



TAOGLAS®



Datasheet

GPS/GLONASS/Galileo SMD Patch Antenna

Part No:
SGGP.18.4.A.08

Description:
18*18*4mm GPS/GLONASS/Galileo SMD Patch Antenna

Features:

- SMD Direct Mount Ceramic Patch Antenna
- GPS/Galileo/GLONASS Antenna
- GPS L1/Galileo E1 (1575.42 MHz) – 78% Efficiency
- GLONASS L1 (1602 MHz) – 80% Efficiency
- Dimensions: 18*18*4mm
- RoHS & Reach Compliant

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1. Introduction



The Taoglas SGGP.18 is a ceramic GPS/GLONASS/Galileo passive patch antenna designed for optimal performance on GPS L1/Galileo E1 band (1575.42 MHz) and GLONASS L1 band (1602 MHz). With a low-profile thickness of just 4mm and convenient mounting via standard SMD process, it is ideal for high-volume, low-cost assembly applications. SGGP.18 is designed for applications in navigation devices, vehicle tracking/fleet management systems, and telematics devices. It is an excellent choice for applications in transportation, defense, marine, agriculture, and navigation industries.

This antenna has been tuned for use on a 50mm*50mm ground plane to achieve 2.86 dBi gain at 1575.42 MHz and 3.04 dBi gain at 1602 MHz. In addition to excellent efficiency, it also offers a broadly hemispherical radiation pattern with stable gain across elevations.

SGGP.18 is manufactured and tested in an IATF16949 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 further information or support with integrating this antenna into your device, please contact your regional Taoglas customer support team.

2. Specifications

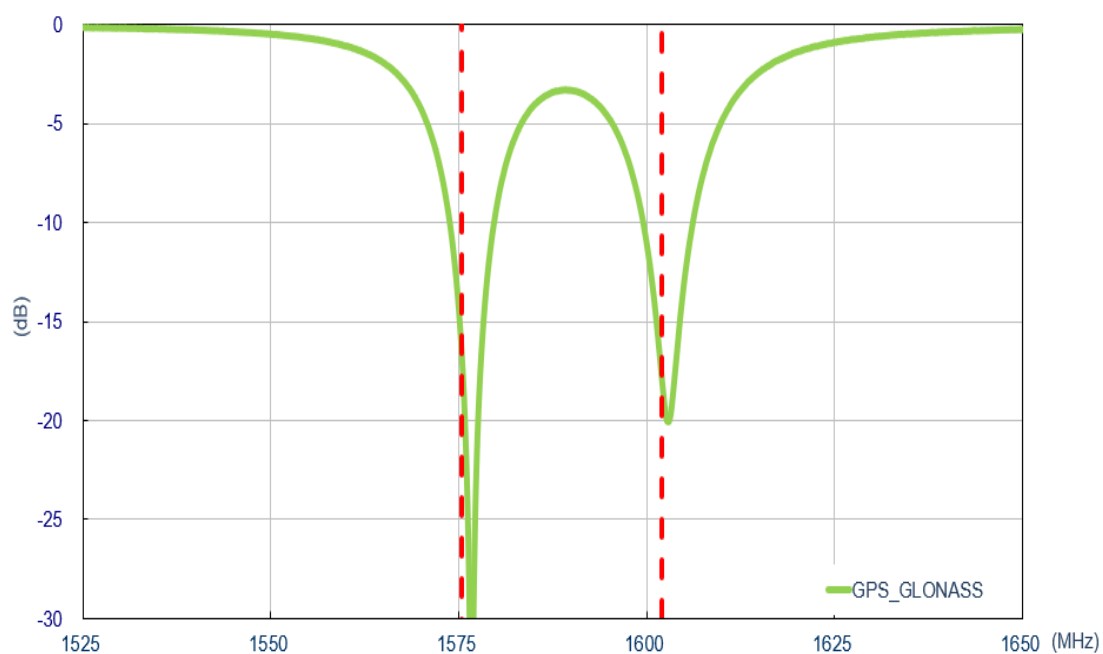
GNSS Frequency Bands Covered							
GPS/QZSS	L1	L2	L5	L6			
	1575.42MHz	1227.6MHz	1176.45MHz	1278.75MHz			
	■	□	□	□			
GLONASS	L5R	L3PT	L2PT	L1CR	L1PT		
	1176.45MHz	1201.5MHz	1246MHz	1575.42MHz	1602MHz		
	□	□	□	■	■		
Galileo	E5a	E5b	E4	E3	E6	E2	E1
	1176.45MHz	1201.5MHz	1215MHz	1256MHz	1278.75MHz	1561MHz	1575.42MHz
	□	□	□	□	□	□	■
BeiDou	B1	B2	B3				
	1561MHz	1207.14MHz	1268.52MHz				
	□	□	□				
Compass	E5B(B2)/ E6(B3)	E2(B1)					
	1268.56MHz	1561MHz					
	□	□					
SBAS	Omnistar	WAAS/EGN OS					
	1542.5MHz	1575.42MHz					
	□	■					

GNSS Electrical		
Application Bands	GPS/Galileo	GLONASS
Operation Frequency (MHz)	1575.42 ±1.023	1602±5
Return Loss (dB)	< -10	< -10
Efficiency (%)	78	80
Average Gain (dB)	-1.07	-0.98
Peak Gain (dBi)	2.86	3.04
Impedance		50 ohms
Polarization		RHCP
Mechanical		
Ceramic Dimension	18*18*4mm	
Weight	5.8g	
Enviorinmental		
Operation Temperature	-40°C to 85°C	
Humidity	Non-condensing 65°C 95% RH	
Moisture Sensitivity Level (MSL)	3 (168 Hours)	

