

Antenna review

2.4GHz inverted F antenna on a 2.0mm FR4 PCB

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General

Original source of the antenna:

https://github.com/sad-electronics/wch-kicad-lbr/blob/main/footprints/wch-antenna.pretty/ANT-F-1-2.4G-2.0MM-FR4-WCH.kicad_mod

Modified by Xdevelop: No

Simulation software: Dassault Systems CST Studio Suite® 2023

Number of tetrahedrons: 51,785

Matched: No

If you have any questions, contact

Bernhard Wörndl-Aichriedler

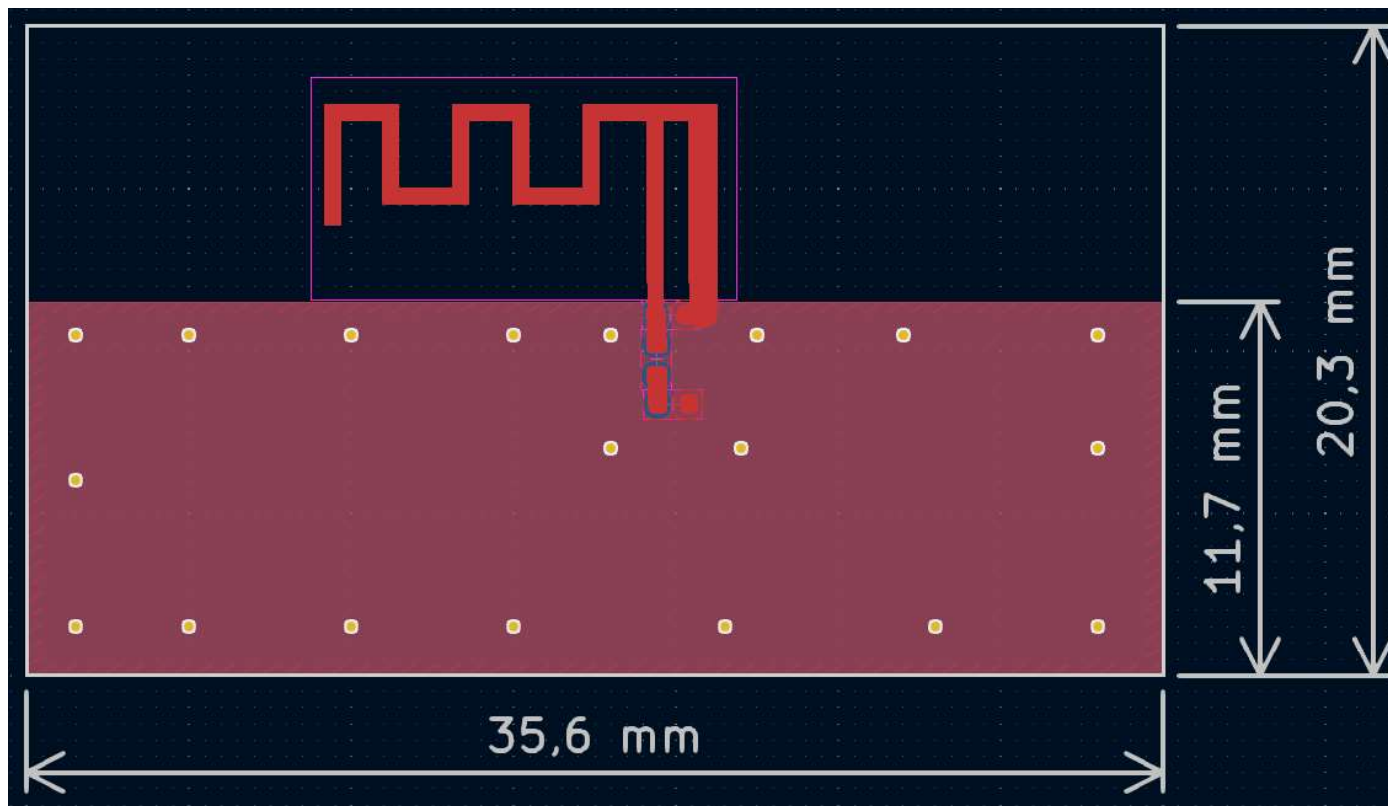
bwa@xdevelop.at

PCB data

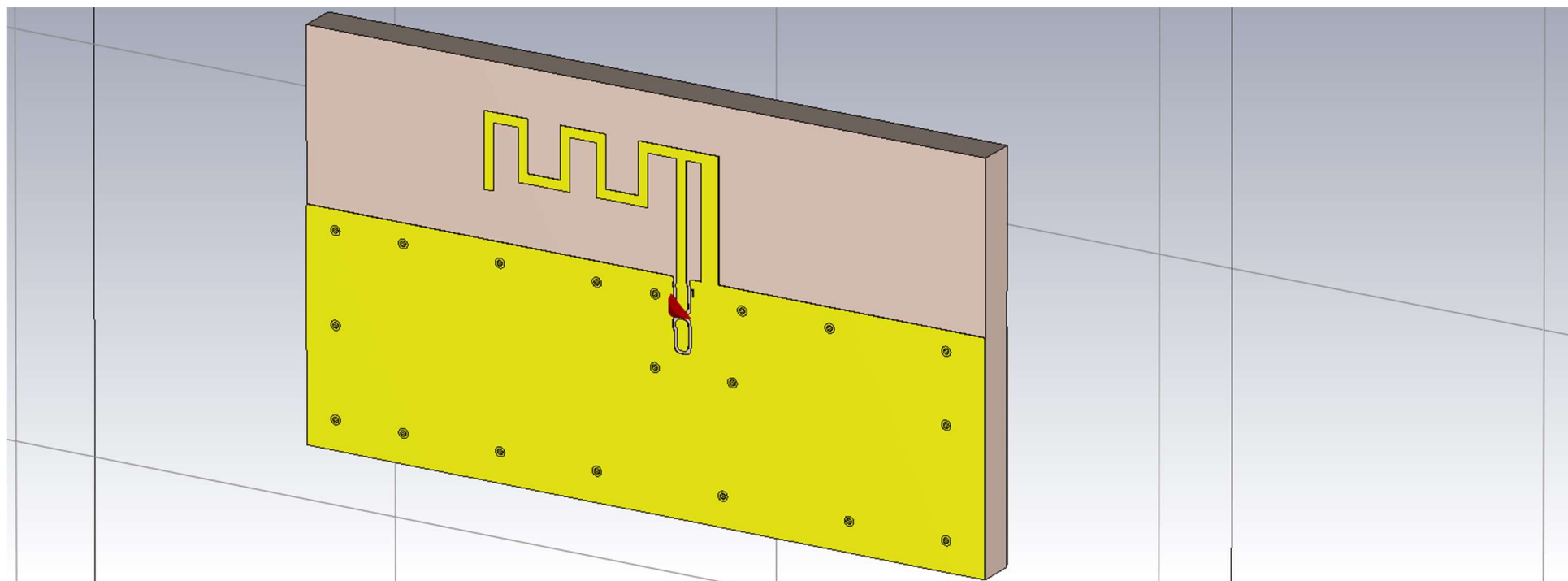
Stackup:

Layer	Thickness	Material	Dielectric constant ϵ_r
Top	35 μ m	Copper	Not relevant
Core	1.93mm	FR4 (epoxy resin + fiberglass)	4.3
Bottom	35 μ m	Copper	Not relevant

