

Specification

| | | |
|--------------|---|--|
| Part No. | : | SDCP.5900.12.4.A.40 |
| Product Name | : | 5.9GHz Circular Polarized Embedded DSRC/C-V2X SMD Patch Antenna |
| Features | : | 5.9GHz C-V2X Ceramic Patch Antenna 5850MHz to 5925MHz Peak Gain: 4.64dBi Efficiency: 60% Dimensions: 12*12*4mm IATF16949 Production & Quality Approved RoHS & REACH Compliant |



1. Introduction

The SDCP.5900.12.4.A.40 is a 12*12*4mm embedded ceramic C-V2X (& DSRC) Patch antenna. It is a high-performance directional antenna designed to operate at 5.9GHz for V2V / V2X / V2I systems. The directionality of the antenna allows further range of C-V2X communications. For example, one patch can be mounted to the front of the vehicle, and one to back. Its tiny size allows placement in crowded vehicle interiors. The SMD mounting is particularly suited to high volume manufacturing applications.

The SDCP.5900 patch antenna has been designed to be circularly polarized to enable a more stable system signal strength typically required on moving vehicles. Circular polarization limits any potential drop in signal from orientation change to 3dB compared to a potential drop of 40dB or more for linear solutions. It results in a system that will maintain the communication link much more reliably.

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

2. Specification

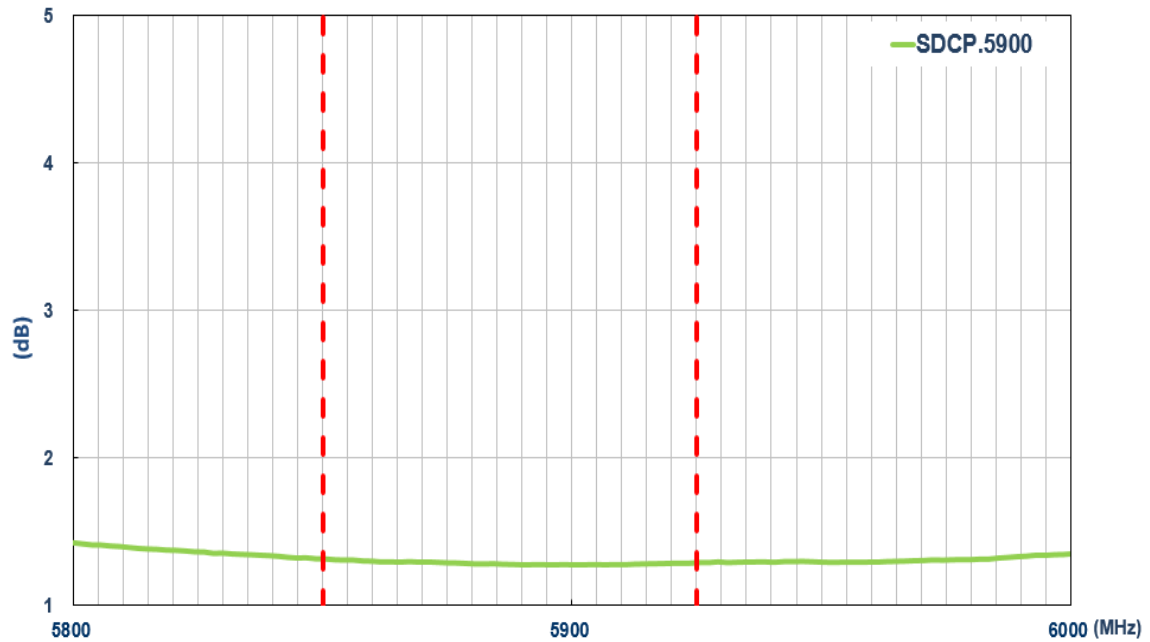
| DSRC | |
|-------------------|----------------------------|
| Frequency | 5850~5925MHz |
| Efficiency | 60.45 % |
| Peak Gain | 4.64 dBi |
| Average Gain | -2.15 dBi |
| VSWR | < 2 |
| Polarization | RHCP |
| Axial Ratio | < 4 |
| Impedance | 50 Ohms |
| MECHANICAL | |
| Dimensions | 12*12*4mm |
| Weight | 2.0g |
| ENVIRONMENTAL | |
| Temperature Range | -40°C to 125°C |
| Humidity | Non-condensing 65°C 95% RH |

*Antenna properties were measured with the antenna mounted on 50*50 mm ground plane.

