

# Supplemental “Transmit Simultaneously” Test Report

**REPORT NO.:** IC131205E01-4

**MODEL NO.:** RTL8812AEBT

**IC:** 6317A-RTL8812AEBT

**RECEIVED:** Dec. 04, 2013

**TESTED:** Dec. 24, 2013 to Jan. 17, 2014

**ISSUED:** Feb. 10, 2014

**APPLICANT:** Realtek Semiconductor Corp.

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
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## RELEASE CONTROL RECORD

| ISSUE NO.     | REASON FOR CHANGE | DATE ISSUED   |
|---------------|-------------------|---------------|
| IC131205E01-4 | Original release  | Feb. 10, 2014 |



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## 1. CERTIFICATION

**PRODUCT :** 802.11a/b/g/n/ac RTL8812AE Combo module  
**BRAND NAME :** Realtek  
**MODEL NO. :** RTL8812AEBT  
**TEST ITEM:** ENGINEERING SAMPLE  
**APPLICANT :** Realtek Semiconductor Corp.  
**TESTED:** Dec. 24, 2013 to Jan. 17, 2014  
**STANDARDS:** **Canada RSS-210 Issue 8 (2010-12)**  
**Canada RSS-Gen Issue 3 (2010-12)**  
ANSI C63.10-2009

The above equipment (Model: RTL8812AEBT) 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 :** Midoli Peng , **DATE:** Feb. 10, 2014  
( Midoli Peng, Specialist )

**APPROVED BY :** May Chen , **DATE:** Feb. 10, 2014  
( May Chen, Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For WLAN 2.4GHz & BT

| STANDARD SECTION | TEST TYPE                   | RESULT | REMARK                                                                                |
|------------------|-----------------------------|--------|---------------------------------------------------------------------------------------|
| RSS-Gen<br>7.2.4 | AC Power Conducted Emission | PASS   | Meet the requirement of limit.<br>Minimum passing margin is<br>-32.67dB at 1.34766MHz |
| RSS-210<br>A8.5  | Radiated Emissions          | PASS   | Meet the requirement of limit.<br>Minimum passing margin is<br>-7.6dB at 7311.00MHz   |

For WLAN 5GHz & BT

| STANDARD SECTION | TEST TYPE                   | RESULT | REMARK                                                                                |
|------------------|-----------------------------|--------|---------------------------------------------------------------------------------------|
| RSS-Gen<br>7.2.4 | AC Power Conducted Emission | PASS   | Meet the requirement of limit.<br>Minimum passing margin is<br>-29.20dB at 0.38828MHz |
| RSS-210<br>A8.5  | Radiated Emissions          | PASS   | Meet the requirement of limit.<br>Minimum passing margin is<br>-5.8dB at 11570.00MHz  |

## 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)   | 5.37 dB |
| Radiated emissions (1GHz -6GHz)   | 3.65 dB |
| Radiated emissions (6GHz -18GHz)  | 3.88 dB |
| Radiated emissions (18GHz -40GHz) | 4.11 dB |

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                              |                                                                                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>PRODUCT</b>               | 802.11a/b/g/n/ac RTL8812AE Combo module                                                                                                             |
| <b>MODEL NO.</b>             | RTL8812AEBT                                                                                                                                         |
| <b>POWER SUPPLY</b>          | DC 3.3V from host equipment                                                                                                                         |
| <b>MODULATION TYPE</b>       | <b>For WLAN</b><br>CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM<br>BT-LE (GFSK) for DTS<br>256QAM for OFDM in 11ac mode only     |
|                              | <b>For BT</b><br>GFSK, $\pi/4$ -DQPSK, 8DPSK                                                                                                        |
| <b>MODULATION TECHNOLOGY</b> | <b>For WLAN</b><br>DSSS, OFDM, DTS                                                                                                                  |
|                              | <b>For BT</b><br>FHSS                                                                                                                               |
| <b>TRANSFER RATE</b>         | <b>For WLAN</b><br>802.11b: up to 11Mbps<br>802.11a / g: up to 54Mbps<br>802.11n: up to 300Mbps<br>802.11ac: up to 866.7Mbps<br>BT-LE (GFSK): 1Mbps |
|                              | <b>For BT</b><br>Up to 3Mbps                                                                                                                        |
| <b>OPERATING FREQUENCY</b>   | <b>For WLAN(Annex 9)</b><br>5GHz: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz,<br>5.50 ~ 5.58GHz & 5.66GHz ~ 5.70GHz                                             |
|                              | <b>For WLAN(Annex 8)</b><br>2.4GHz: 2.412 ~ 2.462GHz<br>5GHz: 5.745 ~ 5.825GHz<br>BT-LE(GFSK): 2.402 ~ 2.480GHz                                     |
|                              | <b>For BT</b><br>2402MHz ~ 2480MHz                                                                                                                  |
|                              |                                                                                                                                                     |



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|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NUMBER OF CHANNEL    | <b>For WLAN(Annex 9)</b><br>16 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)<br>7 for 802.11n (HT40), 802.11ac (VHT40)<br>3 for 802.11ac (VHT80)                                                                                                                                                                                                                                                                                                                  |
|                      | <b>For WLAN(Annex 8, 2.4GHz)</b><br>11 for 802.11b, 802.11g, 802.11n (HT20)<br>7 for 802.11n (HT40)<br>40 for BT-LE(GFSK)<br><b>For WLAN(Annex 8, 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>For BT</b><br>78                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| MAXIMUM OUTPUT POWER | <b>For WLAN(Annex 9)</b><br>802.11a: 147.582mW<br>802.11ac (VHT20): 137.730mW<br>802.11ac (VHT40): 139.680mW<br>802.11ac (VHT80): 27.530mW<br><b>For WLAN(Annex 8, 2.4GHz)</b><br>802.11b: 123.310mW<br>802.11g: 572.434mW<br>802.11n (HT20): 514.717mW<br>802.11n (HT40): 393.088mW<br>BT-LE(GFSK): 2.415mW<br><b>For WLAN(Annex 8, 5GHz)</b><br>802.11a: 676.106mW<br>802.11ac (VHT20): 579.327mW<br>802.11ac (VHT40): 592.004mW<br>802.11ac (VHT80): 548.990mW |
|                      | <b>For BT</b><br>2.723 mW                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ANTENNA TYPE         | Please see NOTE                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| DATA CABLE           | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| I/O PORTS            | Refer to user's manual                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ASSOCIATED DEVICES   | NA                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Note:**

1. There are Bluetooth technology and WLAN technology used for the EUT.
2. For WLAN: 2.4GHz and 5GHz technology cannot transmit at same time.
3. WLAN & BT technology can transmit at same time.
4. The antennas provided to the EUT, please refer to the following table:

| No. | Brand   | Model                                                                    | Antenna Type | Peak gain with cable loss (dBi) (2.4GHz) | Peak gain with cable loss(dBi) (5GHz) | Cable Loss (dB) (2.4GHz) | Cable Loss (dB) (5GHz) | Connector Type |
|-----|---------|--------------------------------------------------------------------------|--------------|------------------------------------------|---------------------------------------|--------------------------|------------------------|----------------|
| 1   | LYNwave | ALA110-222050-300010 (Main)<br>ALA110-222050-300010 (Aux)                | PIFA         | 3.5<br>3.5                               | 5<br>5                                | NA                       | NA                     | IPEX           |
| 2   | JOYMAX  | TWF-614XMPXX-500 (Main)<br>TWF-614XMPXX-500 (Aux)                        | Dipole       | 3<br>3                                   | 5<br>5                                | NA                       | NA                     | IPEX           |
| 3   | WGT     | SKA91WMPB02+A (Tx1)<br>SKA91WMPB01+A (Tx2)                               | PIFA         | 0.82<br>-2.23                            | 0.94<br>2.18                          | -1.32<br>-0.75           | -2.04<br>-1.17         | IPEX           |
| 4   | JEM     | 1510-0122-0027 (Tx1)<br>1510-0122-0027 (Tx2)                             | PIFA         | 3.23<br>2.31                             | 4.89<br>1.89                          | NA                       | NA                     | RF             |
| 5   | FVC     | K05007014501(6-23-7W25H-010) (Tx1)<br>K05007014501(6-23-7W25H-010) (Tx2) | PIFA         | 2.85<br>1.59                             | 2.46<br>2.91                          | NA                       | NA                     | IPEX           |
| 6   | JEM     | 1510-0122-0022(IA-120073) (Tx1)<br>1510-0122-0022(IA-120073) (Tx2)       | PIFA         | 2.23<br>2.21                             | 1.69<br>1.84                          | NA                       | NA                     | RF             |
| 7   | WGT     | SK81WMPB01+A (Tx1)<br>SK81WMPB02+A (Tx2)                                 | PIFA         | 1.79<br>0.66                             | 1.49<br>-0.40                         | -1.88<br>-2.95           | -3.17<br>-4.96         | IPEX           |
| 8   | WGT     | SKW2UWMPB01+A (Tx1)<br>SKW2UWMPB01+A (Tx2)                               | PIFA         | 1.36<br>2.88                             | 1.92<br>3.16                          | NA                       | NA                     | IPEX           |
| 9   | WGT     | SKW25WMPB01+A (Tx1)<br>SKW25WMPB01+A (Tx2)                               | PIFA         | 0.72<br>0.49                             | -0.72<br>-0.71                        | -1.41<br>-1.39           | -2.18<br>-2.15         | IPEX           |
| 10  | WGT     | SK549WMPB01+A (Tx1)<br>SK549WMPB02+A (Tx2)                               | PIFA         | -0.17<br>-2.24                           | -0.13<br>0.03                         | -1.04<br>-0.88           | -1.94<br>-1.64         | IPEX           |
| 11  | WGT     | SK110WMPB01+A (Tx1)<br>SK110WMPB02+A (Tx2)                               | PIFA         | 1.05<br>-0.41                            | 1.08<br>2.32                          | -0.98<br>-0.99           | -1.52<br>-1.54         | IPEX           |
| 12  | WGT     | SKW31WMPB01+A (Tx1)<br>SKW31WMPB01+A (Tx2)                               | PIFA         | 1.85<br>3.14                             | 1.74<br>2.10                          | NA                       | NA                     | IPEX           |
| 13  | FVC     | 6-23-7B51M-031 (Tx1)<br>6-23-7B51M-031 (Tx2)                             | PIFA         | 1.58<br>1.75                             | 2.54<br>2.24                          | NA                       | NA                     | IPEX           |
| 14  | FVC     | 6-23-7E51Q-011 (Tx1)<br>6-23-7E51Q-011 (Tx2)                             | PIFA         | 2.70<br>2.19                             | 1.57<br>2.94                          | NA                       | NA                     | IPEX           |
| 15  | FVC     | 6-23-7B710-022 (WM1)<br>6-23-7B710-022 (WM2)                             | PIFA         | 1.51<br>2.04                             | 2.99<br>3.02                          | NA                       | NA                     | IPEX           |



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| No. | Brand | Model                                                                          | Antenna Type | Peak gain with cable loss (dBi) (2.4GHz) | Peak gain with cable loss(dBi) (5GHz) | Cable Loss (dB) (2.4GHz) | Cable Loss (dB) (5GHz) | Connector Type |
|-----|-------|--------------------------------------------------------------------------------|--------------|------------------------------------------|---------------------------------------|--------------------------|------------------------|----------------|
| 16  | WGT   | SKM11WMPB03+A (Tx1)<br>SKM11WMPB02+D (Tx2)                                     | PIFA         | -1.84<br>-2.93                           | 0.44<br>1.35                          | 1.17<br>0.89             | 2.02<br>1.54           | IPEX           |
| 17  | WGT   | SKW23WMPB01+A (Tx1)<br>SKW23WMPB02+A (Tx2)                                     | PIFA         | -1.61<br>-2.84                           | -0.14<br>-0.96                        | -2.10<br>-2.07           | -3.25<br>-3.20         | IPEX           |
| 18  | WGT   | SKW24WMPB01+B (WM1)<br>SKW24WMPB01+B (WM2)                                     | PIFA         | 1.25<br>3.17                             | 1.95<br>2.42                          | NA                       | NA                     | IPEX           |
| 19  | FVC   | K05007015501(6-23-7W244-02 0-1) (Tx1)<br>K05007015501(6-23-7W244-02 0-1) (Tx2) | PIFA         | 2.53<br>2.28                             | 2.86<br>2.97                          | NA                       | NA                     | IPEX           |
| 20  | FVC   | K05007014201(6-23-7W25P-02 0) (Tx1)<br>K05007014201(6-23-7W25P-02 0) (Tx2)     | PIFA         | 3.00<br>1.52                             | 2.82<br>2.21                          | NA                       | NA                     | IPEX           |
| 21  | WGT   | SKW10WMPB01+A (Tx1)<br>SKW10WMPB02+A (Tx2)                                     | PIFA         | 0.85<br>0.44                             | 0.75<br>1.24                          | -1.56<br>-1.53           | -2.42<br>-2.36         | IPEX           |
| 22  | WGT   | SKCZTWMPB01+A (Tx1)<br>SKCZTWMPB02+A (Tx2)                                     | PIFA         | 0.46<br>-0.79                            | 2.80<br>1.03                          | -1.56<br>-1.53           | -2.42<br>-2.36         | IPEX           |
| 23  | JEM   | IA-120266 (Tx1)<br>IA-120267 (Tx2)                                             | PIFA         | 2.60<br>0.53                             | 2.61<br>2.60                          | 2.12<br>1.76             | 3.48<br>2.87           | IPEX           |
| 24  | WGT   | SK547WMPB01+A (Tx1)<br>SK549WMPB02+A (Tx2)                                     | PIFA         | -0.66<br>0.78                            | -0.19<br>2.06                         | -1.42<br>-1.43           | -2.20<br>-2.21         | IPEX           |
| 25  | WGT   | SK555WMPB01+B (Tx1)<br>SK555WMPB02+B (Tx2)                                     | PIFA         | 0.76<br>0.09                             | 1.97<br>0.56                          | -1.83<br>-1.80           | -2.83<br>-2.78         | IPEX           |
| 26  | WGT   | SK65EWMPB01+A (Tx1)<br>SK650WMPB02+A (Tx2)                                     | PIFA         | 0.42<br>-0.13                            | 0.11<br>1.27                          | -1.56<br>-0.61           | -2.41<br>-0.94         | IPEX           |
| 27  | WGT   | SK670WMPB01+A (Tx1)<br>SK670WMPB02+A (Tx2)                                     | PIFA         | 1.48<br>1.15                             | -0.44<br>0.42                         | -2.47<br>-1.93           | -3.82<br>-2.99         | IPEX           |
| 28  | WGT   | SK740WMPB01+A (Tx1)<br>SK740WMPB02+A (Tx2)                                     | PIFA         | -0.93<br>0.20                            | 0.96<br>0.86                          | -1.39<br>-1.26           | -2.16<br>-1.95         | IPEX           |
| 29  | WGT   | SK840WMPB01+B_SN (Tx1)<br>SK840WMPB01+B_SN (Tx2)                               | PIFA         | 3.03<br>0.55                             | 4.16<br>0.90                          | -1.12<br>-1.20           | -1.74<br>-1.86         | IPEX           |
| 30  | WGT   | SK94SWMPB01+B (TX1)<br>SK94SWMPB01+B (TX2)                                     | PIFA         | 0.76<br>0.46                             | 1.12<br>1.44                          | -0.32<br>-0.44           | -0.50<br>-0.68         | IPEX           |
| 31  | WGT   | SK94TWMPB01+B (TX1)<br>SK94TWMPB01+B (TX2)                                     | PIFA         | 1.32<br>1.86                             | 2.59<br>1.57                          | -0.59<br>-0.71           | -0.91<br>-1.10         | IPEX           |
| 32  | WGT   | SK50SWMPB01+A (TX1)<br>SK50SWMPB02+A (TX2)                                     | PIFA         | -0.03<br>-0.13                           | 1.25<br>2.13                          | -0.86<br>-0.72           | -1.32<br>-1.12         | IPEX           |
| 33  | WGT   | SK94TWMPB01+D (TX1)<br>SK94TWMPB01+D (TX2)                                     | PIFA         | 1.32<br>1.86                             | 2.59<br>1.57                          | -0.59<br>-0.71           | -0.91<br>-1.10         | IPEX           |

