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# FCC TEST REPORT

**REPORT NO.:** RF991220C05  
**MODEL NO.:** INRD01u  
**FCC ID:** EHA-INRD01U  
**RECEIVED:** Dec. 20, 2010  
**TESTED:** Dec. 31, 2010 ~ Jan. 05, 2011  
**ISSUED:** Apr. 11, 2011

**APPLICANT:** Intermec Technologies Corporation  
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**ISSUED BY:** Bureau Veritas Consumer Products Services  
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**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen,  
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Taiwan, R.O.C.

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Testing Laboratory  
2021



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## RELEASE CONTROL RECORD

| ISSUE NO.        | REASON FOR CHANGE | DATE ISSUED   |
|------------------|-------------------|---------------|
| Original release | NA                | Apr. 11, 2011 |



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## 1. CERTIFICATION

**PRODUCT:** RFID UHF Module

**BRAND:** Intermec

**MODEL:** INRD01u

**APPLICANT:** Intermec Technologies Corporation

**TESTED:** Dec. 31, 2010 ~ Jan. 05, 2011

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** FCC Part 15, Subpart C (Section 15.247),

ANSI C63.4-2003

ANSI C63.10-2009

The above equipment (Model: INRD01u) 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 : Apr. 11, 2011  
Andrea Hsia / Specialist

**APPROVED BY** :  , DATE : Apr. 11, 2011  
Gary Chang / Assistant Manager



## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) |  |        |  |
|---|--|--------|--|
| STANDARD SECTION  | TEST TYPE AND LIMIT  | RESULT | REMARK   |
| 15.207  | AC Power Conducted Emission  | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -1.37dB at 2.266MHz. |
| 15.247(a)(1)(i)   | Number of Hopping Frequency Used<br>Spec.: At least 50 channels  | PASS   | Meet the requirement of limit.   |
| 15.247(a)(1)(i)   | Dwell Time on Each Channel<br>Spec.: Max. 0.4 second within 20 second  | PASS   | Meet the requirement of limit.   |
| 15.247(a)(1)(i)   | 1. Hopping Channel Separation<br>Spec.: Min. 25 kHz or 20 dB bandwidth, whichever is greater<br>2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System | PASS   | Meet the requirement of limit.   |
| 15.247(b)(2)  | Maximum Output Power<br>Spec.: max. 30dBm  | PASS   | Meet the requirement of limit.   |
| 15.247(d)   | Transmitter Radiated Emissions<br>Spec.: Table 15.209  | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -4.3dB at 358.48MHz. |
| 15.247(d)   | Band Edge Measurement  | PASS   | Meet the requirement of limit.   |
| 15.203  | Antenna Requirement  | PASS   | Antenna connector is MMCX (F) not a standard connector.                          |

### 2.1 MEASUREMENT UNCERTAINTY

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

| MEASUREMENT        | FREQUENCY       | UNCERTAINTY |
|--------------------|-----------------|-------------|
| Conducted Emission | 150kHz~30MHz    | 2.44dB      |
| Radiated emissions | 30MHz ~ 200MHz  | 3.19 dB     |
|                    | 200MHz ~1000MHz | 3.21 dB     |
|                    | 1GHz ~ 18GHz    | 2.26 dB     |
|                    | 18GHz ~ 40GHz   | 1.94 dB     |

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



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### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                            |                    |
|----------------------------|--------------------|
| <b>EUT</b>                 | RFID UHF Module    |
| <b>MODEL NO.</b>           | INRD01u            |
| <b>FCC ID</b>              | EHA-INRD01U        |
| <b>POWER SUPPLY</b>        | 5Vdc               |
| <b>MODULATION TYPE</b>     | PR-ASK             |
| <b>TRANSFER RATE</b>       | 80Kb/s             |
| <b>OPERATING FREQUENCY</b> | 902.75 ~ 927.25MHz |
| <b>NUMBER OF CHANNEL</b>   | 50                 |
| <b>CHANNEL SPACING</b>     | 500kHz             |
| <b>OUTPUT POWER</b>        | 242.1mW            |
| <b>ANTENNA TYPE</b>        | Refer to Note      |
| <b>ANTENNA CONNECTOR</b>   | MMCX (F)           |
| <b>POWER LINE</b>          | NA                 |
| <b>I/O PORT</b>            | NA                 |
| <b>ACCESSORY DEVICES</b>   | NA                 |

#### NOTE:

1. There are three antennas for the EUT.

| Ant No. | Part No.        | Antenna Type                  | Antenna Connector | Gain (dBi) |
|---------|-----------------|-------------------------------|-------------------|------------|
| 1       | PN-234-117-0001 | Microstripe antenna "Coupler" | MMCX (F)          | -18.71     |
| 2       | PN1-971140-0001 |                               |                   | -18.31     |
| 3       | PN-234-079-0001 |                               |                   | -19.96     |

\* Antenna 1 & 2 were chosen for the final test.

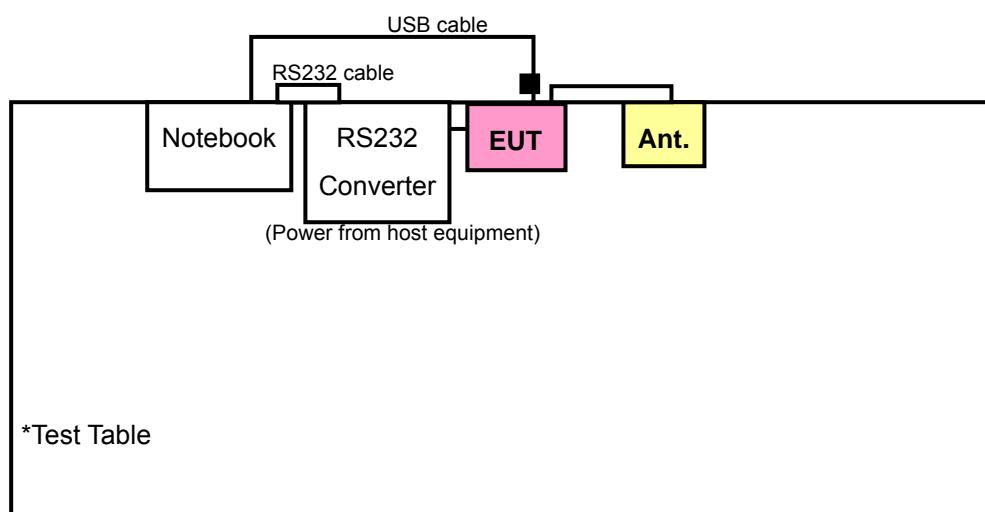
2. The EUT has transmitter and receiver functions.
3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

50 channels are provided to this EUT:

| CHANNEL | FREQ.<br>(MHz) | CHANNEL | FREQ.<br>(MHz) | CHANNEL | FREQ.<br>(MHz) |
|---------|----------------|---------|----------------|---------|----------------|
| 0       | 902.75         | 17      | 911.25         | 34      | 919.75         |
| 1       | 903.25         | 18      | 911.75         | 35      | 920.25         |
| 2       | 903.75         | 19      | 912.25         | 36      | 920.75         |
| 3       | 904.25         | 20      | 912.75         | 37      | 921.25         |
| 4       | 904.75         | 21      | 913.25         | 38      | 921.75         |
| 5       | 905.25         | 22      | 913.75         | 39      | 922.25         |
| 6       | 905.75         | 23      | 914.25         | 40      | 922.75         |
| 7       | 906.25         | 24      | 914.75         | 41      | 923.25         |
| 8       | 906.75         | 25      | 915.25         | 42      | 923.75         |
| 9       | 907.25         | 26      | 915.75         | 46      | 924.25         |
| 10      | 907.75         | 27      | 916.25         | 44      | 924.75         |
| 11      | 908.25         | 28      | 916.75         | 45      | 925.25         |
| 12      | 908.75         | 29      | 917.25         | 49      | 925.75         |
| 13      | 909.25         | 30      | 917.75         | 47      | 926.25         |
| 14      | 909.75         | 31      | 918.25         | 48      | 926.75         |
| 15      | 910.25         | 32      | 918.75         | 49      | 927.25         |
| 16      | 910.75         | 33      | 919.25         |         |                |

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





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### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT<br>CONFIGURE<br>MODE | APPLICABLE TO |           |     |      | DESCRIPTION               |
|--------------------------|---------------|-----------|-----|------|---------------------------|
|                          | RE $\geq$ 1G  | RE $<$ 1G | PLC | APCM |                           |
| A                        | ✓             | ✓         | ✓   | ✓    | EUT tested with antenna 1 |
| B                        | ✓             | ✓         | ✓   | -    | EUT tested with antenna 2 |

Where RE $\geq$ 1G: Radiated Emission above 1GHz

RE $<$ 1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: “-” means no effect.

#### RADIATED EMISSION TEST (ABOVE 1 GHz):

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

| EUT<br>CONFIGURE<br>MODE | AVAILABLE<br>CHANNEL | TESTED CHANNEL | MODULATION<br>TYPE | DATA RATE<br>(Kbps) | ANT. AXIS |
|--------------------------|----------------------|----------------|--------------------|---------------------|-----------|
| A                        | 0 to 49              | 0, 25, 49      | PR-ASK             | 80                  | Y         |
| B                        | 0 to 49              | 0, 25, 49      | PR-ASK             | 80                  | X         |

#### RADIATED EMISSION TEST (BELOW 1 GHz):

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

| EUT<br>CONFIGURE<br>MODE | AVAILABLE<br>CHANNEL | TESTED CHANNEL | MODULATION<br>TYPE | DATA RATE<br>(Kbps) | ANT. AXIS |
|--------------------------|----------------------|----------------|--------------------|---------------------|-----------|
| A                        | 0 to 49              | 0, 25, 49      | PR-ASK             | 80                  | Y         |
| B                        | 0 to 49              | 0, 25, 49      | PR-ASK             | 80                  | X         |

#### POWER LINE CONDUCTED EMISSION TEST:

- 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.

| EUT<br>CONFIGURE<br>MODE | AVAILABLE<br>CHANNEL | TESTED CHANNEL | MODULATION<br>TYPE | DATA RATE<br>(Kbps) |
|--------------------------|----------------------|----------------|--------------------|---------------------|
| A & B                    | 0 to 49              | 25             | PR-ASK             | 80Kbps              |



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**ANTENNA PORT CONDUCTED 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, antenna ports (if EUT with antenna diversity architecture), and packet types.
- Following channel(s) was (were) selected for the final test as listed below.

| EUT<br>CONFIGURE<br>MODE | AVAILABLE<br>CHANNEL | TESTED CHANNEL | MODULATION<br>TYPE | DATA RATE<br>(Kbps) |
|--------------------------|----------------------|----------------|--------------------|---------------------|
| A                        | 0 to 49              | 0, 25, 49      | PR-ASK             | 80Kbps              |

**TEST CONDITION:**

| APPLICABLE<br>TO | ENVIRONMENTAL CONDITIONS  | INPUT POWER  | TESTED BY  |
|------------------|---------------------------|--------------|------------|
| RE≥1G            | 23deg. C, 65%RH, 1012 hPa | 120Vac, 60Hz | Frank Wang |
| RE<1G            | 23deg. C, 65%RH, 1012 hPa | 120Vac, 60Hz | Frank Wang |
|                  | 23deg. C, 65%RH, 1012 hPa | 120Vac, 60Hz | Frank Wang |
| PLC              | 20deg. C, 60%RH, 1010 hPa | 120Vac, 60Hz | Match Tsui |
| APCM             | 25deg. C, 66%RH, 1012 hPa | 120Vac, 60Hz | Brad Wu    |



### 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 Part 15, Subpart C. (15.247)**

**ANSI C63.4-2003**

**ANSI C63.10-2009**

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

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It 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              | DELL  | PP18L     | 33497605792 | CXSMM01BRD02D330 |
| 2   | RS232 Converter Board | NA    | NA        | NA          | NA               |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1   | 1.8m USB cable with one core                        |
| 2   | 1.8m RS232 cable                                    |

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8 m).
2. Items 2 and the USB cable were provided by the client.

