

**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

FCC PART 15 SUBPART C TEST REPORT**FCC PART 15.247****Report Reference No.**.....: **GTS20211014013-1-2****FCC ID**.....: **2ATKG-RAD78235**

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Date of issue: Nov.04, 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.....: **Sutro Connect Inc.**

Address: 181 2nd St.#21, San Francisco, California, 94105 United States

Test specificationStandard: **FCC Part 15.247**

TRF Originator.....: Shenzhen Global Test Service Co.,Ltd.

Master TRF: Dated 2014-12

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Test item description: **Sutro Hub+Charger**

Trade Mark: SUTRO

Manufacturer: Sutro Connect Inc.

Model/Type reference: SHC-1

Listed Models: N/A

Modulation Type.....: 2FSK

Operation Frequency.....: From 2402MHz to 2480MHz

Hardware Version: V1.5

Software Version: V2.1.1

Rating: DC 5.0V by Adapter

Result: **PASS**

TEST REPORT

| | | |
|--------------------------|---------------------------|---------------|
| Test Report No. : | GTS20211014013-1-2 | Nov.04, 2021 |
| | | Date of issue |

Equipment under Test : Sutro Hub+Charger

Model /Type : SHC-1

Listed model : N/A

Applicant : **Sutro Connect Inc.**

Address : 181 2nd St.#21, San Francisco, California, 94105 United States

Manufacturer : **Sutro Connect Inc.**

Address : 181 2nd St.#21, San Francisco, California, 94105 United States

| | |
|---------------------|-------------|
| 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.

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1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10-2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB558074 D01 DTS Meas Guidance v05r02](#): Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247.

2. SUMMARY

2.1. General Remarks

| | | |
|--------------------------------|---|--------------|
| Date of receipt of test sample | : | Oct.15, 2021 |
| | : | |
| Testing commenced on | : | Oct.15, 2021 |
| | : | |
| Testing concluded on | : | Nov.04, 2021 |

2.2. Product Description

| | |
|------------------------------|---|
| Product Name | Sutro Hub+Charger |
| Trade Mark | SUTRO |
| Model/Type reference | SHC-1 |
| List Models | N/A |
| Model Declaration | N/A |
| Power supply: | DC 5.0V by Adapter |
| Sample ID | GTS20211014013-1-1# & GTS20211014013-1-2# |
| WIFI(2.4G Band) | |
| Frequency Range | 2412MHz ~ 2462MHz |
| Channel Spacing | 5MHz |
| Channel Number | 11 Channel for 20MHz bandwidth(2412~2462MHz) |
| Modulation Type | 802.11b: DSSS; 802.11g/n: OFDM |
| Antenna Description | FPC Antenna, 2.10dBi(Max.) |
| SRD | |
| Frequency Range | 915MHz |
| Channel Number | 1Channel |
| Modulation Type | 2FSK |
| Antenna Description | FPC Antenna, 2.38dBi(Max.) |
| LTE | |
| LTE Operation Frequency Band | E-UTRA Band 2(1850 MHz -1910MHz) E-UTRA Band 4(1710 MHz -1755MHz) E-UTRA Band 12(699 MHz -716MHz) |
| LTE Release Version | R9 |
| Type Of Modulation | QPSK/16QAM |
| Antenna Description | FPC Antenna; 3.68dBi (max.) For LTE Band 2; 3.68dBi (max.) For LTE Band 4; 3.68dBi (max.) For LTE Band 12; |

2.3. Equipment Under Test

Power supply system utilised

| | | | | | |
|----------------------|---|----------------------------------|----------------------------------|-----------------------|-------------|
| Power supply voltage | : | <input type="radio"/> | 230V / 50 Hz | <input type="radio"/> | 120V / 60Hz |
| | | <input type="radio"/> | 12 V DC | <input type="radio"/> | 24 V DC |
| | | <input checked="" type="radio"/> | Other (specified in blank below) | | |

DC 5.0V

2.4. Short description of the Equipment under Test (EUT)

This is a Sutro Hub+Charger .

For more details, refer to the user's manual of the EUT.

2.5. EUT operation mode

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing .There are 40 channels provided to the EUT. Channel 00/19/39 was selected to test.

| Mode of Operations | Frequency Range (MHz) | Data Rate (Mbps) |
|------------------------|-----------------------|------------------|
| (SRD) | 915 | 1 |
| For Conducted Emission | | |
| Test Mode | | TX Mode |
| For Radiated Emission | | |
| Test Mode | | TX Mode |

| Channel | Frequency(MHz) |
|---------|----------------|
| 1 | 915 |

The EUT has been tested under operating condition.

