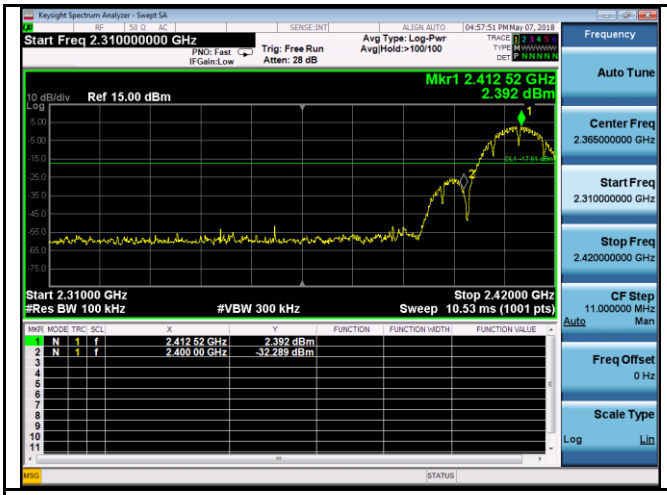
## Test Plots

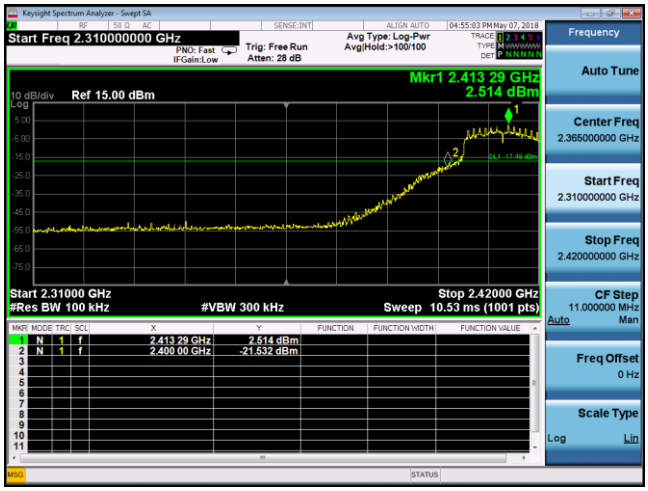
### Band Edge measurement result

### TX 0:



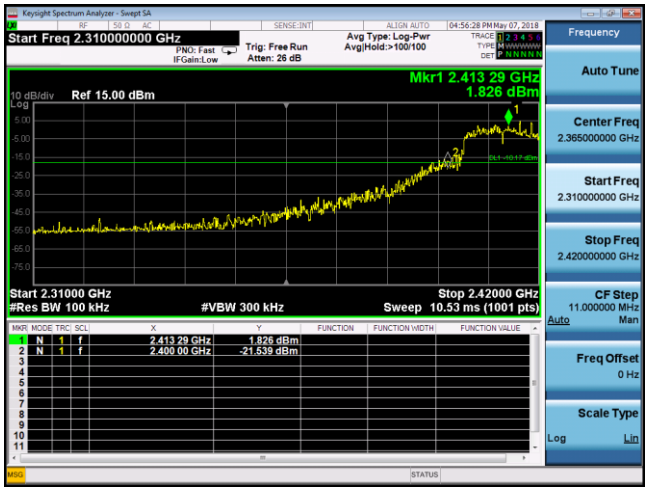

Band Edge, Left Side - 802.11b


Band Edge, Right Side - 802.11b




Band Edge, Left Side - 802.11g


Band Edge, Right Side - 802.11g




Band Edge, Left Side - 802.11n20

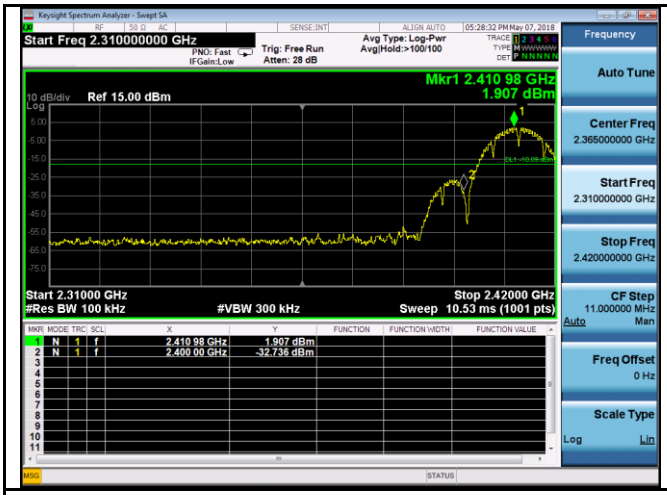

Band Edge, Right Side - 802.11n20


Band Edge, Left Side - 802.11n40


Band Edge, Right Side - 802.11n40

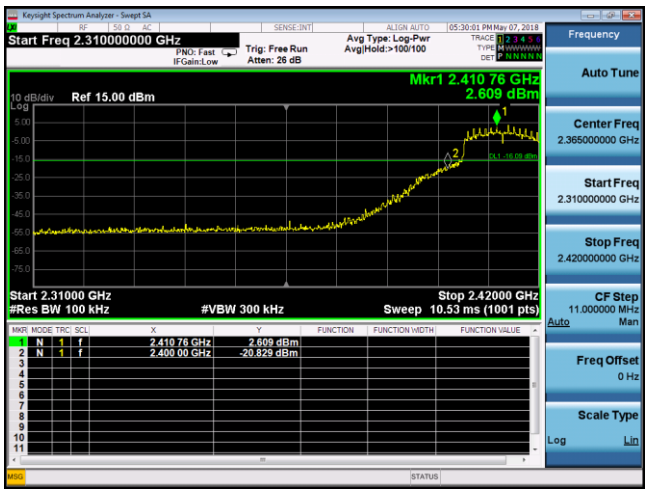
Note: Both Horizontal and vertical polarities were investigated

## TX 1:



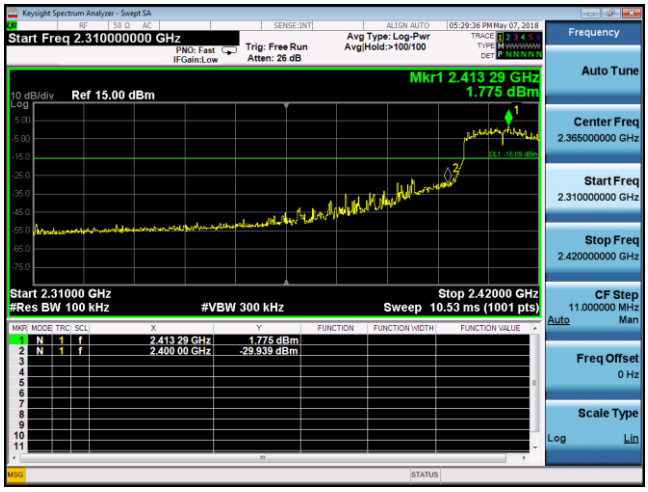

Band Edge, Left Side - 802.11b


Band Edge, Right Side - 802.11b




Band Edge, Left Side - 802.11g


Band Edge, Right Side - 802.11g




Band Edge, Left Side - 802.11n20


Band Edge, Right Side - 802.11n20


Band Edge, Left Side - 802.11n40

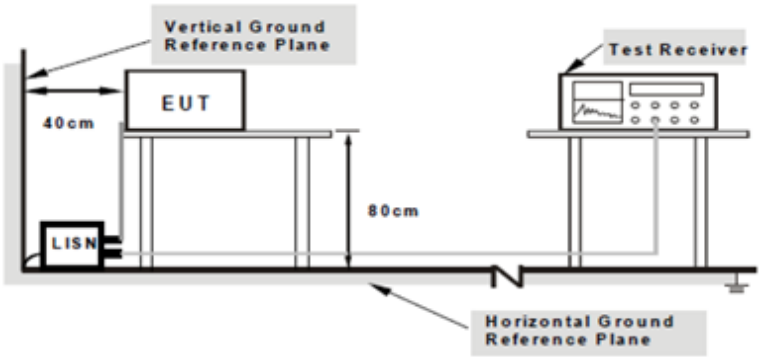

Band Edge, Right Side - 802.11n40

Note: Both Horizontal and vertical polarities were investigated

## 6.6 AC Power Line Conducted Emissions

| | |
|---|---|
| Temperature | 25℃ |
| Relative Humidity | 57% |
| Atmospheric Pressure | 1014mbar |
| Test date : | May 07, 2018 |
| Tested By : | Aaron Liang |

**Requirement(s):**

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.207, RSS210 (A8.1)</td><td>a)</td><td>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.
<table>
<tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>QP</th><th>Average</th></tr>
<tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr>
<tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr>
<tr><td>5 ~ 30</td><td>60</td><td>50</td></tr>
</table></td><td>☑</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 

Note: 1.Support units were connected to second LISN.<br>2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.<br>2. The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.<br>3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss</td></tr>
</table>

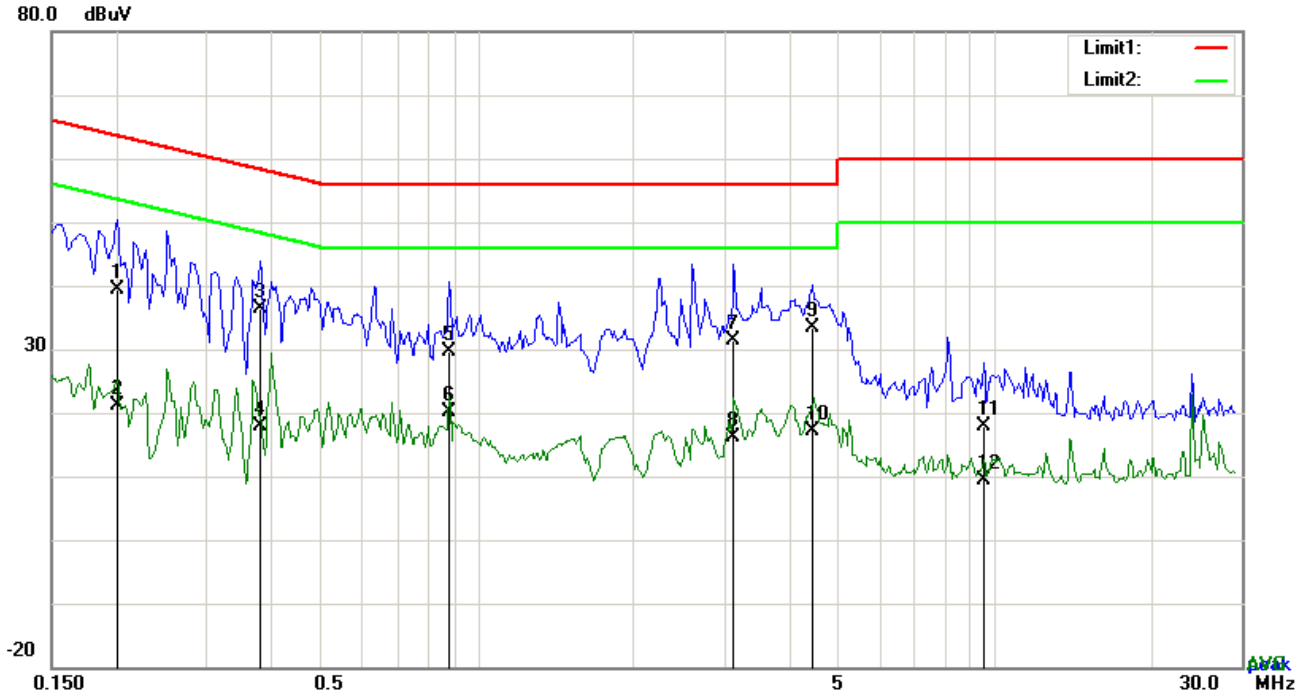
| | |
| --- | --- |
| | coaxial cable.<br>4. All other supporting equipment were powered separately from another main supply.<br>5. The EUT was switched on and allowed to warm up to its normal operating condition.<br>6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.<br>7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.<br>8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power). |
| Remark | Transformer model: EPC13 test data |
| Result | ☑ Pass ☐ Fail |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☑ Yes (See below) ☐ N/A

TX 0:

| Test Mode: | Transmitting Mode |
|---|---|

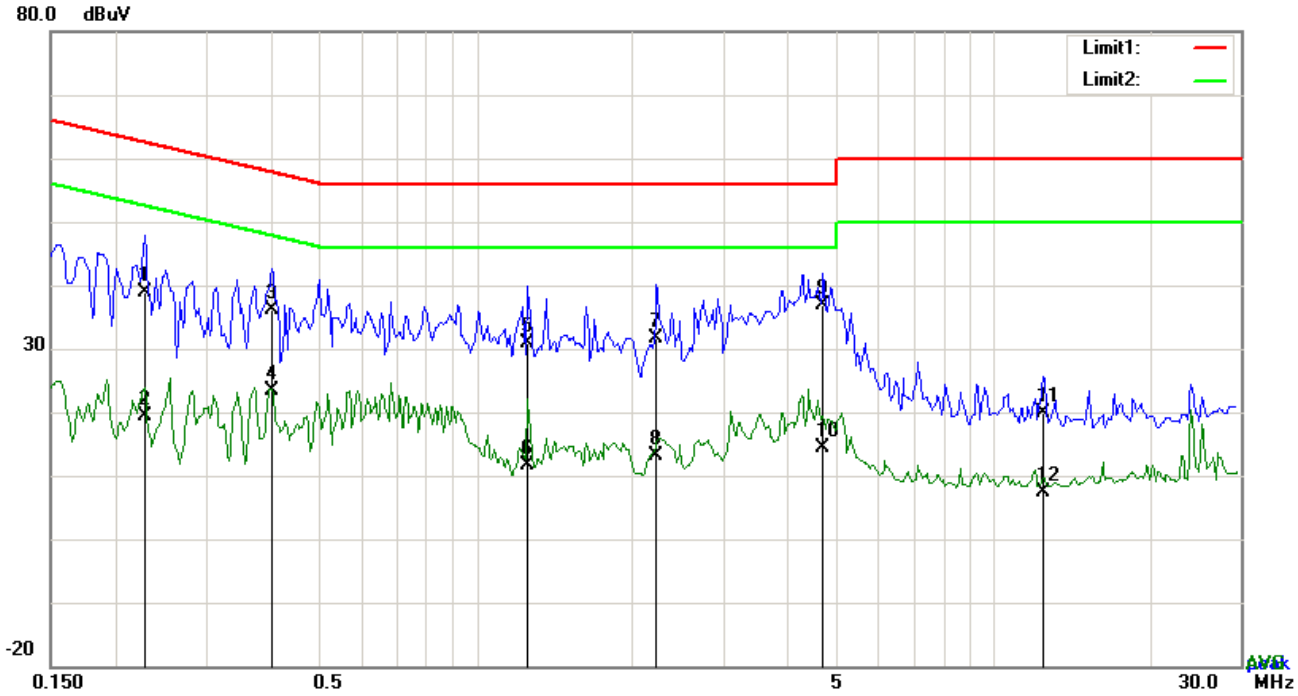



*Test Data*

Phase Line Plot at 120Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | L1 | 0.2007 | 29.38 | QP | 10.03 | 39.41 | 63.58 | -24.17 |
| 2 | L1 | 0.2007 | 11.19 | AVG | 10.03 | 21.22 | 53.58 | -32.36 |
| 3 | L1 | 0.3801 | 26.26 | QP | 10.03 | 36.29 | 58.28 | -21.99 |
| 4 | L1 | 0.3801 | 7.73 | AVG | 10.03 | 17.76 | 48.28 | -30.52 |
| 5 | L1 | 0.8832 | 19.60 | QP | 10.03 | 29.63 | 56.00 | -26.37 |
| 6 | L1 | 0.8832 | 10.15 | AVG | 10.03 | 20.18 | 46.00 | -25.82 |
| 7 | L1 | 3.1287 | 21.28 | QP | 10.06 | 31.34 | 56.00 | -24.66 |
| 8 | L1 | 3.1287 | 6.16 | AVG | 10.06 | 16.22 | 46.00 | -29.78 |
| 9 | L1 | 4.4469 | 23.33 | QP | 10.07 | 33.40 | 56.00 | -22.60 |
| 10 | L1 | 4.4469 | 7.03 | AVG | 10.07 | 17.10 | 46.00 | -28.90 |
| 11 | L1 | 9.5091 | 7.83 | QP | 10.14 | 17.97 | 60.00 | -42.03 |
| 12 | L1 | 9.5091 | -0.81 | AVG | 10.14 | 9.33 | 50.00 | -40.67 |

