



TAOGLAS®



Datasheet

Stream MA233 3in1 Adhesive Mount Antenna

Part No:
MA233.LBC.001

Description:

Adhesive Mount 3 in 1 Antenna with GNSS, LTE, Wi-Fi
Suitable for Mounting on Metal Surfaces

Features:

1*LTE, 1*Wi-Fi & 1*Active GNSS Antenna
GNSS Covers GPS L1, GLONASS L1 & Galileo E1
LTE: 3M TGC-200 Cable and SMA(M) Connector
Wi-Fi: 3M TGC-200 Cable and RP-SMA(M) Connector
GNSS: 3M RG-174 Cable and SMA(M) Connector
IP67 Rated Enclosure
Dimensions: 203*69*13 mm
RoHS & REACH Compliant

1. Introduction	3
2. Specifications	4
3. Active Antenna Characteristics	9
4. Antenna Characteristics	15
5. Radiation Patterns	20
6. Mechanical Drawing	26
7. Packaging	27
8. Application Note	28
Changelog	32

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1. Introduction



The Stream 3in1 MA233 is an adhesive mount antenna specifically designed for use on metal surfaces. With GPS-GLONASS-Galileo, LTE and Dual Band Wi-Fi, the Stream is a low profile, heavy-duty, fully IP67 rated external M2M antenna for use by RF professionals in telematics, transportation and remote monitoring applications.

The Stream 3in1 is unique in the market as it combines the highest possible efficiency and peak gain for GPS-GLONASS-GALILEO, Wi-Fi dual-band and all cellular bands in 4G/3G/2G in a low profile compact format. It is mounted via high quality, first tier automotive approved, 3M adhesive foam. The patent pending design incorporates a custom Taoglas 35mm GPS-GLONASS-GALILEO patch antenna on an extended integral ground-plane. A front-end SAW filter dramatically reduces radiated spurious emissions.

The extended ground-plane used with an innovative internal LTE PIFA also enables wide frequency bandwidth to cover LTE with fallback to 3G/2G in order to deliver the highest performance possible at 3 meters cable lengths. High antenna efficiencies are absolutely critical in today's systems in able to achieve targeted data-speeds and coverage. A powerful Wi-Fi dual-band antenna covering 2.4 & 5.8GHz gives maximum gain and coverage for common applications.

Contact your regional Taoglas Customer Support team for customized options or further information.

2. Specifications

GNSS Frequency Band							
GPS/QZSS	L1 1575.42MHz	L2 1227.6MHz	L5 1176.45MHz	L6 1278.75MHz			
	■	□	□	□			
GLONASS	L5R 1176.45MHz	L3PT 1201.5MHz	L2PT 1246MHz	L1CR 1575.42MHz	L1PT 1602MHz		
	□	□	□	■	■		
Galileo	E5a 1176.45MHz	E5b 1201.5MHz	E4 1215MHz	E3 1256MHz	E6 1278.75MHz	E2 1561MHz	L1 1575.42MHz
	□	□	□	□	□	□	■
Beidou	B1 1561MHz	B2 1207.14MHz	B3 1268.52MHz				
	□	□	□				
Compass	E5B(B2)/ E6(B3) 1268.56MHz	E2(B1) 1561MHz					
	□	□					
SBAS	Omnistar 1542.5MHz	WAAS/EGN OS 1575.42MHz					
	□	■					

GNSS ELECTRICAL		
Frequency (MHz)	1575.42	1602
VSWR (max.)	2.0:1	2.0:1
Passive Antenna Efficiency (%) (Without cable loss)	62	67
Passive Antenna Gain at Zenith (dBi) (Without cable loss)	-1.98	-1.67
Polarization	RHCP	
Impedance	50Ω	
Cable	RG-174, 3meter standard, fully customizable	
Connector	SMA(M) standard, fully customizable	

LNA and Filter Electrical Properties		
Frequency (MHz)	1575.42	1602
VSWR (max.)	2.0:1	2.0:1
Gain@1.8V (Typ.)	20 dB typ.	20 dB typ.
Gain@3.0V (Typ.)	28 dB typ.	28 dB typ.
Gain@5.5V (Typ.)	29 dB typ.	28.5 dB typ.
Noise@1.8V (Typ.)	3.1 dB typ.	3.6 dB typ.
Noise@3.0V (Typ.)	3.1 dB typ.	3.6 dB typ.
Noise@5.5V (Typ.)	3.1dB typ.	3.6 dB typ.
Power consumption@1.8V (Typ.)	4.16 mA	
Power consumption@3.0V (Typ.)	10.47 mA	
Power consumption@5.5V (Typ.)	11.9 mA	
Total Specification (Through Antenna, SAW Filter and LNA)		
Frequency (MHz)	1575.42	1602
Gain@3V (dBi)	31 ± 3	31 ± 3
Output Impedance	50 Ω	

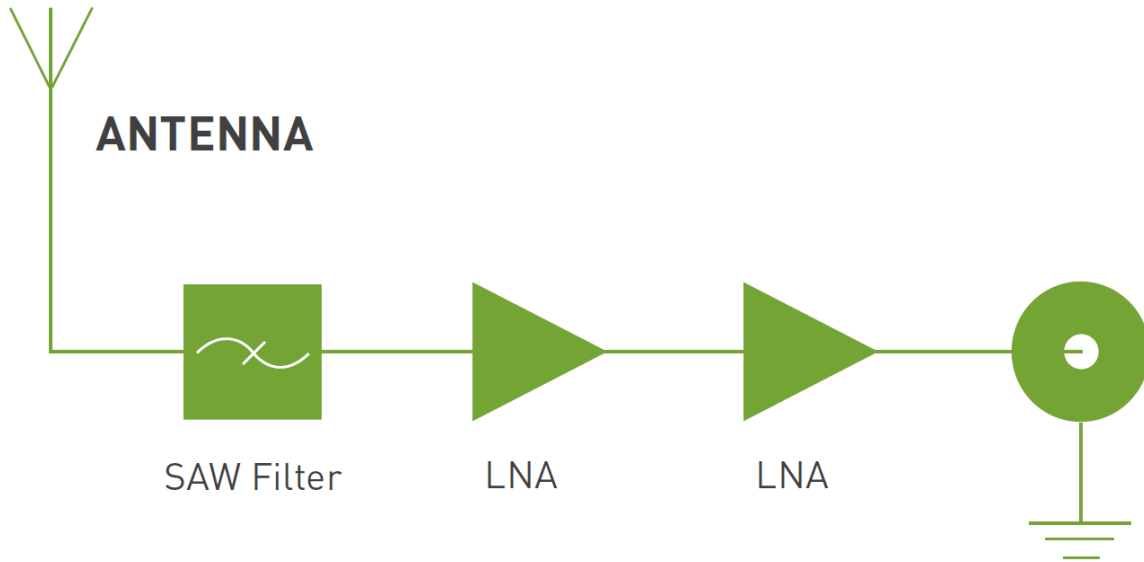
LTE Antenna						
Frequency (MHz)	LTE700	GSM850/900	DCS	PCS	UMTS1	LTE2600
	698~806	824~960	1710~1880	1850~1990	1920~2170	2490~2690
Efficiency (%)						
0.3m	73.34	80.74	78.24	76.81	73.82	76.11
1m	69.57	77.14	71.36	70.06	68.04	69.39
2m	64.93	70.36	63.60	61.98	59.62	60.31
3m	60.10	65.42	56.54	54.53	52.71	52.52
5m	55.63	60.84	50.27	47.99	46.61	45.74
Average Gain (dB)						
0.3m	-1.35	-0.93	-1.07	-1.15	-1.32	-1.19
1m	-1.58	-1.13	-1.47	-1.55	-1.67	-1.59
2m	-1.88	-1.53	-1.97	-2.08	-2.25	-2.20
3m	-2.21	-1.84	-2.48	-2.63	-2.78	-2.80
5m	-2.55	-2.16	-2.99	-3.19	-3.32	-3.40
Peak Gain (dBi)						
0.3m	3.65	3.26	4.03	4.12	3.80	5.05
1m	3.45	3.06	3.63	3.72	3.40	4.65
2m	3.15	2.66	3.13	3.22	2.90	3.95
3m	2.75	2.36	2.55	2.62	2.30	3.35
5m	2.35	2.06	2.05	2.03	1.70	2.75
Impedance	50Ω					
Polarization	Linear					
Radiation Pattern	Directional					

Wi-Fi Antenna		
Frequency (MHz)	2400~2500	5150~5850
Efficiency (%)		
0.3m	71.16	62.11
1m	64.89	53.55
2m	56.52	43.41
3m	49.23	35.18
5m	42.87	28.51
Average Gain (dB)		
0.3m	-1.48	-2.07
1m	-1.88	-2.71
2m	-2.48	-3.62
3m	-3.08	-4.54
5m	-3.68	-5.45
Peak Gain (dBi)		
0.3m	6.00	5.01
1m	5.60	4.41
2m	5.00	3.51
3m	4.40	2.61
5m	3.80	1.71
Impedance	50Ω	
Polarization	Linear	
Radiation Pattern	Directional	

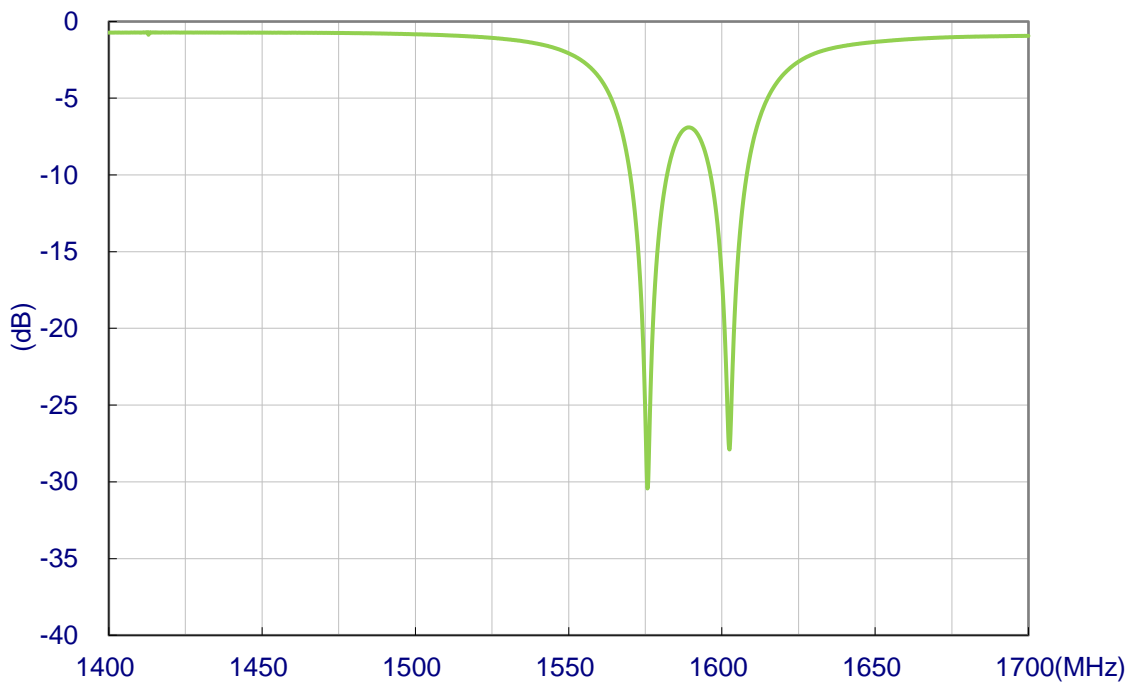
Mechanical	
Height	11.6 ±1.8mm
Planner Dimension	202*68 ±1.8mm
Casing	ABS+PC
Cable	LTE: 3000mm TGC-200 Wi-Fi: 3000mm TGC-200 GNSS: 3000mm RG174
Connector	LTE: SMA(M) Wi-Fi: RP-SMA(M) GNSS: SMA(M)
Weight	180g
Environmental	
Protection	IP67
Temperature Range	-40°C to 85°C
Humidity	Non-condensing 65°C 95% RH

