# FCC TEST REPORT (Part 24)

**REPORT NO.:** RF110615E06-1

**MODEL NO.:** MAX HD2, Device Connector M1, Express, AP Pro Duo, Air Connector Duo, Air Switch

**FCC ID:** U8G-P1820

**RECEIVED:** June 15, 2011

**TESTED:** Aug. 04 to 05, 2011

**ISSUED:** Aug. 23, 2011

**APPLICANT:** Pismo Labs Technology Limited

**ADDRESS:** 1703A, 17/F, Park Building 476 Castle Peak Road, Cheung Sha Wan, Kowloon, Hong Kong

**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

**LAB ADDRESS :** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

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# RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---|---|---|
| RF110615E06-1 | Original release | Aug. 23, 2011 |

# 1 CERTIFICATION

| | |
|---|---|
| **PRODUCT :** | Pepwave Wireless Product |
| **BRAND NAME :** | Pepwave |
| **MODEL NO.:** | MAX HD2, Device Connector M1, Express, AP Pro Duo, Air Connector Duo, Air Switch |
| **TEST SAMPLE :** | R&D SAMPLE |
| **APPLICANT :** | Pismo Labs Technology Limited |
| **TESTED :** | Aug. 04 to 05, 2011 |
| **STANDARDS :** | **FCC Part 24, Subpart E**<br>ANSI C63.4-2003 |

The above equipment (model: MAX HD2) 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:** *Aug. 23, 2011*
( Midoli Peng, Specialist )

**APPROVED BY** : _____ **DATE:** *Aug. 23, 2011*
( May Chen, Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 24 & Part 2 | | | |
|---|---|---|---|
| **STANDARD SECTION** | **TEST TYPE AND LIMIT** | **RESULT** | **REMARK** |
| 2.1046<br>24.232 | Maximum Peak Output Power<br>Limit: max. 2 watts e.i.r.p peak power | PASS | Meet the requirement of limit.<br>Max. e.i.r.p is 25.9dBm at 1880.0MHz. |
| 2.1055<br>24.235 | Frequency Stability<br>AFC Freq. Error vs. Voltage<br>AFC Freq. Error vs. Temperature<br>Limit: max. ±2.5ppm | PASS | Meet the requirement of limit. |
| 2.1049<br>24.238(b) | Occupied Bandwidth | PASS | Meet the requirement of limit. |
| 24.238(b) | Band Edge Measurements | PASS | Meet the requirement of limit. |
| 2.1051<br>24.238 | Conducted Spurious Emissions | PASS | Meet the requirement of limit. |
| 2.1053<br>24.238 | Radiated Spurious Emissions | PASS | Meet the requirement of limit.<br>Minimum passing margin is -28.08dB at 3704.8MHz. |

## 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:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Measurement | Value |
|---|---|
| Radiated emissions (30MHz-1GHz) | 4 dB |
| Radiated emissions (1GHz -18GHz) | 2.49 dB |
| Radiated emissions (18GHz -40GHz) | 2.70 dB |

# 3 GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | Pepwave Wireless Product |
| **MODEL NO.** | MAX HD2, Device Connector M1, Express,<br>AP Pro Duo, Air Connector Duo, Air Switch |
| **FCC ID** | U8G-P1820 |
| **POWER SUPPLY** | DC 12V from adapter (Class II, AC 2Pin) or<br>DC 48V from PoE Adapter |
| **MODULATION TYPE** | GMSK, 8PSK (for GSM / GPRS / E-GPRS)<br>QPSK, OQPSK, HPSK (for CDMA)<br>BPSK (for WCDMA) |
| **OPERATING FREQUENCY** | 1850.2MHz ~ 1909.8MHz (for GSM / GPRS / E-GPRS)<br>1851.25MHz ~ 1908.75MHz (for CDMA)<br>1852.4MHz ~ 1907.6MHz (for WCDMA) |
| **NUMBER OF CHANNEL** | 299 (for GSM / GPRS / E-GPRS)<br>1151 (for CDMA)<br>277 (for WCDMA) |
| **MAX. EIRP POWER** | GSM Mode: 25.9dBm (0.389Watts)<br>GPRS Mode: 25.9dBm (0.389Watts)<br>E-GPRS Mode: 25.7dBm (0.3715Watts)<br>CDMA Mode: 21.1dBm (0.1Watts)<br>WCDMA Mode: 21.0dBm (0.1253Watts) |
| **ANTENNA TYPE** | Please see note |
| **MAX. ANTENNA GAIN** | Please see note |
| **DATA CABLE** | NA |
| **I/O PORTS** | LAN (RJ-45) port x 4 (Ethernet, 10Mbps / 100Mbps / 1000Mbps)<br>WAN port x 2<br>USB port x 1 (3G)<br>Antenna port x 4<br>Power (Terminal Block) port x 1 (10Vdc – 30Vdc)<br>Cellular (Main) port x 2<br>GPS / Cellular (Aux) port x 2 |
| **ACCESSORY DEVICES** | Adapter x 1 |

**NOTE:**

1. The EUT has six model names which are identical to each other in all aspects except for the followings table:

| Product Name | Model Name |
|---|---|
| Pepwave Wireless Product | MAX HD2 |
| | Device Connector M1 |
| | Express |
| | AP Pro Duo |
| | Air Connector Duo |
| | Air Switch |

From the above models, model: **MAX HD2** was selected as representative model for the test and its data was recorded in this report.

2. There are four antennas provided to this EUT, please refer to the following table:

| **WLAN Antenna Spec.** | | | | | | |
|---|---|---|---|---|---|---|
| No | Brand | Model | Antenna Type | Gain(dBi) | Connecter Type | Frequency range (GHz) |
| 1 | KBT | TQC-2400CI | Dipole | 5 | R-SMA | 2.4 ~ 2.4835 |
| 2 | KBT | TQC-2400CI | Dipole | 5 | R-SMA | 2.4 ~ 2.4835 |
| **GPS Antenna Spec.** | | | | | | |
| No | Brand | Model | Antenna Type | Gain(dBi) | Connecter Type | Frequency range (GHz) |
| 3 | Chang Hong | GPS-01 | Magnetic | -1 | R-SMA Male | 1.57542 (+/- 1.023) |
| **GSM / GPRS / E-GPRS / CDMA / WCDMA Antenna Spec.** | | | | | | |
| No | Brand | Model | Antenna Type | Gain(dBi) | Connecter Type | Frequency range (MHz) |
| 4 | Chang Hong | GSM-01 | Magnetic Base | 3 | R-SMA Male | 850/900/1800/ 1900/2170 |

3. The device support time division techonlogy, no simultaneosuly transmission. (WLAN, GSM, CDMA and WCDMA technology cannot transmit at same time.)

4. The EUT inside has one WLAN 802.11b/g/n Module which model name is N21 and FCC ID: U8G-P1121.

5. The communicated functions of EUT listed as below:

| | | GSM (850&1900MHz) | CDMA (850&1900MHz) | WCDMA (850&1900MHz) |
|---|---|---|---|---|
| 2G | GPRS | √ | | |
| | EDGE | √ | | |
| 3G | CDMA | | √ | |
| | 1*EVDO | | √ | |
| | WCDMA | | | √ |
| | Release 5 HSDPA | | | √ |
| | Release 6 HSUPA | | | √ |

6. The EUT must be supplied with one power adapter and following different models could be chosen: (The PoE adapter is only for test.)

| Adapter 1 (Supply to DC Jack) | |
|---|---|
| Brand: | Ten Pao |
| Model No.: | S040EM1200300 |
| Input power : | 100-240V, 50/60Hz, 1.2A |
| Output power : | 12V, 3000mA<br>DC output cable(shielded, 1.55m, with one core) |
| Adapter 2 (Supply to Terminal Block) | |
| Brand: | Ten Pao |
| Model No.: | S040EM1200300 |
| Input power : | 100-240V, 50/60Hz, 1.2A |
| Output power : | 12V, 3000mA<br>DC output cable(shielded, 1.55m, with one core) |
| PoE Adapter | |
| Brand: | NA |
| Model No.: | PSE-G300 |
| Input power : | 100-240V, 50/60Hz<br>AC output cable (unshielded, 1.8m) |
| Output power : | 45V, 630mA, 30W |

7. The EUT was pre-tested in chamber under following test modes :

| Pre-test Mode | Description |
|---|---|
| Mode A | Laying-flat type: EUT + Adapter 1 |
| Mode B | Laying-flat type: EUT + Adapter 2 |
| **Mode C** | **Laying-flat type: EUT + PoE Adapter** |
| Mode D | Stand-up type: EUT + PoE Adapter |

The worse spurious emission was found in **Mode C**. Therefore only the test data of the modes were recorded in this report.

8. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

## 3.2 DESCRIPTION OF TEST MODES

### FOR GSM, GPRS & E-GPRS:

299 channels are provided to this EUT. Therefore, the low, middle and high channels are chosen for testing.

| | CHANNEL | FREQUENCY | TX MODE |
|---|---|---|---|
| **LOW** | 512 | 1850.2 MHz | GSM, GPRS, E-GPRS |
| **MIDDLE** | 661 | 1880.0 MHz | GSM, GPRS, E-GPRS |
| **HIGH** | 810 | 1909.8 MHz | GSM, GPRS, E-GPRS |

**NOTE:**

1. Below 1 GHz, the channel 512, 661, and 810 were pre-tested in chamber. The channel 810 was chosen for final test.
2. Above 1 GHz, the channel 512, 661, and 810 were tested individually.
3. The worst case for final test is chosen when the power control level set 5.
4. The channel space is 0.2MHz.
5. The EUT is a GSM/GPRS/E-GPRS class 10 device, which provide 2 up-link. After pre-tested both functions, found up-link with 1 time slot is worse, therefore, test results of output power, frequency stability, occupied bandwidth and band edge tests came out from this.
6. The EUT has GSM, GPRS, E-GPRS functions. After pre-testing, GSM function is the worst case for all the emission tests.

## FOR CDMA:

1151 channels are provided to this EUT in the CDMA1900 band. Therefore, the low, middle and high channels are chosen for testing.

| | CHANNEL | FREQUENCY | TX MODE |
|---|---|---|---|
| **LOW** | 25 | 1851.25 MHz | 1x EV-DO, CDMA2000(SO55) |
| **MIDDLE** | 600 | 1880.00 MHz | 1x EV-DO, CDMA2000(SO55) |
| **HIGH** | 1175 | 1908.75 MHz | 1x EV-DO, CDMA2000(SO55) |

**NOTE:**

1. Below 1 GHz, the channel 25, 600 and 1175 were pre-tested in chamber. The channel 25 was the worst case and chosen for final test.
2. Above 1 GHz, the channel 25, 600 and 1175 were tested individually.
3. The channel space is 0.05MHz.
4. The EUT has 1x EV-DO, CDMA2000(SO32), CDMA2000(SO2), CDMA2000(SO9) & CDMA2000(SO55) functions. After pre-testing, CDMA2000(SO55) function is the worst case for all the emission tests.

## FOR WCDMA:

277 channels are provided to this EUT. Therefore, the low, middle and high channels are chosen for testing.

| | CHANNEL | FREQUENCY | TX MODE |
|---|---|---|---|
| **LOW** | 9262 | 1852.4 MHz | WCDMA, HSDPA, HSUPA |
| **MIDDLE** | 9400 | 1880.0 MHz | WCDMA, HSDPA, HSUPA |
| **HIGH** | 9538 | 1907.6 MHz | WCDMA, HSDPA, HSUPA |

**NOTE:**

1. Below 1 GHz, the channel 9262, 9400 and 9538 were pre-tested in chamber. The channel 9400 was chosen for final test.
2. Above 1 GHz, the channel 9262, 9400 and 9538 were tested individually.
3. The channel space is 0.2MHz.
4. The EUT has WCDMA-RMC, WCDMA-AMR, HSUPA & HSDPA functions. After pre-testing, WCDMA-RMC function is the worst case for all the emission tests.

## 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

### FOR GSM, GPRS E-GPRS:

| EUT CONFIGURE MODE | APPLICABLE TO | | | | | | | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|
| | OP | FS | OB | BE | CE | RE<1G | RE≥1G | |
| - | √ | √ | √ | √ | √ | √ | √ | - |

Where **OP:** Output power **FS:** Frequency stability

**OB:** Occupied bandwidth **BE:** Band edge

**CE**: Conducted spurious emissions **RE<1G:** Radiated emission below 1GHz

**RE≥1G:** Radiated emission above 1GHz

**OUTPUT POWER MEASUREMENT:**

☒ 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 (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 512 to 810 | 512, 661, 810 | GSM , GPRS, E-GPRS |

**FREQUENCY STABILITY MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 512 to 810 | 661 | GSM |

**OCCUPIED BANDWIDTH MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 512 to 810 | 512, 661, 810 | GSM , GPRS, E-GPRS |

**BAND EDGE MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 512 to 810 | 512, 810 | GSM , GPRS, E-GPRS |

**CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 512 to 810 | 512, 661, 810 | GSM |

**RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):**

☒ 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 (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 512 to 810 | 810 | GSM |

**RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):**

☒ 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 (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 512 to 810 | 512, 661, 810 | GSM |

**TEST CONDITION:**

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---|---|---|---|
| OP | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| FS | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| OB | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| EM | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| BE | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| CE | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| RE < 1G | 27deg. C, 63%RH | 120Vac, 60Hz | Evan Huang |
| RE ³ 1G | 27deg. C, 63%RH | 120Vac, 60Hz | Evan Huang |

**FOR CDMA:**

| EUT CONFIGURE MODE | APPLICABLE TO | | | | | | | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|
| | OP | FS | OB | BE | CE | RE<1G | RE≥1G | |
| - | √ | √ | √ | √ | √ | √ | √ | - |

**Where** **OP:** Output power **FS:** Frequency stability
**OB:** Occupied bandwidth **BE:** Band edge
**CE**: Conducted spurious emissions **RE<1G:** Radiated emission below 1GHz
**RE≥1G:** Radiated emission above 1GHz

**NOTE:** Speed mode worst enable during the test

**OUTPUT POWER MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 25 to 1175 | 25, 600, 1175 | 1x EV-DO, CDMA |

**FREQUENCY STABILITY MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 25 to 1175 | 600 | CDMA |

**OCCUPIED BANDWIDTH MEASUREMENT:**

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 25 to 1175 | 25, 600, 1175 | 1x EV-DO , CDMA |

**BAND EDGE MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 25 to 1175 | 25, 1175 | 1x EV-DO , CDMA |

**CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 25 to 1175 | 25, 600, 1175 | CDMA |

**RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 25 to 1175 | 25 | CDMA |

**RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 25 to 1175 | 25, 600, 1175 | CDMA |

## TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER (SYSTEM) | TESTED BY |
|---|---|---|---|
| OP | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| FS | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| OB | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| EM | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| BE | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| CE | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| RE < 1G | 27deg. C, 63%RH | 120Vac, 60Hz | Evan Huang |
| RE ³ 1G | 27deg. C, 63%RH | 120Vac, 60Hz | Evan Huang |

**FOR WCDMA:**

| EUT CONFIGURE MODE | APPLICABLE TO | | | | | | | DESCRIPTION |
|---|---|---|---|---|---|---|---|---|
| | OP | FS | OB | BE | CE | RE<1G | RE≥1G | |
| - | √ | √ | √ | √ | √ | √ | √ | - |

Where **OP:** Output power **FS:** Frequency stability
**OB:** Occupied bandwidth **BE:** Band edge
**CE**: Conducted spurious emissions **RE<1G:** Radiated emission below 1GHz
**RE≥1G:** Radiated emission above 1GHz

**OUTPUT POWER MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 9262 to 9538 | 9262, 9400, 9538 | WCDMA, HSDPA, HSUPA |

**FREQUENCY STABILITY MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 9262 to 9538 | 9400 | WCDMA |

**OCCUPIED BANDWIDTH MEASUREMENT:**

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 9262 to 9538 | 9262, 9400, 9538 | WCDMA, HSDPA, HSUPA |

**BAND EDGE MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 9262 to 9538 | 9262, 9538 | WCDMA, HSDPA, HSUPA |

**CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 9262 to 9538 | 9262, 9400, 9538 | WCDMA |

**RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 9262 to 9538 | 9400 | WCDMA |

**RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY |
|---|---|---|
| 9262 to 9538 | 9262, 9400, 9538 | WCDMA |

## TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER (SYSTEM) | TESTED BY |
|---|---|---|---|
| OP | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| FS | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| OB | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| EM | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| BE | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| CE | 27deg. C, 63%RH | 120Vac, 60Hz | Wen Yu |
| RE < 1G | 27deg. C, 63%RH | 120Vac, 60Hz | Evan Huang |
| RE ³ 1G | 27deg. C, 63%RH | 120Vac, 60Hz | Evan Huang |

## 3.3 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 24**

**ANSI C63.4-2003**

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

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

**NOTE**: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

## 3.4 DESCRIPTION OF SUPPORT UNITS

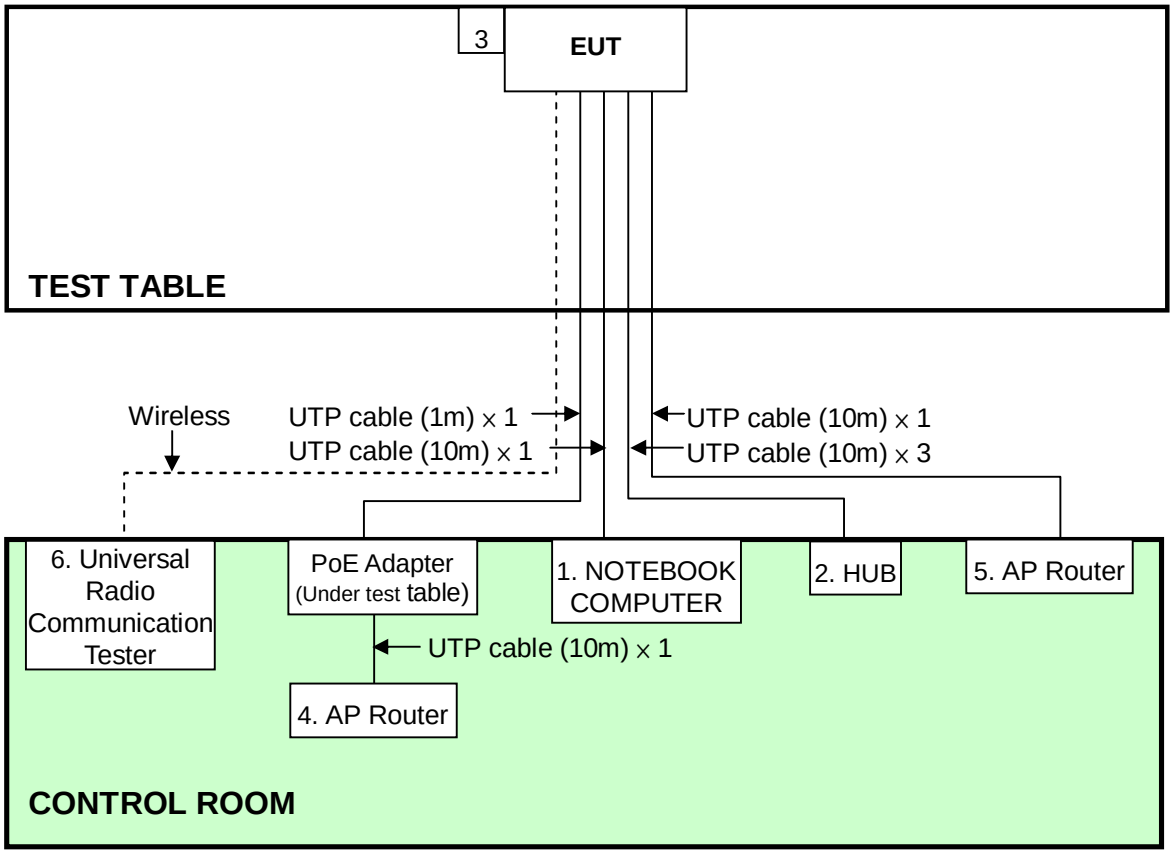
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|---|---|---|---|---|---|
| 1 | NOTEBOOK COMPUTER | DELL | PP17L | CN-ONF743-48643-7AV-0124 | FCC DoC |
| 2 | HUB | ZyXEL | ES-116P | S060H02000215 | FCC DoC |
| 3 | 3.5G USB WIRELESS DEVICE | HUAWEI | E169u | Q54CAB1042404880 | QISE169 |
| 4 | AP Router | NA | SUS-AGN1 | 2830-82E7-CDC3 | U8G-P1213 |
| 5 | AP Router | NA | SUS-AGN1 | 2830-830D-2266 | U8G-P1213 |
| 6 | Universal Radio Communication Tester | R&S | CMU200 | 1100.0008.02 | NA |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | UTP cable, 10m |
| 2 | UTP cable, 10m |
| 3 | NA |
| 4 | UTP cable, 10m |
| 5 | UTP cable, 10m |
| 6 | NA |

**NOTE:** All power cords of the above support units are non shielded (1.8m).

## 3.5 CONFIGURATION OF SYSTEM UNDER TEST




NOTE: 1. Supply unit 3 is the 3.5G USB WIRELESS DEVICE.

# 4 TEST TYPES AND RESULTS

## 4.1 OUTPUT POWER MEASUREMENT

### 4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 24.232(b) that “Mobile / Portable station are limited to 2 watts e.i.r.p” and 24.232(c) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

## 4.1.2 TEST INSTRUMENTS

**Test date: Aug. 04, 2011**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| ROHDE & SCHWARZ Spectrum Analyzer | FSP40 | 100036 | Dec. 08, 2010 | Dec. 07, 2011 |
| Agilent PSA Spectrum Analyzer | E4446A | MY48250113 | Nov. 30 , 2010 | Nov. 29 , 2011 |
| HP Pre_Amplifier | 8449B | 300801923 | Nov. 01, 2010 | Oct. 31, 2011 |
| ROHDE & SCHWARZ Test Receiver | ESCS30 | 847124/029 | Sep. 03, 2010 | Sep. 02, 2011 |
| SCHWARZBECK TRILOG Broadband Antenna | VULB 9168 | 138 | Apr. 14, 2011 | Apr. 13, 2012 |
| Schwarzbeck Horn_Antenna | BBHA9120 | D124 | Dec. 17, 2010 | Dec. 16, 2011 |
| Schwarzbeck Horn_Antenna | BBHA 9170 | BBHA9170153 | Jan. 17, 2011 | Jan. 16, 2012 |
| RF Switches | EMH-011 | 1001 | NA | NA |
| RF CABLE (Chaintek) | Sucoflex 104+ Sucoflex 106 | RF104-101+R F106-101 | Aug. 24, 2010 | Aug. 23, 2011 |
| RF Cable | 8DFB | STCCAB-30M-1GHz | NA | NA |
| Software | ADT_Radiated_ V7.6.15.9.2 | NA | NA | NA |
| CT Antenna Tower & Turn Table | NA | 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 horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

### 4.1.3 TEST PROCEDURES

a. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 512, 661 and 810 (GSM, GPRS & E-GPRS) / 25, 600 and 1175 (CDMA) / 9262, 9400 and 9538 (WCDMA) (low, middle and high operational frequency range.)

b. The conducted peak output power used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. The path loss included the splitter loss, cable loss and 20dB pad loss. The spectrum set RB/VB 1MHz (GSM, GPRS & E-GPRS), 3MHz (CDMA), and 5MHz (WCDMA), then read peak power value and record to the test. (All transmitted path loss shall be considered in the test report data.)

