

## SPECIFICATION

Part No. : **AP.10G.01**

Product Name : 10mm SMT 14dB Active GPS/GALILEO Patch Antenna  
With Front End Saw Filter

Features : Unique SMT GPS/GALILEO active patch  
Wide Input Voltage 1.5V to 3.3V  
Ultra low power consumption  
**RoHS Compliant**

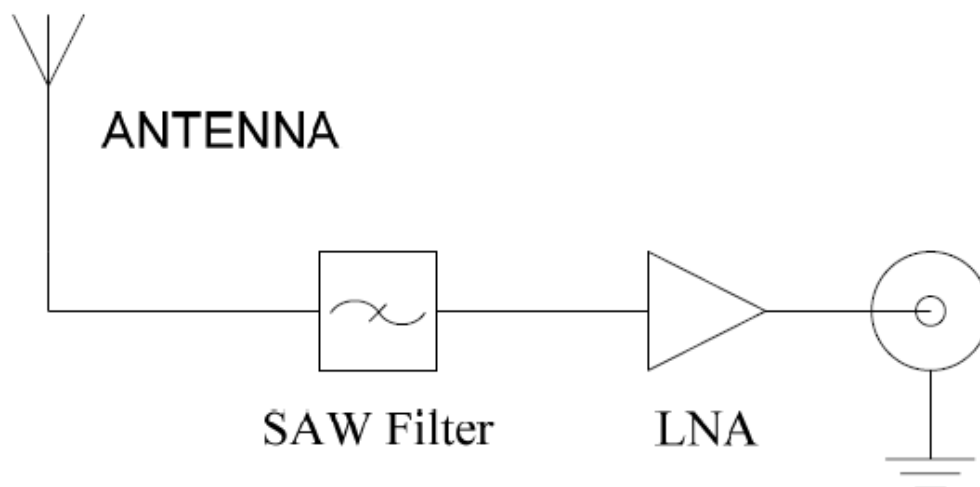


## 1. Introduction

The AP.10G.01 one stage 14dB active GPS/GALILEO patch antenna is the smallest SMT GPS/GALILEO high performance embedded antenna currently available in the world. Using extremely sensitive high dielectric constant powder formulation and tight process control the 10mm x 10mm x 4mm patch antenna is accurately tuned to have its frequency band right at 1575.42MHz for GPS/GALILEO systems.

A patented SMT structure gives high reliability in integration. With an ultra low power consumption one stage LNA with Saw Filter, this small active patch has the performance of an ordinary active patch, but at only a quarter of the size. This product is suited to small form factor mobile devices such as GPS Smartphones, Personal Location, Medical devices, Telematic devices and Automotive navigation and tracking. Custom gain, connector and cable versions are available.

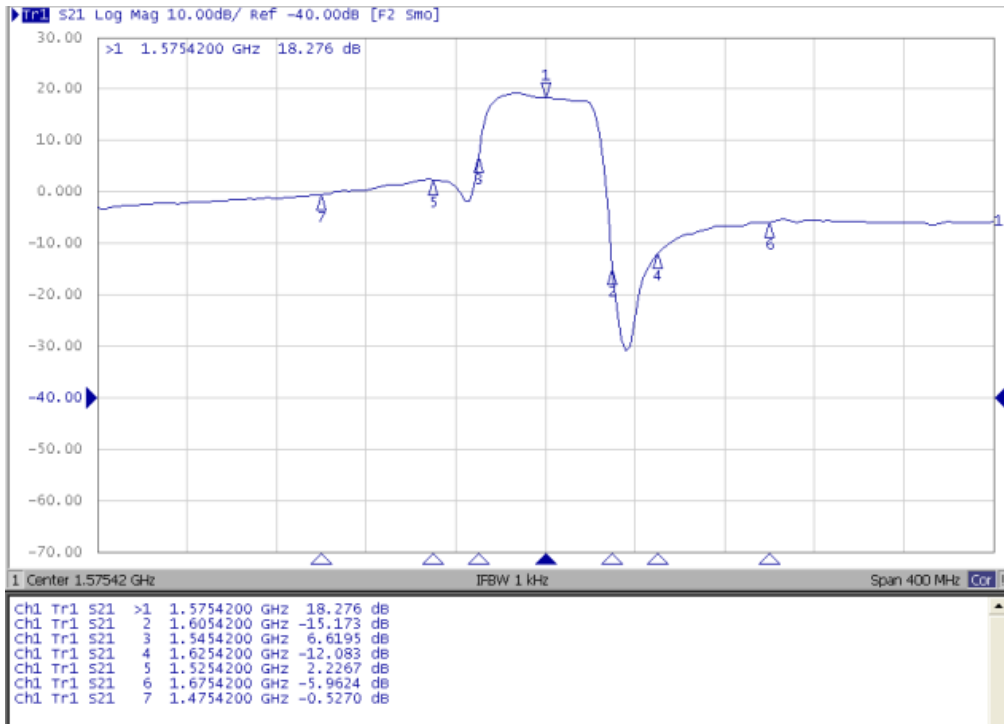
The AP.10G consists of 2 functional blocks – the LNA and also the patch antenna.



