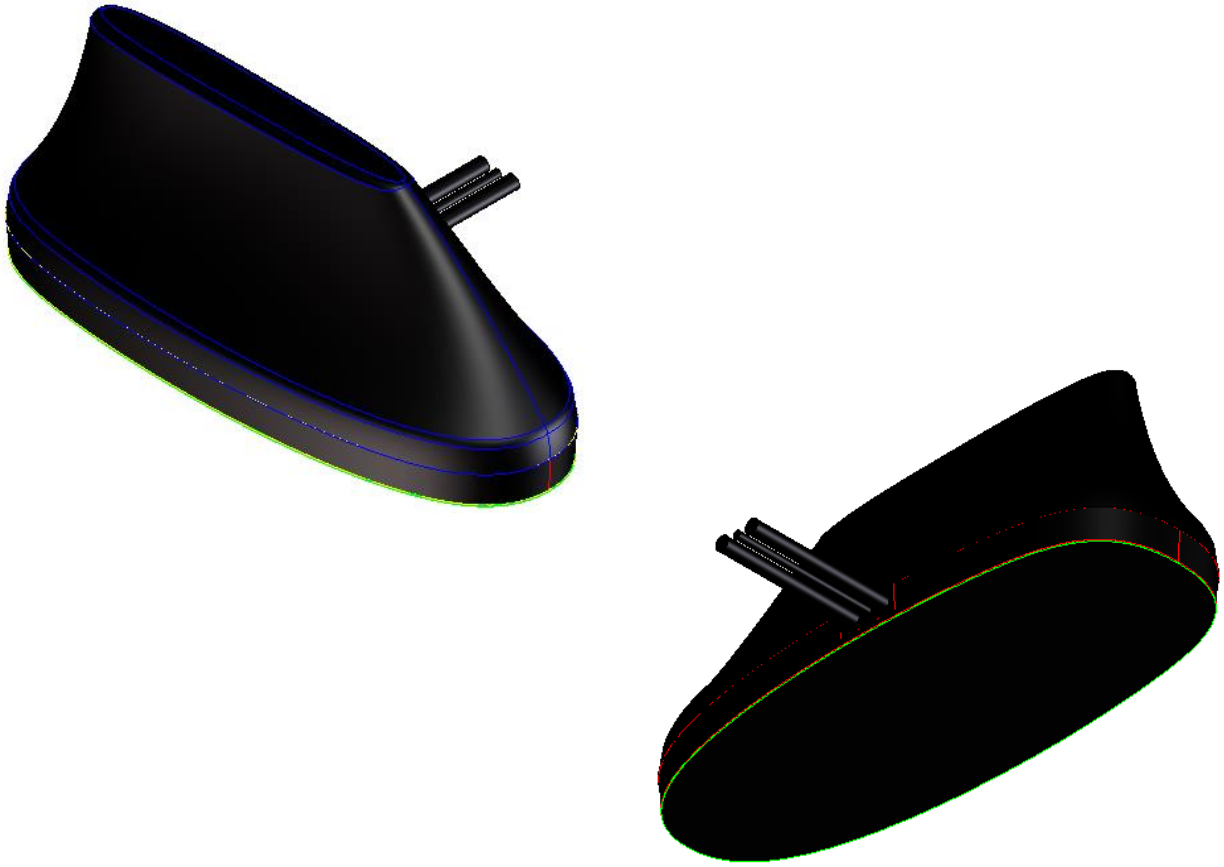
Wistron NeWeb Corp.



MODEL SPECIFICATIONS

Project Name: VYAC-Z1

WNC PN: 81VYAC15.G01

Author: Wistron NeWeb Corporation

Test Person: Elaine Huang

Revision: 1

Revision Date: 2024/05/13

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Revision History

Rev. #	Author	Summary of Changes	Date
1	Elaine Huang	First edition release	2024/05/13

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1. Introduction

VYAC-Z1 is a customized 3 in 1 sharkfin antenna (2xCV2X+1xGNSS) for Denso. It is IP67 rated with a PC enclosure. It supports multiple GNSS constellations, GPS and two CV2X antennas. The DUT size is 193 mm × 76.05 mm × 74.9 mm, with two 3 meters RG58 low loss cables and one 3 meters RG174 low loss cable for V2X/GPS. The peak gain at horizon ± 5° of V2X antenna is 5.5dBi, including the integrated 3-meter RF cable assemblies. Identification of the peak V2X antenna gain over the horizon ± 5° elevation range supports FCC KDB document, 511808 D01 C-V2X Waiver v01r01.

2. Electrical Specifications

Electrical characteristics of antenna. The antennas have the electrical characteristics given in Table 1 under WNC standard installation conditions shown in the figure.