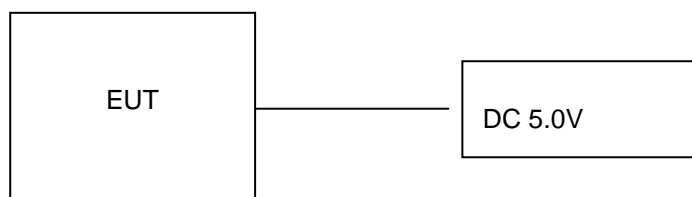
This test was performed with EUT in X, Y, Z position and the worst case was found when EUT in X position.

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/60Hz modes, recorded worst case.

Worst-case mode and channel used for 150 KHz-30 MHz power line conducted emissions was the mode and channel with the highest output power, which was determined to be SRD mode.

Worst-case mode and channel used for 9 KHz-1000 MHz radiated emissions was the mode and channel with the highest output power, that was determined to be SRD mode.

2.6. Block Diagram of Test Setup



2.7. EUT Exercise Software

N/A

2.8. Special Accessories

| Manufacturer | Description | Model | Serial Number | Certificate |
|--|-------------|--------------------|---------------|-------------|
| SHENZHEN FUSHIGANG TECHNOLOGY CO.,LTD. | Adapter | AS1201A-0502000USU | -- | SDOC |

2.9. External I/O Cable

| I/O Port Description | Quantity | Cable |
|----------------------|----------|------------------------|
| DC IN Port | 1 | 1.0M, Unscreened Cable |

2.10. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2ATKG-RAD78235** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.11. 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, China.

3.2. Test Facility

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

CNAS (No. CNAS 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: 2019 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA (Certificate No. 4758.01)

Shenzhen Global Test Service Co., Ltd. has been assessed by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4758.01.

Industry Canada Registration Number. is 24189.

FCC Designation Number is CN1234.

FCC Registered Test Site Number is 165725.

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. 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) |

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

3.5. Test Description

| Applied Standard: FCC Part 15 Subpart C | | | | |
|---|--------------------------------|---------------------|-----------|--------|
| FCC Rules | Description of Test | Test Sample | Result | Remark |
| §15.247(b) | Maximum Conducted Output Power | GTS20211014013-1-1# | Compliant | Note 1 |
| §15.209, §15.247(d) | Radiated Spurious Emissions | GTS20211014013-1-2# | Compliant | Note 1 |
| §15.205 | Emissions at Restricted Band | GTS20211014013-1-2# | Compliant | Note 1 |
| §15.207(a) | AC Conducted Emissions | GTS20211014013-1-2# | Compliant | Note 1 |
| §15.203 §15.247(c) | Antenna Requirements | GTS20211014013-1-1# | Compliant | Note 1 |
| §15.247(i)§2.1093 | RF Exposure | / | Compliant | Note 2 |

Remark:

1. The measurement uncertainty is not included in the test result.
2. NA = Not Applicable; NP = Not Performed
3. Note 1 – Test results inside test report;
4. Note 2 – Test results in other test report (MPE Report).
5. We tested all test mode and recorded worst case in report

