

FCC REPORT

Applicant: Hulu Robotics Technology Company Limited

Address of Applicant: Unit A, 3/F, Cheong Sun Tower, 116-118 Wing Lok Street,
Sheung Wan, Hong Kong

Equipment Under Test (EUT)

Product Name: 2.4G Wireless Serial-USB

Model No.: MBK-2.4G-USB

FCC ID: 2ACWW1300303U

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.249

Date of sample receipt: 15 May 2015

Date of Test: 15 May to 16 Jun., 2015

Date of report issued: 16 Jun., 2015

Test Result: PASS*

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

Authorized Signature:

A blue circular stamp with the text "SHENZHEN ZHONGJIAN NANFANG TESTING CO., LTD." around the perimeter and "CCIS" in the center. A handwritten signature in black ink is written across the stamp.

Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

| Version No. | Date | Description |
|-------------|---------------|-------------|
| 00 | 16 Jun., 2015 | Original |
| | | |
| | | |
| | | |
| | | |

Prepared By:

Sera Xiang

Project Engineer

Date:

16 Jun., 2015

Check By:

Gaven Liu

Reviewer

Date:

16 Jun., 2015

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4 Test Summary

| Test Item | Section in CFR 47 | Result |
|--|-----------------------|--------|
| Antenna requirement | 15.203 | Pass |
| Conducted Emission | 15.207 | Pass |
| Field strength of the fundamental signal | 15.249 (a) | Pass |
| Spurious emissions | 15.249 (a) (d)/15.209 | Pass |
| Band edge | 15.249 (d)/15.205 | Pass |
| 20dB Occupied Bandwidth | 15.215 (c) | Pass |

Pass: The EUT comply with the essential requirements in the standard.

5 General Information

5.1 Client Information

| | |
|----------------------------------|--|
| Applicant: | Hulu Robotics Technology Company Limited |
| Address of Applicant: | Unit A, 3/F, Cheong Sun Tower, 116-118 Wing Lok Street, Sheung Wan, Hong Kong |
| Manufacturer/Factory: | Maker Works Technology INC |
| Address of Manufacturer/Factory: | Building C3, Floor 4th, Zhiyuan, Xili, Nanshan District, ShenZhen 518057 China |

5.2 General Description of E.U.T.

| | |
|----------------------|--------------------------|
| Product Name: | 2.4G Wireless Serial-USB |
| Model No.: | MBK-2.4G-USB |
| Operation Frequency: | 2404MHz to 2480MHz |
| Channel numbers: | 47 |
| Modulation type: | GFSK |
| Antenna Type: | PCB antenna |
| Antenna gain: | -3dBi |
| Power supply: | DC 5V |

5.3 Test mode

| | | | |
|--|--|-------|-------|
| Transmitting mode: | Keep the EUT in transmitting mode with modulation. | | |
| Pre-Test Mode: (lowest channel=2440MHz) | | | |
| CCIS 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) | 89.66 | 90.58 | 92.19 |
| Final Test Mode: | | | |
| According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”: Z axis (see the test setup photo) | | | |

5.4 Description of Support Units

| Manufacturer | Description | Model | Serial Number | FCC ID/DoC |
|--------------|-------------|-------------|---------------|------------|
| DELL | PC | OPTIPLEX745 | N/A | DoC |
| DELL | MONITOR | E178FPC | N/A | DoC |
| DELL | KEYBOARD | SK-8115 | N/A | DoC |
| DELL | MOUSE | MOC5UO | N/A | DoC |
| HP | Printer | CB495A | 05257893 | DoC |

5.5 Laboratory Facility

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

● **FCC - Registration No.: 817957**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 817957, February 27, 2012.