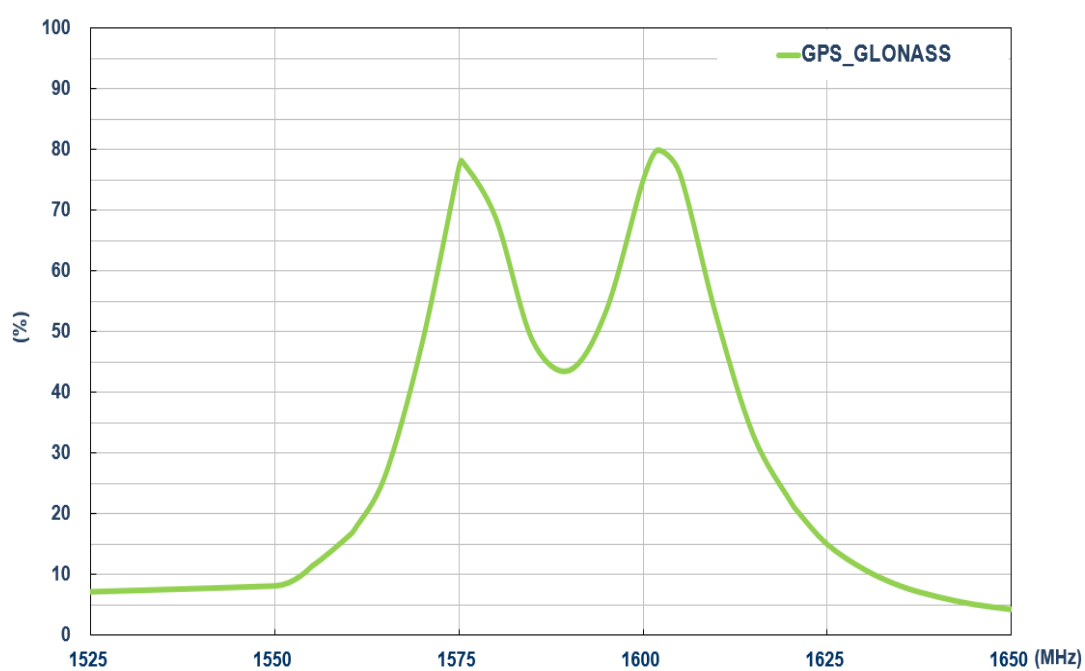
*Measurements tested on 50*50mm ground plane