3.6. Equipments Used during the Test

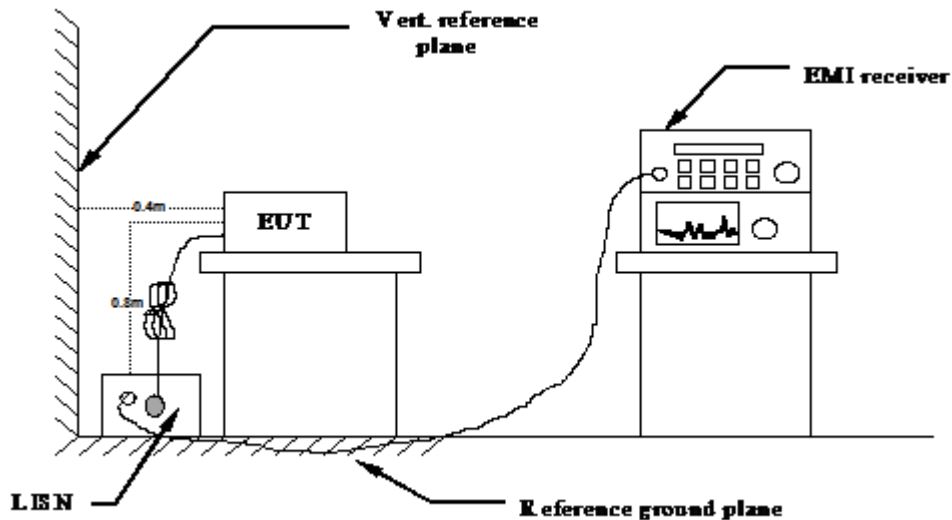
| Test Equipment | Manufacturer | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|----------------------------|-----------------------------------|-----------------------|-----------------|------------------|----------------------|
| LISN | CYBERTEK | EM5040A | E1850400105 | 2021/07/17 | 2022/07/16 |
| LISN | R&S | ESH2-Z5 | 893606/008 | 2021/07/17 | 2022/07/16 |
| EMI Test Receiver | R&S | ESPI3 | 101841-cd | 2021/07/17 | 2022/07/16 |
| EMI Test Receiver | R&S | ESCI7 | 101102 | 2021/09/19 | 2022/09/18 |
| Spectrum Analyzer | Agilent | N9020A | MY48010425 | 2021/09/19 | 2022/09/18 |
| Spectrum Analyzer | R&S | FSV40 | 100019 | 2021/07/17 | 2022/07/16 |
| Vector Signal generator | Agilent | N5181A | MY49060502 | 2021/07/17 | 2022/07/16 |
| Signal generator | Agilent | N5182A | 3610AO1069 | 2021/09/19 | 2022/09/18 |
| Climate Chamber | ESPEC | EL-10KA | A20120523 | 2021/09/19 | 2022/09/18 |
| Controller | EM Electronics | Controller EM 1000 | N/A | N/A | N/A |
| Horn Antenna | Schwarzbeck | BBHA 9120D | 01622 | 2020/11/08 | 2021/11/07 |
| Active Loop Antenna | Beijing Da Ze Technology Co.,Ltd. | ZN30900C | 15006 | 2021/09/19 | 2022/09/18 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 000976 | 2021/08/08 | 2022/08/07 |
| Broadband Horn Antenna | SCHWARZBECK | BBHA 9170 | 791 | 2020/11/08 | 2021/11/07 |
| Amplifier | Schwarzbeck | BBV 9743 | #202 | 2021/07/17 | 2022/07/16 |
| Amplifier | Schwarzbeck | BBV9179 | 9719-025 | 2021/07/17 | 2022/07/16 |
| Amplifier | EMCI | EMC051845B | 980355 | 2021/07/17 | 2022/07/16 |
| Temperature/Humidity Meter | Gangxing | CTH-608 | 02 | 2021/07/17 | 2022/07/16 |
| High-Pass Filter | K&L | 9SH10-2700/X12750-O/O | KL142031 | 2021/07/17 | 2022/07/16 |
| High-Pass Filter | K&L | 41H10-1375/U12750-O/O | KL142032 | 2021/07/17 | 2022/07/16 |
| RF Cable(below 1GHz) | HUBER+SUHNER | RG214 | RE01 | 2021/07/17 | 2022/07/16 |
| RF Cable(above 1GHz) | HUBER+SUHNER | RG214 | RE02 | 2021/07/17 | 2022/07/16 |
| Data acquisition card | Agilent | U2531A | TW53323507 | 2021/07/17 | 2022/07/16 |
| Power Sensor | Agilent | U2021XA | MY5365004 | 2021/07/17 | 2022/07/16 |
| Test Control Unit | Tonscend | JS0806-1 | 178060067 | 2021/07/17 | 2022/07/16 |
| Automated filter bank | Tonscend | JS0806-F | 19F8060177 | 2021/07/17 | 2022/07/16 |
| 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: 1. 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 C63.10-2013.
- 2 Support equipment, if needed, was placed as per ANSI C63.10-2013
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
- 4 The EUT received DC 5V power, the adapter received AC120V/60Hz or AC 240V/60Hz 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.
- 8 During the above scans, the emissions were maximized by cable manipulation.

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.

