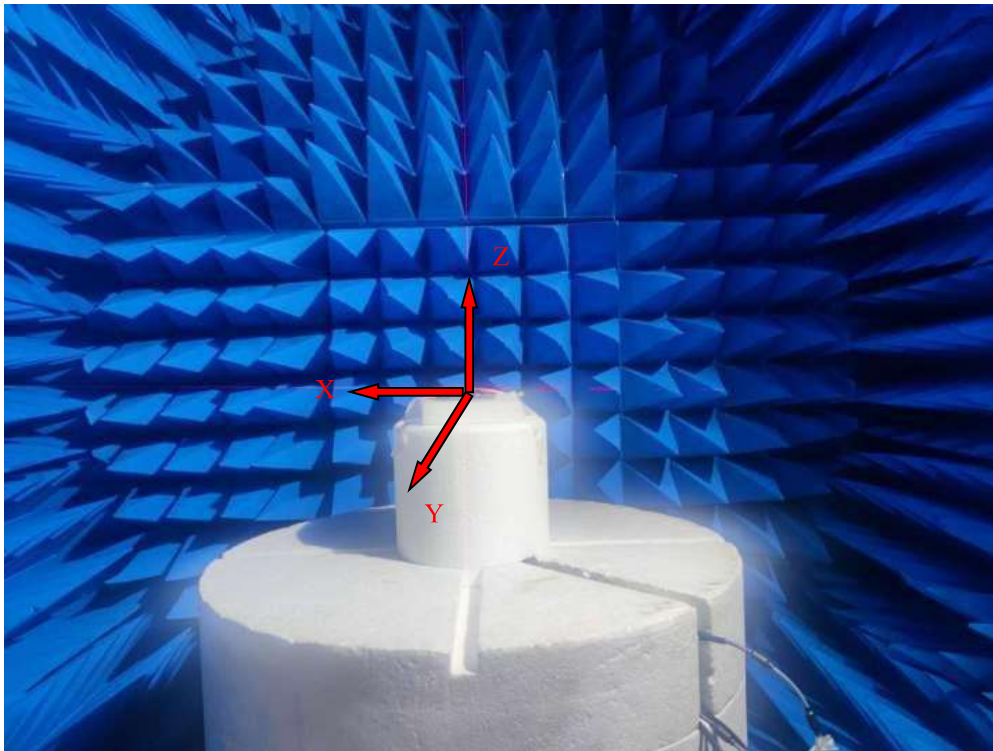


## 2.4G-2.48G frequency band onboard PIFA antenna test report

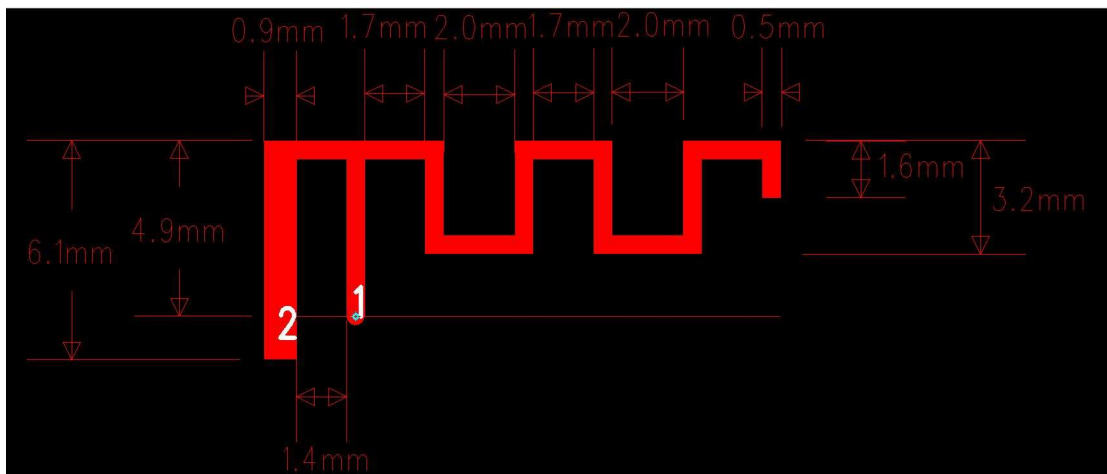
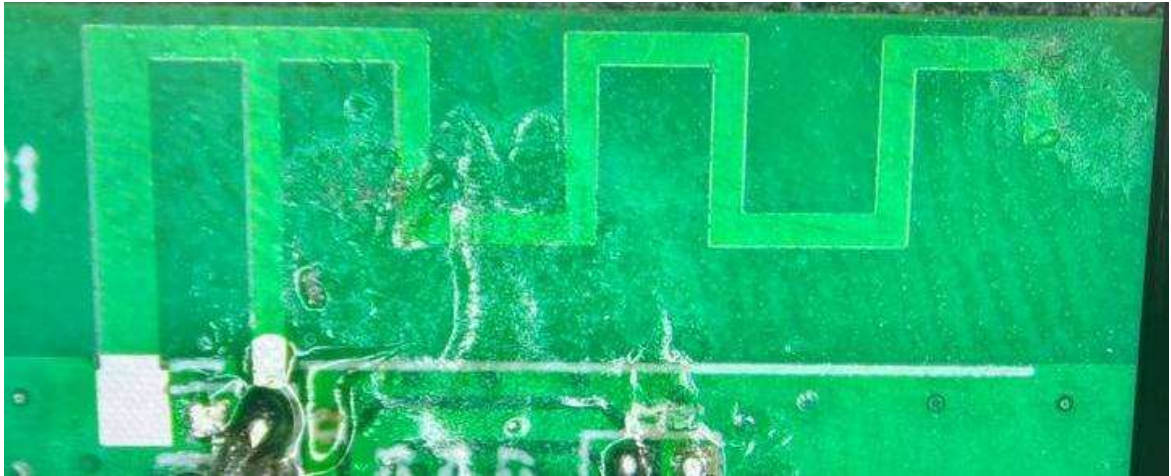
## SPECIFICATIONS

|                        |                                     |
|------------------------|-------------------------------------|
| Frequency (MHz)        | 2400-2480                           |
| Peak Gain (dBi)        | 2.499                               |