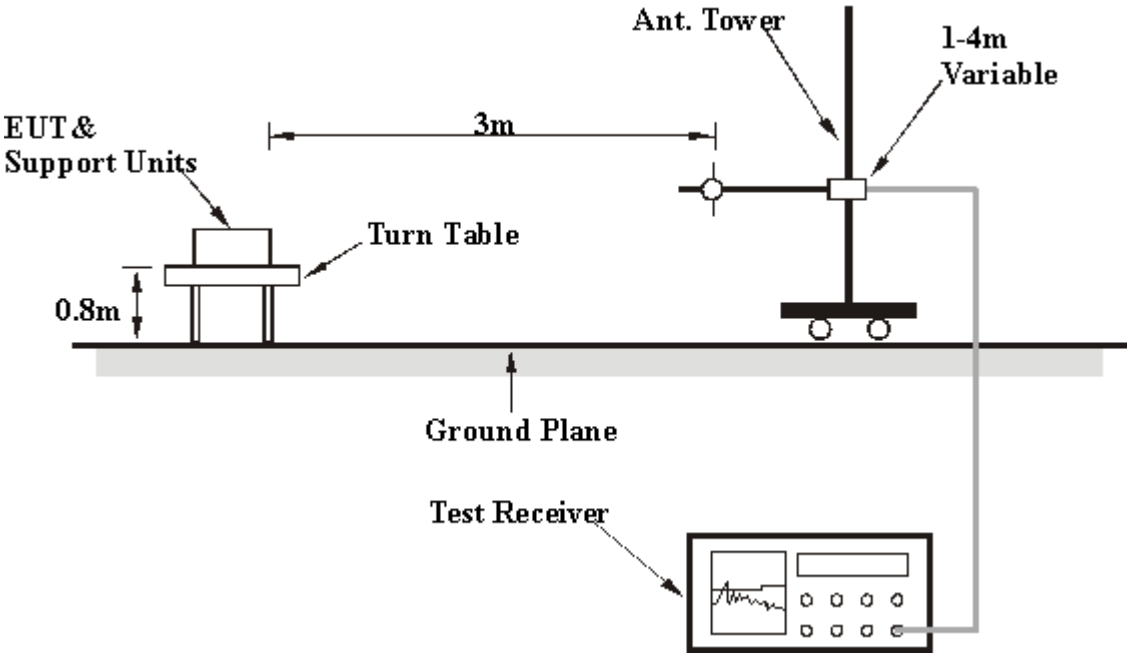
c. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from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

d. 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 c. Record the power level of S.G

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

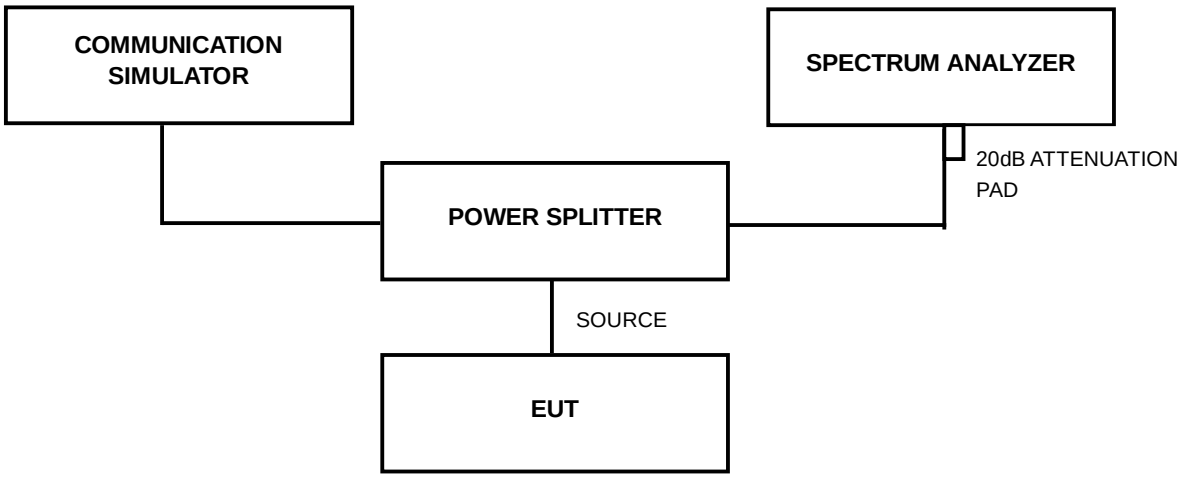
## 4.1.4 TEST SETUP

**EIRP POWER 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 related item – Photographs of the Test Configuration.

### 4.1.5 EUT OPERATING CONDITIONS

a. The EUT makes a call to the communication simulator.

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

## 4.1.6 TEST RESULTS

### FOR GSM, GPRS & E-GPRS:

**GSM MODE**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 512 | 1850.2 | 25.8 | 2.7 | 28.5 | 0.7079 |
| 661 | 1880.0 | 25.4 | 2.7 | 28.1 | 0.6457 |
| 810 | 1909.8 | 25.3 | 2.7 | 28.0 | 0.6310 |

**GPRS MODE**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 512 | 1850.2 | 25.7 | 2.7 | 28.4 | 0.6918 |
| 661 | 1880.0 | 25.3 | 2.7 | 28.0 | 0.6310 |
| 810 | 1909.8 | 25.3 | 2.7 | 28.0 | 0.6310 |

**E-GPRS MODE**

| CONDUCTED PEAK OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | PEAK OUTPUT POWER | |
| | | | | dBm | Watt |
| 512 | 1850.2 | 25.5 | 2.7 | 28.2 | 0.6607 |
| 661 | 1880.0 | 25.2 | 2.7 | 27.9 | 0.6166 |
| 810 | 1909.8 | 25.2 | 2.7 | 27.9 | 0.6166 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).

2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

## GSM MODE

| EIRP POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | S.G VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 512 | 1850.2 | 19.0 | 6.6 | 25.7 | 0.3715 |
| 661 | 1880.0 | 19.2 | 6.7 | 25.9 | 0.3890 |
| 810 | 1909.8 | 19.0 | 6.7 | 25.7 | 0.3715 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = substitution Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).

## GPRS MODE

| EIRP POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | S.G VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 512 | 1850.2 | 18.9 | 6.6 | 25.6 | 0.3597 |
| 661 | 1880.0 | 19.2 | 6.7 | 25.9 | 0.3890 |
| 810 | 1909.8 | 18.9 | 6.7 | 25.7 | 0.3715 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = substitution Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).

## E-GPRS MODE

| EIRP POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | S.G VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 512 | 1850.2 | 18.8 | 6.6 | 25.5 | 0.3508 |
| 661 | 1880.0 | 19.1 | 6.7 | 25.7 | 0.3715 |
| 810 | 1909.8 | 18.8 | 6.7 | 25.6 | 0.3606 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = substitution Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).

## FOR CDMA:

### 1x EV-DO MODE

| WORST CASE CONDUCTED POWER | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CHANNEL | FREQ. (MHz) | Rev. A | Rev. 0 | CORR. FACTOR (dB) | Rev. A | | Rev. 0 | |
| | | RAW VALUE (dBm) | | | OUTPUT POWER | | | |
| | | | | | dBm | Watt | dBm | Watt |
| 25 | 1851.25 | 24.0 | 24.2 | 2.7 | 26.7 | 0.4677 | 26.9 | 0.4898 |
| 600 | 1880 | 24.2 | 24.1 | 2.7 | 26.9 | 0.4898 | 26.8 | 0.4786 |
| 1175 | 1908.75 | 23.7 | 23.6 | 2.7 | 26.4 | 0.4365 | 26.3 | 0.4266 |

### CDMA 2000 MODE

| CDMA 2000 CONDUCTED POWER | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHAN. | FREQ. (MHz) | CDMA 2000 | RAW VALUE (dBm) | | | | | CORR. FACTOR (dB) | OUTPUT POWER (dBm) | | | | |
| | | RC | SO2 | SO55 | TDSO SO32 (FCH) | TDSO SO32 (FCH+ SCH) | SO9 | | SO2 | SO55 | TDSO SO32 (FCH) | TDSO SO32 (FCH+ SCH) | SO9 |
| 25 | 1851.25 | RC1 | 24.2 | 24.2 | - | - | 24.0 | 2.7 | 26.9 | 26.9 | - | - | 26.7 |
| | | RC3 | 24.3 | 24.4 | 24.3 | 24.3 | 24.1 | 2.7 | 27.0 | 27.1 | 27.0 | 27.0 | 26.8 |
| 600 | 1880 | RC1 | 24.1 | 24.2 | - | - | 24.0 | 2.7 | 26.8 | 26.9 | - | - | 26.7 |
| | | RC3 | 24.2 | 24.3 | 24.1 | 24.0 | 24.0 | 2.7 | 26.9 | 27.0 | 26.8 | 26.7 | 26.7 |
| 1175 | 1908.75 | RC1 | 23.7 | 23.8 | - | - | 23.6 | 2.7 | 26.4 | 26.5 | - | - | 26.3 |
| | | RC3 | 23.8 | 23.8 | 23.7 | 23.7 | 23.7 | 2.7 | 26.5 | 26.5 | 26.4 | 26.4 | 26.4 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

## 1x EV-DO MODE

| EIRP POWER | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CHANNEL | FREQ. (MHz) | S.G. VALUE (dBm) | | CORR. FACTOR (dB) | OUTPUT POWER | | | |
| | | | | | Rev. A | | Rev. 0 | |
| | | Rev. A | Rev. 0 | | dBm | Watt | dBm | Watt |
| 25 | 1851.25 | 12.5 | 12.5 | 6.6 | 19.2 | 0.1 | 19.1 | 0.1 |
| 600 | 1880 | 14.0 | 13.9 | 6.7 | 20.7 | 0.1 | 20.6 | 0.1 |
| 1175 | 1908.75 | 14.3 | 14.3 | 6.7 | 21.0 | 0.1 | 21.0 | 0.1 |

## CDMA 2000 MODE

| EIRP POWER (SO55) | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | S.G. VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 25 | 1851.25 | 12.6 | 6.6 | 19.2 | 0.1 |
| 600 | 1880 | 14.1 | 6.7 | 20.7 | 0.1 |
| 1175 | 1908.75 | 14.4 | 6.7 | 21.1 | 0.1 |

**REMARKS:** 1. Peak Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = substitution Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).

## FOR WCDMA:

### WCDMA-RMC MODE

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 24.0 | 2.7 | 26.7 | 0.4677 |
| 9400 | 1880 | 24.6 | 2.7 | 27.3 | 0.5370 |
| 9538 | 1907.6 | 23.3 | 2.7 | 26.0 | 0.3981 |

### WCDMA-AMR :

**(The EUT has AMR-NB speech code function.**
**The AMR-NB support 4.75kbit/s,5.15kbit/s,5.9kbit/s,6.7kbit/s,7.4kbit/s,7.95kbit/s,10.2kbit/s & 12.2kbit/s)**

### Mode A (AMR-NB Rate: 4.75kbit/s )

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 24.0 | 2.7 | 26.7 | 0.4677 |
| 9400 | 1880 | 24.1 | 2.7 | 26.8 | 0.4786 |
| 9538 | 1907.6 | 23.3 | 2.7 | 26.0 | 0.3981 |

### MODE B (AMR-NB Rate: 5.15kbit/s)

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.4 | 2.7 | 26.1 | 0.4074 |
| 9400 | 1880 | 23.7 | 2.7 | 26.4 | 0.4365 |
| 9538 | 1907.6 | 23.3 | 2.7 | 26.0 | 0.3981 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

**MODE C (AMR-NB rate : 5.9kbit/s)**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.5 | 2.7 | 26.2 | 0.4169 |
| 9400 | 1880 | 24.0 | 2.7 | 26.7 | 0.4677 |
| 9538 | 1907.6 | 23.2 | 2.7 | 25.9 | 0.3890 |

**MODE D (AMR-NB rate :6.7kbit/s)**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.5 | 2.7 | 26.2 | 0.4169 |
| 9400 | 1880 | 23.9 | 2.7 | 26.6 | 0.4571 |
| 9538 | 1907.6 | 23.1 | 2.7 | 25.8 | 0.3802 |

**MODE E(AMR-NB rate: 7.4kbit/s)**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 24.0 | 2.7 | 26.7 | 0.4677 |
| 9400 | 1880 | 23.9 | 2.7 | 26.6 | 0.4571 |
| 9538 | 1907.6 | 23.1 | 2.7 | 25.8 | 0.3802 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

**MODE F(AMR-NB rate 7.95kbit/s)**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.9 | 2.7 | 26.6 | 0.4571 |
| 9400 | 1880 | 23.9 | 2.7 | 26.6 | 0.4571 |
| 9538 | 1907.6 | 23.1 | 2.7 | 25.8 | 0.3802 |

**MODE G(AMR-NB rate :10.2kbit/s)**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.5 | 2.7 | 26.2 | 0.4169 |
| 9400 | 1880 | 23.9 | 2.7 | 26.6 | 0.4571 |
| 9538 | 1907.6 | 23.3 | 2.7 | 26.0 | 0.3981 |

**MODE H (AMR-NB rate : 12.2kbit/s)**

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.6 | 2.7 | 26.3 | 0.4266 |
| 9400 | 1880 | 23.9 | 2.7 | 26.6 | 0.4571 |
| 9538 | 1907.6 | 23.3 | 2.7 | 26.0 | 0.3981 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

## HSDPA-RMC MODE

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.0 | 2.7 | 25.7 | 0.3715 |
| 9400 | 1880 | 23.6 | 2.7 | 26.3 | 0.4266 |
| 9538 | 1907.6 | 23.0 | 2.7 | 25.7 | 0.3715 |

## HSDPA MODE- Subtest 1

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 22.9 | 2.7 | 25.6 | 0.3631 |
| 9400 | 1880 | 23.8 | 2.7 | 26.5 | 0.4467 |
| 9538 | 1907.6 | 22.9 | 2.7 | 25.6 | 0.3631 |

## HSDPA MODE- Subtest 2

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.0 | 2.7 | 25.7 | 0.3715 |
| 9400 | 1880 | 23.9 | 2.7 | 26.6 | 0.4571 |
| 9538 | 1907.6 | 22.7 | 2.7 | 25.4 | 0.3467 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

## HSDPA MODE- Subtest 3

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 22.5 | 2.7 | 25.2 | 0.3311 |
| 9400 | 1880 | 23.0 | 2.7 | 25.7 | 0.3715 |
| 9538 | 1907.6 | 22.4 | 2.7 | 25.1 | 0.3236 |

## HSDPA MODE- Subtest 4

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 21.9 | 2.7 | 24.6 | 0.2884 |
| 9400 | 1880 | 22.3 | 2.7 | 25.0 | 0.3162 |
| 9538 | 1907.6 | 21.8 | 2.7 | 24.5 | 0.2818 |

## HSUPA MODE- Subtest 1

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.5 | 2.7 | 26.2 | 0.4169 |
| 9400 | 1880 | 23.6 | 2.7 | 26.3 | 0.4266 |
| 9538 | 1907.6 | 23.2 | 2.7 | 25.9 | 0.3890 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB) + 20dB Pad.

## HSUPA MODE- Subtest 2

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.3 | 2.7 | 26.0 | 0.3981 |
| 9400 | 1880 | 23.6 | 2.7 | 26.3 | 0.4266 |
| 9538 | 1907.6 | 23.2 | 2.7 | 25.9 | 0.3890 |

## HSUPA MODE- Subtest 3

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 22.6 | 2.7 | 25.3 | 0.3388 |
| 9400 | 1880 | 23.6 | 2.7 | 26.3 | 0.4266 |
| 9538 | 1907.6 | 22.6 | 2.7 | 25.3 | 0.3388 |

## FOR HSUPA MODE- Subtest 4

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 23.6 | 2.7 | 26.3 | 0.4266 |
| 9400 | 1880 | 23.6 | 2.7 | 26.3 | 0.4266 |
| 9538 | 1907.6 | 23.0 | 2.7 | 25.7 | 0.3715 |

## HSUPA MODE- Subtest 5

| CONDUCTED OUTPUT POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | RAW VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 22.6 | 2.7 | 25.3 | 0.3388 |
| 9400 | 1880 | 23.2 | 2.7 | 25.9 | 0.3890 |
| 9538 | 1907.6 | 22.6 | 2.7 | 25.3 | 0.3388 |

**REMARKS:** 1. Peak Output Power (dBm) = Raw Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Power Splitter Loss (dB) + Cable Loss (dB)+ 20dB Pad.

## WCDMA-RMC MODE

| EIRP POWER | | | | | |
|---|---|---|---|---|---|
| CHANNEL NO. | FREQUENCY (MHz) | S.G VALUE (dBm) | CORRECTION FACTOR (dB) | OUTPUT POWER | |
| | | | | dBm | Watt |
| 9262 | 1852.4 | 12.3 | 6.6 | 18.9 | 0.0780 |
| 9400 | 1880 | 14.0 | 6.7 | 20.7 | 0.1164 |
| 9538 | 1907.6 | 14.3 | 6.7 | 21.0 | 0.1253 |

**REMARKS:** 1. Peak Output Power (dBm) = S.G Value (dBm) + Correction Factor (dB).

2. Correction Factor (dB) = substitution Antenna Gain (dBi) + Cable Loss (dB) + Free Space Loss (dB).

## 4.2 FREQUENCY STABILITY MEASUREMENT

### 4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

According to the FCC part 24.235 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 frequency error rate is according to the JTC standard that the frequency error rate shall be accurate to within 2.5ppm of the received frequency from the base station. 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 the 2.1055(a)(1) –30℃~50℃.

### 4.2.2 TEST INSTRUMENTS

**Test date: Aug. 04, 2011**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Sep. 08, 2010 | Sep. 07, 2011 |
| OVEN | MHU-225AU | 911033 | Dec. 17, 2010 | Dec. 16, 2011 |
| HUBER+SUHNER | SUCOFLEX104 | 222684/4 | Aug. 14, 2010 | Aug. 13, 2011 |
| AC POWER SOURCE | 6205 | 1140503 | NA | NA |

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

### 4.2.3 TEST PROCEDURE

a. Because of the measure the carrier frequency under the condition of the AFC lock, it shall be used the mobile station in the GSM / CDMA / WCDMA link mode. This is accomplished with the use of the R&S CMU200 / JRC NJZ-2000 simulator station. The oven room could control the temperatures and humidity. The GSM link channel is the 661, the CDMA link channel is the 600 and the WCDMA link channel is the 9400.

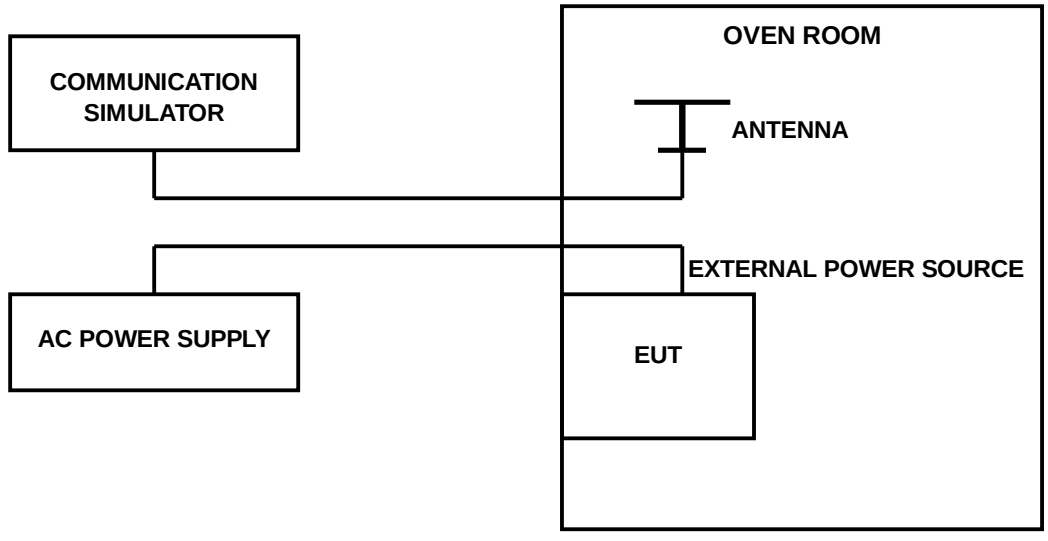
b. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.

c. EUT is connected the external power supply to control the AC input power. The various Volts from the minimum 138 Volts to 102 Volts. Each step shall be record the frequency error rate.

d. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing.

e. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

### 4.2.4 TEST SETUP



## 4.2.5 TEST RESULTS

**FOR GSM:**

| AFC FREQUENCY ERROR vs. VOLTAGE | | | |
|---|---|---|---|
| **VOLTAGE (Volts)** | **FREQUENCY ERROR (Hz)** | **FREQUENCY ERROR (ppm)** | **LIMIT (ppm)** |
| 102 | -61 | -0.032 | 2.5 |
| 138 | -55 | -0.029 | 2.5 |

| AFC FREQUENCY ERROR vs. TEMP. | | | |
|---|---|---|---|
| **TEMP. (℃)** | **FREQUENCY ERROR (Hz)** | **FREQUENCY ERROR (ppm)** | **LIMIT (ppm)** |
| 50 | -63 | -0.034 | 2.5 |
| 40 | -60 | -0.032 | 2.5 |
| 30 | -55 | -0.029 | 2.5 |
| 20 | -45 | -0.024 | 2.5 |
| 10 | -51 | -0.027 | 2.5 |
| 0 | -52 | -0.028 | 2.5 |
| -10 | -48 | -0.026 | 2.5 |
| -20 | -53 | -0.028 | 2.5 |
| -30 | -58 | -0.031 | 2.5 |

## FOR CDMA:

| AFC FREQUENCY ERROR vs. VOLTAGE | | | |
|---|---|---|---|
| **VOLTAGE (Volts)** | **FREQUENCY ERROR (Hz)** | **FREQUENCY ERROR (ppm)** | **LIMIT (ppm)** |
| 102 | -85 | -0.045 | 2.5 |
| 138 | -75 | -0.040 | 2.5 |

| AFC FREQUENCY ERROR vs. TEMP. | | | |
|---|---|---|---|
| **TEMP. (℃)** | **FREQUENCY ERROR (Hz)** | **FREQUENCY ERROR (ppm)** | **LIMIT (ppm)** |
| 50 | -83 | -0.044 | 2.5 |
| 40 | -85 | -0.045 | 2.5 |
| 30 | -82 | -0.044 | 2.5 |
| 20 | -81 | -0.043 | 2.5 |
| 10 | -75 | -0.040 | 2.5 |
| 0 | -77 | -0.041 | 2.5 |
| -10 | -78 | -0.041 | 2.5 |
| -20 | -79 | -0.042 | 2.5 |
| -30 | -83 | -0.044 | 2.5 |

## FOR WCDMA:

| AFC FREQUENCY ERROR vs. VOLTAGE | | | |
|---|---|---|---|
| **VOLTAGE (Volts)** | **FREQUENCY ERROR (Hz)** | **FREQUENCY ERROR (ppm)** | **LIMIT (ppm)** |
| 102 | -75 | -0.040 | 2.5 |
| 138 | -52 | -0.028 | 2.5 |

| AFC FREQUENCY ERROR vs. TEMP. | | | |
|---|---|---|---|
| **TEMP. (℃)** | **FREQUENCY ERROR (Hz)** | **FREQUENCY ERROR (ppm)** | **LIMIT (ppm)** |
| 50 | -68 | -0.036 | 2.5 |
| 40 | -62 | -0.033 | 2.5 |
| 30 | -53 | -0.028 | 2.5 |
| 20 | -58 | -0.031 | 2.5 |
| 10 | -55 | -0.029 | 2.5 |
| 0 | -61 | -0.032 | 2.5 |
| -10 | -60 | -0.032 | 2.5 |
| -20 | -62 | -0.033 | 2.5 |
| -30 | -69 | -0.037 | 2.5 |

## 4.3 OCCUPIED BANDWIDTH MEASUREMENT

### 4.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

According to FCC 24.238(b) 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 26 dB below the transmitter power.

