



# TAOGLAS®



# Datasheet

**Part No:**

SDCP.5900.12.4.A.40

**Description:**

SDCP.5900 5.9GHz DSRC Circular Polarized Embedded SMD 12\*12\*4mm Patch Antenna

**Features:**

5.9GHz DSRC Ceramic Patch Antenna

5850MHz to 5925MHz

Peak Gain: 4.64dBi

Efficiency: 60%

Dimensions: 12\*12\*4mm

IATF16949 Production & Quality Approved

RoHS & REACH Compliant

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## 1. Introduction



The SDCP.5900.12.4.A.40 is a 12\*12\*4mm embedded ceramic DSRC Patch antenna. It is a high-performance directional antenna designed to operate at 5.9GHz for DSRC systems. Primarily designated for vehicle safety applications, DSRC offers high-speed, low-latency wireless communication over short distances. The directionality of the antenna allows further range of DSRC 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.

### Typical Applications:

- Automotive Rearview Mirror Back Mount
- In-Vehicle Window Mount
- Embedded in Roadside Transceivers

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.

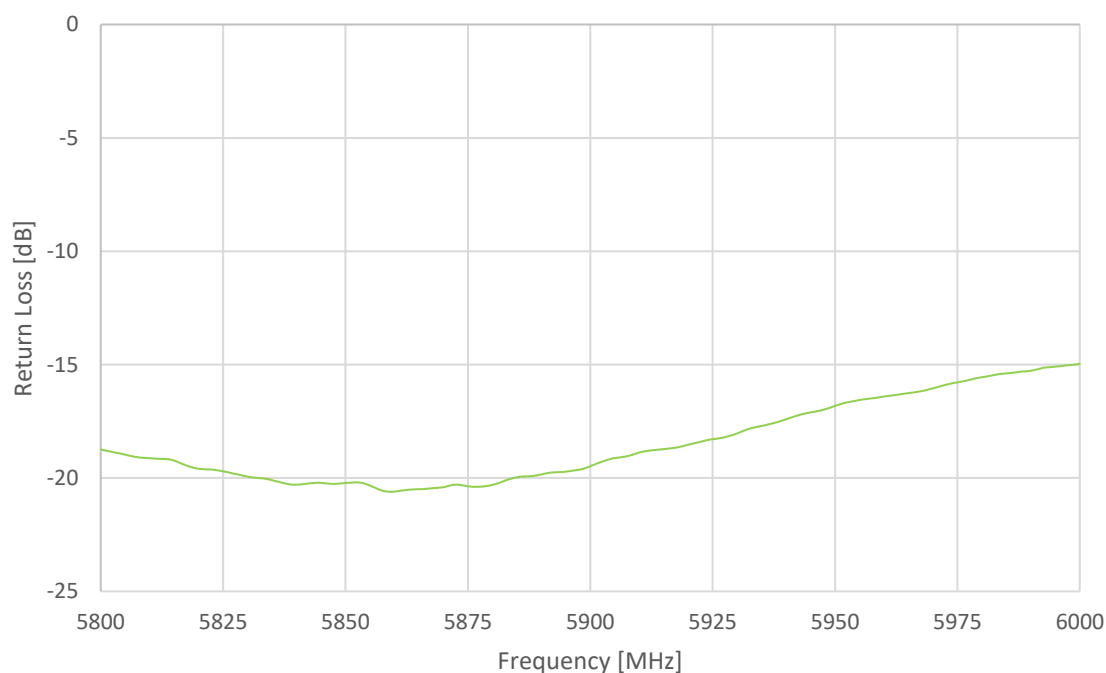
For support on how to integrate and test this antenna within your application, or for sample requests, contact your regional Taoglas Customer Services Team.

## 2. Specifications

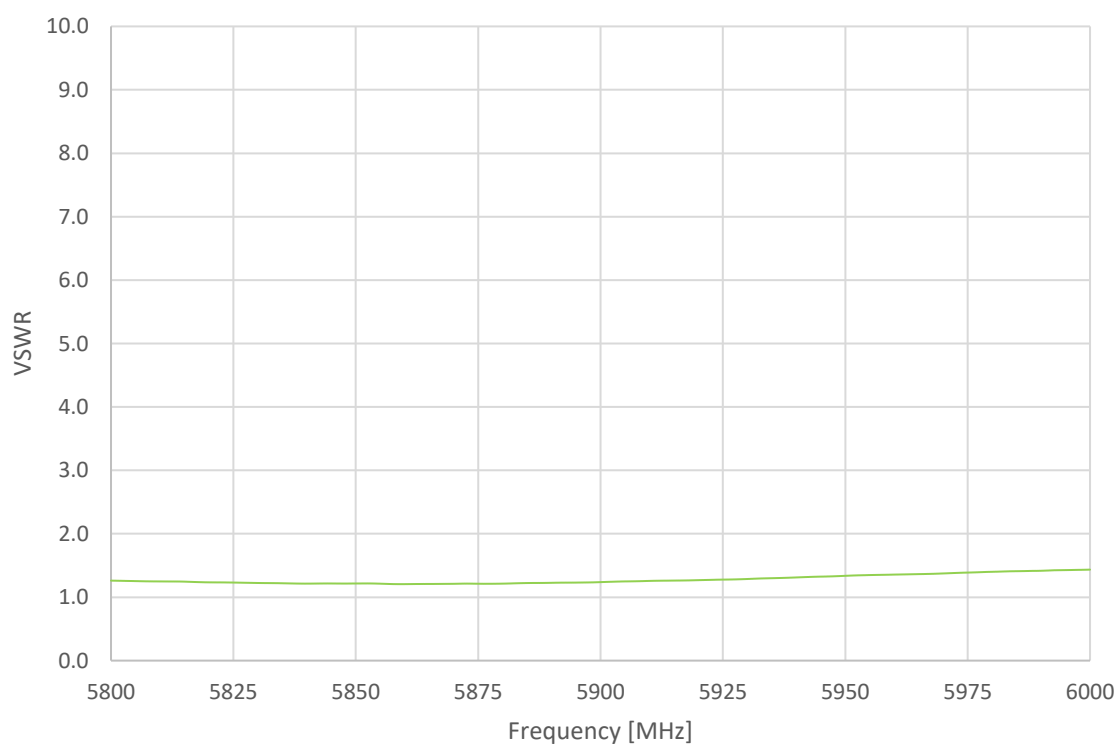
Antenna	
Frequency (MHz)	5850~5925MHz
Efficiency	60.45 %
Peak Gain	4.64 dBi
Average Gain	-2.15 dBi
VSWR	< 2
Polarization	RHCP
Axial Ratio	< 4
Impedance ( $\Omega$ )	50 Ohms
Mechanical	
Dimensions (mm)	12 x 12 x 4
Weight	2.0g
Mechanical	
Temperature Range	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH
Moisture Sensitivity Level (MSL)	3 (168 Hours)

