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-215

Derivative model No.: N/A

Brand Name: netradyne

Applied Standard:

FCC Part15-B:2014

Laboratory Details:

AA Electro Magnetic Test Laboratory Private Limited

Plot No174, Udyog Vihar-Phase4, Sector18, Gurgaon, Haryana, India

Date of Receipt: Sep. 01, 2021

Date of Test: Sep. 01~Sep. 3, 2021

Date of Issue: Oct. 22, 2021

Test Result: **In Compliance/Pass**

Declaration of Conformity: Declaration of conformity of the results is based as per the standard limits

This device has been tested and found to comply with the stated standard(s) and indicated in the test report and are applicable only to the tested sample identified in the report.

Note: This report shall not be reproduced except in full, without the written approval of AA Electro Magnetic Test Laboratory Private Limited, this document may be altered or revised by AA Electro Magnetic Test Laboratory Private Limited, personal only, and shall be noted in the revision of the document. This test report must not be used by the client to claim product endorsement.

Prepared By: (+ signature) Abhinav Kumar

Reviewed & Approved by: (+ signature)

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

Plot No.174, Udyog Vihar Phase 4, Sector -18, Gurgaon -122016, Haryana, India
Contact:0124-4235350, 4145343; e-mail: info @aaemtlabs.com; Website: www.aaemtlabs.com

1 Contents

Plot No.174, Udyog Vihar Phase 4, Sector -18, Gurgaon -122016, Haryana, India
Contact:0124-4235350, 4145343; e-mail: info @aaemtlabs.com; Website: www.aaemtlabs.com

2 Test Summary

Test	Test Requirement	Test Method	Criterion	Result
Conducted Emission 150kHz to 30MHz	FCC Part15-B:2014	ANSI C63.4	Limits Class B	**PASS**
Radiated Emissions 30MHz to 6GHz	FCC Part15-B:2014	ANSI C63.4	Limits Class B	**PASS**

N/A is an abbreviation for Not Applicable.

Model description: D-215 : Intelligent Driver Monitoring System Smart Dash-cam

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 though a Power cable. The device is capable to connect with the OBDII/J1939 of the vehicle to collect the engine data.

Changes from Previous design: N/A

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.

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2.1 Measurement Uncertainty

The report uncertainty of measurement **y** ± **U**, where expended 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	2.96 dB
2	Radiated Emission Test	30MHz~1GHz	3.94 dB
3	Radiated Emission Test	1GHz~6GHz	3.78 dB

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3 Test Facility

The test facility is recognized, certified or accredited by the following organizations:

ILAC / NABL Accreditation No.: TC-8597

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by National Accreditation Board for Testing and Calibration Laboratories (NABL).

ILAC –A2LA Accreditation No.: 5593.01

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered American Association of Laboratory Accreditation (A2LA.)

FCC- Recognition No.: 137777

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Federal Communications Commission (FCC).

ISED Recognition No.: 26046

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Institute for Social and Economic Development.(ISED)

VCCI- Registration No: 4053

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Voluntary Control Council for Interference.(VCCI)

TEC Designation No.: IND063

Three 3m Semi-Anechoic Chamber, 1 full-Anechoic chamber and 2 Shielding Rooms of AA Electro Magnetic Test Laboratory Private Limited have been registered by Telecommunication Engineering (TEC) Center.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

None

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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-215
Serial Number:	661000045
Brand Name:	netradyne
H/W No.:	501-1-01549 A2
S/W No.:	4.5.8.rc.1
Power Supply Range:	Input : 12VDC, 3A
Battery:	N/A

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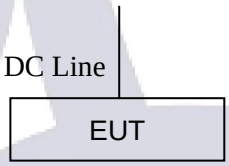
4.2 EUT Test Mode

Mode 1	The EUT in full transmission mode.

4.3 Description of Test setup

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

1. Block diagram of EUT configuration
Config 1: 

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4.4 Test Peripheral List

No.	Equipment	Manufacturer	EMC Compliance	Model No.	Serial No.	Power cord	signal cable
1	DC Power Supply	JUNKE	N/A	JK15040K	20181126-43	2m Unshielded Cable	N/A

4.5 EUT Peripheral List

No.	Equipment	Manufacturer	FCC ID	Model No.	Serial No.	Power cord	signal cable
1.	Power Adaptor	Netradyne Inc.	N/A	D-210-AD3	N/A	1m Unshielded Cable	N/A

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5 Equipments List for All Test Items

☒ 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	2020/12/11	2022/12/10
2	Loop antenna	DA ZE Beijing	ZN30900C	18052	2020/01/29	2022/01/28
3	Horn antenna	DA ZE Beijing	ZN30701	18012	2020/01/30	2022/01/29
4	Horn antenna	DA ZE Beijing	ZN30702	18006	2020/01/30	2022/01/29
5	Horn antenna	DA ZE Beijing	ZN30703	18005	2020/01/30	2022/01/29
6	Pre Amplifier	KELIANDA	LNA-0009295	-	2020/01/28	2022/01/27
7	Pre Amplifier	KELIANDA	CF-00218	-	2020/01/28	2022/01/27
8	Bi conical Antenna	DA ZE Beijing	ZN30505C	17038	2020/01/28	2022/01/27

