

**SGP.18c**

Specification

<b>Part No.</b>	SGP.1575.18.4.C.02
<b>Product Name</b>	GPS SMT Patch Antenna
<b>Feature</b>	18mm*18mm*4.5mm 1575MHz Centre Frequency Patent Pending  RoHS Compliant

## 1. Introduction

This ceramic GPS patch antenna is based on smart **XtremeGain™** technology. It is mounted via SMT process and has been selected as optimal solution for the 45x45mm ground plane.

## 2. Specification

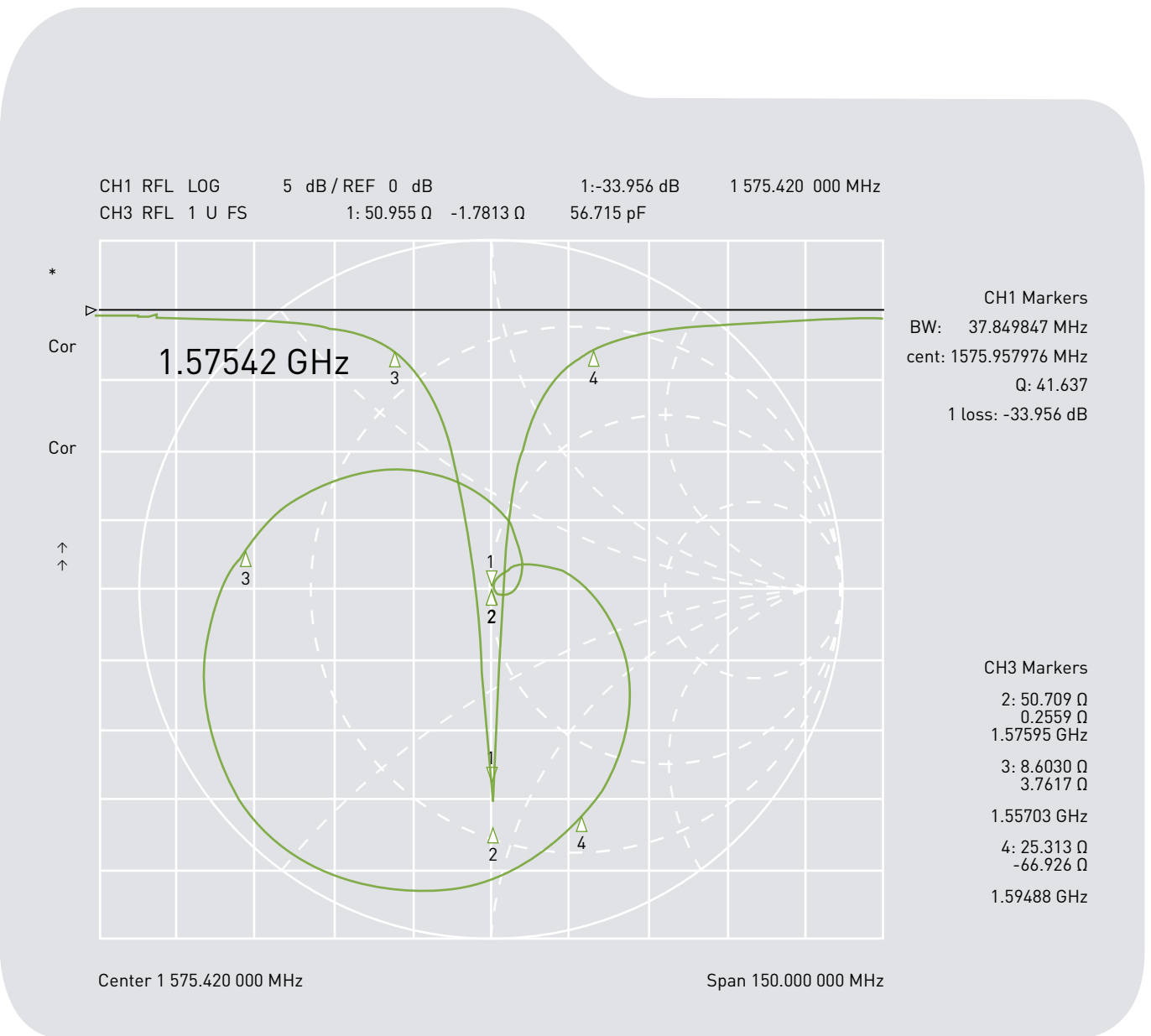
### Original Patch Specification tested on 45mm ground plane

