

Date: 20-12-2023

RADIATION PATTERN RESULT
VIVALDI TYPE ANTENNA
400 to 2600 MHz

1. Test Cases

1.1 Antenna Return Loss

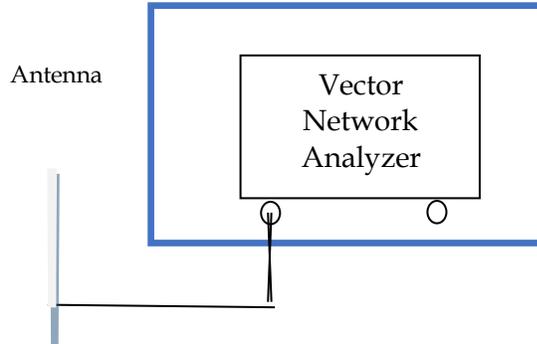


Figure 1: Setup to Test Antenna Return loss

Test Procedure	
Step-1	Calibrate the Network Analyzer for the operating frequency band
Step-2	Connect the Antenna under test to port-1 as shown in the Error! Reference source not found.1.
Step-3	Set the frequency band and select S11 to measure the return loss over the required frequency band. Return loss over the operating frequency range should be greater than 10 dB or as per the requirement
Step-4	Save the plot
Equipment Setup	
	Agilent Network Analyzer/Equivalent device, Cable and Adaptor
	Calibration Kit

1.2 Antenna Radiation Pattern

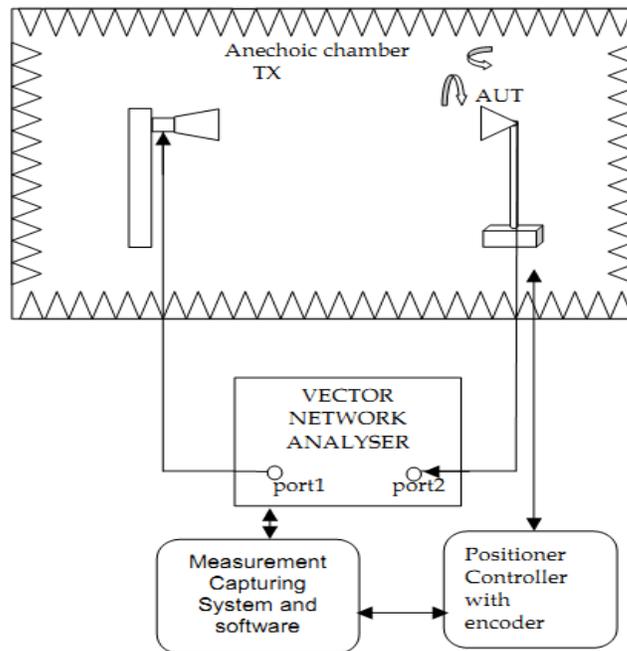


Figure 2: Setup to Measure the Radiation Pattern

Test Procedure	
Step-1	Connect the AUT and Tx antenna in Anechoic chamber as shown in figure 2.0
Step-2	Set the required frequency points in the software and give sweep angles between -180° to $+180^{\circ}$.
Step-3	The AUT will rotate in Azimuth from -180° to $+180^{\circ}$ degrees and capture the power from the Tx antenna.
Step-4	Save Polar/3D plots
Step-5	Replace the AUT with the Standard Gain antenna and measure the power levels for -180° to $+180^{\circ}$ for gain calculation
Equipment Setup	
	Anechoic Chamber, Cables, Vector Network Analyzer
	Standard Gain Antenna, Tx Antenna