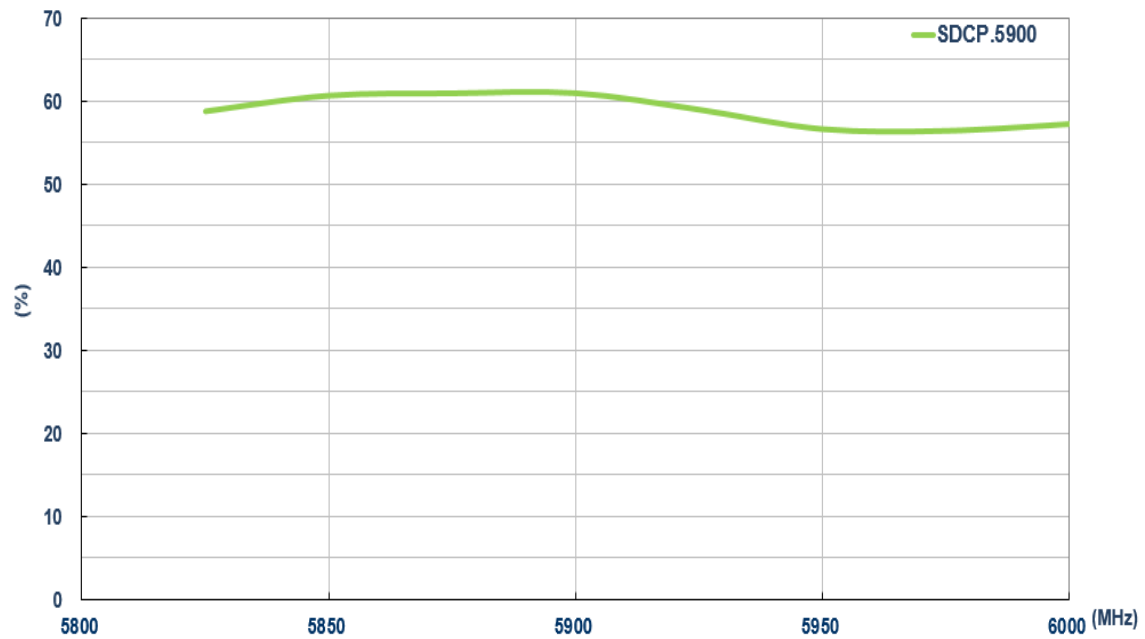
**Taoglas Part Number SDCPD.12A

3. Antenna Characteristics

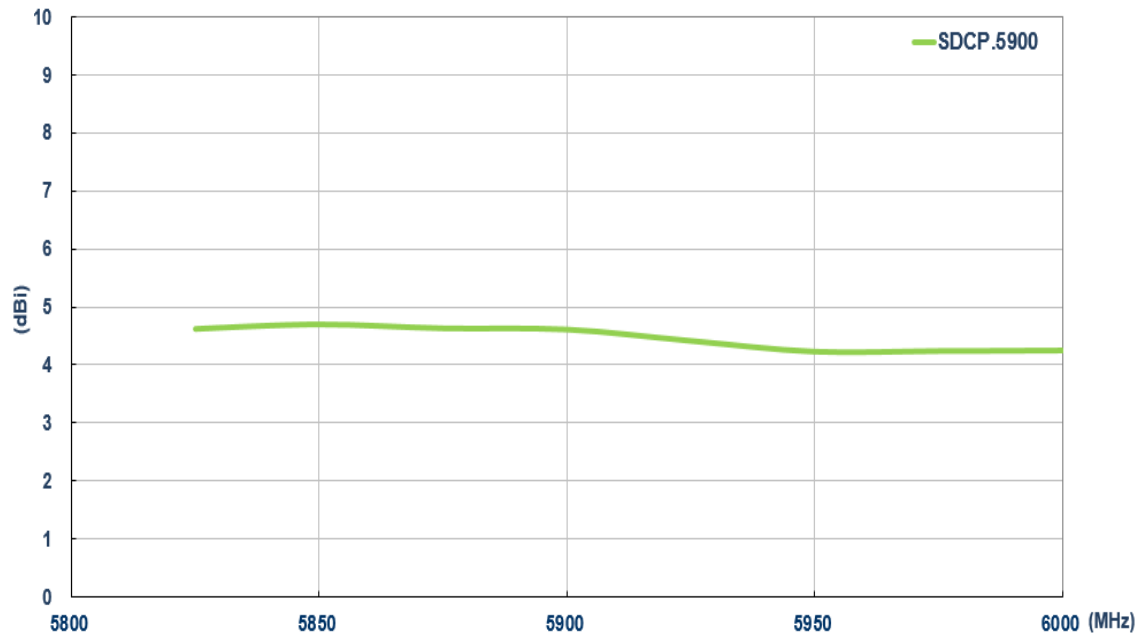
3.1. VSWR



