



AP.35E.07.0054A

Specification

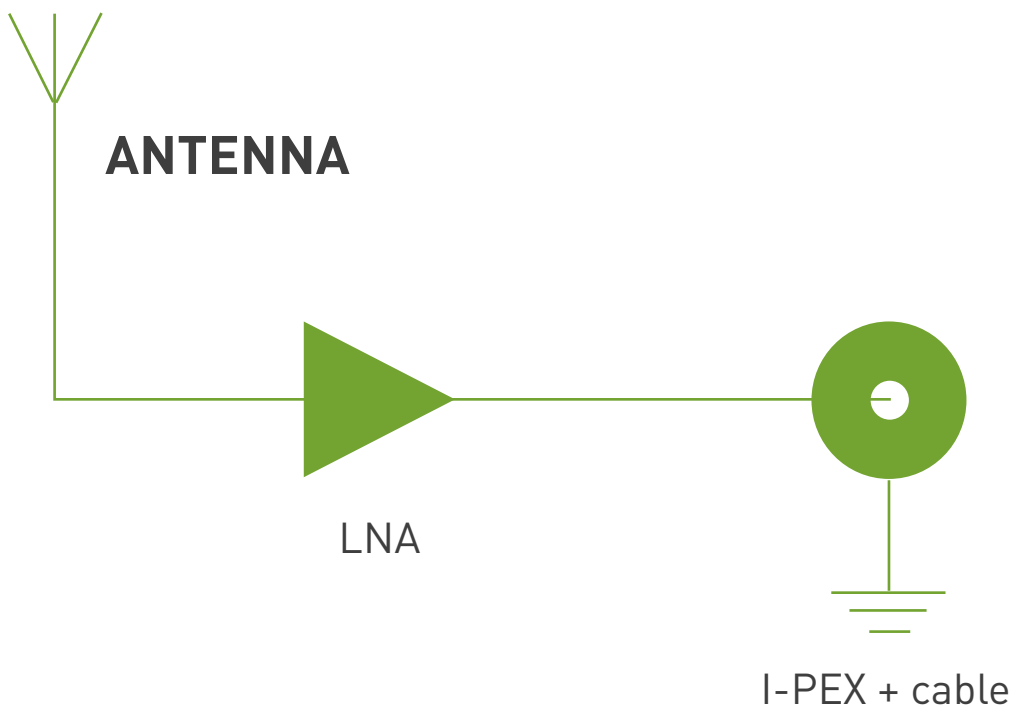
Part No.	AP.35E.07.0054A
Product Name	35mm One Stage GPS Active Patch Antenna Module with front-end Saw Filter
Features	Industry leading GPS antenna performance 35mm*35mm*5.5mm (Ground Plane) 54mm Ø1.13 I-PEX MHFI (U.FL) 15dB LNA Wide Input Voltage 1.8V to 5.5V Low Power Consumption ROHS Compliant

1. Introduction

The AP.35E 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.35E combines a 35*35*3.5mm 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.35E consists of 2 functional blocks – the LNA and also the patch antenna.



The AP.35E has a SAW filter on the front of it. The main use of the AP.35E 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	+2.5 dBic Typ. @ Zenith (35mm GP)
Polarization	RHCP
Axial Ratio	3.0dB max. @Zenith
Patch Dimension	35*35*3.5mm

2.2 LNA

Parameter	Specification		
Frequency	1575.42 ± 1.023MHz		
Outer Band	F0=1575.42MHz		
Attenuation	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 62 ± 2.0mm
Connector	IPEX MHFI (U.FL)

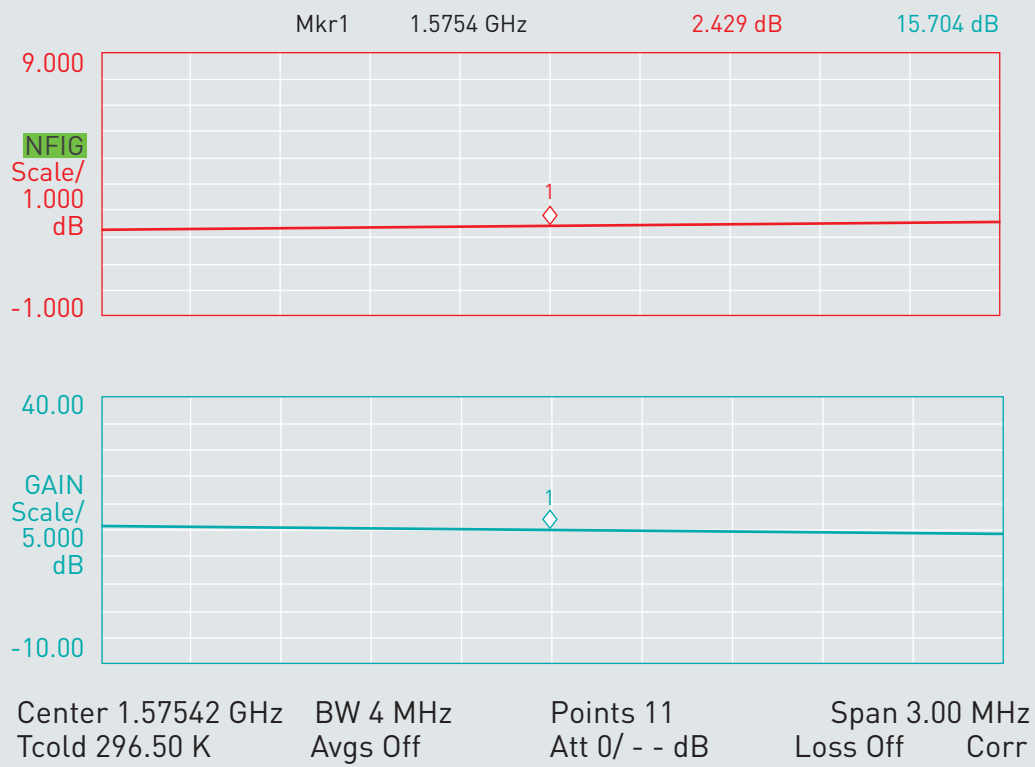
3. LNA Gain and Out Band Rejection @3.0V

