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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Changelog

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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

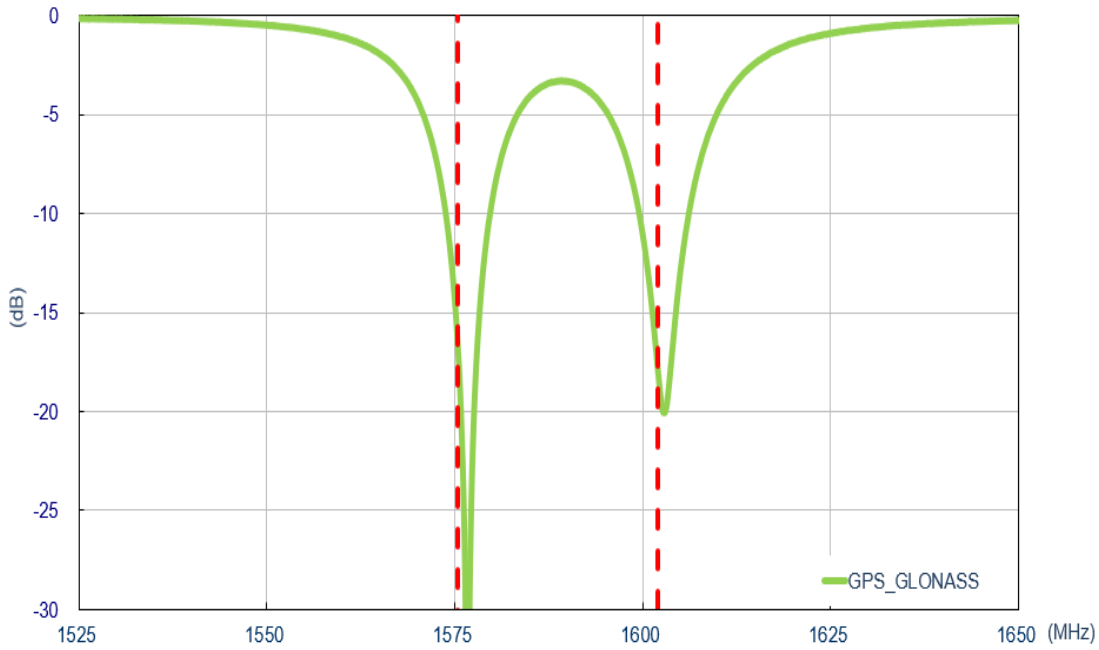
GNSS Frequency Bands Covered							
GPS/QZSS	L1 1575.42MHz	L2 1227.6MHz	L5 1176.45MHz	L6 1278.75MHz			
	■	□	□	□			
GLONASS	L5R 1176.45MHz	L3PT 1201.5MHz	L2PT 1246MHz	L1CR 1575.42MHz	L1PT 1602MHz		
	□	□	□	■	■		
Galileo	E5a 1176.45MHz	E5b 1201.5MHz	E4 1215MHz	E3 1256MHz	E6 1278.75MHz	E2 1561MHz	E1 1575.42MHz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

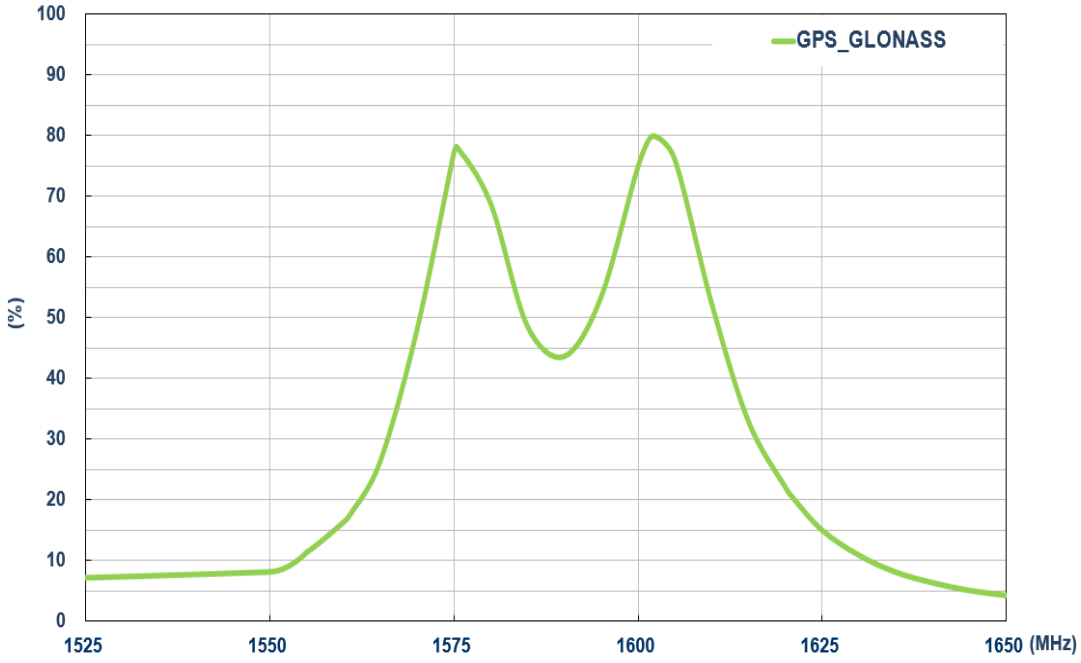
*Measurements tested on 50*50mm ground plane

