



TAOGLAS®



Datasheet

6dBi 5.9GHz 12mm DSRC Ceramic Patch Antenna

Part No:
DCP.5900.12.4.A.02

Features:

5.9GHz DSRC Ceramic Patch Antenna

5850MHz to 5925MHz

Peak Gain: 5.89dBi

Efficiency: >75%

Dimensions: 12*12*4mm

Manufactured in an IATF16949 Approved Facility

RoHS Compliant

| | |
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1. Introduction



The DCP.5900 is a world-leading DSRC Antenna with up to 75% efficiency. It is a 12*12*4 mm embedded ceramic DSRC Patch antenna. Primarily designated for vehicle safety applications, DSRC offers high-speed, low-latency wireless communication over short distances. It is a high performance compact 6dBi directional antenna designed to operate at 5850 MHz to 5925 MHz for DSRC systems. It is mounted via pin and double-sided adhesive and has been tuned for a center position on a 70mm *70mm ground plane.

The polarization has been designed to be circularly polarized to enable a more stable system signal strength on moving vehicles. For further optimization to customer-specific device environments where positioning is off-center or a different ground-plane size, a custom-tuned patch antenna can be supplied, subject to NRE and MOQ.

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

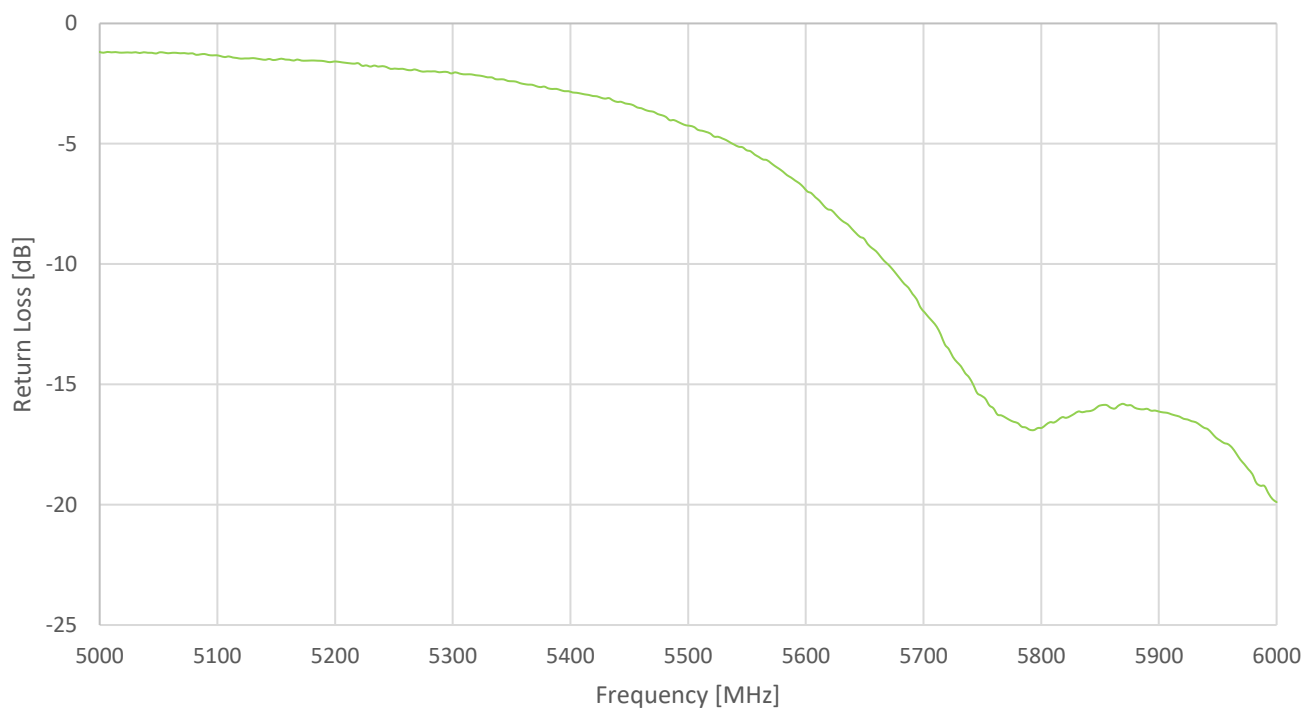
2. Specifications

| Electrical | |
|-------------------|----------------------------|
| 5850-5925 (MHz) | |
| Peak Gain (dBi) | 5.1 |
| Average Gain (dB) | -2.6 |
| Efficiency (%) | 55.0 |
| Impedance | 50Ω |
| Polarization | RHCP |
| Mechanical | |
| Ceramic Dimension | 12 x 12 x 4 mm |
| Pin Diameter | 0.85 mm |
| Pin Length | 2.4mm |
| Weight | 2.1g |
| Environmental | |
| Temperature Range | -40°C to 105°C |
| Humidity | Non-condensing 65°C 95% RH |

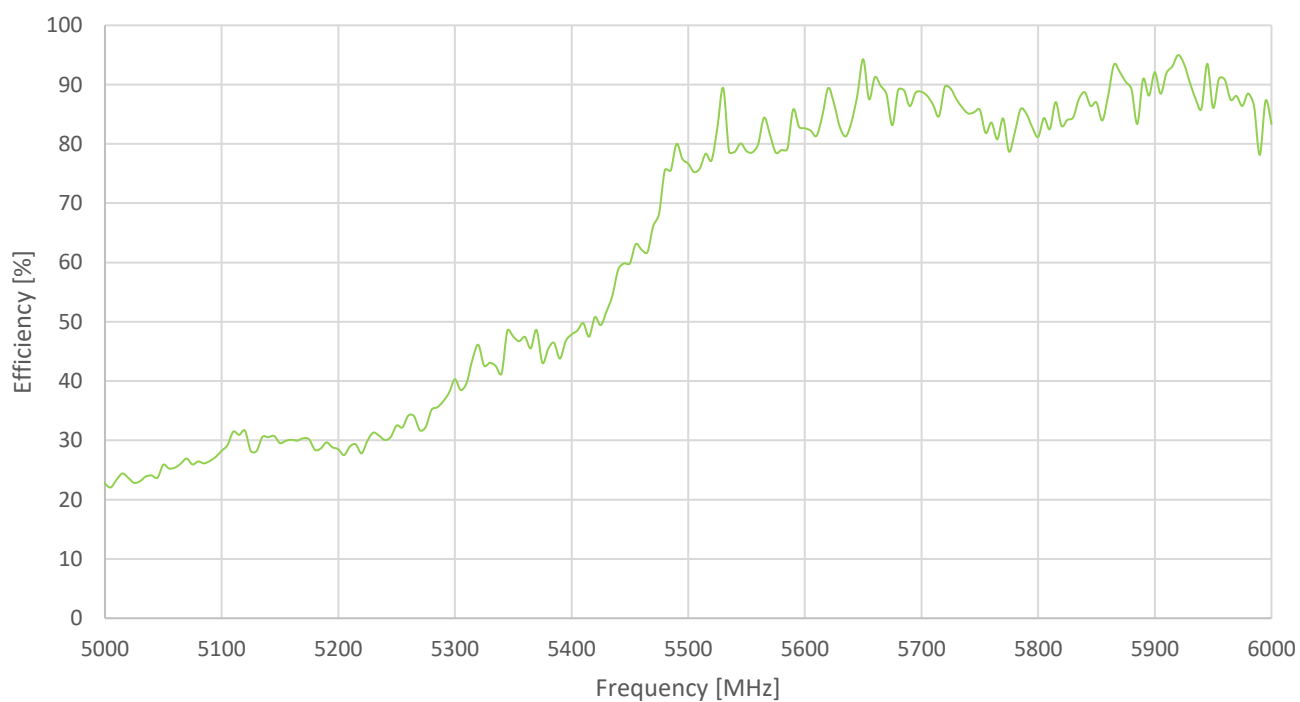
*All tests done on a 70mm x 70mm ground plane

