AMERICAN OUTDOOR BRANDS

Velociradar Antenna Design

Antenna Version R4

2024-06-07

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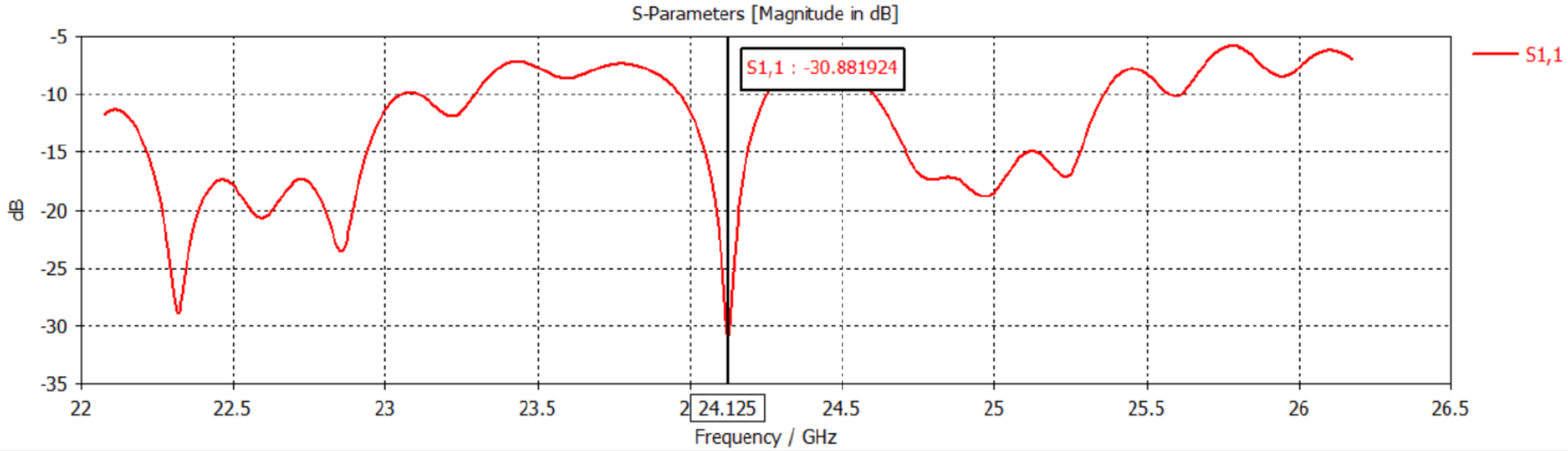
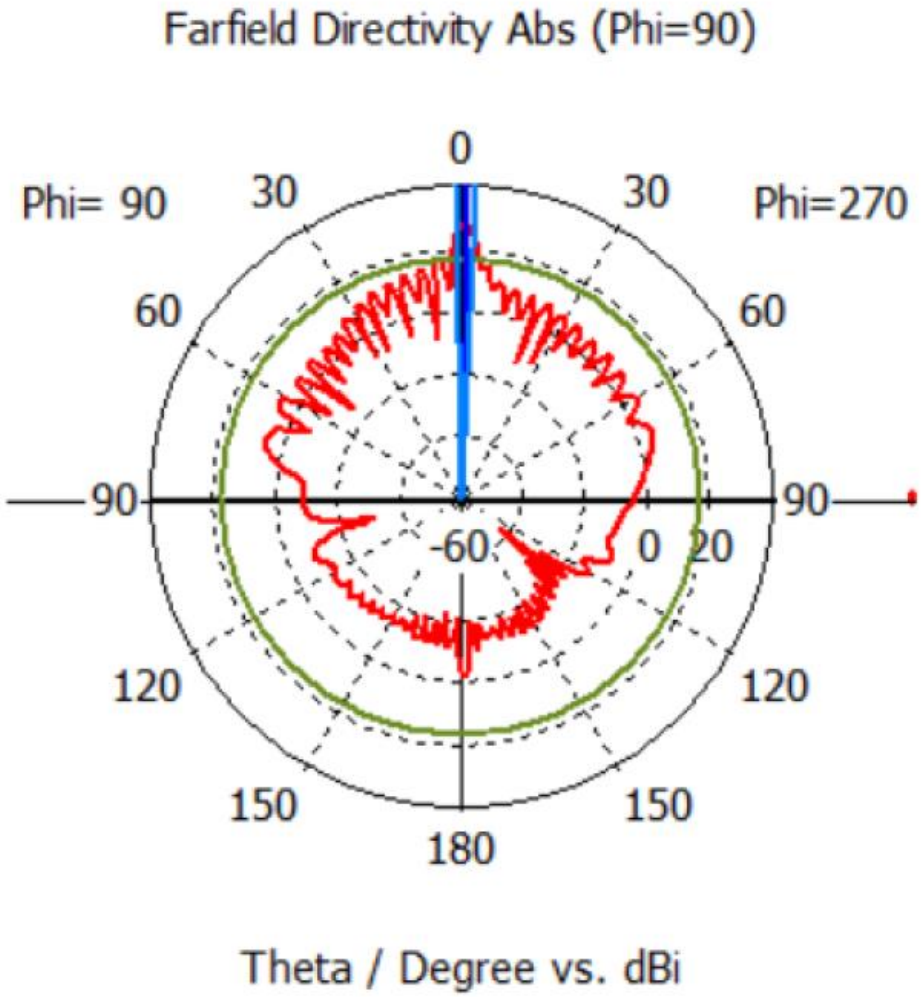
S11