☒ Conduction Test equipment						
No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	EMI-RECEIVER	Schwarzbeck	FCKL	1528194	2021/01/13	2022/01/13
2	Spectrum Analyzer	ADVANTEST	R3361	-	2021/01/13	2022/01/13
4	LISN	Kyoritsu	KNW-407	8-1789-5	2021/01/13	2022/01/13
5	Network – LISN	Schwarzbeck	NNBM8125	81251314	2021/01/13	2022/01/13
6	Network – LISN	Schwarzbeck	NNBM8125	81251315	2021/01/13	2022/01/13
7	ISN	Schwarzbeck	ISN T8 CAT5	CATS-8158#225	2021/01/13	2022/01/13
8	ISN	Schwarzbeck	ISN T8 CAT6	NTFM8158#184	2021/01/13	2022/01/13
9	ISN	Schwarzbeck	ISN T8 CAT3	CAT3-8158#120	2021/01/13	2022/01/13
10	PULSE LIMITER	Rohde and schwarz	ESH3-Z2	100681	2021/05/12	2022/05/11
11	50Ω Coaxial Switch	DAIWA	1565157	-	2021/05/12	2022/05/11
12	50Ω Coaxial Switch	-	-	-	2021/05/12	2022/05/11

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6 Emission Test Results

6.1 Mains Terminals Disturbance Voltage Measurement

Limits for AC mains Port :

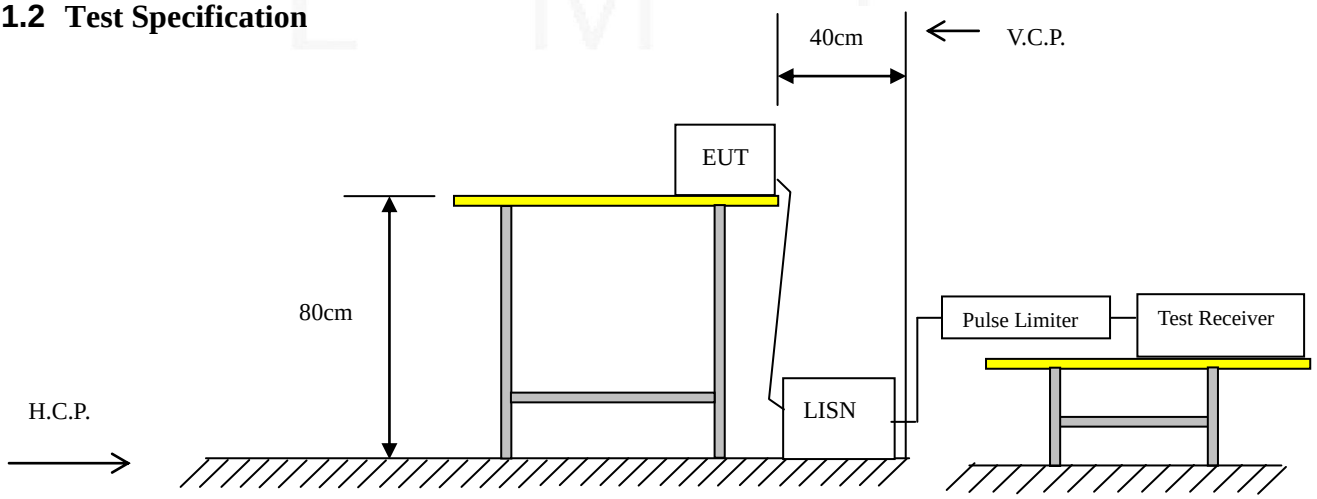
Frequency (MHz)	☐ Class A (dBµV)		☒ Class B (dBµV)	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 ~ 0.50	79	66	66 to 56	56 to 46
0.50 ~ 5.0	3	60	56	46
5.0 ~ 30	73	60	60	50

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.

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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.

