# FCC Test Report

# (PART 27)

| | |
|---|---|
| **Report No.:** | RF150114C11-2 |
| **FCC ID:** | 2AA5WPAMR04LN |
| **Test Model:** | PA-MR04LN |
| **Received Date:** | Jan. 14, 2015 |
| **Test Date:** | Feb. 05 ~ Mar. 26, 2015 |
| **Issued Date:** | Mar. 30, 2015 |
| **Applicant:** | NEC Platforms, Ltd. |
| **Address:** | 800, Shimomata, Kakegawa-shi, Shizuoka 436-8501, Japan |
| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch |
| **Lab Address:** | No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.) |
| **Test Location:** | No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.) |

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RF150114C11-2 | Original release. | Mar. 30, 2015 |

## 1 Certificate of Conformity

| | |
|---|---|
| **Product:** | AtermMR04LN |
| **Brand:** | NEC |
| **Test Model:** | PA-MR04LN |
| **Sample Status:** | Engineering sample |
| **Applicant:** | NEC Platforms, Ltd. |
| **Test Date:** | Feb. 05 ~ Mar. 26, 2015 |
| **Standards:** | FCC Part 27, Subpart C,M |

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** _____ , **Date:** Mar. 30, 2015

Ivy Lin / Specialist

**Approved by :** _____ , **Date:** Mar. 30, 2015

Bruce Chen / Project Engineer

## 2 Summary of Test Results

| Applied Standard: FCC Part 27 & Part 2 | | | |
|---|---|---|---|
| FCC Clause | Test Item | Result | Remarks |
| 2.1046<br>27.50(d)(4) | Equivalent Isotropically radiated power | PASS | Meet the requirement of limit. |
| 2.1055<br>27.54 | Frequency Stability<br>Stay with the authorized bands of operation | PASS | Meet the requirement of limit. |
| 2.1049<br>27.53(m)(6) | Emission Bandwidth | PASS | Meet the requirement of limit. |
| 2.1051<br>27.53(m)(4)(6) | Band Edge Measurements | PASS | Meet the requirement of limit. |
| --- | Peak To Average Ratio | PASS | Meet the requirement of limit. |
| 2.1051<br>27.53(m)(4)(6) | Conducted Spurious Emissions | PASS | Meet the requirement of limit. |
| 2.1053<br>27.53(m)(4)(6) | Radiated Spurious Emissions | PASS | Meet the requirement of limit.<br>Minimum passing margin is -25.60dB at 1413.00MHz. |

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Expended Uncertainty (k=2) (±) |
|---|---|---|
| Radiated Emissions up to 1 GHz | 30MHz ~ 200MHz | 3.59 dB |
| | 200MHz ~1000MHz | 3.60 dB |
| Radiated Emissions above 1 GHz | 1GHz ~ 18GHz | 2.29 dB |
| | 18GHz ~ 40GHz | 2.29 dB |

## 2.2 Test Site And Instruments

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|---|---|---|---|---|
| Test Receiver<br>ROHDE & SCHWARZ | ESCI | 100424 | Oct. 06, 2014 | Oct. 05, 2015 |
| BILOG Antenna<br>SCHWARZBECK | VULB9168 | 9168-155 | Feb. 26, 2014 | Feb. 25, 2015 |
| | | | Feb. 06, 2015 | Feb. 05, 2016 |
| HORN Antenna<br>SCHWARZBECK | BBHA 9120D | 9120D-1170 | Aug. 25, 2014 | Aug. 24, 2015 |
| HORN Antenna<br>SCHWARZBECK | BBHA 9170 | BBHA9170241 | Feb. 20, 2014 | Feb. 19, 2015 |
| | | | Feb. 09, 2015 | Feb. 08, 2016 |
| Preamplifier<br>Agilent | 8449B | 3008A01961 | Oct. 18, 2014 | Oct. 17, 2015 |
| Preamplifier<br>Agilent | 8447D | 2944A10738 | Oct. 18, 2014 | Oct. 17, 2015 |
| RF signal cable<br>HUBER+SUHNNER | SUCOFLEX 104 | 309220/4 | Aug. 09, 2014 | Aug. 08, 2015 |
| RF signal cable<br>HUBER+SUHNNER | SUCOFLEX 104 | 250724/4 | Aug. 09, 2014 | Aug. 08, 2015 |
| RF signal cable<br>HUBER+SUHNNER | SUCOFLEX 104 | 295012/4 | Aug. 09, 2014 | Aug. 08, 2015 |
| Software<br>BV ADT | ADT_Radiated_<br>V7.6.15.9.4 | NA | NA | NA |
| Antenna Tower<br>inn-co GmbH | MA 4000 | 010303 | NA | NA |
| Antenna Tower Controller<br>inn-co GmbH | CO2000 | 019303 | NA | NA |
| Turn Table<br>BV ADT | TT100. | TT93021704 | NA | NA |
| Turn Table Controller<br>BV ADT | SC100. | SC93021704 | NA | NA |
| Mini-Circuits Power Splitter | ZN2PD-9G | NA | Apr. 25, 2014 | Apr. 24, 2015 |
| JFW 20dB attenuation | 50HF-020-SMA | NA | NA | NA |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 4.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 460141.

5. The IC Site Registration No. is IC7450F-4.

## 3 General Information

### 3.1 General Description of EUT

| | | |
|---|---|---|
| Product | AtermMR04LN | |
| Brand | NEC | |
| Test Model | PA-MR04LN | |
| Status of EUT | Engineering sample | |
| Power Supply Rating | 5Vdc (adapter)<br>3.8Vdc (battery) | |
| Modulation Type | QPSK, 16QAM | |
| Operating Frequency | 709MHz ~ 711MHz | |
| Max. ERP Power | 5MHz | 52.119mW (17.17dBm) |
| | 10MHz | 44.055mW (16.44dBm) |
| Antenna Type | Inverted F antenna with -2.69dBi gain | |
| Antenna Connector | UFL | |
| Accessory Device | N/A | |
| Data Cable Supplied | N/A | |

Note:

1. The EUT uses following adapter, battery and USB cable.

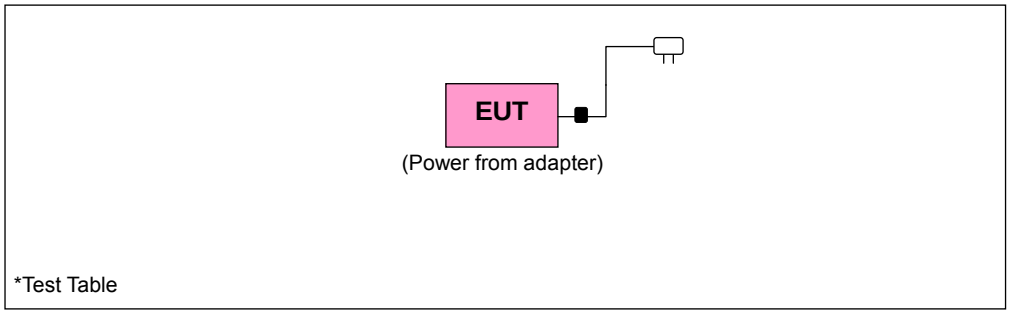
| Adapter (Support unit only) | |
|---|---|
| Brand | NEC |
| Model | AL1-004001-001 |
| Input Power | 100-240Vac, 50/60Hz, 140mA |
| Output Power | 5Vdc, 1.0A |

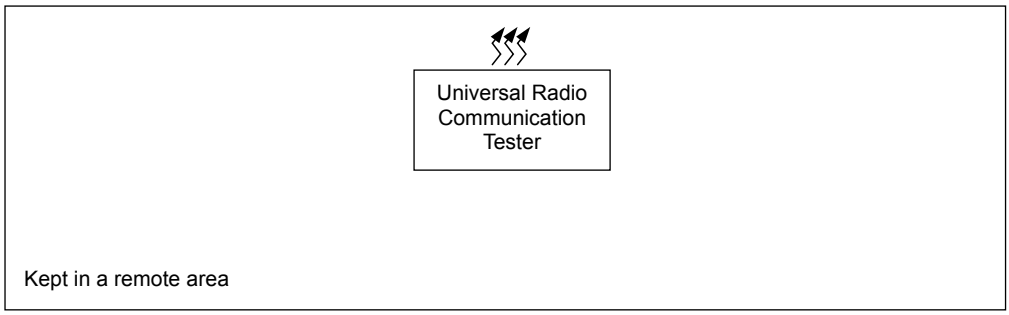
| Li-ion Battery (Support unit only) | |
|---|---|
| Brand | NEC |
| Model | AL1-003388-001 |
| Input Power | 3.8Vdc, 2300mAh |

| | |
|---|---|
| USB cable<br>(Support unit only) | 1.0m non-shielded cable with one core |

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

## 3.2 Configuration of System Under Test




### 3.2.1 Description Of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|---|---|---|---|---|---|---|
| A. | Universal Radio Communication Tester | R&S | CMU200 | 117260 | NA | - |

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

### 3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports
The worst case was found when positioned on Z-plane. Following channel(s) was (were) selected for the final test as listed below:

Test results are presented in the report as below.

| Test Mode | Test Condition |
|---|---|
| A | Power from adapter |
| B | Power from battery |

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION TYPE | MODE |
|---|---|---|---|---|---|---|
| A | ERP | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK | 1 RB / 24 RB Offset |
| | | 23755 to 23825 | 23780, 23790, 23800 | 10MHz | QPSK | 1 RB / 49 RB Offset |
| B | FREQUENCY STABILITY | 23755 to 23825 | 23790 | 5MHz | QPSK | 1 RB / 24 RB Offset |
| | | 23755 to 23825 | 23790 | 10MHz | QPSK | 1 RB / 49 RB Offset |
| B | OCCUPIED BANDWIDTH | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | 23755 to 23825 | 23780, 23790, 23800 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| B | PEAK TO AVERAGE RATIO | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK, 16QAM | 1 RB / 24 RB Offset |
| | | 23755 to 23825 | 23780, 23790, 23800 | 10MHz | QPSK, 16QAM | 1 RB / 49 RB Offset |
| B | BAND EDGE | 23755 to 23825 | 23755, 23825 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset<br>1 RB / 24 RB Offset<br>25 RB / 0 RB Offset |
| | | 23755 to 23825 | 23780 23800 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset<br>1 RB / 49 RB Offset<br>50 RB / 0 RB Offset |
| B | CONDCUDETED EMISSION | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK | 1 RB / 24 RB Offset |
| | | 23755 to 23825 | 23780, 23790, 23800 | 10MHz | QPSK | 1 RB / 49 RB Offset |
| A | RADIATED EMISSION BELOW 1GHz | 23755 to 23825 | 23755 | 5MHz | QPSK | 1 RB / 24 RB Offset |
| | | 23755 to 23825 | 23780 | 10MHz | QPSK | 1 RB / 49 RB Offset |
| A | RADIATED EMISSION ABOVE 1GHz | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK | 1 RB / 24 RB Offset |
| | | 23755 to 23825 | 23780, 23790, 23800 | 10MHz | QPSK | 1 RB / 49 RB Offset |

