Report No: AAEMT/EMC/210901-01-02

## IC: 23098-D-215

# ICES Test Report

| | | |
|---|---|---|
| **Equipment** | : | **Driveri** |
| **BrandName** | : | netradyne |
| **ModelNo.** | : | **D-215** |
| **Derivative ModelNo.:** | | **N/A** |
| **Standard** | : | **47 CFR FCC Part15B**<br>**Canada Standard ICES-003 Issue 7** |
| **DeviceClass** | : | **Class B** |
| **Applicant** | : | **Netradyne Inc.** |
| **Manufacturer** | : | **Netradyne Inc.** |

Prepared By: (+ signature) Abhinav Kumar

Reviewed & Approved by: (+ signature)
Dr. Lenin Raja (Authorized Representative) (/ lenin83/)

# Table of Contents

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# 1 Summary of Test Result

| Test | Test Requirement | Test Method | Criterion | Result |
|---|---|---|---|---|
| Conducted Emission 150kHz to 30MHz | FCC Part15-B:2014, ANSI C63.4-2014, ICES-003 Issue7 | ANSI C63.4 | Limits Class B | **PASS** |
| Radiated Emissions 30MHz to 6GHz | FCC Part15-B:2014, ANSI C63.4-2014, ICES-003 Issue7 | 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.

# 2 GeneralDescription

## 2.1 General Description of EUT

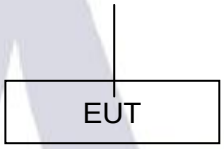
| | |
|---|---|
| Manufacturer: | Netradyne Inc. |
| Manufacturer Address: | 9191 Towne Centre Drive, Suite 200, San Diego, CA 92122 |
| EUT Name: | Driveri |
| Model No: | D-215 |
| Serial Number: | 661000045 |
| Brand Name: | netradyne |
| H/W No.: | 501-1-01549 A2 |
| S/W No.: | 4.5.8.rc.1 |
| Power Supply Range: | Input : 12VDC, 3A |
| Battery: | N/A |

## 2.2 EUT Test Mode

| | |
|---|---|
| Mode 1 | The EUT in full transmission mode. |

## 2.3 Description of Test setup

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

| **1. Block diagram of EUT configuration** |
|---|
| **Config 1:**<br><br>DC Line<br><br>  |

## 2.4 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 |

## 2.5 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 | N/A | N/A |

## 2.6 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part15B
- Canada Standard ICES-003 Issue7
- ANSIC63.4-2014

## 2.7 Testing facility

**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.

## 2.8 Measurement Uncertainty

ISO/IEC17025requiresthatanestimateofthemeasurementuncertaintiesassociatedwiththeemissionstest resultsbeincludedinthereport.Themeasurementuncertaintiesgivenbelowarebasedona95%confidence level (based on a coverage factor (k=2)

| No. | Item | Frequency Range | U , Value |
|---|---|---|---|
| 1 | Power Line Conducted Emission | 150KHz~30MHz | 2.81 dB |
| 2 | Radiated Emission Test | 30MHz~1GHz | 4.02 dB |
| 3 | Radiated Emission Test | 1GHz~13GHz | 3.78 dB |

# 3 Transmitter TestResult

## 3.1 AC Power-line Conducted Emissions

### 3.1.1 AC Power-line Conducted EmissionsLimit

### 3.1.2 MeasuringInstruments

| 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 | 73 | 60 | 56 | 46 |
| 5.0 ~ 30 | 73 | 60 | 60 | 50 |

