

SMD Antenna Specification Document

CrossAir TM SMD antenna series
Complies with RoHS regulations

PN: CA-C03

2.4 GHz ISM Band Antenna

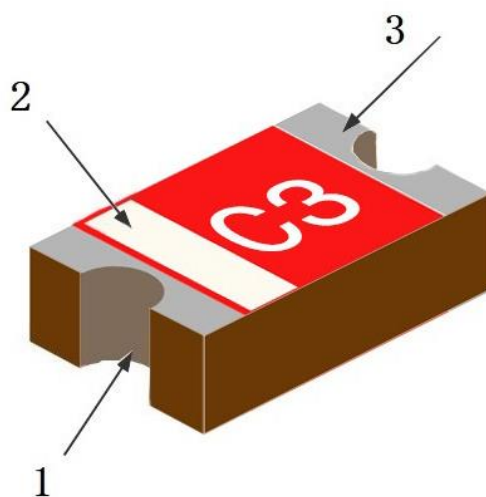
Characteristic

1. A small SMD surface mount antenna with dimensions of only 5.5 X 2.0 X 1.0 mm³.
2. Low energy loss and high antenna efficiency.
3. It exhibits high stability under temperature and humidity variations.

Apply

1. Antenna applications in the 2.4GHz ISM band
2. Bluetooth, ZigBee, wireless applications, smart home applications, etc.
3. WIFI (2.4G only)

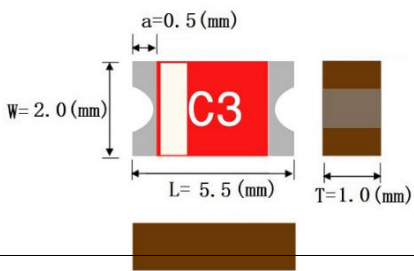
structure



1、 Antenna Feed Terminal

2、 Feed Identification Mark

3、 Antenna Welding Fixed End

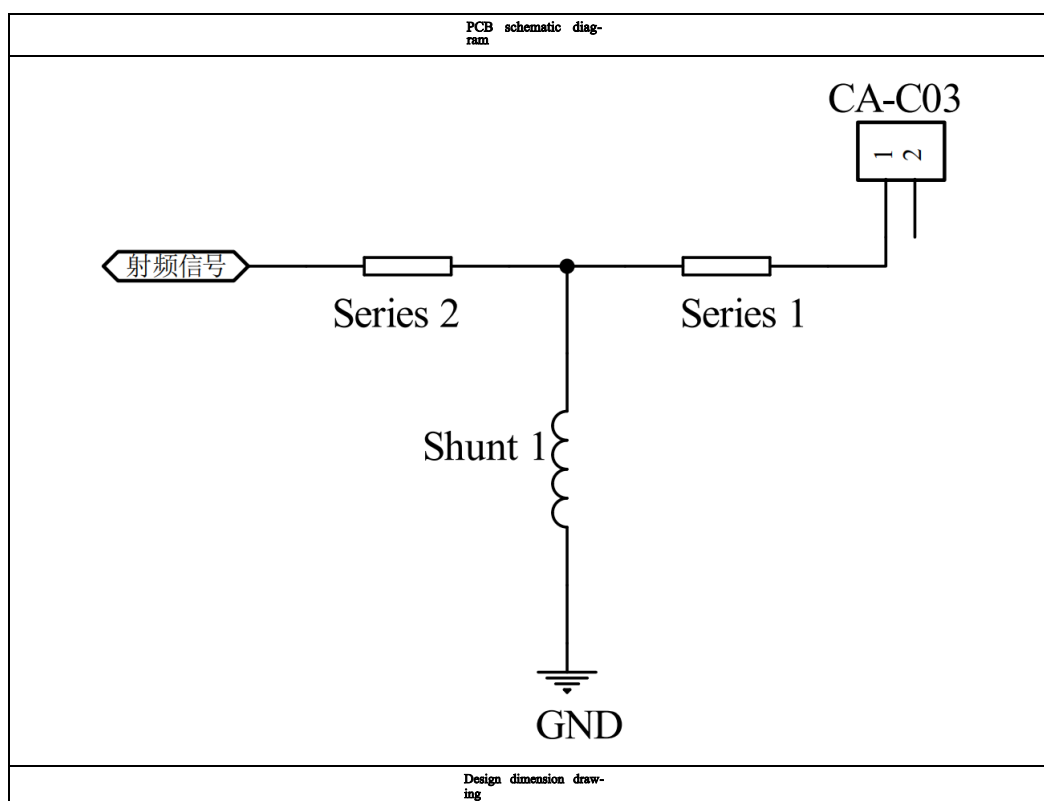
Size		
Three views	Symbol	Size (mm)
	L	5.5±0.2
	w	2.0±0.1
	T	1.0±0.1
	a	0.5±0.1