| Test Mode: | Transmitting Mode |
| --- | --- |

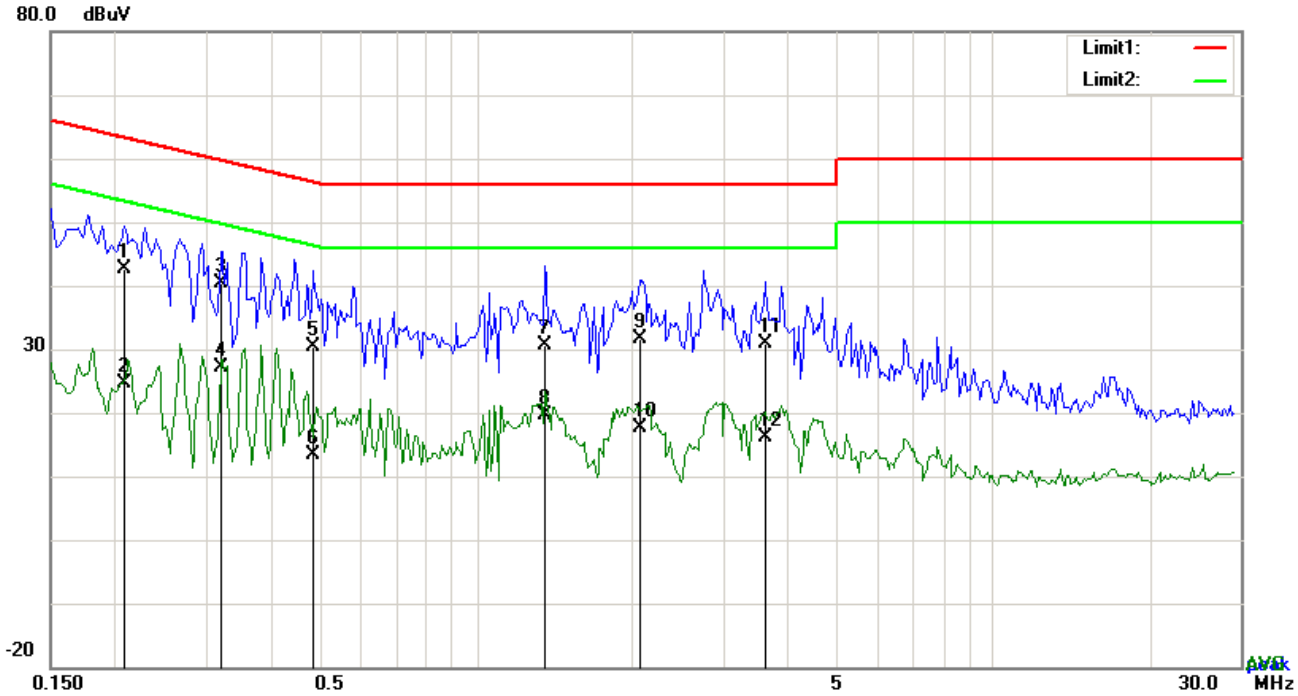



*Test Data*

Phase Neutral Plot at 120Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | N | 0.2280 | 28.93 | QP | 10.02 | 38.95 | 62.52 | -23.57 |
| 2 | N | 0.2280 | 9.39 | AVG | 10.02 | 19.41 | 52.52 | -33.11 |
| 3 | N | 0.4035 | 26.11 | QP | 10.02 | 36.13 | 57.78 | -21.65 |
| 4 | N | 0.4035 | 13.26 | AVG | 10.02 | 23.28 | 47.78 | -24.50 |
| 5 | N | 1.2537 | 20.95 | QP | 10.03 | 30.98 | 56.00 | -25.02 |
| 6 | N | 1.2537 | 1.66 | AVG | 10.03 | 11.69 | 46.00 | -34.31 |
| 7 | N | 2.2326 | 21.62 | QP | 10.04 | 31.66 | 56.00 | -24.34 |
| 8 | N | 2.2326 | 3.14 | AVG | 10.04 | 13.18 | 46.00 | -32.82 |
| 9 | N | 4.6770 | 26.69 | QP | 10.07 | 36.76 | 56.00 | -19.24 |
| 10 | N | 4.6770 | 4.22 | AVG | 10.07 | 14.29 | 46.00 | -31.71 |
| 11 | N | 12.5121 | 9.76 | QP | 10.17 | 19.93 | 60.00 | -40.07 |
| 12 | N | 12.5121 | -2.76 | AVG | 10.17 | 7.41 | 50.00 | -42.59 |

| Test Mode: | Transmitting Mode |
| --- | --- |

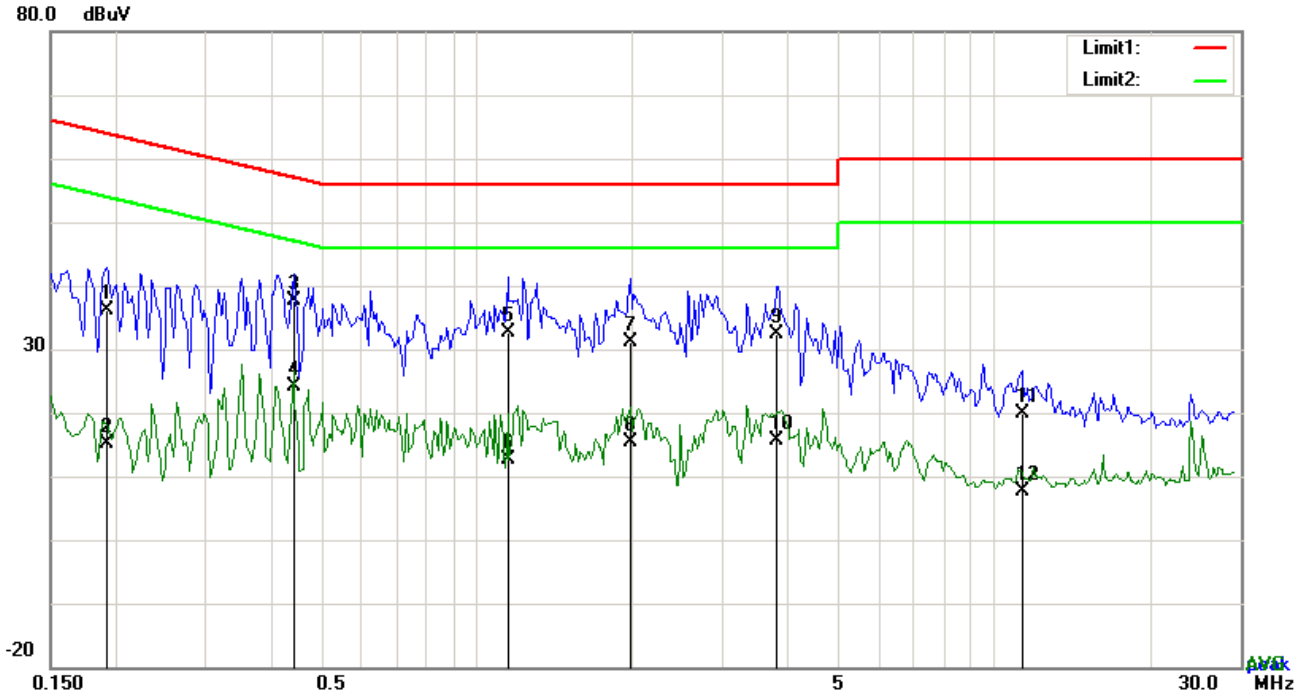



*Test Data*

Phase Line Plot at 240Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | L1 | 0.2085 | 32.48 | QP | 10.03 | 42.51 | 63.26 | -20.75 |
| 2 | L1 | 0.2085 | 14.58 | AVG | 10.03 | 24.61 | 53.26 | -28.65 |
| 3 | L1 | 0.3216 | 30.37 | QP | 10.03 | 40.40 | 59.67 | -19.27 |
| 4 | L1 | 0.3216 | 17.02 | AVG | 10.03 | 27.05 | 49.67 | -22.62 |
| 5 | L1 | 0.4815 | 20.30 | QP | 10.03 | 30.33 | 56.31 | -25.98 |
| 6 | L1 | 0.4815 | 3.24 | AVG | 10.03 | 13.27 | 46.31 | -33.04 |
| 7 | L1 | 1.3551 | 20.59 | QP | 10.03 | 30.62 | 56.00 | -25.38 |
| 8 | L1 | 1.3551 | 9.59 | AVG | 10.03 | 19.62 | 46.00 | -26.38 |
| 9 | L1 | 2.0727 | 21.48 | QP | 10.04 | 31.52 | 56.00 | -24.48 |
| 10 | L1 | 2.0727 | 7.62 | AVG | 10.04 | 17.66 | 46.00 | -28.34 |
| 11 | L1 | 3.6045 | 20.71 | QP | 10.06 | 30.77 | 56.00 | -25.23 |
| 12 | L1 | 3.6045 | 6.07 | AVG | 10.06 | 16.13 | 46.00 | -29.87 |

| Test Mode: | Transmitting Mode |
| --- | --- |



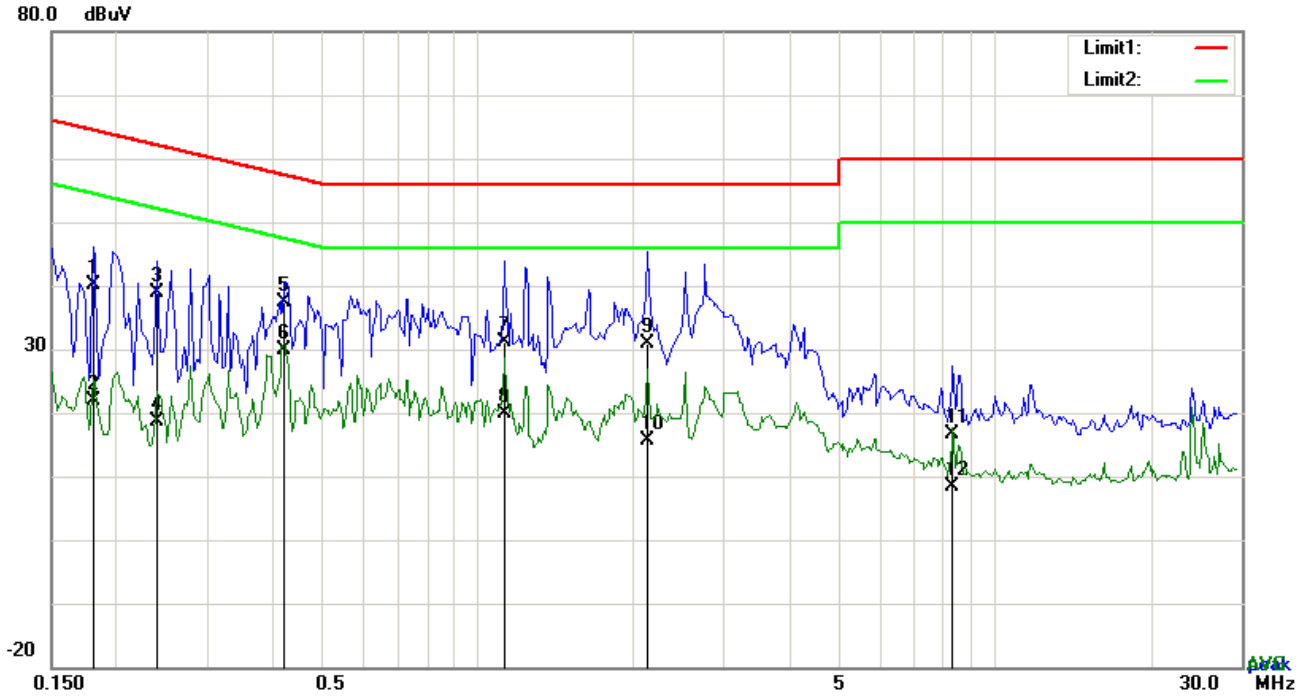

*Test Data*

Phase Neutral Plot at 240Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | N | 0.1929 | 26.10 | QP | 10.02 | 36.12 | 63.91 | -27.79 |
| 2 | N | 0.1929 | 5.09 | AVG | 10.02 | 15.11 | 53.91 | -38.80 |
| 3 | N | 0.4425 | 27.50 | QP | 10.02 | 37.52 | 57.01 | -19.49 |
| 4 | N | 0.4425 | 14.12 | AVG | 10.02 | 24.14 | 47.01 | -22.87 |
| 5 | N | 1.1523 | 22.59 | QP | 10.03 | 32.62 | 56.00 | -23.38 |
| 6 | N | 1.1523 | 2.60 | AVG | 10.03 | 12.63 | 46.00 | -33.37 |
| 7 | N | 1.9830 | 21.04 | QP | 10.04 | 31.08 | 56.00 | -24.92 |
| 8 | N | 1.9830 | 5.31 | AVG | 10.04 | 15.35 | 46.00 | -30.65 |
| 9 | N | 3.8190 | 22.24 | QP | 10.06 | 32.30 | 56.00 | -23.70 |
| 10 | N | 3.8190 | 5.55 | AVG | 10.06 | 15.61 | 46.00 | -30.39 |
| 11 | N | 11.3460 | 9.72 | QP | 10.16 | 19.88 | 60.00 | -40.12 |
| 12 | N | 11.3460 | -2.49 | AVG | 10.16 | 7.67 | 50.00 | -42.33 |