3. Active Antenna Characteristics

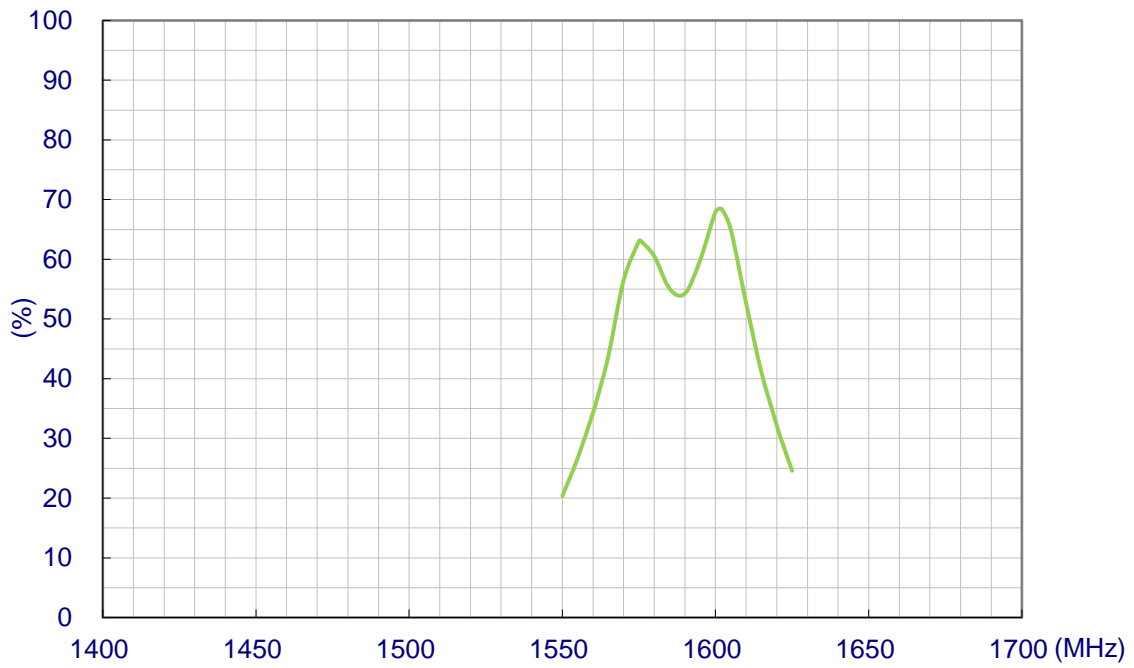
3.1 Block Diagram (Active antenna)