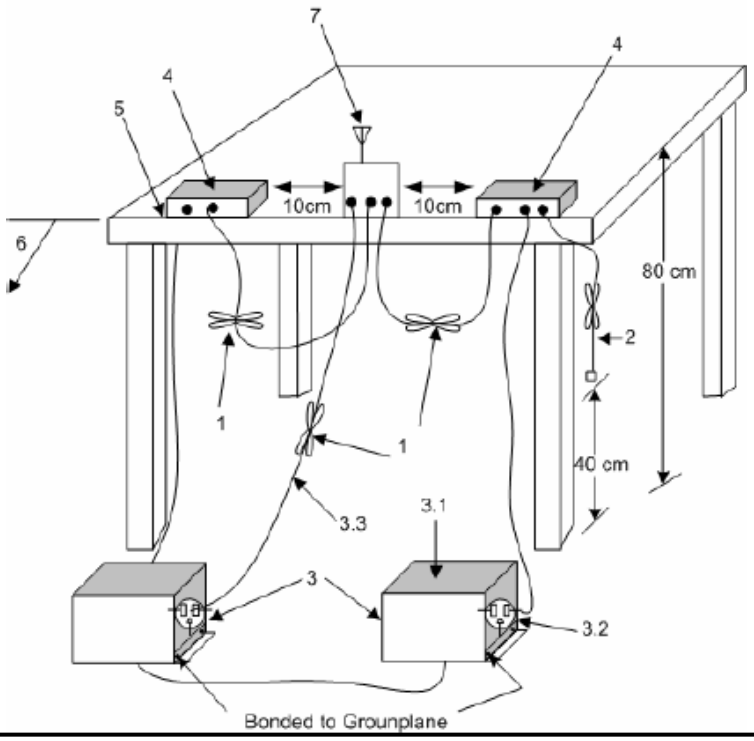
Refer a test equipment and calibration data table in this test report.

### 3.1.3 TestProcedures

| Test Method |
|---|
| ☒ Refer as ANSI C63.4, clause 7.3 for AC power-line conducted emissions. |

