SPECIFICATION

PATENT PENDING

Part No	:	**MFX3.07.0150C**
Product Name	:	CAT M1 Wide Band Flex Antenna 698MHz - 3000 MHz
Features	:	Patent Pending Ground Plane Independent CAT M1 Bands 698-3000 MHz >45% Efficiency on All bands 5 dBi Peak Gain 96*21*0.2 mm size Φ1.37mm Cable, IPEX MHFI (U.FL Compatible) RoHS Compliant

1. Introduction

The patent pending MFX3 ultra-wideband flexible antenna has been designed for CAT M1 applications to provide highest efficiency and covers all working frequencies in the 698-3000MHz spectrum, covering all Cellular, 2.4GHz Wi-Fi, ISM and AGPS. The antenna is omni-directional, delivered with a flexible body with excellent efficiencies on all bands, ground independent, with cable and connector for easy installation.

Category (CAT) M1 is a low power wide area (LPWA) technology specifically designed for IoT and M2M. CAT M1 technology offers lower maintenance cost, with greater efficiency and reliability by reducing power consumption and providing deeper penetration compared to standard cellular technologies. It operates on secure mobile networks making it suited to automotive, smart meter, medical and smart city applications.

The MFX3 flexible polymer antenna, at 96*21*0.2mm, is extremely thin, and truly ultra-wideband, with high efficiencies across the bands. It is assembled by a simple "peel and stick" process, attaching securely to non-metal surfaces via 3M adhesive. It enables designers to use only one antenna that covers CAT M1 and all common LTE frequencies.

The MFX3 is made of durable flexible polymer and is designed to be mounted directly onto a plastic or glass cover. It offers a peak gain of 5dBi, an efficiency of more than 45% across the bands and is an ideal choice for any device maker that needs to keep manufacturing costs down over the lifetime of a product. It is ground plane independent and delivered with a cable and connector for easy connecting to the wireless module or customer PCB.

Cables and connectors are customizable. Like all similar antennas, care should be taken to mount the antenna at least 10mm from metal components or surfaces, and ideally 20mm for best radiation efficiency.

2. Specification

ELECTRICAL						
Frequency(MHz)	Band 2		Band 4		Band 12	
	Tx	Rx	Tx	Rx	Tx	Rx
	1850-1910	1930-1990	1710-1755	2110-2155	699-716	729-746
Peak Gain (dBi)	3.07	3.10	3.68	4.51	0.36	0.21
Efficiency (%)	75.98	71.07	68.22	82.01	45.59	44.35
Average Gain (dB)	-1.19	-1.48	-1.66	-0.86	-3.41	-3.53
Radiation Properties	Omni-directional					
Max Input Power (Watts)	5					
Polarization	Linear					
Impedance (Ohms)	50 Ohms					

*Antenna measured on plastic plate of 3 mm thickness.

MECHANICAL	
Dimensions (mm)	96*21*0.2 mm
Material	Flexible Polymer
Connector and Cable	U.FL and 1.37 mm mini coax
Cable Length	150 mm

ENVIRONMENTAL	
Operation Temperature	-40°C to 85°C
Storage Temperature	-40°C to 85°C
Relative Humidity	40% to 95%
RoHs Compliant	Yes