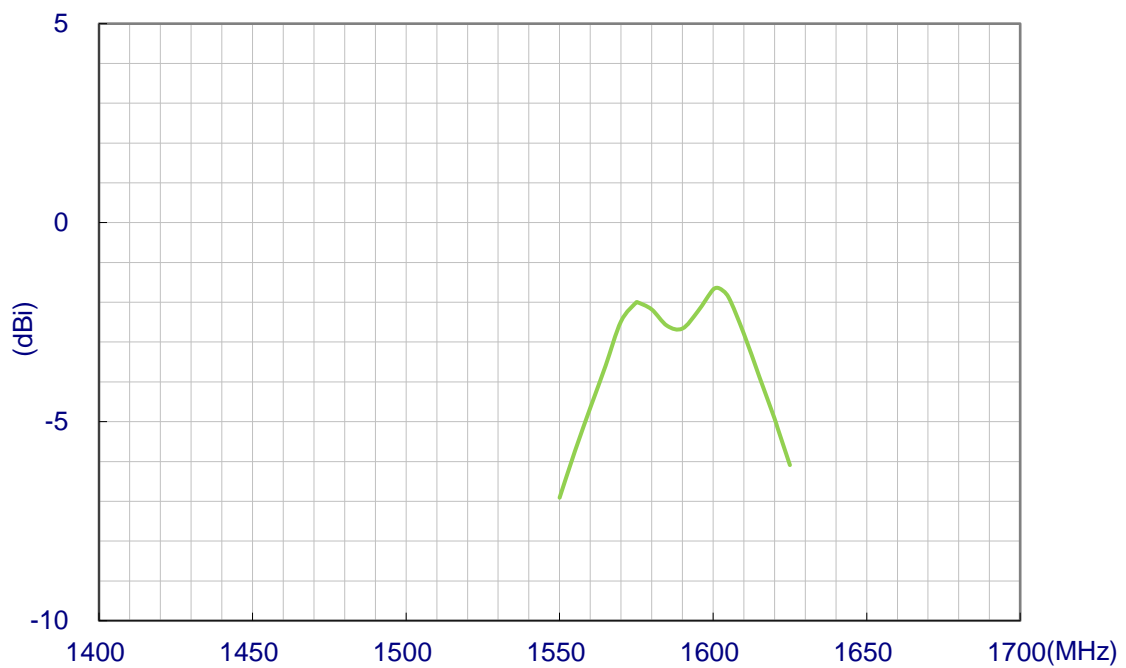
3.2 Passive Antenna Return Loss



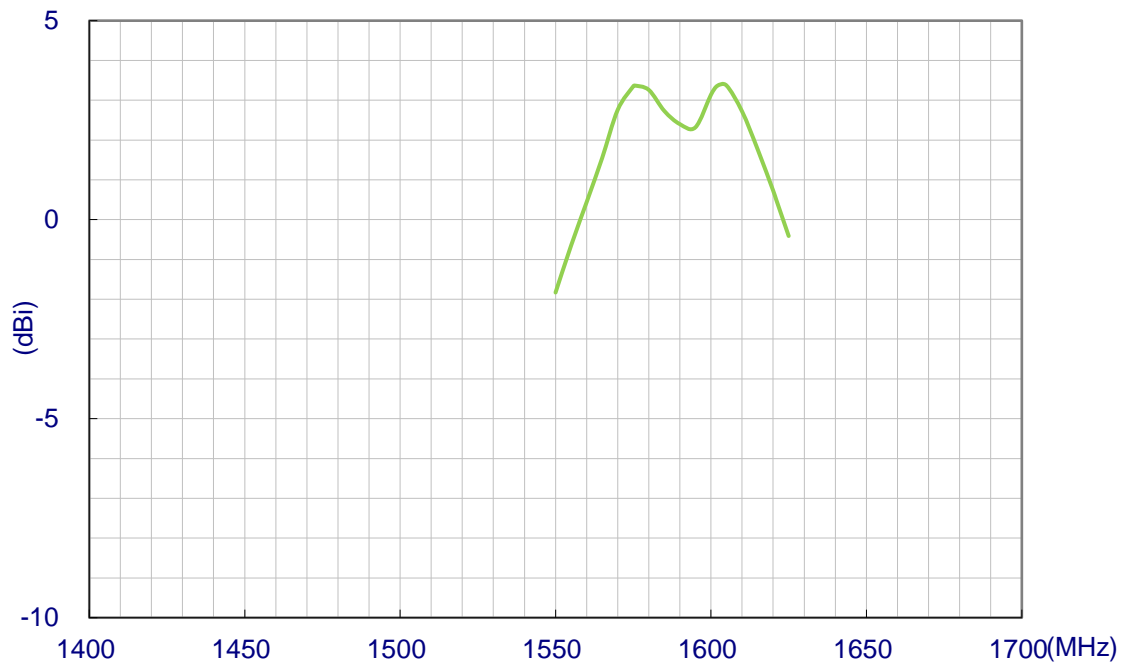
3.3 Passive Antenna Efficiency



3.4 Passive Antenna Average Gain

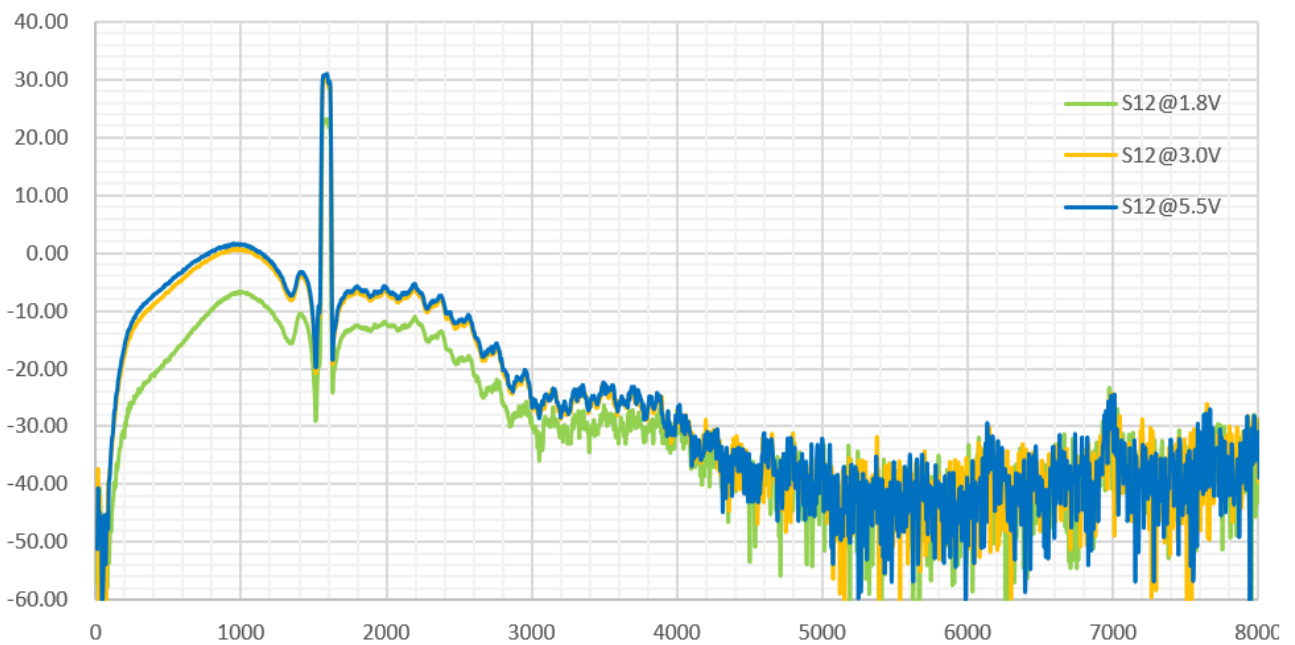


3.5 Passive Antenna Peak Gain

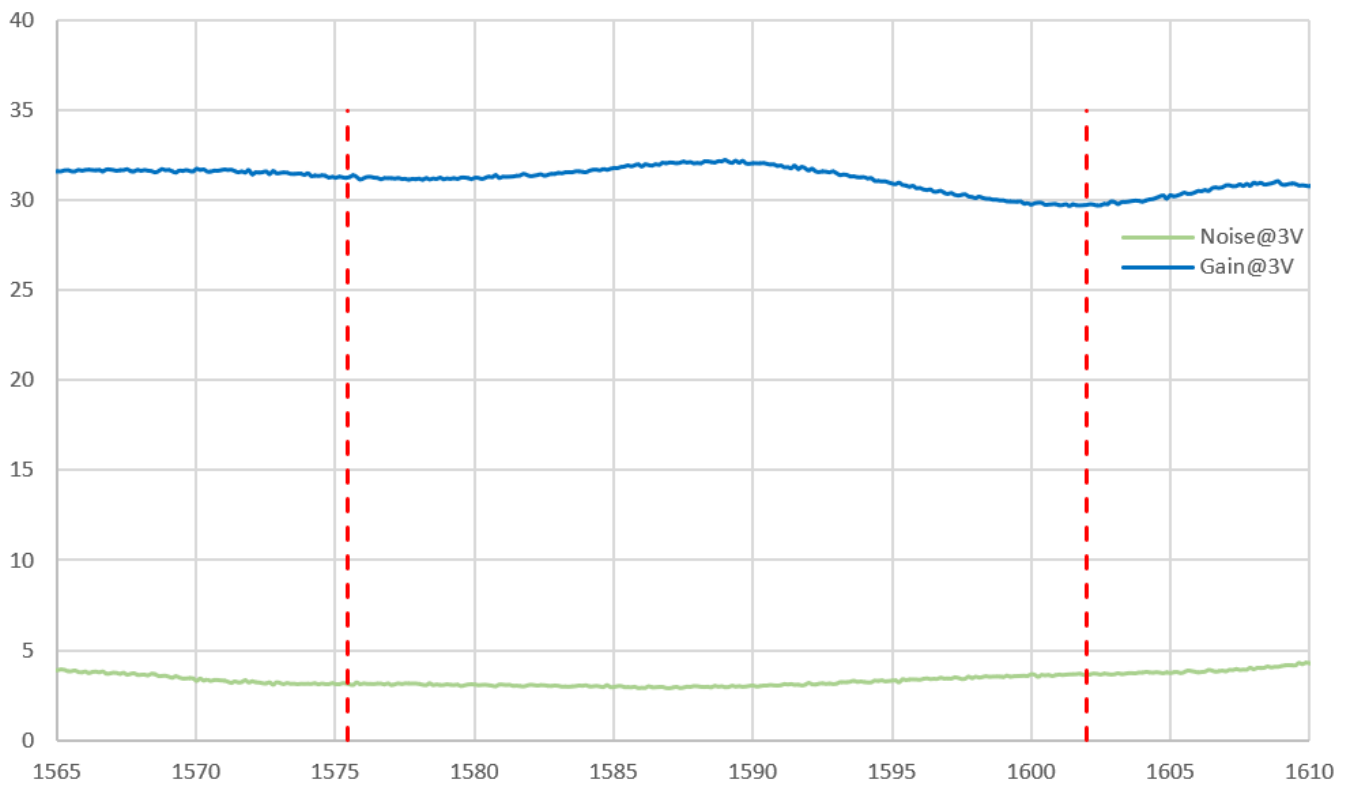


3.6 Active measurements

LNA Gain

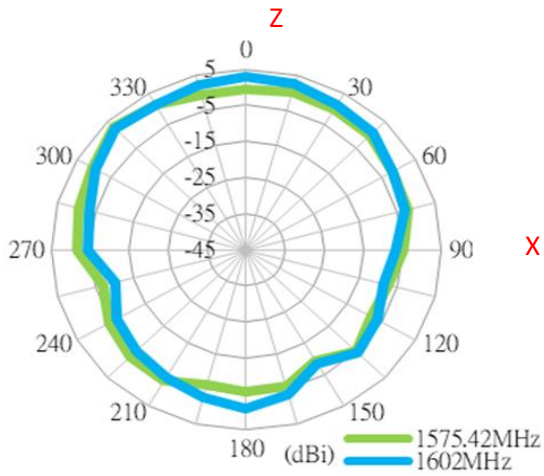


Noise Figure @ 3.0V

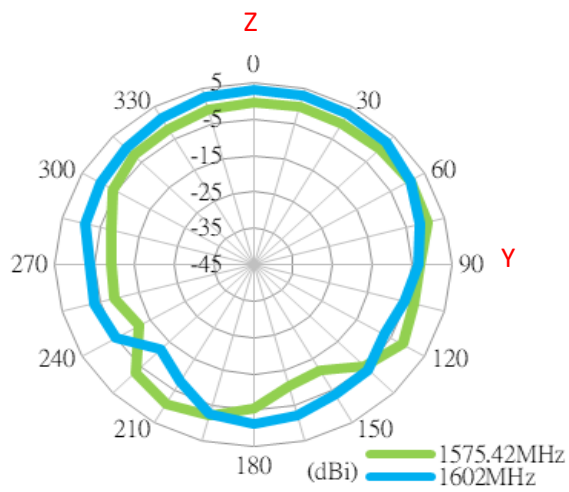


3.7 Passive Antenna 2D Radiation Patterns

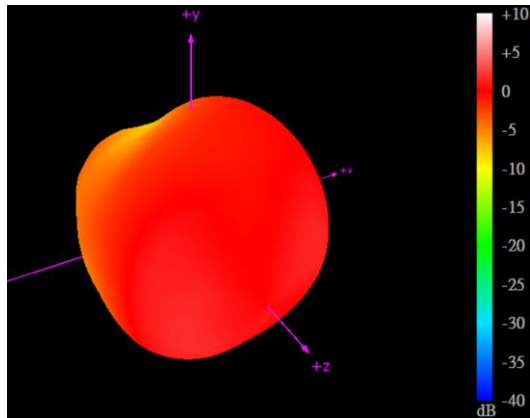
XZ Plane



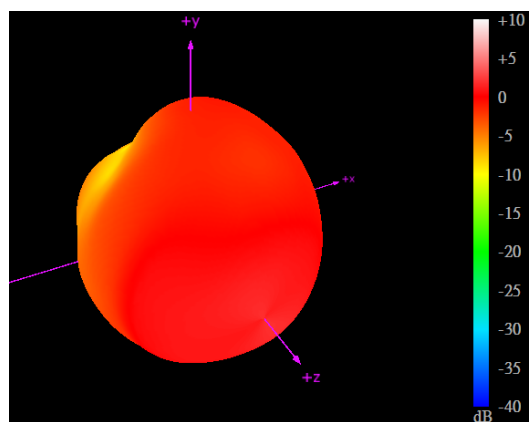
YZ Plane



