

Antenna

YC0002AA Datasheet

Antenna Services

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Status: Released



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About the Document

Revision History

| Version | Date | Author | Note |
|---------|------------|-----------|---|
| 1.0 | 2020-06-03 | Kenny YIN | Initial |
| 2.0 | 2020-06-22 | Kenny YIN | Updated the specifications in Chapter 3. |
| 2.1 | 2020-12-16 | Kenny YIN | Updated the antenna image in Chapter 2. |
| 2.2 | 2021-01-27 | Kenny YIN | Added the return loss and package, and updated the direction map. |
| 2.3 | 2021-03-17 | Kenny YIN | Updated the product height tolerance in Chapter 12. |
| 2.4 | 2021-06-17 | Kenny YIN | Updated working temperature in Chapter 3. |
| 2.5 | 2021-07-15 | Kenny YIN | Updated the drawing in Chapters 6, 8 and 12. |

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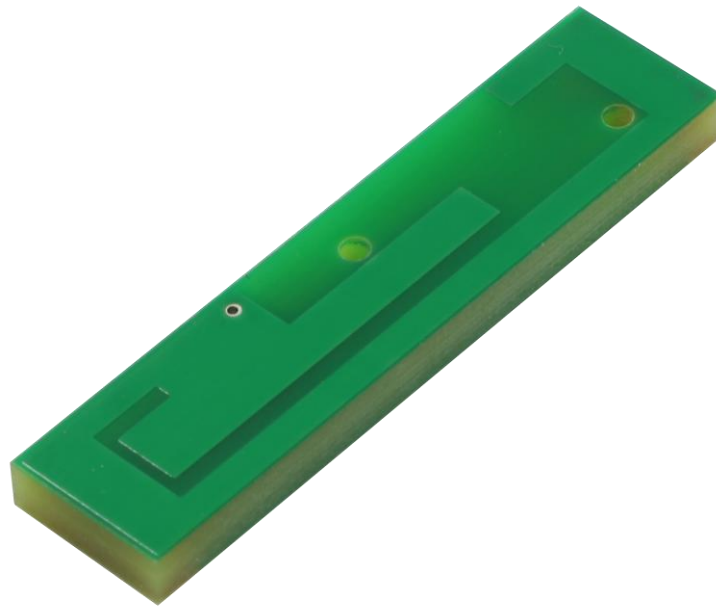
1 Product Description

The antenna is designed for superior performance, and can be widely used for wireless applications.

We provide comprehensive antenna design support such as simulation, testing and manufacturing for custom antenna solutions to meet your specific application needs.

2 Product Features

- 4G LTE SMD Antenna
- High efficiency
- Excellent performance



3 Product Specifications

Passive Electrical Specifications

| | |
|-------------------|----------------------------|
| Frequency Range | 698–960 MHz, 1710–2690 MHz |
| Input Impedence | 50 Ω |
| VSWR | ≤ 3.0 |
| Gain | ≤ 3 dBi |
| Polarization Type | Linear |

Mechanical Specifications

| | |
|---------------------|--------------------------------------|
| Antenna Size | 42 mm \times 10 mm \times 3 mm |
| Casing | FR4 |
| Connector Type | SMD |
| Working Temperature | -40 $^{\circ}$ C to +85 $^{\circ}$ C |
| Radome Color | Green |

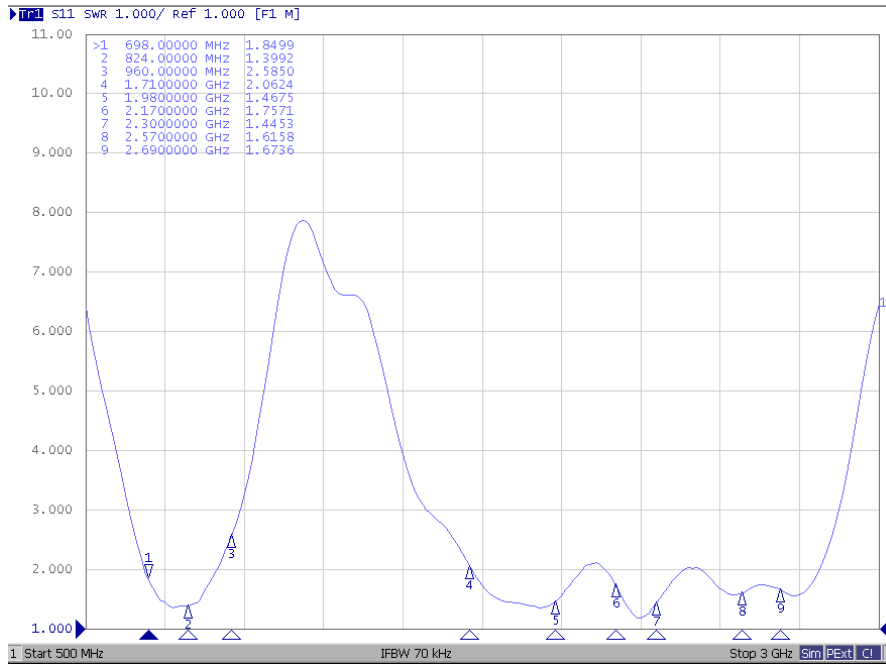
4 Overall Performance

4.1. Test Environment

- KEYSIGHT VNA Network Analyzer E5063A 100 kHz – 8.5 GHz
- RayZone® 2800 Chamber 5G (FR1) SISO/MIMO, 400 MHz – 8.0 GHz

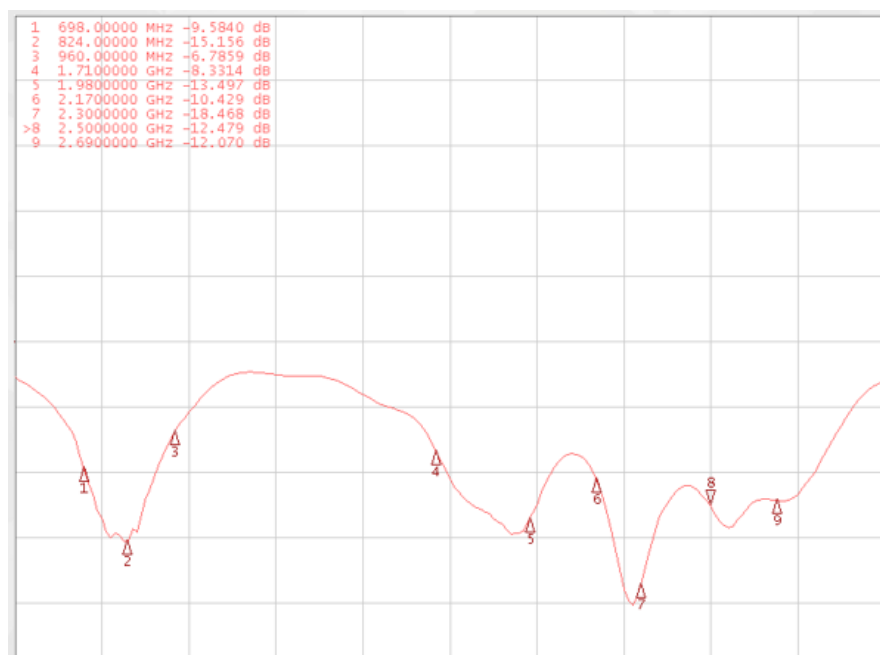


4.2. VSWR

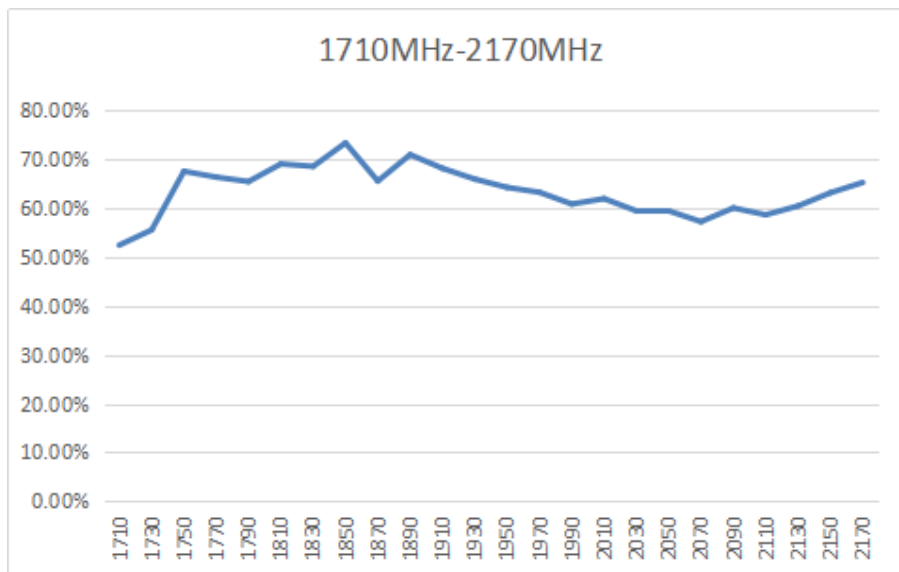
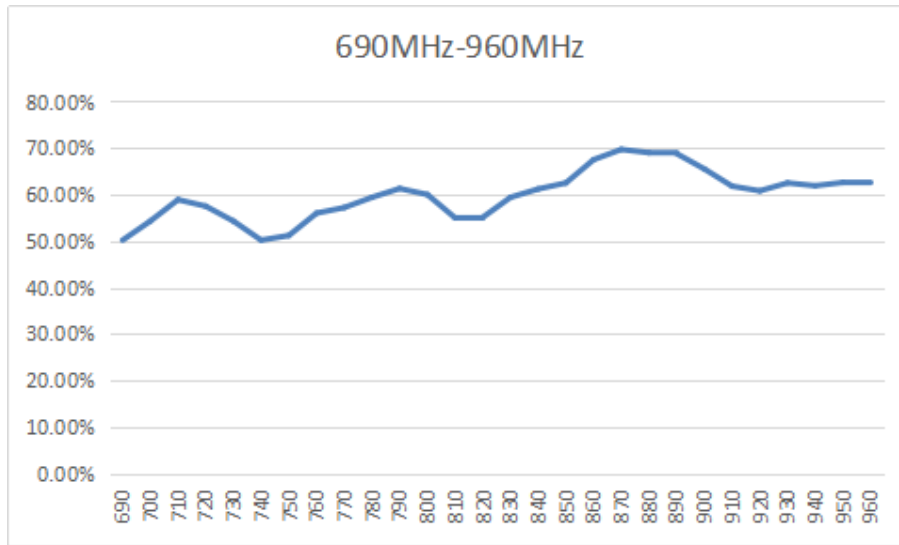