● **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

5.6 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282

Fax: +86-755-23116366

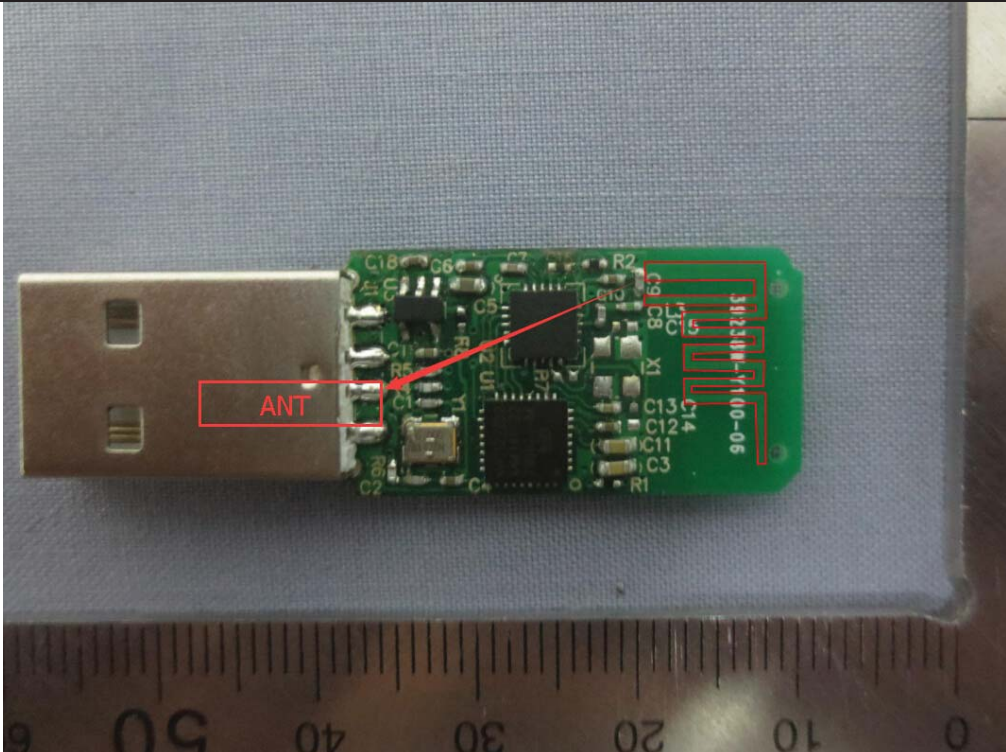
5.7 Test Instruments list

| Radiated Emission: | | | | | | |
|--------------------|----------------------------------|--------------------------------------|-----------------------------|---------------|------------------------|----------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9163 | CCIS0005 | 03-28-2015 | 03-28-2016 |
| 2 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | BBHA9120D | CCIS0006 | 03-28-2015 | 03-28-2016 |
| 3 | Amplifier (10KHz-1.3GHz) | HP | 8447D | CCIS0003 | 04-01-2015 | 03-31-2016 |
| 4 | Amplifier (1GHz-18GHz) | Compliance Direction Systems Inc. | PAP-1G18 | CCIS0011 | 04-01-2015 | 03-31-2016 |
| 5 | Spectrum analyzer | Rohde & Schwarz | FSP | CCIS0023 | 03-28-2015 | 03-28-2016 |
| 6 | EMI Test Receiver | Rohde & Schwarz | ECSI | CCIS0002 | 03-28-2015 | 03-28-2016 |
| 7 | Pre-amplifier (18-26GHz) | Rohde & Schwarz | AFS33-18002 650-30-8P-44 | GTS218 | 04-01-2015 | 03-31-2016 |
| 8 | Horn Antenna | ETS-LINDGREN | 3160 | GTS217 | 04-01-2015 | 03-31-2016 |

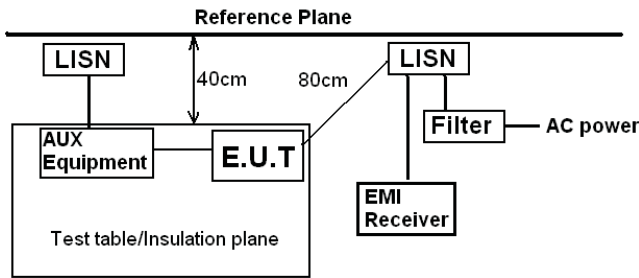
| Conducted Emission: | | | | | | |
|---------------------|-------------------|-----------------|-----------|---------------|------------------------|----------------------------|
| Item | Test Equipment | Manufacturer | Model No. | Inventory No. | Cal.Date (mm-dd-yy) | Cal.Due date (mm-dd-yy) |
| 1 | EMI Test Receiver | Rohde & Schwarz | ESCI | CCIS0002 | 03-28-2015 | 03-28-2016 |
| 2 | LISN | CHASE | MN2050D | CCIS0074 | 03-28-2015 | 03-28-2016 |
| 3 | Coaxial Cable | CCIS | N/A | CCIS0086 | 04-01-2015 | 03-31-2016 |
| 4 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |

6 Test results and Measurement Data

6.1 Antenna requirement:

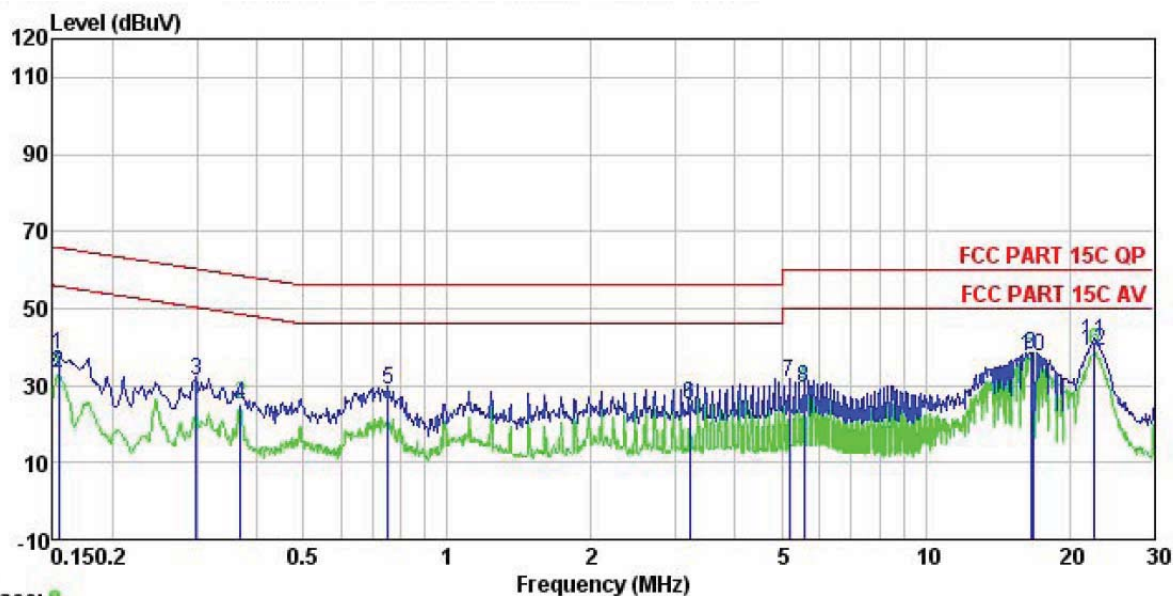
| | |
|--|-----------------------------|
| Standard requirement: | FCC Part15 C Section 15.203 |
| 15.203 requirement: <i>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached 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.</i> | |
| E.U.T Antenna: | |
| <i>The antenna is monopole antenna which cannot detachable . The best case gain of the antenna is -3dBi.</i> | |
|  | |

6.2 Conducted Emissions

| | | | |
|--|--|--------------|-----------|
| Test Requirement: | FCC Part15 C Section 15.249 and 15.209 | | |
| Test Method: | ANSI C63.4:2009 | | |
| Test Frequency Range: | 150 kHz to 30 MHz | | |
| Class / Severity: | Class B | | |
| Receiver setup: | RBW=9 kHz, VBW=30 kHz, Sweep time=auto | | |
| Limit: | Frequency range (MHz) | Limit (dBuV) | |
| | | Quasi-peak | Average |
| | 0.15-0.5 | 66 to 56* | 56 to 46* |
| | 0.5-5 | 56 | 46 |
| | 5-30 | 60 | 50 |
| * Decreases with the logarithm of the frequency. | | | |
| Test setup: |  <p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p> | | |
| Test procedure: | <ol style="list-style-type: none"> 1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement. | | |
| Test Instruments: | Refer to section 5.7 for details | | |
| Test mode: | Transmitting mode | | |
| Test results: | Pass | | |

Measurement Data

Line:

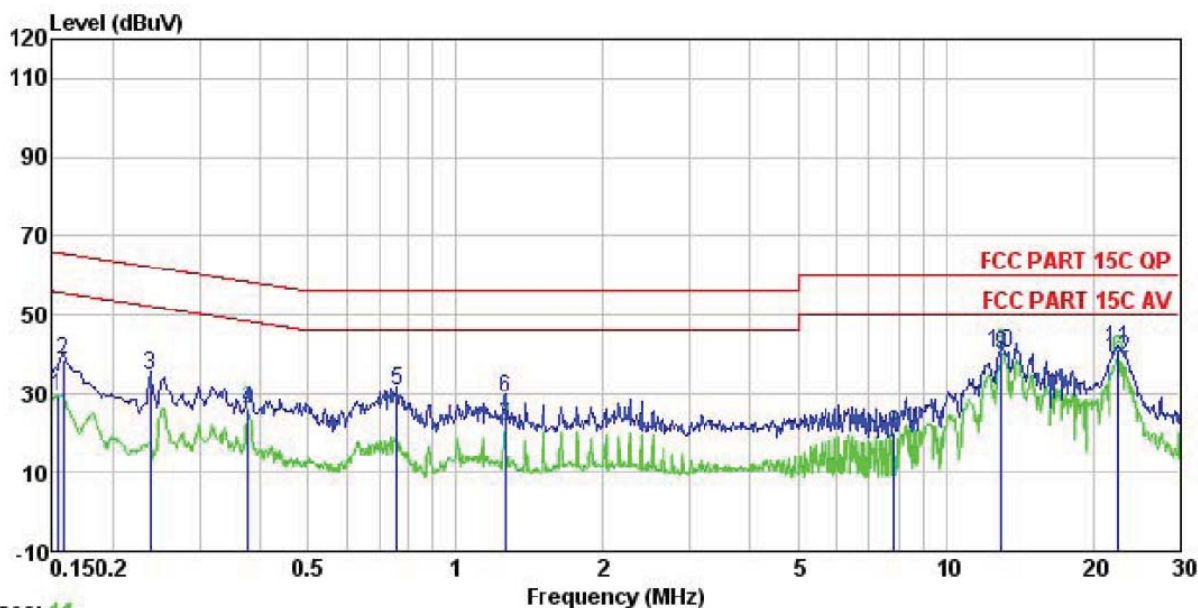


Trace: 9

Site : CCIS Shielding Room
 Condition : FCC PART 15C QP LISN LINE
 EUT : 2.4G Wireless Serial-USB
 Model : MBK-2.4G-USB
 Test Mode : ON mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: GAREN
 Remark :