## 3. Antenna Characteristics

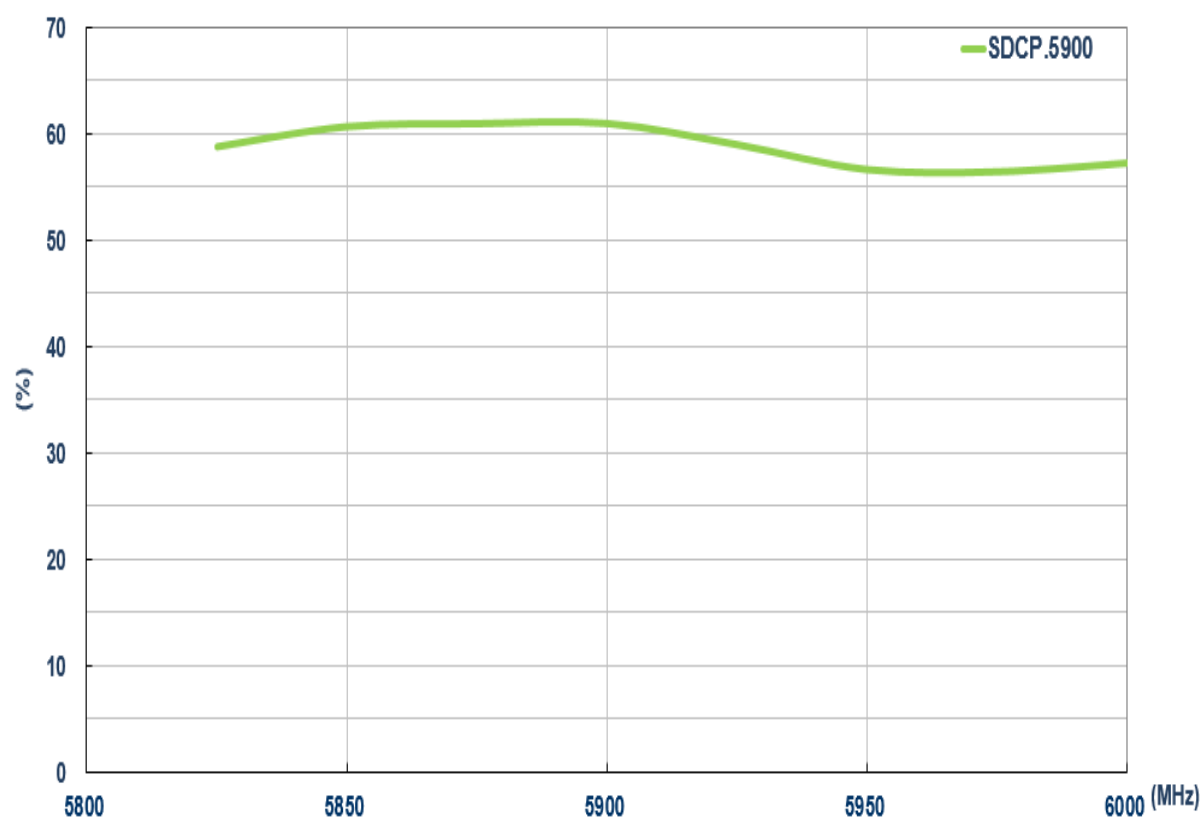
### 3.1 Return Loss



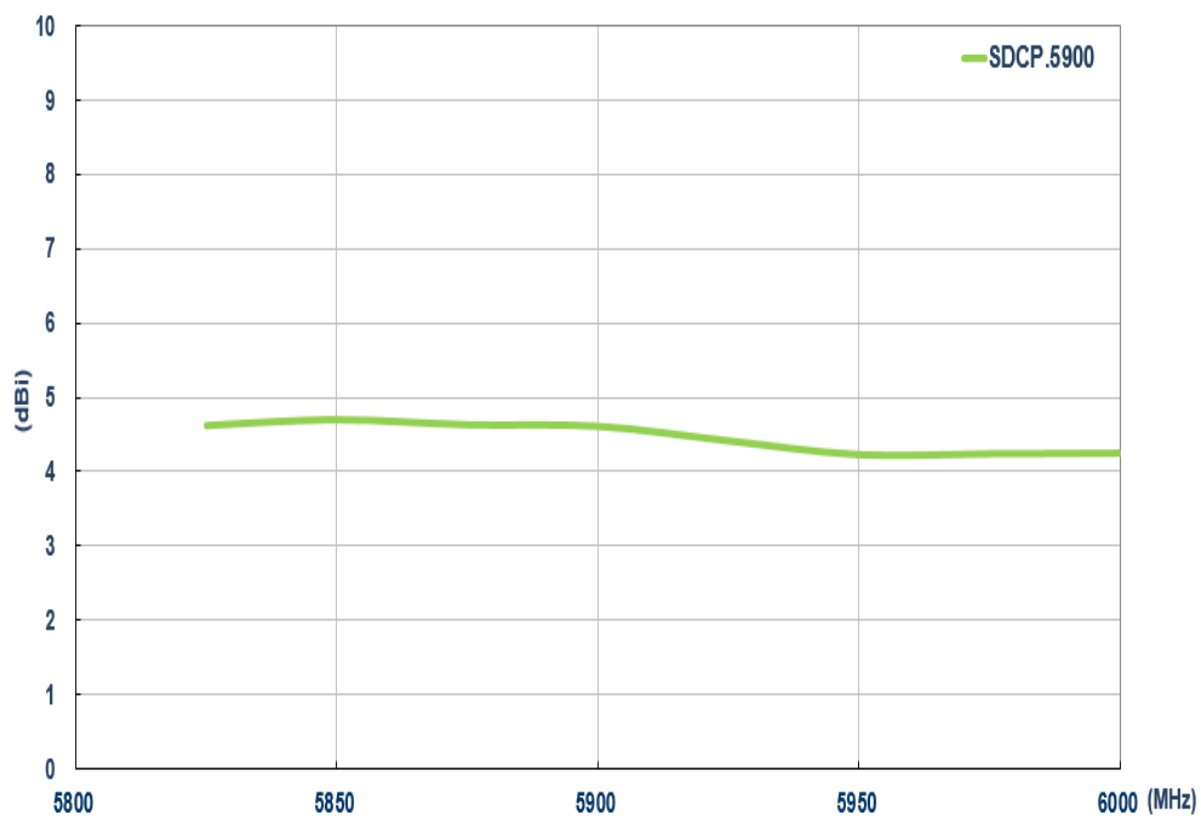
### 3.2 VSWR



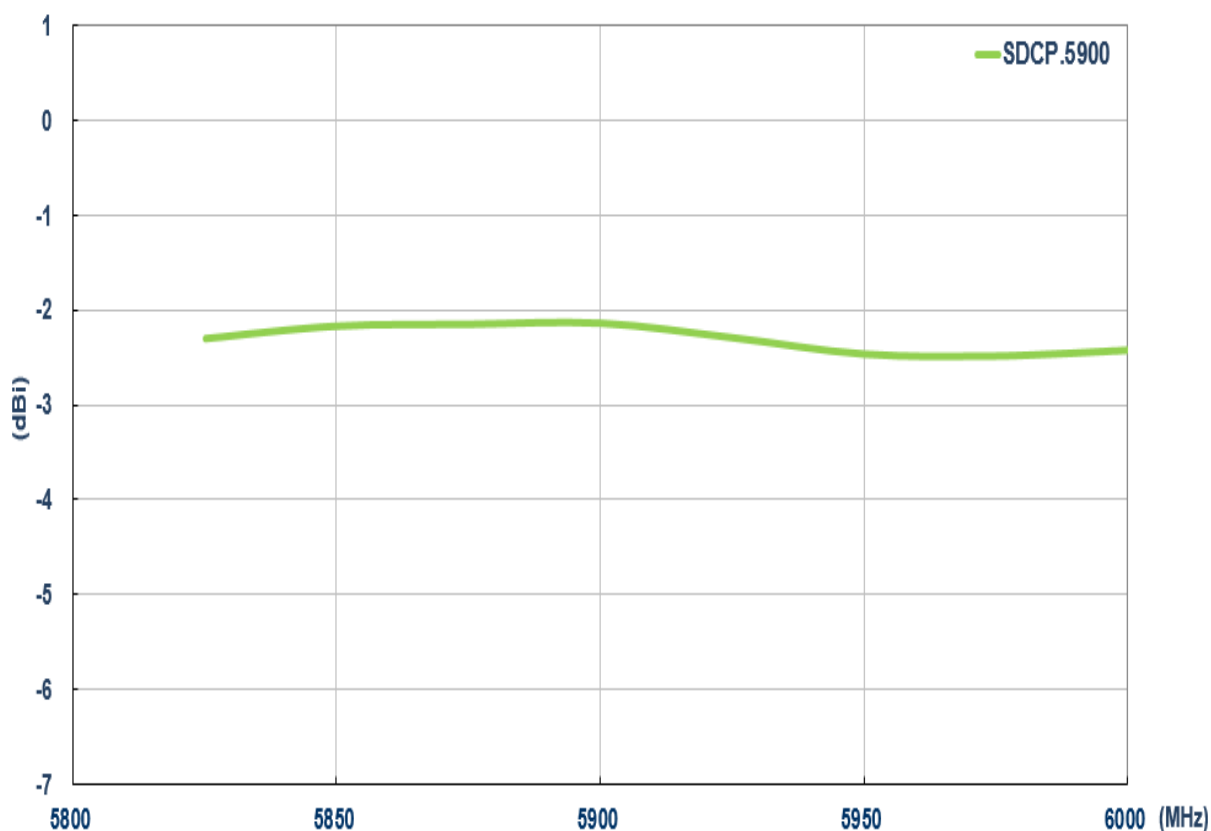
### 3.3 Efficiency



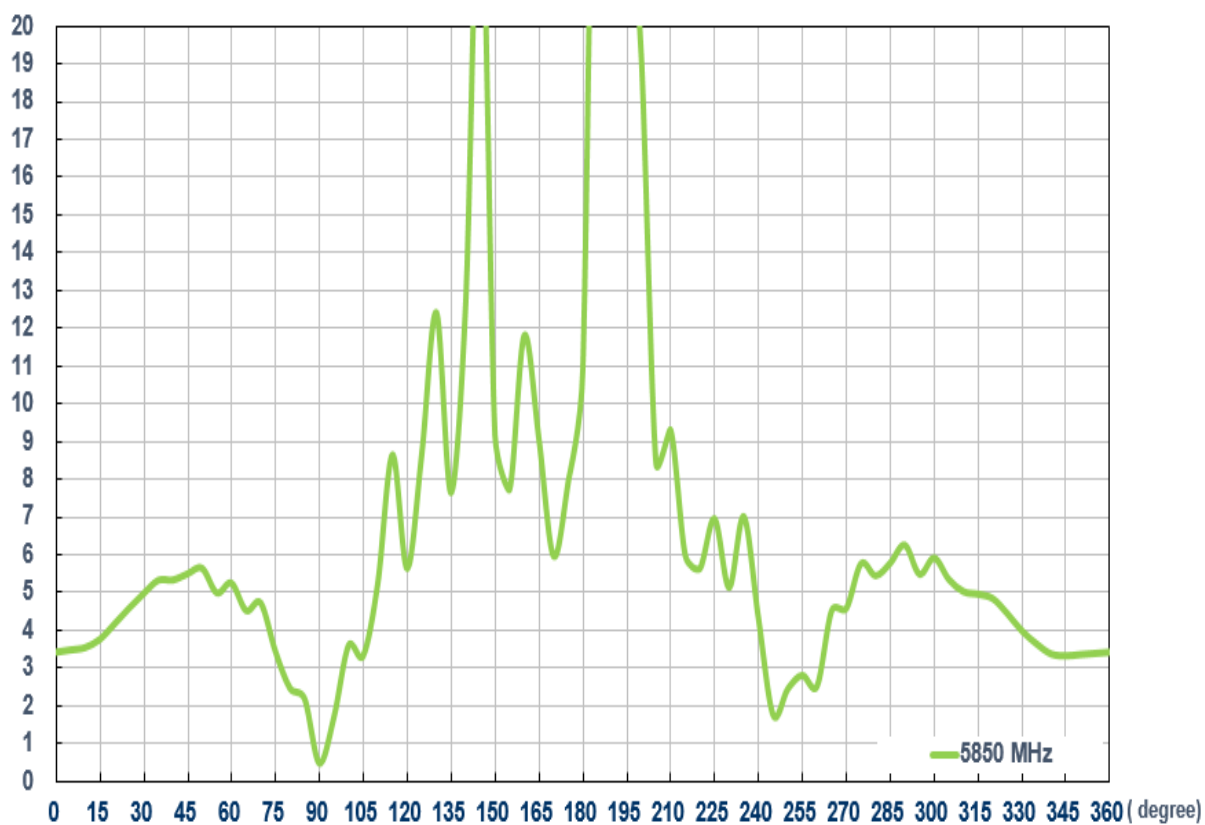
### 3.4 Peak Gain



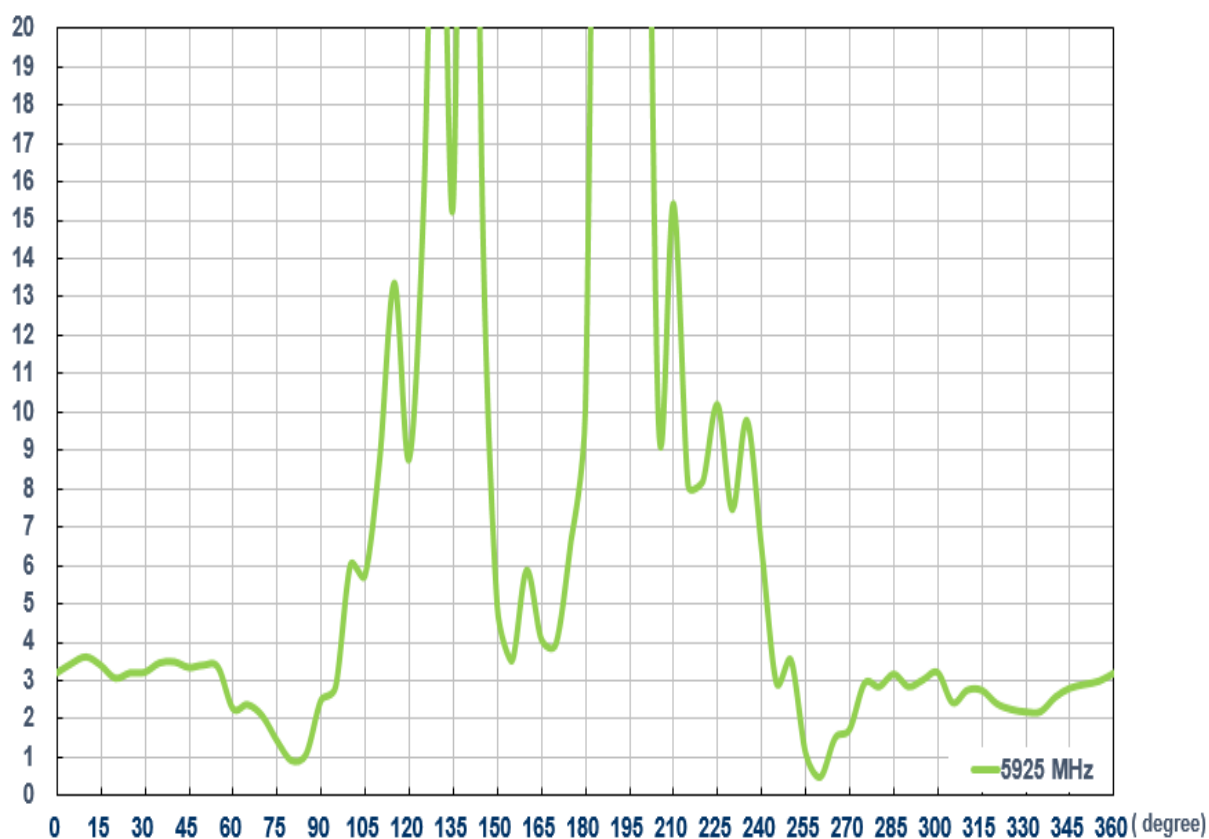
### 3.5 Average Gain



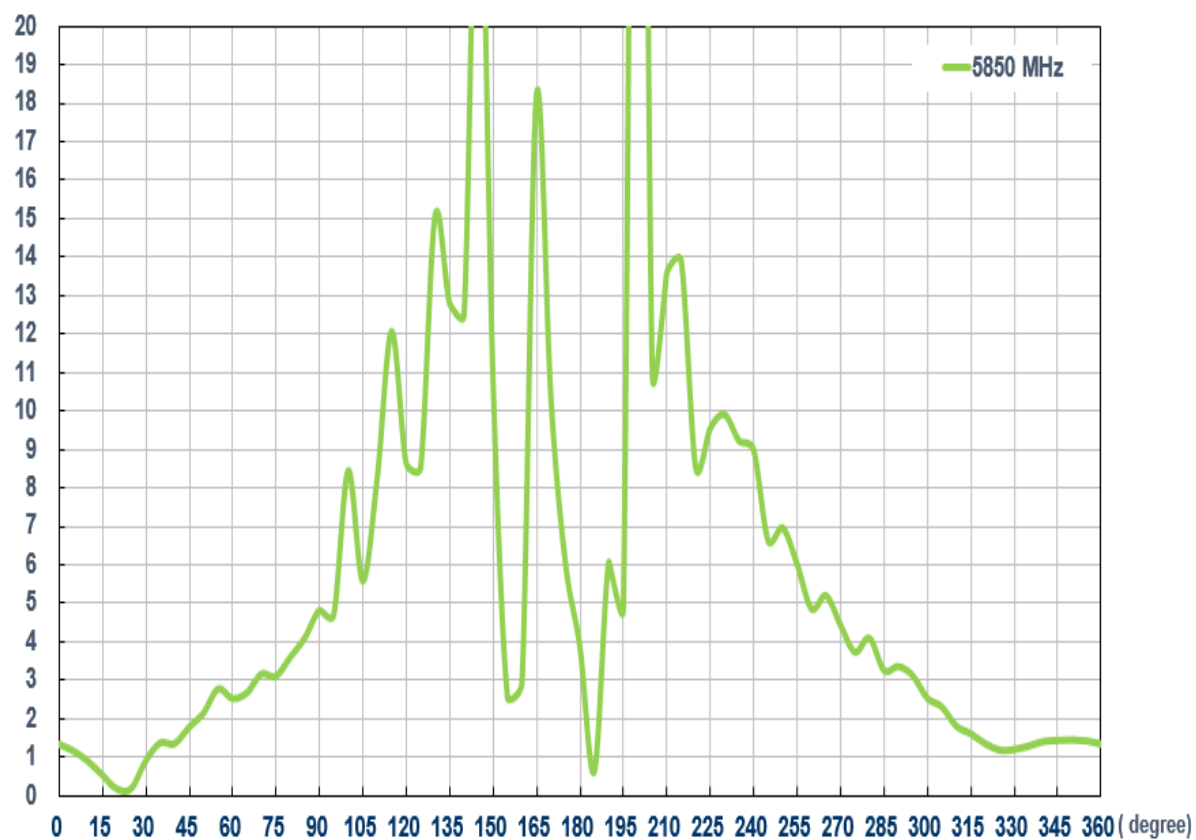
### 3.6 Axial Ratio: XZ Plane



### 3.7 Axial Ratio: XZ Plane

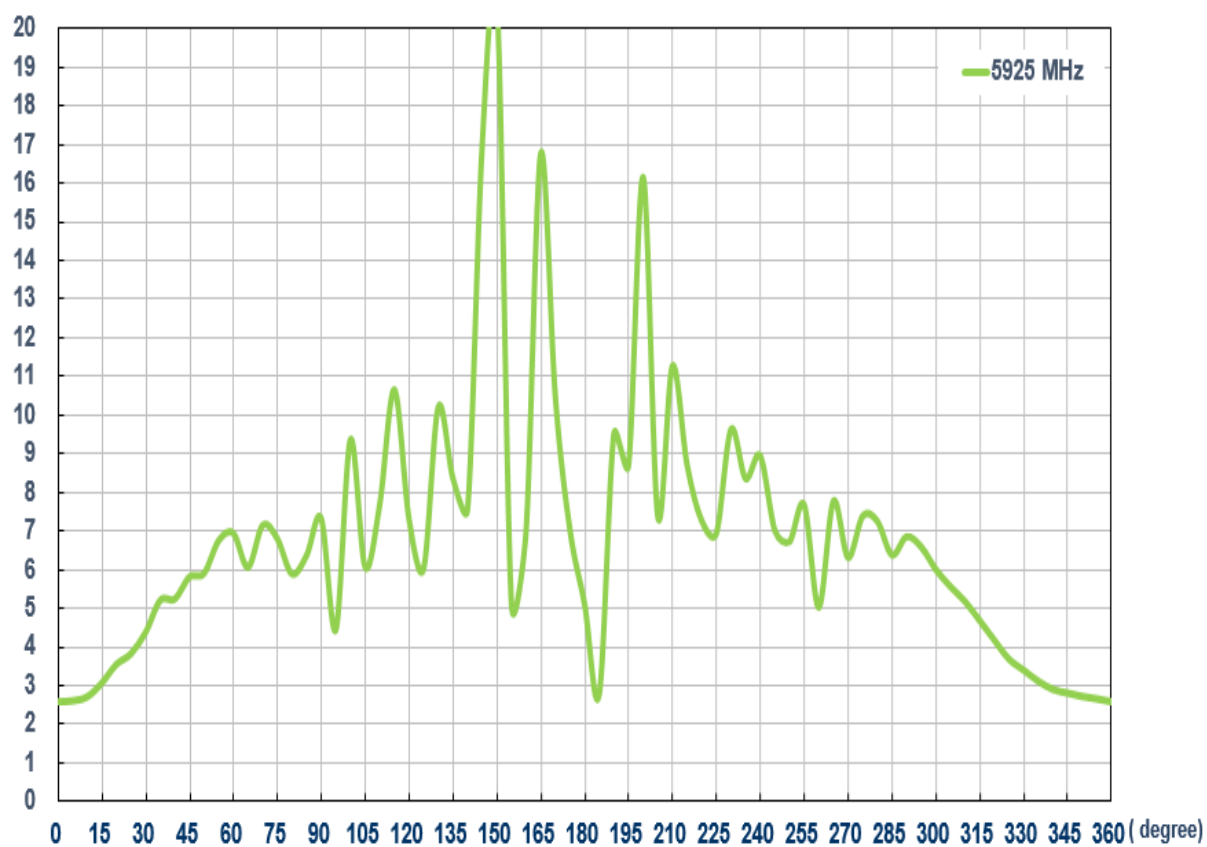


