



**Spectrum Research & Testing Lab., Inc.**  
 No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

# TEST REPORT

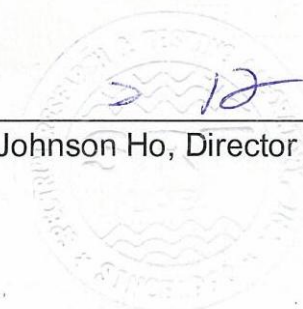
Reference No.: A14101501  
 Report No.: FCCA14101501  
 FCC ID : QSWDHRCS1  
 Page: 1 of 52  
 Date: Nov. 10, 2014

Product Name: TP3 Duplex Heart Rate Transmitter  
 Model No.: ZT26D  
 Applicant: Zentan Technology Co., Ltd  
 NO.92, Hsing-Sheng Road, Chia-Li District, Tainan City, 72254 Taiwan  
 Date of Receipt: Oct. 15, 2014  
 Finished date of Test: Nov. 05, 2014  
 Applicable Standards: 47 CFR Part 15, Subpart C, 15.247  
 ANSI C63.4: 2003  
 FCC publication KDB 558074 D01 v03r02 Measurement of Digital Transmission Systems (DTS) Operating under Section 15.247 June 5, 2014

We, **Spectrum Research & Testing Laboratory Inc.**, hereby certify that one sample of the above was tested in our laboratory with positive results according to the above-mentioned standards. The records in the report are an accurate account of the results. Details of the results are given in the subsequent pages of this report.

Tested By : Richard Lin , Date: 11/10/2014  
 (Richard Lin)

Approved By : [Signature] , Date: 11/10/2014  
 ( Johnson Ho, Director )





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## Revisions History

| Report No.   | Issue Date    | Revisions     |
|--------------|---------------|---------------|
| FCCA14101501 | Nov. 10, 2014 | Initial issue |



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## 1. DOCUMENT POLICY AND TEST STATEMENT

### 1.1 DOCUMENT POLICY

- The report shall not be reproduced except in full, without the written approval of SRT Lab, Inc.

### 1.2 TEST STATEMENT

- The test results in the report apply only to the unit tested by SRT Lab.
- There was no deviation from the requirements of test standards during the test.
- DC power source, 3Vdc of CR2032 battery.
- New DC dry battery (CR2032) was used during testing.

### 1.3 EUT MODIFICATION

- No modification in SRT Lab.

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**TEST REPORT**Reference No.: A14101501  
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Page: 6 of 52  
Date: Nov. 10, 2014**2. DESCRIPTION OF EUT AND TEST MODE****2.1 GENERAL DESCRIPTION OF EUT**

|                                    |  |
|------------------------------------|--|
| <b>PRODUCT</b>                     | TP3 Duplex Heart Rate Transmitter              |
| <b>MODEL NO.</b>                   | ZT26D  |
| <b>POWER SUPPLY</b>                | DC power source from CR2032 battery : DC 3.0V  |
| <b>CABLE</b>                       | NA   |
| <b>FREQUENCY BAND</b>              | 2.4 GHz (Bluetooth V4.0 Low Energy, no BR/EDR) |
| <b>CARRIER FREQUENCY</b>           | 2.402 GHz ~ 2.480 GHz                          |
| <b>NUMBER OF CHANNEL</b>           | 40   |
| <b>RATED RF OUTPUT POWER</b>       | -4.23 dBm                                      |
| <b>MODULATION TYPE</b>             | GFSK   |
| <b>MODE OF OPERATION</b>           | Duplex   |
| <b>ANTENNA TYPE</b>                | Chip Antenna                                   |
| <b>ANTENNA GAIN</b>                | 1.57 dBi                                       |
| <b>OPERATING TEMPERATURE RANGE</b> | -20 ~ 55°C                                     |

**NOTE:**

The EUT operates in single mode Bluetooth Low Energy, therefore, no BR/EDR tests were performed. For more detailed information, please refer to the EUT's specification or user's manual provided by manufacturer.

**2.2 DESCRIPTION OF EUT INTERNAL DEVICE**

| <b>DEVICE</b> | <b>BRAND / MAKER</b> | <b>MODEL #</b> | <b>FCC ID / DOC</b> | <b>REMARK</b> |
|---------------|----------------------|----------------|---------------------|---------------|
|               |                      |                |                     |               |



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## 2.3 DESCRIPTION OF TEST MODE

| Mode |         | Frequency |
|------|---------|-----------|
| 1    | Tx-1    | 2402 MHz  |
| 2    | Tx-2    | 2440 MHz  |
| 3    | Tx-3    | 2480 MHz  |
| 4    | Standby | N/A       |
| 5    | Link    | N/A       |

**NOTE:** The axis X,Y and Z we evaluate in chamber, the X axis is worst case.

X axis:



Y axis:



Z axis:



## 2.4 EUT OPERATING CONDITION

Tx-1, Tx-2, Tx3 :

1. For use customer provided continuous transmission EUT.
2. Setup 3V CR2032 Battery to EUT. Turn on the power.
3. Shake one time. Into mode : Tx-1.
4. Shake one time. Into mode : Tx-2.
5. Shake one time. Into mode : Tx-3.

Standby, Link :

1. For use customer provided normal EUT.
2. Setup 3V CR2032 Battery to EUT. Turn on the power.
3. Into mode : Standby.
4. Turn on peripheral devices (iPad) & open Cadence Pod App.
5. Connect & Pair the EUT to iPad App. Into mode : Link.



## 2.5 DESCRIPTION OF SUPPORT UNIT

The EUT was configured by the requirement of ANSI C63.4:2003. All interface ports were connected to the appropriate support units via specific cables. The support units and cables are listed below.

| NO | DEVICE         | BRAND | MODEL # | FCC ID/DOC | CABLE |
|----|----------------|-------|---------|------------|-------|
| 1  | iPad Wi-Fi 16G | Apple | A1458   | BCGA1458   | N/A   |

**NOTE:** For the actual test configuration, please refer to the photos of testing.

## 2.6 CHANNEL AND FREQUENCY TABLE

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| CH01    | 2402 MHz  | CH21    | 2442 MHz  |
| CH02    | 2404 MHz  | CH22    | 2444 MHz  |
| CH03    | 2406 MHz  | CH23    | 2446 MHz  |
| CH04    | 2408 MHz  | CH24    | 2448 MHz  |
| CH05    | 2410 MHz  | CH25    | 2450 MHz  |
| CH06    | 2412 MHz  | CH26    | 2452 MHz  |
| CH07    | 2414 MHz  | CH27    | 2454 MHz  |
| CH08    | 2416 MHz  | CH28    | 2456 MHz  |
| CH09    | 2418 MHz  | CH29    | 2458 MHz  |
| CH10    | 2420 MHz  | CH30    | 2460 MHz  |
| CH11    | 2422 MHz  | CH31    | 2462 MHz  |
| CH12    | 2424 MHz  | CH32    | 2464 MHz  |
| CH13    | 2426 MHz  | CH33    | 2466 MHz  |
| CH14    | 2428 MHz  | CH34    | 2468 MHz  |
| CH15    | 2420 MHz  | CH35    | 2470 MHz  |
| CH16    | 2432 MHz  | CH36    | 2472 MHz  |
| CH17    | 2434 MHz  | CH37    | 2474 MHz  |
| CH18    | 2436 MHz  | CH38    | 2476 MHz  |
| CH19    | 2438 MHz  | CH39    | 2478 MHz  |
| CH20    | 2440 MHz  | CH40    | 2480 MHz  |



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**3. DESCRIPTION OF APPLIED STANDARDS**

The EUT is a wireless product. According to the specifications provided by the applicant, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C, 15.247

ANSI C63.4: 2003

FCC publication KDB 558074 D01 v03r02 Measurement of Digital Transmission Systems (DTS) Operating under Section 15.247 June 5, 2014

All tests have been performed and recorded as the above standards.

**3.1 SUMMARY OF TEST RESULTS**

The EUT has been tested according to the following specifications:

| <b>STANDARD SECTION</b> | <b>TEST TYPE AND LIMIT RESULTS</b>  | <b>RESULTS</b> |
|-------------------------|---|----------------|
| 15.203                  | Antenna requirement   | PASS           |
| 15.207                  | AC Power Line Conducted Emission  | N/A            |
| 15.247(a)(2)            | 6 dB Bandwidth<br>Limit: minimum of 500 kHz   | PASS           |
| 15.247(b)               | Peak Power Test:<br>Limit: 21 dBm   | PASS           |
| 15.247(d)               | Band Edge Measurement:<br>Limit: 20dB less than the peak value of fundamental frequency | PASS           |
| 15.247(d)               | Transmitter Radiated Emissions<br>Limit: Table 15.209                                   | PASS           |
| 15.247(e)               | Power Density:<br>Limit: 8dBm/3kHz  | PASS           |

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Date: Nov. 10, 2014**4. TECHNICAL CHARACTERISTICS TEST****4.1 RADIATED EMISSION TEST****4.1.1 LIMIT**

FCC Part15, Subpart C Section 15.209 limit of radiated emission for frequency below1000MHz. The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| FREQUENCY (MHz) | FIELD STRENGTH (microvolts/meter) | DISTANCE (m) | FIELD STRENGTH (dBμV/m) |
|-----------------|-----------------------------------|--------------|-------------------------|
| 0.009 - 0.490   | 2400/F(kHz)                       | 300          | 67.6-20log(kHz)         |
| 0.490 - 1.705   | 24000/F(kHz)                      | 30           | 87.6-20log(kHz)         |
| 1.705 - 30      | 30                                | 30           | 30                      |
| 30 - 88         | 100                               | 3            | 40.0                    |
| 88 - 216        | 150                               | 3            | 43.5                    |
| 216 - 960       | 200                               | 3            | 46.0                    |
| Above 960       | 500                               | 3            | 54.0                    |

**NOTE:**

1. 30 dBuV (in 30m) = 70 dBuV (in 3m).
2. In the emission tables above , the tighter limit applies at the band edges.
3. Distance refers to the distance between measuring instrument, antenna, and the closest point of any part of the device or system.

FCC Part 15, Section15.35(b) limit of radiated emission for frequency above 1000 MHz

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) |         | Class B (dBuV/m) (at 3m) |         |
|-----------------|--------------------------|---------|--------------------------|---------|
|                 | PEAK                     | AVERAGE | PEAK                     | AVERAGE |
| Above 1000      | 80.0                     | 60.0    | 74.0                     | 54.0    |



## 4.1.2 TEST EQUIPMENT

The following test equipment was used during the radiated emission test:

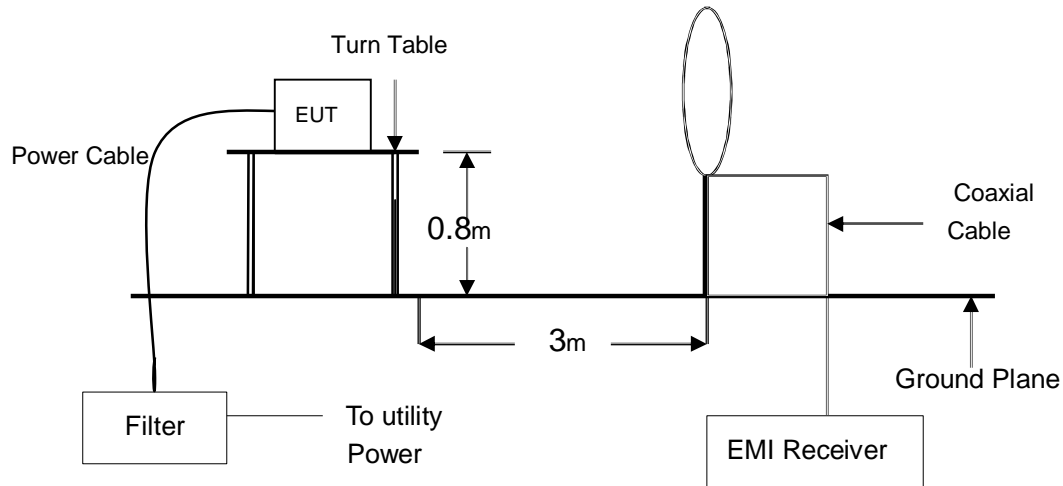
| EQUIPMENT/<br>FACILITIES                      | SPECIFICATIONS       | MANUFACTURER    | MODEL#/<br>SERIAL#             | DUE DATE OF CAL. &<br>CAL. CENTER |
|---|----------------------|-----------------|--------------------------------|-----------------------------------|
| EMI TEST RECEIVER                             | 9 kHz ~ 2.75 GHz     | ROHDE & SCHWARZ | ESCS30 / 100376                | JAN. 12, 2015 ETC                 |
| EMI TEST RECEIVER                             | 20 MHz ~ 1000 MHz    | ROHDE & SCHWARZ | ESVS30 / 841977/003            | DEC. 08, 2014 ETC                 |
| SPECTRUM ANALYZER                             | 9 kHz ~ 40GHz        | ROHDE & SCHWARZ | FSP40 / 100093                 | DEC 08, 2014 ETC                  |
| EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER) | 9 KHz ~ 6 GHz        | ROHDE & SCHWARZ | ESL /100176                    | MAR. 28, 2015 ETC                 |
| LOOP ANTENNA                                  | 9 kHz ~ 30 MHz       | ETS.LINDGREN    | HFH2-Z2/ 860605/002 (1162 1/2) | MAR. 17, 2015 ETC                 |
| BI-LOG ANTENNA                                | 30 MHz ~ 2 GHz       | SCHAFFNER       | CBL6141A / 4181                | JUN. 18, 2015 ETC                 |
| HORN ANTENNA                                  | 1 GHz ~ 18 GHz       | EMCO            | 3115/ 9602-4681                | DEC. 12, 2014 ETC                 |
| HORN ANTENNA                                  | 18 ~ 40 GHZ          | ETS-LINDGREN    | 3116 /00032255                 | JAN. 10, 2015 ETC                 |
| PRE-AMPLIFIER                                 | 1 GHz ~ 26.5 GHz     | AGILENT         | 8449B/ 3008A01995              | DEC. 10, 2014 ETC                 |
| OPEN AREA TEST SITE                           | 3 – 10 M MEASUREMENT | SRT             | A02 / SRT002                   | MAR. 07, 2015 SRT                 |
| ANECHOIC CHAMBER                              | 3 M MEASUREMENT      | SRT             | A01 / SRT001                   | MAY. 7, 2015 SRT                  |
| COAXIAL CABLE                                 | 30 M                 | TIMES           | LMR-400 / #30M(L1TCAB014)      | MAY. 21, 2015 ETC                 |
| FILTER  | 2 LINE, 30 A         | FIL.COIL        | FC-943 / 869                   | NCR                               |
| K-TYPE CABLE                                  | UP TO 40 GHz<br>3 m  | HUBER+SUHNER    | SF102-46/2*11SK 252 /MY2611/2  | MAR. 09, 2015 ETC                 |
| K-TYPE CABLE                                  | UP TO 40 GHz,<br>1 m | HUBER+SUHNER    | SF 102-40/2*11 /23934/2        | OCT. 12, 2015 ETC                 |
| CDN   | 0.15 MHz ~ 300 MHz   | LUTHI           | CDN L-801 M2/M3 / 2790         | MAY. 20, 2015 ETC                 |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