No	Antenna	Parameter		Specification
1	V2X	Frequency Band		5895MHz – 5925MHz
2		Connector Type		Fakra Code Z Jack
3		VSWR		< 2:1
5		3D average gain	V2X_1	-4.26dBi
			V2X_2	-4.35dBi
6		Peak gain of horizon ± 5°	V2X_1	5.18dBi
			V2X_2	5.5dBi
7		Polarization		Linear, Vertical
8		Impedance		50 ohm
9	GPS	Frequency Band		1575MHz
10		Connector Type		Fakra Code C Jack
11		VSWR		2:1
12		Gain		5.45dBi, RHCP
13		LNA		30dB
14		Noise Figure		0.86dB
15		Amplifier Bias		3.3/5 VDC
16		Amplifier Current		10mA

17	**Test Condition**	**90cm x 90cm ground plane**

3. Environmental conditions

3.1 Operating temperatures

-40℃ to +85℃

3.2 Storage temperature range

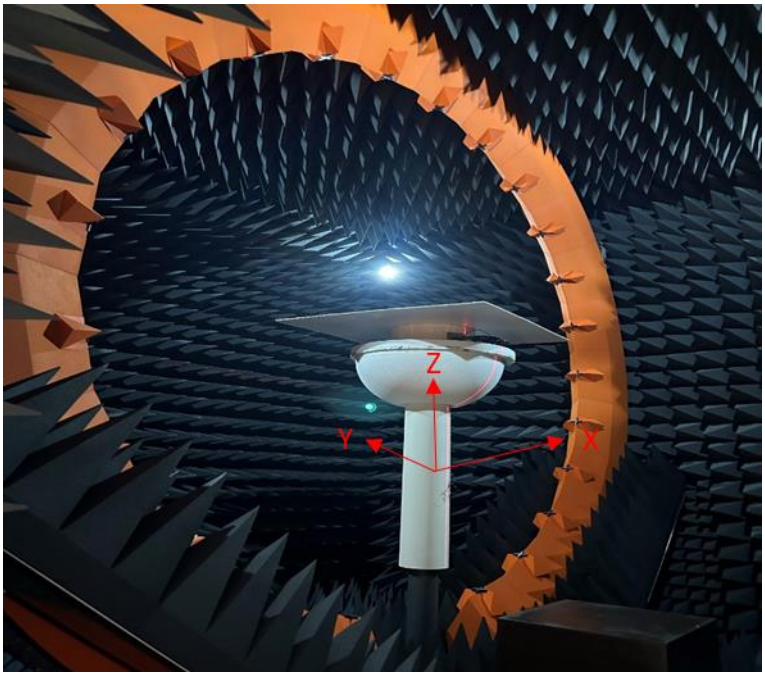
The storage temperature range of product is -40℃ to +85℃.

3.3 Environment Rating

IP67 waterproof.

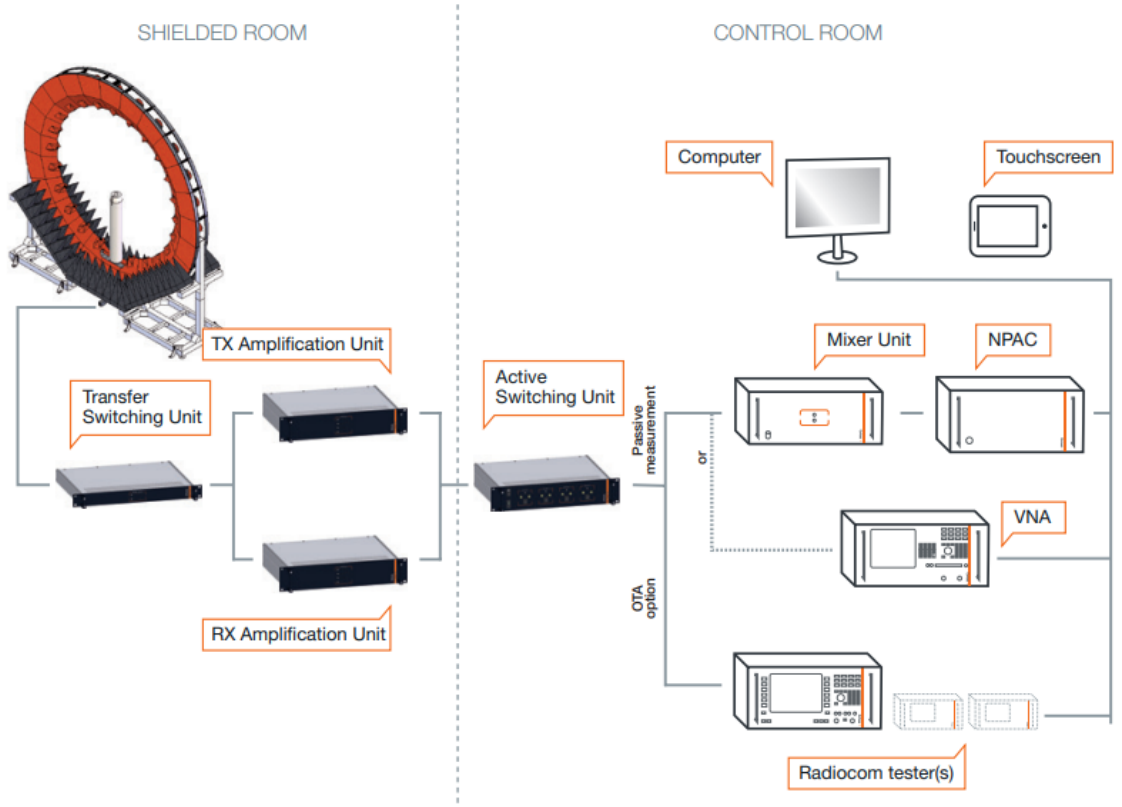
3.4 Test environment

DUT on 90cmx90cm ground plane.