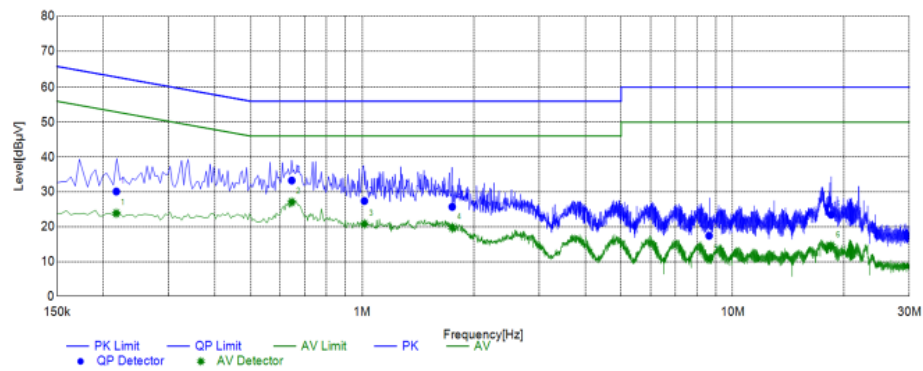
TEST RESULTS

Remark: We measured Conducted Emission at SRD mode from 150 KHz to 30MHz in AC120V and the worst case was recorded.

| | | | |
|---------------|-----------|----------------|-----|
| Temperature | 25°C | Humidity | 60% |
| Test Engineer | Oliver Ou | Configurations | BT |

| | | | |
|---------------|--------------|--------------|---|
| Power supply: | AC 120V/60Hz | Polarization | L |
|---------------|--------------|--------------|---|

Test Graph



Final Data List

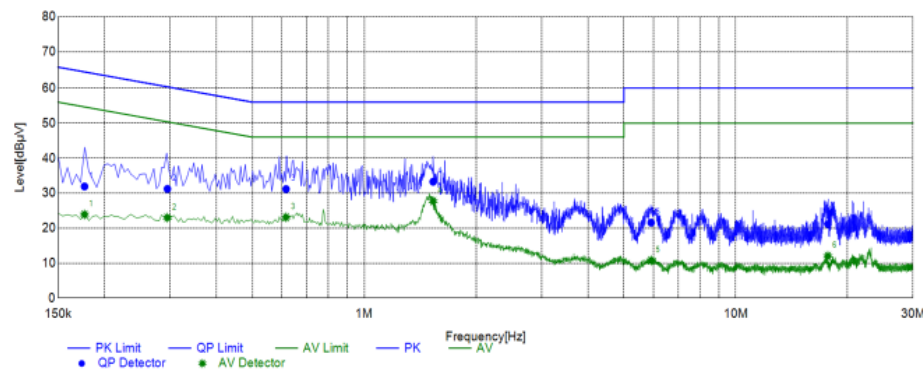
| NO. | Frequency [MHz] | QP Reading [dBμV] | AVG. Reading [dBμV] | Factor [dB] | QP Result [dBμV] | AVG. Result [dBμV] | QP Limit [dBμV] | AVG. Limit [dBμV] | QP Margin [dB] | AVG. Margin [dB] | Line | Remark |
|-----|--------------------|-------------------------|---------------------------|----------------|------------------------|--------------------------|-----------------------|-------------------------|----------------------|------------------------|------|--------|
| 1 | 0.2169 | 20.05 | 13.80 | 10.05 | 30.10 | 23.85 | 62.94 | 52.94 | 32.84 | 29.09 | L1 | PASS |
| 2 | 0.6455 | 23.20 | 17.02 | 10.06 | 33.26 | 27.08 | 56.00 | 46.00 | 22.74 | 18.92 | L1 | PASS |
| 3 | 1.0136 | 17.32 | 10.73 | 10.07 | 27.39 | 20.80 | 56.00 | 46.00 | 28.61 | 25.20 | L1 | PASS |
| 4 | 1.7499 | 15.57 | 9.66 | 10.13 | 25.70 | 19.79 | 56.00 | 46.00 | 30.30 | 26.21 | L1 | PASS |
| 5 | 8.6386 | 6.76 | 0.15 | 10.64 | 17.40 | 10.79 | 60.00 | 50.00 | 42.60 | 39.21 | L1 | PASS |
| 6 | 18.4521 | 12.07 | 3.18 | 11.36 | 23.43 | 14.54 | 60.00 | 50.00 | 36.57 | 35.46 | L1 | PASS |

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

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

| | | | |
|---------------|--------------|--------------|---|
| Power supply: | AC 120V/60Hz | Polarization | N |
|---------------|--------------|--------------|---|