### 3.8 Axial Ratio: YZ Plane



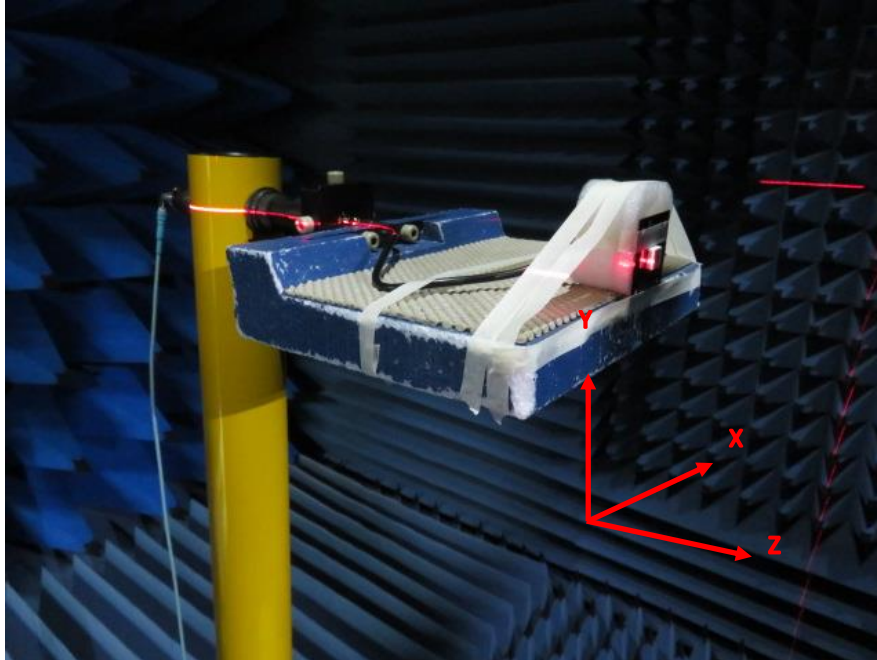


### 3.9 Axial Ratio: YZ Plane



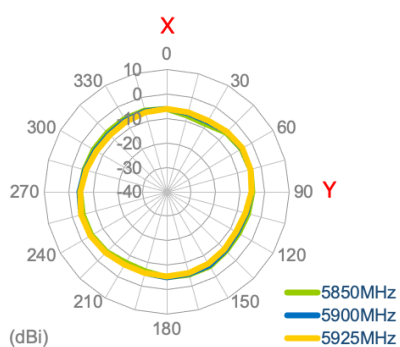
## 4. Radiation Patterns

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

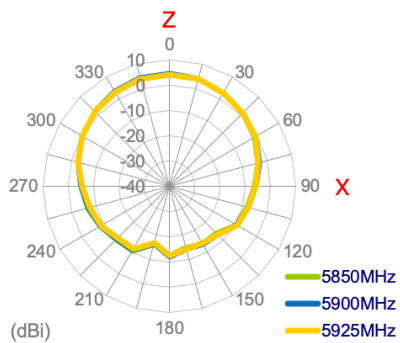


## 4.2 Radiation Patterns

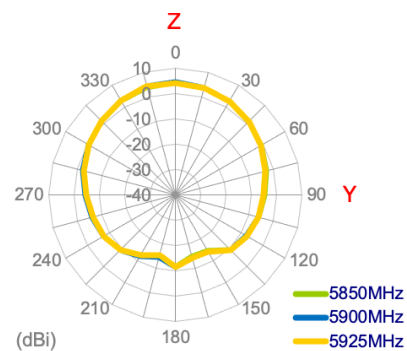
XY Plane



XY Plane Flipped

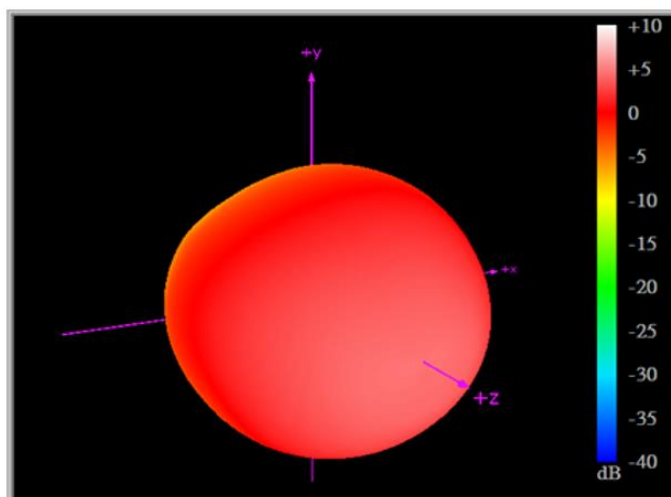


XZ Plane