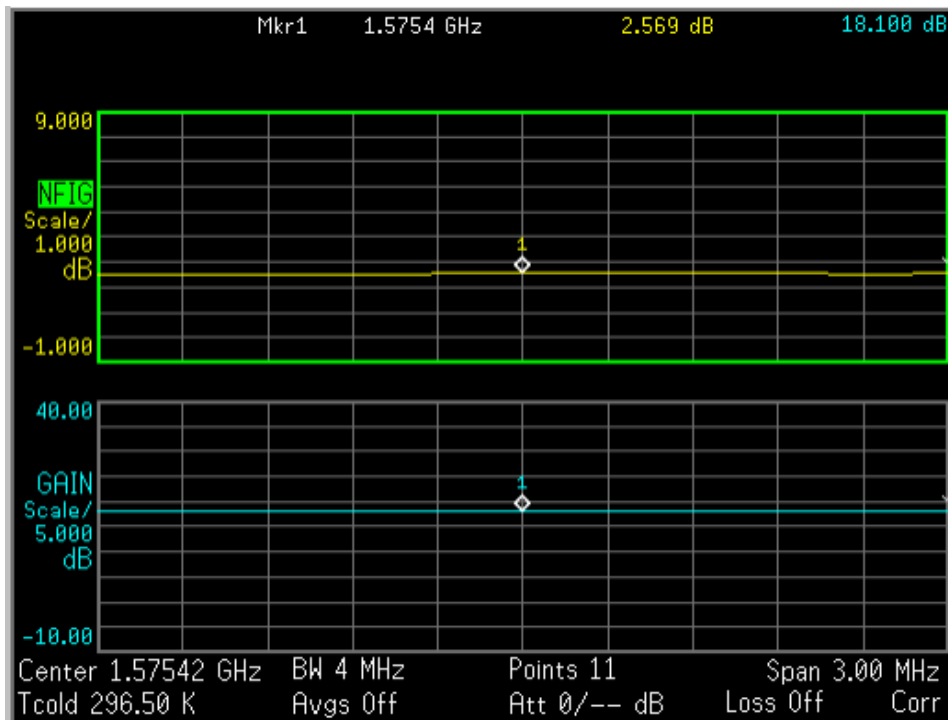
## 2. Specification

ANTENNA			
Frequency	1575.42 ± 1.023MHz		
Gain (Patch)	Typ -10dBic @ Zenith		
Gain (Patch and LNA)	8 ± 4dBic @ 90°		
Impedance	50Ω		
Polarization	RHCP		
Axial Ratio	Max 4.0dB @ Zenith		
Input Voltage	Min. 1.5V, Typ. 1.8V, Max. 3.3V		
LNA			
Frequency	1575.42 ± 1.023MHz		
Outer Band Attenuation	F0=1575.42MHz		
	F0±30MHz	9dB min.	
	F0±50MHz	14dB min.	
	F0±100MHz	16dB min.	
Output Impedance	50Ω		
Output VSWR	2.0 Max		
Pout at 1dB Gain Compression point	Typ. 1dBm		
LNA Gain, Power Consumption and Noise Figure			
Voltage	LNA Gain (Typ)	Power Consumption(mA) Typ	Noise Figure Typ
Min. 1.5V	18dB	3.5mA	2.6dB
Typ. 1.8V	18dB	3.5mA	2.6dB
Max. 3.3V	18dB	3.5mA	2.6dB
MECHANICAL			
Dimension	10mm x 10mm x 4mm (add 7.3mm depth for vertical PCB)		
Connection	SMT via solder pads		
ENVIRONMENTAL			
Operation Temperature	-20°C to + 85°C		
Storage Temperature	-30°C to + 85°C		
Relative Humidity	40% to 95%		

