



Topside View

Underside View

Stream

MA208.A.AB.001

Specification

|              |                                                                                                                                          |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Part No.     | MA208.A.AB.001                                                                                                                           |
| Product Name | <b>Stream</b><br>GPS and LTE/GSM/UMTS<br>(2G/3G/4G 700MHz to 960MHz/1710MHz to 2200MHz)<br>Combination Antenna                           |
| Feature      | Adhesive Mount IP67 Antenna<br>GPS: 3M RG-174 SMA(M)<br>Cellular: 3M CFD-200 SMA(M)<br>1.8~5.5V/30dB<br>200.5*66.5*9mm<br>RoHS Compliant |

## 1. Introduction

The Stream MA.208 GPS/LTE Cellular antenna is a low profile, heavy-duty, fully IP67 waterproof external M2M antenna for use by RF professionals in telematics, transportation and remote monitoring applications. The Stream is unique in the market as it combines the highest possible efficiency and peak gain for GPS and all cellular bands in 2G/3G/4G in a low profile compact format for mounting via high quality first tier automotive approved 3M adhesive foam.

The patent pending design incorporates internally a custom Taoglas 35mm patch antenna on an extended integral ground-plane to deliver more than

3.5dBiC gain. A front-end SAW filter dramatically reduces radiated spurious emissions.

The extended ground-plane used with an innovative internal cellular PIFA also enables the unique wide-band 2G/3G/4G response to deliver the highest performance possible, at 3 metres cable length. Nothing else out there comes close in terms of consistency of efficiency and peak gain at all cellular bands, with an awesome 70%+ at the LTE 700MHz band, again including 3 metres of cable loss. High antenna efficiencies are absolutely critical in today's 3G and 4G systems to achieving targeted data-speeds and coverage.

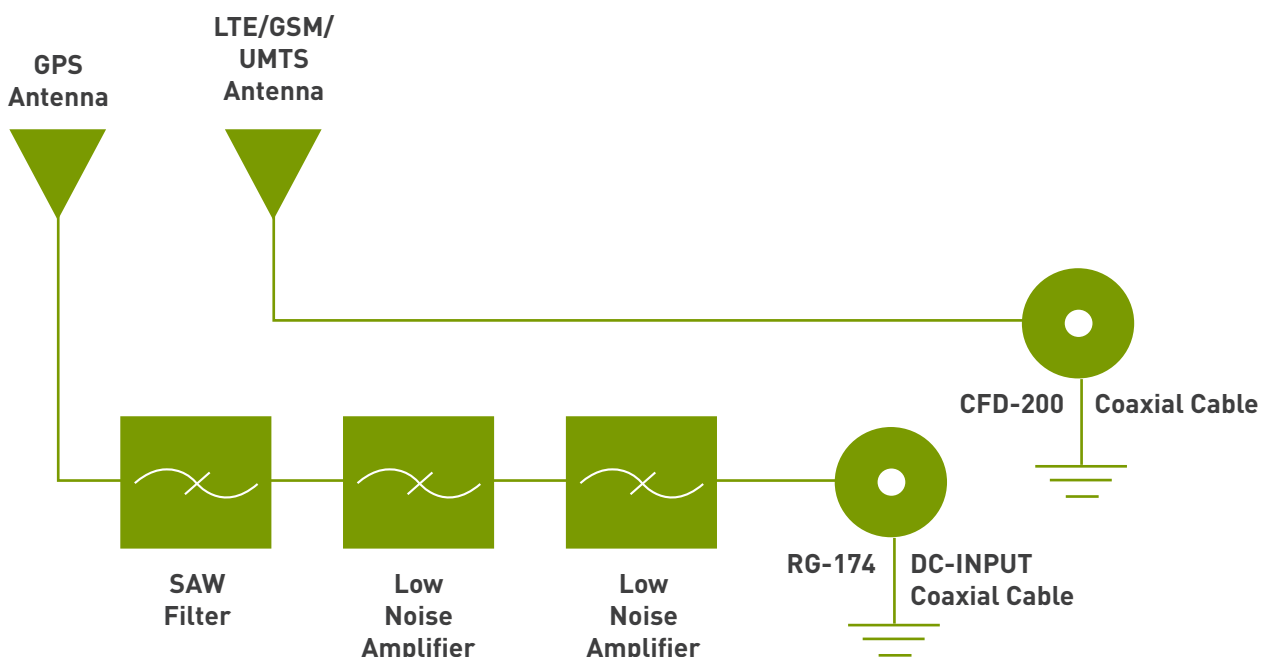
All this is done while still maintaining 20dB isolation between antennas.

The Stream uses high-shielded PTFE dielectric ultra low-loss cables that maintain low attenuation at all frequency bands, and high noise rejection, with an average loss of only 0.3dB per meter (0.1dB per foot), compared to 0.7dB for RG58 and 1.2dB for RG174.

Because of this, the Stream maximizes chances of passing PTCRB and network approvals first time. The Stream works best when attached to plastic or glass, but can also be used on metal if some foam spacing is added.

## 2. System Configuration

This antenna specification covers the LTE/GSM/UMTS Full band for 700MHz~960MHz, 1710MHz~2170MHz and GPS (L1 Band).



## 3. Specification

### 3.1 Electrical Data

| Parameter           | GPS Antenna                                                                                              | Cellular Antenna                                                                                                                                                                                   |
|---------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Features</b>     | High performance GPS 35*35*4mm<br>ceramic patch antenna with two<br>stage high gain 1575.42 +/- 1.023MHz | LTE - 700MHz<br>CDMA:824~896MHz<br>GSM:880~960MHz<br>DCS:1710~1880MHz<br>PCS:1850~1990MHz<br>3G:1920~2170MHz                                                                                       |
| <b>Gain</b>         | 3.5dBic typ @ Zenith                                                                                     | Average:-3.03dBi at 700~960MHz<br>-4.34dBi at 1710~2170MHz<br>Peak: 2.16dBi at 700~960MHz<br>0.42dBi at 1710~2170MHz                                                                               |
| <b>Polarization</b> | RHCP                                                                                                     | Linear                                                                                                                                                                                             |
| <b>VSWR</b>         |                                                                                                          | 3.3 Max. at 700~960MHz<br>3.6 Max. at 1710~1850MHz<br>2.2 Max. at 1880~2170MHz                                                                                                                     |
| <b>Impedance</b>    | 50Ω                                                                                                      | 50Ω                                                                                                                                                                                                |
| <b>Efficiency</b>   |                                                                                                          | ≥ 68% @ 700MHz<br>≥ 72% @ 750MHz<br>≥ 66% @ 824MHz<br>≥ 56% @ 890MHz<br>≥ 61% @ 880MHz<br>≥ 53% @ 960MHz<br>≥ 37% @1710MHz<br>≥ 51% @1880MHz<br>≥ 55% @1990MHz<br>≥ 54% @2110MHz<br>≥ 45% @2170MHz |

### 3.2 Cable and Connectors (Fully Customisable)

| Parameter | GPS Antenna | Cellular Antenna |
|-----------|-------------|------------------|
| Cable     | 3M RG-174   | CFD-200          |
| Connector | SMA(M)      | SMA(M)           |

