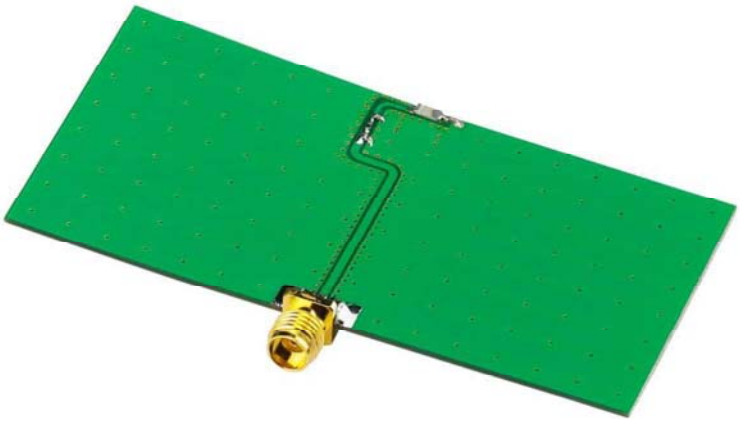
SPECIFICATION

Part No.	:	**HLA.01**
Product Name	:	5150-5900 MHz Ceramic Loop antenna WLAN/ Wi-Fi/ HDMI
Feature	:	3.2mm *1.6mm * 0.5mm Low profile Peak gain 2.1dBi 65%+ Efficiency Typical Compact Size RoHS Compliant



HLAD.01 EVB Board

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Top

1. Introduction

The HLA.01 5150-5900 MHz ceramic chip antenna is specifically designed for Wi-Fi/ WHDMI applications where high data throughput is needed. It is a high efficiency miniature SMD edge mounted ceramic antenna with minimum footprint requirement. This ceramic chip antenna uses the main PCB as its ground plane, thereby increasing antenna efficiency. It is tuned for different PCB sizes by simply changing the value of the matching circuit. The HLA.01 with dimension of 3.2mm *1.6mm * 0.5mm, is one of the smallest antennas available worldwide. This antenna is delivered on tape and reel.
Many module manufacturers specify peak gain limits for any antennas that are to be connected to that module. Those peak gain limits are based on free-space conditions. In practice, the peak gain of an antenna tested in free-space can degrade by at least 1 or 2dBi when put inside a device. So ideally you should go for a slightly higher peak gain antenna than mentioned on the module specification to compensate for this effect, giving you better performance.

Upon testing of any of our antennas with your device and a selection of appropriate layout, integration technique, or cable, Taoglas can make sure any of our antennas' peak gain will be below the peak gain limits. Taoglas can then issue a specification and/or report for the selected antenna in your device that will clearly show it complying with the peak gain limits, so you can be assured you are meeting regulatory requirements for that module.

For example, a module manufacturer may state that the antenna must have less than 2dBi peak gain, but you don't need to select an embedded antenna that has a peak gain of less than 2dBi in free-space. This will give you a less optimized solution. It is better to go for a slightly higher free-space peak gain

of 3dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2dBi peak gain due to the effects of GND plane, surrounding components, and device housing. If you want to be absolutely sure, contact Taoglas and we will test. Choosing a Taoglas antenna with a higher peak gain than what is specified by the module manufacturer and enlisting our help will ensure you are getting the best performance possible without exceeding the peak gain limits.

Applications

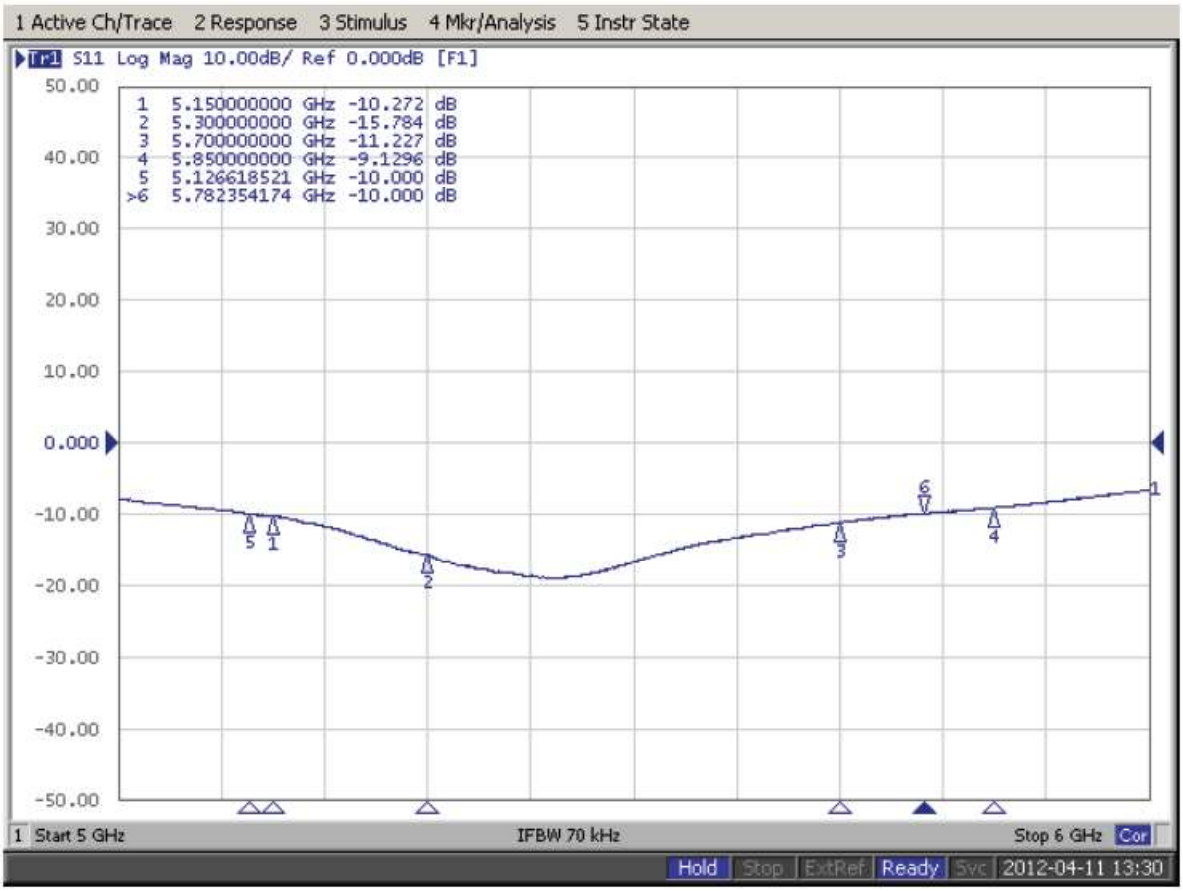
IEEE802.11a (5150-5900 MHz)
WHDMI PCMCIA cards or Wireless USB dongles

