Specification

Part No.	:	**NCP.5820**
Product Name	:	NB-IoT SMD Ceramic Antenna For Bands 5, 8 and 20
Features		Small size, Small Footprint SMD Antenna Global NB-IoT Coverage for: • Band 5, 824-894MHz • Band 8, 880-960MHz • Band 20, 791-862mHz High Efficiency across each Band Dimensions: 14.1 x 8.3 x 2mm Automotive IATF16949 Production and Quality Approved **RoHS compliant**

1. Introduction

The evolution of IoT connectivity has seen an urgent need for low power applications that can connect thousands of devices to the internet and Narrowband IoT (NBIoT) is a new way to facilitate this demand. For a small compact embedded antenna, the Taoglas NCP.5820 fits will fit in many size challenged designs without performance compromises.

The NCP.5820 supports Bands 5 (824-894MHz), 8 (880-960MHz) and 20 (791-862MHz) providing global NB-IoT coverage and demonstrates excellent efficiency across all bands.

The tiny antenna measures just 14.1x8.3x2mm. As it is a surface mount antenna it can be easily integrated into even the smallest of devices. It allows device designers to take advantage of all of the benefits of NB-IoT technology, including reduced power consumption and increased battery life; increased system capacity and spectrum efficiency; and extended coverage in both rural and deep indoors environments all with a very small form factor.

Overall, this antenna is suitable for applications that need to meet the following requirements:

- Small footprint, low profile design factors
- SMT Components for assembly accuracy and reliability
- Excellent antenna efficiency helping to maintain better system gain and hence better device send and receive sensitivity (TRP & TIS)
- Excellent antenna efficiency to aid lower power consumption and increased battery life
- Global coverage for mobility and one global SKU
- 100% quality and performance testing prior to shipping for reliability and consistency
- Mechanical and environmental robustness across the lifetime of the device

For more information or support with integrating this antenna into your device. please contact your regional Taoglas sales office.

2. Specification

Band 5,8 Electrical			
	Band 5	Band 8	
Frequency (MHz)	824~894	880~960	
Peak Gain (dBi)*	0.6	1.2	
Average Gain (dBi)*	-3.5	-2.7	
Efficiency (%)*	53.5	60.7	
Return Loss (dB)*	<-4.5	<-5	
Band 5,8,20 Electrical			
	Band 5	Band 8	Band 20
Frequency (MHz)	824~894	880~960	791~862
Peak Gain (dBi)*	1.1	1.7	-0.3
Average Gain (dBi)*	-3.9	-3.1	-4.3
Efficiency (%)*	47	53.1	38.7
Return Loss (dB)*	<-4.5	<-5	<-4.5
Impedance	50 Ω		
Maximum Input Power	5W		
Mechanical			
Antenna Dimensions	14.1mm x 8.3mm x 2mm		
Material	Ceramic		
Weight	0.76 g		
Soldering Type	SMT through Reflow		
Environmental			
Operation Temperature	-40°C ~ +85°C		
Storage Temperature	-40°C ~ +85°C		
Humidity	Non-condensing 65°C 95% RH		

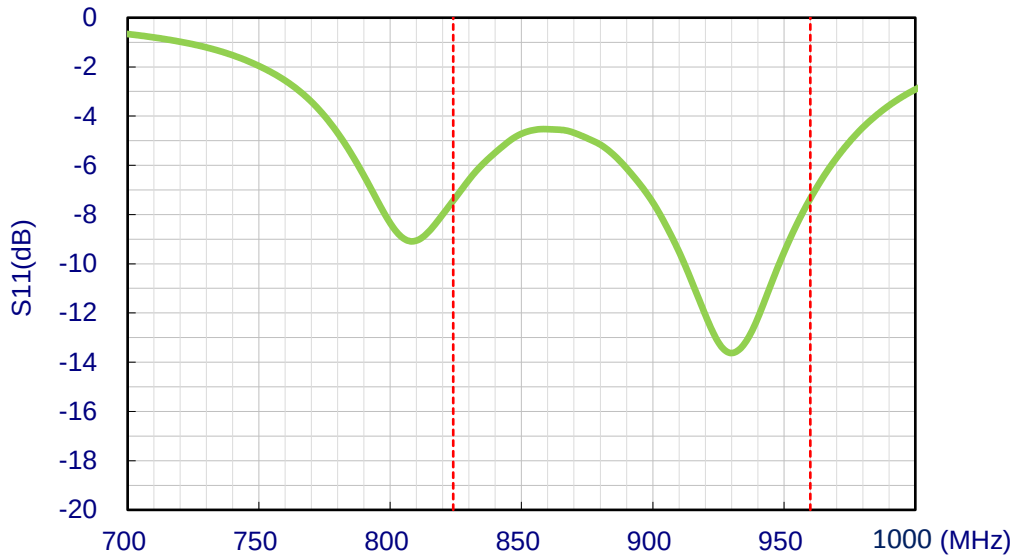
All measurements were conducted with SMT on a 115*35mm evaluation board with 100mm length ground plane and matching circuit.

See EVB drawing and matching circuit diagram in Section 7.