3. Antenna Characteristics

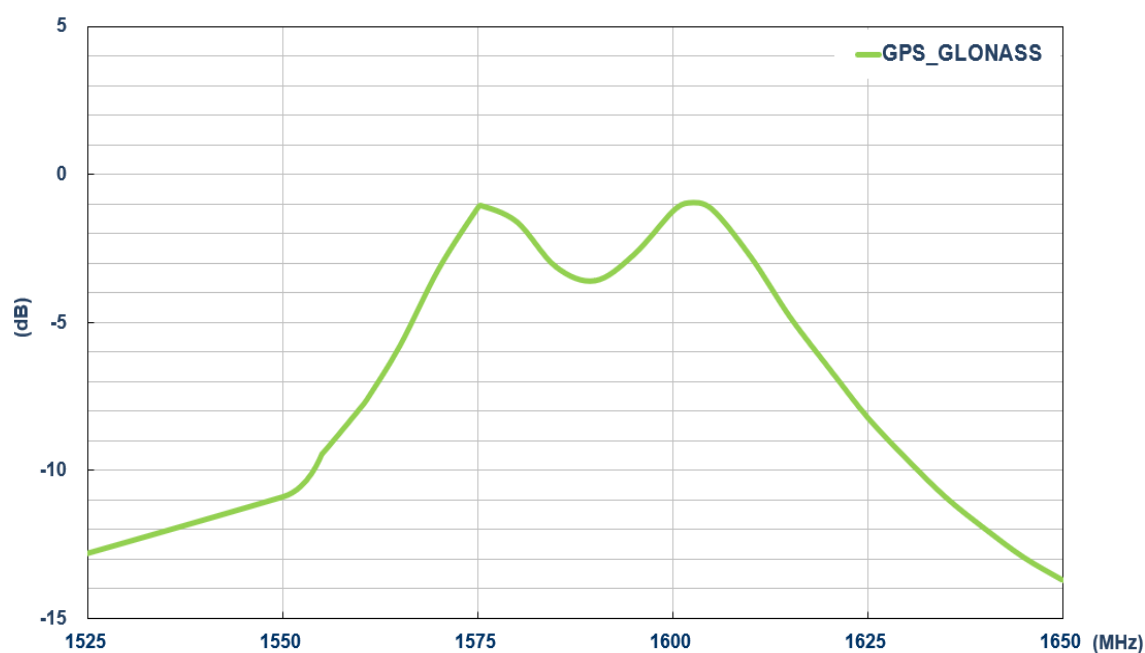
3.1 Return Loss



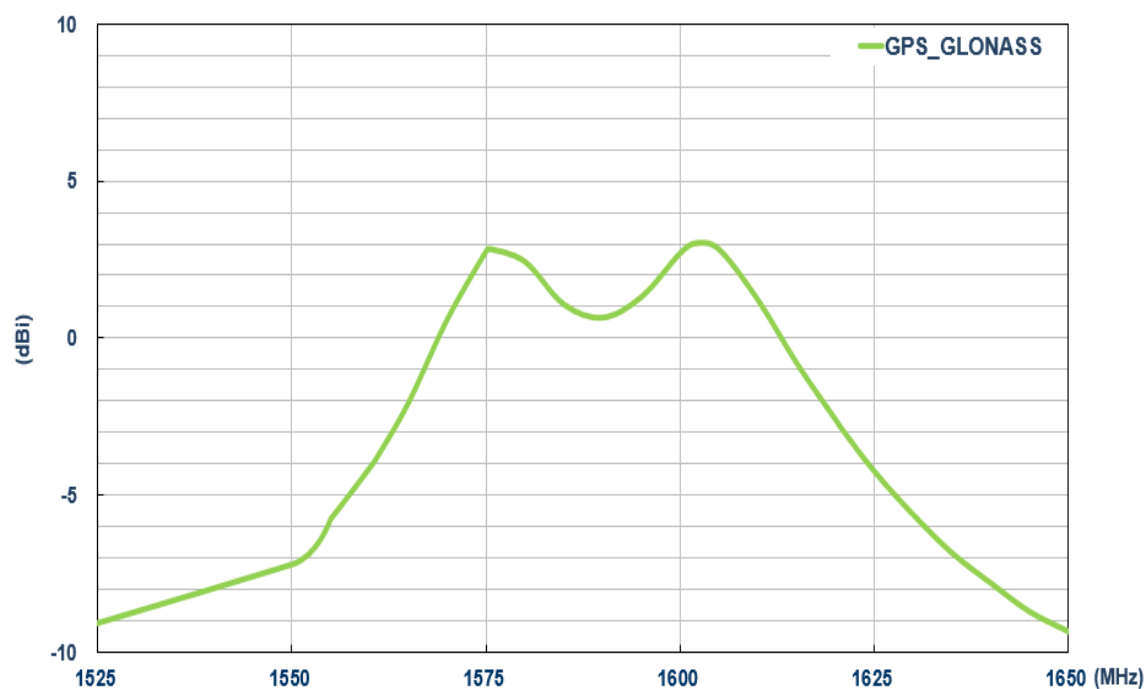
3.2 Efficiency



3.3 Average Gain

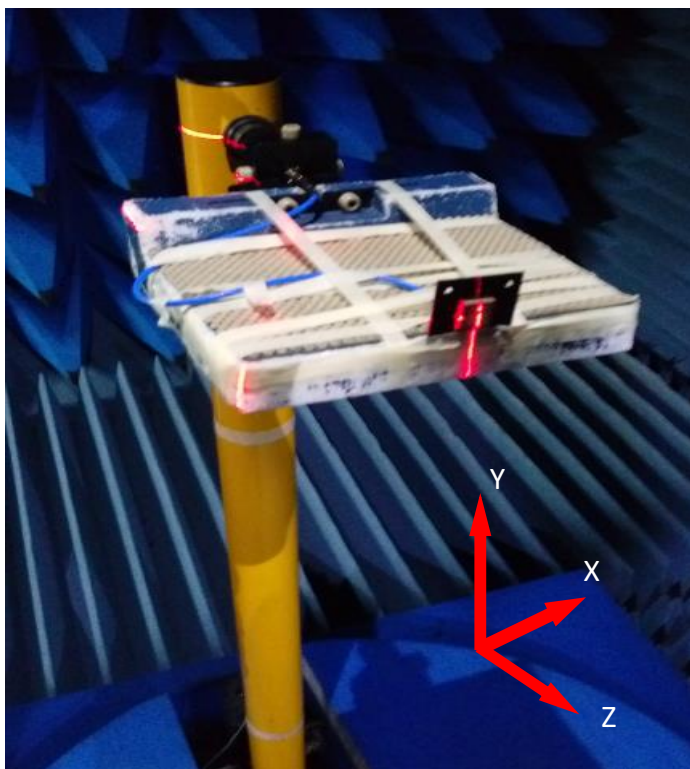


3.4 Peak Gain



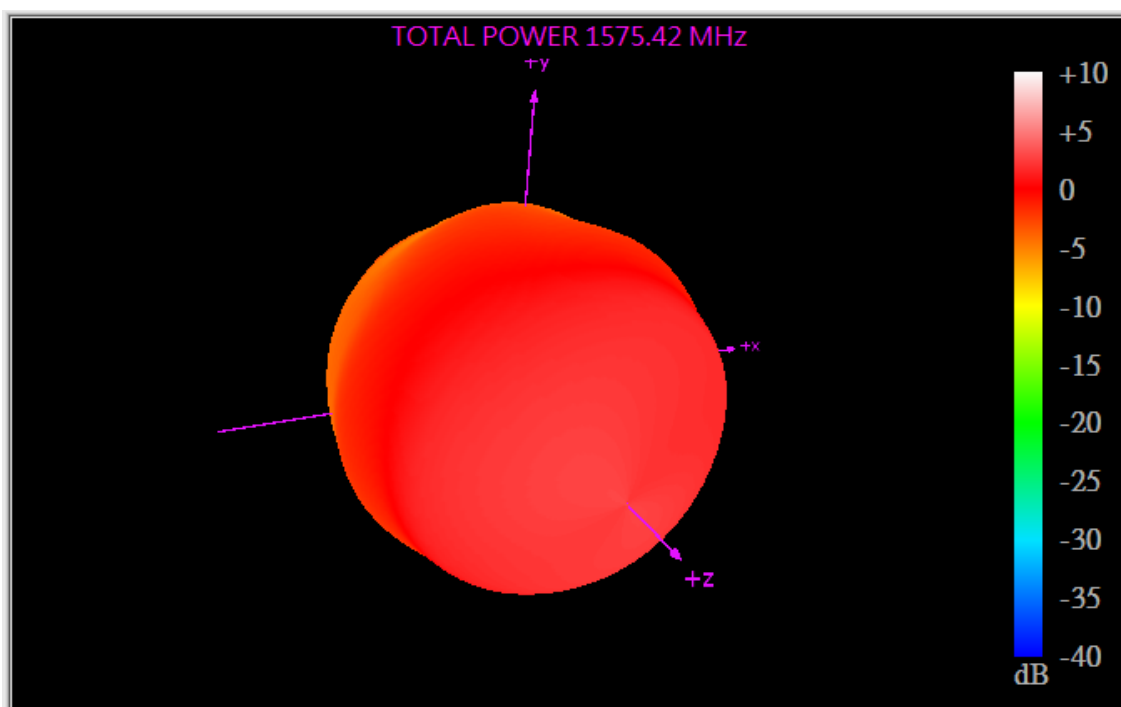
4. Radiation Patterns

4.1 Test Setup



The SGGP.18.4.A.08 antenna is tested with 50mm*50mm ground plane in a CTIA certified ETS-Lindgren Anechoic Chamber. The test setup is shown above.

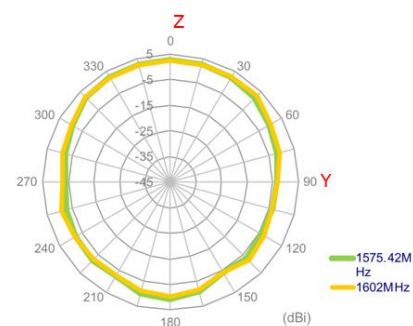
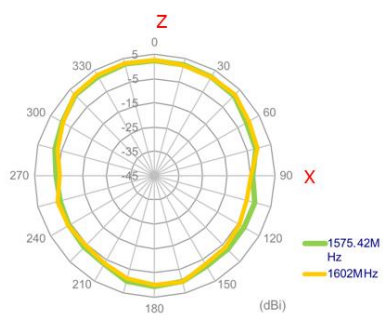
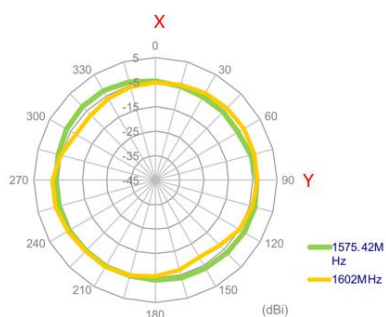
4.2 1575.42MHz 3D and 2D Radiation Patterns