2. Specification Table

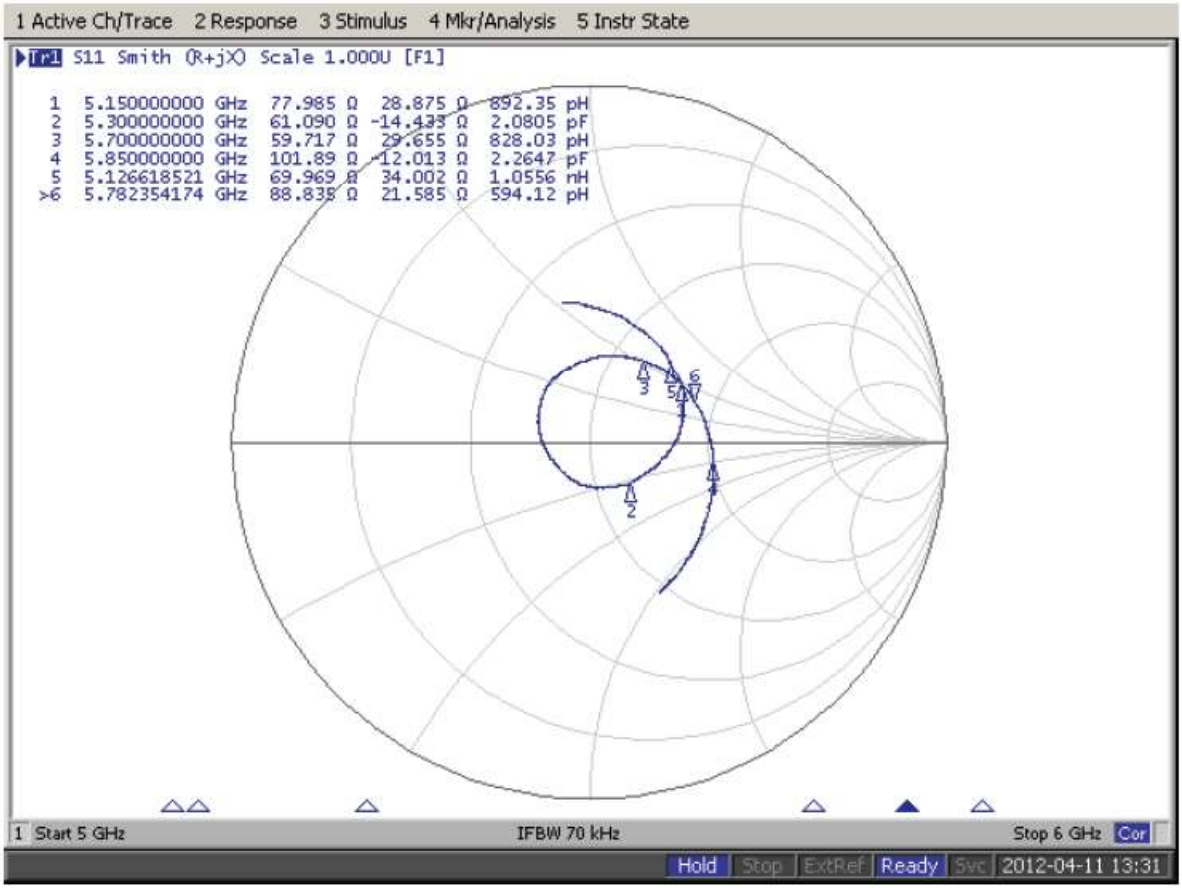
Electrical	
Center Frequency (MHz)	5500

Bandwidth (MHz)	524
Peak Gain (dBi)	2.1 (typical)
Efficiency (%)	65 (typical)
VSWR	2 max.
Impedance (Ω)	50
Polarization	Linear
Radiation Pattern	Omni
Input Power(W)	50
MECHANICAL	
Dimensions (mm)	3.2 x 1.6 x 0.5
Ground plane (mm)	80x40
Material	AS 6
ENVIRONMENTAL	
Temperature Range	-40°C to 85°C
Temperature Coefficient of Frequency (ppm/°C)	0±20 max. (@-40°C to 85°C)
Humidity	Non-condensing 65°C 95% RH

