



A D T

# Supplemental “Transmit Simultaneously” Test Report

**REPORT NO.:** RF130725E01A-2

**MODEL NO.:** EA6900 V1.1

**FCC ID:** Q87-EA6900V11

**RECEIVED:** July 26, 2013

**TESTED:** July 26, 2013 to Jan. 20, 2014

**ISSUED:** Feb. 17, 2014

**APPLICANT:** Linksys LLC

**ADDRESS:** 131 Theory Drive Irvine California 92617 United States

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

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

**TEST LOCATION (1):** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

**TEST LOCATION (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

## Table of Contents

|                                                              |    |
|--------------------------------------------------------------|----|
| RELEASE CONTROL RECORD .....                                 | 3  |
| 1. CERTIFICATION .....                                       | 4  |
| 2. SUMMARY OF TEST RESULTS.....                              | 5  |
| 2.1 MEASUREMENT UNCERTAINTY .....                            | 6  |
| 3. GENERAL INFORMATION .....                                 | 7  |
| 3.1 GENERAL DESCRIPTION OF EUT .....                         | 7  |
| 3.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:.....  | 11 |
| 3.3 DESCRIPTION OF SUPPORT UNITS .....                       | 13 |
| 3.4 CONFIGURATION OF SYSTEM UNDER TEST.....                  | 14 |
| 4. TEST TYPES AND RESULTS.....                               | 16 |
| 4.1 CONDUCTED EMISSION MEASUREMENT.....                      | 16 |
| 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT.....          | 16 |
| 4.1.2 TEST INSTRUMENTS.....                                  | 16 |
| 4.1.3 TEST PROCEDURES .....                                  | 17 |
| 4.1.4 DEVIATION FROM TEST STANDARD.....                      | 17 |
| 4.1.5 TEST SETUP .....                                       | 18 |
| 4.1.6 EUT OPERATING CONDITIONS.....                          | 18 |
| 4.1.7 TEST RESULTS (MODE 1).....                             | 19 |
| 4.1.8 TEST RESULTS (MODE 2).....                             | 21 |
| 4.2 RADIATED EMISSION MEASUREMENT.....                       | 23 |
| 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT.....           | 23 |
| 4.2.2 TEST INSTRUMENTS.....                                  | 24 |
| 4.2.3 TEST PROCEDURES .....                                  | 25 |
| 4.2.4 DEVIATION FROM TEST STANDARD.....                      | 25 |
| 4.2.5 TEST SETUP .....                                       | 26 |
| 4.2.6 EUT OPERATING CONDITIONS.....                          | 26 |
| 4.2.7 TEST RESULTS .....                                     | 27 |
| 4.3 CONDUCTED OUT-BAND EMISSION MEASUREMENT.....             | 29 |
| 4.3.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT..... | 29 |
| 4.3.2 TEST INSTRUMENTS.....                                  | 29 |
| 4.3.3 TEST PROCEDURE.....                                    | 29 |
| 4.3.4 DEVIATION FROM TEST STANDARD.....                      | 30 |
| 4.3.5 TEST SETUP .....                                       | 30 |
| 4.3.6 EUT OPERATING CONDITION .....                          | 30 |
| 4.3.7 TEST RESULTS .....                                     | 30 |
| 5. INFORMATION ON THE TESTING LABORATORIES .....             | 32 |



A D T

## RELEASE CONTROL RECORD

| ISSUE NO.      | REASON FOR CHANGE | DATE ISSUED   |
|----------------|-------------------|---------------|
| RF130725E01A-2 | Original release  | Feb. 17, 2014 |



A D T

## 1. CERTIFICATION

**PRODUCT :** Linksys Smart Wi-Fi Router AC1900  
**BRAND NAME :** Linksys  
**MODEL NO. :** EA6900 V1.1  
**TEST ITEM:** ENGINEERING SAMPLE  
**APPLICANT :** Linksys LLC  
**TESTED:** July 26, 2013 to Jan. 20, 2014  
**STANDARDS :** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.10-2009

The above equipment (Model: EA6900 V1.1) 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 :** Phoenix Huang , **DATE:** Feb. 17, 2014  
( Phoenix Huang, Specialist )

**APPROVED BY :** May Chen , **DATE:** Feb. 17, 2014  
( May Chen, Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) |                             |        |                                                                                   |
|-----------------------------------------------------------|-----------------------------|--------|-----------------------------------------------------------------------------------|
| STANDARD SECTION                                          | TEST TYPE                   | RESULT | REMARK                                                                            |
| 15.207                                                    | AC Power Conducted Emission | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -7.50dB at 0.16172MHz |
| 15.247(d)<br>15.209                                       | Radiated Emissions          | PASS   | Meet the requirement of limit.<br>Minimum passing margin is -3.7dB at 45.931MHz   |

## 2.1 MEASUREMENT UNCERTAINTY

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

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

| Measurement                       | Value   |
|-----------------------------------|---------|
| Conducted emissions               | 2.98 dB |
| Radiated emissions (30MHz-1GHz)   | 4.53 dB |
| Radiated emissions (1GHz -6GHz)   | 3.72 dB |
| Radiated emissions (6GHz -18GHz)  | 4.00 dB |
| Radiated emissions (18GHz -40GHz) | 4.11 dB |

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT</b>               | Linksys Smart Wi-Fi Router AC1900                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>MODEL NO.</b>             | EA6900 V1.1                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>POWER SUPPLY</b>          | DC 12V from power adapter                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>MODULATION TYPE</b>       | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM<br>256QAM for OFDM in 11ac mode and 11n (HT40) mode of 2.4GHz Band.                                                                                                                                                                                                                                                                                                         |
| <b>MODULATION TECHNOLOGY</b> | DSSS, OFDM                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>TRANSFER RATE</b>         | 802.11b: up to 11Mbps<br>802.11a / g: up to 54Mbps<br>802.11n: up to 450Mbps(HT40), up to 600Mbps(VHT40)<br>802.11ac: up to 1300Mbps                                                                                                                                                                                                                                                                                                        |
| <b>OPERATING FREQUENCY</b>   | <b>For 15.407</b><br><b>5GHz:</b> 5.18 ~ 5.24GHz<br><b>For 15.247</b><br><b>2.4GHz:</b> 2.412 ~ 2.462GHz<br><b>5GHz:</b> 5.745 ~ 5.825GHz                                                                                                                                                                                                                                                                                                   |
| <b>NUMBER OF CHANNEL</b>     | <b>For 15.407</b><br>4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)<br>2 for 802.11n (HT40), 802.11ac (VHT40)<br>1 for 802.11ac (VHT80)<br><b>For 15.247 (2.4GHz)</b><br>11 for 802.11b, 802.11g, 802.11n(HT20),<br>802.11n_256QAM(VHT20)<br>7 for 802.11n(HT40), 802.11n_256QAM(VHT40)<br><b>For 15.247 (5GHz)</b><br>5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)<br>2 for 802.11n (HT40), 802.11ac (VHT40)<br>1 for 802.11ac (VHT80) |

|                             |                        |
|-----------------------------|------------------------|
| <b>MAXIMUM OUTPUT POWER</b> | Please see NOTE        |
| <b>ANTENNA TYPE</b>         | Please see NOTE        |
| <b>DATA CABLE</b>           | NA                     |
| <b>I/O PORTS</b>            | Refer to user's manual |
| <b>ASSOCIATED DEVICES</b>   | Adapter x1             |