3.8 Passive Antenna 3D Radiation patterns



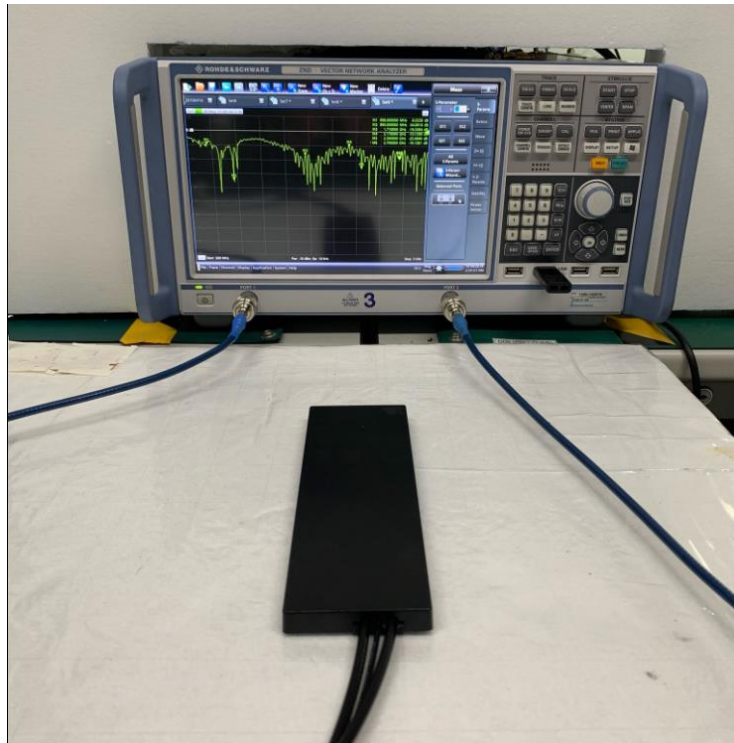
1575.42MHz



1602MHz

4. Antenna Characteristics

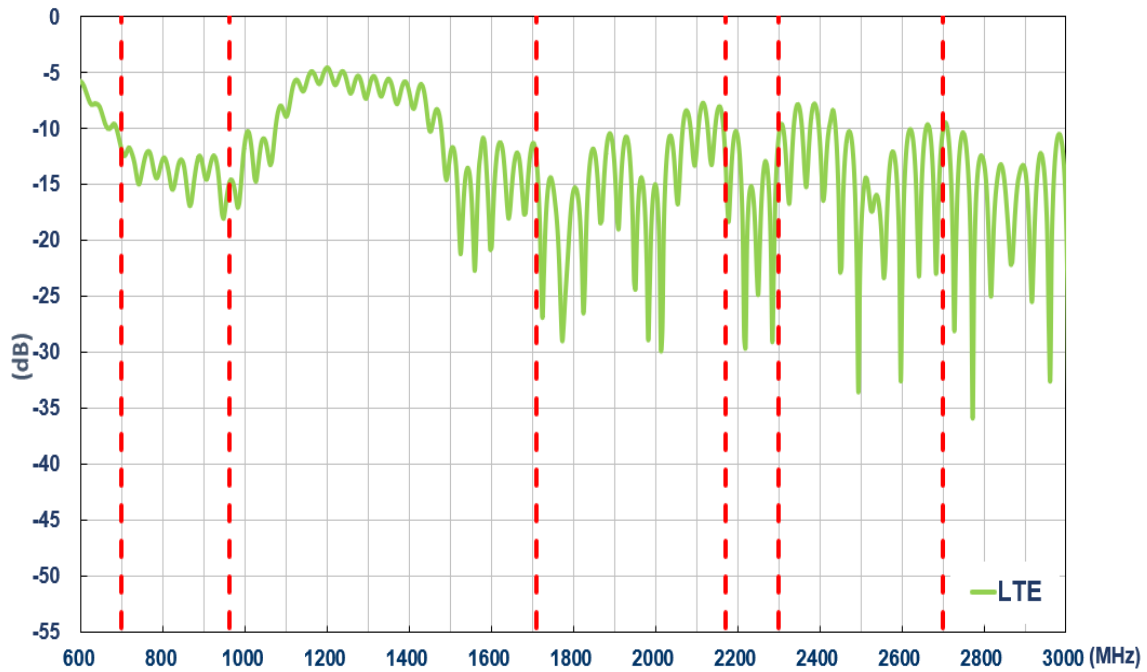
4.1 Test Setup



Free Space

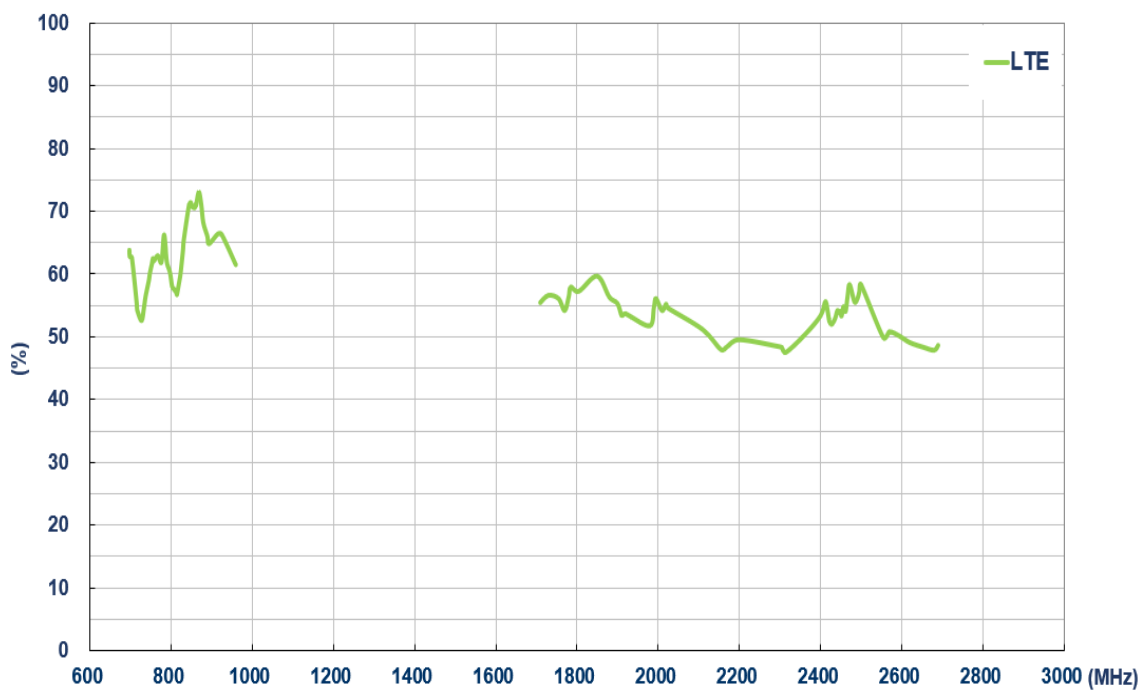
4.2 Return Loss

LTE



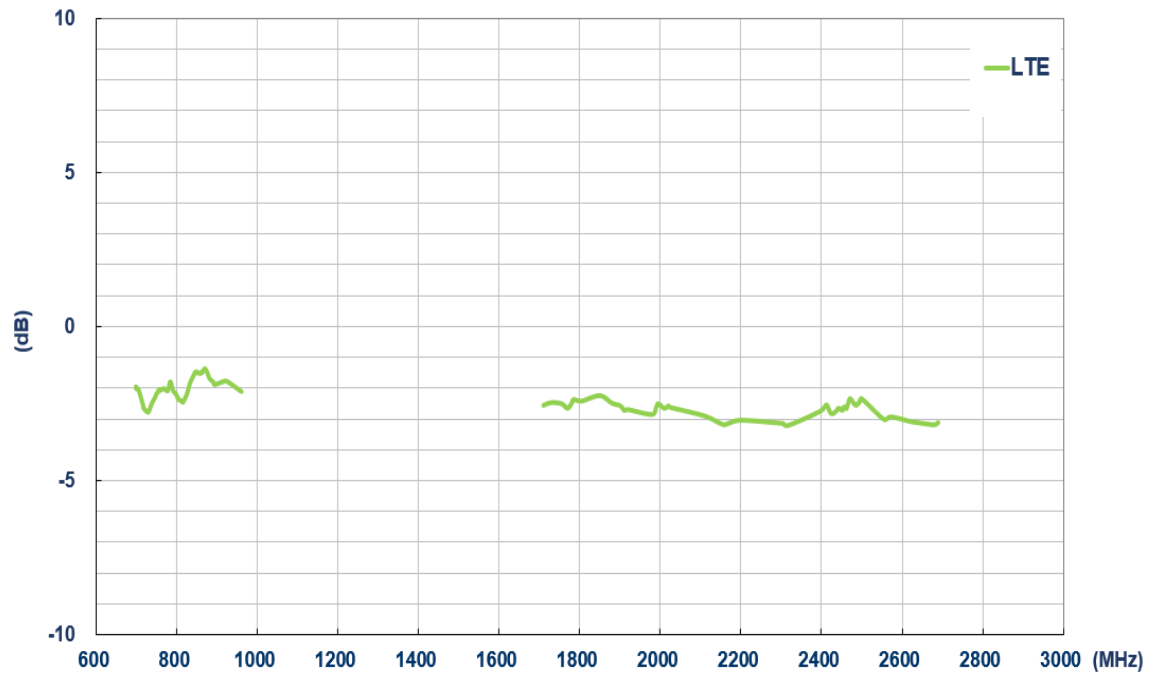
4.3 Efficiency

LTE



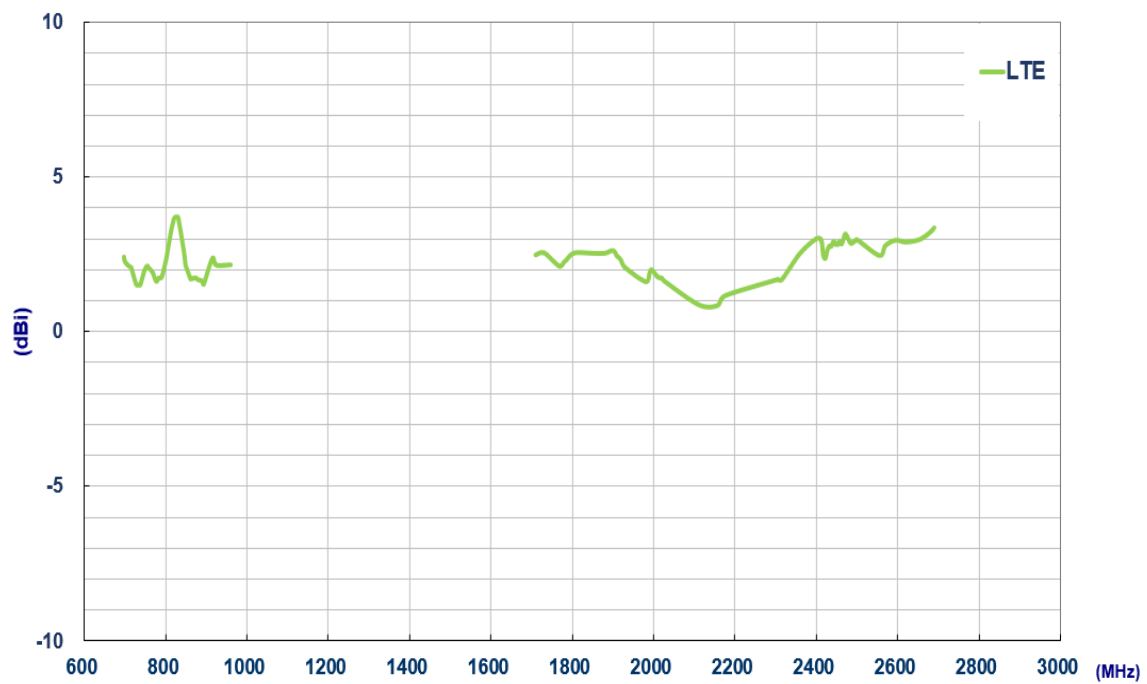
4.4 Average gain

LTE



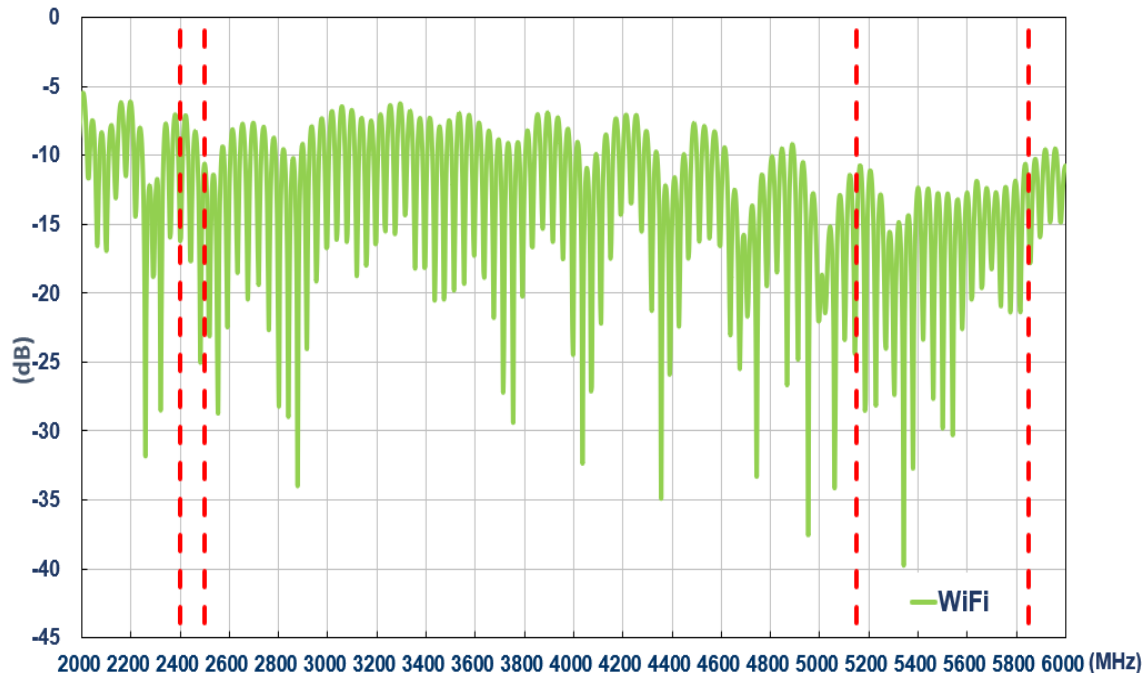
4.5 Peak gain

LTE



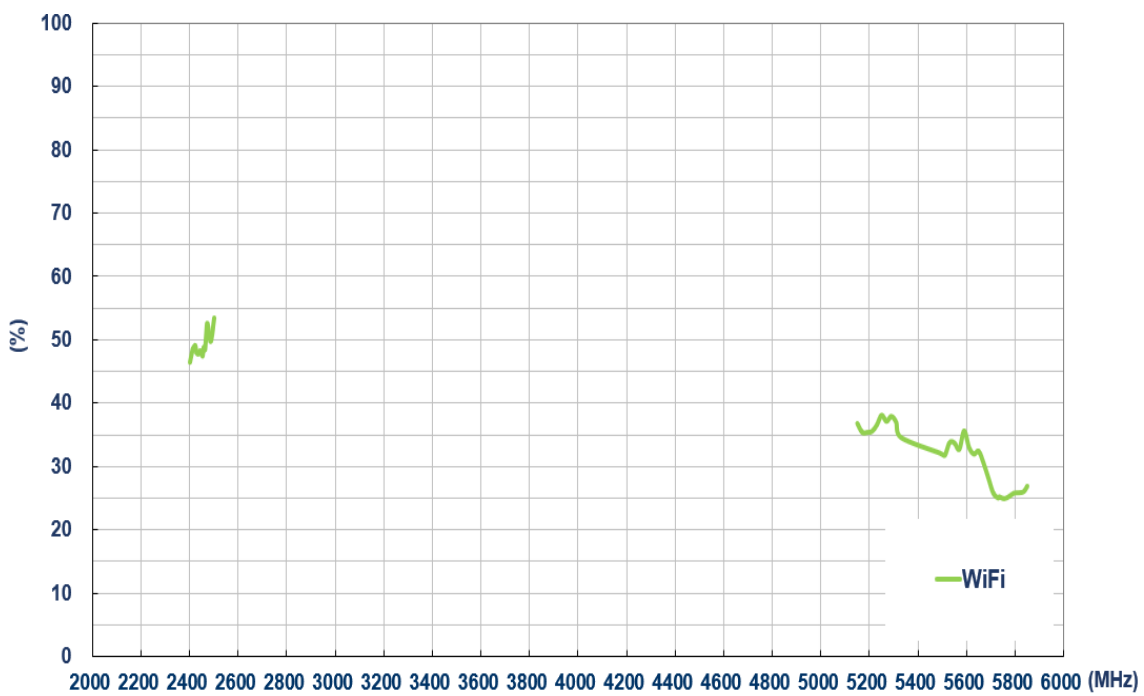
4.6 Return Loss

Wi-Fi



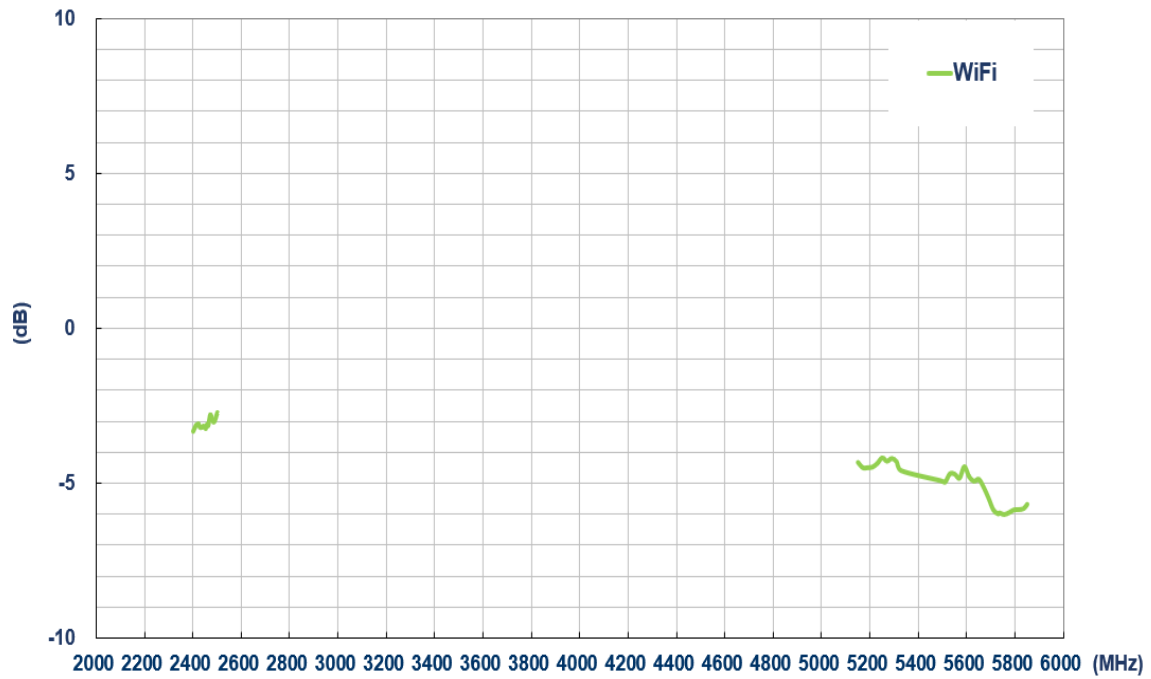
4.7 Efficiency

Wi-Fi



