AP.25F.07.0078A

Specification

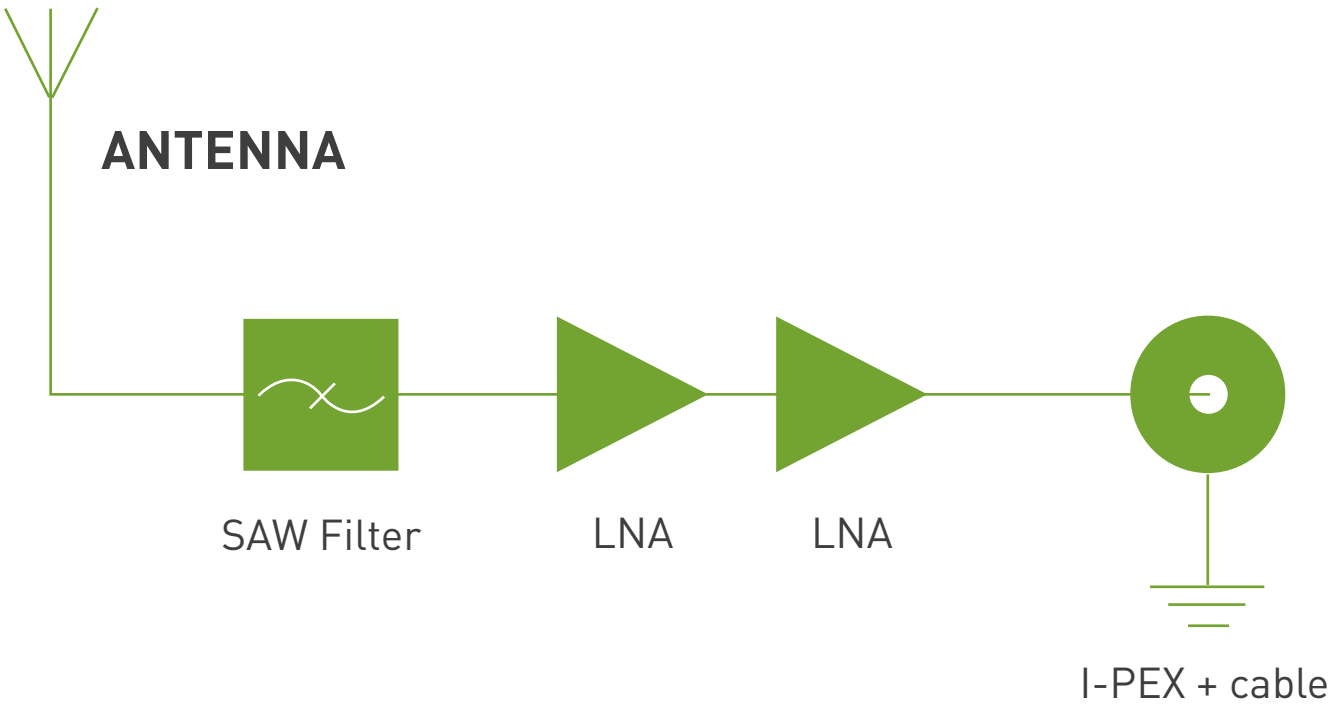
Part No.	**AP.25F.07.0078A**
Product Name	25mm Two Stage GPS Active Patch Antenna Module with front-end Saw Filter
Feature	Industry leading GPS antenna performance 25mm*25mm*8mm (Ground Plane) 78mm Ø1.13 I-PEX MHFI (U.FL) 28dB LNA Wide Input Voltage 1.8V to 5.5V Low Power Consumption ROHS Compliant

1. Introduction

The AP.25F has been designed specifically for embedded (inside device) integration with GPS receiver modules where there is a GSM transmitter nearby and risk of interference and saturation.

The AP.25F combines a 25*25*4mm advanced low profile ceramic patch antenna with a two stage LNA and a front-end SAW filter, with ultra thin coaxial cable.

Taoglas active antenna modules utilise XtremeGainTM technology for the highest sensitivity in the industry. The AP.25F consists of 2 functional blocks – the LNA and also the patch antenna.



