# UROVO DT50

## Specifications




**UROVO PTE. LIMITED**

UROVO

## Specifications

| | | |
|---|---|---|
| Performance | Model | UROVO DT50 |
| | O.S. | Android 11<br>Android 13 (optional) |
| | Processor | Octa-core 2.45GHz |
| | Memory | RAM: 4GB, ROM: 64GB<br>RAM: 6GB, ROM: 64GB (optional)<br>RAM: 8GB, ROM: 128GB (optional) |
| | Extended memory | Micro SD card, Up to 256 GB |
| Basic specifications | Dimensions | 162.6*76*13.6mm |
| | Weight | 265g |
| | Display | 5.7 inch display, 720*1440 |
| | Touch Screen | Ultra sensitive capacitive touch panel, support multi-touch, works with gloves and wet fingers |
| | Main battery | Capacity：3.85V 5000mAh |
| | RTC | The system time could be backed up for 10 minutes after the battery is removed |
| | Audio | Dual-Microphone (noise cancellation), Speaker (1.5W, 100dB @10cm), Receiver, 3.5mm audio jack |
| | Buttons | PWR button, Vol+/- button, Scan button*2, Custom button |
| | Notifications | Audible tone; multi-color LED; vibration |
| | Camera | Front 5MP，Rear 13MP with flash |
| | Sensors | Light + Accelerator+ Proximity + Geomagnetic + Gyro |
| | Fingerprint | Capacitive Fingerprint Module（optional） |
| | Scanning | Professional scan engine<br>Support international standard 1D/2D barcode；<br>Support barcode displayed on screen and colored barcode； |
| | Slots | Micro SD/TFx1 , Nano-SIMx2 |
| | Interfaces | USB Type-C*1, support OTG, support USB3.1;<br>Bottom pogo pin*2, back pogo pin* 9 |
| Network Connections | WWAN | 4G/ 3G/ 2G<br>Dual-SIM, Dual-Standby |
| | Bluetooth | BT5.0 + BR/EDR + BLE |
| | Wi-Fi | 2.4G/5G, IEEE 802.11a/b/g/n/ac/d/e/h/i/k/r/v/w<br>Roaming: 802.11r /OKC/ PMKID caching，802.11ax ready |
| | NFC | RFID 13.56MHz ，ISO15693、ISO14443A/B 、Mifare、Felica |
| | Positioning | GPS、A-GPS、BeiDou、GLONASS 、Galileo |
| Environment | Operating Temp. | -20°C to 60°C |
| | Storage Temp. | -40°C to 70°C |
| | Humidity | 5%RH～95%RH (No condensation) |
| | Drop | Multiple 1.5 m drops to concrete at room temperature |

| | | |
|---|---|---|
| | Specification | |
| | Sealing | IP67 |
| | ESD | +/-15kv Air; +/-8kv contact |

## Data Capture Specifications

### 1) Camera

| **Rear Camera** | |
|---|---|
| functions | Flash light (700mA), Auto-focus, Video, PDAF |
| Pixels | 13MP |
| **Front Camera** | |
| Pixels | 5MP, Fixed-focus, |

### 2) Scan Engine

| | **2D Imager Engine Specifications** |
|---|---|
| Scan Angle Tilt | 360° |
| Scan Angle Pitch | ±60° |
| Scan Angle Skew | ±60° |
| Laser type | Class Ⅱ |
| Fill-in light | White LED, soft light |
| Barcodes support | Linear: Codabar, Code 11, Code 128, Code 2 of 5, Code 39, Code 93 and 93i, EAN/JAN-13, EAN/JAN 8, IATA Code 2 of 5, Interleaved 2 of 5, Matrix 2 of 5, MSI, GS1 Databar, UPC-A, UPC E, UPC-A/EAN-13 with Extended Coupon Code, Coupon GS1 Code 32(PARAF), EAN-UCC Emulation, GS1 Data Bar<br>2D Stacked: Codablock A, Codablock F, PDF417, MicroPDF417<br>2D Matrix: Aztec Code, Data Matrix, MaxiCode, QR Code, Chinese Sensible (Han Xin), Grid Matrix, Dot Code<br>Postal: Australian Post, British Post, Canadian Post, China Post, Japanese Post, Korea Post, Netherlands Post, Planet Code, Postnet |

### 3) RFID(HF)

| RFID | HF |
|---|---|
| Protocol | ISO15693、ISO14443 A/B 、Mifare、Felica |
| Frequency | 13.56MHz |
| Mode | Card Emulation、Peer-to-Peer、Reader |
| Reading Range | Read distance 0-6cm (ISO15693), 0-4cm(ISO14443A/B) |

## Network Connections

### 1) Positioning

| Positioning | Specification |
|---|---|
| Mode | GPS、A-GPS、BEIDOU、GLONASS、Galileo |
| Frequency | GPS（L1）， BeiDou（B1 1.561GHz）， GLONASS(L1 1.602GHz)， |

| | |
|---|---|
| | Galileo（E1 1.589 GHz / E2 1.561 GHz） |
| Cold start time | Less than 40s |
| Max channel | 31 channel |
| Sensitivity | -130dB(SNR value 40dBHz) |
| Accuracy | 5~10 Meters（open space） |

## 2) Wireless LAN

| WLAN | Specification |
|---|---|
| Protocol | IEEE 802.11a/b/g/n/ac/d/e/h/i/k/r/v/w （2.4G/5G dual band Wi-Fi)<br>IEEE 802.11ax ready |
| Frequency | 2.4G、5G |
| Working Channels | CH1~CH13，CH34-CH140，CH149~CH165，depends on country (region) |
| Security and Encryption | WEP (40 or 104 bit); WPA/WPA2 Personal (TKIP, and AES); WPA3 Personal (SAE); WPA/WPA2 Enterprise (TKIP and AES); WPA3 Enterprise 192-bit mode (GCMP-256) - EAP-TLS; Enhanced Open (OWE) |
| Fast roaming | PMKID caching; Cisco CCKM; 802.11r(Over-the-Air); OKC, Wi-Fi roaming threshold could be set |