NO	PARAMETER	SPECIFICATION	NOTES
1	Range of Receiving Frequency	1575.42 MHz ± 1.023 MHz	
2	Center Frequency	1575.42 ± 3MHz	With 45*45mm Ground Plane
3	Bandwidth	5MHz min	Return Loss ≤-10 dB
4	VSWR	1.5 max	
5	Gain at Zenith	+1.0 dBic typ.	
6	Gain at 10°elevation	-3.0 dBic typ.	
7	Axial Ratio	4.0 dB max	
8	Polarization	RHCP	
9	Impedance	50 Ohms	
10	Frequency Temperature Coefficient (rf)	0 ± 20ppm / °C	-40°C to +85°C
11	Operating Temperature	-40°C to +85°C	

**\*\*Changes in user groundplane and environment will offset centre frequency**

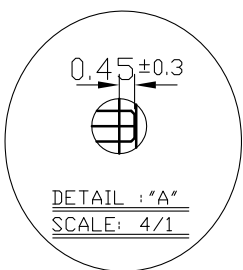
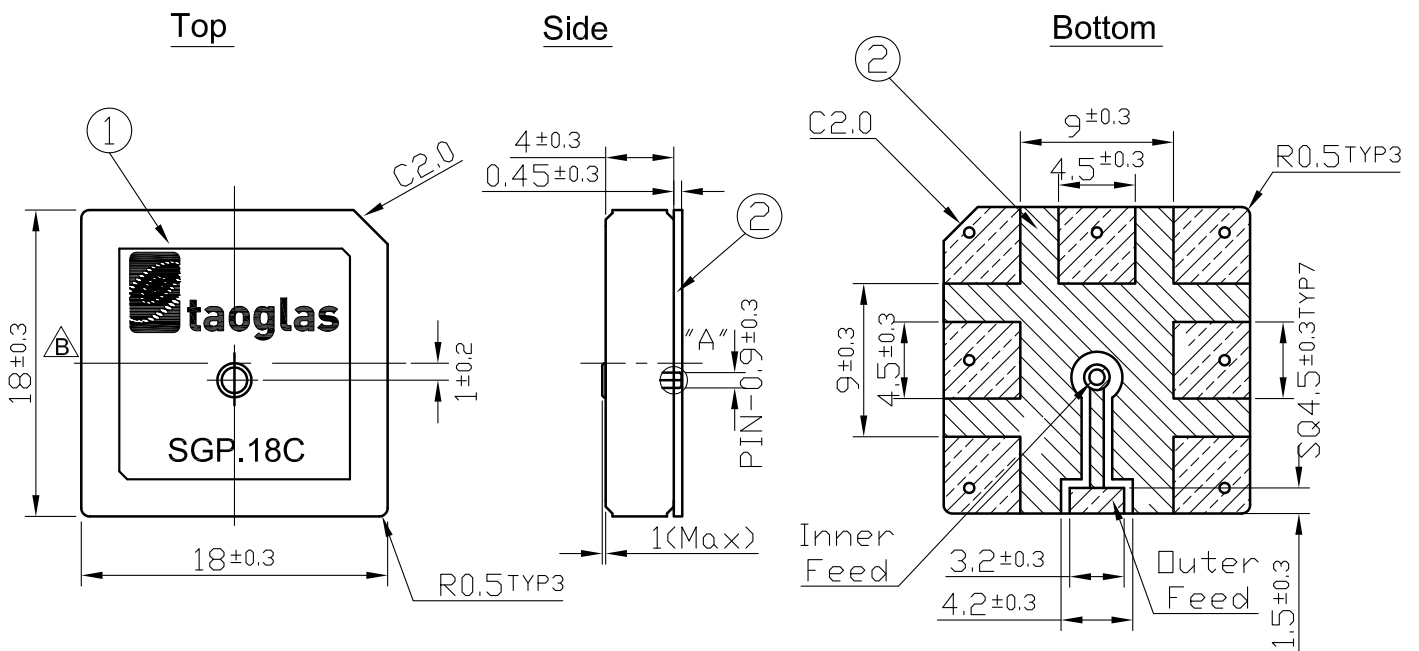
### 3. Electrical Specifications