3. Antenna Characteristics

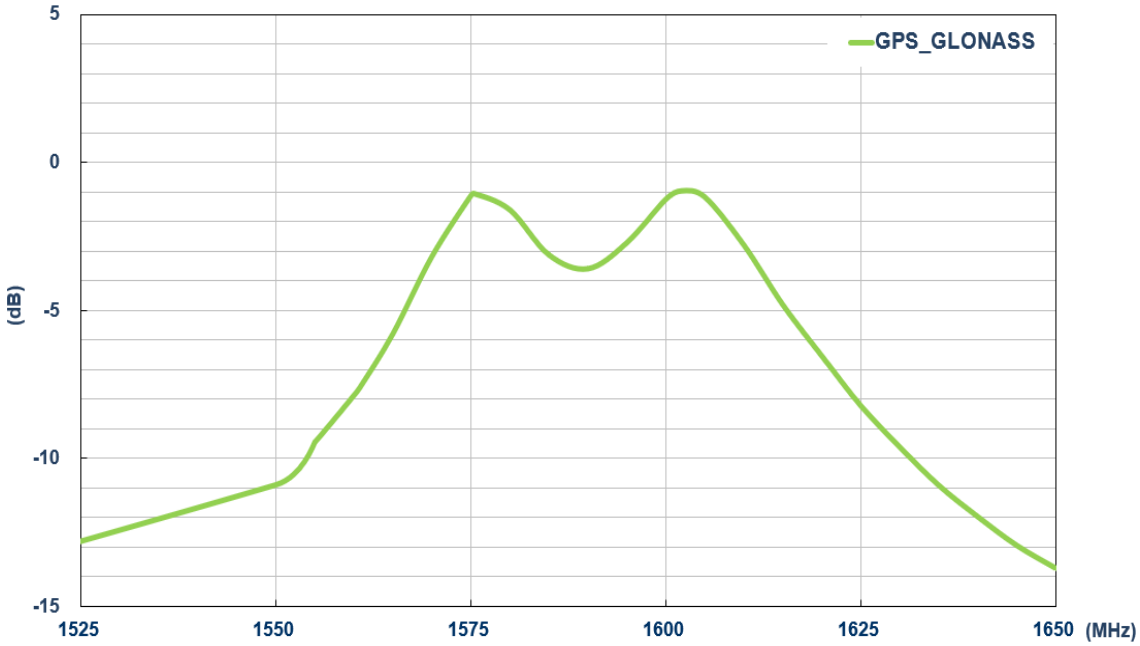
3.1 Return Loss



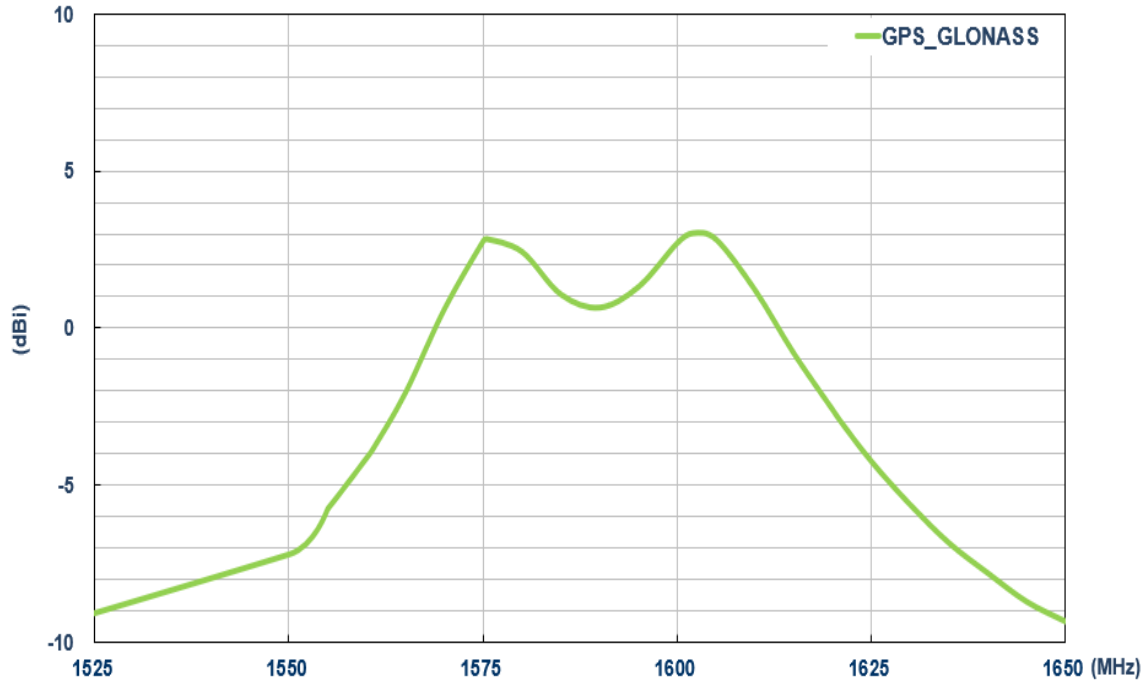
3.2 Efficiency



3.3 Average Gain

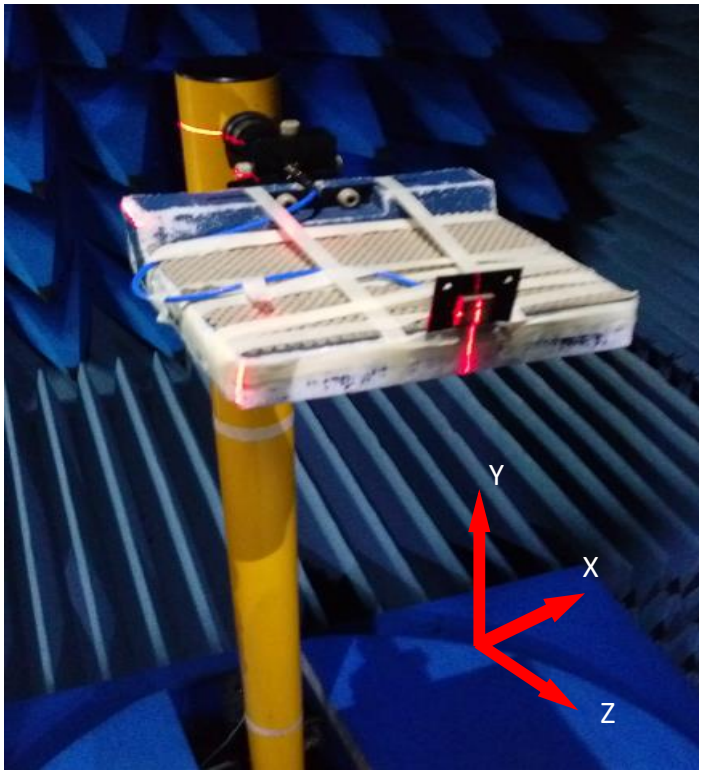


3.4 Peak Gain



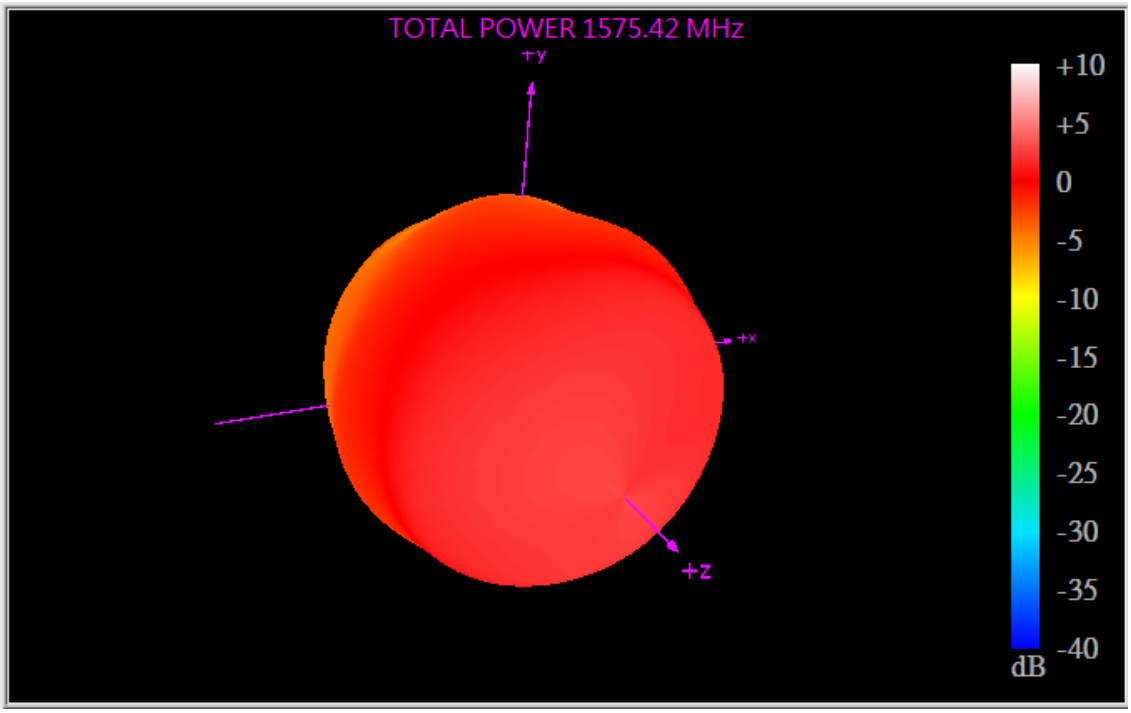
4. Radiation Patterns

4.1 Test Setup

