



# VARIANT FCC TEST REPORT

**REPORT NO.:** RF991220C07D  
**MODEL NO.:** INRD01u  
**FCC ID:** EHA-INRD01U  
**RECEIVED:** Jul. 17, 2012  
**TESTED:** Aug. 03 ~ Aug. 07, 2012  
**ISSUED:** Aug. 10, 2012

**APPLICANT:** Intermec Technologies Corporation

**ADDRESS:** 550 Second street SE Cedar Rapids Iowa  
52401-2029 USA

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

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,  
New Taipei City, Taiwan, R.O.C.

**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen,  
Kwei Shan Hsiang, Taoyuan Hsien 333,  
Taiwan, R.O.C.

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## RELEASE CONTROL RECORD

| ISSUE NO.    | REASON FOR CHANGE | DATE ISSUED   |
|--------------|-------------------|---------------|
| RF991220C07D | Original release  | Aug. 10, 2012 |



## 1. CERTIFICATION

**PRODUCT:** RFID UHF Module

**BRAND:** Intermec

**MODEL:** INRD01u

**APPLICANT:** Intermec Technologies Corporation

**TESTED:** Aug. 03 ~ Aug. 07, 2012

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** **FCC Part 15, Subpart C (Section 15.247),**  
ANSI C63.10-2009

This report is issued as a supplementary report of RF991220C05. This report shall be used combined together with its original report.

**PREPARED BY** :  , **DATE** : Aug. 10, 2012  
Pettie Chen / Senior Specialist

**APPROVED BY** :  , **DATE** : Aug. 10, 2012  
Gary Chang / Technical Manager

**NOTE:** The radiated emission test and AC power conducted emission were performed for the addendum. Refer to original report for the other test data.

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 15, Subpart C |   |        |   |
|--|---|--------|---|
| STANDARD SECTION                         | TEST TYPE AND LIMIT   | RESULT | REMARK  |
| 15.207                                   | AC Power Conducted Emission   | PASS   | Meet the requirement of limit. Minimum passing margin is -9.25dB at 0.18125MHz. |
| 15.247(a)(1) (iii)                       | Number of Hopping Frequency Used  | NA     | Refer to Note   |
| 15.247(a)(1) (iii)                       | Dwell Time on Each Channel  | NA     | Refer to Note   |
| 15.247(a)(1)                             | 1. Hopping Channel Separation<br>2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System | NA     | Refer to Note   |
| 15.247(b)                                | Maximum Peak Output Power   | NA     | Refer to Note   |
| 15.247(d)                                | Transmitter Radiated Emissions  | PASS   | Meet the requirement of limit. Minimum passing margin is -3.0dB at 338.42MHz.   |
| 15.247(d)                                | Band Edge Measurement   | NA     | Refer to Note   |
| 15.203                                   | Antenna Requirement   | NA     | Refer to Note   |

**NOTE:** The radiated emission test and AC power conducted emission were performed for the addendum. Refer to original report for the other test data.

### 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     | 2.44 dB     |
| Radiated emissions | 30MHz ~ 200MHz   | 2.93 dB     |
|                    | 200MHz ~ 1000MHz | 2.95 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.



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                            |                    |
|----------------------------|--------------------|
| <b>EUT</b>                 | RFID UHF Module    |
| <b>MODEL NO.</b>           | 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. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of BV ADT report no.: RF991220C05. The difference compared with original report is adding an antenna. Therefore, we re-tested radiated emission test and AC power conducted emission and presented in the test report.

2. The EUT uses the following antenna.

| Part No.    | Antenna Type                  | Antenna Connector | Gain (dBi) |
|-------------|-------------------------------|-------------------|------------|
| 145-536-002 | Microstripe antenna "Coupler" | MMCX (F)          | -7.81      |

3. The EUT has transmitter and receiver functions.
4. 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. (MHz) | CHANNEL | FREQ. (MHz) | CHANNEL | FREQ. (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 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

| EUT CONFIGURE MODE | APPLICABLE TO |           |     | DESCRIPTION |
|--------------------|---------------|-----------|-----|-------------|
|                    | RE $\geq$ 1G  | RE $<$ 1G | PLC |             |
| -                  | √             | √         | √   | -           |

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz  
**PLC**: Power Line Conducted Emission

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

#### 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 CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE | DATA RATE (Kbps) | ANT. AXIS |
|--------------------|-------------------|----------------|-----------------|------------------|-----------|
| -                  | 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 CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE | DATA RATE (Kbps) | ANT. AXIS |
|--------------------|-------------------|----------------|-----------------|------------------|-----------|
| -                  | 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 CONFIGURE MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TYPE | DATA RATE (Kbps) |
|--------------------|-------------------|----------------|-----------------|------------------|
| -                  | 0 to 49           | 25             | PR-ASK          | 80Kbps           |



**TEST CONDITION:**

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER  | TESTED BY     |
|---------------|--------------------------|--------------|---------------|
| RE≥1G         | 25deg. C, 65%RH          | 120Vac, 60Hz | Anderson Hong |
| RE<1G         | 25deg. C, 65%RH          | 120Vac, 60Hz | Anderson Hong |
| PLC           | 25deg. C, 65%RH          | 120Vac, 60Hz | Jones Chang   |

**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 C63.10-2009**

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.