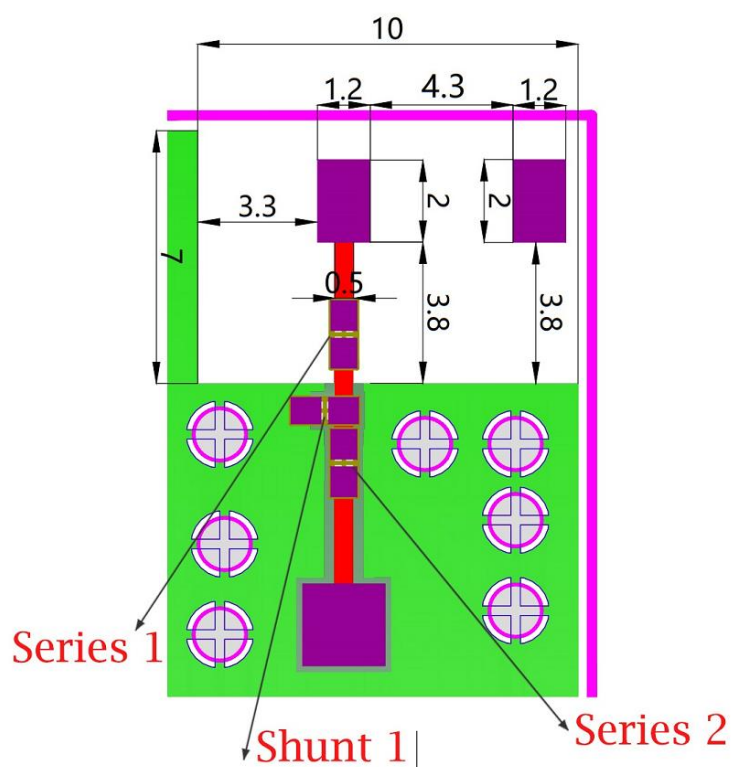
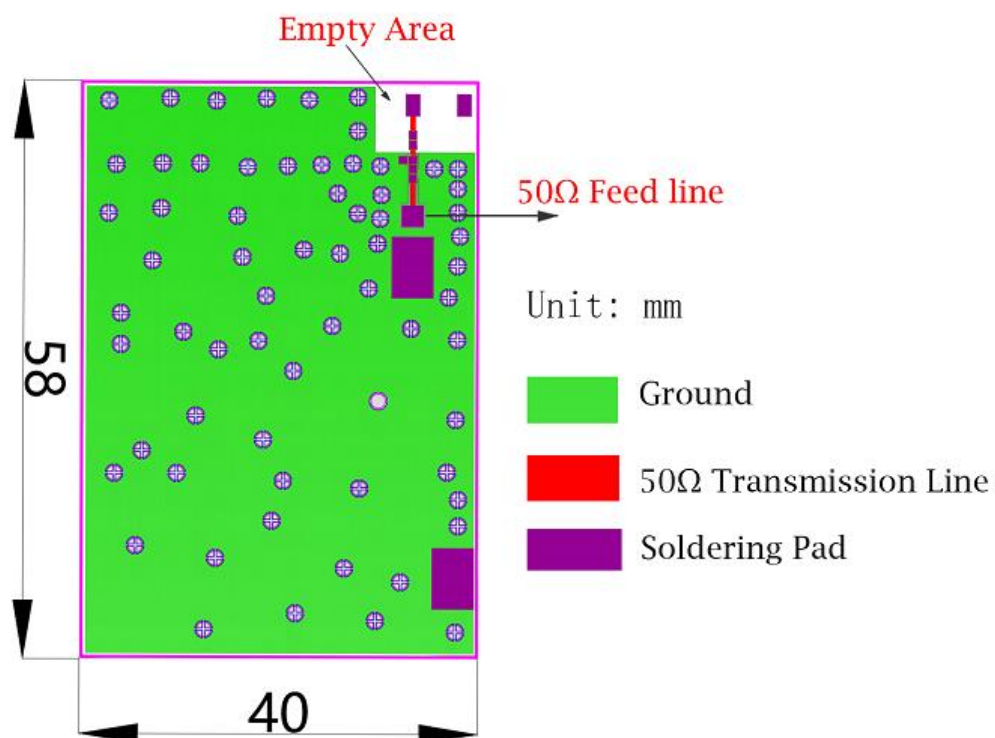
Electrical Character