3. Antenna Characteristics

3.1. Return Loss

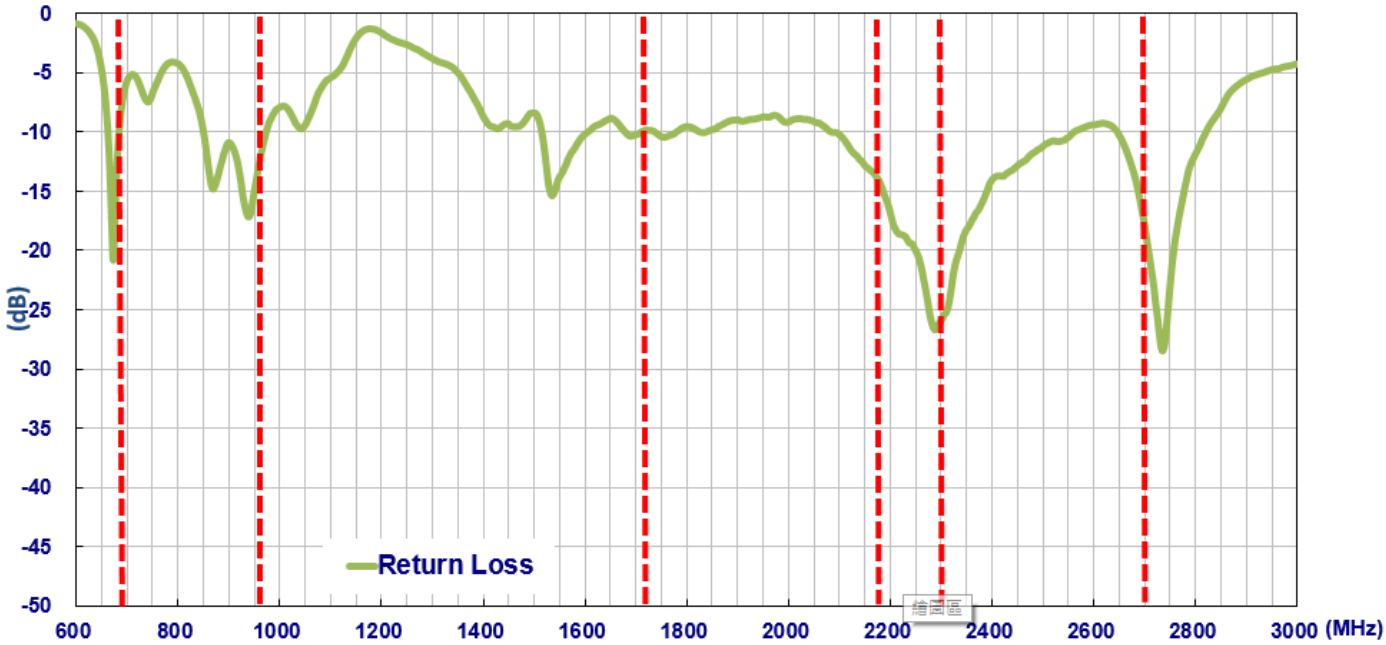


Figure 1. Return loss of MFX3 Antenna.

3.2. Peak Gain

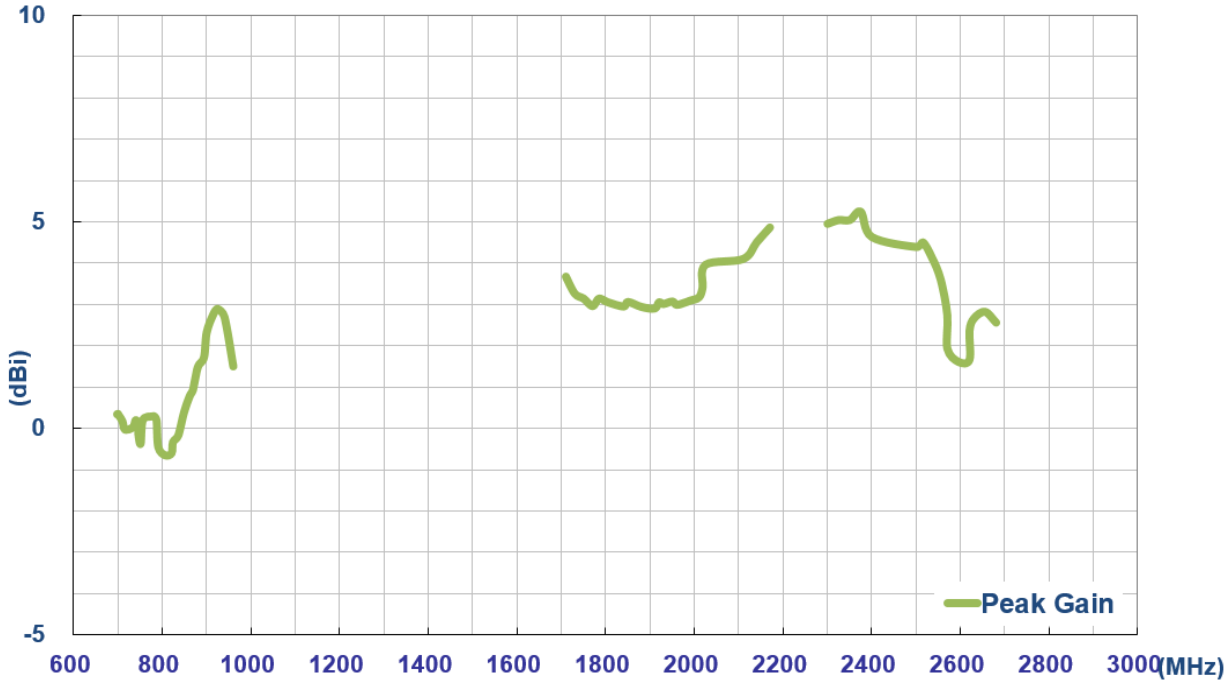


Figure 2. Peak Gain of MFX3 Antenna.

