**Report No: GTSE11030015201**

# FCC REPORT

| | |
|---|---|
| **Applicant:** | KATUMFEL INDUSTRY LIMITED(HK) |
| **Address of Applicant:** | FuCheng Industrial Town, Hong Tian,ShaJing, ShenZhen |

**Equipment Under Test (EUT)**

| | |
|---|---|
| Product Name: | 2.4GTransmitter |
| Model No.: | KTH-91102 |
| **FCC ID:** | XNZHTX-242 |
| **Applicable standards:** | FCC CFR Title 47 Part 15 Subpart C Section 15.249:2010 |
| **Date of sample receipt:** | 26 Mar., 2011 |
| **Date of Test:** | 28 Mar. -08 Apr., 2011 |
| **Date of report issued:** | 09 Apr., 2011 |
| **Test Result :** | PASS * |

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

# 2 Version

| Version No. | Date | Description |
|---|---|---|
| *00* | *2011-04-09* | *Original* |
| | | |
| | | |
| | | |
| | | |

***Prepared By:*** *Collin.He* ***Date:*** *2011-04-09*

***Project Engineer***

***Check By:*** *Hans.Hu* ***Date:*** *2011-04-09*

***Reviewer***

# 3 Contents

# 4 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Antenna requirement | 15.203 | Pass |
| Field strength of the fundamental signal | 15.249 (a) | Pass |
| Spurious emissions | 15.249 (a) (d)/15.209 | Pass |
| Band edge (Radiated Emission) | 15.249 (d)/15.205 | Pass |
| 20dB Occupied Bandwidth | 15.215 (c) | Pass |

*Remark:*

*Pass: The EUT complies with the essential requirements in the standard.*

# 5 General Information

## 5.1 Client Information

| | |
|---|---|
| Applicant: | KATUMFEL INDUSTRY LIMITED(HK) |
| Address of Applicant: | FuCheng Industrial Town, Hong Tian, ShaJing, ShenZhen |
| Manufacturer/ Factory: | KATUMFELINDUSTRY LIMITED(HK) |
| Address of Manufacturer/ Factory: | FuCheng Industrial Town, Hong Tian, ShaJing, ShenZhen |

## 5.2 General Description of E.U.T.

| | |
|---|---|
| Product Name: | 2.4G transmitter |
| Model No.: | KTH-91102 |
| Operation Frequency: | 2410MHz to 2474.86MHz |
| Channel numbers: | 81 |
| Channel separation: | 0.81075MHz |
| Modulation type: | GFSK |
| Antenna Type: | Integral |
| Antenna gain: | 2dBi |
| Power Supply: | 4X1.5V (AA)=6.0V |