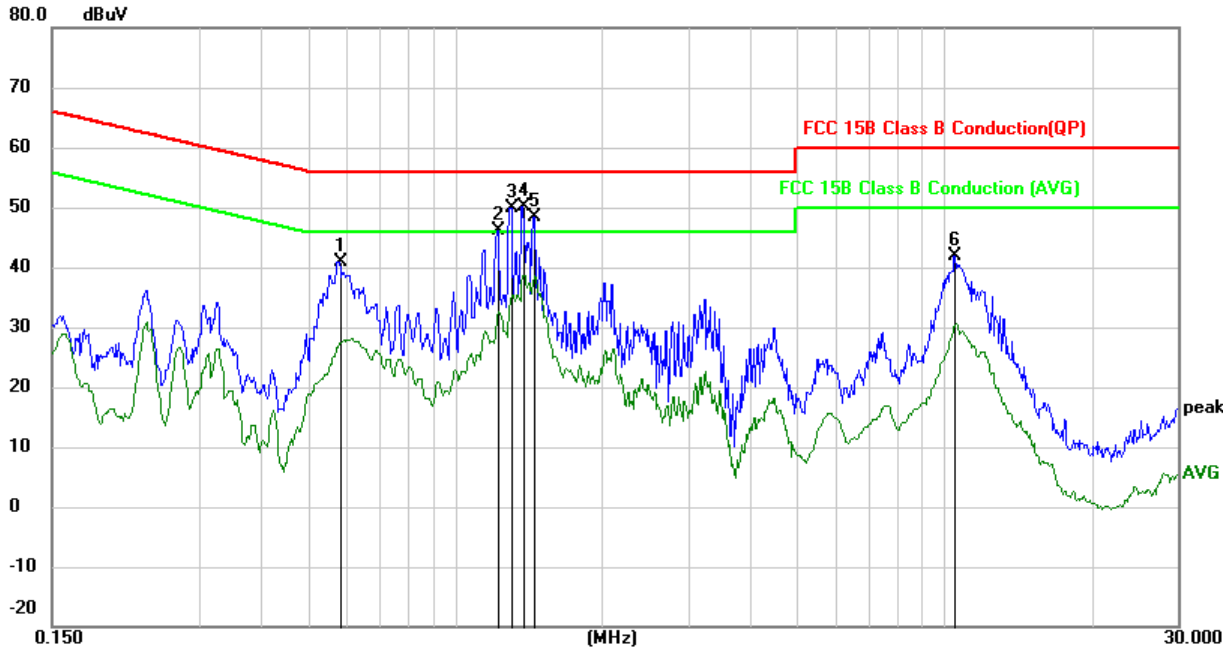
### 3.1.4 TestSetup

**AC Power-line Conducted Emissions**



### 3.1.5 Test Result of AC Power-line ConductedEmissions

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

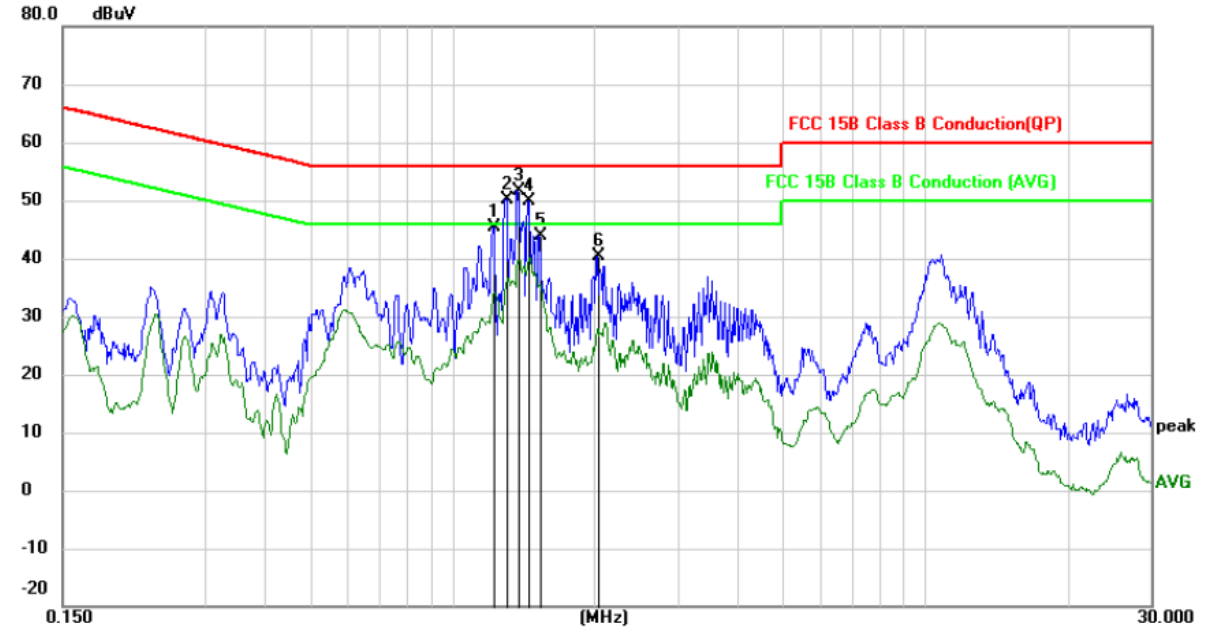



Remark: Factor = LISN factor + Cable Loss + Pulse limiter factor.

| 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

| 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

## 3.2 Radiated Spurious Emissions

### 3.2.1 Radiated Spurious EmissionsLimit

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 ~ 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) | ☐ Class A (3m) | | ☒ Class B (3m) | |
|---|---|---|---|---|
| | Peak dB(μV/m) | Average dB(μV/m) | Peak dB(μV/m) | Average dB(μV/m) |
| 1000~6000 | 80 | 60 | 74 | 54 |

### 3.2.2 MeasuringInstruments

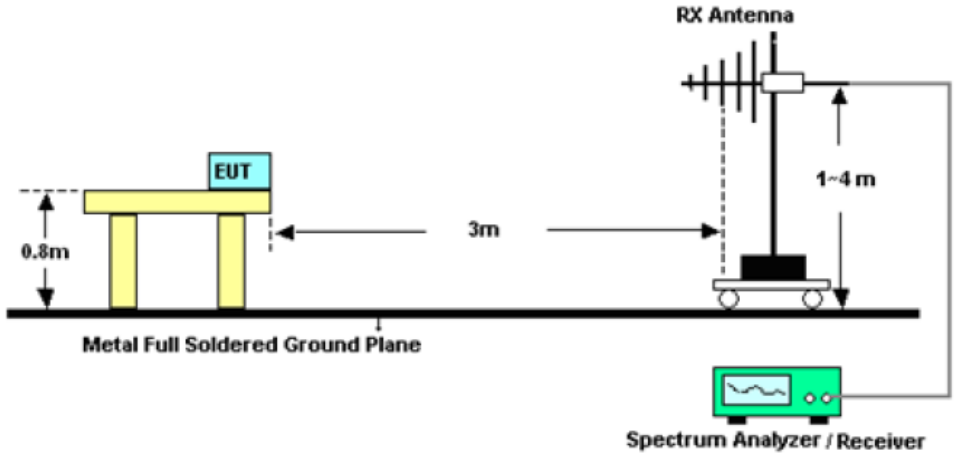
Refer a test equipment and calibration data table in this test report.

