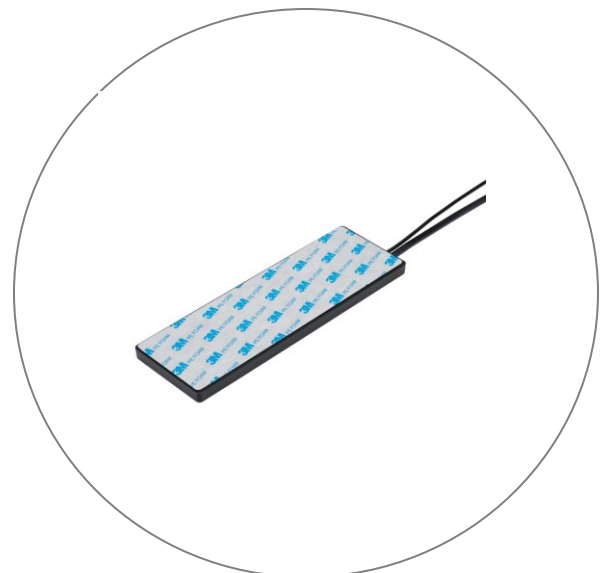
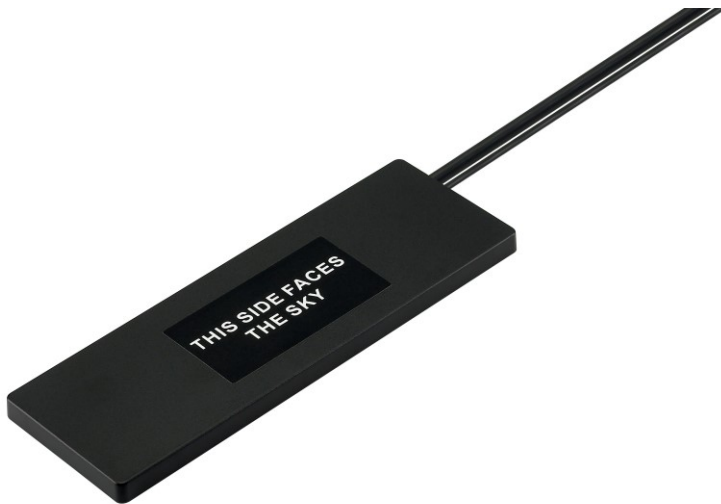


SPECIFICATION

Part No.	:	MA208.A.AB.007
Product Name	:	GPS and LTE/GSM/UMTS (2G/3G/4G 700MHz to 960MHz/1710MHz to 2200MHz) Combination Antenna
Description		Adhesive Mount IP67 Antenna GPS: 3M RG-174 Fakra Code C Blue Cellular: 3M CFD-200 Fakra Code D Violet 1.8~5.5V/30dB 200.5*66.5*9mm RoHS Compliant





1. Introduction

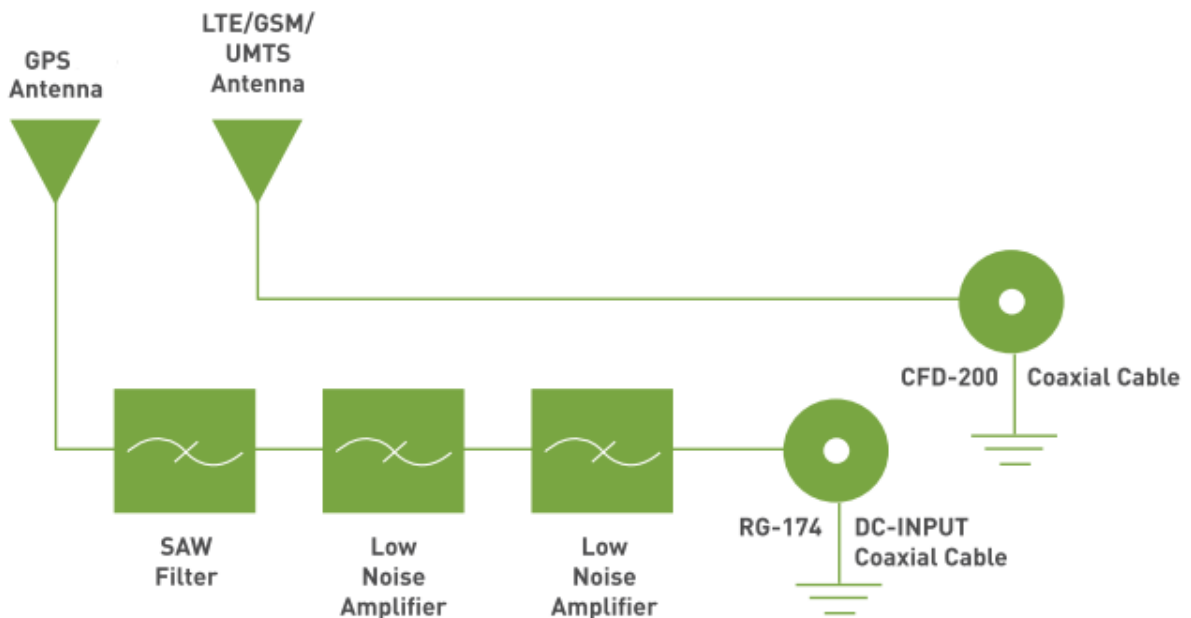
The Stream MA.208 GPS/LTE Cellular antenna is a low profile, heavy-duty, fully IP67 waterproof external M2M antenna for use by RF professionals in telematics, transportation and remote monitoring applications. The Stream is unique in the market as it combines the highest possible efficiency and peak 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).