| Operation Frequency each of channel | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| 1 | 2410.00000 | 22 | 2427.02575 | 43 | 2444.05150 | 64 | 2461.07725 |
| 2 | 2410.81075 | 23 | 2427.83650 | 44 | 2444.86225 | 65 | 2461.88800 |
| 3 | 2411.62150 | 24 | 2428.64725 | 45 | 2445.67300 | 66 | 2462.69875 |
| 4 | 2412.43225 | 25 | 2429.45800 | 46 | 2446.48375 | 67 | 2463.50950 |
| 5 | 2413.24300 | 26 | 2430.26875 | 47 | 2447.29450 | 68 | 2464.32025 |
| 6 | 2414.05375 | 27 | 2431.07950 | 48 | 2448.10525 | 69 | 2465.13100 |
| 7 | 2414.86450 | 28 | 2431.89025 | 49 | 2448.91600 | 70 | 2465.94175 |
| 8 | 2415.67525 | 29 | 2432.70100 | 50 | 2449.72675 | 71 | 2466.75250 |
| 9 | 2416.48600 | 30 | 2433.51175 | 51 | 2450.53750 | 72 | 2467.56325 |
| 10 | 2417.29675 | 31 | 2434.32250 | 52 | 2451.34825 | 73 | 2468.37400 |
| 11 | 2418.10750 | 32 | 2435.13325 | 53 | 2452.15900 | 74 | 2469.18475 |
| 12 | 2418.91825 | 33 | 2435.94400 | 54 | 2452.96975 | 75 | 2469.99550 |
| 13 | 2419.72900 | 34 | 2436.75475 | 55 | 2453.78050 | 76 | 2470.80625 |
| 14 | 2420.53975 | 35 | 2437.56550 | 56 | 2454.59125 | 77 | 2471.61700 |
| 15 | 2421.35050 | 36 | 2438.37625 | 57 | 2455.40200 | 78 | 2472.42775 |
| 16 | 2422.16125 | 37 | 2439.18700 | 58 | 2456.21275 | 79 | 2473.23850 |
| 17 | 2422.97200 | 38 | 2439.99775 | 59 | 2457.02350 | 80 | 2474.04925 |
| 18 | 2423.78275 | 39 | 2440.80850 | 60 | 2457.83425 | 81 | 2474.86000 |
| 19 | 2424.59350 | 40 | 2441.61925 | 61 | 2458.64500 | | |
| 20 | 2425.40425 | 41 | 2442.43000 | 62 | 2459.45575 | | |
| 21 | 2426.21500 | 42 | 2443.24075 | 63 | 2460.26650 | | |

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

| Channel | Frequency |
|---|---|
| The lowest channel | 2410.00MHz |
| The middle channel | 2442.43MHz |
| The Highest channel | 2474.86MHz |

## 5.3 Test mode

| Transmitting mode: | Keep the EUT in transmitting mode with modulation. |
|---|---|

**Pre-Test Mode:** (lowest channel)

GTS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:

| Axis | X | Y | Z |
|---|---|---|---|
| Field Strength(dBuV/m) | 95.24 | 103.59 | 100.25 |

**Final Test Mode:**

According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”:

Y axis (see the test setup photo)

## 5.4 Test Facility

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

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, July 20, 2010.

● **Industry Canada (IC)**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.

## 5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480 Fax: 0755-27798960

## 5.6 Other Information Requested by the Customer

None.

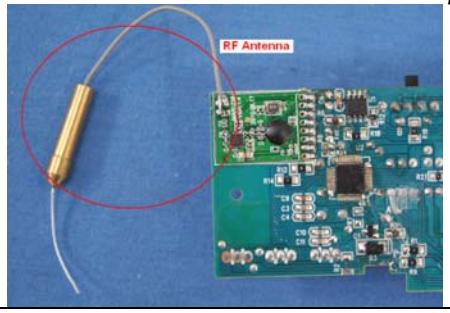
## 5.7 Test Instruments list

| Radiated Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (dd-mm-yy)** | **Cal.Due date (dd-mm-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS201 | Mar. 30 2011 | Mar. 30 2012 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS202 | N/A | N/A |
| 3 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | Sept. 10 2010 | Sept. 10 2011 |
| 4 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9163 | GTS204 | Feb. 26 2011 | Feb. 26 2012 |
| 5 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | 9120D-829 | GTS205 | June 30 2010 | June 30 2011 |
| 6 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 7 | Coaxial Cable | GTS | N/A | GTS400 | Apr. 01 2011 | Apr. 01 2012 |
| 8 | Coaxial Cable | GTS | N/A | GTS401 | Apr. 01 2011 | Apr. 01 2012 |
| 9 | Coaxial cable | GTS | N/A | GTS402 | Apr. 01 2011 | Apr. 01 2012 |
| 10 | Coaxial Cable | GTS | N/A | GTS407 | Apr. 01 2011 | Apr. 01 2012 |
| 11 | Coaxial Cable | GTS | N/A | GTS408 | Apr. 01 2011 | Apr. 01 2012 |
| 12 | Amplifier(100KHz-3GHz) | HP | 8347A | GTS210 | Aug. 03 2010 | Aug. 03 2011 |
| 13 | Amplifier(2GHz-20GHz) | HP | 8349B | GTS224 | Aug. 03 2010 | Aug. 03 2011 |