**NOTE:**

1. The EUT is a 2.4GHz & 5GHz WLAN device.
2. The maximum output power table as below table:

2. The maximum output power table as below table.

| MAXIMUM OUTPUT POWER (mW) |         |                  |         |              |                  |         |              |                  |         |              |
|---------------------------|---------|------------------|---------|--------------|------------------|---------|--------------|------------------|---------|--------------|
| 15.247 (2.4GHz)           |         |                  |         |              |                  |         |              |                  |         |              |
| Test Mode                 | 802.11b | 802.11g          |         |              | 802.11n (HT20)   |         |              | 802.11n (HT40)   |         |              |
| 1Tx                       | 497.737 | 454.988          |         |              |                  |         |              |                  |         |              |
| 3Tx                       |         |                  |         |              | CDD              | STBC    | Beam forming | CDD              | STBC    | Beam forming |
|                           |         |                  |         |              | 986.826          | 986.826 | 986.826      | 336.396          | 417.997 | 336.396      |
| 15.247 (5GHz)             |         |                  |         |              |                  |         |              |                  |         |              |
| Test Mode                 | 802.11a | 802.11ac (VHT20) |         |              | 802.11ac (VHT40) |         |              | 802.11ac (VHT80) |         |              |
| 1Tx                       | 409.261 |                  |         |              |                  |         |              |                  |         |              |
| 3Tx                       |         | CDD              | STBC    | Beam forming | CDD              | STBC    | Beam forming | CDD              | STBC    | Beam forming |
|                           |         | 957.686          | 957.686 | 747.871      | 934.916          | 934.916 | 739.090      | 457.400          | 457.400 | 457.400      |
| 15.407                    |         |                  |         |              |                  |         |              |                  |         |              |
| Test Mode                 | 802.11a | 802.11ac (VHT20) |         |              | 802.11ac (VHT40) |         |              | 802.11ac (VHT80) |         |              |
| 1Tx                       | 44.361  |                  |         |              |                  |         |              |                  |         |              |
| 3Tx                       |         | CDD              | STBC    | Beam forming | CDD              | STBC    | Beam forming | CDD              | STBC    | Beam forming |
|                           |         | 44.417           | 44.417  | 44.417       | 45.834           | 45.834  | 45.834       | 40.331           | 47.399  | 40.331       |



3. The EUT has two different RJ45 XFRM Transformer types could be chosen and please refer the below table:

| Type 1(Vendor: MINGTEK) |                                                         |         |          |
|-------------------------|---------------------------------------------------------|---------|----------|
| Vendor P/N              | Different                                               | Vendor  | Location |
| HN1878CG                | TRANSFORMER VARIABLE COILS,DIP,350UH,HN1878CG           | MINGTEK | T1       |
| HN3678CG                | TRANSFORMER VARIABLE COILS,DIP,350UH,HN3678CG           | MINGTEK | T2, T3   |
| Type 2(Vendor: MYJWD)   |                                                         |         |          |
| Vendor P/N              | Different                                               | Vendor  | Location |
| DG18107-1 G             | TRANSFORMER,DIP,350UH,16.8*8.5*1.85MM,18PIN,DG18107-1 G | MYJWD   | T1       |
| DG36005-1 G             | TRANSFORMER,DIP,350UH,32.7*8.5*1.85MM,36PIN             | MYJWD   | T2, T3   |

From the above types, the worst case was found in **Type 2(Vendor: MYJWD)**. Therefore only the test data of the type were recorded in this report.

4. The EUT must be supplied with a power adapter and following two different model names could be chosen:

| No. | Brand | Model No.        | Spec.                                                                                            |
|-----|-------|------------------|--------------------------------------------------------------------------------------------------|
| 1   | Ktec  | KSAS0451200350HU | AC Input : 100-240V, 1.2A, 50-60Hz<br>DC Output : 12V, 3.5A<br>DC output cable(unshielded ,1.5m) |
| 2   | LEI   | MU42-1120350-A1  | AC Input : 100-240V, 1.5A, 50-60Hz<br>DC Output : 12V, 3.5A<br>DC output cable(unshielded ,1.5m) |

From the above adapters, the worst radiated emission was found in **Adapter 2**. Therefore only the test data of the modes were recorded in this report.

5. The antennas provided to the EUT, please refer to the following table:

| Transmitter Circuit  | Brand      | Antenna Type | Peak Gain(dBi)<br>(Include cable loss ) |                                                                   | Connector Type | Cable Loss (dB) | Cable Length (mm) |
|----------------------|------------|--------------|-----------------------------------------|-------------------------------------------------------------------|----------------|-----------------|-------------------|
|                      |            |              | For 2.4GHz<br>(2.4GHz to 2.4835GHz)     | For 5GHz<br>(Band 1: 5.15 to 5.25GHz<br>Band 4: 5.725 to 5.85GHz) |                |                 |                   |
| Right Side Chain (0) | Galtronics | Dipole       | 1.3                                     | 5G Band1: 0.87<br>5G Band4: 1.95                                  | R-SMA          | NA              | 168               |
| In center Chain (1)  | Galtronics | Dipole       | 1.1                                     | 5G Band1: 0.47<br>5G Band4: 1.55                                  | R-SMA          | NA              | 262               |
| Left Side Chain (2)  | Galtronics | Dipole       | 1.1                                     | 5G Band1: 0.47<br>5G Band4: 1.55                                  | R-SMA          | NA              | 260               |

Note: From the above antennas, Chain (0) was selected as representative antenna for the 802.11a/b/g test and its data was recorded in this report.

6. The specifications of EUT listed as below:

| MODULATION MODE  | TX/RX FUNCTION              |
|------------------|-----------------------------|
| 802.11b          | 1TX (Diversity) /3RX        |
| 802.11g          | 1TX (Diversity) /3RX        |
| 802.11n (HT20)   | 3TX/3RX (CDD Mode)          |
|                  | 3TX/3RX (STBC Mode)         |
|                  | 3TX/3RX (Beam forming Mode) |
| 802.11n (HT40)   | 3TX/3RX (CDD Mode)          |
|                  | 3TX/3RX (STBC Mode)         |
|                  | 3TX/3RX (Beam forming Mode) |
| 802.11a          | 1TX (Diversity) /3RX        |
| 802.11ac (VHT20) | 3TX/3RX (CDD Mode)          |
|                  | 3TX/3RX (STBC Mode)         |
|                  | 3TX/3RX (Beam forming Mode) |
| 802.11ac (VHT40) | 3TX/3RX (CDD Mode)          |
|                  | 3TX/3RX (STBC Mode)         |
|                  | 3TX/3RX (Beam forming Mode) |
| 802.11ac (VHT80) | 3TX/3RX (CDD Mode)          |
|                  | 3TX/3RX (STBC Mode)         |
|                  | 3TX/3RX (Beam forming Mode) |

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report.