Test Graph



Final Data List

| NO. | Frequency [MHz] | QP Reading [dBμV] | AVG. Reading [dBμV] | Factor [dB] | QP Result [dBμV] | AVG. Result [dBμV] | QP Limit [dBμV] | AVG. Limit [dBμV] | QP Margin [dB] | AVG. Margin [dB] | Line | Remark |
|-----|--------------------|-------------------------|---------------------------|----------------|------------------------|--------------------------|-----------------------|-------------------------|----------------------|------------------------|------|--------|
| 1 | 0.1767 | 21.87 | 13.86 | 10.05 | 31.92 | 23.91 | 64.64 | 54.64 | 32.72 | 30.73 | N | PASS |
| 2 | 0.2954 | 21.24 | 13.02 | 9.98 | 31.22 | 23.00 | 60.37 | 50.37 | 29.15 | 27.37 | N | PASS |
| 3 | 0.6161 | 21.11 | 13.05 | 10.06 | 31.17 | 23.11 | 56.00 | 46.00 | 24.83 | 22.89 | N | PASS |
| 4 | 1.5329 | 23.16 | 17.58 | 10.11 | 33.27 | 27.69 | 56.00 | 46.00 | 22.73 | 18.31 | N | PASS |
| 5 | 5.9196 | 11.03 | 0.25 | 10.54 | 21.57 | 10.79 | 60.00 | 50.00 | 38.43 | 39.21 | N | PASS |
| 6 | 17.7019 | 9.91 | 0.80 | 11.24 | 21.15 | 12.04 | 60.00 | 50.00 | 38.85 | 37.96 | N | PASS |

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

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

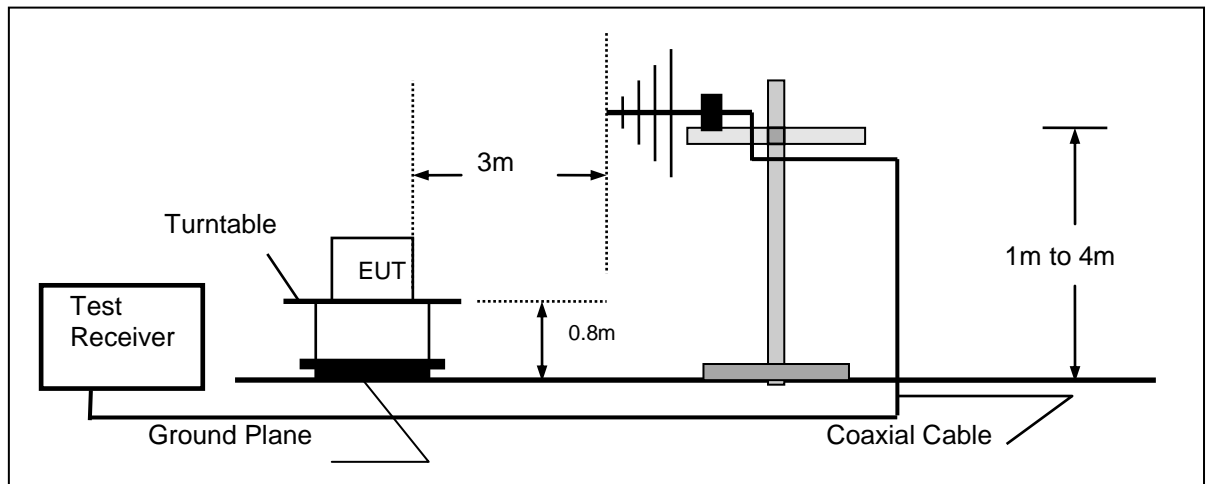
4.2. Radiated Emission

TEST CONFIGURATION

Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –1GHz;the EUT was placed on a turn table which is 1.5m above ground plane when testing frequency range 1GHz – 25GHz.
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 30MHz to 25GHz.
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 | Ultra-Broadband Antenna | 3 |
| 1GHz-18GHz | Double Ridged Horn Antenna | 3 |
| 18GHz-25GHz | Horn Antenna | 1 |

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 |
| 1GHz-40GHz | Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto | Peak |

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

| | |
|---------------------------|--|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude | AG = Amplifier Gain |
| AF = Antenna Factor | |

$$Transd=AF +CL-AG$$

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

| Frequency (MHz) | Distance (Meters) | Radiated (dBµV/m) | Radiated (µV/m) |
|-----------------|-------------------|--|-----------------------|
| 0.009-0.49 | 3 | $20\log(2400/F(\text{KHz}))+40\log(300/3)$ | $2400/F(\text{KHz})$ |
| 0.49-1.705 | 3 | $20\log(24000/F(\text{KHz}))+40\log(30/3)$ | $24000/F(\text{KHz})$ |
| 1.705-30 | 3 | $20\log(30)+40\log(30/3)$ | 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 RESULTS

Remark: We measured Radiated Emission at SRD mode from 30 MHz to 25GHz in AC120V and the worst case was recorded.

| | | | |
|---------------|-----------|----------------|-----|
| Temperature | 25°C | Humidity | 60% |
| Test Engineer | Oliver Ou | Configurations | BT |

For 9 KHz~30MHz

| Freq. (MHz) | Level (dBuV) | Over Limit (dB) | Over Limit (dBuV) | Remark |
|-------------|--------------|-----------------|-------------------|----------|
| - | - | - | - | See Note |

Note:

The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.

