TAOGLAS

Datasheet

Part No:
MFX3.07.0150C

Description:

NB-IoT / CAT M1 Wide Band Flex Antenna

698MHz - 3000 MHz

Features:

Patent Pending

Ground Plane Independent

NB-IoT / CAT M1 Bands

698-3000 MHz

>45% Efficiency on All bands

5 dBi Peak Gain

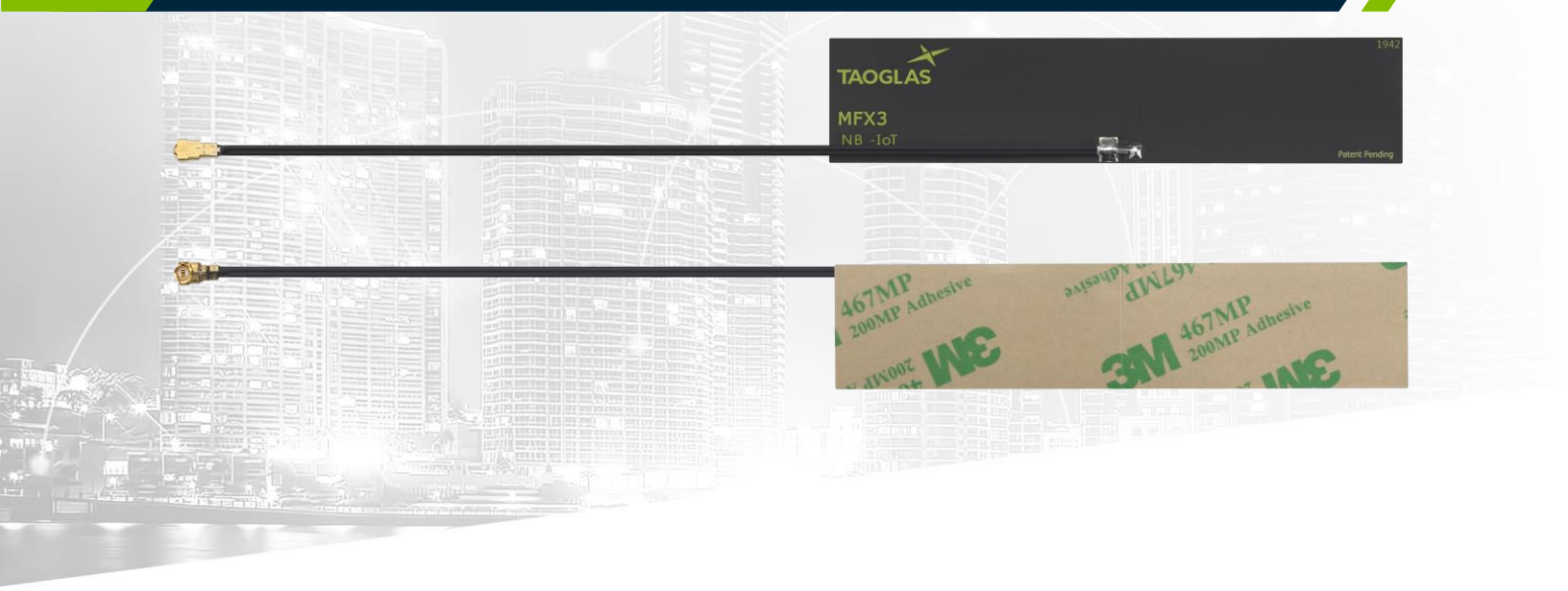
Dimensions: 96*21*0.2 mm

Cable: 150mm of Ø1.37mm

Connector: IPEX MHFI (U.FL Compatible)

RoHS & Reach Compliant

1. Introduction



The patent pending MFX3 ultra-wideband flexible antenna has been designed for NB-IoT / 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.

NB-IoT / CAT M1is a low power wide area (LPWA) technology specifically designed for IoT and M2M. NB-IoT / 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 NB-IoT, 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.

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. Cables and connectors are customizable, for further information contact your regional Taoglas customer support team.