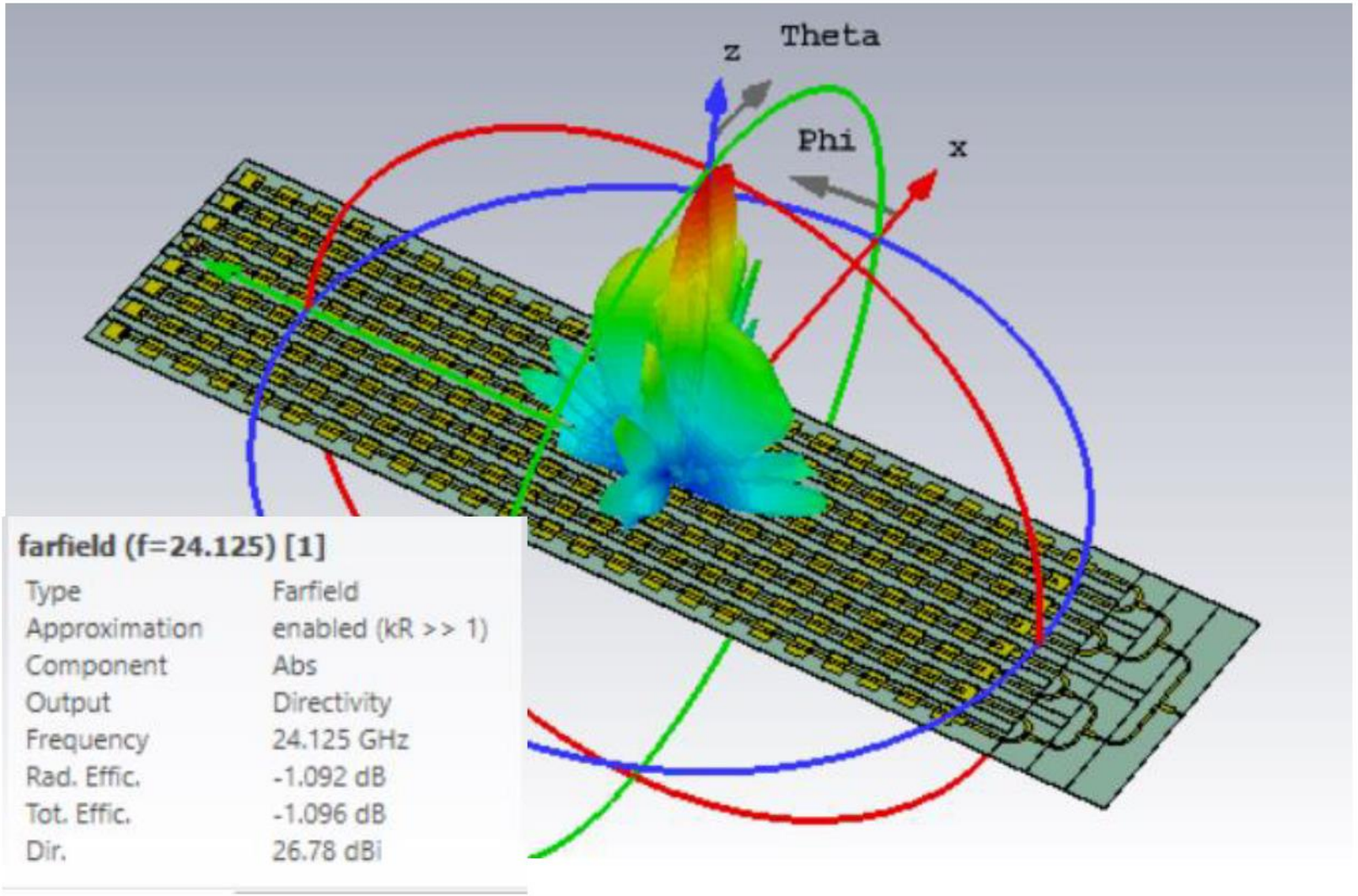
FARFIELD 2D



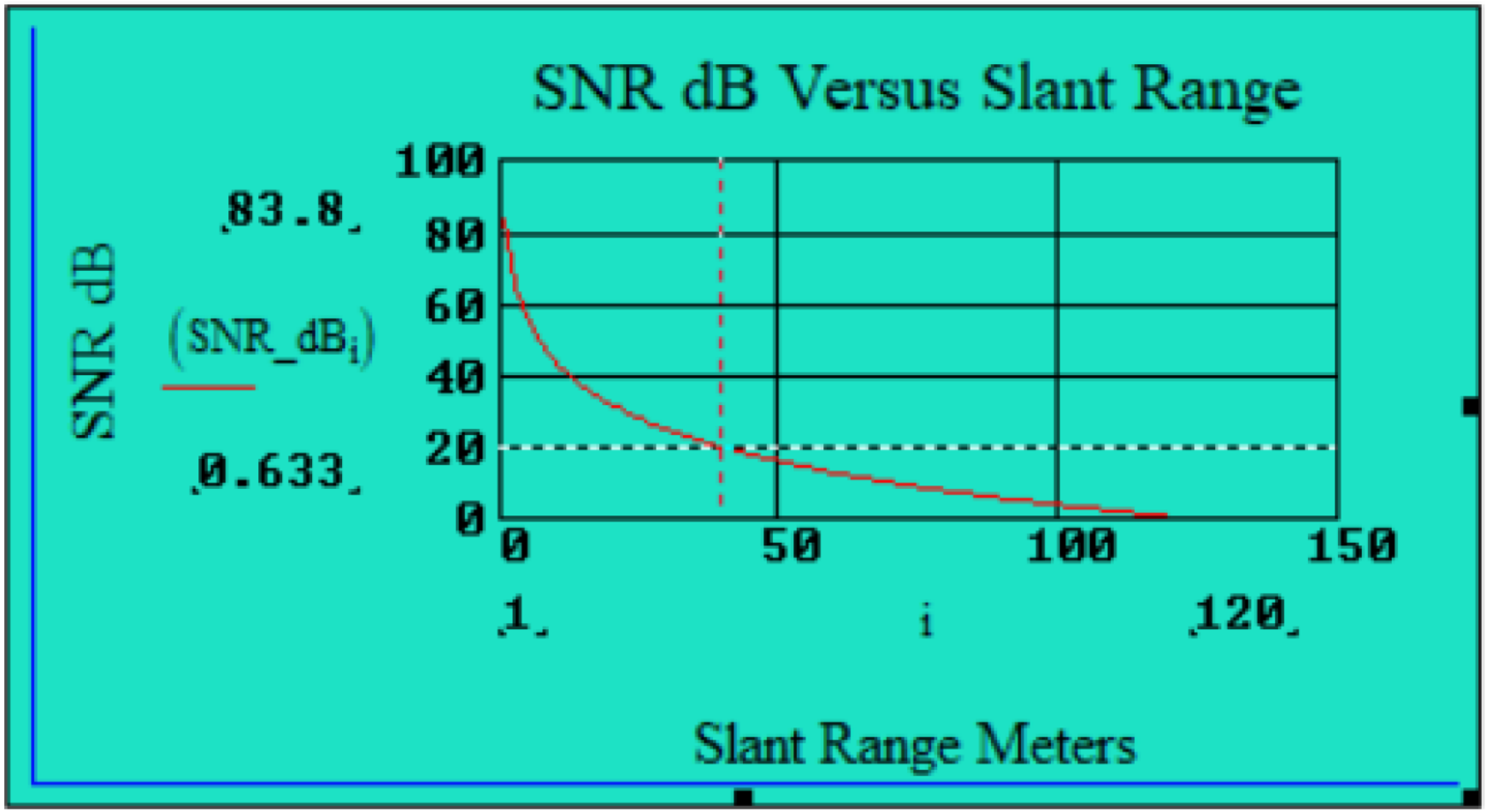
farfield (f=24.125) [1]

Frequency = 24.125 GHz
Main lobe magnitude = 27.2 dBi
Main lobe direction = 1.0 deg.
Angular width (3 dB) = 3.6 deg.
Side lobe level = -10.0 dB