**Test Condition:**

| Test Item | Environmental Conditions | Input Power | Tested By |
|---|---|---|---|
| ERP | 18deg.C, 69%RH | 120Vac, 60Hz | Nick Hsu |
| Frequency Stability | 24deg.C, 64%RH | 3.8Vdc | Match Tsui |
| Occupied Bandwidth | 24deg.C, 64%RH | 3.8Vdc | Match Tsui |
| Band Edge | 24deg.C, 64%RH | 3.8Vdc | Match Tsui |
| Peak To Average Ratio | 24deg.C, 64%RH | 3.8Vdc | Match Tsui |
| Condcudeted Emission | 24deg.C, 64%RH | 3.8Vdc | Match Tsui |
| Radiated Emission | 25deg.C, 65%RH,<br>18deg.C, 69%RH | 120Vac, 60Hz | Chris Lin,<br>Nick Hsu |

### 3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

### 3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**ANSI/TIA/EIA-603-C 2004**

**NOTE:** All test items have been performed and recorded as per the above standards.

## 4 Test Types and Results

### 4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 3 watts e.r.p.

4.1.2 Test Procedures

**ERP:**

a. All measurements were done at low, middle and high operational frequency range. RWB and VBW is 5MHz for LTE.

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G

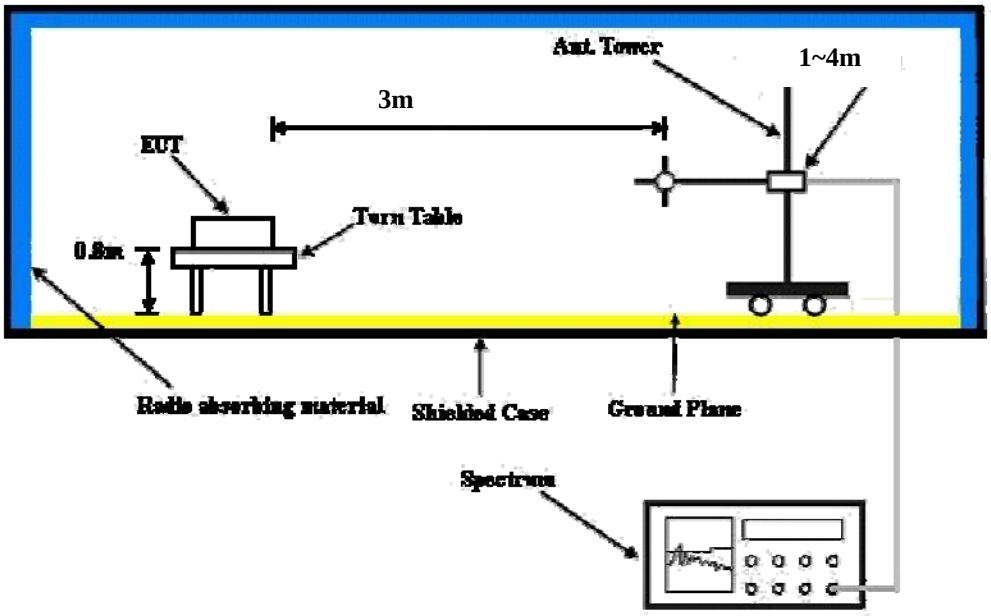
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

**Conducted Power Measurement:**

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.1.3 Test Setup

EIRP / ERP MEASUREMENT:




For the actual test configuration, please refer to the attached file (Test Setup Photo).

CONDUCTED POWER MEASUREMENT:


For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.4 Test Results

**CONDUCTED OUTPUT POWER (dBm)**

| Band / BW | RB Size | RB Offset | QPSK | | | 3GPP MPR (dB) | 16QAM | | | 3GPP MPR (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 23755 | Mid CH 23790 | High CH 23825 | | Low CH 23755 | Mid CH 23790 | High CH 23825 | |
| | | | 706.5 MHz | 710.0 MHz | 713.5 MHz | | 706.5 MHz | 710.0 MHz | 713.5 MHz | |
| 17 / 5M | 1 | 0 | 21.81 | 21.78 | 21.85 | 0 | 20.77 | 20.74 | 20.81 | 1 |
| | 1 | 12 | 22.05 | 22.02 | 22.09 | 0 | 21.01 | 20.98 | 21.05 | 1 |
| | 1 | 24 | 21.97 | 21.94 | 22.01 | 0 | 20.93 | 20.90 | 20.97 | 1 |
| | 12 | 0 | 21.03 | 21.00 | 21.07 | 1 | 19.99 | 19.96 | 20.03 | 2 |
| | 12 | 6 | 21.08 | 21.05 | 21.12 | 1 | 20.04 | 20.01 | 20.08 | 2 |
| | 12 | 13 | 20.94 | 20.91 | 20.98 | 1 | 19.90 | 19.87 | 19.94 | 2 |
| | 25 | 0 | 20.97 | 20.94 | 21.01 | 1 | 19.93 | 19.90 | 19.97 | 2 |

| Band / BW | RB Size | RB Offset | QPSK | | | 3GPP MPR (dB) | 16QAM | | | 3GPP MPR (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 23780 | Mid CH 23790 | High CH 23800 | | Low CH 23780 | Mid CH 23790 | High CH 23800 | |
| | | | 709.0 MHz | 710.0 MHz | 711.0 MHz | | 709.0 MHz | 710.0 MHz | 711.0 MHz | |
| 17 / 10M | 1 | 0 | 21.92 | 21.89 | 21.96 | 0 | 20.90 | 20.87 | 20.94 | 1 |
| | 1 | 24 | 22.16 | 22.13 | 22.20 | 0 | 21.14 | 21.11 | 21.18 | 1 |
| | 1 | 49 | 22.08 | 22.05 | 22.12 | 0 | 21.06 | 21.03 | 21.10 | 1 |
| | 25 | 0 | 21.14 | 21.11 | 21.18 | 1 | 20.12 | 20.09 | 20.16 | 2 |
| | 25 | 12 | 21.19 | 21.16 | 21.23 | 1 | 20.17 | 20.14 | 20.21 | 2 |
| | 25 | 25 | 21.05 | 21.02 | 21.09 | 1 | 20.03 | 20.00 | 20.07 | 2 |
| | 50 | 0 | 21.08 | 21.05 | 21.12 | 1 | 20.06 | 20.03 | 20.10 | 2 |

## ERP POWER (dBm)

### CHANNEL BANDWIDTH: 5MHz QPSK

| MODE | | TX channel 23755 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 706.50 | -13.46 | 16.57 | -1.07 | 15.50 | 34.77 | -19.27 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 706.50 | -16.36 | 16.63 | -1.07 | 15.56 | 34.77 | -19.21 |

| MODE | | TX channel 23790 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| **1** | **710.00** | **-11.76** | **18.24** | **-1.07** | **17.17** | **34.77** | **-17.60** |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 710.00 | -15.26 | 17.55 | -1.07 | 16.48 | 34.77 | -18.29 |

| MODE | | TX channel 23825 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 713.50 | -13.31 | 16.90 | -1.07 | 15.83 | 34.77 | -18.94 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 713.50 | -15.73 | 17.32 | -1.07 | 16.25 | 34.77 | -18.52 |

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)

## CHANNEL BANDWIDTH: 10MHz QPSK

| MODE | | TX channel 23780 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 709.00 | -13.55 | 16.41 | -1.07 | 15.34 | 34.77 | -19.43 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 709.00 | -16.49 | 16.37 | -1.07 | 15.30 | 34.77 | -19.47 |

| MODE | | TX channel 23790 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 710.00 | -14.48 | 15.52 | -1.07 | 14.45 | 34.77 | -20.32 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 710.00 | -16.99 | 15.82 | -1.07 | 14.75 | 34.77 | -20.02 |

| MODE | | TX channel 23800 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 711.00 | -14.90 | 15.15 | -1.07 | 14.08 | 34.77 | -20.69 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 711.00 | -15.39 | 17.51 | -1.07 | 16.44 | 34.77 | -18.33 |

**NOTE:** ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB)

## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stabiliity Measurement

According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT -30℃ ~ 50℃.

