TAOGLAS

Datasheet

Globalstar 25mm 1615Mhz

Part No:
SP.1615.25.4.A.02

Description:
25*25*4mm Globalstar 25mm 1615Mhz

Features:

Embedded Ceramic Patch Antenna

Globalstar 1615Mhz

Dimensions: 25*25*4mm

RoHS & Reach Compliant

1. Introduction

This miniaturized 25mm square ceramic patch antenna is mounted via pin and double-sided adhesive and is the optimal embedded antenna solution for mobile Globalstar applications.

The antenna is tuned to a reference 60mm square ground-plane. With an efficiency of nearly 80% at 1615 MHz, the antenna exhibits excellent upper hemisphere radiation pattern stability. Axial ratio is less than 3 on antenna operational angles, with a minimum axial ratio of 0.54 at zenith. The SP.1615.25.4.A.02 gain and directivity characteristics have been analyzed and approved by Globalstar.

Different device ground-planes and housing environments may require a custom tuned antenna. Taoglas provides testing and support services to characterize this antenna in your device and determine whether a custom tuned solution is necessary. There is a minimum order quantity and possible NRE for a custom solution.

For further information or support with integrating this antenna into your device, please contact your regional Taoglas customer support team.

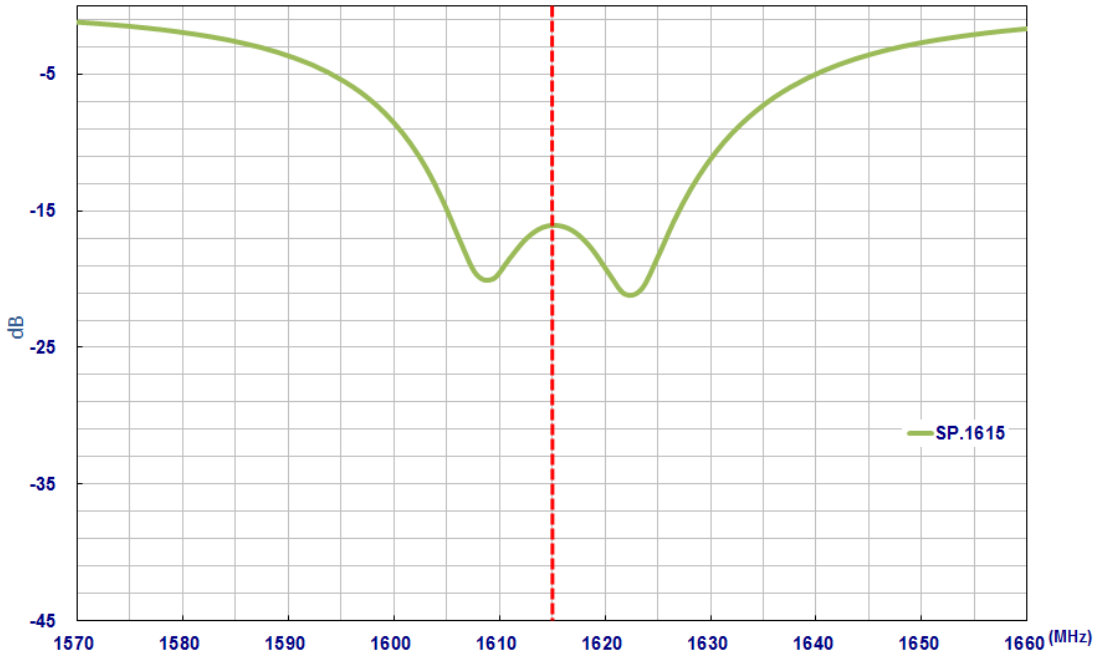
2. Specifications

Electrical		
Parameter	**Specification**	**Notes**
Range Of Receiving Frequency	1615.68 ± 4.1 MHz	
Center Frequency	1615 MHz ± 3 MHz	With 60×60mm GND Plane
Bandwidth	26 MHz min	Return Loss@-10 dB
VSWR	1.5 max	Center Frequency
Peak Gain	5 dBi	
Polarization	LHCP	Left Hand Circular Polarization
Axial Ratio	3 Max. @ Zenith	
Impedance	50 Ohm	

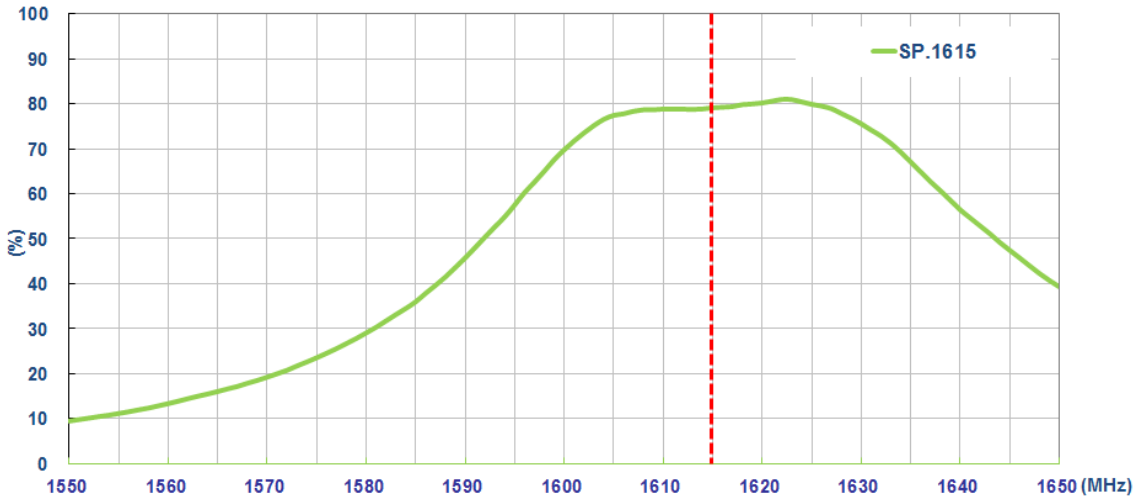
Mechanical	
Ceramic Dimension	25*25*5mm
Weight	5.8g
Enviorinmental	
Frequency Temperature Coefficient	-40°C to +105°C
Operating Temperature	-40°C to +105°C

