

SGP.15a

## Specification

<b>Part No.</b>	SGP.1575.15.4.A.02
<b>Product Name</b>	GPS SMT Patch Antenna
<b>Feature</b>	15mm*15mm*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

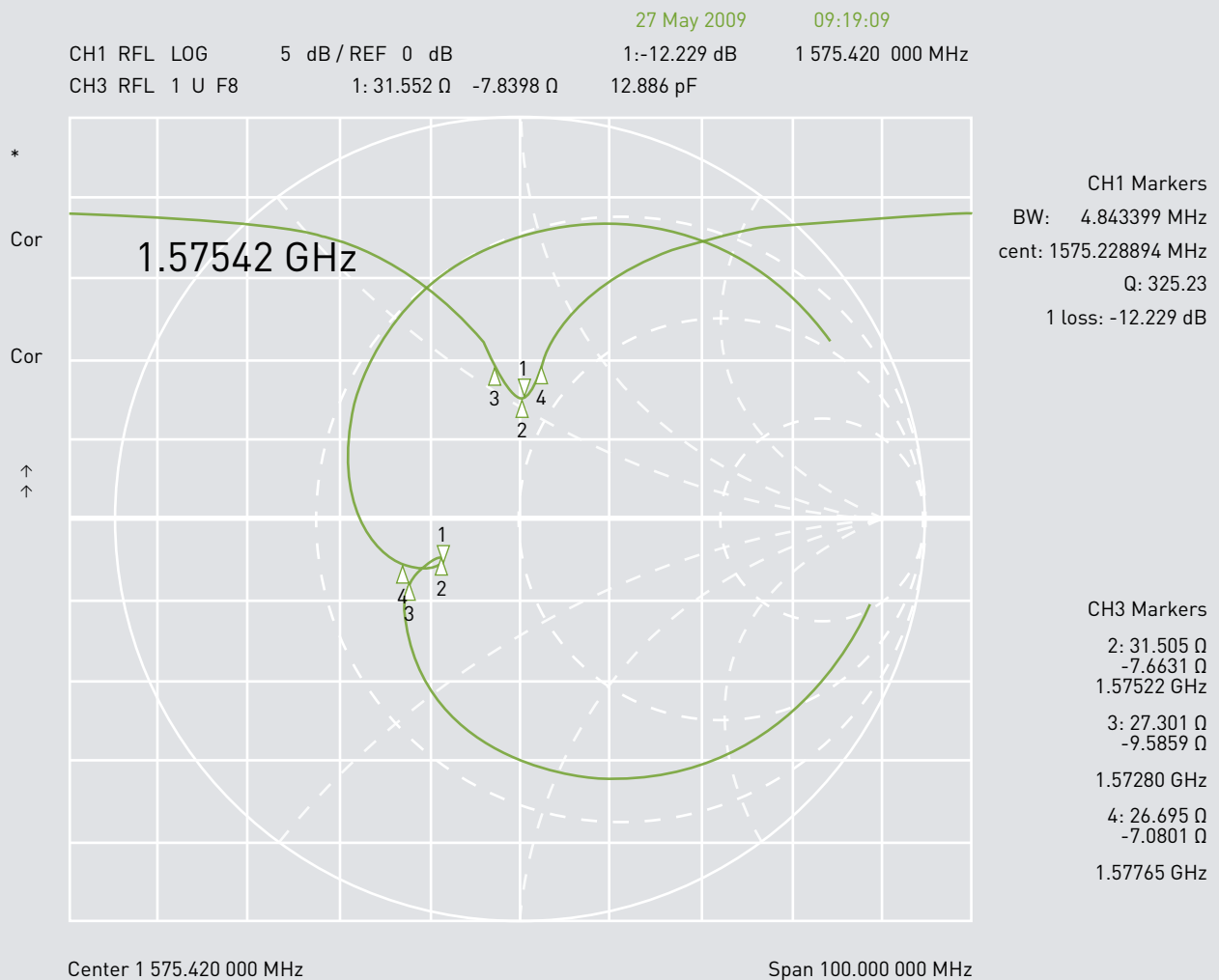
Original Patch Specification tested on 45mm ground plane