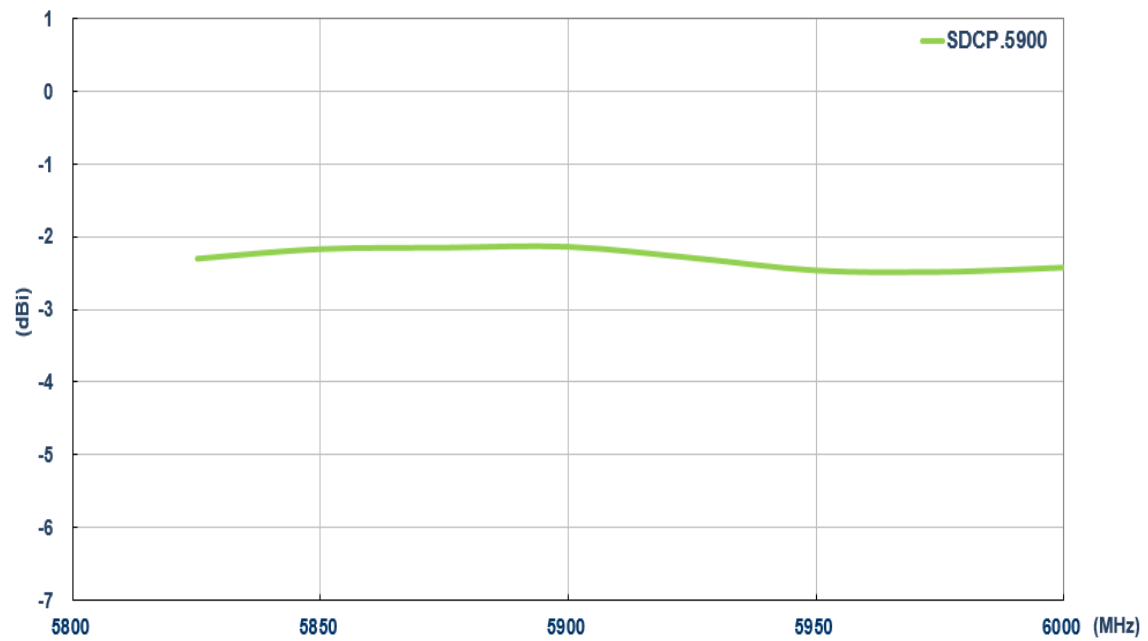
3.2. Efficiency



3.3. Peak Gain

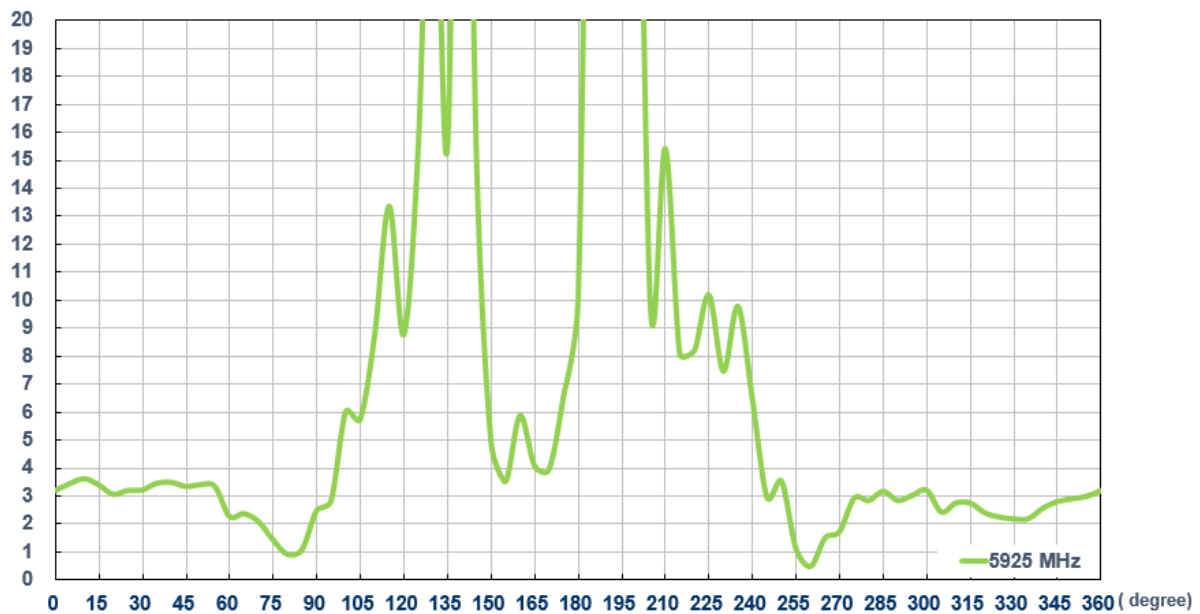
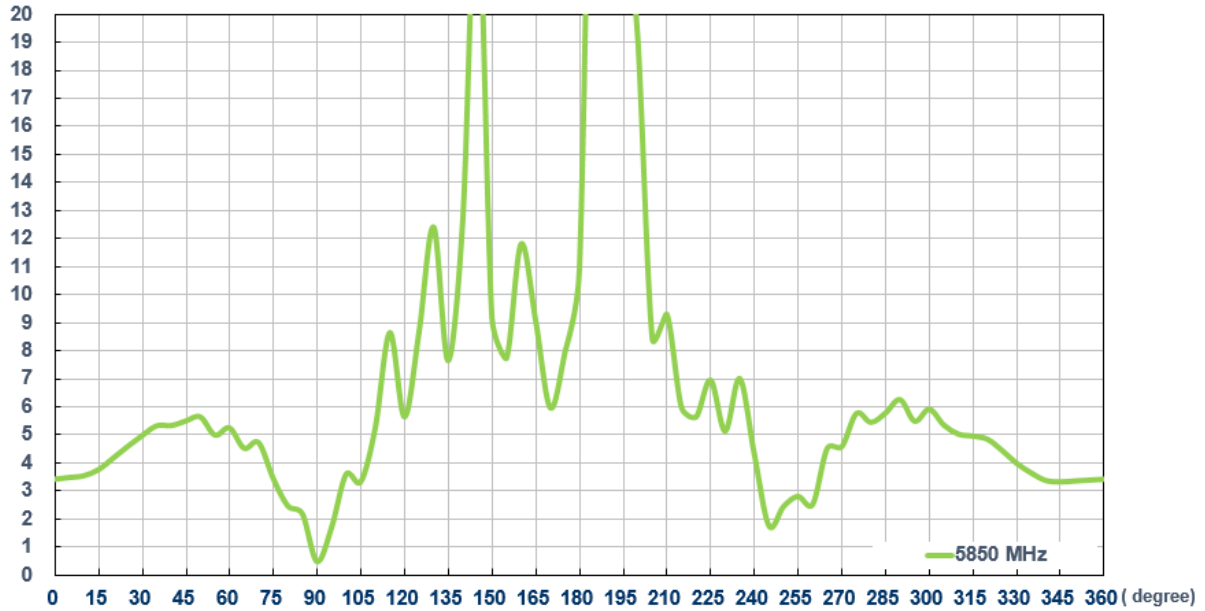