### 3. LNA Gain and Out Band Rejection @3.0V

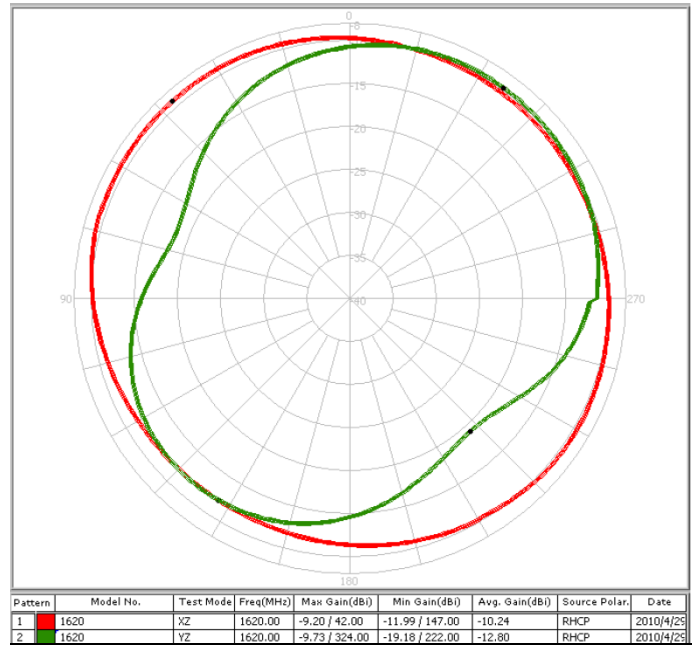


### 4. LNA Noise Figure @3.0V

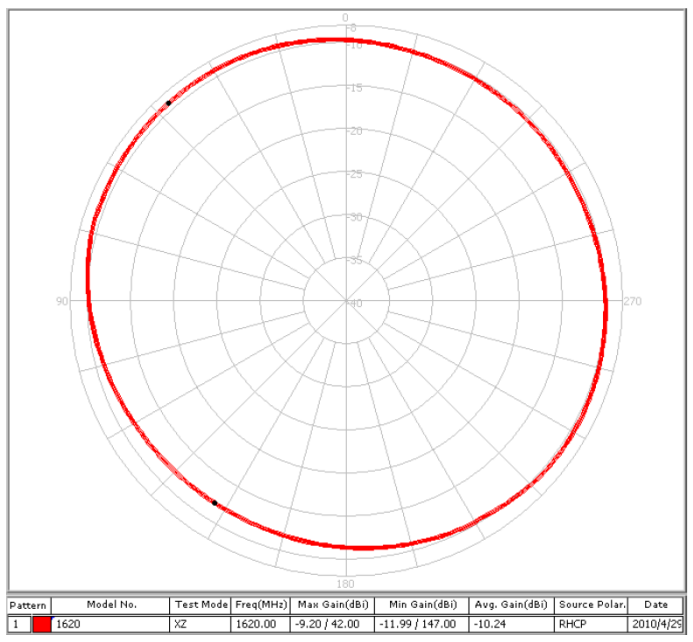


# 5. Radiation Patterns

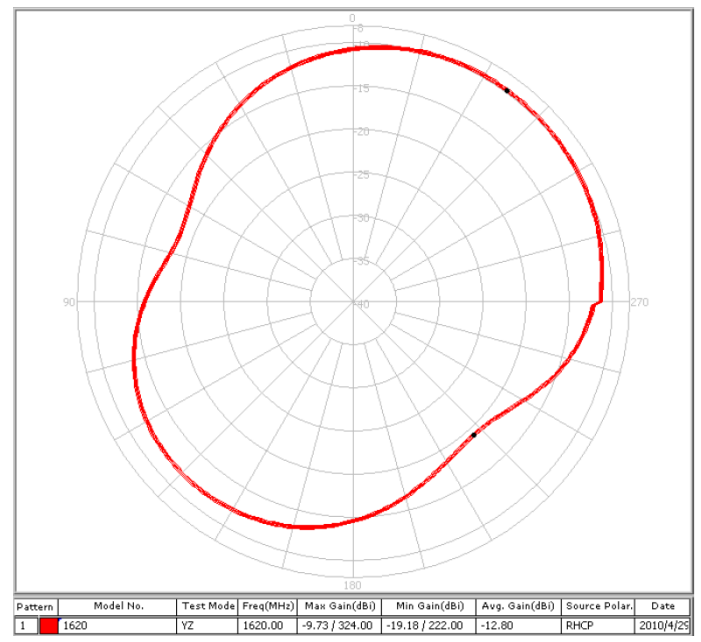
XY Plane