| No. | Brand          | Model                                         | Antenna Type | Peak gain with cable loss (dBi) (2.4GHz) | Peak gain with cable loss(dBi) (5GHz) | Cable Loss (dB) (2.4GHz) | Cable Loss (dB) (5GHz) | Connector Type |
|-----|----------------|-----------------------------------------------|--------------|------------------------------------------|---------------------------------------|--------------------------|------------------------|----------------|
| 34  | WGT            | SKC45WMPB03+B (WM1)<br>SKC45WMPB03+B (WM2)    | PIFA         | 2.46<br>2.91                             | 2.90<br>2.67                          | NA                       | NA                     | IPEX           |
| 35  | FVC            | K05007015801 (WM1)<br>K05007015901 (WM2)      | PIFA         | 3.12<br>1.01                             | 3.51<br>1.93                          | NA                       | NA                     | RF             |
| 36  | WGT            | SK345WMPB01+A (WM1)<br>SK345WMPB02+A (WM2)    | PIFA         | 0.86<br>2.51                             | 2.94<br>3.25                          | NA                       | NA                     | IPEX           |
| 37  | FVC            | K05007014901 (WM1)<br>K05007015001 (WM2)      | PIFA         | 1.85<br>1.94                             | 1.35<br>1.99                          | NA                       | NA                     | IPEX           |
| 38  | WGT            | SKX51WMPB01+C (WM1)<br>SKX51WMPB02+C (WM2)    | PIFA         | 3.2<br>2.76                              | 2.28<br>2.51                          | NA                       | NA                     | IPEX           |
| 39  | INPAQ          | WA-P-LB-02-122 (Main)<br>WA-P-LB-01-072 (Aux) | PIFA         | -1.41<br>-0.33                           | -2.44<br>-3.87                        | 1.23<br>1.86             | 2.06<br>3.12           | IPEX           |
| 40  | Smart Approach | SE-ECZ50-001 (Tx1)<br>SE-ECZ50-002 (Tx2)      | PIFA         | -1.37<br>-2.17                           | 1.83<br>1.86                          | 0.96<br>1.45             | 1.73<br>2.62           | IPEX           |
| 41  | INPAQ          | WA-P-LB-02-121 (Main)<br>WA-P-LB-01-071 (Aux) | PIFA         | -2.26<br>-4.63                           | -2.87<br>-2.49                        | 1.32<br>1.95             | 2.22<br>3.28           | IPEX           |
| 42  | Smart Approach | SE-ECZ70-001 (Tx1)<br>SE-ECZ70-002 (Tx2)      | PIFA         | -0.65<br>-2.39                           | 1.52<br>0.58                          | 1.03<br>1.52             | 1.87<br>2.76           | IPEX           |

Antenna 1 & 2 were chosen for final test.

5. The EUT incorporates a MIMO function.

| MODULATION MODE                                       | Tx/Rx FUNCTION     | Beam forming |
|-------------------------------------------------------|--------------------|--------------|
| 802.11a                                               | 1Tx/2RX or 2Tx/2Rx | No           |
| 802.11b                                               | 1Tx/1Rx            | No           |
| 802.11g                                               | 1Tx/2RX or 2Tx/2Rx | No           |
| 802.11n (HT20)                                        | 1Tx/2RX or 2Tx/2Rx | Yes          |
| 802.11n (HT40)                                        | 1Tx/2RX or 2Tx/2Rx | Yes          |
| 802.11ac (VHT20)                                      | 1Tx/2RX or 2Tx/2Rx | Yes          |
| 802.11ac (VHT40)                                      | 1Tx/2RX or 2Tx/2Rx | Yes          |
| 802.11ac (VHT80)                                      | 1Tx/2RX or 2Tx/2Rx | Yes          |
| For 1Tx, 1Rx mode will fix transmission on Chain (0). |                    |              |

6. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.

7. When the EUT operating in 802.11ac, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 9.

8. 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:

#### Simultaneously Transmission Mode (WLAN 2.4GHz + BT)

| EUT<br>configure<br>mode | Applicable to |       |                    |    | Description         |
|--------------------------|---------------|-------|--------------------|----|---------------------|
|                          | PLC           | RE<1G | RE <sup>3</sup> 1G | OB |                     |
| Mode 1                   | √             | √     | √                  | √  | With PIFA antenna   |
| Mode 2                   | -             | √     | √                  | -  | With Dipole antenna |

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz  
RE≥1G: Radiated Emission above 1GHz OB: Conducted Out-Band Emission Measurement

#### Simultaneously Transmission Mode (WLAN 5GHz + BT)

| EUT<br>configure<br>mode | Applicable to |       |                    |    | Description         |
|--------------------------|---------------|-------|--------------------|----|---------------------|
|                          | PLC           | RE<1G | RE <sup>3</sup> 1G | OB |                     |
| Mode 1                   | √             | √     | √                  | √  | With PIFA antenna   |
| Mode 2                   | -             | √     | √                  | -  | With Dipole antenna |

Where PLC: Power Line Conducted Emission RE<1G RE: Radiated Emission below 1GHz  
RE≥1G: Radiated Emission above 1GHz OB: Conducted Out-Band Emission Measurement

### POWER LINE CONDUCTED EMISSION TEST:

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

| Mode                                          | Available Channel | Tested Channel | Modulation Technology | Modulation Type |
|-----------------------------------------------|-------------------|----------------|-----------------------|-----------------|
| 2.4 GHz<br>(802.11n (HT20))<br>+<br>Bluetooth | 1 to 13           | 6              | OFDM                  | BPSK            |
|                                               | 0 to 78           | 78             | FHSS                  | 8DPSK           |
| 5 GHz<br>(802.11a)<br>+<br>Bluetooth          | 149 to 165        | 157            | OFDM                  | BPSK            |
|                                               | 0 to 78           | 78             | FHSS                  | 8DPSK           |

# **RADIATED EMISSION TEST:**

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

| Mode                                          | Available Channel | Tested Channel | Modulation Technology | Modulation Type |
|-----------------------------------------------|-------------------|----------------|-----------------------|-----------------|
| 2.4 GHz<br>(802.11n (HT20))<br>+<br>Bluetooth | 1 to 13           | 6              | OFDM                  | BPSK            |
|                                               | 0 to 78           | 78             | FHSS                  | 8DPSK           |
| 5 GHz<br>(802.11a)<br>+<br>Bluetooth          | 149 to 165        | 157            | OFDM                  | BPSK            |
|                                               | 0 to 78           | 78             | FHSS                  | 8DPSK           |

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

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

| Mode                                          | Available Channel | Tested Channel | Modulation Technology | Modulation Type |
|-----------------------------------------------|-------------------|----------------|-----------------------|-----------------|
| 2.4 GHz<br>(802.11n (HT20))<br>+<br>Bluetooth | 1 to 13           | 6              | OFDM                  | BPSK            |
|                                               | 0 to 78           | 78             | FHSS                  | 8DPSK           |
| 5 GHz<br>(802.11a)<br>+<br>Bluetooth          | 149 to 165        | 157            | OFDM                  | BPSK            |
|                                               | 0 to 78           | 78             | FHSS                  | 8DPSK           |

# **TEST CONDITION:**

| APPLICABLE TO      | ENVIRONMENTAL CONDITIONS | INPUT POWER  | TESTED BY    |
|--------------------|--------------------------|--------------|--------------|
| PLC                | 24deg. C, 53%RH          | 120Vac, 60Hz | Bear Lee     |
| RE<1G              | 24deg. C, 64%RH          | 120Vac, 60Hz | Jason Huang  |
| RE <sup>3</sup> 1G | 23deg. C, 66%RH          | 120Vac, 60Hz | Nelson Tseng |
| OB                 | 25deg. C, 60%RH          | 120Vac, 60Hz | Nelson Tseng |



### 3.3 DESCRIPTION OF SUPPORT UNITS

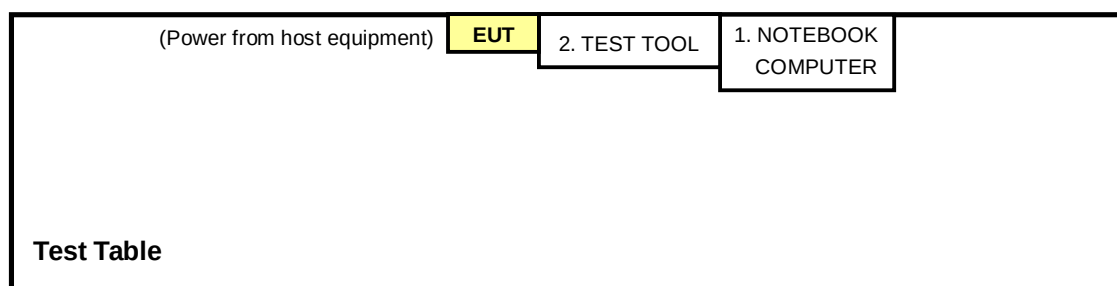
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No. | Product           | Brand   | Model No. | Serial No. | FCC ID  |
|-----|-------------------|---------|-----------|------------|---------|
| 1   | NOTEBOOK COMPUTER | DELL    | E6420     | 482T3R1    | FCC DoC |
| 2   | TEST TOOL         | Realtek | NA        | NA         | NA      |

| No. | Signal cable description |
|-----|--------------------------|
| 1   | NA                       |
| 2   | NA                       |

Note: The power cords of the above support units were unshielded (1.8m).

