

Antenna review

2.4GHz inverted F antenna on a 0.4mm 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-0.4MM-FR4-WCH.kicad_mod

Modified by Xdevelop: No

Simulation software: Dassault Systems CST Studio Suite® 2023

Number of tetrahedrons: 43,998

Matched: No

If you have any questions, contact

Bernhard Wörndl-Aichriedler

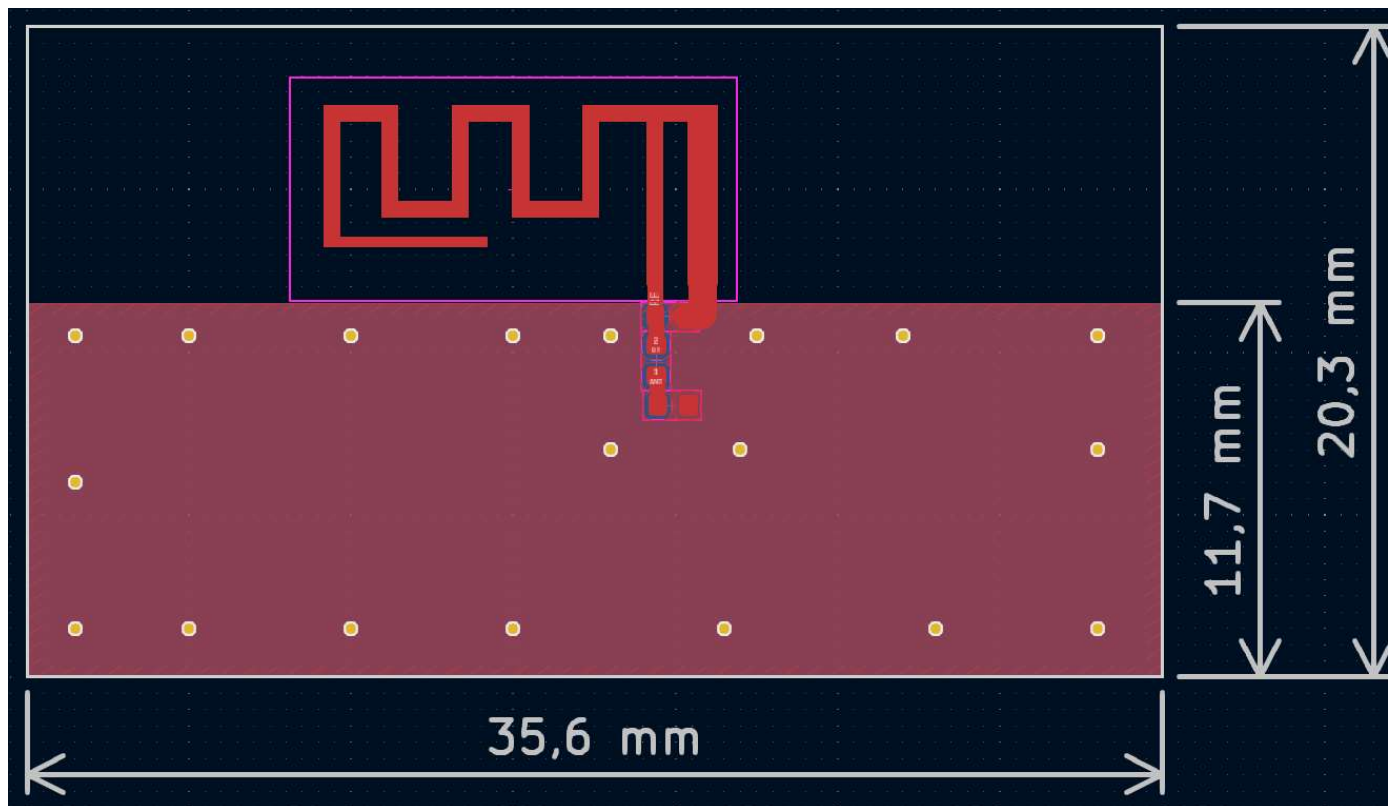
bwa@xdevelop.at

PCB data

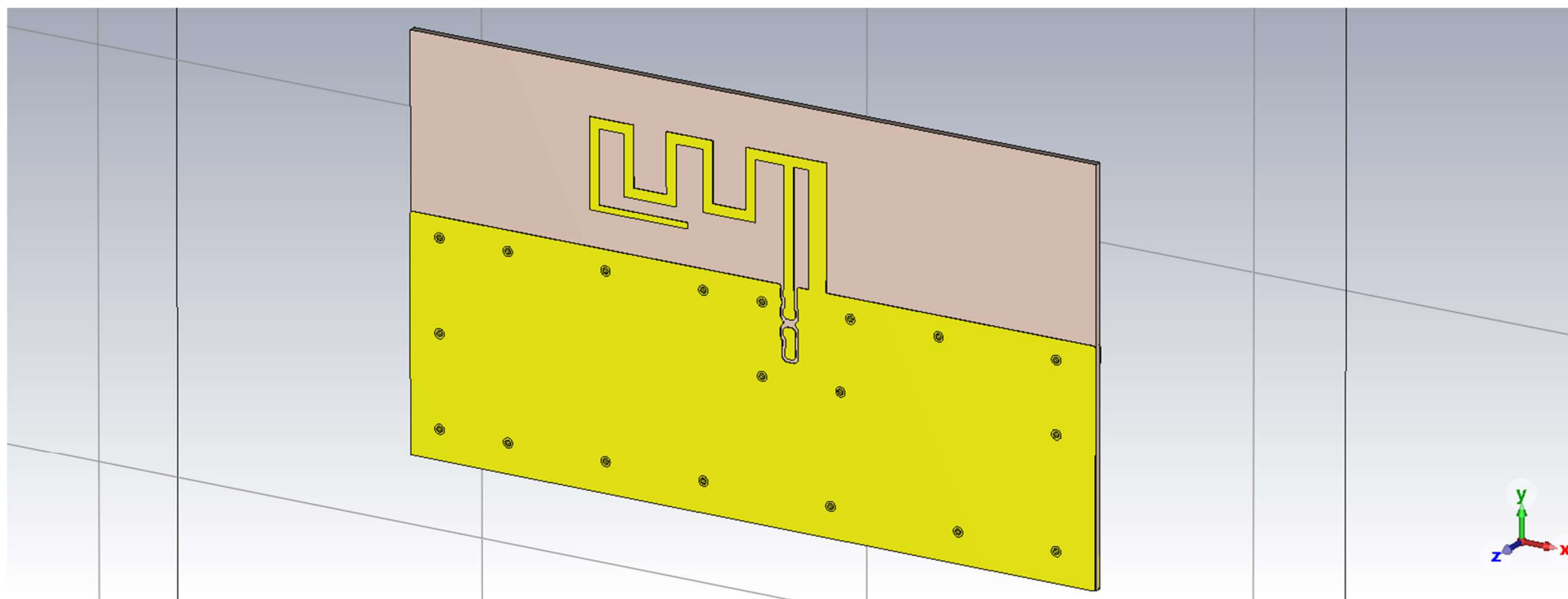
Stackup:

Layer	Thickness	Material	Dielectric constant ϵ_r
Top	35 μ m	Copper	Not relevant
Core	0.35mm	FR4 (epoxy resin + fiberglass)	4.3
Bottom	35 μ m	Copper	Not relevant