#### 3.1 Return Loss, SWR, Impedance, measured on the test fixture





## 4. Mechanical Specifications

### 4.1 Antenna Dimensions and Drawing



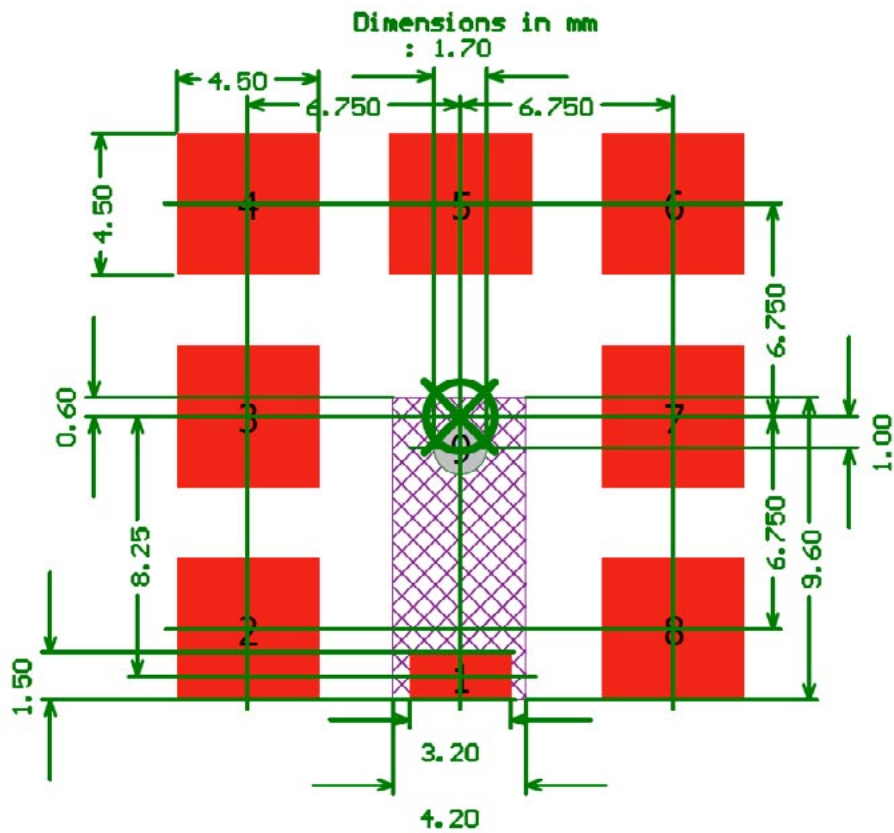
#### NOTE:

1. Solder mask. 
2. Area to be soldered. 
3. Dimension of 50 Ohm CPW dependent on individual board.
4. Matching circuit-capacitor and inductor values dependent on individual environment
5. Must be soldered to complete antenna feed connection

	Name	Part No.	Material	Finish	Quantity
1	SGP.18 Patch 18x18x4	SGP.18c	Ceramic	Clear	1
2	SGP.18 PCB		FR 0.5t	Green	1

