

Specification

Part No. : **CA.51**

Product Name : DSRC / C-V2X / V2V / V2X / V2I
5900MHz Ceramic Chip Antenna

Feature : 5.9GHz C-V2X Ceramic SMD Mount Chip
Antenna
5850MHz to 5925MHz
Peak Gain 2dBi
Stable and Reliable Performance
Linear Polarized & High Efficiency
Low Profile, Compact Size
Manufactured in an IATF16949 Approved Facility
Dimensions: 1.6*0.8*0.3mm
RoHS & REACH Compliant



1. Introduction

The Taoglas CA.51 5.9GHz is a ceramic chip antenna specifically designed for C-V2X (& DSRC) applications and exhibits high-efficiency in a miniature SMD mount ceramic antenna with a small footprint requirement. This ceramic chip antenna uses the main PCB as its ground plane, thereby increasing antenna efficiency and decreasing the assembly cost. It is tuned for different PCB sizes by simply changing the value of the matching circuit. At 1.6mm*0.8mm*0.3mm, it is one of the smallest antennas available worldwide. This antenna is delivered on tape and reel.

C-V2X is the communications medium of choice for active safety V2V/V2X (Vehicle-to-Vehicle and Vehicle-to-Other) systems. Primarily allocated for vehicle safety applications, C-V2X supports high-speed, low-latency, short-range, V2V/V2X wireless communications.

For further optimization to customer-specific device environments and for support to integrate and test this antennas performance in your device, contact your regional Taoglas Customer Services Team

Applications

IEEE 802.11p (WAVE- Wireless Access in the Vehicular Environment)

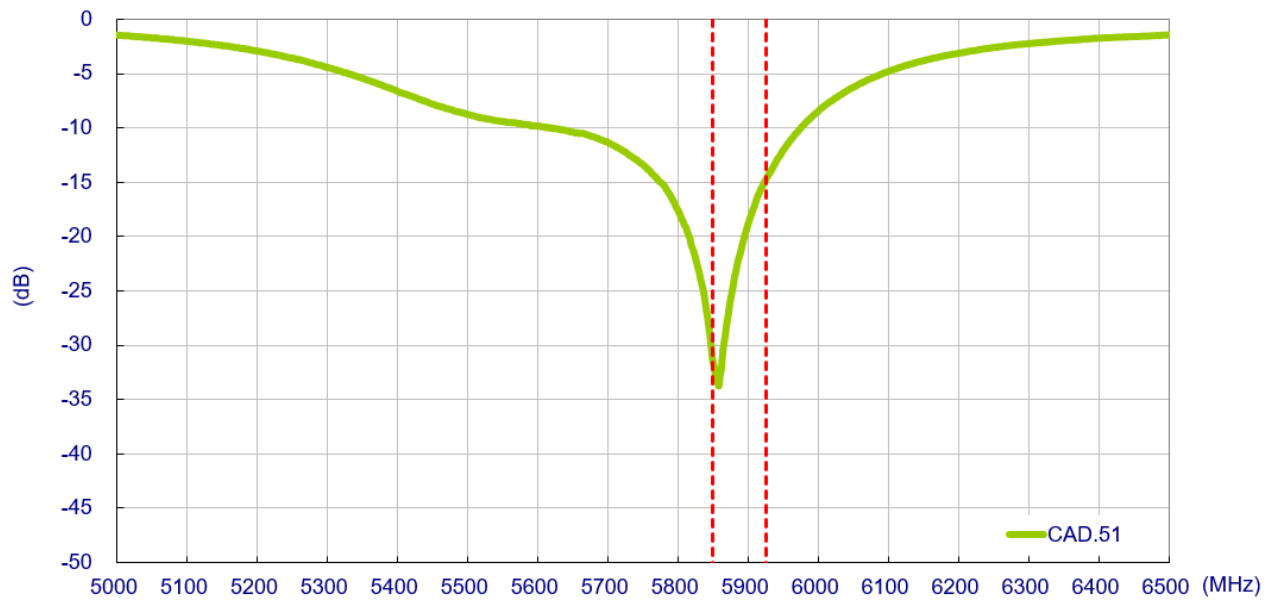
DSRC (Dedicated Short Range Communication) systems for V2V / V2I / V2X

