

FCC Test Report

Part 15 subpart C

Client Information:

| Applicant: | Guangzhou Panyu Juda Car Audio Equipment Co., Ltd. | | | | |
|-----------------|--------------------------------------------------------------------------|--|--|--|--|
| Applicant add.: | Vtrek Dewei Industrial Garden, Shibei Industrial Road, Dashi Town, Panyu | | | | |
| Applicant add | Borough, Guangzhou City ,Guangdong Province, China | | | | |

Product Information:

| Product Name: | RUGGED SPEAKER SYSTEM | |
|---------------|--------------------------------------------------|--|
| Model No.: | NS-HMPS3018 | |
| Brand Name: | INSIGNIA | |
| FCC ID: | ESX-HMPS3018 | |
| Standards: | CFR 47 FCC PART 15 SUBPART C:2017 section 15.247 | |

Prepared By:

UL-CCIC Company Limited

Add. : Electronic Building, Parage Electronic Industrial Park, No. 8 Nanyun Er Road, Guangzhou Science Park, Guangzhou, 510663 China

| Date of Receipt: | Mar. 20, 2017 | Date of Test: | Mar. 21, 2017~April 22, 2017 |
|------------------|----------------|---------------|------------------------------|
| Date of Issue: | April 24, 2017 | Test Result: | Pass |

This device described above has been tested by Dongguan Yaxu (AiT) Technology Limited, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Danny Grang Reviewed by: -

Approved by: Richard Pi



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2 Test Summary

2.1 Compliance with FCC Part 15 subpart C

| Test | Test Requirement | Standard Paragraph | Result | | | |
|---------------------------------|-----------------------------------------------------------------------------------|----------------------|--------|--|--|--|
| Antenna Requirement | FCC Part 15 C:2017 | Section 15.247(c) | PASS | | | |
| Conduction Emissions | FCC Part 15 C:2017 | Section 15.207(a) | PASS | | | |
| Radiated Emissions | FCC Part 15 C:2017 | Section 15.247(d) | PASS | | | |
| Occupied Bandwidth | FCC Part 15 C:2017 | Section 15.247(a)(2) | PASS | | | |
| Peak power density | FCC Part 15 C:2017 | Section 15.247(e) | PASS | | | |
| Maximum Peak Output Power | FCC Part 15 C:2017 | Section 15.247(b)(1) | PASS | | | |
| Band edge | FCC Part 15 C:2017 | Section 15.247(d) | PASS | | | |
| Conducted Spurious Emissions | FCC Part 15 C:2017 | Section 15.247(d) | PASS | | | |
| Note: | | | | | | |
| (1) Reference to the | (1) Reference to the KDB 558074 D01 DTS Guidance v04 and ANSI C63.10:2013. | | | | | |
| (2) The pouduct sup | (2) The pouduct support for Bluetooth basic rate / EDR and low energy connections | | | | | |

(2) The pouduct support for Bluetooth basic rate / EDR and low energy connections Bluetooth 4.0Dual-mode, this report is low energy connection test mode, for basic rate / EDR connection please refers to the report number 4787901494-1.

2.2 Test Location

All tests were performed at:

Dongguan Yaxu (AiT) Technology Limited No.22, Jinqianling Third Street, Jitigang, Huangjiang,Dongguan, Guangdong, China Tel.: +86.769.82020499 Fax.: +86.769.82020495



2.3 Measurement Uncertainty

All measurements involve certain levels of uncertainties, the maximum value of the uncertainty as below:

| No. | Item | Uncertainty |
|-----|------------------------------|-------------|
| 1 | Conducted Emission Test | 1.20dB |
| 2 | Radiated Emission Test | 3.30dB |
| 3 | RF power,conducted | 0.16dB |
| 4 | RF power density,conducted | 0.24dB |
| 5 | Spurious emissions,conducted | 0.21dB |
| 6 | All emissions,radiated(<1G) | 4.68dB |
| 7 | All emissions,radiated(>1G) | 4.89dB |



3 Test Facility

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

.CNAS- Registration No: L6177

Dongguan Yaxu (AiT) technology Limited is accredited to ISO/IEC 17025:2005 general Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the competence of testing and calibration laboratories) on Apr. 18, 2013

.FCC- Registration No: 248337

The 3m Semi-Anechoic Chamber, 3m/10m Open Area Test Site and Shielding Room of Dongguan Yaxu (AiT) Technology Limited have been registered by Federal Communications Commission (FCC) on Aug.29, 2014.

.Industry Canada(IC)-Registration No: IC6819A-1

The 3m Semi-Anechoic Chamber and 3m/10m Open Area Test Site of Dongguan Yaxu (AiT) Technology Limited have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing on Oct. 12, 2014.

3.1 Deviation from standard

None

3.2 Abnormalities from standard conditions

None



4 General Information

4.1 General Description of EUT

| Manufacturer: | Guangzhou Panyu Juda Car Audio Equipment Co., Ltd. | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|--|--|--|
| Manufacturer Address:Vtrek Dewei Industrial Garden, Shibei Industrial Road, Dashi Town, Panyu BoGuangzhou City ,Guangdong Province, China | | | | |
| EUT Name: | RUGGED SPEAKER SYSTEM | | | |
| Model No: | NS-HMPS3018 | | | |
| Brand Name: | INSIGNIA | | | |
| Operation frequency: | 2402 MHz to 2480 MHz | | | |
| NUMBER OF CHANNEL: | 40 | | | |
| Modulation Technology: | GFSK | | | |
| Bluetooth version: | BT4.0 Dual-mode (BLE) | | | |
| Antenna Type: | PCB Antenna | | | |
| Antenna Gain: | maximum 0 dBi | | | |
| H/W No.: | VER:B | | | |
| S/W No.: | 00 | | | |
| Serial No: | N/A | | | |
| Power Supply Range: | 100-240V~ 50/60Hz 30W | | | |
| Power Supply: | AC 100-240V 50/60Hz or DC 12 from battery | | | |
| Power Cord: | 1.5 m AC cable | | | |
| Output power (max) : | 2.03dBm | | | |
| Note: | For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. | | | |

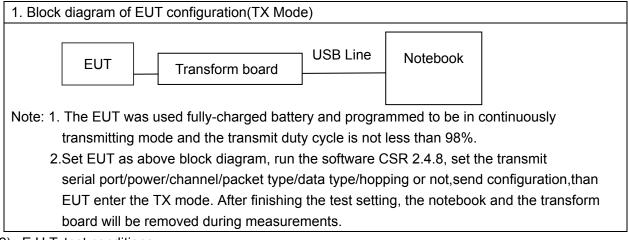


| | Description of Channel: | | | | | |
|---------|-------------------------|---------|-----------------|--|--|--|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | | | |
| 00 | 2402 | 20 | 2442 | | | |
| 01 | 2404 | 21 | 2444 | | | |
| 02 | 2406 | 22 | 2446 | | | |
| 03 | 2408 | 23 | 2448 | | | |
| 04 | 2410 | 24 | 2450 | | | |
| 05 | 2412 | 25 | 2452 | | | |
| 06 | 2414 | 26 | 2454 | | | |
| 07 | 2416 | 27 | 2456 | | | |
| 08 2418 | | 28 | 2458 | | | |
| 09 2420 | | 29 | 2460 | | | |
| 10 | 2422 | 30 | 2462 | | | |
| 11 | 2424 | 31 | 2464 | | | |
| 12 | 2426 | 32 | 2466 | | | |
| 13 | 2428 | 33 | 2468 | | | |
| 14 | 2430 | 34 | 2470 | | | |
| 15 | 2432 | 35 | 2472 | | | |
| 16 | 2434 | 36 | 2474 | | | |
| 17 | 2436 | 37 | 2476 | | | |
| 18 | 2438 | 38 | 2478 | | | |
| 19 | 2440 | 39 | 2480 | | | |



4.2 Description of Test conditions

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



(2) E.U.T. test conditions:

15.31(e): For intentional radiators, measurements of the variation of the input power or the adiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

(3) Test frequencies:

According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and. If required reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

| Frequency range over | Number of | Location in |
|-----------------------|-------------|-------------------------------|
| which device operates | frequencies | the range of operation |
| 1 MHz or less | 1 | Middle |
| 1 to 10 MHz | 2 | 1 near top and 1 near bottom |
| Mara than 10 Miliz | 2 | 1 near top, 1 near middle and |
| More than 10 MHz | 3 | 1 near bottom |

(4) Frequency range of radiated measurements:

According to the 15.33, the test range will be up to the tenth harmonic of the highest fundamental frequency.