### 3.2.3 TestProcedures

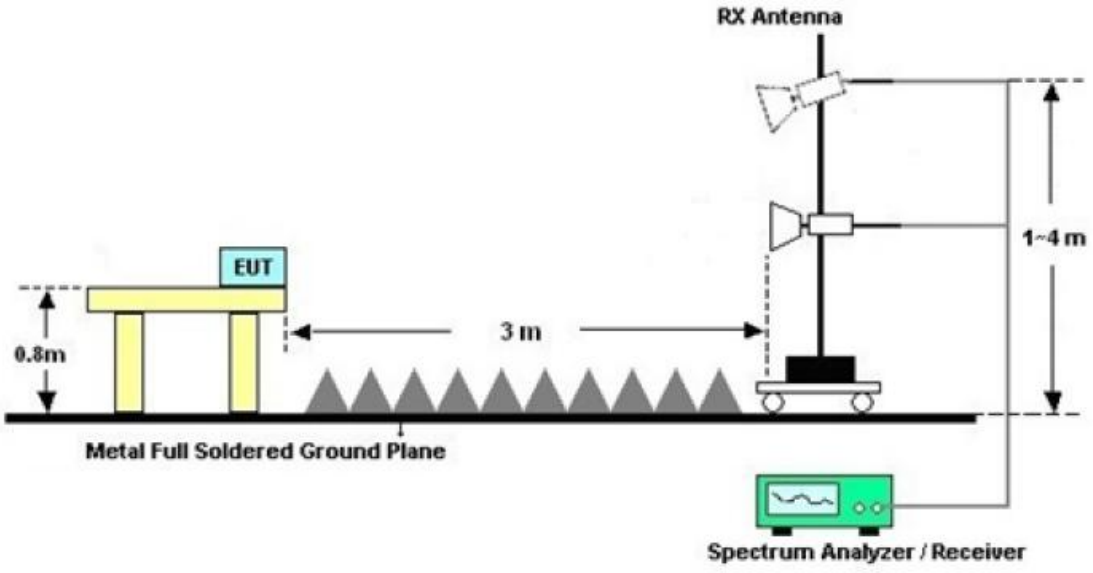
| Test Method – General Information |
|---|
| EUT was placed upon a wooden test table which was placed on the turn table 0.8m above the horizontal metal ground plane, and operating in the mode as mentioned above. A receiving antenna was placed 3m away from the EUT. During testing, turn around the turn 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 weretested. |