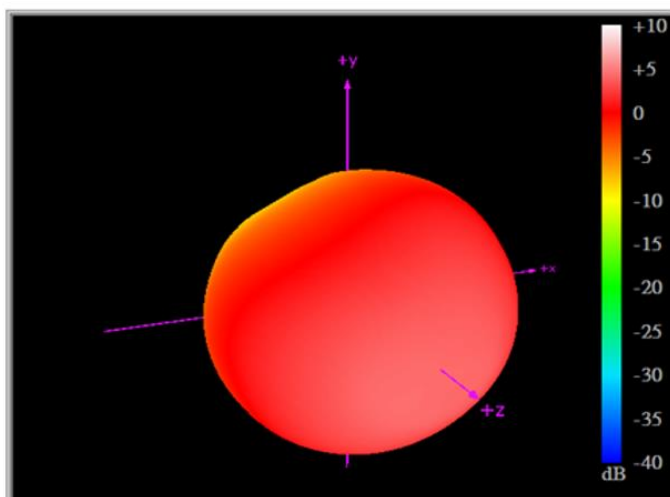


## 4.3 Antenna 3D Radiation Pattern (In free space)

5850MHz

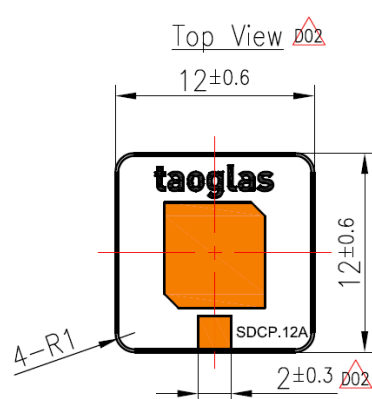


5925MHz



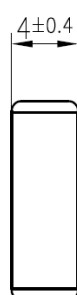
## 5. Mechanical Drawing - Antenna

### 5.1 Antenna Main Body

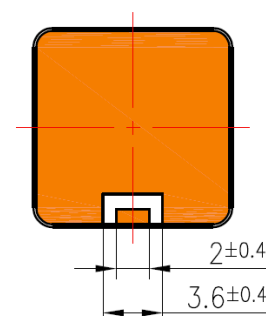


SCALE: 1/1

Side View

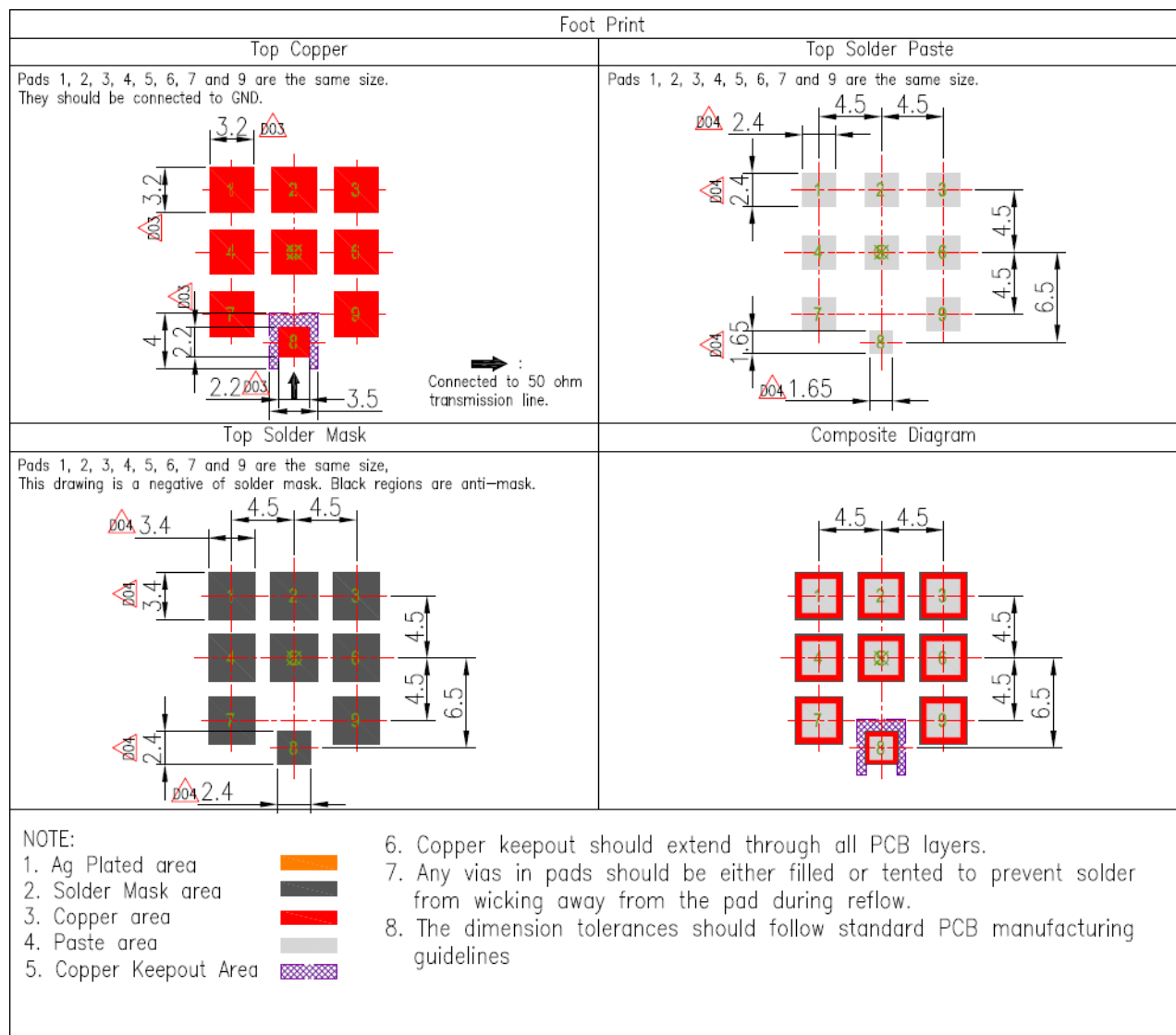


Bottom View

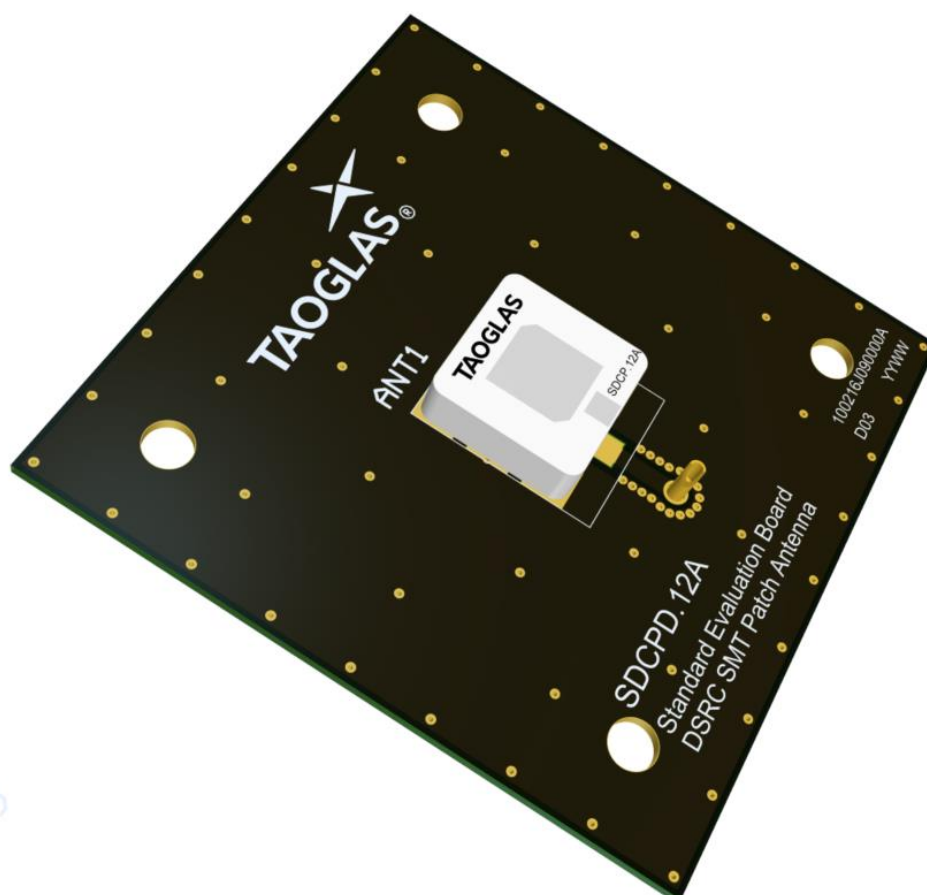