## 3) Wireless WAN

| WAN | Specification | |
|---|---|---|
| Mode | Dual-SIM, Dual-Standby | |
| Frequency Band (Worldwide) | 4G(TD-LTE)<br>4G(FDD-LTE) | TD-LTE(B34/B38/B39/B40/B41)<br>FDD-LTE(B1/B2/B3/B4/B5/<br>B7/B8/B12/B13/B17/B20/B28A/B28B) |
| | 3G(WCDMA)<br>3G(CDMA2000)<br>3G(TD-SCDMA) | WCDMA(B1/B2/B4/B5/B8)<br>TD-SCDMA(B34/B39)<br>CDMA2000 1x EV-DO Rev.A BC0 (800MHz) |
| | 2G(GSM)<br>2G(GSM)<br>2G(CDMA) | CDMA1x<br>GSM/EDGE/GPRS(850/900/1800/1900) |
| Frequency Band (Europe & Asia) | 4G(TD-LTE)<br>4G(FDD-LTE) | TD-LTE(B34/B38/B39/B40/B41)<br>FDD-LTE(B1/B3/B5/B7/B8/B20) |
| | 3G(WCDMA)<br>3G(CDMA2000)<br>3G(TD-SCDMA) | WCDMA(B1/B2/B4/B5/B8)<br>TD-SCDMA(B34/B39)<br>CDMA2000 1x EV-DO Rev.A BC0 (800MHz) |
| | 2G(GSM)<br>2G(CDMA) | CDMA1x<br>GSM/EDGE/GPRS(850/900/1800/1900) |

## 4) Wireless PAN

| BT | Specification |
|---|---|
| Mode | BT5.0 + BR/EDR + BLE |

| | |
|---|---|
| Range | More than 10 Meters |

## Accessories

| | Type |
|---|---|
| Standard Accessories | Adapter*1, Type-C cable*1, Battery*1, Instructions & Security Information & Warranty Card*1 |
| Optional Accessories | Charging cradle, 5-slot Charging Cradle, 4-lot battery charging cradle, Hand strap, Gun grip, UHF gun grip, Boot case, Optical fingerprint, Screen Protector, Holster, Shoulder Strap |

# EU DECLARATION OF CONFORMITY

Manufacturer Name: **Urovo Technology Co., Ltd**

Manufacturer Address: **36F,High-Tech Zone Union Tower,No.63,Xuefu Road,Nanshan district,Shenzhen, Guangdong, China**

Exporter **:Trump Technologies Holding Co.Limited**

This Declaration of Conformity is issued under the soleresponsibility of the manufacturer.

Description **: Handheld Data Terminal**
Model **:DT50**

UROVO TECHNOLOGY CO., LTD DECLARE UNDER OUR SOLE RESPONSIBILITY THAT THE PRODUCT (S) TO WHICH THIS DECLARATION RELATES IS IN CONFORMITY WITH THE TECHNICAL REQUIREMRNTS THE STANDARD (S) AND DIRECTIVE (S) DECLARE UNDER THIS DECLARATION OF CONFORMITY

ACCORDING TO THE RADIO EQUIPMENT DIRECTIVE 2014 / 53 / EU

| Radio: | Standards |
|---|---|
| | ETSI EN 301 511 12.5.1 |
| | ETSIEN 301 908-1 V11.1.1 |
| | ETSI EN 301 908-2 V11.1.2 |
| | ETSI EN 301 908-13 V11.1.2 |
| | ETSI EN 303 413 V1.1.1 |
| | ETSI EN 300 328 V2.2.2 |
| | ETSI EN 300 330 V2.1.1 |
| | ETSIEN 301 893 V2.1.1 |
| | ETSI EN 300 440 V2.1.1 |

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Location: Moldova
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| EMC: | Standards |
|---|---|

1st

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ETSI EN 301 489-1 V2.2.3
ETSI EN 301 489-3 V2.1.1
Draft ETSI EN 301 489-17 3.2.3
Draft ETSI EN 301 489-19 V2.1.0
Draft ETSI EN 301 489-52 V1.1.0

| **Health :** | **Standards** |
|---|---|
| | EN 50360 2017<br>EN 50566: 2017<br>EN 62209-1:2016<br>EN 62209-2: 2010<br>EN 50663: 2017 |

| **SAFETY**: | **Standards** |
|---|---|
| | EN 62368-1:2014+A11:2017 |

**Signed on behalf of Urovo Technology Co., Ltd**

YuXu_Lei

**(Signature of authorized person)**
YU XUELEI
Sr. Manager
Date : 10, September , 2019

## Appendix A

### EU Operating frequencies and maximum power levels

| Technology | Operating frequencies | Maximum Transmit power level |
|---|---|---|
| WLAN | 2412-2472MHz | 17.57dBm (EIRP) |
| | 5150-5350MHz | 18.27dBm (EIRP) |
| | 5470-5725MHz | |
| | 5725-5850MHZRX/TX) | |
| Bluetooth | 2402-2480MHZ(RX/TX) | 4.95dBm (EIRP) |
| NFC | 13.56MHz(RX/TX) | |

**Accessories:**

2nd

**Urovo Technology Co., Ltd**
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| Description | Model /PN |
| --- | --- |
| Charge Cradle | HBCDT50B/HBCDT50RB/ACC-HBCDT50-E-TP/4BCDT50<br>5BCDT5001-TP/5BCDT5001/5BCDT5002/5BCDT5003/5BCDT5004 |
| Pistol Grip | TR-50 |
| Battery | HBLDT50/HBLDT50S/HBLDT50E |
| Rubber boot | ACCDT50-RB01/ACCDT50-RB03/ACCDT50-5G-RB04 |



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# EMC TEST REPORT

| | |
|---|---|
| **Report No.:** | SET2019-13940 |
| **Product:** | Handheld Data Terminal |
| **FCC ID:** | SWSDT50 |
| **Trade name:** | UROVO |
| **Model No. :** | DT50、DT50C、DT51 |
| **Applicant:** | UROVO TECHNOLOGY CO., LTD. |
| **Received Date:** | 2019.09.25 |
| **Test Date:** | 2019.09.25-2019.10.24 |
| **Issued by:** | CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. |
| **Lab Location:** | Building 28/29, East of Shigu Xili Industrial Zone, Nanshan District Shenzhen, Guangdong 518055, China<br>**Tel:** 86 755 26627338 **Fax:** 86 755 26627238 |

This test report consists of **20** pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CCIC-SET. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver. Any objections must be raised to CCIC-SET within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

