1. Features

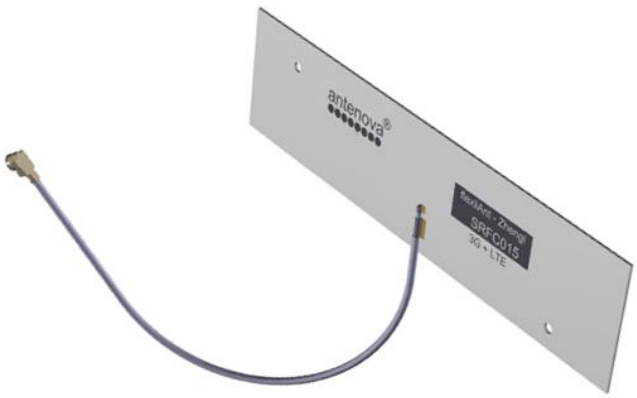
- Antenna for 3G and 4G LTE applications including MIMO systems.
- GSM850, GSM900, DCS1800, PCS1900, WCDMA2100, LTE B7 (2500-2690 MHz), LTE B30, B40 (2300-2400 MHz)
- 1.13mm diameter RF cable with I-PEX MHF connector
- Self-adhesive mounted
- Quick and simple integration minimizes design cycle
- Available in two standard cable lengths, 100mm and 200mm, other cable lengths are available.

2. Description

Zhengi is intended for use with 3G + 4G LTE applications. This antenna covers all 3G bands along with additional LTE bands (B7, B30, B38, B40, and B41). This product specification shows the performance of this antenna in all workable bands.

3. Applications

- Smart meters
- Femto / Pico base stations
- Telematics
- Remote monitoring
- Machine to Machine
- POS (Point of Sale) terminals



4. Part Number

Zhengi: SRFC015

5. General Data

Product name	Zhengi
Part Number	SRFC015
Frequency	824-960MHz 1710-1990MHz 2110-2170MHz 2300-2400MHz 2500-2690MHz
Polarization	Linear
Operating temperature	-40°C to 85°C
Environmental condition test	ISO 16750-4 5.1.1 / 5.1.2
Impedance with matching	50 Ω
Weight	< 0.5 g
Antenna type	FPC Self-adhesive 3M 468P
Dimensions (Antenna)	80.0 x 20.0 x 0.15 (mm)
Connection	I-PEX MHF 1 (20278-112R-13)

6. RF Characteristics

	824 – 960 MHz	1710 – 1990 MHz	2110 – 2170 MHz
Peak gain	0.50dBi	4.00dBi	3.50dBi
Average gain	-2.50dBi	-1.50dBi	-2.50dBi
Average efficiency	>50%	>65%	>50%
Maximum return loss	-5.4dB	-6.0dB	-8.0dB
Maximum VSWR	3.30:1	2.90:1	2.10:1

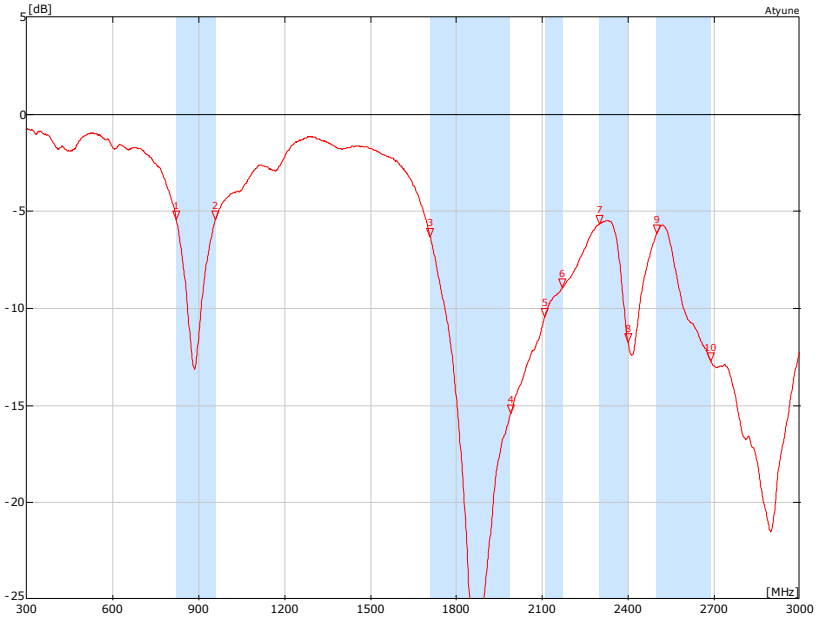
	2300 – 2400 MHz	2500 – 2690 MHz
Peak gain	3.80dBi	5.00dBi
Average gain	-2.50dBi	-1.50dBi
Average efficiency	>50%	>65%
Maximum return loss	-5.5dB	-6.0dB
Maximum VSWR	3.20:1	2.90:1

All data measured in a loaded condition adhered to a 1.6mm thick plastic carrier free space.