### 4.3.2 TEST INSTRUMENTS

**Test date: Aug. 04, 2011**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Sep. 08, 2010 | Sep. 07, 2011 |
| OVEN | MHU-225AU | 911033 | Dec. 17, 2010 | Dec. 16, 2011 |
| HUBER+SUHNER | SUCOFLEX104 | 222684/4 | Aug. 14, 2010 | Aug. 13, 2011 |
| AC POWER SOURCE | 6205 | 1140503 | NA | NA |

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

### 4.3.3 TEST SETUP

Same as Item 4.2.4 (Conducted Power Setup)

### 4.3.4 TEST PROCEDURES

a. The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 3 channels, 512, 661 and 810 (GSM, GPRS & E-GPRS) / 25, 600 and 1175 (CDMA) / 9262, 9400 and 9538 (WCDMA) (low, middle and high operational frequency range.)

b. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 6.5dB in the transmitted path track.

c. 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.

### 4.3.5 EUT OPERATING CONDITION

Same as the 4.1.5

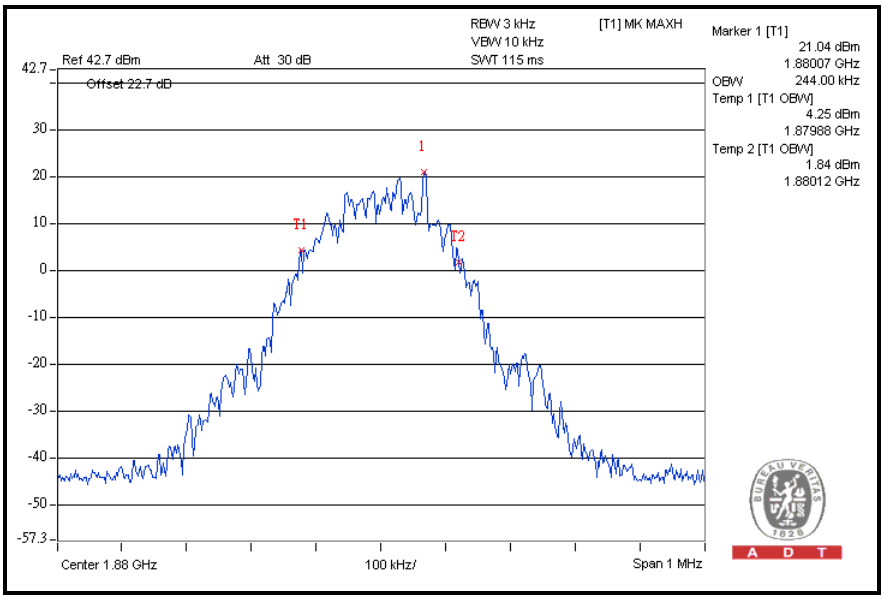
## 4.3.6 TEST RESULTS

### FOR GSM, GPRS & E-GPRS:

#### GSM MODE

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (kHz) |
|---|---|---|
| 512 | 1850.2 | 242.0 |
| 661 | 1880 | 244.0 |
| 810 | 1909.8 | 242.0 |

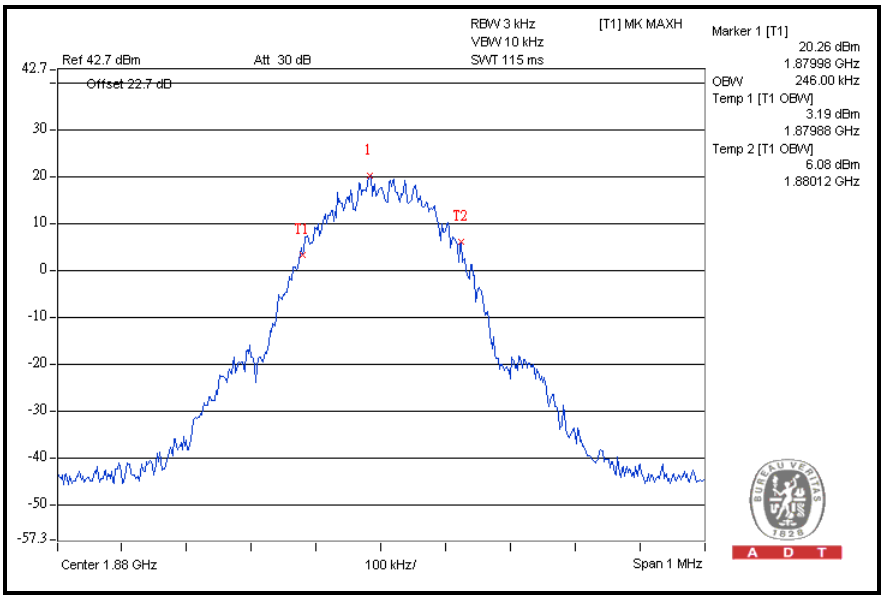
**CH 661**



## GPRS MODE

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (kHz) |
|---|---|---|
| 512 | 1850.2 | 244.0 |
| 661 | 1880 | 246.0 |
| 810 | 1909.8 | 244.0 |

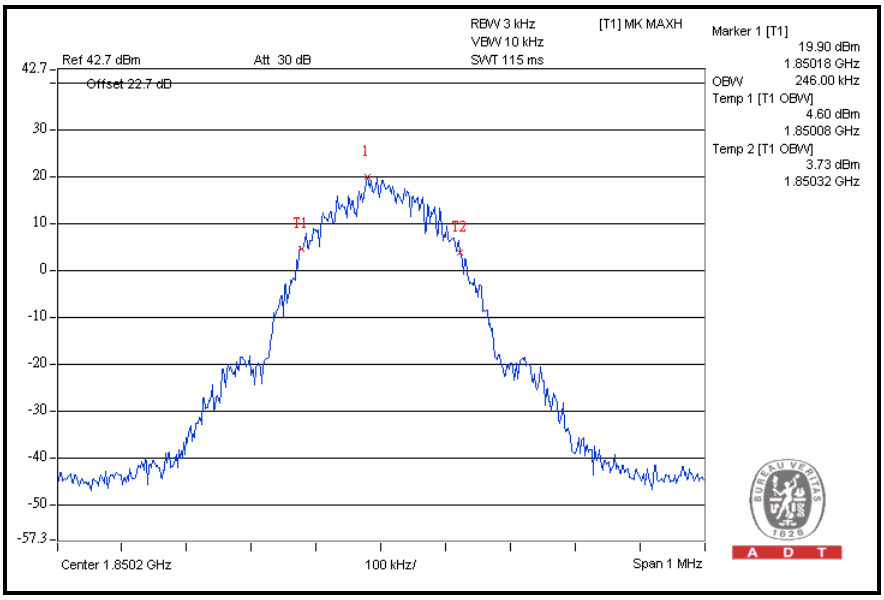
**CH 661**



## E-GPRS MODE

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (kHz) |
|---|---|---|
| 512 | 1850.2 | 246.0 |
| 661 | 1880 | 246.0 |
| 810 | 1909.8 | 242.0 |

**CH 512**

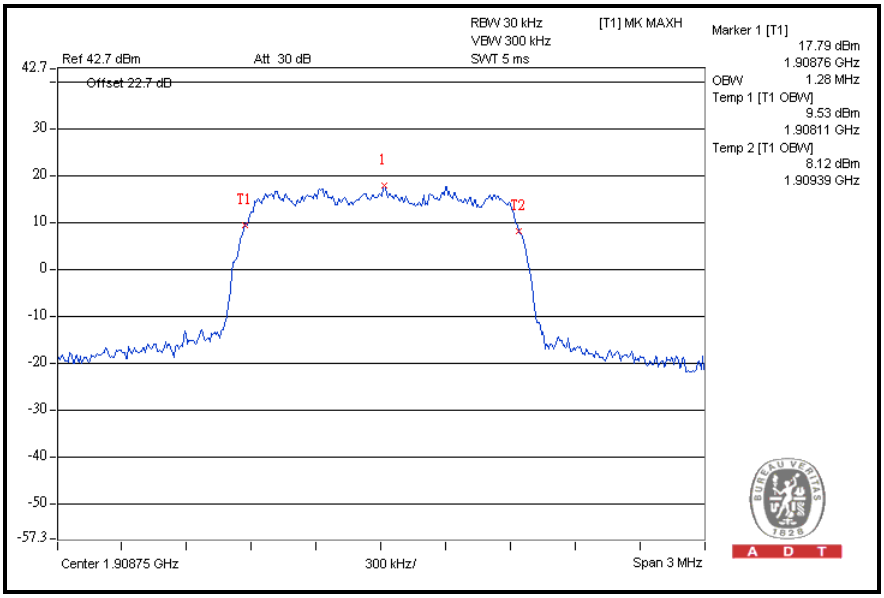


## FOR CDMA

### CDMA 2000:

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|
| 25 | 1851.25 | 1.28 |
| 600 | 1880 | 1.28 |
| 1175 | 1908.75 | 1.28 |

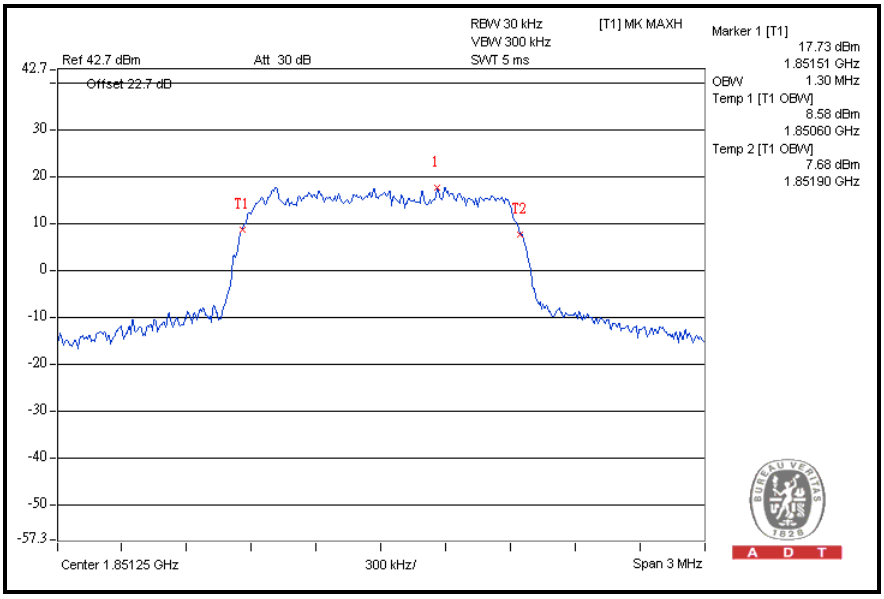
**CH 1175**



### 1x EV-DO Rev. A:

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|
| 25 | 1851.25 | 1.3 |
| 600 | 1880 | 1.28 |
| 1175 | 1908.75 | 1.28 |

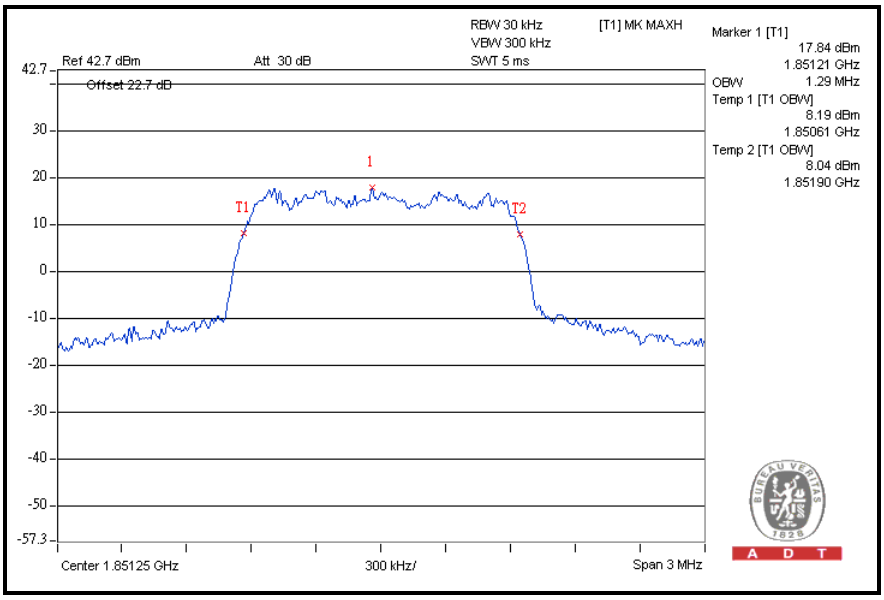
**CH 25**



### 1x EV-DO Rev. 0

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|
| 25 | 1851.25 | 1.29 |
| 600 | 1880 | 1.28 |
| 1175 | 1908.75 | 1.27 |

**CH 25**

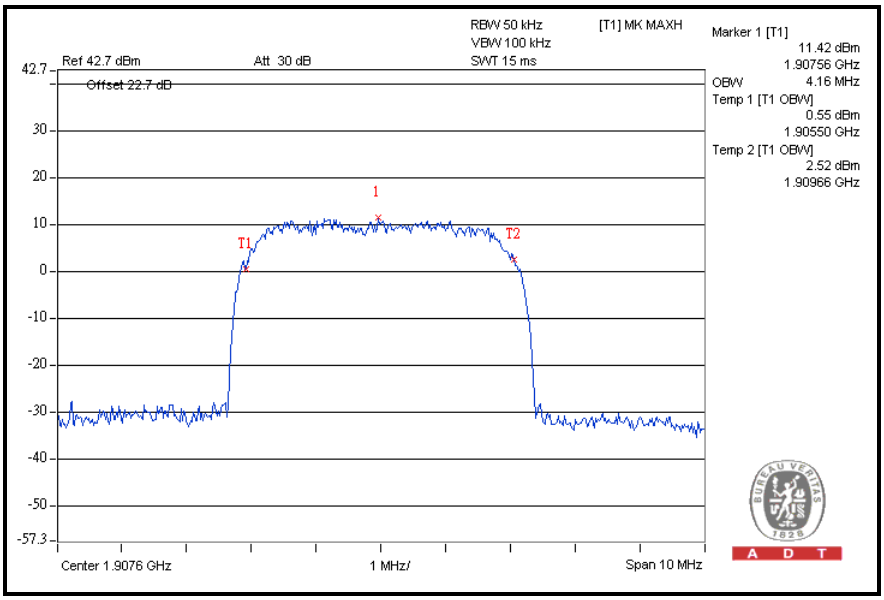


**FOR WCDMA:**

**WCDMA:**

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|
| 9262 | 1852.4 | 4.14 |
| 9400 | 1880 | 4.14 |
| 9538 | 1907.6 | 4.16 |

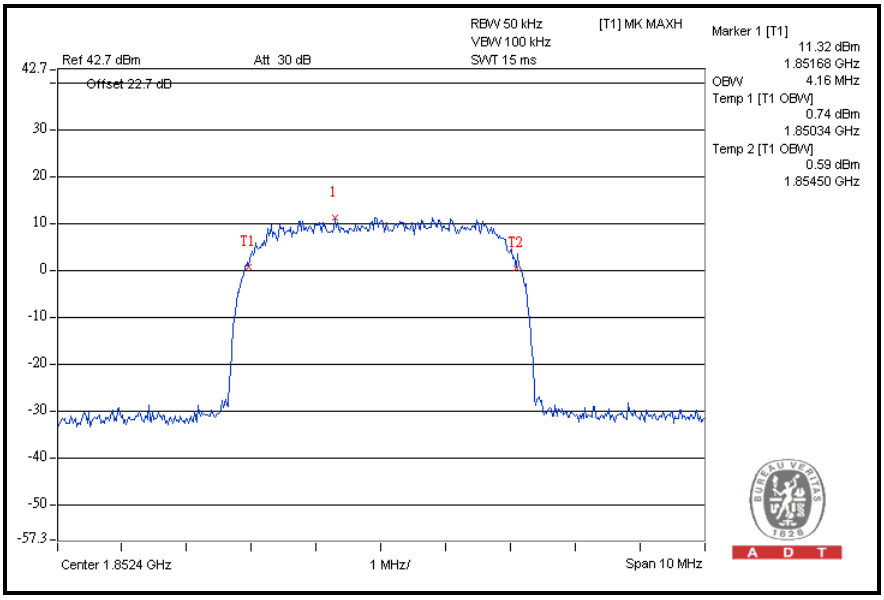
**CH 9538**



**HSDPA:**

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|
| 9262 | 1852.4 | 4.16 |
| 9400 | 1880 | 4.16 |
| 9538 | 1907.6 | 4.16 |

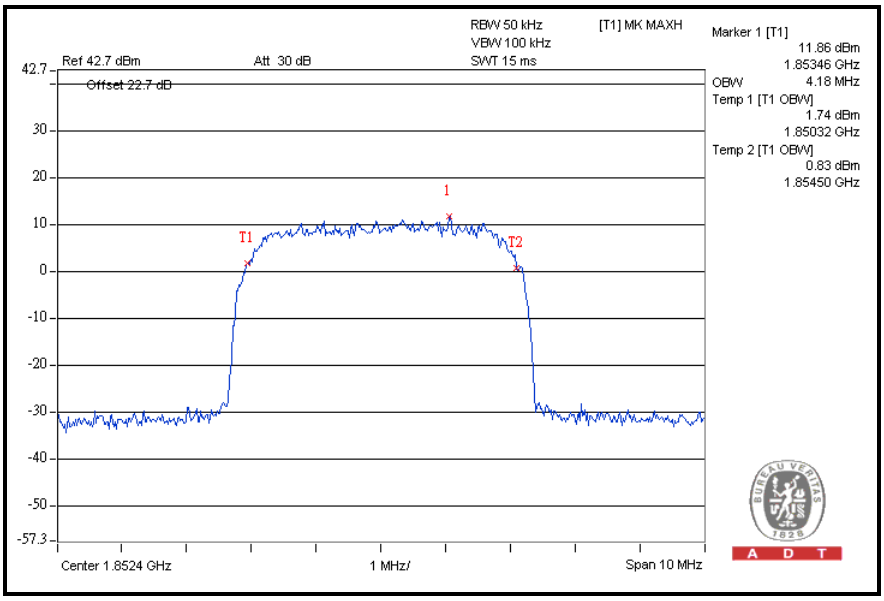
**CH 9262**



**HSUPA:**

| CHANNEL | FREQUENCY (MHz) | 99% OCCUPIED BANDWIDTH (MHz) |
|---|---|---|
| 9262 | 1852.4 | 4.18 |
| 9400 | 1880 | 4.14 |
| 9538 | 1907.6 | 4.16 |

**CH 9262**



## 4.4 BAND EDGE MEASUREMENT

### 4.4.1 LIMITS OF BAND EDGE MEASUREMENT

According to FCC 24.238(a) specified that power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz 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 INSTRUMENTS

**Test date: Aug. 04, 2011**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Sep. 08, 2010 | Sep. 07, 2011 |
| OVEN | MHU-225AU | 911033 | Dec. 17, 2010 | Dec. 16, 2011 |
| HUBER+SUHNER | SUCOFLEX104 | 222684/4 | Aug. 14, 2010 | Aug. 13, 2011 |
| AC POWER SOURCE | 6205 | 1140503 | NA | NA |

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

### 4.4.3 TEST SETUP

Same as Item 4.2.4 (Conducted Power Setup)

### 4.4.4 TEST PROCEDURES

a. The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels, 512 and 810 (GSM, GPRS & E-GPRS) / 25 and 1175 (CDMA) / 9262 and 9538 (WCDMA) (low and high operational frequency range.)

b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 6.5dB in the transmitted path track.

c. The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RB of the spectrum is 3kHz and VB of the spectrum is 10kHz.

