TAOGLAS

Datasheet

# Supercombo Permanent Mount 5 in 1 Antenna

**Part No:**
**MA1045.A.ALBTX.002**

**Description:**

MA1045 – 5in1 2*GPS, LTE, SDARS & AM/FM

**Features:**

Combination Antenna Vehicle Mount Antenna

2* GPS Antenna: FAKRA Code C Blue

1* LTE with fallback to 3G/2G: FAKRA Code D Bordeaux Violet

1* SDARS: FAKRA Code K Curry Yellow

1* AM/FM: FAKRA Code A Black

Cable: 300mm RG-174

IP67 Rated Waterproof

Manufactured in TS16949 Automotive Approved Facilities

RoHS & Reach Compliant

# 1. Introduction

The MA1045 Supercombo antenna is the world's smallest next generation 5in1, vehicle roof permanent mount solution. Fully IP67 waterproof with robust ABS+PC housing. The antenna is approved for use on heavy-duty trucks and meets the strictest OEM heavy-duty truck standards. It supports the following bands: Two GPS outputs, LTE (4G/3G/2G), SDARS, and AM/FM/WB.

The antenna is first tier TS16949 heavy-duty truck approved and is an ideal choice for Automotive Telematic and heavy-duty plant applications.

The antenna comes with low-loss RG-174 coaxial pigtail cables as standard, terminating in FAKRA SMB code C for GPS, BNC for AM/FM/WB, FAKRA SMB code K for SDARS, and with FAKRA SMB code D for LTE. The SDARS antenna meets the latest (Gen 3) specifications.

The LTE antenna provides highest efficiency on all common worldwide LTE bands and also works great if the system falls back to 3G and 2G as it also covers these cellular bands. The AM/FM/WB antenna has an in-built amplifier to increase receive signal sensitivity. The antenna works in conjunction with a 12v DC wire that powers the AM/FM/WB circuits. The antenna is manufactured in TS16949 automotive approved facilities.

The cable and connectors are fully customizable, for more information or installation instructions please contact your regional Taoglas Customer Support Team.

# 2. Specifications

| Cellular Antenna | | | | | | | |
|---|---|---|---|---|---|---|---|
| Frequency (MHz) | 698~803 | 824~894 | 880~960 | 1710~1880 | 1850~1990 | 1920~2170 | 2300~2500 |
| **Efficiency (%)** | | | | | | | |
| | 51 | 44 | 46 | 38 | 38 | 36 | 44 |
| **Peak Gain (dBi)** | | | | | | | |
| | 0.6 | 2.7 | 2.7 | 4.4 | 2.2 | 1.2 | 4.6 |
| **Average Gain (dB)** | | | | | | | |
| | -2.7 | -3.1 | -3.3 | -4.1 | -4 | -4.3 | -3.5 |
| Impedance | 50 Ω | | | | | | |

| SDARS Antenna | |
|---|---|
| Frequency (MHz) | 2320~2345 |
| **Efficiency (%)** | |
| 64 | |
| **Peak Gain (dBi)** | |
| 5.4 | |
| **Average Gain (dB)** | |
| -1.9 | |
| Polarization | LHCP |

| GPS Antenna(Feed 1) | |
|---|---|
| Frequency | BeiDou : 1561.098 ± 2.046MHz.<br>GPS : 1575.42 ± 1.023MHz |
| Return loss (GPS L1) | < -10 dB |
| Passive Gain at Zenith (GPS L1) | +3dBi typ. |
| Average Gain (GPS L1) | -4.5dB |
| Polarization | RHCP |
| Impedance | 50 Ω |

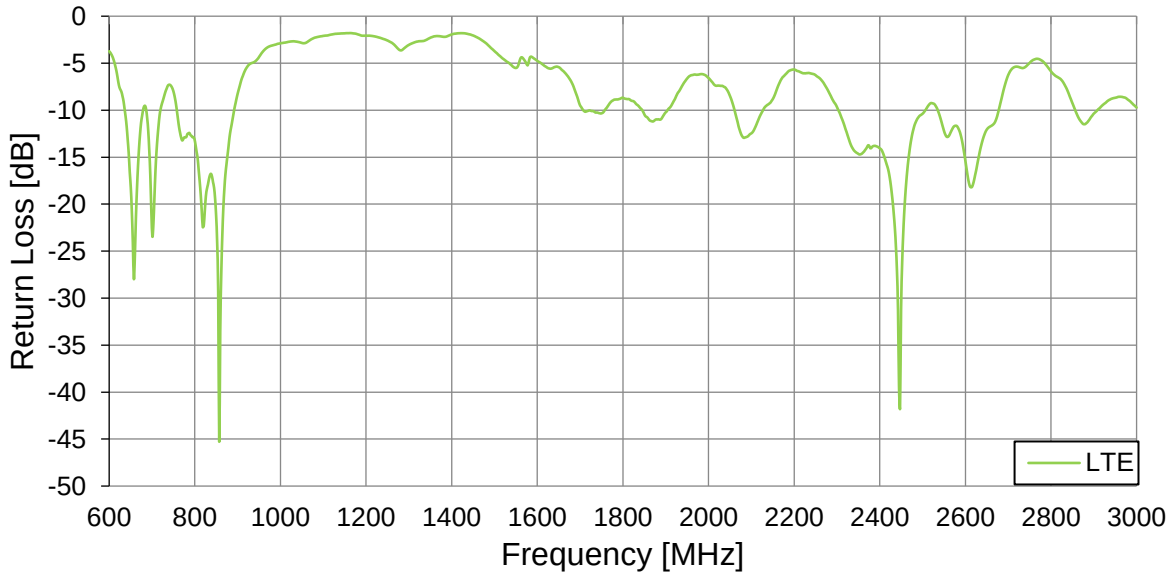
| GPS Antenna(Feed 2) | |
|---|---|
| Frequency | BeiDou : 1561.098 ± 2.046MHz.<br>GPS : 1575.42 ± 1.023MHz |
| Return loss (GPS L1) | < -10 dB |
| Passive Gain at Zenith (GPS L1) | +3dBi typ. |
| Average Gain (GPS L1) | -4.5dB |
| Polarization | RHCP |
| Impedance | 50 Ω |

| Mechanical | |
|---|---|
| Dimensions | 165.45*96.61*61.45mm |
| Cable | RG-174 |
| Connector | GPS(1 & 2): FAKRA Code C Blue<br>AM/FM/WB: BNC(F)ST<br>SDARS: FAKRA Code K Curry<br>LTE: FAKRA Code D |
| Casing | ASA+PC w/UV Stabilizer |
| Sealant | Silicone |
| Weight | 0.23kg |
| **Environmental** | |
| IP Rating | IP67 |
| Temperature Range | -40°C to 85°C |
| Thermal Shock | IEC 60068-2-14 |
| Humidity | Non-condensing 65°C 95% RH |
| Cable Pull | 35.59N |
| Recommended Mounting Torque | 6.78Nm |
| Maximum Mounting Torque | 8.13Nm |