The AP.25F has a SAW filter on the front of it. The main use of the AP.25F would be for small devices where the GSM transmitter is close to the GPS antenna, it helps avoid burn-out of the LNA or the module due to interference from the GSM transmitter at out band frequencies.

2. Specification

2.1 Patch Antenna

Parameter	Specification
Frequency	1575.42 ± 1.023MHz
Gain @ Zenith	+2.0 dBic Typ. @ Zenith
Polarization	RHCP
Axial Ratio	3.0dB max. @ Zenith
Patch Dimension	25*25*4mm

2.2 LNA

Parameter	Specification
Frequency	1575.42 ± 1.023MHz
Outer Band Attenuation	F0=1575.42MHz
	F0±30MHz 5dB min.
	F0±50MHz 20dB min.
	F0±100MHz 25dB min.
Output Impedance	50Ω
Output VSWR	2.0 Max
Pout at 1dB Gain Compression point	Typ. -2dBm Min. -6dBm

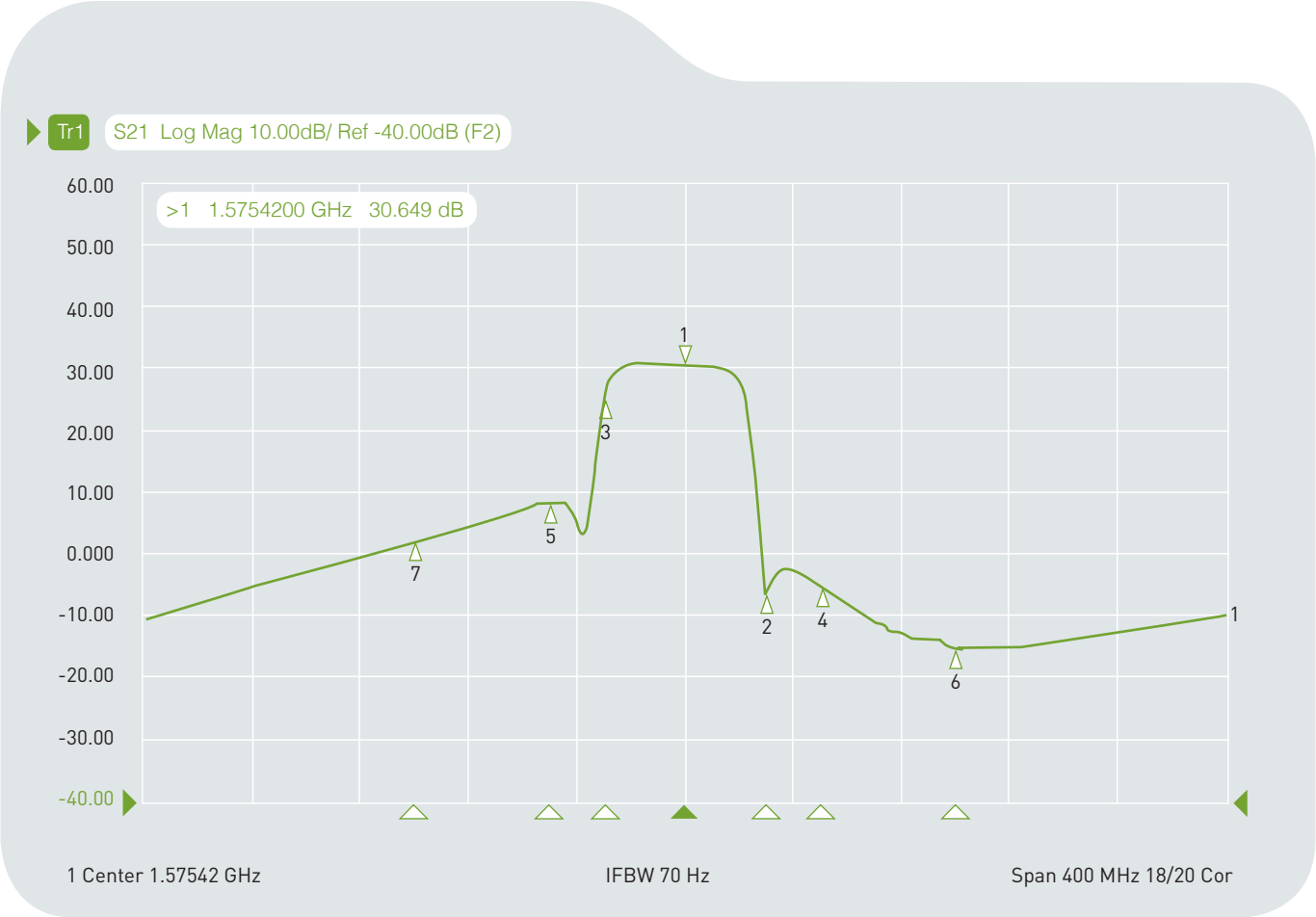
LNA Gain, Power Consumption and Noise Figure