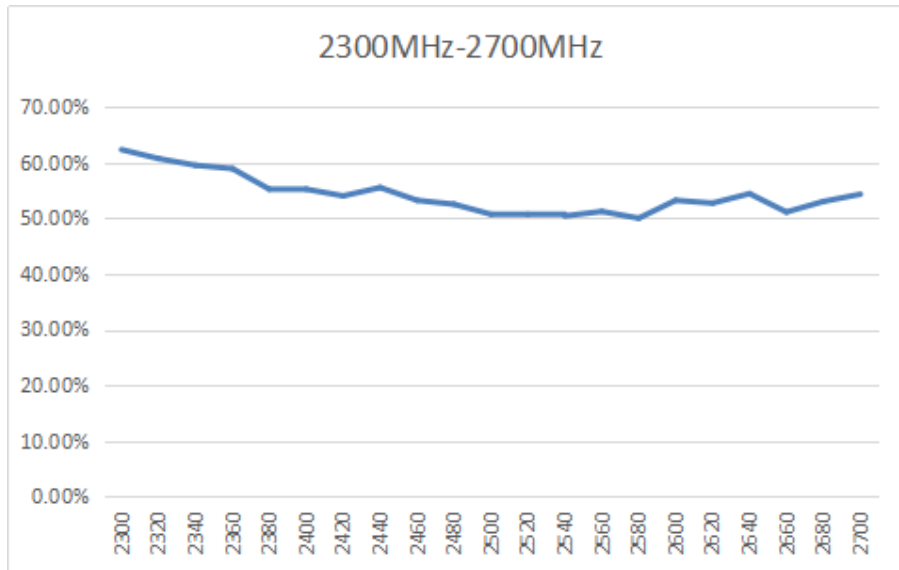
| Frequency (MHz) | 698 | 824 | 960 | 1710 | 1980 | 2170 | 2300 | 2570 | 2690 |
|-----------------|------|------|------|------|------|------|------|------|------|
| VSWR | 1.85 | 1.40 | 2.59 | 2.06 | 1.47 | 1.76 | 1.45 | 1.62 | 1.67 |

4.3. Return Loss



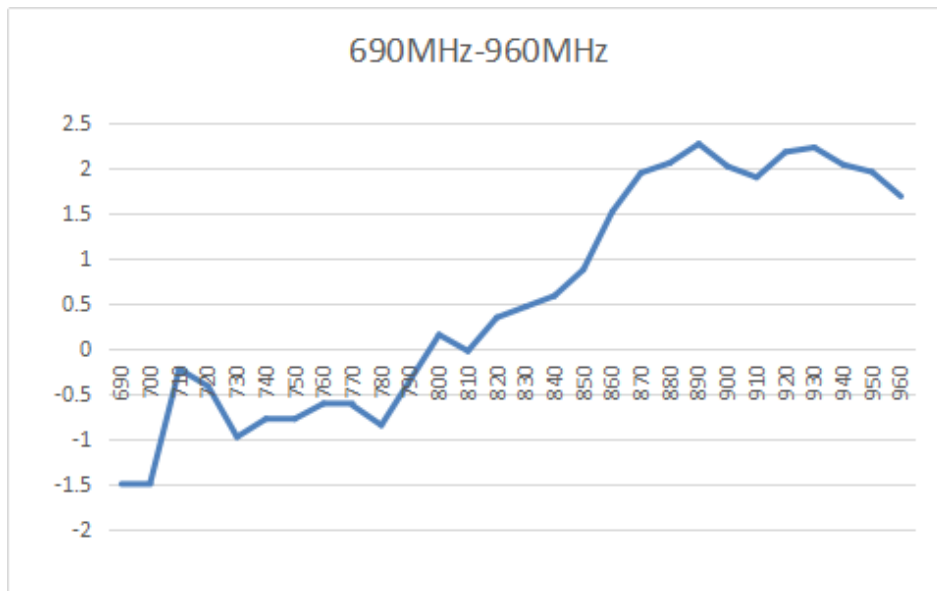
4.4. Efficiency

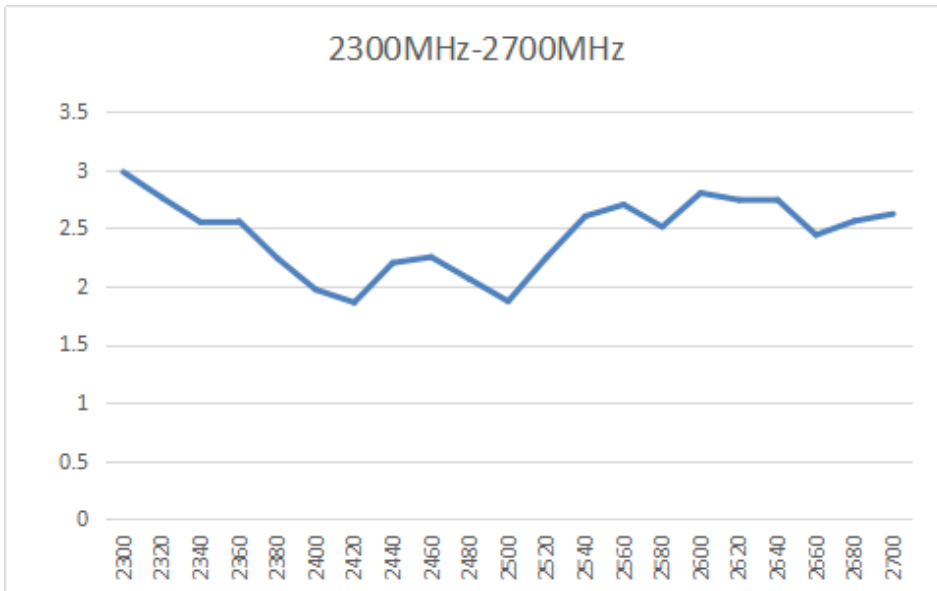
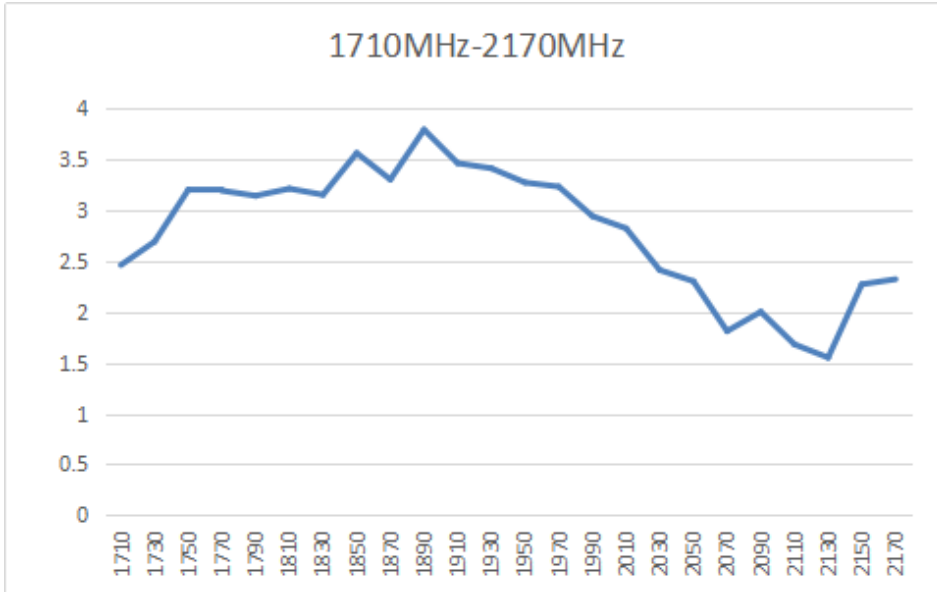




| | | | | | | | | | |
|------------------------|-------|-------|------|------|------|------|------|------|------|
| Frequency (MHz) | 690 | 820 | 960 | 1710 | 1990 | 2170 | 2300 | 2580 | 2680 |
| Eff. (%) | 50.20 | 55.10 | 62.5 | 52.4 | 60.8 | 65.2 | 62.3 | 50 | 53 |

