TAOGLAS®

Datasheet

Meteor

Part No:
FW.91.TNC.M

Description:

Cellular 4G Flexible Whip Monopole Antenna

With IP67 Rated TNC Male connector

Features:

Covers most Worldwide 4G Cellular bands from 698-3500MHz

Covers CAT-M/NB-IoT Bands

Robust Inner Steel Core

TNC Male Connector

IP67 Rated Waterproof

Dimensions: 255mm Ø16mm

RoHS & Reach Compliant

Ireland & USA
ISO 9001:2015
Certified

Taiwan
ISO 9001:2015
Certified

IATF16949

1. Introduction

The FW.91 is a flexible cellular whip antenna with IP67 housing. It has a wide response and high peak gain. Ideal for outdoor environments which require high gain, on both lower and upper bands. Its unique characteristic is it has stable peak gain on across common cellular bands used worldwide.

Typical Applications include:

- Smart Metering
- Remote Pipeline Monitoring
- Transportation

The antenna radiates best attached to a metal plate but it can still perform without as evidenced by the table below. The FW.91 is IP67 waterproof rated and can be used in areas where water ingress may be a possible concern.

The FW.91 can be used with a Wall Mounting Bracket, and we have designed an L Shaped Bracket for use with the Whip Antenna, the part number for this option is WM.91. A.305111. Testing of the whip antenna on the bracket, in free-space, and on a reference ground-plane has been done to show the benefit of the L-bracket.

This antenna delivers wider coverage areas and more reliable connections for professional customers in the automotive, industrial industries. The whip is made up of a flexible inner steel core covered by TPU so extremely resistant to collisions and maintaining its original shape and RF performance.

The FW.91's connector can be customized subject to NRE, for further information please contact your regional Taoglas customer support team.

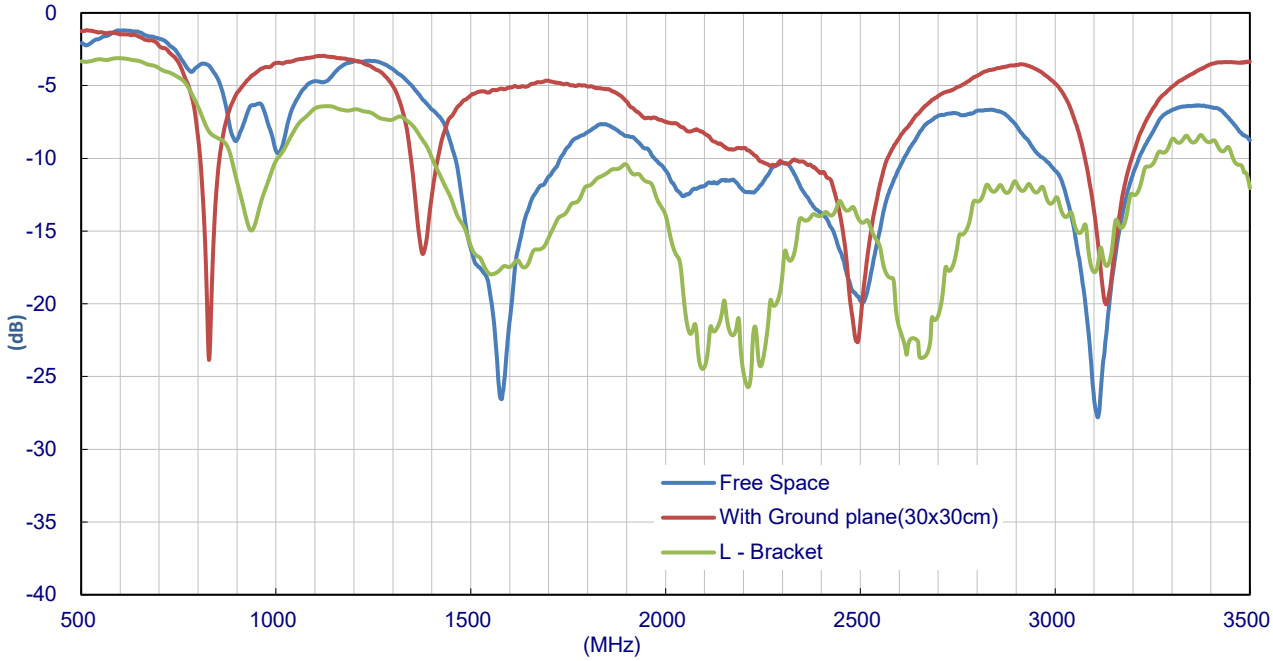
2. Specifications

Electrical							
Frequency (MHz)	698~896	880~960	1710~1880	1850~1990	1710~2170	2570~2690	3300~3500
Peak Gain (dBi)							
Free Space	-1.7	-0.3	2.5	3.4	2.8	3.5	2.1
With Ground plane(30x30cm)	-1.7	2	4.7	5.1	4.6	4.7	4.3
L - Bracket	0.7	1.8	1.8	2.2	2.2	1.8	0.5
Average Gain (dB)							
Free Space	-5.8	-4.6	-1.9	-1.5	-1.7	-2.1	-3.4
With Ground plane(30x30cm)	-5.2	-3	-1.7	-1.4	-1.7	-1.8	-1.4
L - Bracket	-4	-2.4	-2.7	-3	-2.8	-2.9	-5.7
Efficiency							
Free Space	26.4	35.1	65.4	70.8	67.3	61.6	46
With Ground plane(30x30cm)	30.8	50.3	67.3	71.8	67.9	65.5	67.2
L - Bracket	43.3	57.2	53.9	49.9	53.2	51.6	27.4
Impedance	50Ω						
Polarization	Linear						
Radiation Pattern	Omni						
Input Power	50 W						
Tested Power	10 W						
Mechanical							
Height	255mm						
Base Diameter	16mm						
Whip Diameter	4mm						
Casing	ABS						
Connector	TNC Male						
Ingress Rating	IP67						
Environmental							
Temperature Range	-40°C to 80°C						
Humidity	Non-condensing 65°C 95% RH						