Voltage	LNA Gain (Typ)	Power Consumption(mA) Typ	Noise Figure Typ
Min. 1.8V	23dB	Min. 3mA - Max. 10mA	2.7dB
Typ. 3.0V	28dB	Min. 8mA – Max. 20mA	3.0dB
Max. 5.5V	30dB	Min. 30mA – Max. 40mA	3.7dB

2.3 Cable* & Connector

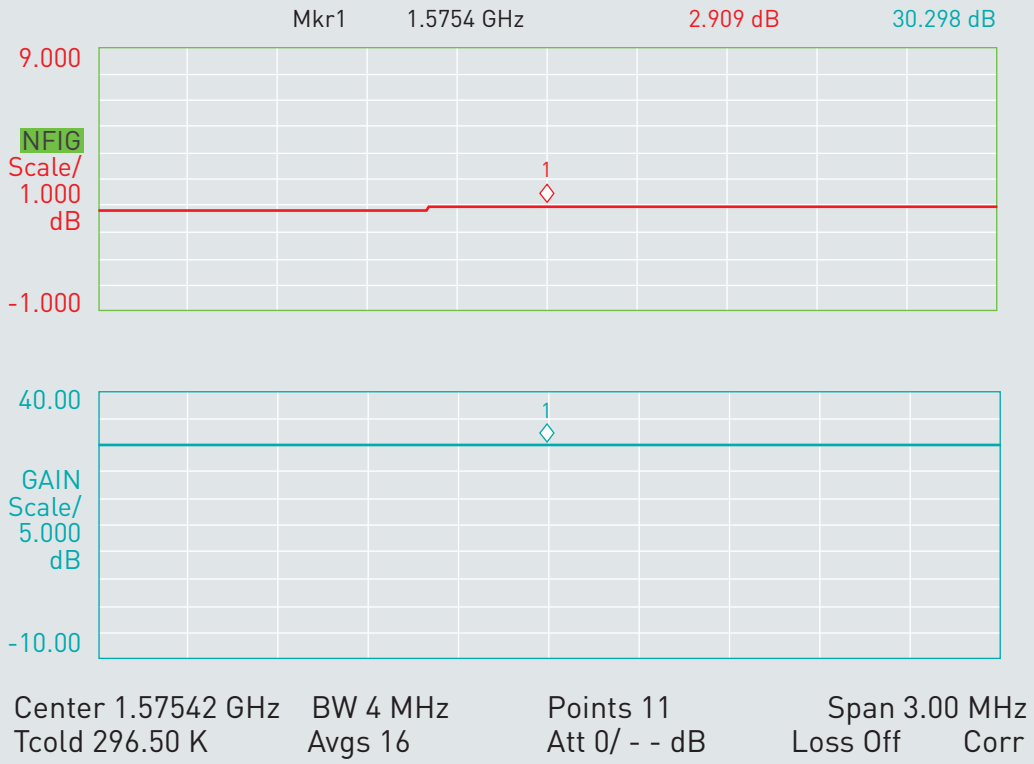
Parameter	Specification
RF Cable	Coaxial Cable Ø1.13 ± 0.1mm, length 80 ± 2.0mm
Connector	IPEX MHFI (U.FL)