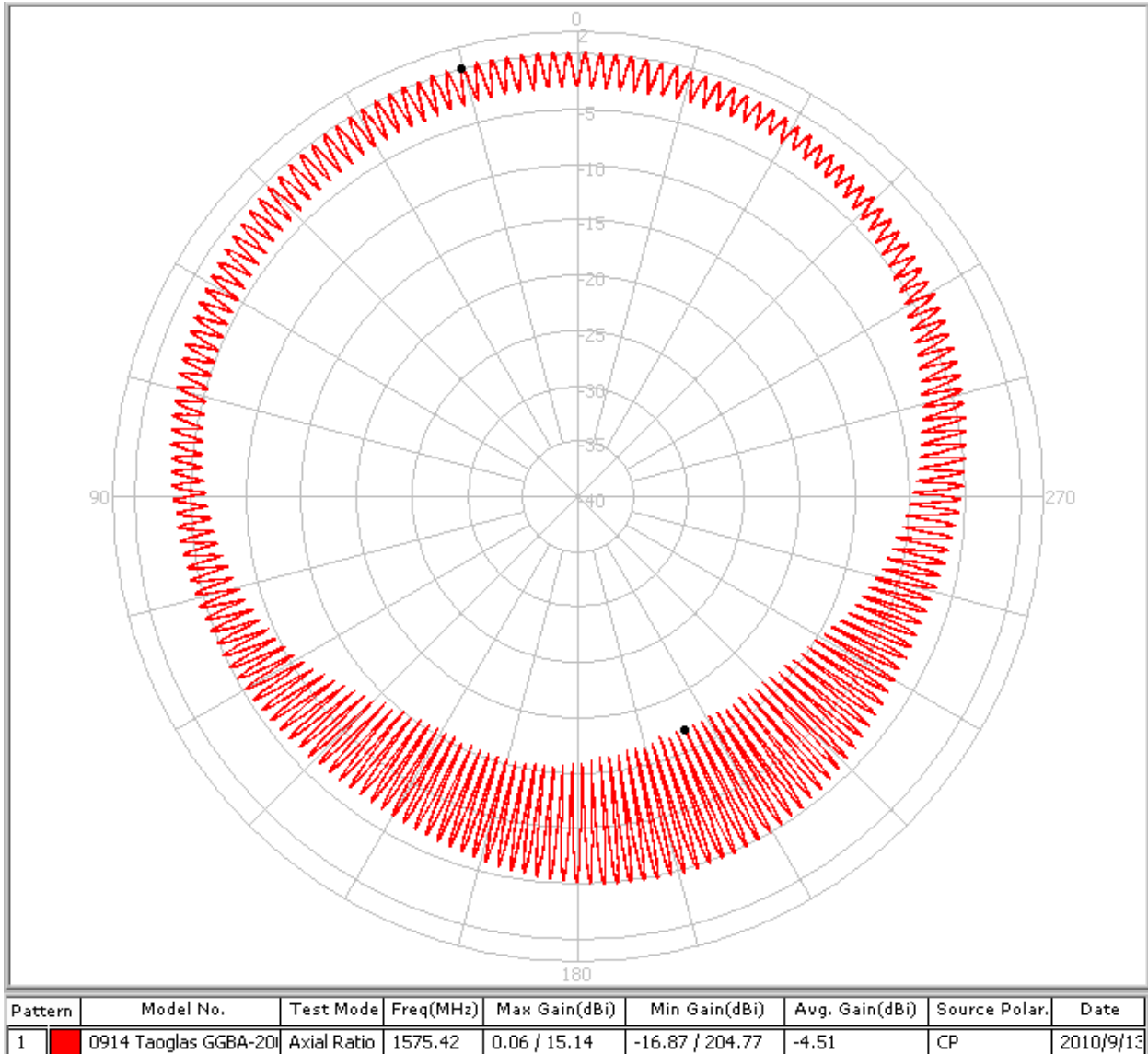
3. Antenna Specification

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

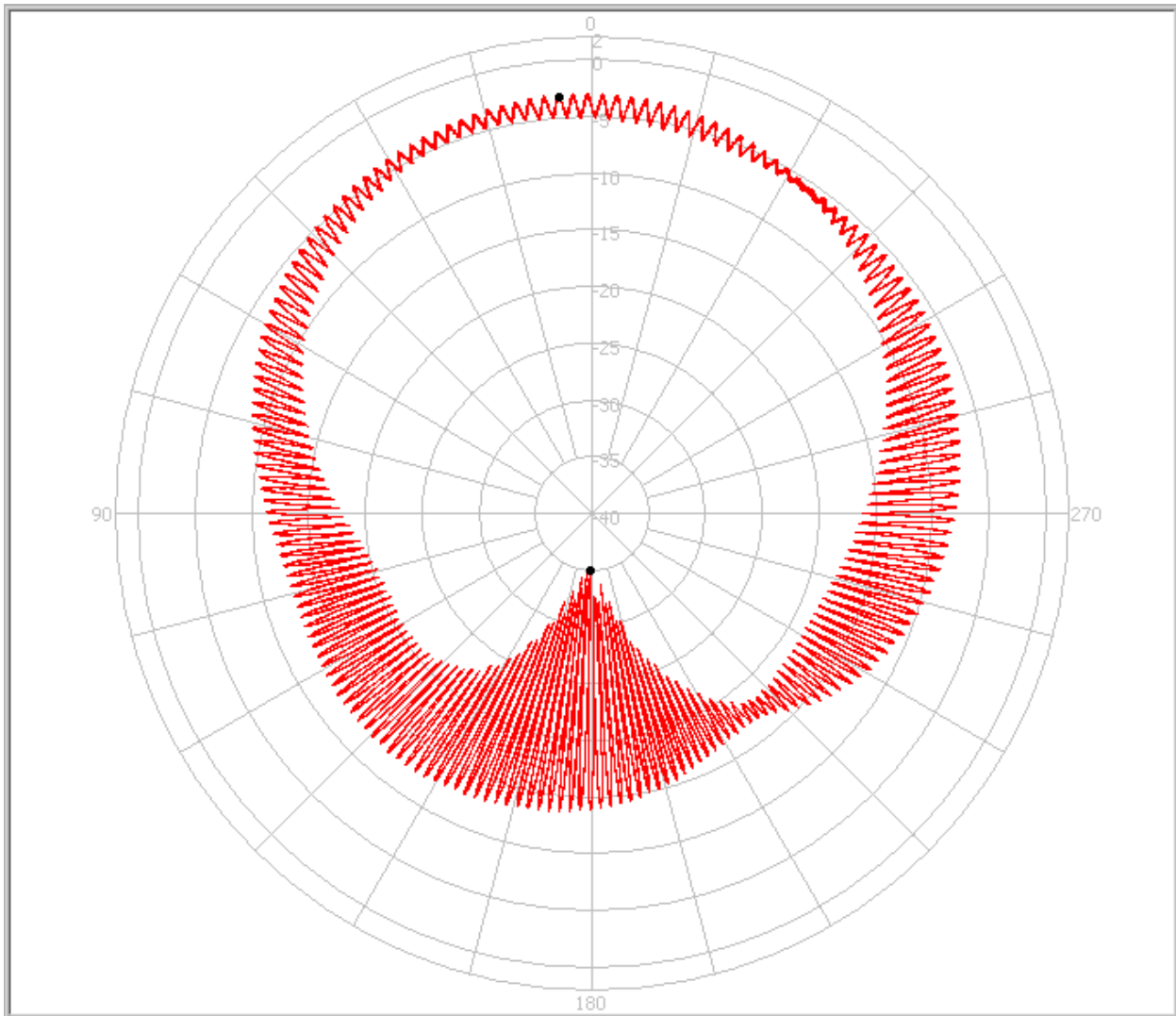
Cable / Connector	3m RG-174 Cable Fakra Code C Blue connector Fully Customisable	CFD-200 with Fakra Code D Violet Fully customisable
Housing	UV resistant PVC	
Adhesive Mount	3M 1600TB(196.57*62.57*1.25mm)	
Protection Class	IP-67	
Operation Temperature	-40°C to +85°C	
Storage Temperature	-40°C to +85°C	
Relative Humidity	20% to 95%	
Weight per unit	0.18kg	

