

FCC Verification Test Report

Client Information:

Applicant: Netradyne Inc.

Applicant add.: 9191 Towne Centre Drive, Suite 200, San Diego, CA 92122

Manufacturer: Netradyne Inc.

Manufacturer add.: 9191 Towne Centre Drive, Suite 200, San Diego, CA 92122

Product Information:

Product Name: Driveri

Model No.: D-210

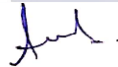
Derivative model No.: D-210A, D-211

Brand Name: Netradyne

Applied Standard:

FCC Part15-B:2014

Prepared By:



Anshul Tyagi

Laboratory Details:

AA Electro Magnetic Test Laboratory Private Limited
PlotNo174, Udyog Vihar-Phase4, Sector18, Gurgaon, Haryana, India

Date of Receipt: Jun. 23, 2020

Date of Test: Jun. 25, 2020

Date of Issue: Jul. 13, 2020

Test Result: In Compliance/Pass

This device has been tested and found to comply with the stated standard(s), which is(are) required by the council directive of 2014/53/EU and indicated in the test report and are applicable only to the tested sample identified in the report.

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Reviewed by: _____

Approved by: _____

(Dr R Lenin Raja) (Authorized Representative) (/ lenin83/)

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Plot 174, Udyog Vihar Phase 4, Sector -18, Gurgaon, Haryana, India.

Contact:0124-4235350,4145343;e-mail:info@aaemtlabs.com;Website: www.aaemtlabs.com

An ISO 17025: 2017, Accredited Laboratory ,VCCI (support member - #4053),ISED#: 26046, FCC #0029402088 CE #800058_00



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2 Test Summary

Test	Test Requirement	Test Method	Criterion	Result
Conducted Emission 150kHz to 30MHz	FCC Part15-B:2014, CISPR 32:2015+AMD1:2019 CSV	Clause 7 of CISPR 16-2-1	Limits	PASS
Radiated Emissions 30MHz to 1GHz	FCC Part15-B:2014, CISPR 32:2015+AMD1:2019 CSV	Clause 7.3 of CISPR 16-2-3	Limits	PASS

N/A is an abbreviation for Not Applicable.

Model description: D-210 : Intelligent Driver Monitoring System Smart Dash-cam

D-210A : Intelligent Driver Monitoring System Smart Dash-cam Series 1

D-211 : Intelligent Driver Monitoring System Smart Dash-cam WA

Driveri is an AI powered vision based IoT system, sold as an aftermarket product to fleets. The device is installed in trucks/cars behind the rear-view mirror, and the power is supplied from the car battery through a custom power cable.

When the vehicle is being driven, the road facing camera is enabled by default, records and generates real time safety alerts to assist the driver. The camera facing the driver / passenger's optional due to privacy requirements and enabled at customers' request. The recorded videos are processed (using our patented machine learning algorithms) on the device together with the other sensor data and can detect any events related to driving behavior and driver behavior. The device has 2 buttons on the bottom side of the device, when pressed creates alerts which are user generated. 2 LEDs on driver facing side indicate the current operational state of device & also indicate privacy setting (driver facing camera recording status).

Product documentation

The specification used by the manufacturer to define the performance criteria for the testing required by this standard shall be made available to the user upon request.

2.1 Measurement Uncertainty

The report uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty Multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

No.	Item	Frequency Range	U , Value
1	Power Line Conducted Emission	150KHz~30MHz	2.77 dB
2	Radiated Emission Test	30MHz~1GHz	2.81 dB
3	Radiated Emission Test	1GHz~6GHz	2.84 dB

3 Test Facility

AA Electro Magnetic Test Laboratory is an ISO 17025:2017 certified lab by NABL, Certification No. TC-8597, CE Marking Certificate from Phoenix Germany # 800058_00 and ILC-MRA #0366.
We are also accredited ISO 17025:2017 by A2LA (American association for laboratory accreditation) #5593.01 , FCC recognized #0029402088 , ISED recognized for wireless product #26046 , VCCI (Japan) supporting member #4053.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

None

4 General Information

4.1 General Description of EUT

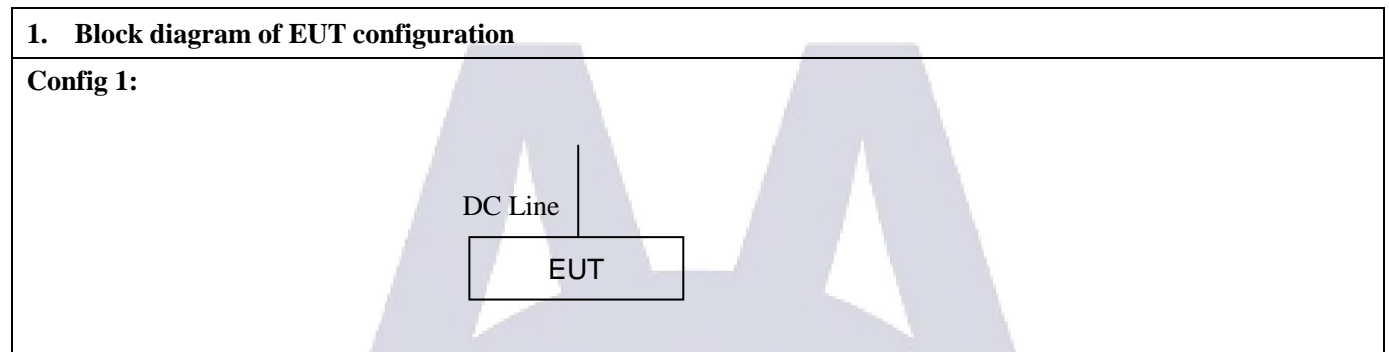
Manufacturer:	Netradyne Inc.
Manufacturer Address:	9191 Towne Centre Drive, Suite 200, San Diego, CA 92122
EUT Name:	Driveri
Model No:	D-210
Serial Number:	D-210A, D-211
Brand Name:	Netradyne
H/W No.:	501-1-01283_A1, 501-1-01301_A1, 501-1-00908_B1, 501-1-01243_A1
S/W No.:	2.4.9.rc.2
Power Supply Range:	Input : 12VDC, 3A
Battery:	N/A

4.2 EUT Test Mode

Mode 1	The EUT in full transmission mode.
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4.3 Description of Test setup

EUT was tested in normal configuration (Please See following Block diagrams)



4.3 Test Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A

4.4 EUT Peripheral List

No.	Equipment	Manufacturer	FCC ID	Model No.	Serial No.	Power cord	signal cable
1	DriverI/DCM LTE Module	Netradyne Inc.	2AM8R-DC M-NA1-100	DriverI/DCM	N/A	N/A	N/A
2	CAN Adaptor Board	Netradyne Inc.	N/A	A1 version : D-210-AD1 A2 version : D-210-AD2 A3 Version : D-210-AD3	N/A	N/A	N/A

5 Equipments List for All Test Items

<input checked="" type="checkbox"/> Radiation Test Equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI TEST Receiver	Rohde and schwarz	ESIB26	838786/010	2020/01/28	2021/01/27
2	Loop antenna	DA ZE Beijing	ZN30900C	18052	2020/01/29	2021/01/28
3	Horn antenna	DA ZE Beijing	ZN30701	18012	2020/01/30	2021/01/29
4	Horn antenna	DA ZE Beijing	ZN30702	18006	2020/01/30	2021/01/29
5	Horn antenna	DA ZE Beijing	ZN30703	18005	2020/01/30	2021/01/29
6	Pre Amplifier	KELIANDA	LNA-0009295	-	2020/01/28	2021/01/27
7	Pre Amplifier	KELIANDA	CF-00218	-	2020/01/28	2021/01/27
8	Bi conical Antenna	DA ZE Beijing	ZN30505C	17038	2020/01/29	2021/01/30