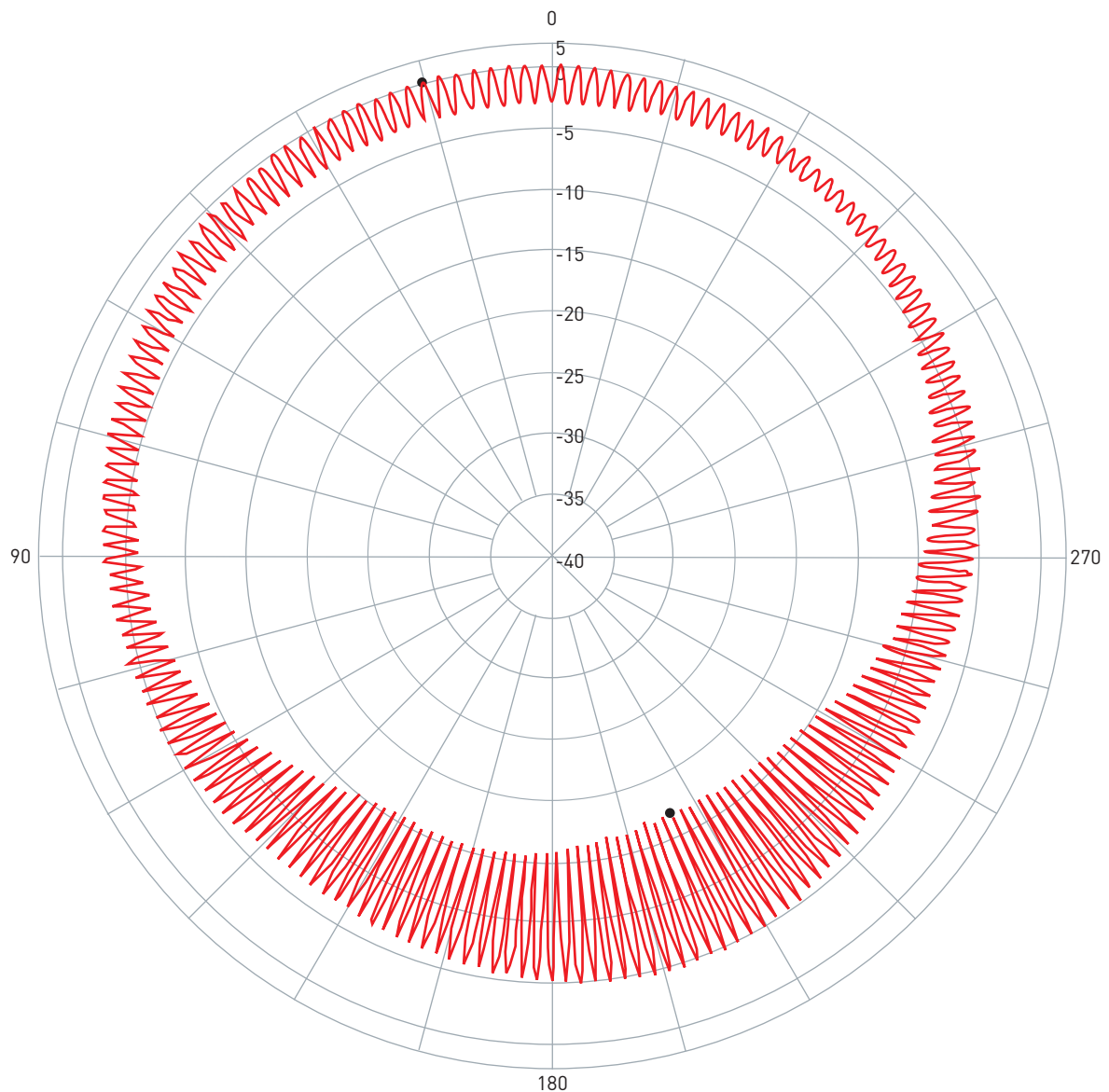
### 3.3 Mechanical Data

| Parameter             |                                 |
|-----------------------|---------------------------------|
| Housing               | UV resistant PVC                |
| Adhesive Mount        | 3M 1600TB (196.57*62.57*1.25mm) |
| Protection Class      | IP-67                           |
| Operation Temperature | -40°C to +85°C                  |
| Storage Temperature   | -40°C to +85°C                  |
| Relative Humidity     | 20% to 95%                      |
| Weight per unit       | 0.18kg                          |

**\*Note:** specifications may be subject to change

## 4. Axial Ratio

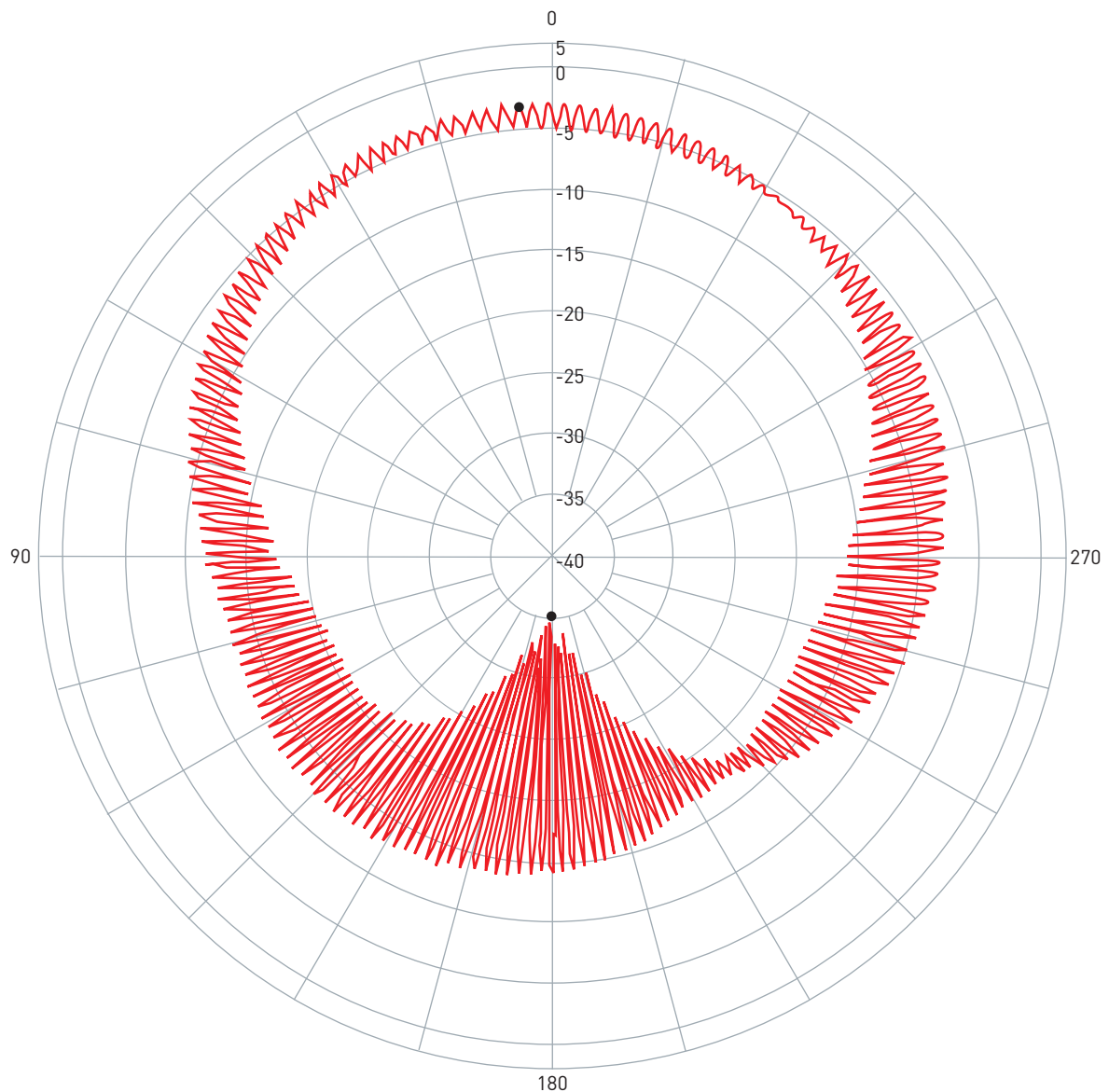
### 4.1 With IPEX Cable



| Pattern                                                                               | Model No.      | Test Mode   | Freq (MHz) | Max Gain(dBi) | Min Gain(dBi)   | Avg. Gain(dBi) | Source Polar. |
|---------------------------------------------------------------------------------------|----------------|-------------|------------|---------------|-----------------|----------------|---------------|
| 1  | MA208.A.AB.001 | Axial Ratio | 1575.42    | 0.06 / 15.14  | -16.87 / 204.77 | -4.51          | CP            |