3. Antenna Characteristics

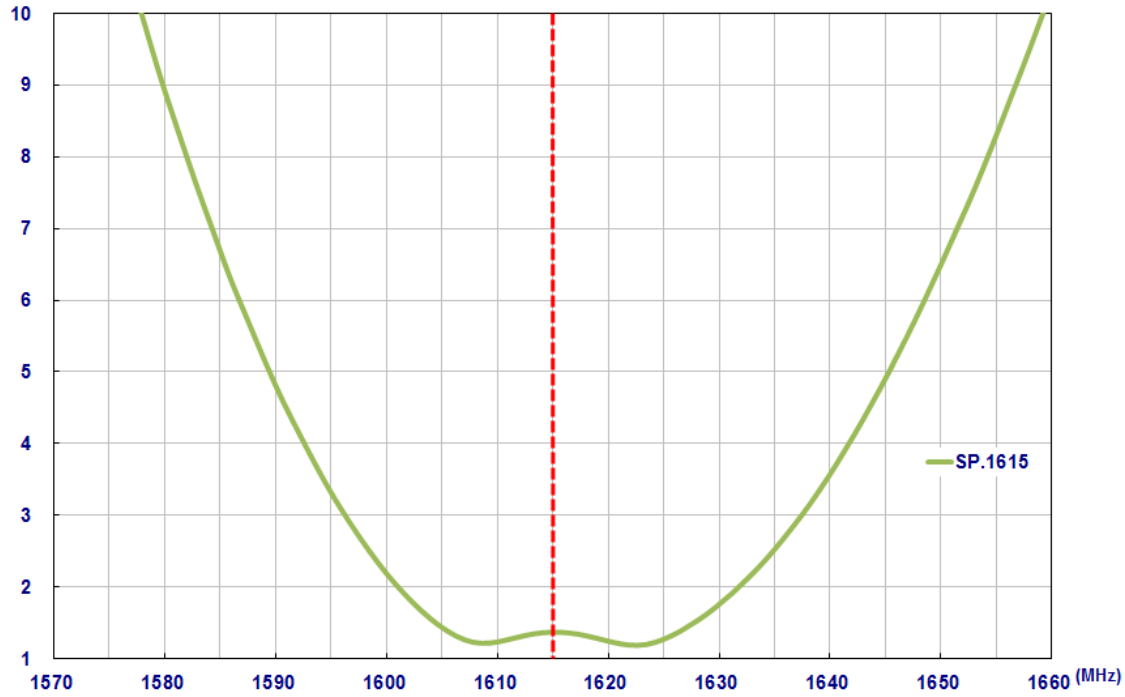
3.1 Return Loss



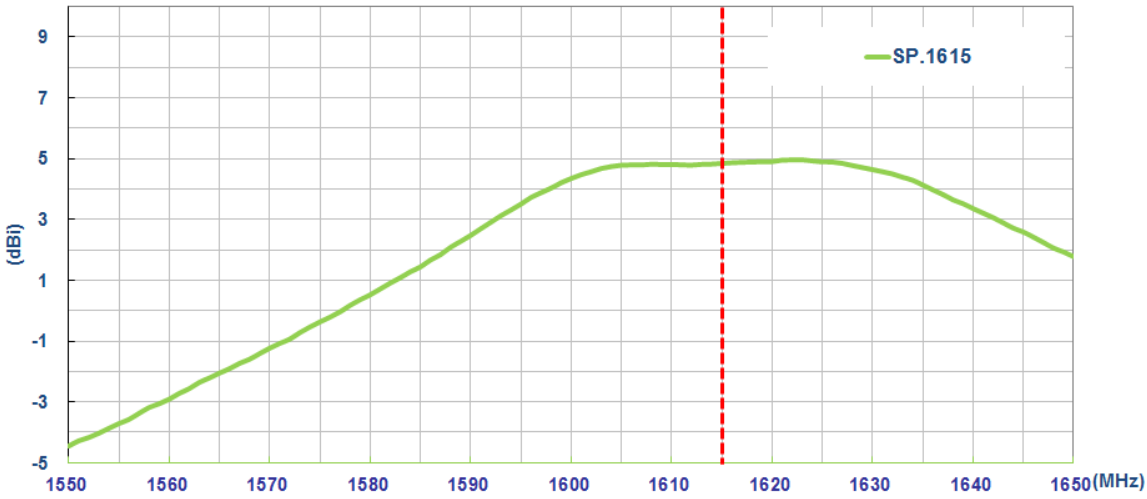
3.2 Efficiency



3.3 VSWR

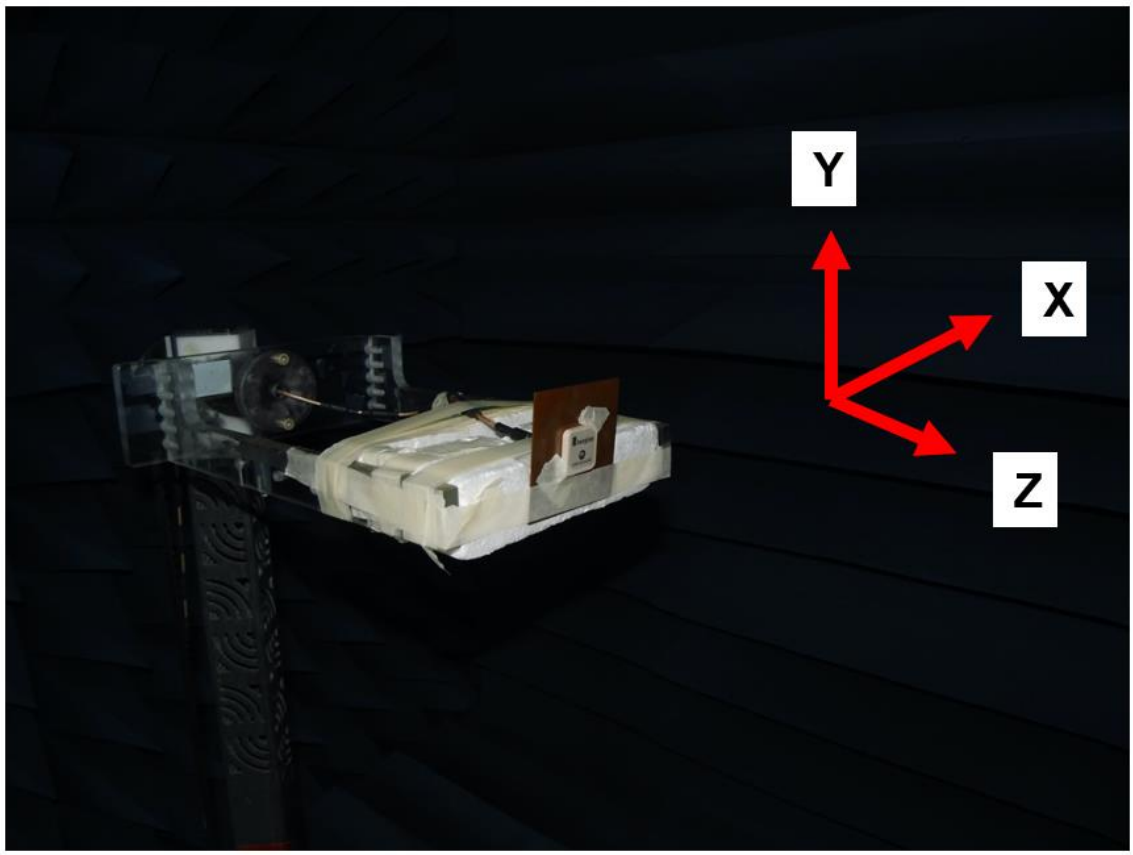


3.4 Peak Gain



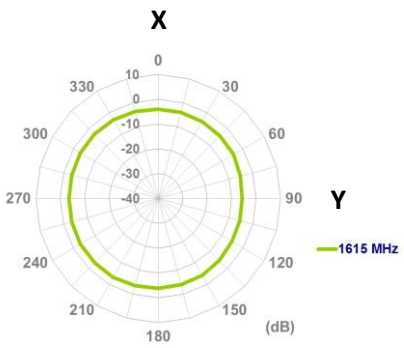
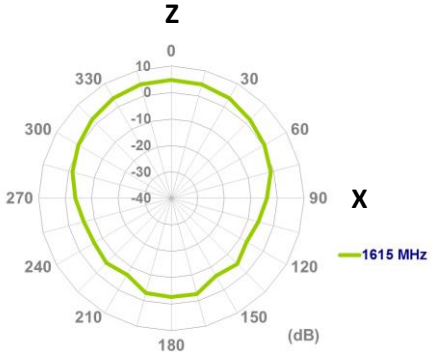
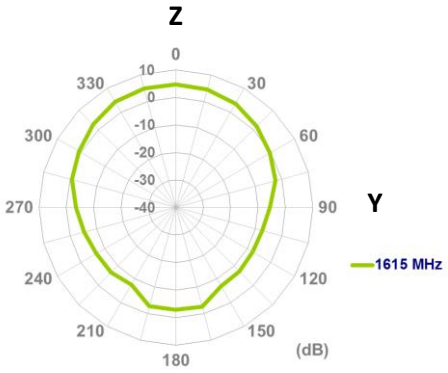
4. Radiation Patterns

