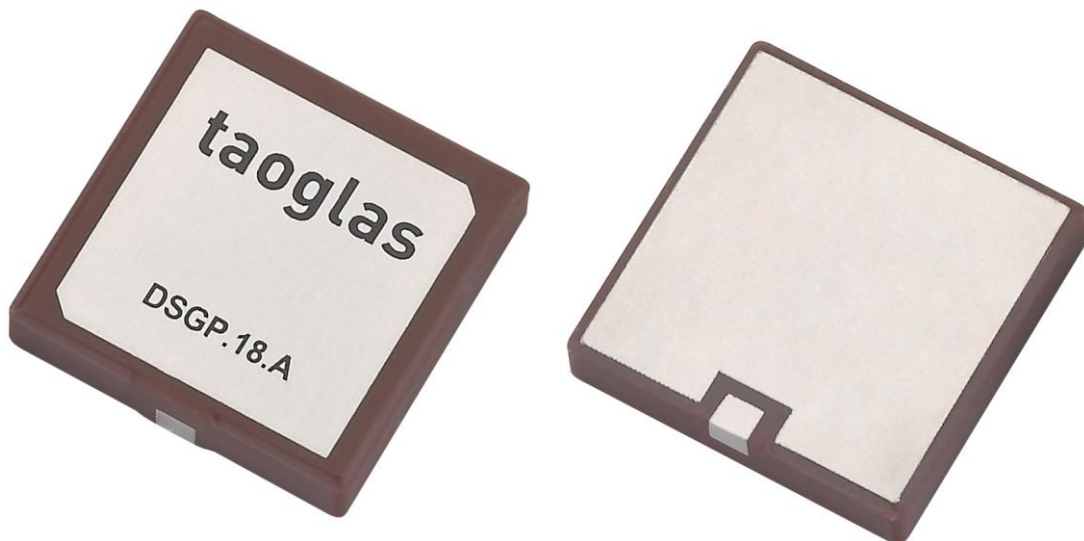


## SPECIFICATION

- Part No. : **DSGP.1575.18.4.A.02**
- Description : GPS L1 / GALILEO E1 1575MHz SMT 18\*18\*4mm  
Ceramic Patch SMT Antenna
- Features : 4.20 dBi Peak Gain for GPS/GALILEO Band  
Dims: 18\*18\*4mm  
SMT Direct Mount Ceramic Patch Antenna  
Automotive TS16949 Approved  
RoHS Compliant



## 1. Introduction

The DSGP.1575.18.4.A.02 is an 18mm square ceramic GPS L1 / GALILEO E1 passive patch antenna. 18mm square with a height of just 4mm, this low profile antenna is ideal for space constrained applications in telematics devices, vehicle tracking/fleet management systems, wearables and navigation.

The antenna has been tuned on a 50\*50mm ground plane, working at 1575.42MHz with a 4.20dBi gain. The radiation pattern is broadly hemispherical with a stable gain across elevations.

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, custom tuned patch antennas can be supplied, subject to NRE and MOQ. For more details please contact your regional Taoglas sales office.