- When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.
- When the EUT operating in 802.11ac and support 256QAM of VHT40 for 2.4GHz band, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 9.
- The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

| EUT<br>CONFIGURE<br>MODE | APPLICABLE TO |         |                    |    | DESCRIPTION                        |
|--------------------------|---------------|---------|--------------------|----|------------------------------------|
|                          | PLC           | RE < 1G | RE <sup>3</sup> 1G | OB |                                    |
| 1                        | √             | √       | √                  | √  | 3TX configuration (with Adapter 2) |
| 2                        | √             | -       | -                  | -  | 3TX configuration (with Adapter 1) |

Where **PLC**: Power Line Conducted Emission **RE < 1G**: Radiated Emission below 1GHz  
**RE <sup>3</sup> 1G**: Radiated Emission above 1GHz **OB**: Conducted Out-Band Emission Measurement

**NOTE:** 1. “-” means no effect.

2. The EUT had been pre-tested on the positioned of each 2 axis. The radiated emission worst case was found when positioned on **X-plane**

### POWER LINE CONDUCTED EMISSION TEST:

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

| 3TX CONFIGURATION                  |                   |                |                       |                 |                  |
|------------------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| CDD_MODE                           | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| For 2.4 GHz<br>802.11n (HT20)<br>+ | 1 to 11           | 6              | OFDM                  | BPSK            | 6.5              |
| For 5 GHz<br>802.11n (HT20)        | 149 to 165        | 165            | OFDM                  | BPSK            | 6.5              |

### RADIATED EMISSION TEST:

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

| 3TX CONFIGURATION                  |                   |                |                       |                 |                  |
|------------------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| CDD_MODE                           | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| For 2.4 GHz<br>802.11n (HT20)<br>+ | 1 to 11           | 6              | OFDM                  | BPSK            | 6.5              |
| For 5 GHz<br>802.11ac (VHT20)      | 149 to 165        | 165            | OFDM                  | BPSK            | 6.5              |

# **CONDUCTED OUT-BAND EMISSION MEASUREMENT:**

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

| 3TX CONFIGURATION                  |                   |                |                       |                 |                  |
|------------------------------------|-------------------|----------------|-----------------------|-----------------|------------------|
| CDD_MODE                           | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
| For 2.4 GHz<br>802.11n (HT20)<br>+ | 1 to 11           | 6              | OFDM                  | BPSK            | 6.5              |
| For 5 GHz<br>802.11ac (VHT20)      | 149 to 165        | 165            | OFDM                  | BPSK            | 6.5              |

# **TEST CONDITION:**

| APPLICABLE TO      | ENVIRONMENTAL CONDITIONS | INPUT POWER  | TESTED BY    |
|--------------------|--------------------------|--------------|--------------|
| PLC                | 26deg. C, 66%RH          | 120Vac, 60Hz | JyunChun Lin |
| RE<1G              | 22deg. C, 73%RH          | 120Vac, 60Hz | Andy Ho      |
| RE <sup>3</sup> 1G | 21deg. C, 67%RH          | 120Vac, 60Hz | Jason Huang  |
| OB                 | 25deg. C, 60%RH          | 120Vac, 60Hz | Robert Cheng |

### 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.

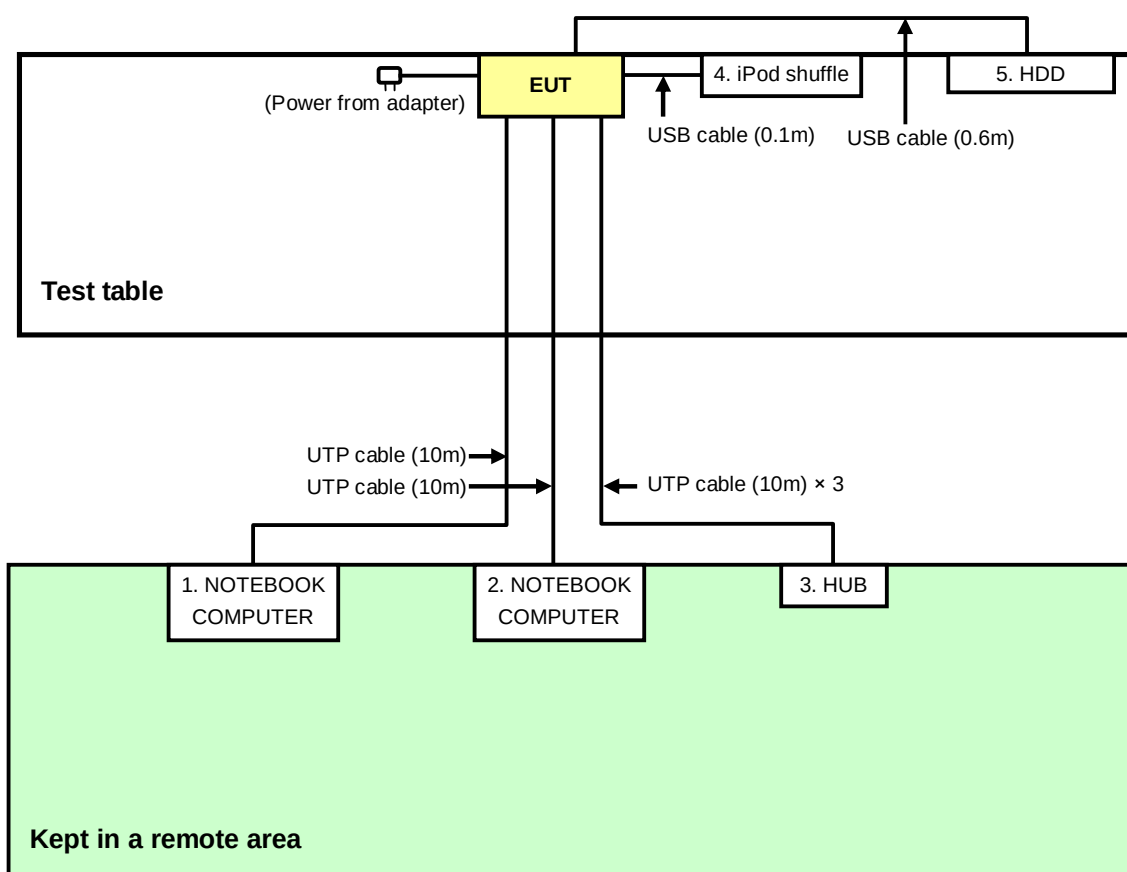
| NO. | PRODUCT                                    | BRAND | MODEL NO.          | SERIAL NO.    | FCC ID  |
|-----|--------------------------------------------|-------|--------------------|---------------|---------|
| 1   | NOTEBOOK COMPUTER                          | DELL  | PP32LA             | FSLB32S       | FCC DoC |
| 2   | NOTEBOOK COMPUTER                          | DELL  | PP32LA             | GSLB32S       | FCC DoC |
| 3   | HUB                                        | ZyXEL | ES-116P            | S060H02000215 | FCC DoC |
| 4   | iPod shuffle                               | Apple | MC749TA/A          | CC4DMFJUDFDM  | NA      |
| 5   | External Hard Drive (for other test items) | WD    | WDBACW0010HBK-SESN | WCAZAL625787  | FCC DoC |
|     | HDD (for conducted test)                   | WD    | WDBACW0010HBK-SESN | WXK1A51E5819  | FCC DoC |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|-----------------------------------------------------|
| 1   | UTP cable, 10m                                      |
| 2   | UTP cable, 10m                                      |
| 3   | UTP cable, 10m                                      |
| 4   | USB cable, 0.1m                                     |
| 5   | USB cable, 0.5m (for other test items)              |
|     | USB cable, 0.6m (for conducted test)                |