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Location: Moldova
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# Test Report

| | |
|---|---|
| **Product Name.....:** | Handheld Data Terminal |
| **Model No. .....:** | DT50、DT50C、DT51 |
| **Trade name.....** | UROVO |
| **Applicant.....:** | UROVO TECHNOLOGY CO., LTD. |
| **Applicant Address.....:** | 36F,High-Tech Zone Union Tower,No.63,Xuefu Road, Nanshan District, Shenzhen, Guangdong, China |
| **Manufacturer .....:** | UROVO TECHNOLOGY CO., LTD. |
| **Manufacturer Address .....:** | 36F,High-Tech Zone Union Tower,No.63,Xuefu Road, Nanshan District, Shenzhen, Guangdong, China |
| **Test Standards.....:** | 47 CFR Part 15 Subpart B |
| **Test Result.....:** | PASS |
| **Tested by .....:** | Yun Lei Fang Test Engineer 2019.10.24 |
| **Reviewed by .....:** | Chris You Senior Engineer 2019.10.24 |
| **Approved by .....:** | 2019.10.24<br>Shuangwen Zhang, Manager |

# TABLE OF CONTENTS



| Change History | | |
|---|---|---|
| Issue | Date | Reason for change |
| 1.0 | 2019.10.24 | First edition |
| | | |
| | | |

# 1. GENERAL INFORMATION

## 1.1 EUT Description

EUT Name ..... .: Handheld Data Terminal
Model No. ..... .: DT50、DT50C、DT51
FCC ID ..... .: SWSDT50
Trade Name……: UROVO
Brand Name……: UROVO
Hardware Version……..… : N/A
Software Version ..... : N/A

*Note1*:The EUT is a Handheld Data Terminal;

*Note 2*:For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

## 1.2 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B:

| No. | Identity |
|---|---|
| 1 | 47 CFR Part 15<br>Subpart B |

Test detailed items/section required by FCC rules and results are as below:

| No. | Section | Description | Result |
|---|---|---|---|
| 1 | 15.107 | Conducted Emission | PASS |
| 2 | 15.109 | Radiated Emission | PASS |

NOTE:

(1) The EUT has been tested according to 47 CFR Part 15 Subpart B,Class B.The test procedure is according to ANSI C63.4:2014.

## 1.3 Facilities and Accreditations

### 1.3.1 Facilities

**FCC-Registration No.: CN5031**

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN5031, valid time is until December 31, 2019.

**ISED Registration: 11185A-1**

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until December 31, 2019.

**NVLAP Lab Code: 201008-0**

CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

### 1.3.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

| | |
|---|---|
| Temperature (°C): | 15°C - 35°C |
| Relative Humidity (%): | 25% -75% |
| Atmospheric Pressure (kPa): | 86kPa-106kPa |

### 1.3.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

| | |
|---|---|
| Uncertainty of Conducted Emission: | Uc = 3.6 dB (k=2) |
| Uncertainty of Radiated Emission: | Uc = 4.5 dB (k=2) |

# 2. TEST CONDITIONS SETTING

## 2.1 Test Peripherals

The following is a listing of the EUT and peripherals utilized during the performance of EMC test:

**Support Cable：**

| Description | Shield Type | Ferrite Core | Length |
|---|---|---|---|
| PC Power adapter Cable | Un- shielding | No | 1.2m |

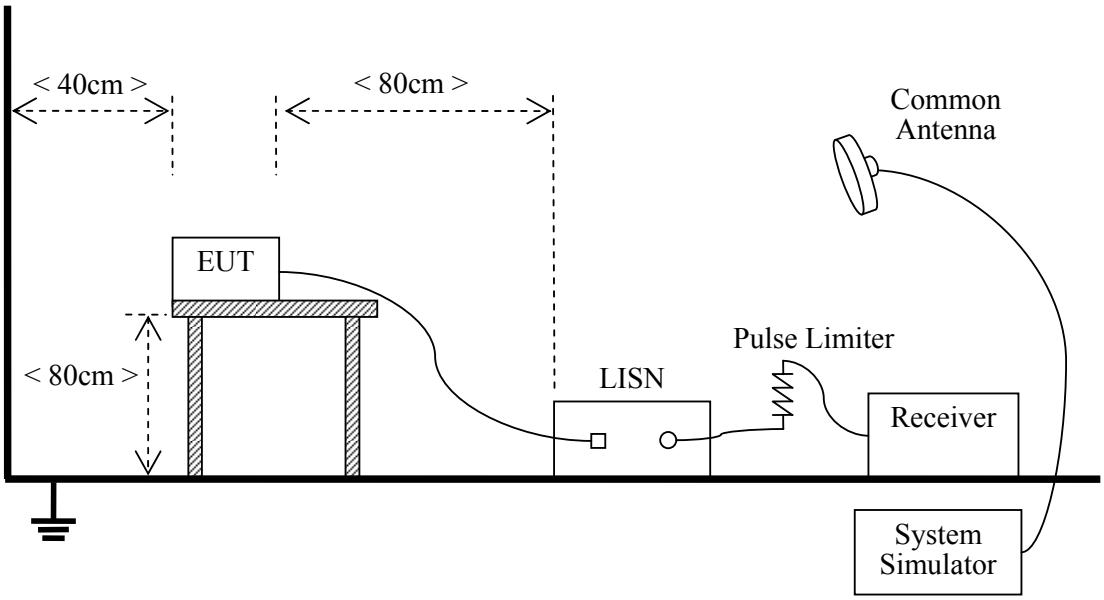
## 2.2 Test Mode

The EUT have the following typical setups during the test:
Setup 1: EUT + Notebook PC
Setup 2: EUT + Adapter (Charger)+ WWAN Traffic
Setup 3: EUT + Adapter (Charger)+ WLAN Traffic

## 2.3 Test Setup and Equipments List

### 2.3.1 Conducted Emission

**A. Test Setup:**




The EUT is placed on a 0.8m high insulating table, which stands on the grounded conducting floor, and keeps 0.4m away from the grounded conducting wall. The EUT is connected to the power mains through a LISN which provides 50Ω/50μH of coupling impedance for the measuring instrument. The Common Antenna is used for the call between the EUT and the System Simulator (SS). A Pulse Limiter is used to protect the measuring instrument. The factors of the whole test system are calibrated to correct the reading.