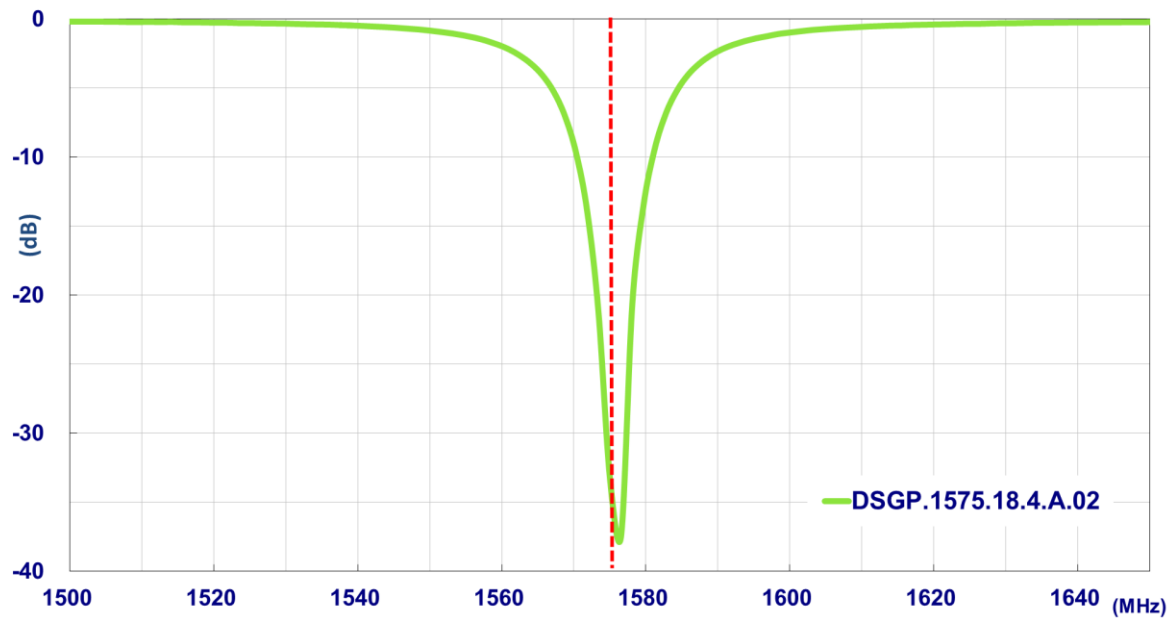
## 2. Specification

| ELECTRICAL            |                            |
|-----------------------|----------------------------|
| Application Bands     | GPS/GALILEO                |
| Operation Frequency   | 1575.42 ±1.023MHz          |
| Return Loss           | <-10dB                     |
| Gain at Zenith        | 4.20dBi                    |
| Efficiency            | 83.33%                     |
| Impedance             | 50Ω                        |
| MECHANICAL            |                            |
| Ceramic Dimension     | 18*18*4mm                  |
| Weight                | 5.8g                       |
| ENVIRONMENTAL         |                            |
| Operation Temperature | -40°C to 85°C              |
| Humidity              | Non-condensing 65°C 95% RH |

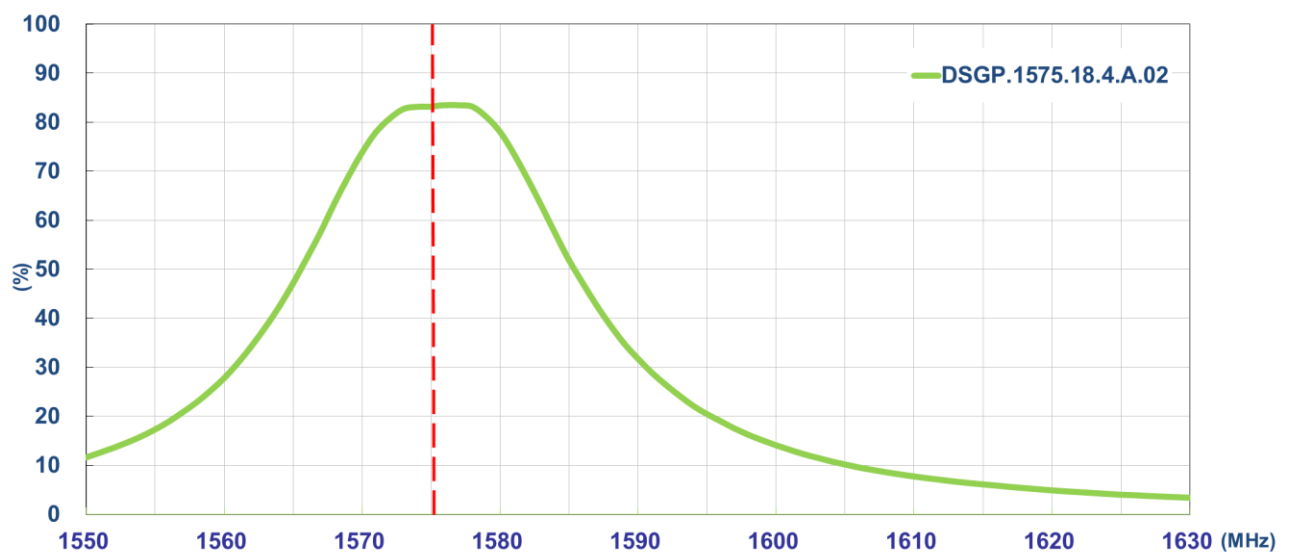
\*Antenna properties were measured with the antenna mounted on 50\*50mm Ground Plane  
Taoglas Part # DSGPD.18A