| Conducted Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (dd-mm-yy)** | **Cal.Due date (dd-mm-yy)** |
| 1 | Shielding Room | ZhongYu Electron | 7.0(L)x3.0(W)x3.0(H) | GTS206 | Apr. 10 2011 | Apr. 10 2012 |
| 2 | EMI Test Receiver | Rohde & Schwarz | ESCS30 | GTS208 | Sept. 14 2010 | Sept. 14 2011 |
| 3 | 10dB Pulse Limita | Rohde & Schwarz | N/A | GTS209 | Sept. 14 2010 | Sept. 14 2011 |
| 4 | LISN | SCHWARZBECK MESS-ELEKTRONIK | NSLK 8127 | GTS207 | Apr. 14 2010 | Apr. 14 2011 |
| 5 | Coaxial Cable | GTS | N/A | GTS406 | Apr. 01 2011 | Apr. 01 2012 |
| 6 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |

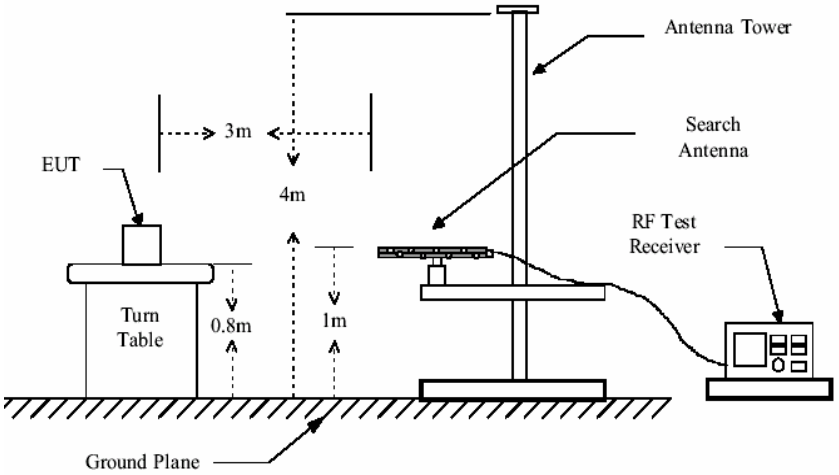
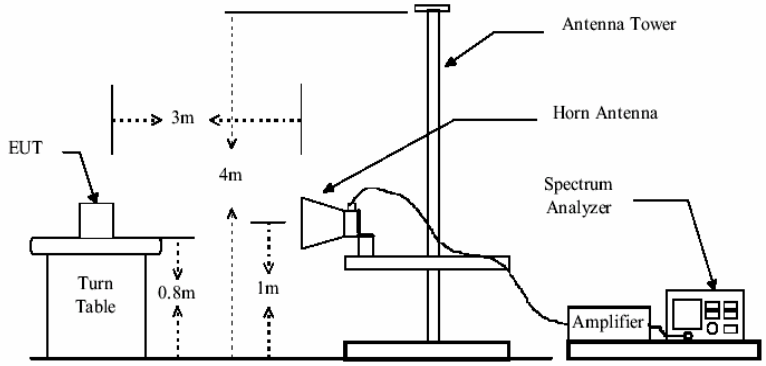
# 6 Test results and Measurement Data

## 6.1 Antenna requirement:

| | |
|---|---|
| **Standard requirement:** | FCC Part15 C Section 15.203 |
| 15.203 requirement:<br>*An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.* | |
| **E.U.T Antenna:** | |
| *The antenna is no consideration of replacement. The best case gain of the antenna is 2dBi.*<br>  | |