### 3.2.4 TestSetup

For radiated emissions from 30MHz to 1GHz

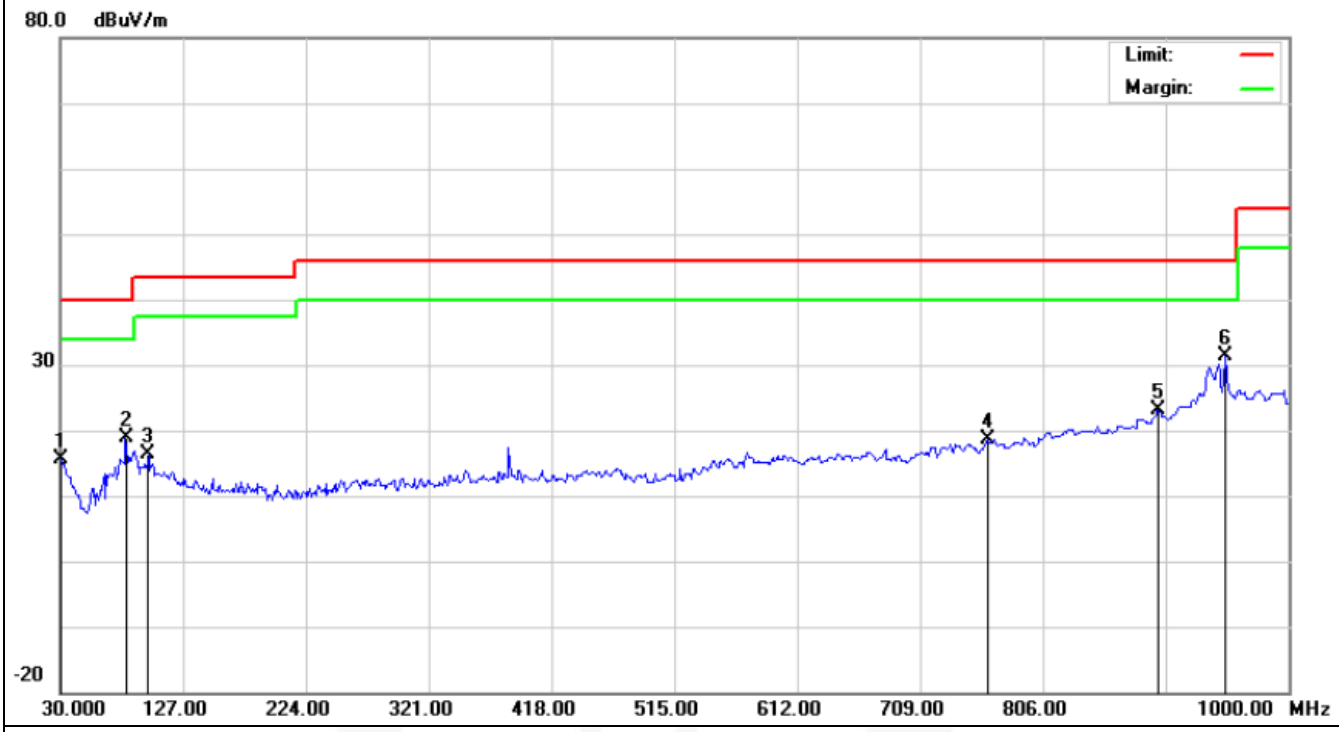



For radiated emissions above 1GHz



### 3.2.5 Radiated Emissions (Below1GHz)

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

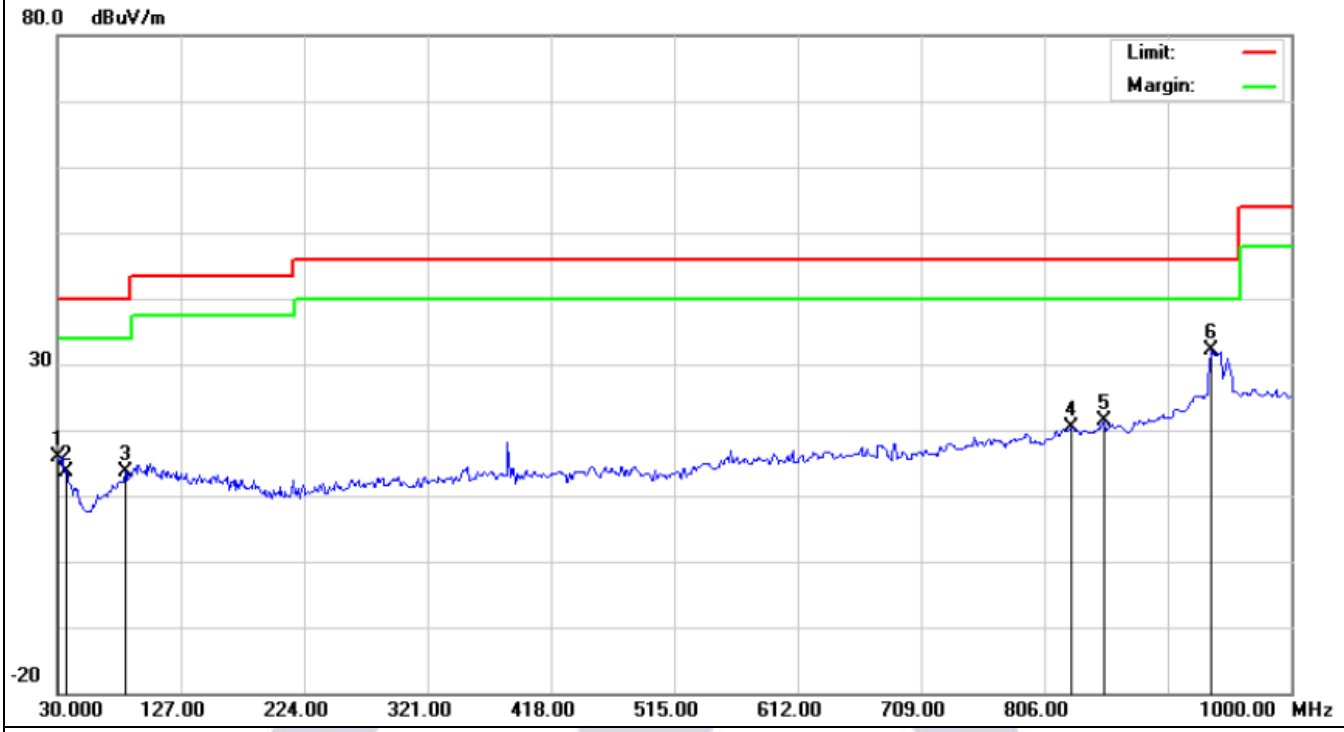



