

Report No.: 14EAB03052 21



FCC CERTIFICATION TEST REPORT FOR

| FCC | ID: 2AB3B-RECEIVER |
|------------------------|--|
| Report Reference No: | 14EAB03052 21 |
| Date of issue: | 2014-04-11 |
| | |
| Testing Laboratory: | ATT Product Service Co., Ltd. |
| Address: | No. 3, ChangLianShan Industrial Park, ChangAn Town, DongGuan City, GuangDong, China. |
| Applicant's name: | Viditar Inc |
| Address: | 3108 Industrial Terrace Austin, TX78758 USA |
| Manufacturer: | Season Components Company Ltd. |
| | |
| Test specification: | |
| Test item description: | Livid Guitar Wing |
| Trade Mark:: | |
| Model/Type reference: | Livid USB Receiver 1 |
| Ratings:: | 5Vdc,12mA |
| | |
| | |
| | |
| Responsible Engineer | Approved by |
| Bin Jiang | To We |
| (Bin Jiang/ Engineer) | (Tomy Wu /EMC Manager) |
| | |

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TEST REPORT DECLARE

| Applicant | : | Viditar Inc. | |
|----------------------|---|---|--|
| Address | : | 3108 Industrial Terrace Austin, TX78758 USA | |
| Equipment under Test | : | Livid Guitar Wing | |
| Model No | : | Livid USB Receiver 1 | |
| Trade Mark | : | | |
| Manufacturer | : | Season Components Company Ltd. | |
| Address | : | Jun Da Lu,DongKeng,Dongguan,Guangdong,China | |

Test Standard Used: FCC Rules and Regulations Part 15 Subpart C: 2010

Test procedure used: ANSI C63.10:2009 ANSI C63.4:2009

FCC ID: 2AB3B-RECEIVER

We Declare:

The equipment described above is tested by ATT Product 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 ATT Product 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: | 14EAB03052 21 | | |
|---------------|----------------------|-----------------|------------|
| Date of Test: | 2014-03-252014-04-09 | Date of Report: | 2014-04-11 |

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



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1. Summary of test Standards and results

The EUT have been tested according to the applicable standards as referenced below.

| Description of Test Item | Standard | Results |
|--------------------------|--|---------|
| 20dB Bandwidth | &15. 215(c) ANSI C63.10 :2009 | PASS |
| Radiated Emission | 15.209,&15.205,&15.249 ANSI C63.4 :2009 | PASS |
| Conducted Emissions | &15.207(a) ANSI C63.4 :2009 | PASS |
| Antenna requirement | &15.203 | PASS |

Note:

1. N/A: the EUT was powered by DC battery in normal use condition



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2.General test information

2.1 ACCREDITATIONS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Registration Number:923232 USA **FCC** Canada **INDUSTRY CANADA Registration Number 11033A**

2.2 Description of EUT

| EUT* Name | : | Livid Guitar Wing |
|--------------------------|---|--|
| Model Number | : | Livid USB Receiver 1 |
| Trade Mark | : | |
| EUT function description | : | Please reference user manual of this device |
| Power supply | : | 5Vdc |
| Operation frequency | : | 2402MHz -2480MHz |
| Modulation | : | GFSK |
| Data rate | : | 2Mpbs |
| Antenna Type | : | built-in "F" shape PCB antenna, maximum PK gain:0dBi |
| Date of Receipt | : | 2014-03-25 |
| Sample Type | : | Series production |
| | | |

2.3 Accessories of EUT

| Description of Accessories | Manufacturer | Model number or Type | Other | |
|----------------------------|--------------|----------------------|-------|--|
| 1 | 1 | / | / | |

2.4 Assistant equipment used for test

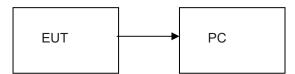
| Description of Assistant equipment | Manufacturer | Model number or Type | comments |
|---------------------------------------|--------------|----------------------|----------|
| PC | Lenovo | E R500 | FCC DOC |

ATT Product Service Co., Ltd. (CBTL Lab of UL/Demko)
No. 3, ChangLianShan Industrial Park, ChangAn Town, DongGuan City, GuangDong, China.



