



TAOGLAS®



Datasheet

DSGP.1575.18.2.A.02

Description:

GPS L1 / GALILEO E1 1575.42MHz 18*18*2mm Ceramic Patch SMD Antenna

Features:

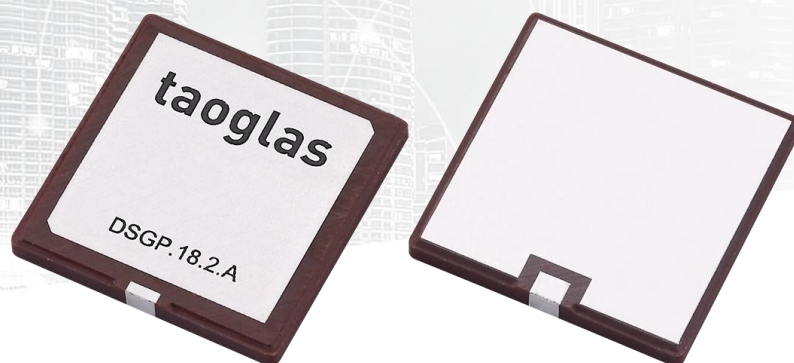
2.4 dBi Peak Gain for GPS/GALILEO Band
Dimensions: 18 x 18 x 2mm
SMD Direct Mount Ceramic Patch Antenna
TS16949 Approved
RoHS & Reach Compliant

| | |
|--|----|
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1. Introduction



The DSGP.1575.18.2.A.02 is a ceramic GPS L1 / GALILEO E1 passive patch antenna, 18mm square, with a low profile of 2mm thickness. It is designed for applications in space constrained navigation devices, vehicle tracking/fleet management systems, as well as telematics devices.

The antenna has been tuned on a 50 x 50 mm ground plane, working at 1575.42MHz with a 2.4 dBi gain. The ceramic patch is mounted via SMT process, ideal for high volume low cost assembly. It is manufactured and tested in a TS16949 first tier automotive approved facility.

For further optimization to customer specific device environments where ground-plane size is different, custom tuned patch antennas can be supplied. For more details please contact your regional Taoglas sales office.

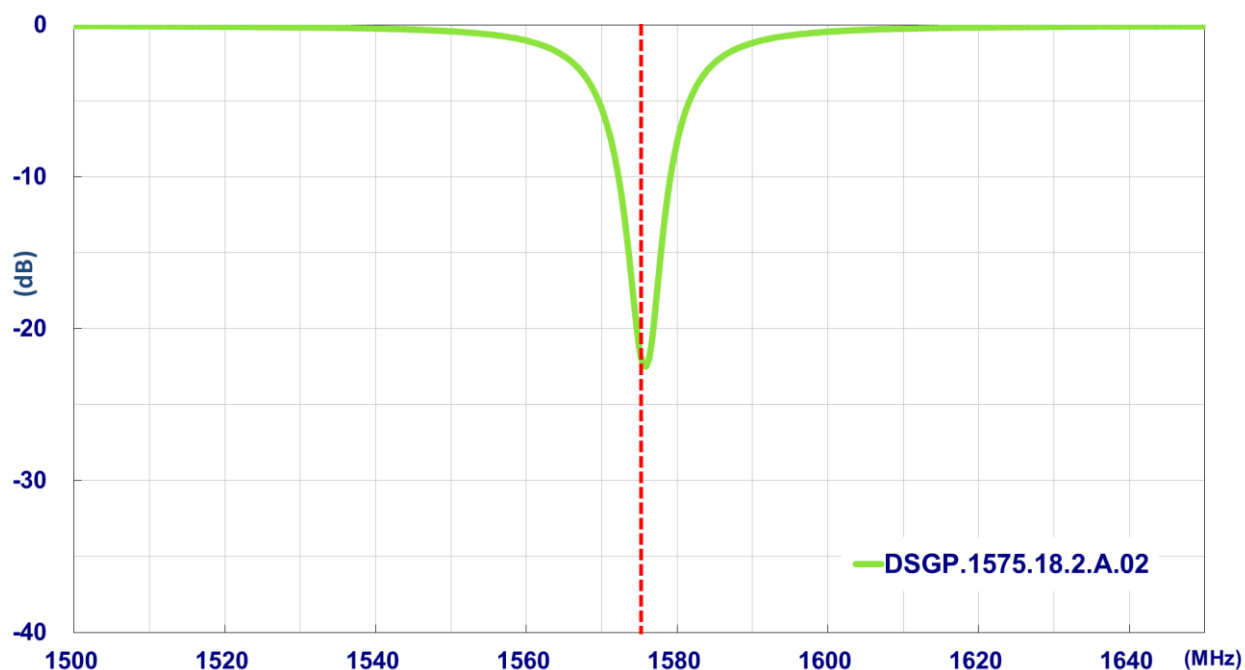
2. Specifications

| GNSS Frequency Bands Covered | | | | | | | |
|------------------------------|-------------------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|-------------------------------------|
| GPS/QZSS | L1 1575.42MHz | L2 1227.6MHz | L5 1176.45MHz | L6 1278.75MHz | | | |
| | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | |
| GLONASS | L5R 1176.45MHz | L3PT 1201.5MHz | L2PT 1246MHz | L1CR 1575.42MHz | L1PT 1602MHz | | |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | | |
| Galileo | E5a 1176.45MHz | E5b 1201.5MHz | E4 1215MHz | E3 1256MHz | E6 1278.75MHz | E2 1561MHz | L1 1575.42MHz |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| BeiDou | B1 1561MHz | B2 1207.14MHz | B3 1268.52MHz | | | | |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | | | |
| Compass | E5B(B2)/ E6(B3) 1268.56MHz | E2(B1) 1561MHz | | | | | |
| | <input type="checkbox"/> | <input type="checkbox"/> | | | | | |
| SBAS | Omnistar 1542.5MHz | WAAS/EGN OS 1575.42MHz | | | | | |
| | <input type="checkbox"/> | <input checked="" type="checkbox"/> | | | | | |

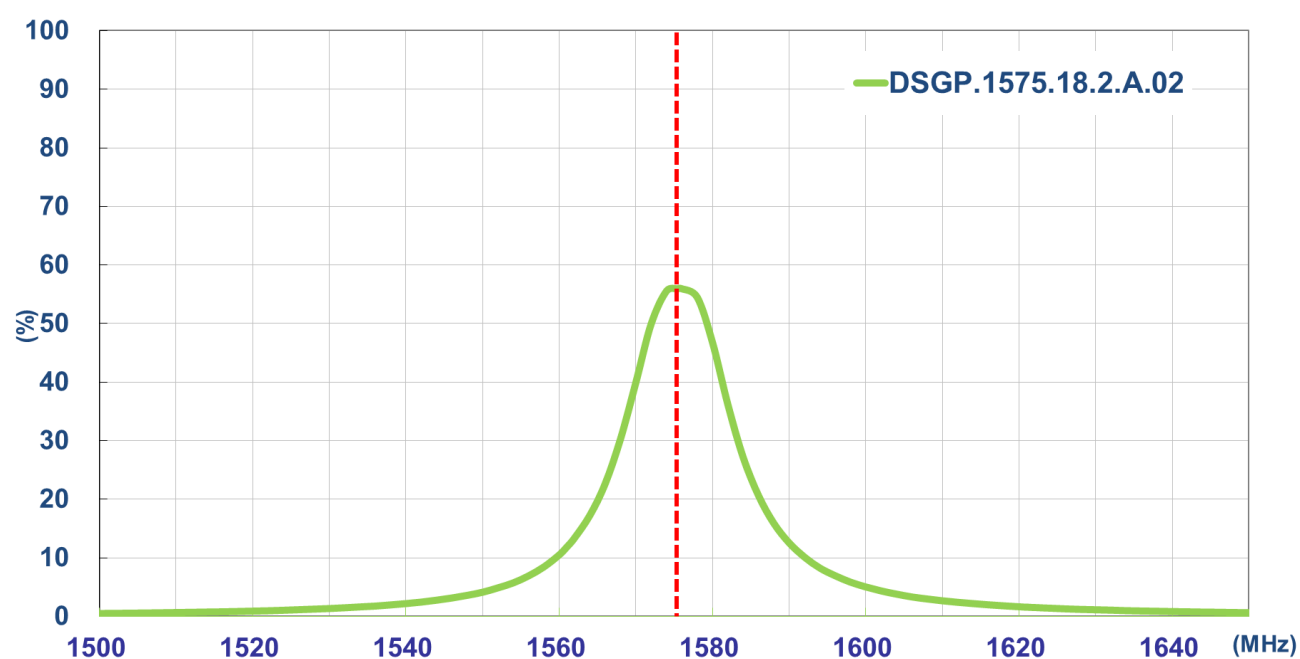
| Electrical | |
|--------------------------------------|----------------------------|
| Frequency (MHz) | 1575.42 |
| VSWR (max.) | 2.0:1 |
| Passive Antenna Efficiency (%) | 55.94 |
| Passive Antenna Gain at Zenith (dBi) | 2.4 |
| Return Loss (dB) | <-10 |
| Impedance | 50Ω |
| Mechanical | |
| Dimensions | 18 x18 x 2 mm |
| Weight | 3.3g |
| Material | Ceramic |
| Environmental | |
| Temperature Range | -40°C to 85°C |
| Humidity | Non-condensing 65°C 95% RH |
| Moisture Sensitivity Level (MSL) | 3 (168 Hours) |