3. LNA Gain and Out Band Rejection @3.0V



Cg1	Tr1	S21	>1	1.5754200	GHz	30.649	dB
Cg1	Tr1	S21	2	1.6054200	GHz	-6.7098	dB
Cg1	Tr1	S21	3	1.5454200	GHz	24.584	dB
Cg1	Tr1	S21	4	1.6254200	GHz	-5.6354	dB
Cg1	Tr1	S21	5	1.5254200	GHz	8.0734	dB
Cg1	Tr1	S21	6	1.6754200	GHz	-15.436	dB
Cg1	Tr1	S21	7	1.4754200	GHz	1.5714	dB

4. LNA Noise Figure @3.0V

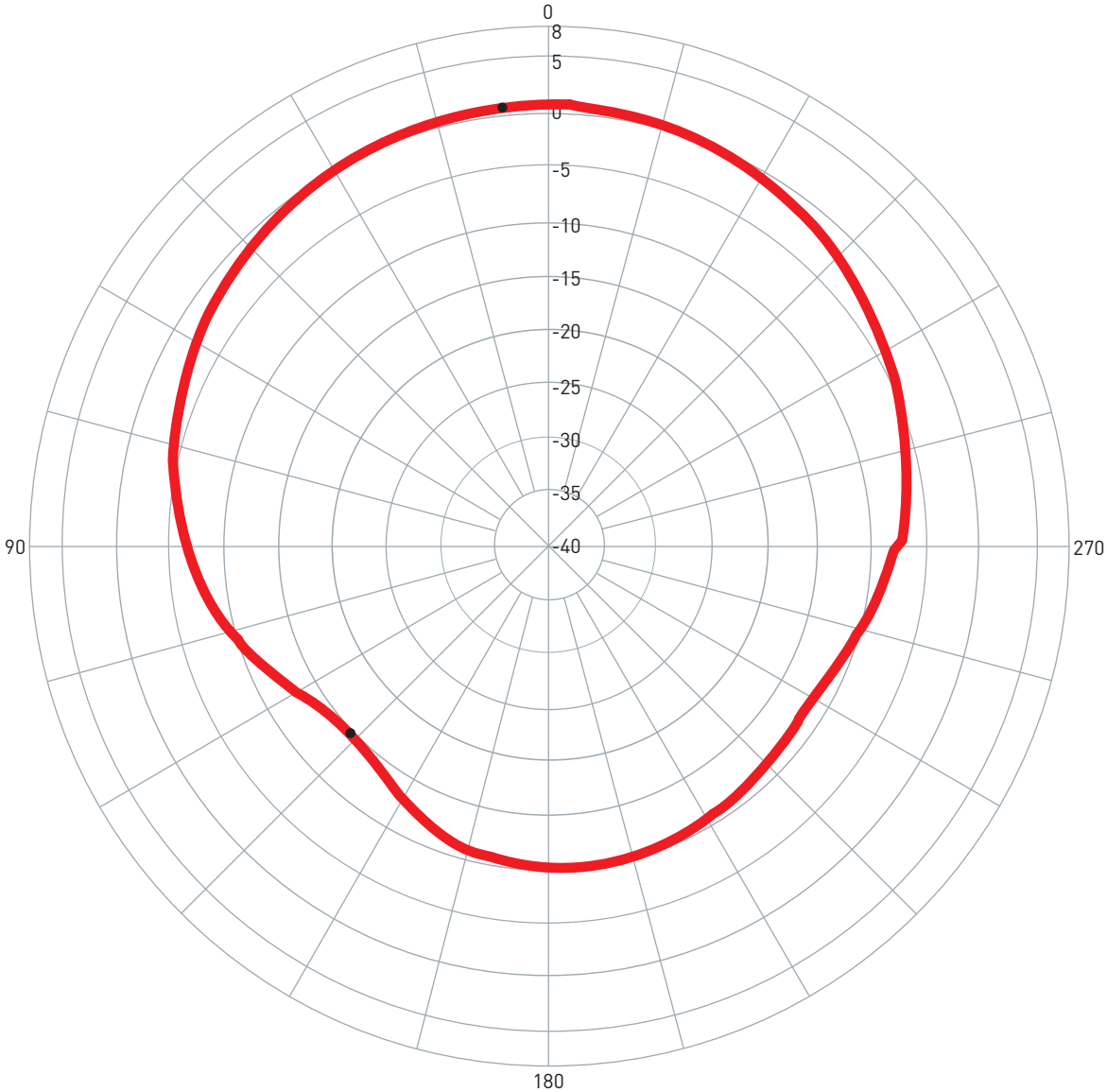


5. Total Specification (through Antenna, LNA, Cable and Connector)

Parameter	Specification
Frequency	1575.42 ± 1.023MHz
Gain	At 3V: 30 ± 3dBic @ 90°
Output Impedance	50Ω
Polarization	RHCP
Output VSWR	Max 2.0
Operation Temperature	-40°C to + 85°C
Storage Temperature	-40°C to + 85°C
Relative Humidity	40% to 95%
Input Voltage	Min. 1.8V, Typ. 3.0V, Max. 5V
Antenna	25*25*8mm