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

### 4.4.5 EUT OPERATING CONDITION

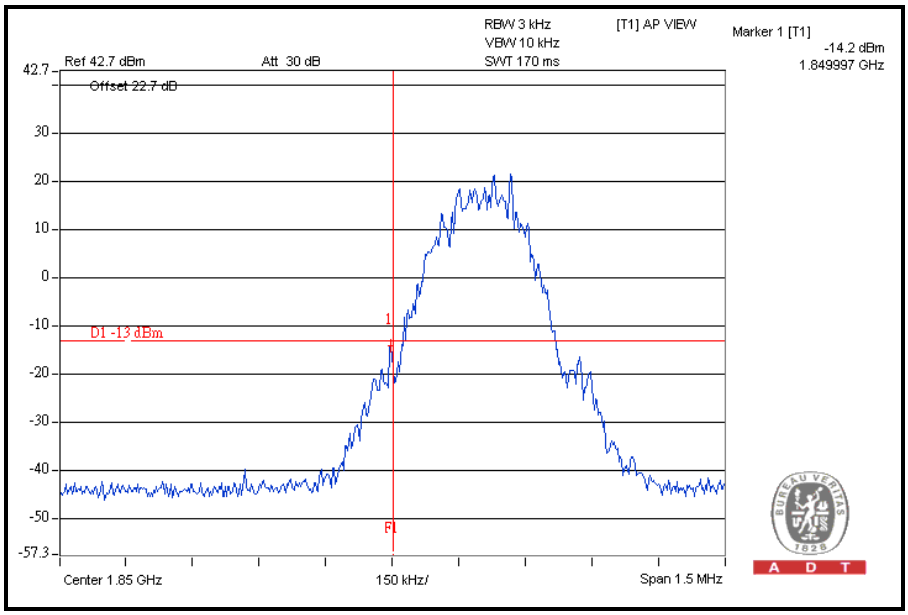
Same as the 4.1.5

## 4.4.6 TEST RESULTS

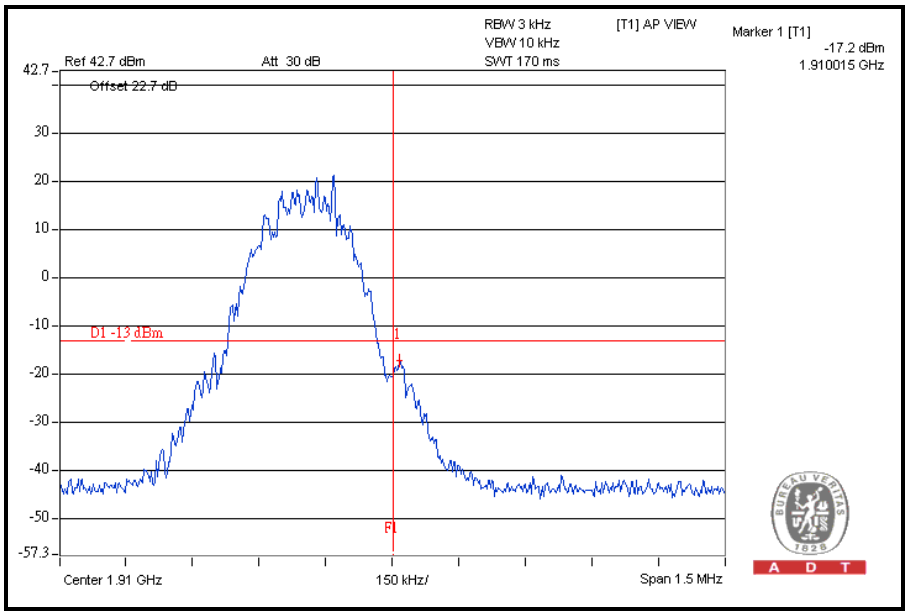
### FOR GSM / GPRS / E-GPRS:

#### GSM MODE

**LOWER BAND EDGE**

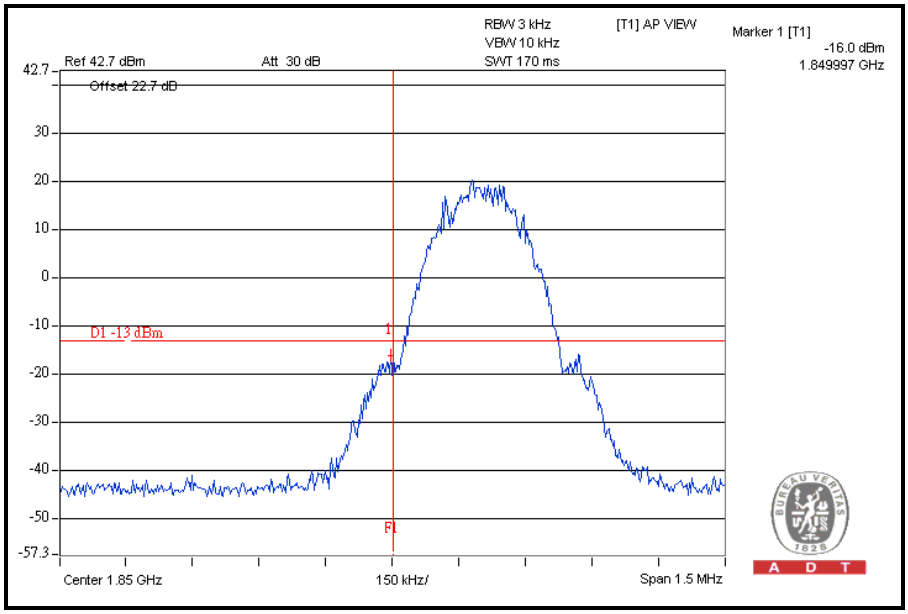



**HIGHER BAND EDGE**

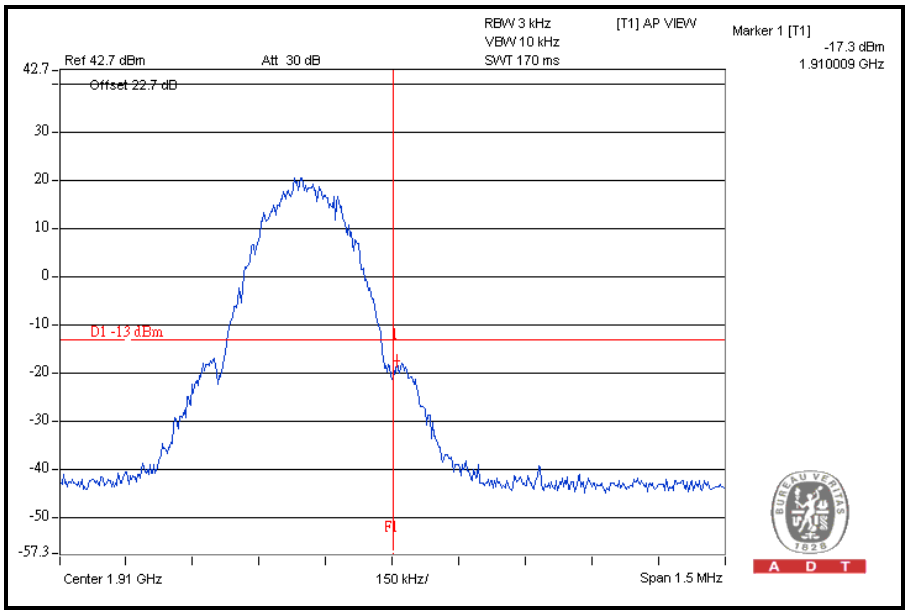


## GPRS MODE

### LOWER BAND EDGE

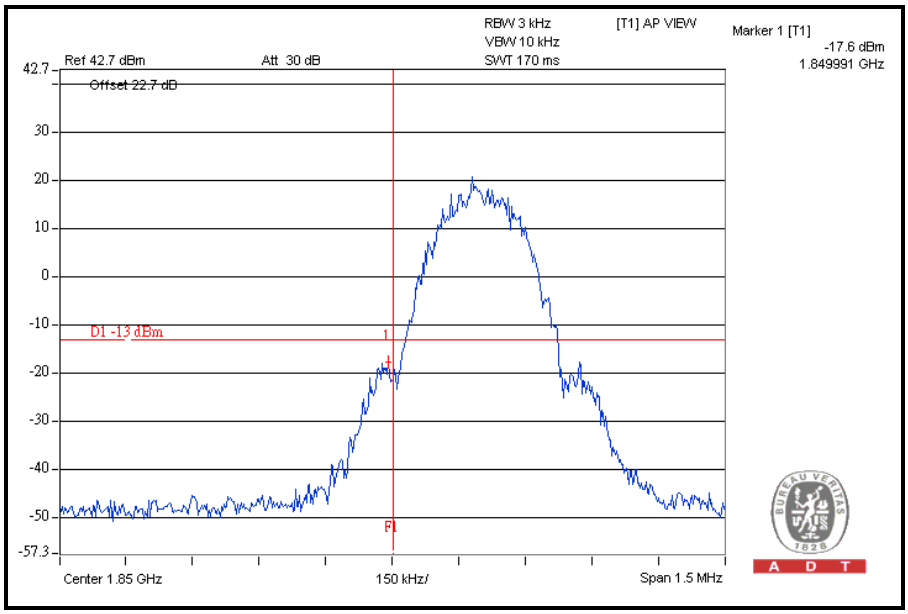



### HIGHER BAND EDGE

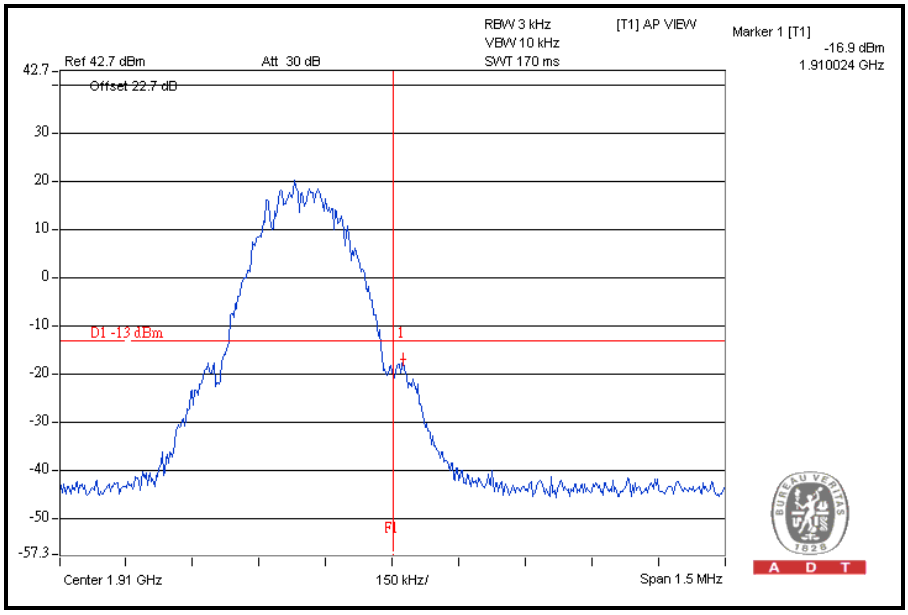


## E-GPRS MODE

### LOWER BAND EDGE



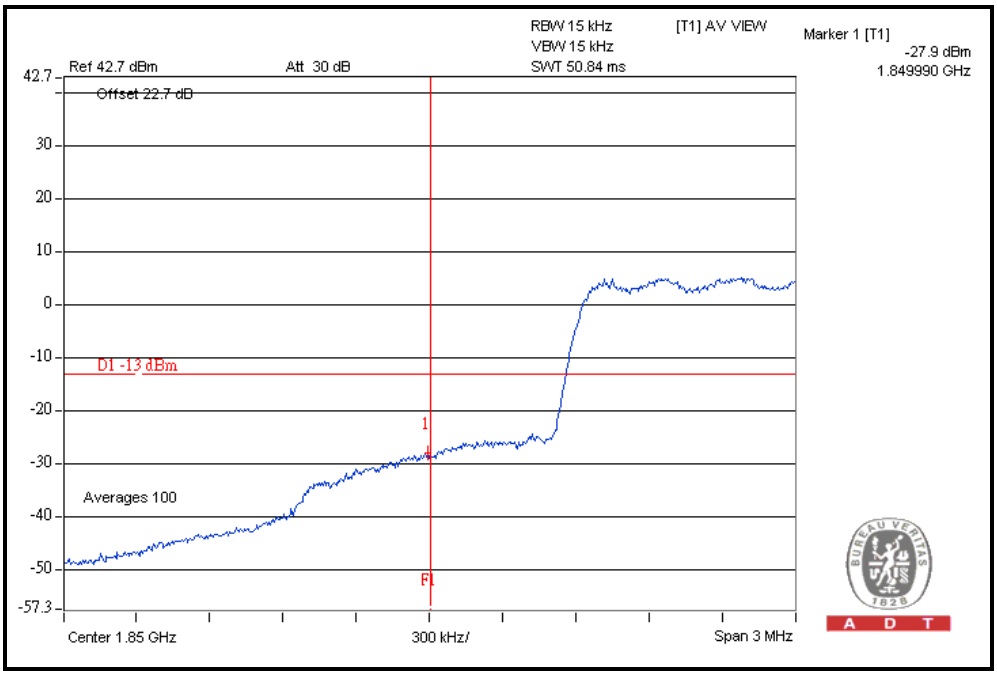

### HIGHER BAND EDGE



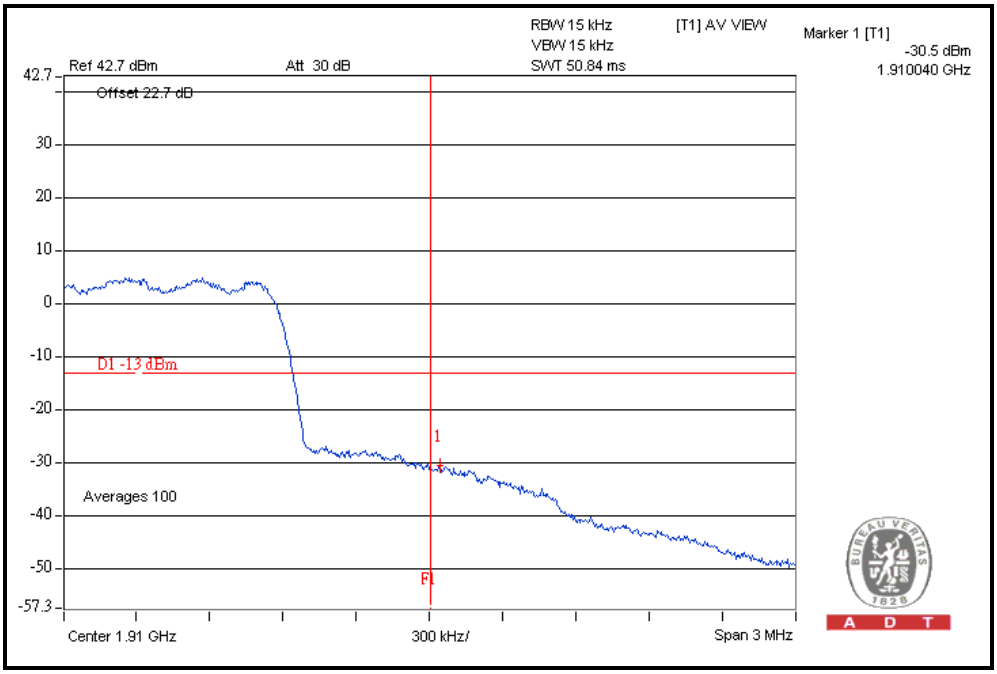
## FOR CDMA:

### CDMA 2000:

**LOWER BAND EDGE**

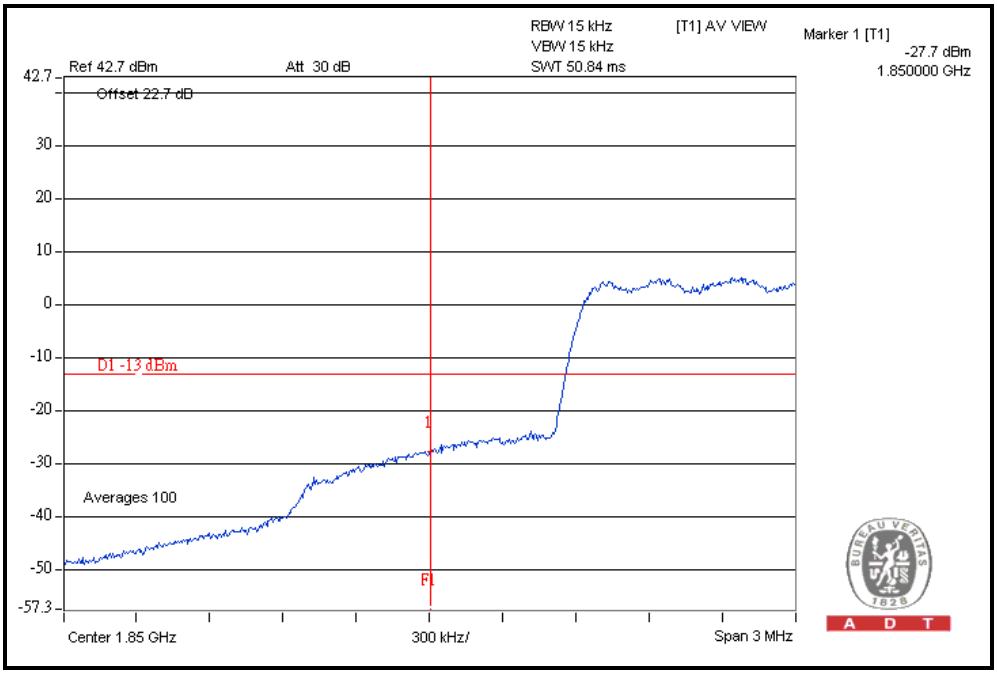



**HIGHER BAND EDGE**

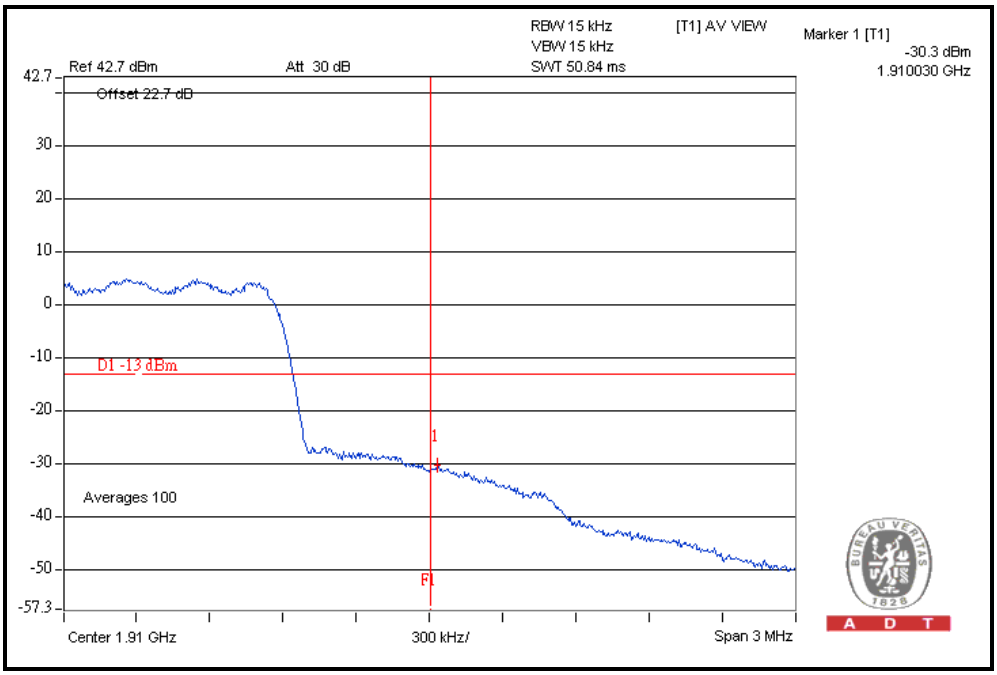


## 1x EV-DO Rev. A:

### LOWER BAND EDGE

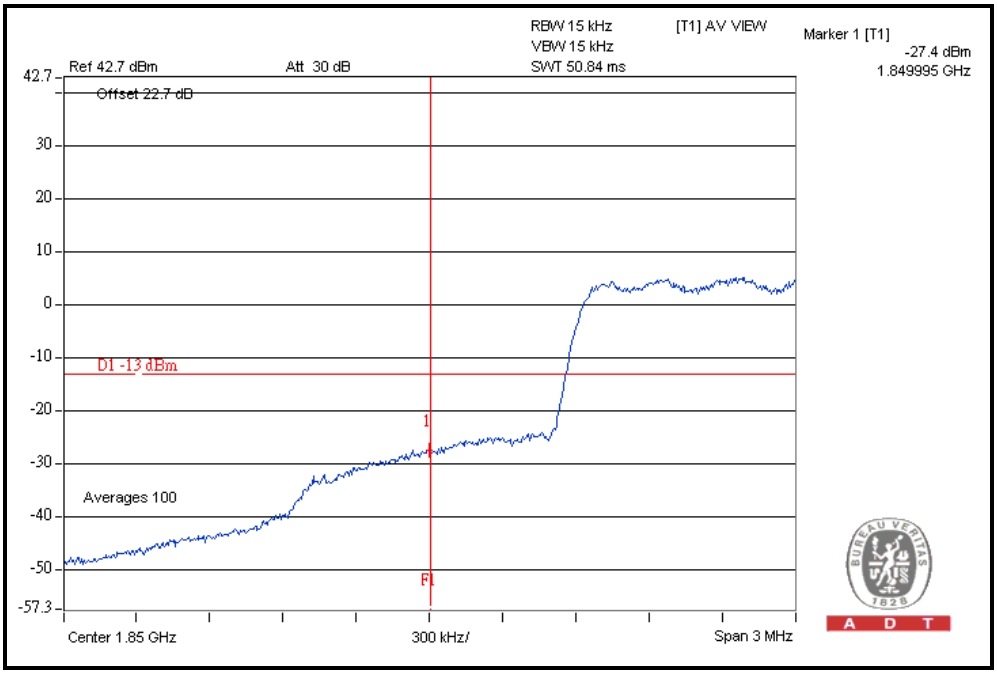



### HIGHER BAND EDGE

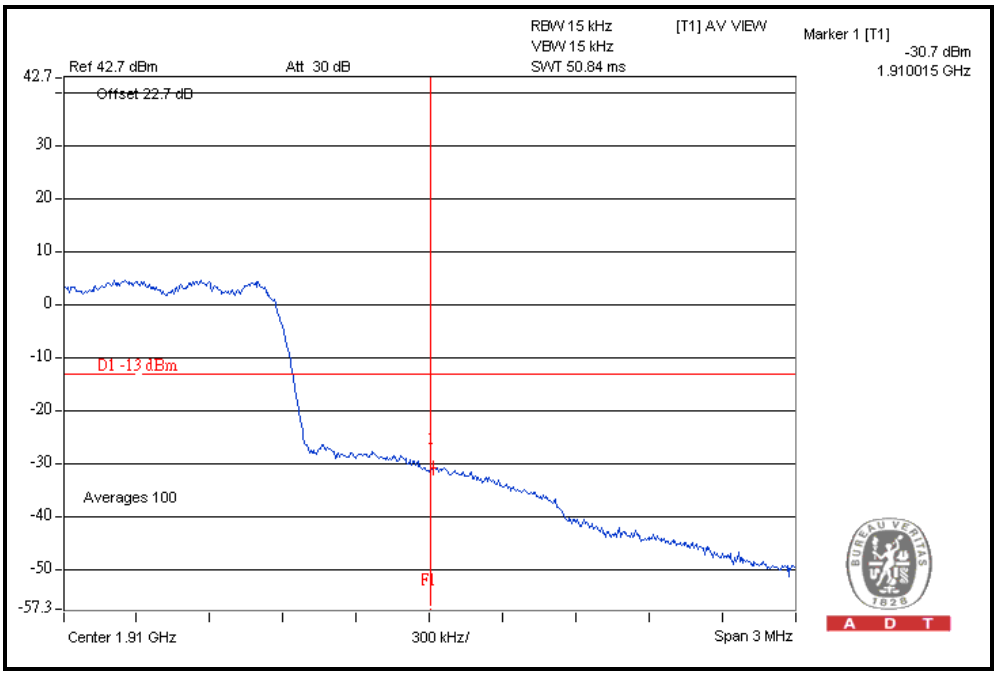


## 1x EV-DO Rev. 0:

### LOWER BAND EDGE



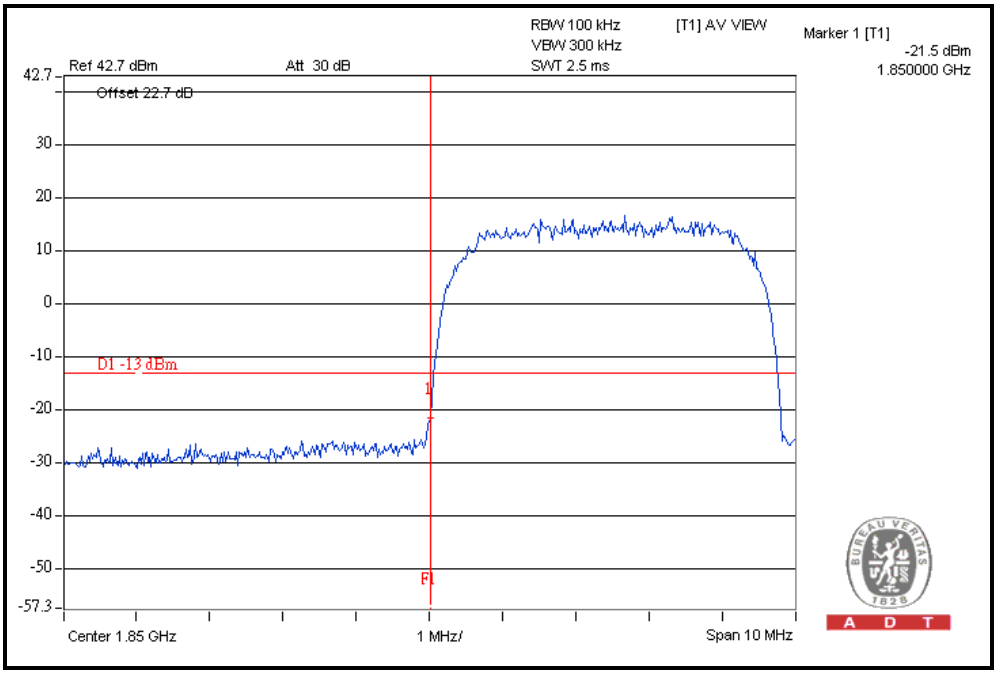

### HIGHER BAND EDGE



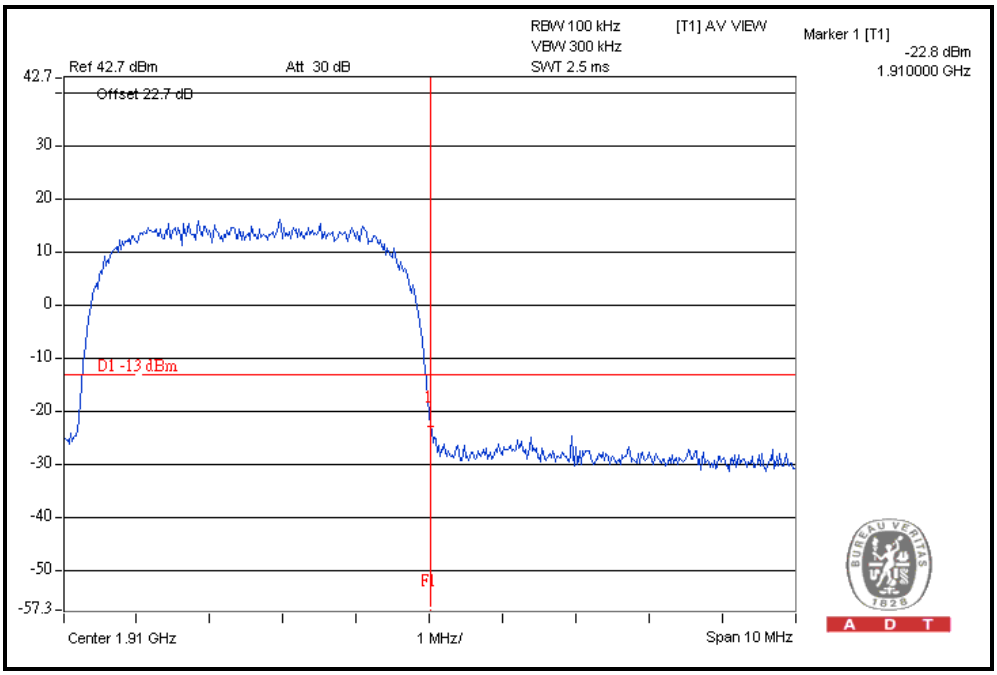
## FOR WCDMA:

### WCDMA MODE

**LOWER BAND EDGE**

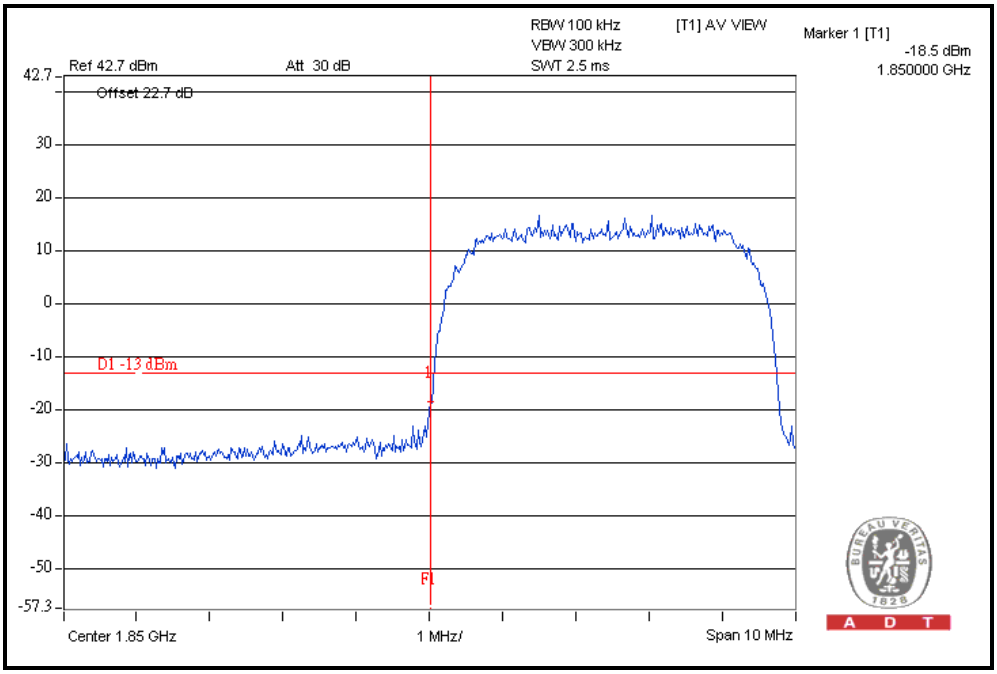



**HIGHER BAND EDGE**

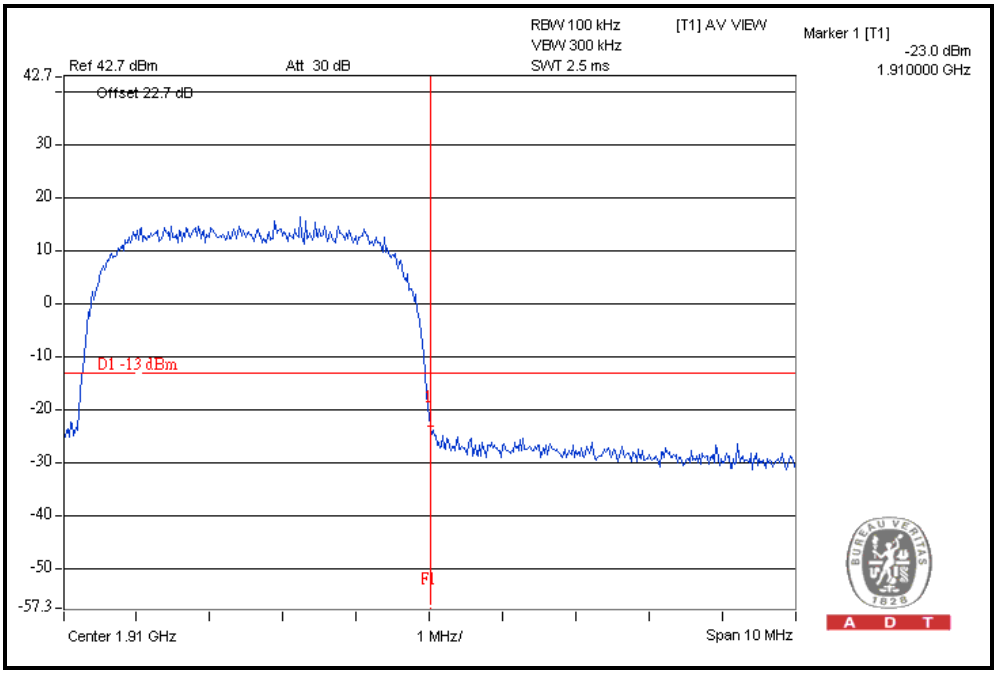


## HSDPA MODE

### LOWER BAND EDGE

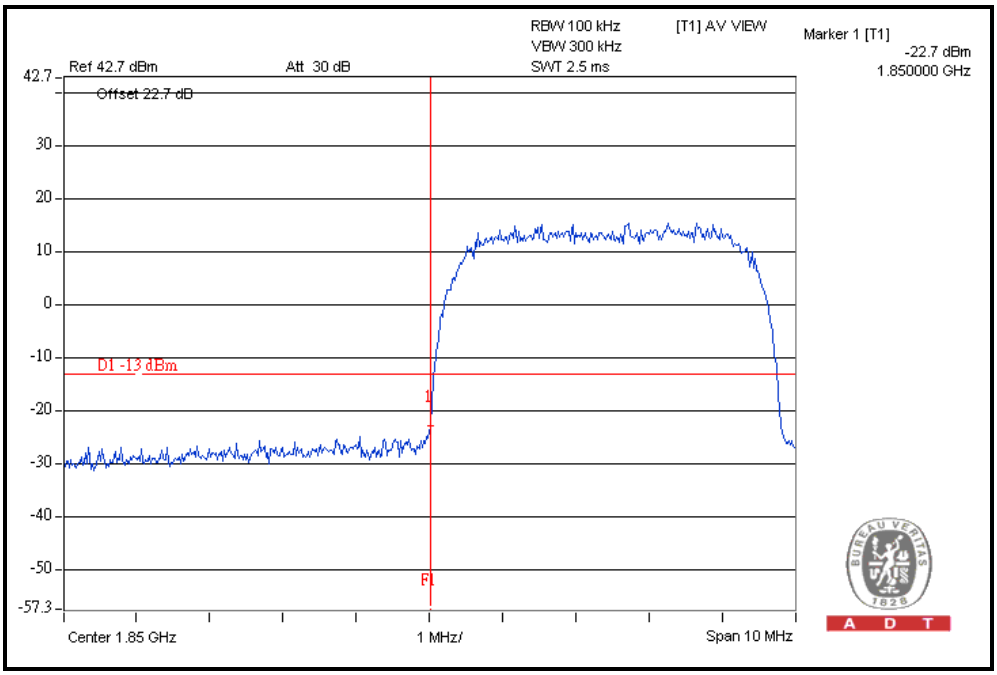



### HIGHER BAND EDGE

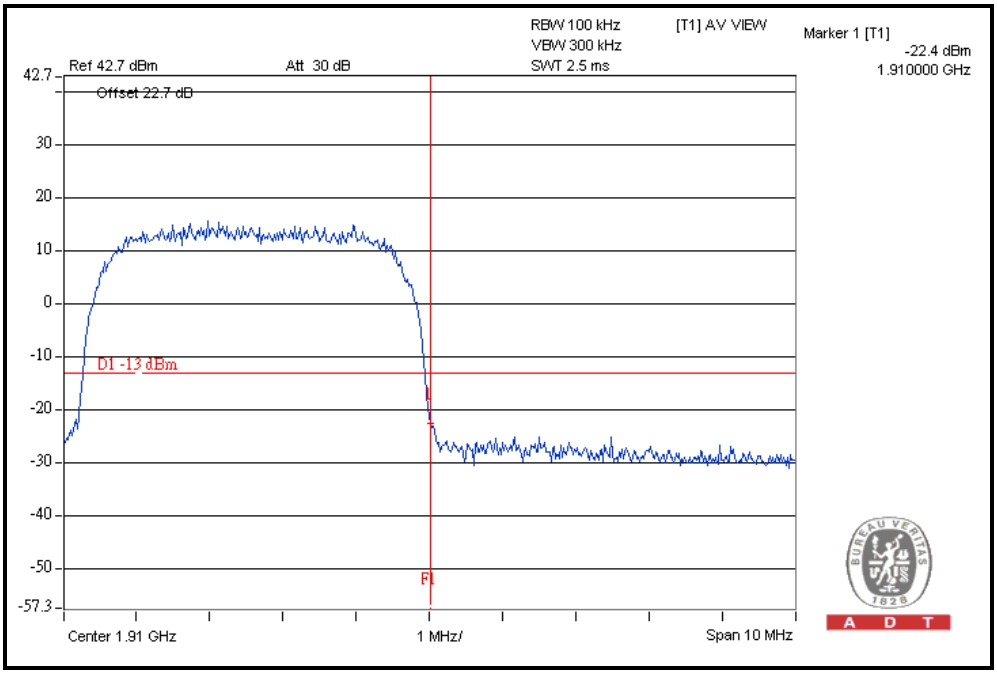


## HSUPA MODE

### LOWER BAND EDGE




### HIGHER BAND EDGE



## 4.5 CONDUCTED SPURIOUS EMISSIONS

### 4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The limit of emission equal to –13dBm.

### 4.5.2 TEST INSTRUMENTS

**Test date: Aug. 04, 2011**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Sep. 08, 2010 | Sep. 07, 2011 |
| OVEN | MHU-225AU | 911033 | Dec. 17, 2010 | Dec. 16, 2011 |
| HUBER+SUHNER | SUCOFLEX104 | 222684/4 | Aug. 14, 2010 | Aug. 13, 2011 |
| AC POWER SOURCE | 6205 | 1140503 | NA | NA |
| Wainwright Instruments Band Reject Filter | WRCG1850/1910-1830/1930-60/10SS | SN1 | NA | NA |
| * Wainwright Instruments High Pass Filter | WHK3.1/18G-10SS | SN1 | NA | NA |

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

### 4.5.3 TEST PROCEDURE

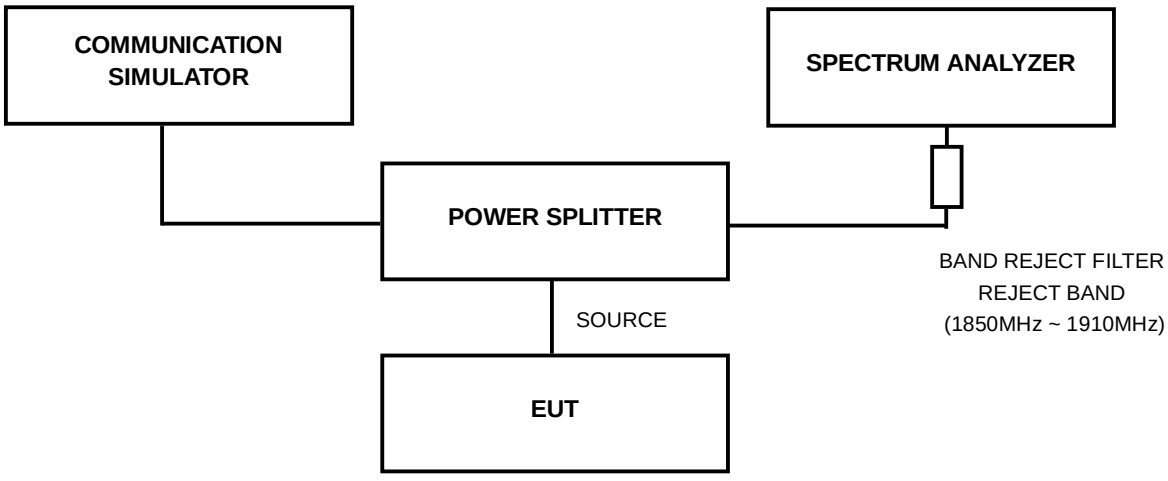
a. The EUT makes a call to the communication simulator. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels, 512 and 810 (GSM) / 25 and 1175 (CDMA) / 9262 and 9538 (WCDMA) (low and high operational frequency range.)

b. The conducted spurious emission used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer. This splitter loss and cable loss are the worst loss 6.5dB in the transmitted path track.

c. When the spectrum scanned from 9kHz to 3GHz, it shall be connected to the band reject filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.

d. When the spectrum scanned from 3kHz to 20GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB=1MHz, VB=3MHz.

