

## 2J7050JGFa

CELLULAR/LTE MIMO, 2.4/5.0 GHz ISM MIMO and GNSS

### Key Features

**Cable 1 and 2: CELLULAR / LTE**

**Cable 3 and 4: 2.4/5.0 GHz ISM**

**Cable 5: GPS/GLONASS/QZSS/Galileo**

Mast Mount

Heavy Duty antenna

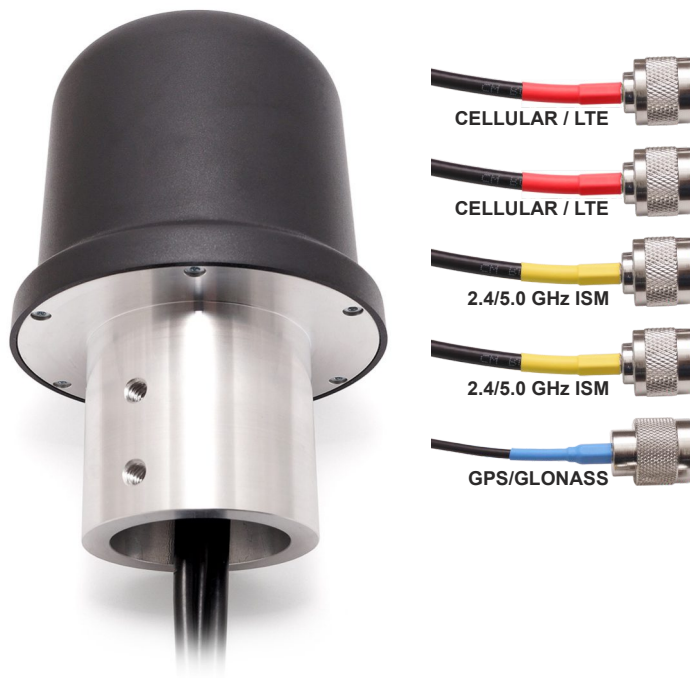
High Performance

Ground Plane Independent

Customizable Cable and Connector

Dimensions: Ø 96 x H 90 mm

Certificates: IP67, IP69, IK09



## 1. Antenna Description

### 2J7050JGFa

#### The heavy-duty antenna that offers multiple technologies in one small form factor

With one of the smallest form factor designs, this antenna is packed with a 5-in-1 configuration. Providing connectivity for LTE-MIMO, Dual WiFi-MIMO, GNSS, GPS and GLONASS it makes it ideal for international use in application where data integrity is a must. With a high gain and up to 60% efficiency across worldwide 4G LTE, 3G and 2G bands the 2J7050JGFa antenna makes a superior candidate for high-end public safety applications such as police, ambulance, fire services, HD video broadcasting, resource management, transportation, critical communications, and other industries.

Having an extremely low ECC (Envelope Correlation Coefficient) allows for low latency and high data transfer rates. High gain, low noise, and post-filtered GNSS allow for more accurate geo-location and navigation, as well as high-performance dual WI-FI-MIMO antennas for better signal reception.

The 2J7050JGFa system provides five output cables connected to the respective antennas. Cables one and two allow access to the Cellular/LTE antenna creating the MIMO configuration for this application. Cables three and four are allocated to 2.4GHz and 5.0GHz ISM antennas providing the same MIMO configuration. Cable five serves access to the GPS/GLONASS/GNSS antenna.

#### Installation

This antenna comes with a specific mast mounting installation system made of aluminum alloy implementing a low loss cables thread through a single mounting hole for easy installation. This antenna provides an anti-rotation mounting design, removing the possibility of cables getting cut through the lifetime of the product. Cables and connectors can be customized to specific requirements based on the end-use application and needs.

#### Durability

The IP67 and IP69 ingress ratings provide this compact antenna with maximum protection against dust and water penetration, while the IK09 rating adds an extra level of anti-vandal security, with high impact resistance. This antenna design has also been tested to comply with EN61373 (Vibration and Shock) and EN45545-2 (Fire Protection) for use in railway applications while the UV stable housing material is available in a range of colored finishes.

#### Typical applications

- Infotainment systems
- WiFi hotspot
- HD video transmission
- Dash cameras
- Connected cars
- Self-driving cars
- Fleet management
- Gateways
- Routers
- Public transportation
- Logistics
- And others

#### Compatibility Standards

##### LTE Cables

- CAT 1 2 3 4 5 6 7 8 9 10 11 12
- NB-IoT, LTE-NB1, CAT-M1, CAT-M2WCDMA, 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                   |                     |           |
|-----------------------------|------------------------------------------|---------------------|-----------|
| <b>Standards</b>            | 2G,3G and 4G                             |                     |           |
| <b>Band (MHz)</b>           | 700/850/900                              | 1700/1800/1900/2100 | 2600      |
| <b>Frequency (MHz)</b>      | 698-960                                  | 1710-2170           | 2500-2700 |
| <b>Return Loss (dB)</b>     | ~-10.6                                   | ~-15.6              | ~-11.7    |
| <b>VSWR</b>                 | ~1.9:1                                   | ~1.6:1              | ~1.7:1    |
| <b>Efficiency (%)</b>       | ~57                                      | ~57                 | ~47       |
| <b>Peak Gain (dBi)</b>      | ~2.1                                     | ~4.2                | ~3.1      |
| <b>Average Gain (dB)</b>    | ~-2.4                                    | ~-2.5               | ~-3.3     |
| <b>Impedance (Ohm)</b>      | 50                                       |                     |           |
| <b>Polarisation</b>         | Linear                                   |                     |           |
| <b>Radiation Pattern</b>    | Omni-Directional                         |                     |           |
| <b>Max. Input Power (W)</b> | 25                                       |                     |           |
| <b>Connector Type</b>       | Most RF Connectors (SMA-Male Standard)   |                     |           |
| <b>Cable Length</b>         | Any Cable Length (300 cm Standard)       |                     |           |
| <b>Cable Type</b>           | Other Cables Available (LMR195 Standard) |                     |           |

**Cable 2**

| Parameters                  | CELLULAR / LTE Antenna                   |                     |           |
|-----------------------------|------------------------------------------|---------------------|-----------|
| <b>Standards</b>            | 2G,3G and 4G                             |                     |           |
| <b>Band (MHz)</b>           | 700/850/900                              | 1700/1800/1900/2100 | 2600      |
| <b>Frequency (MHz)</b>      | 698-960                                  | 1710-2170           | 2500-2700 |
| <b>Return Loss (dB)</b>     | ~-11.0                                   | ~-14.3              | ~-16.5    |
| <b>VSWR</b>                 | ~1.9:1                                   | ~1.6:1              | ~1.4:1    |
| <b>Efficiency (%)</b>       | ~63                                      | ~54                 | ~57       |
| <b>Peak Gain (dBi)</b>      | ~3.0                                     | ~3.2                | ~4.0      |
| <b>Average Gain (dB)</b>    | ~-2.0                                    | ~-2.6               | ~-2.4     |
| <b>Impedance (Ohm)</b>      | 50                                       |                     |           |
| <b>Polarisation</b>         | Linear                                   |                     |           |
| <b>Radiation Pattern</b>    | Omni-Directional                         |                     |           |
| <b>Max. Input Power (W)</b> | 25                                       |                     |           |
| <b>Connector Type</b>       | Most RF Connectors (SMA-Male Standard)   |                     |           |
| <b>Cable Length</b>         | Any Cable Length (300 cm Standard)       |                     |           |
| <b>Cable Type</b>           | Other Cables Available (LMR195 Standard) |                     |           |

### Antenna Measurement Conditions:

Mounted on Metal Plate of 30 x 30 cm  
 200 cm of LMR195 Cable  
 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)     | ~-10.4                                   | ~-13.6    |
| VSWR                 | ~1.9:1                                   | ~1.6:1    |
| Efficiency (%)       | ~58                                      | ~64       |
| Peak Gain (dBi)      | ~5.6                                     | ~5.5      |
| Average Gain (dB)    | ~-2.3                                    | ~-1.9     |
| Impedance (Ohm)      | 50                                       |           |
| Polarisation         | Linear                                   |           |
| Radiation Pattern    | Omni-Directional                         |           |
| Max. Input Power (W) | 25                                       |           |
| Connector Type       | Most RF Connectors (SMA-Male Standard)   |           |
| Cable Length         | Any Cable Length (300 cm Standard)       |           |
| Cable Type           | Other Cables Available (LMR195 Standard) |           |

**Cable 4**

| 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)     | ~-8.9                                    | ~-13.6    |
| VSWR                 | ~2.1:1                                   | ~1.6:1    |
| Efficiency (%)       | ~57                                      | ~59       |
| Peak Gain (dBi)      | ~5.5                                     | ~4.4      |
| Average Gain (dB)    | ~-2.4                                    | ~-2.3     |
| Impedance (Ohm)      | 50                                       |           |
| Polarisation         | Linear                                   |           |
| Radiation Pattern    | Omni-Directional                         |           |
| Max. Input Power (W) | 25                                       |           |
| Connector Type       | Most RF Connectors (SMA-Male Standard)   |           |
| Cable Length         | Any Cable Length (300 cm Standard)       |           |
| Cable Type           | Other Cables Available (LMR195 Standard) |           |

**Antenna Measurement Conditions:**

Mounted on Metal Plate of 30 x 30 cm  
 200 cm of LMR195 Cable  
 Measured in Certified CTIA 3D Anechoic Chamber

