

■ **Report No.:** DDT-R17Q0119-2E1

■ **Issued Date:** Feb. 22, 2017

FCC CERTIFICATION TEST REPORT

FOR

| Applicant | : | Audio Pro AB |
|-----------------------------|----|--|
| Address | •• | Garnisonsgatan 52, 25466, Helsingborg, Sweden |
| Equipment under Test | : | WIFI Player |
| Model No. | • | LINK1TESTING |
| Trade Mark | •• | audio pro |
| FCC ID | : | 2AGNC-LINK1 |
| Manufacturer | į | DONGGUAN TRISTAR ELECTRONIC CO., LTD. |
| Address | : | NO. 24A DONGXING AVE SOUTH, ZHENXINGWEI, TANGXIA TOWN, DONGGUAN CITY, CHINA 523710 |

Issued By: Dongguan Dongdian Testing Service Co., Ltd.

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

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TEST REPORT DECLARE

| Applicant | : | Audio Pro AB | |
|-----------------------------|---|--|--|
| Address | : | Garnisonsgatan 52, 25466, Helsingborg, Sweden | |
| Equipment under Test | : | VIFI Player | |
| Model No | : | JNK1 | |
| Trade Mark | : | audio pro | |
| Manufacturer | : | DONGGUAN TRISTAR ELECTRONIC CO., LTD. | |
| Address | : | NO. 24A DONGXING AVE SOUTH, ZHENXINGWEI, TANGXIA TOWN, DONGGUAN CITY, CHINA 523710 | |

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C, RSS-247 Issue 1 May 2015. **Test procedure used:** ANSI C63.10:2013, ANSI C63.4:2014, KDB558074 D01 DTS Meas Guidance V03r02, RSS-Gen Issue 4, Nov. 2014.

We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

| Report No: | DDT-R17Q0119-2E1 | | |
|---------------|------------------------------|-----------------|---------------|
| Date of Test: | Jan. 20, 2017 ~Jan. 24, 2017 | Date of Report: | Feb. 22, 2017 |

Prepared By:

Leo Liu/Engineer

Kevin eng/EMC Manager

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Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

1. Summary of test results

| The EUT have been tested according to the applicable standards as referenced below. | | | |
|---|------------------------------|---------|--|
| Description of Test Item | Standard | Results | |
| | FCC Part 15: 15.247 | | |
| 6dB Bandwidth and 99% Bandwidth | RSS-247 Issue 1 clause 5.2 | PASS | |
| | KDB558074 | | |
| | FCC Part 15: 15.247 | | |
| Conducted Peak Output Power | RSS-247 Issue 1 clause 5.4 | PASS | |
| | KDB558074 | | |
| | FCC Part 15: 15.247 | | |
| Power Spectral Density | RSS-247 Issue 1 clause 5.2 | PASS | |
| | KDB558074 | | |
| | FCC Part 15: 15.247 | | |
| Band-edge and Spurious Emissions (Conducted) | RSS-247 Issue 1 clause 5.5 | PASS | |
| | KDB558074 | | |
| | FCC Part 15: 15.209 | | |
| | FCC Part 15: 15.247 | PASS | |
| | RSS-Gen Issue 4 clause 7.2.2 | | |
| Radiated Spurious Emissions | RSS-Gen Issue 4 clause 7.2.5 | | |
| Radiated Spurious Emissions | RSS-247 Issue 1 clause 5.2 | rass | |
| | ANSI C63.10: 2013 | | |
| | ANSI C63.4:2014 | | |
| | KDB558074 | | |
| | FCC Part 15: 15.209 | | |
| | FCC Part 15: 15.247 | | |
| Radiated Band Edge Compliance | ANSI C63.10: 2013 | PASS | |
| | ANSI C63.4:2014 | | |
| | KDB558074 | | |
| | FCC Part 15: 15.207 | | |
| Power Line Conducted Emission | RSS-Gen Issue 4 clause 7.2.4 | PASS | |
| Fower Line Conducted Emission | ANSI C63.10: 2013 | rass | |
| | ANSI C63.4:2014 | | |
| A storme a social mont | FCC Part 15: 15.203 | DACC | |
| Antenna requirement | RSS-Gen Issue 4 clause 7.1.2 | PASS | |

2. General test information

2.1. Description of EUT

| EUT* Name | : | VIFI Player | | |
|-------------------------|---|---|--|--|
| Model Number | : | LINK1 | | |
| Channels | : | Channel: 11 (for 802.11b/g/n H20); Channel: 7 (for 802.11n H40) | | |
| Power supply | : | DC 5V from Adapter input AC 120V/60Hz | | |
| Radio Technology | : | EEE802.11b/g/n | | |
| FCC Operation frequency | : | EEE 802.11b: 2412MHz—2462MHz EEE 802.11g: 2412MHz—2462MHz EEE 802.11n HT20: 2412MHz—2462MHz EEE 802.11n HT40:2422MHz—2452MHz | | |
| Modulation | : | EEE 802.11b: DSSS(CCK,DQPSK,DBPSK) EEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) EEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK,BPSK) | | |
| Antenna Type | : | Integral antenna WIFI antenna 1: 2.87dBi WIFI antenna 2: 2.87dBi WIFI Array gain: 5.88dBi | | |
| Smart system | : | SISO for 802.11b/g MIMO for 802.11n | | |
| Date of Receipt | : | Jan. 20, 2017 | | |
| Sample Type | : | eries production | | |