3. Antenna Characteristics

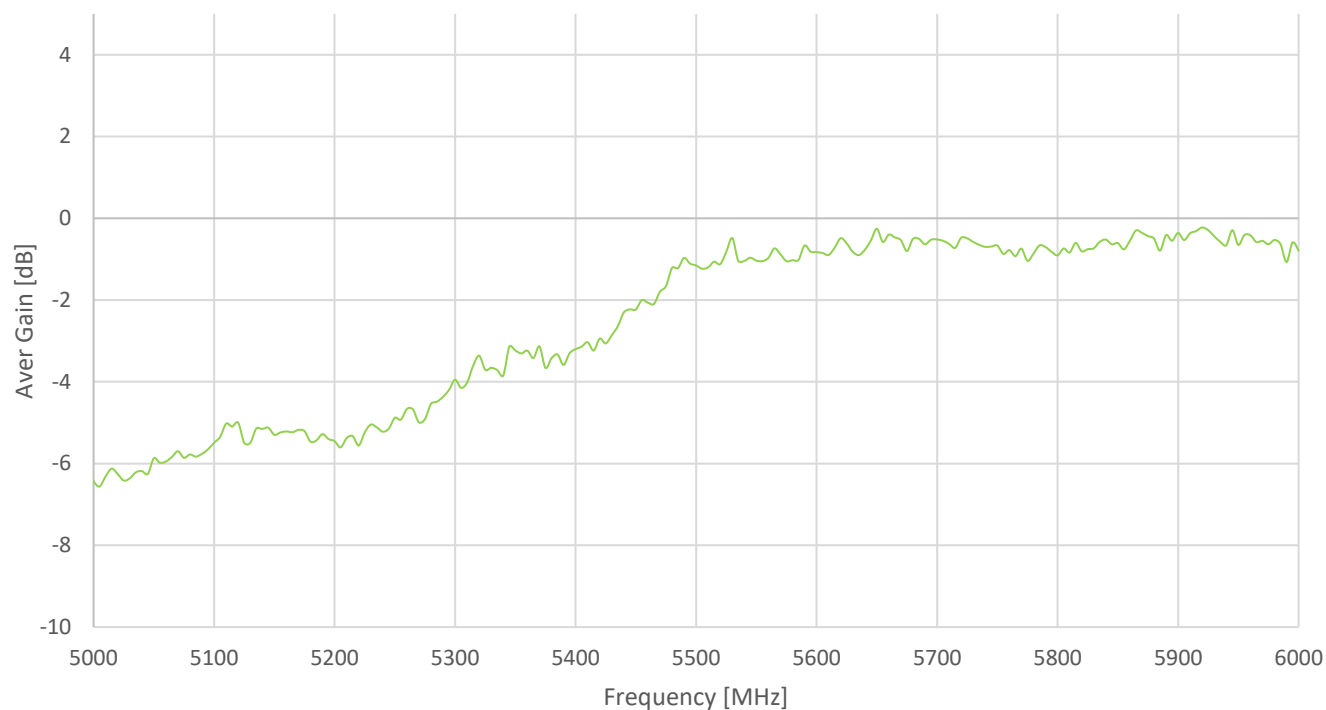
3.1 Return Loss



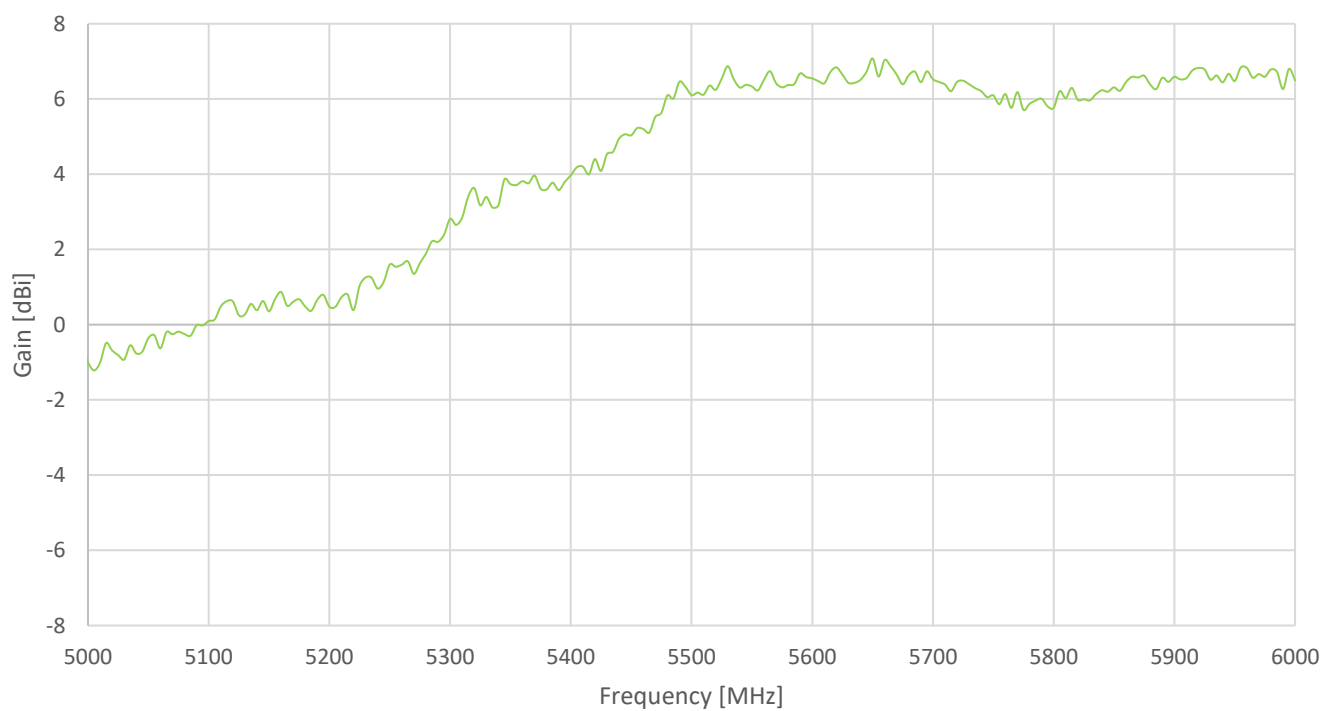
3.2 Efficiency



3.3 Average Gain

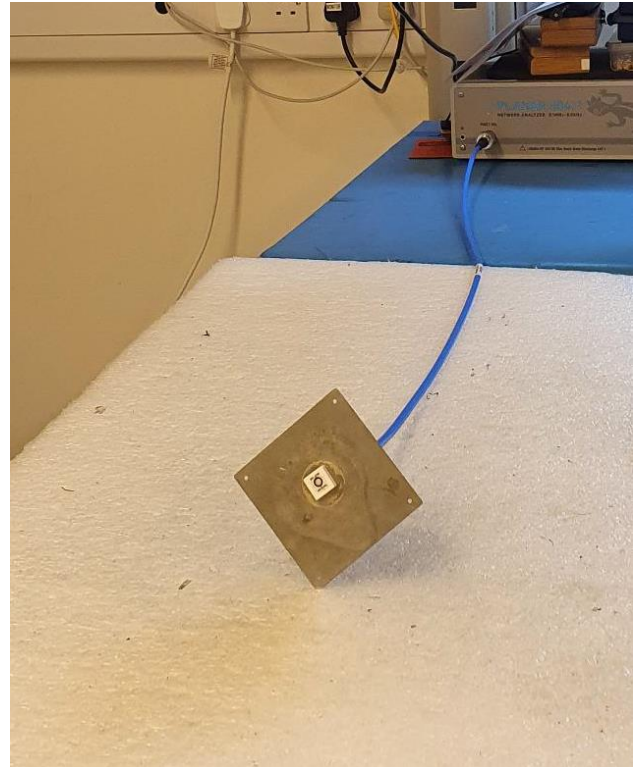
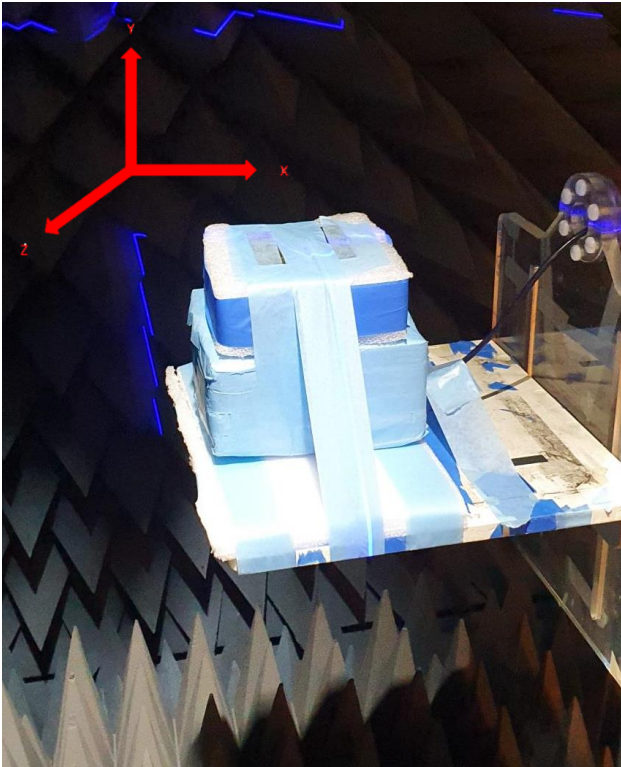


3.4 Peak Gain



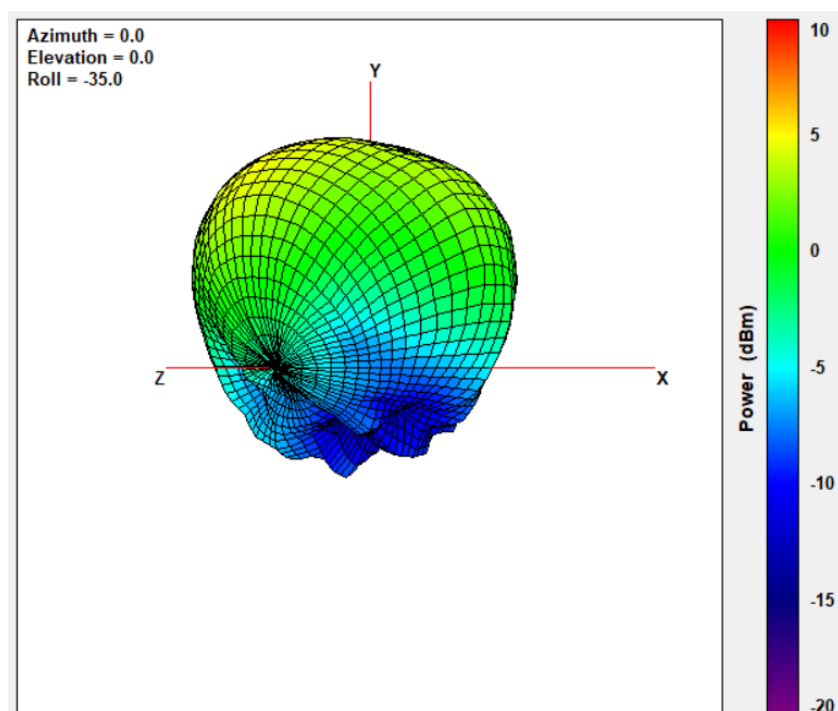
4. Radiation Patterns

4.1 Test Setup



70mm x 70mm Ground Plane

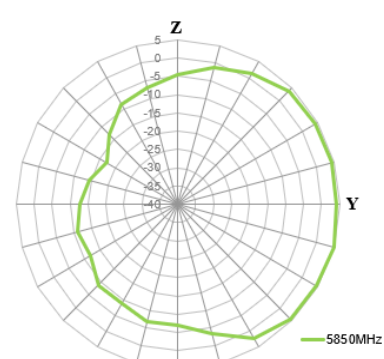