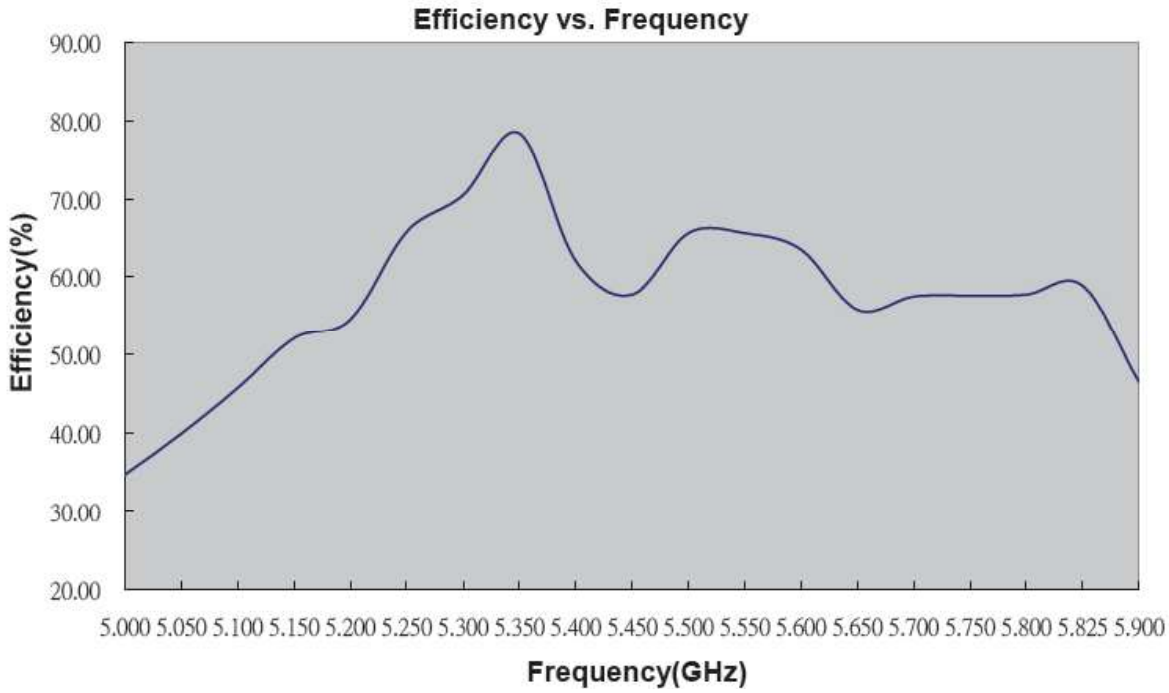
3. Return Loss



4. Smith Chart



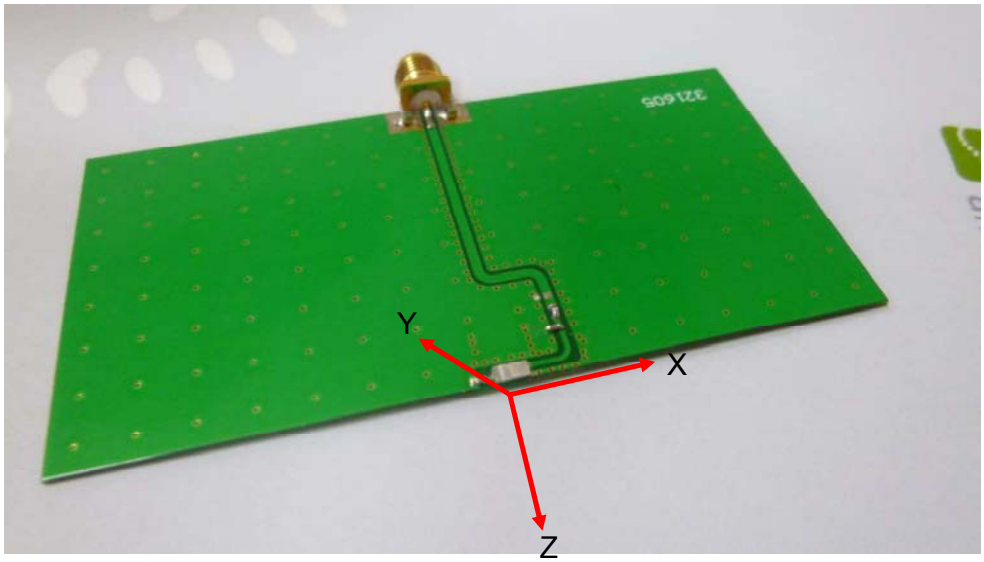
5. Efficiency



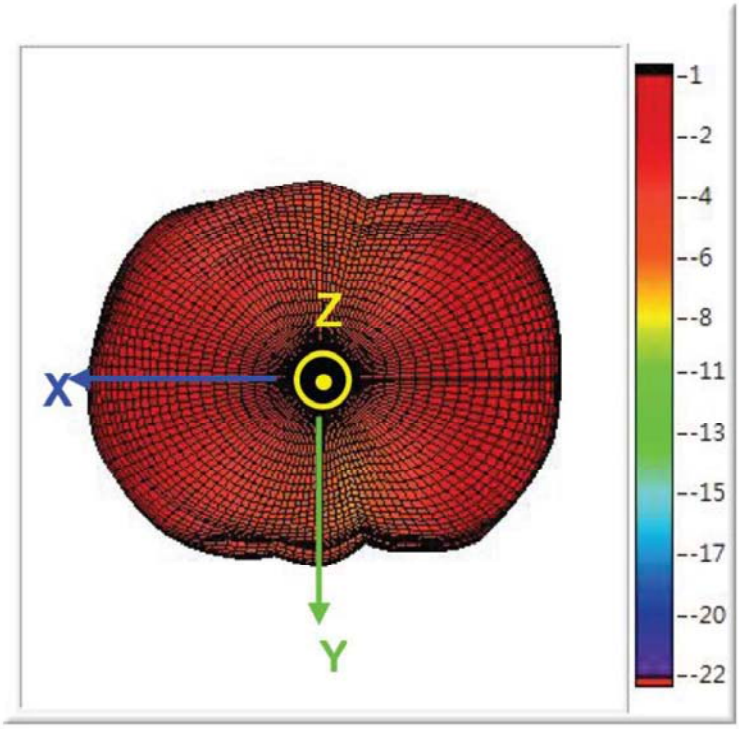
Frequency(GHz)	5.000	5.050	5.100	5.150	5.200	5.250	5.300	5.350	5.400	5.450
Efficiency(dB)	-4.58	-3.98	-3.39	-2.83	-2.63	-1.82	-1.52	-1.06	-2.07	-2.38
Efficiency(%)	34.83	39.99	45.81	52.12	54.58	65.77	70.47	78.34	62.09	57.81
Gain(dBi)	-0.23	0.00	0.54	0.83	1.23	2.06	1.95	2.46	1.82	1.14

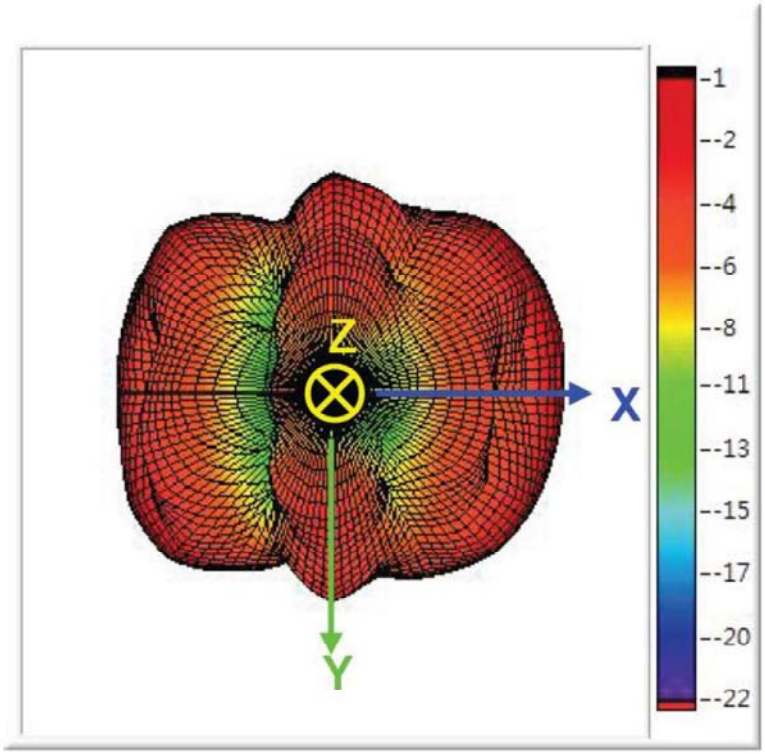
Frequency(GHz)	5.500	5.550	5.600	5.650	5.700	5.750	5.800	5.825	5.900
Efficiency(dB)	-1.83	-1.83	-1.97	-2.53	-2.40	-2.39	-2.38	-2.30	-3.32
Efficiency(%)	65.61	65.61	63.53	55.85	57.54	57.68	57.81	58.88	46.56
Gain(dBi)	2.12	1.73	1.70	1.28	1.75	1.85	1.87	1.63	0.60

