

FCC Test Report

Equipment : Personal Computer
Brand Name : SONY
Model No. : SVF15AC1QL
FCC ID : AK8SVF15AC1QL
Standard : 47 CFR FCC Part 15.247
Operating Band : 2400 MHz – 2483.5 MHz
Equipment Class : DTS
Applicant : Sony Corporation
Manufacturer : 1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan

The product sample received on Jan. 31, 2013 and completely tested on Mar. 28, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

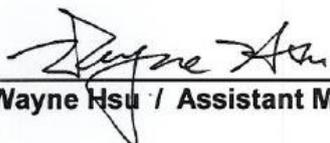

Wayne Hsu / Assistant Manager





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Summary of Test Result

| Conformance Test Specifications | | | | | |
|---------------------------------|------------------|---|--|---|----------|
| Report Clause | Ref. Std. Clause | Description | Measured | Limit | Result |
| 1.1.2 | 15.203 | Antenna Requirement | Antenna connector mechanism complied | FCC 15.203 | Complied |
| 3.1 | 15.207 | AC Power-line Conducted Emissions | [dBuV]: 0.1883950MHz 43.45 (Margin 10.66dB) - AV 59.87 (Margin 4.24dB) - QP | FCC 15.207 | Complied |
| 3.2 | 15.247(a) | 6dB Bandwidth | LE:0.7164 MHz | ≥500kHz | Complied |
| 3.3 | 15.247(b) | RF Output Power (Maximum Peak Conducted Output Power) | Power [dBm] LE: -1.68 | Power [dBm] LE:30 | Complied |
| 3.4 | 15.247(d) | Power Spectral Density | PSD [dBm/3kHz] LE: -17.63 | PSD [dBm/3kHz]: 8 | Complied |
| 3.5 | 15.247(c) | Transmitter Radiated Bandedge Emissions | Non-Restricted Bands: 2514.12MHz: 28.94dB Restricted Bands [dBuV/m at 3m]: 2328.16MHz 62.68 (Margin 11.32dB) - PK 13.86 (Margin 40.14dB) - AV | Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209 | Complied |
| 3.6 | 15.247(c) | Transmitter Radiated Unwanted Emissions | Restricted Bands [dBuV/m at 3m]: 7320.000MHz 49.77 (Margin 4.23dB) - PK | Non-Restricted Bands: > 20 dBc Restricted Bands: FCC 15.209 | Complied |

1 General Description

1.1 Information

1.1.1 RF General Information

| RF General Information | | | | | |
|---|-------------------|---------------------|----------------|-----------------------|-------------|
| Frequency Range (MHz) | Bluetooth Version | Ch. Frequency (MHz) | Channel Number | RF Output Power (dBm) | Co-location |
| 2400-2483.5 | v4.0 LE | 2402-2480 | 0-39 [40] | -1.68 | Yes |
| <p>Note 1: Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation.</p> <p>Note 2: RF output power specifies that Maximum Peak Conducted Output Power.</p> <p>Note 3: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (i.e., EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)</p> | | | | | |

1.1.2 Antenna Information

| Antenna Category | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Integral antenna (antenna permanently attached) |
| <input checked="" type="checkbox"/> | Temporary RF connector provided |
| <input type="checkbox"/> | No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path. |
| <input type="checkbox"/> | External antenna (dedicated antennas) |
| <input type="checkbox"/> | Single power level with corresponding antenna(s). |
| <input type="checkbox"/> | Multiple power level and corresponding antenna(s). |
| <input type="checkbox"/> | RF connector provided |
| <input type="checkbox"/> | Unique antenna connector. (e.g., MMCX, U.FL, IPX, and RP-SMA, RP-N type...) |
| <input type="checkbox"/> | Standard antenna connector. (e.g., SMA, N, BNC, and TNC type...) |

| Antenna General Information | | | |
|-----------------------------|-----------|-----------|------------|
| No. | Ant. Cat. | Ant. Type | Gain (dBi) |
| 1 | Integral | PIFA | 0.16 |



1.1.3 Type of EUT

| Identify EUT | |
|-------------------------------------|---|
| EUT Serial Number | N/A |
| Presentation of Equipment | <input checked="" type="checkbox"/> Production ; <input type="checkbox"/> Pre-Production ; <input type="checkbox"/> Prototype |
| Type of EUT | |
| <input checked="" type="checkbox"/> | Stand-alone |
| <input type="checkbox"/> | Combined (EUT where the radio part is fully integrated within another device) Combined Equipment - Brand Name / Model No.: ... |
| <input type="checkbox"/> | Plug-in radio (EUT intended for a variety of host systems) Host System - Brand Name / Model No.: ... |
| <input type="checkbox"/> | Other: |

1.1.4 Test Signal Duty Cycle

| Operated Mode for Worst Duty Cycle | |
|---|---------------------------------------|
| <input checked="" type="checkbox"/> Operated test mode for worst duty cycle | |
| Test Signal Duty Cycle (x) | Power Duty Factor [dB] – (10 log 1/x) |
| <input checked="" type="checkbox"/> 72.10% - test mode single channel - LE | 1.42 |

1.1.5 EUT Operational Condition

| | | | |
|--------------------------|--|---|---|
| Supply Voltage | <input checked="" type="checkbox"/> AC mains | <input checked="" type="checkbox"/> DC | |
| Type of DC Source | <input type="checkbox"/> Internal DC supply | <input checked="" type="checkbox"/> External DC adapter | <input checked="" type="checkbox"/> Li-on Battery |

1.2 Accessories and Support Equipment

| Accessories Information | | | | |
|-------------------------|--------------|--|------------|-------------|
| AC Adapter | Brand Name | SONY | Model Name | VGP-AC19V43 |
| | Power Rating | I/P: 100-240V ~ 1.6A 50/60Hz ; O/P: 19.5V $\overline{\text{---}}$ 3.3A | | |
| Li-ion Battery | Brand Name | SONY | Model Name | VGP-BPS34 |
| | Power Rating | 11.4V $\overline{\text{---}}$ / 3780 mAh / 43 Wh | | |

Reminder: Regarding to more detail and other information, please refer to user manual.

| Support Equipment | | | | |
|-------------------|---|------------|------------|------------|
| No. | Equipment | Brand Name | Model Name | Serial No. |
| 1 | (USB) Mouse | Microsoft | 1004 | DoC |
| 2 | Printer | EPSON | C61 | DoC |
| 3 | Wireless AP (Remote Workstation) | ZO TECH | WR110B | DoC |
| 4 | Bluetooth Headset (Remote Workstation) | SONY | Z354 | DoC |

1.3 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ◆ 47 CFR FCC Part 15
- ◆ ANSI C63.10-2009
- ◆ FCC KDB 558074
- ◆ FCC KDB 412172

1.4 Testing Location Information

| Testing Location | | | | |
|-------------------------------------|---------------|---|----------------------|--------------------------|
| <input checked="" type="checkbox"/> | HWA YA | ADD : No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. | | |
| | | TEL : 886-3-327-3456 | FAX : 886-3-327-0973 | |
| Test Condition | Test Site No. | Test Engineer | Test Environment | Test Date |
| AC Conduction | CO04-HY | Bill | 24.3°C / 56% | 28-Mar.-13 |
| RF Conducted | TH01-HY | Shiming | 22.1C / 61% | 14-Mar.-13 |
| Radiated Emission | 03CH02-HY | Hsiao | 22.6°C / 54% | 19-Feb.-13 10-Mar.-13 |

1.5 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

| Measurement Uncertainty | | | |
|-----------------------------------|---------------|--------------------|--------------|
| Test Item | | Uncertainty | Limit |
| AC power-line conducted emissions | | ±2.26 dB | N/A |
| Emission bandwidth, 6dB bandwidth | | ±1.42 % | N/A |
| RF output power, conducted | | ±0.63 dB | N/A |
| Power density, conducted | | ±0.81 dB | N/A |
| Unwanted emissions, conducted | 30 – 1000 MHz | ±0.51 dB | N/A |
| | 1 – 18 GHz | ±0.67 dB | N/A |
| | 18 – 40 GHz | ±0.83 dB | N/A |
| | 40 – 200 GHz | N/A | N/A |
| All emissions, radiated | 30 – 1000 MHz | ±2.56 dB | N/A |
| | 1 – 18 GHz | ±3.59 dB | N/A |
| | 18 – 40 GHz | ±3.82 dB | N/A |
| | 40 – 200 GHz | N/A | N/A |
| Temperature | | ±0.8 °C | N/A |
| Humidity | | ±3 % | N/A |
| DC and low frequency voltages | | ±3 % | N/A |
| Time | | ±1.42 % | N/A |
| Duty Cycle | | ±1.42 % | N/A |

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

| Worst Modulation Used for Conformance Testing | | | | |
|--|------------------------------------|-----------|-----------------|-----------------------|
| Bluetooth Version | Transmit Chains (N _{TX}) | Data Rate | Modulation Mode | RF Output Power (dBm) |
| v4.0 LE | 1 | 1 Mbps | LE-1Mbps | -1.68 |
| Note 1: Bluetooth LE (Low Energy) using GFSK modulation for DTS digital modulation. Note 2: Modulation modes consist below configuration: DSSS LE-1Mbps: GFSK (1Mbps) Note 3: RF output power specifies that Maximum Peak Conducted Output Power. | | | | |

2.2 Test Channel Frequencies Configuration

| Test Channel Frequencies Configuration | |
|--|---------------------------------|
| Bluetooth Mode | Test Channel Frequencies (MHz) |
| LE | 2402-(F1), 2440-(F2), 2480-(F3) |

2.3 The Worst Case Power Setting Parameter

| The Worst Case Power Setting Parameter | | | |
|--|----------|----------|----------|
| Test Software Version | BlutTool | | |
| Modulation Mode | 2402 MHz | 2440 MHz | 2480 MHz |
| LE, 1Mbps | Default | Default | Default |