3. Antenna Characteristics

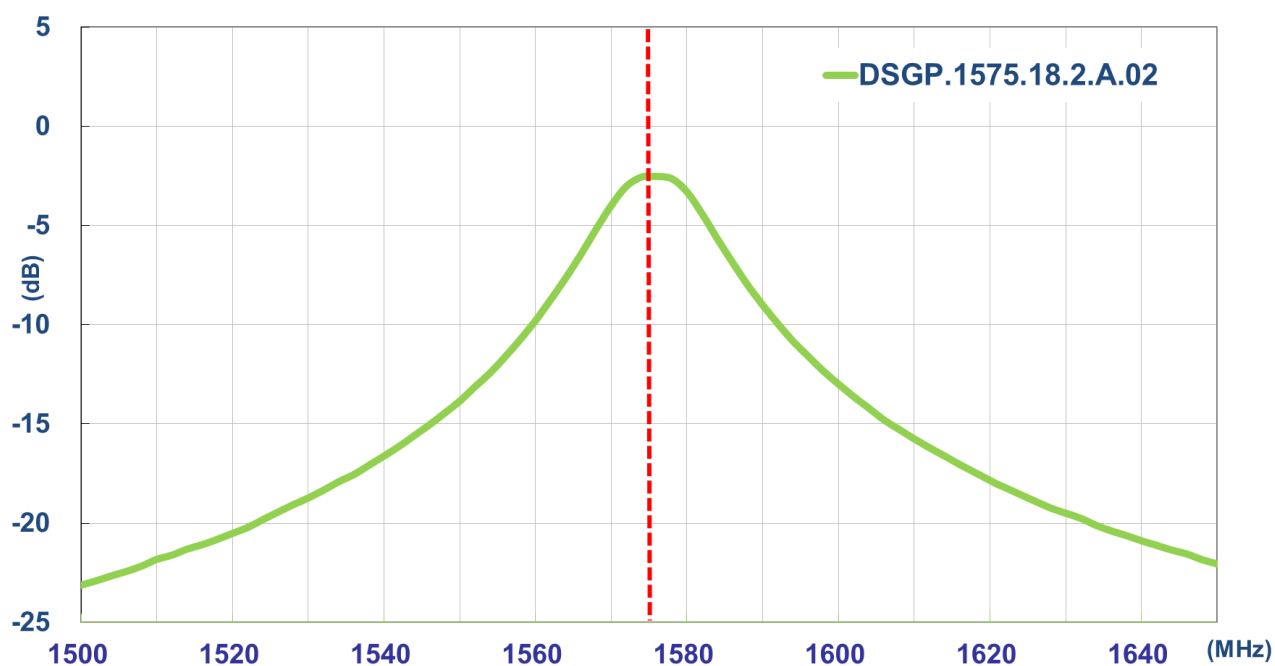
3.1 Return Loss



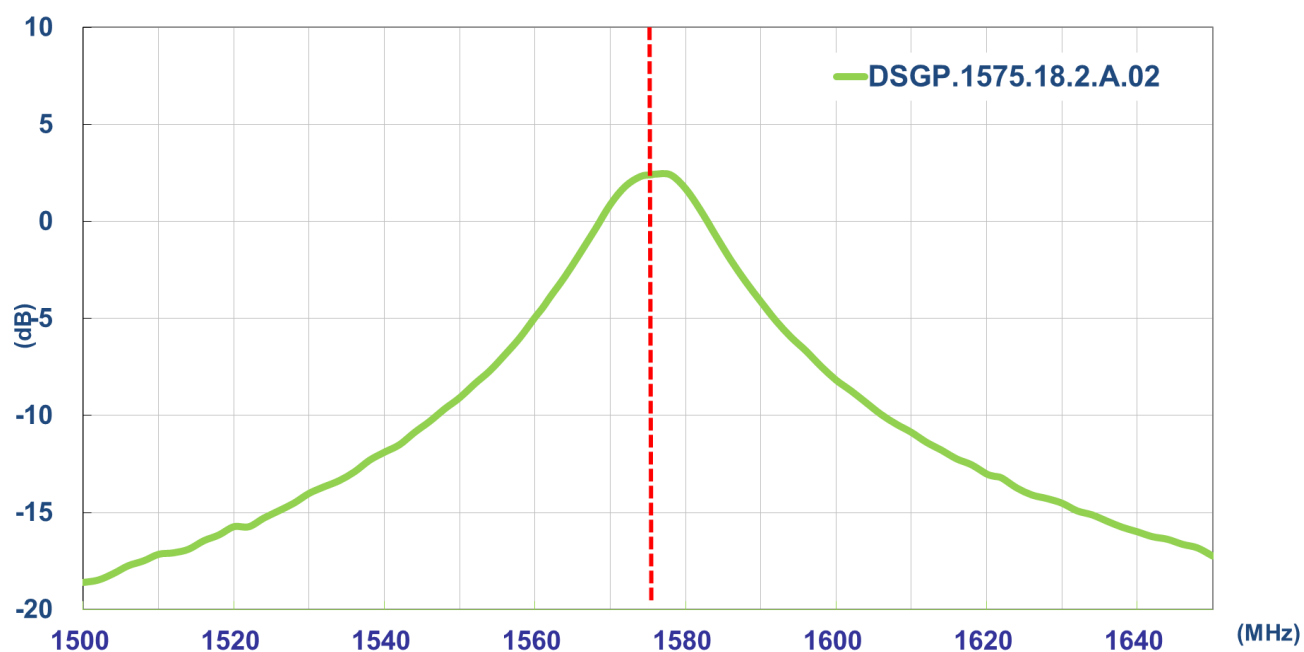
3.2 Efficiency



3.3 Average Gain



3.4 Peak Gain



4. Radiation Patterns

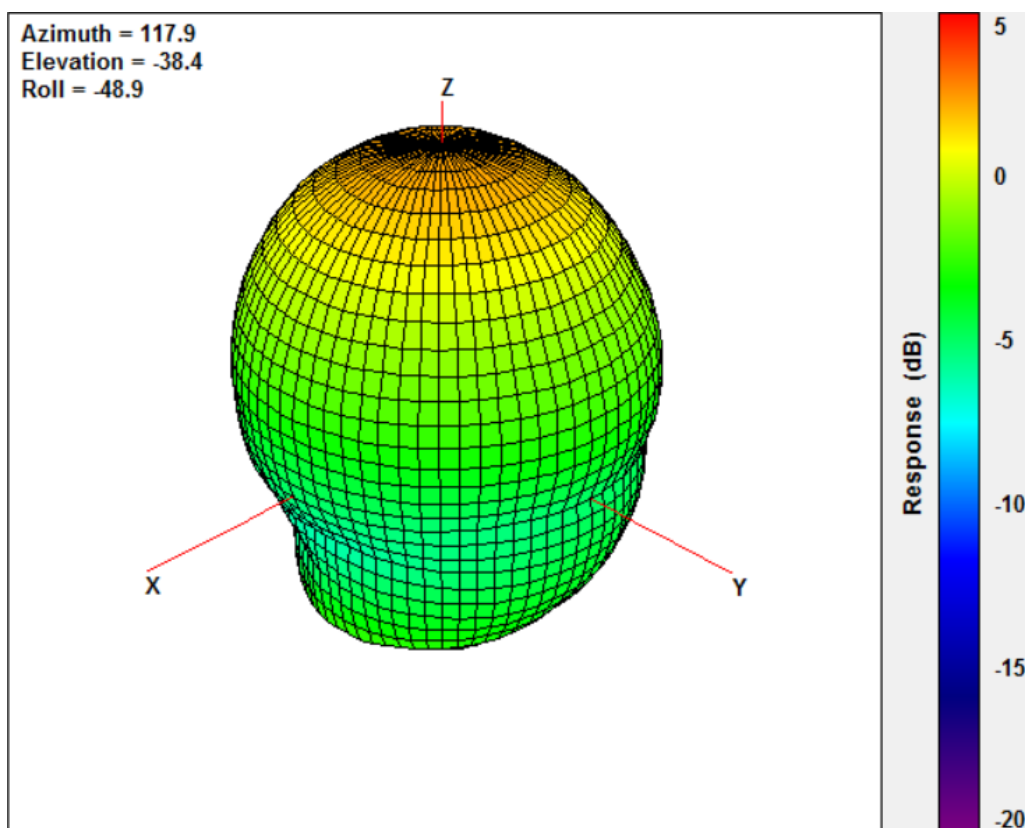
4.1 Test Setup



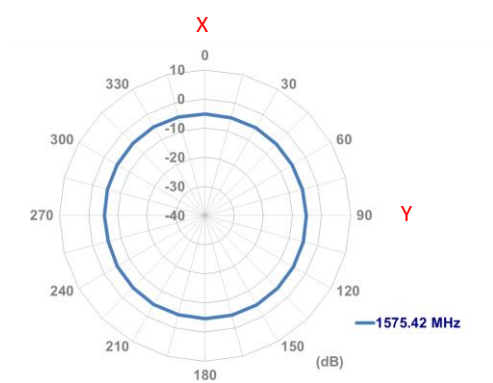
On Evaluation Board

Taoglas Part number: DSGPD.18B

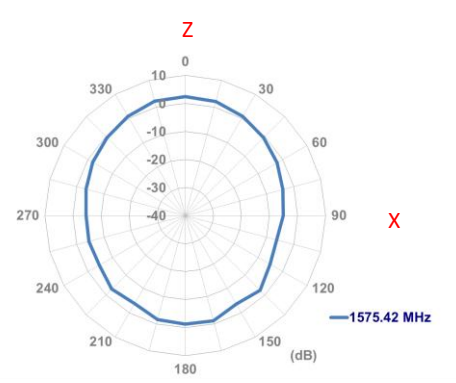
4.2 1575.42MHz 3D and 2D Radiation Patterns



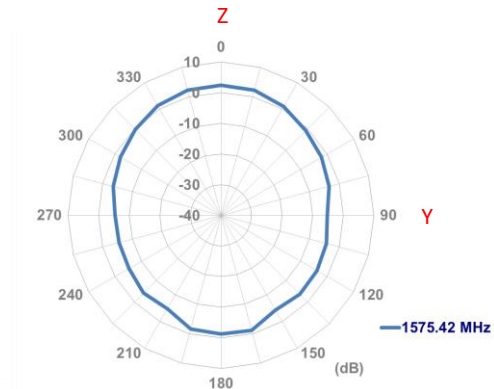
XY Plane



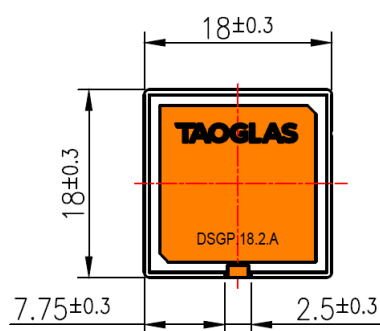
XZ Plane



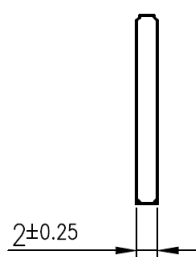
YZ Plane



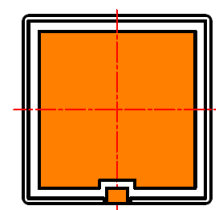
5. Mechanical Drawing (Units: mm)