### 3.4 CONFIGURATION OF SYSTEM UNDER TEST



## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

#### 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. 05, 2013   | Sep. 04, 2014    |
| Line-Impedance<br>Stabilization Network<br>(for Peripheral)         | ENV216                      | 100072     | June 06, 2013   | June 05, 2014    |
| RF Cable<br>(JYEBAO)                                                | 5DFB                        | COCCAB-001 | Mar. 11, 2013   | Mar. 10, 2014    |
| 50 ohms Terminator                                                  | 50                          | EMC-03     | Sep. 24, 2013   | Sep. 23, 2014    |
| 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: Dec. 24, 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.

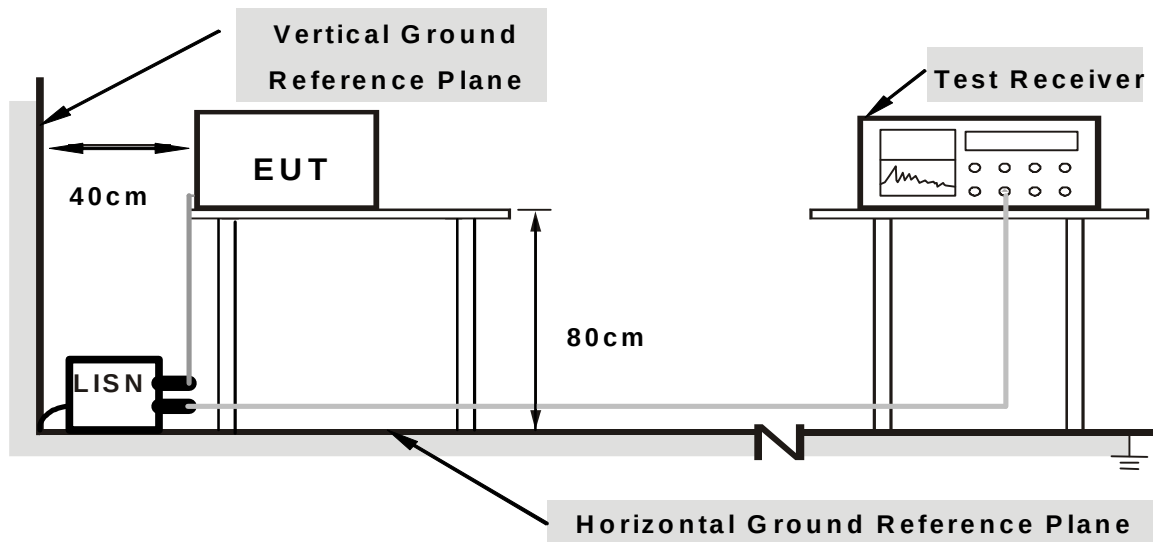
**NOTE:**

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. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program  
“MP\_Kit\_RTL11ac\_8812AE\_PCIE\_v57\_20131202<WLAN> &  
RTL\_BT\_MP\_Kit\_Setup\_20140123\_cer<BT>” to enable EUT under  
transmission/receiving condition continuously at specific channel frequency.

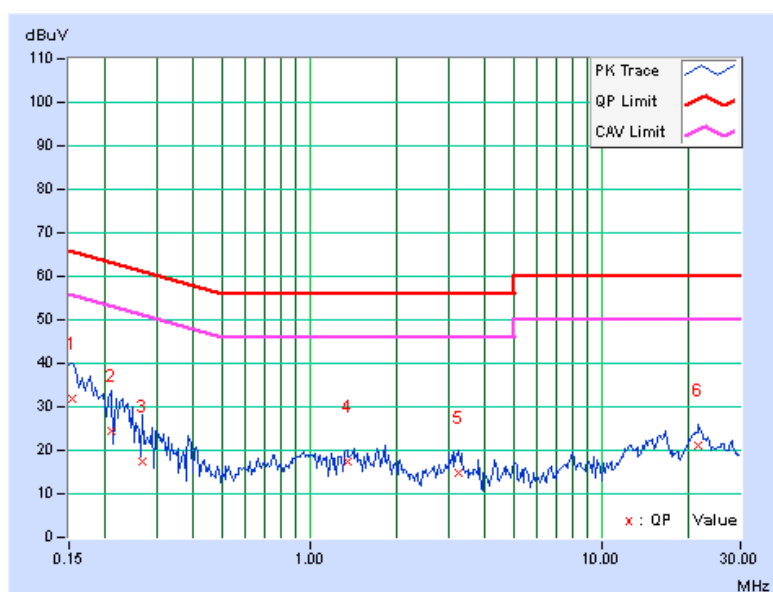
#### 4.1.7 TEST RESULTS (WLAN 2.4GHz + BT)

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

| No | Freq.          | Corr.       | Reading Value |              | Emission Level |              | Limit        |              | Margin        |               |
|----|----------------|-------------|---------------|--------------|----------------|--------------|--------------|--------------|---------------|---------------|
|    | [MHz]          | Factor      | [dB (uV)]     |              | [dB (uV)]      |              | [dB (uV)]    |              | (dB)          |               |
|    |                | (dB)        | Q.P.          | AV.          | Q.P.           | AV.          | Q.P.         | AV.          | Q.P.          | AV.           |
| 1  | 0.15391        | 0.08        | 31.83         | 19.06        | 31.91          | 19.14        | 65.79        | 55.79        | -33.87        | -36.64        |
| 2  | 0.20859        | 0.10        | 24.25         | 14.88        | 24.35          | 14.98        | 63.26        | 53.26        | -38.91        | -38.28        |
| 3  | 0.26719        | 0.11        | 17.45         | 4.25         | 17.56          | 4.36         | 61.20        | 51.20        | -43.64        | -46.84        |
| 4  | <b>1.34766</b> | <b>0.18</b> | <b>17.08</b>  | <b>13.15</b> | <b>17.26</b>   | <b>13.33</b> | <b>56.00</b> | <b>46.00</b> | <b>-38.74</b> | <b>-32.67</b> |
| 5  | 3.23438        | 0.25        | 14.49         | 9.30         | 14.74          | 9.55         | 56.00        | 46.00        | -41.26        | -36.45        |
| 6  | 21.57031       | 0.76        | 20.34         | 14.44        | 21.10          | 15.20        | 60.00        | 50.00        | -38.90        | -34.80        |