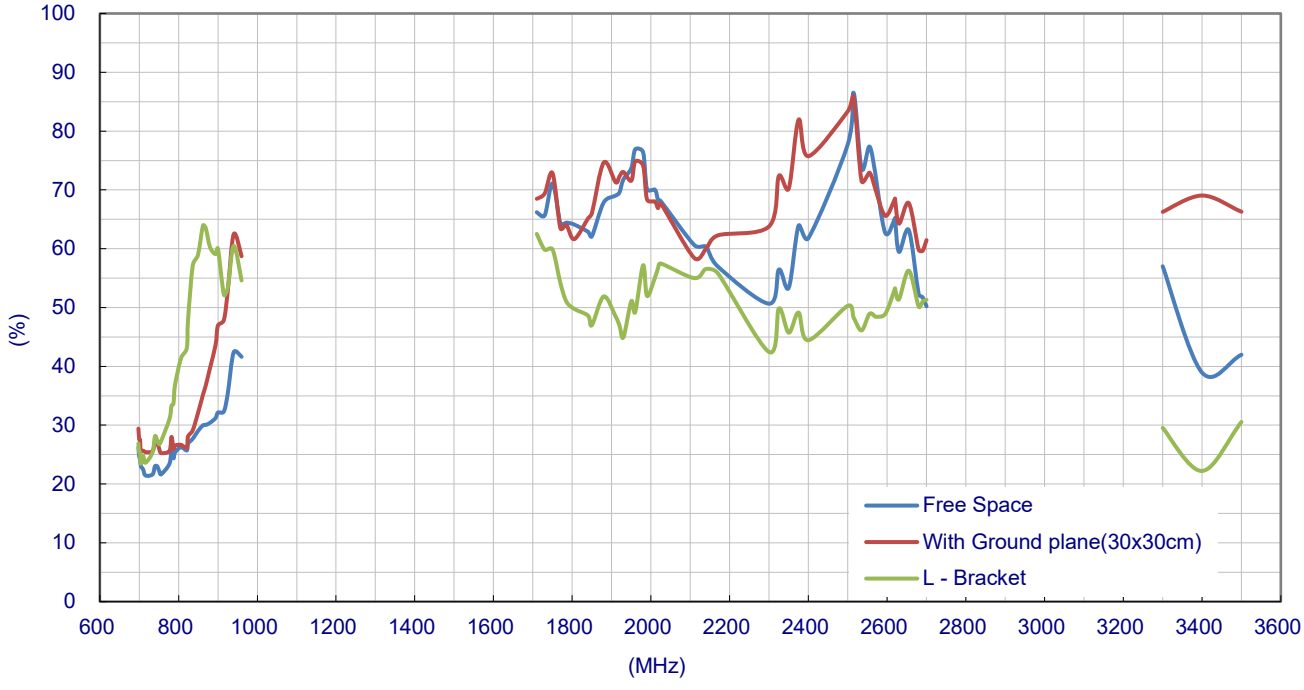
5G/4G Bands			
Band Number	5GNR / FR1 / LTE / LTE-Advanced / WCDMA / HSPA / HSPA+ / TD-SCDMA		
	Uplink	Downlink	Covered
1	UL: 1920 to 1980	DL: 2110 to 2170	✓
2	UL: 1850 to 1910	DL: 1930 to 1990	✓
3	UL: 1710 to 1785	DL: 1805 to 1880	✓
4	UL: 1710 to 1755	DL: 2110 to 2155	✓
5	UL: 824 to 849	DL: 869 to 894	✓
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		✗
77	3300 to 4200		✗
78	3300 to 3800		✓
79	4400 to 5000		✗