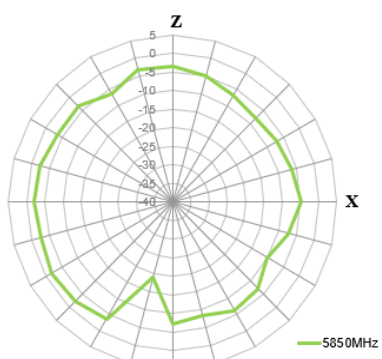
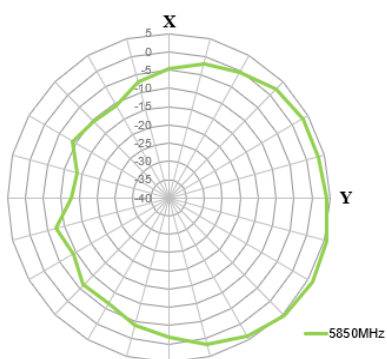
4.2 5850MHz, 2D & 3D Radiation Patterns



XY Plane

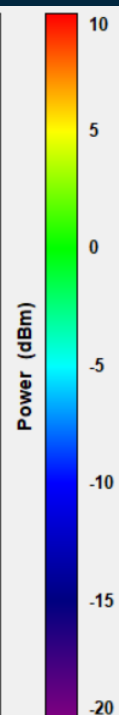
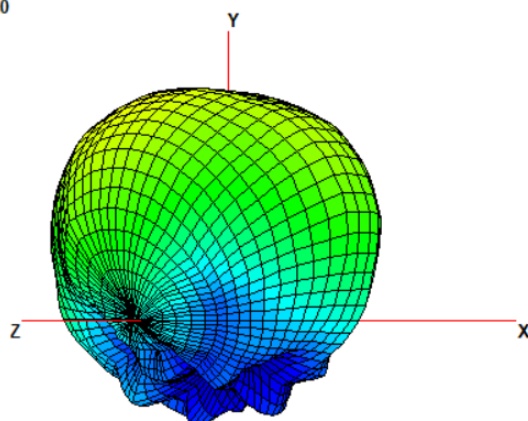
XZ Plane

YZ Plane



5925MHz

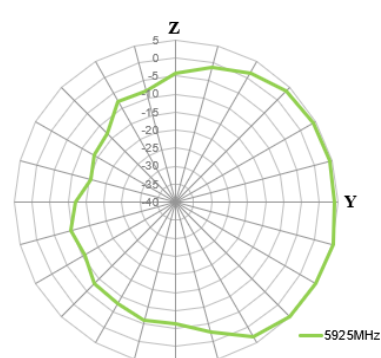
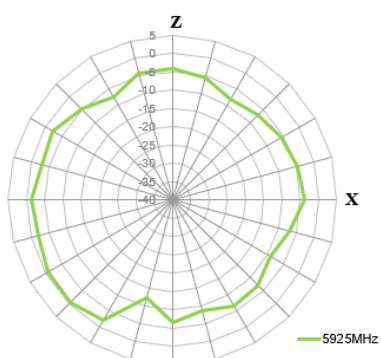
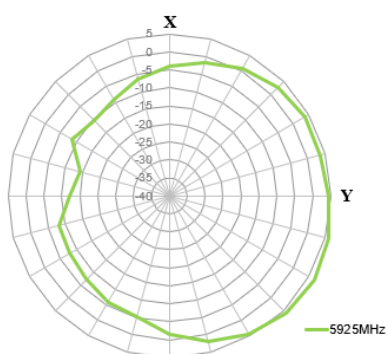
Azimuth = 0.0
Elevation = 0.0
Roll = -35.0



