

# **SMD Antenna Specification Document**

**OverAir<sup>®</sup> SMD Antenna Series  
Complies with RoHS standards**

**PN: OA-C09**

**2.4 GHz LSM-Band Antenna**

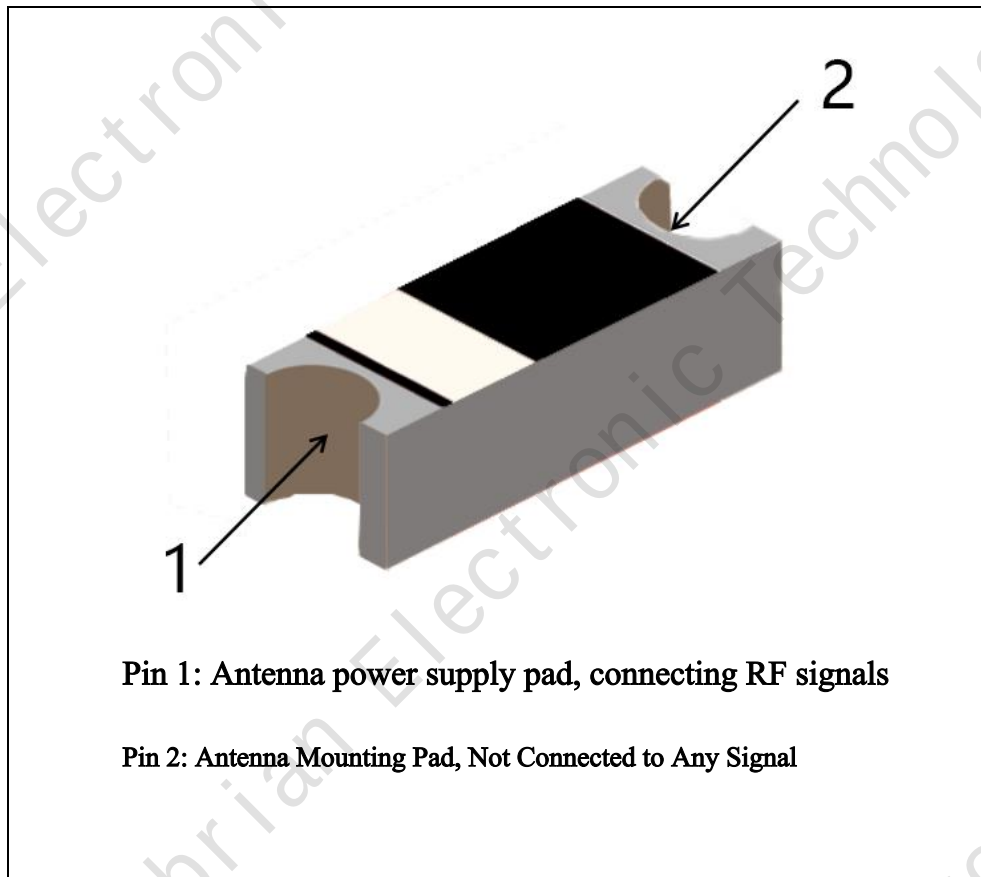
### Characteristic

1. A compact SMD surface-mount antenna measuring only 5.5 X 1.2 X 1.2 mm<sup>3</sup>.
2. Low energy loss and high antenna efficiency.
3. It exhibits high stability under variations in temperature and humidity.

### Apply

1. 2.4 GHz ISM Band Antenna Application
2. Bluetooth, ZigBee, wireless applications, smart home applications, etc.
3. WIFI (only 2.4 GHz)

