# FCC PART 15 SUBPART C TEST REPORT

| | | |
|---|---|---|
| **Report Reference No.......................:** | **GTS20210721003-1-4** | |
| **FCC ID........................................... :** | **2ART3-K518PRO** | |
| Compiled by ( position+printed name+signature)..: | File administrators Jimmy Wang | Jimmy Wang |
| Supervised by ( position+printed name+signature)..: | Test Engineer Aaron Tan | Aaron Tan |
| Approved by ( position+printed name+signature)..: | Manager Jason Hu | Jason Hu |
| Date of issue....................................: | Aug. 05, 2021 | |
| **Representative Laboratory Name .:** | **Shenzhen Global Test Service Co., Ltd.** | |
| Address............................................: | No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong, China | |
| **Applicant's name** ............................: | **Shenzhen Lonsdor Technology Co., Ltd.** | |
| Address ............................................: | No.201-202, Block B3, Zhimei park, Fuhai Industrial Zone, Fuhai Ave, Fuyong St., Bao'an, Shenzhen 518000 | |
| **Test specification ..........................:** | | |
| Standard ...........................................: | **FCC Rules and Regulations Part 15 Subpart C ( Section 15.207 &15.209),**<br>**ANSI C63.10: 2013** | |
| TRF Originator..................................: | Shenzhen Global Test Service Co.,Ltd. | |
| Master TRF.......................................: | Dated 2014-12 | |



| | |
|---|---|
| **Test item description .....................:** | K518 PRO Key Programmer |
| Trade Mark .......................................: | Lonsdor® |
| Manufacturer ....................................: | Shenzhen Lonsdor Technology Co., Ltd. |
| Model/Type reference.......................: | K518PRO |
| Listed Models .................................: | N/A |
| Modulation Type ...............................: | ASK |
| Operation Frequency........................: | 134.2KHz |
| Hardware Version ............................: | K518 PROV5.2 |
| Software Version .............................: | V1.0 |
| Rating ..............................................: | 12.0V⎓2.0A |

# TEST REPORT

| Test Report No. : | GTS20210721003-1-4 | Aug. 05, 2021<br>Date of issue |
|---|---|---|

| | | |
|---|---|---|
| Equipment under Test | : | K518 PRO Key Programmer |
| Model /Type | : | K518PRO |
| Listed Models | : | N/A |
| **Applicant** | : | **Shenzhen Lonsdor Technology Co., Ltd.** |
| Address | : | No.201-202, Block B3, Zhimei park, Fuhai Industrial Zone, Fuhai Ave, Fuyong St., Bao'an, Shenzhen 518000 |
| **Manufacturer** | : | **Shenzhen Lonsdor Technology Co., Ltd.** |
| Address | : | No.201-202, Block B3, Zhimei park, Fuhai Industrial Zone, Fuhai Ave, Fuyong St., Bao'an, Shenzhen 518000 |

| **Test Result**: | **PASS** |
|---|---|

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

# Contents

# 1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart C (Section 15.207): Conducted limits.
FCC Rules and Regulations Part 15 Subpart C (Section 15.209): Radiated emission limits; general requirements.
ANSI C63.10: 2013: American National Standard for Testing Unlicensed Wireless Devices

# 2 SUMMARY

## 2.1 General Remarks

| | | |
|---|---|---|
| Date of receipt of test sample | : | July 22, 2021 |
| | | |
| | | |
| Testing commenced on | : | July 23, 2021 |
| | | |
| | | |
| Testing concluded on | : | Aug. 05, 2021 |

## 2.2 Product Description

| | |
|---|---|
| Product Name: | K518 PRO Key Programmer |
| Model/Type reference: | K518 PRO |
| Power supply: | DC 3.80V from battery |
| Adapter information: | Model:JHD-AP024U-120200BA-A<br>Input:100-240V~ 50/60Hz 0.55A<br>Output:12.0V⎓2.0A 24.0W |
| **134.2KHz** | |
| Operation frequency: | 134.2KHz |
| Modulation : | ASK |
| No. of Channel : | 1 |
| Antenna type: | Loop Antenna |

## 2.3 Test Sample

The application provides 2 samples to meet requirement.

| Sample Number | Description |
|---|---|
| GTS20210721003-1-1# | Engineer sample – continuous transmit |
| GTS20210721003-1-2# | Normal sample – Intermittent transmit |

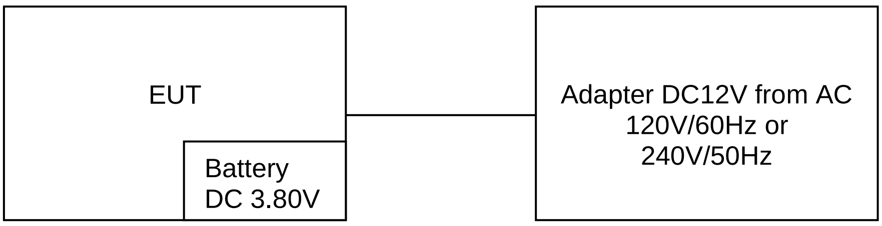
## 2.4 Equipment under Test

### Power supply system utilised

| | | | | | |
|---|---|---|---|---|---|
| Power supply voltage | : | ○ | 230V / 50 Hz | ○ | 120V / 60Hz |
| | | ○ | 12 V DC | ○ | 24 V DC |
| | | ● | Other (specified in blank below) | | |