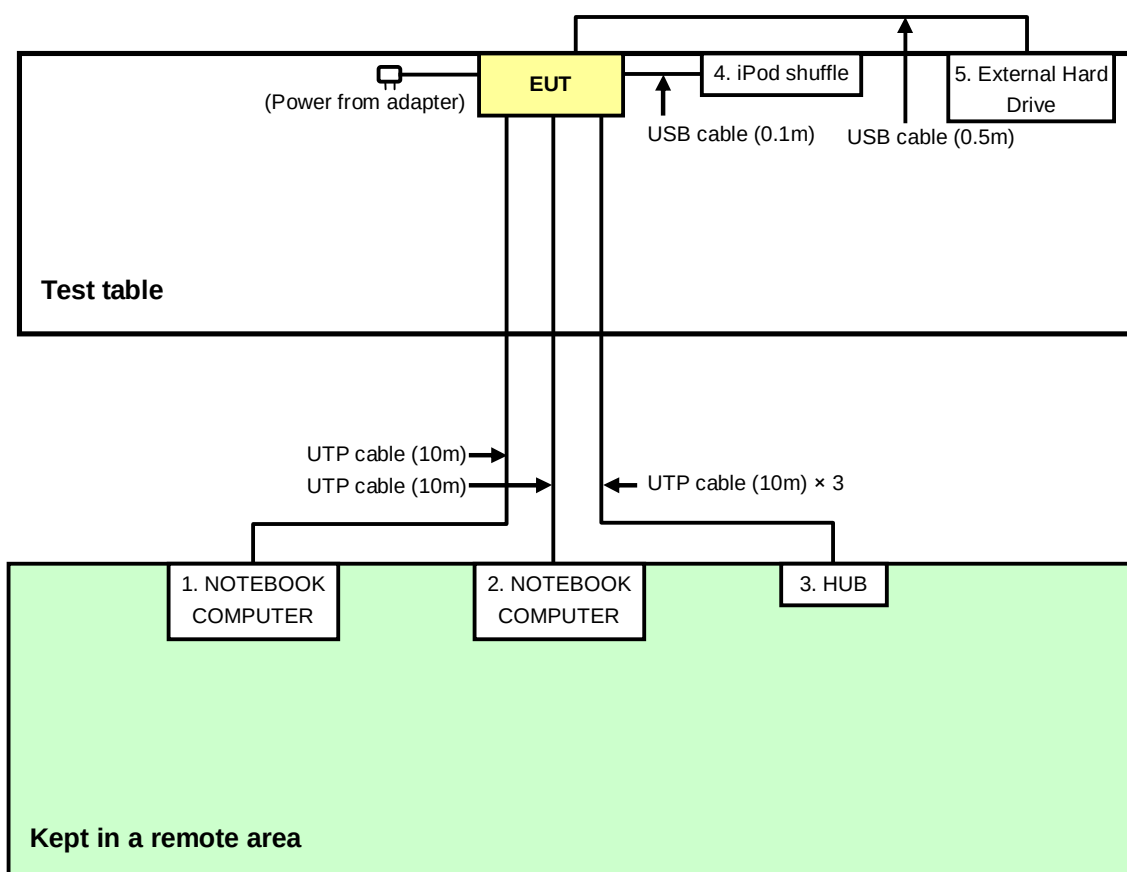
**NOTE:** All power cords of the above support units are non shielded (1.8m).

### 3.4 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission Test:



For other test items:



## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) |          |
|-----------------------------|------------------------|----------|
|                             | 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.

#### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER                                          | MODEL NO.                   | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|---------------------------------------------------------------------|-----------------------------|------------|-----------------|------------------|
| Test Receiver<br>ROHDE & SCHWARZ                                    | ESCS 30                     | 100375     | Mar. 08, 2013   | Mar. 07, 2014    |
| Line-Impedance<br>Stabilization Network<br>(for EUT)<br>SCHWARZBECK | NSLK8127                    | 8127-522   | Sep. 06, 2012   | Sep. 05, 2013    |
| Line-Impedance<br>Stabilization Network<br>(for Peripheral)         | ENV216                      | 100072     | June 07, 2013   | June 06, 2014    |
| RF Cable<br>(JYEBAO)                                                | 5DFB                        | COCCAB-001 | Mar. 11, 2013   | Mar. 10, 2014    |
| 50 ohms Terminator                                                  | 50                          | EMC-3      | Sep. 25, 2012   | Sep. 24, 2013    |
| Software<br>ADT                                                     | BV<br>ADT_Cond_V7.3.7.<br>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 Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: July 26, 2013



#### 4.1.3 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.
- b. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- d. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

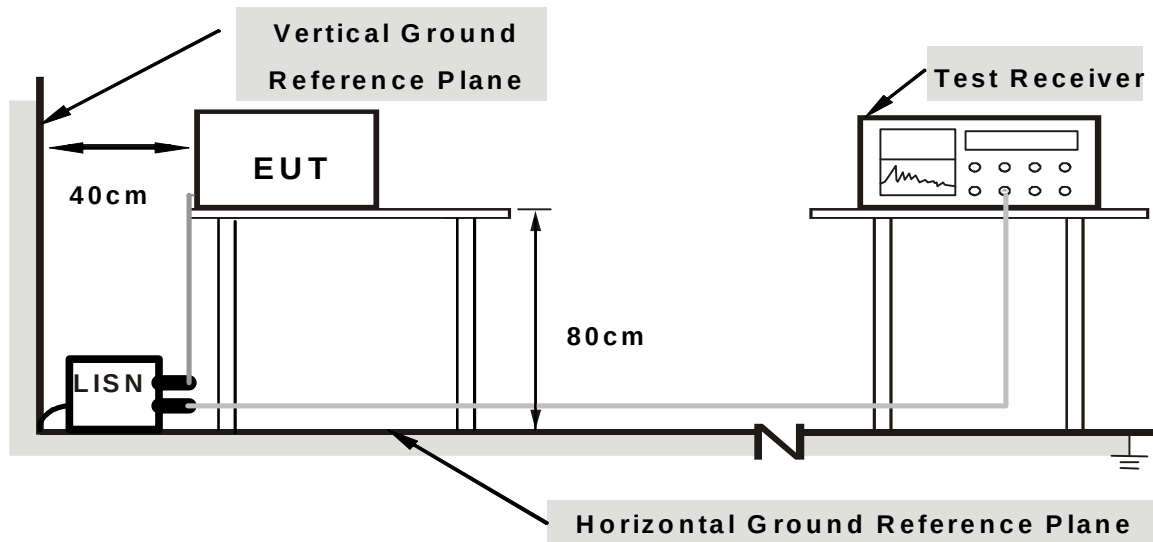
**NOTE:**

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



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

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.1.6 EUT OPERATING CONDITIONS