### structure



### Size

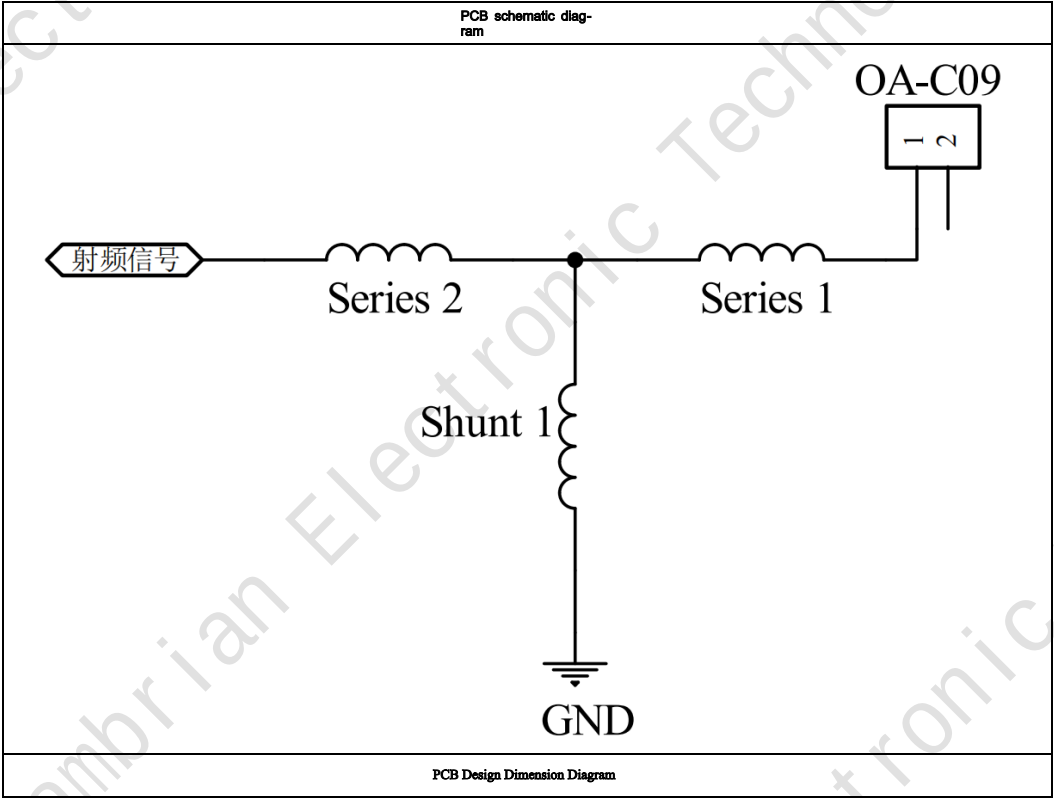
| Three views | Symbol   | Size (mm)        |
|-------------|----------|------------------|
|             | <b>L</b> | <b>5.5 ± 0.2</b> |
|             | <b>w</b> | <b>1.2 ± 0.1</b> |
|             | <b>T</b> | <b>1.2 ± 0.1</b> |
|             | <b>a</b> | <b>0.4 ± 0.1</b> |