| | Freq | Read Level | LISN Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|----|--------|------------|-------------|------------|-------|------------|------------|---------|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.154 | 27.11 | 0.27 | 10.78 | 38.16 | 65.78 | -27.62 | QP |
| 2 | 0.154 | 22.21 | 0.27 | 10.78 | 33.26 | 55.78 | -22.52 | Average |
| 3 | 0.299 | 20.42 | 0.26 | 10.74 | 31.42 | 60.28 | -28.86 | QP |
| 4 | 0.369 | 13.99 | 0.27 | 10.73 | 24.99 | 48.52 | -23.53 | Average |
| 5 | 0.751 | 18.01 | 0.23 | 10.79 | 29.03 | 56.00 | -26.97 | QP |
| 6 | 3.207 | 13.97 | 0.27 | 10.91 | 25.15 | 46.00 | -20.85 | Average |
| 7 | 5.194 | 19.68 | 0.30 | 10.84 | 30.82 | 60.00 | -29.18 | QP |
| 8 | 5.564 | 18.21 | 0.30 | 10.83 | 29.34 | 50.00 | -20.66 | Average |
| 9 | 16.573 | 26.59 | 0.33 | 10.91 | 37.83 | 50.00 | -12.17 | Average |
| 10 | 16.750 | 26.39 | 0.33 | 10.91 | 37.63 | 60.00 | -22.37 | QP |
| 11 | 22.416 | 29.77 | 0.43 | 10.90 | 41.10 | 60.00 | -18.90 | QP |
| 12 | 22.535 | 27.63 | 0.44 | 10.89 | 38.96 | 50.00 | -11.04 | Average |

Neutral:



Trace: 11

Site : CCIS Shielding Room
 Condition : FCC PART 15C QP LISN NEUTRAL
 EUT : 2.4G Wireless Serial-USB
 Model : MBK-2.4G-USB
 Test Mode : ON mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: GAREN
 Remark :

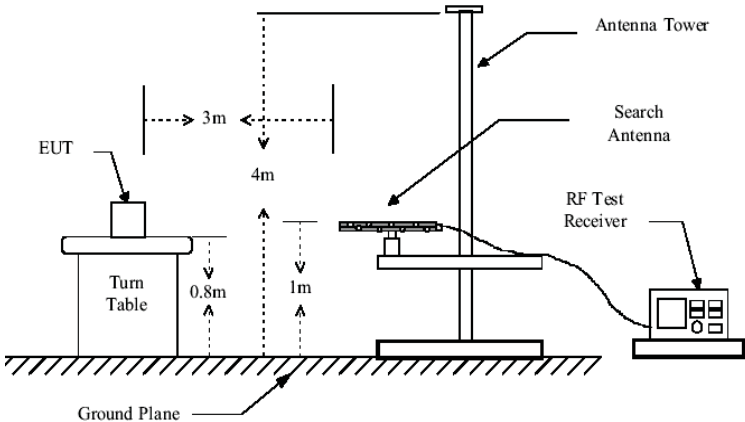
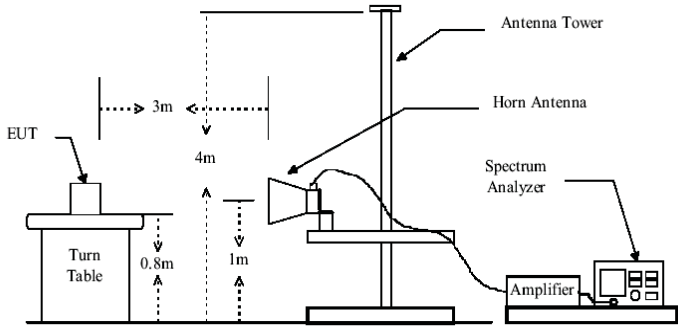
| | Read | LISN | Cable | Limit | Over | |
|-------|--------|--------|-------|-------|-------|----------------------|
| Freq | Level | Factor | Loss | Line | Limit | Remark |
| ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| MHz | dBuV | dB | dB | dBuV | dB | |
| 1 | 0.154 | 18.52 | 0.25 | 10.78 | 29.55 | 55.78 -26.23 Average |
| 2 | 0.158 | 27.44 | 0.25 | 10.78 | 38.47 | 65.56 -27.09 QP |
| 3 | 0.238 | 23.38 | 0.25 | 10.75 | 34.38 | 62.17 -27.79 QP |
| 4 | 0.377 | 15.17 | 0.25 | 10.72 | 26.14 | 48.34 -22.20 Average |
| 5 | 0.759 | 19.71 | 0.19 | 10.80 | 30.70 | 56.00 -25.30 QP |
| 6 | 1.262 | 17.83 | 0.24 | 10.90 | 28.97 | 56.00 -27.03 QP |
| 7 | 1.262 | 10.46 | 0.24 | 10.90 | 21.60 | 46.00 -24.40 Average |
| 8 | 7.852 | 8.75 | 0.26 | 10.84 | 19.85 | 50.00 -30.15 Average |
| 9 | 12.988 | 28.87 | 0.25 | 10.91 | 40.03 | 60.00 -19.97 QP |
| 10 | 12.988 | 29.10 | 0.25 | 10.91 | 40.26 | 50.00 -9.74 Average |
| 11 | 22.416 | 29.88 | 0.37 | 10.90 | 41.15 | 60.00 -18.85 QP |
| 12 | 22.535 | 27.84 | 0.38 | 10.89 | 39.11 | 50.00 -10.89 Average |