## 4. Axial Ratio

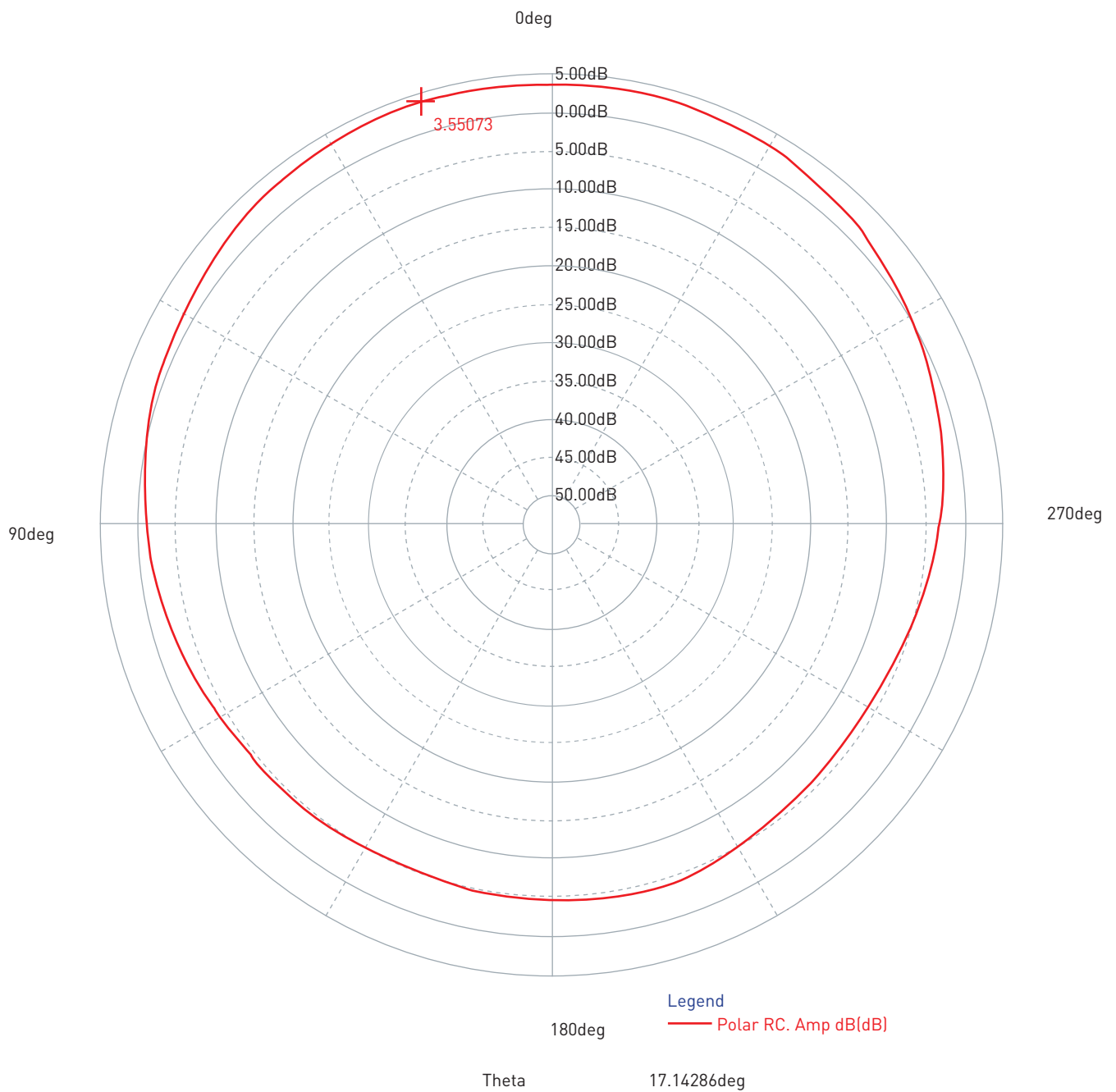
### 4.2 3M CFD-200 Cable



| Pattern                                                                               | Model No.      | Test Mode   | Freq (MHz) | Max Gain(dBi) | Min Gain(dBi)   | Avg. Gain(dBi) | Source Polar. |
|---------------------------------------------------------------------------------------|----------------|-------------|------------|---------------|-----------------|----------------|---------------|
| 1  | MA208.A.AB.001 | Axial Ratio | 1575.42    | -3.19 / 4.61  | -34.89 / 178.75 | -8.79          | CP            |