## 6. Footprint

### 6.1 Solder Land Pattern



## 7. Antenna Integration Guide

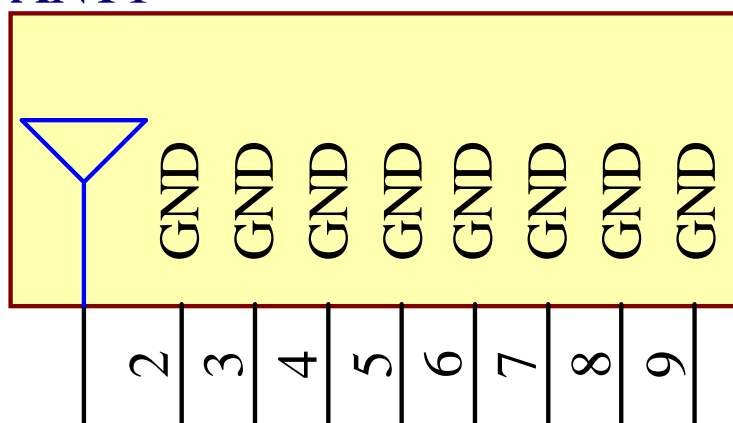


## 7.1 Schematic Symbol and Pin Definition

The circuit symbol for the antenna is shown below. The antenna has 9 pins as indicated below.

Pin	Description
1	RF Feed
2, 3, 4, 5, 6, 7, 8, 9	Ground

SDCP.5900.12.4.A40  
ANT1

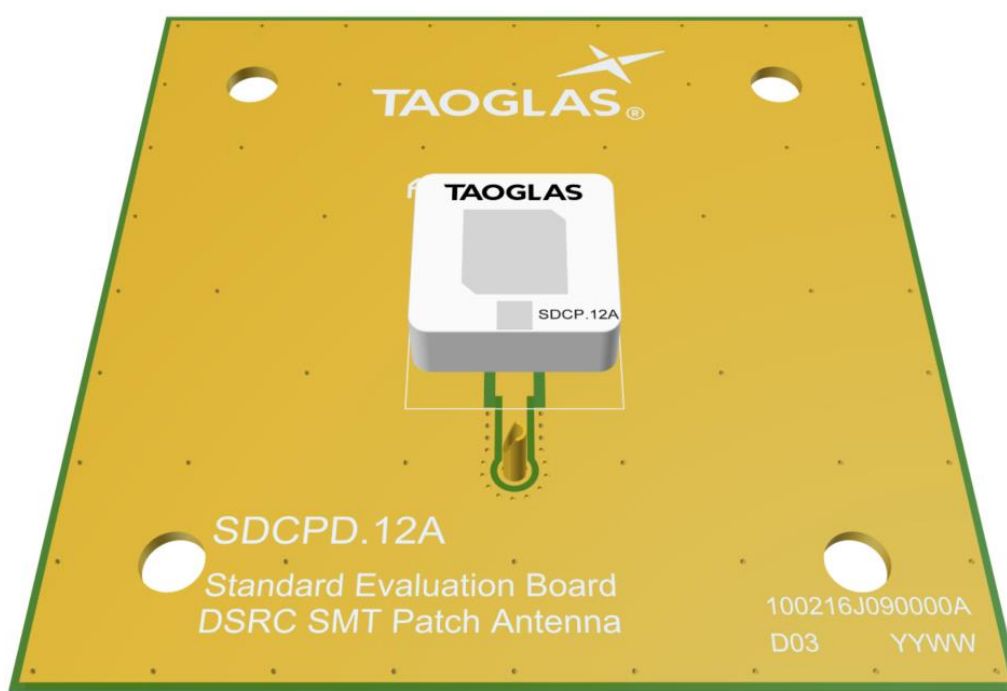


## 7.2 Antenna Integration

The antenna should be placed at the center of the ground plane with a length and width of 50mm. Maintaining a