1. Place the EUT on testing table.
2. Prepare computer system (support unit 1) to act as communication partner.
3. The communication partner runs test program “MTool\_2.0.0.8.msi.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

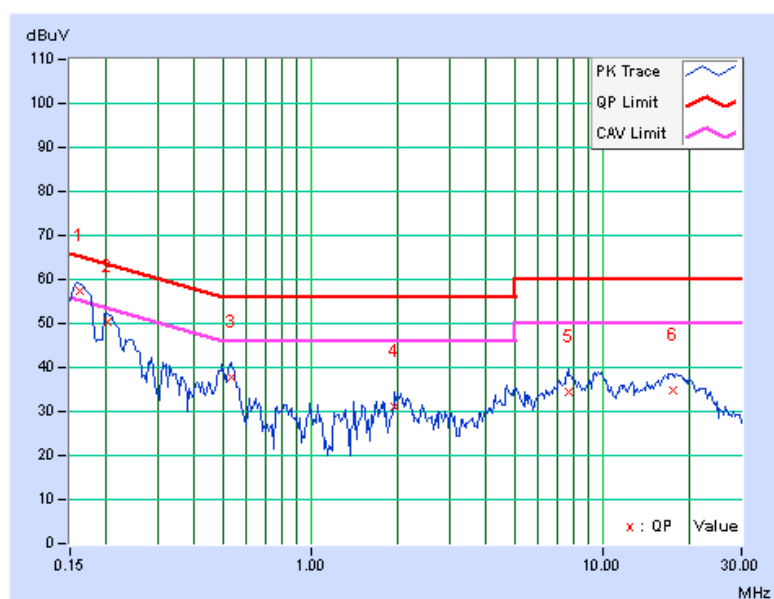
#### 4.1.7 TEST RESULTS (MODE 1)

| PHASE | Line (L) | DETECTOR FUNCTION | Quasi-Peak (QP) / Average (AV) |
|-------|----------|-------------------|--------------------------------|
|-------|----------|-------------------|--------------------------------|

| No | Freq. [MHz] | Corr. Factor [dB] | Reading Value [dB (uV)] |       | Emission Level [dB (uV)] |       | Limit [dB (uV)] |       | Margin (dB) |        |
|----|-------------|-------------------|-------------------------|-------|--------------------------|-------|-----------------|-------|-------------|--------|
|    |             |                   | Q.P.                    | AV.   | Q.P.                     | AV.   | Q.P.            | AV.   | Q.P.        | AV.    |
| 1  | 0.16172     | 0.13              | 57.32                   | 47.74 | 57.45                    | 47.87 | 65.38           | 55.38 | -7.92       | -7.50  |
| 2  | 0.20078     | 0.15              | 50.25                   | 40.21 | 50.40                    | 40.36 | 63.58           | 53.58 | -13.18      | -13.22 |
| 3  | 0.53281     | 0.21              | 37.51                   | 32.07 | 37.72                    | 32.28 | 56.00           | 46.00 | -18.28      | -13.72 |
| 4  | 1.94922     | 0.34              | 30.91                   | 25.30 | 31.25                    | 25.64 | 56.00           | 46.00 | -24.75      | -20.36 |
| 5  | 7.62891     | 0.73              | 33.62                   | 28.81 | 34.35                    | 29.54 | 60.00           | 50.00 | -25.65      | -20.46 |
| 6  | 17.43359    | 1.32              | 33.53                   | 28.54 | 34.85                    | 29.86 | 60.00           | 50.00 | -25.15      | -20.14 |

#### 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

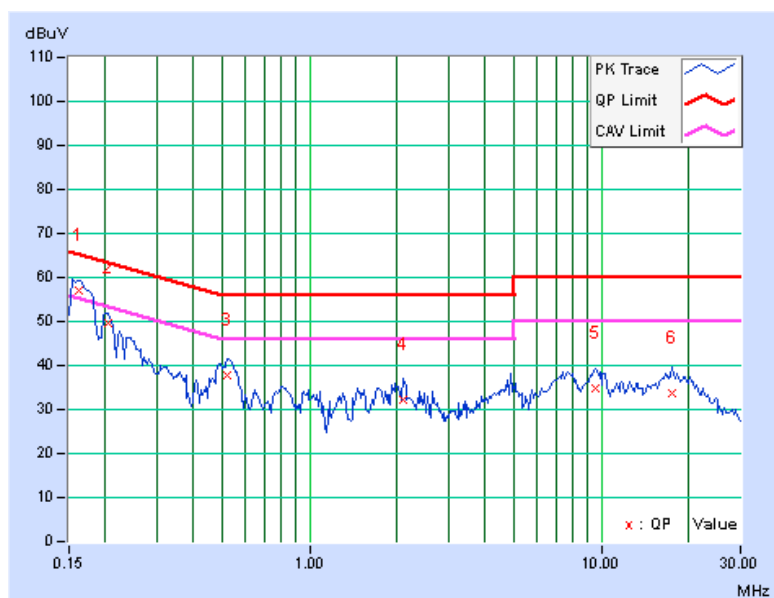


|       |             |                      |                                   |
|-------|-------------|----------------------|-----------------------------------|
| PHASE | Neutral (N) | DETECTOR<br>FUNCTION | Quasi-Peak (QP) /<br>Average (AV) |
|-------|-------------|----------------------|-----------------------------------|

|    | Freq.    | Corr.  | Reading<br>Value |       | Emission<br>Level |       | Limit     |       | Margin |        |
|----|----------|--------|------------------|-------|-------------------|-------|-----------|-------|--------|--------|
| No |          | Factor | [dB (uV)]        |       | [dB (uV)]         |       | [dB (uV)] |       | (dB)   |        |
|    | [MHz]    | (dB)   | Q.P.             | AV.   | Q.P.              | AV.   | Q.P.      | AV.   | Q.P.   | AV.    |
| 1  | 0.16172  | 0.11   | 57.01            | 45.99 | 57.12             | 46.10 | 65.38     | 55.38 | -8.25  | -9.27  |
| 2  | 0.20469  | 0.13   | 49.64            | 38.21 | 49.77             | 38.34 | 63.42     | 53.42 | -13.65 | -15.08 |
| 3  | 0.52500  | 0.20   | 37.57            | 30.91 | 37.77             | 31.11 | 56.00     | 46.00 | -18.23 | -14.89 |
| 4  | 2.09766  | 0.31   | 31.94            | 24.96 | 32.25             | 25.27 | 56.00     | 46.00 | -23.75 | -20.73 |
| 5  | 9.52344  | 0.72   | 34.14            | 29.53 | 34.86             | 30.25 | 60.00     | 50.00 | -25.14 | -19.75 |
| 6  | 17.48828 | 1.04   | 32.67            | 27.77 | 33.71             | 28.81 | 60.00     | 50.00 | -26.29 | -21.19 |