An RF choke was used to prevent cable radiation.

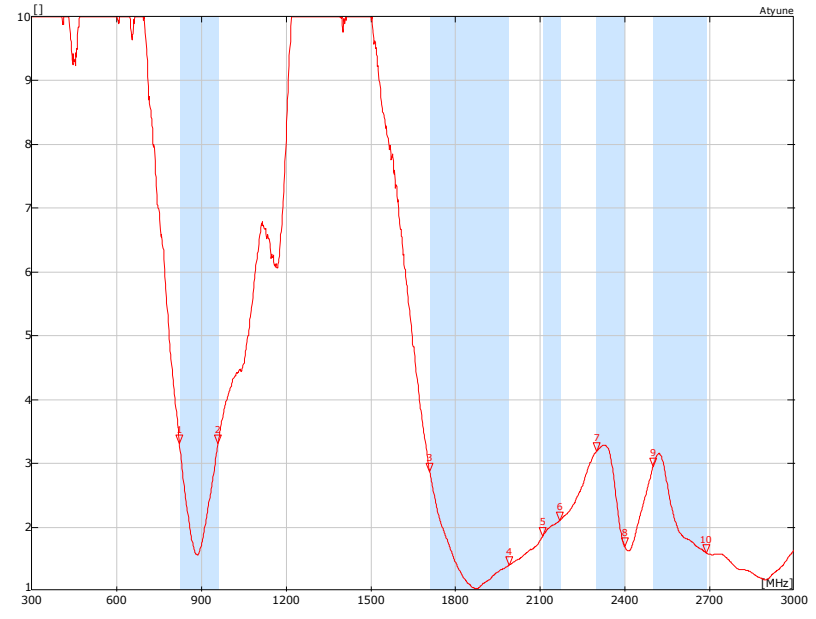
7. RF Performance

7.1 Return Loss



MARKERS:	MHz	dB	MHz	dB	MHz	dB	MHz	dB	MHz	dB
SRFC015.S1P - S11										
	1: 824	-5.41	3: 1710	-6.31	5: 2110	-10.41	7: 2300	-5.62	9: 2500	-6.11
	2: 960	-5.40	4: 1990	-15.39	6: 2170	-8.92	8: 2400	-11.71	10: 2690	-12.69