Cable 5

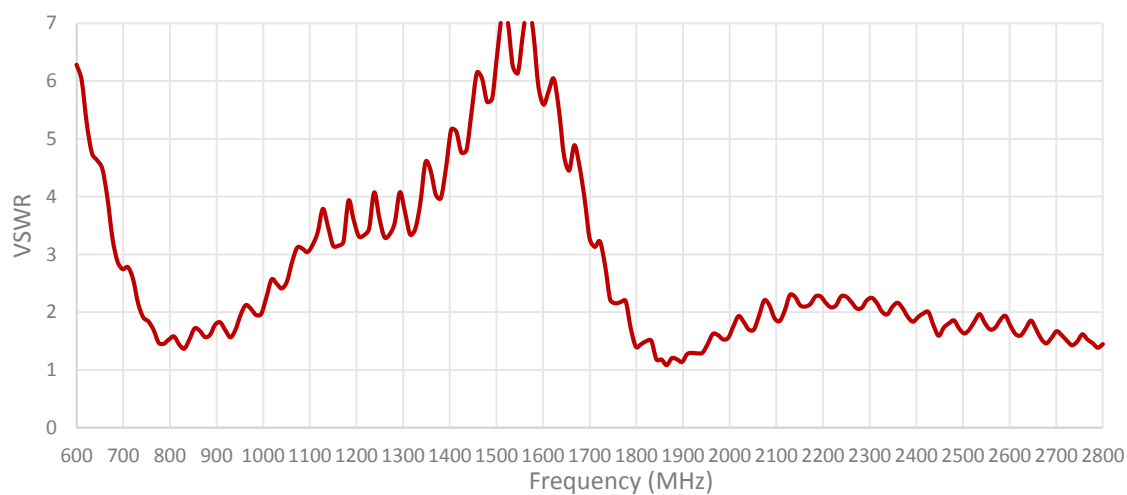
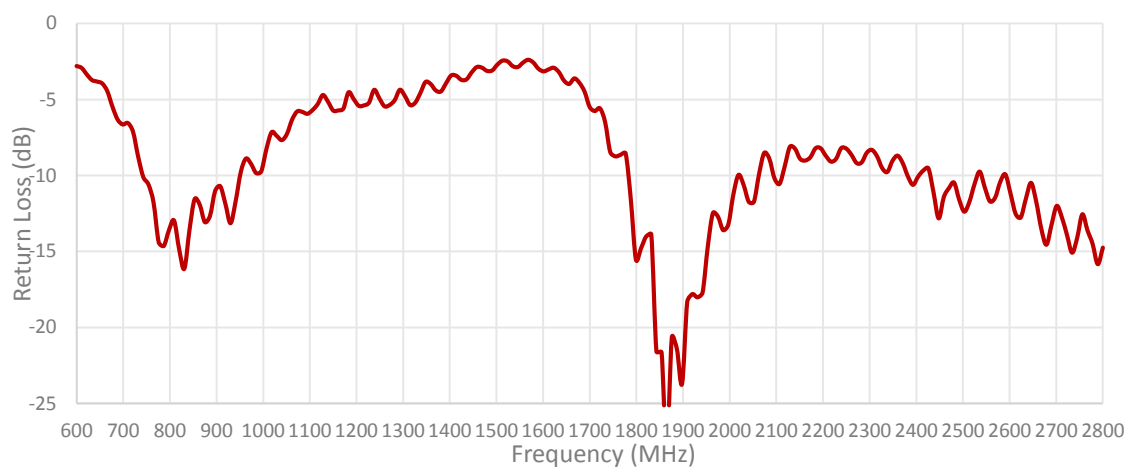
| Parameters                  | GPS/GLONASS Antenna                            |           |
|-----------------------------|------------------------------------------------|-----------|
| Standard                    | GPS/QZSS/Galileo                               | GLONASS   |
| Band (MHz)                  | 1575                                           | 1602      |
| Frequency(MHz)              | 1575.42                                        | 1598-1610 |
| Return Loss (dB)            | <=-14                                          |           |
| VSWR                        | <=1.5:1                                        |           |
| Impedance                   | 50                                             |           |
| Radiation Pattern           | Hemispherical                                  |           |
| Polarization                | RHCP                                           |           |
| Saw Filter                  | Post-Filter                                    |           |
| Active Gain (dB)            | 23 @ 3 V, 24 @ 5 V                             |           |
| Noise Figure (dB)           | 1.2                                            |           |
| Voltage (V)                 | 2.7 - 5.5                                      |           |
| Current Consumption (mA)    | 15 - 25                                        |           |
| Power Consumption (mW)      | 40.5 - 137.5                                   |           |
| Out of Band Rejection (dBc) | ~32                                            |           |
| Connector Type              | SMA-Male Standard (Other Connectors Available) |           |
| Cable Length                | 300 cm Standard (Any Cable Length Available)   |           |
| Cable Type                  | LMR100 Standard (Other Cables Available)       |           |

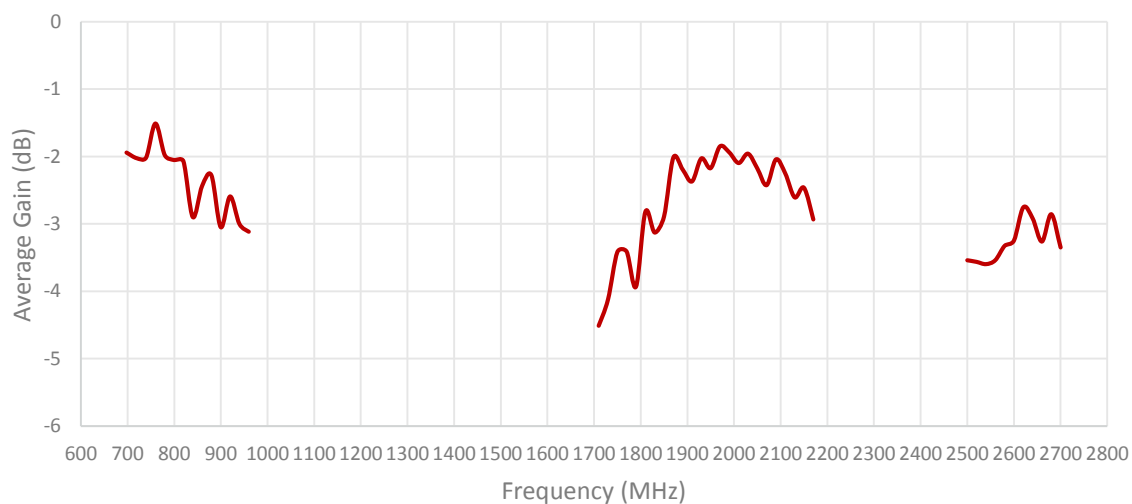
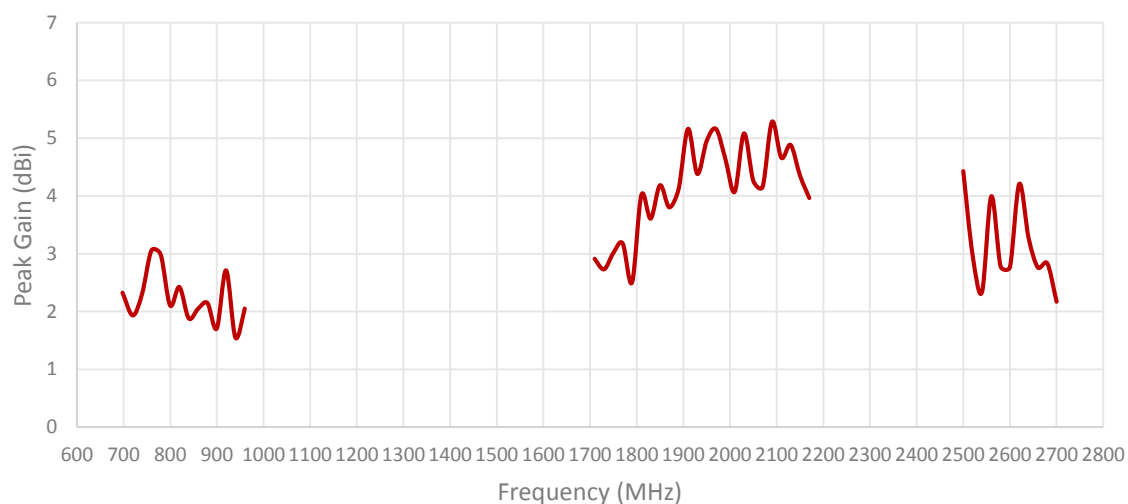
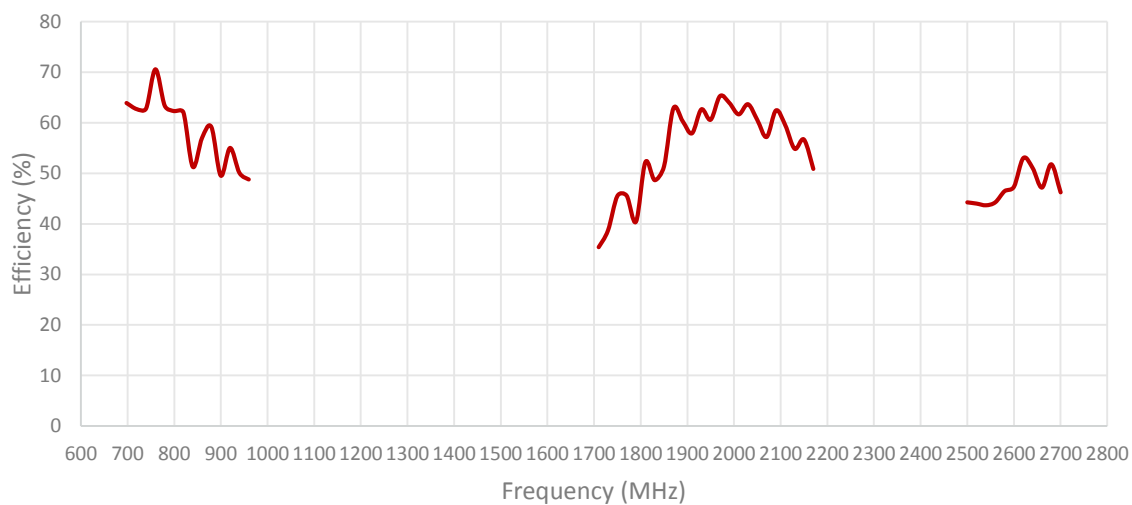
### 3. Mechanical and environmental specifications

| Specifications            | 2J7050JGFa       |
|---------------------------|------------------|
| Mounting Type             | Mast Mount       |
| Dimensions (mm)           | Ø 96 x H 90      |
| Radome                    | ASA              |
| Radome color              | White, Black     |
| Antenna Base              | Alluminium alloy |
| Operating Temperature (C) | -40 to +85       |
| Storage Temperature (C)   | -40 to +85       |
| Substance Compliance      | RoHS             |
| Certificates              | IP67, IP69, IK09 |

