

AP.25E.07.0054A

## Specification

<b>Part No.</b>	AP.25E.07.0054A
<b>Product Name</b>	25mm One Stage GPS Active Patch Antenna Module with front-end Saw Filter
<b>Feature</b>	<p>Industry leading GPS antenna performance</p> <p>35mm*35mm*4.50mm (Ground Plane)</p> <p>54mm Ø1.13 I-PEX MHFI (U.FL)</p> <p>15dB LNA</p> <p>Wide Input Voltage 1.8V to 5.5V</p> <p>Low Power Consumption</p> <p>ROHS Compliant</p>

# 1. Introduction

The AP.25E 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.25E combines a 25\*25\*2mm advanced low profile ceramic patch

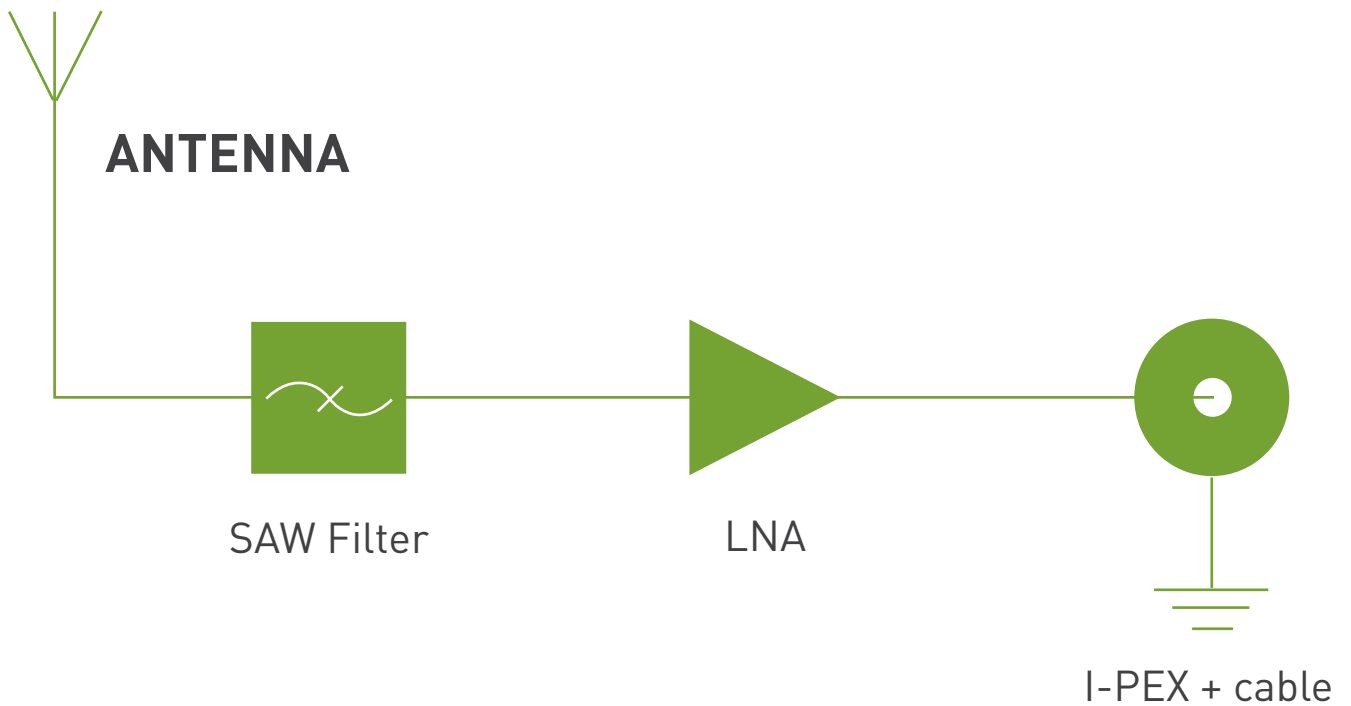
antenna with a one stage LNA and a front-end SAW filter with ultra thin coaxial cable.

The Ground Plane size of 35\*35mm combined with the larger size GPS Patch, gives this solution a performance increase in gain of 1~2dB. It also helps shields the

patch antenna from noise and increases performance at low elevations.