NO	PARAMETER	SPECIFICATION	NOTES
1	Range of Receiving Frequency	1575.42 MHz $\pm$ 1.023 MHz	
2	Center Frequency	1575.42 $\pm$ 3MHz	With 45*45mm Ground Plane
3	Bandwidth	6MHz min	Return Loss $\leq$ -10 dB
4	VSWR	1.5 max	
5	Gain at Zenith	+1.0 dBic typ.	
6	Gain at 10°elevation	-	
7	Axial Ratio	3.0 dB max	
8	Polarization	RHCP	
9	Impedance	50 Ohms	
10	Frequency Temperature Coefficient (rf)	0 $\pm$ 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**

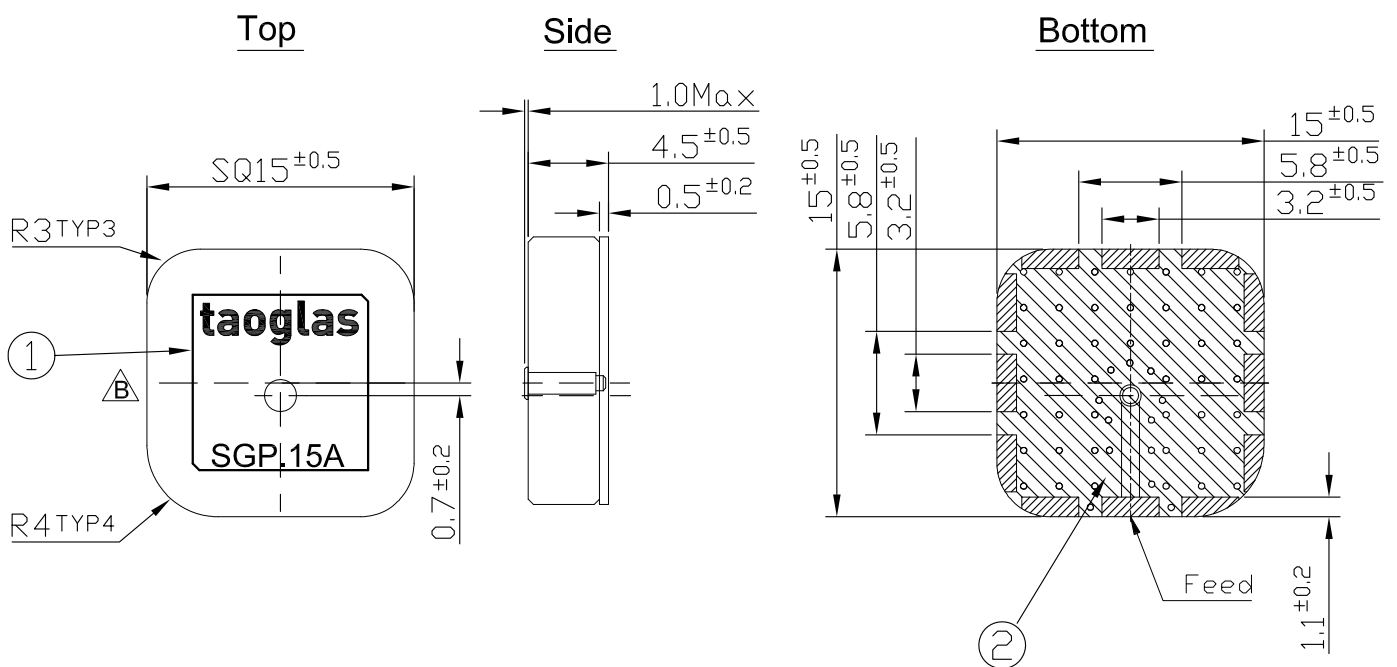
### 3. Electrical Specifications

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