TX 1:

| Test Mode: | Transmitting Mode |
|---|---|

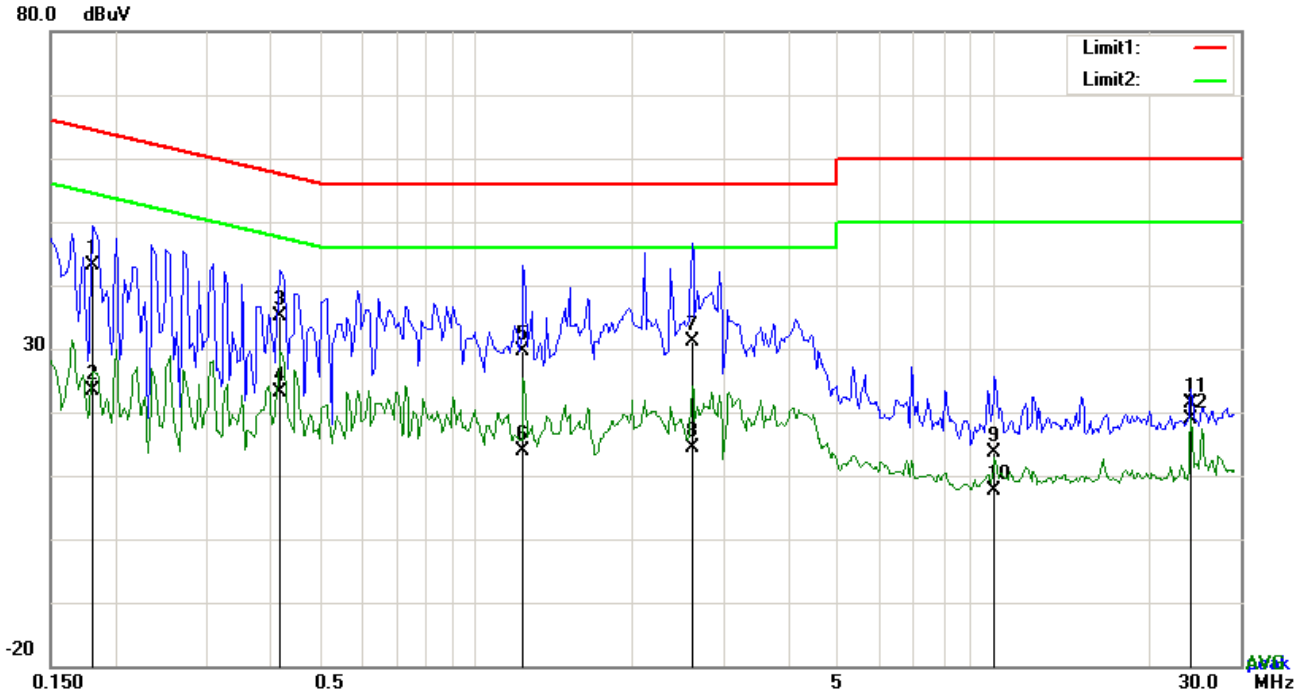



*Test Data*

Phase Line Plot at 120Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | L1 | 0.1812 | 30.15 | QP | 10.03 | 40.18 | 64.43 | -24.25 |
| 2 | L1 | 0.1812 | 11.95 | AVG | 10.03 | 21.98 | 54.43 | -32.45 |
| 3 | L1 | 0.2397 | 28.93 | QP | 10.03 | 38.96 | 62.11 | -23.15 |
| 4 | L1 | 0.2397 | 8.51 | AVG | 10.03 | 18.54 | 52.11 | -33.57 |
| 5 | L1 | 0.4230 | 27.29 | QP | 10.03 | 37.32 | 57.39 | -20.07 |
| 6 | L1 | 0.4230 | 19.88 | AVG | 10.03 | 29.91 | 47.39 | -17.48 |
| 7 | L1 | 1.1250 | 21.03 | QP | 10.03 | 31.06 | 56.00 | -24.94 |
| 8 | L1 | 1.1250 | 9.93 | AVG | 10.03 | 19.96 | 46.00 | -26.04 |
| 9 | L1 | 2.1312 | 20.93 | QP | 10.04 | 30.97 | 56.00 | -25.03 |
| 10 | L1 | 2.1312 | 5.58 | AVG | 10.04 | 15.62 | 46.00 | -30.38 |
| 11 | L1 | 8.2962 | 6.61 | QP | 10.13 | 16.74 | 60.00 | -43.26 |
| 12 | L1 | 8.2962 | -1.80 | AVG | 10.13 | 8.33 | 50.00 | -41.67 |

| Test Mode: | Transmitting Mode |
|---|---|

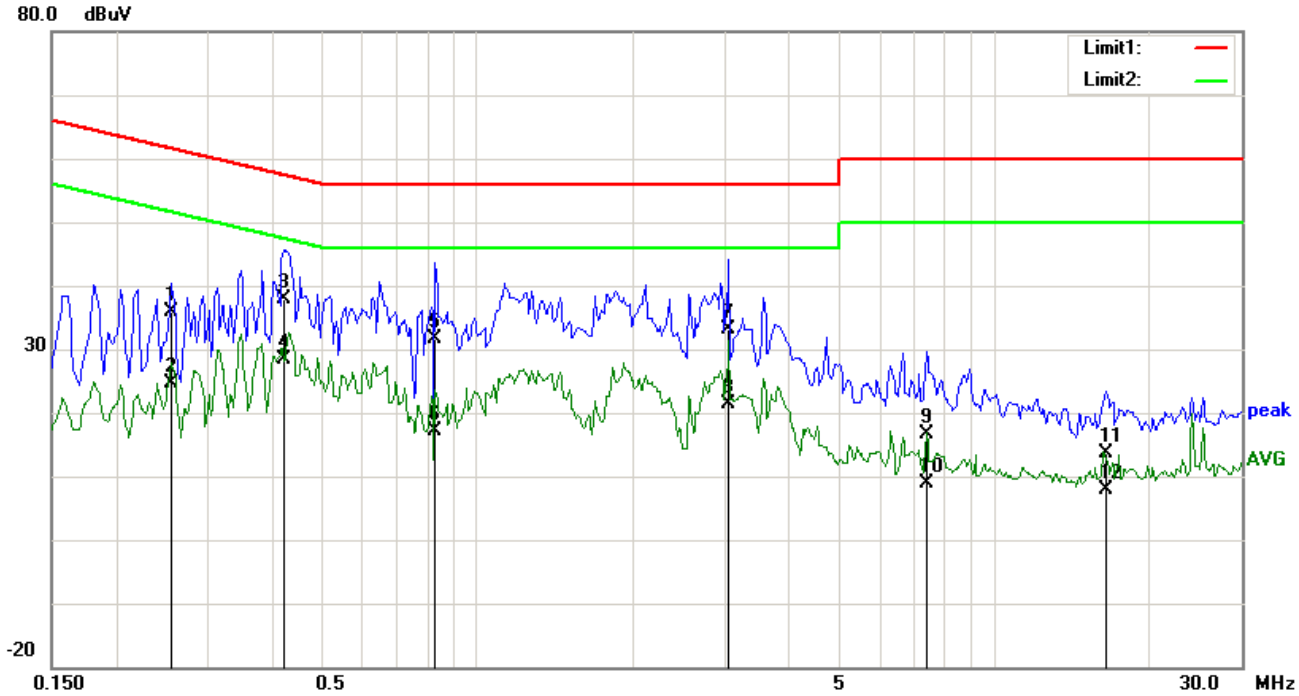



*Test Data*

Phase Neutral Plot at 120Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | N | 0.1812 | 33.15 | QP | 10.02 | 43.17 | 64.43 | -21.26 |
| 2 | N | 0.1812 | 13.43 | AVG | 10.02 | 23.45 | 54.43 | -30.98 |
| 3 | N | 0.4152 | 24.99 | QP | 10.02 | 35.01 | 57.54 | -22.53 |
| 4 | N | 0.4152 | 13.23 | AVG | 10.02 | 23.25 | 47.54 | -24.29 |
| 5 | N | 1.2342 | 19.48 | QP | 10.03 | 29.51 | 56.00 | -26.49 |
| 6 | N | 1.2342 | 3.86 | AVG | 10.03 | 13.89 | 46.00 | -32.11 |
| 7 | N | 2.6187 | 21.05 | QP | 10.05 | 31.10 | 56.00 | -24.90 |
| 8 | N | 2.6187 | 4.26 | AVG | 10.05 | 14.31 | 46.00 | -31.69 |
| 9 | N | 10.0590 | 3.41 | QP | 10.14 | 13.55 | 60.00 | -46.45 |
| 10 | N | 10.0590 | -2.52 | AVG | 10.14 | 7.62 | 50.00 | -42.38 |
| 11 | N | 24.0249 | 11.00 | QP | 10.32 | 21.32 | 60.00 | -38.68 |
| 12 | N | 24.0249 | 8.58 | AVG | 10.32 | 18.90 | 50.00 | -31.10 |

| Test Mode: | Transmitting Mode |
|---|---|

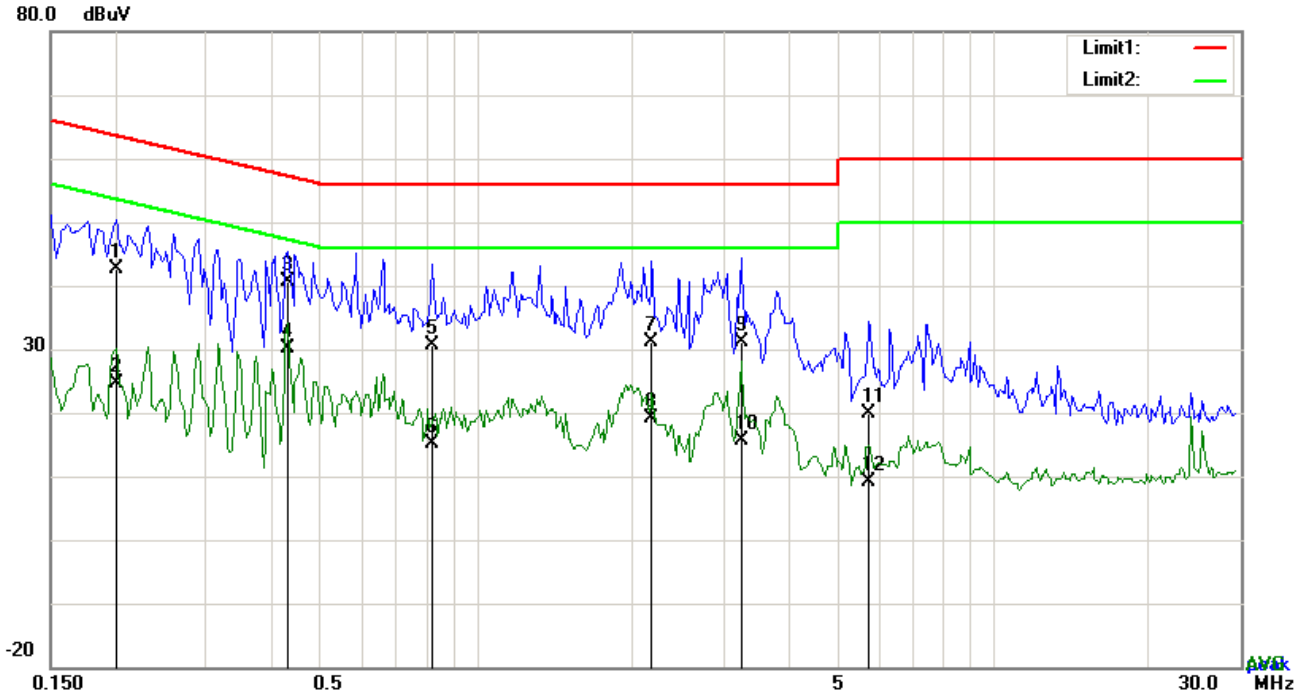



*Test Data*

Phase Line Plot at 240Vac, 60Hz

| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|
| 1 | L1 | 0.2553 | 25.88 | QP | 10.03 | 35.91 | 61.58 | -25.67 |
| 2 | L1 | 0.2553 | 14.57 | AVG | 10.03 | 24.60 | 51.58 | -26.98 |
| 3 | L1 | 0.4230 | 27.82 | QP | 10.03 | 37.85 | 57.39 | -19.54 |
| 4 | L1 | 0.4230 | 18.42 | AVG | 10.03 | 28.45 | 47.39 | -18.94 |
| 5 | L1 | 0.8286 | 21.59 | QP | 10.03 | 31.62 | 56.00 | -24.38 |
| 6 | L1 | 0.8286 | 7.20 | AVG | 10.03 | 17.23 | 46.00 | -28.77 |
| 7 | L1 | 3.0663 | 23.00 | QP | 10.06 | 33.06 | 56.00 | -22.94 |
| 8 | L1 | 3.0663 | 11.37 | AVG | 10.06 | 21.43 | 46.00 | -24.57 |
| 9 | L1 | 7.3719 | 6.43 | QP | 10.11 | 16.54 | 60.00 | -43.46 |
| 10 | L1 | 7.3719 | -1.30 | AVG | 10.11 | 8.81 | 50.00 | -41.19 |
| 11 | L1 | 16.4277 | 3.42 | QP | 10.25 | 13.67 | 60.00 | -46.33 |
| 12 | L1 | 16.4277 | -2.29 | AVG | 10.25 | 7.96 | 50.00 | -42.04 |

| Test Mode: | Transmitting Mode |
| --- | --- |




*Test Data*

Phase Neutral Plot at 240Vac, 60Hz

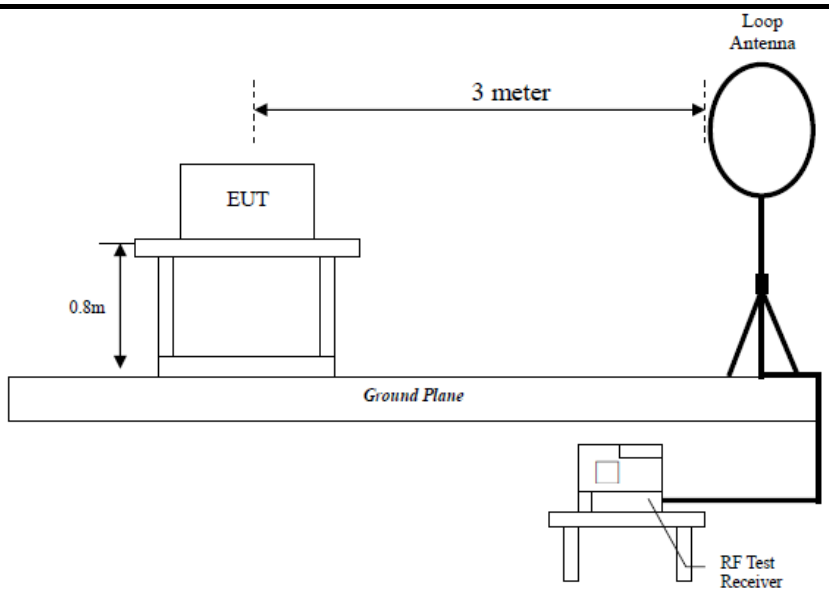
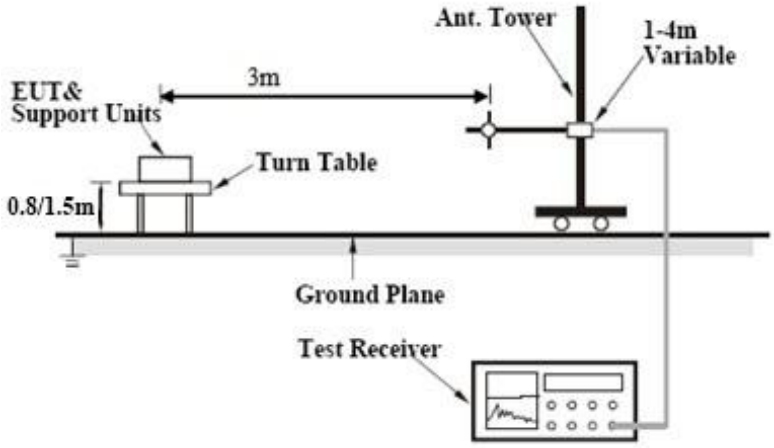
| No. | P/L | Frequency (MHz) | Reading (dBµV) | Detector | Corrected (dB) | Result (dBµV) | Limit (dBµV) | Margin (dB) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | N | 0.2007 | 32.51 | QP | 10.02 | 42.53 | 63.58 | -21.05 |
| 2 | N | 0.2007 | 14.52 | AVG | 10.02 | 24.54 | 53.58 | -29.04 |
| 3 | N | 0.4308 | 30.65 | QP | 10.02 | 40.67 | 57.24 | -16.57 |
| 4 | N | 0.4308 | 20.04 | AVG | 10.02 | 30.06 | 47.24 | -17.18 |
| 5 | N | 0.8208 | 20.50 | QP | 10.03 | 30.53 | 56.00 | -25.47 |
| 6 | N | 0.8208 | 5.19 | AVG | 10.03 | 15.22 | 46.00 | -30.78 |
| 7 | N | 2.1819 | 21.10 | QP | 10.04 | 31.14 | 56.00 | -24.86 |
| 8 | N | 2.1819 | 9.02 | AVG | 10.04 | 19.06 | 46.00 | -26.94 |
| 9 | N | 3.2457 | 21.01 | QP | 10.05 | 31.06 | 56.00 | -24.94 |
| 10 | N | 3.2457 | 5.67 | AVG | 10.05 | 15.72 | 46.00 | -30.28 |
| 11 | N | 5.7339 | 9.71 | QP | 10.08 | 19.79 | 60.00 | -40.21 |
| 12 | N | 5.7339 | -1.01 | AVG | 10.08 | 9.07 | 50.00 | -40.93 |