► Tr1 S21 Log Mag 10.00dB/ Ref -30.00dB (F2)



Cg1	Tr1	S21	1	1.5754200 GHz	15.116	dB
Cg1	Tr1	S21	2	1.5554200 GHz	14.667	dB
Cg1	Tr1	S21	3	1.5954200 GHz	12.663	dB
Cg1	Tr1	S21	4	1.5454200 GHz	5.3884	dB
Cg1	Tr1	S21	5	1.6054200 GHz	-20.272	dB
Cg1	Tr1	S21	6	1.5254200 GHz	-8.4576	dB
Cg1	Tr1	S21	7	1.6254200 GHz	-21.711	dB
Cg1	Tr1	S21	8	1.6754200 GHz	-12.491	dB
Cg1	Tr1	S21	>9	1.4754200 GHz	-13.972	dB

4. LNA Noise Figure @3.0V

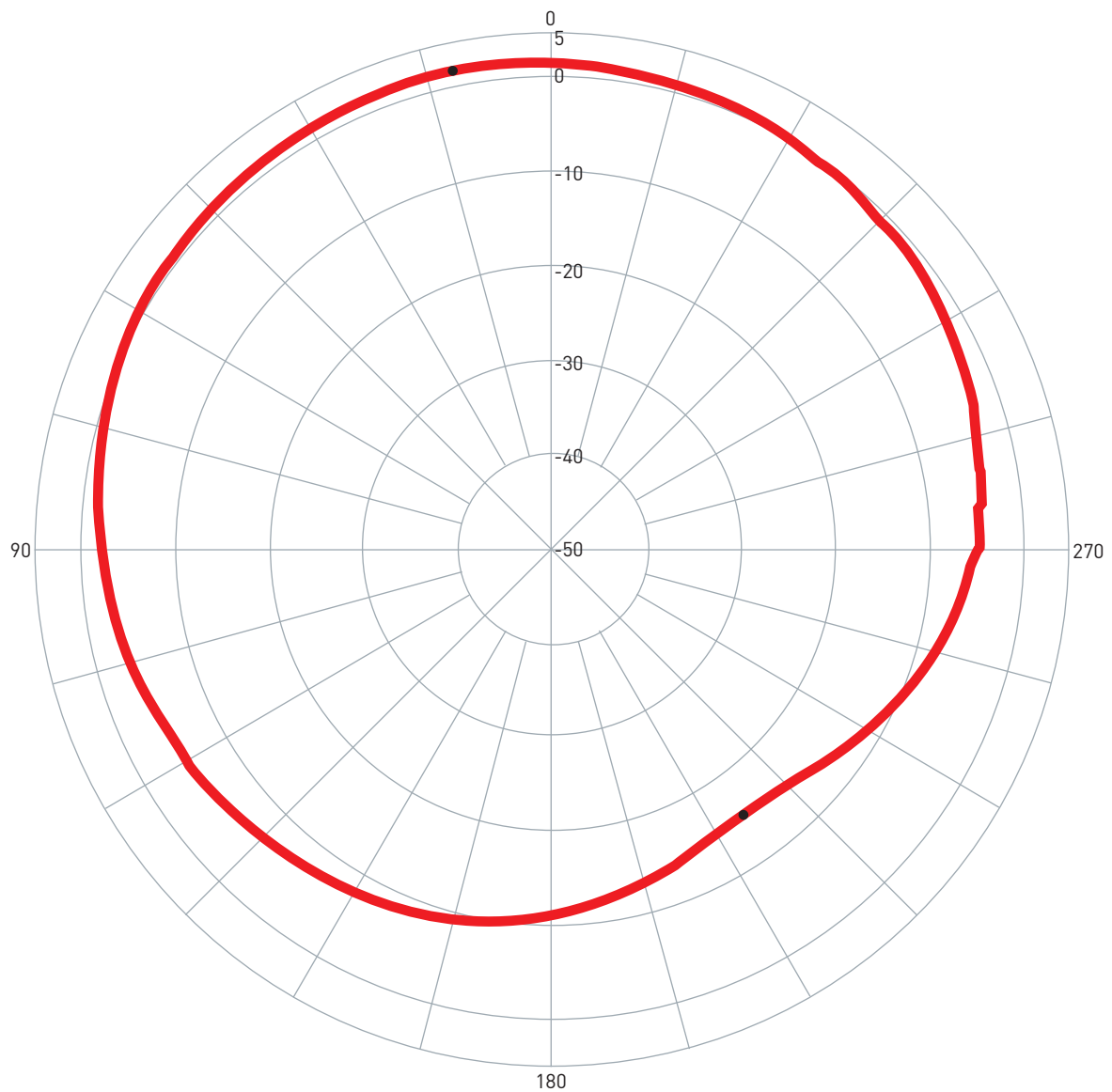


5. Total Specification (through Antenna, LNA, Cable and Connector)

Parameter	Specification
Frequency	1575.42 ± 1.023MHz
Gain	At 5V: 18± 3dBi At 3V: 17.5 ± 3dBi At 1.8V: 15.5 ± 3dBi
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*5.5mm
Weight(g)	14.6g