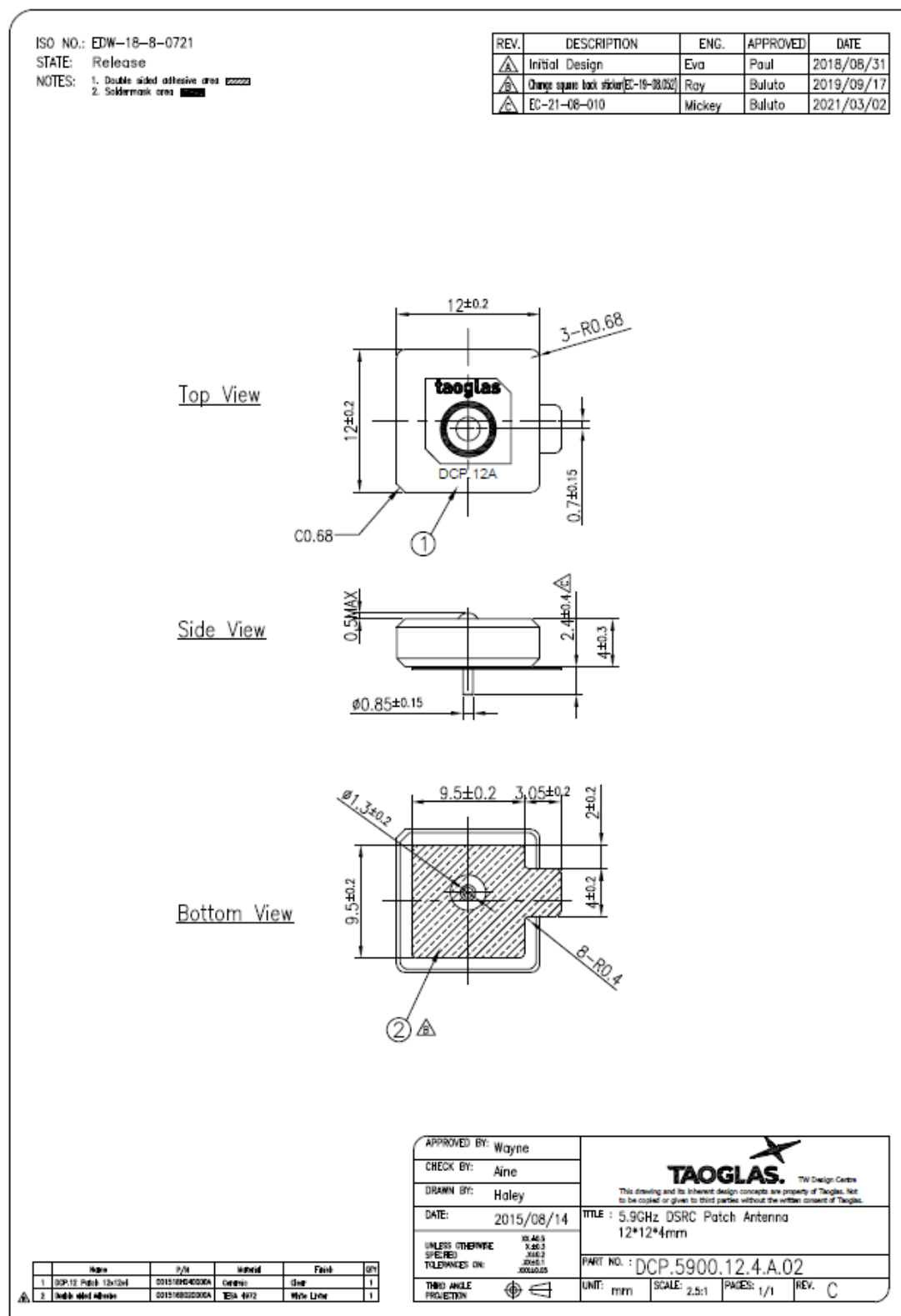
XY Plane

XZ Plane

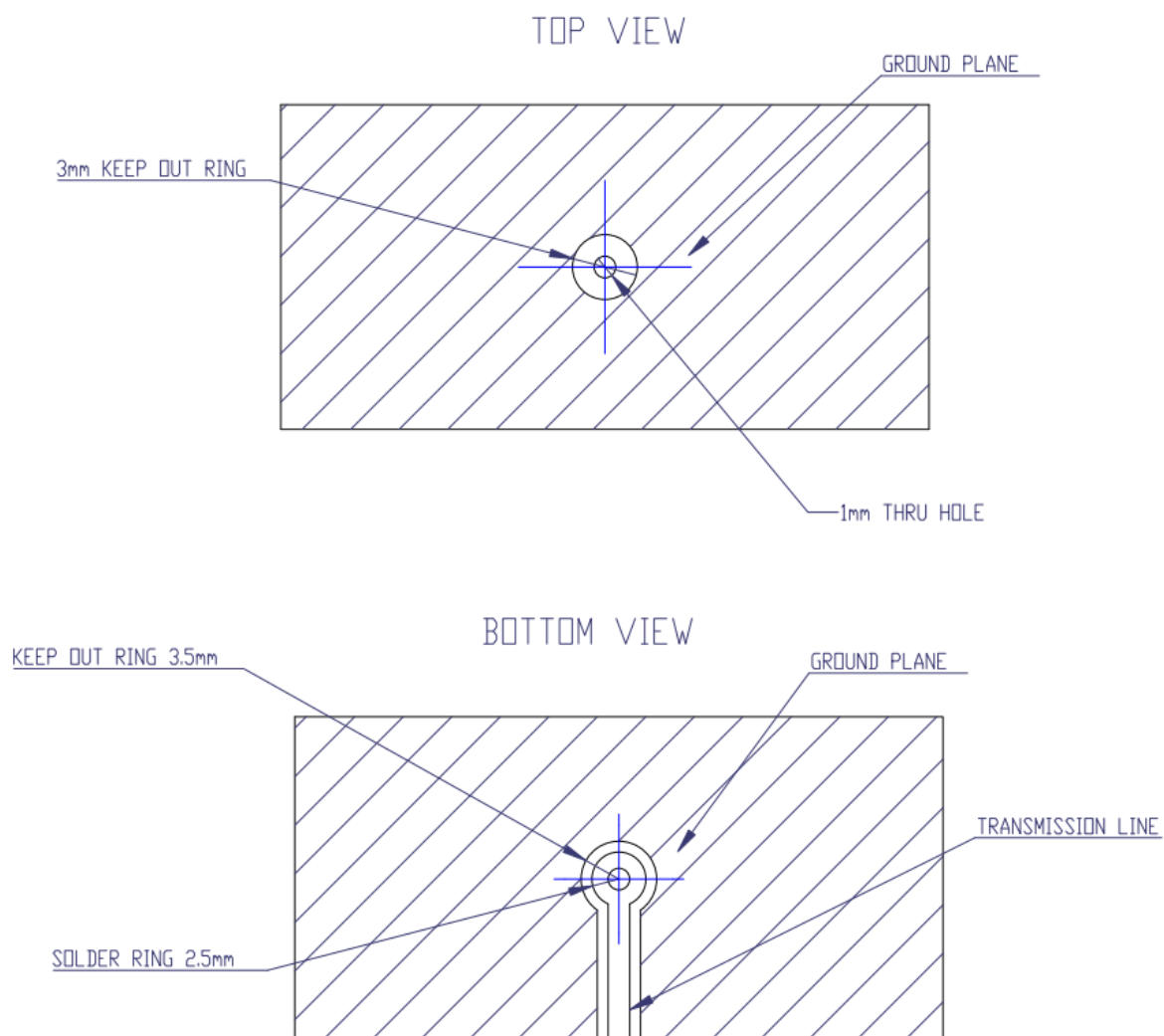
YZ Plane



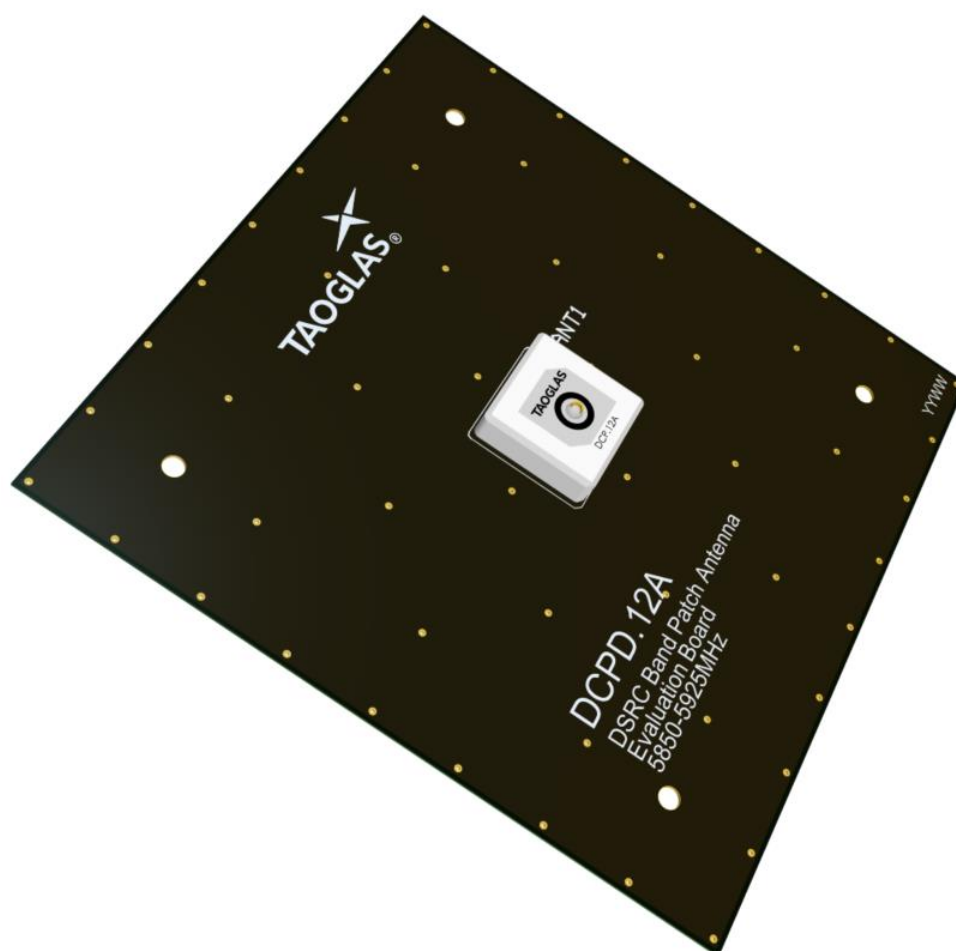
5. Mechanical Drawing (Units: mm)



6. Footprint



7. Antenna Integration Guide

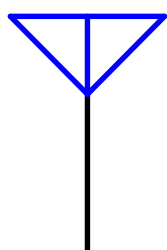


7.1 Schematic Symbol and Pin Definition

The circuit symbol for the antenna is shown below. The antenna has 1 pin as indicated below.