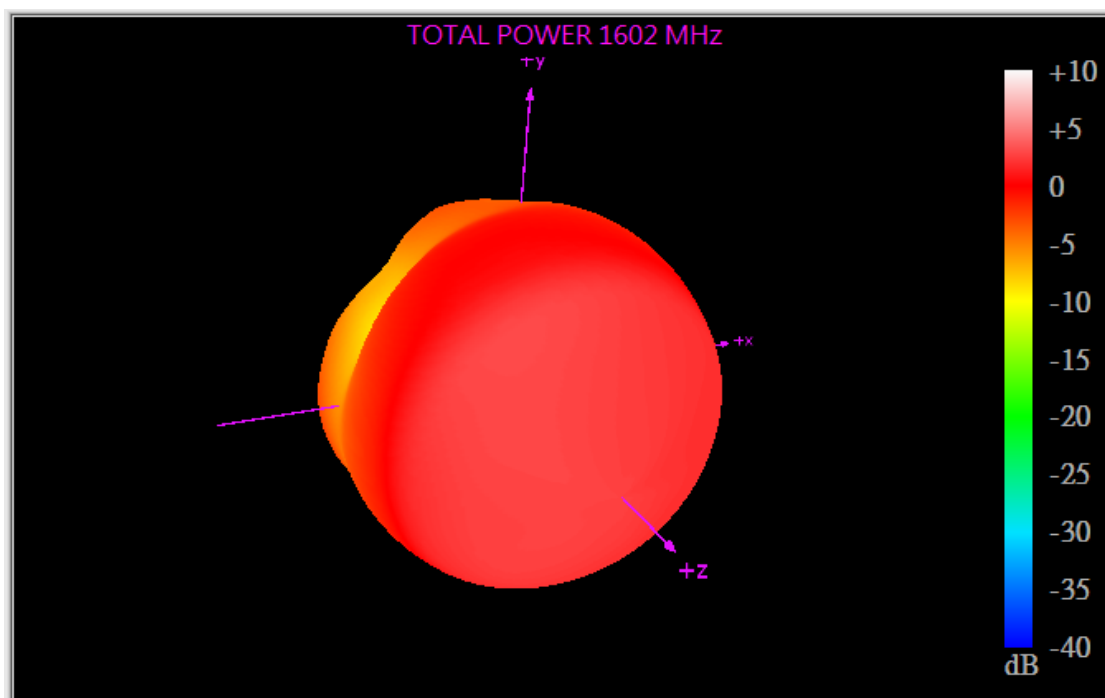
XY Plane

XZ Plane

YZ Plane



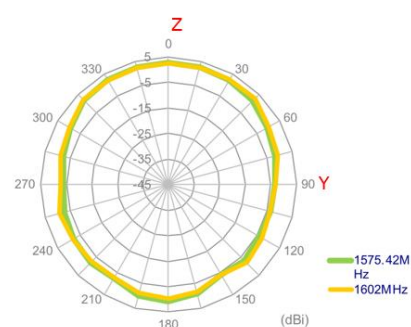
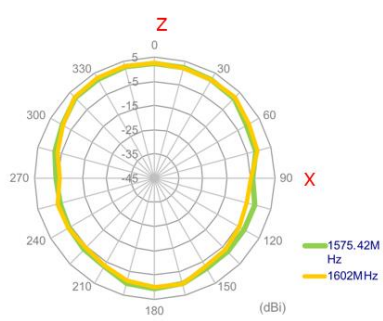
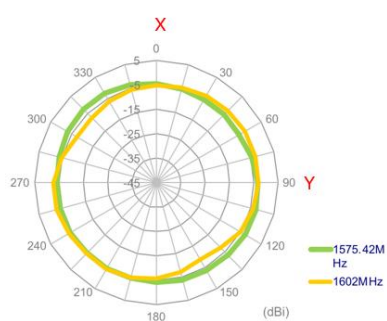
1602MHz



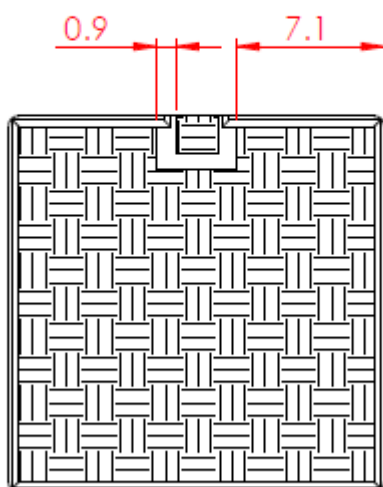
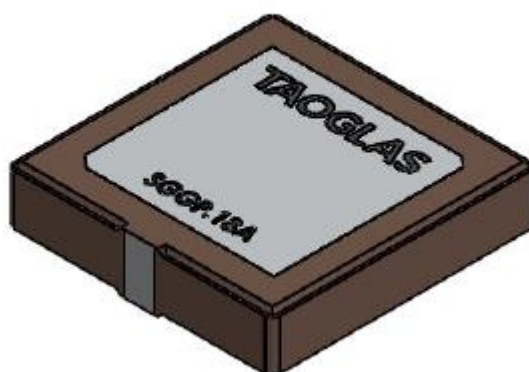
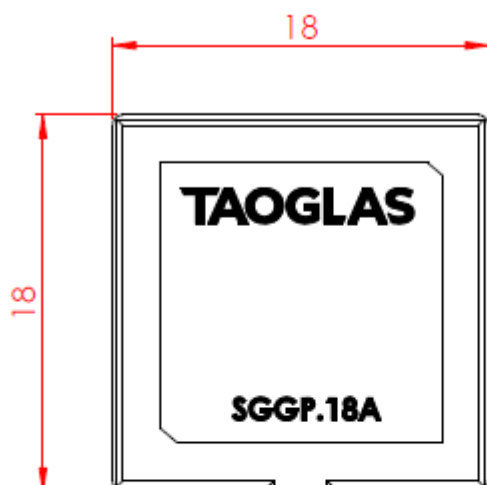
XY Plane