3. Antenna Characteristics

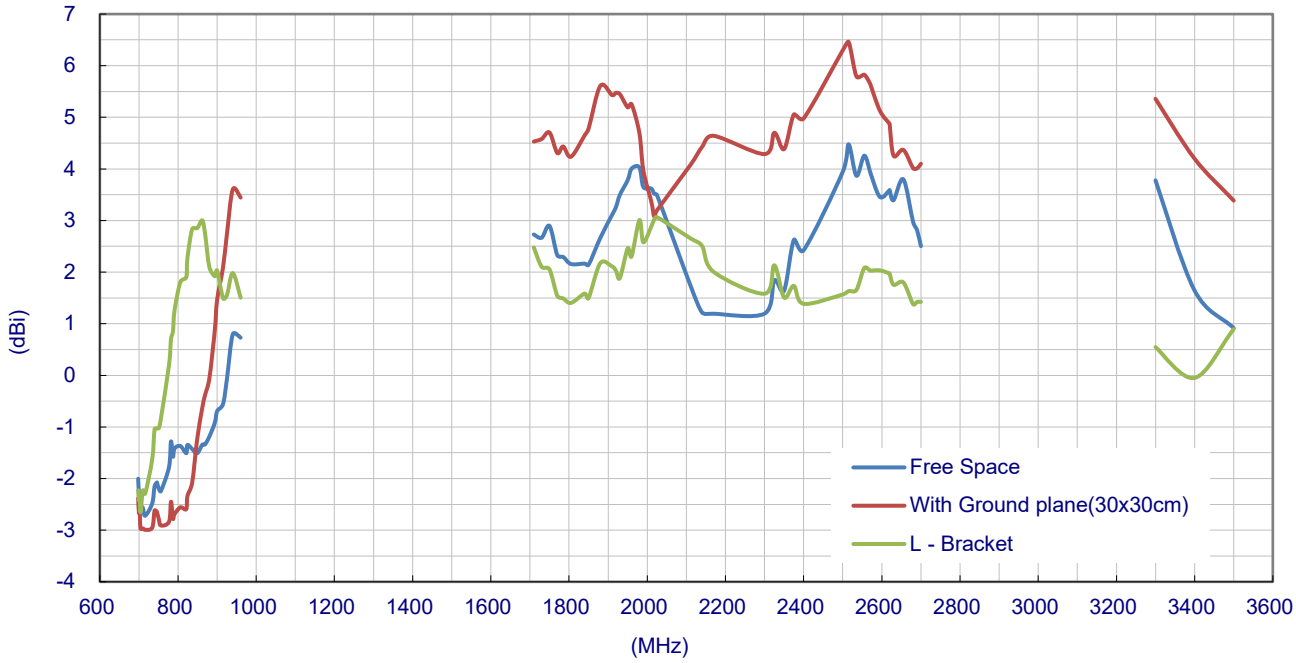
3.1 Return Loss



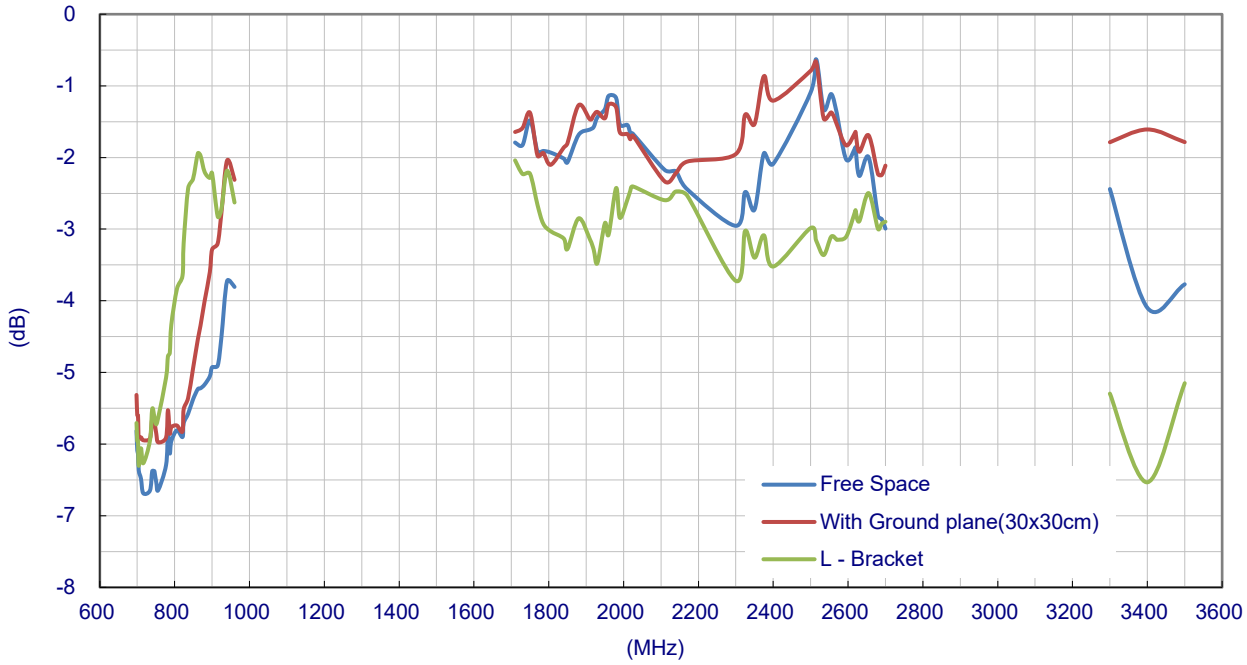
3.2 Efficiency



3.3 Peak Gain

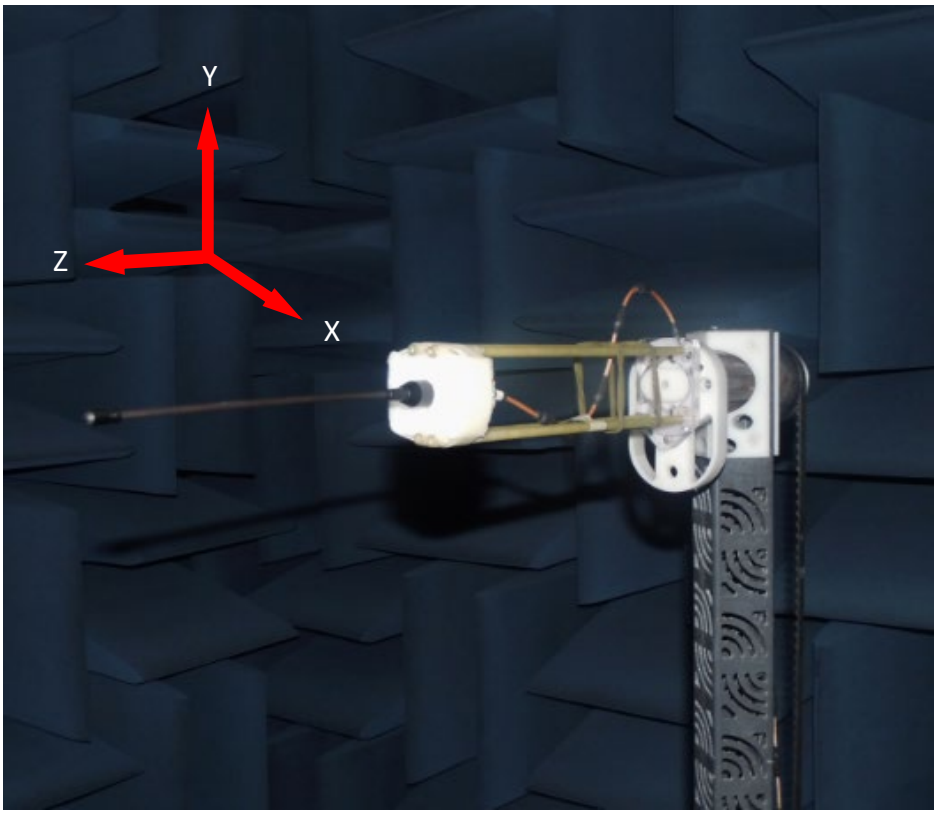


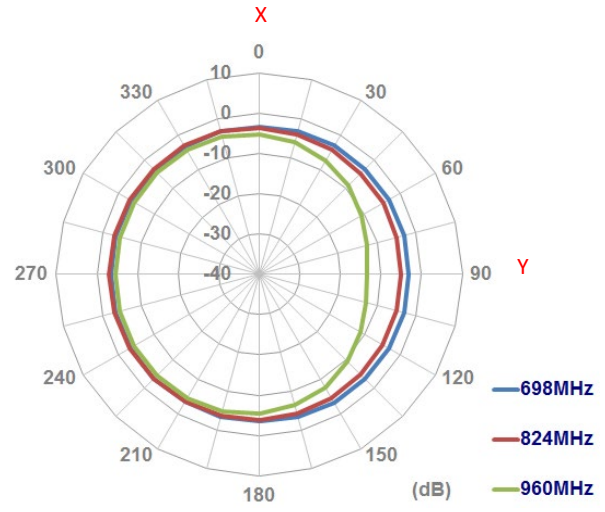