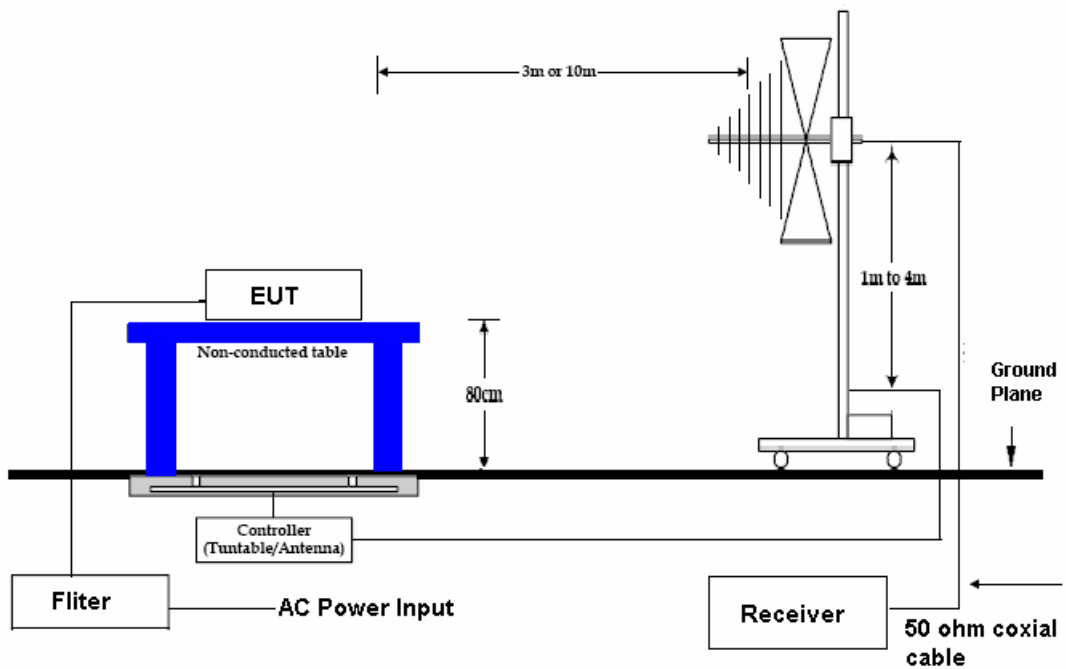


### 4.1.3 TEST SET-UP

#### 9KHz ~ 30MHz

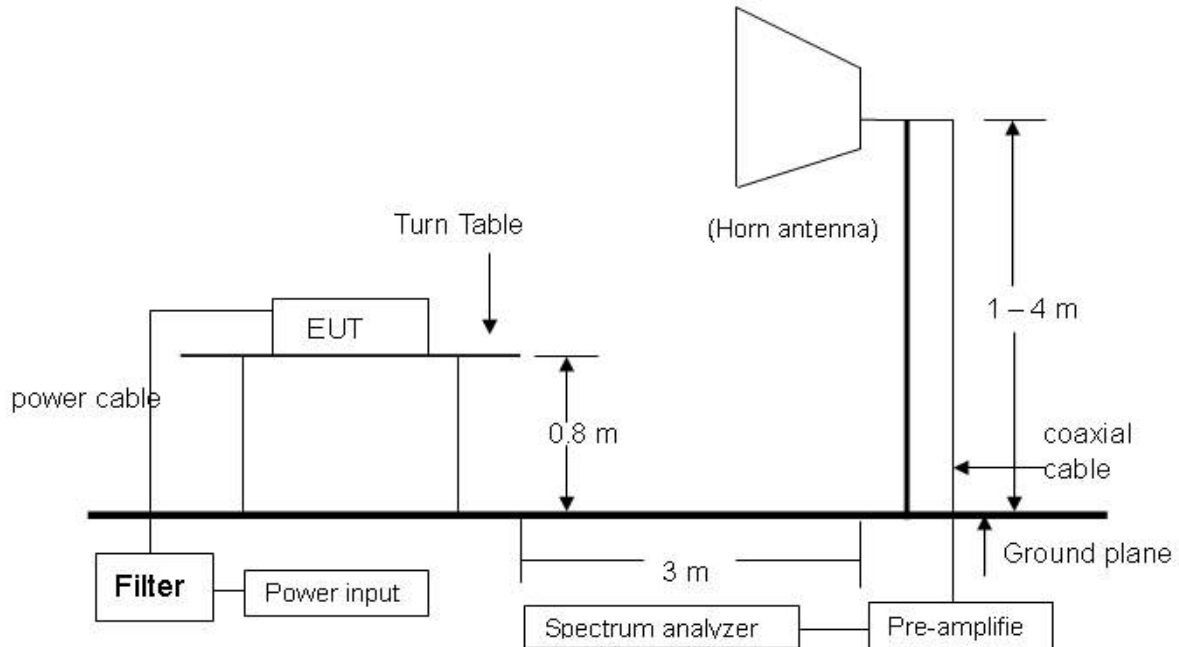


#### 30 MHz ~ 1 GHz





## Above 1 GHz



**NOTE:** The EUT system was put on a wooden table with 0.8m heights above a ground plane.  
For the actual test configuration, please refer to the photos of testing.

### 4.1.4 TEST PROCEDURE

The EUT was tested according to the requirement of ANSI C63.4:2003 and CISPR 22:2003. When the frequency spectrum measured started from 9 kHz to 30 MHz, then use antenna is a loop antenna. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 9kHz to 30MHz and 30 MHz to 1 GHz, all readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak or average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency. First, find the margin or higher points at least 6 points by software, then use manual to find the maximum data. The procedure is referred on the test procedure of SRT LAB.



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## 4.1.5 TEST RESULT

|                    |                       |                    |                      |
|--------------------|-----------------------|--------------------|----------------------|
| Temperature:       | <u>24 °C</u>          | Humidity:          | <u>60 %RH</u>        |
| Frequency Range:   | <u>9 kHz – 30 MHz</u> | Measured Distance: | <u>3 m</u>           |
| Receiver Detector: | <u>AV.</u>            | Tested Mode:       | <u>Tx-1</u>          |
| Tested By:         | <u>Richard Lin</u>    | Tested Date:       | <u>Nov. 05, 2014</u> |

| Frequency (KHz) | Cable Loss (dB) | Ant. Fac. (dB) | Reading (dBμV) | Emission (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) |
|-----------------|-----------------|----------------|----------------|-------------------|---------------------|-------------|
| 8.24            | 0.62            | 20.52          | 7.83           | 28.97             | 70.00               | -41.03      |
| 14.41           | 0.82            | 21.19          | 5.63           | 27.63             | 70.00               | -42.37      |
| 17.75           | 0.92            | 21.55          | 6.25           | 28.71             | 70.00               | -41.29      |
| 19.69           | 0.97            | 21.76          | 6.13           | 28.86             | 70.00               | -41.14      |
| 25.02           | 1.12            | 21.85          | 7.47           | 30.44             | 70.00               | -39.56      |
| 27.13           | 1.17            | 21.87          | 5.41           | 28.45             | 70.00               | -41.55      |

|                    |                       |                    |                      |
|--------------------|-----------------------|--------------------|----------------------|
| Temperature:       | <u>24 °C</u>          | Humidity:          | <u>60 %RH</u>        |
| Frequency Range:   | <u>9 kHz – 30 MHz</u> | Measured Distance: | <u>3 m</u>           |
| Receiver Detector: | <u>AV.</u>            | Tested Mode:       | <u>Tx-2</u>          |
| Tested By:         | <u>Richard Lin</u>    | Tested Date:       | <u>Nov. 05, 2014</u> |

| Frequency (KHz) | Cable Loss (dB) | Ant. Fac. (dB) | Reading (dBμV) | Emission (dBμV/m) | Limit Line (dBμV/m) | Margin (dB) |
|-----------------|-----------------|----------------|----------------|-------------------|---------------------|-------------|
| 8.04            | 0.61            | 20.50          | 8.83           | 29.94             | 70.00               | -40.06      |
| 8.67            | 0.63            | 20.57          | 7.88           | 29.08             | 70.00               | -40.92      |
| 11.48           | 0.73            | 20.86          | 7.06           | 28.65             | 70.00               | -41.35      |
| 22.40           | 1.05            | 21.82          | 7.11           | 29.98             | 70.00               | -40.02      |
| 24.98           | 1.12            | 21.85          | 6.85           | 29.82             | 70.00               | -40.18      |
| 27.52           | 1.18            | 21.88          | 5.55           | 28.61             | 70.00               | -41.39      |

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|--------------------|----------------|--------------------|---------------|
| Temperature:       | 24 °C          | Humidity:          | 60 %RH        |
| Frequency Range:   | 9 kHz – 30 MHz | Measured Distance: | 3 m           |
| Receiver Detector: | AV.            | Tested Mode:       | Tx-3          |
| Tested By:         | Richard Lin    | Tested Date:       | Nov. 05, 2014 |

| Frequency (KHz) | Cable Loss (dB) | Ant. Fac. (dB) | Reading (dB $\mu$ V) | Emission (dB $\mu$ V/m) | Limit Line (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-----------------|----------------|----------------------|-------------------------|---------------------------|-------------|
| 8.56            | 0.63            | 20.56          | 7.55                 | 28.73                   | 70.00                     | -41.27      |
| 16.55           | 0.88            | 21.42          | 6.81                 | 29.11                   | 70.00                     | -40.89      |
| 17.16           | 0.90            | 21.48          | 6.37                 | 28.75                   | 70.00                     | -41.25      |
| 22.03           | 1.04            | 21.82          | 5.96                 | 28.82                   | 70.00                     | -41.18      |
| 25.09           | 1.12            | 21.85          | 7.89                 | 30.86                   | 70.00                     | -39.14      |
| 29.17           | 1.22            | 21.89          | 5.26                 | 28.37                   | 70.00                     | -41.63      |

|                    |                |                    |               |
|--------------------|----------------|--------------------|---------------|
| Temperature:       | 24 °C          | Humidity:          | 60 %RH        |
| Frequency Range:   | 9 kHz – 30 MHz | Measured Distance: | 3 m           |
| Receiver Detector: | AV.            | Tested Mode:       | Standby       |
| Tested By:         | Richard Lin    | Tested Date:       | Nov. 05, 2014 |

| Frequency (KHz) | Cable Loss (dB) | Ant. Fac. (dB) | Reading (dB $\mu$ V) | Emission (dB $\mu$ V/m) | Limit Line (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-----------------|----------------|----------------------|-------------------------|---------------------------|-------------|
| 8.57            | 0.63            | 20.56          | 8.05                 | 29.24                   | 70.00                     | -40.76      |
| 14.85           | 0.83            | 21.23          | 6.86                 | 28.92                   | 70.00                     | -41.08      |
| 19.62           | 0.97            | 21.75          | 5.94                 | 28.66                   | 70.00                     | -41.34      |
| 22.77           | 1.06            | 21.83          | 6.10                 | 28.99                   | 70.00                     | -41.01      |
| 23.51           | 1.08            | 21.84          | 6.21                 | 29.12                   | 70.00                     | -40.88      |
| 25.06           | 1.12            | 21.85          | 7.11                 | 30.08                   | 70.00                     | -39.92      |

**Spectrum Research & Testing Lab., Inc.**

No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

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|                    |                |                    |               |
|--------------------|----------------|--------------------|---------------|
| Temperature:       | 24 °C          | Humidity:          | 60 %RH        |
| Frequency Range:   | 9 kHz – 30 MHz | Measured Distance: | 3 m           |
| Receiver Detector: | AV.            | Tested Mode:       | Link          |
| Tested By:         | Richard Lin    | Tested Date:       | Nov. 05, 2014 |

| Frequency (KHz) | Cable Loss (dB) | Ant. Fac. (dB) | Reading (dB $\mu$ V) | Emission (dB $\mu$ V/m) | Limit Line (dB $\mu$ V/m) | Margin (dB) |
|-----------------|-----------------|----------------|----------------------|-------------------------|---------------------------|-------------|
| 3.01            | 0.38            | 19.70          | 8.80                 | 28.88                   | 70.00                     | -41.12      |
| 8.54            | 0.63            | 20.55          | 8.08                 | 29.26                   | 70.00                     | -40.74      |
| 10.08           | 0.68            | 20.71          | 7.71                 | 29.10                   | 70.00                     | -40.90      |
| 22.19           | 1.04            | 21.82          | 6.61                 | 29.47                   | 70.00                     | -40.53      |
| 25.06           | 1.12            | 21.85          | 7.95                 | 30.92                   | 70.00                     | -39.08      |
| 29.22           | 1.22            | 21.89          | 6.44                 | 29.55                   | 70.00                     | -40.45      |



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|                  |              |               |               |
|------------------|--------------|---------------|---------------|
| Temperature:     | 21 °C        | Humidity:     | 62 %RH        |
| Frequency Range: | 30 M – 1 GHz | Tested Mode:  | Tx-1          |
| Detector Type:   | Quasi-peak   | IF Bandwidth: | 120 kHz       |
| Tested By:       | Richard Lin  | Tested Date:  | Oct. 31, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBµV) | Emission Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 52.34           | 1.41            | 13.86                 | 3.75                | 19.02                   | 40             | -20.98      | 209   | 3.53  |
| 415.29          | 3.71            | 16.54                 | 4.97                | 25.22                   | 46             | -20.78      | 145   | 2.94  |
| 499.77          | 4.16            | 17.59                 | 3.57                | 25.32                   | 46             | -20.69      | 257   | 2.68  |
| 521.50          | 4.28            | 18.31                 | 4.29                | 26.89                   | 46             | -19.11      | 37    | 2.44  |
| 679.91          | 4.99            | 20.14                 | 4.13                | 29.26                   | 46             | -16.74      | 178   | 1.98  |
| 804.63          | 5.62            | 21.90                 | 3.44                | 30.95                   | 46             | -15.05      | 64    | 1.65  |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBµV) | Emission Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 74.45           | 1.53            | 8.20                  | 10.35               | 20.08                   | 40             | -19.92      | 231   | 1.13  |
| 411.83          | 3.68            | 16.48                 | 4.10                | 24.26                   | 46             | -21.74      | 305   | 2.17  |
| 495.24          | 4.14            | 17.55                 | 4.66                | 26.35                   | 46             | -19.66      | 158   | 2.48  |
| 517.56          | 4.26            | 18.18                 | 3.27                | 25.71                   | 46             | -20.29      | 270   | 2.56  |
| 704.95          | 5.10            | 20.22                 | 4.00                | 29.32                   | 46             | -16.68      | 182   | 3.08  |
| 772.22          | 5.48            | 21.69                 | 3.79                | 30.95                   | 46             | -15.05      | 51    | 3.35  |

**NOTE :**

1. Measurement uncertainty is 4.73 dB.
2. "\*\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss – Pre-Amplifier.
4. The field strength of other emission frequencies were very low against the limit.