<input checked="" type="checkbox"/> Conduction Test equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI-RECEIVER	Schwarzbeck	FCKL	1528194	2020/01/28	2021/01/27
2	Spectrum Analyzer	ADVANTEST	R3361	-	2019/05/15	2021/05/14
4	LISN	Kyoritsu	KNW-407	8-1789-5	2020/01/28	2021/01/27
5	Network – LISN	Schwarzbeck	NNBM8125	81251314	2020/01/28	2021/01/27
6	Network – LISN	Schwarzbeck	NNBM8125	81251315	2020/01/28	2021/01/27
7	ISN	Schwarzbeck	ISN T8 CAT5	CATS-8158#225	2020/01/28	2021/01/27
8	ISN	Schwarzbeck	ISN T8 CAT6	NTFM8158#184	2020/01/28	2021-01-27
9	ISN	Schwarzbeck	ISN T8 CAT3	CAT3-8158#120	2020/01/28	2021/01/27
10	PULSE LIMITER	Rohde and schwarz	ESH3-Z2	100681	2019/05/13	2021/05/12
11	50Ω Coaxial Switch	DAIWA	1565157	-	2019/05/13	2021/05/12
12	50Ω Coaxial Switch	-	-	-	2019/05/13	2021/05/12

6 Emission Test Results

6.1 Mains Terminals Disturbance Voltage Measurement

Limits for AC mains Port :

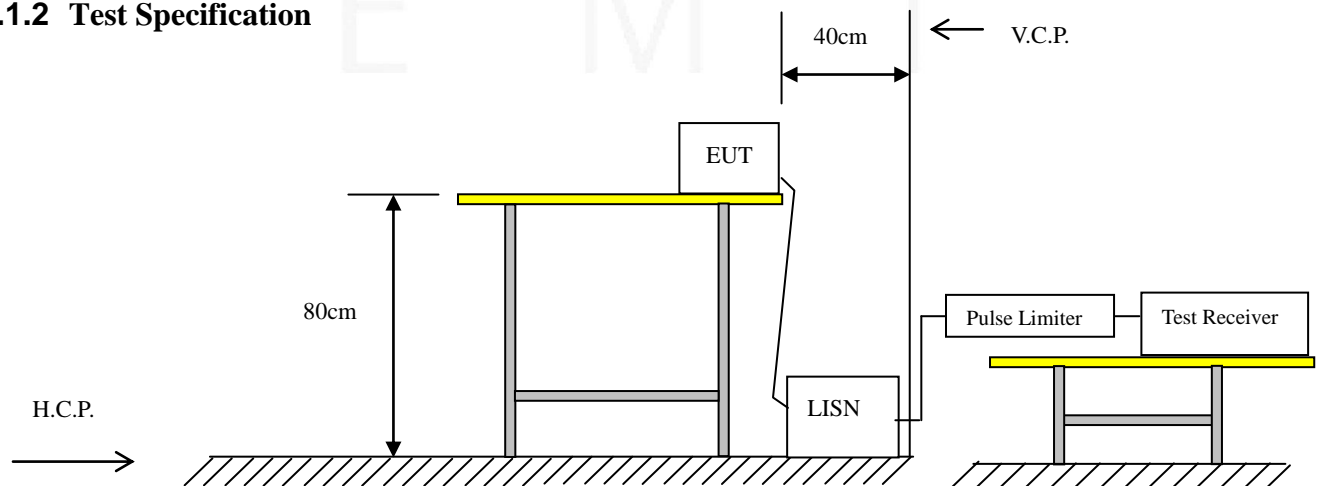
Frequency (MHz)	<input type="checkbox"/> Class A (dB μ V)		<input checked="" type="checkbox"/> Class B (dB μ V)	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 ~ 0.50	79	66	66 to 56	56 to 46
0.50 ~ 5.0	73	60	56	46
5.0 ~ 30	73	60	60	50

Detector: Peak for pre-scan (9kHz Resolution Bandwidth)
Quasi-Peak & Average if maximized peak within 6dB of Average Limit

6.1.1 E.U.T. Operation

Temperature:	24°C	Humidity:	52% RH	Atmospheric Pressure:	101	Kpa
Test Mode:	Mode 1					

6.1.2 Test Specification



EUT was placed upon a wooden test table 0.8m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A spectrum and receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

6.1.3 Measurement Data

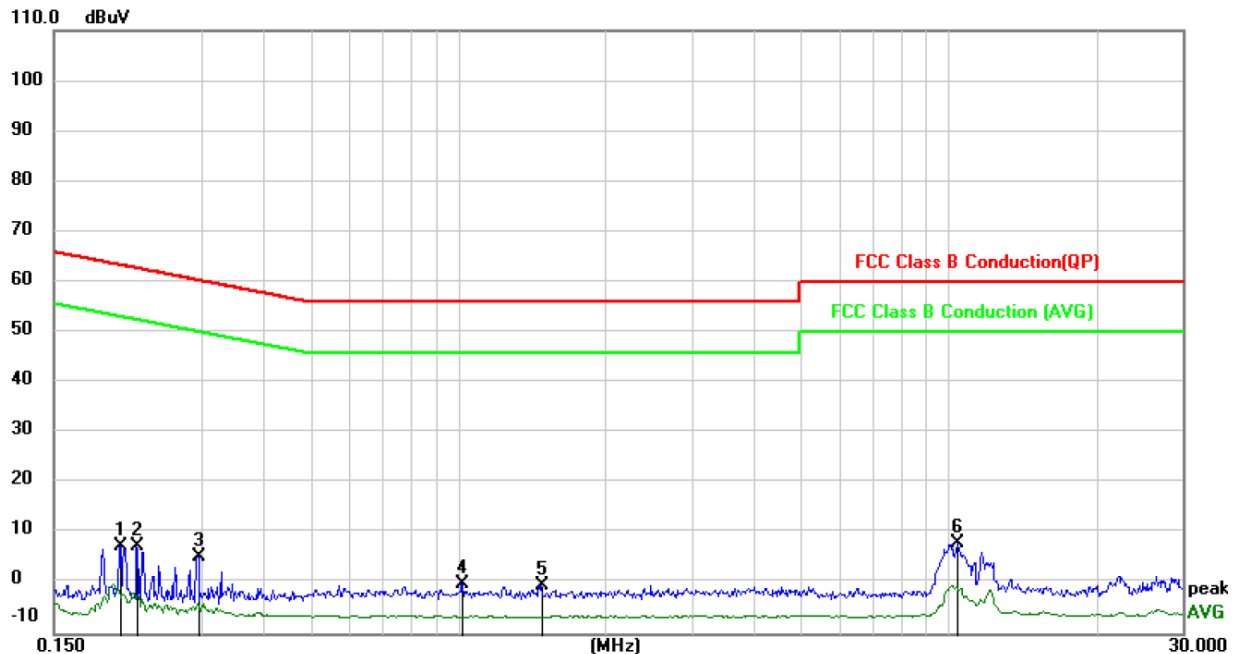
An initial pre-scan was performed on the live and neutral lines.

