antenna conceptor

Product Datasheet

# 2J8750BGFb

## CELLULAR/LTE, 2× 2.4/5.0 GHz ISM MIMO and GNSS Screw Mount

## Key Features

**Cable 1: CELLULAR / LTE**
- 698-960 MHz
- 1710-2170 MHz
- 2500-2700 MHz

**Cable 2-3: 2.4/5.0 GHz ISM**
- 2410-2490 MHz
- 4920-5925 MHz

**Cable 4: GPS/GLONASS/QZSS/Galileo**
- 1575-1606 MHz

Screw Mount
Anti-Rotation Mechanism
Ground Plane Dependent
Customizable Cable and Connector
Dimensions: 102 x 63 × 63 mm
Certificates: IP67, IP69, IK09

## 1. Antenna Description

# 2J8750BGFb "The Mako Series"

**The Next Generation 4-in-1 Antenna Reaching Global Connectivity With Excellence**

The Cellular/LTE, 2× 2.4/5.0 GHz ISM and GNSS Screw Mount Antenna (2J8750BGFb) is a 4-in-1 'Shark Fin', high-performance antenna ideal for powerful global connection on the move. The 2J8750BGFb outperforms any competitor by offering 4G, LTE, 2G, 3G, 2× WiFi, Bluetooth-BT, ZigBee, GPS, QZSS, Galileo and GLONASS standards. The 2J8750BGFb is highly reliable while maintaining constant global connectivity across a multitude of terrains. This makes it ideal for tracking/mapping devices, automobile navigation, commercial transportation, M2M and worldwide voice/data communications.

The Cellular/LTE (Cable 1) is designed within 4G LTE, 3G and 2G standards. Designed with an omni-directional radiation pattern and operates within 698MHz-960MHz, 1710MHz-2170MHz and 2500MHz-2700MHz frequencies. The 2J8750BGFb is tuned and calibrated to improve signal strength and allow for uninterrupted connectivity, better signal quality, and reliability while providing increased long- and short-range cellular data and video bandwidth throughput.

The 2.4/5.0 GHz ISM (Cable 2 and 3) Antennas are ideal for WiFi, Bluetooth-BT, ZigBee and ISM standards. The 2J8750BGFb WIFI antennas operates within 2410MHz-2490MHz and 4920MHz-5925MHz frequencies. Designed for reliable M2M connection ideal for low power WiFi, Bluetooth-BT, smart home and commercial devices.

The GPS/GLONASS Antenna (Cable 4) is designed for reliable navigational connectivity within GPS, QZSS, Galileo and GLONASS standards. With a hemispherical radiation pattern, the 2J8750BGFb navigation antenna operates within 1575.42MHz and 1598MHz-1606MHz frequencies. This high-quality antenna offers access to multiple satellites improving accuracy, redundancy and availability uninterrupted ideal for global automotive navigation/geolocation while moving through busy urban areas where obstructions pose a threat to connectivity and signal degradation.

**Installation / Environmental**

For external applications, the production material used is ABS UV stable, protecting the antenna from temperatures between -40C and +80C. With a shark fin design, anti-rotation mechanism and ground plane independence, this screw mount antenna is easy to install with maximum durability. All three cables on the 2J8750BGFb antenna have a SMA-Male standard connector, 300cm standard cable length and are fully customizable by offering additional connector types, cable lengths and cable types. 2J8750BGFb is RoHS compliant with complete IP67, IP69 and IK09 certification.

**Typical applications**

- Automotive connectivity
- Multimedia
- Navigation and telematics systems
- V2V and V2X applications
- Fleet management
- HD video and audio streaming
- Emergency communication

**Compatibility Standards**

**LTE Cables**
- CAT 1 2 3 4 5 6 7 8 9 10 11 12
- NB-IoT, LTE-NB1, CAT-M1, CAT-M2
- WCDMA, UMTS, HSPA, EDGE GRPS, GSM, CDMA

**2.4/5.0 Cables**
- WiFi, Bluetooth, BLE, ISM
- DSRC, V2V, V2X
- Sigfox, LoRa, ZigBee, RPMA, LPWAN

**GPS/GLO Cable**
- GPS, GLONASS
- Galileo, QZSS, L1, E1

## 2. Antenna and electrical specifications

**Cable 1**

| Parameters | CELLULAR / LTE Antenna | | |
|---|---|---|---|
| Standards | 2G,3G and 4G | | |
| Band (MHz) | 700/850/900 | 1700/1800/1900/2100 | 2600 |
| Frequency (MHz) | 698-960 | 1710-2170 | 2500-2700 |
| Return Loss (dB) | ~-10.9 | ~-11.2 | ~-17.9 |
| VSWR | ~2.0:1 | ~1.8:1 | ~1.3:1 |
| Efficiency (%) | ~50.9 | ~38.6 | ~42.0 |
| Peak Gain (dBi) | ~1.2 | ~1.2 | ~2.4 |
| Average Gain (dB) | ~-3.6 | ~-5.2 | ~-3.8 |
| Impendance (Ohm) | 50 | | |
| Polarisation | Linear | | |
| Radiation Pattern | Omni-Directional | | |
| Max. Input Power (W) | 25 | | |
| Connector Type | SMA-Male Standard (Other Connectors Available) | | |
| Cable Length | 300 cm Standard (Any Cable Length Available) | | |
| Cable Type | D302 Standard (Other Cables Available) | | |

**Cable 2**

| Parameters | 2.4/5.0 GHz ISM Antenna | |
|---|---|---|
| Standards | WiFi, BT, ZigBee, ISM | |
| Band (MHz) | 2.4 GHz | 5.0 GHz |
| Frequency (MHz) | 2410-2490 | 4920-5925 |
| Return Loss (dB) | ~-21.7 | ~-11.2 |
| VSWR | ~1.2:1 | ~1.9:1 |
| Efficiency (%) | ~38.9 | ~20.8 |
| Peak Gain (dBi) | ~1.7 | ~1.1 |
| Average Gain (dB) | ~-4.6 | ~-8.7 |
| Impendance (Ohm) | 50 | |
| Polarisation | Linear | |
| Radiation Pattern | Omni-Directional | |
| Max. Input Power (W) | 25 | |
| Connector Type | RP-SMA-Male Standard (Other Connectors Available) | |
| Cable Length | 300 cm Standard (Any Cable Length Available) | |
| Cable Type | D100 Standard (Other Cables Available) | |

**Antenna Measurement Conditions:**

Mounted on 30 x 30 cm Ground Plane

DACAR302 200 cm Cable Length

Measured in Certified CTIA 3D Anechoic Chamber

**Cable 3**

| Parameters | 2.4/5.0 GHz ISM Antenna | |
|---|---|---|
| Standards | WiFi, BT, ZigBee, ISM | |
| Band (MHz) | 2.4 GHz | 5.0 GHz |
| Frequency (MHz) | 2410-2490 | 4920-5925 |
| Return Loss (dB) | ~-19.9 | ~-18.1 |
| VSWR | ~1.3:1 | ~1.4:1 |
| Efficiency (%) | ~35.1 | ~22.0 |
| Peak Gain (dBi) | ~1.5 | ~1.1 |
| Average Gain (dB) | ~-4.6 | ~-9.0 |
| Impendance (Ohm) | 50 | |
| Polarisation | Linear | |
| Radiation Pattern | Omni-Directional | |
| Max. Input Power (W) | 25 | |
| Connector Type | RP-SMA-Male Standard (Other Connectors Available) | |
| Cable Length | 300 cm Standard (Any Cable Length Available) | |
| Cable Type | D100 Standard (Other Cables Available) | |

**Cable 4**

| Parameters | GPS/GLONASS Antenna | |
|---|---|---|
| Standard | GPS/QZSS/Galileo | GLONASS |
| Band (MHz) | 1575 | 1602 |
| Frequency(MHz) | 1575.42 | 1598-1606 |
| Patch Size (mm) | 25 x 25 x 4 | |
| Return Loss (dB) | <=-15.0 dB | |
| VSWR | <=1.4:1 dB | |
| Impedance | 50 | |
| Radiation Pattern | Hemispherical | |
| Polarization | RHCP | |
| Saw Filter | Pre-filter | |
| Active Gain (dB) | 28 @ 2.7 V | |
| Noise Figure (dB) | 1.5 Typ | |
| Voltage (V) | 1.5 - 3.6 | |
| Current (mA) | 9 Typ | |
| Power Consumption (mW) | 24.3 Typ | |
| ESD Protection (kV) | 2kV | |
| Connector Type | SMA-Male Standard (Other Connectors Available) | |
| Cable Length | 300 cm Standard (Any Cable Length Available) | |
| Cable Type | D100 Standard (Other Cables Available) | |