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|                  |              |               |               |
|------------------|--------------|---------------|---------------|
| Temperature:     | 21 °C        | Humidity:     | 62 %RH        |
| Frequency Range: | 30 M – 1 GHz | Tested Mode:  | Tx-2          |
| Detector Type:   | Quasi-peak   | IF Bandwidth: | 120 kHz       |
| Tested By:       | Richard Lin  | Tested Date:  | Oct. 31, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBµV) | Emission Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 55.71           | 1.42            | 12.90                 | 3.35                | 17.67                   | 40             | -22.33      | 219   | 3.53  |
| 410.59          | 3.68            | 16.46                 | 3.90                | 24.04                   | 46             | -21.96      | 342   | 2.97  |
| 492.84          | 4.12            | 17.52                 | 5.61                | 27.25                   | 46             | -18.75      | 105   | 2.54  |
| 516.34          | 4.25            | 18.14                 | 3.79                | 26.19                   | 46             | -19.81      | 75    | 2.31  |
| 656.06          | 4.89            | 20.19                 | 3.97                | 29.04                   | 46             | -16.96      | 168   | 2.09  |
| 776.95          | 5.49            | 21.70                 | 3.81                | 31.01                   | 46             | -14.99      | 81    | 1.68  |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBµV) | Emission Level (dBµV/m) | Limit (dBµV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 56.17           | 1.42            | 12.58                 | 5.08                | 19.08                   | 40             | -20.92      | 221   | 1.09  |
| 74.68           | 1.53            | 8.20                  | 10.33               | 20.06                   | 40             | -19.94      | 68    | 1.15  |
| 189.39          | 2.29            | 10.57                 | 5.33                | 18.19                   | 44             | -25.31      | 235   | 1.47  |
| 499.76          | 4.16            | 17.59                 | 3.42                | 25.17                   | 46             | -20.84      | 303   | 2.42  |
| 613.66          | 4.69            | 19.68                 | 3.37                | 27.74                   | 46             | -18.26      | 264   | 2.86  |
| 782.28          | 5.52            | 21.73                 | 3.89                | 31.14                   | 46             | -14.86      | 292   | 3.35  |

**NOTE :**

1. Measurement uncertainty is 4.73 dB.
2. "\*\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

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|                  |              |               |               |
|------------------|--------------|---------------|---------------|
| Temperature:     | 21 °C        | Humidity:     | 62 %RH        |
| Frequency Range: | 30 M – 1 GHz | Tested Mode:  | Tx-3          |
| Detector Type:   | Quasi-peak   | IF Bandwidth: | 120 kHz       |
| Tested By:       | Richard Lin  | Tested Date:  | Oct. 31, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 457.50          | 3.95            | 17.17                 | 3.38                | 24.50                   | 46             | -21.51      | 244   | 2.69  |
| 499.49          | 4.16            | 17.59                 | 3.59                | 25.34                   | 46             | -20.67      | 150   | 2.51  |
| 625.79          | 4.75            | 19.85                 | 4.02                | 28.62                   | 46             | -17.39      | 169   | 2.17  |
| 715.32          | 5.17            | 20.55                 | 3.30                | 29.02                   | 46             | -16.98      | 117   | 1.89  |
| 755.14          | 5.40            | 21.62                 | 3.71                | 30.73                   | 46             | -15.27      | 309   | 1.67  |
| 850.98          | 5.79            | 23.00                 | 3.74                | 32.53                   | 46             | -13.47      | 199   | 1.45  |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 56.62           | 1.42            | 12.58                 | 5.34                | 19.34                   | 40             | -20.66      | 228   | 1.04  |
| 74.53           | 1.53            | 8.20                  | 12.03               | 21.76                   | 40             | -18.24      | 130   | 1.15  |
| 189.87          | 2.29            | 10.57                 | 5.53                | 18.39                   | 44             | -25.11      | 44    | 1.47  |
| 614.05          | 4.69            | 19.70                 | 3.42                | 27.81                   | 46             | -18.19      | 260   | 2.65  |
| 778.46          | 5.50            | 21.71                 | 3.69                | 30.91                   | 46             | -15.09      | 286   | 3.02  |
| 860.29          | 5.83            | 23.16                 | 3.56                | 32.55                   | 46             | -13.45      | 89    | 3.38  |

**NOTE :**

1. Measurement uncertainty is 4.73 dB.
2. "\*\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.



# TEST REPORT

|                  |              |               |               |
|------------------|--------------|---------------|---------------|
| Temperature:     | 21 °C        | Humidity:     | 62 %RH        |
| Frequency Range: | 30 M – 1 GHz | Tested Mode:  | Standby       |
| Detector Type:   | Quasi-peak   | IF Bandwidth: | 120 kHz       |
| Tested By:       | Richard Lin  | Tested Date:  | Oct. 31, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 414.90          | 3.70            | 16.52                 | 3.74                | 23.97                   | 46             | -22.03      | 248   | 2.83  |
| 490.48          | 4.11            | 17.50                 | 3.52                | 25.13                   | 46             | -20.87      | 159   | 2.59  |
| 660.22          | 4.90            | 20.18                 | 4.17                | 29.25                   | 46             | -16.75      | 61    | 2.02  |
| 697.74          | 5.07            | 20.11                 | 3.62                | 28.79                   | 46             | -17.21      | 174   | 1.96  |
| 793.15          | 5.57            | 21.77                 | 3.79                | 31.13                   | 46             | -14.87      | 83    | 1.65  |
| 933.88          | 6.15            | 24.66                 | 3.80                | 34.61                   | 46             | -11.39      | 302   | 1.22  |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dBμV) | Emission Level (dBμV/m) | Limit (dBμV/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------|-------------------------|----------------|-------------|-------|-------|
| 44.69           | 1.38            | 17.32                 | 3.58                | 22.28                   | 40             | -17.72      | 180   | 1.06  |
| 74.18           | 1.53            | 8.20                  | 7.87                | 17.60                   | 40             | -22.40      | 225   | 1.17  |
| 414.02          | 3.70            | 16.52                 | 3.64                | 23.87                   | 46             | -22.13      | 146   | 2.14  |
| 499.73          | 4.16            | 17.59                 | 3.72                | 25.47                   | 46             | -20.54      | 281   | 2.44  |
| 713.12          | 5.16            | 20.49                 | 3.63                | 29.28                   | 46             | -16.72      | 75    | 3.12  |
| 922.35          | 6.10            | 24.37                 | 3.51                | 33.98                   | 46             | -12.02      | 113   | 3.52  |

**NOTE :**

1. Measurement uncertainty is 4.73 dB.
2. "\*\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

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|                  |              |               |               |
|------------------|--------------|---------------|---------------|
| Temperature:     | 21 °C        | Humidity:     | 62 %RH        |
| Frequency Range: | 30 M – 1 GHz | Tested Mode:  | Link          |
| Detector Type:   | Quasi-peak   | IF Bandwidth: | 120 kHz       |
| Tested By:       | Richard Lin  | Tested Date:  | Oct. 31, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dB $\mu$ V) | Emission Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------------|-------------------------------|----------------------|-------------|-------|-------|
| 54.84           | 1.42            | 13.22                 | 3.61                      | 18.25                         | 40                   | -21.75      | 119   | 3.52  |
| 490.11          | 4.11            | 17.50                 | 3.81                      | 25.42                         | 46                   | -20.58      | 254   | 2.79  |
| 499.96          | 4.16            | 17.59                 | 4.03                      | 25.78                         | 46                   | -20.23      | 74    | 2.51  |
| 515.25          | 4.25            | 18.11                 | 4.00                      | 26.36                         | 46                   | -19.64      | 159   | 2.36  |
| 668.73          | 4.94            | 20.16                 | 3.94                      | 29.04                         | 46                   | -16.96      | 170   | 2.01  |
| 776.06          | 5.49            | 21.70                 | 3.58                      | 30.78                         | 46                   | -15.22      | 81    | 1.67  |

Antenna Polarization : Vertical

| Frequency (MHz) | Cable Loss (dB) | Antenna Factor (dB/m) | Reading Data (dB $\mu$ V) | Emission Level (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | AZ(°) | EL(m) |
|-----------------|-----------------|-----------------------|---------------------------|-------------------------------|----------------------|-------------|-------|-------|
| 56.48           | 1.42            | 12.58                 | 5.36                      | 19.36                         | 40                   | -20.64      | 212   | 1.06  |
| 74.50           | 1.53            | 8.20                  | 11.55                     | 21.28                         | 40                   | -18.72      | 329   | 1.15  |
| 497.12          | 4.15            | 17.57                 | 4.81                      | 26.53                         | 46                   | -19.48      | 156   | 2.45  |
| 515.09          | 4.25            | 18.11                 | 4.93                      | 27.29                         | 46                   | -18.71      | 86    | 2.68  |
| 703.32          | 5.10            | 20.19                 | 3.94                      | 29.23                         | 46                   | -16.77      | 273   | 3.12  |
| 750.87          | 5.38            | 21.60                 | 3.97                      | 30.95                         | 46                   | -15.05      | 173   | 3.31  |

**NOTE :**

1. Measurement uncertainty is 4.73 dB.
2. "\*\*": Measurement does not apply for this frequency.
3. Emission Level = Reading Value + Ant. Factor + Cable Loss.
4. The field strength of other emission frequencies were very low against the limit.

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|                  |                |               |               |
|------------------|----------------|---------------|---------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH        |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Tx-1          |
| Detector Type:   | PK. and AV.    | IF Bandwidth: | 1 MHz         |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 1647.38         | -31.98              | 25.83              | 46.00                     | 35.52 | 39.85                         | 29.37 | 74                   | 54  | -34.15      | -24.63 | 235    | 2.33   |
| 2314.50         | -30.88              | 27.98              | 46.99                     | 36.41 | 44.09                         | 33.51 | 74                   | 54  | -29.91      | -20.49 | 106    | 2.12   |
| 3881.24         | -28.53              | 32.21              | 43.19                     | 32.67 | 46.87                         | 36.35 | 74                   | 54  | -27.13      | -17.65 | 78     | 1.60   |
| 4432.59         | -27.73              | 32.50              | 42.96                     | 32.47 | 47.73                         | 37.24 | 74                   | 54  | -26.27      | -16.76 | 221    | 1.48   |
| 4587.66         | -27.54              | 32.69              | 43.04                     | 32.54 | 48.19                         | 37.69 | 74                   | 54  | -25.81      | -16.31 | 315    | 1.40   |
| 5549.13         | -26.11              | 34.19              | 40.96                     | 30.49 | 49.04                         | 38.57 | 74                   | 54  | -24.96      | -15.43 | 72     | 1.12   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 1843.15         | -31.66              | 26.53              | 45.28                     | 34.71 | 40.16                         | 29.59 | 74                   | 54  | -33.84      | -24.41 | 69     | 1.26   |
| 3052.88         | -29.93              | 30.31              | 44.20                     | 33.82 | 44.58                         | 34.20 | 74                   | 54  | -29.42      | -19.80 | 217    | 1.67   |
| 3198.47         | -29.75              | 30.64              | 43.73                     | 33.26 | 44.62                         | 34.15 | 74                   | 54  | -29.38      | -19.85 | 110    | 1.75   |
| 3790.01         | -28.73              | 32.00              | 43.29                     | 32.85 | 46.56                         | 36.12 | 74                   | 54  | -27.44      | -17.88 | 89     | 1.83   |
| 4229.53         | -27.99              | 32.50              | 43.53                     | 33.01 | 48.04                         | 37.52 | 74                   | 54  | -25.96      | -16.48 | 201    | 1.99   |
| 5096.49         | -26.84              | 33.72              | 42.53                     | 32.14 | 49.41                         | 39.02 | 74                   | 54  | -24.59      | -14.98 | 297    | 2.25   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "F": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



# TEST REPORT

|                  |                |               |                                  |
|------------------|----------------|---------------|----------------------------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH                           |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Tx-1 (Fundamental and Harmonics) |
| Detector:        | PK. and AV.    | IF Bandwidth: | 1 MHz                            |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014                    |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 2402.00 (F)     | -30.73              | 28.23              | 84.07                     | 72.19 | 81.56                         | 69.68 | 114                  | 94  | -32.44      | -24.32 | 90     | 1.55   |
| 4804.00         | -27.27              | 33.17              | 40.76                     | 30.18 | 46.66                         | 36.08 | 74                   | 54  | -27.34      | -17.92 | 152    | 1.49   |
| 7206.00         | -26.17              | 35.69              | 38.51                     | 28.09 | 48.04                         | 37.62 | 74                   | 54  | -25.96      | -16.38 | 73     | 1.62   |
| 9608.00         | -25.21              | 37.79              | 37.94                     | 27.46 | 50.52                         | 40.04 | 74                   | 54  | -23.48      | -13.96 | 275    | 1.60   |
| 12010.0         | -23.46              | 39.19              | 34.74                     | 24.39 | 50.48                         | 40.13 | 74                   | 54  | -23.52      | -13.87 | 296    | 1.58   |
| 14412.0         | -20.62              | 41.88              | 30.98                     | 20.46 | 52.23                         | 41.71 | 74                   | 54  | -21.77      | -12.29 | 190    | 1.59   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 2402.00 (F)     | -30.73              | 28.23              | 80.67                     | 68.30 | 78.16                         | 65.79 | 114                  | 94  | -35.84      | -28.21 | 115    | 1.52   |
| 4804.00         | -27.27              | 33.17              | 40.65                     | 30.12 | 46.55                         | 36.02 | 74                   | 54  | -27.45      | -17.98 | 48     | 1.47   |
| 7206.00         | -26.17              | 35.69              | 38.54                     | 28.04 | 48.07                         | 37.57 | 74                   | 54  | -25.93      | -16.43 | 328    | 1.71   |
| 9608.00         | -25.21              | 37.79              | 37.42                     | 27.02 | 50.00                         | 39.60 | 74                   | 54  | -24.00      | -14.40 | 66     | 1.64   |
| 12010.0         | -23.46              | 39.19              | 34.93                     | 24.39 | 50.67                         | 40.13 | 74                   | 54  | -23.33      | -13.87 | 102    | 1.58   |
| 14412.0         | -20.62              | 41.88              | 31.25                     | 20.60 | 52.50                         | 41.85 | 74                   | 54  | -21.50      | -12.15 | 305    | 1.45   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.