2. Specification Table

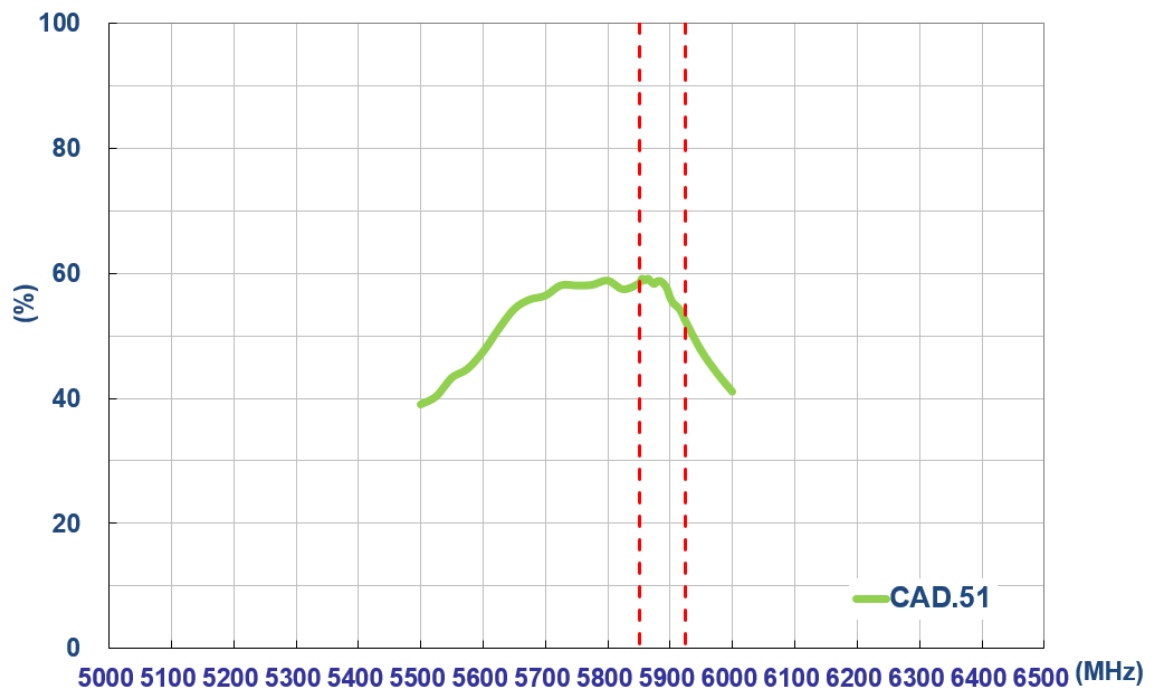
Electrical Characteristics*	
Operation Frequency Band	5850~5925 MHz
Bandwidth	110 MHz (typical)
Peak Gain	2.87 dBi (typical)
Efficiency	57.08% (typical)
Average Gain	-2.44 dBi
VSWR	2 max.
Impedance	50Ω
Polarization	Linear
Radiation Pattern	Omni-Directional
Input Power	2W
MECHANICAL	
Dimensions	1.6*0.8*0.3mm
Ground plane	40*40mm (Recommended)
Material	Ceramic
ENVIRONMENTAL	
Temperature Range	-40°C to 85°C
Temperature Coefficient of Frequency	0±20 ppm/°C max. (@-40°C to 85°C)
Humidity	Non-condensing 65°C 95% RH

*Antenna tested on 40mm*40mm evaluation board.