Note1: EUT is the ab.of equipment under test.

| Channle in | Channle information | | | | | | |
|------------|---------------------|----|-----------|----|-----------|----|-----------|
| СН | Frequency | СН | Frequency | CH | Frequency | СН | Frequency |
| 1 | 2412 | 5 | 2432 | 9 | 2452 | / | / |
| 2 | 2417 | 6 | 2437 | 10 | 2457 | / | / |
| 3 | 2422 | 7 | 2442 | 11 | 2462 | / | / |
| 4 | 2427 | 8 | 2447 | / | / | / | / |

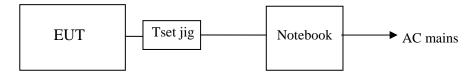
2.2. Accessories of EUT

| Description of Accessories | Brand | Model number | Parameter | Remark |
|----------------------------|-----------|----------------|-----------|--------|
| SWITCHING POWER SUPPLY | audio pro | BI12T-050100-I | 5V DC 1A | N/A |

2.3. Assistant equipment used for test

| Description of Assistant equipment | Manufacturer | Model number or Type | EMC Compliance | SN |
|------------------------------------|--------------|----------------------|----------------|-------------------|
| Notebook | DELL | Latitude D610 | FCC DOC | 00045-534-136-300 |

2.4. Block diagram of EUT configuration for test



EUT was connected to control to a special test jig provided by manufacturer which has a standard RSS-232 connector to connect to Notebook, and the Notebook will run a special test software provided by manufacturer to control EUT work in Continuous TX mode (>98% duty cycle), and select test channel, wireless mode and data rate.

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| Tested mode, channel, and data rate information | | | | |
|---|------------------|-----------|-----------|--|
| Mode | data rate (Mbps) | Channel | Frequency | |
| | (see Note) | | (MHz) | |
| | 11 | LCH :CH1 | 2412 | |
| IEEE 802.11b | 11 | MCH: CH6 | 2437 | |
| | 11 | HCH: CH11 | 2462 | |
| | 54 | LCH :CH1 | 2412 | |
| IEEE 802.11g | 54 | MCH: CH6 | 2437 | |
| | 54 | HCH: CH11 | 2462 | |
| | MSC0 | LCH :CH1 | 2412 | |
| IEEE 802.11n HT20 | MSC0 | MCH: CH6 | 2437 | |
| | MSC0 | HCH: CH11 | 2462 | |
| | MCS 7 | LCH :CH3 | 2422 | |
| IEEE 802.11n HT40 | MCS 7 | MCH: CH6 | 2437 | |
| | MCS 7 | НСН: СН9 | 2452 | |

Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

2.5. Deviations of test standard

No Deviation

2.6. Test environment conditions

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

| Temperature range: | 21-25℃ |
|--------------------|-----------|
| Humidity range: | 40-75% |
| Pressure range: | 86-106kPa |

2.7. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong

Province, China, 523808 Tel: +86-0769-22891499 http://www.dgddt.com

FCC Registration Number: 270092 Industry Canada site registration number: 10288A-1

2.8. Measurement uncertainty

| Test Item | Unaartainty | | | |
|--|---|--|--|--|
| | Uncertainty | | | |
| Bandwidth | 1.1% | | | |
| Peak Output Power(Conducted)(Spectrum analyzer) | $0.86dB(10 \text{ MHz} \leq f < 3.6GHz);$ | | | |
| reak Output rower(Conducted)(Spectrum analyzer) | $1.38dB(3.6GHz \le f < 8GHz)$ | | | |
| Peak Output Power(Conducted)(Power Sensor) | 0.74dB | | | |
| Davier Chapter I Dangity | $0.74 dB(10 MHz \le f < 3.6 GHz);$ | | | |
| Power Spectral Density | $1.38dB(3.6GHz \le f < 8GHz)$ | | | |
| Eragyanaias Stability | 6.7 x 10-8 (Antenna couple methed) | | | |
| Frequencies Stability | 5.5 x 10-8 (Conducted method) | | | |
| | 0.86 dB(10 MHz $\leq f < 3.6$ GHz); | | | |
| Conducted spurious emissions | $1.40 dB(3.6GHz \leqslant f < 8GHz)$ | | | |
| | 1.66dB(8GHz≤ f < 22GHz) | | | |
| Uncertainty for radio frequency (RBW<20KHz) | 3×10-8 | | | |
| Temperature | 0.4°C | | | |
| Humidity | 2% | | | |
| Uncertainty for Radiation Emission test | 4.70 dB (Antenna Polarize: V) | | | |
| (30MHz-1GHz) | 4.84 dB (Antenna Polarize: H) | | | |
| | 4.10dB(1-6GHz) | | | |
| Uncertainty for Radiation Emission test (1GHz-26GHz) | 4.40dB (6GHz-18Gz) | | | |
| (10112-200112) | 3.54dB (18GHz-26Gz) | | | |
| Uncertainty for Power line conduction emission test | 3.32dB (150KHz-30MHz) | | | |
| Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% | | | | |