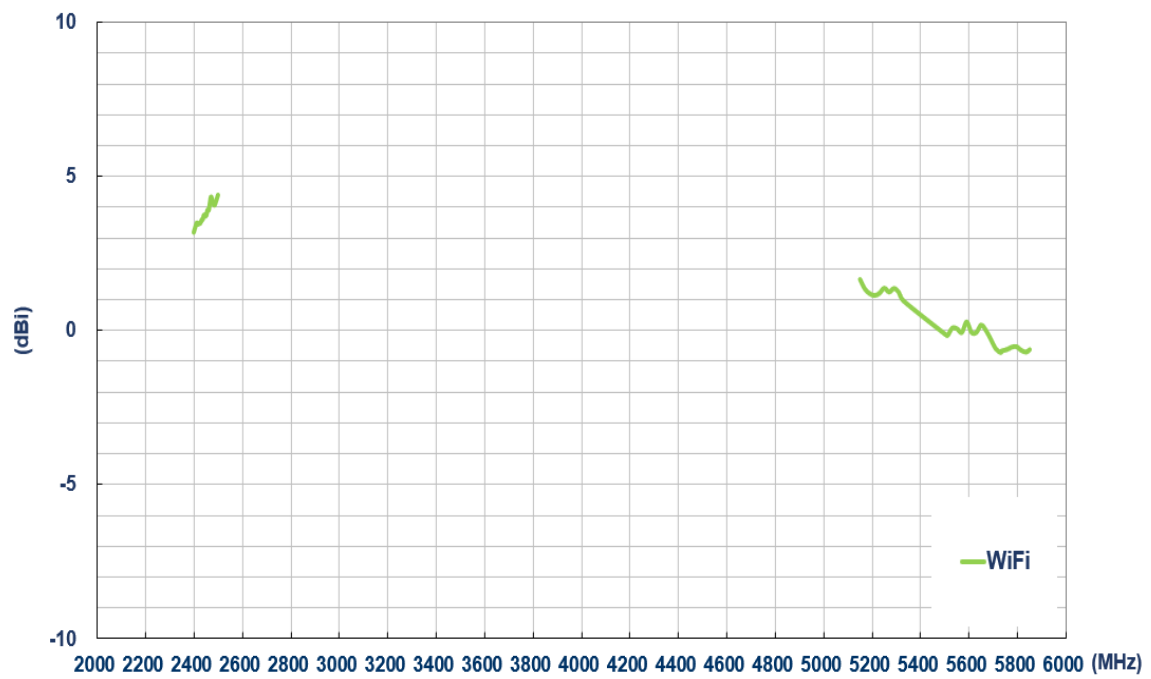
4.8 Average gain

Wi-Fi



4.9 Peak gain

Wi-Fi



5. Radiation Patterns

5.1 Test Setup

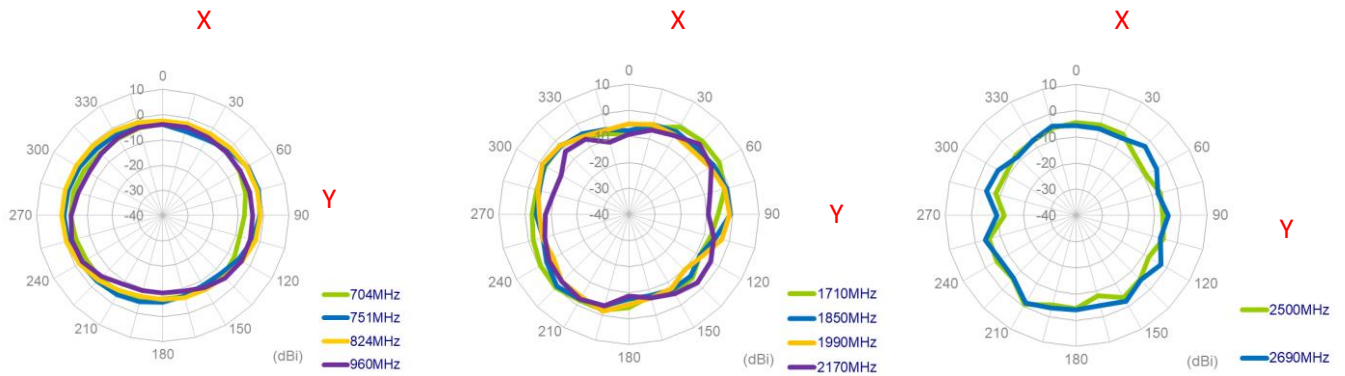


Free space

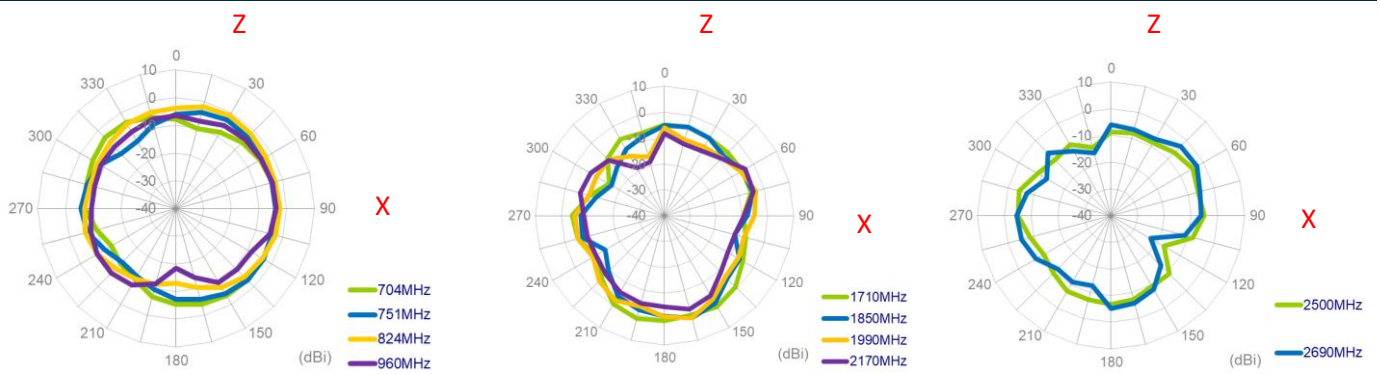
5.2 2D Radiation Patterns

LTE

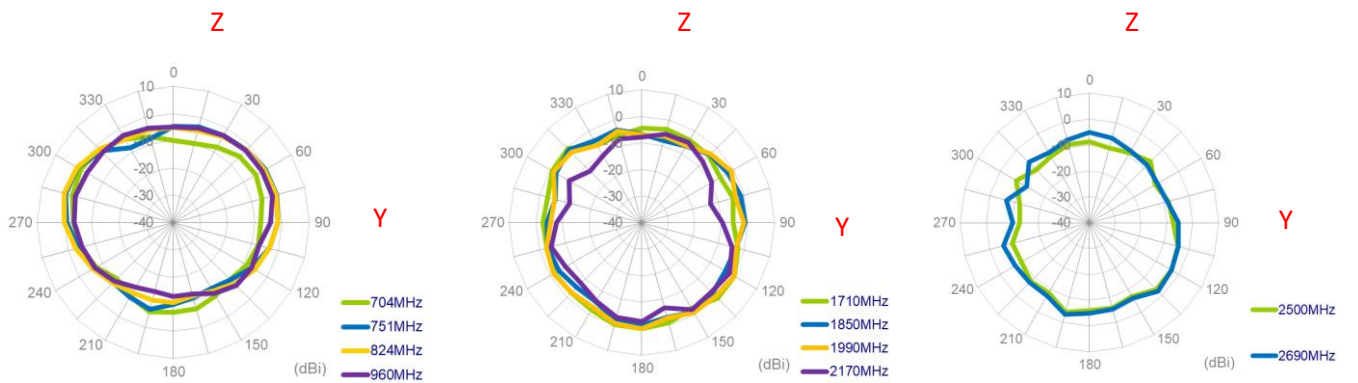
XY Plane



XZ Plane

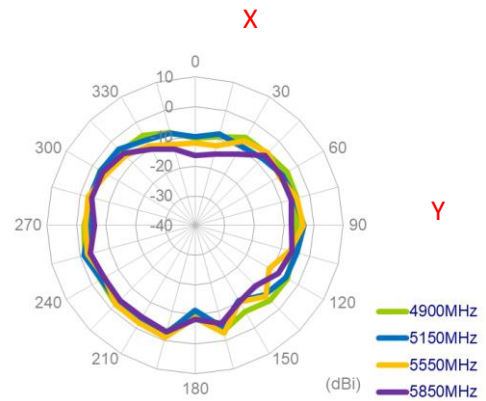
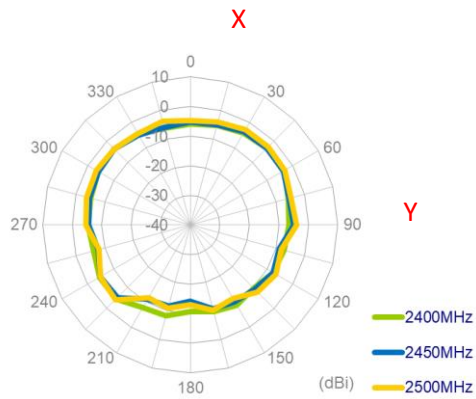


YZ Plane

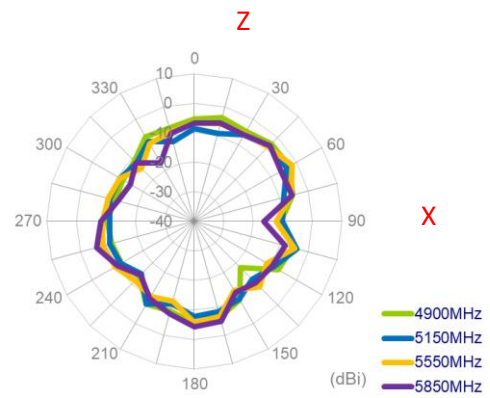
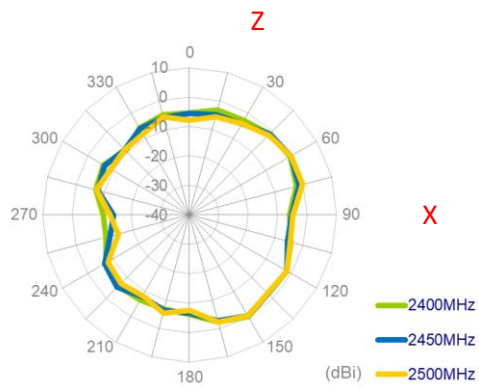


Wi-Fi

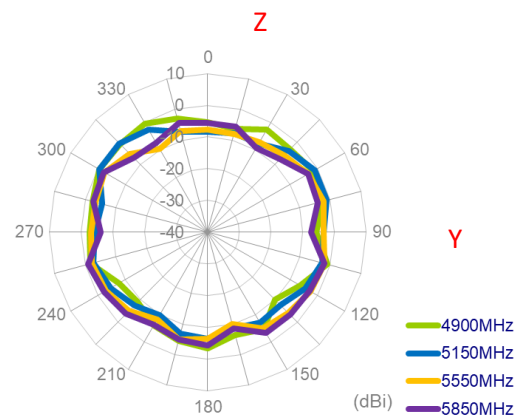
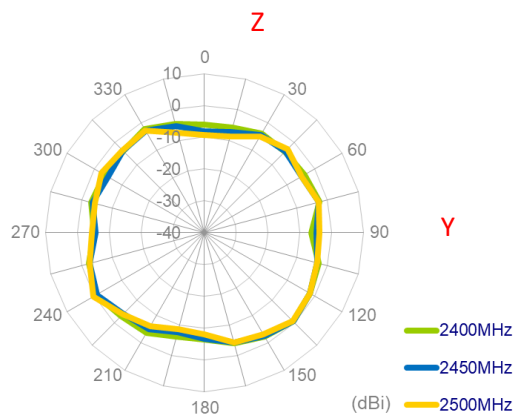
XY Plane