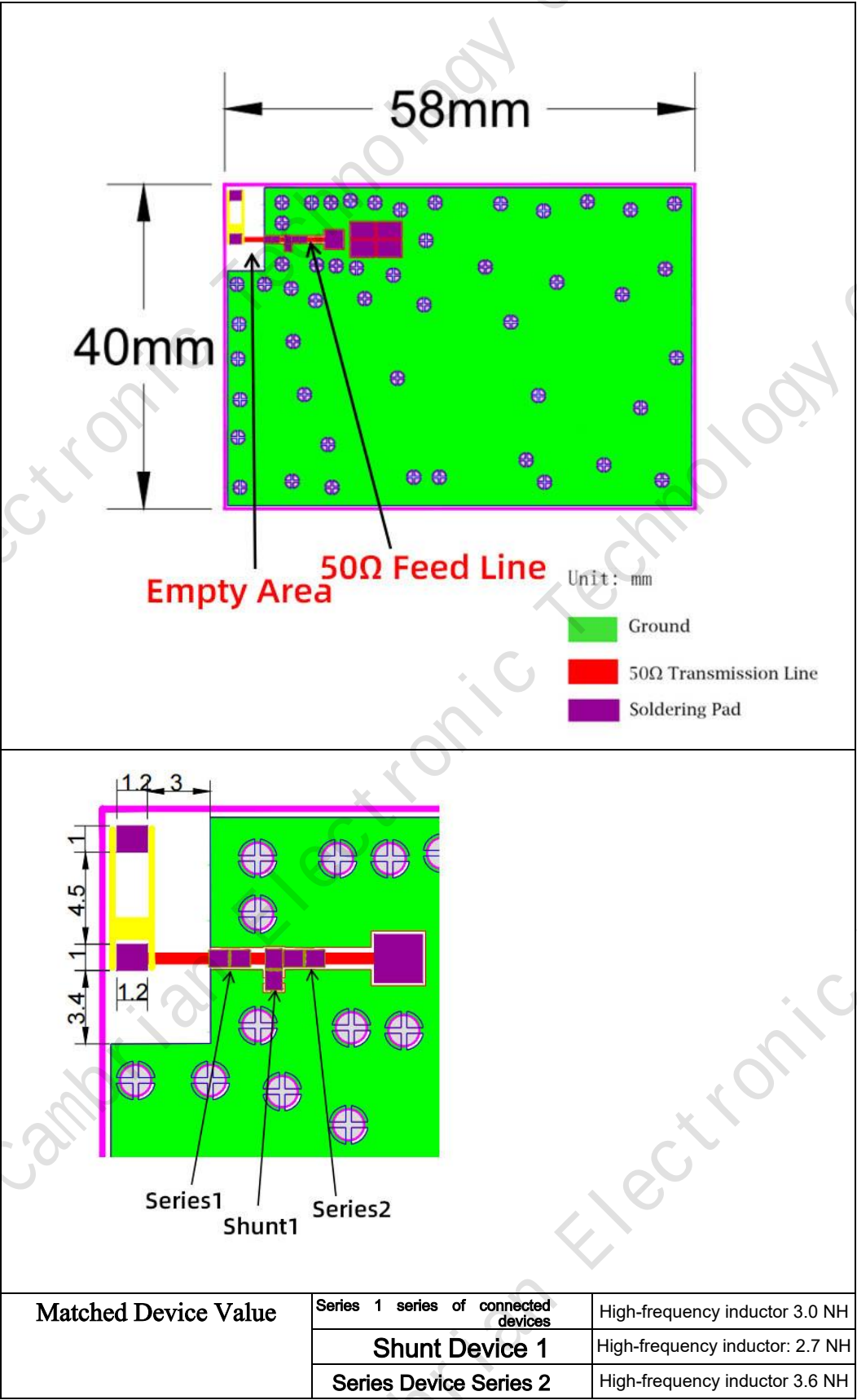
Electrical Character

| OA-C09                                       | Specification |
|----------------------------------------------|---------------|
| Working Frequency Range    Working Frequency | 2450 ± 50MHz  |
| Bandwidth                                    | >100MHz       |
| Impedance                                    | 50 Ω          |
| Gain (dBi)                                   | 4.0 (peak)    |
| Standing wave ratio (VSWR)                   | <2            |
| Operating temperature                        | -40℃~+95℃     |
| Power Capacity                               | 3W            |