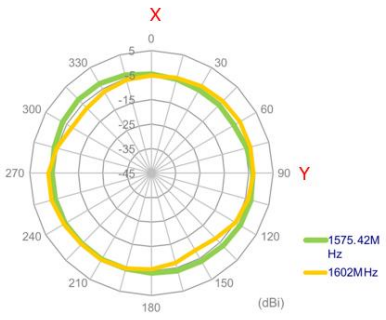


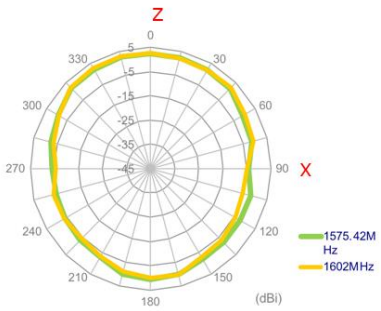
The SGGP.18.4.A.08 antenna is tested with 50mm*50mm ground plane in a CTIA certified ETS-Lindgren Anechoic Chamber. The test setup is shown above.

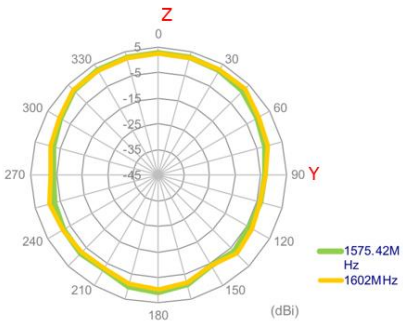
4.2 1575.42MHz 3D and 2D Radiation Patterns