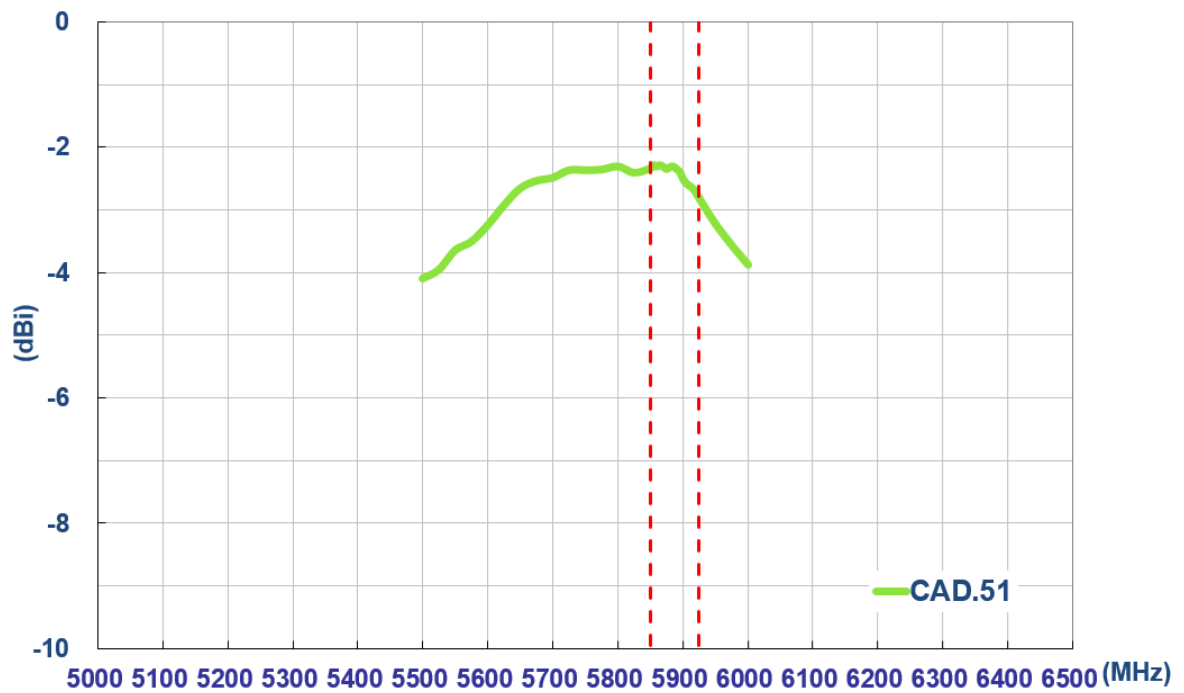
3. Return Loss



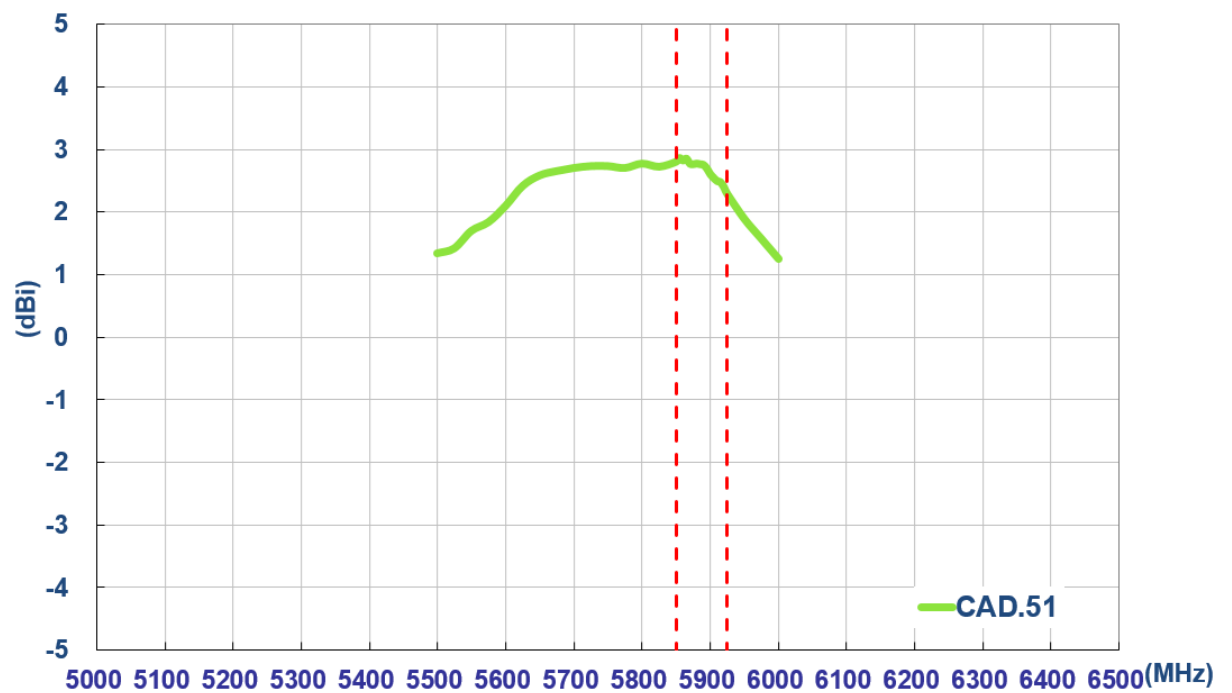
4. Efficiency



5. Average Gain



6. Peak Gain



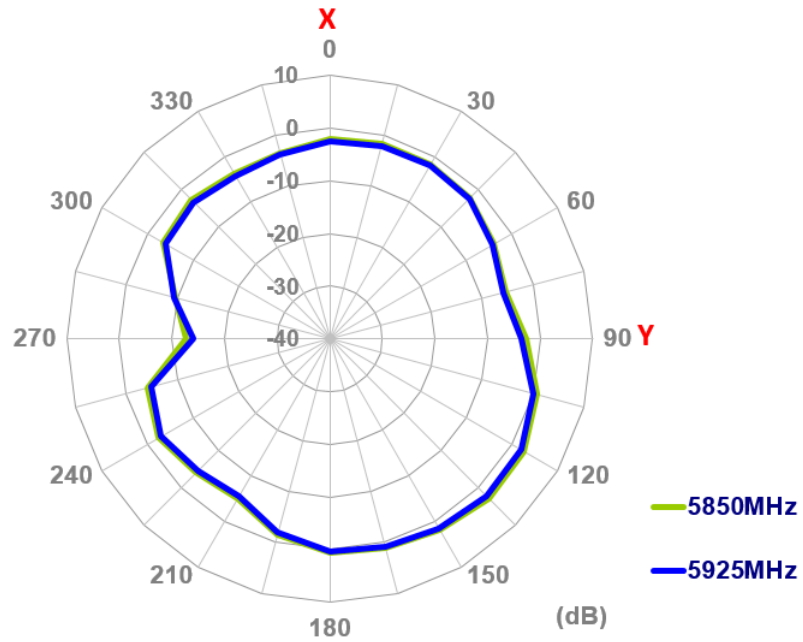
7. Antenna Radiation Patterns

7.1. Test Setup – Antenna on Evaluation Board

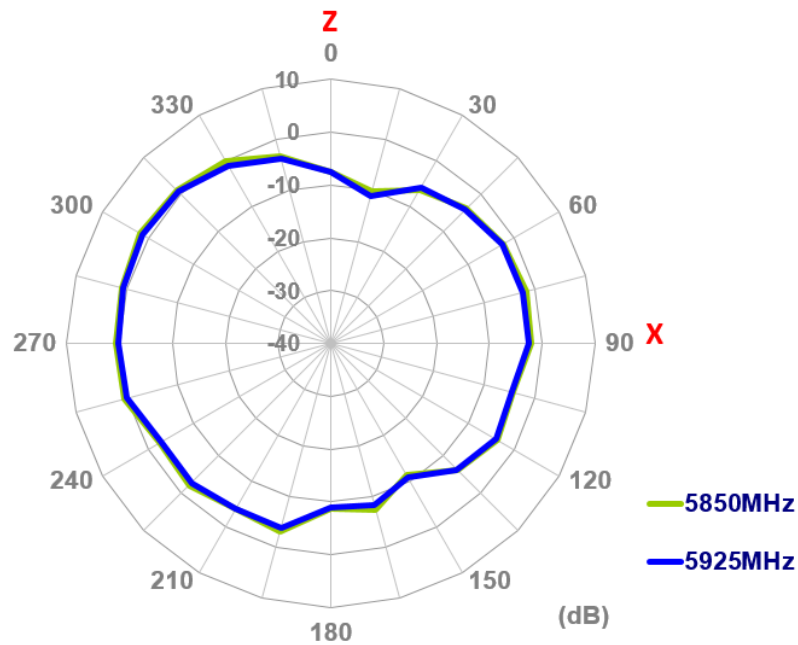