***note: specifications may be subject to change**

4. Axial Ratio



With IPEX Cable

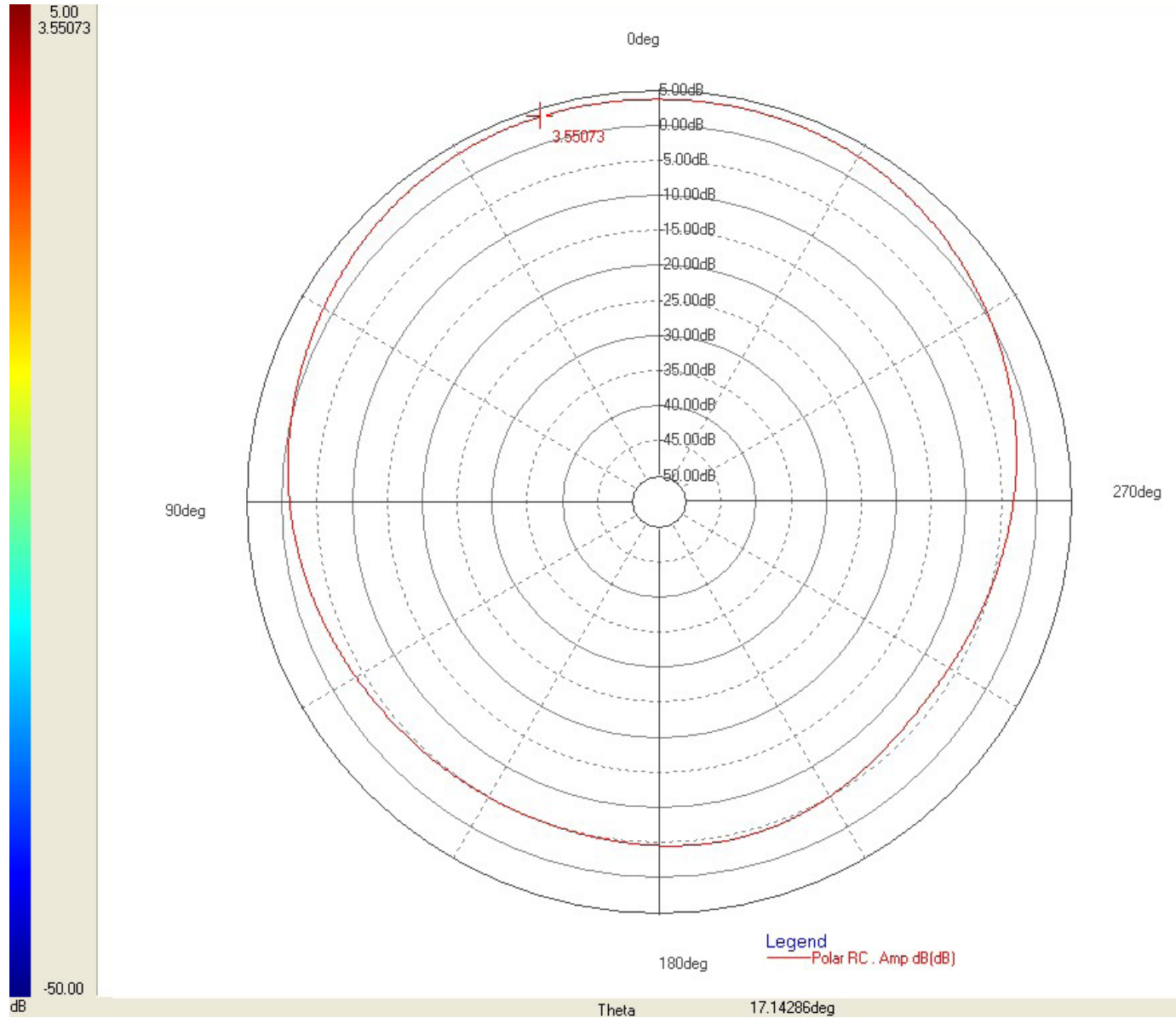


Pattern	Model No.	Test Mode	Freq(MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	Taoglas GGBA-200 3M	Axial Ratio	1575.42	-3.19 / 4.61	-34.89 / 178.75	-8.79	CP	2010/9/28

