

## FCC Test Report

**Report No.:** RF140707C54I-4

**FCC ID:** M82-UTX-3115

**Test Model:** UTX-3115

**Series Model:** UTX-3115XXXXXXXXXXXXXXXXXX, UTX3115XXXXXXXXXXXXXXXXXX ("X" can be 0-9 or A-Z or blank or any alphanumeric character), HPE Edgeline EL10

**Received Date:** Jun. 18, 2014

**Test Date:** Mar. 22, 2016 (For radiated emission above 1GHz test)

Aug. 30 ~ Oct. 03, 2016 (For radiated emission below 1GHz and power line conducted emission Tests)

**Issued Date:** Oct. 03, 2016

**Applicant:** ADVANTECH CO., LTD

**Address:** No. 1, Alley 20, Lane 26, Rueiguang Rd, Neihu District, Taipei, Taiwan 114

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)



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### Release Control Record

| Issue No.      | Description      | Date Issued   |
|----------------|------------------|---------------|
| RF140707C54I-4 | Original release | Oct. 03, 2016 |

## 1 Certificate of Conformity

**Product:** COMPUTER

**Brand:** Advantech, Hewlett Packard Enterprise

**Test Model:** UTX-3115

**Series Model:** UTX-3115XXXXXXXXXXXXXXXXXX, UTX3115XXXXXXXXXXXXXXXXXX ("X" can be 0-9 or A-Z or blank or any alphanumeric character), HPE Edgeline EL10

**Sample Status:** Engineering sample

**Applicant:** ADVANTECH CO., LTD

**Test Date:** Mar. 22, 2016 (For radiated emission above 1GHz test)  
Aug. 30 ~ Oct. 03, 2016 (For radiated emission below 1GHz and power line conducted emission Tests)

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.10:2013

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

**Prepared by :** Celine Chou , **Date:** Oct. 03, 2016  
Celine Chou / Specialist

**Approved by :** Ken Liu , **Date:** Oct. 03, 2016  
Ken Liu / Senior Manager

## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart C (Section 15.247) |                                                                                                               |        |                                                                                  |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------|
| FCC Clause                                     | Test Item                                                                                                     | Result | Remarks                                                                          |
| 15.207                                         | AC Power Conducted Emission                                                                                   | Pass   | Meet the requirement of limit. Minimum passing margin is -14.40dB at 0.15000MHz. |
| 15.247(a)(1)(iii)                              | Number of Hopping Frequency Used                                                                              | NA     | Refer to Note below.                                                             |
| 15.247(a)(1)(iii)                              | Dwell Time on Each Channel                                                                                    | NA     | Refer to Note below.                                                             |
| 15.247(a)(1)                                   | 1. Hopping Channel Separation<br>2. Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System | NA     | Refer to Note below.                                                             |
| 15.247(b)                                      | Maximum Peak Output Power                                                                                     | NA     | Refer to Note below.                                                             |
| 15.205 / 15.209 / 15.247(d)                    | Radiated Emissions and Band Edge Measurement                                                                  | Pass   | Meet the requirement of limit. Minimum passing margin is -3.1dB at 30.00MHz.     |
| 15.247(d)                                      | Antenna Port Emission                                                                                         | NA     | Refer to Note below.                                                             |
| 15.203                                         | Antenna Requirement                                                                                           | Pass   | Antenna connector is SMA (M) not a standard connector.                           |

Note: Test items for conducted and radiated emission test were performed for this report. Other testing data please refer to module (Brand: Intel, Model: 7260HMW, FCC ID: PD97260H) Report.

### 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        | Expanded Uncertainty (k=2) (±) |
|-------------------------------------|------------------|--------------------------------|
| Conducted Emissions at mains ports0 | 150kHz ~ 30MHz   | 2.44 dB                        |
| Radiated Emissions up to 1 GHz      | 30MHz ~ 200MHz   | 3.63 dB                        |
|                                     | 200MHz ~ 1000MHz | 3.64 dB                        |
| Radiated Emissions above 1 GHz      | 1GHz ~ 18GHz     | 2.29 dB                        |
|                                     | 18GHz ~ 40GHz    | 2.29 dB                        |

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

|                       |                                                                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Product               | COMPUTER                                                                                                                                |
| Brand                 | Advantech, Hewlett Packard Enterprise                                                                                                   |
| Test Model            | UTX-3115                                                                                                                                |
| Series Model          | UTX-3115XXXXXXXXXXXXXXXXXX, UTX3115XXXXXXXXXXXXXXXXXX ("X" can be 0-9 or A-Z or blank or any alphanumeric character), HPE Edgeline EL10 |
| Model Difference      | Refer to Note                                                                                                                           |
| Status of EUT         | Engineering sample                                                                                                                      |
| Power Supply Rating   | 12Vdc from Adapter                                                                                                                      |
| Modulation Type       | GFSK, $\pi/4$ -DQPSK, 8DPSK                                                                                                             |
| Modulation Technology | FHSS                                                                                                                                    |
| Transfer Rate         | 1/2/3Mbps                                                                                                                               |
| Operating Frequency   | 2402 ~ 2480MHz                                                                                                                          |
| Number of Channel     | 79                                                                                                                                      |
| Antenna Type          | Dipole antenna with 2.98dBi gain                                                                                                        |
| Antenna Connector     | SMA (M)                                                                                                                                 |
| Accessory Device      | Refer to note                                                                                                                           |
| Data Cable Supplied   | NA                                                                                                                                      |

Note:

1. This report is prepared for FCC class II permissive change
2. This report is issued as a supplementary report to the original BV ADT report no.: RF140707C54D-4. The differences compared with original report are adding components, only radiated emission and power line conducted emission had been tested for this addendum.
3. All models are listed as below.

| Brand                      | Model                                                                                     | Difference             |
|----------------------------|-------------------------------------------------------------------------------------------|------------------------|
| Advantech                  | UTX-3115XXXXXXXXXXXXXXXXXX ("X" can be 0-9 or A-Z or blank or any alphanumeric character) | For marketing purpose. |
|                            | UTX3115XXXXXXXXXXXXXXXXXX ("X" can be 0-9 or A-Z or blank or any alphanumeric character)  |                        |
| Hewlett Packard Enterprise | HPE Edgeline EL10                                                                         |                        |

\* Model UTX-3115 was chosen for final test.