4.3 Test Peripheral List

| No. | Equipment | Manufacturer | EMC Compliance | Model No. | Serial No. | Power cord | signal cable |
|-----|---------------------|--------------|-------------------|---------------|------------|--------------------------------|--------------------------------|
| 1 | Laptop | ASUS | N/A | X401A | X16-96072 | N/A | N/A |
| 2 | Adapter (laptop) | ASUS | N/A | EXA070 3YH | N/A | 1.8m/unshielded /detachable | N/A |
| 3 | USB line | N/A | N/A | N/A | N/A | N/A | 1.2m/unshielded /detachable |
| 4 | Transform board | N/A | N/A | N/A | N/A | N/A | N/A |

4.4 EUT Peripheral List

| No. | Equipment | Manufacturer | EMC Compliance | Model No. | Serial No. | Power cord | signal cable |
|-----|-----------|--------------|-------------------|--------------|------------|------------|---------------------|
| 1 | AC line | N/A | N/A | N/A | N/A | N/A | 1.5m/ detachable |



5 Equipments List for All Test Items

| No | Test Equipment | Manufacturer | Model No | Serial No | Cal. Date | Cal. Due Date | | |
|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|-------------|------------|------------------|--|--|
| 1 | SIGNAL ANALYZER | R&S | FSV40 | 101470 | 2016.06.29 | 2017.06.28 | | |
| 2 | EMI Measuring Receiver | R&S | ESR | 101660 | 2016.06.29 | 2017.06.28 | | |
| 3 | Low Noise Pre Amplifier | Tsj | MLA-10K01-B01-27 | 1205323 | 2016.06.29 | 2017.06.28 | | |
| 4 | Low Noise Pre Amplifier | Tsj | MLA-0120-A02-34 | 2648A04738 | 2016.06.29 | 2017.06.28 | | |
| 5 | TRILOG Super Broadband test Antenna | SCHWARZBECK | VULB9160 | 9160-3206 | 2016.06.29 | 2017.06.28 | | |
| 6 | Broadband Horn Antenna | SCHWARZBECK | BBHA9120D | 452 | 2016.06.29 | 2017.06.28 | | |
| 7 | SHF-EHF Horn | SCHWARZBECK | BBHA9170 | BBHA9170367 | 2016.06.29 | 2017.06.28 | | |
| 8 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264416 | 2016.06.29 | 2017.06.28 | | |
| 9 | EMI Test Receiver | R&S | ESCI | 100124 | 2016.06.29 | 2017.06.28 | | |
| 10 | LISN | Kyoritsu | KNW-242 | 8-837-4 | 2016.06.29 | 2017.06.28 | | |
| 11 | LISN | Kyoritsu | KNW-407 | 8-1789-3 | 2016.06.29 | 2017.06.28 | | |
| 12 | 50Ω Coaxial Switch | Anritsu | MP59B | 6200264417 | 2016.06.29 | 2017.06.28 | | |
| 13 | Loop Antenna | ETS | 6512 | 00165355 | 2016.06.29 | 2017.06.28 | | |
| 14 | Radiated Cable 1# (30MHz-1GHz) | FUJIKURA | 5D-2W | 01 | 2016.12.25 | 2017.12.24 | | |
| 15 | Radiated Cable 2# (1GHz -25GHz) | FUJIKURA | 10D2W | 02 | 2016.12.25 | 2017.12.24 | | |
| 16 | Conducted Cable 1#(9KHz-30MHz) | FUJIKURA | 1D-2W | 01 | 2016.12.25 | 2017.12.24 | | |
| 17 | SMA Antenna connector | Dosin | Dosin-SMA | N/A | N/A | N/A | | |
| Note: | Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list. | | | | | | | |



6 Test Result

6.1 Antenna Requirement

6.1.1 Standard requirement

15.203 requirement: For intentional device, according to 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.

15.247(c) (1)(i) requirement: (i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

6.1.2 EUT Antenna

The antenna is layout on PCB in the EUT and no consideration of replacement. Antenna gain is maximum 0 dBi from 2.4GHz to 2.5GHz.



6.2 Conduction Emissions Measurement

6.2.1 Applied procedures / Limit

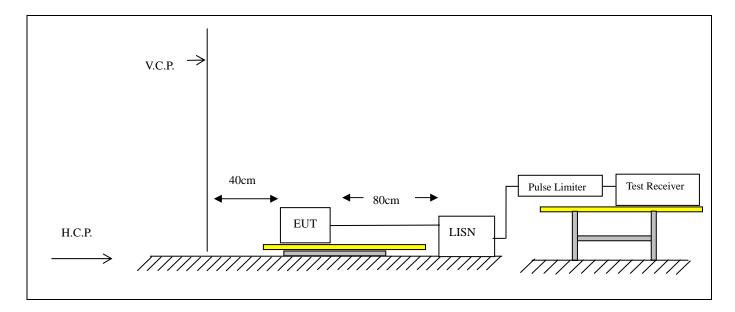
| Frequency of Emission (MHz) | Conducted Limit (dBµV) | | |
|-----------------------------|------------------------|------------|--|
| | Quasi-peak | Average | |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * | |
| 0.5-5 | 56 | 46 | |
| 5-30 | 60 | 50 | |

Note: Decreases with the logarithm of the frequency.

6.2.2 Test procedure

EUT was placed upon a wooden test table 0.1m above the horizontal metal reference plane and 0.4m from the vertical ground plane, and it was connected to an AMN. The closest distance between the boundary of the EUT and the surface of the AMN is 0.8m. All peripherals were connected to another AMN, and placed at a distance of 10cm from each other. A receiver was connected to the RF output port of the AMN. Both average and quasi-peak value were detected.

6.2.3 Test setup





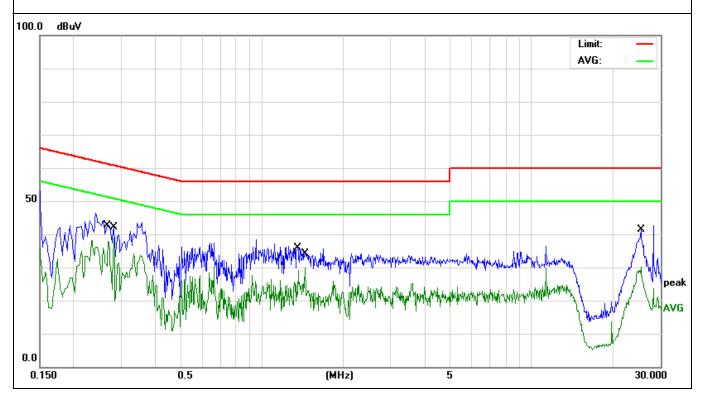
6.2.4 Test results

| EUT: | RUGGED SPEAKER SYSTEM | Model Name. : | NS-HMPS3018 |
|----------------|-----------------------|--------------------|-------------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Test Date : | 2017-04-20 |
| Test Mode: | RF Link mode | Phase : | Line |
| Test Voltage : | AC 120V/60Hz | | |

| Frequency (MHz) | Meter Reading (dBµV) | Factor(dB) | Emission Level (dBµV) | Limits (dBµV) | Margin (dB) | Detector |
|--------------------|-------------------------|------------|--------------------------|---------------|-------------|------------|
| 0.2700 | 31.51 | 10.83 | 42.34 | 61.12 | -18.78 | Quasi-Peak |
| 0.2819 | 28.20 | 10.73 | 38.93 | 50.76 | -11.83 | Average |
| 1.3540 | 26.05 | 9.92 | 35.97 | 56.00 | -20.03 | Quasi-Peak |
| 1.4460 | 20.01 | 9.93 | 29.94 | 46.00 | -16.06 | Average |
| 25.4020 | 39.21 | 2.23 | 41.44 | 60.00 | -18.56 | Quasi-Peak |
| 25.4020 | 27.97 | 2.23 | 30.20 | 50.00 | -19.80 | Average |