| Average Gain (dBi)     | > -4                                |
| VSWR                   | < 3.2                               |
| Impedance ( $\Omega$ ) | 50 $\Omega$                         |
| Antenna Type           | Plannar Inverted F Antenna on board |
| Polarization           | Linear                              |

## Testing environment



Physical antenna and dimensions



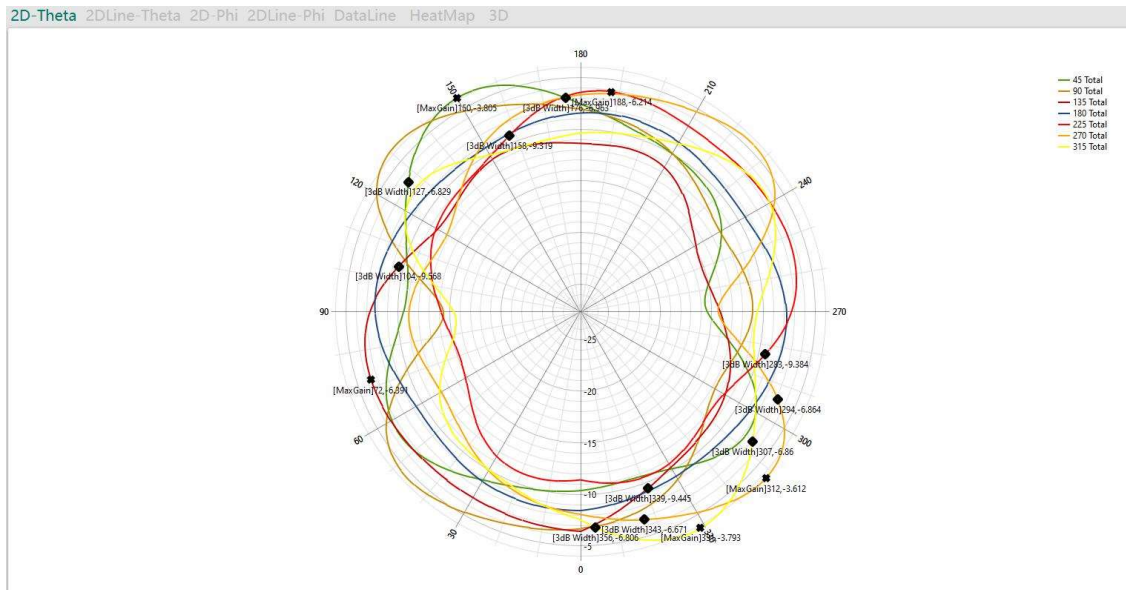
## Passive S-parameters of antenna: Standing Wave Ratio (VSWR), Return Loss, and Smith Chart