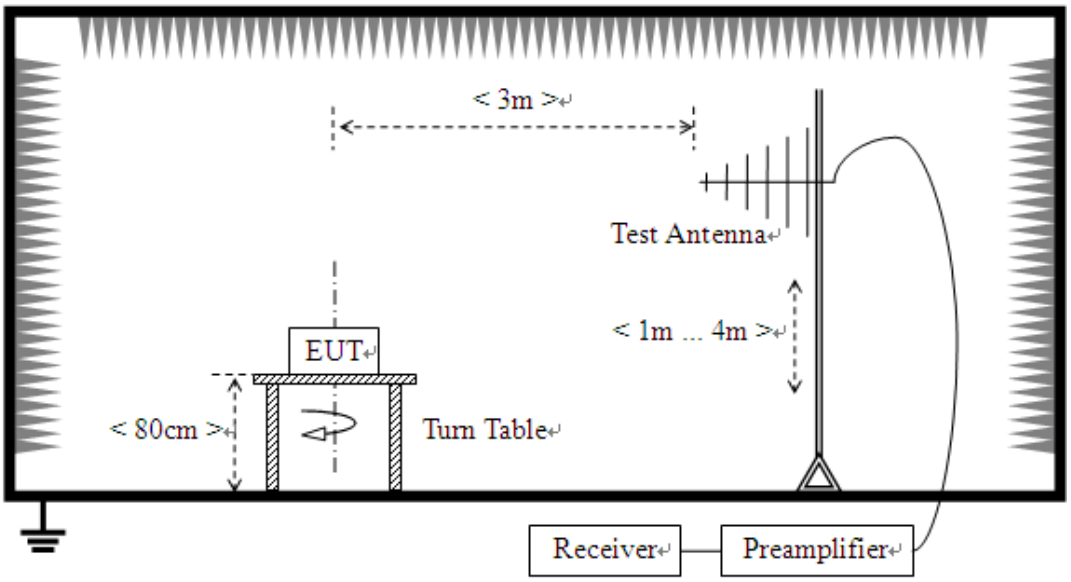
**B. Equipments List:**

| Description | Manufacturer | Model | Serial No. | Calibration Date | Calibration Due. Date |
|---|---|---|---|---|---|
| Test Receiver | KEYSIGHT | N9038A | A141202036 | 2018.12.10 | 2019.12.10 |
| LISN | ROHDE&SCHWARZ | ENV216 | A140701847 | 2018.12.10 | 2019.12.10 |
| Cable | MATCHING PAD | W7 | / | 2019.08.02 | 2020.08.01 |

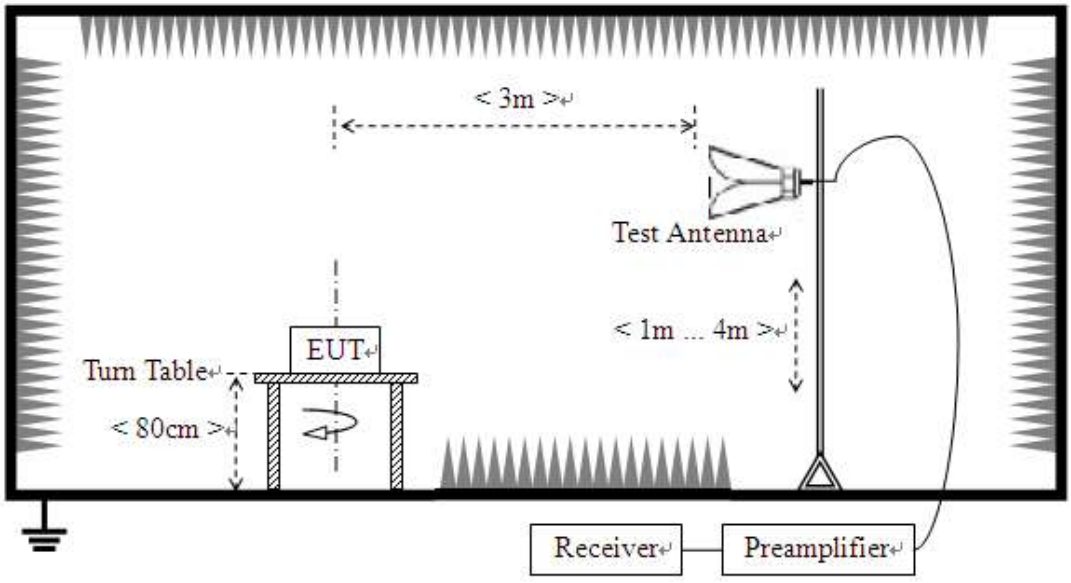
### 2.3.2 Radiated Emission

**A. Test Setup:**

1) For radiated emissions from 30MHz to1GHz




2) For radiated emissions above 1GHz




**B. Test Procedure**

The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor, cable loss and so on of the site (factors) is calculated to correct the reading. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a

variable-height antenna master tower.

For the test Antenna:

1) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

**C. Equipments List:**

| Description | Manufacturer | Model | Serial No. | Calibration Date | Calibration Due. Date |
|---|---|---|---|---|---|
| Test Receiver | KEYSIGHT | N9038A | A141202036 | 2018.12.10 | 2019.12.10 |
| LISN | ROHDE&SCHWARZ | ENV216 | A140701847 | 2018.12.10 | 2019.12.10 |
| Shield Room | Xinju Electronics | L7300*W4500 *H3100 | A181003226 | 2018.09.06 | 2021.09.05 |
| EMI Test Receiver | ROHDE&SCHWARZ | ESIB7 | A0501375 | 2019.07.30 | 2020.07.29 |
| Broadband Ant. | 2786 | ETC | A150402239 | 2018.09.17 | 2021.09.16 |
| 3M Anechoic Chamber | Albatross | SAC-3MAC 9*6*6m | A0412375 | 2019.03.26 | 2023.03.25 |
| EMI Test Receiver | ROHDE&SCHWARZ | ESW26 | A180502935 | 2018.11.01 | 2019.10.31 |
| System Simulator | ROHDE&SCHWARZ | CMW500 | A150802214 | 2019.07.30 | 2021.07.29 |
| 5M Anechoic Chamber | Albatross | SAC-5MAC 12.8x6.8x6.4m | A0304210 | 2019.03.25 | 2023.03.24 |
| EMI Horn Ant. | ROHDE&SCHWARZ | HF906 | A0304225 | 2019.04.17 | 2022.04.17 |

# 3. 47 CFR PART 15B REQUIREMENTS

## 3.1 Conducted Emission

### 3.1.1 Requirement

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

| Frequency range (MHz) | Conducted Limit (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 - 0.50 | 66 to 56 | 56 to 46 |
| 0.50 - 5 | 56 | 46 |
| 5 - 30 | 60 | 50 |

**Note:**

a) The limit subjects to the Class B digital device.

b) The lower limit shall apply at the band edges.

c) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

### 3.1.2 Test Description

See section 2.3.1 of this report.