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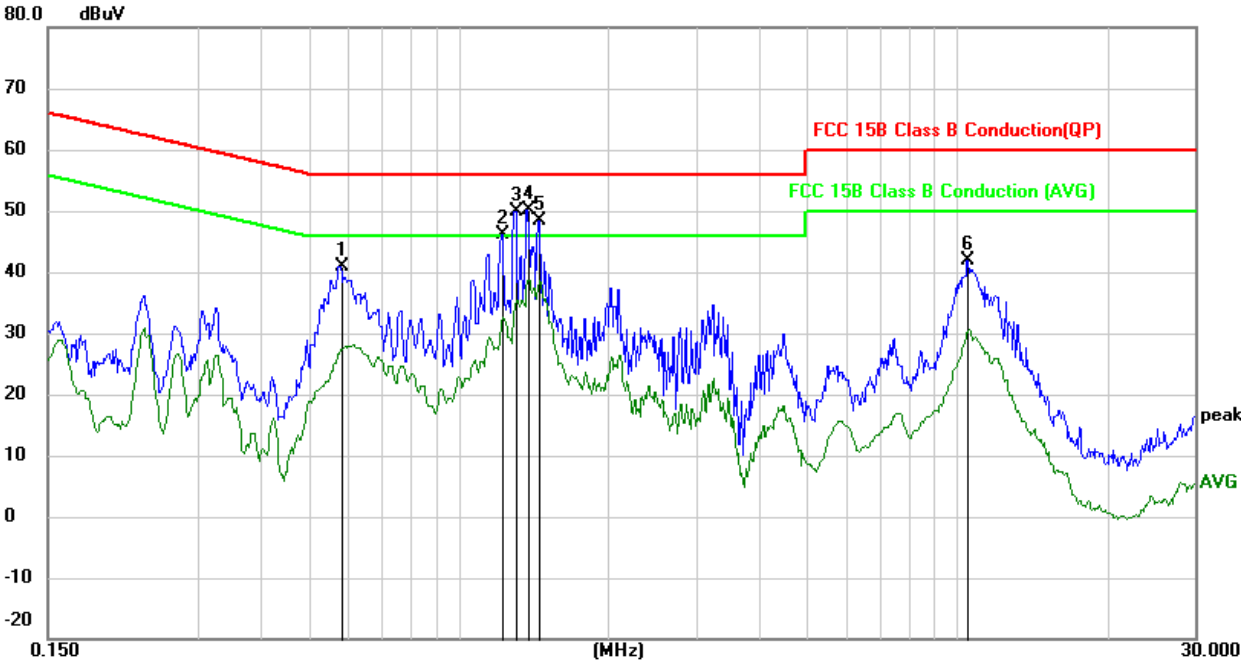
Mode:	Mode 1	Test Date :	2021-09-03
Test Voltage:	DC 12V	Phase :	+ve



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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.5810	40.78	0.14	40.92	56.00	-15.08	peak
2		1.2200	46.04	0.17	46.21	56.00	-9.79	peak
3		1.3055	49.63	0.17	49.80	56.00	-6.20	peak
4	*	1.3775	49.97	0.17	50.14	56.00	-5.86	peak
5		1.4495	48.17	0.17	48.34	56.00	-7.66	peak
6		10.4750	41.60	0.24	41.84	60.00	-18.16	peak

*Maximum Data

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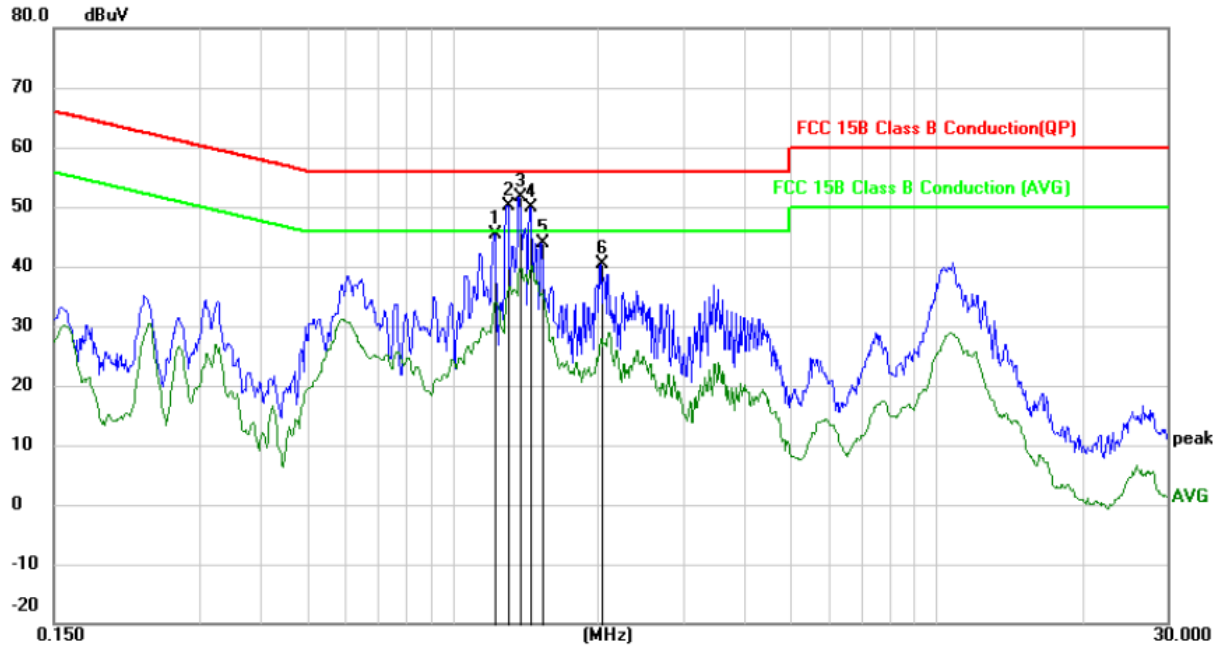
Report No: AAEMT/EMC/210901-01-01

