


RE24 - Antenna Approval sheet

- PCB Overview & Matching Value
- VSWR & Smith Chart / 3D Gain data
- 2D Radiation Pattern & Gain
- 3D Radiation pattern

By designed	By checked	By approved
Kim.j.s	-	 JI Kwon
2024.12.23		2024.12.23

Rev 1.0

December. 23 , 2024

Revision History

Version	Date	Editor	Notes
R1.0	December. 24, 2024	Ji.kwon	• Release

Measurement Process

SWR / Return Loss

Use Network Analyzer when measuring SWR/Return loss and selecting standard SPL.

E5071B Agilent Network Analyzer

Additional Features:

300 kHz to 8.5 GHz

125 dB dynamic range at test port (typical)

9.6 us/point sweep speed

0.001 dB RMS trace noise

Integrated 2-, 3- and 4-ports with balanced measurements

Fixture embedding/de-embedding and port characteristic impedance conversion

Frequency-offset mode for frequency translated devices.

Built-in Visual Basic for Applications (VBA)

Measurement Wizard Assistant (MWA) software

Measurement Process

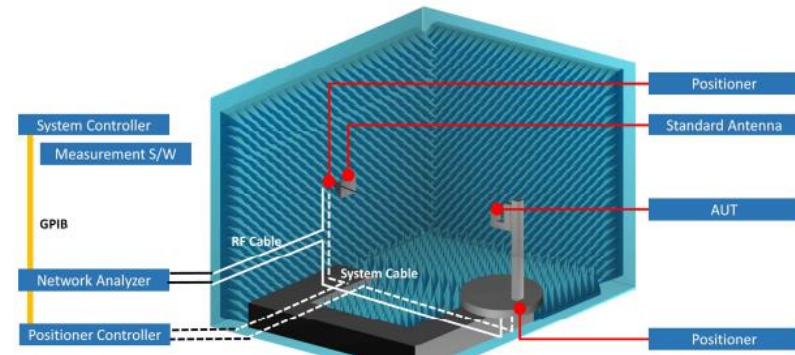
Gain

Antenna gain is measured in the Anechoic Chamber

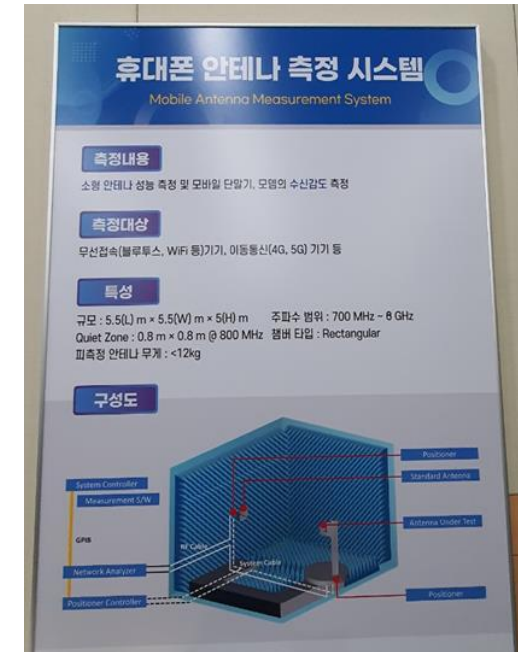


o Size: 5.5(L) m × 5.5(W) m × 5.0(H) m

o Frequency range: 700 MHz to 8.0 GHz (Far Field)



Network Analyzer : R&C ZVA24 (10MHz ~ 24GHz)	GSM, CDMA, WCDMA : Agilent 5515C
4G, LTE Cat.M, NB-IoT : Anritsu MT8821C	
5G (Sub6G, mmWave) : Anritsu MT8000A	WLAN (802.11 a,b,g,n,ac) : Anritsu MT8862A



Electrical Characteristics

This specification covers the dielectric pattern antenna **RE24A** used in Bluetooth