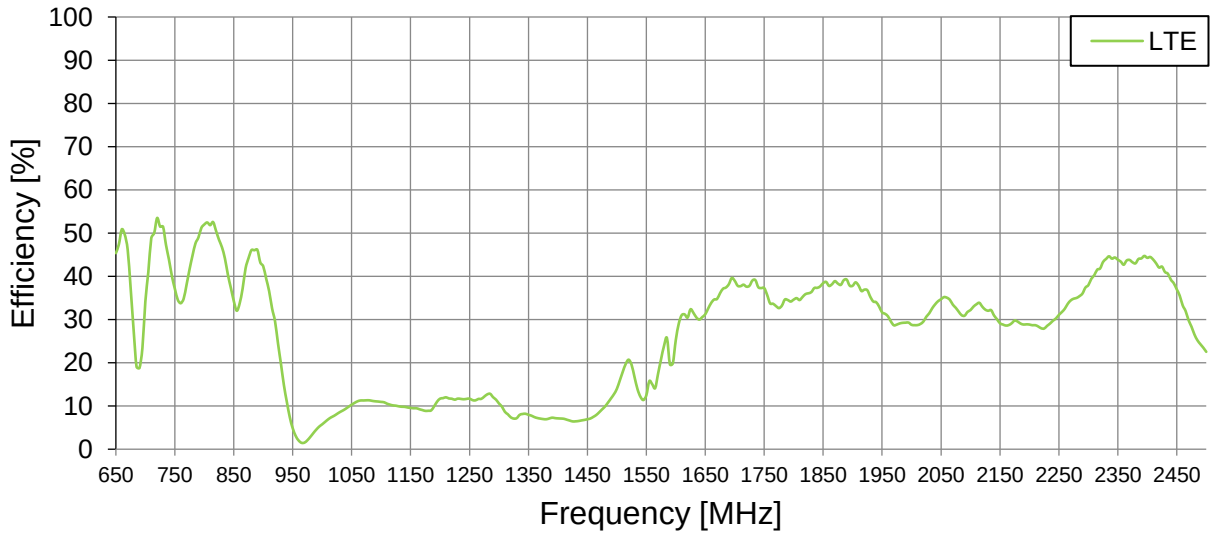
# 3. Antenna Characteristics

## 3.1 LTE

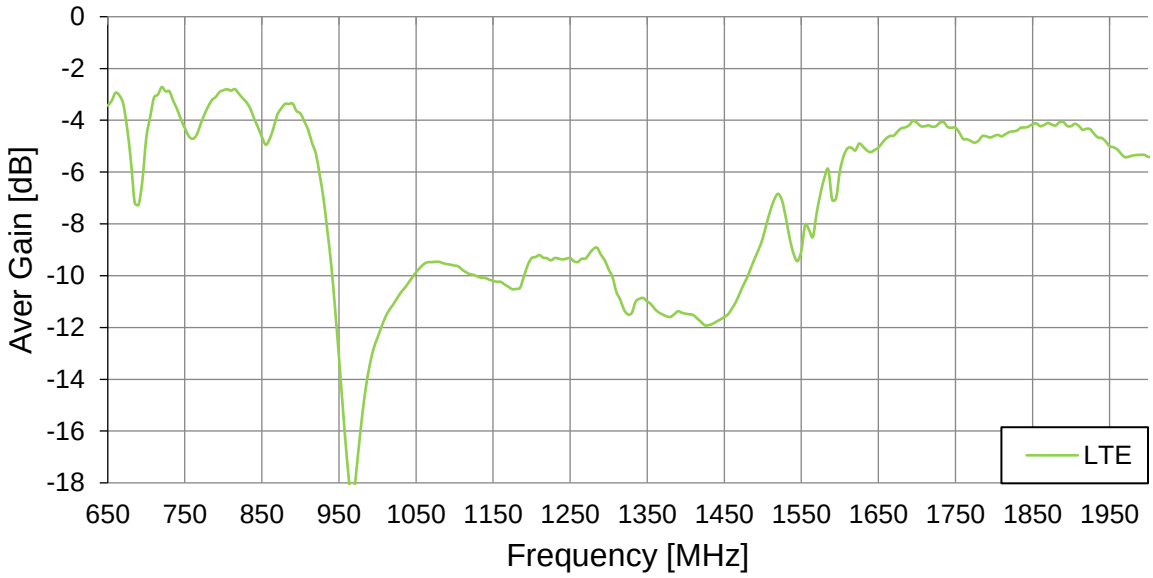
### Return Loss



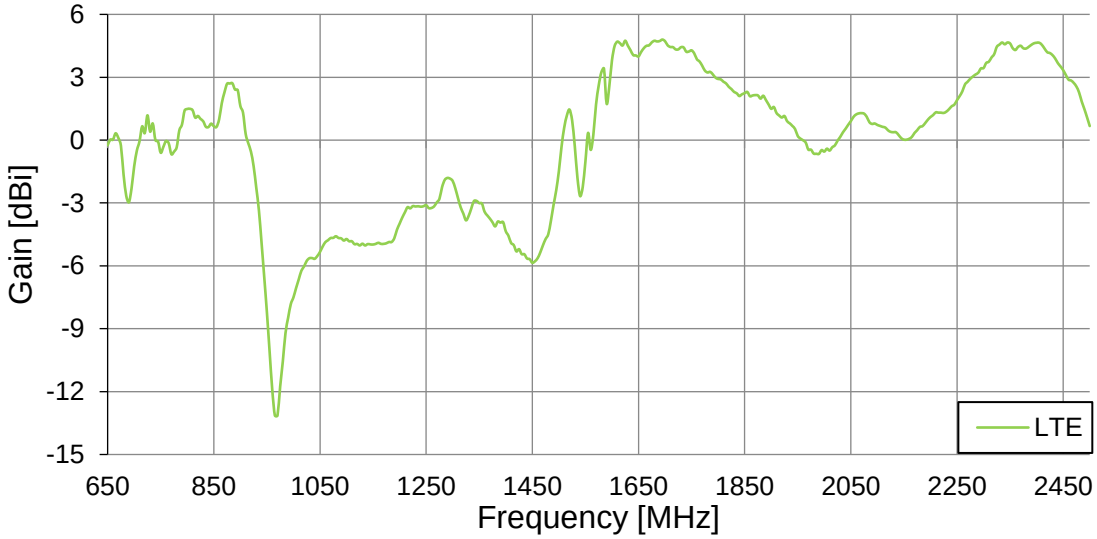

### Efficiency



## Average Gain

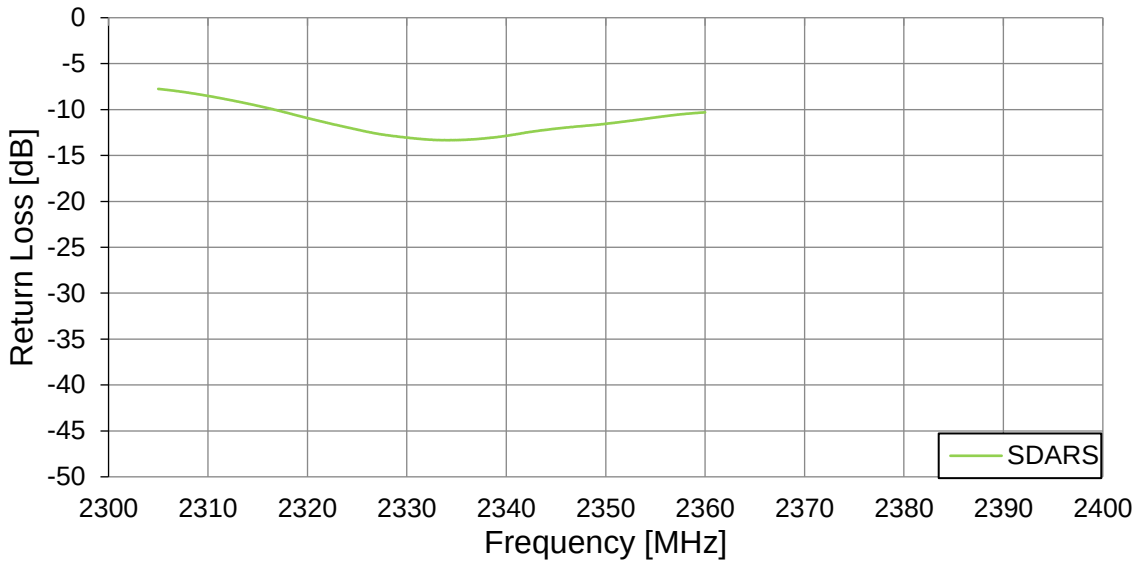



## Peak Gain

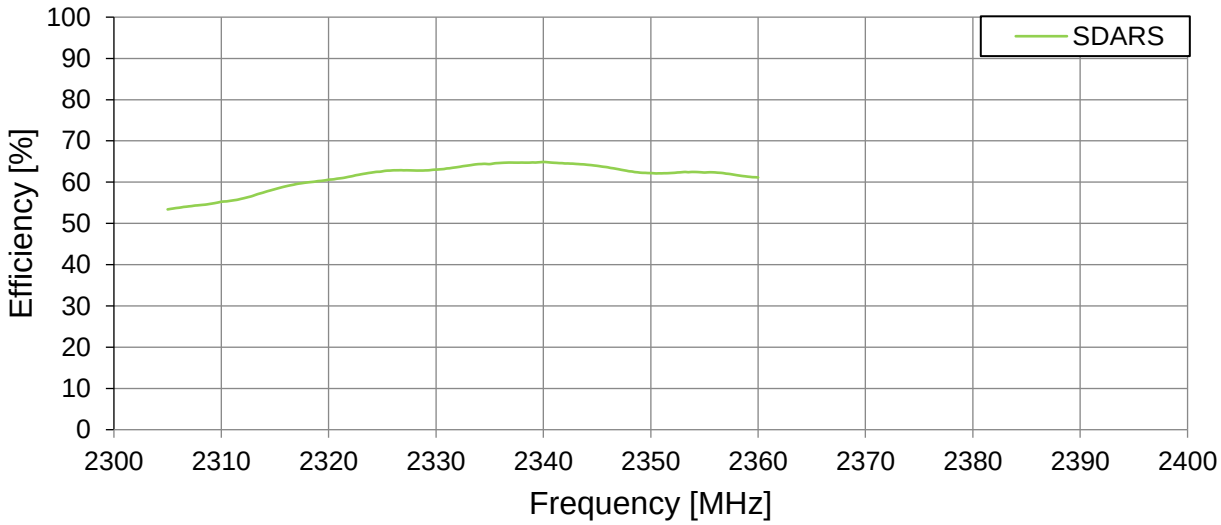


## 3.2 SDARS Antenna

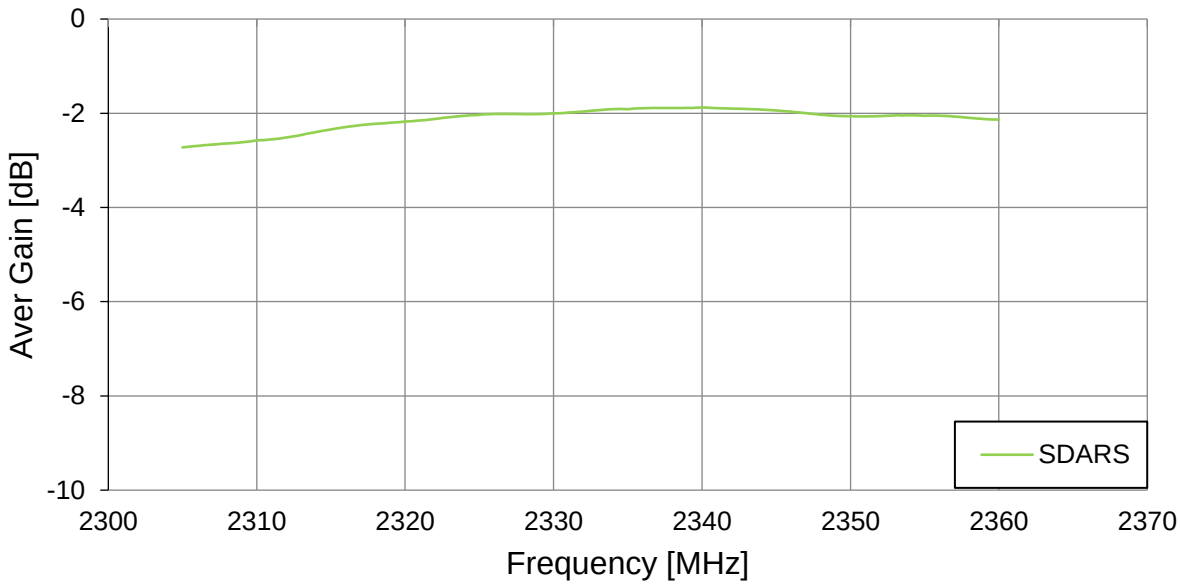
### Return Loss



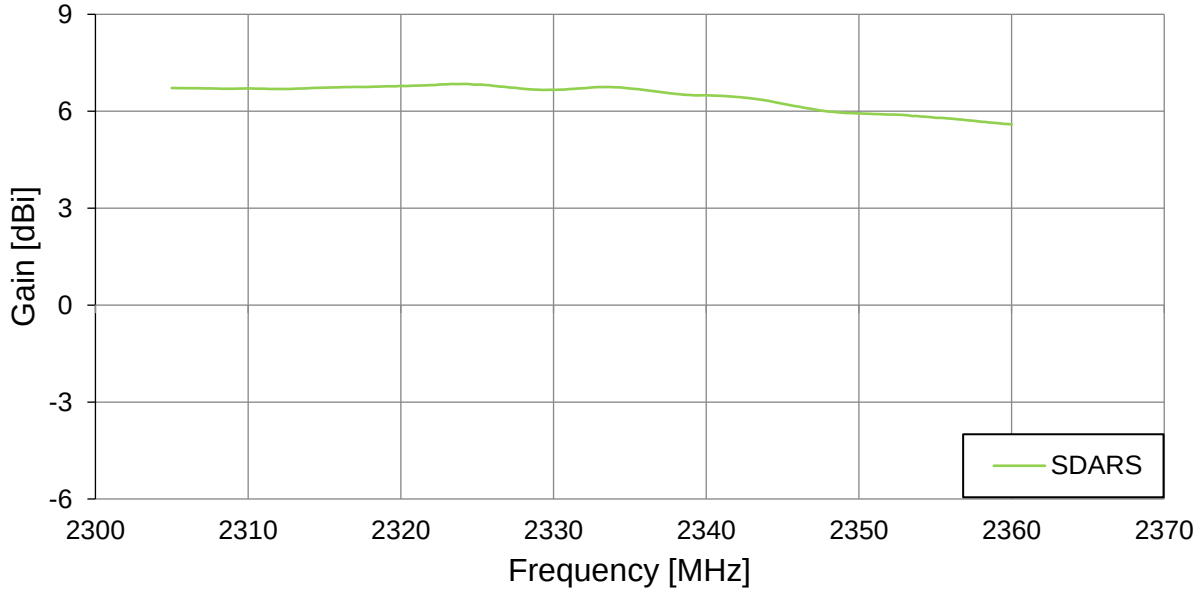