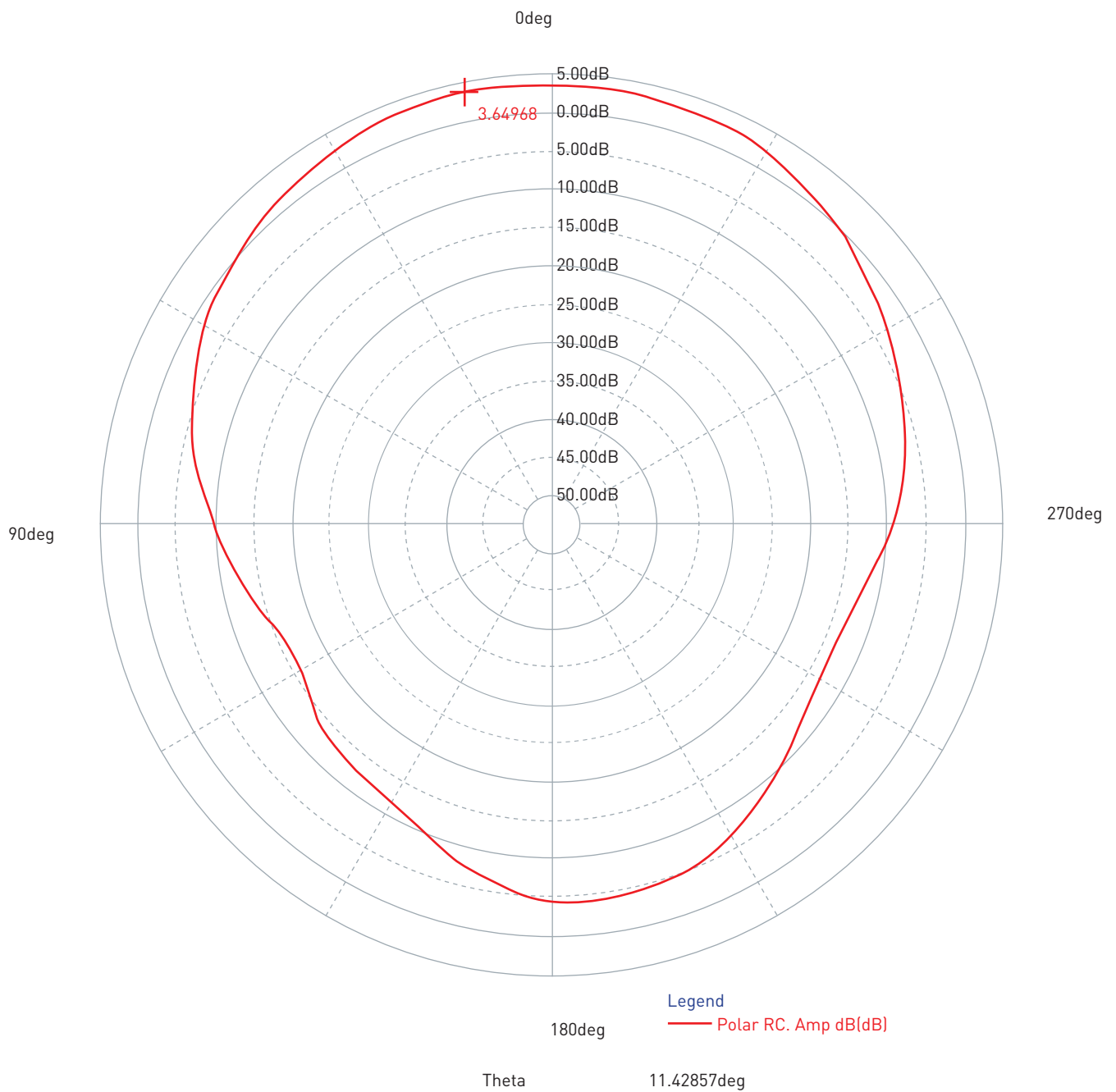
## 5. Radiation Patterns

### 5.1 Radiation Pattern in XZ plane



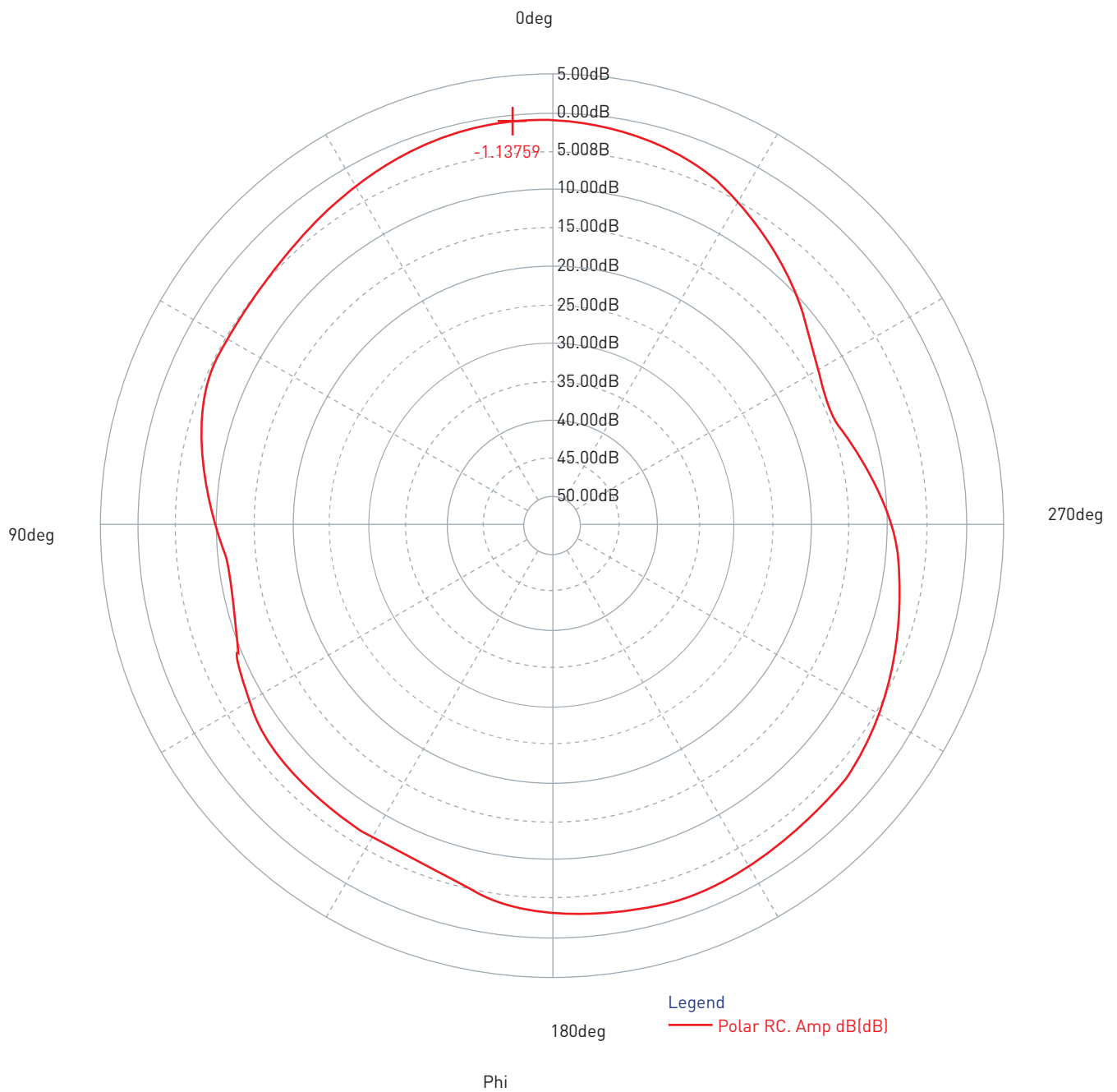
## 5. Radiation Patterns

### 5.2 Radiation Pattern in YZ plane

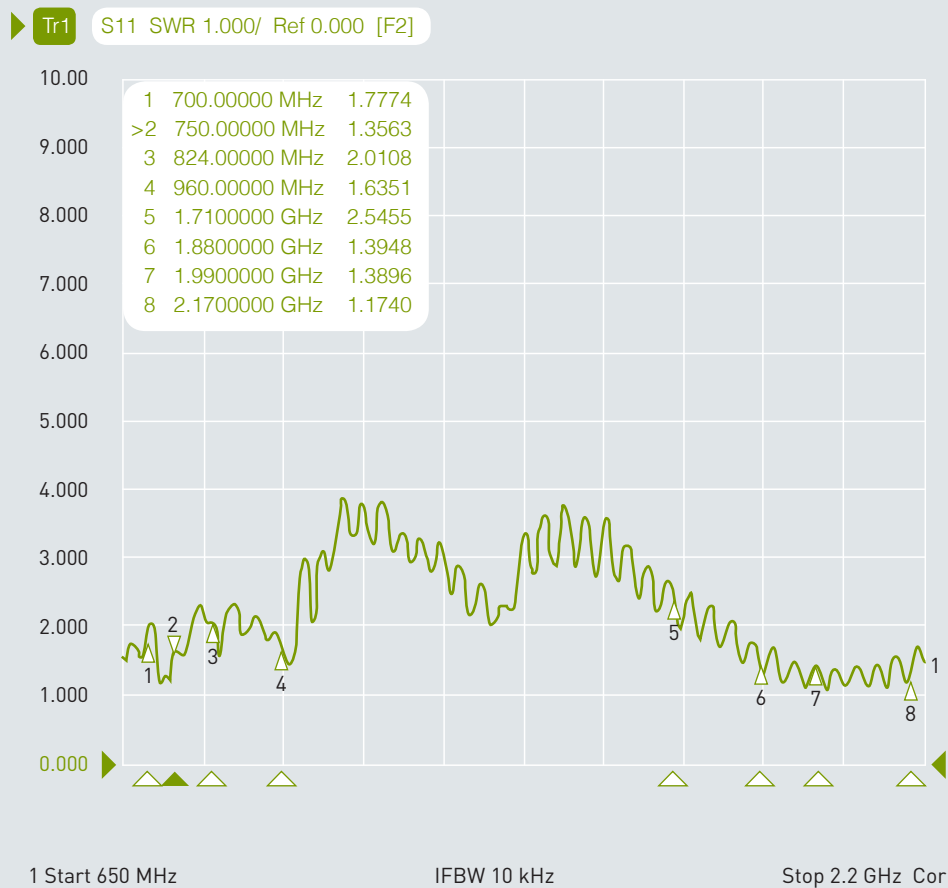