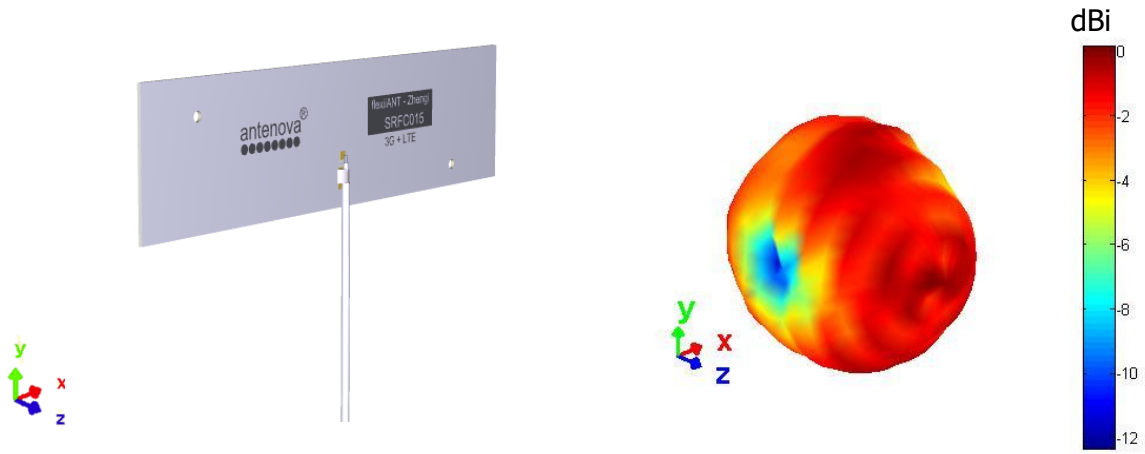
7.2 VSWR



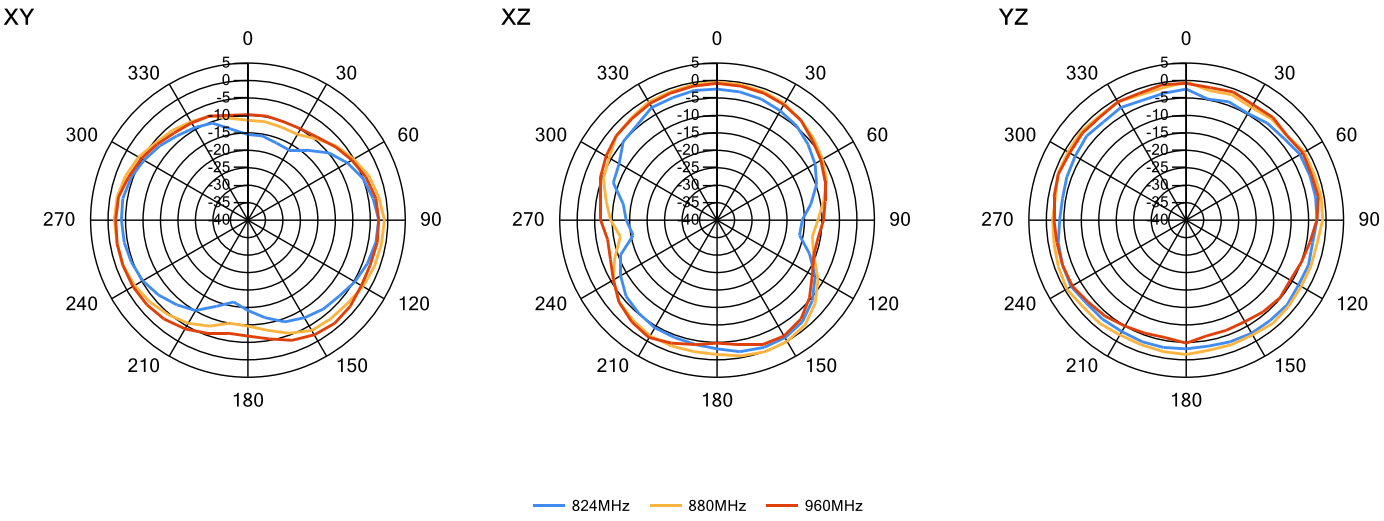
MARKERS:	MHz		MHz		MHz		MHz		MHz	
SRFC015.S1P - S11										
	1: 824	3.32	3: 1710	2.87	5: 2110	1.86	7: 2300	3.20	9: 2500	2.96
	2: 960	3.32	4: 1990	1.41	6: 2170	2.11	8: 2400	1.70	10: 2690	1.60

7.3 Antenna patterns

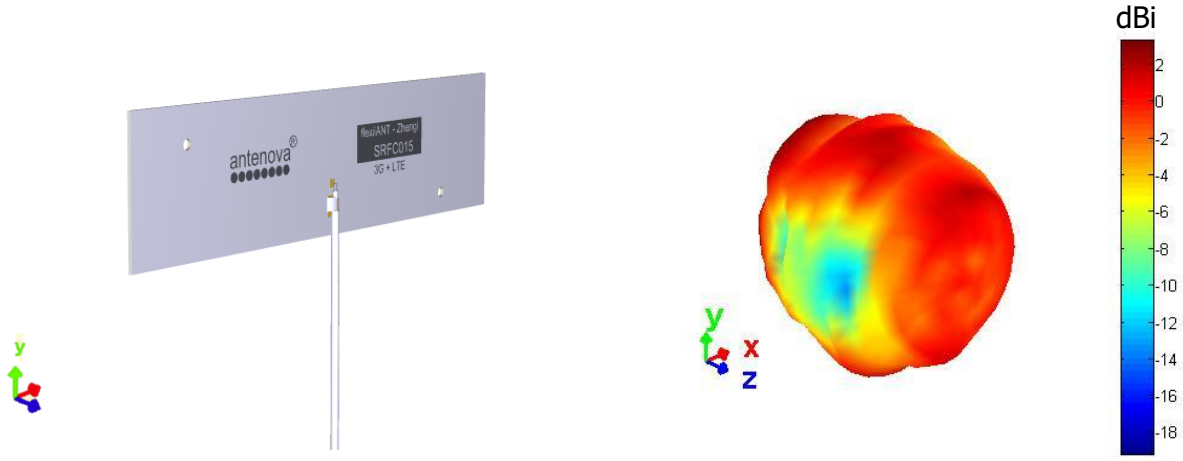
7.3.1 824 MHz – 960 MHz



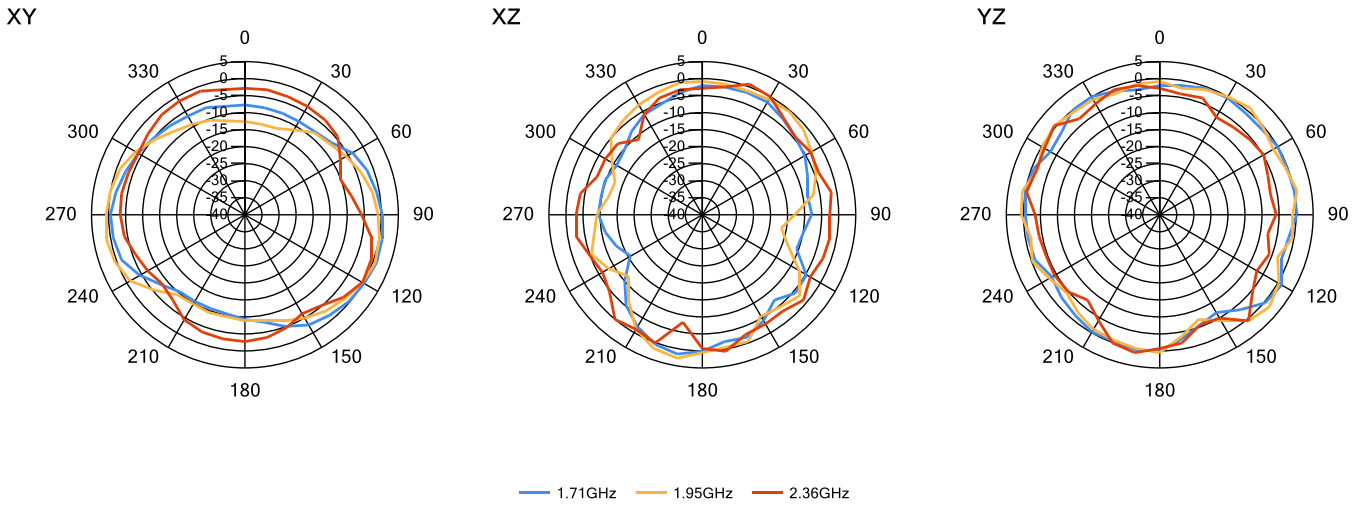
3D pattern at 890 MHz
Drag to rotate pattern and PCB by using Adobe Reader
(Click to Activate)