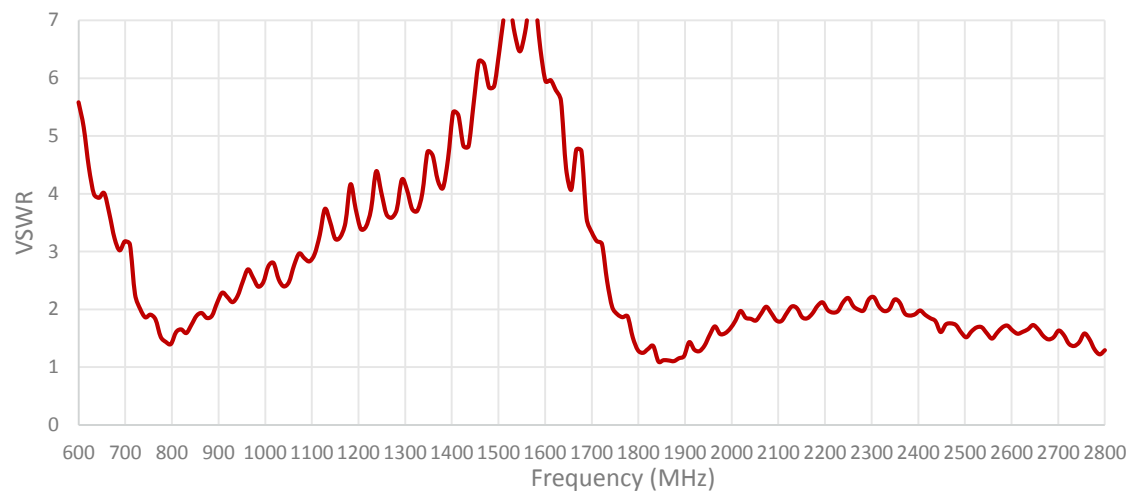
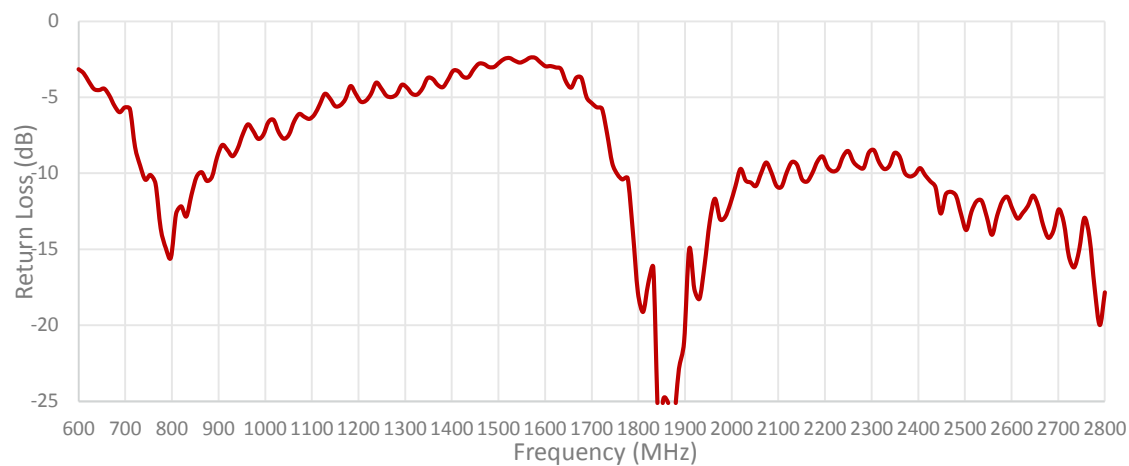
## 4. Antenna parameters

**Cable 1: CELLULAR/LTE**

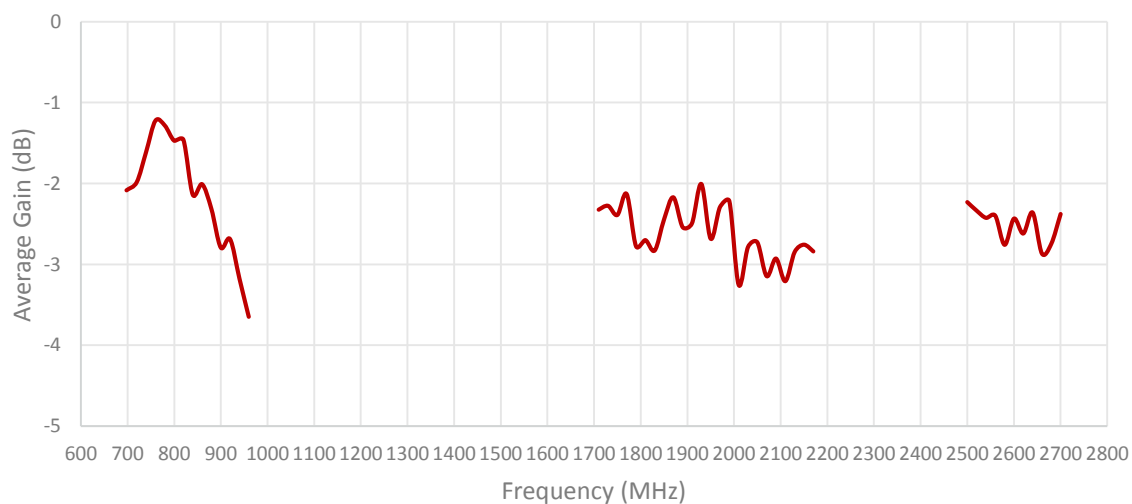
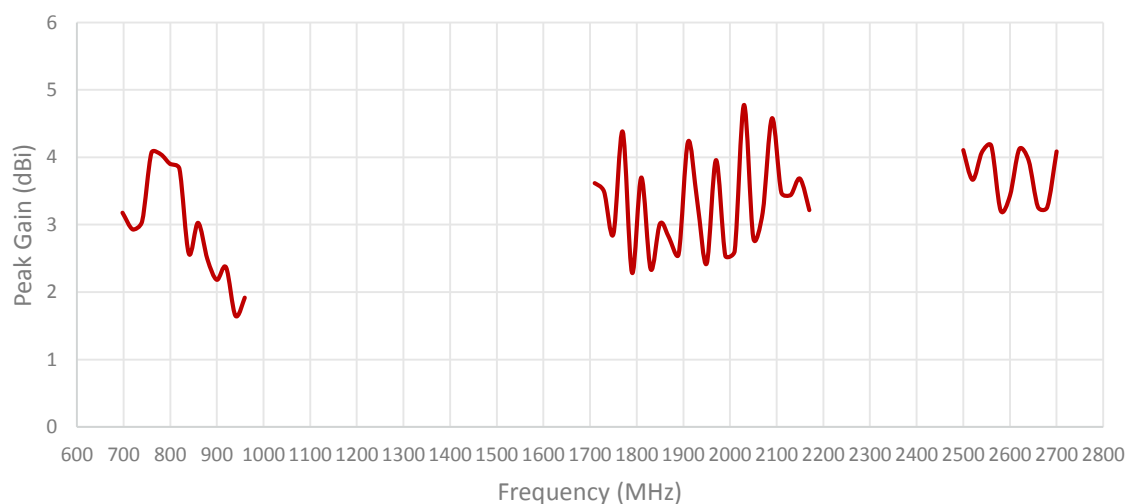
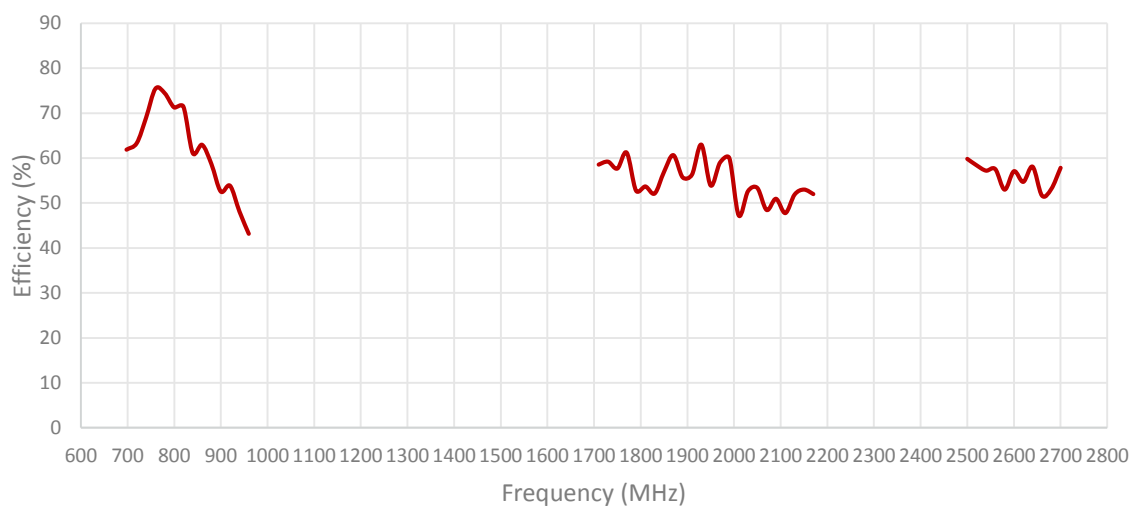




