

APPROVAL SPECIFICATION

Product : Internal Antenna

Model Name : TMRV5GTB

Date : 2023.05.03

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1. Manufacturer

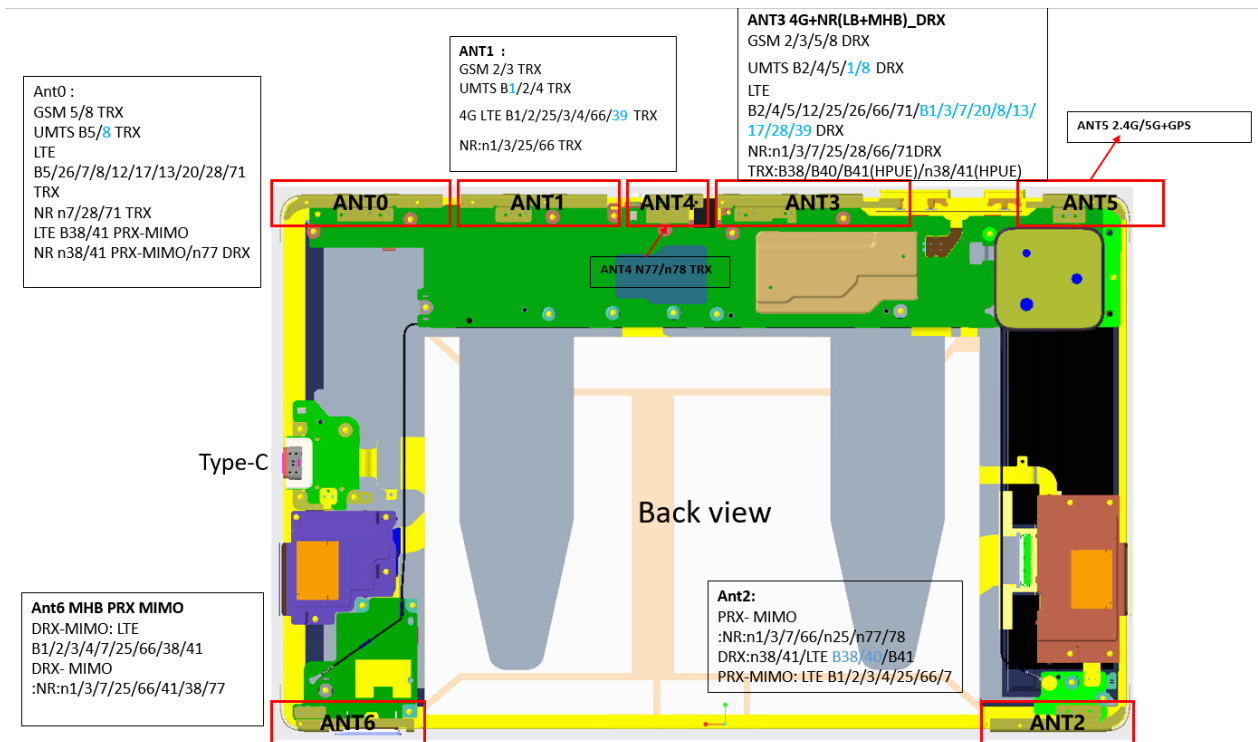
- Kunshan Innowave Communication Technology Co.,Ltd

2. Model Name

- Basic Model: TMRV5GTB

3. Antenna Type

ANT	Antenna type
ANT0	FPC Antenna, IFA
ANT1	FPC Antenna, IFA
ANT2	FPC Antenna, IFA
ANT3	FPC Antenna, IFA
ANT4	FPC Antenna, IFA
ANT5	FPC Antenna, IFA
ANT6	FPC Antenna, IFA



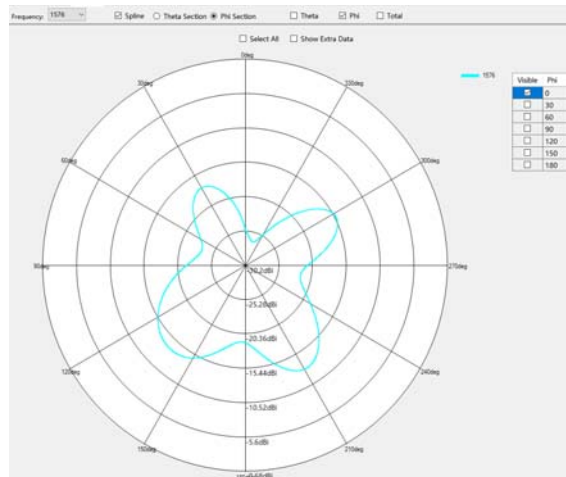
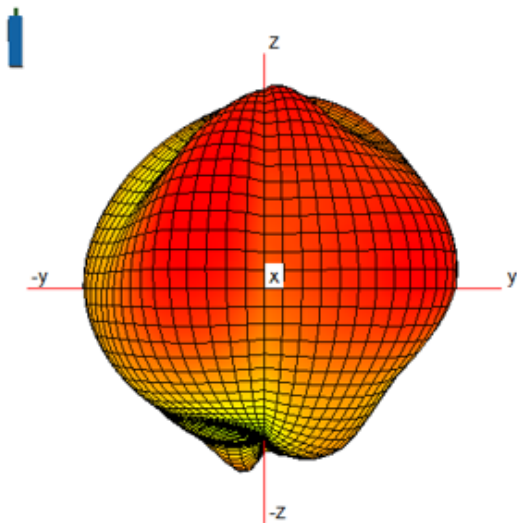
4. Electric Performance Data

4.1 Specification Sheet

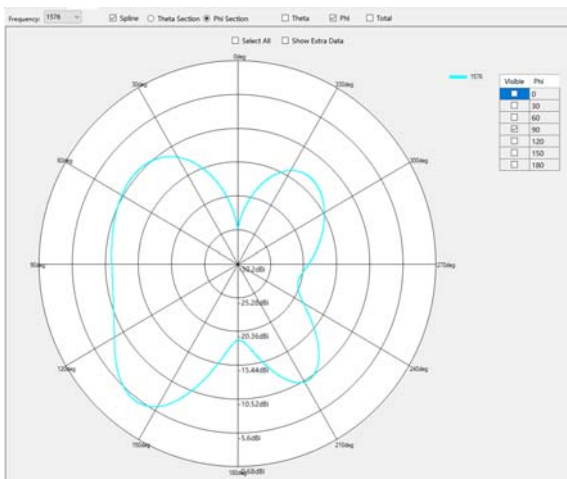
Electronic Specification				
Frequency Range [MHz]	LTE B1/n1 WCDMA B1	LTE B2/WCDMA B2/PCS1900	LTE B3/n3 DCS1800	LTE B4/WCDMA B4
	1920-2170	1805-1990	1710-1880	1710-2155
ANT	ANT1	ANT1	ANT1	ANT1
Peak Gain(dBi)	0.2	0.2	0.16	0.2
Average Gain(dBi)	-0.89	-0.37	-0.63	-0.72
Frequency Range [MHz]	LTE B5/WCDMA B5/GSM850	LTE B7/n7	LTE B8/WCDMA B8/GSM 900	LTE B12
	824-894	2500-2690	880-960	699-746
ANT	ANT0	ANT0	ANT0	ANT0
Peak Gain(dBi)	-1.3	-0.6	-0.94	-7.48
Average Gain(dBi)	-1.58	-2.1	-2.2	-8.2
Frequency Range [MHz]	LTE B13	LTE B17	LTE B20	LTE B25/n25
	746-787	704-746	791-862	1850-1995
ANT	ANT0	ANT0	ANT0	ANT1
Peak Gain(dBi)	-5.9	-7.6	-1.3	0.2
Average Gain(dBi)	-6.3	-7.9	-2.2	-0.22
Frequency Range [MHz]	LTE B26	LTE B28/n28	LTE B38/n38	LTE B39
	814-894	703-803	2570-2620	1880-1920
ANT	ANT0	ANT0	ANT3	ANT1
Peak Gain(dBi)	-1.3	-3.64	0.93	0.2
Average Gain(dBi)	-1.6	-4.5	0.39	-0.13
Frequency Range [MHz]	LTE B40	LTE B41/n41	LTE B66/n66	LTE B71/n71
	2300-2400	2496-2690	1710-2180	617-698
ANT	ANT3	ANT3	ANT1	ANT0
Peak Gain(dBi)	2.9	2.93	0.2	-5.7
Average Gain(dBi)	2.73	0.56	-0.75	-8.8
Frequency Range [MHz]	n77	n78	WIFI 2.4G	WIFI 5G
	3300-4200	3300-3800	2400-2484	5150-5850
ANT	ANT4	ANT4	ANT5	ANT5
Peak Gain(dBi)	0.77	0.22	0.79	0.71
Average Gain(dBi)	-0.96	-1.14	0.24	-1.43

4.2 Antenna Pattern Drawing

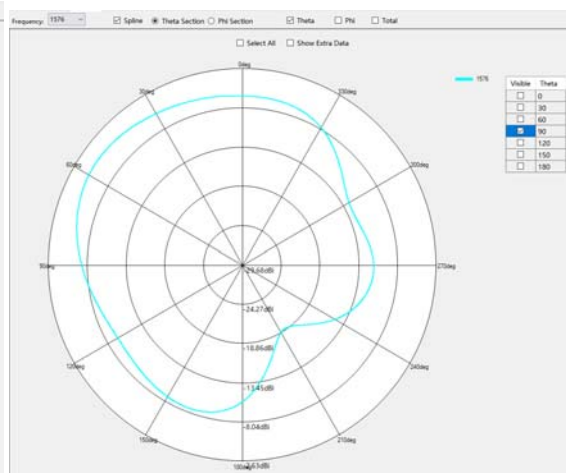
ANT5 GPS(1576MHz)



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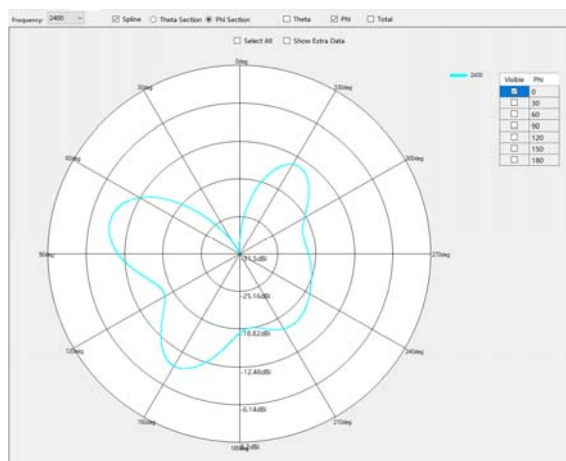
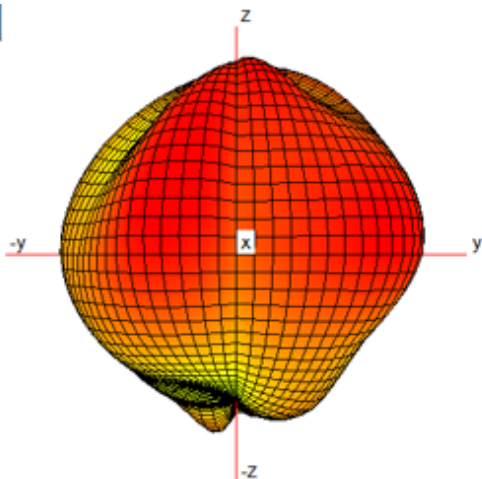


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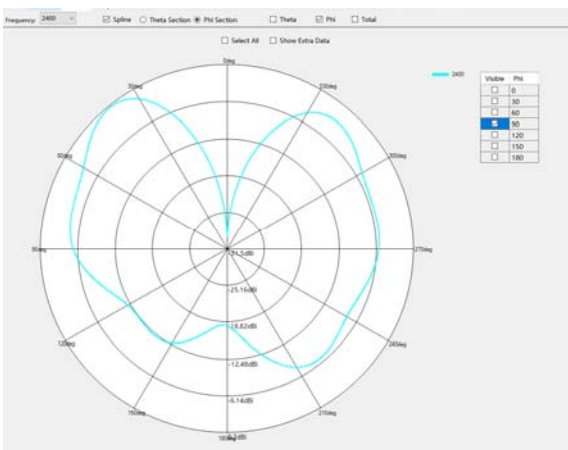


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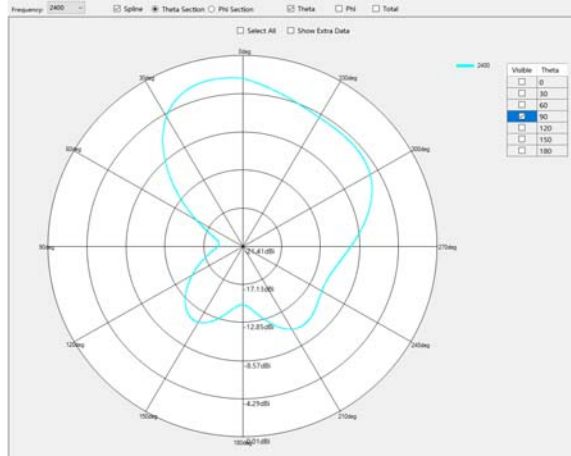
ANT5 WIFI 2.4G(2400MHz)



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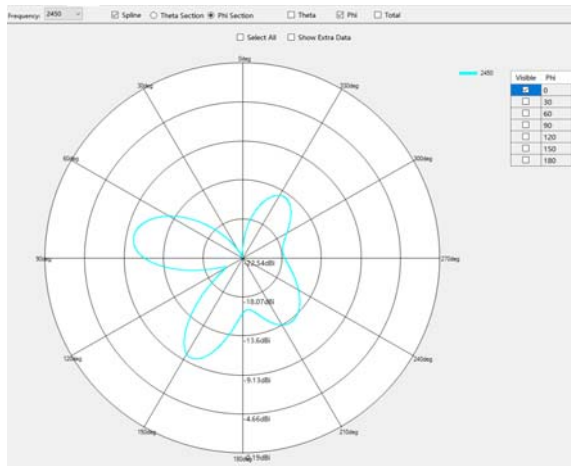
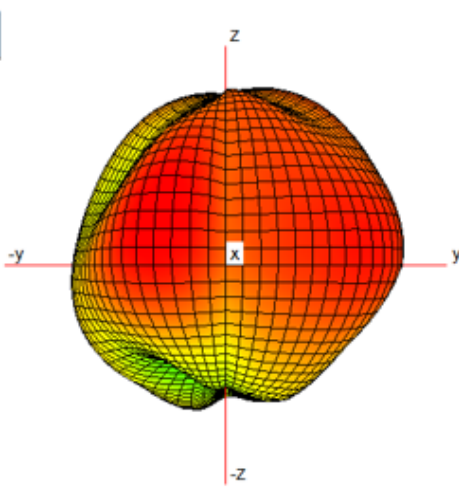


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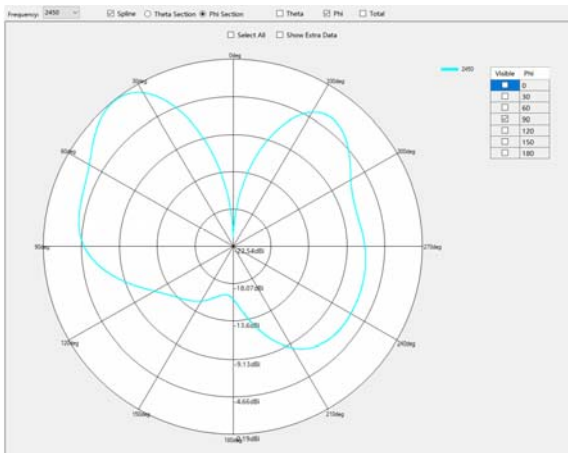