square symmetric ground plane shape and symmetric environment around the antenna is critical to maintaining the excellent axial ratio and phase center performance shown in this datasheet.



Top Side w/ Solder Mask



Top Side w/o Solder Mask

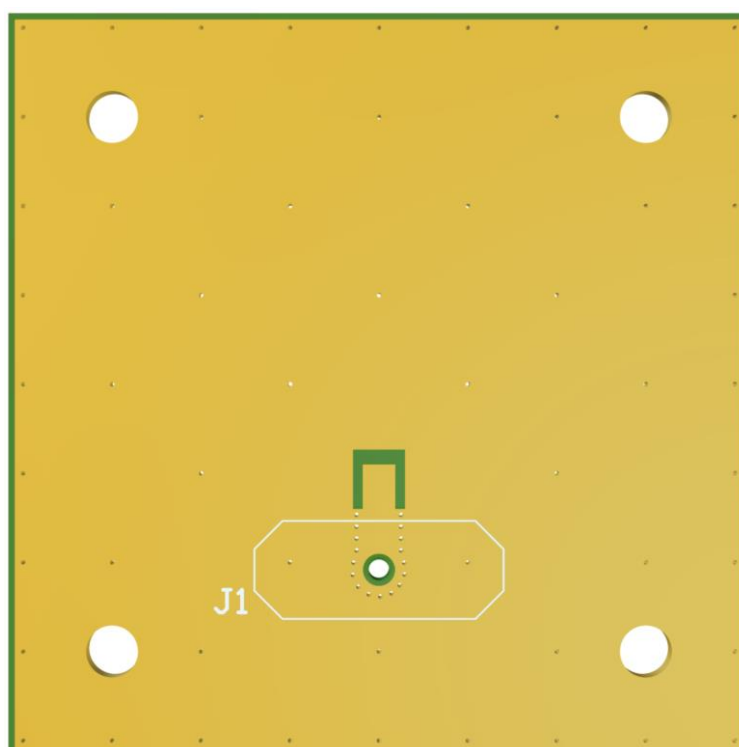


## 7.3 PCB Layout

The footprint and clearance on the PCB must comply with the antenna specification. The PCB layout shown in the diagram below demonstrates the antenna footprint.