XZ Plane

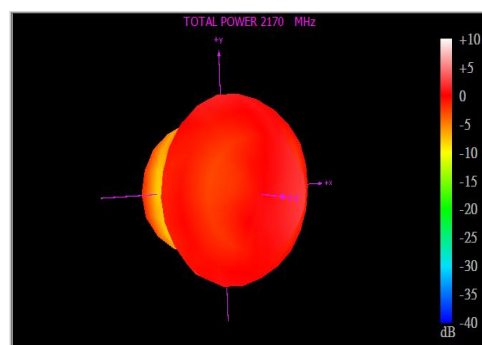
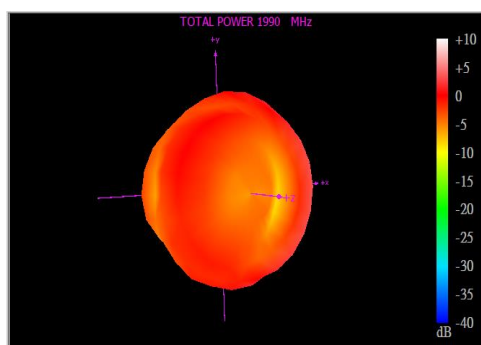
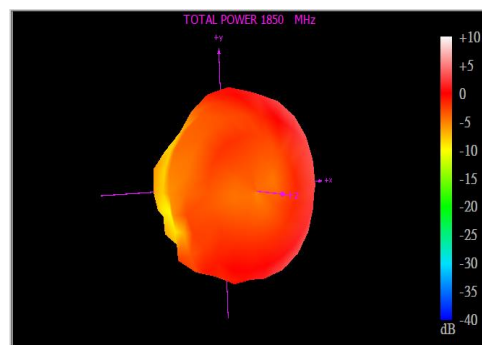
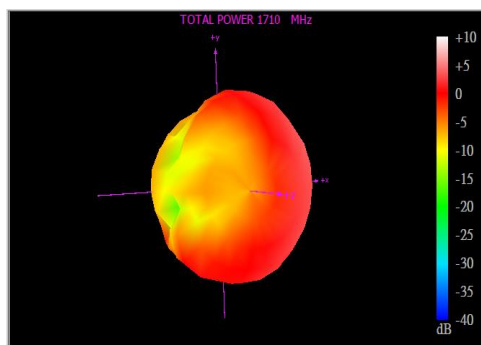
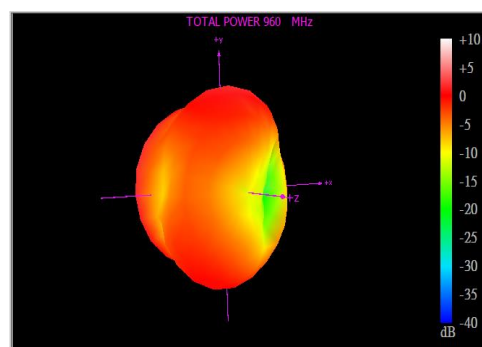
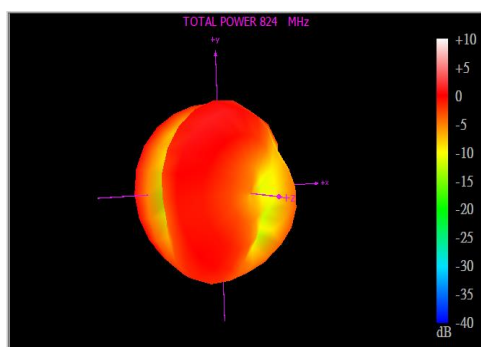
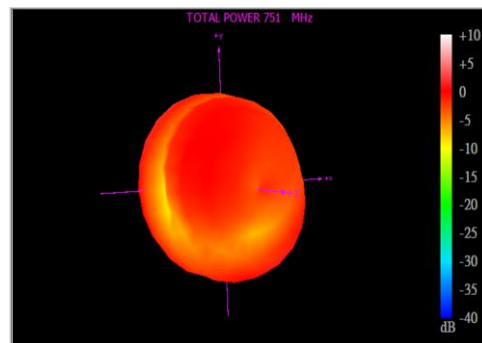
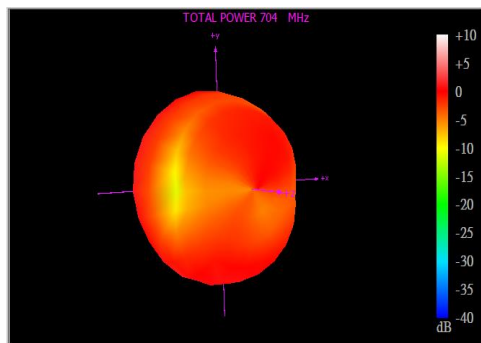


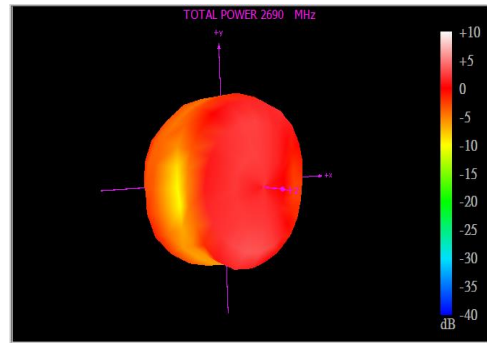
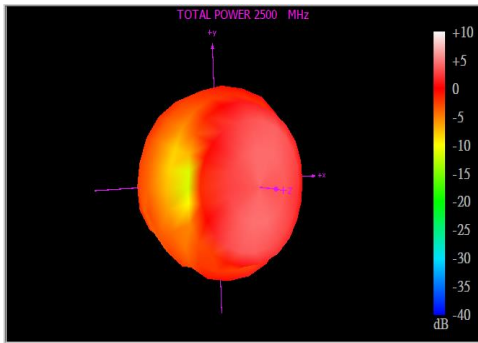
YZ Plane



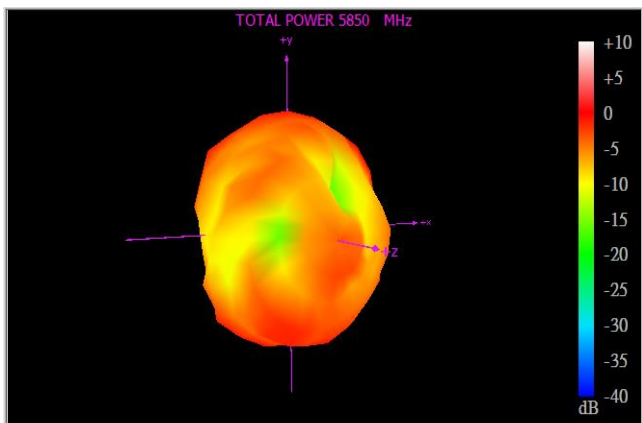
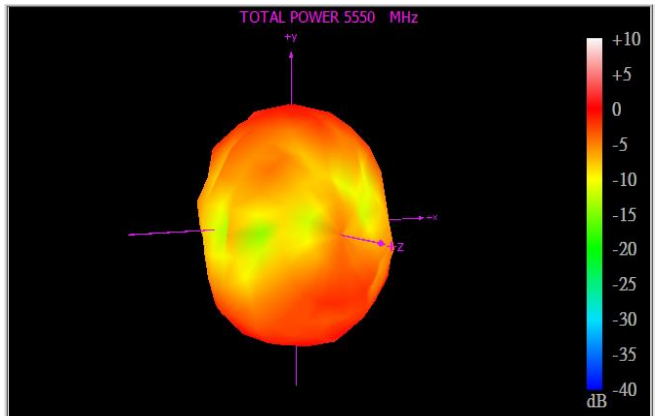
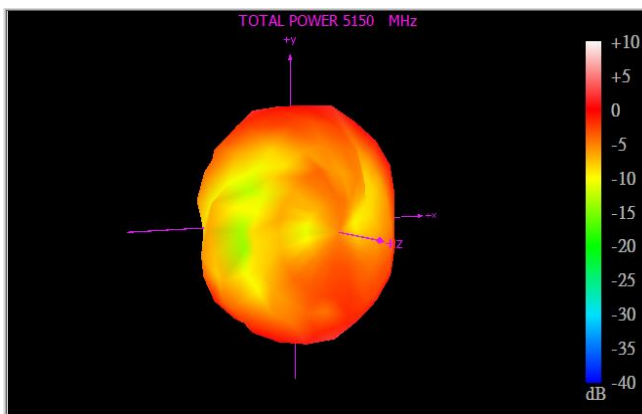
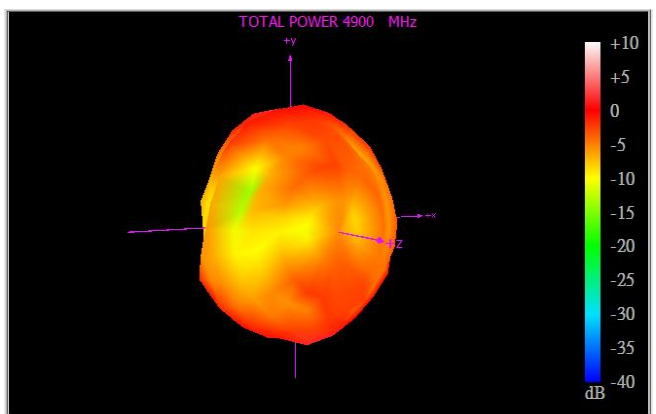
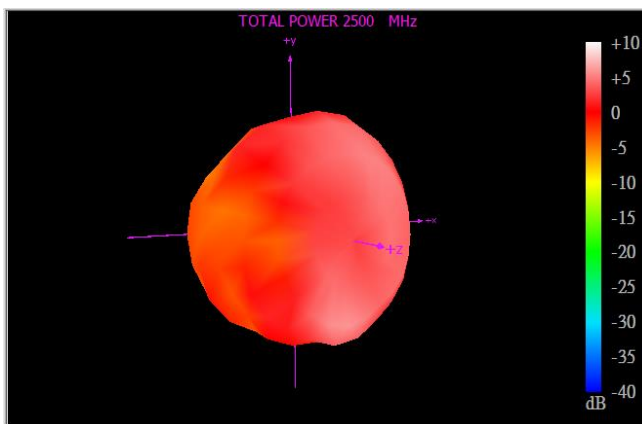
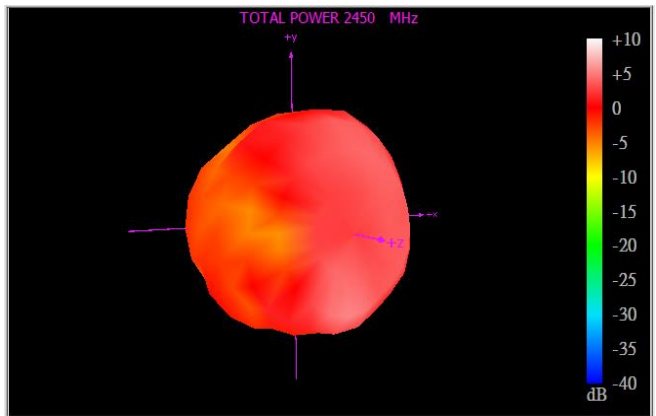
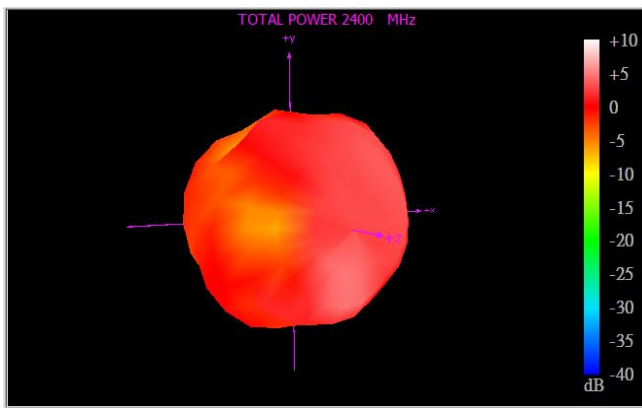
5.3 3D Radiation Pattern