7.2. 2D Radiation Pattern

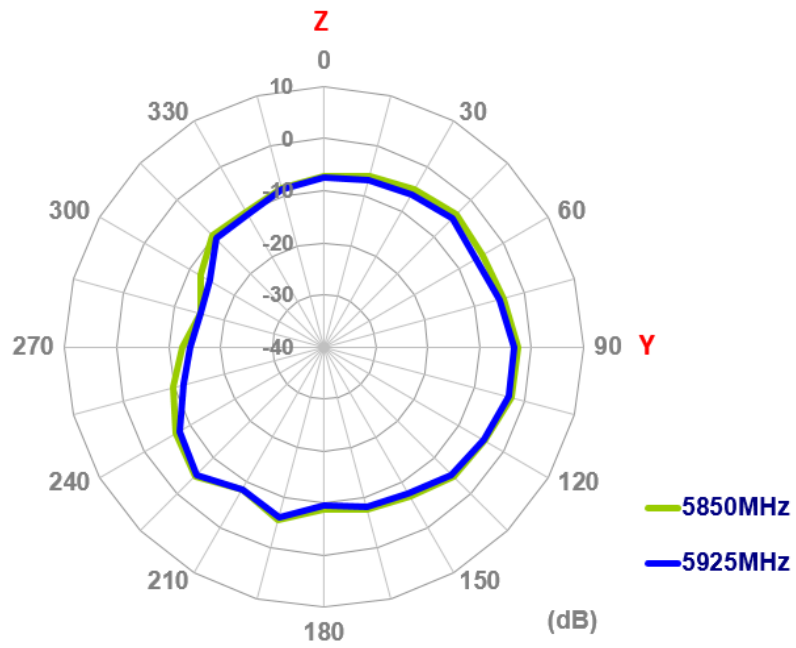
XY Plane



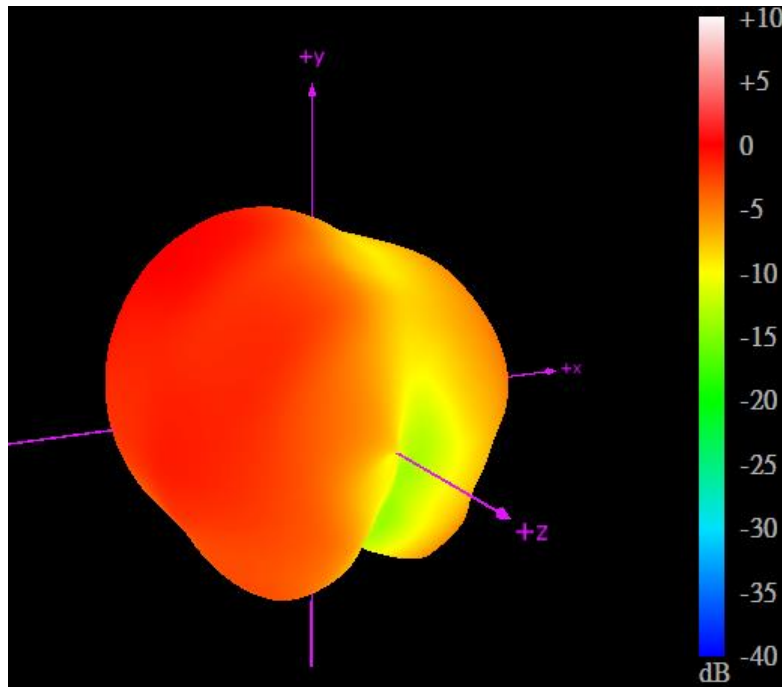
XZ Plane



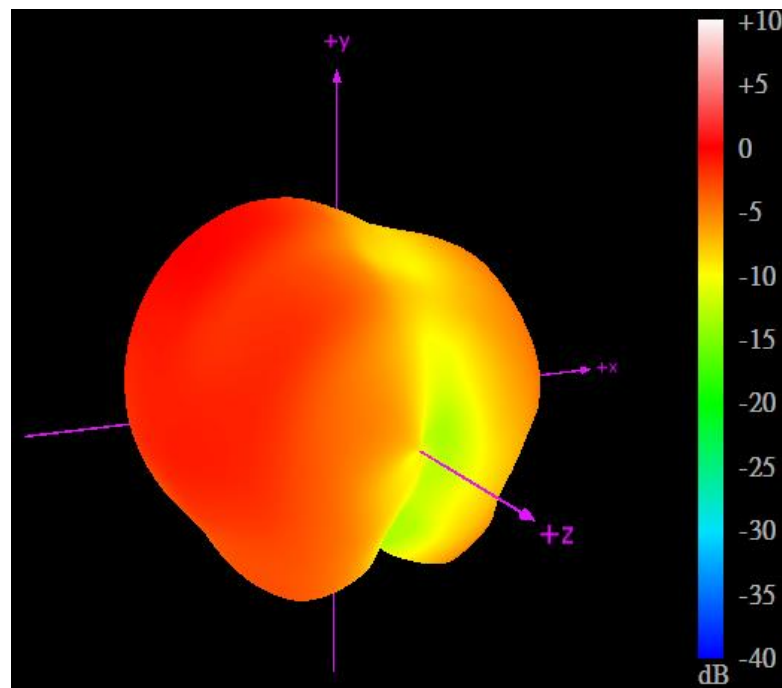
YZ Plane



7.3. 3D Radiation Pattern



5850MHz

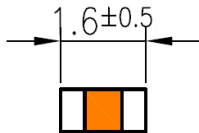


5925MHz

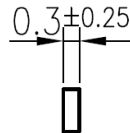