### 4.2.2 Test Procedure

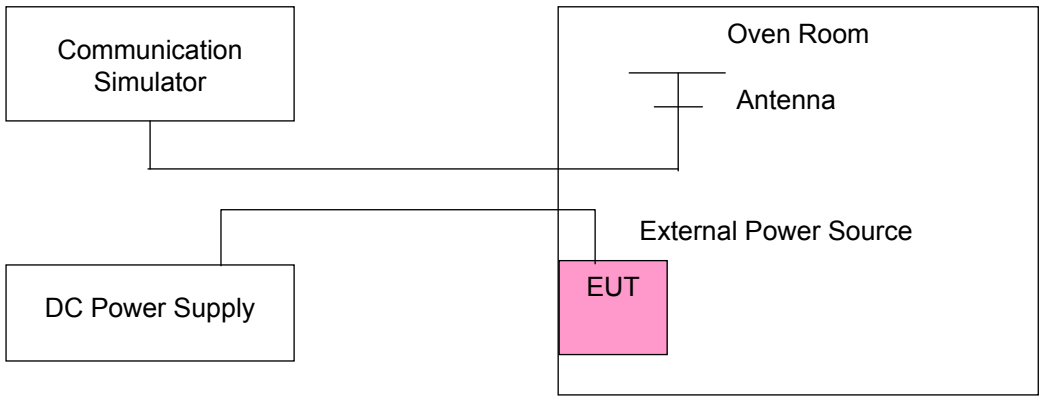
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5 ℃ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 4.2.3 Test Setup



4.2.4 Test Results

Frequency Error vs. Voltage

| Voltage (Volts) | Frequency Error (ppm) | | Limit (ppm) |
|---|---|---|---|
| | 5MHz | 10MHz | |
| 4.2 | -0.018 | -0.018 | 2.5 |
| 3.8 | -0.015 | -0.018 | 2.5 |
| 3.5 | -0.017 | -0.021 | 2.5 |

**NOTE:** The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

Frequency Error vs. Temperature.

| TEMP. (℃) | Frequency Error (ppm) | | Limit (ppm) |
|---|---|---|---|
| | 5MHz | 10MHz | |
| 60 | -0.042 | -0.048 | 2.5 |
| 50 | -0.048 | -0.044 | 2.5 |
| 40 | -0.044 | -0.038 | 2.5 |
| 30 | -0.023 | -0.030 | 2.5 |
| 20 | -0.015 | -0.018 | 2.5 |
| 10 | -0.027 | -0.025 | 2.5 |
| 0 | -0.034 | -0.037 | 2.5 |
| -10 | -0.052 | -0.058 | 2.5 |
| -20 | -0.058 | -0.059 | 2.5 |

## 4.3 Emission Bandwidth Measurement

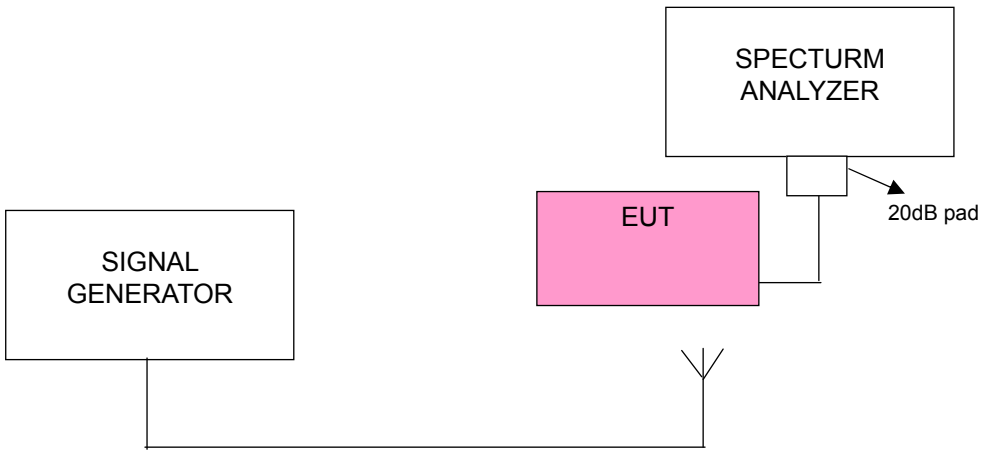
### 4.3.1 Limits of Emission Bandwidth Measurement

According to FCC 27.53(m)(6) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

### 4.3.2 Test Procedure

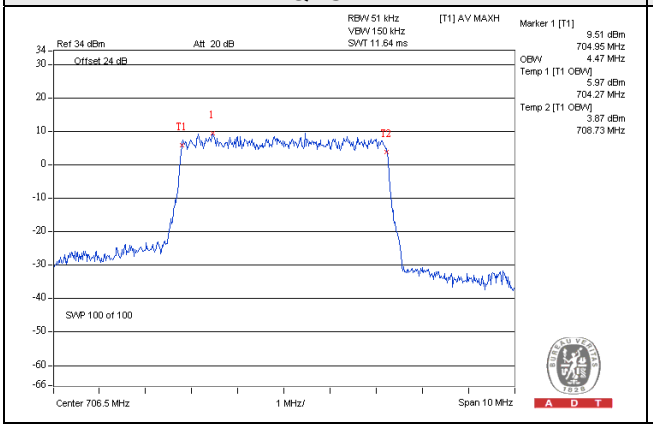
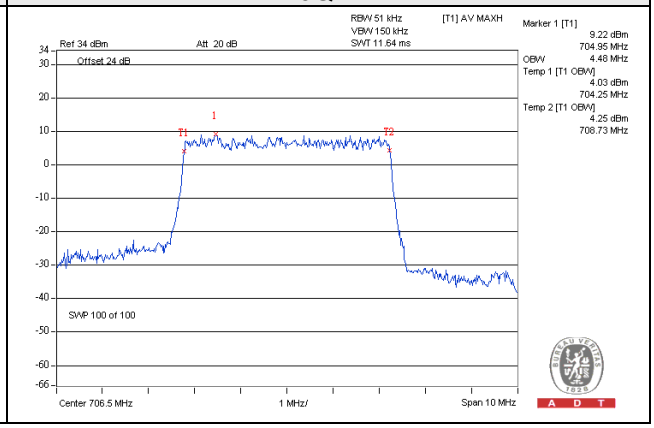
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

### 4.3.3 Test Setup

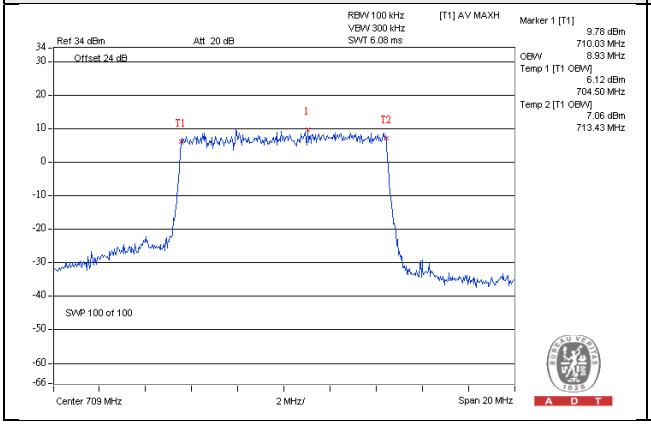
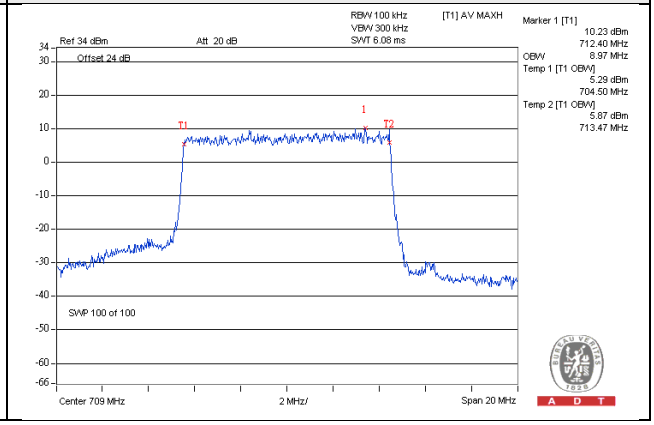


### 4.3.4 Test Result

| Channel Bandwidth: 5MHz | | | |
|---|---|---|---|
| Channel | Frequency (MHz) | QPSK | 16QAM |
| 23755 | 706.5 | 4.47 | 4.48 |
| 23790 | 710.0 | 4.47 | 4.47 |
| 23825 | 713.5 | 4.45 | 4.47 |

| SPECTRUM PLOT OF WORST VALUE | |
|---|---|
| QPSK | 16QAM |
|  |  |

| Channel Bandwidth: 10MHz | | | |
|---|---|---|---|
| Channel | Frequency (MHz) | QPSK | 16QAM |
| 23780 | 709.0 | 8.93 | 8.97 |
| 23790 | 710.0 | 8.90 | 8.93 |
| 23800 | 711.0 | 8.90 | 8.90 |

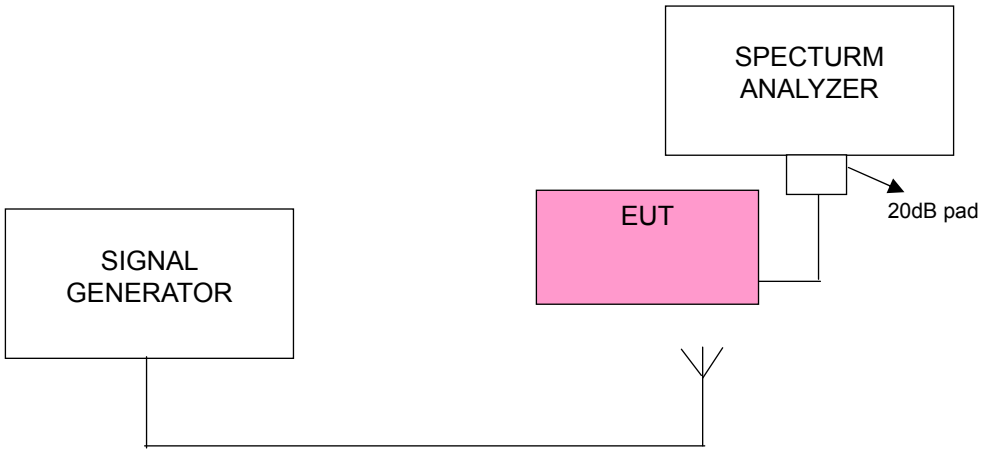
| SPECTRUM PLOT OF WORST VALUE | |
|---|---|
| QPSK | 16QAM |
|  |  |

## 4.4 Band Edge Measurement

### 4.4.1 Limits of Band Edge Measurement

According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than 43 + 10 log (P) dB at the channel edge, the limit of emission equal to –13dBm. And 55 + 10 log (P) dB at 5.5 MHz from the channel edges, the limit of emission equal to –25dBm.In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

### 4.4.2 Test Setup




### 4.4.3 Test Procedures

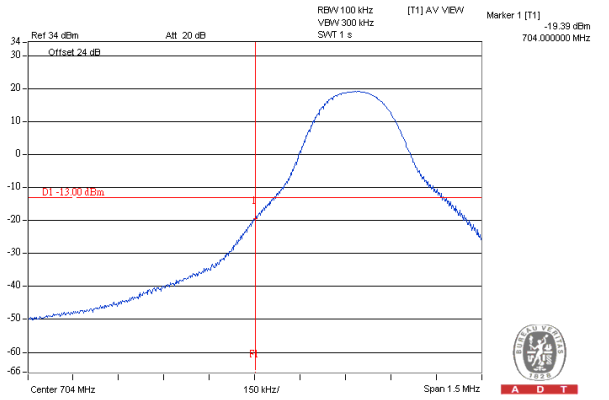
a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels: low, middle and high operational frequency range.