### 3. Antenna Characteristics

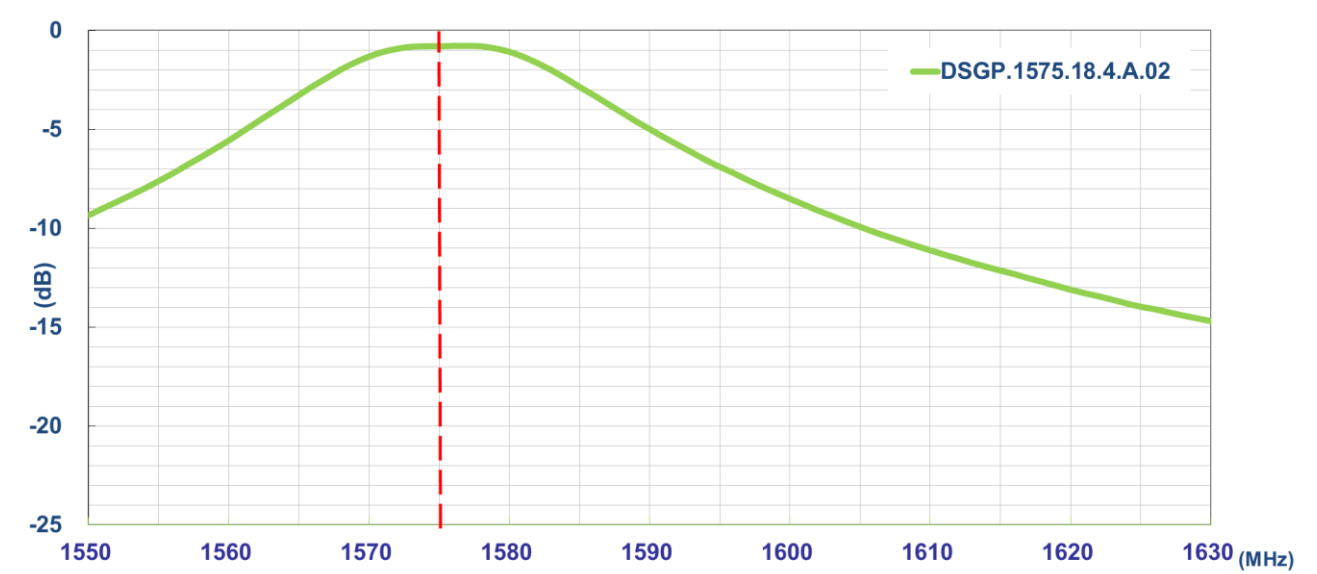
#### 3.1. Return Loss



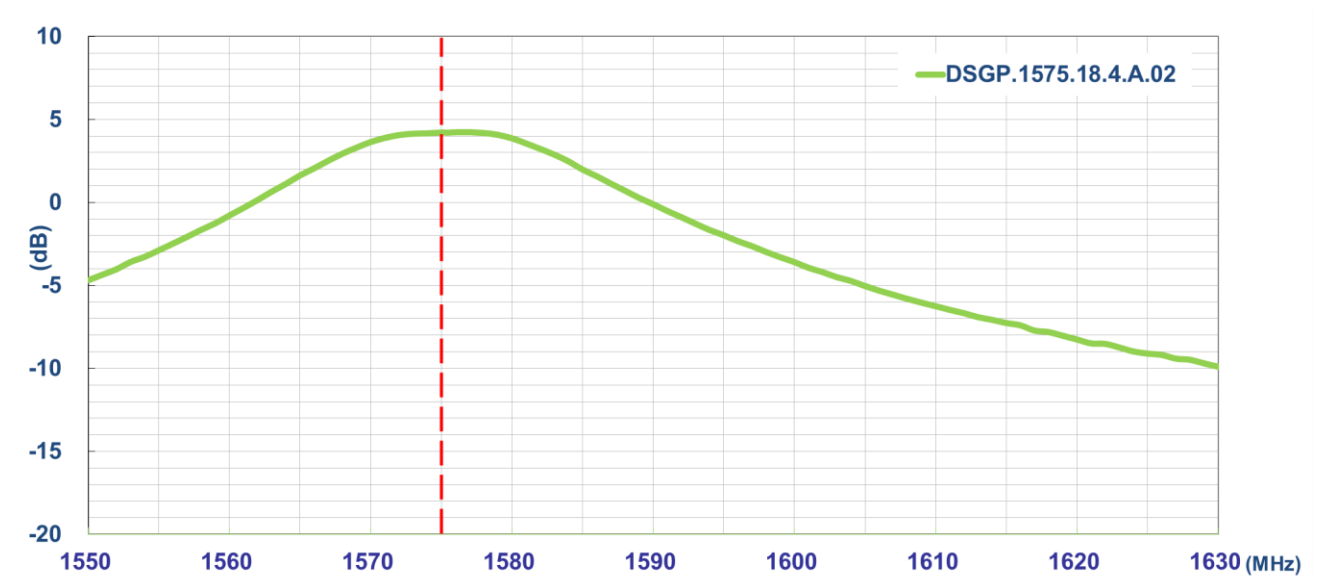
#### 3.2. Efficiency



### 3.3. Average Gain



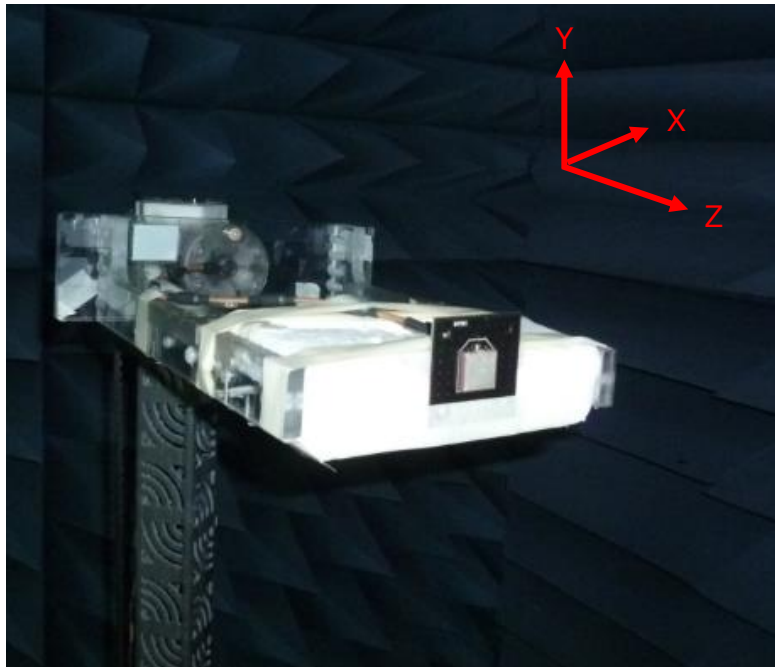