DC 3.8V from battery

## 2.5 Block Diagram of Test Setup



## 2.6 Description of the test mode

| Operation Frequency each of channel | |
|---|---|
| Channel | Frequency |
| 1 | 134.2KHz |

Operating Mode
The mode is used: Transmitting mode

## 2.7 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

| Description | Manufacturer | Model | Technical Parameters | Certificate | Provided by |
|---|---|---|---|---|---|
| / | / | / | / | / | / |
| / | / | / | / | / | / |

## 2.8 Modifications

No modifications were implemented to meet testing criteria.

# 3 TEST ENVIRONMENT

## 3.1 Address of the test laboratory

**Shenzhen Global Test Service Co.,Ltd.**
No.7-101 and 8A-104, Building 7 and 8, DCC Cultural and Creative Garden, No.98, Pingxin North Road, Shangmugu Community, Pinghu Street, Longgang District, Shenzhen, Guangdong

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

## 3.2 Test Facility

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

### FCC-Registration No.: 165725 Designation Number: CN1234

Shenzhen Global Test Service 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.

### A2LA-Lab Cert. No.: 4758.01

Shenzhen Global Test Service Co.,Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### CNAS-Lab Code: L8169

Shenzhen Global Test Service Co.,Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories. Date of Registration: Dec. 11, 2015. Valid time is until Dec. 10, 2024.

## 3.3 Environmental conditions

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

| | |
|---|---|
| Temperature: | 15-35 ° C |
| | |
| Humidity: | 30-60 % |
| | |
| Atmospheric pressure: | 950-1050mbar |

## 3.4 Summary of measurement results

| DESCRIPTION OF TEST | RESULT |
|---|---|
| CONDUCTED EMISSIONS TEST | COMPLIANT |
| RADIATED EMISSION TEST | COMPLIANT |
| OCCUPIED BANDWIDTH MEASUREMENT | COMPLIANT |
| ANTENNA REQUIREMENT | COMPLIANT |

## 3.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Global Test Service Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen GTS laboratory is reported:

| Test | Range | Measurement Uncertainty | Notes |
|---|---|---|---|
| Radiated Emission | 30~1000MHz | 4.10 dB | (1) |
| Radiated Emission | 1~18GHz | 4.32 dB | (1) |
| Radiated Emission | 18-40GHz | 5.54 dB | (1) |
| Conducted Disturbance | 0.15~30MHz | 3.12 dB | (1) |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 3.6 Equipments Used during the Test

| Test Equipment | Manufacturer | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| LISN | R&S | ENV216 | 3560.6550.08 | 2020/09/19 | 2021/09/18 |
| LISN | R&S | ESH2-Z5 | 893606/008 | 2020/09/19 | 2021/09/18 |
| EMI Test Receiver | R&S | ESPI3 | 101841-cd | 2020/09/19 | 2021/09/18 |
| EMI Test Receiver | R&S | ESCI7 | 101102 | 2020/09/19 | 2021/09/18 |
| Spectrum Analyzer | Agilent | N9020A | MY48010425 | 2020/09/19 | 2021/09/18 |
| Spectrum Analyzer | R&S | FSV40 | 100019 | 2020/09/19 | 2021/09/18 |
| Vector Signal generator | Agilent | N5181A | MY49060502 | 2020/09/19 | 2021/09/18 |
| Signal generator | Agilent | E4421B | 3610AO1069 | 2020/09/19 | 2021/09/18 |
| Climate Chamber | ESPEC | EL-10KA | A20120523 | 2020/09/19 | 2021/09/18 |
| Controller | EM Electronics | Controller EM 1000 | N/A | N/A | N/A |
| Horn Antenna | Schwarzbeck | BBHA 9120D | 01622 | 2020/09/19 | 2021/09/18 |
| Active Loop Antenna | Beijing Da Ze Technology Co.,Ltd. | ZN30900C | 15006 | 2020/10/11 | 2021/10/10 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 000976 | 2021/05/25 | 2022/05/24 |
| Broadband Horn Antenna | SCHWARZBECK | BBHA 9170 | 791 | 2020/09/19 | 2021/09/18 |
| Amplifier | Schwarzbeck | BBV 9743 | #202 | 2020/09/19 | 2021/09/18 |
| Amplifier | Schwarzbeck | BBV9179 | 9719-025 | 2020/09/19 | 2021/09/18 |
| Amplifier | EMCI | EMC051845B | 980355 | 2020/09/19 | 2021/09/18 |
| Temperature/Humidi | Gangxing | CTH-608 | 02 | 2020/09/19 | 2021/09/18 |