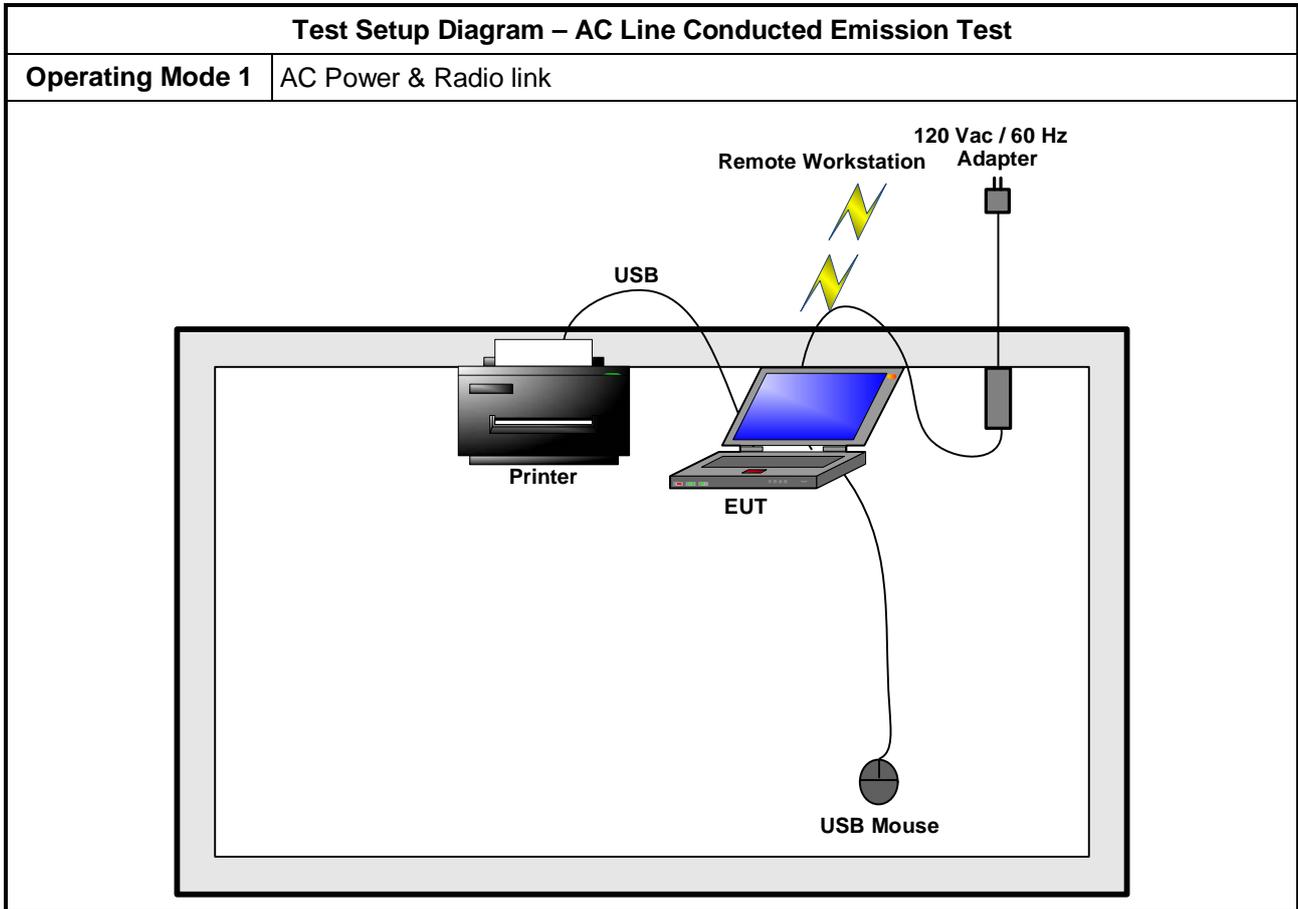
2.4 The Worst Case Measurement Configuration

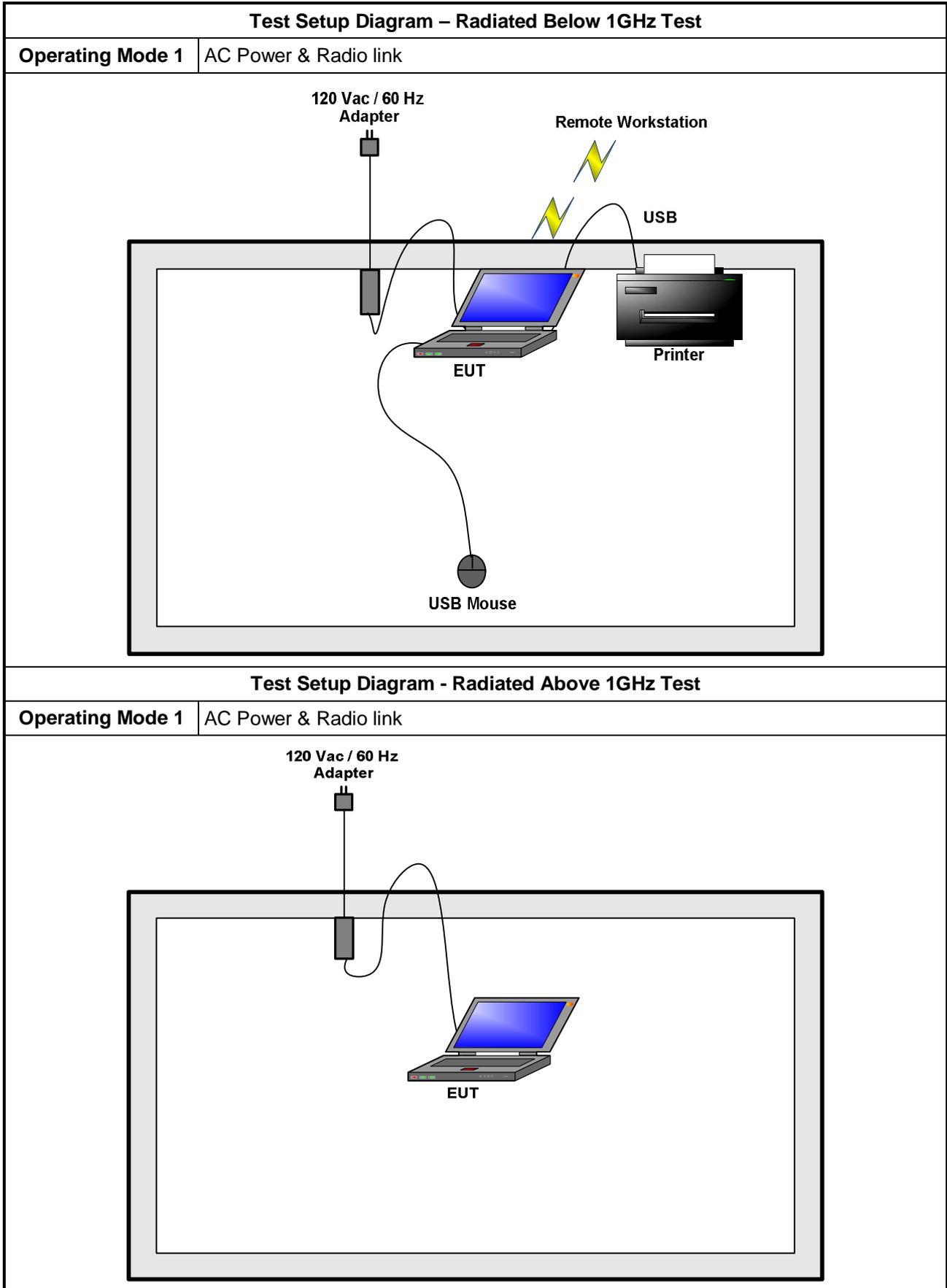
| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| Tests Item | AC power-line conducted emissions |
| Condition | AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz |
| Operating Mode | Operating Mode Description |
| 1 | AC Power & Radio link |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| Tests Item | RF Output Power, Power Spectral Density, 6 dB Bandwidth |
| Test Condition | Conducted measurement at transmit chains |
| Modulation Mode | LE-1Mbps |

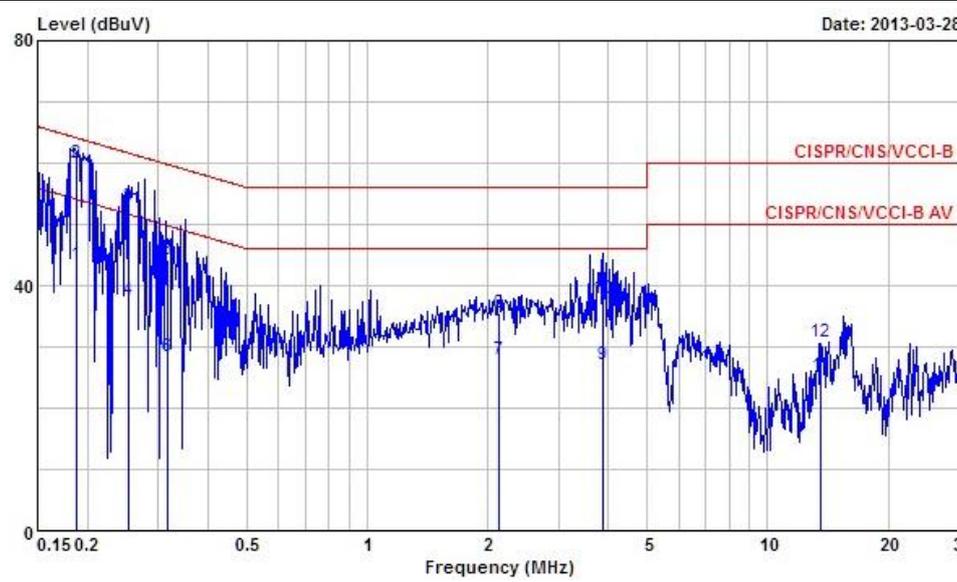
| The Worst Case Mode for Following Conformance Tests | |
|---|--|
| Tests Item | Transmitter Radiated Unwanted Emissions Transmitter Radiated Bandedge Emissions |
| Test Condition | Radiated measurement |
| User Position | <input checked="" type="checkbox"/> EUT will be placed in fixed position. |
| | <input type="checkbox"/> EUT will be placed in mobile position and operating multiple positions. EUT shall be performed two orthogonal planes. |
| | <input type="checkbox"/> EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions. EUT shall be performed two or three orthogonal planes. |
| Operating Mode < 1GHz | <input checked="" type="checkbox"/> 1. AC Power & Radio link |
| Modulation Mode | LE-1Mbps |