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss

6.3 Radiated Emission

| | | | | | |
|---|---|------------|--------------------|--------|------------------|
| Test Requirement: | FCC Part15 C Section 15.249 and 15.209 | | | | |
| Test Method: | ANSI C63.4:2009 | | | | |
| Test Frequency Range: | 30MHz to 25000MHz | | | | |
| Test site: | Measurement Distance: 3m | | | | |
| Receiver setup: | Frequency | Detector | RBW | VBW | Remark |
| | 30MHz-1GHz | Quasi-peak | 120kHz | 300kHz | Quasi-peak Value |
| | Above 1GHz | Peak | 1MHz | 3MHz | Peak Value |
| | | Peak | 1MHz | 10Hz | Average Value |
| Limit: (Field strength of the fundamental signal) | Frequency | | Limit (dBuV/m @3m) | | Remark |
| | 2400MHz-2483.5MHz | | 94.00 | | Average Value |
| | | | 114.00 | | Peak Value |
| Limit: (Spurious Emissions) | Frequency | | Limit (dBuV/m @3m) | | Remark |
| | 30MHz-88MHz | | 40.00 | | Quasi-peak Value |
| | 88MHz-216MHz | | 43.50 | | Quasi-peak Value |
| | 216MHz-960MHz | | 46.00 | | Quasi-peak Value |
| | 960MHz-1GHz | | 54.00 | | Quasi-peak Value |
| | Above 1GHz | | 54.00 | | Average Value |
| | | | 74.00 | | Peak Value |
| Limit: (band edge) | 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. | | | | |
| Test Procedure: | <div>1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.</div> <div>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</div> <div>3. 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.</div> <div>4. 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.</div> <div>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</div> <div>6. 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.</div> | | | | |

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

6.3.1 Field Strength Of The Fundamental Signal

| Peak value | | | | | | | |
|-----------------|-------------------|-----------------------|-----------------|----------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
| 2404.00 | 57.15 | 27.54 | 6.66 | 91.35 | 114.00 | -22.65 | Horizontal |
| 2404.00 | 53.15 | 27.54 | 6.66 | 87.35 | 114.00 | -26.65 | Vertical |
| 2440.00 | 56.47 | 27.46 | 6.76 | 90.69 | 114.00 | -23.31 | Horizontal |
| 2440.00 | 52.30 | 27.46 | 6.76 | 86.52 | 114.00 | -27.48 | Vertical |
| 2480.00 | 57.84 | 27.52 | 6.83 | 92.19 | 114.00 | -21.81 | Horizontal |
| 2480.00 | 54.82 | 27.52 | 6.83 | 89.17 | 114.00 | -24.83 | Vertical |