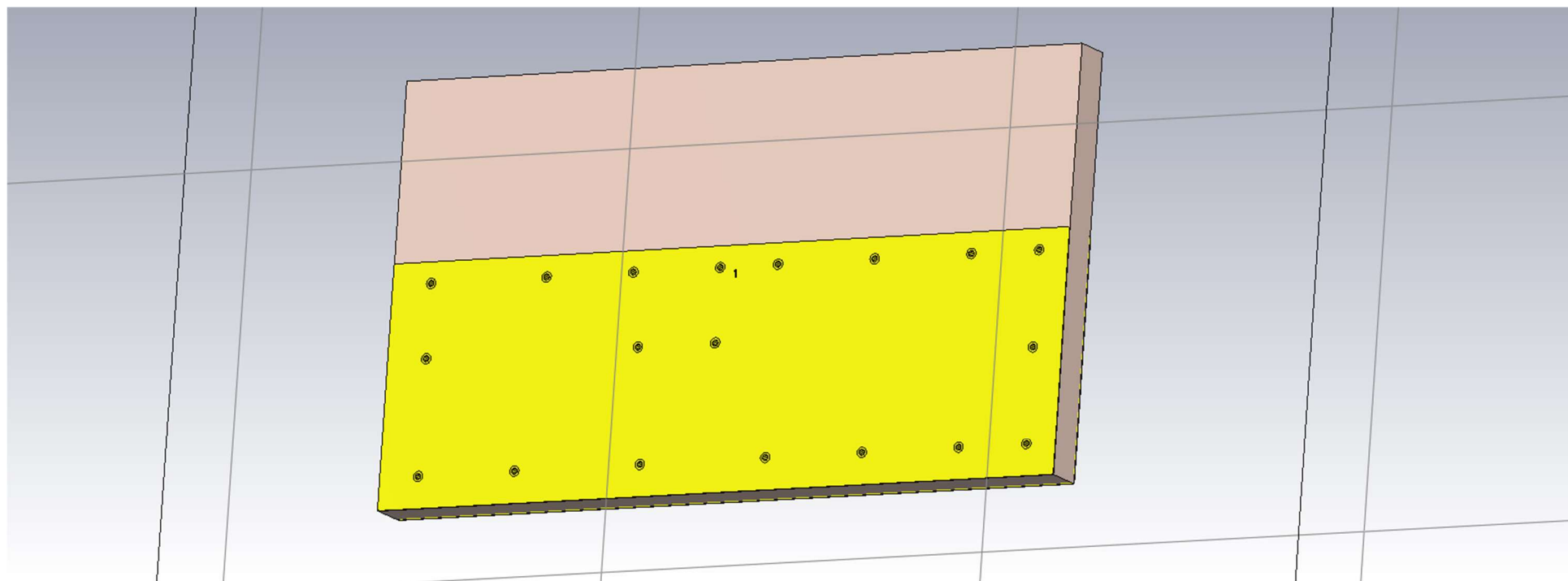
PCB dimensions & layout



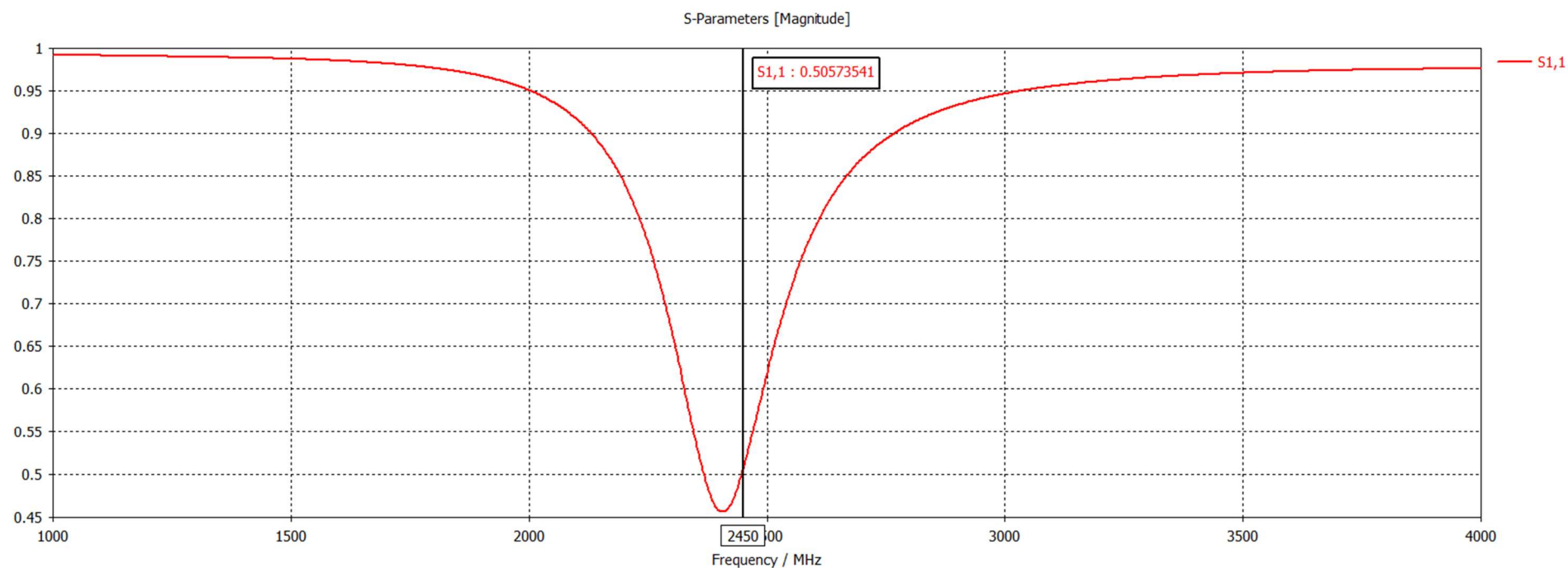
3D model of the PCB from the front