## 4. TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| FREQUENCIES (MHz) | FIELD STRENGTH (microvolts/meter) | MEASUREMENT DISTANCE (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009 ~ 0.490     | 2400/F(kHz)                       | 300                           |
| 0.490 ~ 1.705     | 24000/F(kHz)                      | 30                            |
| 1.705 ~ 30.0      | 30                                | 30                            |
| 30 ~ 88           | 100                               | 3                             |
| 88 ~ 216          | 150                               | 3                             |
| 216 ~ 960         | 200                               | 3                             |
| Above 960         | 500                               | 3                             |

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dB<sub>u</sub>V/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



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#### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER                 | MODEL NO.                | SERIAL NO.  | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|--|--------------------------|-------------|---------------------|-------------------------|
| Test Receiver<br>ROHDE & SCHWARZ           | ESI7                     | 838496/016  | Dec. 27, 2010       | Dec. 26, 2011           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ       | FSP40                    | 100039      | Jan. 11, 2010       | Jan. 10, 2011           |
| BILOG Antenna<br>SCHWARZBECK               | VULB9168                 | 9168-155    | Apr. 28, 2010       | Apr. 27, 2011           |
| HORN Antenna<br>SCHWARZBECK                | BBHA 9120 D              | 9120D-209   | Aug. 02, 2010       | Aug. 01, 2011           |
| HORN Antenna<br>SCHWARZBECK                | BBHA 9170                | BBHA9170243 | Dec. 27, 2010       | Dec. 26, 2011           |
| Preamplifier<br>Agilent                    | 8449B                    | 3008A01961  | Nov. 02, 2010       | Nov. 01, 2011           |
| Preamplifier<br>Agilent                    | 8447D                    | 2944A10738  | Nov. 02, 2010       | Nov. 01, 2011           |
| RF signal cable<br>HUBER+SUHNNER           | SUCOFLEX 104             | 274041/4    | Aug. 21, 2010       | Aug. 20, 2011           |
| RF signal cable<br>HUBER+SUHNNER           | SUCOFLEX 104             | 283397/4    | Aug. 21, 2010       | Aug. 20, 2011           |
| Software<br>ADT.                           | ADT_Radiated_V7.6.15.9.2 | NA          | NA                  | NA                      |
| Antenna Tower<br>inn-co GmbH               | MA 4000                  | 010303      | NA                  | NA                      |
| Antenna Tower<br>Controller<br>inn-co GmbH | CO2000                   | 019303      | NA                  | NA                      |
| Turn Table<br>ADT.                         | TT100.                   | TT93021704  | NA                  | NA                      |
| Turn Table Controller<br>ADT.              | SC100.                   | SC93021704  | NA                  | NA                      |

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

2. The test was performed in HwaYa Chamber 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC7450F-4.



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#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

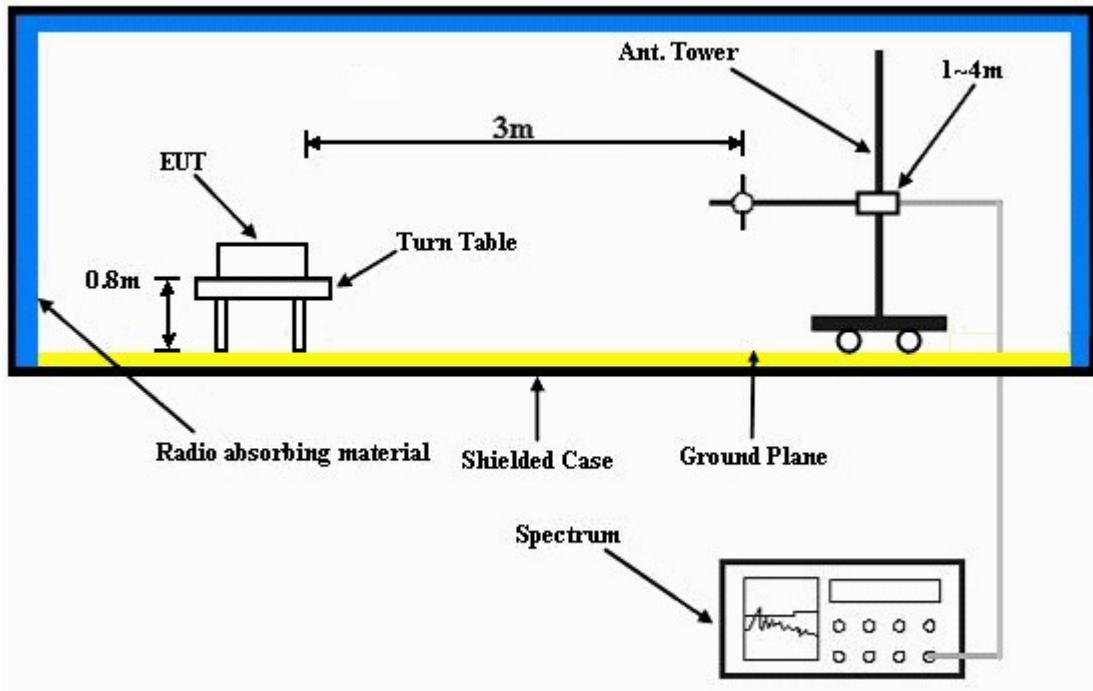
#### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



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

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. Set the EUT under transmission condition continuously at specific channel frequency.
- c. The necessary accessories enable the system in full functions.



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#### 4.1.7 TEST RESULTS

| EUT TEST CONDITION       |  | MEASUREMENT DETAIL          |  |                   |
|--------------------------|--|-----------------------------|--|-------------------|
| CHANNEL                  |  | Channel 0                   |  | FREQUENCY RANGE   |
| INPUT POWER              |  | 120Vac, 60 Hz               |  | DETECTOR FUNCTION |
| ENVIRONMENTAL CONDITIONS |  | 23deg. C, 65%RH<br>1012 hPa |  | TEST MODE         |
| TESTED BY                |  | Frank Wang                  |  |                   |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | #902.00     | 25.8 PK                 | 69.6           | -43.8       | 1.58 H             | 264                  | -0.4             | 26.2                     |
| 2   | #902.00     | 13.6 AV                 | 67.8           | -54.2       | 1.58 H             | 264                  | -12.6            | 26.2                     |
| 3   | *902.75     | 89.6 PK                 |                |             | 1.58 H             | 265                  | 63.4             | 26.2                     |
| 4   | *902.75     | 87.8 AV                 |                |             | 1.58 H             | 265                  | 61.6             | 26.2                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | #902.00     | 25.6 PK                 | 60.6           | -35.0       | 1.06 V             | 241                  | -0.6             | 26.2                     |
| 2   | #902.00     | 13.4 AV                 | 58.8           | -45.4       | 1.06 V             | 241                  | -12.8            | 26.2                     |
| 3   | *902.75     | 80.6 PK                 |                |             | 1.06 V             | 242                  | 54.4             | 26.2                     |
| 4   | *902.75     | 78.8 AV                 |                |             | 1.06 V             | 242                  | 52.6             | 26.2                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency
6. “#”: The radiated frequency is out the restricted band.
7. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB

Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |  | MEASUREMENT DETAIL          |  |                   |  |
|--------------------------|--|-----------------------------|--|-------------------|--|
| CHANNEL                  |  | Channel 25                  |  | FREQUENCY RANGE   |  |
| INPUT POWER              |  | 120Vac, 60 Hz               |  | DETECTOR FUNCTION |  |
| ENVIRONMENTAL CONDITIONS |  | 23deg. C, 65%RH<br>1012 hPa |  | TEST MODE         |  |
| TESTED BY                |  | Frank Wang                  |  |                   |  |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *915.25     | 88.8 PK                 |                |             | 1.60 H             | 265                  | 62.5             | 26.3                     |
| 2   | *915.25     | 87.0 AV                 |                |             | 1.60 H             | 265                  | 60.7             | 26.3                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *915.25     | 81.3 PK                 |                |             | 1.05 V             | 240                  | 55.0             | 26.3                     |
| 2   | *915.25     | 79.5 AV                 |                |             | 1.05 V             | 240                  | 53.2             | 26.3                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency
6. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB

Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 49                  | FREQUENCY RANGE    | Below 1GHz                |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | A                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *927.25     | 88.3 PK                 |                |             | 1.57 H             | 266                  | 61.9             | 26.4                     |
| 2   | *927.25     | 86.5 AV                 |                |             | 1.57 H             | 266                  | 60.1             | 26.4                     |
| 3   | #928.00     | 25.5 PK                 | 68.3           | -42.8       | 1.57 H             | 266                  | -0.9             | 26.4                     |
| 4   | #928.00     | 13.5AV                  | 66.5           | -53.0       | 1.57 H             | 266                  | -12.9            | 26.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *927.25     | 81.9 PK                 |                |             | 1.01 V             | 240                  | 55.5             | 26.4                     |
| 2   | *927.25     | 80.1 AV                 |                |             | 1.01 V             | 240                  | 53.7             | 26.4                     |
| 3   | #928.00     | 25.3 PK                 | 61.9           | -36.6       | 1.01 V             | 240                  | -1.1             | 26.4                     |
| 4   | #928.00     | 13.2 AV                 | 60.1           | -46.9       | 1.01 V             | 240                  | -13.2            | 26.4                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency
6. “#”: The radiated frequency is out the restricted band.
7. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB  
Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | Below 1GHz                |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | B                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | #902.00     | 26.0 PK                 | 75.9           | -49.9       | 1.55 H             | 131                  | -0.2             | 26.2                     |
| 2   | #902.00     | 14.0 AV                 | 74.1           | -60.1       | 1.55 H             | 131                  | -12.2            | 26.2                     |
| 3   | *902.75     | 95.9 PK                 |                |             | 1.55 H             | 131                  | 69.7             | 26.2                     |
| 4   | *902.75     | 94.1 AV                 |                |             | 1.55 H             | 131                  | 67.9             | 26.2                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | #902.00     | 25.2 PK                 | 69.1           | -43.9       | 1.83 V             | 341                  | -1.0             | 26.2                     |
| 2   | #902.00     | 13.2 AV                 | 67.3           | -54.1       | 1.83 V             | 341                  | -13.0            | 26.2                     |
| 3   | *902.75     | 89.1 PK                 |                |             | 1.83 V             | 341                  | 62.9             | 26.2                     |
| 4   | *902.75     | 87.3 AV                 |                |             | 1.83 V             | 341                  | 61.1             | 26.2                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency
6. “#”: The radiated frequency is out the restricted band.
7. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB  
Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 25                  | FREQUENCY RANGE    | Below 1GHz                |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | B                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *915.25     | 96.3 PK                 |                |             | 1.50 H             | 132                  | 70.0             | 26.3                     |
| 2   | *915.25     | 94.5 AV                 |                |             | 1.50 H             | 132                  | 68.2             | 26.3                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *915.25     | 89.0 PK                 |                |             | 1.72 V             | 340                  | 62.7             | 26.3                     |
| 2   | *915.25     | 87.2 AV                 |                |             | 1.72 V             | 340                  | 60.9             | 26.3                     |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “\*”: Fundamental frequency  
6. The average value of fundamental frequency and harmonics is calculated by using formula as below  
Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)  
20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB  
Therefore  
Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 49                  | FREQUENCY RANGE    | Below 1GHz                |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | B                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *927.25     | 94.6 PK                 |                |             | 1.45 H             | 130                  | 68.2             | 26.4                     |
| 2   | *927.25     | 82.8 AV                 |                |             | 1.45 H             | 130                  | 66.4             | 26.4                     |
| 3   | #928.00     | 25.6 PK                 | 74.6           | -49.0       | 1.45 H             | 130                  | -0.8             | 26.4                     |
| 4   | #928.00     | 13.4AV                  | 62.8           | -49.4       | 1.45 H             | 130                  | -13.0            | 26.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | *927.25     | 88.2 PK                 |                |             | 1.76 V             | 342                  | 61.8             | 26.4                     |
| 2   | *927.25     | 86.4 AV                 |                |             | 1.76 V             | 342                  | 60.0             | 26.4                     |
| 3   | #928.00     | 25.2 PK                 | 68.2           | -43.0       | 1.76 V             | 342                  | -1.2             | 26.4                     |
| 4   | #928.00     | 13.2 AV                 | 66.4           | -53.2       | 1.76 V             | 342                  | -13.2            | 26.4                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “\*”: Fundamental frequency
6. "#": The radiated frequency is out the restricted band.
7. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB

Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

## ABOVE 1GHZ DATA

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | A                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1805.50     | 45.8 PK                 | 74.0           | -28.2       | 1.00 H             | 34                   | 17.1             | 28.7                     |
| 2   | 1805.50     | 44.0 AV                 | 54.0           | -10.0       | 1.00 H             | 34                   | 15.3             | 28.7                     |
| 3   | 2708.25     | 39.4 PK                 | 74.0           | -34.6       | 1.00 H             | 14                   | 7.9              | 31.5                     |
| 4   | 2708.25     | 37.6 AV                 | 54.0           | -16.4       | 1.00 H             | 14                   | 6.1              | 31.5                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1805.50     | 47.9 PK                 | 74.0           | -26.1       | 1.03 V             | 348                  | 19.2             | 28.7                     |
| 2   | 1805.50     | 46.1 AV                 | 54.0           | -7.9        | 1.03 V             | 348                  | 17.4             | 28.7                     |
| 3   | 2708.25     | 38.8 PK                 | 74.0           | -35.2       | 1.00 V             | 170                  | 7.3              | 31.5                     |
| 4   | 2708.25     | 37.0 AV                 | 54.0           | -17.0       | 1.00 V             | 170                  | 5.5              | 31.5                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

5. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB  
Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 25                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | A                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1830.50     | 46.4 PK                 | 74.0           | -27.6       | 1.21 H             | 334                  | 17.7             | 28.7                     |
| 2   | 1830.50     | 44.6 AV                 | 54.0           | -9.4        | 1.21 H             | 334                  | 15.9             | 28.7                     |
| 3   | 2745.75     | 39.0 PK                 | 74.0           | -35.0       | 1.00 H             | 257                  | 7.3              | 31.7                     |
| 4   | 2745.75     | 37.2 AV                 | 54.0           | -16.8       | 1.00 H             | 257                  | 5.5              | 31.7                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1830.50     | 49.3 PK                 | 74.0           | -24.7       | 1.00 V             | 347                  | 20.6             | 28.7                     |
| 2   | 1830.50     | 47.5 AV                 | 54.0           | -6.5        | 1.00 V             | 347                  | 18.8             | 28.7                     |
| 3   | 2745.75     | 38.4 PK                 | 74.0           | -35.6       | 1.13 V             | 11                   | 6.7              | 31.7                     |
| 4   | 2745.75     | 36.6 AV                 | 54.0           | -17.4       | 1.13 V             | 11                   | 4.9              | 31.7                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

5. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB

Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |  | MEASUREMENT DETAIL          |  |   |
|--------------------------|--|-----------------------------|--|---|
| CHANNEL                  |  | Channel 49                  |  | FREQUENCY RANGE 1 ~ 25GHz                   |
| INPUT POWER              |  | 120Vac, 60 Hz               |  | DETECTOR FUNCTION Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS |  | 23deg. C, 65%RH<br>1012 hPa |  | TEST MODE A                                 |
| TESTED BY                |  | Frank Wang                  |  |   |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1854.50     | 45.7 PK                 | 74.0           | -28.3       | 1.05 H             | 340                  | 16.9             | 28.8                     |
| 2   | 1854.50     | 43.9 AV                 | 54.0           | -10.1       | 1.05 H             | 340                  | 15.1             | 28.8                     |
| 3   | 2781.75     | 39.8 PK                 | 74.0           | -34.2       | 1.00 H             | 57                   | 8.0              | 31.8                     |
| 4   | 2781.75     | 38.0 AV                 | 54.0           | -16.0       | 1.00 H             | 57                   | 6.2              | 31.8                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1854.50     | 46.3 PK                 | 74.0           | -27.7       | 1.00 V             | 349                  | 17.5             | 28.8                     |
| 2   | 1854.50     | 44.5 AV                 | 54.0           | -9.5        | 1.00 V             | 349                  | 15.7             | 28.8                     |
| 3   | 2781.75     | 39.1 PK                 | 74.0           | -34.9       | 1.00 V             | 34                   | 7.3              | 31.8                     |
| 4   | 2781.75     | 37.3 AV                 | 54.0           | -16.7       | 1.00 V             | 34                   | 5.5              | 31.8                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB

Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | B                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1805.50     | 43.8 PK                 | 74.0           | -30.2       | 1.67 H             | 285                  | 15.1             | 28.7                     |
| 2   | 1805.50     | 42.0 AV                 | 54.0           | -12.0       | 1.67 H             | 285                  | 13.3             | 28.7                     |
| 3   | 2708.25     | 38.6 PK                 | 74.0           | -35.40      | 1.08 H             | 77                   | 7.1              | 31.5                     |
| 4   | 2708.25     | 36.8 AV                 | 54.0           | -17.20      | 1.08 H             | 77                   | 5.3              | 31.5                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1805.50     | 44.7 PK                 | 74.0           | -29.3       | 1.00 V             | 262                  | 16.0             | 28.7                     |
| 2   | 1805.50     | 42.9 AV                 | 54.0           | -11.1       | 1.00 V             | 262                  | 14.2             | 28.7                     |
| 3   | 2708.25     | 39.6 PK                 | 74.0           | -34.4       | 1.24 V             | 85                   | 8.1              | 31.5                     |
| 4   | 2708.25     | 37.8 AV                 | 54.0           | -16.2       | 1.24 V             | 85                   | 6.3              | 31.5                     |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
 3. The other emission levels were very low against the limit.  
 4. Margin value = Emission level – Limit value.  
 5. The average value of fundamental frequency and harmonics is calculated by using formula as below  
 Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)  
 20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB  
 Therefore  
 Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------------------|--------------------|---------------------------|
| CHANNEL                  | Channel 25                  | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1012 hPa | TEST MODE          | B                         |
| TESTED BY                | Frank Wang                  |                    |                           |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1830.50     | 44.7 PK                 | 74.0           | -29.3       | 1.04 H             | 74                   | 16.0             | 28.7                     |
| 2   | 1830.50     | 42.9 AV                 | 54.0           | -11.1       | 1.04 H             | 74                   | 14.2             | 28.7                     |
| 3   | 2745.75     | 38.4 PK                 | 74.0           | -35.6       | 1.36 H             | 0                    | 6.7              | 31.7                     |
| 4   | 2745.75     | 36.6 AV                 | 54.0           | -17.4       | 1.36 H             | 0                    | 4.9              | 31.7                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1830.50     | 45.2 PK                 | 74.0           | -28.8       | 1.00 V             | 266                  | 16.5             | 28.7                     |
| 2   | 1830.50     | 43.4 AV                 | 54.0           | -10.6       | 1.00 V             | 266                  | 14.7             | 28.7                     |
| 3   | 2745.75     | 39.5 PK                 | 74.0           | -34.5       | 1.25 V             | 37                   | 7.8              | 31.7                     |
| 4   | 2745.75     | 37.7 AV                 | 54.0           | -16.3       | 1.25 V             | 37                   | 6.0              | 31.7                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

5. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB  
Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



A D T

| EUT TEST CONDITION       |  | MEASUREMENT DETAIL          |  |   |
|--------------------------|--|-----------------------------|--|---|
| CHANNEL                  |  | Channel 49                  |  | FREQUENCY RANGE 1 ~ 25GHz                   |
| INPUT POWER              |  | 120Vac, 60 Hz               |  | DETECTOR FUNCTION Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS |  | 23deg. C, 65%RH<br>1012 hPa |  | TEST MODE B                                 |
| TESTED BY                |  | Frank Wang                  |  |   |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1854.50     | 42.3 PK                 | 74.0           | -31.7       | 1.20 H             | 35                   | 13.5             | 28.8                     |
| 2   | 1854.50     | 40.5 AV                 | 54.0           | -35.5       | 1.20 H             | 35                   | 11.7             | 28.8                     |
| 3   | 2781.75     | 38.7 PK                 | 74.0           | -35.3       | 1.00 H             | 153                  | 6.9              | 31.8                     |
| 4   | 2781.75     | 36.9 AV                 | 54.0           | -17.1       | 1.00 H             | 153                  | 5.1              | 31.8                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 1854.50     | 42.8 PK                 | 74.0           | -31.2       | 1.00 V             | 250                  | 14.0             | 28.8                     |
| 2   | 1854.50     | 41.0 AV                 | 54.0           | -13.0       | 1.00 V             | 250                  | 12.2             | 28.8                     |
| 3   | 2781.75     | 39.3 PK                 | 74.0           | -34.7       | 1.50 V             | 243                  | 7.5              | 31.8                     |
| 4   | 2781.75     | 37.5 AV                 | 54.0           | -16.5       | 1.50 V             | 243                  | 5.7              | 31.8                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The average value of fundamental frequency and harmonics is calculated by using formula as below

Average = Reading value of RBW=1MHz and VBW=10Hz + 20 log (duty cycle of normal operation)

20 log (duty cycle of normal operation) = 20 log (81 ms / 100 ms) = -1.8 dB

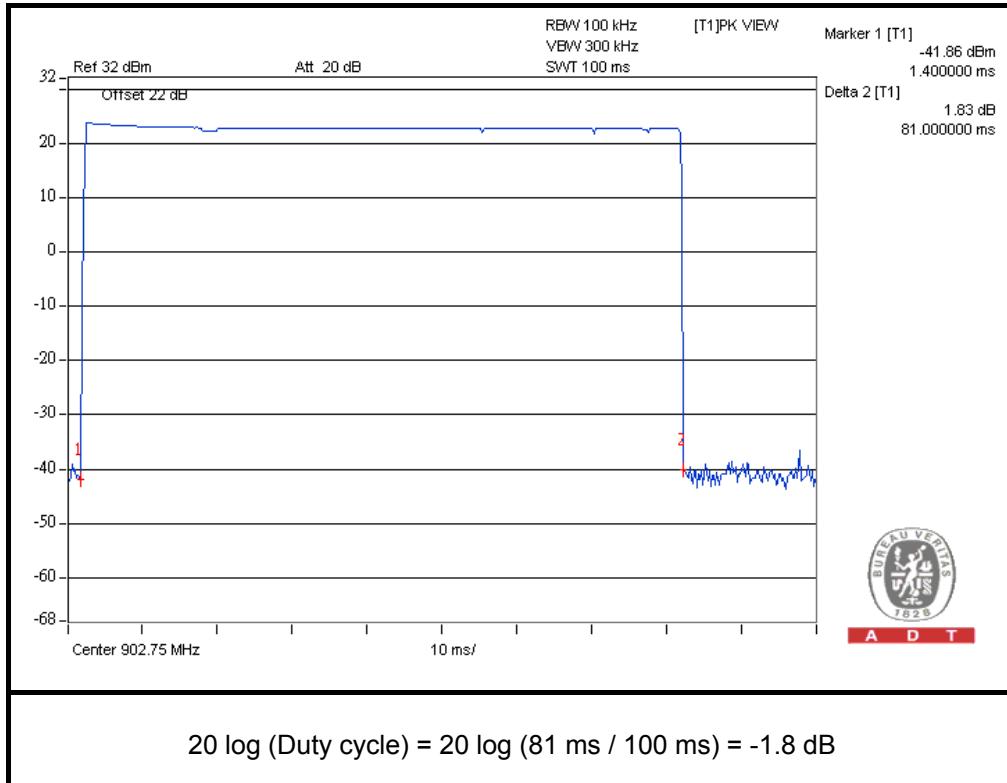
Therefore

Average=Reading value of RBW=1MHz and VBW=10Hz -1.8 dB

Please see page 27 for plotted duty.



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**BELOW 1GHZ WORST-CASE DATA**

| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1016 hPa | TEST MODE          | A             |
| TESTED BY                | Brad Wu                     |                    |               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 129.06      | 35.4 QP                 | 43.5           | -8.1        | 1.50 H             | 250                  | 23.2             | 12.2                     |
| 2   | 249.60      | 40.5 QP                 | 46.0           | -5.5        | 1.25 H             | 4                    | 27.6             | 12.9                     |
| 3   | 354.60      | 40.9 QP                 | 46.0           | -5.1        | 1.00 H             | 292                  | 25.9             | 15.0                     |
| 4   | 436.26      | 33.4 QP                 | 46.0           | -12.6       | 1.00 H             | 295                  | 16.1             | 17.3                     |
| 5   | 628.74      | 36.9 QP                 | 46.0           | -9.1        | 1.50 H             | 316                  | 14.7             | 22.2                     |
| 6   | 725.96      | 36.1 QP                 | 46.0           | -9.9        | 1.50 H             | 10                   | 12.7             | 23.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 51.29       | 32.0 QP                 | 40.0           | -8.0        | 1.00 V             | 184                  | 18.3             | 13.7                     |
| 2   | 249.60      | 35.6 QP                 | 46.0           | -10.4       | 1.75 V             | 91                   | 22.7             | 12.9                     |
| 3   | 339.04      | 33.3 QP                 | 46.0           | -12.7       | 1.50 V             | 43                   | 18.7             | 14.6                     |
| 4   | 436.26      | 30.7 QP                 | 46.0           | -15.3       | 1.25 V             | 109                  | 13.4             | 17.3                     |
| 5   | 628.74      | 32.8 QP                 | 46.0           | -13.2       | 1.00 V             | 160                  | 10.6             | 22.2                     |
| 6   | 725.96      | 29.8 QP                 | 46.0           | -16.2       | 1.25 V             | 145                  | 6.4              | 23.4                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |  | MEASUREMENT DETAIL          |  |                               |
|--------------------------|--|-----------------------------|--|-------------------------------|
| CHANNEL                  |  | Channel 25                  |  | FREQUENCY RANGE Below 1000MHz |
| INPUT POWER              |  | 120Vac, 60 Hz               |  | DETECTOR FUNCTION Quasi-Peak  |
| ENVIRONMENTAL CONDITIONS |  | 23deg. C, 65%RH<br>1016 hPa |  | TEST MODE A                   |
| TESTED BY                |  | Brad Wu                     |  |                               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 136.84      | 38.3 QP                 | 43.5           | -5.2        | 2.00 H             | 247                  | 25.8             | 12.5                     |
| 2   | 245.72      | 41.0 QP                 | 46.0           | -5.0        | 1.00 H             | 10                   | 28.3             | 12.7                     |
| 3   | 350.71      | 38.8 QP                 | 46.0           | -7.2        | 1.00 H             | 88                   | 23.9             | 14.9                     |
| 4   | 533.47      | 34.3 QP                 | 46.0           | -11.7       | 1.75 H             | 22                   | 14.0             | 20.3                     |
| 5   | 628.74      | 38.5 QP                 | 46.0           | -7.5        | 1.25 H             | 319                  | 16.3             | 22.2                     |
| 6   | 725.96      | 35.5 QP                 | 46.0           | -10.5       | 1.25 H             | 31                   | 12.1             | 23.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 49.34       | 31.3 QP                 | 40.0           | -8.7        | 1.00 V             | 106                  | 17.7             | 13.6                     |
| 2   | 129.06      | 30.3 QP                 | 43.5           | -13.2       | 1.00 V             | 88                   | 18.1             | 12.2                     |
| 3   | 247.66      | 36.3 QP                 | 46.0           | -9.7        | 1.50 V             | 91                   | 23.5             | 12.8                     |
| 4   | 339.04      | 31.3 QP                 | 46.0           | -14.7       | 1.25 V             | 37                   | 16.7             | 14.6                     |
| 5   | 436.26      | 30.4 QP                 | 46.0           | -15.6       | 1.25 V             | 106                  | 13.1             | 17.3                     |
| 6   | 628.74      | 32.7 QP                 | 46.0           | -13.3       | 1.00 V             | 169                  | 10.5             | 22.2                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |  | MEASUREMENT DETAIL          |  |                               |
|--------------------------|--|-----------------------------|--|-------------------------------|
| CHANNEL                  |  | Channel 49                  |  | FREQUENCY RANGE Below 1000MHz |
| INPUT POWER              |  | 120Vac, 60 Hz               |  | DETECTOR FUNCTION Quasi-Peak  |
| ENVIRONMENTAL CONDITIONS |  | 23deg. C, 65%RH<br>1016 hPa |  | TEST MODE A                   |
| TESTED BY                |  | Brad Wu                     |  |                               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 136.84      | 36.4 QP                 | 43.5           | -7.1        | 2.00 H             | 250                  | 23.9             | 12.5                     |
| 2   | 249.60      | 40.1 QP                 | 46.0           | -5.9        | 1.00 H             | 10                   | 27.2             | 12.9                     |
| 3   | 350.71      | 37.7 QP                 | 46.0           | -8.3        | 1.00 H             | 10                   | 22.8             | 14.9                     |
| 4   | 533.47      | 34.5 QP                 | 46.0           | -11.5       | 1.50 H             | 28                   | 14.2             | 20.3                     |
| 5   | 630.69      | 37.7 QP                 | 46.0           | -8.3        | 1.25 H             | 31                   | 15.5             | 22.2                     |
| 6   | 725.96      | 35.0 QP                 | 46.0           | -11.0       | 1.00 H             | 34                   | 11.6             | 23.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 51.29       | 31.3 QP                 | 40.0           | -8.7        | 1.00 V             | 61                   | 17.6             | 13.7                     |
| 2   | 136.84      | 30.1 QP                 | 40.0           | -13.4       | 1.00 V             | 103                  | 17.6             | 12.5                     |
| 3   | 247.66      | 35.6 QP                 | 43.5           | -10.4       | 1.75 V             | 55                   | 22.8             | 12.8                     |
| 4   | 356.54      | 31.6 QP                 | 46.0           | -14.4       | 1.50 V             | 58                   | 16.5             | 15.1                     |
| 5   | 628.74      | 32.4 QP                 | 46.0           | -13.6       | 1.00 V             | 112                  | 10.2             | 22.2                     |
| 6   | 725.96      | 30.9 QP                 | 46.0           | -15.1       | 1.00 V             | 157                  | 7.5              | 23.4                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 0                   | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1016 hPa | TEST MODE          | B             |
| TESTED BY                | Brad Wu                     |                    |               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 136.84      | 34.4 QP                 | 43.5           | -9.1        | 2.00 H             | 214                  | 21.9             | 12.5                     |
| 2   | 290.43      | 31.7 QP                 | 46.0           | -14.3       | 1.25 H             | 58                   | 18.1             | 13.6                     |
| 3   | 339.04      | 36.7 QP                 | 46.0           | -9.3        | 1.25 H             | 4                    | 22.1             | 14.6                     |
| 4   | 434.31      | 32.0 QP                 | 46.0           | -14.0       | 2.00 H             | 286                  | 14.8             | 17.2                     |
| 5   | 628.74      | 37.4 QP                 | 46.0           | -8.6        | 1.25 H             | 43                   | 15.2             | 22.2                     |
| 6   | 725.96      | 36.2 QP                 | 46.0           | -9.8        | 1.25 H             | 346                  | 12.8             | 23.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 49.34       | 32.3 QP                 | 40.0           | -7.7        | 1.00 V             | 118                  | 18.7             | 13.6                     |
| 2   | 241.83      | 28.2 QP                 | 46.0           | -17.8       | 1.75 V             | 70                   | 15.7             | 12.5                     |
| 3   | 339.04      | 31.3 QP                 | 46.0           | -14.7       | 1.25 V             | 34                   | 16.7             | 14.6                     |
| 4   | 434.31      | 29.8 QP                 | 46.0           | -16.2       | 2.00 V             | 331                  | 12.6             | 17.2                     |
| 5   | 628.74      | 34.8 QP                 | 46.0           | -11.2       | 1.00 V             | 190                  | 12.6             | 22.2                     |
| 6   | 725.96      | 31.8 QP                 | 46.0           | -14.2       | 2.00 V             | 31                   | 8.4              | 23.4                     |

**REMARKS:**

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 25                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1016 hPa | TEST MODE          | B             |
| TESTED BY                | Brad Wu                     |                    |               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |               |                         |                |             |                    |                      |                  |                          |
|---|---------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz)   | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 136.84        | 36.7 QP                 | 43.5           | -6.8        | 1.75 H             | 217                  | 24.2             | 12.5                     |
| 2   | 249.60        | 38.0 QP                 | 46.0           | -8.0        | 1.50 H             | 7                    | 25.1             | 12.9                     |
| 3   | <b>358.48</b> | <b>41.7 QP</b>          | <b>46.0</b>    | <b>-4.3</b> | <b>1.25 H</b>      | <b>10</b>            | <b>26.6</b>      | <b>15.1</b>              |
| 4   | 533.47        | 34.9 QP                 | 46.0           | -11.1       | 1.50 H             | 37                   | 14.6             | 20.3                     |
| 5   | 630.69        | 38.2 QP                 | 46.0           | -7.8        | 1.25 H             | 316                  | 16.0             | 22.2                     |
| 6   | 725.96        | 35.0 QP                 | 46.0           | -11.0       | 1.25 H             | 349                  | 11.6             | 23.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |               |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz)   | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 51.29         | 34.8 QP                 | 40.0           | -5.2        | 1.00 V             | 124                  | 21.1             | 13.7                     |
| 2   | 119.34        | 30.5 QP                 | 43.5           | -13.0       | 1.50 V             | 340                  | 18.8             | 11.7                     |
| 3   | 251.55        | 34.7 QP                 | 46.0           | -11.3       | 1.50 V             | 91                   | 21.8             | 12.9                     |
| 4   | 337.10        | 32.2 QP                 | 46.0           | -13.8       | 1.00 V             | 31                   | 17.6             | 14.6                     |
| 5   | 436.26        | 29.2 QP                 | 46.0           | -16.8       | 2.00 V             | 304                  | 11.9             | 17.3                     |
| 6   | 628.74        | 32.8 QP                 | 46.0           | -13.2       | 1.00 V             | 169                  | 10.6             | 22.2                     |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.



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| EUT TEST CONDITION       |                             | MEASUREMENT DETAIL |               |
|--------------------------|-----------------------------|--------------------|---------------|
| CHANNEL                  | Channel 49                  | FREQUENCY RANGE    | Below 1000MHz |
| INPUT POWER              | 120Vac, 60 Hz               | DETECTOR FUNCTION  | Quasi-Peak    |
| ENVIRONMENTAL CONDITIONS | 23deg. C, 65%RH<br>1016 hPa | TEST MODE          | B             |
| TESTED BY                | Brad Wu                     |                    |               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                          |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 136.84      | 34.8 QP                 | 43.5           | -8.7        | 1.00 H             | 112                  | 22.3             | 12.5                     |
| 2   | 245.72      | 40.1 QP                 | 46.0           | -5.9        | 1.25 H             | 358                  | 27.4             | 12.7                     |
| 3   | 360.43      | 41.4 QP                 | 46.0           | -4.6        | 1.25 H             | 76                   | 26.3             | 15.1                     |
| 4   | 582.08      | 32.3 QP                 | 46.0           | -13.7       | 1.50 H             | 304                  | 10.8             | 21.5                     |
| 5   | 628.74      | 38.1 QP                 | 46.0           | -7.9        | 1.25 H             | 34                   | 15.9             | 22.2                     |
| 6   | 725.96      | 34.5 QP                 | 46.0           | -11.5       | 1.25 H             | 1                    | 11.1             | 23.4                     |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.   | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1   | 51.29       | 30.4 QP                 | 40.0           | -9.6        | 1.50 V             | 88                   | 16.7             | 13.7                     |
| 2   | 136.84      | 30.6 QP                 | 40.0           | -12.9       | 1.00 V             | 97                   | 18.1             | 12.5                     |
| 3   | 245.72      | 36.1 QP                 | 43.5           | -9.9        | 1.50 V             | 91                   | 23.4             | 12.7                     |
| 4   | 348.76      | 32.3 QP                 | 46.0           | -13.7       | 1.00 V             | 37                   | 17.4             | 14.9                     |
| 5   | 436.26      | 30.0 QP                 | 46.0           | -16.0       | 2.00 V             | 337                  | 12.7             | 17.3                     |
| 6   | 630.69      | 33.6 QP                 | 46.0           | -12.4       | 1.00 V             | 178                  | 11.4             | 22.2                     |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.



## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB $\mu$ V) |          |
|-----------------------------|------------------------------|----------|
|                             | Quasi-peak                   | Average  |
| 0.15-0.5                    | 66 to 56                     | 56 to 46 |
| 0.5-5                       | 56                           | 46       |
| 5-30                        | 60                           | 50       |

**NOTE:** 1. The lower limit shall apply at the transition frequencies.  
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.  
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER       | MODEL NO.       | SERIAL NO.     | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|----------------------------------|-----------------|----------------|---------------------|-------------------------|
| Test Receiver<br>ROHDE & SCHWARZ | ESCS30          | 100291         | Nov. 30, 2010       | Nov. 29, 2011           |
| RF signal cable<br>Woken         | 5D-FB           | Cable-HYC01-01 | Dec. 30, 2010       | Dec. 29, 2011           |
| LISN<br>ROHDE & SCHWARZ          | ESH3-Z5         | 100312         | Jun. 28, 2010       | Jun. 27, 2011           |
| V-LISN<br>SCHWARZBECK            | NNBL 8226-2     | 8226-142       | Jul. 12, 2010       | Jul. 11, 2011           |
| Software<br>ADT                  | ADT_Cond_V7.3.7 | NA             | NA                  | NA                      |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The test was performed in HwaYa Shielded Room 1.  
3. The VCCI Site Registration No. is C-2040.