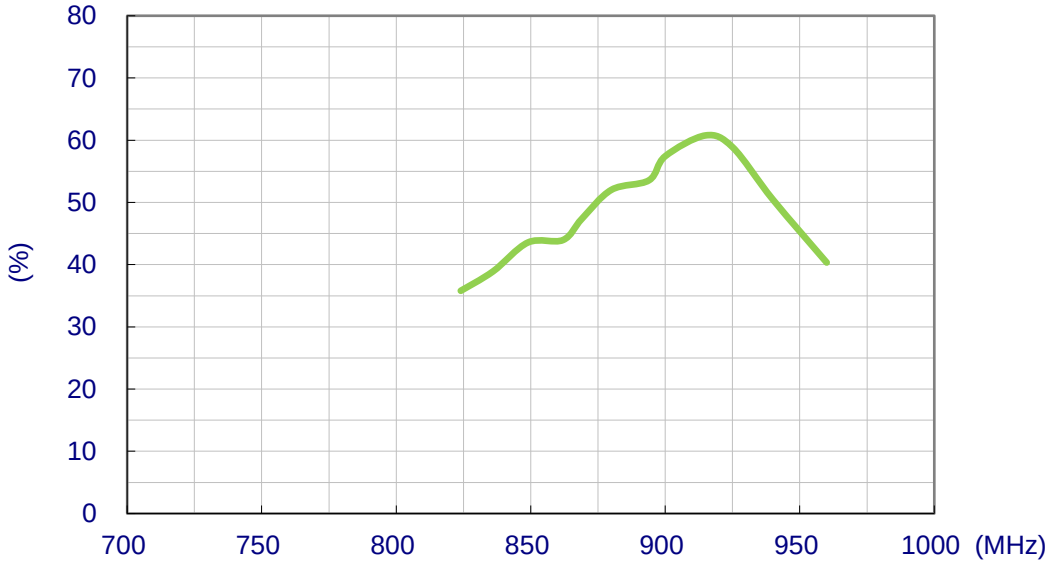
3. Antenna Characteristics

All data was measured on the evaluation board illustrated in Section 7, with the documented matching circuit.

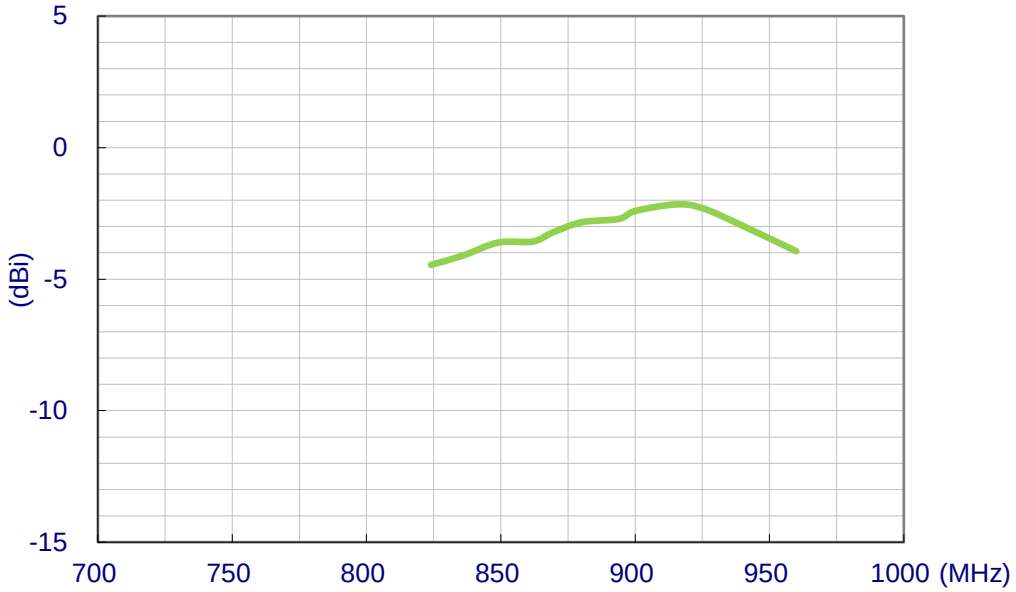
3.1 Return Loss (Band 5,8)



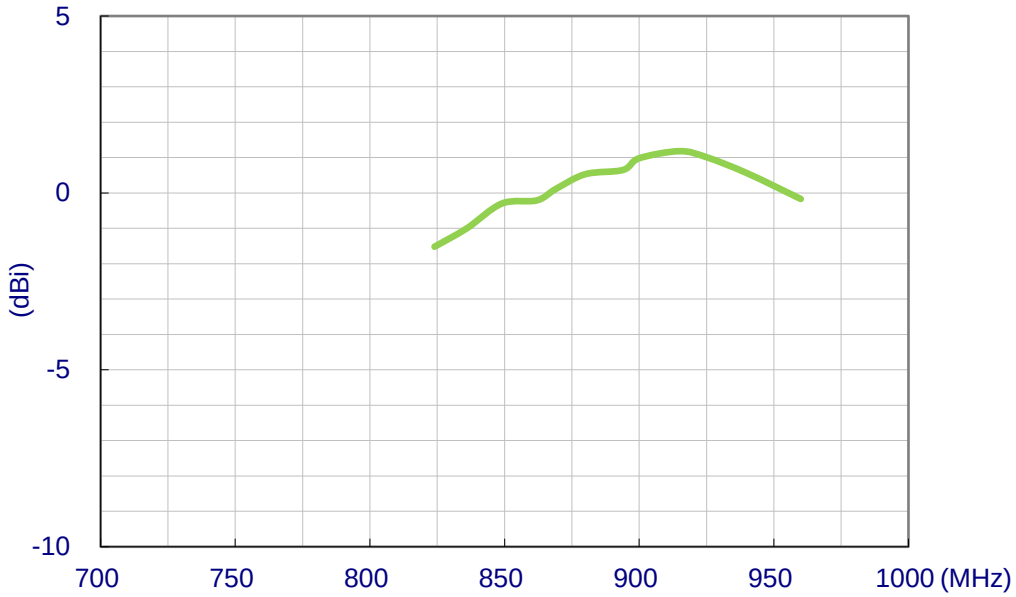
3.2 Efficiency (Band 5,8)