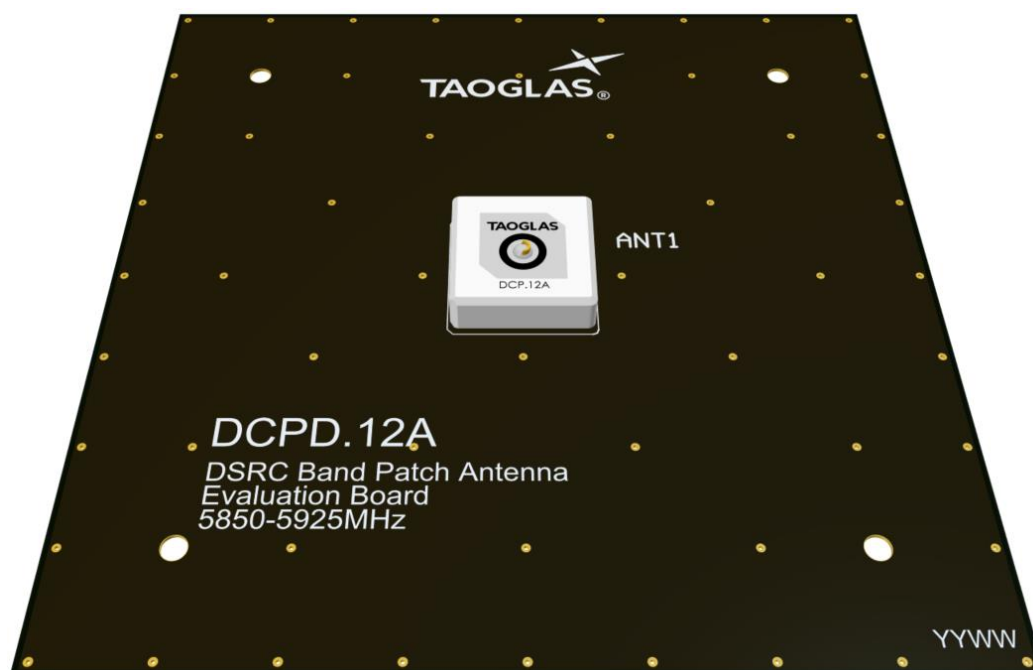
| Pin | Description |
|-----|-------------|
| 1 | RF Feed |

DCP.5900.12.4.A.02
ANT1



7.2 Antenna Integration

The antenna should be placed at the center of the ground plane with a length and width of 70mm. 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



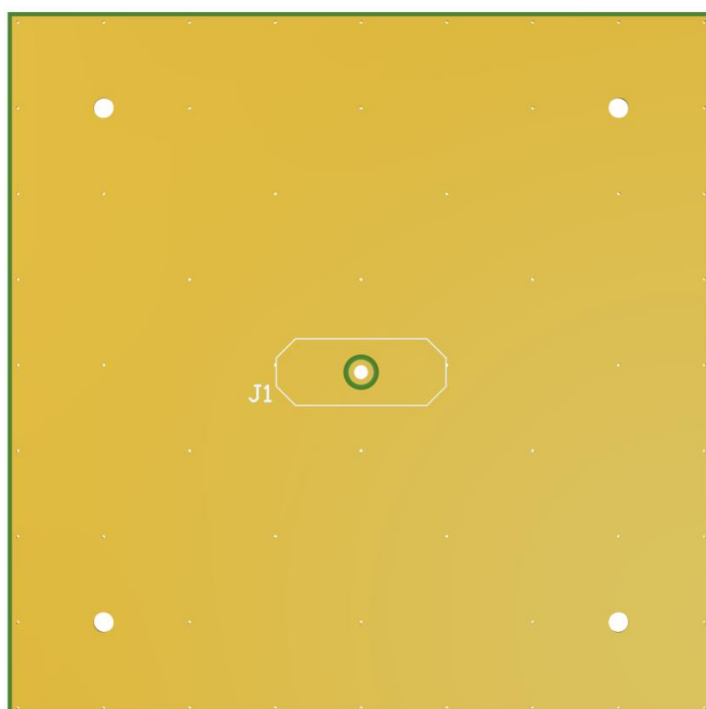
Top Side w/o Solder Mask

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.