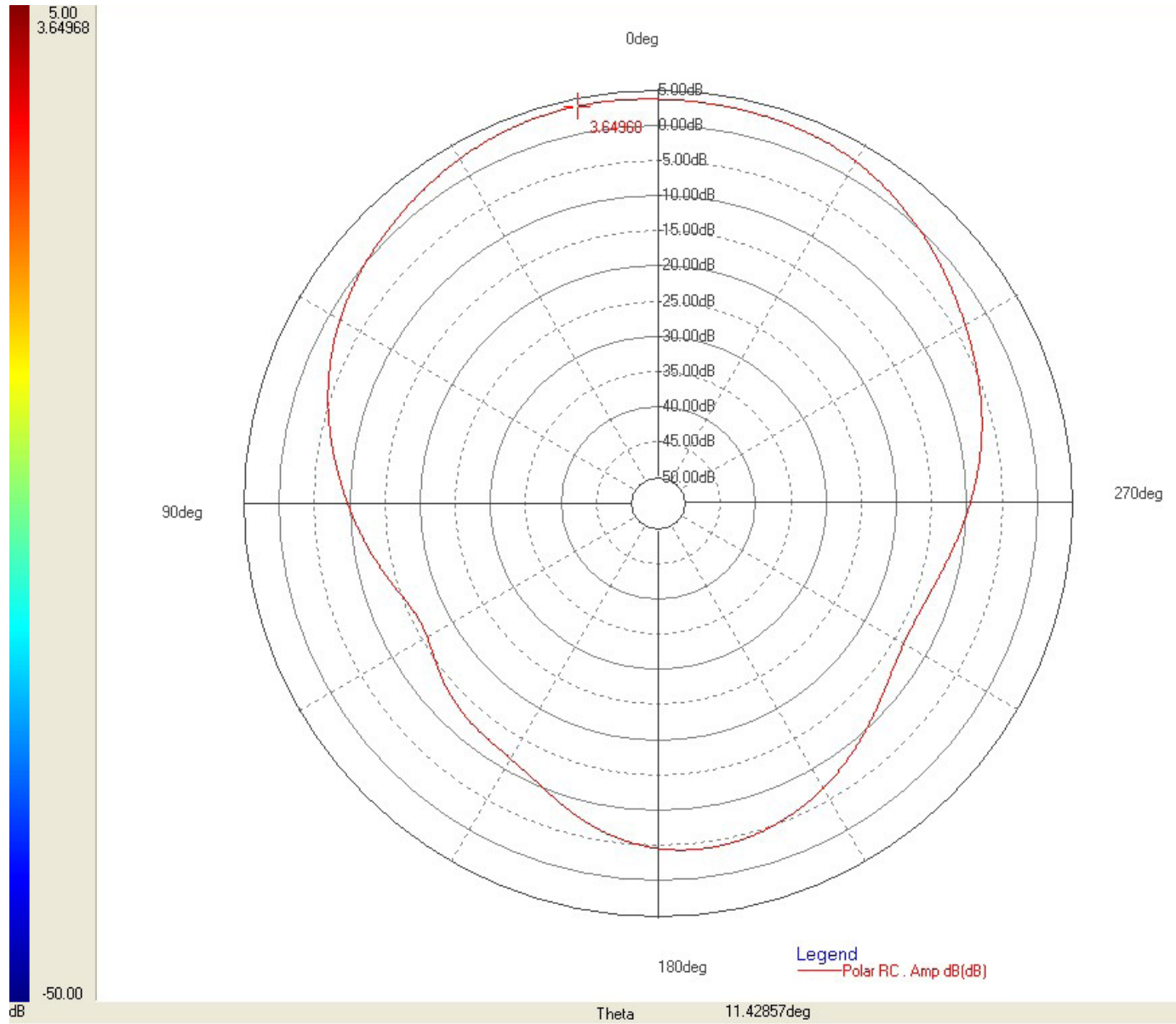
3M CFD-200 Cable

5. Radiation Patterns

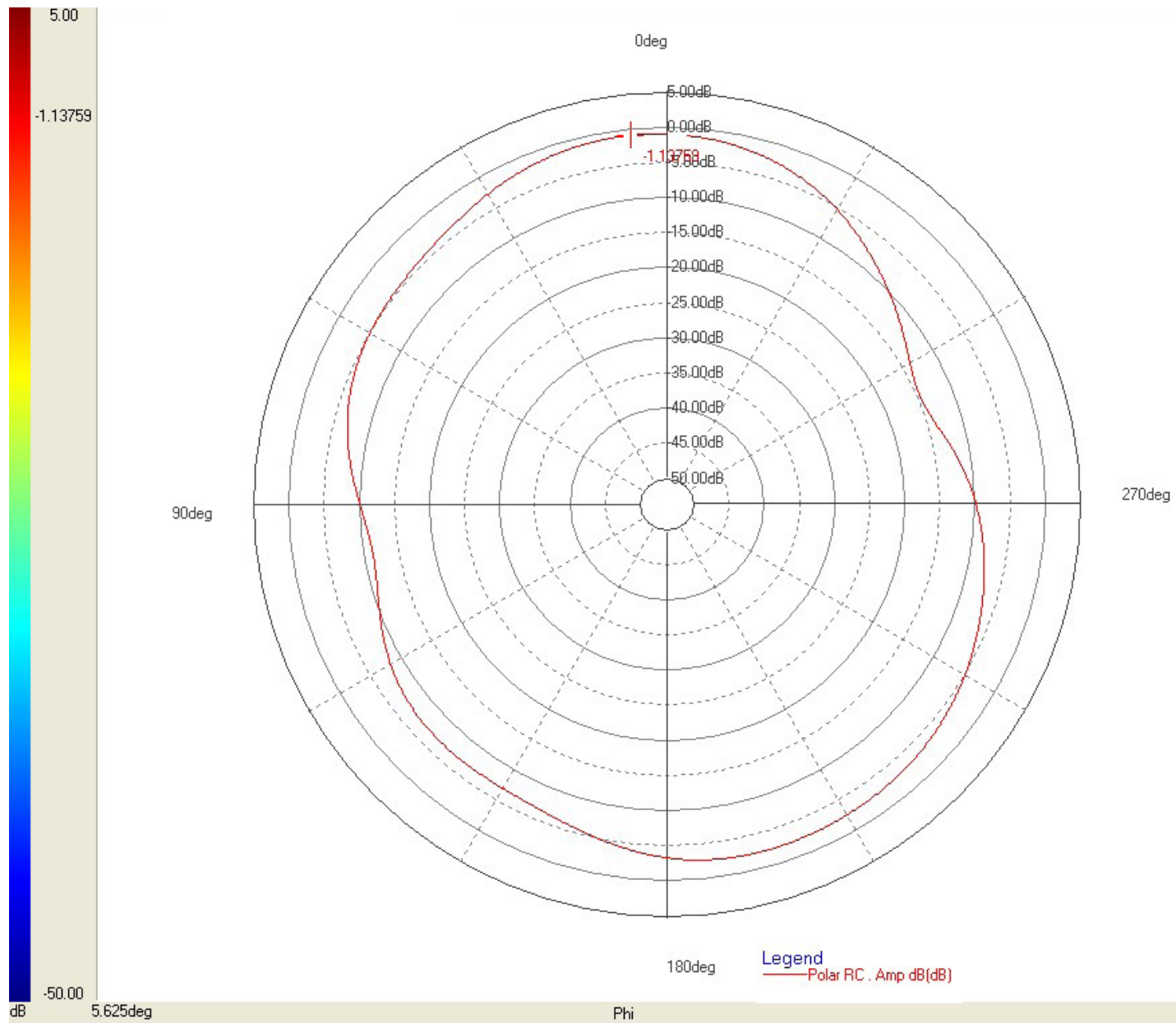
Radiation Pattern in XZ plane



Radiation Pattern in YZ plane