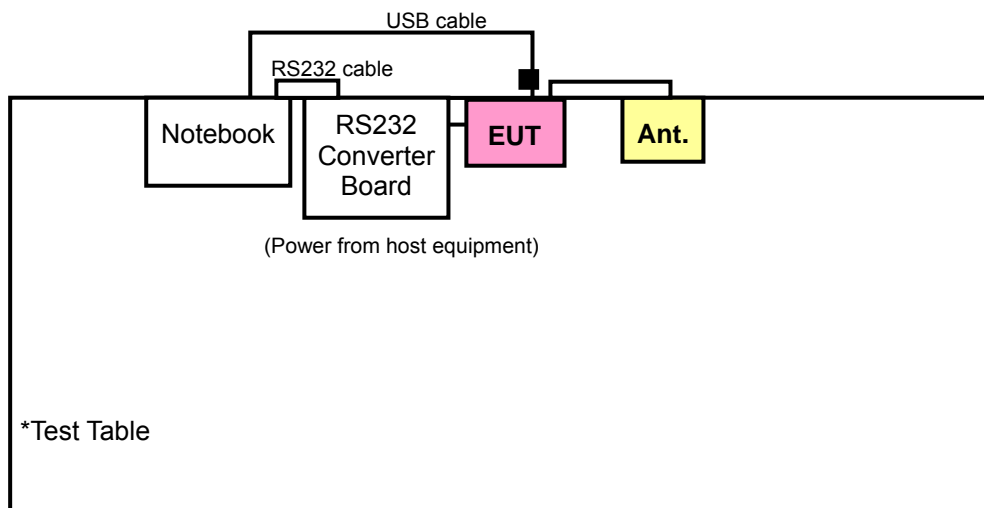
| NO. | PRODUCT               | BRAND | MODEL NO. | SERIAL NO.  | FCC ID           |
|-----|-----------------------|-------|-----------|-------------|------------------|
| 1   | NOTEBOOK              | DELL  | PP18L     | 33497605792 | CXSMM01BRD02D330 |
| 2   | RS232 Converter Board | NA    | NA        | 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.

#### 3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



## 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 (dBuV/m) = 20 log Emission level (uV/m).
3. 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                 | ESCI                         | 100744               | Apr. 19, 2012       | Apr. 18, 2013           |
| Spectrum Analyzer<br>ROHDE & SCHWARZ             | FSP40                        | 100269               | Jan. 30, 2012       | Jan. 29, 2013           |
| BILOG Antenna<br>SCHWARZBECK                     | VULB9168                     | 9168-156             | Apr. 03, 2012       | Apr. 02, 2013           |
| HORN Antenna<br>SCHWARZBECK                      | BBHA 9120 D                  | 9120D-563            | Sep. 06, 2011       | Sep. 05, 2012           |
| HORN Antenna<br>SCHWARZBECK                      | BBHA 9170                    | 148                  | Jul. 11, 2012       | Jul. 10, 2013           |
| Preamplifier<br>Agilent                          | 8449B                        | 3008A01911           | Oct. 29, 2011       | Oct. 28, 2012           |
| Preamplifier<br>Agilent                          | 8447D                        | 2944A10638           | Oct. 29, 2011       | Oct. 28, 2012           |
| RF signal cable<br>HUBER+SUHNNER                 | SUCOFLEX 104                 | 295013/4<br>283403/4 | Aug. 19, 2011       | Aug. 18, 2012           |
| RF signal cable<br>Worken                        | 8D-FB                        | Cable-HYCH9-01       | Aug. 13, 2011       | Aug. 12, 2012           |
| Software   | ADT_Radiated_<br>V7.6.15.9.2 | NA                   | NA                  | NA                      |
| Antenna Tower<br>EMCO                            | 2070/2080                    | 512.835.4684         | NA                  | NA                      |
| Turn Table<br>EMCO                               | 2087-2.03                    | NA                   | NA                  | NA                      |
| Antenna Tower & Turn<br>Table Controller<br>EMCO | 2090                         | NA                   | NA                  | NA                      |

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.