2.5 Test Setup Diagram



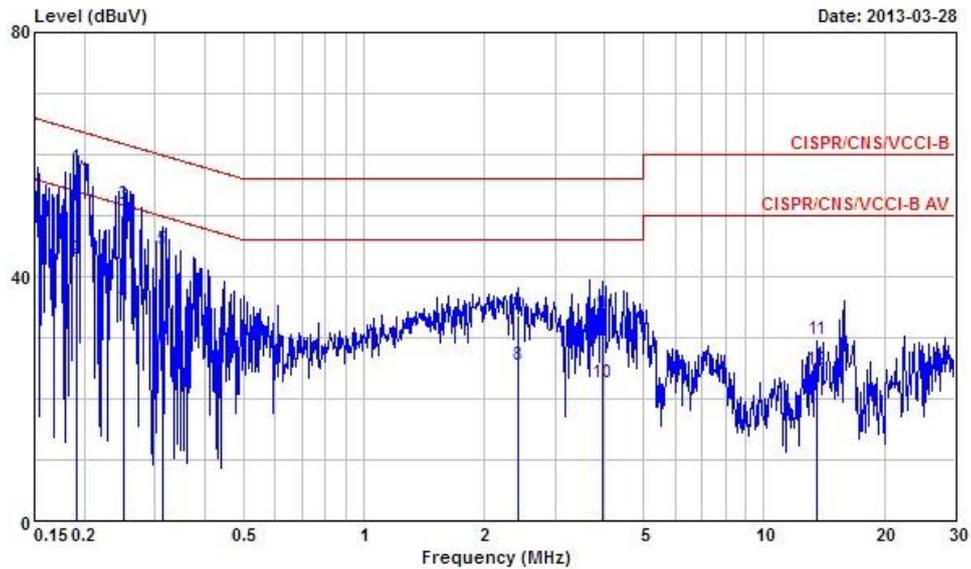


3.1.5 Test Result of AC Power-line Conducted Emissions

| AC Power-line Conducted Emissions Result | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------------------|-------------|------------|------------|------------|-------------|------------|------------|------------|-------------|------------|--------|--|-----|------|----|------|------|----|----|--|---|-----------|-------|--------|-------|-------|------|------|---------|---|-----------|-------|-------|-------|-------|------|------|----|---|-----------|-------|-------|-------|-------|------|------|----|---|-----------|-------|--------|-------|-------|------|------|---------|---|-----------|-------|--------|-------|-------|------|------|----|---|-----------|-------|--------|-------|-------|------|------|---------|---|-------|-------|--------|-------|-------|------|------|---------|---|-------|-------|--------|-------|-------|------|------|----|---|-------|-------|--------|-------|-------|------|------|---------|----|-------|-------|--------|-------|-------|------|------|----|----|--------|-------|--------|-------|-------|------|------|---------|----|--------|-------|--------|-------|-------|------|------|----|
| Operating Mode | 1 | Power Phase | Neutral | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Function | AC Power & Radio link | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date: 2013-03-28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Freq</th> <th>Level</th> <th>Over Limit</th> <th>Limit Line</th> <th>Read Level</th> <th>LISN Factor</th> <th>Cable Loss</th> <th>Remark</th> </tr> <tr> <th></th> <th>MHz</th> <th>dBuV</th> <th>dB</th> <th>dBuV</th> <th>dBuV</th> <th>dB</th> <th>dB</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.1883950</td> <td>43.45</td> <td>-10.66</td> <td>54.11</td> <td>43.21</td> <td>0.11</td> <td>0.13</td> <td>Average</td> </tr> <tr> <td>2</td> <td>0.1883950</td> <td>59.87</td> <td>-4.24</td> <td>64.11</td> <td>59.63</td> <td>0.11</td> <td>0.13</td> <td>QP</td> </tr> <tr> <td>3</td> <td>0.2534510</td> <td>52.91</td> <td>-8.73</td> <td>61.64</td> <td>52.70</td> <td>0.11</td> <td>0.10</td> <td>QP</td> </tr> <tr> <td>4</td> <td>0.2534510</td> <td>37.63</td> <td>-14.01</td> <td>51.64</td> <td>37.42</td> <td>0.11</td> <td>0.10</td> <td>Average</td> </tr> <tr> <td>5</td> <td>0.3159830</td> <td>44.25</td> <td>-15.56</td> <td>59.81</td> <td>44.05</td> <td>0.10</td> <td>0.10</td> <td>QP</td> </tr> <tr> <td>6</td> <td>0.3159830</td> <td>28.39</td> <td>-21.42</td> <td>49.81</td> <td>28.19</td> <td>0.10</td> <td>0.10</td> <td>Average</td> </tr> <tr> <td>7</td> <td>2.140</td> <td>27.79</td> <td>-18.21</td> <td>46.00</td> <td>27.37</td> <td>0.13</td> <td>0.29</td> <td>Average</td> </tr> <tr> <td>8</td> <td>2.140</td> <td>35.60</td> <td>-20.40</td> <td>56.00</td> <td>35.18</td> <td>0.13</td> <td>0.29</td> <td>QP</td> </tr> <tr> <td>9</td> <td>3.880</td> <td>27.09</td> <td>-18.91</td> <td>46.00</td> <td>26.74</td> <td>0.15</td> <td>0.20</td> <td>Average</td> </tr> <tr> <td>10</td> <td>3.880</td> <td>37.84</td> <td>-18.16</td> <td>56.00</td> <td>37.49</td> <td>0.15</td> <td>0.20</td> <td>QP</td> </tr> <tr> <td>11</td> <td>13.560</td> <td>25.39</td> <td>-24.61</td> <td>50.00</td> <td>24.95</td> <td>0.27</td> <td>0.17</td> <td>Average</td> </tr> <tr> <td>12</td> <td>13.560</td> <td>30.74</td> <td>-29.26</td> <td>60.00</td> <td>30.30</td> <td>0.27</td> <td>0.17</td> <td>QP</td> </tr> </tbody> </table> | | | | | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark | | MHz | dBuV | dB | dBuV | dBuV | dB | dB | | 1 | 0.1883950 | 43.45 | -10.66 | 54.11 | 43.21 | 0.11 | 0.13 | Average | 2 | 0.1883950 | 59.87 | -4.24 | 64.11 | 59.63 | 0.11 | 0.13 | QP | 3 | 0.2534510 | 52.91 | -8.73 | 61.64 | 52.70 | 0.11 | 0.10 | QP | 4 | 0.2534510 | 37.63 | -14.01 | 51.64 | 37.42 | 0.11 | 0.10 | Average | 5 | 0.3159830 | 44.25 | -15.56 | 59.81 | 44.05 | 0.10 | 0.10 | QP | 6 | 0.3159830 | 28.39 | -21.42 | 49.81 | 28.19 | 0.10 | 0.10 | Average | 7 | 2.140 | 27.79 | -18.21 | 46.00 | 27.37 | 0.13 | 0.29 | Average | 8 | 2.140 | 35.60 | -20.40 | 56.00 | 35.18 | 0.13 | 0.29 | QP | 9 | 3.880 | 27.09 | -18.91 | 46.00 | 26.74 | 0.15 | 0.20 | Average | 10 | 3.880 | 37.84 | -18.16 | 56.00 | 37.49 | 0.15 | 0.20 | QP | 11 | 13.560 | 25.39 | -24.61 | 50.00 | 24.95 | 0.27 | 0.17 | Average | 12 | 13.560 | 30.74 | -29.26 | 60.00 | 30.30 | 0.27 | 0.17 | QP |
| | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MHz | dBuV | dB | dBuV | dBuV | dB | dB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0.1883950 | 43.45 | -10.66 | 54.11 | 43.21 | 0.11 | 0.13 | Average | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0.1883950 | 59.87 | -4.24 | 64.11 | 59.63 | 0.11 | 0.13 | QP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 0.2534510 | 52.91 | -8.73 | 61.64 | 52.70 | 0.11 | 0.10 | QP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 0.2534510 | 37.63 | -14.01 | 51.64 | 37.42 | 0.11 | 0.10 | Average | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 0.3159830 | 44.25 | -15.56 | 59.81 | 44.05 | 0.10 | 0.10 | QP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 0.3159830 | 28.39 | -21.42 | 49.81 | 28.19 | 0.10 | 0.10 | Average | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 2.140 | 27.79 | -18.21 | 46.00 | 27.37 | 0.13 | 0.29 | Average | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 2.140 | 35.60 | -20.40 | 56.00 | 35.18 | 0.13 | 0.29 | QP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 3.880 | 27.09 | -18.91 | 46.00 | 26.74 | 0.15 | 0.20 | Average | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 3.880 | 37.84 | -18.16 | 56.00 | 37.49 | 0.15 | 0.20 | QP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | 13.560 | 25.39 | -24.61 | 50.00 | 24.95 | 0.27 | 0.17 | Average | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 13.560 | 30.74 | -29.26 | 60.00 | 30.30 | 0.27 | 0.17 | QP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit. Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



| AC Power-line Conducted Emissions Result | | | |
|--|-----------------------|-------------|------|
| Operating Mode | 1 | Power Phase | Line |
| Operating Function | AC Power & Radio link | | |



| | Freq | Level | Over | Limit | Read | LISN | Cable | Remark |
|----|-----------|-------|--------|-------|-------|--------|-------|---------|
| | MHz | dBuV | Limit | Line | Level | Factor | Loss | |
| | | | dB | dBuV | dBuV | dB | dB | |
| 1 | 0.1903870 | 57.81 | -6.21 | 64.02 | 57.45 | 0.23 | 0.13 | QP |
| 2 | 0.1903870 | 42.84 | -11.18 | 54.02 | 42.48 | 0.23 | 0.13 | Average |
| 3 | 0.2507790 | 51.91 | -9.82 | 61.73 | 51.58 | 0.23 | 0.10 | QP |
| 4 | 0.2507790 | 35.79 | -15.94 | 51.73 | 35.46 | 0.23 | 0.10 | Average |
| 5 | 0.3149460 | 44.45 | -15.39 | 59.84 | 44.13 | 0.22 | 0.10 | QP |
| 6 | 0.3149460 | 28.17 | -21.67 | 49.84 | 27.85 | 0.22 | 0.10 | Average |
| 7 | 2.420 | 33.67 | -22.33 | 56.00 | 33.14 | 0.26 | 0.27 | QP |
| 8 | 2.420 | 25.46 | -20.54 | 46.00 | 24.93 | 0.26 | 0.27 | Average |
| 9 | 3.960 | 33.85 | -22.15 | 56.00 | 33.36 | 0.29 | 0.20 | QP |
| 10 | 3.960 | 22.74 | -23.26 | 46.00 | 22.25 | 0.29 | 0.20 | Average |
| 11 | 13.560 | 29.68 | -30.32 | 60.00 | 29.03 | 0.48 | 0.17 | QP |
| 12 | 13.560 | 24.61 | -25.39 | 50.00 | 23.96 | 0.48 | 0.17 | Average |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)

3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

| 6dB Bandwidth Limit | |
|--|--------------------------------|
| Systems using digital modulation techniques: | |
| <input checked="" type="checkbox"/> | 6 dB bandwidth \geq 500 kHz. |

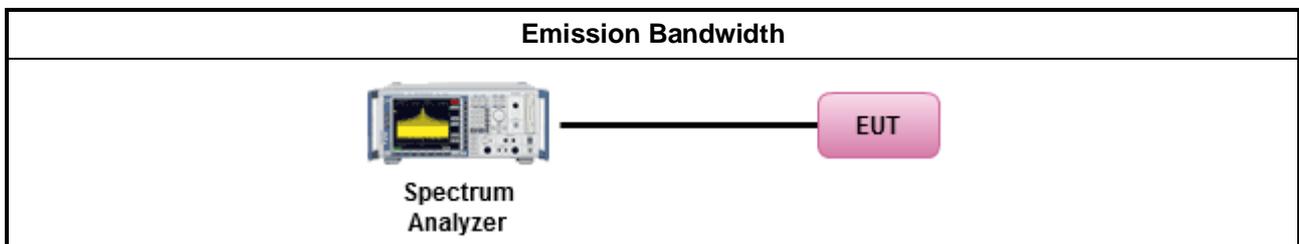
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

| Test Method | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | For the emission bandwidth shall be measured using one of the options below: |
| <input checked="" type="checkbox"/> | Refer as FCC KDB 558074, clause 7.1 Option 1 for 6 dB bandwidth measurement. |
| <input type="checkbox"/> | Refer as FCC KDB 558074, clause 7.2 Option 2 for 6 dB bandwidth measurement. |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing. |
| <input checked="" type="checkbox"/> | For conducted measurement. |
| <input checked="" type="checkbox"/> | The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input checked="" type="checkbox"/> | The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |

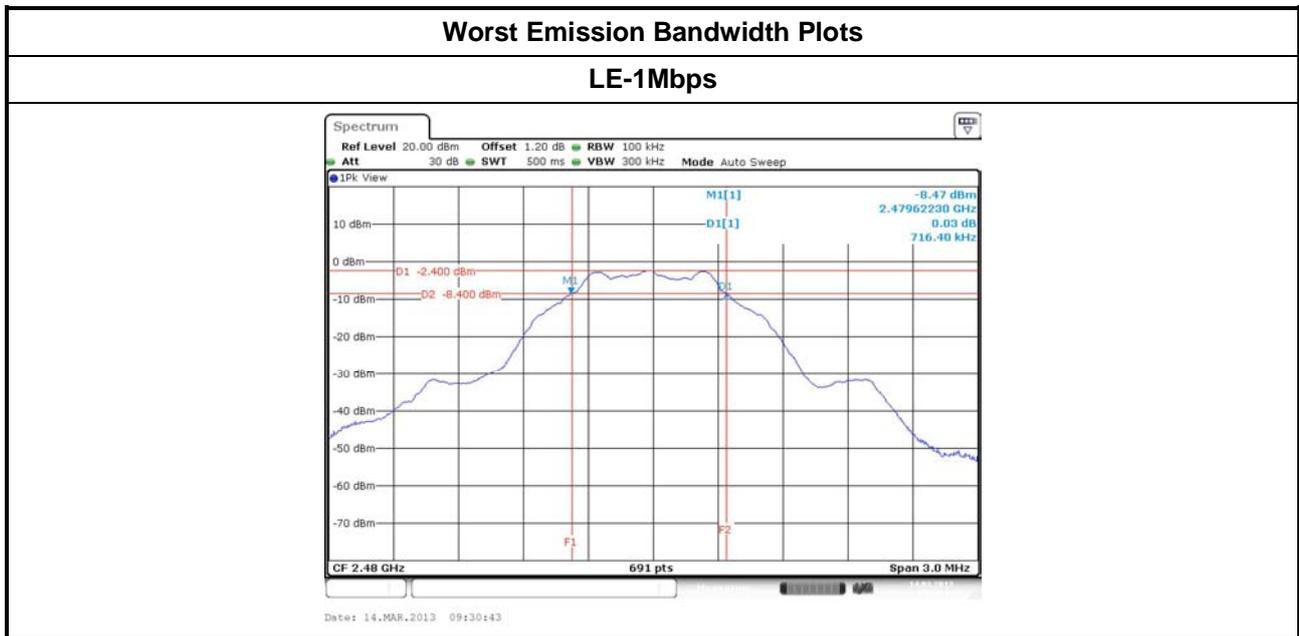
3.2.4 Test Setup





3.2.5 Test Result of Emission Bandwidth

| Emission Bandwidth Result | | | |
|---------------------------|-------------|---------------------|---------------------|
| Modulation Mode | Freq. (MHz) | 99% Bandwidth (kHz) | 6dB Bandwidth (kHz) |
| LE-1Mbps | 2402 | 1076.70 | 712.00 |
| LE-1Mbps | 2440 | 1076.70 | 712.00 |
| LE-1Mbps | 2480 | 1076.70 | 716.40 |
| Limit | | N/A | ≥500 kHz |
| Result | | Complied | |



3.3 RF Output Power

3.3.1 RF Output Power Limit

| RF Output Power Limit for Digital Modulation Systems | |
|--|--|
| Maximum Peak Conducted Output Power or Maximum Conducted Output Power Limit | |
| <input checked="" type="checkbox"/> 2400-2483.5 MHz Band: | |
| <input checked="" type="checkbox"/> | If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W) |
| <input type="checkbox"/> | Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ dBm |
| e.i.r.p. Power Limit: | |
| <input checked="" type="checkbox"/> 2400-2483.5 MHz Band | |
| <input checked="" type="checkbox"/> | Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W) |
| P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi. P_{eirp} = e.i.r.p. Power in dBm. | |

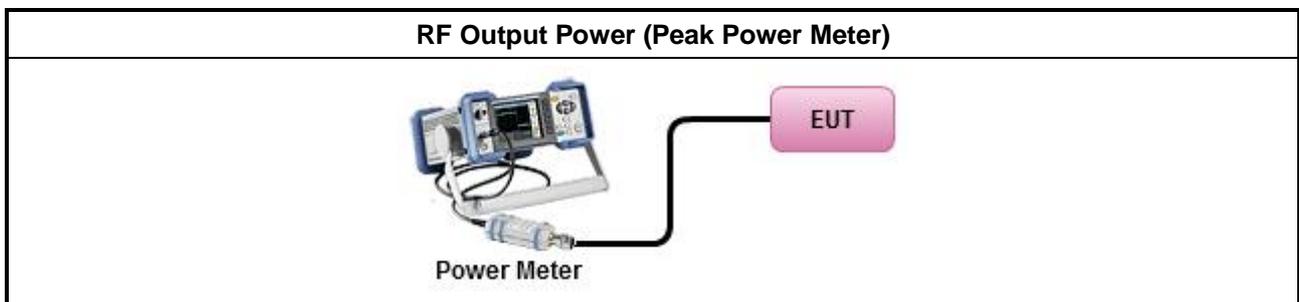
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

| Test Method | |
|--|---|
| <input checked="" type="checkbox"/> Maximum Peak Conducted Output Power | |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.10.2.1 a) for peak power meter. |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 6.10.2.1 a) for spectrum analyzer - (RBW \geq EBW). |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 2 for conducted measurement. | |
| <input checked="" type="checkbox"/> | The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input checked="" type="checkbox"/> | The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |

3.3.4 Test Setup





3.3.5 Test Result of Maximum Peak Conducted Output Power

| Maximum Peak Conducted Output Power Result | | | | | | |
|--|-------------|-----------------------|-------------|--------------------|------------|------------|
| Condition | | RF Output Power (dBm) | | | | |
| Modulation Mode | Freq. (MHz) | RF Output Power | Power Limit | Antenna Gain (dBi) | EIRP Power | EIRP Limit |
| LE-1Mbps | 2402 | -1.69 | 30 | 0.16 | -1.53 | 36 |
| LE-1Mbps | 2440 | -1.89 | 30 | 0.16 | -1.73 | 36 |
| LE-1Mbps | 2480 | -1.68 | 30 | 0.16 | -1.52 | 36 |
| Result | | Complied | | | | |

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

| Power Spectral Density Limit |
|--|
| <input checked="" type="checkbox"/> Power Spectral Density (PSD) \leq 8 dBm/3kHz |

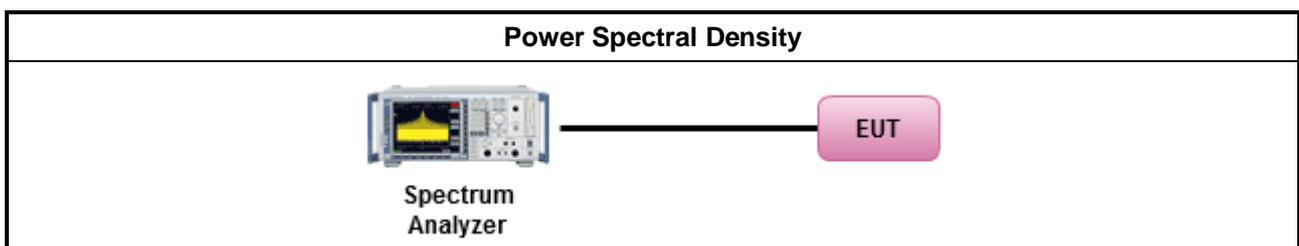
3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

| Test Method |
|--|
| <input checked="" type="checkbox"/> Power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the power spectral density. In addition, the use of a peak PSD procedure will always result in a "worst-case" measured level for comparison to the limit. Therefore, whenever the DTS bandwidth exceeds 500 kHz, it is acceptable to utilize the peak PSD procedure to demonstrate compliance to the PSD limit, regardless of how the fundamental output power was measured. For the power spectral density shall be measured using below options: |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 9.1 Option 1 - (RBW \geq 3kHz; sweep=auto, detector=peak). |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.2 Option 2 - (RBW \geq 3kHz; sweep=auto, average=100). |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.3 Option 3 - (RBW \geq 3kHz; slow sweep speed). |
| <input type="checkbox"/> Refer as FCC KDB 558074, clause 9.4 Alternative 1 (average PSD; Add 10log (1/duty cycle)). |
| <input checked="" type="checkbox"/> RBW>3kHz, add the bandwidth correction factor (BWCF) adjusting in PSD per 3kHz. |
| <input checked="" type="checkbox"/> Refer as FCC KDB 558074, clause 2 for conducted measurement. |
| <input checked="" type="checkbox"/> The EUT supports single transmit chain and measurements performed on this transmit chain. |
| <input checked="" type="checkbox"/> The EUT supports diversity transmitting and the results on transmit chain port 1 is the worst case. |