4. The EUT uses the following components. (New components are marked in boldface.)

| Part         | Specification                                                                                                                                                             | Vendor           | Model                    |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|--------------------------|
| Main board   | -                                                                                                                                                                         | Advantech        | AIMB-115                 |
| Memory       | DDR3L 4GB                                                                                                                                                                 | Apacer           | PC3-1066 CL9             |
| SSD          | 32GB                                                                                                                                                                      | Plextor          | PX-32G5Le-72             |
|              | <b>64GB</b>                                                                                                                                                               | <b>Plextor</b>   | <b>PX-64G5Le-72</b>      |
|              | <b>64GB</b>                                                                                                                                                               | <b>Liteon</b>    | <b>PZ8-CC064</b>         |
|              | <b>64GB</b>                                                                                                                                                               | <b>Advantech</b> | <b>SQF-S25M4-64G-S9E</b> |
|              | <b>64GB</b>                                                                                                                                                               | <b>Transcend</b> | <b>96FD25-S064-TR7</b>   |
| CPU          | 1.4GHz                                                                                                                                                                    | Intel            | ATOM E3826               |
| 3G Module    | -                                                                                                                                                                         | Telit            | HE910                    |
| Wi-Fi Module | -                                                                                                                                                                         | Intel            | 7260HMW                  |
| Adapter 1    | I/P: 100-240Vac, 50-60Hz, 1.5A<br>O/P: 12Vdc, 3A<br>DC: 1.5m cable with one core attached on adapter<br>AC: 1.8m shielded cable without core                              | FSP              | FSP036-RAB               |
| Adapter 2    | <b>I/P: 100-240Vac, 50-60Hz, 1.2A</b><br><b>O/P: 12Vdc, 3A</b><br><b>DC: 1.45m cable with one core attached on adapter</b><br><b>AC: 1.8m shielded cable without core</b> | <b>FSP</b>       | <b>FSP036-RBBN2</b>      |

### 3.2 Description of Test Modes

79 channels are provided to this EUT:

| Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 0       | 2402        | 20      | 2422        | 40      | 2442        | 60      | 2462        |
| 1       | 2403        | 21      | 2423        | 41      | 2443        | 61      | 2463        |
| 2       | 2404        | 22      | 2424        | 42      | 2444        | 62      | 2464        |
| 3       | 2405        | 23      | 2425        | 43      | 2445        | 63      | 2465        |
| 4       | 2406        | 24      | 2426        | 44      | 2446        | 64      | 2466        |
| 5       | 2407        | 25      | 2427        | 45      | 2447        | 65      | 2467        |
| 6       | 2408        | 26      | 2428        | 46      | 2448        | 66      | 2468        |
| 7       | 2409        | 27      | 2429        | 47      | 2449        | 67      | 2469        |
| 8       | 2410        | 28      | 2430        | 48      | 2450        | 68      | 2470        |
| 9       | 2411        | 29      | 2431        | 49      | 2451        | 69      | 2471        |
| 10      | 2412        | 30      | 2432        | 50      | 2452        | 70      | 2472        |
| 11      | 2413        | 31      | 2433        | 51      | 2453        | 71      | 2473        |
| 12      | 2414        | 32      | 2434        | 52      | 2454        | 72      | 2474        |
| 13      | 2415        | 33      | 2435        | 53      | 2455        | 73      | 2475        |
| 14      | 2416        | 34      | 2436        | 54      | 2456        | 74      | 2476        |
| 15      | 2417        | 35      | 2437        | 55      | 2457        | 75      | 2477        |
| 16      | 2418        | 36      | 2438        | 56      | 2458        | 76      | 2478        |
| 17      | 2419        | 37      | 2439        | 57      | 2459        | 77      | 2479        |
| 18      | 2420        | 38      | 2440        | 58      | 2460        | 78      | 2480        |
| 19      | 2421        | 39      | 2441        | 59      | 2461        |         |             |

### 3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT CONFIGURE MODE | APPLICABLE TO |       |     | DESCRIPTION                               |
|--------------------|---------------|-------|-----|-------------------------------------------|
|                    | RE $\geq$ 1G  | RE<1G | PLC |                                           |
| A                  | √             | √     | √   | Powered by adapter 1 + Plextor SSD (32GB) |
| B                  | -             | √     | √   | Powered by adapter 2 + Liteon SSD (64GB)  |

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz & Bandedge Measurement  
**RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission  
**APCM**: Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

#### **Radiated Emission Test (Above 1GHz):**

- ☒ 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 TECHNOLOGY | MODULATION TYPE | PACKET TYPE |
|--------------------|-------------------|----------------|-----------------------|-----------------|-------------|
| A                  | 0 to 78           | 0, 39, 78      | FHSS                  | GFSK            | DH5         |
| A                  | 0 to 78           | 0, 39, 78      | FHSS                  | 8DPSK           | DH5         |

#### **Radiated Emission Test (Below 1GHz):**

- ☒ 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 TECHNOLOGY | MODULATION TYPE | PACKET TYPE |
|--------------------|-------------------|----------------|-----------------------|-----------------|-------------|
| A, B               | 0 to 78           | 0              | FHSS                  | GFSK            | DH5         |

#### **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 TECHNOLOGY | MODULATION TYPE | PACKET TYPE |
|--------------------|-------------------|----------------|-----------------------|-----------------|-------------|
| A, B               | 0 to 78           | 0              | FHSS                  | GFSK            | DH5         |

### Test Condition:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS           | INPUT POWER  | TESTED BY            |
|---------------|------------------------------------|--------------|----------------------|
| RE $\geq$ 1G  | 22deg. C, 66%RH                    | 120Vac, 60Hz | Tank Wu              |
| RE $<$ 1G     | 20deg. C, 69%RH<br>25deg. C, 69%RH | 120Vac, 60Hz | Bond Tseng           |
| PLC           | 25deg. C, 75%RH<br>20deg. C, 69%RH | 120Vac, 60Hz | Chris Lin<br>Bayu Wu |

### 3.3 Description of Support Units

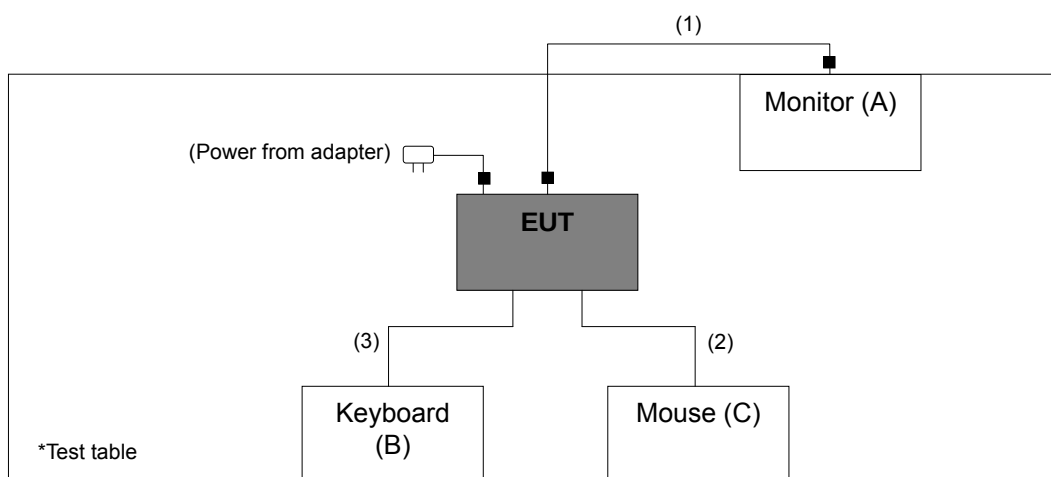
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| ID | Product  | Brand   | Model No. | Serial No.                   | FCC ID           | Remarks |
|----|----------|---------|-----------|------------------------------|------------------|---------|
| A. | Monitor  | Samsung | 173v      | N/A                          | FCC DoC Approved | -       |
| B. | Mouse    | DELL    | MS-111T   | CN-0KW2YH-71616-2<br>8H-0L30 | N/A              | -       |
| C. | Keyboard | WINTEK  | WM700     | 20110700000                  | N/A              | -       |

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

| ID | Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|----|--------------|------|------------|--------------------|--------------|---------|
| 1. | D-Sub        | 1    | 1.8        | Y                  | 2            | -       |
| 2. | USB          | 1    | 1.8        | Y                  | 0            | -       |
| 3. | USB          | 1    | 1.8        | Y                  | 0            | -       |

#### 3.3.1 Configuration of System under Test



### 3.4 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)**

**FCC Public Notice DA 00-705**

ANSI C63.10-2013

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

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

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

| Frequencies<br>(MHz) | Field Strength<br>(microvolts/meter) | Measurement Distance<br>(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.