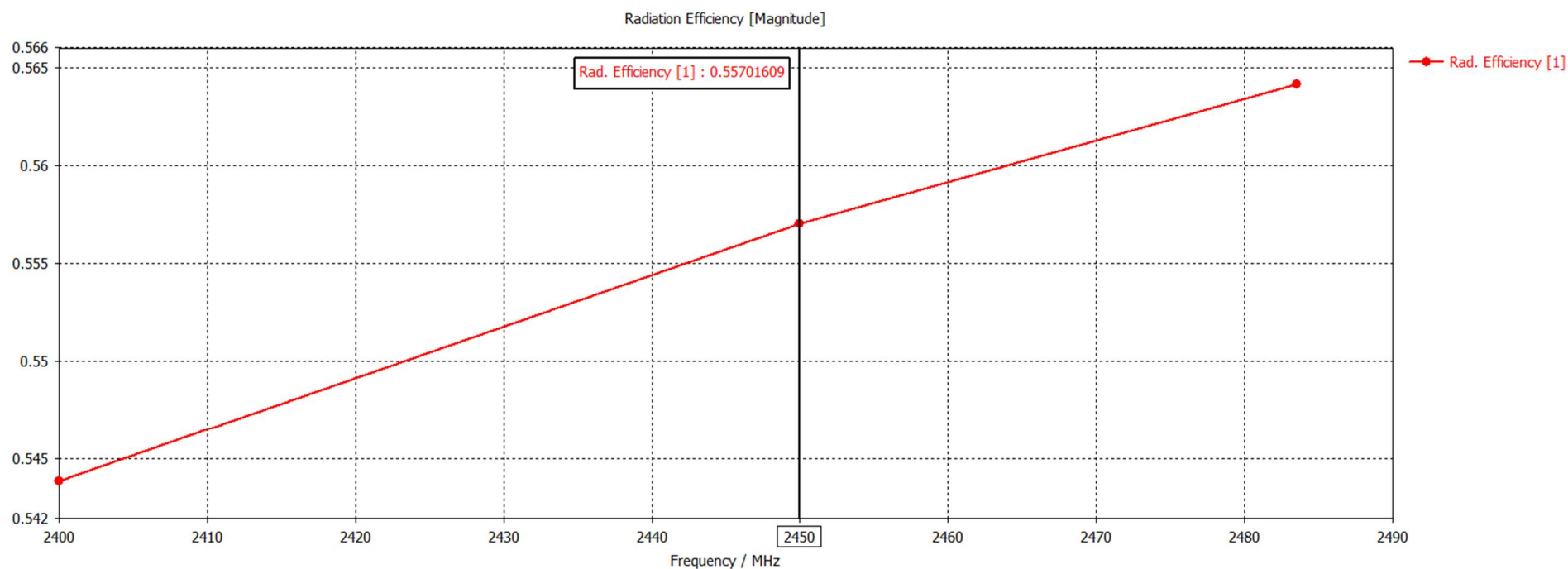
3D model of the PCB from the back



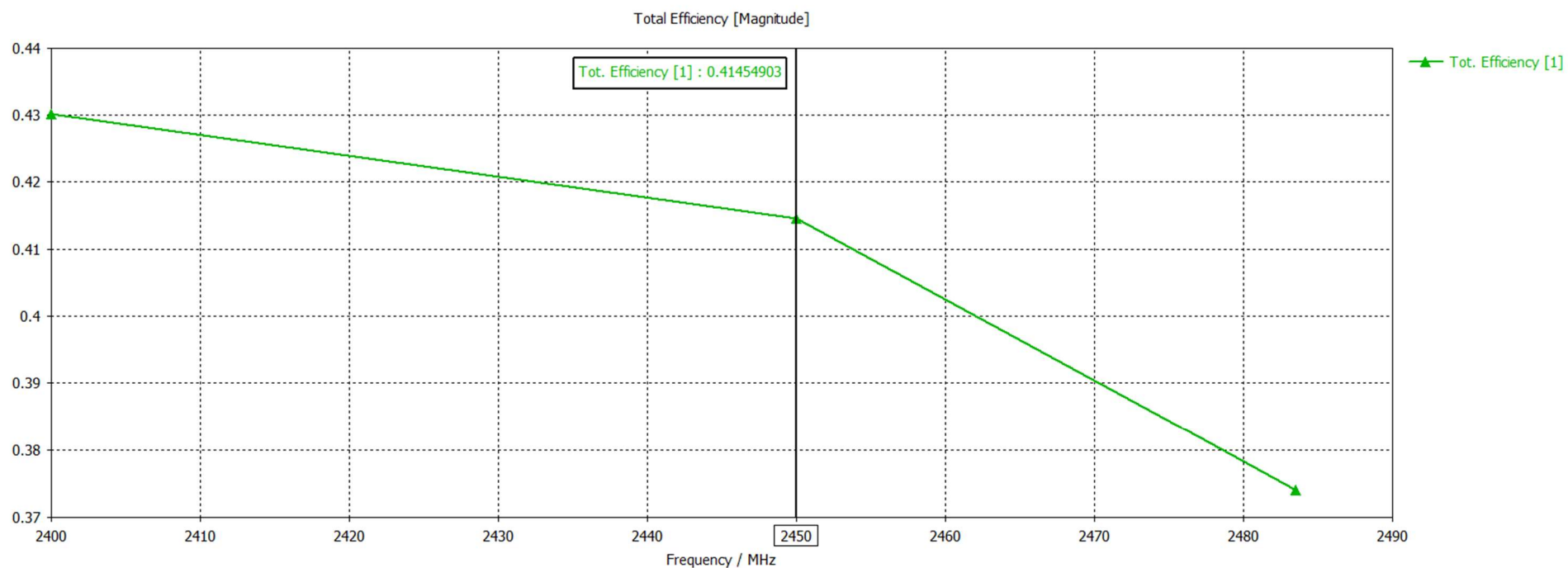
S-parameter



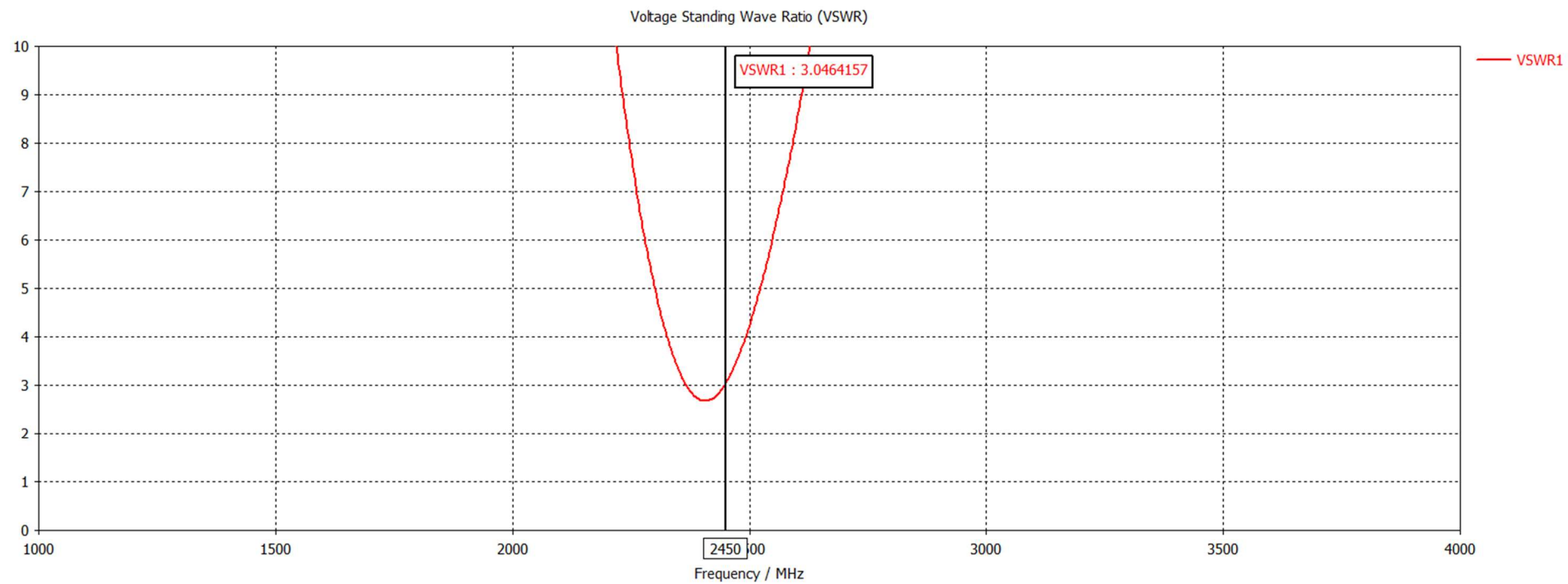