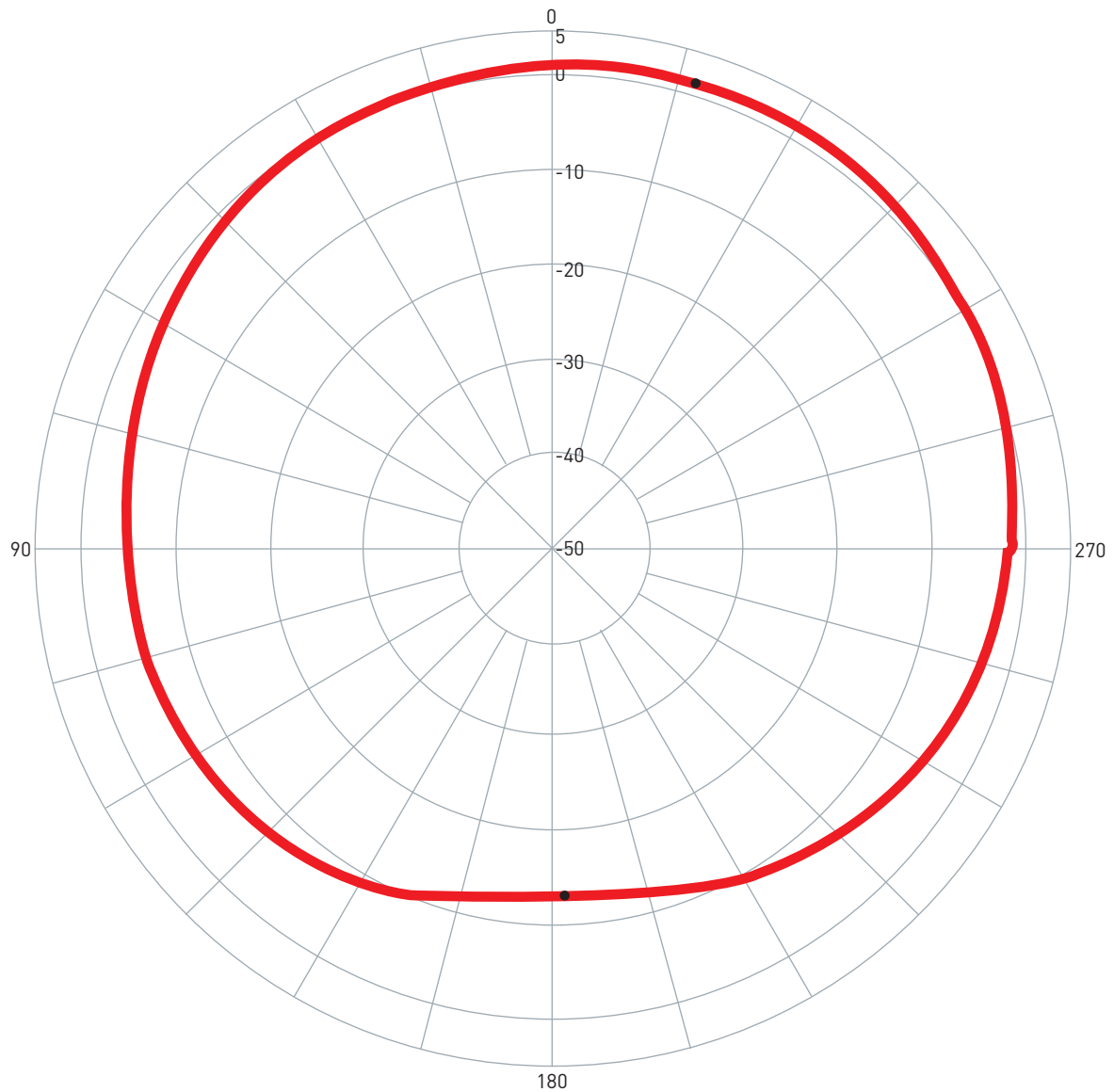
6. Radiation Patterns

6.1 XZ Plane Radiation



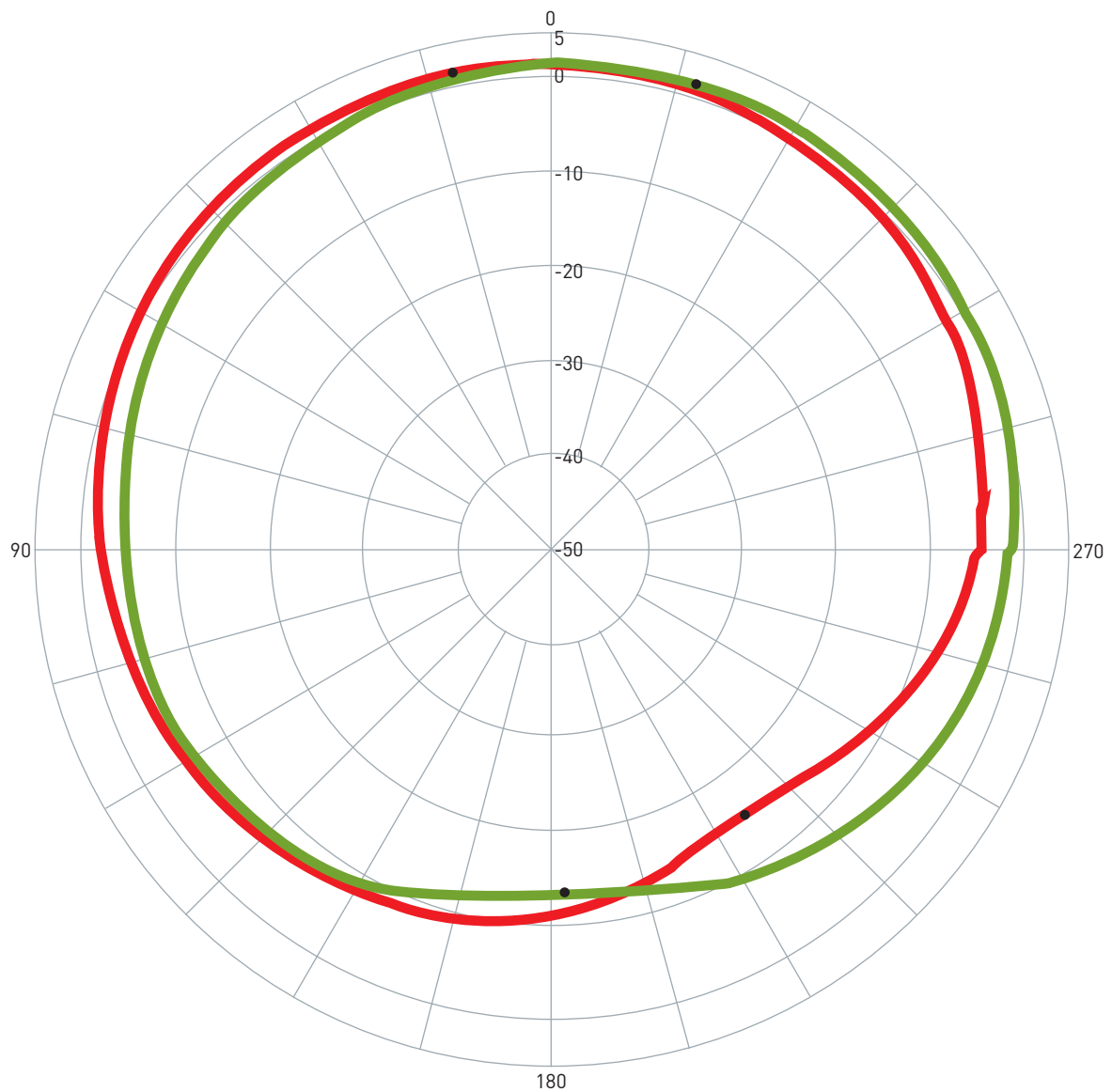
Pattern	Model No.	Test Mode	Freq (Mhz)	Max Gain (dBi)	Min Gain (dBi)	Avg. Gain (dBi)	Source Polar	Date
1 	AP.35A.07.0054A	XZ	1575.42	1.65 / 11.56	-15.22 / 215.70	-2.22	RHCP	2010/1/14

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.35A.07.0054A	YZ	1575.42	1.62 / 343.00	-13.37 / 182	-2.08	RHCP	2010/1/14