## 6.2 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.249 and 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4:2003</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 25000MHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:<br>(Field strength of the fundamental signal)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBµV/m @3m)</th><th>Remark</th></tr>
<tr><td rowspan="2">2400MHz-2483.5MHz</td><td>94.0</td><td>Average Value</td></tr>
<tr><td>114.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:<br>(Spurious Emissions)</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBµV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>74.0</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:<br>(band edge)</td><td>Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.</td></tr>
<tr><td>Test Procedure:</td><td>a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.<br>c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.<br>d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.</td></tr>
</table>

| | |
|---|---|
| Test setup: | Below 1GHz<br>  <br><br>Above 1GHz<br>  <br> |
| Test Instruments: | Refer to section 5.7 |
| Test mode: | Refer to section 5.3 |
| Test results: | Passed |

*Note:*
*The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:*

*Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*

**Measurement Data**

## 6.2.1 Field Strength Of The Fundamental Signal

Peak value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 2410 | 102.71 | 27.57 | 3.37 | 30.06 | 103.59 | 114.00 | -10.41 | Horizontal |
| 2410 | 98.43 | 27.57 | 3.37 | 30.06 | 99.31 | 114.00 | -14.69 | Vertical |
| 2442.43 | 101.81 | 27.48 | 3.43 | 29.99 | 102.73 | 114.00 | -11.27 | Horizontal |
| 2442.43 | 98.23 | 27.48 | 3.43 | 29.99 | 99.15 | 114.00 | -14.85 | Vertical |
| 2474.86 | 101.35 | 27.52 | 3.49 | 29.93 | 102.43 | 114.00 | -11.57 | Horizontal |
| 2474.86 | 98.09 | 27.52 | 3.49 | 29.93 | 99.17 | 114.00 | -14.83 | Vertical |

Average value:

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | polarization |
|---|---|---|---|---|---|---|---|---|
| 2410 | 85.22 | 27.57 | 3.37 | 30.06 | 86.10 | 94.00 | -7.90 | Horizontal |
| 2410 | 82.07 | 27.57 | 3.37 | 30.06 | 82.95 | 94.00 | -11.05 | Vertical |
| 2442.43 | 81.26 | 27.48 | 3.43 | 29.99 | 82.18 | 94.00 | -11.82 | Horizontal |
| 2442.43 | 79.16 | 27.48 | 3.43 | 29.99 | 80.08 | 94.00 | -13.92 | Vertical |
| 2474.86 | 83.26 | 27.52 | 3.49 | 29.93 | 84.34 | 94.00 | -9.66 | Horizontal |
| 2474.86 | 80.19 | 27.52 | 3.49 | 29.93 | 81.27 | 94.00 | -12.73 | Vertical |

## 6.2.2 Spurious Emissions

| 30MHz~1GHz | | |
|---|---|---|
| Test mode: | Transmitting | |

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Preamp Factor (dB) | Read Level (dBuV) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 39.70 | 0.60 | 11.30 | 28.09 | 40.20 | 24.01 | 40.00 | -15.99 | Vertical |
| 118.27 | 1.25 | 8.02 | 27.70 | 46.99 | 28.56 | 43.50 | -14.94 | Vertical |
| 129.91 | 1.28 | 7.70 | 27.61 | 49.29 | 30.66 | 43.50 | -12.84 | Vertical |
| 144.46 | 1.31 | 8.53 | 27.49 | 46.35 | 28.70 | 43.50 | -14.80 | Vertical |
| 432.55 | 2.34 | 16.56 | 27.52 | 42.40 | 33.78 | 46.00 | -12.22 | Vertical |
| 78.50 | 1.05 | 7.59 | 28.00 | 39.12 | 19.76 | 40.00 | -20.24 | Horizontal |
| 118.27 | 1.25 | 8.02 | 27.70 | 43.50 | 25.07 | 43.50 | -18.43 | Horizontal |
| 129.91 | 1.28 | 7.70 | 27.61 | 51.67 | 33.04 | 43.50 | -10.46 | Horizontal |
| 144.46 | 1.31 | 8.53 | 27.49 | 41.60 | 23.95 | 43.50 | -19.55 | Horizontal |
| 710.94 | 2.94 | 21.60 | 27.24 | 37.50 | 34.80 | 46.00 | -11.20 | Horizontal |

| Above 1GHz | | | | | |
|---|---|---|---|---|---|
| Test mode: | Transmitting | Test channel: | Lowest | Remark: | Peak |