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2.5 Block diagram of EUT configuration for test



| Tested mode, channel, information | | | |
|-----------------------------------|---------|--------------------|--|
| Test Mode | Channel | Frequency (MHz) | |
| GFSK Tx Mode | CH0 | 2402 | |
| | CH19 | 2440 | |
| | CH39 | 2480 | |

Note1: Some modes not apply for all the test items.

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 Measurement uncertainty

| Test Item | Uncertainty |
|---|-----------------------|
| Uncertainty for Conduction emission test | 2.44dB |
| Uncertainty for Radiation Emission test (150KHz-30MHz) | 3.21dB |
| Lie containt of an Dadintina Fraincian took (20ML) 4.0Lb) | 3.14 dB (Polarize: V) |
| Uncertainty for Radiation Emission test (30MHz-1GHz) | 3.16 dB (Polarize: H) |
| Uncertainty for Radiation Emission toot (10Hz to 250Hz) | 2.08dB(Polarize: V) |
| Uncertainty for Radiation Emission test (1GHz to 25GHz) | 2.56dB (Polarize: H) |
| Uncertainty for radio frequency | 1×10-9 |
| Uncertainty for conducted RF Power | 0.65dB |

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



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3. 20dB Bandwidth

3.1 Test equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until | Cal. Interval |
|------|----------------------|---------------|-------------|------------|------------------|---------------|
| 1 | EMI Test Receiver | R&S | ESCI | 101307 | 2014/12/26 | 1Y |
| 2 | Attenuator | Mini-Circuits | BW-S10W2 | 101109 | 2014/12/27 | 1Y |
| 3 | RF Cable | Micable | C10-01-01-1 | 100309 | 2014/12/27 | 1Y |

3.2 Block diagram of test setup



3.3 Applicable Standard

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated...

3.4 Test Procedure

- 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- 2. Position the EUT on the test table without connection to measurement instrument. Turn on the EUT. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- 3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
- 4. Repeat above procedures until all frequencies measured were complete..



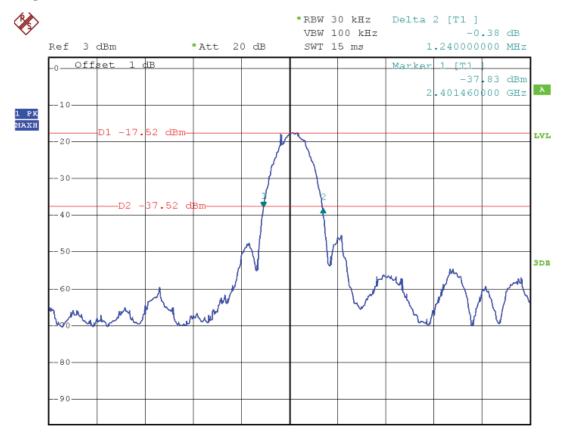
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3.5 Test Result

| EUT: Livid Guitar Wing M/N: Livid USB Receiver 1 | | | | | | | | | |
|--|---------------|-----------------|----------------|-----------------|------------|--|--|--|--|
| Mode | Freq (MHz) | Result (MHz) | Limit (MHz) | Margin (MHz) | Conclusion | | | | |
| | 2402 | 1.24 | 1 | / | PASS | | | | |
| GFSK | 2440 | 1.22 | / | / | PASS | | | | |
| | 2480 | 1.22 | / | 1 | PASS | | | | |
| Toot Date + 201 | 14.02.26 | | Toot Engin | oor i Din Jona | | | | | |