Quasi-peak or average measurements were performed at the frequency which maximum peak emissions were detected.

Please refer to the attached quasi-peak & average measurement data for reference.



Mode:	Mode 1	Test Date :	2020-06-23
Test Voltage:	DC 12V	Phase :	Ambient

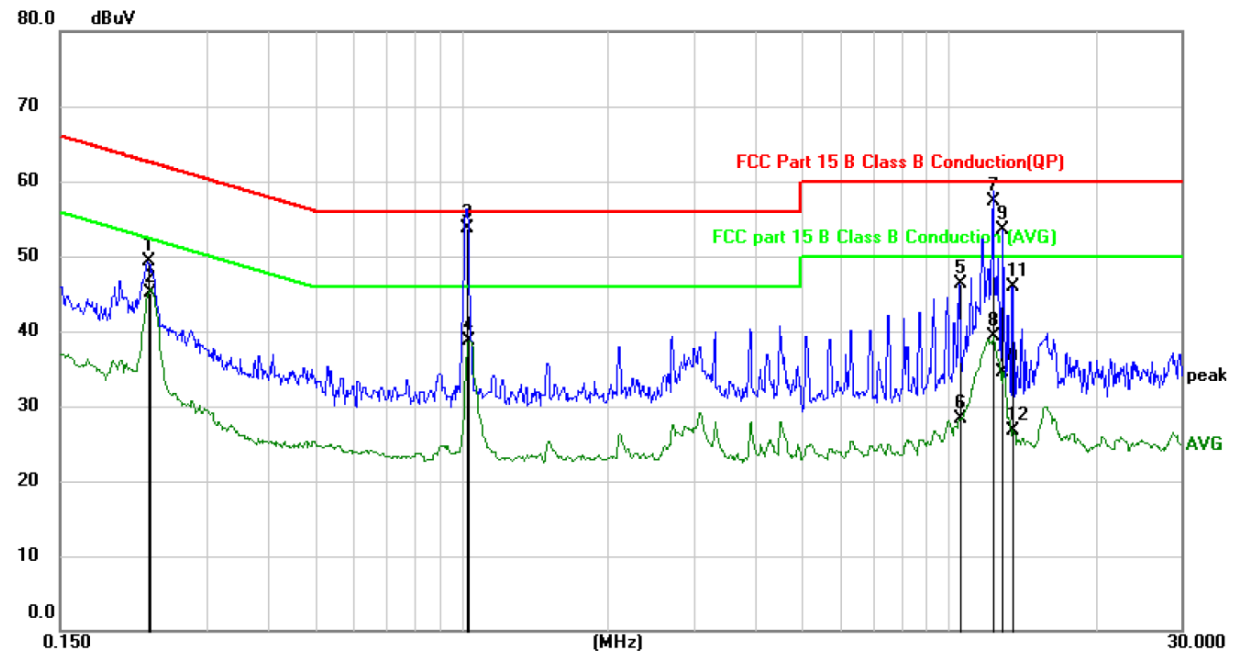


Remark: Factor = LISN factor + Cable Loss + Pulse limiter factor.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Detector
		MHz	dBuV	dB	dBuV	dBuV	dB	
1		0.2042	6.27	1.27	7.54	63.43	-55.89	peak
2		0.2210	6.34	1.26	7.60	62.78	-55.18	peak
3		0.2942	4.12	1.25	5.37	60.40	-55.03	peak
4		1.0175	-0.73	0.90	0.17	56.00	-55.83	peak
5		1.4720	-1.20	0.85	-0.35	56.00	-56.35	peak
6	*	10.3500	7.36	0.85	8.21	60.00	-51.79	peak

*Maximum Data

Mode:	Mode 1	Test Date :	2020-06-23
Test Voltage:	DC 12V	Phase :	Line

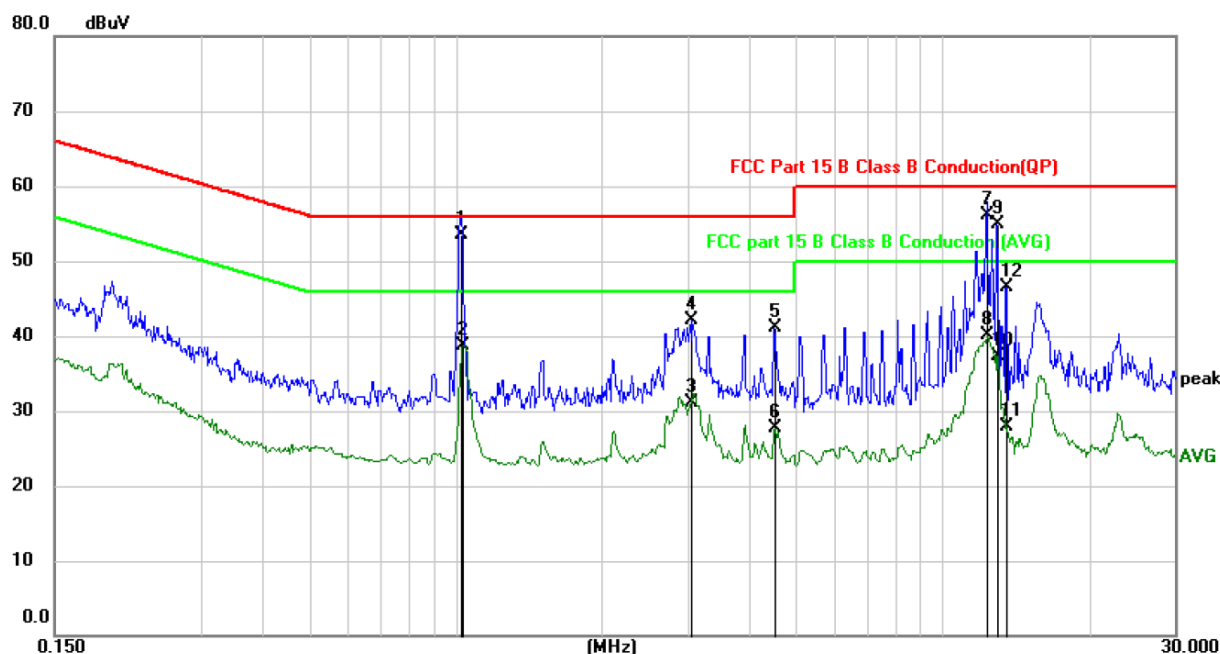


Remark: Factor = LISN factor + Cable Loss + Pulse limiter factor.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.2270	33.81	15.46	49.27	62.56	-13.29	QP
2		0.2280	29.72	15.46	45.18	52.52	-7.34	AVG
3	*	1.0258	38.35	15.40	53.75	56.00	-2.25	QP
4		1.0354	23.37	15.40	38.77	46.00	-7.23	AVG
5		10.5250	30.99	15.35	46.34	60.00	-13.66	QP
6		10.5250	13.04	15.35	28.39	50.00	-21.61	AVG
7		12.2987	41.86	15.35	57.21	60.00	-2.79	QP
8		12.3000	23.89	15.35	39.24	50.00	-10.76	AVG
9		12.9000	38.11	15.35	53.46	60.00	-6.54	QP
10		12.9000	19.18	15.35	34.53	50.00	-15.47	AVG
11		13.5000	30.54	15.34	45.88	60.00	-14.12	QP
12		13.5000	11.44	15.34	26.78	50.00	-23.22	AVG