Radiation efficiency



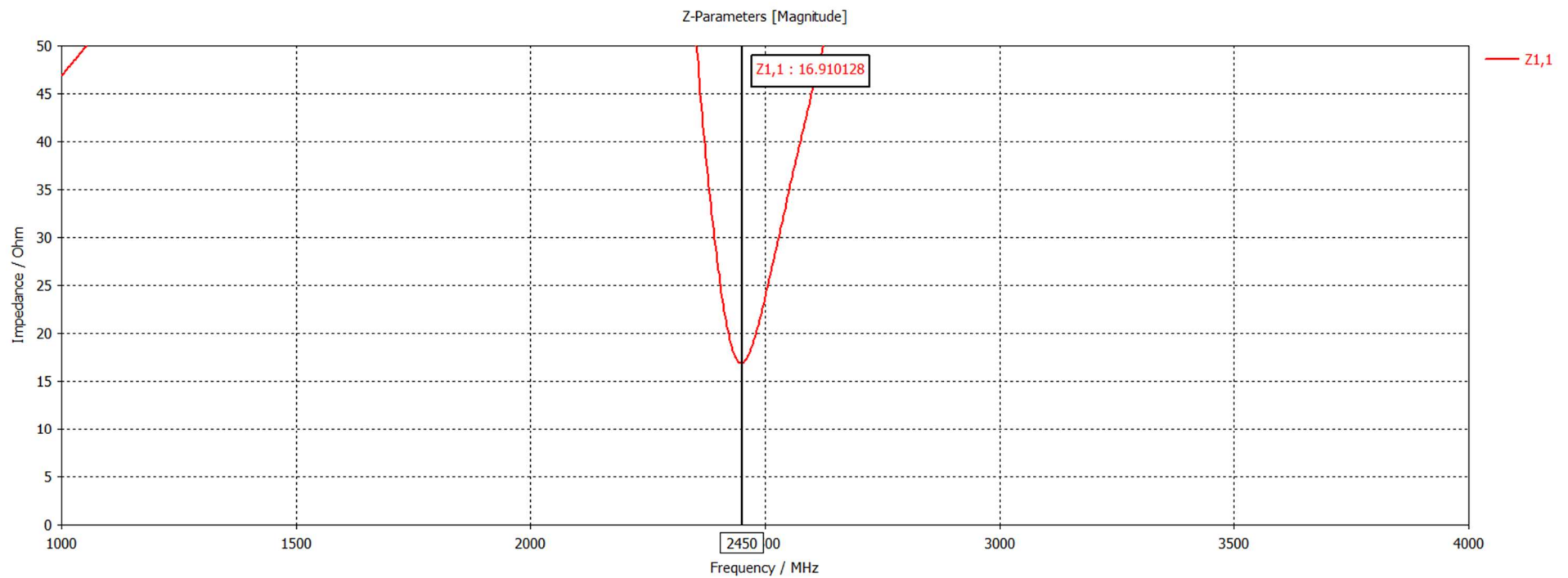
Total efficiency



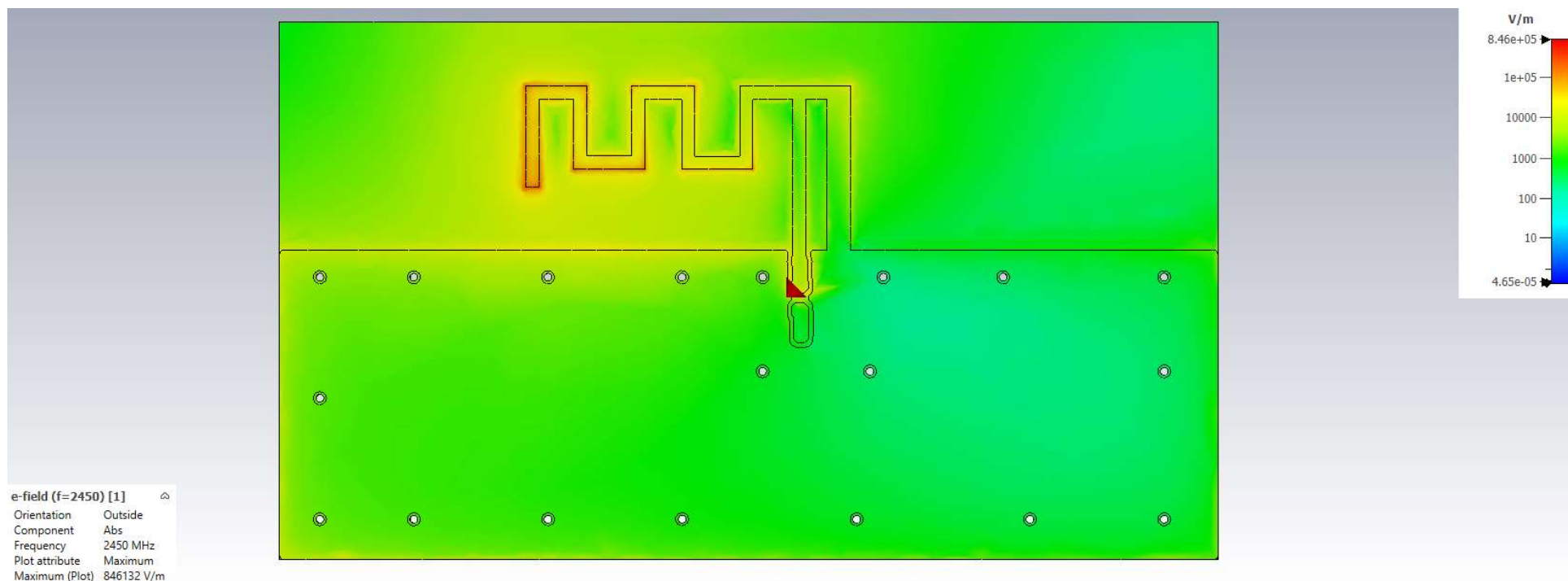
VSWR



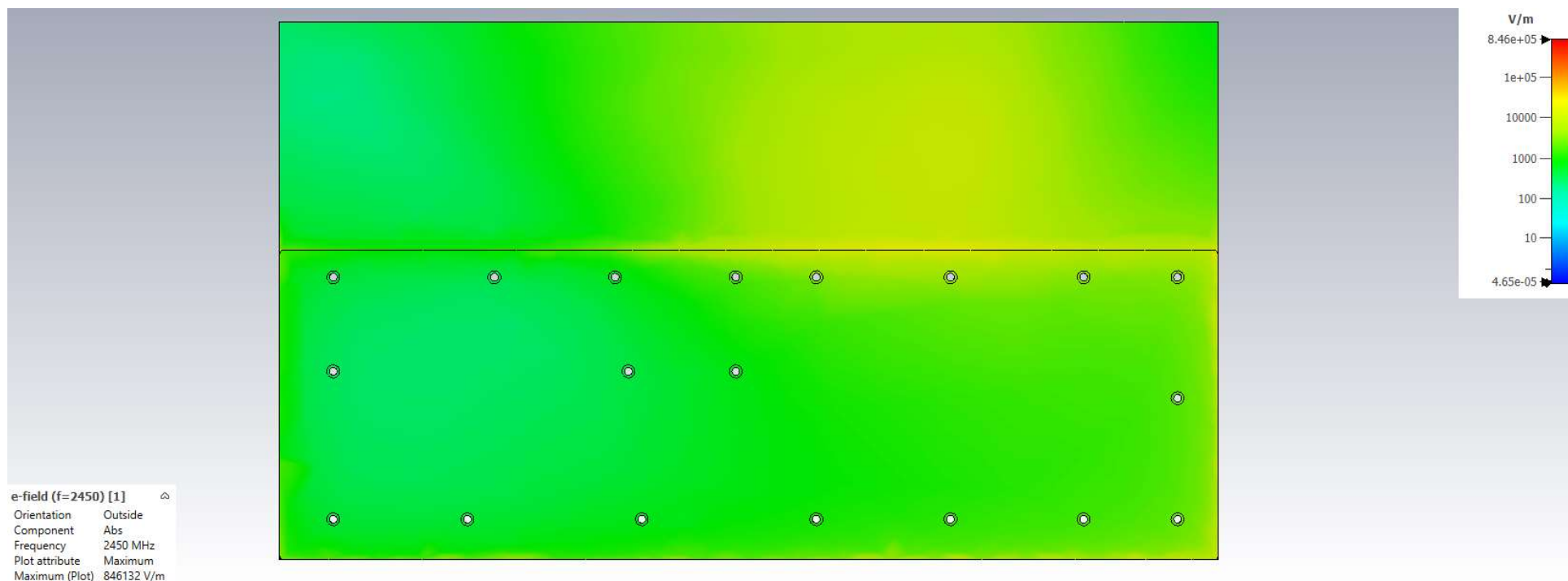