#### 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

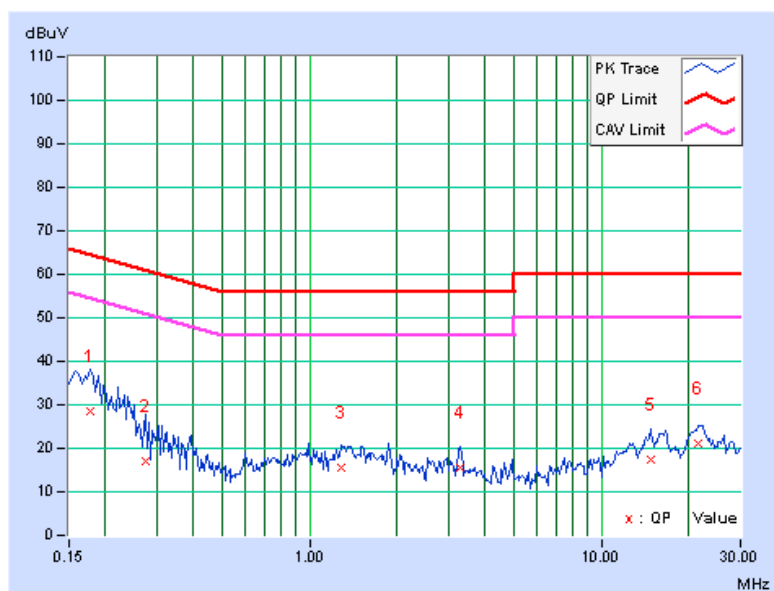


|       |             |                      |                                   |
|-------|-------------|----------------------|-----------------------------------|
| PHASE | Neutral (N) | DETECTOR<br>FUNCTION | Quasi-Peak (QP) /<br>Average (AV) |
|-------|-------------|----------------------|-----------------------------------|

|    | Freq.    | Corr.  | Reading 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  | 0.17734  | 0.10   | 28.59         | 16.69 | 28.69          | 16.79 | 64.61     | 54.61 | -35.92 | -37.82 |
| 2  | 0.27500  | 0.12   | 16.93         | 3.68  | 17.05          | 3.80  | 60.97     | 50.97 | -43.92 | -47.17 |
| 3  | 1.28906  | 0.18   | 15.32         | 13.13 | 15.50          | 13.31 | 56.00     | 46.00 | -40.50 | -32.69 |
| 4  | 3.29297  | 0.26   | 15.34         | 10.93 | 15.60          | 11.19 | 56.00     | 46.00 | -40.40 | -34.81 |
| 5  | 14.73828 | 0.61   | 16.87         | 11.50 | 17.48          | 12.11 | 60.00     | 50.00 | -42.52 | -37.89 |
| 6  | 21.40625 | 0.74   | 20.51         | 15.36 | 21.25          | 16.10 | 60.00     | 50.00 | -38.75 | -33.90 |

#### 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



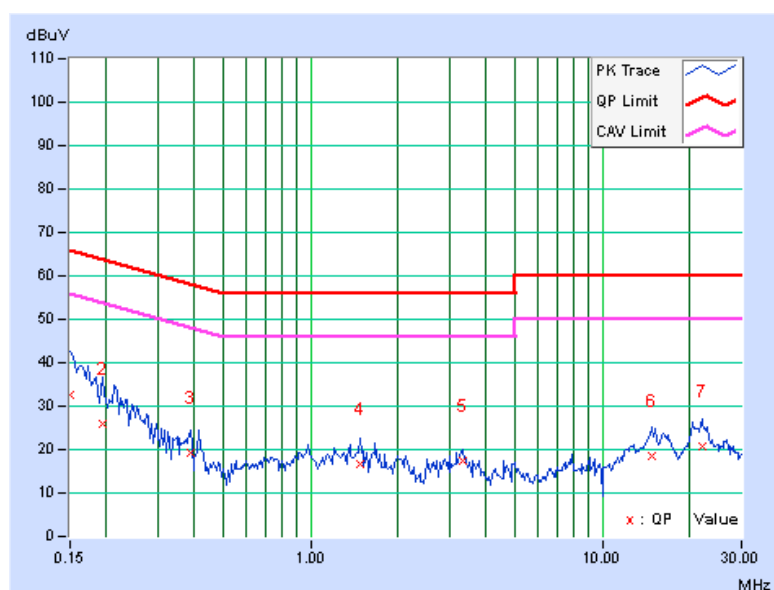
#### 4.1.8 TEST RESULTS (WLAN 5GHz + BT)

| 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  | 0.15000     | 0.08              | 32.61                   | 18.65 | 32.69                    | 18.73 | 66.00           | 56.00 | -33.31      | -37.27 |
| 2  | 0.19297     | 0.10              | 25.77                   | 16.06 | 25.87                    | 16.16 | 63.91           | 53.91 | -38.04      | -37.75 |
| 3  | 0.38828     | 0.14              | 19.03                   | 18.76 | 19.17                    | 18.90 | 58.10           | 48.10 | -38.93      | -29.20 |
| 4  | 1.48047     | 0.19              | 16.50                   | 12.05 | 16.69                    | 12.24 | 56.00           | 46.00 | -39.31      | -33.76 |
| 5  | 3.30859     | 0.26              | 17.26                   | 9.83  | 17.52                    | 10.09 | 56.00           | 46.00 | -38.48      | -35.91 |
| 6  | 14.78516    | 0.61              | 17.79                   | 12.08 | 18.40                    | 12.69 | 60.00           | 50.00 | -41.60      | -37.31 |
| 7  | 22.03906    | 0.77              | 19.97                   | 14.53 | 20.74                    | 15.30 | 60.00           | 50.00 | -39.26      | -34.70 |

#### 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

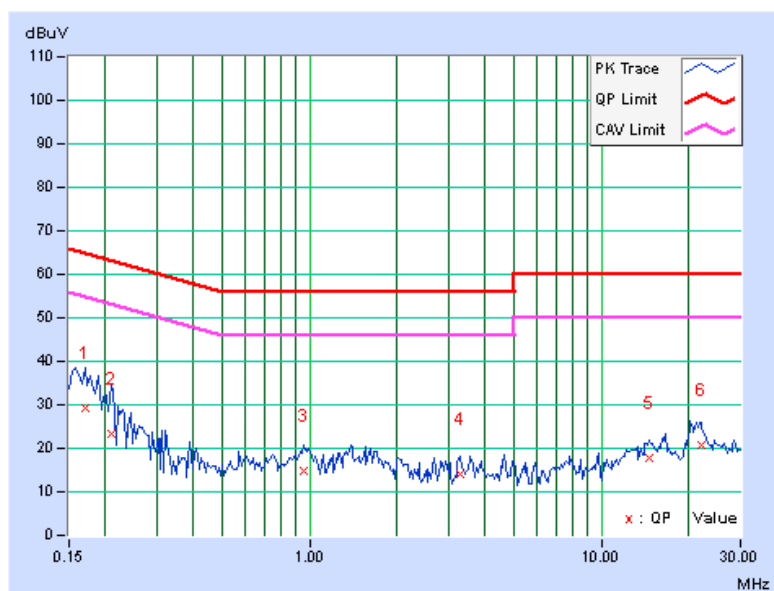


|       |             |                   |                                |
|-------|-------------|-------------------|--------------------------------|
| PHASE | Neutral (N) | DETECTOR FUNCTION | Quasi-Peak (QP) / Average (AV) |
|-------|-------------|-------------------|--------------------------------|

|    | 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  | 0.16953  | 0.09   | 29.30         | 16.58 | 29.39          | 16.67 | 64.98     | 54.98 | -35.59 | -38.31 |
| 2  | 0.20859  | 0.10   | 23.22         | 14.27 | 23.32          | 14.37 | 63.26     | 53.26 | -39.94 | -38.89 |
| 3  | 0.95859  | 0.17   | 14.63         | 12.22 | 14.80          | 12.39 | 56.00     | 46.00 | -41.20 | -33.61 |
| 4  | 3.27734  | 0.26   | 13.92         | 8.09  | 14.18          | 8.35  | 56.00     | 46.00 | -41.82 | -37.65 |
| 5  | 14.57422 | 0.60   | 17.05         | 12.44 | 17.65          | 13.04 | 60.00     | 50.00 | -42.35 | -36.96 |
| 6  | 22.08203 | 0.76   | 20.13         | 14.88 | 20.89          | 15.64 | 60.00     | 50.00 | -39.11 | -34.36 |

#### 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 20dB 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.



#### 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER              | MODEL NO.               | SERIAL NO.                          | CALIBRATED DATE | CALIBRATED UNTIL |
|-----------------------------------------|-------------------------|-------------------------------------|-----------------|------------------|
| MXE EMI Receiver<br>Agilent             | N9038A                  | MY51210105                          | Jan. 29, 2013   | Jan. 28, 2014    |
| Pre-Amplifier<br>Mini-Circuits          | ZFL-1000VH2<br>B        | AMP-ZFL-03                          | Nov. 13, 2013   | Nov. 12, 2014    |
| Trilog Broadband Antenna<br>SCHWARZBECK | VULB 9168               | 9168-360                            | Mar. 19, 2013   | Mar. 18, 2014    |
| RF Cable                                | NA                      | CHGCAB_001                          | Oct. 05, 2013   | Oct. 04, 2014    |
| Spectrum Analyzer<br>R&S                | FSV40                   | 100964                              | July 15, 2013   | July 14, 2014    |
| Horn_Antenna<br>AISI                    | AIH.8018                | 0000320091110                       | Nov. 18, 2013   | Nov. 17, 2014    |
| Pre-Amplifier<br>Agilent                | 8449B                   | 3008A02578                          | June 25, 2013   | June 24, 2014    |
| RF Cable                                | NA                      | RF104-201<br>RF104-203<br>RF104-204 | 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. G.
4. The FCC Site Registration No. is 966073.
- 5 The VCCI Site Registration No. is G-137.
- 6 The CANADA Site Registration No. is IC 7450H-2.
- 7 Tested Date: Jan. 17, 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:**