2. Specifications

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					

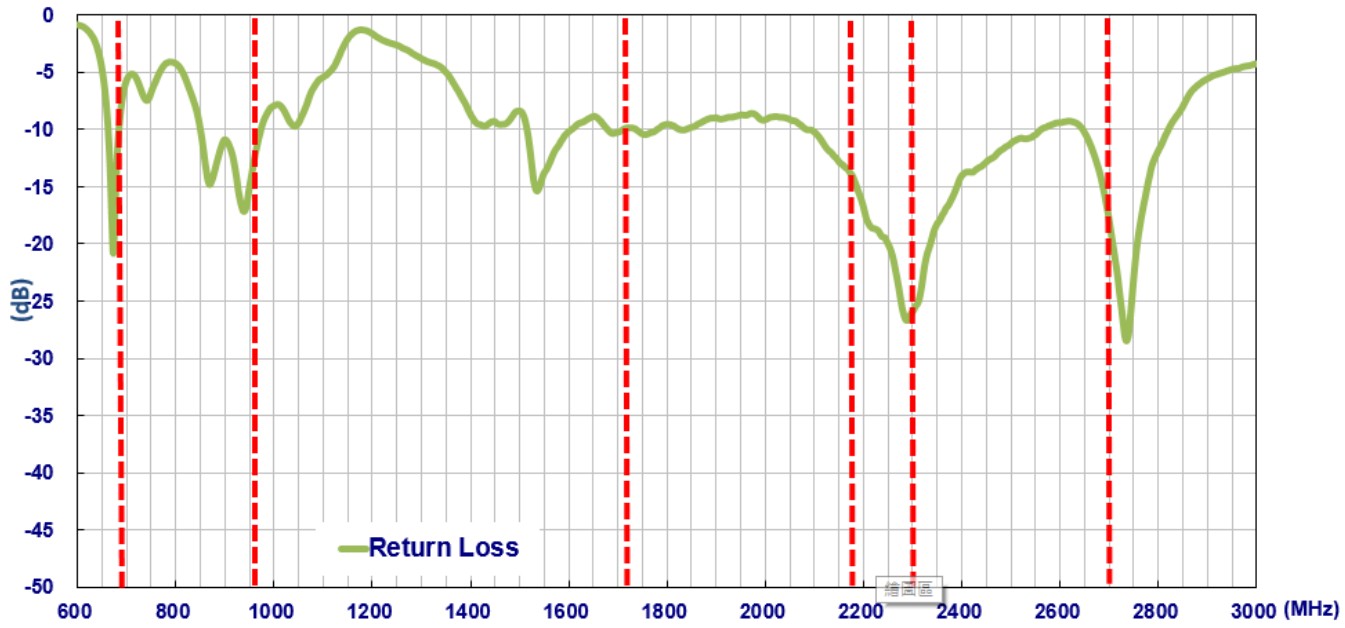
*Tested on 3mm ABS Plastic

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
REACH Complaint	Yes

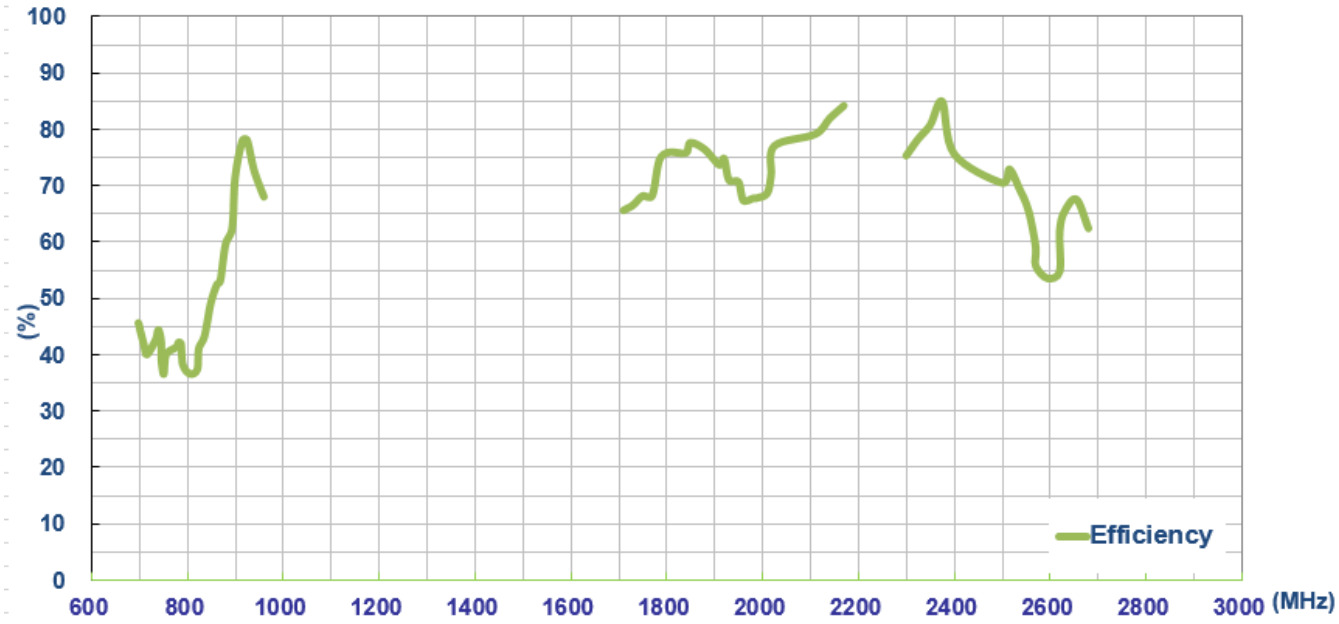
5G/4G Bands			
Band Number	5GNR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA		
	Uplink	**Downlink**	**Covered**
1	UL: 1920 to 1980	DL: 2110 to 2170	✓
2	UL: 1850 to 1910	DL: 1930 to 1990	✓
3	UL: 1710 to 1785	DL: 1805 to 1880	✓
4	UL: 1710 to 1755	DL: 2110 to 2155	✓
5	UL: 824 to 849	DL: 869 to 894	✓
7	UL: 2500 to 2570	DL:2620 to 2690	✓
8	UL: 880 to 915	DL: 925 to 960	✓
9	UL: 1749.9 to 1784.9	DL: 1844.9 to 1879.9	✓
11	UL: 1427.9 to 1447.9	DL: 1475.9 to 1495.9	✗
12	UL: 699 to 716	DL: 729 to 746	✓
13	UL: 777 to 787	DL: 746 to 756	✓
14	UL: 788 to 798	DL: 758 to 768	✓
17	UL: 704 to 716	DL: 734 to 746	✓
18	UL: 815 to 830	DL: 860 to 875	✓
19	UL: 830 to 845	DL: 875 to 890	✓
20	UL: 832 to 862	DL: 791 to 821	✓
21	UL: 1447.9 to 1462.9	DL: 1495.9 to 1510.9	✗
22	UL: 3410 to 3490	DL: 3510 to 3590	✗
23	UL:2000 to 2020	DL: 2180 to 2200	✓
24	UL:1625.5 to 1660.5	DL: 1525 to 1559	✗
25	UL: 1850 to 1915	DL: 1930 to 1995	✓
26	UL: 814 to 849	DL: 859 to 894	✓
27	UL: 807 to 824	DL: 852 to 869	✓
28	UL: 703 to 748	DL: 758 to 803	✓
29	UL: -	DL: 717 to 728	✓
30	UL: 2305 to 2315	DL: 2350 to 2360	✓
31	UL: 452.5 to 457.5	DL: 462.5 to 467.5	✗
32	UL: -	DL: 1452 - 1496	✓
35	1850 to 1910		✓
38	2570 to 2620		✓
39	1880 to 1920		✓
40	2300 to 2400		✓
41	2496 to 2690		✓
42	3400 to 3600		✗
43	3600 to 3800		✗
48	3550 to 3700		✗
66	UL: 1710-1780	DL: 2110-2200	✓
71	617 to 698		✗
74/75/76	1427 to 1518		✗
78	3300 to 3800		✗
79	4400 to 5000		✗