### 3.1.3 Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. All test modes are considered, refer to recorded points and plots below.

**Note:**

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a Nominal 120V AC,50/60Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

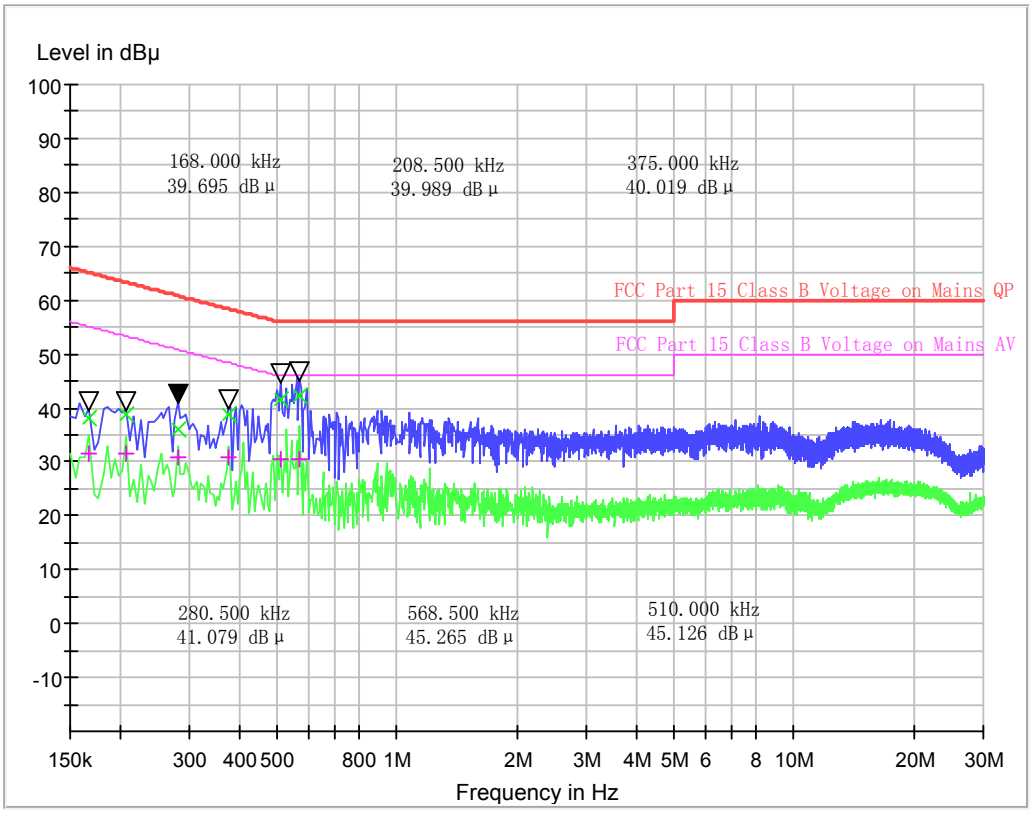
**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor
2. Correction Factor(dB) = Attenuator (dB)+ Cable loss(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Limit value – Emission Level

Note: Correction factor=Cabel loss+ attenuation factor
attenuation factor=10dB
Note: the test plots show the PK value

**Test voltage and frequency (120V AC,60Hz)**

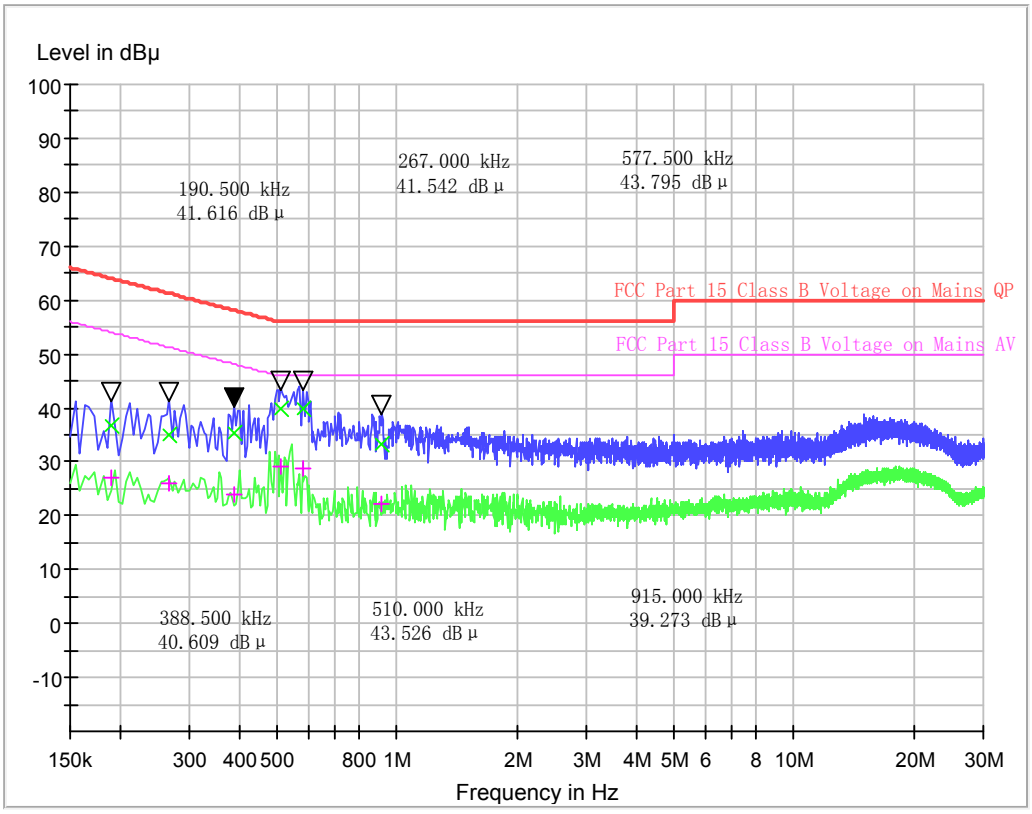
**A. Mains terminal disturbance voltage, L phase**