## 6.7 Radiated Spurious Emissions & Restricted Band

| | |
|---|---|
| Temperature | 25℃ |
| Relative Humidity | 57% |
| Atmospheric Pressure | 1014mbar |
| Test date : | May 07, 2018 |
| Tested By : | Aaron Liang |

**Requirement(s):**

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td rowspan="3">47CFR§15.247(d), RSS210 (A8.5)</td><td>a)</td><td>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (μV/m)</th></tr>
<tr><td>0.009~0.490</td><td>2400/F(KHz)</td></tr>
<tr><td>0.490~1.705</td><td>24000/F(KHz)</td></tr>
<tr><td>1.705~30.0</td><td>30</td></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☑</td></tr>
<tr><td>b)</td><td>For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required<br>☒ 20 dB down ☐ 30 dB down</td><td>☑</td></tr>
<tr><td>c)</td><td>or restricted band, emission must also comply with the radiated emission limits specified in 15.209</td><td>☑</td></tr>
</table>

| | |
|---|---|
| Test Setup |  <br>  |
| Procedure | 1. The EUT was switched on and allowed to warm up to its normal operating condition.<br>2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:<br>a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.<br>b. The EUT was then rotated to the direction that gave the maximum emission.<br>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.<br>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.<br>4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz. |

| | |
|---|---|
| | The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz.<br>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. |
| Remark | Transformer model: EPC13 test data |
| Result | ☑ Pass ☐ Fail |

**Test Data** ☑ Yes ☐ N/A

**Test Plot** ☑ Yes (See below) ☐ N/A

## Test Result:

| Test Mode: | Transmitting Mode |
| --- | --- |

Frequency range: 9KHz - 30MHz

| Freq. (MHz) | Detection value | Factor (dB/m) | Reading (dBuV/m) | Result (dBuV/m) | Limit@3m (dBuV/m) | Margin (dB) |
| --- | --- | --- | --- | --- | --- | --- |
| -- | -- | -- | -- | -- | -- | >20 |
| -- | -- | -- | -- | -- | -- | >20 |

Note:

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

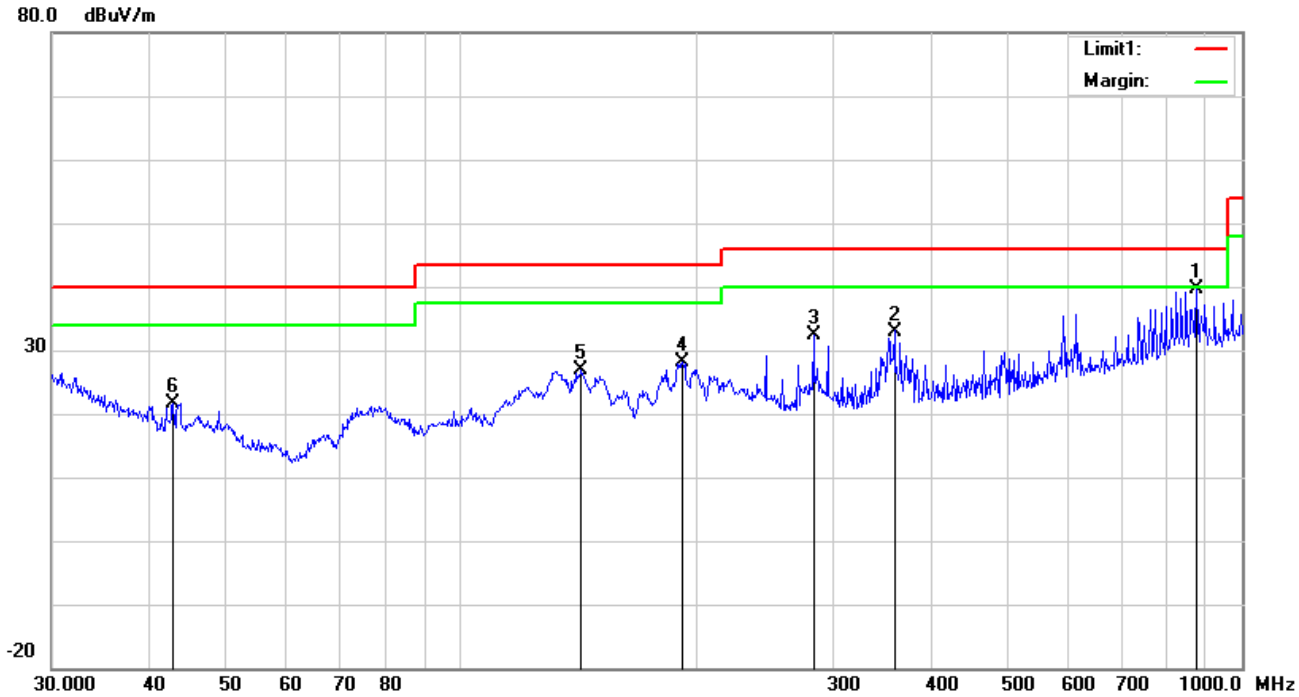
Distance extrapolation factor =40 log (specific distance/test distance)(dB);

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

TX 0:

| Test Mode: | Transmitting Mode |
| --- | --- |

30MHz -1GHz

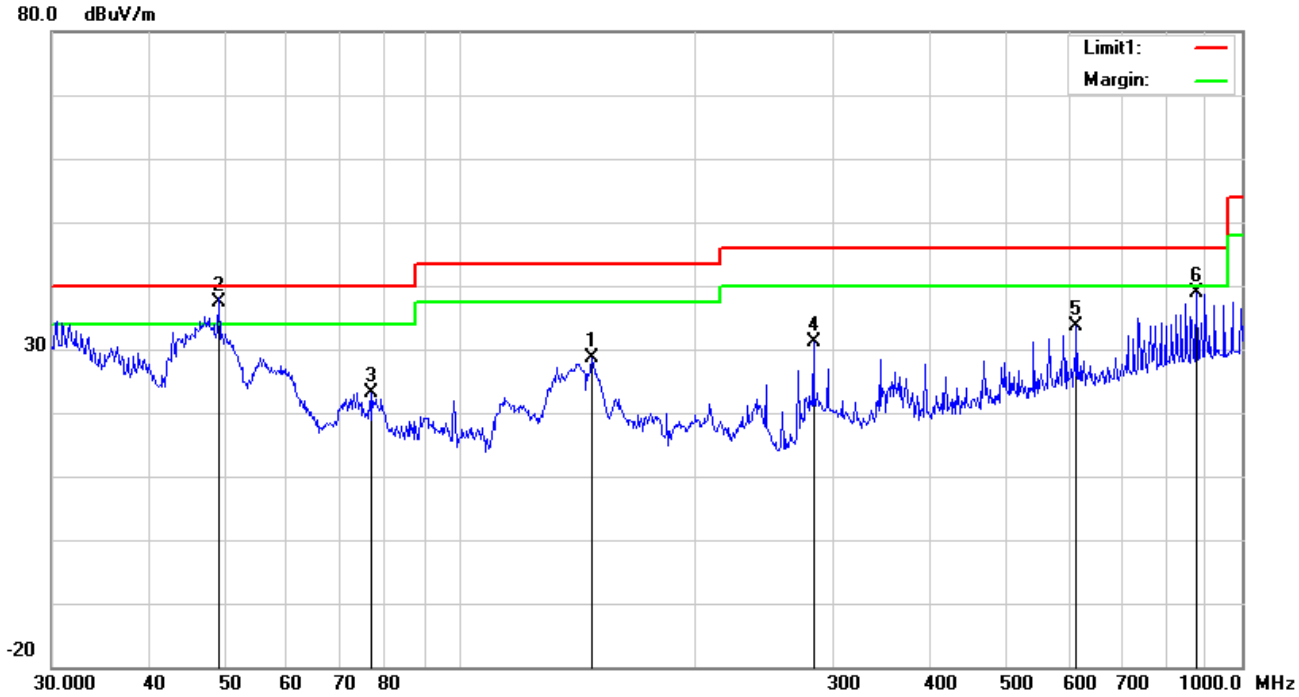



*Test Data*

Vertical Polarity Plot @3m

| No. | P/L | Frequency | Reading | Detector | Ant_F | PA_G | Cab_L | Result | Limit | Margin |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | (MHz) | (dBuV/m) | | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | H | 875.2470 | 35.45 | peak | 22.23 | 20.95 | 2.97 | 39.70 | 46.00 | -6.30 |
| 2 | H | 359.1860 | 38.25 | peak | 14.84 | 22.12 | 2.03 | 33.00 | 46.00 | -13.00 |
| 3 | H | 282.9852 | 40.13 | peak | 12.85 | 22.29 | 1.76 | 32.45 | 46.00 | -13.55 |
| 4 | H | 192.4186 | 37.17 | peak | 11.68 | 22.33 | 1.54 | 28.06 | 43.50 | -15.44 |
| 5 | H | 142.8244 | 35.45 | peak | 12.60 | 22.39 | 1.29 | 26.95 | 43.50 | -16.55 |
| 6 | H | 42.8998 | 31.08 | peak | 11.99 | 22.29 | 0.77 | 21.55 | 40.00 | -18.45 |

30MHz -1GHz




*Test Data*

Horizontal Polarity Plot @3m

| No. | P/L | Frequency | Reading | Detector | Ant_F | PA_G | Cab_L | Result | Limit | Margin |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | (MHz) | (dBuV/m) | | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | V | 147.4036 | 37.17 | peak | 12.60 | 22.36 | 1.32 | 28.73 | 43.50 | -14.77 |
| 2 | V | 49.0145 | 50.24 | QP | 8.83 | 22.36 | 0.79 | 37.50 | 40.00 | -2.50 |
| 3 | V | 77.0505 | 36.79 | peak | 7.66 | 22.41 | 1.00 | 23.04 | 40.00 | -16.96 |
| 4 | V | 282.9852 | 38.72 | peak | 12.85 | 22.29 | 1.76 | 31.04 | 46.00 | -14.96 |
| 5 | V | 614.2142 | 33.40 | peak | 19.26 | 21.55 | 2.53 | 33.64 | 46.00 | -12.36 |
| 6 | V | 875.2470 | 34.55 | peak | 22.23 | 20.95 | 2.97 | 38.80 | 46.00 | -7.20 |

## Above 1GHz

| Test Mode: | Transmitting Mode |
|---|---|

| Frequency | Meter Reading | Antenna Factor | Cable loss | Preamp factor | Emission Level | Limits | Margin | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dB) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | (PK/AV) | (H/V) |
| Low Channel:802.11b(Worst Case)-2412MHz | | | | | | | | | |
| 2390 | 41.59 | 28.72 | 3.36 | 26.32 | 47.35 | 74.00 | -26.65 | peak | Vertical |
| 4824 | 31.41 | 32.94 | 3.98 | 27.49 | 40.84 | 54.00 | -13.16 | Average | Vertical |
| 4824 | 41.29 | 32.94 | 3.98 | 27.49 | 50.72 | 74.00 | -23.28 | peak | Vertical |
| 7240 | 31.66 | 25.28 | 5.51 | 27.94 | 34.51 | 54.00 | -19.49 | Average | Vertical |
| 7240 | 42.23 | 25.28 | 5.51 | 27.94 | 45.08 | 74.00 | -28.92 | peak | Vertical |
| 2390 | 41.24 | 28.72 | 3.36 | 26.32 | 47.00 | 74.00 | -27.00 | peak | Horizontal |
| 4824 | 31.28 | 32.94 | 3.98 | 27.49 | 40.71 | 54.00 | -13.29 | Average | Horizontal |
| 4824 | 42.32 | 32.94 | 3.98 | 27.49 | 51.75 | 74.00 | -22.25 | peak | Horizontal |
| 7240 | 31.78 | 25.28 | 5.51 | 27.94 | 34.63 | 54.00 | -19.37 | Average | Horizontal |
| 7240 | 41.27 | 25.28 | 5.51 | 27.94 | 44.12 | 74.00 | -29.88 | peak | Horizontal |
| Middle Channel:802.11b(Worst Case)-2437MHz | | | | | | | | | |
| 4876 | 31.54 | 32.11 | 4.04 | 27.53 | 40.16 | 54.00 | -13.84 | Average | Vertical |
| 4876 | 41.50 | 32.11 | 4.04 | 27.53 | 50.12 | 74.00 | -23.88 | peak | Vertical |
| 7311 | 31.25 | 24.33 | 5.58 | 27.96 | 33.20 | 54.00 | -20.80 | Average | Vertical |
| 7311 | 41.47 | 24.33 | 5.58 | 27.96 | 43.42 | 74.00 | -30.58 | peak | Vertical |
| 4876 | 31.65 | 32.11 | 4.04 | 27.53 | 40.27 | 54.00 | -13.73 | Average | Horizontal |
| 4876 | 41.80 | 32.11 | 4.04 | 27.53 | 50.42 | 74.00 | -23.58 | peak | Horizontal |
| 7311 | 31.32 | 24.33 | 5.58 | 27.96 | 33.27 | 54.00 | -20.73 | Average | Horizontal |
| 7311 | 41.19 | 24.33 | 5.58 | 27.96 | 43.14 | 74.00 | -30.86 | peak | Horizontal |
| High Channel:802.11b(Worst Case)-2462MHz | | | | | | | | | |
| 2483.2 | 41.53 | 28.79 | 3.48 | 26.34 | 47.46 | 74.00 | -26.54 | peak | Vertical |
| 4924 | 31.92 | 31.32 | 4.12 | 27.58 | 39.78 | 54.00 | -14.22 | Average | Vertical |
| 4924 | 41.12 | 31.32 | 4.12 | 27.58 | 48.98 | 74.00 | -25.02 | peak | Vertical |
| 7386 | 31.70 | 24.38 | 5.68 | 27.99 | 33.77 | 54.00 | -20.23 | Average | Vertical |
| 7386 | 41.56 | 24.38 | 5.68 | 27.99 | 43.63 | 74.00 | -30.37 | peak | Vertical |
| 2483.2 | 41.23 | 28.79 | 3.48 | 26.34 | 47.16 | 74.00 | -26.84 | peak | Horizontal |
| 4924 | 31.23 | 31.32 | 4.12 | 27.58 | 39.09 | 54.00 | -14.91 | Average | Horizontal |
| 4924 | 42.70 | 31.32 | 4.12 | 27.58 | 50.56 | 74.00 | -23.44 | peak | Horizontal |
| 7386 | 31.12 | 24.38 | 5.68 | 27.99 | 33.19 | 54.00 | -20.81 | Average | Horizontal |
| 7386 | 41.99 | 24.38 | 5.68 | 27.99 | 44.06 | 74.00 | -29.94 | peak | Horizontal |