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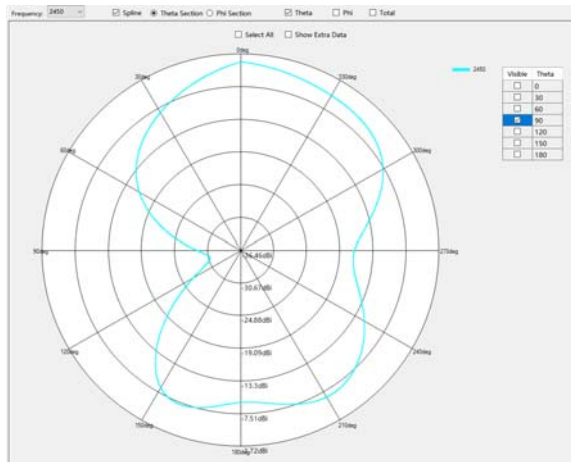
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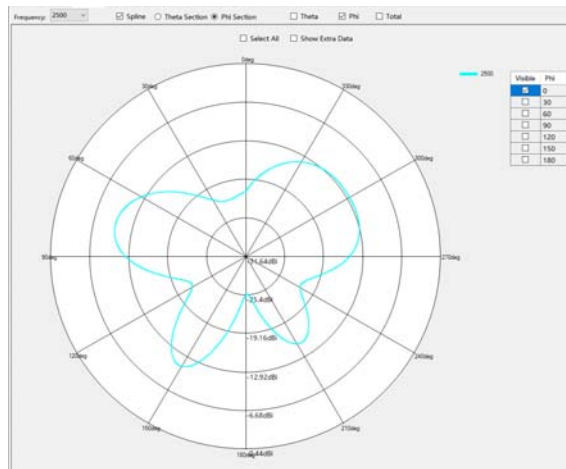
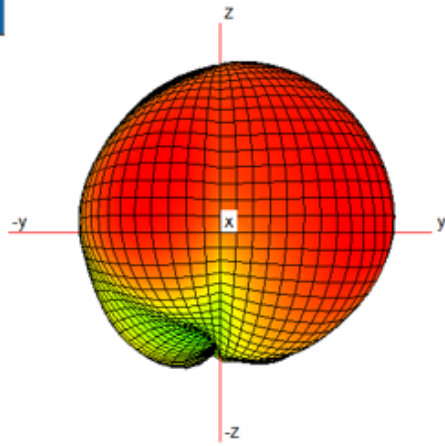


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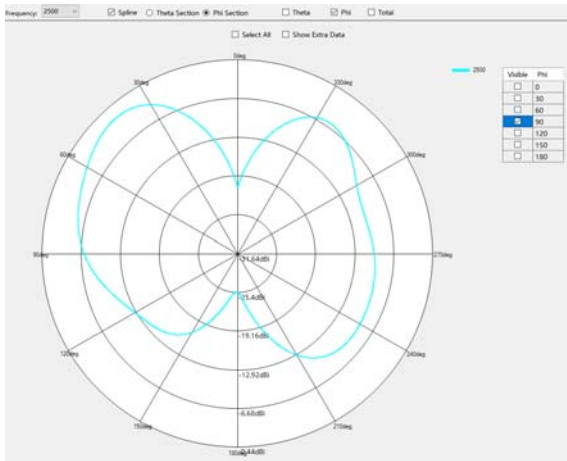


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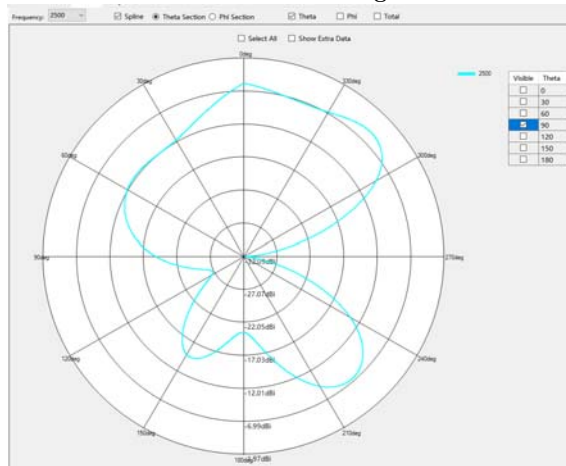
ANT5 WIFI 2.4G(2500MHz)



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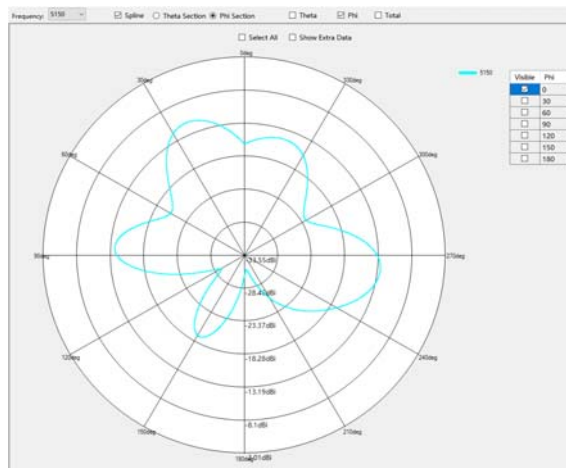
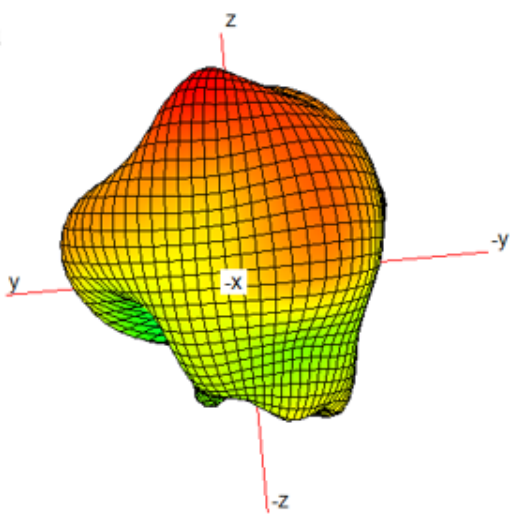


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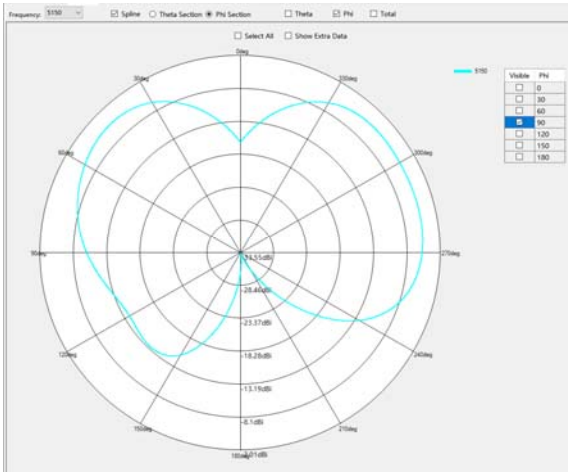


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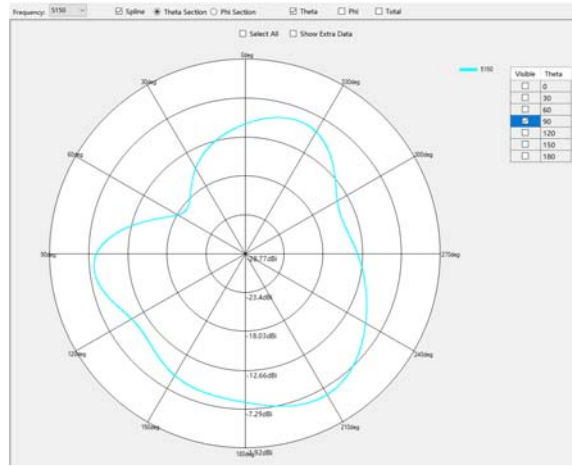
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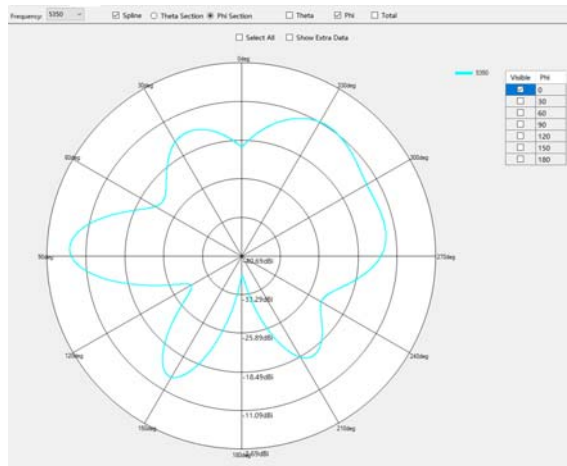
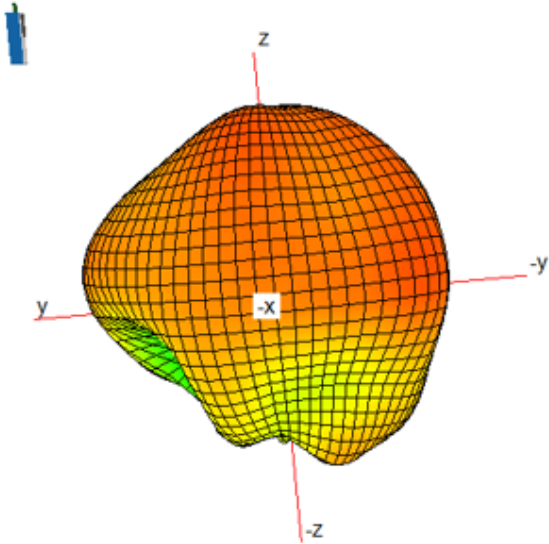


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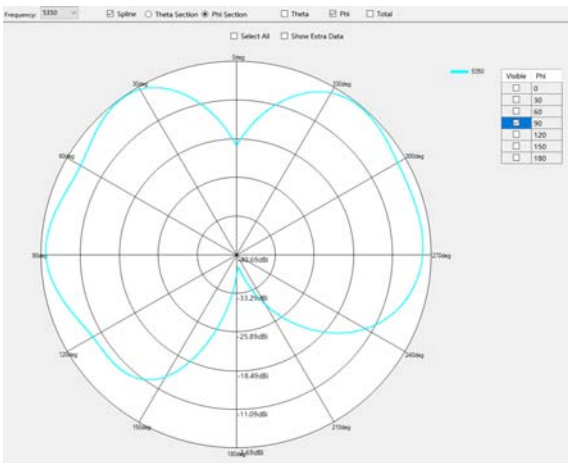


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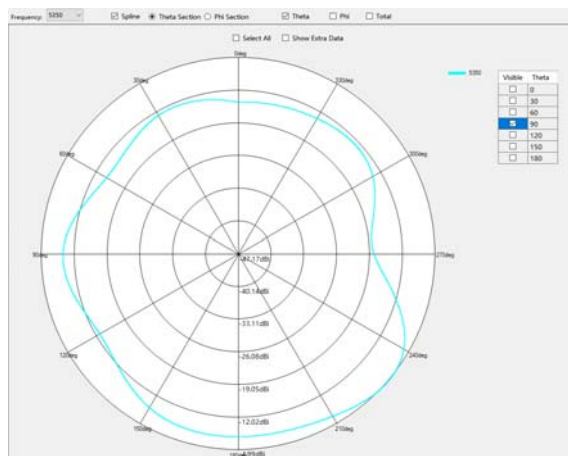
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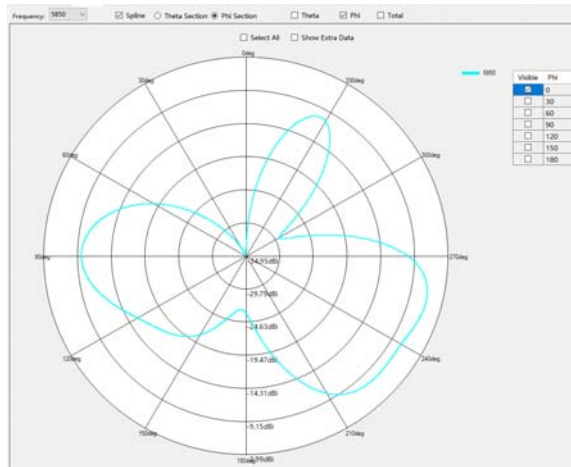
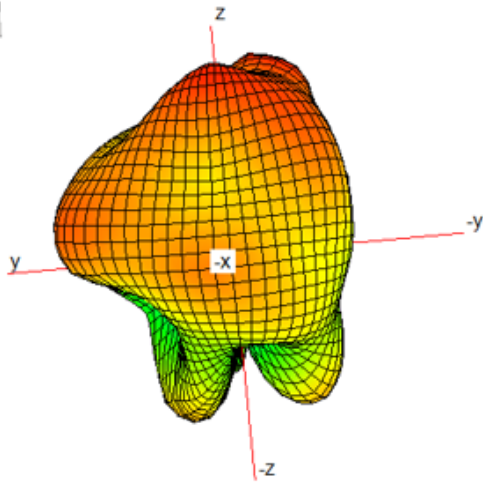


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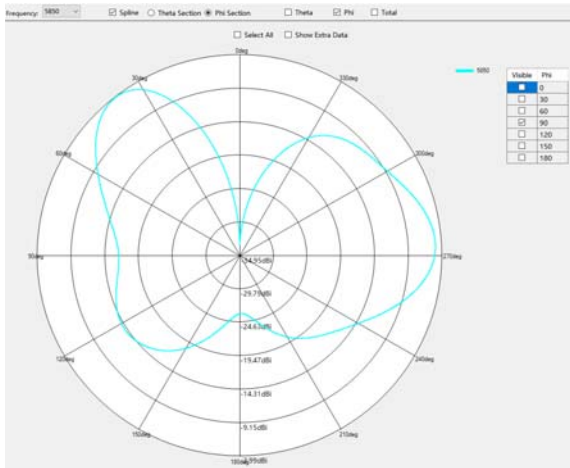


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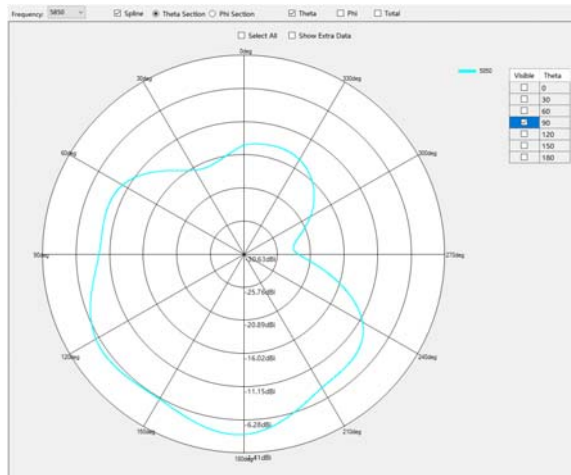
ANT5 WIFI 5G(5850MHz)



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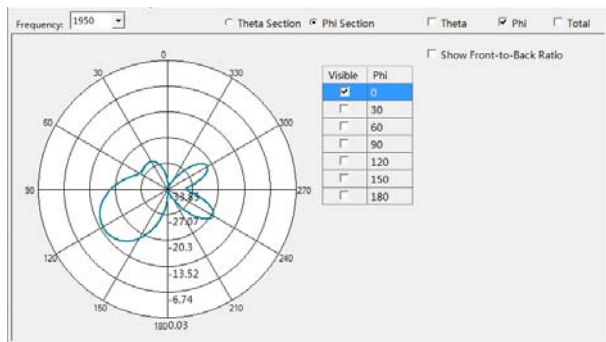
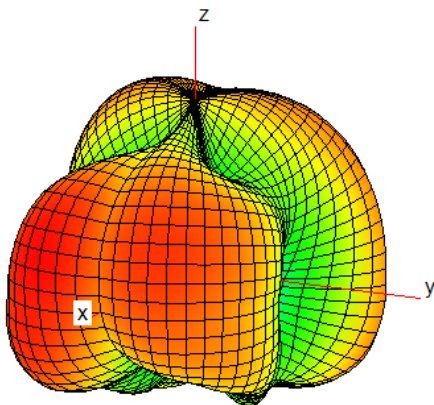


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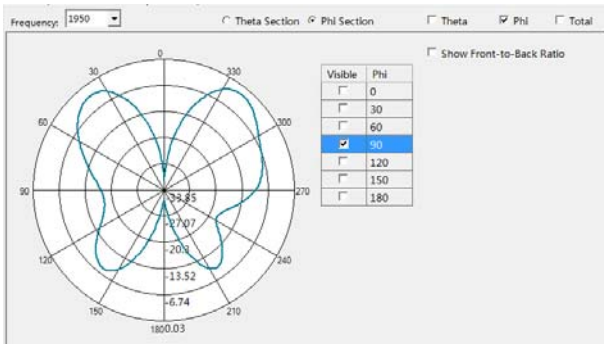


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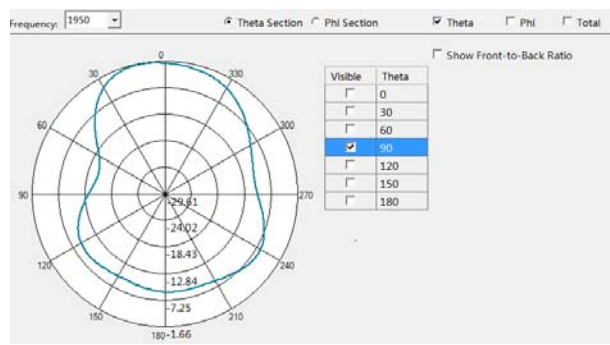
ANT1 Band1