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

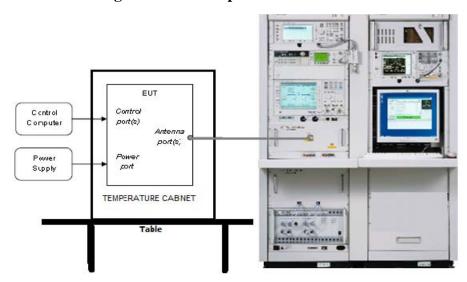
3. Equipment used during test

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|-----------------------------------|-------------------|-----------------|------------------|------------|---------------|
| Equipment RF Connected test | Manufacturei | Wiodel No. | Seriai No. | Last Cal. | Cal. Interval |
| | D 0 C | EGITOC | 1166 1660 26 | 2016/10/16 | 137 |
| Spectrum analyzer | R&S | FSU26 | 1166.1660.26 | 2016/10/16 | 1Year |
| Vertor Signal Generator | Agilent | E8267D | MY52098743 | 2016/10/20 | 1Year |
| Vector Signal Generator | Agilent | N5182A | MY48180737 | 2016/07/05 | 1Year |
| Power Sensor | Agilent | U2021XA | MY55150010 | 2016/04/18 | 1Year |
| Power Sensor | Agilent | U2021XA | MY55150011 | 2016/04/19 | 1Year |
| DC Power Source | MATRIS | MPS-3005L-3 | D813058W | 2016/10/24 | 1Year |
| Attenuator | Mini-Circuits | BW-S10W2 | 101109 | 2016/08/18 | 1Year |
| RF Cable | Micable | C10-01-01-1 | 100309 | 2016/08/18 | 1Year |
| Temp&Humi Programmable Chamber | Dongguan Bell | BE-TH-150M3 | 20120815336 4 | 2016/09/23 | 1Year |
| Test Software | JS Tonscend | JS1120-2 | Ver.2.5 | N/A | N/A |
| USB Data acquisition | Agilent | U2531A | TW55043503 | N/A | N/A |
| Auto control Unit | JS Tonscend | JS0806-2 | 158060010 | N/A | N/A |
| RE/RF in chamber | | • | • | | |
| EMI Test Receiver | R&S | ESU8 | 100316 | 2016/10/16 | 1Year |
| Spectrum analyzer | R&S | FSU26 | 1166.1660.26 | 2016/10/16 | 1Year |
| Trilog Broadband Antenna | Schwarzbeck | VULB9163 | 9163-462 | 2016/10/27 | 1 Year |
| Active Loop antenna | Schwarzbeck | FMZB-1519 | 1519-038 | 2016/10/27 | 1 Year |
| Double Ridged Horn Antenna | R&S | HF907 | 100276 | 2016/10/12 | 1 Year |
| Pre-amplifier | A.H. | PAM-0118 | 360 | 2016/10/16 | 1 Year |
| RF Cable | HUBSER | CP-X2 | W11.03 | 2016/10/16 | 1Year |
| RF Cable | HUBSER | CP-X1 | W12.02 | 2016/10/16 | 1 Year |
| MI Cable | HUBSER | C10-01-01-1M | 1091629 | 2016/10/16 | 1 Year |
| Test software | Audix | E3 | V 6.11111b | / | / |
| Conducted disturbance | at mains terminal | s/Telecommunica | ation port | | |
| Test Receiver | R&S | ESU8 | 100316 | 2016/10/16 | 1 Year |
| LISN 1 | R&S | ENV216 | 101109 | 2016/10/16 | 1 Year |
| LISN 2 | R&S | ESH2-Z5 | 100309 | 2016/10/16 | 1 Year |
| 8 Line ISN | R&S | ENY81 | 100063 | 2016/10/16 | 1Year |
| Pulse Limiter | R&S | ESH3-Z2 | 101242 | 2016/10/16 | 1 Year |
| CE Cable 1 | HUBSER | ESU8/RF2 | W10.01 | 2016/10/16 | 1 Year |
| Test software | Audix | E3 | V 6.11111b | / | / |

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4. 6dB Bandwidth and 99% Bandwidth

4.1. Block diagram of test setup



4.2. Limits

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 KHz

4.3. Test Procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Set the spectrum analyzer as follows:

RBW: 100KHz
VBW: 300KHz
Detector Mode: Peak
Sweep time: auto
Trace mode Max hold

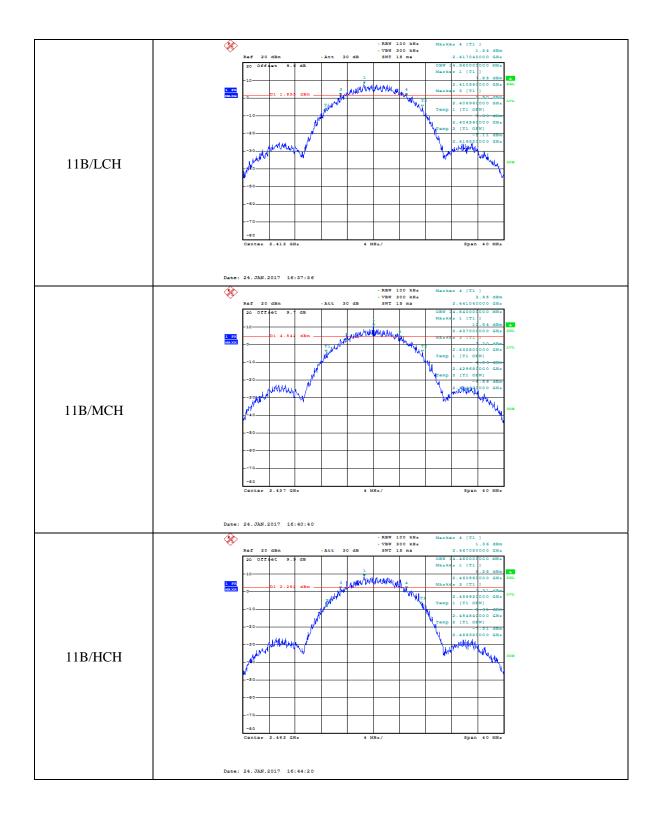
(3) Allow the trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