6. Antenna Radiation Patterns



6.1 3D Gain pattern @ 5150 MHz

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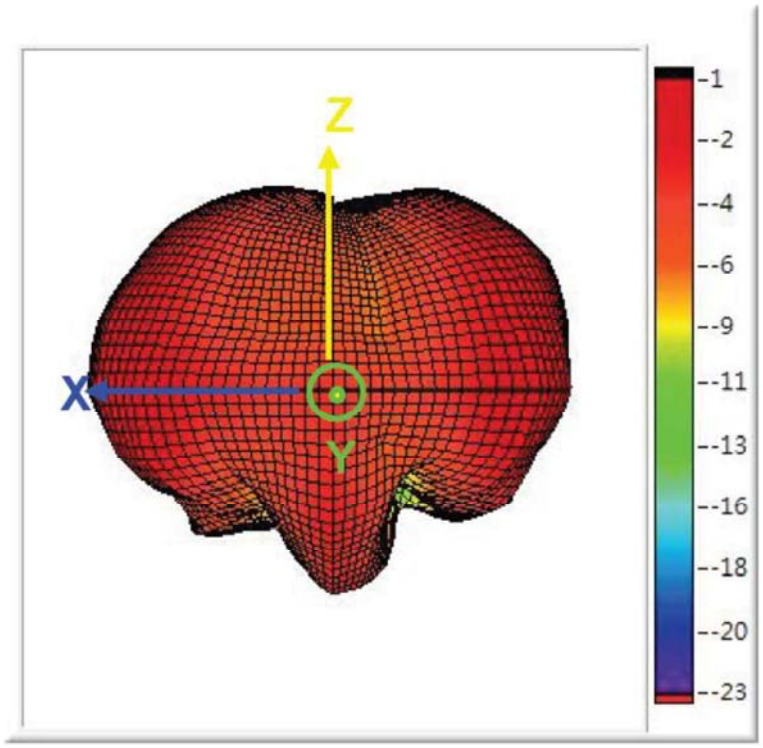
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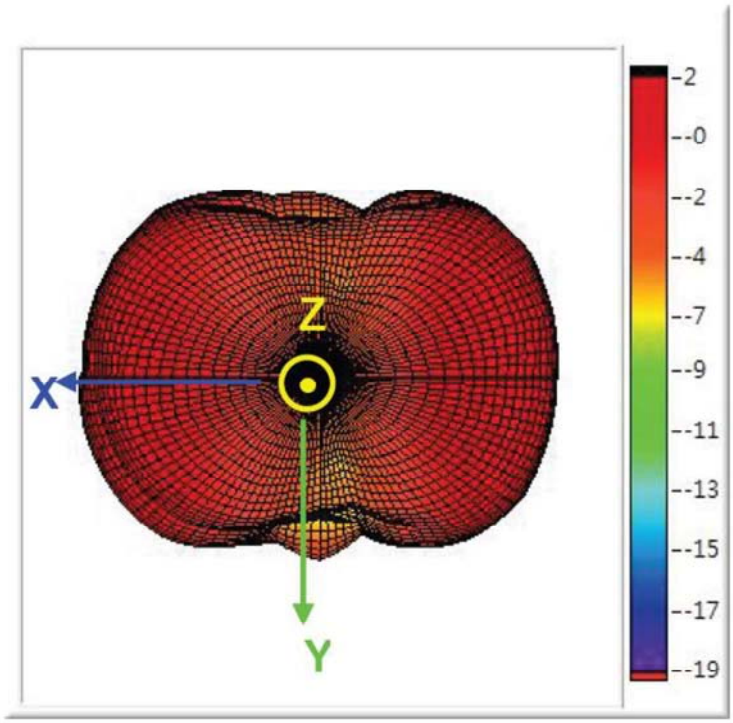
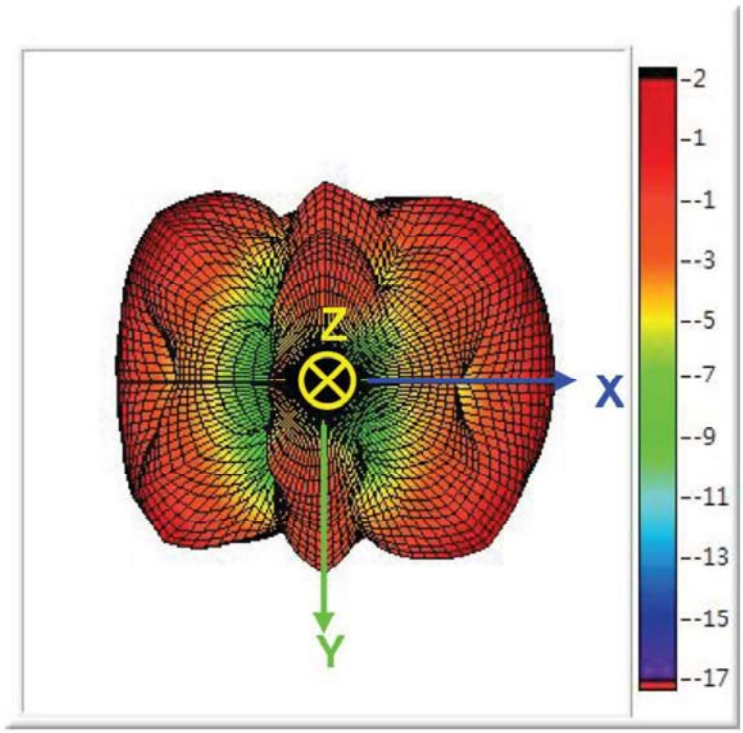
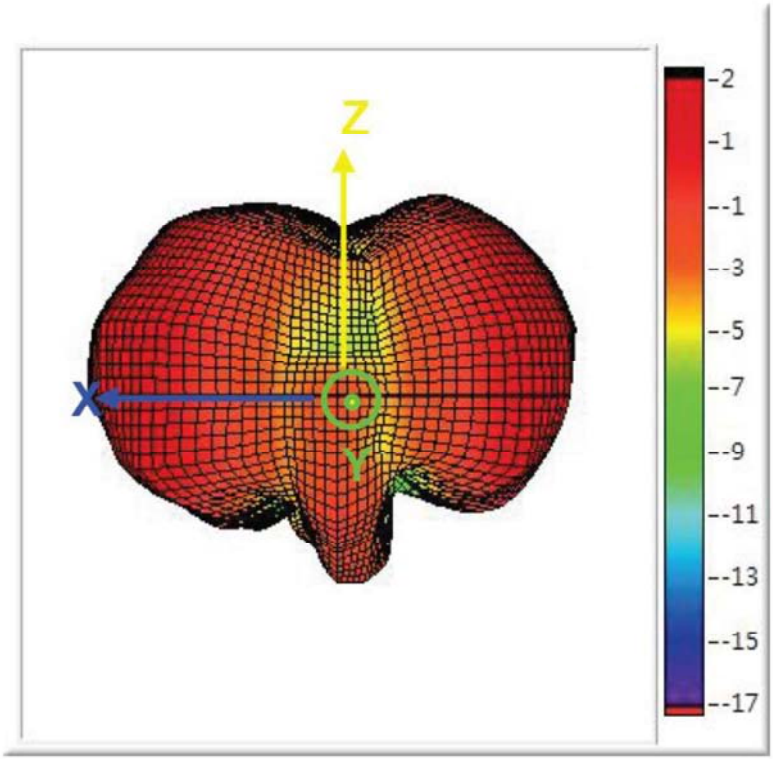
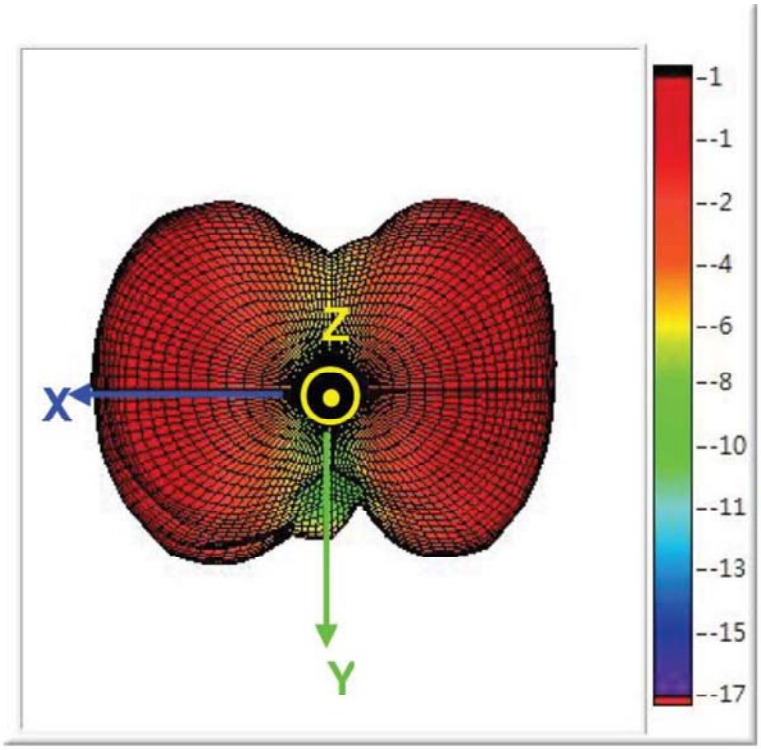
6.2 3D Gain pattern @ 5350 MHz