**Note:**

*1, The testing has been conformed to 10*2462MHz=24,620MHz*

*2, All other emissions more than 30 dB below the limit*

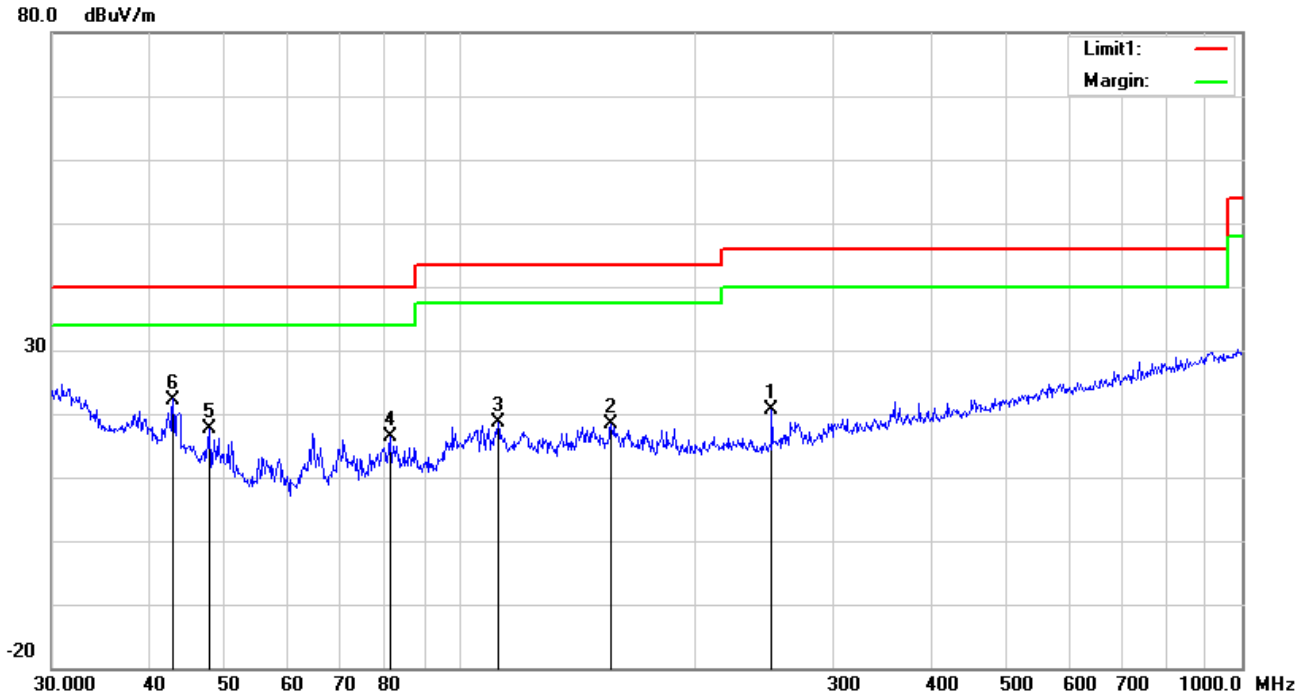
*3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.*

*4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.*

TX 1:

| Test Mode: | Transmitting Mode |
| --- | --- |

30MHz -1GHz

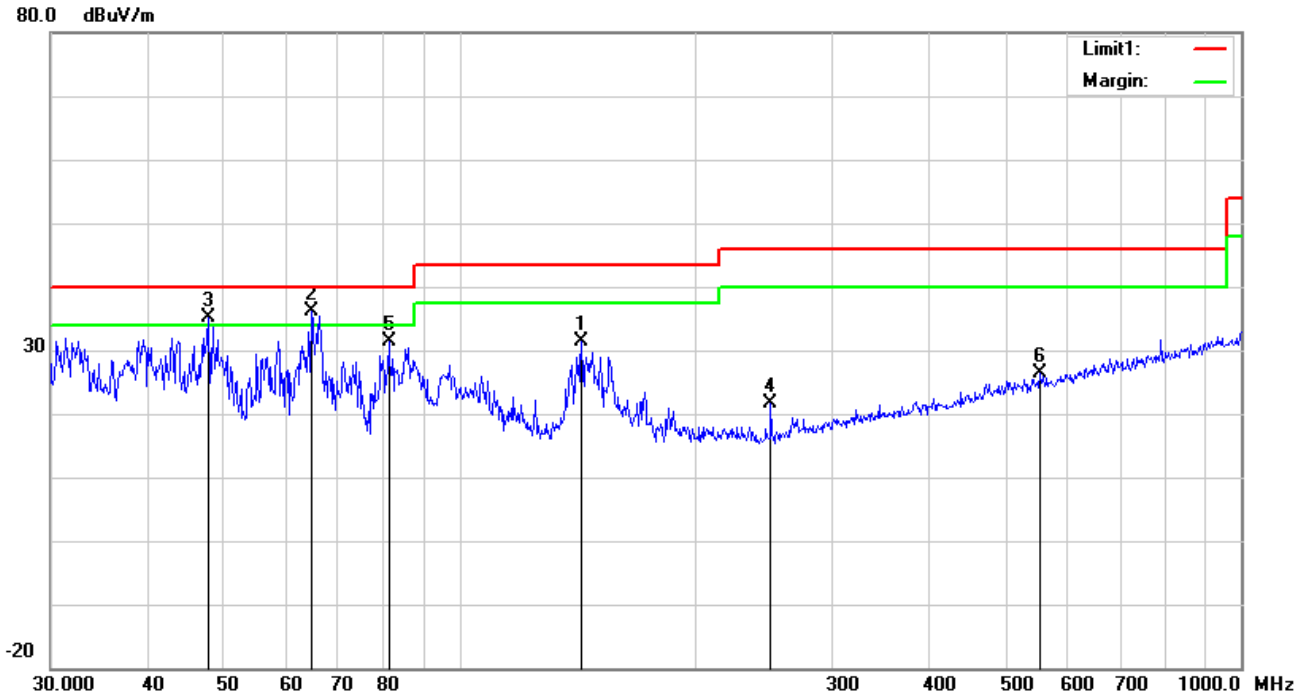



*Test Data*

Vertical Polarity Plot @3m

| No. | P/L | Frequency | Reading | Detector | Ant_F | PA_G | Cab_L | Result | Limit | Margin |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | (MHz) | (dBuV/m) | | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | H | 250.3012 | 29.84 | peak | 11.41 | 22.29 | 1.70 | 20.66 | 46.00 | -25.34 |
| 2 | H | 155.9101 | 26.65 | peak | 12.60 | 22.30 | 1.37 | 18.32 | 43.50 | -25.18 |
| 3 | H | 111.7380 | 27.34 | peak | 12.45 | 22.34 | 1.17 | 18.62 | 43.50 | -24.88 |
| 4 | H | 81.2117 | 30.17 | peak | 7.65 | 22.41 | 1.05 | 16.46 | 40.00 | -23.54 |
| 5 | H | 47.8260 | 29.90 | peak | 9.36 | 22.34 | 0.78 | 17.70 | 40.00 | -22.30 |
| 6 | H | 42.8998 | 31.78 | peak | 11.99 | 22.29 | 0.77 | 22.25 | 40.00 | -17.75 |

30MHz -1GHz




*Test Data*

Horizontal Polarity Plot @3m

| No. | P/L | Frequency | Reading | Detector | Ant_F | PA_G | Cab_L | Result | Limit | Margin |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | (MHz) | (dBuV/m) | | (dB/m) | (dB) | (dB) | (dBuV/m) | (dBuV/m) | (dB) |
| 1 | V | 143.3261 | 39.92 | peak | 12.60 | 22.39 | 1.29 | 31.42 | 43.50 | -12.08 |
| 2 | V | 64.6594 | 50.19 | peak | 7.53 | 22.40 | 0.87 | 36.19 | 40.00 | -3.81 |
| 3 | V | 47.6586 | 47.15 | peak | 9.43 | 22.34 | 0.78 | 35.02 | 40.00 | -4.98 |
| 4 | V | 250.3012 | 30.71 | peak | 11.41 | 22.29 | 1.70 | 21.53 | 46.00 | -24.47 |
| 5 | V | 81.2117 | 45.12 | peak | 7.65 | 22.41 | 1.05 | 31.41 | 40.00 | -8.59 |
| 6 | V | 552.8833 | 27.03 | peak | 18.44 | 21.69 | 2.48 | 26.26 | 46.00 | -19.74 |

## Above 1GHz

| Test Mode: | Transmitting Mode |
|---|---|

| Frequency | Meter Reading | Antenna Factor | Cable loss | Preamp factor | Emission Level | Limits | Margin | Detector | Polarity |
|---|---|---|---|---|---|---|---|---|---|
| (MHz) | (dBμV) | (dB) | (dB) | (dB) | (dBμV/m) | (dBμV/m) | (dB) | (PK/AV) | (H/V) |
| Low Channel:802.11n(Worst Case)-2412MHz | | | | | | | | | |
| 2392 | 42.28 | 28.72 | 3.36 | 26.32 | 48.04 | 74.00 | -25.96 | peak | Vertical |
| 4824.2 | 31.98 | 32.94 | 3.98 | 27.49 | 41.41 | 54.00 | -12.59 | Average | Vertical |
| 4824.2 | 41.74 | 32.94 | 3.98 | 27.49 | 51.17 | 74.00 | -22.83 | peak | Vertical |
| 7241 | 32.69 | 25.28 | 5.51 | 27.94 | 35.54 | 54.00 | -18.46 | Average | Vertical |
| 7241 | 42.57 | 25.28 | 5.51 | 27.94 | 45.42 | 74.00 | -28.58 | peak | Vertical |
| 2392 | 42.64 | 28.72 | 3.36 | 26.32 | 48.40 | 74.00 | -25.60 | peak | Horizontal |
| 4824.2 | 32.35 | 32.94 | 3.98 | 27.49 | 41.78 | 54.00 | -12.22 | Average | Horizontal |
| 4824.2 | 43.32 | 32.94 | 3.98 | 27.49 | 52.75 | 74.00 | -21.25 | peak | Horizontal |
| 7241 | 32.05 | 25.28 | 5.51 | 27.94 | 34.90 | 54.00 | -19.10 | Average | Horizontal |
| 7241 | 41.58 | 25.28 | 5.51 | 27.94 | 44.43 | 74.00 | -29.57 | peak | Horizontal |
| Middle Channel:802.11n(Worst Case)-2437MHz | | | | | | | | | |
| 4875 | 32.02 | 32.11 | 4.04 | 27.53 | 40.64 | 54.00 | -13.36 | Average | Vertical |
| 4875 | 42.36 | 32.11 | 4.04 | 27.53 | 50.98 | 74.00 | -23.02 | peak | Vertical |
| 7311.5 | 32.58 | 24.33 | 5.58 | 27.96 | 34.53 | 54.00 | -19.47 | Average | Vertical |
| 7311.5 | 42.28 | 24.33 | 5.58 | 27.96 | 44.23 | 74.00 | -29.77 | peak | Vertical |
| 4875 | 32.02 | 32.11 | 4.04 | 27.53 | 40.64 | 54.00 | -13.36 | Average | Horizontal |
| 4875 | 42.06 | 32.11 | 4.04 | 27.53 | 50.68 | 74.00 | -23.32 | peak | Horizontal |
| 7311.5 | 31.58 | 24.33 | 5.58 | 27.96 | 33.53 | 54.00 | -20.47 | Average | Horizontal |
| 7311.5 | 42.01 | 24.33 | 5.58 | 27.96 | 43.96 | 74.00 | -30.04 | peak | Horizontal |
| High Channel:802.11n(Worst Case)-2462MHz | | | | | | | | | |
| 2483.5 | 42.55 | 28.79 | 3.48 | 26.34 | 48.48 | 74.00 | -25.52 | peak | Vertical |
| 4923.5 | 31.99 | 31.32 | 4.12 | 27.58 | 39.85 | 54.00 | -14.15 | Average | Vertical |
| 4923.5 | 42.31 | 31.32 | 4.12 | 27.58 | 50.17 | 74.00 | -23.83 | peak | Vertical |
| 7385 | 32.44 | 24.38 | 5.68 | 27.99 | 34.51 | 54.00 | -19.49 | Average | Vertical |
| 7385 | 42.05 | 24.38 | 5.68 | 27.99 | 44.12 | 74.00 | -29.88 | peak | Vertical |
| 2483.5 | 41.57 | 28.79 | 3.48 | 26.34 | 47.50 | 74.00 | -26.50 | peak | Horizontal |
| 4923.5 | 32.36 | 31.32 | 4.12 | 27.58 | 40.22 | 54.00 | -13.78 | Average | Horizontal |
| 4923.5 | 42.89 | 31.32 | 4.12 | 27.58 | 50.75 | 74.00 | -23.25 | peak | Horizontal |
| 7385 | 32.36 | 24.38 | 5.68 | 27.99 | 34.43 | 54.00 | -19.57 | Average | Horizontal |
| 7385 | 42.56 | 24.38 | 5.68 | 27.99 | 44.63 | 74.00 | -29.37 | peak | Horizontal |