4.1 Test Setup



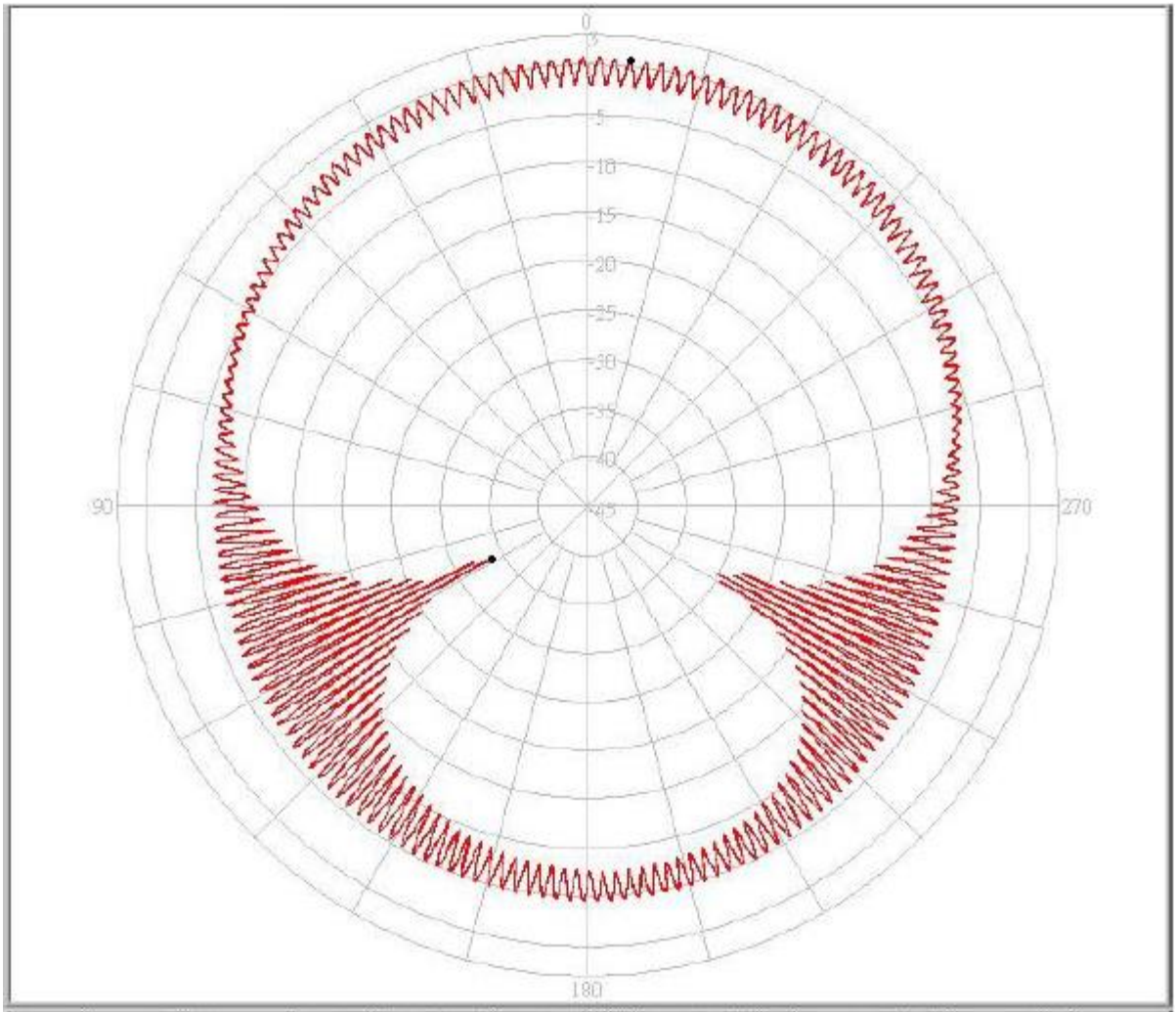
The antenna is tested in a CTIA certified ETS-Lindgren Anechoic Chamber

4.2 2D Radiation Patterns

XY Plane	XZ Plane	YZ Plane
		

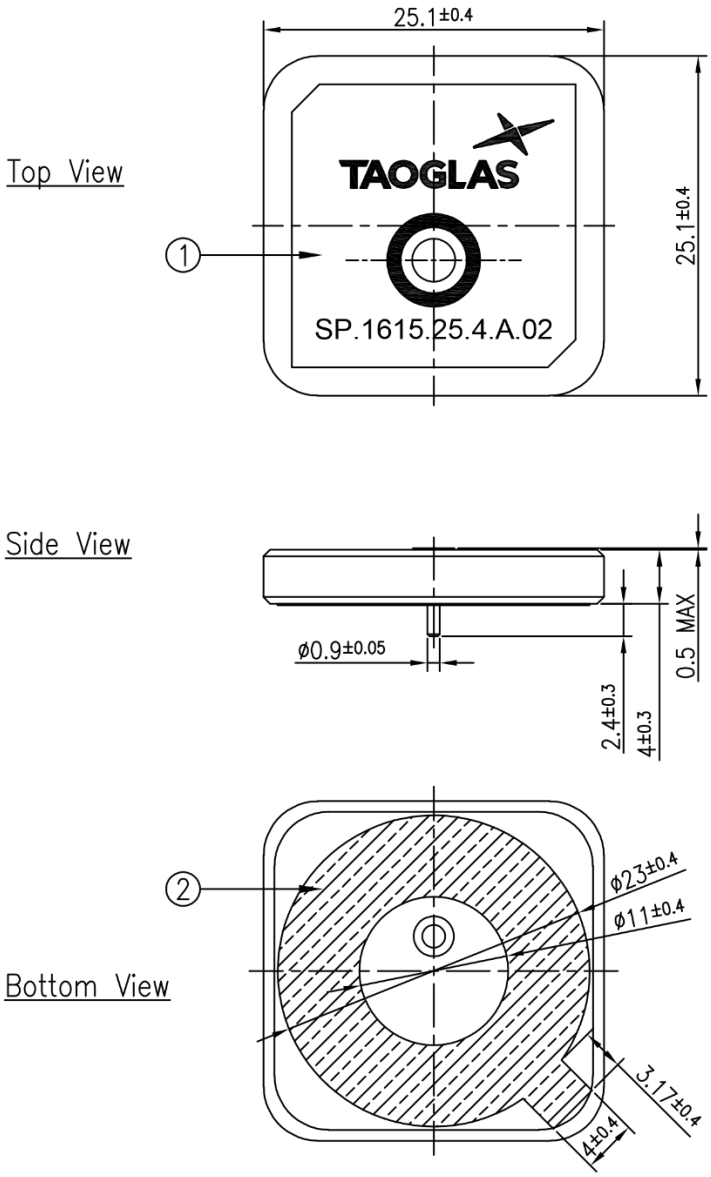
4.3 Axial Ration

1615MHz



Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	SP.1615.25.4.A.02	Axial Ratio	1615.00	0.65 / 354.48	-33.75 / 118.43	-4.65	CP	2014/5/12