CA-C03	Specification
Frequency Range	$2450 \pm 50\text{MHz}$
Bandwidth	$>100\text{MHz}$
Impedance	$50\ \Omega$
Gain (dBi)	4.3 (peak)
Standing-wave ratio VSWR	<2
Working Temperature	$-40^{\circ}\text{C} \sim +95^{\circ}\text{C}$
Acceptable Power	3W

The 2.4G operating frequency of the antenna requires debugging through impedance matching components.

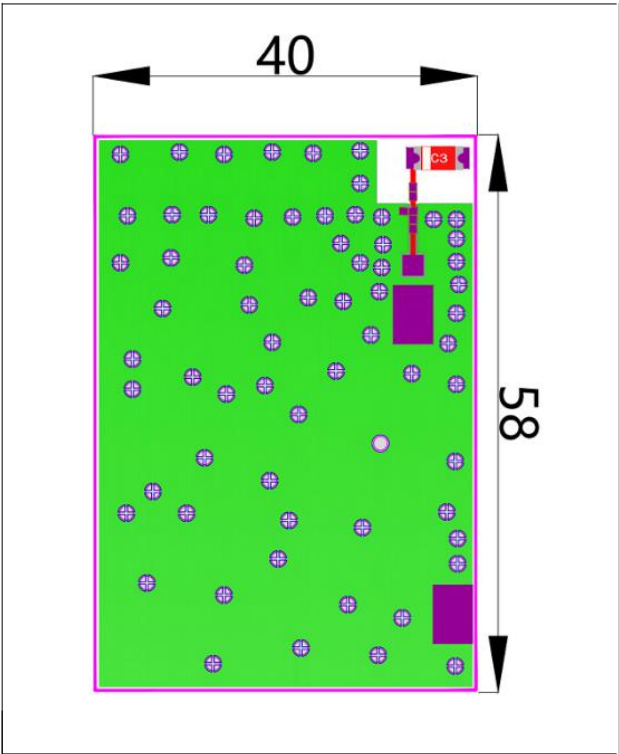
Antenna Pad and Tracing Design



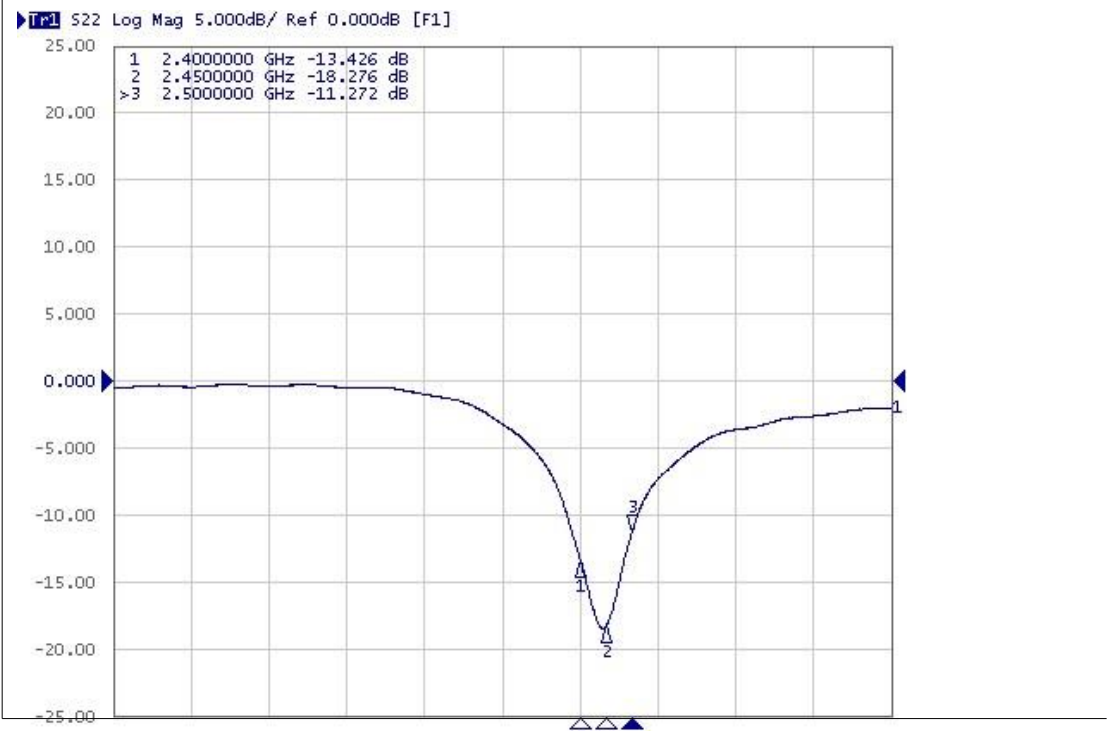


Matched device value	Series 1 devices	Resistance 0 Ω
	Shunt 1 parallel device	High-frequency inductor 3NH
	Series 2 components	Resistance 0 Ω

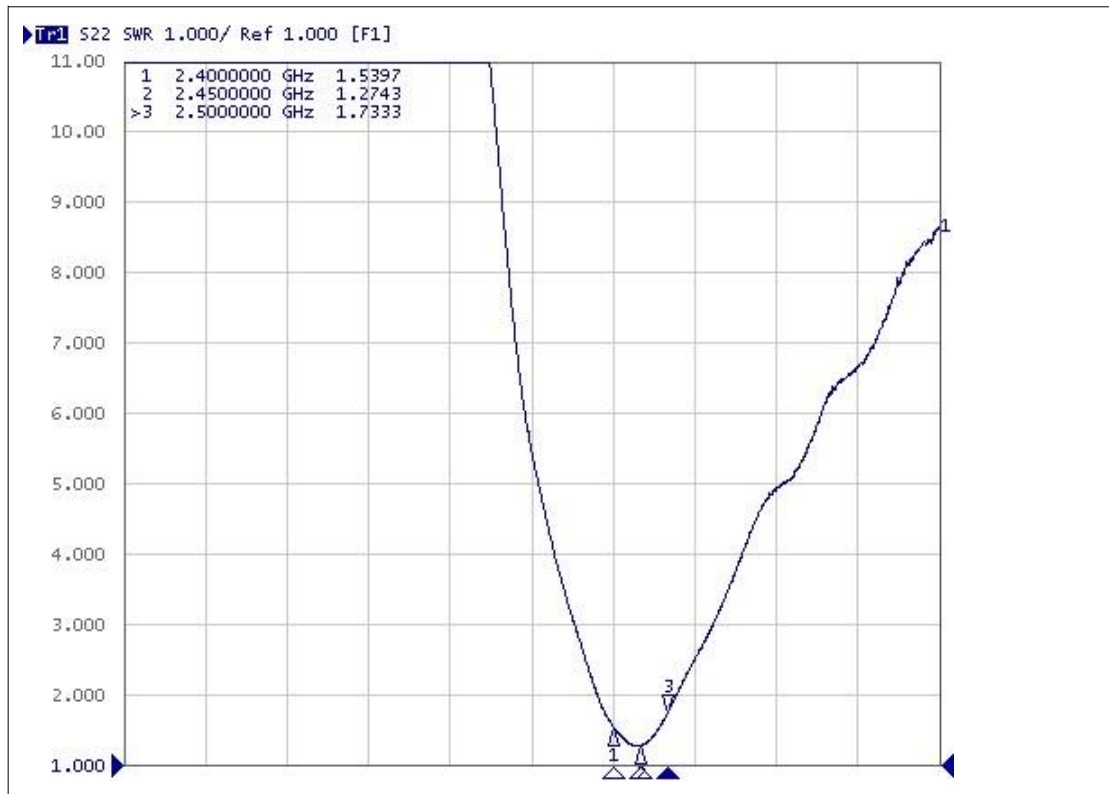
Antenna testing on test board (board thickness 1.0mm)