8. Mechanical Drawings (Unit: mm)

8.1. Antenna Dimension and Drawing

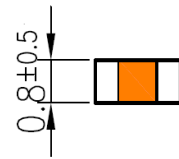
Front View



Side View

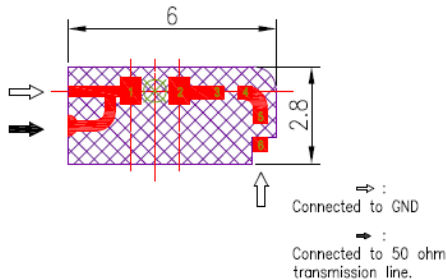
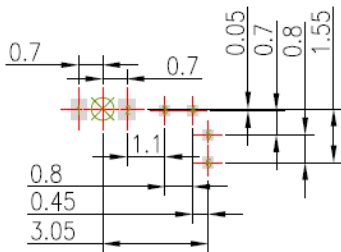
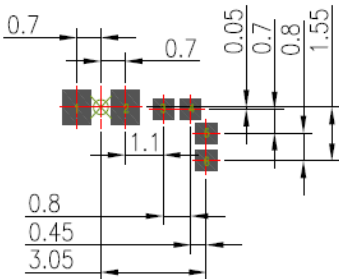
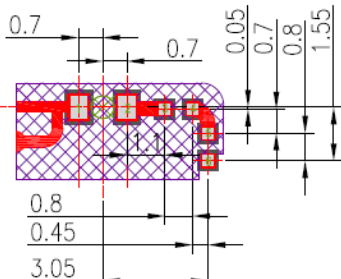