#### 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.

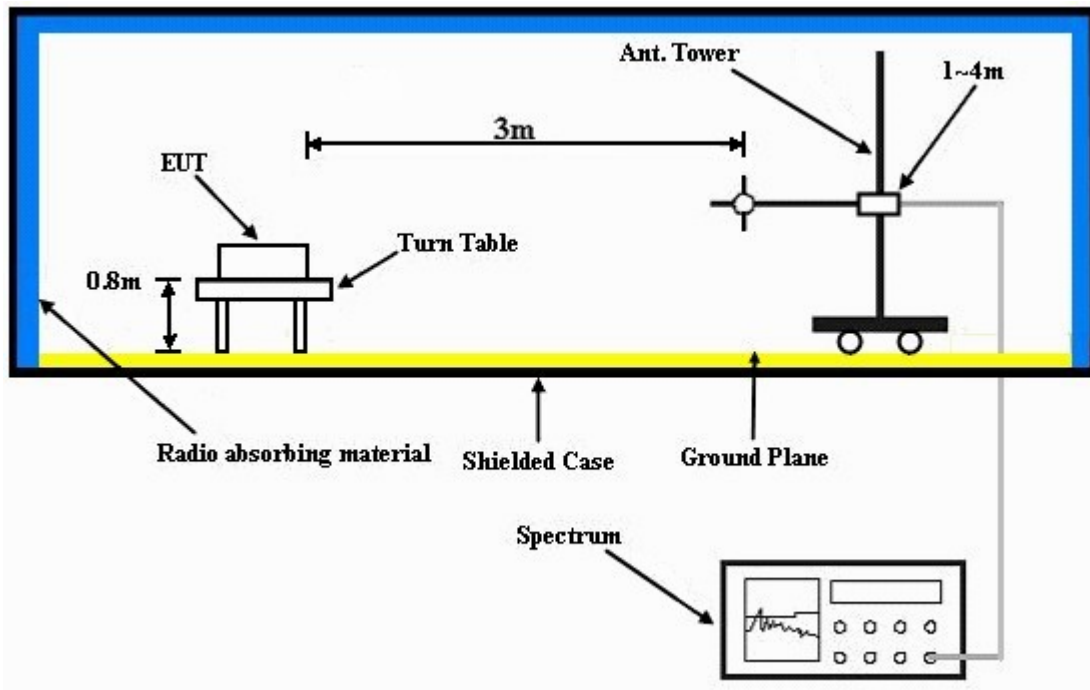
**NOTE:**

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

- Placed the EUT on a testing table.
- Set the EUT under transmission condition continuously at specific channel frequency.
- 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    | Below 1GHz                |
| INPUT POWER              | 120Vac, 60 Hz   | DETECTOR FUNCTION  | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY          | Anderson Hong             |

| 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     | 47.6 PK                 | 75.7           | -28.1       | 1.43 H             | 254                  | 21.30            | 26.30                    |
| 2   | #902.00     | 35.5 AV                 | 73.9           | -38.4       | 1.43 H             | 254                  | 9.20             | 26.30                    |
| 3   | *902.75     | 95.7 PK                 |                |             | 1.43 H             | 254                  | 69.40            | 26.30                    |
| 4   | *902.75     | 93.9 AV                 |                |             | 1.43 H             | 254                  | 67.60            | 26.30                    |
| 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     | 47.0 PK                 | 68.8           | -21.8       | 1.16 V             | 258                  | 20.70            | 26.30                    |
| 2   | #902.00     | 35.0 AV                 | 67.0           | -32.0       | 1.16 V             | 258                  | 8.70             | 26.30                    |
| 3   | *902.75     | 88.8 PK                 |                |             | 1.16 V             | 258                  | 62.50            | 26.30                    |
| 4   | *902.75     | 87.0 AV                 |                |             | 1.16 V             | 258                  | 60.70            | 26.30                    |

**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  

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

$$20 \log (\text{duty cycle of normal operation}) = 20 \log (81 \text{ ms} / 100 \text{ ms}) = -1.8 \text{ dB}$$
 Therefore  

$$\text{Average} = \text{Reading value of RBW=1MHz and VBW=10Hz} - 1.8 \text{ dB}$$

Please see page 21 for plotted duty.



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| 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 | 25deg. C, 65%RH | TESTED BY          | Anderson Hong             |

| 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     | 94.4 PK                 |                |             | 1.32 H             | 128                  | 68.00            | 26.40                    |
| 2   | *915.25     | 92.6 AV                 |                |             | 1.32 H             | 128                  | 66.20            | 26.40                    |
| 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     | 89.9 PK                 |                |             | 1.50 V             | 177                  | 63.50            | 26.40                    |
| 2   | *915.25     | 88.1 AV                 |                |             | 1.50 V             | 177                  | 61.70            | 26.40                    |

**REMARKS:**

- Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- The other emission levels were very low against the limit.
- Margin value = Emission level – Limit value.
- “ \* ” : Fundamental frequency
- 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 21 for plotted duty.





