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FCC TEST REPORT (15.247)

REPORT NO.: RF130129C10

MODEL NO.: SVG7782U DIAGNOSTIC
(Refer to item 3.1 for more details)

FCC ID: W5HSVG7782HH

RECEIVED: Jan. 29, 2013

TESTED: Feb. 20 ~ Mar. 23, 2013

ISSUED: Mar. 28, 2013

APPLICANT: GENERAL INSTRUMENT OF TAIWAN, LTD.

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|-------------|-------------------|---------------|
| RF130129C10 | Original release. | Mar. 28, 2013 |



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1. CERTIFICATION

PRODUCT: Wireless voice cable modem gateway
MODEL NO.: SVG7782U DIAGNOSTIC (Refer to item 3.1 for more details)
BRAND: Motorola
APPLICANT: GENERAL INSTRUMENT OF TAIWAN, LTD.
TESTED: Feb. 20 ~ Mar. 23, 2013
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (model: SVG7782U DIAGNOSTIC) 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 : Sun Li , **DATE :** Mar. 28, 2013
Suntee Liu / Specialist

APPROVED BY : Ken Liu , **DATE :** Mar. 28, 2013
Ken Liu / Senior Manager



2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) | | | |
|---|-----------------------------|--------|--|
| STANDARD SECTION | TEST TYPE | RESULT | REMARK |
| 15.207 | AC Power Conducted Emission | PASS | Meet the requirement of limit. Minimum passing margin is -15.55dB at 0.37287MHz. |
| 15.247(d) 15.209 | Radiated Emissions | PASS | Meet the requirement of limit. Minimum passing margin is -0.7dB at 5725.00MHz. |
| 15.247(d) | Band Edge Measurement | PASS | Meet the requirement of limit. |
| 15.247(a)(2) | 6dB bandwidth | PASS | Meet the requirement of limit. |
| 15.247(b) | Conducted power | PASS | Meet the requirement of limit. |
| 15.247(e) | Power Spectral Density | PASS | Meet the requirement of limit. |
| 15.203 | Antenna Requirement | PASS | Antenna connector is IPEX not a standard connector. |

2.1 MEASUREMENT UNCERTAINTY

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

| MEASUREMENT | FREQUENCY | UNCERTAINTY |
|---------------------|-----------------|-------------|
| Conducted emissions | 9kHz~30MHz | 2.44 dB |
| Radiated emissions | 30MHz ~ 200MHz | 3.34 dB |
| | 200MHz ~1000MHz | 3.35 dB |
| | 1GHz ~ 18GHz | 2.26 dB |
| | 18GHz ~ 40GHz | 1.94 dB |

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



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|------------------------------|--|
| EUT | Wireless voice cable modem gateway |
| MODEL NO. | SVG7782U DIAGNOSTIC (Refer to Note for more details) |
| POWER SUPPLY | 100-240Vac |
| MODULATION TYPE | CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM |
| MODULATION TECHNOLOGY | DSSS, OFDM |
| TRANSFER RATE | 802.11b: 11/5.5/2/1Mbps 802.11a/g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 450Mbps |
| OPERATING FREQUENCY | 2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz |
| NUMBER OF CHANNEL | 2.4GHz: 802.11b, 802.11g, 802.11n (20MHz): 11 802.11n (40MHz): 7 5.0GHz: 802.11a, 802.11n (20MHz): 5 802.11n (40MHz): 2 |
| OUTPUT POWER | 562.932mW for 2412 ~ 2462MHz 719.741mW for 5745 ~ 5825MHz |
| ANTENNA TYPE | 2.4GHz: Printed antenna with 4.4dBi gain 5.0GHz: Printed antenna with 3.5dBi gain |
| ANTENNA CONNECTOR | IPEX |
| DATA CABLE | 1.8m non-shielded RJ45 cable w/o core 1.5m non-shielded Diagnostic cable w/o core |
| I/O PORTS | Refer to user's manual |
| ACCESSORY DEVICES | 1.5m non-shielded power cable w/o core |



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NOTE:

1. All models are listed as below.

| Brand | Model | Remark |
|--------------|---------------------|-------------------------------|
| Motorola | SVG7782U DIAGNOSTIC | with Diagnostic & USB port |
| | SVG7782U | with USB port |
| | SVG7782 | without Diagnostic & USB port |

*The model: SVG7782U DIAGNOSTIC was chosen for the final test and presented in the test report.

2. The EUT incorporates a MIMO function. The EUT provides 3 completed transmitters and 3 receivers. The EUT has diversity function.

| MODULATION MODE | TX FUNCTION |
|------------------------|--------------------|
| 802.11b | 1TX |
| 802.11g | 1TX |
| 802.11a | 1TX |
| 802.11n (20MHz) | 3TX |
| 802.11n (40MHz) | 3TX |

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.



3.2 DESCRIPTION OF TEST MODES

FOR 2.4GHz:

11 channels are provided for 802.11b, 802.11g, 802.11n (20MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 1 | 2412MHz | 7 | 2442MHz |
| 2 | 2417MHz | 8 | 2447MHz |
| 3 | 2422MHz | 9 | 2452MHz |
| 4 | 2427MHz | 10 | 2457MHz |
| 5 | 2432MHz | 11 | 2462MHz |
| 6 | 2437MHz | | |

7 channels are provided for 802.11n (40MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 3 | 2422MHz | 7 | 2442MHz |
| 4 | 2427MHz | 8 | 2447MHz |
| 5 | 2432MHz | 9 | 2452MHz |
| 6 | 2437MHz | | |

FOR 5.0GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (20MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 149 | 5745MHz | 161 | 5805MHz |
| 153 | 5765MHz | 165 | 5825MHz |
| 157 | 5785MHz | | |

2 channels are provided for 802.11n (40MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---------|-----------|---------|-----------|
| 151 | 5755MHz | 159 | 5795MHz |

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

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

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11b | 1 to 11 | 1, 6, 11 | DSSS | DBPSK | 1.0 |
| - | 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.0 |
| - | 802.11n (20MHz) | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 7.2 |
| - | 802.11n (40MHz) | 3 to 9 | 3, 6, 9 | OFDM | BPSK | 15.0 |

RADIATED EMISSION TEST (BELOW 1GHz):

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11n (20MHz) | 1 to 11 | 6 | OFDM | BPSK | 7.2 |

POWER LINE CONDUCTED EMISSION TEST:

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11n (20MHz) | 1 to 11 | 6 | OFDM | BPSK | 7.2 |



BANDEDGE MEASUREMENT:

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11b | 1 to 11 | 1, 11 | DSSS | DBPSK | 1.0 |
| - | 802.11g | 1 to 11 | 1, 11 | OFDM | BPSK | 6.0 |
| - | 802.11n (20MHz) | 1 to 11 | 1, 11 | OFDM | BPSK | 7.2 |
| - | 802.11n (40MHz) | 3 to 9 | 3, 9 | OFDM | BPSK | 15.0 |

ANTENNA PORT CONDUCTED MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11b | 1 to 11 | 1, 6, 11 | DSSS | DBPSK | 1.0 |
| - | 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.0 |
| - | 802.11n (20MHz) | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 7.2 |
| - | 802.11n (40MHz) | 3 to 9 | 3, 6, 9 | OFDM | BPSK | 15.0 |

TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---------------|------------------------------------|--------------|-------------------------|
| RE≥1G | 27deg. C, 69%RH 25deg. C, 65%RH | 120Vac, 60Hz | Alan Wu Ted Chang |
| RE<1G | 21deg. C, 69%RH | 120Vac, 60Hz | Alan Wu |
| PLC | 21deg. C, 69%RH | 120Vac, 60Hz | Alan Wu |
| APCM | 24deg. C, 75%RH | 120Vac, 60Hz | Match Tsui Nick Chen |



FOR 5.0GHz (5745 ~ 5825MHz):

| EUT CONFIGURE MODE | APPLICABLE TO | | | | DESCRIPTION |
|--------------------|---------------|-------|-----|------|-------------|
| | RE≥1G | RE<1G | PLC | APCM | |
| - | √ | √ | √ | √ | - |

Where **RE≥1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

RADIATED EMISSION TEST (ABOVE 1GHz):

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11a | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6.0 |
| - | 802.11n (20MHz) | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 7.2 |
| - | 802.11n (40MHz) | 151 to 159 | 151, 159 | OFDM | BPSK | 15.0 |

RADIATED EMISSION TEST (BELOW 1GHz):

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11n (20MHz) | 149 to 165 | 149 | OFDM | BPSK | 7.2 |

POWER LINE CONDUCTED EMISSION TEST:

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11n (20MHz) | 149 to 165 | 149 | OFDM | BPSK | 7.2 |



BANDEDGE MEASUREMENT:

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

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11a | 149 to 165 | 149, 165 | OFDM | BPSK | 6.0 |
| - | 802.11n (20MHz) | 149 to 165 | 149, 165 | OFDM | BPSK | 7.2 |
| - | 802.11n (40MHz) | 151 to 159 | 151, 159 | OFDM | BPSK | 15.0 |

ANTENNA PORT CONDUCTED MEASUREMENT:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

| EUT CONFIGURE MODE | MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) |
|--------------------|-----------------|-------------------|----------------|-----------------------|-----------------|------------------|
| - | 802.11a | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 6.0 |
| - | 802.11n (20MHz) | 149 to 165 | 149, 157, 165 | OFDM | BPSK | 7.2 |
| - | 802.11n (40MHz) | 151 to 159 | 151, 159 | OFDM | BPSK | 15.0 |

TEST CONDITION:

| APPLICABLE TO | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---------------|--------------------------|--------------|-----------|
| RE≥1G | 21deg. C, 66%RH | 120Vac, 60Hz | Alan Wu |
| RE<1G | 21deg. C, 69%RH | 120Vac, 60Hz | Alan Wu |
| PLC | 21deg. C, 69%RH | 120Vac, 60Hz | Alan Wu |
| APCM | 24deg. C, 75%RH | 120Vac, 60Hz | Nick Chen |



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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.

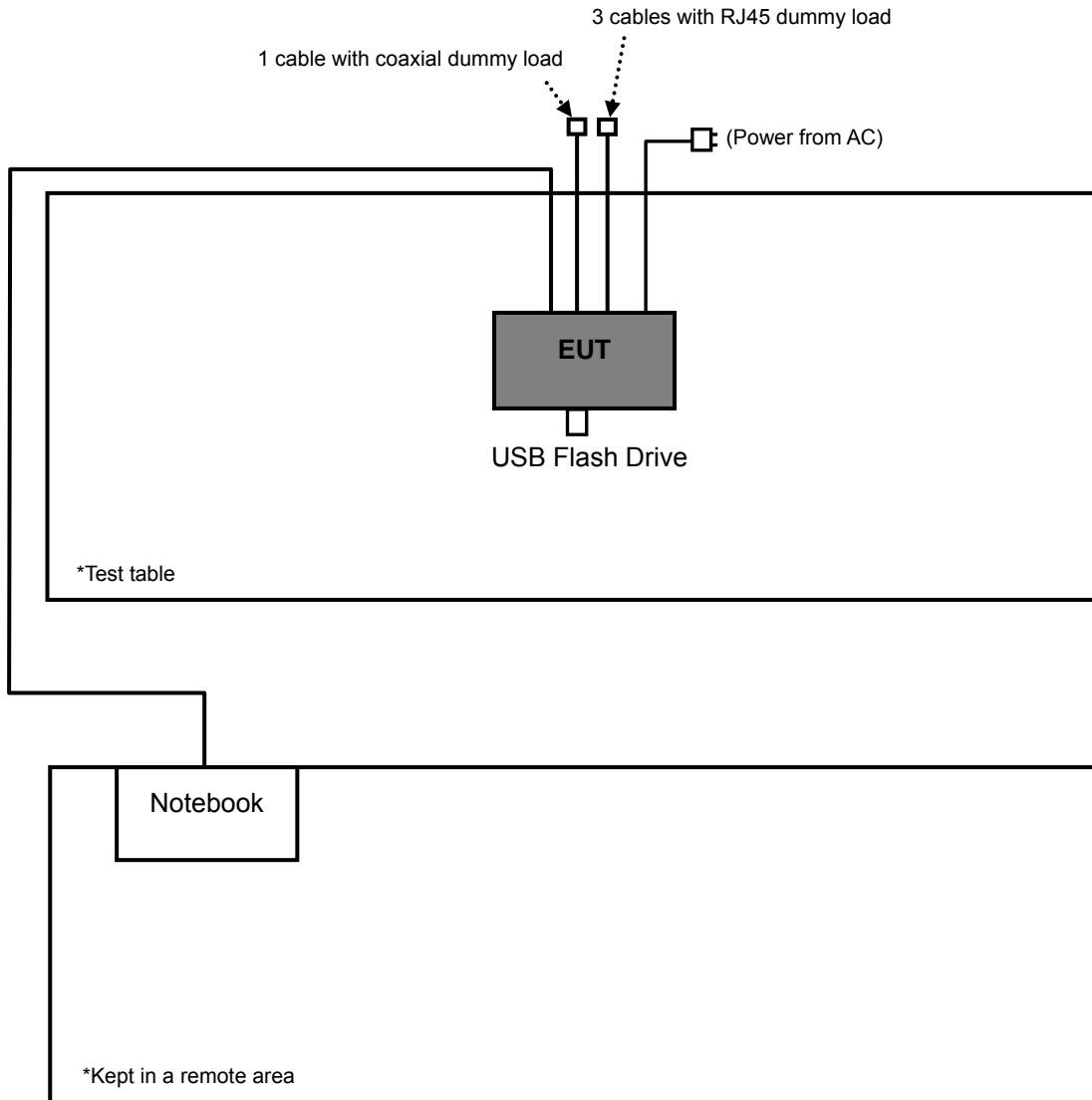
| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|-----|-----------------|-----------|-----------|------------------------------|--------------|
| 1 | USB Flash Drive | Transcend | V85 | 569992-8210 | NA |
| 2 | Notebook | DELL | D531 | CN-0XM006-48643-8 1U-2973 | QDS-BRCM1020 |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1 | NA |
| 2 | 10m RJ45 UTP cable |

NOTE:

1. All power cords of the above support units are non-shielded (1.5m).
2. Item 2 acted as a communication partner to transfer data.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST





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3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v02

662911 D01 Multiple Transmitter Output v01 r02

ANSI C63.10-2009

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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

NOTE:

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



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4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|---|------------------------------|------------|---------------------|-------------------------|
| Test Receiver ROHDE & SCHWARZ | ESCI | 100424 | Aug. 21, 2012 | Aug. 20, 2013 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSU 43 | 100115 | Oct. 25, 2012 | Oct. 24, 2013 |
| BILOG Antenna SCHWARZBECK | VULB9168 | 9168-155 | Apr. 06, 2012 | Apr. 05, 2013 |
| HORN Antenna SCHWARZBECK | BBHA 9120D | 9120D-404 | Dec. 22, 2012 | Dec. 21, 2013 |
| HORN Antenna SCHWARZBECK | BBHA 9170 | 148 | Jul. 11, 2012 | Jul. 10, 2013 |
| Loop Antenna | HFH2-Z2 | 100070 | Jan. 31, 2012 | Jan. 30, 2014 |
| Preamplifier Agilent | 8449B | 3008A01961 | Oct. 25, 2012 | Oct. 24, 2013 |
| Preamplifier Agilent | 8447D | 2944A10738 | Oct. 23, 2012 | Oct. 22, 2013 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 309220/4 | Aug. 28, 2012 | Aug. 27, 2013 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 250724/4 | Aug. 28, 2012 | Aug. 27, 2013 |
| RF signal cable HUBER+SUHNNER | SUCOFLEX 104 | 295012/4 | Aug. 28, 2012 | Aug. 27, 2013 |
| Software ADT | ADT_Radiated_ V7.6.15.9.2 | NA | NA | NA |
| Antenna Tower inn-co GmbH | MA 4000 | 010303 | NA | NA |
| Antenna Tower Controller inn-co GmbH | CO2000 | 019303 | NA | NA |
| Turn Table ADT | TT100. | TT93021704 | NA | NA |
| Turn Table Controller ADT | SC100. | SC93021704 | NA | NA |
| 26GHz ~ 40GHz Amplifier | EM26400 | 815221 | Oct. 25, 2012 | Oct. 24, 2013 |
| High Speed Peak Power Meter | ML2495A | 0842014 | Apr. 28, 2012 | Apr. 27, 2013 |
| Power Sensor | MA2411B | 0738404 | Apr. 28, 2012 | Apr. 27, 2013 |

- 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. The test was performed in HwaYa Chamber 4.
 4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 5. The FCC Site Registration No. is 460141.
 6. The IC Site Registration No. is IC7450F-4.