3.3. Efficiency

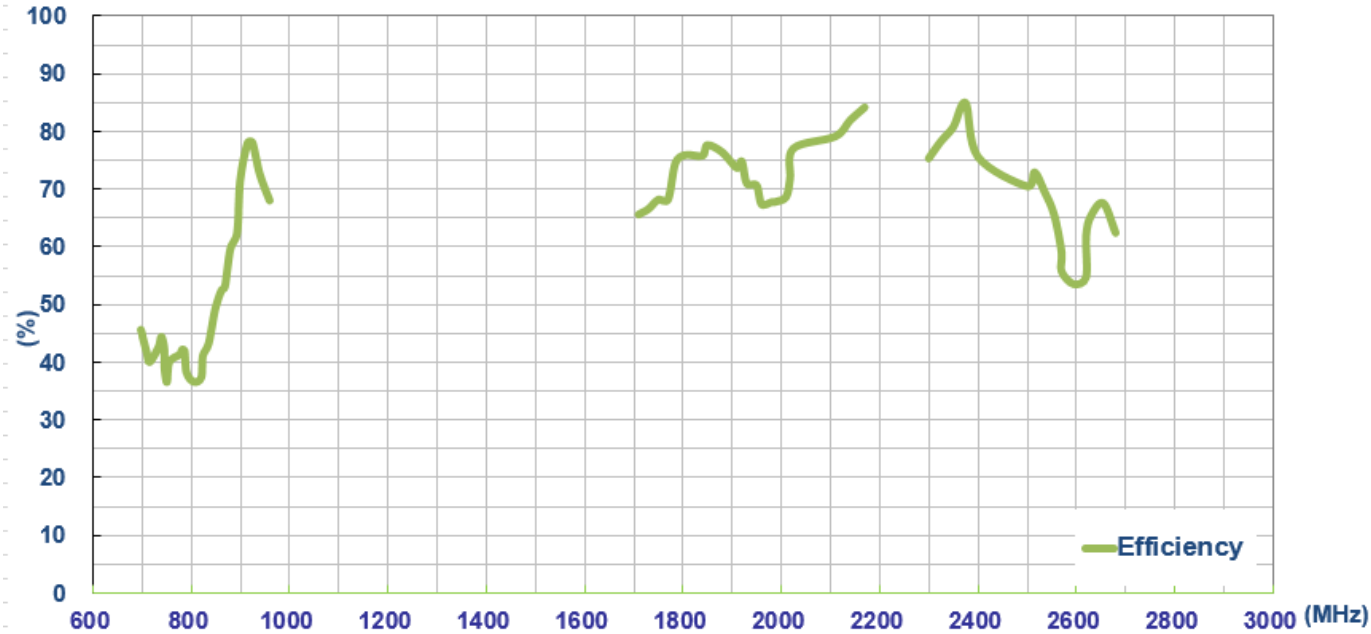


Figure 3. Efficiency of MFX3 Antenna.

3.4. Average Gain

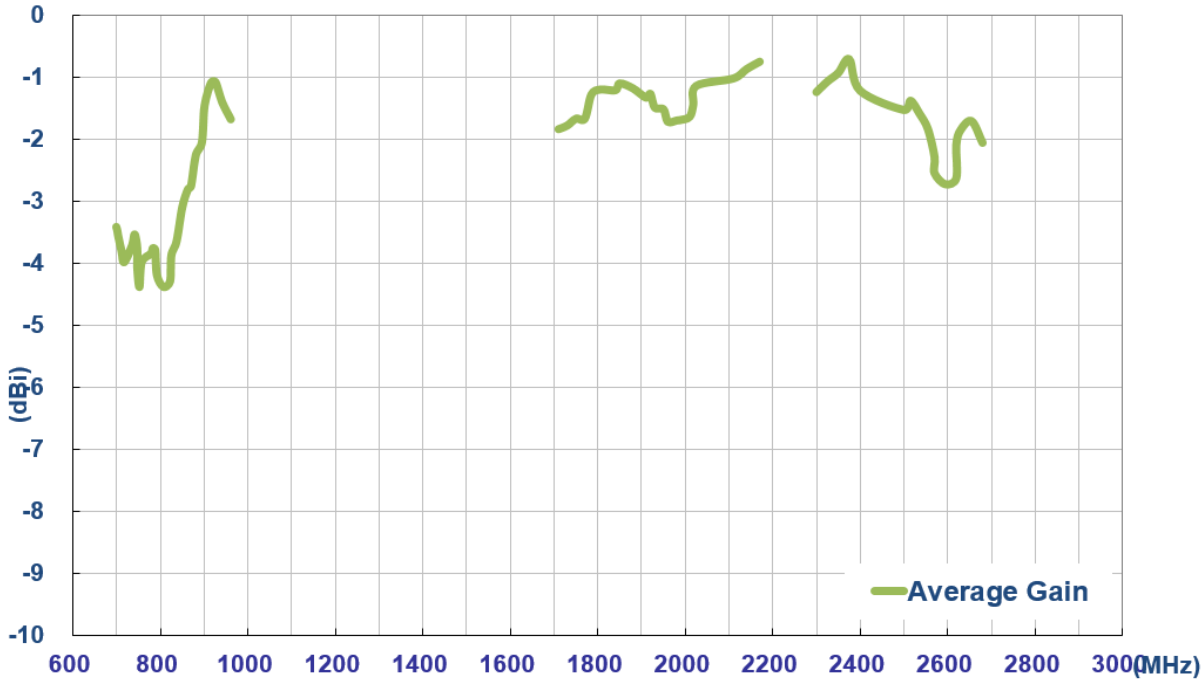
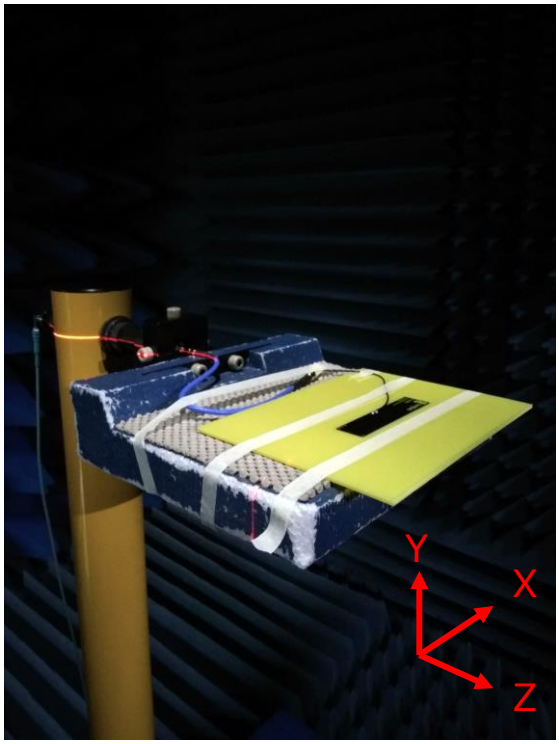