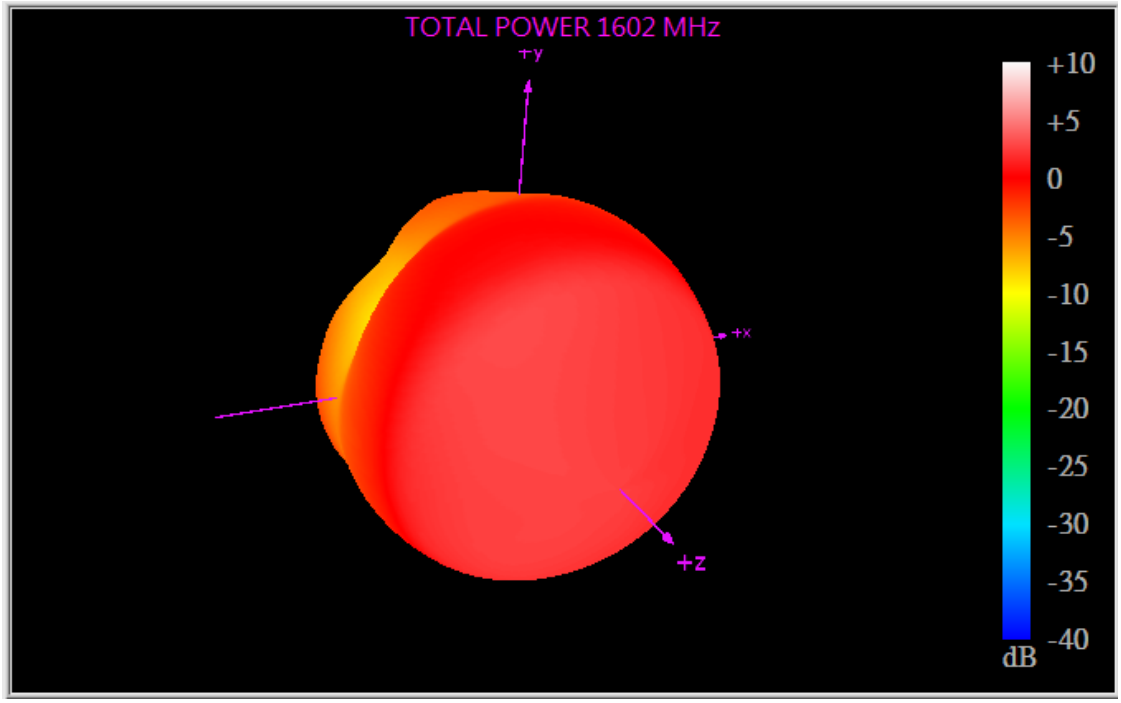
XY Plane	XZ Plane	YZ Plane



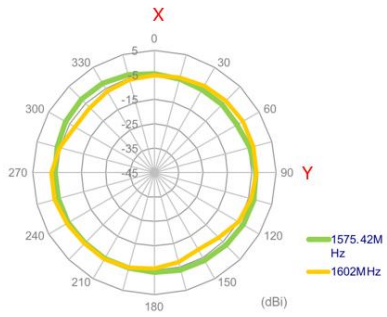


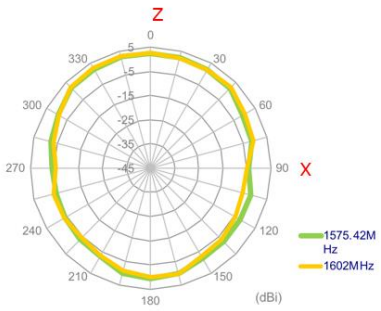


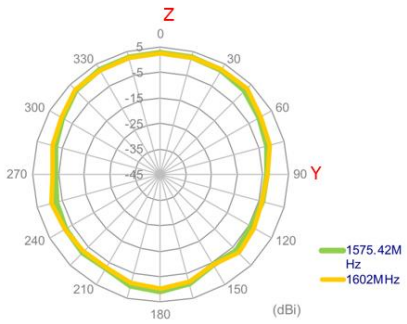
1602MHz



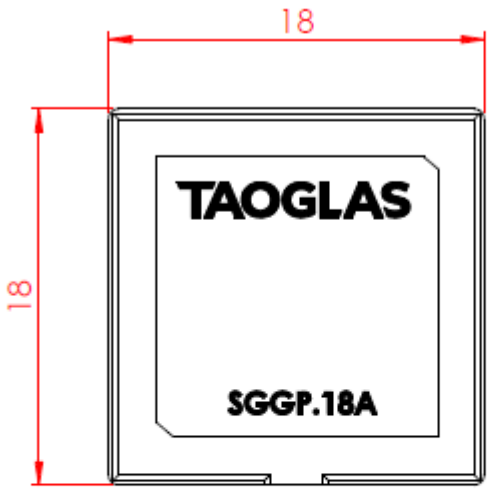
XY Plane	XZ Plane	YZ Plane

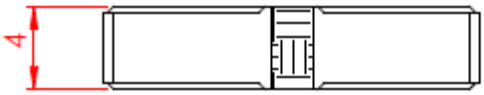


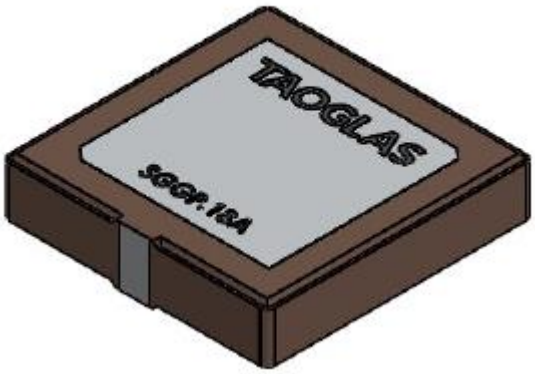


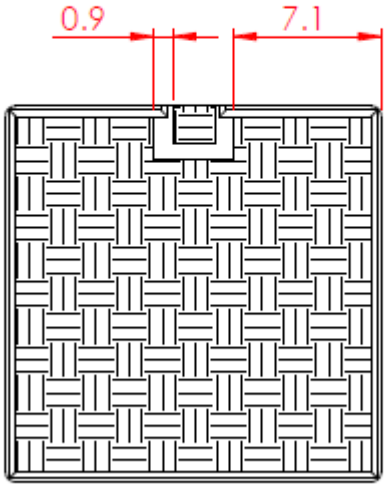


5. Mechanical Drawing (Units: mm)