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 4820 | 44.58 | 31.79 | 5.34 | 24.07 | 57.64 | 74.00 | -16.36 | Vertical |
| 7230 | 40.75 | 36.41 | 6.91 | 26.62 | 57.45 | 74.00 | -16.55 | Vertical |
| 9640 | 41.16 | 40.25 | 7.58 | 27.85 | 61.14 | 74.00 | -12.86 | Vertical |
| 12050 | * | * | * | * | * | 74.00 | * | Vertical |
| 14460 | * | * | * | * | * | 74.00 | * | Vertical |
| 4820 | 48.45 | 31.79 | 5.34 | 24.07 | 61.51 | 74.00 | -12.49 | Horizontal |
| 7230 | 44.21 | 36.41 | 6.91 | 26.62 | 60.91 | 74.00 | -13.09 | Horizontal |
| 9640 | 44.21 | 40.25 | 7.58 | 27.85 | 64.19 | 74.00 | -9.81 | Horizontal |
| 12050 | * | * | * | * | * | 74.00 | * | Horizontal |
| 14460 | * | * | * | * | * | 74.00 | * | Horizontal |

| Test mode: | Transmitting | Test channel: | Lowest | Remark: | average |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 4820 | 22.27 | 31.79 | 5.34 | 24.07 | 35.33 | 54.00 | -18.67 | Vertical |
| 7230 | 19.49 | 36.41 | 6.91 | 26.62 | 36.19 | 54.00 | -17.81 | Vertical |
| 9640 | 20.95 | 40.25 | 7.58 | 27.85 | 40.93 | 54.00 | -13.07 | Vertical |
| 12050 | * | * | * | * | * | 54.00 | * | Vertical |
| 14460 | * | * | * | * | * | 54.00 | * | Vertical |
| 4820 | 25.57 | 31.79 | 5.34 | 24.07 | 38.63 | 54.00 | -15.37 | Horizontal |
| 7230 | 22.94 | 36.41 | 6.91 | 26.62 | 39.64 | 54.00 | -14.36 | Horizontal |
| 9640 | 22.55 | 40.25 | 7.58 | 27.85 | 42.53 | 54.00 | -11.47 | Horizontal |
| 12050 | * | * | * | * | * | 54.00 | * | Horizontal |
| 14460 | * | * | * | * | * | 54.00 | * | Horizontal |

*Remark:*

1. *"*", means this data is the too weak instrument of signal is unable to test.*
2. *Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*
3. *The emission levels of 6th harmonic are very lower than the limit and not show in test report.*

| Test mode: | Transmitting | Test channel: | Middle | Remark: | Peak |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 4884.86 | 43.32 | 31.85 | 5.40 | 24.01 | 56.56 | 74.00 | -17.44 | Vertical |
| 7327.29 | 41.14 | 36.41 | 6.91 | 26.65 | 57.81 | 74.00 | -16.19 | Vertical |
| 9769.72 | 40.58 | 41.55 | 7.94 | 27.22 | 62.85 | 74.00 | -11.15 | Vertical |
| 12212.15 | * | * | * | * | * | 74.00 | * | Vertical |
| 14654.58 | * | * | * | * | * | 74.00 | * | Vertical |
| 4884.86 | 46.78 | 31.85 | 5.40 | 24.01 | 60.02 | 74.00 | -13.98 | Horizontal |
| 7327.29 | 44.08 | 36.41 | 6.91 | 26.65 | 60.75 | 74.00 | -13.25 | Horizontal |
| 9769.72 | 44.25 | 41.55 | 7.94 | 27.22 | 66.52 | 74.00 | -7.48 | Horizontal |
| 12212.15 | * | * | * | * | * | 74.00 | * | Horizontal |
| 14654.58 | * | * | * | * | * | 74.00 | * | Horizontal |