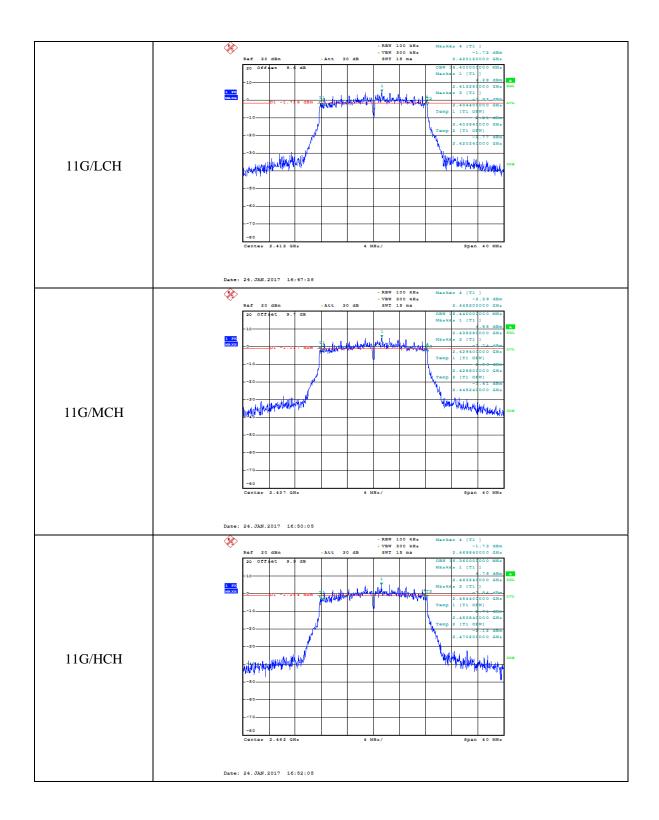
4.4. Test Result

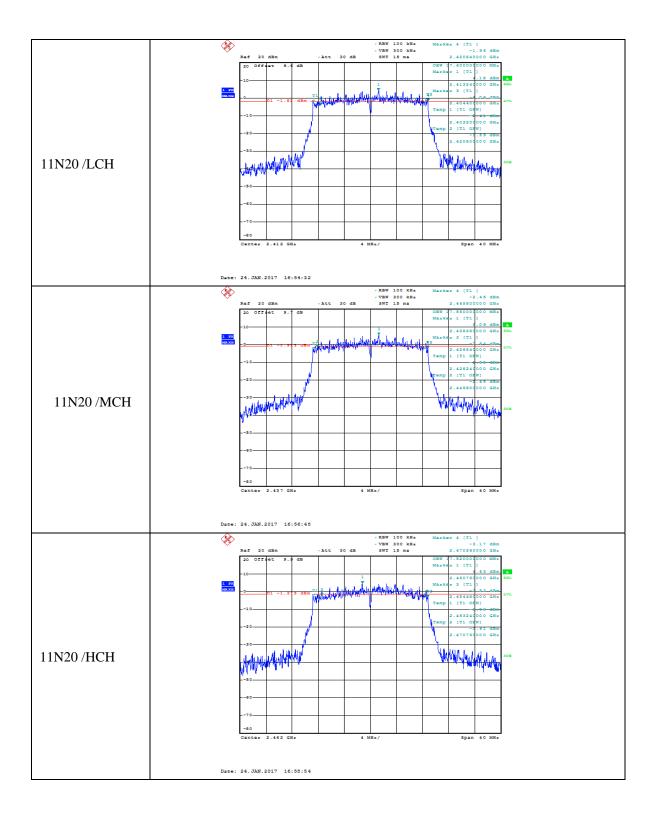
| ELIE C (M. 1 | CH or | 6 dB bandwidth | 99% dB bandwidth | |
|---------------------------|-----------|----------------|---------------------|--|
| EUT Set Mode | Frequency | Result (MHz) | Result (MHz) | |
| Antenna 1 | | | | |
| | CH1 | 10.080 | 14.960 | |
| 11b | CH6 | 8.240 | 14.840 | |
| | CH11 | 10.160 | 14.480 | |
| | CH1 | 15.720 | 16.400 | |
| 11g | CH6 | 15.800 | 16.440 | |
| | CH11 | 15.440 | 16.360 | |
| | CH1 | 16.440 | 17.600 | |
| 11n HT 20 | CH6 | 16.960 | 17.560 | |
| | CH11 | 16.080 | 17.520 | |
| | CH3 | 28.960 | 35.760 | |
| 11n HT 40 | CH6 | 35.280 | 35.840 | |
| | CH9 | 32.720 | 35.840 | |
| Antenna 2 | | _ | | |
| 11b | CH1 | 10.056 | 14.940 | |
| | СН6 | 8.230 | 14.840 | |
| | CH11 | 10.150 | 14.430 | |
| | CH1 | 15.710 | 16.430 | |
| 11g | CH6 | 15.810 | 16.420 | |
| | CH11 | 15.430 | 16.320 | |
| | CH1 | 16.430 | 17.630 | |
| 11n HT 20 | CH6 | 16.950 | 17.540 | |
| | CH11 | 16.070 | 17.520 | |
| | СНЗ | 28.960 | 35.750 | |
| 11n HT 40 | СН6 | 35.230 | 35.830 | |
| | СН9 | 32.710 | 35.820 | |
| Limit: >500KHz | | | Conclusion: PASS | |
| Test Date : Jan. 24, 2017 | | | Test Engineer: Toby | |