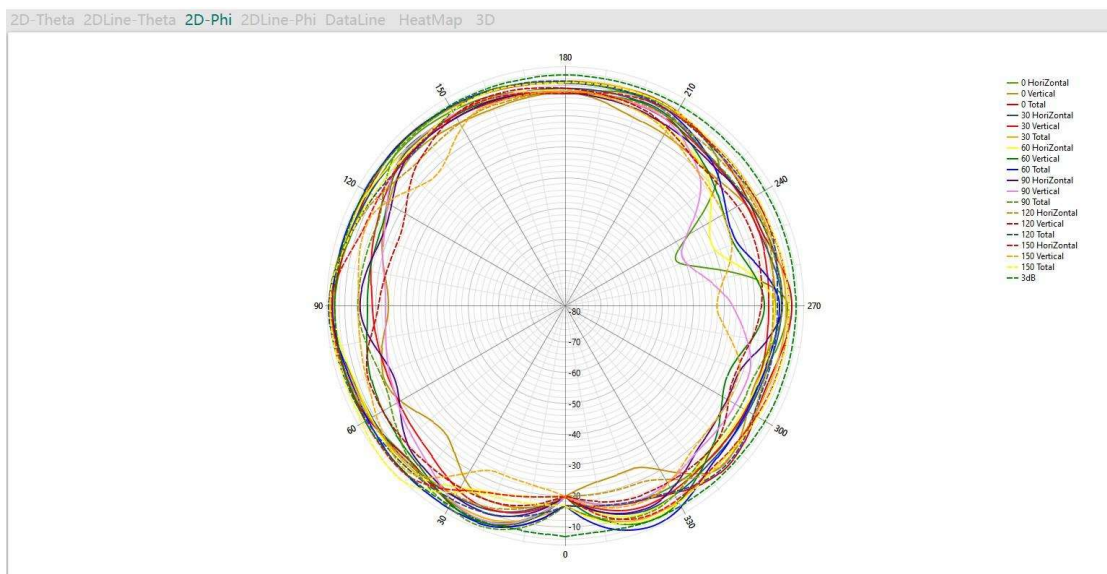
## Antenna efficiency and gain

| Frequency (MHz) | Gain (dBi) | Efficiency (%) | AverageGain (dBi) | Efficiency (dB) |
|-----------------|------------|----------------|-------------------|-----------------|
| 2400            | 1.433      | 59.329%        | -2.717            | -2.267          |
| 2410            | 0.927      | 51.861%        | -3.416            | -2.852          |
| 2420            | 0.829      | 52.112%        | -3.166            | -2.831          |
| 2430            | 0.881      | 49.299%        | -3.258            | -3.072          |
| 2440            | 1.192      | 50.672%        | -3.144            | -2.952          |
| 2450            | 1.688      | 53.067%        | -2.735            | -2.752          |
| 2460            | 2.194      | 59.423%        | -2.276            | -2.260          |
| 2470            | 2.118      | 56.680%        | -2.438            | -2.466          |
| 2480            | 2.499      | 61.727%        | -2.112            | -2.095          |
| Average         | 1.529      | 54.908%        | -2.806            | -2.616          |
| Peak            | 2.499      | 61.727%        | -2.112            | -2.095          |