*Maximum Data

Mode:	Mode 1	Test Date :	2020-06-23
Test Voltage:	DC 12V	Phase :	Neutral

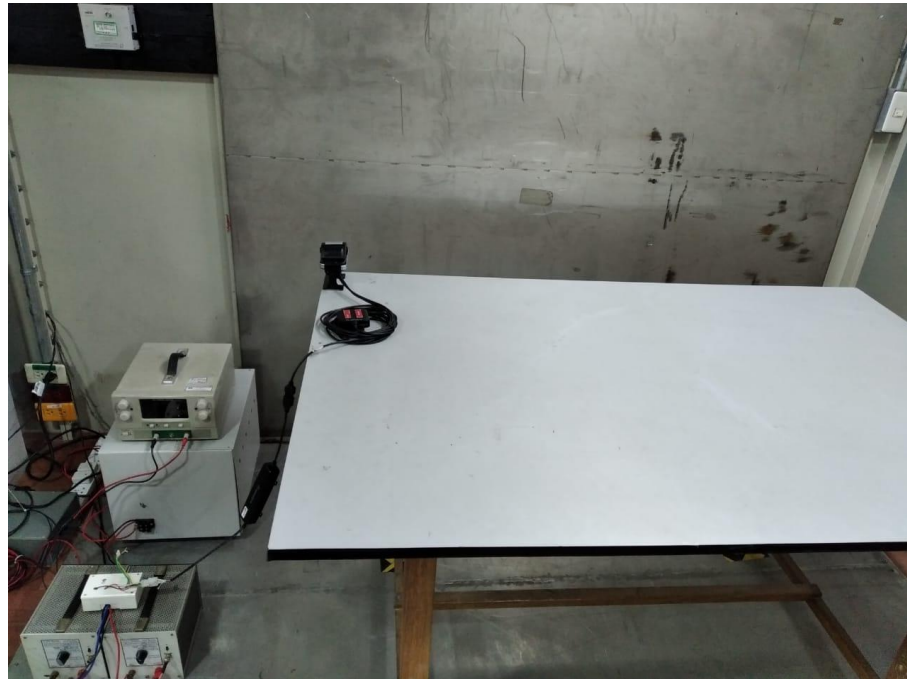


Remark: Factor = LISN factor + Cable Loss + Pulse limiter factor.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	1.0234	38.17	15.40	53.57	56.00	-2.43	QP
2		1.0354	23.38	15.40	38.78	46.00	-7.22	AVG
3		3.0424	15.72	15.41	31.13	46.00	-14.87	AVG
4		3.0425	26.63	15.41	42.04	56.00	-13.96	QP
5		4.5050	25.66	15.41	41.07	56.00	-14.93	QP
6		4.5095	12.29	15.41	27.70	46.00	-18.30	AVG
7		12.2990	40.79	15.35	56.14	60.00	-3.86	QP
8		12.3249	24.78	15.35	40.13	50.00	-9.87	AVG
9		12.9250	39.50	15.35	54.85	60.00	-5.15	QP
10		12.9250	21.88	15.35	37.23	50.00	-12.77	AVG
11		13.5000	12.49	15.34	27.83	50.00	-22.17	AVG
12		13.5250	31.20	15.35	46.55	60.00	-13.45	QP

*Maximum Data

6.1.4 Test Setup photograph



EMT

6.2 Radiated Emission Measurement

Limits of Radiated Emission Measurement (Below 1GHz)

Frequency (MHz)	<input type="checkbox"/> Class A (3m)	<input checked="" type="checkbox"/> Class B (3m)
	Quasi-Peak dB(μ V/m)	Quasi-Peak dB(μ V/m)
30 ~ 88	49.5	40.0
88 ~ 216	54.0	43.5
216 ~ 960	57.0	46.0
Above 960	60.0	54.0

Limits of Radiated Emission Measurement (Above 1GHz)

Frequency (MHz)	<input type="checkbox"/> Class A (3m)		<input checked="" type="checkbox"/> Class B (3m)	
	Peak dB(μ V/m)	Average dB(μ V/m)	Peak dB(μ V/m)	Average dB(μ V/m)
1000~6000	80	60	74	54

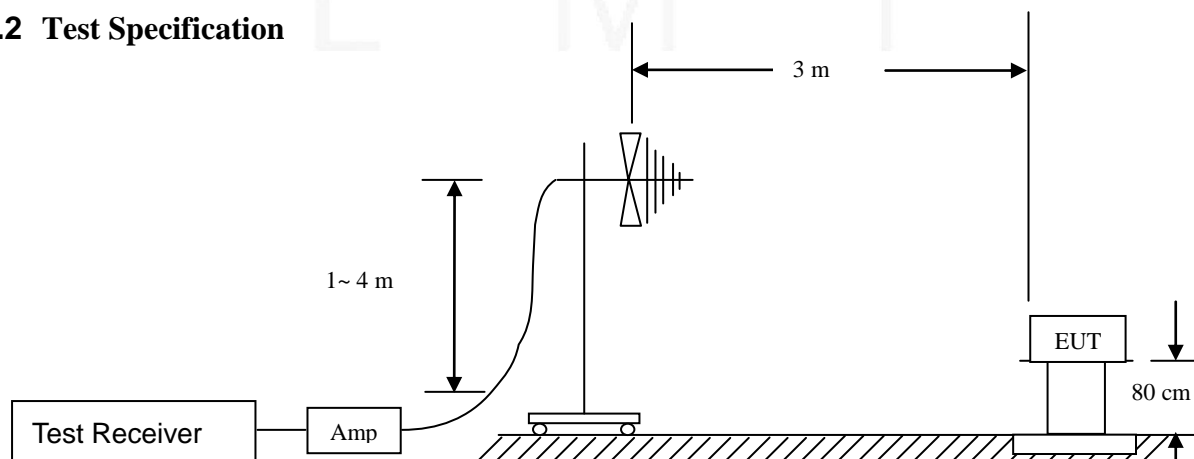
Detector:

Peak for pre-scan (120kHz resolution bandwidth)
Quasi-Peak if maximum peak within 6dB of limit

6.2.1 E.U.T. Operation

Temperature:	24.5°C	Humidity:	51% RH	Atmospheric Pressure:	98.6	Kpa
Test Mode:	Mode 1					

6.2.2 Test Specification



EUT was placed upon a Polyester Fiber top test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn table and move the antenna from 1m to 4m to find the maximum field-strength reading. All peripherals were placed at a distance of 10cm between each other. Both horizontal and vertical antenna polarities were tested.