Figure 4. Average Gain of MFX3 Antenna.

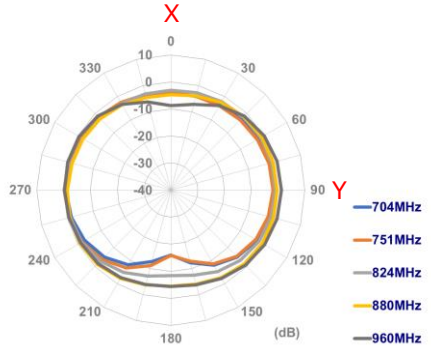
4. Radiation Patterns

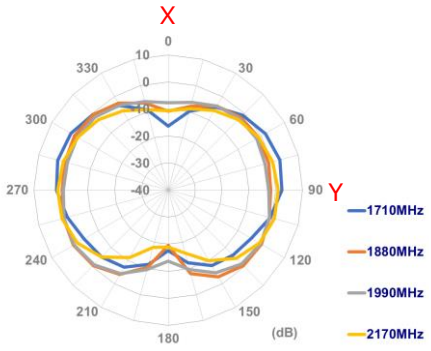
4.1. Antenna Test Setup

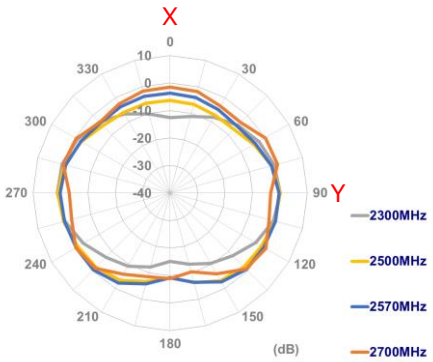


4.2. 2D Radiation Patterns

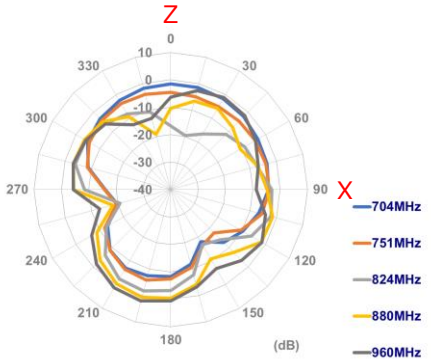
XY Plane

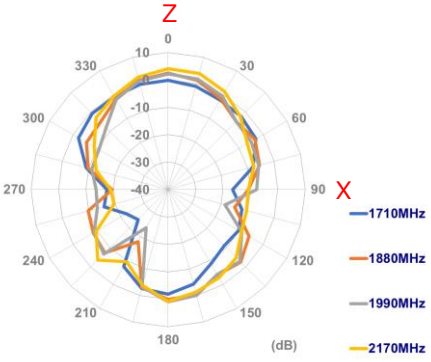


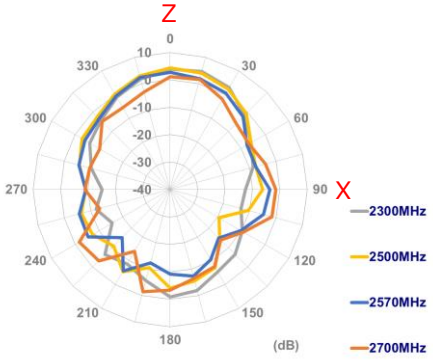




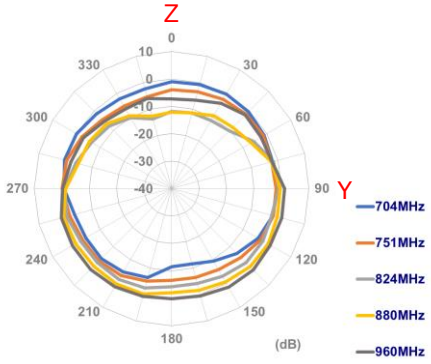
