WLAN/WIFI/BLUETOOTH COMPACT CHIP ANTENNA

AMCA31-101-2R450G-S1F-T3

FEATURES

- 2450MHz, bandwidth ≥90MHz
- 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Spec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>2450MHz</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>≥90MHz</td>
</tr>
<tr>
<td>Peak Gain</td>
<td>0.5 dBi typ.</td>
</tr>
<tr>
<td>Average Gain</td>
<td>-1 dBi typ</td>
</tr>
<tr>
<td>VSWR</td>
<td>&lt;2:1</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 Ohm</td>
</tr>
<tr>
<td>Power Capability</td>
<td>3W max</td>
</tr>
<tr>
<td>Operating Temperature Range</td>
<td>-40ºC to + 85ºC</td>
</tr>
</tbody>
</table>

PART IDENTIFICATION

AMCA31-101-2R450G-S1F-T3

Packaging

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

Electrical Performance with matching circuit:

Passive Test with Network Analyzer

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna</td>
<td>AMCA31-101-2R450G-S1F-T3</td>
<td>----</td>
</tr>
<tr>
<td>Capacitor</td>
<td>*Series C</td>
<td>0.5 ~ 10 pF</td>
</tr>
<tr>
<td></td>
<td>*Shunt C</td>
<td>33pF, 100 pF</td>
</tr>
<tr>
<td>Inductor</td>
<td>Series L</td>
<td>1.0 ~ 6nH</td>
</tr>
<tr>
<td></td>
<td>Shunt L</td>
<td>1.0 ~ 6nH</td>
</tr>
</tbody>
</table>

*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 π-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
ANTENNA RESPONSE – SMITH CHART OF MATCH AND RETURN LOSS S11
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.

<table>
<thead>
<tr>
<th>Series</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMCA31</td>
<td>3.2±0.2</td>
<td>1.6±0.2</td>
<td>1.2±0.2</td>
<td>0.5±0.2</td>
<td>1.6±0.2</td>
<td>0.8±0.2</td>
<td>0.8±0.2</td>
<td>2.6±0.2</td>
<td>3.5±0.2</td>
</tr>
</tbody>
</table>

**TERMINAL CONFIGURATION**

Terminal identifications

Table (7.1) - Terminal Configuration

<table>
<thead>
<tr>
<th>No</th>
<th>Terminal Name</th>
<th>No</th>
<th>Terminal Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pad 1</td>
<td>Feed Point</td>
<td>Pad 2</td>
<td>NC</td>
</tr>
</tbody>
</table>
WLAN/WIFI/BLUETOOTH COMPACT CHIP ANTENNA

AMCA31-101-2R450G-S1F-T3

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.]
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 H2S).
- 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

AMCA31-101-2R450G-S1F-T3

TAPE DIMENSIONS:

Dimensions: mm

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>8.0±0.10</td>
<td>D0</td>
</tr>
<tr>
<td>P1</td>
<td>4.0±0.10</td>
<td>P0</td>
</tr>
<tr>
<td>E</td>
<td>1.75±0.10</td>
<td>K0</td>
</tr>
<tr>
<td>F</td>
<td>3.50±0.15</td>
<td>A0</td>
</tr>
<tr>
<td>B0</td>
<td>3.50±0.10</td>
<td>t</td>
</tr>
</tbody>
</table>

REEL DIMENSIONS:

Dimensions: mm
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