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| 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 | 25deg. C, 65%RH | TESTED BY          | Anderson Hong             |

| 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     | 96.5 PK                 |                |             | 1.36 H             | 262                  | 70.00            | 26.50                    |
| 2   | *927.25     | 86.5 AV                 |                |             | 1.36 H             | 262                  | 68.20            | 26.50                    |
| 3   | #928.00     | 47.3 PK                 | 76.5           | -29.2       | 1.36 H             | 262                  | 20.80            | 26.50                    |
| 4   | #928.00     | 35.3 AV                 | 66.5           | -31.2       | 1.36 H             | 262                  | 8.80             | 26.50                    |
| 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     | 90.6 PK                 |                |             | 1.13 V             | 244                  | 64.10            | 26.50                    |
| 2   | *927.25     | 88.8 AV                 |                |             | 1.13 V             | 244                  | 62.30            | 26.50                    |
| 3   | #928.00     | 47.2 PK                 | 70.6           | -23.4       | 1.13 V             | 244                  | 20.70            | 26.50                    |
| 4   | #928.00     | 34.9 AV                 | 68.8           | -33.9       | 1.13 V             | 244                  | 8.40             | 26.50                    |

**REMARKS:**

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

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

$$20 \log (\text{duty cycle of normal operation}) = 20 \log (81 \text{ ms} / 100 \text{ ms}) = -1.8 \text{ dB}$$
 Therefore  

$$\text{Average} = \text{Reading value of RBW=1MHz and VBW=10Hz} - 1.8 \text{ dB}$$

Please see page 21 for plotted duty.

### 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 | 25deg. C, 65%RH | TESTED BY          | Anderson Hong             |

| 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     | 51.8 PK                 | 74.0           | -22.2       | 1.07 H             | 63                   | 22.50            | 29.30                    |
| 2   | 1805.50     | 50.0 AV                 | 54.0           | -4.0        | 1.07 H             | 63                   | 20.70            | 29.30                    |
| 3   | 2708.25     | 40.8 PK                 | 74.0           | -33.2       | 1.28 H             | 112                  | 8.40             | 32.40                    |
| 4   | 2708.25     | 39.0 AV                 | 54.0           | -15.0       | 1.28 H             | 112                  | 6.60             | 32.40                    |
| 5   | 3611.00     | 44.2 PK                 | 74.0           | -29.8       | 1.42 H             | 308                  | 9.80             | 34.40                    |
| 6   | 3611.00     | 42.4 AV                 | 54.0           | -11.6       | 1.42 H             | 308                  | 8.00             | 34.40                    |
| 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     | 52.2 PK                 | 74.0           | -21.8       | 1.51 V             | 100                  | 22.90            | 29.30                    |
| 2   | 1805.50     | 50.4 AV                 | 54.0           | -3.6        | 1.51 V             | 100                  | 21.10            | 29.30                    |
| 3   | 2708.25     | 40.9 PK                 | 74.0           | -33.1       | 1.00 V             | 81                   | 8.50             | 32.40                    |
| 4   | 2708.25     | 39.1 AV                 | 54.0           | -14.9       | 1.00 V             | 81                   | 6.70             | 32.40                    |
| 5   | 3611.00     | 44.3 PK                 | 74.0           | -29.7       | 1.31 V             | 40                   | 9.90             | 34.40                    |
| 6   | 3611.00     | 42.5 AV                 | 54.0           | -11.5       | 1.31 V             | 40                   | 8.10             | 34.40                    |

- 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 21 for plotted duty.



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| 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 | 25deg. C, 65%RH | TESTED BY          | Anderson Hong             |

| 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     | 51.5 PK                 | 74.0           | -22.5       | 1.04 H             | 65                   | 22.10            | 29.40                    |
| 2   | 1830.50     | 49.7 AV                 | 54.0           | -4.3        | 1.04 H             | 65                   | 20.30            | 29.40                    |
| 3   | 2745.75     | 40.5 PK                 | 74.0           | -33.5       | 1.26 H             | 115                  | 8.00             | 32.50                    |
| 4   | 2745.75     | 38.7 AV                 | 54.0           | -15.3       | 1.26 H             | 115                  | 6.20             | 32.50                    |
| 5   | 3661.00     | 43.9 PK                 | 74.0           | -30.1       | 1.45 H             | 312                  | 9.40             | 34.50                    |
| 6   | 3661.00     | 42.1 AV                 | 54.0           | -11.9       | 1.45 H             | 312                  | 7.60             | 34.50                    |
| 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     | 52.2 PK                 | 74.0           | -21.8       | 1.49 V             | 99                   | 22.80            | 29.40                    |
| 2   | 1830.50     | 50.4 AV                 | 54.0           | -3.6        | 1.49 V             | 99                   | 21.00            | 29.40                    |
| 3   | 2745.75     | 40.7 PK                 | 74.0           | -33.3       | 1.00 V             | 83                   | 8.20             | 32.50                    |
| 4   | 2745.75     | 38.9 AV                 | 54.0           | -15.1       | 1.00 V             | 83                   | 6.40             | 32.50                    |
| 5   | 3661.00     | 44.1 PK                 | 74.0           | -29.9       | 1.33 V             | 43                   | 9.60             | 34.50                    |
| 6   | 3661.00     | 42.3 AV                 | 54.0           | -11.7       | 1.33 V             | 43                   | 7.80             | 34.50                    |

**REMARKS:**

- Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- The other emission levels were very low against the limit.
- Margin value = Emission level – Limit value.
- 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 21 for plotted duty.