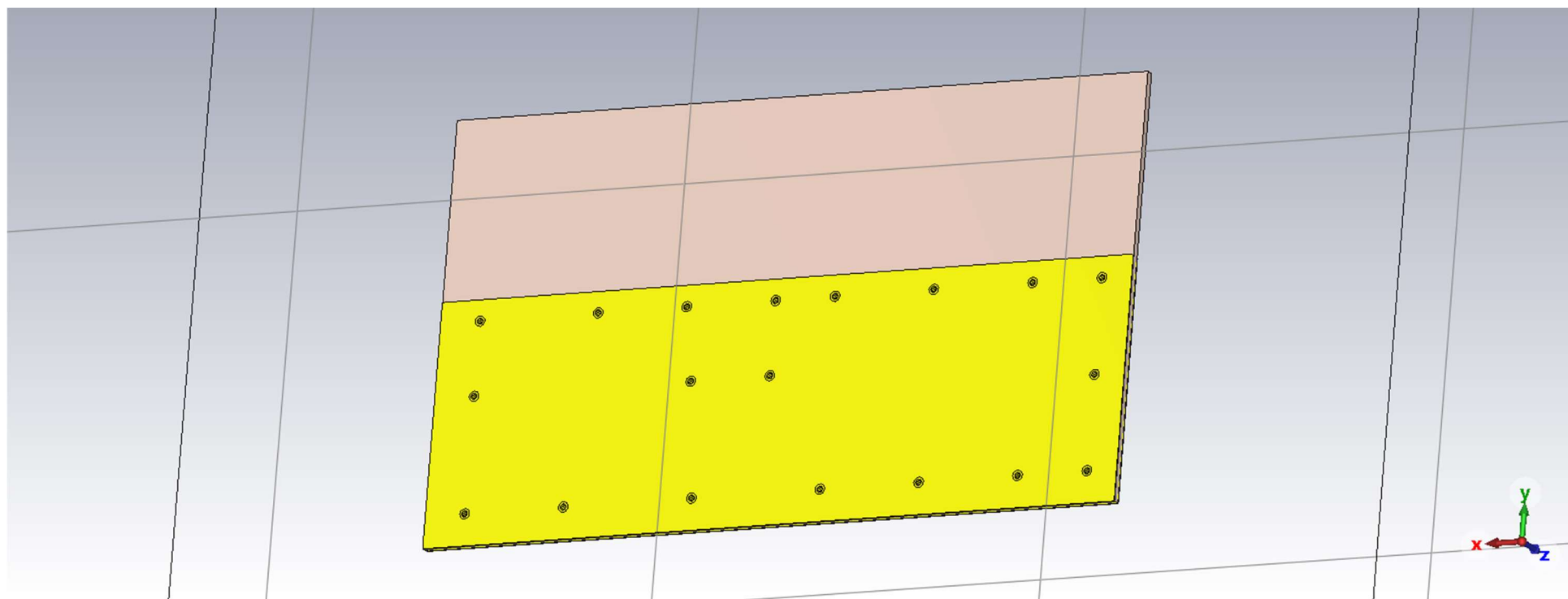
PCB dimensions & layout



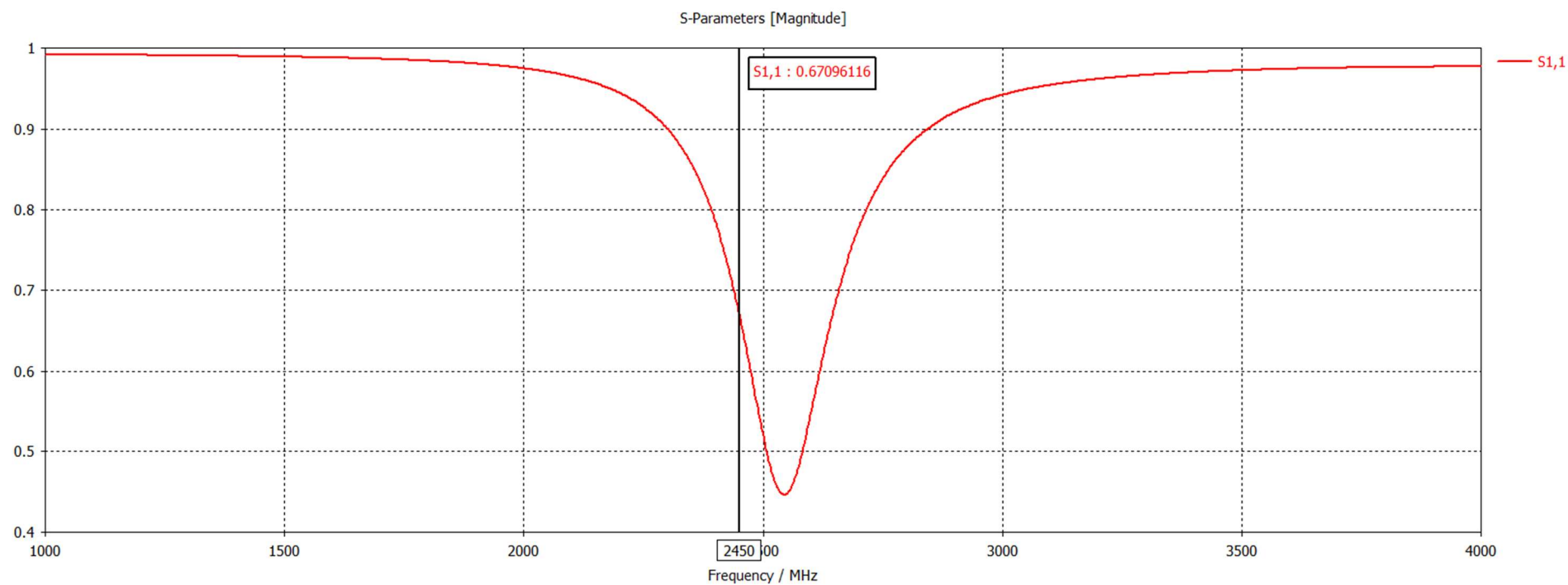
3D model of the PCB from the front