## 4.2 Antenna Footprint

### 4.2.1 Top Copper

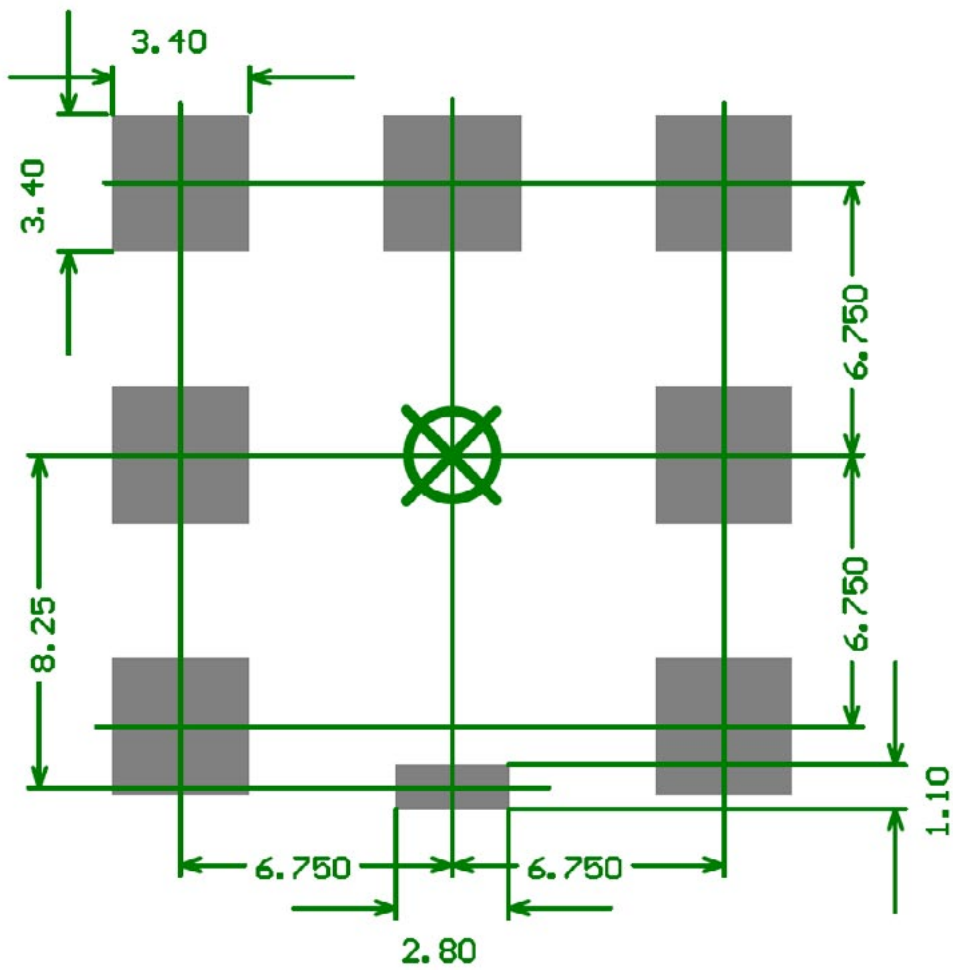


 **Copper Keepout Region**

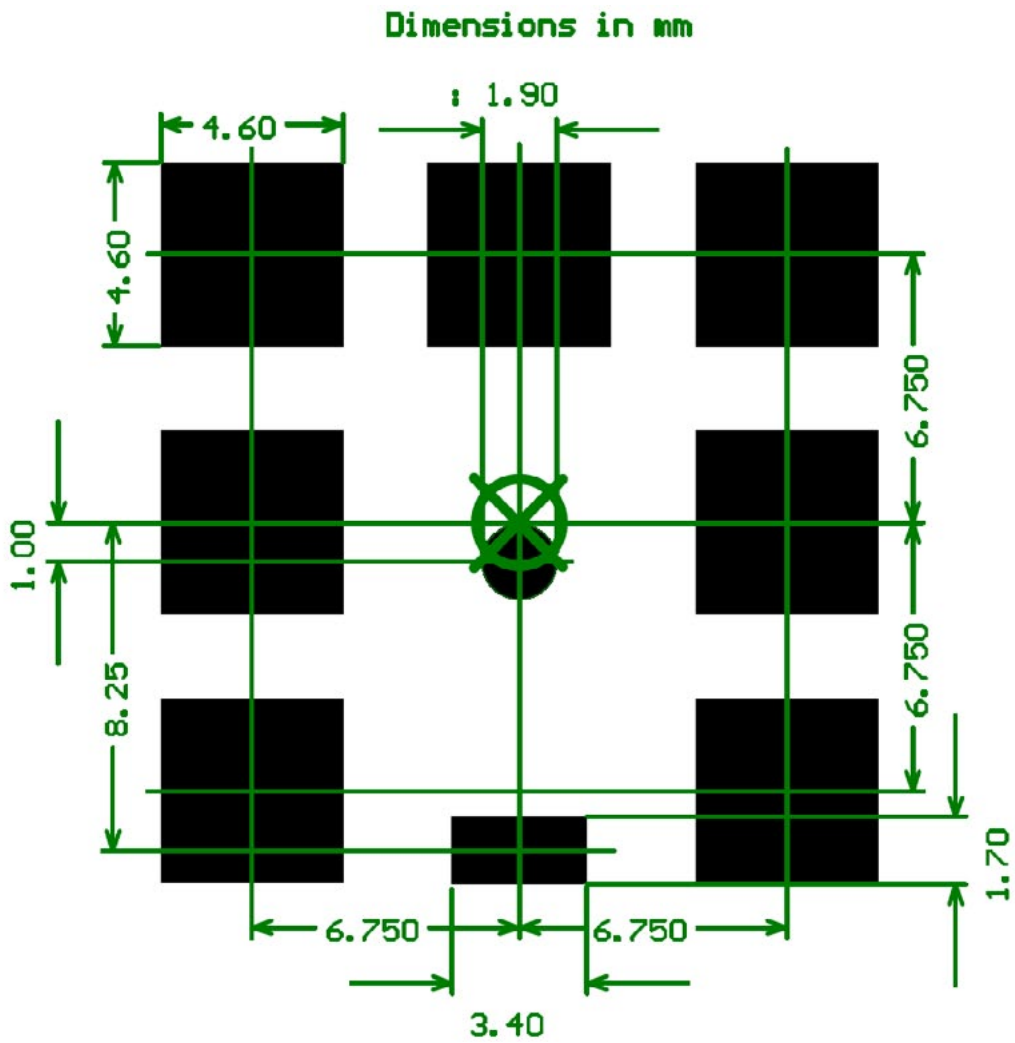
Pads 2, 3, 4, 5, 6, 7, 8 are the same size and should be connected to GND.  
 Pad 9 is a 1.70mm dia. non-plated thru-hole.  
 Connect 50 ohm transmission line to Pad 1.  
 Copper Keepout Region should extend at least 2 mm down into PCB.