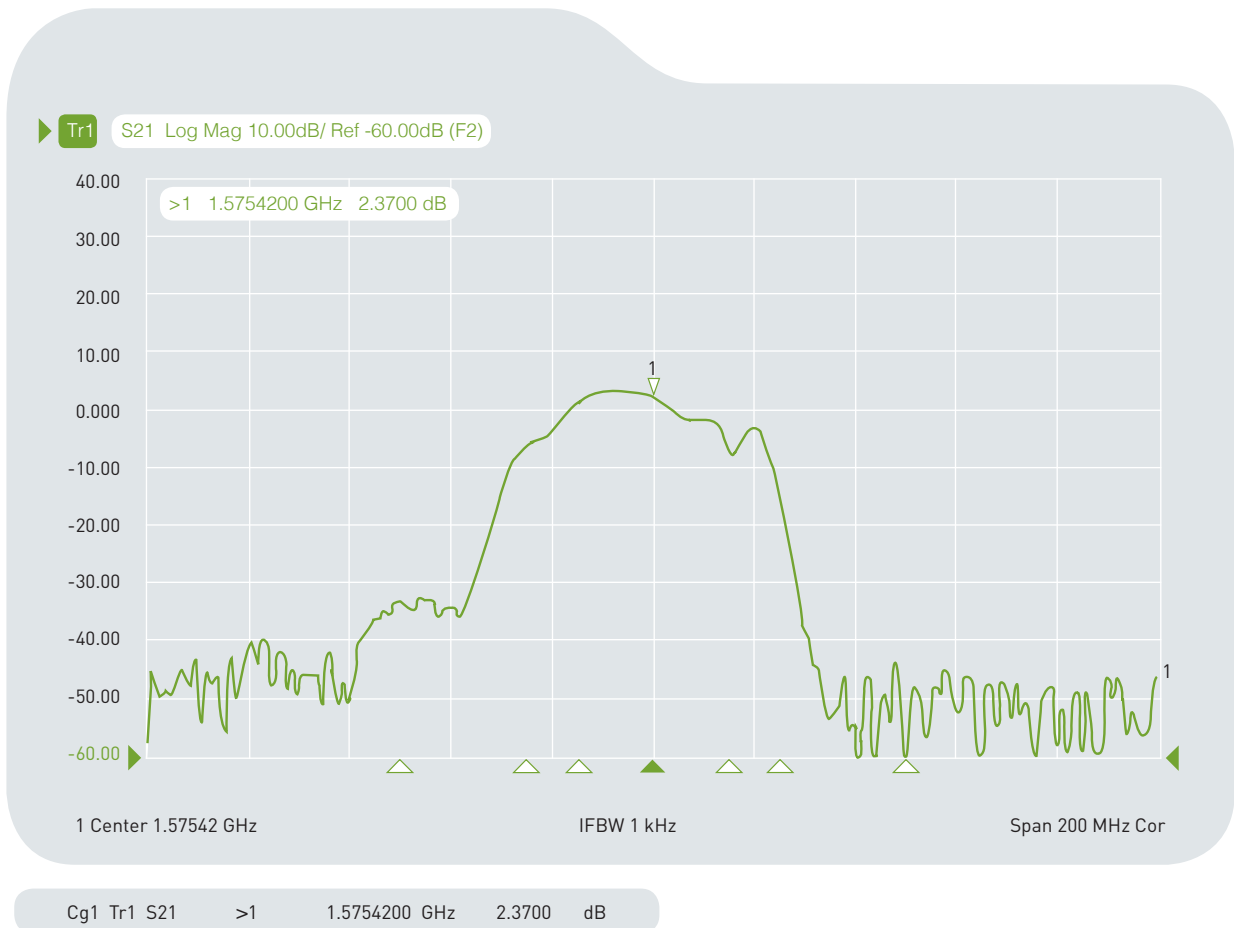
6.3 XY Plane Radiation



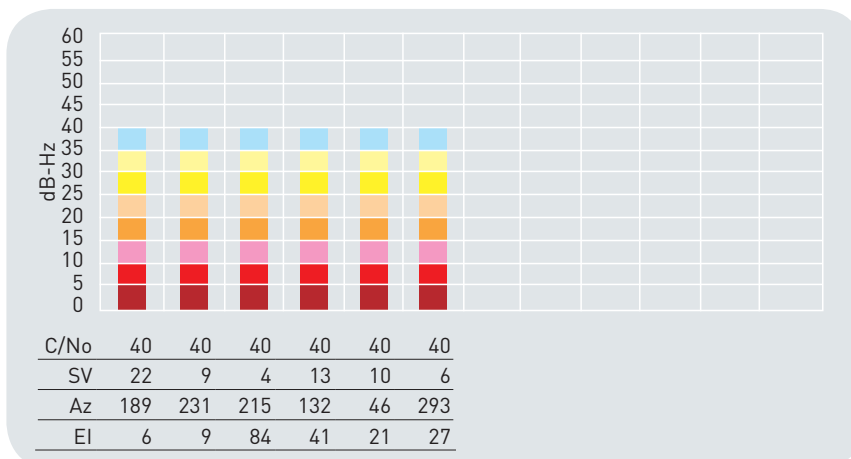
Pattern	Model No.	Test Mode	Freq (Mhz)	Max Gain (dBi)	Min Gain (dBi)	Avg. Gain (dBi)	Source Polar	Date
1 	AP.35A.07.0054A	XZ	1575.42	1.65 / 11.56	-15.22 / 215.70	-2.22	RHCP	2010/1/14
2	AP.35A.07.0054A	XZ	1575.42	1.62 / 343.00	-13.37 / 182.00	-2.08	RHCP	2010/1/14

7. Reliability Test

7.1 (Room temperature +25°C)