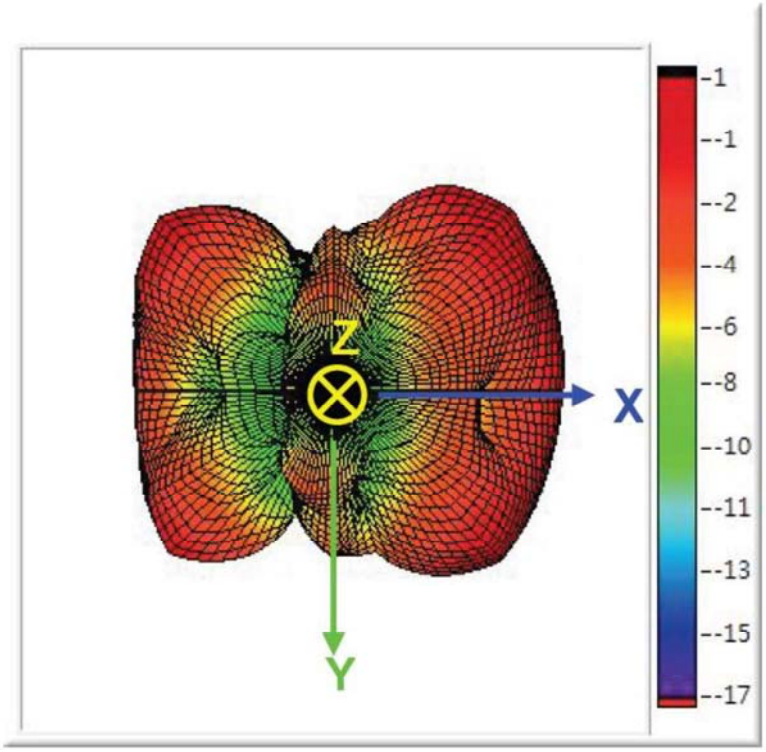






6.3 3D Gain pattern @ 5700 MHz

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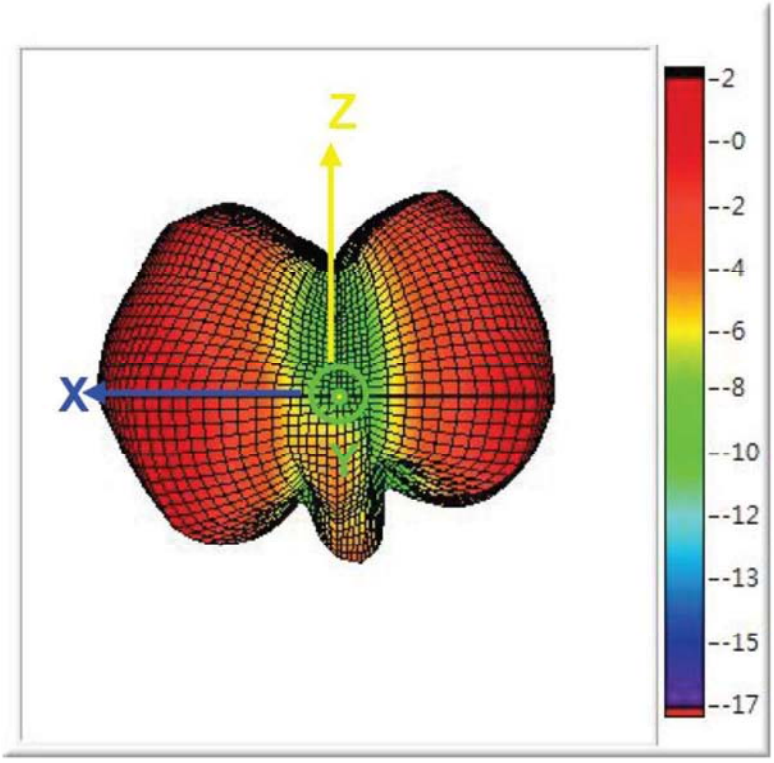
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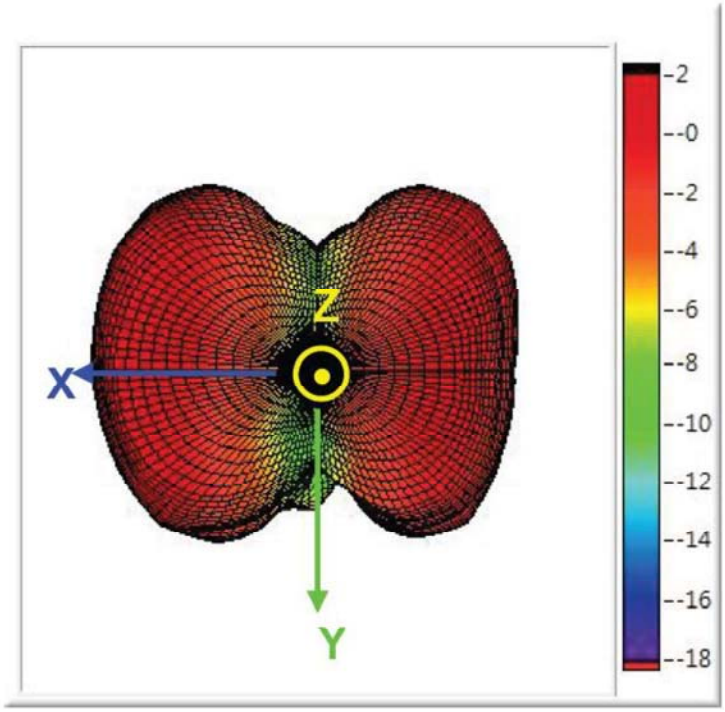
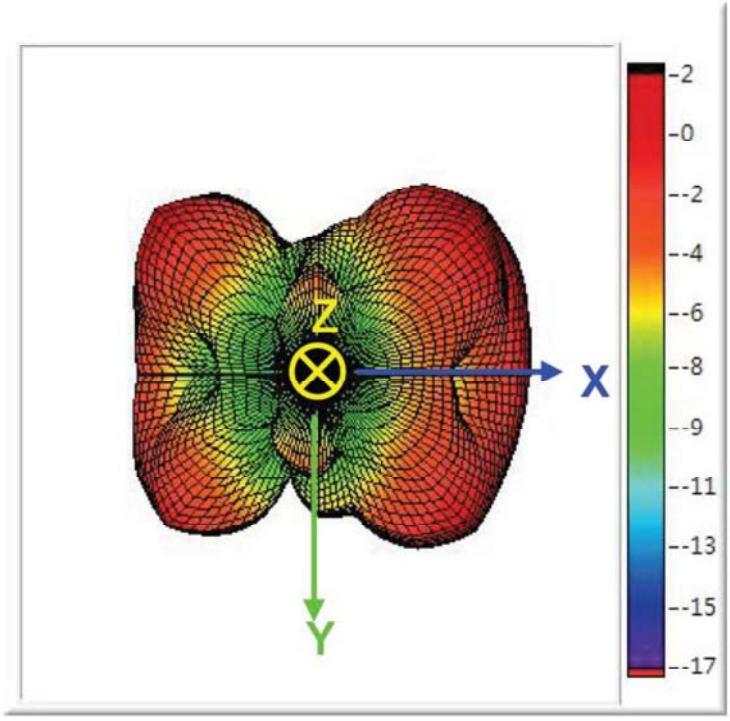
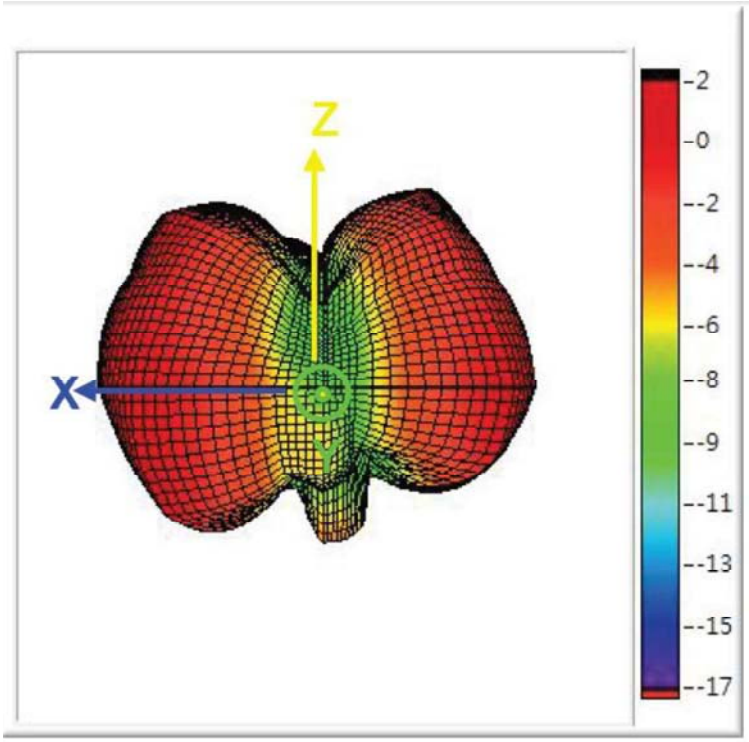
6.4 3D Gain pattern @ 5850 MHz