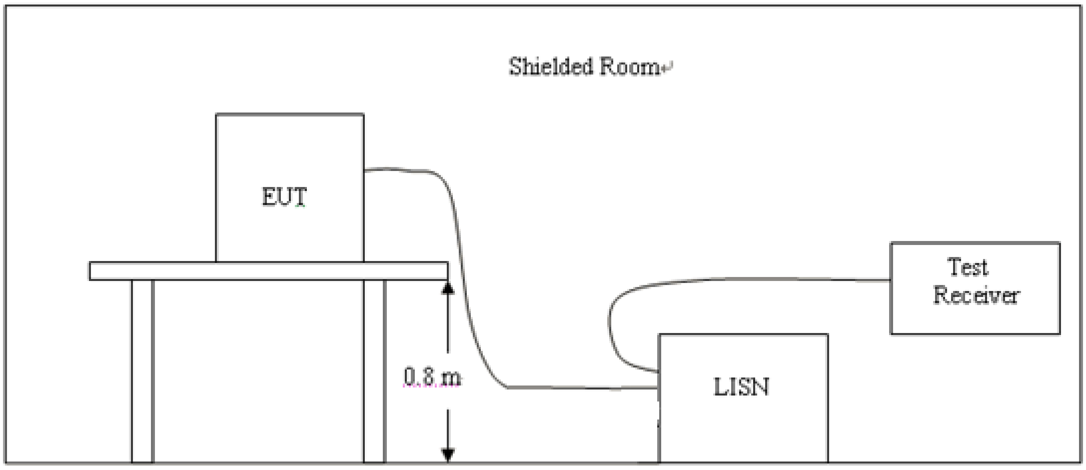
| | | | | | |
|---|---|---|---|---|---|
| ty Meter | | | | | |
| High-Pass Filter | K&L | 9SH10-2700/X12750-O/O | KL142031 | 2020/09/19 | 2021/09/18 |
| High-Pass Filter | K&L | 41H10-1375/U12750-O/O | KL142032 | 2020/09/19 | 2021/09/18 |
| RF Cable(below 1GHz) | HUBER+SUHNER | RG214 | RE01 | 2020/09/19 | 2021/09/18 |
| RF Cable(above 1GHz) | HUBER+SUHNER | RG214 | RE02 | 2020/09/19 | 2021/09/18 |
| Data acquisition card | Agilent | WX06610-A531A | TW53323507 | 2020/09/19 | 2021/09/18 |
| Power Sensor | Agilent | WX06610-A021XA | MY5365004 | 2020/09/19 | 2021/09/18 |
| Test Control Unit | Tonscend | JS0806-1 | 178060067 | 2021/06/18 | 2022/06/17 |
| Automated filter bank | Tonscend | JS0806-F | 19F8060177 | 2021/06/18 | 2022/06/17 |
| EMI Test Software | Tonscend | JS1120-1 | Ver 2.6.8.0518 | / | / |
| EMI Test Software | Tonscend | JS1120-3 | Ver 2.5.77.0418 | / | / |
| EMI Test Software | Tonscend | JS32-CE | Ver 2.5 | / | / |
| EMI Test Software | Tonscend | JS32-RE | Ver 2.5.1.8 | / | / |

Note: The Cal.Interval was one year.

# 4 TEST CONDITIONS AND RESULTS

## 4.1 AC Power Conducted Emission

**TEST CONFIGURATION**




**TEST PROCEDURE**

1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2, Support equipment, if needed, was placed as per ANSI C63.10.
3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5, All support equipments received AC power from a second LISN, if any.
6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

**AC Power Conducted Emission Limit**

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

| Frequency range (MHz) | Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| * Decreases with the logarithm of the frequency. | | |

## TEST RESULTS

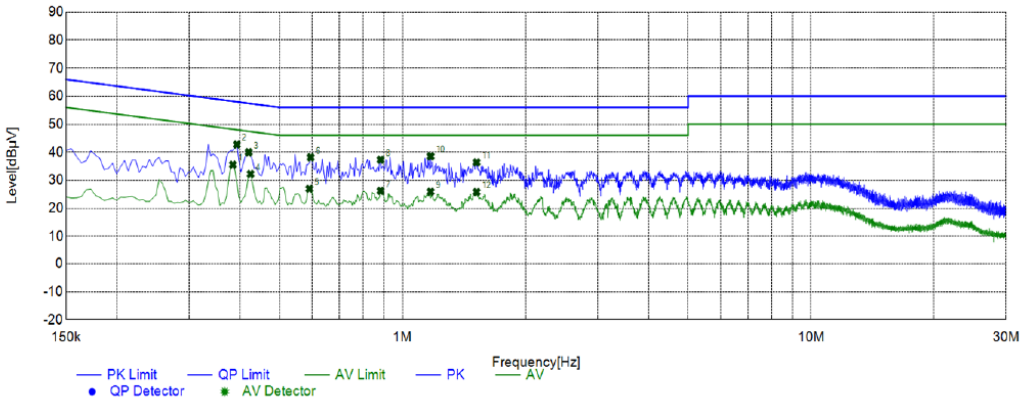
Remark:

1. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:.

| Temperature | 22.8℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Moon Tan | Test mode | TX |

| Power supply: | DC 12V from Adapter AC 120V/60Hz | Polarization | L |
|---|---|---|---|

**Test Graph**




Suspected List

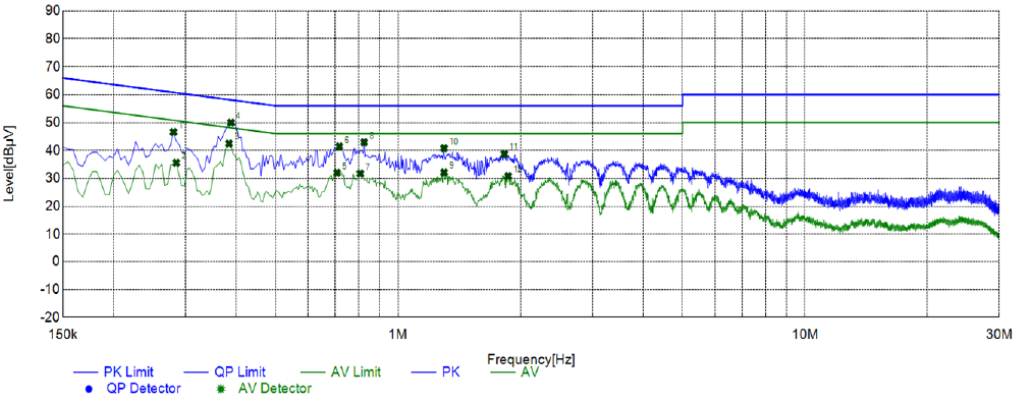
| NO. | Frequency [MHz] | Reading [dBμV] | Factor [dB] | Result [dBμV] | Limit [dBμV] | Margin [dB] | Detector | Line | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.3840 | 25.56 | 10.02 | 35.58 | 48.19 | 12.61 | AV | L1 | PASS |
| 2 | 0.3930 | 32.69 | 10.02 | 42.71 | 58.00 | 15.29 | PK | L1 | PASS |
| 3 | 0.4200 | 29.96 | 10.03 | 39.99 | 57.45 | 17.46 | PK | L1 | PASS |
| 4 | 0.4245 | 22.25 | 10.03 | 32.28 | 47.36 | 15.08 | AV | L1 | PASS |
| 5 | 0.5910 | 16.90 | 10.06 | 26.96 | 46.00 | 19.04 | AV | L1 | PASS |
| 6 | 0.5955 | 28.11 | 10.06 | 38.17 | 56.00 | 17.83 | PK | L1 | PASS |
| 7 | 0.8835 | 16.18 | 10.06 | 26.24 | 46.00 | 19.76 | AV | L1 | PASS |
| 8 | 0.8835 | 27.30 | 10.06 | 37.36 | 56.00 | 18.64 | PK | L1 | PASS |
| 9 | 1.1715 | 15.84 | 10.09 | 25.93 | 46.00 | 20.07 | AV | L1 | PASS |
| 10 | 1.1715 | 28.47 | 10.09 | 38.56 | 56.00 | 17.44 | PK | L1 | PASS |
| 11 | 1.5180 | 26.32 | 10.11 | 36.43 | 56.00 | 19.57 | PK | L1 | PASS |
| 12 | 1.5180 | 15.70 | 10.11 | 25.81 | 46.00 | 20.19 | AV | L1 | PASS |

Note:1. Result (dBμV) = Reading (dBμV) + Factor (dB).

2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

| Power supply: | DC 12V from Adapter AC 120V/60Hz | Polarization | N |
|---|---|---|---|