3. Antenna Characteristics

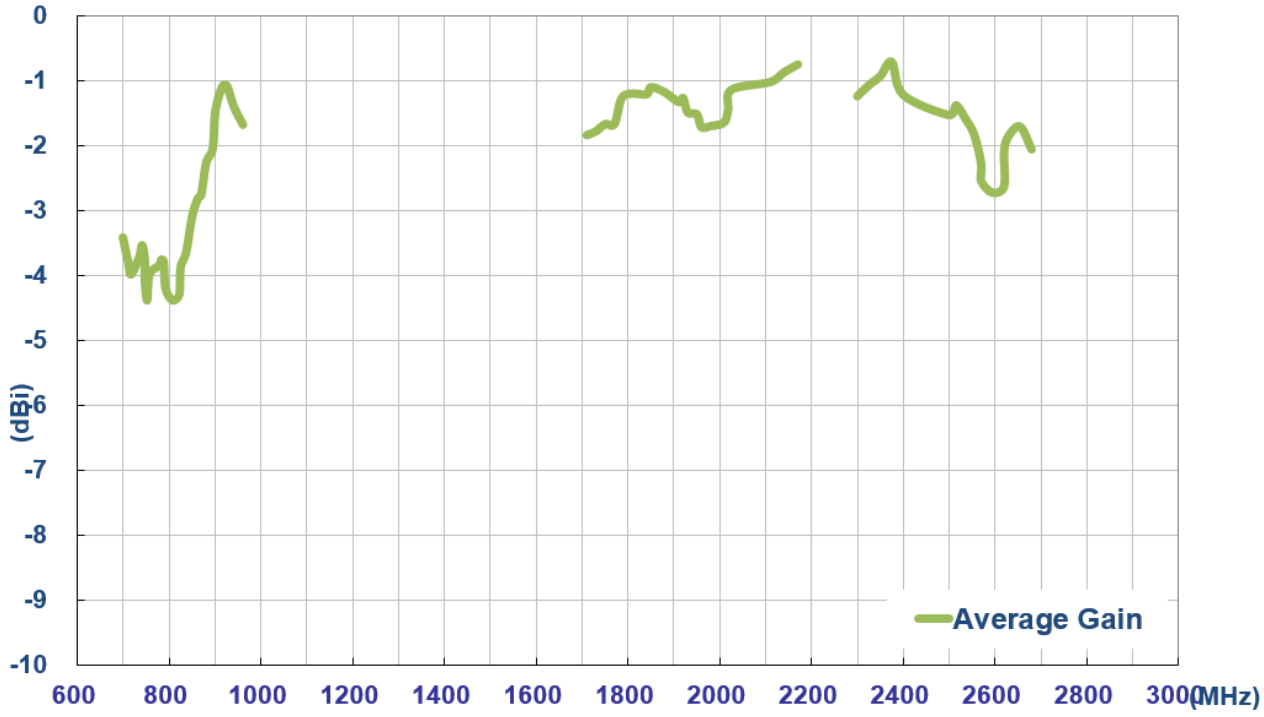
3.1 Return Loss



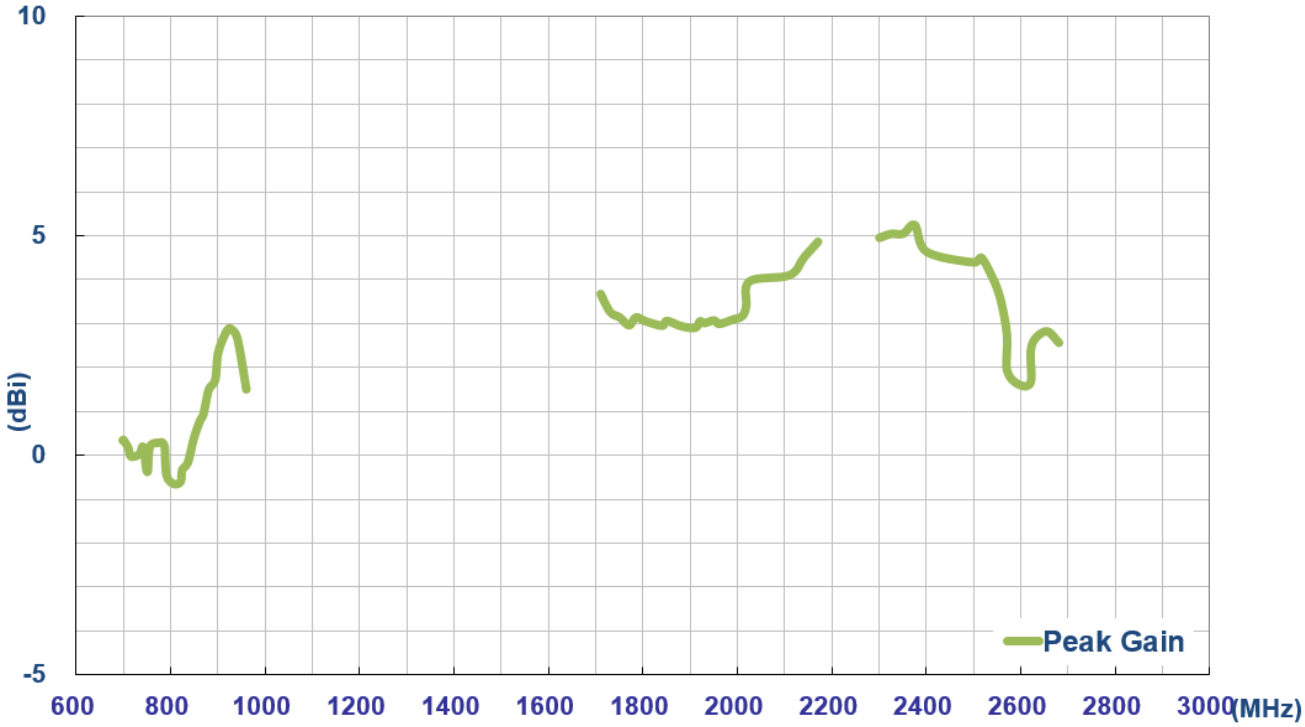
3.2 Efficiency



3.3 Average Gain

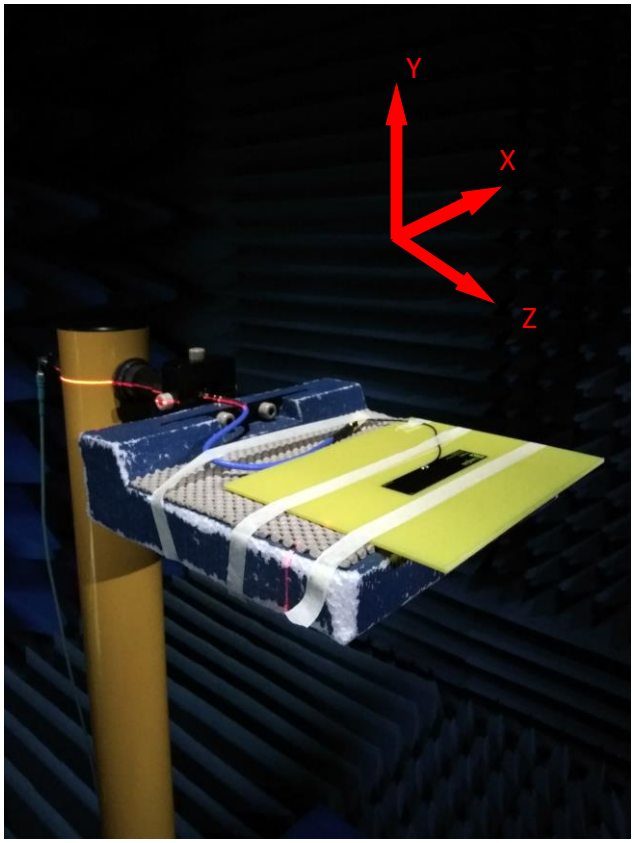


3.4 Peak Gain



4. Radiation Patterns