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#### 4.2.3 TEST PROCEDURES

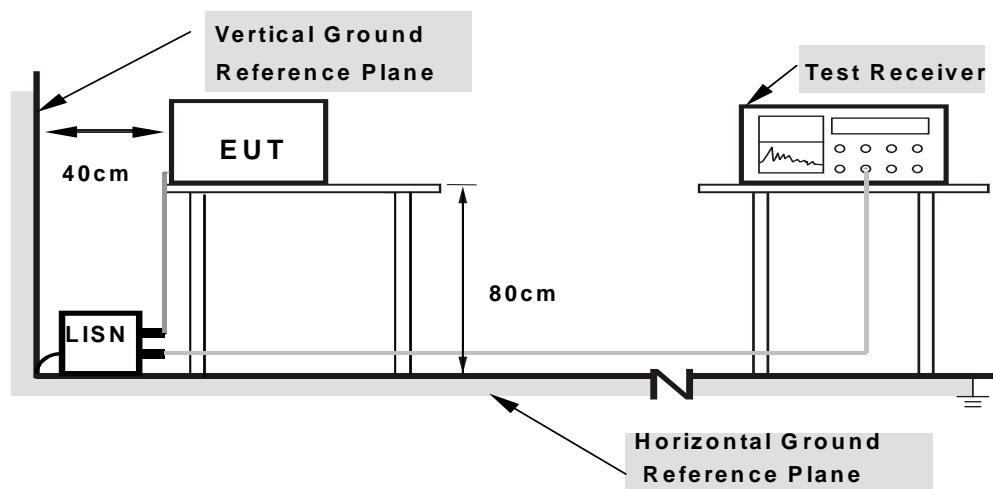
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

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

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

#### 4.2.7 TEST RESULTS

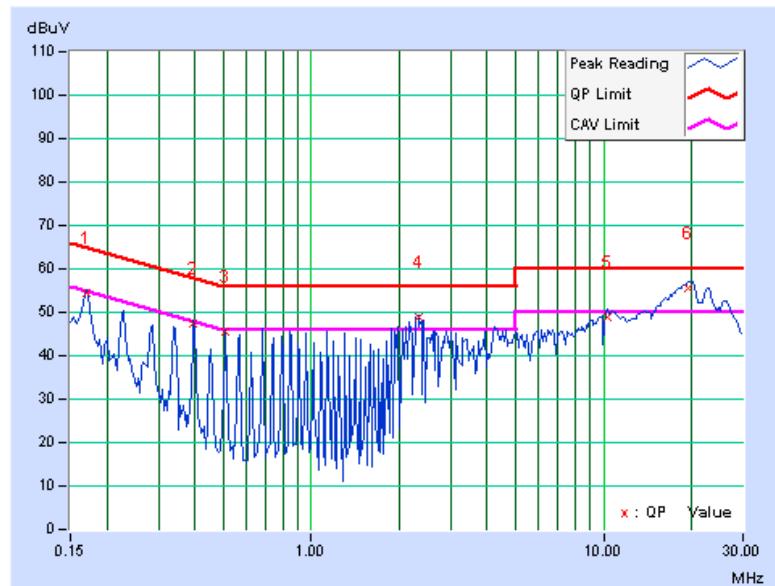
##### CONDUCTED WORST-CASE DATA

|           |        |               |      |
|-----------|--------|---------------|------|
| PHASE     | Line 1 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | A      |               |      |

| No | Freq.<br>[MHz] | Corr.<br>(dB) | Reading Value |       | Emission<br>Level |       | Limit |       | Margin |       |
|----|----------------|---------------|---------------|-------|-------------------|-------|-------|-------|--------|-------|
|    |                |               | Q.P.          | AV.   | Q.P.              | AV.   | Q.P.  | AV.   | Q.P.   | AV.   |
| 1  | 0.170          | 0.15          | 54.14         | -     | 54.29             | -     | 64.98 | 54.98 | -10.70 | -     |
| 2  | 0.396          | 0.17          | 47.30         | -     | 47.47             | -     | 57.93 | 47.93 | -10.47 | -     |
| 3  | 0.509          | 0.18          | 45.30         | -     | 45.48             | -     | 56.00 | 46.00 | -10.52 | -     |
| 4  | 2.324          | 0.30          | 48.50         | 44.30 | 48.80             | 44.60 | 56.00 | 46.00 | -7.20  | -1.40 |
| 5  | 10.259         | 0.66          | 48.32         | -     | 48.98             | -     | 60.00 | 50.00 | -11.02 | -     |
| 6  | 19.547         | 1.34          | 54.22         | 46.32 | 55.56             | 47.66 | 60.00 | 50.00 | -4.44  | -2.34 |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

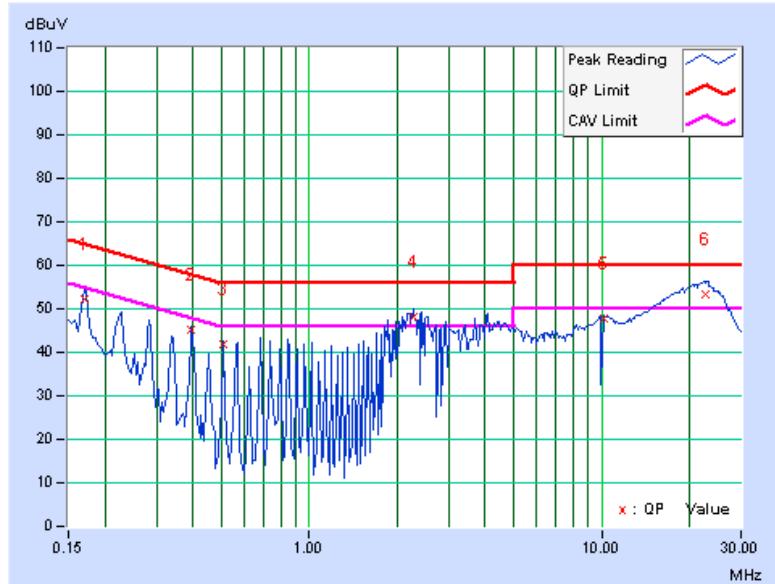


|           |        |               |      |
|-----------|--------|---------------|------|
| PHASE     | Line 2 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | A      |               |      |

|          | Freq.        | Corr.       | Reading Value |              | Emission Level |              | Limit        |              | Margin       |              |
|----------|--------------|-------------|---------------|--------------|----------------|--------------|--------------|--------------|--------------|--------------|
| No       |              | Factor      | [dB (uV)]     |              | [dB (uV)]      |              | [dB (uV)]    |              | (dB)         |              |
|          | [MHz]        | (dB)        | Q.P.          | AV.          | Q.P.           | AV.          | Q.P.         | AV.          | Q.P.         | AV.          |
| 1        | 0.170        | 0.11        | 51.96         | -            | 52.07          | -            | 64.98        | 54.98        | -12.92       | -            |
| 2        | 0.396        | 0.13        | 45.02         | -            | 45.15          | -            | 57.93        | 47.93        | -12.79       | -            |
| 3        | 0.509        | 0.14        | 41.74         | -            | 41.88          | -            | 56.00        | 46.00        | -14.12       | -            |
| <b>4</b> | <b>2.266</b> | <b>0.25</b> | <b>48.00</b>  | <b>44.38</b> | <b>48.25</b>   | <b>44.63</b> | <b>56.00</b> | <b>46.00</b> | <b>-7.75</b> | <b>-1.37</b> |
| 5        | 10.128       | 0.47        | 47.30         | -            | 47.77          | -            | 60.00        | 50.00        | -12.23       | -            |
| 6        | 22.572       | 0.97        | 52.22         | 45.16        | 53.19          | 46.13        | 60.00        | 50.00        | -6.81        | -3.87        |

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



|           |        |               |      |
|-----------|--------|---------------|------|
| PHASE     | Line 1 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | B      |               |      |

|    | Freq.  | Corr.  | Reading Value |       | Emission Level |       | Limit     |       | Margin |       |
|----|--------|--------|---------------|-------|----------------|-------|-----------|-------|--------|-------|
| No |        | Factor | [dB (uV)]     |       | [dB (uV)]      |       | [dB (uV)] |       | (dB)   |       |
|    | [MHz]  | (dB)   | Q.P.          | AV.   | Q.P.           | AV.   | Q.P.      | AV.   | Q.P.   | AV.   |
| 1  | 0.170  | 0.15   | 53.02         | -     | 53.17          | -     | 64.98     | 54.98 | -11.82 | -     |
| 2  | 0.396  | 0.17   | 47.04         | -     | 47.21          | -     | 57.93     | 47.93 | -10.73 | -     |
| 3  | 0.506  | 0.18   | 45.10         | -     | 45.28          | -     | 56.00     | 46.00 | -10.72 | -     |
| 4  | 2.426  | 0.31   | 47.76         | 43.46 | 48.07          | 43.77 | 56.00     | 46.00 | -7.93  | -2.23 |
| 5  | 10.492 | 0.67   | 47.94         | -     | 48.61          | -     | 60.00     | 50.00 | -11.39 | -     |
| 6  | 19.680 | 1.36   | 54.50         | 47.26 | 55.86          | 48.62 | 60.00     | 50.00 | -4.14  | -1.38 |

**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.

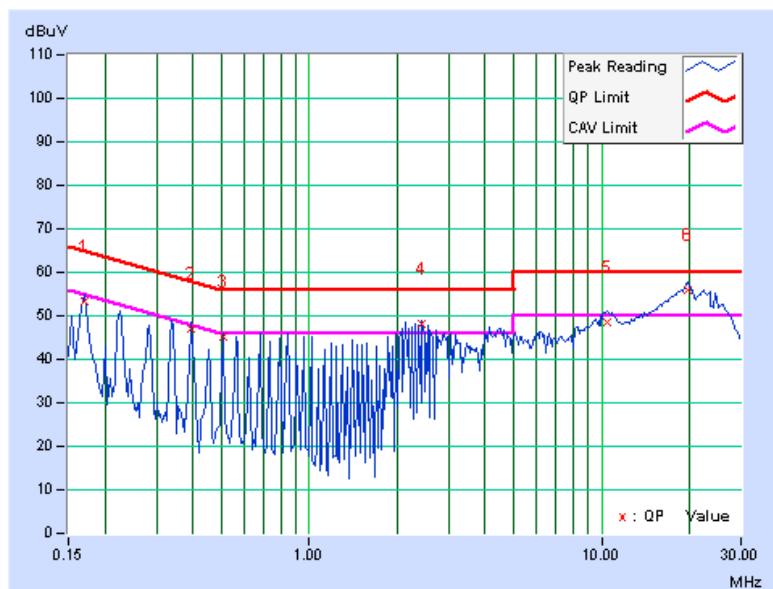
2. ":"; The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.

3. The emission levels of other frequencies were very low against the limit.

4. Margin value = Emission level - Limit value

5. Correction factor = Insertion loss + Cable loss

6. Emission Level = Correction Factor + Reading Value.

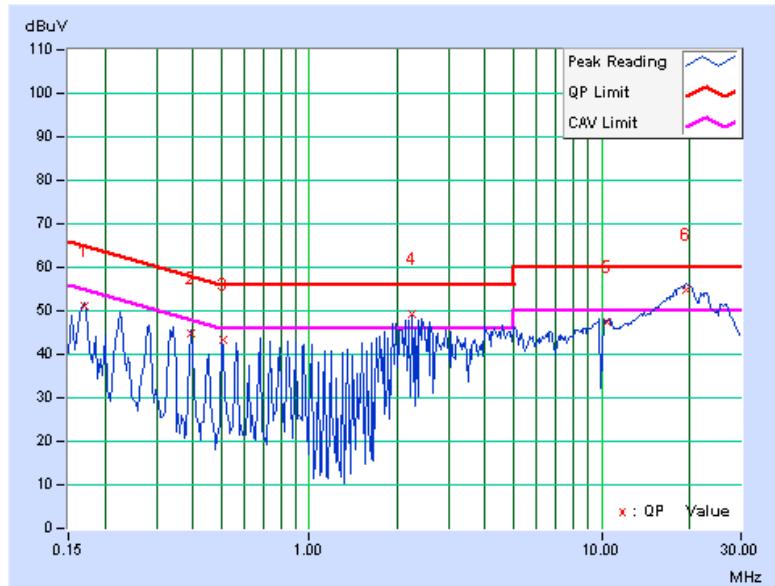


|           |        |               |      |
|-----------|--------|---------------|------|
| PHASE     | Line 2 | 6dB BANDWIDTH | 9kHz |
| TEST MODE | B      |               |      |

|    | Freq.  | Corr.  | Reading Value |       | Emission Level |       | Limit     |       | Margin |       |
|----|--------|--------|---------------|-------|----------------|-------|-----------|-------|--------|-------|
| No |        | Factor | [dB (uV)]     |       | [dB (uV)]      |       | [dB (uV)] |       | (dB)   |       |
|    | [MHz]  | (dB)   | Q.P.          | AV.   | Q.P.           | AV.   | Q.P.      | AV.   | Q.P.   | AV.   |
| 1  | 0.170  | 0.11   | 50.96         | -     | 51.07          | -     | 64.98     | 54.98 | -13.92 | -     |
| 2  | 0.396  | 0.13   | 44.70         | -     | 44.83          | -     | 57.93     | 47.93 | -13.11 | -     |
| 3  | 0.507  | 0.14   | 43.04         | -     | 43.18          | -     | 56.00     | 46.00 | -12.82 | -     |
| 4  | 2.254  | 0.25   | 48.94         | 44.26 | 49.19          | 44.51 | 56.00     | 46.00 | -6.81  | -1.49 |
| 5  | 10.483 | 0.48   | 46.80         | -     | 47.28          | -     | 60.00     | 50.00 | -12.72 | -     |
| 6  | 19.383 | 0.91   | 53.92         | 47.64 | 54.83          | 48.55 | 60.00     | 50.00 | -5.17  | -1.45 |

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.