Mode:	Mode 1	Test Date :	2021-09-03
Test Voltage:	DC 12V	Phase :	-ve



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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		1.2245	45.21	0.17	45.38	56.00	-10.62	peak
2		1.2965	50.03	0.17	50.20	56.00	-5.80	peak
3	*	1.3775	51.48	0.17	51.65	56.00	-4.35	peak
4		1.4495	49.65	0.17	49.82	56.00	-6.18	peak
5		1.5305	43.66	0.18	43.84	56.00	-12.16	peak
6		2.0255	40.10	0.18	40.28	56.00	-15.72	peak

*Maximum Data

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6.1.4 Test Setup photograph

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6.2 Radiated Emission Measurement

Limits of Radiated Emission Measurement (Below 1GHz)

Frequency (MHz)	☐ Class A (3m)	☒ Class B (3m)
	Quasi-Peak dB(μV/m)	Quasi-Peak dB(μV/m)
30 8	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)	☐ Class A (3m)		☒ Class B (3m)	
	Peak dB(μV/m)	Average dB(μV/m)	Peak dB(μV/m)	Average dB(μV/m)
1000~18000	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:	24.7°C	Humidity:	53% RH	Atmospheric Pressure:	98.8	Kpa
Test Mode:	Mode 1					

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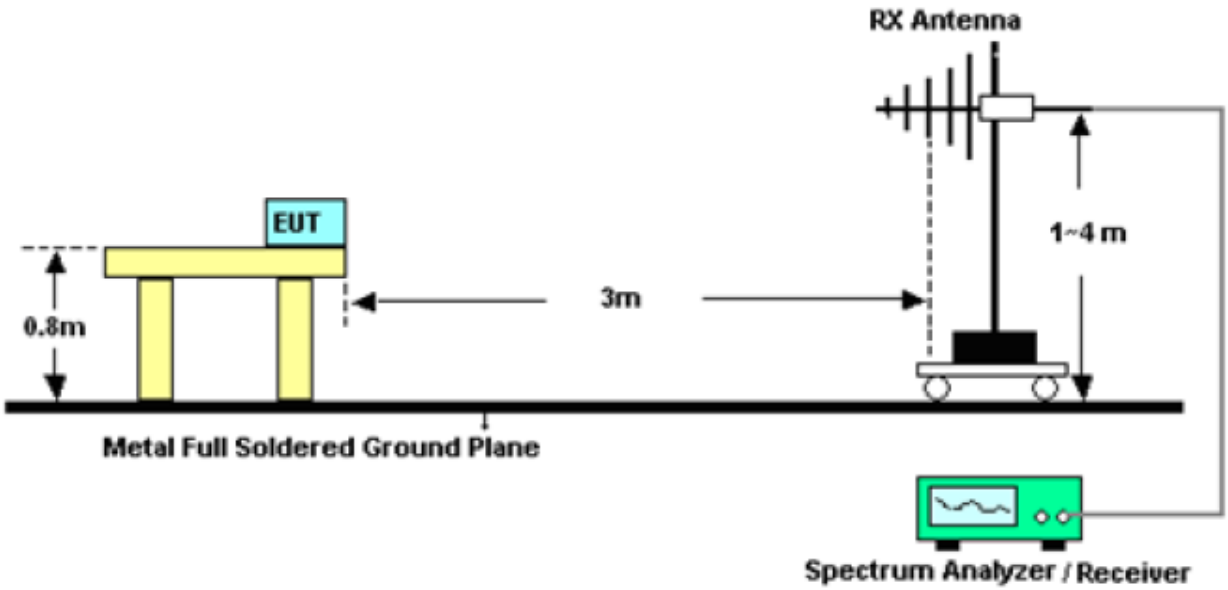
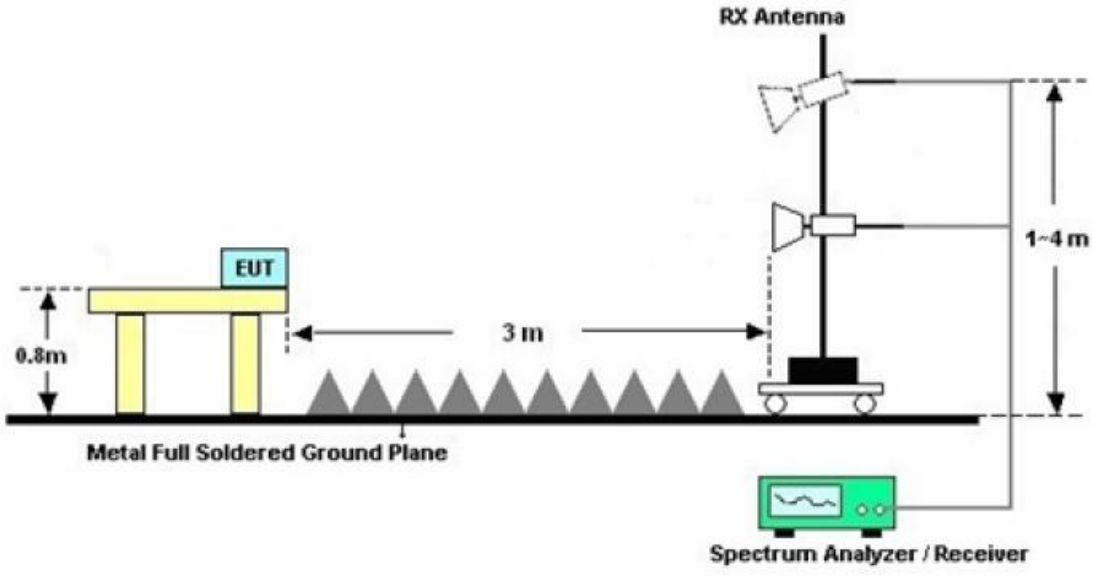
6.2.2 Test Specification