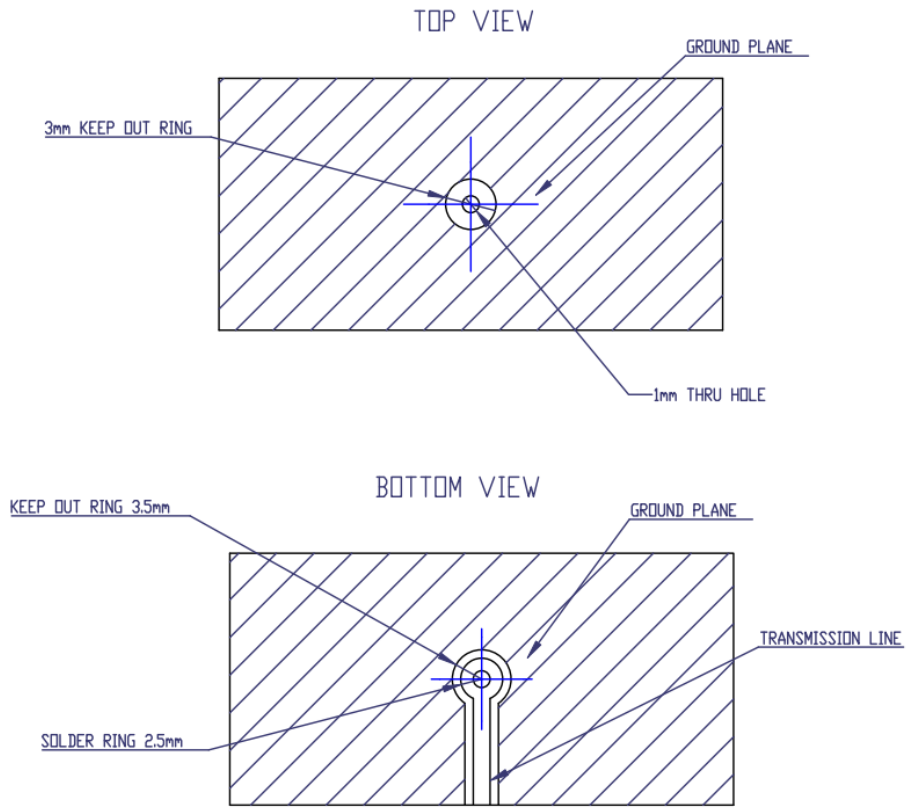
5. Mechanical Drawing (Units: mm)



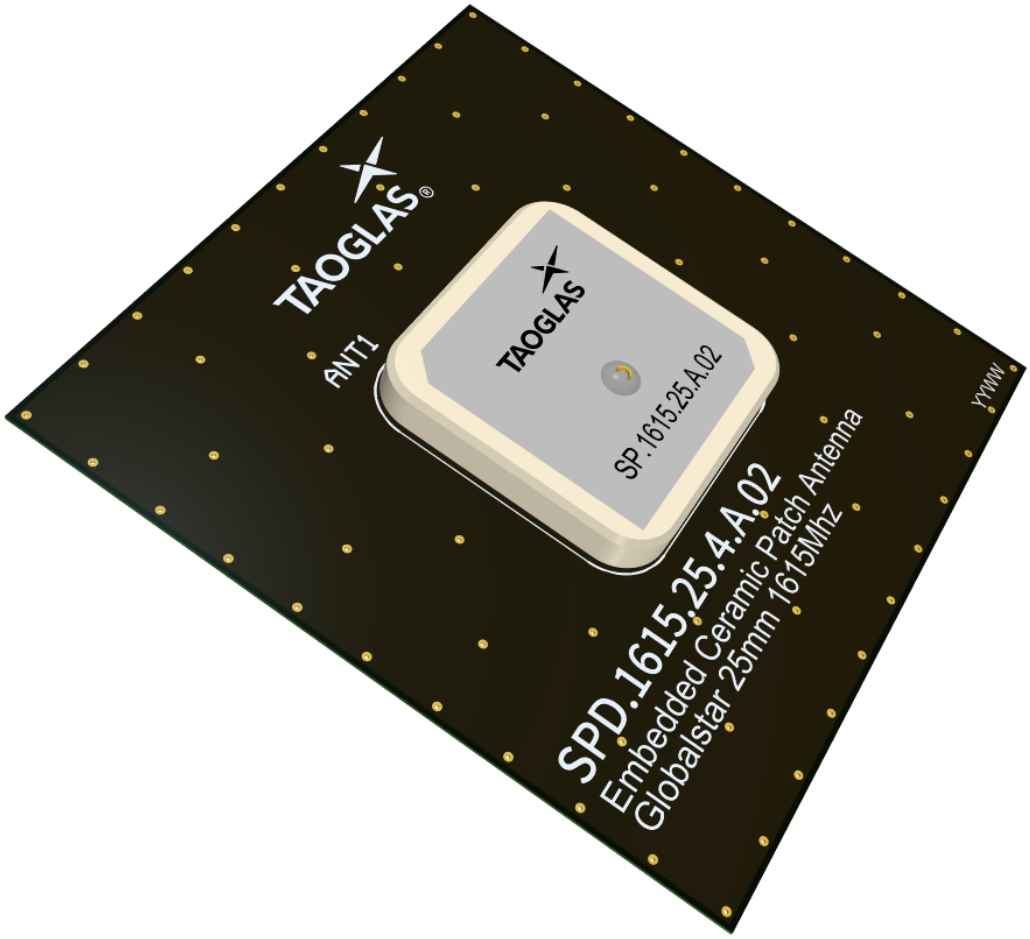
NOTES:
1. Double Sided Adhesive Area.
2. Soldermask Area

	Name	P/N	Material	Finish	QTY
1	Patch	001518A030000A	Ceramic	Clear	1
2	Double sided Adhesive	001518A030000A	NITTO 5015	White Linter	1