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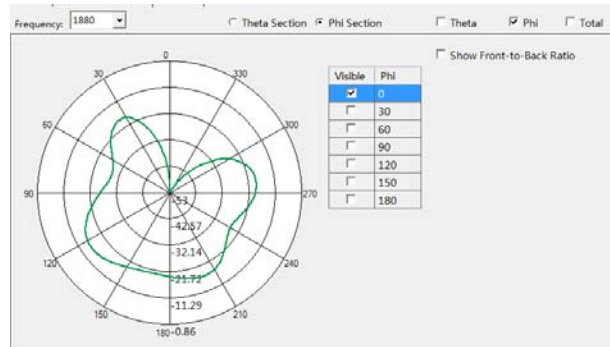
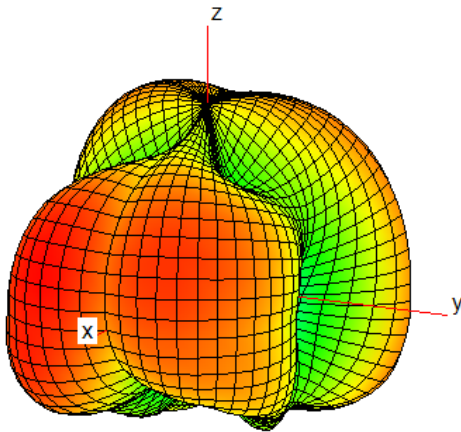


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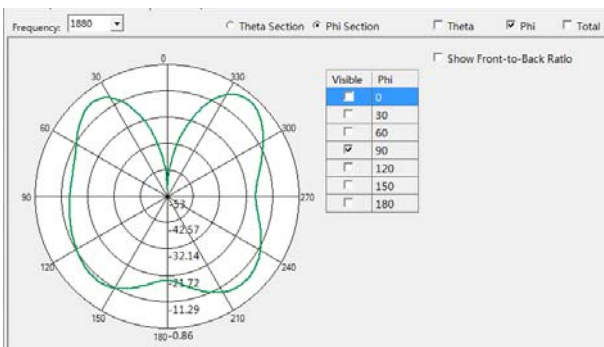


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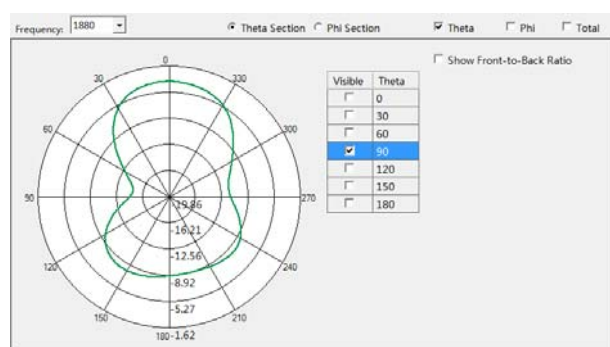
ANT1 Band2



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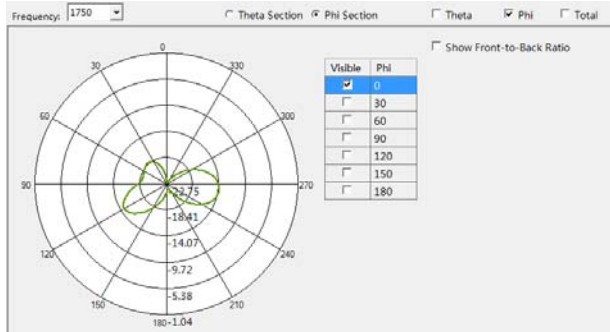
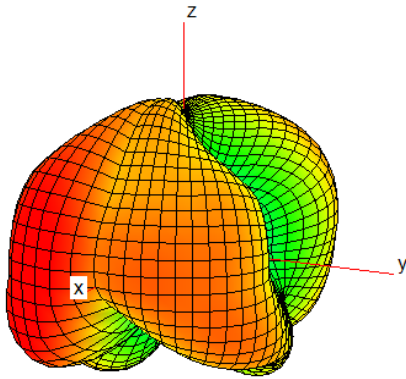


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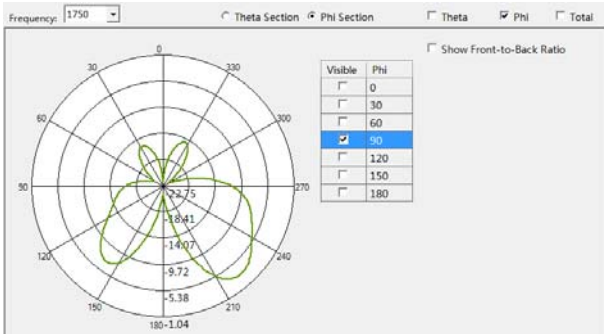


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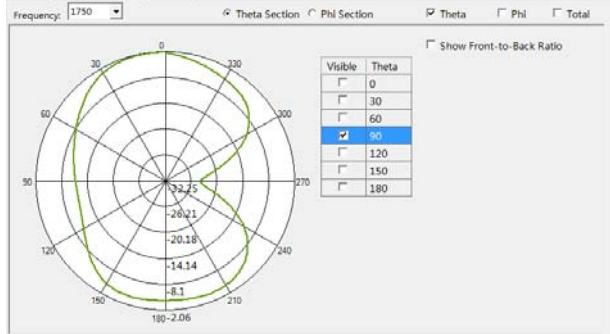
ANT1 Band3



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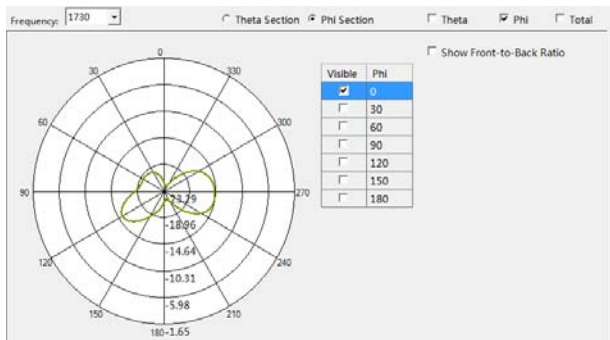
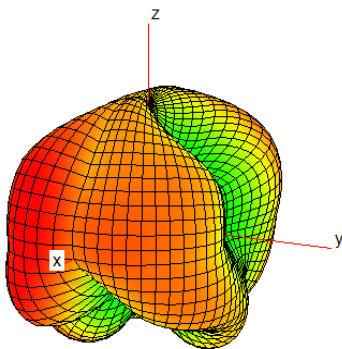


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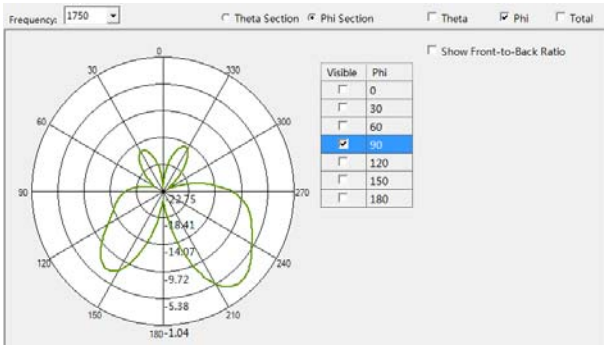


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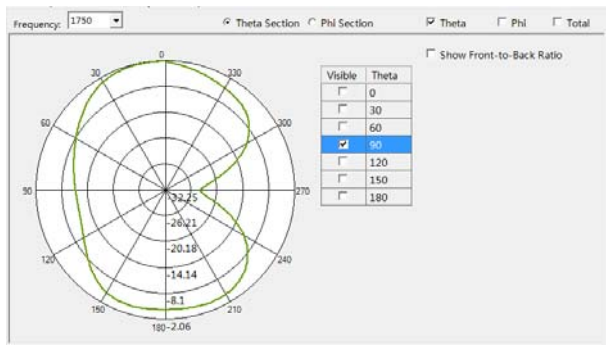
ANT1 Band4



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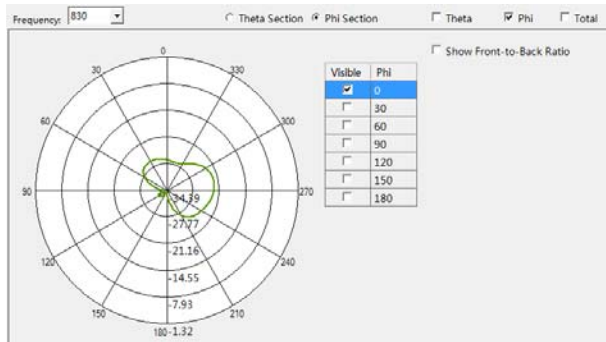
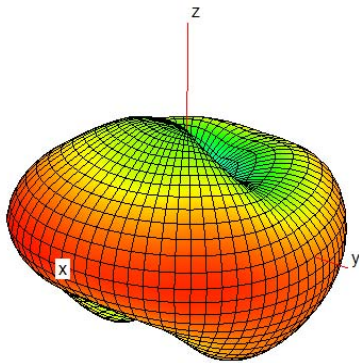


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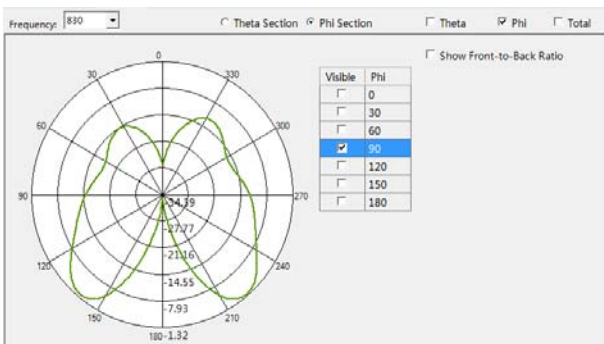


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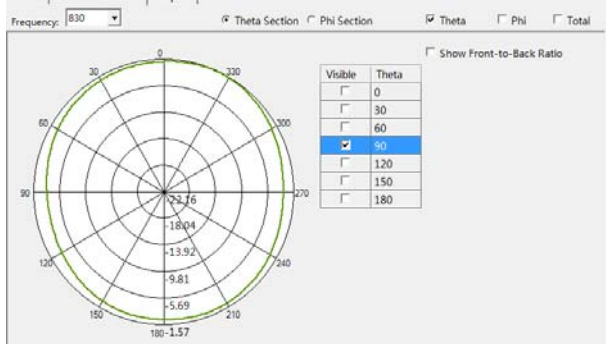
ANT0 Band5



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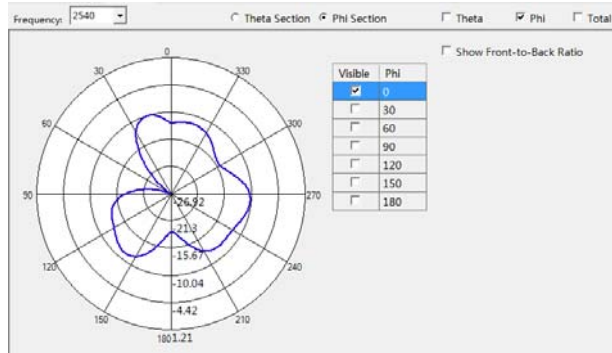
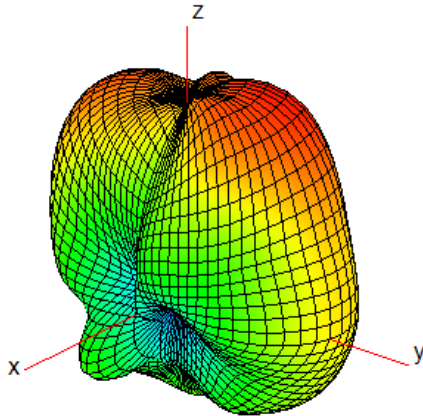


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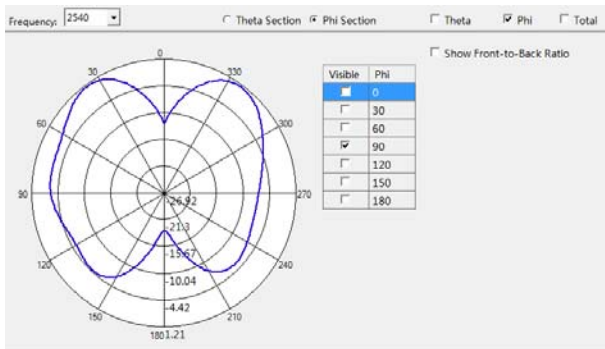


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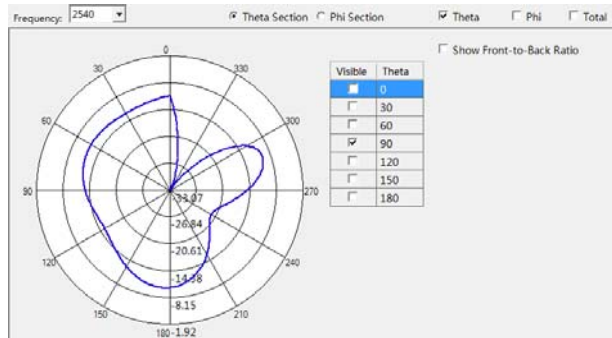
ANT0 Band7



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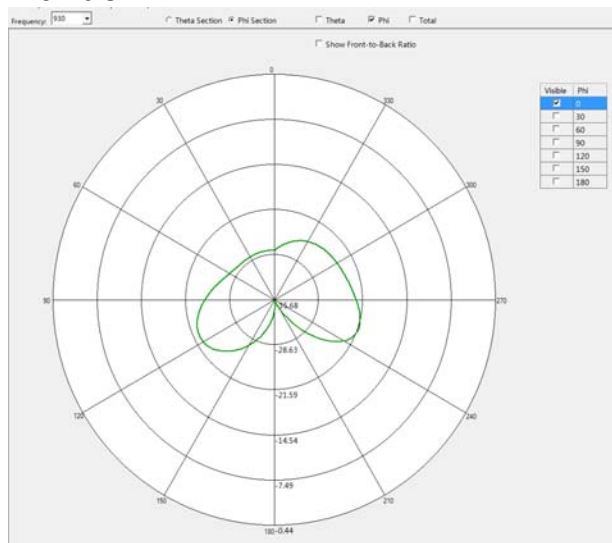
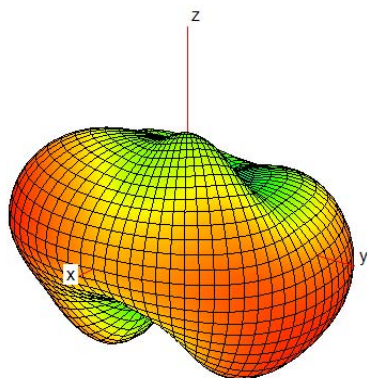


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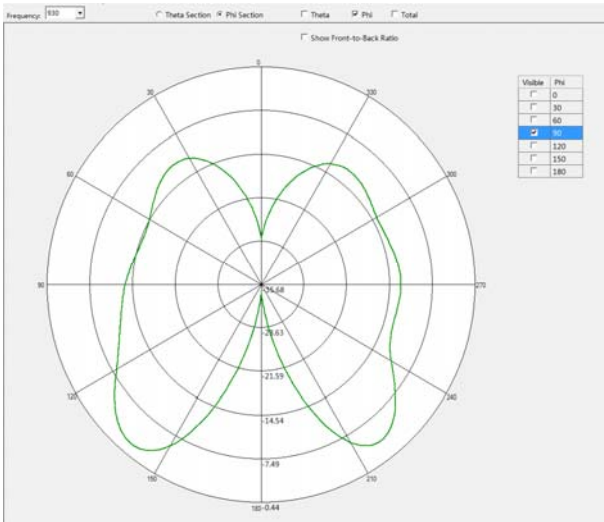


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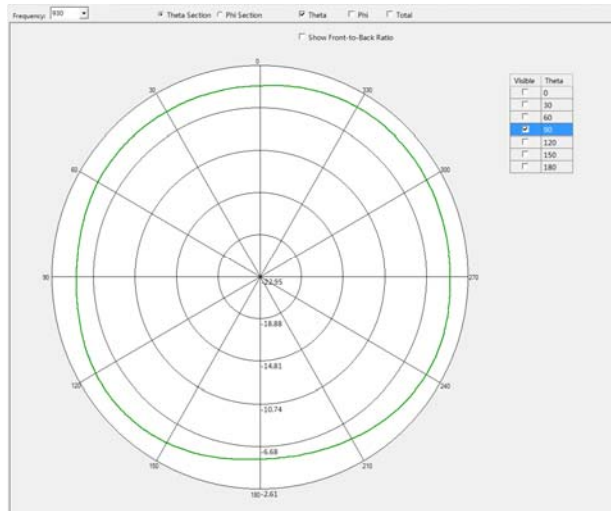
ANT0 Band8