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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.

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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.

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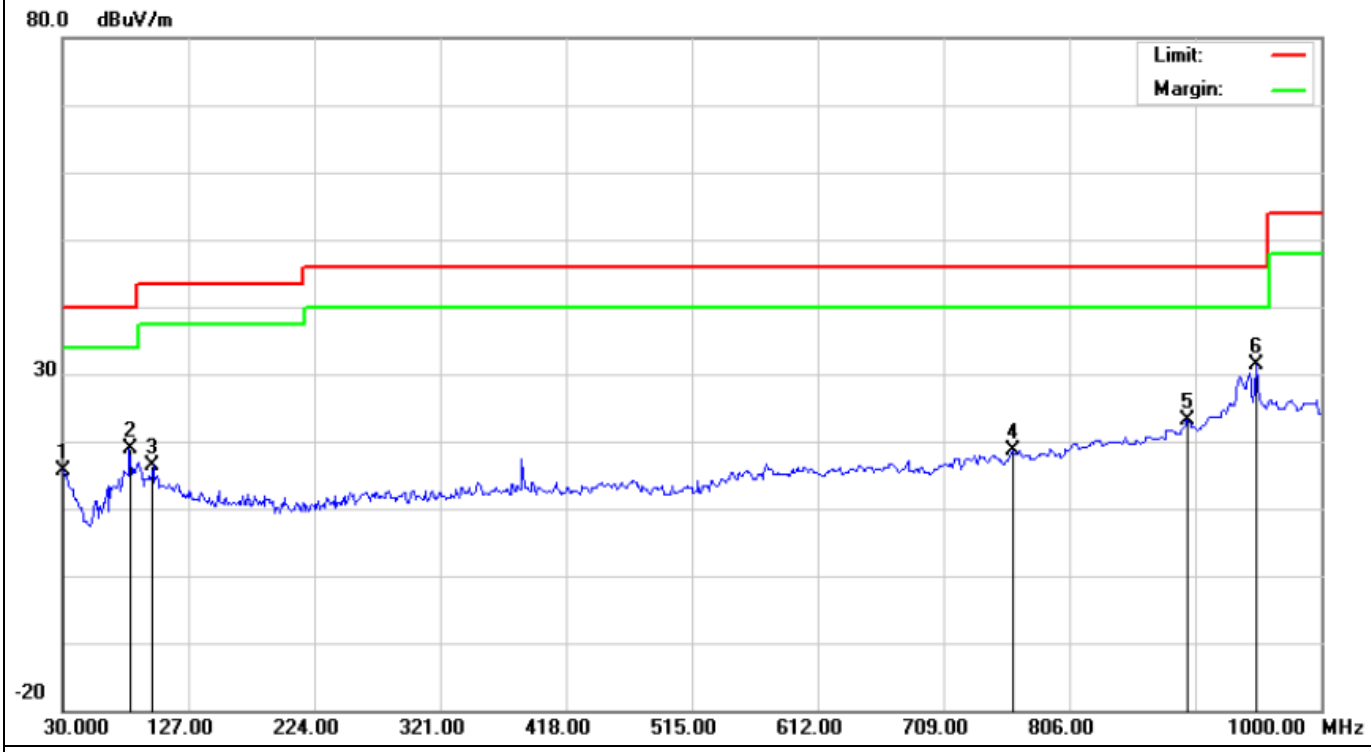
Report No: AAEMT/EMC/210901-01-01

Between 30 MHz - 1000 MHz

Test Mode:	Mode 1	Test Date :	2021-09-03
Test Voltage :	DC 12V	Polarization :	Vertical