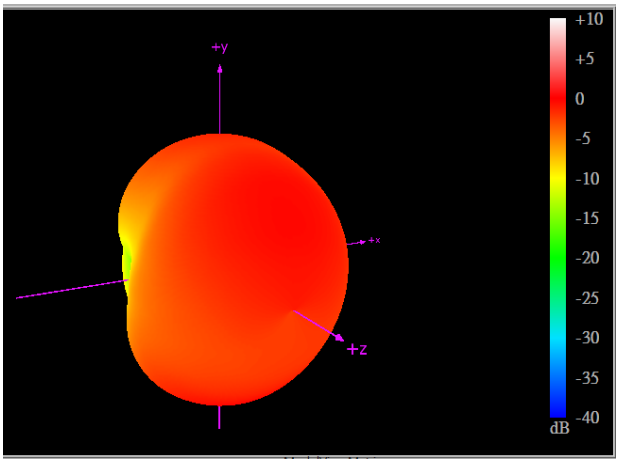
4.1 Test Setup – on 3mm ABS



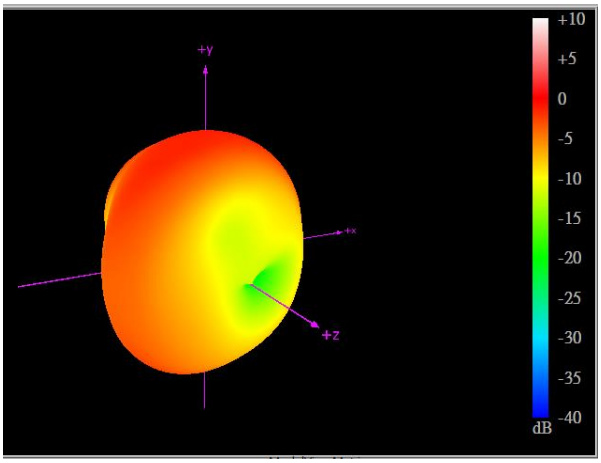
4.2 3D and 2D Radiation Patterns

704-960MHz

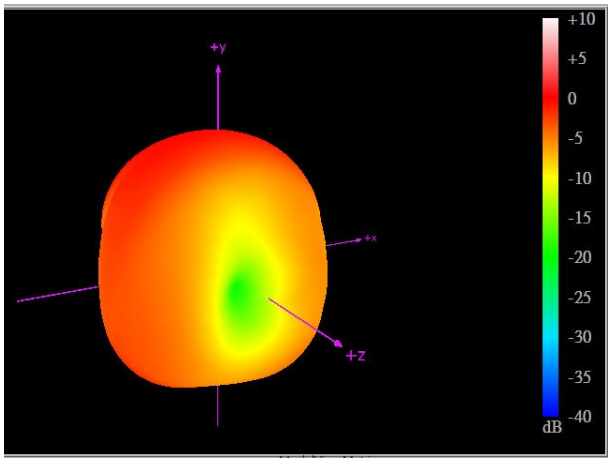
704MHz



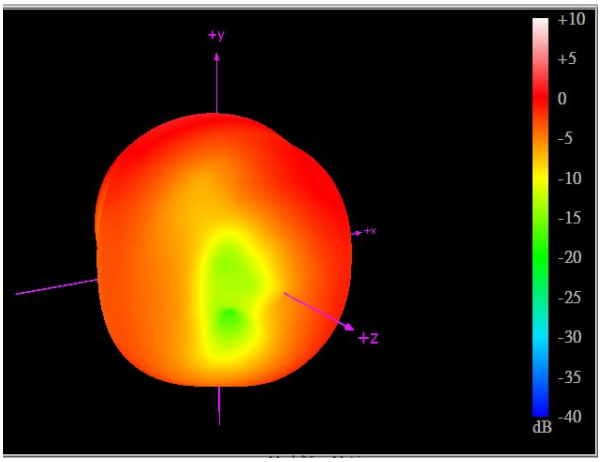
