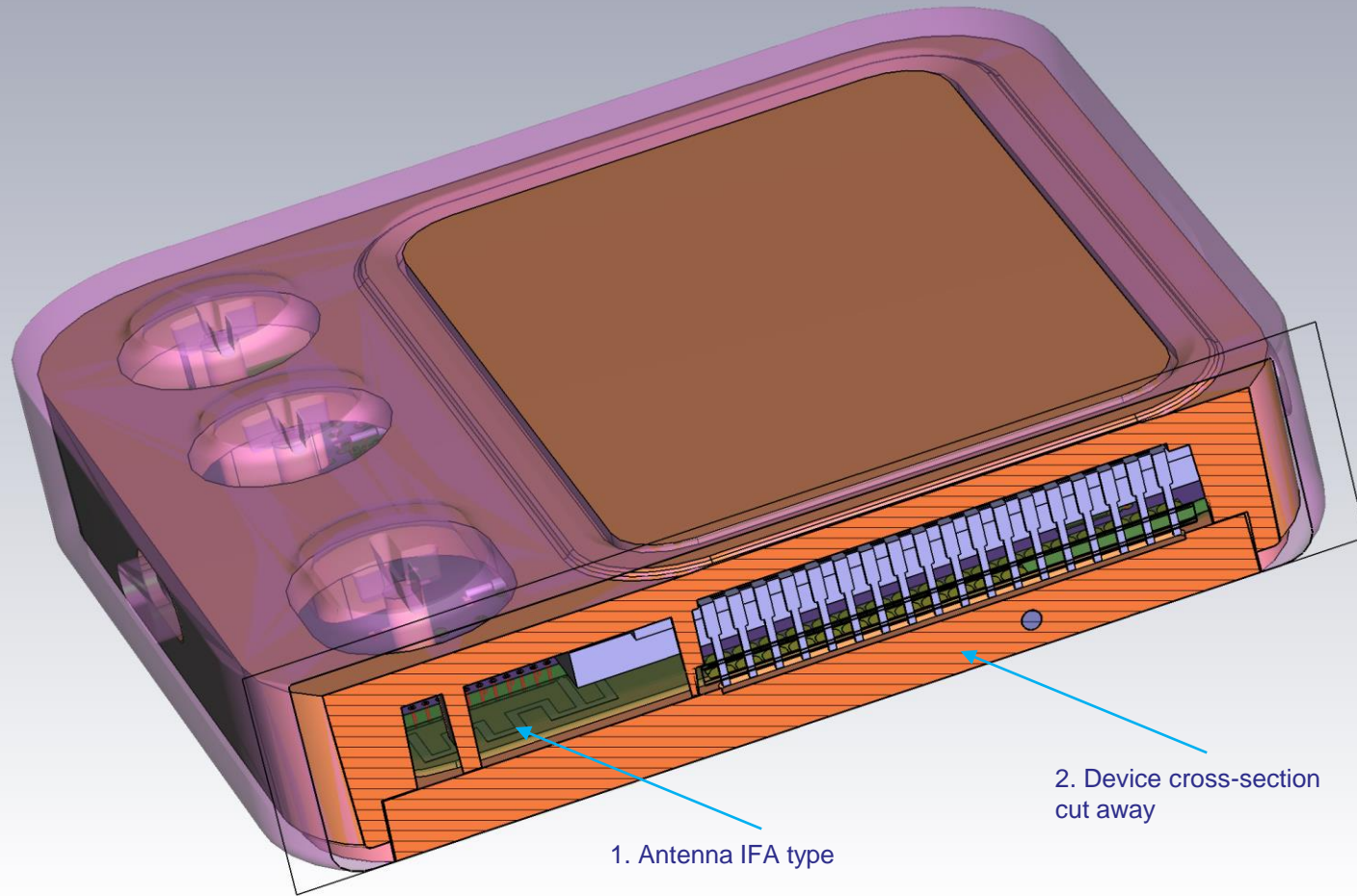


# Combustion Inc. Kitchen Timer: Antenna Specification

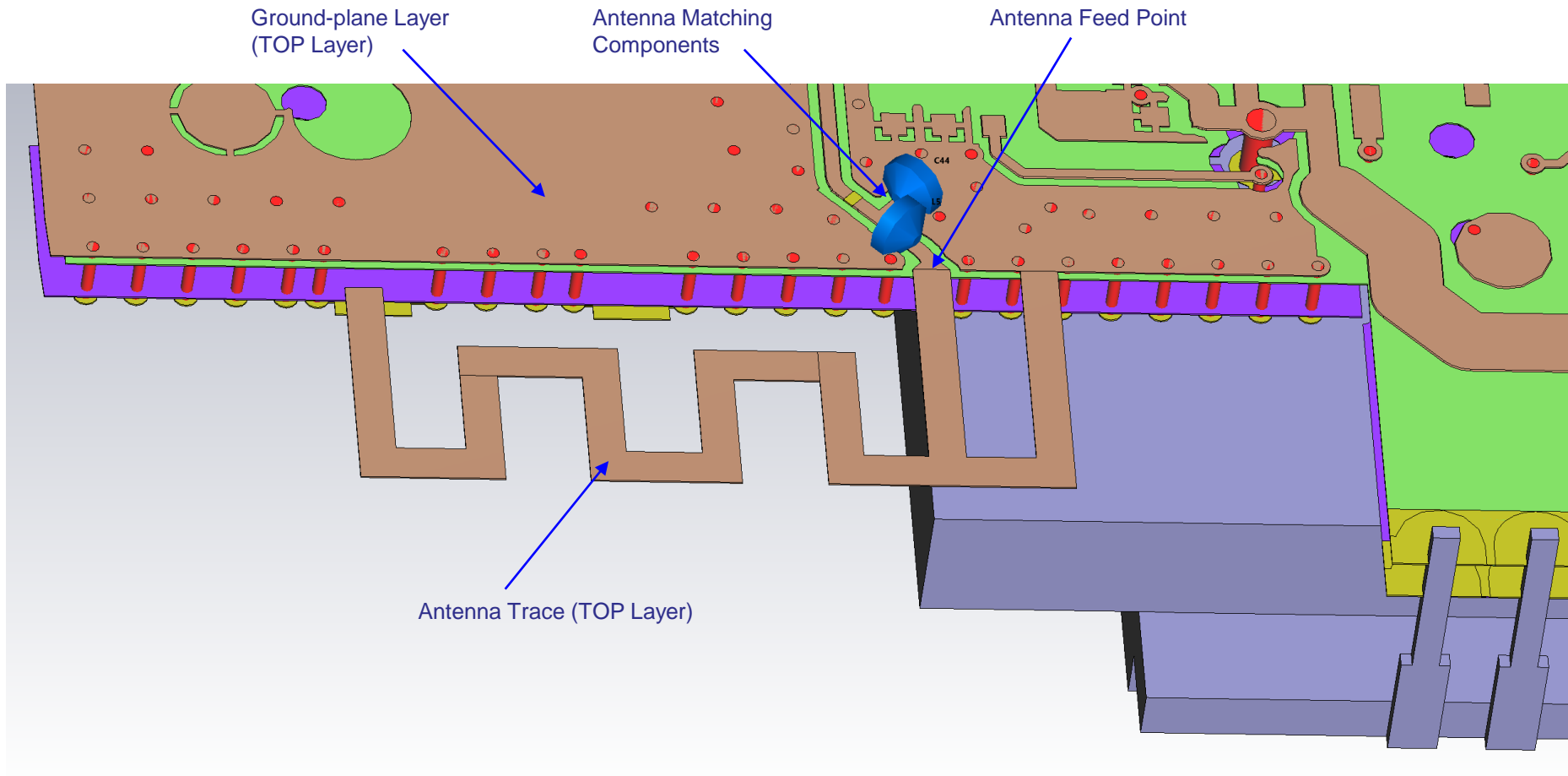
Version	Date	Description	Report
1	11-27-2022	Description of BLE Antenna Configuration	JCM-EM: Joseph C. Modro
2	2-1-2023	Radiation Patterns, Peak Gain	JCM-EM
3	2-7-2023	Typo corrected: peak gain (Slide 4)	JCM-EM

## Timer: Version 1 Build: External View



- PCB trace antenna [1] shown in cross-section [2]