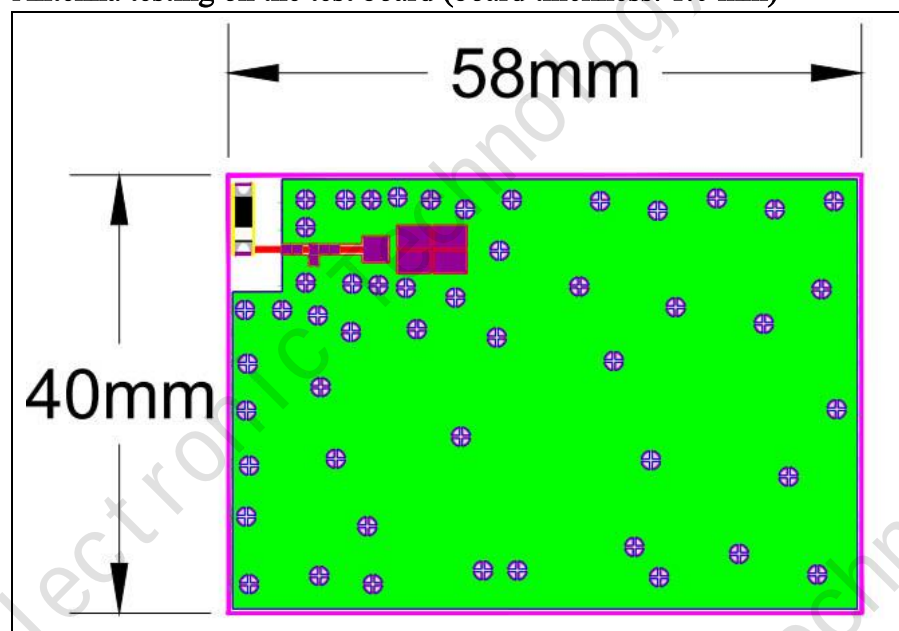
The operating frequency of the 2.4 GHz antenna must be calibrated using impedance matching components.