Remark:

1. Factor = Insertion Loss + Cable Loss + Pulse limit.



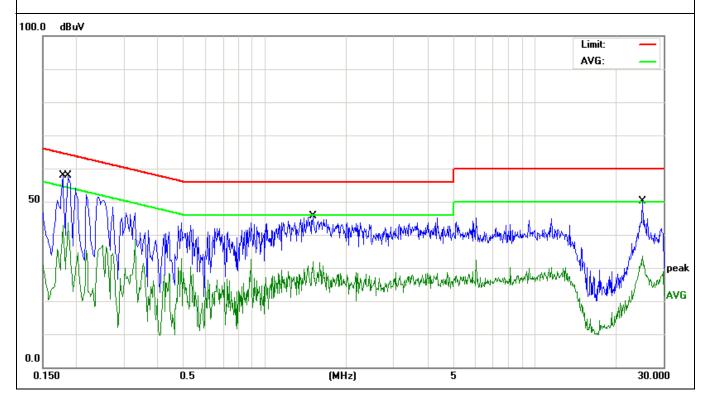


| EUT: | RUGGED SPEAKER SYSTEM | Model Name. : | NS-HMPS3018 |
|----------------|-----------------------|--------------------|-------------|
| Temperature: | 26 ℃ | Relative Humidity: | 54% |
| Pressure: | 1010hPa | Test Date : | 2017-04-20 |
| Test Mode: | RF Link mode | Phase : | Neutral |
| Test Voltage : | AC 120V/60Hz | | |

| Frequency (MHz) | Meter Reading (dBµV) | Factor(dB) | Emission Level (dBµV) | Limits (dBµV) | Margin (dB) | Detector |
|--------------------|-------------------------|------------|--------------------------|---------------|-------------|------------|
| 0.1780 | 46.57 | 11.41 | 57.98 | 64.57 | -6.59 | Quasi-Peak |
| 0.1860 | 32.30 | 11.31 | 43.61 | 54.21 | -10.60 | Average |
| 1.5060 | 35.57 | 9.93 | 45.50 | 56.00 | -10.50 | Quasi-Peak |
| 1.5060 | 22.07 | 9.93 | 32.00 | 46.00 | -14.00 | Average |
| 25.0940 | 47.89 | 2.22 | 50.11 | 60.00 | -9.89 | Quasi-Peak |
| 25.0940 | 31.49 | 2.22 | 33.71 | 50.00 | -16.29 | Average |

Remark:

1. Factor = Insertion Loss + Cable Loss + Pulse limit.





6.3 Radiated Emissions Measurement

6.3.1 Applied procedures / Limit

15.247(d) 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

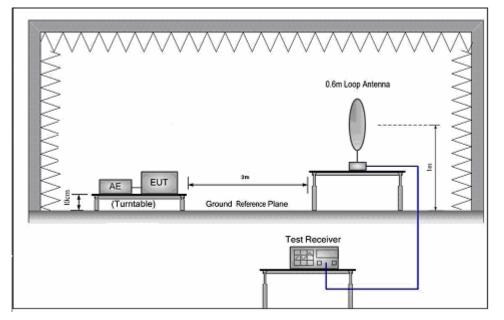
| Execution of Emission (MHz) | Field Strer | ngth | Measurement |
|-----------------------------|--------------|--------|-------------------|
| Frequency of Emission (MHz) | μV/m | dBµV/m | Distance (meters) |
| 0.009-0.49 | 2400/F(kHz) | | 300 |
| 0.49-1.705 | 24000/F(kHz) | | 30 |
| 1.705-30 | 30 | | 30 |
| 30-88 | 100 | 40 | 3 |
| 88-216 | 150 | 43.5 | 3 |
| 216-960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |



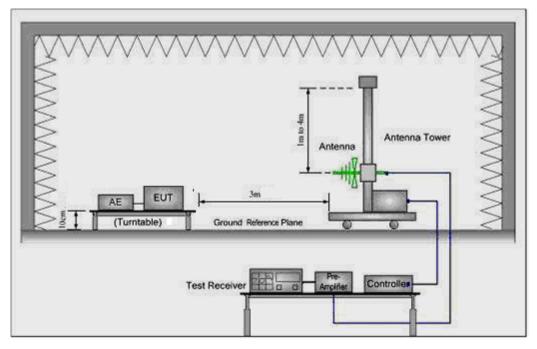
6.3.2 Test setup

Test Configuration:

1) 9 kHz to 30 MHz emissions:

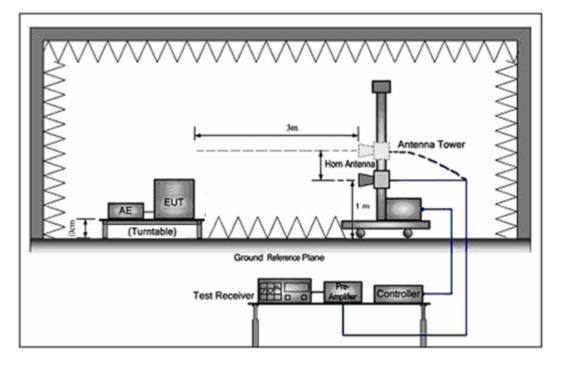


2) 30 MHz to 1 GHz emissions:





3) 1 GHz to 25 GHz emissions:





6.3.3 Test procedure

- a. The EUT was placed on the top of a wooden table 0.1 meters (for measurement at frequency below 1GHz) and a wooden table 0.1 meters (for measurement at frequency above 1GHz) above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter, for the test frequency of above 1GHz, horn antenna opening in the test would have been facing the EUT when rise or fall) and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. The resolution bandwidth and video bandwidth of the test receiver was 1MHz and 1MHz for Peak detection at frequency above 1GHz.
- g. Test the EUT in the lowest channel (2402MHz), the middle channel (2441MHz), the Highest channel (2480MHz)
- h. Repeat above procedures until all frequencies measured was complete.

For measurement at frequency above 1GHz

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

In 18GHz to 25GHz, The EUT was checked by Horn ANT. But the test result at least have 20dB margin.The EUT was tested in Chamber Site.



6.3.4 Test Result

Radiated Emissions Test Data Below 30MHz

| EUT: | RUGGED SPEAKER SYSTEM | Model Name : | NS-HMPS3018 | | |
|----------------------|----------------------------------------------------------|--------------------|--------------------|--|--|
| Temperature: | 25 ℃ | Test Data | 2017-04-20 | | |
| Pressure: | 1005 hPa | Relative Humidity: | 60% | | |
| Test Mode : | TX(1Mbps worst case) | Test Voltage : | DC 12 from battery | | |
| Measurement Distance | 3 m Frenqucy Range 9KHz to 30MHz | | | | |
| RBW/VBW | 9KHz~150KHz/RB 200Hz for QP, 150KHz~30MHz/RB 9KHz for QP | | | | |

No emission found between lowest internal used/generated frequencies to 30MHz.