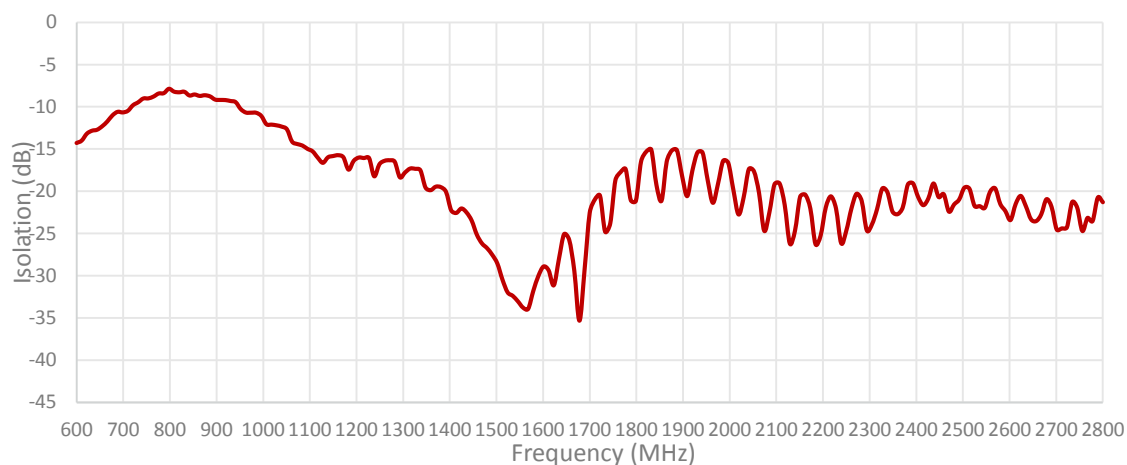
**Cable 2: CELLULAR/LTE**



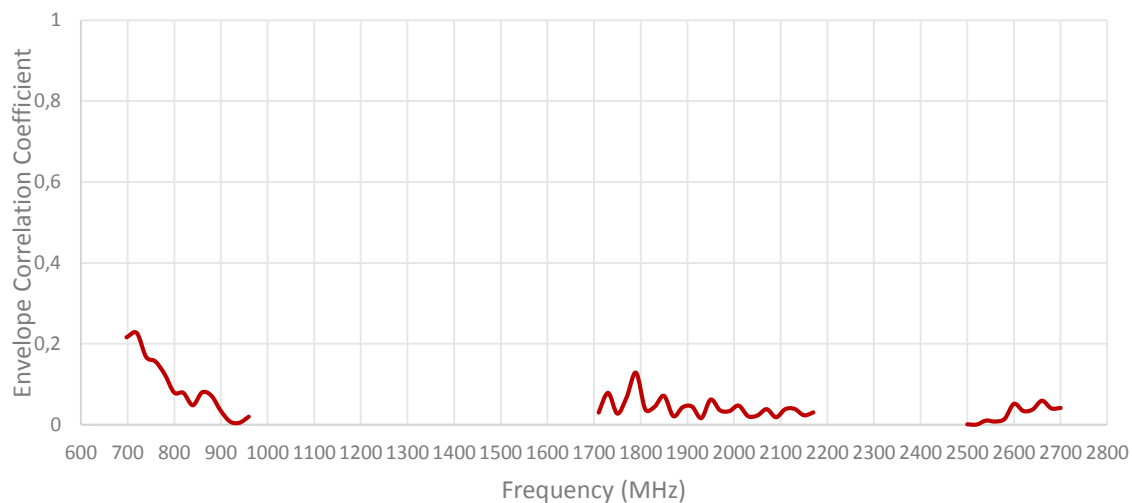




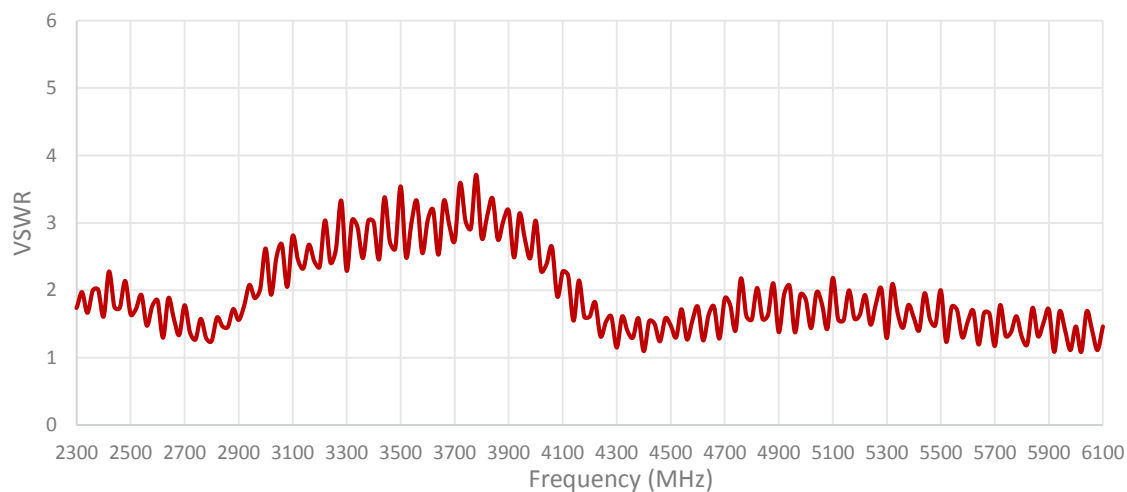
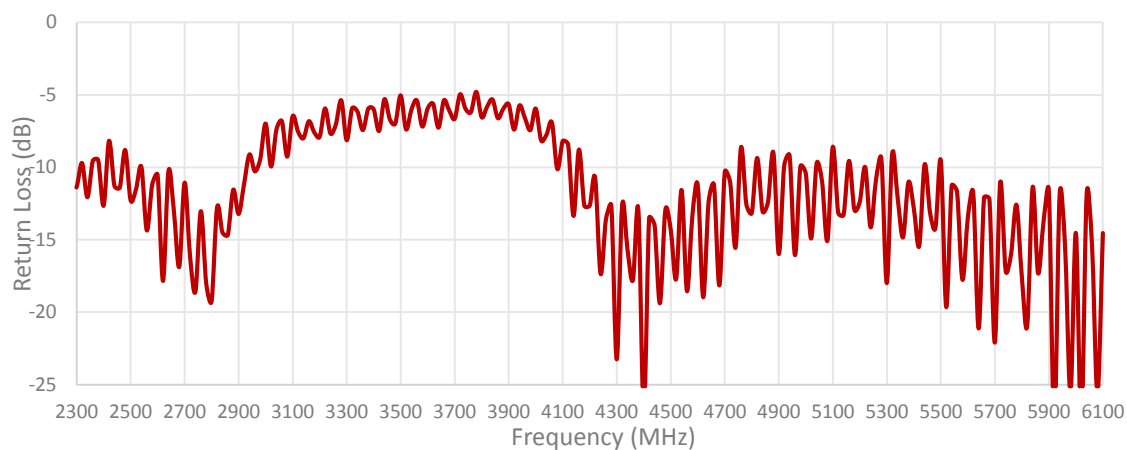
## ISOLATION FOR CABLES 1 AND 2

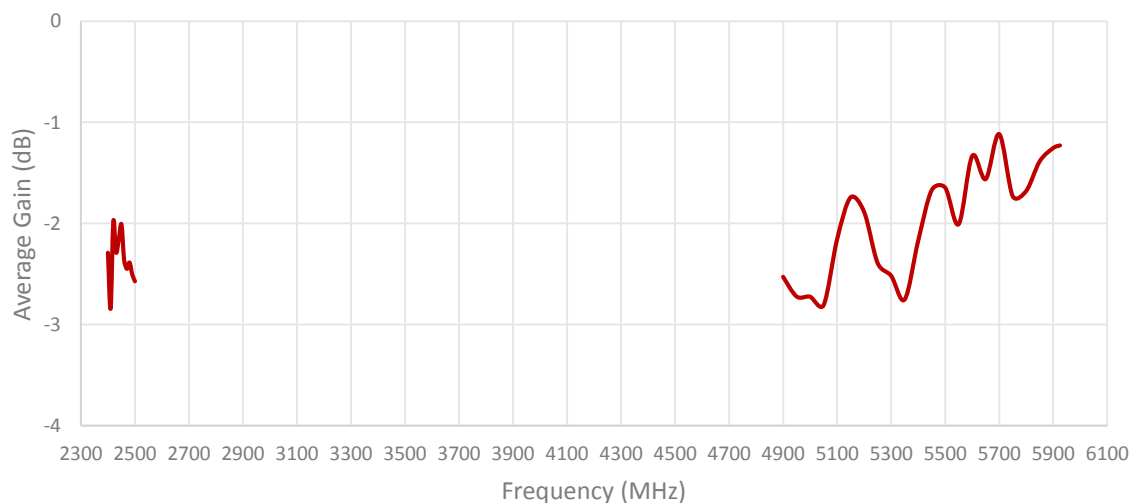
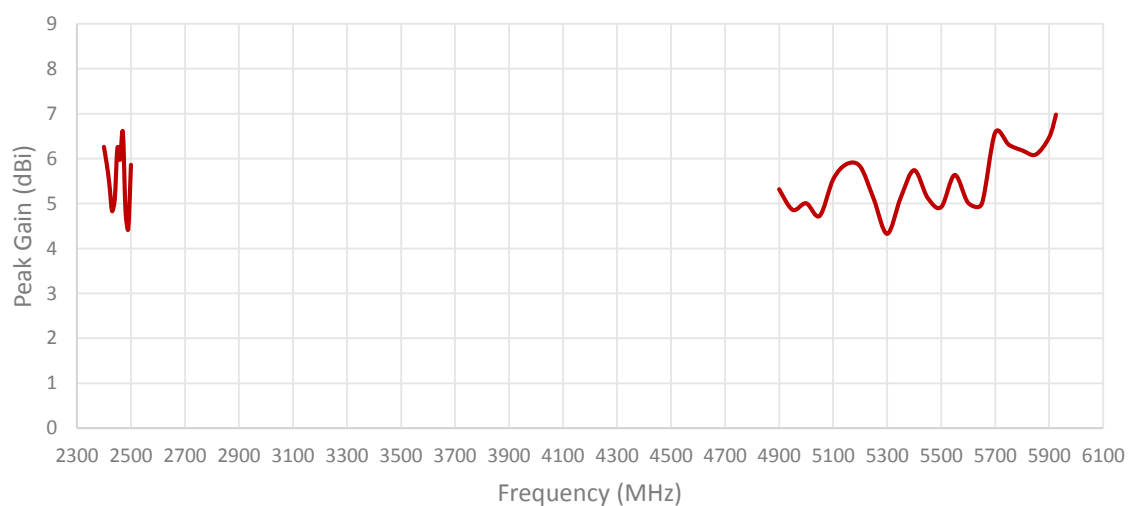
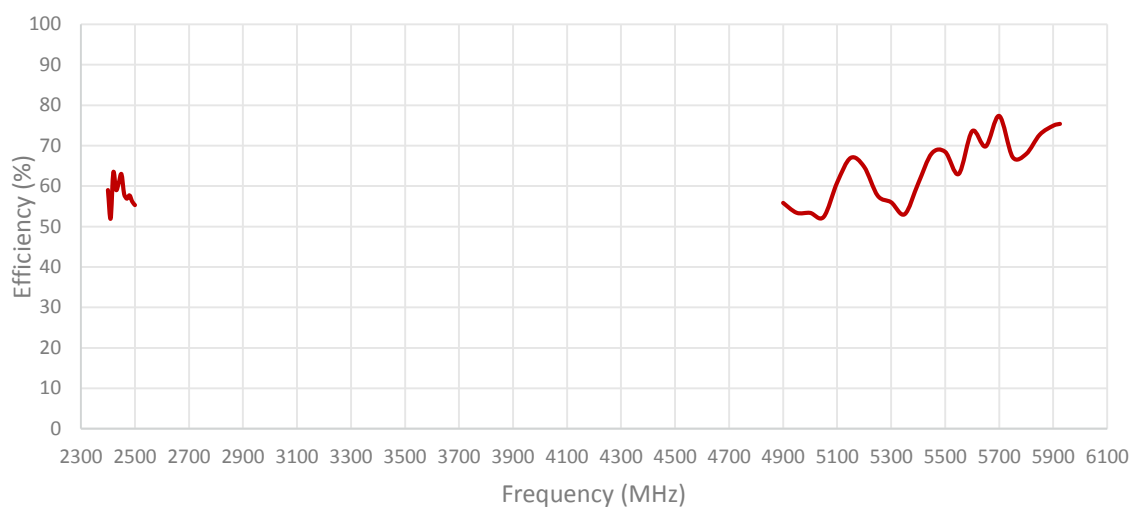