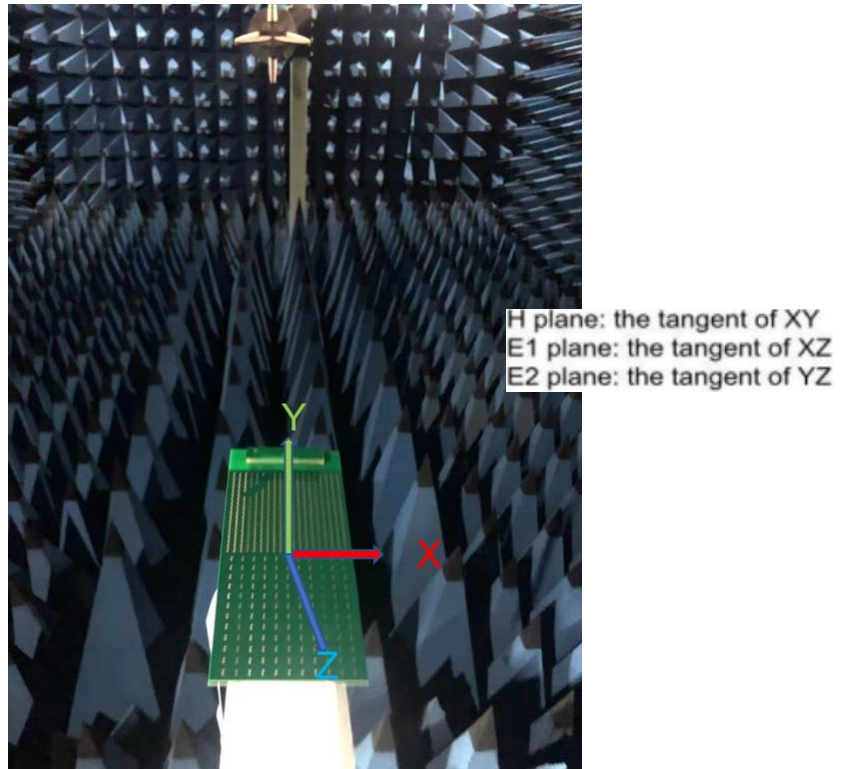
4.5. Gain



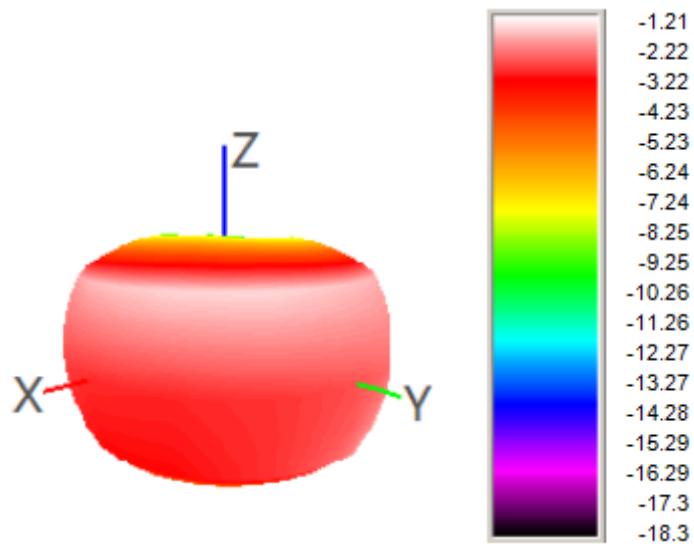


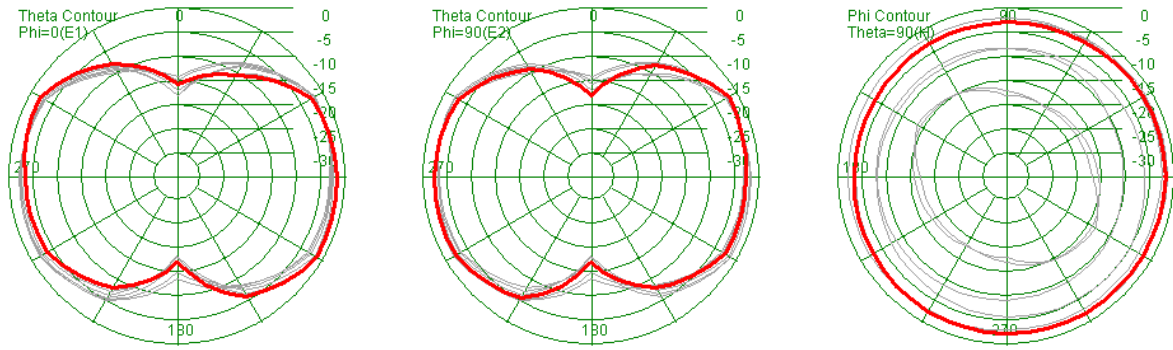
| | | | | | | | | | |
|------------------------|------|------|------|------|------|------|------|------|------|
| Frequency (MHz) | 690 | 820 | 960 | 1710 | 1990 | 2170 | 2300 | 2580 | 2680 |
| Gain (dBi) | -1.5 | 0.34 | 1.68 | 2.46 | 2.94 | 2.32 | 2.98 | 2.51 | 2.56 |

4.6. Radiation Pattern

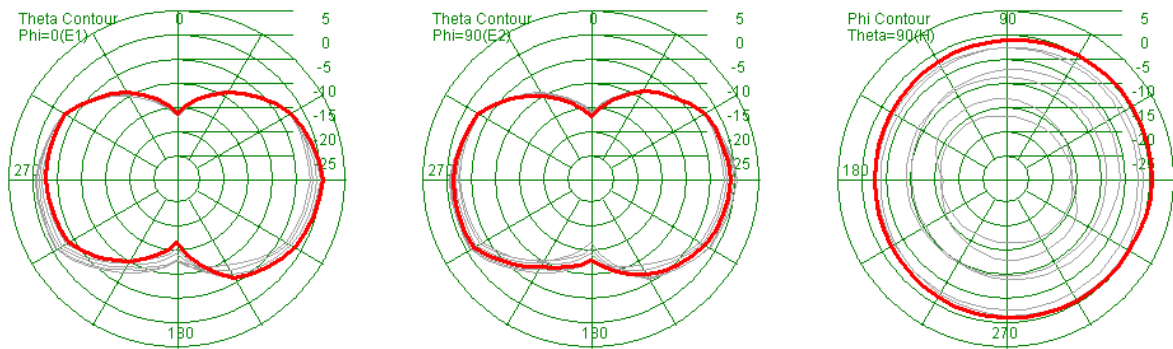
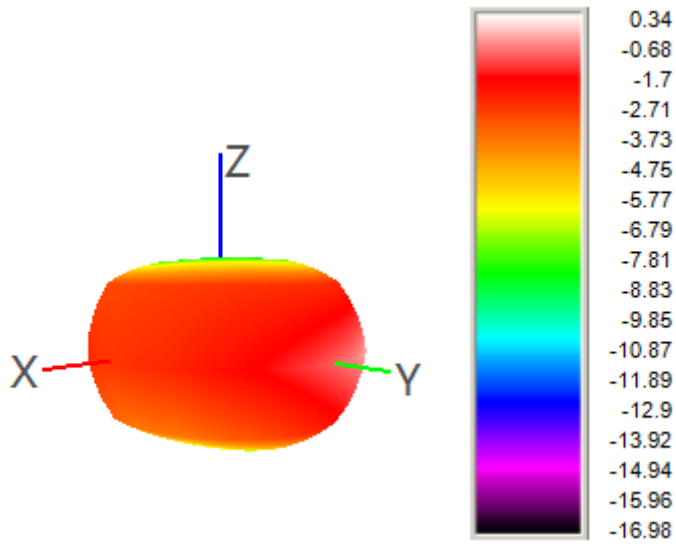