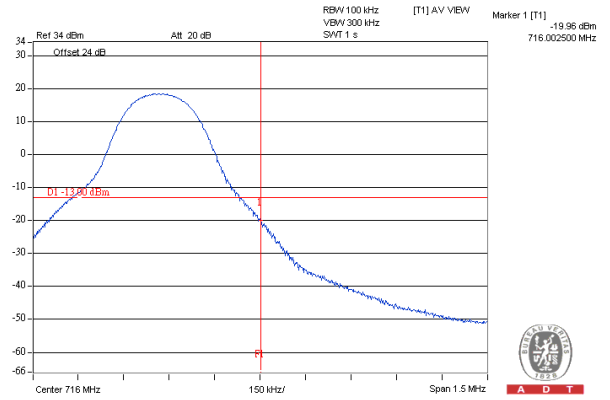
b. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 5MHz/ 10MHz).

c. Record the max trace plot into the test report.

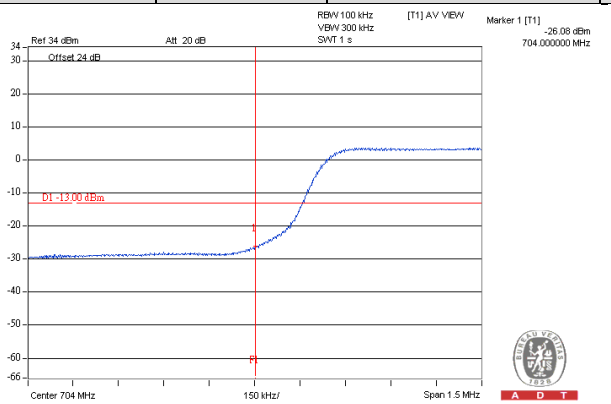
## 4.4.4 Test Results

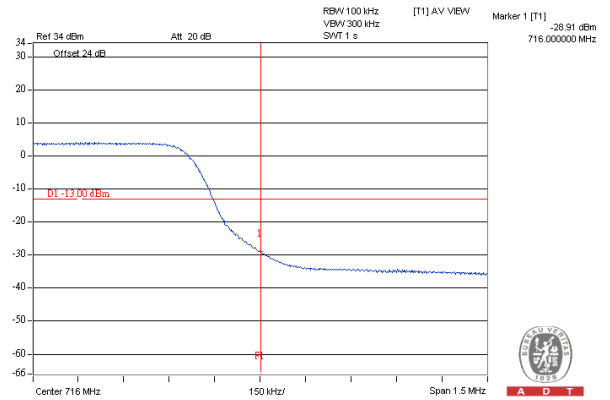
| Channel Bandwidth: 5MHz / QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23755 | 1 RB / 0 RB Offset | CHANNEL | 23825 | 1 RB / 24 RB Offset |



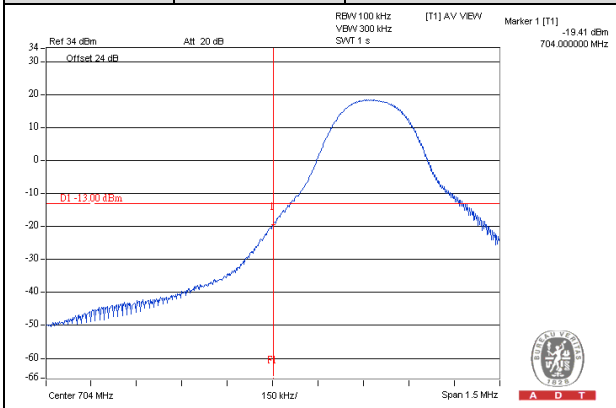



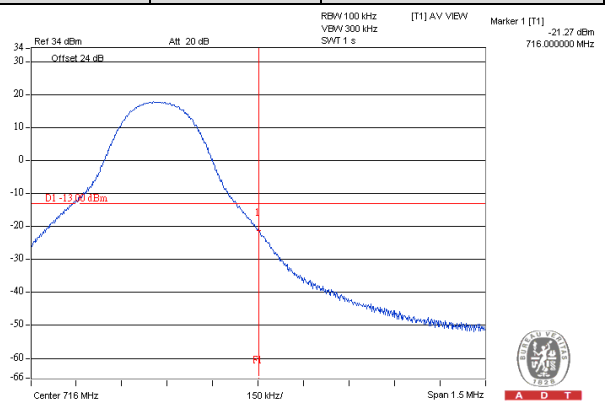

| Channel Bandwidth: 5MHz / QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23755 | 25 RB / 0 RB Offset | CHANNEL | 23825 | 25 RB / 0 RB Offset |



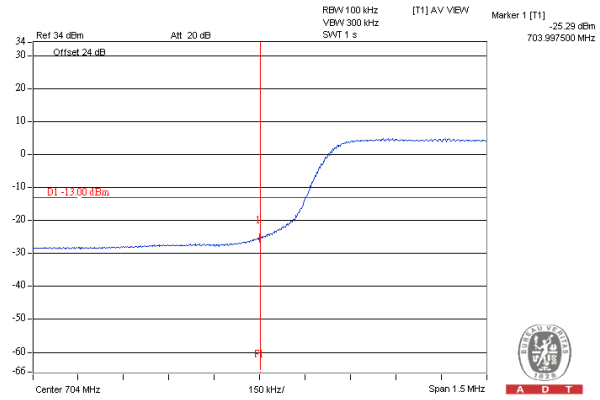



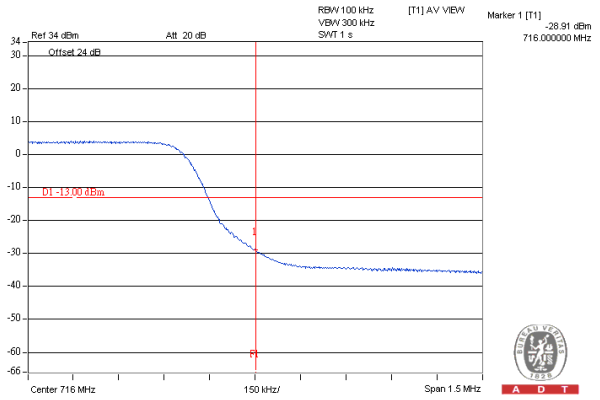
| Channel Bandwidth: 5MHz / 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23755 | 1 RB / 0 RB Offset | CHANNEL | 23825 | 1 RB / 24 RB Offset |



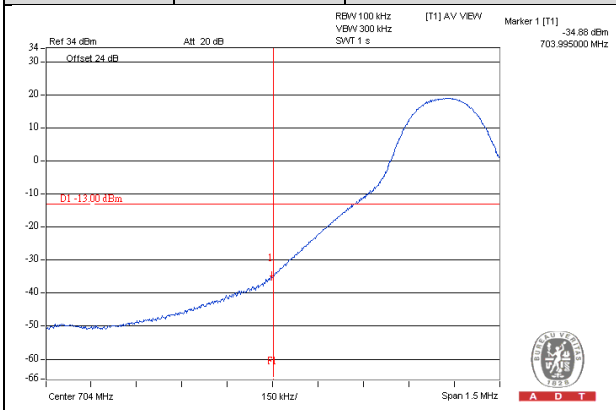



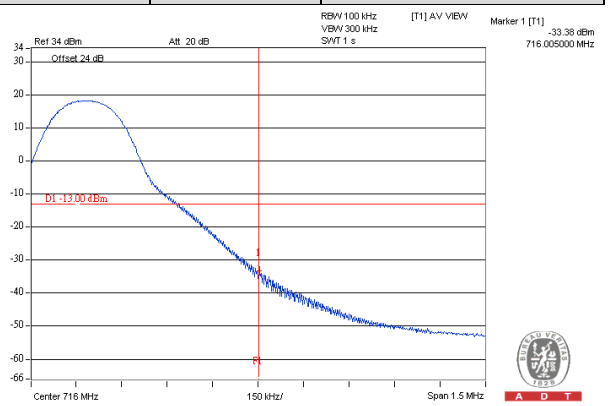

| Channel Bandwidth: 5MHz / 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23755 | 25 RB / 0 RB Offset | CHANNEL | 23825 | 25 RB / 0 RB Offset |



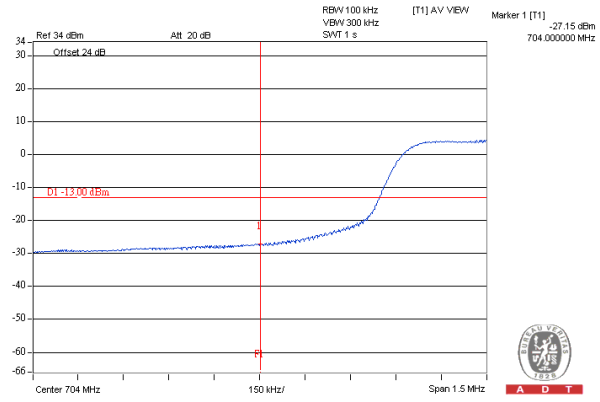



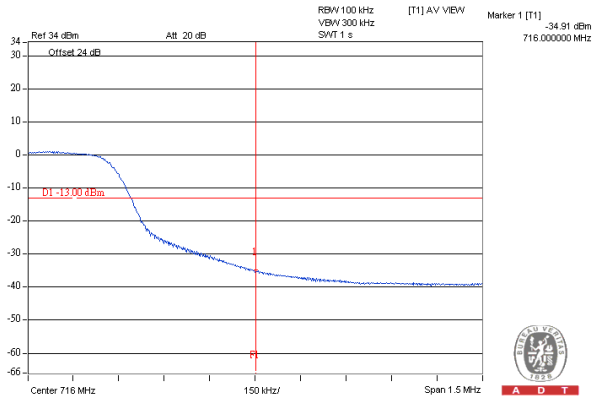
| Channel Bandwidth: 10MHz / QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23780 | 1 RB / 0 RB Offset | CHANNEL | 23800 | 1 RB / 49 RB Offset |