**Antenna Measurement Conditions:**

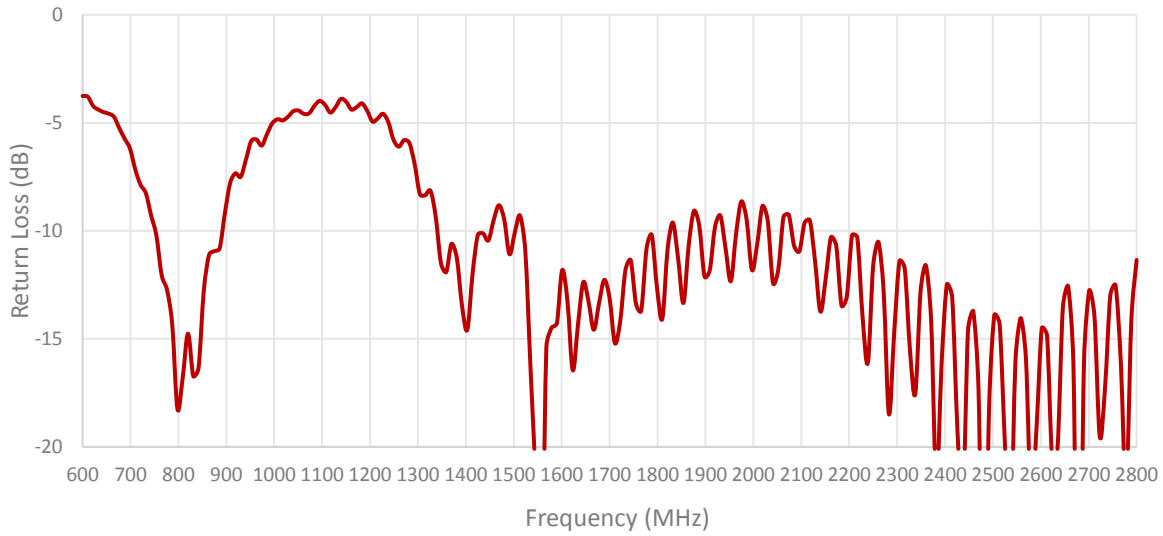
Mounted on 30 x 30 cm Metal Plate
D302 200 cm Cable Length for LTE
D100 200cm Cable Length for 2.4/5.0GHz
Measured in Certified CTIA 3D Anechoic Chamber

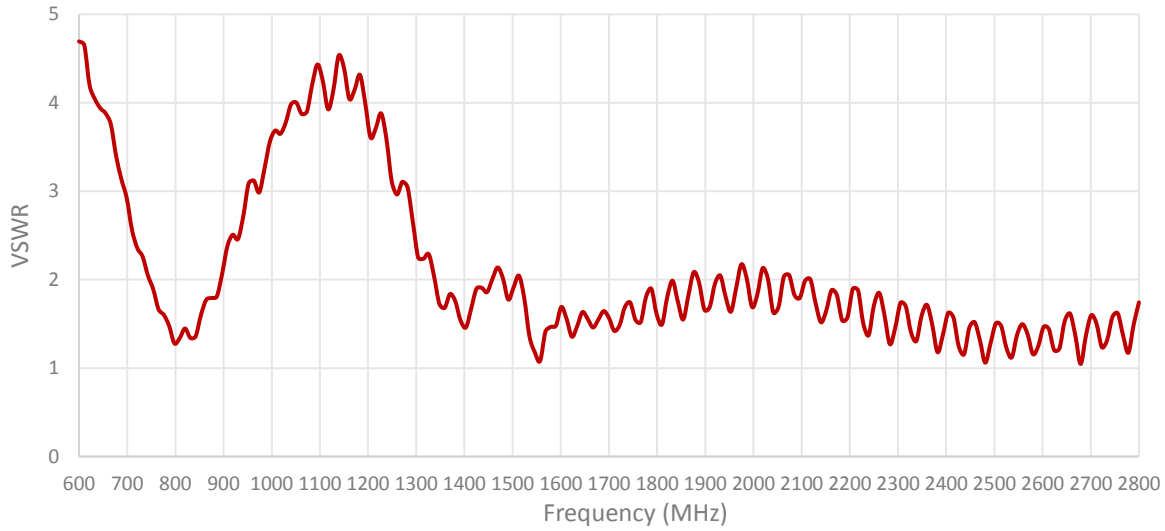
## 3. Mechanical and environmental specifications

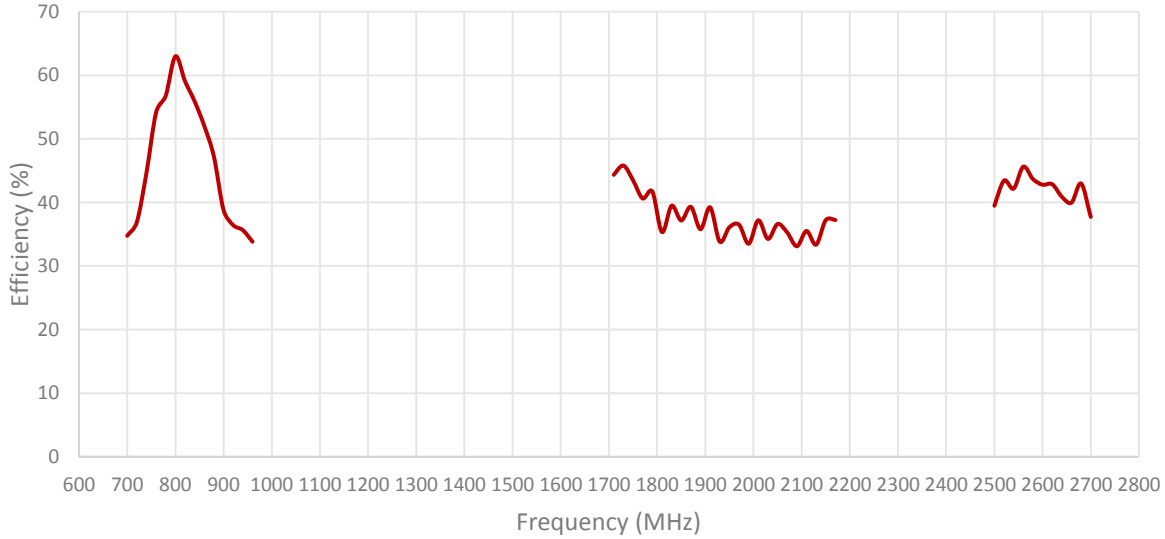
| Specifications | 2J8750BGFb |
|---|---|
| Mounting Type | Screw Mount |
| Dimensions (mm) | 102 x 63 × 63 |
| Radome Type | PC/ABS UV Stable |
| Radome Color | Black |
| Antenna Base | Zamak |
| Gasket | TPE |
| Operating Temperature (C) | -40 to +85 |
| Storage Temperature (C) | -40 to +85 |
| Substance Compliance | RoHS |
| Certificates | IP67, IP69, IK09 |