Antenna S11 characteristics

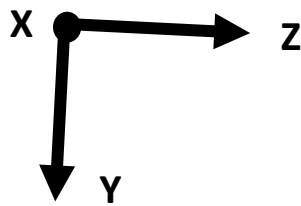
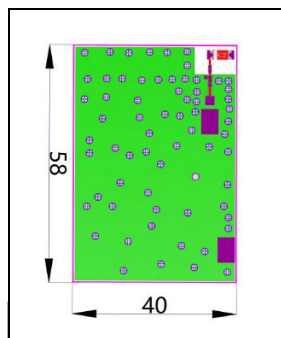


Antenna VSWR characteristics

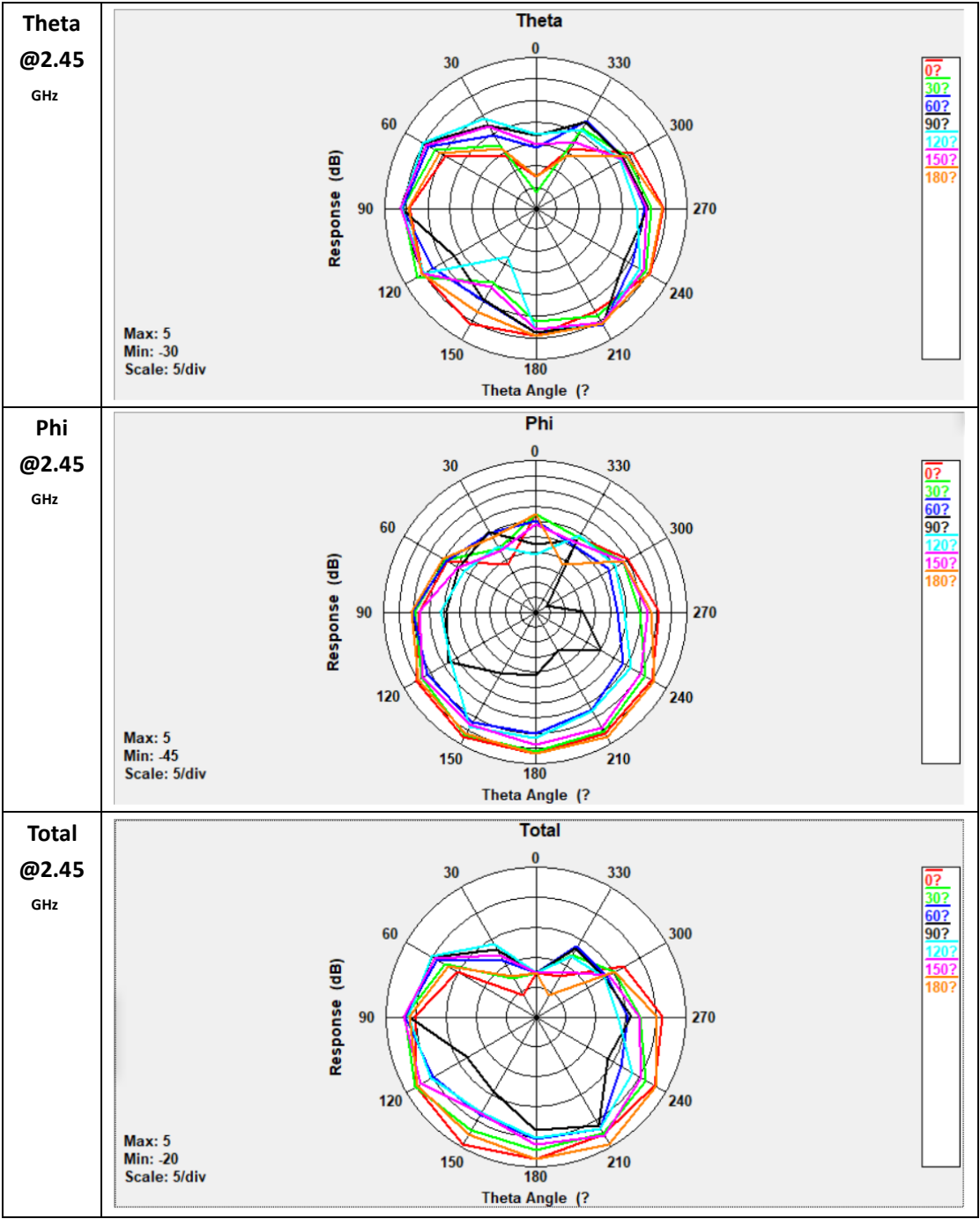


Efficiency and Radiation Diagram

Performance metrics including efficiency, radiation pattern, and gain were derived from the test board design. The specification characteristic test data for the CA-C03 antenna was obtained based on the test PCB dimensions and the test orientation illustrated in