3.5 Measurement Setup Information & Test Method

SG 24-L uses analog RF signal generators to emit EM waves from the probe array to the antenna under test (AUT) or vice versa. It uses the NPAC as an RF receiver for antenna measurements. The NPAC also drives the electronic scanning of the probe array. The NPAC includes the fastest and most accurate sources and receivers on the market.

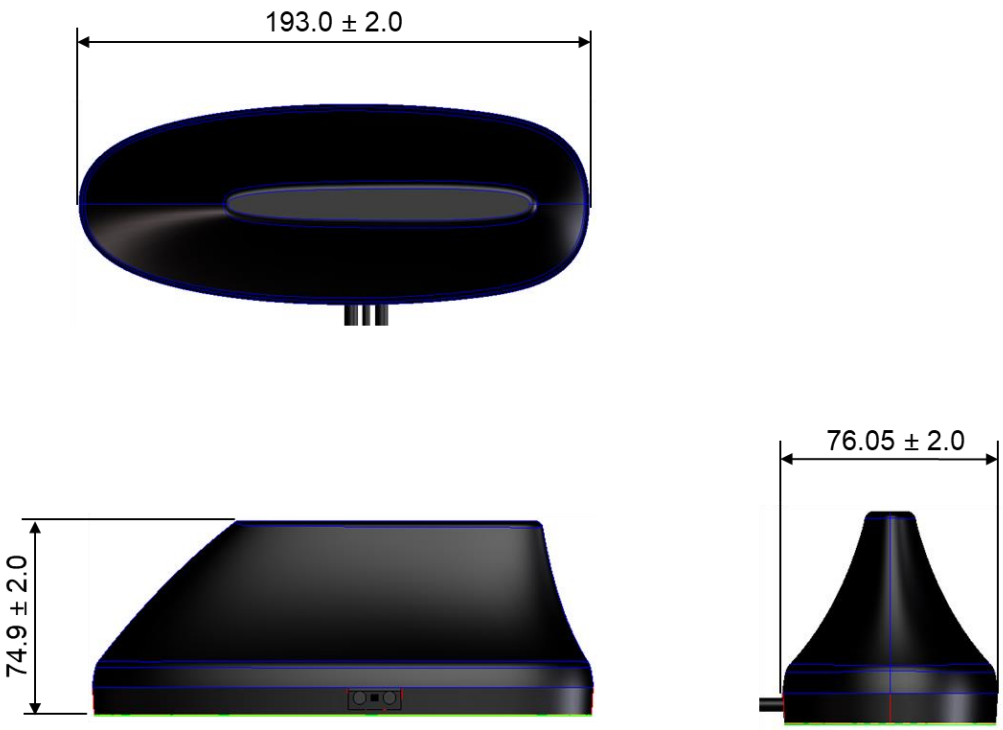


3.6 Calibrated And Measurement Equipment Table List

Device	Type / Model	Serial #	Manufacture	Cal. Date
Anechoic Chamber	555-FAC	CPT-SE-3rd-2023	ChamPro	2021-11-08
Antenna Measurement System	SG24-L	HKG1669S	MVG-SATIMO	2022-05-03
Network Analyzer	Keysight E5080B	MY59203136	Keysight	2024-04-07

Tx Amplifier Unit	SG24 Series Accessories	81524	MVG-SATIMO	2022-05-03
Rx Amplifier Unit	SG24 Series Accessories	81527	MVG-SATIMO	2022-05-03
Probe Select Unit	SG24 Series Accessories	80497	MVG-SATIMO	2022-05-03
Motion Control Unit	SG24 Series Accessories	75993	MVG-SATIMO	2022-05-03
Power and Control Unit	SG24 Series Accessories	71875	MVG-SATIMO	2022-05-03
Array Control Unit	SG24 Series Accessories	63030	MVG-SATIMO	2022-05-03
Turn Table	SG24 Series Accessories	MVG-151	MVG-SATIMO	2022-05-03
Goniometer	SG24 Series Accessories	MVG-115	MVG-SATIMO	2022-05-03
Control Software	WaveStudio	Ver. 22.5.6	MVG-SATIMO	N/A
Uninterruptible Power Supply	FT-130H-U	83312302500475	FTUPS	N/A
Wide Band Dipole	WD6000	65	MVG-SATIMO	2022-05-03