#### 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



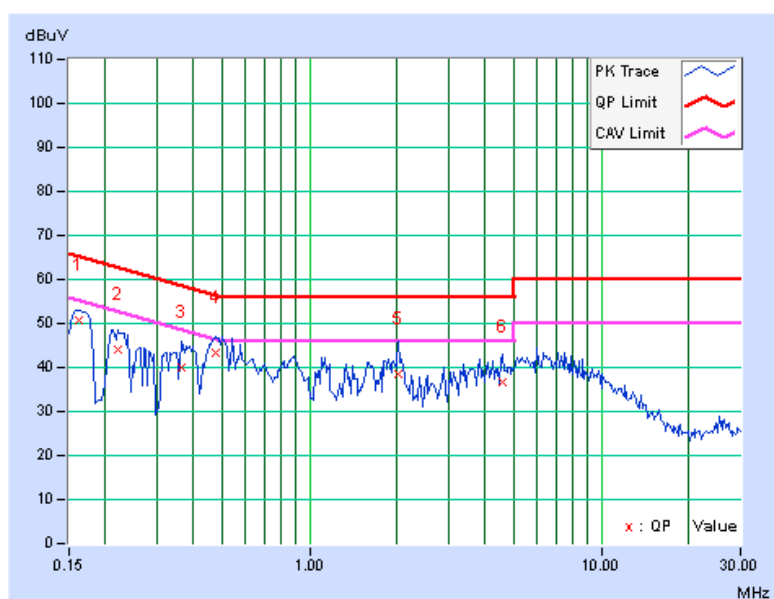
#### 4.1.8 TEST RESULTS (MODE 2)

| PHASE | Line (L) | DETECTOR<br>FUNCTION | Quasi-Peak (QP) /<br>Average (AV) |
|-------|----------|----------------------|-----------------------------------|
|-------|----------|----------------------|-----------------------------------|

| No | Freq.<br>[MHz] | Corr.<br>Factor<br>[dB] | Reading<br>Value<br>[dB (uV)] |       | Emission<br>Level<br>[dB (uV)] |       | Limit<br>[dB (uV)] |       | Margin<br>(dB) |        |
|----|----------------|-------------------------|-------------------------------|-------|--------------------------------|-------|--------------------|-------|----------------|--------|
|    |                |                         | Q.P.                          | AV.   | Q.P.                           | AV.   | Q.P.               | AV.   | Q.P.           | AV.    |
| 1  | 0.16172        | 0.13                    | 50.68                         | 39.24 | 50.81                          | 39.37 | 65.38              | 55.38 | -14.56         | -16.00 |
| 2  | 0.22031        | 0.16                    | 44.01                         | 32.09 | 44.17                          | 32.25 | 62.81              | 52.81 | -18.64         | -20.56 |
| 3  | 0.36484        | 0.19                    | 39.77                         | 27.35 | 39.96                          | 27.54 | 58.62              | 48.62 | -18.66         | -21.08 |
| 4  | 0.47422        | 0.21                    | 43.26                         | 32.78 | 43.47                          | 32.99 | 56.44              | 46.44 | -12.97         | -13.45 |
| 5  | 2.01953        | 0.34                    | 38.21                         | 30.53 | 38.55                          | 30.87 | 56.00              | 46.00 | -17.45         | -15.13 |
| 6  | 4.60938        | 0.51                    | 36.15                         | 28.51 | 36.66                          | 29.02 | 56.00              | 46.00 | -19.34         | -16.98 |

#### 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

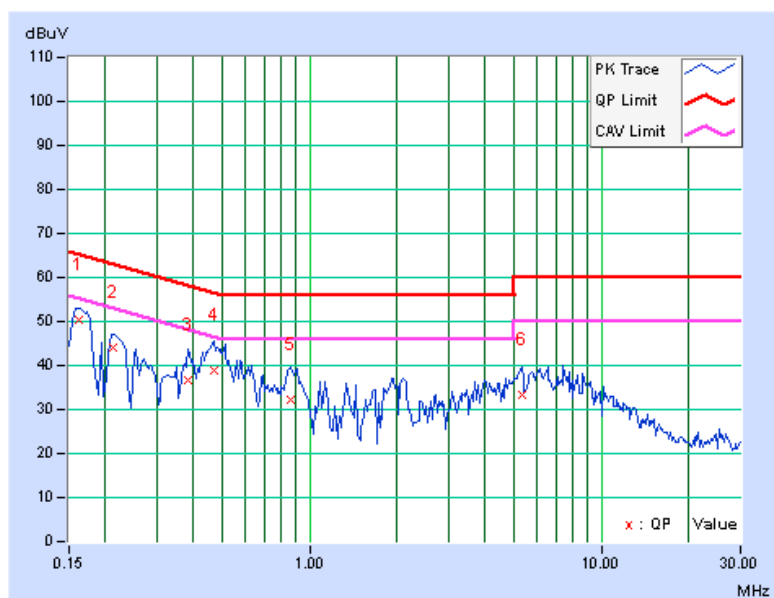


|       |             |                   |                                |
|-------|-------------|-------------------|--------------------------------|
| PHASE | Neutral (N) | DETECTOR FUNCTION | Quasi-Peak (QP) / Average (AV) |
|-------|-------------|-------------------|--------------------------------|

|    | Freq.   | Corr.  | Reading Value |       | Emission Level |       | Limit     |       | Margin |        |
|----|---------|--------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| No |         | Factor | [dB (uV)]     |       | [dB (uV)]      |       | [dB (uV)] |       | (dB)   |        |
|    | [MHz]   | (dB)   | Q.P.          | AV.   | Q.P.           | AV.   | Q.P.      | AV.   | Q.P.   | AV.    |
| 1  | 0.16172 | 0.11   | 50.09         | 38.07 | 50.20          | 38.18 | 65.38     | 55.38 | -15.17 | -17.19 |
| 2  | 0.21250 | 0.13   | 44.07         | 31.72 | 44.20          | 31.85 | 63.11     | 53.11 | -18.90 | -21.25 |
| 3  | 0.38438 | 0.19   | 36.32         | 25.02 | 36.51          | 25.21 | 58.18     | 48.18 | -21.68 | -22.98 |
| 4  | 0.47031 | 0.19   | 38.84         | 27.23 | 39.03          | 27.42 | 56.51     | 46.51 | -17.47 | -19.08 |
| 5  | 0.85703 | 0.21   | 32.08         | 22.03 | 32.29          | 22.24 | 56.00     | 46.00 | -23.71 | -23.76 |
| 6  | 5.33203 | 0.50   | 32.95         | 25.69 | 33.45          | 26.19 | 60.00     | 50.00 | -26.55 | -23.81 |

#### 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



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION 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 30dB below the highest level of the desired power:

| 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.