3.4. Average Gain

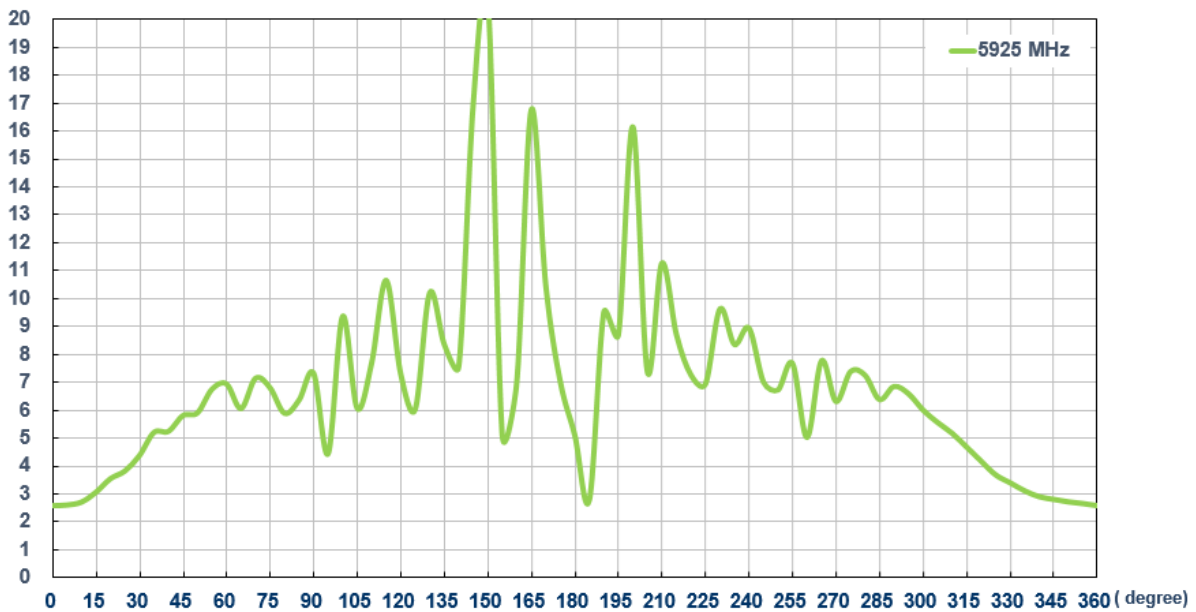
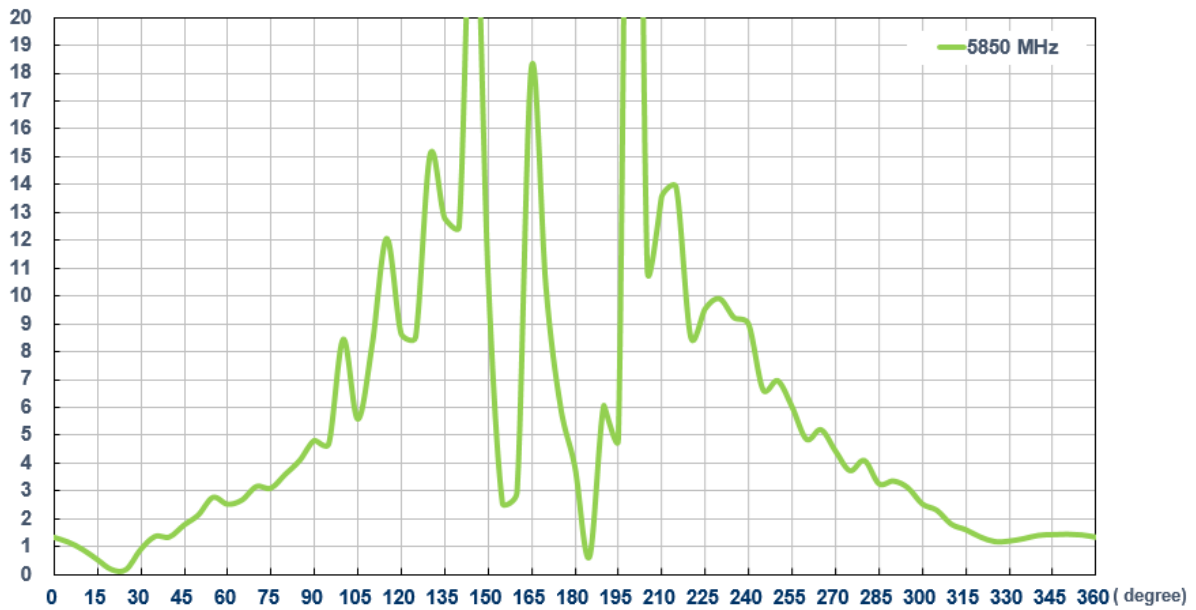