Back View



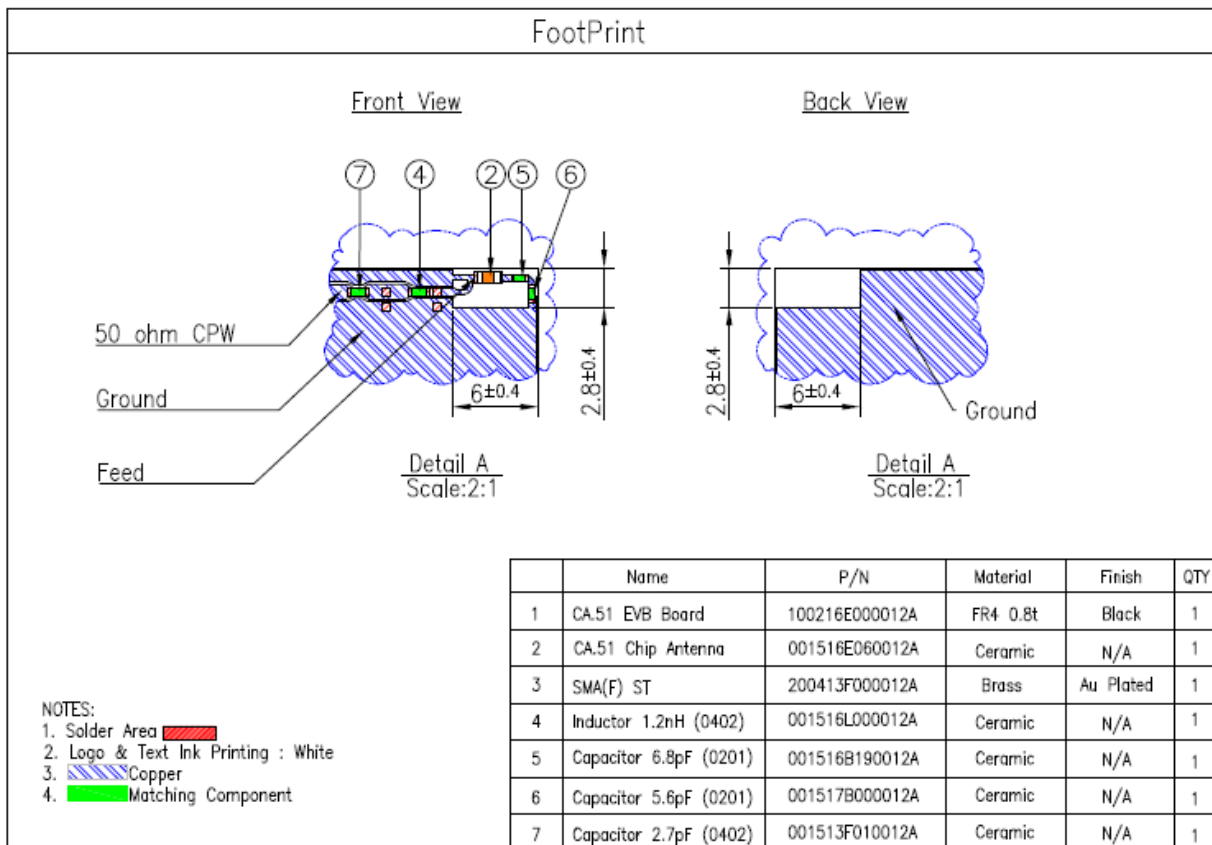
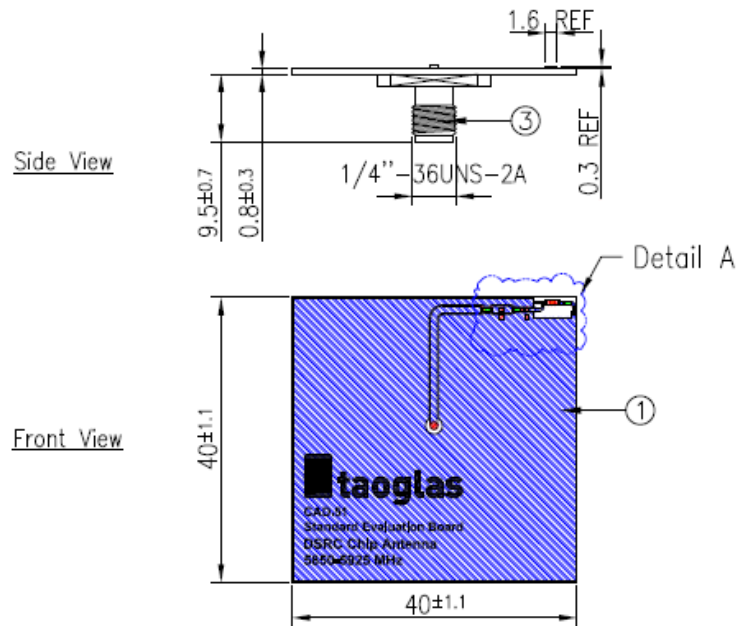
Unit: mm