#### 4.1.2 Test Instruments

| Description & Manufacturer           | Model No.                    | Serial No.                      | Cal. Date     | Cal. Due      |
|--------------------------------------|------------------------------|---------------------------------|---------------|---------------|
| Test Receiver<br>ROHDE & SCHWARZ     | ESCS30                       | 100289                          | Dec. 23, 2015 | Dec. 22, 2016 |
| Spectrum Analyzer<br>ROHDE & SCHWARZ | FSP40                        | 100269                          | Apr. 19, 2015 | Apr. 18, 2016 |
|                                      |                              |                                 | Apr. 19, 2016 | Apr. 18, 2017 |
| BILOG Antenna<br>SCHWARZBECK         | VULB9168                     | 9168-148                        | Jan. 18, 2016 | Jan. 17, 2017 |
| HORN Antenna<br>SCHWARZBECK          | BBHA 9120 D                  | 9120D-1169                      | Jan. 08, 2016 | Jan. 07, 2017 |
| HORN Antenna<br>SCHWARZBECK          | BBHA 9170                    | BBHA9170241                     | Jan. 18, 2016 | Jan. 17, 2017 |
| Loop Antenna                         | EM-6879                      | 269                             | Aug. 11, 2015 | Aug. 10, 2016 |
|                                      |                              |                                 | Aug. 11, 2016 | Aug. 10, 2017 |
| Preamplifier<br>Agilent              | 8449B                        | 3008A01911                      | Aug. 09, 2015 | Aug. 08, 2016 |
|                                      |                              |                                 | Aug. 09, 2016 | Aug. 08, 2017 |
| Preamplifier<br>Agilent              | 8447D                        | 2944A10638                      | Aug. 09, 2015 | Aug. 08, 2016 |
|                                      |                              |                                 | Aug. 09, 2016 | Aug. 08, 2017 |
| RF signal cable<br>HUBER+SUHNER      | SUCOFLEX 104                 | CABLE-CH9-02(309222<br>+248780) | Aug. 09, 2015 | Aug. 08, 2016 |
|                                      |                              |                                 | Aug. 09, 2016 | Aug. 08, 2017 |
| RF signal cable<br>HUBER+SUHNER      | SUCOFLEX 104                 | CABLE-CH9-03(274092<br>)        | Aug. 09, 2015 | Aug. 08, 2016 |
|                                      |                              |                                 | Aug. 09, 2016 | Aug. 08, 2017 |
| RF signal cable<br>Woken             | 8D-FB                        | Cable-CH9-01                    | Aug. 09, 2015 | Aug. 08, 2016 |
|                                      |                              |                                 | Aug. 09, 2016 | Aug. 08, 2017 |
| Software<br>BV ADT                   | ADT_Radiated_<br>V7.6.15.9.4 | 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>BV ADT       | AT100                        | AT93021705                      | NA            | NA            |
| Turn Table<br>BV ADT                 | TT100                        | TT93021705                      | NA            | NA            |
| Turn Table Controller<br>BV ADT      | SC100                        | SC93021705                      | 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 preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 215374.
  5. The IC Site Registration No. is IC 7450F-9.

#### 4.1.3 Test Procedures

##### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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 Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

##### Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

##### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

##### Note:

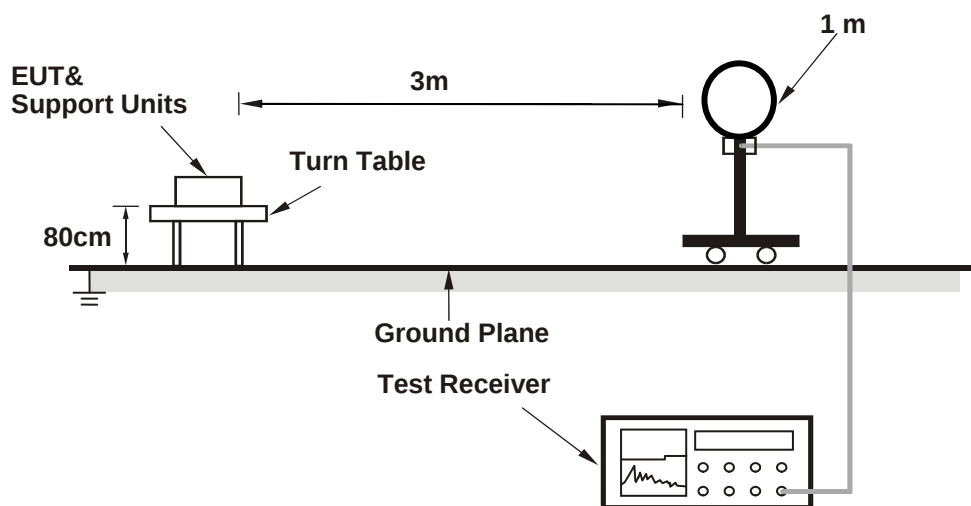
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

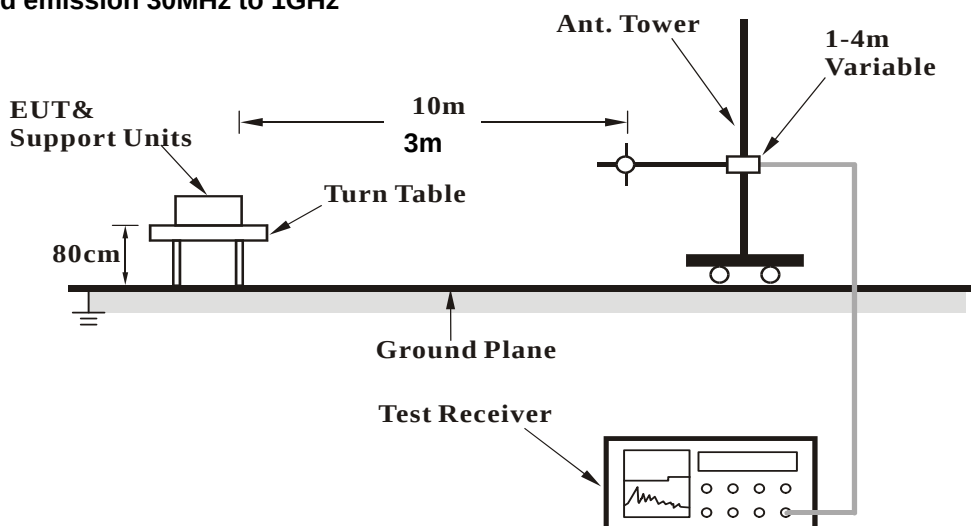
No deviation.