**Note:**

*1, The testing has been conformed to 10*2462MHz=24,620MHz*

*2, All other emissions more than 30 dB below the limit*

*3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.*

*4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.*

# Annex A. TEST INSTRUMENT

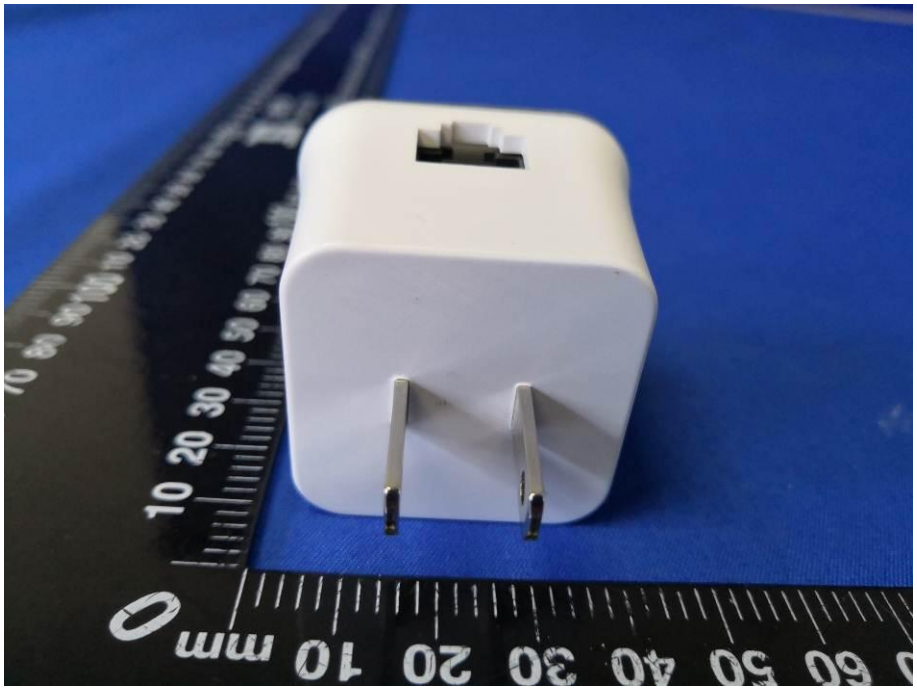
| Instrument | Model | Serial # | Cal Date | Cal Due | In use |
|---|---|---|---|---|---|
| **AC Line Conducted** | | | | | |
| EMI test receiver | ESCS30 | 8471241027 | 09/15/2017 | 09/14/2018 | ☑ |
| Line Impedance | LI-125A | 191106 | 09/23/2017 | 09/22/2018 | ☑ |
| Line Impedance | LI-125A | 191107 | 09/23/2017 | 09/22/2018 | ☑ |
| ISN | ISN T800 | 34373 | 09/23/2017 | 09/22/2018 | ☐ |
| Transient Limiter | LIT-153 | 531118 | 08/30/2017 | 08/29/2018 | ☐ |
| **RF conducted test** | | | | | |
| Agilent ESA-E SERIES | E4407B | MY45108319 | 09/15/2017 | 09/14/2018 | ☑ |
| Power Splitter | 1# | 1# | 08/30/2017 | 08/29/2018 | ☑ |
| DC Power Supply | E3640A | MY40004013 | 09/15/2017 | 09/14/2018 | ☑ |
| **Radiated Emissions** | | | | | |
| EMI test receiver | ESL6 | 100262 | 09/15/2017 | 09/14/2018 | ☑ |
| Positioning Controller | UC3000 | MF780208282 | 11/17/2017 | 11/16/2018 | ☑ |
| OPT 010 AMPLIFIER (0.1-1300MHz) | 8447E | 2727A02430 | 08/30/2017 | 08/29/2018 | ☑ |
| Microwave Preamplifier (1 ~ 26.5GHz) | 8449B | 3008A02402 | 03/22/2018 | 03/21/2019 | ☑ |
| Horn Antenna | BBHA9170 | 3145226D1 | 09/27/2017 | 09/26/2018 | ☑ |
| Active Antenna (9kHz-30MHz) | AL-130 | 121031 | 10/12/2017 | 10/11/2018 | ☑ |
| Bilog Antenna (30MHz~6GHz) | JB6 | A110712 | 09/19/2017 | 09/18/2018 | ☑ |
| Double Ridge Horn Antenna (1 ~18GHz) | AH-118 | 71283 | 09/22/2017 | 09/21/2018 | ☑ |
| Universal Radio Communication Tester | CMU200 | 121393 | 09/23/2017 | 09/22/2018 | ☑ |

# Annex B. EUT and Test Setup Photographs

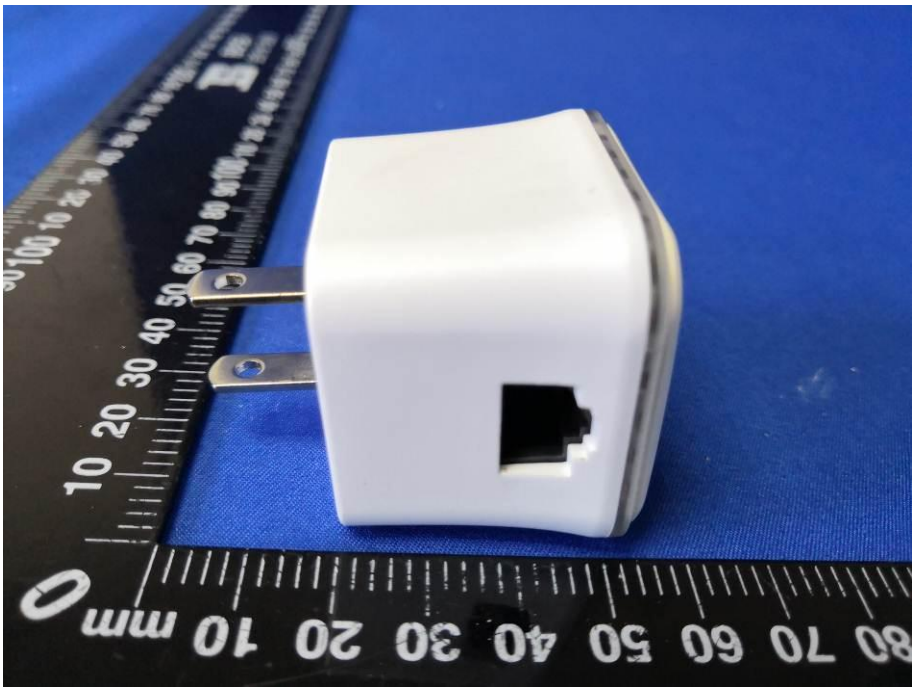
## Annex B.i. Photograph: EUT External Photo