2. Observations:

2.1 Operating Frequency & Return loss, VSWR:

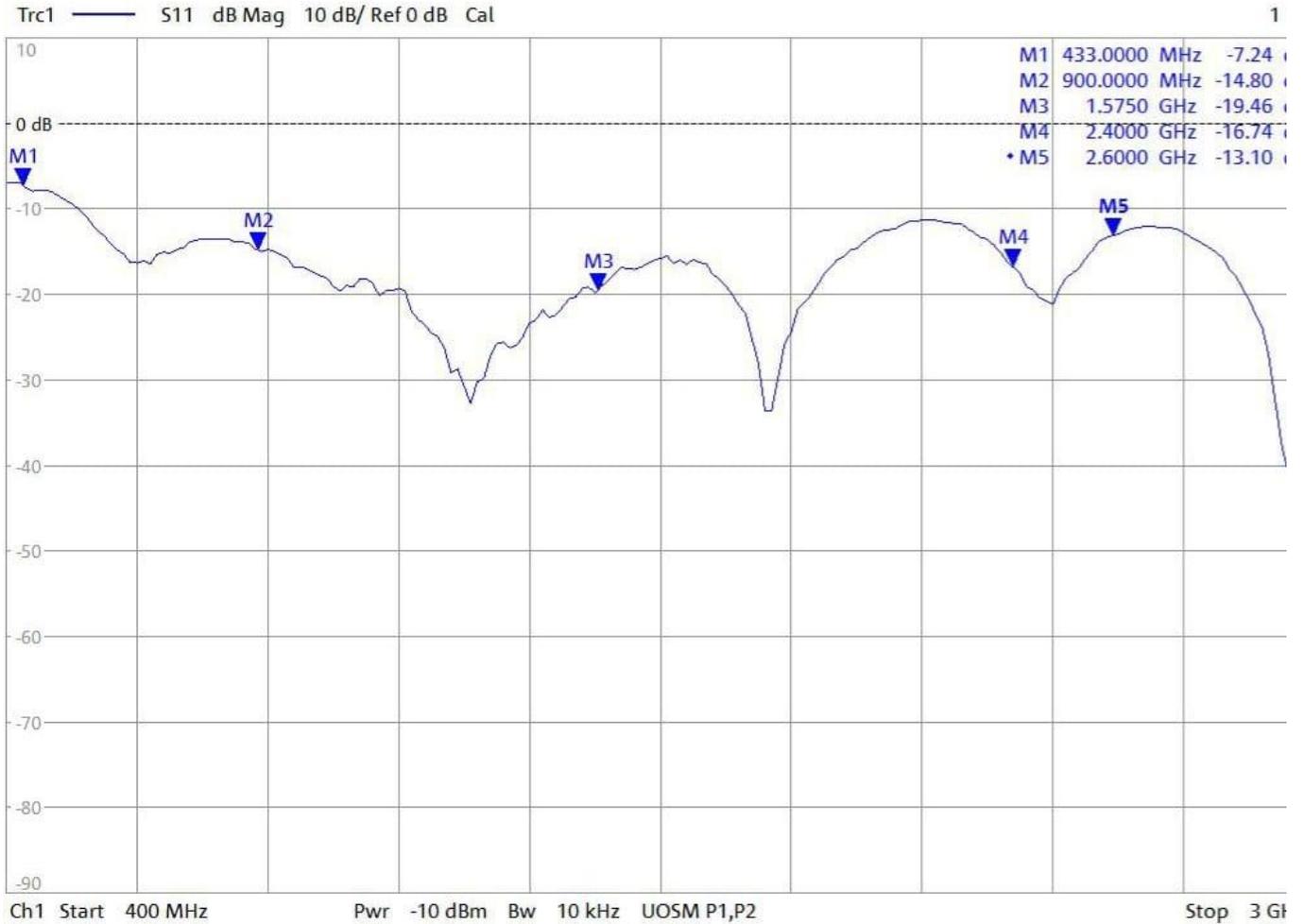


Figure 3: Return loss

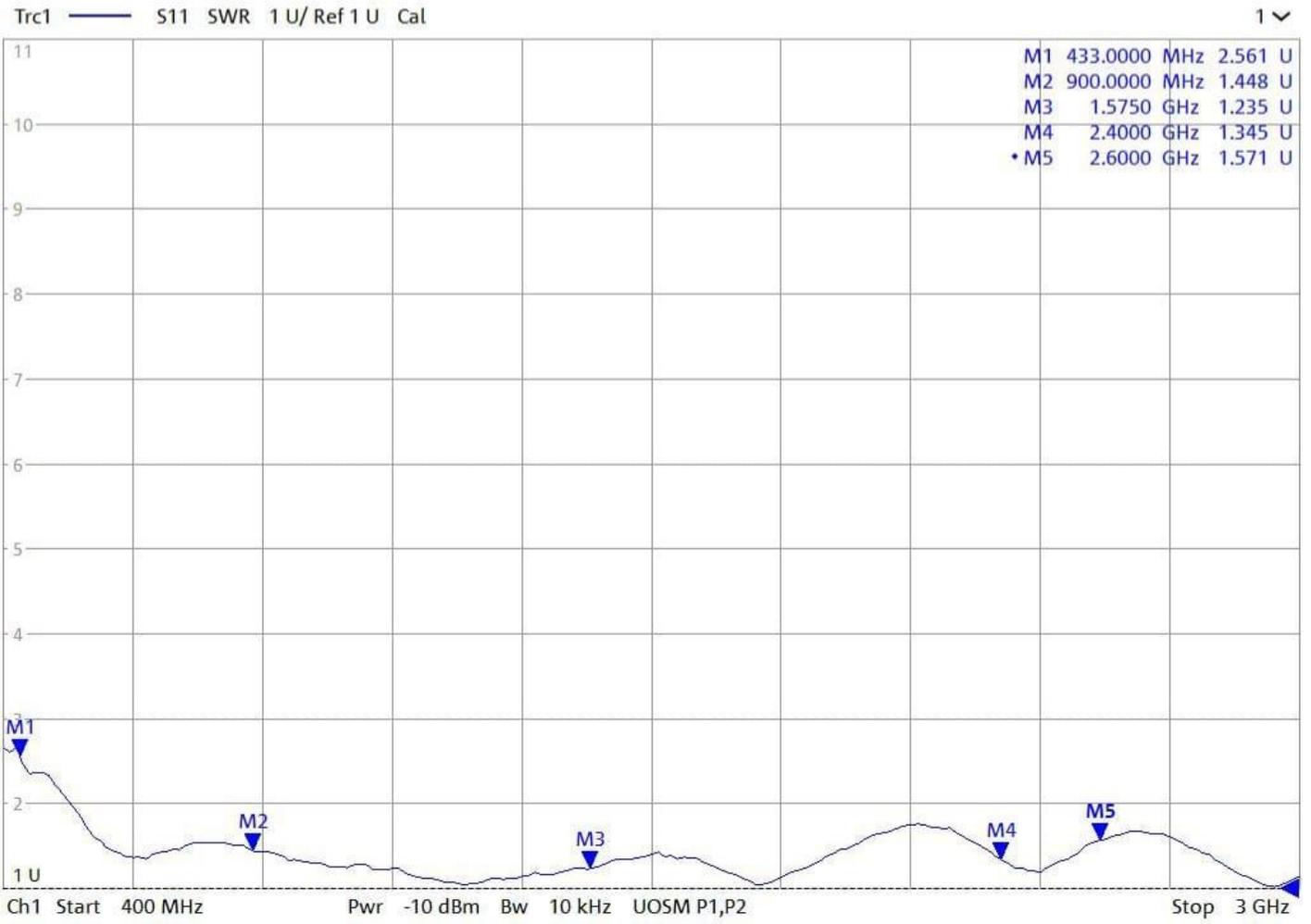


Figure 4: VSWR

2.2 Radiation Pattern Measurement

Horizontal Pattern

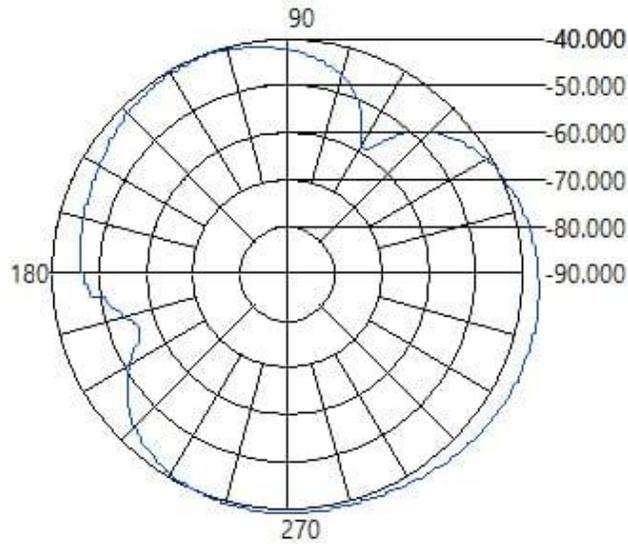