## ENVELOPE CORRELATION COEFFICIENT FOR CABLES 1 AND 2

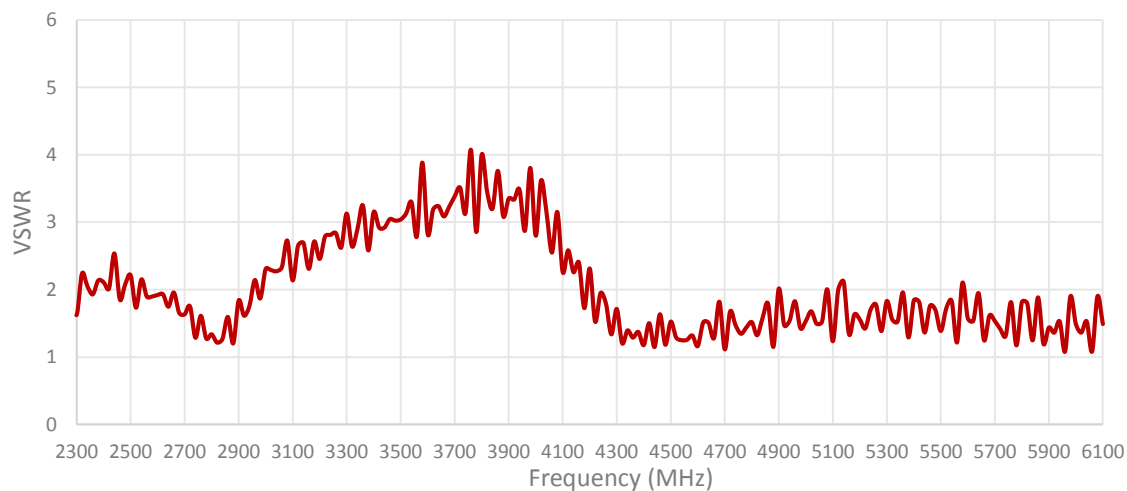
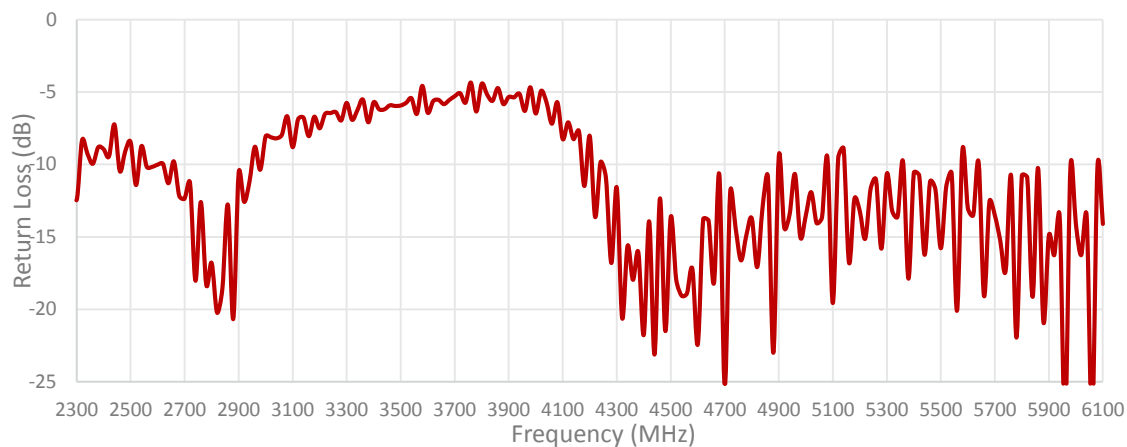


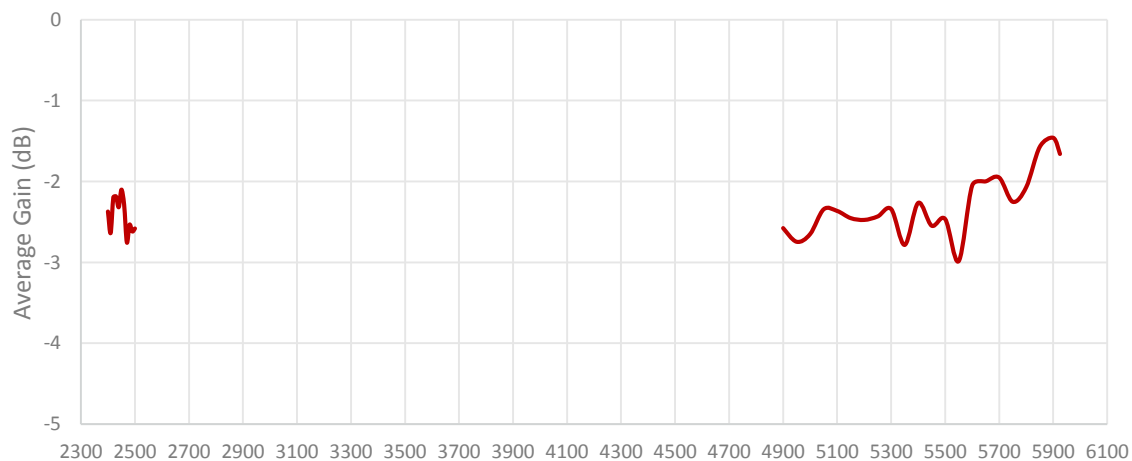
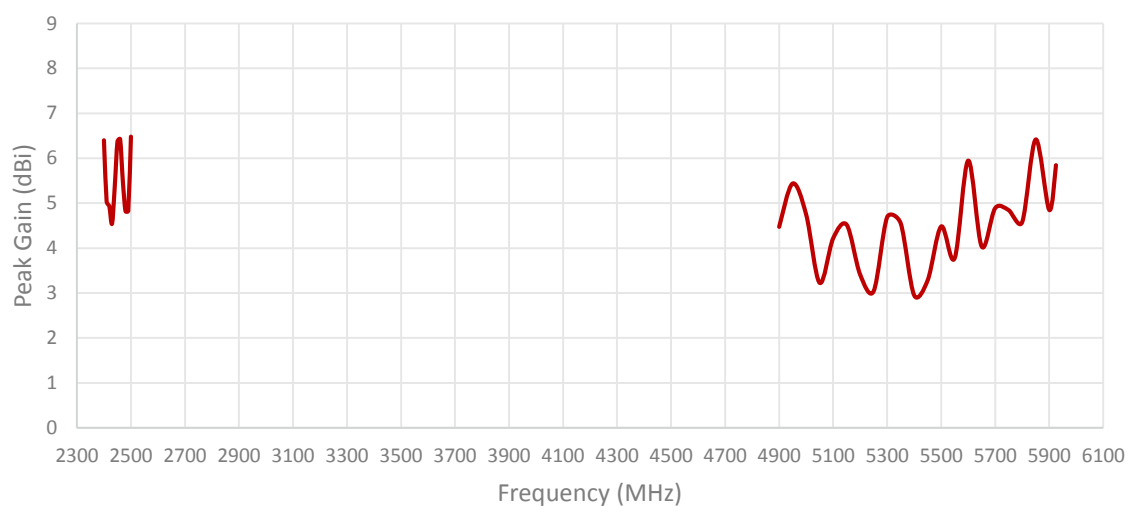
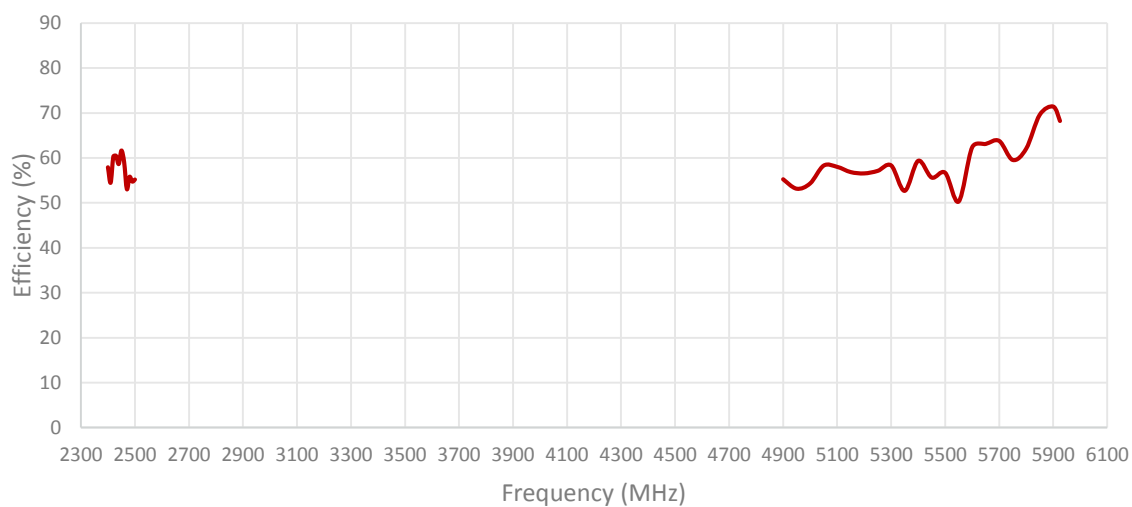
**Cable 3: 2.4/5.0 GHz ISM**