the figure below. All subsequent measurements were completed in an ETS 3D microwave anechoic chamber.

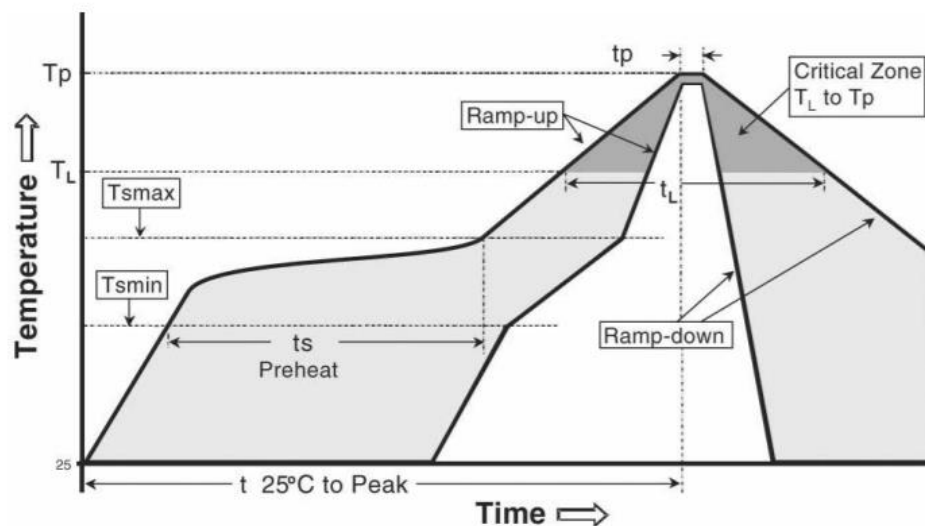


Gain and efficiency	Bandwidth: 2.4G-2.5GHz
Peak Gain	4.3dBi
Band average gain	4.1dBi
Average Gain across the band	
Band gain range	3.9dBi~4.3dBi
Gain Range across the band	
Peak Efficiency	81.7%
In-band average efficiency	80.2%
Average Efficiency across the band	
Band efficiency range	78.6%~81.7%
Efficiency Range across the band	