3.3 Average Gain(Band 5,8)

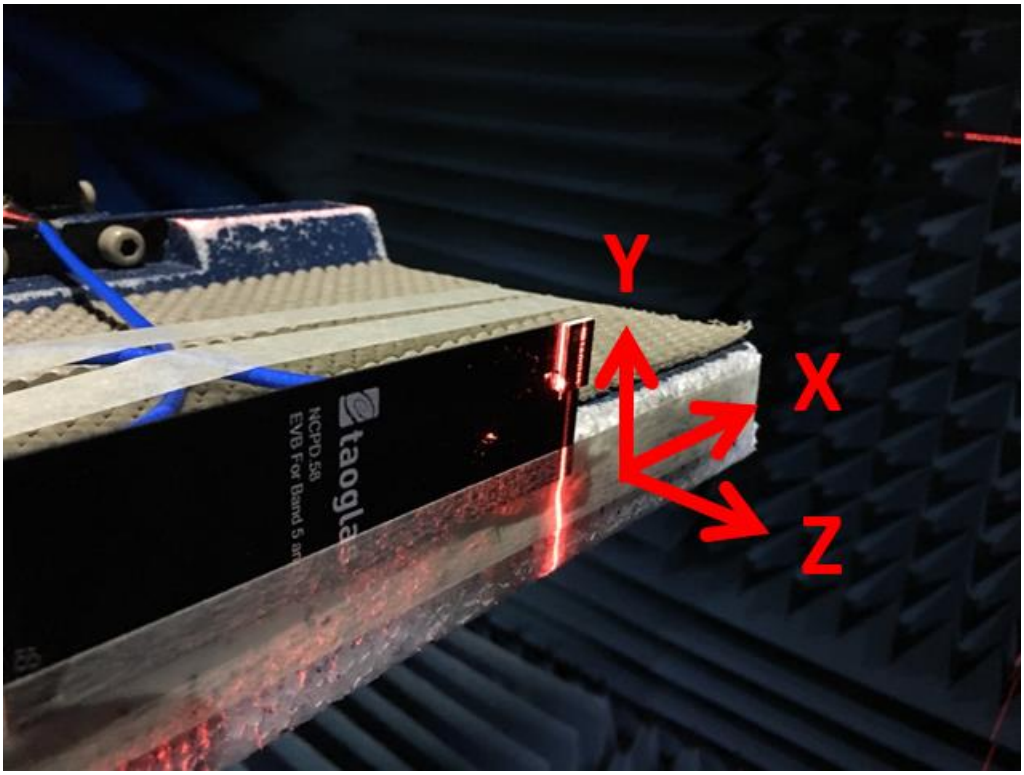


3.4 Peak Gain (Band 5,8)



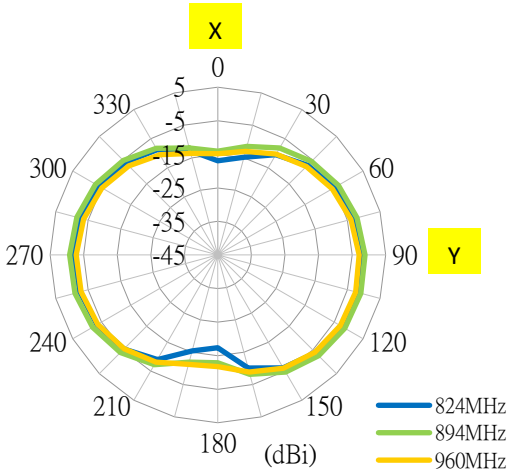
4. Antenna Radiation Patterns

4.1 Antenna Setup (Antenna Test Setup in Anechoic Chamber)

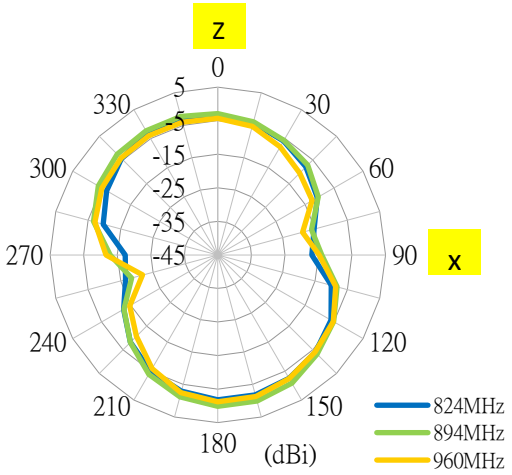


4.2 2D Radiation Patterns (Band 5,8)