XZ Plane

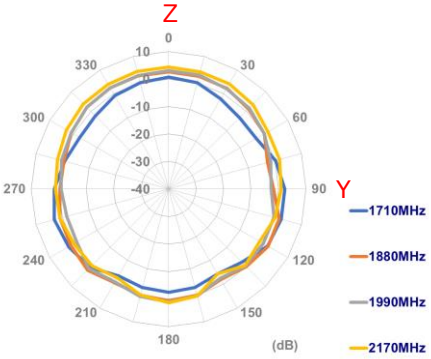


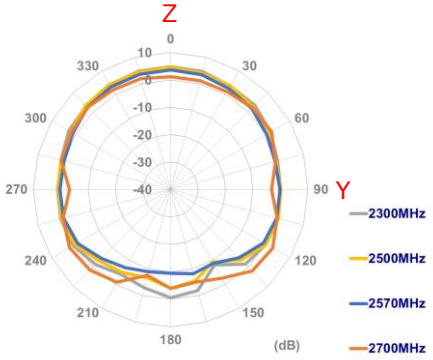




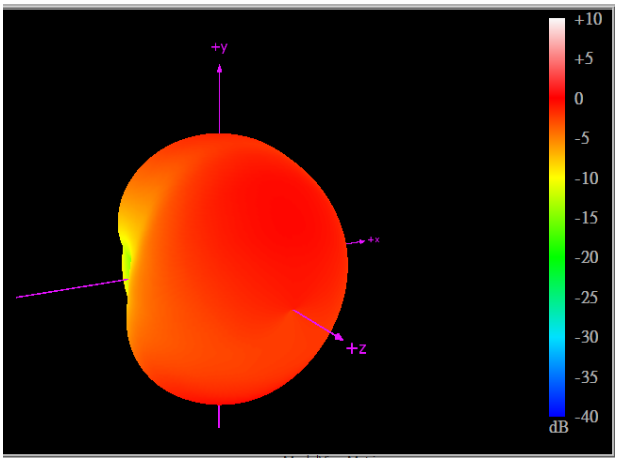
YZ Plane



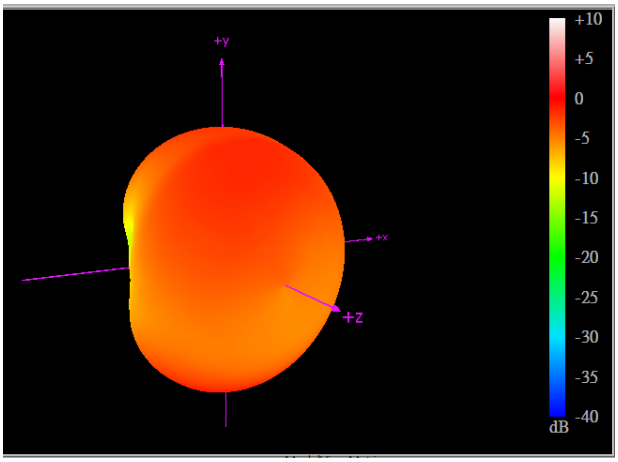




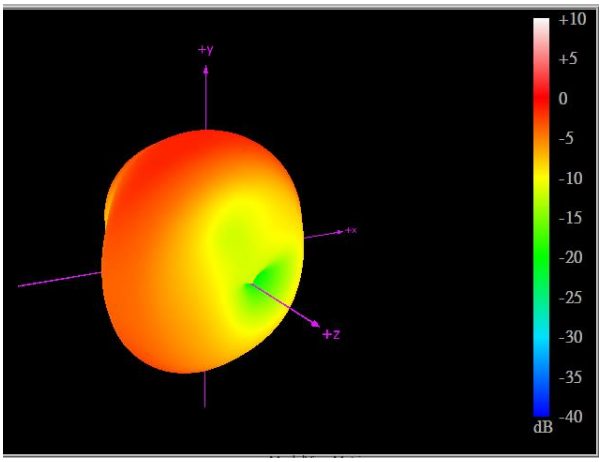
4.3. 3D Radiation Patterns



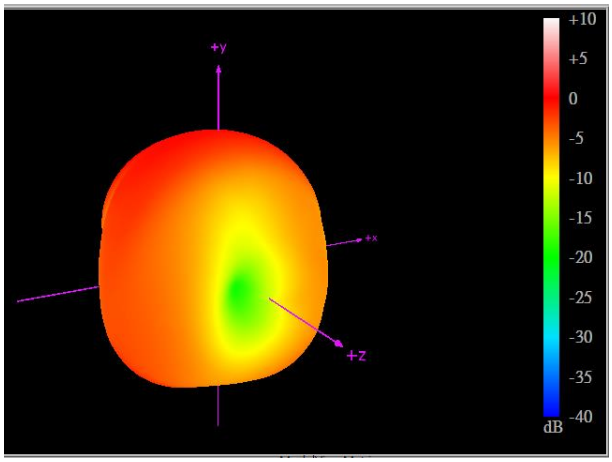
704 MHz



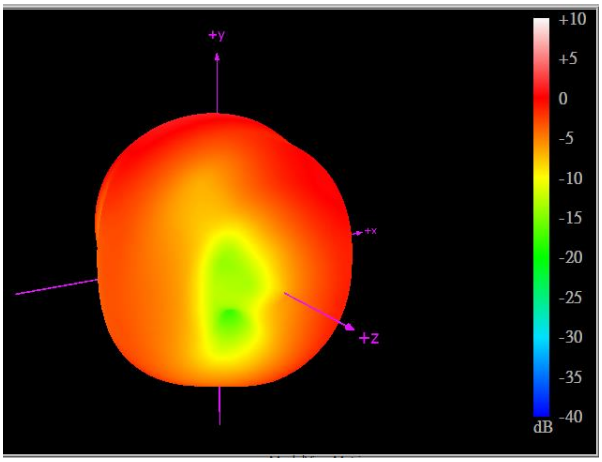
751 MHz