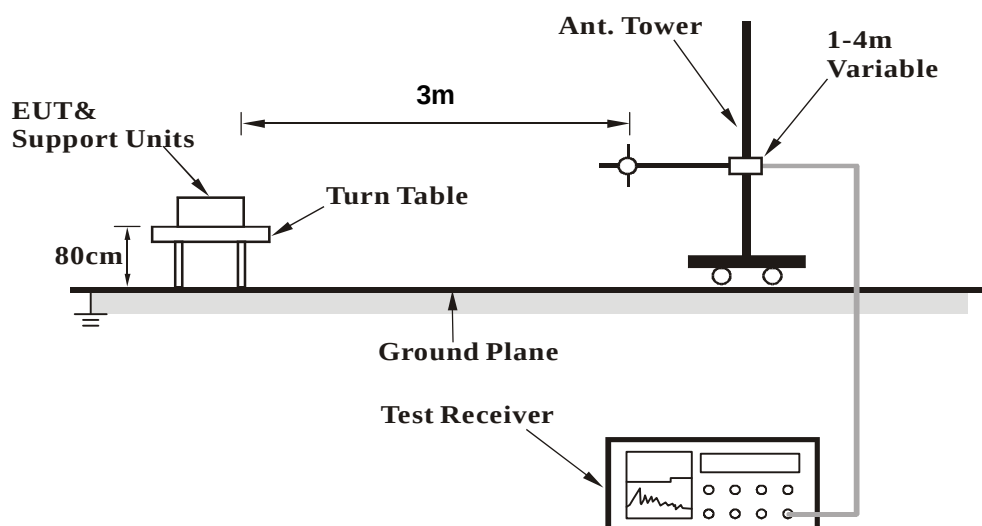
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

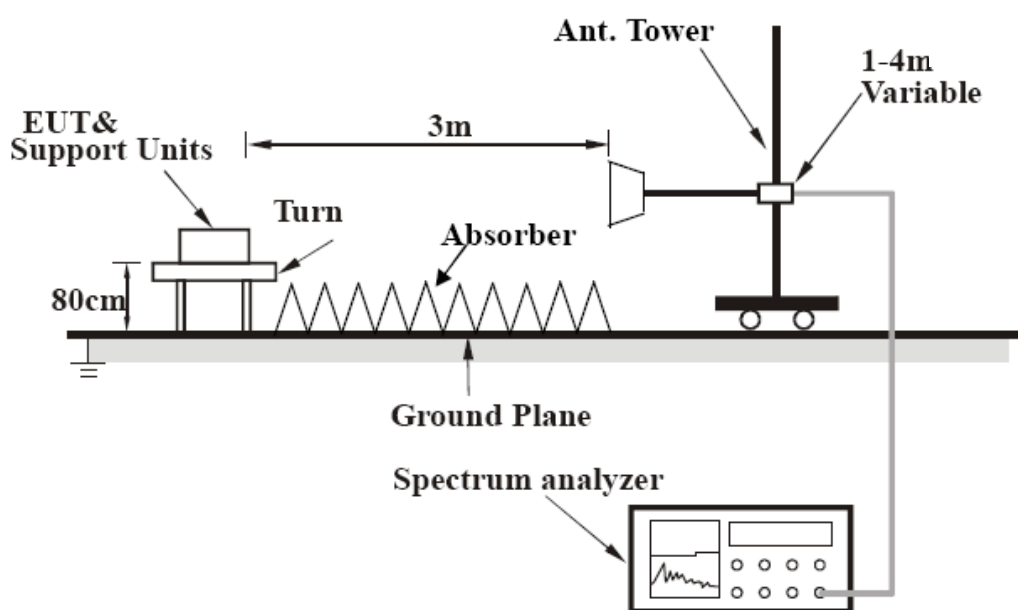
No deviation

## 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

#### 4.2.7 TEST RESULTS (MODE 1, WLAN 2.4GHz +BT)

##### BELOW 1GHz 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                                                   | 118.42      | 29.3 QP                 | 43.5           | -14.2       | 1.50 H             | 37                   | 44.67            | -15.34                   |
| 2                                                   | 147.52      | 28.3 QP                 | 43.5           | -15.2       | 2.00 H             | 224                  | 41.93            | -13.63                   |
| 3                                                   | 167.51      | 32.7 QP                 | 43.5           | -10.8       | 2.00 H             | 81                   | 46.55            | -13.83                   |
| 4                                                   | 232.34      | 33.5 QP                 | 46.0           | -12.5       | 1.50 H             | 237                  | 49.09            | -15.59                   |
| 5                                                   | 243.22      | 33.3 QP                 | 46.0           | -12.7       | 1.00 H             | 212                  | 47.96            | -14.65                   |
| 6                                                   | 400.00      | 30.2 QP                 | 46.0           | -15.8       | 1.00 H             | 34                   | 40.11            | -9.91                    |
| 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                                                   | 117.43      | 33.3 QP                 | 43.5           | -10.3       | 1.50 V             | 179                  | 48.62            | -15.37                   |
| 2                                                   | 146.74      | 30.2 QP                 | 43.5           | -13.3       | 1.50 V             | 42                   | 43.77            | -13.56                   |
| 3                                                   | 249.12      | 30.4 QP                 | 46.0           | -15.6       | 1.00 V             | 241                  | 44.78            | -14.35                   |
| 4                                                   | 260.54      | 30.1 QP                 | 46.0           | -15.9       | 2.00 V             | 73                   | 44.12            | -13.99                   |
| 5                                                   | 400.01      | 29.5 QP                 | 46.0           | -16.5       | 1.00 V             | 157                  | 39.42            | -9.91                    |
| 6                                                   | 960.40      | 31.2 QP                 | 54.0           | -22.8       | 1.50 V             | 89                   | 30.15            | 1.03                     |

##### 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



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## ABOVE 1GHz DATA

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

| 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                                                   | 4874.00     | 50.2 PK                 | 74.0           | -23.8       | 1.06 H             | 348                  | 42.87            | 7.33                     |
| 2                                                   | 4874.00     | 37.0 AV                 | 54.0           | -17.0       | 1.06 H             | 348                  | 29.67            | 7.33                     |
| 3                                                   | 4960.00     | 51.3 PK                 | 74.0           | -22.7       | 1.06 H             | 354                  | 43.72            | 7.58                     |
| 4                                                   | 4960.00     | 37.0 AV                 | 54.0           | -17.0       | 1.06 H             | 354                  | 29.42            | 7.58                     |
| 5                                                   | 7311.00     | 57.3 PK                 | 74.0           | -16.7       | 1.02 H             | 116                  | 42.34            | 14.96                    |
| 6                                                   | 7311.00     | 44.1 AV                 | 54.0           | -9.9        | 1.02 H             | 116                  | 29.14            | 14.96                    |
| 7                                                   | 7440.00     | 58.6 PK                 | 74.0           | -15.4       | 1.03 H             | 155                  | 43.75            | 14.85                    |
| 8                                                   | 7440.00     | 44.1 AV                 | 54.0           | -9.9        | 1.03 H             | 155                  | 29.25            | 14.85                    |
| 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                                                   | 4874.00     | 55.0 PK                 | 74.0           | -19.0       | 1.02 V             | 177                  | 47.67            | 7.33                     |
| 2                                                   | 4874.00     | 43.5 AV                 | 54.0           | -10.5       | 1.02 V             | 177                  | 36.17            | 7.33                     |
| 3                                                   | 4960.00     | 51.7 PK                 | 74.0           | -22.3       | 1.05 V             | 358                  | 44.12            | 7.58                     |
| 4                                                   | 4960.00     | 43.4 AV                 | 54.0           | -10.6       | 1.05 V             | 358                  | 35.82            | 7.58                     |
| 5                                                   | 7311.00     | 58.7 PK                 | 74.0           | -15.3       | 1.00 V             | 235                  | 43.74            | 14.96                    |
| 6                                                   | 7311.00     | 46.4 AV                 | 54.0           | -7.6        | 1.00 V             | 235                  | 31.44            | 14.96                    |
| 7                                                   | 7440.00     | 58.8 PK                 | 74.0           | -15.2       | 1.04 V             | 137                  | 43.95            | 14.85                    |
| 8                                                   | 7440.00     | 46.0 AV                 | 54.0           | -8.0        | 1.04 V             | 137                  | 31.15            | 14.85                    |