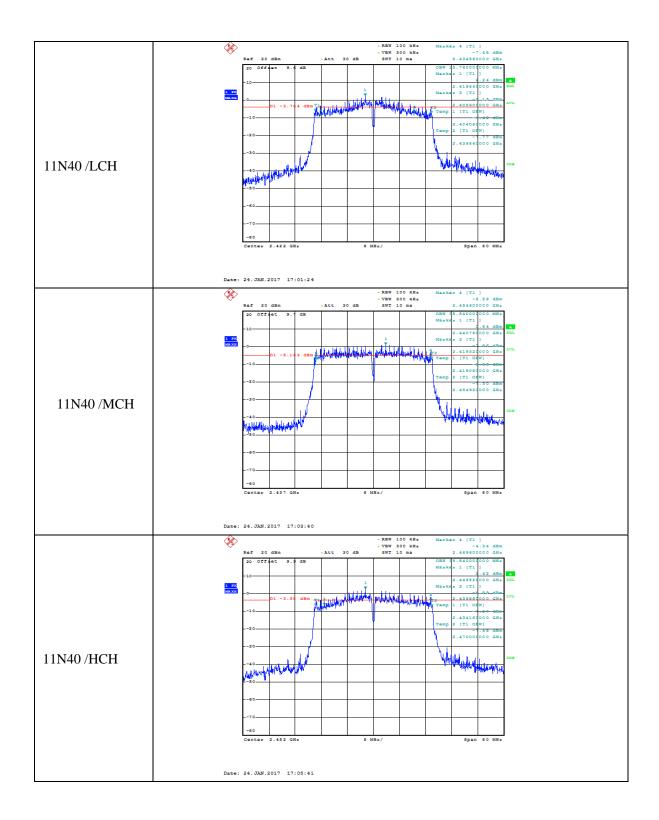
4.5. Original test data(Worse case Antenna 1)

| Graphs |
|--------|
|--------|









5. Conducted Peak Output Power

5.1. Block diagram of test setup

Same as scetion 4.1

5.2. Limits

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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5.3. Test Procedure

- (1) Connect each EUT's antenna output to power sensor by RF cable and attenuator
- (2) Measure the Peak output power of each antenna port by power sensor.

5.4. Test Result

| EUT Set Mode | СН | Result(dBm) Peak | | | |
|---|------|------------------|-----------|----------------------|--|
| | | Antenna 1 | Antenna 2 | Antenna 1+2 | |
| | CH1 | 17.59 | 17.56 | N/A | |
| 11b | CH6 | 18.25 | 18.24 | N/A | |
| | CH11 | 18.01 | 18.03 | N/A | |
| | CH1 | 14.33 | 14.33 | N/A | |
| 11g | CH6 | 15.19 | 15.14 | N/A | |
| | CH11 | 14.75 | 14.34 | N/A | |
| | CH1 | 14.30 | 14.52 | 17.42 | |
| 11n HT20 | CH6 | 15.03 | 15.43 | 18.24 | |
| | CH11 | 14.77 | 14.23 | 17.52 | |
| 11n HT40 | CH3 | 11.38 | 11.45 | 14.43 | |
| | CH6 | 11.90 | 11.23 | 14.59 | |
| | CH9 | 12.04 | 12.45 | 15.26 | |
| Limit: 30dBm (Peak power) Conclusion: PAS | | | | | |
| Test Date : Jan. 24, 2017 Test 3 | | | | Test Engineer : Toby | |

6. Power Spectral Density

6.1. Block diagram of test setup

Same as scetion 4.1

6.2. Limits

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

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6.3. Test Procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Set the spectrum analyzer as follows:

Center frequency DTS Channel center frequency

RBW: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$

VBW: ≥ 3RBW

Span 1.5times the DTS bandwidth

Detector Mode: Peak
Sweep time: auto

Trace mode Max hold

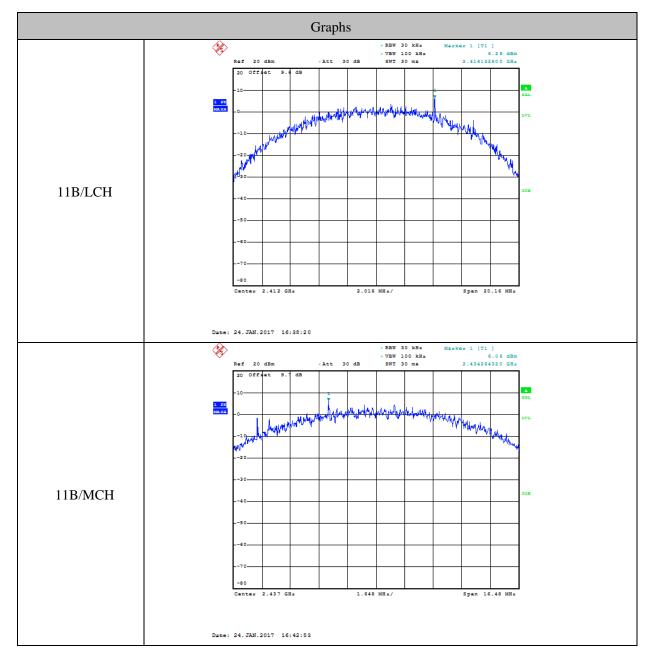
- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
- (4) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