Fig 5: Measured Radiation pattern@ 433 MHz

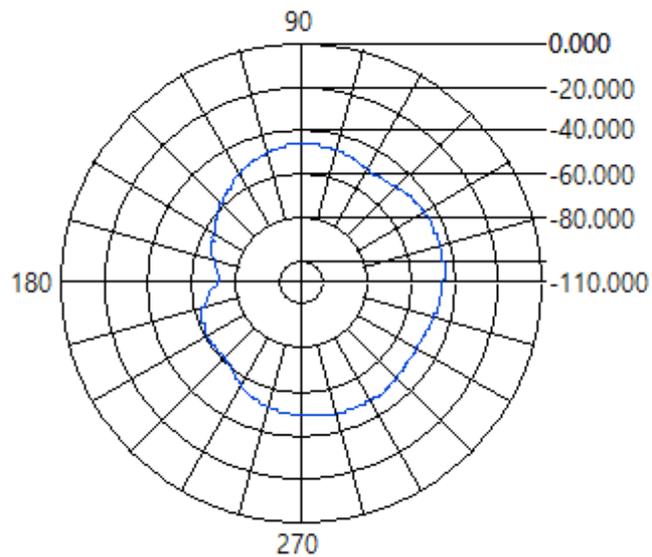


Fig 6: Measured Radiation pattern@ 900 MHz

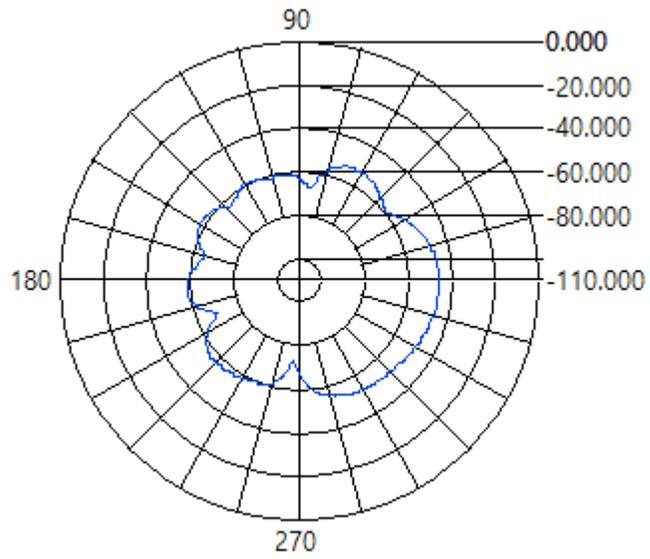


Fig 7: Measured Radiation pattern@ 1575 MHz

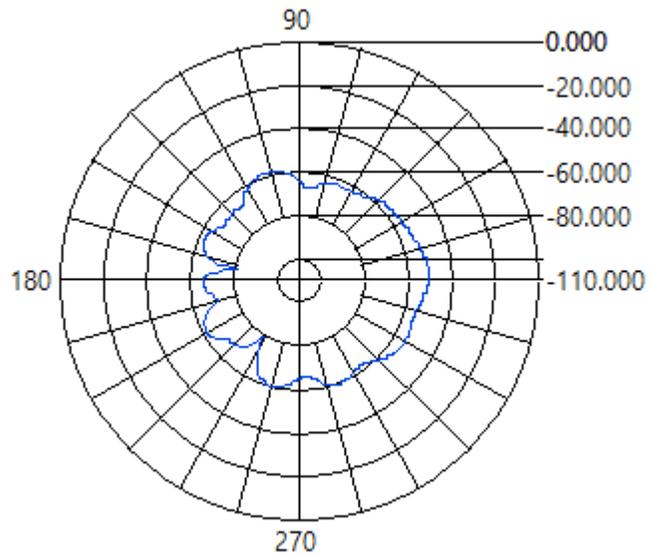


Fig 8: Measured Radiation pattern@ 2400 MHz

Vertical Pattern