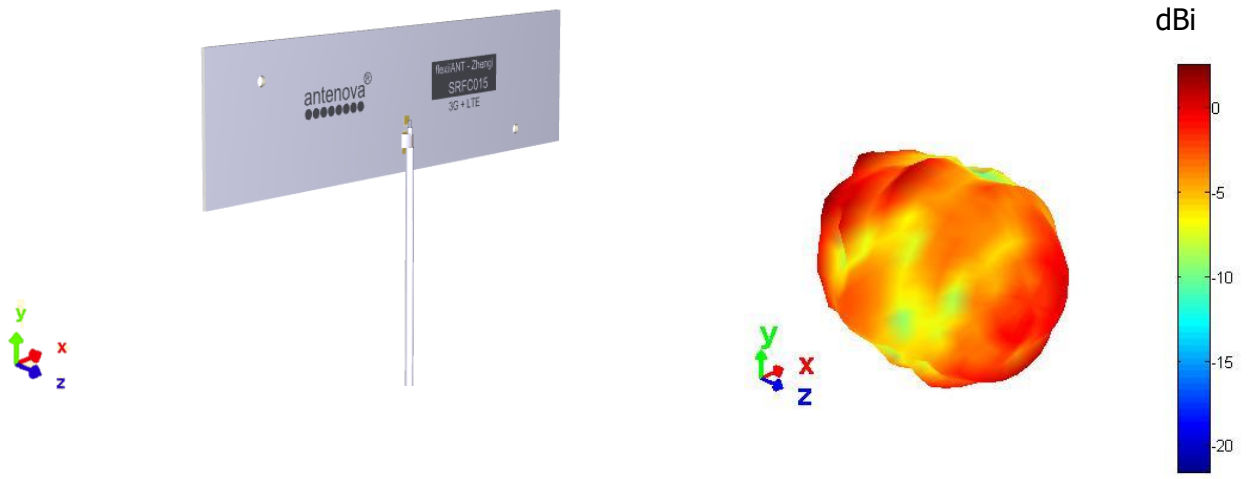
7.3.2 1710 MHz – 2170 MHz



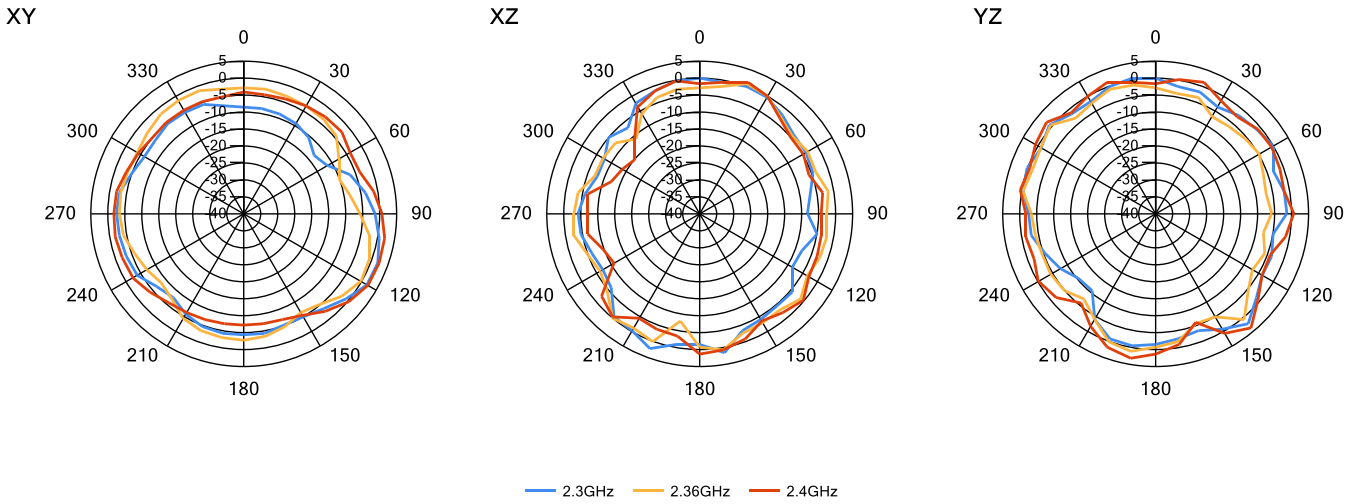
3D pattern at 1990 MHz
Drag to rotate pattern and PCB by using Adobe Reader
(Click to Activate)