Taoglas active antenna modules utilise XtremeGain™ technology for the highest sensitivity in the industry.

The AP.25E consists of 2 functional blocks – the LNA and also the patch antenna.



The AP.25E has a SAW filter on the front of it. The main use of the AP.25E 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	+1.5dBic Typ. @ Zenith
Polarization	RHCP
Axial Ratio	3.0dB max @ Zenith
Patch Dimension	25*25*2mm

### 2.2 LNA

Parameter	Specification
Frequency	1575.42 ± 1.023MHz
Outer Band Attenuation	F0=1575.42MHz F0±30MHz 9dB min. F0±50MHz 20dB min. F0±100MHz 25dB min.
Output Impedance	50Ω
Output VSWR	2.0 Max
Pout at 1dB Gain	Typ. -2dBm
Compression point	Min. -6dBm

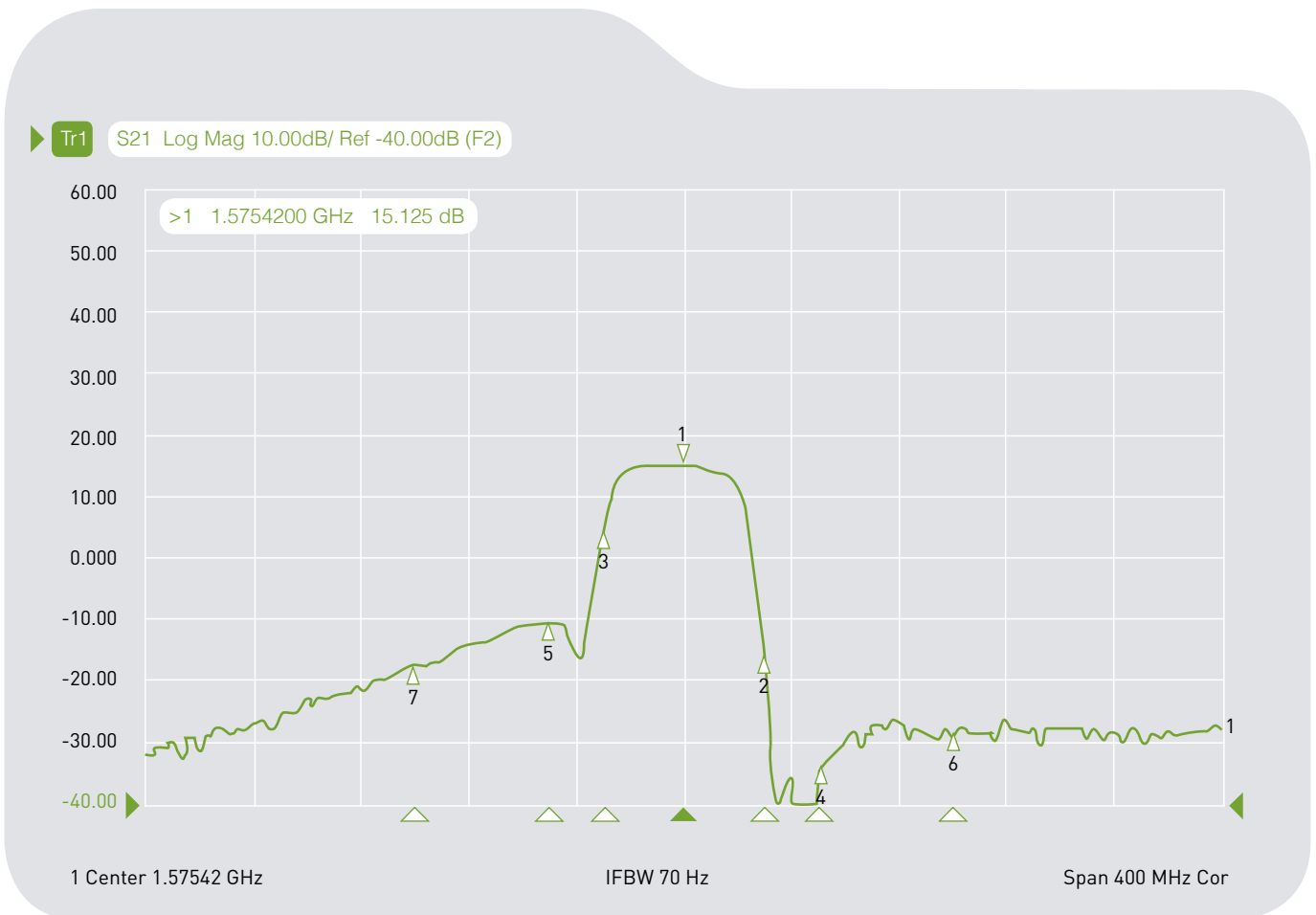
#### LNA Gain, Power Consumption and Noise Figure