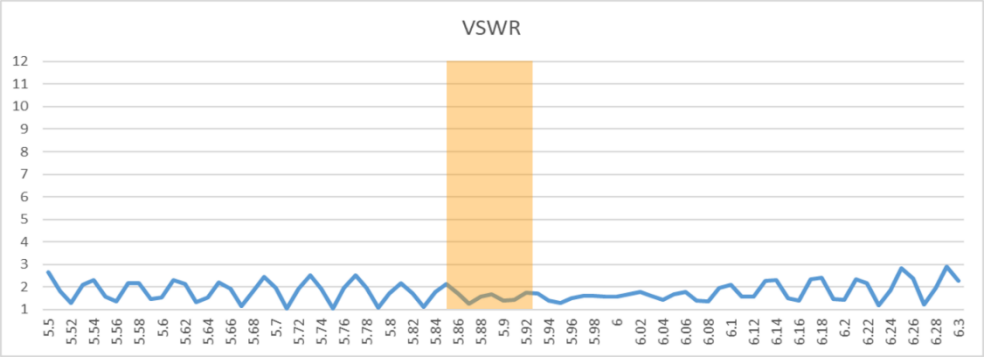
4. Shape and Dimension



5. Typical Electrical Characteristics (T=25°C)

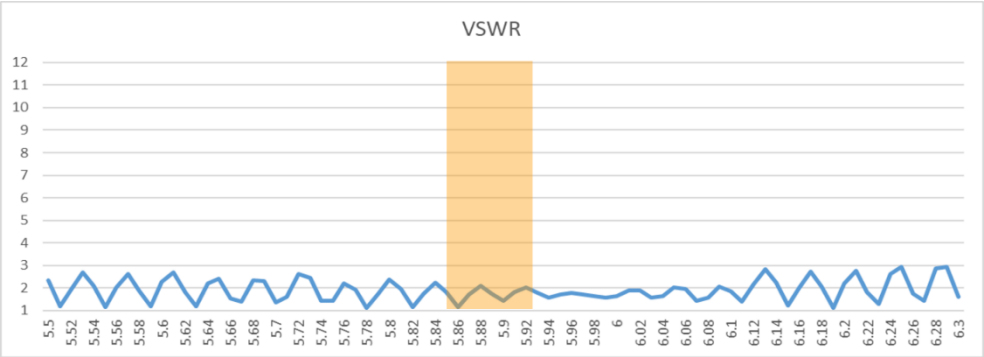
Antennas in shark-fin S11 pattern measurement

V2X_1 is the element located in the front of the sharkfin.



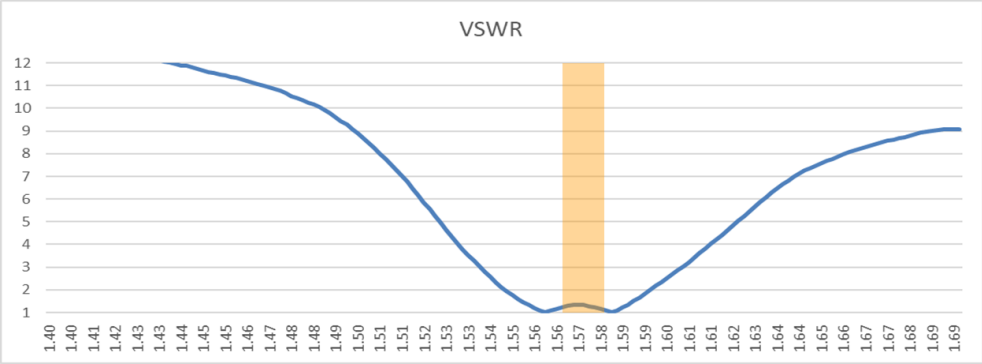
5900MHz	1.7
5915MHz	1.4

V2X_2 is the element located in the back of the sharkfin(and behind the V2X_1 element).