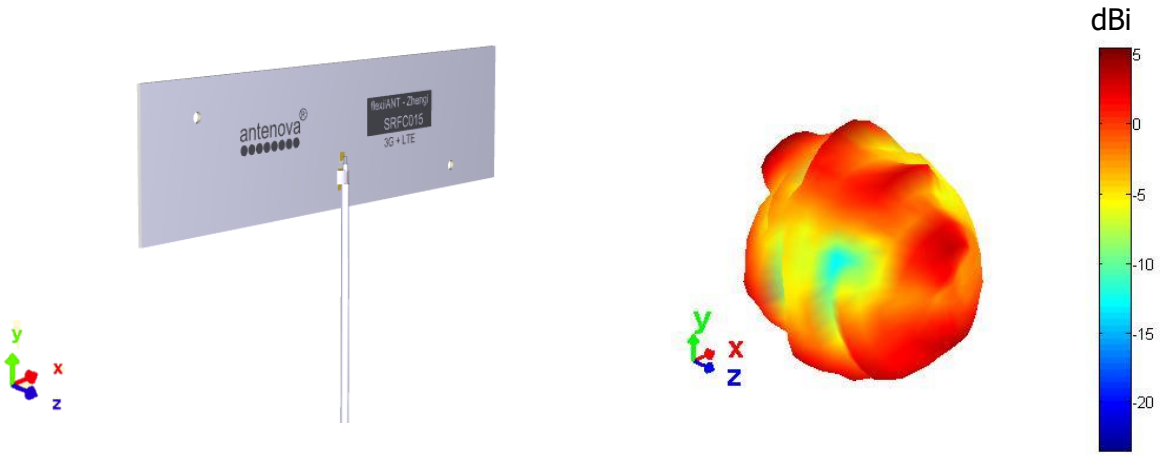
7.3.3 2300 MHz – 2400 MHz



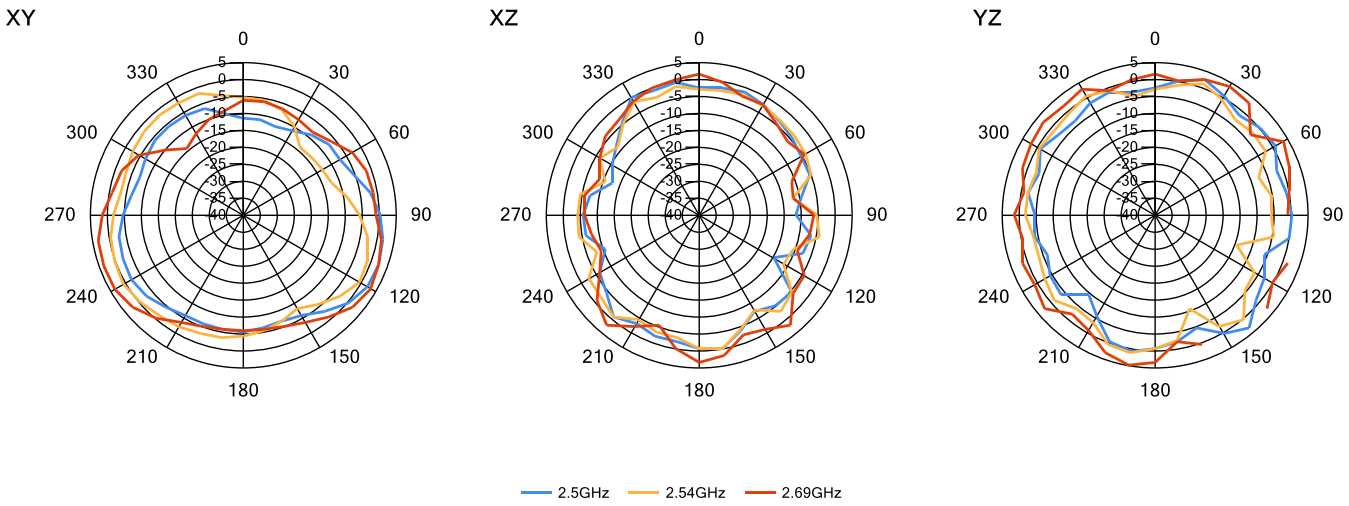
3D pattern at 2350 MHz
Drag to rotate pattern and PCB by using Adobe Reader
(Click to Activate)