Voltage	LNA Gain (Typ)	Power Consumption(mA) Typ	Noise Figure Typ
Min. 1.8V	14dB	3mA	2.5dB
Typ. 3.0V	15dB	3mA	2.5dB
Max. 5.5V	15dB	3mA	2.5dB

### 2.3 Cable\* & Connector

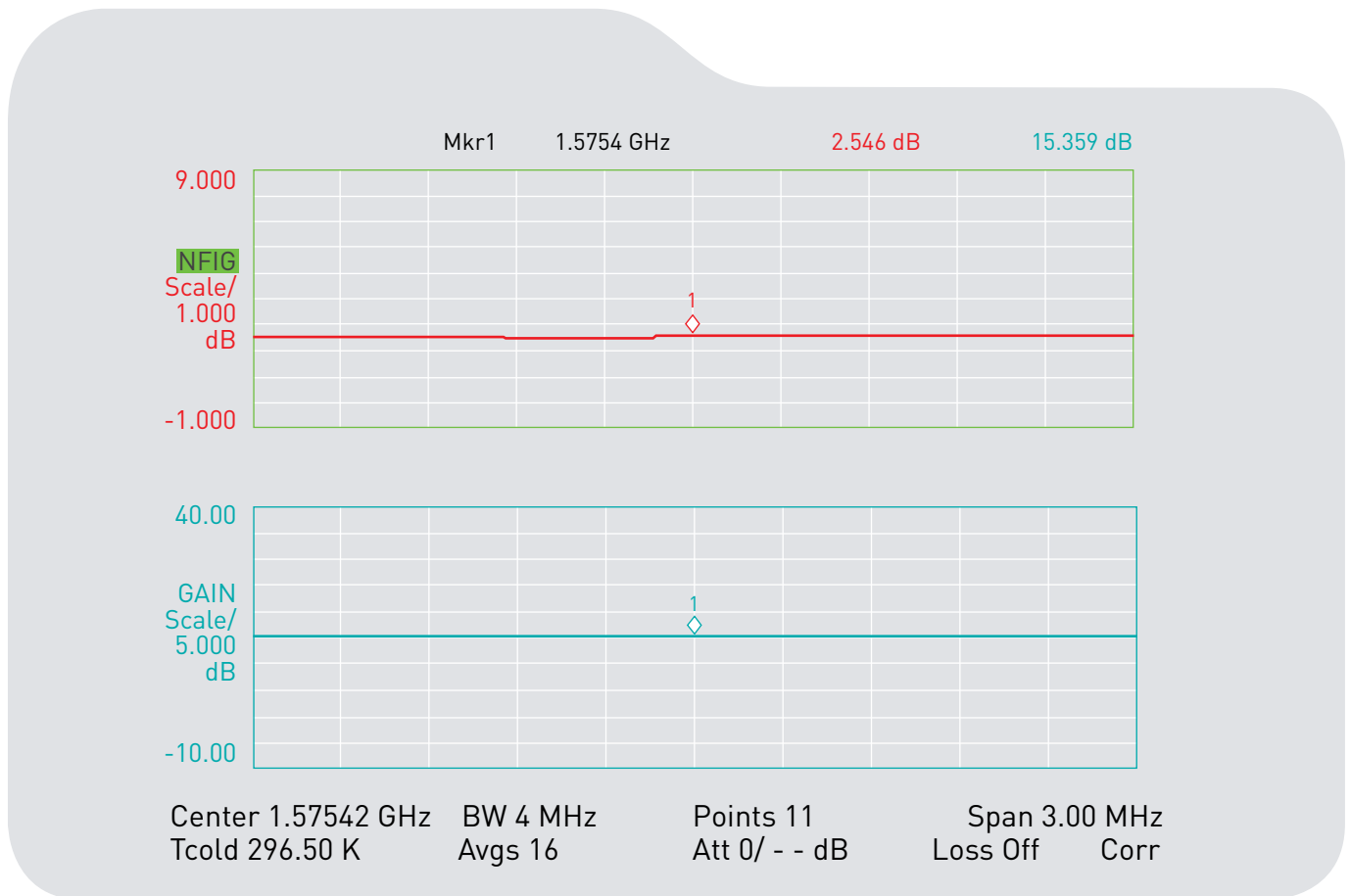
Parameter	Specification
RF Cable	Coaxial Cable Ø1.13 ± 0.1mm, length 54 ± 4.5mm
Connector	IPEX MHFI (U.FL)