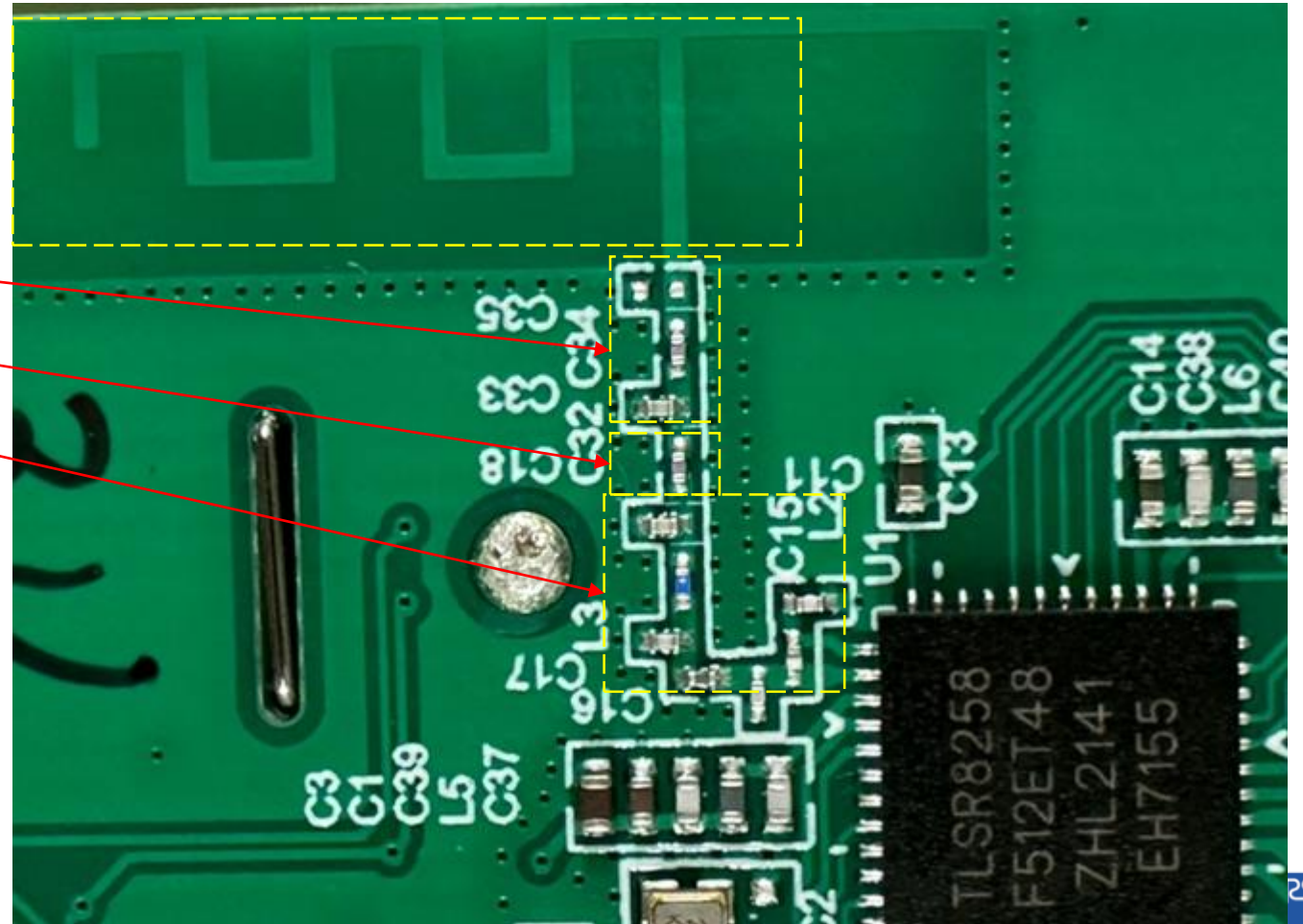
ITEM		SPECIFICATION				
Frequency Range		2402 ~ 2480 MHz				
VSWR		3:1 Max				
Polarization		Linear				
Frequency [MHz]		2400	2430	2450	2470	2480
Gain [dBi]	Peak	3.40	3.45	3.12	2.53	2.67
	Average	-1.35	-1.20	-1.66	-2.25	-2.07
Efficiency [%]		73.28	75.82	68.24	59.55	62.08