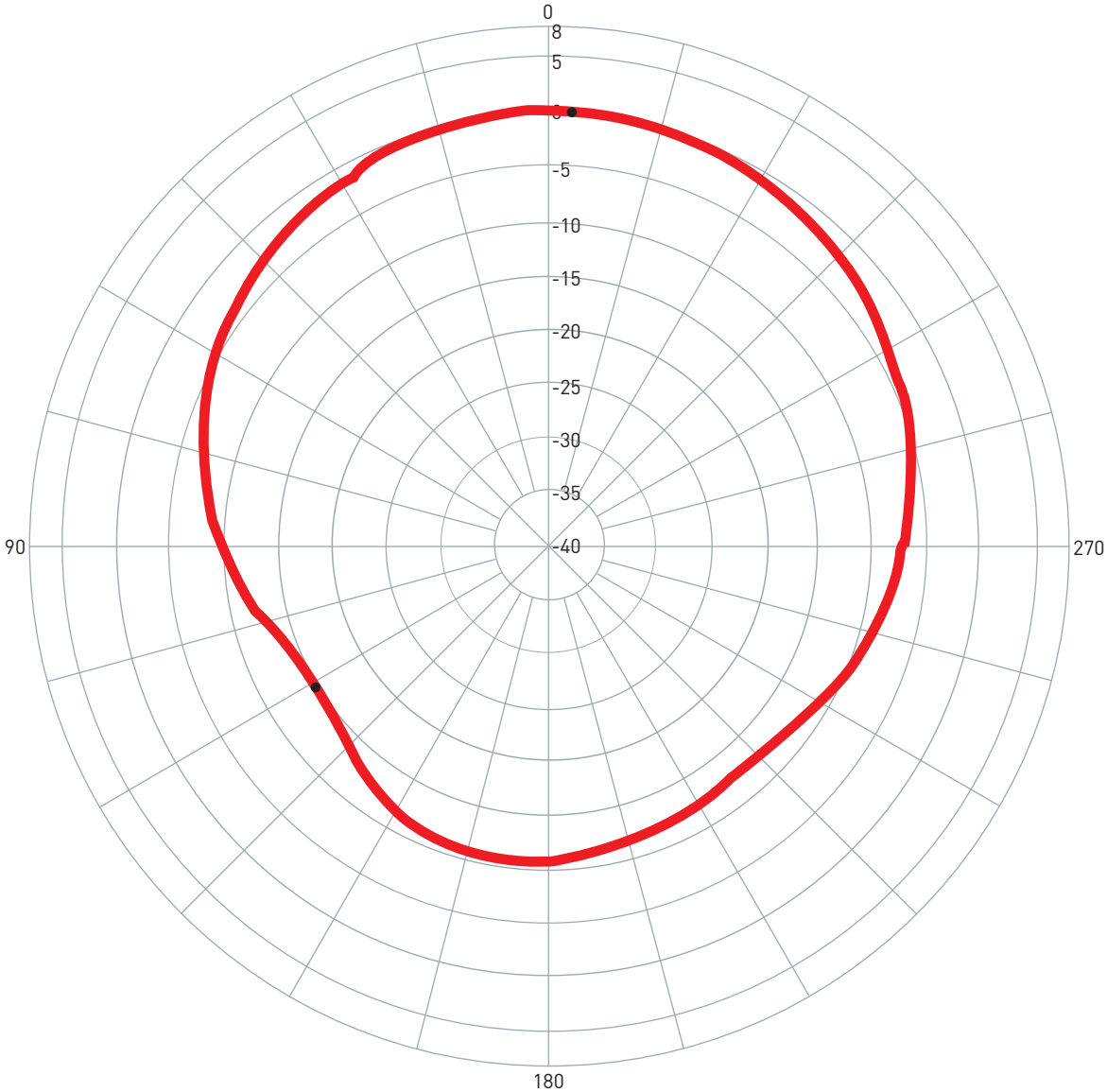
6. Radiation Patterns

6.1 XZ Plane Radiation



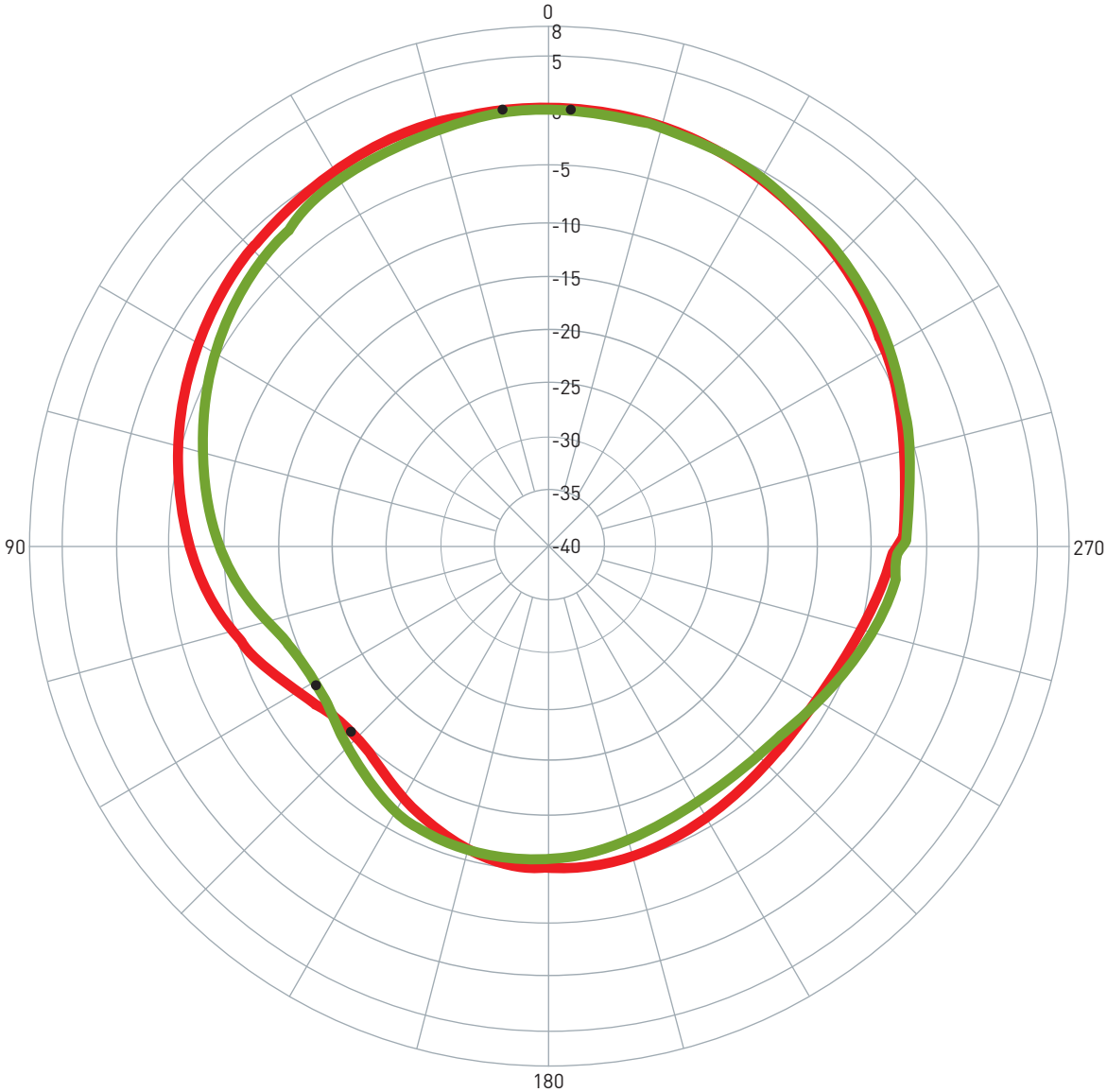
Pattern	Model No.	Test Mode	Freq (MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	AP.25F.07.0078A	XZ	1610.00	0.59 / 6.00	-14.77 / 134.00	-4.16	RHCP	2010/4/19