FARFIELD 3D

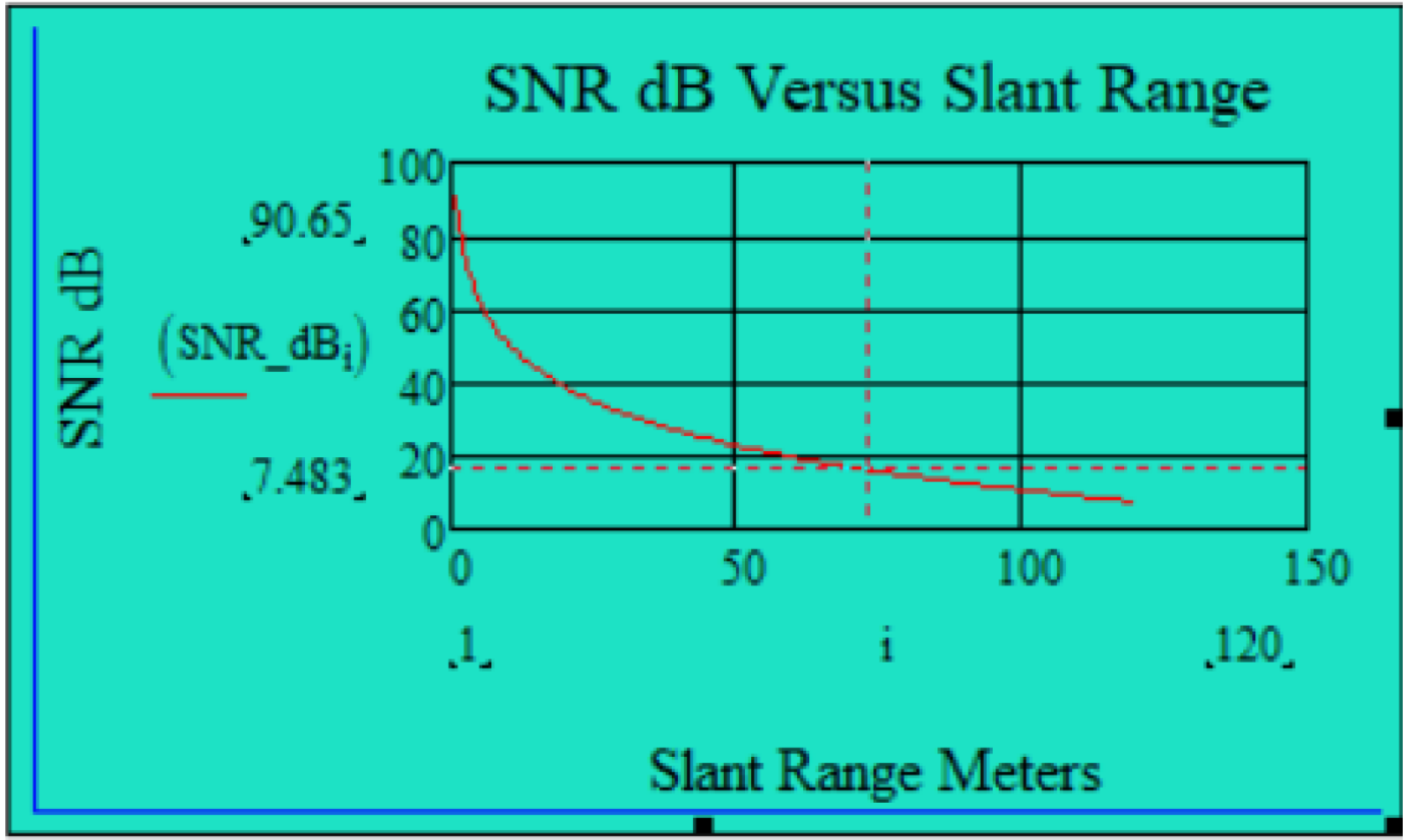


SNR AT MAX RANGE .22



- 21dB SNR at Max Range of 40yd

SNR AT MAX RANGE .308



- 16dB SNR at Max Range of 80yd

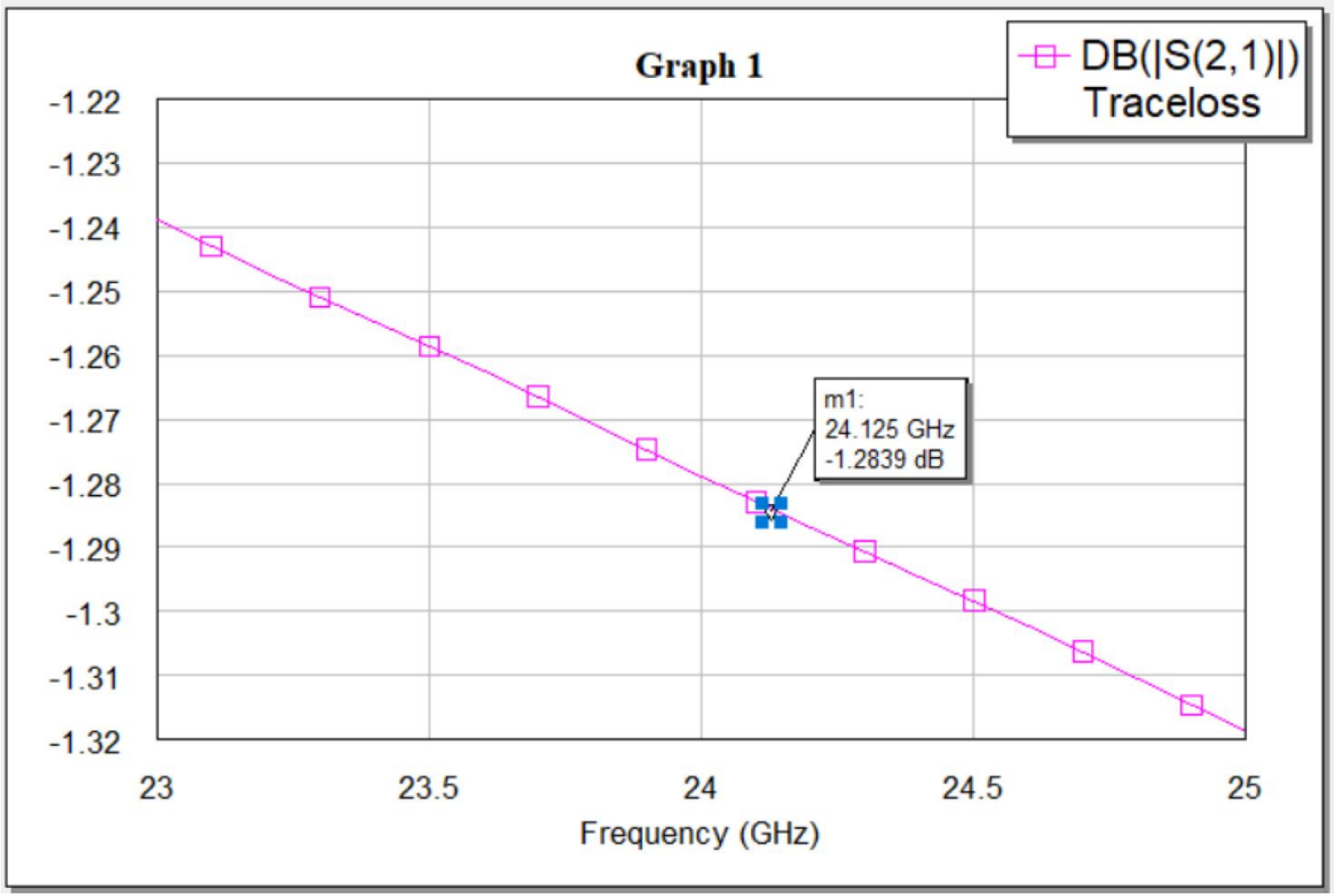
SNR AT MAX RANGE .355

- 17.7dB SNR at Max Range of 100yd

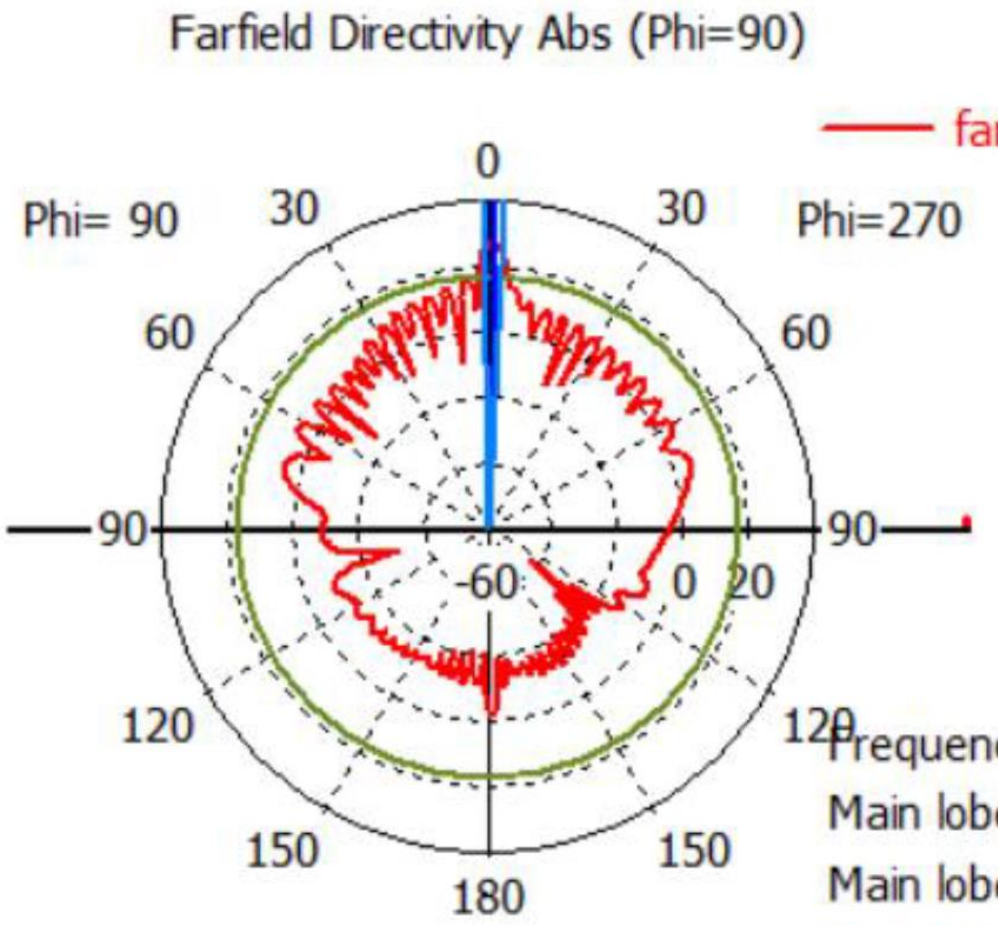
SUMMARY OF RESULTS

- Max EIRP = 32.7dBm
- Simulated CST Tx Gain = 26.78dBi
- Measured Tx Gain = 31.8dBi
- Tx Azimuth Elements = 24
- Tx Elevation Elements = 8
- 3dB beam width = 3.6°
- 16dB SNR at 110m
- 21dB SNR at Max Range of 40yd
- 16dB SNR at Max Range of 80yd
- 17.7dB SNR at Max Range of 100yd