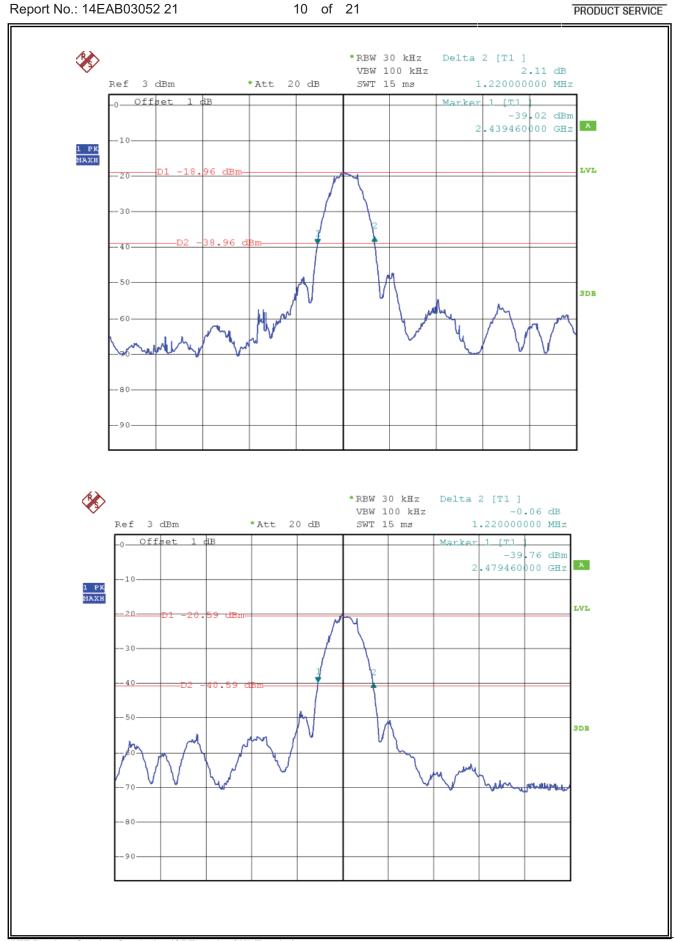
Test Engineer : Bin Jang Test Date : 2014-03-26

3.6 Original test data









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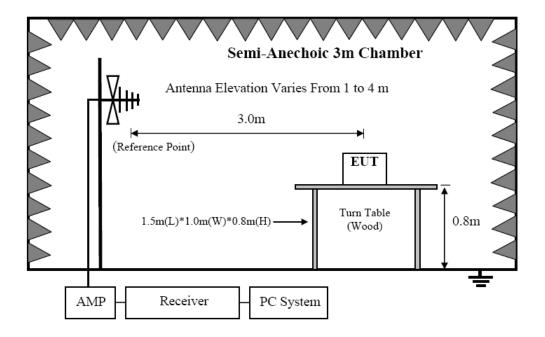
Radiated emission 4.

4.1 **Test equipment**

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until | Cal. Interval |
|------|-------------------------------|--------------|-----------|------------|------------------|---------------|
| 1 | EMI Test Receiver | R&S | ESCI | 101307 | 2014/12/21 | 1Y |
| 2 | Spectrum analyzer | Agilent | E4407B | US40240708 | 2014/07/17 | 1Y |
| 3 | Loop antenna | Chase | HLA6120 | 20129 | 2014/12/27 | 1Y |
| 4 | Trilog Broadband Antenna | Schwarzbeck | VULB9163 | 9163-462 | 2014/12/27 | 1Y |
| 5 | Double Ridged Horn Antenna | R&S | HF907 | 100276 | 2014/12/27 | 1Y |
| 6 | Pre-Amplifier | R&S | SCU-01 | 10049 | 2014/12/27 | 1Y |
| 7 | Pre-amplifier | A.H. | PAM0-0118 | 360 | 2014/12/27 | 1Y |
| 8 | RF Cable | R&S | R01 | 10403 | 2014/12/27 | 1Y |
| 9 | RF Cable | R&S | R02 | 10512 | 2014/12/27 | 1Y |
| 10 | Horn Antenna | EMCO | 3116 | 9608-4877 | 2014/12/27 | 1Y |

4.2 Block diagram of test setup

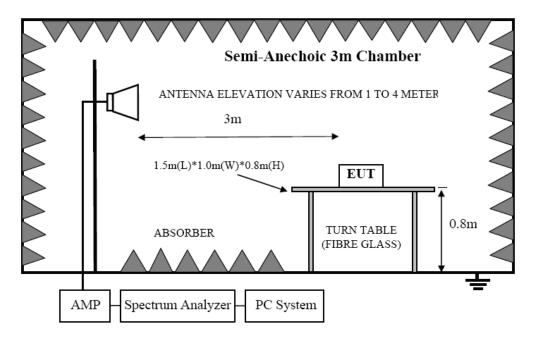
In 3m Anechoic Chamber Test Setup Diagram for below 1GHz



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In 3m Anechoic Chamber Test Setup Diagram for frequency above 1GHz



Note: For harmonic emissions test a appropriate high pass filter was inserted in the input port of AMP.