6.2 YZ Plane Radiation



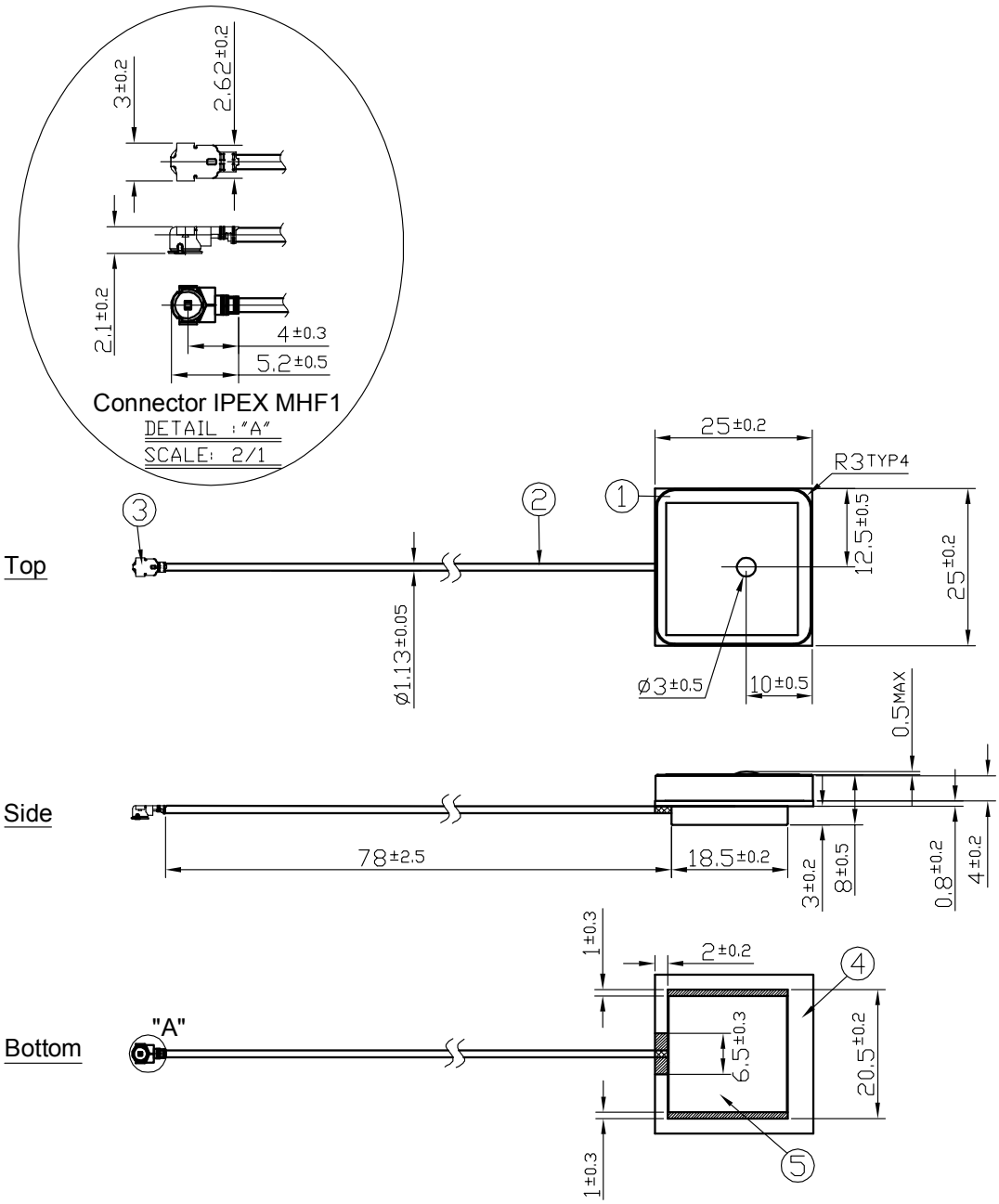
Pattern	Model No.	Test Mode	Freq (MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	AP.25F.07.0078A	YZ	1610.00	0.17 / 356.97	-14.85 / 121.35	-4.75	RHCP	2010/4/19