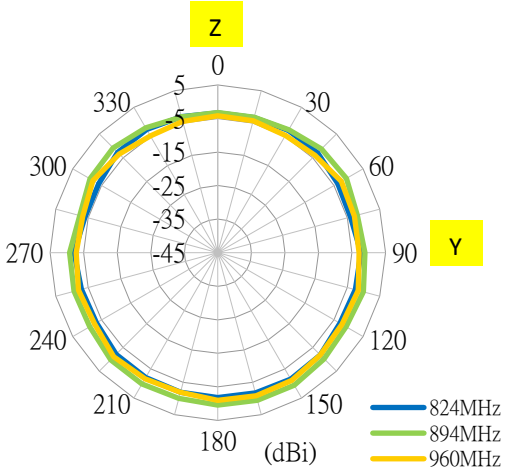
XY Plane



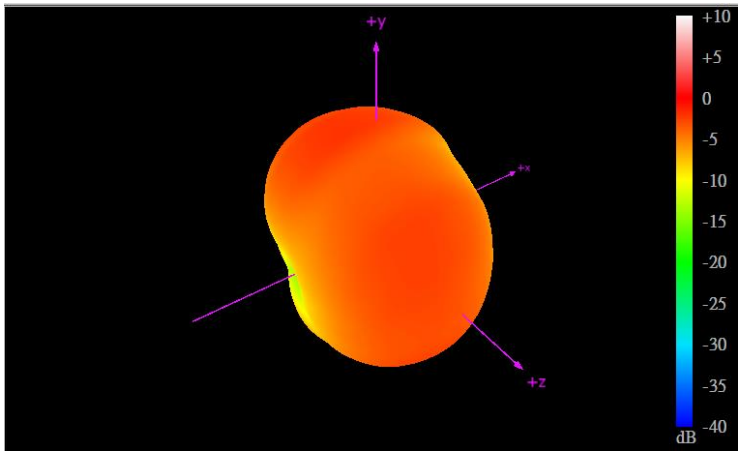
XZ Plane



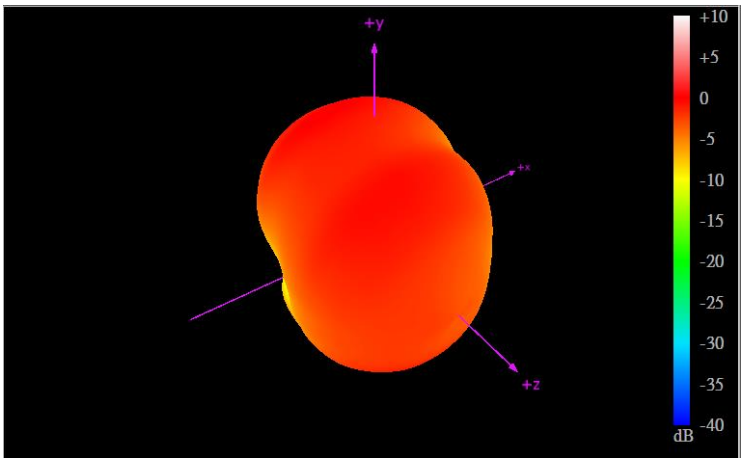
YZ Plane



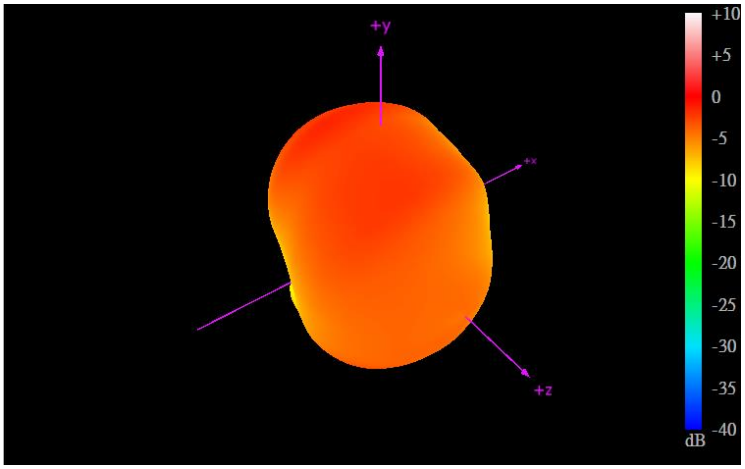
4.3 3D Radiation Patterns (Band 5,8)



824MHz



894MHz

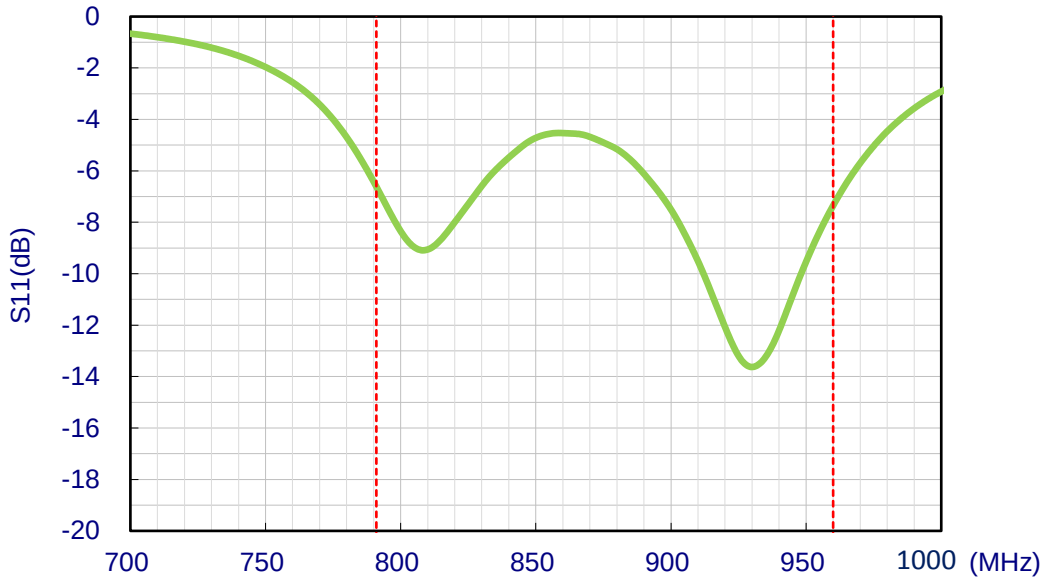


960MHz

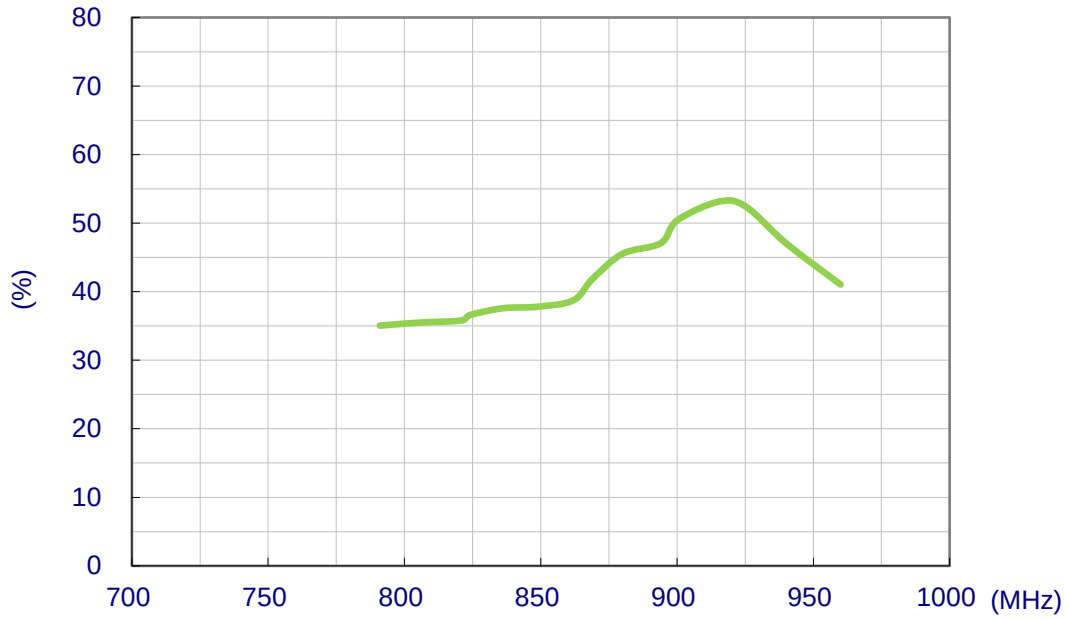
5. Antenna Characteristics

All data was measured on the evaluation board illustrated in Section 7, with the documented matching circuit.