## 4. Mechanical Specifications

### 4.1 Dimensions and Drawing



#### NOTE:

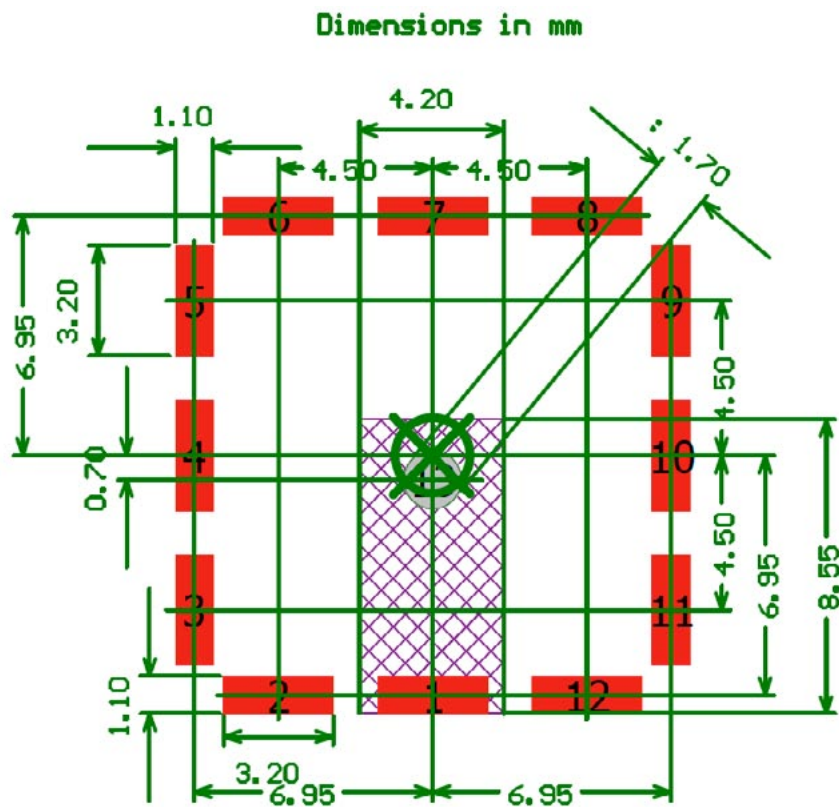
1. Solder mask.
2. Area to be soldered.
3. Clearance area.
4. Dimension of 50 Ohm CPW dependent on individual board.
5. Must be soldered to complete antenna feed connection.



	Name	Part No.	Material	Finish	Quantity
1	SGP.15 Patch 15x15x4	SGP.15	Ceramic	Clear	1
2	SGP.15 PCB		FR4 0.5t	Green	1

## 4.2 Antenna Footprint

### 4.2.1 Top Copper



**Copper Keepout Region**

Pads 2 through 12 should be connected to GND.

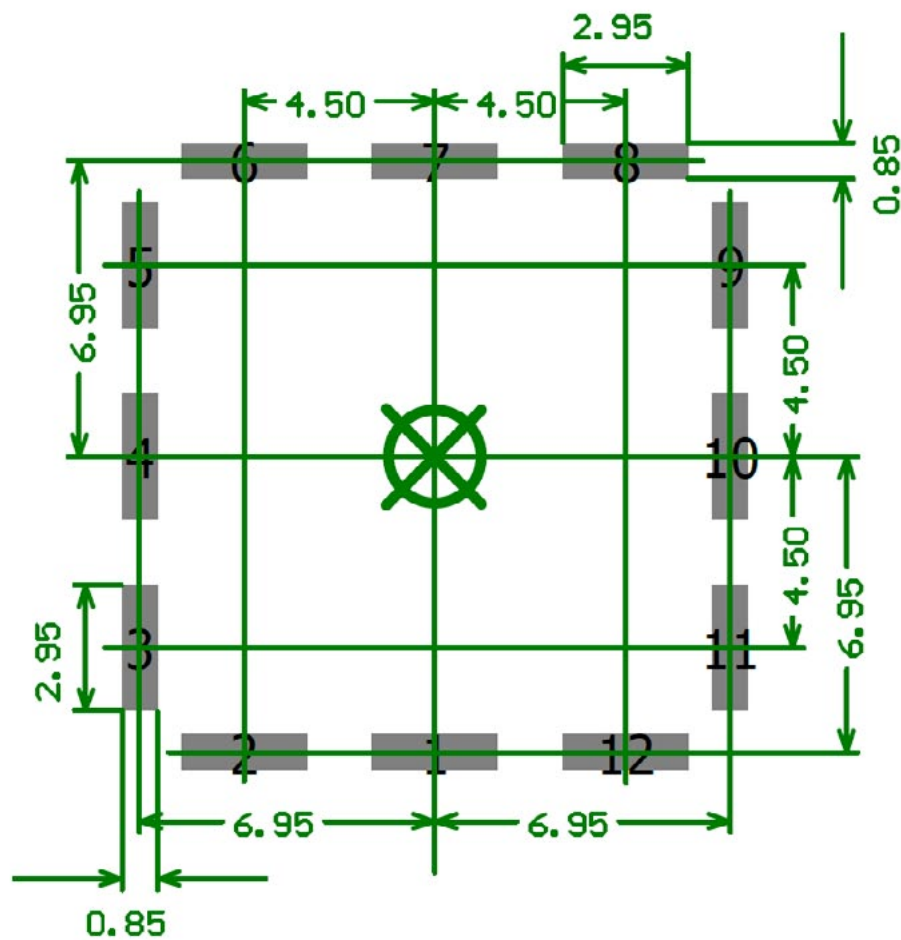
Pad 13 is a 1.70mm dia. non-plated thru-hole.