Radiated Emissions Test Data Below 1GHz

| EUT: | RUGGED SPEAKER SYSTEM | Model Name : | NS-HMPS3018 | | |
|----------------------|--------------------------------------------------------|--------------------|--------------------|--|--|
| Temperature: | 25 ℃ | Test Data | 2017-04-20 | | |
| Pressure: | 1010 hPa | Relative Humidity: | 60% | | |
| Test Mode : | TX (1Mbps) CH00 (worst case) | Test Voltage : | DC 12 from battery | | |
| Measurement Distance | 3 m Frenqucy Range 30MHz to 1GHz | | | | |
| RBW/VBW | 100KHz / 300KHz for spectrum, RBW=120KHz for receiver. | | | | |

(a) Antenna polarization: Horizontal

| Frequency | Reading | Correct | Measure | Limit | Margin | Detector Type |
|-----------|---------|---------|----------|----------|--------|---------------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 47.8260 | 30.84 | -14.23 | 16.61 | 40.00 | -23.39 | QUASIPEAK |
| 66.0341 | 37.08 | -17.73 | 19.35 | 40.00 | -20.65 | QUASIPEAK |
| 180.6487 | 36.16 | -12.00 | 24.16 | 43.50 | -19.34 | QUASIPEAK |
| 316.5889 | 34.25 | -8.94 | 25.31 | 46.00 | -20.69 | QUASIPEAK |
| 425.0280 | 37.64 | -6.60 | 31.04 | 46.00 | -14.96 | QUASIPEAK |
| 593.0497 | 40.15 | -2.08 | 38.07 | 46.00 | -7.93 | QUASIPEAK |

(b) Antenna polarization: vertical

| Frequency | Reading | Correct | Measure | Limit | Margin | Detector Type |
|-----------|---------|---------|----------|----------|--------|---------------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 53.5052 | 44.36 | -19.72 | 24.64 | 40.00 | -15.36 | QUASIPEAK |
| 103.8055 | 37.56 | -13.65 | 23.91 | 43.50 | -19.59 | QUASIPEAK |
| 180.6488 | 46.31 | -15.27 | 31.04 | 43.50 | -12.46 | QUASIPEAK |
| 271.3246 | 50.15 | -12.38 | 37.77 | 46.00 | -8.23 | QUASIPEAK |
| 383.9318 | 41.93 | -7.45 | 34.48 | 46.00 | -11.52 | QUASIPEAK |
| 672.8444 | 39.40 | -0.83 | 38.57 | 46.00 | -7.43 | QUASIPEAK |

Note:

Measurement Level = Reading Level + Factor

Factor= Ant Factor + Cable Loss - Pre-amplifier



Radiated Emissions Test Data Above 1GHz

| EUT: | RUGGED SPEAKER SYSTEM | Model Name : | NS-HMPS3018 | | |
|----------------------|---------------------------------------------------------------|--------------------|--------------------|--|--|
| Temperature: | 25 ℃ | Test Data | 2017-04-20 | | |
| Pressure: | 1010 hPa | Relative Humidity: | 60% | | |
| Test Mode : | TX(1Mbps) | Test Voltage : | DC 12 from battery | | |
| Measurement Distance | 3 m | Frenqucy Range | 1GHz to 25GHz | | |
| RBW/VBW | Spurious emission: 1MHz/1MHz for Peak, 1MHz/10Hz for Average. | | | | |
| | non-restricted band: 100KHz/300KHz for Peak. | | | | |

(a) Antenna polarization: Horizontal

| Frequency | Reading | Correct | Measure | Limit | Margin | Detector |
|-----------|---------|---------|----------|----------|--------|----------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | Туре |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 4804.000 | 55.35 | 5.06 | 60.41 | 74.00 | -13.59 | PEAK |
| 4804.000 | 42.32 | 5.06 | 47.38 | 54.00 | -6.62 | AVERAGE |
| 7206.000 | 46.43 | 7.03 | 53.46 | 74.00 | -20.54 | PEAK |
| 7206.000 | 33.87 | 7.03 | 40.90 | 54.00 | -13.10 | AVERAGE |

(b) Antenna polarization: Vertical

| Frequency | Reading | Correct | Measure | Limit | Margin | Detector |
|-----------|---------|---------|----------|----------|--------|----------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | Туре |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 4804.000 | 51.45 | 5.06 | 56.51 | 74.00 | -17.49 | PEAK |
| 4804.000 | 42.52 | 5.06 | 47.58 | 54.00 | -6.42 | AVERAGE |
| 7206.000 | 42.73 | 7.03 | 49.76 | 74.00 | -24.24 | PEAK |
| 7206.000 | 34.72 | 7.03 | 41.75 | 54.00 | -12.25 | AVERAGE |

Note:

8~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor Factor= Ant Factor + Cable Loss - Pre-amplifier Low Channel 00: 2402 MHz Data rate: 1Mbps



| Frequency | Reading | Correct | Measure | Limit | Margin | Detector |
|-----------|---------|---------|----------|----------|--------|----------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | Туре |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 4880.000 | 54.78 | 5.14 | 59.92 | 74.00 | -14.08 | PEAK |
| 4880.000 | 41.45 | 5.14 | 46.59 | 54.00 | -7.41 | AVERAGE |
| 7320.000 | 43.00 | 7.52 | 50.52 | 74.00 | -23.48 | PEAK |
| 7320.000 | 32.16 | 7.52 | 39.68 | 54.00 | -14.32 | AVERAGE |

(a) Antenna polarization: Horizontal

(b) Antenna polarization: Vertical

| Frequency | Reading | Correct | Measure | Limit | Margin | Detector |
|-----------|---------|---------|----------|----------|--------|----------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | Туре |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 4880.000 | 55.18 | 5.14 | 60.32 | 74.00 | -13.68 | PEAK |
| 4880.000 | 43.85 | 5.14 | 48.99 | 54.00 | -5.01 | AVERAGE |
| 7320.000 | 43.11 | 7.52 | 50.63 | 74.00 | -23.37 | PEAK |
| 7320.000 | 33.90 | 7.52 | 41.42 | 54.00 | -12.58 | AVERAGE |

Note:

8~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor Factor= Ant Factor + Cable Loss - Pre-amplifier Low Channel 19: 2440 MHz

Data rate: 1Mbps



(a) Antenna polarization: Horizontal

| Frequency | Reading | Correct | Measure | Limit | Margin | Detector |
|-----------|---------|---------|----------|----------|--------|----------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | Туре |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 4960.000 | 54.81 | 5.22 | 60.03 | 74.00 | -13.97 | PEAK |
| 4960.000 | 41.85 | 5.22 | 47.07 | 54.00 | -6.93 | AVERAGE |
| 7440.000 | 44.77 | 8.06 | 52.83 | 74.00 | -21.17 | PEAK |
| 7440.000 | 31.86 | 8.06 | 39.92 | 54.00 | -14.08 | AVERAGE |

(b) Antenna polarization: Vertical

| Frequency | Reading | Correct | Measure | Limit | Margin | Detector |
|-----------|---------|---------|----------|----------|--------|----------|
| (MHz) | Level | Factor | Level | (dBuV/m) | (dB) | Туре |
| | (dBuV) | (dB) | (dBuV/m) | | | |
| 4960.000 | 55.01 | 5.22 | 60.23 | 74.00 | -13.77 | PEAK |
| 4960.000 | 42.72 | 5.22 | 47.94 | 54.00 | -6.06 | AVERAGE |
| 7440.000 | 44.46 | 8.06 | 52.52 | 74.00 | -21.48 | PEAK |
| 7440.000 | 33.96 | 8.06 | 42.02 | 54.00 | -11.98 | AVERAGE |

Note:

8~25GHz at least have 20dB margin. No recording in the test report.