6.2.3 Measurement Data

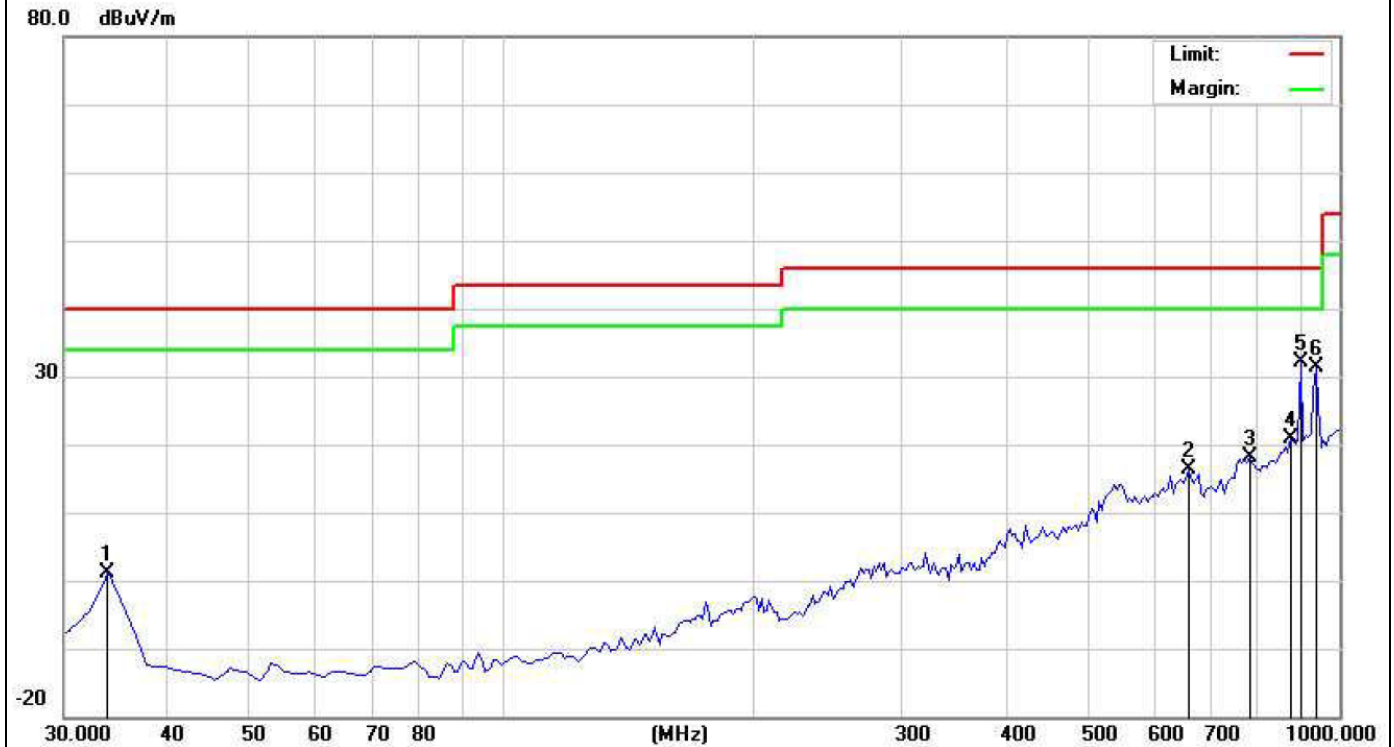
An initial pre-scan was performed in the 3m chamber using the spectrum analyzers in peak detection mode. The EUT was measured by Biolog antenna with 2 orthogonal polarities and peak emissions from the EUT were detected within 6dB of the class B limit line.

The following quasi-peak measurements were performed on the EUT.



Between 30 MHz - 1000 MHz

Test Mode:	Mode 1	Test Date :	2020-06-23
Test Voltage :	DC 12V	Polarization :	Ambient

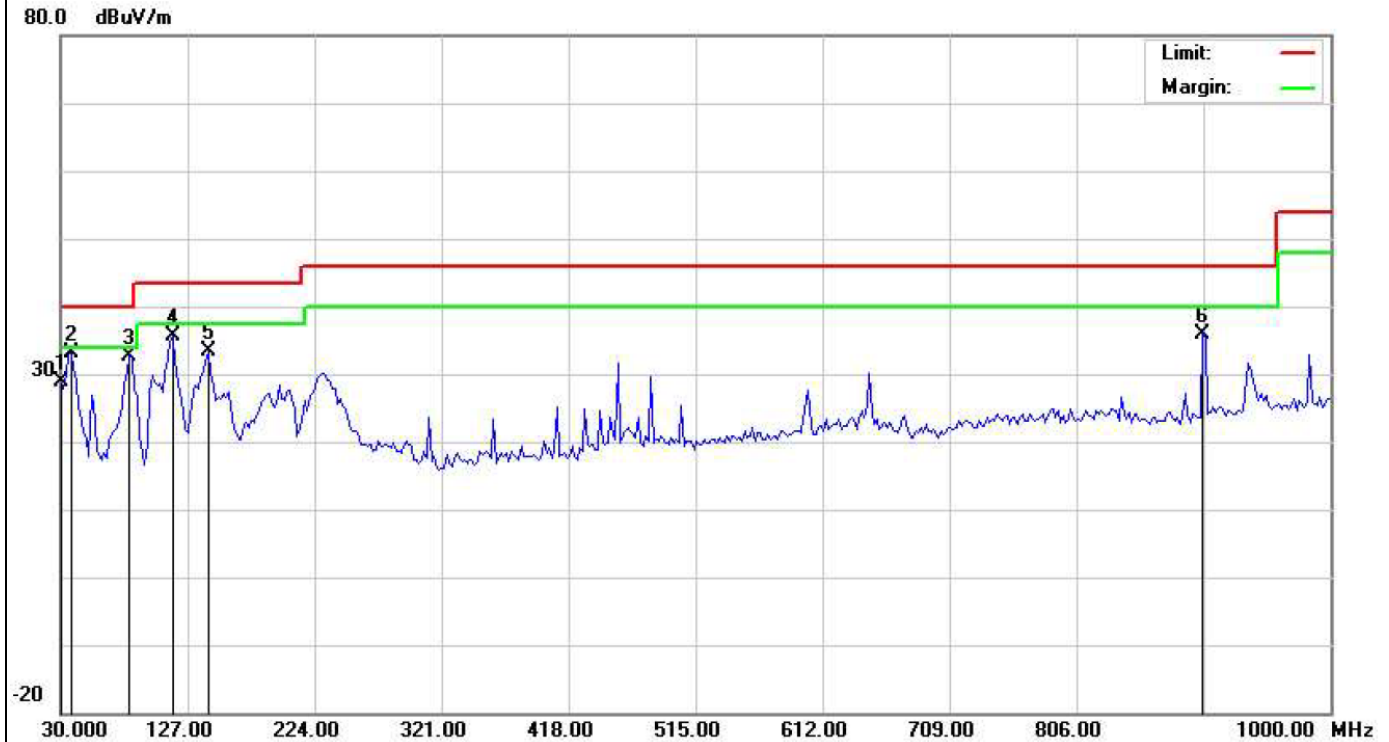


Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		33.8878	16.77	-15.52	1.25	40.00	-38.75	peak
2		661.7635	23.16	-6.75	16.41	46.00	-29.59	peak
3		782.2846	22.88	-4.78	18.10	46.00	-27.90	peak
4		877.5351	25.54	-4.61	20.93	46.00	-25.07	peak
5	*	902.8056	36.60	-4.49	32.11	46.00	-13.89	peak
6		941.6834	34.74	-3.31	31.43	46.00	-14.57	peak

*Maximum Data

Test Mode:	Mode 1	Test Date :	2020-06-23
Test Voltage :	DC 12V	Polarization :	Vertical