6. PCB Footprint Recommendation



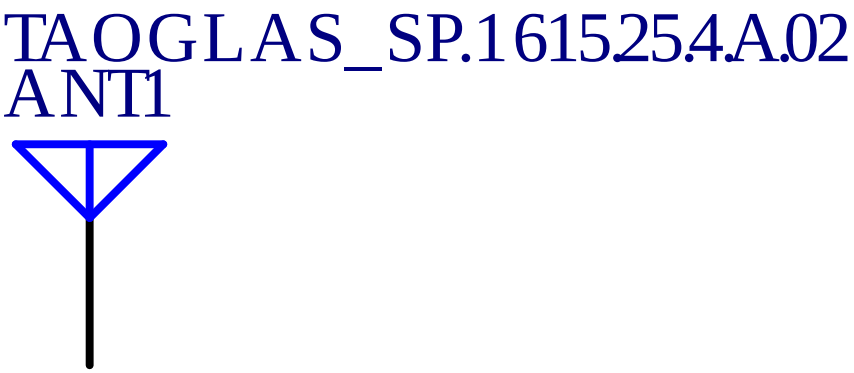
7. Antenna Integration Guide



7.1 Schematic Symbol and Pin Definition

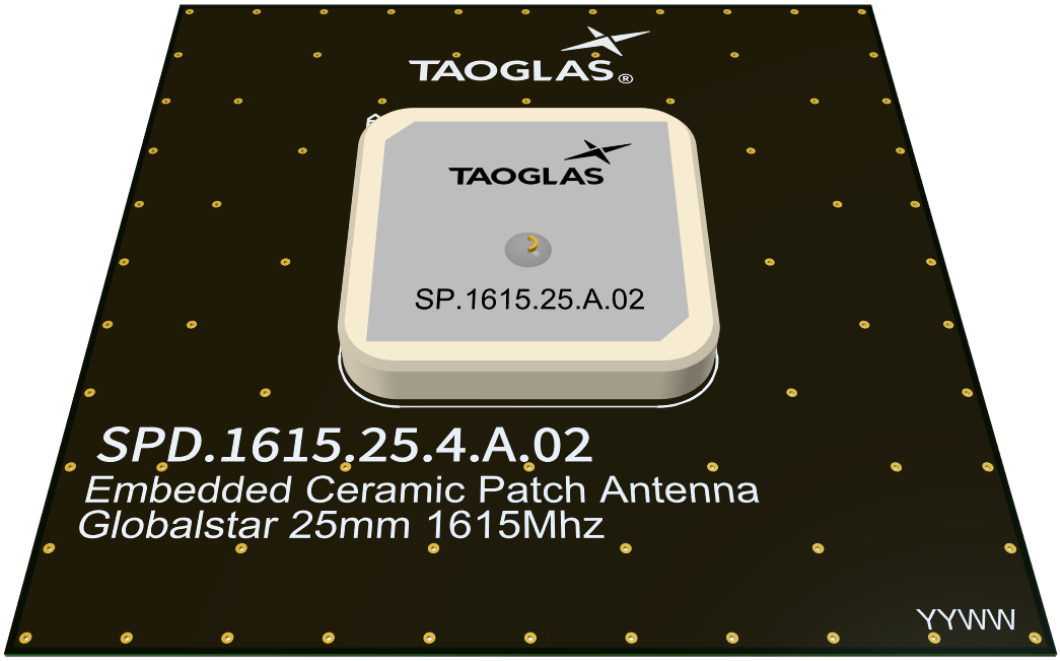
The circuit symbol for the antenna is shown below. The antenna has 1 pin as indicated below.

Pin	Description
1	RF Feed

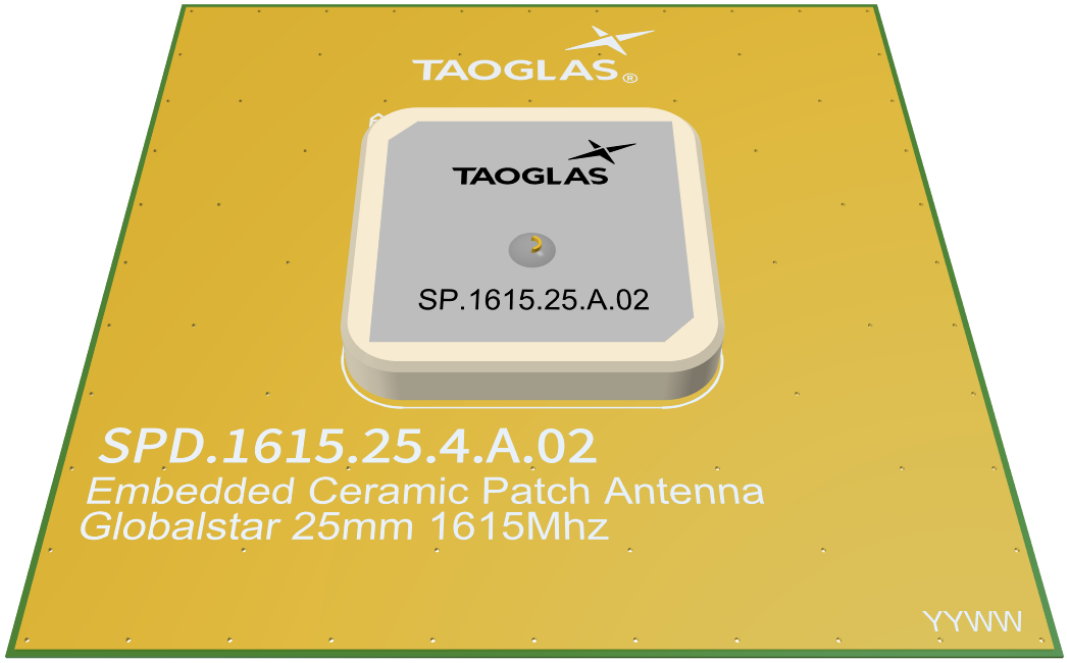


7.2 Antenna Integration

The antenna should be placed at the center of the ground plane with a length and width of 60mm. 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.