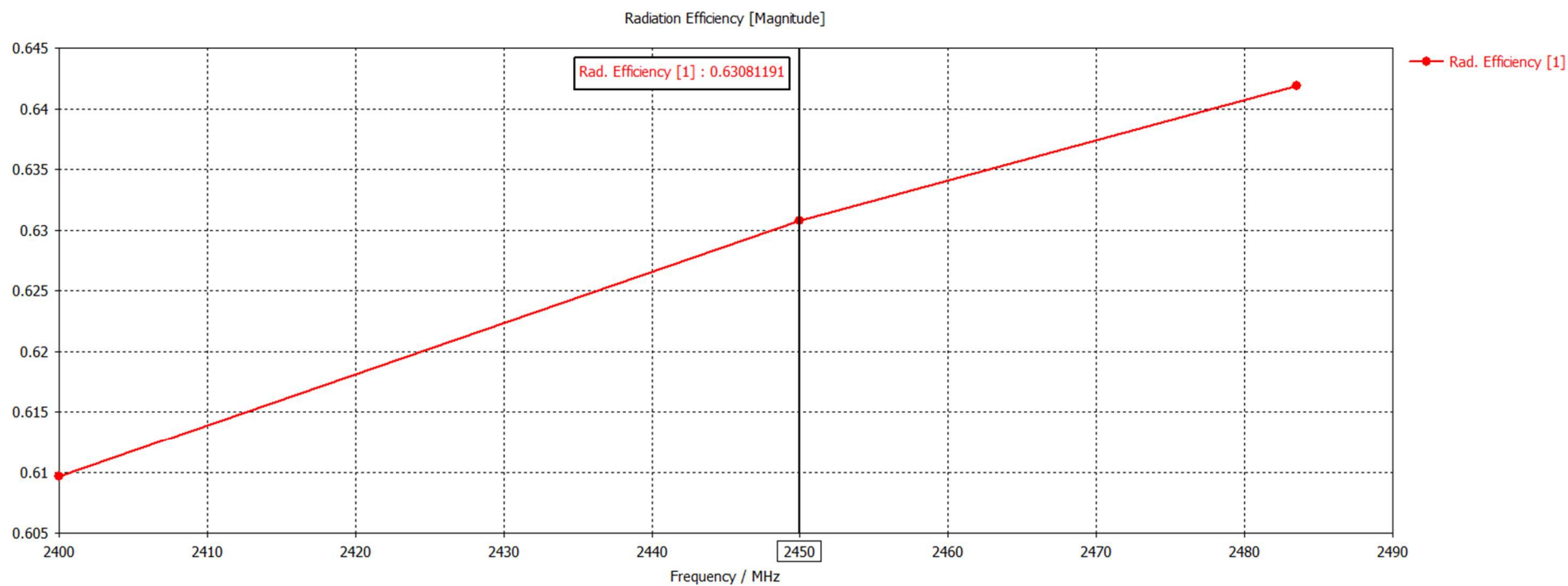
3D model of the PCB from the back



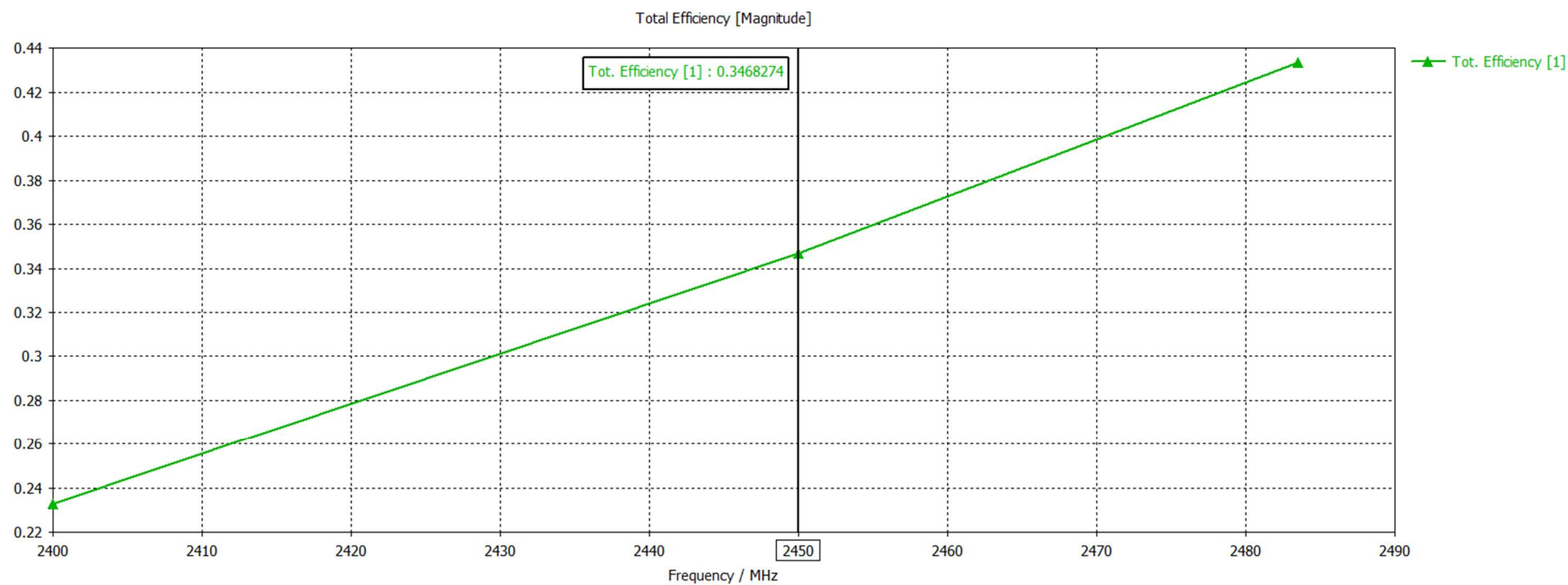