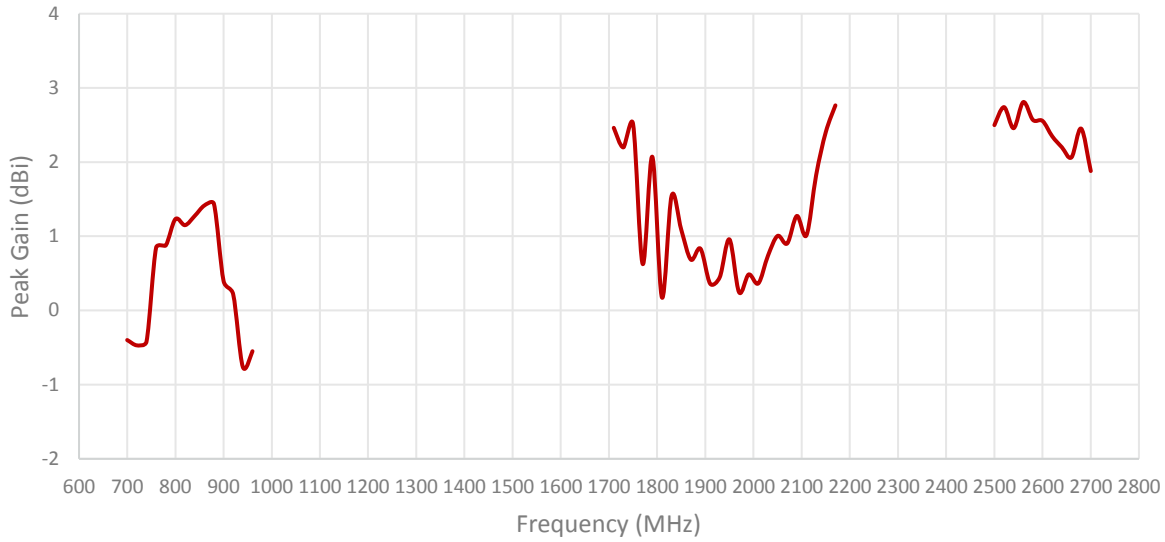
## 4. Antenna parameters

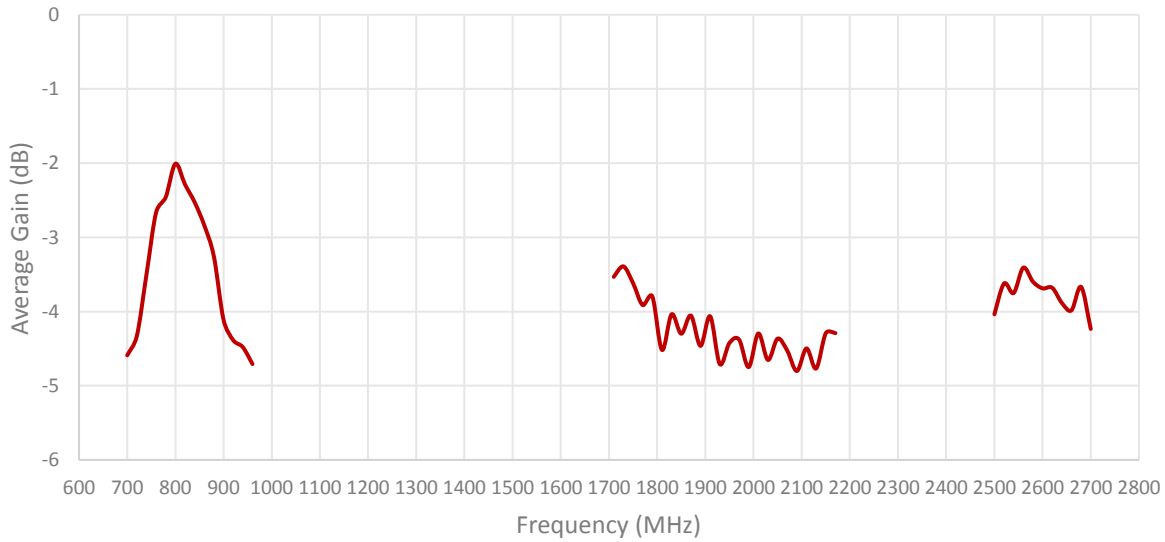
**Cable 1: CELLULAR/LTE**



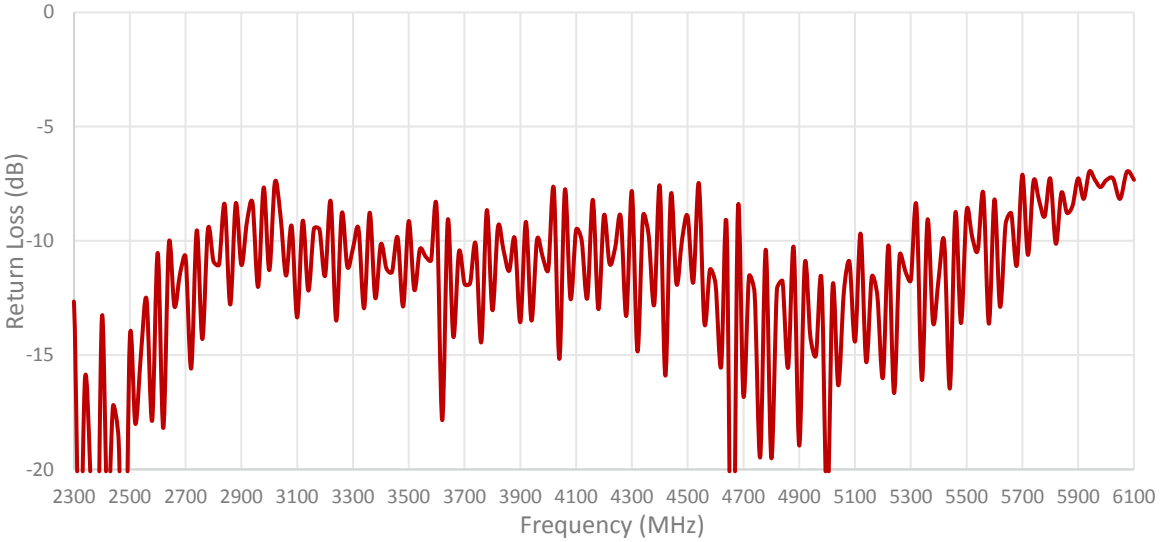



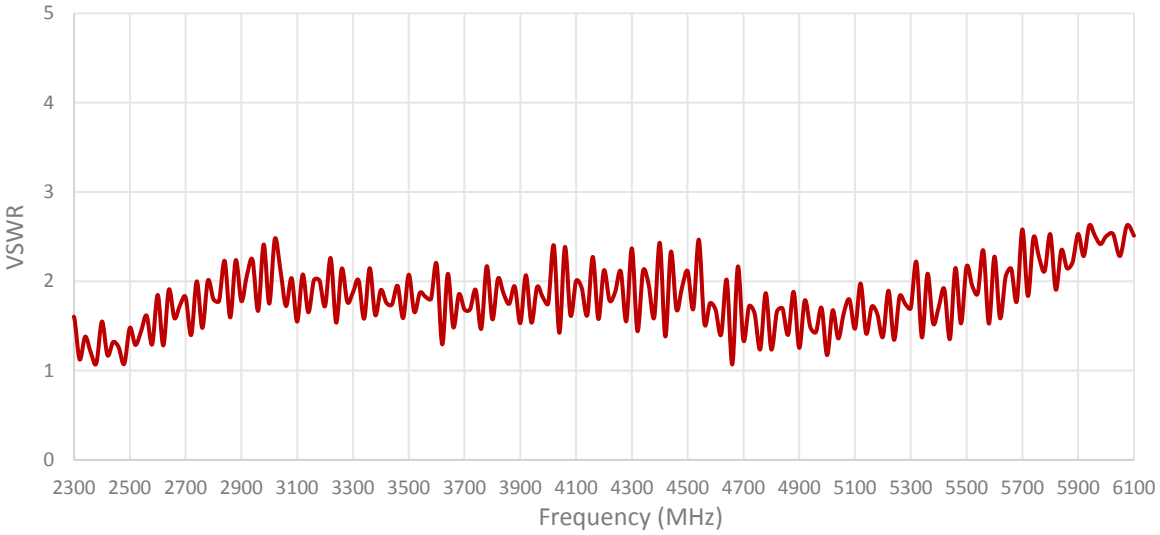

Efficiency (%)
70
60
50
40
30
20
10
0
600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800
Frequency (MHz)

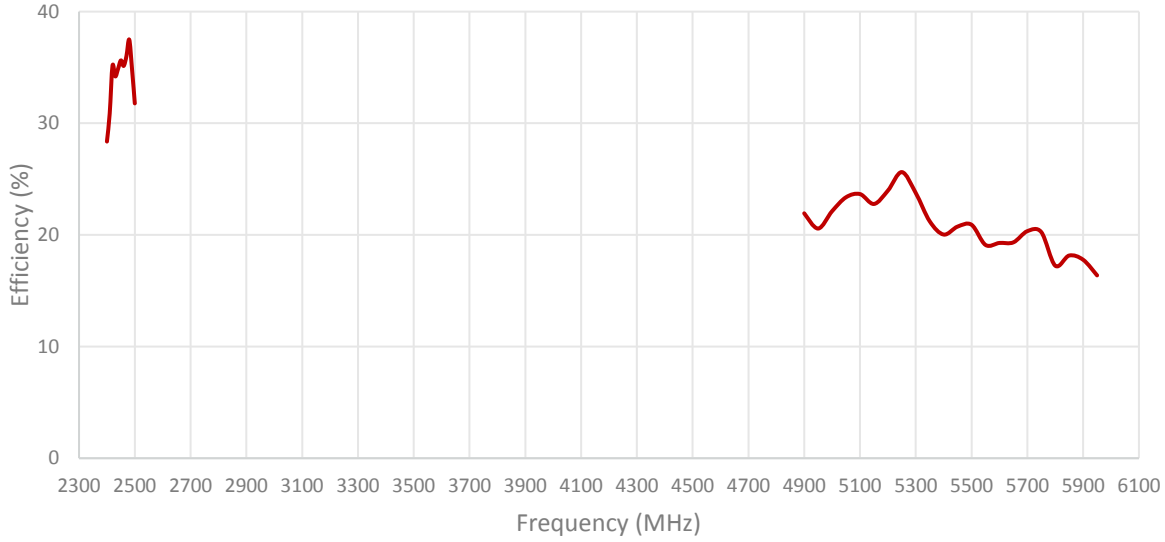

Peak Gain (dBi)
4
3
2
1
0
-1
-2
600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800
Frequency (MHz)