#### 4.1.5 Test Set Up

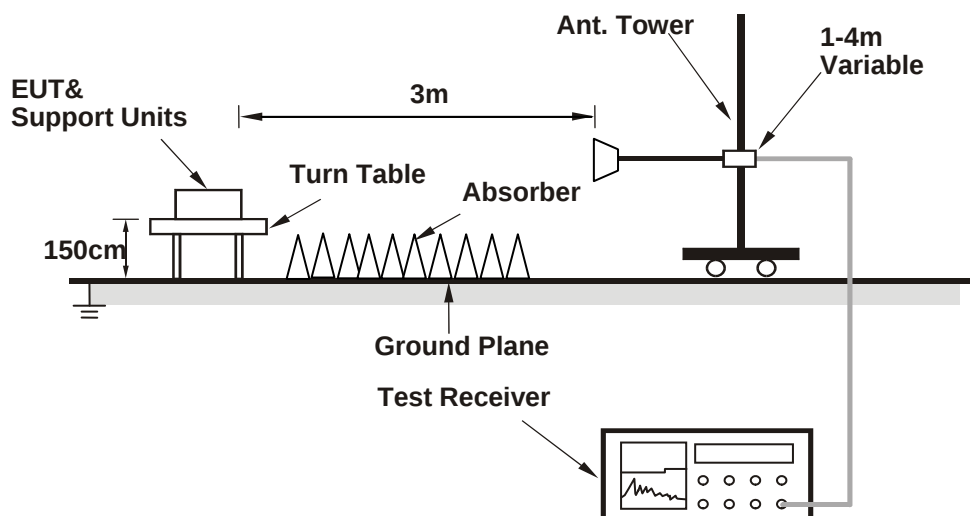
##### For Radiated emission below 30MHz



##### For Radiated emission 30MHz to 1GHz



### For Radiated emission above 1GHz



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

#### 4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- The EUT ran a test program (provided by manufacturer) to enable itself under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

Above 1GHz Data:

GFSK

|                 |              |                      |              |
|-----------------|--------------|----------------------|--------------|
| CHANNEL         | TX Channel 0 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                |                               |                   |                |                          |                            |                        |                                |
|-----------------------------------------------------|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | 2390.00        | 53.2 PK                       | 74.0              | -20.8          | 1.15 H                   | 312                        | 55.60                  | -2.40                          |
| 2                                                   | 2390.00        | 40.2 AV                       | 54.0              | -13.8          | 1.15 H                   | 312                        | 42.60                  | -2.40                          |
| 3                                                   | #2400.00       | 51.8 PK                       | 74.0              | -22.2          | 1.16 H                   | 128                        | 54.00                  | -2.20                          |
| 4                                                   | #2400.00       | 21.7 AV                       | 54.0              | -32.3          | 1.16 H                   | 128                        | 23.90                  | -2.20                          |
| 5                                                   | *2402.00       | 96.8 PK                       |                   |                | 1.16 H                   | 128                        | 64.70                  | 32.10                          |
| 6                                                   | *2402.00       | 66.7 AV                       |                   |                | 1.16 H                   | 128                        | 34.60                  | 32.10                          |
| 7                                                   | 4804.00        | 47.8 PK                       | 74.0              | -26.2          | 1.26 H                   | 39                         | 41.30                  | 6.50                           |
| 8                                                   | 4804.00        | 17.7 AV                       | 54.0              | -36.3          | 1.26 H                   | 39                         | 11.20                  | 6.50                           |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                |                               |                   |                |                          |                            |                        |                                |
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | 2390.00        | 55.6 PK                       | 74.0              | -18.4          | 1.25 V                   | 97                         | 58.00                  | -2.40                          |
| 2                                                   | 2390.00        | 40.2 AV                       | 54.0              | -13.8          | 1.25 V                   | 97                         | 42.60                  | -2.40                          |
| 3                                                   | #2400.00       | 59.8 PK                       | 74.0              | -14.2          | 1.42 V                   | 298                        | 62.00                  | -2.20                          |
| 4                                                   | #2400.00       | 29.7 AV                       | 54.0              | -24.3          | 1.42 V                   | 298                        | 31.90                  | -2.20                          |
| 5                                                   | *2402.00       | 104.8 PK                      |                   |                | 1.42 V                   | 298                        | 72.70                  | 32.10                          |
| 6                                                   | *2402.00       | 74.7 AV                       |                   |                | 1.42 V                   | 298                        | 42.60                  | 32.10                          |
| 7                                                   | 4804.00        | 47.0 PK                       | 74.0              | -27.0          | 1.06 V                   | 228                        | 40.50                  | 6.50                           |
| 8                                                   | 4804.00        | 16.9 AV                       | 54.0              | -37.1          | 1.06 V                   | 228                        | 10.40                  | 6.50                           |

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
5. " \* ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

|                 |               |          |              |
|-----------------|---------------|----------|--------------|
| CHANNEL         | TX Channel 39 | DETECTOR | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  | FUNCTION | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                |                               |                   |                |                          |                            |                        |                                |
|-----------------------------------------------------|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2441.00       | 97.1 PK                       |                   |                | 1.28 H                   | 153                        | 64.90                  | 32.20                          |
| 2                                                   | *2441.00       | 67.0 AV                       |                   |                | 1.28 H                   | 153                        | 34.80                  | 32.20                          |
| 3                                                   | 4882.00        | 47.5 PK                       | 74.0              | -26.5          | 1.62 H                   | 35                         | 40.90                  | 6.60                           |
| 4                                                   | 4882.00        | 17.4 AV                       | 54.0              | -36.6          | 1.62 H                   | 35                         | 10.80                  | 6.60                           |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                |                               |                   |                |                          |                            |                        |                                |
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2441.00       | 107.1 PK                      |                   |                | 1.35 V                   | 282                        | 74.90                  | 32.20                          |
| 2                                                   | *2441.00       | 77.0 AV                       |                   |                | 1.35 V                   | 282                        | 44.80                  | 32.20                          |
| 3                                                   | 4882.00        | 49.5 PK                       | 74.0              | -24.5          | 1.39 V                   | 64                         | 42.90                  | 6.60                           |
| 4                                                   | 4882.00        | 19.4 AV                       | 54.0              | -34.6          | 1.39 V                   | 64                         | 12.80                  | 6.60                           |

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.