S-parameter



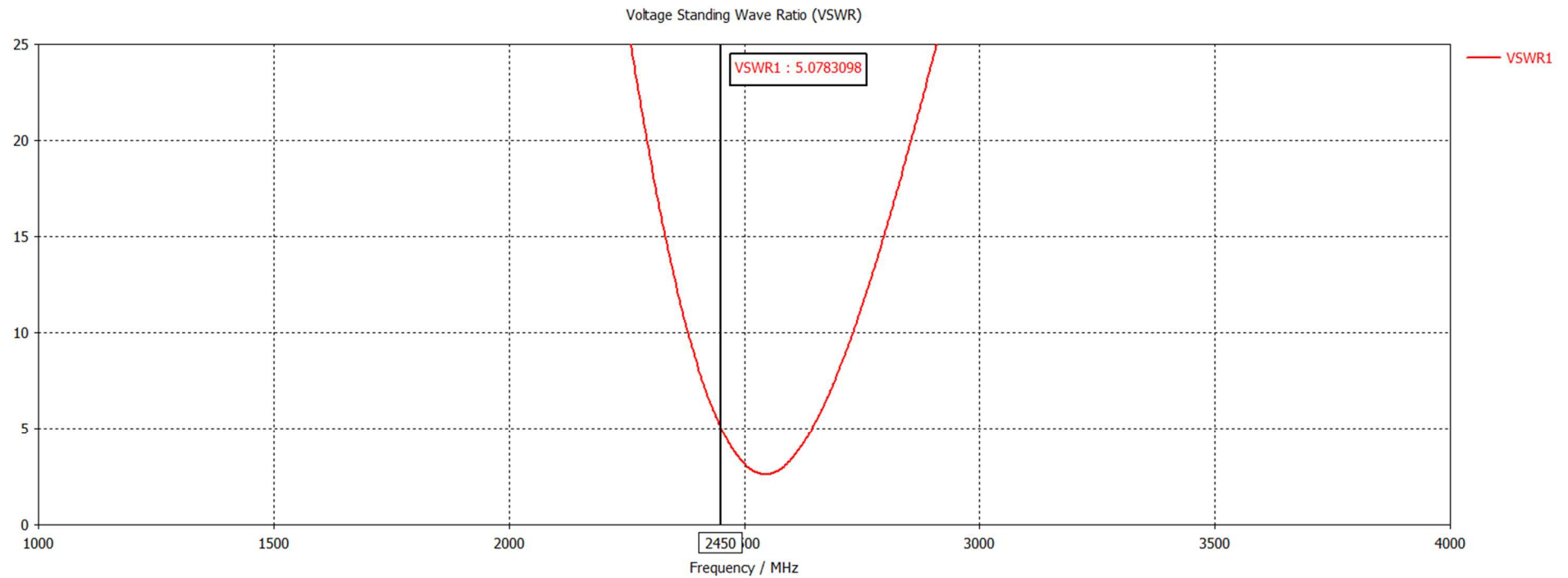
Radiation efficiency



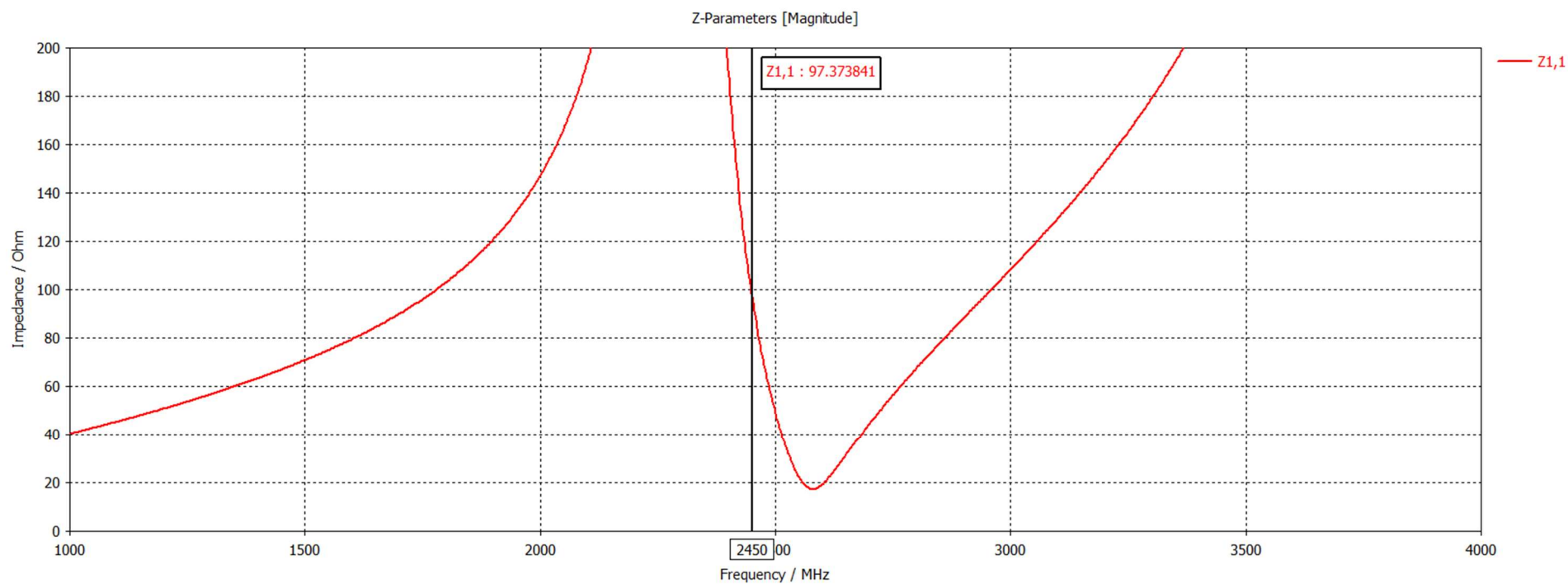
Total efficiency