XZ Plane

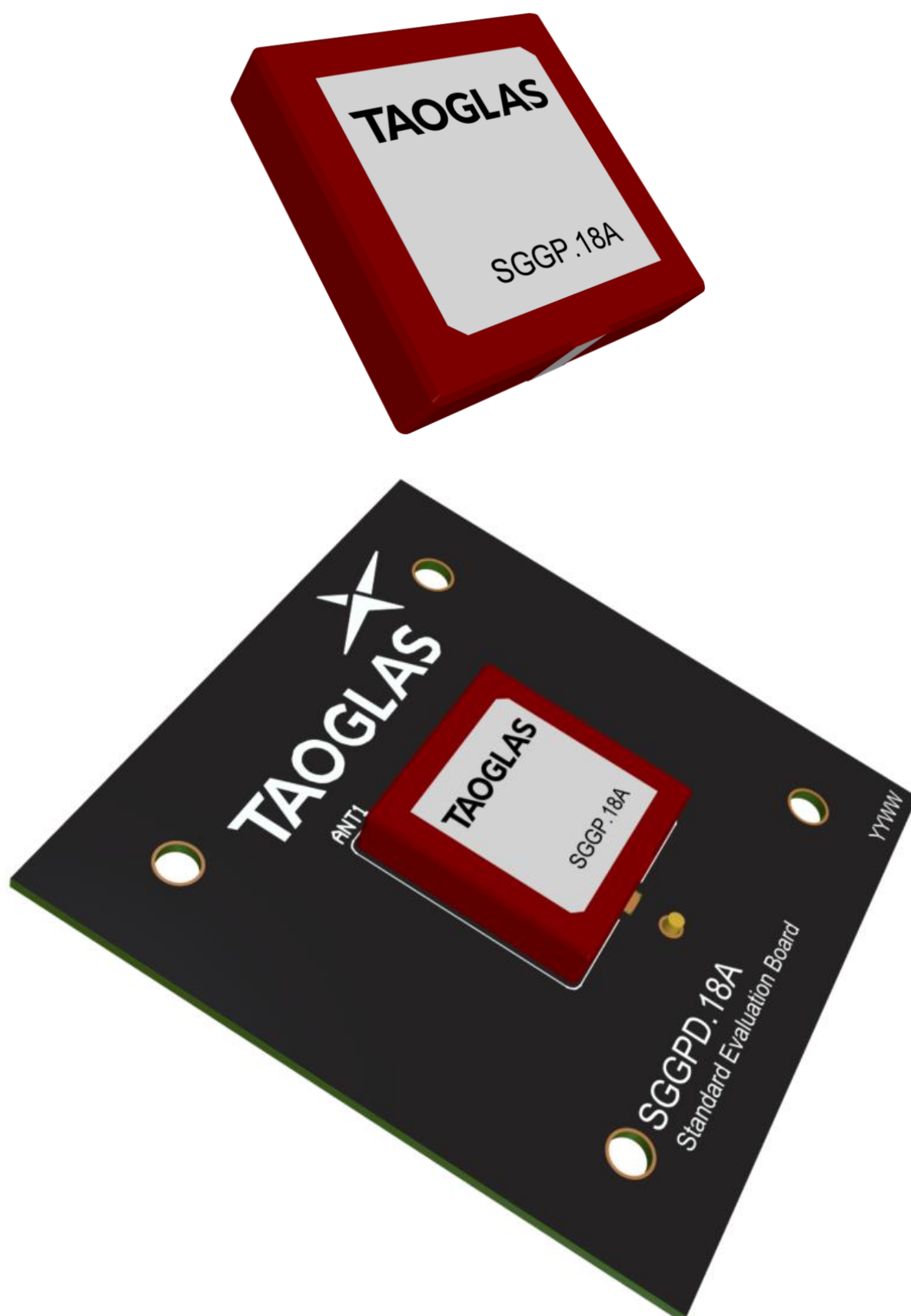
YZ Plane



5. Mechanical Drawing (Units: mm)



6. Antenna Integration Guide

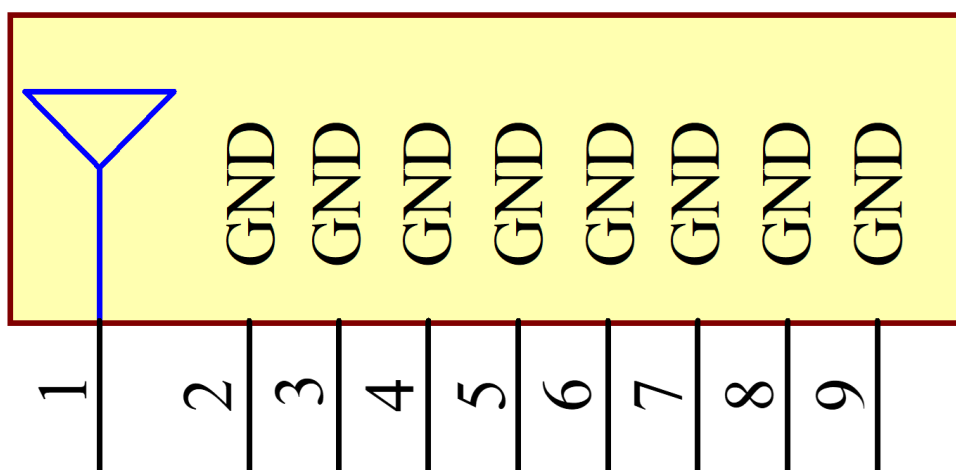


6.1 Schematic Symbol and Pin Definition

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

Pin	Description
1	RF Feed
2-9	Ground

TAOGLAS_SGGP.18.4.A.08
ANT1



Please note you can download the design files, 3D model, 2D drawings and CST simulation files from the website here:

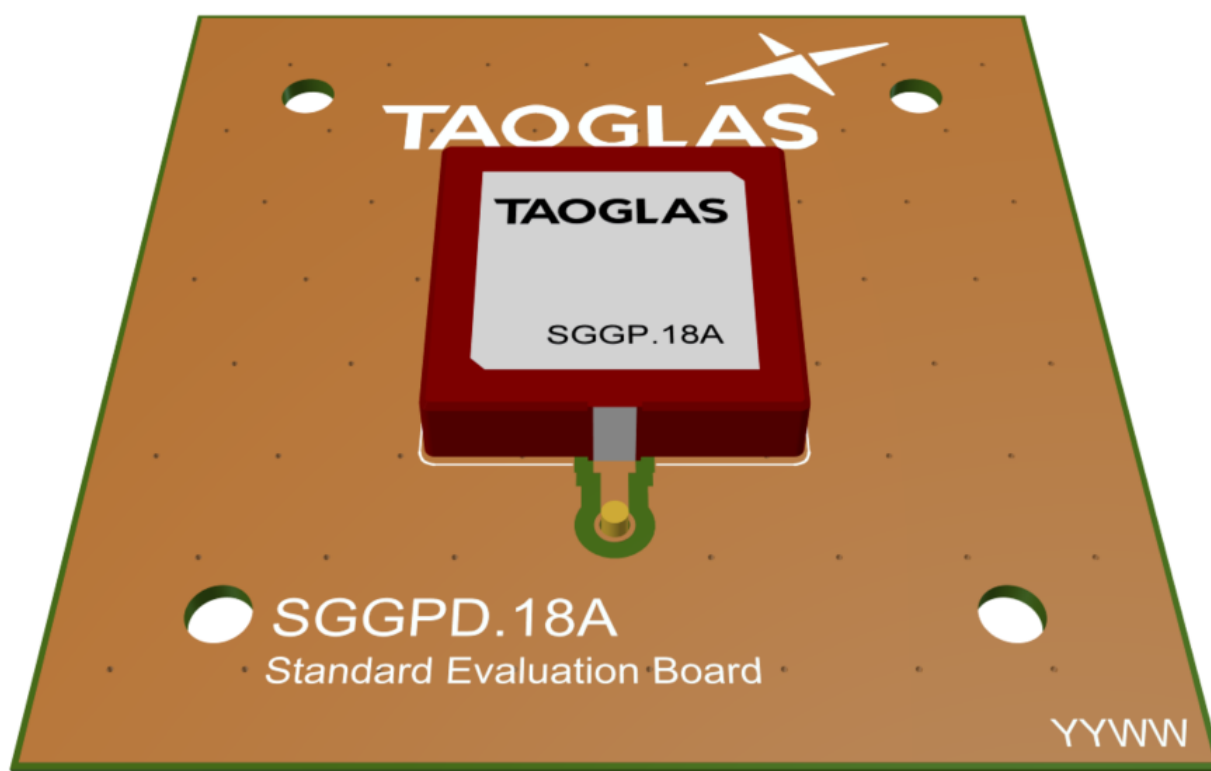
<https://www.taoglas.com/product/sggp-18-4-a-08-gps-glonass-galileo-smd-18184mm-mount-patch/>