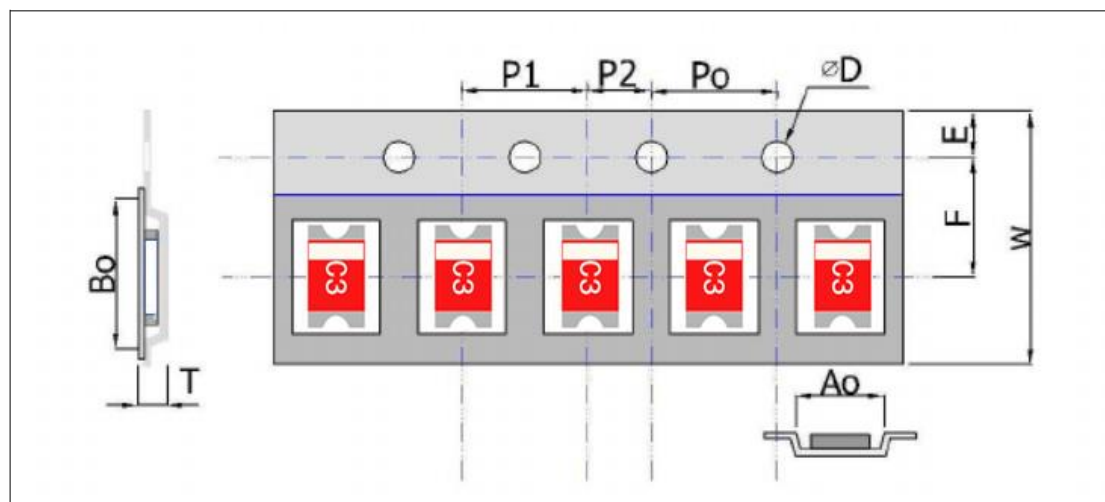
Welding Condition

The following figure illustrates a typical reliable and non-destructive welding specification:



Phase	Profile features	Pb-Free assembly (SnAgCu)
RAMP-UP	Avg. Ramp-up Rate (Tsmax to Tp)	3 °C / second (max.)
PREHEAT	- Temperature Min (Tsmmin) - Temperature Max (Tsmmax) - Time (tsmin to tsmax)	150 °C 200 °C 60-180 seconds
REFLOW	- Temperature (TL) - Total Time above TL (tL)	217 °C 60-150 seconds
PEAK	- Temperature (Tp) - Time (tp)	260 °C 20-40 seconds
RAMP-DOWN	Rate	6 °C/second max
Time from 25 °C to Peak Temperature		8 minutes max

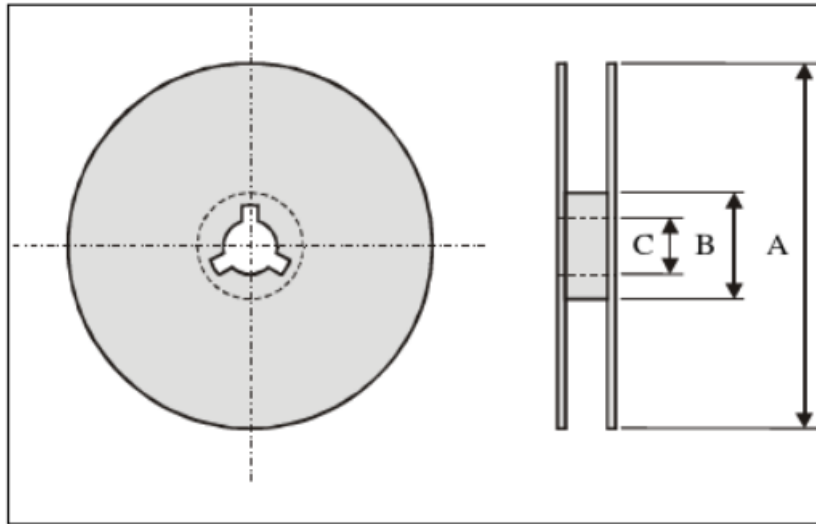
pack



Plastic carrier specifications (unit: mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	3.0 ± 0.1	6.0 ± 0.1	1.55 ± 0.05	1.6 ± 0.1	16 ± 0.2
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.1	7.0 ± 0.1	4.0 ± 0.1	4.0 ± 0.1	2.0 ± 0.1

Spool Size



Index	A	B	C
Dimension(mm)	330	100	13.5

Standard quantity: 3000 PCS per tray.

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 placed in locations away from corrosive gases such as sulfur. Chlorine or acids may cause electrode oxidation, leading to reduced weldability.

The product should be stored in a tool box and protected from moisture and dust exposure.

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

The product should be stored under closed conditions.

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