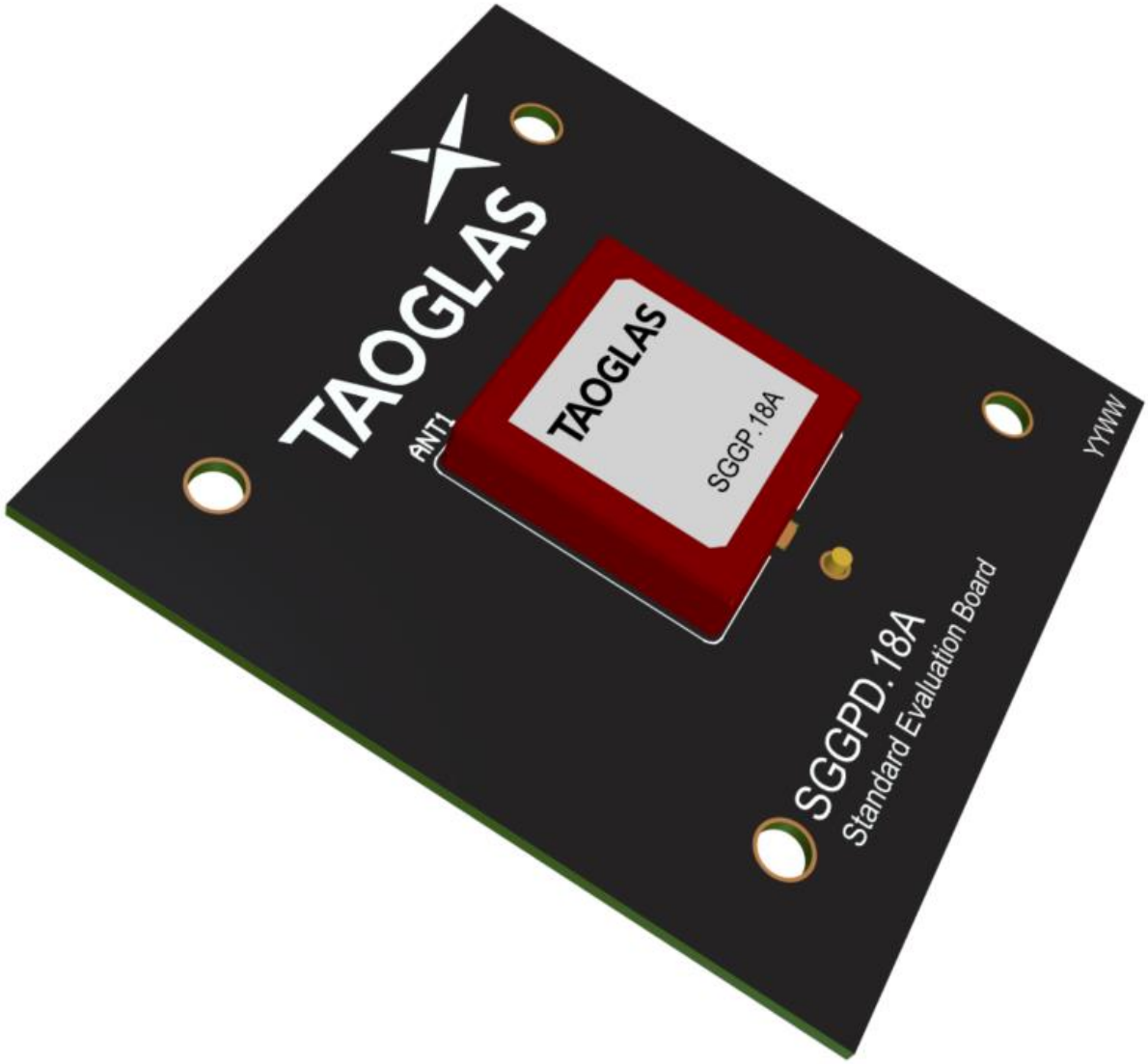






6. Antenna Integration Guide

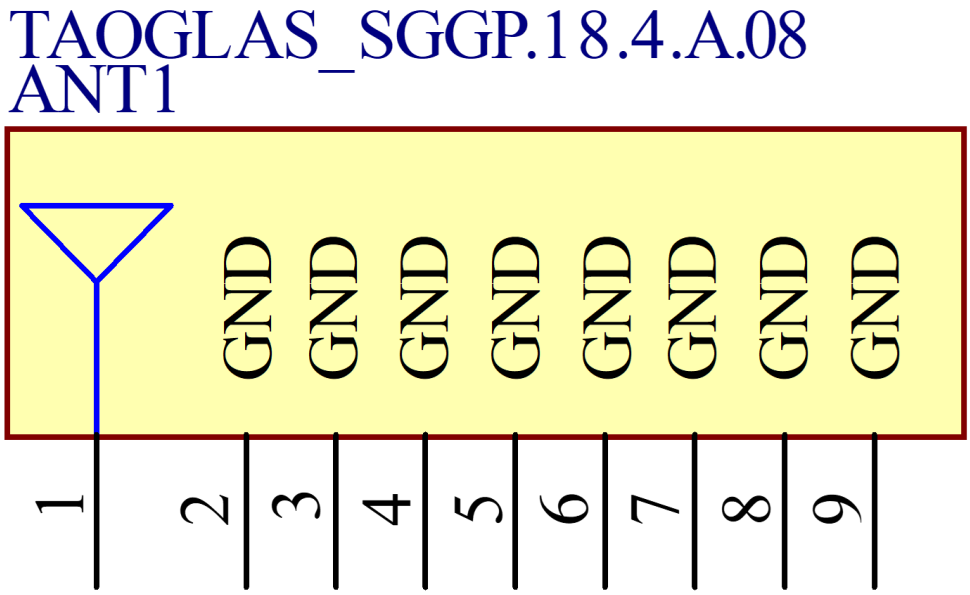




6.1 Schematic Symbol and Pin Definition

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



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

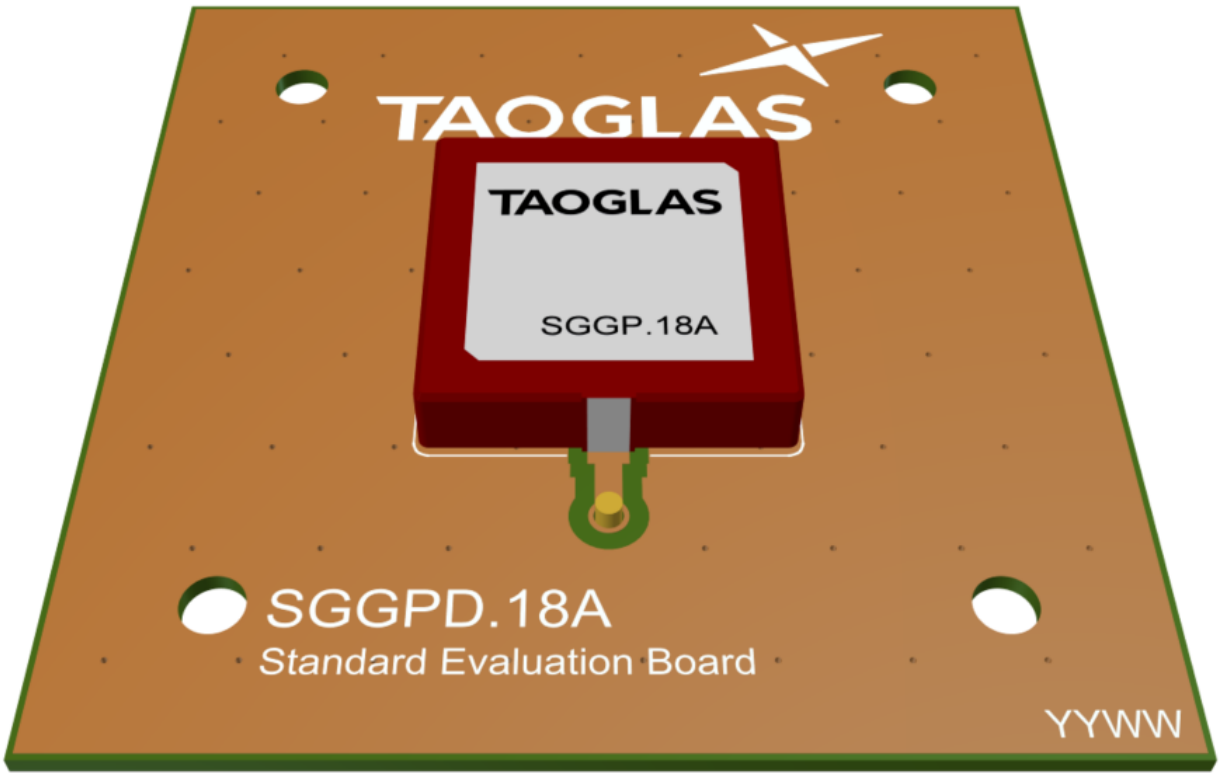
https://www.taoglas.com/product/sggp-18-4-a-08-gps-glonass-galileo-smd-18184mm-mount-patch/

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.