Top View

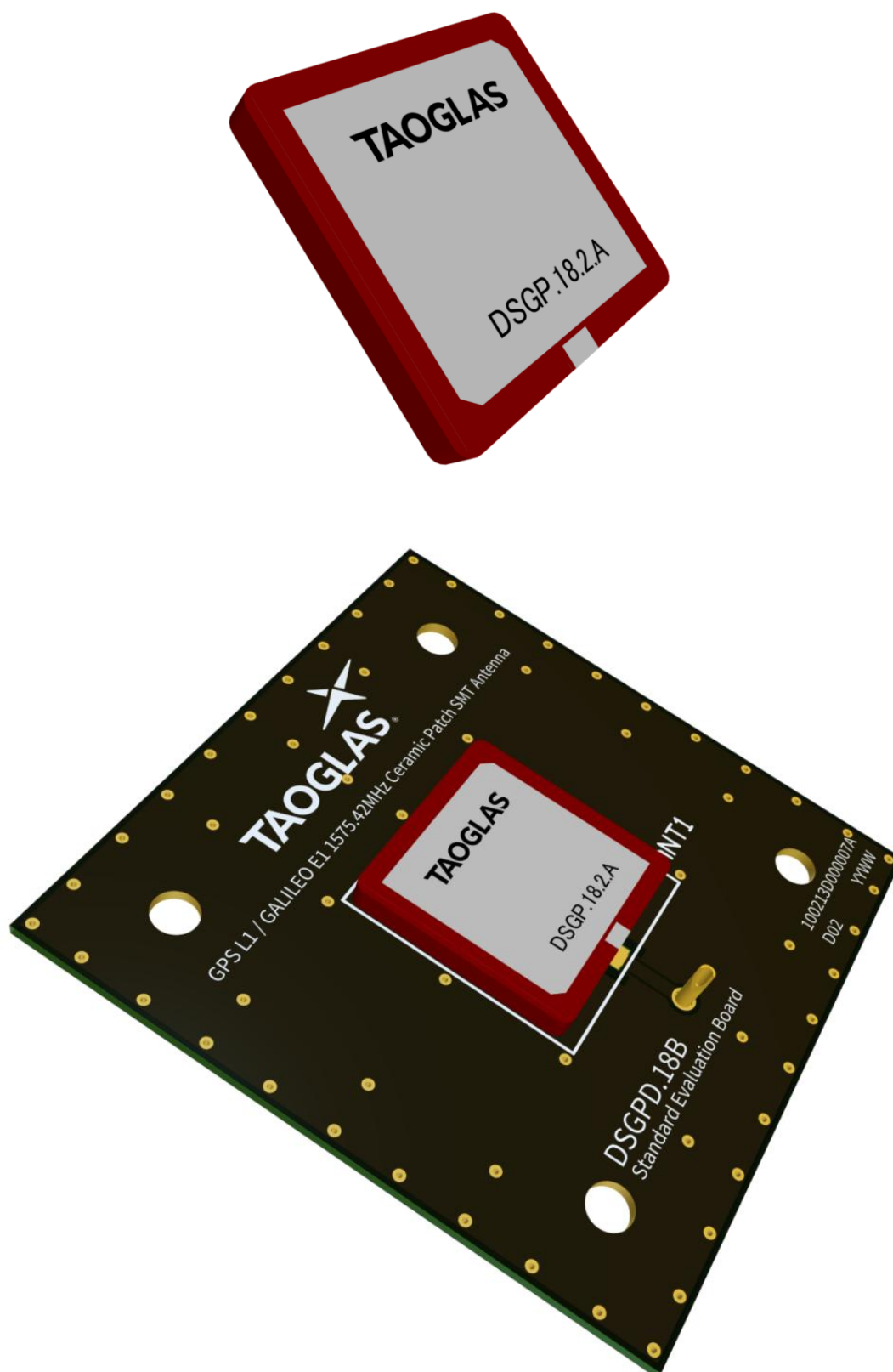


Side View



Bottom View

6. Antenna Integration Guide

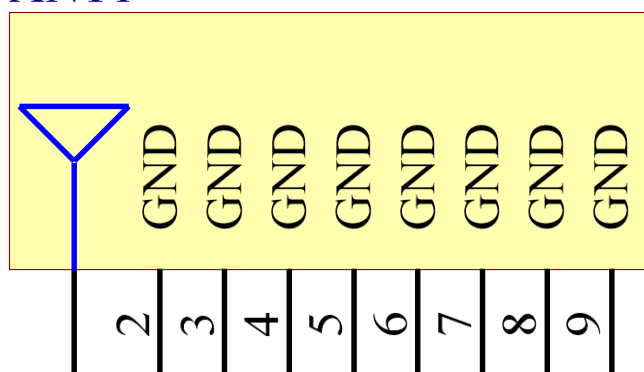


6.1 Schematic Symbol and Pin Definition

The circuit symbol for the antenna is shown below. The antenna has 8 pins with all as functional.

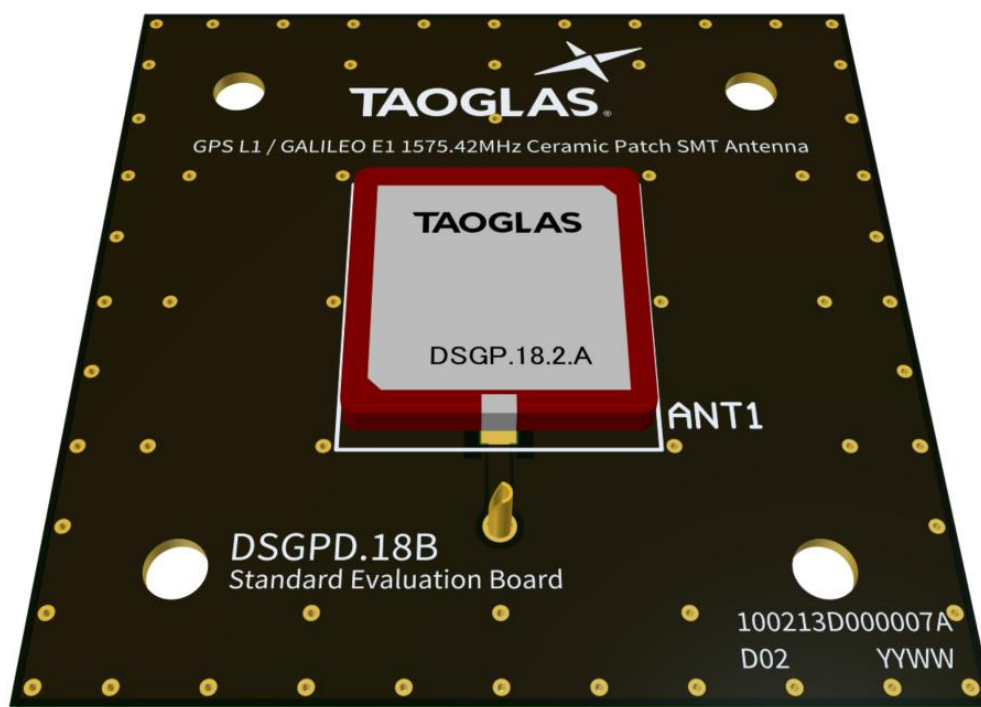
| Pin | Description |
|---------------------|-------------|
| 1 | RF Feed |
| 2, 3, 4, 5, 6, 7, 8 | Ground |

DSGP.1575.18.2.A.02
ANT1

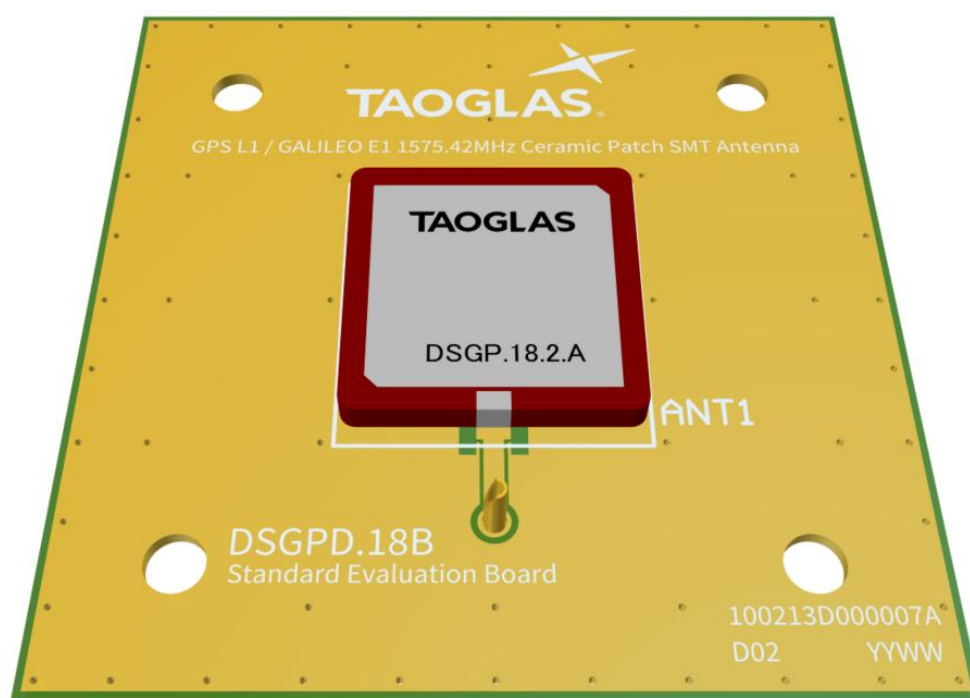


6.2 Antenna Integration

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.