(Plot A: L Phase)

| Frequency (MHz) | QuasiPeak (dB µ V) | CAverage (dB µ V) | Cabel Loss(dB) | Corr. (dB) | Margin - QPK | Limit - QPK | Margin - AV | Limit - AV |
|---|---|---|---|---|---|---|---|---|
| 0.1680 | 38.01 | 31.66 | 0.1 | 10.1 | 27.05 | 65.10 | 23.40 | 55.10 |
| 0.2085 | 38.96 | 31.64 | 0.1 | 10.1 | 24.30 | 63.30 | 21.62 | 53.30 |
| 0.2805 | 35.91 | 30.80 | 0.1 | 10.1 | 24.89 | 60.80 | 20.00 | 60.80 |
| 0.3750 | 38.71 | 30.88 | 0.1 | 10.1 | 19.68 | 58.40 | 17.51 | 48.40 |
| 0.5100 | 41.66 | 30.43 | 0.1 | 10.1 | 14.34 | 56.00 | 15.57 | 46.00 |
| 0.5685 | 42.21 | 30.64 | 0.1 | 10.1 | 13.79 | 56.00 | 15.36 | 46.00 |

## B. Mains terminal disturbance voltage, N phase




(Plot B: N Phase)

| Frequency (MHz) | QuasiPeak (dB µ V) | CAverage (dB µ V) | Cabel Loss(dB) | Corr. (dB) | Margin - QPK | Limit - QPK | Margin - AV | Limit - AV |
|---|---|---|---|---|---|---|---|---|
| 0.1905 | 36.55 | 27.20 | 0.1 | 10.1 | 27.46 | 64.00 | 26.81 | 54.00 |
| 0.2670 | 35.08 | 26.02 | 0.1 | 10.1 | 26.13 | 61.20 | 25.19 | 51.20 |
| 0.3885 | 35.42 | 23.97 | 0.1 | 10.1 | 22.68 | 58.10 | 24.13 | 48.10 |
| 0.5100 | 39.88 | 29.05 | 0.1 | 10.1 | 16.12 | 56.00 | 16.95 | 46.00 |
| 0.5775 | 39.66 | 28.59 | 0.1 | 10.1 | 16.34 | 56.00 | 17.41 | 46.00 |
| 0.9150 | 33.23 | 22.21 | 0.1 | 10.1 | 22.77 | 56.00 | 23.79 | 46.00 |

## 3.2 Radiated Emission

### 3.2.1 Requirement

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency range (MHz) | Field Strength | | Field Strength Limitation at 3m Measurement Dist | |
|---|---|---|---|---|
| | μV/m | Dist | (uV/m) | (dBuV/m) |
| 30.0 - 88.0 | 100 | 3m | 100 | 20log 100 |
| 88.0 - 216.0 | 150 | 3m | 150 | 20log 150 |
| 216.0 - 960.0 | 200 | 3m | 200 | 20log 200 |
| Above 960.0 | 500 | 3m | 500 | 20log 500 |

a) As shown in FCC section 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector. When average radiated emission measurements are specified in this part, including emission measurements below 1000MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

b) Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

c) For below 1G :QP detector RBW 120kHz ,VBW 300kHz.

d) For Above 1G: PK detector RBW 1MHz,VBW 3MHz for PK value ;AV detector RBW 1MHz, VBW 10Hz for AV value.

**Note:**

1) The tighter limit shall apply at the boundary between two frequency range.
2) Limitation expressed in dBuV/m is calculated by 20log Emission Level(uV/m).

### 3.2.2 Test Description

See section 2.3.2 of this report.

### 3.2.3 Test Result

The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors. Both the vertical and the horizontal polarizations of the Test Antenna are considered to

perform the tests. All test modes are considered, refer to recorded points and plots below.

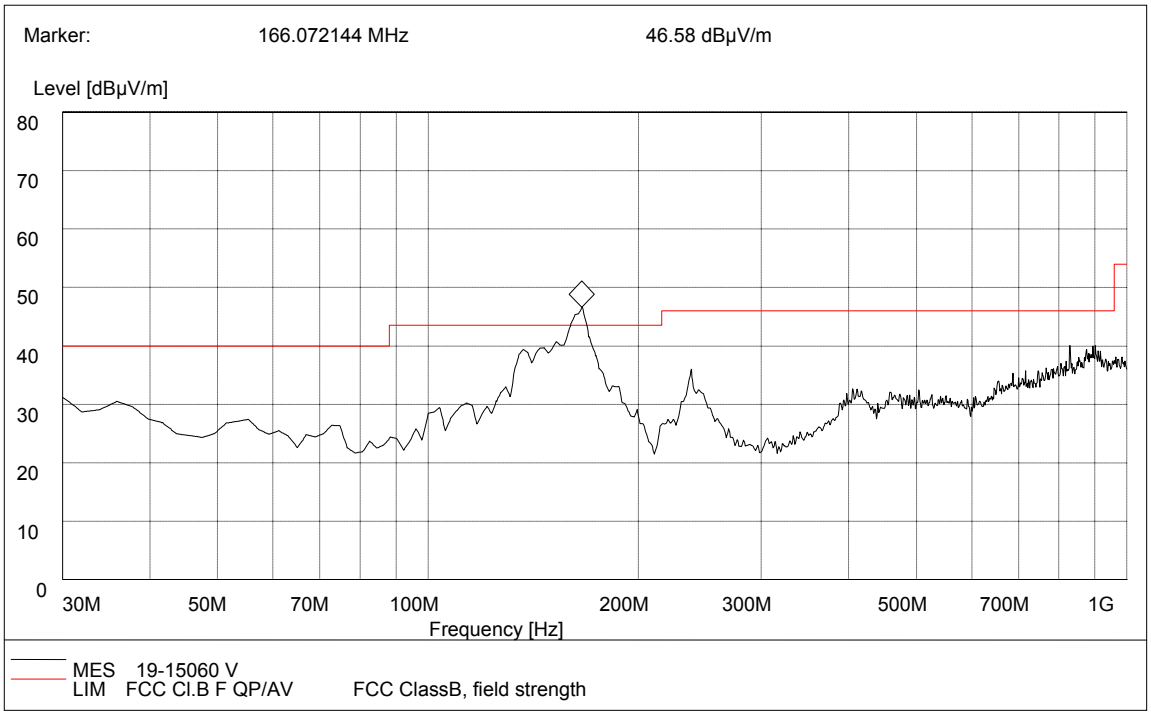
The amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

Note: All radiated emission tests were performed in X, Y, Z axis direction, and only the worst axis test condition was recorded in this test report.