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		30.0000	18.17	-2.42	15.75	40.00	-24.25	QP
2		82.3799	24.51	-5.75	18.76	40.00	-21.24	QP
3		99.8399	17.61	-1.34	16.27	43.50	-27.23	QP
4		762.3500	15.52	3.17	18.69	46.00	-27.31	QP
5		897.1798	15.66	7.45	23.11	46.00	-22.89	QP
6	*	950.5298	21.19	10.25	31.44	46.00	-14.56	QP

*Maximum Data

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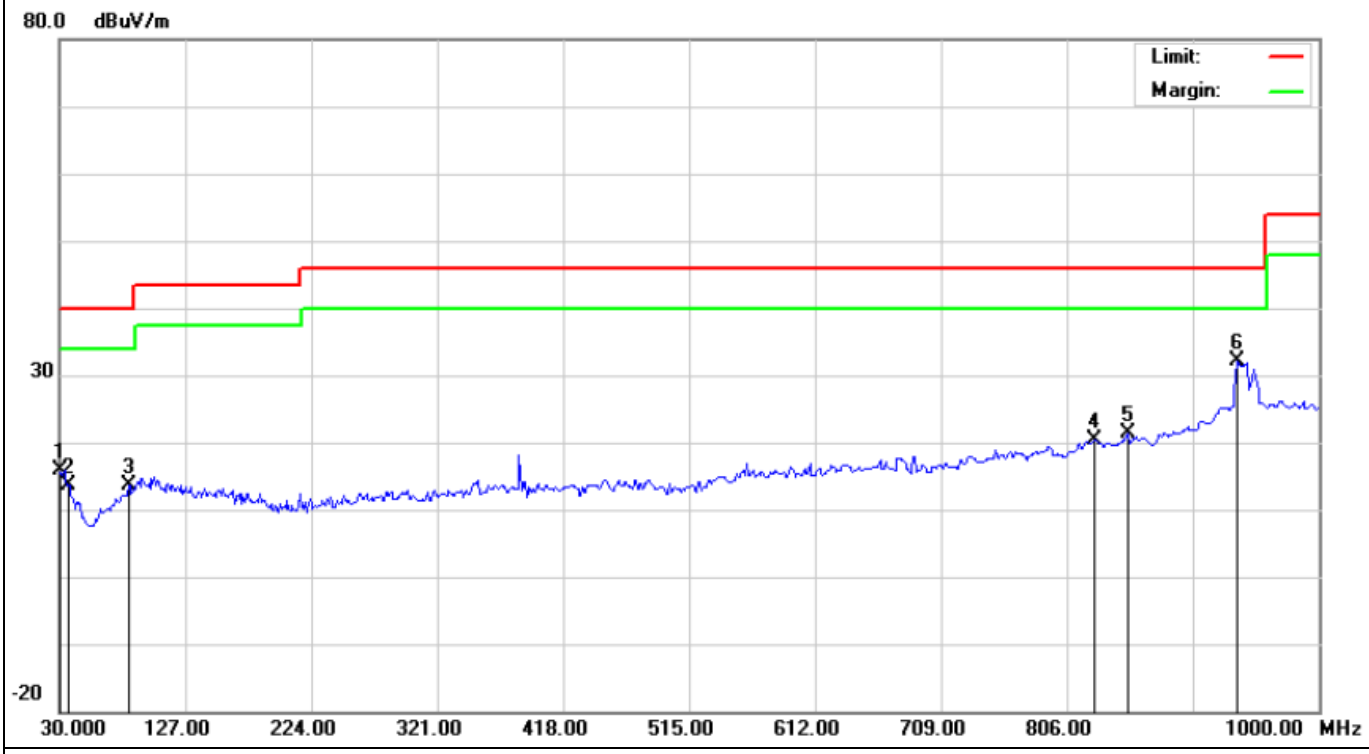
Test Mode:	Mode 1	Test Date :	2021-09-03
Test Voltage:	DC 12V	Polarization :	Horizontal



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		30.0000	18.12	-2.12	16.00	40.00	-24.00	QP
2		37.7599	22.88	-9.18	13.70	40.00	-26.30	QP
3		84.3198	19.00	-5.34	13.66	40.00	-26.34	QP
4		827.3400	15.34	5.08	20.42	46.00	-25.58	QP
5		853.5298	15.38	5.97	21.35	46.00	-24.65	QP
6	*	936.9500	22.03	10.03	32.06	46.00	-13.94	QP