4.3 Limit

8.3.1 FCC 15.205 Restricted frequency band

| MHz | MHz MHz | | GHz |
|----------------------------|-----------------------|-----------------|---------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2690 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | (2) |



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8.3.2 FCC 15.209 Limit

| FREQUENCY | DISTANCE | FIELD STRENG | THS LIMIT |
|------------|----------|--------------------------------|-----------|
| MHz | Meters | μV/m | dB(μV)/m |
| 30 ~ 88 | 3 | 100 | 40.0 |
| 88 ~ 216 | 3 | 150 | 43.5 |
| 216 ~ 960 | 3 | 200 | 46.0 |
| 960 ~ 1000 | 3 | 500 | 54.0 |
| Above 1000 | 3 | 74.0 dB(μV)/r 54.0 dB(μV)/m | , |

8.3.2 FCC 15.249 Limit

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|-----------------------|--|--|
| 902–928 MHz | 50 | 500 |
| 2400–2483.5 MHz | 50 | 500 |
| 5725–5875 MHz | 50 | 500 |
| 24.0–24.25 GHz | 250 | 2500 |

8.3.3 Limit for this EUT

The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC 15.209, and FCC 15.249 limits.

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4.4 TEST PROCEDURE

- (1) EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber.
- (2) Setup EUT and assistant system according clause 2.4 and 8.2
- (3) Test antenna was located 3m from the EUT on an adjustable mast. Below pre-scan procedure was first performed in order to find prominent radiated emissions.
 - (a) Change work frequency or channel of device if practicable.
 - (b) Change modulation type of device if practicable.
 - (c) Change power supply range from 85% to 115% of the rated supply voltage.
 - (d) Rotated EUT though three orthogonal axes to determine the attitude of EUT arrangement Produces highest emissions.
- (4) Spectrum frequency from 9MHz to 25GHz (tenth harmonic of fundamental frequency) was investigated, and no any obvious emission were detected from 9KHz to 30MHz and 18GHz to 25GHz, so below final test was performed with frequency range from 30MHz to 18GHz.
- (5) For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.10 2009 on Radiated Emission test.
- (6) For emissions from 30MHz to 1GHz, Quasi-Peak values were measured with EMI Receiver and the bandwidth of Receiver is 120 KHz.
- (7) For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz, VBW is set at 3MHz for Peak measure, Detector is at PK; RBW is set at 1MHz, VBW is set at 10Hz for Average measure, Detector is at PK.

4.5 Test result

PASS. (See below detailed test result)

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C,

and section 15.205, 15.209 and 15.249, Vertical and Horizontal mode all have been tested, Horizontal mode is the worse case .with the worst margin reading of:

6.02 dB at 2483.5 MHz in the Horizontal polarization.

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Radiated Emission Test Result