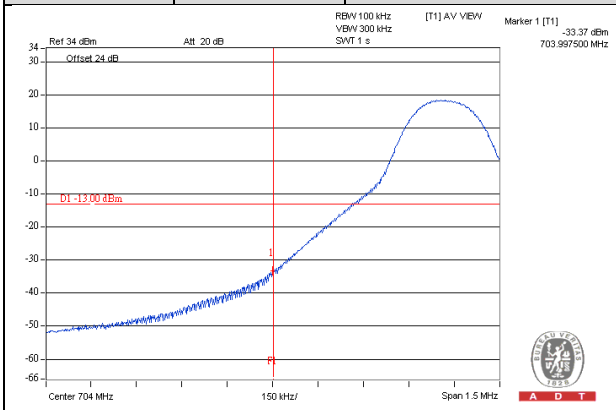



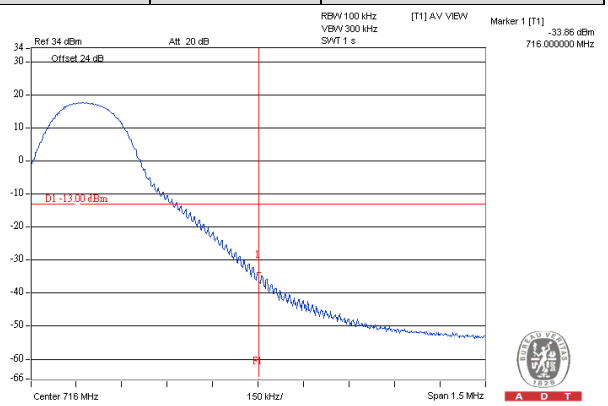

| Channel Bandwidth: 10MHz / QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23780 | 50 RB / 0 RB Offset | CHANNEL | 23800 | 50 RB / 0 RB Offset |



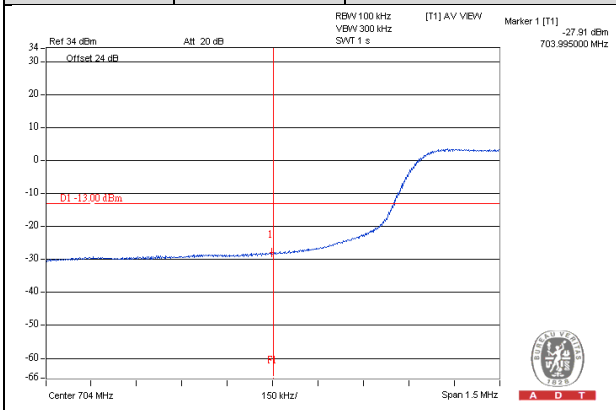



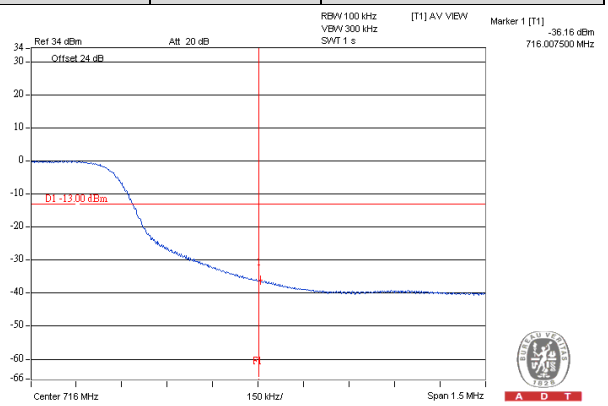
| Channel Bandwidth: 10MHz / 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23780 | 1 RB / 0 RB Offset | CHANNEL | 23800 | 1 RB / 49 RB Offset |




| Channel Bandwidth: 10MHz / 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 23780 | 50 RB / 0 RB Offset | CHANNEL | 23800 | 50 RB / 0 RB Offset |



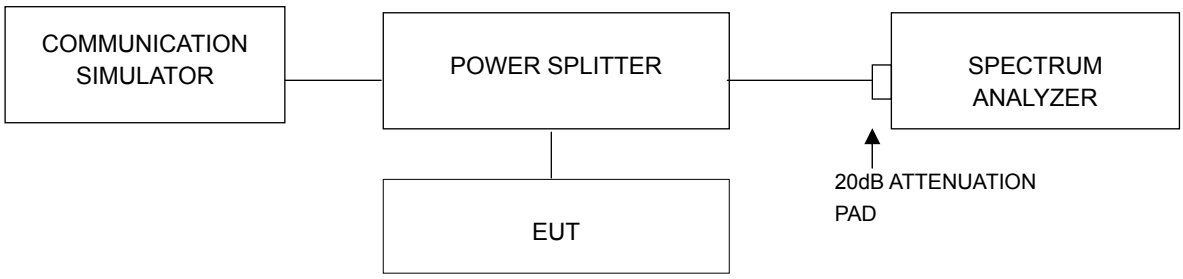



## 4.5 Peak To Average Ratio

### 4.5.1 Limits of Peak To Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

### 4.5.2 Test Setup




### 4.5.3 Test Procedures

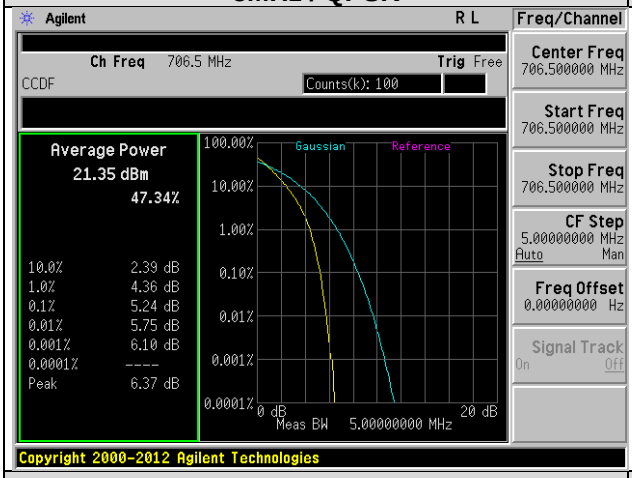
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

4.5.4 Test Results

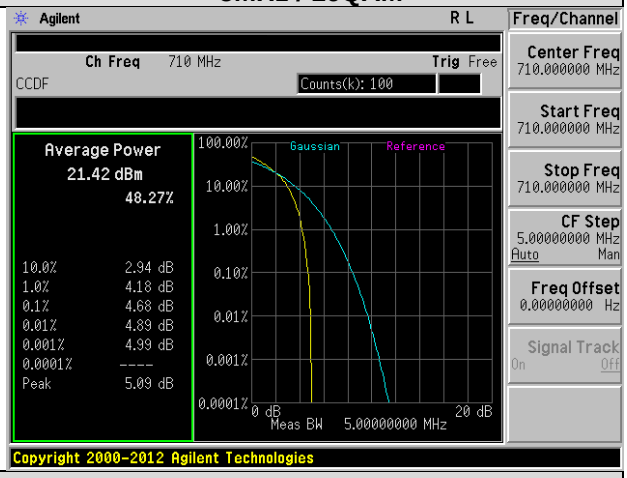
| CHANNEL BANDWIDTH: 5MHz | | | | CHANNEL BANDWIDTH: 10MHz | | | |
|---|---|---|---|---|---|---|---|
| CHANNEL | FREQUENCY (MHz) | Peak To Average Ratio (dB) | | CHANNEL | FREQUENCY (MHz) | Peak To Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23755 | 706.5 | 5.24 | 4.68 | 23780 | 709.0 | 5.03 | 5.03 |
| 23790 | 710.0 | 5.16 | 4.68 | 23790 | 710.0 | 5.11 | 5.11 |
| 23825 | 713.5 | 5.06 | 4.61 | 23800 | 711.0 | 5.05 | 5.05 |

**SPECTRUM PLOT OF WORST VALUE**

**5MHz / QPSK**

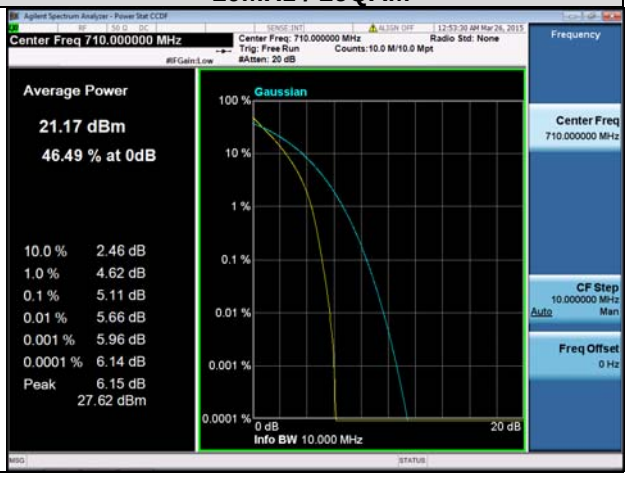



**5MHz / 16QAM**




**10MHz / QPSK**


**10MHz / 16QAM**

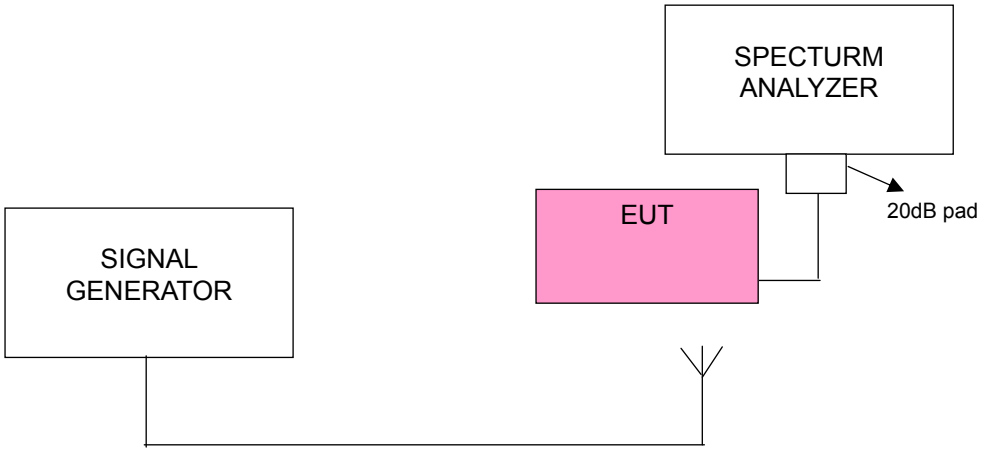


## 4.6 Conducted Spurious Emissions

### 4.6.1 Limits of Conducted Spurious Emissions Measurement

In the FCC 27.53(m)(4), On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. The emission limit equal to –13dBm.