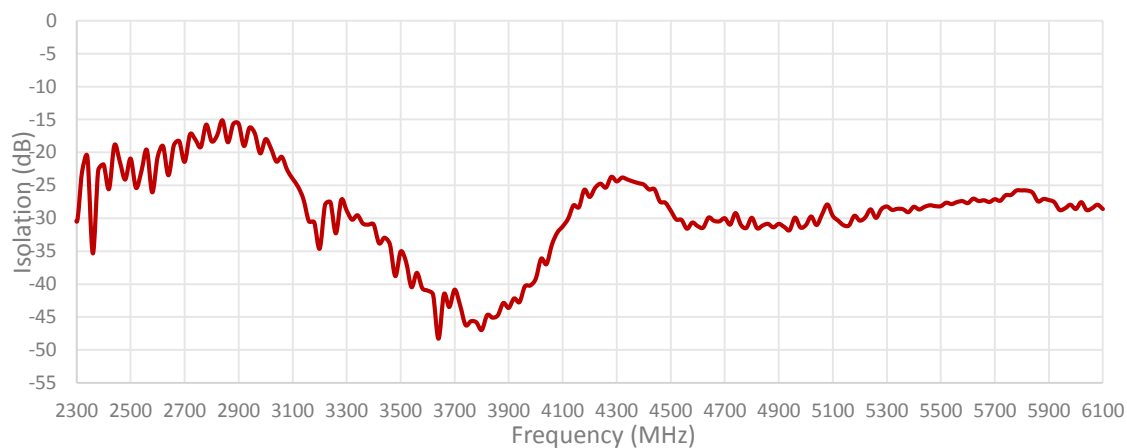


**Cable 4: 2.4/5.0 GHz ISM**

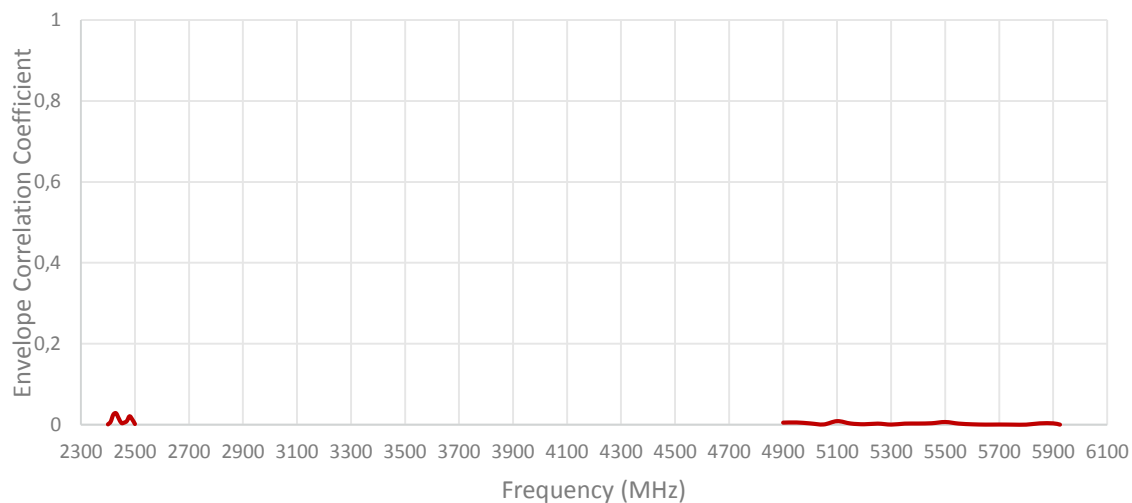




#### ISOLATION FOR CABLES 3 AND 4



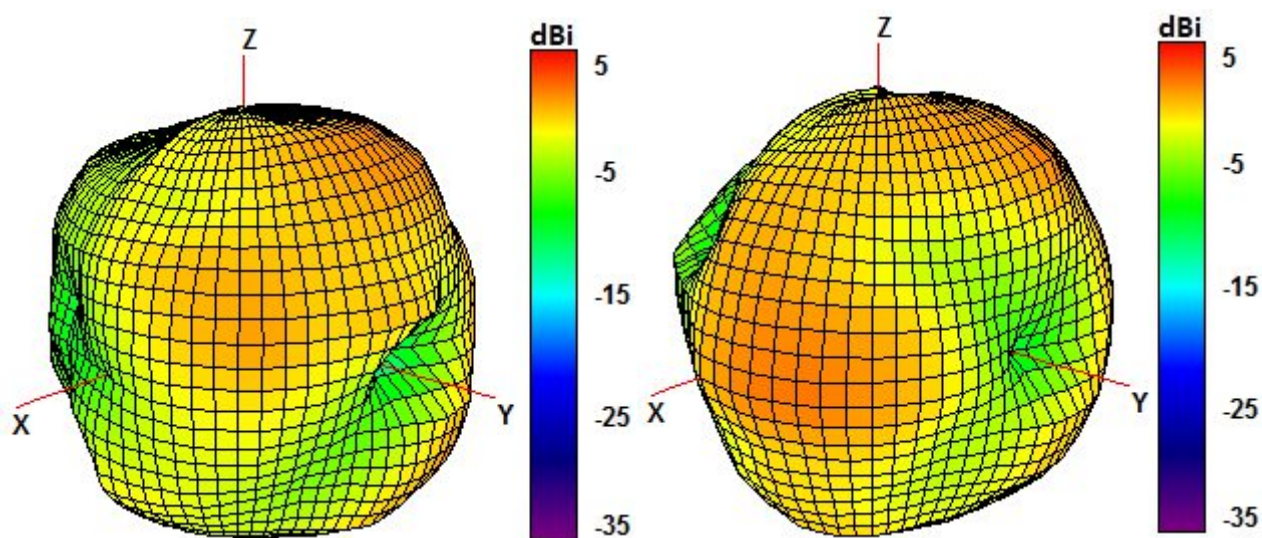
#### ENVELOPE CORRELATION COEFFICIENT FOR CABLES 3 AND 4





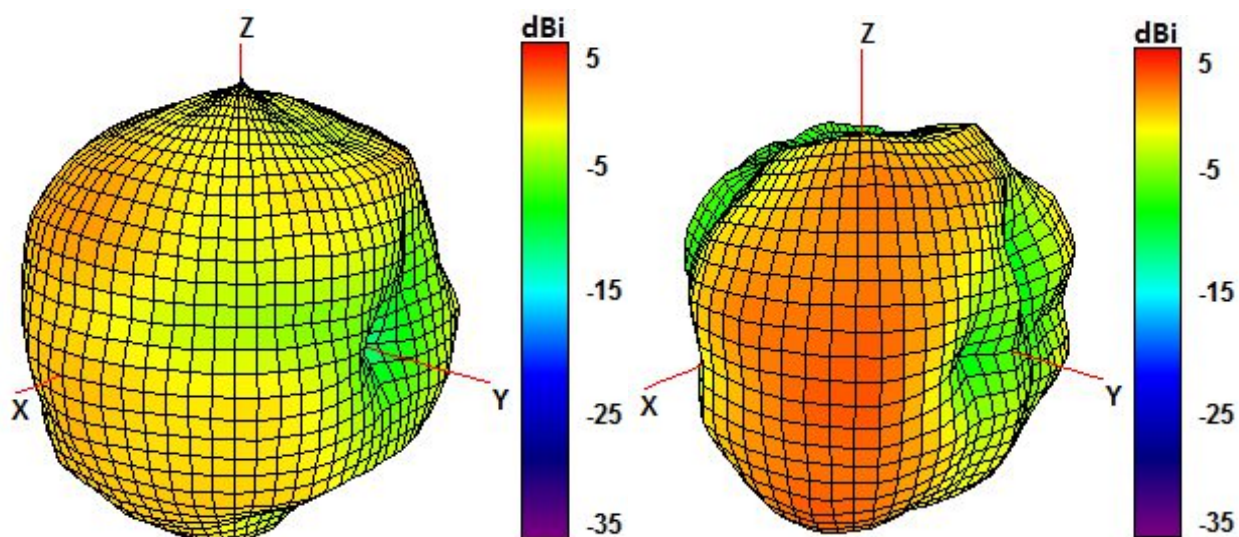
Radiation pattern reference

Cable 1: CELLULAR/LTE

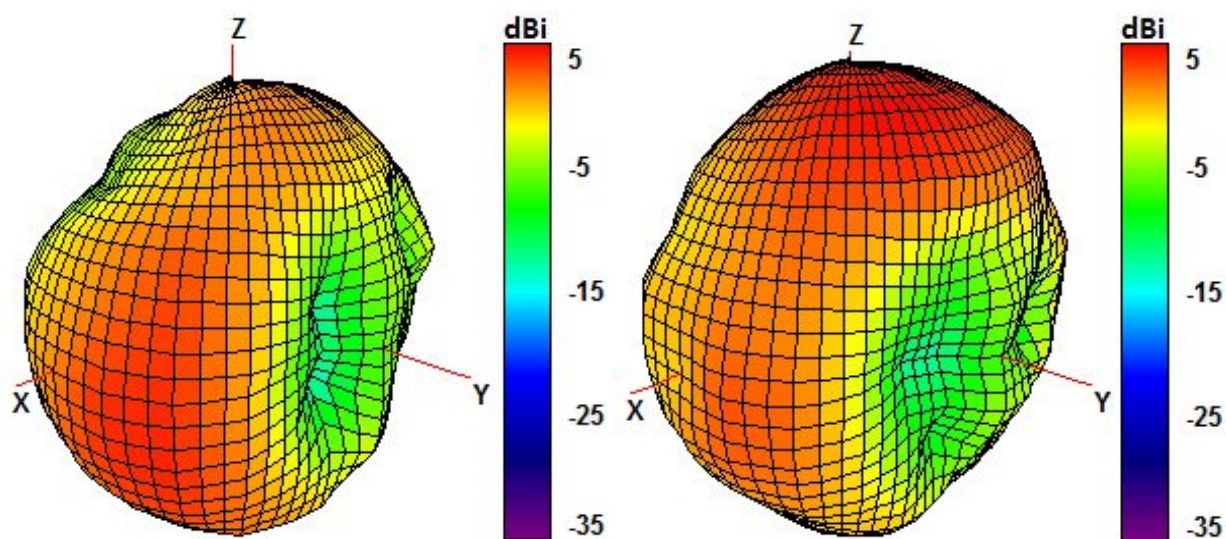


750 and 850 MHz Radiation pattern

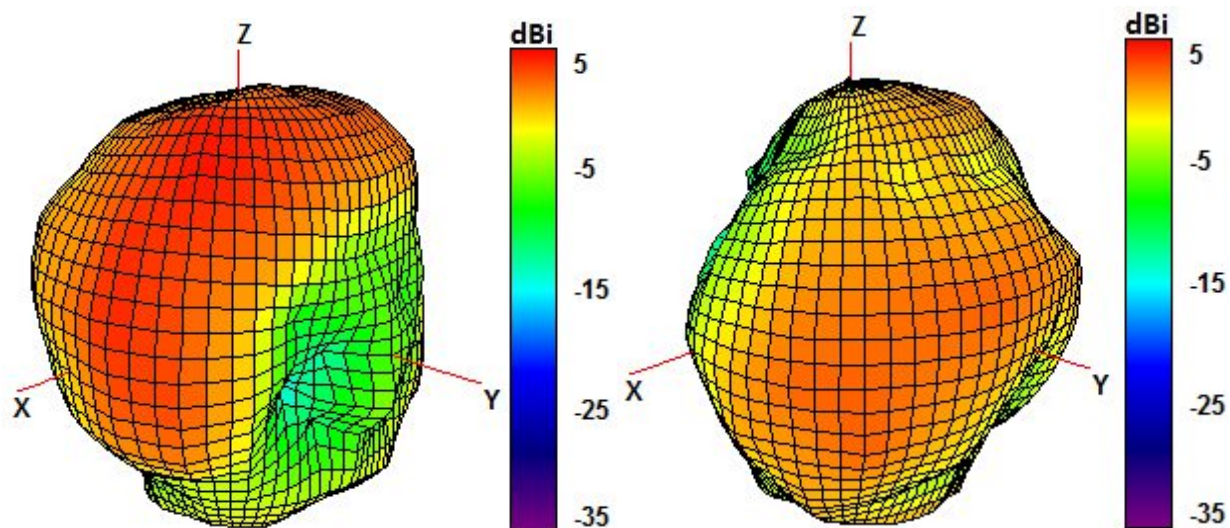




940 and 1750 MHz Radiation pattern

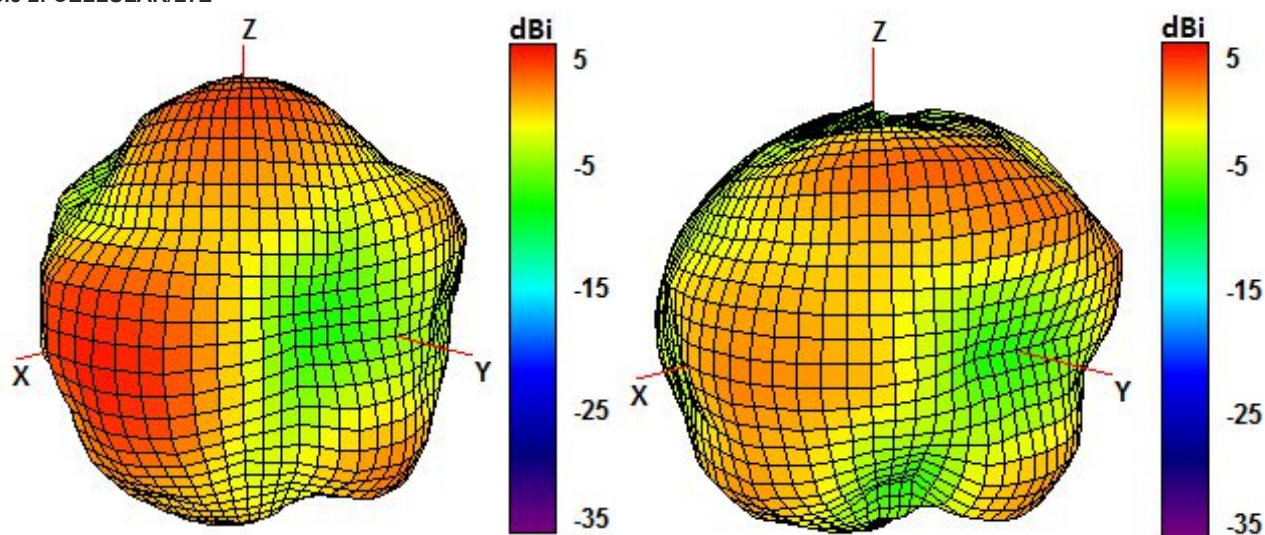


1850 and 1950 MHz Radiation pattern



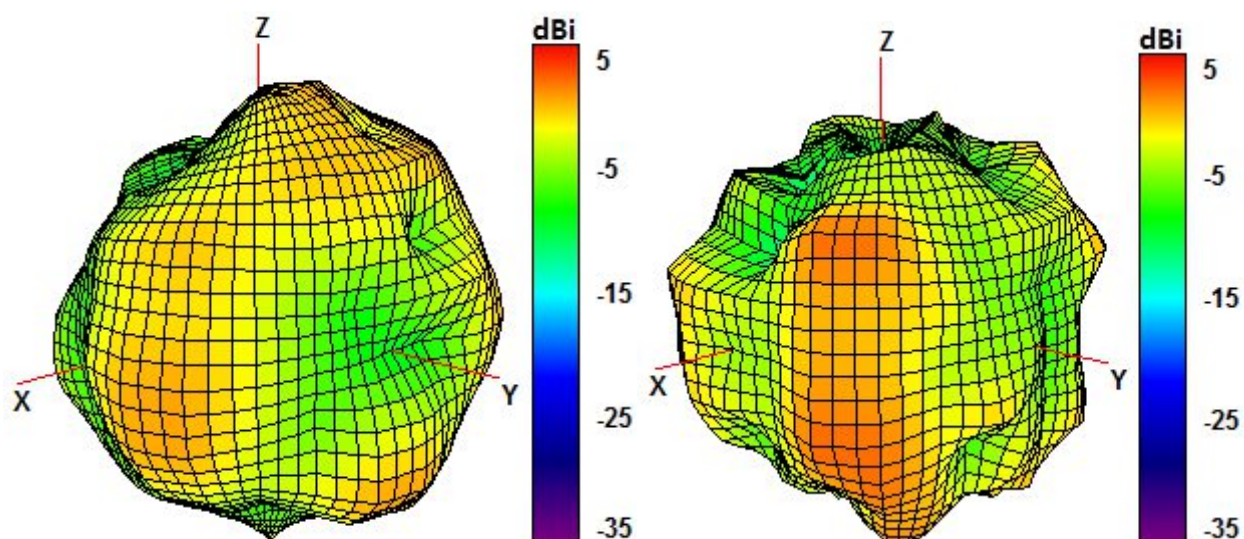
2100 and 2600 MHz Radiation pattern

Cable 2: CELLULAR/LTE

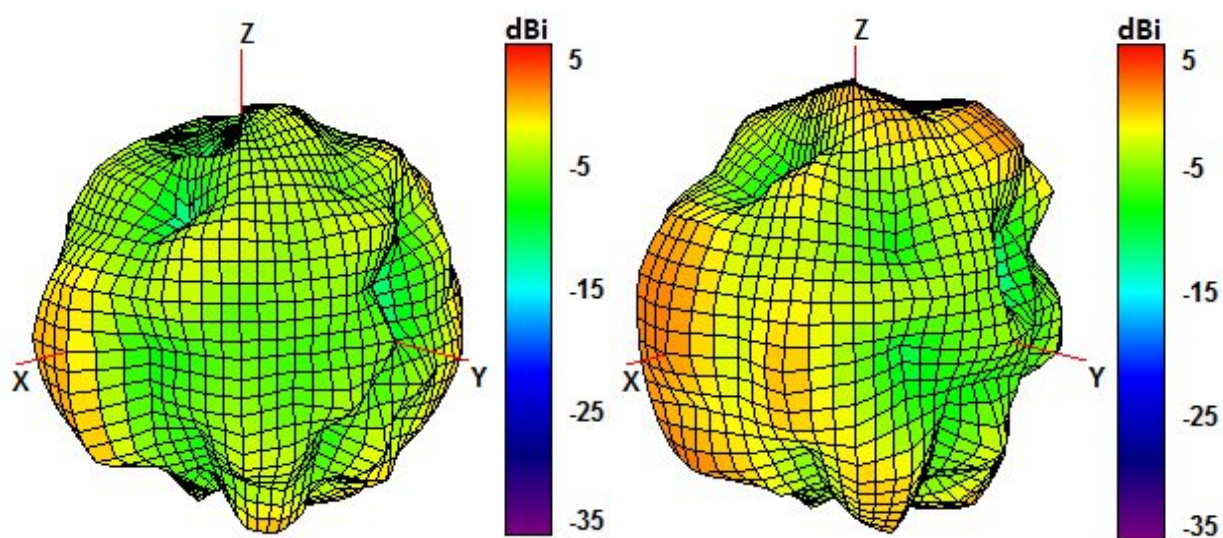


750 and 850 MHz Radiation pattern

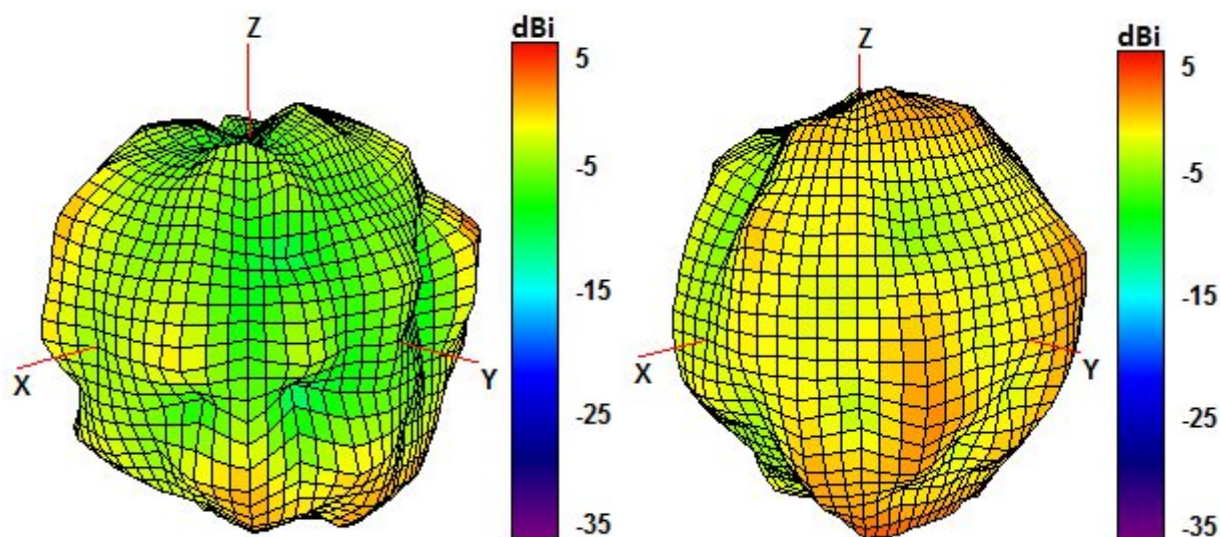




940 and 1750 MHz Radiation pattern