Topside

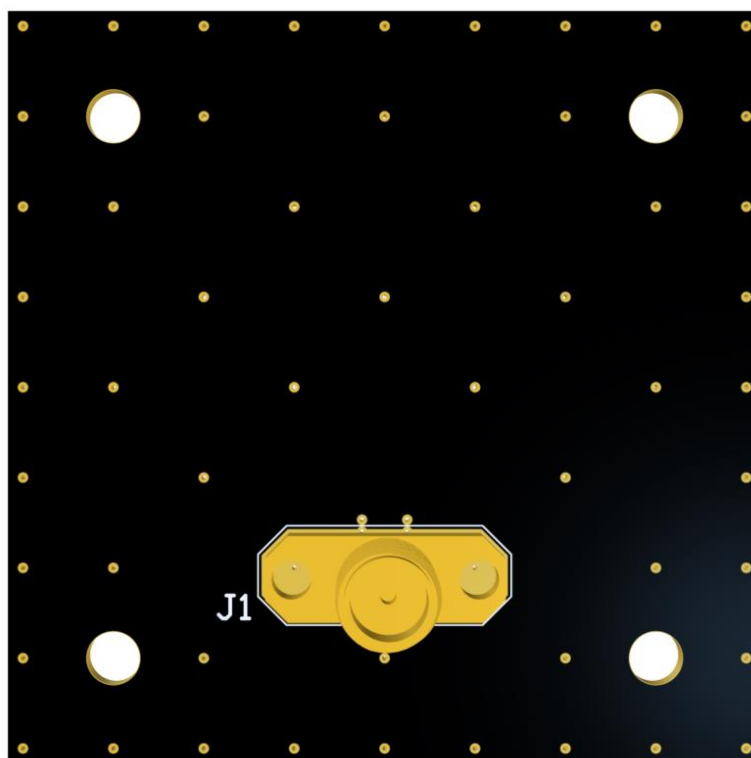


Bottom Side

## 7.4 Evaluation Board

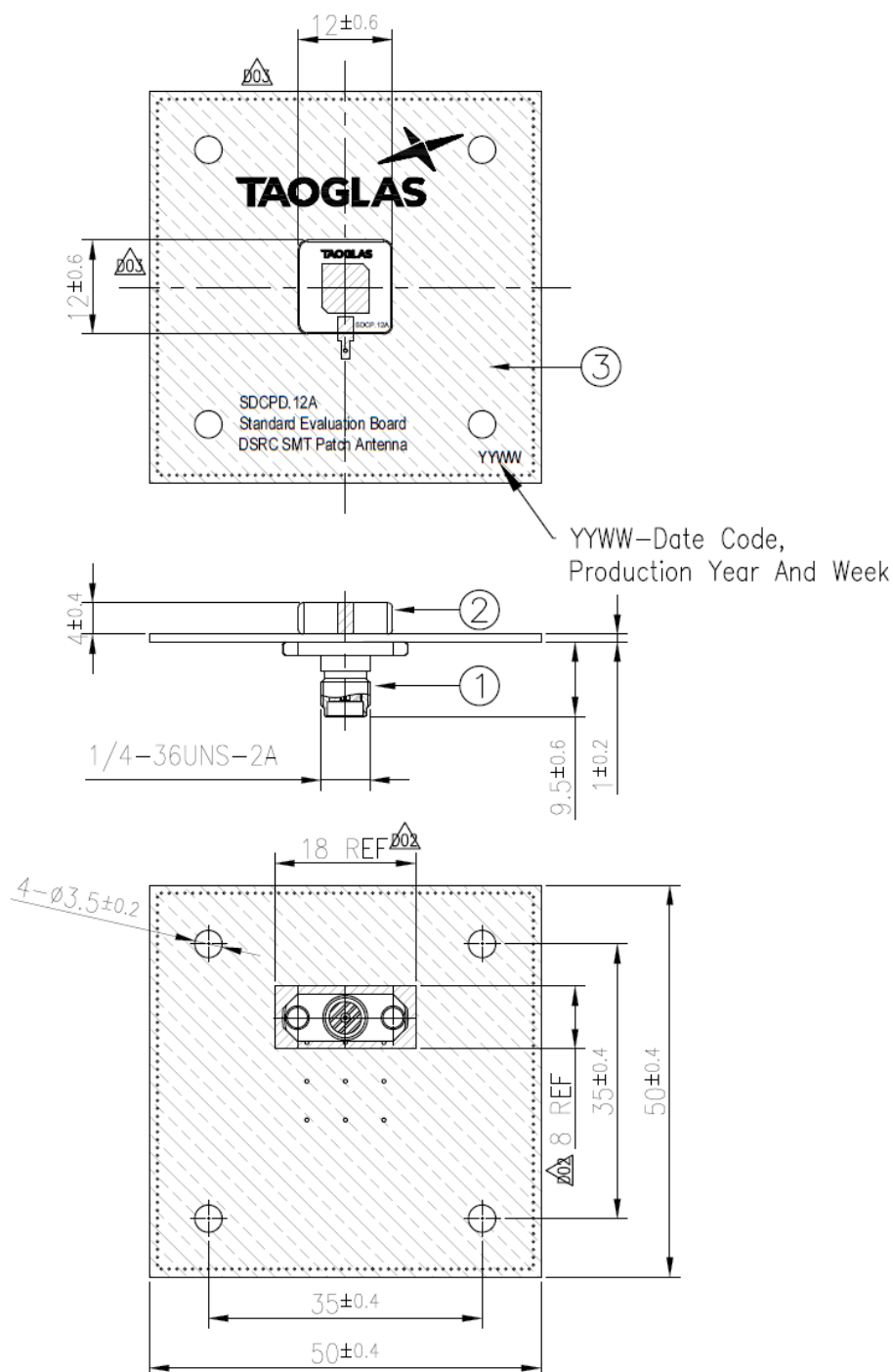


Topside



Bottom Side

## 8. Mechanical Drawing – Evaluation Board



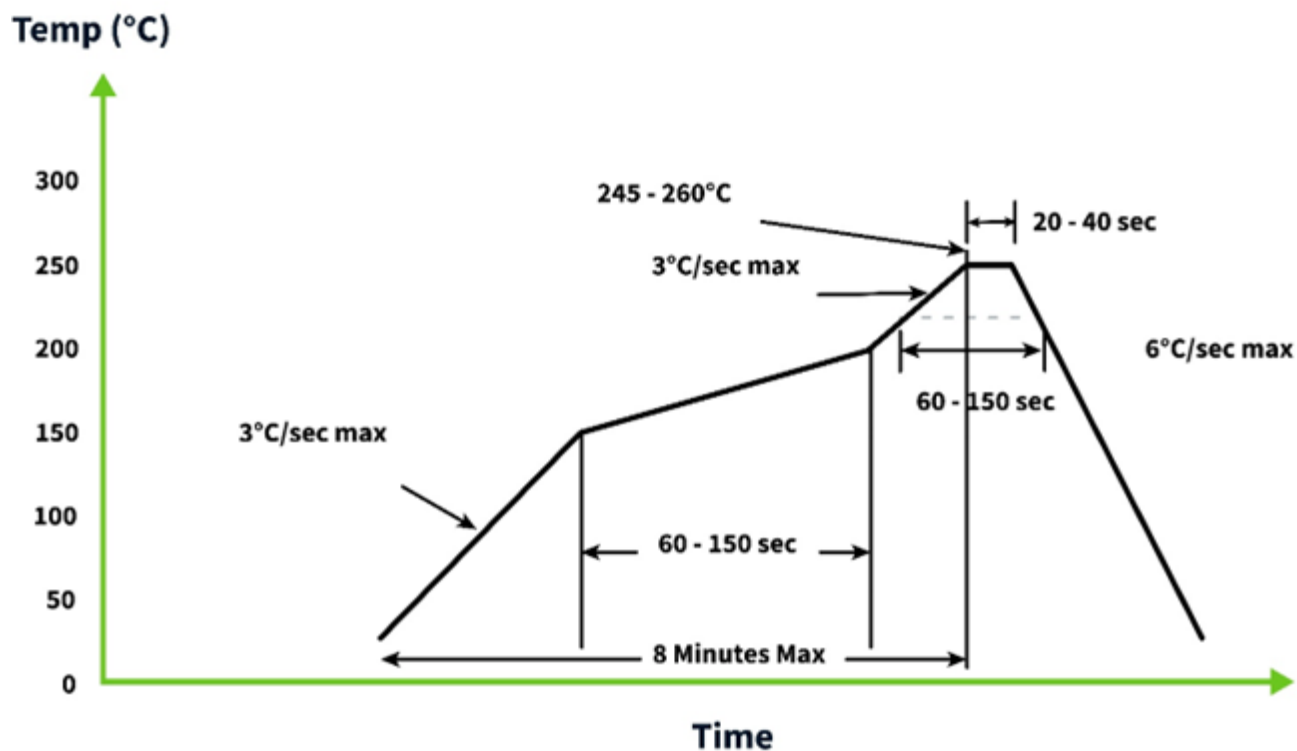
Note:

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

	Name	P/N	Material	Finish	QTY
1	PCB SMA(F)ST $\phi 0.3$	001516J000000A	Brass	Au Plated	1
2	SDCP.12A Patch(12x12x4mm)	001516J000000A	Ceramic	Clear	1
3	SDCPD.12A PCB	100216J090000A	Composite 1.0t	Black	1

## 9. Solder Reflow Profile

The SDCP.5900.12.4.A.40 can be assembled by following the recommended soldering temperatures are as follows:

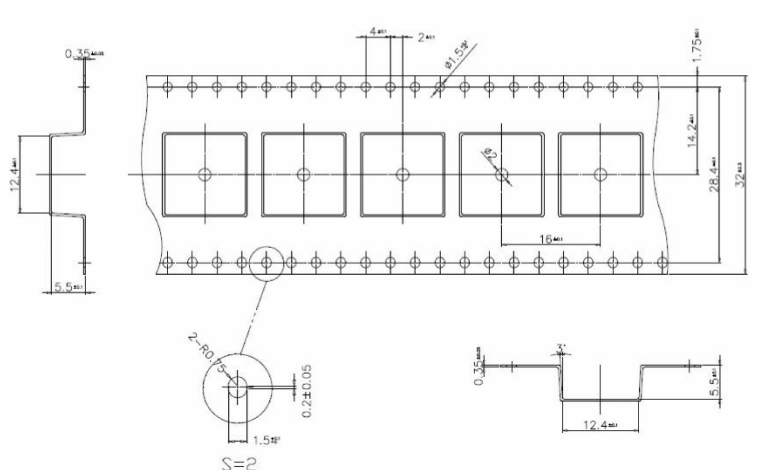
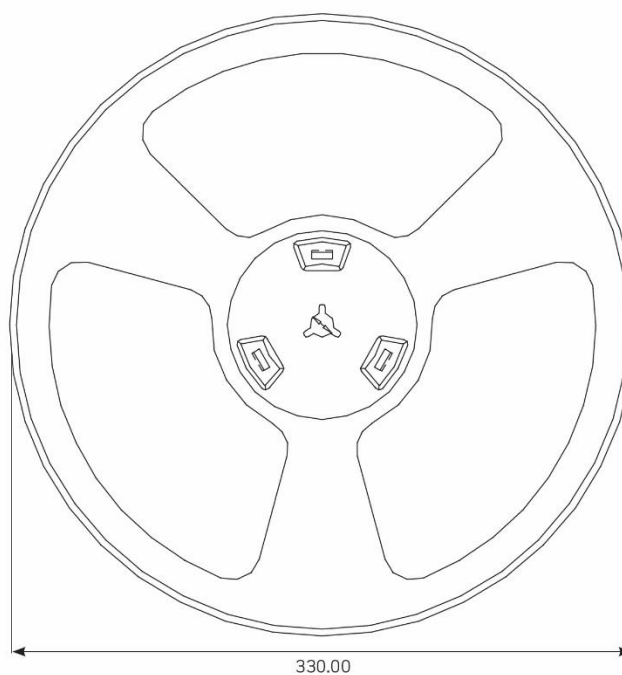


\*Temperatures listed within a tolerance of  $\pm 10^{\circ}\text{C}$

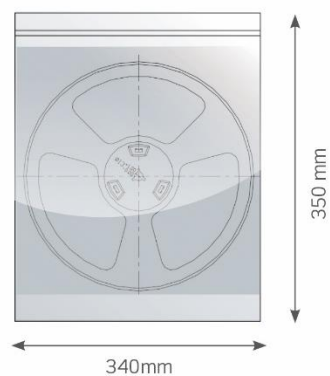
Smaller components are typically mounted on the first pass, however, we do advise mounting the SDCP.5900.12.4.A.40 when placing larger components on the board during subsequent reflows.

## 10. Packaging

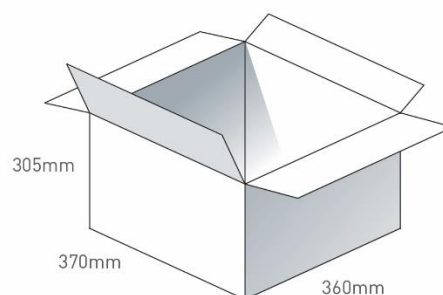
500 pc SDCP.5900.12.4.A.40 per reel  