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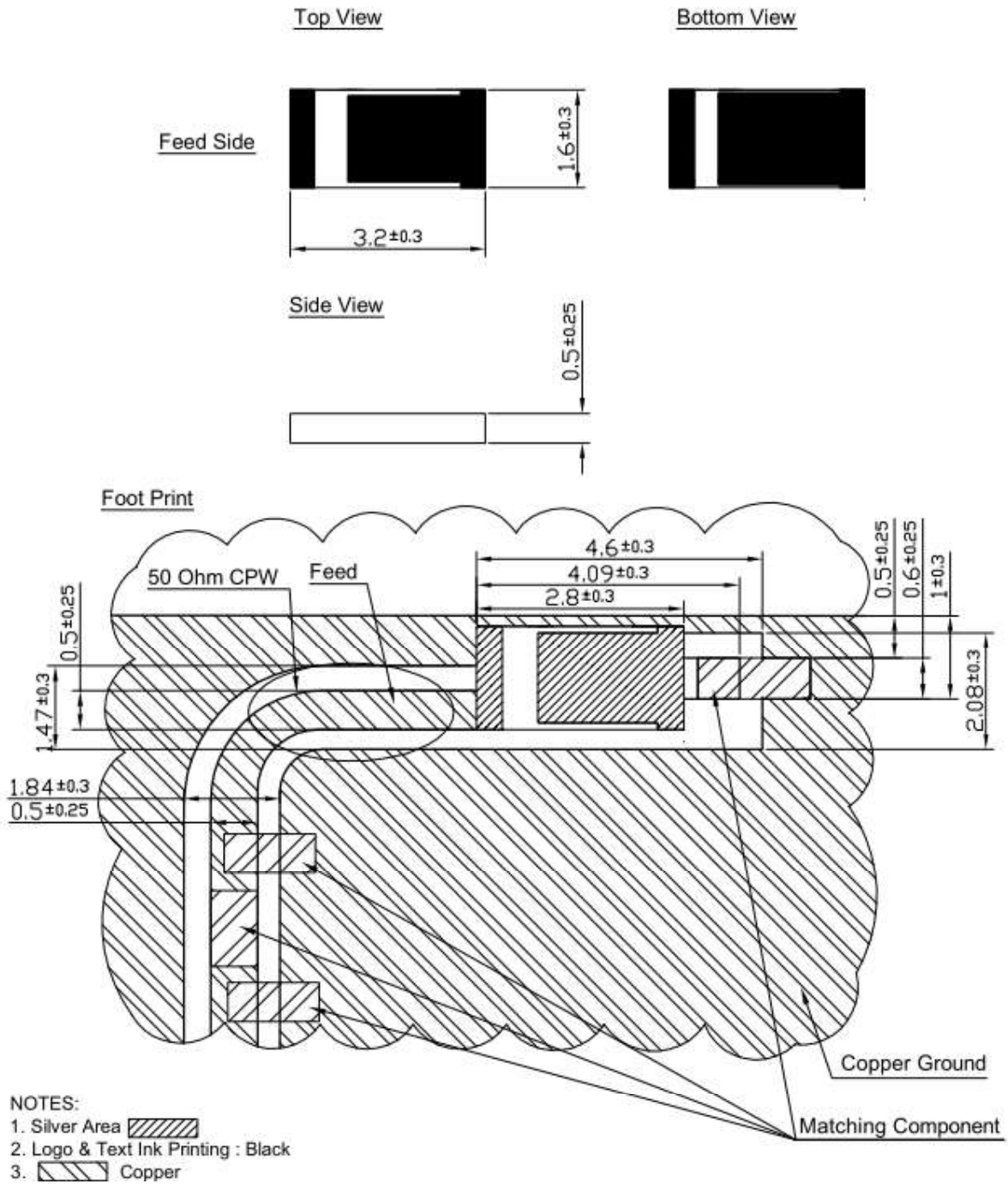
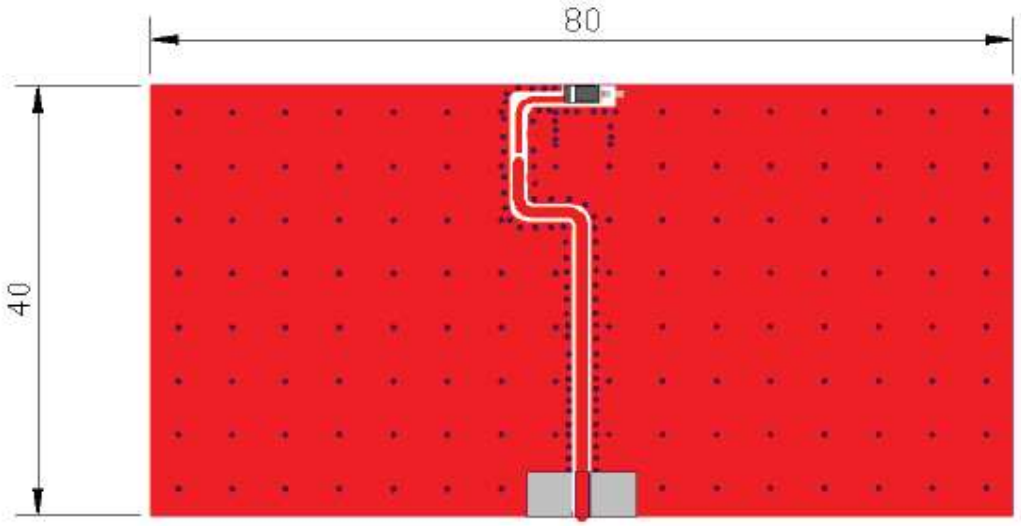
7. Mechanical Drawing

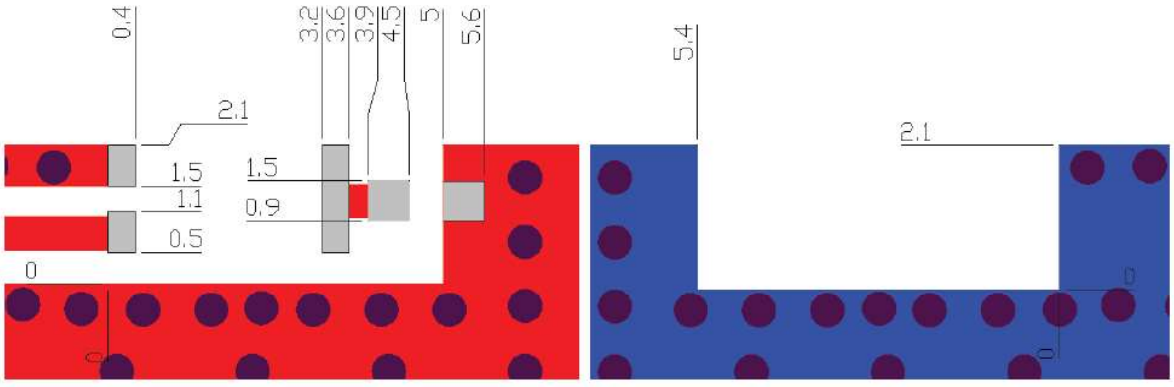