Impedance Z



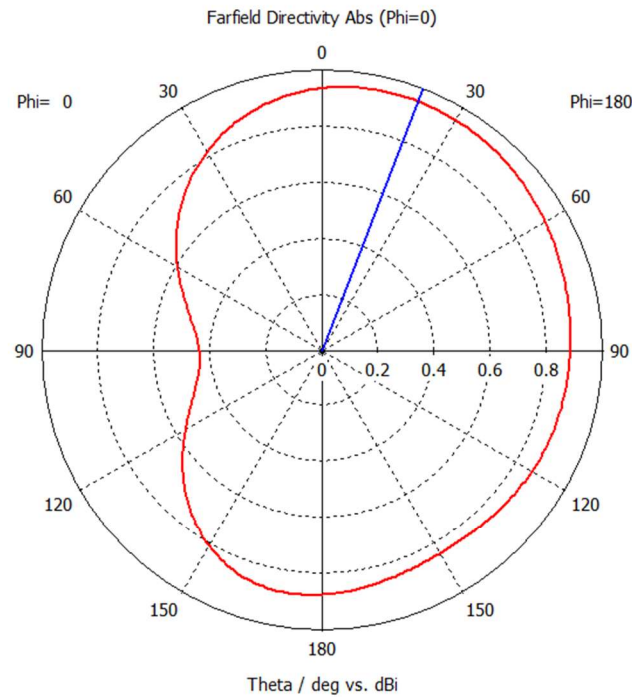
Maximum E-field (front)



Maximum E-field (back)



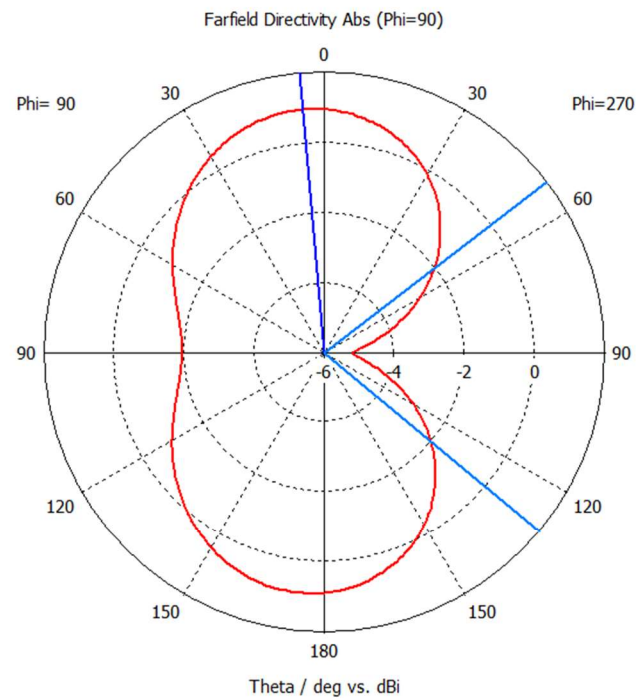
Farfield viewed from the upper edge (-y) of the PCB



— farfield (f=2450)

Frequency = 2450 MHz
Main lobe magnitude = 0.951 dBi
Main lobe direction = 21.0 deg.