Radiation Pattern in XY plane

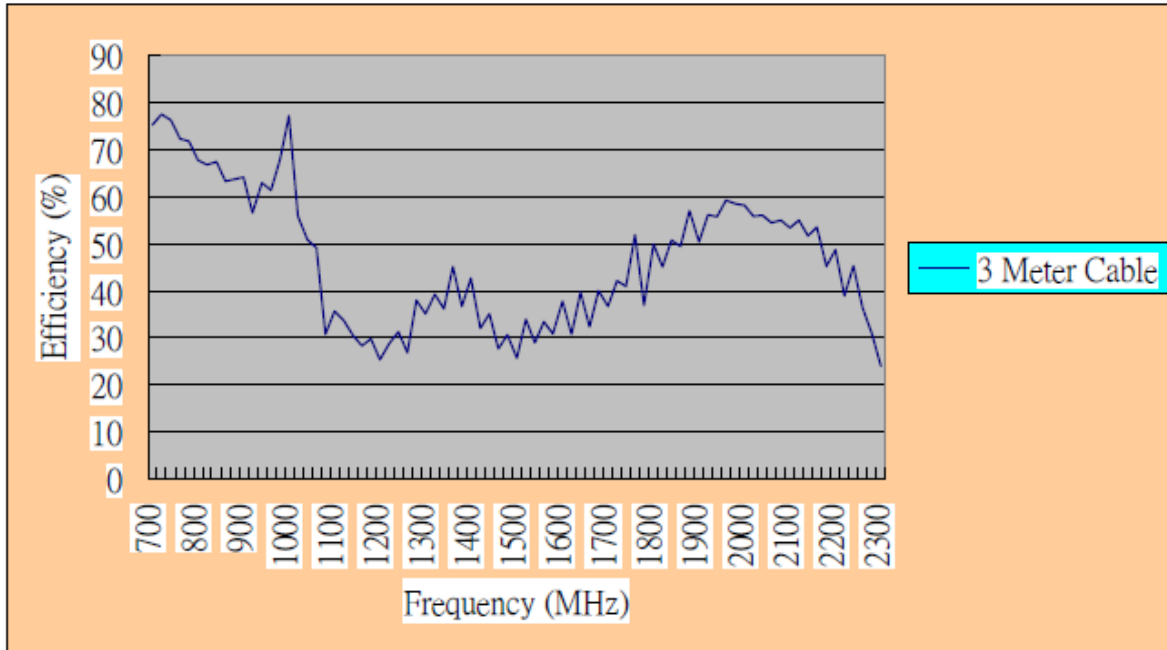


6. VSWR



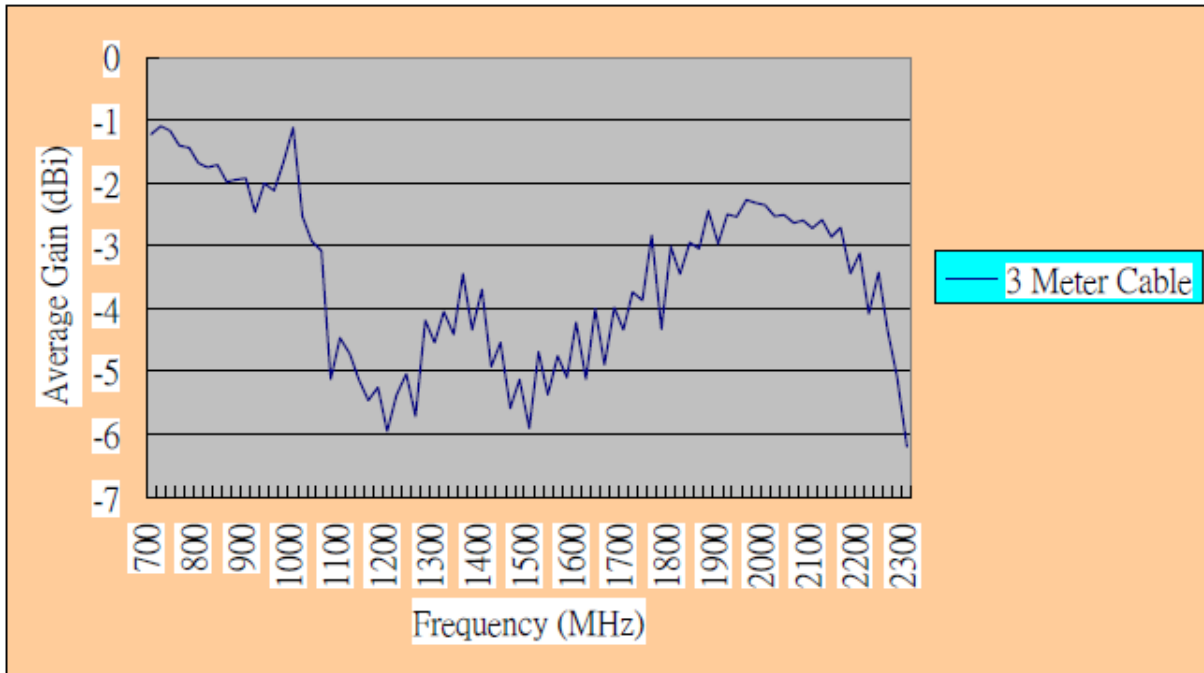
GSM/ UMTS Band VSWR (with length 3 meter CFD-200 Cable)