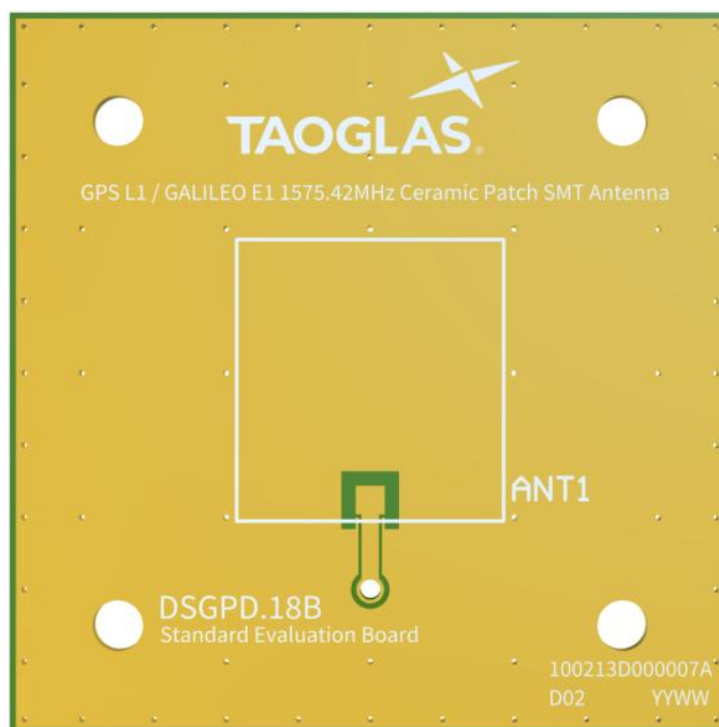
Top Side w/ Solder Mask



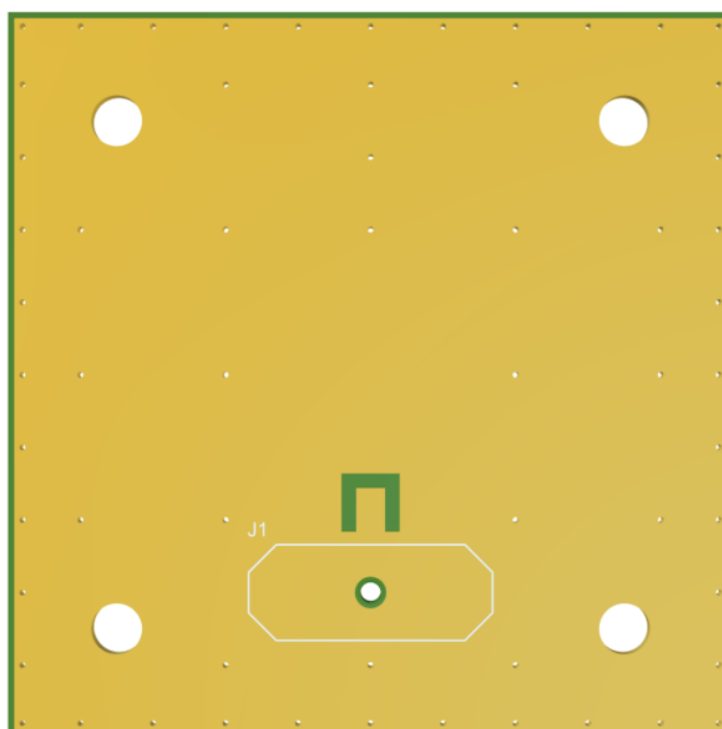
Top Side w/o Solder Mask

6.3 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.