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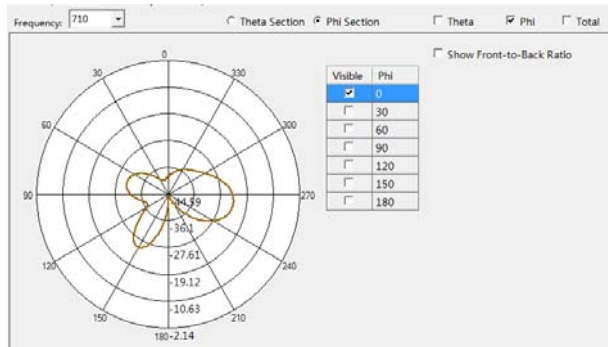
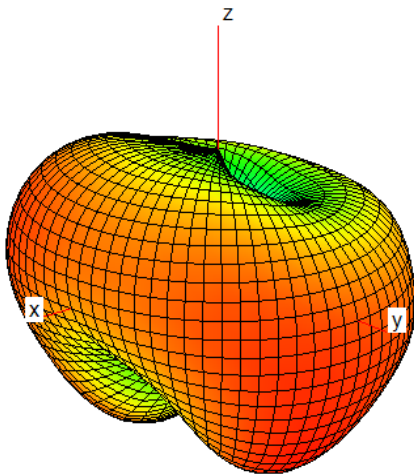


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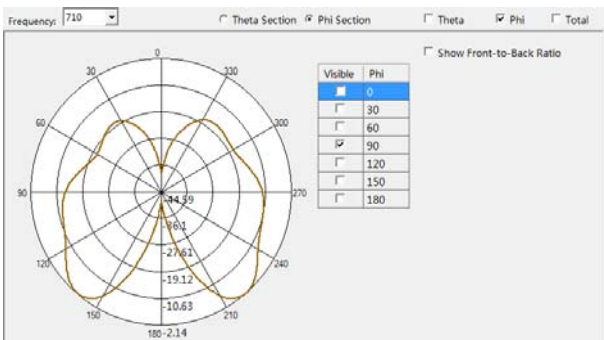


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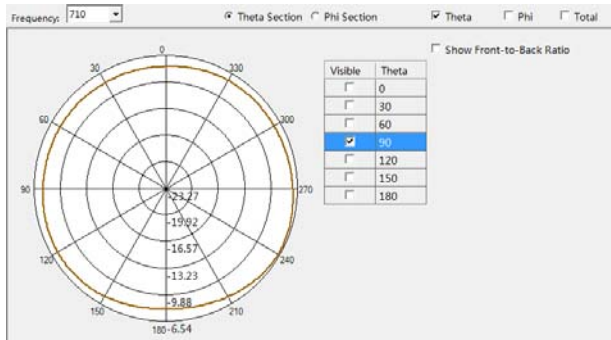
ANT0 Band12



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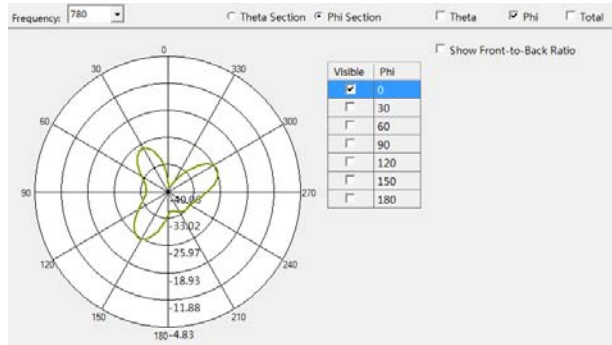
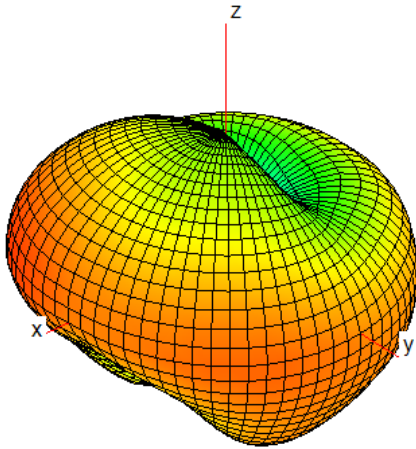


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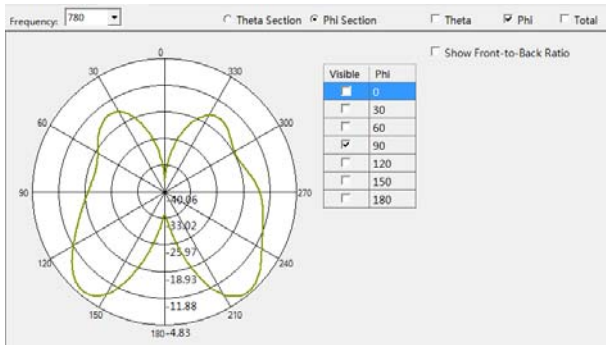


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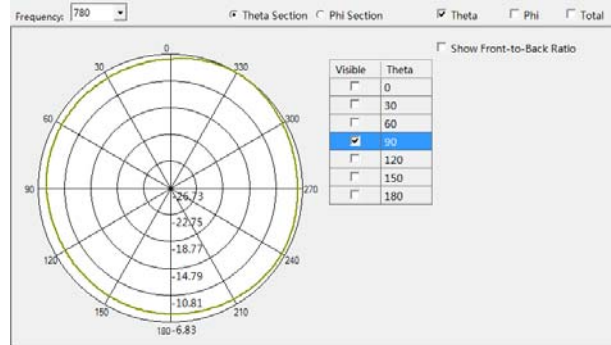
ANT0 Band13



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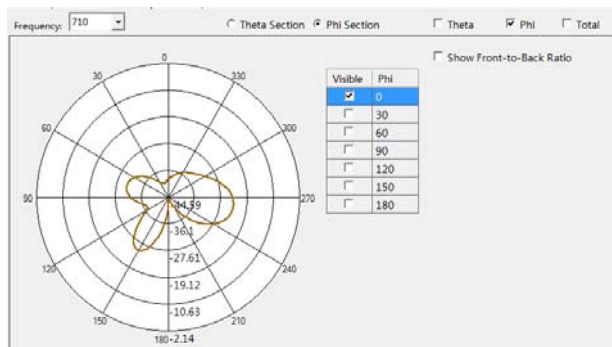
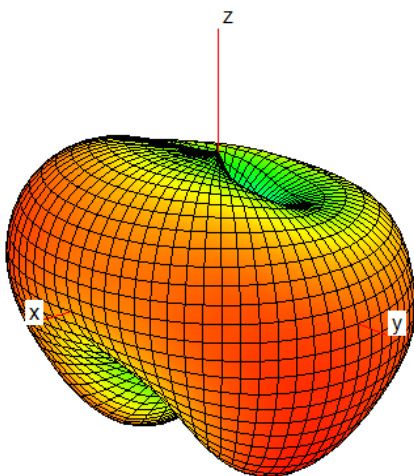


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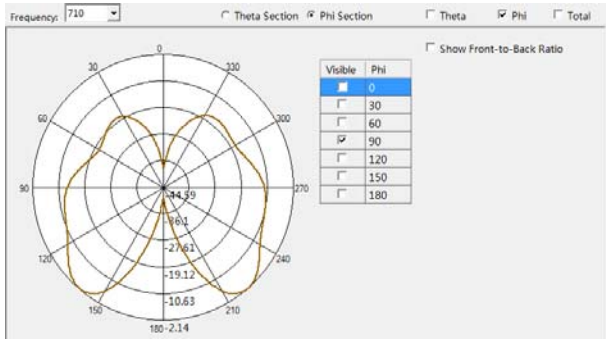


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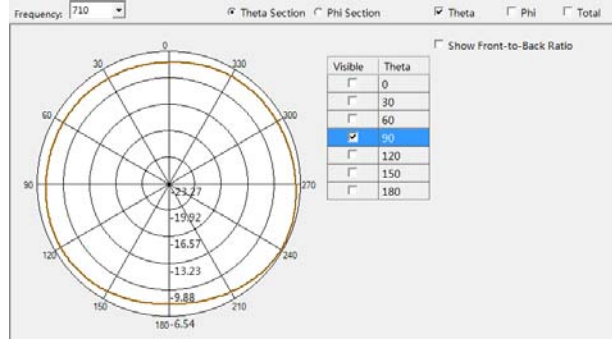
ANT0 Band17



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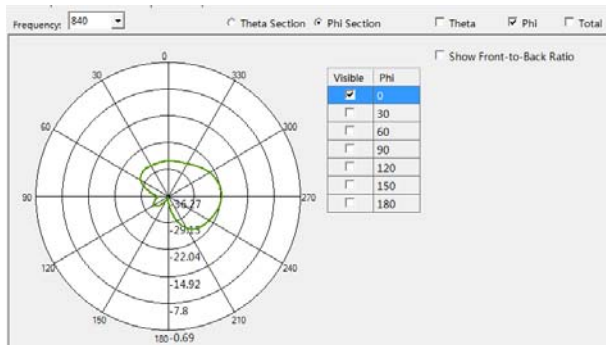
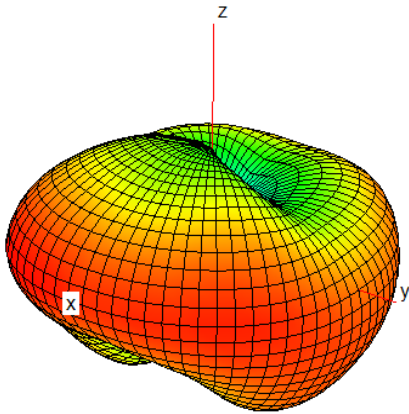


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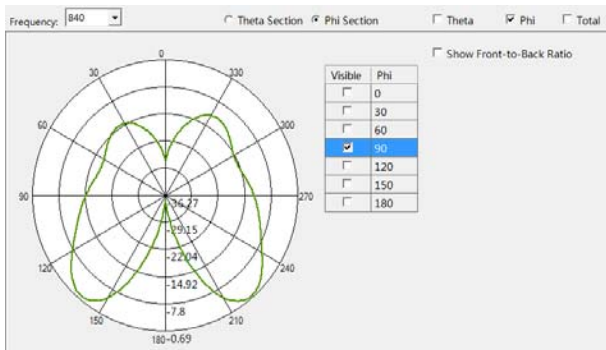


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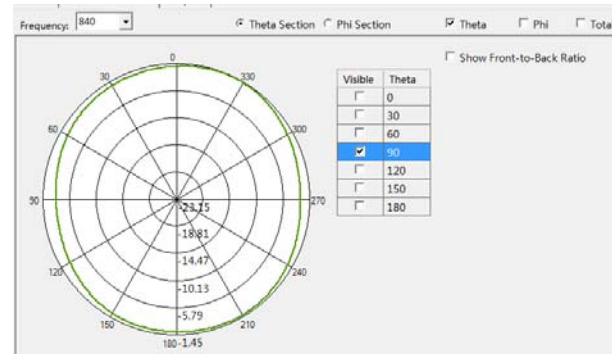
ANT0 Band20



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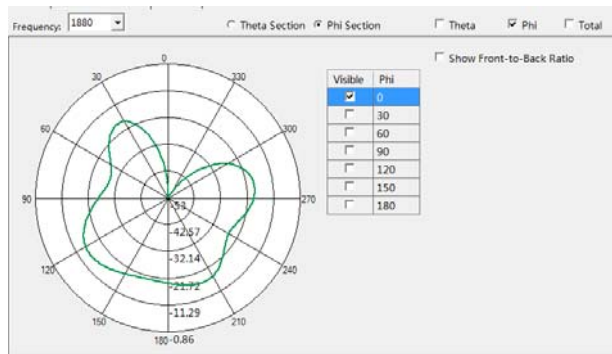
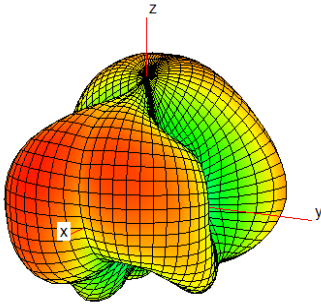


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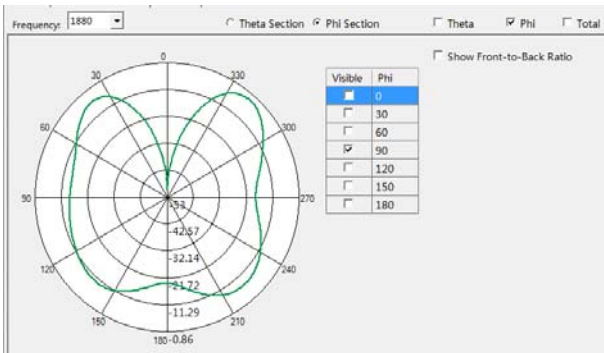


Theta=90.00deg

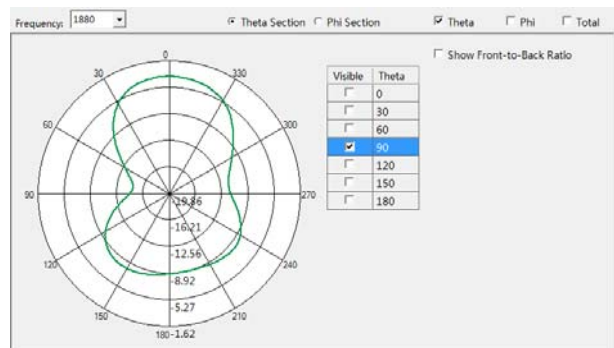
ANT1 Band25



Phi=0.00deg

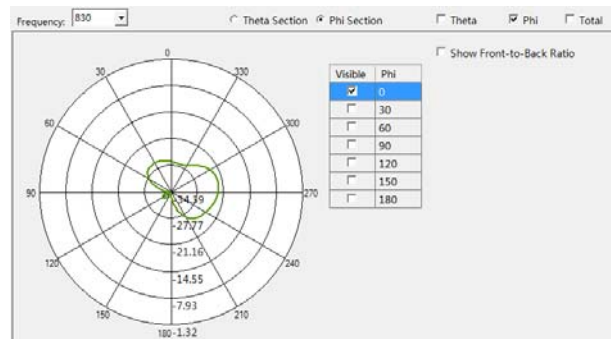
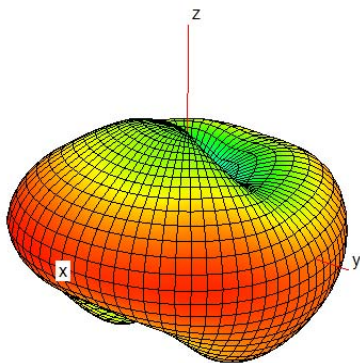


Phi=90.00deg

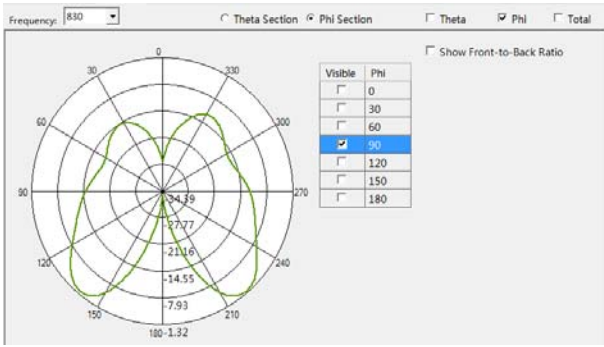


Theta=90.00deg

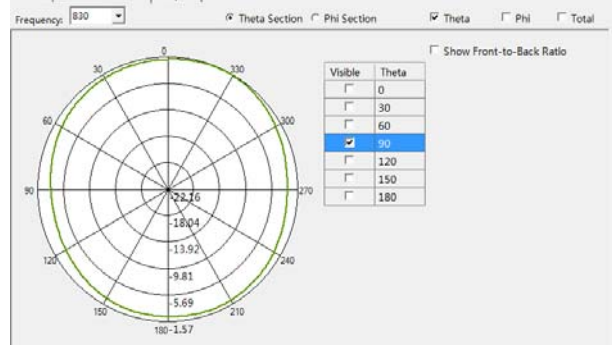
ANT0 Band26



Phi=0.00deg

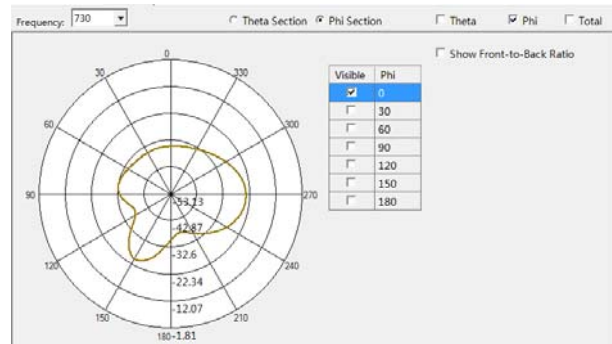
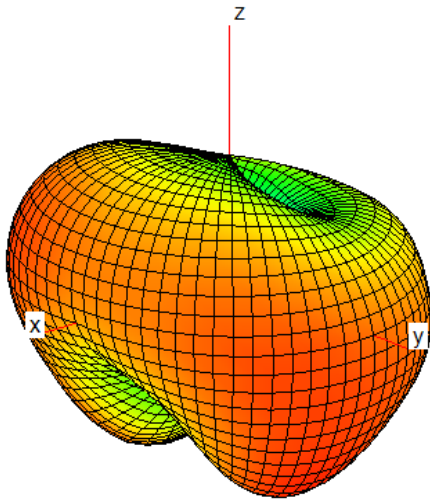