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4.1.3 TEST PROCEDURES

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

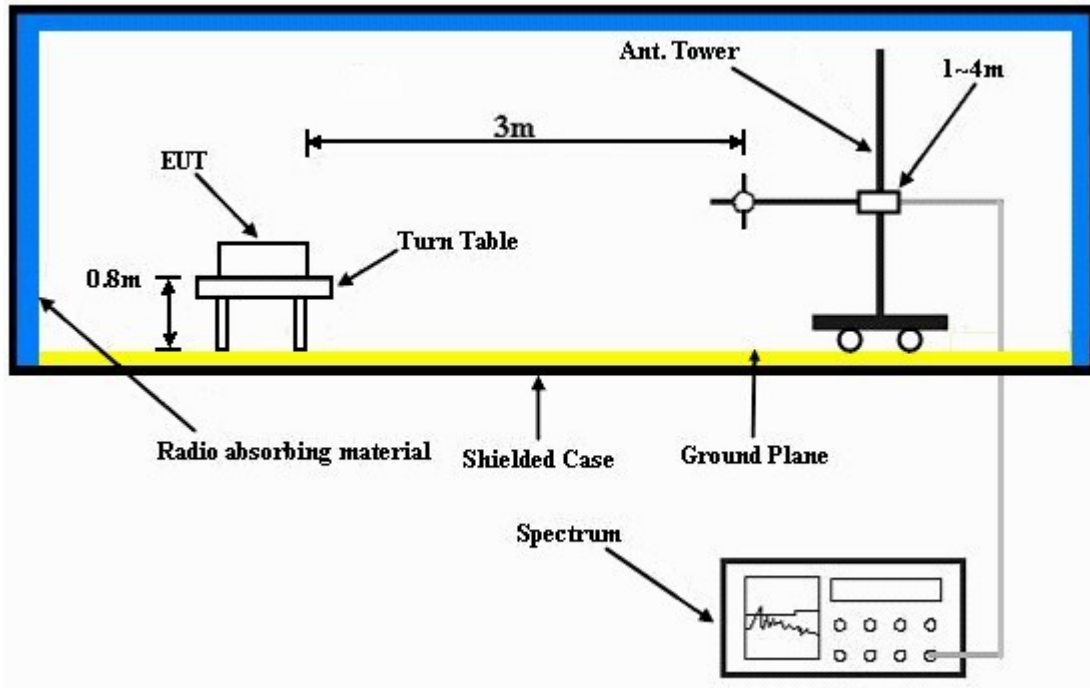
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

- Placed the EUT on the testing table.
- Prepared a notebook to act as a communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partners sent data to EUT by command "PING".
- The necessary accessories enabled the system in full functions.



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4.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA :

802.11b

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 1 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 27deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2332.00 | 63.7 PK | 74.0 | -10.3 | 1.26 H | 269 | 31.30 | 32.40 |
| 2 | 2332.00 | 53.0 AV | 54.0 | -1.0 | 1.26 H | 269 | 20.60 | 32.40 |
| 3 | *2412.00 | 116.8 PK | | | 1.24 H | 265 | 84.10 | 32.70 |
| 4 | *2412.00 | 112.6 AV | | | 1.24 H | 265 | 79.90 | 32.70 |
| 5 | 4824.00 | 47.7 PK | 74.0 | -26.3 | 1.00 H | 88 | 8.90 | 38.80 |
| 6 | 4824.00 | 39.8 AV | 54.0 | -14.2 | 1.00 H | 88 | 1.00 | 38.80 |
| 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 | 2332.00 | 58.9 PK | 74.0 | -15.1 | 1.36 V | 200 | 26.50 | 32.40 |
| 2 | 2332.00 | 46.6 AV | 54.0 | -7.4 | 1.36 V | 200 | 14.20 | 32.40 |
| 3 | *2412.00 | 105.9 PK | | | 1.31 V | 205 | 73.20 | 32.70 |
| 4 | *2412.00 | 101.8 AV | | | 1.31 V | 205 | 69.10 | 32.70 |
| 5 | 4824.00 | 46.3 PK | 74.0 | -27.7 | 1.00 V | 292 | 7.50 | 38.80 |
| 6 | 4824.00 | 34.7 AV | 54.0 | -19.3 | 1.00 V | 292 | -4.10 | 38.80 |

REMARKS:

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



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 6 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 27deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2437.00 | 117.8 PK | | | 1.22 H | 260 | 85.00 | 32.80 |
| 2 | *2437.00 | 113.7 AV | | | 1.22 H | 260 | 80.90 | 32.80 |
| 3 | 4874.00 | 49.4 PK | 74.0 | -24.6 | 1.00 H | 82 | 10.60 | 38.80 |
| 4 | 4874.00 | 41.7 AV | 54.0 | -12.3 | 1.00 H | 82 | 2.90 | 38.80 |
| 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 | *2437.00 | 108.0 PK | | | 1.83 V | 219 | 75.20 | 32.80 |
| 2 | *2437.00 | 104.1 AV | | | 1.83 V | 219 | 71.30 | 32.80 |
| 3 | 4874.00 | 48.9 PK | 74.0 | -25.1 | 1.00 V | 291 | 10.10 | 38.80 |
| 4 | 4874.00 | 36.1 AV | 54.0 | -17.9 | 1.00 V | 291 | -2.70 | 38.80 |

REMARKS:

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



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 11 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 27deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 109.9 PK | | | 1.25 H | 210 | 77.70 | 32.20 |
| 2 | *2462.00 | 106.0 AV | | | 1.25 H | 210 | 73.80 | 32.20 |
| 3 | 2483.50 | 61.2 PK | 74.0 | -12.8 | 1.25 H | 210 | 29.00 | 32.20 |
| 4 | 2483.50 | 48.7 AV | 54.0 | -5.3 | 1.25 H | 210 | 16.50 | 32.20 |
| 5 | 4924.00 | 53.3 PK | 74.0 | -20.7 | 1.25 H | 67 | 14.50 | 38.80 |
| 6 | 4924.00 | 49.6 AV | 54.0 | -4.4 | 1.25 H | 67 | 10.80 | 38.80 |
| 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 | *2462.00 | 117.1 PK | | | 1.03 V | 56 | 84.90 | 32.20 |
| 2 | *2462.00 | 113.6 AV | | | 1.03 V | 56 | 81.40 | 32.20 |
| 3 | 2483.50 | 64.8 PK | 74.0 | -9.2 | 1.03 V | 56 | 32.60 | 32.20 |
| 4 | 2483.50 | 53.0 AV | 54.0 | -1.0 | 1.03 V | 56 | 20.80 | 32.20 |
| 5 | 4924.00 | 52.2 PK | 74.0 | -21.8 | 1.20 V | 56 | 13.40 | 38.80 |
| 6 | 4924.00 | 47.8 AV | 54.0 | -6.2 | 1.20 V | 56 | 9.00 | 38.80 |

REMARKS:

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



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802.11g

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 1 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 27deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 68.8 PK | 74.0 | -5.2 | 1.29 H | 269 | 36.20 | 32.60 |
| 2 | 2390.00 | 52.7 AV | 54.0 | -1.3 | 1.29 H | 269 | 20.10 | 32.60 |
| 3 | *2412.00 | 111.9 PK | | | 1.25 H | 262 | 79.20 | 32.70 |
| 4 | *2412.00 | 99.5 AV | | | 1.25 H | 262 | 66.80 | 32.70 |
| 5 | 4824.00 | 51.8 PK | 74.0 | -22.2 | 1.00 H | 68 | 13.00 | 38.80 |
| 6 | 4824.00 | 35.0 AV | 54.0 | -19.0 | 1.00 H | 68 | -3.80 | 38.80 |

| 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 | 2390.00 | 61.3 PK | 74.0 | -12.7 | 1.82 V | 211 | 28.70 | 32.60 |
| 2 | 2390.00 | 47.7 AV | 54.0 | -6.3 | 1.82 V | 211 | 15.10 | 32.60 |
| 3 | *2412.00 | 103.3 PK | | | 1.84 V | 218 | 70.60 | 32.70 |
| 4 | *2412.00 | 91.4 AV | | | 1.84 V | 218 | 58.70 | 32.70 |
| 5 | 4824.00 | 50.9 PK | 74.0 | -23.1 | 1.00 V | 293 | 12.10 | 38.80 |
| 6 | 4824.00 | 33.5 AV | 54.0 | -20.5 | 1.00 V | 293 | -5.30 | 38.80 |

REMARKS:

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



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 6 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 27deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2437.00 | 122.9 PK | | | 1.21 H | 262 | 90.10 | 32.80 |
| 2 | *2437.00 | 108.0 AV | | | 1.21 H | 262 | 75.20 | 32.80 |
| 3 | 2483.50 | 64.9 PK | 74.0 | -9.1 | 1.29 H | 260 | 32.00 | 32.90 |
| 4 | 2483.50 | 51.6 AV | 54.0 | -2.4 | 1.29 H | 260 | 18.70 | 32.90 |
| 5 | 4874.00 | 59.5 PK | 74.0 | -14.5 | 1.00 H | 67 | 20.70 | 38.80 |
| 6 | 4874.00 | 43.9 AV | 54.0 | -10.1 | 1.00 H | 67 | 5.10 | 38.80 |
| 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 | *2437.00 | 111.9 PK | | | 1.81 V | 218 | 79.10 | 32.80 |
| 2 | *2437.00 | 99.2 AV | | | 1.81 V | 218 | 66.40 | 32.80 |
| 3 | 2483.50 | 60.2 PK | 74.0 | -13.8 | 1.88 V | 214 | 27.30 | 32.90 |
| 4 | 2483.50 | 47.6 AV | 54.0 | -6.4 | 1.88 V | 214 | 14.70 | 32.90 |
| 5 | 4874.00 | 54.4 PK | 74.0 | -19.6 | 1.00 V | 292 | 15.60 | 38.80 |
| 6 | 4874.00 | 38.2 AV | 54.0 | -15.8 | 1.00 V | 292 | -0.60 | 38.80 |

REMARKS:

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



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 11 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 27deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *2462.00 | 105.7 PK | | | 1.17 H | 88 | 73.50 | 32.20 |
| 2 | *2462.00 | 95.5 AV | | | 1.17 H | 88 | 63.30 | 32.20 |
| 3 | 2483.50 | 62.2 PK | 74.0 | -11.8 | 1.17 H | 88 | 30.00 | 32.20 |
| 4 | 2483.50 | 50.1 AV | 54.0 | -3.9 | 1.17 H | 88 | 17.90 | 32.20 |
| 5 | 4924.00 | 46.6 PK | 74.0 | -27.4 | 1.00 H | 258 | 7.80 | 38.80 |
| 6 | 4924.00 | 33.9 AV | 54.0 | -20.1 | 1.00 H | 258 | -4.90 | 38.80 |
| 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 | *2462.00 | 113.6 PK | | | 1.28 V | 58 | 81.40 | 32.20 |
| 2 | *2462.00 | 103.0 AV | | | 1.28 V | 58 | 70.80 | 32.20 |
| 3 | 2483.50 | 66.2 PK | 74.0 | -7.8 | 1.28 V | 58 | 34.00 | 32.20 |
| 4 | 2483.50 | 53.0 AV | 54.0 | -1.0 | 1.28 V | 58 | 20.80 | 32.20 |
| 5 | 4924.00 | 48.6 PK | 74.0 | -25.4 | 1.00 V | 95 | 9.80 | 38.80 |
| 6 | 4924.00 | 37.5 AV | 54.0 | -16.5 | 1.00 V | 95 | -1.30 | 38.80 |

REMARKS:

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



A D T

802.11n (20MHz)

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

| 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 | 2390.00 | 67.7 PK | 74.0 | -6.3 | 1.02 H | 289 | 35.80 | 31.90 |
| 2 | 2390.00 | 52.1 AV | 54.0 | -1.9 | 1.02 H | 289 | 20.20 | 31.90 |
| 3 | *2412.00 | 111.2 PK | | | 1.02 H | 211 | 79.20 | 32.00 |
| 4 | *2412.00 | 101.2 AV | | | 1.02 H | 211 | 69.20 | 32.00 |
| 5 | 4824.00 | 46.4 PK | 74.0 | -27.6 | 1.08 H | 219 | 7.80 | 38.60 |
| 6 | 4824.00 | 33.5 AV | 54.0 | -20.5 | 1.08 H | 219 | -5.10 | 38.60 |

| 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 | 2390.00 | 67.5 PK | 74.0 | -6.5 | 1.04 V | 56 | 35.60 | 31.90 |
| 2 | 2390.00 | 52.9 AV | 54.0 | -1.1 | 1.04 V | 56 | 21.00 | 31.90 |
| 3 | *2412.00 | 109.8 PK | | | 1.59 V | 55 | 77.80 | 32.00 |
| 4 | *2412.00 | 101.0 AV | | | 1.59 V | 55 | 69.00 | 32.00 |
| 5 | 4824.00 | 47.5 PK | 74.0 | -26.5 | 1.00 V | 253 | 8.90 | 38.60 |
| 6 | 4824.00 | 37.2 AV | 54.0 | -16.8 | 1.00 V | 253 | -1.40 | 38.60 |

REMARKS:

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



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 6 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Ted Chang |

| 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 | 2390.00 | 66.1 PK | 74.0 | -7.9 | 1.22 H | 261 | 33.50 | 32.60 |
| 2 | 2390.00 | 49.9 AV | 54.0 | -4.1 | 1.22 H | 261 | 17.30 | 32.60 |
| 3 | *2437.00 | 119.9 PK | | | 1.21 H | 264 | 87.10 | 32.80 |
| 4 | *2437.00 | 108.1 AV | | | 1.21 H | 264 | 75.30 | 32.80 |
| 5 | 4874.00 | 55.5 PK | 74.0 | -18.5 | 1.00 H | 63 | 16.70 | 38.80 |
| 6 | 4874.00 | 39.3 AV | 54.0 | -14.7 | 1.00 H | 63 | 0.50 | 38.80 |
| 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 | 2390.00 | 68.1 PK | 74.0 | -5.9 | 1.31 V | 76 | 35.50 | 32.60 |
| 2 | 2390.00 | 51.8 AV | 54.0 | -2.2 | 1.31 V | 76 | 19.20 | 32.60 |
| 3 | *2437.00 | 120.2 PK | | | 1.31 V | 73 | 87.40 | 32.80 |
| 4 | *2437.00 | 108.9 AV | | | 1.31 V | 73 | 76.10 | 32.80 |
| 5 | 4874.00 | 60.0 PK | 74.0 | -14.0 | 1.00 V | 65 | 21.20 | 38.80 |
| 6 | 4874.00 | 44.9 AV | 54.0 | -9.1 | 1.00 V | 65 | 6.10 | 38.80 |

REMARKS:

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



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 11 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Ted Chang |

| 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 | *2462.00 | 110.1 PK | | | 1.24 H | 276 | 77.90 | 32.20 |
| 2 | *2462.00 | 99.5 AV | | | 1.24 H | 276 | 67.30 | 32.20 |
| 3 | 2483.50 | 68.4 PK | 74.0 | -5.6 | 1.17 H | 270 | 36.20 | 32.20 |
| 4 | 2483.50 | 53.0 AV | 54.0 | -1.0 | 1.17 H | 270 | 20.80 | 32.20 |
| 5 | 4924.00 | 46.8 PK | 74.0 | -27.2 | 1.08 H | 296 | 8.00 | 38.80 |
| 6 | 4924.00 | 35.5 AV | 54.0 | -18.5 | 1.08 H | 296 | -3.30 | 38.80 |
| 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 | *2462.00 | 109.9 PK | | | 1.29 V | 51 | 77.70 | 32.20 |
| 2 | *2462.00 | 100.7 AV | | | 1.29 V | 51 | 68.50 | 32.20 |
| 3 | 2483.50 | 63.4 PK | 74.0 | -10.6 | 1.27 V | 69 | 31.20 | 32.20 |
| 4 | 2483.50 | 52.0 AV | 54.0 | -2.0 | 1.27 V | 69 | 19.80 | 32.20 |
| 5 | 4924.00 | 48.9 PK | 74.0 | -25.1 | 1.08 V | 132 | 10.10 | 38.80 |
| 6 | 4924.00 | 37.6 AV | 54.0 | -16.4 | 1.08 V | 132 | -1.20 | 38.80 |

REMARKS:

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



A D T

802.11n (40MHz)