824MHz



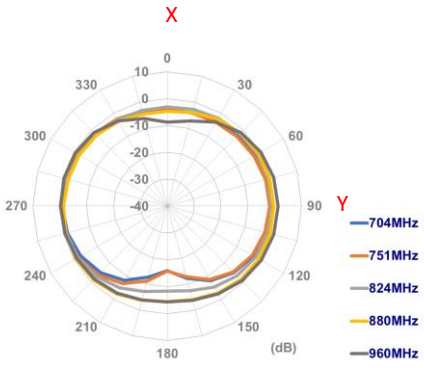
880MHz



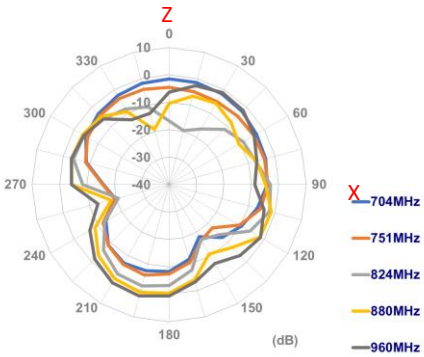
960MHz



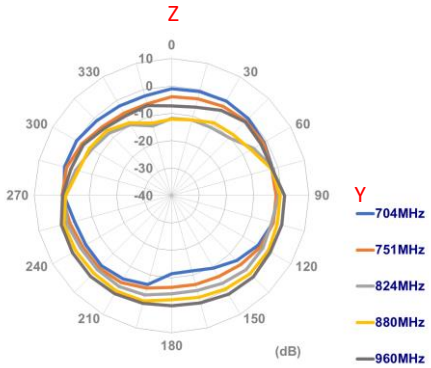
XY Plane



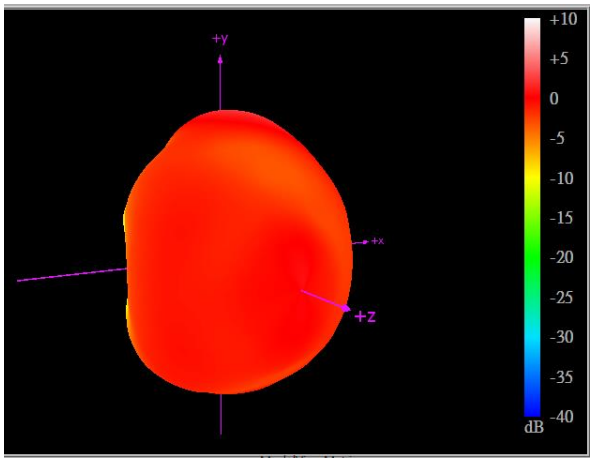
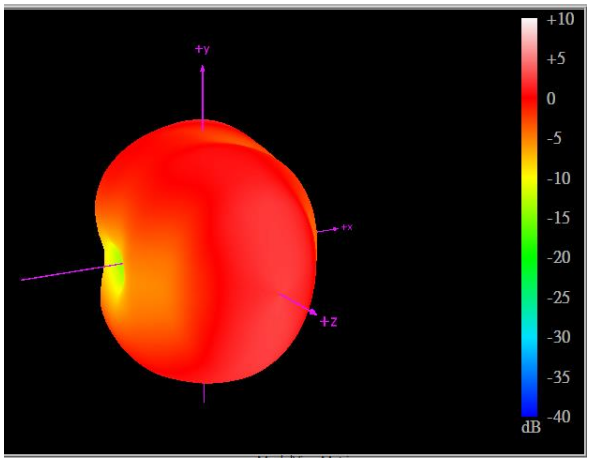
XZ Plane