**Test Graph**




## Suspected List

| NO. | Frequency [MHz] | Reading [dBμV] | Factor [dB] | Result [dBμV] | Limit [dBμV] | Margin [dB] | Detector | Line | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.2805 | 36.61 | 9.99 | 46.60 | 60.80 | 14.20 | PK | N | PASS |
| 2 | 0.2850 | 25.63 | 9.99 | 35.62 | 50.67 | 15.05 | AV | N | PASS |
| 3 | 0.3840 | 32.42 | 10.02 | 42.44 | 48.19 | 5.75 | AV | N | PASS |
| 4 | 0.3885 | 39.96 | 10.02 | 49.98 | 58.10 | 8.12 | PK | N | PASS |
| 5 | 0.7080 | 21.99 | 10.05 | 32.04 | 46.00 | 13.96 | AV | N | PASS |
| 6 | 0.7170 | 31.32 | 10.05 | 41.37 | 56.00 | 14.63 | PK | N | PASS |
| 7 | 0.8070 | 21.67 | 10.07 | 31.74 | 46.00 | 14.26 | AV | N | PASS |
| 8 | 0.8250 | 32.84 | 10.07 | 42.91 | 56.00 | 13.09 | PK | N | PASS |
| 9 | 1.2975 | 22.06 | 10.09 | 32.15 | 46.00 | 13.85 | AV | N | PASS |
| 10 | 1.2975 | 30.67 | 10.09 | 40.76 | 56.00 | 15.24 | PK | N | PASS |
| 11 | 1.8240 | 28.59 | 10.13 | 38.72 | 56.00 | 17.28 | PK | N | PASS |
| 12 | 1.8645 | 20.70 | 10.14 | 30.84 | 46.00 | 15.16 | AV | N | PASS |

Note:1. Result (dBμV) = Reading (dBμV) + Factor (dB).
2. Factor (dB) = Cable loss (dB) + LISN Factor (dB).

## 4.2 Radiated Emission

**Limit**

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

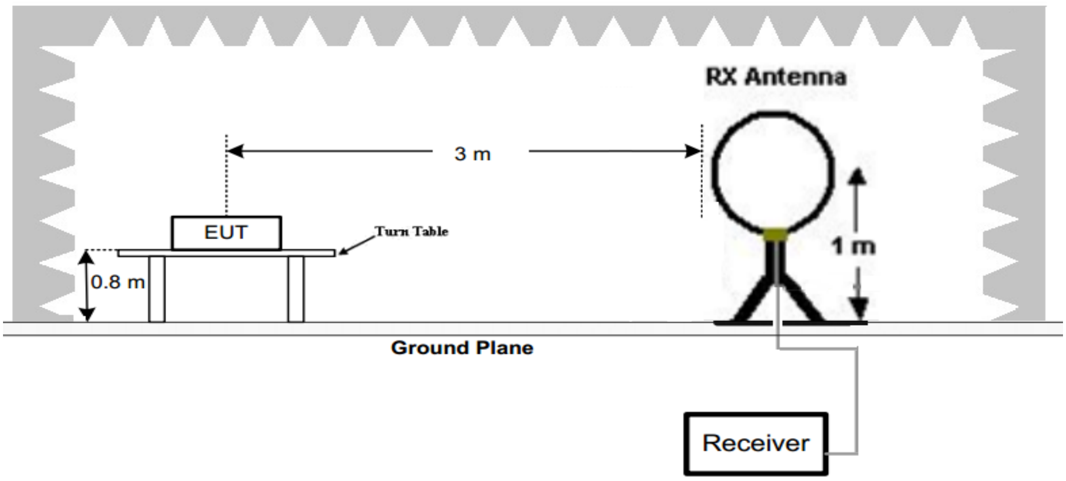
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

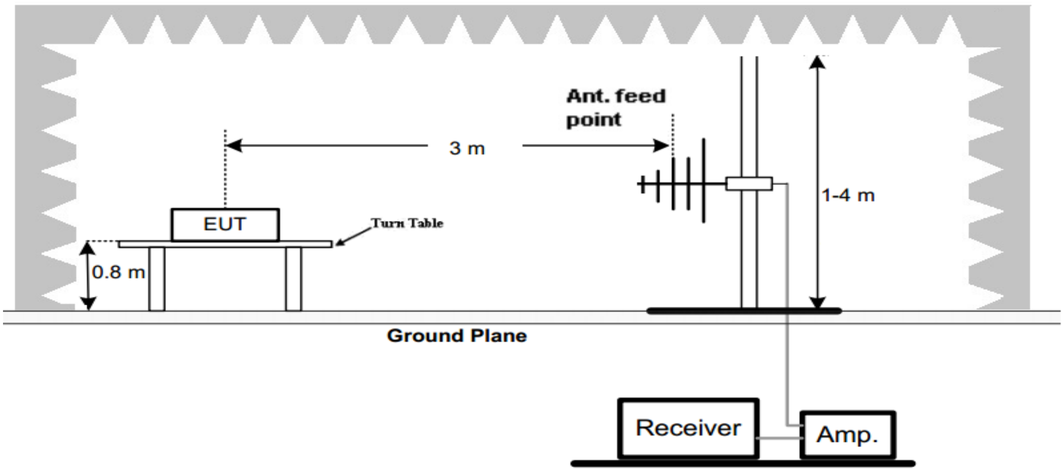
| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m) | Radiated (μV/m) |
|---|---|---|---|
| 0.009-0.49 | 3 | 20log(2400/F(KHz))+40log(300/3) | 2400/F(KHz) |
| 0.49-1.705 | 3 | 20log(24000/F(KHz))+ 40log(30/3) | 24000/F(KHz) |
| 1.705-30 | 3 | 20log(30)+ 40log(30/3) | 30 |
| 30-88 | 3 | 40.0 | 100 |
| 88-216 | 3 | 43.5 | 150 |
| 216-960 | 3 | 46.0 | 200 |
| Above 960 | 3 | 54.0 | 500 |