### 4.6.2 Test Setup

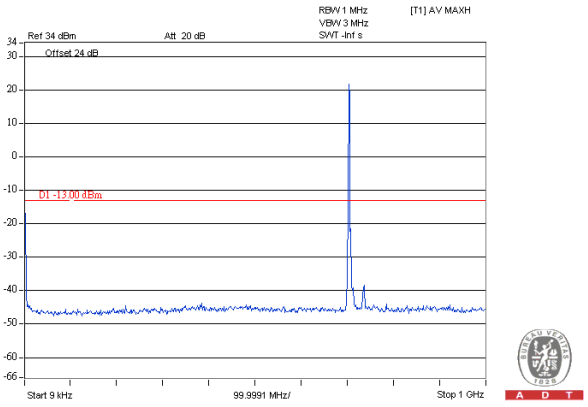
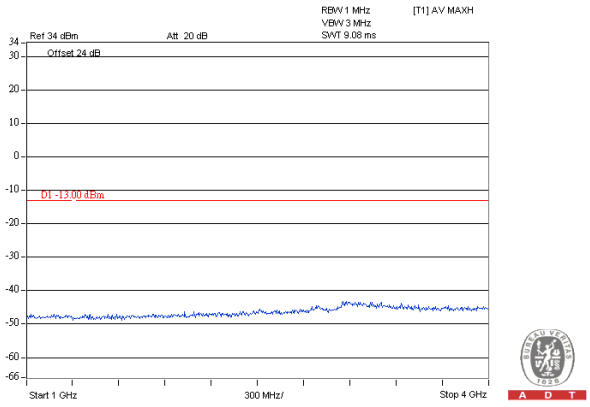
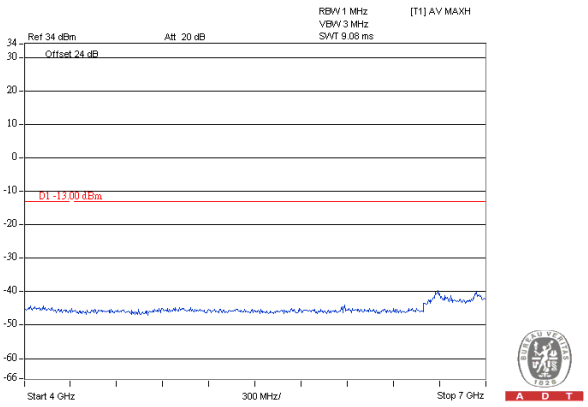
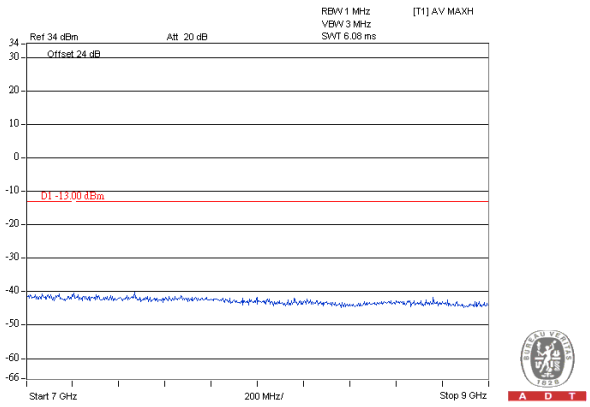



### 4.6.3 Test Procedure

a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.

b. Measuring frequency range is from 9 kHz to 9GHz. 20dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

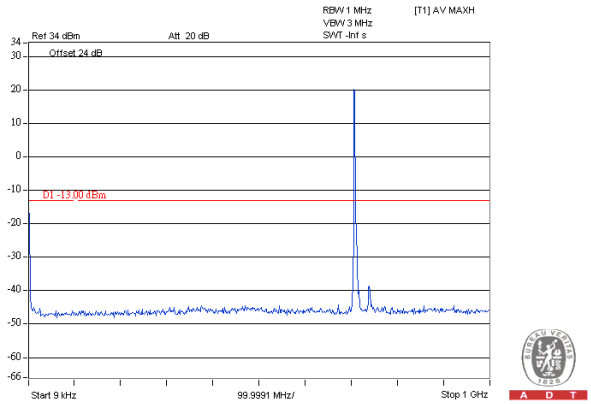
## 4.6.4 Test Results

| Channel Bandwidth: 5MHz / QPSK | |
|---|---|
| CHANNEL 23755 | |
| FREQUENCY RANGE : 9kHz~1GHz | FREQUENCY RANGE : 1GHz~4GHz |
|  |  |
| FREQUENCY RANGE : 4GHz~7GHz | FREQUENCY RANGE : 7GHz~9GHz |
|  |  |