PCB Overview & Matching Value

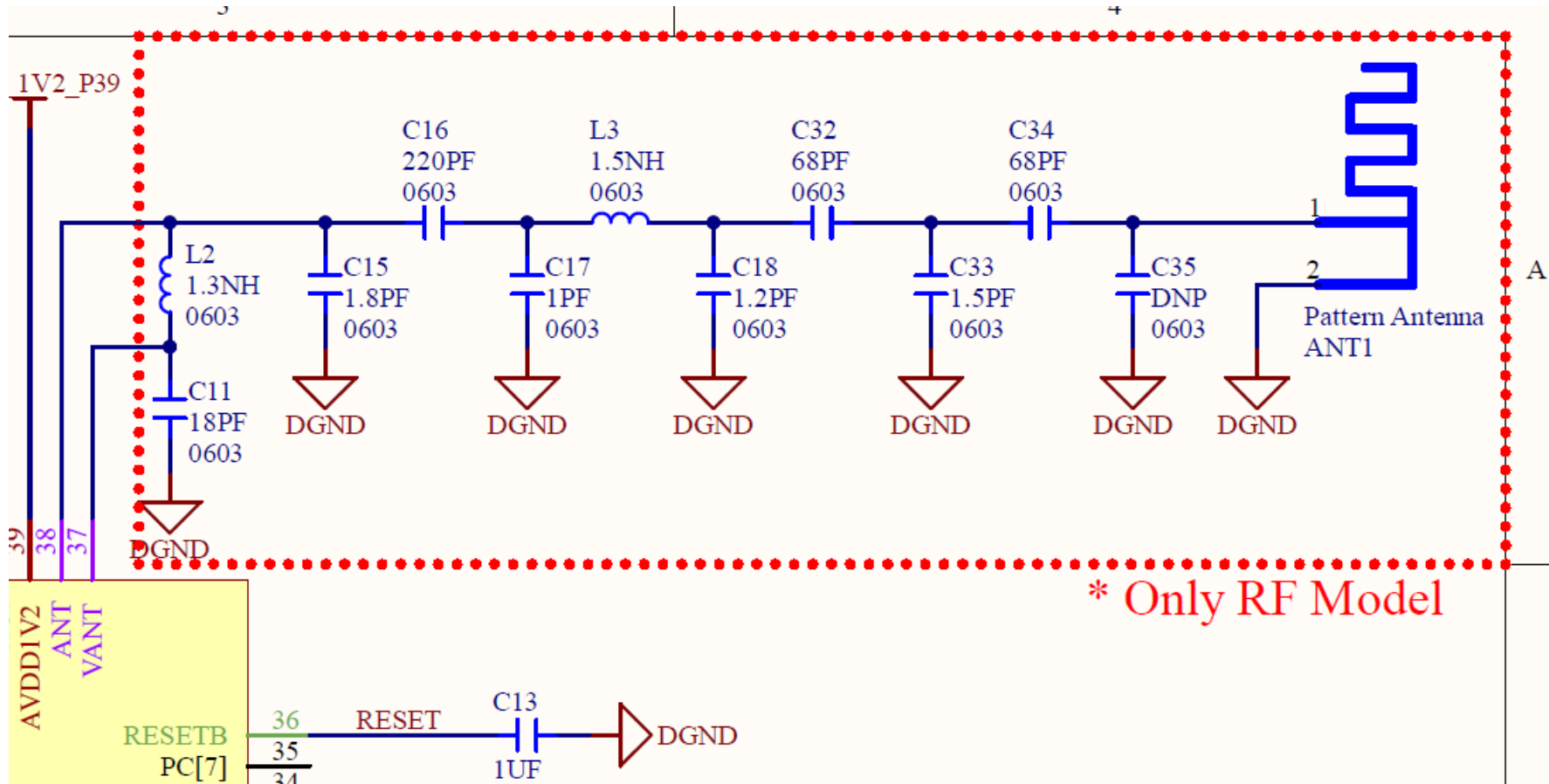
PCB Pattern Antenna

50ohm matching
Blocking Capacitor

2.4GHz LPF



PCB Overview & Matching Value



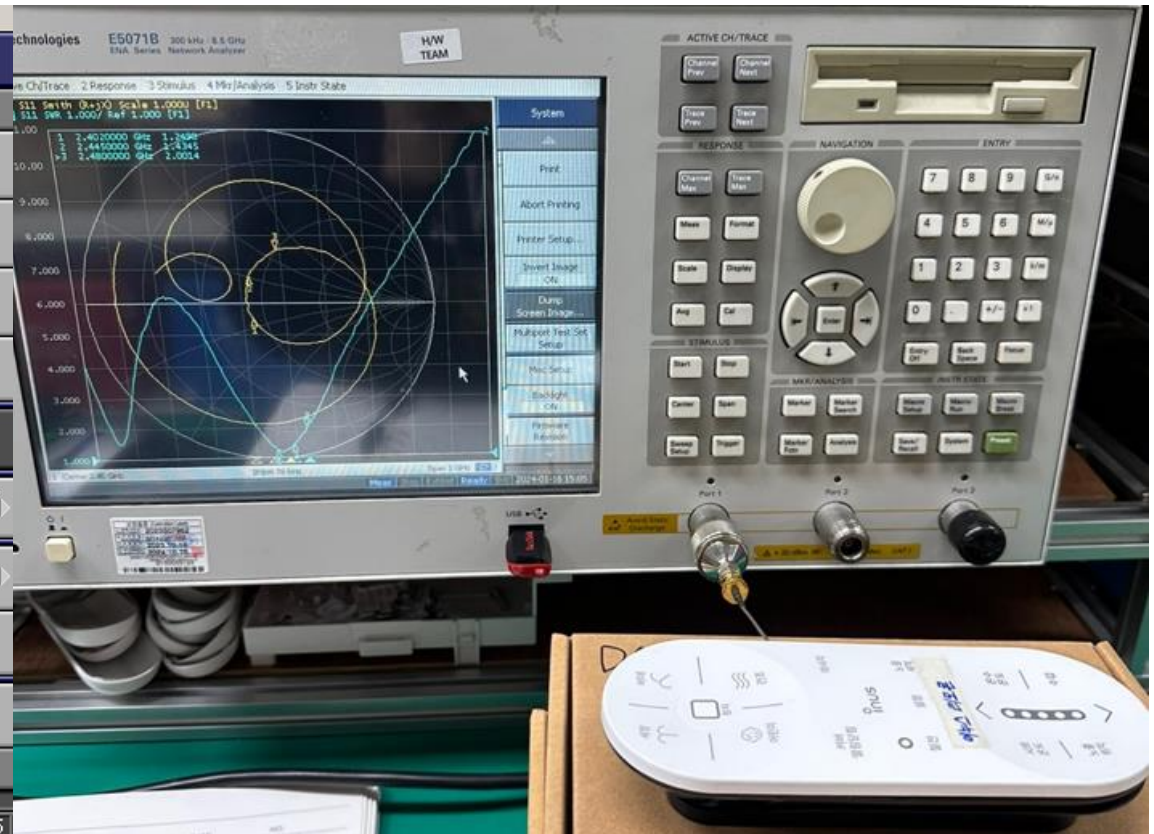
1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

Tr1 S11 Smith (R+jX) Scale 1.000U [F1]
 Tr2 S11 SWR 1.000/ Ref 1.000 [F1]

Point	Frequency (GHz)	SWR
1	2.4020000	1.2468
2	2.4450000	1.4480
3	2.4800000	2.0056

1 Center 2.45 GHz IFBW 70 kHz Span 1 GHz

System
 Print
 Abort Printing
 Printer Setup...
 Invert Image ON
 Dump Screen Image...
 Multiport Test Set Setup
 Misc Setup
 Backlight ON
 Firmware Revision