4.6.1. 690 MHz

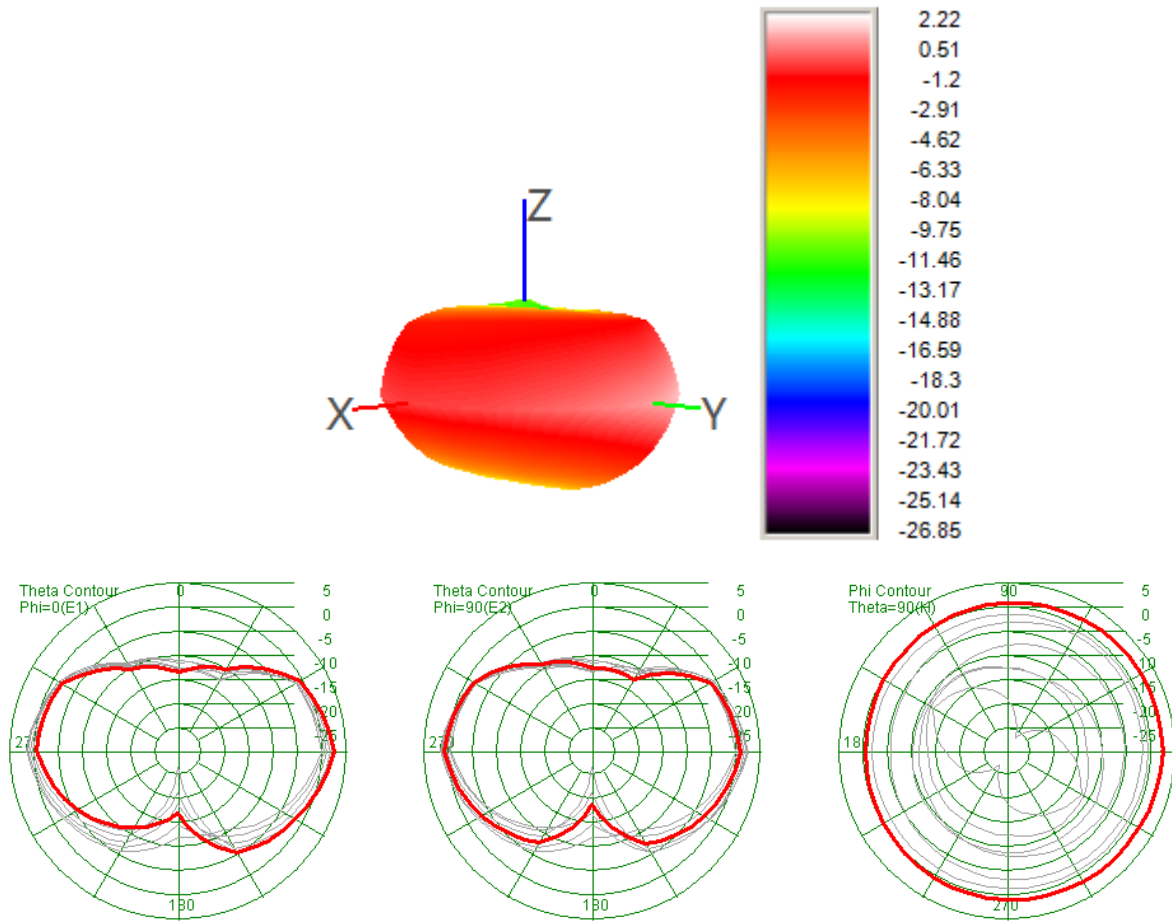




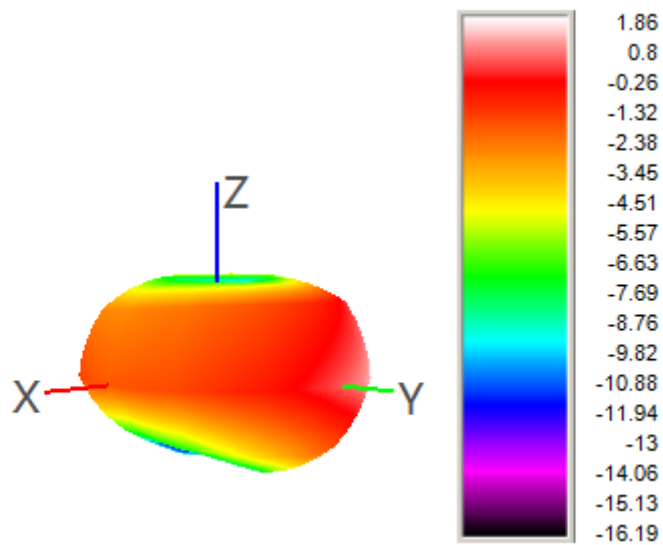
4.6.2. 820 MHz

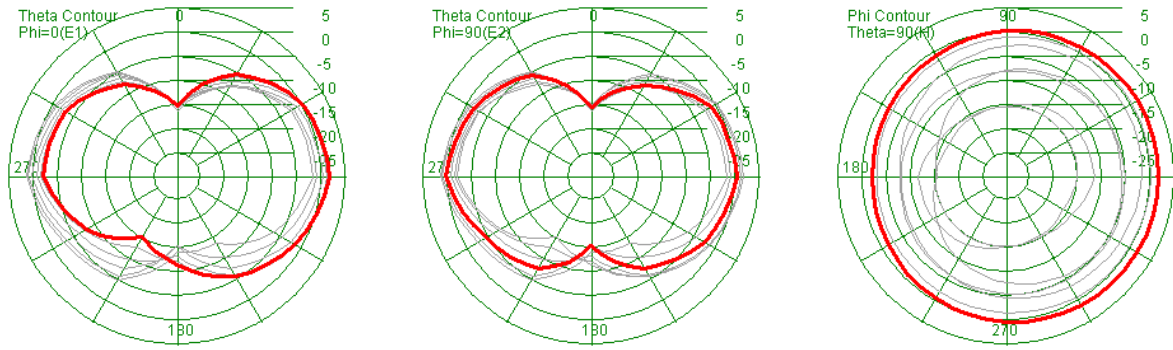


4.6.3. 890 MHz

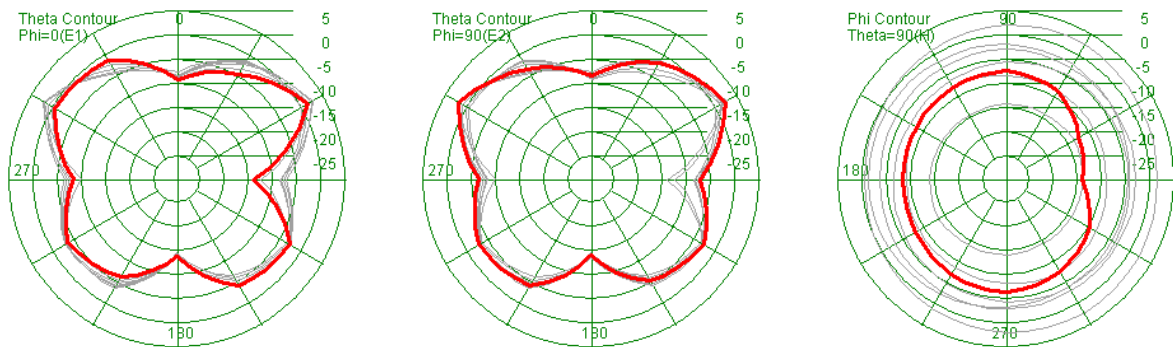
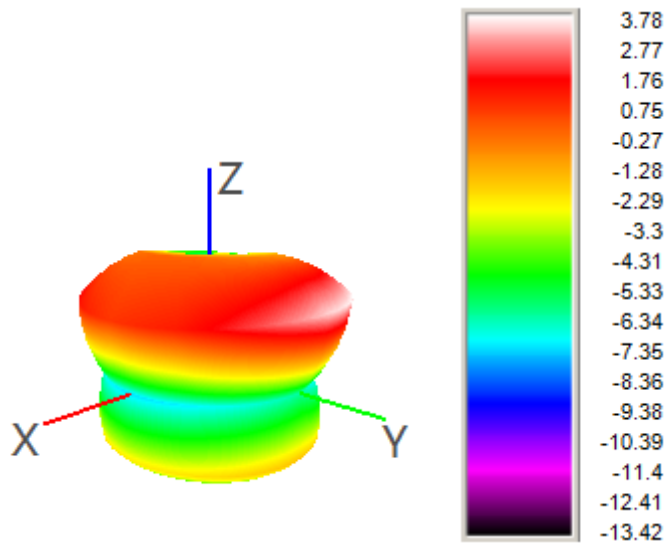