3.5. Axial Ratio

3.5.1. XZ Plane

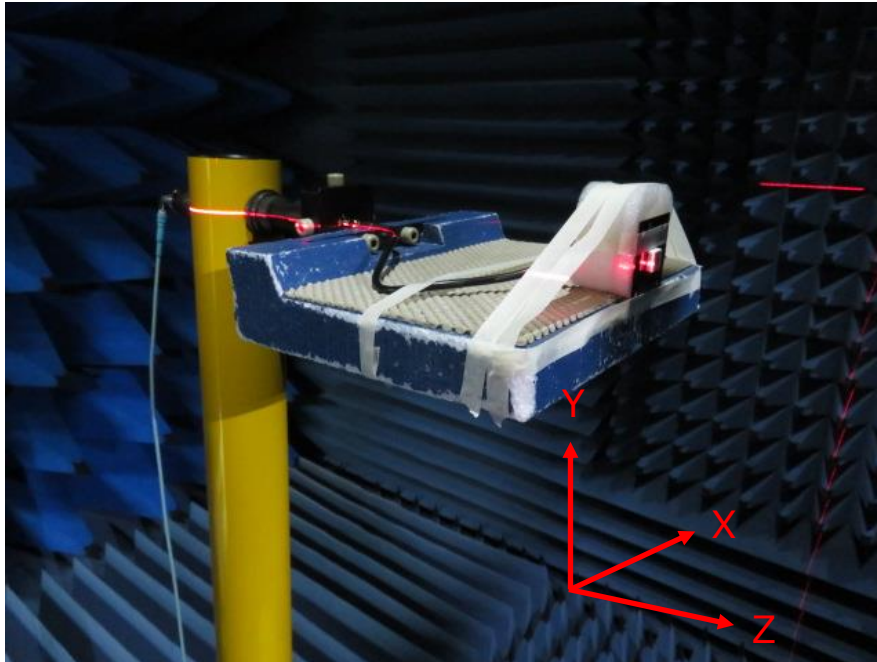


3.5.2. YZ Plane



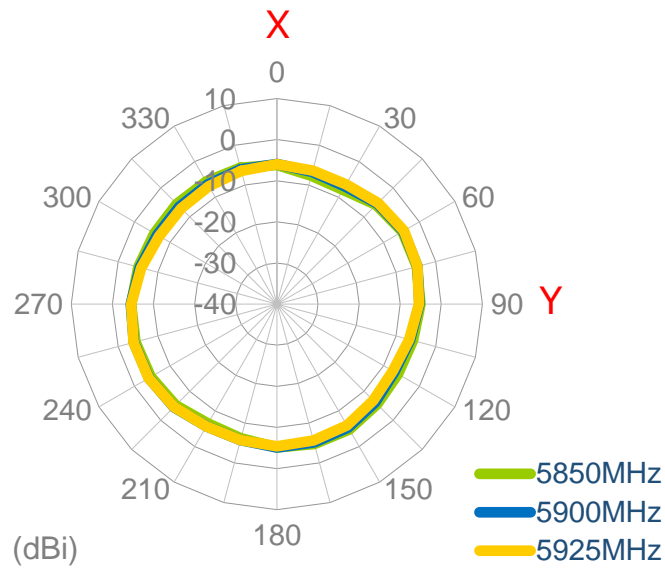
4. Antenna Radiation Patterns

4.1. Antenna Setup (Antenna testing Setup in ETS Anechoic Chamber)

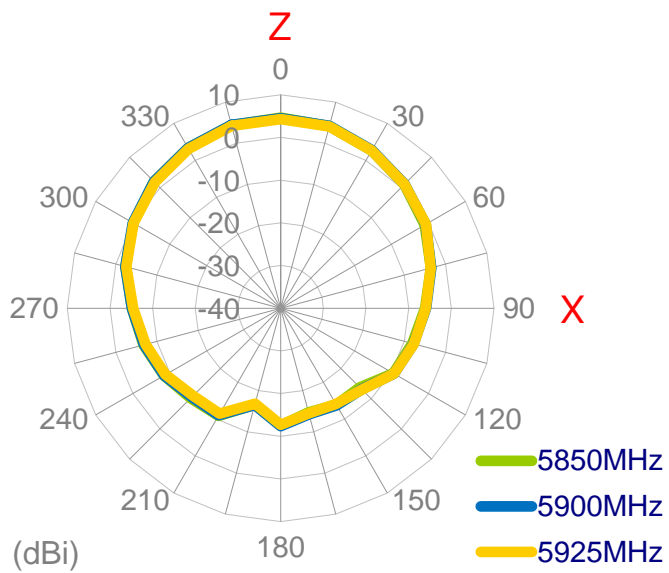


4.2. 2D Radiation Patterns