## 4.3 NUMBER OF HOPPING FREQUENCY USED

### 4.3.1 LIMIT OF HOPPING FREQUENCY USED

At least 50 channels frequencies, and should be equally spaced.

### 4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|----------------------------|-----------|------------|---------------------|-------------------------|
| SPECTRUM ANALYZER R&S      | FSP40     | 100039     | Jan. 11, 2010       | Jan. 10, 2011           |

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

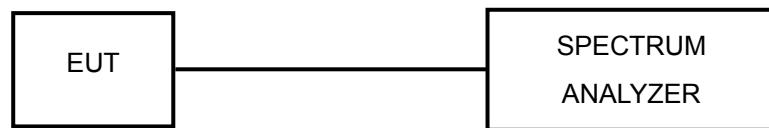
### 4.3.3 TEST PROCEDURES

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
- d. Set the SA on View mode and then plot the result on SA screen.
- e. Repeat above procedures until all frequencies measured were complete.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.5 TEST SETUP

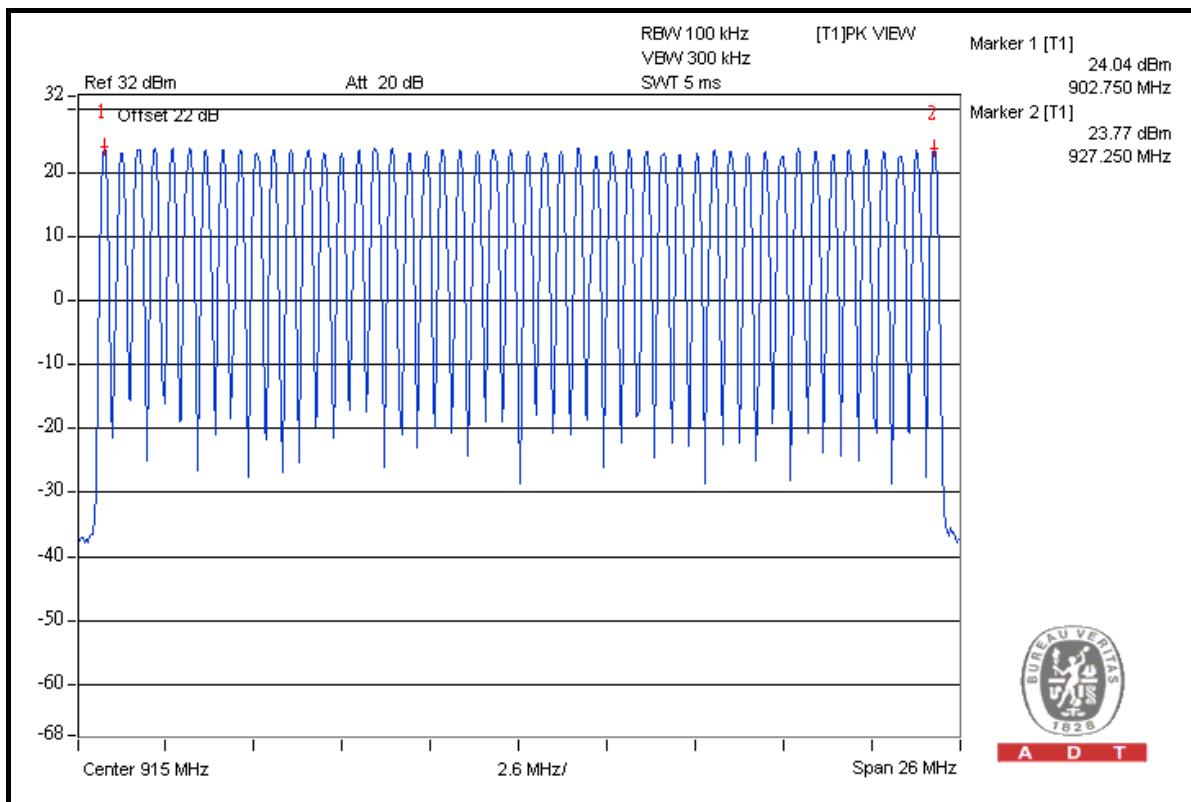


#### 4.3.6 TEST RESULTS

There are 50 hopping frequencies in the hopping mode. Please refer to next page for the test result. On the plots, it shows that the hopping frequencies are equally spaced.



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## 4.4 DWELL TIME ON EACH CHANNEL

### 4.4.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period;

### 4.4.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|----------------------------|-----------|------------|---------------------|-------------------------|
| SPECTRUM ANALYZER<br>R&S   | FSP40     | 100039     | Jan. 11, 2010       | Jan. 10, 2011           |

**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 PROCEDURES

- a. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- c. Adjust the center frequency of SA on any frequency to be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- d. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- e. Repeat above procedures until all different time-slot modes have been completed.

### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.4.5 TEST SETUP

Same as 4.3.5.



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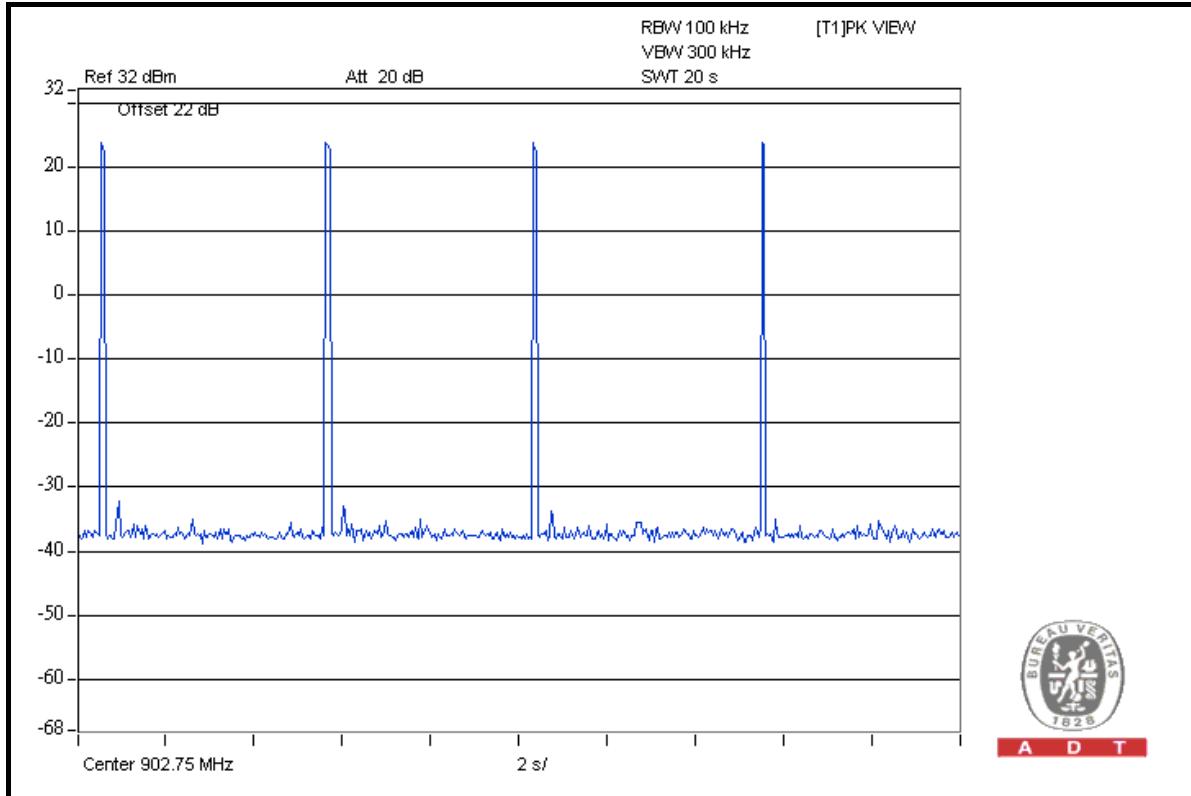
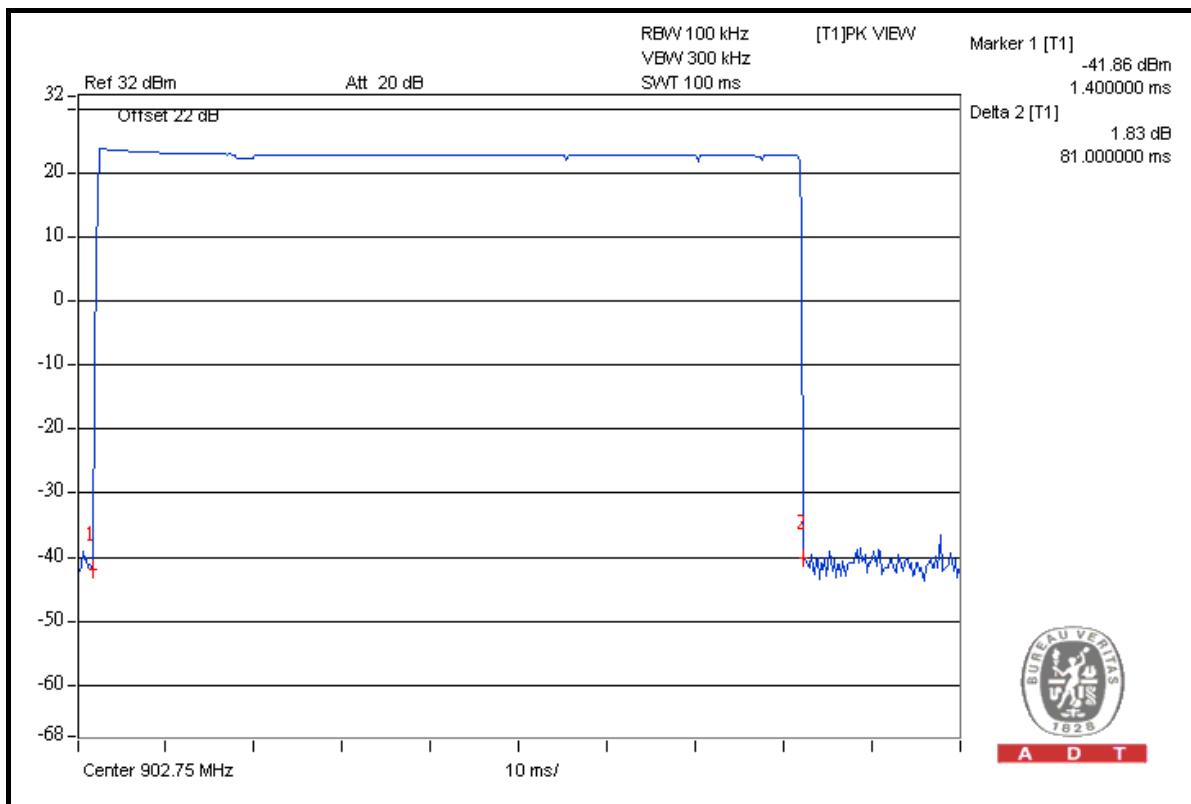
#### 4.4.6 TEST RESULTS

| Length of transmission time (ms) | TX Burst of 20s period | Result        | Limit       |
|----------------------------------|------------------------|---------------|-------------|
| 81                               | 4                      | 324.0ms / 20s | 400ms / 20s |

**NOTE:** Test plots of the transmitting time slot are shown on next page.



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## 4.5 CHANNEL BANDWIDTH

### 4.5.1 LIMITS OF CHANNEL BANDWIDTH

The 20 dB bandwidth of the hopping channel shall be less than 250 kHz.

### 4.5.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|----------------------------|-----------|------------|---------------------|-------------------------|
| SPECTRUM ANALYZER<br>R&S   | FSP40     | 100039     | Jan. 11, 2010       | Jan. 10, 2011           |

**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. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.5.5 TEST SETUP

Same as 4.3.5.