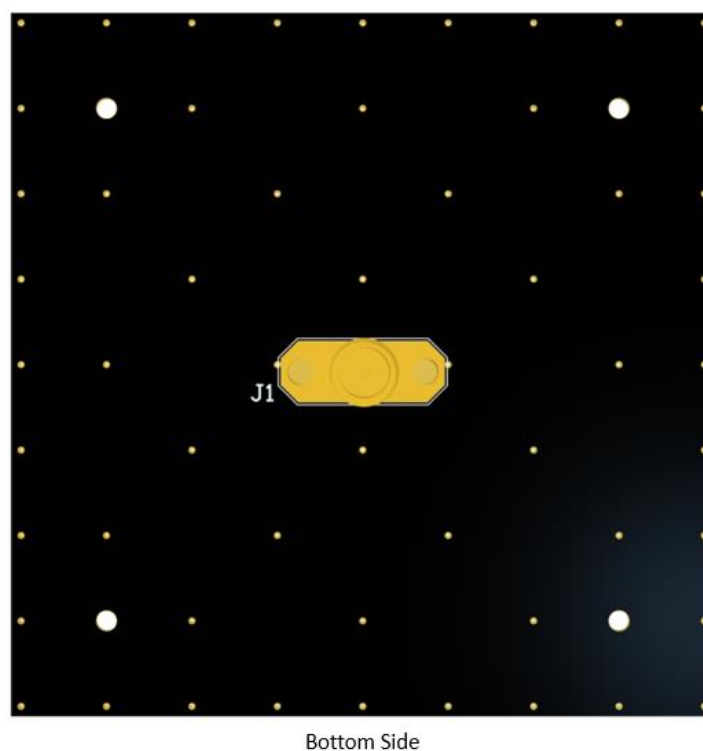
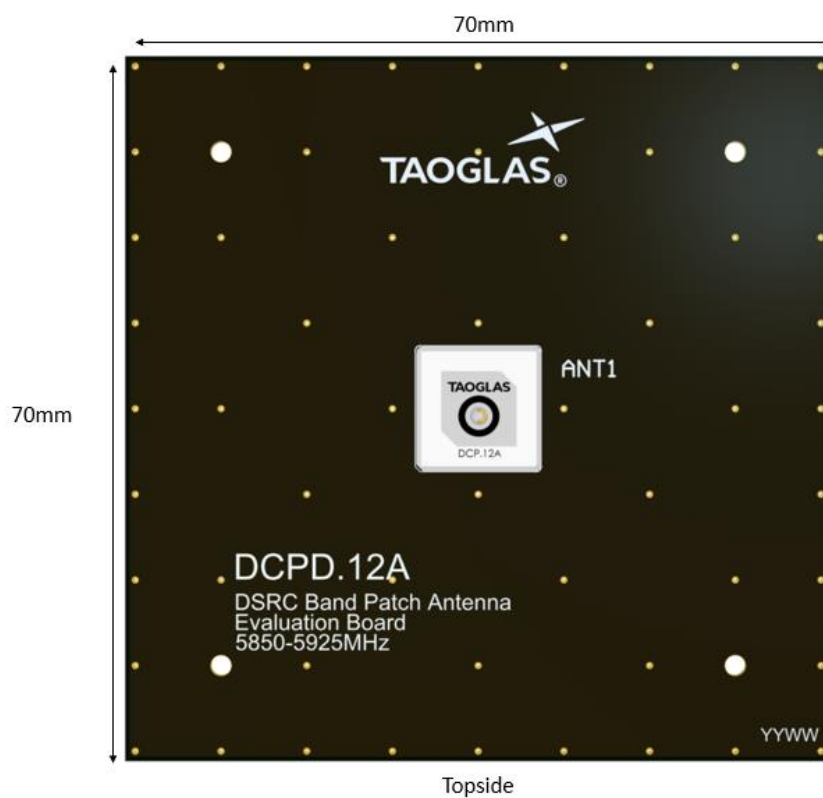