Phi=90. 00deg

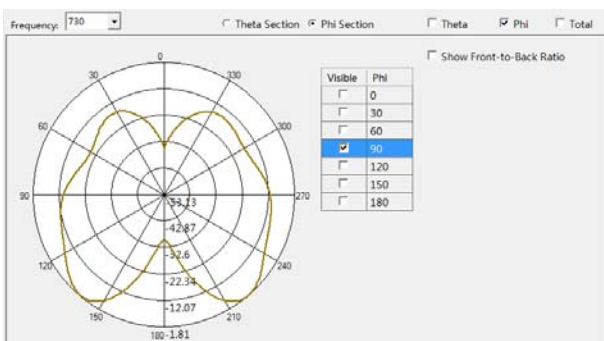


Theta=90. 00deg

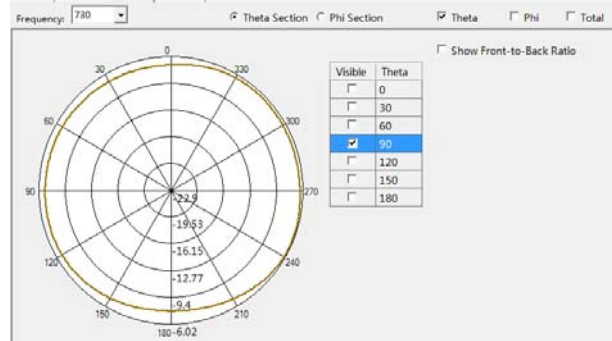
ANT0 Band28



Phi=0. 00deg

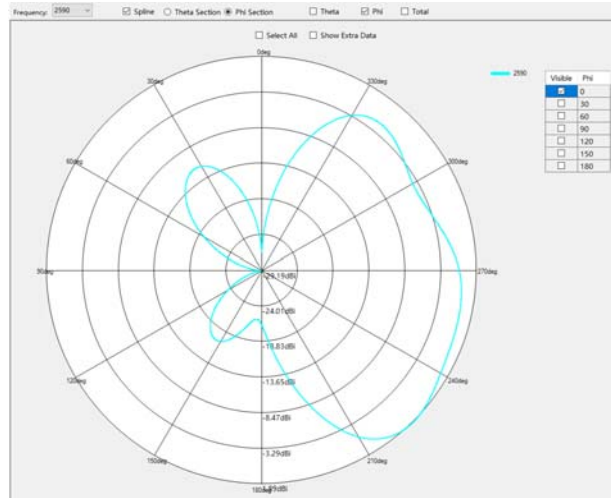
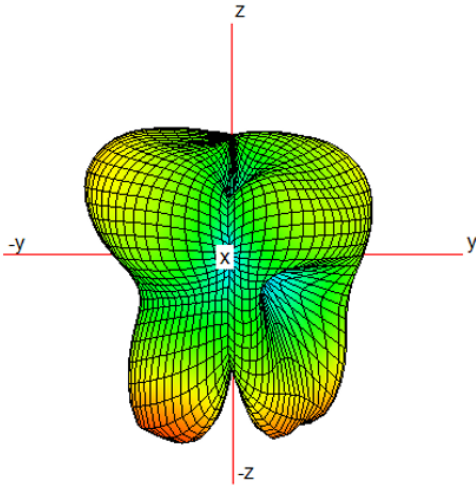


Phi=90. 00deg

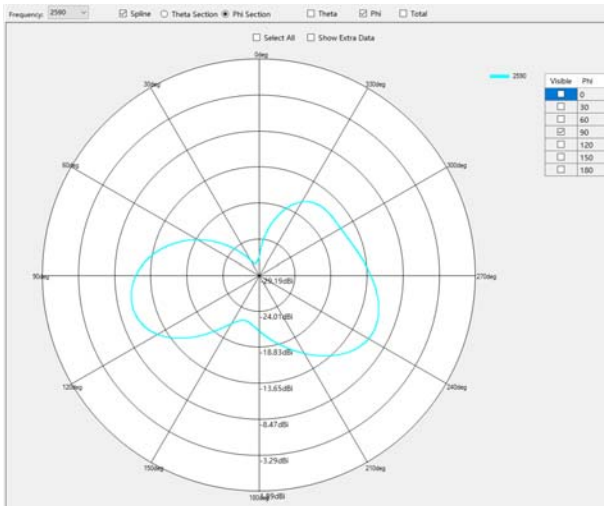


Theta=90. 00deg

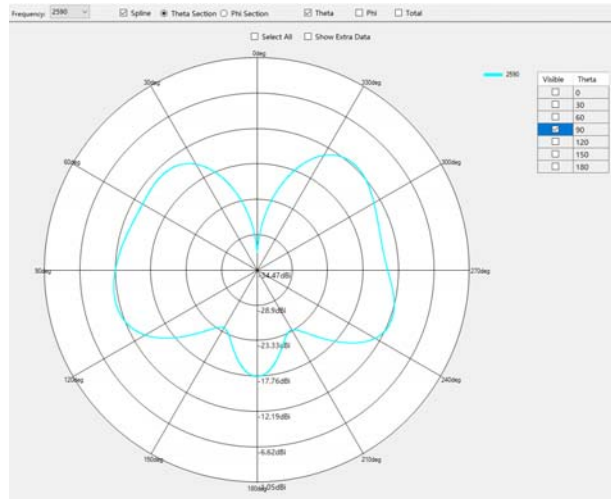
ANT3 Band38



$\Phi=0.00\text{deg}$

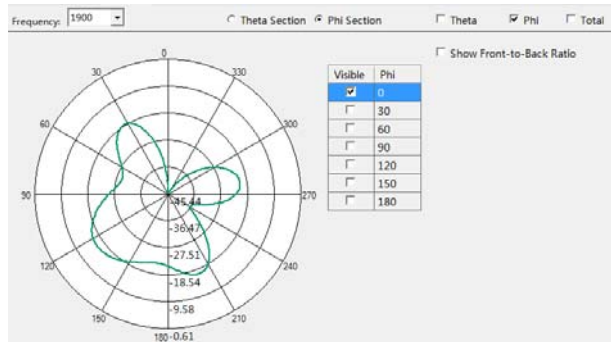
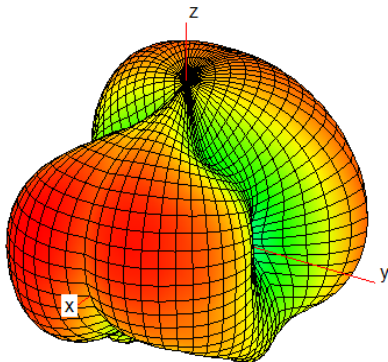


$\Phi=90.00\text{deg}$

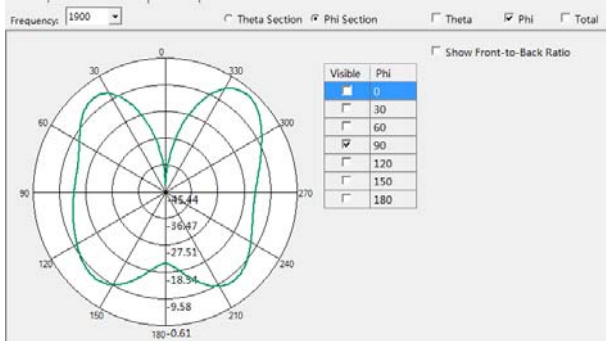


$\Theta=90.00\text{deg}$

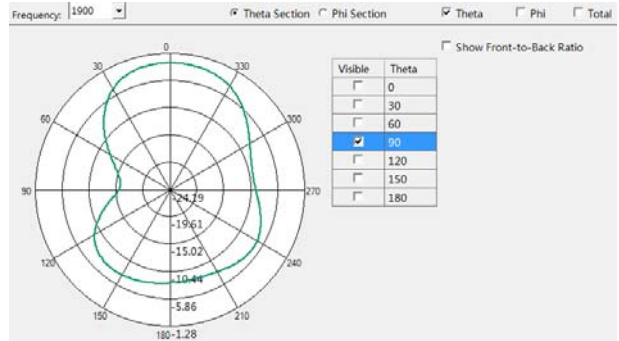
ANT1 Band39



$\Phi=0.00\text{deg}$

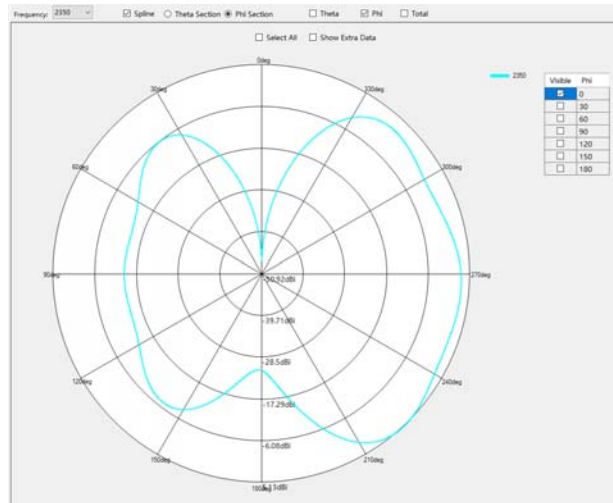
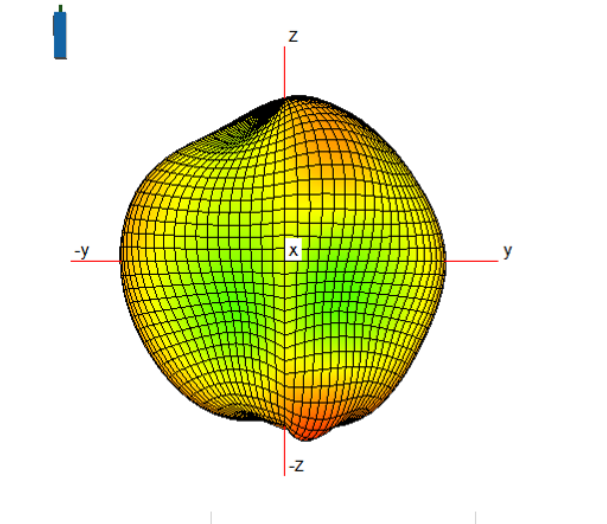


Phi=90. 00deg

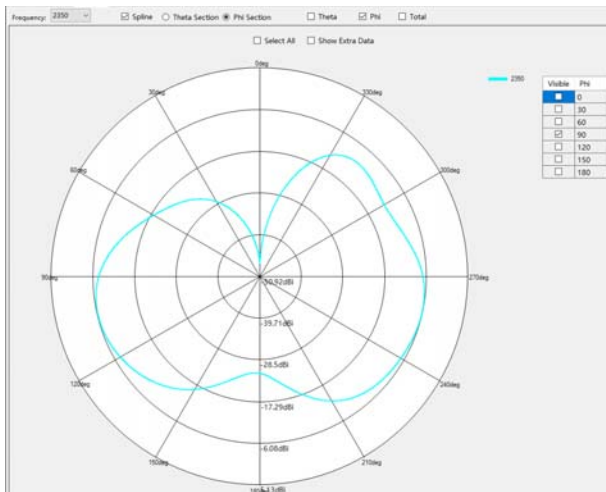


Theta=90. 00deg

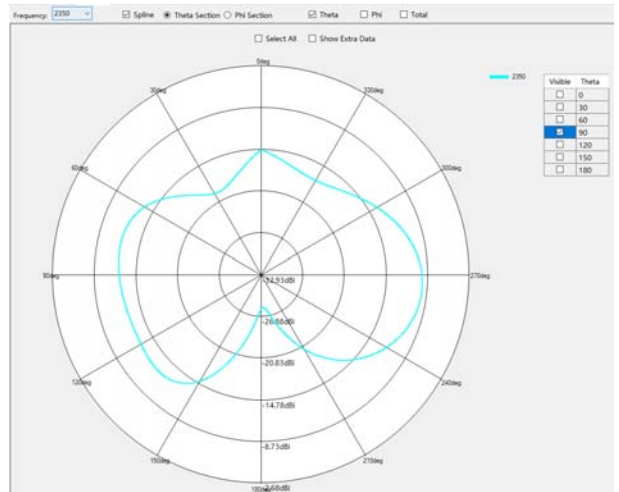
ANT3 Band40



Phi=0. 00deg

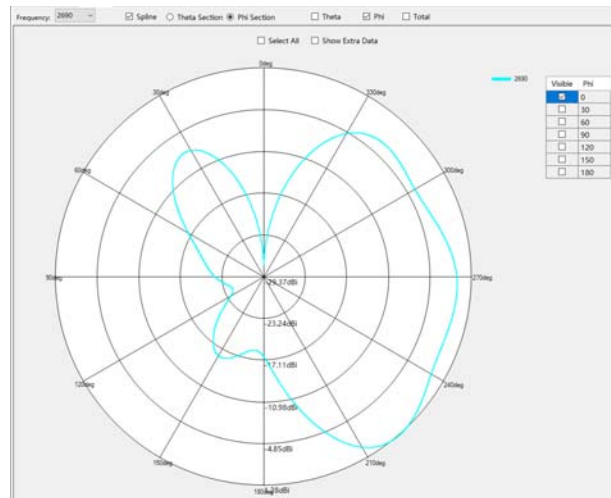
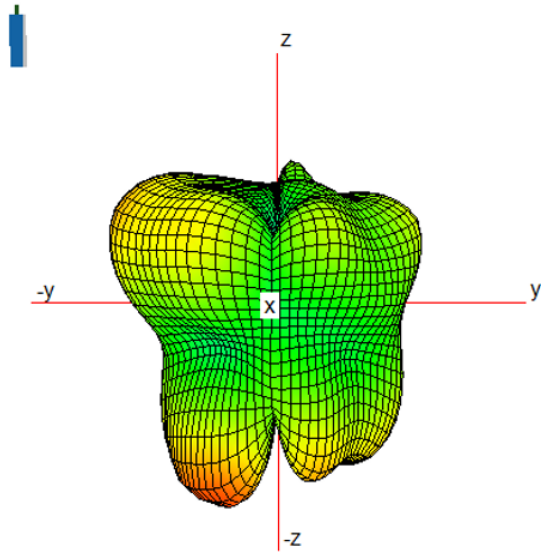