### Efficiency



## Average Gain

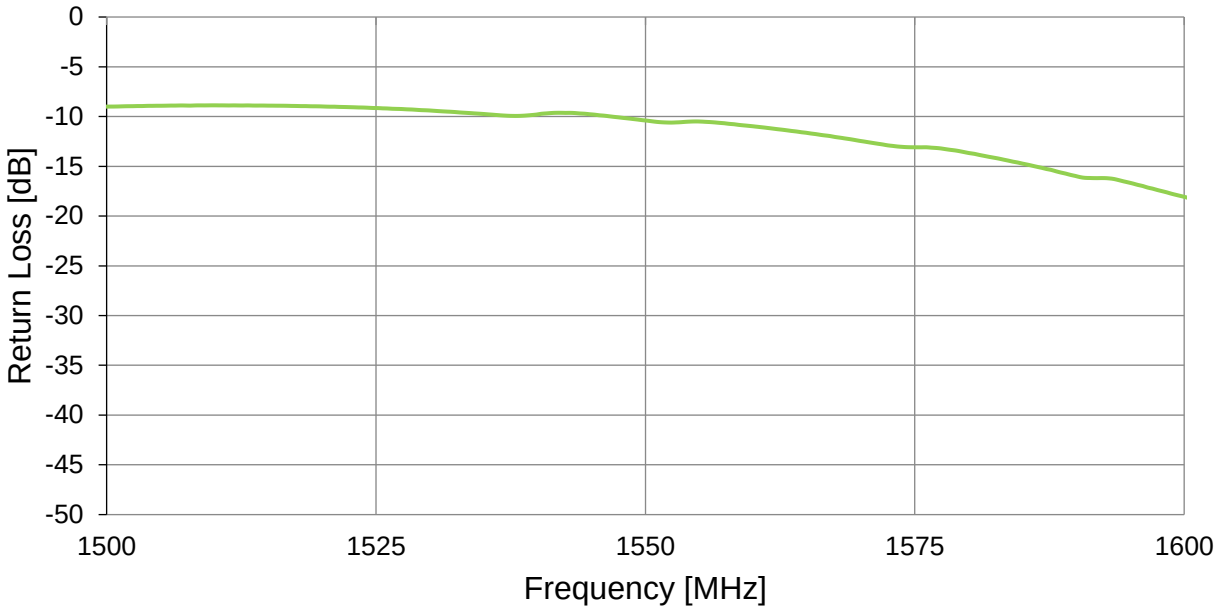



## Peak Gain

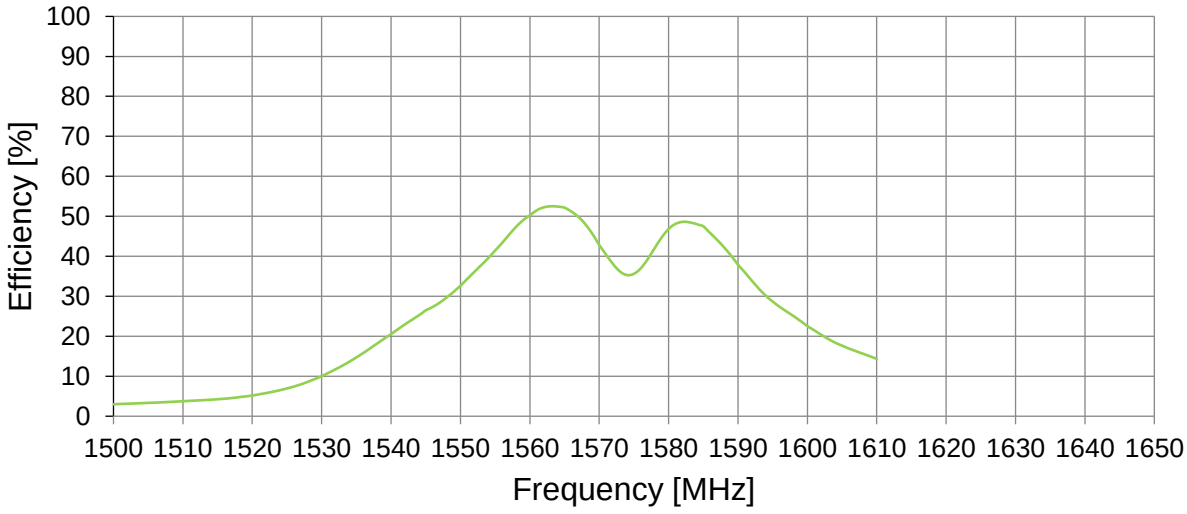


## 3.3 GPS Antenna Feed 1

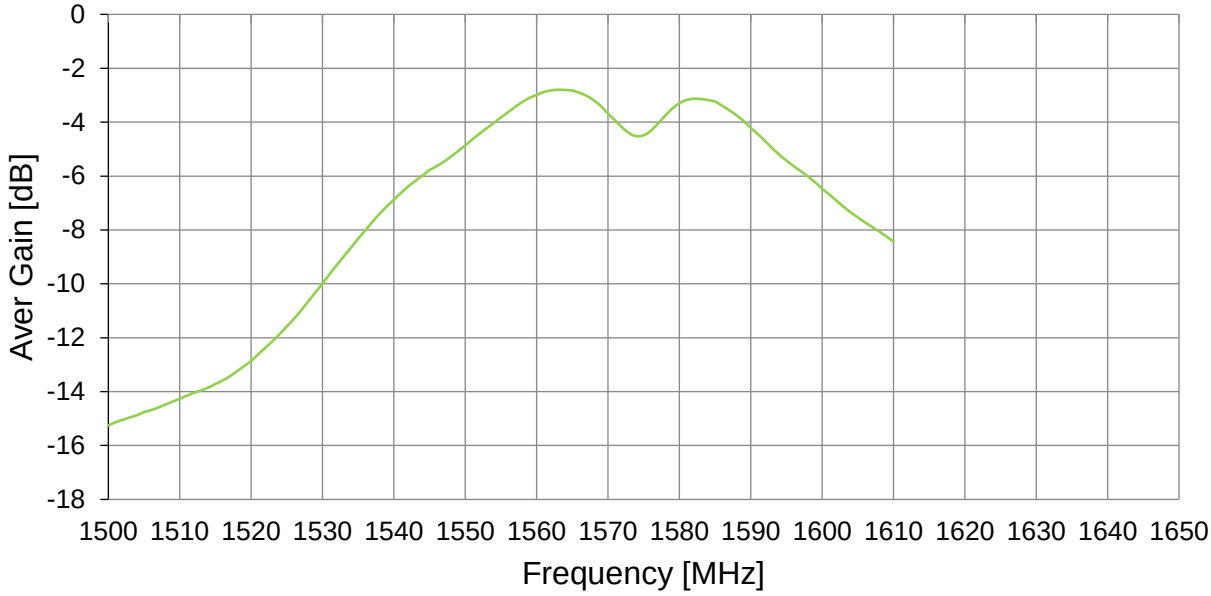
### Return Loss



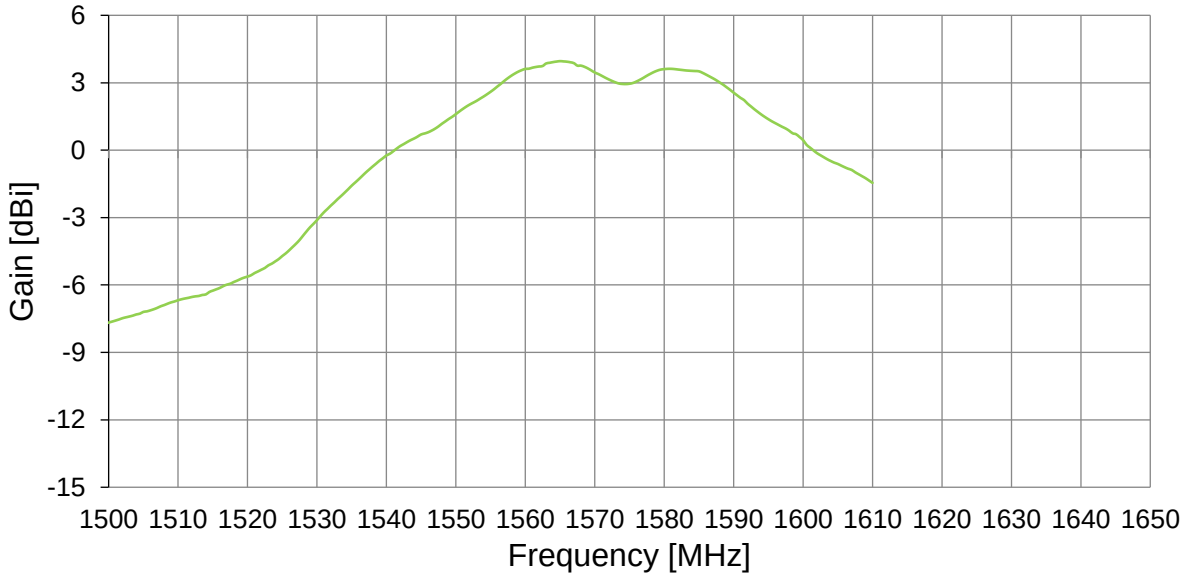

### Efficiency



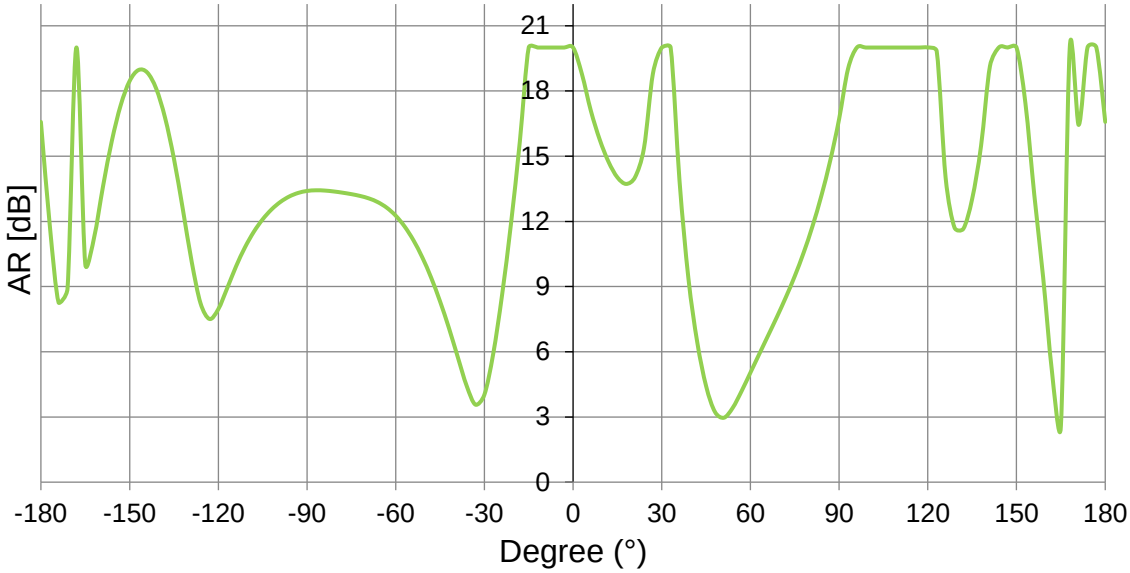
## Average Gain



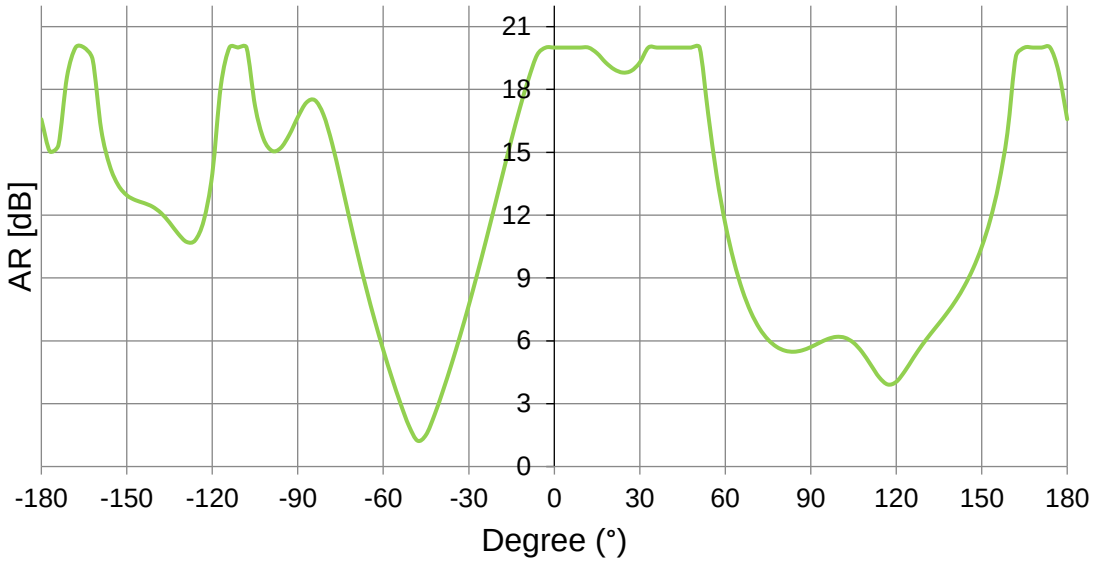

## Peak Gain



## Axial Ratio XZ Plane @ 1575.5MHz

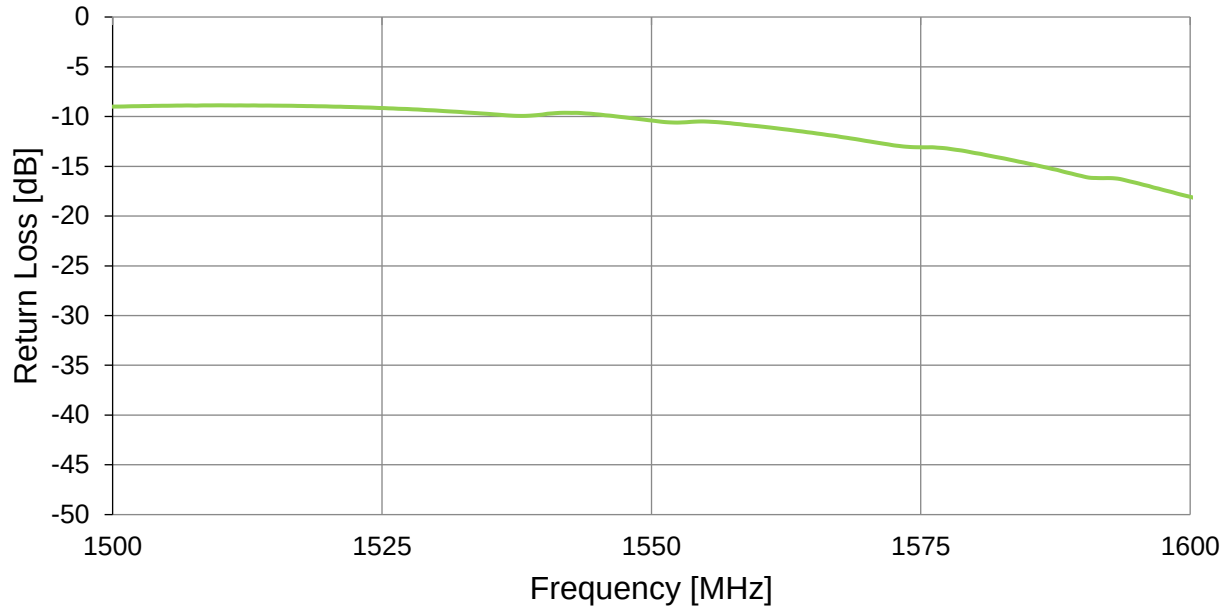