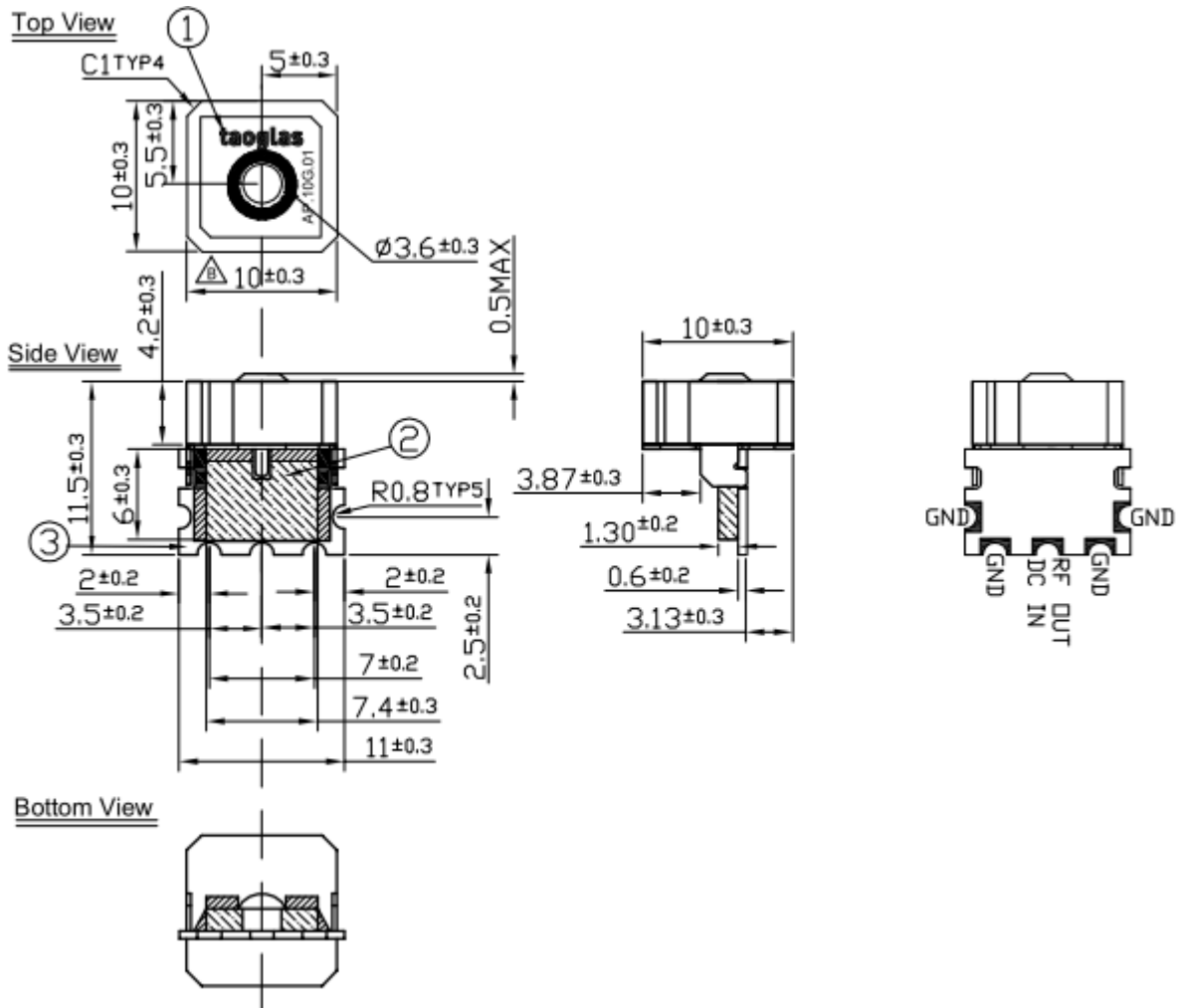
XZ Plane



YZ Plane



## 6. Mechanical Drawing (Unit: mm)



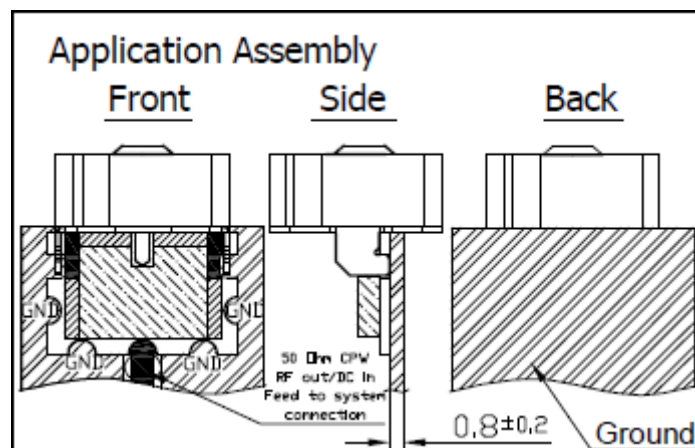
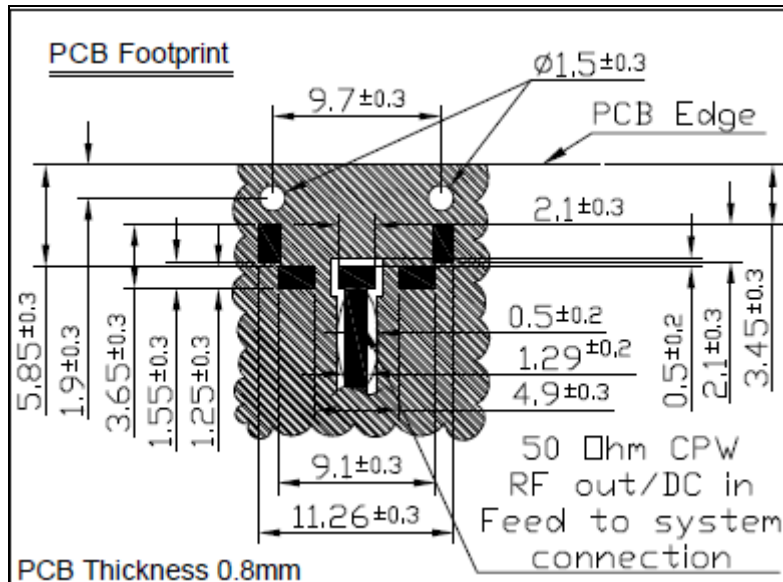
	Name	Material	Finish	QTY
1	Patch (10mmx10mmx4.2mm)	Ceramic	Clear	1
2	Shielding Case	Tin (SPTE)	Tin Plated	1
3	PCB	FR4 0.6t	Green	1

Note:

- 1.Soldered Area
- 2.Solder Mask Area(Green)
- 3.Clearance Area
- 4.Shielding Case Area
- 5.Area to be solder (Pad)



## 6.1. PCB Footprint



Note:

1. Soldered Area
2. Solder Mask Area (Green)
3. Clearance Area
4. Shielding Case Area
5. Area to be solder (Pad)



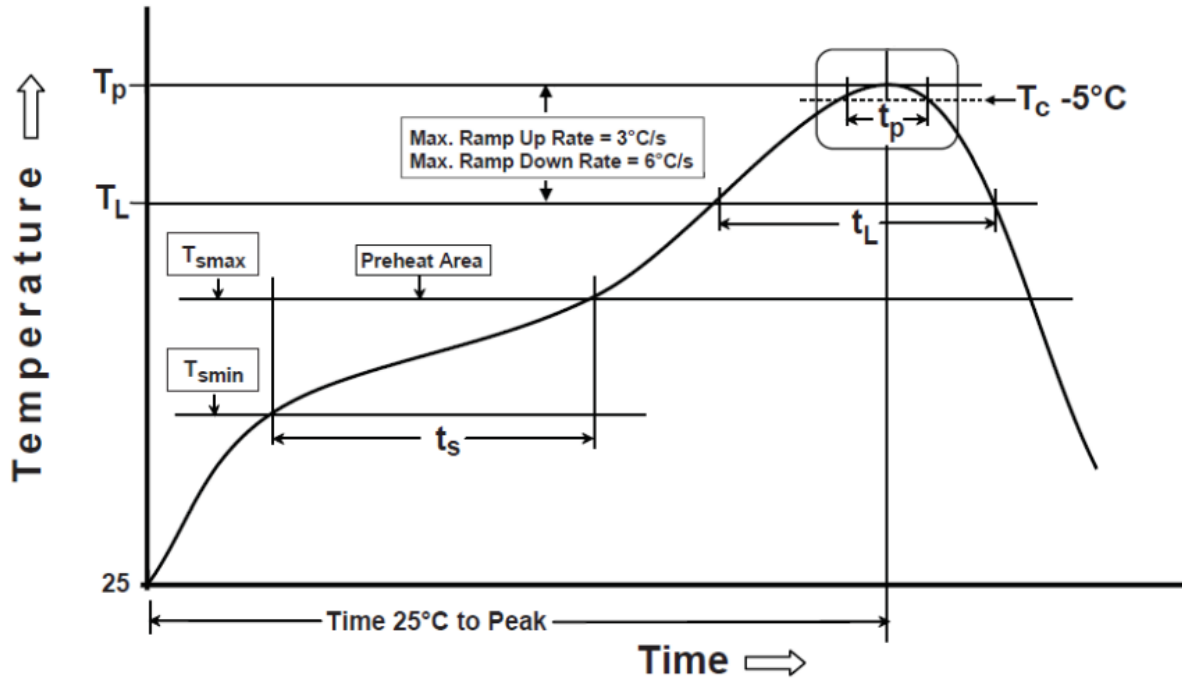
## 7. Recommended Reflow Soldering Profile

AP.10G can be assembled following Pb-free assembly. According to the Standard IPC/JEDEC J-STD-020C, the temperature profile suggested is as follow:

<b>Phase</b>	<b>Profile Features</b>	<b>Pb-Free Assembly (SnAgCu)</b>
PREHEAT	Temperature Min(Tsmin)	150°C
	Temperature Max(Tsmax)	200°C
	Time(ts) from (Tsmin to Tsmax)	60-120 seconds
RAMP-UP	Avg. Ramp-up Rate (Tsmax to TP)	3°C/second(max)
REFLOW	Temperature(TL)	217°C
	Total Time above TL (tL)	30-100 seconds
PEAK	Temperature(TP)	260°C
	Time(tp)	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  $270^\circ C \pm 10^\circ C$ .

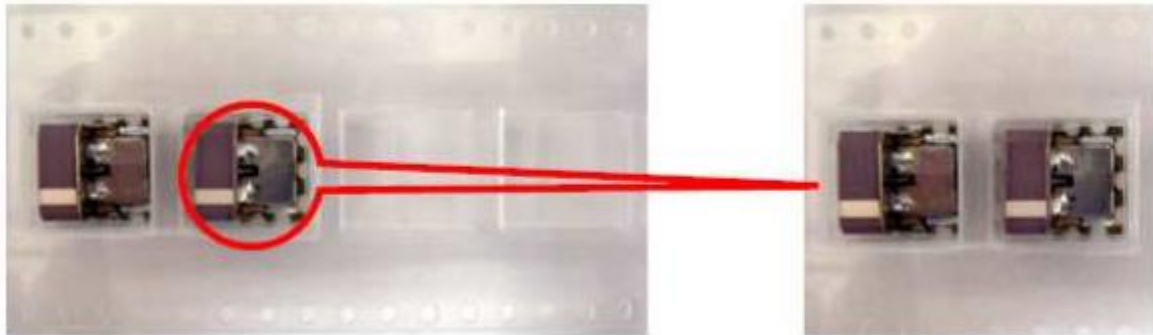
Apply preheating at  $120^\circ C$  for 2-3 minutes. Finish soldering for each terminal within 3 seconds, if soldering iron temperature over  $270^\circ C \pm 10^\circ C$  or 3 seconds, it will make cause component surface peeling or damage.

## 8. Packaging

Packaged on Tape and Reel – 250 pieces per reel

Each Reel is packaged – Inner Carton

Outer Carton contains 5 Reels – 1250 pieces per Carton



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