EUT - Front View


EUT - Rear View



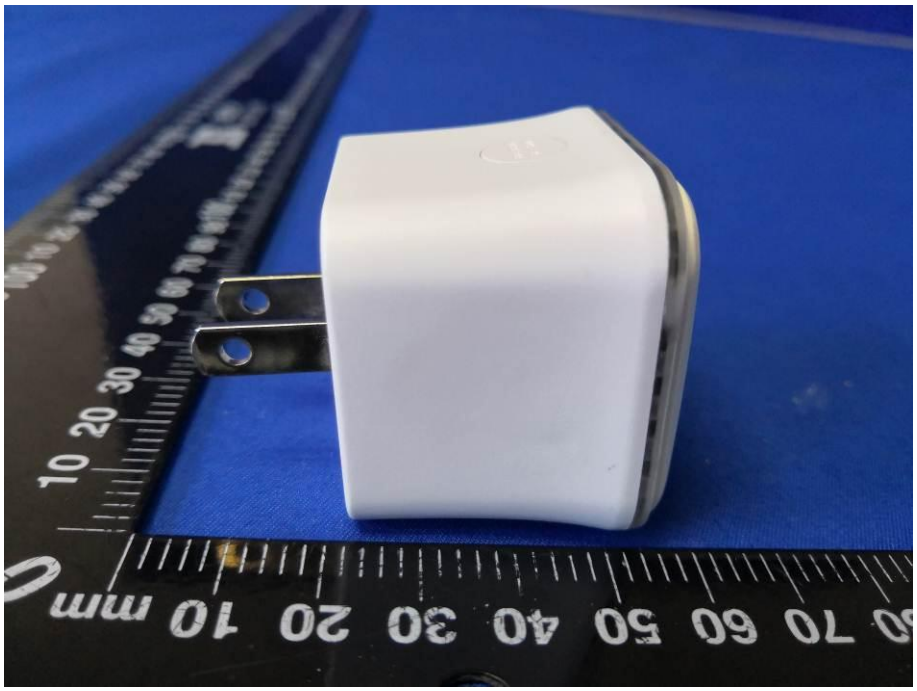
EUT - Top View



EUT - Bottom View

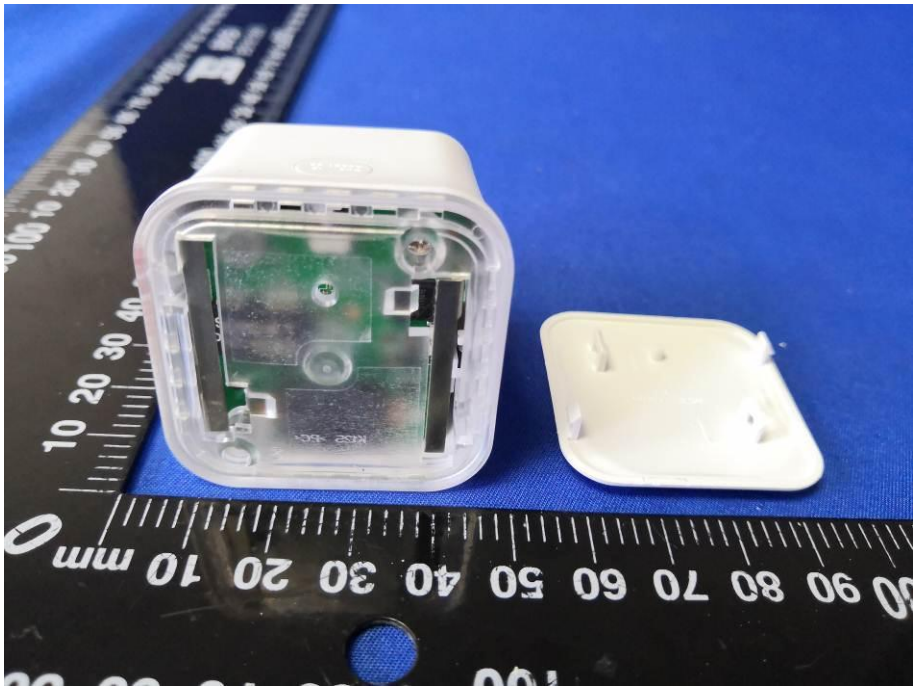
EUT - Left View

EUT - Right View

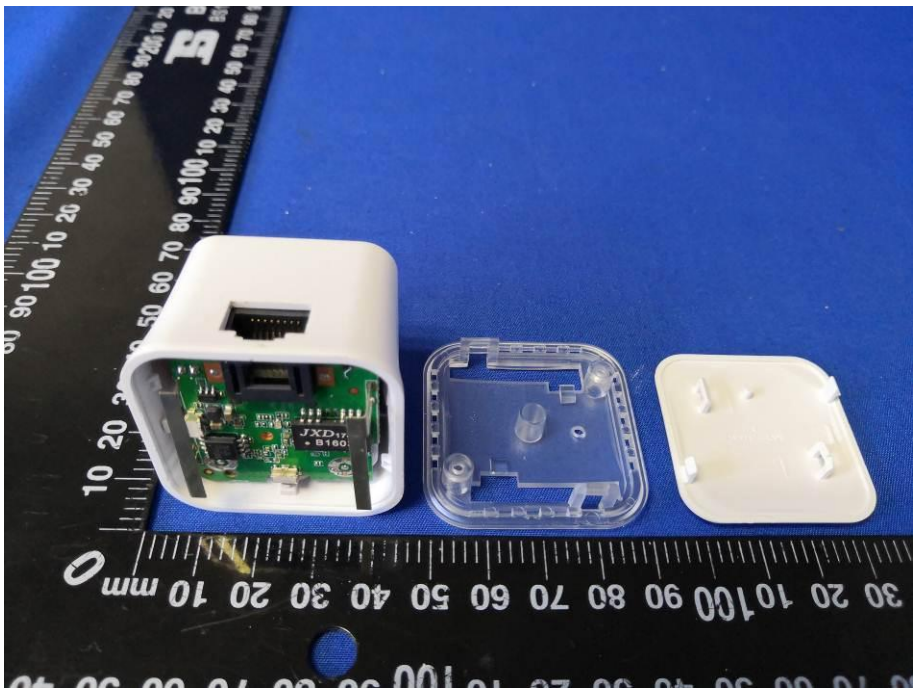


## Annex B.ii. Photograph: EUT Internal Photo

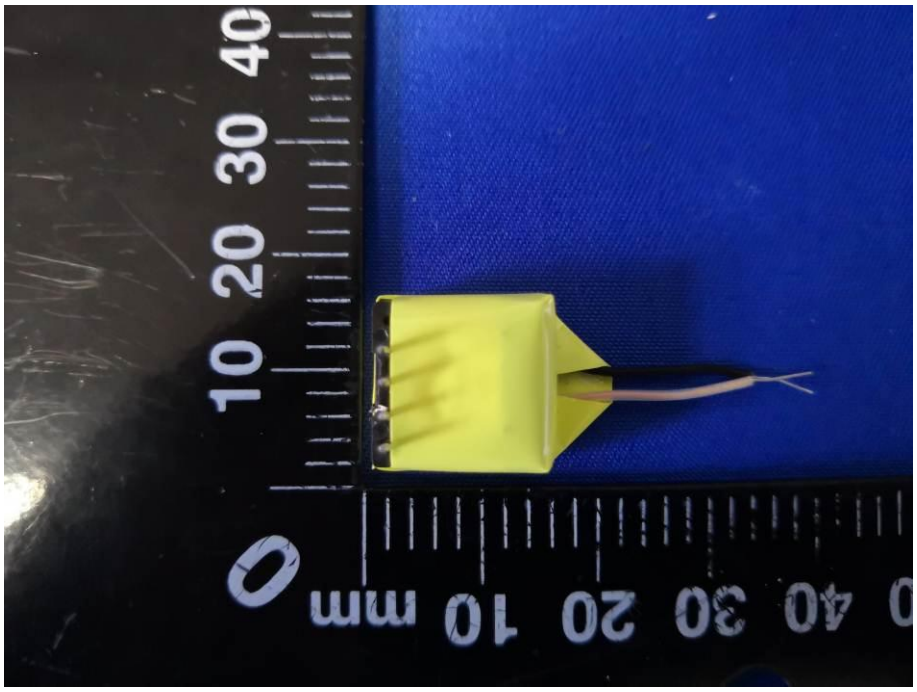
Cover Off - Top View 1



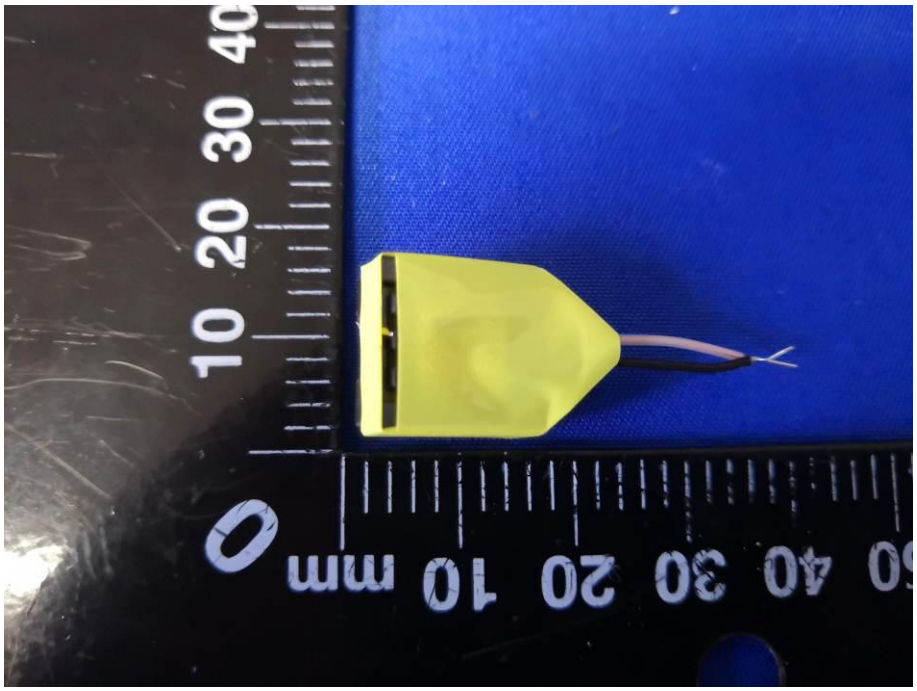
Cover Off - Top View 2



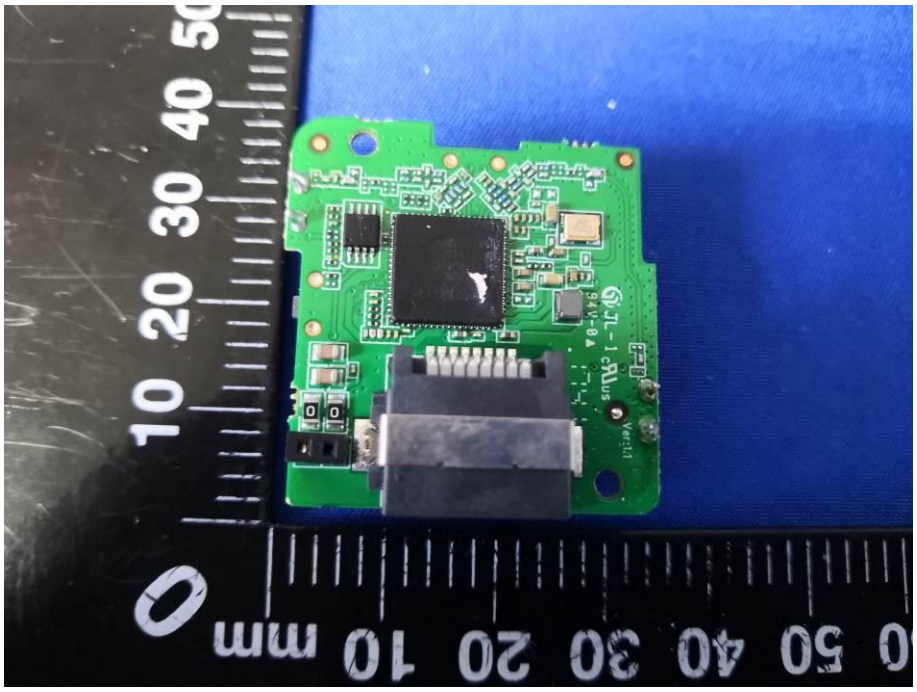
Transformer View(Model: EPC13)



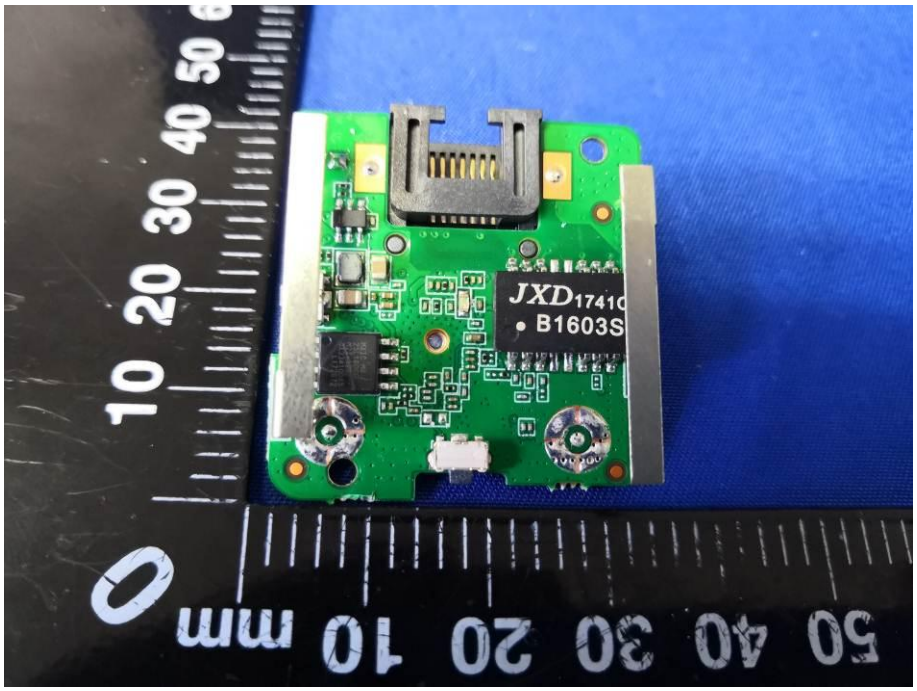

Transformer View(Model: EPC13)



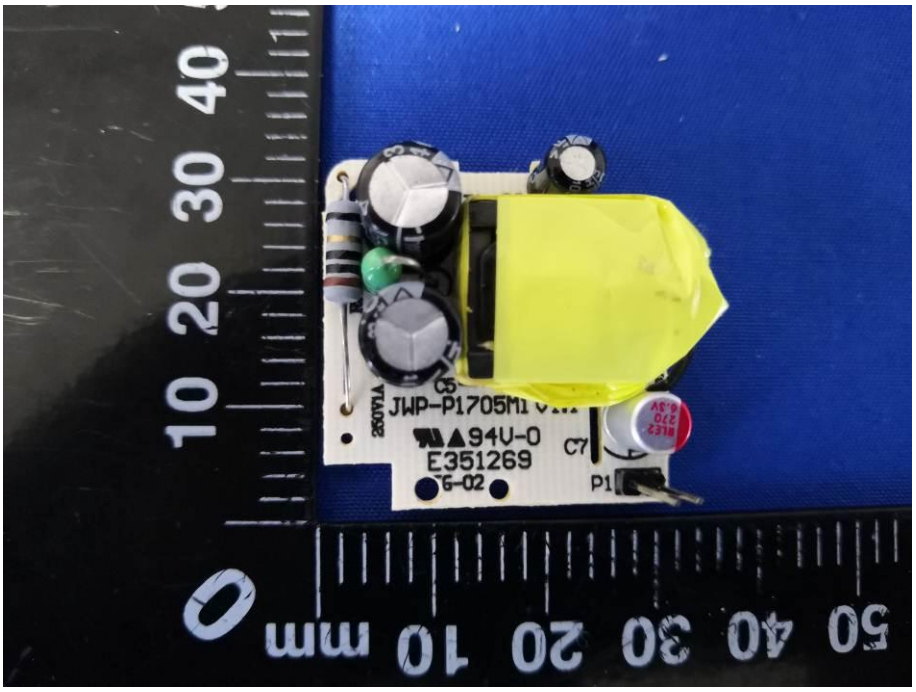
Mainboard - Front View



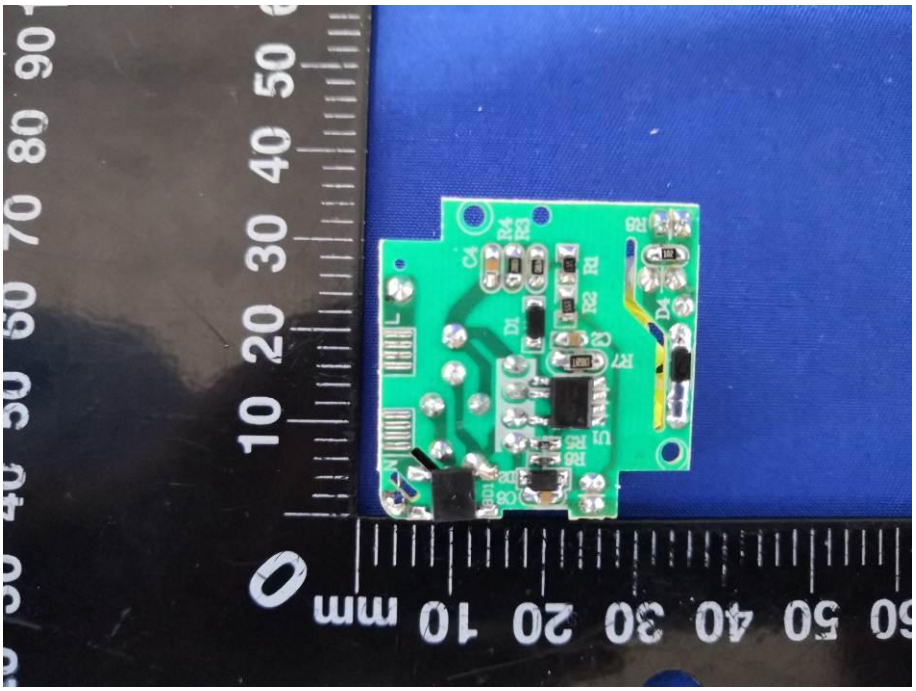
Mainboard – Rear View



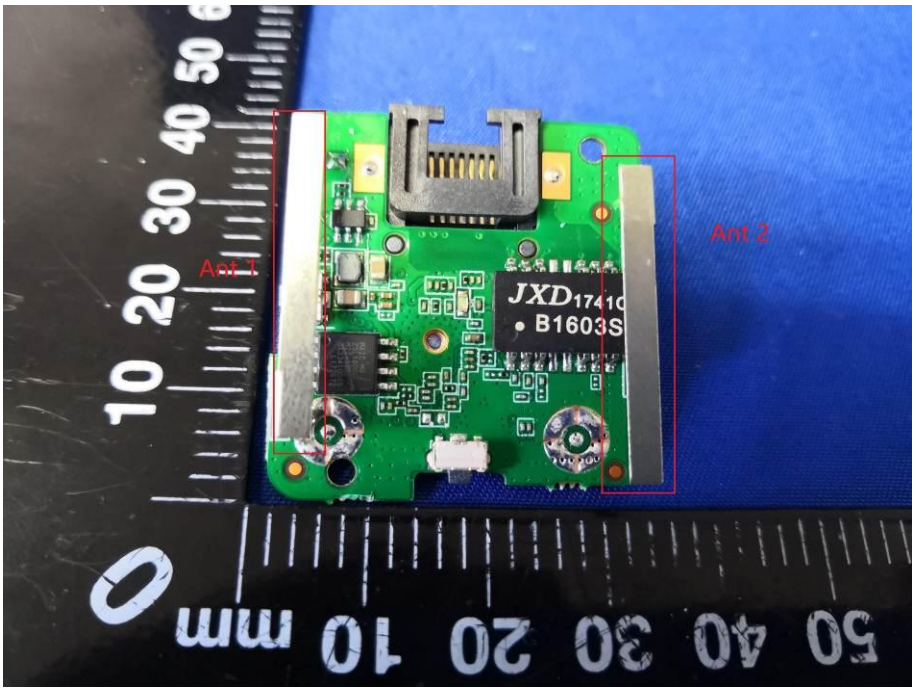
Power- Front View




Power – Rear View

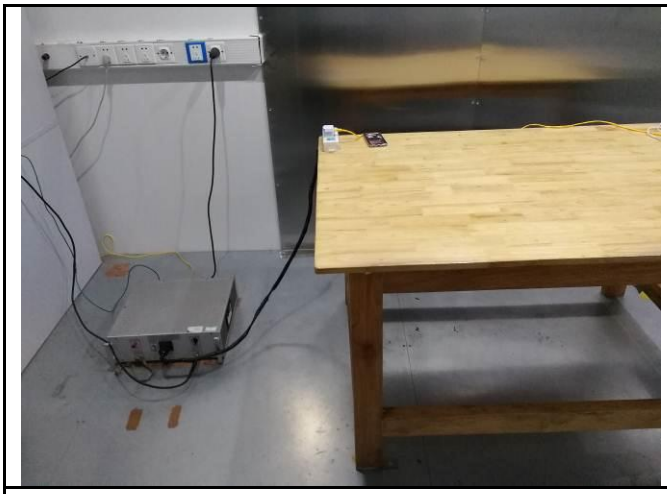
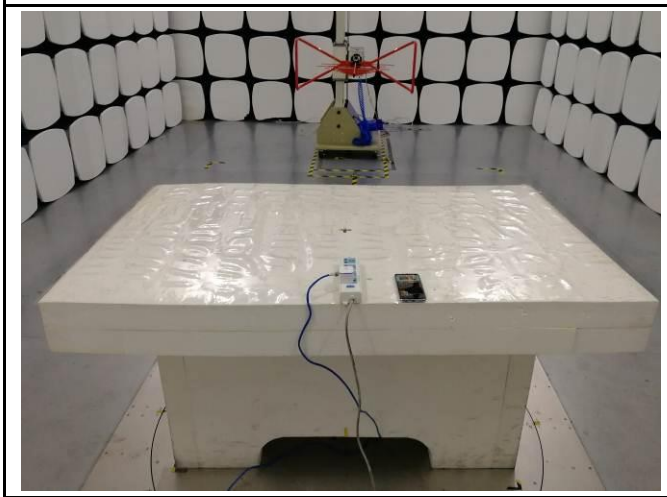
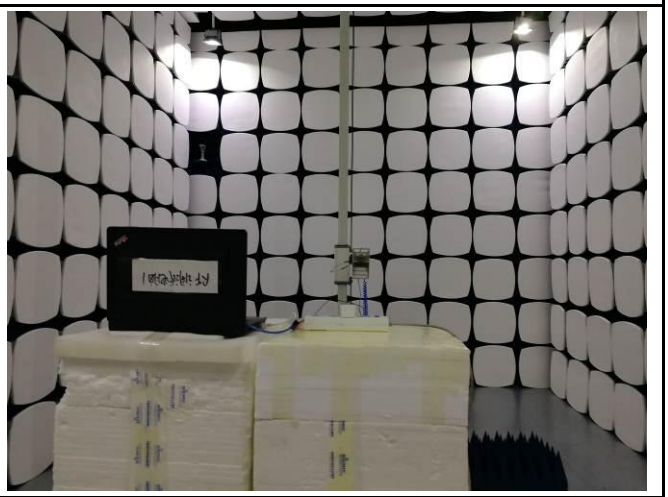