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 3 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Ted Chang |

| 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 | 2390.00 | 65.9 PK | 74.0 | -8.1 | 1.22 H | 273 | 34.00 | 31.90 |
| 2 | 2390.00 | 50.5 AV | 54.0 | -3.5 | 1.22 H | 273 | 18.60 | 31.90 |
| 3 | *2422.00 | 106.4 PK | | | 1.26 H | 298 | 74.40 | 32.00 |
| 4 | *2422.00 | 94.5 AV | | | 1.26 H | 298 | 62.50 | 32.00 |
| 5 | 4844.00 | 46.4 PK | 74.0 | -27.6 | 1.00 H | 245 | 7.70 | 38.70 |
| 6 | 4844.00 | 32.5 AV | 54.0 | -21.5 | 1.00 H | 245 | -6.20 | 38.70 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 2390.00 | 57.0 PK | 74.0 | -17.0 | 1.06 V | 57 | 25.10 | 31.90 |
| 2 | 2390.00 | 52.7 AV | 54.0 | -1.3 | 1.06 V | 57 | 20.80 | 31.90 |
| 3 | *2422.00 | 104.8 PK | | | 1.03 V | 60 | 72.80 | 32.00 |
| 4 | *2422.00 | 93.6 AV | | | 1.03 V | 60 | 61.60 | 32.00 |
| 5 | 4844.00 | 45.2 PK | 74.0 | -28.8 | 1.00 V | 24 | 6.50 | 38.70 |
| 6 | 4844.00 | 32.8 AV | 54.0 | -21.2 | 1.00 V | 24 | -5.90 | 38.70 |

REMARKS:

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



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 6 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Ted Chang |

| 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 | 2390.00 | 66.1 PK | 74.0 | -7.9 | 1.29 H | 267 | 33.50 | 32.60 |
| 2 | 2390.00 | 52.3 AV | 54.0 | -1.7 | 1.29 H | 267 | 19.70 | 32.60 |
| 3 | *2437.00 | 109.9 PK | | | 1.22 H | 264 | 77.10 | 32.80 |
| 4 | *2437.00 | 101.7 AV | | | 1.22 H | 264 | 68.90 | 32.80 |
| 5 | 4874.00 | 49.3 PK | 74.0 | -24.7 | 1.00 H | 66 | 10.50 | 38.80 |
| 6 | 4874.00 | 39.2 AV | 54.0 | -14.8 | 1.00 H | 66 | 0.40 | 38.80 |
| 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 | 2390.00 | 65.7 PK | 74.0 | -8.3 | 1.28 V | 73 | 33.10 | 32.60 |
| 2 | 2390.00 | 52.9 AV | 54.0 | -1.1 | 1.28 V | 73 | 20.30 | 32.60 |
| 3 | *2437.00 | 110.8 PK | | | 1.29 V | 79 | 78.00 | 32.80 |
| 4 | *2437.00 | 102.0 AV | | | 1.29 V | 79 | 69.20 | 32.80 |
| 5 | 4874.00 | 54.9 PK | 74.0 | -19.1 | 1.00 V | 295 | 16.10 | 38.80 |
| 6 | 4874.00 | 44.8 AV | 54.0 | -9.2 | 1.00 V | 295 | 6.00 | 38.80 |

REMARKS:

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



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 9 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 25deg. C, 65%RH | TESTED BY | Ted Chang |

| 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 | *2452.00 | 106.3 PK | | | 1.01 H | 274 | 74.20 | 32.10 |
| 2 | *2452.00 | 94.3 AV | | | 1.01 H | 274 | 62.20 | 32.10 |
| 3 | 2483.50 | 68.7 PK | 74.0 | -5.3 | 1.00 H | 298 | 36.50 | 32.20 |
| 4 | 2483.50 | 53.0 AV | 54.0 | -1.0 | 1.00 H | 298 | 20.80 | 32.20 |
| 5 | 4904.00 | 46.0 PK | 74.0 | -28.0 | 1.00 H | 306 | 7.20 | 38.80 |
| 6 | 4904.00 | 32.8 AV | 54.0 | -21.2 | 1.00 H | 306 | -6.00 | 38.80 |
| 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 | *2452.00 | 106.6 PK | | | 1.00 V | 59 | 74.50 | 32.10 |
| 2 | *2452.00 | 95.3 AV | | | 1.00 V | 59 | 63.20 | 32.10 |
| 3 | 2483.50 | 66.6 PK | 74.0 | -7.4 | 1.24 V | 57 | 34.40 | 32.20 |
| 4 | 2483.50 | 51.7 AV | 54.0 | -2.3 | 1.24 V | 57 | 19.50 | 32.20 |
| 5 | 4904.00 | 45.3 PK | 74.0 | -28.7 | 1.00 V | 55 | 6.50 | 38.80 |
| 6 | 4904.00 | 34.7 AV | 54.0 | -19.3 | 1.00 V | 55 | -4.10 | 38.80 |

REMARKS:

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



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n (20MHz)

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------|
| CHANNEL | Channel 6 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 138.56 | 29.4 QP | 43.5 | -14.1 | 1.99 H | 82 | 16.10 | 13.30 |
| 2 | 249.17 | 32.3 QP | 46.0 | -13.7 | 1.24 H | 105 | 19.50 | 12.80 |
| 3 | 375.29 | 39.6 QP | 46.0 | -6.4 | 1.00 H | 56 | 23.10 | 16.50 |
| 4 | 625.60 | 41.5 QP | 46.0 | -4.5 | 1.24 H | 208 | 19.60 | 21.90 |
| 5 | 749.79 | 42.4 QP | 46.0 | -3.6 | 1.00 H | 186 | 18.70 | 23.70 |
| 6 | 875.91 | 44.0 QP | 46.0 | -2.0 | 1.49 H | 314 | 18.40 | 25.60 |

| 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 | 59.01 | 34.6 QP | 40.0 | -5.4 | 1.74 V | 298 | 21.10 | 13.50 |
| 2 | 375.29 | 43.4 QP | 46.0 | -2.6 | 1.24 V | 193 | 26.90 | 16.50 |
| 3 | 540.23 | 36.5 QP | 46.0 | -9.5 | 1.00 V | 317 | 16.20 | 20.30 |
| 4 | 637.25 | 40.6 QP | 46.0 | -5.4 | 1.49 V | 0 | 18.60 | 22.00 |
| 5 | 749.79 | 40.6 QP | 46.0 | -5.4 | 1.00 V | 94 | 16.90 | 23.70 |
| 6 | 875.91 | 42.3 QP | 46.0 | -3.7 | 1.74 V | 81 | 16.70 | 25.60 |

REMARKS:

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



A D T

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB μ 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 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | DATE OF CALIBRATION | DUE DATE OF CALIBRATION |
|---|--------------------------|----------------|---------------------|-------------------------|
| Test Receiver ROHDE & SCHWARZ | ESCS30 | 100289 | Nov. 16, 2012 | Nov. 15, 2013 |
| RF signal cable Woken | 5D-FB | Cable-HYC01-01 | Dec. 28, 2012 | Dec. 27, 2013 |
| LISN ROHDE & SCHWARZ (Peripheral) | ESH3-Z5 | 100312 | Jul. 02, 2012 | Jul. 01, 2013 |
| LISN ROHDE & SCHWARZ (EUT) | ESH3-Z5 | 835239/001 | Feb. 04, 2013 | Feb. 03, 2014 |
| Software ADT | BV ADT_Cond_ V7.3.7.3 | NA | NA | NA |

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

4.2.3 TEST PROCEDURES

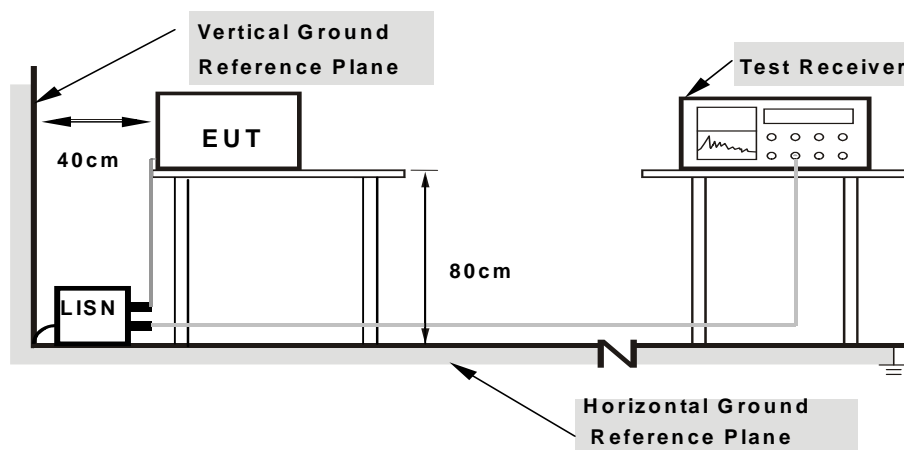
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



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

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

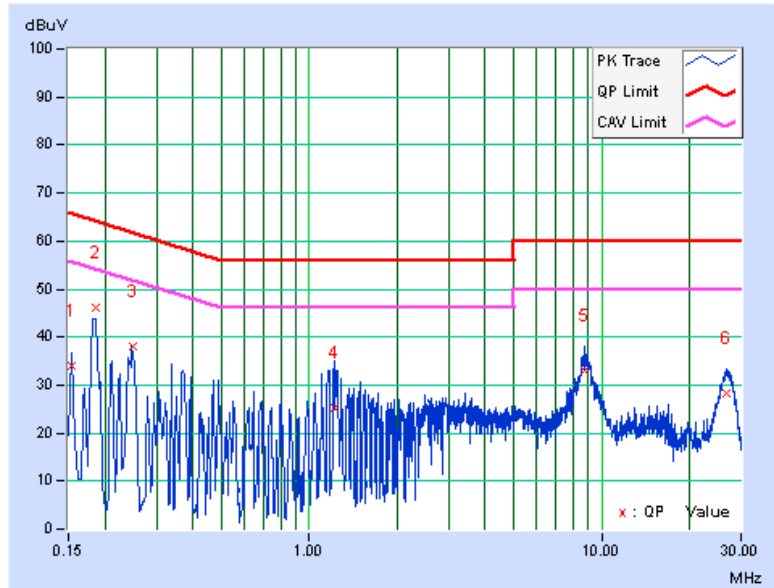
CONDUCTED WORST-CASE DATA : 802.11n (20MHz)

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

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15391 | 0.15 | 33.84 | 22.79 | 33.99 | 22.94 | 65.79 | 55.79 | -31.80 | -32.85 |
| 2 | 0.18508 | 0.15 | 45.82 | 37.94 | 45.97 | 38.09 | 64.25 | 54.25 | -18.29 | -16.17 |
| 3 | 0.24796 | 0.16 | 37.78 | 33.25 | 37.94 | 33.41 | 61.83 | 51.83 | -23.88 | -18.41 |
| 4 | 1.21352 | 0.24 | 24.87 | 6.67 | 25.11 | 6.91 | 56.00 | 46.00 | -30.89 | -39.09 |
| 5 | 8.74809 | 0.63 | 32.29 | 21.96 | 32.92 | 22.59 | 60.00 | 50.00 | -27.08 | -27.41 |
| 6 | 26.74582 | 1.49 | 26.87 | 20.56 | 28.36 | 22.05 | 60.00 | 50.00 | -31.64 | -27.95 |

REMARKS:

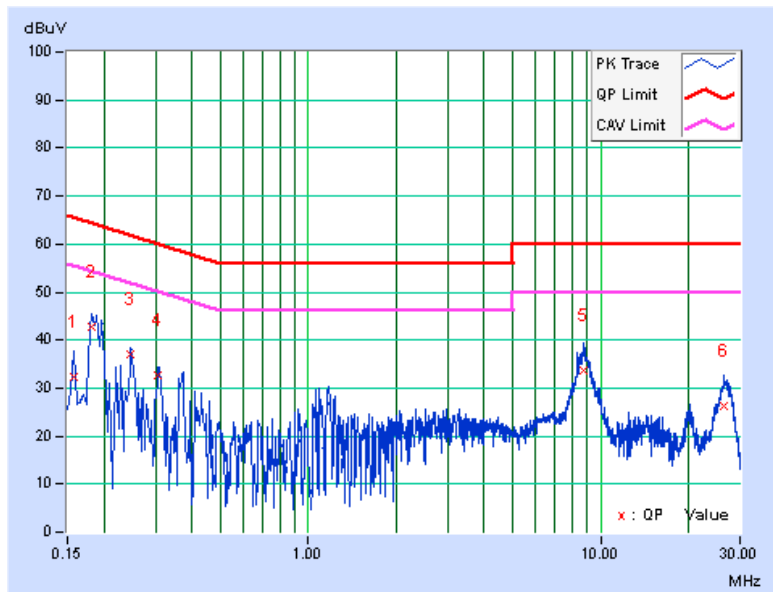
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



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

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15782 | 0.20 | 32.08 | 17.77 | 32.28 | 17.97 | 65.58 | 55.58 | -33.30 | -37.61 |
| 2 | 0.18122 | 0.20 | 42.72 | 32.56 | 42.92 | 32.76 | 64.43 | 54.43 | -21.51 | -21.67 |
| 3 | 0.24775 | 0.21 | 36.79 | 31.67 | 37.00 | 31.88 | 61.83 | 51.83 | -24.83 | -19.95 |
| 4 | 0.30696 | 0.23 | 32.45 | 29.72 | 32.68 | 29.95 | 60.05 | 50.05 | -27.37 | -20.10 |
| 5 | 8.79501 | 0.59 | 32.97 | 22.20 | 33.56 | 22.79 | 60.00 | 50.00 | -26.44 | -27.21 |
| 6 | 26.33136 | 1.13 | 25.04 | 18.74 | 26.17 | 19.87 | 60.00 | 50.00 | -33.83 | -30.13 |

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

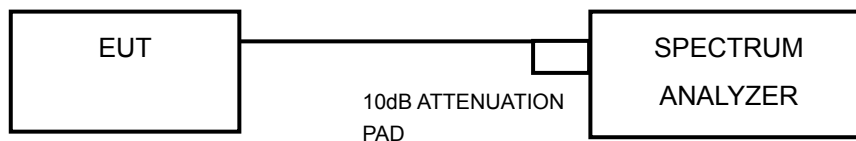


4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.3.4 TEST PROCEDURE

- a. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
- b. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



4.3.7 TEST RESULTS

802.11b

| CHANNEL | FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-----------------|---------------------|---------------------|-------------|
| 1 | 2412 | 8.05 | 0.5 | PASS |
| 6 | 2437 | 8.13 | 0.5 | PASS |
| 11 | 2462 | 7.68 | 0.5 | PASS |

802.11g

| CHANNEL | FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-----------------|---------------------|---------------------|-------------|
| 1 | 2412 | 16.46 | 0.5 | PASS |
| 6 | 2437 | 15.96 | 0.5 | PASS |
| 11 | 2462 | 16.46 | 0.5 | PASS |

802.11n (20MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | | | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------|---------|---------------------|-------------|
| | | CHAIN 0 | CHAIN 1 | CHAIN 2 | | |
| 1 | 2412 | 17.67 | 17.67 | 17.67 | 0.5 | PASS |
| 6 | 2437 | 17.35 | 16.99 | 17.23 | 0.5 | PASS |
| 11 | 2462 | 17.67 | 17.71 | 17.62 | 0.5 | PASS |

802.11n (40MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | | | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------|---------|---------------------|-------------|
| | | CHAIN 0 | CHAIN 1 | CHAIN 2 | | |
| 3 | 2422 | 36.43 | 35.90 | 36.32 | 0.5 | PASS |
| 6 | 2437 | 35.89 | 36.49 | 36.42 | 0.5 | PASS |
| 9 | 2452 | 36.42 | 35.92 | 35.77 | 0.5 | PASS |

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

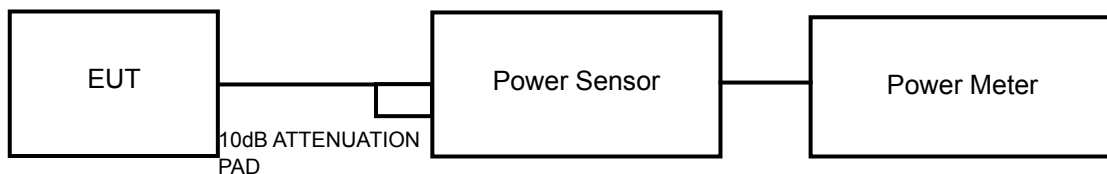
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;

Array Gain = $5 \log(NANT/NSS)$ dB or 3 dB, whichever is less for 20-MHz channel widths with $NANT \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

An average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power sensor. Record the peak power level.