### 3.4. Peak Gain



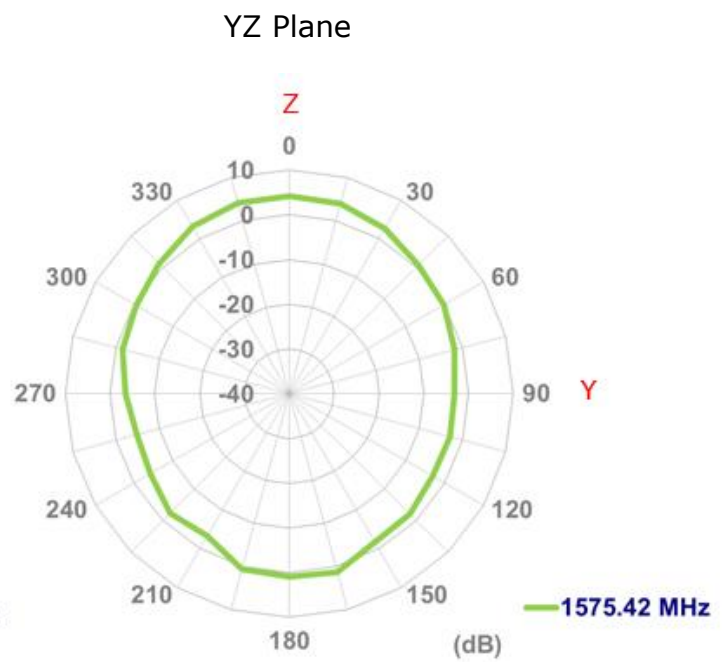
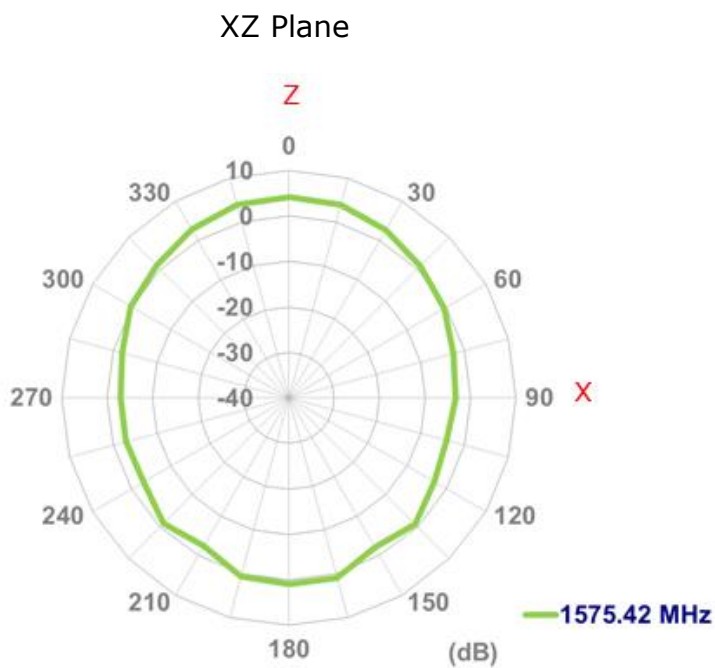
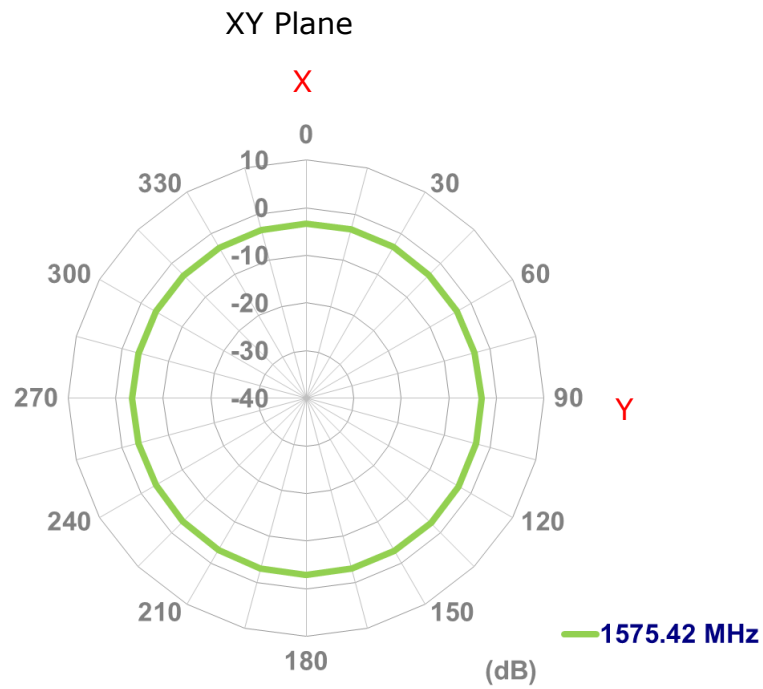
## 4. Antenna Radiation Pattern