4.6.4. 960 MHz

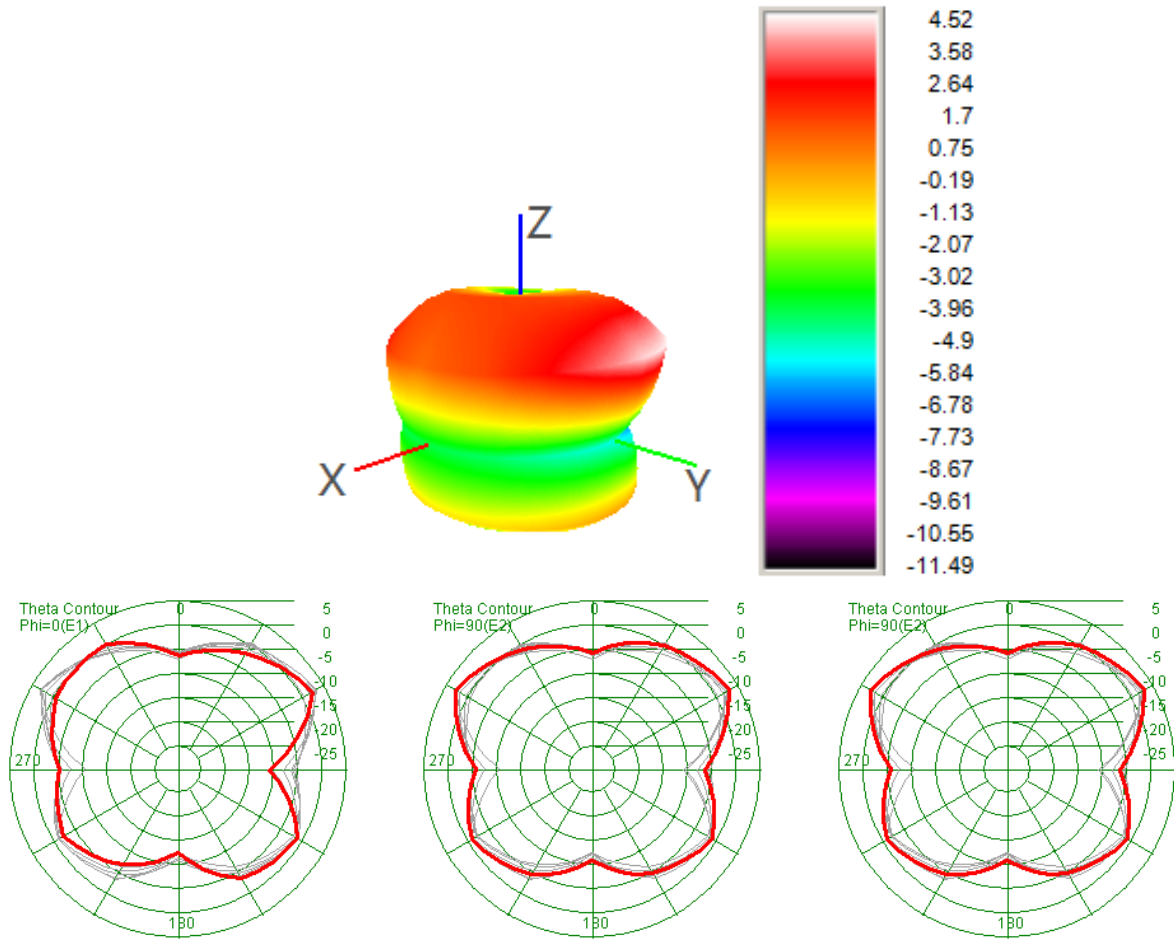




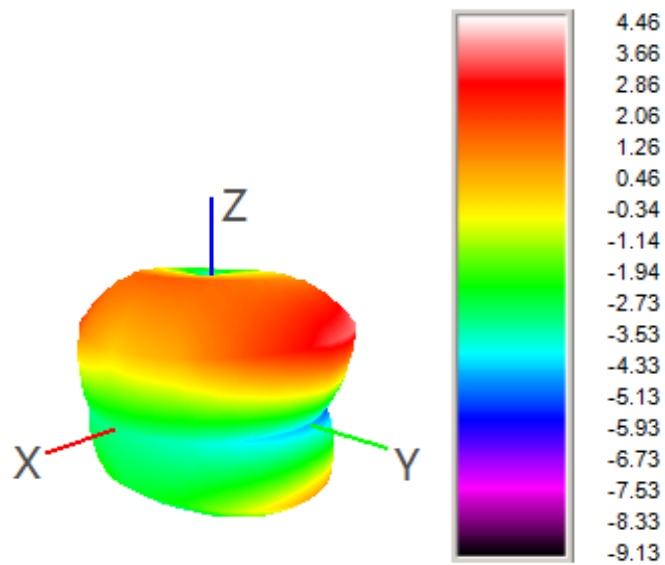
4.6.5. 1710 MHz

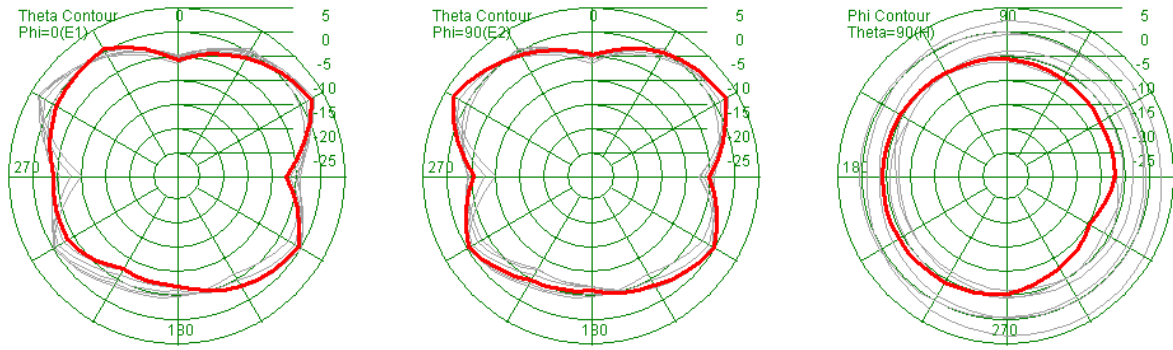


4.6.6. 1810 MHz

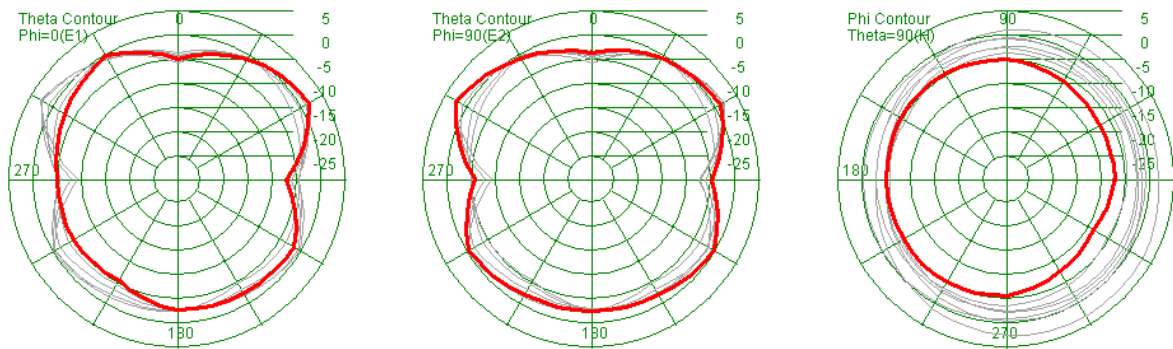
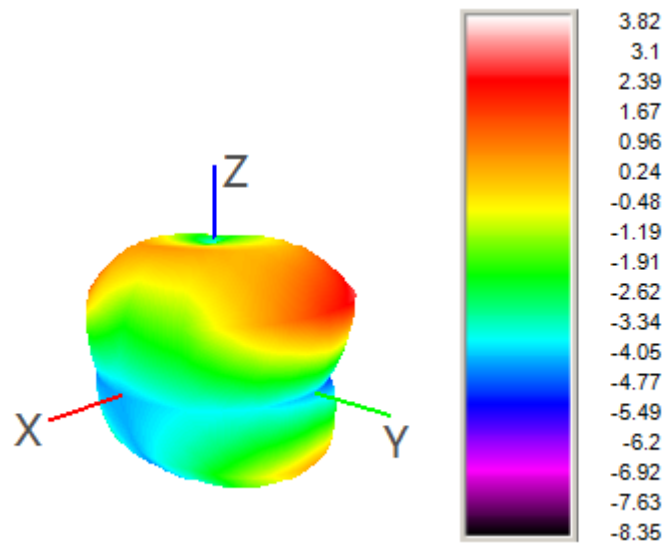