A D T

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



A D T

4.4.7 TEST RESULTS

FOR AVERAGE POWER

802.11b

| Chan. | Freq. (MHz) | Average Power (mW) | Average Power (dBm) | Limit (dBm) | Pass / Fail |
|-------|-------------|--------------------|---------------------|-------------|-------------|
| 1 | 2412 | 207.014 | 23.16 | 30 | PASS |
| 6 | 2437 | 267.917 | 24.28 | 30 | PASS |
| 11 | 2462 | 246.604 | 23.92 | 30 | PASS |

802.11g

| Chan. | Freq. (MHz) | Average Power (mW) | Average Power (dBm) | Limit (dBm) | Pass / Fail |
|-------|-------------|--------------------|---------------------|-------------|-------------|
| 1 | 2412 | 46.026 | 16.63 | 30 | PASS |
| 6 | 2437 | 269.153 | 24.30 | 30 | PASS |
| 11 | 2462 | 71.285 | 18.53 | 30 | PASS |

802.11n (20MHz)

| Chan. | Freq. (MHz) | Average Power (dBm) | | | Total Average Power (mW) | Total Average Power (dBm) | Limit (dBm) | Pass / Fail |
|-------|-------------|---------------------|---------|---------|--------------------------|---------------------------|-------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | | | |
| 1 | 2412 | 15.14 | 14.12 | 15.36 | 92.838 | 19.68 | 30 | PASS |
| 6 | 2437 | 22.72 | 22.75 | 22.73 | 562.932 | 27.50 | 30 | PASS |
| 11 | 2462 | 14.26 | 12.60 | 13.40 | 66.744 | 18.24 | 30 | PASS |

802.11n (40MHz)

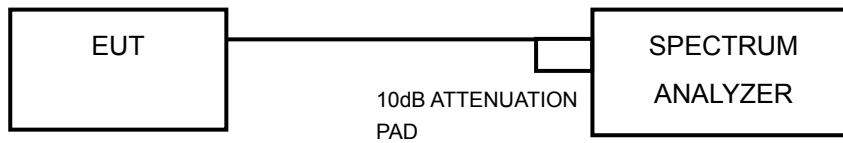
| Chan. | Freq. (MHz) | Average Power (dBm) | | | Total Average Power (mW) | Total Average Power (dBm) | Limit (dBm) | Pass / Fail |
|-------|-------------|---------------------|---------|---------|--------------------------|---------------------------|-------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | | | |
| 3 | 2422 | 12.28 | 12.20 | 12.37 | 50.758 | 17.06 | 30 | PASS |
| 6 | 2437 | 17.25 | 16.65 | 17.25 | 152.414 | 21.83 | 30 | PASS |
| 9 | 2452 | 12.50 | 12.19 | 13.75 | 58.055 | 17.64 | 30 | PASS |

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURE

- Set the RBW = 3 kHz, VBW = 10 kHz, Detector = peak.
- Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



A D T

4.5.7 TEST RESULTS

802.11b

| Channel | FREQ. (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | PASS /FAIL |
|---------|-------------|----------------|------------------|------------|
| 1 | 2412 | -4.94 | 8 | PASS |
| 6 | 2437 | -4.34 | 8 | PASS |
| 11 | 2462 | -4.40 | 8 | PASS |

802.11g

| Channel | FREQ. (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | PASS /FAIL |
|---------|-------------|----------------|------------------|------------|
| 1 | 2412 | -17.25 | 8 | PASS |
| 6 | 2437 | -9.59 | 8 | PASS |
| 11 | 2462 | -15.27 | 8 | PASS |

802.11n (20MHz)

| TX chain | Channel | FREQ. (MHz) | PSD (dBm/3kHz) | 10 log (N=3) dB | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | PASS /FAIL |
|----------|---------|-------------|----------------|-----------------|----------------------|------------------|------------|
| 0 | 1 | 2412 | -17.59 | 4.77 | -12.56 | 4.83 | PASS |
| | 6 | 2437 | -9.68 | 4.77 | -4.65 | 4.83 | PASS |
| | 11 | 2462 | -19.27 | 4.77 | -14.24 | 4.83 | PASS |
| 1 | 1 | 2412 | -19.26 | 4.77 | -14.23 | 4.83 | PASS |
| | 6 | 2437 | -10.16 | 4.77 | -5.13 | 4.83 | PASS |
| | 11 | 2462 | -21.42 | 4.77 | -16.39 | 4.83 | PASS |
| 2 | 1 | 2412 | -17.45 | 4.77 | -12.42 | 4.83 | PASS |
| | 6 | 2437 | -9.17 | 4.77 | -4.14 | 4.83 | PASS |
| | 11 | 2462 | -18.94 | 4.77 | -13.91 | 4.83 | PASS |

NOTE: Directional gain = $4.4\text{dBi} + 10\log(3) = 9.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8 - (9.17 - 6) = 4.83\text{dBm}$.



A D T

802.11n (40MHz)

| TX chain | Channel | FREQ. (MHz) | PSD (dBm/3kHz) | 10 log (N=3) dB | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | PASS /FAIL |
|----------|---------|-------------|----------------|-----------------|----------------------|------------------|------------|
| 0 | 3 | 2422 | -22.73 | 4.77 | -17.47 | 4.83 | PASS |
| | 6 | 2437 | -19.26 | 4.77 | -14.00 | 4.83 | PASS |
| | 9 | 2452 | -22.72 | 4.77 | -17.46 | 4.83 | PASS |
| 1 | 3 | 2422 | -25.14 | 4.77 | -19.88 | 4.83 | PASS |
| | 6 | 2437 | -18.85 | 4.77 | -13.59 | 4.83 | PASS |
| | 9 | 2452 | -25.41 | 4.77 | -20.15 | 4.83 | PASS |
| 2 | 3 | 2422 | -23.76 | 4.77 | -18.50 | 4.83 | PASS |
| | 6 | 2437 | -17.96 | 4.77 | -12.70 | 4.83 | PASS |
| | 9 | 2452 | -22.86 | 4.77 | -17.60 | 4.83 | PASS |

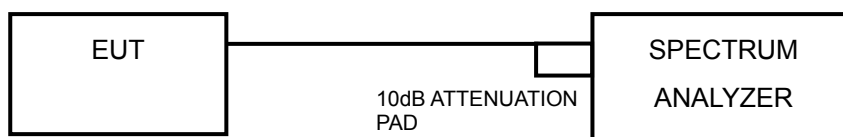
NOTE: Directional gain = $4.4\text{dBi} + 10\log(3) = 9.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $8 - (9.17 - 6) = 4.83\text{dBm}$.

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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.



A D T

MEASUREMENT PROCEDURE OOB

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.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit.

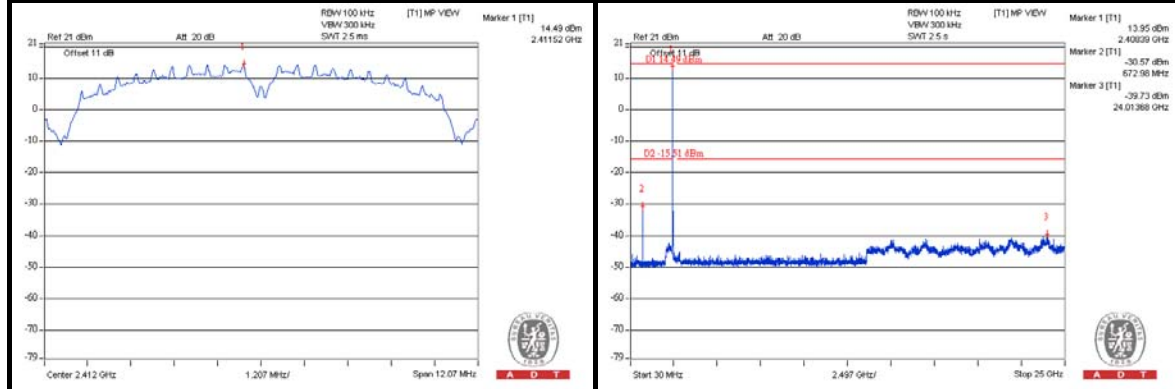
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



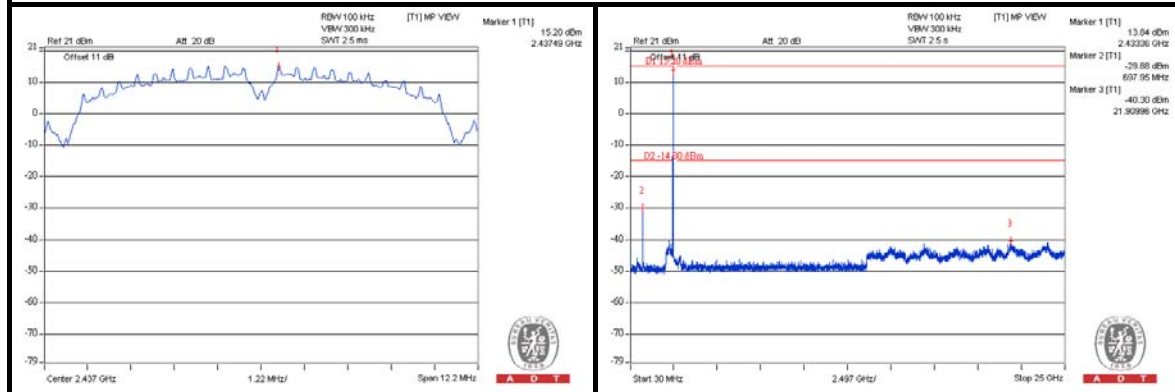
A D T

802.11b

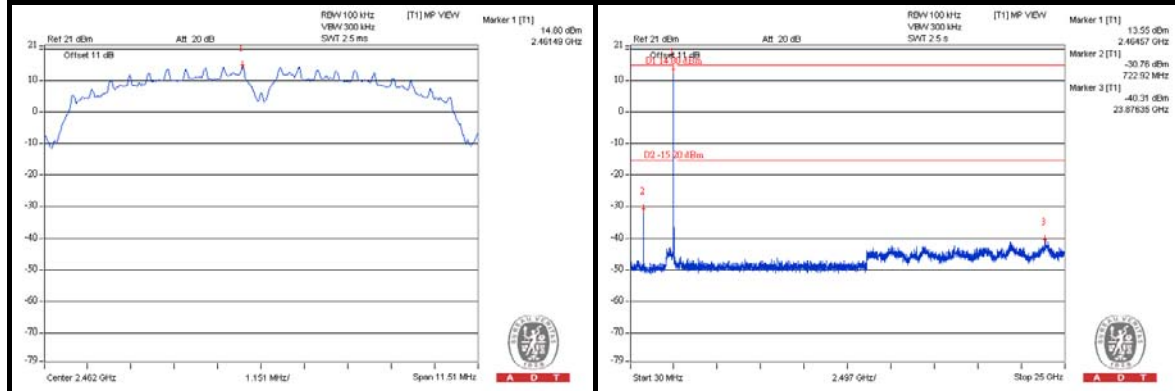
CH 1



CH 6



CH 11

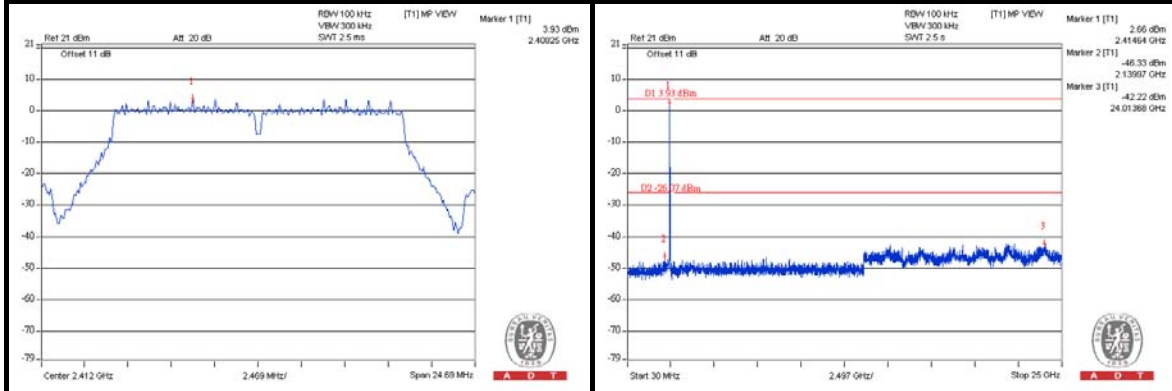




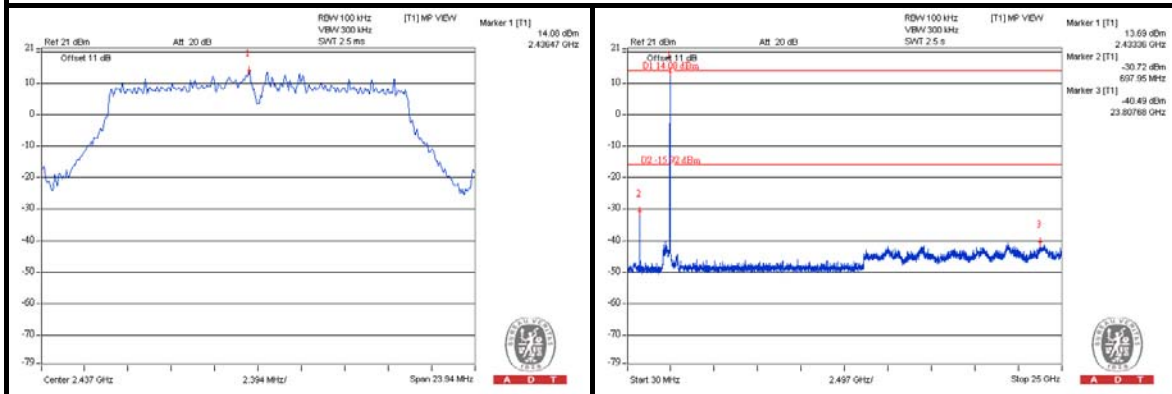
A D T

802.11g

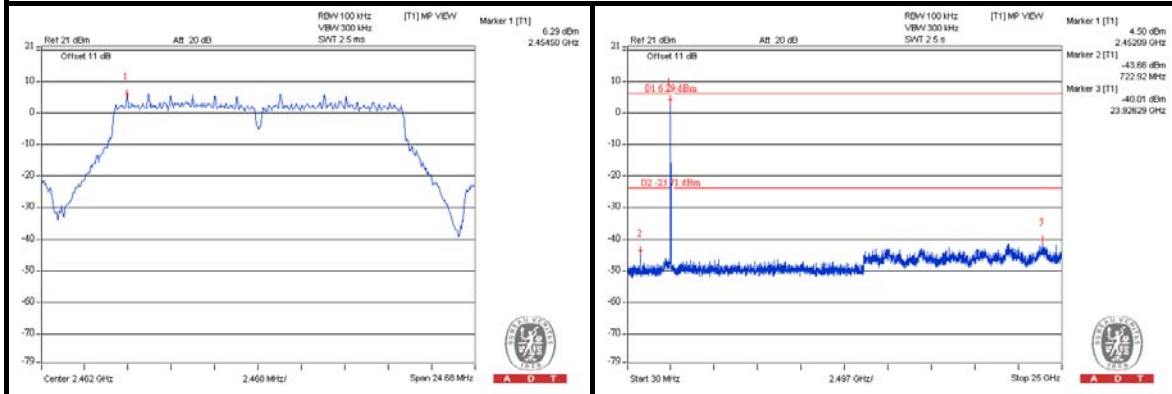
CH 1



CH 6



CH 11



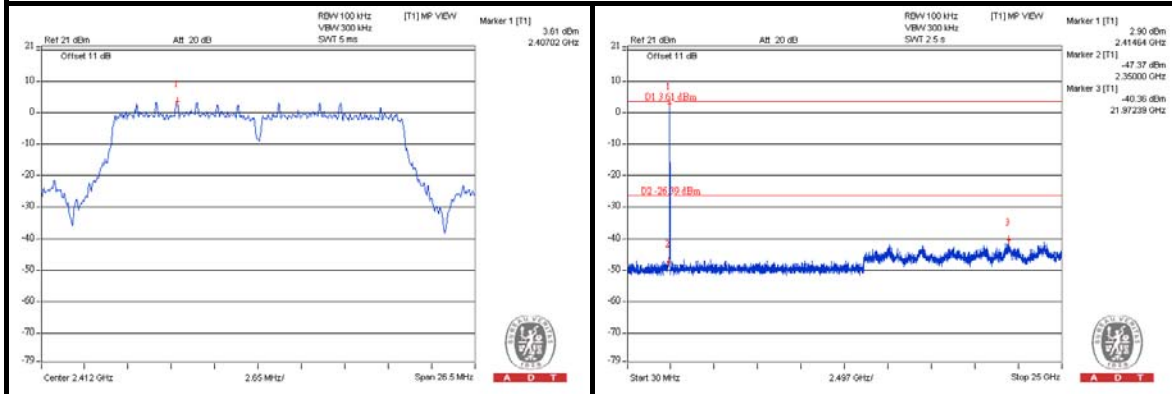


A D T

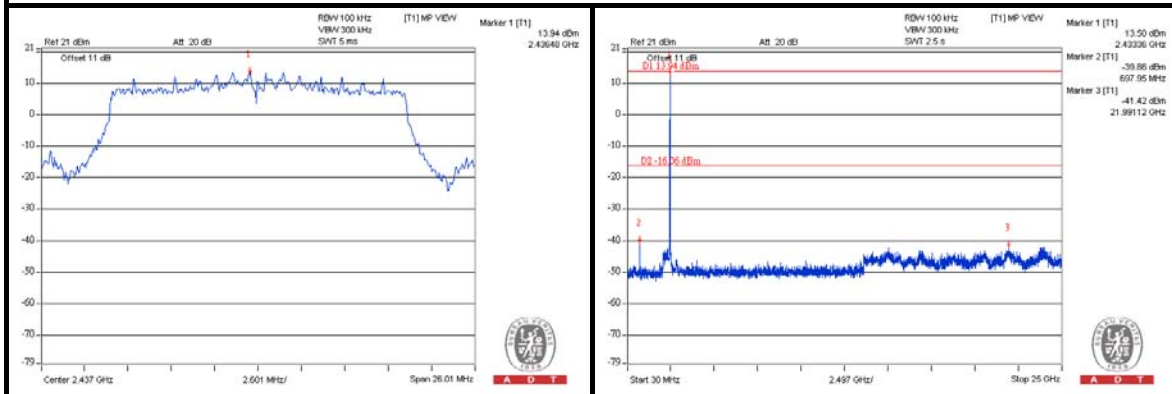
802.11n (20MHz)