**TEST CONFIGURATION**

1. Radiated Emission Test Set-Up, Frequency Below 30MHz




2. Radiated Emission Test Set-Up, Frequency below 1000MHz



**Test Procedure**

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. Radiated emission test frequency band from 9KHz to 1000MHz.
6. The distance between test antenna and EUT as following table states:

| Test Frequency range | Test Antenna Type | Test Distance |
|---|---|---|
| 9KHz-30MHz | Active Loop Antenna | 3 |
| 30MHz-1GHz | Bilog Antenna | 3 |

7. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting | Detector |
|---|---|---|
| 9KHz-150KHz | RBW=200Hz/VBW=3KHz,Sweep time=Auto | QP |
| 150KHz-30MHz | RBW=9KHz/VBW=100KHz,Sweep time=Auto | QP |
| 30MHz-1GHz | RBW=120KHz/VBW=1000KHz,Sweep time=Auto | QP |

**TEST RESULTS**

| Temperature | 22.8℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Moon Tan | Test mode | TX |

**For 9 KHz-30MHz**

**WORST-CASE RADIATED EMISSION BELOW 30 MHz**

| Frequency | Reading | Polar | Antenna Factor | Cable Loss | Emission Levels | Limits at 3m | Margin | Detector Mode |
|---|---|---|---|---|---|---|---|---|
| (MHz) | (dBµV/m) | Loop | (dB/m) | (dB) | (dBµV/m) | (dBµV/m) | (dB) | |
| 0.134(F) | 38.93 | Loop | 23.64 | 0.01 | 62.58 | 105.05 | 42.47 | PK |
| 0.134(F) | 29.01 | Loop | 23.64 | 0.01 | 52.66 | 85.05 | 32.39 | AV |
| 0.110 | 26.80 | Loop | 23.55 | 0.01 | 50.36 | 106.78 | 56.42 | PK |
| 0.110 | 17.80 | Loop | 23.55 | 0.01 | 41.36 | 86.78 | 45.42 | AV |
| 0.268 | 24.66 | Loop | 23.75 | -0.17 | 48.24 | 99.04 | 50.80 | QP |
| 0.403 | 19.31 | Loop | 24.19 | -0.25 | 43.25 | 95.50 | 52.25 | QP |
| 3.025 | 15.33 | Loop | 24.65 | -0.24 | 39.74 | 69.54 | 29.80 | QP |
| -- | -- | -- | -- | -- | -- | -- | | -- |

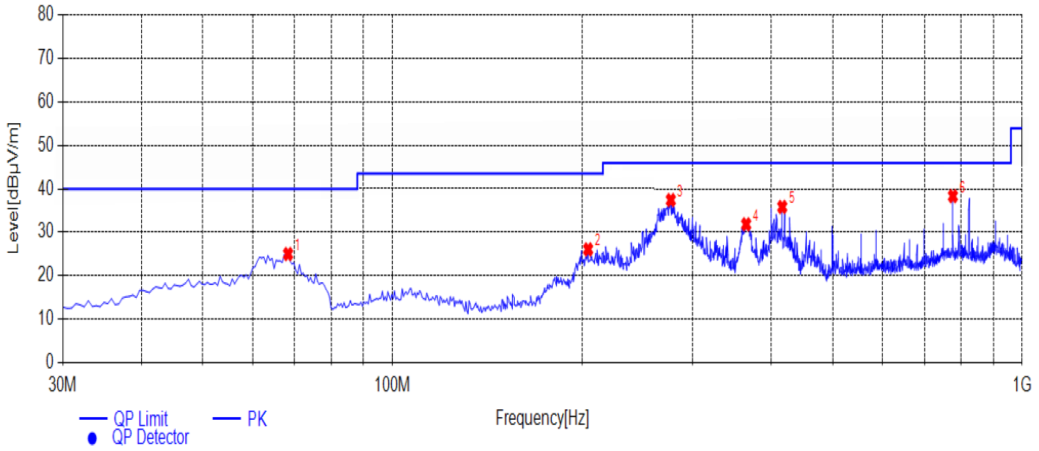
Remark:

1. Data of measurement within this frequency range shown "-- in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits and not recorded.
2. The test limit distance is 3m limit.
3. PK means Peak Value, QP means Quasi Peak Value, AV means Average Value.
4. F means Fundamental Frequency.
5. Emission level (dBuV/m) =Reading + Antenna Factor + Cable Loss.
6. Margin value = Limit value- Emission level.