LTE

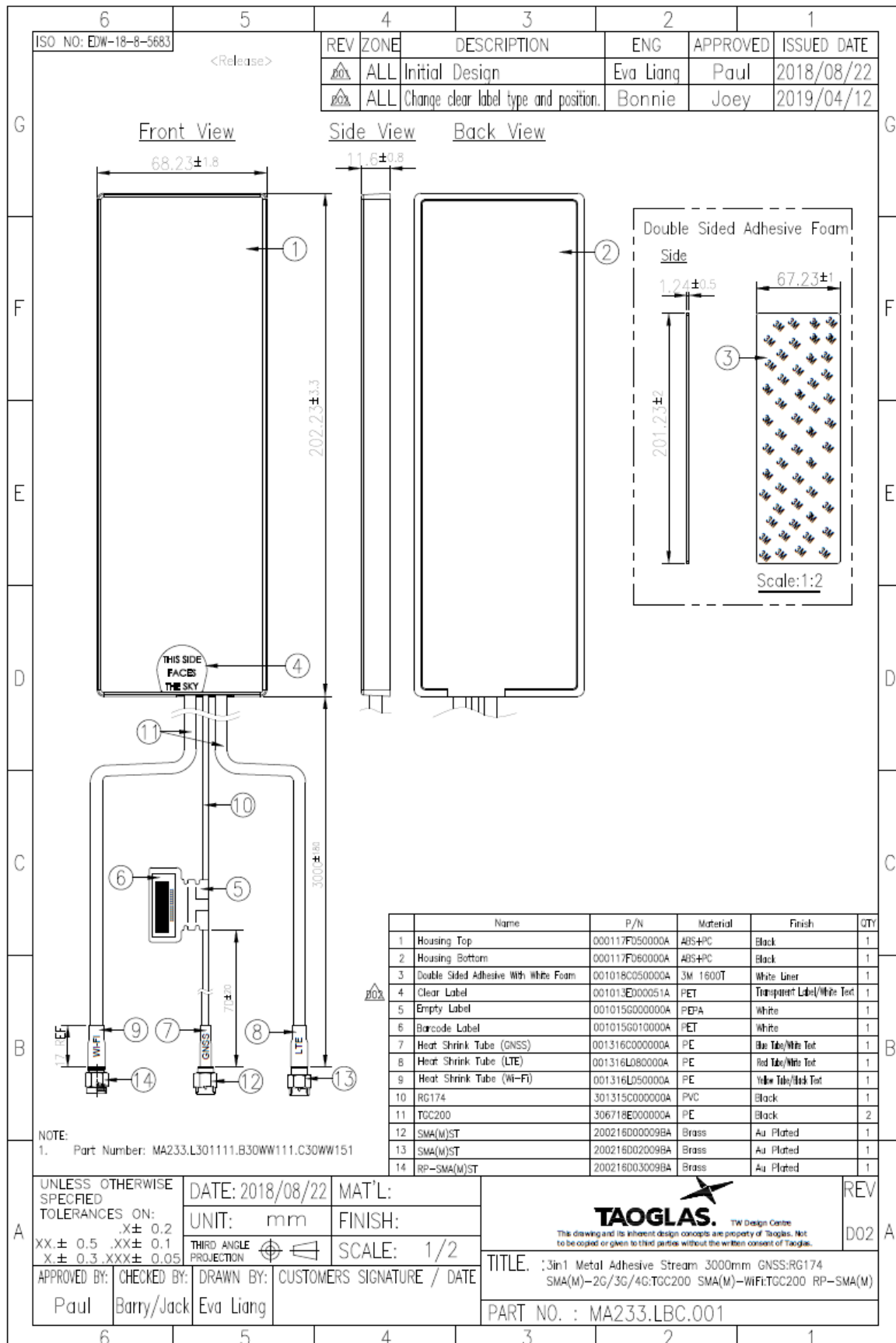




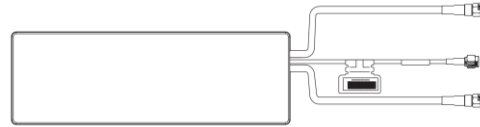
Wi-Fi



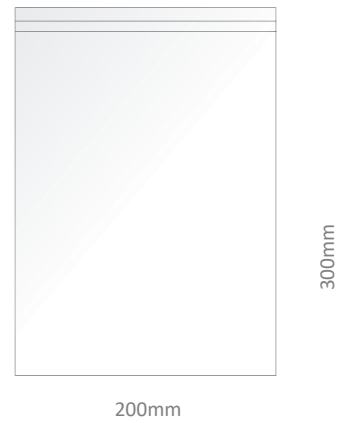
6. Mechanical Drawing (Units: mm)



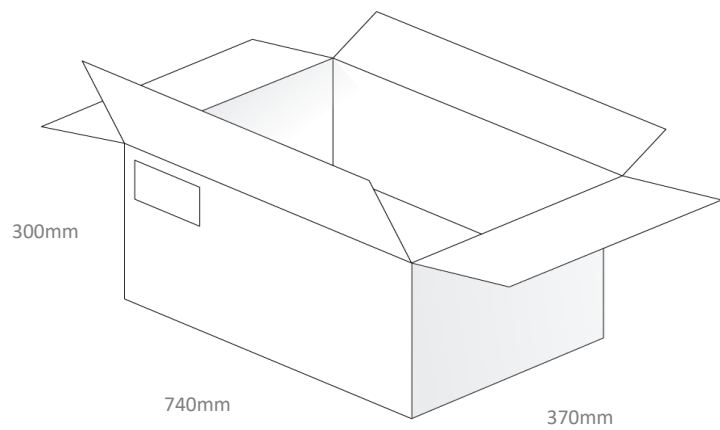
7. Packaging



1pc MA233.LBC.003 per PE Bag
 Dimensions: 300*200mm
 Weight: 300g



20pcs MA233.LBC.003 per Carton
 Dimensions: 740*370*300mm
 Weight: 6Kg

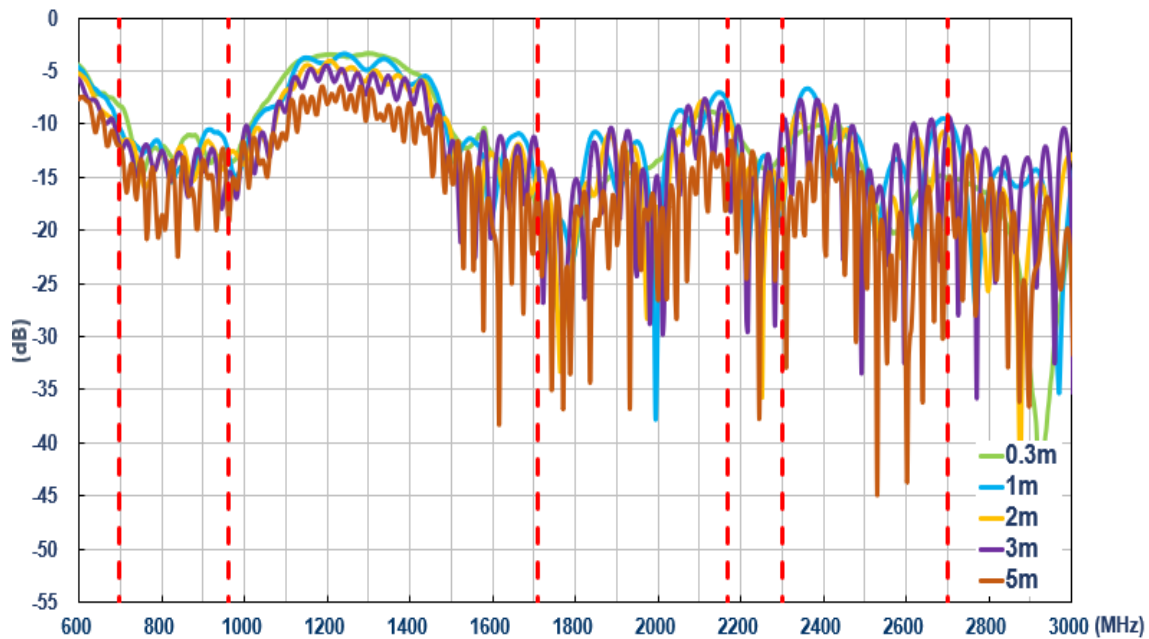


8. Application Note

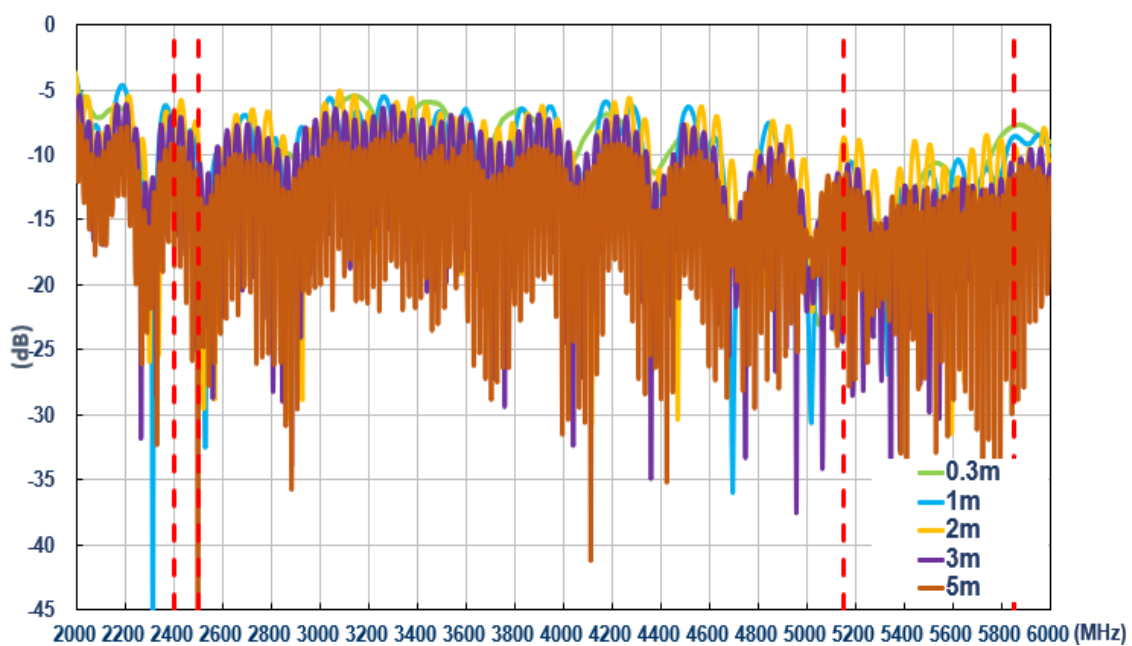
The MA233.LBC.001 antenna performance with different cable lengths is shown below.