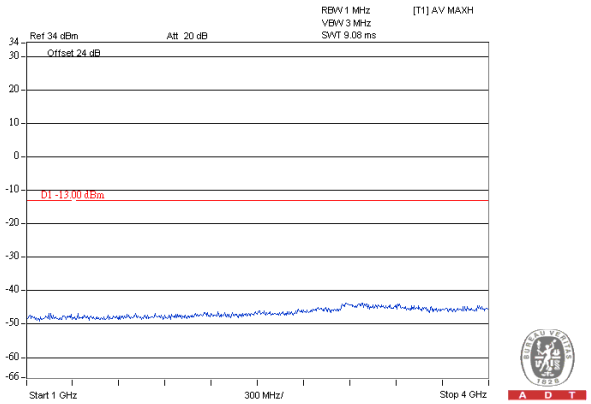
## Channel Bandwidth: 5MHz / QPSK

### CHANNEL 23790

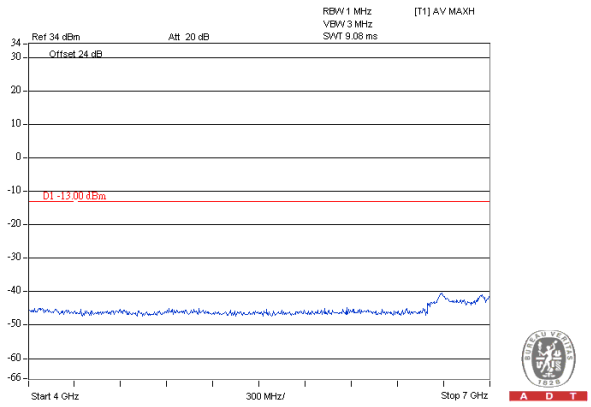
### FREQUENCY RANGE : 9kHz~1GHz



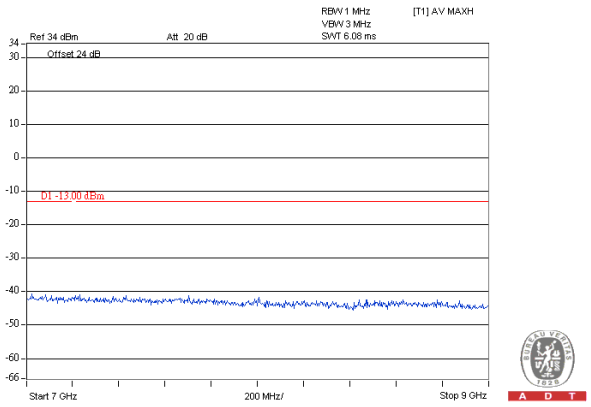

### FREQUENCY RANGE : 1GHz~4GHz




### FREQUENCY RANGE : 4GHz~7GHz



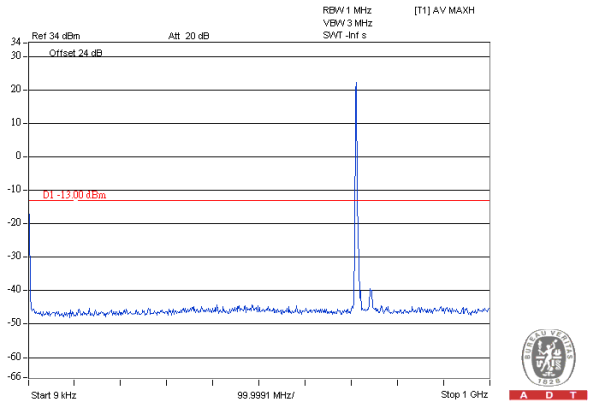

### FREQUENCY RANGE : 7GHz~9GHz



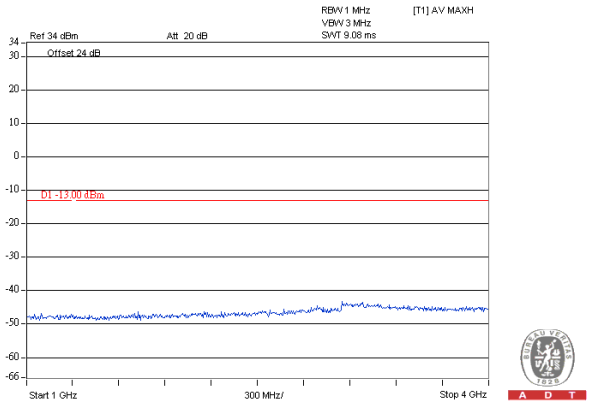
## Channel Bandwidth: 5MHz / QPSK

### CHANNEL 23825

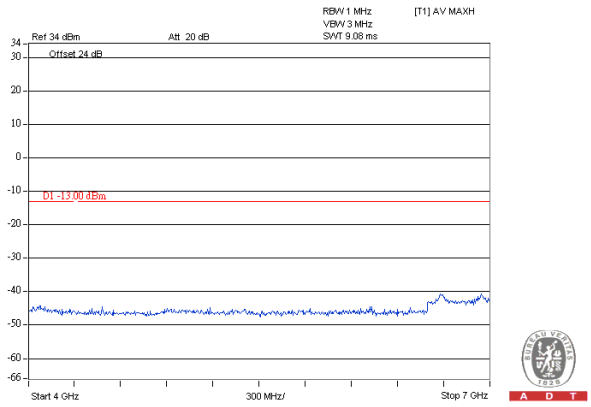
### FREQUENCY RANGE : 9kHz~1GHz



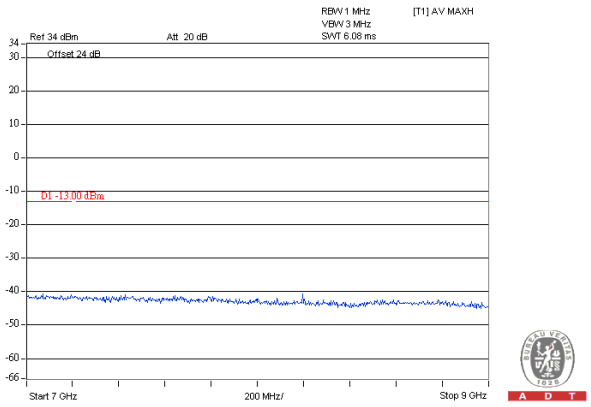

### FREQUENCY RANGE : 1GHz~4GHz




### FREQUENCY RANGE : 4GHz~7GHz



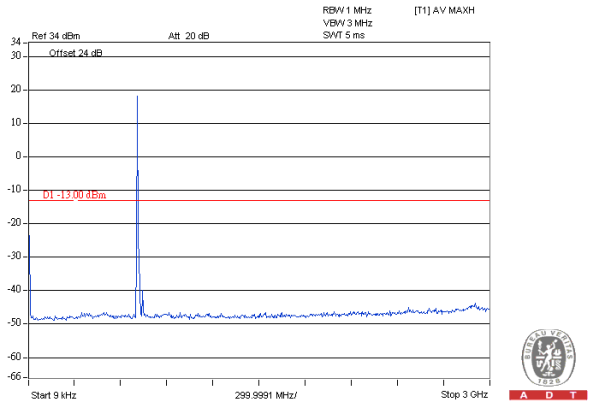

### FREQUENCY RANGE : 7GHz~9GHz



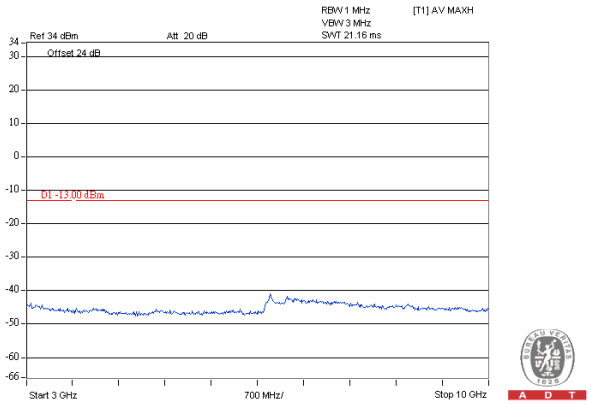
## Channel Bandwidth: 10MHz / QPSK

### CHANNEL 23780

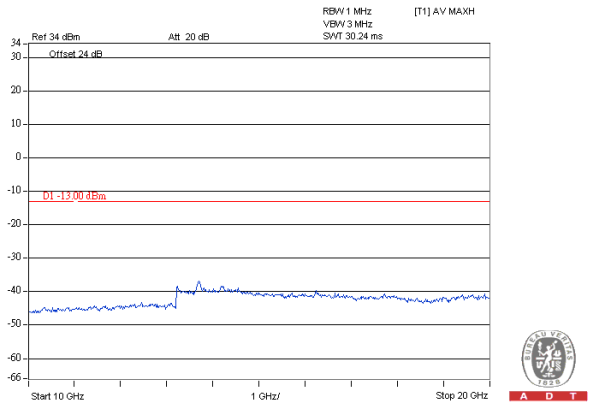
### FREQUENCY RANGE : 9kHz~3GHz




### FREQUENCY RANGE : 3GHz~10GHz



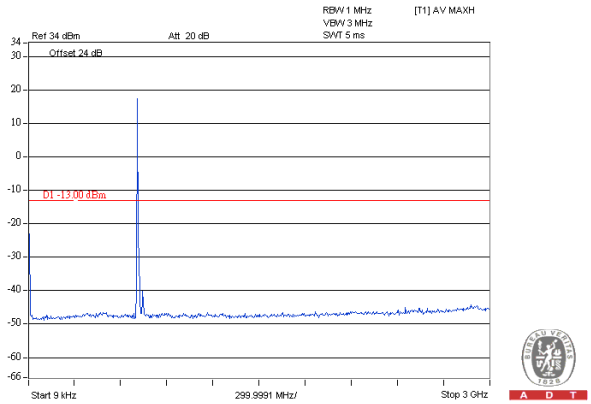

### FREQUENCY RANGE : 10GHz~20GHz



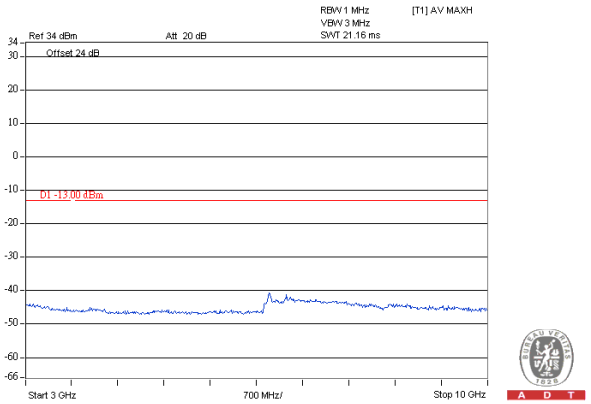
## Channel Bandwidth: 10MHz / QPSK

### CHANNEL 23790

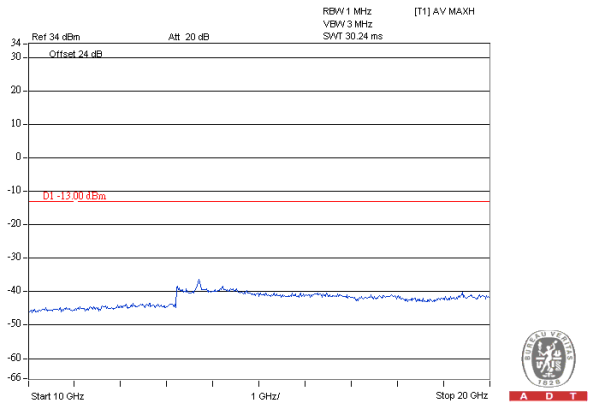
#### FREQUENCY RANGE : 9kHz~3GHz




#### FREQUENCY RANGE : 3GHz~10GHz



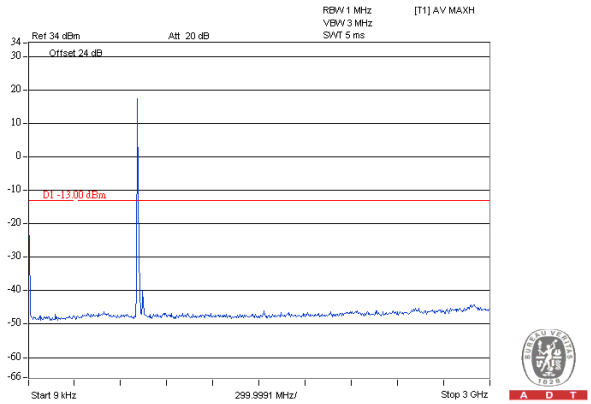

#### FREQUENCY RANGE : 10GHz~20GHz



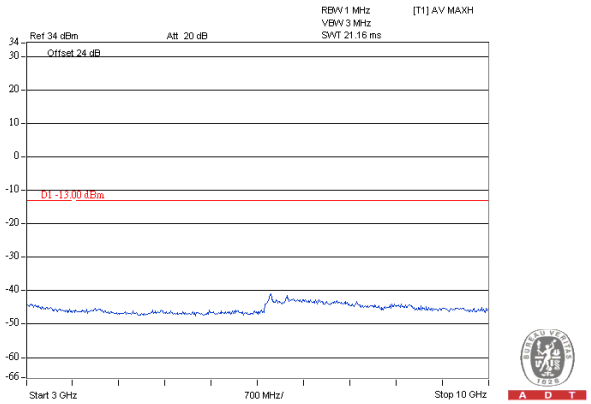
## Channel Bandwidth: 10MHz / QPSK

### CHANNEL 23800

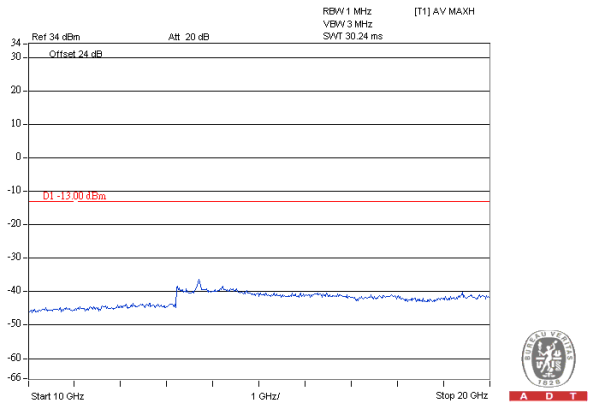
### FREQUENCY RANGE : 9kHz~3GHz




### FREQUENCY RANGE : 3GHz~10GHz




### FREQUENCY RANGE : 10GHz~20GHz



## 4.7 Radiated Emission Measurement

### 4.7.1 Limits of Radiated Emission Measurement

In the FCC 27.53(m) (4), On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB. The emission limit equal to –13dBm.