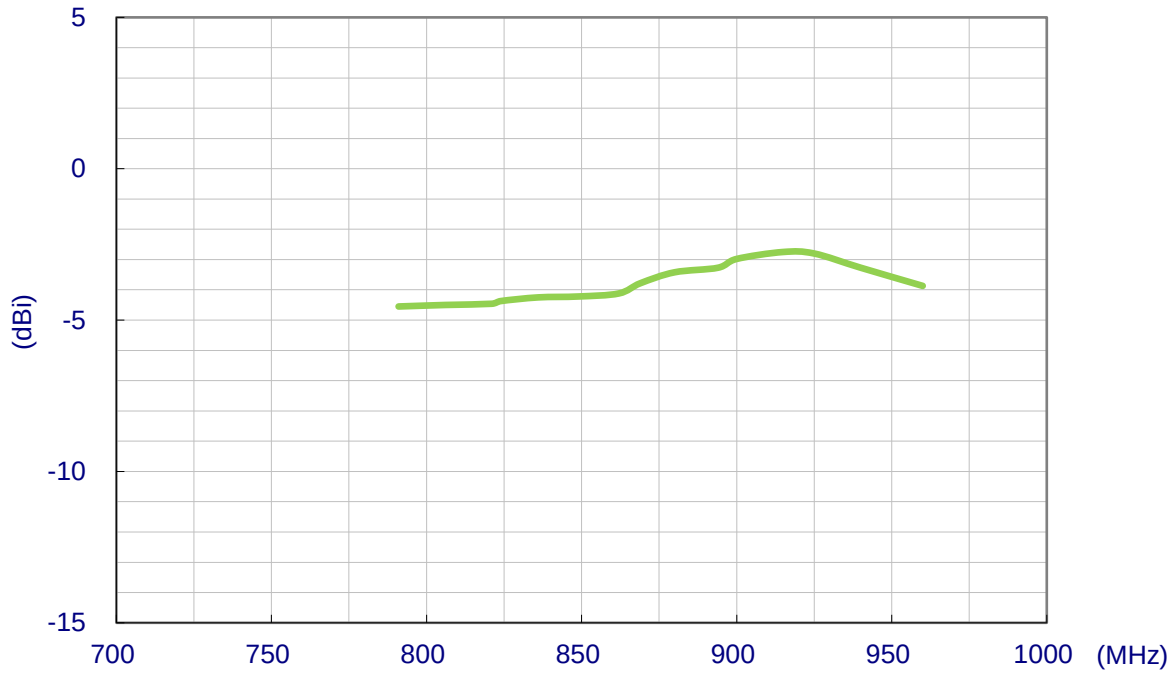
5.1 Return Loss (Band 5,8,20)



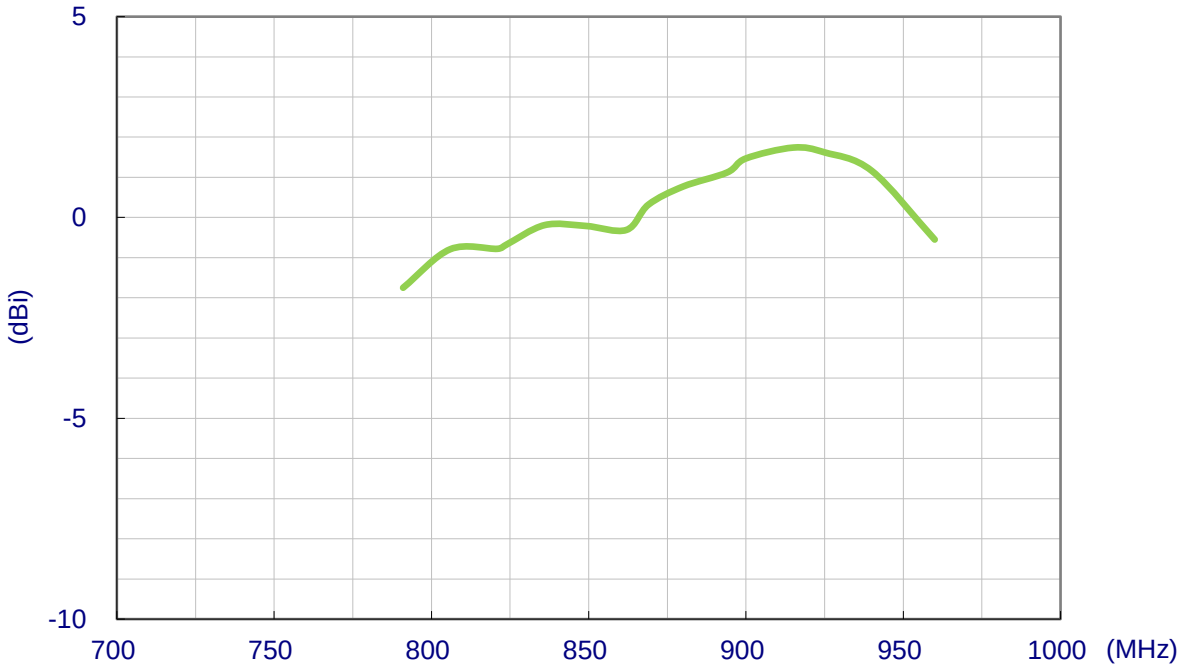
5.2 Efficiency (Band 5,8,20)