| Test mode: | Transmitting | Test channel: | Middle | Remark: | average |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 4884.86 | 25.61 | 31.85 | 5.40 | 24.01 | 38.85 | 54.00 | -15.15 | Vertical |
| 7327.29 | 23.54 | 36.41 | 6.91 | 26.65 | 40.21 | 54.00 | -13.79 | Vertical |
| 9769.72 | 22.27 | 41.55 | 7.94 | 27.22 | 44.54 | 54.00 | -9.46 | Vertical |
| 12212.15 | * | * | * | * | * | 54.00 | * | Vertical |
| 14654.58 | * | * | * | * | * | 54.00 | * | Vertical |
| 4884.86 | 28.59 | 31.85 | 5.40 | 24.01 | 41.83 | 54.00 | -12.17 | Horizontal |
| 7327.29 | 26.15 | 36.41 | 6.91 | 26.65 | 42.82 | 54.00 | -11.18 | Horizontal |
| 9769.72 | 24.56 | 41.55 | 7.94 | 27.22 | 46.83 | 54.00 | -7.17 | Horizontal |
| 12212.15 | * | * | * | * | * | 54.00 | * | Horizontal |
| 14654.58 | * | * | * | * | * | 54.00 | * | Horizontal |

*Remark:*

1. *"*", means this data is the too weak instrument of signal is unable to test.*
2. *Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*
3. *The emission levels of 6th harmonic are very lower than the limit and not show in test report.*

| Test mode: | Transmitting | Test channel: | Highest | Remark: | Peak |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 4949.72 | 43.57 | 31.97 | 5.52 | 23.90 | 57.16 | 74.00 | -16.84 | Vertical |
| 7424.58 | 41.08 | 36.66 | 6.96 | 27.08 | 57.62 | 74.00 | -16.38 | Vertical |
| 9899.44 | 42.71 | 42.66 | 8.20 | 27.36 | 66.21 | 74.00 | -7.79 | Vertical |
| 12374.3 | * | * | * | * | * | 74.00 | * | Vertical |
| 14849.16 | * | * | * | * | * | 74.00 | * | Vertical |
| 4949.72 | 46.90 | 31.97 | 5.52 | 23.90 | 60.49 | 74.00 | -13.51 | Horizontal |
| 7424.58 | 43.65 | 36.66 | 6.96 | 27.08 | 60.19 | 74.00 | -13.81 | Horizontal |
| 9899.44 | 43.79 | 42.66 | 8.20 | 27.36 | 67.29 | 74.00 | -6.71 | Horizontal |
| 12374.3 | * | * | * | * | * | 74.00 | * | Horizontal |
| 14849.16 | * | * | * | * | * | 74.00 | * | Horizontal |

| Test mode: | Transmitting | Test channel: | Highest | Remark: | average |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 4960.00 | 25.58 | 31.97 | 5.52 | 23.90 | 39.17 | 54.00 | -14.83 | Vertical |
| 7440.00 | 23.78 | 36.66 | 6.96 | 27.08 | 40.32 | 54.00 | -13.68 | Vertical |
| 9920.00 | 22.70 | 42.66 | 8.20 | 27.36 | 46.20 | 54.00 | -7.80 | Vertical |
| 12400.00 | * | * | * | * | * | 54.00 | * | Vertical |
| 14646.00 | * | * | * | * | * | 54.00 | * | Vertical |
| 4960.00 | 25.61 | 31.97 | 5.52 | 23.90 | 39.20 | 54.00 | -14.80 | Horizontal |
| 7440.00 | 25.78 | 36.66 | 6.96 | 27.08 | 42.32 | 54.00 | -11.68 | Horizontal |
| 9920.00 | 23.19 | 42.66 | 8.20 | 27.36 | 46.69 | 54.00 | -7.31 | Horizontal |
| 12400.00 | * | * | * | * | * | 54.00 | * | Horizontal |
| 14646.00 | * | * | * | * | * | 54.00 | * | Horizontal |