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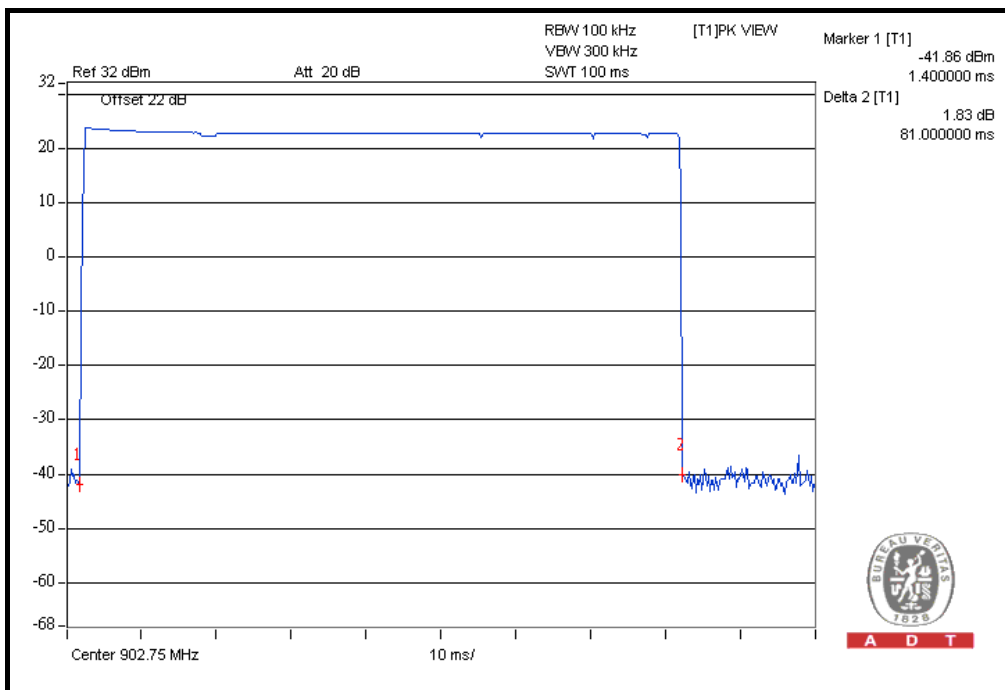
| EUT TEST CONDITION       |                 | MEASUREMENT DETAIL |                           |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL                  | Channel 49      | FREQUENCY RANGE    | 1 ~ 25GHz                 |
| INPUT POWER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

| 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     | 49.6 PK                 | 74.0           | -24.4       | 1.04 H             | 66                   | 20.10            | 29.50                    |
| 2   | 1854.50     | 47.8 AV                 | 54.0           | -6.2        | 1.04 H             | 66                   | 18.30            | 29.50                    |
| 3   | 2781.75     | 40.2 PK                 | 74.0           | -33.8       | 1.28 H             | 113                  | 7.60             | 32.60                    |
| 4   | 2781.75     | 38.4 AV                 | 54.0           | -15.6       | 1.28 H             | 113                  | 5.80             | 32.60                    |
| 5   | 3709.00     | 43.5 PK                 | 74.0           | -30.5       | 1.47 H             | 317                  | 8.80             | 34.70                    |
| 6   | 3709.00     | 41.7 AV                 | 54.0           | -12.3       | 1.47 H             | 317                  | 7.00             | 34.70                    |
| 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     | 51.3 PK                 | 74.0           | -22.7       | 1.44 V             | 100                  | 21.80            | 29.50                    |
| 2   | 1854.50     | 49.5 AV                 | 54.0           | -4.5        | 1.44 V             | 100                  | 20.00            | 29.50                    |
| 3   | 2781.75     | 40.2 PK                 | 74.0           | -33.8       | 1.00 V             | 80                   | 7.60             | 32.60                    |
| 4   | 2781.75     | 38.4 AV                 | 54.0           | -15.6       | 1.00 V             | 80                   | 5.80             | 32.60                    |
| 5   | 3709.00     | 43.7 PK                 | 74.0           | -30.3       | 1.37 V             | 46                   | 9.00             | 34.70                    |
| 6   | 3709.00     | 41.9 AV                 | 54.0           | -12.1       | 1.37 V             | 46                   | 7.20             | 34.70                    |

**REMARKS:**

- Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- The other emission levels were very low against the limit.
- Margin value = Emission level – Limit value.
- 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 21 for plotted duty.



$$20 \log (\text{Duty cycle}) = 20 \log (81 \text{ ms} / 100 \text{ ms}) = -1.8 \text{ dB}$$