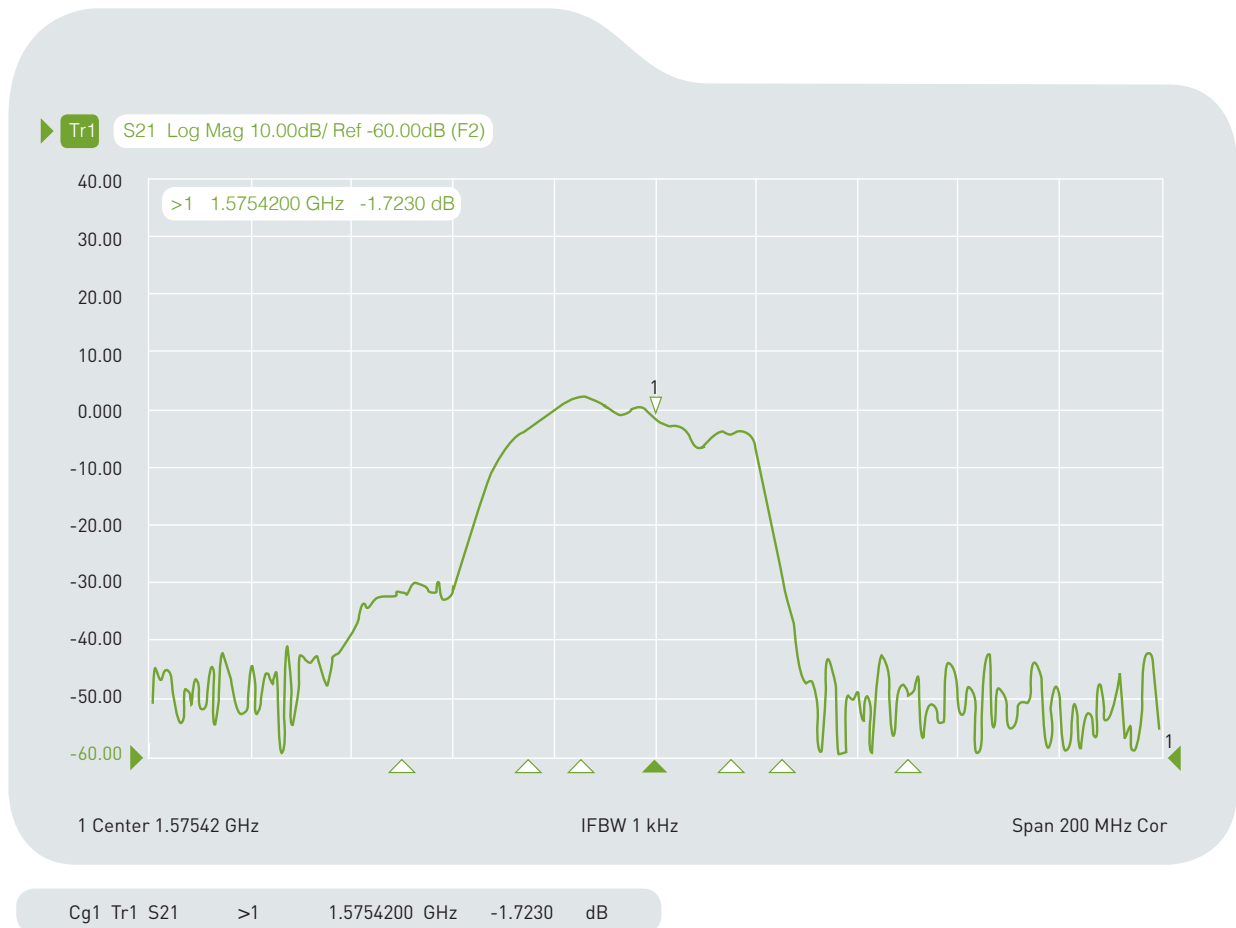


7.1.1 S21 Radiation Gain at +25°C

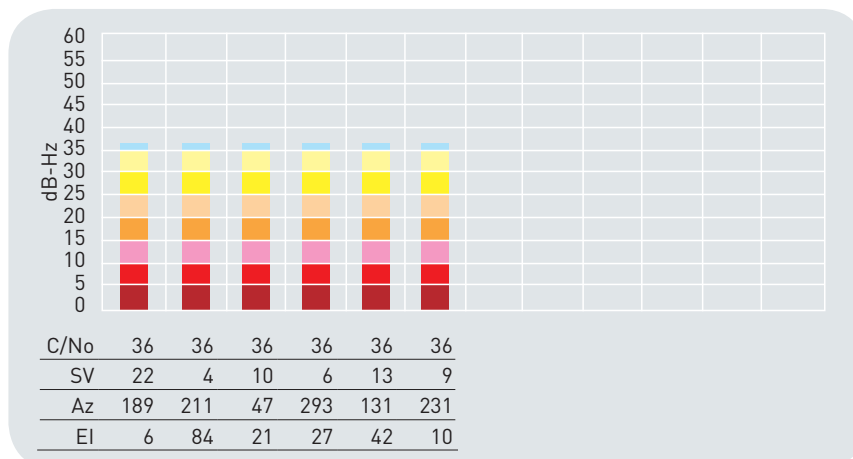


**C/N at
+25°C**

7.2 (Room temperature +85°C)