7.3.4 2500 MHz – 2690 MHz

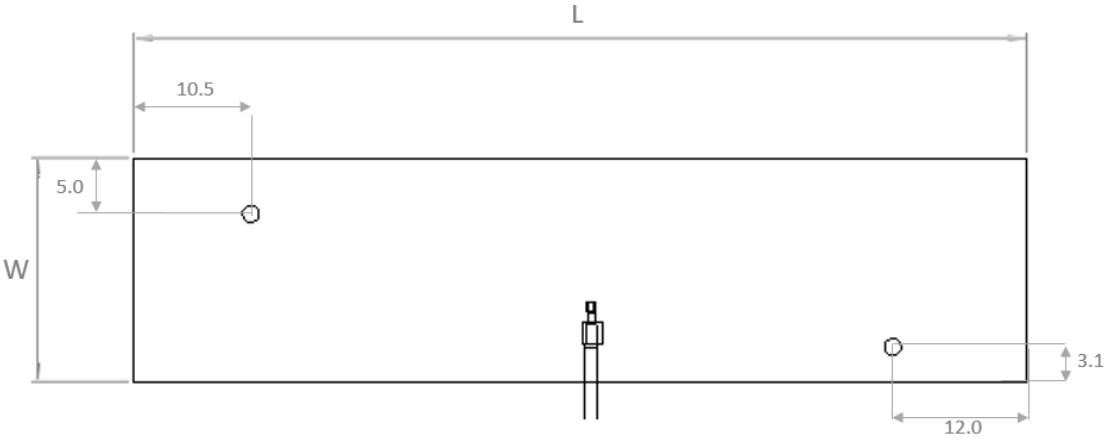


3D pattern at 2600 MHz
Drag to rotate pattern and PCB by using Adobe Reader
(Click to Activate)



8. Antenna Dimensions

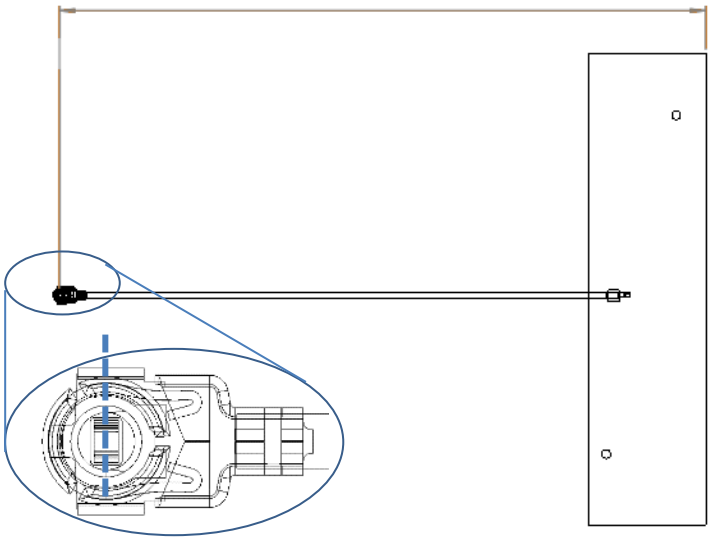
8.1 Dimensions FPC section



L	W	T
Length	**Width**	**Thickness**
80.0 ±0.2 (mm)	20.0 ±0.2 (mm)	0.15 (mm) nominal

All dimensions in mm

8.2 Dimensions assembled

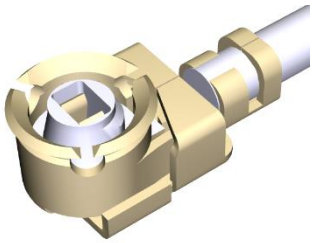


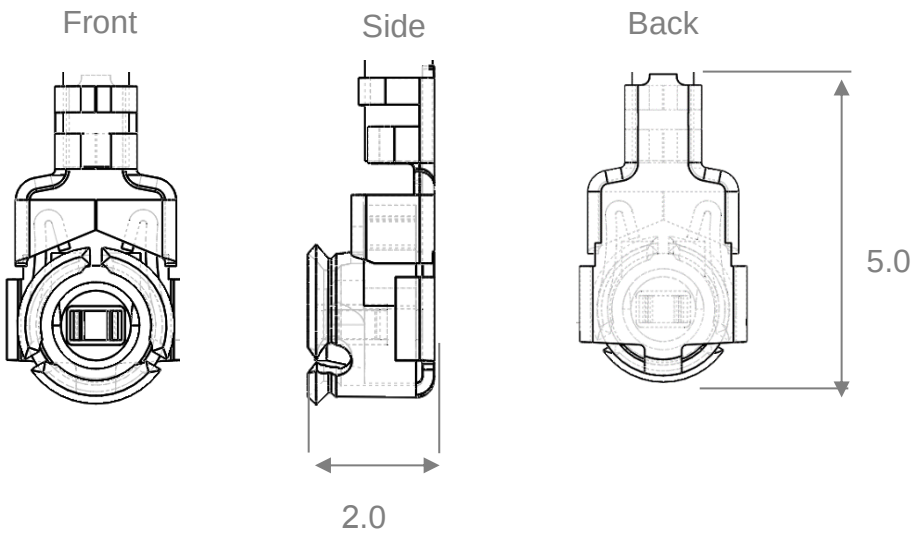
SRFC015-100	SRFC015-200
L	**L**
113 ±2.0 (mm)	213 ±2.0 (mm)