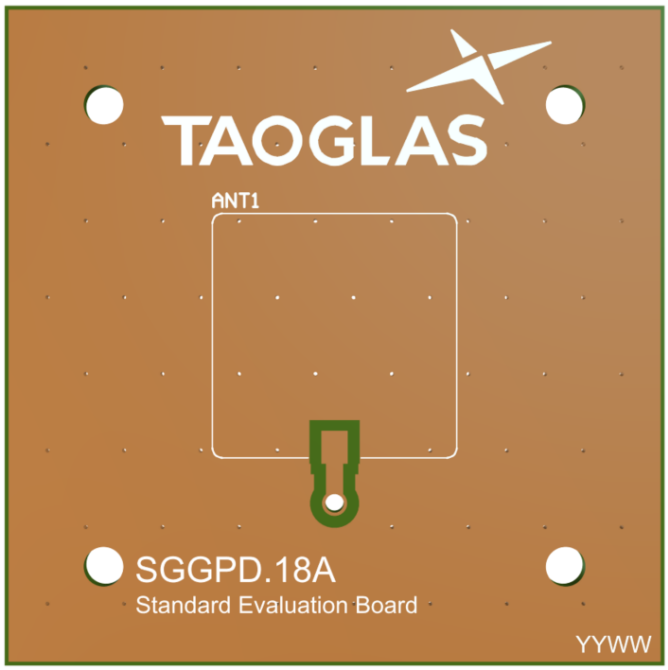
Top Side w/ Solder Mask



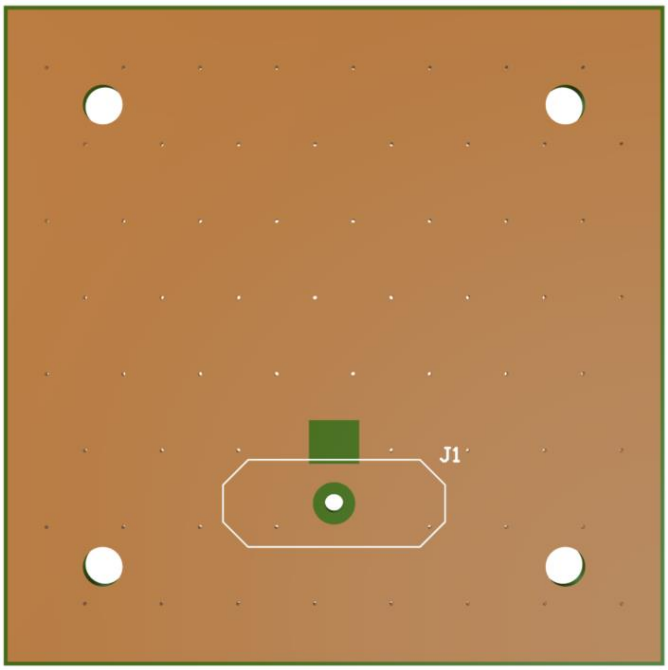
Top Side w/o Solder Mask

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.