## Timer: Internal View of Antenna

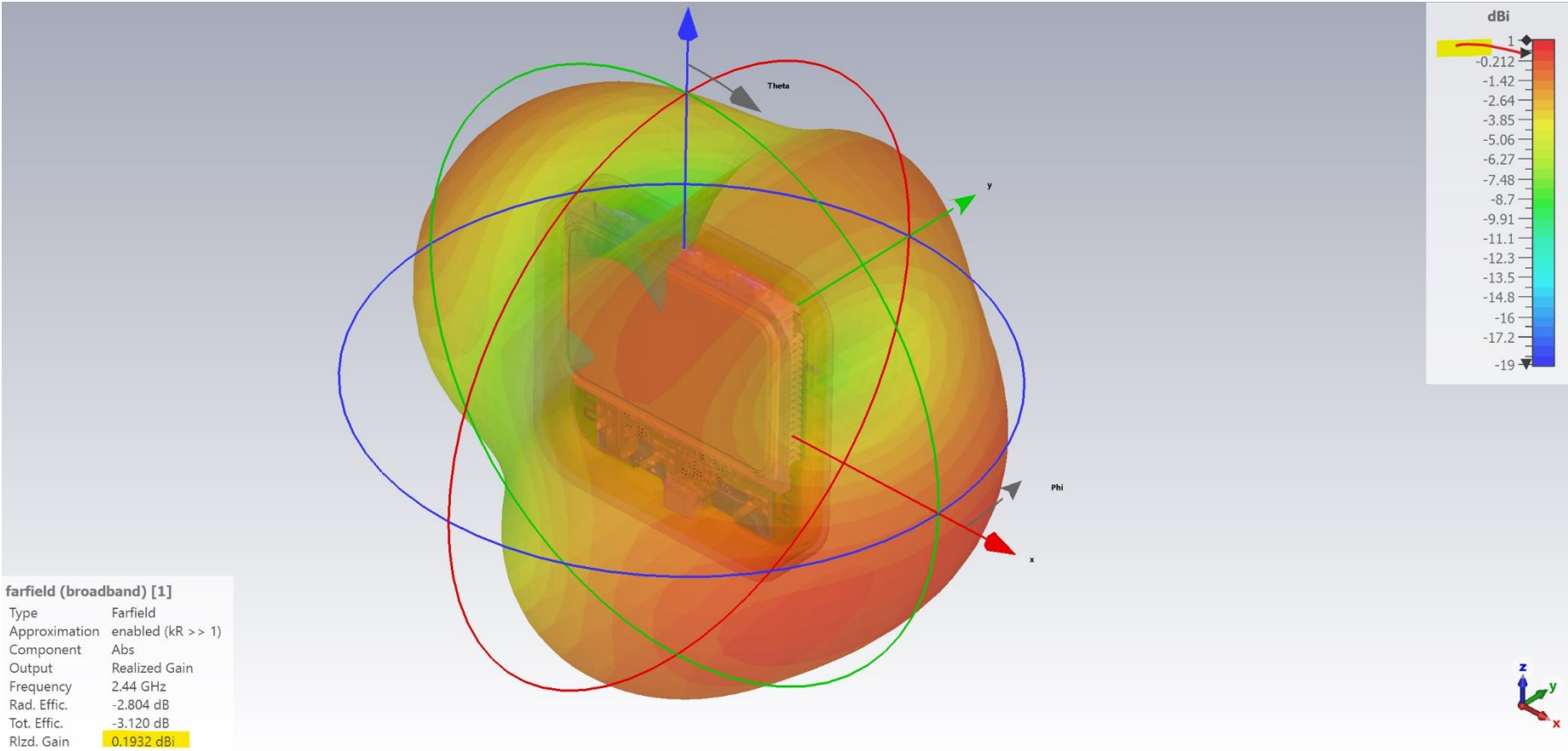


- PCB has 4 copper layers with total thickness of 1.55mm

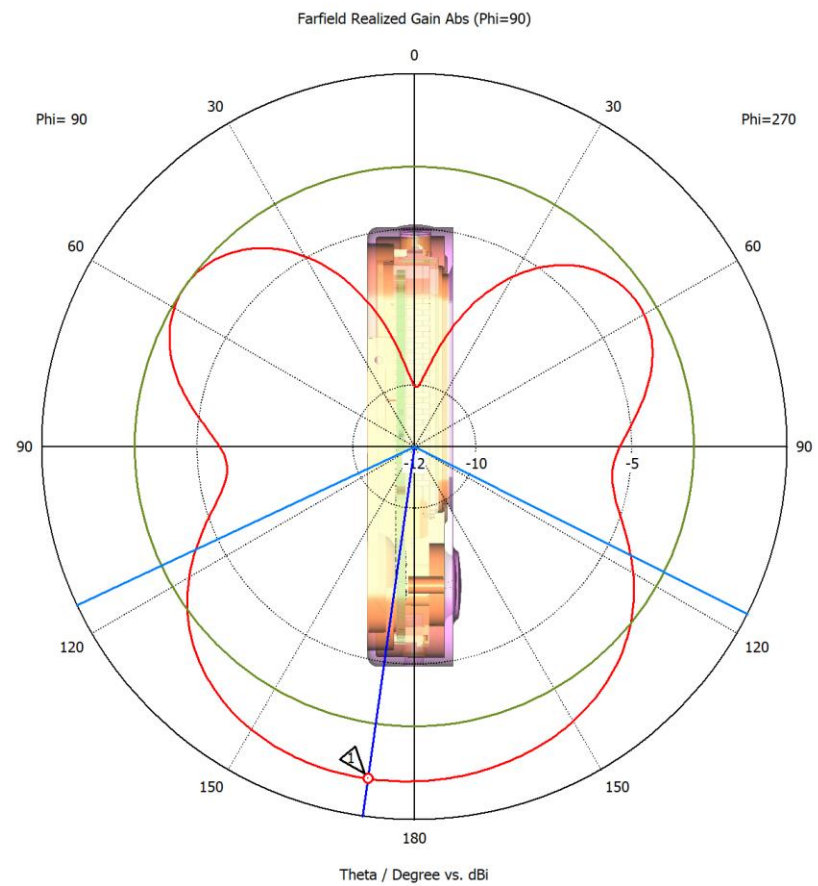
# Summary of Antenna Properties

- Antenna Type: Meandered Inverted-F Antenna (IFA) trace on PCB, with matching components tuned for optimum efficiency
- Peak Antenna Gain: **0.1932dBi**
- Frequency Range: 2.402GHz – 2.48GHz [BLE band]
- Antenna Dimensions: ref. previous slide [3]: PCB trace area 4.7mm X 14.5mm