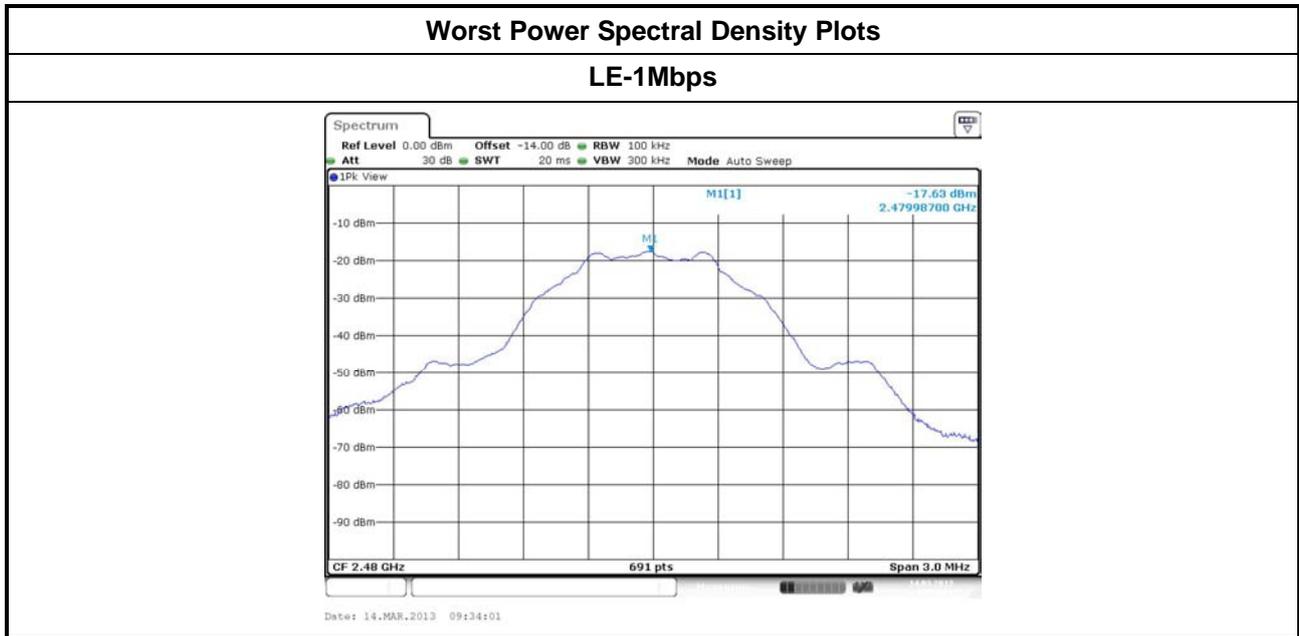
3.4.4 Test Setup





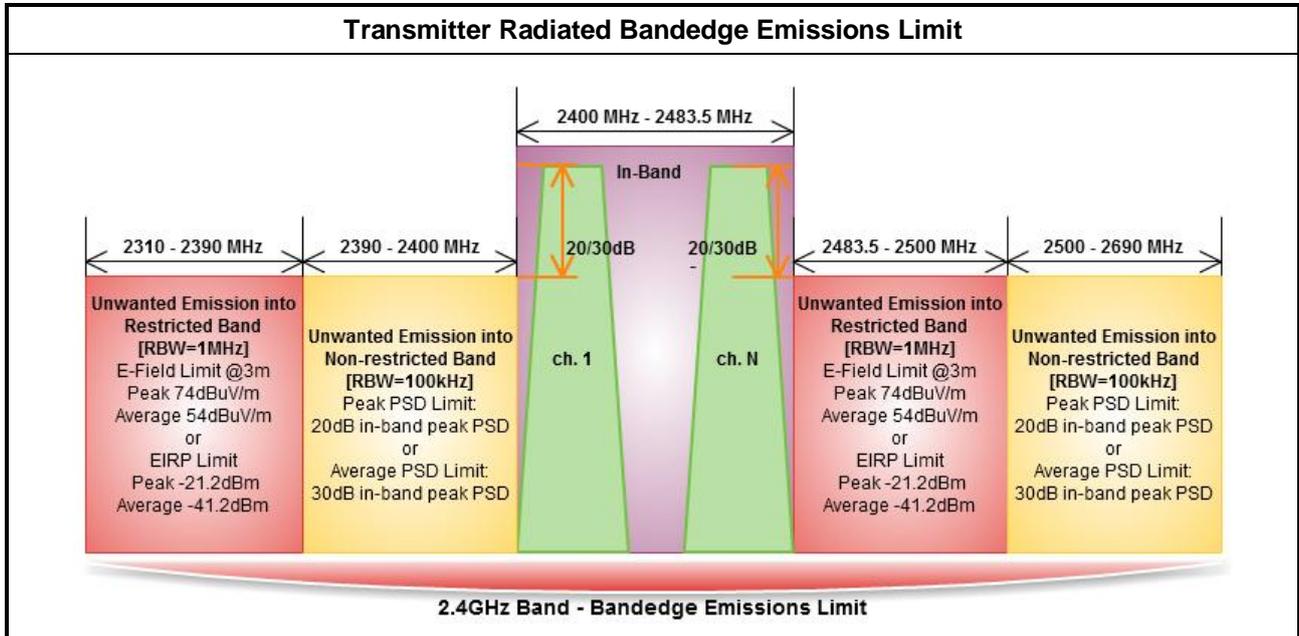
3.4.5 Test Result of Power Spectral Density

| Power Spectral Density Result (dBm/3kHz) | | | |
|---|-------------|-----------------|-----------|
| Modulation Mode | Freq. (MHz) | PSD | PSD Limit |
| LE-1Mbps | 2402 | -18.30 | 8 |
| LE-1Mbps | 2440 | -17.95 | 8 |
| LE-1Mbps | 2480 | -17.63 | 8 |
| Result | | Complied | |
| Note 1: PSD [dBm/3kHz] = PSD [dBm/100kHz] + BWFC [-15.2 dB] | | | |



3.5 Transmitter Radiated Bandedge Emissions

3.5.1 Transmitter Radiated Bandedge Emissions Limit



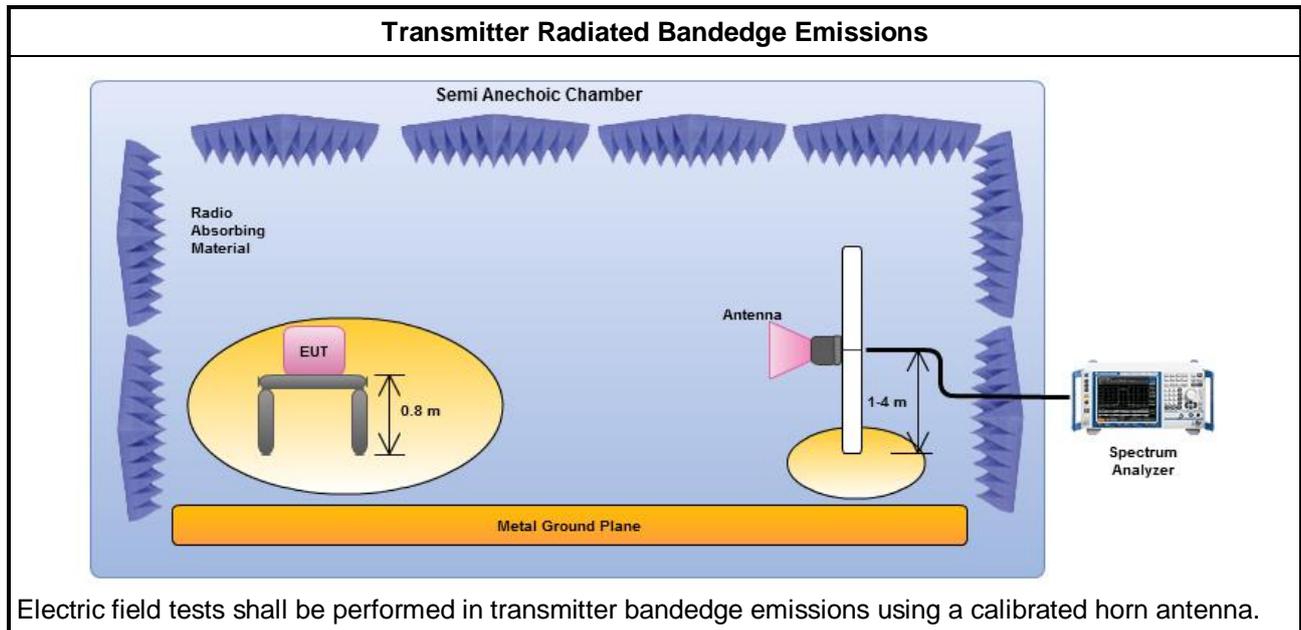
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

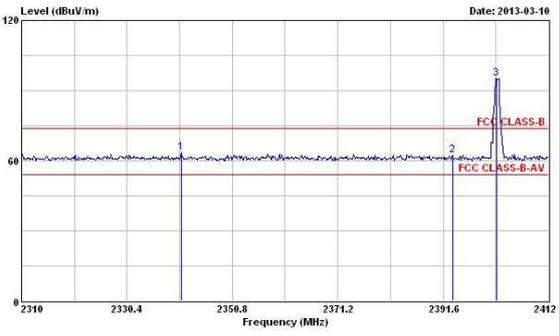
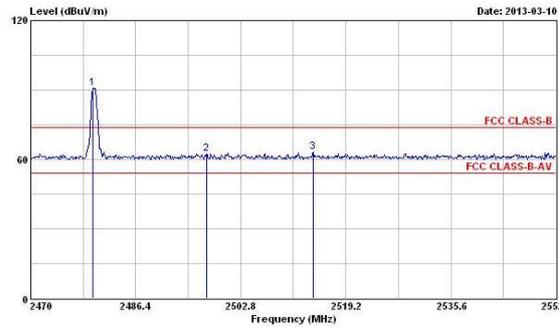
3.5.3 Test Procedures

| Test Method – General Information | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band. |
| <input checked="" type="checkbox"/> | For the transmitter unwanted emissions shall be measured using following options below: |
| <input checked="" type="checkbox"/> | For unwanted emissions into non-restricted bands. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level. |
| <input checked="" type="checkbox"/> | For unwanted emissions into restricted bands. |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). $VBW \geq 1/T$, where T is pulse time. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit. |
| <input checked="" type="checkbox"/> | For the transmitter bandedge emissions shall be measured using following options below: |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.9.2 for band-edge testing. |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 7.7.9 for band-edge testing into non-restricted bands. |
| <input checked="" type="checkbox"/> | For radiated measurement, refer as FCC KDB 558074, clause 10.2.1. |
| <input checked="" type="checkbox"/> | For conducted measurement, refer as FCC KDB 558074, clause 10.2.2. |

3.5.4 Test Setup



3.5.5 Test Result of Transmitter Radiated Bandedge Emissions

| Transmitter Radiated Bandedge Emissions Result | | | | | | | | |
|---|----------------------|-------------------------------|-------------------------------|---|----------------|------------|------------|-------------|
| Modulation | LE-1Mbps | | Non-restricted Band Emissions | | | | | |
| Non-restricted Band (MHz) | Test Ch. Freq. (MHz) | In-band PSD [i] (dBuV/100kHz) | NBE Freq. (MHz) | Out-band PSD [o] (dBuV/100kHz) | [i] – [o] (dB) | Limit (dB) | Level Type | Pol. note 1 |
| 2390-2400 | 2402 | 95.20 | 2393.44 | 62.50 | 32.79 | 20 | PK | H |
| 2500-2690 | 2480 | 90.66 | 2514.12 | 63.02 | 28.96 | 20 | PK | H |
| Low Bandedge | | | | Up Bandedge | | | | |
|  | | | |  | | | | |
| Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical) | | | | | | | | |

| Transmitter Radiated Bandedge Emissions Result | | | | | | | | |
|--|----------------------|-----------------------------|---------------------------|----------------------|-------------------------|----------------|------------|-------------|
| Modulation | LE-1Mbps | | Restricted Band Emissions | | | | | |
| Restricted Band (MHz) | Test Ch. Freq. (MHz) | In-band PSD [i] (dBuV/1MHz) | RBE Freq. (MHz) | Measure Distance (m) | Out-Band Level (dBuV/m) | Limit (dBuV/m) | Level Type | Pol. note 1 |
| 2310-2390 | 2402 | 95.71 | 2316.43 | 3 | 62.68 | 74 | PK | H |
| 2310-2390 | 2402 | 54.61 | 2328.16 | 3 | 13.86 | 54 | AV | H |
| 2483.5-2500 | 2480 | 91.82 | 2495.50 | 3 | 63.32 | 74 | PK | H |
| 2483.5-2500 | 2480 | 44.72 | 2483.50 | 3 | 13.67 | 54 | AV | H |
| Note 1: Measurement worst emissions of receive antenna polarization: H (Horizontal) or V (Vertical). Note 2: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz. | | | | | | | | |



3.6 Transmitter Radiated Unwanted Emissions

3.6.1 Transmitter Radiated Unwanted Emissions Limit

| Restricted Band Emissions Limit | | | |
|---------------------------------|-----------------------|-------------------------|----------------------|
| Frequency Range (MHz) | Field Strength (uV/m) | Field Strength (dBuV/m) | Measure Distance (m) |
| 0.009~0.490 | 2400/F(kHz) | 48.5 - 13.8 | 300 |
| 0.490~1.705 | 24000/F(kHz) | 33.8 - 23 | 30 |
| 1.705~30.0 | 30 | 29 | 30 |
| 30~88 | 100 | 40 | 3 |
| 88~216 | 150 | 43.5 | 3 |
| 216~960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

| Un-restricted Band Emissions Limit | |
|------------------------------------|------------|
| RF output power procedure | Limit (dB) |
| Peak output power procedure | 20 |
| Average output power procedure | 30 |

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.

Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.6.2 Measuring Instruments

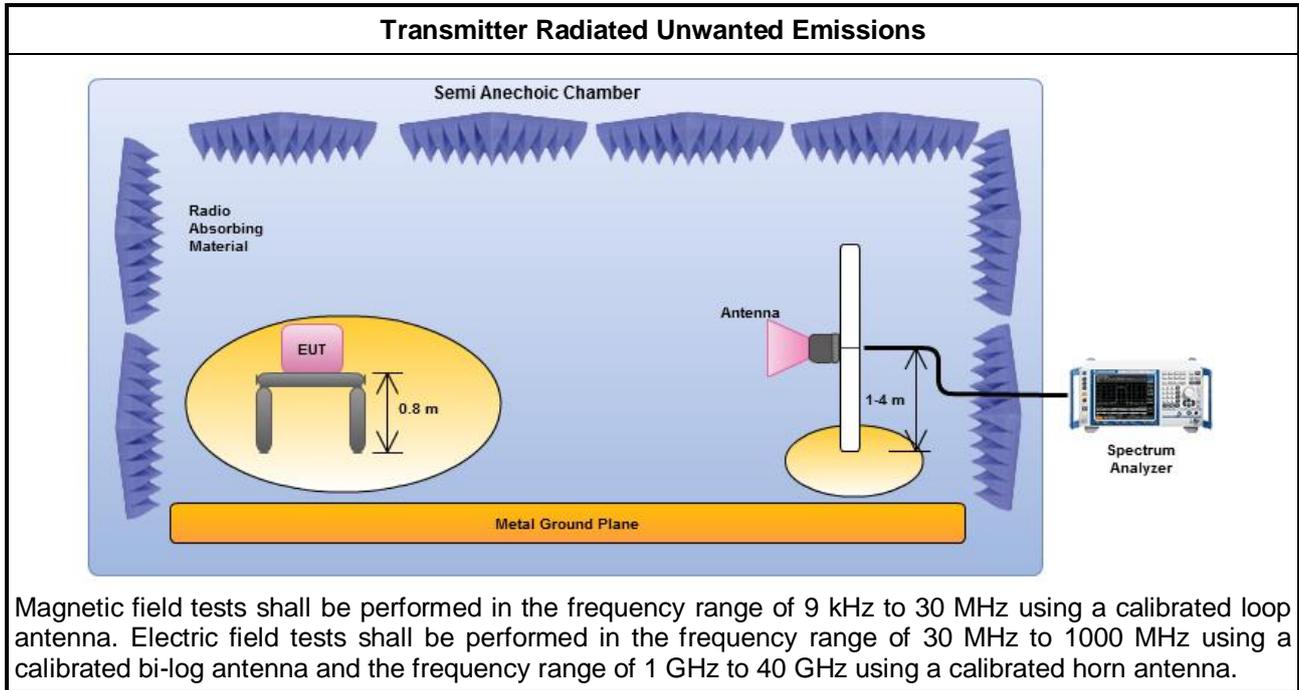
Refer a test equipment and calibration data table in this test report.



3.6.3 Test Procedures

| Test Method – General Information | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements). |
| <input checked="" type="checkbox"/> | Measurements in the frequency range 10 GHz - 18GHz are typically made at a closer distance 1m, because the instrumentation noise floor is typically close to the radiated emission limit. |
| <input checked="" type="checkbox"/> | Measurements in the frequency range above 18 GHz - 25GHz are typically made at a closer distance 0.5m, because the instrumentation noise floor is typically close to the radiated emission limit. |
| <input checked="" type="checkbox"/> | The average emission levels shall be measured in [duty cycle \geq 98 or duty factor]. |
| <input checked="" type="checkbox"/> | For the transmitter unwanted emissions shall be measured using following options below: |
| <input checked="" type="checkbox"/> | For unwanted emissions into non-restricted bands. Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level. |
| <input checked="" type="checkbox"/> | For unwanted emissions into restricted bands. |
| <input type="checkbox"/> | Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW). $VBW \geq 1/T$, where T is pulse time. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 4.2.3.2.2 measurement procedure peak limit. |
| <input checked="" type="checkbox"/> | For radiated measurement. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz. |
| <input checked="" type="checkbox"/> | Refer as ANSI C63.10, clause 6.6 for radiated emissions from above 1 GHz. |

3.6.4 Test Setup



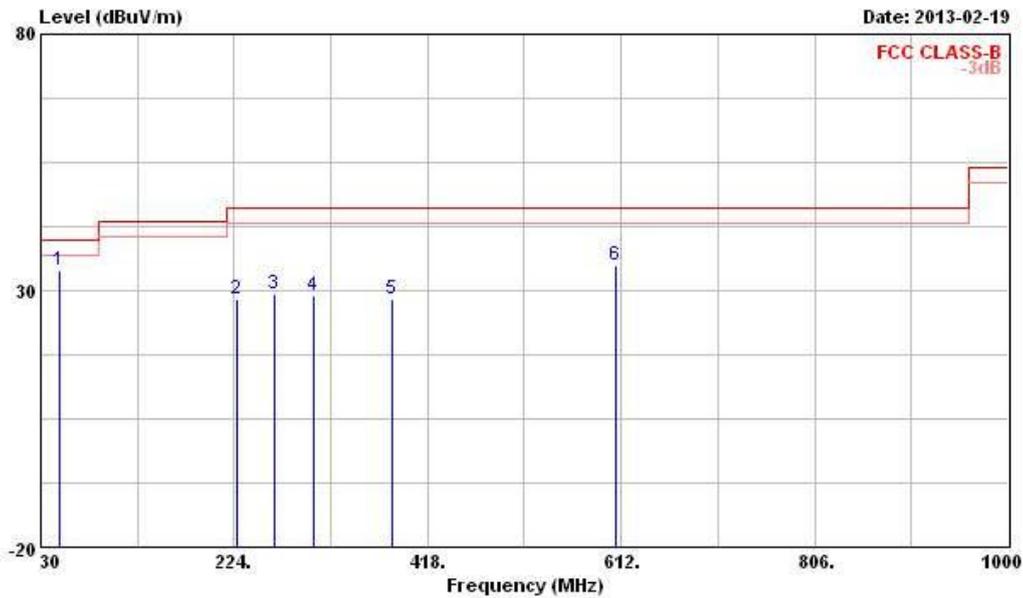
3.6.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

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



3.6.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

| Transmitter Radiated Unwanted Emissions (Below 1GHz) | | | |
|--|-----------------------|--------------|---|
| Operating Mode | 1 | Polarization | V |
| Operating Function | AC Power & Radio link | | |

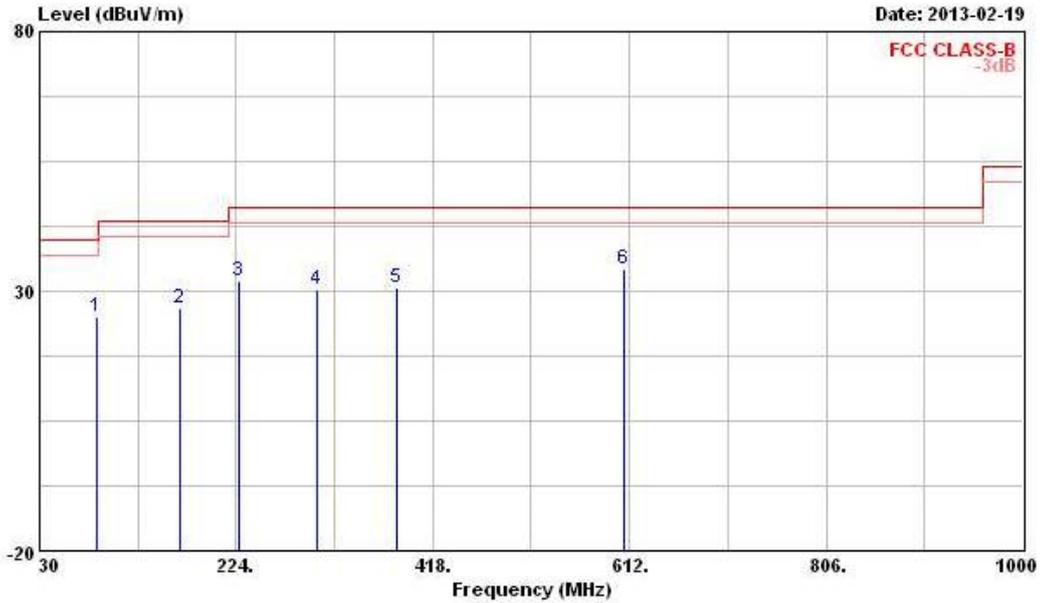


| Req | Freq | Level | Over Limit | Limit Line | ReadAntenna | Cable | Preamp | Remark | Ant Pos | Table Pos |
|-----|---------|--------|------------|------------|-------------|-------|--------|--------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg |
| 1 @ | 48.430 | 33.82 | -6.18 | 40.00 | 50.18 | 10.34 | 1.16 | 27.86 | Peak | --- |
| 2 | 226.910 | 28.34 | -17.66 | 46.00 | 40.90 | 12.24 | 2.62 | 27.42 | Peak | --- |
| 3 | 264.740 | 29.39 | -16.61 | 46.00 | 40.66 | 13.21 | 2.83 | 27.31 | Peak | --- |
| 4 | 303.540 | 29.06 | -16.94 | 46.00 | 39.55 | 13.76 | 2.98 | 27.23 | Peak | --- |
| 5 | 382.110 | 28.42 | -17.58 | 46.00 | 37.94 | 14.98 | 3.32 | 27.82 | Peak | --- |
| 6 | 606.180 | 34.80 | -11.20 | 46.00 | 38.99 | 20.10 | 4.26 | 28.55 | Peak | --- |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



| Transmitter Radiated Unwanted Emissions (Below 1GHz) | | | |
|--|-----------------------|--------------|---|
| Operating Mode | 1 | Polarization | H |
| Operating Function | AC Power & Radio link | | |



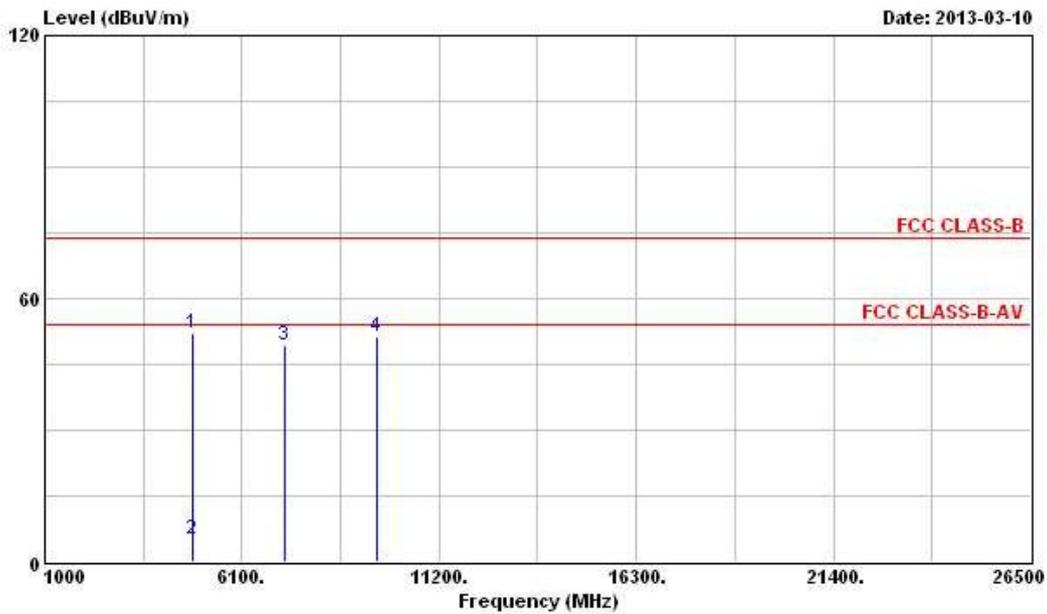
| | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|---------|--------|------------|------------|-------------------|----------------|------------|---------------|--------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 87.230 | 25.09 | -14.91 | 40.00 | 42.49 | 8.92 | 1.57 | 27.89 | Peak | --- | --- |
| 2 | 167.740 | 26.57 | -16.93 | 43.50 | 41.80 | 10.22 | 2.18 | 27.63 | Peak | --- | --- |
| 3 | 226.910 | 32.08 | -13.92 | 46.00 | 44.64 | 12.24 | 2.62 | 27.42 | Peak | --- | --- |
| 4 | 303.540 | 30.27 | -15.73 | 46.00 | 40.76 | 13.76 | 2.98 | 27.23 | Peak | --- | --- |
| 5 | 382.110 | 30.66 | -15.34 | 46.00 | 40.18 | 14.98 | 3.32 | 27.82 | Peak | --- | --- |
| 6 | 606.180 | 34.42 | -11.58 | 46.00 | 38.61 | 20.10 | 4.26 | 28.55 | Peak | --- | --- |