8.2. Antenna Footprint

Foot Print																
Top Copper	Top Solder Paste															
Pad 1 and 6 should be connected to Ground. Pad 1 should be connected to a 50 ohm transmission line.  ↑ : Connected to GND ↑ : Connected to 50 ohm transmission line.	Pads 1 and 2 are the same size, Pad 3, 4, 5 and 6 are the same size. 															
Top Solder Mask	Composite Diagram															
Pads 1 and 2 are the same size, Pad 3, 4, 5 and 6 are the same size. This drawing is a negative of solder mask. Black regions are anti-mask. 																
NOTE: <table><tr><td>1. Ag Plated area</td><td></td><td>6. Ground keepout should extend from top layer through all inner PCB layers to minimize coupling from RF feed to ground.</td></tr><tr><td>2. Solder Mask area</td><td></td><td>7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow.</td></tr><tr><td>3. Copper area</td><td></td><td>8. The dimension tolerances should follow standard PCB manufacturing guidelines</td></tr><tr><td>4. Paste area</td><td></td><td></td></tr><tr><td>5. Copper Keepout Area</td><td></td><td></td></tr></table>		1. Ag Plated area		6. Ground keepout should extend from top layer through all inner PCB layers to minimize coupling from RF feed to ground.	2. Solder Mask area		7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow.	3. Copper area		8. The dimension tolerances should follow standard PCB manufacturing guidelines	4. Paste area			5. Copper Keepout Area		
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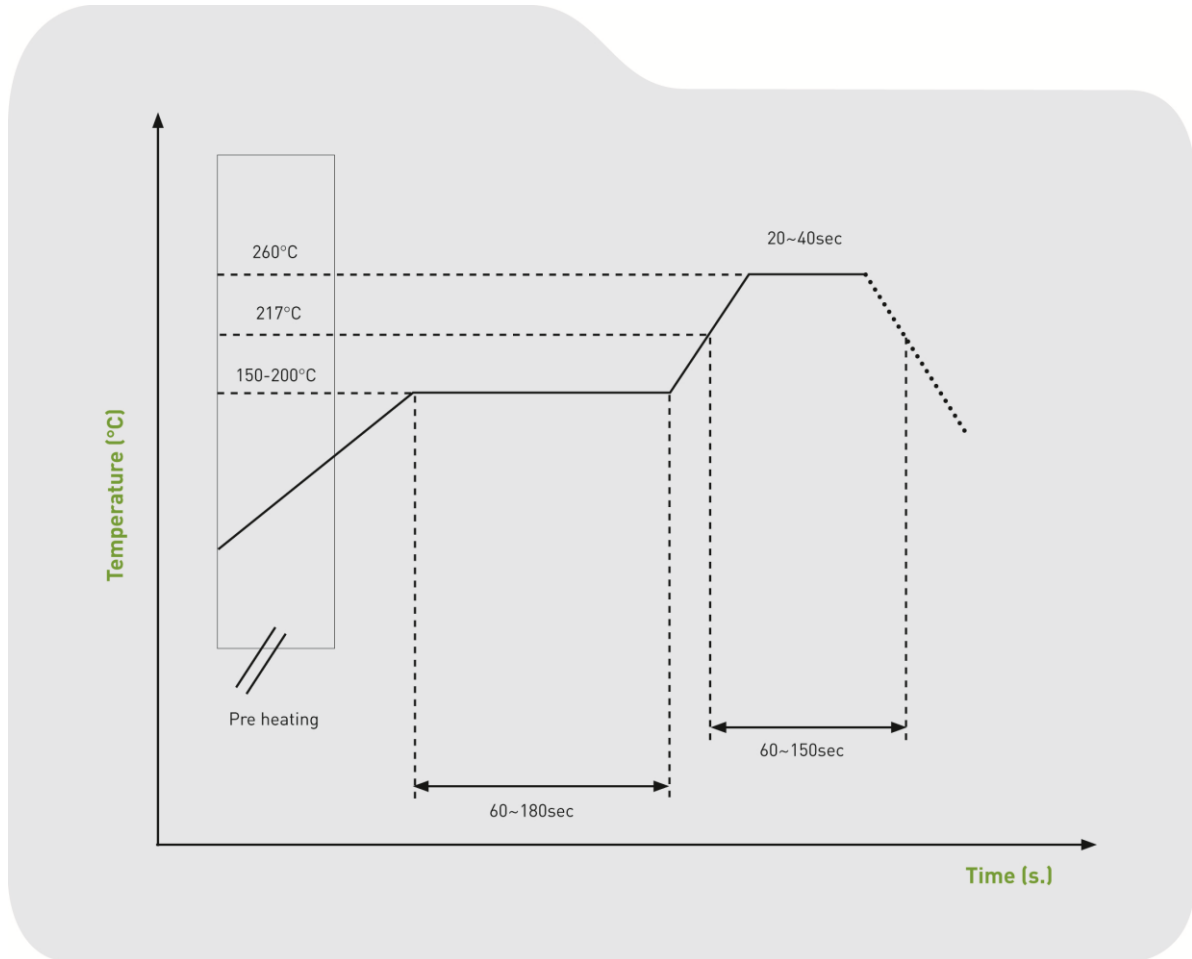
*Taoglas is able to provide CAD drawing file to customers for evaluation.