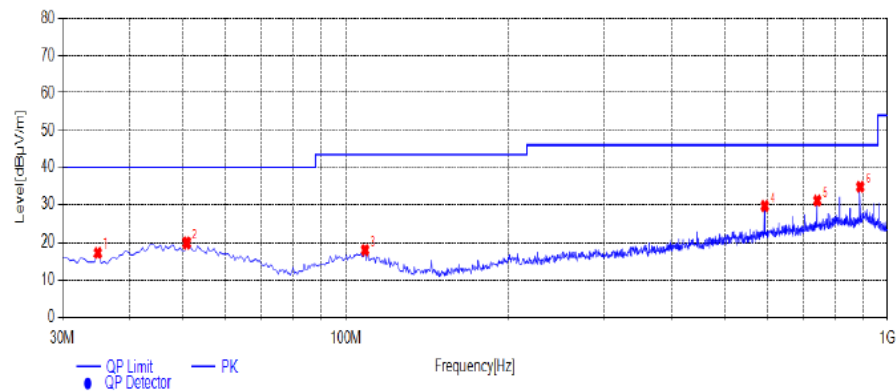
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

For 30MHz to 1000MHz

Horizontal

Test Graph



Suspected List

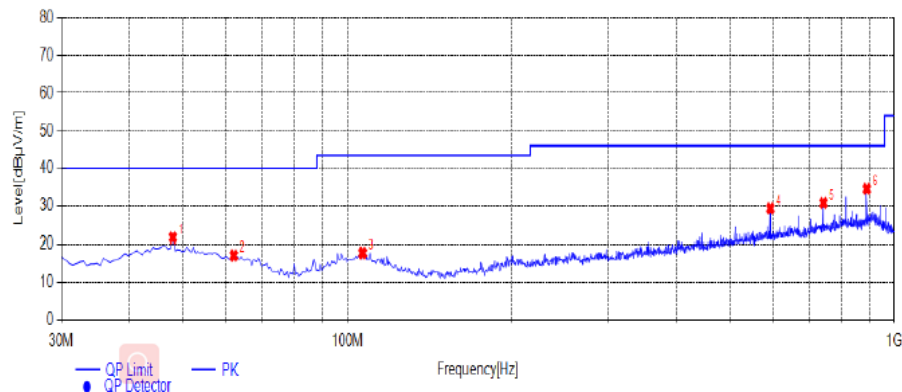
| NO. | Frequency [MHz] | Reading [dBμV/m] | Factor [dB] | Result [dBμV/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Detector | Polarity | Remark |
|-----|-----------------|------------------|-------------|-----------------|----------------|-------------|-------------|-----------|----------|------------|--------|
| 1 | 34.8500 | 27.33 | -9.91 | 17.42 | 40.00 | 22.58 | 100 | 206 | PK | Horizontal | PASS |
| 2 | 50.8550 | 26.51 | -6.51 | 20.00 | 40.00 | 20.00 | 100 | 181 | PK | Horizontal | PASS |
| 3 | 108.5700 | 26.41 | -8.22 | 18.19 | 43.50 | 25.31 | 100 | 124 | PK | Horizontal | PASS |
| 4 | 594.0550 | 31.47 | -1.81 | 29.66 | 46.00 | 16.34 | 100 | 300 | PK | Horizontal | PASS |
| 5 | 742.4650 | 30.58 | 0.51 | 31.09 | 46.00 | 14.91 | 100 | 219 | PK | Horizontal | PASS |
| 6 | 891.3600 | 32.40 | 2.40 | 34.80 | 46.00 | 11.20 | 100 | 298 | PK | Horizontal | 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 | 47.9450 | 28.45 | -6.66 | 21.79 | 40.00 | 18.21 | 100 | 163 | PK | Vertical | PASS |
| 2 | 62.0100 | 25.97 | -8.75 | 17.22 | 40.00 | 22.78 | 100 | 144 | PK | Vertical | PASS |
| 3 | 106.6300 | 25.67 | -7.79 | 17.88 | 43.50 | 25.62 | 100 | 242 | PK | Vertical | PASS |
| 4 | 594.0550 | 31.22 | -1.81 | 29.41 | 46.00 | 16.59 | 100 | 100 | PK | Vertical | PASS |
| 5 | 742.4650 | 30.32 | 0.51 | 30.83 | 46.00 | 15.17 | 100 | 160 | PK | Vertical | PASS |
| 6 | 891.3600 | 32.16 | 2.40 | 34.56 | 46.00 | 11.44 | 100 | 100 | 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).