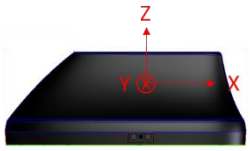
5900MHz	1.6
5915MHz	1.3

GPS



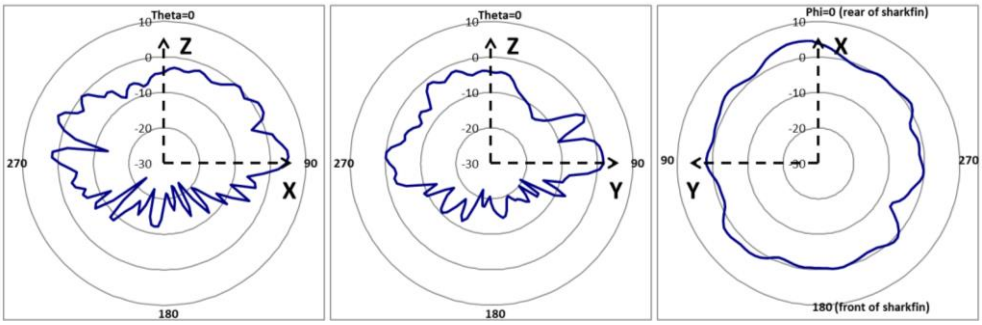
1575MHz	1.1

6. 2D Radiation Pattern



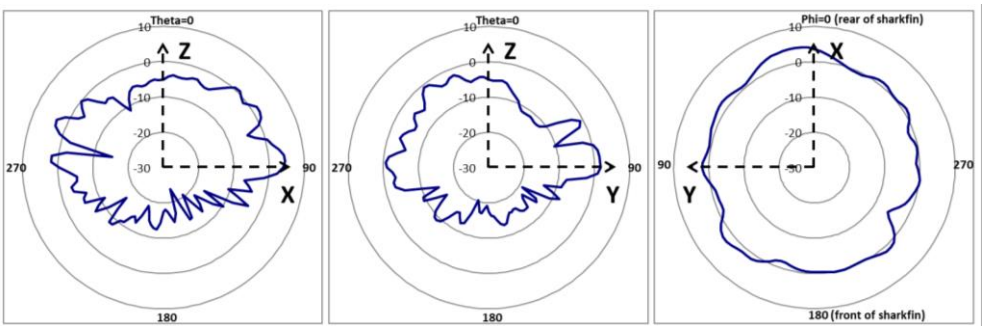
V2X_1: 5900MHz

(Phi = 0 deg) (Phi = 90 deg) (Theta = 90 deg)



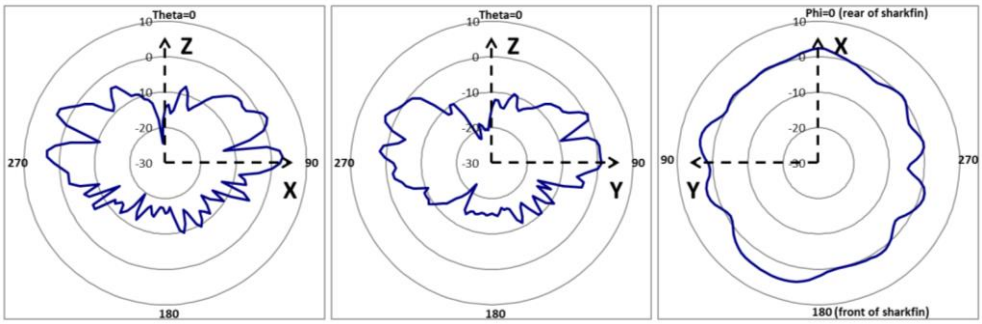
V2X_1: 5915MHz

(Phi = 0 deg) (Phi = 90 deg) (Theta = 90 deg)



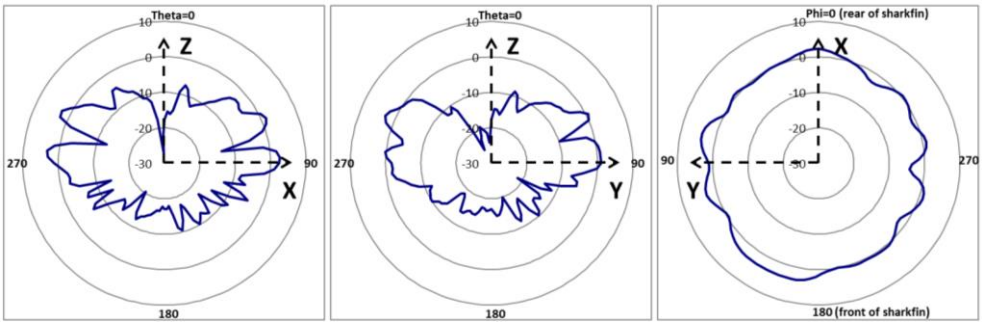
V2X_2: 5900MHz

(Phi = 0 deg) (Phi = 90 deg) (Theta = 90 deg)



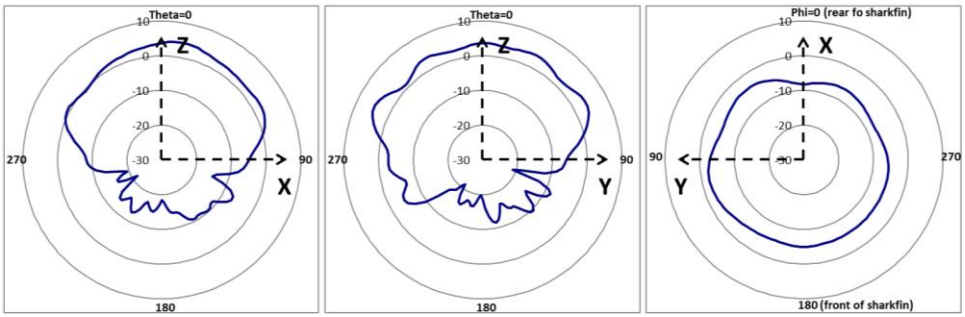
V2X_2: 5915MHz

(Phi = 0 deg) (Phi = 90 deg) (Theta = 90 deg)