8.3. Evaluation Board CAD.51



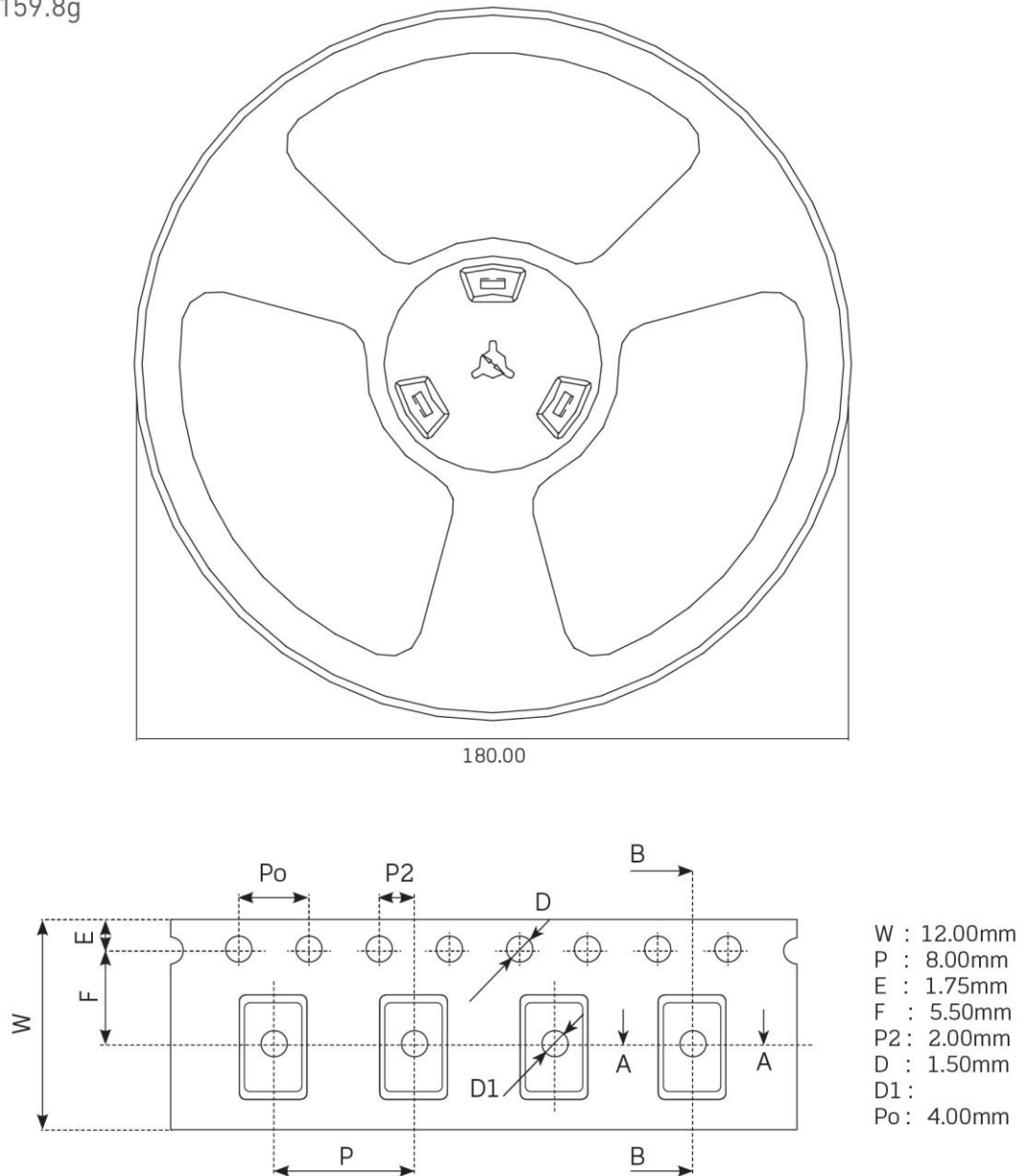
9. Soldering Conditions

Typical Soldering profile for lead-free process:

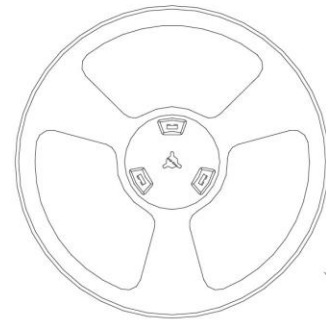


10. Packaging

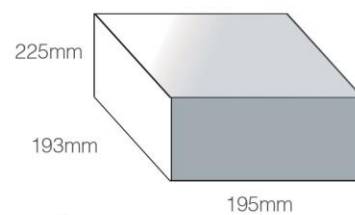
5000 pc CA.51 per reel
 Dimensions - Ø180*11mm
 Weight - 159.8g



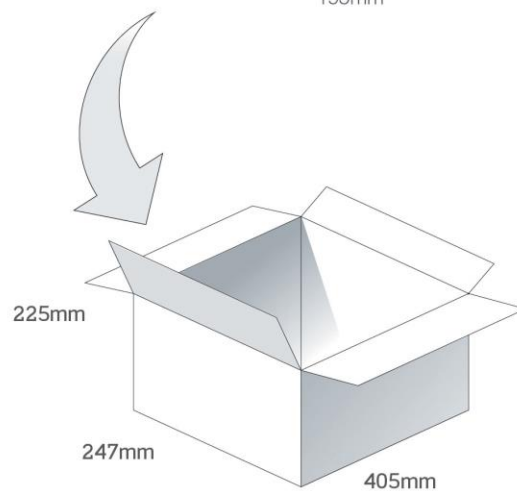
5000 pcs CA.51 reel
 Dimensions - 180*180*11mm
 Weight - 159.8g



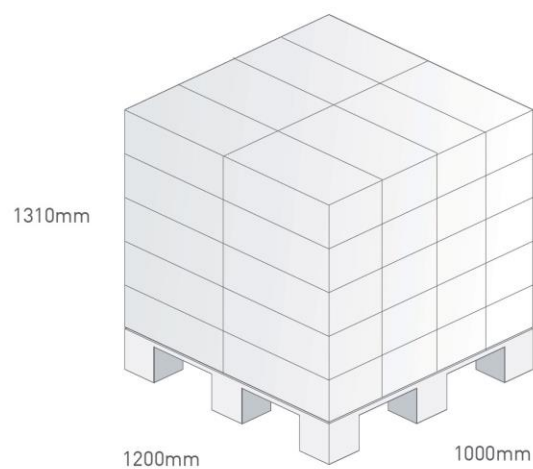
50,000 pcs CA.51 / 10 Reel in small box
 Dimensions - 193*225*195mm
 Weight - 1.6Kg



2 small boxes, 100,000 pcs in one carton
 Carton Dimensions - 247*405*225mm
 Weight - 3.2Kg



Pallet Dimensions 1200*1000*1310mm
 40 Cartons per Pallet
 8 Cartons per layer
 5 Layers



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