Measurement Level = Reading Level + Factor Factor= Ant Factor + Cable Loss - Pre-amplifier Low Channel 39: 2480 MHz Data rate: 1Mbps



6.3.5 TEST RESULTS (Restricted Bands Requirements)

| EUT: | RUGGED SPEAKER SYSTEM | Model Name : | NS-HMPS3018 | | | |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------|--|--|--|
| Temperature: | 25 ℃ | Test Data | 2017-04-20 | | | |
| Pressure: | 1010 hPa | Relative Humidity: | 60% | | | |
| Test Mode : | TX(1Mbps) | Test Voltage : | DC 12 from battery | | | |
| RBW/VBW | 1MHz/1MHz for Peak, 1MHz/10Hz | 1MHz/1MHz for Peak, 1MHz/10Hz for Average. | | | | |
| | The transmitter was setup to strength was measured at 2310- The transmitter was setup to strength was measured at 2483. The data of 2390MHz and 2483 | -2390 MHz. transmit at the hig 5-2500 MHz. | hest channel. Then the field | | | |

| Test | Ant.Pol. | Freq. | Rea | ding | Ant/CF | A | ct | Lir | nit |
|-----------------|----------|----------|--------|--------|--------|----------|----------|----------|----------|
| Mode | H/V | (MHz) | Peak | AV | CF(dB) | Peak | AV | Peak | AV |
| | | | (dBuv) | (dBuv) | | (dBuv/m) | (dBuv/m) | (dBuv/m) | (dBuv/m) |
| | Н | 2390.000 | 46.31 | 35.38 | -5.79 | 40.52 | 29.59 | 74.00 | 54.00 |
| TX Data rate | V | 2390.000 | 46.72 | 35.48 | -5.79 | 40.93 | 29.69 | 74.00 | 54.00 |
| 1Mbps | Н | 2483.500 | 43.31 | 34.69 | -4.98 | 38.33 | 29.71 | 74.00 | 54.00 |
| | V | 2483.500 | 44.17 | 34.24 | -4.98 | 39.19 | 29.26 | 74.00 | 54.00 |



6.4 BANDWIDTH TEST

6.4.1 Applied procedures / Limit

15.247(a) (2) Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.4.2 Test procedure

- a. The testing follows FCC KDB publication No. 558074 D01 DTS Meas. Guidance v04
- b. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- c. Spectrum Setting: RBW= 100KHz, VBW≧3×RBW, Sweep time = Auto, Detector Function = Peak, centering on a hopping channel Trace = Max Hold.
- d. Mark the peak frequency and -6 dB points bandwidth.

6.4.3 Deviation from standard

No deviation.

6.4.4 Test setup



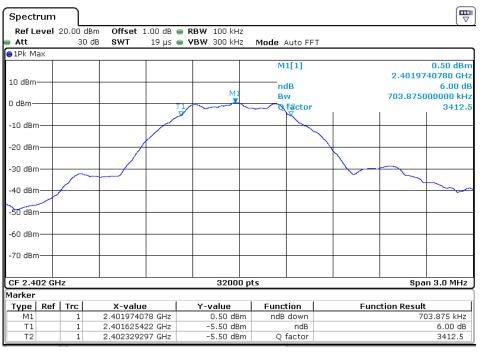


6.4.5 Test results

| EUT: | RUGGED SPEAKER SYSTEM | Model Name : | NS-HMPS3018 |
|--------------|-----------------------|--------------------|--------------------|
| Temperature: | 26 ℃ | Relative Humidity: | 53% |
| Pressure: | 1010 hPa | Test Power : | DC 12 from battery |
| Test Mode : | TX(1Mbps) | | |

| Test Mode | Test Channel | Frequency | 6 dB Bandwidth | Limit |
|-----------------|--------------|-----------|----------------|-------|
| | | (MHz) | (KHz) | (kHz) |
| | CH00 | 2402 | 703.875 | ≧500 |
| Data rate 1Mbps | CH19 | 2440 | 704.250 | ≧500 |
| | CH39 | 2480 | 712.312 | ≧500 |



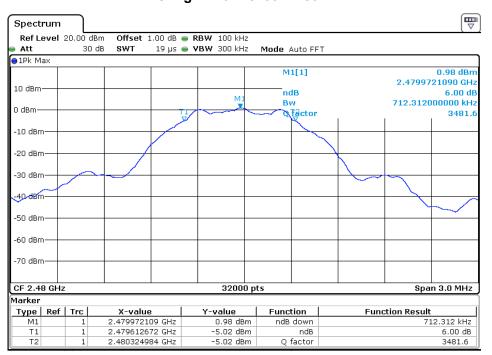




(1Mbps) The Middle Channel 19: 2440 MHz

| Spectru | m | | | | | | |
|---------------|------------|---------------------|----------------------|--------------|------|--------------|-----------------------|
| Ref Leve | el 20.00 d | Bm Offset 1.00 dB | 🔵 RBW 100 kHz | | | | |
| 🗎 Att | 30 | dB SWT 19 μs | 👄 VBW 300 kHz | Mode Auto FF | т | | |
| ⊖1Pk Max | | | | | | | |
| | | | | M1[1] | | 2.43997 | 1.83 dBm 32340 GHz |
| 10 dBm— | | | M1 | ndB | | | 6.00 dB |
| 0 dBm | | | | | | 704.2500 | 00000 kHz 3464.6 |
| | | | | | | | |
| -10 dBm— | | | | | | | |
| -20 dBm— | | | | | | | |
| -30 dBm— | \vdash | | | | | | |
| -40 dBm- | | | | | | | |
| ∽ -50 dBm— | | | | | | | \sim |
| -50 UBIII— | | | | | | | |
| -60 dBm— | | | | | | | |
| -70 dBm— | | | | | | | |
| | | | | | | | |
| CF 2.44 G | Hz | · · · · · · | 32000 | ots | • | Spai | n 3.0 MHz |
| Marker | | | | | | | |
| Type R | ef Trc | X-value | Y-value | Function | Fund | ction Result | |
| M1 | 1 | 2.439973234 GHz | 1.83 dBm | ndB down | | 7 | 04.25 kHz |
| T1 | 1 | 2.439613703 GHz | -4.17 dBm | ndB | | | 6.00 dB |
| T2 | 1 | 2.440317953 GHz | -4.17 dBm | Q factor | | | 3464.6 |

(1Mbps) The High Channel 39: 2480MHz





6.5 Peak Power Density

6.5.1 Applied procedures / Limit

15.247(a) (e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

6.5.2 Test procedure

- a. The testing follows Measurement procedure 10.2 Method PKPSD of FCC KDB publication No. 558074 D01 DTS Meas. Guidance v04
- b. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- c. Connected the antenna port to the Spectrum Analyzer, set the Spectrum Analyzer as center frequency to channel center frequency, span=1.5 times the bandwith, detector = peak 3kHz≤RBW≤100kHz, VBW≥3×RBW kHz, Sweep time=Auto.
- d. Trace mode = max hold. Mark the peak.
- e. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

6.5.3 Deviation from standard

No deviation.

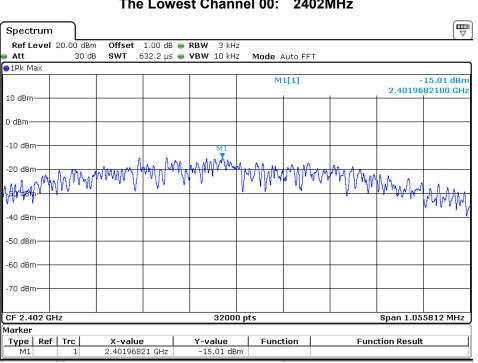


6.5.4 Test results

| EUT: | RUGGED SPEAKER SYSTEM | Model Name : | NS-HMPS3018 |
|--------------|-----------------------|--------------------|--------------------|
| Temperature: | 24 ℃ | Relative Humidity: | 53% |
| Pressure: | 1010 hPa | Test Power : | DC 12 from battery |
| Test Mode : | TX(1Mbps) | | |

| Test Mode | Channel frenqucy (MHz) | Power Density PSD 3kHz (dBm/3kHz) | Limit (dBm/3kHz) | Result |
|--------------|------------------------------|-----------------------------------------|---------------------|--------|
| тх | 2402 | -15.01 | 8 | Pass |
| (1Mbps) | 2440 | -13.64 | 8 | Pass |
| (Twipps) | 2480 | -14.50 | 8 | Pass |