A D T

#### 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER              | MODEL NO.                | SERIAL NO.                          | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------------|--------------------------|-------------------------------------|-----------------|------------------|
| MXE EMI Receiver<br>Agilent             | N9038A                   | MY50010156                          | Jan. 15, 2014   | Jan. 14, 2015    |
| Pre-Amplifier<br>Mini-Circuits          | ZFL-1000VH2<br>B         | AMP-ZFL-04                          | Nov. 13, 2013   | Nov. 12, 2014    |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168                | 9168-361                            | Mar. 25, 2013   | Mar. 24, 2014    |
| RF Cable                                | NA                       | CHHCAB_001                          | Oct. 06, 2013   | Oct. 05, 2014    |
| Spectrum Analyzer<br>R&S                | FSV40                    | 100964                              | July 15, 2013   | July 14, 2014    |
| Horn_Antenna<br>AISI                    | AIH.8018                 | 0000220091110                       | Dec. 06, 2013   | Dec. 05, 2014    |
| Pre-Amplifier<br>Agilent                | 8449B                    | 3008A01923                          | Oct. 29, 2013   | Oct. 28, 2014    |
| RF Cable                                | NA                       | RF104-205<br>RF104-207<br>RF104-202 | Dec. 12, 2013   | Dec. 11, 2014    |
| Spectrum Analyzer<br>Agilent            | E4446A                   | MY48250253                          | Aug. 28, 2013   | Aug. 27, 2014    |
| Pre-Amplifier<br>SPACEK LABS            | SLKKa-48-6               | 9K16                                | Nov. 13, 2013   | Nov. 12, 2014    |
| Horn_Antenna<br>SCHWARZBECK             | BBHA 9170                | 9170-424                            | Oct. 08, 2013   | Oct. 07, 2014    |
| Software                                | ADT_Radiated<br>_V8.7.07 | NA                                  | NA              | NA               |
| Antenna Tower & Turn Table<br>CT        | NA                       | NA                                  | NA              | NA               |

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Jan. 16 to 20, 2014



#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters 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:**

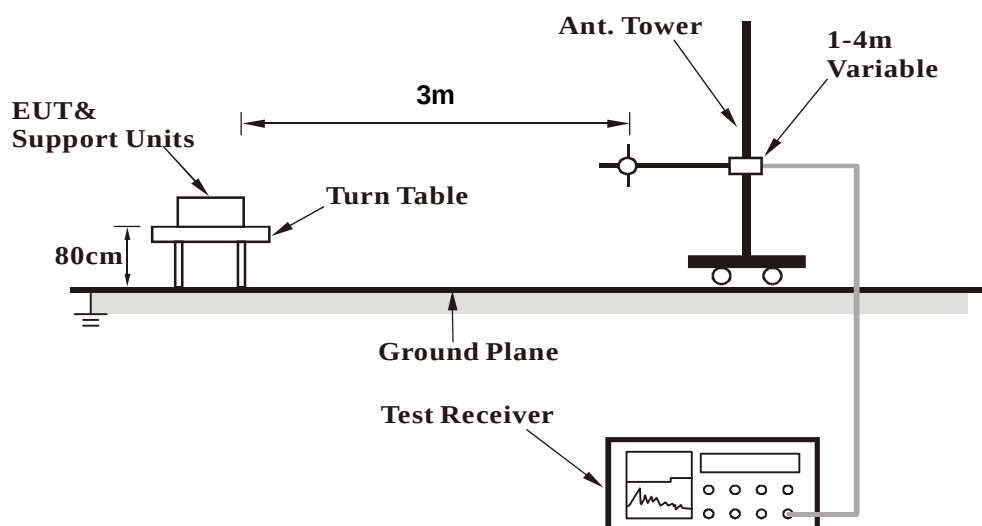
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ( $10 \log(1/\text{duty cycle})$ ).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.2.4 DEVIATION FROM TEST STANDARD

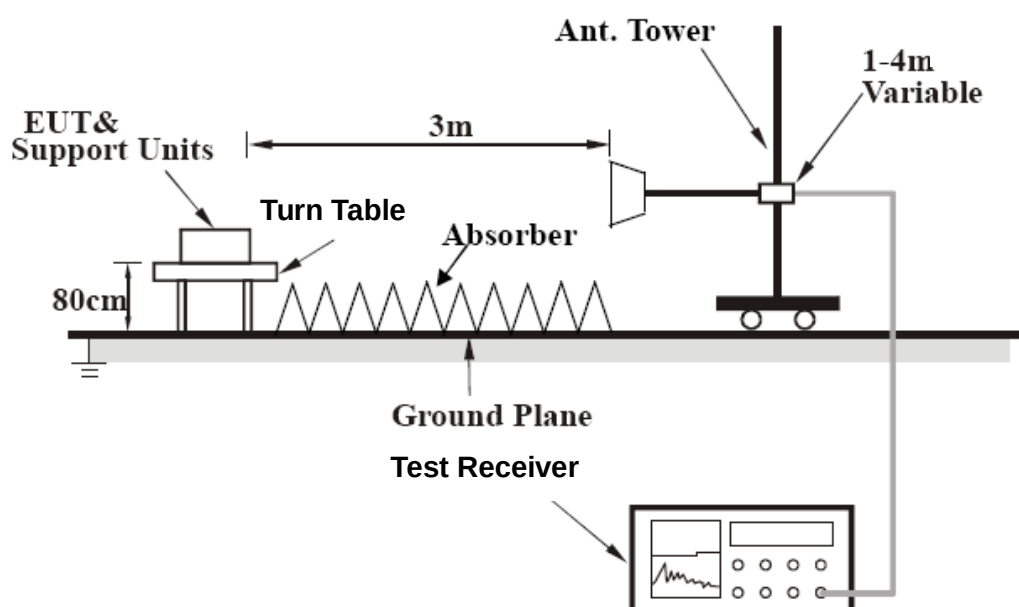
No deviation

## 4.2.5 TEST SETUP

### <Frequency Range below 1GHz>



### <Frequency Range above 1GHz>



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

## 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6



A D T

## 4.2.7 TEST RESULTS

### CDD\_MODE

### BELOW 1GHz WORST-CASE DATA

|                        |            |                          |                 |
|------------------------|------------|--------------------------|-----------------|
| <b>FREQUENCY RANGE</b> | Below 1GHz | <b>DETECTOR FUNCTION</b> | Quasi-Peak (QP) |
|------------------------|------------|--------------------------|-----------------|

| 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                                                   | 89.02       | 31.9 QP                 | 43.5           | -11.6       | 1.59 H             | 281                  | 50.44            | -18.54                   |
| 2                                                   | 188.21      | 34.6 QP                 | 43.5           | -8.9        | 2.00 H             | 145                  | 49.58            | -15.00                   |
| 3                                                   | 209.16      | 38.1 QP                 | 43.5           | -5.4        | 2.00 H             | 115                  | 53.88            | -15.82                   |
| 4                                                   | 219.68      | 38.8 QP                 | 46.0           | -7.3        | 1.22 H             | 243                  | 54.27            | -15.52                   |
| 5                                                   | 296.07      | 38.5 QP                 | 46.0           | -7.5        | 1.00 H             | 243                  | 50.27            | -11.79                   |
| 6                                                   | 500.01      | 34.4 QP                 | 46.0           | -11.6       | 2.00 H             | 247                  | 41.34            | -6.91                    |
| 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                                                   | 41.93       | 36.4 QP                 | 40.0           | -3.7        | 1.00 V             | 218                  | 49.84            | -13.49                   |
| 2                                                   | 65.79       | 35.3 QP                 | 40.0           | -4.7        | 1.00 V             | 322                  | 49.93            | -14.60                   |
| 3                                                   | 121.08      | 31.8 QP                 | 43.5           | -11.7       | 1.00 V             | 227                  | 46.42            | -14.65                   |
| 4                                                   | 229.43      | 33.0 QP                 | 46.0           | -13.0       | 1.00 V             | 258                  | 48.11            | -15.08                   |
| 5                                                   | 500.01      | 38.7 QP                 | 46.0           | -7.3        | 1.00 V             | 343                  | 45.63            | -6.91                    |
| 6                                                   | 940.59      | 34.1 QP                 | 46.0           | -11.9       | 1.00 V             | 181                  | 32.89            | 1.25                     |