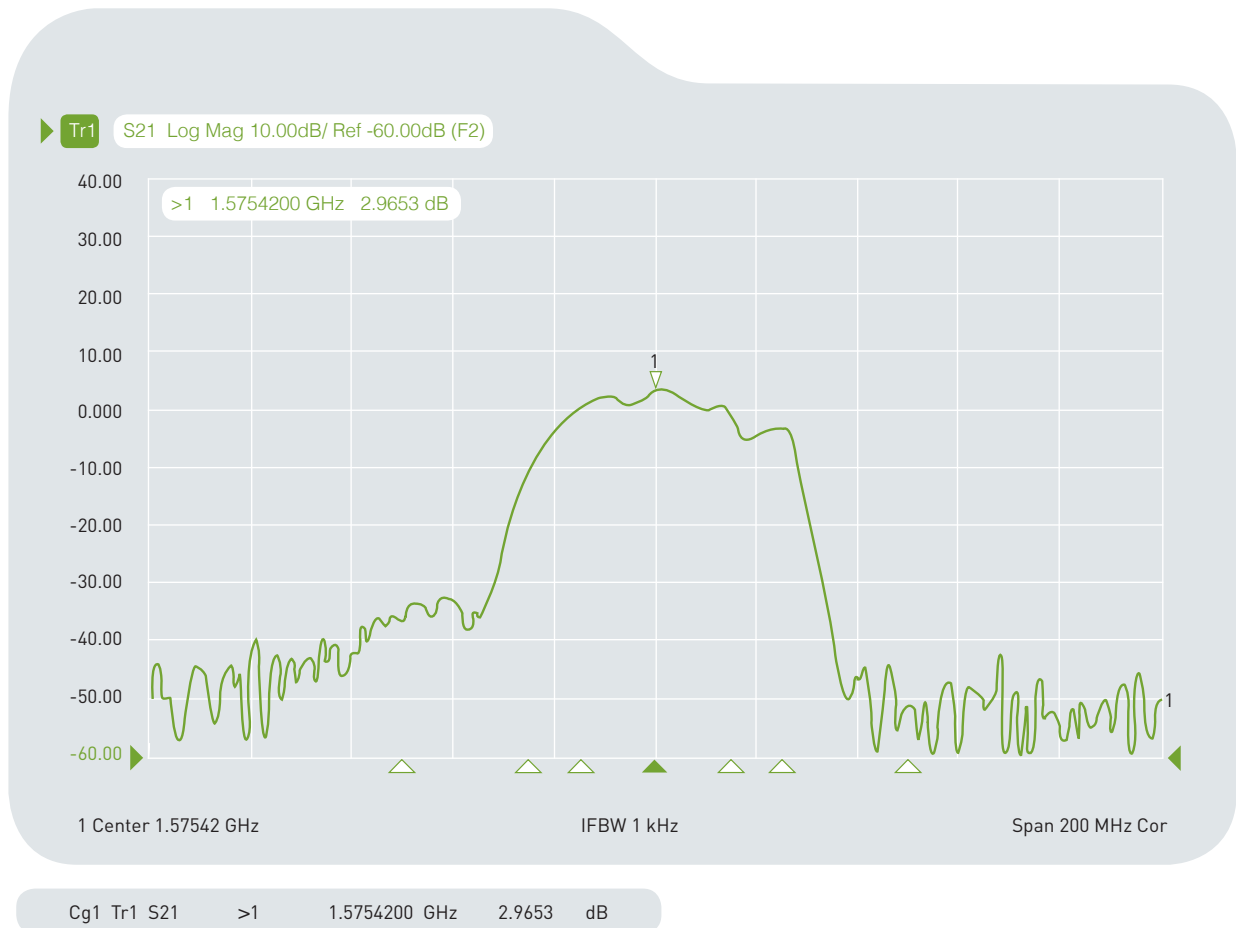


7.2.1 S21 Radiation Gain at +85°C

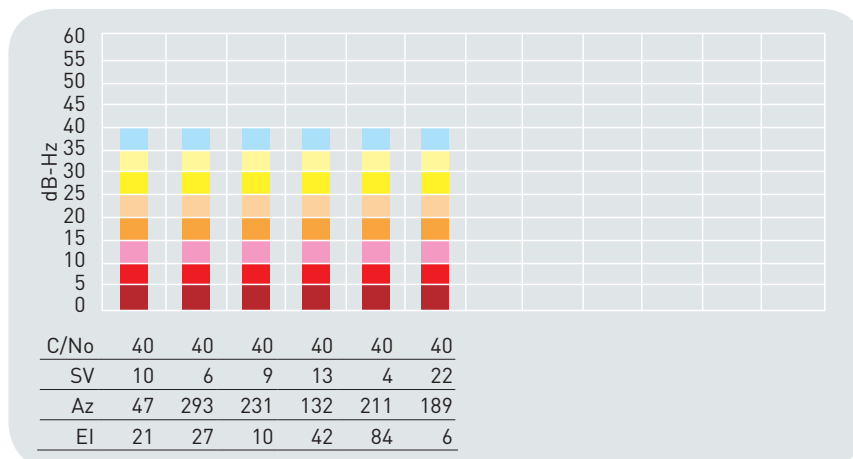


**C/N at
+85°C**

7.3 (Low temperature -40°C)

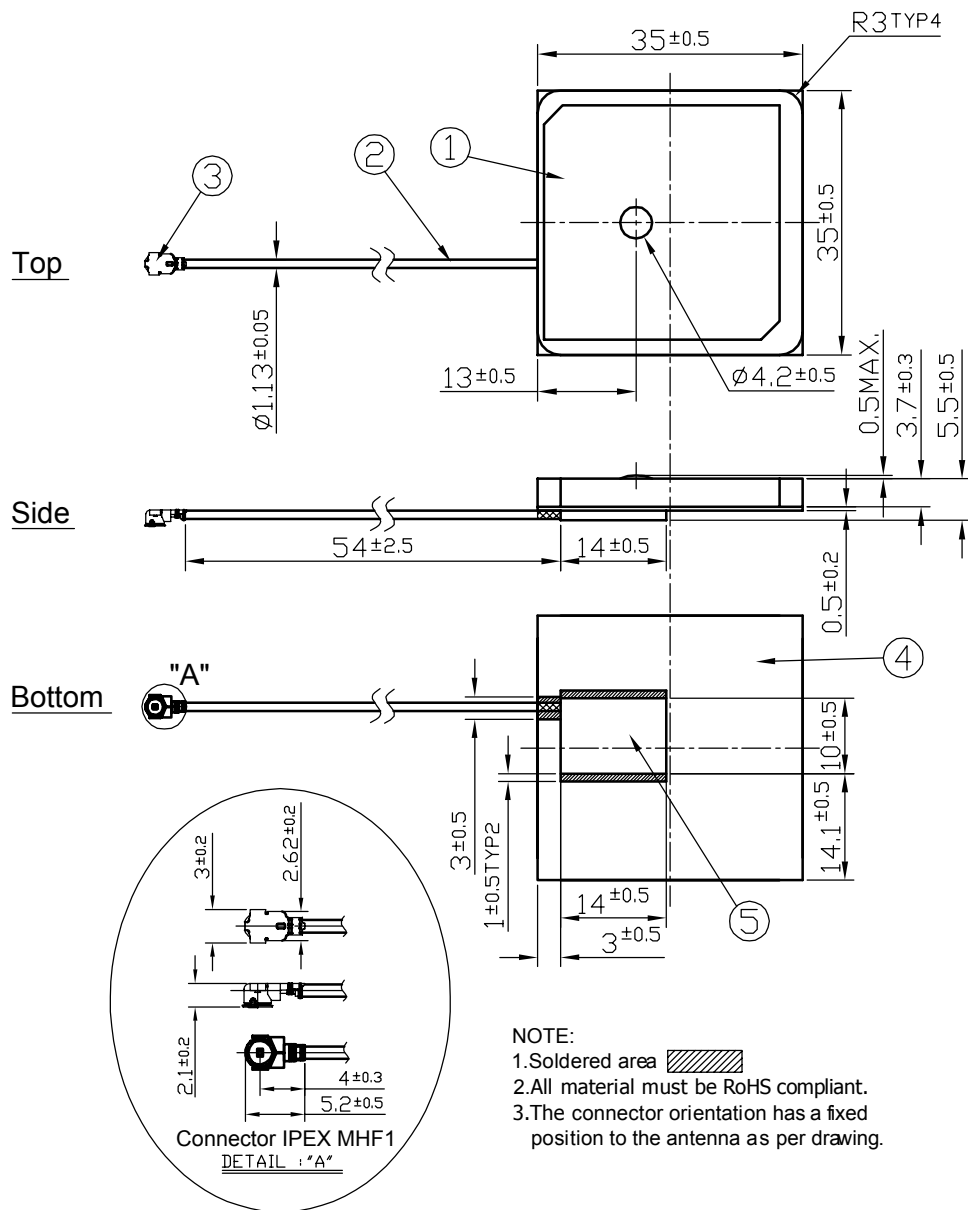


7.3.1 S21 Radiation Gain at -40°C



**C/N at
-40°C**

8. Technical Drawing



	Name	Material	Finish	QTY
1	Patch(35*35*4mm)	Ceramics	Clear1	
2	1.13 Coaxial Cable	FEP	Gray	1
3G	IPEX MHF1	Brass	old	1
4	PCB	FR4 0.5t	Green	1
5T	Shielding Case	(Tin)SPTE	in Plated	1