4.6.7. 1910 MHz

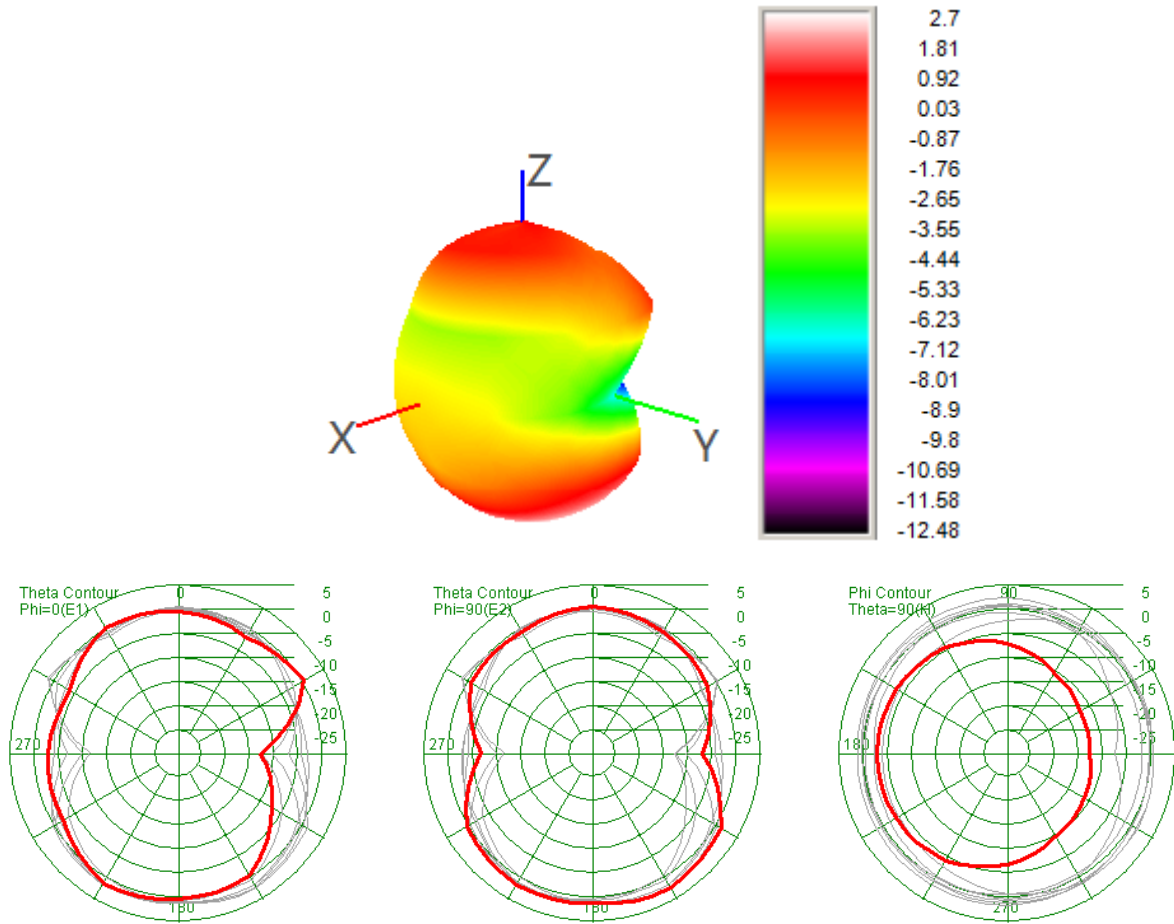




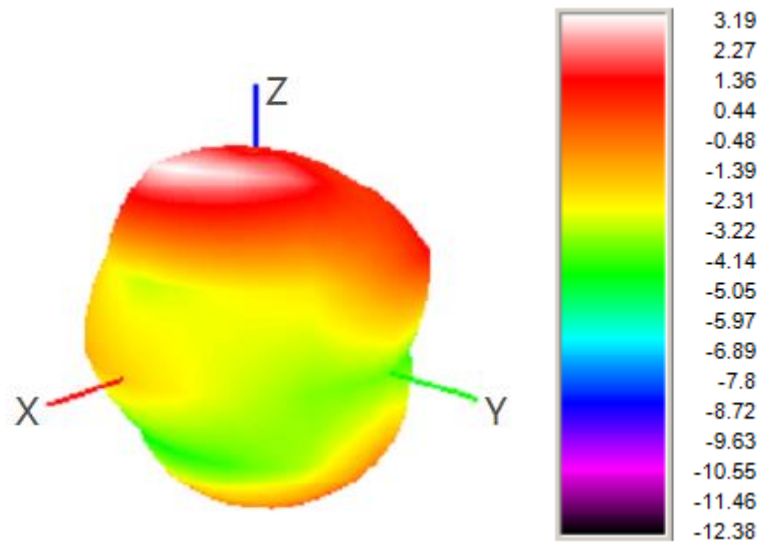
4.6.8. 1990 MHz

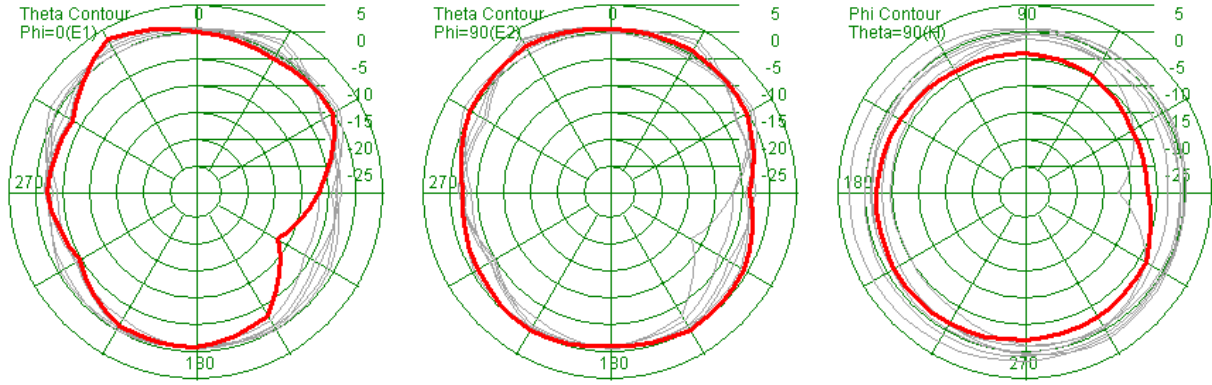


4.6.9. 2170 MHz

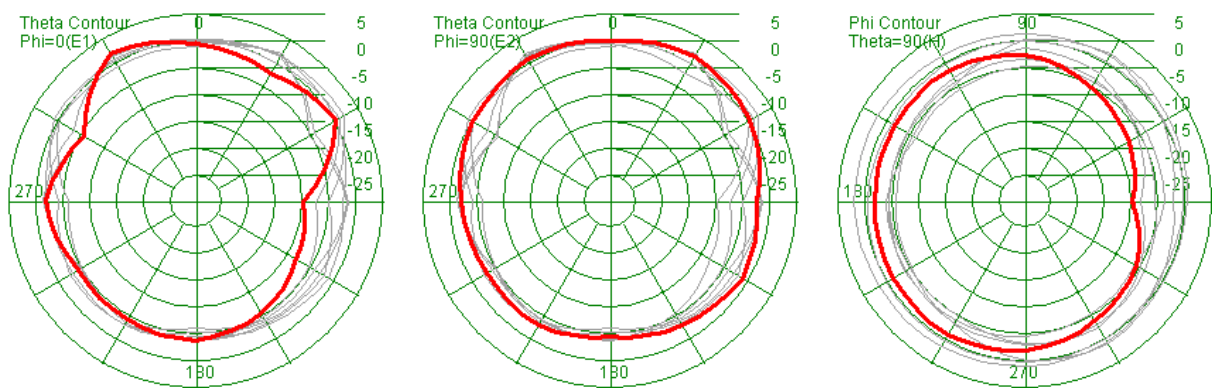
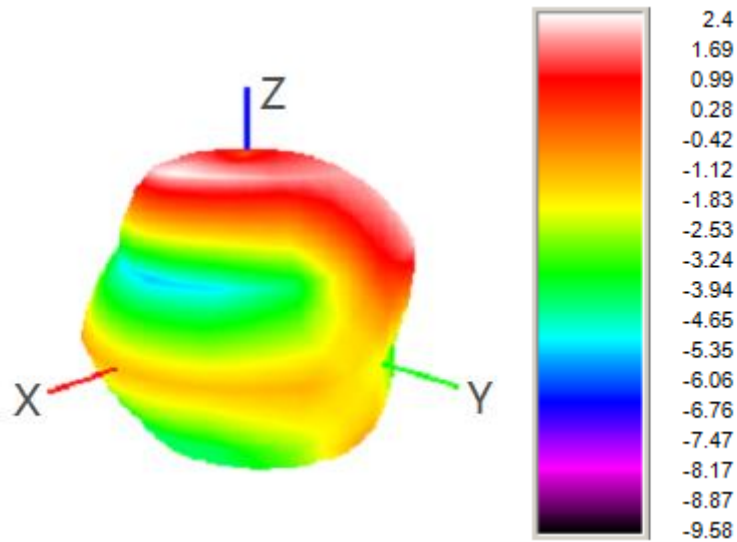