CHAIN 0

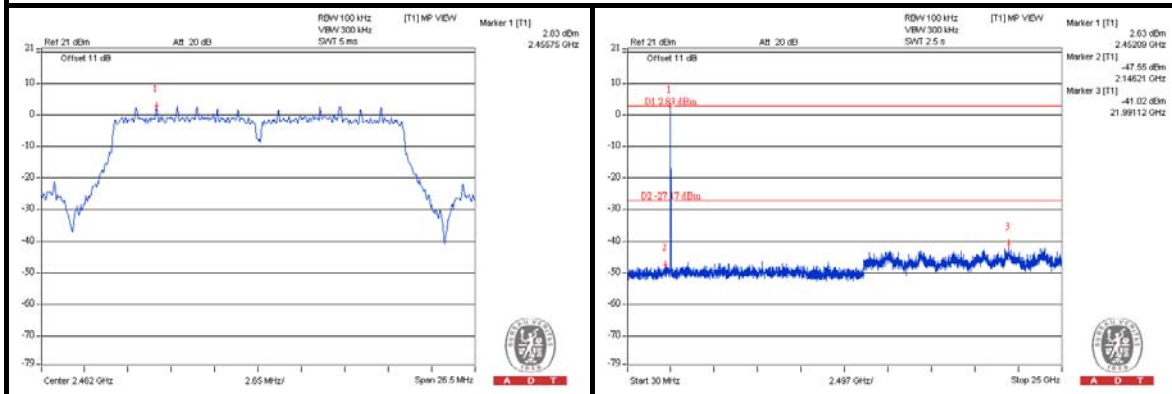
CH 1



CH 6



CH 11

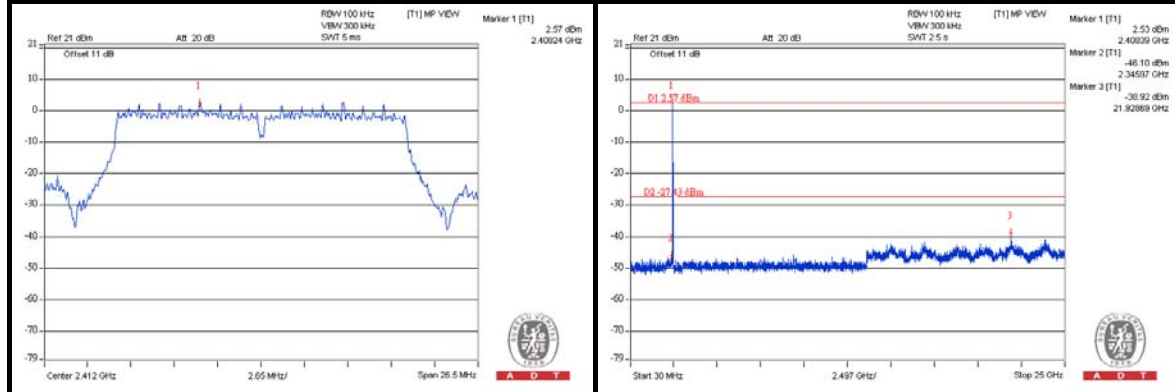




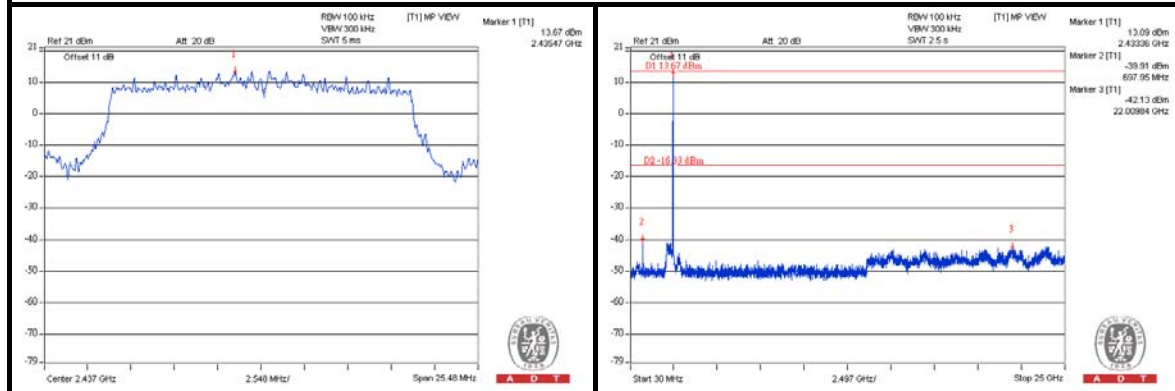
A D T

CHAIN 1

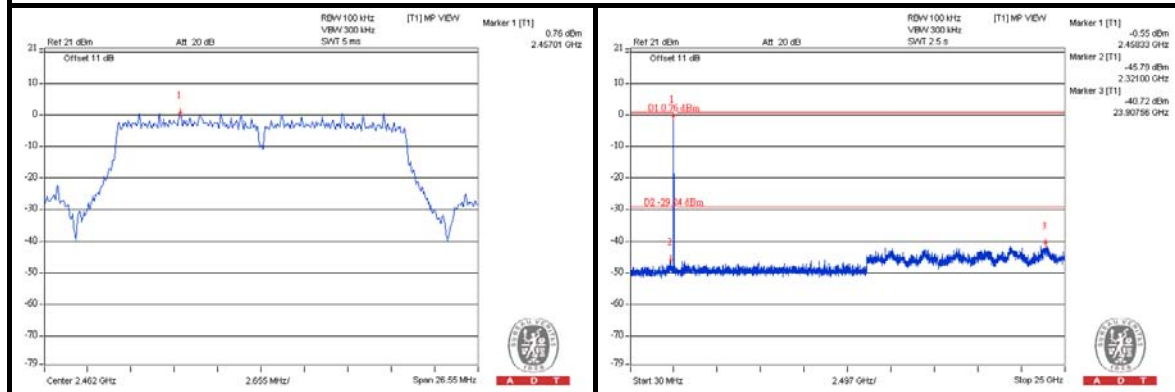
CH 1



CH 6



CH 11

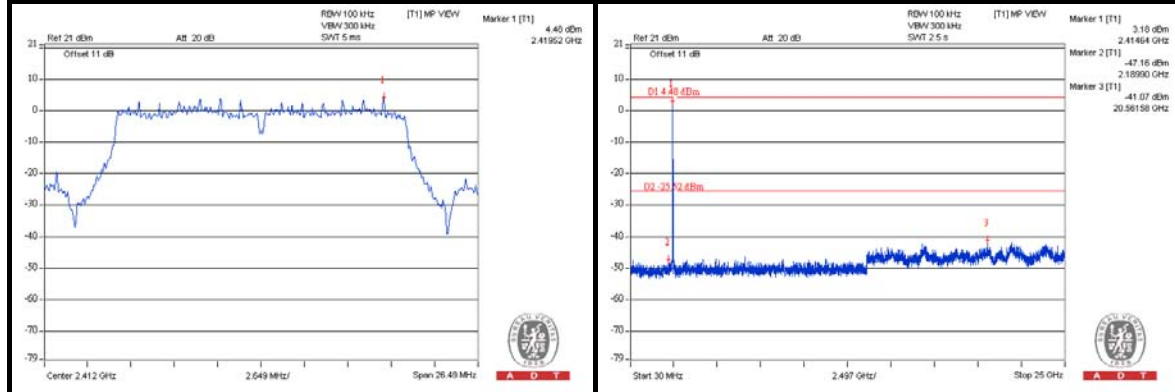




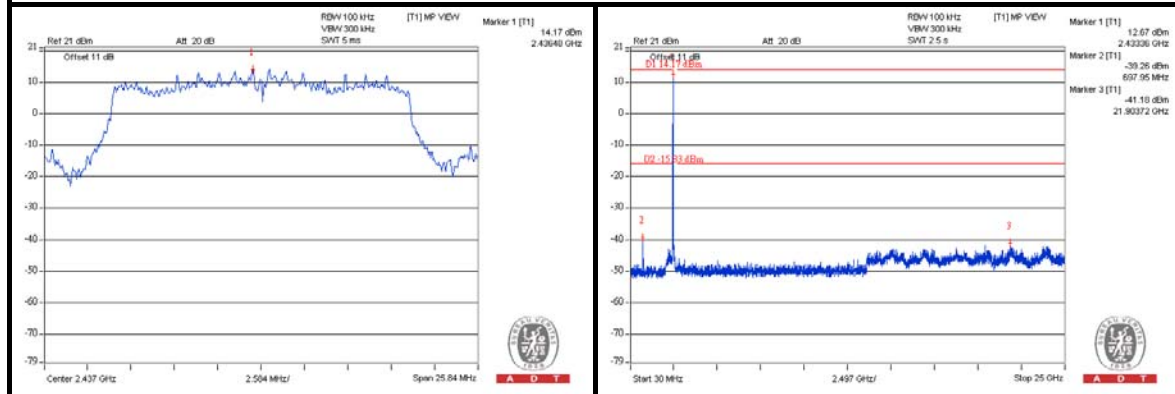
A D T

CHAIN 2

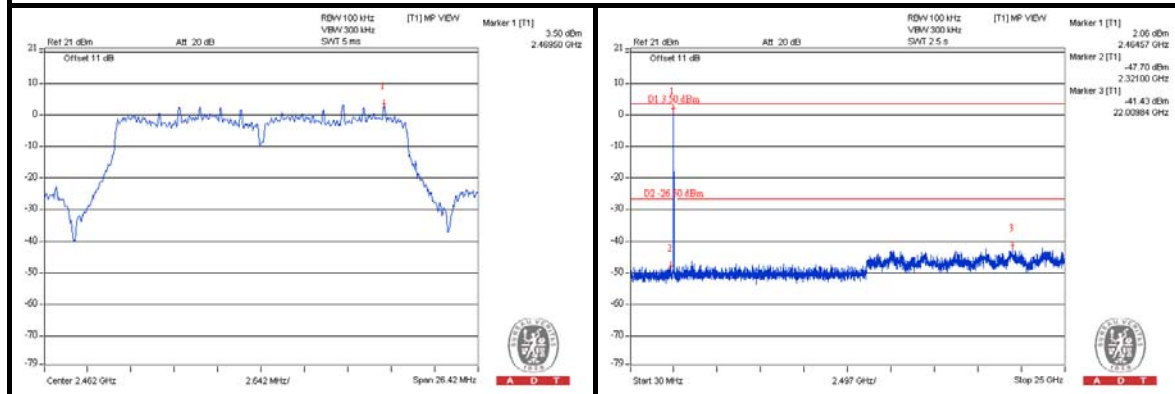
CH 1



CH 6



CH 11



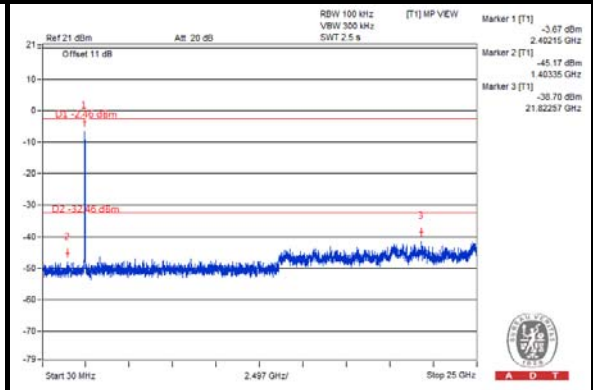
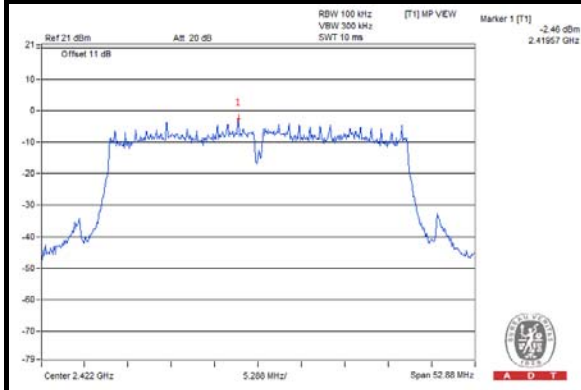


A D T

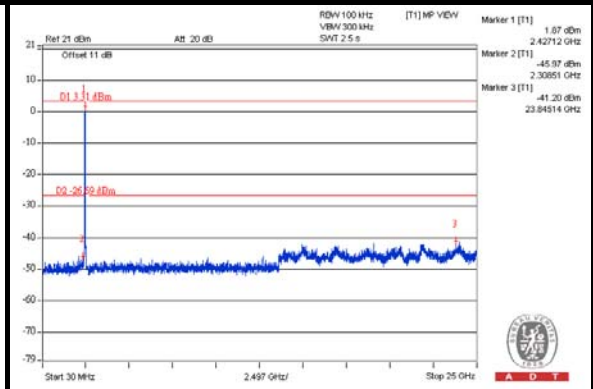
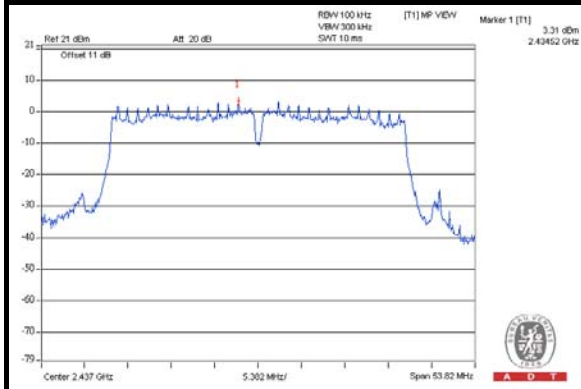
802.11n (40MHz)

CHAIN 0

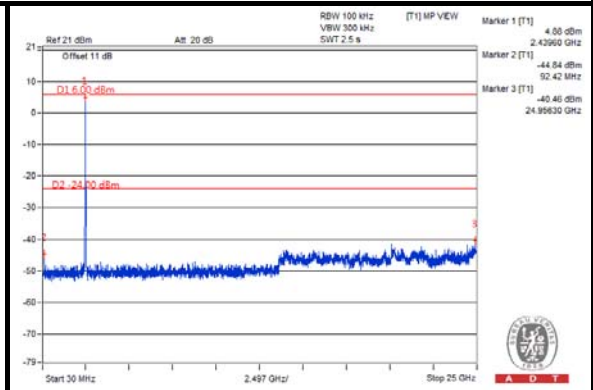
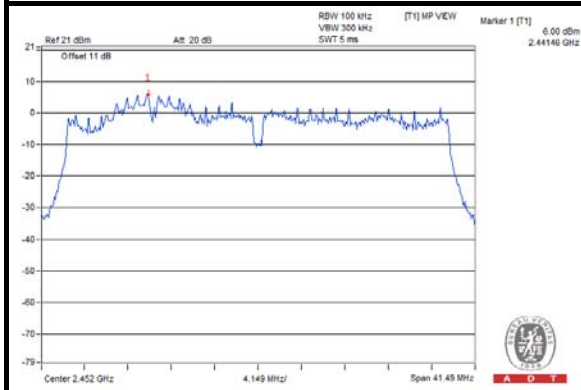
CH 3