*Maximum Data

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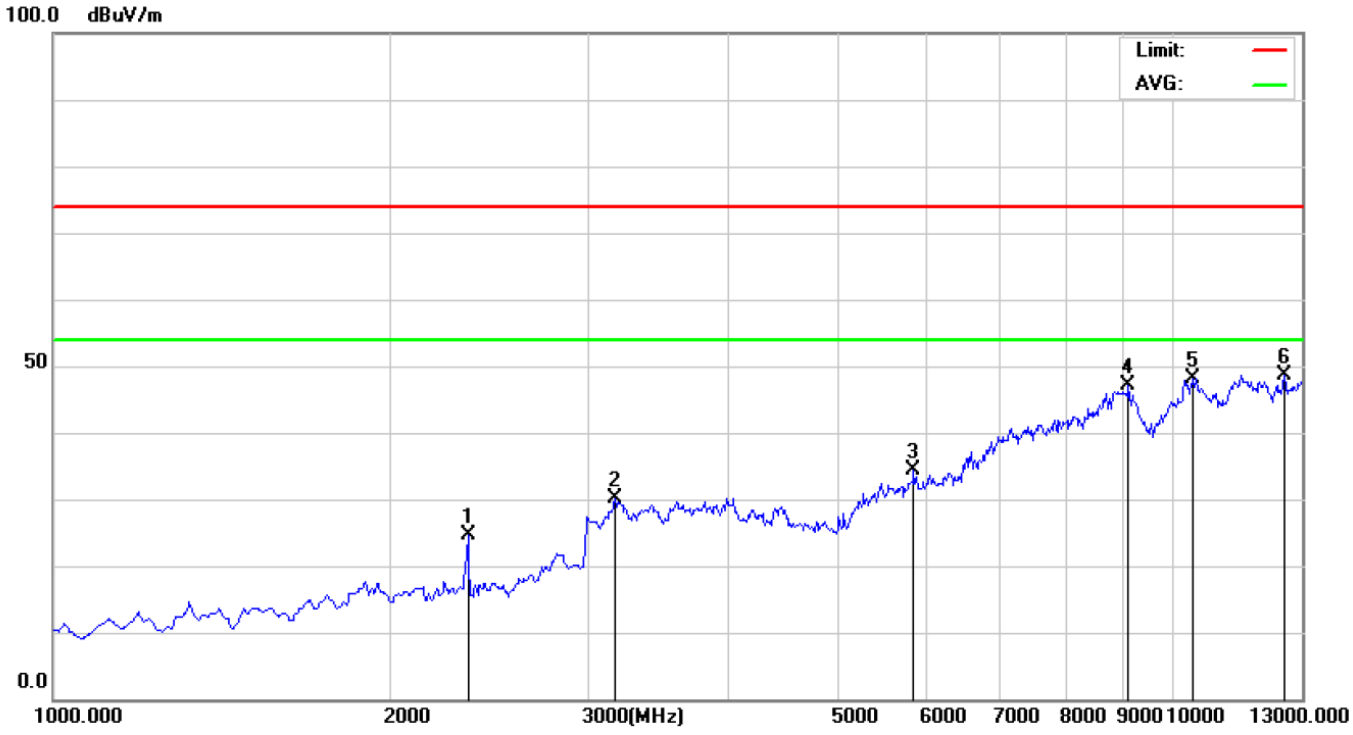
Report No: AAEMT/EMC/210901-01-01

Between 1000 MHz - 6000 MHz

Test Mode:	Mode 1	Test Date :	2021-09-03
Test Voltage :	DC 12V	Polarization :	Vertical



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		2344.000	32.58	-7.99	24.59	74.00	-49.41	peak
2		3172.000	35.51	-5.46	30.05	74.00	-43.95	peak
3		5860.000	33.72	0.72	34.44	74.00	-39.56	peak
4		9124.000	34.32	12.79	47.11	74.00	-26.89	peak
5		10420.00	34.82	13.22	48.04	74.00	-25.96	peak
6	*	12544.00	36.13	12.39	48.52	74.00	-25.48	peak