*Remark:*

1. *"*", means this data is the too weak instrument of signal is unable to test.*
2. *Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor*
3. *The emission levels of 6th harmonic are very lower than the limit and not show in test report.*

### 6.2.3 Band edge (Radiated Emission)

| Test mode: | Transmitting | Test channel: | Lowest | Remark: | Peak |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 63.01 | 27.59 | 3.33 | 30.10 | 63.83 | 74.00 | -10.17 | Horizontal |
| 2400.00 | 69.30 | 27.58 | 3.37 | 30.10 | 70.15 | 74.00 | -3.85 | Horizontal |
| 2390.00 | 59.86 | 27.59 | 3.33 | 30.10 | 60.68 | 74.00 | -13.32 | Vertical |
| 2400.00 | 66.04 | 27.58 | 3.37 | 30.10 | 66.89 | 74.00 | -7.11 | Vertical |

| Test mode: | Transmitting | Test channel: | Lowest | Remark: | Average |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2390.00 | 38.56 | 27.59 | 3.33 | 30.10 | 39.38 | 54.00 | -14.62 | Horizontal |
| 2400.00 | 45.20 | 27.58 | 3.37 | 30.10 | 46.05 | 54.00 | -7.95 | Horizontal |
| 2390.00 | 37.12 | 27.59 | 3.33 | 30.10 | 37.94 | 54.00 | -16.06 | Vertical |
| 2400.00 | 42.65 | 27.58 | 3.37 | 30.10 | 43.50 | 54.00 | -10.50 | Vertical |

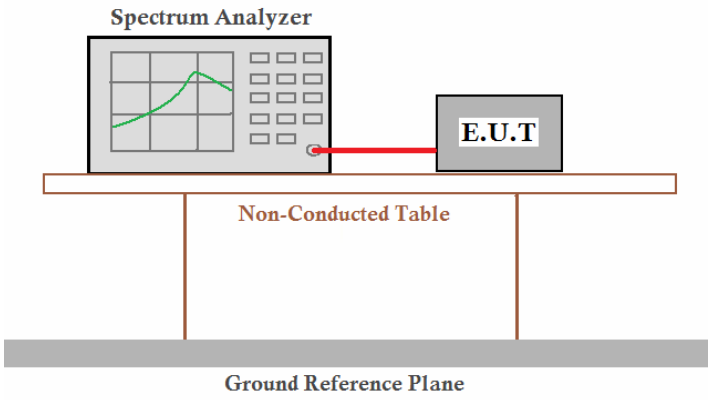
| Test mode: | Transmitting | Test channel: | Highest | Remark: | Peak |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 66.77 | 27.53 | 3.49 | 29.93 | 67.86 | 74.00 | -6.14 | Horizontal |
| 2500.00 | 60.95 | 27.54 | 3.49 | 30.70 | 61.28 | 74.00 | -12.72 | Horizontal |
| 2483.50 | 62.42 | 27.53 | 3.49 | 29.93 | 63.51 | 74.00 | -10.49 | Vertical |
| 2500.00 | 56.09 | 27.54 | 3.49 | 30.70 | 56.42 | 74.00 | -17.58 | Vertical |

| Test mode: | Transmitting | Test channel: | Highest | Remark: | Average |
|---|---|---|---|---|---|

| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
|---|---|---|---|---|---|---|---|---|
| 2483.50 | 42.18 | 27.53 | 3.49 | 29.93 | 43.27 | 54.00 | -10.73 | Horizontal |
| 2500.00 | 38.36 | 27.54 | 3.49 | 30.70 | 38.69 | 54.00 | -15.31 | Horizontal |
| 2483.50 | 40.00 | 27.53 | 3.49 | 29.93 | 41.09 | 54.00 | -12.91 | Vertical |
| 2500.00 | 35.95 | 27.54 | 3.49 | 30.70 | 36.28 | 54.00 | -17.72 | Vertical |