### 4.5.4 TEST SETUP



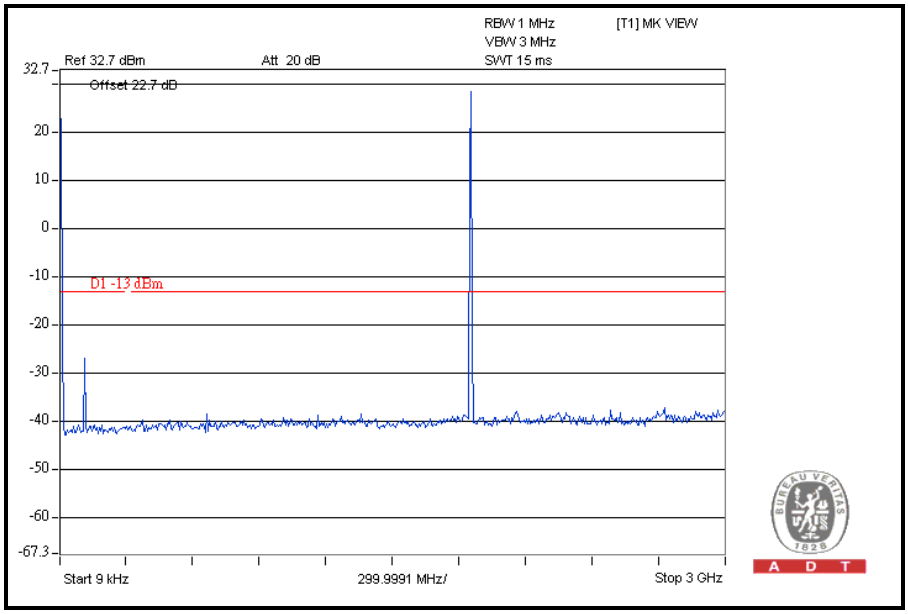

### 4.5.5 EUT OPERATING CONDITIONS

Same as the 4.1.5

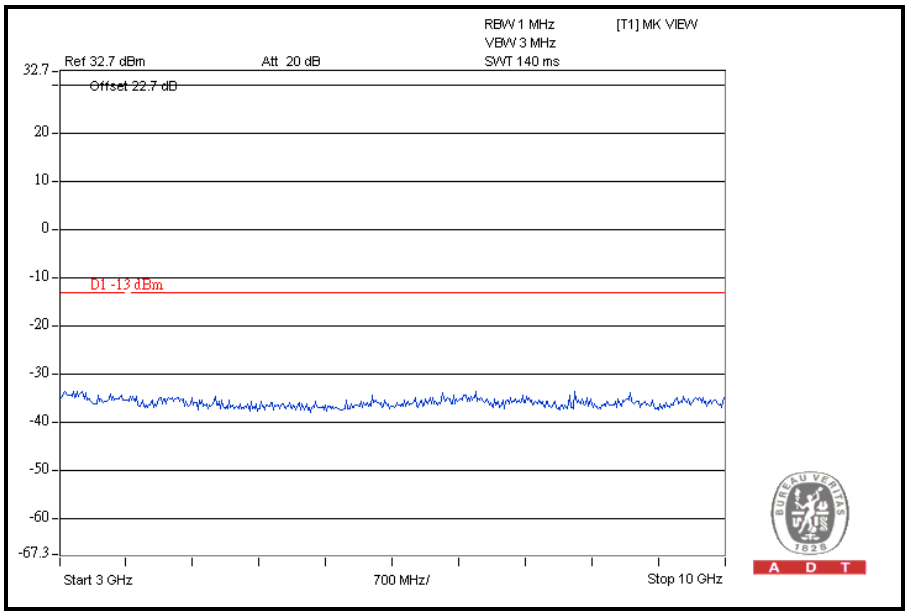
## 4.5.6 TEST RESULTS

**FOR GSM:**

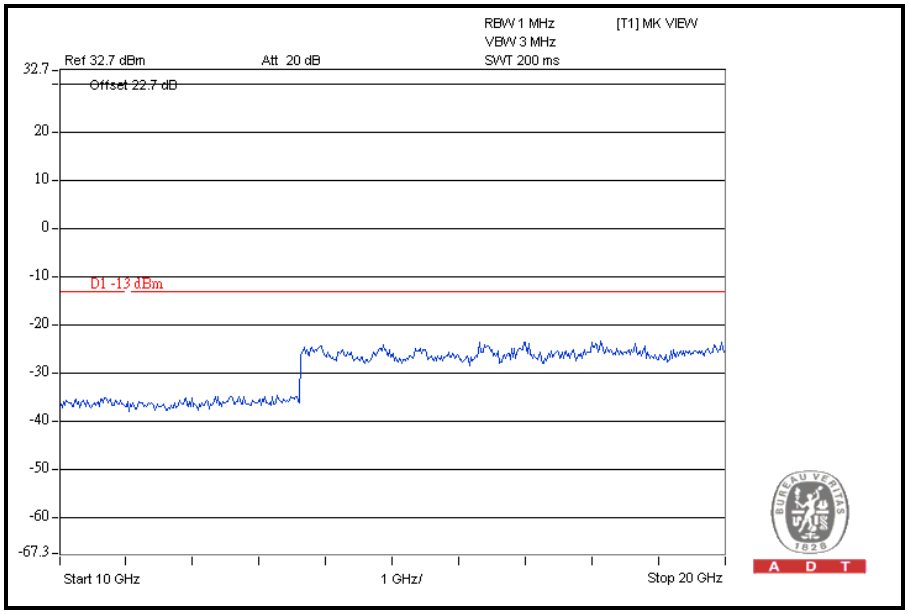
**CH 512:** 9kHz ~ 3GHz



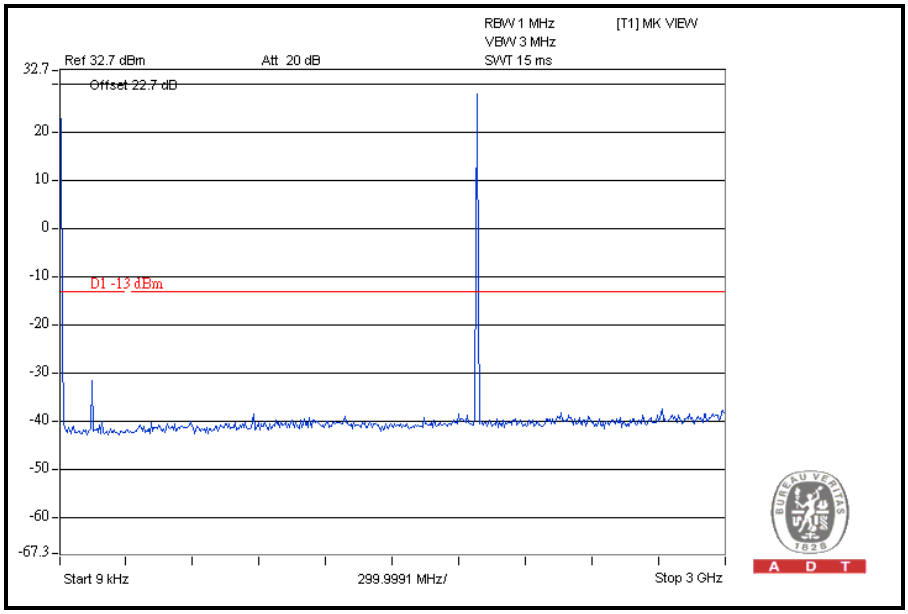

3GHz ~ 10GHz



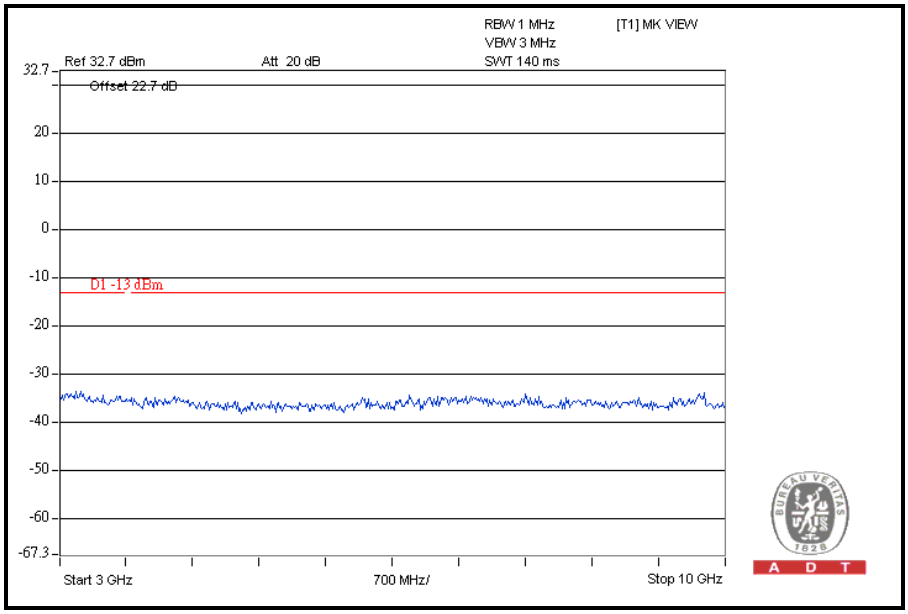
10GHz ~ 20GHz


RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

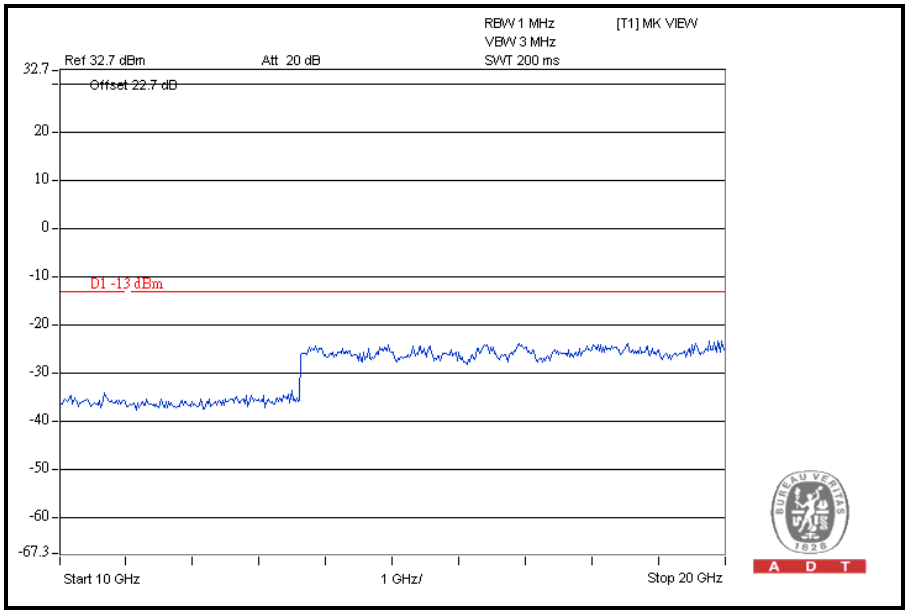
**CH 661:** 9kHz ~ 3GHz



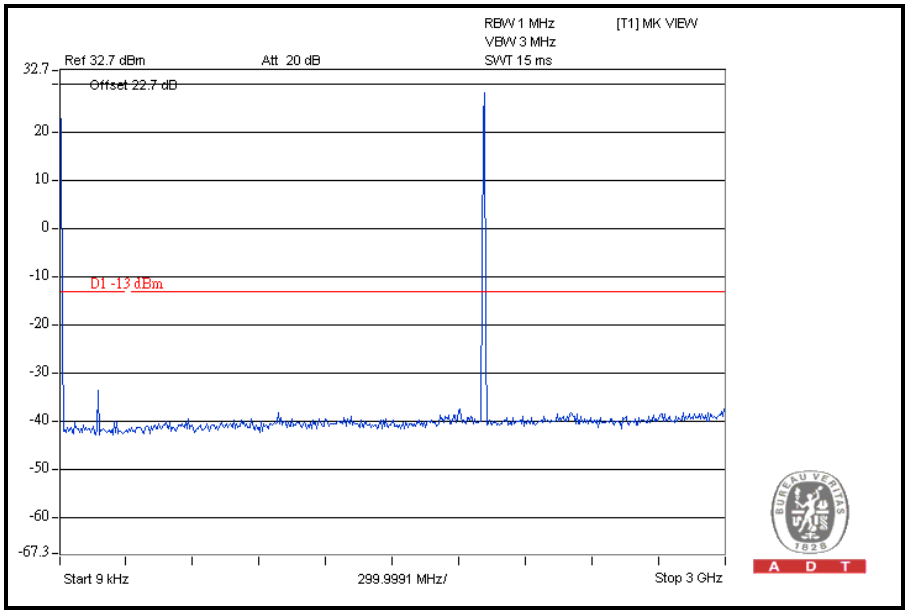

3GHz ~ 10GHz



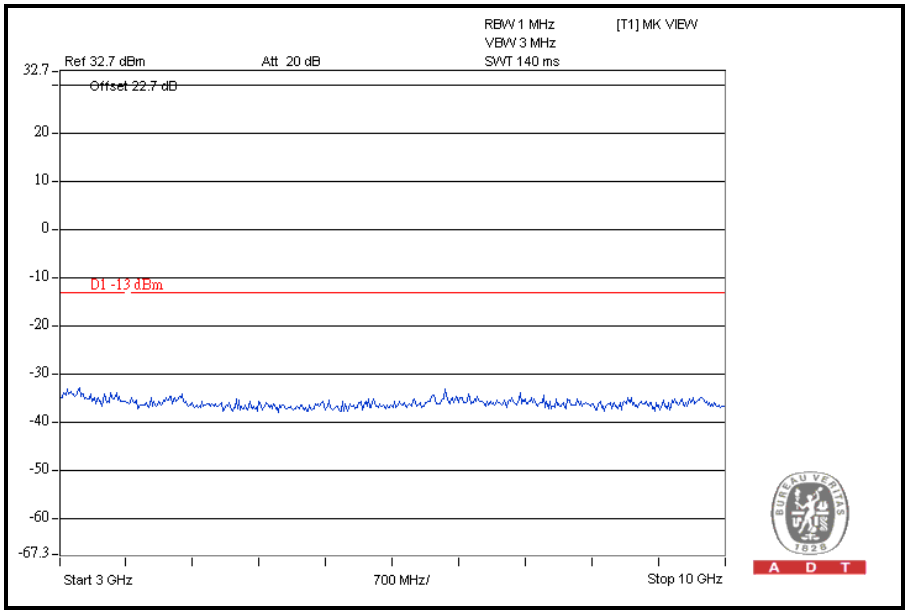
10GHz ~ 20GHz


RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

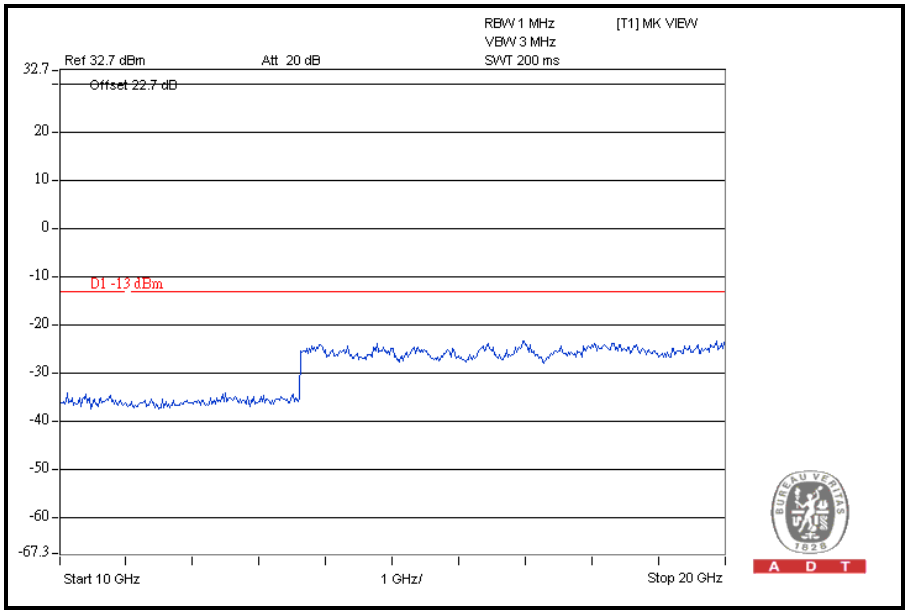
**CH 810:** 9kHz ~ 3GHz




3GHz ~ 10GHz

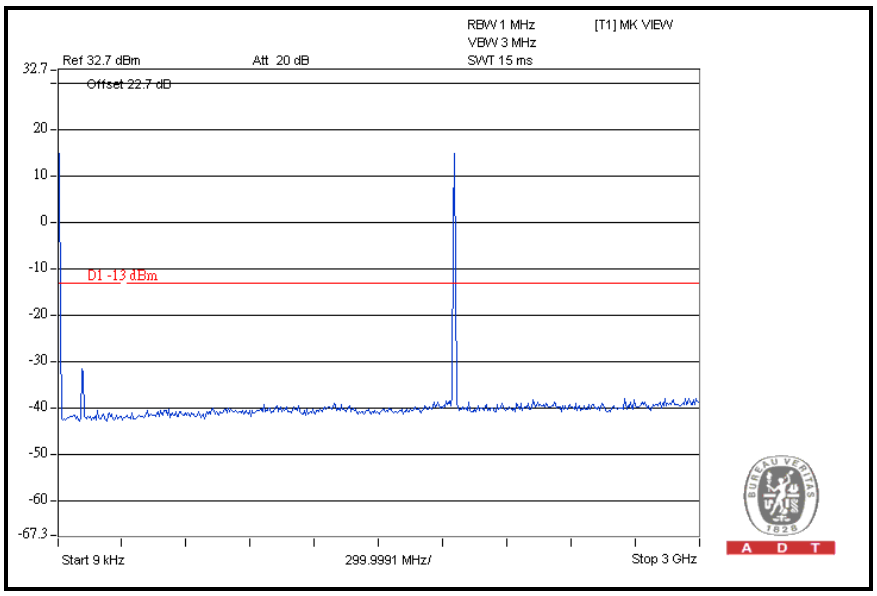


10GHz ~ 20GHz

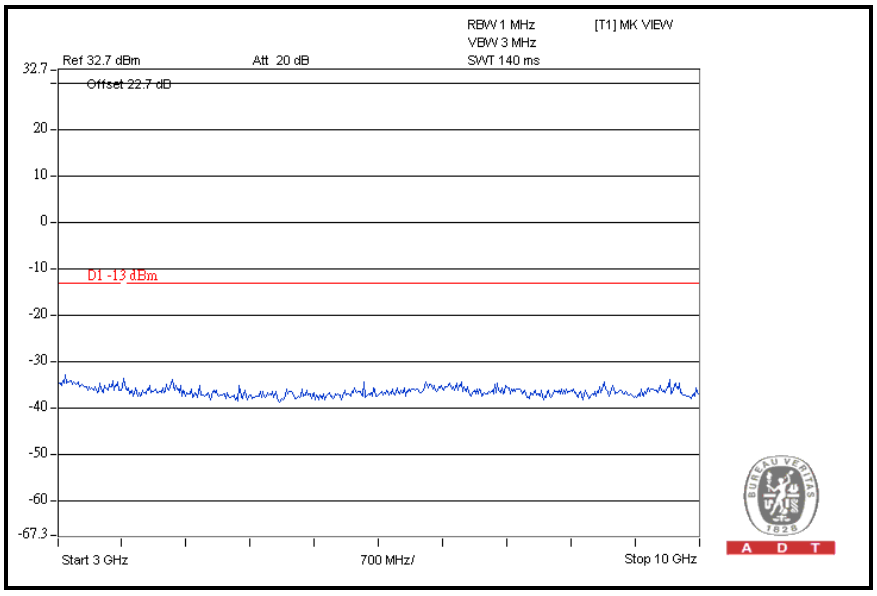

RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

**FOR CDMA:**

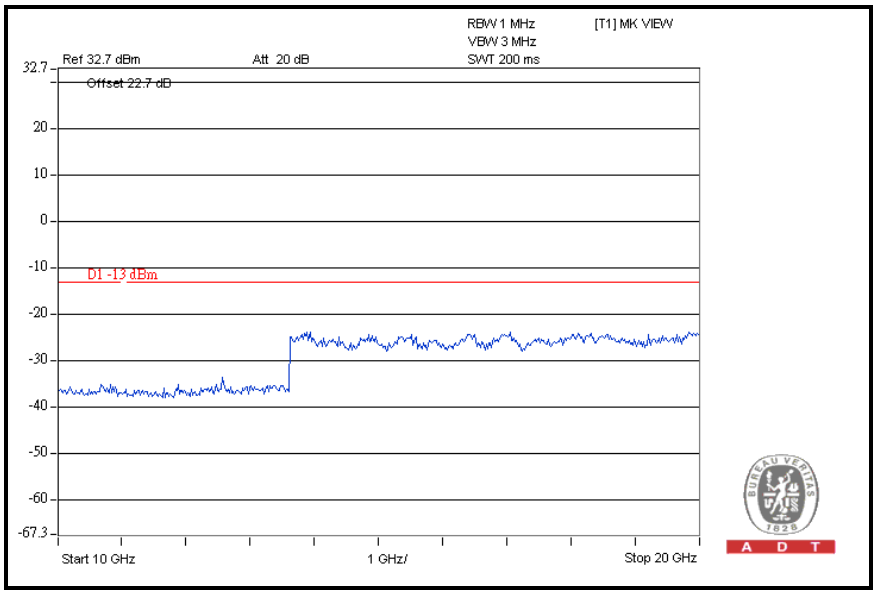
**CH 25:** 9kHz ~ 3GHz



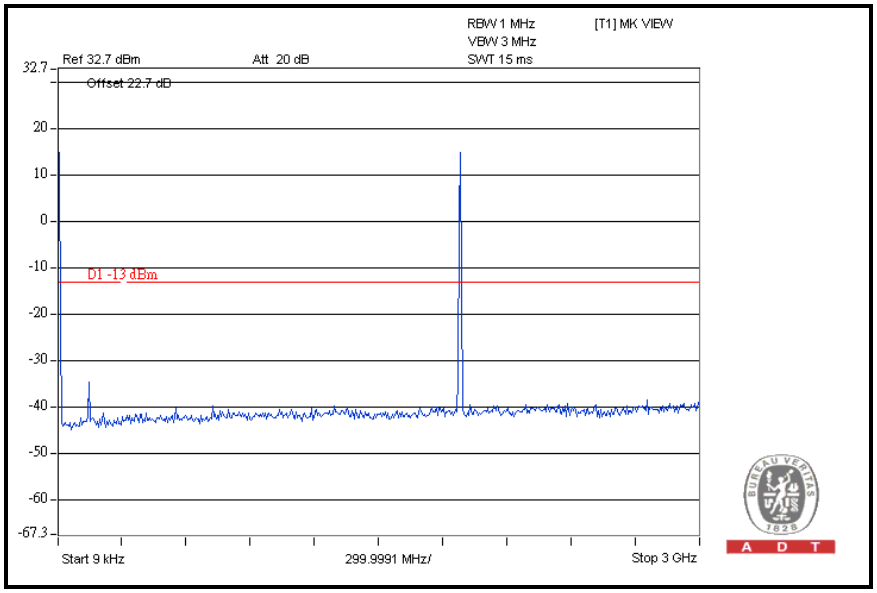

3GHz ~ 10GHz



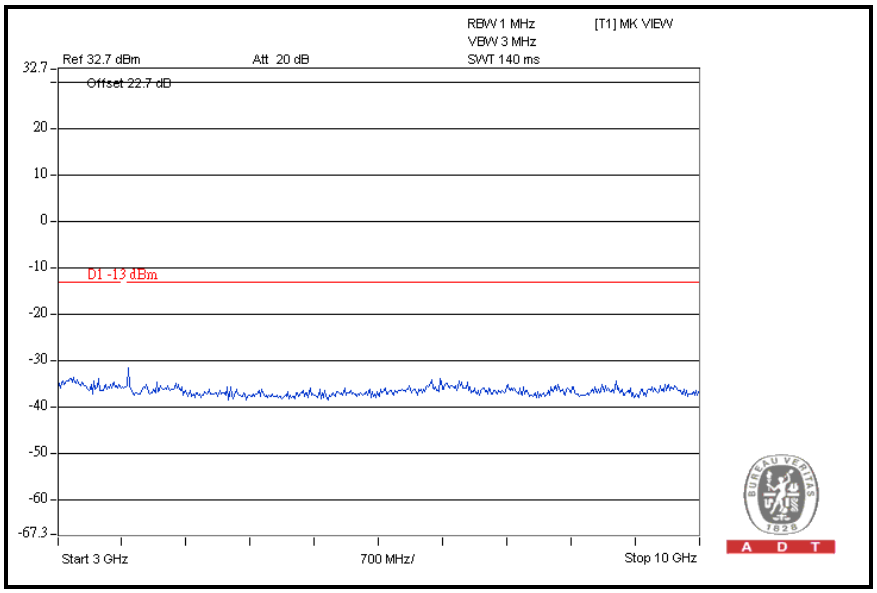
10GHz ~ 20GHz


RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

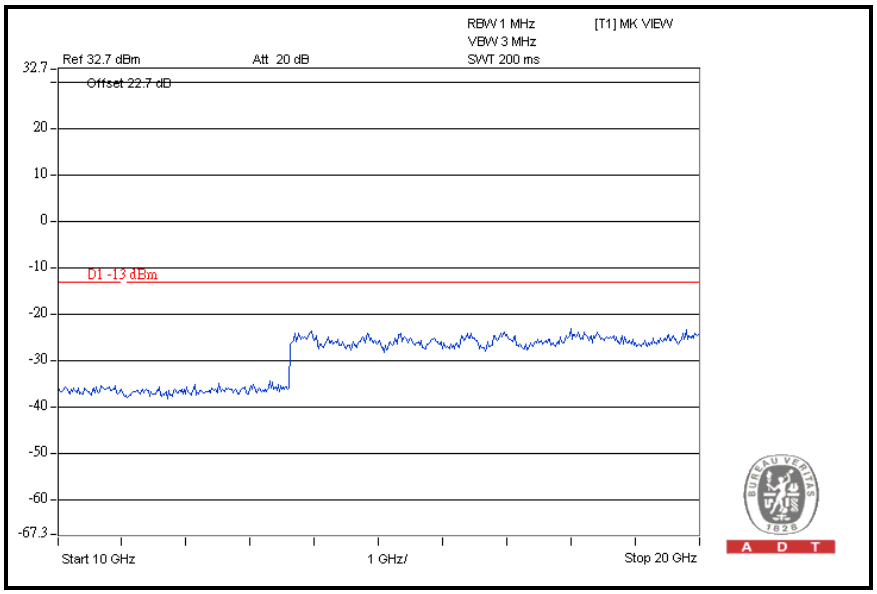