*Maximum Data

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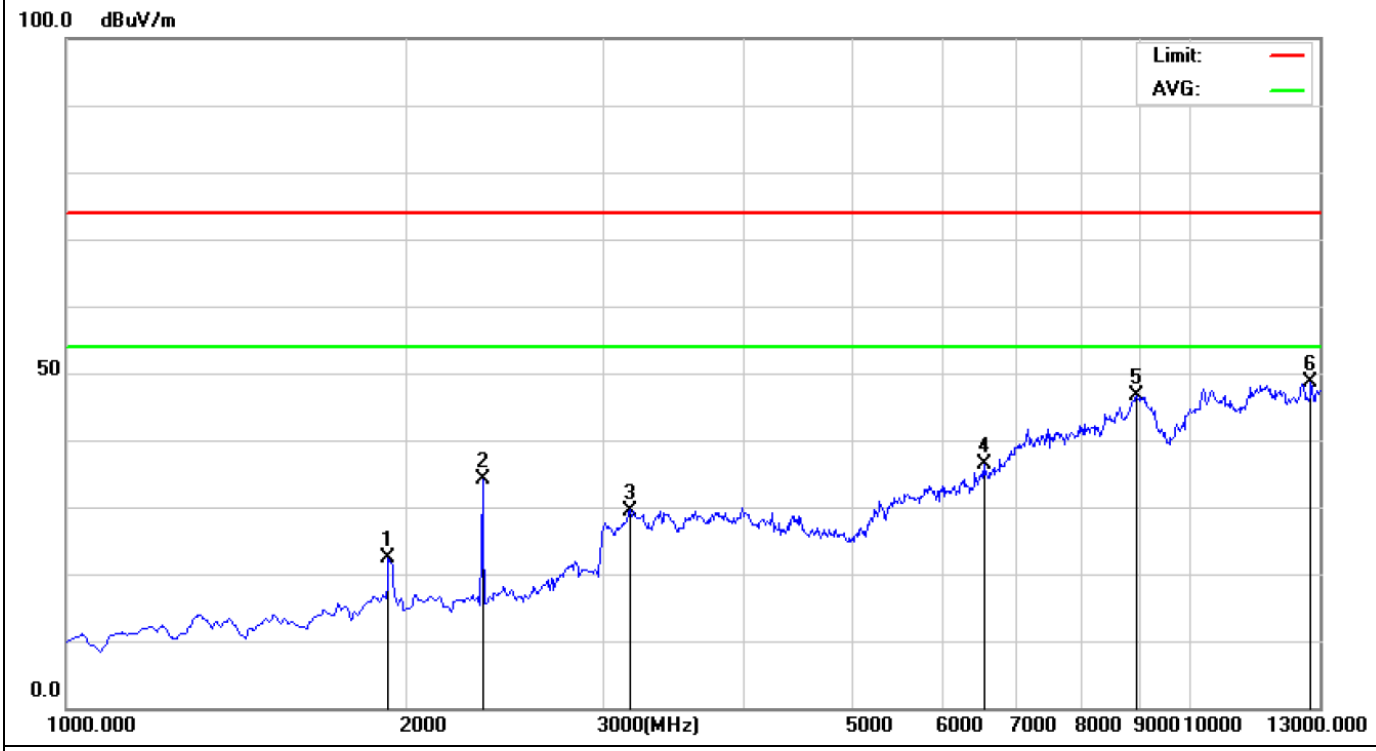
Test Mode:	Mode 1	Test Date :	2021-09-03
Test Voltage:	DC 12V	Polarization :	Horizontal



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		1936.000	32.28	-9.88	22.40	74.00	-51.60	peak
2		2344.000	42.03	-7.99	34.04	74.00	-39.96	peak
3		3172.000	34.96	-5.46	29.50	74.00	-44.50	peak
4		6544.000	33.45	2.90	36.35	74.00	-37.65	peak
5		8944.000	32.54	14.07	46.61	74.00	-27.39	peak
6	*	12772.00	35.52	12.99	48.51	74.00	-25.49	peak

*Maximum Data

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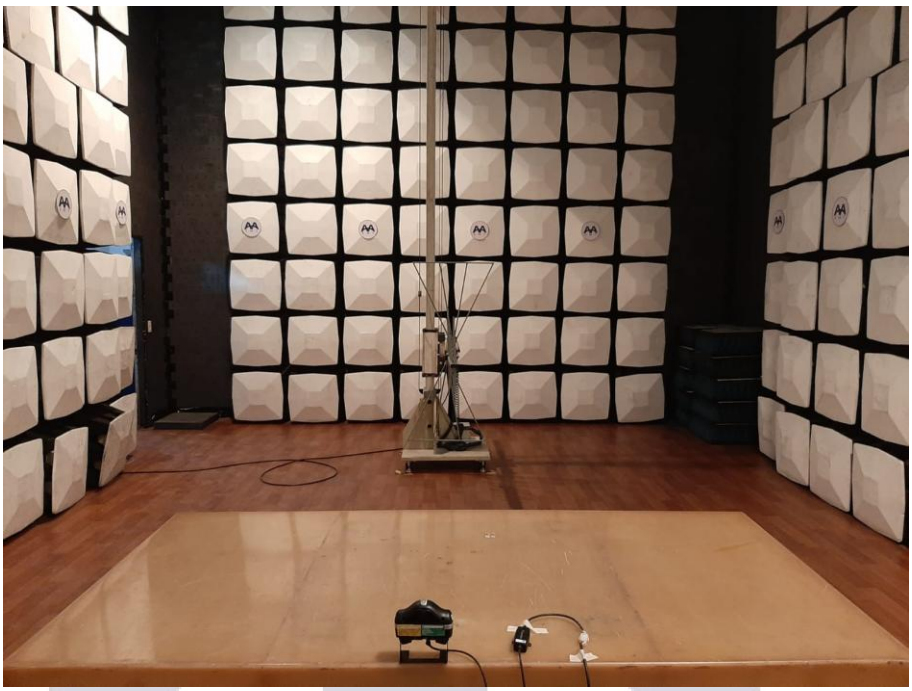
6.2.4 Test Setup photograph



****END OF REPORT****

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