Connect 50 ohm transmission line to Pad 1.

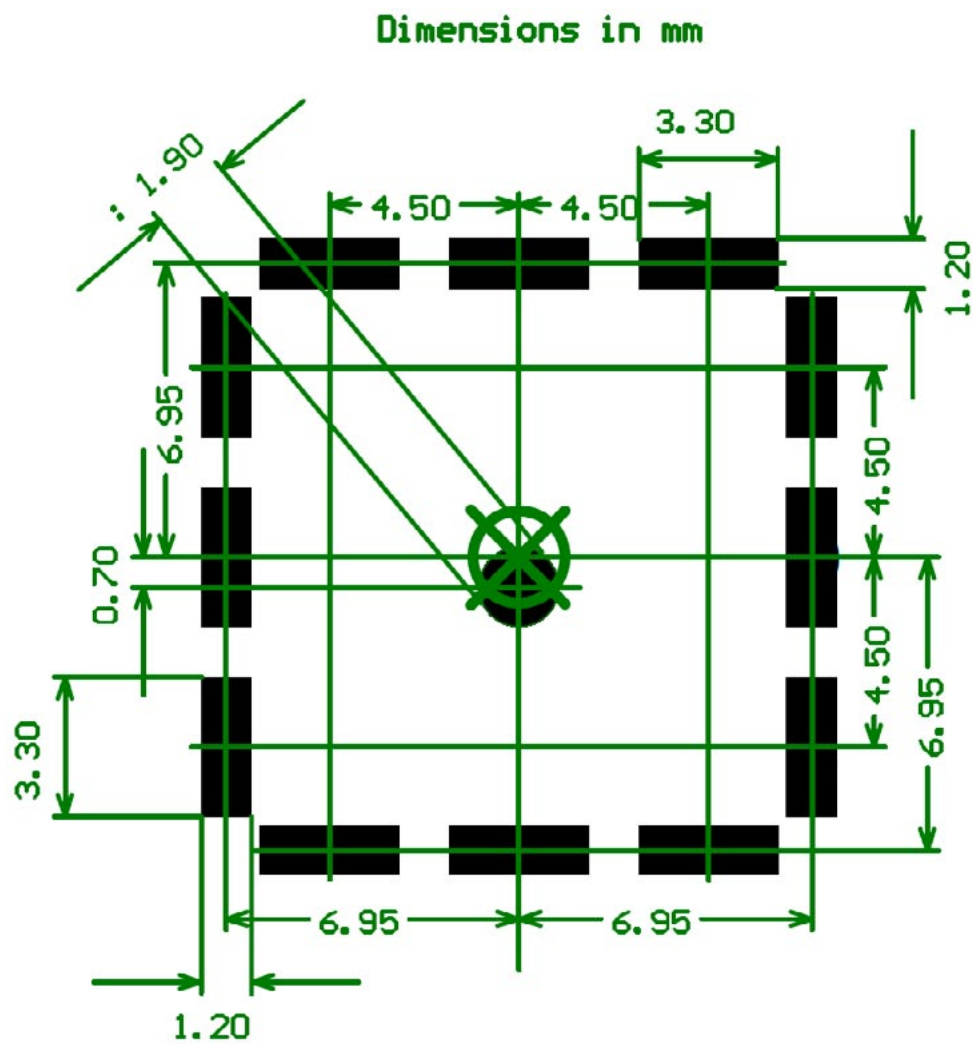
Copper Keepout Region should extend at least 2 mm down into PCB.