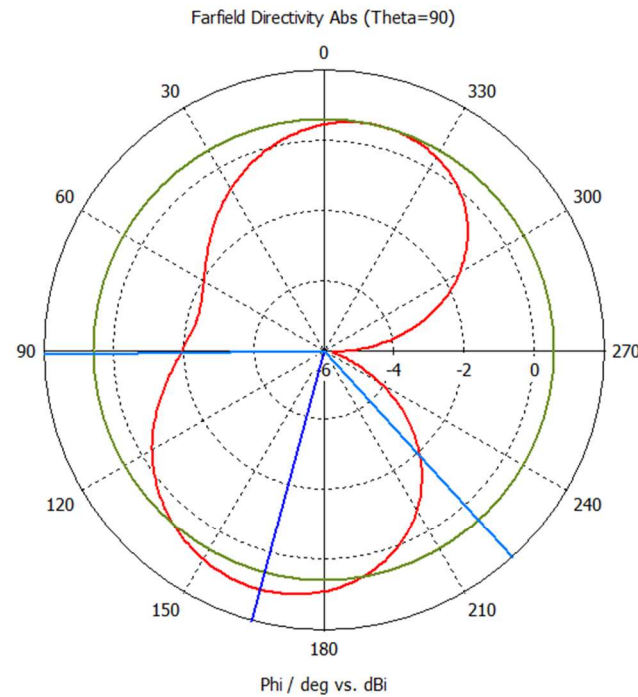
Farfield viewed from the right edge (-x) of the PCB



— farfield (f=2450)

Frequency = 2450 MHz
Main lobe magnitude = 0.954 dBi
Main lobe direction = 5.0 deg.
Angular width (3 dB) = 282.8 deg.

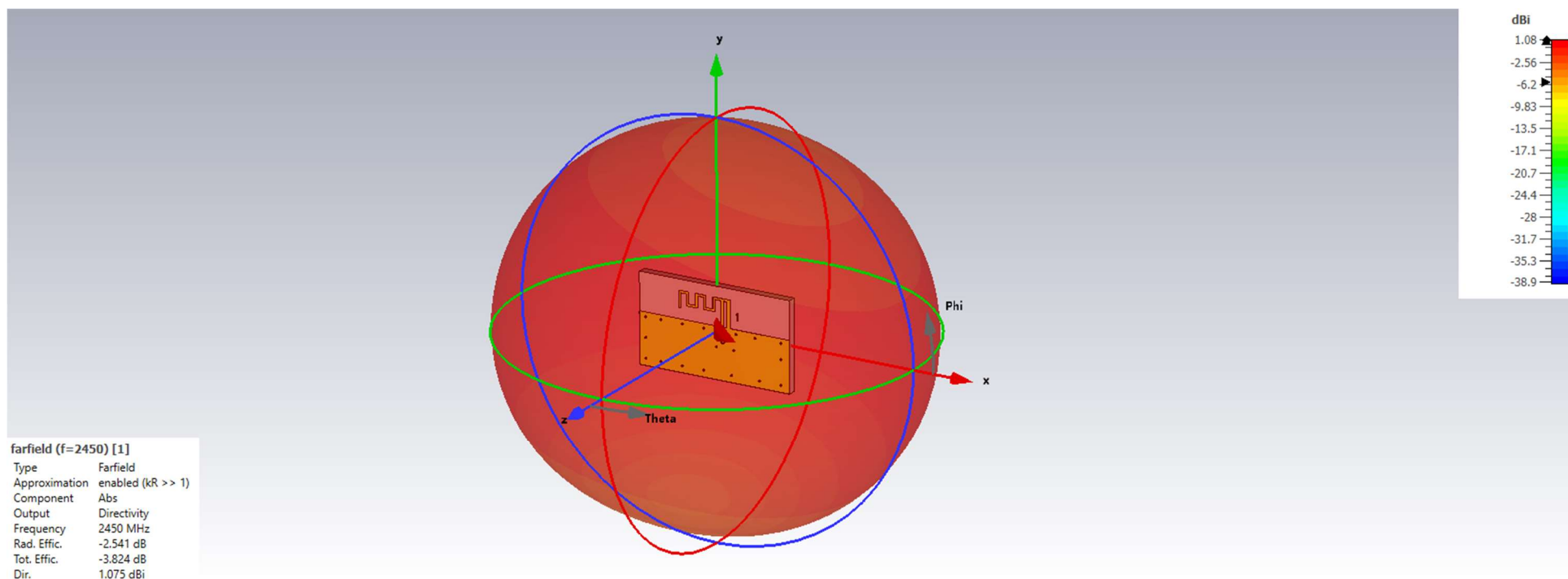
Farfield viewed from the top (-z) of the PCB



— farfield (f=2450)

Frequency = 2450 MHz
Main lobe magnitude = 1.07 dBi
Main lobe direction = 165.0 deg.
Angular width (3 dB) = 131.5 deg.
Side lobe level = -0.5 dB

3D-Farfield (perspective)



3D-Farfield (perspective)