Above 1G (The worst test result for Tx) :

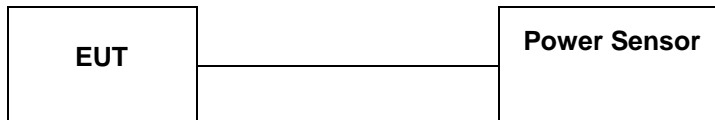
| Freq. MHz | Reading dBuv | Ant. Fac dB/m | Pre. Fac. dB | Cab. Loss dB | Measured dBuv/m | Limit dBuv/m | Margin dB | Remark | Pol. |
|-----------|--------------|---------------|--------------|--------------|-----------------|--------------|-----------|---------|------------|
| 1830.0 | 50.09 | 33.01 | 35 | 3.86 | 51.96 | 74.00 | -22.04 | Peak | Horizontal |
| 1830.0 | 35.93 | 33.01 | 35 | 3.86 | 37.80 | 54.00 | -16.20 | Average | Horizontal |
| 2745.0 | 53.46 | 33.03 | 35.02 | 3.91 | 55.38 | 74.00 | -18.62 | Peak | Horizontal |
| 2745.0 | 35.82 | 33.03 | 35.02 | 3.91 | 37.74 | 54.00 | -16.26 | Average | Horizontal |
| 1830.0 | 50.17 | 33.01 | 35 | 3.86 | 52.04 | 74.00 | -21.96 | Peak | Vertical |
| 1830.0 | 35.26 | 33.01 | 35 | 3.86 | 37.13 | 54.00 | -16.87 | Average | Vertical |
| 2745.0 | 53.32 | 33.03 | 35.02 | 3.91 | 55.24 | 74.00 | -18.76 | Peak | Vertical |
| 2745.0 | 34.59 | 33.03 | 35.02 | 3.91 | 36.51 | 54.00 | -17.49 | Average | Vertical |

Notes:

- 1). Measuring frequencies from 9 KHz~10th harmonic or 10GHz (which is less), No emission found between lowest internal used/generated frequency to 30MHz.
- 2). Radiated emissions measured in frequency range from 9 KHz~10th harmonic or 10GHz (which is less) were made with an instrument using Peak detector mode.
- 3). 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 or the field strength is too small to be measured.
- 4). Measured= Reading- Pre. Fac.+ Ant. Fac.+ Cab. Loss
- 5). Margin = Measured- Limit

4.3. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to KDB558074 D01 DTS Measurement Guidance Section 9.1 Maximum peak conducted output power,9.1.2.

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

TEST RESULTS

| | | | |
|---------------|-----------|----------------|-------|
| Temperature | 22.9℃ | Humidity | 53.2% |
| Test Engineer | Oliver Ou | Configurations | SRD |

| Modulation | Channel | Peak Output power (dBm) | Limit (dBm) | Result |
|------------|---------|-------------------------|-------------|--------|
| 2FSK | 1 | 11.02 | 30 | Pass |