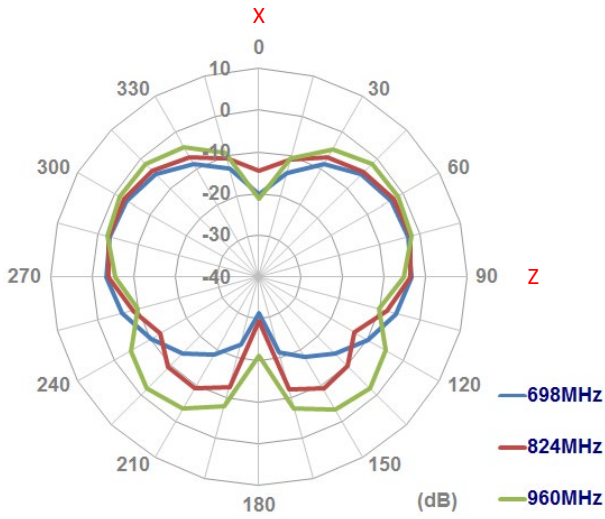
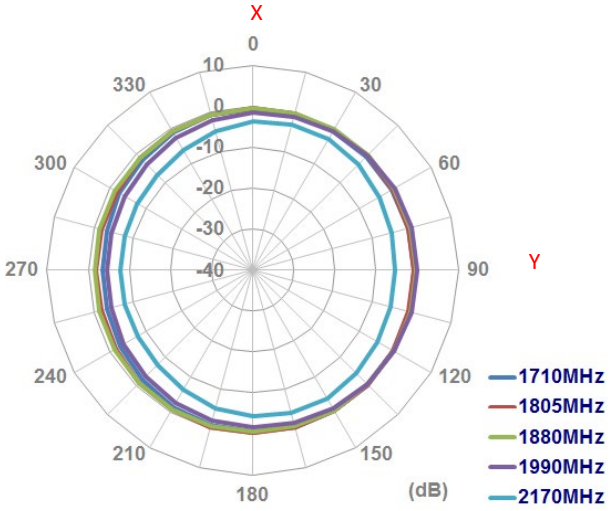
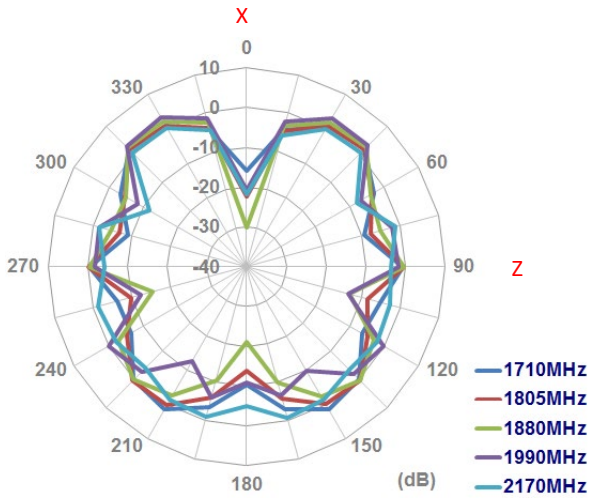
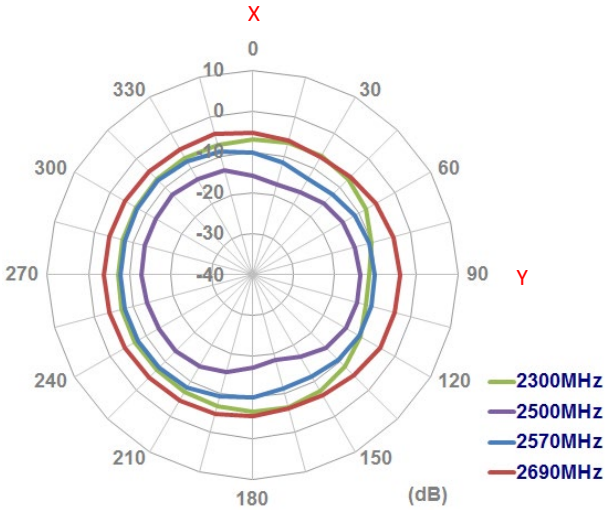
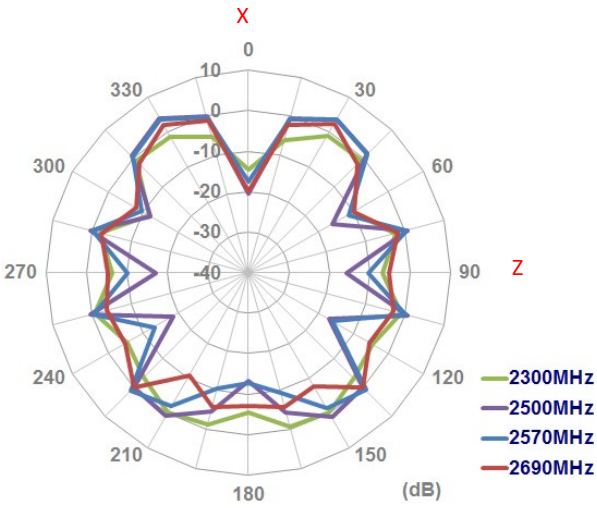
3.4 Average Gain