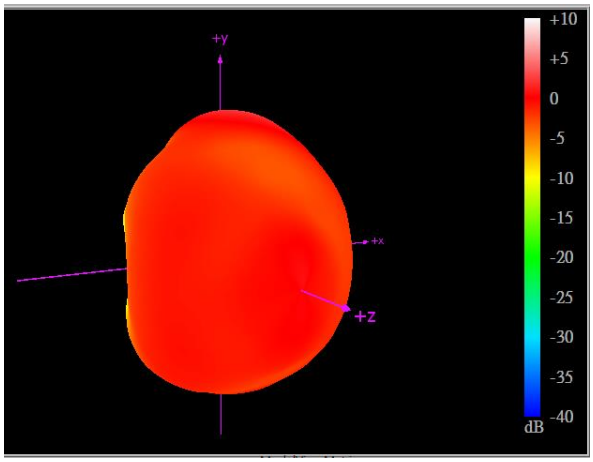
824 MHz



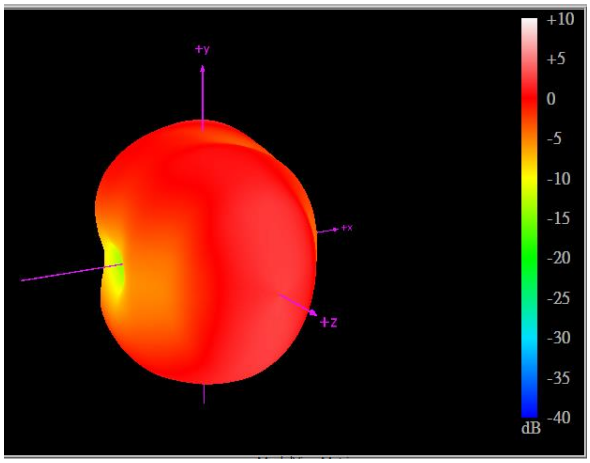
880 MHz



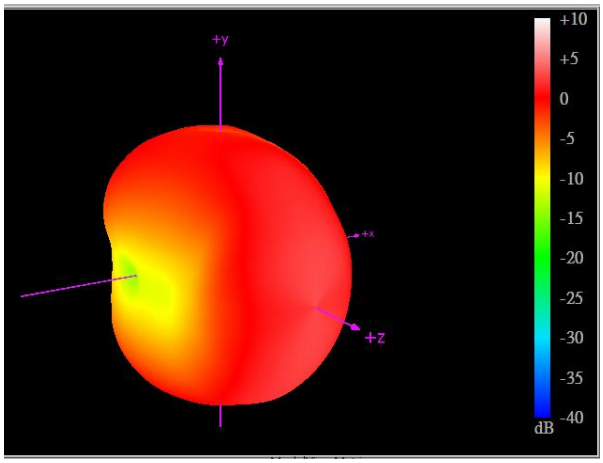
960 MHz



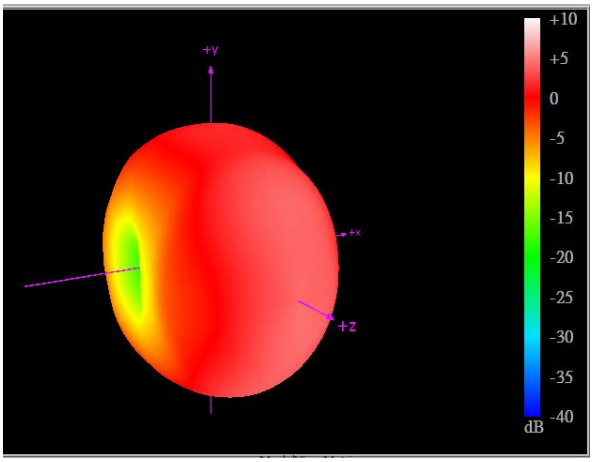
1710 MHz



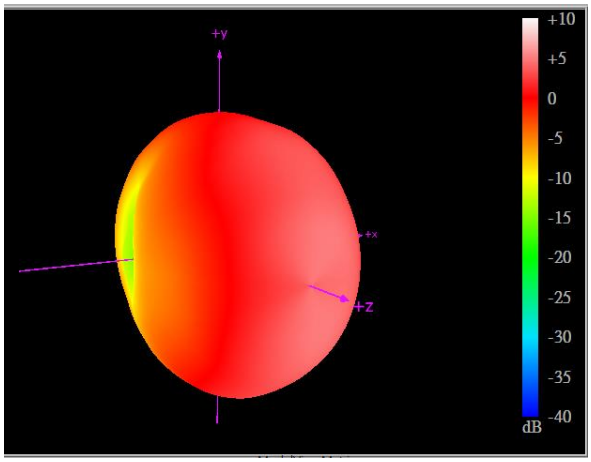
1880 MHz



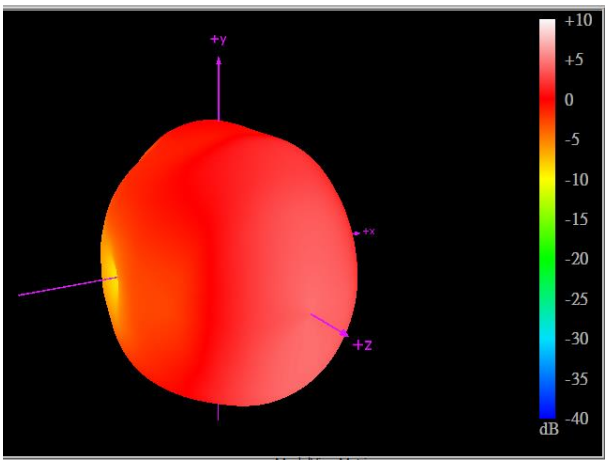
1990 MHz



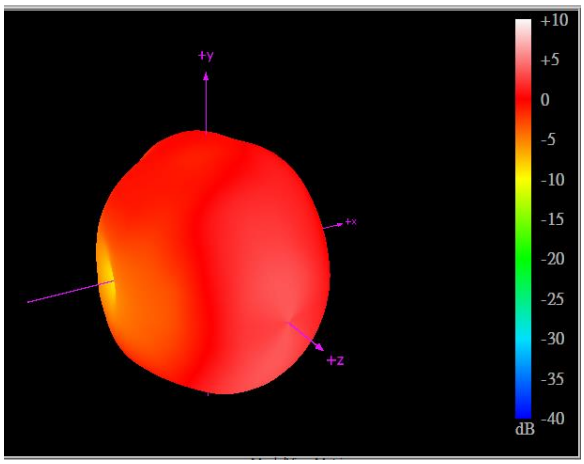
2170 MHz



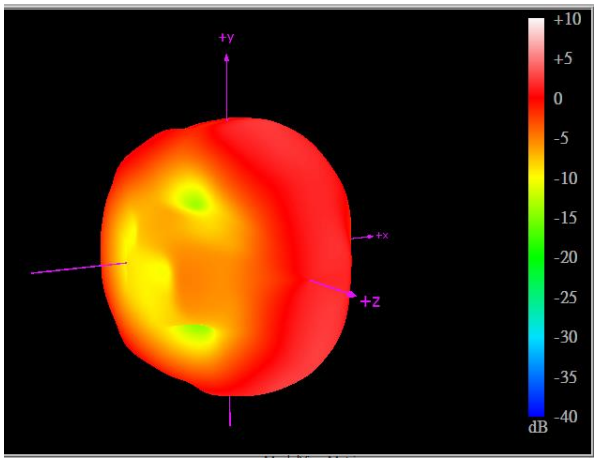