## 5. Radiation Patterns

### 5.3 Radiation Pattern in XY plane

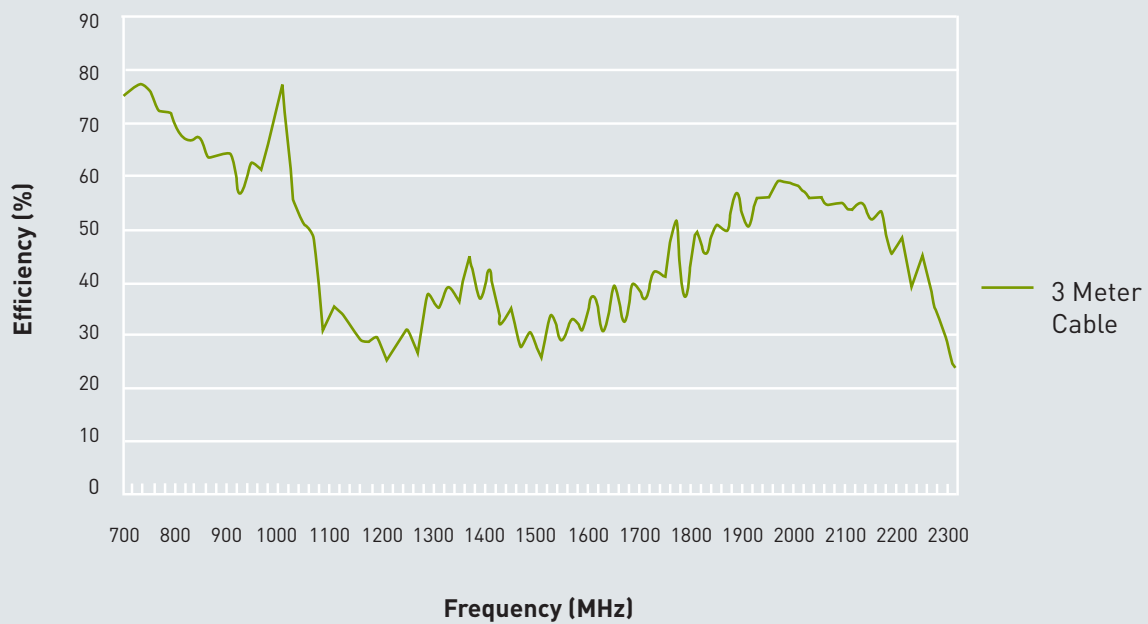


## 6. VSWR



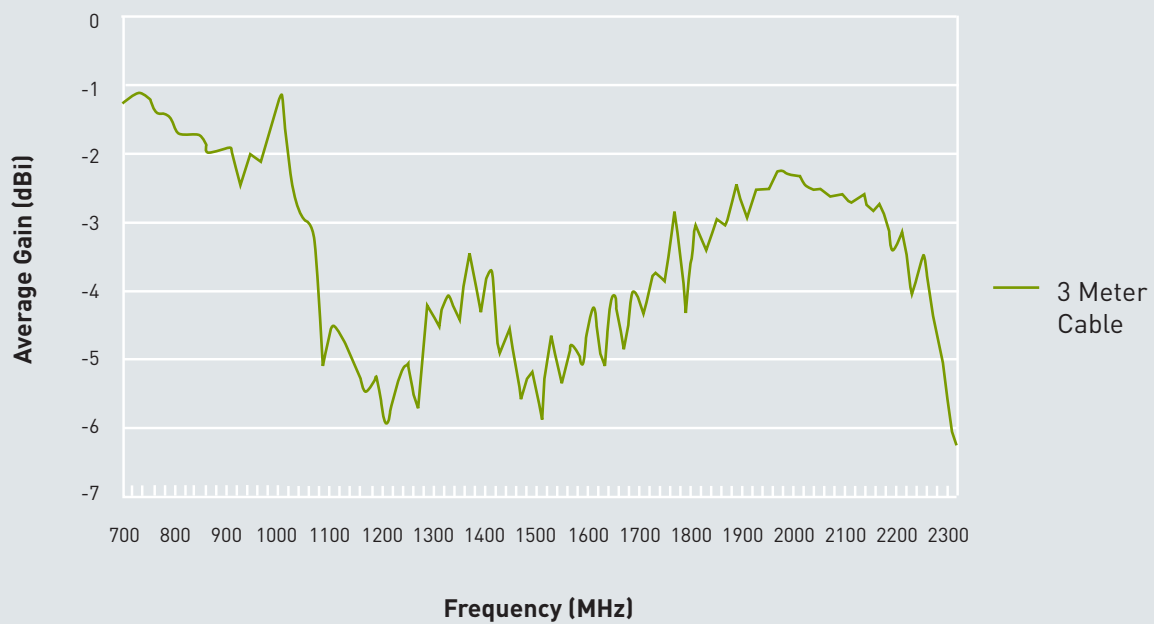
GSM / UMTS Band VSWR (with length 3 meter CFD-200 Cable)

## 7. Efficiency



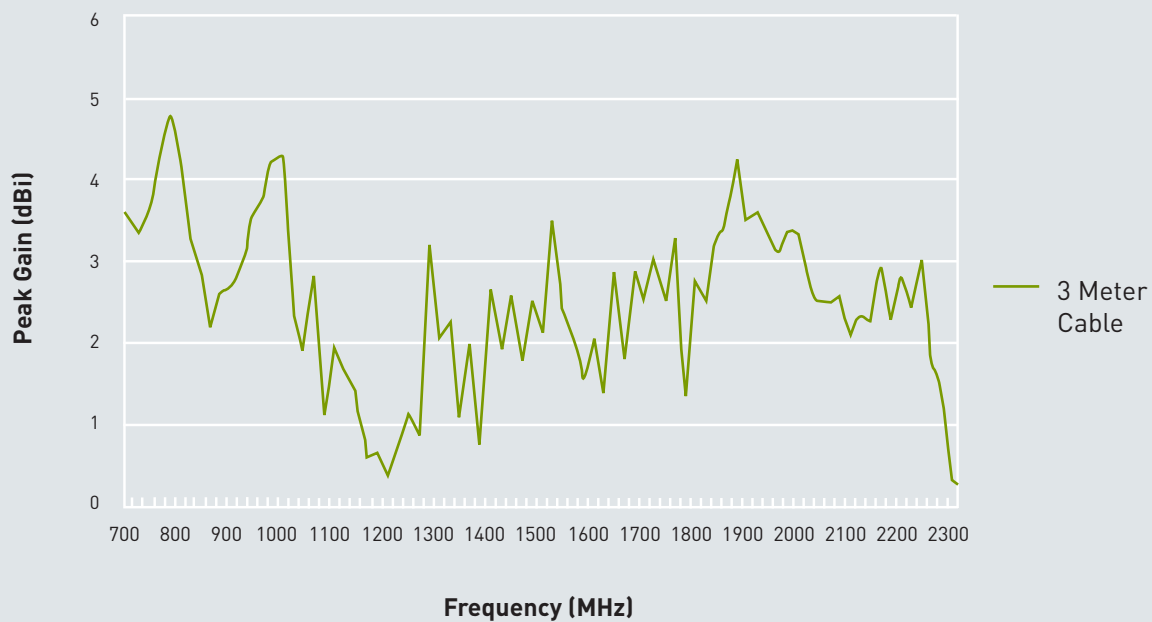
GSM / UMTS Band Efficiency (with length 3 meter CFD-200 Cable)