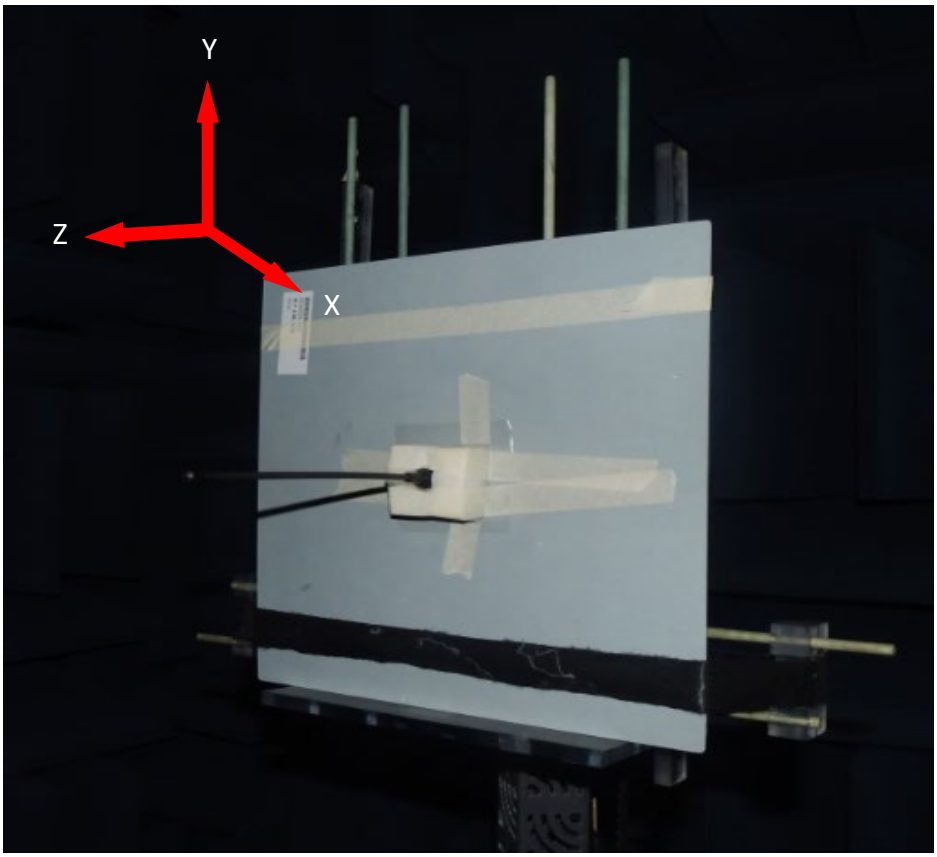
4. Radiation Patterns

4.1 Antenna Stand Alone (Free Space)

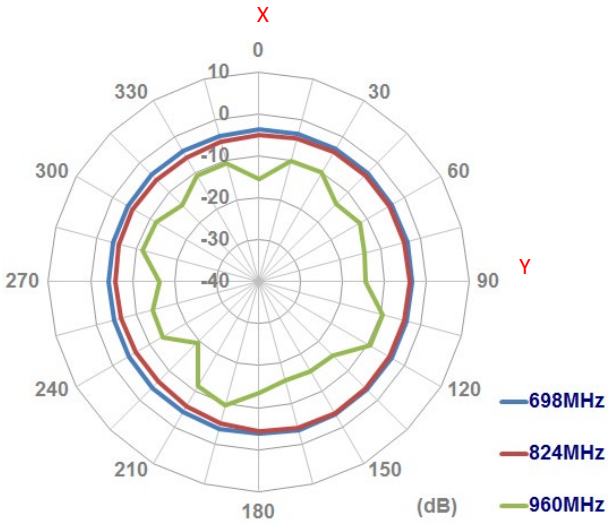


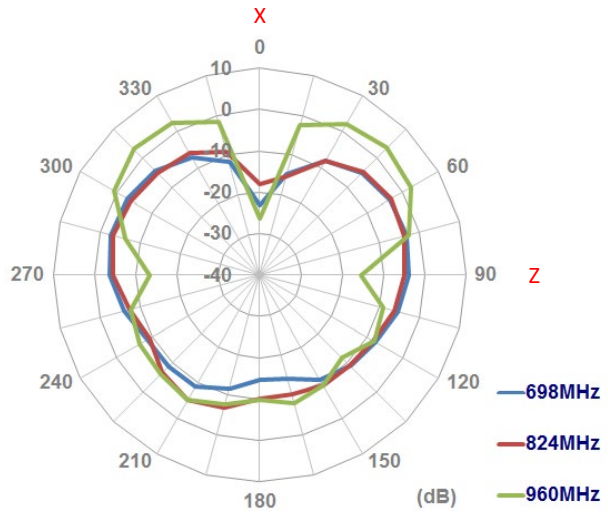
XY Plane	XZ Plane
	
	
	

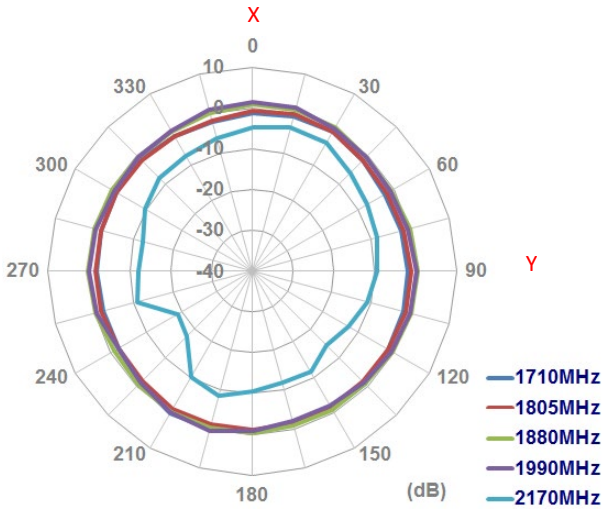
4.2 Antenna with Ground plane (30*30cm)

