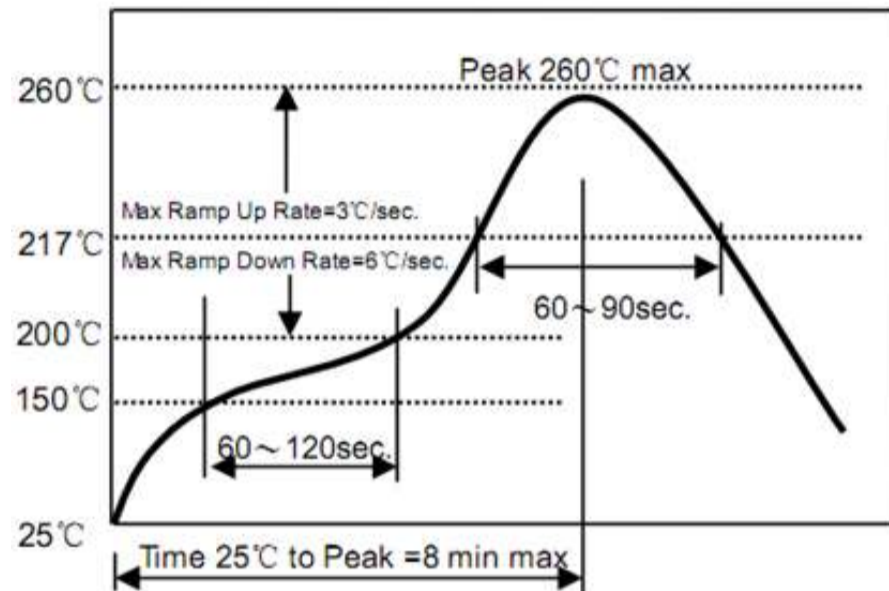


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## REFLOW PROFILE :



- Preheat condition: 150 ~200 /60~120°C sec.
- Allowed time above 217°C: 60~90sec.
- Max temp: 260°C
- Max time at max temp: 10sec.
- Solder paste: Sn/3.0Ag/0.5Cu
- Allowed Reflow time: 2x max

[Note: The reflow profile in the above table is only for qualification and is not meant to specify board assembly profiles. Actual board assembly profiles must be based on the customer's specific board design, solder paste and process, and should not exceed the parameters as the Reflow profile shows.]

# WLAN/WIFI/BLEETOOTH COMPACT CHIP ANTENNA



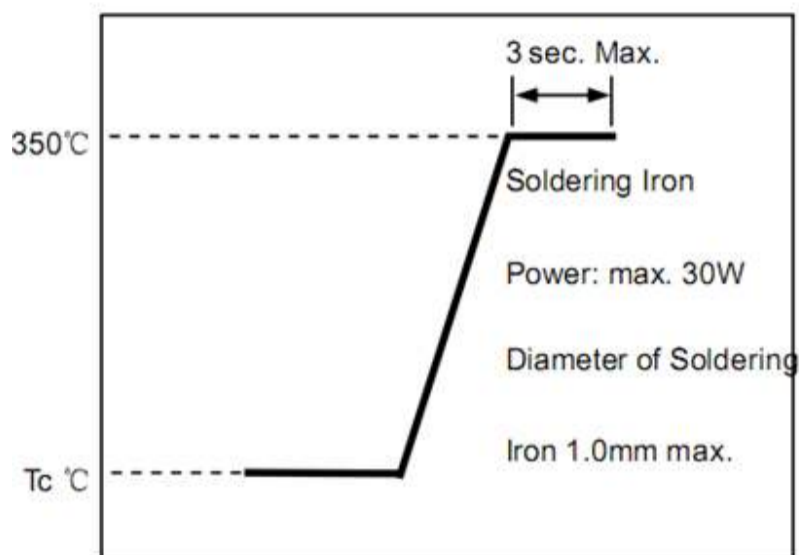
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## MANUAL SOLDERING

Pre-heating Temperature: 120°C, 60 ~ 300 sec.



- Iron soldering power: Max.30W.
- Pre-heating: 150 / 60 sec. °C.
- Soldering Tip temperature: 350 Max. °C.
- Soldering time: 3 sec Max.
- Solder paste: Sn/3.0Ag/0.5Cu.
- Max 1 times for iron soldering.
- Soldering Temperature: 340°C±5°C, 5sec max per each terminal.

[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]

**PACKAGING: T3=3000 UNITS PER REEL**

### Package Handling and Storage Precautions

- The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at 40 °C or less and 70% RH or less.
- The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H<sub>2</sub>S).
- Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.
- Solderability specified in Para 9.4 shall be guaranteed for 6 months from the date of delivery on condition that they are stored at the environment specified in Para 1.1. For those parts, which passed more than 6 months shall be checked solder-ability before use.