## 4.2.2 Top Paste

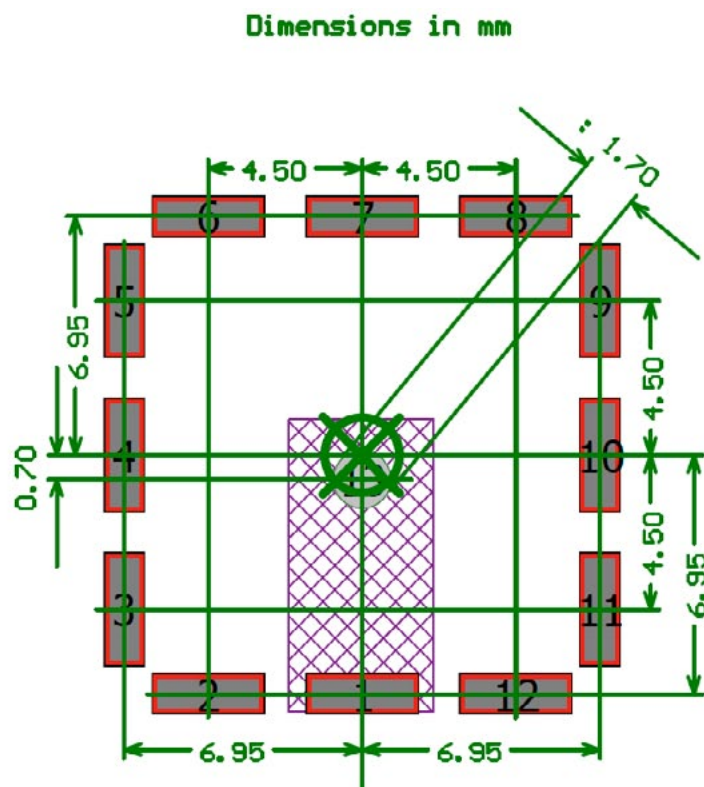
Dimensions in mm



### 4.2.3 Top Mask



#### 4.2.4 Composite

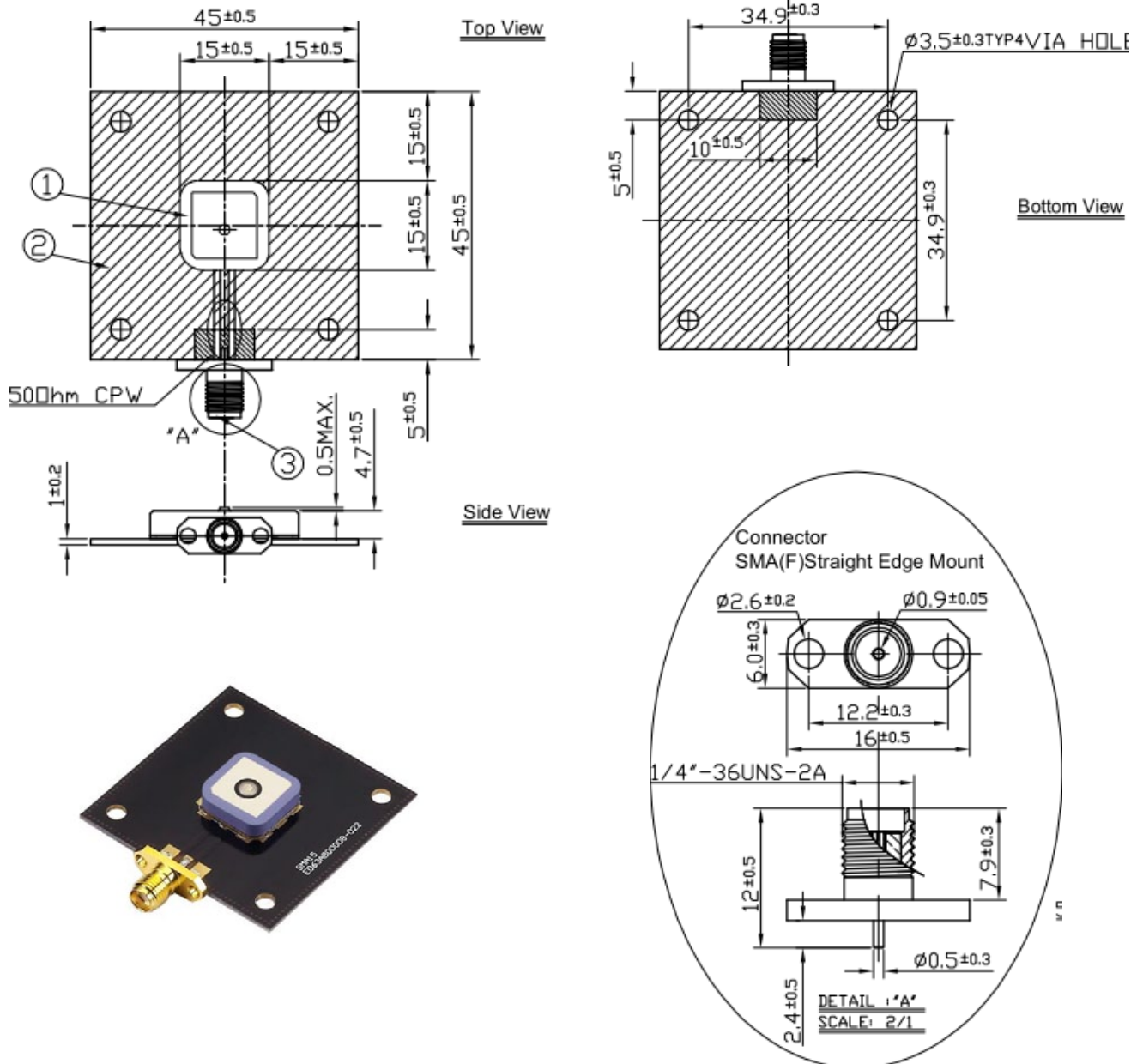


#### Copper Keepout Region



Pads 2 through 12 should be connected to GND.  
 Pad 13 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