### 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 | 25deg. C, 65%RH | TESTED BY          | Anderson Hong |

| 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   | 165.73      | 35.7 QP                 | 43.5           | -7.8        | 1.50 H             | 158                  | 22.00            | 13.70                    |
| 2   | 231.70      | 37.3 QP                 | 46.0           | -8.7        | 1.50 H             | 3                    | 24.90            | 12.40                    |
| 3   | 338.42      | 42.8 QP                 | 46.0           | -3.2        | 1.00 H             | 146                  | 26.90            | 15.90                    |
| 4   | 435.44      | 39.5 QP                 | 46.0           | -6.5        | 1.50 H             | 131                  | 21.10            | 18.40                    |
| 5   | 629.48      | 41.7 QP                 | 46.0           | -4.3        | 1.25 H             | 136                  | 19.20            | 22.50                    |
| 6   | 726.50      | 39.8 QP                 | 46.0           | -6.2        | 1.00 H             | 43                   | 16.40            | 23.40                    |
| 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   | 53.18       | 28.8 QP                 | 40.0           | -11.2       | 1.00 V             | 118                  | 15.00            | 13.80                    |
| 2   | 132.74      | 30.1 QP                 | 43.5           | -13.4       | 1.00 V             | 1                    | 17.10            | 13.00                    |
| 3   | 189.01      | 29.6 QP                 | 43.5           | -13.9       | 1.00 V             | 195                  | 17.60            | 12.00                    |
| 4   | 338.42      | 33.7 QP                 | 46.0           | -12.3       | 1.00 V             | 102                  | 17.80            | 15.90                    |
| 5   | 450.97      | 33.7 QP                 | 46.0           | -12.3       | 1.00 V             | 75                   | 14.90            | 18.80                    |
| 6   | 629.48      | 33.5 QP                 | 46.0           | -12.5       | 1.00 V             | 298                  | 11.00            | 22.50                    |

- 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 | 25deg. C, 65%RH | TESTED BY          | Anderson Hong |

| 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   | 165.73        | 36.2 QP                 | 43.5           | -7.3        | 1.50 H             | 151                  | 22.50            | 13.70                    |
| 2   | 231.70        | 35.9 QP                 | 46.0           | -10.1       | 1.25 H             | 7                    | 23.50            | 12.40                    |
| 3   | <b>338.42</b> | <b>43.0 QP</b>          | <b>46.0</b>    | <b>-3.0</b> | <b>1.00 H</b>      | <b>148</b>           | <b>27.10</b>     | <b>15.90</b>             |
| 4   | 435.44        | 39.5 QP                 | 46.0           | -6.5        | 1.50 H             | 131                  | 21.10            | 18.40                    |
| 5   | 629.48        | 42.2 QP                 | 46.0           | -3.8        | 1.25 H             | 18                   | 19.70            | 22.50                    |
| 6   | 726.50        | 39.9 QP                 | 46.0           | -6.1        | 1.00 H             | 45                   | 16.50            | 23.40                    |
| 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   | 51.24         | 27.9 QP                 | 40.0           | -12.1       | 1.00 V             | 104                  | 13.90            | 14.00                    |
| 2   | 132.74        | 29.6 QP                 | 43.5           | -13.9       | 1.00 V             | 157                  | 16.60            | 13.00                    |
| 3   | 189.01        | 29.2 QP                 | 43.5           | -14.3       | 1.00 V             | 13                   | 17.20            | 12.00                    |
| 4   | 338.42        | 32.9 QP                 | 46.0           | -13.1       | 1.00 V             | 102                  | 17.00            | 15.90                    |
| 5   | 435.44        | 32.5 QP                 | 46.0           | -13.5       | 1.50 V             | 104                  | 14.10            | 18.40                    |
| 6   | 629.48        | 33.2 QP                 | 46.0           | -12.8       | 1.25 V             | 75                   | 10.70            | 22.50                    |

- 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 | 25deg. C, 65%RH | TESTED BY          | Anderson Hong |

| 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   | 165.73      | 34.9 QP                 | 43.5           | -8.6        | 1.50 H             | 127                  | 21.20            | 13.70                    |
| 2   | 227.82      | 36.6 QP                 | 46.0           | -9.4        | 1.00 H             | 3                    | 24.40            | 12.20                    |
| 3   | 338.42      | 42.9 QP                 | 46.0           | -3.1        | 1.00 H             | 148                  | 27.00            | 15.90                    |
| 4   | 435.44      | 39.8 QP                 | 46.0           | -6.2        | 1.50 H             | 128                  | 21.40            | 18.40                    |
| 5   | 629.48      | 41.6 QP                 | 46.0           | -4.4        | 1.00 H             | 135                  | 19.10            | 22.50                    |
| 6   | 726.50      | 40.1 QP                 | 46.0           | -5.9        | 1.00 H             | 44                   | 16.70            | 23.40                    |

| 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   | 53.18       | 27.1 QP                 | 40.0           | -12.9       | 1.00 V             | 97                   | 13.30            | 13.80                    |
| 2   | 132.74      | 29.6 QP                 | 43.5           | -13.9       | 1.00 V             | 161                  | 16.60            | 13.00                    |
| 3   | 266.63      | 27.7 QP                 | 46.0           | -18.3       | 1.25 V             | 86                   | 14.10            | 13.60                    |
| 4   | 338.42      | 33.5 QP                 | 46.0           | -12.5       | 1.00 V             | 109                  | 17.60            | 15.90                    |
| 5   | 450.97      | 28.3 QP                 | 46.0           | -17.7       | 1.00 V             | 75                   | 9.50             | 18.80                    |
| 6   | 629.48      | 33.7 QP                 | 46.0           | -12.3       | 1.00 V             | 79                   | 11.20            | 22.50                    |