Phi=90. 00deg

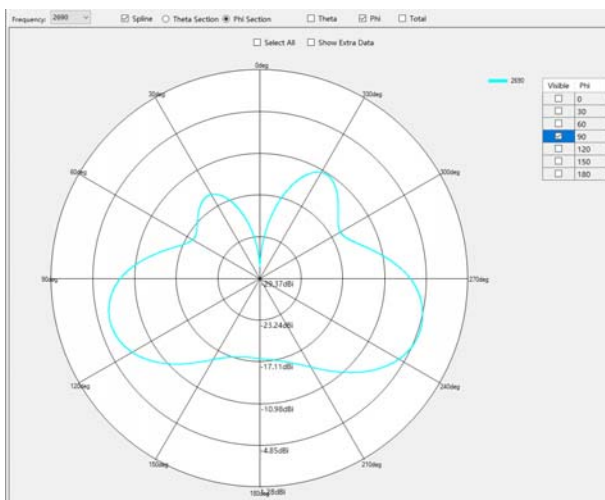


Theta=90. 00deg

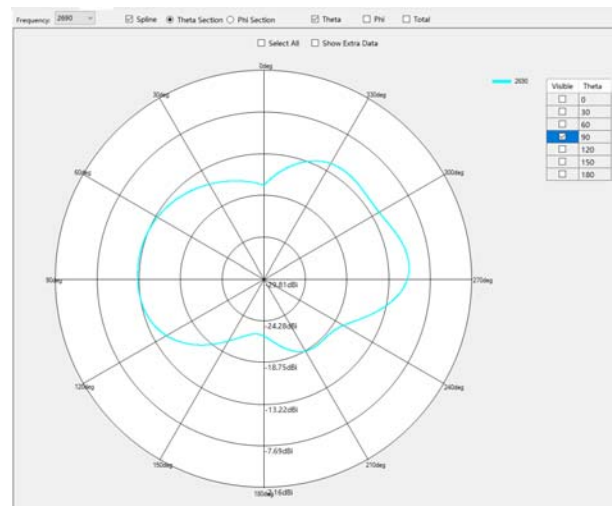
ANT3 Band41



$\Phi=0.00\text{deg}$

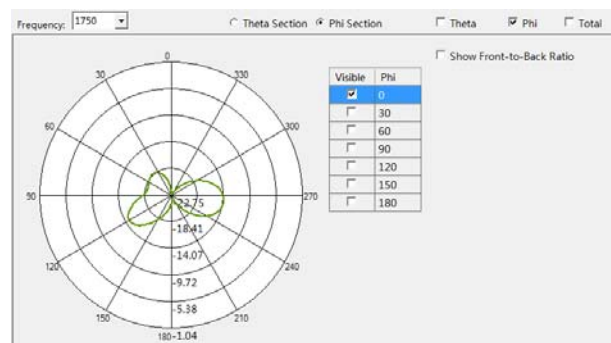
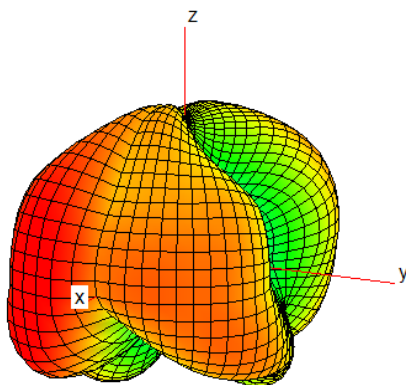


$\Phi=90.00\text{deg}$

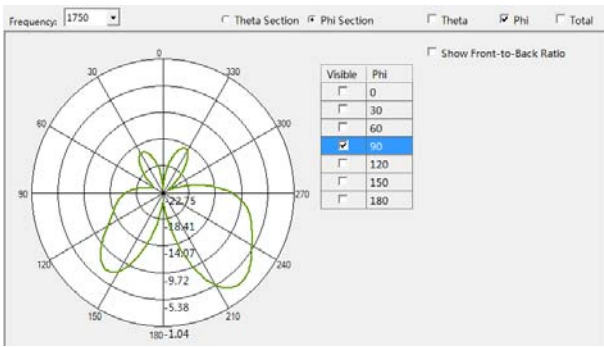


$\Theta=90.00\text{deg}$

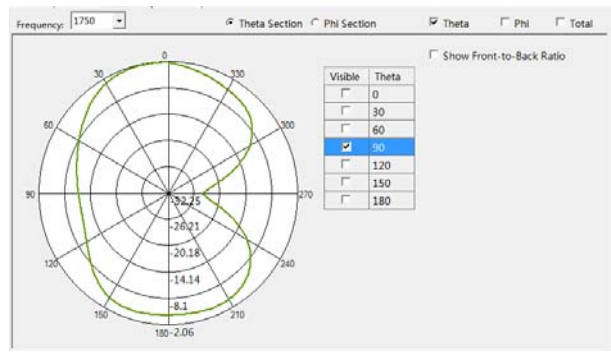
ANT1 Band66



$\Phi=0.00\text{deg}$

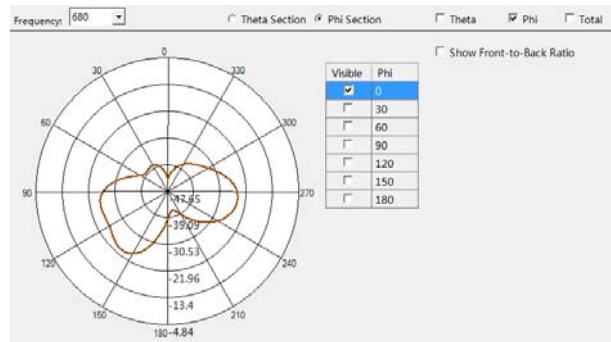
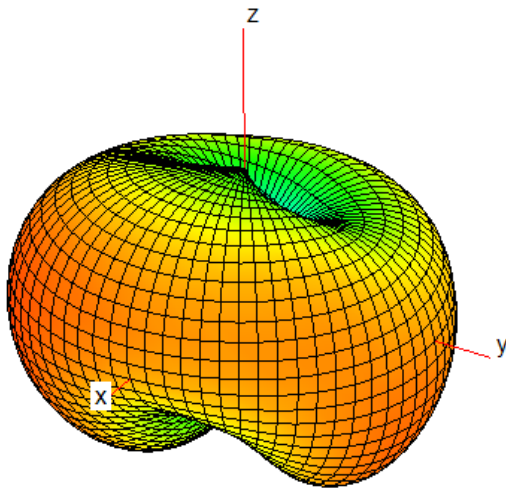


Phi=90.00deg

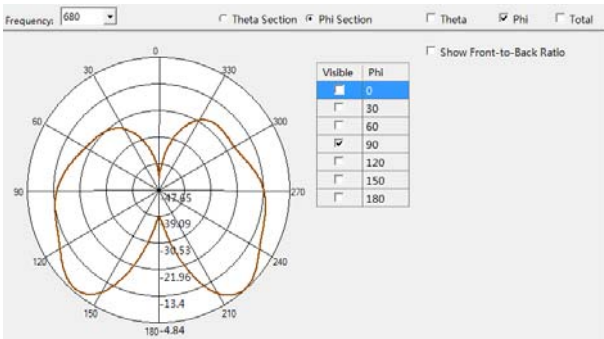


Theta=90.00deg

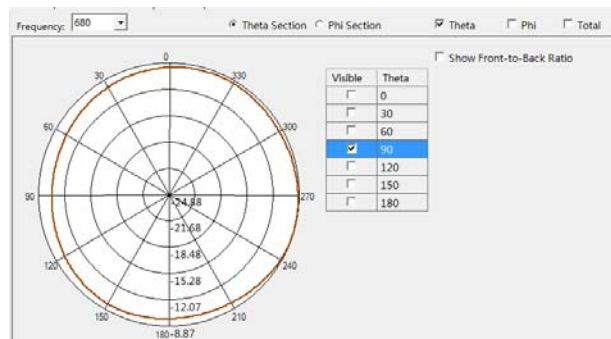
ANT0 Band71



Phi=0.00deg

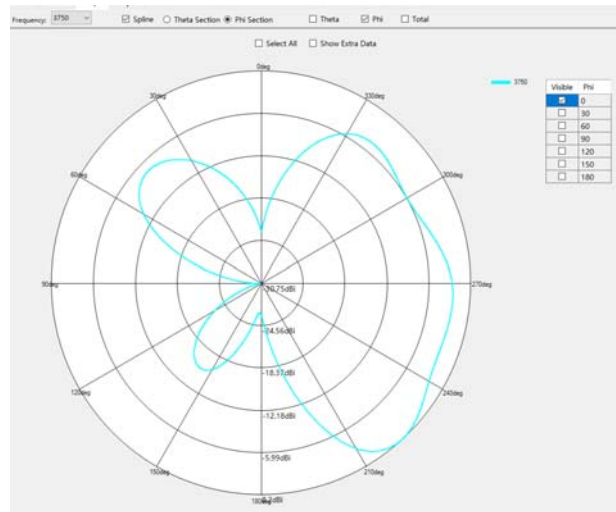
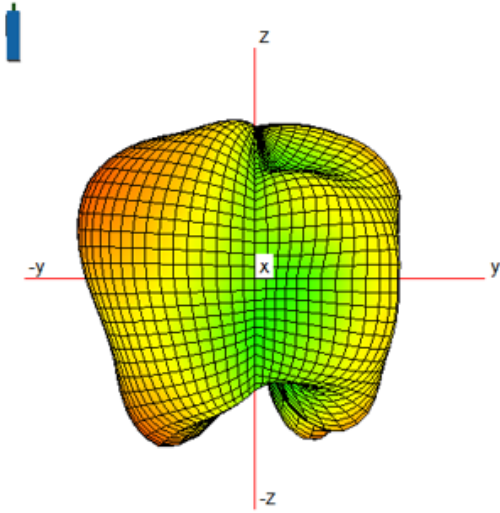