## Axial Ratio YZ Plane @ 1575.5MHz

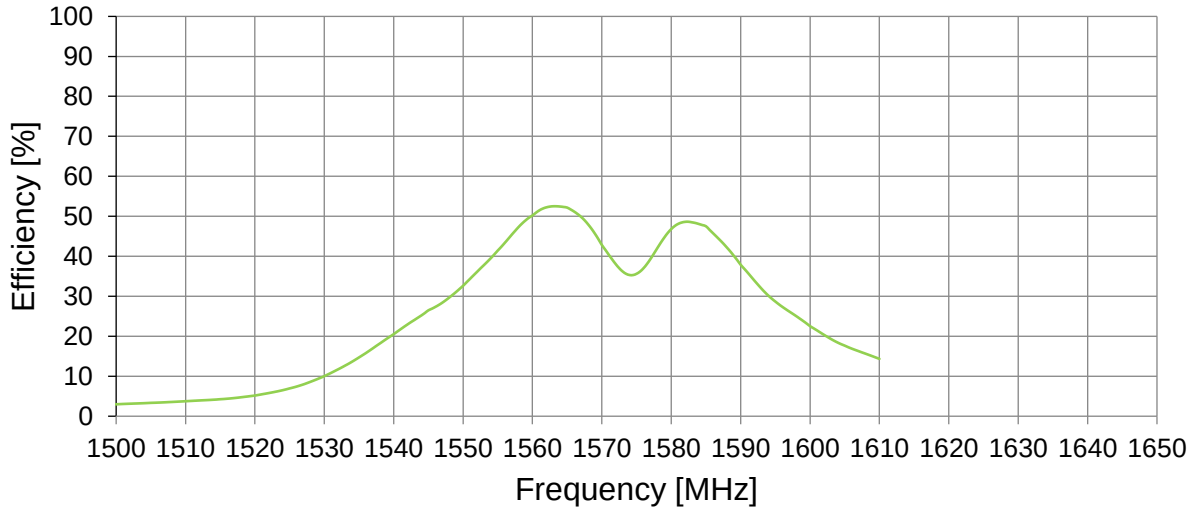


## 3.3 GPS Antenna Feed 2

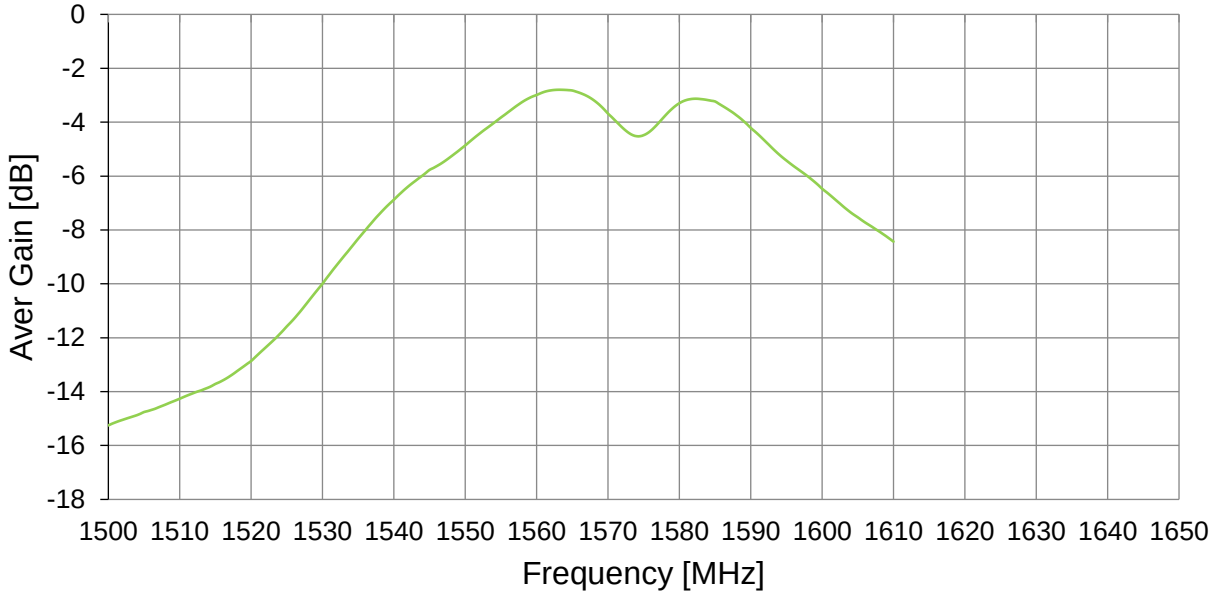
### Return Loss



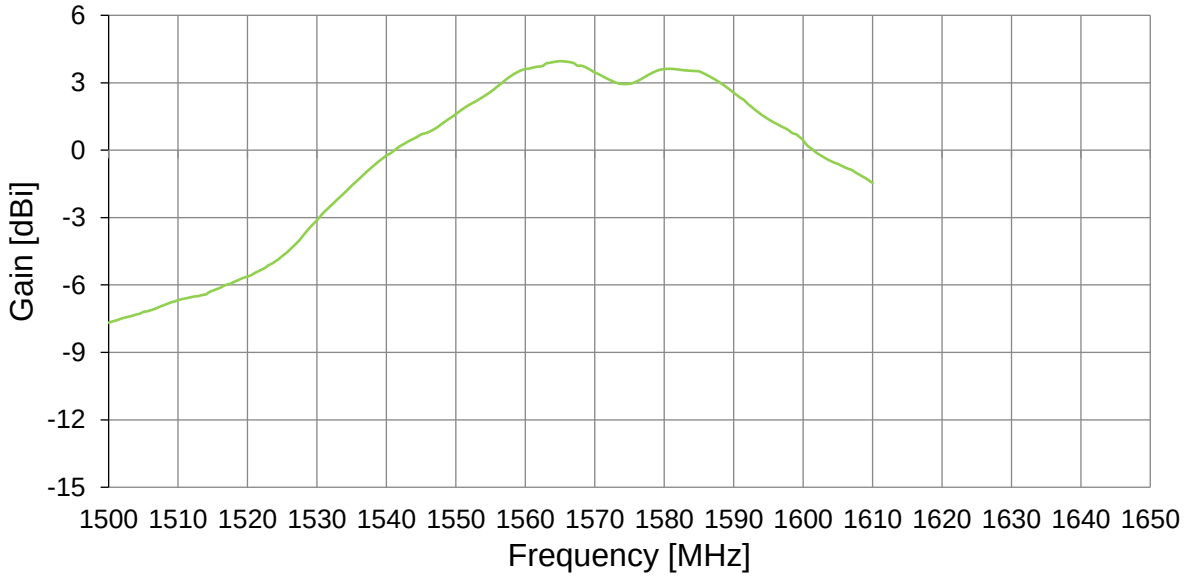

### Efficiency



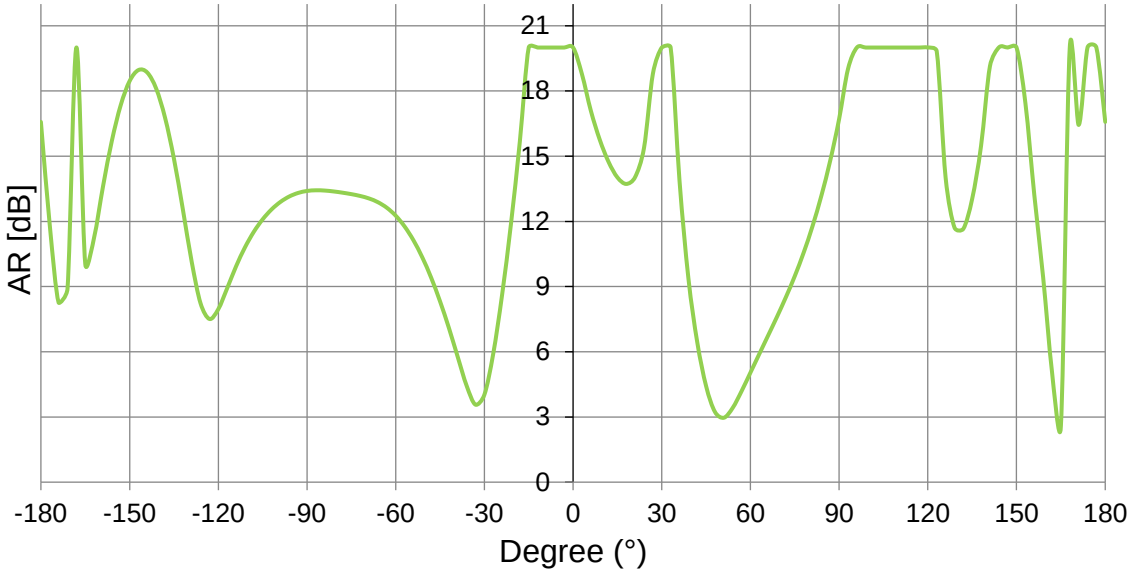
## Average Gain



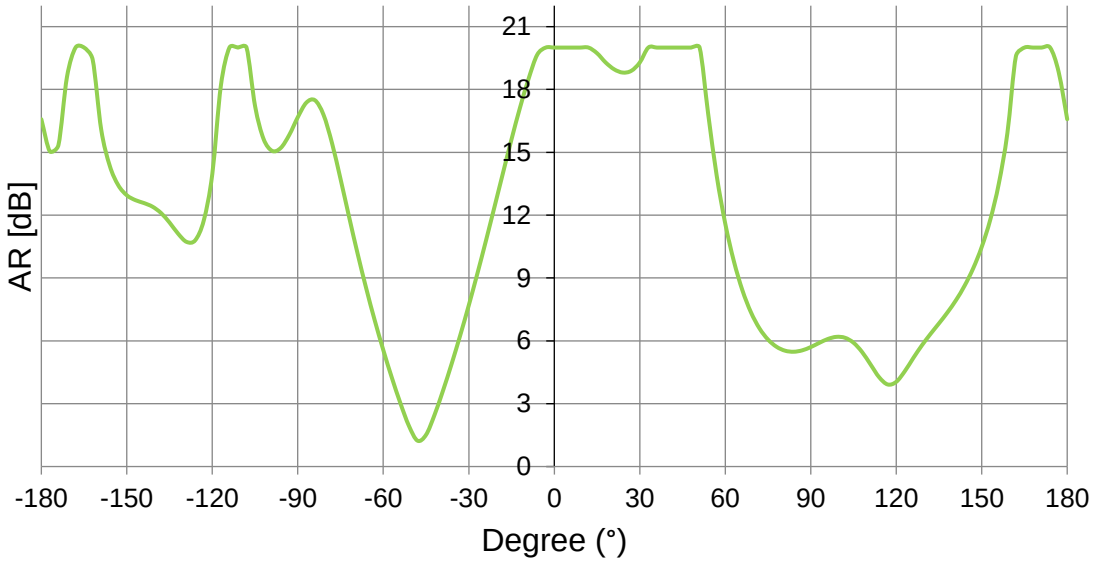

## Peak Gain



## Axial Ratio XZ Plane @ 1575.5MHz



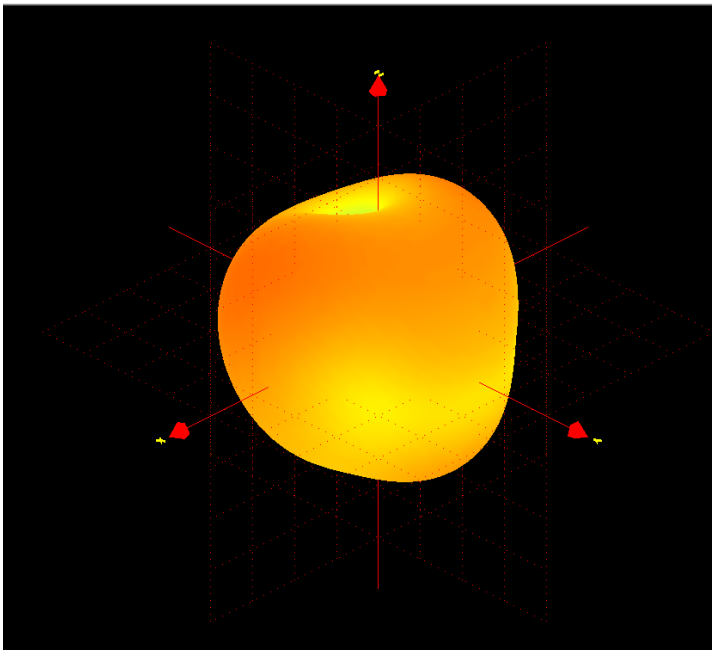

## Axial Ratio YZ Plane @ 1575.5MHz

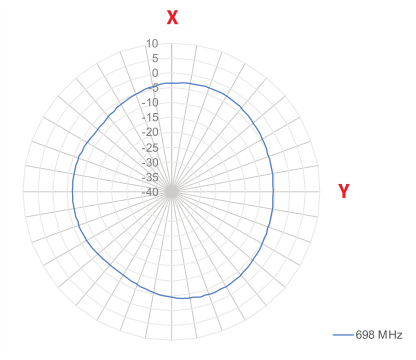