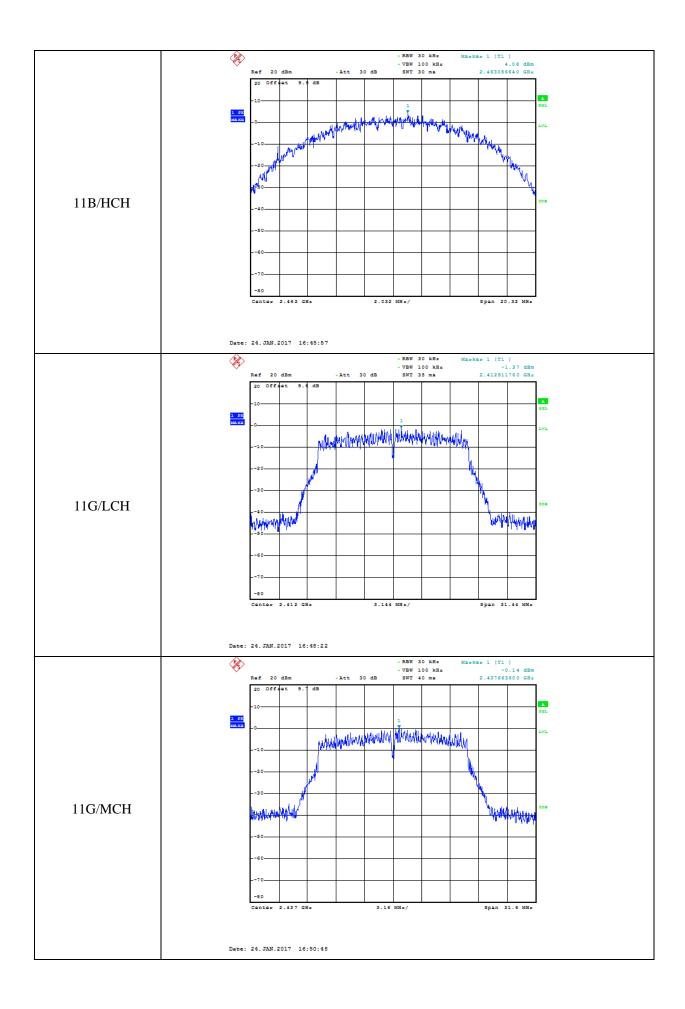
6.4. Test Result

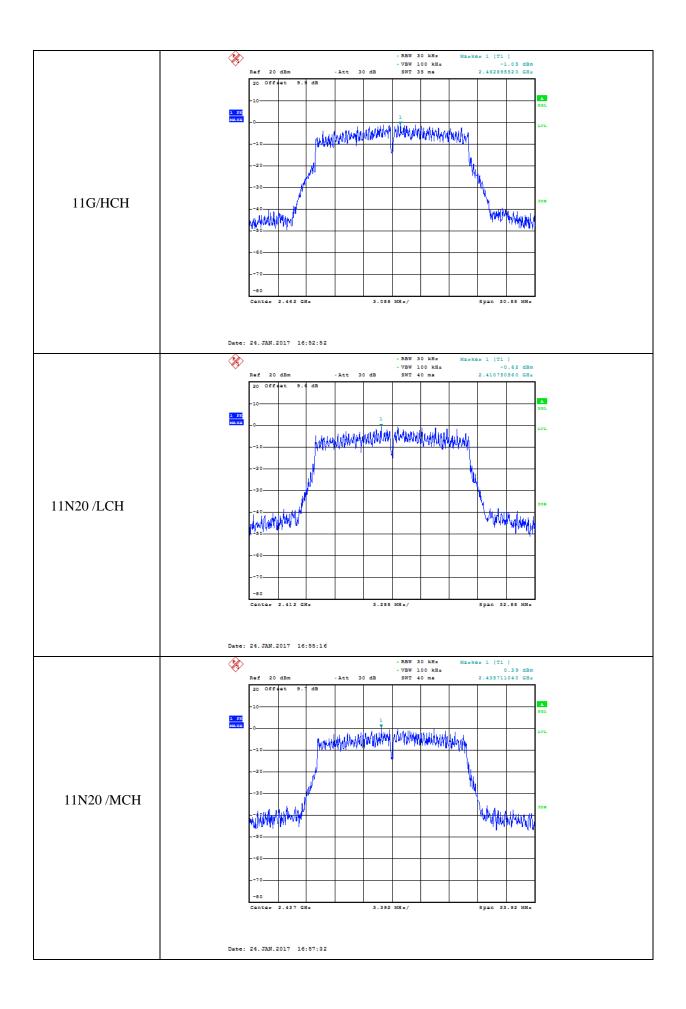
| EUT Set Mode | CH or | Antenna 1 | Antenna 2 | Antenna 1+2 |
|-------------------|-----------|-------------|------------------|-------------|
| EUT Set Wode | Frequency | Result(dBm) | Result(dBm) | Result(dBm) |
| 11b | CH1 | 4.08 | 4.05 | N/A |
| | СН6 | 6.29 | 6.28 | N/A |
| | CH11 | 6.06 | 6.04 | N/A |
| | CH1 | -1.05 | -1.06 | N/A |
| 11g | СН6 | -1.37 | -1.38 | N/A |
| | CH11 | -0.14 | -0.15 | N/A |
| | CH1 | 0.47 | 0.46 | 3.48 |
| 11n HT 20 | СН6 | -0.62 | -0.60 | 2.40 |
| | CH11 | 0.39 | 0.38 | 3.40 |
| 11n HT 40 | СН3 | -3.34 | -3.34 | -0.33 |
| | СН6 | -3.73 | -3.72 | -0.71 |
| | CH9 | -3.92 | -3.90 | -0.90 |
| Limit: <8dBm/3KHz | | | Conclusion: PASS | · |