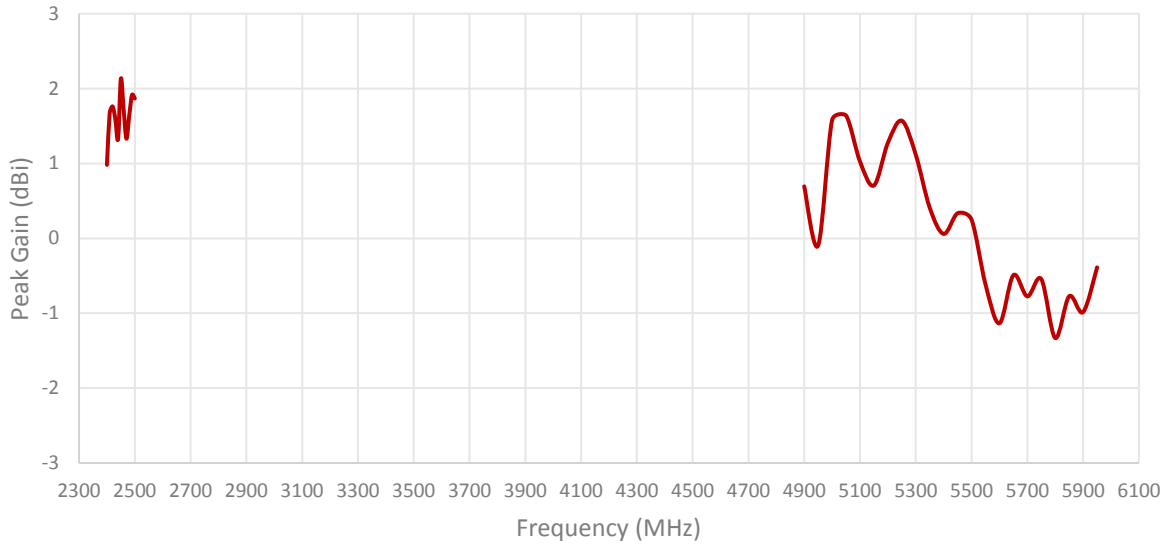

Average Gain (dB)
0
-1
-2
-3
-4
-5
-6
600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2100 2200 2300 2400 2500 2600 2700 2800
Frequency (MHz)

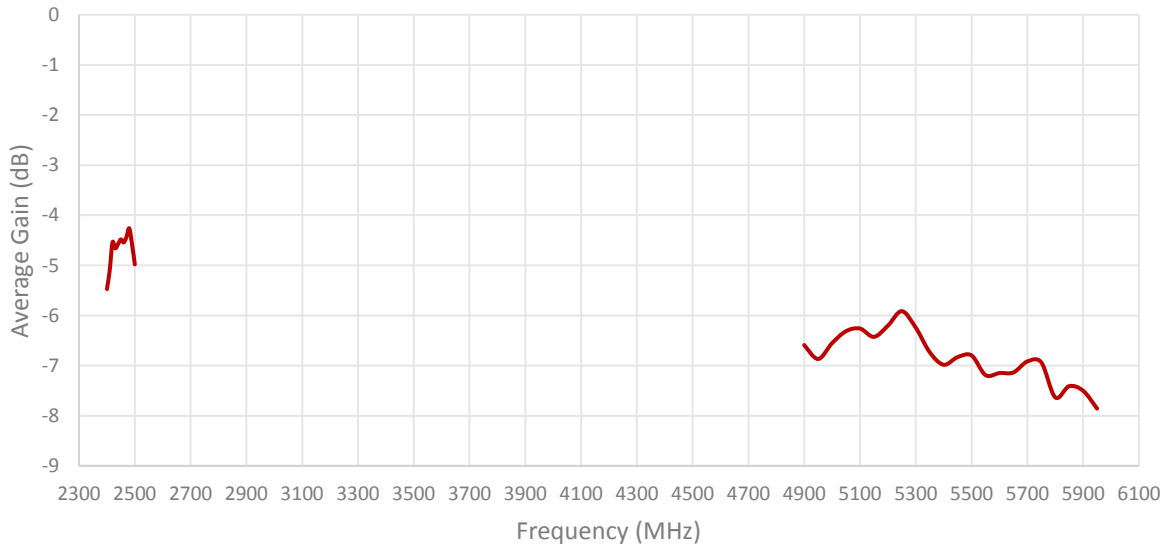
**Cable 2: 2.4/5.0 GHz ISM**



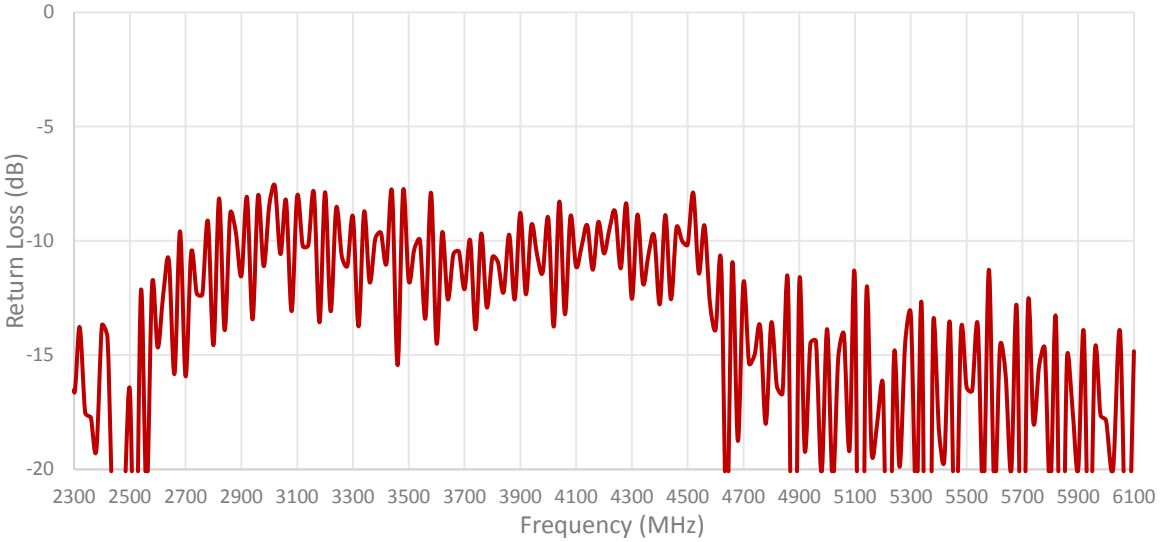



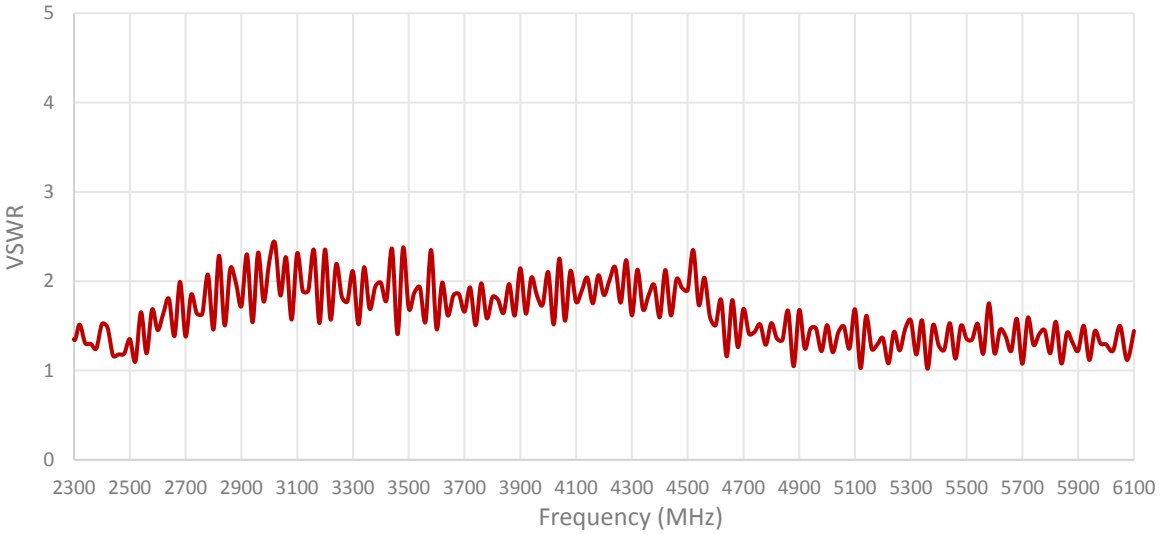

Efficiency (%)
40
30
20
10
0
2300 2500 2700 2900 3100 3300 3500 3700 3900 4100 4300 4500 4700 4900 5100 5300 5500 5700 5900 6100
Frequency (MHz)