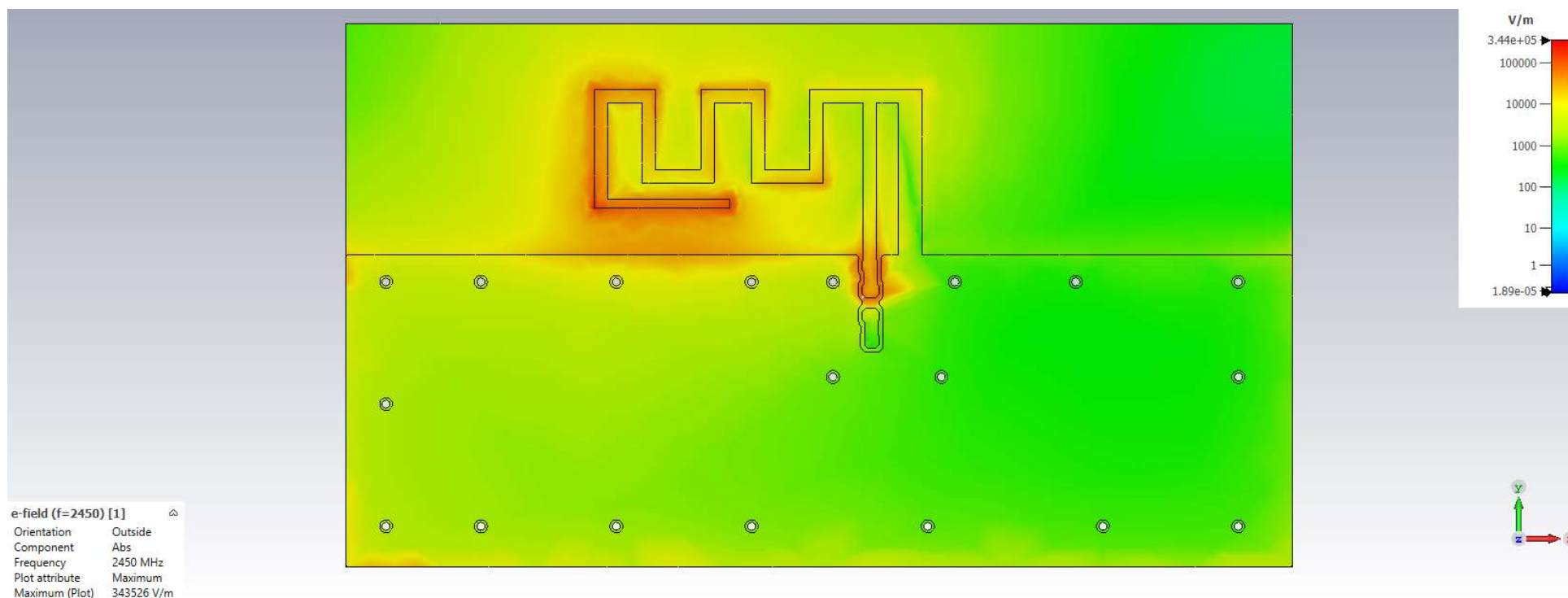
VSWR



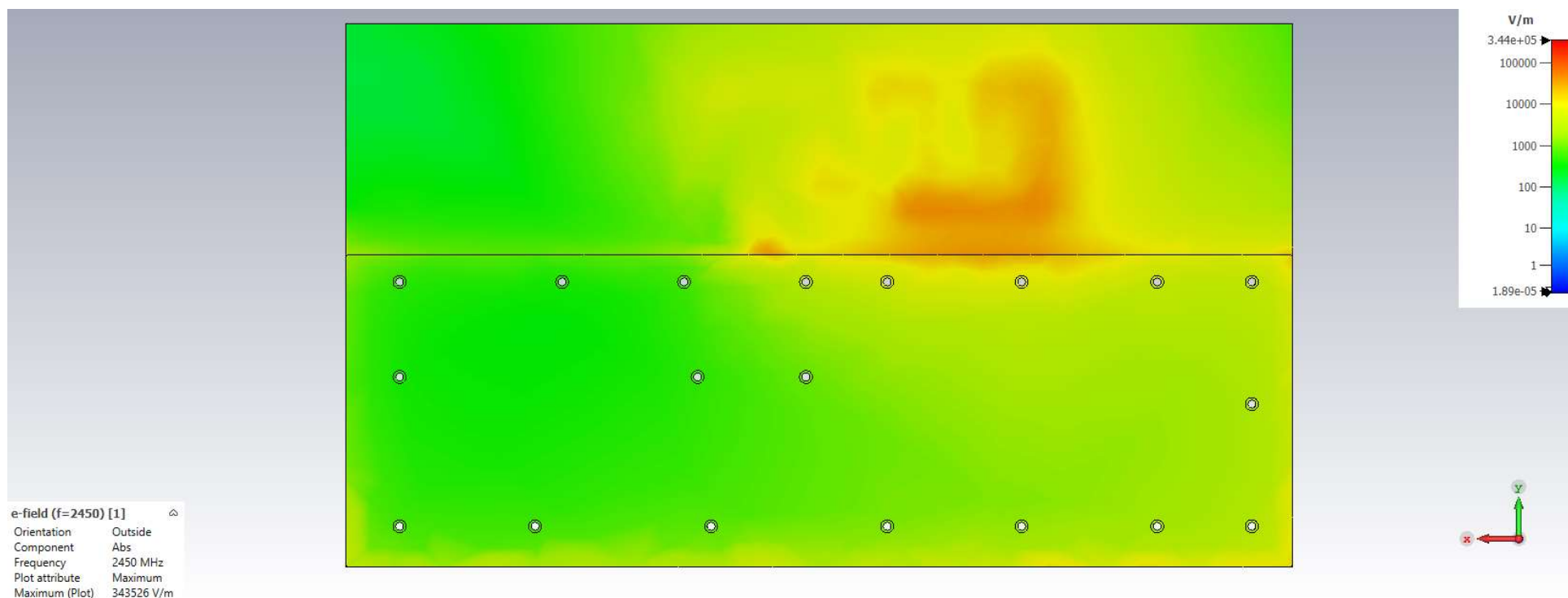
Impedance Z



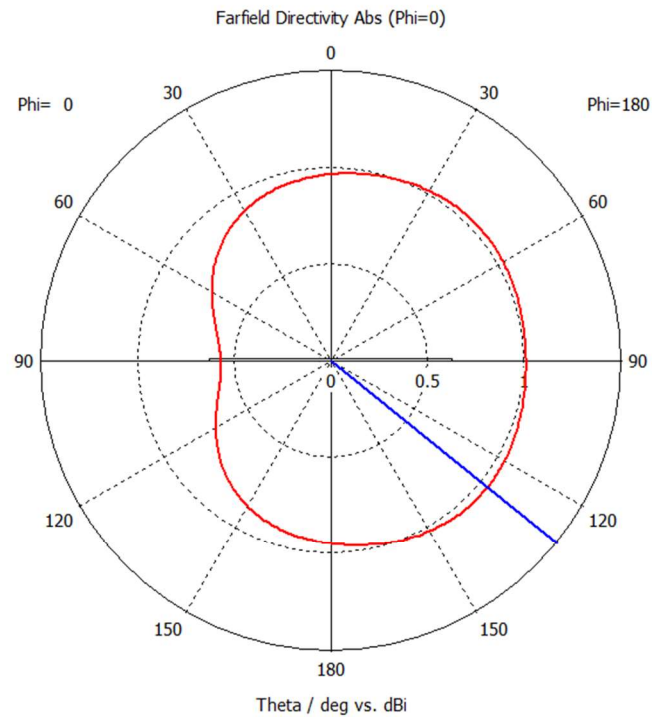