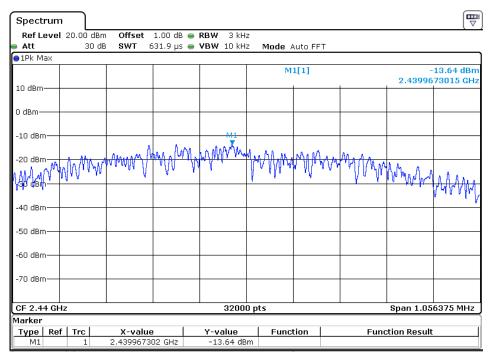
Note: The cable loss is 1.0dB



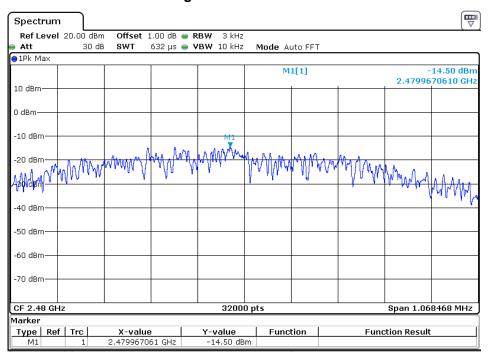
PSD 3kHz (1Mbps) The Lowest Channel 00: 2402MHz



PSD 3kHz (1Mbps) The Middle Channel 19: 2440MHz



PSD 3kHz (1Mbps) The High Channel 39: 2480MHz





6.6 Maximum Peak Output Power

6.6.1 Applied procedures / Limit

15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

6.6.2 Test procedure

- a. The testing follows FCC KDB publication No. 558074 D01 DTS Meas. Guidance v04
- b. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- ^{C.} Spectrum Setting: RBW≥Bandwidth, VBW≥3×RBW, Sweep time = Auto, Span≥3×RBW,
- d Detector = peak. Trace mode = max hold.
- e. Use peak marker function to determine the peak amplitude level.

6.6.3 Deviation from standard

No deviation.

6.6.4 Test setup



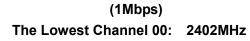


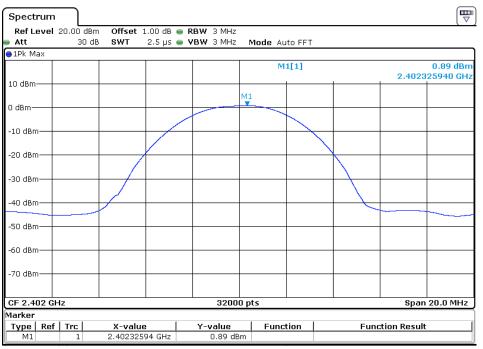
6.6.5 Test results

| EUT: | RUGGED SPEAKER SYSTEM | Model Name : | NS-HMPS3018 |
|--------------|-----------------------|--------------------|--------------------|
| Temperature: | 26 ℃ | Relative Humidity: | 60% |
| Pressure: | 1010 hPa | Test Voltage : | DC 12 from battery |
| Test Mode : | TX (1Mbps) | | |
| Note: N/A | | | |

| Test Mode | Frequency | Peak Output Power (dBm) | Limit (dBm) | Result |
|-----------------|-----------|----------------------------|----------------|--------|
| | 2402 MHz | 0.89 | 30 | Pass |
| Data rate 1Mbps | 2440 MHz | 2.03 | 30 | Pass |
| | 2480 MHz | 1.25 | 30 | Pass |

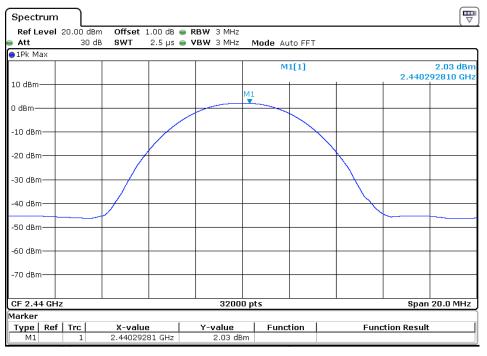
Note: The cable loss is 1.0dB







(1Mbps) The Middle Channel 19: 2440MHz



(1Mbps) The High Channel 39: 2480MHz

| Spectrum | | | | | | | ĺ | ♥ |
|--------------|-------|----------|-------------------|---------------------|---------------|---------------|-------------------------|----------|
| Ref Level 20 | | | L.OO dB 👄 F | | | | | <u> </u> |
| Att 🛛 | 30 dB | SWT | 2.5 µs 😑 \ | BW 3 MHz I | Mode Auto FFT | • | | |
| ●1Pk Max | | | 1 | | | | | |
| | | | | | M1[1] | | 1.25 d 2.479671560 (| |
| 10 dBm | | | | | | | | |
| 0 dBm | | | | M1 | | | | |
| | | | | | | | | |
| -10 dBm | | | | | | | | |
| -20 dBm | | | | | | | | |
| -30 dBm | | | | | | \rightarrow | | |
| -40 dBm | | | | | | | | |
| | | | | | | | | |
| -50 dBm | | | | | | | | |
| -60 dBm | | | | | | | | |
| -70 dBm | | | | | | | | |
| | | | | | | | | |
| CF 2.48 GHz | | | | 32000 p | ts | | Span 20.0 Mi | Hz |
| Marker | | | | | | | | |
| Type Ref M1 | Trc | 2.479671 | | Y-value 1.25 dBm | Function | Fund | ction Result | _ |



6.7 Band edge

6.7.1 Applied procedures / Limit

15.247(d) 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(c)).

6.7.2 Test procedure

- a. The testing follows FCC KDB publication No. 558074 D01 DTS Meas. Guidance v04
- b. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- c. Spectrum Setting: RBW=100kHz, VBW≧300kHz, Sweep time=Auto, Detector Function=Peak.
- d. The band edges was measured and recorded Result:

The Lower Edges attenuated more than 20dB. The Upper Edges attenuated more than 20dB.

6.7.3 Deviation from standard

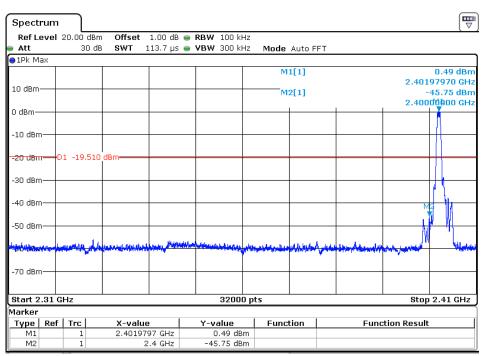
No deviation.

6.7.4 Test setup

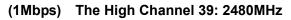


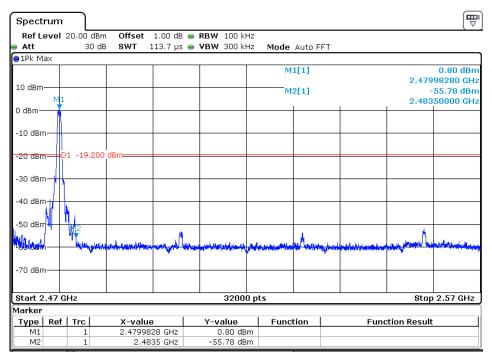


6.7.5 Test results











6.8 Conducted Spurious Emissions

6.8.1 Applied procedures / Limit

15.247(d) 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 Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.205(c)).

6.8.2 Test procedure

- a. The testing follows FCC KDB publication No. 558074 D01 DTS Meas. Guidance v04
- b. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- c. Spectrum Setting: RBW=100kHz, VBW=300kHz, Sweep time=Auto, Detector Function=Peak, sweep points ≥ investigated frequency range/RBW.

6.8.3 Deviation from standard

No deviation.