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.



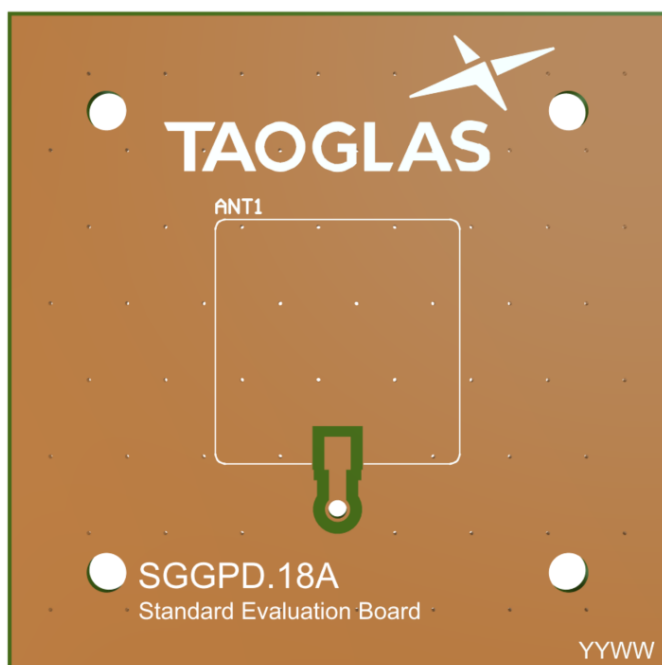
Top Side w/ Solder Mask



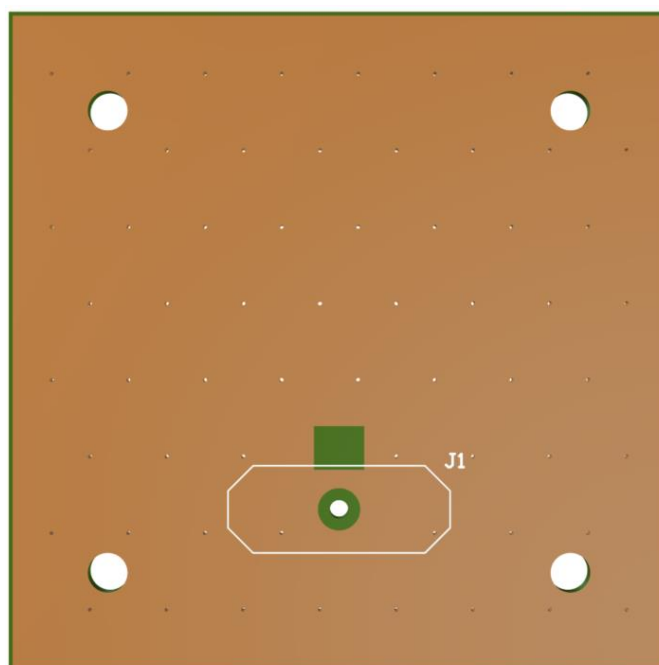
Top Side w/o Solder Mask

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.