8.1 Return Loss

LTE

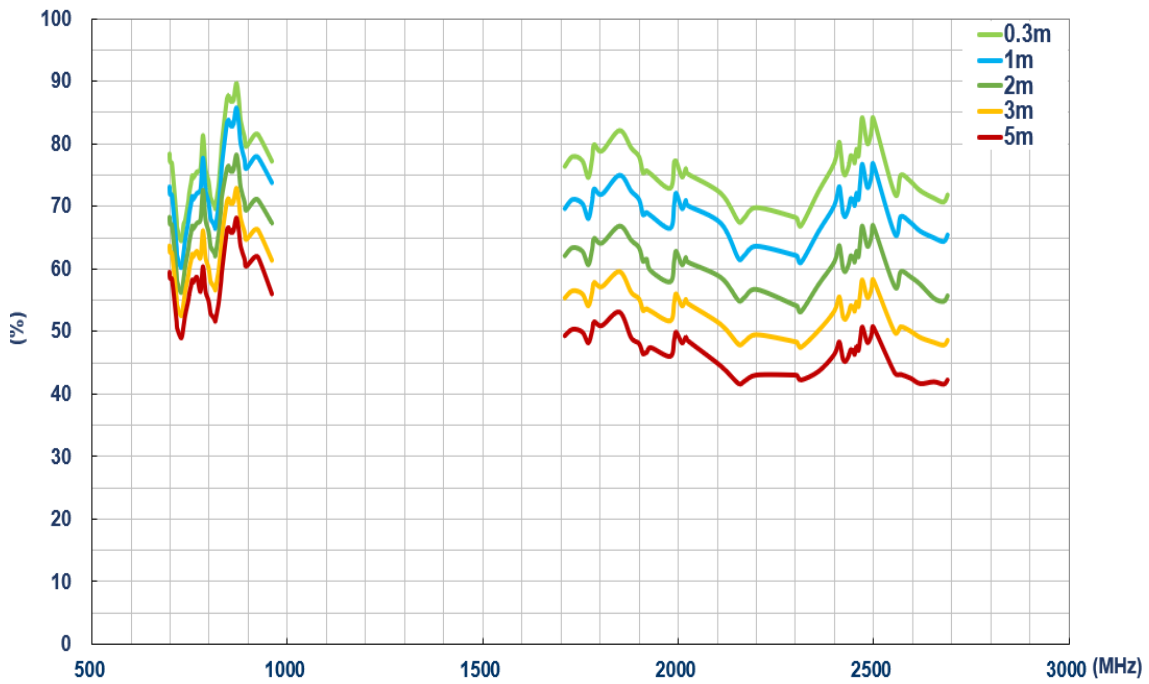


Wi-Fi

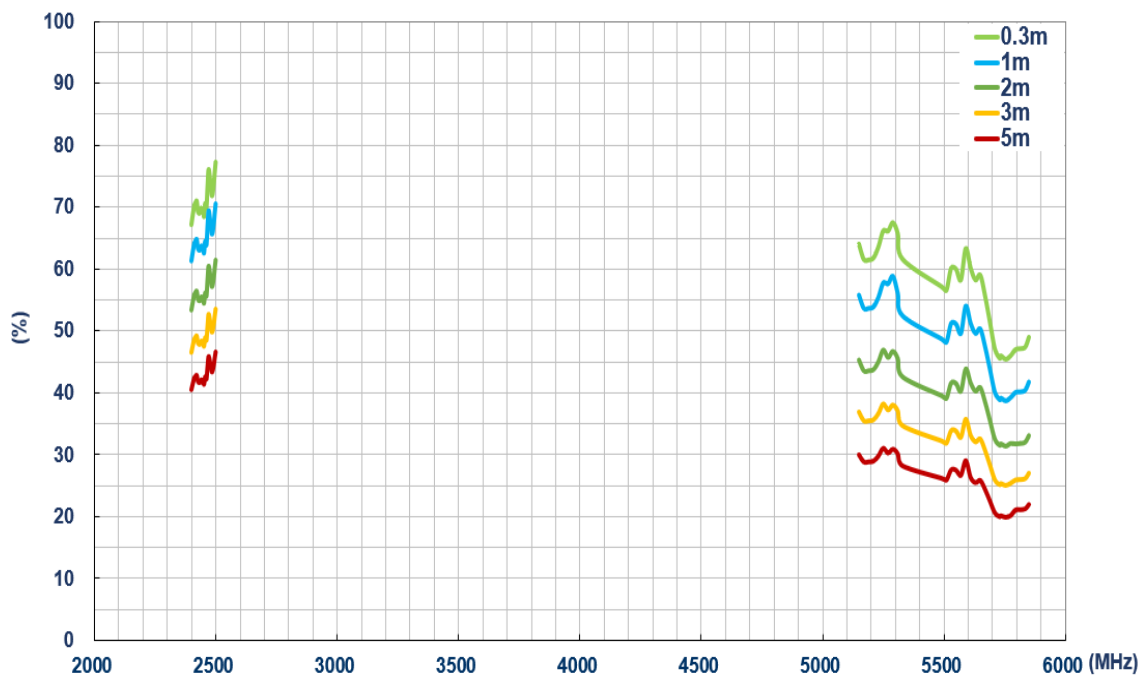


8.2 Efficiency

LTE

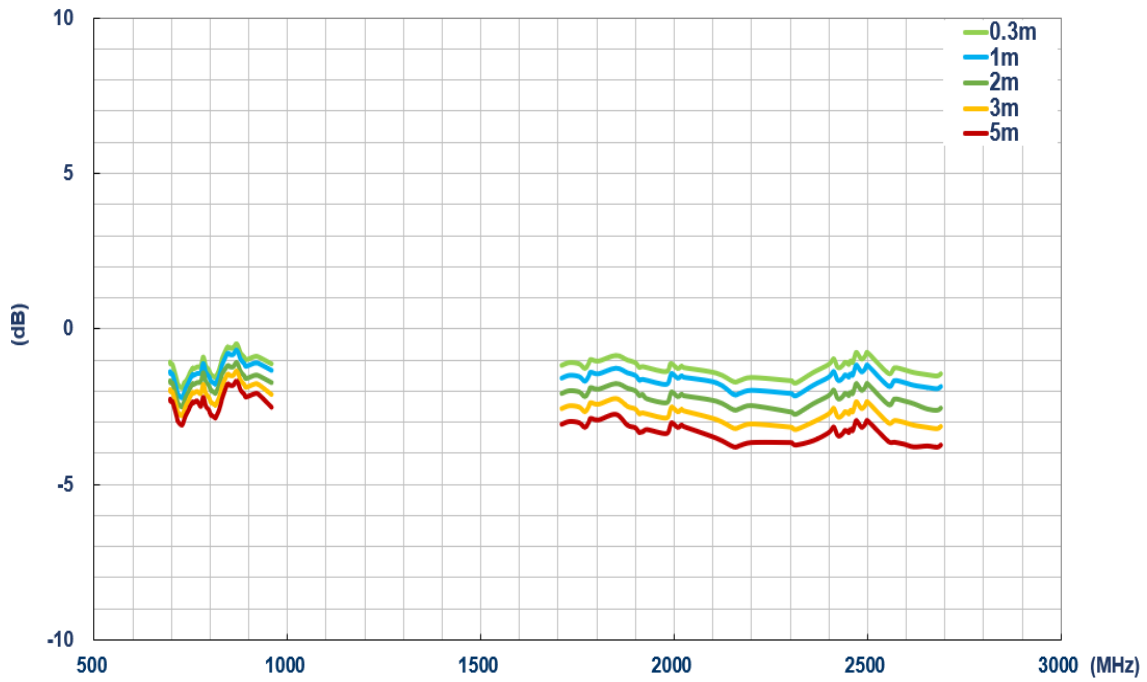


Wi-Fi

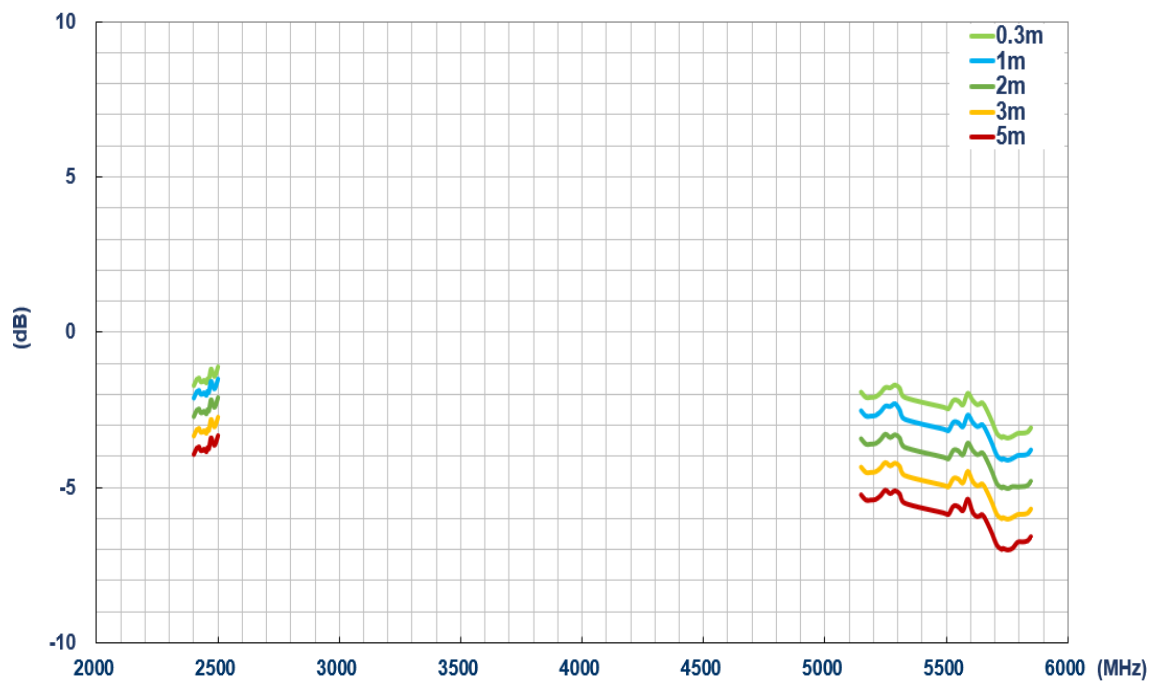


8.3 Average Gain

LTE

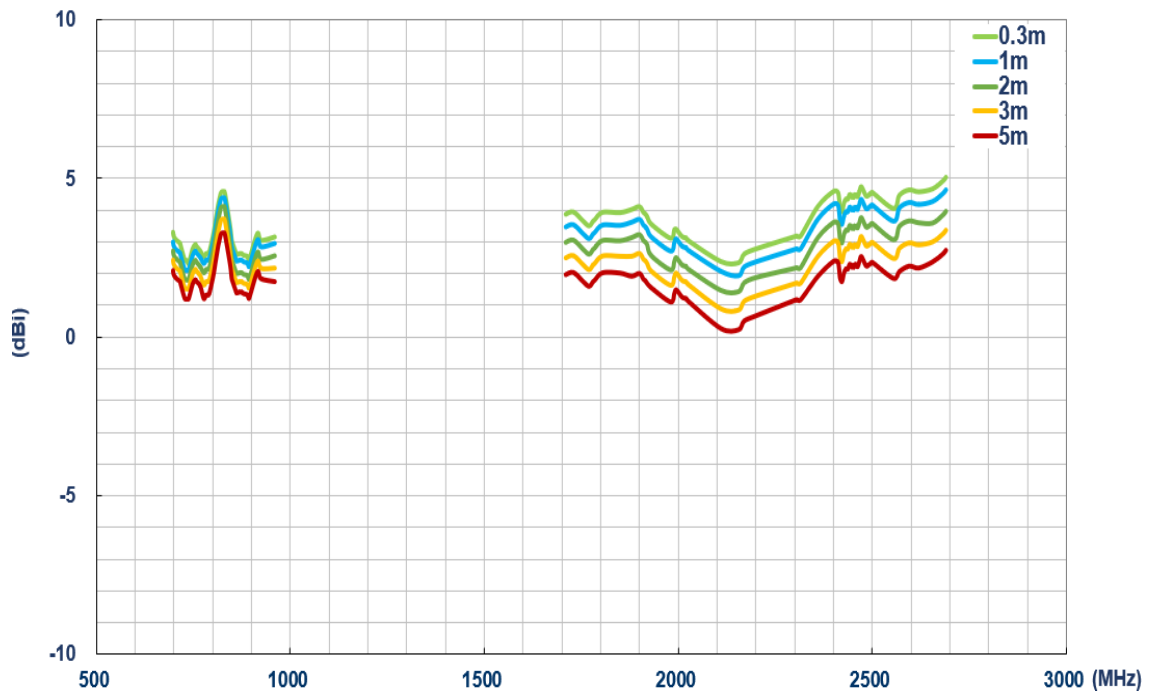


Wi-Fi

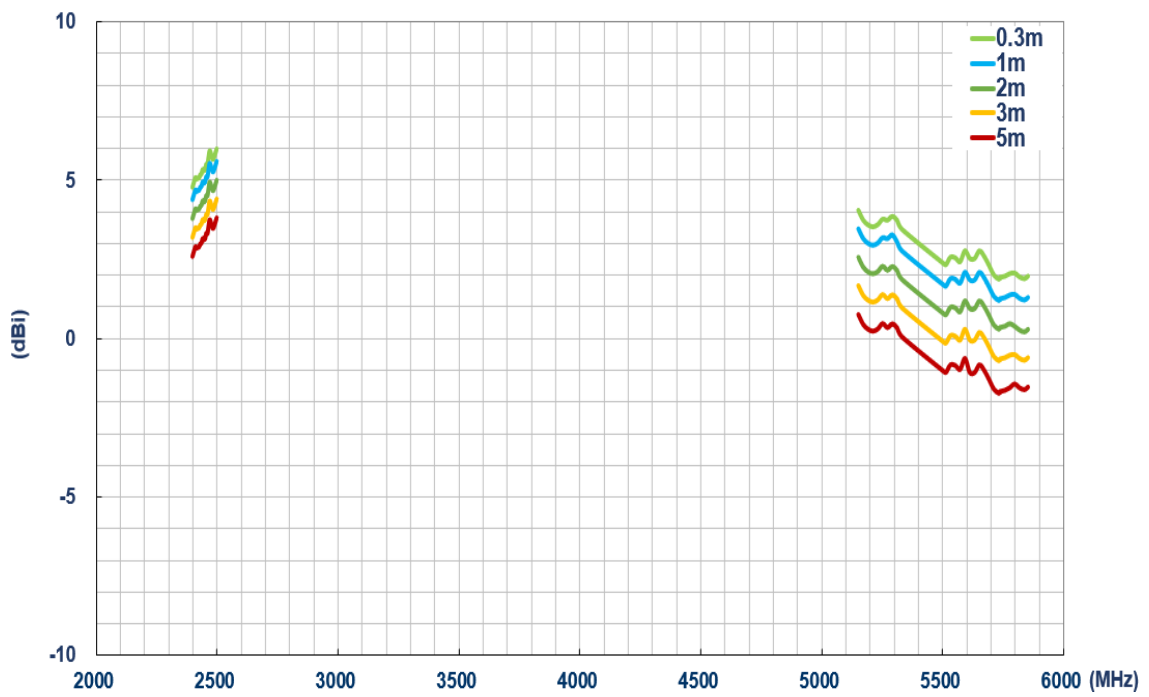


8.4 Peak Gain

LTE



Wi-Fi



Changelog for the datasheet

SPE-19-8-067 – MA233.LBC.001

Revision: A (Original First Release)	
Date:	2019-05-27
Notes:	
Author:	Jack Conroy

Previous Revisions



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