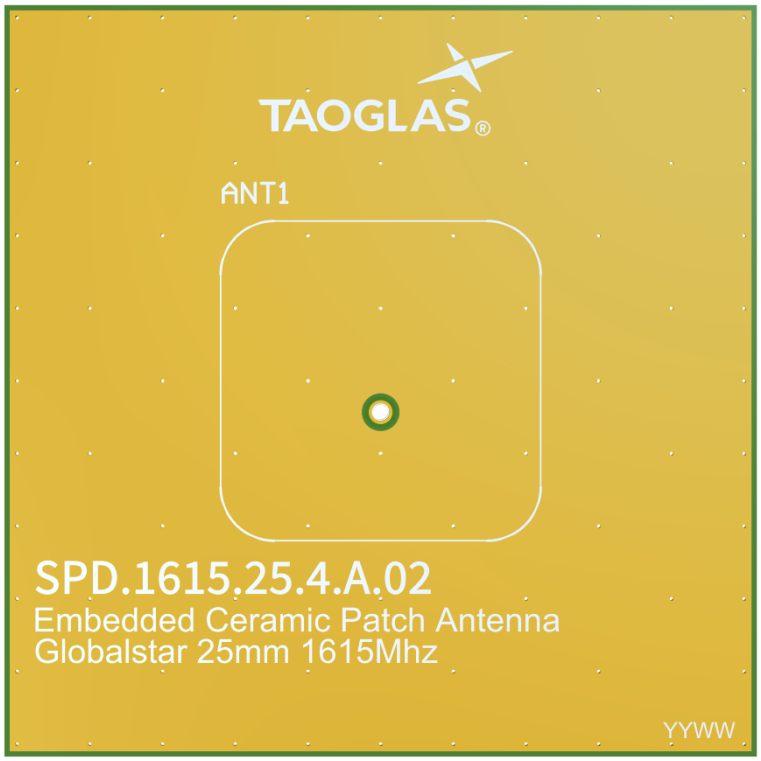
Top Side w/ Solder Mask



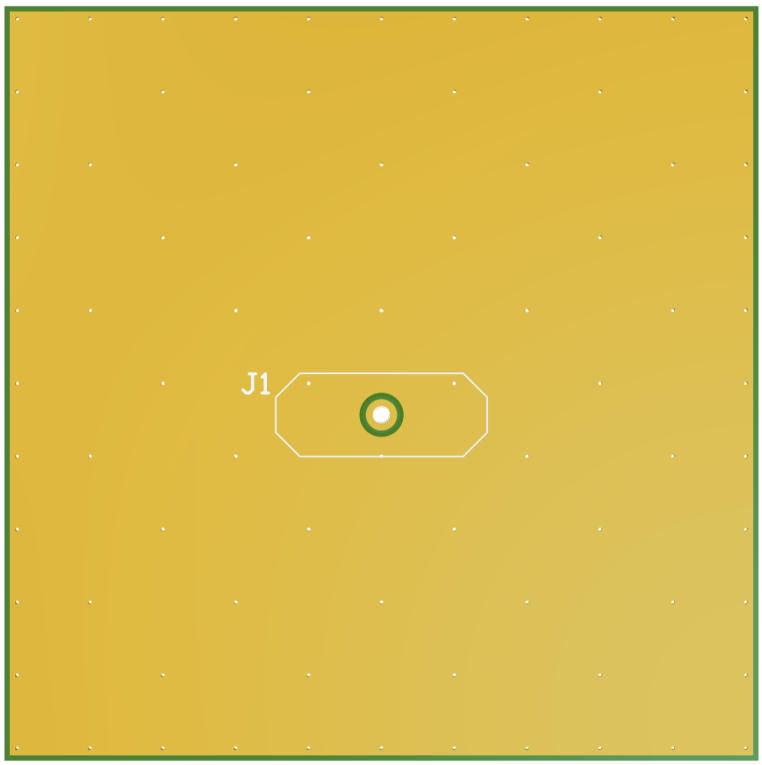
Top Side w/o Solder Mask

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.