4.6.10. 2300 MHz

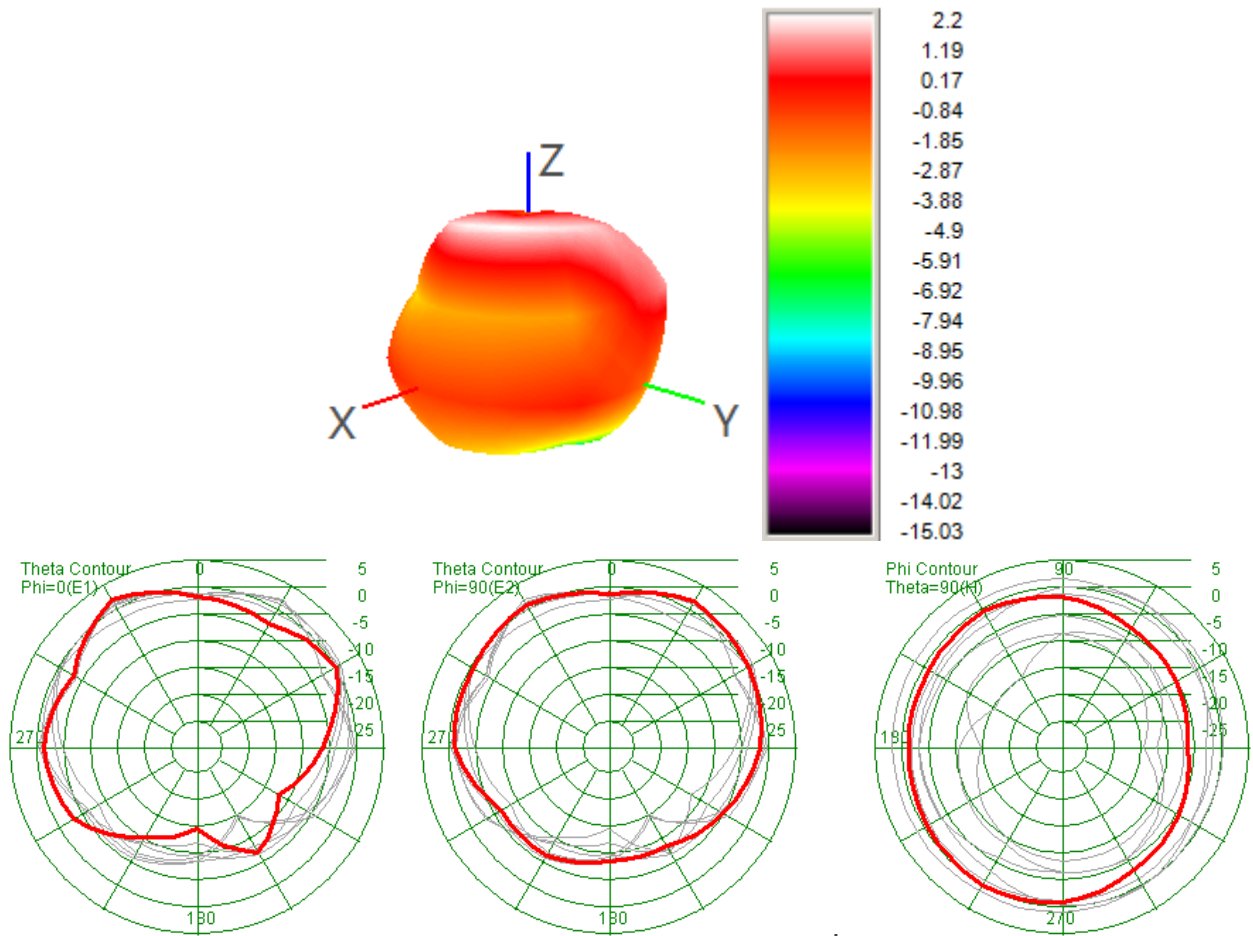




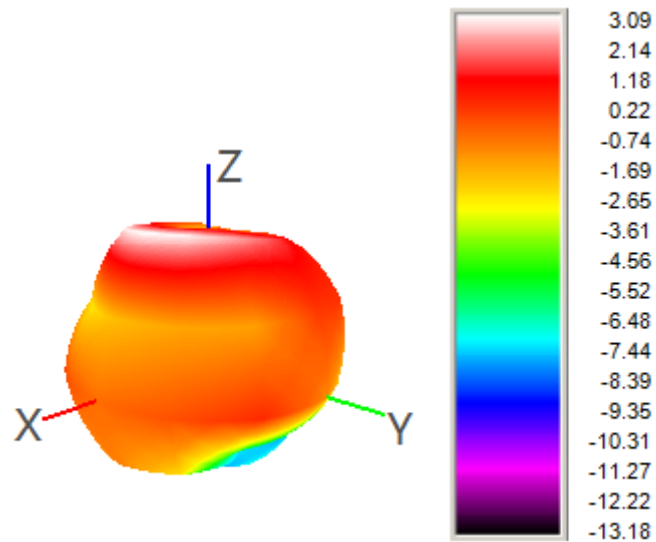
4.6.11. 2400 MHz

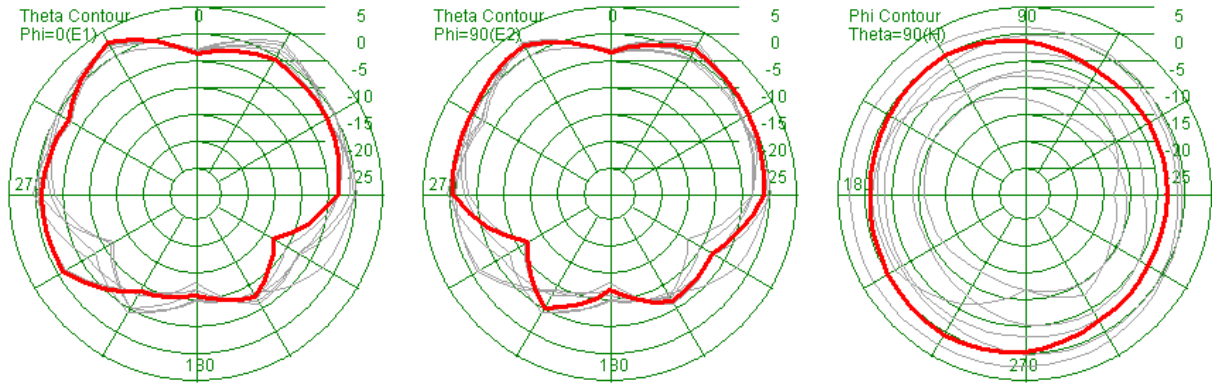


4.6.12. 2500 MHz

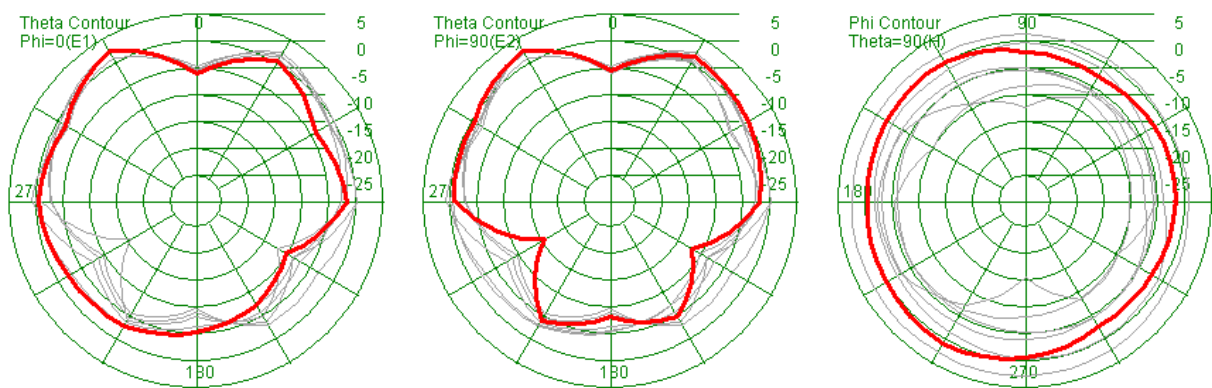
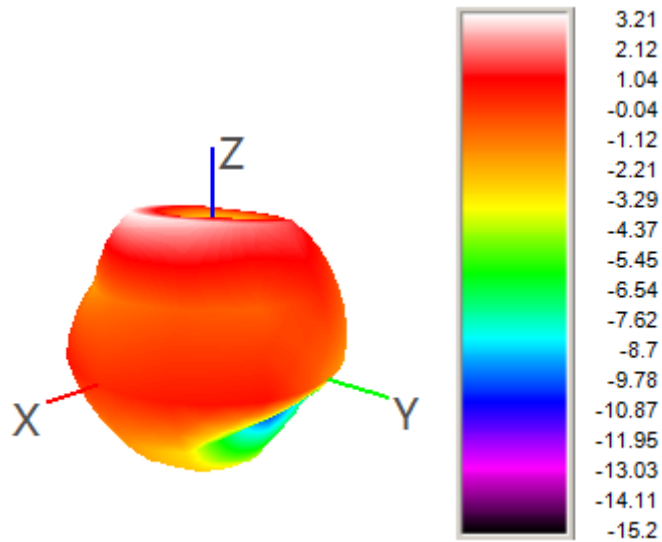


4.6.13. 2600 MHz



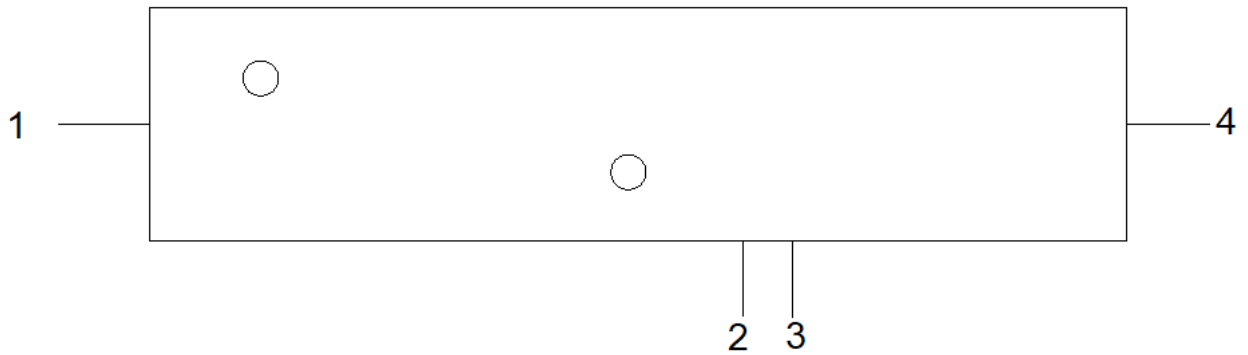


4.6.14. 2700 MHz



5 Schematic Symbol and Pin Definition

The pin assignment for the antenna is as follows. The antenna has 4 pins and only two work. All other pins are designed for mechanical strength.

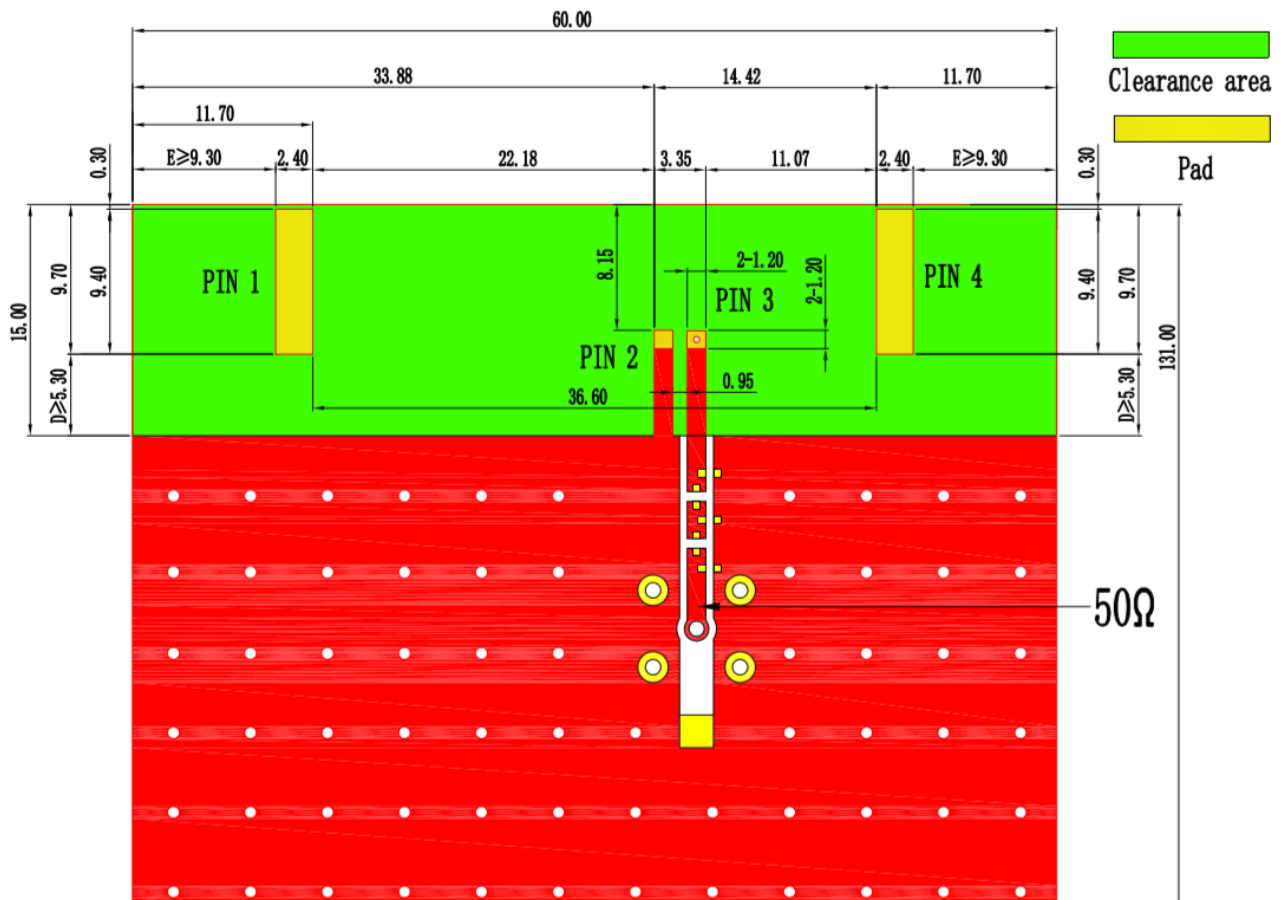


| Pin No. | Description |
|---------|----------------------------|
| 3 | Feed |
| 2 | Return/GND |
| 1, 4 | Not used (mechanical only) |