7. Efficiency



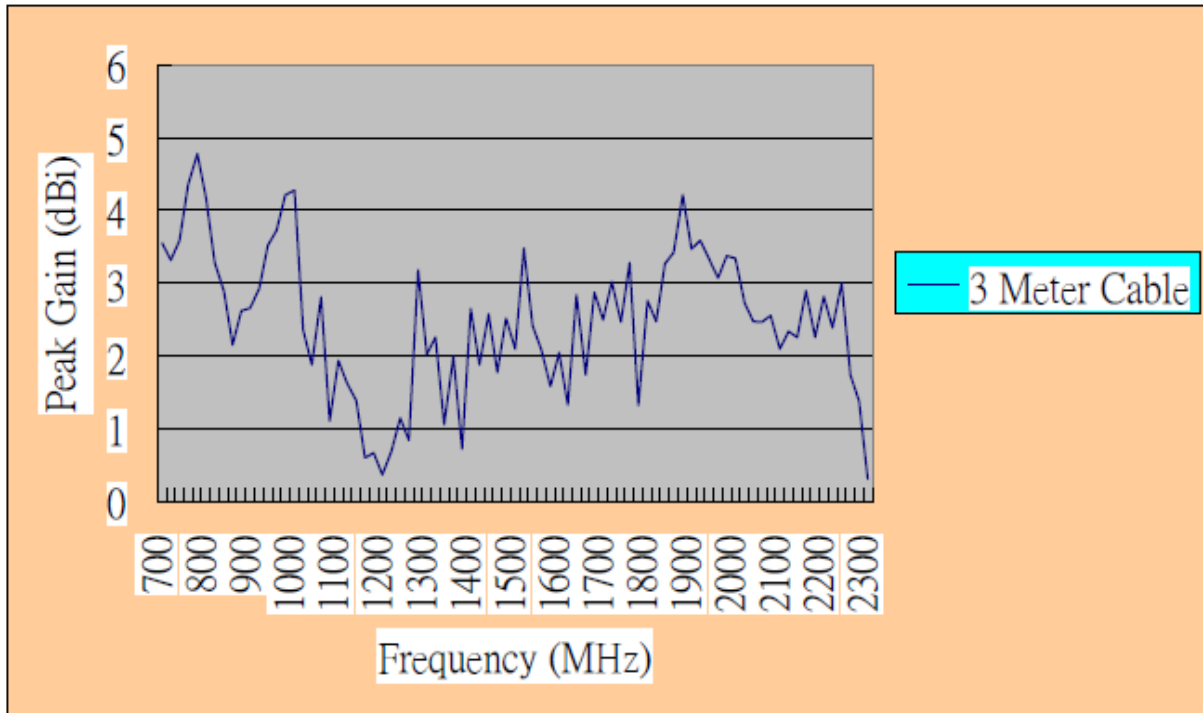
GSM/ UMTS Band Efficiency (with length 3 meter CFD-200 Cable)

8. Average Gain



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

9. Peak Gain



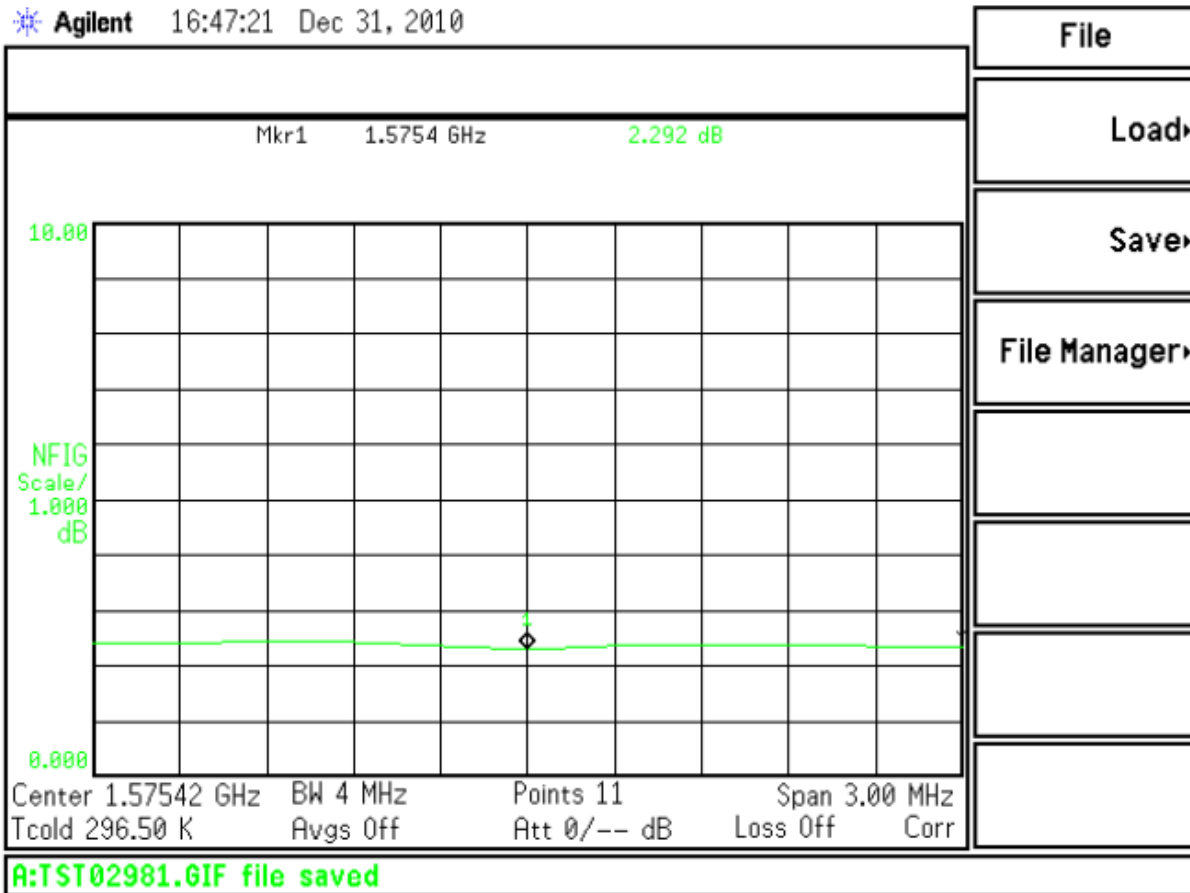
GSM/ UMTS Peak Gain (with length 3 meter CFD-200 Cable)