Standard cable lengths for this antenna (other lengths are available, MOQs apply)

8.3 I-PEX Connector MHF1 (20278-112R-13)

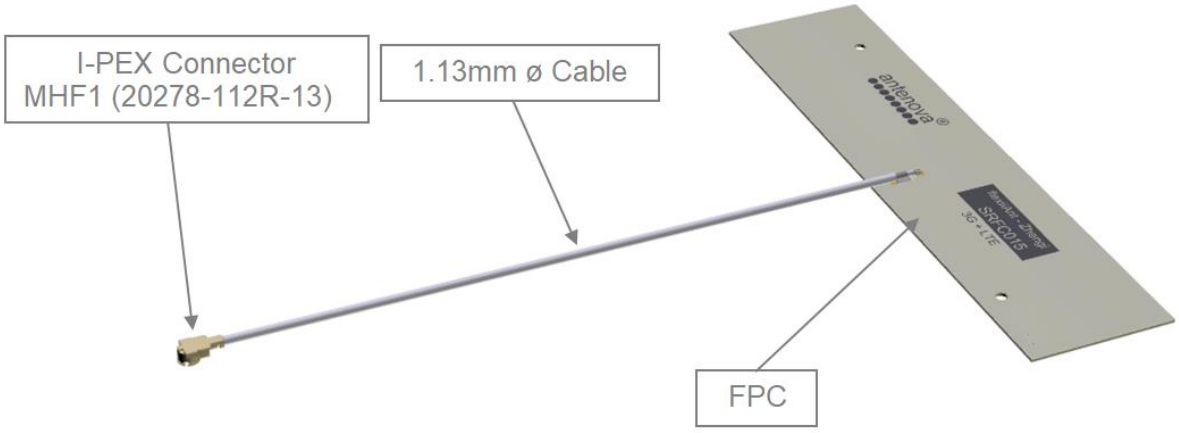
I-PEX	
Material	Copper Alloy
Plating	Ag





All dimensions in mm

8.4 Assembly



9. Electrical Interface

9.1 Host Interface

The host PCB requires the mating connector which is the I-PEX MHF (UFL) receptacle. The location should be close to the chip/modules pin for the RF. Any feed from this receptacle should be maintained at 50Ω impedance.

9.2 Transmission Line

All transmission lines should be designed to have a characteristic impedance of 50Ω.

• The length of the transmission lines should be kept to a minimum
• Any other parts of the RF system like transceivers, power amplifiers, etc, should also be designed to have an impedance of 50 Ω

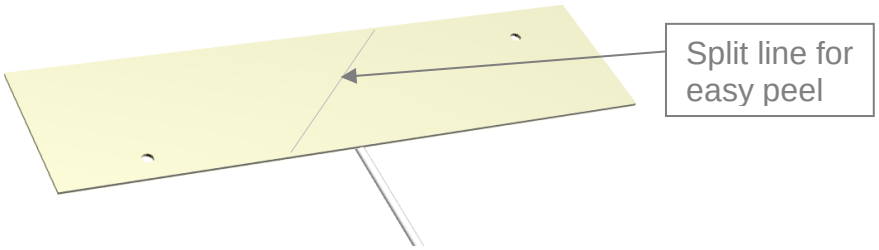
Once the material for the PCB has been chosen (PCB thickness and dielectric constant), a coplanar transmission line can easily be designed using any of the commercial software packages for transmission line design. For the chosen PCB thickness, copper thickness and substrate dielectric constant, the program will calculate the appropriate transmission line width and gaps on either side of the feed.

A DC blocking capacitor should be placed in line to protect the RF front end.

10. Mechanical Fixing

The antenna uses 3M 468MP adhesive on the reverse side of the FPC. The antenna has an easy access split line to peel off to reveal the adhesive side. It is designed for a one time fix to a clean smooth surface.