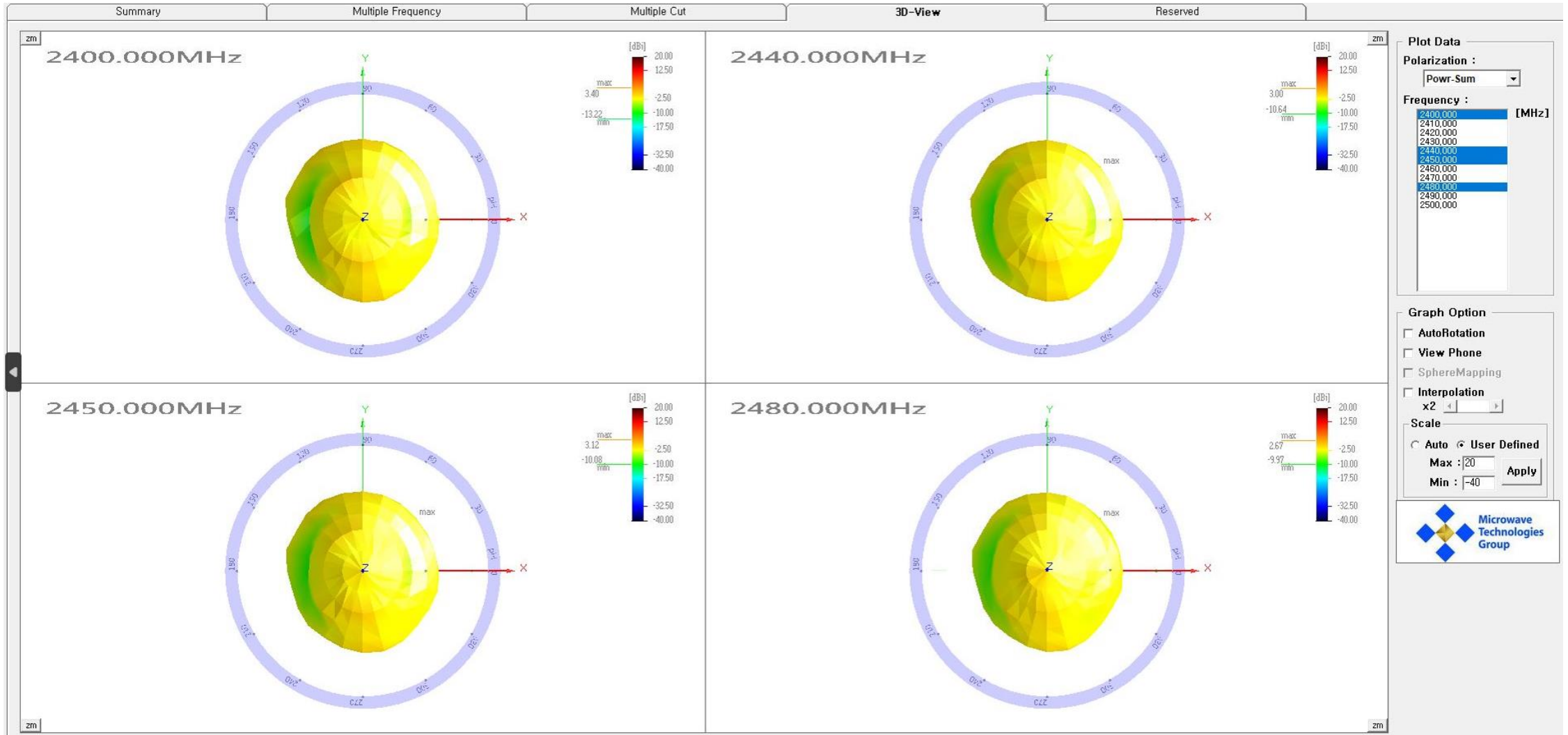


2D Radiation Pattern & Gain (ANT1)

3D Result Summary :

		Theta-Pc					Phi-Pol(\					Pwr Sum				
No	Freq.[MHz]	Eff.[%]	Avg.[dBi]	Peak[dBi]	Theta	Phi[de	Eff.[%]	Avg.[dBi]	Peak[dBi]	Theta	Phi[de	Eff.[%]	Avg.[dBi]	Peak[dBi]	Theta	Phi[de
1	2400.000	43.79	-3.59	3.06	135.00	15.00	29.49	-5.30	2.48	180.00	90.00	73.28	-1.35	3.40	180.00	345.00
2	2410.000	46.20	-3.35	3.31	135.00	0.00	31.02	-5.08	2.57	180.00	90.00	77.21	-1.12	3.62	180.00	330.00
3	2420.000	46.30	-3.34	3.38	135.00	0.00	30.67	-5.13	2.46	180.00	90.00	76.96	-1.14	3.52	180.00	330.00
4	2430.000	45.67	-3.40	3.40	135.00	0.00	30.16	-5.21	2.36	180.00	90.00	75.82	-1.20	3.45	150.00	45.00
5	2440.000	40.16	-3.96	2.87	135.00	0.00	26.46	-5.77	1.85	180.00	90.00	66.63	-1.76	3.00	150.00	45.00
6	2450.000	41.01	-3.87	2.94	135.00	0.00	27.23	-5.65	2.05	180.00	90.00	68.24	-1.66	3.12	150.00	45.00
7	2460.000	37.98	-4.20	2.65	135.00	0.00	25.45	-5.94	1.83	180.00	90.00	63.43	-1.98	2.79	150.00	45.00
8	2470.000	35.73	-4.47	2.39	135.00	0.00	23.82	-6.23	1.62	180.00	90.00	59.55	-2.25	2.53	150.00	45.00
9	2480.000	37.46	-4.26	2.60	135.00	0.00	24.62	-6.09	1.81	180.00	90.00	62.08	-2.07	2.67	150.00	45.00
10	2490.000	34.82	-4.58	2.30	135.00	0.00	22.81	-6.42	1.38	180.00	90.00	57.63	-2.39	2.33	135.00	0.00
11	2500.000	38.05	-4.20	2.69	135.00	0.00	24.25	-6.15	1.53	180.00	90.00	62.31	-2.05	2.72	135.00	0.00

3D Radiation pattern





Thank you