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		30.0000	57.07	-28.29	28.78	40.00	-11.22	peak
2	*	37.7756	64.88	-31.64	33.24	40.00	-6.76	peak
3		82.4850	62.28	-29.63	32.65	40.00	-7.35	peak
4		115.5311	60.23	-24.50	35.73	43.50	-7.77	peak
5		142.7455	55.95	-22.65	33.30	43.50	-10.20	peak
6		902.8056	41.29	-5.29	36.00	46.00	-10.00	peak

*Maximum Data

Test Mode:	Mode 1	Test Date :	2020-06-23
Test Voltage:	DC 12V	Polarization :	Horizontal



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

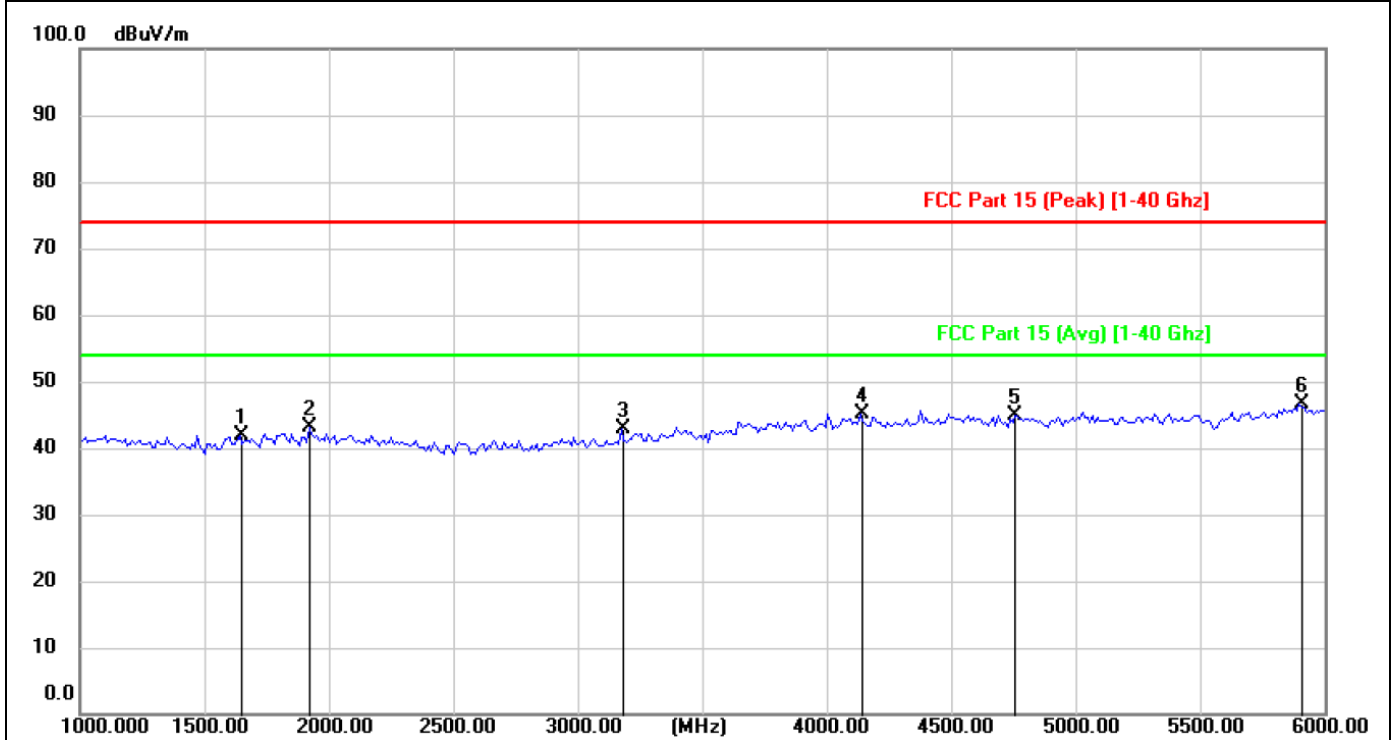
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		35.8316	62.25	-30.79	31.46	40.00	-8.54	peak
2		84.4289	63.00	-29.19	33.81	40.00	-6.19	peak
3	!	101.9238	65.44	-25.68	39.76	43.50	-3.74	peak
4	*	115.5311	64.92	-24.50	40.42	43.50	-3.08	peak
5		133.0261	60.27	-23.25	37.02	43.50	-6.48	peak
6		144.6894	58.26	-22.51	35.75	43.50	-7.75	peak

*Maximum Data

!Above Margin

Between 1000 MHz - 6000 MHz

Test Mode:	Mode 1	Test Date :	2020-06-25
Test Voltage :	DC 12V	Polarization :	Vertical

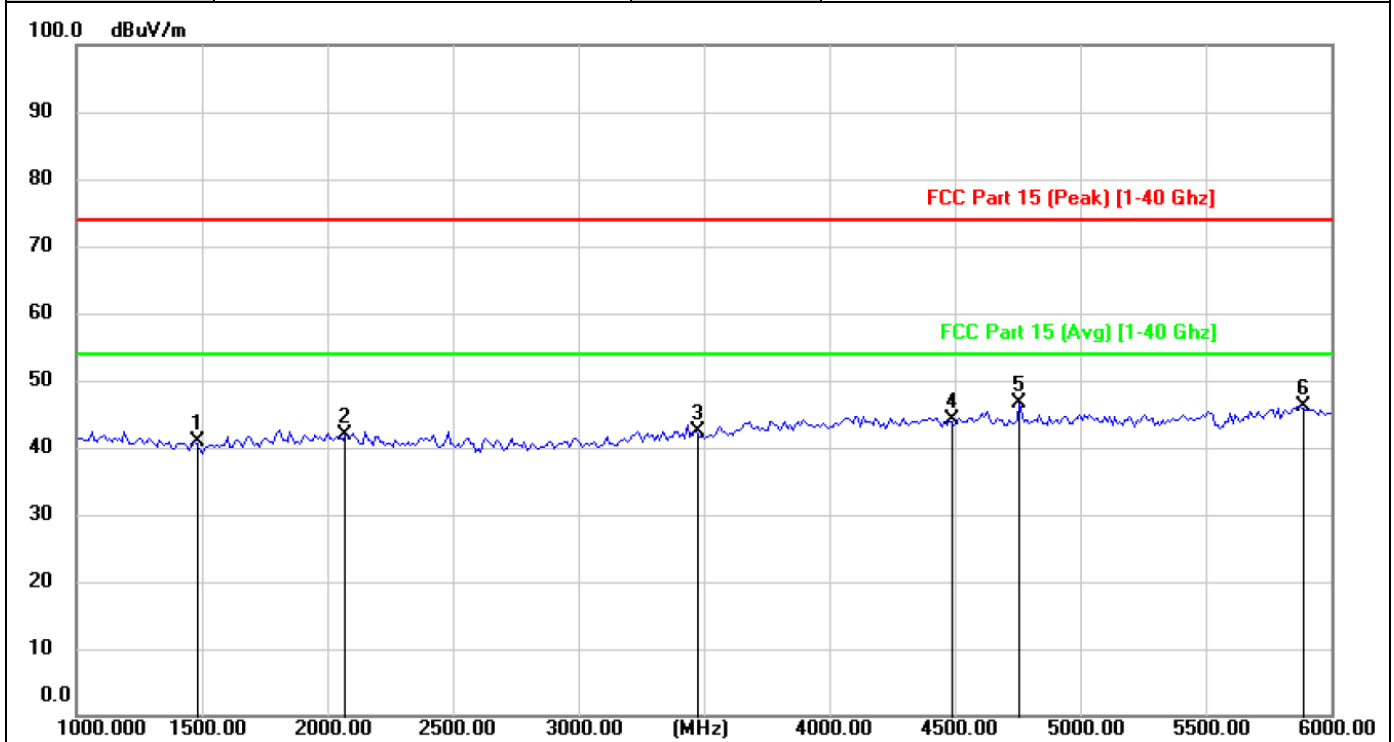


Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		1641.283	35.28	6.57	41.85	74.00	-32.15	peak
2		1921.843	36.55	6.61	43.16	74.00	-30.84	peak
3		3174.349	37.75	5.06	42.81	74.00	-31.19	peak
4		4136.273	37.61	7.49	45.10	74.00	-28.90	peak
5		4757.515	37.17	7.67	44.84	74.00	-29.16	peak
6	*	5899.800	37.28	9.34	46.62	74.00	-27.38	peak