- 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. 23, 2011       | Nov. 22, 2012           |
| RF signal cable<br>Woken                | 5D-FB                    | Cable-HYC01-01 | Dec. 29, 2011       | Dec. 28, 2012           |
| LISN<br>ROHDE & SCHWARZ<br>(Peripheral) | ESH3-Z5                  | 100312         | Jul. 02, 2012       | Jul. 01, 2013           |
| LISN<br>ROHDE & SCHWARZ<br>(EUT)        | ESH3-Z5                  | 835239/001     | Feb. 07, 2012       | Feb. 06, 2013           |
| Software<br>ADT                         | BV ADT_Cond_<br>V7.3.7.3 | 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.

#### 4.2.3 TEST PROCEDURES

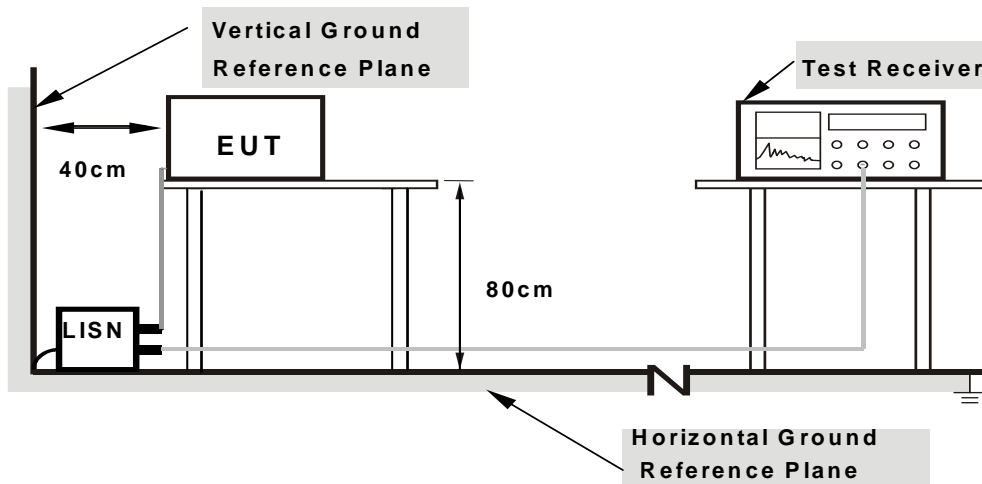
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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

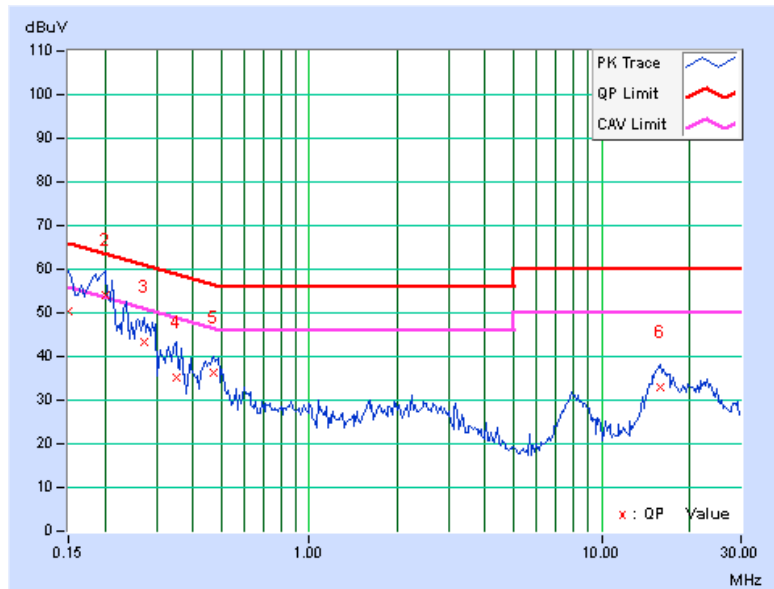
### CONDUCTED WORST-CASE DATA

|       |        |               |      |
|-------|--------|---------------|------|
| PHASE | Line 1 | 6dB BANDWIDTH | 9kHz |
|-------|--------|---------------|------|