Maximum E-field (front)



Maximum E-field (back)



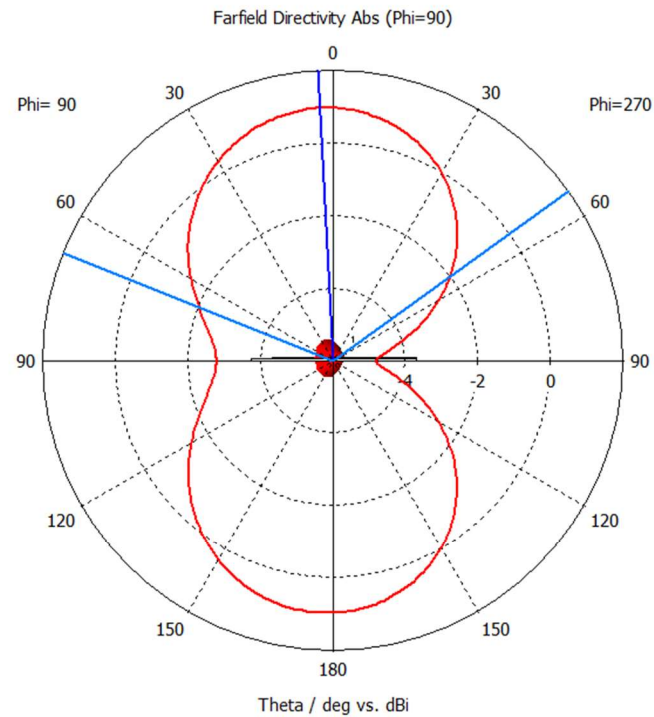
Farfield viewed from the upper edge (-y) of the PCB



— farfield (f=2450)

Frequency = 2450 MHz
Main lobe magnitude = 1.04 dBi
Main lobe direction = 129.0 deg.