*Maximum Data

Test Mode:	Mode 1	Test Date :	2020-06-25
Test Voltage:	DC 12V	Polarization :	Horizontal



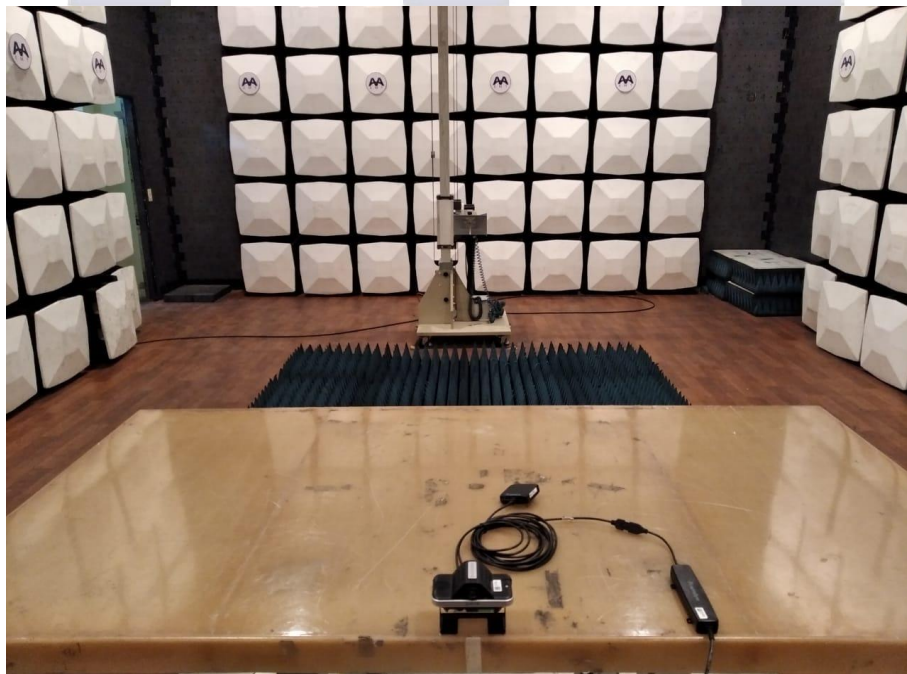
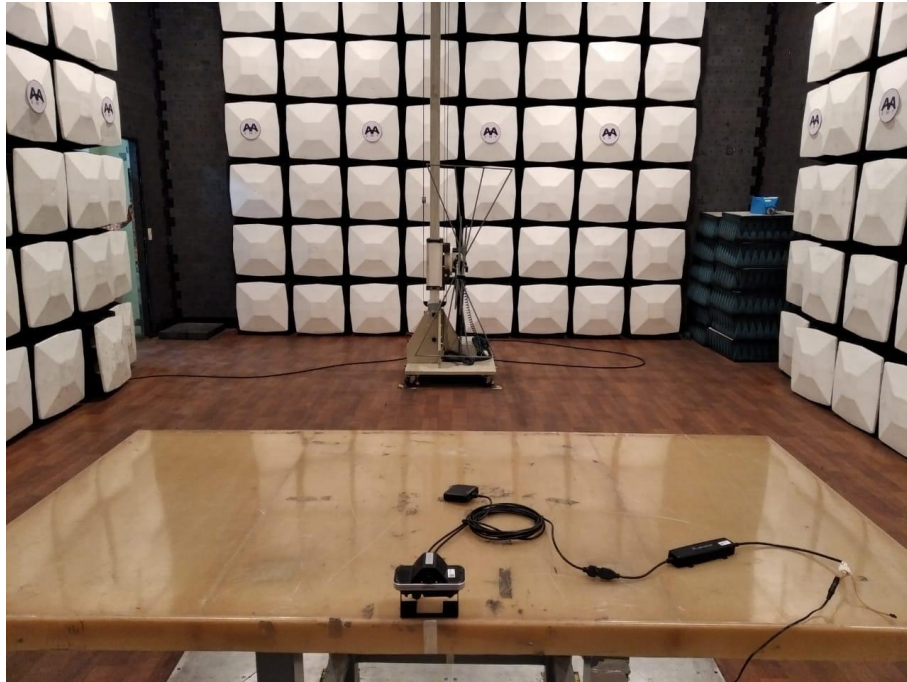
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		1470.942	34.11	6.73	40.84	74.00	-33.16	peak
2		2072.144	35.58	6.28	41.86	74.00	-32.14	peak
3		3464.930	36.51	5.93	42.44	74.00	-31.56	peak
4		4476.954	36.44	7.59	44.03	74.00	-29.97	peak
5	*	4757.515	38.91	7.67	46.58	74.00	-27.42	peak
6		5879.760	36.79	9.28	46.07	74.00	-27.93	peak