**Spectrum Research & Testing Lab., Inc.**

No.167, Ln. 780, Shan-Tong Rd., Ling 8, Shan-Tong Li, Chung-Li City, Taoyuan County 320, Taiwan (R.O.C.)

**TEST REPORT**Reference No.: A14101501  
Report No.: FCCA14101501  
FCC ID : QSWDHRCS1  
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Date: Nov. 10, 2014

|                  |                |               |               |
|------------------|----------------|---------------|---------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH        |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Tx-2          |
| Detector Type:   | PK. and AV.    | IF Bandwidth: | 1 MHz         |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 1876.22         | -31.60              | 26.65              | 46.12                     | 35.67 | 41.17                         | 30.72 | 74                   | 54  | -32.83      | -23.28 | 322    | 2.35   |
| 3382.13         | -29.51              | 31.04              | 43.22                     | 32.71 | 44.75                         | 34.24 | 74                   | 54  | -29.25      | -19.76 | 210    | 1.93   |
| 3859.60         | -28.58              | 32.16              | 42.96                     | 32.53 | 46.54                         | 36.11 | 74                   | 54  | -27.46      | -17.89 | 205    | 1.77   |
| 4194.08         | -28.03              | 32.50              | 43.14                     | 32.65 | 47.61                         | 37.12 | 74                   | 54  | -26.39      | -16.88 | 106    | 1.58   |
| 5343.55         | -26.34              | 34.01              | 41.63                     | 31.11 | 49.30                         | 38.78 | 74                   | 54  | -24.70      | -15.22 | 82     | 1.24   |
| 5834.74         | -26.56              | 34.13              | 41.46                     | 31.02 | 49.03                         | 38.59 | 74                   | 54  | -24.97      | -15.41 | 117    | 1.06   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 1844.13         | -31.66              | 26.54              | 47.09                     | 36.55 | 41.97                         | 31.43 | 74                   | 54  | -32.03      | -22.57 | 38     | 1.26   |
| 3158.68         | -29.80              | 30.55              | 43.32                     | 32.78 | 44.07                         | 33.53 | 74                   | 54  | -29.93      | -20.47 | 330    | 1.67   |
| 3457.05         | -29.42              | 31.21              | 42.95                     | 32.60 | 44.74                         | 34.39 | 74                   | 54  | -29.26      | -19.61 | 256    | 1.79   |
| 3981.25         | -28.31              | 32.45              | 42.58                     | 32.07 | 46.72                         | 36.21 | 74                   | 54  | -27.28      | -17.79 | 167    | 1.82   |
| 4612.86         | -27.51              | 32.75              | 42.40                     | 31.98 | 47.64                         | 37.22 | 74                   | 54  | -26.36      | -16.78 | 195    | 2.09   |
| 5139.92         | -26.75              | 33.77              | 41.70                     | 31.24 | 48.71                         | 38.25 | 74                   | 54  | -25.29      | -15.75 | 299    | 2.28   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.





# TEST REPORT

|                  |                |               |                                  |
|------------------|----------------|---------------|----------------------------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH                           |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Tx-2 (Fundamental and Harmonics) |
| Detector:        | PK.and AV.     | IF Bandwidth: | 1 MHz                            |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014                    |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 2440.00 (F)     | -30.67              | 28.33              | 86.63                     | 74.57 | 84.29                         | 72.23 | 114                  | 94  | -29.71      | -21.77 | 224    | 1.62   |
| 4880.00         | -27.18              | 33.34              | 39.51                     | 29.04 | 45.67                         | 35.20 | 74                   | 54  | -28.33      | -18.80 | 80     | 1.64   |
| 7320.00         | -26.11              | 35.97              | 37.78                     | 27.23 | 47.64                         | 37.09 | 74                   | 54  | -26.36      | -16.91 | 97     | 1.55   |
| 9760.00         | -25.07              | 37.91              | 37.30                     | 26.78 | 50.14                         | 39.62 | 74                   | 54  | -23.86      | -14.38 | 162    | 1.57   |
| 12200.0         | -22.84              | 39.08              | 34.25                     | 23.77 | 50.49                         | 40.01 | 74                   | 54  | -23.51      | -13.99 | 150    | 1.60   |
| 14640.0         | -20.65              | 41.58              | 29.37                     | 18.85 | 50.30                         | 39.78 | 74                   | 54  | -23.70      | -14.22 | 273    | 1.48   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 2440.00 (F)     | -30.67              | 28.33              | 80.49                     | 68.18 | 78.15                         | 65.84 | 114                  | 94  | -35.85      | -28.16 | 269    | 1.67   |
| 4880.00         | -27.18              | 33.34              | 39.65                     | 29.28 | 45.81                         | 35.44 | 74                   | 54  | -28.19      | -18.56 | 332    | 1.59   |
| 7320.00         | -26.11              | 35.97              | 37.69                     | 27.23 | 47.55                         | 37.09 | 74                   | 54  | -26.45      | -16.91 | 70     | 1.51   |
| 9760.00         | -25.07              | 37.91              | 37.02                     | 26.54 | 49.86                         | 39.38 | 74                   | 54  | -24.14      | -14.62 | 184    | 1.49   |
| 12200.0         | -22.84              | 39.08              | 34.07                     | 23.51 | 50.31                         | 39.75 | 74                   | 54  | -23.69      | -14.25 | 296    | 1.44   |
| 14640.0         | -20.65              | 41.58              | 29.21                     | 18.62 | 50.14                         | 39.55 | 74                   | 54  | -23.86      | -14.45 | 91     | 1.48   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



# TEST REPORT

|                  |                |               |               |
|------------------|----------------|---------------|---------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH        |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Tx-3          |
| Detector Type:   | PK. and AV.    | IF Bandwidth: | 1 MHz         |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 1842.97         | -31.66              | 26.53              | 47.37                     | 36.81 | 42.24                         | 31.68 | 74                   | 54  | -31.76      | -22.32 | 127    | 2.31   |
| 3048.38         | -29.94              | 30.31              | 44.68                     | 33.24 | 45.05                         | 33.61 | 74                   | 54  | -28.95      | -20.39 | 215    | 1.92   |
| 3719.23         | -28.88              | 31.83              | 43.43                     | 32.87 | 46.37                         | 35.81 | 74                   | 54  | -27.63      | -18.19 | 109    | 1.67   |
| 4007.79         | -28.26              | 32.50              | 42.87                     | 32.40 | 47.11                         | 36.64 | 74                   | 54  | -26.89      | -17.36 | 67     | 1.58   |
| 4553.81         | -27.58              | 32.62              | 42.22                     | 31.76 | 47.25                         | 36.79 | 74                   | 54  | -26.75      | -17.21 | 195    | 1.42   |
| 5744.60         | -26.42              | 34.15              | 41.17                     | 30.69 | 48.90                         | 38.42 | 74                   | 54  | -25.10      | -15.58 | 63     | 1.09   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 1844.20         | -31.66              | 26.54              | 47.18                     | 36.66 | 42.06                         | 31.54 | 74                   | 54  | -31.94      | -22.46 | 234    | 1.24   |
| 2558.19         | -30.50              | 28.70              | 45.79                     | 35.21 | 43.98                         | 33.40 | 74                   | 54  | -30.02      | -20.60 | 170    | 1.48   |
| 3052.36         | -29.93              | 30.31              | 44.14                     | 33.67 | 44.52                         | 34.05 | 74                   | 54  | -29.48      | -19.95 | 248    | 1.63   |
| 3693.54         | -28.94              | 31.76              | 42.72                     | 32.30 | 45.54                         | 35.12 | 74                   | 54  | -28.46      | -18.88 | 329    | 1.85   |
| 4414.90         | -27.76              | 32.50              | 42.45                     | 31.85 | 47.19                         | 36.59 | 74                   | 54  | -26.81      | -17.41 | 192    | 2.03   |
| 5787.67         | -26.49              | 34.14              | 41.45                     | 31.01 | 49.10                         | 38.66 | 74                   | 54  | -24.90      | -15.34 | 285    | 2.45   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "\*\*": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



# TEST REPORT

|                  |                |               |                                  |
|------------------|----------------|---------------|----------------------------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH                           |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Tx-3 (Fundamental and Harmonics) |
| Detector:        | PK. and AV.    | IF Bandwidth: | 1 MHz                            |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014                    |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 2480.00 (F)     | -30.60              | 28.44              | 85.57                     | 73.25 | 83.41                         | 71.09 | 114                  | 94  | -30.59      | -22.91 | 134    | 1.56   |
| 4960.00         | -27.08              | 33.51              | 41.30                     | 30.78 | 47.73                         | 37.21 | 74                   | 54  | -26.27      | -16.79 | 62     | 1.60   |
| 7440.00         | -26.05              | 36.26              | 38.25                     | 27.76 | 48.46                         | 37.97 | 74                   | 54  | -25.54      | -16.03 | 85     | 1.63   |
| 9920.00         | -24.92              | 38.04              | 37.11                     | 26.64 | 50.22                         | 39.75 | 74                   | 54  | -23.78      | -14.25 | 302    | 1.57   |
| 12400.0         | -22.19              | 38.96              | 33.49                     | 23.05 | 50.26                         | 39.82 | 74                   | 54  | -23.74      | -14.18 | 260    | 1.52   |
| 14880.0         | -20.71              | 40.86              | 30.82                     | 20.38 | 50.97                         | 40.53 | 74                   | 54  | -23.03      | -13.47 | 291    | 1.50   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 2480.00 (F)     | -30.60              | 28.44              | 80.10                     | 67.84 | 77.94                         | 65.68 | 114                  | 94  | -36.06      | -28.32 | 183    | 1.48   |
| 4960.00         | -27.08              | 33.51              | 40.28                     | 29.76 | 46.71                         | 36.19 | 74                   | 54  | -27.29      | -17.81 | 75     | 1.45   |
| 7440.00         | -26.05              | 36.26              | 38.31                     | 27.76 | 48.52                         | 37.97 | 74                   | 54  | -25.48      | -16.03 | 327    | 1.63   |
| 9920.00         | -24.92              | 38.04              | 36.97                     | 26.54 | 50.08                         | 39.65 | 74                   | 54  | -23.92      | -14.35 | 129    | 1.59   |
| 12400.0         | -22.19              | 38.96              | 33.84                     | 23.33 | 50.61                         | 40.10 | 74                   | 54  | -23.39      | -13.90 | 95     | 1.55   |
| 14880.0         | -20.71              | 40.86              | 30.87                     | 20.40 | 51.02                         | 40.55 | 74                   | 54  | -22.98      | -13.45 | 33     | 1.52   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.



# TEST REPORT

|                  |                |               |               |
|------------------|----------------|---------------|---------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH        |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Standby       |
| Detector Type:   | PK. and AV.    | IF Bandwidth: | 1 MHz         |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 3562.88         | -29.22              | 31.45              | 43.79                     | 33.24 | 46.01                         | 35.46 | 74                   | 54  | -27.99      | -18.54 | 116    | 1.95   |
| 3619.46         | -29.10              | 31.59              | 43.59                     | 33.01 | 46.08                         | 35.50 | 74                   | 54  | -27.92      | -18.50 | 301    | 1.76   |
| 4368.17         | -27.81              | 32.50              | 42.09                     | 31.59 | 46.78                         | 36.28 | 74                   | 54  | -27.22      | -17.72 | 88     | 1.52   |
| 4814.02         | -27.26              | 33.19              | 41.24                     | 30.76 | 47.17                         | 36.69 | 74                   | 54  | -26.83      | -17.31 | 322    | 1.33   |
| 5174.83         | -26.68              | 33.81              | 41.20                     | 30.72 | 48.33                         | 37.85 | 74                   | 54  | -25.67      | -16.15 | 60     | 1.29   |
| 5319.96         | -26.39              | 33.98              | 41.05                     | 30.57 | 48.64                         | 38.16 | 74                   | 54  | -25.36      | -15.84 | 132    | 1.20   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 3287.93         | -29.63              | 30.83              | 43.04                     | 32.57 | 44.24                         | 33.77 | 74                   | 54  | -29.76      | -20.23 | 215    | 1.68   |
| 3549.22         | -29.25              | 31.42              | 43.43                     | 32.96 | 45.59                         | 35.12 | 74                   | 54  | -28.41      | -18.88 | 194    | 1.74   |
| 3912.56         | -28.46              | 32.29              | 42.57                     | 32.01 | 46.40                         | 35.84 | 74                   | 54  | -27.60      | -18.16 | 255    | 1.92   |
| 4611.85         | -27.51              | 32.74              | 42.33                     | 31.88 | 47.56                         | 37.11 | 74                   | 54  | -26.44      | -16.89 | 194    | 1.98   |
| 5214.06         | -26.60              | 33.86              | 41.57                     | 31.04 | 48.82                         | 38.29 | 74                   | 54  | -25.18      | -15.71 | 278    | 2.11   |
| 5778.34         | -26.47              | 34.14              | 40.44                     | 29.95 | 48.11                         | 37.62 | 74                   | 54  | -25.89      | -16.38 | 314    | 2.34   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.: Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F): The field strength of fundamental frequency.