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
3. Margin value = Limit value － Emission Level

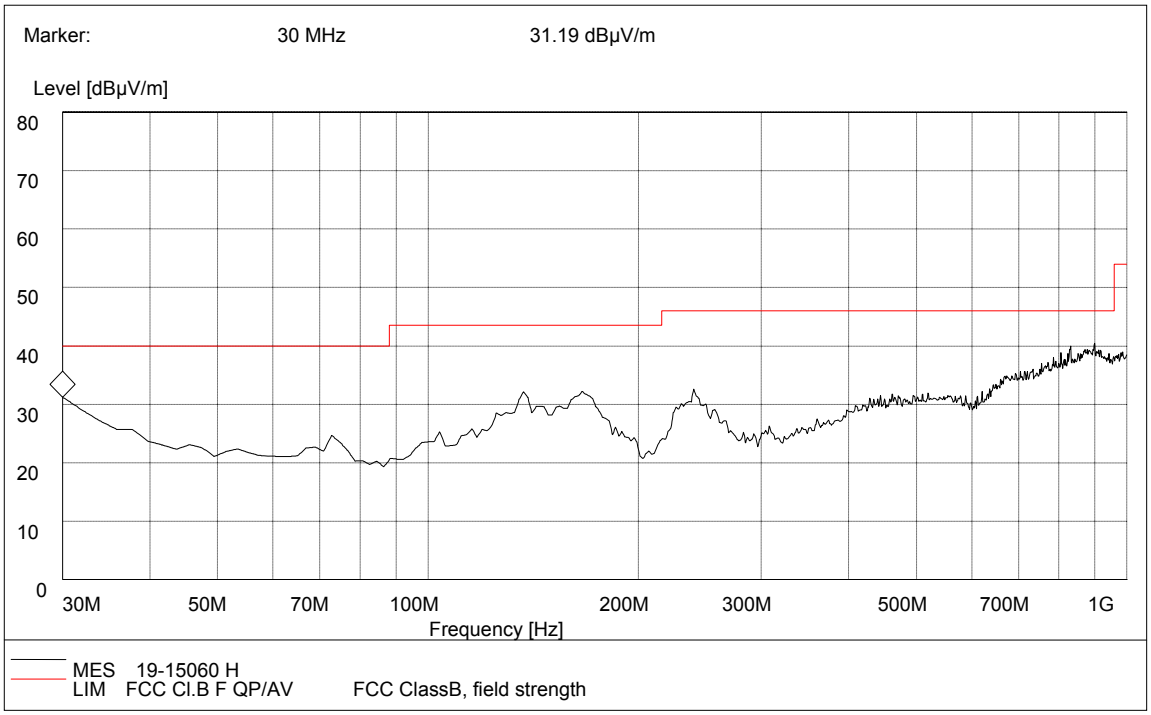
**A.Radiation disturbances, antenna polarization:Vertical**




(Plot C: Test Antenna Vertical 30M - 1G)

| Frequency (MHz) | QuasiPeak (dB µ V/m) | Correction Factor(dB) | Bandwidth (kHz) | Antenna height (cm) | Limit (dB µ V/m) | Margin (dB) | Antenna | Verdict |
|---|---|---|---|---|---|---|---|---|
| 30.12 | 29.69 | 25.9 | 120.000 | 208.0 | 40.00 | 10.31 | Vertical | Pass |
| 45.28 | 27.01 | 25.9 | 120.000 | 129.0 | 40.00 | 12.99 | Vertical | Pass |
| 64.54 | 25.03 | 25.9 | 120.000 | 147.0 | 40.00 | 14.97 | Vertical | Pass |
| 164.75 | 43.24 | 25.9 | 120.000 | 169.0 | 43.50 | 0.30 | Vertical | Pass |
| 245.66 | 33.51 | 25.9 | 120.000 | 207.0 | 46.00 | 12.49 | Vertical | Pass |
| 403.23 | 31.12 | 25.2 | 120.000 | 207.0 | 46.00 | 14.88 | Vertical | Pass |

**B.Radiation disturbances, antenna polarization: Horizontal**

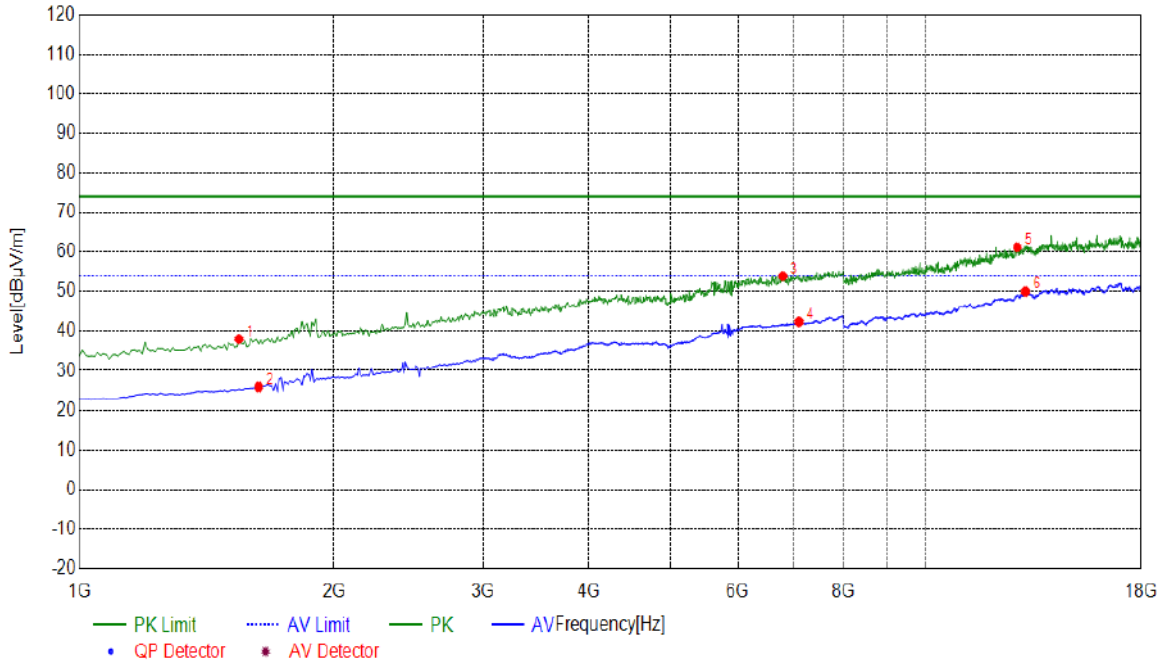



(Plot D: Test Antenna Horizontal 30M - 1G)