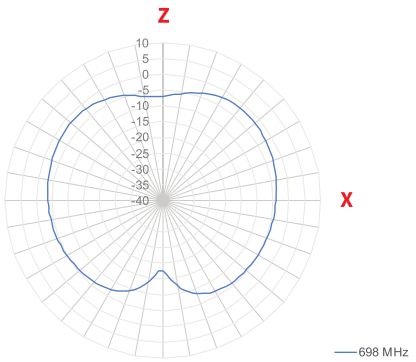
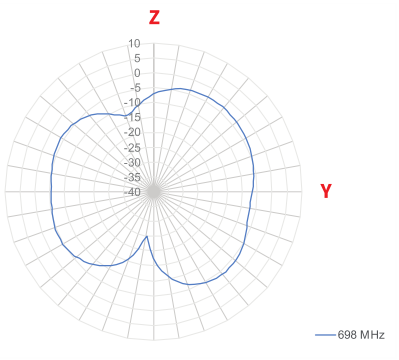


# 4. 2D Radiation Patterns

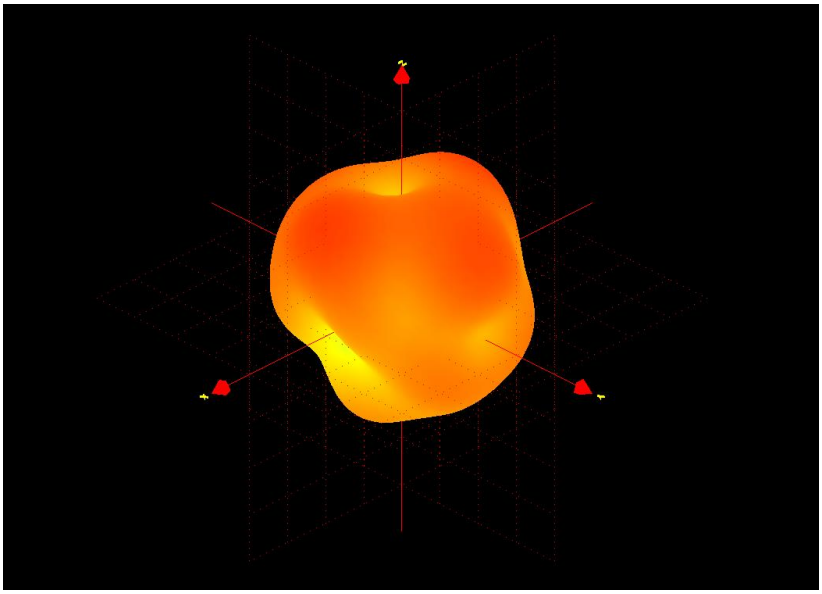
## 4.1 Test Setup

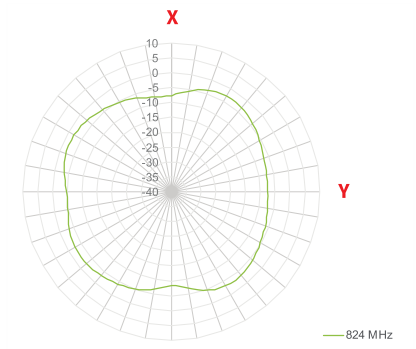
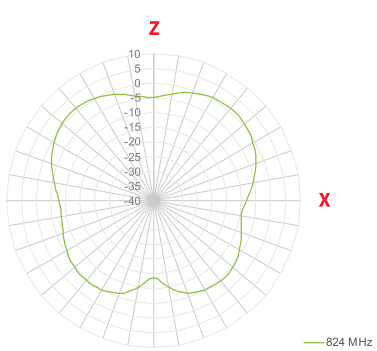
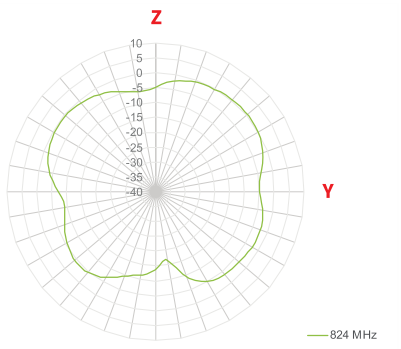
## 4.2 LTE 698MHz 3D and 2D Radiation Patterns



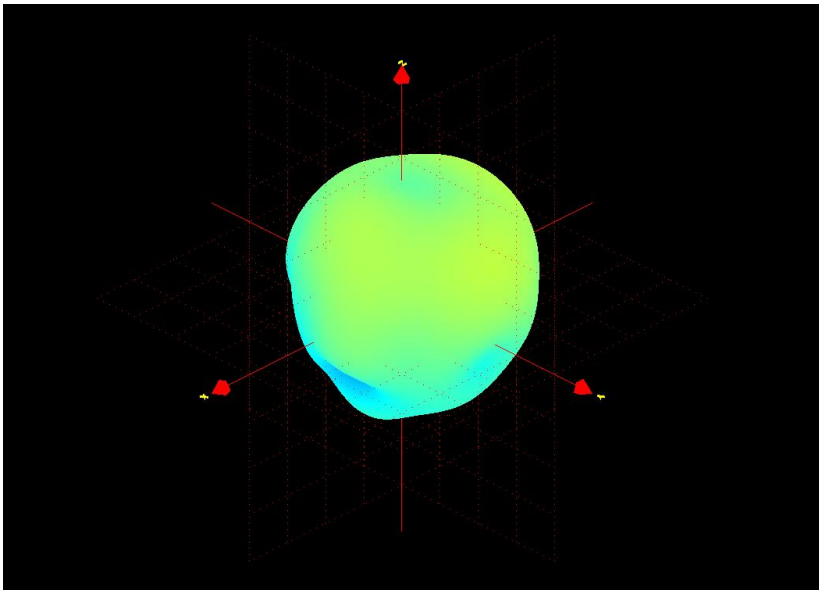
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