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| 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

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



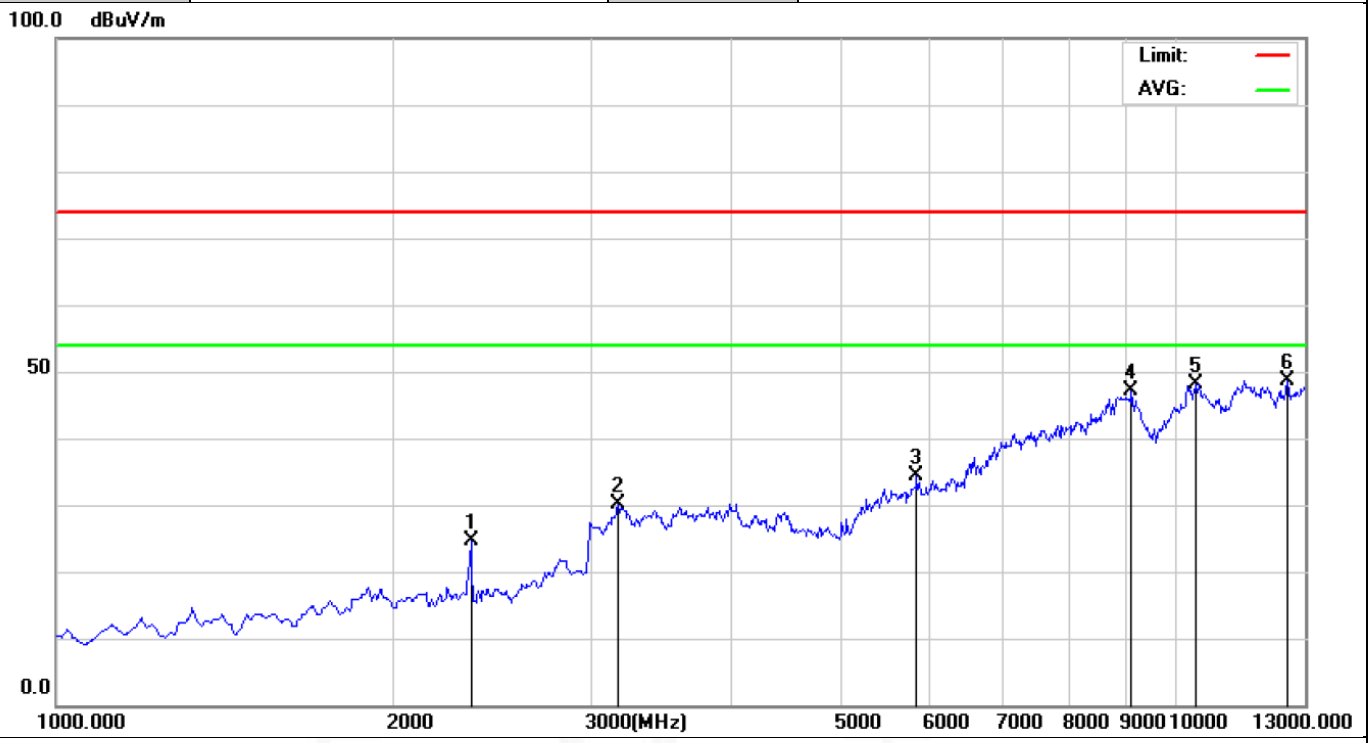

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| 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