## 6.3 20dB Bandwidth

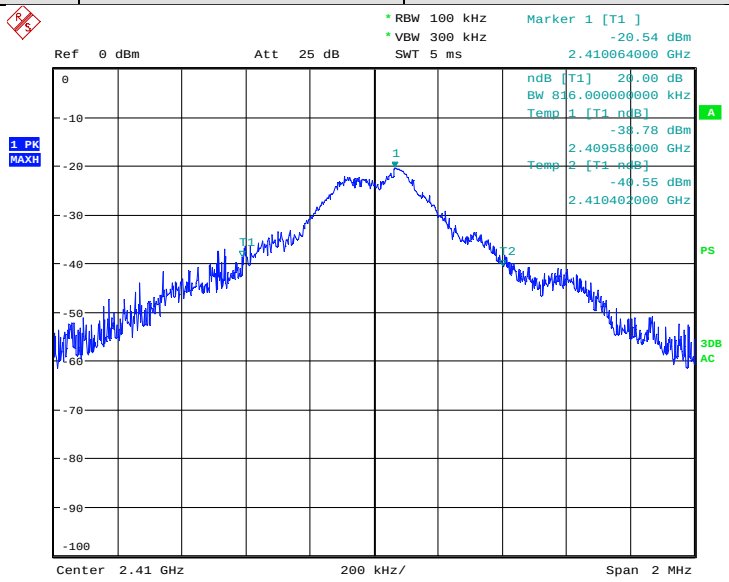
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.249/15.215 |
| Test Method: | ANSI C63.4:2003 |
| Receiver setup: | RBW=10kHz, VBW=30kHz, detector: Peak |
| Limit: | Operation Frequency range 2400MHz-2483.5MHz |
| Test Procedure: | 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT.<br>2. Set the EUT to proper test channel.<br>3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points.<br>4. Read 20dB bandwidth. |
| Test setup: |  |
| Test Instruments: | Refer to section 5.7 for details |
| Test mode: | Refer to section 5.3 for details |
| Test results: | Passed |

**Measurement Data**

| Test channel | 20dB bandwidth (MHz) | Results |
|---|---|---|
| Lowest | 0.816 | Pass |
| Middle | 0.858 | Pass |
| Highest | 0.794 | Pass |

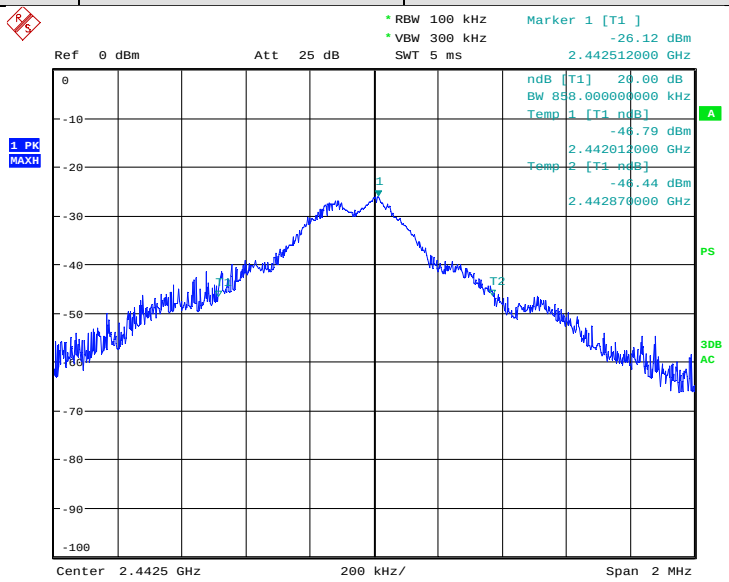
**Test plot as follows:**

| Test channel: | Lowest | |
|---|---|---|




Date: 8.APR.2011 22:18:51

| Test channel: | Middle | |
|---|---|---|

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| Test channel: | Highest | |
|---|---|---|