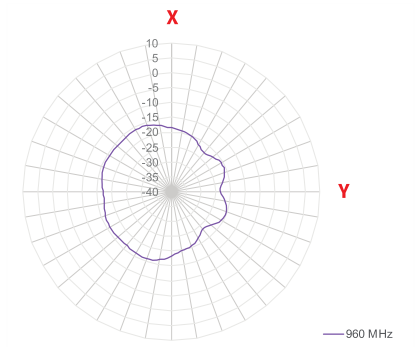
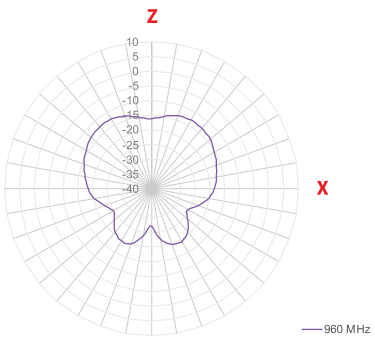
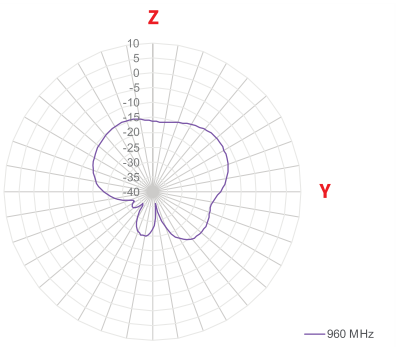
## 4.3 LTE 824MHz 3D and 2D Radiation Patterns



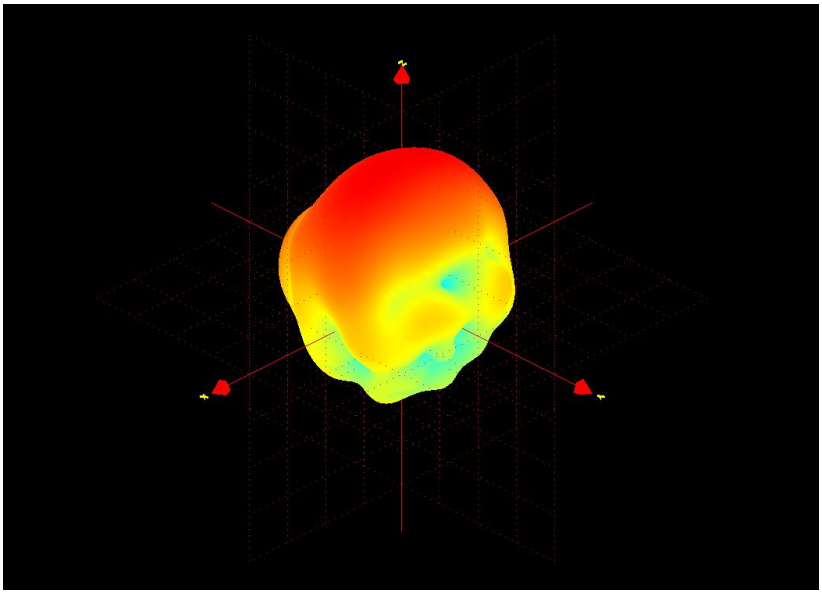
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

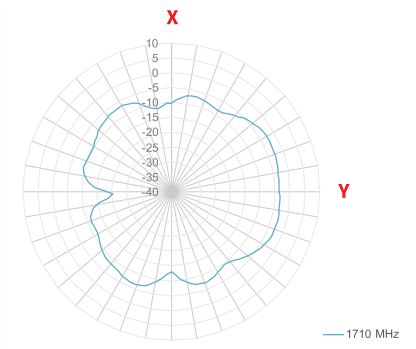
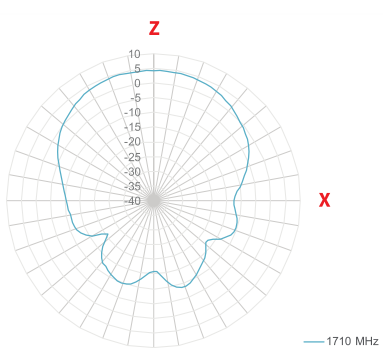
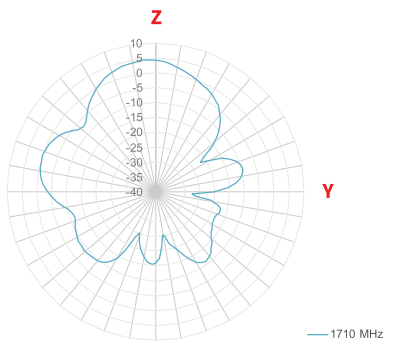
## 4.4 LTE 960MHz 3D and 2D Radiation Patterns



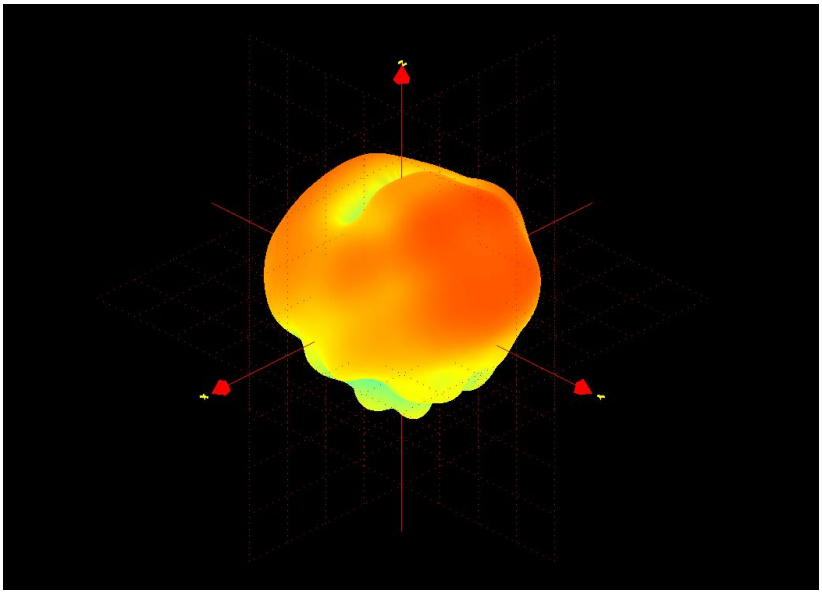
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

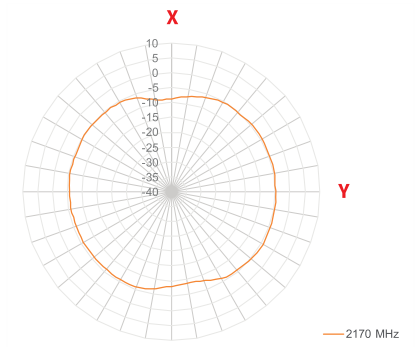
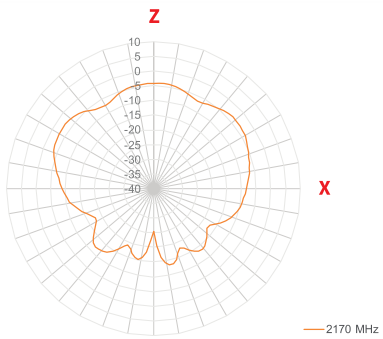
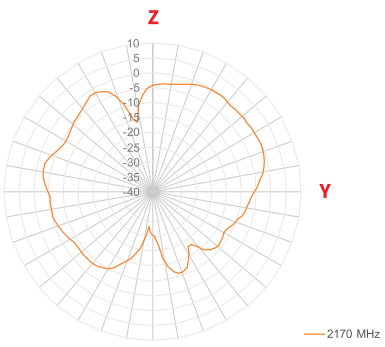
## 4.5 LTE 1710MHz 3D and 2D Radiation Patterns



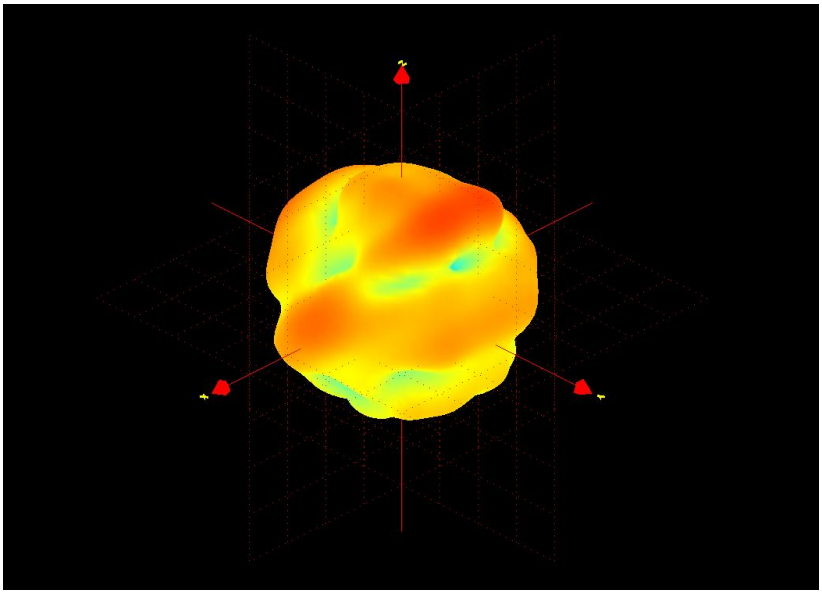
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

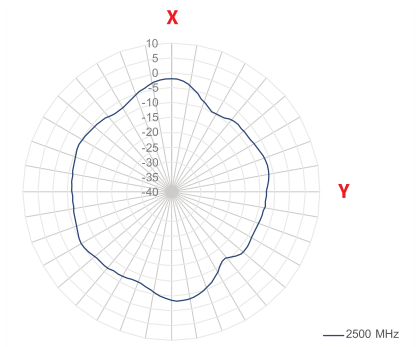
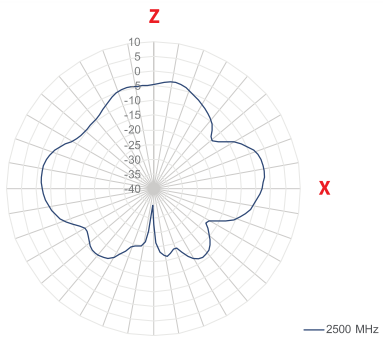
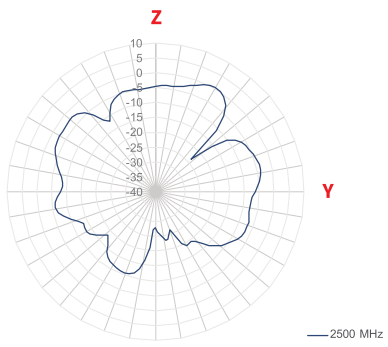
## 4. 6 LTE 2170MHz 3D and 2D Radiation Patterns



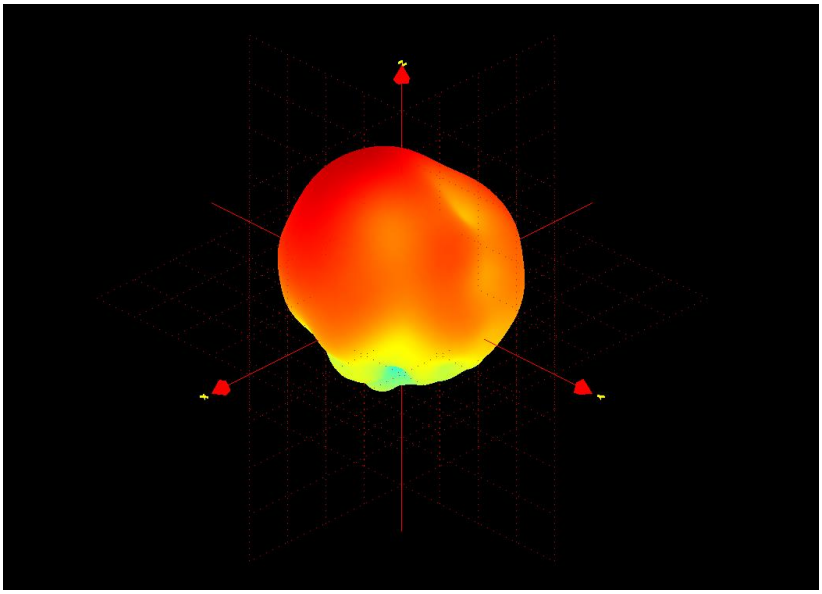
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