6.8.4 Test setup





6.8.5 Test results

| Spectru | n] | | | | | | | | |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------|------------------------------------------|-------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| Ref Leve | el 20.00 dBr 30 d | | | RBW 100 kHz /BW 300 kHz | | | | | |
| 1Pk Max | 30 u | 5 5 WI | 1.1 ms 🔲 🕯 | 76W 300 KH2 | : Mode i | Auto FFT | | | |
| | | | | | M | 1[1] | | | -56.56 dBn |
| 10 dBm | | | | | | | 1 | 798 | 3.0730 MH |
| | | | | | | | | | |
| D dBm—— | | | | | | | | | |
| -10 dBm— | | | | | | | | | |
| -10 UBIII | | | | | | | | | |
| -20 dBm | D1 -19.560 |) dBm | | | | | | | |
| | | | | | | | | | |
| -30 dBm— | | | | | | | | | |
| -40 dBm— | | | | | | | | | |
| | | | | | | | | | |
| -50 dBm— | | | | | | | M | | |
| 60 dDm | | | | | | tales a | | ale a cancerta | har and the train |
| | יינויזי קון קיימוויי. יינויזי קון קיימוויי | and all and the second states | an a | n allah ki pana katalah Kalimber | ang mangang mengerakkan di se | li dun di na anti-pris Il dun di na anti-pris | a internet and the second s | a service and the service of the ser | trading a different |
| -70 dBm | and the second sec | alteriore differente | and a state of the state of the state of the | and a state of the second second | a huma a ra tha | and some on other | | 10.13 | i de la composición de |
| | | | | | | | | | |
| Start 30.0 |) MHz | 1 | 1 | 32000 |) pts | 1 | 1 | Sto |) pp 1.0 GHz |
| 1arker | | | | | | | | | |
| Type Ro M1 | ef Trc | X-value | 9 //////////////////////////////////// | <u>Y-value</u> -56,56 dBr | Func | tion | Fund | tion Result | t |

Spectrum Offset 1.00 dB ■ RBW 100 kHz SWT 32 ms ■ VBW 300 kHz Ref Level 20.00 dBm 30 dB Mode Auto Sweep Att 😑 1Pk Max 0.44 dBm 2.4019690 GHz M1[1] 10 dBm-0 dBm--10 dBm-D1 -19.560 -20 dBm dBm -30 dBm -40 dBm--50 dBmht -70 dBm-Start 1.0 GHz 32000 pts Stop 3.0 GHz Marker Type Ref Trc X-value 2.401969 GHz **Y-value** 0.44 dBm Function Result Function M1 1





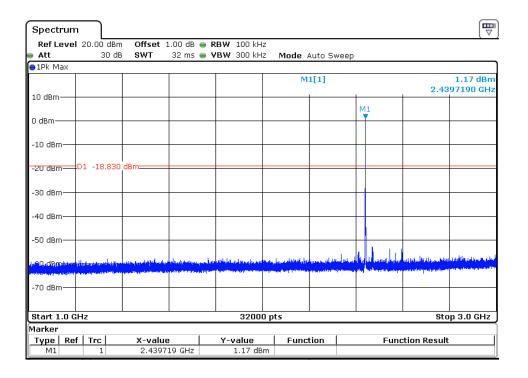
| Spectrum | | | | |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| RefLevel 20.00 dBm Att 30 dB | Offset 1.00 dB | BW 100 kHz BW 300 kHz Mode A | uto Sweep | |
| ●1Pk Max | | | I | |
| | | M1 | [1] | -51.37 dBn 10.644220 GH |
| 10 dBm | | | | |
| 0 dBm | | | | |
| -10 dBm | | | | |
| -20 dBm D1 -19.560 (| dBm | | | |
| -30 dBm | | | | |
| -40 dBm | | | | |
| -50 dBm | | | M1 | |
| Land, Marshill Mills and Marshill and | Annual states in the states of | Relayed and a press of a second large the second data | and a loss of the second s | Language at large staff ^{the} r |
| Depending of the state of the providence of a | and a second | and the state of the | a the second | and the second secon |
| -70 dBm | | | | |
| Start 3.0 GHz | | 32000 pts | | Stop 13.0 GHz |
| Marker | | • | | |
| Type Ref Trc | X-value 10.64422 GHz | Y-value Functi | ion Function R | esult |

| Spectrum | | | |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RefLevel 20.00 dBm Att 30 dB | Offset 1.00 dB RBW SWT 120 ms VBW | | X |
| ■ Att 30 0B | SWT 120 ms 👄 VBW | / 300 kHz Mode Auto Sweep | |
| | | M1[1] | -47.83 dBn 20.104940 GH: |
| 10 dBm | | | |
| 0 dBm | | | |
| -10 dBm | | | |
| -20 dBm | Bm | | |
| -30 dBm | | | |
| -40 dBm | | M1 | |
| -50 dBm | A state of the second stat | | Least of the second state of the state of the second state of the |
| =60 jiBm | Alexandra and a second second and a second secon | | an the second |
| -70 dBm | | | |
| Start 13.0 GHz | | 32000 pts | Stop 25.0 GHz |
| Marker Type Ref Trc M1 1 | | -value Function 47.83 dBm | Function Result |



The Middle Channel 19(1Mbps): 2440MHz

| Spectrun | Γ | | | | | | | | |
|---------------------|-----------------------------------------------------------------------------------------------------------------|----------------|----------------------|---------------------------|-----------------------------------------------------|--------------------------------------------------|---------------------------|-----------------|----------------------------------|
| Ref Leve | I 20.00 dBm | Offset : | L.OO dB 😑 I | RBW 100 kH: | z | | | | |
| 🕨 Att | 30 dB | SWT | 1.1 ms 😑 ' | VBW 300 kH: | Z Mode | Auto FFT | | | |
| ⊖1Pk Max | | | | | | | | | |
| | | | | | М | 1[1] | | | -56.71 dBm 1.3200 MHz |
| 10 dBm | | | | | | I | | 81 | 1.3200 MHZ |
| | | | | | | | | | |
| 0 dBm | | | | | | | | | |
| | | | | | | | | | |
| -10 dBm— | | | | | | | | | |
| -20 dBm | D1 -18.830 | dBm= | | | | | | | |
| 20 00 | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| | | | | | | | | | |
| -40 dBm | | | | | | | | | + |
| | | | | | | | | | |
| -50 dBm | | | | | | | ١ | 11 | |
| 60. 6 8m | | | | | | | diff the market store but | الاربية المراجع | |
| and a second second | nd beri nen finskriven. I | and the colors | n han a mhaitheann a | tata Malak, animatika (| a ne a contrata a mili. Na dendra da contrata de | a nede por ner den de Lande anderskandelse se | and Incentioner and | der and and | the of a part of the part of the |
| -70 dBm | and the state of the second | par | | an an aileiteiteiteiteite | | | 1 | | |
| | | | | | | | | | |
| Start 30.0 | MHz | | 1 | 32000 |) pts | I | 1 | Ste | op 1.0 GHz |
| Marker | | | | | | | | | <u> </u> |
| | f Trc | X-value | - | Y-value | Func | tion | Fund | tion Result | t l |
| M1 | 1 | 811.3 | 32 MHz | -56.71 dB | m | | | | |





| Spectrun | τ | | | | | | | | |
|-----------------------|----------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------|-----------------------|----------------------------------------------------------------------------------------------------------------|------------------------|
| Ref Leve | 1 20.00 dBm | Offset 1 | 00 dB 😑 R | . BW 100 kH | z | | | | |
| 🗕 Att | 30 dB | SWT | 100 ms 👄 V | ' BW 300 kH | z Mode / | Auto Sweep | | | |
| 😑 1Pk Max | | | | | | | | | |
| | | | | | M | 1[1] | | | 52.08 dBm |
| 10 dBm | | | | | | 1 | | 9.2 | 35160 GHz |
| TO UBIII- | | | | | | | | | |
| 0 dBm | | | | | | | | | |
| | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| -10 UBIII | | | | | | | | | |
| -20 dBm | D1 -18.830 | dBm | | | | | | | |
| -20 uBIII | .01 10.000 | dom | | | | | | | |
| 00 d0 | | | | | | | | | |
| -30 dBm | | | | | | | | | |
| 10 10- | | | | | | | | | |
| -40 dBm— | | | | | | | | | |
| -50 dBm | | | | | | M1 | | | |
| -50 UBIII | | . u alu | المناسبية والمسالية | ي ا ي ا | ala | Internet and the | | Lance on the | مدرر ومأكل الفرطير ورو |
| بقظاء أداء بلاستيابيت | and a second | tylu, bir da tu | and the second | and the second | | and a sheat was a | | data a ser a s | a materia data ana |
| المالية محيول محيول م | phintspropagate | an she an ta | and the second | hand with a star | and the product of the second second | Maga () Majasa) penja | ovhiller or somethics | aller of decision of | 11 1 1 M |
| -70 dBm | | | | | | | | | |
| -70 uBIII | | | | | | | | | |
| | | | | | | | | | |
| Start 3.0 G | Hz | | | 3200 | D pts | | | Stop | 13.0 GHz |
| Marker | | | | | | | | | |
| Type Re | | X-value | | Y-value | Func | tion | Fund | tion Result | |
| M1 | 1 | 9,235 | 16 GHz | -52.08 dB | m | | | | |