### 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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



A D T

## ABOVE 1GHz DATA

|                 |              |                   |                           |
|-----------------|--------------|-------------------|---------------------------|
| FREQUENCY RANGE | 1GHz ~ 40GHz | DETECTOR FUNCTION | Peak (PK)<br>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                                                   | 4874.00        | 48.2 PK                       | 74.0              | -25.8          | 1.00 H                   | 115                        | 5.00                   | 43.20                          |
| 2                                                   | 4874.00        | 35.9 AV                       | 54.0              | -18.1          | 1.00 H                   | 115                        | -7.30                  | 43.20                          |
| 3                                                   | 7311.00        | 55.6 PK                       | 74.0              | -18.4          | 1.05 H                   | 114                        | 7.50                   | 48.10                          |
| 4                                                   | 7311.00        | 43.5 AV                       | 54.0              | -10.5          | 1.05 H                   | 114                        | -4.60                  | 48.10                          |
| 5                                                   | 11650.00       | 52.9 PK                       | 74.0              | -21.1          | 1.09 H                   | 315                        | 1.30                   | 51.60                          |
| 6                                                   | 11650.00       | 40.2 AV                       | 54.0              | -13.8          | 1.09 H                   | 315                        | -11.40                 | 51.60                          |
| 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                                                   | 4874.00        | 50.0 PK                       | 74.0              | -24.0          | 1.20 V                   | 278                        | 6.80                   | 43.20                          |
| 2                                                   | 4874.00        | 36.9 AV                       | 54.0              | -17.1          | 1.20 V                   | 278                        | -6.30                  | 43.20                          |
| 3                                                   | 7311.00        | 56.5 PK                       | 74.0              | -17.5          | 1.04 V                   | 153                        | 8.40                   | 48.10                          |
| 4                                                   | 7311.00        | 44.7 AV                       | 54.0              | -9.3           | 1.04 V                   | 153                        | -3.40                  | 48.10                          |
| 5                                                   | 11650.00       | 58.3 PK                       | 74.0              | -15.7          | 1.43 V                   | 199                        | 6.70                   | 51.60                          |
| 6                                                   | 11650.00       | 45.6 AV                       | 54.0              | -8.4           | 1.43 V                   | 199                        | -6.00                  | 51.60                          |

## 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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



### 4.3 CONDUCTED OUT-BAND EMISSION MEASUREMENT

#### 4.3.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

#### 4.3.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED DATE | CALIBRATED UNTIL |
|----------------------------|-----------|------------|-----------------|------------------|
| Spectrum Analyzer R&S      | FSP40     | 100036     | Jan. 21, 2013   | Jan. 20, 2014    |

**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. Tested date : Jan. 17, 2014

#### 4.3.3 TEST PROCEDURE

##### Measurement Procedure - Reference Level

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

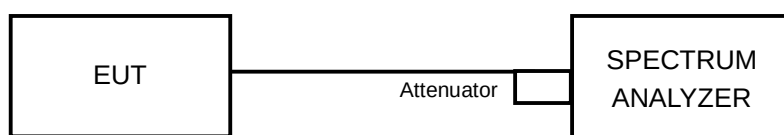
##### Measurement Procedure –Unwanted Emission Level

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



#### 4.3.6 EUT OPERATING CONDITION

Same as Item 4.1.6

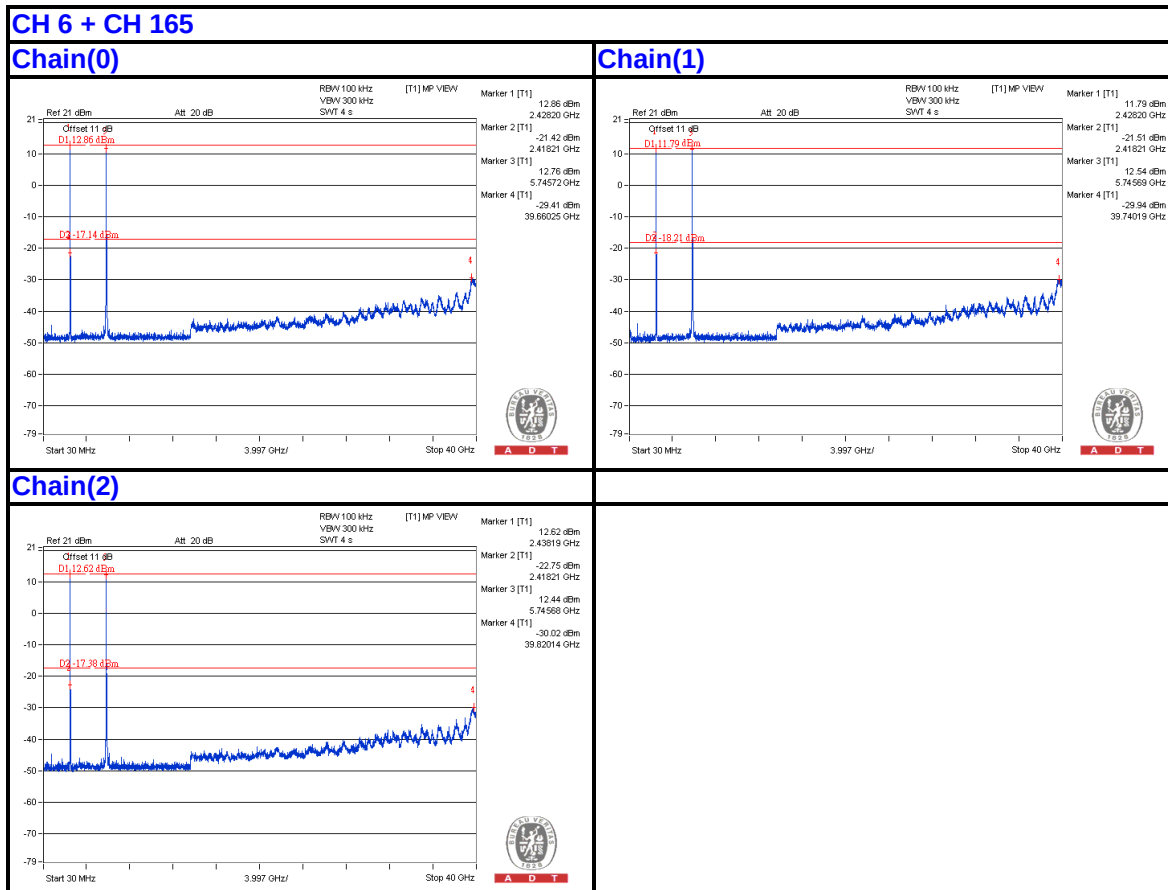
#### 4.3.7 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



A D T

For 2.4 GHz\_802.11n (HT20) + For 5 GHz\_802.11ac (VHT20)





A D T

## 5. 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:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

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

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

---END---