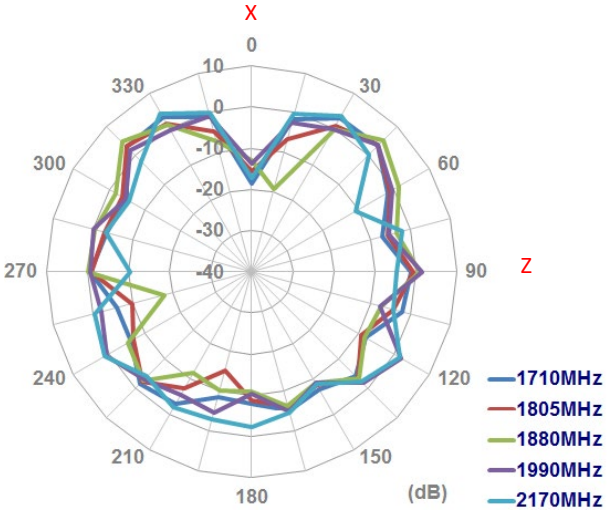


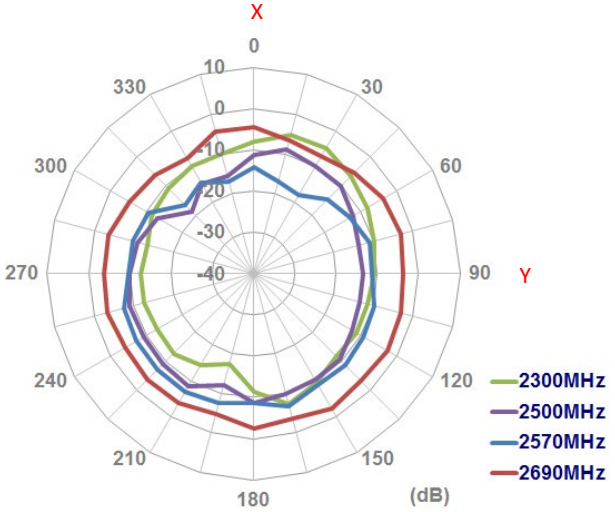
XY Plane	XZ Plane

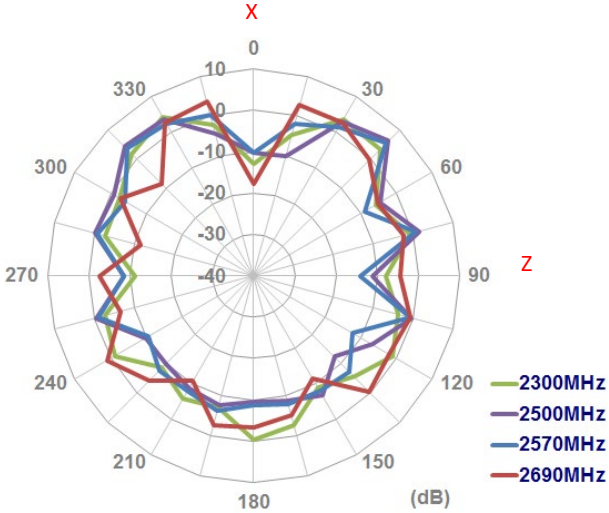




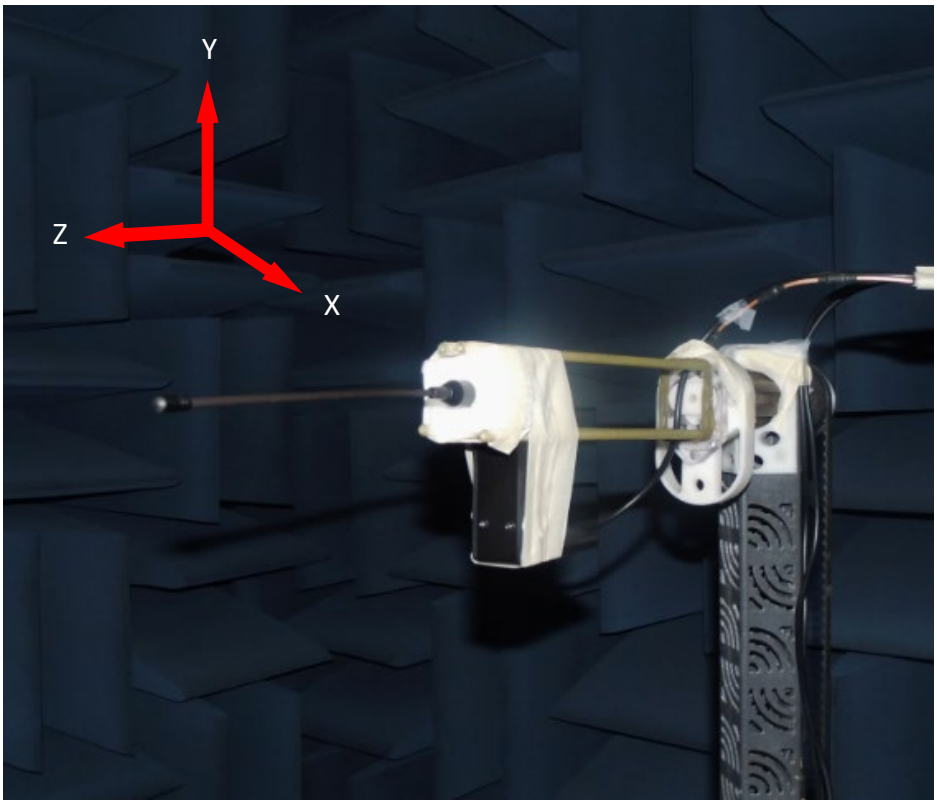


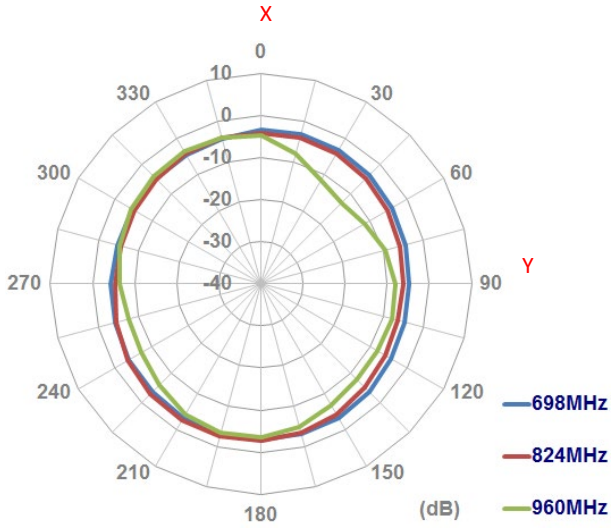