Phi=90.00deg

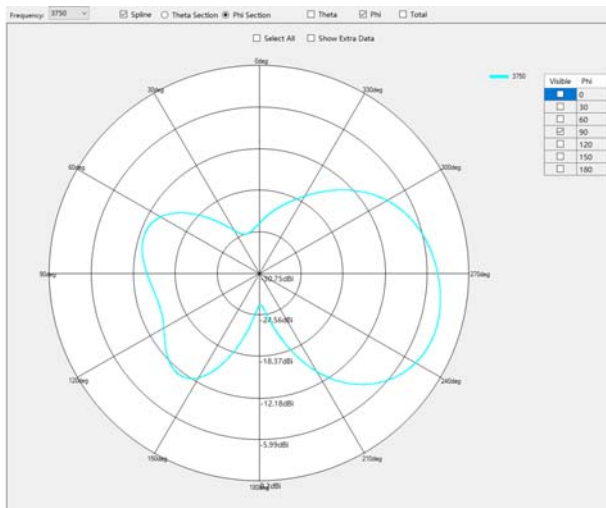


Theta=90.00deg

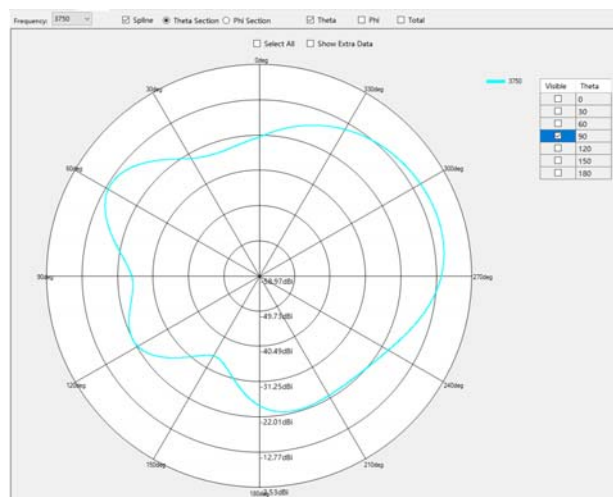
ANT4 Band77



Phi=0.00deg

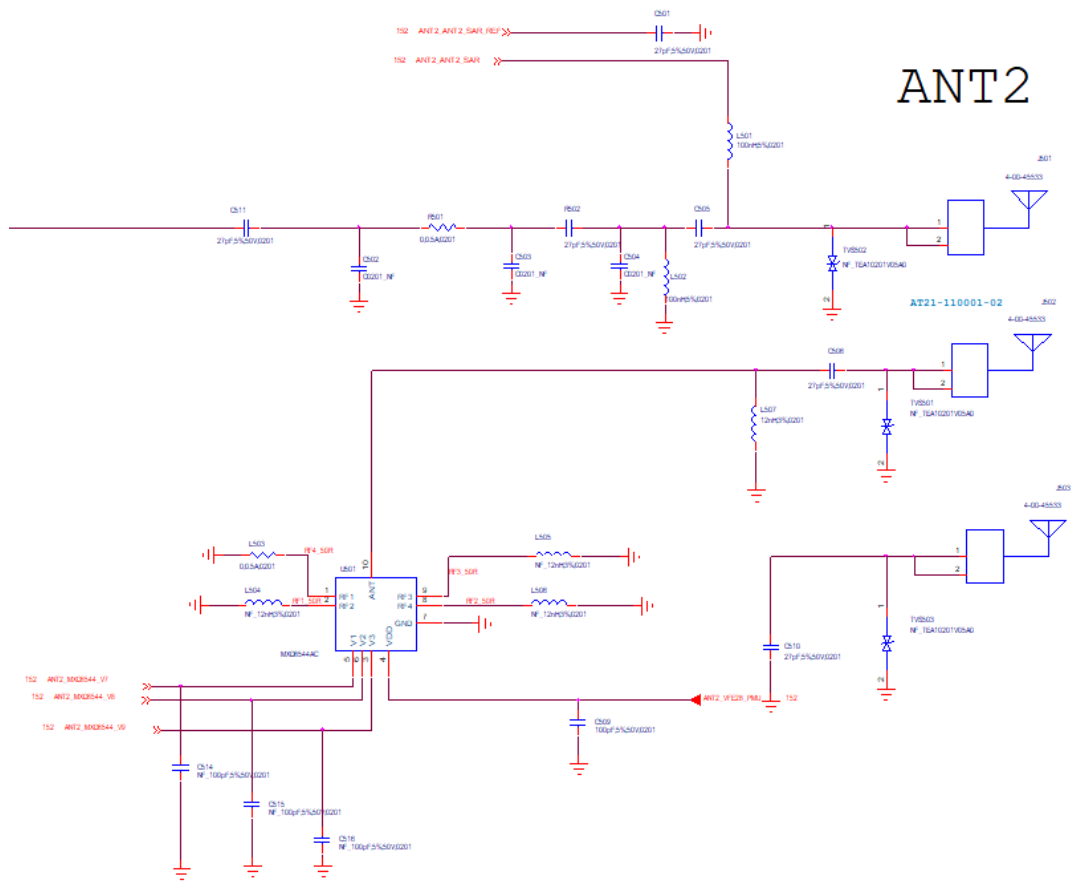


Phi=90.00deg

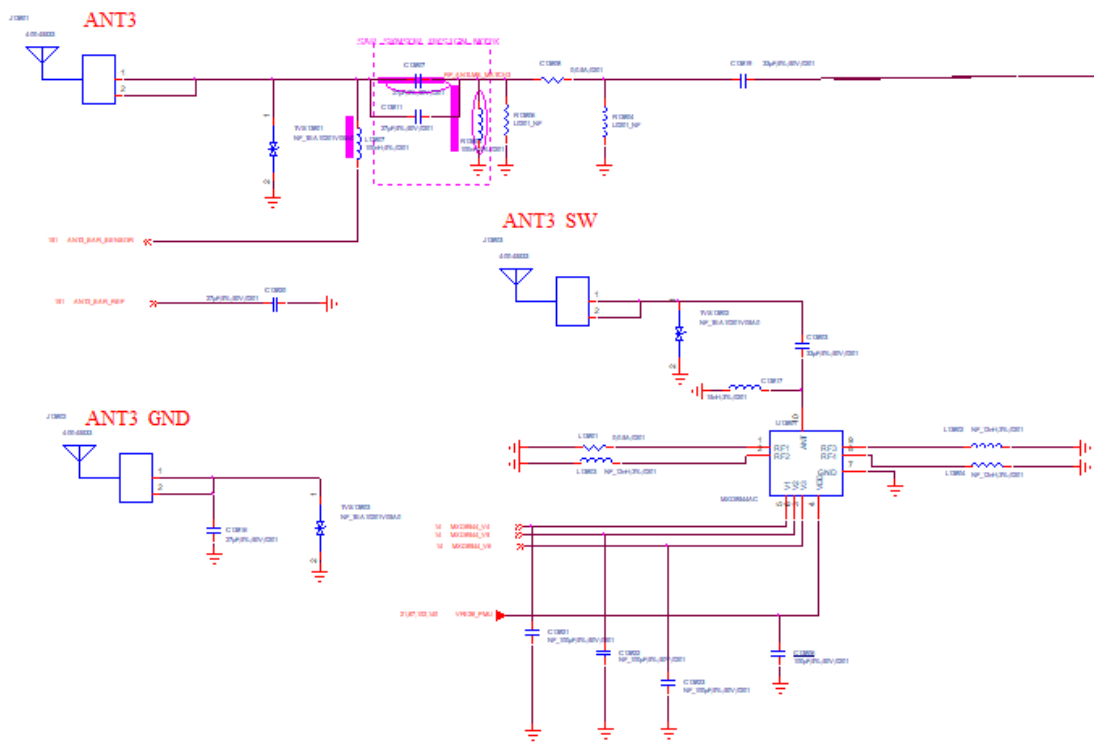


Theta=90.00deg

5.3 ANT2

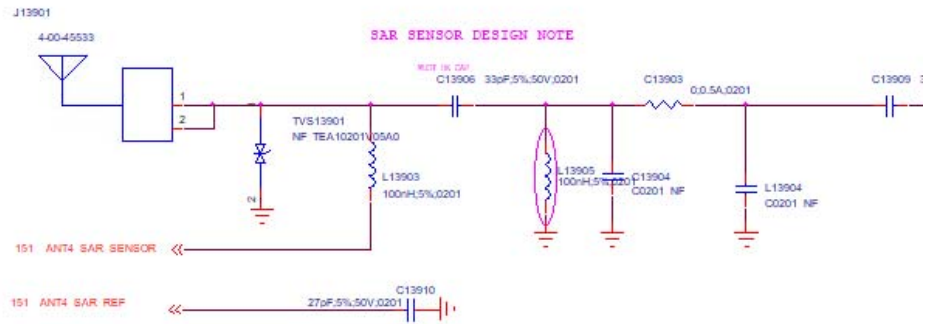


5.4 ANT3

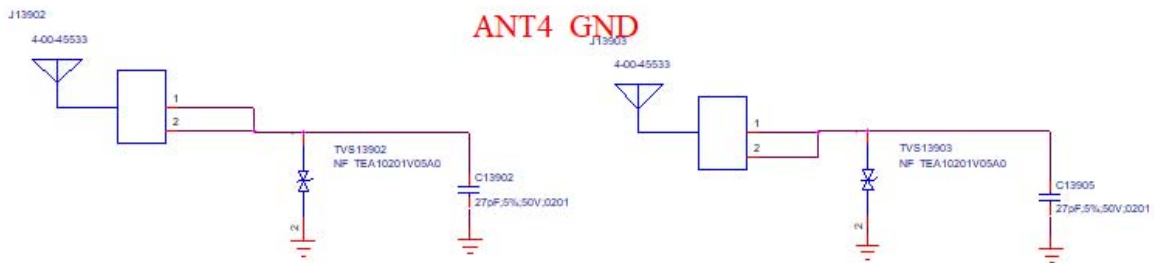


5.5 ANT4

ANT4 FEED

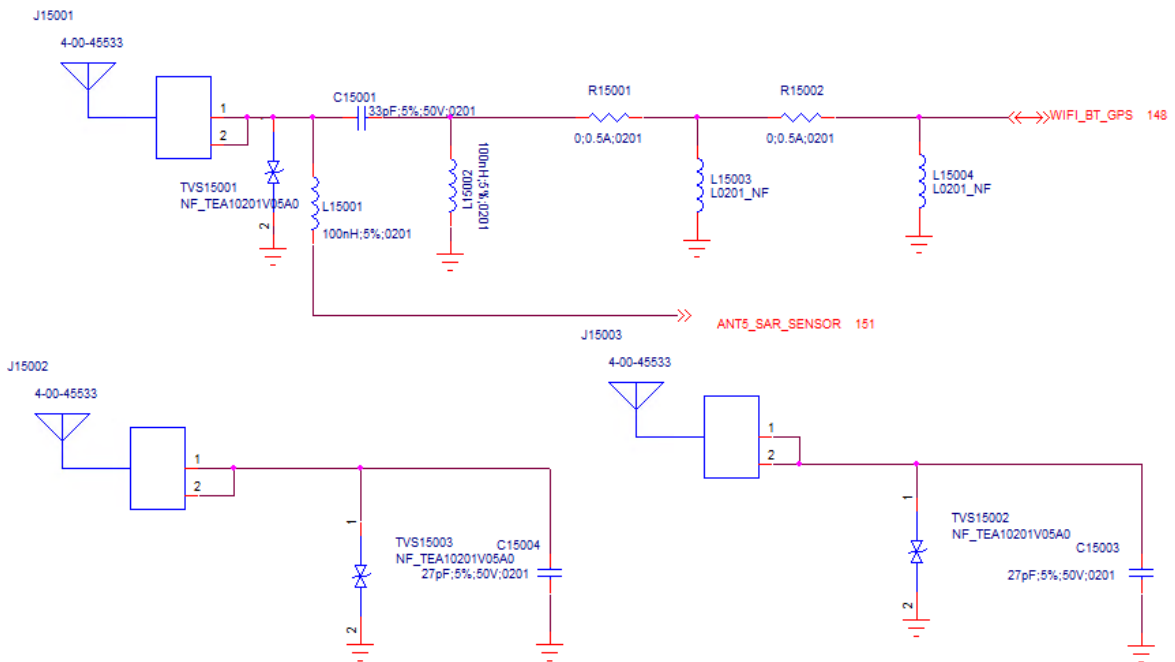


ANT4 GND

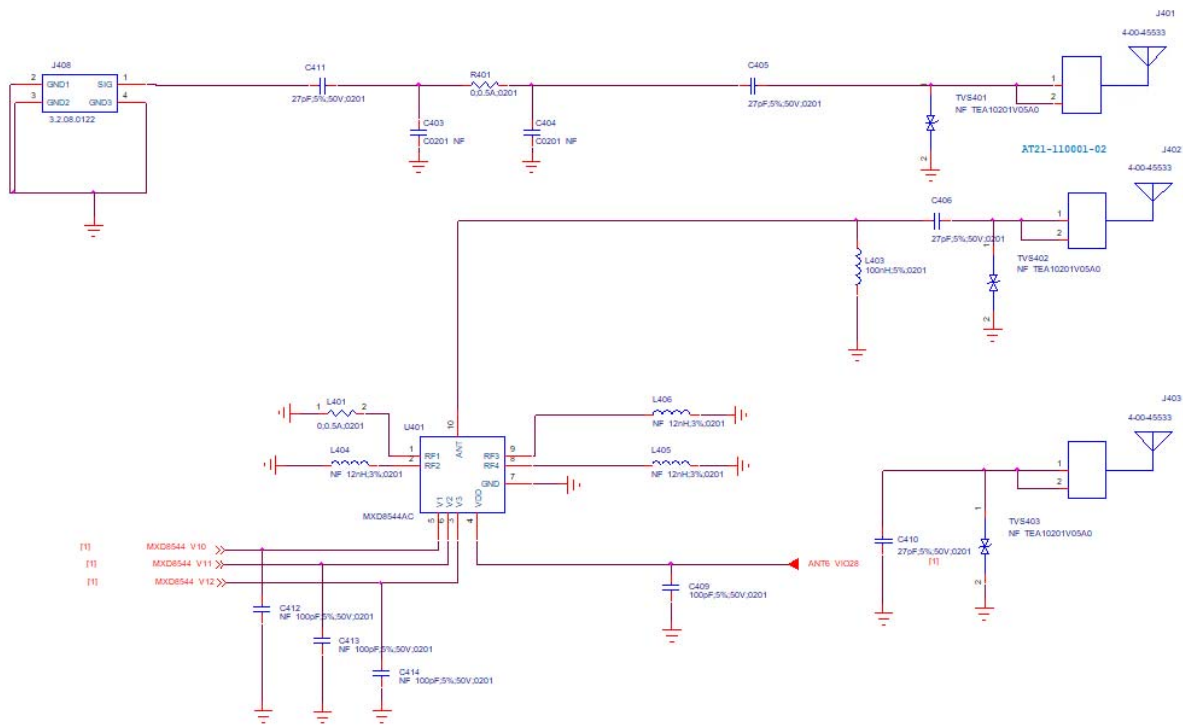


5.6 ANT5

ANT5 WIFI/GPS



5.7 ANT6

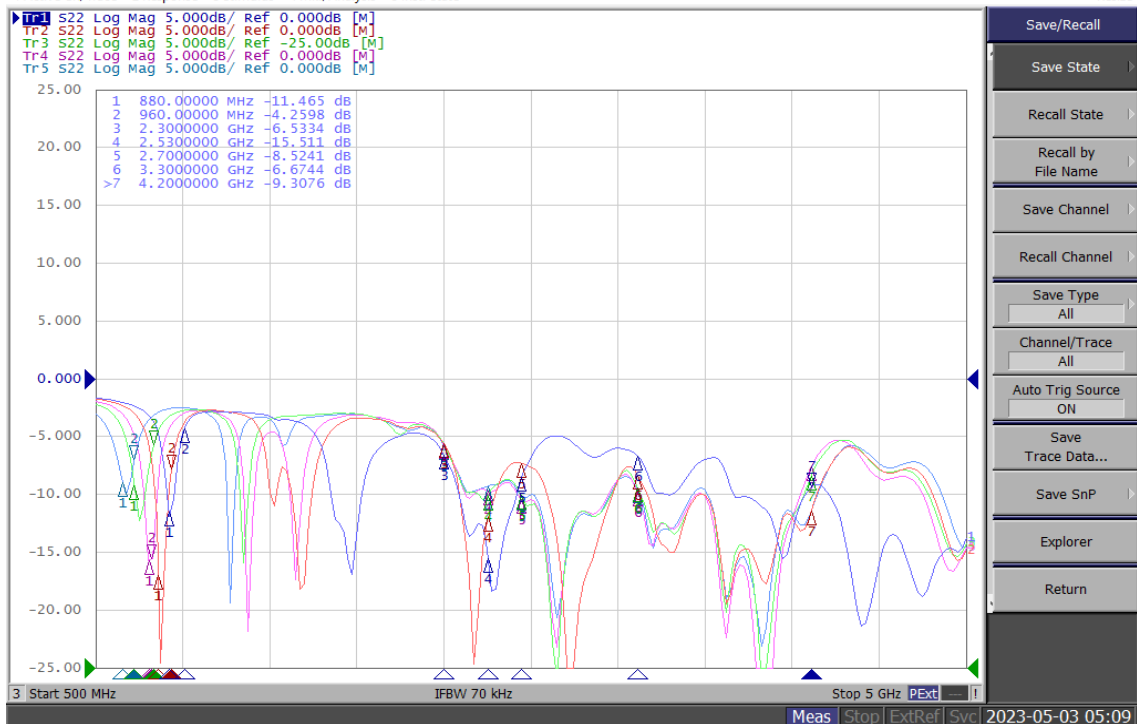


6. ElectricalGraph(Returnloss)

6.1 ANT0 Return loss

E5071C Network Analyzer

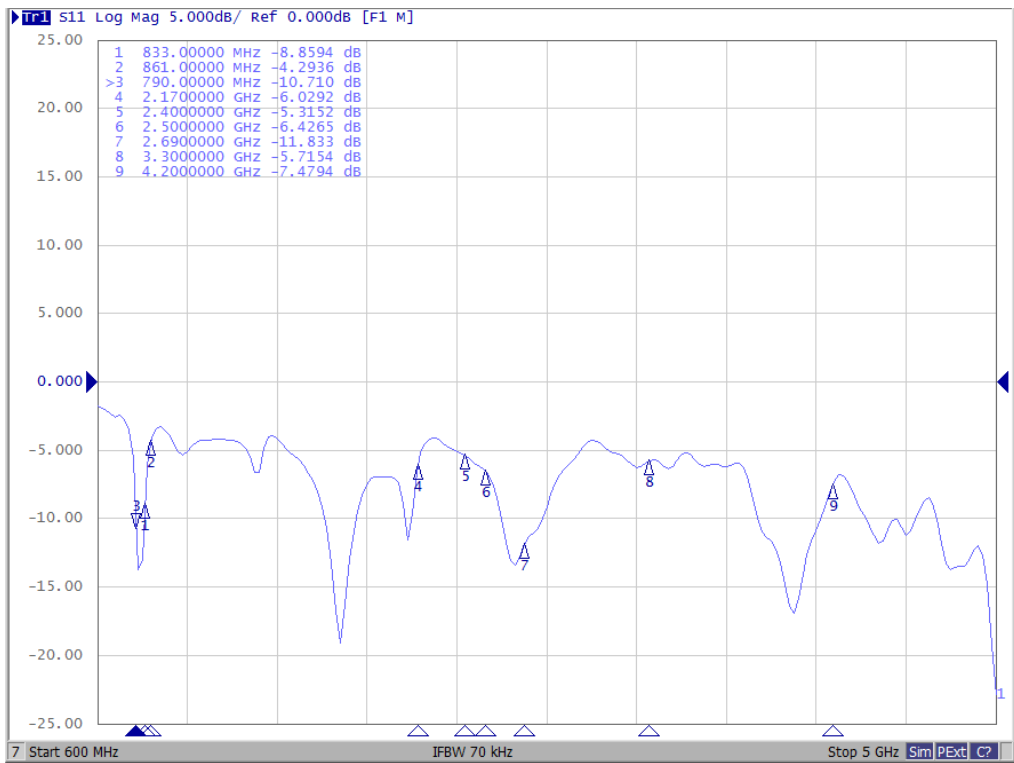
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State