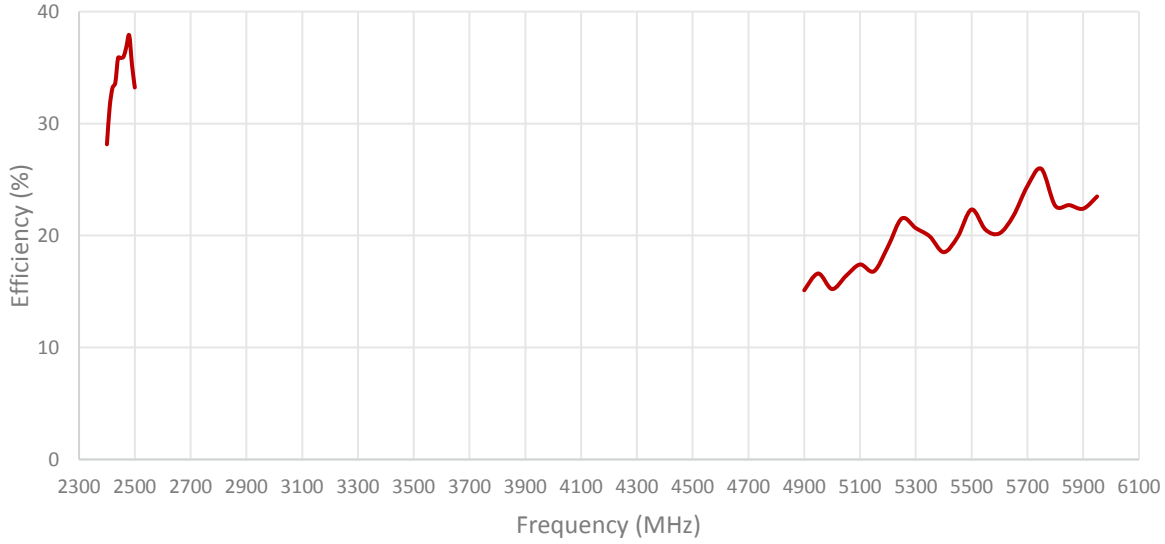

Peak Gain (dBi)
3
2
1
0
-1
-2
-3
2300 2500 2700 2900 3100 3300 3500 3700 3900 4100 4300 4500 4700 4900 5100 5300 5500 5700 5900 6100
Frequency (MHz)

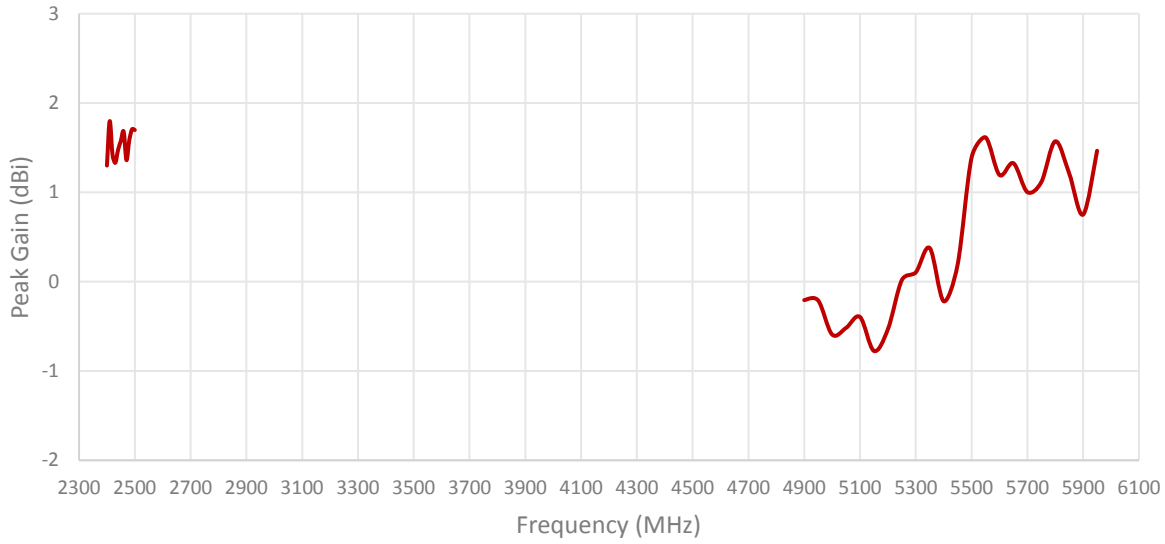

Average Gain (dB)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
2300 2500 2700 2900 3100 3300 3500 3700 3900 4100 4300 4500 4700 4900 5100 5300 5500 5700 5900 6100
Frequency (MHz)