GPS: 1575MHz

(Phi = 0 deg) (Phi = 90 deg) (Theta = 90 deg)



7. Efficiency

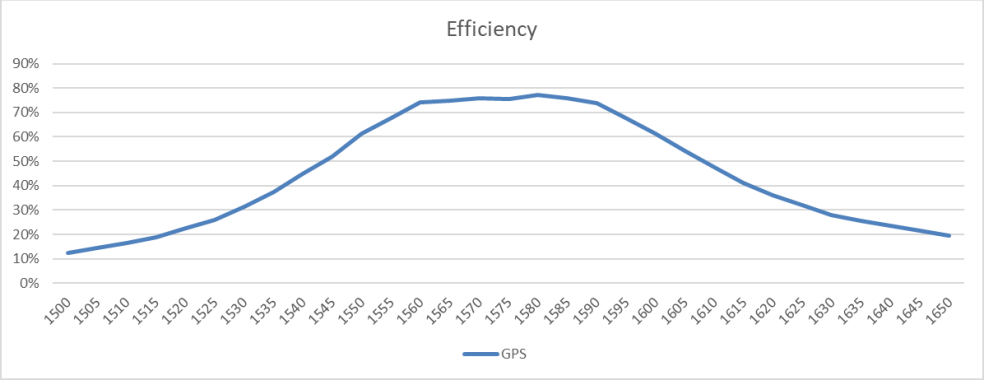
V2X_1

5900MHz	40%
5915MHz	37%

V2X_2

5900MHz	38%
5915MHz	36%

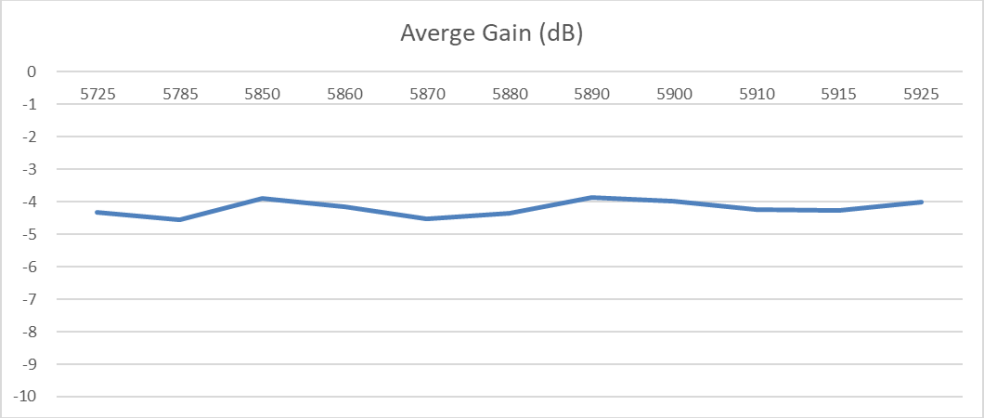
GPS



1575MHz	75%

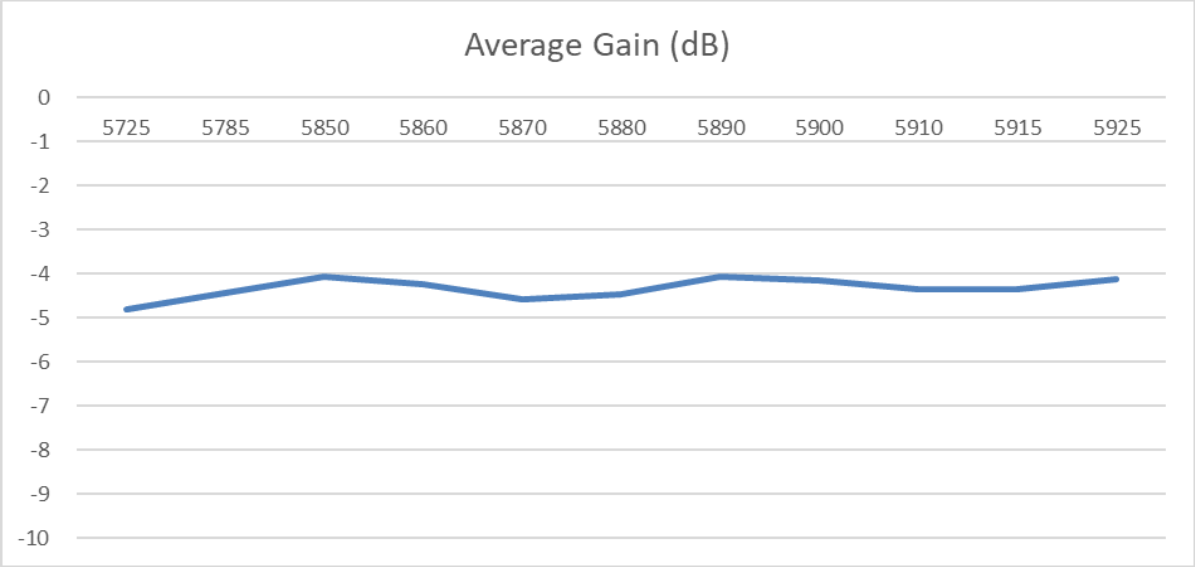
8. Average Gain