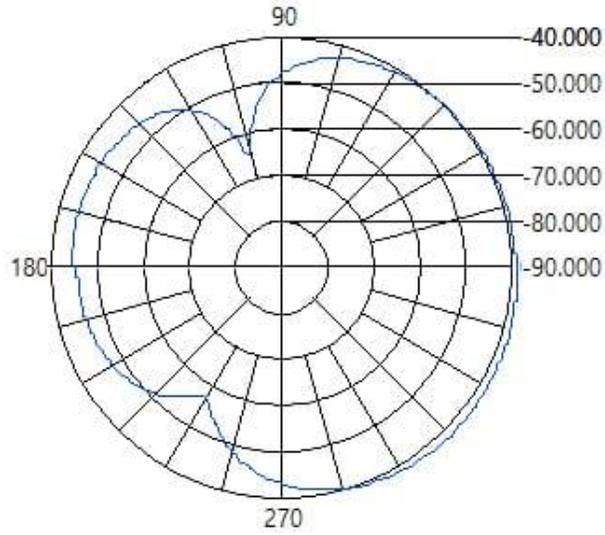


Fig 9: Measured Radiation pattern@ 433 MHz

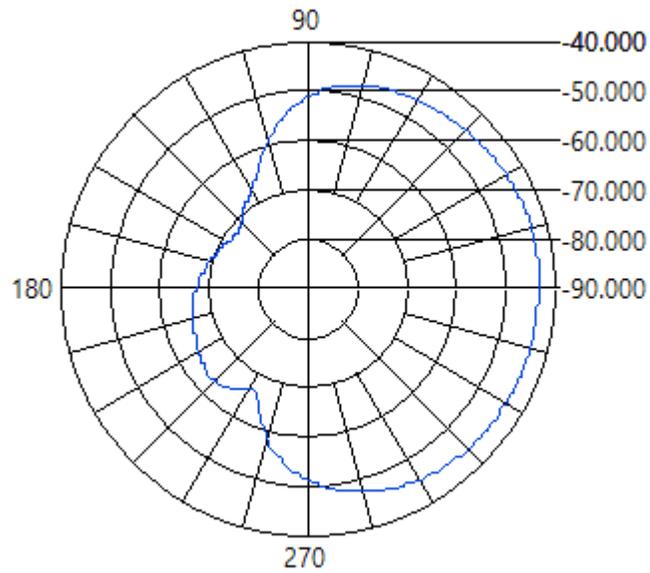


Fig 10: Measured Radiation pattern@ 900 MHz

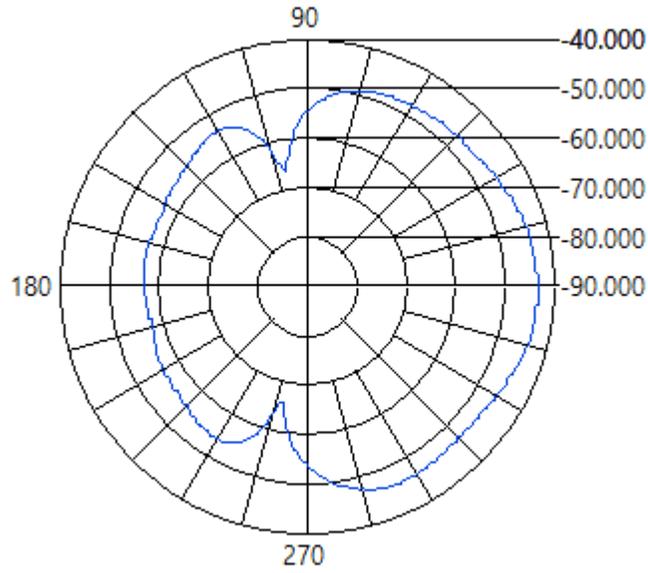


Fig 11: Measured Radiation pattern@ 1575 MHz

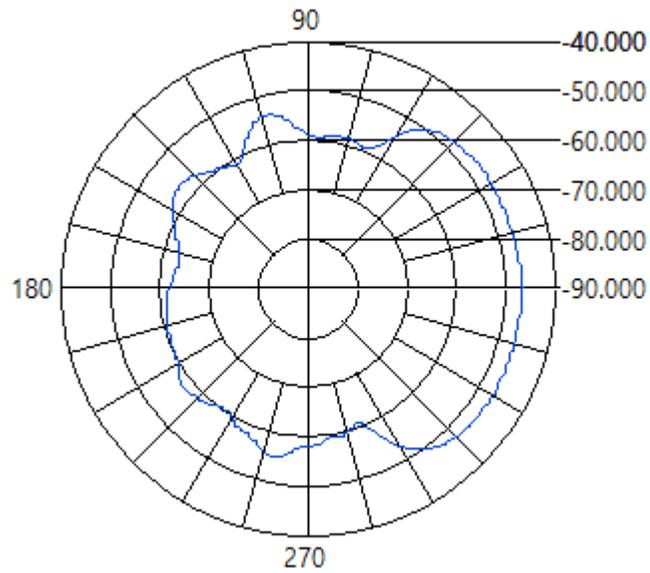


Fig 12: Measured Radiation pattern@ 2400 MHz

Measured Gain Table

Frequency (In MHz)	Simulated Gain (dBi)	Measured Gain (dBi)	3dB Beamwidth (Deg)
433	0.98	0.35	170 (Az) x 90 (El)
900	5.1	3.5	135 (Az) x 85 (El)
1575	6.8	5.4	95 (Az) x 40 (El)
2400	9.7	8.6	90 (Az) x 40 (El)

Antenna Size:

300x200x1.6mm