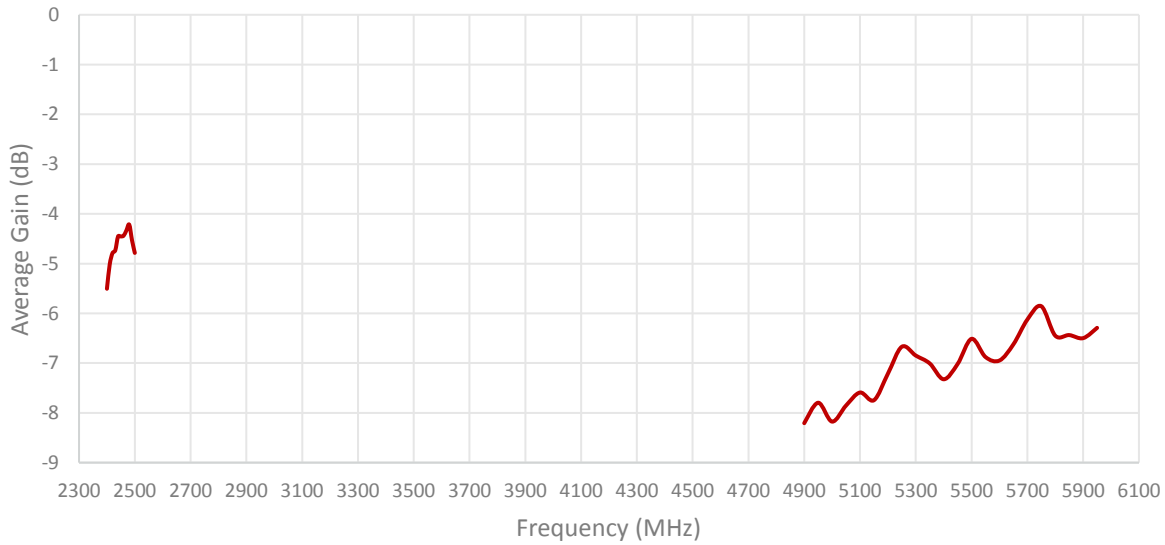
**Cable 3: 2.4/5.0 GHz ISM**



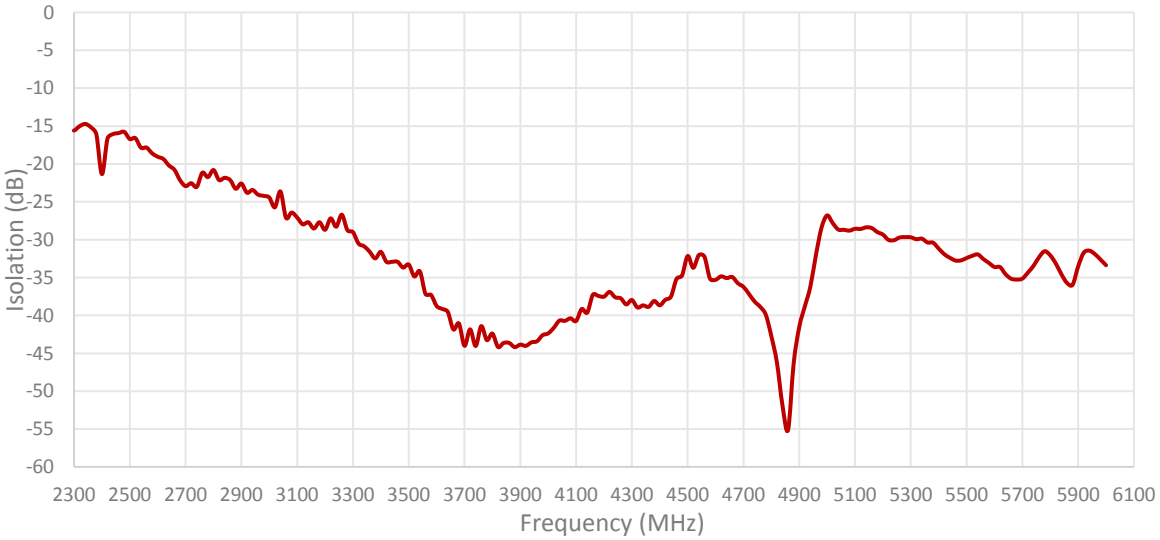




Efficiency (%)
40
30
20
10
0
2300 2500 2700 2900 3100 3300 3500 3700 3900 4100 4300 4500 4700 4900 5100 5300 5500 5700 5900 6100
Frequency (MHz)

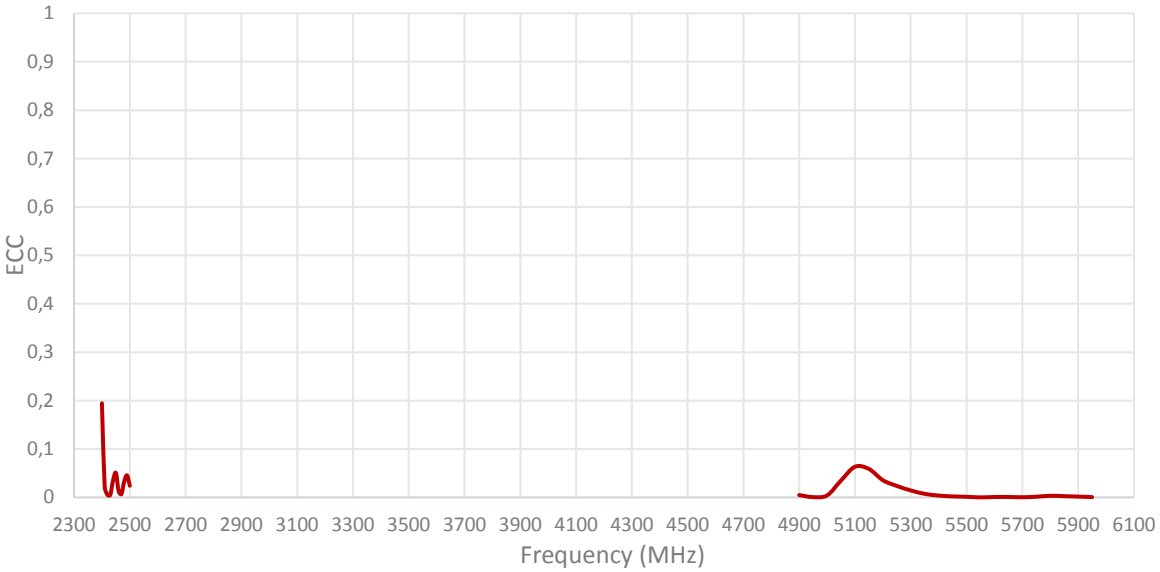

Peak Gain (dBi)
3
2
1
0
-1
-2
2300 2500 2700 2900 3100 3300 3500 3700 3900 4100 4300 4500 4700 4900 5100 5300 5500 5700 5900 6100
Frequency (MHz)

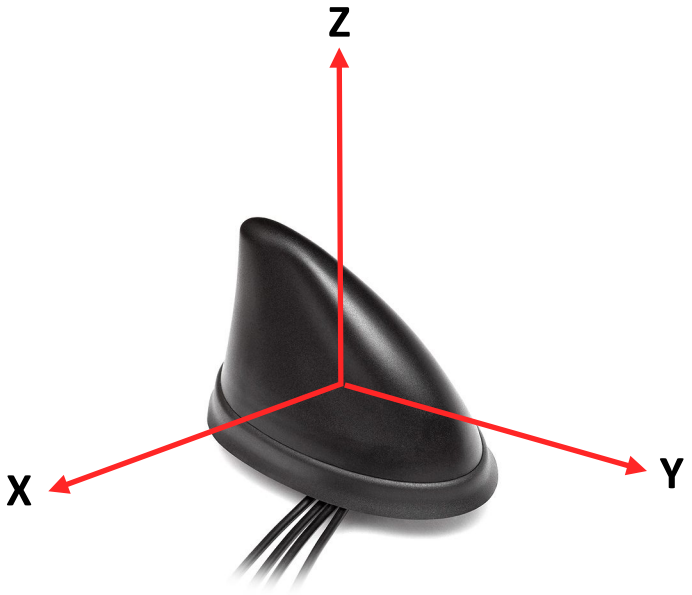

Average Gain (dB)
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
2300 2500 2700 2900 3100 3300 3500 3700 3900 4100 4300 4500 4700 4900 5100 5300 5500 5700 5900 6100
Frequency (MHz)