## 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

#### 4.2.8 TEST RESULTS (MODE 2, WLAN 2.4GHz +BT)

##### BELOW 1GHz 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                                                   | 117.88      | 26.8 QP                 | 43.5           | -16.7       | 1.50 H             | 249                  | 42.13            | -15.32                   |
| 2                                                   | 139.32      | 26.3 QP                 | 43.5           | -17.2       | 1.50 H             | 185                  | 40.20            | -13.93                   |
| 3                                                   | 255.36      | 33.8 QP                 | 46.0           | -12.2       | 2.00 H             | 174                  | 48.08            | -14.27                   |
| 4                                                   | 324.93      | 28.7 QP                 | 46.0           | -17.3       | 1.00 H             | 68                   | 40.43            | -11.72                   |
| 5                                                   | 400.03      | 28.8 QP                 | 46.0           | -17.2       | 1.00 H             | 124                  | 38.73            | -9.91                    |
| 6                                                   | 613.59      | 26.2 QP                 | 46.0           | -19.8       | 1.00 H             | 274                  | 30.71            | -4.50                    |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M   |             |                         |                |             |                    |                      |                  |                          |
| NO.                                                 | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1                                                   | 115.43      | 34.7 QP                 | 43.5           | -8.8        | 1.00 V             | 339                  | 50.39            | -15.66                   |
| 2                                                   | 147.32      | 29.4 QP                 | 43.5           | -14.1       | 1.00 V             | 271                  | 43.00            | -13.62                   |
| 3                                                   | 172.32      | 27.3 QP                 | 43.5           | -16.2       | 1.00 V             | 242                  | 41.34            | -14.00                   |
| 4                                                   | 249.33      | 30.7 QP                 | 46.0           | -15.3       | 1.50 V             | 138                  | 45.04            | -14.34                   |
| 5                                                   | 335.31      | 27.3 QP                 | 46.0           | -18.7       | 1.50 V             | 178                  | 38.78            | -11.48                   |
| 6                                                   | 400.08      | 27.7 QP                 | 46.0           | -18.3       | 2.00 V             | 304                  | 37.63            | -9.91                    |

##### 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



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## ABOVE 1GHz DATA

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

| 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                                                   | 4874.00     | 49.5 PK                 | 74.0           | -24.5       | 1.04 H             | 355                  | 42.17            | 7.33                     |
| 2                                                   | 4874.00     | 37.1 AV                 | 54.0           | -16.9       | 1.04 H             | 355                  | 29.77            | 7.33                     |
| 3                                                   | 4960.00     | 50.9 PK                 | 74.0           | -23.1       | 1.05 H             | 327                  | 43.32            | 7.58                     |
| 4                                                   | 4960.00     | 36.6 AV                 | 54.0           | -17.4       | 1.05 H             | 327                  | 29.02            | 7.58                     |
| 5                                                   | 7311.00     | 54.9 PK                 | 74.0           | -19.1       | 1.06 H             | 201                  | 39.94            | 14.96                    |
| 6                                                   | 7311.00     | 42.2 AV                 | 54.0           | -11.8       | 1.06 H             | 201                  | 27.24            | 14.96                    |
| 7                                                   | 7440.00     | 57.5 PK                 | 74.0           | -16.5       | 1.04 H             | 141                  | 42.65            | 14.85                    |
| 8                                                   | 7440.00     | 43.1 AV                 | 54.0           | -10.9       | 1.04 H             | 141                  | 28.25            | 14.85                    |
| 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                                                   | 4874.00     | 52.1 PK                 | 74.0           | -21.9       | 1.02 V             | 103                  | 44.77            | 7.33                     |
| 2                                                   | 4874.00     | 43.9 AV                 | 54.0           | -10.1       | 1.02 V             | 103                  | 36.57            | 7.33                     |
| 3                                                   | 4960.00     | 51.4 PK                 | 74.0           | -22.6       | 1.01 V             | 350                  | 43.82            | 7.58                     |
| 4                                                   | 4960.00     | 43.4 AV                 | 54.0           | -10.6       | 1.01 V             | 350                  | 35.82            | 7.58                     |
| 5                                                   | 7311.00     | 54.7 PK                 | 74.0           | -19.3       | 1.00 V             | 342                  | 39.74            | 14.96                    |
| 6                                                   | 7311.00     | 41.8 AV                 | 54.0           | -12.2       | 1.00 V             | 342                  | 26.84            | 14.96                    |
| 7                                                   | 7440.00     | 57.9 PK                 | 74.0           | -16.1       | 1.04 V             | 136                  | 43.05            | 14.85                    |
| 8                                                   | 7440.00     | 45.2 AV                 | 54.0           | -8.8        | 1.04 V             | 136                  | 30.35            | 14.85                    |

## 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



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## 4.2.9 TEST RESULTS (MODE 1, WLAN 5Hz +BT)

## BELOW 1GHz DATA :

|                 |            |                   |                 |
|-----------------|------------|-------------------|-----------------|
| FREQUENCY RANGE | Below 1GHz | DETECTOR FUNCTION | Quasi-Peak (QP) |
|-----------------|------------|-------------------|-----------------|

| 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                                                   | 118.41         | 25.3 QP                       | 43.5              | -18.2          | 1.00 H                   | 351                        | 40.65                  | -15.33                         |
| 2                                                   | 138.06         | 25.1 QP                       | 43.5              | -18.4          | 1.50 H                   | 325                        | 39.12                  | -13.99                         |
| 3                                                   | 167.20         | 30.3 QP                       | 43.5              | -13.3          | 1.00 H                   | 128                        | 44.10                  | -13.85                         |
| 4                                                   | 246.51         | 32.1 QP                       | 46.0              | -13.9          | 1.00 H                   | 73                         | 46.66                  | -14.56                         |
| 5                                                   | 272.16         | 30.8 QP                       | 46.0              | -15.2          | 1.00 H                   | 215                        | 44.16                  | -13.39                         |
| 6                                                   | 398.34         | 28.0 QP                       | 46.0              | -18.0          | 1.00 H                   | 187                        | 37.93                  | -9.92                          |
| 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                                                   | 116.34         | 34.7 QP                       | 43.5              | -8.8           | 1.00 V                   | 242                        | 50.16                  | -15.46                         |
| 2                                                   | 146.51         | 28.3 QP                       | 43.5              | -15.2          | 1.50 V                   | 37                         | 41.86                  | -13.53                         |
| 3                                                   | 249.90         | 31.6 QP                       | 46.0              | -14.4          | 1.50 V                   | 314                        | 45.88                  | -14.31                         |
| 4                                                   | 261.53         | 29.1 QP                       | 46.0              | -16.9          | 2.00 V                   | 33                         | 43.04                  | -13.92                         |
| 5                                                   | 400.00         | 28.5 QP                       | 46.0              | -17.5          | 1.50 V                   | 320                        | 38.42                  | -9.91                          |
| 6                                                   | 960.40         | 30.2 QP                       | 54.0              | -23.8          | 1.00 V                   | 38                         | 29.20                  | 1.03                           |