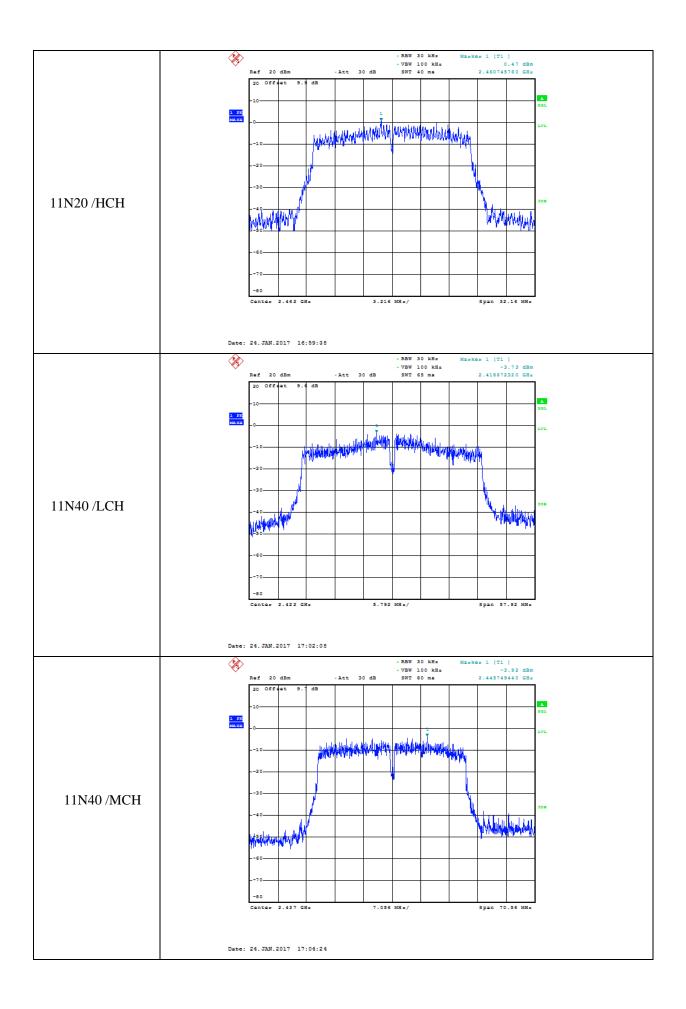
Test Date : Jan. 24, 2017 Test Engineer: Toby

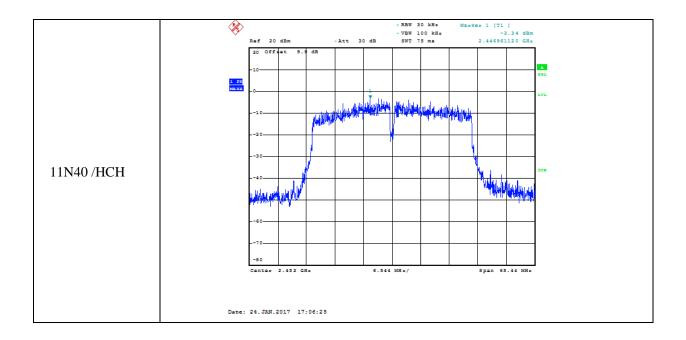
6.5. Original test data(Worse case Antenna 1)











6.6. Band Edge and Spurious Emissions (Conducted)

6.7. Block diagram of test setup

Same as scetion 4.1

6.8. Limits

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 30dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

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6.9. Test Procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Establish a reference level by using the following procedure:

Center frequency DTS Channel center frequency

RBW: 100KHz VBW: 300KHz

Span 1.5times the DTS bandwidth

Detector Mode: Peak
Sweep time: auto

Trace mode Max hold

- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
- (4) Set the spectrum analyzer as follows:

RBW: 100KHz VBW: 300KHz

Span Encompass frequency range to be measured

Number of measurement points > span/RBW

Detector Mode: Peak
Sweep time: auto
Trace mode Max hold

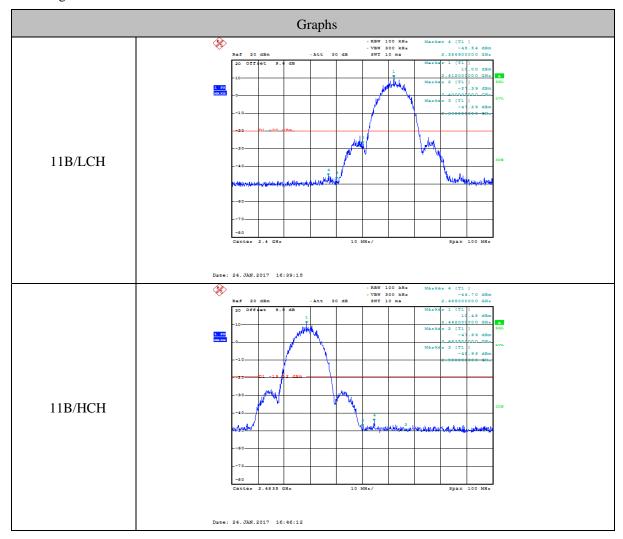
(5) Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

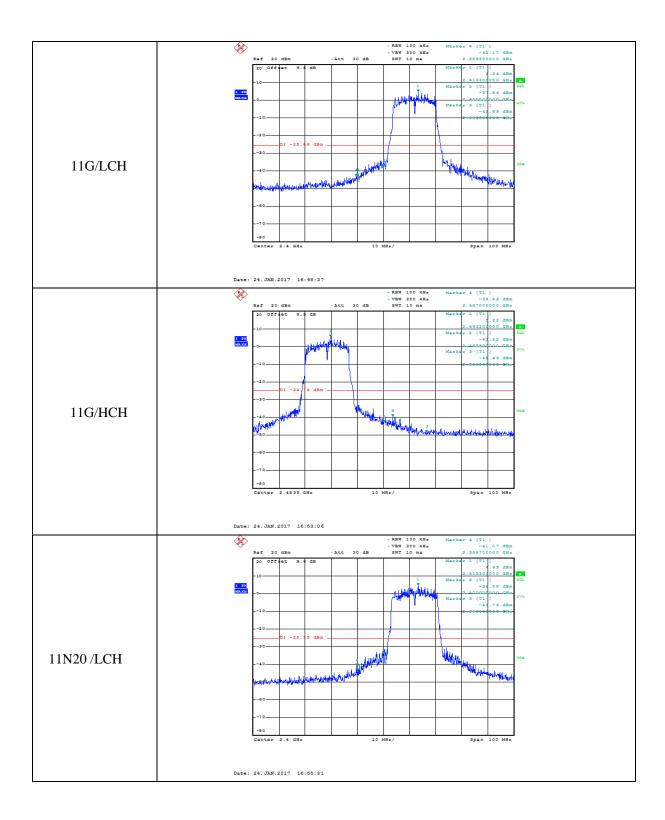
6.10. Test Result

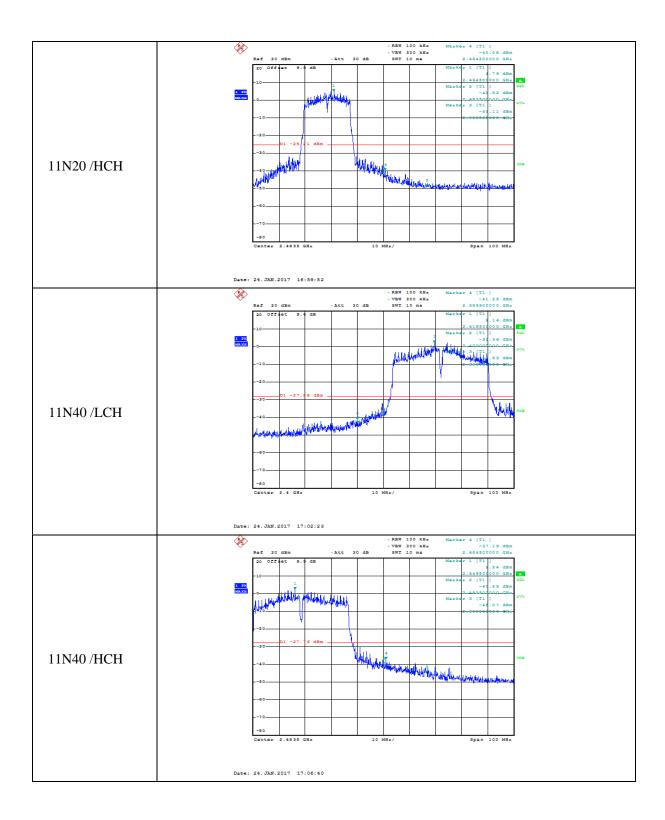
| EUT Set Mode | CH or | Result | EUT Set Mode | CH or | Result |
|---------------------------|-----------|----------------------|-----------------|-----------|--------|
| Mode | Frequency | (dBm) | Mode | Frequency | (dBm) |
| | CH1 | PASS | | CH1 | PASS |
| 11b | CH6 | PASS | 11n HT 20 | CH6 | PASS |
| | CH11 | PASS | | CH11 | PASS |
| | CH1 | PASS | | СН3 | PASS |
| 11g | СН6 | PASS | 11n HT 40 | СН6 | PASS |
| | CH11 | PASS | | СН9 | PASS |
| Test Date : Jan. 24, 2017 | | Test Engineer : Toby | | | |

6.11. Original test data(Worse case Antenna 1)

Band Edge:







Spurious Emissions (Worse case mode):