10. LNA

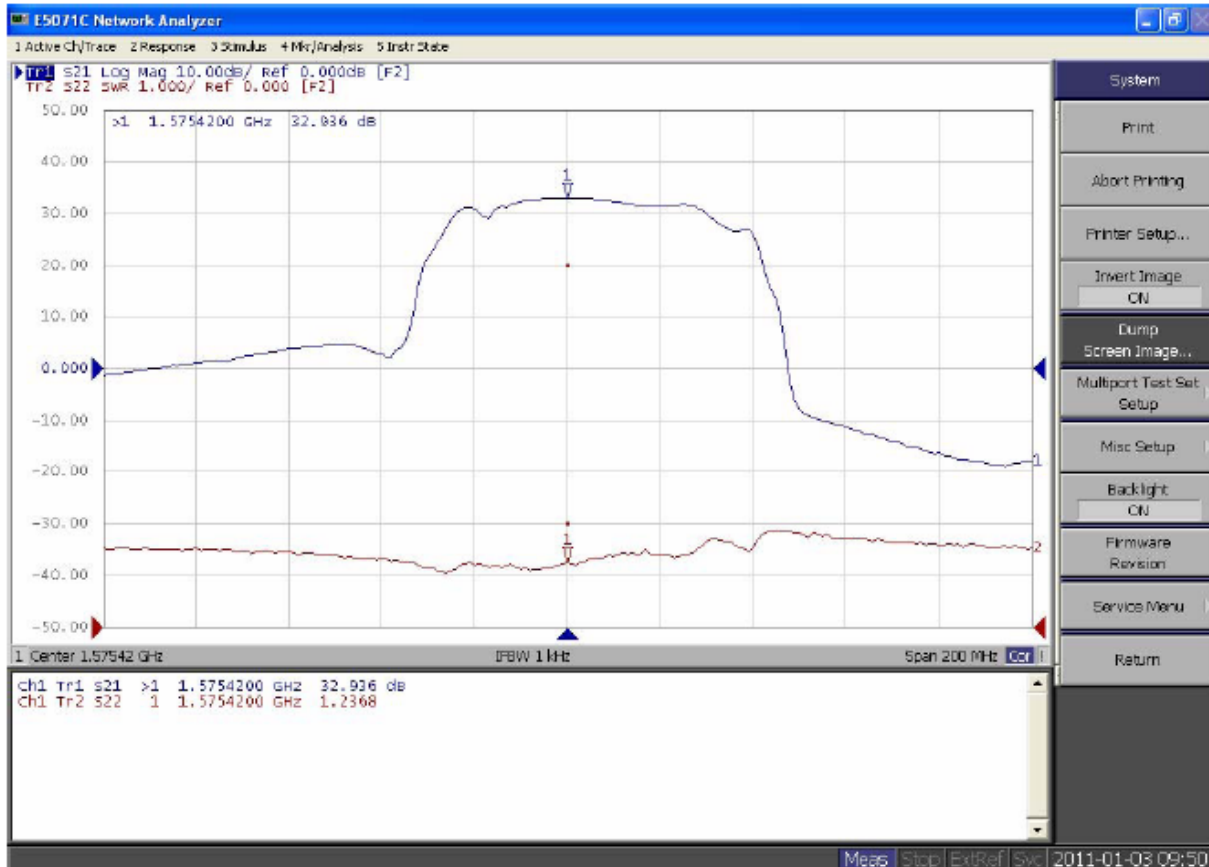
Frequency Range	1575.42+/-1.023Mhz
Output Impedance	50 Ohm
Output Power at 1dB Compression Point	-35dBm typ.
Output VSWR	2.0 Max.