Note 1: ">20dB" means emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: "N/F" means Nothing Found emissions (No emissions were detected.)
 Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)



3.6.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

| Transmitter Radiated Unwanted Emissions (Above 1GHz) | | | |
|--|----------|-----------------|----|
| Modulation Mode | LE-1Mbps | Test Freq. (FX) | F1 |
| Operating Function | Transmit | Polarization | V |



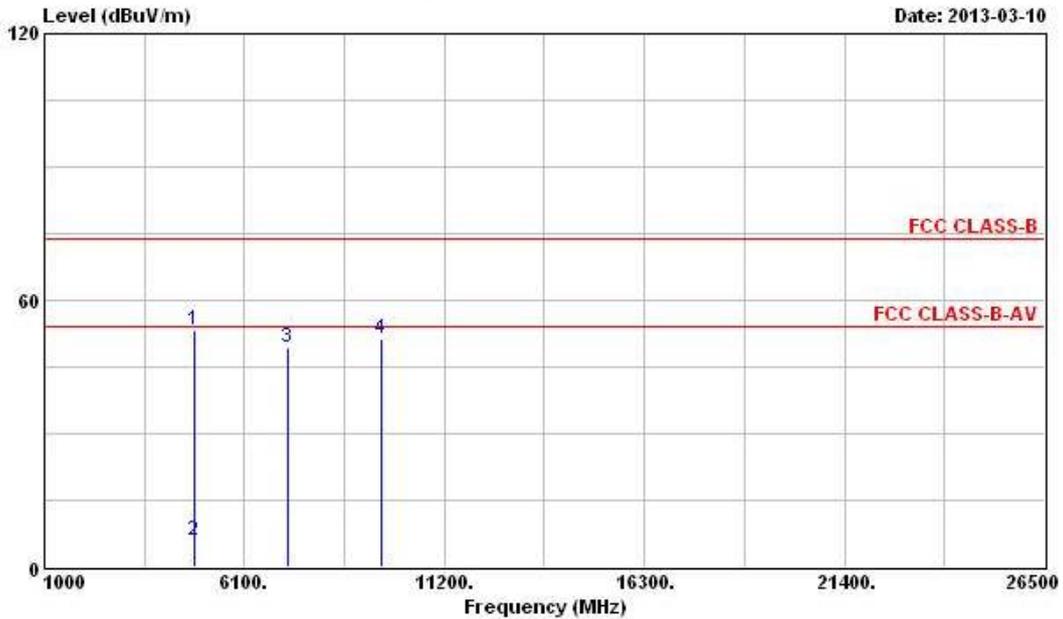
| | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|---|----------|--------|------------|------------|-------------------|----------------|------------|---------------|---------|---------|-----------|
| | MHz | dBUV/m | dB | dBUV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 4804.000 | 52.11 | -21.89 | 74.00 | 47.86 | 34.81 | 4.32 | 34.88 | Peak | --- | --- |
| 2 | 4804.000 | 5.01 | -48.99 | 54.00 | 0.76 | 34.81 | 4.32 | 34.88 | Average | --- | --- |
| 3 | 7206.000 | 49.29 | --- | --- | 42.83 | 35.90 | 5.70 | 35.14 | Peak | --- | --- |
| 4 | 9608.000 | 51.36 | --- | --- | 43.61 | 36.87 | 6.45 | 35.57 | Peak | --- | --- |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: For un-restricted bands, unwanted emissions (items 3, 4) shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
 Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|--------------------|----------|-----------------|----|
| Modulation Mode | LE-1Mbps | Test Freq. (FX) | F1 |
| Operating Function | Transmit | Polarization | H |



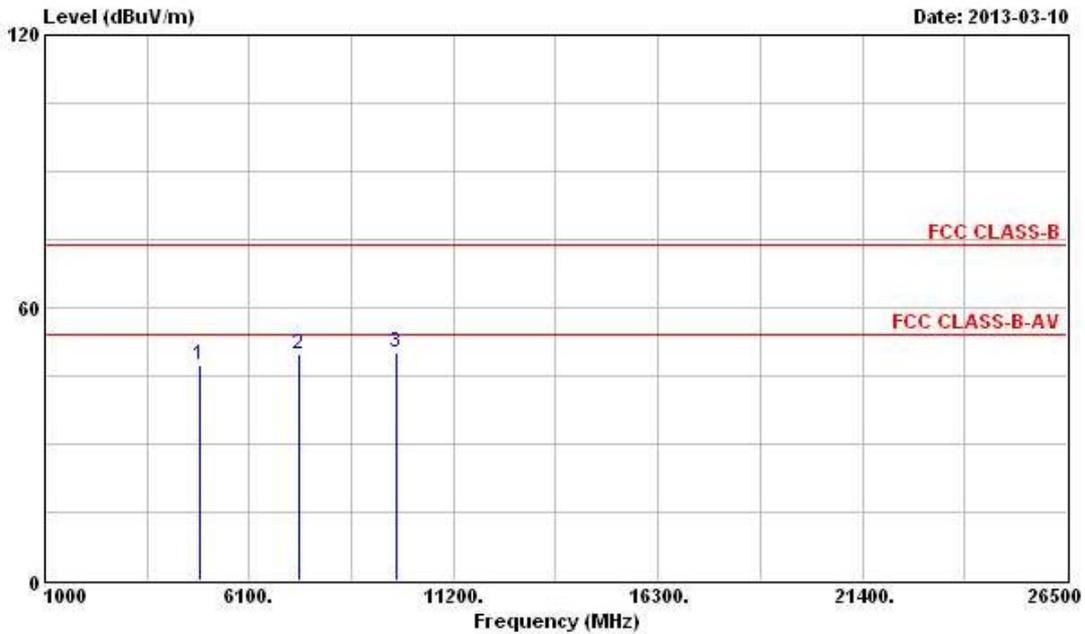
| | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp | Remark | Ant Pos | Table Pos |
|---|----------|--------|------------|------------|-------------------|----------------|------------|--------|---------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | 4804.000 | 53.21 | -20.79 | 74.00 | 48.96 | 34.81 | 4.32 | 34.88 | Peak | --- | --- |
| 2 | 4804.000 | 6.11 | -47.89 | 54.00 | 1.86 | 34.81 | 4.32 | 34.88 | Average | --- | --- |
| 3 | 7206.000 | 49.24 | | | 42.78 | 35.90 | 5.70 | 35.14 | Peak | --- | --- |
| 4 | 9608.000 | 51.49 | | | 43.74 | 36.87 | 6.45 | 35.57 | Peak | --- | --- |

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 4: For un-restricted bands, unwanted emissions (items 3, 4) shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
- Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW ≥ 1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|--------------------|----------|-----------------|----|
| Modulation Mode | LE-1Mbps | Test Freq. (FX) | F2 |
| Operating Function | Transmit | Polarization | V |

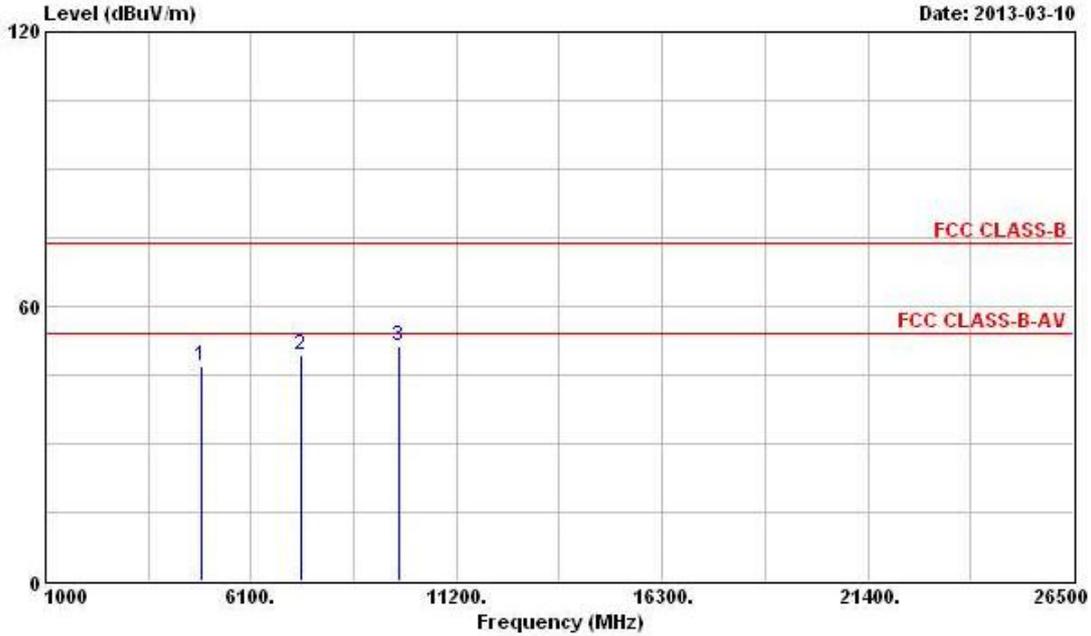


| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------------|--------|-------|---------|-------|--------|------|--------|--------|-----|-----|----|
| Over | Limit | Read | Antenna | Cable | Preamp | Ant | Table | | | | |
| Freq | Level | Limit | Line | Level | Factor | Loss | Factor | Remark | Pos | Pos | |
| MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg | |
| 1 @ 4880.000 | 47.41 | -6.59 | 54.00 | 43.19 | 34.77 | 4.31 | 34.86 | PK | --- | --- | |
| 2 @ 7320.000 | 49.77 | -4.23 | 54.00 | 43.33 | 35.90 | 5.71 | 35.17 | PK | --- | --- | |
| 3 @ 9760.000 | 50.32 | | | 42.49 | 37.11 | 6.30 | 35.58 | Peak | --- | --- | |

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 4: For un-restricted bands, unwanted emissions (item 3) shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
- Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



| Transmitter Radiated Unwanted Emissions (Above 1GHz) | | | |
|--|----------|-----------------|----|
| Modulation Mode | LE-1Mbps | Test Freq. (FX) | F2 |
| Operating Function | Transmit | Polarization | H |