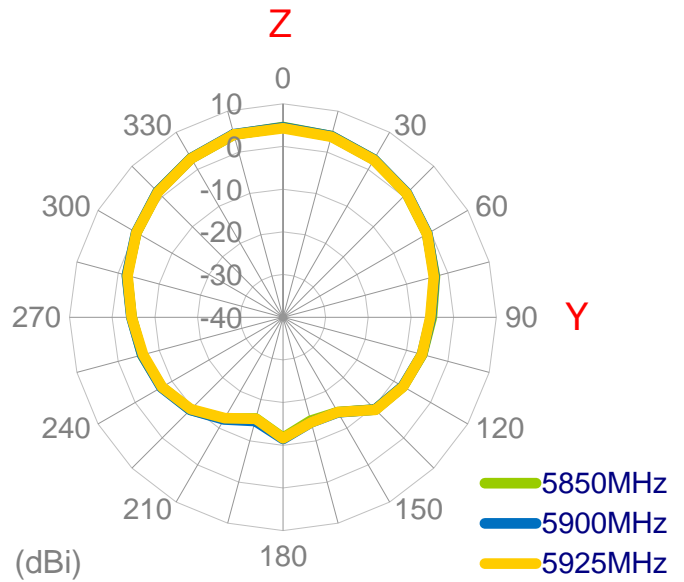
XY Plane



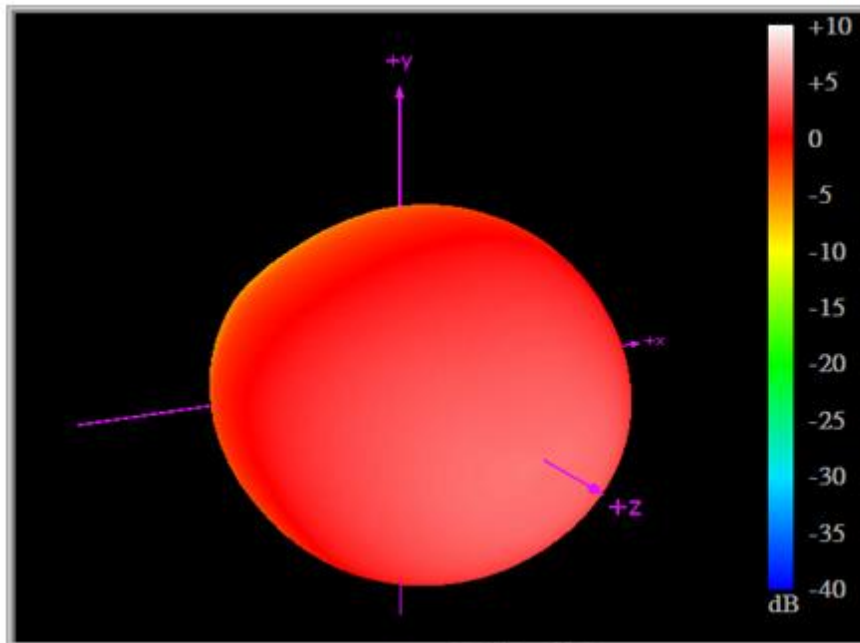
XZ Plane



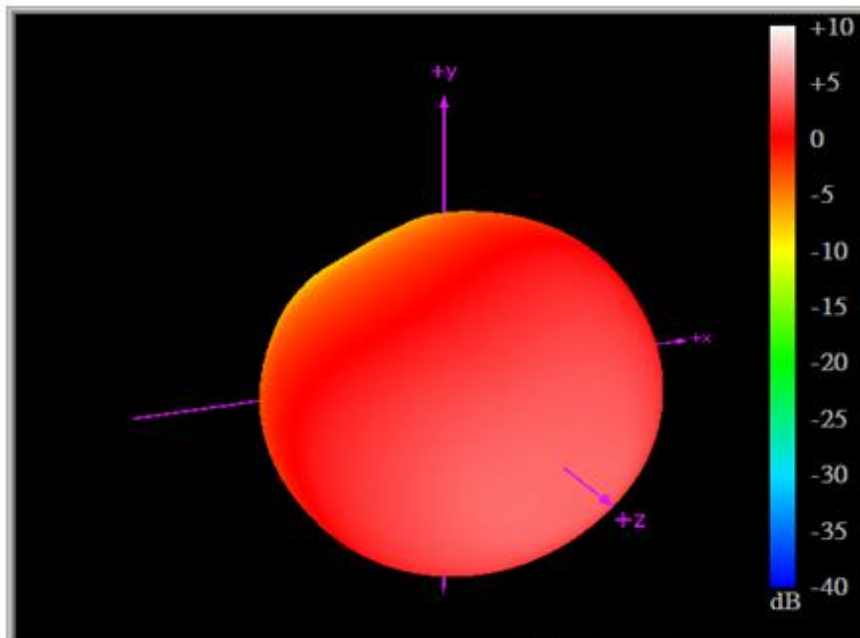
YZ Plane



4.3. Antenna 3D Radiation Pattern (In free space)

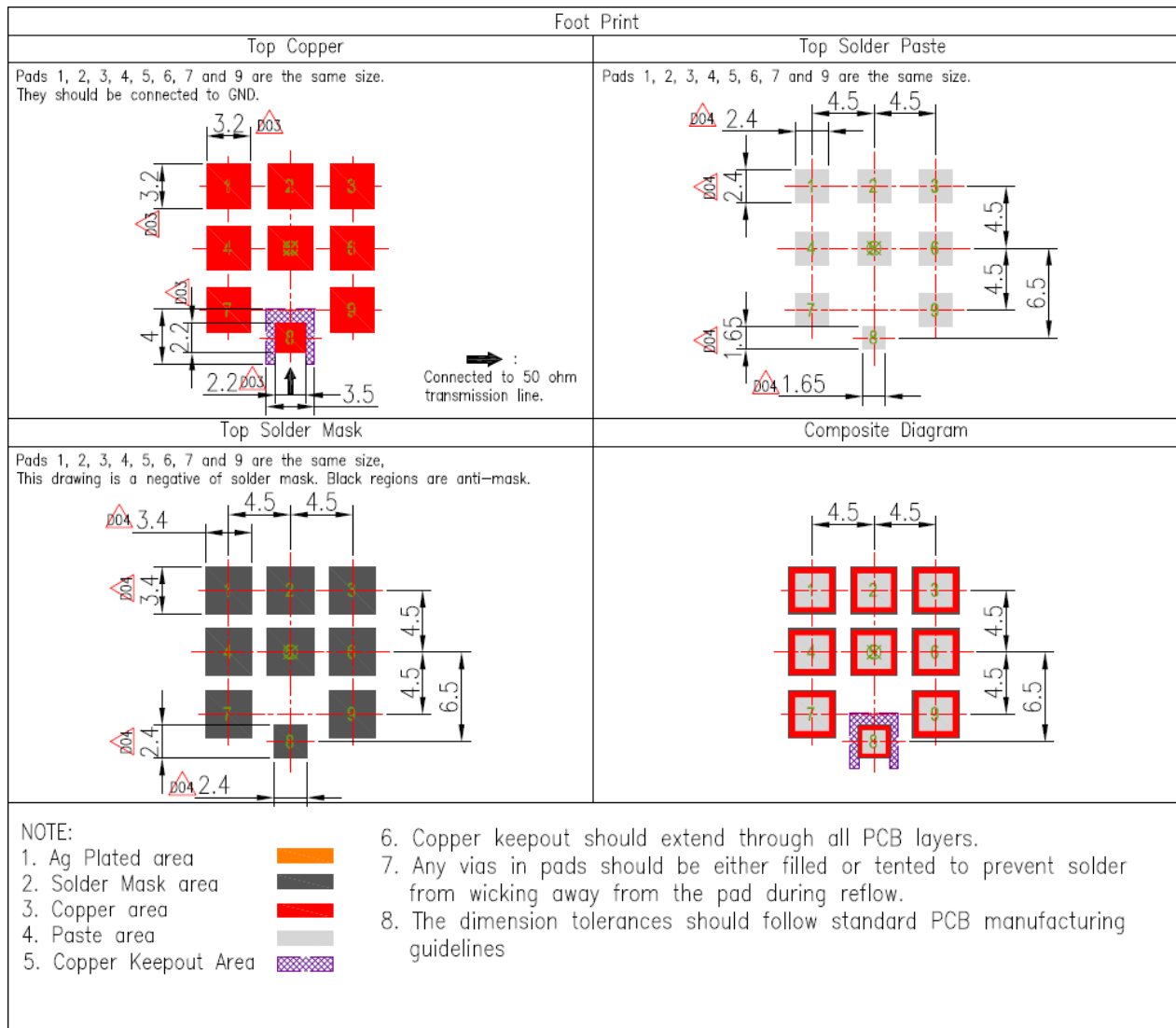
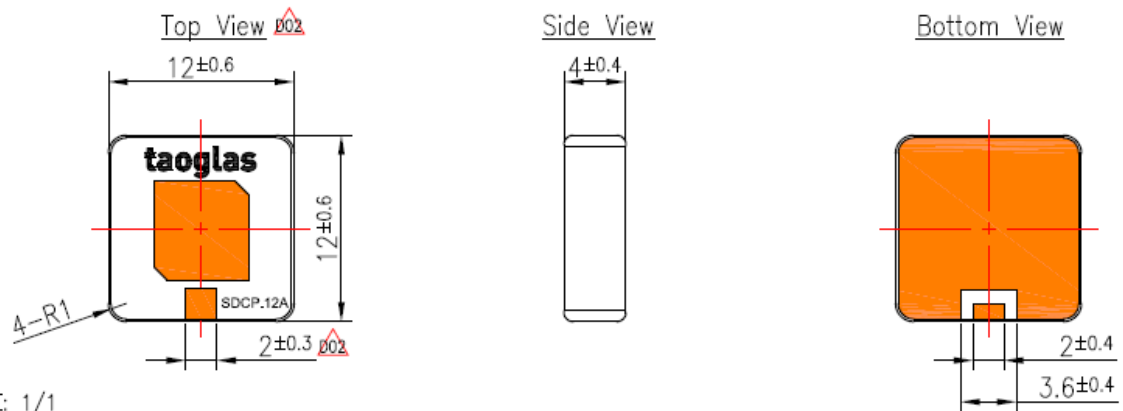