### 4.1. Measurement Setup

The DSGP.1575.18.4 antenna is tested with 50\*50mm ground plane in a CTIA certified ETS-Lindgren Anechoic Chamber. The test setup is shown below.

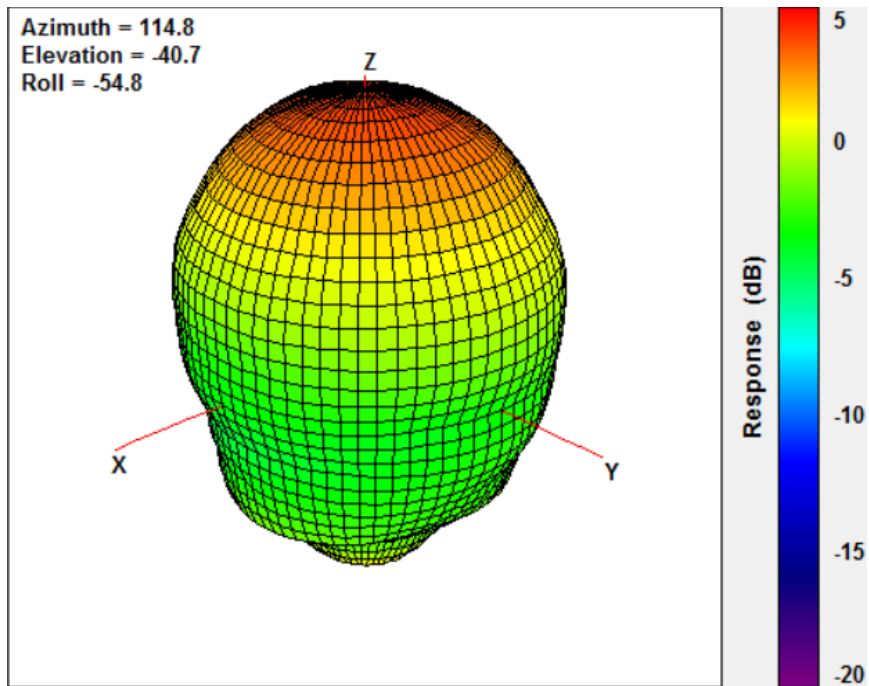


## 4.2. 2D Radiation Pattern



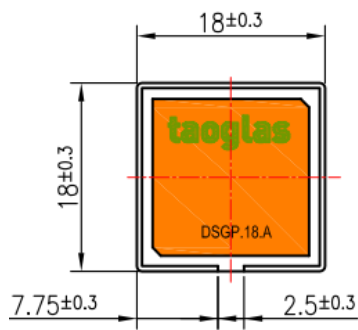
### 4.3. 3D Radiation Pattern

1575.42MHz

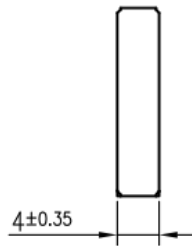


## 5. Mechanical Drawing (Unit: mm)

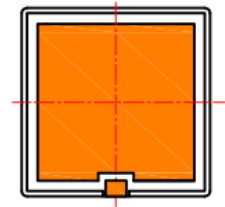
Top View



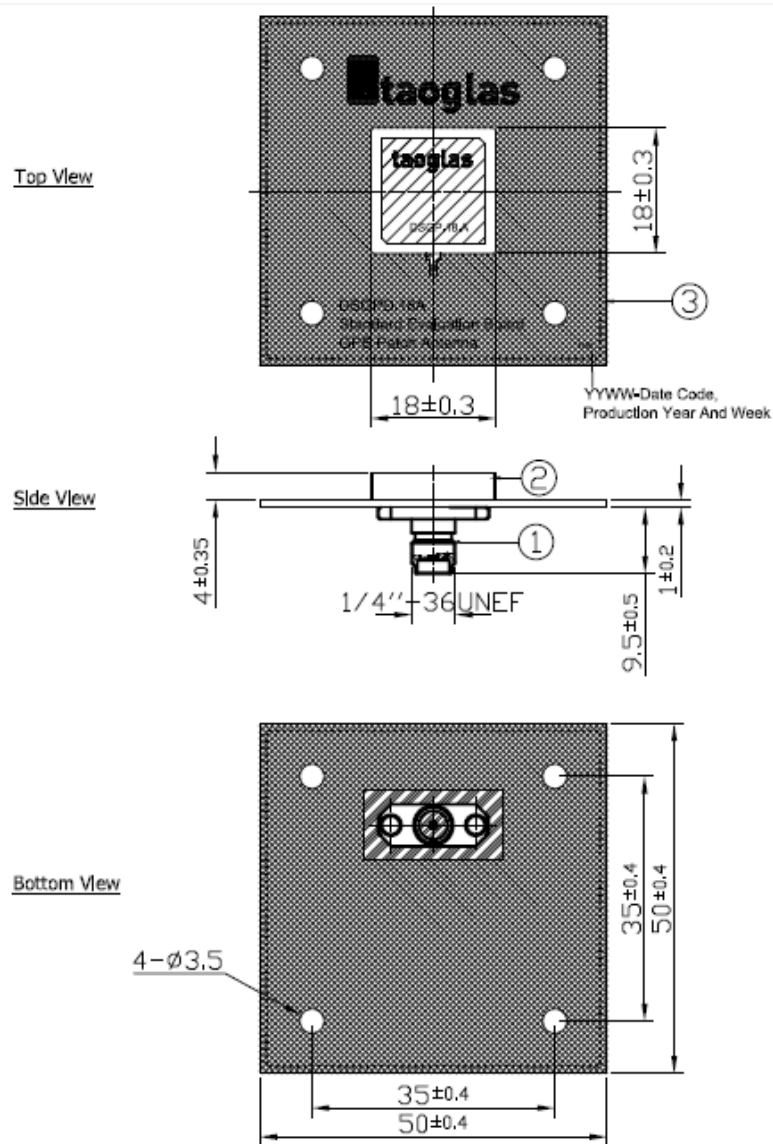
Side View