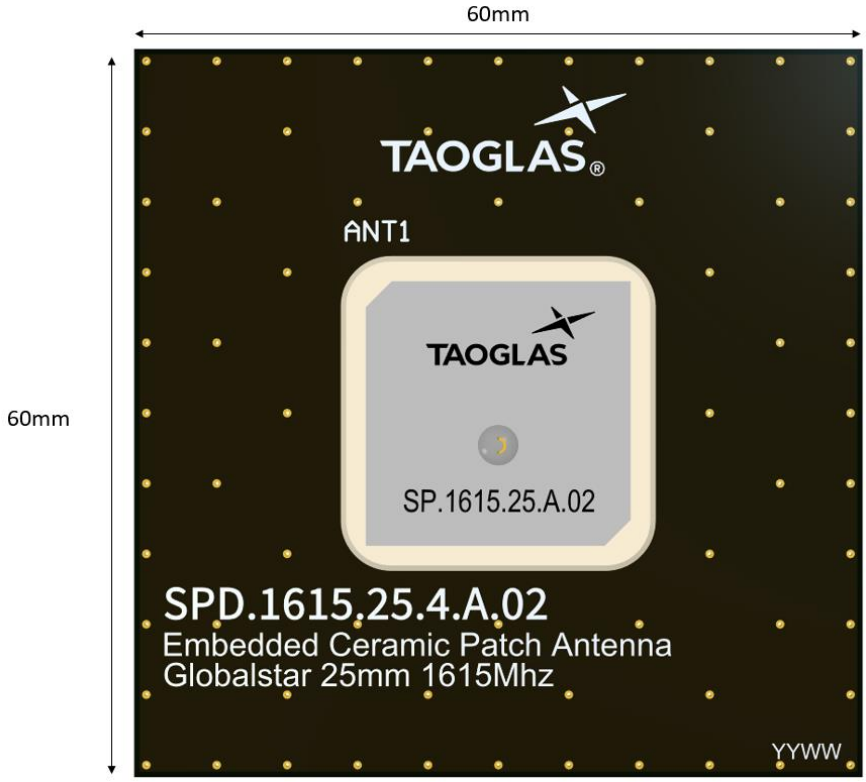


Topside

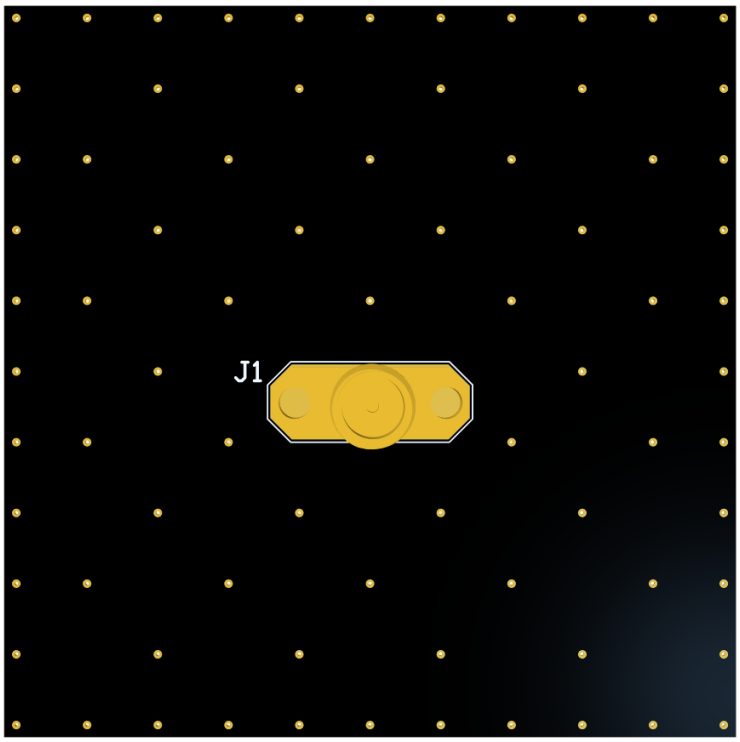


Bottom Side

7.4 Evaluation Board

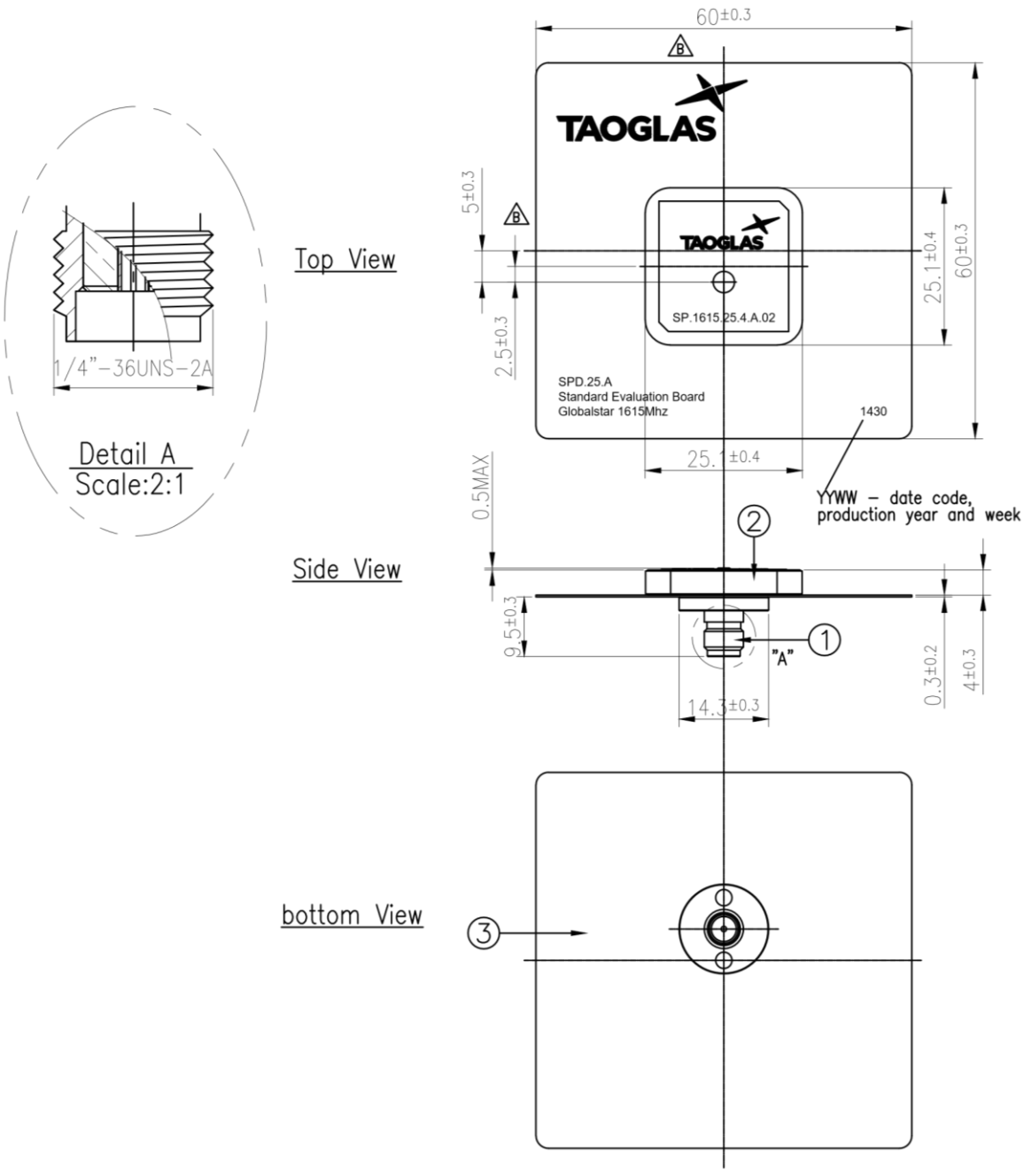


Topside



Bottom Side

8. Mechanical Drawing – Evaluation Board



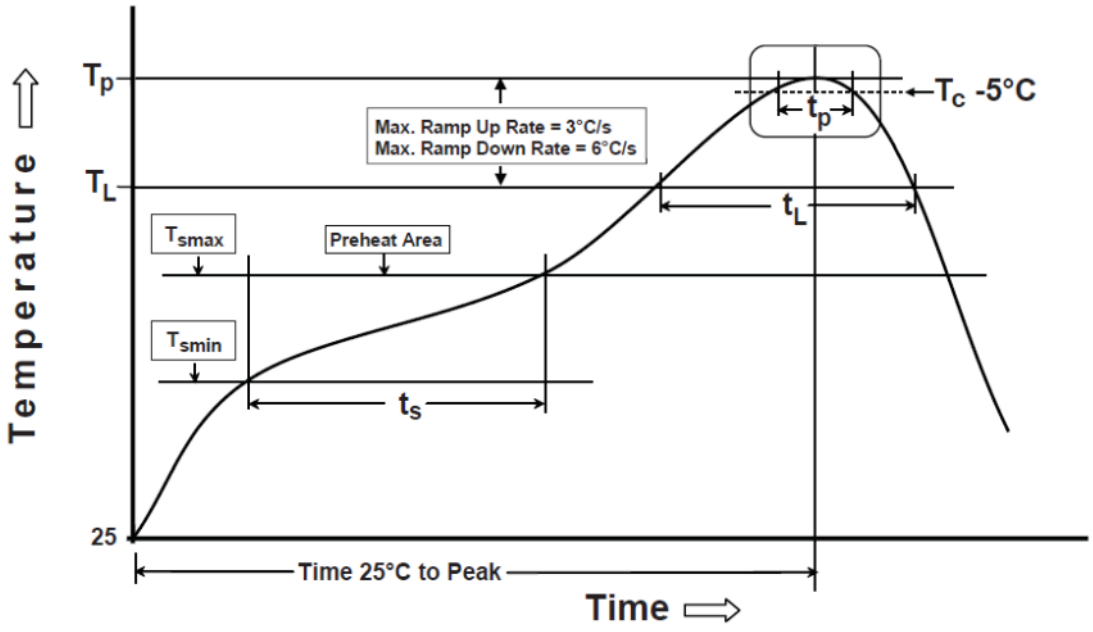
	Name	P/N	Material	Finish	QTY
1	SMA(F) ST	200413L000007A	Brass	Au Plated	1
2	SP.1615.25 Patch	001514F010007A	Ceramic	Clear	1
3	Brass Ground–Plane	000514F030007A	Brass	Silver	1

9. Recommended Reflow Soldering Profile

SGGP.12 can be assembled following Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follows:

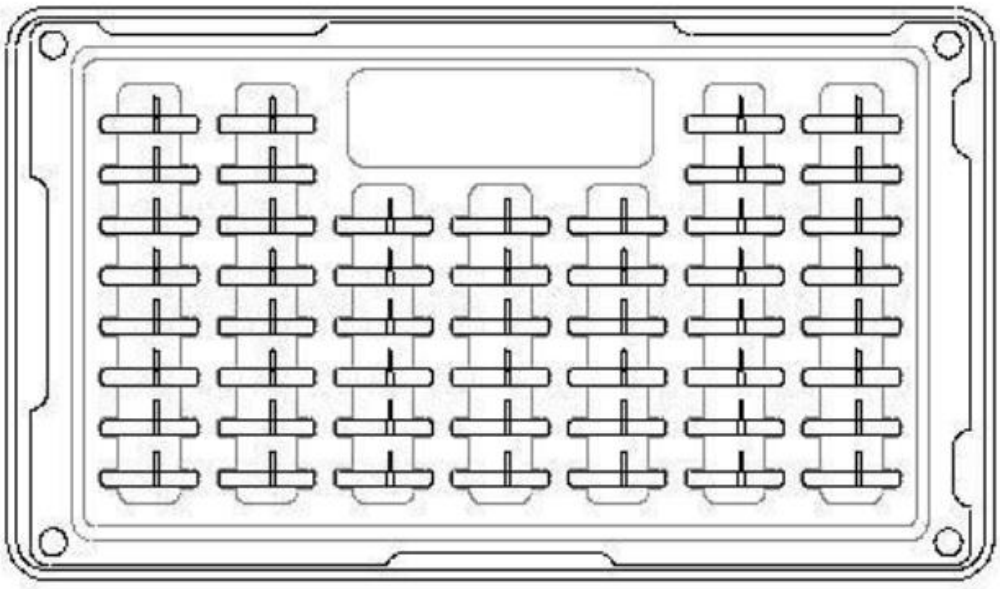
Phase	Profile Features	Pb-Free Assembly (SnAgCu)
Preheat	Temperature Min(Tsmin) Temperature Max(Tsmax) Time(ts) from (Tsmin to Tsmax)	150°C 200°C 60-120 seconds
Ramp-up	Avg. Ramp-up Rate (Tsmax to TP)	3°C/second(max)
Reflow	Temperature(TL) Total Time above TL (tL)	217°C 30-100 seconds
PEAK	Temperature(TP) Time(tp)	260°C 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