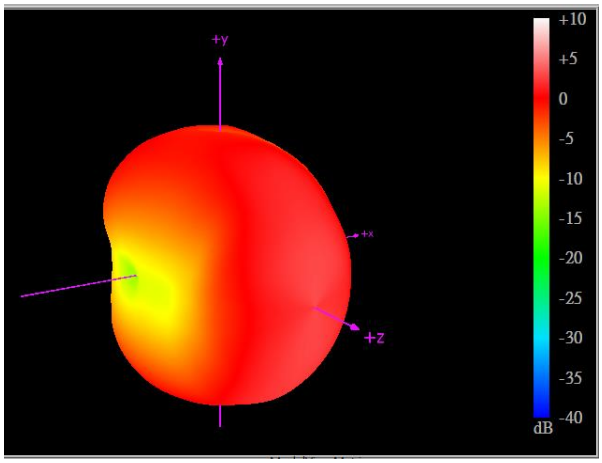
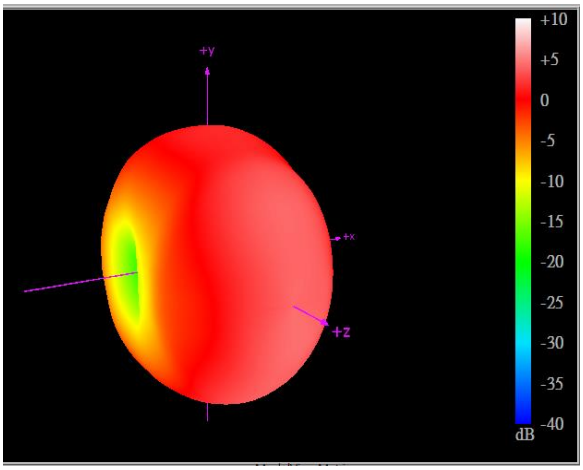


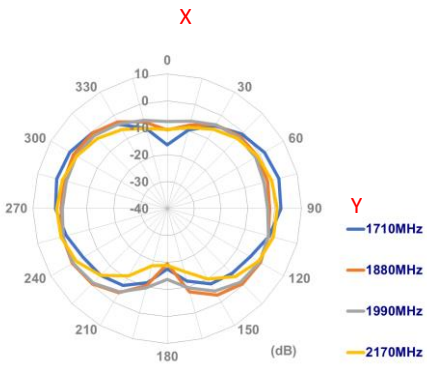
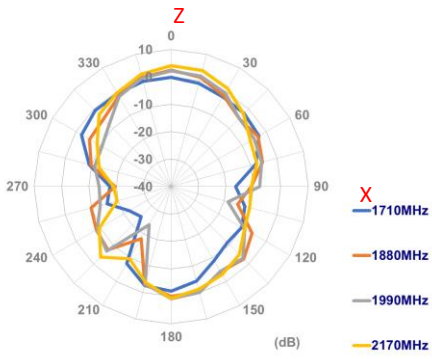
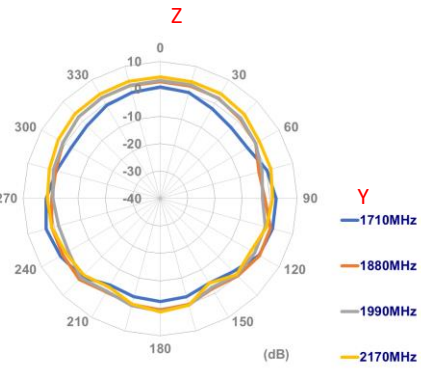
YZ Plane