Test Mode:GFSK

Test Site : 3m Chamber

Test Date : 2014-03-28 **Tested By** : Bin Jiang

EUT : Livid Guitar Wing Model Number : Livid USB Receiver 1

Power Supply : 5Vdc **Test Mode** : Tx mode CH0,CH19,CH39

: 3m Condition : Temp:24.5'C,Humi:55% Antenna/Distance

| Frequency | Re | ceiver | Rx Aı | ntenna | Cable | Amplifier | Corrected | FCC 15 | 5.249 | |
|--------------------|-------------------|------------------------|----------------|----------------|--------------|--------------|-----------------------|-------------------|----------------|--|
| (MHz) | Reading (dBµV) | Detector (PK/QP/AV) | Polar (H/V) | Factor (dB) | loss (dB) | Gain (dB) | Amplitude (dBµV/m) | Limit (dBµV/m) | Margin (dB) | |
| Low Channel (2402) | | | | | | | | | | |
| 2402 | 70.35 | PK | Н | 28 | 3.65 | 0 | 102 | 114 | 12 | |
| 2402 | 55.83 | AV | Н | 28 | 3.65 | 0 | 87.48 | 94 | 6.52 | |
| 2402 | 65.32 | PK | V | 28 | 3.65 | 0 | 96.97 | 114 | 17.03 | |
| 2402 | 50.36 | AV | V | 28 | 3.65 | 0 | 82.01 | 94 | 11.99 | |
| 2390 | 28.63 | PK | Н | 28.4 | 3.57 | 0 | 60.6 | 74 | 13.4 | |
| 2390 | 15.47 | AV | Н | 28.4 | 3.57 | 0 | 47.44 | 54 | 6.56 | |
| 2390 | 28.63 | PK | V | 28.4 | 3.57 | 0 | 60.6 | 74 | 13.4 | |
| 2390 | 15.47 | AV | V | 28.4 | 3.57 | 0 | 47.44 | 54 | 6.56 | |
| 2400 | 30.21 | PK | Н | 28.4 | 3.57 | 0 | 62.18 | 74 | 11.82 | |
| 2400 | 17.35 | AV | Н | 28.4 | 3.57 | 0 | 49.32 | 54 | 4.68 | |
| 2400 | 29.53 | PK | V | 28.4 | 3.57 | 0 | 61.5 | 74 | 11.82 | |
| 2400 | 16.82 | AV | V | 28.4 | 3.57 | 0 | 48.79 | 54 | 4.68 | |
| 4804 | 44.32 | PK | Н | 32.3 | 5.91 | 31.78 | 50.75 | 74 | 23.25 | |
| 4804 | 28.96 | AV | Н | 32.3 | 5.91 | 31.78 | 35.39 | 54 | 18.61 | |
| 4804 | 42.86 | PK | V | 32.3 | 5.91 | 31.78 | 49.29 | 74 | 24.71 | |
| 4804 | 27.65 | AV | V | 32.3 | 5.91 | 31.78 | 34.08 | 54 | 19.92 | |
| 7206 | 43.51 | PK | Н | 36.3 | 6.34 | 30.97 | 55.18 | 74 | 18.82 | |
| 7206 | 27.66 | AV | Н | 36.3 | 6.34 | 30.97 | 39.33 | 54 | 14.67 | |
| 7206 | 42.13 | PK | V | 36.3 | 6.34 | 30.97 | 53.8 | 74 | 20.2 | |
| 7206 | 27.18 | AV | V | 36.3 | 6.34 | 30.97 | 38.85 | 54 | 15.15 | |
| 9608 | 44.11 | PK | Н | 37.9 | 8.01 | 30.86 | 59.16 | 74 | 14.84 | |
| 9608 | 27.08 | AV | Н | 37.9 | 8.01 | 30.86 | 42.13 | 54 | 11.87 | |
| 9608 | 43.25 | PK | V | 37.9 | 8.01 | 30.86 | 58.3 | 74 | 15.7 | |
| 9608 | 26.38 | AV | V | 37.9 | 8.01 | 30.86 | 41.43 | 54 | 12.57 | |
| 256.34 | 38.64 | QP | Н | 12.8 | 2.63 | 27.2 | 26.87 | 43.5 | 16.63 | |
| 256.34 | 36.88 | QP | V | 12.8 | 2.63 | 27.2 | 25.03 | 43.5 | 18.47 | |
| | | | Mid | dle Cha | nnel (24 | 140) | | | | |
| 2440 | 70.08 | PK | Н | 28.7 | 3.74 | 0 | 102.52 | 114 | 11.48 | |
| 2440 | 54.32 | AV | Н | 28.7 | 3.74 | 0 | 86.76 | 94 | 7.24 | |
| 2440 | 65.07 | PK | V | 28.7 | 3.74 | 0 | 97.51 | 114 | 16.49 | |
| 2440 | 51.22 | AV | V | 28.7 | 3.74 | 0 | 83.66 | 94 | 10.34 | |
| 4880 | 43.65 | PK | Н | 32.6 | 6.15 | 31.78 | 50.62 | 74 | 23.38 | |
| 4880 | 29.14 | AV | Н | 32.6 | 6.15 | 31.78 | 36.11 | 54 | 17.89 | |