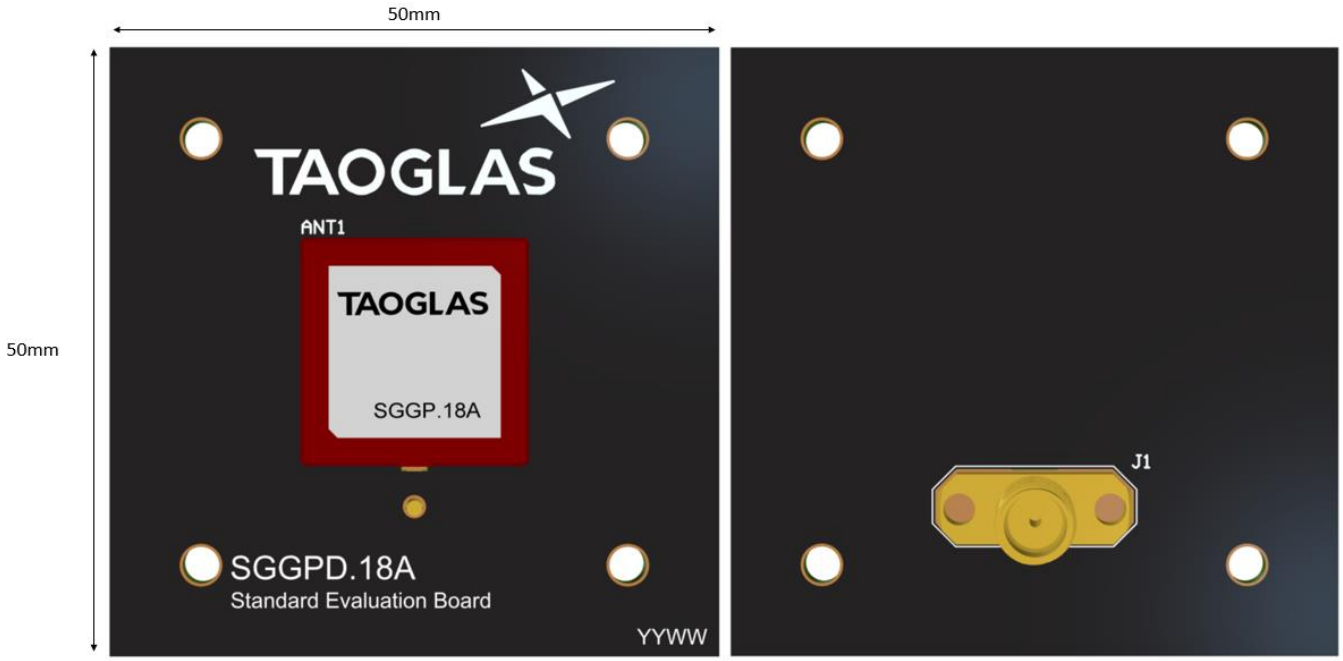


Topside

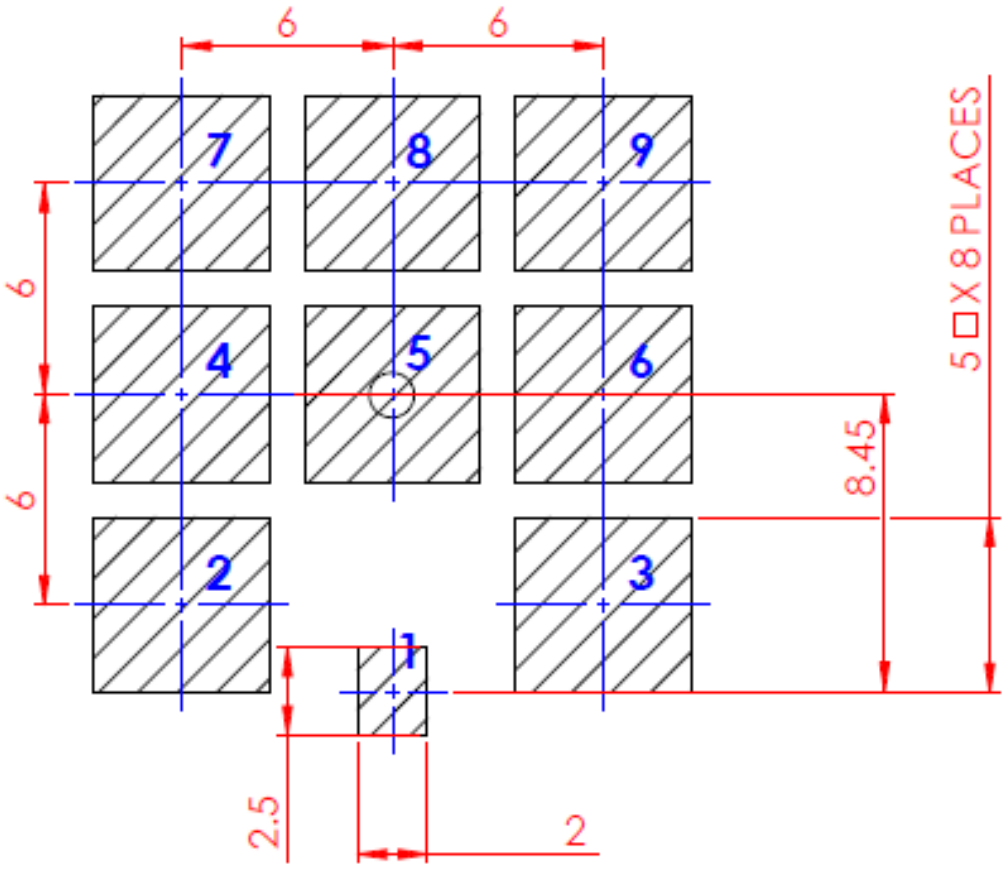


Bottom Side

6.4 Evaluation Board



6.5 Footprint

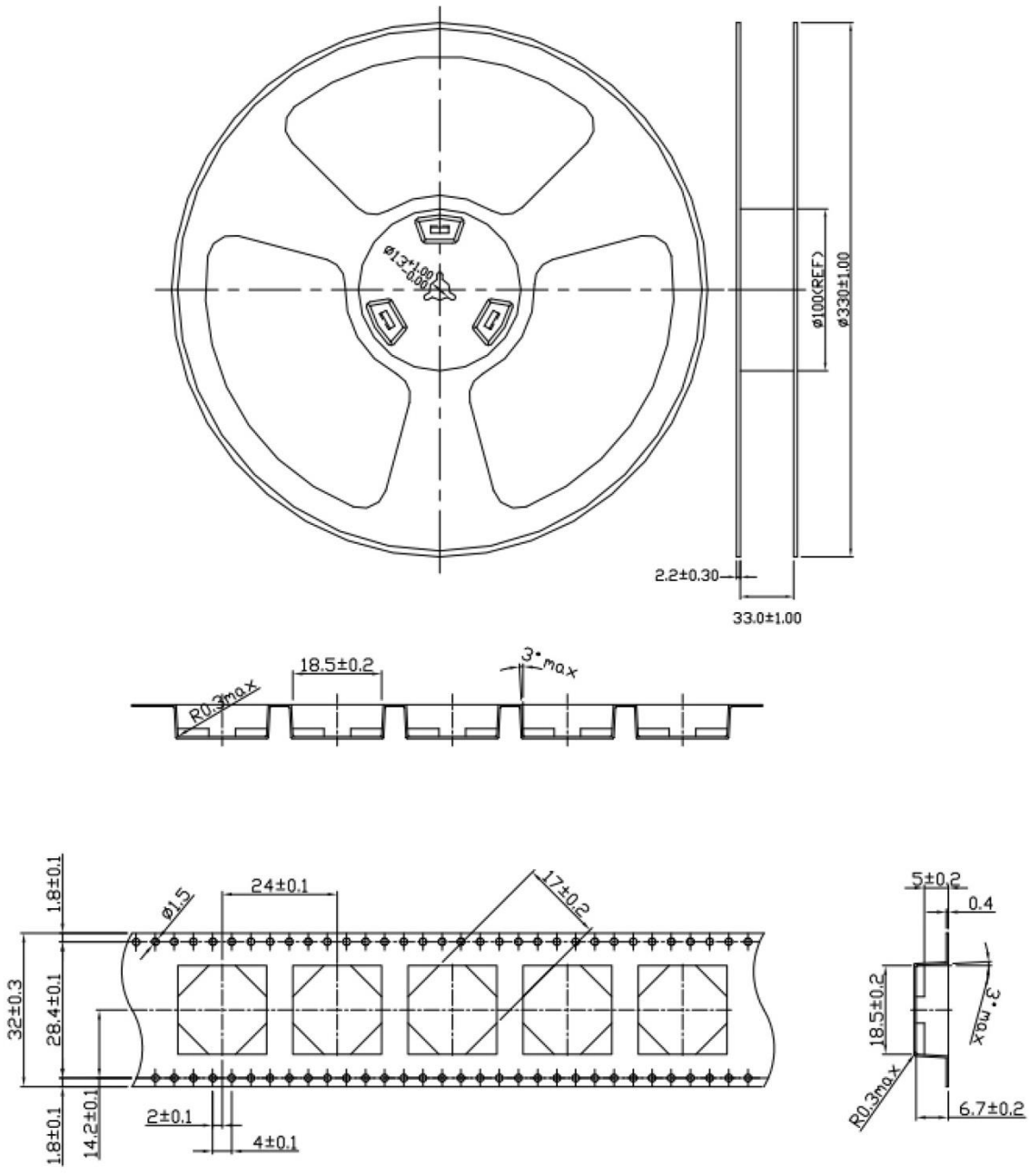


FOOTPRINT PCB

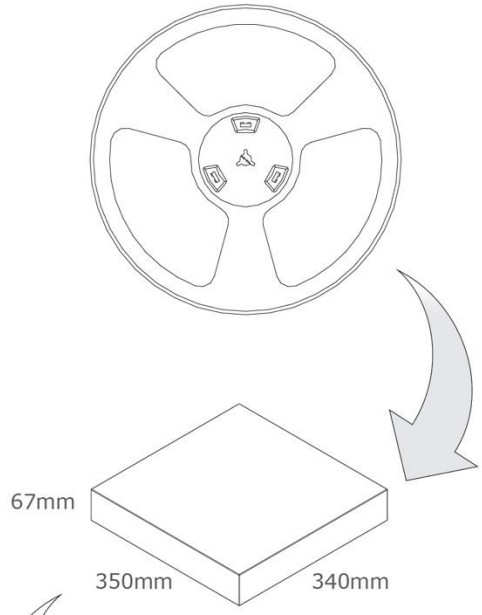
PIN	DESCRIPTION:
1	RF FEED (50 Ohm)
2	GROUND
3	GROUND
4	GROUND
5	GROUND
6	GROUND
7	GROUND
8	GROUND
9	GROUND

7. Packaging

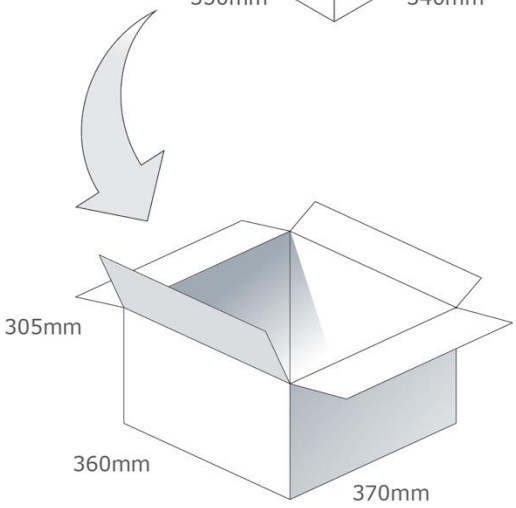
200 pc SGGP.18.4.A.08 per reel
Dimensions - Ø330*33mm
Weight - 2.125Kg



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

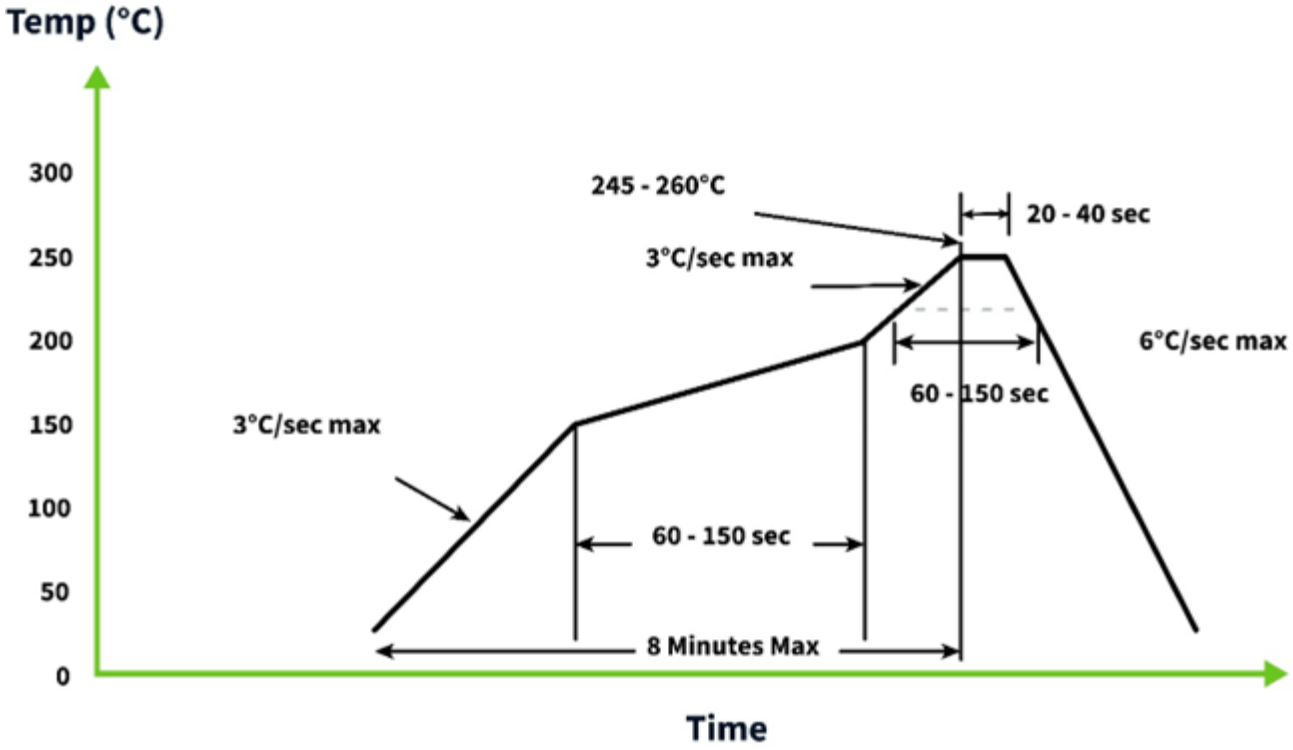


800 pcs SGGP.18.4.A.08 per carton
Dimensions - 370*360*305mm
Weight - 8.5Kg



8. Soldering Recommendations

The SGGP.18.4.A.08 can be assembled by following the recommended soldering temperatures are as follows:



*Temperatures listed within a tolerance of +/- 10º C

Smaller components are typically mounted on the first pass, however, we do advise mounting the SGGP.18.4.A.08 when placing larger components on the board during subsequent reflows.

Changelog for the datasheet

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

Revision: F (Current Version)	
Date:	2023-01-05
Changes:	Updated Solder Reflow Information.
Changes Made by:	Cesar Sousa

Previous Revisions

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

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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