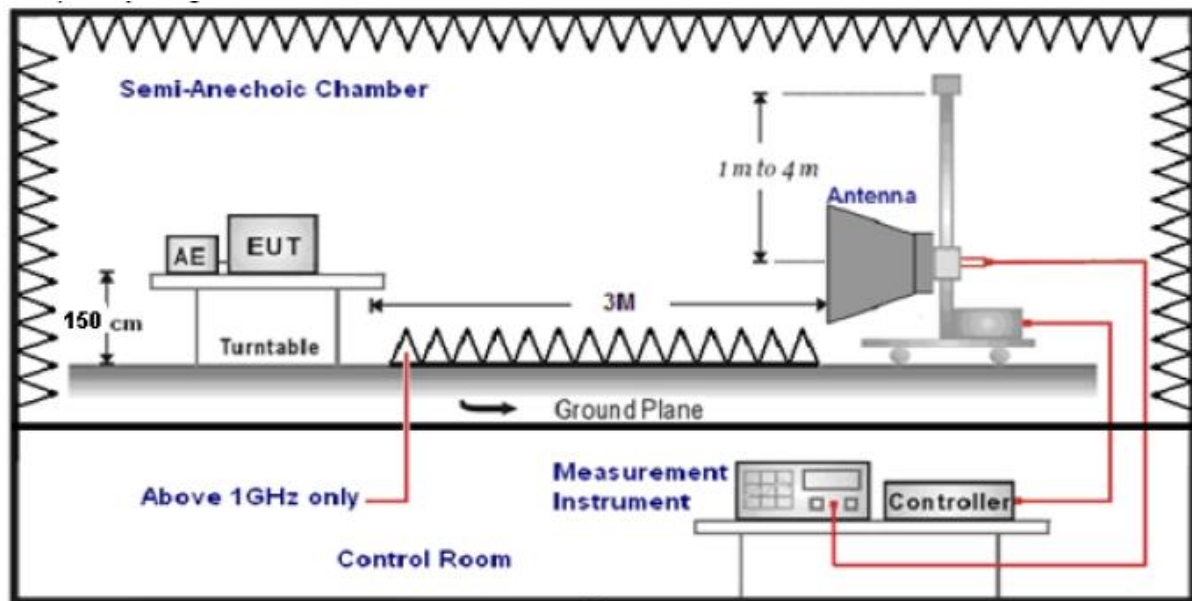
Note: 1.The test results including the cable lose.

4.4. Band Edge Compliance of RF Emission

TEST REQUIREMENT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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) (see §15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was placed on a turn table which is 1.5m 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. The distance between test antenna and EUT was 3 meter:
6. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting | Detector |
|----------------------|---|----------|
| 1GHz-40GHz | Peak Value: RBW=1MHz/VBW=3MHz, Sweep time=Auto Average Value: RBW=1MHz/VBW=10Hz, Sweep time=Auto | Peak |

LIMIT

Below -20dB of the highest emission level in operating band.

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)

TEST RESULTS**4.6.1 For Radiated Bandedge Measurement**

| | | | |
|---------------|-----------|----------------|-------|
| Temperature | 23.8°C | Humidity | 53.7% |
| Test Engineer | Oliver Ou | Configurations | BT |

| Frequency(MHz): | | | 2402 | | | Polarity: | | | HORIZONTAL | | |
|-----------------|-------------------------|----|----------------|-------------|--------------------|----------------------|------------------|-----------------------|-------------------|---------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 916.00 | 42.47 | PK | 94.00 | -51.53 | 1 | 73 | 50.70 | 31.02 | 3.51 | 35.74 | -8.23 |
| 945.00 | 32.69 | AV | 54.00 | -21.31 | 1 | 73 | 40.92 | 31.02 | 3.51 | 35.74 | -8.23 |
| Frequency(MHz): | | | 2402 | | | Polarity: | | | VERTICAL | | |
| Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 917.00 | 47.03 | PK | 94.00 | -46.97 | 1 | 294 | 55.26 | 31.02 | 3.51 | 35.74 | -8.23 |
| 942.00 | 28.43 | AV | 54.00 | -25.57 | 1 | 294 | 36.66 | 31.02 | 3.51 | 35.74 | -8.23 |
| Frequency(MHz): | | | 2480 | | | Polarity: | | | HORIZONTAL | | |
| Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 914.00 | 43.07 | PK | 94.00 | -50.93 | 1 | 95 | 51.30 | 31.02 | 3.51 | 35.74 | -8.23 |
| 905.00 | 32.39 | AV | 94.00 | -61.61 | 1 | 69 | 40.62 | 31.02 | 3.51 | 35.74 | -8.23 |
| Frequency(MHz): | | | 2480 | | | Polarity: | | | VERTICAL | | |
| Frequency (MHz) | Emission Level (dBuV/m) | | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier | Correction Factor (dB/m) |
| 913.00 | 47.37 | PK | 94.00 | -46.63 | 1 | 270 | 55.60 | 31.02 | 3.51 | 35.74 | -8.23 |
| 903.00 | 27.37 | AV | 94.00 | -66.63 | 1 | 290 | 35.60 | 31.02 | 3.51 | 35.74 | -8.23 |

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)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

4.5. Antenna Requirement

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.

Test Result

The antenna used for this product is FPC Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 2.38dBi.

Reference to the Test Report: **GTS20211014013-1-1.**

5. TEST SETUP PHOTOS OF THE EUT

Reference to the Test Report: **GTS20211014013-1-1.**

6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Reference to the Test Report: **GTS20211014013-1-1.**

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