|                 |               |          |              |
|-----------------|---------------|----------|--------------|
| CHANNEL         | TX Channel 78 | DETECTOR | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  | FUNCTION | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                |                               |                   |                |                          |                            |                        |                                |
|-----------------------------------------------------|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2480.00       | 96.8 PK                       |                   |                | 1.16 H                   | 222                        | 64.40                  | 32.40                          |
| 2                                                   | *2480.00       | 66.7 AV                       |                   |                | 1.16 H                   | 222                        | 34.30                  | 32.40                          |
| 3                                                   | 2483.50        | 51.8 PK                       | 74.0              | -22.2          | 1.16 H                   | 222                        | 53.80                  | -2.00                          |
| 4                                                   | 2483.50        | 21.7 AV                       | 54.0              | -32.3          | 1.16 H                   | 222                        | 23.70                  | -2.00                          |
| 5                                                   | 4960.00        | 45.5 PK                       | 74.0              | -28.5          | 1.36 H                   | 98                         | 38.70                  | 6.80                           |
| 6                                                   | 4960.00        | 15.4 AV                       | 54.0              | -38.6          | 1.36 H                   | 98                         | 8.60                   | 6.80                           |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                |                               |                   |                |                          |                            |                        |                                |
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2480.00       | 106.2 PK                      |                   |                | 1.29 V                   | 187                        | 73.80                  | 32.40                          |
| 2                                                   | *2480.00       | 76.1 AV                       |                   |                | 1.29 V                   | 187                        | 43.70                  | 32.40                          |
| 3                                                   | 2483.50        | 61.2 PK                       | 74.0              | -12.8          | 1.29 V                   | 187                        | 63.20                  | -2.00                          |
| 4                                                   | 2483.50        | 31.1 AV                       | 54.0              | -22.9          | 1.29 V                   | 187                        | 33.10                  | -2.00                          |
| 5                                                   | 4960.00        | 48.1 PK                       | 74.0              | -25.9          | 1.39 V                   | 68                         | 41.30                  | 6.80                           |
| 6                                                   | 4960.00        | 18.0 AV                       | 54.0              | -36.0          | 1.39 V                   | 68                         | 11.20                  | 6.80                           |

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.

# 8DPSK

|                 |              |                      |              |
|-----------------|--------------|----------------------|--------------|
| CHANNEL         | TX Channel 0 | DETECTOR<br>FUNCTION | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz |                      | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                |                               |                   |                |                          |                            |                        |                                |
|-----------------------------------------------------|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | 2390.00        | 49.9 PK                       | 74.0              | -24.1          | 1.24 H                   | 150                        | 52.30                  | -2.40                          |
| 2                                                   | 2390.00        | 38.1 AV                       | 54.0              | -15.9          | 1.24 H                   | 150                        | 40.50                  | -2.40                          |
| 3                                                   | *2402.00       | 89.7 PK                       |                   |                | 1.29 H                   | 144                        | 57.60                  | 32.10                          |
| 4                                                   | *2402.00       | 59.6 AV                       |                   |                | 1.29 H                   | 144                        | 27.50                  | 32.10                          |
| 5                                                   | 2483.50        | 44.7 PK                       | 74.0              | -29.3          | 1.29 H                   | 144                        | 46.70                  | -2.00                          |
| 6                                                   | 2483.50        | 14.6 AV                       | 54.0              | -39.4          | 1.29 H                   | 144                        | 16.60                  | -2.00                          |
| 7                                                   | 4804.00        | 46.8 PK                       | 74.0              | -27.2          | 1.55 H                   | 206                        | 40.30                  | 6.50                           |
| 8                                                   | 4804.00        | 16.7 AV                       | 54.0              | -37.3          | 1.55 H                   | 206                        | 10.20                  | 6.50                           |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                |                               |                   |                |                          |                            |                        |                                |
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | 2390.00        | 53.2 PK                       | 74.0              | -20.8          | 1.28 V                   | 260                        | 55.60                  | -2.40                          |
| 2                                                   | 2390.00        | 40.2 AV                       | 54.0              | -13.8          | 1.28 V                   | 260                        | 42.60                  | -2.40                          |
| 3                                                   | #2400.00       | 52.0 PK                       | 74.0              | -22.0          | 1.25 V                   | 156                        | 54.20                  | -2.20                          |
| 4                                                   | #2400.00       | 21.9 AV                       | 54.0              | -32.1          | 1.25 V                   | 156                        | 24.10                  | -2.20                          |
| 5                                                   | *2402.00       | 97.0 PK                       |                   |                | 1.25 V                   | 156                        | 64.90                  | 32.10                          |
| 6                                                   | *2402.00       | 66.9 AV                       |                   |                | 1.25 V                   | 156                        | 34.80                  | 32.10                          |
| 7                                                   | 4804.00        | 49.4 PK                       | 74.0              | -24.6          | 1.29 V                   | 64                         | 42.90                  | 6.50                           |
| 8                                                   | 4804.00        | 19.2 AV                       | 54.0              | -34.8          | 1.29 V                   | 64                         | 12.70                  | 6.50                           |

## 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
5. " \* ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

|                 |               |          |              |
|-----------------|---------------|----------|--------------|
| CHANNEL         | TX Channel 39 | DETECTOR | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  | FUNCTION | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                |                               |                   |                |                          |                            |                        |                                |
|-----------------------------------------------------|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2441.00       | 90.7 PK                       |                   |                | 1.30 H                   | 320                        | 58.50                  | 32.20                          |
| 2                                                   | *2441.00       | 60.6 AV                       |                   |                | 1.30 H                   | 320                        | 28.40                  | 32.20                          |
| 3                                                   | 4882.00        | 46.8 PK                       | 74.0              | -27.2          | 1.22 H                   | 56                         | 40.20                  | 6.60                           |
| 4                                                   | 4882.00        | 16.7 AV                       | 54.0              | -37.3          | 1.22 H                   | 56                         | 10.10                  | 6.60                           |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                |                               |                   |                |                          |                            |                        |                                |
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2441.00       | 100.1 PK                      |                   |                | 1.40 V                   | 290                        | 67.90                  | 32.20                          |
| 2                                                   | *2441.00       | 70.0 AV                       |                   |                | 1.40 V                   | 290                        | 37.80                  | 32.20                          |
| 3                                                   | 4882.00        | 48.9 PK                       | 74.0              | -25.1          | 1.36 V                   | 98                         | 42.30                  | 6.60                           |
| 4                                                   | 4882.00        | 18.8 AV                       | 54.0              | -35.2          | 1.36 V                   | 98                         | 12.20                  | 6.60                           |

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.

|                 |               |          |              |
|-----------------|---------------|----------|--------------|
| CHANNEL         | TX Channel 78 | DETECTOR | Peak (PK)    |
| FREQUENCY RANGE | 1GHz ~ 25GHz  | FUNCTION | Average (AV) |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                |                               |                   |                |                          |                            |                        |                                |
|-----------------------------------------------------|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2480.00       | 91.2 PK                       |                   |                | 1.30 H                   | 320                        | 58.80                  | 32.40                          |
| 2                                                   | *2480.00       | 61.1 AV                       |                   |                | 1.30 H                   | 320                        | 28.70                  | 32.40                          |
| 3                                                   | 2483.50        | 46.2 PK                       | 74.0              | -27.8          | 1.28 H                   | 318                        | 48.20                  | -2.00                          |
| 4                                                   | 2483.50        | 16.1 AV                       | 54.0              | -37.9          | 1.28 H                   | 318                        | 18.10                  | -2.00                          |
| 5                                                   | 4960.00        | 47.3 PK                       | 74.0              | -26.7          | 1.26 H                   | 39                         | 40.50                  | 6.80                           |
| 6                                                   | 4960.00        | 17.2 AV                       | 54.0              | -36.8          | 1.26 H                   | 39                         | 10.40                  | 6.80                           |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                |                               |                   |                |                          |                            |                        |                                |
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | *2480.00       | 99.3 PK                       |                   |                | 1.40 V                   | 300                        | 66.90                  | 32.40                          |
| 2                                                   | *2480.00       | 69.2 AV                       |                   |                | 1.40 V                   | 300                        | 36.80                  | 32.40                          |
| 3                                                   | 2483.50        | 54.3 PK                       | 74.0              | -19.7          | 1.38 V                   | 295                        | 56.30                  | -2.00                          |
| 4                                                   | 2483.50        | 24.2 AV                       | 54.0              | -29.8          | 1.38 V                   | 295                        | 26.20                  | -2.00                          |
| 5                                                   | 4960.00        | 49.0 PK                       | 74.0              | -25.0          | 1.30 V                   | 56                         | 42.20                  | 6.80                           |
| 6                                                   | 4960.00        | 18.9 AV                       | 54.0              | -35.1          | 1.30 V                   | 56                         | 12.10                  | 6.80                           |

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.