2300 MHz



2500 MHz

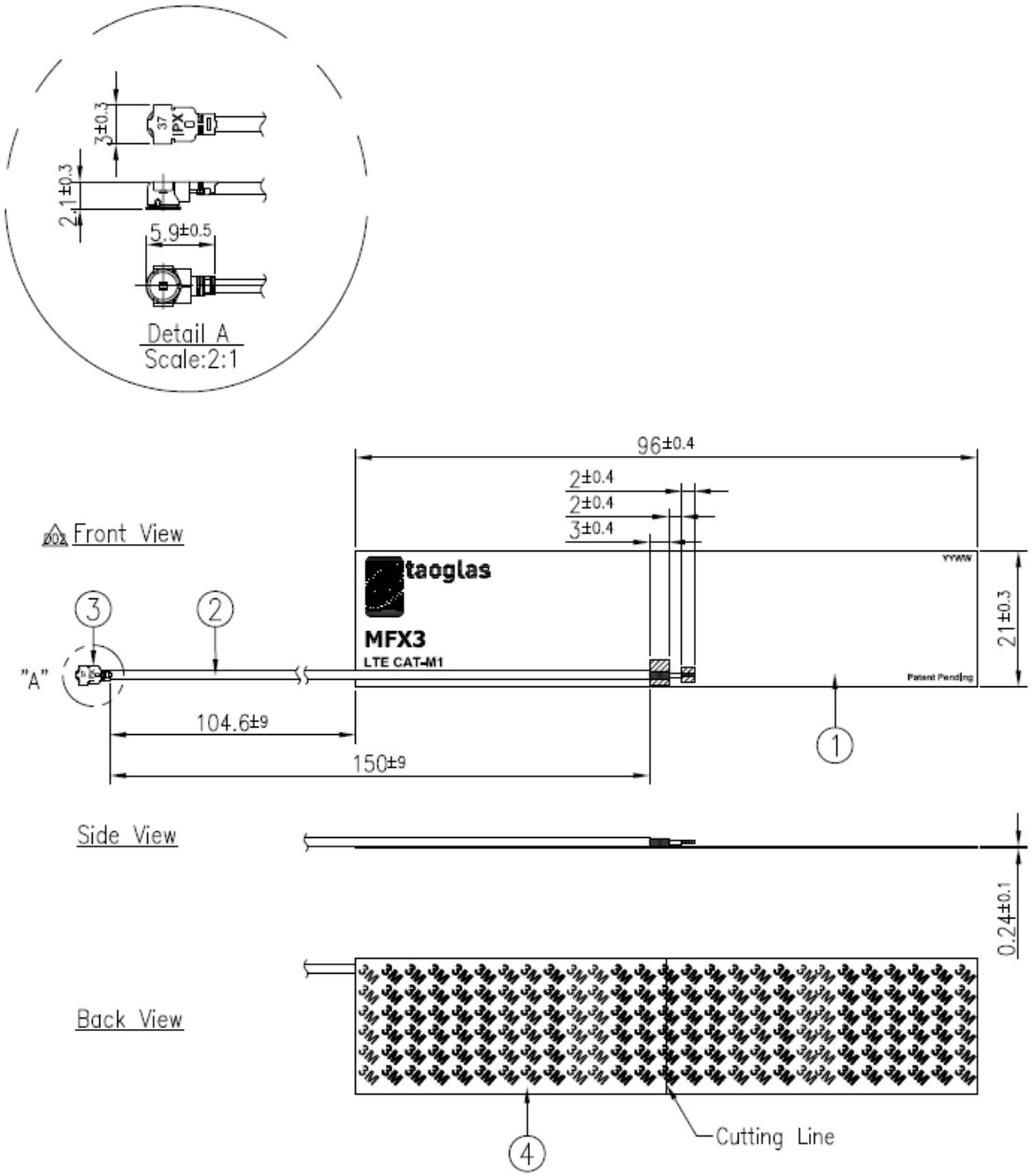


2570 MHz



2700 MHz

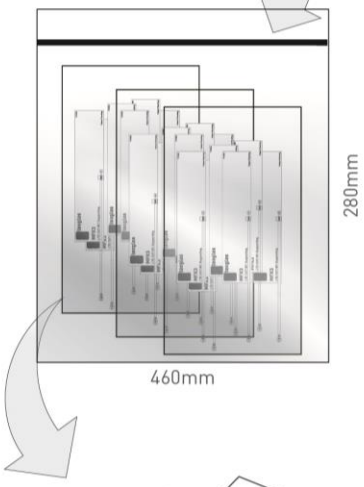
5. Mechanical Drawing (Unit: mm)



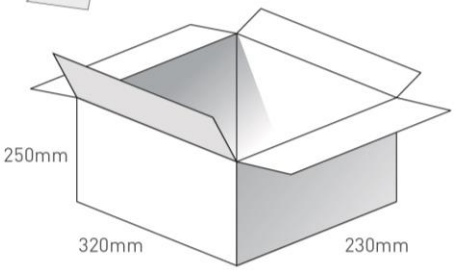
	Name	Material	Finish	QTY
1	MFX3 FPCB	Polymer 0.24t	Black	1
2	1.37 Coaxial Cable	FEP	Black	1
3	IPEX MHFHT	Brass	Au Plated	1
4	Double-Sided Adhesive	3M 467	Brown Liner	1

6. Packaging