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



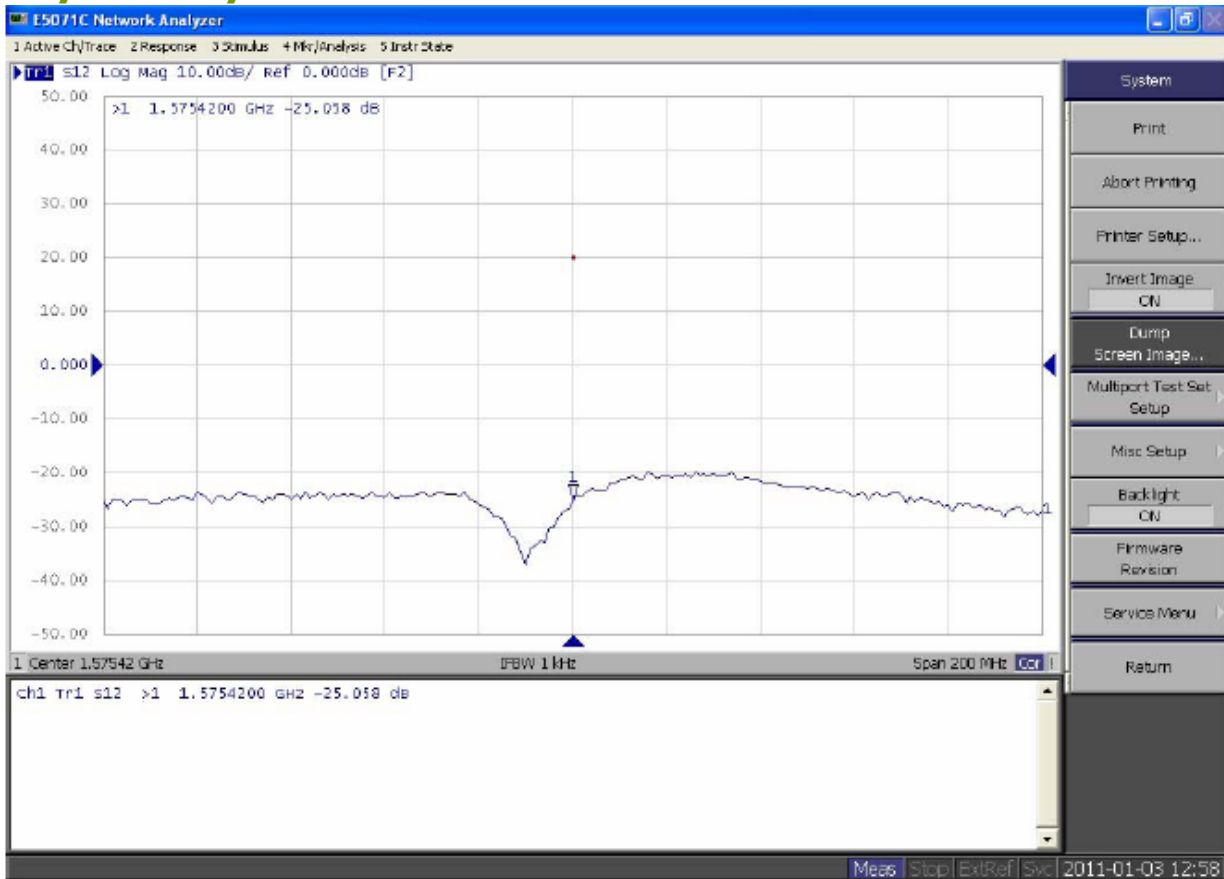
12. LNA Gain and Output of VSWR at 3.0V



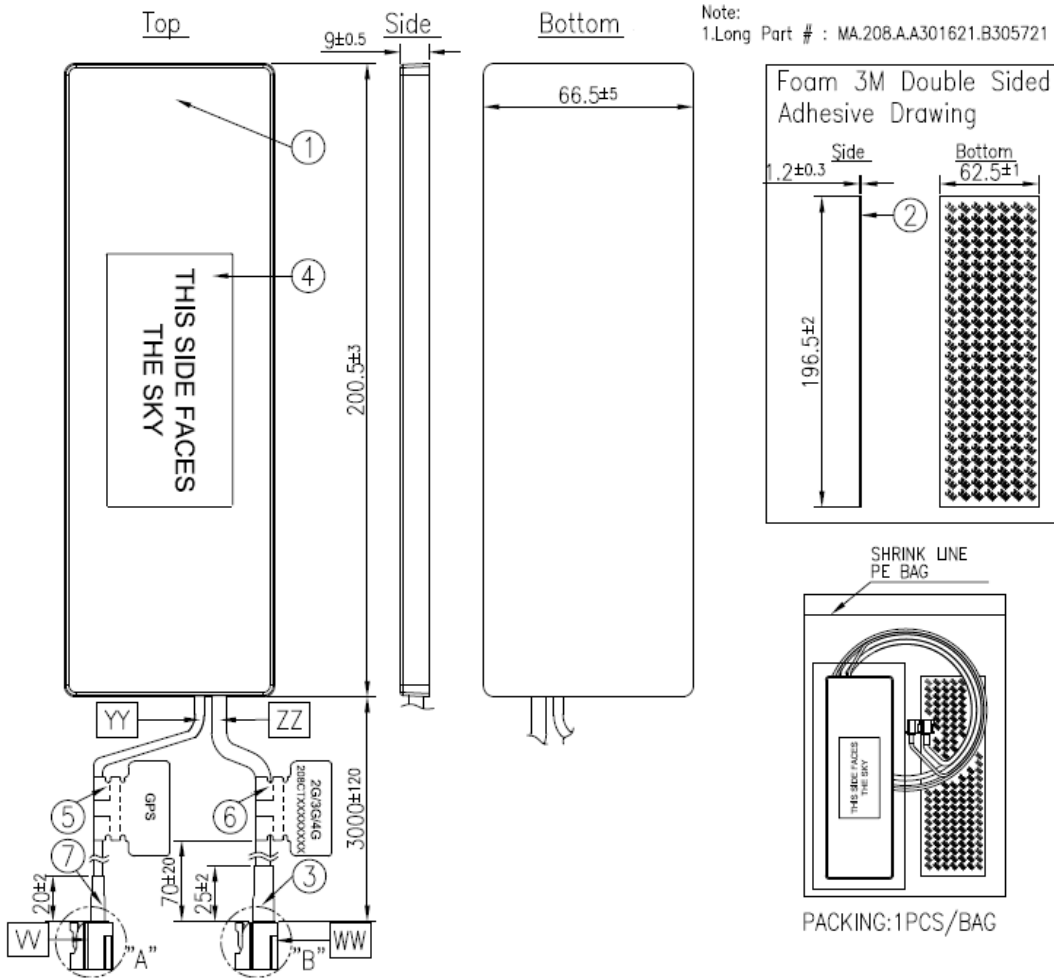
13. GPS Antenna Specifications (Through Antenna, LNA and Cable Assembly)

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

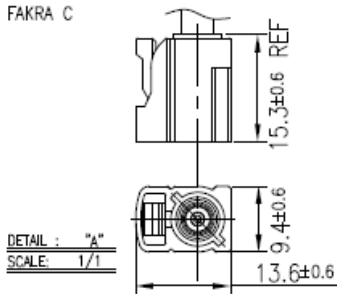
14. 20dB min isolation to GPS LNA input and LTE/ GSM/ UMTS ANTENNA



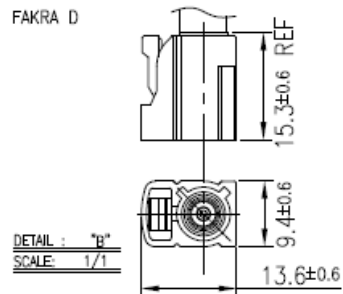
15. Drawing



FAKRA C



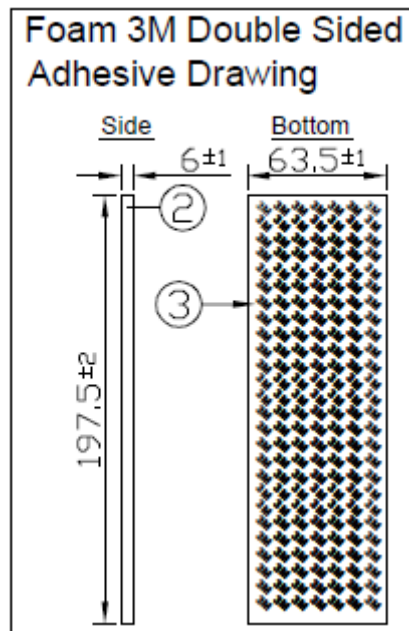
FAKRA D



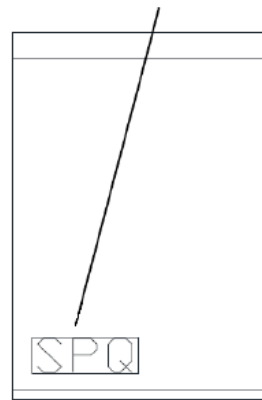
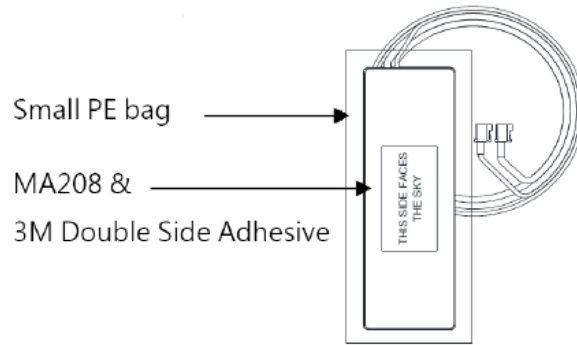
Name	P/N	Material	Finish	QTY
1 Housing	000111030007A	ABS	Black	1
2 3M Double Adhesive Foam	001015030000A	3M 1600TB	Blue Liner	1
3 Heat Shrink Tube	001315C030000A	PE	Black	1
4 Clear Label	001011040007A	Coated Paper	Black	1
5 GPS Label	001011F000007A	PEPA	Orange	1
6 2G/3G/4G Label	001014400007A	eEPA	White	1
7 Heat Shrink Tube	001315C020000A	PE	Black	1

Name	P/N	Spec	Finish	QTY
W Connector Type	202313000007A	FAKRA C	Blue	1
WW Connector Type	202413000007A	FAKRA D	Violet	1
YY Cable Type	301315C000000A	RG174	Black	1
ZZ Cable Type	301415C010000A	JFD 200	Black	1

Separate Adhesive Pad



16. Packing



1PCS per big PE bag