CH 6



CH 9

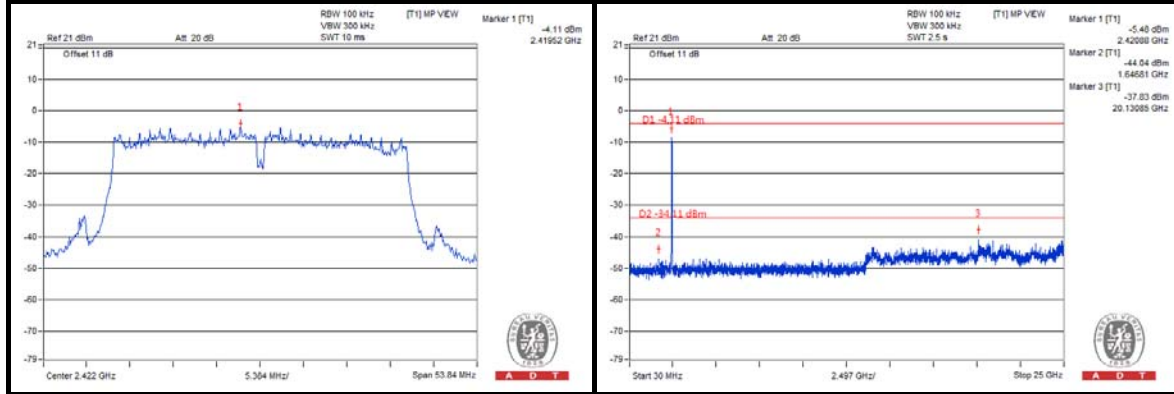




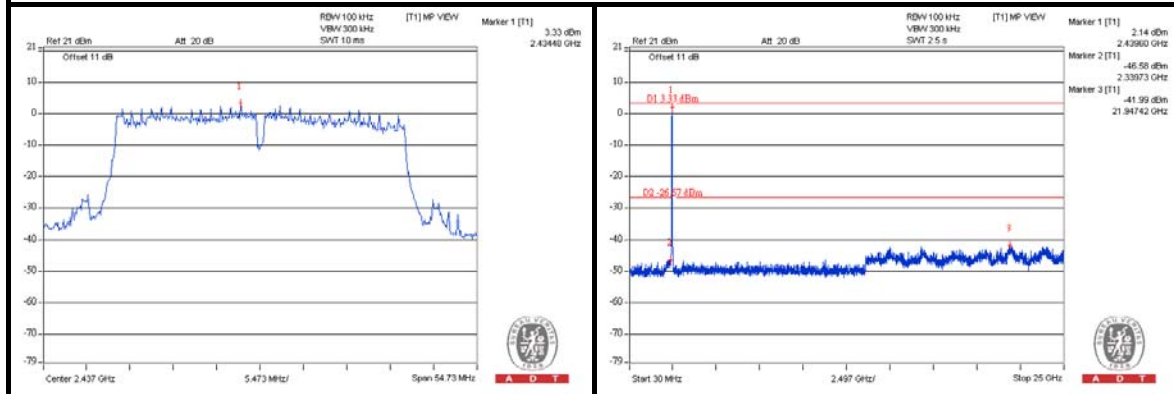
A D T

CHAIN 1

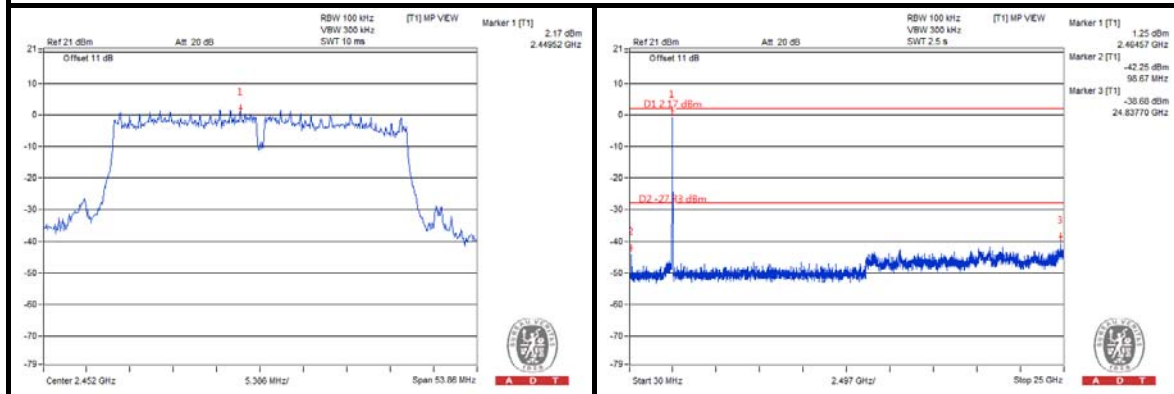
CH 3



CH 6

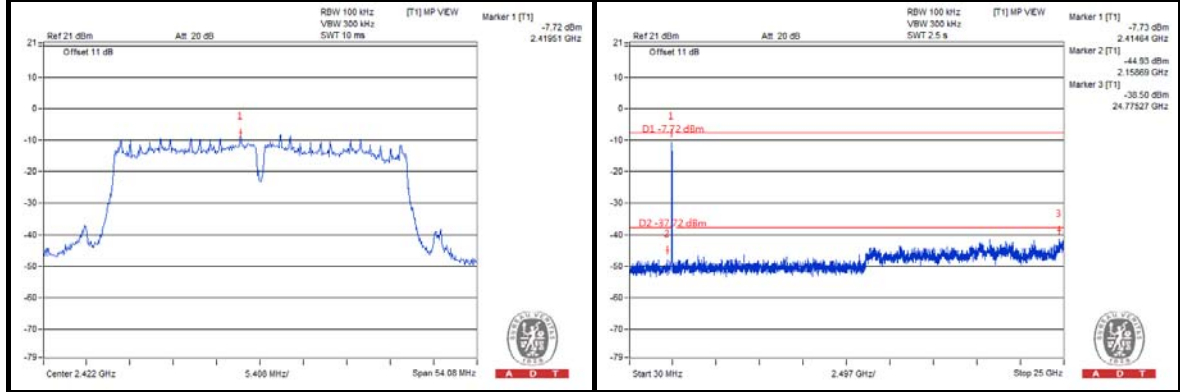


CH 9

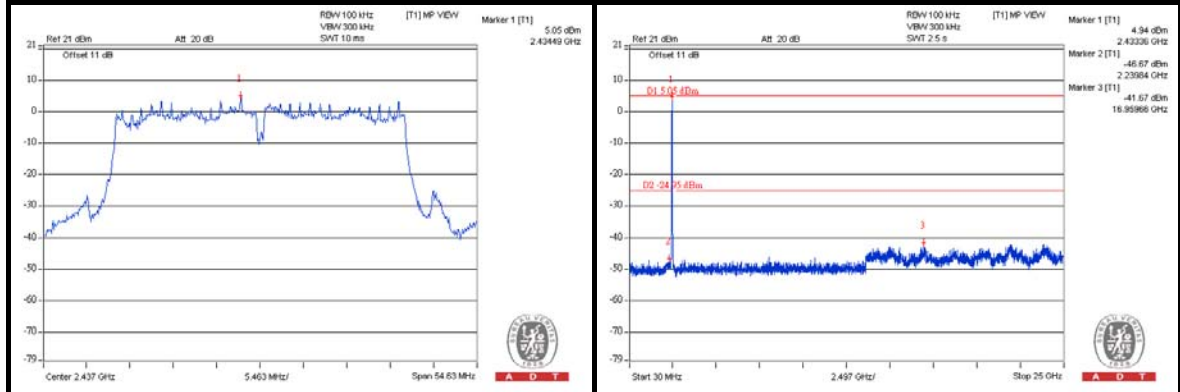


CHAIN 2

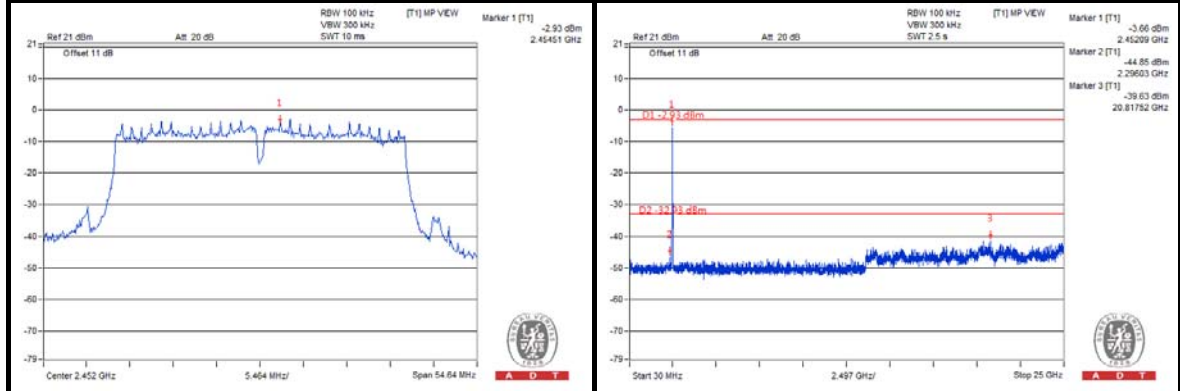
CH 3



CH 6



CH 9





A D T

5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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

NOTE:

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



A D T

5.1.2 TEST INSTRUMENTS

Same as item 4.1.2.

5.1.3 TEST PROCEDURES

Same as item 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as item 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.



A D T

5.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA :

802.11a

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 149 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | #5725.00 | 77.2 PK | 87.2 | -10.0 | 1.00 H | 283 | 36.80 | 40.40 |
| 2 | #5725.00 | 64.6 AV | 74.6 | -10.0 | 1.00 H | 283 | 24.20 | 40.40 |
| 3 | *5745.00 | 117.2 PK | | | 1.00 H | 280 | 76.70 | 40.50 |
| 4 | *5745.00 | 104.6 AV | | | 1.00 H | 280 | 64.10 | 40.50 |
| 5 | 11490.00 | 61.2 PK | 74.0 | -12.8 | 1.00 H | 255 | 8.30 | 52.90 |
| 6 | 11490.00 | 47.7 AV | 54.0 | -6.3 | 1.00 H | 255 | -5.20 | 52.90 |

| 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 | #5725.00 | 76.2 PK | 86.2 | -10.0 | 1.02 V | 79 | 35.80 | 40.40 |
| 2 | #5725.00 | 63.5 AV | 73.5 | -10.0 | 1.02 V | 79 | 23.10 | 40.40 |
| 3 | *5745.00 | 116.2 PK | | | 1.01 V | 76 | 75.70 | 40.50 |
| 4 | *5745.00 | 103.5 AV | | | 1.01 V | 76 | 63.00 | 40.50 |
| 5 | 11490.00 | 62.3 PK | 74.0 | -11.7 | 1.00 V | 285 | 9.40 | 52.90 |
| 6 | 11490.00 | 48.4 AV | 54.0 | -5.6 | 1.00 V | 285 | -4.50 | 52.90 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 157 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5785.00 | 117.7 PK | | | 1.00 H | 268 | 77.10 | 40.60 |
| 2 | *5785.00 | 104.8 AV | | | 1.00 H | 268 | 64.20 | 40.60 |
| 3 | 11570.00 | 61.5 PK | 74.0 | -12.5 | 1.00 H | 256 | 8.80 | 52.70 |
| 4 | 11570.00 | 48.2 AV | 54.0 | -5.8 | 1.00 H | 256 | -4.50 | 52.70 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5785.00 | 115.4 PK | | | 1.00 V | 77 | 74.80 | 40.60 |
| 2 | *5785.00 | 102.6 AV | | | 1.00 V | 77 | 62.00 | 40.60 |
| 3 | 11570.00 | 62.6 PK | 74.0 | -11.4 | 1.00 V | 284 | 9.90 | 52.70 |
| 4 | 11570.00 | 49.0 AV | 54.0 | -5.0 | 1.00 V | 284 | -3.70 | 52.70 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 165 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5825.00 | 117.6 PK | | | 1.00 H | 268 | 76.90 | 40.70 |
| 2 | *5825.00 | 104.7 AV | | | 1.00 H | 268 | 64.00 | 40.70 |
| 3 | #5850.00 | 70.0 PK | 87.6 | -17.6 | 1.00 H | 262 | 29.30 | 40.70 |
| 4 | #5850.00 | 57.1 AV | 74.7 | -17.6 | 1.00 H | 262 | 16.40 | 40.70 |
| 5 | 11650.00 | 60.8 PK | 74.0 | -13.2 | 1.00 H | 252 | 8.30 | 52.50 |
| 6 | 11650.00 | 47.0 AV | 54.0 | -7.0 | 1.00 H | 252 | -5.50 | 52.50 |
| 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 | *5825.00 | 115.5 PK | | | 1.00 V | 77 | 74.80 | 40.70 |
| 2 | *5825.00 | 102.8 AV | | | 1.00 V | 77 | 62.10 | 40.70 |
| 3 | #5850.00 | 67.9 PK | 85.5 | -17.6 | 1.00 V | 75 | 27.20 | 40.70 |
| 4 | #5850.00 | 55.2 AV | 72.8 | -17.6 | 1.00 V | 75 | 14.50 | 40.70 |
| 5 | 11650.00 | 61.8 PK | 74.0 | -12.2 | 1.00 V | 285 | 9.30 | 52.50 |
| 6 | 11650.00 | 47.5 AV | 54.0 | -6.5 | 1.00 V | 285 | -5.00 | 52.50 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

802.11n (20MHz)

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 149 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | #5725.00 | 77.3 PK | 89.5 | -12.2 | 1.00 H | 276 | 36.90 | 40.40 |
| 2 | #5725.00 | 65.4 AV | 77.6 | -12.2 | 1.00 H | 276 | 25.00 | 40.40 |
| 3 | *5745.00 | 119.5 PK | | | 1.00 H | 272 | 79.00 | 40.50 |
| 4 | *5745.00 | 107.6 AV | | | 1.00 H | 272 | 67.10 | 40.50 |
| 5 | 11490.00 | 61.9 PK | 74.0 | -12.1 | 1.00 H | 256 | 9.00 | 52.90 |
| 6 | 11490.00 | 48.2 AV | 54.0 | -5.8 | 1.00 H | 256 | -4.70 | 52.90 |

| 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 | #5725.00 | 75.5 PK | 87.7 | -12.2 | 1.09 V | 73 | 35.10 | 40.40 |
| 2 | #5725.00 | 63.8 AV | 76.0 | -12.2 | 1.09 V | 73 | 23.40 | 40.40 |
| 3 | *5745.00 | 117.7 PK | | | 1.04 V | 75 | 77.20 | 40.50 |
| 4 | *5745.00 | 106.0 AV | | | 1.04 V | 75 | 65.50 | 40.50 |
| 5 | 11490.00 | 62.0 PK | 74.0 | -12.0 | 1.00 V | 282 | 9.10 | 52.90 |
| 6 | 11490.00 | 49.0 AV | 54.0 | -5.0 | 1.00 V | 282 | -3.90 | 52.90 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 157 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5785.00 | 118.7 PK | | | 1.00 H | 266 | 78.10 | 40.60 |
| 2 | *5785.00 | 107.0 AV | | | 1.00 H | 266 | 66.40 | 40.60 |
| 3 | 11570.00 | 61.5 PK | 74.0 | -12.5 | 1.00 H | 254 | 8.80 | 52.70 |
| 4 | 11570.00 | 47.5 AV | 54.0 | -6.5 | 1.00 H | 254 | -5.20 | 52.70 |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | | | | | | |
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5785.00 | 117.2 PK | | | 1.03 V | 77 | 76.60 | 40.60 |
| 2 | *5785.00 | 105.4 AV | | | 1.03 V | 77 | 64.80 | 40.60 |
| 3 | 11570.00 | 62.6 PK | 74.0 | -11.4 | 1.00 V | 285 | 9.90 | 52.70 |
| 4 | 11570.00 | 48.2 AV | 54.0 | -5.8 | 1.00 V | 285 | -4.50 | 52.70 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.