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**TEST REPORT**Reference No.: A14101501  
Report No.: FCCA14101501  
FCC ID : QSWDHRCS1  
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Date: Nov. 10, 2014

|                  |                |               |               |
|------------------|----------------|---------------|---------------|
| Temperature:     | 23 °C          | Humidity:     | 59 %RH        |
| Frequency Range: | 1 GHz – 25 GHz | Tested Mode:  | Link          |
| Detector Type:   | PK. and AV.    | IF Bandwidth: | 1 MHz         |
| VBW:             | 3 MHz          | Tested Date:  | Nov. 04, 2014 |

Antenna Polarization : Horizontal

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 3607.85         | -29.13              | 31.56              | 43.46                     | 33.01 | 45.89                         | 35.44 | 74                   | 54  | -28.11      | -18.56 | 109    | 1.83   |
| 3842.46         | -28.61              | 32.12              | 43.35                     | 32.84 | 46.86                         | 36.35 | 74                   | 54  | -27.14      | -17.65 | 55     | 1.66   |
| 4354.70         | -27.83              | 32.50              | 43.46                     | 32.95 | 48.13                         | 37.62 | 74                   | 54  | -25.87      | -16.38 | 200    | 1.47   |
| 4676.15         | -27.43              | 32.89              | 42.39                     | 31.87 | 47.85                         | 37.33 | 74                   | 54  | -26.15      | -16.67 | 64     | 1.33   |
| 5377.28         | -26.28              | 34.05              | 41.40                     | 30.96 | 49.18                         | 38.74 | 74                   | 54  | -24.82      | -15.26 | 247    | 1.18   |
| 5729.96         | -26.40              | 34.15              | 40.46                     | 30.13 | 48.22                         | 37.89 | 74                   | 54  | -25.78      | -16.11 | 70     | 1.07   |

Antenna Polarization : Vertical

| Frequency (MHz) | Correct Factor (dB) | Ant. Factor (dB/m) | Reading Data (dB $\mu$ V) |       | Emission Level (dB $\mu$ V/m) |       | Limit (dB $\mu$ V/m) |     | Margin (dB) |        | AZ (°) | EL (m) |
|-----------------|---------------------|--------------------|---------------------------|-------|-------------------------------|-------|----------------------|-----|-------------|--------|--------|--------|
|                 |                     |                    | PK.                       | AV.   | PK.                           | AV.   | PK.                  | AV. | PK.         | AV.    |        |        |
| 3093.44         | -29.88              | 30.40              | 44.63                     | 34.17 | 45.15                         | 34.69 | 74                   | 54  | -28.85      | -19.31 | 314    | 1.62   |
| 3669.15         | -28.99              | 31.71              | 44.08                     | 33.54 | 46.79                         | 36.25 | 74                   | 54  | -27.21      | -17.75 | 209    | 1.85   |
| 4311.84         | -27.88              | 32.50              | 43.28                     | 32.76 | 47.90                         | 37.38 | 74                   | 54  | -26.10      | -16.62 | 263    | 1.96   |
| 4657.67         | -27.46              | 32.85              | 42.68                     | 32.18 | 48.07                         | 37.57 | 74                   | 54  | -25.93      | -16.43 | 195    | 2.13   |
| 5178.39         | -26.67              | 33.81              | 41.72                     | 31.24 | 48.86                         | 38.38 | 74                   | 54  | -25.14      | -15.62 | 281    | 2.28   |
| 5716.94         | -26.38              | 34.16              | 40.43                     | 29.94 | 48.21                         | 37.72 | 74                   | 54  | -25.79      | -16.28 | 185    | 2.43   |

**NOTE:**

1. Measurement uncertainty is 3.81 dB.
2. "": The Peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. Emission Level = Reading Value + Ant. Factor + Correct Factor (incl.:Cable Loss and Pre-Amplifier Gain)
4. The field strength of other emission frequencies were very low against the limit.
5. (F):The field strength of fundamental frequency.



## 4.2 6dB Bandwidth

### 4.2.1 LIMIT

FCC Part15, Subpart C Section 15.247 (a)(2). The minimum 6dB bandwidth shall be at least 500 kHz.

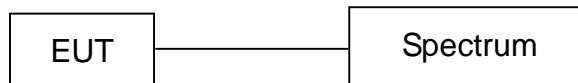
### 4.2.2 TEST EQUIPMENT

The following test equipment was used during the test :

| EQUIPMENT/<br>FACILITIES                      | SPECIFICATIONS | MANUFACTURER    | MODEL#/<br>SERIAL# | DUE DATE OF CAL. &<br>CAL. CENTER |
|---|----------------|-----------------|--------------------|-----------------------------------|
| EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER) | 9 KHz ~ 6 GHz  | ROHDE & SCHWARZ | ESL /100176        | MAR. 28, 2015<br>ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.2.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

### 4.2.4 TEST PROCEDURE

The EUT was operated in hopping mode or any specific channel.  
Printed out the test result from the spectrum by hard copy function.

### 4.2.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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# TEST REPORT

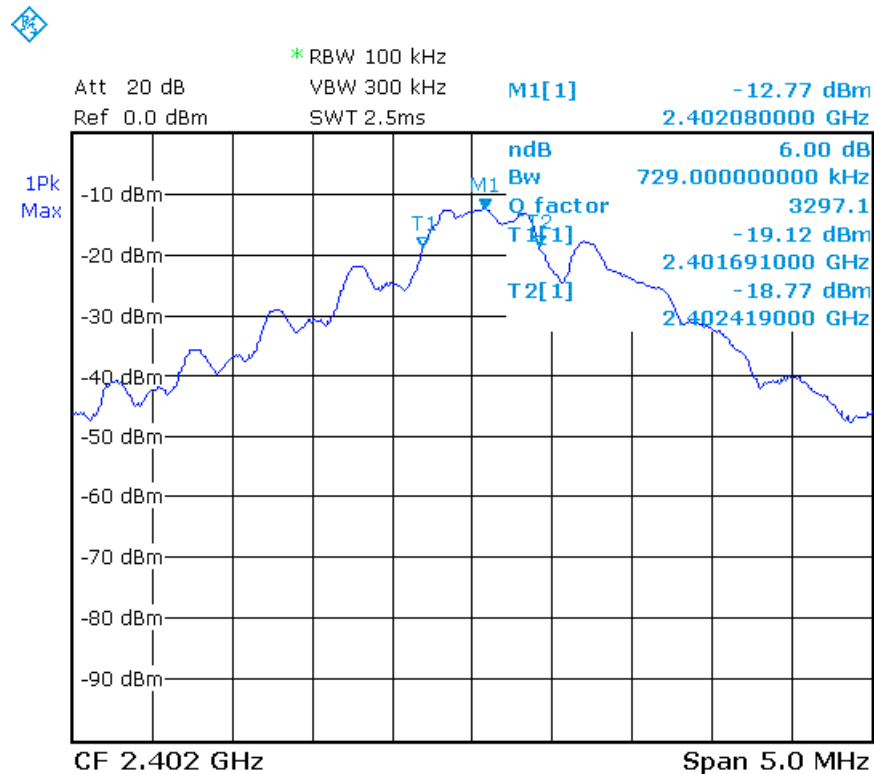
Reference No.: A14101501  
 Report No.: FCCA14101501  
 FCC ID : QSWDHRCS1  
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## 4.2.6 TEST RESULT

|              |             |              |                  |
|--------------|-------------|--------------|------------------|
| Temperature: | 25 °C       | Humidity:    | 64 %RH           |
| Detector:    | Peak        | Test Mode:   | Tx-1, Tx-2, Tx-3 |
| RBW:         | 100 kHz     | VBW:         | 300 kHz          |
| Tested By:   | Richard Lin | Tested Date: | Nov. 03, 2014    |

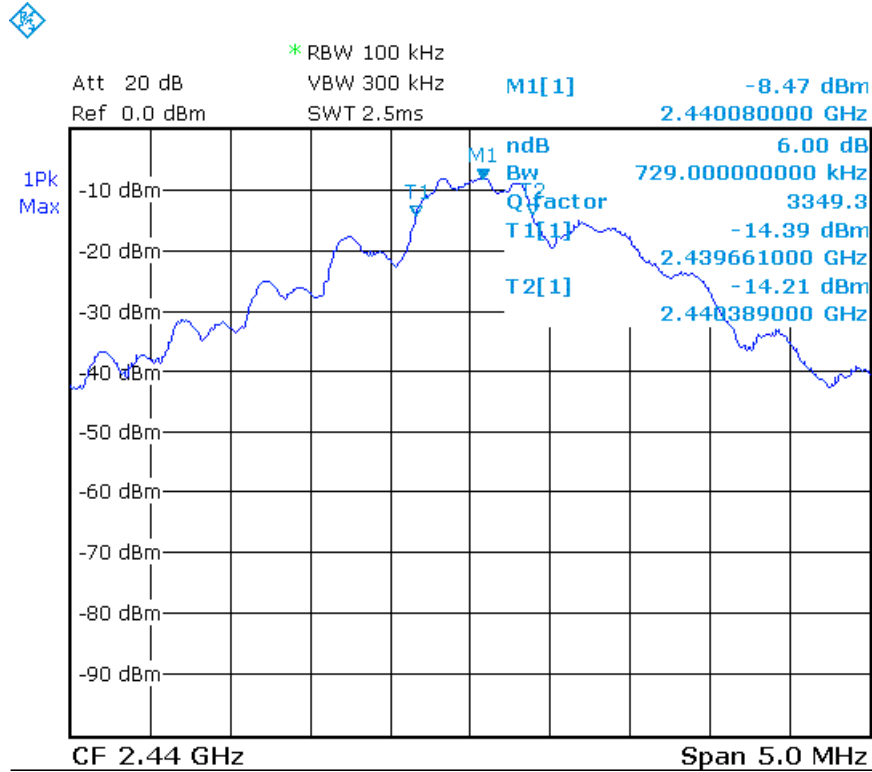
| Channel Number | Channel Frequency (MHz) | 6dB Down Bandwidth (kHz) | Limit (kHz) | Pass/Fail |
|----------------|-------------------------|--------------------------|-------------|-----------|
| CH01           | 2402                    | 729                      | > 500       | Pass      |
| CH20           | 2440                    | 729                      | > 500       | Pass      |
| CH40           | 2480                    | 798                      | > 500       | Pass      |

CH01 :

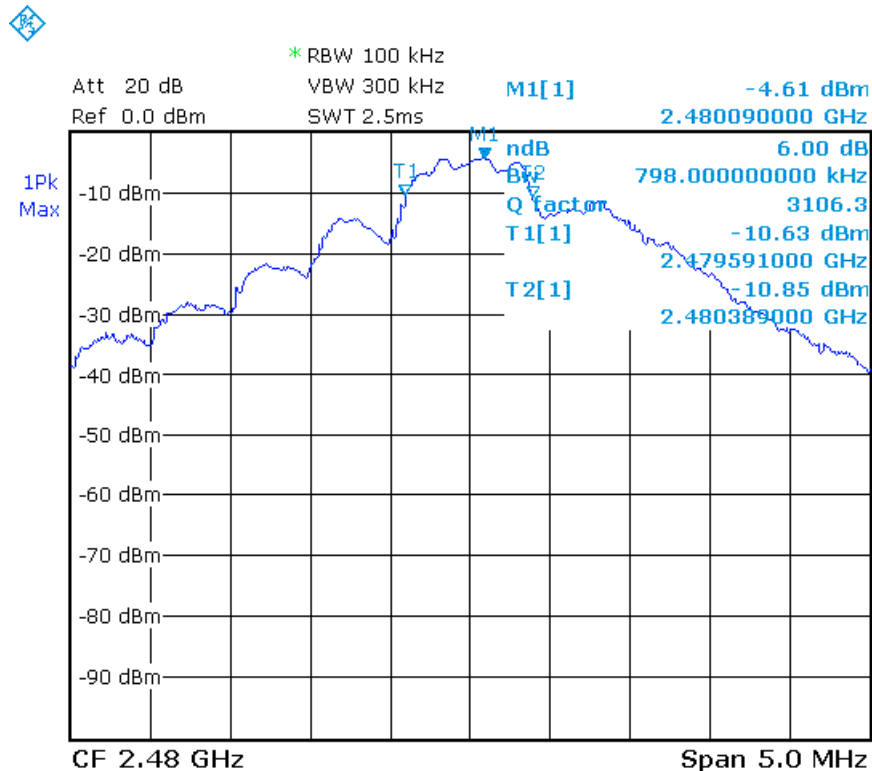




CH20 :



CH40 :







### 4.3 PEAK POWER TEST

#### 4.3.1 LIMIT

FCC Part15, Subpart C Section 15.247(b).

| Frequency Range (MHz) | Limit(W)                    |               |               |           |           |
|-----------------------|-----------------------------|---------------|---------------|-----------|-----------|
|                       | Quantity of Hopping Channel | 50            | 25            | 15        | 75        |
| 902-928               | 1(30 dBm)                   | 0.125(21 dBm) | NA            | NA        | NA        |
| 2400-2483.5           | NA                          | NA            | 0.125( 21dBm) | 1(30 dBm) | 1(30 dBm) |
| 5725-5850             | NA                          | NA            | NA            | NA        | 1(30 dBm) |

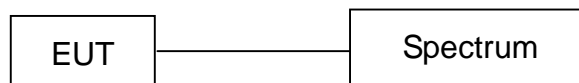
#### 4.3.2 TEST EQUIPMENT

The following test equipment was used during the test :

| Equipment/ Facilities                         | Specifications | Manufacturer    | Model#/ Serial# | Due Date of Cal. & Cal. Center |
|---|----------------|-----------------|-----------------|--------------------------------|
| EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER) | 9 KHz ~ 6 GHz  | ROHDE & SCHWARZ | ESL /100176     | MAR. 28, 2015 ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST SET-UP



The EUT was connected to a spectrum through a 50Ω RF cable.

#### 4.3.4 TEST PROCEDURE

The EUT was operating in hopping mode or could control its channel. Printed out the test result from the spectrum by hard copy function.