# Radiation Pattern 3D: Peak Gain is at 2.44GHz: 0.1932dBi



# Radiation Pattern 2D: Gain vs Theta @ Phi=90 deg.

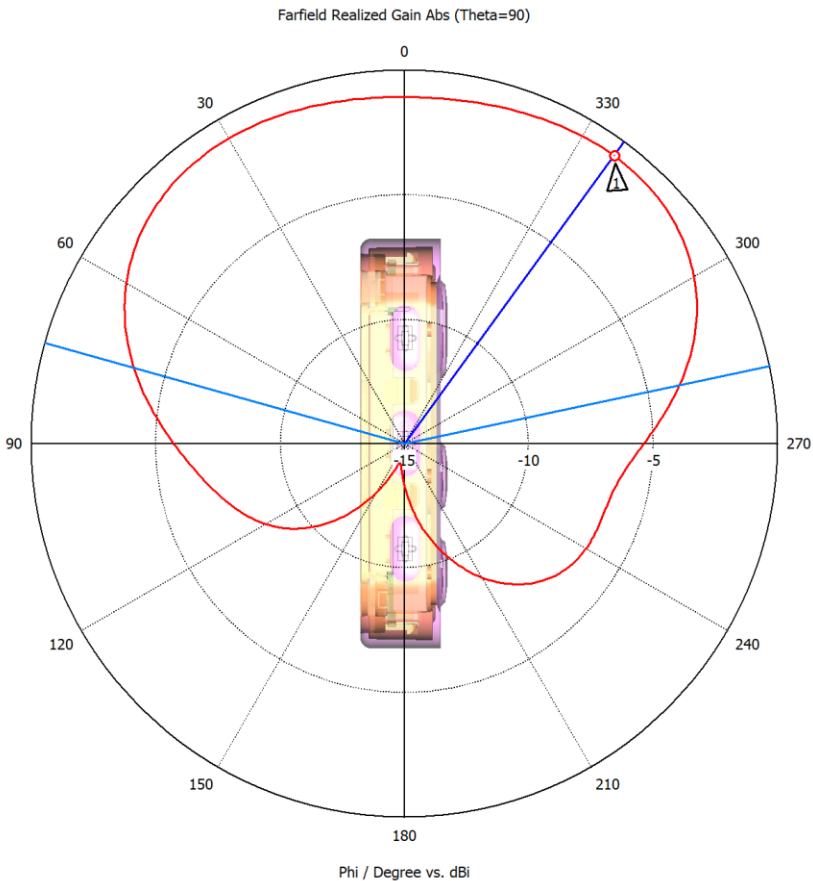


— farfield (broadband) [1]

Frequency = 2.44 GHz  
Main lobe magnitude = -1.23 dBi  
Main lobe direction = 172.0 deg.  
Angular width (3 dB) = 128.2 deg.  
Side lobe level = -1.8 dB

Q ( 172.116, -1.2273 )

# Radiation Pattern 2D: Gain vs. Phi @ Theta=90 deg.



— farfield (broadband) [1]

Frequency = 2.44 GHz  
Main lobe magnitude = -0.707 dBi  
Main lobe direction = 324.0 deg.  
Angular width (3 dB) = 152.4 deg.

Q ( 323.788, -0.70787 )