### 3. LNA Gain and Out Band Rejection @3.0V



Cg1	Tr1	S21	>1	1.5754200 GHz	15.125 dB
Cg1	Tr1	S21	2	1.6054200 GHz	-15.348 dB
Cg1	Tr1	S21	3	1.5454200 GHz	4.4144 dB
Cg1	Tr1	S21	4	1.6254200 GHz	-34.991 dB
Cg1	Tr1	S21	5	1.5254200 GHz	-10.262 dB
Cg1	Tr1	S21	6	1.6754200 GHz	-28.746 dB
Cg1	Tr1	S21	7	1.4754200 GHz	-17.596 dB

## 4. LNA Noise Figure @3.0V

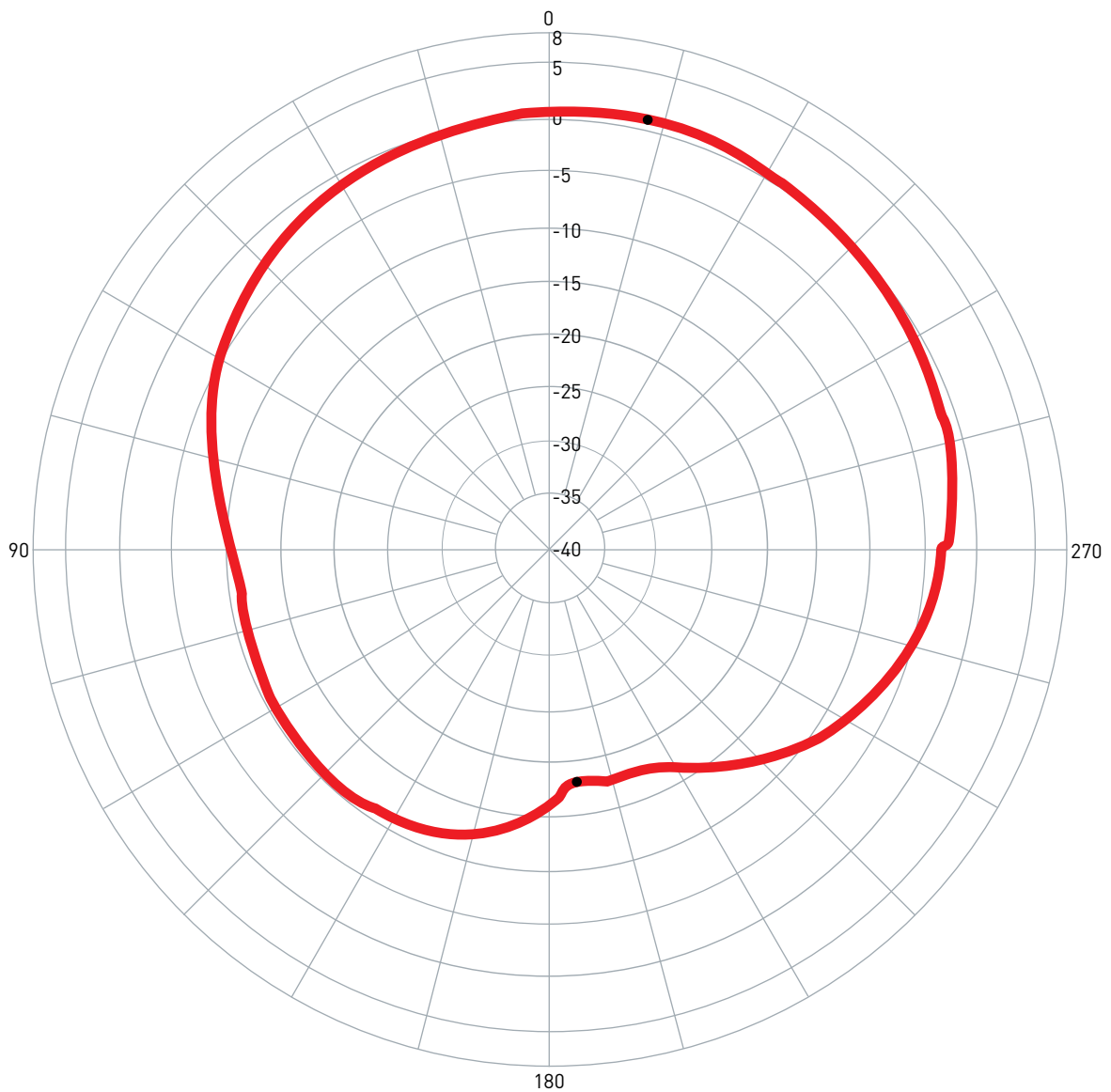


## 5. Total Specification (through Antenna, LNA, Cable and Connector)

Parameter	Specification
Frequency	1575.42 ± 1.023MHz
Gain	At 3V: 16.5 ± 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	35*35*4.5mm