**For 30MHz-1GHz**

Horizontal

**Test Graph**




Suspected List

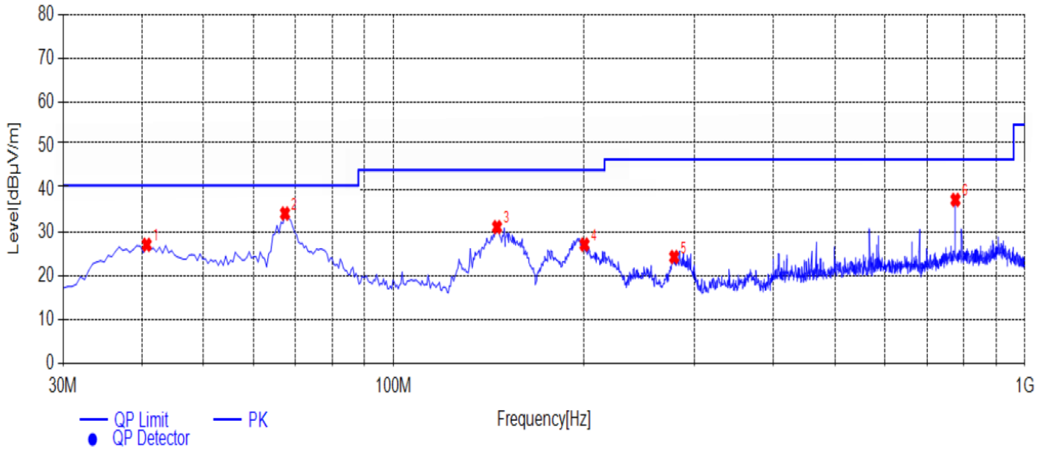
| NO. | Frequency [MHz] | Reading [dBµV/m] | Factor [dB] | Result [dBµV/m] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Detector | Polarity | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 68.3150 | 34.54 | -9.56 | 24.98 | 40.00 | 15.02 | 100 | 90 | PK | Horizonta | PASS |
| 2 | 204.6000 | 34.81 | -8.76 | 26.05 | 43.50 | 17.45 | 100 | 180 | PK | Horizonta | PASS |
| 3 | 276.8650 | 45.24 | -7.82 | 37.42 | 46.00 | 8.58 | 100 | 280 | PK | Horizonta | PASS |
| 4 | 364.6500 | 37.37 | -5.55 | 31.82 | 46.00 | 14.18 | 100 | 300 | PK | Horizonta | PASS |
| 5 | 416.0600 | 40.26 | -4.43 | 35.83 | 46.00 | 10.17 | 100 | 150 | PK | Horizonta | PASS |
| 6 | 776.4150 | 36.76 | 1.56 | 38.32 | 46.00 | 7.68 | 100 | 270 | PK | Horizonta | PASS |

Note:1. Result (dBµV/m) = Reading(dBµV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

Vertical

**Test Graph**




## Suspected List

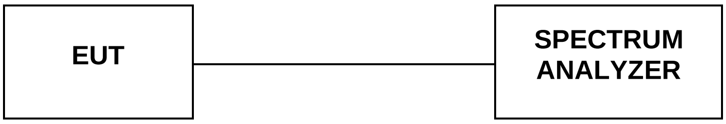
| NO. | Frequency [MHz] | Reading [dBμV/m] | Factor [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Detector | Polarity | Remark |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 40.6700 | 35.63 | -8.40 | 27.23 | 40.00 | 12.77 | 100 | 160 | PK | Vertical | PASS |
| 2 | 67.3450 | 44.12 | -9.70 | 34.42 | 40.00 | 5.58 | 100 | 360 | PK | Vertical | PASS |
| 3 | 145.9150 | 43.65 | -12.36 | 31.29 | 43.50 | 12.21 | 100 | 90 | PK | Vertical | PASS |
| 4 | 200.7200 | 35.96 | -8.69 | 27.27 | 43.50 | 16.23 | 100 | 320 | PK | Vertical | PASS |
| 5 | 278.3200 | 32.17 | -7.76 | 24.41 | 46.00 | 21.59 | 100 | 250 | PK | Vertical | PASS |
| 6 | 776.4150 | 36.00 | 1.56 | 37.56 | 46.00 | 8.44 | 100 | 70 | PK | Vertical | PASS |

Note:1. Result (dBμV/m) = Reading(dBμV/m) + Factor (dB) .

2. Factor (dB) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB).

## 4.3 Occupied Bandwidth

**TEST CONFIGURATION**




**TEST PROCEDURE**

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equip compliance with the 20dB attenuation specification may base on measurement at the intentional radiator's antenna output terminal unless the intentional radiator uses a permanently attached antenna, in which case compliance shall be.deomonstrated by measuring the radiated emissions.