#### 4.3.5 EUT OPERATING CONDITION

1. Set the EUT under frequency hopping transmission condition.
2. The EUT was set to the highest available power level.



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# TEST REPORT

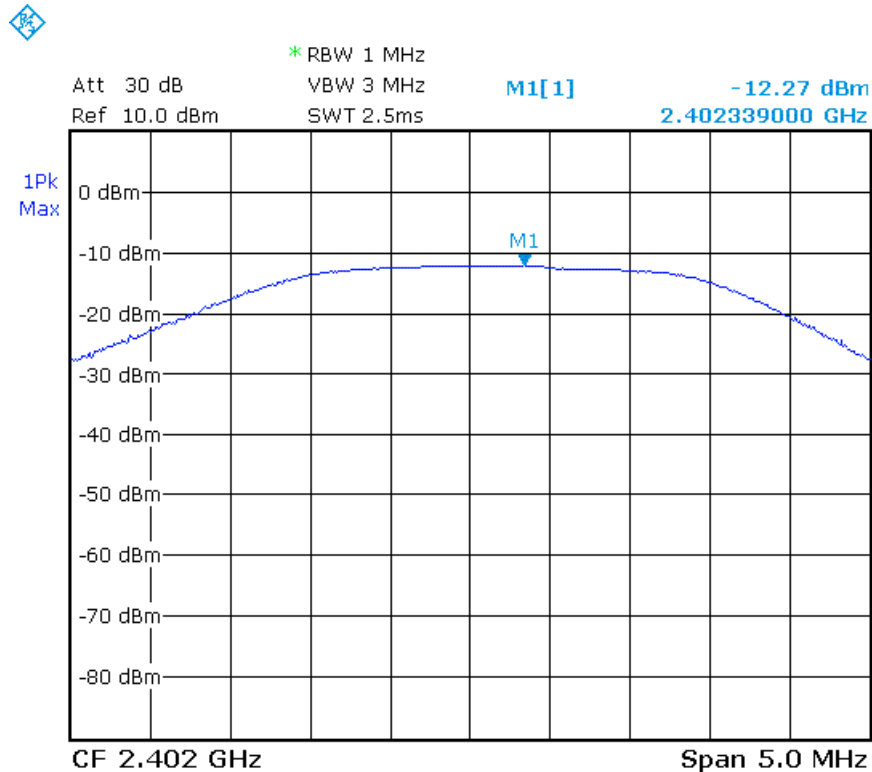
Reference No.: A14101501  
 Report No.: FCCA14101501  
 FCC ID : QSWDHRCS1  
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 Date: Nov. 10, 2014

### 4.3.6 TEST RESULT

|                    |             |              |                  |
|--------------------|-------------|--------------|------------------|
| Temperature:       | 25 °C       | Humidity:    | 64 %RH           |
| Spectrum Detector: | PK.         | Test Mode:   | Tx-1, Tx-2, Tx-3 |
| RBW:               | 1 MHz       | VBW:         | 3 MHz            |
| Tested By:         | Richard Lin | Tested Date: | Nov. 03, 2014    |

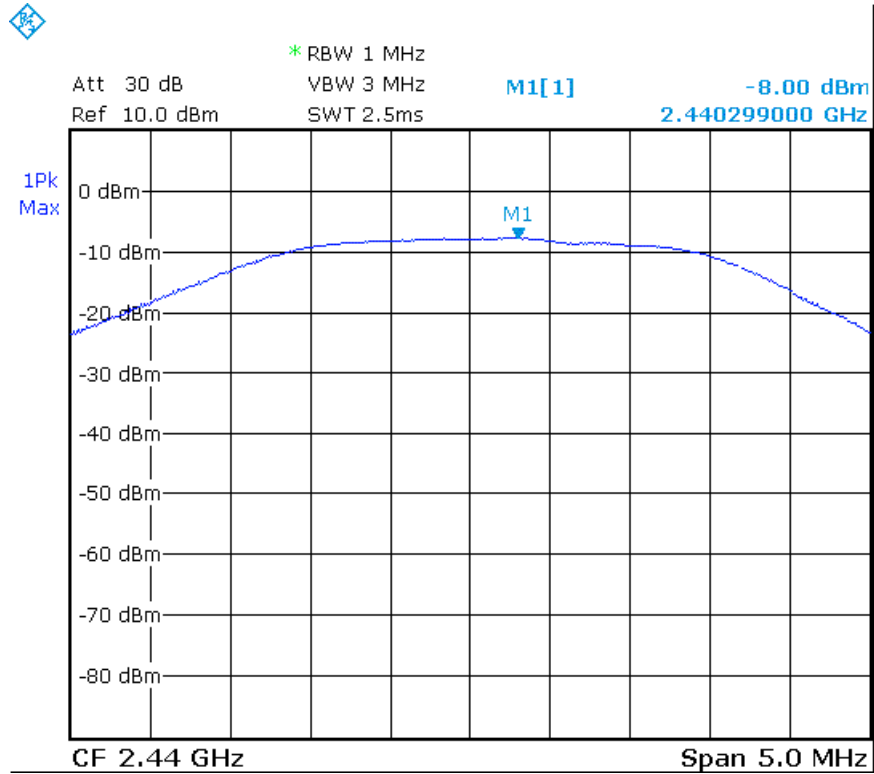
| Channel Number | Channel Frequency (MHz) | Peak Output Power (dBm) | Limit (dBm) |
|----------------|-------------------------|-------------------------|-------------|
| CH01           | 2402                    | -12.27                  | 21          |
| CH20           | 2440                    | -8.00                   | 21          |
| CH40           | 2480                    | -4.23                   | 21          |

CH01 :

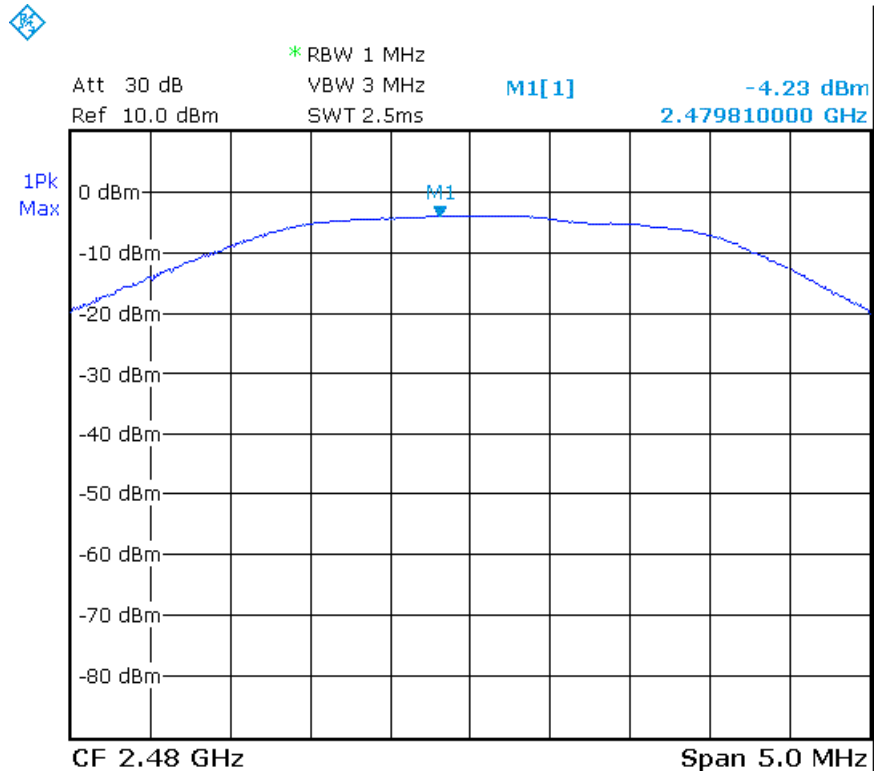




CH20 :



CH40 :





**4.4 BAND EDGE TEST**

**4.4.1 LIMIT**

FCC Part15, Subpart C Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

| OPERATING FREQUENCY RANGE (MHz) | SPURIOUS EMISSION FREQUENCY (MHz) | LIMIT                              |                        |
|---------------------------------|-----------------------------------|------------------------------------|------------------------|
|                                 |                                   | Peak power ration to emission(dBc) | Emission level(dBuV/m) |
| 902 - 928                       | < 902                             | > 20                               | N/A                    |
|                                 | > 928                             | > 20                               | N/A                    |
|                                 | 960-1240                          | N/A                                | 54                     |
| 2400 - 2483.5                   | < 2400                            | > 20                               | N/A                    |
|                                 | > 2483.5-2500                     | N/A                                | 54                     |
| 5725 - 5850                     | < 5350-5460                       | N/A                                | 54                     |
|                                 | < 5725                            | > 20                               | N/A                    |
|                                 | > 5850                            | > 20                               | N/A                    |

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**4.4.2 TEST EQUIPMENT**

The following test equipment was used during the test:

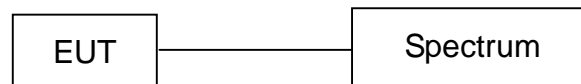
| EQUIPMENT/<br>FACILITIES                      | SPECIFICATIONS       | MANUFACTURER    | MODEL#/<br>SERIAL#               | DUE DATE OF CAL. &<br>CAL. CENTER |
|---|----------------------|-----------------|----------------------------------|-----------------------------------|
| EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER) | 9 KHz ~ 6 GHz        | ROHDE & SCHWARZ | ESL /100176                      | MAR. 28, 2015<br>ETC              |
| SPECTRUM ANALYZER                             | 9 kHz ~ 40GHz        | ROHDE & SCHWARZ | FSP40 / 100093                   | DEC 08, 2014<br>ETC               |
| HORN ANTENNA                                  | 1 GHz ~ 18 GHz       | EMCO            | 3115/<br>9602-4681               | DEC. 12, 2014<br>ETC              |
| PRE-AMPLIFIER                                 | 1 GHz ~ 26.5 GHz     | AGILENT         | 8449B/<br>3008A01995             | DEC. 10, 2014<br>ETC              |
| OPEN AREA TEST SITE                           | 3 – 10 M MEASUREMENT | SRT             | A02 / SRT002                     | MAR. 07, 2015<br>SRT              |
| ANECHOIC CHAMBER                              | 3 M MEASUREMENT      | SRT             | A01 / SRT001                     | MAY. 07, 2015<br>SRT              |
| K-TYPE CABLE                                  | UP TO 40 GHz<br>3 m  | HUBER+SUHNER    | SF102-46/2*11SK<br>252 /MY2611/2 | MAR. 09, 2015<br>ETC              |
| K-TYPE CABLE                                  | UP TO 40 GHz,<br>1 m | HUBER+SUHNER    | SF 102-40/2*11<br>/23934/2       | OCT. 12, 2015<br>ETC              |
| FILTER  | 2 LINE, 30 A         | FIL.COIL        | FC-943/<br>869                   | NCR                               |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.



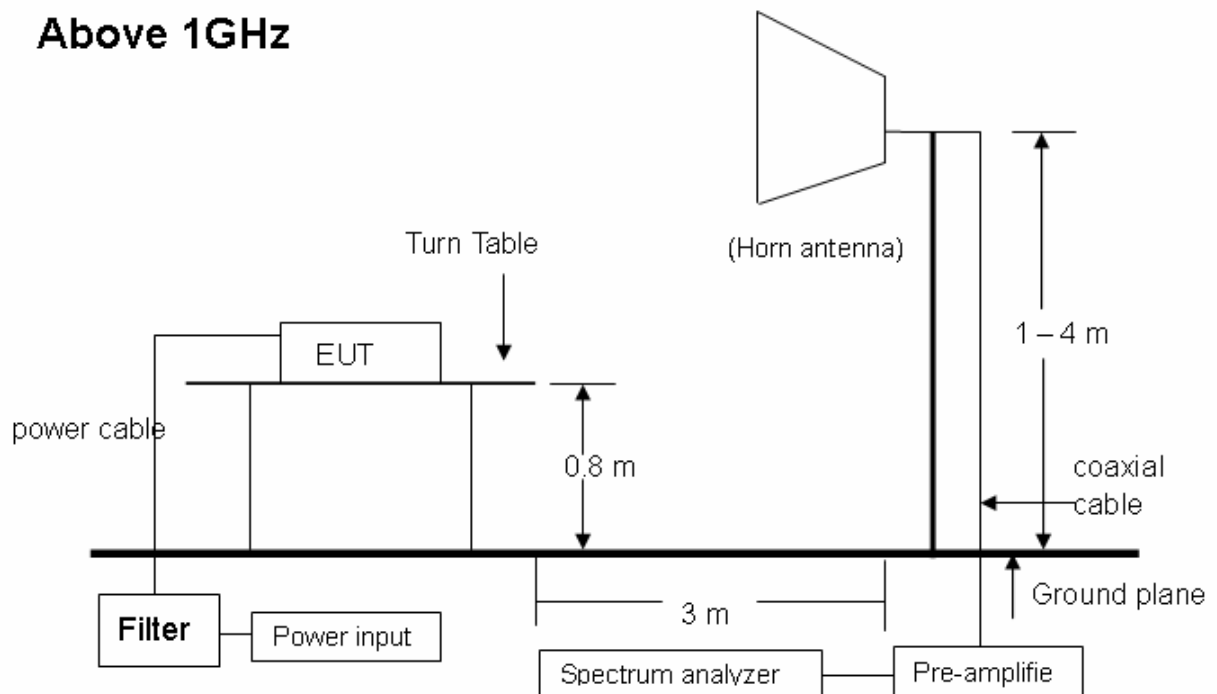
## 4.4.3 TEST SETUP

### FOR RF CONDUCTED TEST (dBc)



The EUT was connected to a spectrum through a 50Ω RF cable.

### Above 1GHz



**NOTE:** The EUT system was put on a wooden table with 0.8m heights above a ground plane. For the actual test configuration, please refer to the photos of testing.



#### 4.4.4 TEST PROCEDURE

1. The EUT was operating in continuous transmission mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.
2. The EUT was tested according to the requirement of ANSI C63.4 and CISPR 22. The measurements were made at an open area test site with 3 meter measurement distance under 1 GHz and with 3m distance above 1GHz. The frequency spectrum measured started from 30 MHz. Under 1 GHz. All readings were quasi-peak values with 120 kHz resolution bandwidth of the test receiver. Above 1 GHz, the measurements were made at an open area test site with 3 meter measurement distance and all readings were peak and average values with 1 MHz resolution bandwidth of the test receiver. The EUT system was operated in all typical methods by users. The cables connected to EUT and support units were moved to find the maximum emission levels for each frequency.