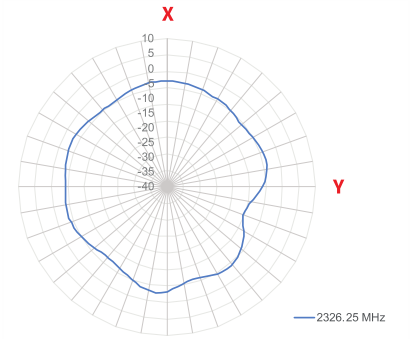
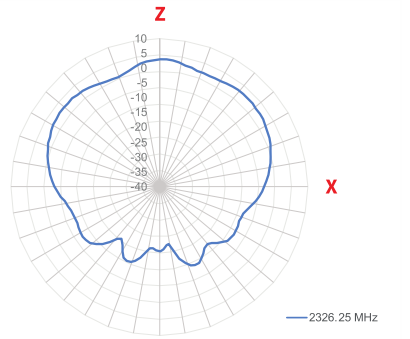
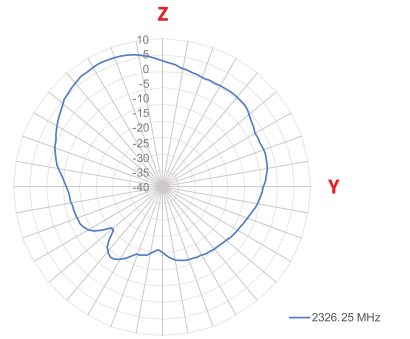
## 4.7 LTE 2500MHz 3D and 2D Radiation Patterns



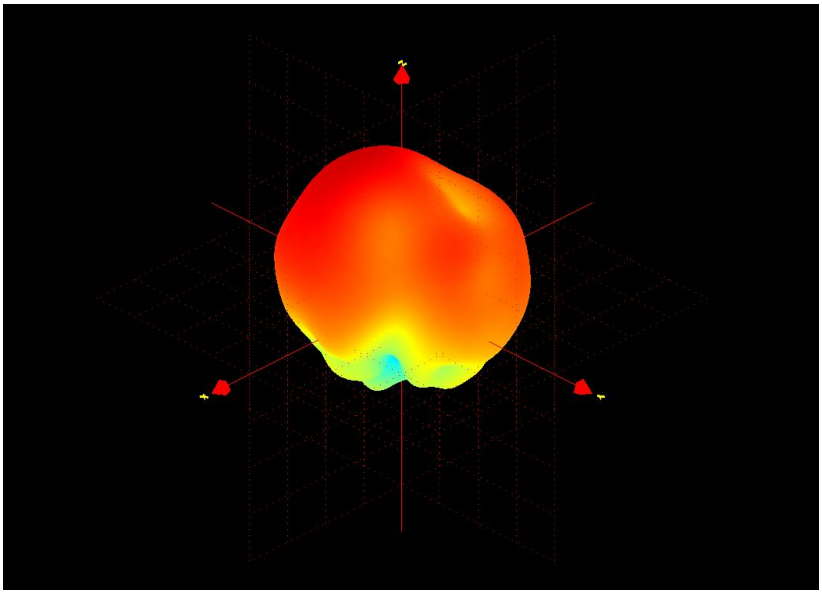
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

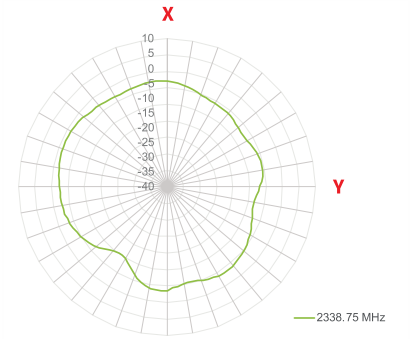
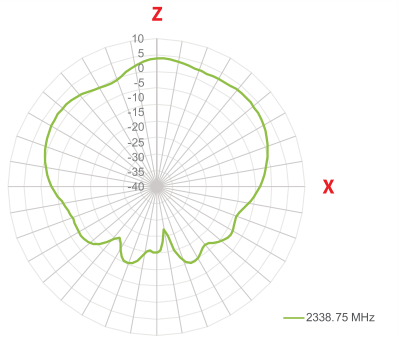
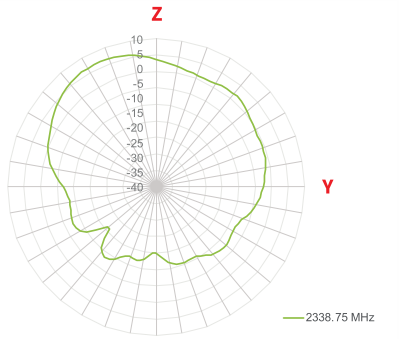
## 4.8 SDARS 2326.25MHz 3D and 2D Radiation Patterns



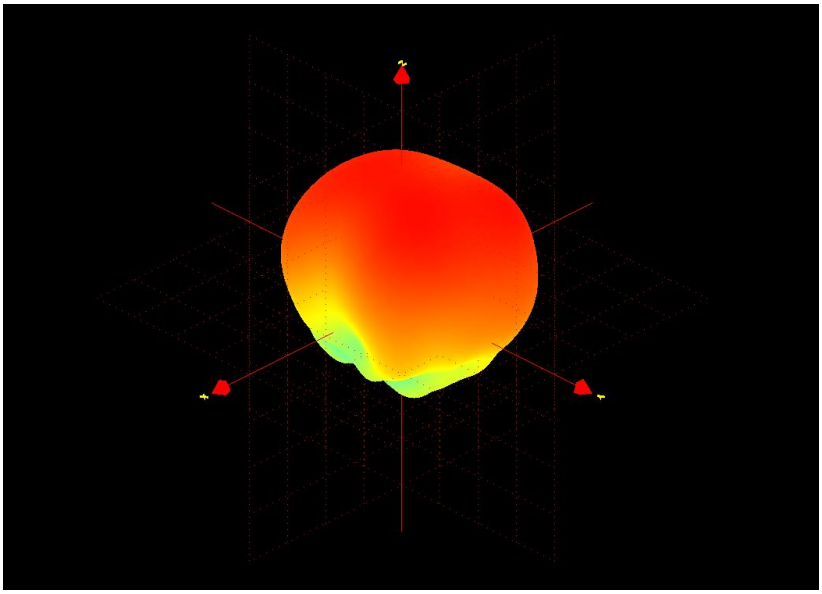
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

## 4.9 SDARS 2338.75MHz 3D and 2D Radiation Patterns

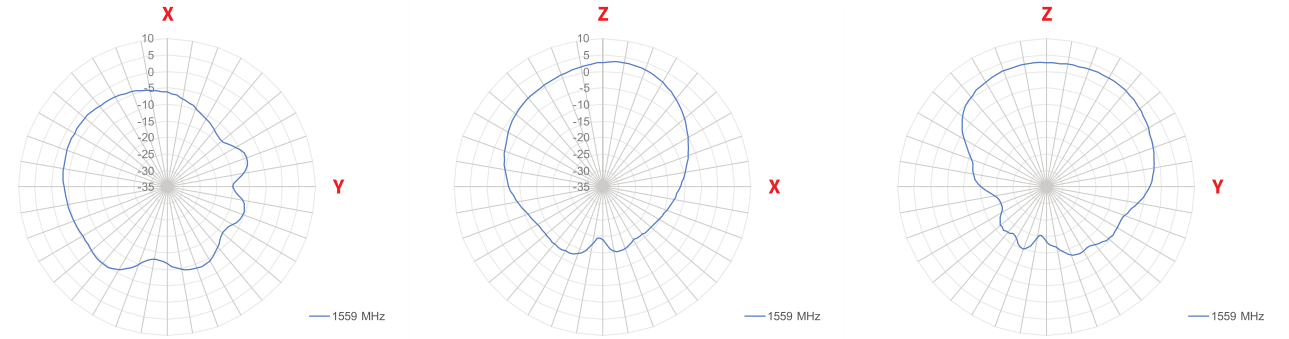


| XY Plane | XZ Plane | YZ Plane |
|---|---|---|
|  |  |  |

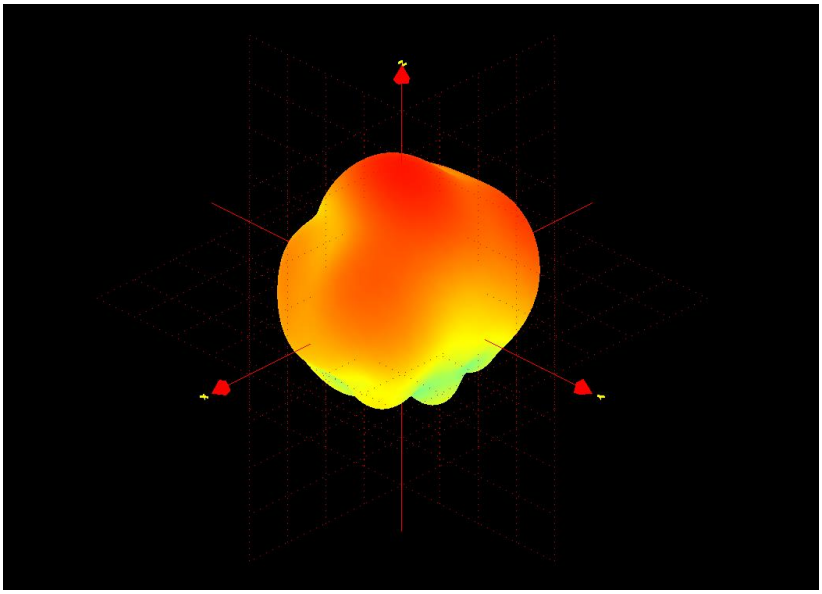
## 4.10 GPS(1&2) 1559MHz 3D and 2D Radiation Patterns



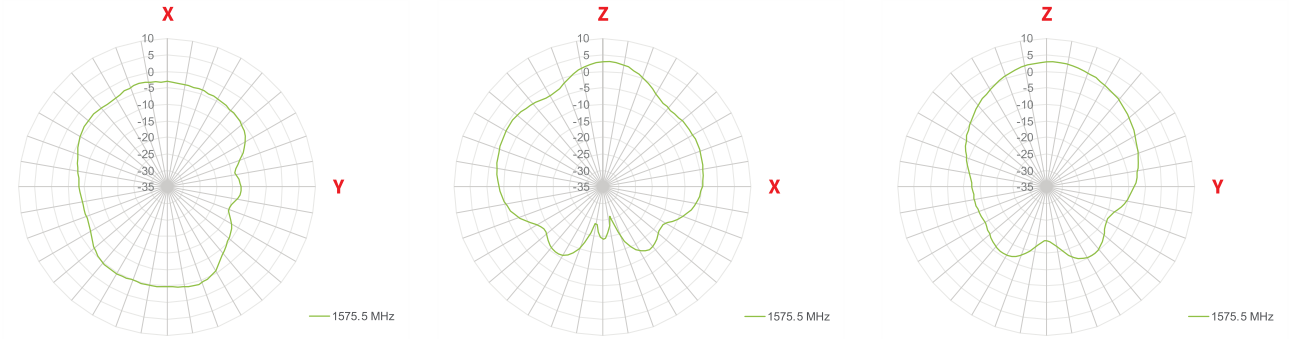
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|