V2X_1



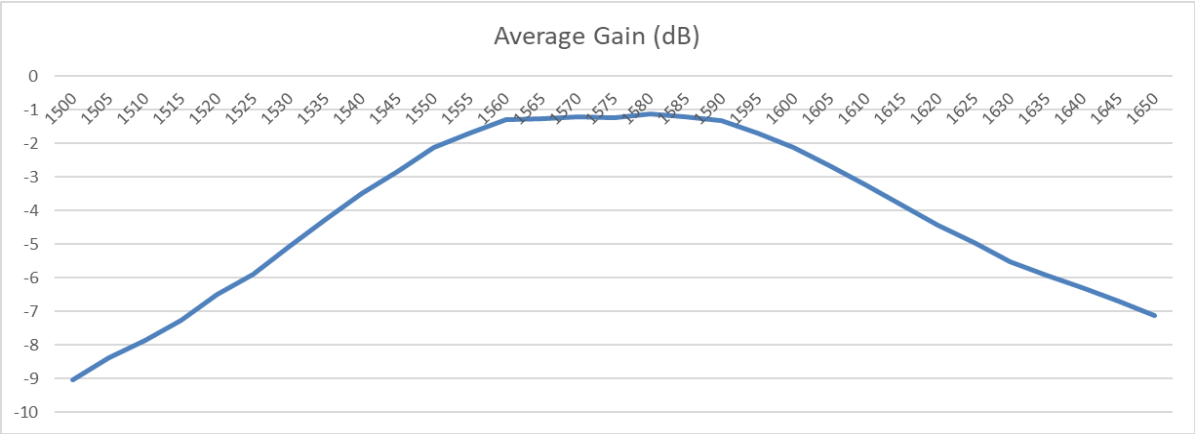
5900MHz	-3.9
5915MHz	-4.2

V2X_2



5900MHz	-4.1
5915MHz	-4.3

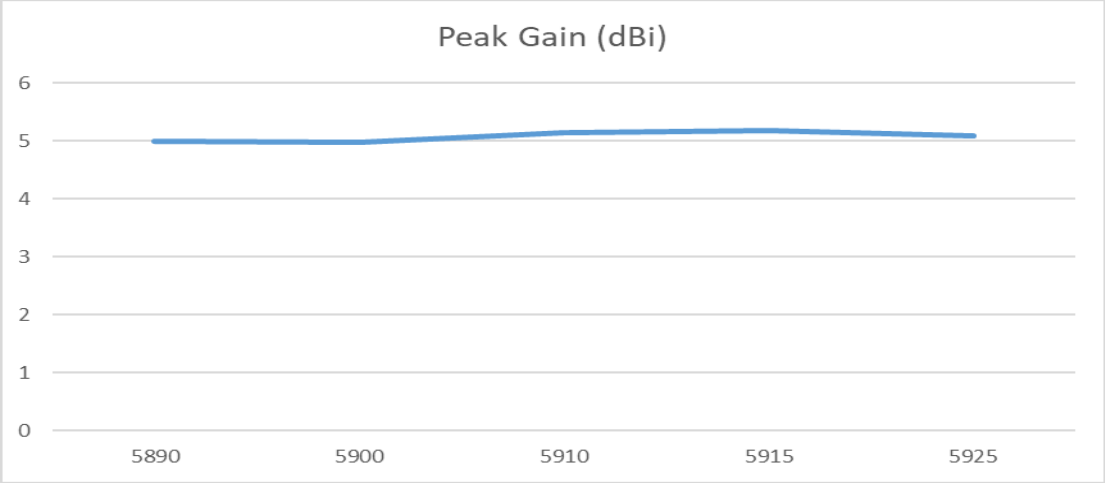
GPS



1575MHz	-1.24

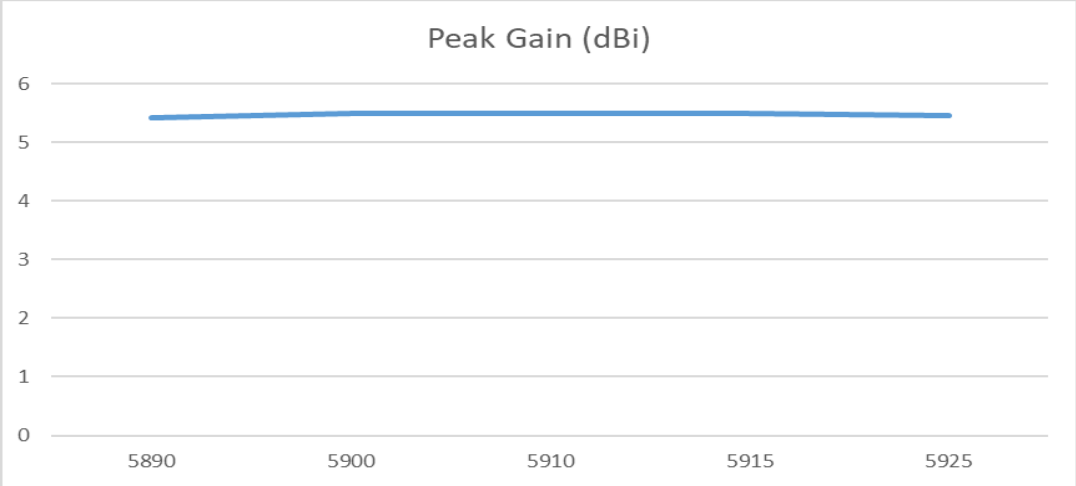
9. Peak Gain (with 3-meter RG-58LL cables and FAKRA termination)