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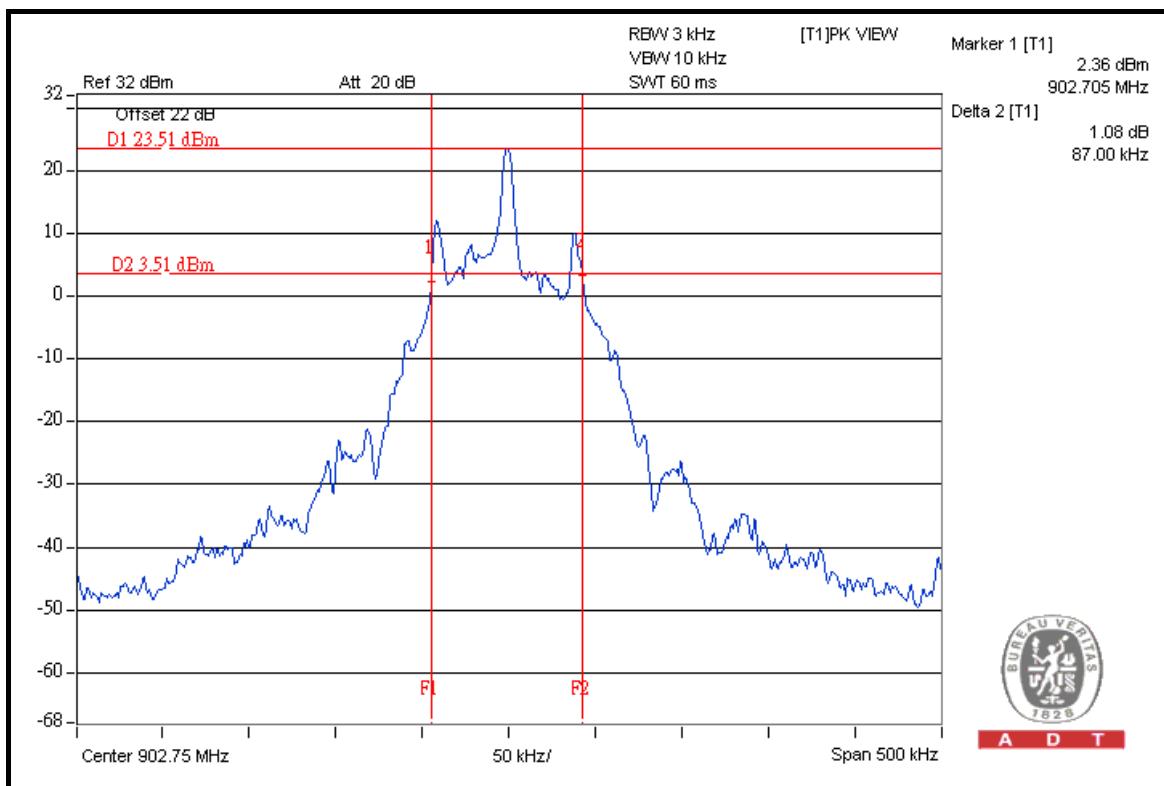
#### 4.5.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

#### 4.5.7 TEST RESULTS

| CHANNEL | CHANNEL FREQUENCY (MHz) | 20dB BANDWIDTH (kHz) | LIMIT (kHz) |
|---------|-------------------------|----------------------|-------------|
| 0       | 902.75                  | 87                   | 250         |
| 25      | 915.25                  | 86                   | 250         |
| 49      | 927.25                  | 87                   | 250         |

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## 4.6 HOPPING CHANNEL SEPARATION

### 4.6.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or 20dB hopping channel bandwidth (whichever is greater).

### 4.6.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|----------------------------|-----------|------------|---------------------|-------------------------|
| SPECTRUM ANALYZER<br>R&S   | FSP40     | 100039     | Jan. 11, 2010       | Jan. 10, 2011           |

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

### 4.6.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.6.5 TEST SETUP

Same as 4.3.5

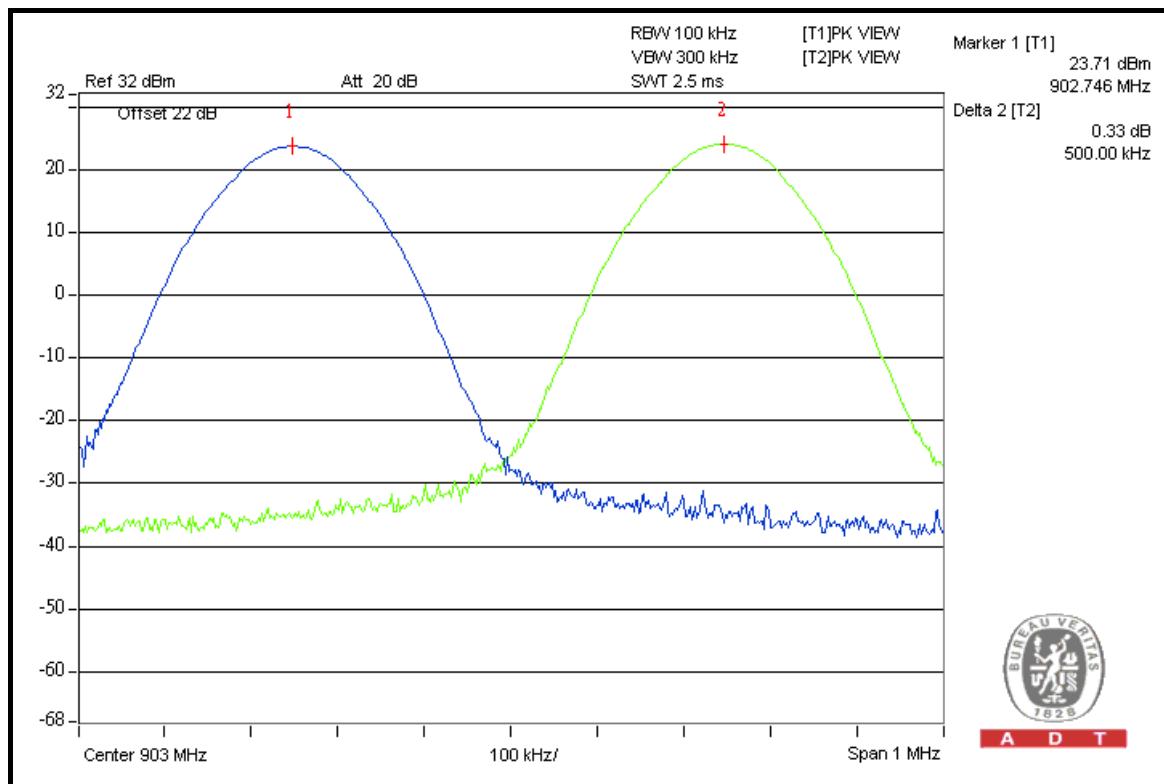


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#### 4.6.6 TEST RESULTS

| CHANNEL | FREQUENCY (MHz) | ADJACENT CHANNEL SEPARATION (kHz) | MINIMUM LIMIT (kHz) | PASS / FAIL |
|---------|-----------------|-----------------------------------|---------------------|-------------|
| 0       | 902.75          | 500                               | 87                  | PASS        |
| 25      | 915.25          | 500                               | 86                  | PASS        |
| 49      | 927.25          | 500                               | 87                  | PASS        |

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## 4.7 MAXIMUM OUTPUT POWER

### 4.7.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 30dBm.

### 4.7.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|----------------------------|-----------|------------|---------------------|-------------------------|
| SPECTRUM ANALYZER<br>R&S   | FSP40     | 100039     | Jan. 11, 2010       | Jan. 10, 2011           |

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

### 4.7.3 TEST PROCEDURES

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 1MHz RBW and 3 MHz VBW.
- d. Measure the captured power within the band and recording the plot.
- e. Repeat above procedures until all frequencies required were complete.

### 4.7.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.7.5 TEST SETUP

Same as 4.3.5.

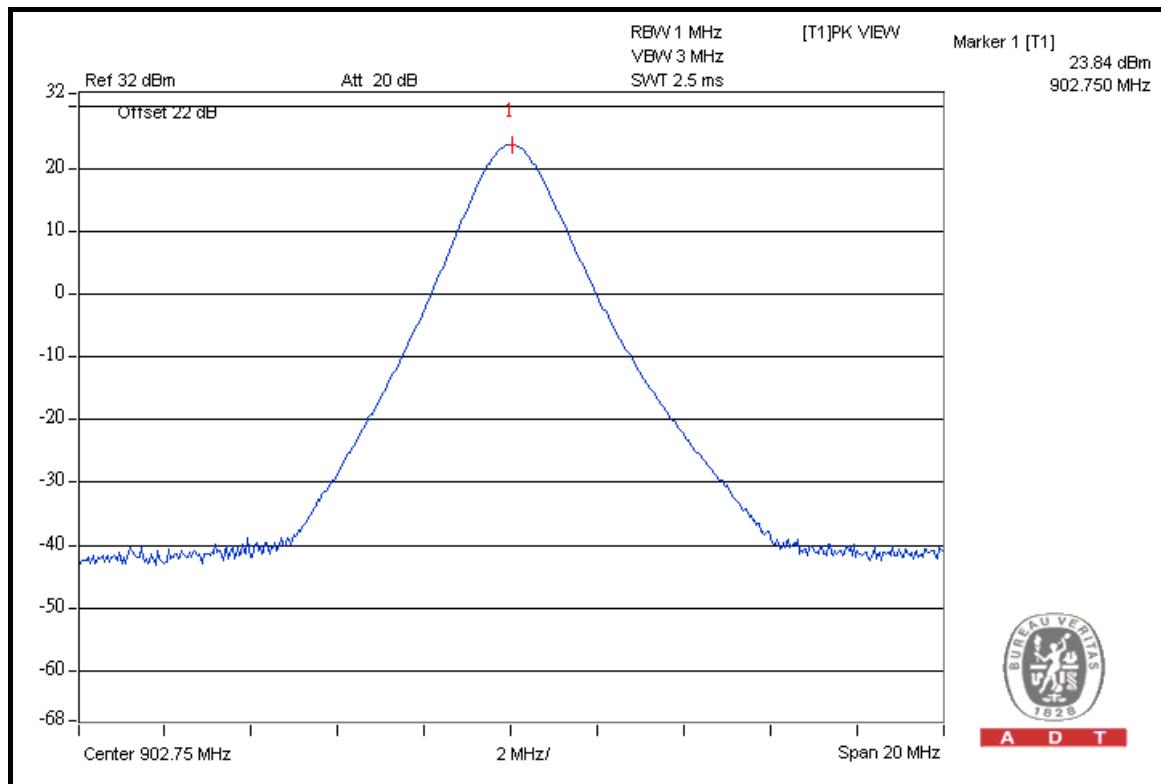
#### 4.7.6 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

#### 4.7.7 TEST RESULTS

| CHANNEL | CHANNEL FREQUENCY (MHz) | POWER OUTPUT (mW) | POWER OUTPUT (dBm) | POWER LIMIT (dBm) | PASS/FAIL |
|---------|-------------------------|-------------------|--------------------|-------------------|-----------|
| 0       | 902.75                  | 242.1             | 23.84              | 30                | PASS      |
| 25      | 915.25                  | 238.8             | 23.78              | 30                | PASS      |
| 49      | 927.25                  | 237.7             | 23.76              | 30                | PASS      |

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## 4.8 BAND EDGES MEASUREMENT

### 4.8.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz RBW).

### 4.8.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|----------------------------|-----------|------------|---------------------|-------------------------|
| SPECTRUM ANALYZER R&S      | FSP40     | 100039     | Jan. 11, 2010       | Jan. 10, 2011           |

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

### 4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100 / 300 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

### 4.8.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.8.5 EUT OPERATING CONDITION

The software provided by client enabled the EUT to transmit and receive data at lowest and highest channel frequencies individually.



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#### 4.8.6 TEST RESULTS

The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

##### TEST MODE A

| FREQUENCY (MHz) | FUNDAMENTAL EMISSION (dBuV/m) | DELTA (dB) | MAXIMUM FIELD STRENGTH OUT OF BAND (dBuV/m) | LIMIT (dBuV/m) |
|-----------------|-------------------------------|------------|---|----------------|
| 902.72 (PK)     | 89.6                          | 61.09      | 28.51                                       | 69.6           |
| 902.72 (AV)     | -                             | -          | 26.71                                       | 67.8           |

| FREQUENCY (MHz) | FUNDAMENTAL EMISSION (dBuV/m) | DELTA (dB) | MAXIMUM FIELD STRENGTH OUT OF BAND (dBuV/m) | LIMIT (dBuV/m) |
|-----------------|-------------------------------|------------|---|----------------|
| 927.25 (PK)     | 88.3                          | 59.82      | 28.48                                       | 68.3           |
| 927.25 (AV)     | -                             | -          | 26.68                                       | 66.5           |

##### TEST MODE B

| FREQUENCY (MHz) | FUNDAMENTAL EMISSION (dBuV/m) | DELTA (dB) | MAXIMUM FIELD STRENGTH OUT OF BAND (dBuV/m) | LIMIT (dBuV/m) |
|-----------------|-------------------------------|------------|---|----------------|
| 902.72 (PK)     | 95.9                          | 61.09      | 34.81                                       | 75.9           |
| 902.72 (AV)     | -                             | -          | 33.01                                       | 74.1           |