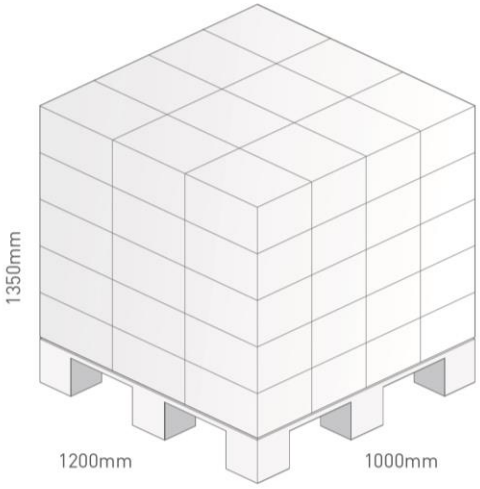
100 pcs MFX3 per PE bag
PE Bag Dimensions - 350 x 100mm
Weight - 150g



1000 pcs MFX3 per large PE bag
Large PE Bag Dimensions - 460 x 280mm
Weight - 1500g



4000 pcs MFX3 per carton
Carton Dimensions - 320*250*230 mm
Weight - 6Kg



Pallet Dimensions 1200*1000*1350mm
60 Cartons per Pallet
12 Cartons per layer
5 Layers

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