**CH 600:** 9kHz ~ 3GHz



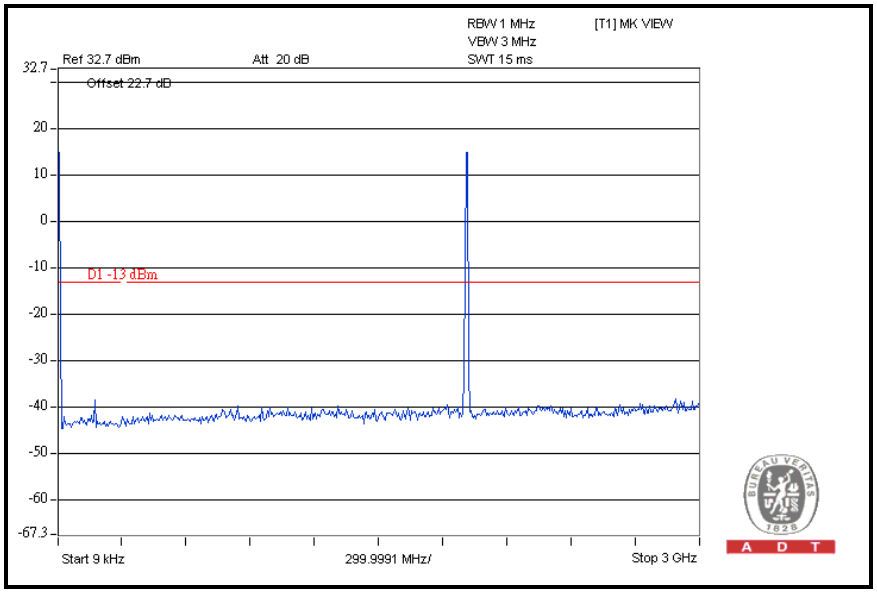

3GHz ~ 10GHz



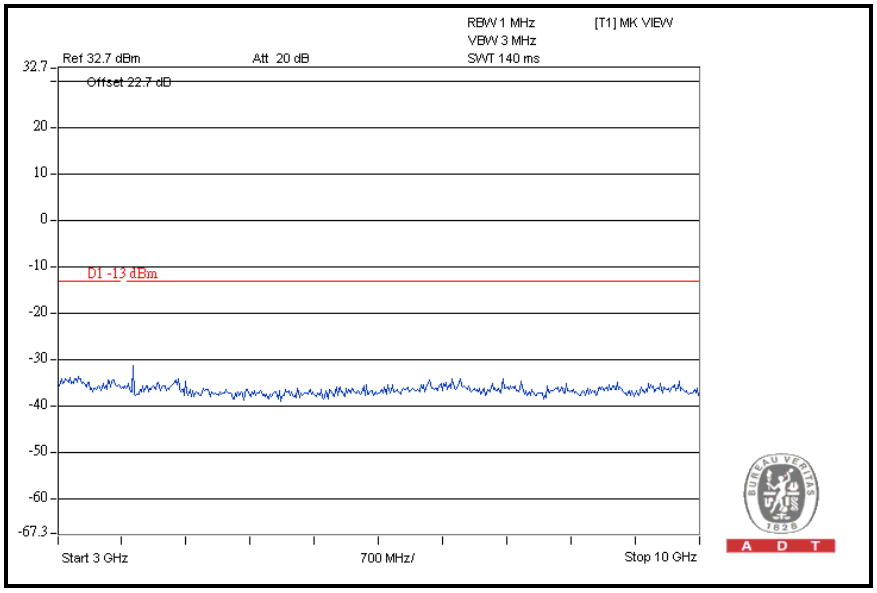
10GHz ~ 20GHz


RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

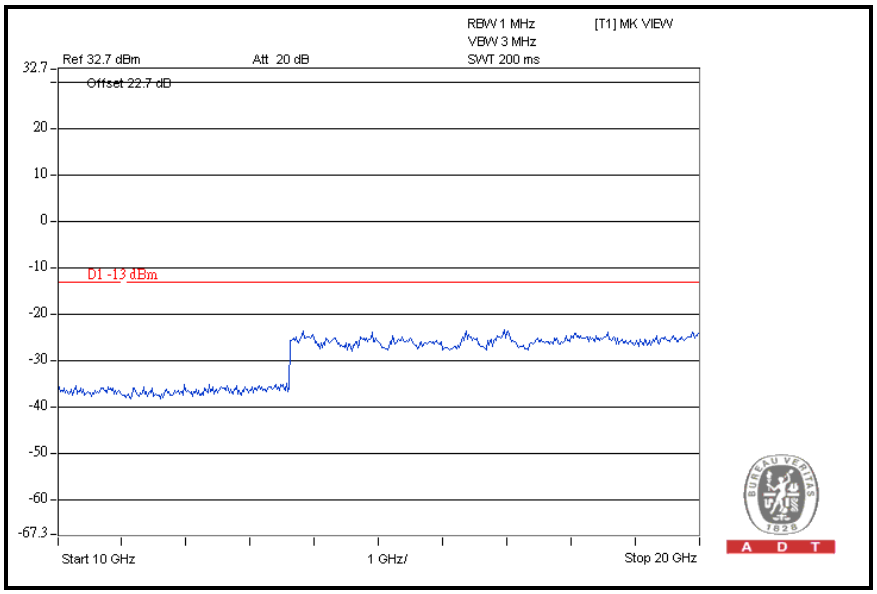
**CH 1175:** 9kHz ~ 3GHz




3GHz ~ 10GHz

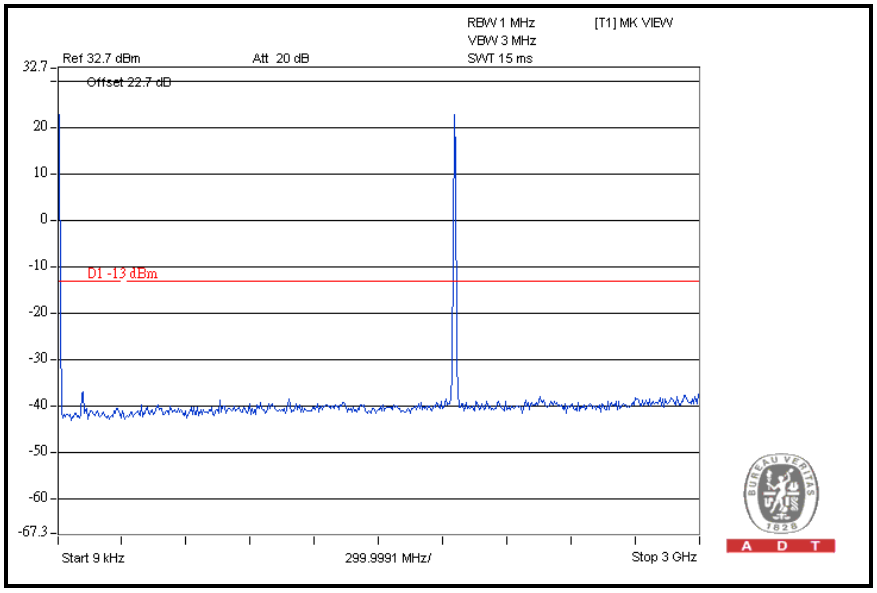


10GHz ~ 20GHz

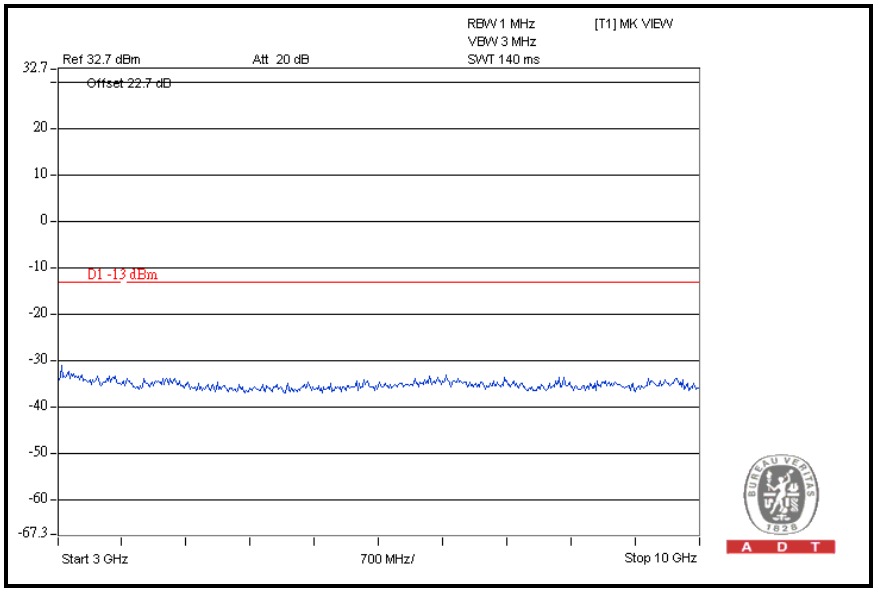

RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

**FOR WCDMA:**

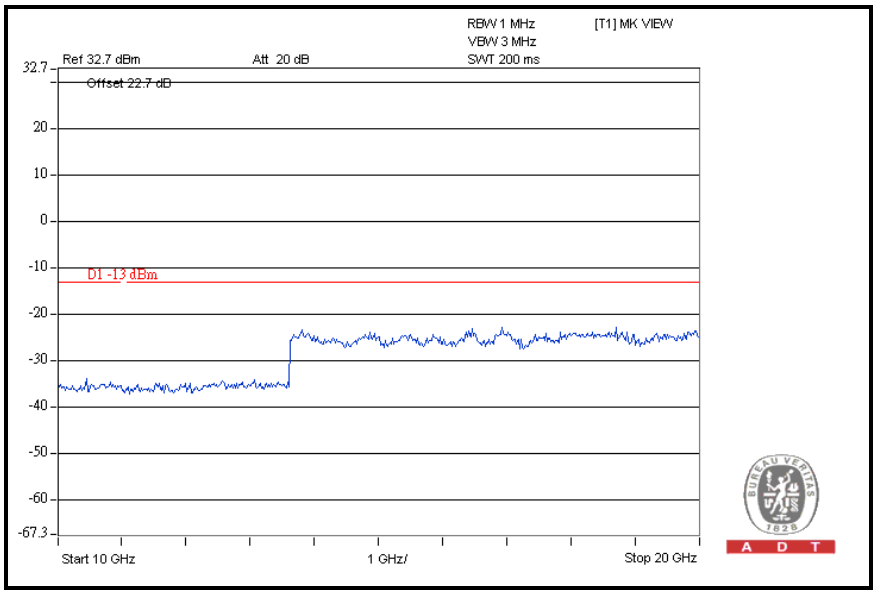
**CH 9262:** 9kHz ~ 3GHz



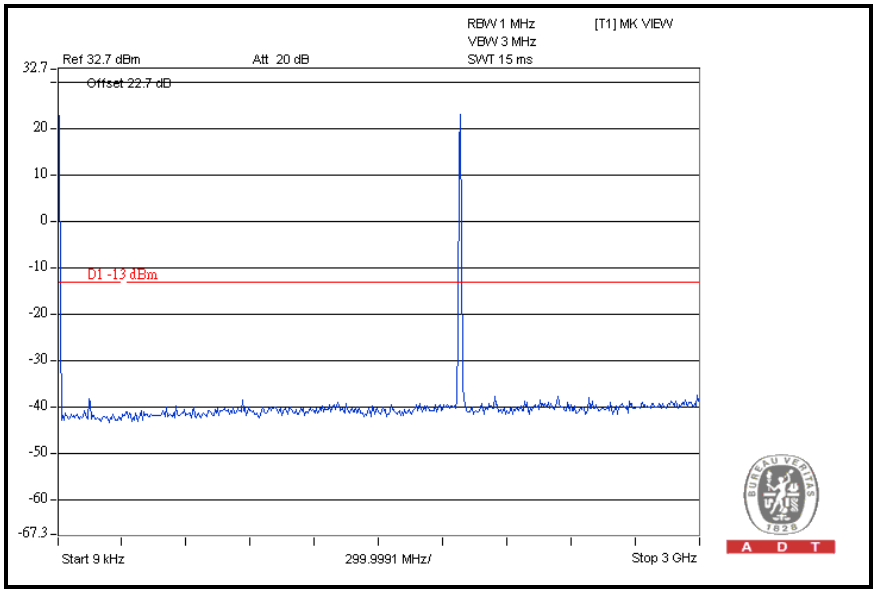

3GHz ~ 10GHz



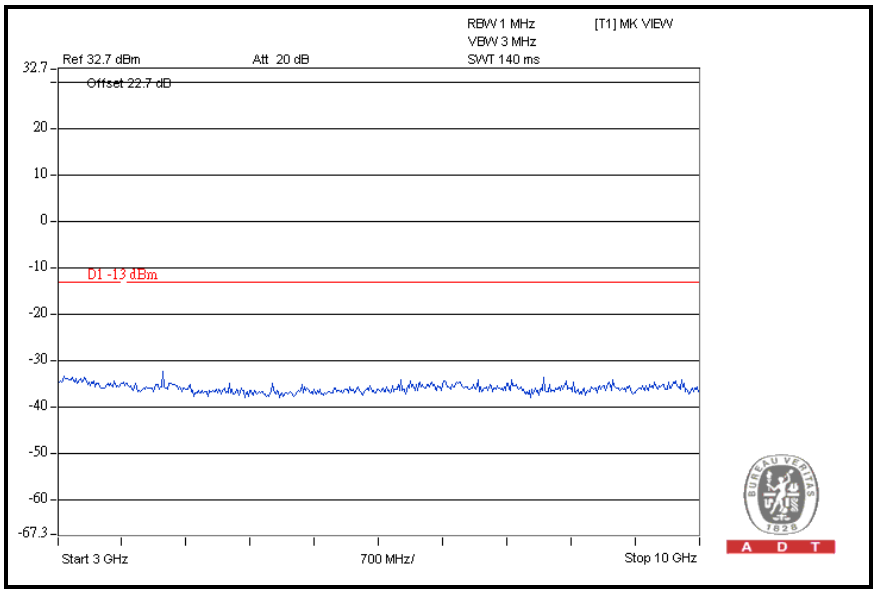
10GHz ~ 20GHz


RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

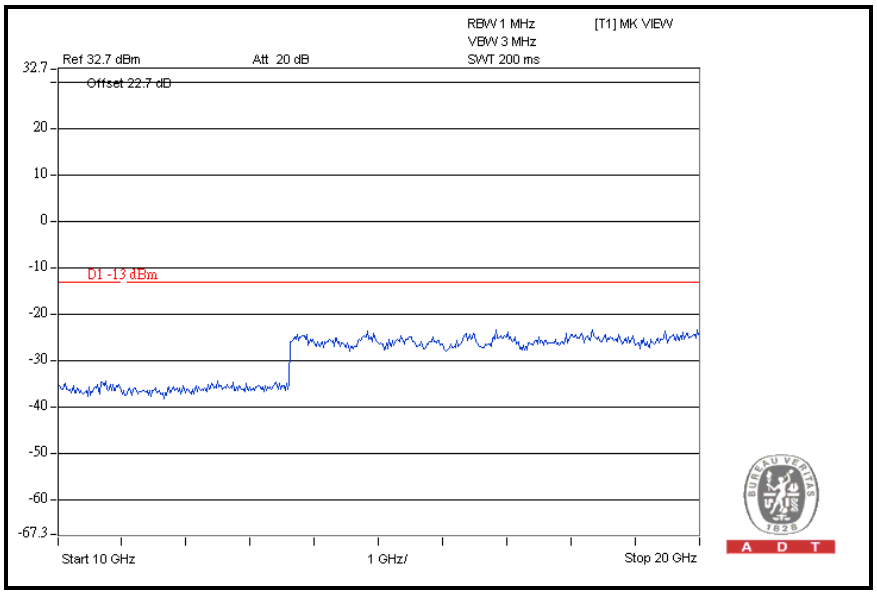
**CH 9400:** 9kHz ~ 3GHz



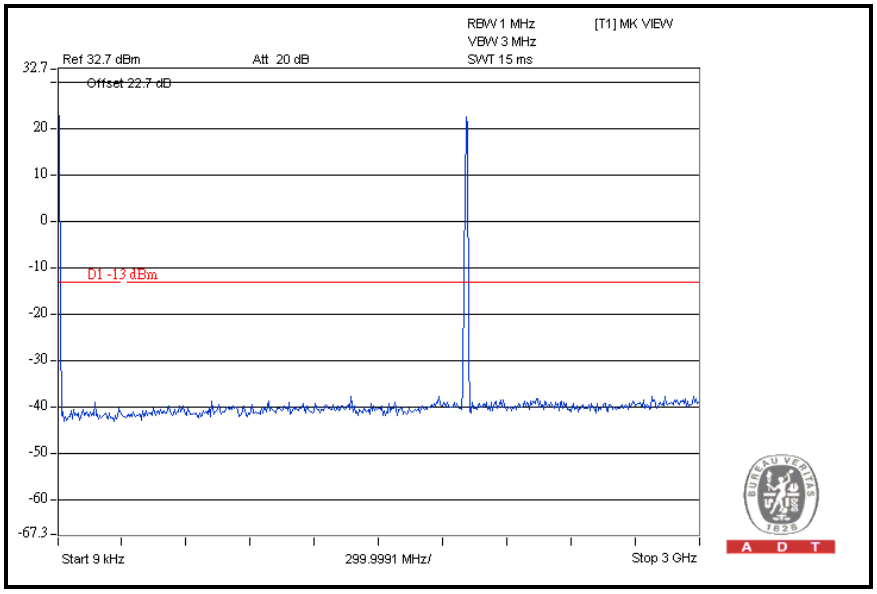

3GHz ~ 10GHz



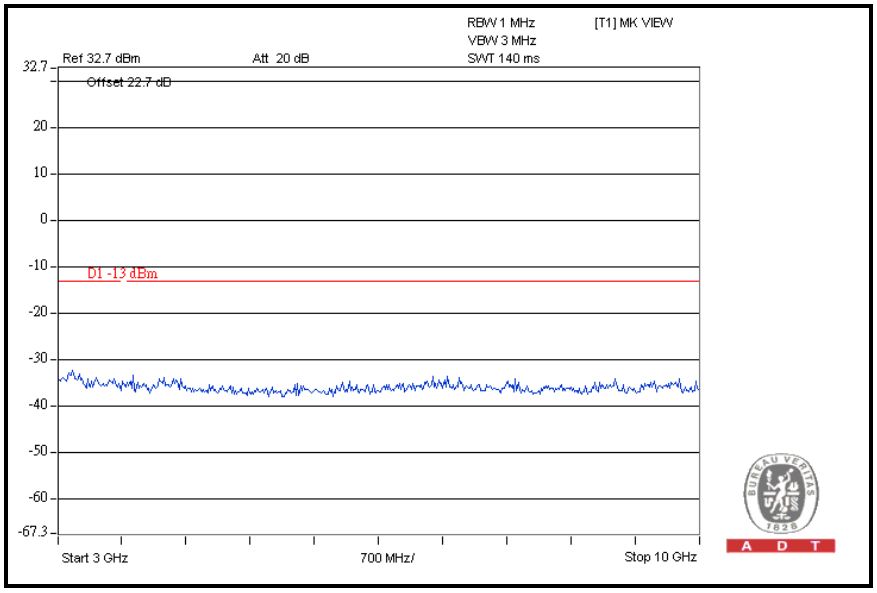
10GHz ~ 20GHz


RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

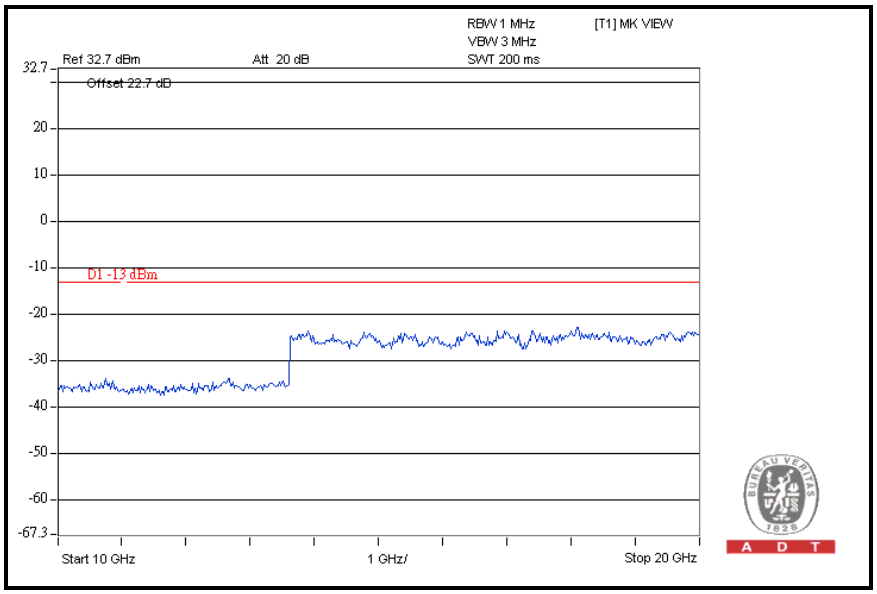
**CH 9538:** 9kHz ~ 3GHz




3GHz ~ 10GHz



10GHz ~ 20GHz


RBW 1 MHz
VBW 3 MHz
SWT 200 ms
[T1] MK VIEW
Ref 32.7 dBm
Att 20 dB
Offset 22.7 dB
32.7
20
10
0
-10
-20
-30
-40
-50
-60
-67.3
D1 -13 dBm
Start 10 GHz
1 GHz/
Stop 20 GHz