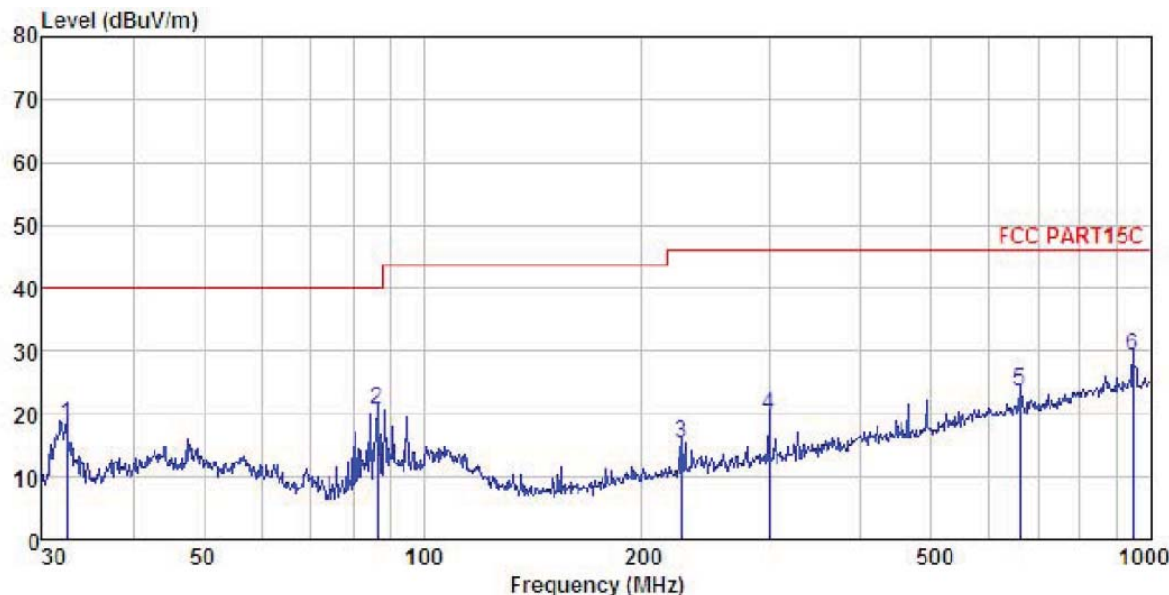
| Average value | | | | | | | |
|-----------------|-------------------|-----------------------|-----------------|----------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
| 2404.00 | 50.24 | 27.54 | 6.66 | 84.44 | 94.00 | -9.56 | Horizontal |
| 2404.00 | 46.55 | 27.54 | 6.66 | 80.75 | 94.00 | -13.25 | Vertical |
| 2440.00 | 49.96 | 27.46 | 6.76 | 84.18 | 94.00 | -9.82 | Horizontal |
| 2440.00 | 44.65 | 27.46 | 6.76 | 78.87 | 94.00 | -15.13 | Vertical |
| 2480.00 | 50.36 | 27.52 | 6.83 | 84.71 | 94.00 | -9.29 | Horizontal |
| 2480.00 | 47.58 | 27.52 | 6.83 | 81.93 | 94.00 | -12.07 | Vertical |

Remark : RBW =3MHz VBW=10MHz Peak detector for PK value ; RMS detector for AV value

6.3.2 Spurious Emissions

Below 1GHz

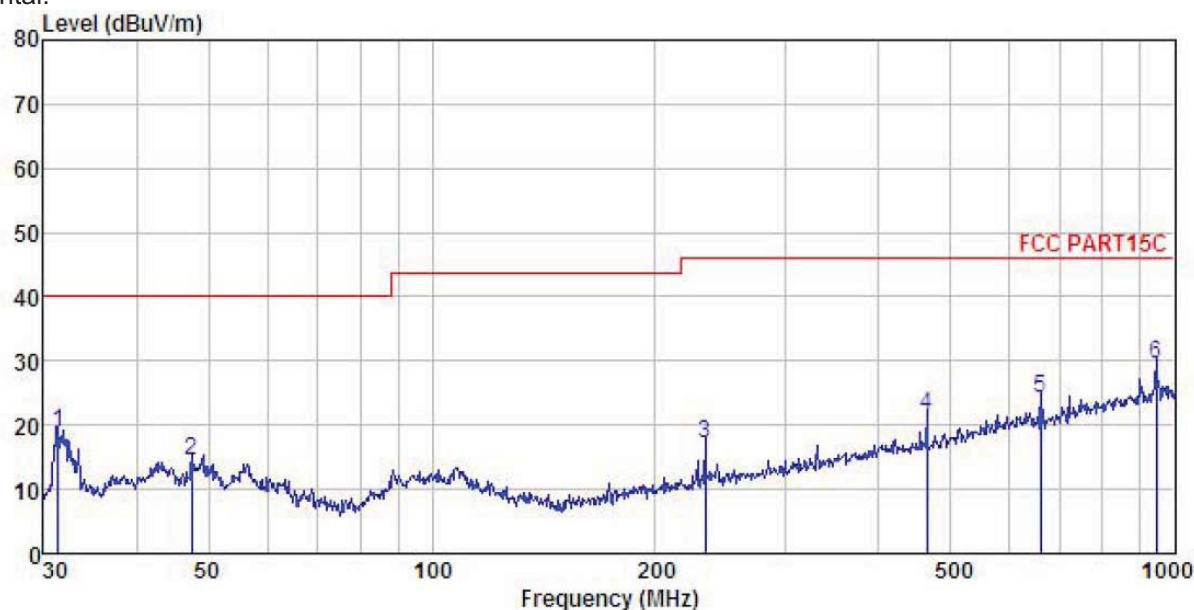
Vertical:



Site : 3m chamber
 Condition : FCC PART15C 3m VULB9163(30M1G) VERTICAL
 EUT : 2.4G Wireless Serial-USB
 Model : MEK-2.4G-USB
 Test mode : ON Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Garen
 REMARK :

| | Freq | ReadAntenna | Cable | Preamp | Limit | Over | |
|---|---------|-------------|-------|--------|-------|--------|-----------------|
| | Level | Factor | Loss | Factor | Line | Limit | Remark |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dB |
| 1 | 32.406 | 35.65 | 12.32 | 0.45 | 29.97 | 18.45 | 40.00 -21.55 QP |
| 2 | 86.503 | 38.49 | 10.89 | 0.89 | 29.59 | 20.68 | 40.00 -19.32 QP |
| 3 | 226.894 | 31.11 | 11.51 | 1.51 | 28.67 | 15.46 | 46.00 -30.54 QP |
| 4 | 298.268 | 33.49 | 13.00 | 1.76 | 28.45 | 19.80 | 46.00 -26.20 QP |
| 5 | 661.151 | 30.84 | 18.67 | 2.82 | 28.75 | 23.58 | 46.00 -22.42 QP |
| 6 | 945.440 | 32.14 | 21.40 | 3.44 | 27.74 | 29.24 | 46.00 -16.76 QP |

Horizontal:



Site : 3m chamber
 Condition : FCC PART15C 3m VULB9163(30M1G) HORIZONTAL
 EUT : 2.4G Wireless Serial-USB
 Model : MBK-2.4G-USB
 Test mode : ON Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Garen
 REMARK :

| | Freq | ReadAntenna | Cable Preamp | | Limit | Over | |
|---|---------|-------------|--------------|-------------|-------|--------|--------|
| | | Level | Factor | Loss Factor | Level | Line | Limit |
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m |
| | | | | | | | dB |
| 1 | 31.399 | 36.12 | 12.32 | 0.44 | 29.97 | 18.91 | 40.00 |
| 2 | 47.492 | 30.42 | 13.41 | 0.59 | 29.84 | 14.58 | 40.00 |
| 3 | 233.349 | 32.38 | 11.78 | 1.54 | 28.63 | 17.07 | 46.00 |
| 4 | 463.970 | 32.39 | 15.71 | 2.30 | 28.89 | 21.51 | 46.00 |
| 5 | 661.151 | 31.47 | 18.67 | 2.82 | 28.75 | 24.21 | 46.00 |
| 6 | 945.440 | 32.47 | 21.40 | 3.44 | 27.74 | 29.57 | 46.00 |

Above 1GHz

| Test channel: | | | Lowest | | Level: | | 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 |
| 4808.00 | 45.44 | 31.53 | 8.90 | 40.24 | 45.63 | 74.00 | -28.37 | Vertical |
| 4808.00 | 46.28 | 31.53 | 8.90 | 40.24 | 46.47 | 74.00 | -27.53 | Horizontal |

| Test channel: | | | Lowest | | Level: | | 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 |
| 4808.00 | 36.38 | 31.53 | 8.90 | 40.24 | 36.57 | 54.00 | -17.43 | Vertical |
| 4808.00 | 36.87 | 31.53 | 8.90 | 40.24 | 37.06 | 54.00 | -16.94 | Horizontal |

| Test channel: | | | Middle | | Level: | | 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 |
| 4880.00 | 42.64 | 31.58 | 8.98 | 40.15 | 43.05 | 74.00 | -30.95 | Vertical |
| 4880.00 | 44.28 | 31.58 | 8.98 | 40.15 | 44.69 | 74.00 | -29.31 | Horizontal |

| Test channel: | | | Middle | | Level: | | 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 |
| 4880.00 | 34.34 | 31.58 | 8.98 | 40.15 | 34.75 | 54.00 | -19.25 | Vertical |
| 4880.00 | 35.12 | 31.58 | 8.98 | 40.15 | 35.53 | 54.00 | -18.47 | Horizontal |

| Test channel: | | | Highest | | Level: | | 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 |
| 4960.00 | 45.69 | 31.69 | 9.08 | 40.03 | 46.43 | 74.00 | -27.57 | Vertical |
| 4960.00 | 45.20 | 31.69 | 9.08 | 40.03 | 45.94 | 74.00 | -28.06 | Horizontal |

| Test channel: | | | Highest | | Level: | | 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 | 35.25 | 31.69 | 9.08 | 40.03 | 35.99 | 54.00 | -18.01 | Vertical |
| 4960.00 | 36.33 | 31.69 | 9.08 | 40.03 | 37.07 | 54.00 | -16.93 | Horizontal |