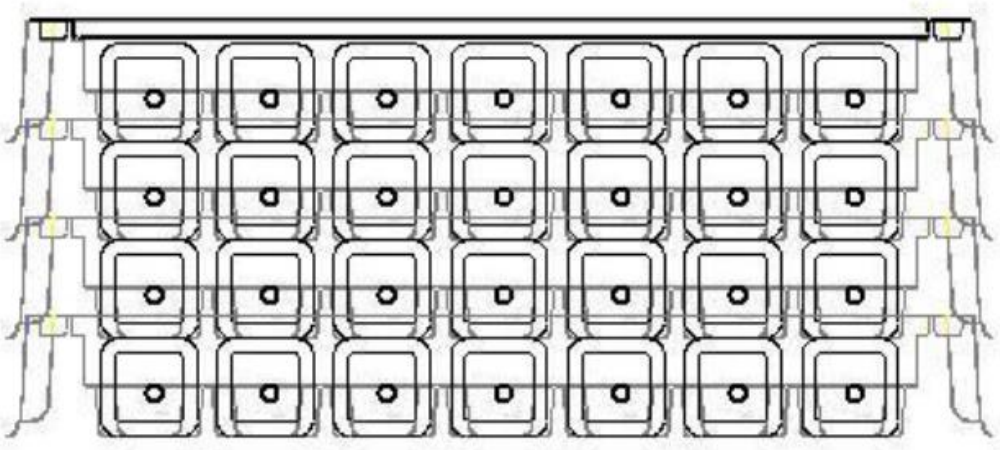
The graphic shows temperature profile for component assembly process in reflow ovens



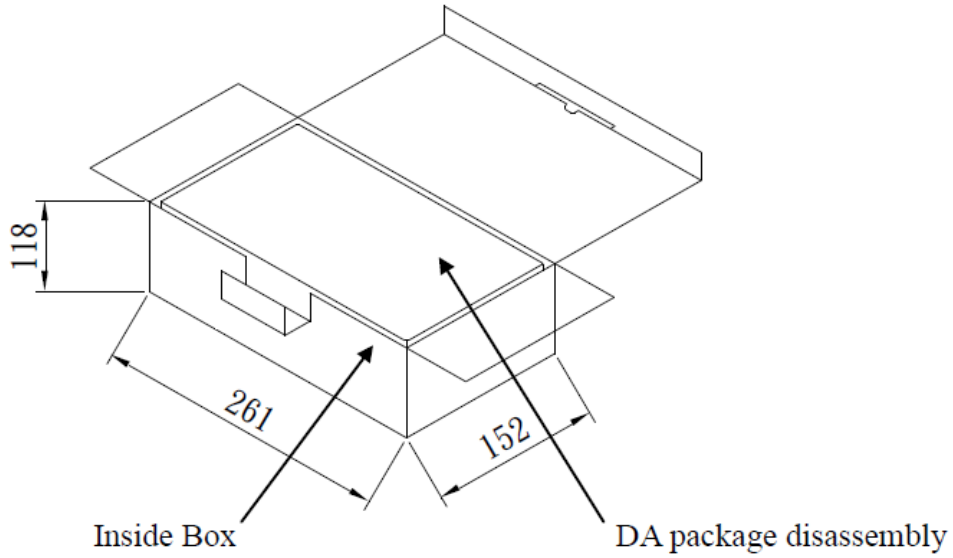
Soldering Iron condition: Soldering iron temperature 270°C±10°C.
Apply preheating at 120°C for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron temperature over 270°C±10°C for 3 seconds, it may cause component surface peeling or damage.

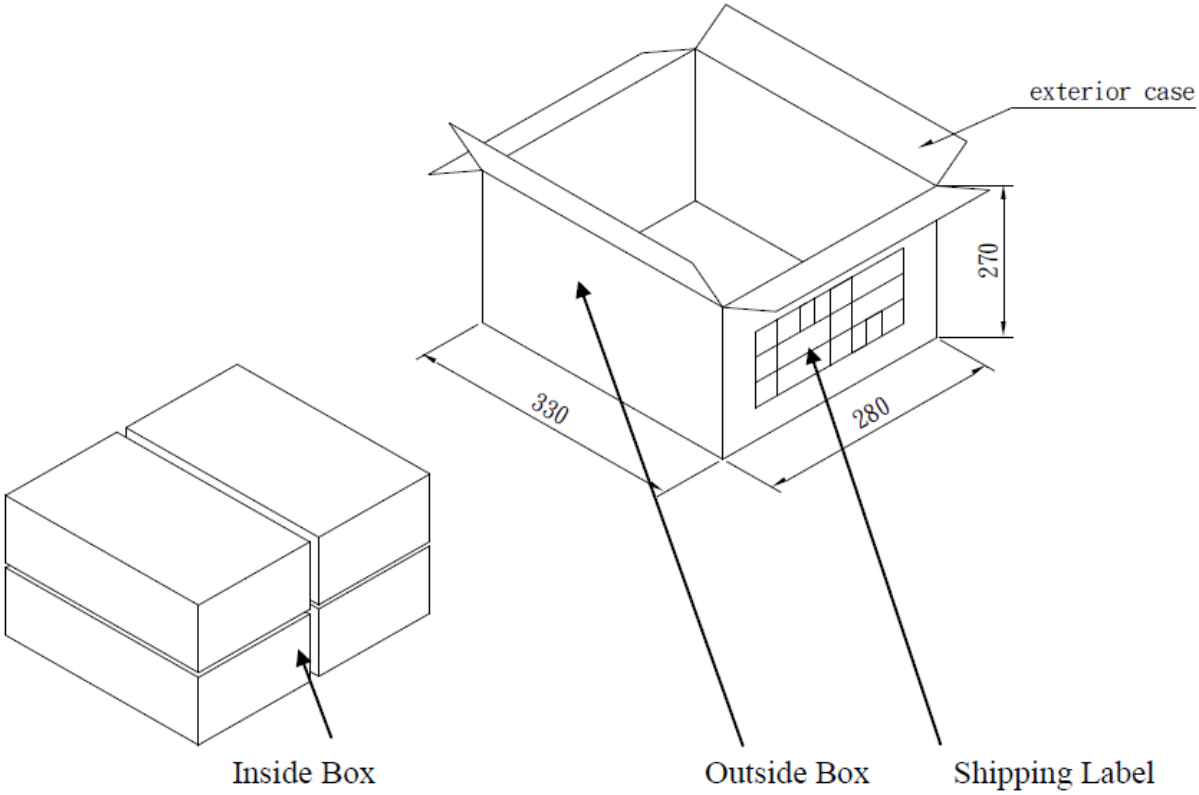
10. Packaging





50 pieces per tray
200 pieces per inner carton
800 pieces per outer carton





Changelog for the datasheet

SPE-14-8-104-E- SP.1615.25.4.A.02

Revision: C(Current Version)	
Date:	2023-03-16
Changes:	Antenna Integration Guide Added
Changes Made by:	Cesar Sousa

Previous Revisions

Revision: B	
Date:	2022-06-30
Changes:	Updated specification
Changes Made by:	Cesar Sousa

Revision: A (Original First Release)	
Date:	2016-05-01
Notes:	First Release
Author:	MC

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