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| 4880 | 41.96 | PK | V | 32.6 | 6.15 | 31.78 | 48.93 | 74 | 25.07 |
|--------|-------|----|-----|---------|---------|-------|--------|------|-------|
| 4880 | 26.55 | AV | V | 32.6 | 6.15 | 31.78 | 33.52 | 54 | 20.48 |
| 7320 | 44.25 | PK | Н | 36.7 | 6.22 | 30.97 | 56.2 | 74 | 17.8 |
| 7320 | 29.88 | AV | Н | 36.7 | 6.22 | 30.97 | 41.83 | 54 | 12.17 |
| 7320 | 42.55 | PK | V | 36.7 | 6.22 | 30.97 | 54.5 | 74 | 19.5 |
| 7320 | 28.63 | AV | V | 36.7 | 6.22 | 30.97 | 40.58 | 54 | 13.42 |
| 9760 | 43.02 | PK | Н | 38.2 | 8.11 | 30.86 | 58.47 | 74 | 15.53 |
| 9760 | 28.14 | AV | Н | 38.2 | 8.11 | 30.86 | 43.59 | 54 | 10.41 |
| 9760 | 41.29 | PK | V | 38.2 | 8.11 | 30.86 | 56.74 | 74 | 17.26 |
| 9760 | 27.54 | AV | V | 38.2 | 8.11 | 30.86 | 42.99 | 54 | 11.01 |
| 256.33 | 38.96 | QP | Н | 12.8 | 2.63 | 27.2 | 27.19 | 43.5 | 16.31 |
| 256.33 | 36.49 | QP | V | 12.8 | 2.63 | 27.2 | 24.72 | 43.5 | 18.78 |
| | | | Hiç | gh Chan | nel (24 | 80) | | | |
| 2480 | 70.16 | PK | Н | 29.1 | 3.81 | 0 | 103.07 | 114 | 10.93 |
| 2480 | 55.34 | AV | Н | 29.1 | 3.81 | 0 | 88.25 | 94 | 5.75 |
| 2480 | 64.89 | PK | V | 29.1 | 3.81 | 0 | 97.8 | 114 | 16.2 |
| 2480 | 51.39 | AV | V | 29.1 | 3.81 | 0 | 84.3 | 94 | 9.7 |
| 2483.5 | 30.63 | PK | Н | 28.7 | 3.62 | 0 | 62.95 | 74 | 11.05 |
| 2483.5 | 17.04 | AV | Н | 28.7 | 3.62 | 0 | 49.36 | 54 | 4.64 |
| 2483.5 | 30.22 | PK | V | 28.7 | 3.62 | 0 | 62.54 | 74 | 11.46 |
| 2483.5 | 16.79 | AV | V | 28.7 | 3.62 | 0 | 49.11 | 54 | 4.89 |
| 4960 | 43.52 | PK | Н | 32.8 | 6.17 | 31.78 | 50.71 | 74 | 23.29 |
| 4960 | 30.12 | AV | Н | 32.8 | 6.17 | 31.78 | 37.31 | 54 | 16.69 |
| 4960 | 41.33 | PK | V | 32.8 | 6.17 | 31.78 | 48.52 | 74 | 25.48 |
| 4960 | 29.16 | AV | V | 32.8 | 6.17 | 31.78 | 36.35 | 54 | 17.65 |
| 7440 | 42.35 | PK | Н | 36.8 | 6.26 | 30.97 | 54.44 | 74 | 19.56 |
| 7440 | 29.61 | AV | Н | 36.8 | 6.26 | 30.97 | 41.7 | 54 | 12.3 |
| 7440 | 40.87 | PK | V | 36.8 | 6.26 | 30.97 | 52.96 | 74 | 21.04 |
| 7440 | 28.44 | AV | V | 36.8 | 6.26 | 30.97 | 40.53 | 54 | 13.47 |
| 9920 | 40.15 | PK | Н | 38.4 | 8.17 | 30.86 | 55.86 | 74 | 18.14 |
| 9920 | 28.33 | AV | Н | 38.4 | 8.17 | 30.86 | 44.04 | 54 | 9.96 |
| 9920 | 39.08 | PK | V | 38.4 | 8.17 | 30.86 | 54.79 | 74 | 19.21 |
| 9920 | 26.55 | AV | V | 38.4 | 8.17 | 30.86 | 42.26 | 54 | 11.74 |
| 256.34 | 37.54 | QP | Н | 12.8 | 2.63 | 27.2 | 25.77 | 43.5 | 17.73 |
| 256.34 | 35.93 | QP | V | 12.8 | 2.63 | 27.2 | 24.16 | 43.5 | 19.34 |

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

2. If Peak Result comply with QP limit, QP Result is deemed to comply with QP limit.

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6. Antenna Requirements

6.1 Limit

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.249 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

6.2 Result

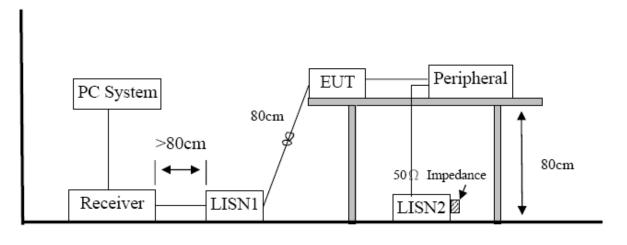
The EUT has an internal chip antenna permanently soldering on the printed circuit board, which complied with 15.203, the maximum gain was 0dBi.