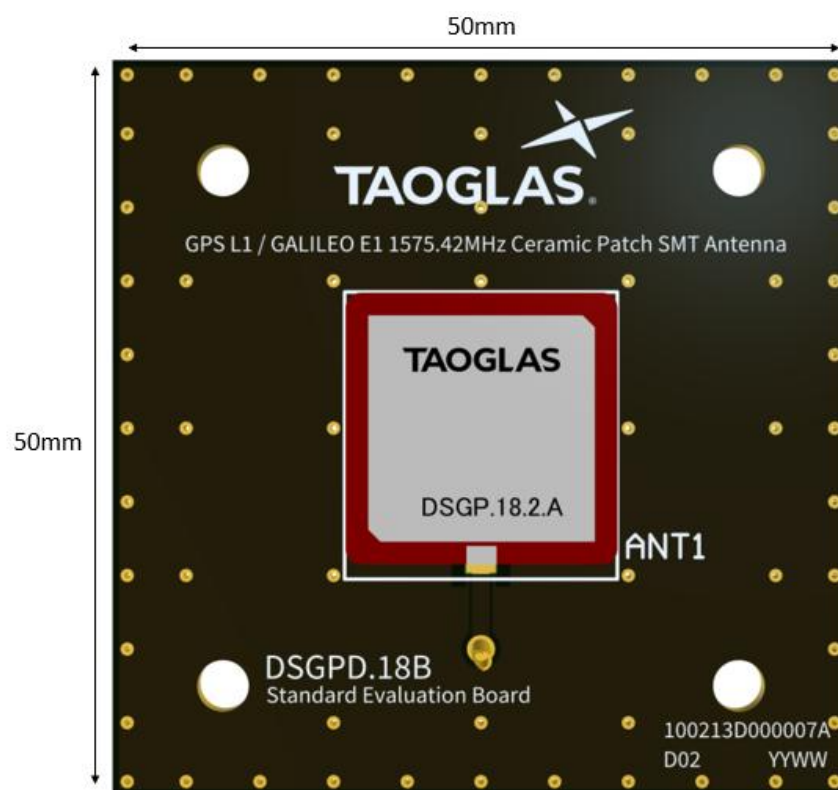


Topside

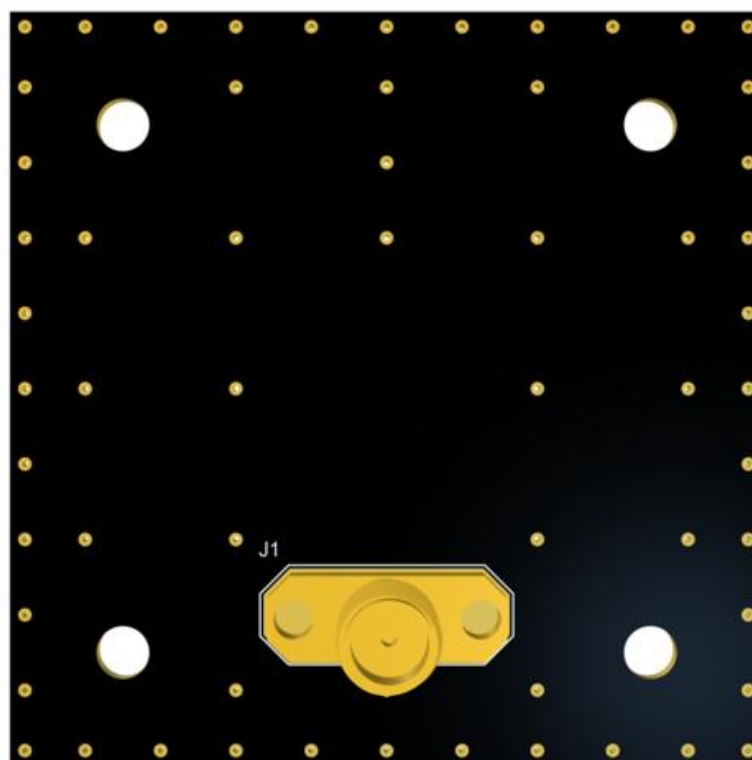


Bottom Side

6.4 Evaluation Board