5.3 Average Gain(Band 5,8,20)

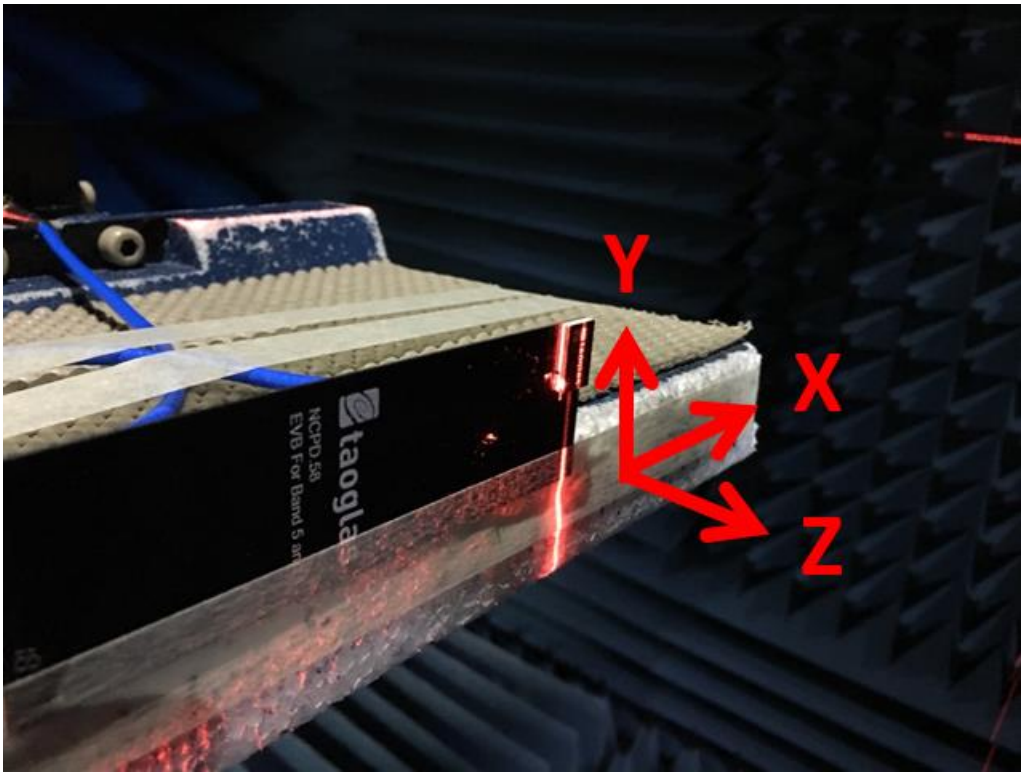


5.4 Peak Gain (Band 5,8,20)



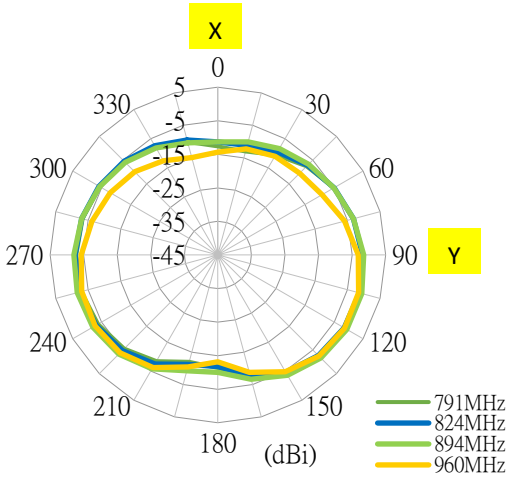
6. Antenna Radiation Patterns

6.1 Antenna Setup (Antenna Test Setup in Anechoic Chamber)

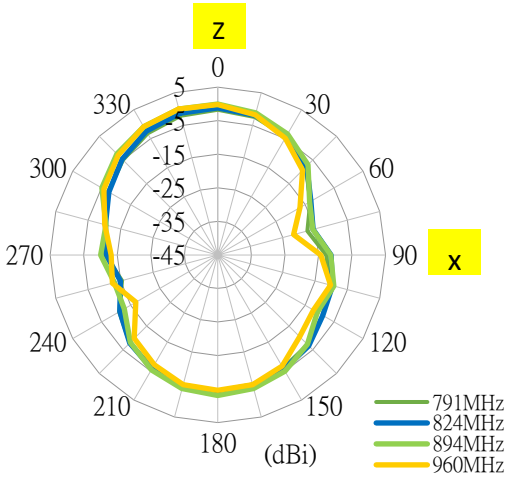


6.2 2D Radiation Patterns (Band 5,8,20)