V2X_1: the peak gain within ± 5° of horizontal plane



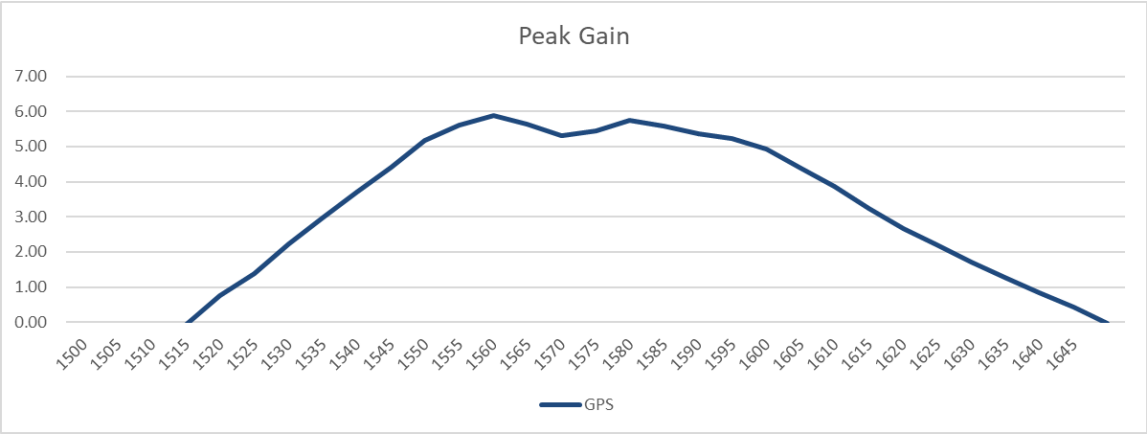
5900MHz	4.97
5915MHz	5.18

V2X_2: the peak gain within ± 5° of horizontal plane



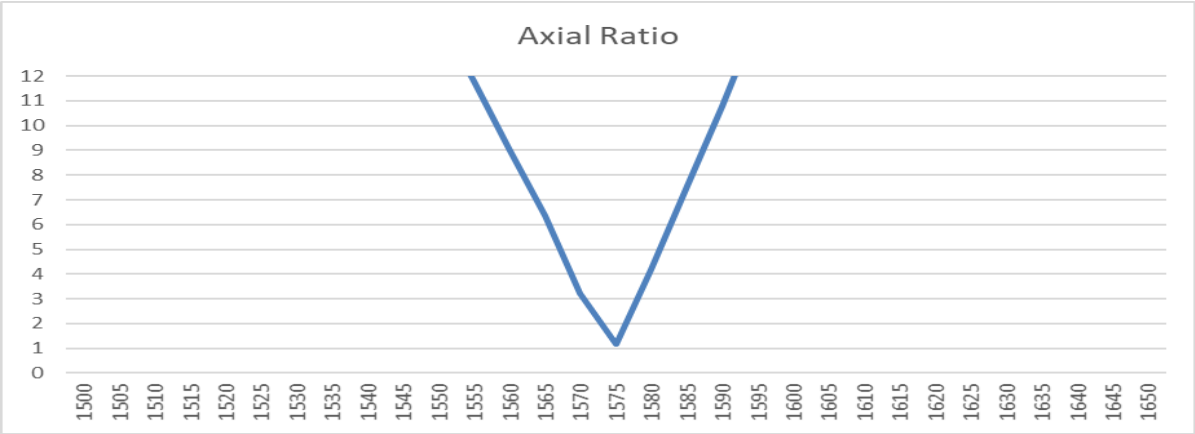
5900MHz	5.49
5915MHz	5.5

GPS



1575MHz	5.52

10. Axial-Ratio



1575MHz	1.02