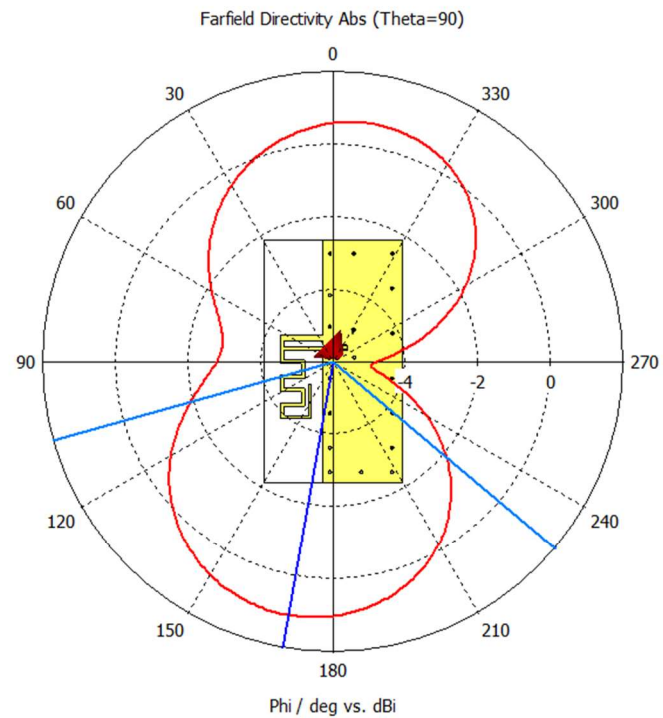
Farfield viewed from the right edge (-x) of the PCB



— farfield (f=2450)

Frequency = 2450 MHz
Main lobe magnitude = 0.97 dBi
Main lobe direction = 3.0 deg.
Angular width (3 dB) = 122.4 deg.

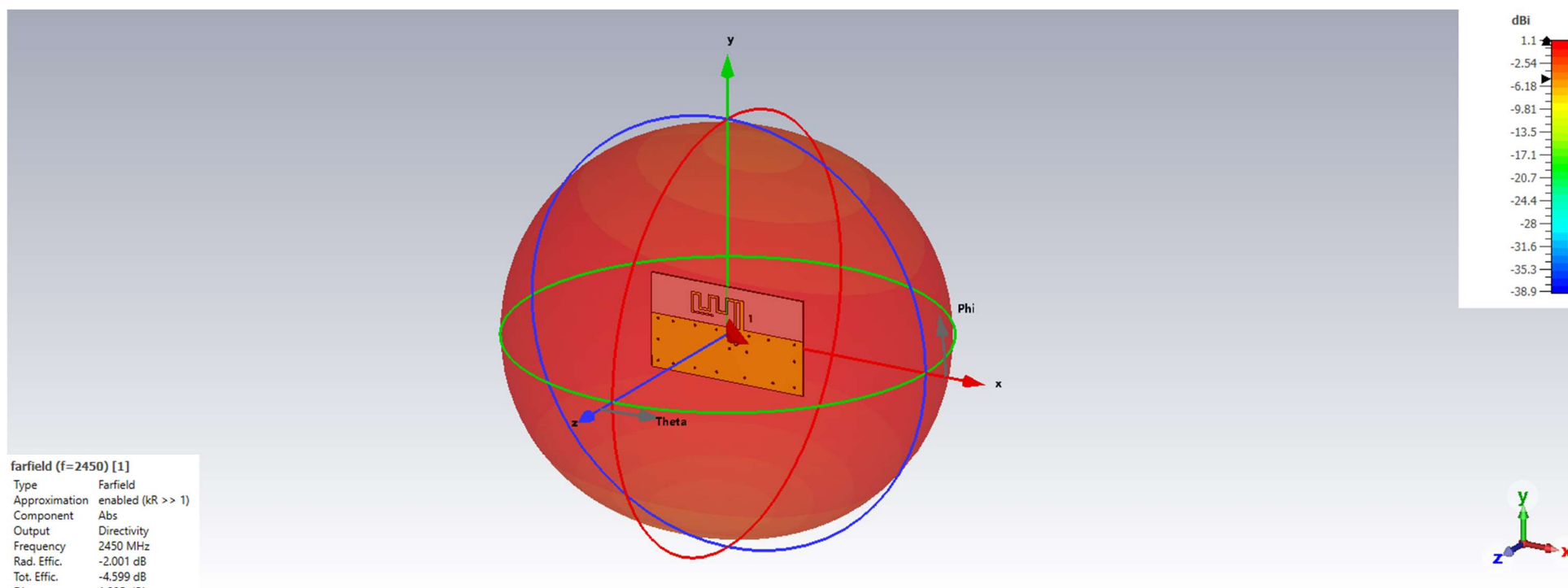
Farfield viewed from the top (-z) of the PCB



— farfield (f=2450)

Frequency = 2450 MHz
Main lobe magnitude = 1.09 dBi
Main lobe direction = 170.0 deg.
Angular width (3 dB) = 124.2 deg.

3D-Farfield (perspective)



3D-Farfield (perspective)