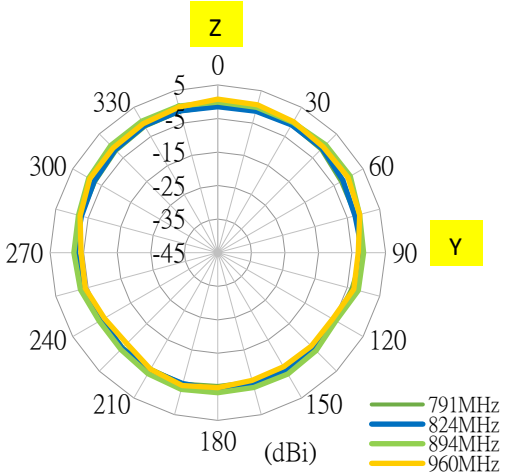
XY Plane



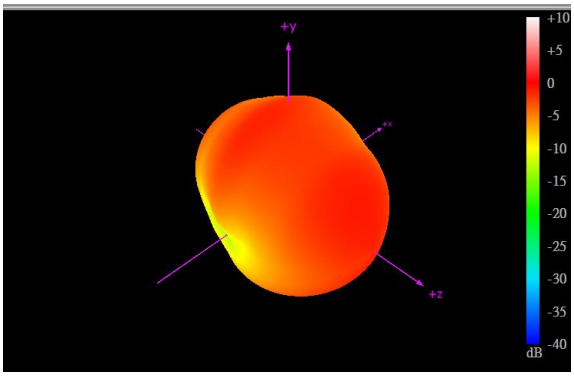
XZ Plane



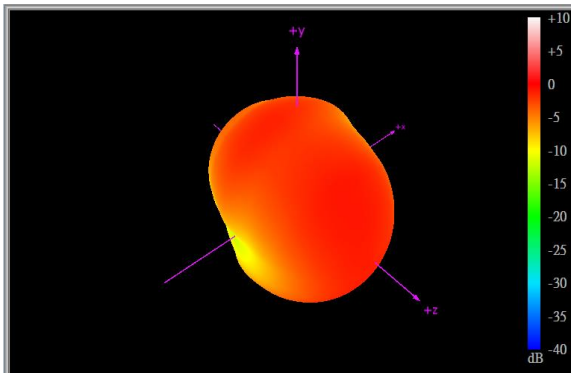
YZ Plane



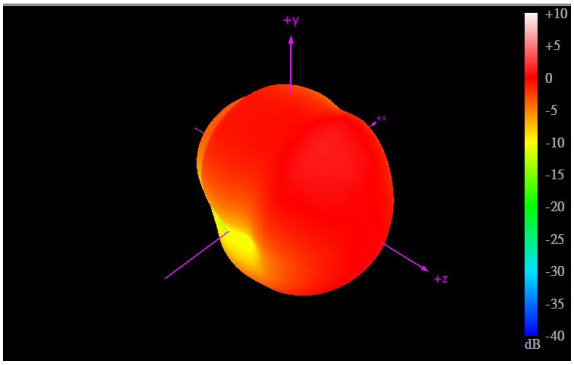
6.3 3D Radiation Patterns (Band 5,8,20)