6.3 XY Plane Radiation



Pattern	Model No.	Test Mode	Freq (MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	AP.25F.07.0078A	XZ	1610.00	0.59 / 6.00	-14.77 / 134.00	-4.16	RHCP	2010/4/19
2	AP.25F.07.0078A	YZ	1610.00	0.17 / 356.97	-14.85 / 121.35	-4.75	RHCP	2010/4/19

7. Technical Drawing



	Name	Material	Finish	QTY
1	Patch(25*25*4mm)	Ceramic	Clear	1
2	1.13 Coaxial Cable	FEP	Gray	1
3	IPEX MHF1	Brass	Gold	1
4	PCB	FR4 0.8t	Green	1
5	Shielding Case	(Tin)SPTE	Tin Plated	1

NOTE:

1. Soldered area

2. All material must be RoHS compliant.

3. The connector orientation has a fixed position to the antenna as per drawing.

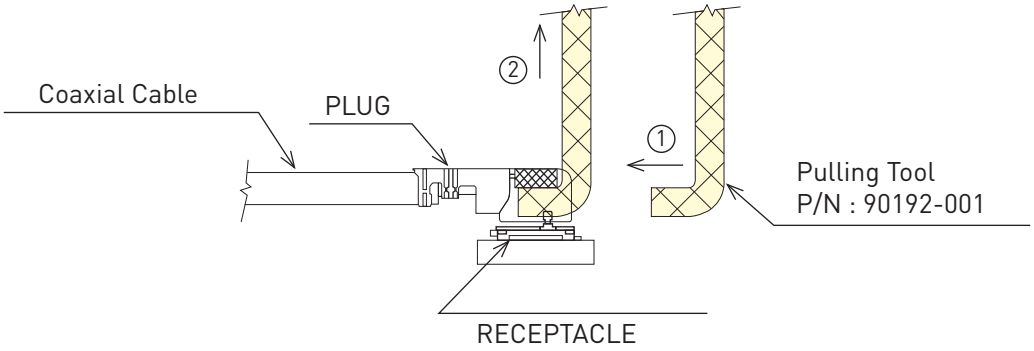
8. Plugs Usage Precautions

8.1 Mating / unmating

(1) To disconnect connectors, insert the end portion of I-PEX under the connector flanges and pull off vertically, in the direction of the connector mating axis.

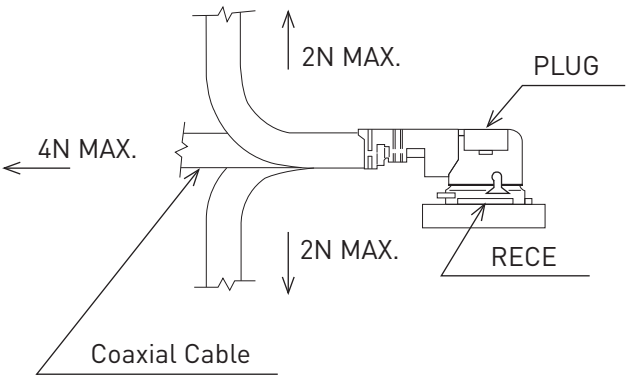
(2) To mate the connectors, the mating axes of both connectors must be aligned and the connectors can be mated. The "click" will confirm fully mated connection.

Do not attempt to insert on an extreme angle.



8.2 Pull forces on the cable after connectors are mated

After the connectors are mated, do not apply a load to the cable in excess of the values indicated in the diagram below.



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 © 2012, Taoglas Ltd.