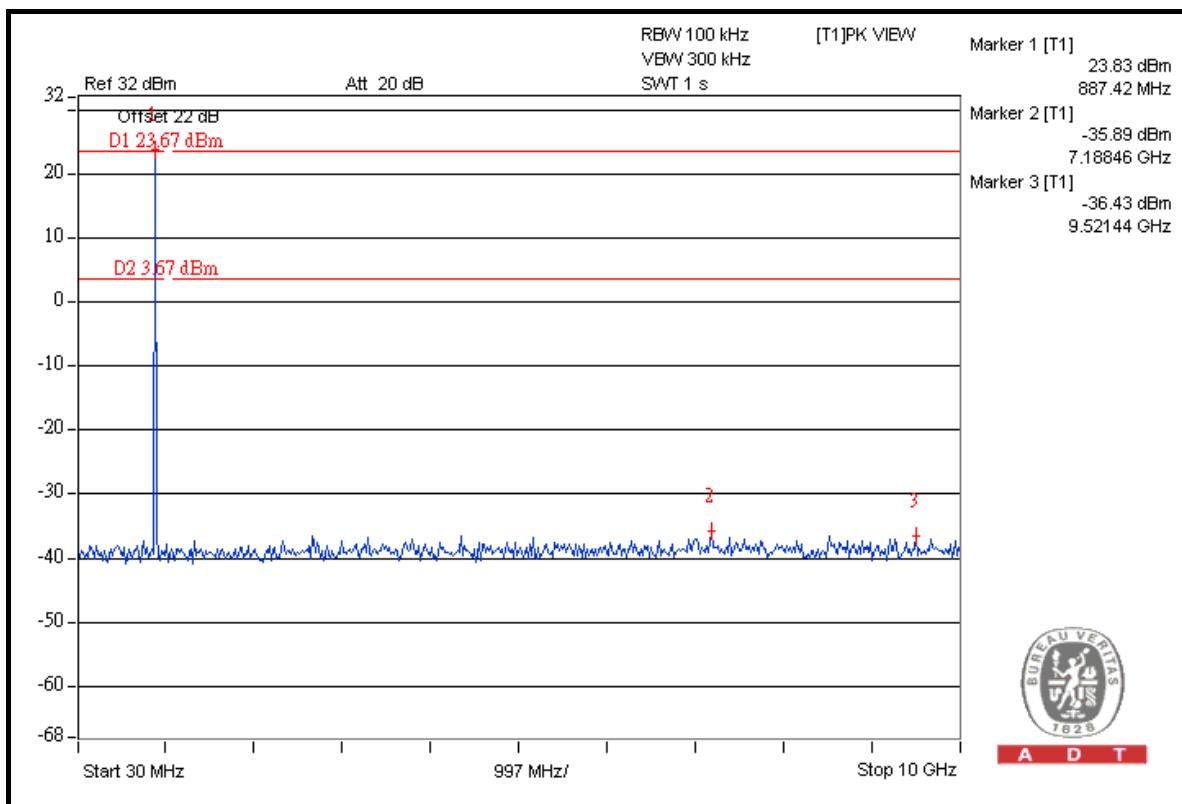
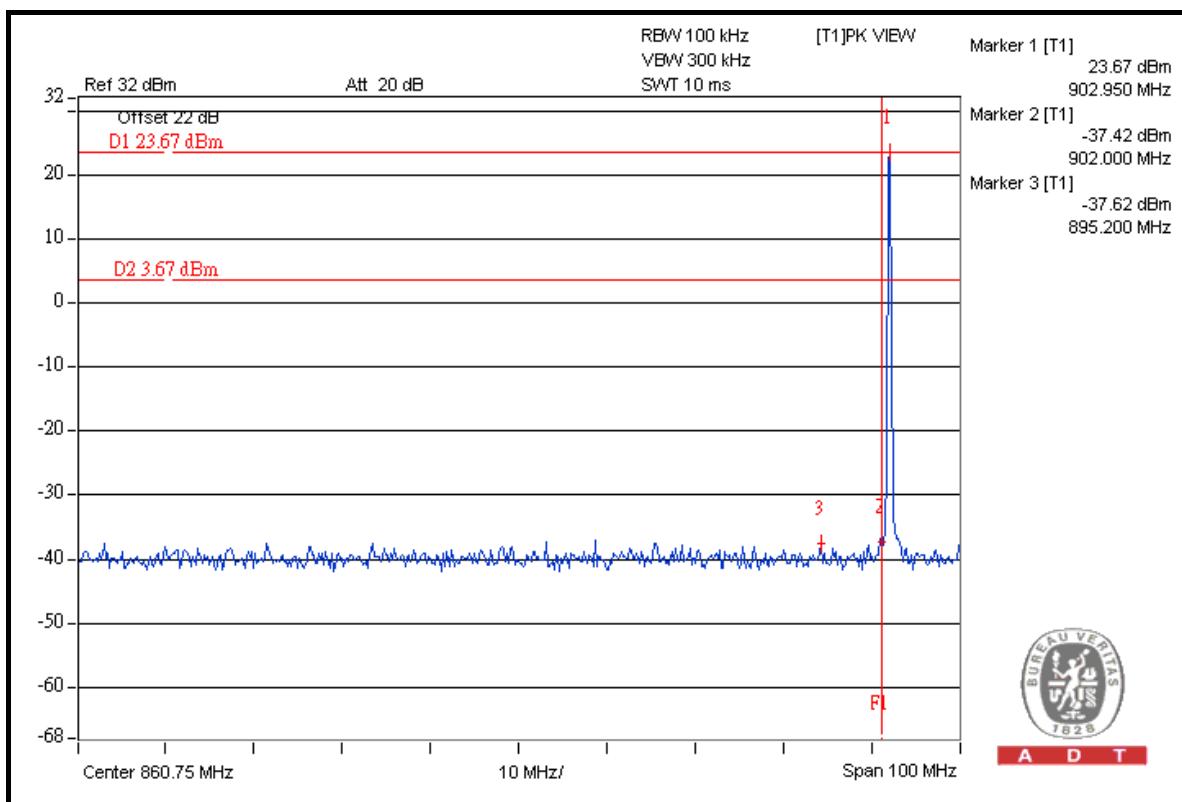
| FREQUENCY (MHz) | FUNDAMENTAL EMISSION (dBuV/m) | DELTA (dB) | MAXIMUM FIELD STRENGTH OUT OF BAND (dBuV/m) | LIMIT (dBuV/m) |
|-----------------|-------------------------------|------------|---|----------------|
| 927.25 (PK)     | 94.6                          | 59.82      | 34.78                                       | 74.6           |
| 927.25 (AV)     | -                             | -          | 32.98                                       | 72.8           |

##### NOTE:

1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 2 pages.
2. Maximum field strength out of band (PK value) = Fundamental emission (PK value) – Delta.
3. Average value = Peak value + 20 Log (duty cycle) = Peak value – 1.8dB.
4. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
$$20 \log (\text{Duty cycle}) = 20 \log (81 \text{ ms} / 100 \text{ ms}) = -1.8 \text{ dB}$$

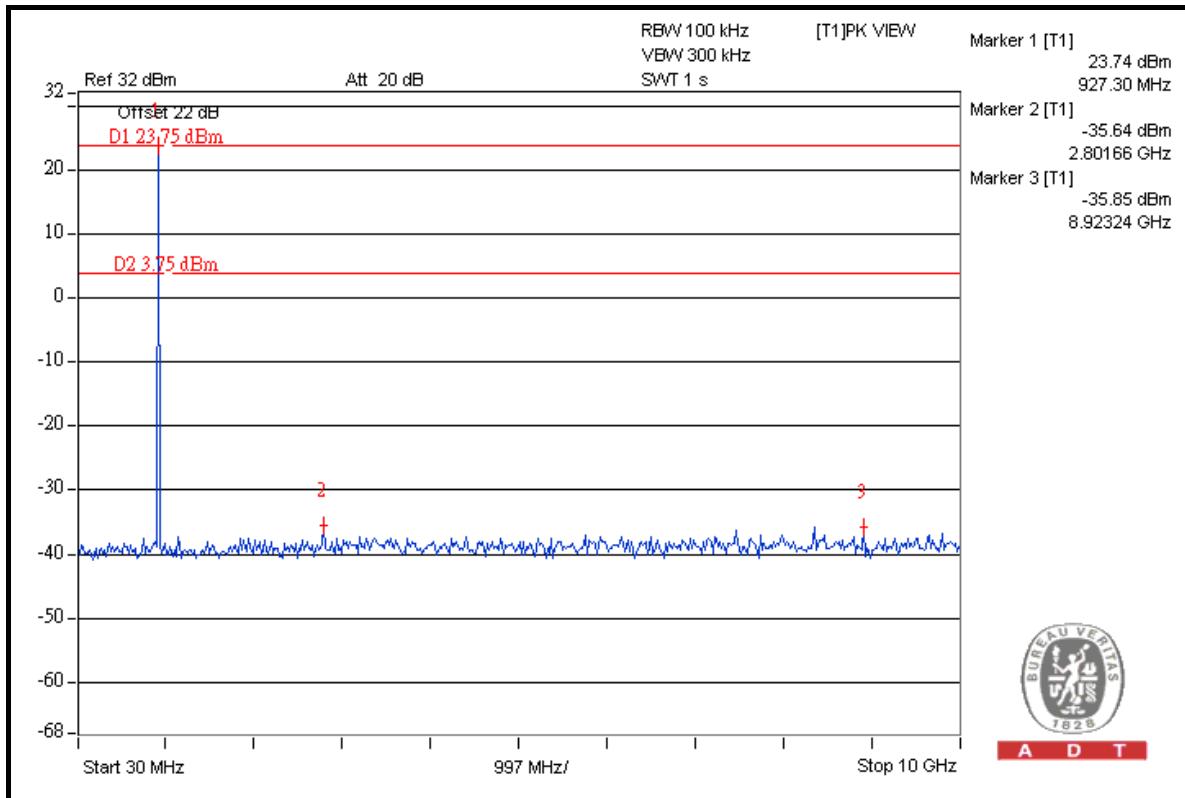
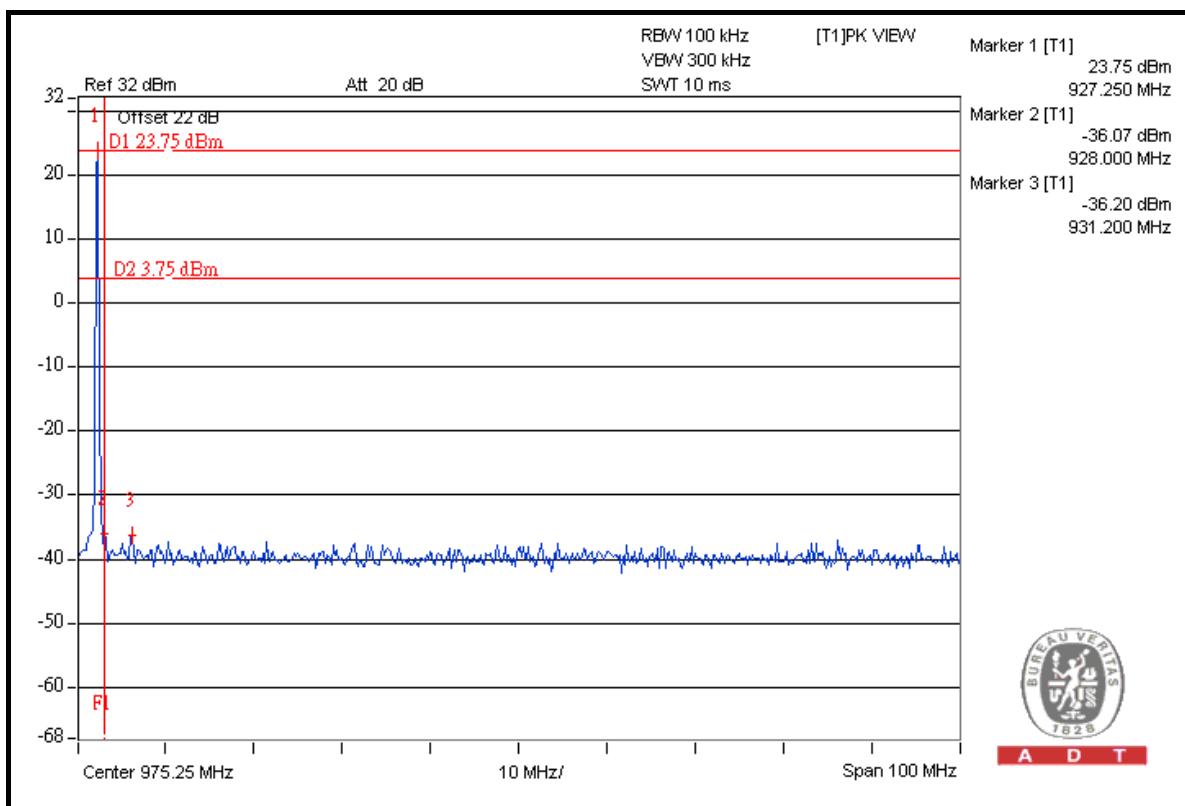


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## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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](http://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: 886-2-26051924

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343  
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**Hwa Ya EMC/RF/Safety Telecom Lab:**

Tel: 886-3-3183232  
Fax: 886-3-3185050

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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



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## **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 ---**