### 3.2.6 Radiated Emissions (Above1GHz)

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

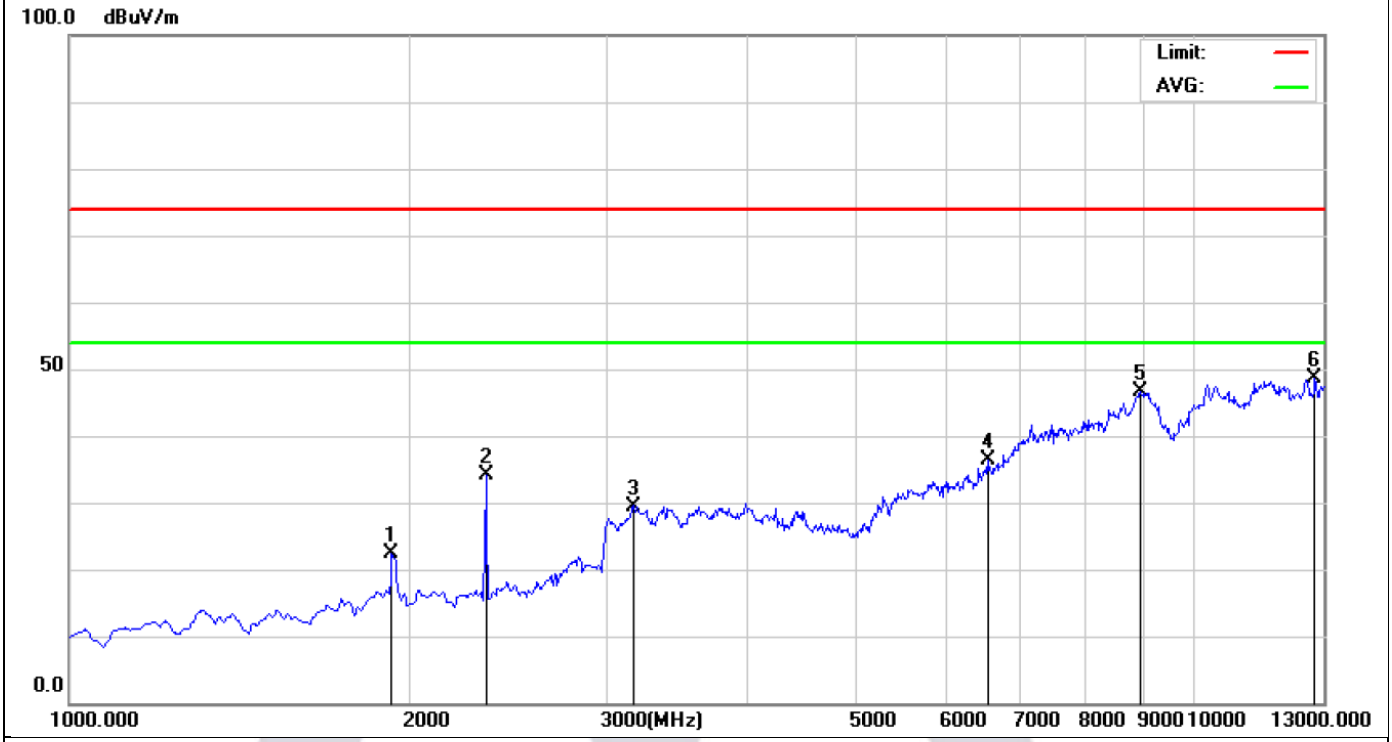



Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

| 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

| 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

# 4 Test Equipment and Calibration Data

| ☒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 |

# 5 Appendix 1

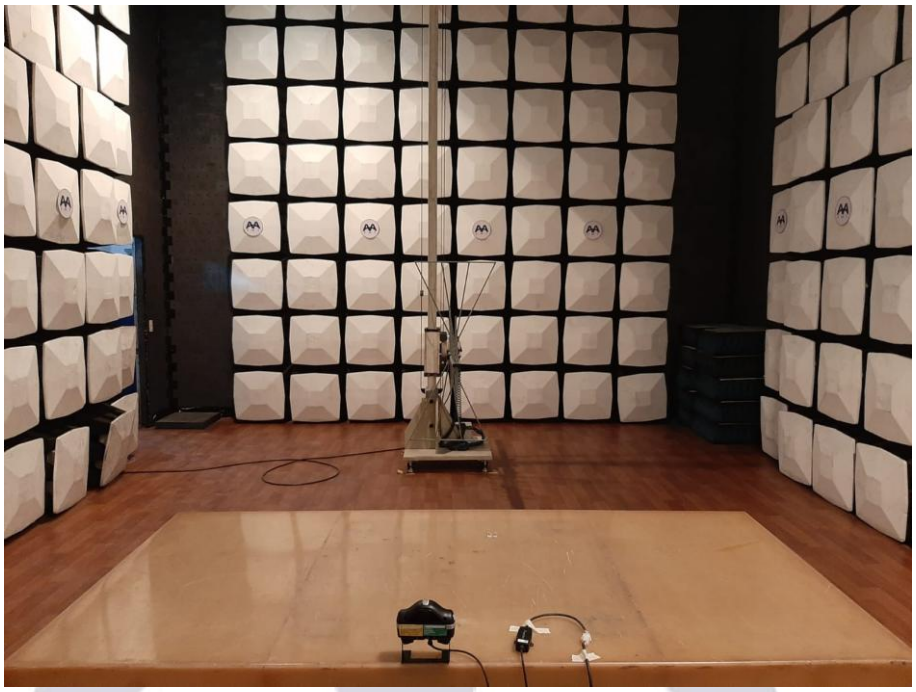