Bottom View



## 6. Evaluation Board - DSGPD.18A (Unit: mm)



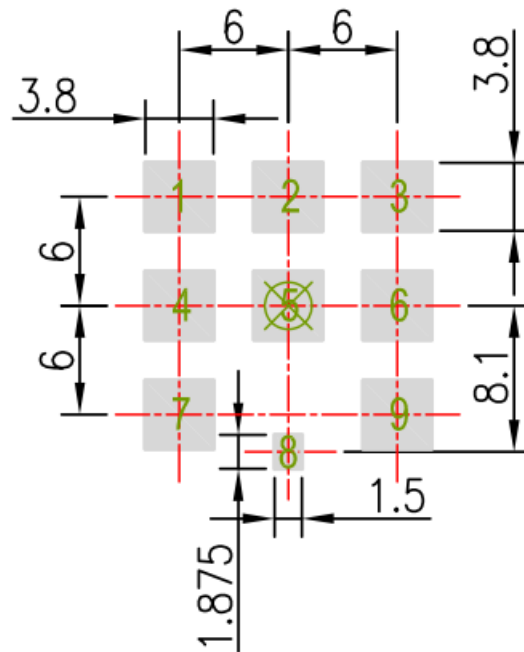
Unit:mm

|   | Name                        | Material | Finish | QTY |
|---|-----------------------------|----------|--------|-----|
| 1 | PCB SMA(F) ST               | FR4      | Gold   | 1   |
| 2 | DSGP.1575.18.4.A.02 Antenna | Ceramic  | Clear  | 1   |
| 3 | PCB (50x50x1mm)             | FR4 1.0t | Black  | 1   |



## 7.2. Paste Area (unit: mm)

Pads 1, 2, 3, 4, 5, 6, 7 and 9 are the same size.