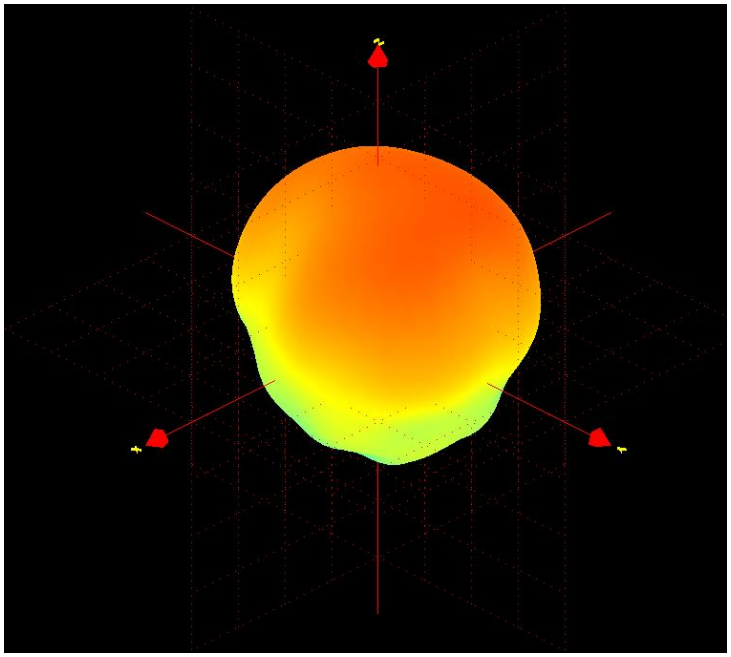
## 4.11 GPS(1&2) 1575.5MHz 3D and 2D Radiation Patterns



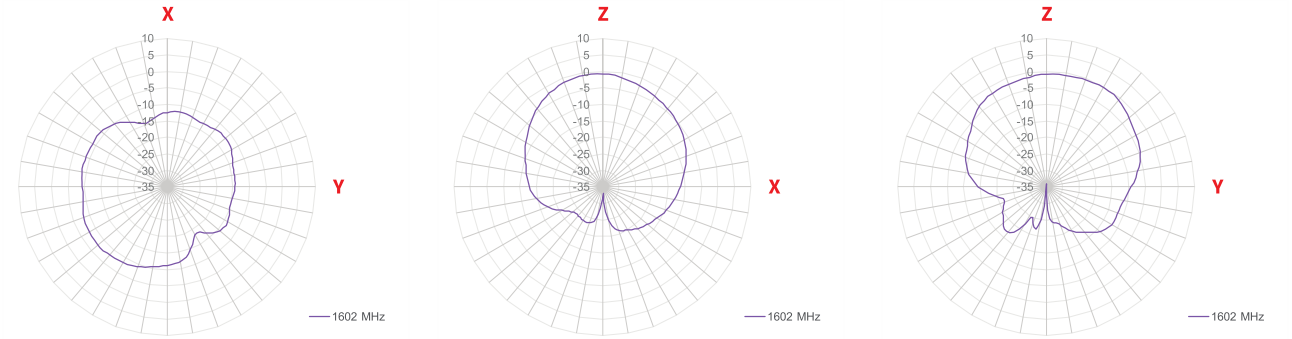
| XY Plane | XZ Plane | YZ Plane |
|---|---|---|



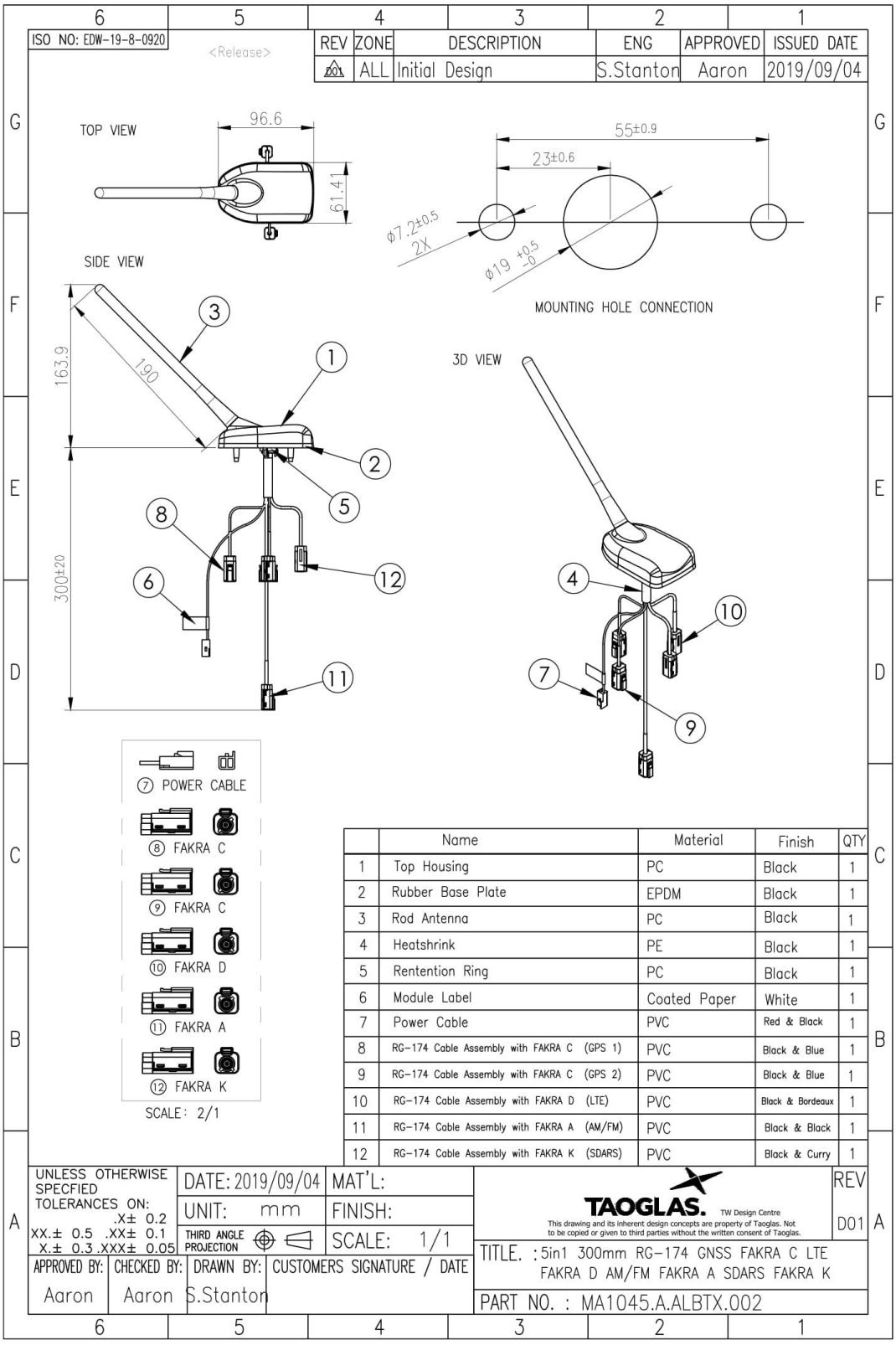
## 4.12 GPS(1&2) 1602MHz 3D and 2D Radiation Patterns



| XY Plane | XZ Plane | YZ Plane |
|---|---|---|



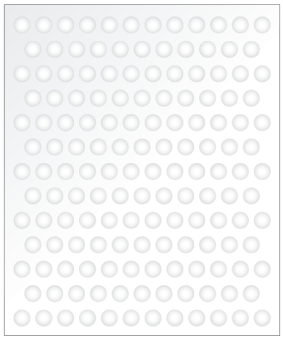
# 5. Mechanical Drawing (Units: mm)



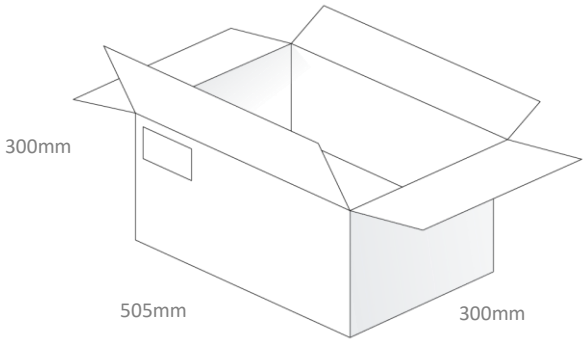

| | Name | Material | Finish | QTY |
|---|---|---|---|---|
| 1 | Top Housing | PC | Black | 1 |
| 2 | Rubber Base Plate | EPDM | Black | 1 |
| 3 | Rod Antenna | PC | Black | 1 |
| 4 | Heatshrink | PE | Black | 1 |
| 5 | Rentention Ring | PC | Black | 1 |
| 6 | Module Label | Coated Paper | White | 1 |
| 7 | Power Cable | PVC | Red & Black | 1 |
| 8 | RG-174 Cable Assembly with FAKRA C (GPS 1) | PVC | Black & Blue | 1 |
| 9 | RG-174 Cable Assembly with FAKRA C (GPS 2) | PVC | Black & Blue | 1 |
| 10 | RG-174 Cable Assembly with FAKRA D (LTE) | PVC | Black & Bordeaux | 1 |
| 11 | RG-174 Cable Assembly with FAKRA A (AM/FM) | PVC | Black & Black | 1 |
| 12 | RG-174 Cable Assembly with FAKRA K (SDARS) | PVC | Black & Curry | 1 |

# 6. Packaging

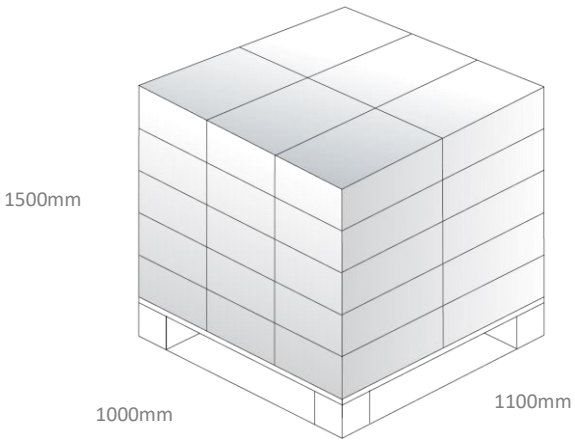
1pc MA1045.A.ALBTX.002 per Bubble Bag
Weight: 230g



50pcs MA1045.A.ALBTX.002 per Carton
Dimensions: 505*300*300mm
Weight: 13.5Kg




Pallet Dimensions:
1500*1000*1100mm
30 Cartons Per Pallet
6 Cartons Per Layer, 5 Layers



Changelog for the datasheet

## SPE-19-8-095 – MA1045.A.ALBTX.002

| Revision: A (Original First Release) | |
|---|---|
| Date: | 2019-08-09 |
| Notes: | Initial Datasheet Release |
| Author: | Jack Conroy |

**Previous Revisions**

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