Topside

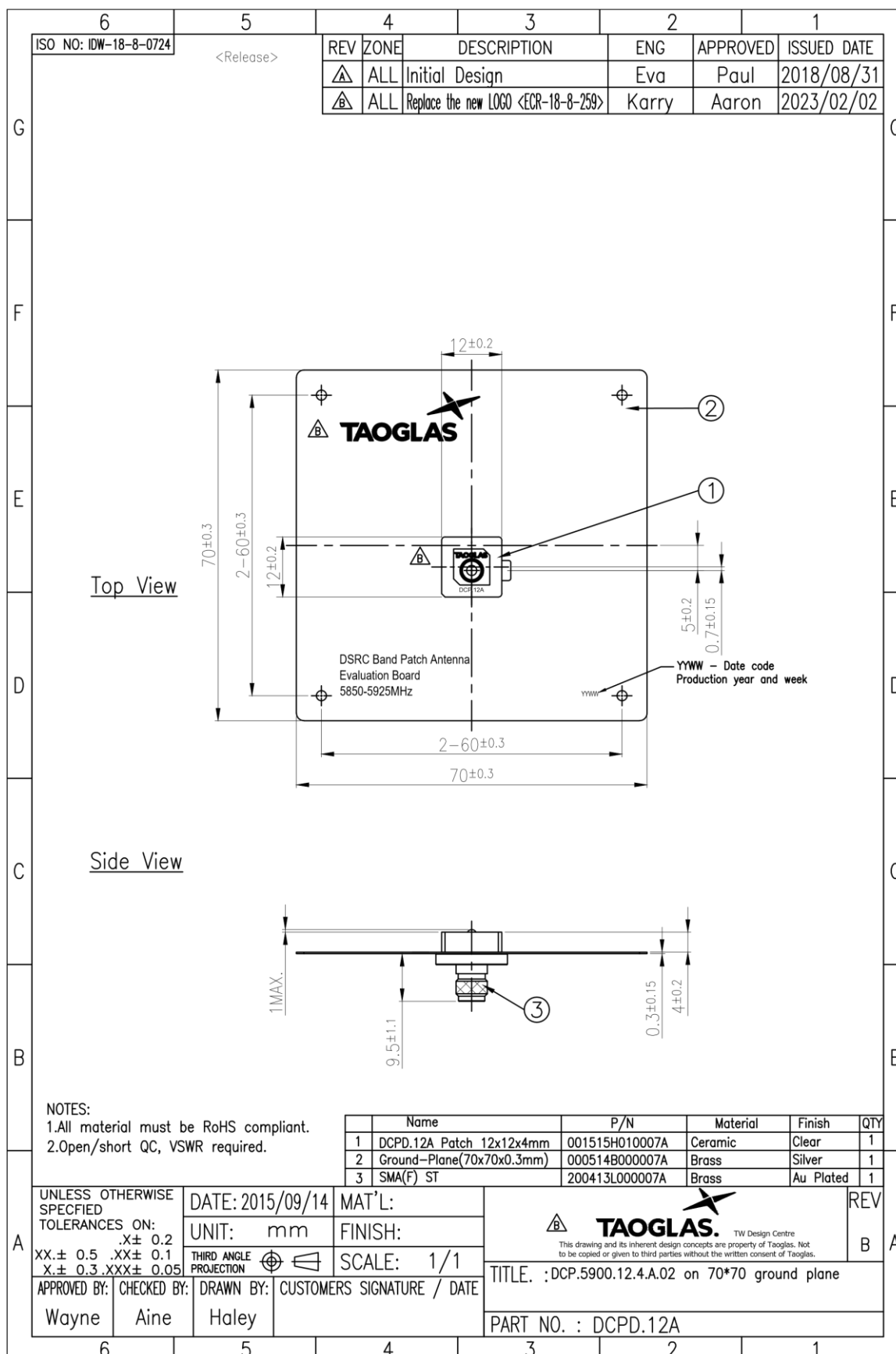


Bottom Side

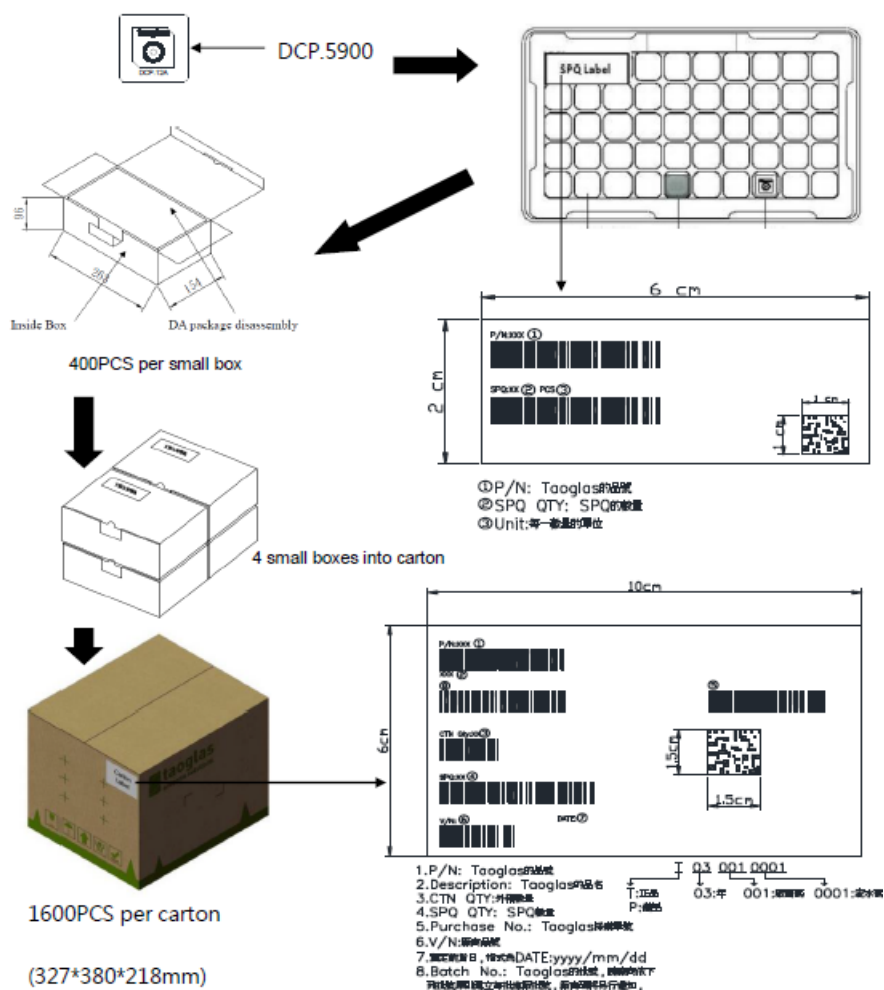
7.4 Evaluation Board



8. Evaluation Board Mechanical Drawing (Unit: mm)

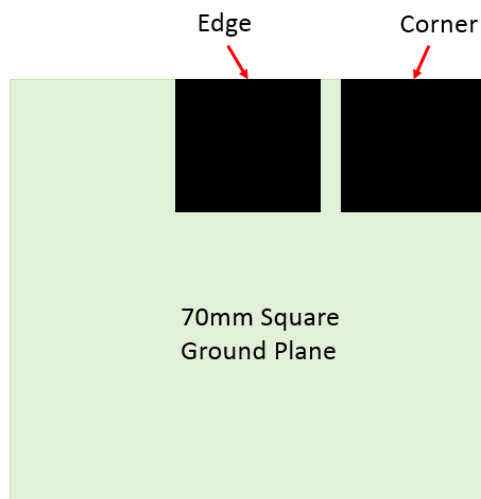


9. Packaging

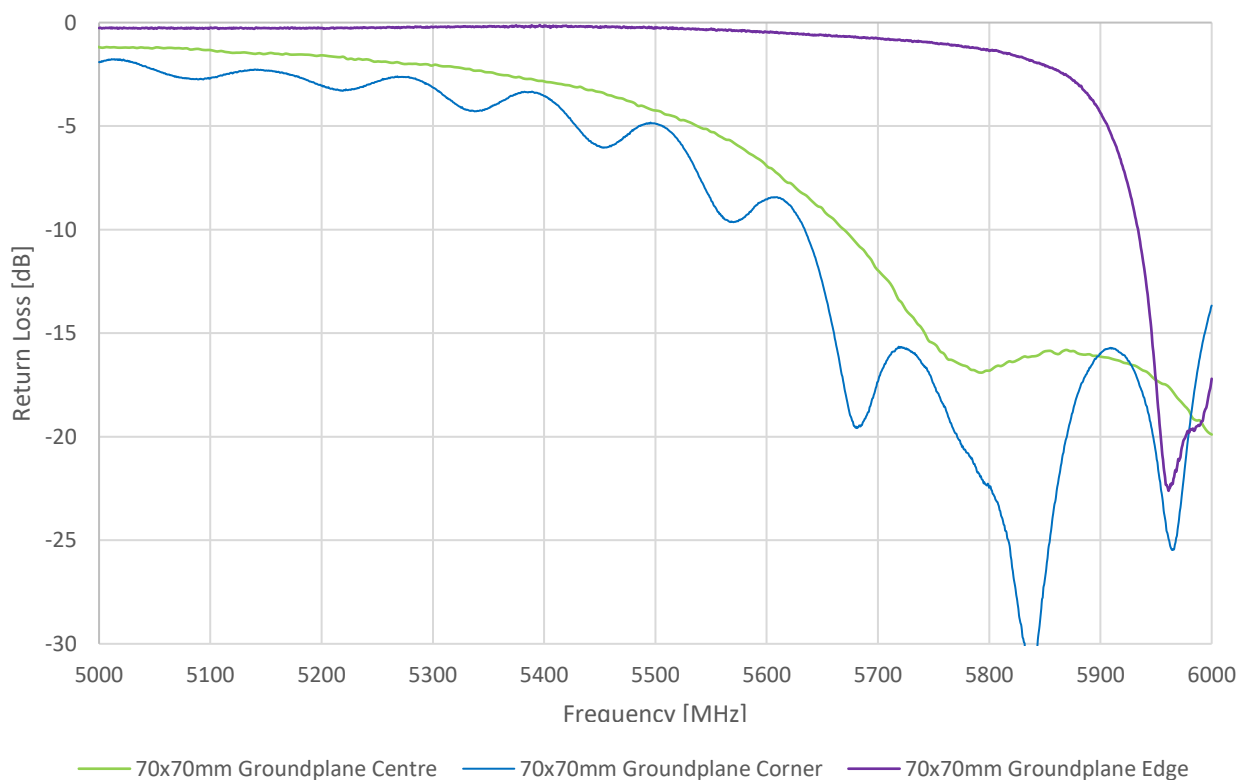


10. Application Note

The DCP.5900 DSRC patch antenna is designed for 70mm*70mm ground plane center. Taoglas provides the experimental reference below if the antenna isn't placed at the center of ground plane. Please refer to the return loss data shown in the graph below.