7. Power Line Conducted Emission

7.1 Test equipment

| Item | Equipment | Manufacturer | Model No. | Serial No. | Calibrated until | Cal. Interval |
|------|---------------|-------------------|-----------------|-----------------|---------------------|---------------|
| 1 | Test Receiver | R&S | ESCI | 101308 | 2014/11/26 | 1 Year |
| 2 | LISN 1 | AFJ | LS16 | 16011103219 | 2014/12/28 | 1 Year |
| 3 | LISN 2 | R&S | ESH2-Z5 | 100309 | 2014/12/28 | 1 Year |
| 4 | Pulse Limiter | MTS-systemtechnik | MTS-IMP- 136 | 261115-010-0024 | 2014/12/28 | 1 Year |

7.2 Block diagram of test setup



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7.3 Power Line Conducted Emission Limits(Class B)

| Frequency | Quasi-Peak Level dB(μV) | Average Level dB(μV) |
|-----------------|----------------------------|-------------------------|
| 150kHz ~ 500kHz | 66 ~ 56* | 56 ~ 46* |
| 500kHz ~ 5MHz | 56 | 46 |
| 5MHz ~ 30MHz | 60 | 50 |

Note 1: * Decreasing linearly with logarithm of frequency.

Note 2: The lower limit shall apply at the transition frequencies

7.4 Test Procedure

The EUT and Support equipment, if needed, were put placed on a non-metallic table, 80cm above the ground plane.

Configuration EUT to simulate typical usage as described in clause 2.4 and test equipment as described in clause 10.2 of this report.

All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.

All support equipment power received from a second LISN.

Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

The Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.

During the above scans, the emissions were maximized by cable manipulation.

The test mode(s) described in clause 2.4 were scanned during the preliminary test.

After the preliminary scan, we found the test mode producing the highest emission level.

The EUT configuration and worse cable configuration of the above highest emission levels were recorded for reference of the final test.

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.

A scan was taken on both power lines, Neutral and Line, recording at least the six highest emissions.

Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

The test data of the worst-case condition(s) was recorded.

The bandwidth of test receiver is set at 9 KHz.

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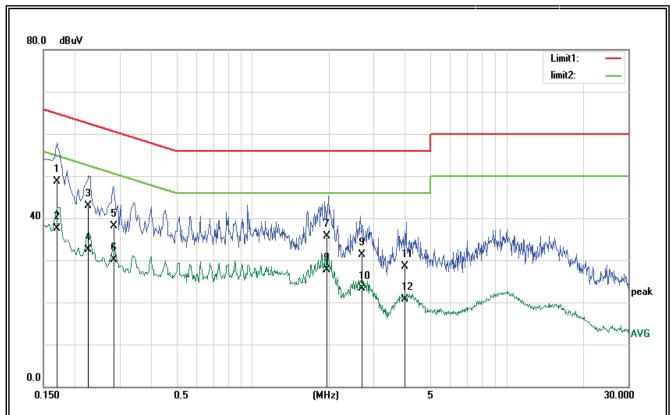
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7.5 Test Result

PASS. (See below detailed test result)

| EUT: | Livid Guitar Wing | Model No.: | Livid USB Receiver 1 |
|--------------|----------------------------|--------------------|----------------------|
| Temperature: | 24℃ | Relative Humidity: | 55% |
| Probe: | N | Test Power: | AC 120V/60Hz |
| Standard: | (CE)FCC PART 15 class B_QP | Test Result: | Pass |
| Test Mode: | KEEPING TX | Test By: | Dylan |
| Note: | | | |