## 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



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## ABOVE 1GHz DATA

|                 |              |                   |                           |
|-----------------|--------------|-------------------|---------------------------|
| FREQUENCY RANGE | 1GHz ~ 40GHz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|-----------------|--------------|-------------------|---------------------------|

| 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                                                   | 4960.00     | 50.6 PK                 | 74.0           | -23.4       | 1.05 H             | 347                  | 43.02            | 7.58                     |
| 2                                                   | 4960.00     | 36.3 AV                 | 54.0           | -17.7       | 1.05 H             | 347                  | 28.72            | 7.58                     |
| 3                                                   | 7440.00     | 58.8 PK                 | 74.0           | -15.2       | 1.03 H             | 139                  | 43.95            | 14.85                    |
| 4                                                   | 7440.00     | 44.1 AV                 | 54.0           | -9.9        | 1.03 H             | 139                  | 29.25            | 14.85                    |
| 5                                                   | 11570.00    | 55.4 PK                 | 74.0           | -18.6       | 1.19 H             | 229                  | 38.76            | 16.64                    |
| 6                                                   | 11570.00    | 43.1 AV                 | 54.0           | -10.9       | 1.19 H             | 229                  | 26.46            | 16.64                    |
| 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                                                   | 4960.00     | 51.5 PK                 | 74.0           | -22.5       | 1.00 V             | 346                  | 43.92            | 7.58                     |
| 2                                                   | 4960.00     | 43.3 AV                 | 54.0           | -10.7       | 1.00 V             | 346                  | 35.72            | 7.58                     |
| 3                                                   | 7440.00     | 59.2 PK                 | 74.0           | -14.8       | 1.06 V             | 121                  | 44.35            | 14.85                    |
| 4                                                   | 7440.00     | 46.3 AV                 | 54.0           | -7.7        | 1.06 V             | 121                  | 31.45            | 14.85                    |
| 5                                                   | 11570.00    | 58.7 PK                 | 74.0           | -15.3       | 1.47 V             | 73                   | 42.06            | 16.64                    |
| 6                                                   | 11570.00    | 47.9 AV                 | 54.0           | -6.1        | 1.47 V             | 73                   | 31.26            | 16.64                    |

## 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



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## 4.2.10 TEST RESULTS (MODE 2, WLAN 5Hz +BT)

## BELOW 1GHz DATA :

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

| 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                                                   | 136.60         | 25.9 QP                       | 43.5              | -17.6          | 1.00 H                   | 206                        | 39.81                  | -13.87                         |
| 2                                                   | 165.95         | 32.4 QP                       | 43.5              | -11.1          | 2.00 H                   | 233                        | 46.36                  | -13.95                         |
| 3                                                   | 254.59         | 33.4 QP                       | 46.0              | -12.6          | 1.00 H                   | 287                        | 47.72                  | -14.30                         |
| 4                                                   | 400.01         | 29.8 QP                       | 46.0              | -16.2          | 1.00 H                   | 157                        | 39.68                  | -9.91                          |
| 5                                                   | 600.10         | 27.0 QP                       | 46.0              | -19.0          | 1.50 H                   | 108                        | 32.14                  | -5.10                          |
| 6                                                   | 960.00         | 29.8 QP                       | 46.0              | -16.2          | 1.50 H                   | 162                        | 28.77                  | 1.03                           |
| 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                                                   | 117.80         | 33.0 QP                       | 43.5              | -10.5          | 1.00 V                   | 32                         | 48.35                  | -15.33                         |
| 2                                                   | 141.76         | 33.7 QP                       | 43.5              | -9.8           | 1.50 V                   | 323                        | 47.24                  | -13.56                         |
| 3                                                   | 245.98         | 31.2 QP                       | 46.0              | -14.8          | 1.50 V                   | 294                        | 45.82                  | -14.61                         |
| 4                                                   | 255.36         | 33.6 QP                       | 46.0              | -12.4          | 1.50 V                   | 313                        | 47.88                  | -14.27                         |
| 5                                                   | 335.10         | 30.2 QP                       | 46.0              | -15.8          | 1.00 V                   | 231                        | 41.66                  | -11.50                         |
| 6                                                   | 400.79         | 27.5 QP                       | 46.0              | -18.5          | 1.50 V                   | 166                        | 37.38                  | -9.91                          |

## 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



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## ABOVE 1GHz DATA

|                 |              |                   |                           |
|-----------------|--------------|-------------------|---------------------------|
| FREQUENCY RANGE | 1GHz ~ 40GHz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
|-----------------|--------------|-------------------|---------------------------|

| 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                                                   | 4960.00     | 50.5 PK                 | 74.0           | -23.5       | 1.11 H             | 358                  | 42.92            | 7.58                     |
| 2                                                   | 4960.00     | 36.3 AV                 | 54.0           | -17.7       | 1.11 H             | 358                  | 28.72            | 7.58                     |
| 3                                                   | 7440.00     | 59.1 PK                 | 74.0           | -14.9       | 1.10 H             | 131                  | 44.25            | 14.85                    |
| 4                                                   | 7440.00     | 44.1 AV                 | 54.0           | -9.9        | 1.10 H             | 131                  | 29.25            | 14.85                    |
| 5                                                   | 11570.00    | 54.9 PK                 | 74.0           | -19.1       | 1.17 H             | 239                  | 38.26            | 16.64                    |
| 6                                                   | 11570.00    | 42.6 AV                 | 54.0           | -11.4       | 1.17 H             | 239                  | 25.96            | 16.64                    |
| 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                                                   | 4960.00     | 50.5 PK                 | 74.0           | -23.5       | 1.05 V             | 335                  | 42.92            | 7.58                     |
| 2                                                   | 4960.00     | 42.3 AV                 | 54.0           | -11.7       | 1.05 V             | 335                  | 34.72            | 7.58                     |
| 3                                                   | 7440.00     | 58.7 PK                 | 74.0           | -15.3       | 1.02 V             | 88                   | 43.85            | 14.85                    |
| 4                                                   | 7440.00     | 45.6 AV                 | 54.0           | -8.4        | 1.02 V             | 88                   | 30.75            | 14.85                    |
| 5                                                   | 11570.00    | 58.9 PK                 | 74.0           | -15.1       | 1.48 V             | 79                   | 42.26            | 16.64                    |
| 6                                                   | 11570.00    | 48.2 AV                 | 54.0           | -5.8        | 1.48 V             | 79                   | 31.56            | 16.64                    |

## 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

## 4.2.11 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

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

### 4.2.13 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

### 4.2.14 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.

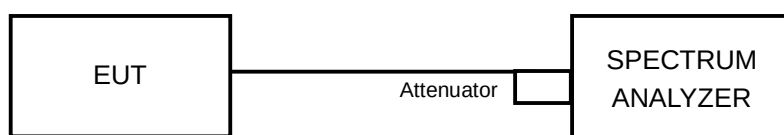
#### Measurement Procedure –Unwanted Emission Level

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.

#### 4.2.15 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.16 TEST SETUP



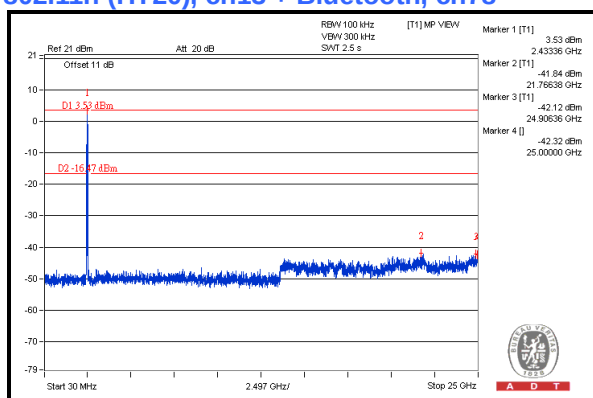
#### 4.2.17 EUT OPERATING CONDITION

Same as Item 4.1.6

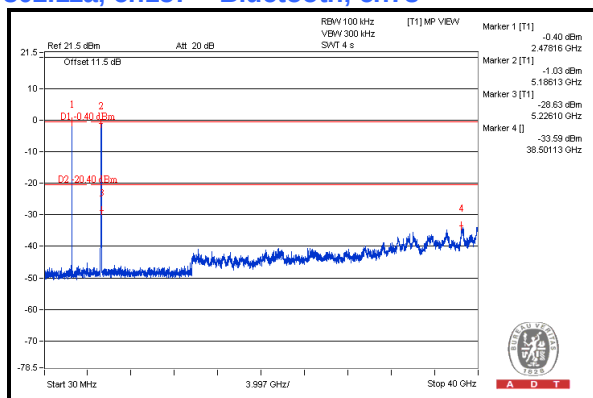
#### 4.2.18 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

# For WLAN 2.4GHz + BT 802.11n (HT20), ch13 + Bluetooth, ch78



# For WLAN 5GHz + BT 802.11a, ch157 + Bluetooth, ch78





A D T

#### 4. INFORMATION ON THE TESTING LABORATORIES

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

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

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**Web Site:** [www.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.

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