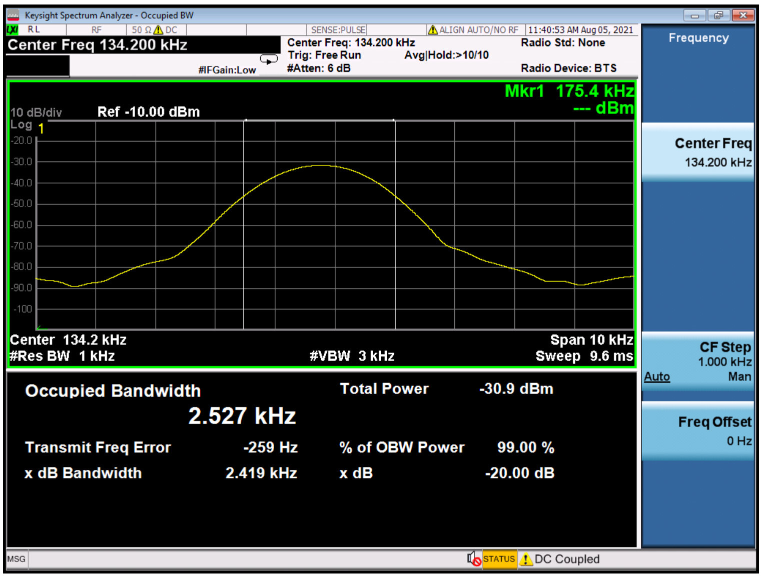
**LIMIT**

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

**TEST RESULTS**

| Temperature | 22.8℃ | Humidity | 56% |
|---|---|---|---|
| Test Engineer | Moon Tan | Test mode | TX |

| Mode | Freq (KHz) | 20dB Bandwidth (KHz) | 99% OBW (KHz) | Conclusion |
|---|---|---|---|---|
| Tx Mode | 134.2 | 2.419 | 2.527 | PASS |



## 4.4 Antenna Requirement

**Standard Applicable**

**Standard Applicable**

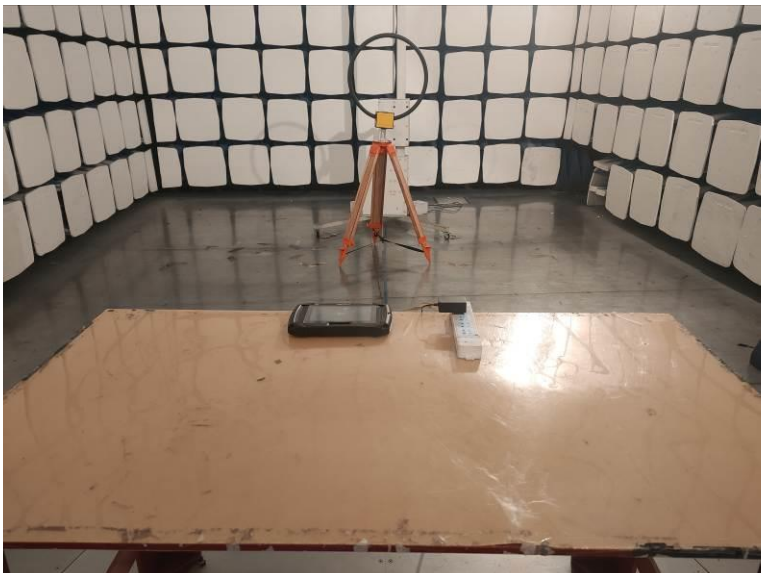
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

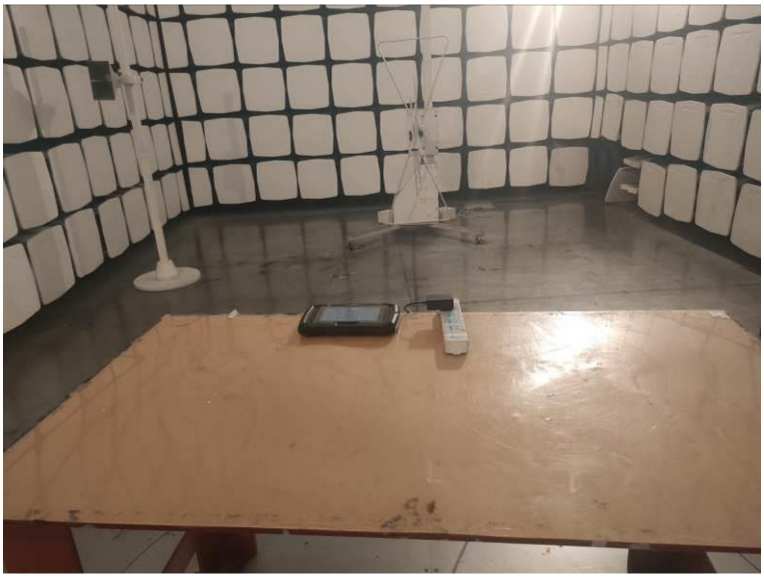
And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

**Antenna Information**

The antenna used in this product is a Coil Antenna, The directional gains of antenna used for transmitting is 0dBi.

# 5 Test Setup Photos of the EUT





# 6 PHOTOS OF THE EUT

Reference to the test report No. GTS20190528003-1-1

************************************************* End of Report *************************************************