Below 1GHz worst-case data:

GFSK

|                 |              |                   |                 |
|-----------------|--------------|-------------------|-----------------|
| CHANNEL         | TX Channel 0 | DETECTOR FUNCTION | Quasi-Peak (QP) |
| FREQUENCY RANGE | 9kHz ~ 1GHz  |                   |                 |
| TEST MODE       | A            |                   |                 |

| 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                                                   | 30.00        | 31.2 QP                 | 40.0           | -8.8        | 1.49 H             | 234                  | 46.8             | -15.6                    |
| 2                                                   | 82.38        | 30.8 QP                 | 40.0           | -9.2        | 1.99 H             | 239                  | 49.2             | -18.4                    |
| 3                                                   | 111.48       | 25.5 QP                 | 43.5           | -18.0       | 1.24 H             | 110                  | 42.3             | -16.8                    |
| 4                                                   | 132.82       | 26.1 QP                 | 43.5           | -17.4       | 1.99 H             | 233                  | 40.7             | -14.6                    |
| 5                                                   | 441.28       | 32.0 QP                 | 46.0           | -14.0       | 1.24 H             | 42                   | 39.8             | -7.8                     |
| 6                                                   | 901.06       | 41.6 QP                 | 46.0           | -4.4        | 1.00 H             | 211                  | 38.6             | 3.0                      |
| 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) |
| <b>1</b>                                            | <b>30.00</b> | <b>36.9 QP</b>          | <b>40.0</b>    | <b>-3.1</b> | <b>1.49 V</b>      | <b>10</b>            | <b>52.5</b>      | <b>-15.6</b>             |
| 2                                                   | 109.54       | 31.0 QP                 | 43.5           | -12.5       | 1.00 V             | 301                  | 48.1             | -17.1                    |
| 3                                                   | 206.54       | 28.3 QP                 | 43.5           | -15.2       | 1.00 V             | 112                  | 44.3             | -16.0                    |
| 4                                                   | 253.10       | 25.4 QP                 | 46.0           | -20.6       | 1.24 V             | 132                  | 38.6             | -13.2                    |
| 5                                                   | 433.52       | 33.1 QP                 | 46.0           | -12.9       | 1.99 V             | 31                   | 41.0             | -7.9                     |
| 6                                                   | 903.00       | 40.8 QP                 | 46.0           | -5.2        | 1.49 V             | 4                    | 37.8             | 3.0                      |

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

|                 |              |                      |                 |
|-----------------|--------------|----------------------|-----------------|
| CHANNEL         | TX Channel 0 | DETECTOR<br>FUNCTION | Quasi-Peak (QP) |
| FREQUENCY RANGE | 9kHz ~ 1GHz  |                      |                 |
| TEST MODE       | B            |                      |                 |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |                |                               |                   |                |                          |                            |                        |                                |
|-----------------------------------------------------|----------------|-------------------------------|-------------------|----------------|--------------------------|----------------------------|------------------------|--------------------------------|
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | 30.00          | 28.6 QP                       | 40.0              | -11.4          | 1.01 H                   | 15                         | 44.2                   | -15.6                          |
| 2                                                   | 78.50          | 23.6 QP                       | 40.0              | -16.4          | 1.50 H                   | 272                        | 41.2                   | -17.6                          |
| 3                                                   | 158.04         | 24.0 QP                       | 43.5              | -19.5          | 2.00 H                   | 88                         | 37.3                   | -13.3                          |
| 4                                                   | 249.22         | 25.7 QP                       | 46.0              | -20.3          | 1.25 H                   | 156                        | 39.1                   | -13.4                          |
| 5                                                   | 499.48         | 29.0 QP                       | 46.0              | -17.0          | 1.01 H                   | 225                        | 35.5                   | -6.5                           |
| 6                                                   | 835.10         | 42.1 QP                       | 46.0              | -3.9           | 1.01 H                   | 6                          | 40.7                   | 1.4                            |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |                |                               |                   |                |                          |                            |                        |                                |
| NO.                                                 | FREQ.<br>(MHz) | EMISSION<br>LEVEL<br>(dBuV/m) | LIMIT<br>(dBuV/m) | MARGIN<br>(dB) | ANTENNA<br>HEIGHT<br>(m) | TABLE<br>ANGLE<br>(Degree) | RAW<br>VALUE<br>(dBuV) | CORRECTION<br>FACTOR<br>(dB/m) |
| 1                                                   | 33.88          | 35.1 QP                       | 40.0              | -4.9           | 1.25 V                   | 107                        | 50.5                   | -15.4                          |
| 2                                                   | 76.56          | 29.7 QP                       | 40.0              | -10.3          | 1.00 V                   | 312                        | 47.0                   | -17.3                          |
| 3                                                   | 158.04         | 20.6 QP                       | 43.5              | -22.9          | 1.00 V                   | 301                        | 33.9                   | -13.3                          |
| 4                                                   | 256.98         | 27.1 QP                       | 46.0              | -18.9          | 2.00 V                   | 309                        | 40.2                   | -13.1                          |
| 5                                                   | 499.48         | 29.7 QP                       | 46.0              | -16.3          | 1.50 V                   | 160                        | 36.2                   | -6.5                           |
| 6                                                   | 835.10         | 41.0 QP                       | 46.0              | -5.0           | 1.00 V                   | 7                          | 39.6                   | 1.4                            |

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

## 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

| Frequency (MHz) | Conducted Limit (dBuV) |         |
|-----------------|------------------------|---------|
|                 | Quasi-peak             | Average |
| 0.15 - 0.5      | 66 - 56                | 56 - 46 |
| 0.50 - 5.0      | 56                     | 46      |
| 5.0 - 30.0      | 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 0.50MHz.