A D T

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 165 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5825.00 | 118.6 PK | | | 1.00 H | 275 | 77.90 | 40.70 |
| 2 | *5825.00 | 107.2 AV | | | 1.00 H | 275 | 66.50 | 40.70 |
| 3 | #5850.00 | 72.2 PK | 88.6 | -16.4 | 1.00 H | 275 | 31.50 | 40.70 |
| 4 | #5850.00 | 60.8 AV | 77.2 | -16.4 | 1.00 H | 275 | 20.10 | 40.70 |
| 5 | 11650.00 | 61.8 PK | 74.0 | -12.2 | 1.00 H | 254 | 9.30 | 52.50 |
| 6 | 11650.00 | 48.0 AV | 54.0 | -6.0 | 1.00 H | 254 | -4.50 | 52.50 |

| 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 | *5825.00 | 117.6 PK | | | 1.02 V | 75 | 76.90 | 40.70 |
| 2 | *5825.00 | 105.8 AV | | | 1.02 V | 75 | 65.10 | 40.70 |
| 3 | #5850.00 | 71.2 PK | 87.6 | -16.4 | 1.06 V | 70 | 30.50 | 40.70 |
| 4 | #5850.00 | 59.4 AV | 75.8 | -16.4 | 1.06 V | 70 | 18.70 | 40.70 |
| 5 | 11650.00 | 62.9 PK | 74.0 | -11.1 | 1.00 V | 286 | 10.40 | 52.50 |
| 6 | 11650.00 | 48.5 AV | 54.0 | -5.5 | 1.00 V | 286 | -4.00 | 52.50 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

802.11n (40MHz)

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 151 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | #5725.00 | 86.2 PK | 86.9 | -0.7 | 1.00 H | 268 | 45.80 | 40.40 |
| 2 | #5725.00 | 76.6 AV | 77.3 | -0.7 | 1.00 H | 268 | 36.20 | 40.40 |
| 3 | *5755.00 | 116.9 PK | | | 1.00 H | 270 | 76.40 | 40.50 |
| 4 | *5755.00 | 107.3 AV | | | 1.00 H | 270 | 66.80 | 40.50 |
| 5 | 11510.00 | 60.3 PK | 74.0 | -13.7 | 1.00 H | 258 | 7.50 | 52.80 |
| 6 | 11510.00 | 46.9 AV | 54.0 | -7.1 | 1.00 H | 258 | -5.90 | 52.80 |

| 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 | #5725.00 | 85.0 PK | 85.7 | -0.7 | 1.17 V | 46 | 44.60 | 40.40 |
| 2 | #5725.00 | 75.1 AV | 75.8 | -0.7 | 1.17 V | 46 | 34.70 | 40.40 |
| 3 | *5755.00 | 115.7 PK | | | 1.16 V | 50 | 75.20 | 40.50 |
| 4 | *5755.00 | 105.8 AV | | | 1.16 V | 50 | 65.30 | 40.50 |
| 5 | 11510.00 | 61.3 PK | 74.0 | -12.7 | 1.00 V | 283 | 8.50 | 52.80 |
| 6 | 11510.00 | 47.5 AV | 54.0 | -6.5 | 1.00 V | 283 | -5.30 | 52.80 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



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| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------------------|
| CHANNEL | Channel 159 | FREQUENCY RANGE | 1 ~ 40GHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK) Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 66%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | *5795.00 | 117.5 PK | | | 1.00 H | 265 | 76.90 | 40.60 |
| 2 | *5795.00 | 107.8 AV | | | 1.00 H | 265 | 67.20 | 40.60 |
| 3 | #5850.00 | 67.6 PK | 87.5 | -19.9 | 1.00 H | 267 | 26.90 | 40.70 |
| 4 | #5850.00 | 57.9 AV | 77.8 | -19.9 | 1.00 H | 267 | 17.20 | 40.70 |
| 5 | 11590.00 | 60.4 PK | 74.0 | -13.6 | 1.00 H | 255 | 7.80 | 52.60 |
| 6 | 11590.00 | 47.2 AV | 54.0 | -6.8 | 1.00 H | 255 | -5.40 | 52.60 |
| 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 | *5795.00 | 115.9 PK | | | 1.13 V | 69 | 75.30 | 40.60 |
| 2 | *5795.00 | 106.1 AV | | | 1.13 V | 69 | 65.50 | 40.60 |
| 3 | #5850.00 | 66.0 PK | 85.9 | -19.9 | 1.16 V | 64 | 25.30 | 40.70 |
| 4 | #5850.00 | 56.2 AV | 76.1 | -19.9 | 1.16 V | 64 | 15.50 | 40.70 |
| 5 | 11590.00 | 61.4 PK | 74.0 | -12.6 | 1.00 V | 282 | 8.80 | 52.60 |
| 6 | 11590.00 | 47.9 AV | 54.0 | -6.1 | 1.00 V | 282 | -4.70 | 52.60 |

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



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BELOW 1GHz WORST-CASE DATA : 802.11n (20MHz)

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|--------------------------|-----------------|--------------------|---------------|
| CHANNEL | Channel 149 | FREQUENCY RANGE | Below 1000MHz |
| INPUT POWER (SYSTEM) | 120Vac, 60 Hz | DETECTOR FUNCTION | Quasi-Peak |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 69%RH | TESTED BY | Alan Wu |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | | | | | | |
|---|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| NO. | FREQ. (MHz) | EMISSION LEVEL (dBuV/m) | LIMIT (dBuV/m) | MARGIN (dB) | ANTENNA HEIGHT (m) | TABLE ANGLE (Degree) | RAW VALUE (dBuV) | CORRECTION FACTOR (dB/m) |
| 1 | 140.50 | 28.2 QP | 43.5 | -15.3 | 1.25 H | 285 | 14.70 | 13.50 |
| 2 | 249.17 | 33.2 QP | 46.0 | -12.8 | 2.00 H | 105 | 20.40 | 12.80 |
| 3 | 375.29 | 39.3 QP | 46.0 | -6.7 | 1.75 H | 63 | 22.80 | 16.50 |
| 4 | 625.60 | 40.6 QP | 46.0 | -5.4 | 1.00 H | 288 | 18.70 | 21.90 |
| 5 | 749.79 | 43.3 QP | 46.0 | -2.7 | 1.00 H | 189 | 19.60 | 23.70 |
| 6 | 875.91 | 43.4 QP | 46.0 | -2.6 | 1.49 H | 323 | 17.80 | 25.60 |

| 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 | 39.60 | 33.4 QP | 40.0 | -6.6 | 1.24 V | 91 | 20.10 | 13.30 |
| 2 | 375.29 | 43.3 QP | 46.0 | -2.7 | 1.00 V | 195 | 26.80 | 16.50 |
| 3 | 540.23 | 37.1 QP | 46.0 | -8.9 | 3.00 V | 317 | 16.80 | 20.30 |
| 4 | 637.25 | 40.4 QP | 46.0 | -5.6 | 1.49 V | 357 | 18.40 | 22.00 |
| 5 | 749.79 | 39.4 QP | 46.0 | -6.6 | 1.24 V | 194 | 15.70 | 23.70 |
| 6 | 875.91 | 42.2 QP | 46.0 | -3.8 | 1.00 V | 118 | 16.60 | 25.60 |

REMARKS:

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

5.2 CONDUCTED EMISSION MEASUREMENT

5.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dB μ 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 0.50MHz.
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

5.2.2 TEST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6



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5.2.7 TEST RESULTS

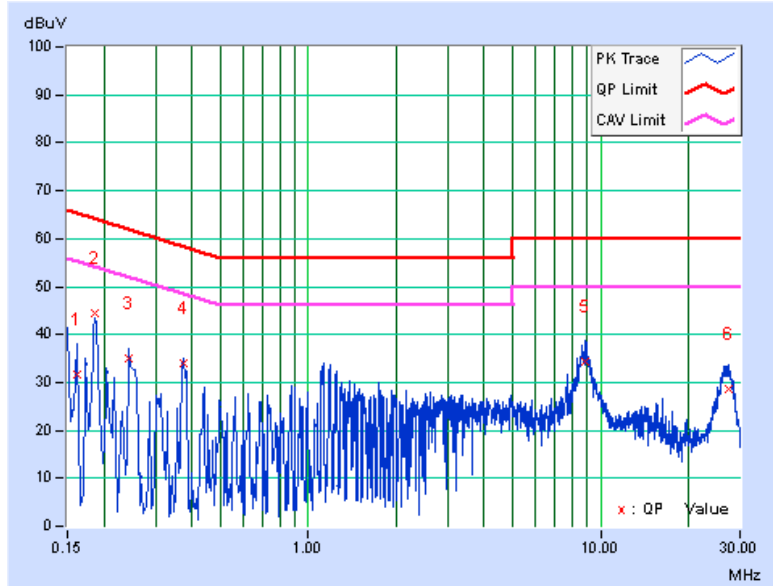
CONDUCTED WORST-CASE DATA : 802.11n (20MHz)

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

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|--------------|----------------|--------------|--------------|--------------|---------------|---------------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.16139 | 0.15 | 31.56 | 7.52 | 31.71 | 7.67 | 65.39 | 55.39 | -33.69 | -47.73 |
| 2 | 0.18557 | 0.15 | 44.19 | 36.85 | 44.34 | 37.00 | 64.23 | 54.23 | -19.89 | -17.23 |
| 3 | 0.24384 | 0.16 | 34.96 | 28.32 | 35.12 | 28.48 | 61.96 | 51.96 | -26.84 | -23.48 |
| 4 | 0.37287 | 0.19 | 33.83 | 32.69 | 34.02 | 32.88 | 58.44 | 48.44 | -24.41 | -15.55 |
| 5 | 8.82629 | 0.63 | 33.70 | 23.12 | 34.33 | 23.75 | 60.00 | 50.00 | -25.67 | -26.25 |
| 6 | 27.40661 | 1.51 | 27.09 | 20.69 | 28.60 | 22.20 | 60.00 | 50.00 | -31.40 | -27.80 |

REMARKS:

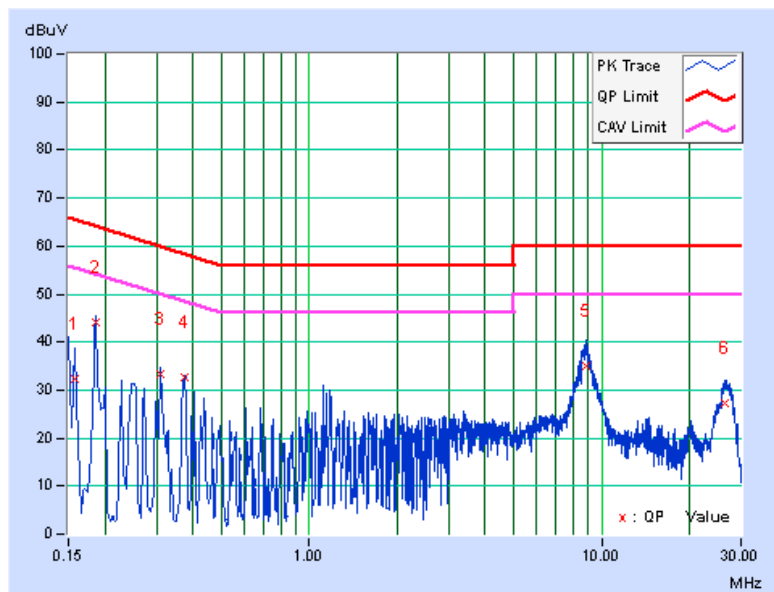
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



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

| No | Freq. [MHz] | Corr. Factor (dB) | Reading Value | | Emission Level | | Limit | | Margin | |
|----|----------------|-------------------------|---------------|-------|----------------|-------|-----------|-------|--------|--------|
| | | | [dB (uV)] | | [dB (uV)] | | [dB (uV)] | | (dB) | |
| | | | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.15782 | 0.20 | 31.97 | 15.96 | 32.17 | 16.16 | 65.58 | 55.58 | -33.41 | -39.42 |
| 2 | 0.18519 | 0.20 | 44.03 | 36.07 | 44.23 | 36.27 | 64.25 | 54.25 | -20.02 | -17.98 |
| 3 | 0.31031 | 0.23 | 33.03 | 30.84 | 33.26 | 31.07 | 59.96 | 49.96 | -26.70 | -18.89 |
| 4 | 0.37600 | 0.25 | 32.48 | 30.83 | 32.73 | 31.08 | 58.37 | 48.37 | -25.63 | -17.28 |
| 5 | 8.83020 | 0.59 | 34.45 | 23.55 | 35.04 | 24.14 | 60.00 | 50.00 | -24.96 | -25.86 |
| 6 | 26.42520 | 1.14 | 26.15 | 19.67 | 27.29 | 20.81 | 60.00 | 50.00 | -32.71 | -29.19 |

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





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5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.



5.3.7 TEST RESULTS

802.11a

| CHANNEL | FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-----------------|---------------------|---------------------|-------------|
| 149 | 5745 | 17.70 | 0.5 | PASS |
| 157 | 5785 | 17.67 | 0.5 | PASS |
| 165 | 5825 | 17.67 | 0.5 | PASS |

802.11n (20MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | | | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------|---------|---------------------|-------------|
| | | CHAIN 0 | CHAIN 1 | CHAIN 2 | | |
| 149 | 5745 | 17.71 | 17.69 | 17.38 | 0.5 | PASS |
| 157 | 5785 | 17.68 | 17.69 | 17.33 | 0.5 | PASS |
| 165 | 5825 | 17.67 | 17.67 | 17.64 | 0.5 | PASS |

802.11n (40MHz)

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | | | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---------|-------------------------|---------------------|---------|---------|---------------------|-------------|
| | | CHAIN 0 | CHAIN 1 | CHAIN 2 | | |
| 151 | 5755 | 35.24 | 36.46 | 36.35 | 0.5 | PASS |
| 159 | 5795 | 35.84 | 36.46 | 36.23 | 0.5 | PASS |



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5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 5725 –5850 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;

Array Gain = $5 \log(NANT/NSS)$ dB or 3 dB, whichever is less for 20-MHz channel widths with $NANT \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

5.4.2 TEST SETUP

Same as Item 4.4.2.

5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

Same as Item 4.4.4.

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



5.4.7 TEST RESULTS

FOR AVERAGE POWER

802.11a

| Chan. | Freq. (MHz) | Average Power (mW) | Average Power (dBm) | Limit (dBm) | Pass / Fail |
|-------|-------------|--------------------|---------------------|-------------|-------------|
| 149 | 5745 | 301.301 | 24.79 | 30 | PASS |
| 157 | 5785 | 293.765 | 24.68 | 30 | PASS |
| 165 | 5825 | 272.270 | 24.35 | 30 | PASS |

802.11n (20MHz)

| Chan. | Freq. (MHz) | Average Power (dBm) | | | Total Average Power (mW) | Total Average Power (dBm) | Limit (dBm) | Pass / Fail |
|-------|-------------|---------------------|---------|---------|--------------------------|---------------------------|-------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | | | |
| 149 | 5745 | 23.53 | 22.99 | 22.50 | 602.319 | 27.80 | 30 | PASS |
| 157 | 5785 | 23.40 | 22.90 | 22.41 | 587.941 | 27.69 | 30 | PASS |
| 165 | 5825 | 23.18 | 22.50 | 22.57 | 566.515 | 27.53 | 30 | PASS |

802.11n (40MHz)

| Chan. | Freq. (MHz) | Average Power (dBm) | | | Total Average Power (mW) | Total Average Power (dBm) | Limit (dBm) | Pass / Fail |
|-------|-------------|---------------------|---------|---------|--------------------------|---------------------------|-------------|-------------|
| | | Chain 0 | Chain 1 | Chain 2 | | | | |
| 151 | 5755 | 24.05 | 23.59 | 23.53 | 708.081 | 28.50 | 30 | PASS |
| 159 | 5795 | 24.17 | 23.77 | 23.43 | 719.741 | 28.57 | 30 | PASS |



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5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP

Same as item 4.5.2.

5.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURE.

Same as item 4.5.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as item 4.3.6.



5.5.7 TEST RESULTS

802.11a

| Channel | FREQ. (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | PASS /FAIL |
|---------|-------------|----------------|------------------|------------|
| 149 | 5745 | -9.19 | 8 | PASS |
| 157 | 5785 | -8.51 | 8 | PASS |
| 165 | 5825 | -10.07 | 8 | PASS |

802.11n (20MHz)

| TX chain | Channel | FREQ. (MHz) | PSD (dBm/3kHz) | 10 log (N=3) dB | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | PASS /FAIL |
|----------|---------|-------------|----------------|-----------------|----------------------|------------------|------------|
| 0 | 149 | 5745 | -9.84 | 4.77 | -4.78 | 5.73 | PASS |
| | 157 | 5785 | -10.42 | 4.77 | -5.36 | 5.73 | PASS |
| | 165 | 5825 | -11.43 | 4.77 | -6.37 | 5.73 | PASS |
| 1 | 149 | 5745 | -9.91 | 4.77 | -4.85 | 5.73 | PASS |
| | 157 | 5785 | -10.50 | 4.77 | -5.44 | 5.73 | PASS |
| | 165 | 5825 | -10.74 | 4.77 | -5.68 | 5.73 | PASS |
| 2 | 149 | 5745 | -10.40 | 4.77 | -5.34 | 5.73 | PASS |
| | 157 | 5785 | -11.06 | 4.77 | -6.00 | 5.73 | PASS |
| | 165 | 5825 | -11.18 | 4.77 | -6.12 | 5.73 | PASS |

NOTE: Directional gain = 3.5dBi + 10log(3) = 8.27dBi > 6dBi , so the power density limit shall be reduced to 8-(8.27-6) = 5.73dBm.