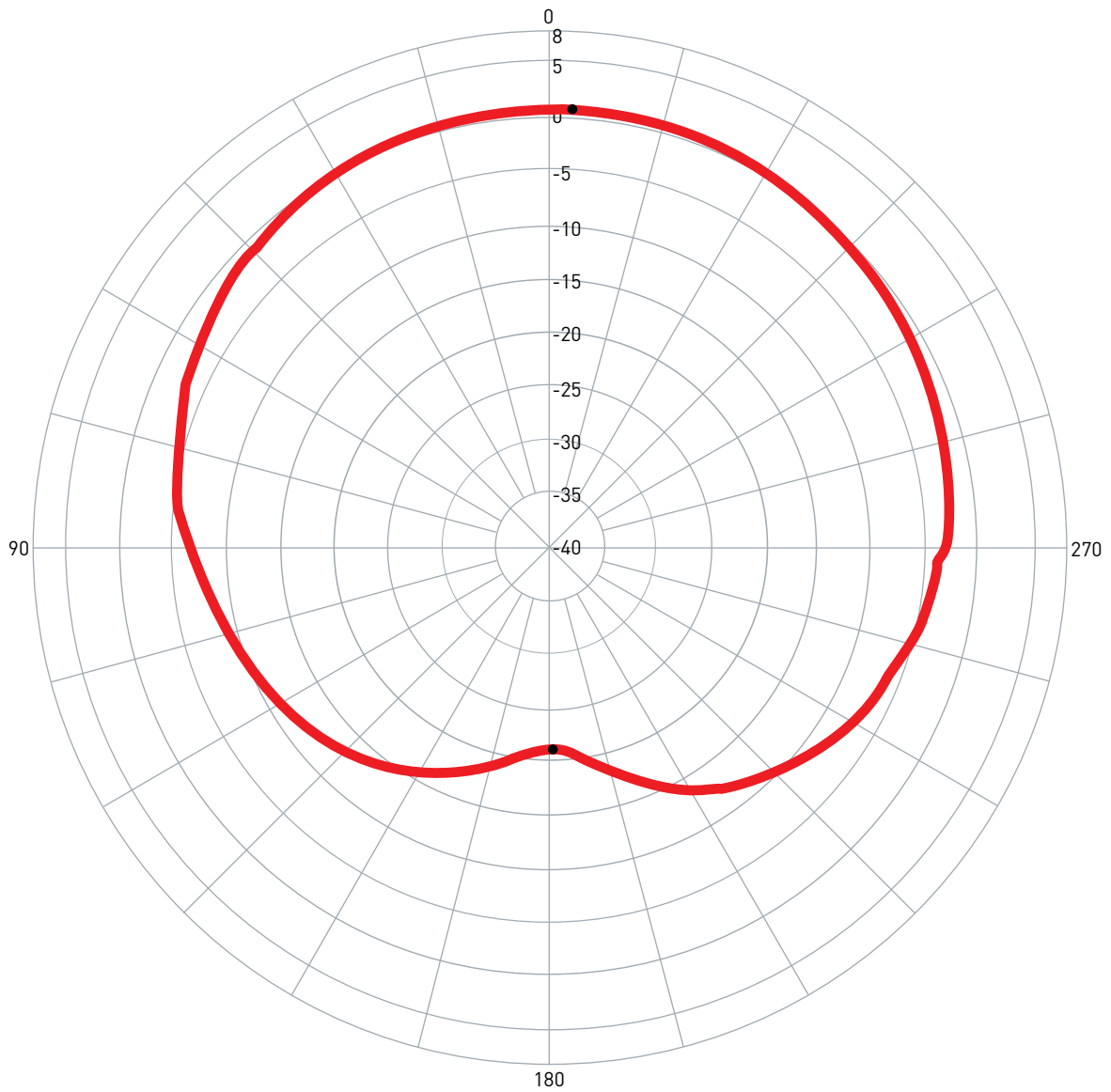
## 6. Radiation Patterns

### 6.1 XZ Plane Radiation



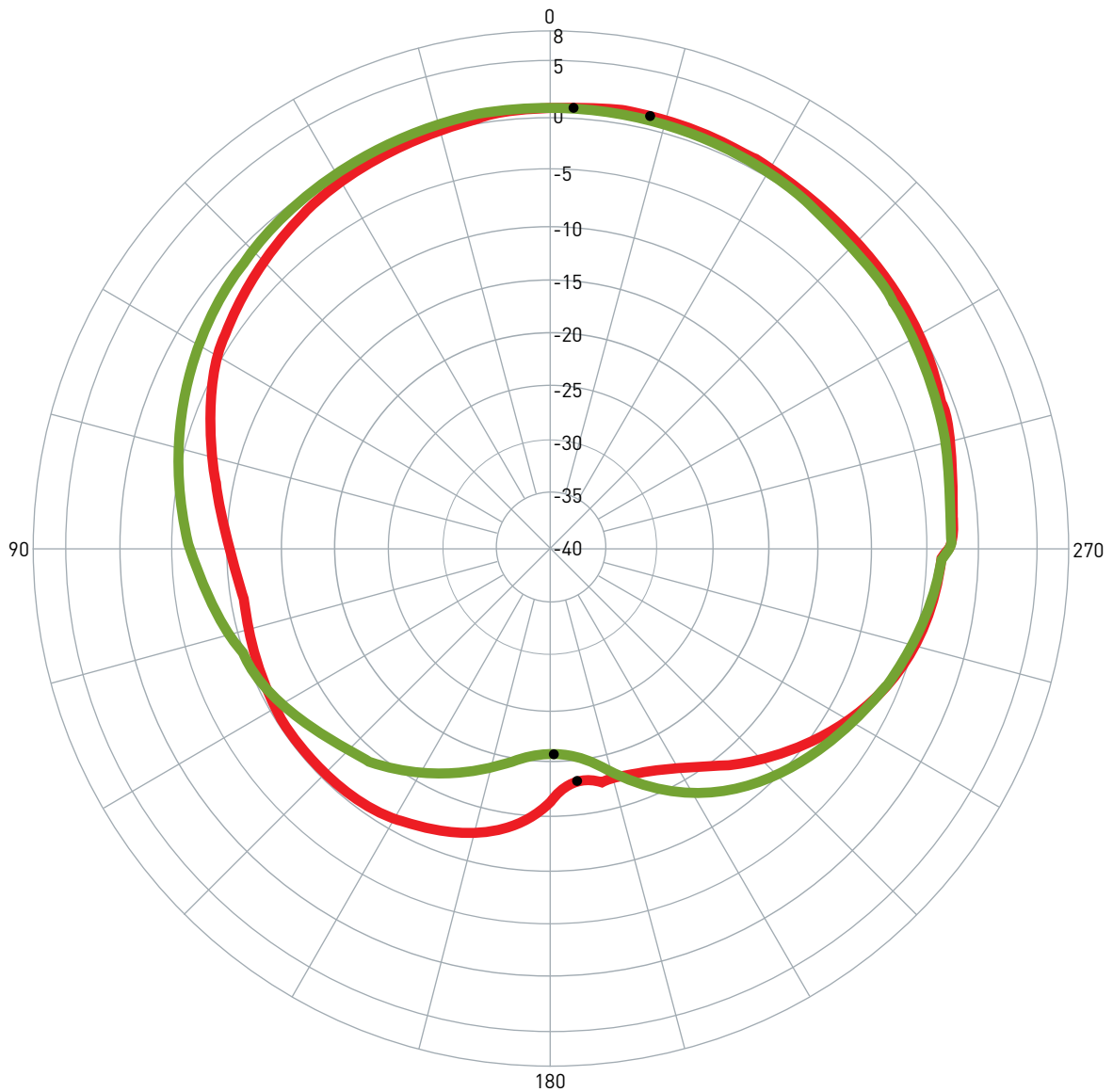
Pattern	Model No.	Test Mode	Freq (MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	AP.25E.07.0054A	XZ	1579.00	0.86 / 347.00	-18.16 / 187.00	-3.65	RHCP	2010/4/19