Dimensions - Ø330\*55mm  
Weight - 2300g



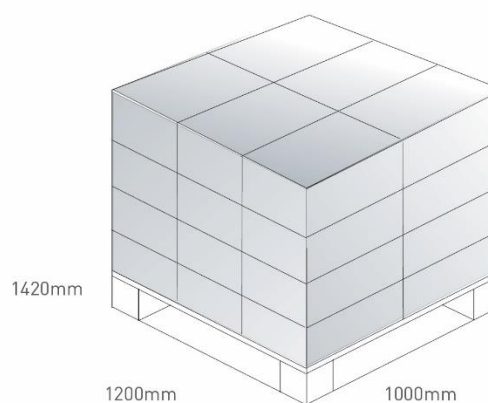
1 pc reel in small in Anti-static Bag  
 Dimensions - 340\*350\*70mm  
 Weight - 2400g



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



## Changelog for the datasheet

### SPE-17-8-037– SDCP.5900.12.4.A.40

#### Revision: F (Current Version)

Date:	2024-10-24
Changes:	Updated solder reflow profile
Changes Made by:	Gary West

#### Previous Revisions

##### Revision: F

Date:	2023-10-16
Changes:	Updated to DSRC terminology
Changes Made by:	Cesar Sousa

##### Revision: A (Original First Release)

Date:	2017-7-12
Notes:	Initial Release
Author:	Technical Writer

##### Revision: E

Date:	2023-03-16
Changes:	Antenna Integration Guide Added
Changes Made by:	Cesar Sousa

##### Revision: D

Date:	2021-10-05
Changes:	Updated VNA measurement graphs.
Changes Made by:	Gary West

##### Revision: C

Date:	2021-10-05
Changes:	Format Change, MSL
Changes Made by:	Erik Landi

##### Revision: B

Date:	2021-10-25
Changes:	Updated to C-V2X
Changes Made by:	Jack Conroy



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