| Spectrum | The second secon |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ref Level 20.00 dBm Offset 1.00 dB 🖷 RBW 100 kHz Att 30 dB SWT 120 ms 🖷 VBW 300 kHz Mode Auto Sweep | |
| 1Pk Max | |
| M1[1] -48.15 d 20.114310 C | |
| 10 dBm | - |
| 0 dBm | |
| -10 dBm | |
| -2U dBm D1 -18.830 dBm | |
| -30 dBm | |
| -40 dBm M1 | |
| | r le |
| | din. |
| -70 dBm | |
| Start 13.0 GHz 32000 pts Stop 25.0 GH | ۰z |
| Marker Type Ref Trc X-value Y-value Function Function Result M1 1 20.11431 GHz -48.15 dBm | |



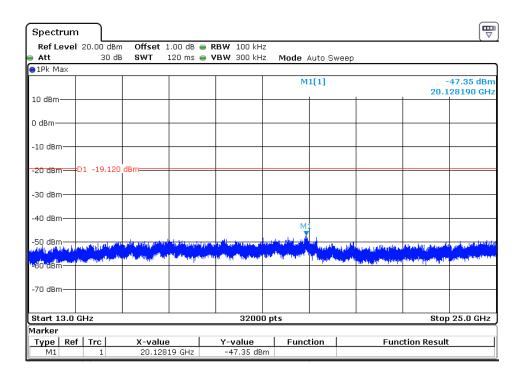
| Spectrum | | | | | | | | | |
|--------------|---------------|--------------------------|-------------------|------------------------|------------------|-------------------|------------------------------|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ref Level | 20.00 dBm | Offset 1 | 00 dB 😑 R | BW 100 kH | Z | | | | |
| 🗕 Att | 30 dB | SWT | 1.1 ms 😑 🎙 | ′BW 300 kH | z Mode / | Auto FFT | - | | |
| ⊖1Pk Max | | | | | | | | |] |
| | | | | | М | 1[1] | | | 57.16 dBm 5700 MHz |
| 10 dBm | | | | | | | | | |
| 0 dBm | | | | | | | | | |
| -10 dBm | | | | | | | | | |
| -20 dBm[| 01 -19.120 | dBm | | | | | | | |
| -30 dBm | | | | | | | | | |
| -40 dBm | | | | | | | | | |
| -50 dBm | | | | | | | | | |
| -60, HBm | | and the latent | nen et at taken e | t data takaba | | isi she sife ta t | iden and the opposite of the | | the state of the s |
| -70 dBm | alphierardeal | A LINE THAT AND A DAMAGE | dolaring lipport | a biling particulities | patens and apple | apoliteration | and the processing of the | alling to paper the | patients begin ^{the} to and so that |
| | | | | | | | | | |
| Start 30.0 M | MHz | | | 3200 | D pts | | | Sto | p 1.0 GHz |
| Marker | | | | | | | | | |
| Type Ref | 1 Trc | X-value 876.3 | 87 MHz | Y-value -57.16 dB | Func m | tion | Func | tion Result | |
| | | 2.010 | | | | | | | |

The High Channel 39(1Mbps): 2480MHz

| Spectrum | | | | | |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------|---------------------------------|--------------------------------------------|
| RefLevel 20.00 dBm Att 30 dB | | ● RB₩ 100 kHz ● VB₩ 300 kHz | Mode Auto Sv | veep | |
| ●1Pk Max | | | | | |
| | | | M1[1] | | 0.88 dBm 2.4799690 GHz |
| 10 dBm | | | | | |
| 0 dBm | | | | M1 | |
| -10 dBm | | | | | |
| -20 dBm-D1 -19.120 | dBm | | | | |
| -30 dBm | | | | | |
| -40 dBm | | | | | |
| -50 dBm | | | | | |
| ษติพิเฮ่Rญ สอง เราสองประเม | Records to all the second betw | tool markets and state | u luidhe ban linn ban | hilila yan <mark>alagaad</mark> | والمراجعة والمراجعة والمروب ومحمد والمراجع |
| -70 dBm | an and a second set of second s | | | | |
| Start 1.0 GHz | | 32000 p | ts | | Stop 3.0 GHz |
| Marker Type Ref Trc | Y uslue | Y-value | Function | Fund | tion Result |
| TypeRefTrcM11 | X-value 2.479969 GHz | 0.88 dBm | Function | Func | |



| Spectrun | n | | | | | | | | | |
|-------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|--|
| Ref Leve | 1 20.00 dBm | Offset 1 | .00 dB 😑 F | RBW 100 kH | z | | | | | |
| 🗕 Att | 30 dB | SWT 1 | 100 ms 😑 \ | /BW 300 kH | z Mode | Auto Sweep |) | | | |
| ⊖1Pk Max | | | | | | | | | | |
| | | | | | М | 1[1] | -50.87 dBm 12.604530 GHz | | | |
| 10 dBm | | | | | | | | | | |
| 0 dBm | | | | | | | | | | |
| -10 dBm— | | | | | | | | | | |
| -20 dBm | D1 -19.120 | dBm | | | | | | | | |
| -30 dBm— | | | | | | | | | | |
| -40 dBm— | | | | | | | | | M1 | |
| -50 dBm— | HAD ALLING SHOULD | and the state of the state of the | el _{eso} nenhielle | The Johnson all | alah tu anta a sala | | All Looks Martin | . Information of the second | والمرافقة والمحاول | |
| ang pikelan dari berdi | addullaat _{Dabbaa} t | n terres de la constant d'Allandia. La constant de la cons | and the second se | Ibaidi Andupathi | diferration and | din <mark>anan dinanan di</mark> | (1) (Alan in the second se | and the second secon | and the second secon | |
| -70 dBm— | | | | | | | | | | |
| Start 3.0 GHz 32000 pts | | | | | | | | Stop | 13.0 GHz | |
| Marker | | | | | | | | | | |
| | f Trc | Trc X-value | | Y-value | Func | Function | | Function Result | | |
| M1 | M1 1 12.60453 GHz -50.87 dBm | | | | | | | | | |

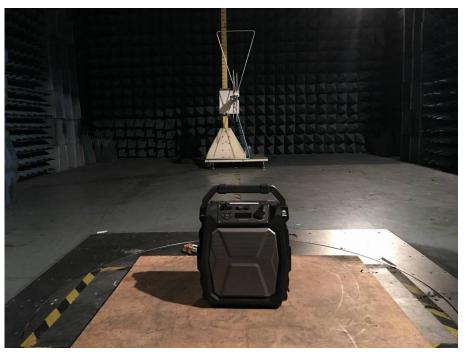




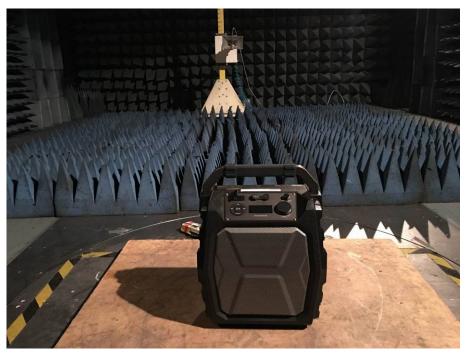
7 Photographs

7.1 Radiated Emission Test Setup

Below 1G



Above 1G





Report No.: 4787901494-2 Issued Date: 2017-04-24

7.2 Conducted Emissions Test Setup





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7.3 EUT Constructional Details

Please refer to report 4787901494-1.

End of report