MICROWAVE OFFICE SIMULATED TRACE LOSS TO ANTENNA



TX AZIMUTH GAIN POLAR 2D



Frequency = 24.125 GHz
Main lobe magnitude = 27.2 dBi
Main lobe direction = 1.0 deg.
Angular width (3 dB) = 3.6 deg.
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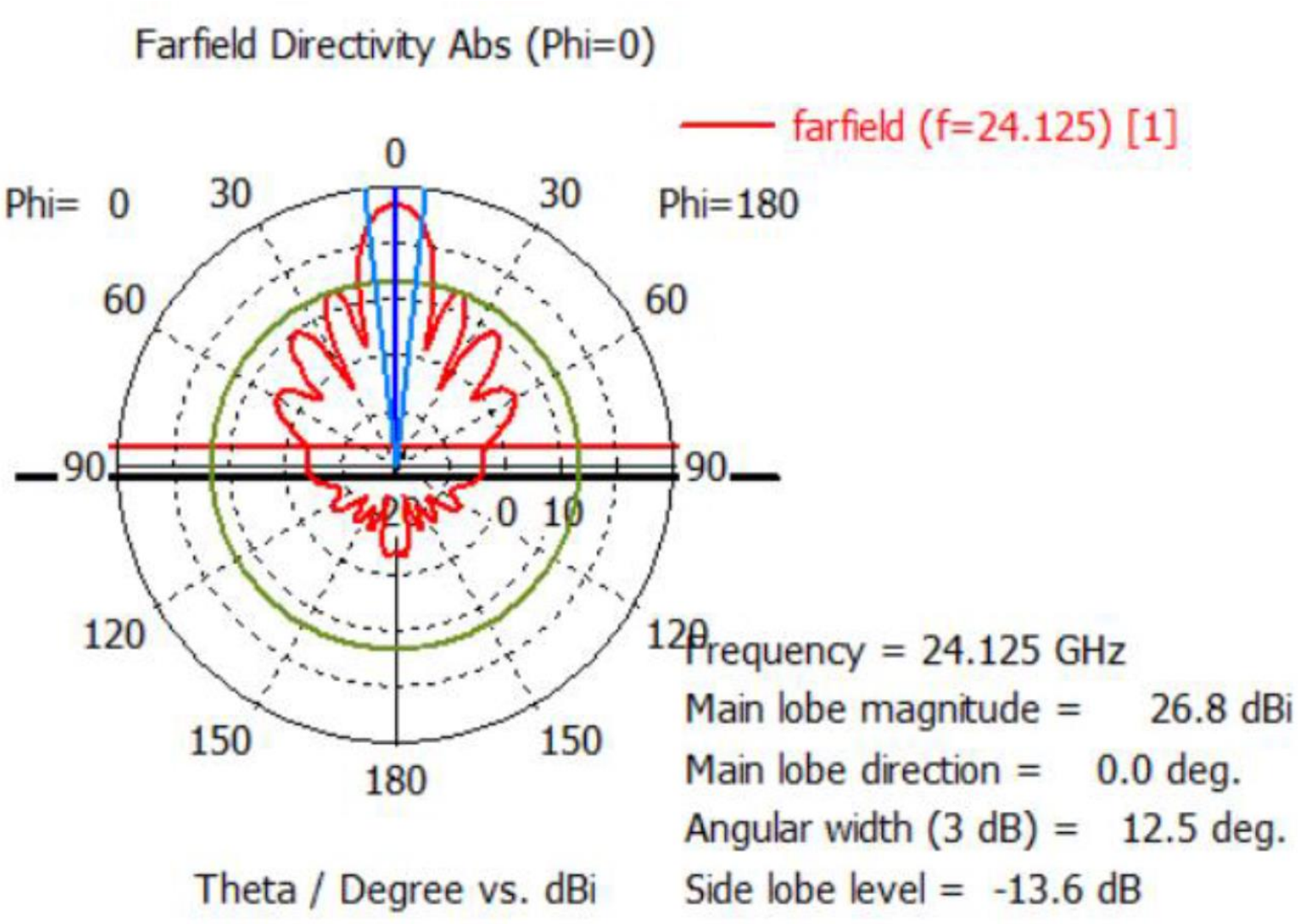
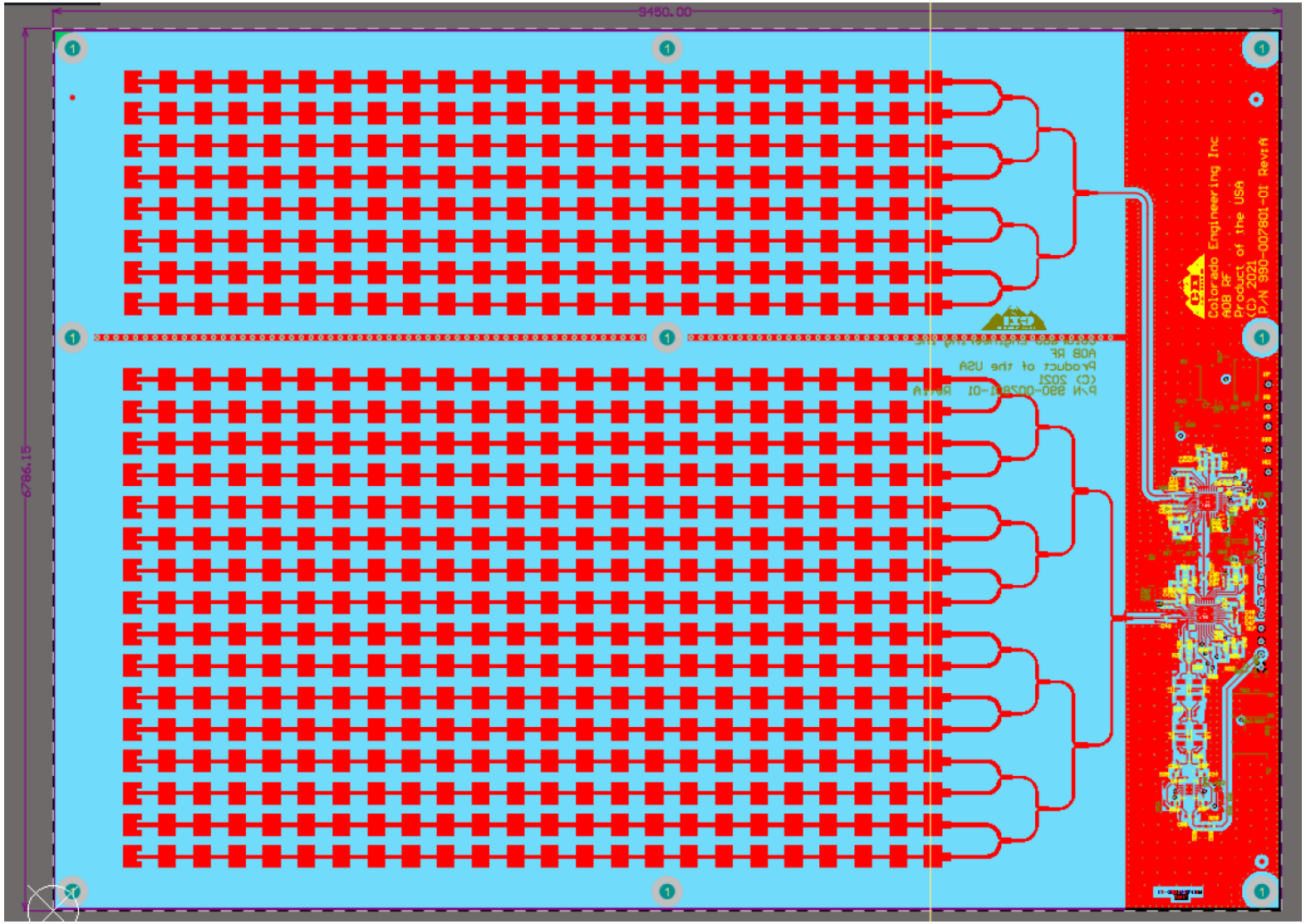
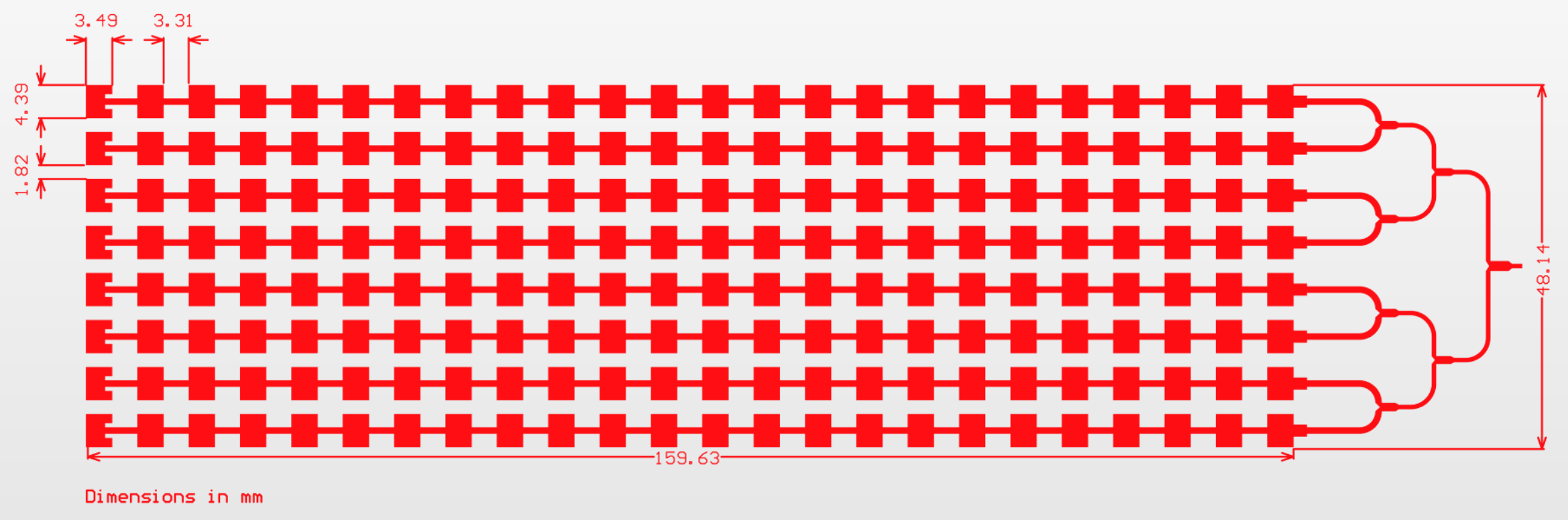
TX ELEVATION GAIN POLAR 2D