Unit : mm

8. Layout Guide

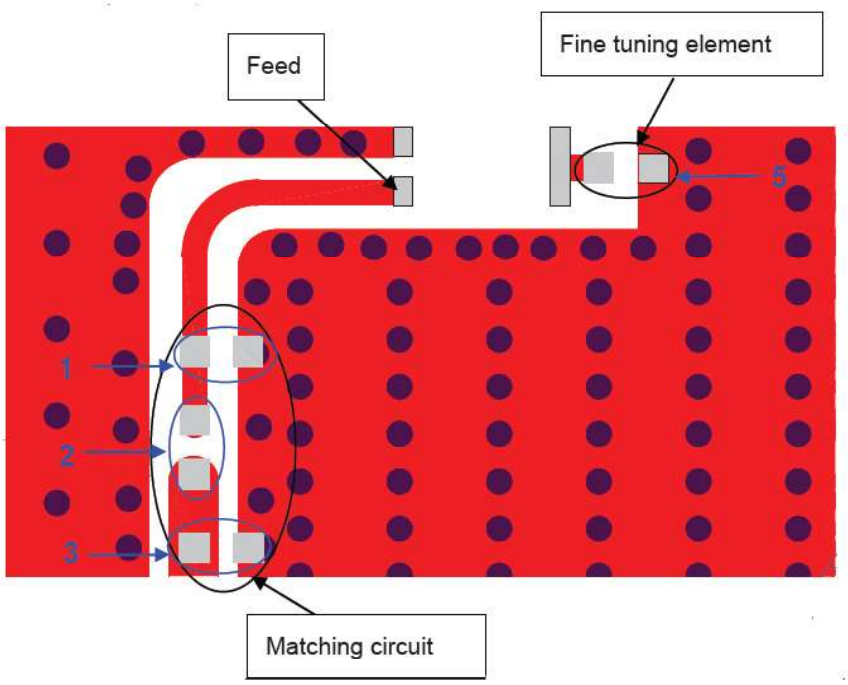
Solder Land Pattern:



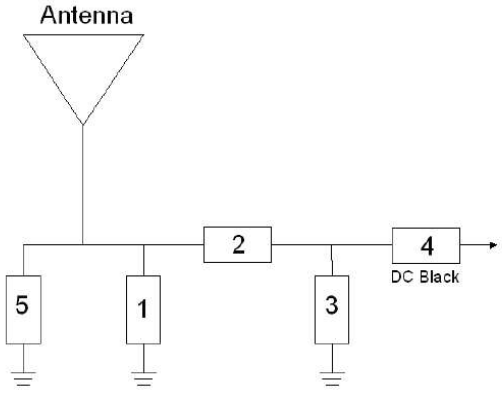
Unit : mm

9. Frequency tuning

Antenna tuning scenario:



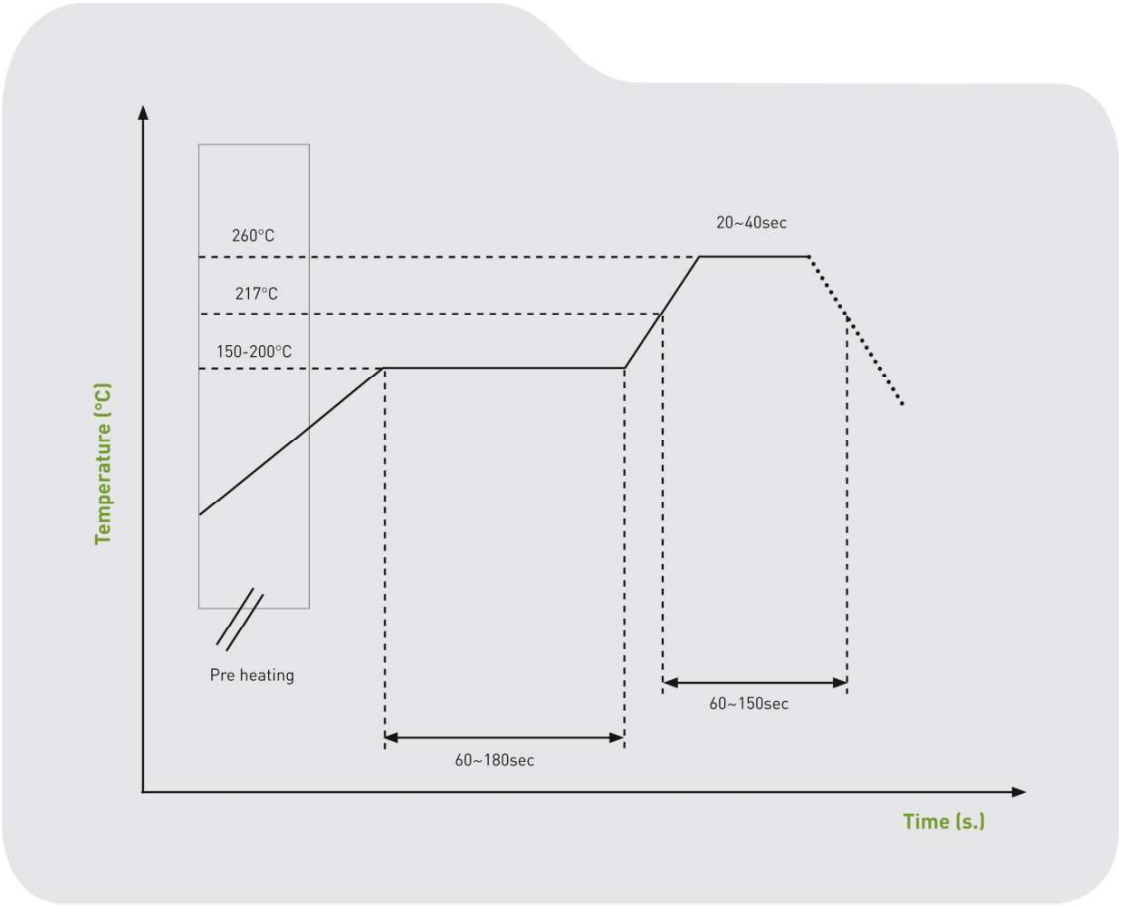
Matching circuit: (Center frequency is 5500MHz at 80x40mm ground plane)



System Matching Circuit Component		
Location	Description	Vendor
1	0.2pF	DARFON(0402)
2	0Ω	(0402)
3	1.5nH	DARFON(0402)
4	22pF	DARFON(0402)
5 (Fine tuning element)	0.2pF	DARFON(0402)

10. Soldering Conditions

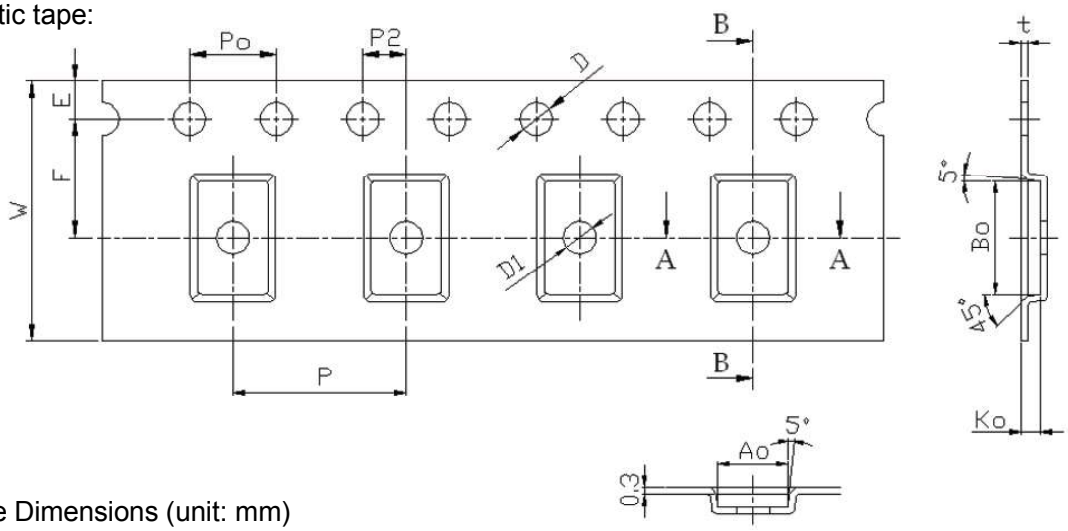
Typical Soldering profile for lead-free process:



11. Packing

Quantity: 6000pcs/ Reel

Plastic tape:



Tape Dimensions (unit: mm)

Feature	Specification	Tolerance
W	12.00	±0.30
P	8.00	±0.10
E	1.75	±0.10
F	5.50	±0.10
P2	2.00	±0.10
D	1.50	+0.10 / -0.00
D1	-	±0.10
Po	4.00	±0.10
10Po	40.00	±0.20

Pocket Dimensions (unit: mm)

Feature	Specification	Tolerance
Ao	1.90	+0.20
Bo	3.50	-0.10
Ko	0.60	±0.05
t	0.30	±0.05

1. Cumulative tolerance of 10 pocket hole pitch: ±0.20mm
2. Carrier camber not to exceed 1mm in 250mm
3. Ao and Bo measured on a plane above the inside bottom of the pocket
4. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier
5. All dimensions meet EIA-481-B requirements
6. Material – Clear non Anti-Static Polystyrene, Black Conductive Polystyrene