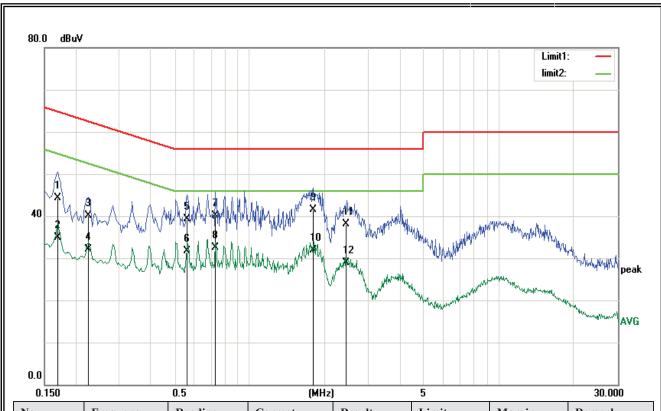




| No. | Frequency | Reading | Correct | Result | Limit | Margin | Remark |
|-----|-----------|---------|------------|--------|--------|--------|--------|
| | (MHz) | (dBuV) | Factor(dB) | (dBuV) | (dBuV) | (dB) | |
| 1 | 0.1689 | 37.06 | 11.64 | 48.70 | 65.01 | -16.31 | QP |
| 2 | 0.1689 | 25.89 | 11.64 | 37.53 | 55.01 | -17.48 | AVG |
| 3 | 0.2262 | 31.81 | 11.11 | 42.92 | 62.58 | -19.66 | QP |
| 4 | 0.2262 | 21.38 | 11.11 | 32.49 | 52.58 | -20.09 | AVG |
| 5 | 0.2845 | 27.48 | 10.58 | 38.06 | 60.68 | -22.62 | QP |
| 6 | 0.2845 | 19.56 | 10.58 | 30.14 | 50.68 | -20.54 | AVG |
| 7 | 1.9728 | 25.53 | 10.20 | 35.73 | 56.00 | -20.27 | QP |
| 8 | 1.9728 | 17.52 | 10.20 | 27.72 | 46.00 | -18.28 | AVG |
| 9 | 2.6843 | 21.08 | 10.28 | 31.36 | 56.00 | -24.64 | QP |
| 10 | 2.6843 | 12.97 | 10.28 | 23.25 | 46.00 | -22.75 | AVG |
| 11 | 3.9658 | 18.07 | 10.39 | 28.46 | 56.00 | -27.54 | QP |
| 12 | 3.9658 | 10.24 | 10.39 | 20.63 | 46.00 | -25.37 | AVG |

| EUT: | Livid Guitar Wing | Model No.: | Livid USB Receiver 1 | |
|--------------|----------------------------|--------------------|----------------------|--|
| Temperature: | 24℃ | Relative Humidity: | 55% | |
| Probe: | L1 | Test Power: | AC 120V/60Hz | |
| Standard: | (CE)FCC PART 15 class B_QP | Test Result: | Pass | |
| Test Mode: | KEEPING TX | Test By: | Dylan | |
| Note: | | | | |





| No. | Frequency | Reading | Correct | Result | Limit | Margin | Remark |
|-----|-----------|---------|------------|--------|--------|--------|--------|
| | (MHz) | (dBuV) | Factor(dB) | (dBuV) | (dBuV) | (dB) | |
| 1 | 0.1689 | 32.76 | 11.64 | 44.40 | 65.01 | -20.61 | QP |
| 2 | 0.1689 | 23.32 | 11.64 | 34.96 | 55.01 | -20.05 | AVG |
| 3 | 0.2253 | 28.89 | 11.12 | 40.01 | 62.62 | -22.61 | QP |
| 4 | 0.2253 | 20.95 | 11.12 | 32.07 | 52.62 | -20.55 | AVG |
| 5 | 0.5595 | 29.11 | 10.16 | 39.27 | 56.00 | -16.73 | QP |
| 6 | 0.5595 | 21.47 | 10.16 | 31.63 | 46.00 | -14.37 | AVG |
| 7 | 0.7291 | 30.03 | 10.12 | 40.15 | 56.00 | -15.85 | QP |
| 8 | 0.7291 | 22.47 | 10.12 | 32.59 | 46.00 | -13.41 | AVG |
| 9 | 1.7952 | 31.29 | 10.18 | 41.47 | 56.00 | -14.53 | QP |
| 10 | 1.7952 | 21.65 | 10.18 | 31.83 | 46.00 | -14.17 | AVG |
| 11 | 2.4354 | 27.85 | 10.25 | 38.10 | 56.00 | -17.90 | QP |
| 12 | 2.4354 | 18.69 | 10.25 | 28.94 | 46.00 | -17.06 | AVG |

END OF REPORT