## 8. Average Gain



GSM / UMTS Average Gain (with length 3 meter CFD-200 Cable)

## 9. Peak Gain



GSM / UMTS Peak Gain (with length 3 meter CFD-200 Cable)

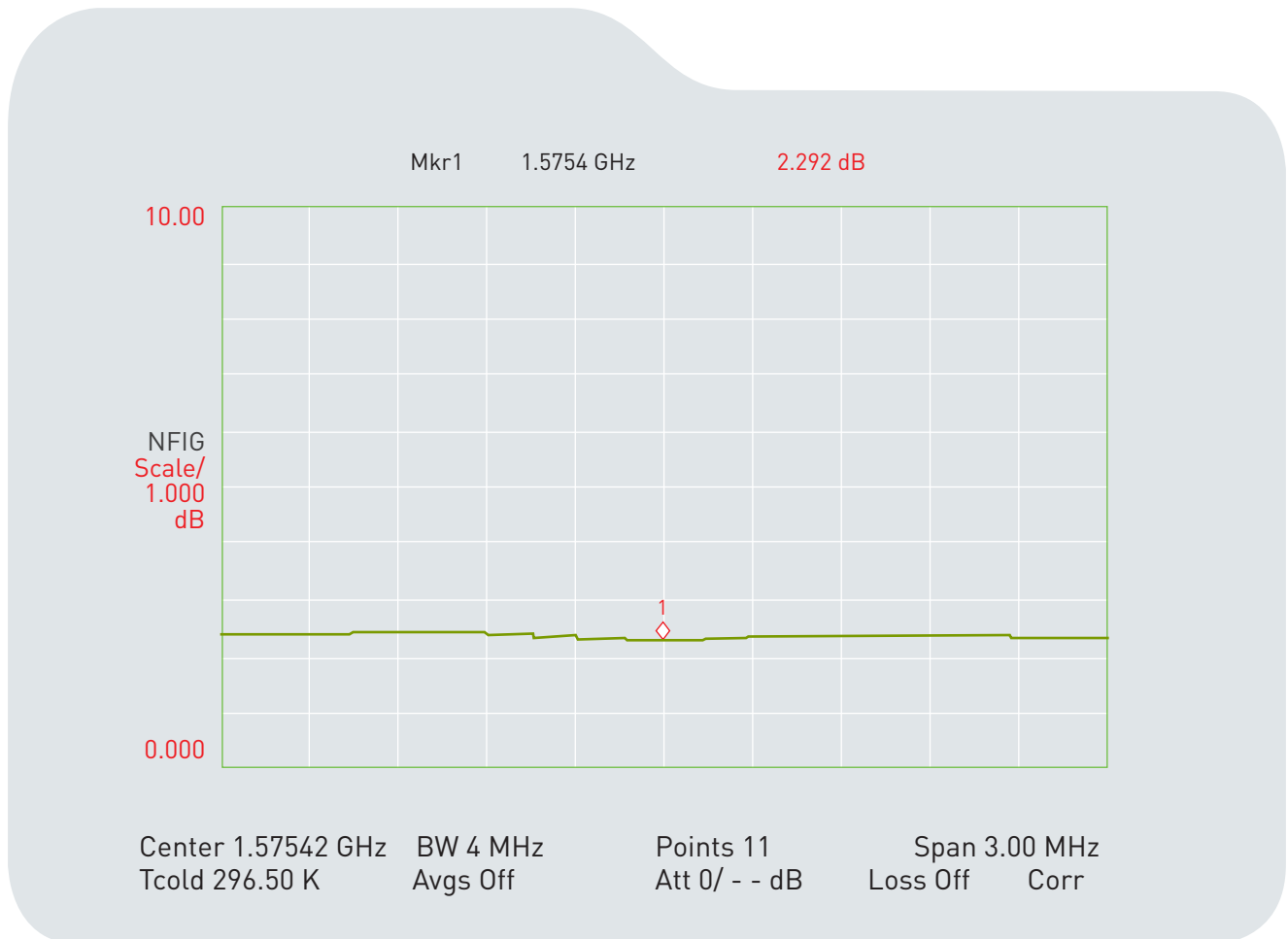
## 10. LNA

### Parameter

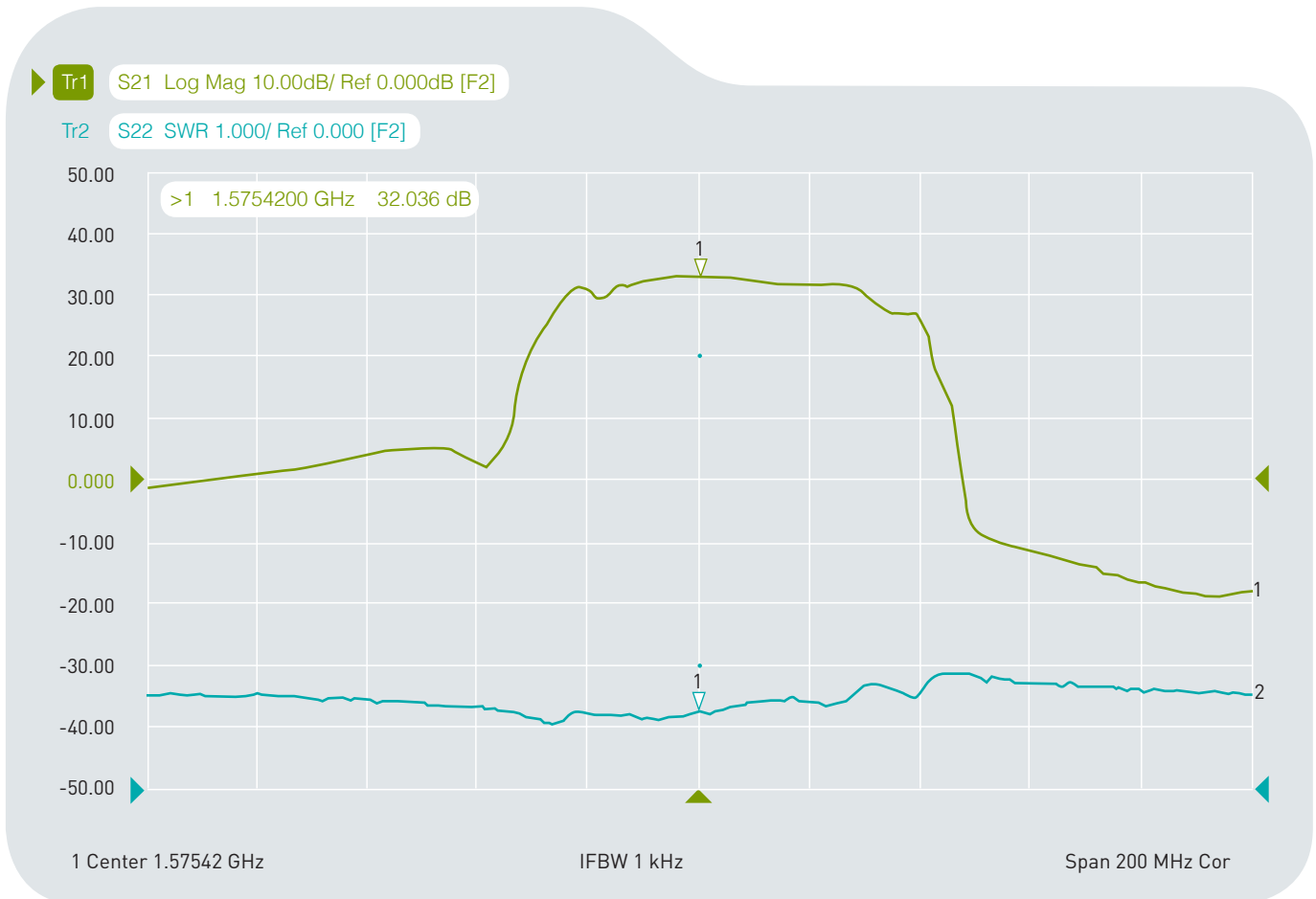
|                                       |                    |
|---------------------------------------|--------------------|
| Frequency Range                       | 1575.42+/-1.023Mhz |
| Output Impedance                      | 50Ω                |
| Output Power at 1dB Compression Point | -35dBm typ.        |
| Output VSWR                           | 2.0 Max.           |

| Supply Voltage | Gain(Typ) | Noise Figure(Typ) | Power Consumption (Typ.) |
|----------------|-----------|-------------------|--------------------------|
| 1.8V           | 27.0dB    | 2.2dB             | 5.5mA                    |
| 3.0V           | 32.9dB    | 2.3dB             | 12.5mA                   |
| 5.5V           | 33.8dB    | 2.5dB             | 15.0mA                   |