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

6.3.3 Band edge (Radiated Emission)

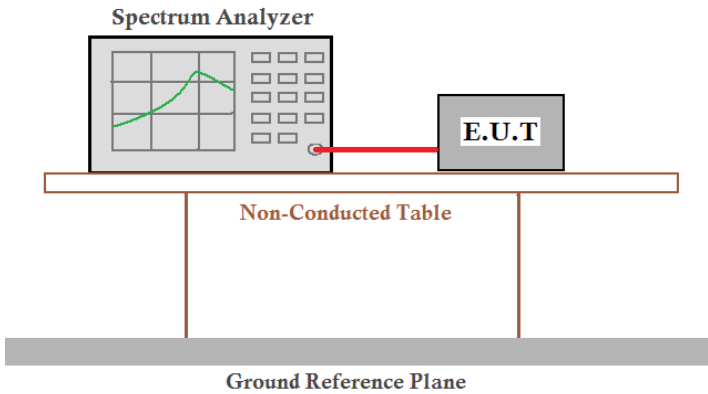
| Test channel: | | | Lowest | | Level: | | Peak | |
|-----------------|-------------------|-----------------------|-----------------|--------------------|----------------|---------------------|-----------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Polarization |
| 2400.00 | 29.77 | 27.58 | 6.66 | 0.00 | 64.01 | 74.00 | -9.99 | Horizontal |
| 2400.00 | 29.75 | 27.58 | 6.66 | 0.00 | 63.99 | 74.00 | -10.01 | Vertical |

| Test channel: | | | Lowest | | Level: | | 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 |
| 2400.00 | 17.59 | 27.58 | 6.66 | 0.00 | 51.83 | 54.00 | -2.17 | Horizontal |
| 2400.00 | 17.25 | 27.58 | 6.66 | 0.00 | 51.49 | 54.00 | -2.51 | Vertical |

| Test channel: | | | Highest | | Level: | | 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 | 32.82 | 27.52 | 6.85 | 0.00 | 67.19 | 74.00 | -6.81 | Horizontal |
| 2483.50 | 30.95 | 27.52 | 6.85 | 0.00 | 65.32 | 74.00 | -8.68 | Vertical |

| Test channel: | | | Highest | | Level: | | 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 | 17.82 | 27.52 | 6.85 | 0.00 | 52.19 | 54.00 | -1.81 | Horizontal |
| 2483.50 | 17.12 | 27.52 | 6.85 | 0.00 | 51.49 | 54.00 | -2.51 | Vertical |

6.4 20dB Bandwidth

| | |
|-------------------|---|
| Test Requirement: | FCC Part15 C Section 15.249/15.215 |
| Test Method: | ANSI C63.4:2009 |
| Receiver setup: | RBW $\geq 1\%$ of the 20 dB bandwidth, VBW \geq VBW, detector: Peak |
| Limit: | Operation Frequency range 2400MHz-2483.5MHz |
| Test Procedure: | <ol style="list-style-type: none"> 1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set the EUT to proper test channel. 3. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. 4. Read 20dB bandwidth. |
| Test setup: |  <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.</p> |
| Test Instruments: | Refer to section 4.7 for details |
| Test mode: | Refer to section 4.3 for details |
| Test results: | Passed |

Measurement Data

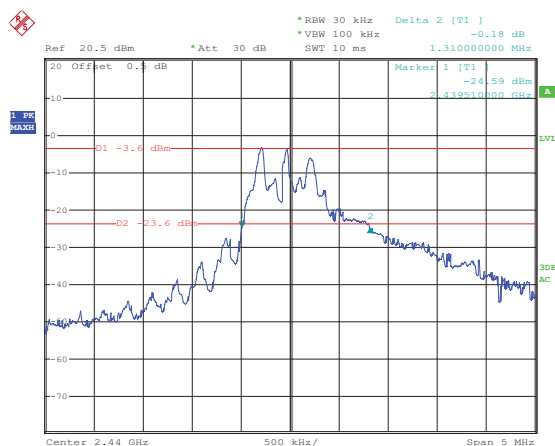
| Test channel | 20dB bandwidth (MHz) | Results |
|--------------|----------------------|---------|
| Lowest | 1.66 | Pass |
| Middle | 1.31 | Pass |
| Highest | 1.21 | Pass |

Test plot as follows:



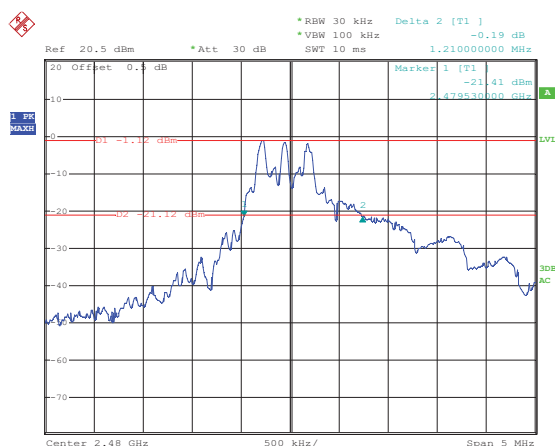
Date: 16.JUN.2015 16:35:41

Lowest channel



Date: 16.JUN.2015 16:41:14

Middle channel



Date: 16.JUN.2015 16:33:21

Highest channel