## 5.1 Photographs of Conducted Emissions Test Configuration



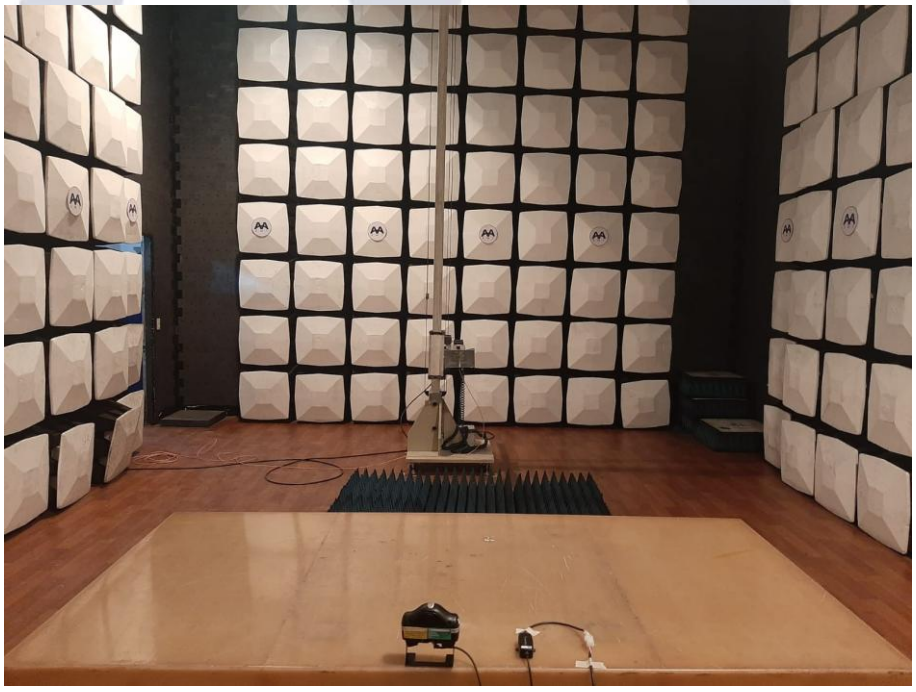
Plot No.174, UdyogVihar Phase 4, Sector -18, Gurgaon -122016, Haryana, India
Contact:0124-4235350, 4145343; e-mail: info @aaemtlabs.com; Website: www.aaemtlabs.com

## 5.2 Photographs of Radiated Emissions Test Configuration

**Radiated Emission below 1GHz**



**For radiated emission above 1GHz**



****End of Report****



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