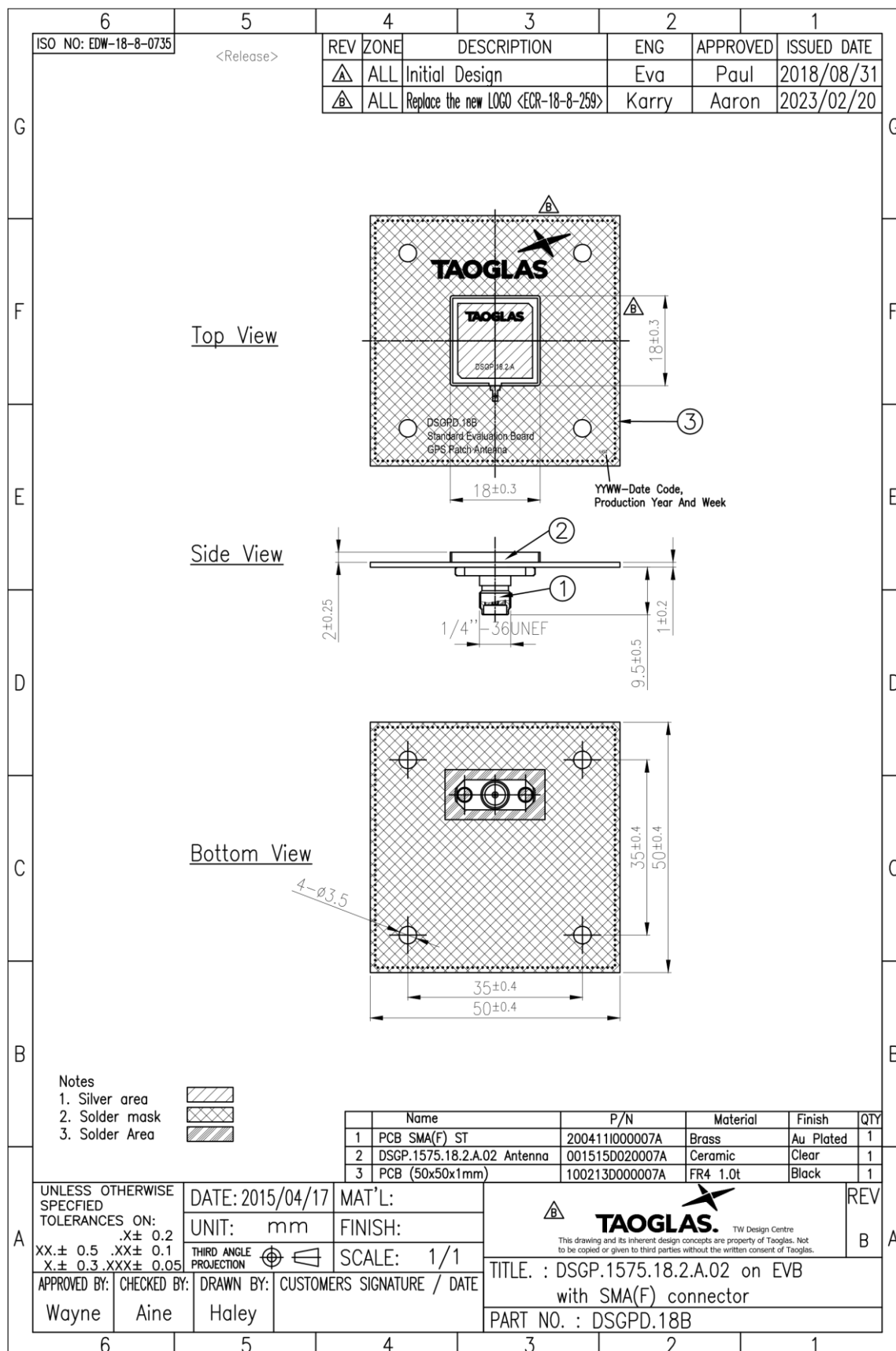


Topside

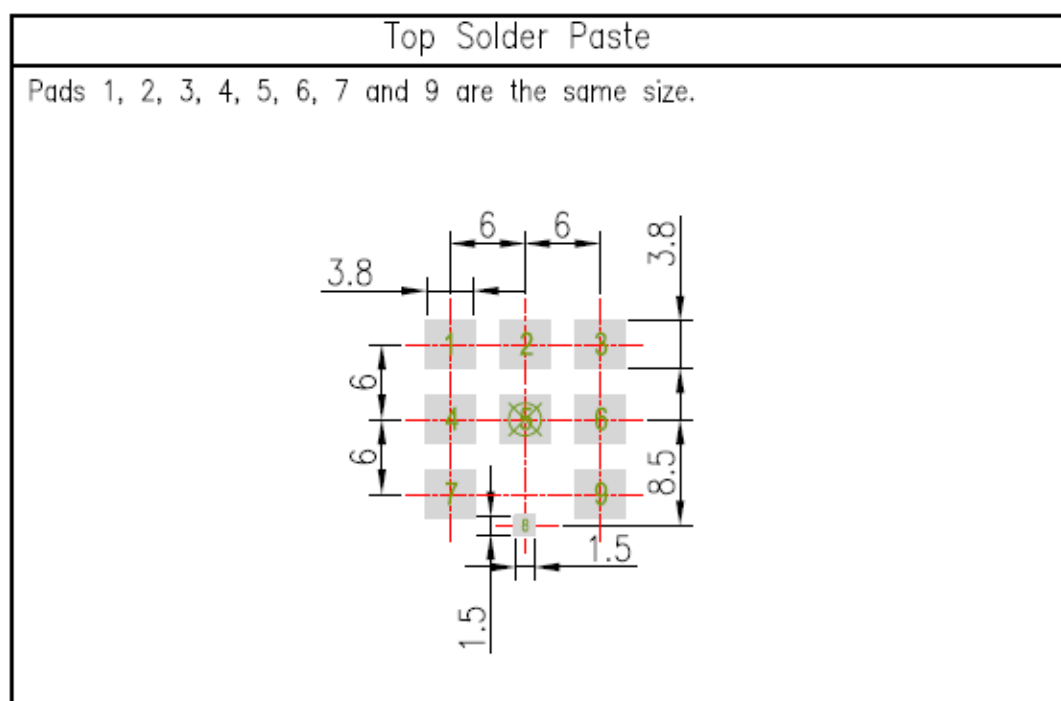
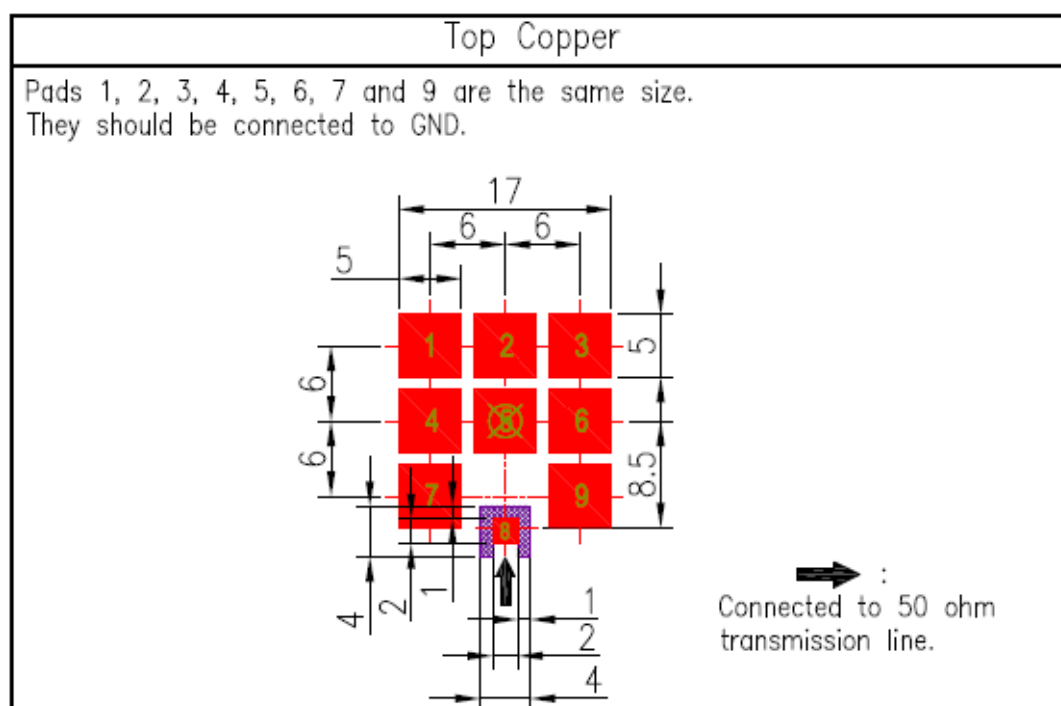