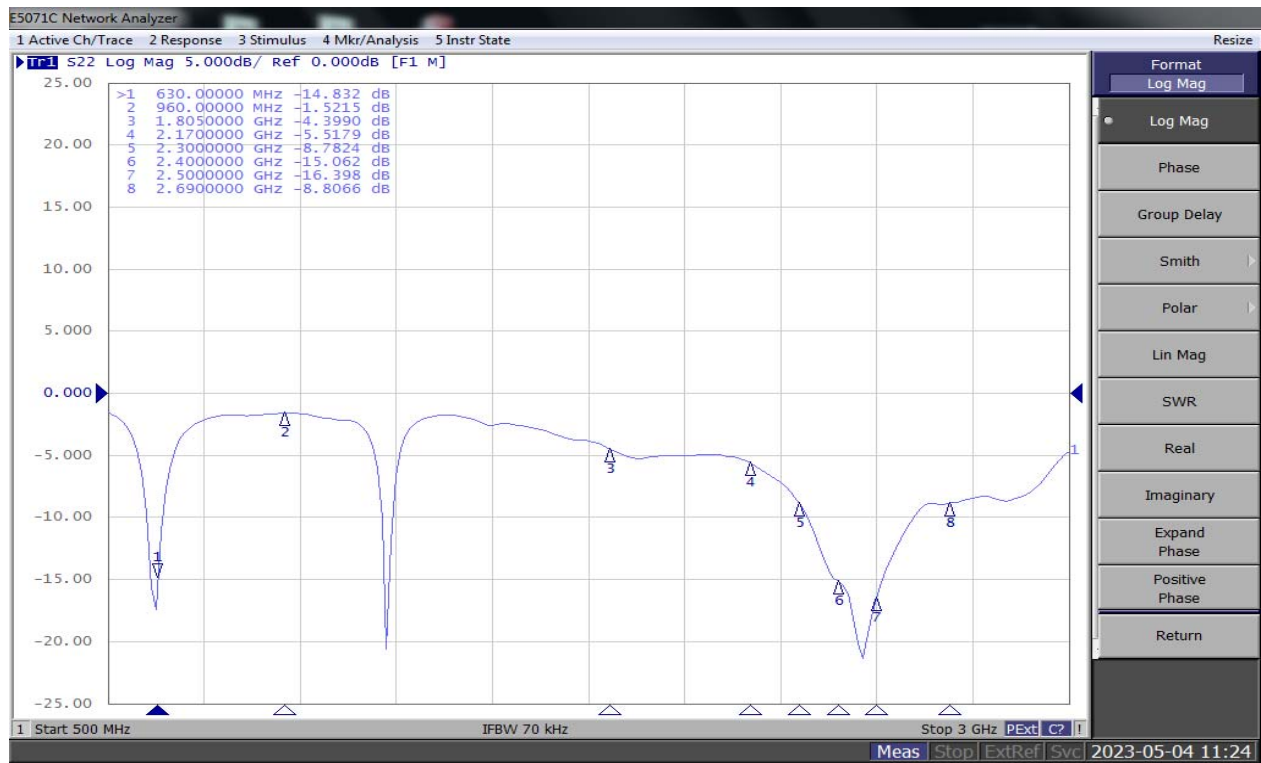
6.2 ANT1 Return loss



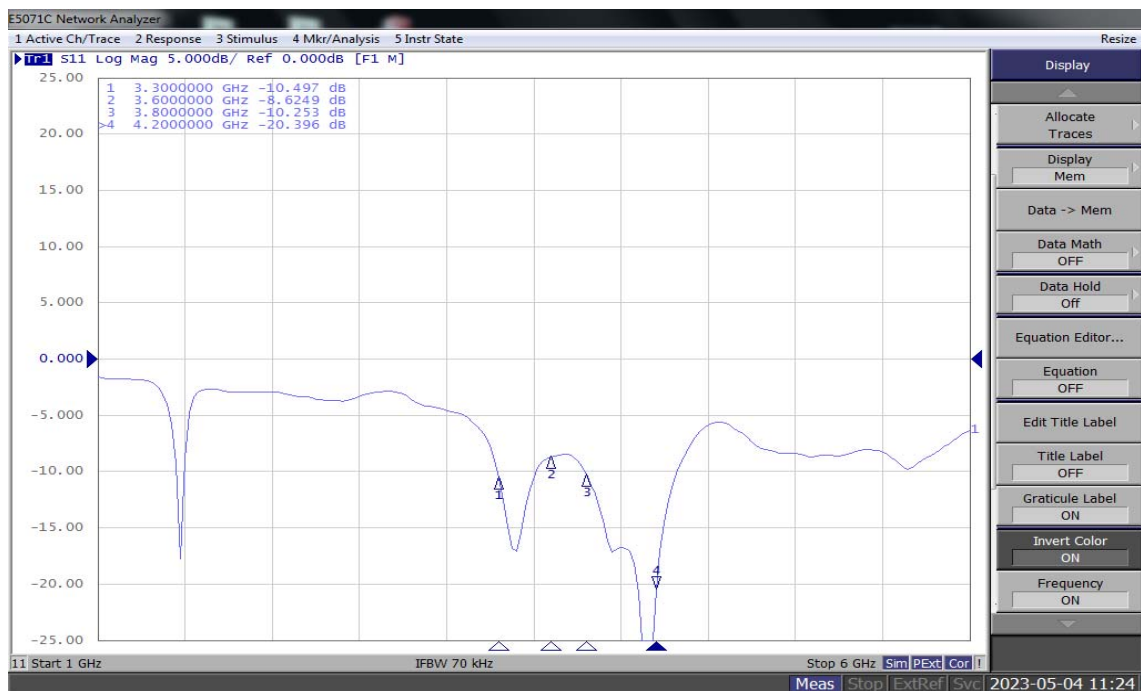
6.3 ANT2 Return loss



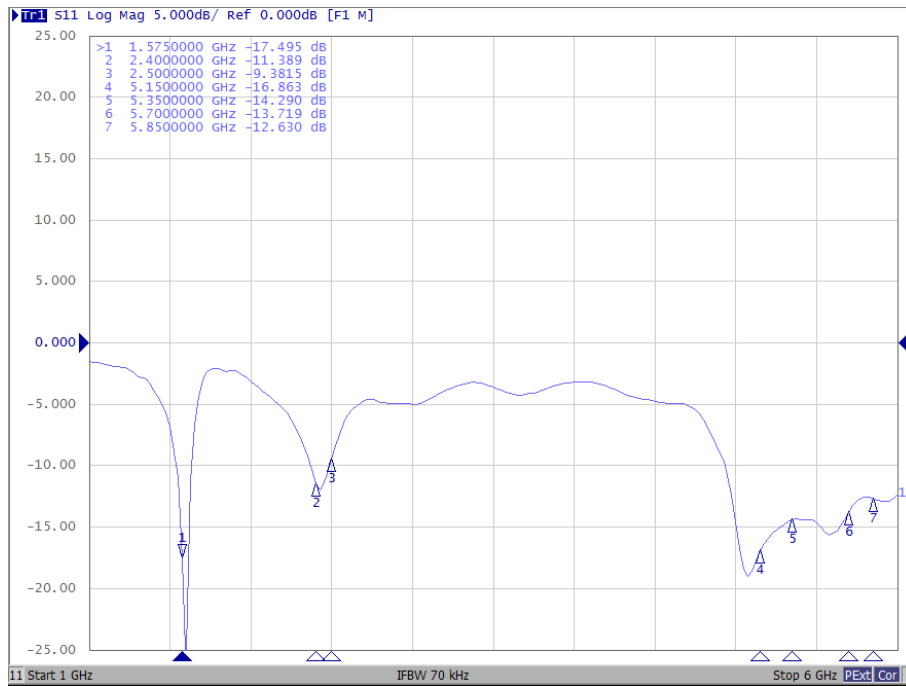
6.4 ANT3 Return loss



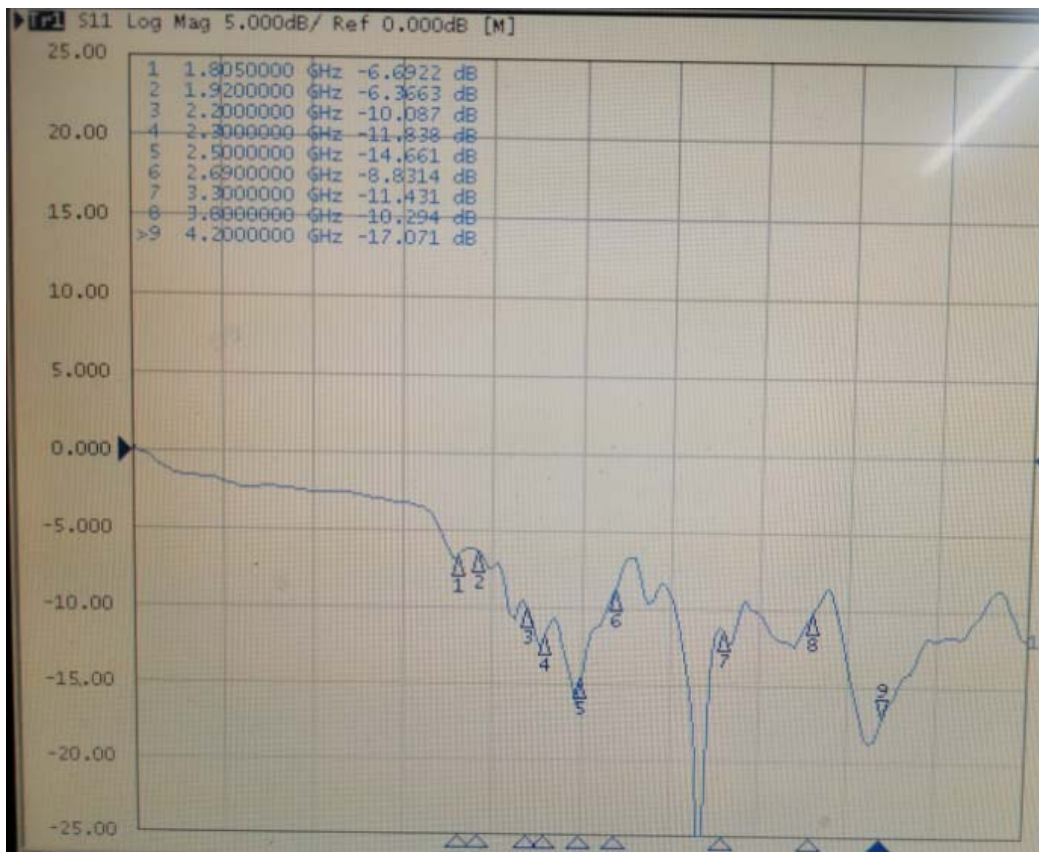
6.5 ANT4 Return loss



6.6 ANT5 Return loss

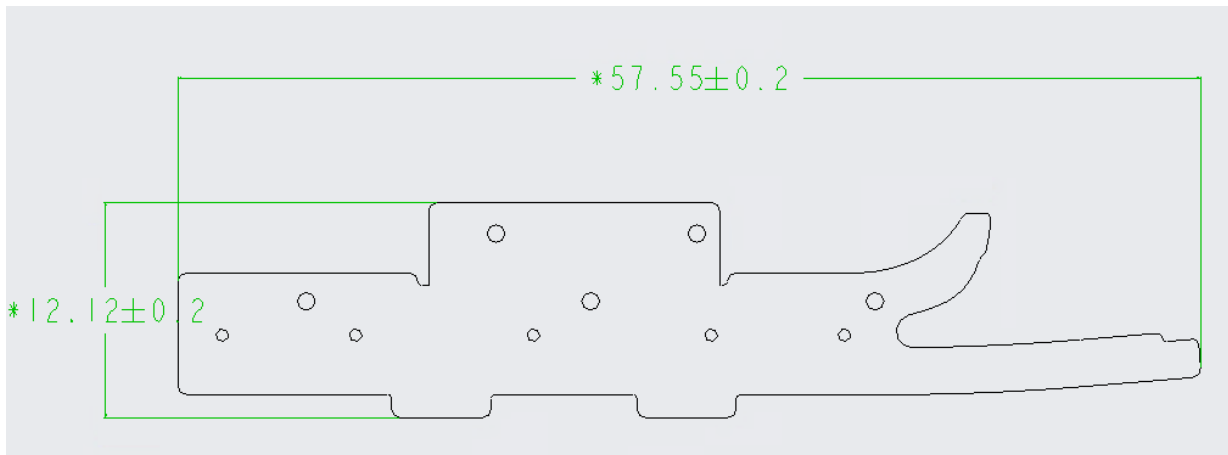


6.7 ANT6 Return loss



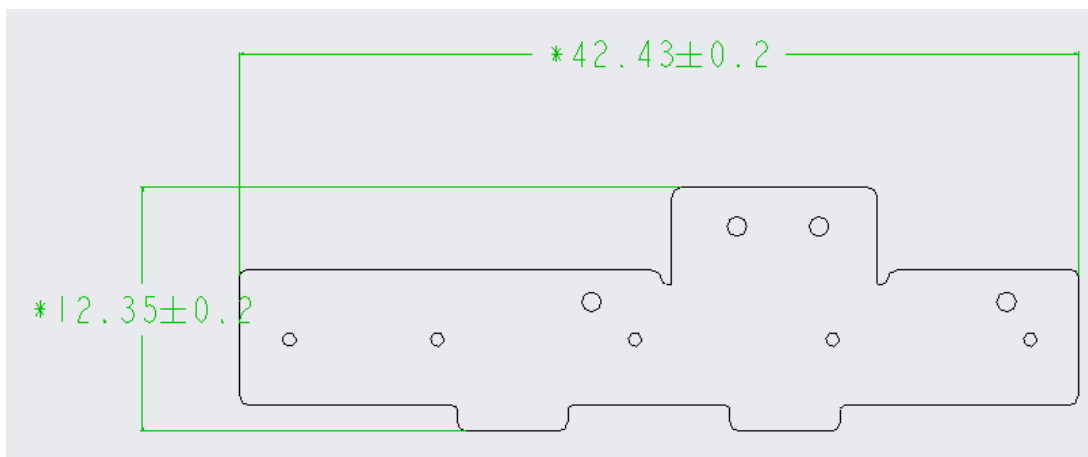
7. External Drawing

7.1 ANT0



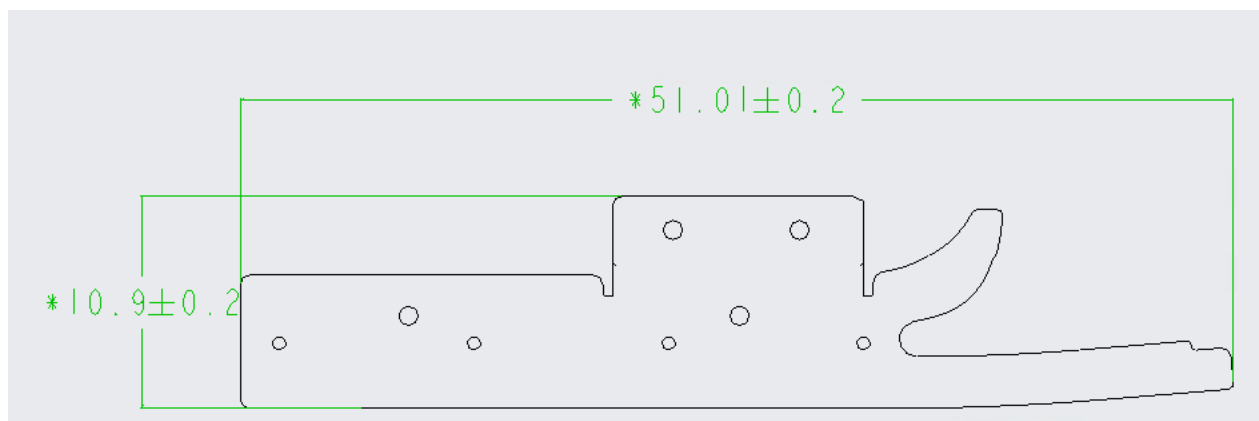
Length: 57.55 mm
Width: 12.12mm

7.2 ANT1



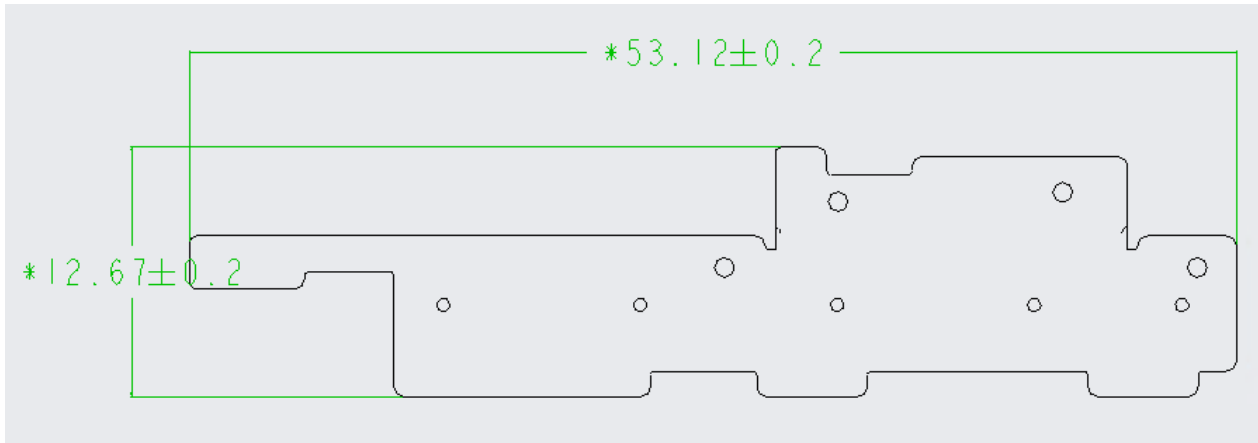
Length: 42.43mm
Width: 12.35mm

7.3 ANT2



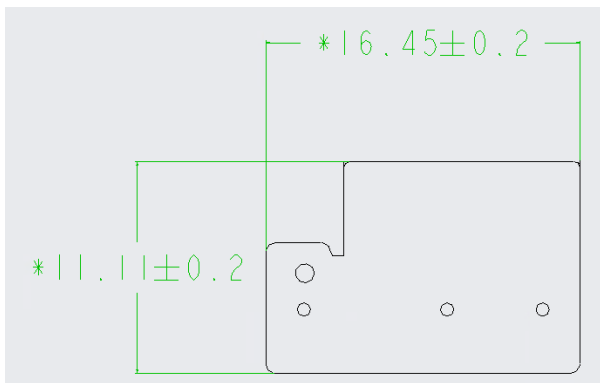
Length: 51.01mm
Width: 10.09mm

7.4 ANT3



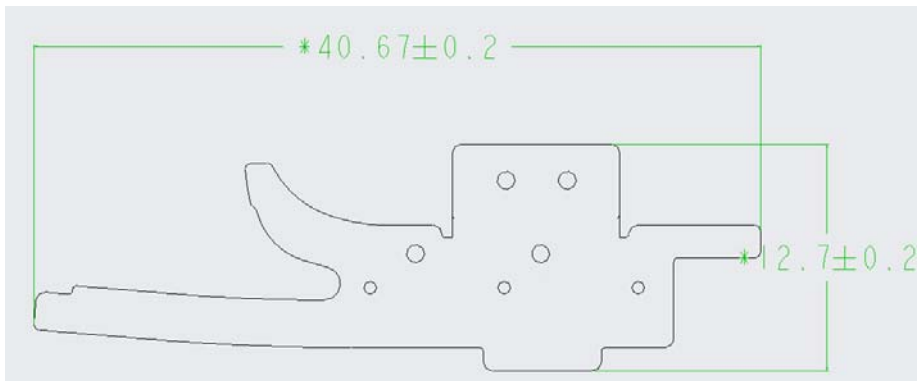
Length: 53.12mm
Width: 12.67mm

7.5 ANT4



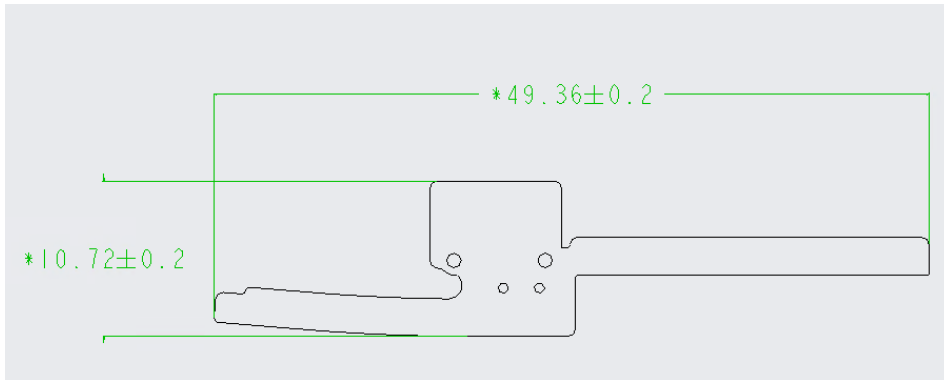
Length: 16.45mm
Width: 11.11mm

7.6 ANT5



Length: 40.67mm
Width: 12.7mm

7.7 ANT6



Length: 49.36mm
Width: 10.72mm