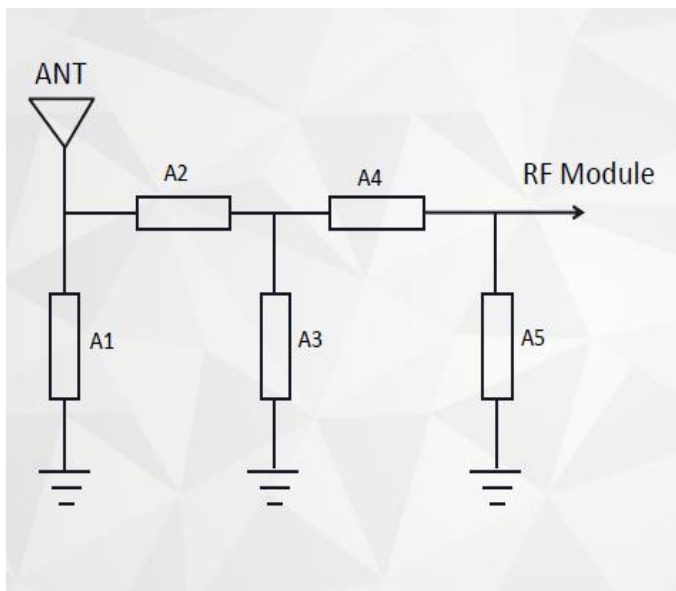
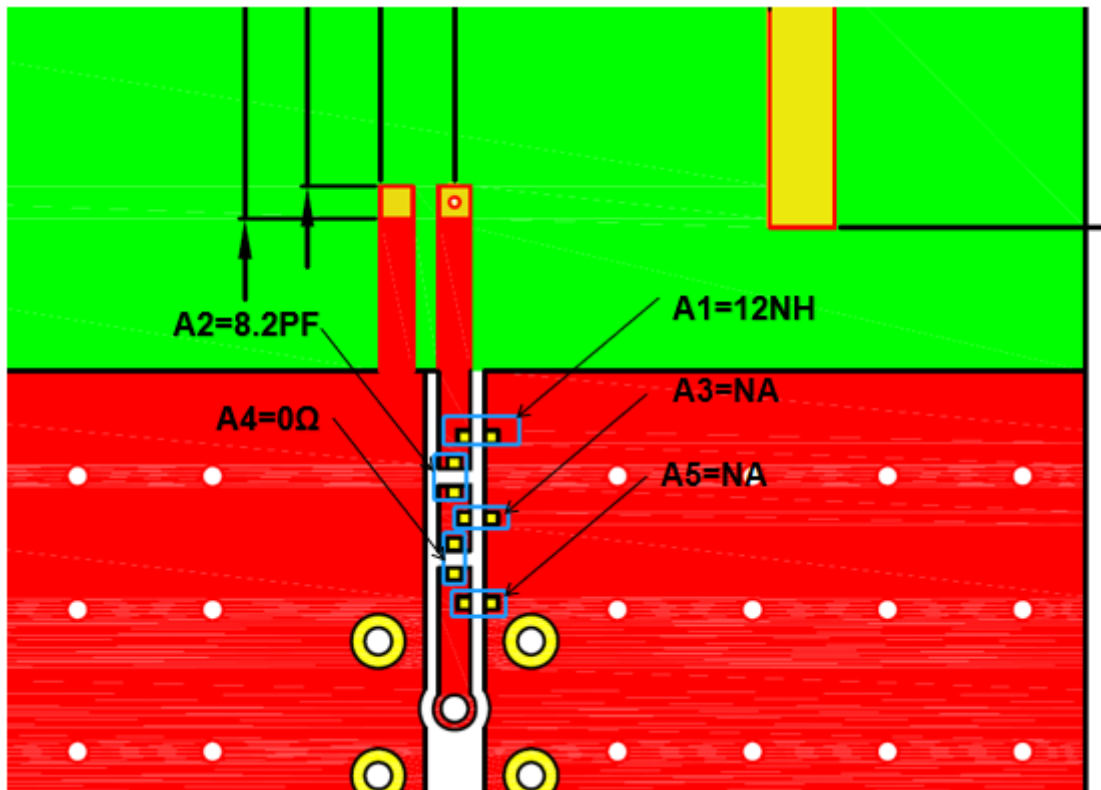
6 Transmission Line

The characteristic impedance of all transmission lines shall be designed as 50 Ω.

- The length of the transmission lines should be kept to as short as possible.
- Any other part of the RF system, such as transceiver, power amplifiers, etc., shall also be designed with an impedance of 50 Ω.



7 Matching Circuit

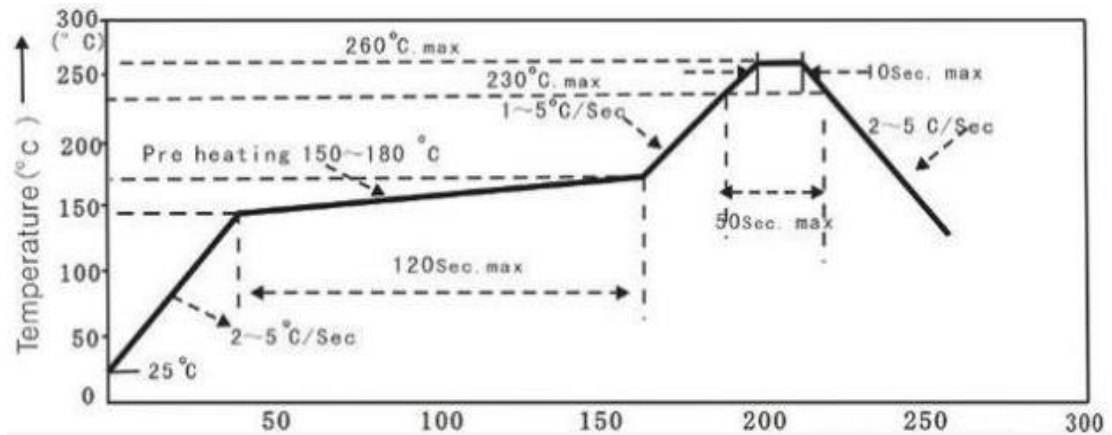


| | |
|----|--------|
| A1 | 12 nH |
| A2 | 8.2 pF |
| A3 | nA |
| A4 | 0 Ω |
| A5 | nA |

9 Soldering Temperature

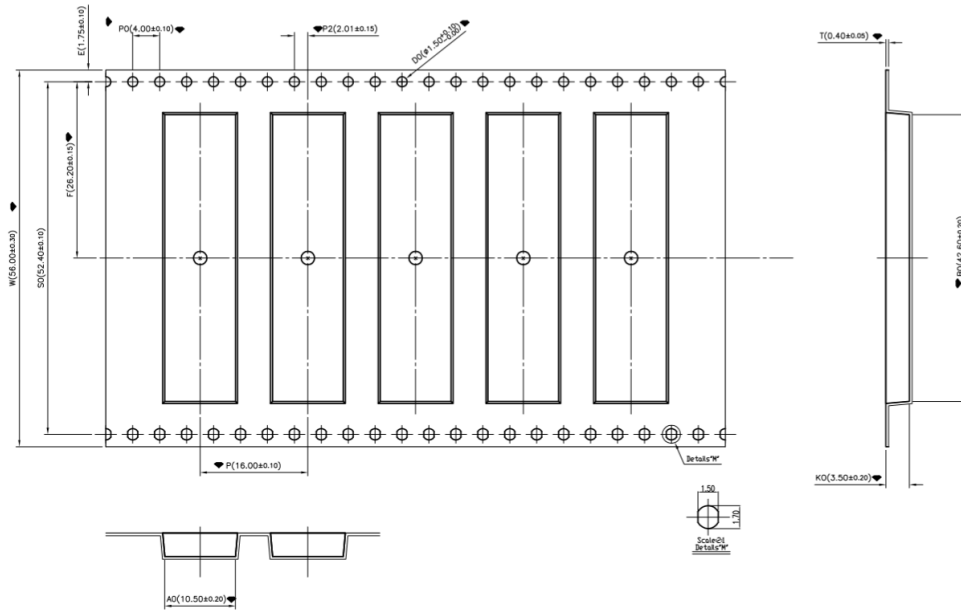
| Phase | Profile Features | PB-Free Assembly (Max.) |
|-----------|--|-------------------------|
| RAMP-UP | Avg. Ramp-up Rate (T _{smax} to T _p) | 3 °C/second |
| PREHEAT | Temperature Min. (T _{smin}) | 150 °C |
| | Temperature Max. (T _{smax}) | 180 °C |
| | Time (T _{smin} to T _{smax}) | 120 seconds |
| REFLOW | Temperature (TL) | 210 °C |
| | Total Time above TL (tl) | 50 seconds |
| PEAK | Temperature (T _p) | 260 °C |
| | Time (t _p) | 10 seconds |
| RAMP-DOWN | Rate | 5 °C/second |

10 Reflow Profile



11 Package

- Quantity/Reel: 1100 pcs/Reel
- Carrier tape dimensions (mm)



- Taping reel dimensions: 330 mm x 56.4 mm