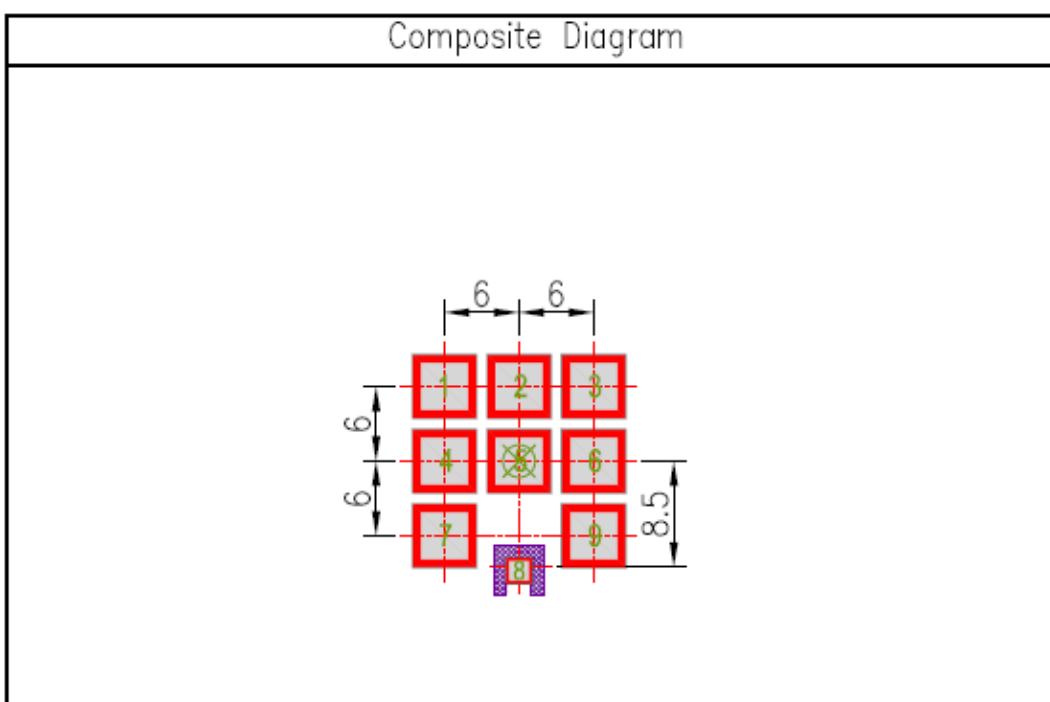
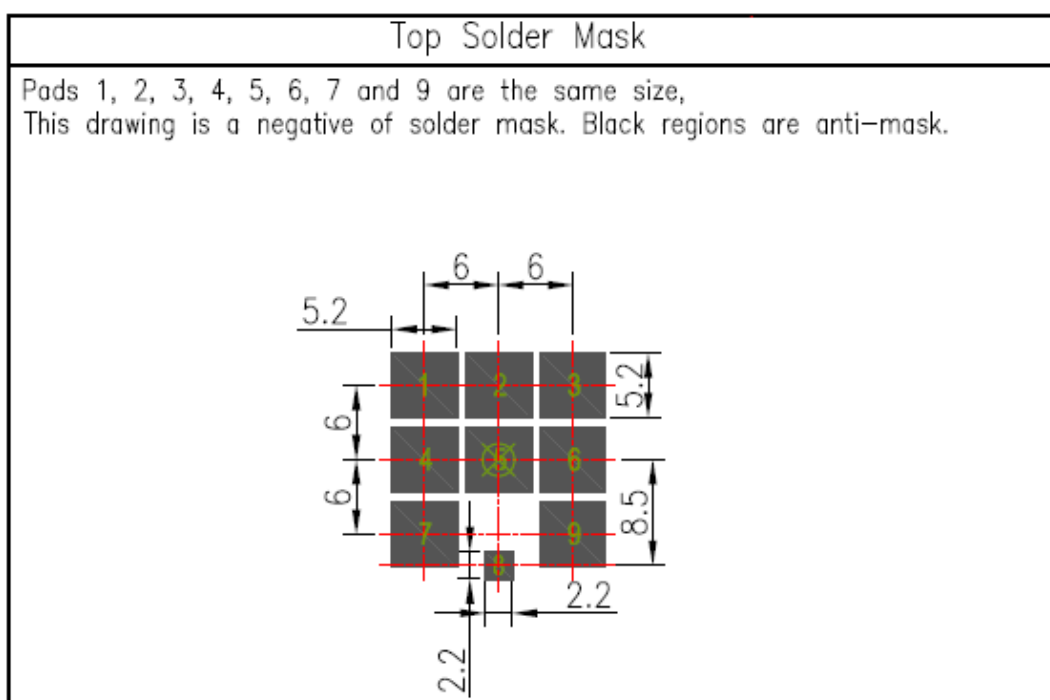
Bottom Side






7. Evaluation Board Mechanical Drawing



8. PCB Footprint Recommendation

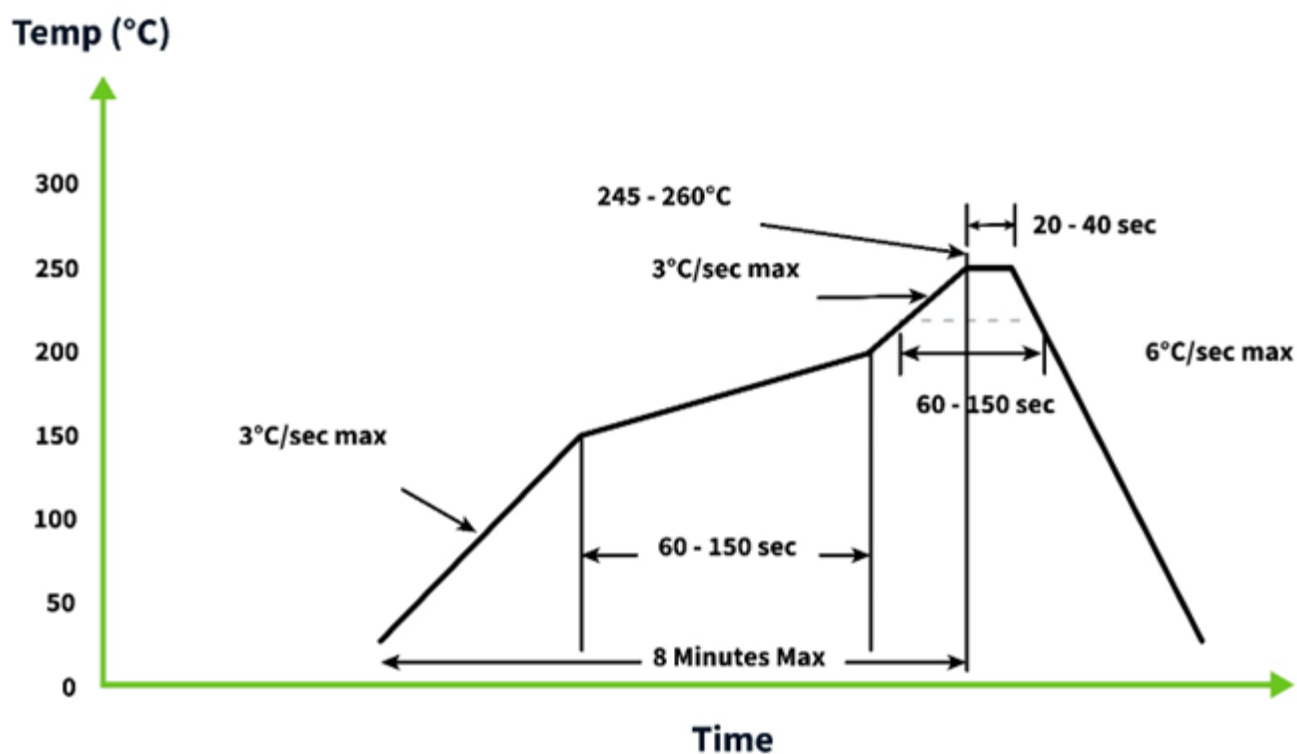




- NOTE:
- | | | |
|------------------------|---|---|
| 1. Ag Plated area |  | 6. Copper keepout should extend through all PCB layers. |
| 2. Solder Mask area |  | 7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow. |
| 3. Copper area |  | 8. The dimension tolerances should follow standard PCB manufacturing guidelines |
| 4. Paste area |  | |
| 5. Copper Keepout Area |  | |