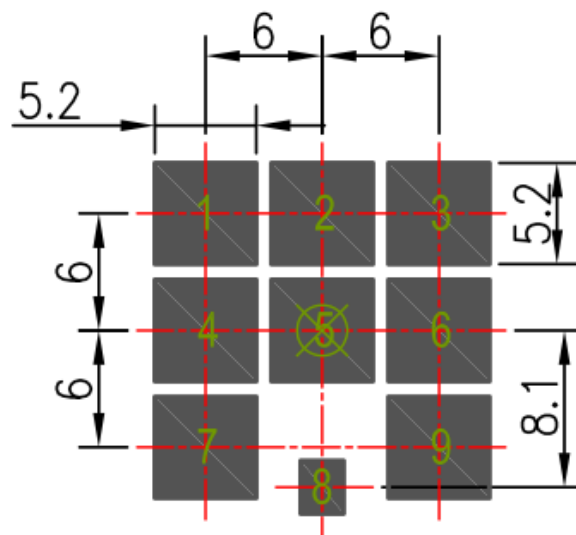


### NOTE:

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

### 7.3. Top Solder Mask (Unit: mm)

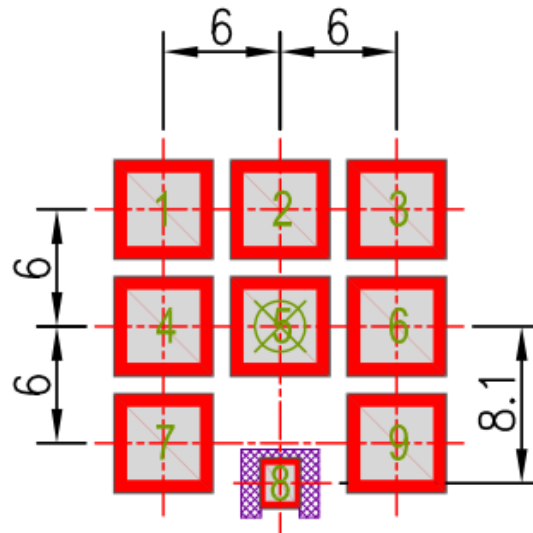
Pads 1, 2, 3, 4, 5, 6, 7 and 9 are the same size. This drawing is a negative of solder mask. Black regions are anti-mask.



#### NOTE:

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

## 7.4. Composite Diagram (unit: mm)



### NOTE:

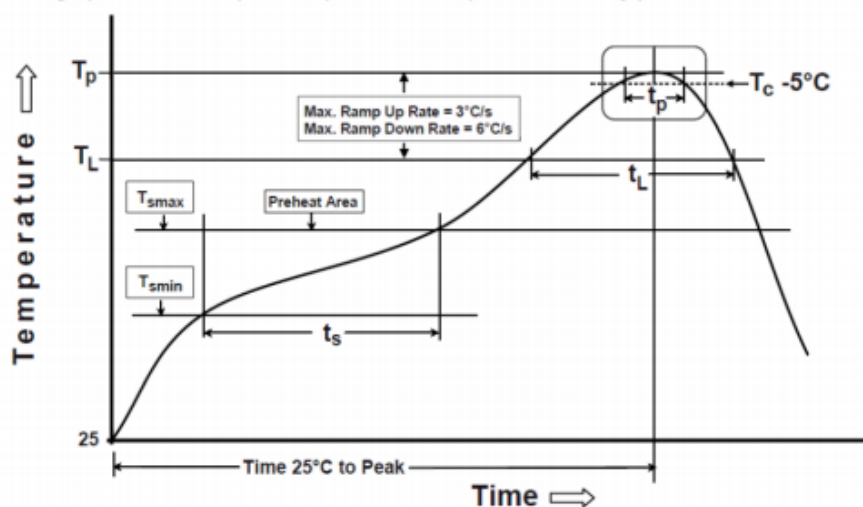
1. Ag Plated area 
2. Solder Mask area 
3. Copper area 
4. Paste area 
5. Copper Keepout area 
6. Copper Keepout should extend through all PCB layers.
7. Any vias in pads should be either filled or tented to prevent solder from wicking away from the pad during reflow
8. The dimension tolerances should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

## 8. Recommended Reflow Soldering Profile

DSGP.18 can be assembled using lead-free process. 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( $T_{smin}$ )<br>Temperature Max( $T_{smax}$ )<br>Time( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ ) | 150°C<br>200°C<br>60-120 seconds |
| RAMP-UP                            | Avg. Ramp-up Rate ( $T_{smax}$ to TP)                                                                             | 3°C/second(max)                  |
| REFLOW                             | Temperature( $T_L$ )<br>Total Time above $T_L$ ( $t_L$ )                                                          | 217°C<br>30-100 seconds          |
| PEAK                               | Temperature( $T_P$ )<br>Time( $t_p$ )                                                                             | 260°C<br>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