**ISOLATION FOR CABLE 2 AND CABLE 3**



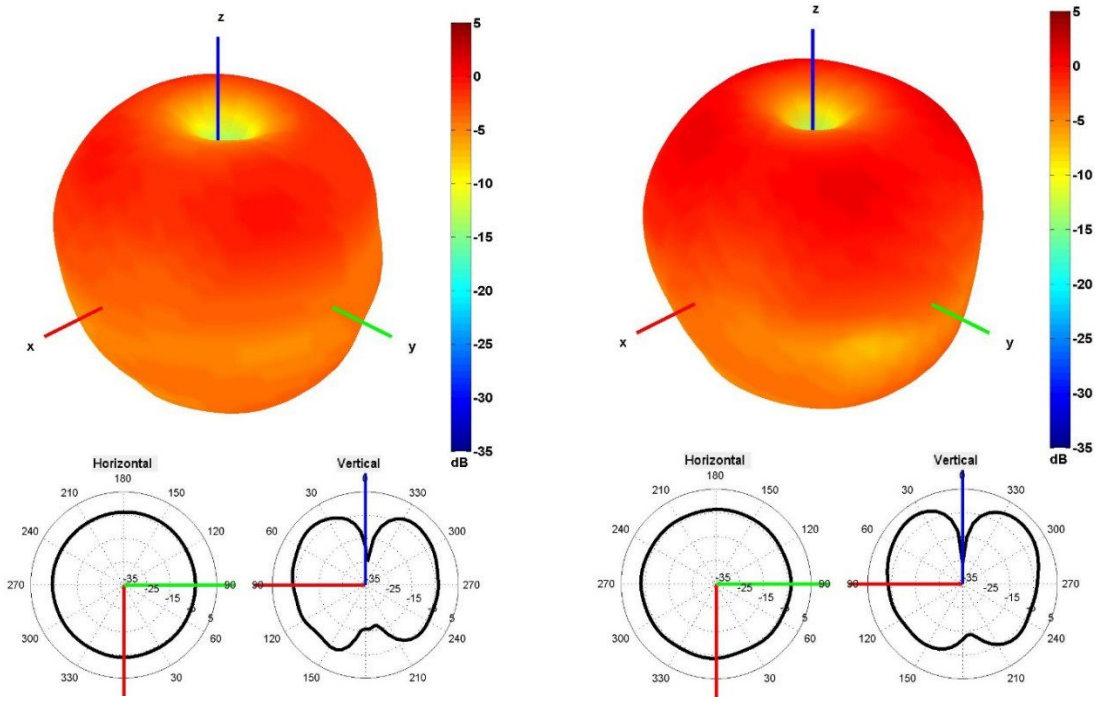

**ENVELOPE CORRELATION COEFFICIENT FOR CABLES 2 AND 3**



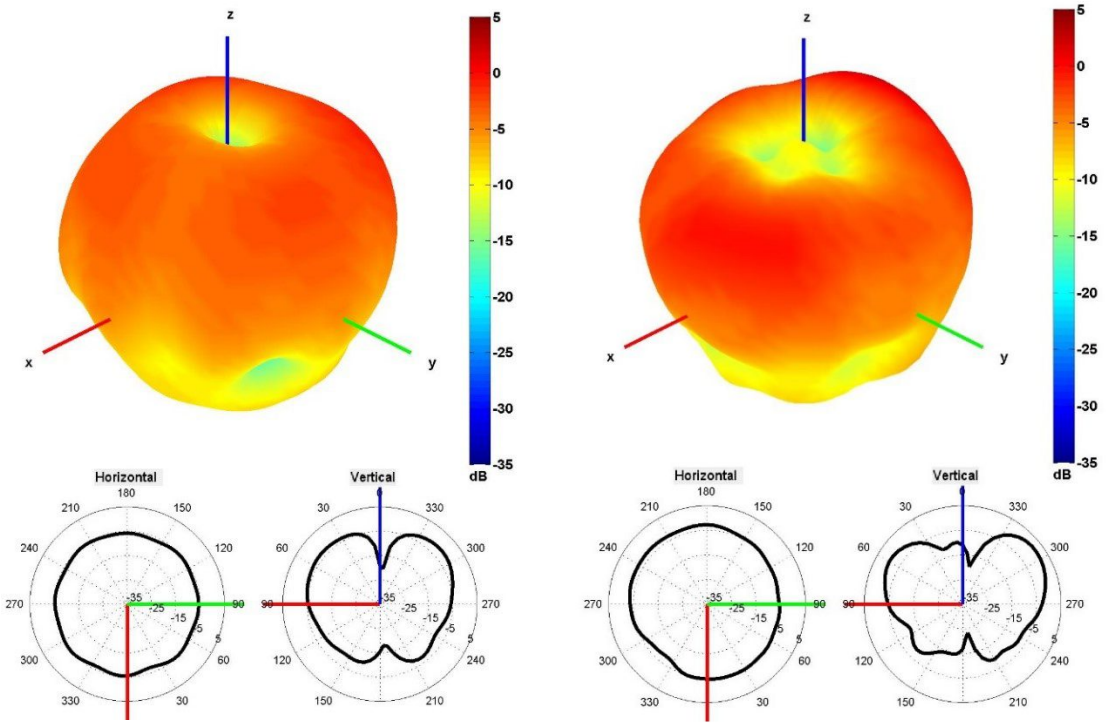



Radiation pattern reference

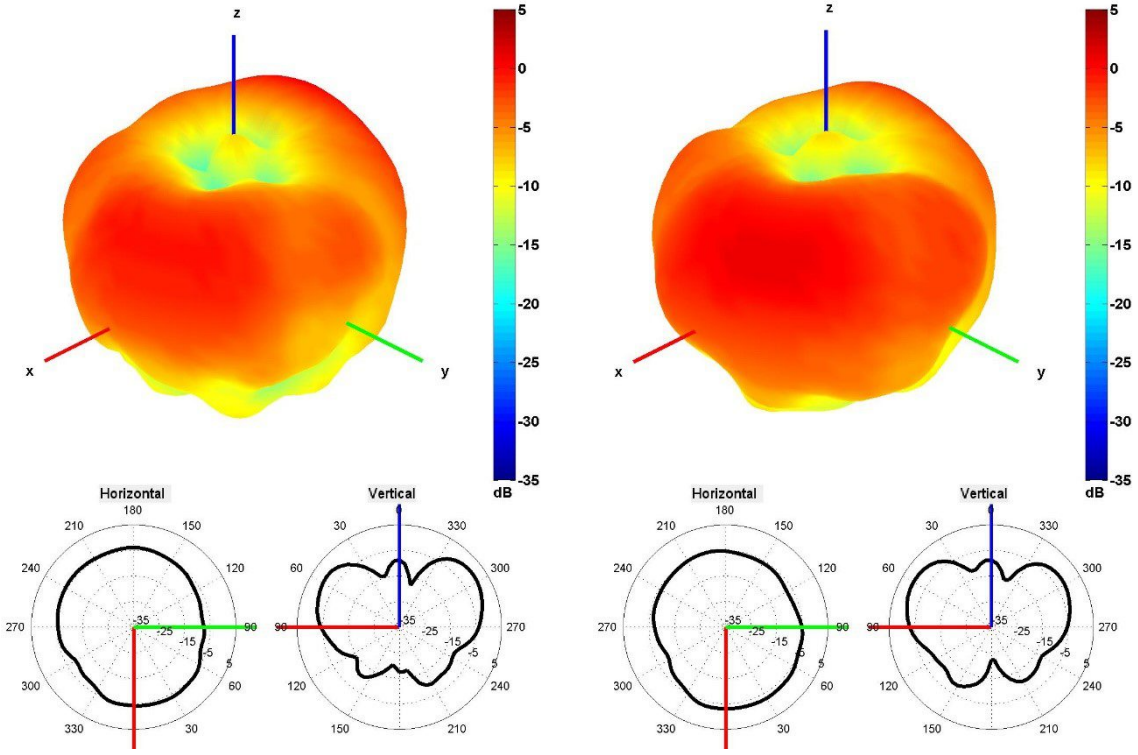
**Cable 1: CELLULAR/LTE**



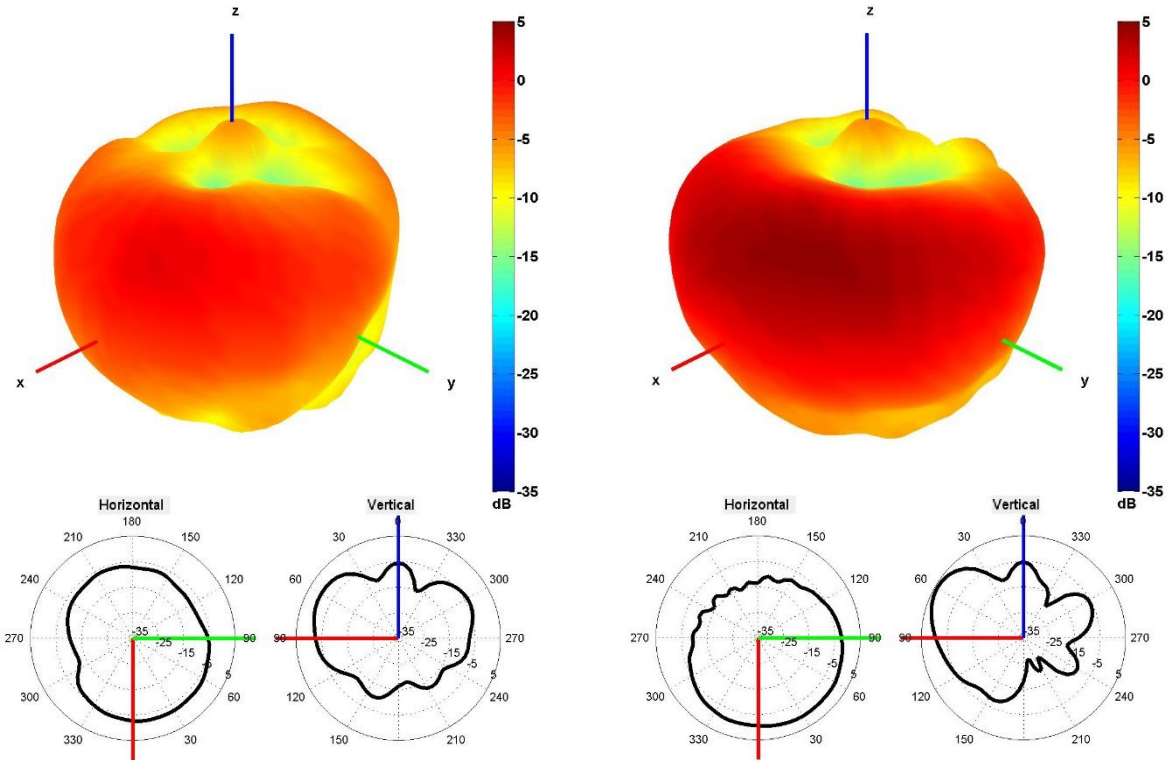

750 and 850 MHz Radiation pattern




940 and 1750 MHz Radiation pattern

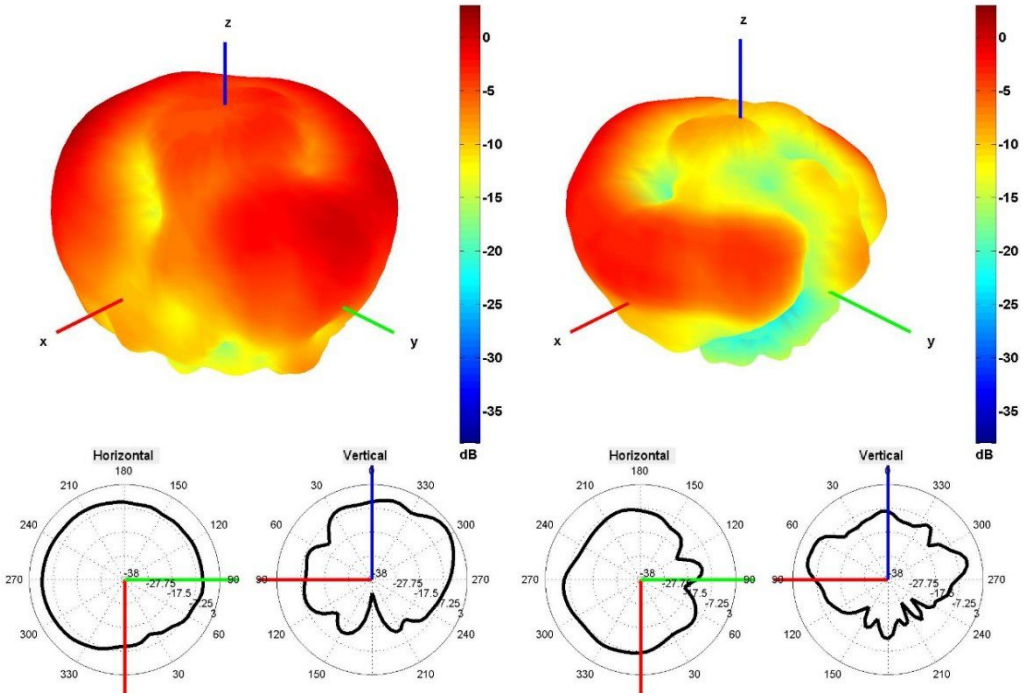