Antenna View

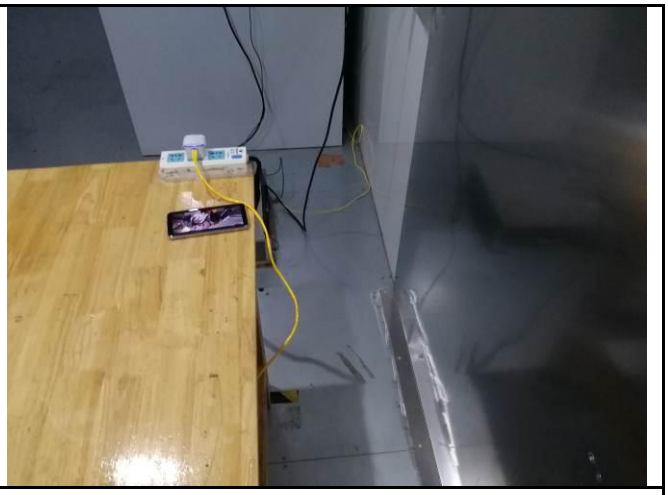
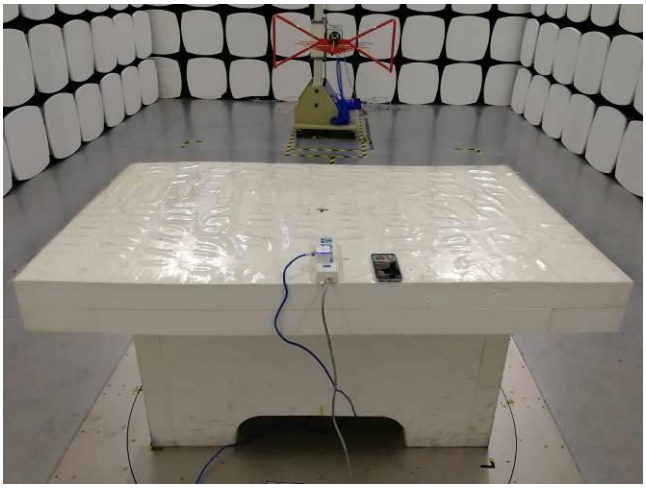
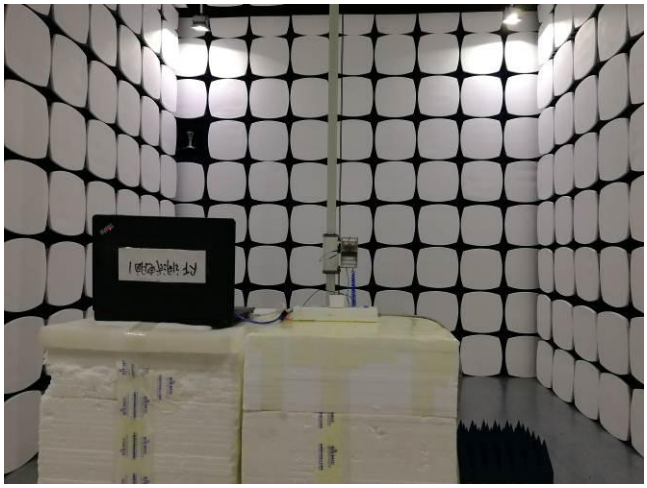


## Annex B.iii. Photograph: Test Setup Photo

TX 0:

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Conducted Emissions Test Setup Front View</td><td>Conducted Emissions Test Setup Side View</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Radiated Spurious Emissions Test Setup Below 1GHz</td><td>Radiated Spurious Emissions Test Setup Above 1GHz</td></tr>
</table>

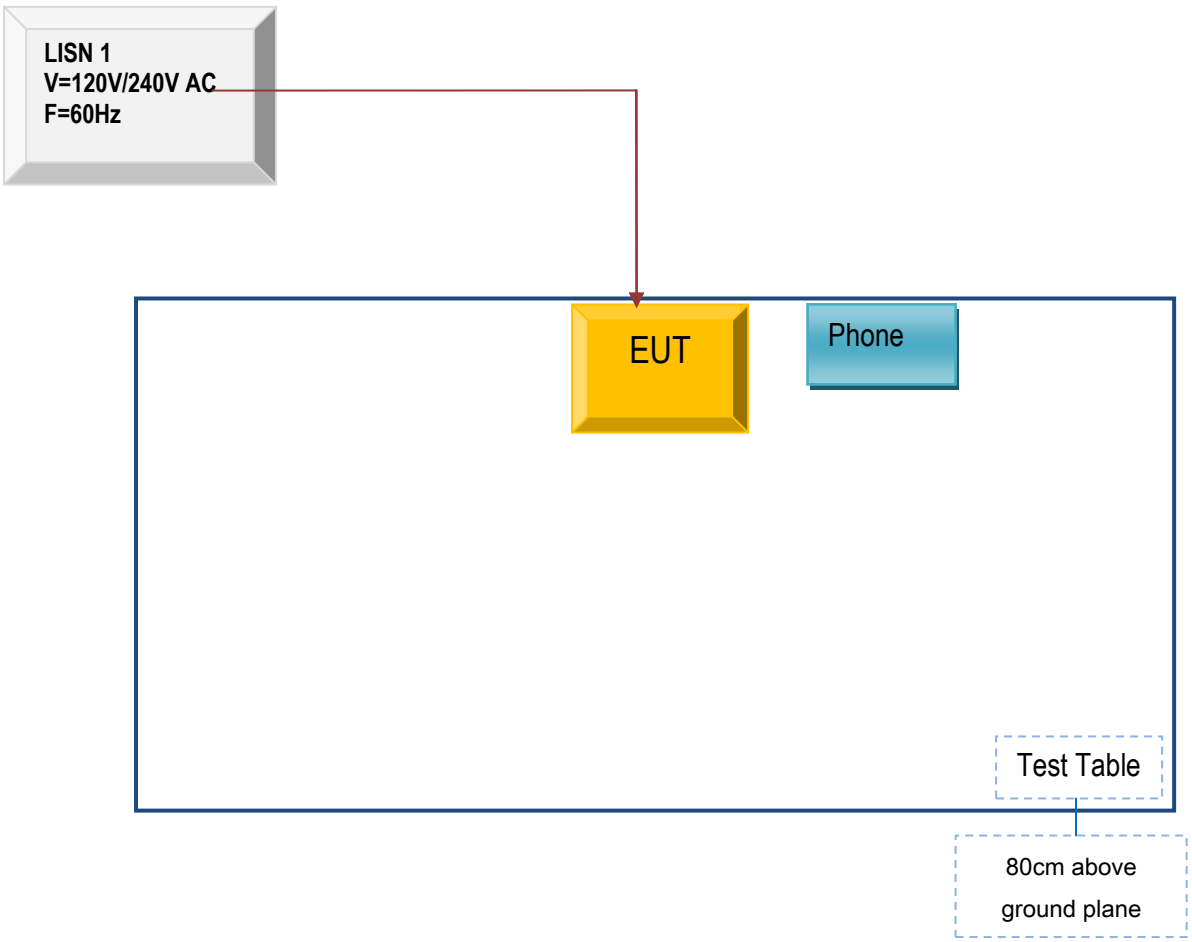
**TX 1:**

| | |
| --- | --- |
|  |  |
| Conducted Emissions Test Setup Front View | Conducted Emissions Test Setup Side View |
|  |  |
| Radiated Spurious Emissions Test Setup Below 1GHz | Radiated Spurious Emissions Test Setup Above 1GHz |

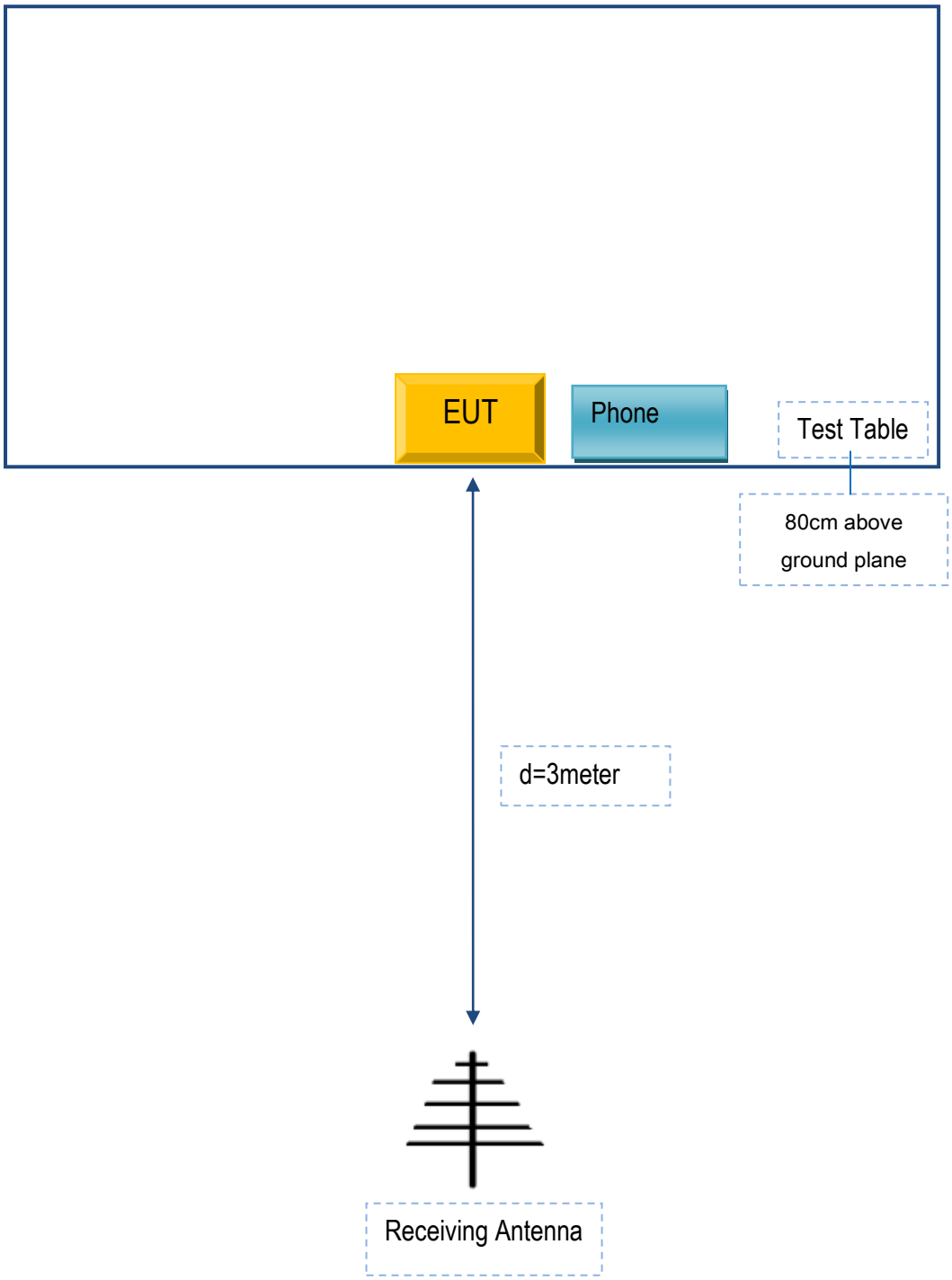
# Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

## Annex C.ii. TEST SET UP BLOCK

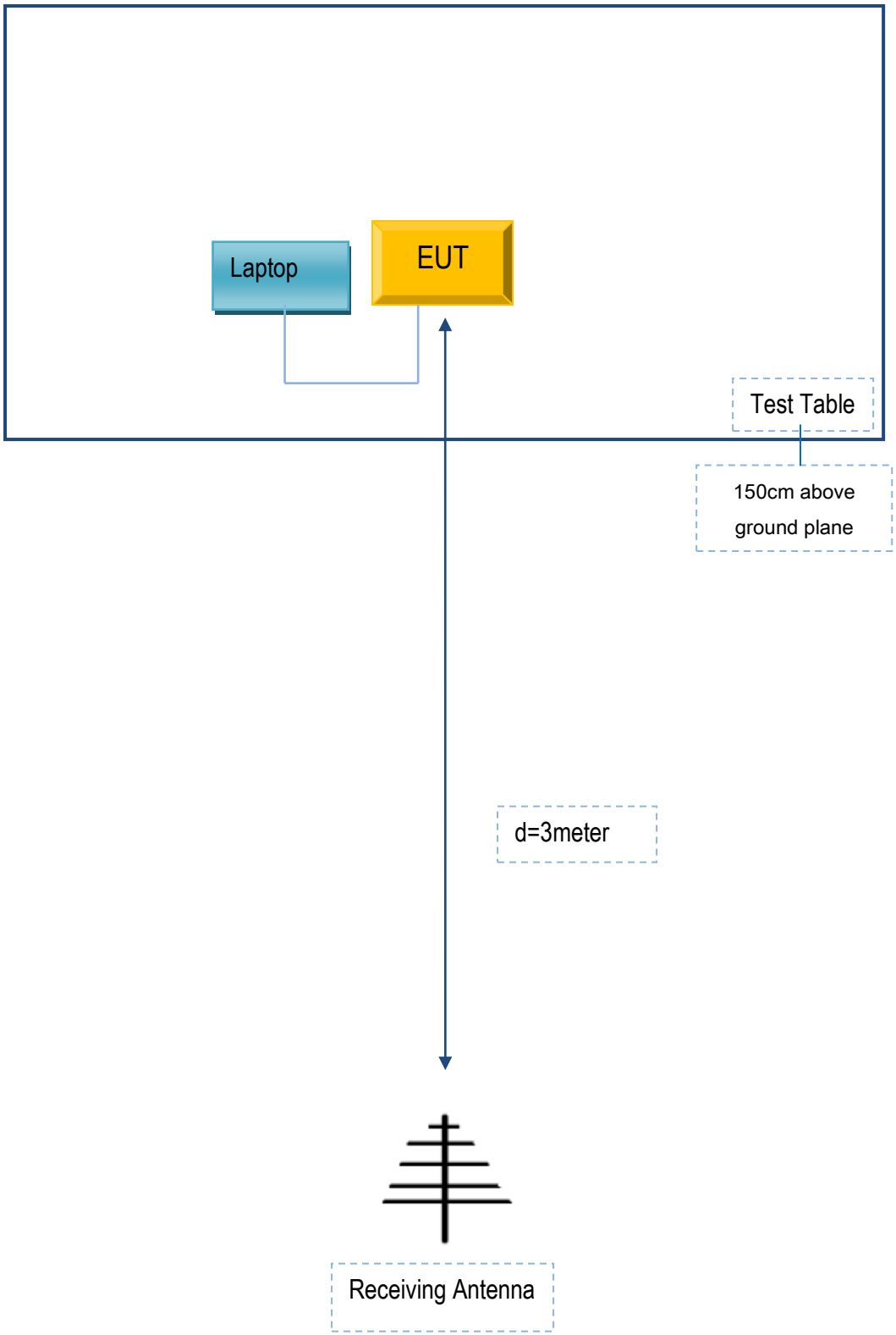
### Block Configuration Diagram for AC Line Conducted Emissions



## Block Configuration Diagram for Radiated Emissions （Below 1GHz）.



## Block Configuration Diagram for Radiated Emissions （Above 1GHz）.



## Annex C. il. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

**Supporting Equipment:**

| Manufacturer | Equipment Description | Model | Serial No |
| --- | --- | --- | --- |
| Lenovo | Laptop | E40 | N/A |
| Huawei | Phone | Honor 9 | N/A |

**Supporting Cable:**

| Cable type | Shield Type | Ferrite Core | Length | Serial No |
| --- | --- | --- | --- | --- |
| USB Cable | Un-shielding | No | 0.8m | N/A |

# Annex D. User Manual / Block Diagram / Schematics / Partlist

Please see the attachment

# Annex E. DECLARATION OF SIMILARITY

N/A