1710-2170MHz

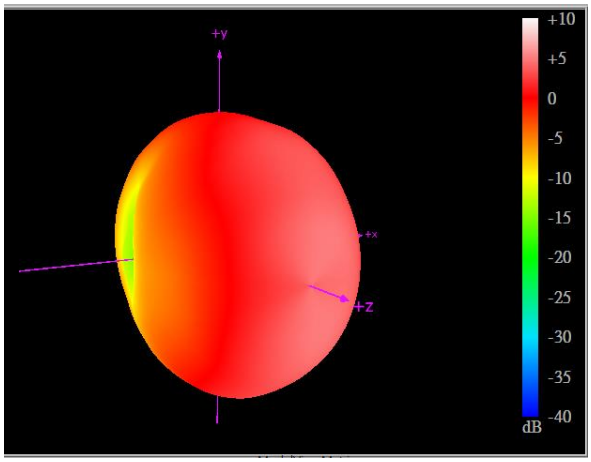
1710MHz	1880MHz
	

1990MHz	2170MHz
	

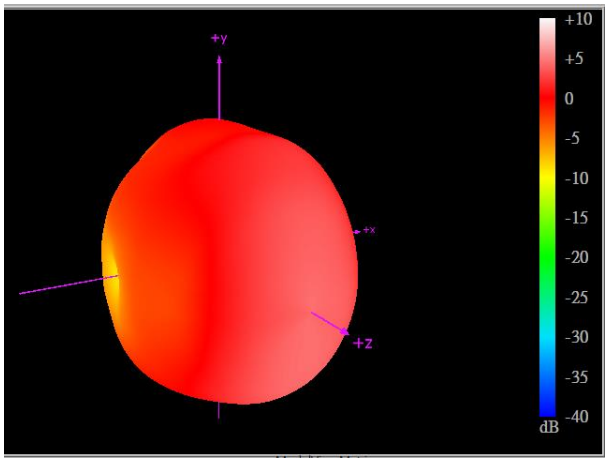
XY Plane	XZ Plane	YZ Plane
		

2300-2700MHz

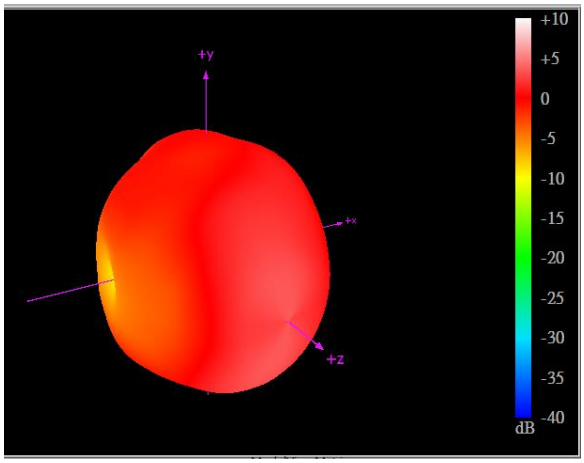
2300MHz



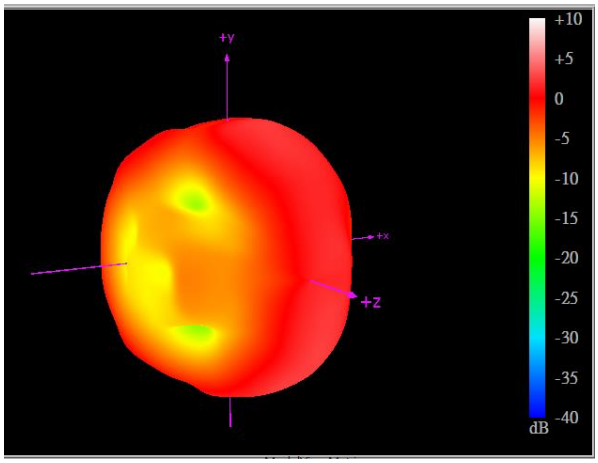
2500MHz



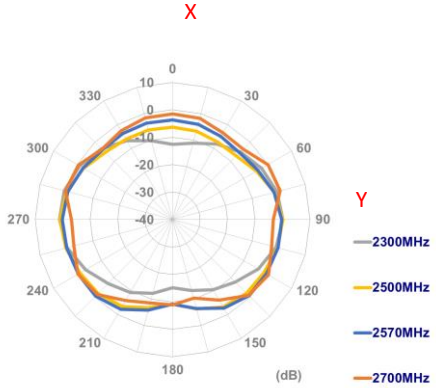
2570MHz



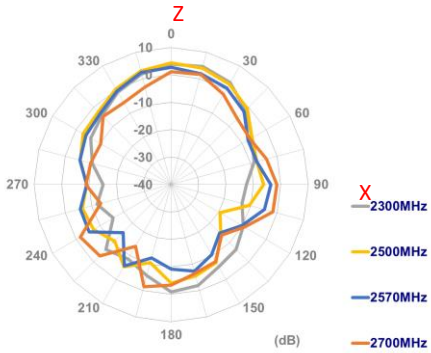
2700MHz



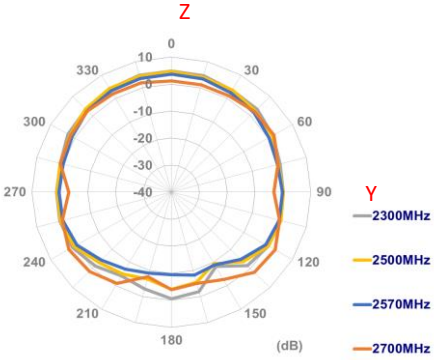
XY Plane



XZ Plane



YZ Plane

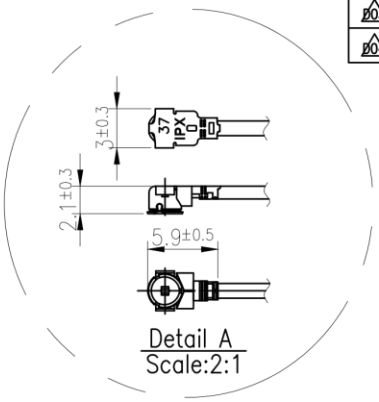


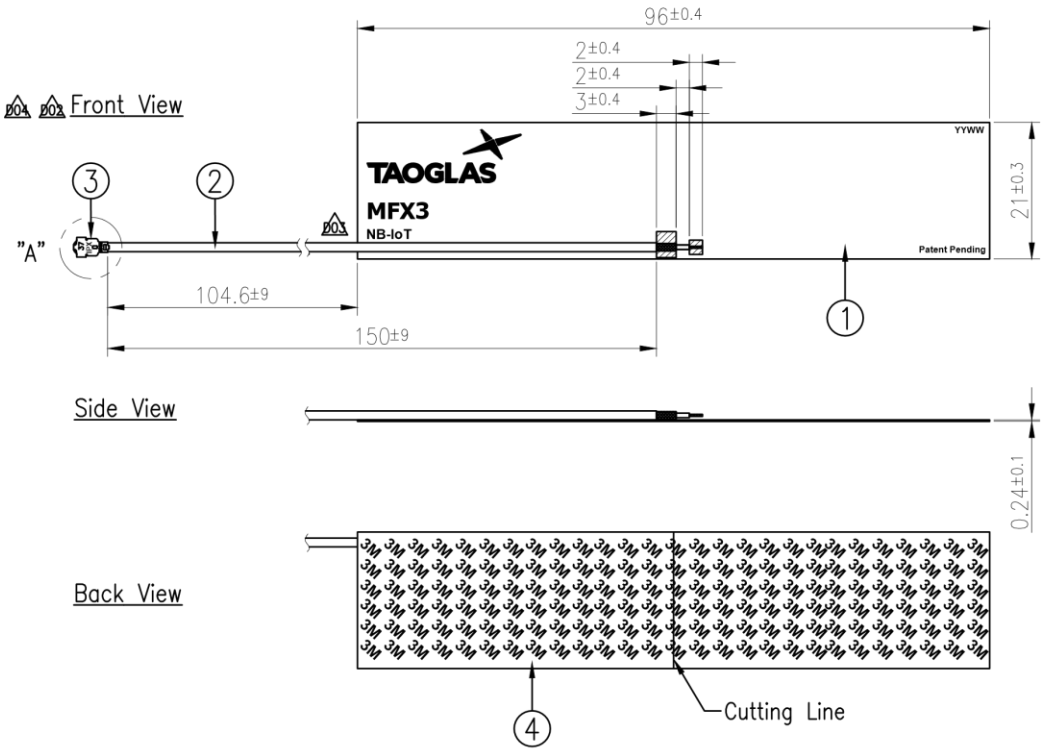
5. Mechanical Drawing (Units: mm)