### 4.2.2 Top Paste

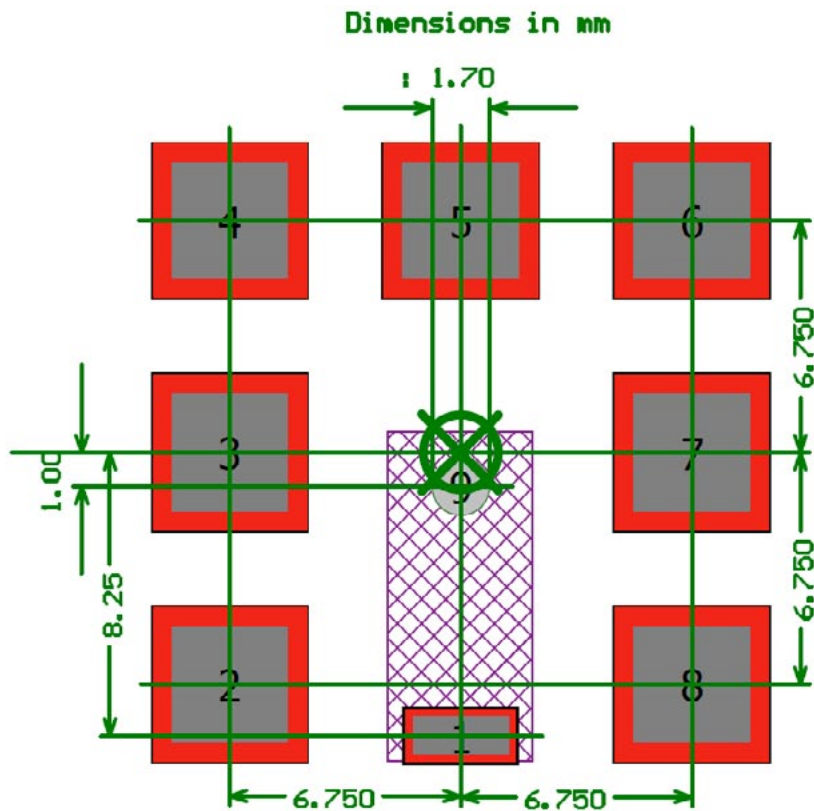
Dimensions in mm



### 4.2.3 Top Paste



### 4.2.4 Composite

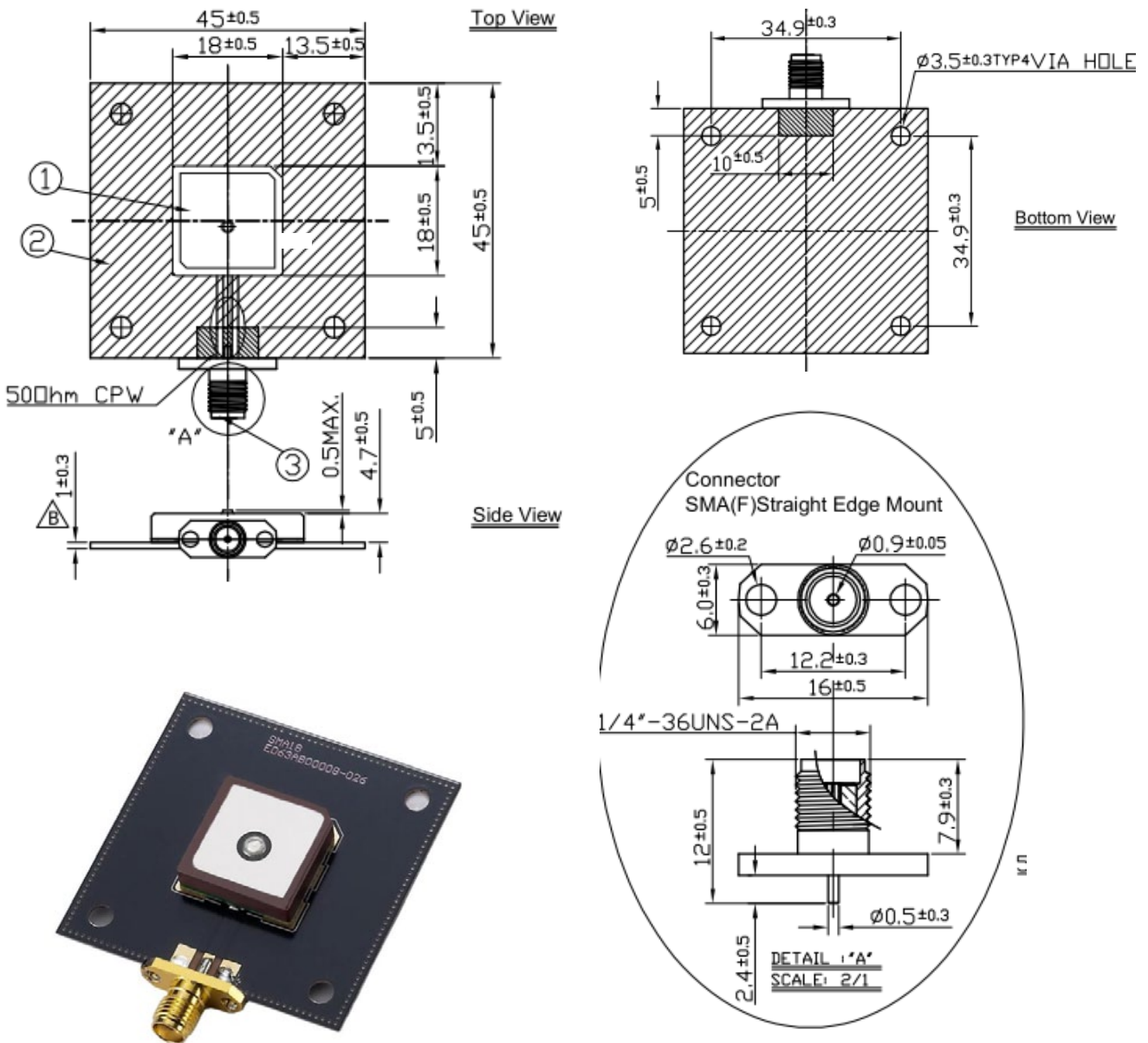


 **Copper Keepout Region**


Pads 2, 3, 4, 5, 6, 7, 8 are the same size and should be connected to GND.  
 Pad 9 is a 1.70mm dia. non-plated thru-hole.  
 Connect 50 ohm transmission line to Pad 1.  
 Copper Keepout Region should extend at least 2 mm down into PCB.