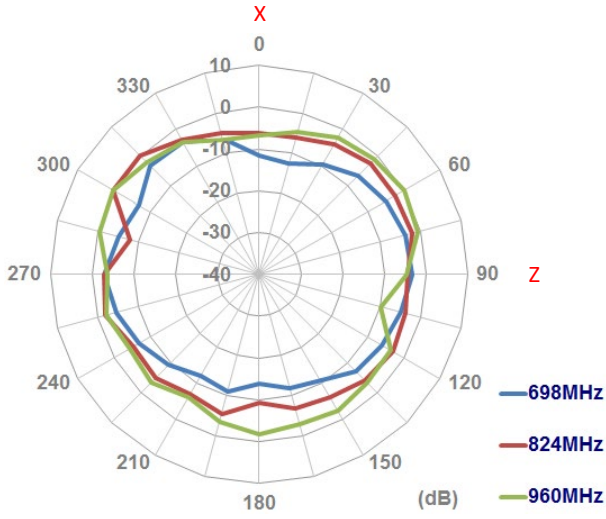
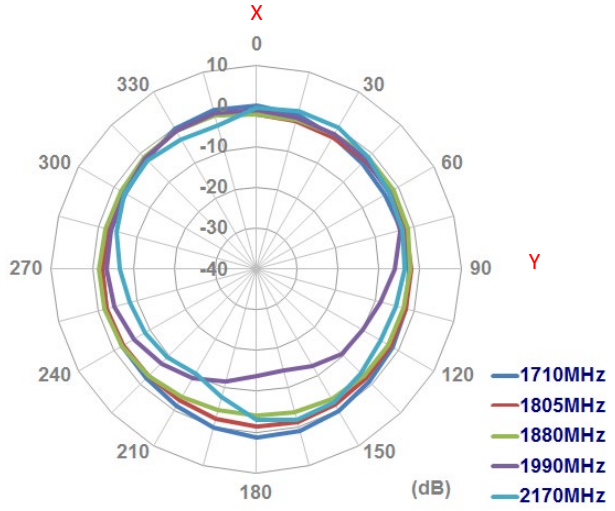
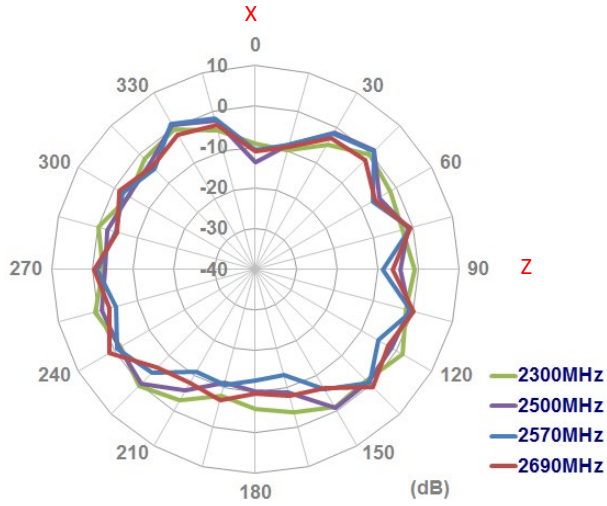
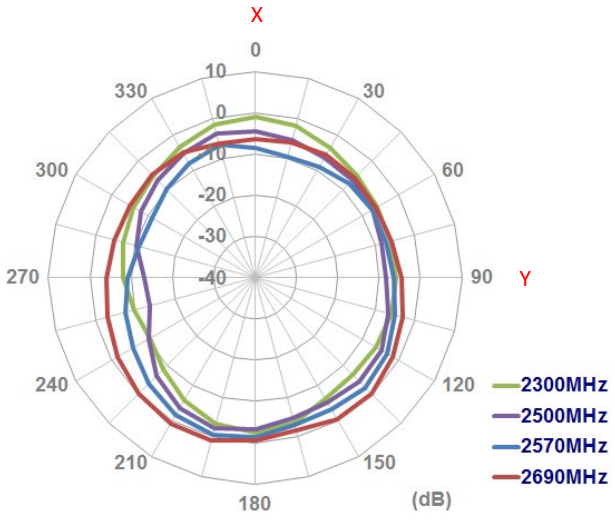
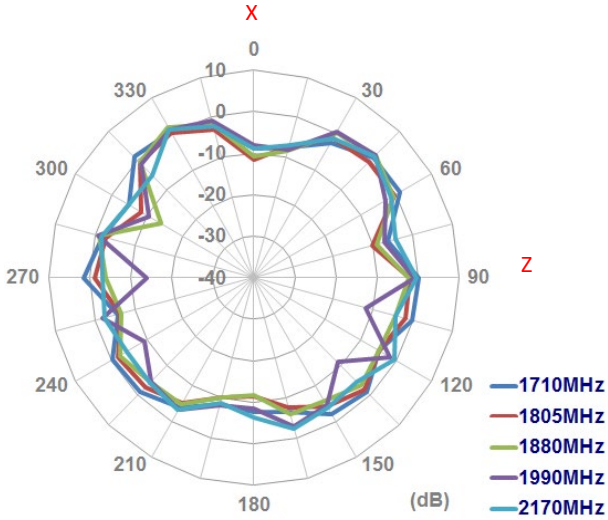