1850 and 1950 MHz Radiation pattern



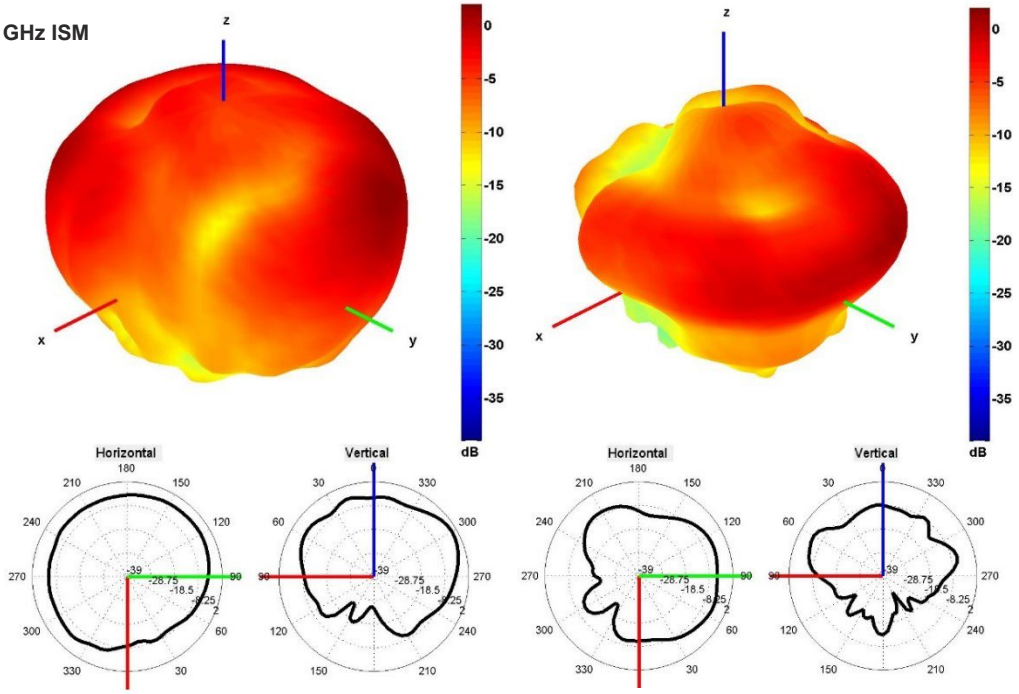

2100 and 2600 MHz Radiation pattern

**Cable 2: 2.4/5.0 GHz ISM**



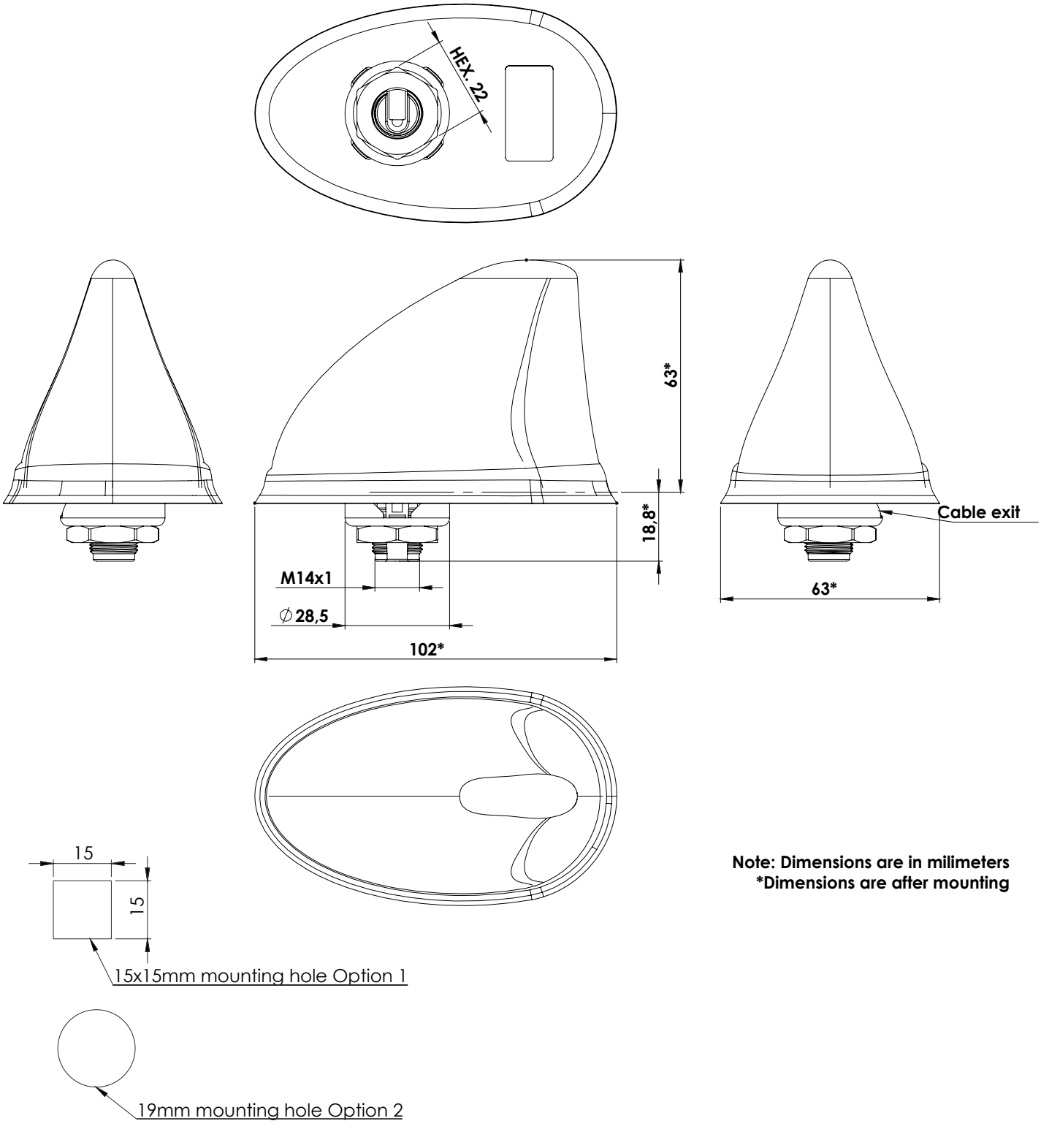

2450 and 5500 MHz Radiation pattern

**Cable 3: 2.4/5.0 GHz ISM**




2450 and 5500 MHz Radiation pattern

## 5. Antenna drawings




**Note: Dimensions are in milimeters**
***Dimensions are after mounting**

## 6. Antenna Images