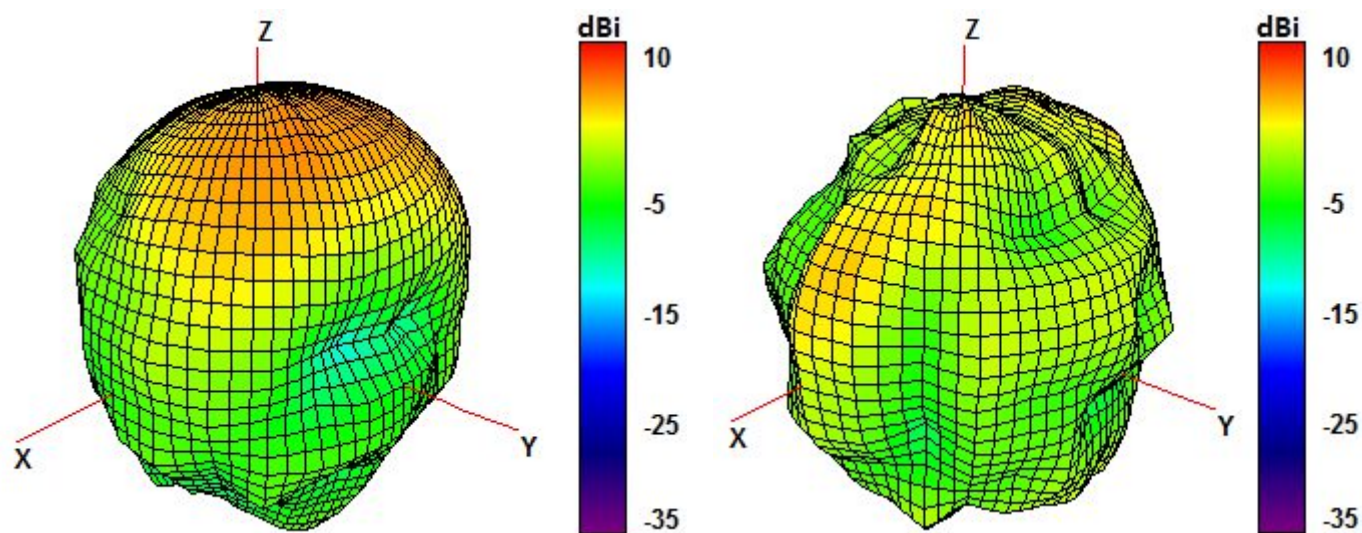


1850 and 1950 MHz Radiation pattern



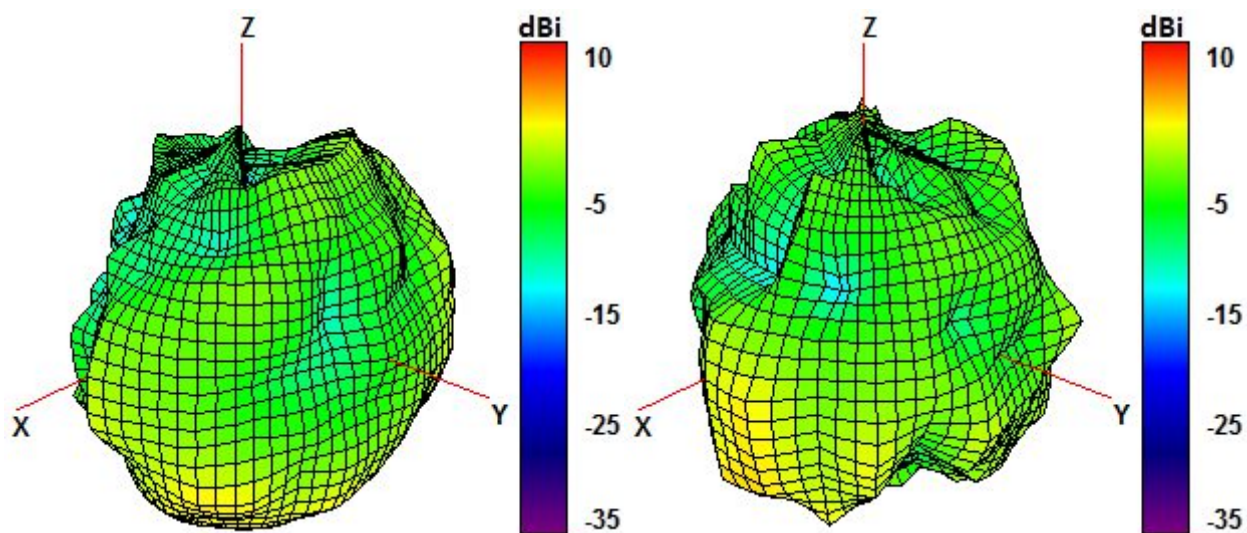
2100 and 2600 MHz Radiation pattern

Cable 3: 2.4/5.0 GHz ISM



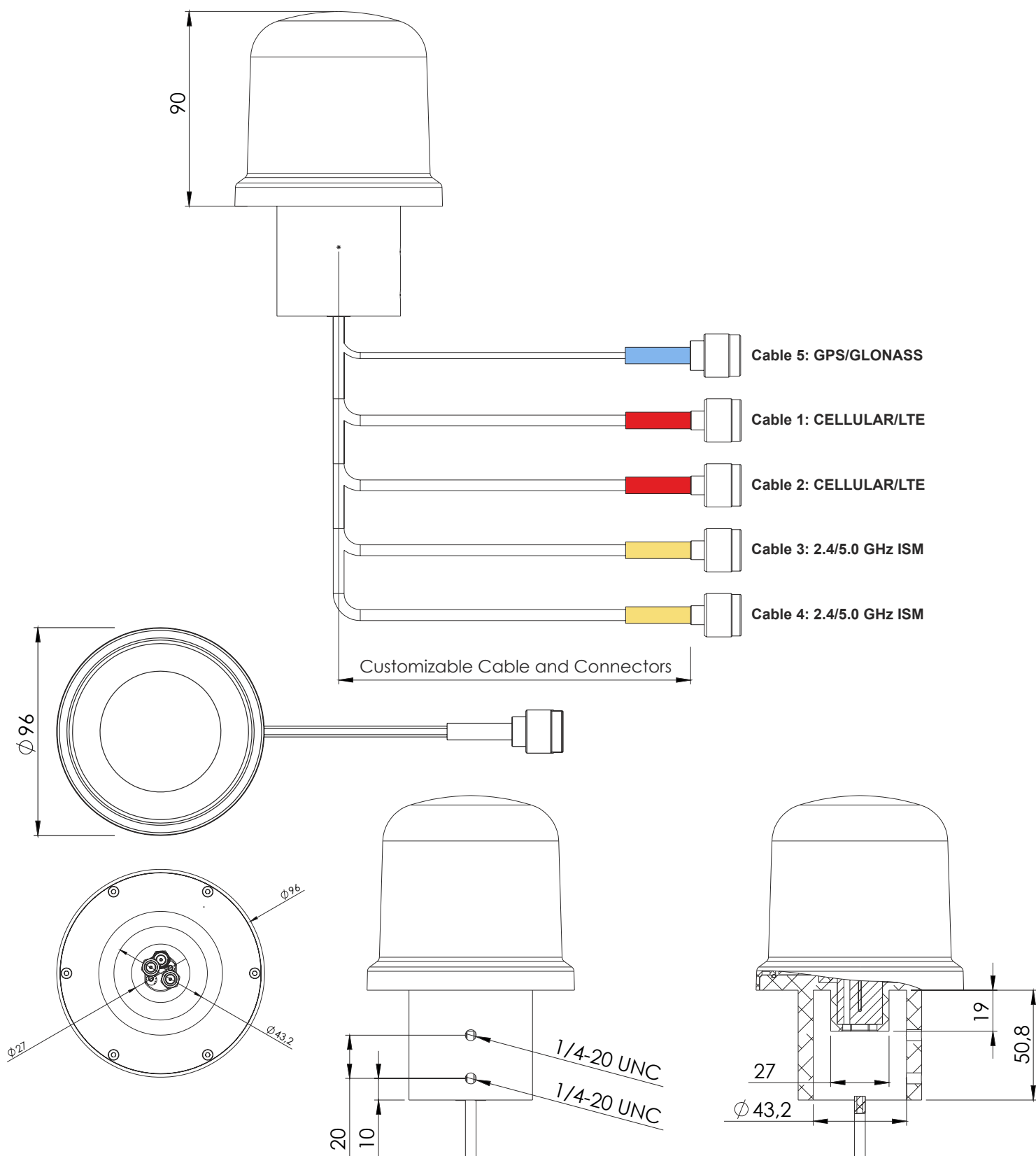
2450 and 5500 MHz Radiation pattern

Cable 4: 2.4/5.0 GHz ISM



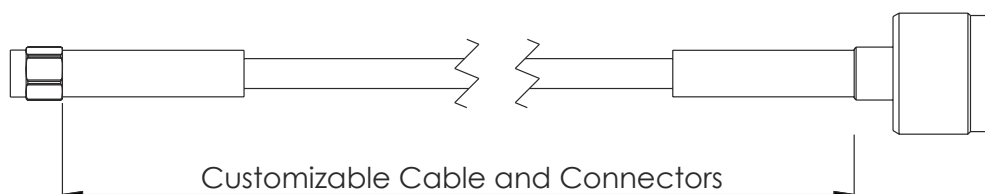
2450 and 5500 MHz Radiation pattern

## 5. Antenna drawings



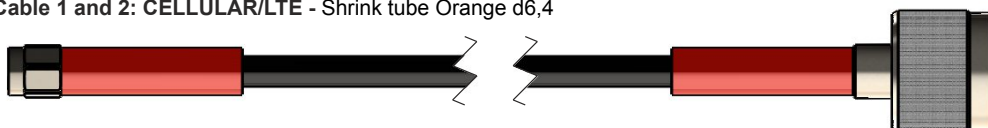


## 6. Jumper cables drawings - Optional



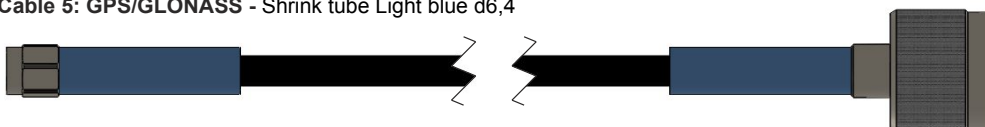
### C318N-LMR195-C91N OST - 2×

Cable 1 and 2: CELLULAR/LTE - Shrink tube Orange d6,4



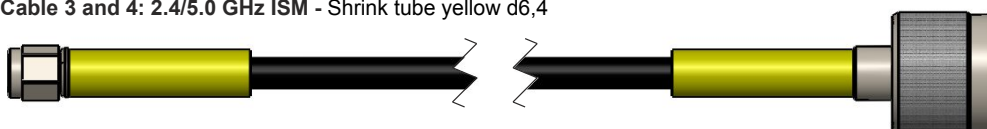
### C318N-LMR195-C91N BST

Cable 5: GPS/GLONASS - Shrink tube Light blue d6,4



### C318N-LMR195-C151N GST - 2×

Cable 3 and 4: 2.4/5.0 GHz ISM - Shrink tube yellow d6,4



## 7. Antenna Images







## Макро Групп – это:

- дистрибьютор электронных компонентов с 1994 года
- контрактный производитель электроники с 2007 года с собственным производством в Санкт-Петербурге (компания Макро ЕМС, входит в ГК Макро Групп)
- поставщик полупроводниковых материалов
- комплексный поставщик электронных компонентов
- моделирование и производство полупроводниковых эпитаксиальных гетероструктур для задач оптоэлектроники

Головной офис расположен в Санкт-Петербурге. Собственные представительства в крупных промышленных городах России и стран СНГ.

## Преимущества для наших заказчиков:

- работа по тендерам с 2012 года
- оформление банковских гарантий
- отсрочки платежей
- поставка электронных компонентов по проектным ценам
- инженерная поддержка проектов заказчиков
- сертификат системы менеджмента качества ISO 9001-2015
- необходимые сертификаты и лицензии

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