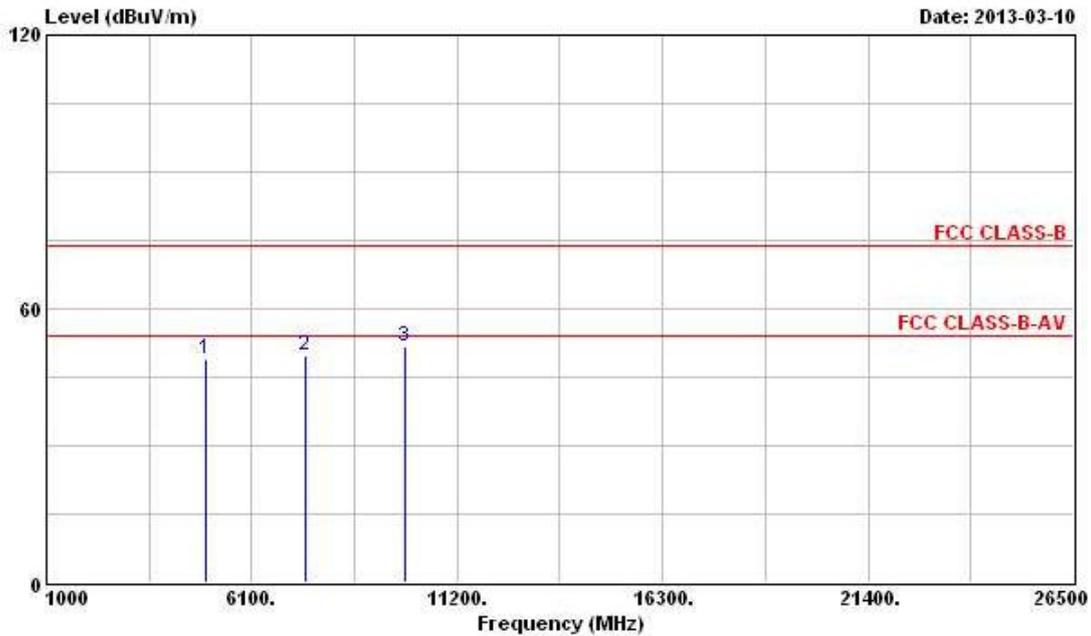
| Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|--------------|--------|------------|------------|-------------------|----------------|------------|---------------|--------|---------|-----------|
| MHz | dBUV/m | dB | dBUV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 @ 4880.000 | 47.17 | -6.83 | 54.00 | 42.95 | 34.77 | 4.31 | 34.86 | PK | --- | --- |
| 2 @ 7320.000 | 49.26 | -4.74 | 54.00 | 42.82 | 35.90 | 5.71 | 35.17 | PK | --- | --- |
| 3 @ 9760.000 | 51.15 | | | 43.32 | 37.11 | 6.30 | 35.58 | Peak | --- | --- |

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
 Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
 Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
 Note 4: For un-restricted bands, unwanted emissions (item 3) shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
 Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|--------------------|----------|-----------------|----|
| Modulation Mode | LE-1Mbps | Test Freq. (FX) | F3 |
| Operating Function | Transmit | Polarization | V |



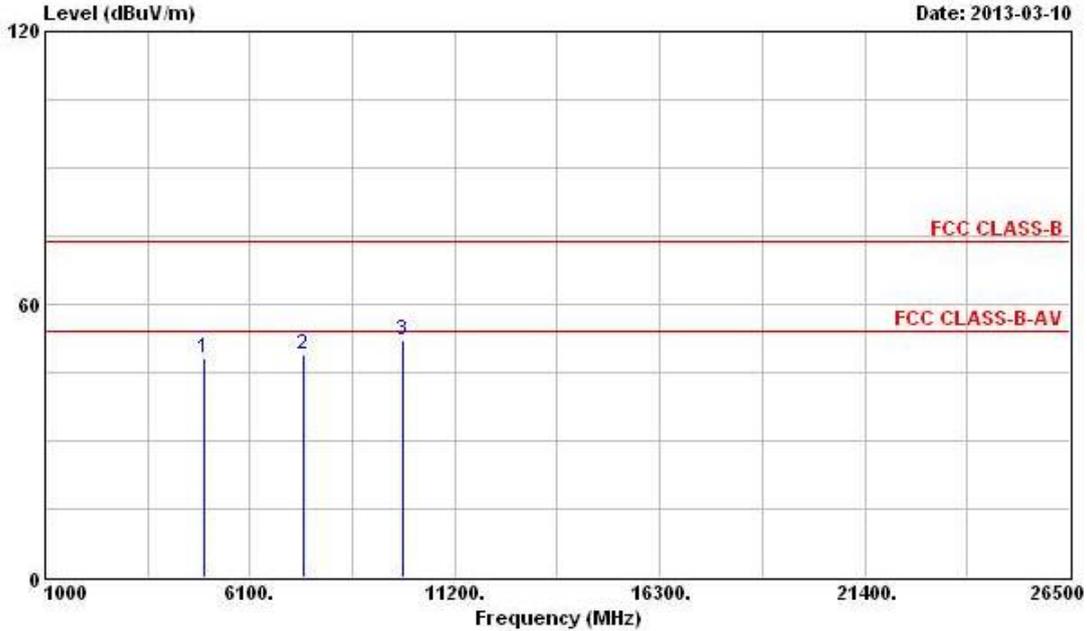
| Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|--------------|--------|------------|------------|-------------------|----------------|------------|---------------|--------|---------|-----------|
| MHz | dBUV/m | dB | dBUV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 @ 4960.000 | 48.94 | -5.06 | 54.00 | 44.79 | 34.72 | 4.27 | 34.84 | PK | --- | --- |
| 2 @ 7440.000 | 49.57 | -4.43 | 54.00 | 43.17 | 35.90 | 5.71 | 35.21 | PK | --- | --- |
| 3 @ 9920.000 | 51.56 | | | 43.62 | 37.39 | 6.14 | 35.59 | Peak | --- | --- |

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 4: For un-restricted bands, unwanted emissions (item 3) shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
- Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



Transmitter Radiated Unwanted Emissions (Above 1GHz)

| | | | |
|--------------------|----------|-----------------|----|
| Modulation Mode | LE-1Mbps | Test Freq. (FX) | F3 |
| Operating Function | Transmit | Polarization | H |



| Line | Freq | Level | Over Limit | Limit Line | ReadAntenna Level | Antenna Factor | Cable Loss | Preamp Factor | Remark | Ant Pos | Table Pos |
|------|------------|--------|------------|------------|-------------------|----------------|------------|---------------|--------|---------|-----------|
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | | cm | deg |
| 1 | @ 4960.000 | 48.19 | -5.81 | 54.00 | 44.04 | 34.72 | 4.27 | 34.84 | PK | --- | --- |
| 2 | @ 7440.000 | 49.08 | -4.92 | 54.00 | 42.68 | 35.90 | 5.71 | 35.21 | PK | --- | --- |
| 3 | @ 9920.000 | 51.91 | | | 43.97 | 37.39 | 6.14 | 35.59 | Peak | --- | --- |

- Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
- Note 2: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
- Note 3: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
- Note 4: For un-restricted bands, unwanted emissions (item 3) shall be attenuated by at least 20 dB relative to the maximum measured in-band level.
- Note 5: Average emission setting: RBW=1MHz; VBW ≥ 1/T, where T is "Pulse On Time", e.g., LE VBW≥1/625us, VBW=3kHz.



4 Test Equipment and Calibration Data

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|------------------------|--------------------------------|-----------|-----------------|-----------------|------------------|----------------------|
| EMC Receiver | R&S | ESCS 30 | 100174 | 9kHz ~ 2.75GHz | Mar. 26, 2013 | Conduction (CO04-HY) |
| LISN | SCHWARZBECK MESS-ELEKTRONIK | NSLK 8127 | 8127-477 | 9kHz ~ 30MHz | Jan. 21, 2013 | Conduction (CO04-HY) |
| LISN (Support Unit) | EMCO | 3810/2NM | 9703-1839 | 9kHz ~ 30MHz | Apr. 20, 2012 | Conduction (CO04-HY) |
| RF Cable-CON | HUBER+SUHNER | RG213/U | 7.61183201e+012 | 9kHz ~ 30MHz | Nov. 09, 2012 | Conduction (CO04-HY) |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|----------------------------|--------------|------------------|-------------|-----------------|------------------|---------------------|
| Spectrum Analyzer | R&S | FSP 30 | 100023/030 | 9KHz ~ 30GHz | Apr. 27, 2012 | Conducted (TH01-HY) |
| AC Power Source | G.W | APS-9102 | EL920581 | AC 0V ~ 300V | Jul. 02, 2012 | Conducted (TH01-HY) |
| Temp. and Humidity Chamber | Giant Force | GTH-225-20-SP-SD | MAA1112-007 | -20 ~ 100°C | Nov. 21, 2012 | Conducted (TH01-HY) |
| Signal Generator | R&S | SMR40 | 100116 | 10MHz ~ 40GHz | Jun. 26, 2012 | Conducted (TH01-HY) |
| Power Sensor | Anritsu | MA2411B | 0917017 | 300MHz ~ 40GHz | Feb. 02, 2013 | Conducted (TH01-HY) |
| Power Meter | Anritsu | ML2495A | 0949003 | 300MHz ~ 40GHz | Feb. 02, 2013 | Conducted (TH01-HY) |
| RF Cable-2m | HUBER+SUHNER | SUCOFLEX_104 | SN 345675/4 | 1GHz ~ 26.5GHz | NA | Conducted (TH01-HY) |
| RF Cable-3m | HUBER+SUHNER | SUCOFLEX_104 | SN 345669/4 | 1GHz ~ 26.5GHz | NA | Conducted (TH01-HY) |

Note: Calibration Interval of instruments listed above is one year.



| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|--------------------------|----------------|-------------|-------------|--------------------|------------------|-----------------------|
| Spectrum Analyzer | R&S | FSP40 | 100593 | 9kHz ~ 40GHz | Sep. 14, 2012 | Radiation (03CH02-HY) |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH02-HY | 30MHz ~ 1GHz 3m | May 10, 2012 | Radiation (03CH02-HY) |
| Amplifier | Agilent | 8447D | 2944A11146 | 100kHz ~ 1.3GHz | Jul. 23, 2012 | Radiation (03CH02-HY) |
| Amplifier | Agilent | 8449B | 3008A02373 | 1GHz ~ 26.5GHz | Aug. 10, 2012 | Radiation (03CH02-HY) |
| Horn Antenna | ETS-LINDGREN | 3117 | 00091920 | 1GHz ~ 18GHz | Nov. 16, 2012 | Radiation (03CH02-HY) |
| Horn Antenna | SCHWARZBECK | BBHA9170 | BBHA9170154 | 15GHz ~ 40GHz | Jan. 08, 2013 | Radiation (03CH02-HY) |
| RF Cable-R03m | Jye Bao | RG142 | CB021 | 9kHz ~ 1GHz | Nov. 10, 2012 | Radiation (03CH02-HY) |
| RF Cable-high | SUHNER | SUCOFLEX106 | 03CH02-HY | 1GHz ~ 40GHz | Mar. 06, 2012 | Radiation (03CH02-HY) |
| RF Cable-high | SUHNER | SUCOFLEX106 | 03CH02-HY | 1GHz ~ 40GHz | Mar. 05, 2013 | Radiation (03CH02-HY) |
| Bilog Antenna | SCHAFFNER | CBL61128 | 2723 | 30MHz ~ 2GHz | Oct. 22, 2012 | Radiation (03CH02-HY) |
| Turn Table | HD | DS 420 | 420/649/00 | 0~ 360 degree | N/A | Radiation (03CH02-HY) |
| Antenna Mast | HD | MA 240 | 240/559/00 | 1 ~ 4 m | N/A | Radiation (03CH02-HY) |

Note: Calibration Interval of instruments listed above is one year.

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Remark |
|--------------|--------------|-----------|-------------|-----------------|------------------|-----------------------|
| Loop Antenna | R&S | HFH2-Z2 | 860004/0001 | 9 kHz - 30 MHz | Jul. 03, 2012 | Radiation (03CH02-HY) |

Note: Calibration Interval of instruments listed above is two year