### 4.2.2 Test Instruments

| Description & Manufacturer                  | Model No.                | Serial No.     | Cal. Date     | Cal. Due      |
|---------------------------------------------|--------------------------|----------------|---------------|---------------|
| Test Receiver<br>ROHDE & SCHWARZ            | ESCI                     | 100613         | Nov. 16, 2015 | Nov. 15, 2016 |
| RF signal cable (with 10dB PAD)<br>Woken    | 5D-FB                    | Cable-cond1-01 | Dec. 26, 2015 | Dec. 25, 2016 |
| LISN/AMN<br>ROHDE & SCHWARZ<br>(EUT)        | ESH3-Z5                  | 835239/001     | Feb. 26, 2016 | Feb. 25, 2017 |
| LISN/AMN<br>ROHDE & SCHWARZ<br>(Peripheral) | ESH3-Z5                  | 100220         | Nov. 13, 2015 | Nov. 12, 2016 |
| Software<br>ADT                             | BV ADT_Conf_<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

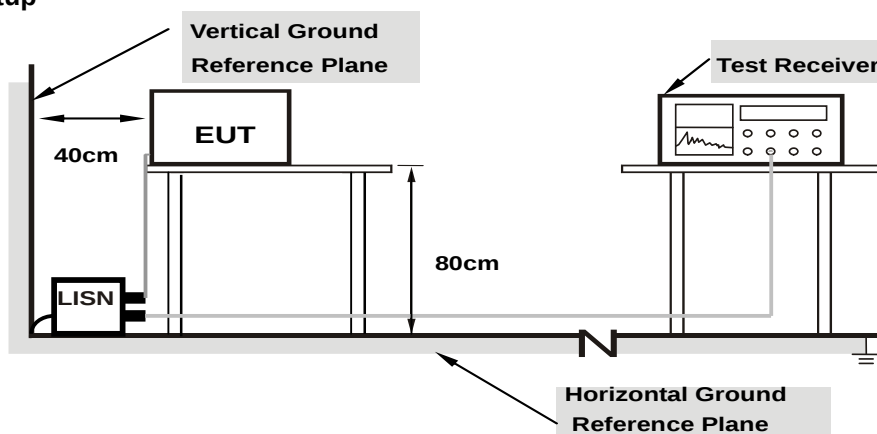
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

**NOTE:** The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

### 4.2.4 Deviation from Test Standard

No deviation.

### 4.2.5 Test Setup



**Note:** 1.Support units were connected to second LISN.

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

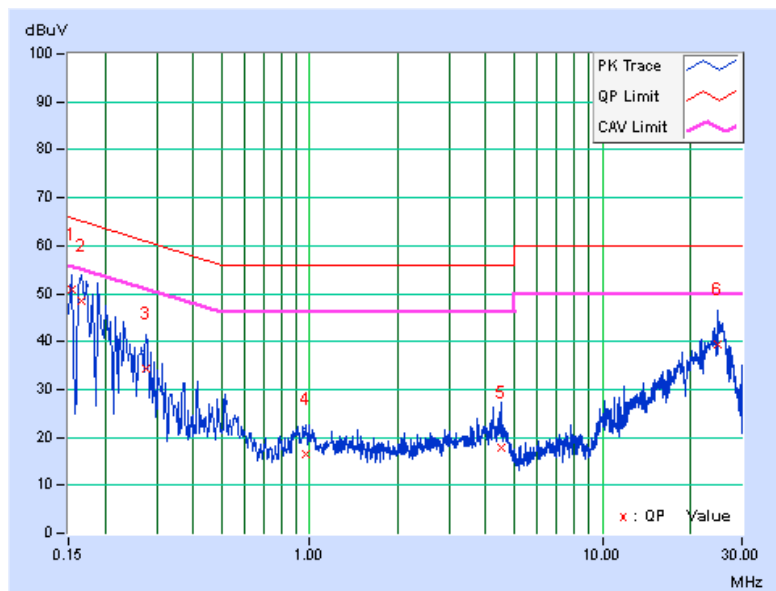
GFSK

| Phase     | Line (L) | Detector Function | Quasi-Peak (QP) / Average (AV) |
|-----------|----------|-------------------|--------------------------------|
| Test Mode | A        |                   |                                |

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |       | Emission Level<br>[dB (uV)] |       | Limit<br>[dB (uV)] |       | Margin<br>(dB) |        |
|----|----------------|-------------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|----------------|--------|
|    |                |                         |                            |       |                             |       |                    |       |                |        |
|    |                |                         | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.           | AV.    |
| 1  | 0.15391        | 10.02                   | 40.87                      | 23.97 | 50.89                       | 33.99 | 65.79              | 55.79 | -14.90         | -21.80 |
| 2  | 0.16569        | 10.02                   | 38.47                      | 20.59 | 48.49                       | 30.61 | 65.17              | 55.17 | -16.68         | -24.56 |
| 3  | 0.27553        | 10.06                   | 24.43                      | 10.97 | 34.49                       | 21.03 | 60.95              | 50.95 | -26.46         | -29.92 |
| 4  | 0.97084        | 10.20                   | 6.45                       | 1.68  | 16.65                       | 11.88 | 56.00              | 46.00 | -39.35         | -34.12 |
| 5  | 4.52920        | 10.44                   | 7.43                       | -1.06 | 17.87                       | 9.38  | 56.00              | 46.00 | -38.13         | -36.62 |
| 6  | 24.87293       | 11.66                   | 27.61                      | 16.87 | 39.27                       | 28.53 | 60.00              | 50.00 | -20.73         | -21.47 |

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.

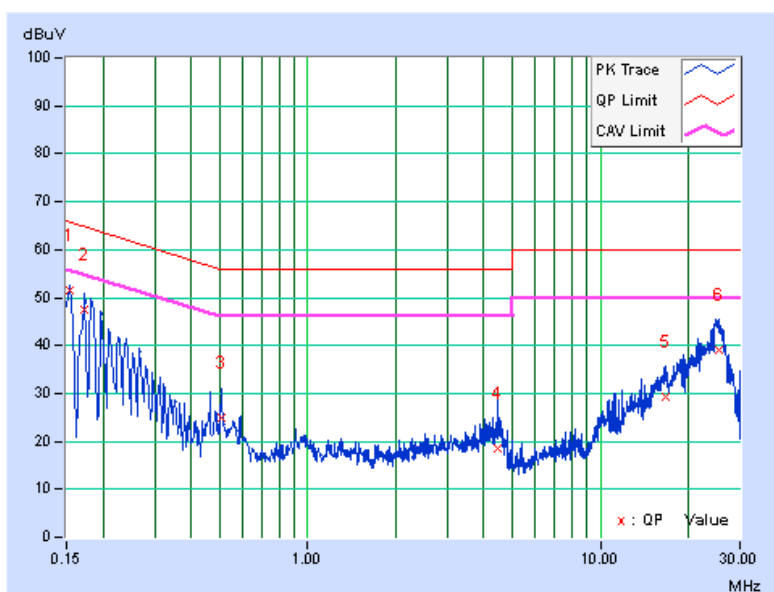


|           |             |                   |                                |
|-----------|-------------|-------------------|--------------------------------|
| Phase     | Neutral (N) | Detector Function | Quasi-Peak (QP) / Average (AV) |
| Test Mode | A           |                   |                                |

| No | Freq.    | Corr. Factor | Reading Value |       | Emission Level |       | Limit     |       | Margin |        |
|----|----------|--------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
|    | [MHz]    |              | [dB (uV)]     |       | [dB (uV)]      |       | [dB (uV)] |       | (dB)   |        |
|    |          |              | Q.P.          | AV.   | Q.P.           | AV.   | Q.P.      | AV.   | Q.P.   | AV.    |
| 1  | 0.15391  | 10.03        | 41.36         | 24.06 | 51.39          | 34.09 | 65.79     | 55.79 | -14.40 | -21.70 |
| 2  | 0.17346  | 10.03        | 37.59         | 21.45 | 47.62          | 31.48 | 64.79     | 54.79 | -17.17 | -23.31 |
| 3  | 0.50581  | 10.14        | 14.61         | 6.47  | 24.75          | 16.61 | 56.00     | 46.00 | -31.25 | -29.39 |
| 4  | 4.47560  | 10.46        | 8.00          | -0.80 | 18.46          | 9.66  | 56.00     | 46.00 | -37.54 | -36.34 |
| 5  | 16.67366 | 11.23        | 18.20         | 10.12 | 29.43          | 21.35 | 60.00     | 50.00 | -30.57 | -28.65 |
| 6  | 25.35777 | 11.85        | 27.20         | 18.09 | 39.05          | 29.94 | 60.00     | 50.00 | -20.95 | -20.06 |

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.