## 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.25E.07.0054A	YZ	1579.00	0.73 / 357.00	-20.87 / 181.00	-3.44	RHCP	2010/4/19

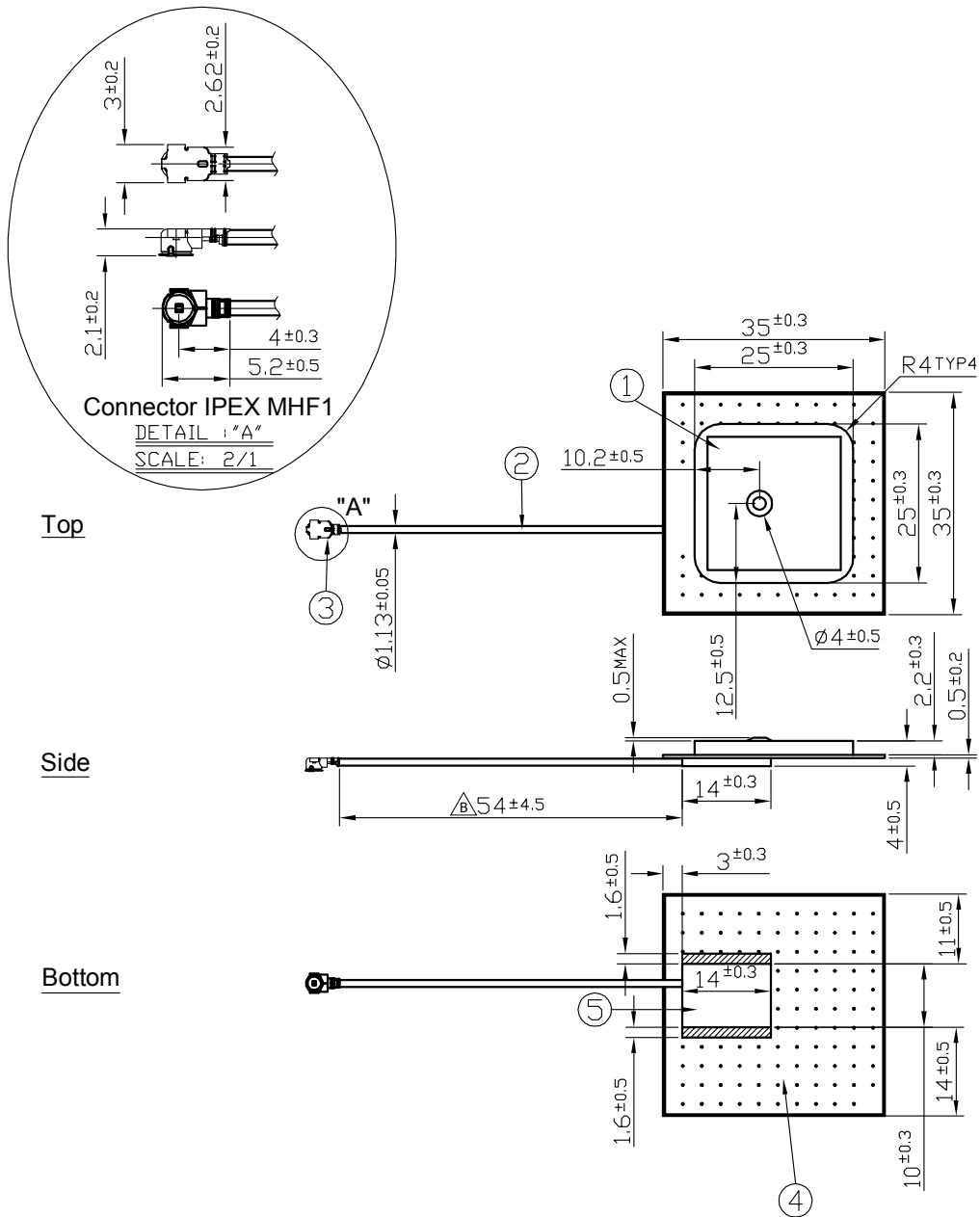
### 6.3 XY Plane Radiation



Pattern	Model No.	Test Mode	Freq (MHz)	Max Gain(dBi)	Min Gain(dBi)	Avg. Gain(dBi)	Source Polar.	Date
1	AP.25E.07.0054A	XZ	1579.42	0.86 / 347.00	-18.16 / 187.00	-3.65	RHCP	2010/4/19
2	AP.25E.07.0054A	YZ	1579.42	0.73 / 357.00	-20.87 / 181.00	-3.44	RHCP	2010/4/19




## 7. Technical Drawing



	Name	Material	Finish	QTY
1	AP.25E Patch(25*25*2mm)	Ceramic	Clear	1
2	1.13 Coaxial Cable	FEP	Gray	1