## 4.6 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

### 4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The emission of limit equal to –13dBm. So the limit of emission is the same absolute specified line.

| LIMIT (dBm) | EQUIVALENT FIELD STRENGTH AT 3m (dBuV/m) (NOTE) |
|---|---|
| -13 | 82.22 |

**NOTE:** The following formula is used to convert the equipment radiated power to field strength.

$$E = [1000000\sqrt{(30P)}] / 3 \text{ uV/m, where P is Watts.}$$

## 4.6.2 TEST INSTRUMENTS

**Test date: Aug. 05, 2011**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| ROHDE & SCHWARZ Spectrum Analyzer | FSP40 | 100036 | Dec. 08, 2010 | Dec. 07, 2011 |
| Agilent PSA Spectrum Analyzer | E4446A | MY48250113 | Nov. 30 , 2010 | Nov. 29 , 2011 |
| HP Pre_Amplifier | 8449B | 300801923 | Nov. 01, 2010 | Oct. 31, 2011 |
| ROHDE & SCHWARZ Test Receiver | ESCS30 | 847124/029 | Sep. 03, 2010 | Sep. 02, 2011 |
| SCHWARZBECK TRILOG Broadband Antenna | VULB 9168 | 138 | Apr. 14, 2011 | Apr. 13, 2012 |
| Schwarzbeck Horn_Antenna | BBHA9120 | D124 | Dec. 17, 2010 | Dec. 16, 2011 |
| Schwarzbeck Horn_Antenna | BBHA 9170 | BBHA9170153 | Jan. 17, 2011 | Jan. 16, 2012 |
| RF Switches | EMH-011 | 1001 | NA | NA |
| RF CABLE (Chaintek) | Sucoflex 104+ Sucoflex 106 | RF104-101+RF106-101 | Aug. 24, 2010 | Aug. 23, 2011 |
| RF Cable | 8DFB | STCCAB-30M-1GHz | NA | NA |
| Software | ADT_Radiated_V7.6.15.9.2 | NA | NA | NA |
| CT Antenna Tower & Turn Table | NA | 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 horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

### 4.6.3 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the open site, 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.

b. 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 a. Record the power level of S.G

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

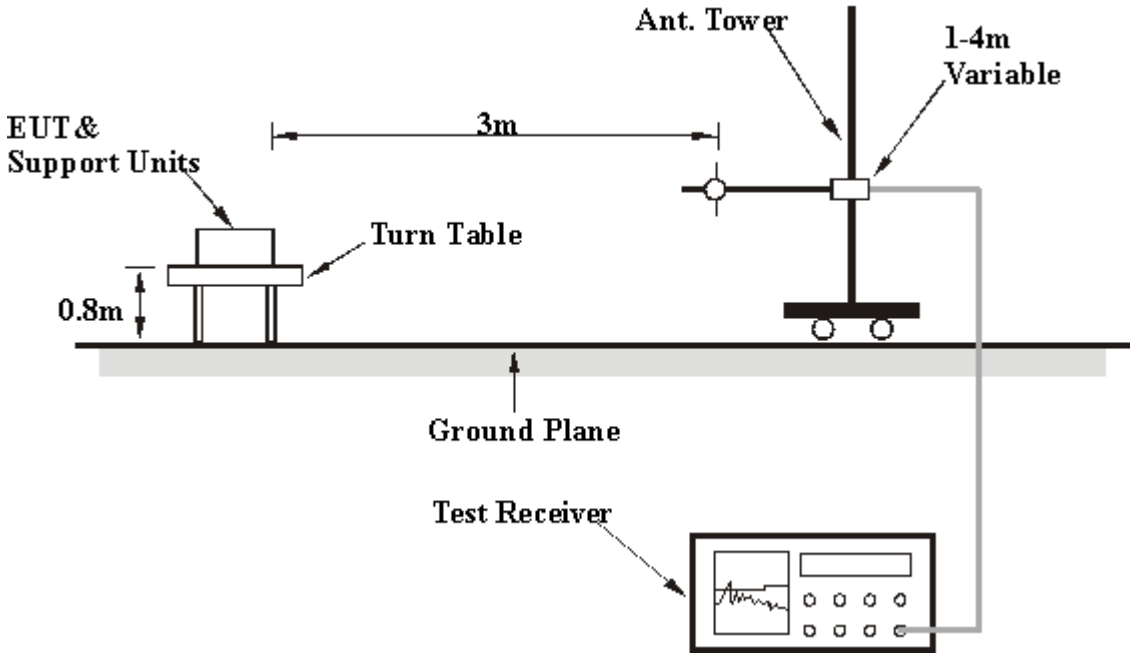
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP




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

4.6.6 EUT OPERATING CONDITIONS

Same as the 4.1.5

## 4.6.7 TEST RESULTS

**FOR GSM:**

| MODE | TX channel 512 | FREQUENCY RANGE | Below 1000 MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 27deg. C, 63%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 75.36 | 37.46 | -13 | -53.87 | -3.12 | -56.99 |
| 2 | 96.42 | 36.54 | -13 | -54.75 | -0.83 | -55.58 |
| 3 | 125.04 | 38.42 | -13 | -52.27 | -1.22 | -53.49 |
| 4 | 225.48 | 34.16 | -13 | -61.25 | 4.01 | -57.24 |
| 5 | 240.06 | 36.29 | -13 | -59.06 | 3.82 | -55.25 |
| 6 | 329.4 | 31.54 | -13 | -65.47 | 3.64 | -61.82 |
| 7 | 479.2 | 38.26 | -13 | -58.40 | 2.86 | -55.54 |
| 8 | 500.2 | 35.16 | -13 | -60.36 | 2.89 | -57.47 |
| 9 | 624.8 | 31.18 | -13 | -63.63 | 1.77 | -61.86 |
| 10 | 750.8 | 40.19 | -13 | -56.22 | 0.83 | -55.40 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 45.66 | 45.23 | -13 | -31.70 | -11.08 | -42.78 |
| 2 | 103.98 | 49.52 | -13 | -40.94 | -0.74 | -41.68 |
| 3 | 117.48 | 42.87 | -13 | -46.86 | -1.11 | -47.98 |
| 4 | 189.3 | 46.27 | -13 | -48.31 | 3.19 | -45.13 |
| 5 | 210.36 | 43.16 | -13 | -52.30 | 4.21 | -48.09 |
| 6 | 479.2 | 31.11 | -13 | -65.55 | 2.86 | -62.69 |
| 7 | 624.8 | 34.59 | -13 | -60.22 | 1.77 | -58.45 |
| 8 | 673.8 | 41.26 | -13 | -54.37 | 1.68 | -52.69 |
| 9 | 718.6 | 37.54 | -13 | -58.81 | 1.32 | -57.49 |
| 10 | 750.8 | 40.19 | -13 | -56.22 | 0.83 | -55.40 |

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

**FOR CDMA:**

| MODE | TX channel 25 | FREQUENCY RANGE | Below 1000 MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 27deg. C, 63%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 75.36 | 37.68 | -13 | -53.65 | -3.12 | -56.77 |
| 2 | 96.42 | 36.74 | -13 | -54.55 | -0.83 | -55.38 |
| 3 | 125.04 | 38.55 | -13 | -52.14 | -1.22 | -53.36 |
| 4 | 225.48 | 34.37 | -13 | -61.04 | 4.01 | -57.03 |
| 5 | 240.06 | 36.57 | -13 | -58.78 | 3.82 | -54.97 |
| 6 | 329.4 | 31.85 | -13 | -65.16 | 3.64 | -61.51 |
| 7 | 479.2 | 38.66 | -13 | -58.00 | 2.86 | -55.14 |
| 8 | 500.2 | 35.47 | -13 | -60.05 | 2.89 | -57.16 |
| 9 | 624.8 | 31.66 | -13 | -63.15 | 1.77 | -61.38 |
| 10 | 750.8 | 40.27 | -13 | -56.14 | 0.83 | -55.32 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 45.66 | 45.37 | -13 | -31.56 | -11.08 | -42.64 |
| 2 | 103.98 | 49.58 | -13 | -40.88 | -0.74 | -41.62 |
| 3 | 117.48 | 42.88 | -13 | -46.85 | -1.11 | -47.97 |
| 4 | 189.3 | 46.37 | -13 | -48.21 | 3.19 | -45.03 |
| 5 | 210.36 | 43.95 | -13 | -51.51 | 4.21 | -47.30 |
| 6 | 479.2 | 31.57 | -13 | -65.09 | 2.86 | -62.23 |
| 7 | 624.8 | 34.67 | -13 | -60.14 | 1.77 | -58.37 |
| 8 | 673.8 | 41.65 | -13 | -53.98 | 1.68 | -52.30 |
| 9 | 718.6 | 37.57 | -13 | -58.78 | 1.32 | -57.46 |
| 10 | 750.8 | 41.22 | -13 | -55.19 | 0.83 | -54.37 |

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

**FOR WCDMA:**

| MODE | TX channel 9400 | FREQUENCY RANGE | Below 1000 MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 27deg. C, 63%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 75.36 | 37.58 | -13 | -53.75 | -3.12 | -56.87 |
| 2 | 96.42 | 36.57 | -13 | -54.72 | -0.83 | -55.55 |
| 3 | 125.04 | 38.49 | -13 | -52.20 | -1.22 | -53.42 |
| 4 | 225.48 | 34.26 | -13 | -61.15 | 4.01 | -57.14 |
| 5 | 240.06 | 36.33 | -13 | -59.02 | 3.82 | -55.21 |
| 6 | 329.4 | 31.74 | -13 | -65.27 | 3.64 | -61.62 |
| 7 | 479.2 | 38.37 | -13 | -58.29 | 2.86 | -55.43 |
| 8 | 500.2 | 35.26 | -13 | -60.26 | 2.89 | -57.37 |
| 9 | 624.8 | 31.22 | -13 | -63.59 | 1.77 | -61.82 |
| 10 | 750.8 | 40.13 | -13 | -56.28 | 0.83 | -55.46 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 45.66 | 45.26 | -13 | -31.67 | -11.08 | -42.75 |
| 2 | 103.98 | 49.63 | -13 | -40.83 | -0.74 | -41.57 |
| 3 | 117.48 | 42.74 | -13 | -46.99 | -1.11 | -48.11 |
| 4 | 189.3 | 46.31 | -13 | -48.27 | 3.19 | -45.09 |
| 5 | 210.36 | 43.22 | -13 | -52.24 | 4.21 | -48.03 |
| 6 | 479.2 | 31.48 | -13 | -65.18 | 2.86 | -62.32 |
| 7 | 624.8 | 34.59 | -13 | -60.22 | 1.77 | -58.45 |
| 8 | 673.8 | 41.37 | -13 | -54.26 | 1.68 | -52.58 |
| 9 | 718.6 | 37.49 | -13 | -58.86 | 1.32 | -57.54 |
| 10 | 750.8 | 41.19 | -13 | -55.22 | 0.83 | -54.40 |

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

## 4.7 RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

### 4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 24.238(a), On any frequency outside a licensee's frequency block within USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB. The limit of emission equal to –13dBm.

## 4.7.2 TEST INSTRUMENTS

**Test date: Aug. 05, 2011**

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---|---|---|---|---|
| ROHDE & SCHWARZ Spectrum Analyzer | FSP40 | 100036 | Dec. 08, 2010 | Dec. 07, 2011 |
| Agilent PSA Spectrum Analyzer | E4446A | MY48250113 | Nov. 30 , 2010 | Nov. 29 , 2011 |
| HP Pre_Amplifier | 8449B | 300801923 | Nov. 01, 2010 | Oct. 31, 2011 |
| ROHDE & SCHWARZ Test Receiver | ESCS30 | 847124/029 | Sep. 03, 2010 | Sep. 02, 2011 |
| SCHWARZBECK TRILOG Broadband Antenna | VULB 9168 | 138 | Apr. 14, 2011 | Apr. 13, 2012 |
| Schwarzbeck Horn_Antenna | BBHA9120 | D124 | Dec. 17, 2010 | Dec. 16, 2011 |
| Schwarzbeck Horn_Antenna | BBHA 9170 | BBHA9170153 | Jan. 17, 2011 | Jan. 16, 2012 |
| RF Switches | EMH-011 | 1001 | NA | NA |
| RF CABLE (Chaintek) | Sucoflex 104+ Sucoflex 106 | RF104-101+R F106-101 | Aug. 24, 2010 | Aug. 23, 2011 |
| RF Cable | 8DFB | STCCAB-30M-1GHz | NA | NA |
| Software | ADT_Radiated_ V7.6.15.9.2 | NA | NA | NA |
| CT Antenna Tower & Turn Table | NA | 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 horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

### 4.7.3 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the open site, 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.

b. 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 a. Record the power level of S.G

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

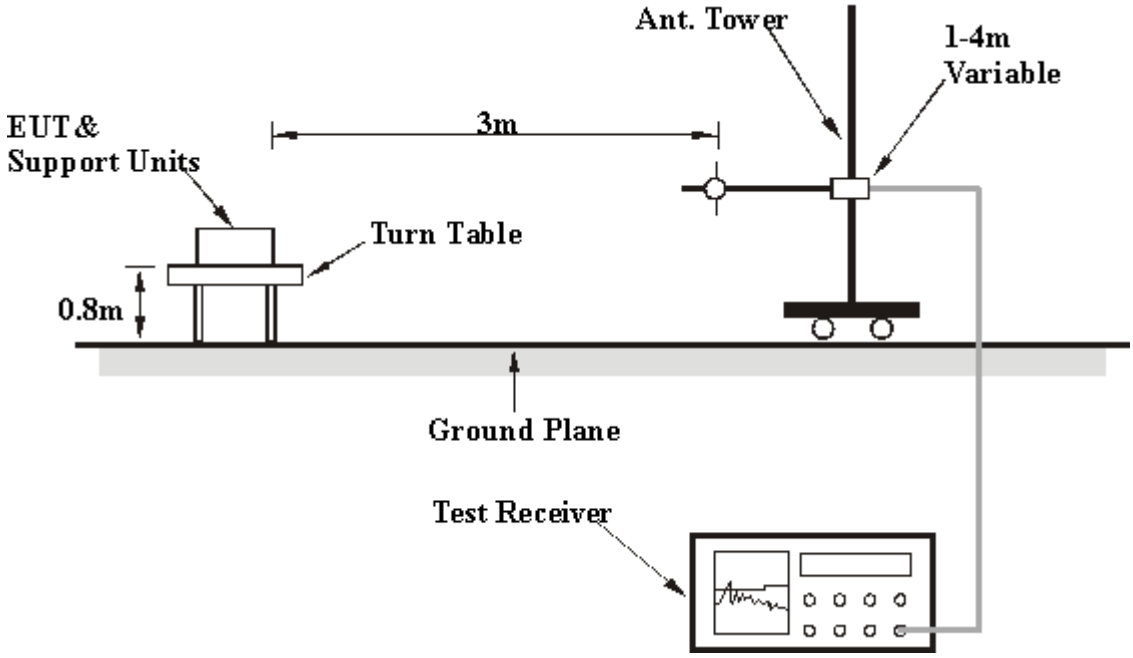
d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

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

### 4.7.4 DEVIATION FROM TEST STANDARD

No deviation

## 4.7.5 TEST SETUP




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

## 4.7.6 EUT OPERATING CONDITIONS

Same as the 4.1.5

## 4.7.7 TEST RESULTS

**FOR GSM BAND:**

| MODE | TX channel 512 | FREQUENCY RANGE | Above 1000 MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 27deg. C, 63%RH | INPUT POWER | 120Vac, 60 Hz |
| TESTED BY | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 3700.4 | 41.07 | -13 | -62.86 | 7.72 | -55.15 |
| 2 | 5550.6 | 43.17 | -13 | -61.72 | 7.08 | -54.64 |
| 3 | 7400.8 | 37.33 | -13 | -65.17 | 4.63 | -60.54 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| No. | Freq. (MHz) | Emission Level (dBuV) | Limit (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | Power Value (dBm) |
| 1 | 3700.4 | 41.03 | -13 | -62.90 | 7.72 | -55.19 |
| 2 | 5550.6 | 45.44 | -13 | -59.45 | 7.08 | -52.37 |
| 3 | 7400.8 | 49.88 | -13 | -52.62 | 4.63 | -47.99 |

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

| | | | |
|---|---|---|---|
| **MODE** | TX channel 661 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3760 | 41.05 | -13 | -63.10 | 7.68 | -55.42 |
| 2 | 5640 | 43.57 | -13 | -61.17 | 7.02 | -54.15 |
| 3 | 7520 | 49.38 | -13 | -53.24 | 4.53 | -48.71 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3760 | 41.12 | -13 | -63.03 | 7.68 | -55.35 |
| 2 | 5640 | 45.23 | -13 | -59.51 | 7.02 | -52.49 |
| 3 | 7520 | 49 | -13 | -53.62 | 4.53 | -49.09 |

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

| | | | |
|---|---|---|---|
| **MODE** | TX channel 810 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3819.6 | 40.77 | -13 | -63.60 | 7.64 | -55.96 |
| 2 | 5729.4 | 44.28 | -13 | -60.31 | 6.96 | -53.35 |
| 3 | 7639.2 | 49.92 | -13 | -52.70 | 4.43 | -48.27 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3819.6 | 41.93 | -13 | -62.44 | 7.64 | -54.80 |
| 2 | 5729.4 | 44.55 | -13 | -60.04 | 6.96 | -53.08 |
| 3 | 7639.2 | 49.86 | -13 | -52.76 | 4.43 | -48.33 |

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

## FOR CDMA BAND:

| | | | |
|---|---|---|---|
| **MODE** | TX channel 25 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3702.5 | 51.74 | -13 | -52.20 | 7.72 | -44.49 |
| 2 | 5553.75 | 48.06 | -13 | -56.83 | 7.08 | -49.75 |
| 3 | 7405 | 51.17 | -13 | -51.34 | 4.63 | -46.71 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3702.5 | 55.78 | -13 | -48.16 | 7.72 | -40.45 |
| 2 | 5553.75 | 50.26 | -13 | -54.63 | 7.08 | -47.55 |
| 3 | 7405 | 49.63 | -13 | -52.88 | 4.63 | -48.25 |

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

| | | | |
|---|---|---|---|
| **MODE** | TX channel 600 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3760 | 51.17 | -13 | -52.98 | 7.68 | -45.30 |
| 2 | 5640 | 46.37 | -13 | -58.37 | 7.02 | -51.35 |
| 3 | 7520 | 49.95 | -13 | -52.67 | 4.53 | -48.14 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3760 | 55.26 | -13 | -48.89 | 7.68 | -41.21 |
| 2 | 5640 | 50.28 | -13 | -54.46 | 7.02 | -47.44 |
| 3 | 7520 | 49.75 | -13 | -52.87 | 4.53 | -48.34 |

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

| | | | |
|---|---|---|---|
| **MODE** | TX channel 1175 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3817.5 | 50.29 | -13 | -54.07 | 7.64 | -46.43 |
| 2 | 5726.25 | 46.77 | -13 | -57.83 | 6.96 | -50.87 |
| 3 | 7635 | 49.99 | -13 | -52.63 | 4.43 | -48.20 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3817.5 | 54.92 | -13 | -49.44 | 7.64 | -41.80 |
| 2 | 5726.25 | 49.26 | -13 | -55.34 | 6.96 | -48.38 |
| 3 | 7635 | 48.78 | -13 | -53.84 | 4.43 | -49.41 |

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

## FOR WCDMA BAND:

| | | | |
|---|---|---|---|
| **MODE** | TX channel 9262 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3704.8 | 51.07 | -13 | -52.88 | 7.71 | -45.17 |
| 2 | 5557.2 | 47.42 | -13 | -57.46 | 7.08 | -50.38 |
| 3 | 7409.6 | 50.28 | -13 | -52.23 | 4.62 | -47.61 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| **1** | **3704.8** | **55.16** | **-13** | **-48.79** | **7.71** | **-41.08** |
| 2 | 5557.2 | 49.47 | -13 | -55.41 | 7.08 | -48.33 |
| 3 | 7409.6 | 48.99 | -13 | -53.52 | 4.62 | -48.90 |

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

| | | | |
|---|---|---|---|
| **MODE** | TX channel 9400 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3760 | 50.14 | -13 | -54.01 | 7.68 | -46.33 |
| 2 | 5640 | 46.25 | -13 | -58.49 | 7.02 | -51.47 |
| 3 | 7520 | 49.87 | -13 | -52.75 | 4.53 | -48.22 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3760 | 54.98 | -13 | -49.17 | 7.68 | -41.49 |
| 2 | 5640 | 49.14 | -13 | -55.60 | 7.02 | -48.58 |
| 3 | 7520 | 48.48 | -13 | -54.14 | 4.53 | -49.61 |

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

| | | | |
|---|---|---|---|
| **MODE** | TX channel 9538 | **FREQUENCY RANGE** | Above 1000 MHz |
| **ENVIRONMENTAL CONDITIONS** | 27deg. C, 63%RH | **INPUT POWER** | 120Vac, 60 Hz |
| **TESTED BY** | Evan Huang | | |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3815.2 | 49.98 | -13 | -54.37 | 7.64 | -46.73 |
| 2 | 5722.8 | 46.01 | -13 | -58.60 | 6.96 | -51.63 |
| 3 | 7630.4 | 49.57 | -13 | -53.05 | 4.43 | -48.62 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Freq. (MHz)** | **Emission Level (dBuV)** | **Limit (dBm)** | **S.G Power Value (dBm)** | **Correction Factor (dB)** | **Power Value (dBm)** |
| 1 | 3815.2 | 54.65 | -13 | -49.70 | 7.64 | -42.06 |
| 2 | 5722.8 | 48.74 | -13 | -55.87 | 6.96 | -48.90 |
| 3 | 7630.4 | 48.08 | -13 | -54.54 | 4.43 | -50.11 |

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

# 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

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

# 6 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.

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.
If you have any comments, please feel free to contact us at the following:


**Linko EMC/RF Lab**:
Tel: 886-2-26052180
Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab**:
Tel: 886-3-5935343
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab**:
Tel: 886-3-3183232
Fax: 886-3-3185050

**Email**: service.adt@tw.bureauveritas.com
**Web Site**: www.adt.com.tw


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

# 7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

**---END---**