5850MHz



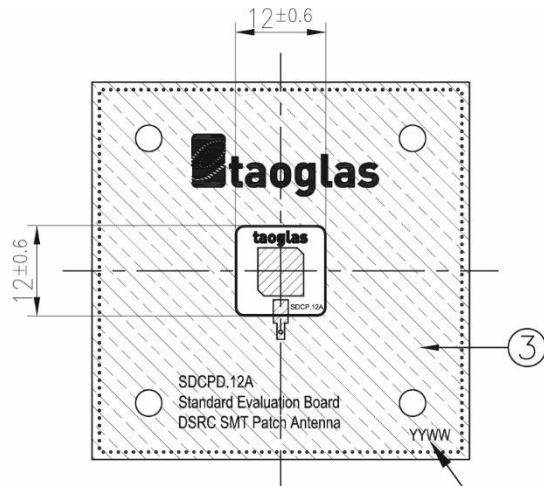
5925MHz

5. Mechanical Drawing (Unit: mm)



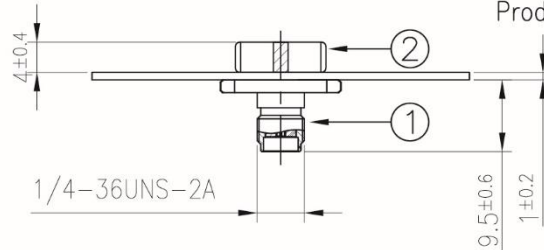
6. Evaluation Board (SDCPD.12.A)

Top View

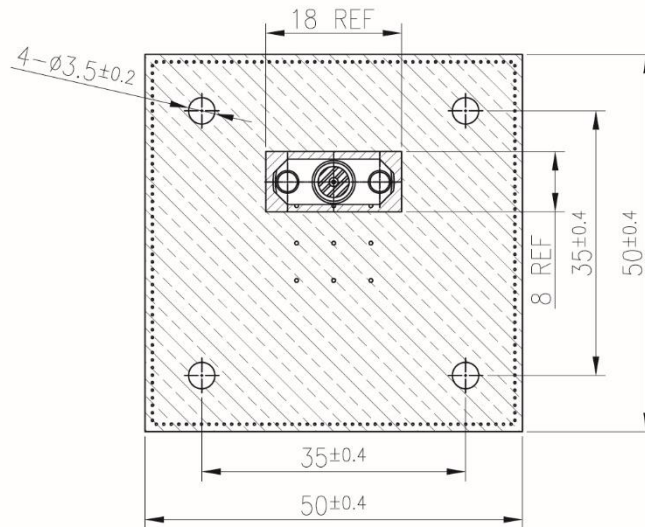


YYWW—Date Code,
Production Year And Week

Side View



Bottom View



Note:

1. Silver Area 
2. Soldermask Area 
3. Logo & Text Ink Printing : White

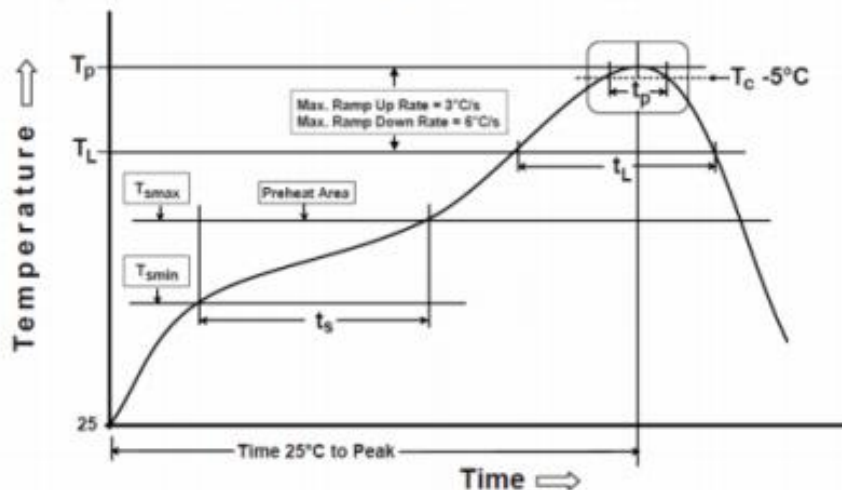
| | Name | Material | Finish | QTY |
|---|---------------------------|----------------|-----------|-----|
| 1 | PCB SMA(F)ST | Brass | Au Plated | 1 |
| 2 | SDCP.12A Patch(12x12x4mm) | Ceramic | Clear | 1 |
| 3 | SDCPD.12A PCB | Composite 1.0t | Black | 1 |

7. Recommended Reflow Soldering Profile

SDCP.5900.12A can be assembled following Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follows:

| Phase | Profile Features | Pb-Free Assembly [SnAgCu] |
|------------------------------------|---|----------------------------------|
| PREHEAT | Temperature Min(T_{smin}) Temperature Max(T_{smax}) Time(t_s) from (T_{smin} to T_{smax}) | 150°C 200°C 60-120 seconds |
| RAMP-UP | Avg. Ramp-up Rate (T_{smax} to T_P) | 3°C/second(max) |
| REFLOW | Temperature(T_L) Total Time above T_L (t_L) | 217°C 30-100 seconds |
| PEAK | Temperature(T_P) Time(t_p) | 260°C 2-5 seconds |
| RAMP-DOWN | Rate | 3°C/second(max) |
| Time from 25°C to Peak Temperature | | 8 minutes max. |
| Composition of solder paste | | 96.5Sn/3Ag/0.5Cu |
| Solder Paste Model | | SHENMAO PF606-P26 |