| Frequency (MHz) | QuasiPeak (dB µ V/m) | Correction Factor(dB) | Bandwidth (kHz) | Antenna height (cm) | Limit (dB µ V/m) | Margin (dB) | Antenna | Verdict |
|---|---|---|---|---|---|---|---|---|
| 30.00 | 29.61 | 25.9 | 120.000 | 223.0 | 40.00 | 12.43 | Horizontal | Pass |
| 38.15 | 24.13 | 25.9 | 120.000 | 209.0 | 40.00 | 15.87 | Horizontal | Pass |
| 73.56 | 29.02 | 25.9 | 120.000 | 126.0 | 43.50 | 14.48 | Horizontal | Pass |
| 158.74 | 31.44 | 25.9 | 120.000 | 268.0 | 43.50 | 12.06 | Horizontal | Pass |
| 244.39 | 30.75 | 25.9 | 120.000 | 214.0 | 46.00 | 15.25 | Horizontal | Pass |
| 451.94 | 30.77 | 25.2 | 120.000 | 364.0 | 46.00 | 15.23 | Horizontal | Pass |

**Test Result: PASS**

**A.Radiation disturbances, antenna polarization: Horizontal**

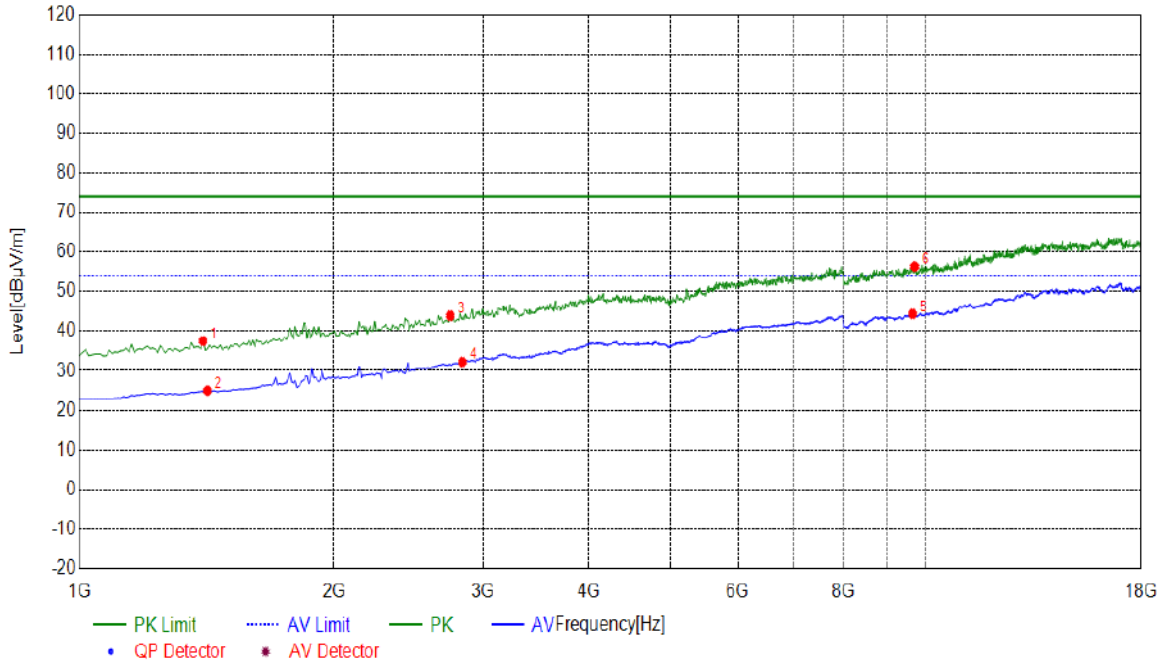



(Plot M: Test Antenna Horizontal 1G – 18G)

**Suspected List**

| NO. | Freq. [MHz] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|
| 1 | 1544.272 | 38.03 | 74.00 | 35.97 | 100 | 270 | Horizontal |
| 2 | 1629.314 | 25.94 | 54.00 | 28.06 | 100 | 240 | Horizontal |
| 3 | 6782.891 | 53.92 | 74.00 | 20.08 | 100 | 180 | Horizontal |
| 4 | 7089.044 | 42.36 | 54.00 | 11.64 | 100 | 130 | Horizontal |
| 5 | 12837.91 | 61.22 | 74.00 | 12.78 | 100 | 50 | Horizontal |
| 6 | 13118.55 | 50.02 | 54.00 | 3.98 | 100 | 300 | Horizontal |

**B.Radiation disturbances, antenna polarization: Vertical**




(Plot N: Test Antenna Vertical 1G – 18G)

**Suspected List**

| NO. | Freq. [MHz] | Level [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|---|---|---|---|---|---|---|---|
| 1 | 1399.699 | 37.50 | 74.00 | 36.50 | 100 | 210 | Vertical |
| 2 | 1416.708 | 25.01 | 54.00 | 28.99 | 100 | 280 | Vertical |
| 3 | 2743.371 | 43.88 | 74.00 | 30.12 | 100 | 350 | Vertical |
| 4 | 2836.918 | 32.25 | 54.00 | 21.75 | 100 | 60 | Vertical |
| 5 | 9657.328 | 44.33 | 54.00 | 9.67 | 100 | 290 | Vertical |
| 6 | 9708.354 | 56.37 | 74.00 | 17.63 | 100 | 70 | Vertical |

-----End of Report-----