# WLAN/WIFI/BLUETOOTH COMPACT CHIP ANTENNA

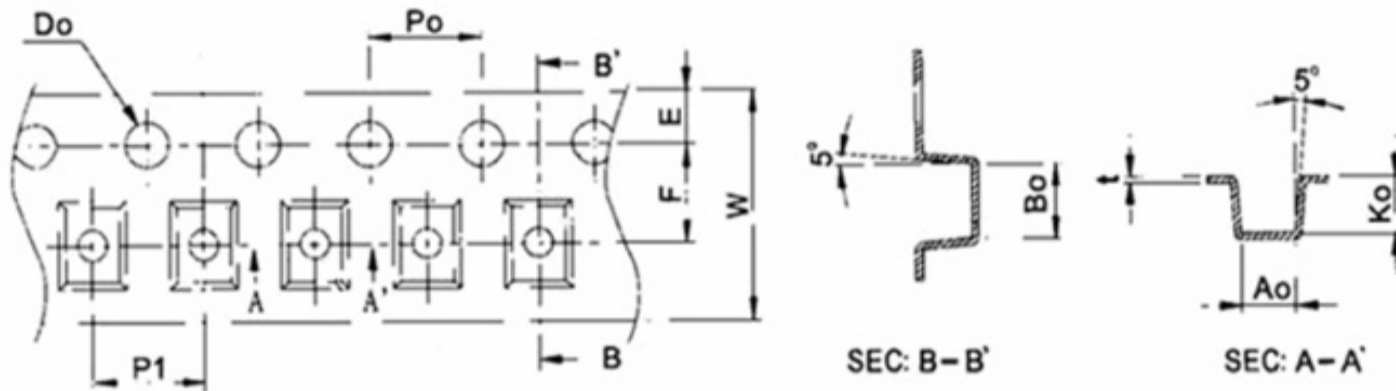


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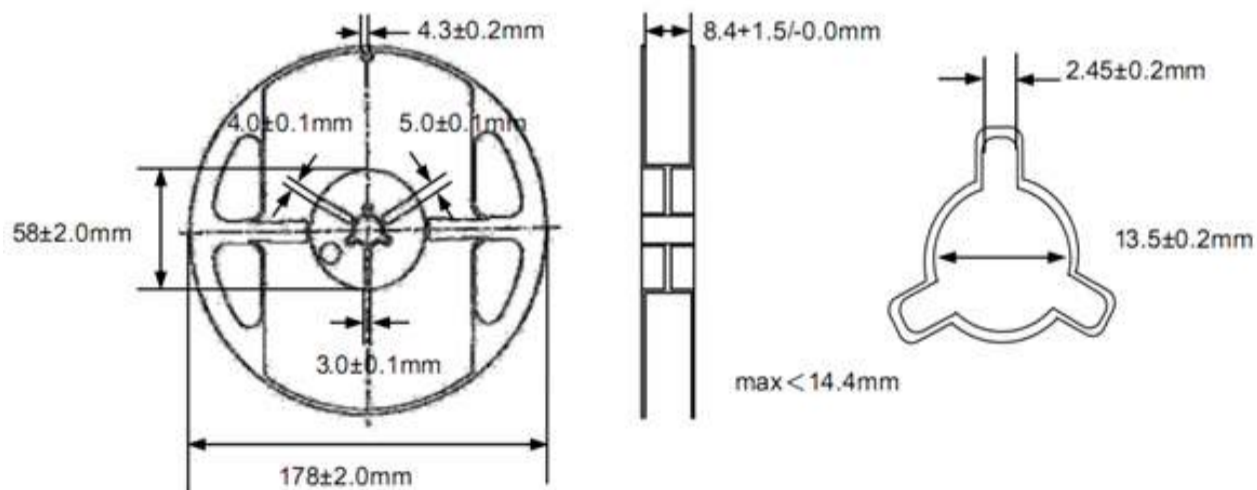
## TAPE DIMENSIONS:



Dimensions: mm

W	8.0±0.10	D0	1.50 +0.10 / -0.0
P1	4.0±0.10	P0	4.0±0.10
E	1.75±0.10	K0	1.50±0.10
F	3.50±0.15	A0	1.80±0.10
B0	3.50±0.10	t	0.22±0.10

## REEL DIMENSIONS:



Dimensions: mm



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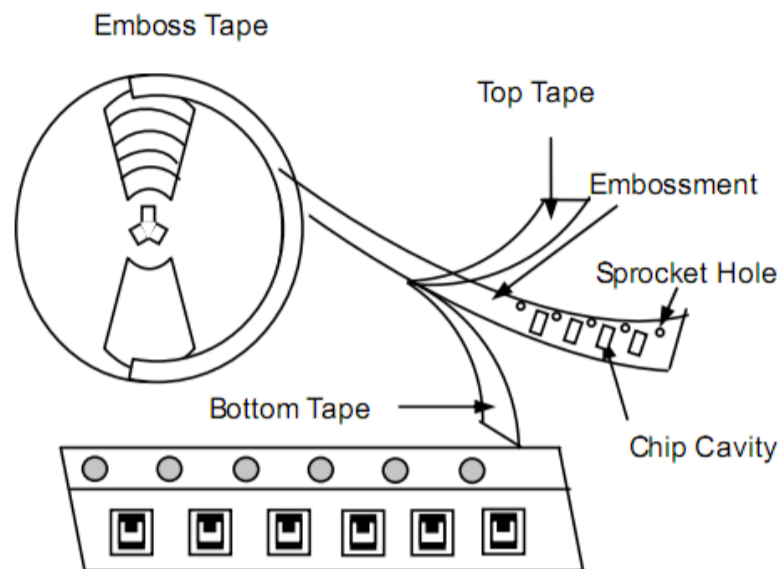


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## Mounting Direction of Tape on Reel



Note: The sprocket holes are to the right as the tape is pulled toward the user

## CAUTIONS

### Ultrasonic cleaning

Ultrasonic vibration may cause deterioration & destruction of the component. Please avoid ultrasonic cleaning.

### Soldering

Only leads of the component may be soldered. Please avoid soldering to any other part of the component, such as the Ag patterning as this will change the performance of the antenna.

### Handling & Packaging

See “**Package Handling**” for further details