Antenna Pad and Trace Design

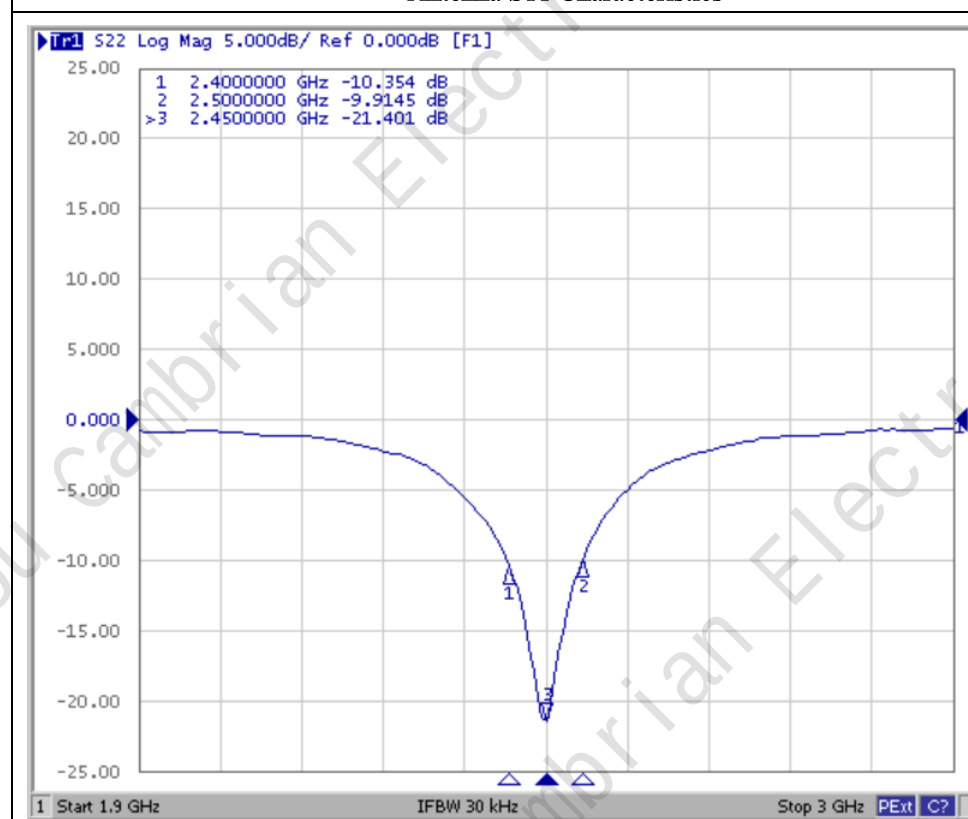


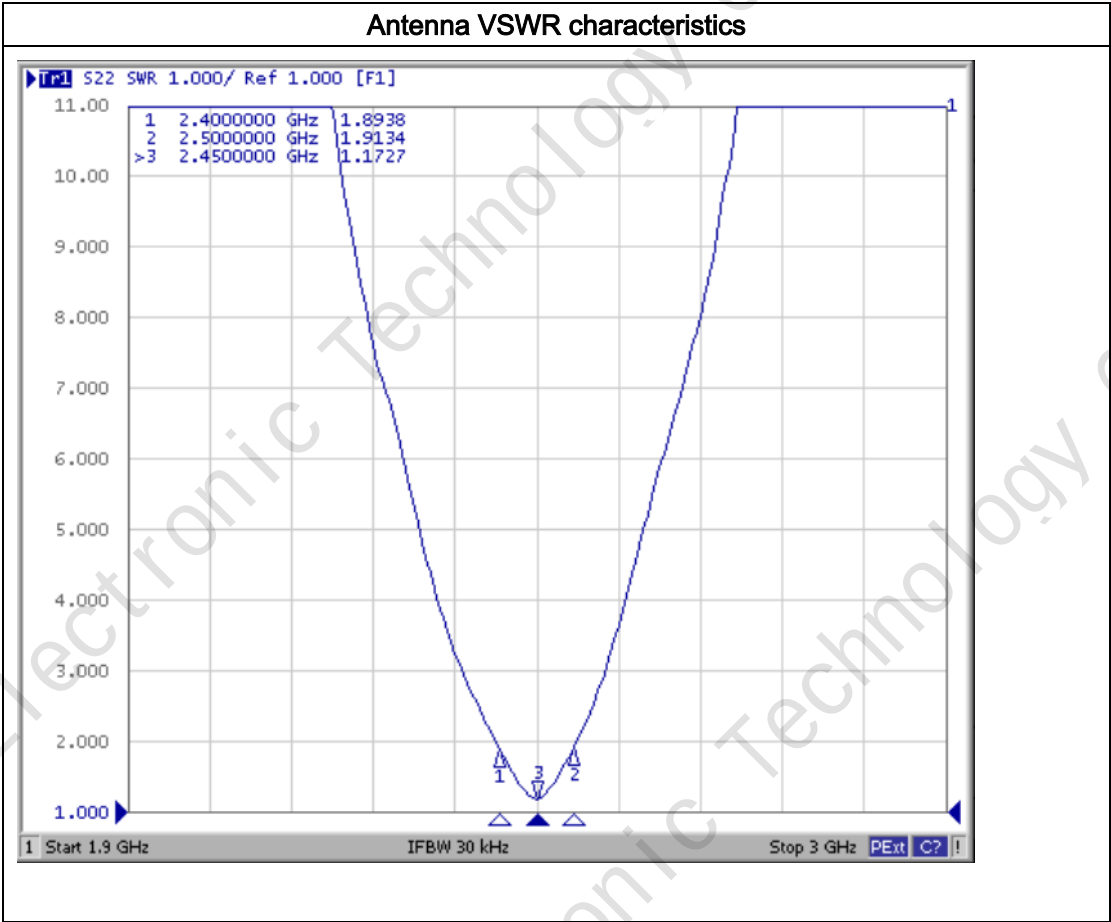


Antenna testing on the test board (board thickness: 1.0 mm)



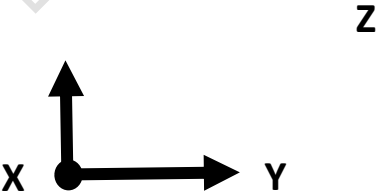
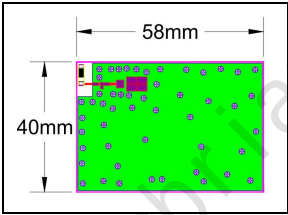
Antenna S11 Characteristics