9. Recommended Reflow Soldering Profile

The DSGP.1575.18.2.A.02 can be assembled by following the recommended soldering temperatures are as follows:

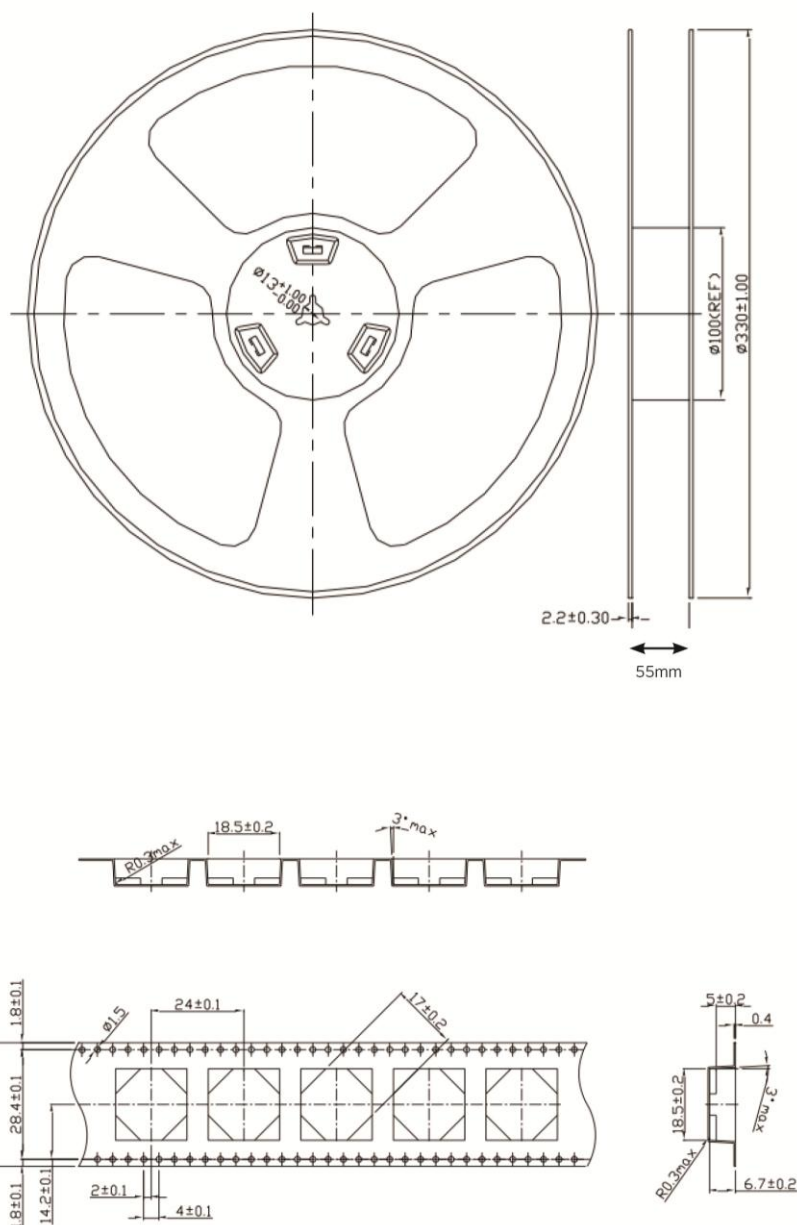


*Temperatures listed within a tolerance of $\pm 10^{\circ}\text{C}$

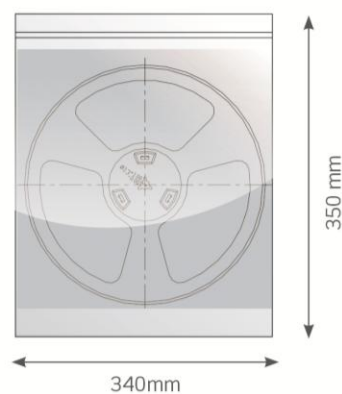
Smaller components are typically mounted on the first pass, however, we do advise mounting the DSGP.1575.18.2.A.02 when placing larger components on the board during subsequent reflows.

10. Packaging

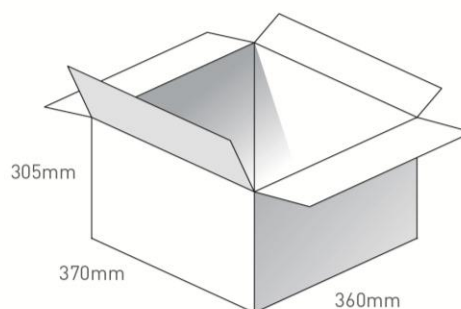
200 pc DSGP.1575.18.2.A.02 per reel
 Dimensions - Ø330*55mm
 Weight - 800g



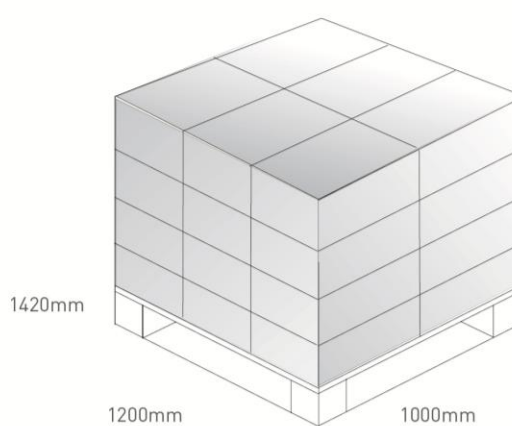
1 pc reel in small in Anti-static Bag
Dimensions - 340*350*70mm
Weight - 1.2Kg



4 Reels i n Anti-static Bags
800 pcs in one carton
Carton Dimensions - 370*360*305mm
Weight - 5.6Kg



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



Changelog for the datasheet

SPE-17-8-029 – DSGP.1575.18.2.A.02

| Revision: E (Current Version) | |
|-------------------------------|-------------------------------|
| Date: | 2024-10-24 |
| Changes: | Updated Solder Reflow Profile |
| Changes Made by: | Gary West |

Previous Revisions

| Revision: D | |
|------------------|---------------------------------|
| Date: | 2023-02-27 |
| Changes: | Antenna Integration Guide Added |
| Changes Made by: | Cesar Sousa |

| Revision: C | |
|------------------|--|
| Date: | 2021-09-07 |
| Changes: | Fixed Alignment of radiation patterns section. Added MSL rating. Fixed Font in tables. |
| Changes Made by: | Erik Landi |

| Revision: B | |
|------------------|-----------------|
| Date: | 2019-09-17 |
| Changes: | Updated Drawing |
| Changes Made by: | Jack Conroy |

| Revision: A (Original First Release) | |
|--------------------------------------|-------------|
| Date: | 2017-05-22 |
| Notes: | |
| Author: | Jack Conroy |



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