#### 4.4.5 EUT OPERATING CONDITION

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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# TEST REPORT

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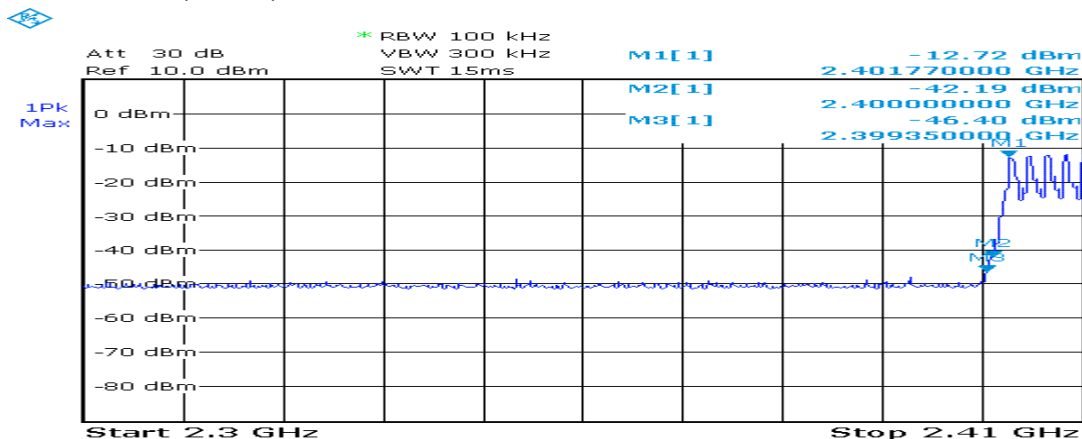
## 4.4.6 TEST RESULT

|                    |             |              |               |
|--------------------|-------------|--------------|---------------|
| Temperature:       | 25 °C       | Humidity:    | 64 %RH        |
| Spectrum Detector: | PK.         | Tesr Mode:   | Tx-1, Tx-3    |
| RBW:               | 100 kHz     | VBW:         | 300 kHz       |
| Tested By:         | Richard Lin | Tested Date: | Nov. 03, 2014 |

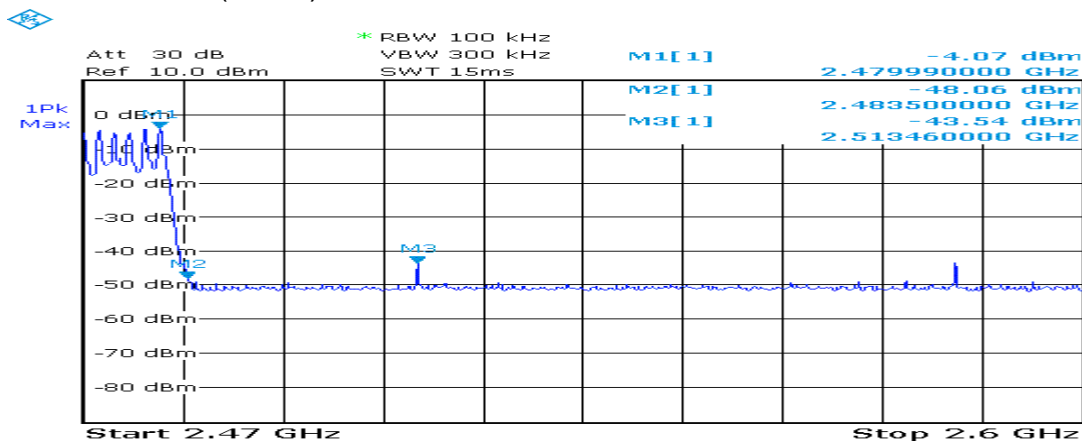
### 1. Conducted test

| Frequency (MHz) | PEAK POWER OUTPUT (dBm) | Emission read Value(dBm) | Result of Band edge (dBc) | Band edge LIMIT (dBc) |
|-----------------|-------------------------|--------------------------|---------------------------|-----------------------|
| < 2400          | -12.72                  | -46.40                   | 33.68                     | > 20 dBc              |
| > 2483.5        | -4.07                   | -43.54                   | 39.47                     | > 20 dBc              |

### Below 2400MHz (CH01) :



### Above 2483.5 MHz (CH40) :





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Date: Nov. 10, 2014**2. Radiated emission test :**

Below 2400MHz (CH01)

|                    |                       |               |               |
|--------------------|-----------------------|---------------|---------------|
| Temperature:       | 23 °C                 | Humidity:     | 59 %RH        |
| Frequency Range:   | 2.3 GHz –<br>2.41 GHz | Tested Mode:  | Tx-1          |
| Receiver Detector: | PK. and AV.           | IF Bandwidth: | 1 MHz         |
| Tested By:         | Richard Lin           | Tested Date:  | Nov. 04, 2014 |

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |       | Emission (dBuV/m) |       | Limit Line (dBuV/m) |       | Over Limit (dBuV/m) |        |
|-----------------|---------------------|----------------|-----------------|----------------|-------|-------------------|-------|---------------------|-------|---------------------|--------|
|                 |                     |                |                 | PK             | AV    | PK                | AV    | PK                  | AV    | PK                  | AV     |
| 2399.38         | -30.74              | 28.22          | H               | 47.38          | 36.82 | 44.86             | 34.30 | 74.00               | 54.00 | -29.14              | -19.70 |
| 2399.75         | -30.74              | 28.22          | V               | 47.56          | 35.01 | 45.04             | 32.49 | 74.00               | 54.00 | -28.96              | -21.51 |
| 2400.00         | -30.74              | 28.22          | H               | 49.69          | 39.18 | 47.17             | 36.66 | 74.00               | 54.00 | -26.83              | -17.34 |
| 2400.00         | -30.74              | 28.22          | V               | 48.61          | 38.24 | 46.09             | 35.72 | 74.00               | 54.00 | -27.91              | -18.28 |

Above 2483.5MHz (CH40)

|                    |                       |               |               |
|--------------------|-----------------------|---------------|---------------|
| Temperature:       | 23 °C                 | Humidity:     | 59 %RH        |
| Frequency Range:   | 2.47 GHz –<br>2.6 GHz | Tested Mode:  | Tx-3          |
| Receiver Detector: | PK. and AV.           | IF Bandwidth: | 1 MHz         |
| Tested By:         | Richard Lin           | Tested Date:  | Nov. 04, 2014 |

| Frequency (MHz) | Correct Factor (dB) | Ant. Fac. (dB) | Ant. Pol. (H/V) | Reading (dBuV) |       | Emission (dBuV/m) |       | Limit Line (dBuV/m) |       | Over Limit (dBuV/m) |        |
|-----------------|---------------------|----------------|-----------------|----------------|-------|-------------------|-------|---------------------|-------|---------------------|--------|
|                 |                     |                |                 | PK             | AV    | PK                | AV    | PK                  | AV    | PK                  | AV     |
| 2483.50         | -30.60              | 28.45          | H               | 40.76          | 30.25 | 38.61             | 28.10 | 74.00               | 54.00 | -35.39              | -25.90 |
| 2483.50         | -30.60              | 28.45          | V               | 35.84          | 25.40 | 33.69             | 23.25 | 74.00               | 54.00 | -40.31              | -30.75 |
| 2490.03         | -30.59              | 28.47          | H               | 39.78          | 29.28 | 37.67             | 27.17 | 74.00               | 54.00 | -36.33              | -26.83 |
| 2490.05         | -30.59              | 28.47          | V               | 38.99          | 28.47 | 36.88             | 26.36 | 74.00               | 54.00 | -37.12              | -27.64 |



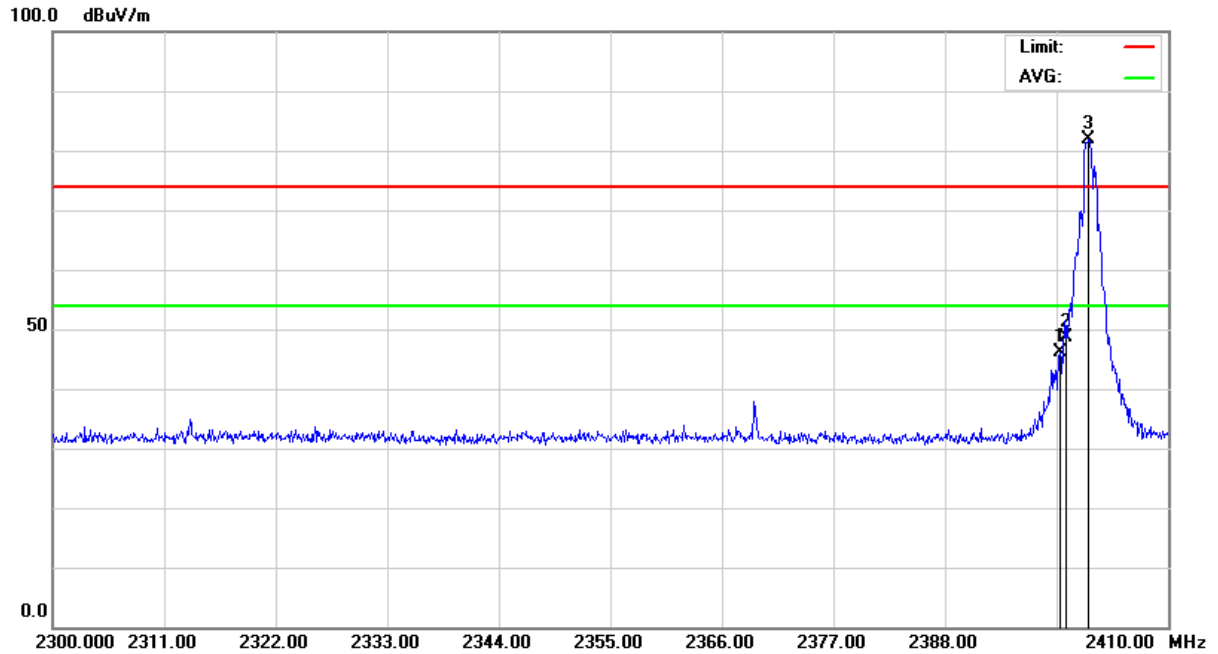
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# TEST REPORT

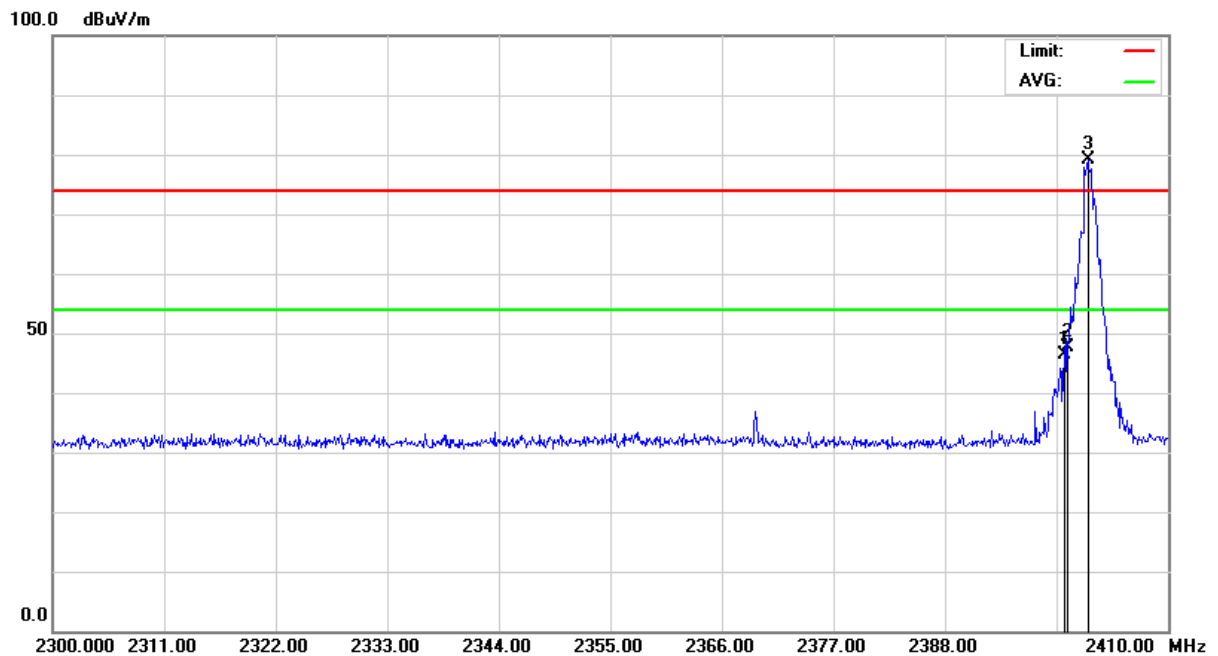
Reference No.: A14101501  
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## Below 2400MHz (CH01)

Antenna Polarization : Horizontal



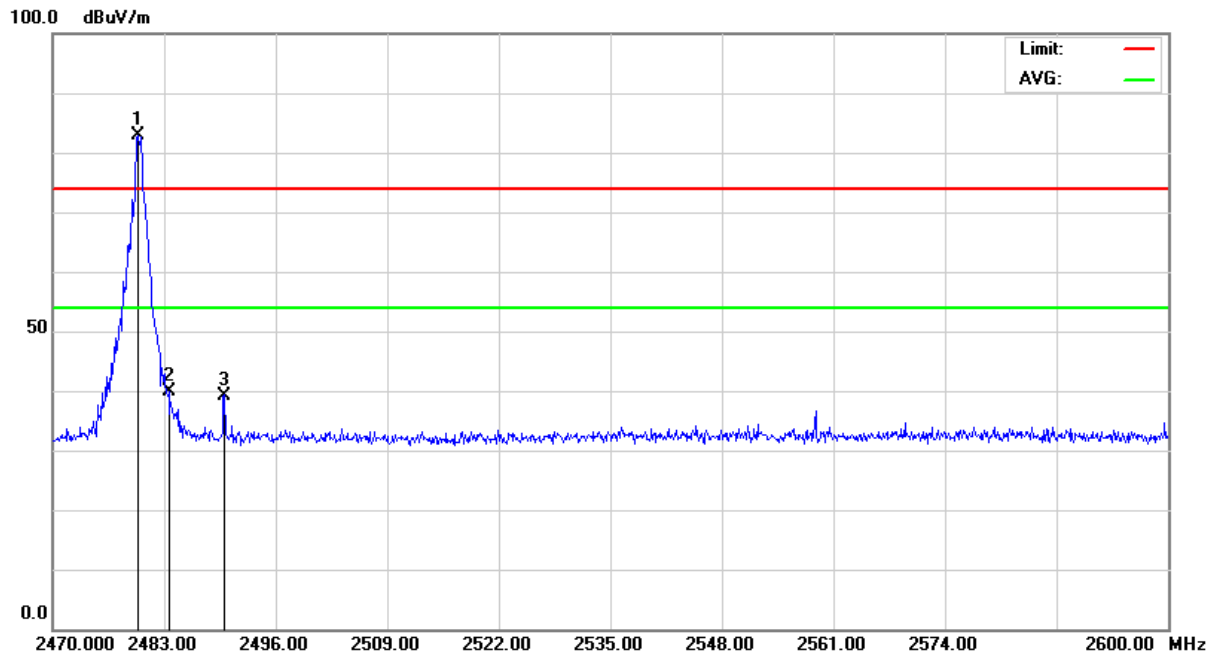
Antenna Polarization : Vertical



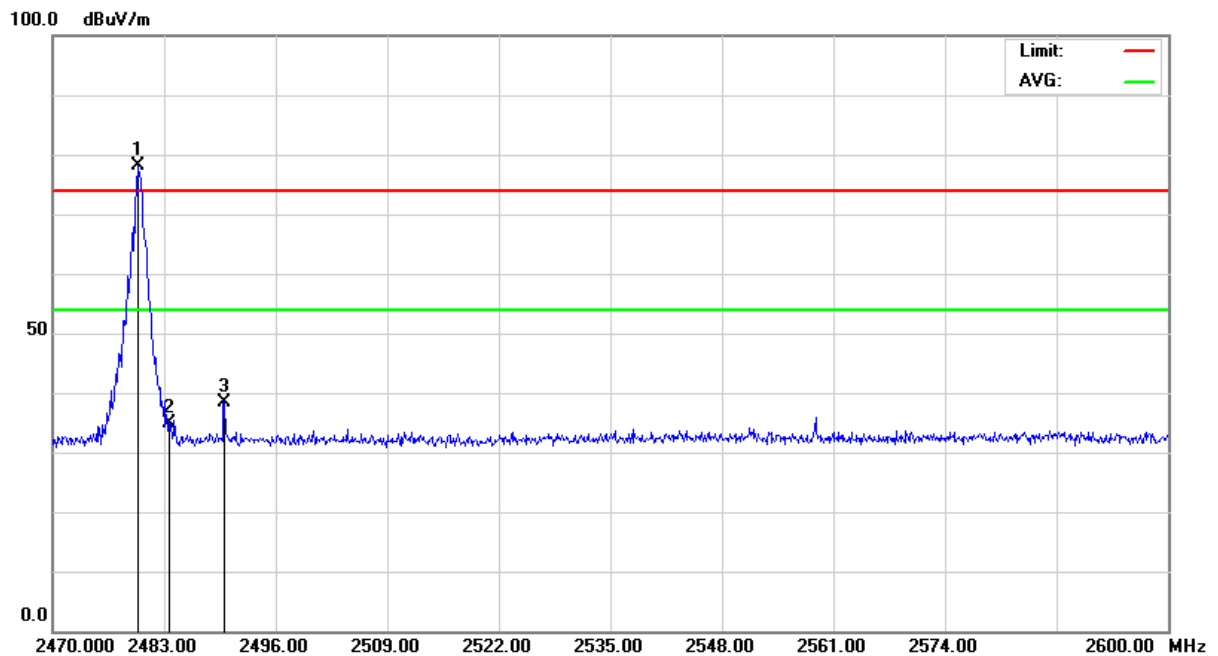


### Above 2483.5MHz (CH40)

Antenna Polarization : Horizontal



Antenna Polarization : Vertical



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**TEST REPORT**

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**4.5 POWER DENSITY TEST****4.5.1 LIMIT**