4.3 Antenna with L-Bracket



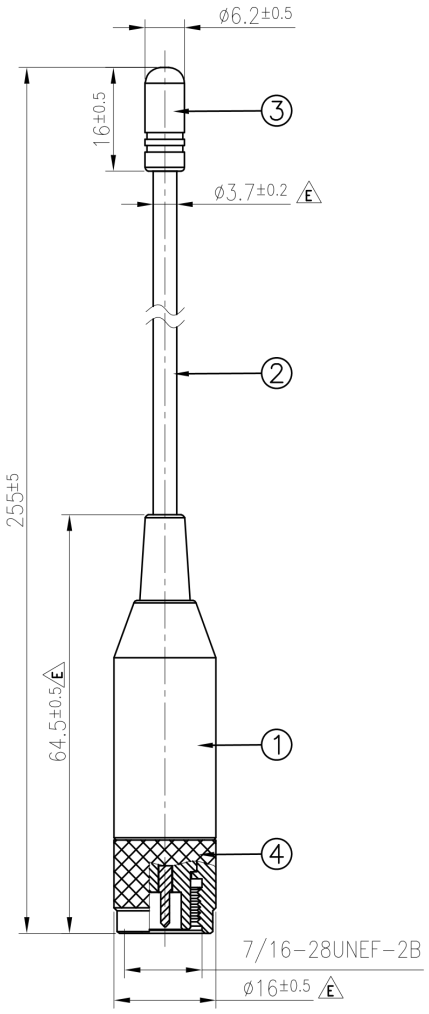
XY Plane	XZ Plane
	
	
	

5. Mechanical Drawing (Units: mm)

ISO NO: EDW-11-8-264

<Release>

REV	ZONE	DESCRIPTION	ENG	APPROVED	ISSUED DATE
A	ALL	Initial Design	Jason	Joanna	2011/06/08
B	B6.A2	Amend Part number By FW.90.TNC.M To FW.91.TNC.M Add Part number	Jason	Joanna	2012/01/11
C	F3	Amend Tolerances	Jason	Joanna	2012/03/21
D	B2	Add P/N(ECR-15-8-312)	Kim	Wayne	2015/12/07
E	ALL	Amend Dimensions & Tolerances Amend Cap Material (ECR-17-8-088)	Haley	Paul	2017/07/24



B D

	Name	P/N	Material	Finish	QTY
1	Housing	000111K060002A	ABS	Black	1
2	Flexible Whip	001111K000002A	Steel+PE Jacket	Black	1
E 3	Cap	000711C000002A	POM	Black	1
4	Outer Body TNC (M)	000611C000002A	Brass	Black	1

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

DATE: 2011/06/08 | MAT'L:
UNIT: mm | FINISH:
THIRD ANGLE PROJECTION | SCALE: 1/1

APPROVED BY: Joanna | CHECKED BY: Joanna | DRAWN BY: Jason | CUSTOMERS SIGNATURE / DATE

taoglas antenna solutions TW Design Centre

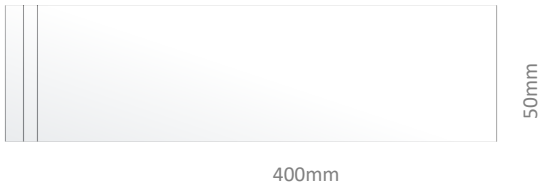
REV E

TITLE. : FW.91 Penta-band Cellular Flexible Whip Antenna TNC(M)

PART NO. : FW.91.TNC.M B

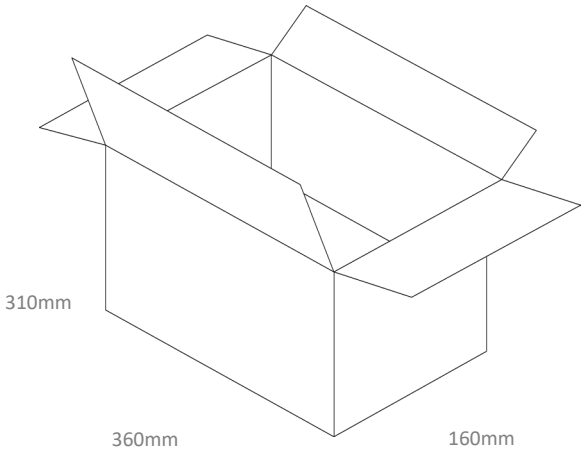
6. Packaging

1pc FW.91.TNC.M per PE Bag
Bag Dimension: 200*100mm
Weight: 50g



50pcs FW.91.TNC.M per Large PE Bag
Bag Dimensions: 520*360mm
Weight: 2.5Kg

200pcs FW.91.TNC.M per Carton
Dimensions: 360*310*160mm
Weight: 10.2Kg



Changelog for the datasheet

SPE-11-8-143 - FW.91.TNC.M

Revision: J (Current Version)	
Date:	2025-03-24
Changes:	Updated max operation temperature to 80°
Changes Made by:	Conor McGrath

Previous Revisions

Revision: I	
Date:	2020-04-17
Changes:	Updated waterproof to IP67
Changes Made by:	Jack Conroy

Revision: D	
Date:	2014-07-31
Changes:	
Changes Made by:	Andy Mahoney

Revision: H	
Date:	2020-03-24
Changes:	Updated to reflect new data
Changes Made by:	Jack Conroy

Revision: C	
Date:	2013-06-13
Changes:	
Changes Made by:	Aine Doyle

Revision: G	
Date:	2019-08-16
Changes:	Updated to new format
Changes Made by:	Dan Cantwell

Revision: B	
Date:	2012-06-02
Changes:	
Changes Made by:	Aine Doyle

Revision: F	
Date:	2018-10-19
Changes:	
Changes Made by:	David Connolly

Revision: A (Original First Release)	
Date:	2011-11-22
Notes:	
Author:	SS

Revision: E	
Date:	2017-08-04
Changes:	Updated as per PCN-16-8-079-B
Changes Made by:	Andy Mahoney

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