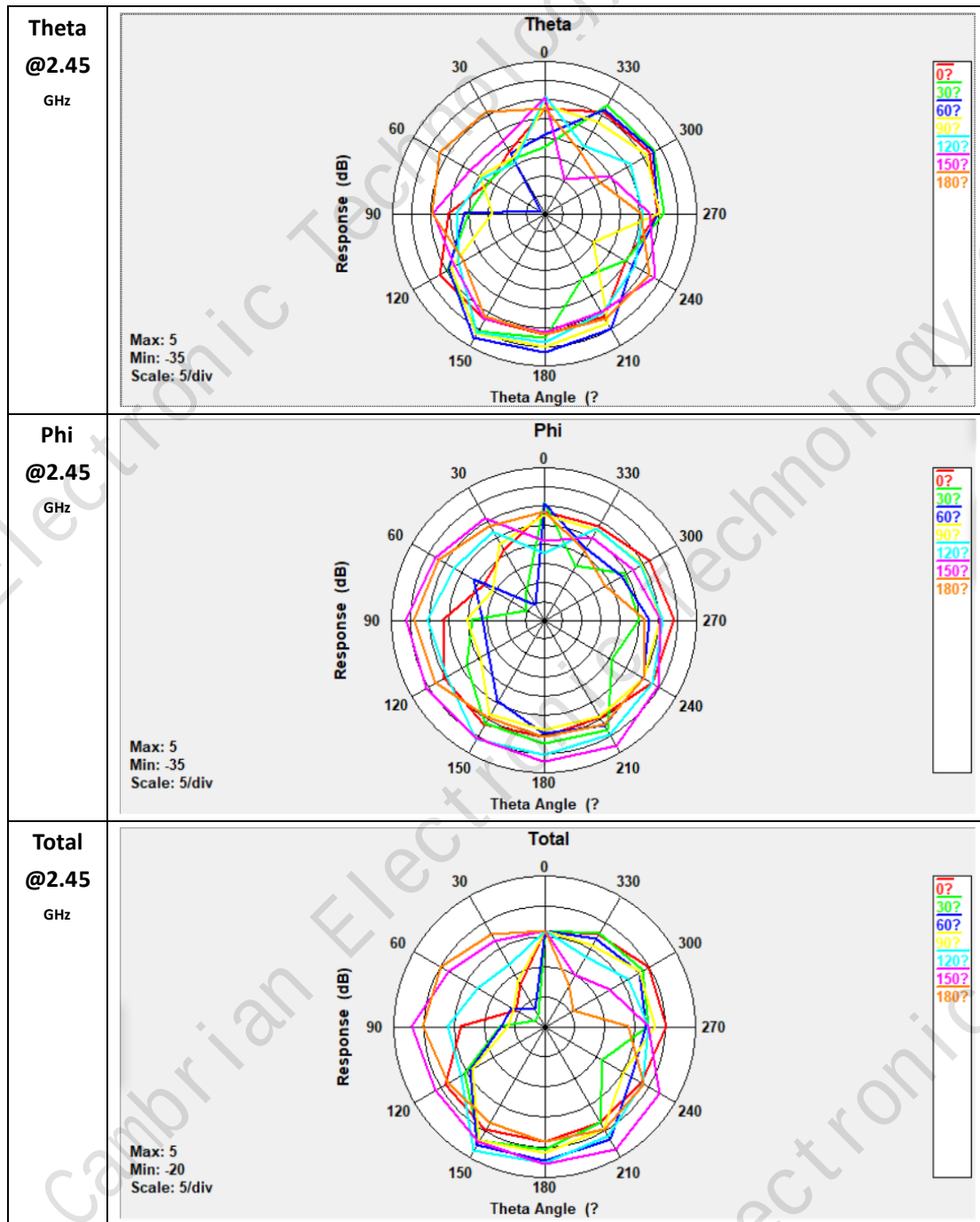
**Efficiency and Radiation Chart**

Performance metrics such as efficiency, radiation pattern, and gain were derived from the test board design. The specification and characteristic test data for the OA-C09 antenna were obtained based on the dimensions of the test PCB and the testing orientation illustrated below. These measurements were completed in an ETS 3D microwave anechoic chamber.