FCC Part15, Subpart C Section 15.247(e)

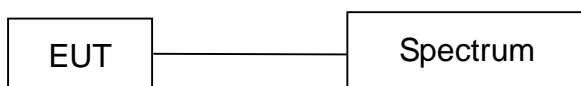
| FREQUENCY RANGE (MHz) | Limit (dBm / kHz) |
|-----------------------|-------------------|
| 902-928               | 8 dBm / 3 kHz     |
| 2400-2483.5           |                   |
| 5725-5850             |                   |

**4.5.2 TEST EQUIPMENT**

The following test equipment was used during the radiated emission test:

| EQUIPMENT/ FACILITIES                         | SPECIFICATIONS | MANUFACTURER    | MODEL#/ SERIAL# | DUE DATE OF CAL. & CAL. CENTER |
|---|----------------|-----------------|-----------------|--------------------------------|
| EMI TEST RECEIVER (INCLUDE SPECTRUM ANALYZER) | 9 KHz ~ 6 GHz  | ROHDE & SCHWARZ | ESL /100176     | MAR. 28, 2015 ETC              |

**NOTE:** The calibration interval of the above test equipment is one year and the calibrations are traceable to NML/ROC and NIST/USA.

**4.5.3 TEST SET-UP**

The EUT was connected to a spectrum through a 50Ω RF cable.

**4.5.4 TEST PROCEDURE**

The EUT was operating in transmitter mode and could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

**4.5.5 EUT OPERATING CONDITION**

1. Set the EUT under continuous transmission condition.
2. The EUT was set to the highest available power level.



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# TEST REPORT

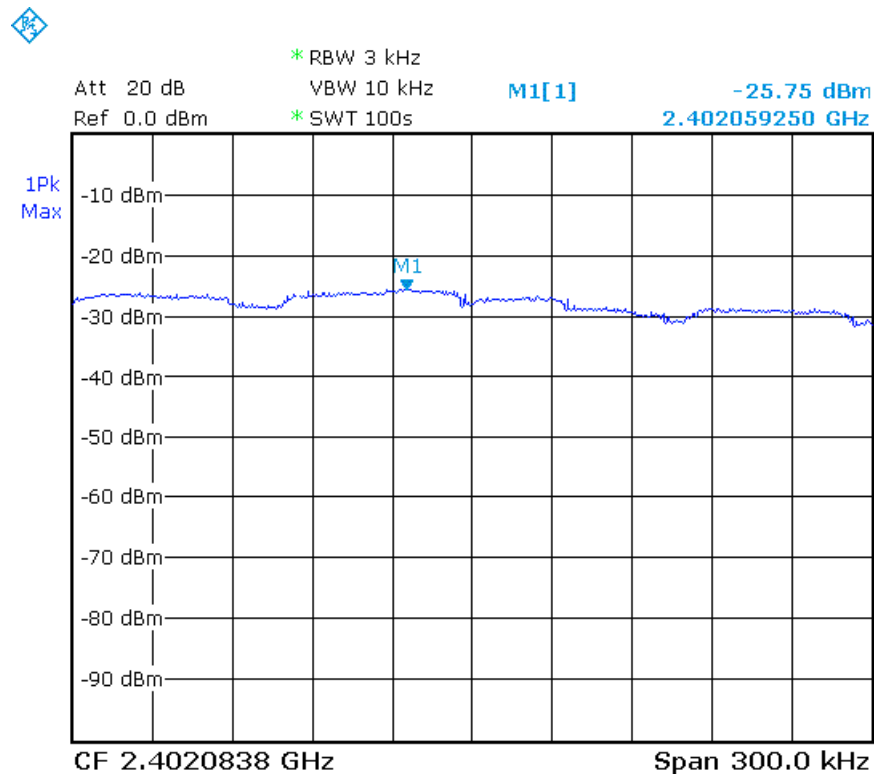
Reference No.: A14101501  
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## 4.5.6 TEST RESULT

|                    |             |              |                  |
|--------------------|-------------|--------------|------------------|
| Temperature:       | 25 °C       | Humidity:    | 64 %RH           |
| Spectrum Detector: | PK.         | Tesr Mode:   | Tx-1, Tx-2, Tx-3 |
| RBW:               | 3 kHz       | VBW:         | 10 kHz           |
| Tested By:         | Richard Lin | Tested Date: | Nov. 03, 2014    |

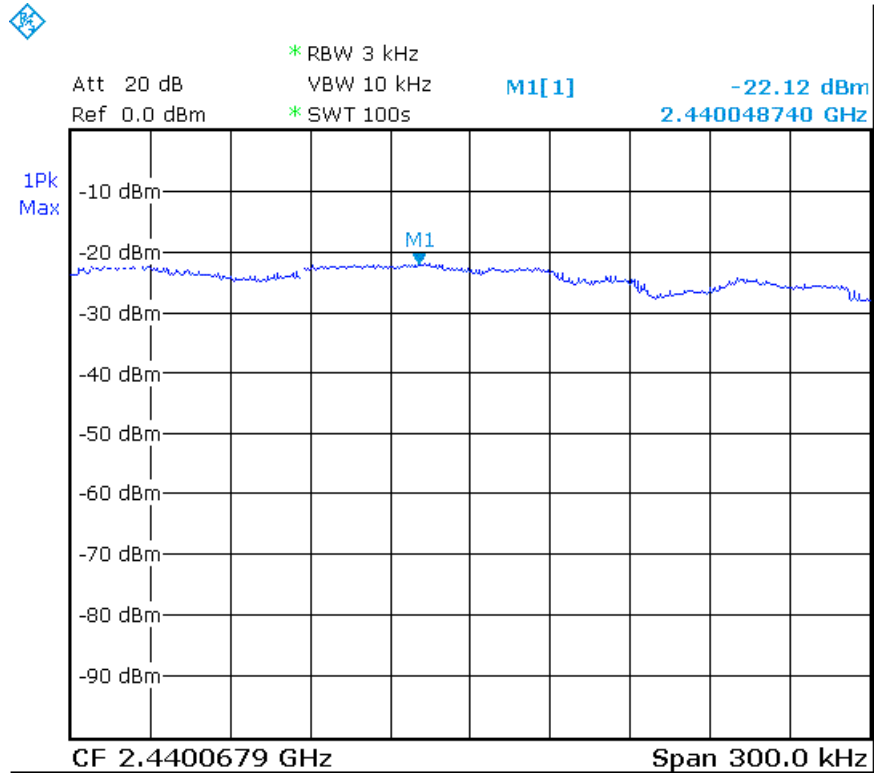
| Channel Number | Channel Frequency (MHz) | RF Power Level in 3 KHz BW (dBm/3kHz) | Maximum Limit (dBm/3kHz) |
|----------------|-------------------------|---------------------------------------|--------------------------|
| CH01           | 2402                    | -25.75                                | 8                        |
| CH20           | 2440                    | -22.12                                | 8                        |
| CH40           | 2480                    | -18.52                                | 8                        |

CH01 :

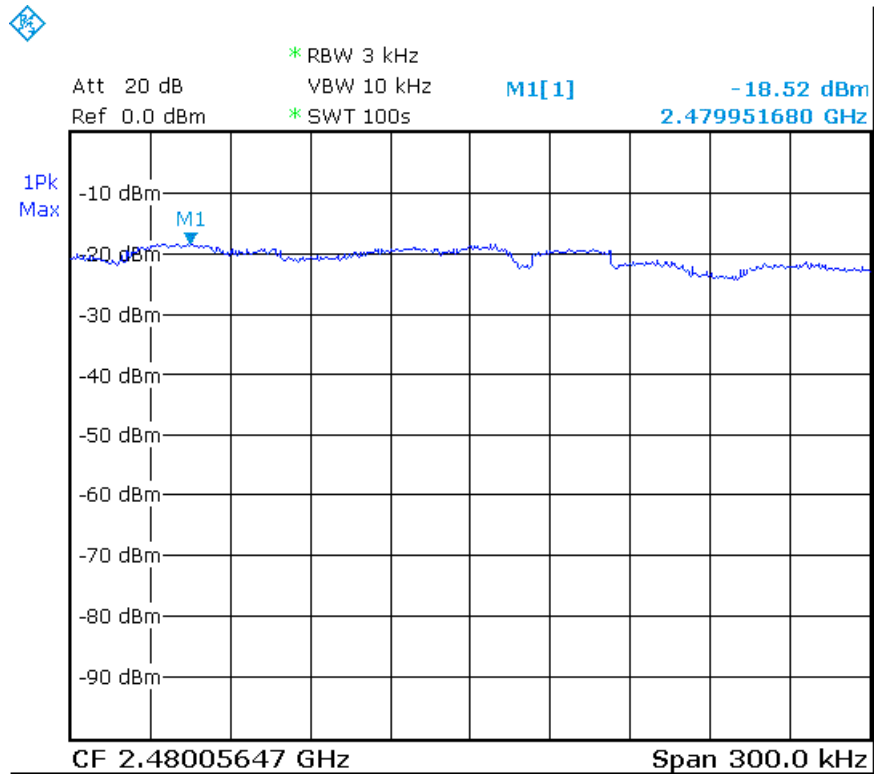




CH20 :



CH40 :





## 5. Antenna application

### 5.1 Antenna requirement

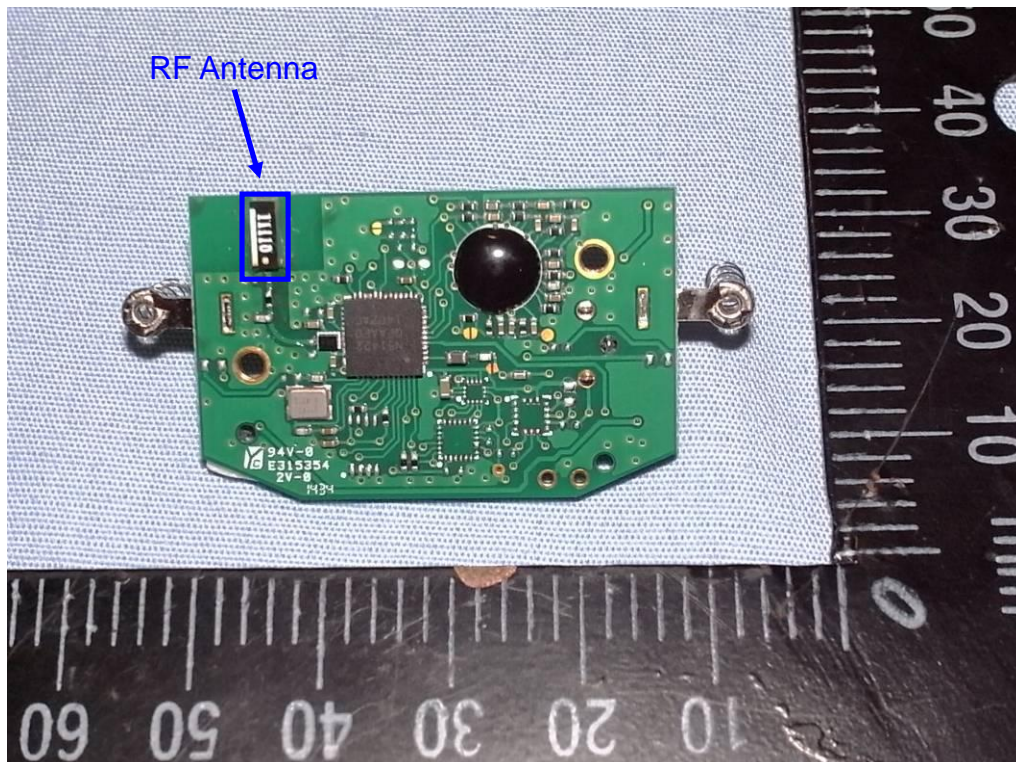
The EUT's antenna is met the requirement of FCC Part 15C section 15.203.

FCC part15C section15.247 requirement:

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

### 5.2 Result

The EUT's antenna used a Chip Antenna. Gain of antenna types is 1.57 dBi that meet the requirement.





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## 6. Description of RF Exposure

SAR compliance has been evaluated in the product(s), and can be used in host product(s) with substantially similar physical dimensions, construction, and electrical and RF characteristics. End-users must be provided with specific information required to satisfy RF exposure compliance for all final host devices. Compliance of this device in all final host configurations is the responsibility of the Grantee.

- I The separation distance -20 cm must be clearly stated in the operating and/or installation manual that is supplied to the User.
- I This application is being made on behalf of the “Grantee”.





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## 7. PHOTOS OF TESTING

- Radiated test (below 30M , Tx, Standby)





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- Radiated test (below 1G , Tx, Standby)





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## 8. TERMS OF ABBREVIATION

|          |  |
|----------|--|
| AV.      | Average detection                            |
| AZ(°)    | Turn table azimuth                           |
| Correct. | Correction                                   |
| EL(m)    | Antenna height (meter)                       |
| EUT      | Equipment Under Test                         |
| Horiz.   | Horizontal direction                         |
| LISN     | Line Impedance Stabilization Network         |
| NSA      | Normalized Site Attenuation                  |
| Q.P.     | Quasi-peak detection                         |
| SRT Lab  | Spectrum Research & Testing Laboratory, Inc. |
| Vert.    | Vertical direction                           |