### 4.7.2 Test Procedure

a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)

b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.

c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G

d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

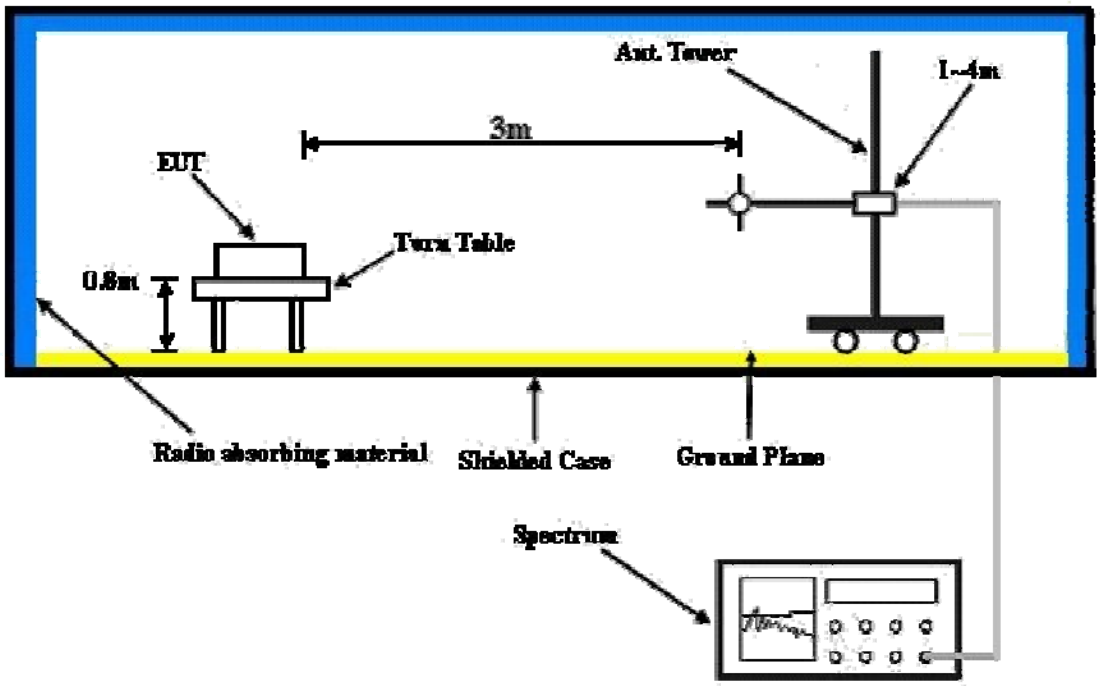
e. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

### 4.7.3 Deviation from Test Standard

No deviation.

4.7.4 Test Setup




For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.7.5 Test Results

**BELOW 1GHz**

**CHANNEL BANDWIDTH: 5MHz / QPSK**

| MODE | TX channel 23755 | FREQUENCY RANGE | Below 1000 MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Chris Lin | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 45.52 | -46.72 | -37.54 | -9.97 | -47.51 | -13.00 | -34.51 |
| 2 | 140.58 | -53.20 | -60.63 | -0.31 | -60.94 | -13.00 | -47.94 |
| 3 | 352.04 | -64.61 | -75.13 | 5.22 | -69.91 | -13.00 | -56.91 |
| 4 | 561.56 | -62.40 | -69.46 | 4.61 | -64.85 | -13.00 | -51.85 |
| 5 | 771.08 | -65.10 | -66.65 | 4.37 | -62.28 | -13.00 | -49.28 |
| 6 | 889.42 | -66.62 | -66.14 | 3.92 | -62.22 | -13.00 | -49.22 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 45.52 | -38.99 | -37.54 | -9.97 | -47.51 | -13.00 | -34.51 |
| 2 | 161.92 | -52.55 | -56.09 | 0.63 | -55.46 | -13.00 | -42.46 |
| 3 | 268.62 | -62.06 | -66.34 | 5.29 | -61.05 | -13.00 | -48.05 |
| 4 | 631.40 | -64.09 | -66.08 | 4.68 | -61.40 | -13.00 | -48.40 |
| 5 | 806.00 | -67.58 | -67.42 | 4.02 | -63.40 | -13.00 | -50.40 |
| 6 | 967.02 | -64.67 | -61.57 | 3.91 | -57.66 | -13.00 | -44.66 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## CHANNEL BANDWIDTH: 10MHz / QPSK

| | | | |
|---|---|---|---|
| MODE | TX channel 23780 | FREQUENCY RANGE | Below 1000 MHz |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Chris Lin | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 92.10 | -61.96 | -63.40 | 1.07 | -62.33 | -13.00 | -49.33 |
| 2 | 123.10 | -60.78 | -62.11 | 0.01 | -62.10 | -13.00 | -49.10 |
| 3 | 229.80 | -68.89 | -69.93 | 5.43 | -64.50 | -13.00 | -51.50 |
| 4 | 297.70 | -62.64 | -63.52 | 5.14 | -58.38 | -13.00 | -45.38 |
| 5 | 363.70 | -68.25 | -69.00 | 5.22 | -63.78 | -13.00 | -50.78 |
| 6 | 743.90 | -50.07 | -50.20 | 4.71 | -45.49 | -13.00 | -32.49 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 92.10 | -58.52 | -59.96 | 1.07 | -58.89 | -13.00 | -45.89 |
| 2 | 123.10 | -55.23 | -56.56 | 0.01 | -56.55 | -13.00 | -43.55 |
| 3 | 229.80 | -62.33 | -63.37 | 5.43 | -57.94 | -13.00 | -44.94 |
| 4 | 297.70 | -60.87 | -61.75 | 5.14 | -56.61 | -13.00 | -43.61 |
| 5 | 363.70 | -68.43 | -69.18 | 5.22 | -63.96 | -13.00 | -50.96 |
| 6 | 743.90 | -54.30 | -54.43 | 4.71 | -49.72 | -13.00 | -36.72 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## ABOVE 1GHz

### CHANNEL BANDWIDTH: 5MHz / QPSK

| | | | |
|---|---|---|---|
| MODE | TX channel 23755 | FREQUENCY RANGE | Above 1000 MHz |
| ENVIRONMENTAL CONDITIONS | 18deg. C, 69%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Nick Hsu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| **1** | **1413.00** | **-43.98** | **-43.35** | **4.75** | **-38.60** | **-13.00** | **-25.60** |
| 2 | 2119.50 | -57.53 | -56.22 | 6.36 | -49.86 | -13.00 | -36.86 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1413.00 | -47.32 | -46.69 | 4.75 | -41.94 | -13.00 | -28.94 |
| 2 | 2119.50 | -60.63 | -59.32 | 6.36 | -52.96 | -13.00 | -39.96 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|---|---|---|---|
| MODE | TX channel 23790 | FREQUENCY RANGE | Above 1000 MHz |
| ENVIRONMENTAL CONDITIONS | 18deg. C, 69%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Nick Hsu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1420.00 | -47.07 | -46.43 | 4.78 | -41.65 | -13.00 | -28.65 |
| 2 | 2130.00 | -49.55 | -48.23 | 6.36 | -41.87 | -13.00 | -28.87 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1420.00 | -49.60 | -48.96 | 4.78 | -44.18 | -13.00 | -31.18 |
| 2 | 2130.00 | -59.02 | -57.70 | 6.36 | -51.34 | -13.00 | -38.34 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|---|---|---|---|
| MODE | TX channel 23825 | FREQUENCY RANGE | Above 1000 MHz |
| ENVIRONMENTAL CONDITIONS | 18deg. C, 69%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Nick Hsu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1427.00 | -46.04 | -45.39 | 4.81 | -40.58 | -13.00 | -27.58 |
| 2 | 2140.50 | -54.39 | -53.06 | 6.36 | -46.70 | -13.00 | -33.70 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1427.00 | -49.41 | -48.76 | 4.81 | -43.95 | -13.00 | -30.95 |
| 2 | 2140.50 | -56.19 | -54.86 | 6.36 | -48.50 | -13.00 | -35.50 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## CHANNEL BANDWIDTH: 10MHz / QPSK

| | | | |
|---|---|---|---|
| MODE | TX channel 23780 | FREQUENCY RANGE | Above 1000 MHz |
| ENVIRONMENTAL CONDITIONS | 18deg. C, 69%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Nick Hsu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1418.00 | -47.44 | -46.80 | 4.77 | -42.03 | -13.00 | -29.03 |
| 2 | 2127.00 | -51.76 | -50.45 | 6.37 | -44.08 | -13.00 | -31.08 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1418.00 | -50.18 | -49.54 | 4.77 | -44.77 | -13.00 | -31.77 |
| 2 | 2127.00 | -57.16 | -55.85 | 6.37 | -49.48 | -13.00 | -36.48 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|---|---|---|---|
| MODE | TX channel 23790 | FREQUENCY RANGE | Above 1000 MHz |
| ENVIRONMENTAL CONDITIONS | 18deg. C, 69%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Nick Hsu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1420.00 | -46.93 | -46.29 | 4.78 | -41.51 | -13.00 | -28.51 |
| 2 | 2130.00 | -51.40 | -50.08 | 6.36 | -43.72 | -13.00 | -30.72 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1420.00 | -50.24 | -49.60 | 4.78 | -44.82 | -13.00 | -31.82 |
| 2 | 2130.00 | -60.04 | -58.72 | 6.36 | -52.36 | -13.00 | -39.36 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

| | | | |
|---|---|---|---|
| MODE | TX channel 23800 | FREQUENCY RANGE | Above 1000 MHz |
| ENVIRONMENTAL CONDITIONS | 18deg. C, 69%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Nick Hsu | | |

| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
|---|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1422.00 | -49.30 | -48.66 | 4.79 | -43.87 | -13.00 | -30.87 |
| 2 | 2133.00 | -53.80 | -52.48 | 6.36 | -46.12 | -13.00 | -33.12 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 1422.00 | -50.06 | -49.42 | 4.79 | -44.63 | -13.00 | -31.63 |
| 2 | 2133.00 | -60.98 | -59.66 | 6.36 | -53.30 | -13.00 | -40.30 |

**REMARKS:**

1. Power Value (dBm) = S.G Power Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB).

## 5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

**Appendix – Information on the Testing Laboratories**

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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The address and road map of all our labs can be found in our web site also.

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