The graphic shows temperature profile for component assembly process in reflow ovens

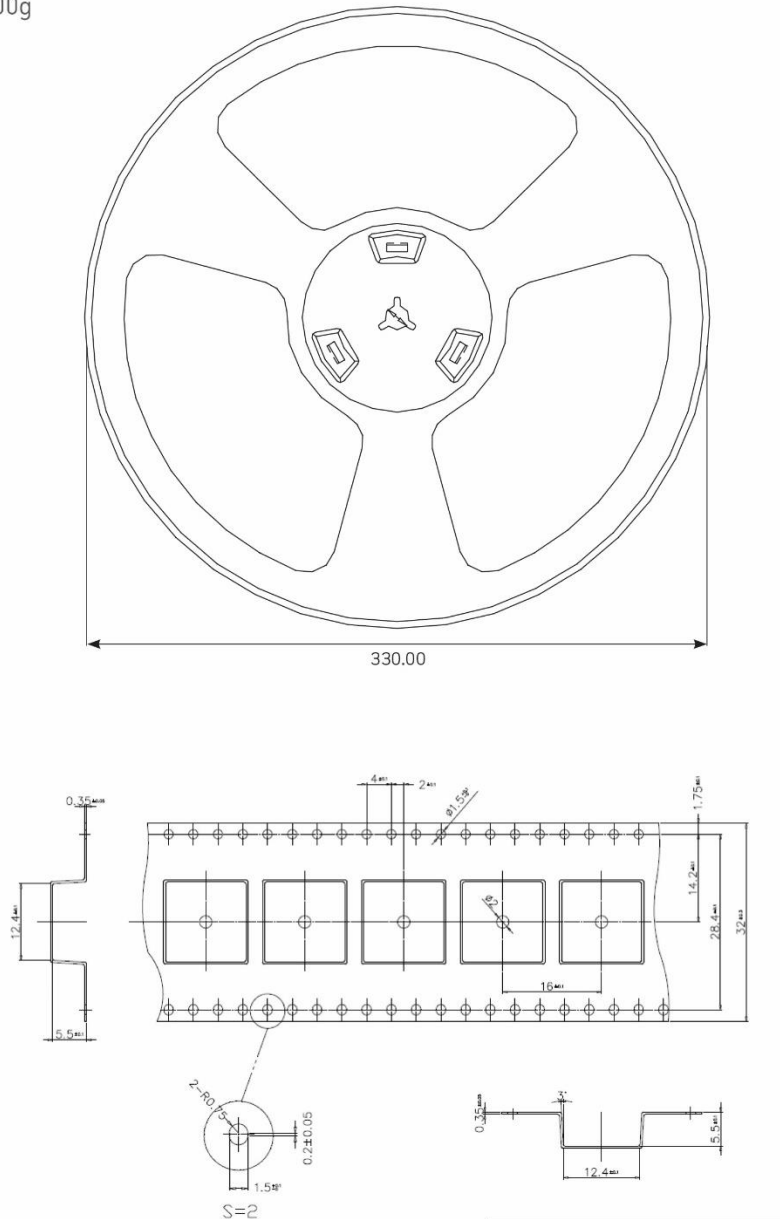


Soldering Iron condition: Soldering iron temperature $270^{\circ}\text{C} \pm 10^{\circ}\text{C}$.

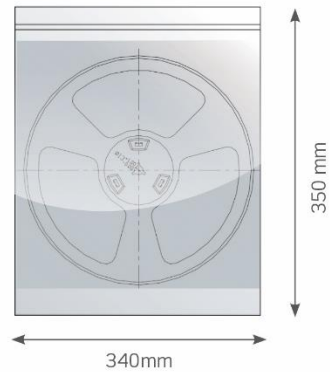
Apply preheating at 120°C for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron temperature over $270^{\circ}\text{C} \pm 10^{\circ}\text{C}$ or 3 seconds, it will make cause component surface peeling or damage.

8. Packaging

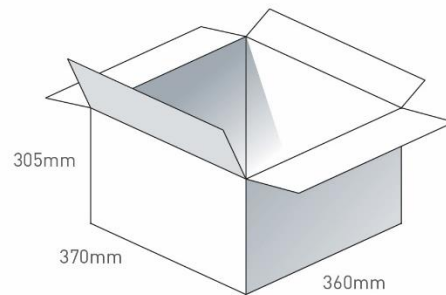
500 pc SDCP.5900.12.4.A.40 per reel
Dimensions - Ø330*55mm
Weight - 2300g



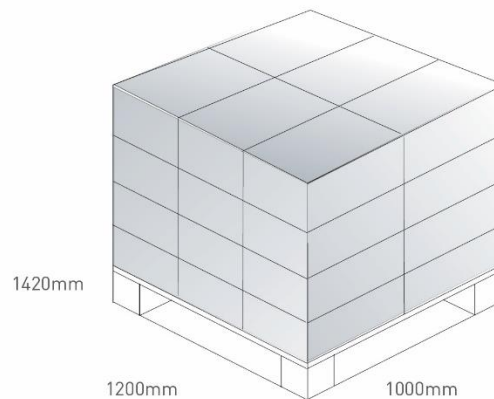
1 pc reel in small in Anti-static Bag
 Dimensions - 340*350*70mm
 Weight - 2400g



4 Reels in Anti-static Bags
 2000 pcs in one carton
 Carton Dimensions - 370*360*305mm
 Weight - 10.5Kg



Pallet Dimensions 1200*1000*1420mm
 24 Cartons per Pallet
 6 Cartons per layer
 4 Layers



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