### 4.3 Test Jig and Dimension



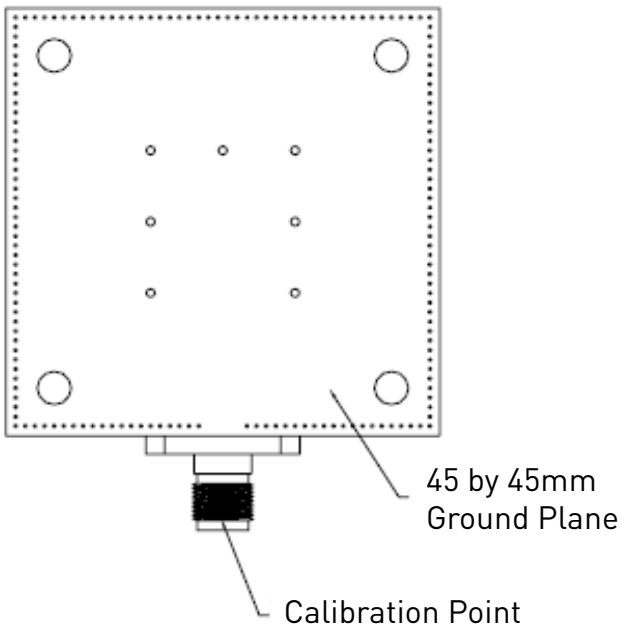
**NOTE:**

- 1. Solder Mask (Black) 
- 2. Solder Area 

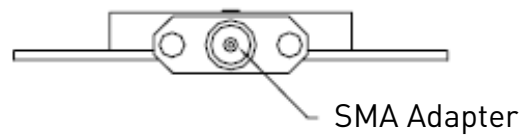
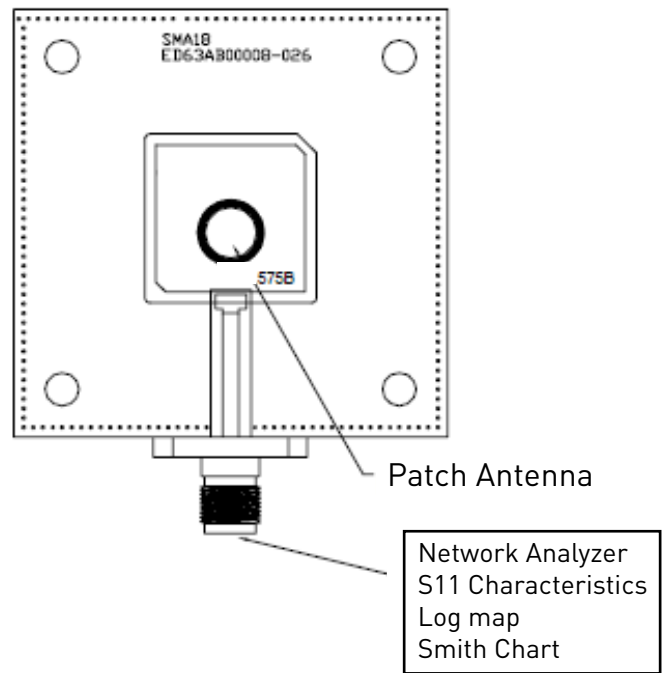
	Name	P/N	Material	Finish	Qty
1	SGP.18 Patch 18x18x4	SGP.18c	Ceramic	Clear	1
2	FR4 PCB		FR4 1t	Black	1
3	SMA(F)Straight Edge Mount	SMA.F.ST.JACK.PANELM.2H.CM	Brass	Gold	1

#### 4.4 Test Fixture set up and measurements

Test Fixture



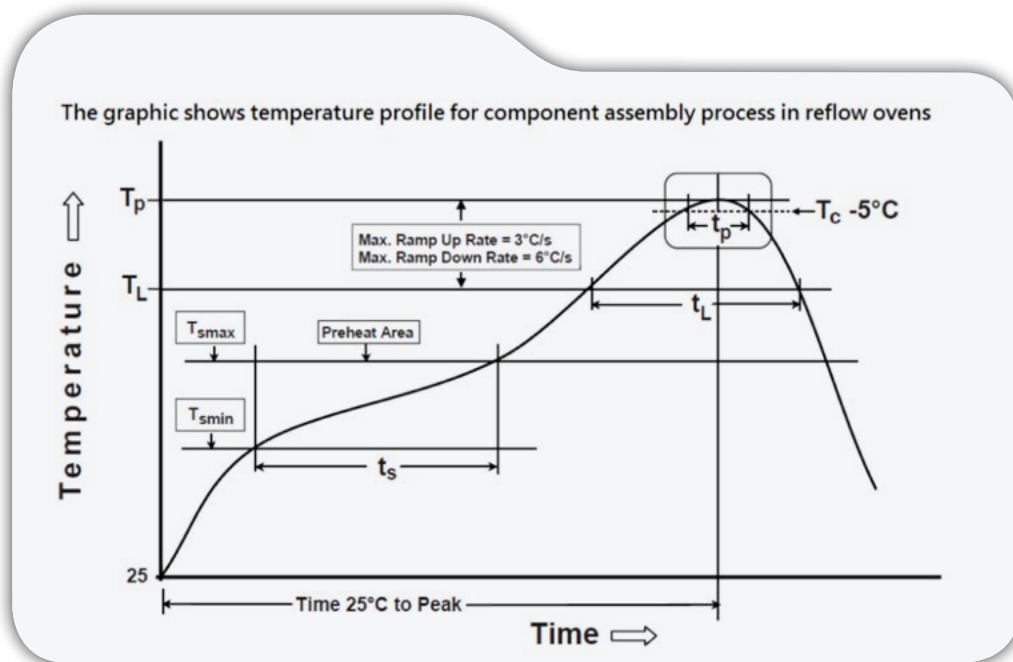
Antenna Setup  
& Measurements



## 5. Recommended Reflow Soldering Profile

SGP.18.C can be assembled following Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follow:

PHASE	PROFILE FEATURES	Pb-Free Assembly (SnAgCu)
<b>PREHEAT</b>	Temperature Min( $T_{smin}$ )	150°C
	Temperature Max( $T_{smax}$ )	200°C
	Time( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	60-120 seconds
<b>RAMP-UP</b>	Avg. Ramp-up Rate ( $T_{smax}$ to TP)	3°C/second(max)
<b>REFLOW</b>	Temperature( $T_L$ )	217°C
	Total Time above $T_L$ ( $t_L$ )	30-100 seconds
<b>PEAK</b>	Temperature( $T_P$ )	260°C
	Time( $t_p$ )	2-5 seconds
<b>RAMP-DOWN</b>	Rate	3°C/second(max)
<b>Time from 25°C to Peak Temperature</b>		8 minutes max.
<b>Composition of solder paste</b>		96.5Sn/3Ag/0.5Cu
<b>Solder Paste Model</b>		SHENMAO PF606-P26