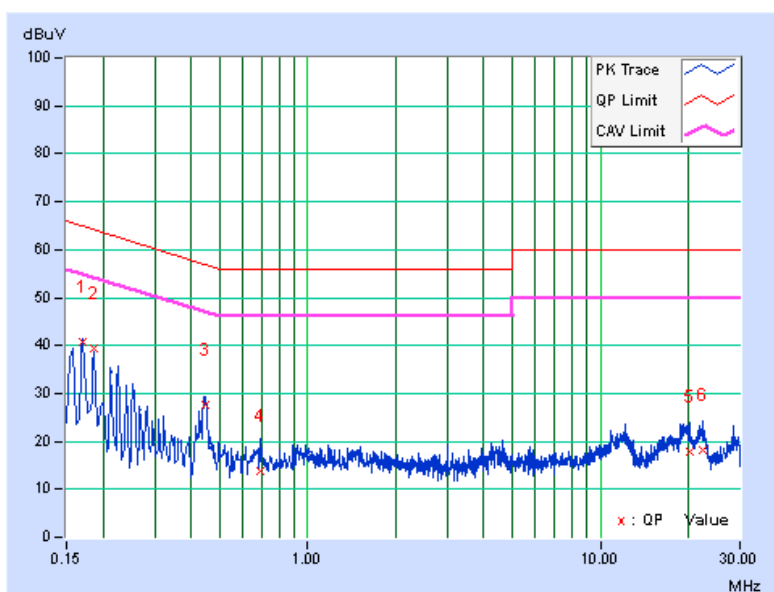


|           |          |                   |                                |
|-----------|----------|-------------------|--------------------------------|
| Phase     | Line (L) | Detector Function | Quasi-Peak (QP) / Average (AV) |
| Test Mode | B        |                   |                                |

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |       | Emission Level<br>[dB (uV)] |       | Limit<br>[dB (uV)] |       | Margin<br>(dB) |        |
|----|----------------|-------------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|----------------|--------|
|    |                |                         |                            |       |                             |       |                    |       |                |        |
|    |                |                         | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.           | AV.    |
| 1  | 0.16955        | 10.02                   | 30.65                      | 15.52 | 40.67                       | 25.54 | 64.98              | 54.98 | -24.31         | -29.44 |
| 2  | 0.18519        | 10.03                   | 29.26                      | 15.15 | 39.29                       | 25.18 | 64.25              | 54.25 | -24.96         | -29.07 |
| 3  | 0.44716        | 10.13                   | 17.62                      | 10.36 | 27.75                       | 20.49 | 56.93              | 46.93 | -29.18         | -26.44 |
| 4  | 0.68958        | 10.16                   | 3.77                       | -1.14 | 13.93                       | 9.02  | 56.00              | 46.00 | -42.07         | -36.98 |
| 5  | 20.29823       | 11.38                   | 6.36                       | 0.63  | 17.74                       | 12.01 | 60.00              | 50.00 | -42.26         | -37.99 |
| 6  | 22.33925       | 11.51                   | 6.62                       | 1.68  | 18.13                       | 13.19 | 60.00              | 50.00 | -41.87         | -36.81 |

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.

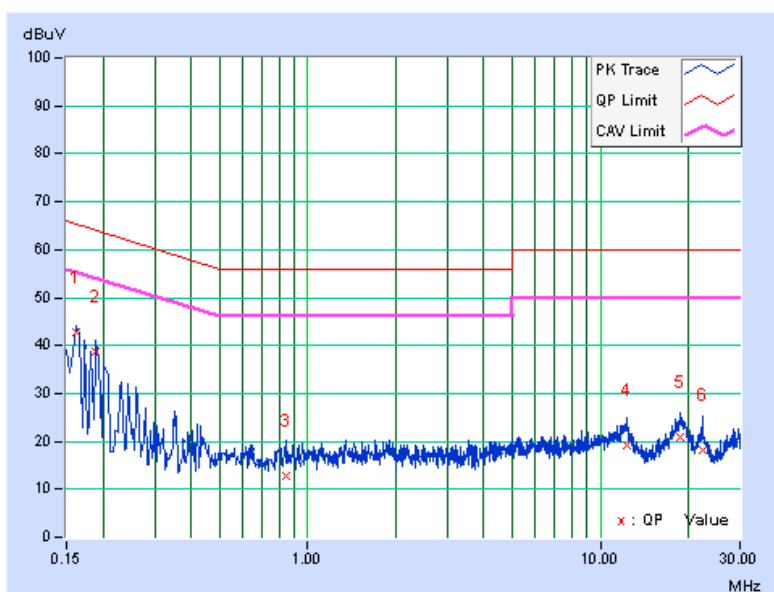


|           |             |                   |                                |
|-----------|-------------|-------------------|--------------------------------|
| Phase     | Neutral (N) | Detector Function | Quasi-Peak (QP) / Average (AV) |
| Test Mode | B           |                   |                                |

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>(dB) | Reading Value<br>[dB (uV)] |       | Emission Level<br>[dB (uV)] |       | Limit<br>[dB (uV)] |       | Margin<br>(dB) |        |
|----|----------------|-------------------------|----------------------------|-------|-----------------------------|-------|--------------------|-------|----------------|--------|
|    |                |                         |                            |       |                             |       |                    |       |                |        |
|    |                |                         | Q.P.                       | AV.   | Q.P.                        | AV.   | Q.P.               | AV.   | Q.P.           | AV.    |
| 1  | 0.16181        | 10.03                   | 32.79                      | 15.57 | 42.82                       | 25.60 | 65.37              | 55.37 | -22.55         | -29.77 |
| 2  | 0.18910        | 10.04                   | 28.78                      | 12.92 | 38.82                       | 22.96 | 64.08              | 54.08 | -25.26         | -31.12 |
| 3  | 0.84598        | 10.19                   | 2.48                       | -1.52 | 12.67                       | 8.67  | 56.00              | 46.00 | -43.33         | -37.33 |
| 4  | 12.32183       | 10.94                   | 8.33                       | 1.47  | 19.27                       | 12.41 | 60.00              | 50.00 | -40.73         | -37.59 |
| 5  | 18.73032       | 11.39                   | 9.54                       | 3.92  | 20.93                       | 15.31 | 60.00              | 50.00 | -39.07         | -34.69 |
| 6  | 22.33925       | 11.64                   | 6.50                       | 1.05  | 18.14                       | 12.69 | 60.00              | 50.00 | -41.86         | -37.31 |

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 Pictures of Test Arrangements

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

## Appendix – Information on the Testing Laboratories

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

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

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