FPC back side



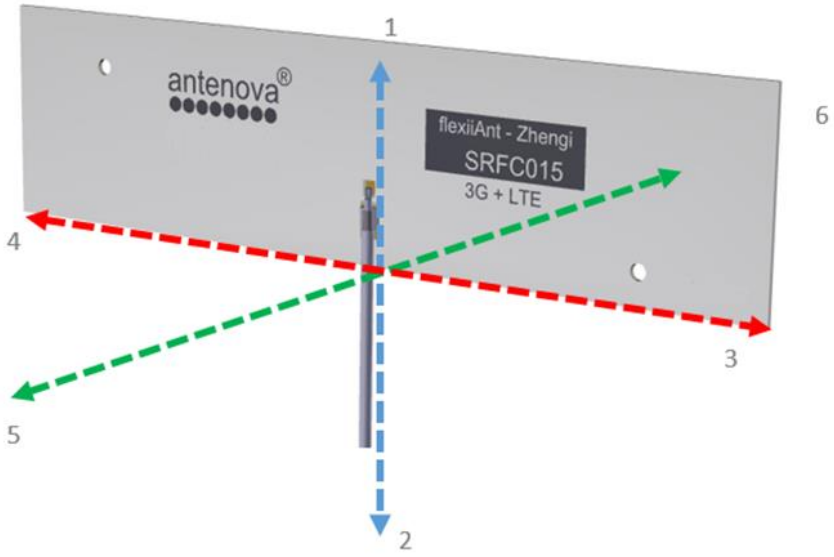
10.0 Antenna Integration Guide

10.1 Placement

For placing the FPC antenna within a device, the host PCB size is not a factor like with PCB mounted antennas. However placement still needs to follow some basic rules, as any antenna is sensitive to its environment.

Use the six spatial directions shown below as a guide. The antenna FPC section should ideally maintain a minimum of three directions free from obstructions to be able to operate effectively. The other directions will have obstacles in their paths - these directions still require a minimum clearance. These minimum clearances are further defined in this section. The plastic case is not included in this, only metal objects/components that will obstruct or come in close proximity to the antenna.

Six spatial directions relative to FPC

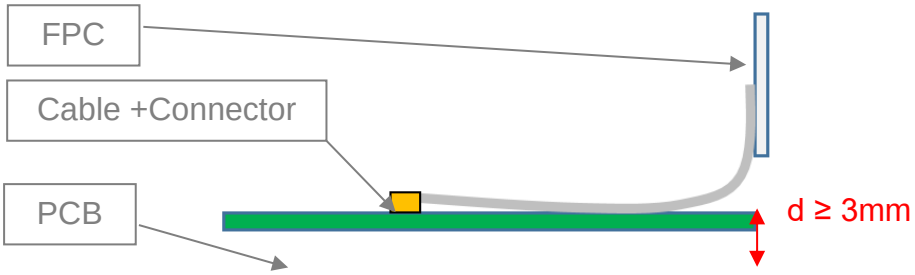


10.2 Orientation of FPC

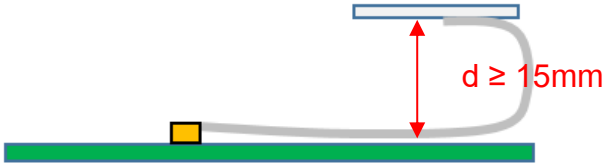
The orientation of the FPC with respect to the host PCB should be defined depending on the unit. The proximity of the GND will have an influence on the antenna so the PCB location relative to the antenna should be considered.

The FPC will normally be placed in one of the three following options for orientation. In each option a distance (d) is the critical dimension to consider. Below shows the minimum value of (d) for each. Other obstructions may increase this dimension.

1) Vertical mounted



2) Co-planar to PCB



3) Planar to PCB (Same plane)

11. Hazardous Material Regulation Conformance

The antenna has been tested to conform to RoHS requirements. A certificate of conformance is available from Antenova's website.

12. Packaging

The antennas are stored in individual plastic (PE) bags. Then stored within a second bag of 100 pcs.

Single antenna per bag

100 units per second bag (Labelled)

12.1 Optimal Storage Conditions

Temperature	-10ºC to 40ºC
Humidity	Less than 75% RH
Shelf life	18 Months
Storage place	Away from corrosive gas and direct sunlight
Packaging	Antennas should be stored in unopened sealed manufacturer's plastic packaging.

The shelf life of the antenna is 18m, provided the bag of 100 pieces remains factory sealed.

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12.2 Label Information

Quality statements

Antenova's products conform to REACH and RoHS legislation. For our statements regarding these and other quality standards, please see **www.antenova.com**.

Antenna design, integration and test resources

Product designers – the details contained in this datasheet will help you to complete your embedded antenna design. Please follow our technical advice carefully to obtain optimum antenna performance.

It is our goal that every customer will create a high performing wireless product using Antenova's antennas. You will find a wealth of design resources, calculators and case studies to aid your design at our website.

Antenova's design laboratories are equipped with the latest antenna design tools and test chambers. We provide antenna design, test and technical integration services to help you complete your design and obtain certifications.

If you cannot find the antenna you require in our product range, please contact us to discuss creating a bespoke antenna to meet your requirement exactly.

Contacts

Join our online antenna design community: **ask.antenova.com**

Order antenna samples and evaluation boards at: **www.antenova.com**

Request a quotation for antennas by volume: **sales@antenova.com**

Global Headquarters:

Antenova Ltd, 2nd Floor Titan Court, 3 Bishop Square,
Hatfield, AL10 9NA +44 (0) 1223 810600