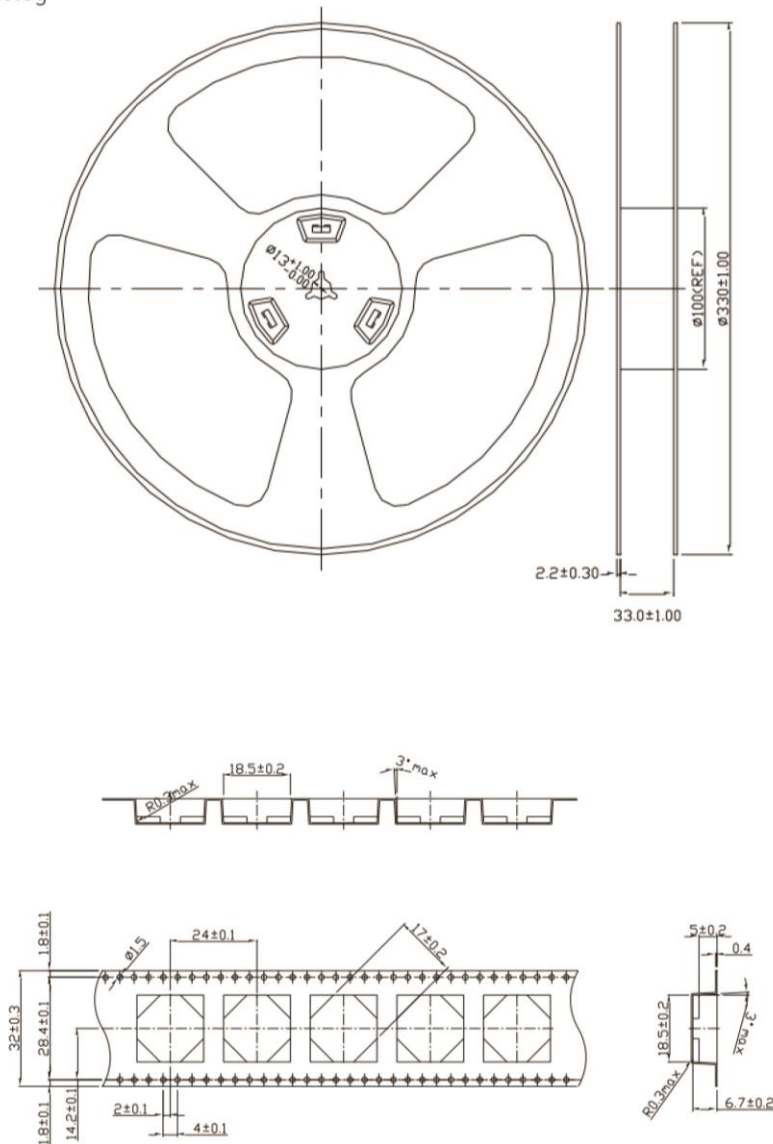
Soldering Iron condition: Soldering iron temperature  $270^\circ\text{C} \pm 10^\circ\text{C}$ .

Apply preheating at  $120^\circ\text{C}$  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.

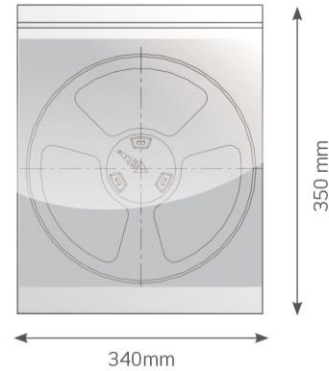
## 9. Packaging (Unit: mm)

### Packaging Specifications (1/2)

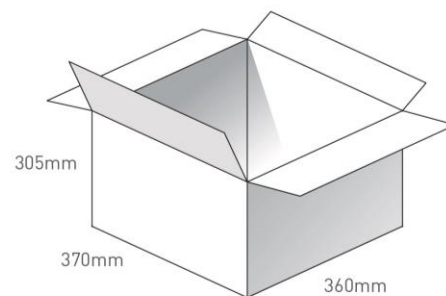
200 pc DSGP.1575.18.4.A.02 per reel  
 Dimensions - Ø330\*50mm  
 Weight - 1556.5g



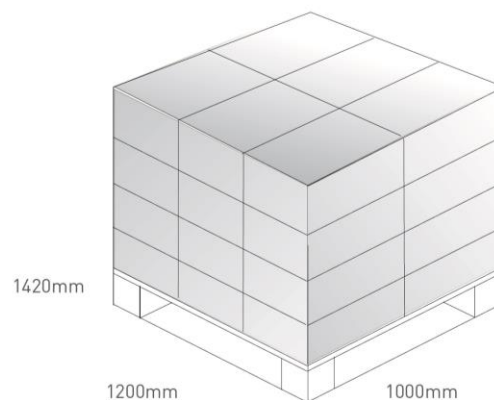
1 pc reel in small in Anti-static Bag  
 Dimensions - 340\*350\*70mm  
 Weight - 1.86Kg



4 Reels in Anti-static Bags  
 800 pcs in one carton  
 Carton Dimensions - 370\*360\*305mm  
 Weight - 8.2Kg



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



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