| No | Freq.<br>[MHz] | Corr. Factor<br>(dB) | Reading Value |       | Emission Level |       | Limit     |       | Margin |        |
|----|----------------|----------------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
|    |                |                      | [dB (uV)]     |       | [dB (uV)]      |       | [dB (uV)] |       | (dB)   |        |
|    |                |                      | Q.P.          | AV.   | Q.P.           | AV.   | Q.P.      | AV.   | Q.P.   | AV.    |
| 1  | 0.15000        | 0.11                 | 50.20         | 36.88 | 50.31          | 36.99 | 66.00     | 56.00 | -15.69 | -19.01 |
| 2  | 0.20078        | 0.13                 | 53.86         | 35.75 | 53.99          | 35.88 | 63.58     | 53.58 | -9.59  | -17.70 |
| 3  | 0.27109        | 0.13                 | 43.24         | 27.14 | 43.37          | 27.27 | 61.08     | 51.08 | -17.71 | -23.81 |
| 4  | 0.34922        | 0.13                 | 35.16         | 21.08 | 35.29          | 21.21 | 58.98     | 48.98 | -23.69 | -27.77 |
| 5  | 0.47031        | 0.14                 | 36.02         | 28.12 | 36.16          | 28.26 | 56.51     | 46.51 | -20.35 | -18.25 |
| 6  | 15.85938       | 0.95                 | 31.83         | 25.81 | 32.78          | 26.76 | 60.00     | 50.00 | -27.22 | -23.24 |

#### REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.

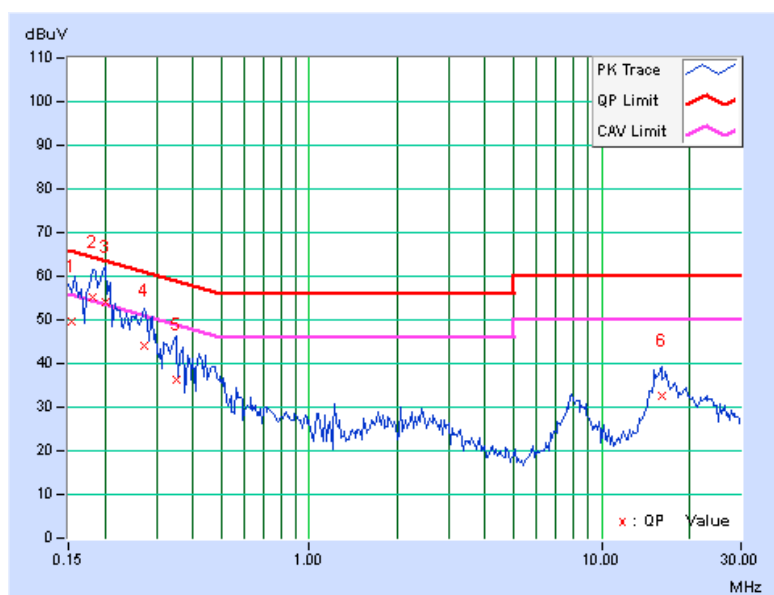


|       |        |               |      |
|-------|--------|---------------|------|
| PHASE | Line 2 | 6dB BANDWIDTH | 9kHz |
|-------|--------|---------------|------|

| No       | Freq.<br>[MHz] | Corr. Factor<br>(dB) | Reading Value |              | Emission Level |              | Limit        |              | Margin       |               |
|----------|----------------|----------------------|---------------|--------------|----------------|--------------|--------------|--------------|--------------|---------------|
|          |                |                      | [dB (uV)]     |              | [dB (uV)]      |              | [dB (uV)]    |              | (dB)         |               |
|          |                |                      | Q.P.          | AV.          | Q.P.           | AV.          | Q.P.         | AV.          | Q.P.         | AV.           |
| 1        | 0.15399        | 0.13                 | 49.45         | 35.79        | 49.58          | 35.92        | 65.78        | 55.78        | -16.21       | -19.87        |
| <b>2</b> | <b>0.18125</b> | <b>0.13</b>          | <b>55.04</b>  | <b>39.43</b> | <b>55.17</b>   | <b>39.56</b> | <b>64.43</b> | <b>54.43</b> | <b>-9.25</b> | <b>-14.86</b> |
| 3        | 0.20078        | 0.14                 | 54.00         | 36.05        | 54.14          | 36.19        | 63.58        | 53.58        | -9.44        | -17.39        |
| 4        | 0.27109        | 0.14                 | 43.97         | 28.19        | 44.11          | 28.33        | 61.08        | 51.08        | -16.97       | -22.75        |
| 5        | 0.34922        | 0.15                 | 36.33         | 22.23        | 36.48          | 22.38        | 58.98        | 48.98        | -22.50       | -26.60        |
| 6        | 16.06250       | 0.82                 | 31.86         | 25.78        | 32.68          | 26.60        | 60.00        | 50.00        | -27.32       | -23.40        |

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



## 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.

If you have any comments, please feel free to contact us at the following:

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**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.

## **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 ---**