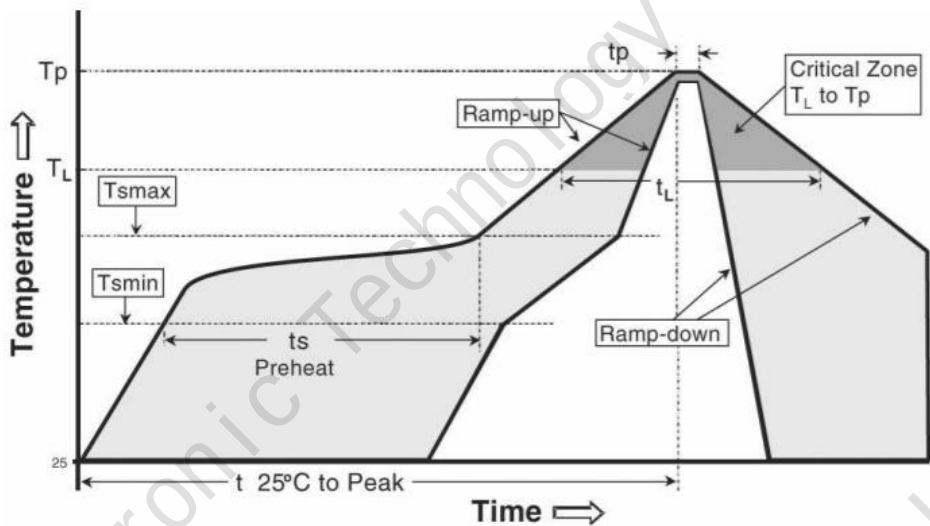
| Gain and Efficiency                | Bandwidth: 2.4 GHz~2.5 GHz |
|------------------------------------|----------------------------|
| Peak Gain                          | 4.33dBi                    |
| Average gain within the band       | 4.0dBi                     |
| Average Gain across the band       |                            |
| Band gain range                    | 3.59dBi~4.33dBi            |
| Gain Range across the band         |                            |
| Peak Efficiency                    | 62.5%                      |
| Average efficiency within the band | 57.5%                      |
| Average Efficiency across the band |                            |
| Band efficiency range              | 51.3%~62.5%                |

Efficiency Range across the band



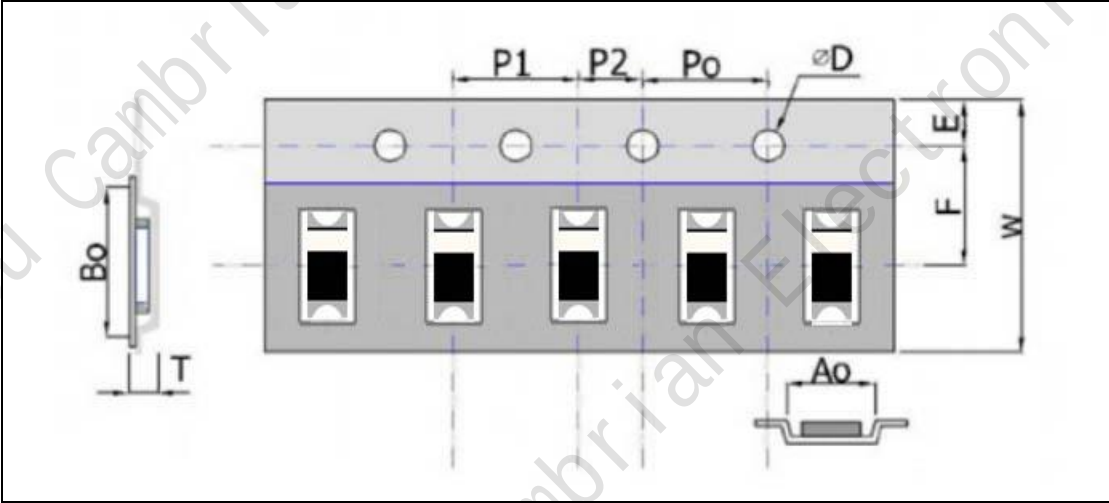
### Welding Condition

The typical reliable and non-destructive welding specification is shown below:



| Phase                               | Profile features                                                                                                                           | Pb-Free assembly (SnAgCu)                                                                    |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| RAMP-UP                             | Avg. Ramp-up Rate (Tsmax to Tp)                                                                                                            | 3 °C / second (max.)                                                                         |
| PREHEAT                             | <ul style="list-style-type: none"><li>- Temperature Min (Tmin)</li><li>- Temperature Max (Tsmax)</li><li>- Time (tsmin to tsmax)</li></ul> | <ul style="list-style-type: none"><li>150 °C</li><li>200 °C</li><li>60-180 seconds</li></ul> |
| REFLOW                              | <ul style="list-style-type: none"><li>- Temperature (TL)</li><li>- Total Time above TL (tL)</li></ul>                                      | <ul style="list-style-type: none"><li>217 °C</li><li>60-150 seconds</li></ul>                |
| PEAK                                | <ul style="list-style-type: none"><li>- Temperature (Tp)</li><li>- Time (tp)</li></ul>                                                     | <ul style="list-style-type: none"><li>260 °C</li><li>20-40 seconds</li></ul>                 |
| RAMP-DOWN                           | Rate                                                                                                                                       | 6 °C/second max                                                                              |
| Time from 25 °C to Peak Temperature |                                                                                                                                            | 8 minutes max                                                                                |

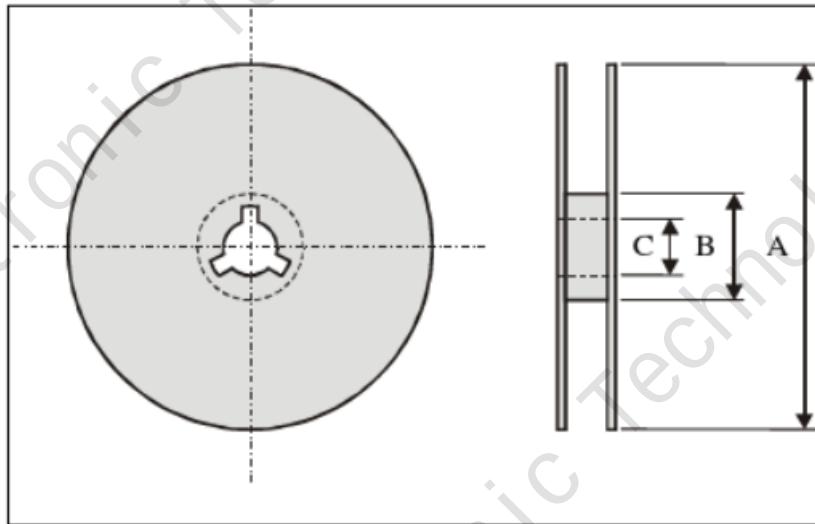
pack



Plastic carrier specifications (Unit: mm)

| Index          | Ao            | Bo            | $\Phi D$        | T             | W             |
|----------------|---------------|---------------|-----------------|---------------|---------------|
| Dimension (mm) | $1.3 \pm 0.1$ | $5.8 \pm 0.1$ | $1.55 \pm 0.05$ | $1.8 \pm 0.1$ | $12 \pm 0.1$  |
| Index          | E             | F             | Po              | P1            | P2            |
| Dimension (mm) | $1.5 \pm 0.1$ | $5.4 \pm 0.1$ | $4.0 \pm 0.1$   | $4.0 \pm 0.1$ | $2.0 \pm 0.1$ |

### Spool Size



| Index         | A   | B   | C    |
|---------------|-----|-----|------|
| Dimension(mm) | 330 | 100 | 13.5 |

Standard quantity: 3000 PCS per disc.

### Storage Environment

Products must meet the following conditions during storage:

temperature :  $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$

Humidity: 30% to 70% relative humidity

The product should be stored away from corrosive gases such as sulfur, Chlorine or acids may cause oxidation of the product electrodes, leading to reduced weldability.

The product should be stored in a toolbox and protected from moisture and dust.

The product shall be stored in a warehouse and protected from heat, vibration, and direct sunlight.

The product should be stored under sealed conditions.

### Business Cooperation and Technical Support

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