*Maximum Data

!Above Margin

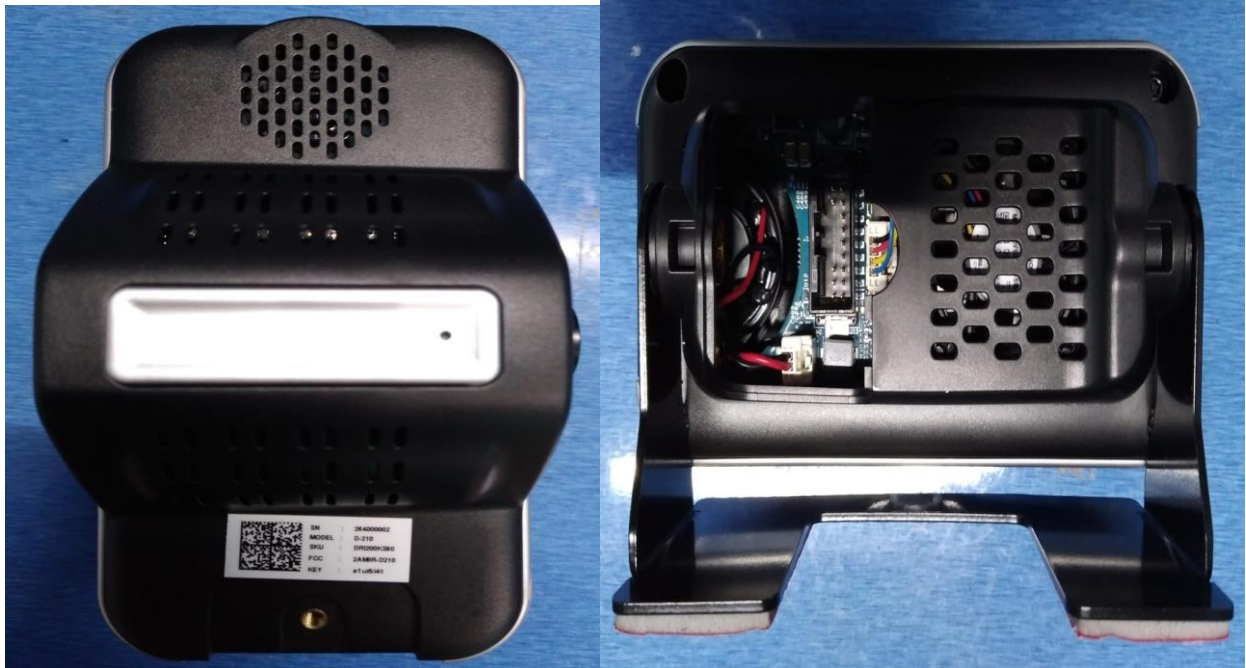
6.2.4 Test Setup photograph



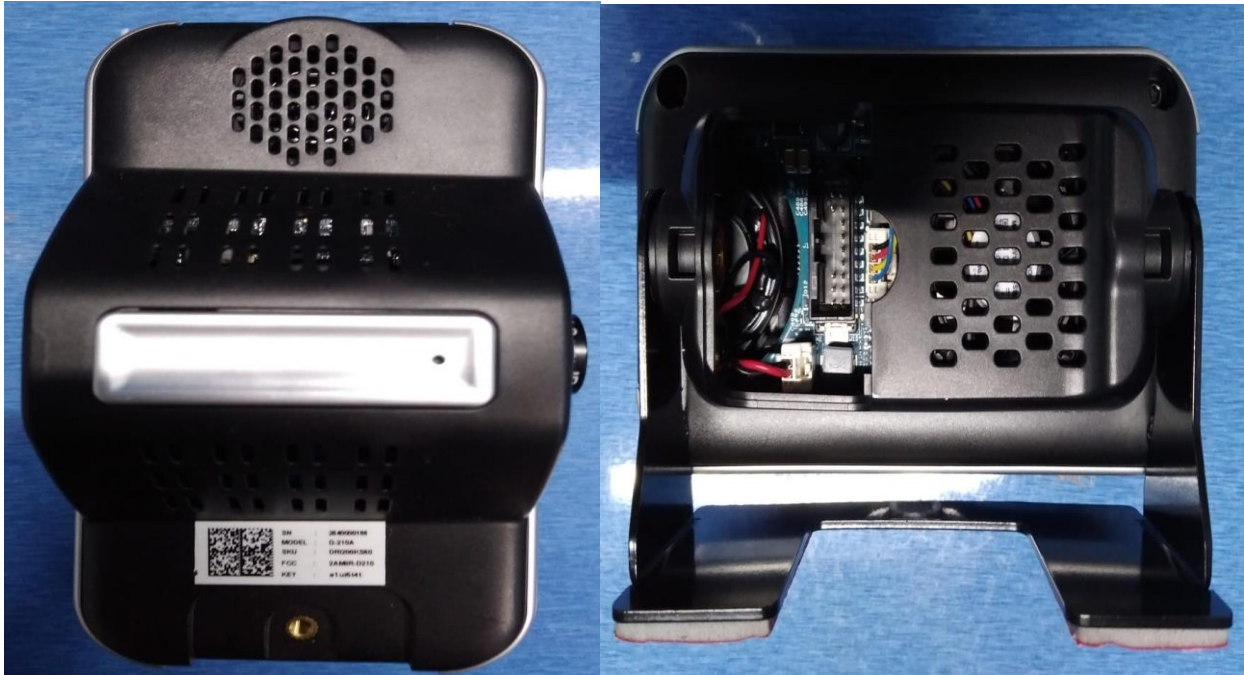
7 Appendix

7.1 EUT Photographs

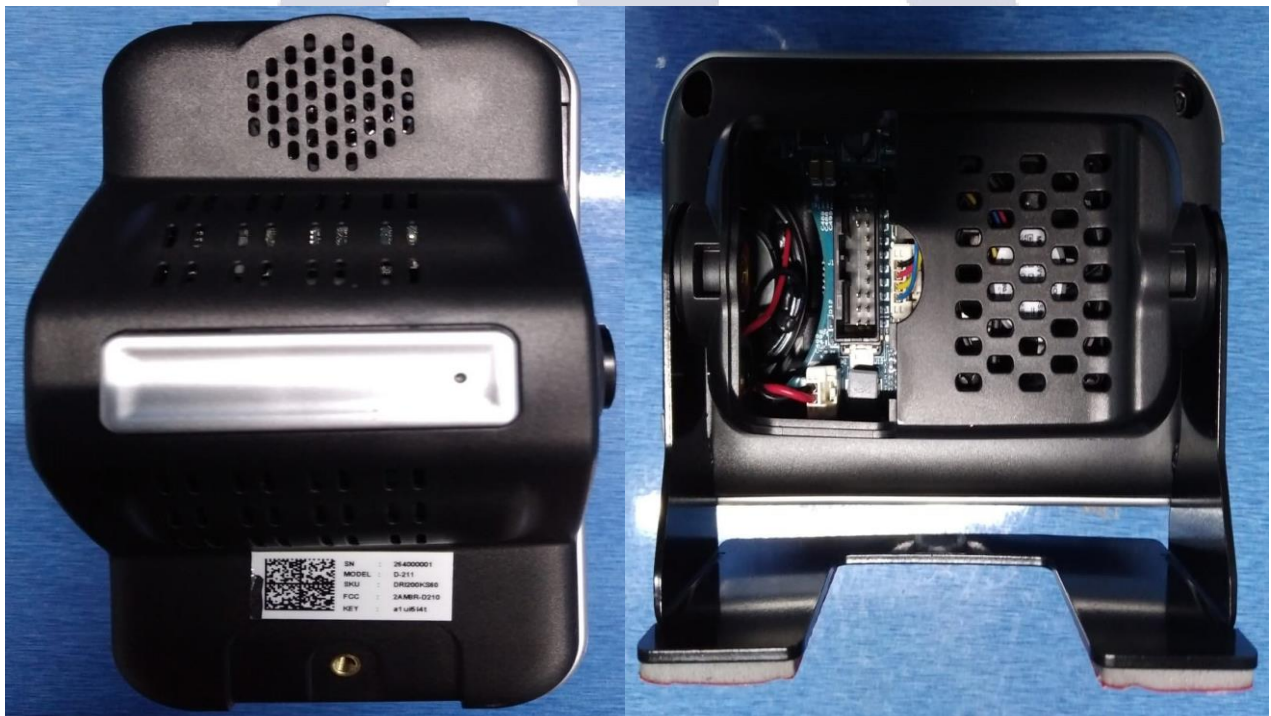
7.1.1 Main Model (D-210)



7.1.2 Serial Model 1 (D-210A)



7.1.3 Serial Model 2 (D-211)



7.2 Accessories Photographs

7.2.1 CAN Adapter AD01

Front



Back



7.2.2 CAN Adapter AD02

Front



Back



7.2.3 CAN Adapter AD03

Front



Back



7.2.4 LTE Modules

Front



LTE Module



****END OF REPORT****