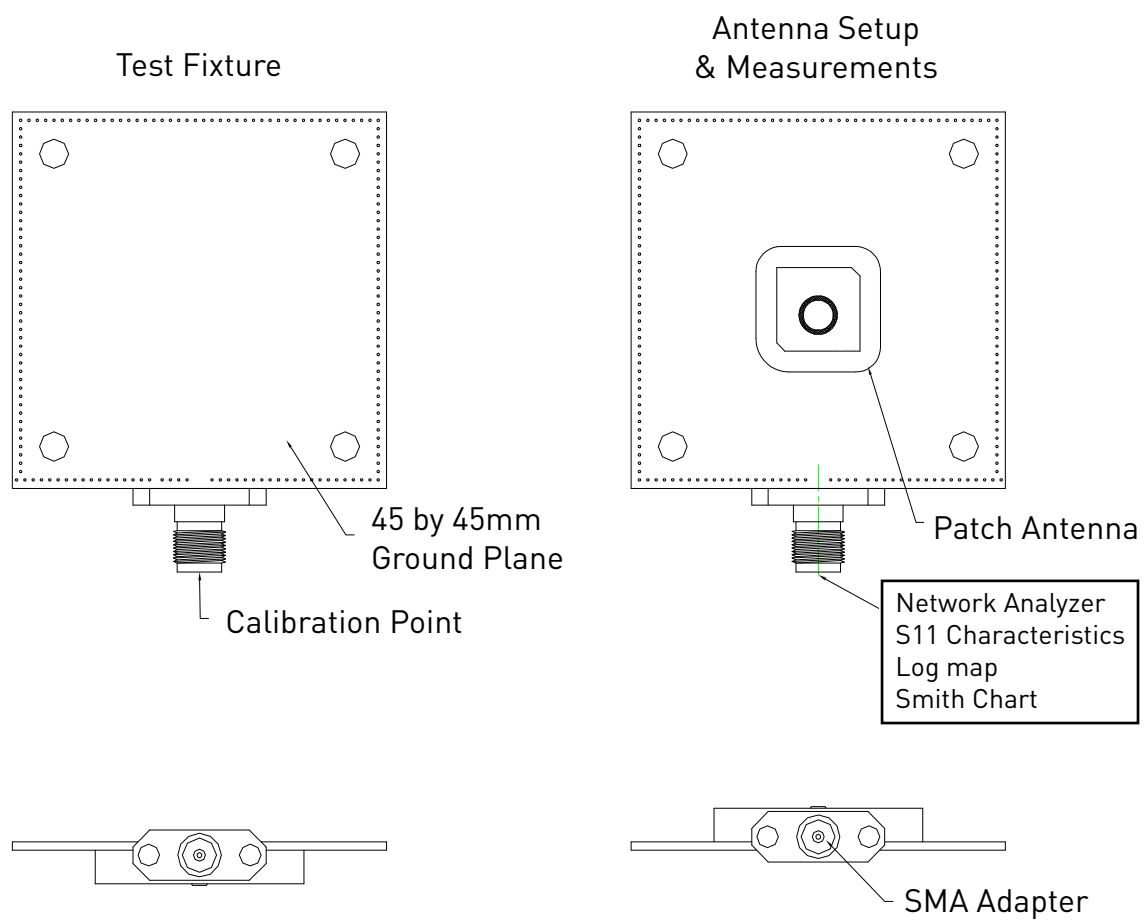


#### NOTE:

1. Solder Mask (Black) 
2. Solder Area 

	Name	P/N	Material	Finish	Qty
1	SGP.15 Patch 15x15x4	SGP.15A	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

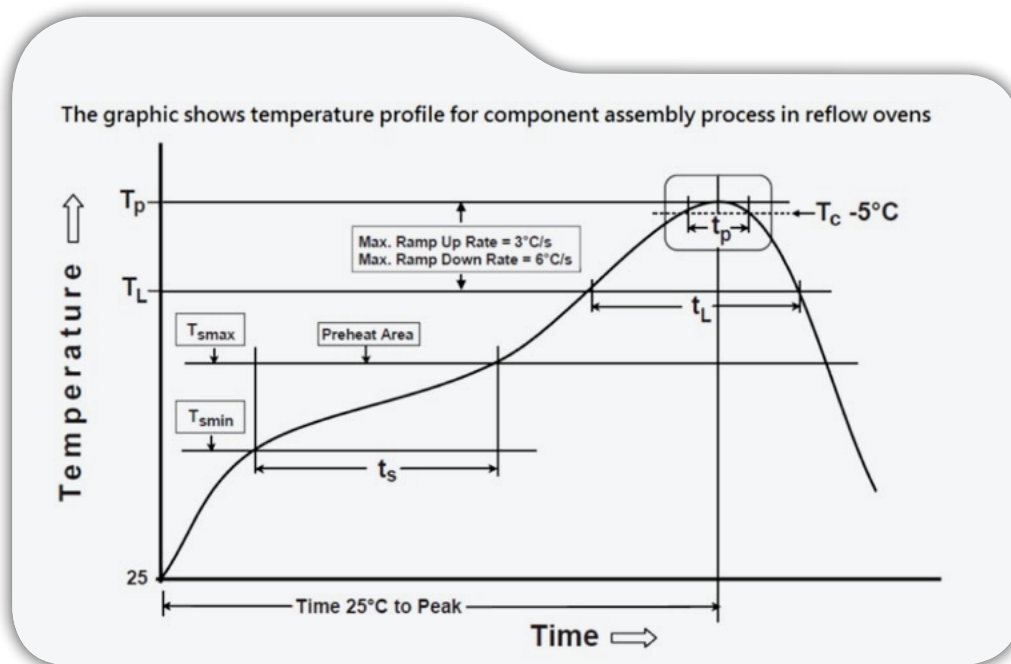
## 4.4 Test Fixture set up and measurements



## 5. Recommended Reflow Soldering Profile

SGP.15A 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  $270^\circ\text{C} \pm 10^\circ\text{C}$ .

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.



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