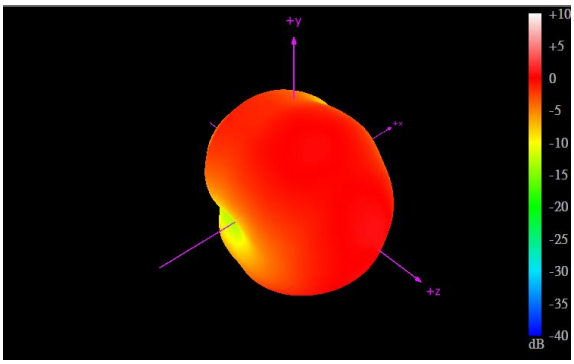
791MHz



824MHz



894MHz

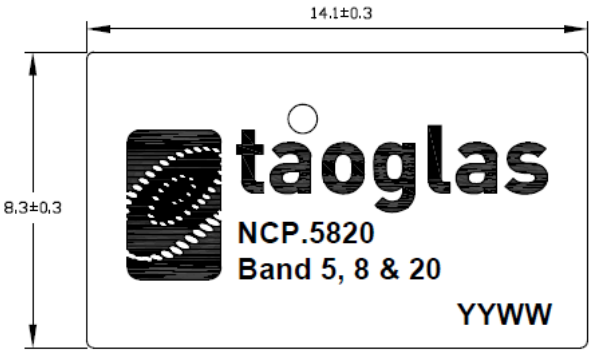


960MHz

7. Mechanical Drawing (Unit: mm)

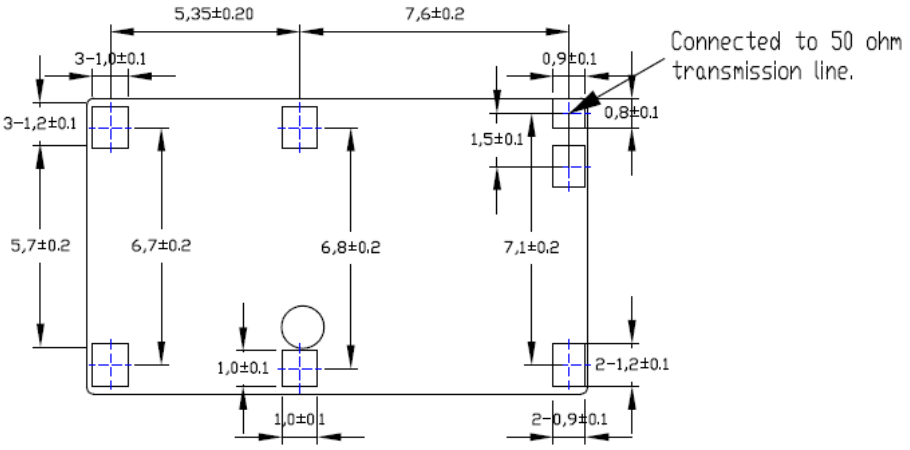
7.1 Antenna

Front View

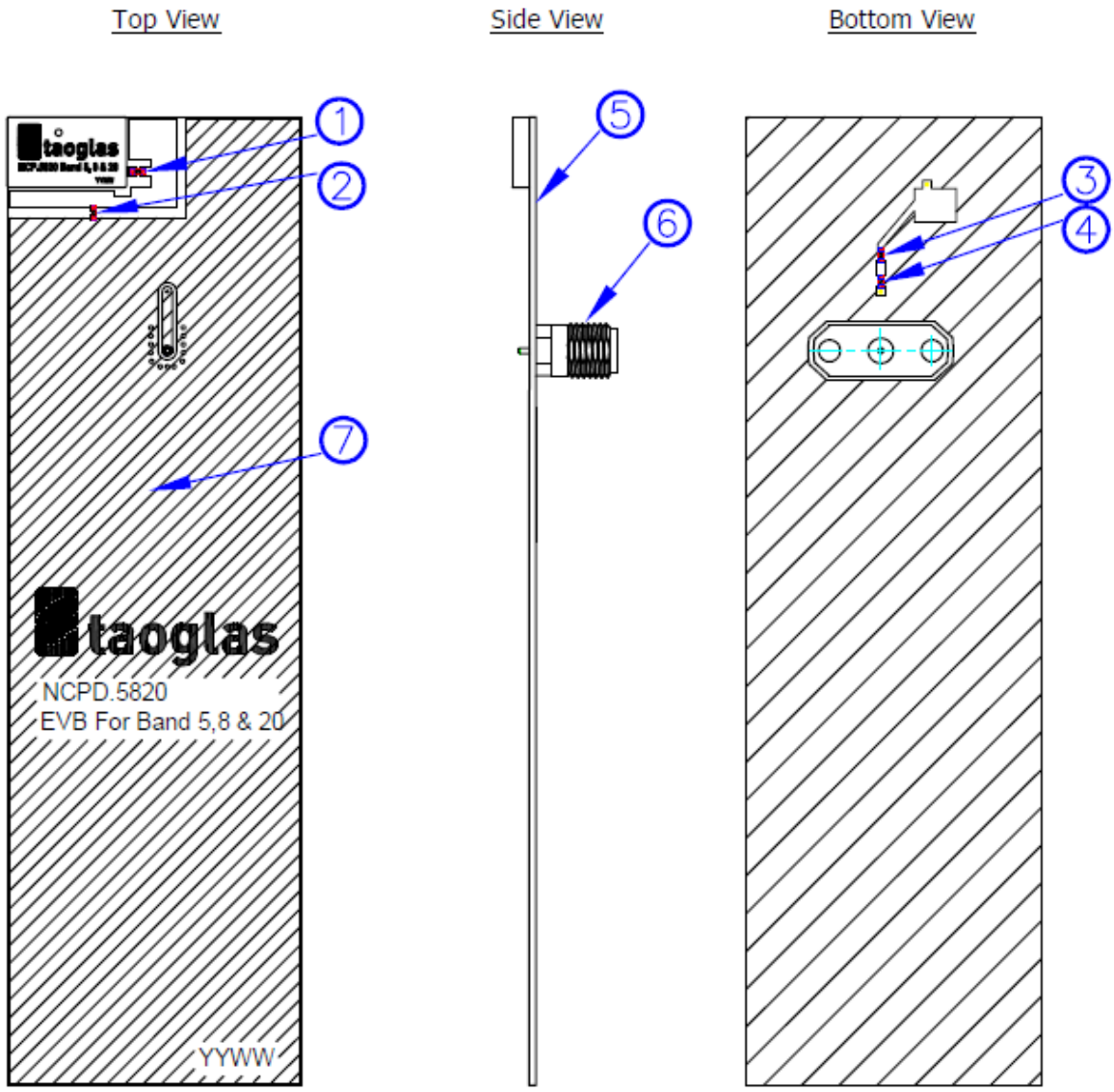


Side View

Bottom View



7.2 Evaluation Board



	Name	Material	Finish	QTY
1	Inductor L1(0402)	Ceramic	N/A	1
2	Inductor L2(0402)	Ceramic	N/A	1
3	Capacitance C1(0402)	Ceramic	N/A	1
4	Inductor L3(0402)	Ceramic	N/A	1
5	NCPD.5820 EVB PCB	FR4 0.8t	Gold	1
6	SMA(F) ST PCB	Brass	Gold	1
7	NCP.5820 Antenna	Ceramic	White	1

7.3 Evaluation Board Matching Circuit

Band5,8

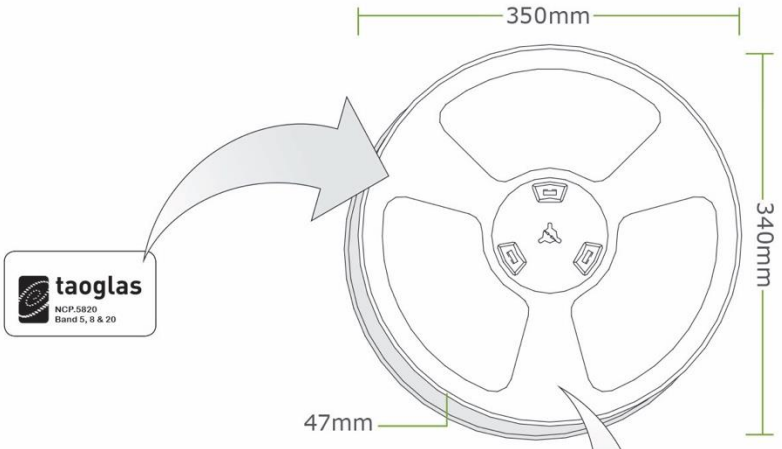
	Name	P/N	Material	Finish	QTY
1	Inductor L1=0R (0402)	Any	Ceramic	N/A	1
2	Inductor L2=5.6nH (0402)	MHQ1005P5N6S	Ceramic	N/A	1
3	Capacitance C1=0.5pF (0402)	GRM1555C1HR50CA01D	Ceramic	N/A	1
4	Inductor L3=39nH (0402)	LQG15HS33NJ02D	Ceramic	N/A	1

Band5,8,20

	Name	P/N	Material	Finish	QTY
1	Inductor L1=1.5nH (0402)	LQG15HS1N5S02D	Ceramic	N/A	1
2	Inductor L2=6.8nH (0402)	MHQ1005P6N8J	Ceramic	N/A	1
3	Capacitance C1=0.5pF (0402)	GRM1555C1HR50CA01D	Ceramic	N/A	1
4	Inductor L3=39nH (0402)	LQG15HS33NJ02D	Ceramic	N/A	1

8. Packaging

700pcs NCP.5820 per Tape & Reel
Dimensions - 350*340*47mm
Weight - 1.1Kg



3500pcs NCP.5820 per carton
Dimensions - 360*370*275mm
Weight - 5.9Kg