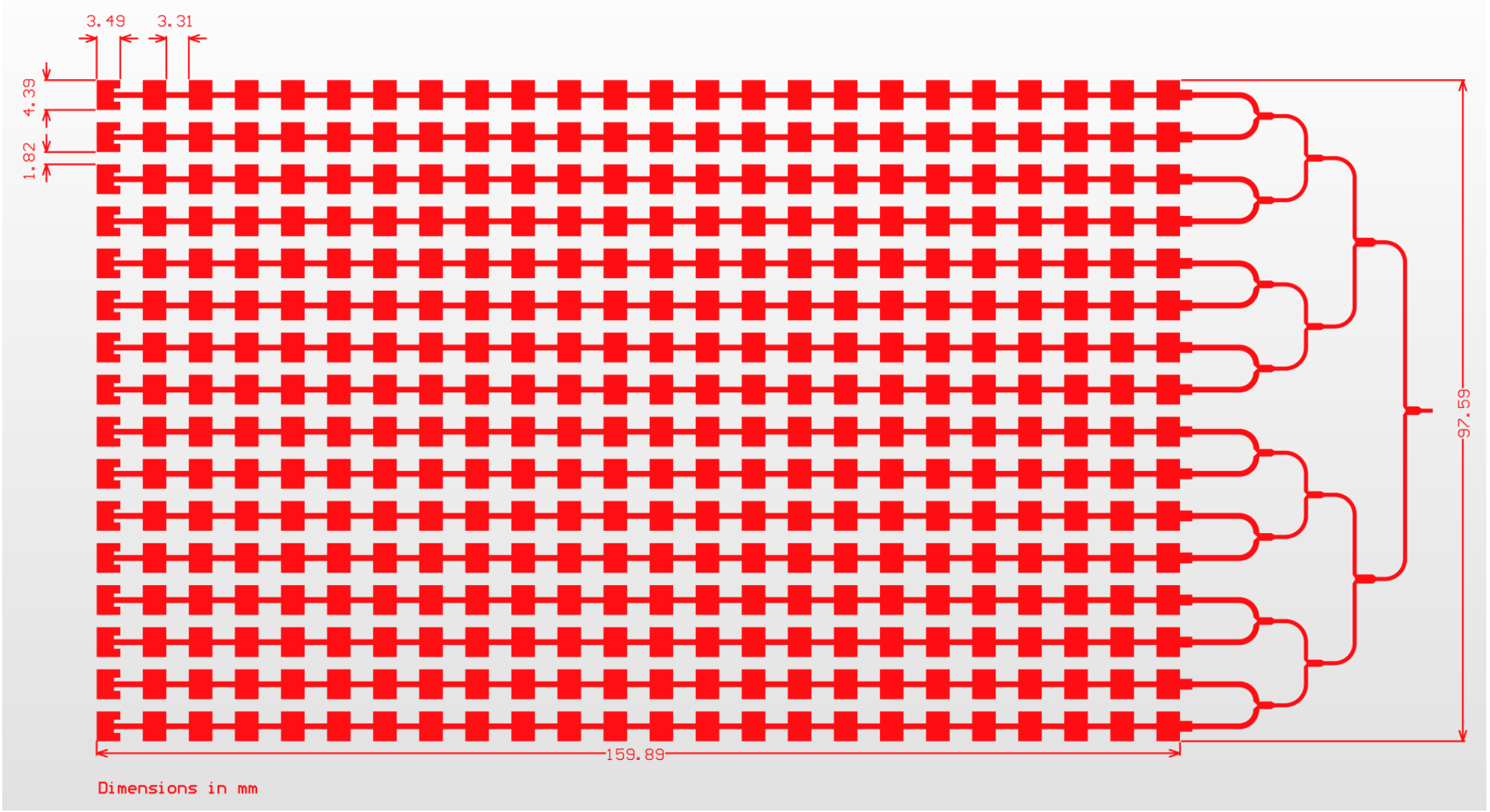
RF BOARD LAYOUT



TX ANTENNA DIMENSION DRAWING



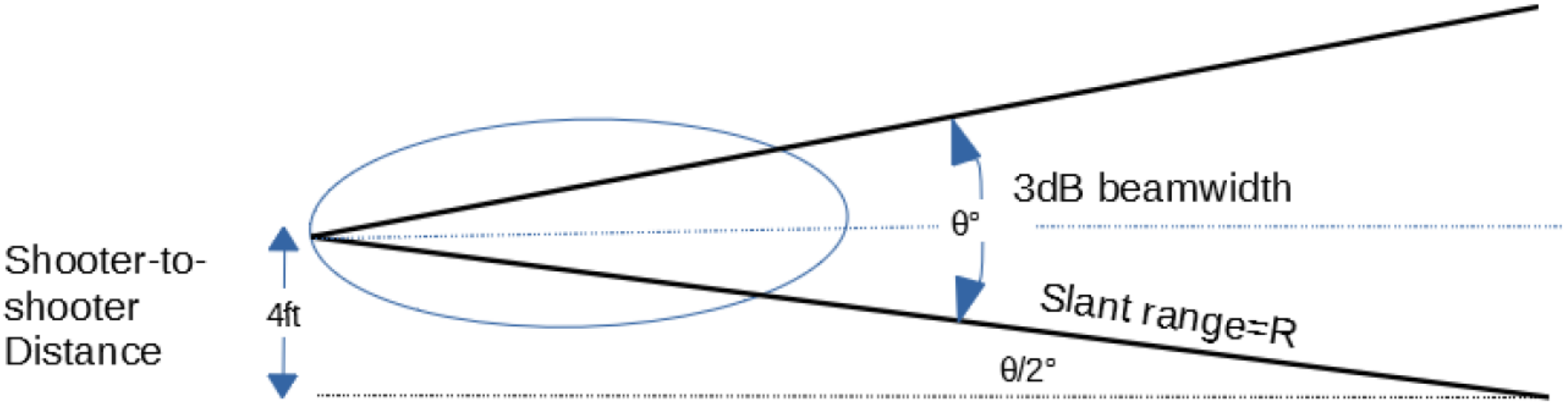
RX ANTENNA DIMENSION DRAWING



BEAMWIDTH

Antenna Configuration	Elements Azimuth	Elements Elevation	Beamwidth Azimuth Mathcad	Beamwidth Elevation Mathcad	Beamwidth Azimuth CST	Beamwidth Elevation CST
TX_24x8	24	8	2.7°	9°	3.6°	6.3°

ADJACENT SHOOTER CALCULATIONS H POLARIZATION



BW=BWaz=3.6°
Shooter-to-Shooter Distance=4ft
Sin(BW/2)=Adjacent shooter distance/Slant Range
Sin(3.6/2)=4ft/R
R=127ft=42yds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