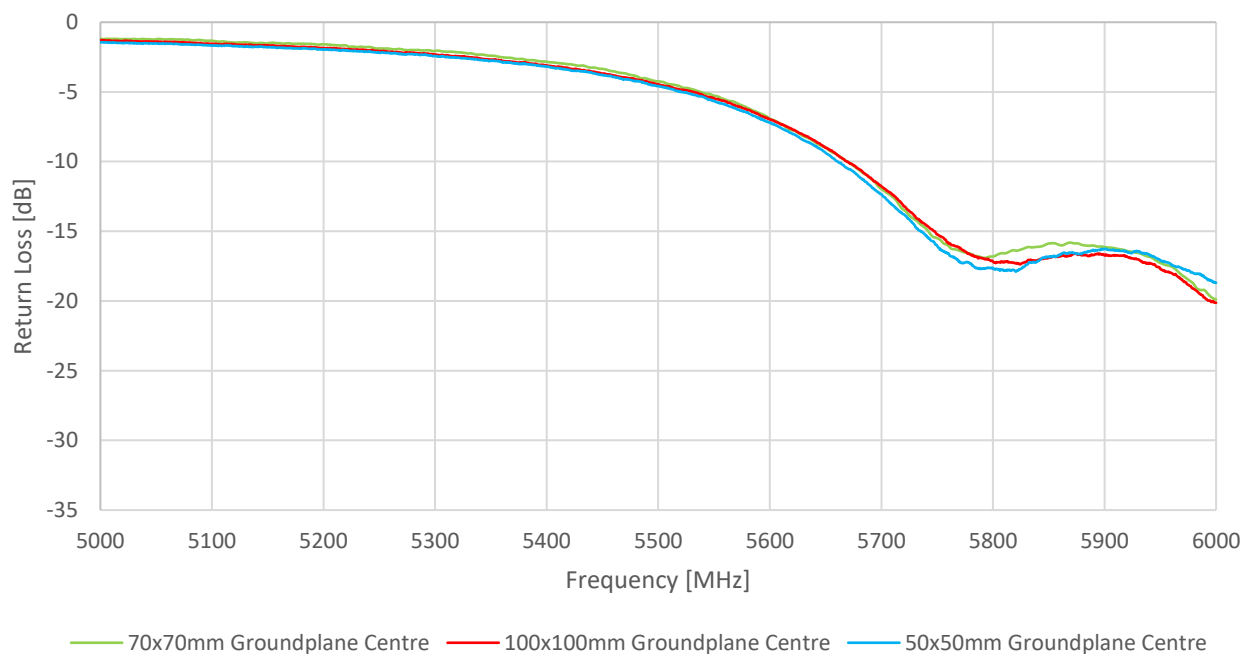


10.1 Return Loss (Varying Position on Ground Plane)

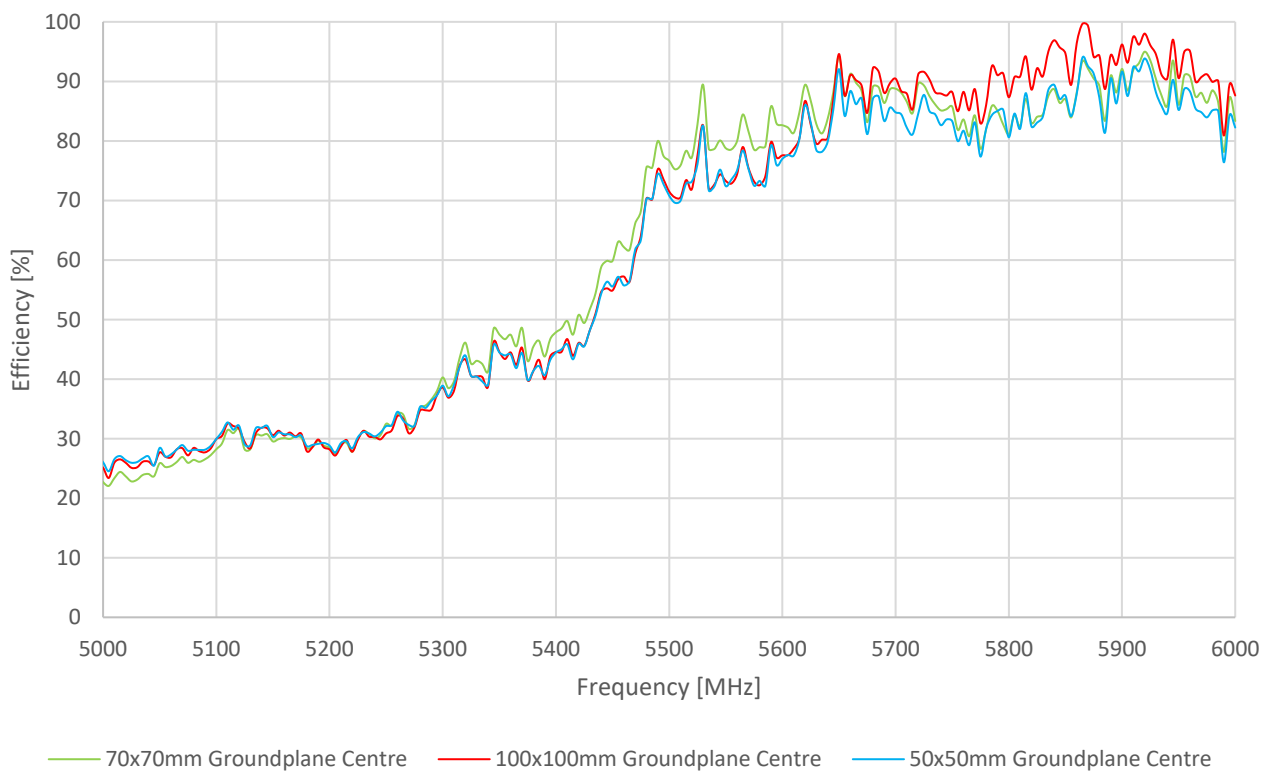


10.2 Return Loss (Varying Ground Plane Size)

Antenna performance on different ground plane sizes is shown below. (The antenna location is at the center of ground plane)



10.3 Efficiency



Changelog for the datasheet

SPE-15-8-071 – DCP.5900.12.4.A.02

Revision: G (Current Version)

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

Previous Revisions

Revision: F

| | |
|------------------|---------------------------------|
| Date: | 2023-02-28 |
| Changes: | Antenna Integration Guide Added |
| Changes Made by: | Cesar Sousa |

Revision: A (Original First Release)

| | |
|---------|----------------|
| Date: | 2017-08-10 |
| Notes: | |
| Author: | Your Name Here |

Revision: E

| | |
|------------------|-----------------------|
| Date: | 2022-08-18 |
| Changes: | Full Datasheet update |
| Changes Made by: | Evan Murphy |

Revision: D (Current Version)

| | |
|------------------|----------------------------|
| Date: | 2018-03-27 |
| Changes: | Installation Guide Amended |
| Changes Made by: | Jack Conroy |

Revision: C

| | |
|------------------|---------------------------|
| Date: | 2017-03-08 |
| Changes: | Packaging Details Updated |
| Changes Made by: | Made by Andy Mahoney |

Revision: B

| | |
|------------------|---------------------------|
| Date: | 2017-08-17 |
| Changes: | Packaging Details Updated |
| Changes Made by: | Andy Mahoney |



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