3	IPEX MHF1	Brass	Gold	1
4	AP.25E PCB	FR4 0.5t	Green	1
5	Shielding Case	SPTE (Tin)	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.

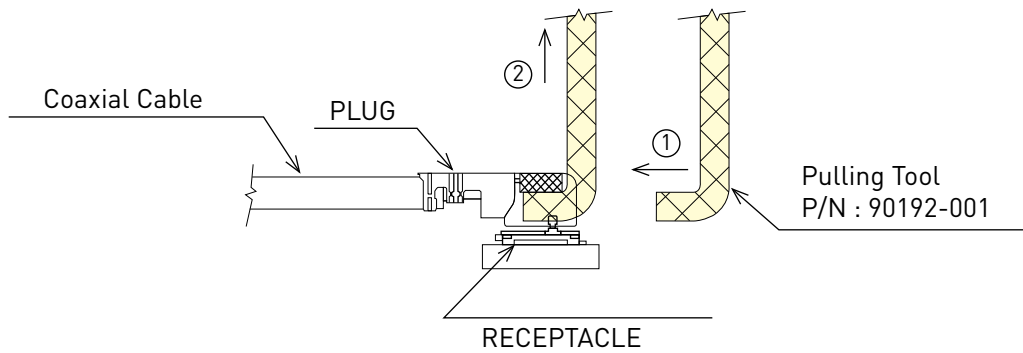
## 8. Plugs Usage Precautions

### 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.

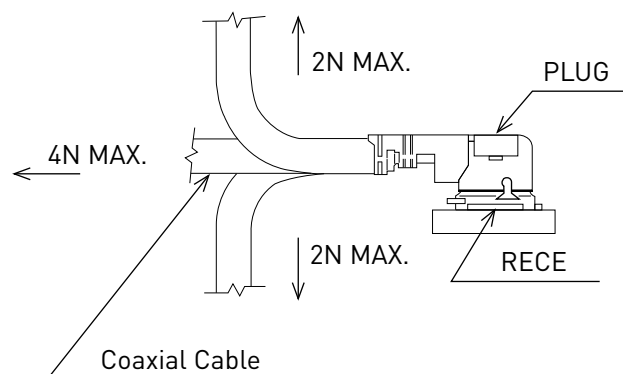
(2) To mate the connectors, the mating axes of both connectors must be aligned and the connectors can be mated. The "click" will confirm fully mated connection.

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.



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