## 11. LNA Noise Figure at 3.0V



## 12. LNA Gain and Output of VSWR at 3.0V



|     |     |     |    |               |        |    |
|-----|-----|-----|----|---------------|--------|----|
| Ch1 | Tr1 | S21 | >1 | 1.5754200 GHz | 32.936 | dB |
| Ch1 | Tr2 | S21 | 1  | 1.5754200 GHz | 1.2368 |    |

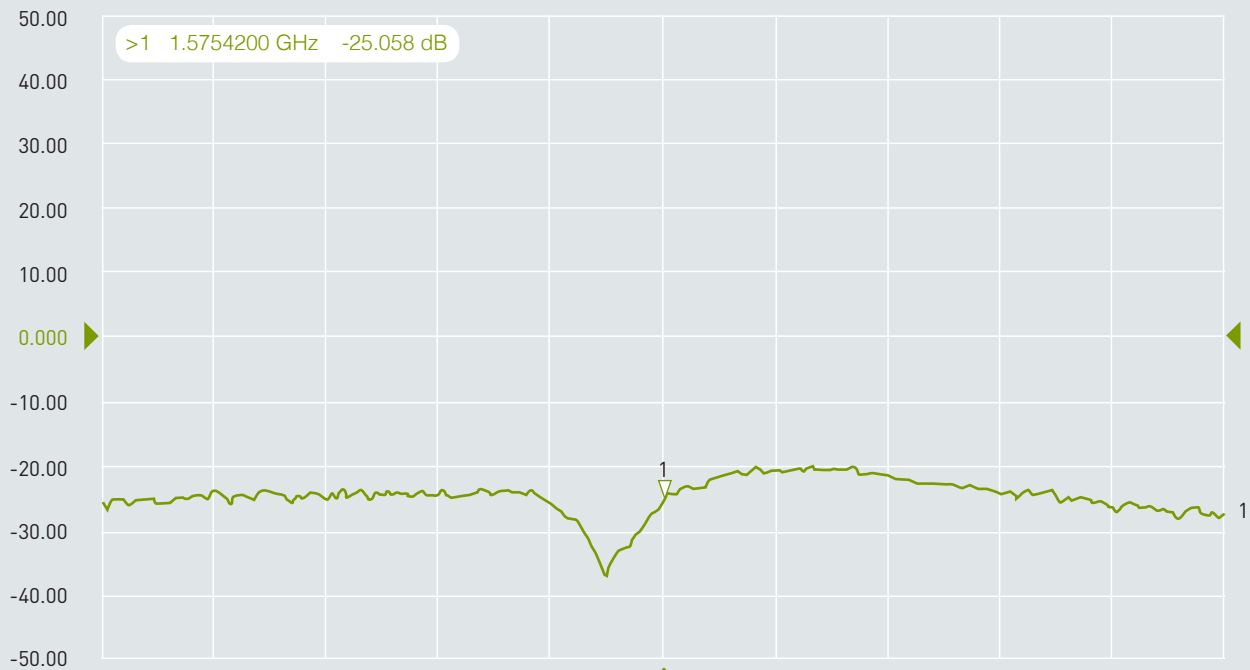
## 13. GPS Antenna Specifications (Through Antenna, LNA and Cable Assembly)

### Parameter

|                  |                    |
|------------------|--------------------|
| Frequency Range  | 1575.42+/-1.023Mhz |
| Gain at 3.0V     | 32.5dBic @ Zenith  |
| Output VSWR      | 2.0 Max.           |
| Output Impedance | 50Ω                |

## 14. 20dB min isolation to GPS LNA input and LTE / GSM / UMTS ANTENNA

► Tr1 S12 Log Mag 10.00dB/ Ref 0.000dB [F2]