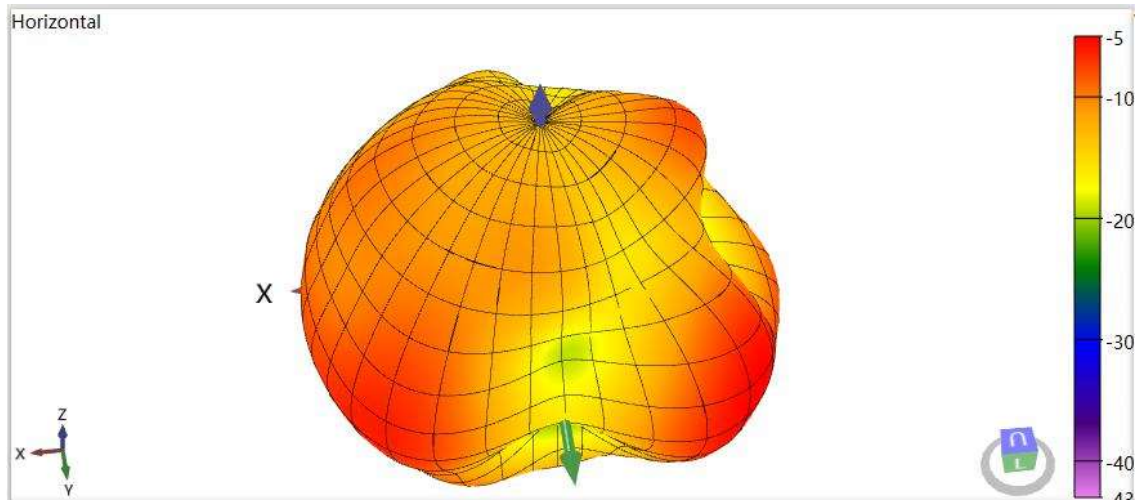
## 2440MHz 2D-Theta Pattern



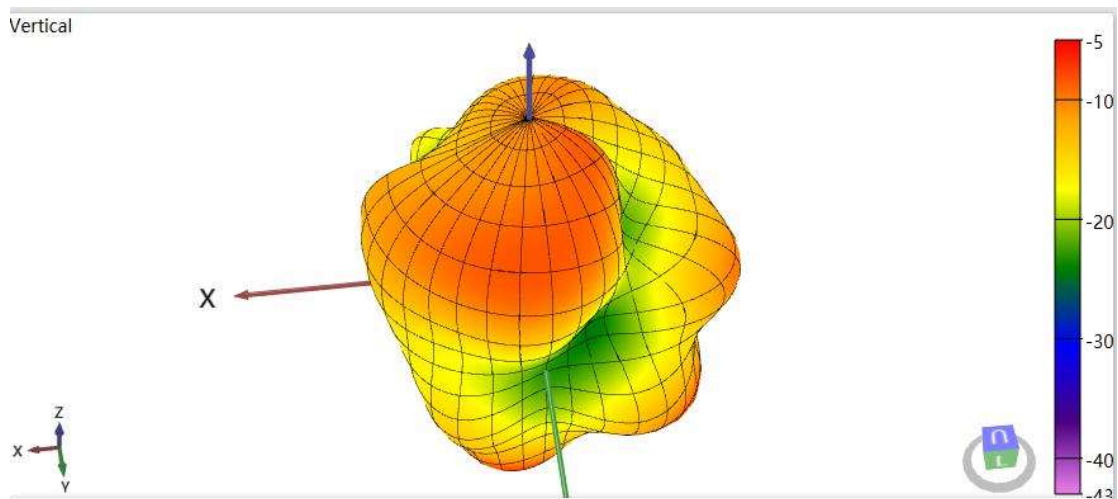
## 2440MHz 2D-Phi Pattern



2440MHz 3D-Horizontal Pattern



2440MHz 3D-Vertical Pattern



2440MHz 3D-Total Pattern