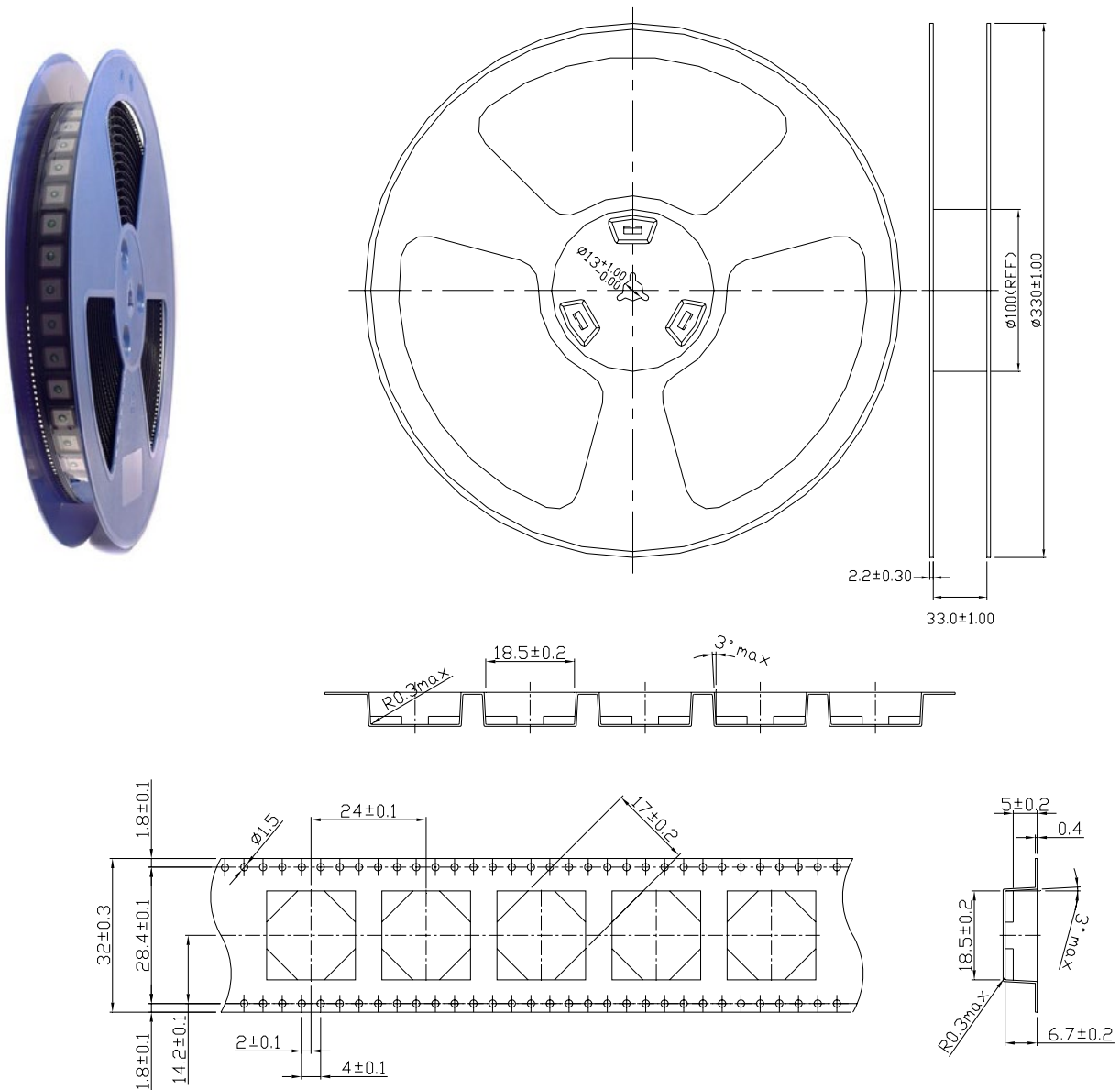


Soldering Iron condition: Soldering iron temperature  $270^\circ C \pm 10^\circ C$ .

Apply preheating at  $120^\circ C$  for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron temperature over  $270^\circ C \pm 10^\circ C$  or 3 seconds, it will make cause component surface peeling or damage.

## 6. Packaging

200 pcs per reel / inner carton  
5 reels per outer carton - 1,000 pcs



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