ISO NO: EDW-18-8-6294

<Release>

REV	ZONE	DESCRIPTION	ENG	APPROVED	ISSUED DATE
D01	ALL	Initial Design	Haley	Paul	2017/05/12
D02	ALL	Amend FPCB Text Printing	Haley	Paul	2017/06/21
D03	ALL	Amend FPCB Text Printing	Bonnie	Haley	2018/05/07
D04	ALL	Replace the new LOGO <ECR-18-8-259>	Bonnie	Aaron	2019/07/11





NOTES:
1. No dregs or insufficient soldering. Solder thickness 0.3~1.7mm.
2. All material must be RoHS compliant.
3. Open/short, insertion loss QC required.
4. The connectors have a fixed orientation to each other.

	Name	P/N	Material	Finish	QTY
1	MFX3 FPCB	100117B000000A	Polymer 0.24t	Black	1
2	1.37 Coaxial Cable	300515C010000A	FEP	Black	1
3	IPEX MHFHT	204511G000013A	Brass	Au Plated	1
4	Double-Sided Adhesive	100117B000000A	3M 467	Brown Liner	1

UNLESS OTHERWISE SPECFIED TOLERANCES ON:
.X± 0.2
XX.± 0.5 .XX± 0.1
X.± 0.3 .XXX± 0.05

DATE: 2017/05/12 | MAT'L:
UNIT: mm | FINISH:
THIRD ANGLE PROJECTION | SCALE: 1/1

TAOGLAS. TW Design Centre

REV D04

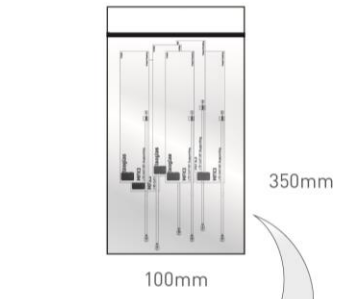
TITLE. :CAT M1 Wide Band Flex Antenna 698MHz to 3GHz with 150mm 1.37 IPEX MHFHT

PART NO. : MFX3.07.0150C

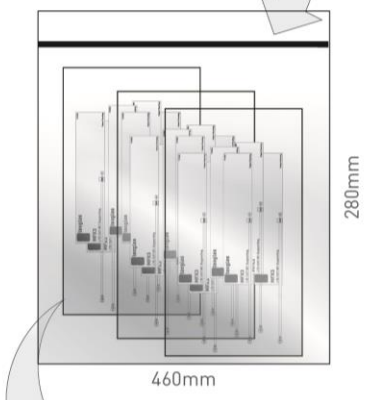
APPROVED BY:	CHECKED BY:	DRAWN BY:	CUSTOMERS SIGNATURE / DATE
Paul	Jack	Haley	

6. Packaging

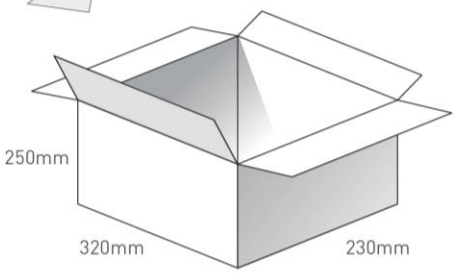
100 pcs MFX3 per PE bag
PE Bag Dimensions - 350 x 100mm
Weight - 150g



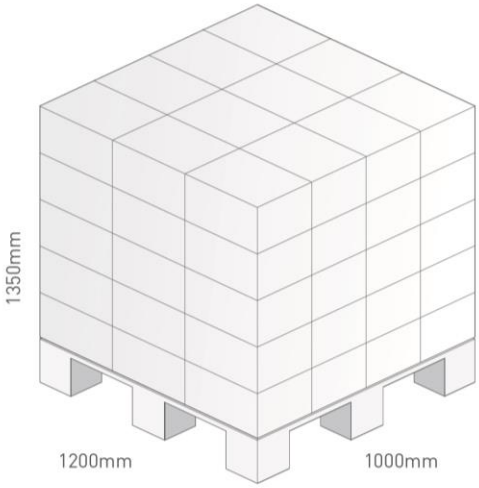
1000 pcs MFX3 per large PE bag
Large PE Bag Dimensions - 460 x 280mm
Weight - 1500g



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



Changelog for the datasheet

SPE-17-8-035 – MFX3.07.0150C

Revision: B	
Date:	2020-05-18
Changes:	Updated Drawing and Photo ECR-18-8-259
Changes Made by:	Jack Conroy

Previous Revisions

Revision: A (Original First Release)	
Date:	2017-08-10
Notes:	
Author:	Jack Conroy

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