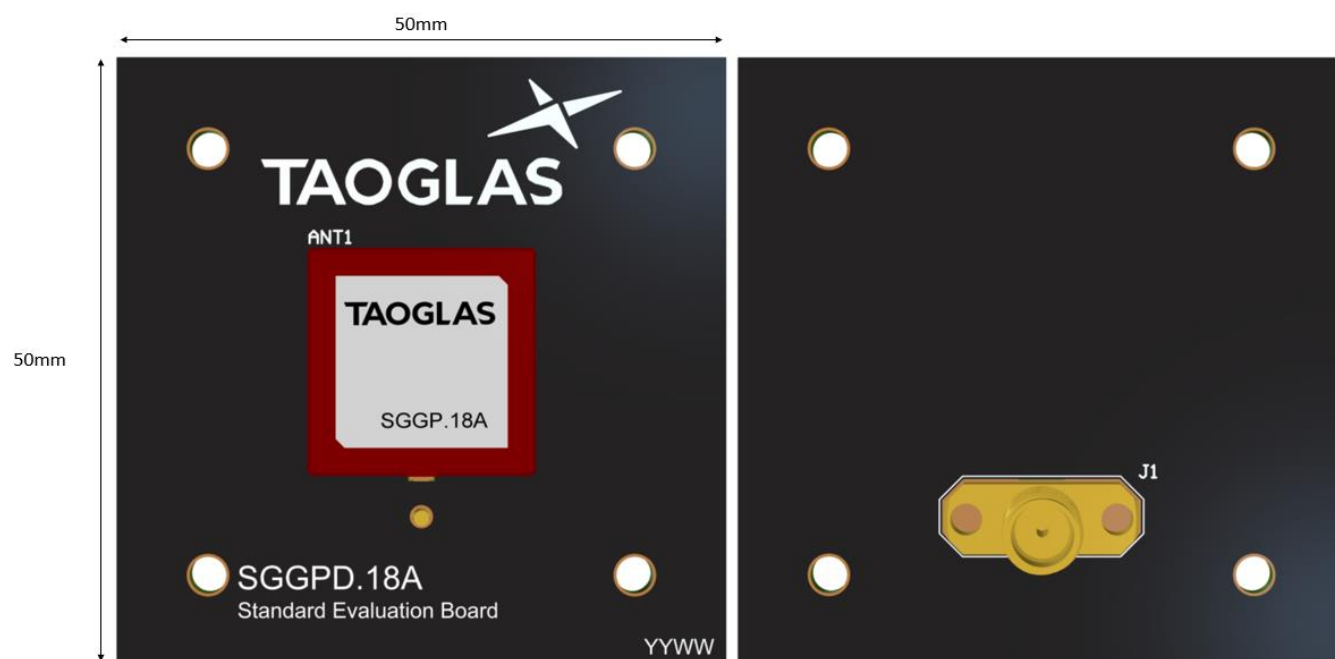


Topside

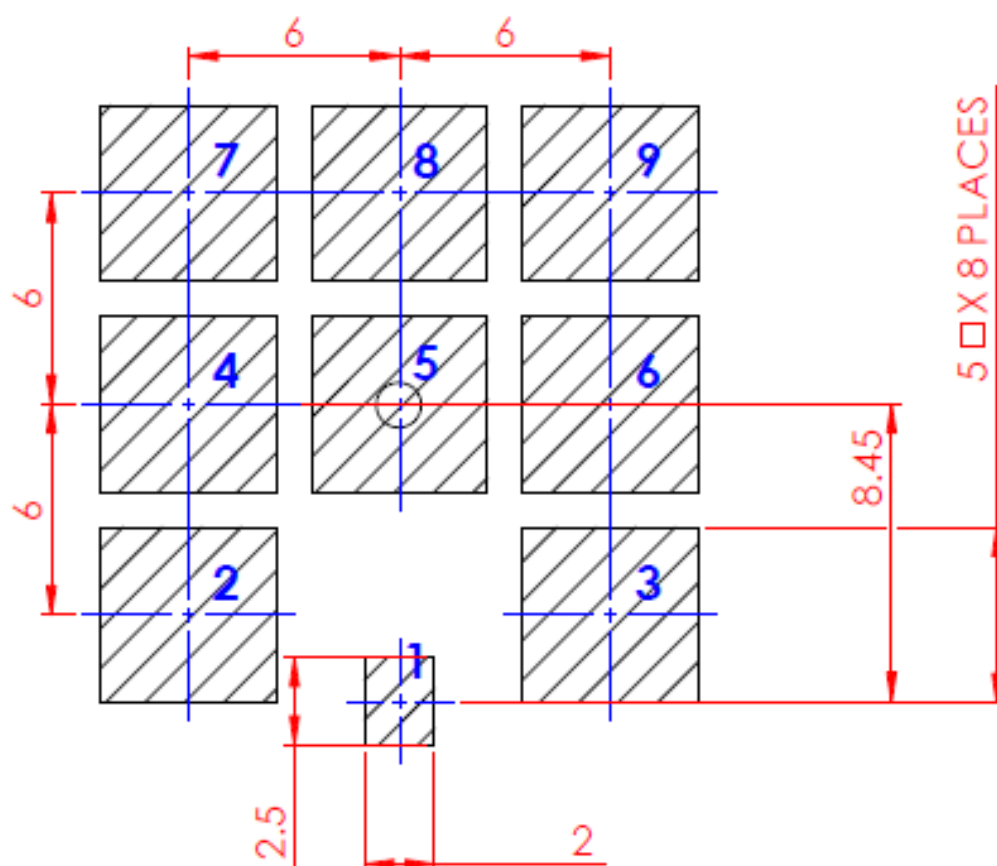


Bottom Side

6.4 Evaluation Board



6.5 Footprint

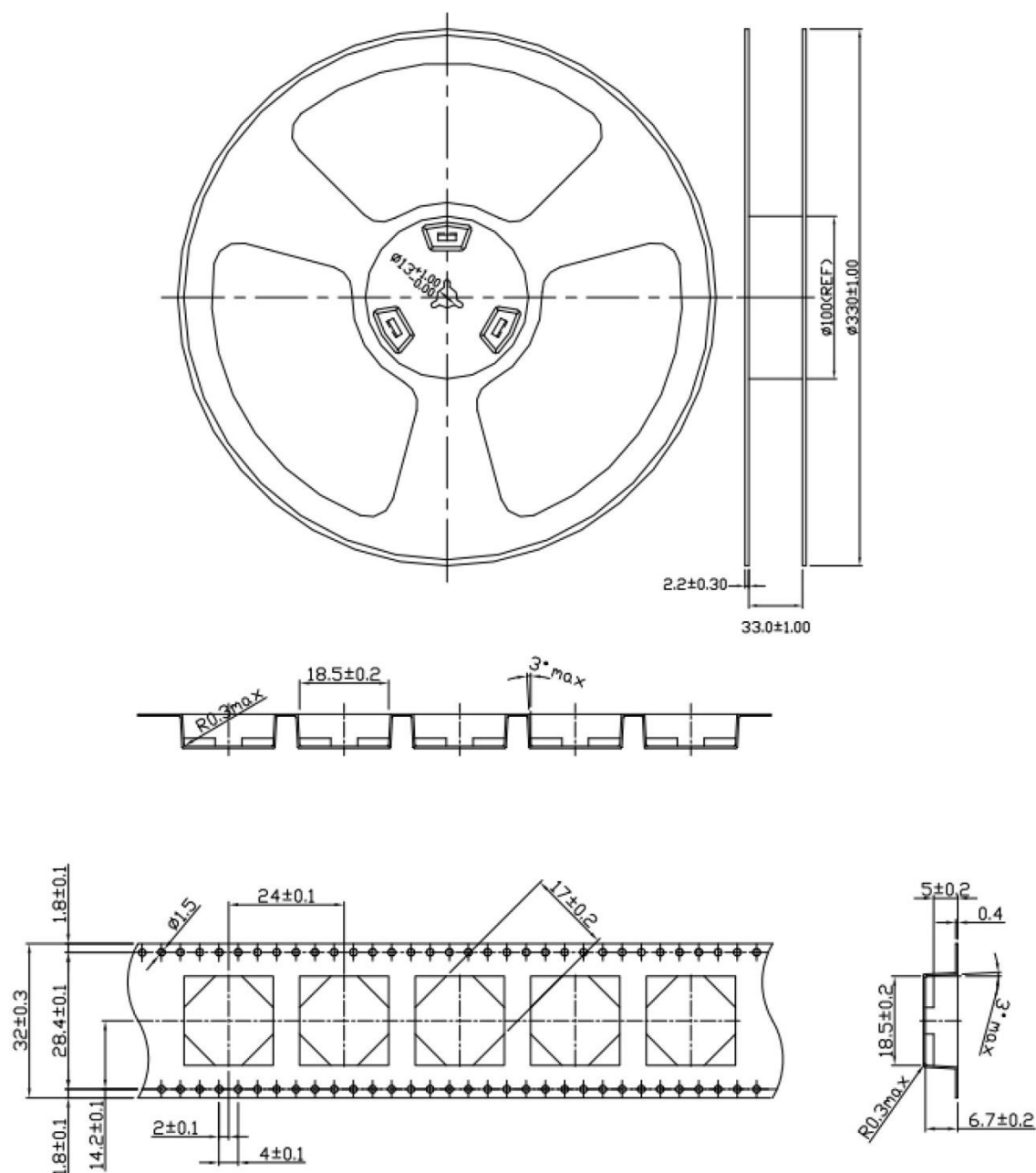


FOOTPRINT PCB

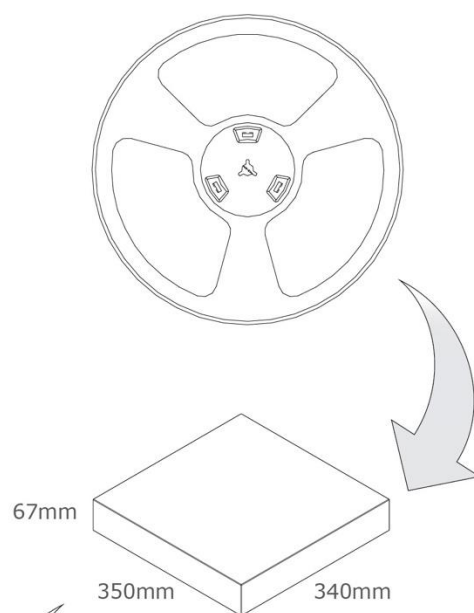
PIN	DESCRIPTION:
1	RF FEED (50 Ohm)
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	GROUND
7	GROUND
8	GROUND
9	GROUND

7. Packaging

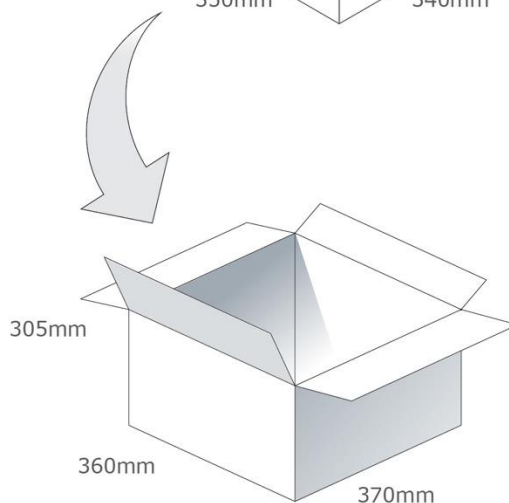
200 pc SGGP.18.4.A.08 per reel
 Dimensions - Ø330*33mm
 Weight - 2.125Kg



200 pc SGGP.18.4.A.08 per small box
 Dimensions - 350*340*67mm
 Weight - 2.125Kg



800 pcs SGGP.18.4.A.08 per carton
 Dimensions - 370*360*305mm
 Weight - 8.5Kg



8. Soldering Recommendations

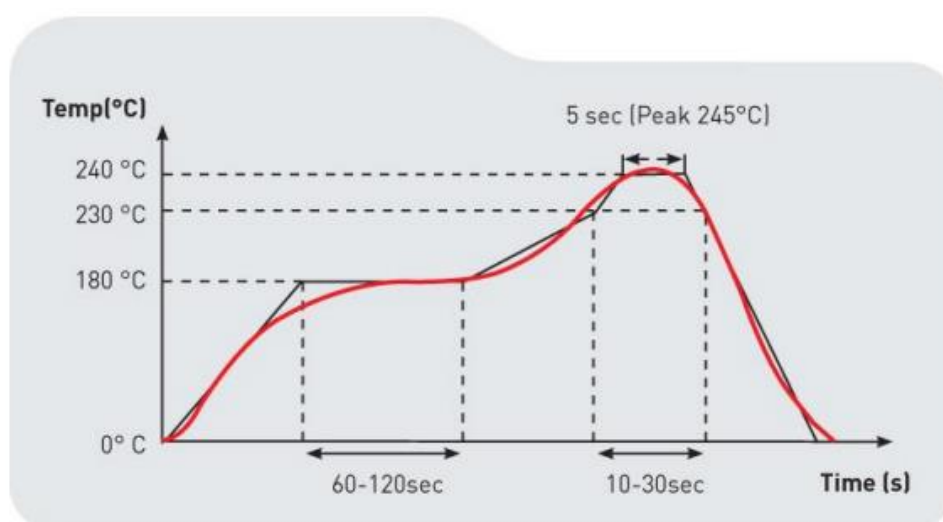
8.1 Flux Solder

Use rosin-based flux. Don't use highly acidic flux with halide content exceeding 0.2wt%(chlorine conversion value).

- Use Sn solder.

8.2 Flux Solder

- Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150°C max. Cooling into solvent after soldering also should be in such a way that temperature difference is limited to 100°C max. Unwrought pre-heating may cause cracks on the product, resulting in the deterioration of products quality.



8.3 Reworking with Soldering Iron

The following conditions must be strictly followed when using a soldering iron.

Pre -heating	150°C , 1 min
Tip temperature	290°C max
Soldering iron output	30w max
Soldering time	3 Second max

Changelog for the datasheet

SPE-18-8-067 - SGGP.18.4.A.08

Revision: E (Current Version)

Date:	2023-01-05
Changes:	Updated PCB Mechanical Footprint Drawing & Integration Guide.
Changes Made by:	Gary West

Previous Revisions

Revision: D

Date:	2023-01-05
Changes:	Updated PCB Keep Out Drawing
Changes Made by:	Gary West

Revision: C

Date:	2022-05-27
Changes:	Added dimension to footprint drawing between pad 1 and 5.
Changes Made by:	Gary West

Revision: B

Date:	2021-10-20
Changes:	Full datasheet template update, Addition of MSL to spec table & Integration guide.
Changes Made by:	Gary West

Revision: A (Original First Release)

Date:	2018-07-02
Notes:	First Release
Author:	MC



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