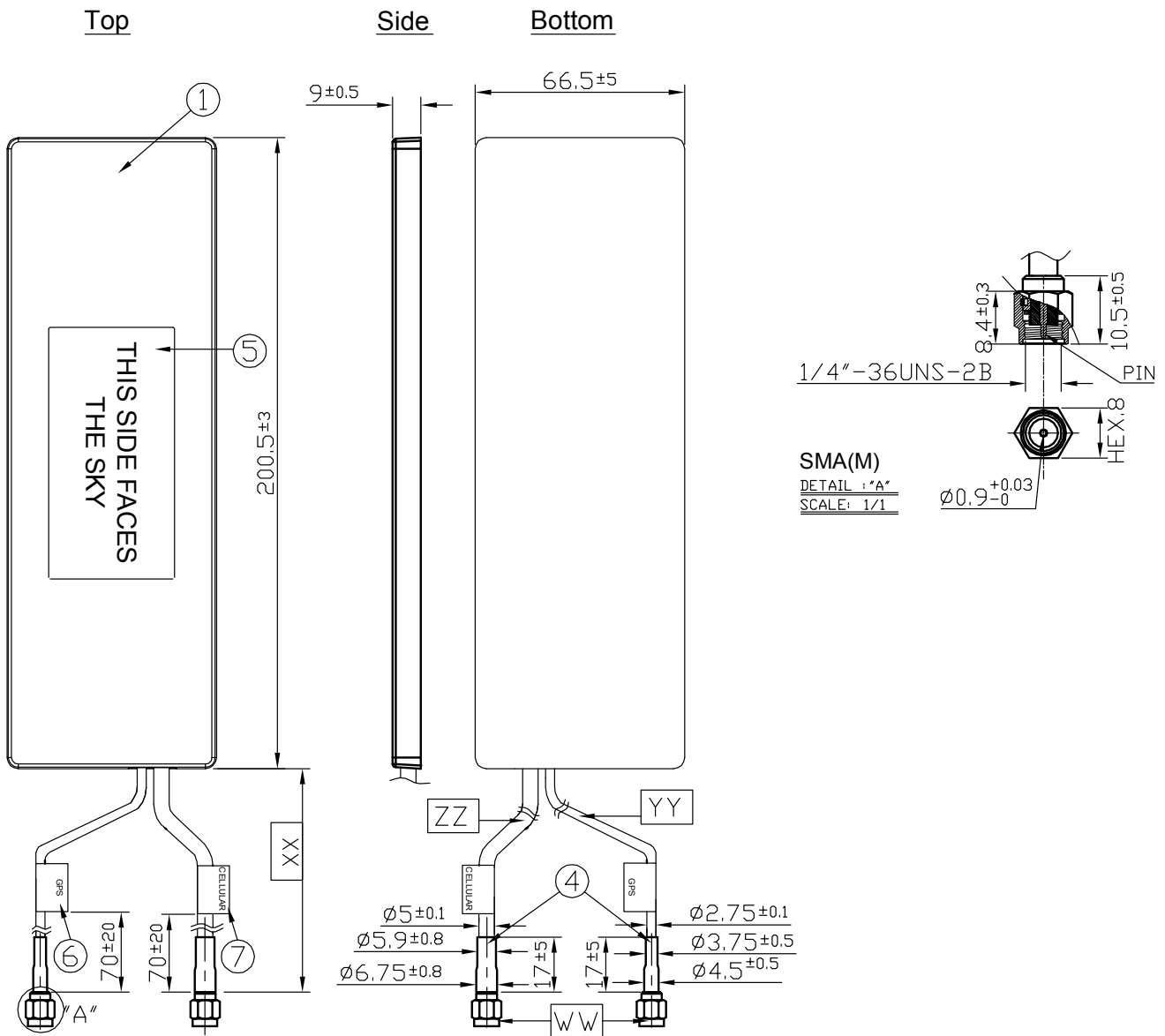
1 Center 1.57542 GHz

IFBW 1 kHz

Span 200 MHz Cor

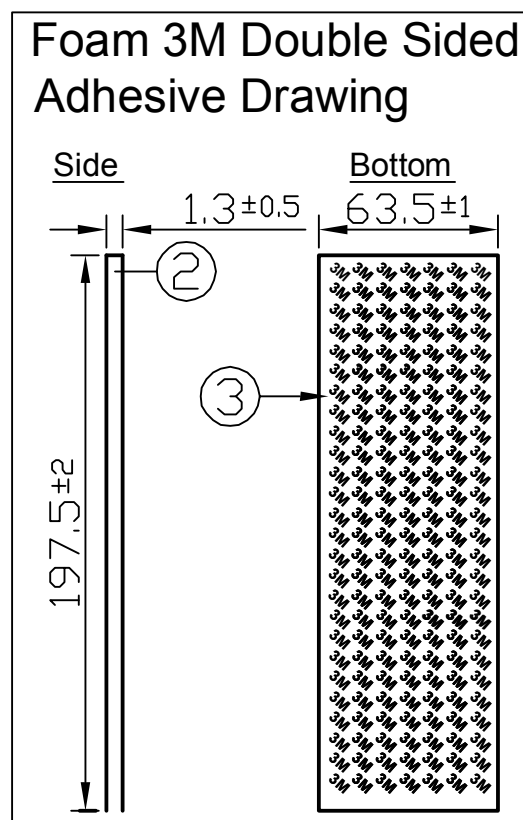
Ch1 Tr1 S12 >1 1.5754200 GHz -25.058 dB

## 15. Drawing



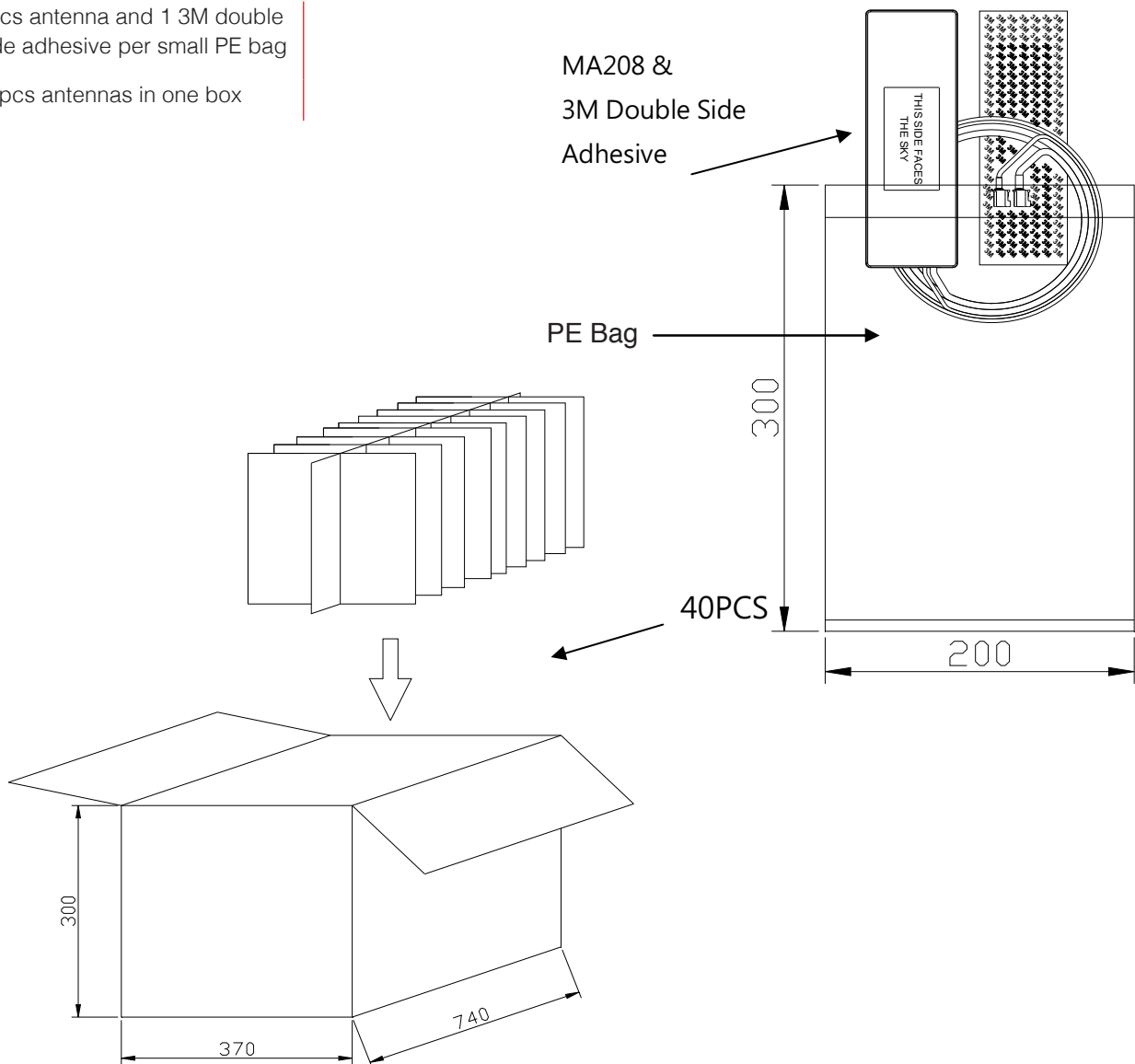
|   | Name               | Material     | Finish      | QTY |    | Name           | Spec               | Finish | QTY |
|---|--------------------|--------------|-------------|-----|----|----------------|--------------------|--------|-----|
| 1 | Housing            | ABS          | Black       | 1   | WW | Connector Type | SMA(M)             | Brass  | 2   |
| 2 | Closed Cell Foam   | F 100        | Black       | 1   | XX | Cable Length   | 3000mm $\pm 30$ mm |        | 1   |
| 3 | 3M Double Adhesive | 3M 9448 B    | White Liner | 1   | YY | Cable Type     | RG174              | Black  | 1   |
| 4 | Heat Shrink Tube   | PE           | Black       | 2   | ZZ | Cable Type     | CFD 200            | Black  | 1   |
| 5 | Clear Label        | PET          | Transparent | 1   |    |                |                    |        |     |
| 6 | GPS Label          | Coated Paper | Orange      | 1   |    |                |                    |        |     |
| 7 | Cellular Label     | Coated Paper | Blue        | 1   |    |                |                    |        |     |

### 15.1 Separate Adhesive Pad



## 7. Packaging

1pcs antenna and 1 3M double side adhesive per small PE bag  
40pcs antennas in one box



Taoglas makes no warranties based on the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and

product descriptions at any time without notice.

Taoglas reserves all rights to this document and the information

contained herein. Reproduction, use or disclosure to third parties without express permission is strictly prohibited. Copyright © Taoglas Ltd.