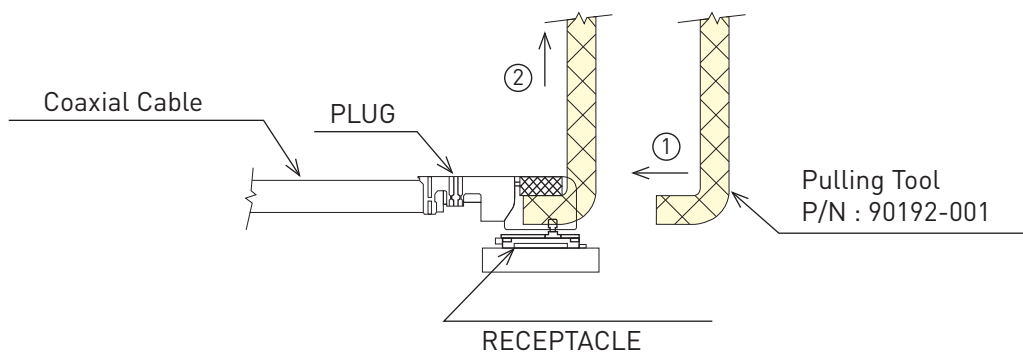
9. IPEX MHFI Usage Precautions

9.1 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.

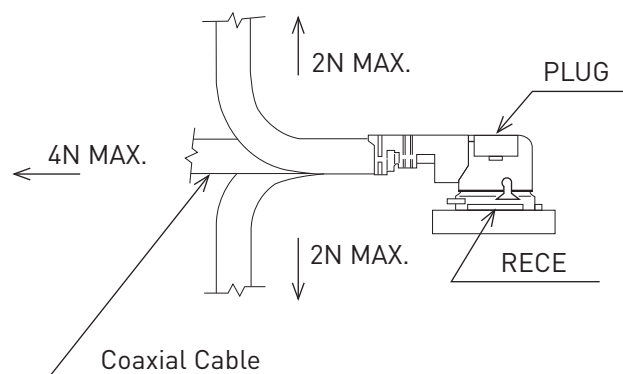
(2) To mate the connectors, the mating axes of both connectors must be aligned and the connectors can be mated. The "click" will confirm fully mated connection.

Do not attempt to insert on an extreme angle.



9.2 Pull forces on the cable after connectors are mated

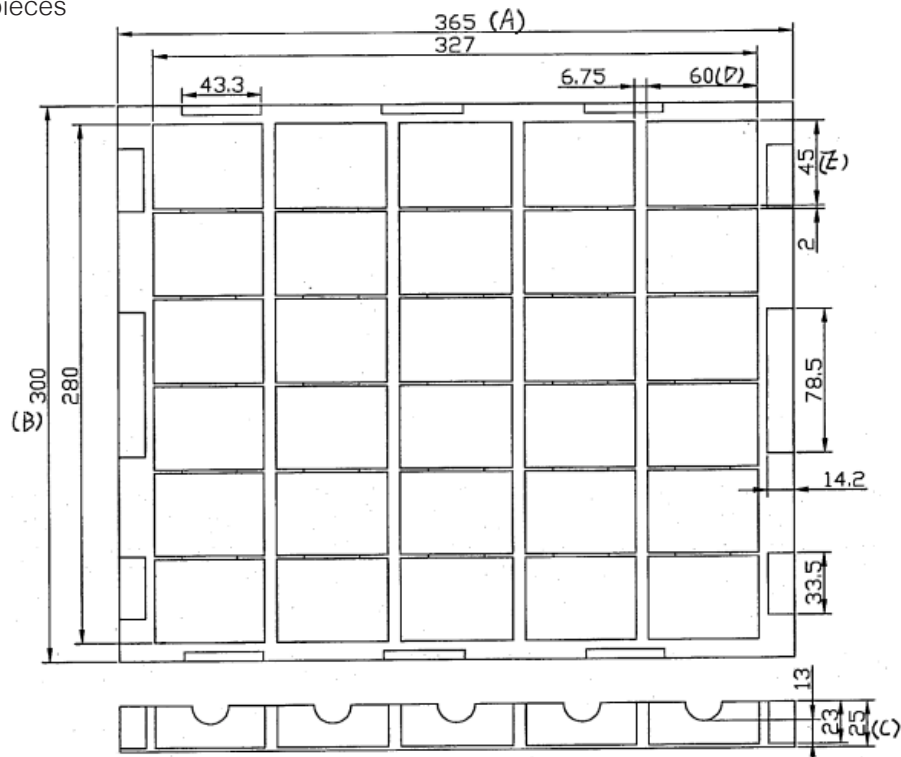
After the connectors are mated, do not apply a load to the cable in excess of the values indicated in the diagram below.



10. Packaging

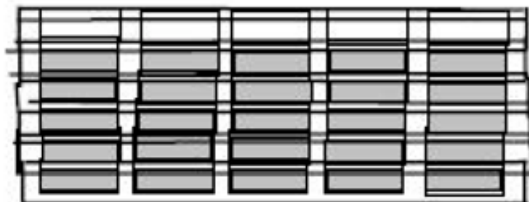
Packaged in Tray with Foam

One Tray = 30 pieces



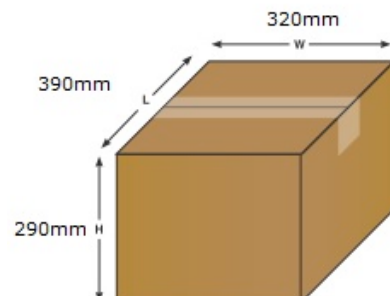
5 Trays packaged together per Section

150 pieces



2 Sections per Outer Carton

300 pieces



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