802.11n (40MHz)

| TX chain | Channel | FREQ. (MHz) | PSD (dBm/3kHz) | 10 log (N=3) dB | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | PASS /FAIL |
|----------|---------|-------------|----------------|-----------------|----------------------|------------------|------------|
| 0 | 151 | 5755 | -10.91 | 4.77 | -5.43 | 5.73 | PASS |
| | 159 | 5795 | -11.48 | 4.77 | -6.00 | 5.73 | PASS |
| 1 | 151 | 5755 | -12.39 | 4.77 | -6.91 | 5.73 | PASS |
| | 159 | 5795 | -12.26 | 4.77 | -6.78 | 5.73 | PASS |
| 2 | 151 | 5755 | -11.14 | 4.77 | -5.66 | 5.73 | PASS |
| | 159 | 5795 | -11.98 | 4.77 | -6.50 | 5.73 | PASS |

NOTE: Directional gain = 3.5dBi + 10log(3) = 8.27dBi > 6dBi , so the power density limit shall be reduced to 8-(8.27-6) = 5.73dBm.



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5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

5.6.2 TEST SETUP

Same as Item 4.6.2

5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 TEST PROCEDURE

Same as Item 4.6.4

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.6.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit.

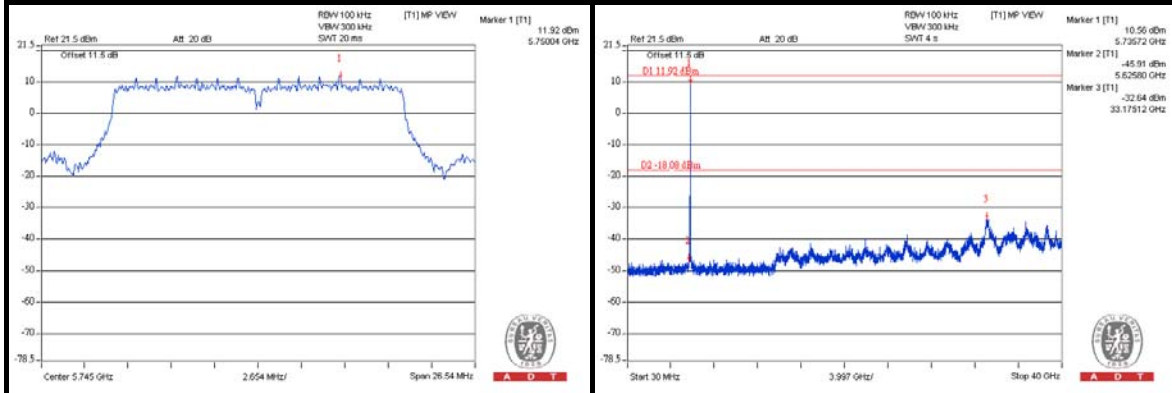
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.



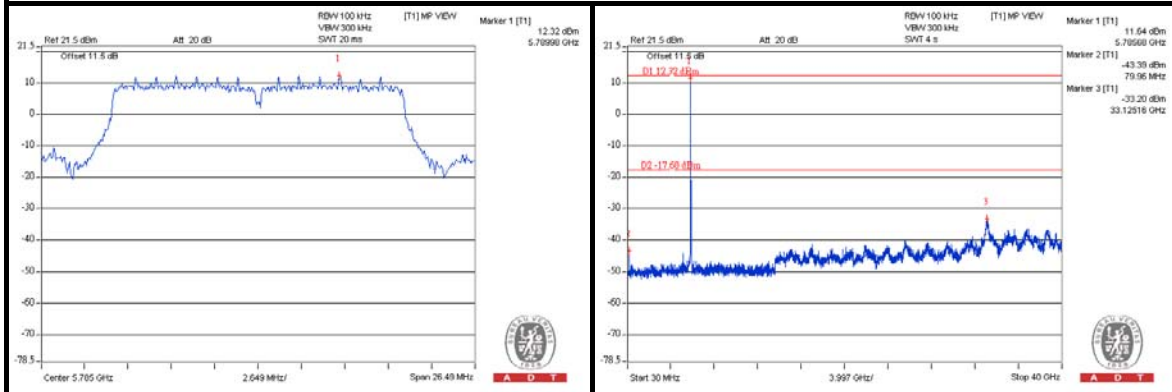
A D T

802.11a

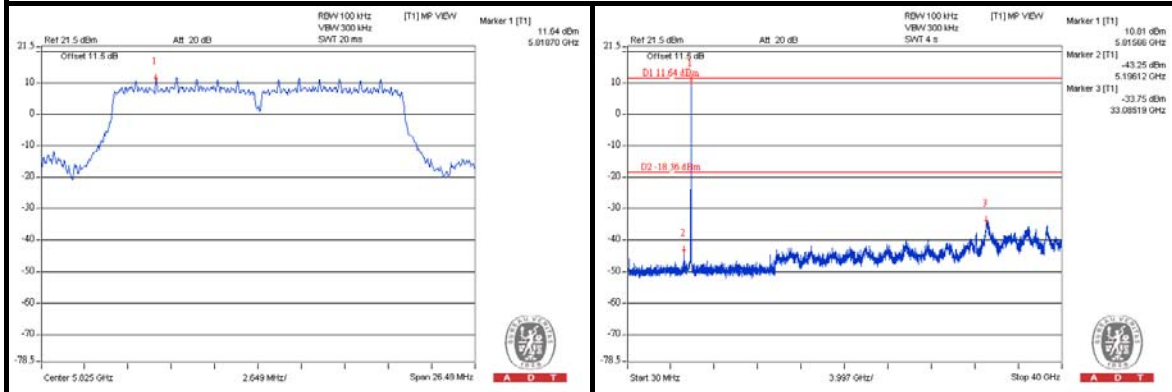
CH 149



CH 157



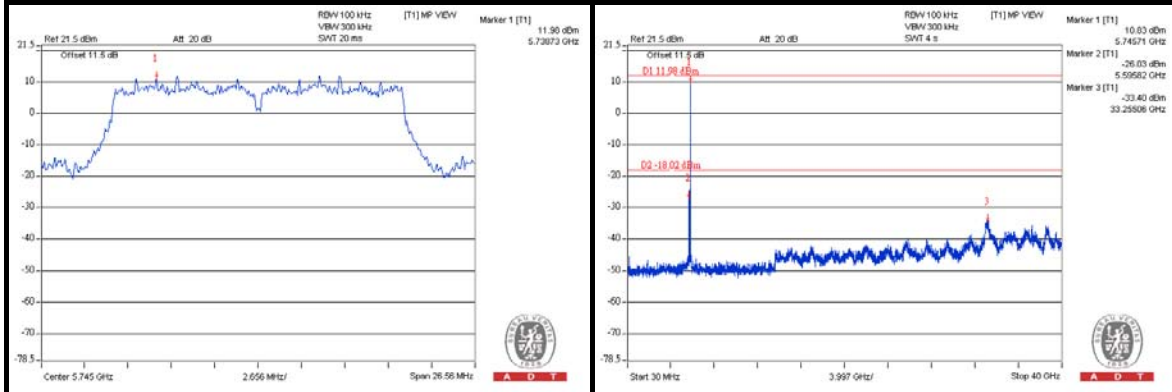
CH 165



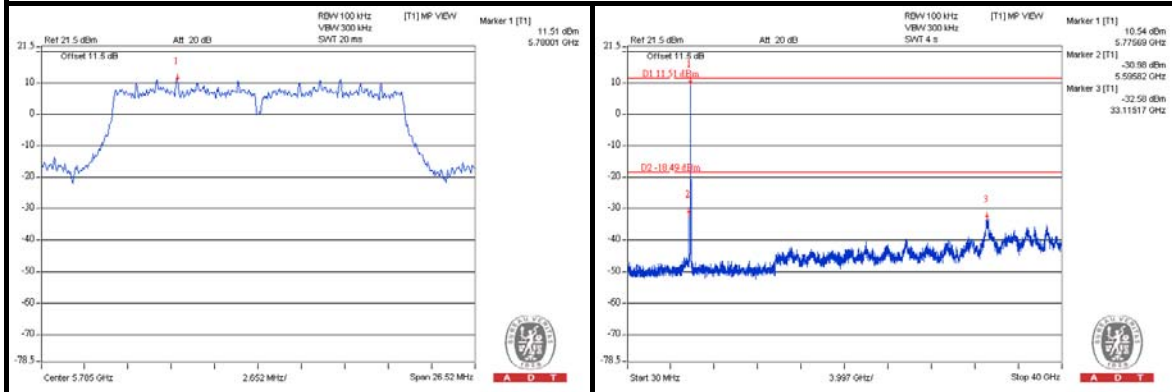
802.11n (20MHz)

CHAIN 0

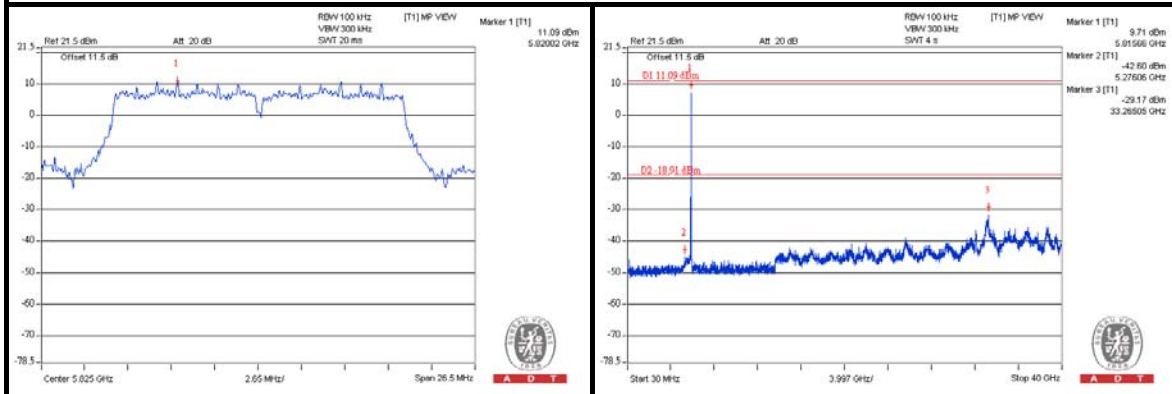
CH 149



CH 157



CH 165

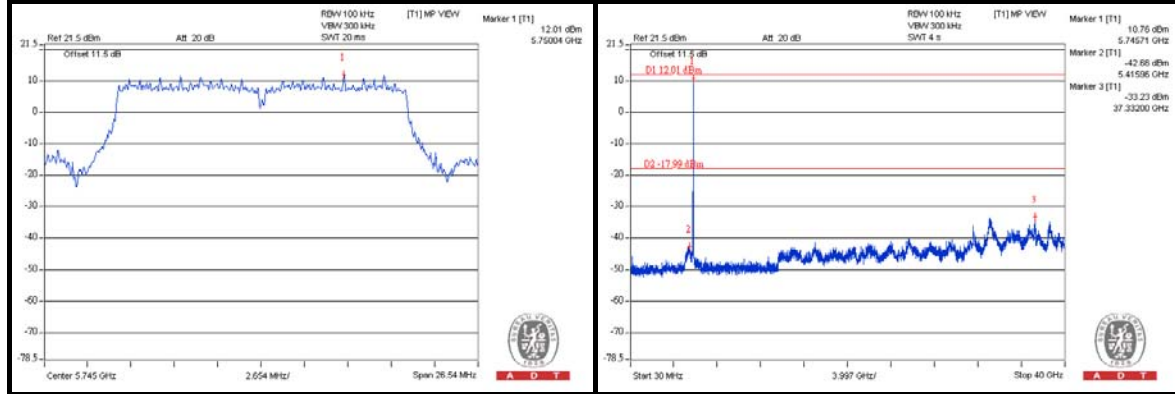




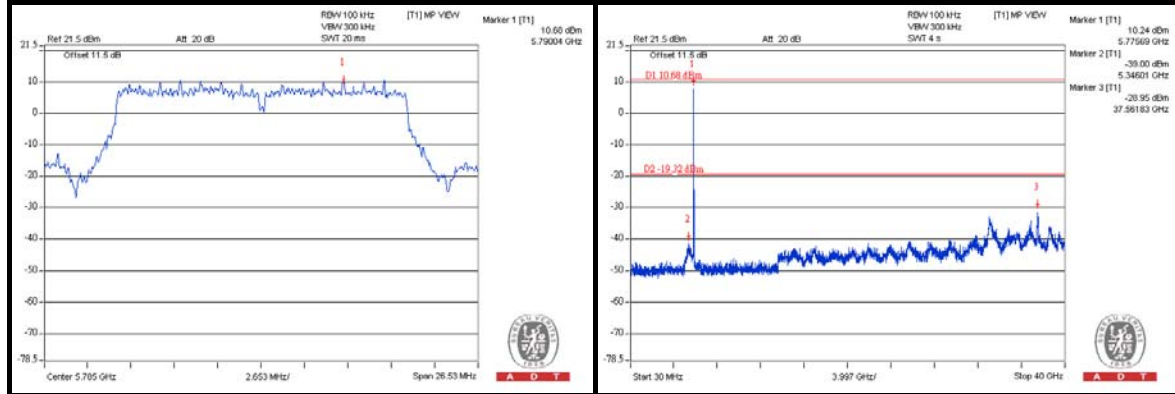
A D T

CHAIN 1

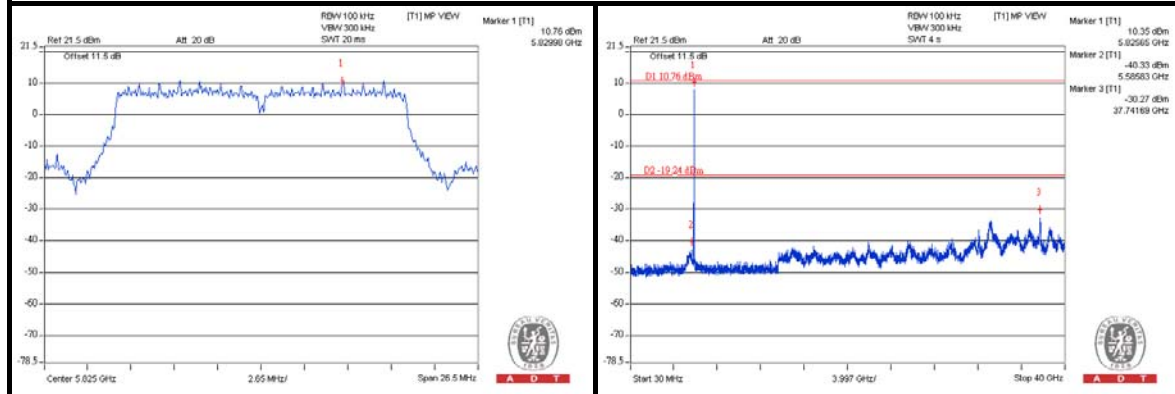
CH 149



CH 157



CH 165

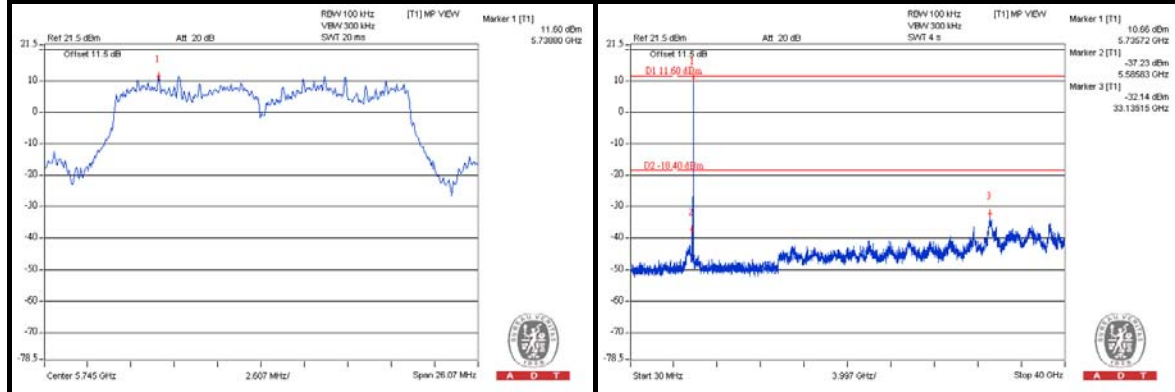




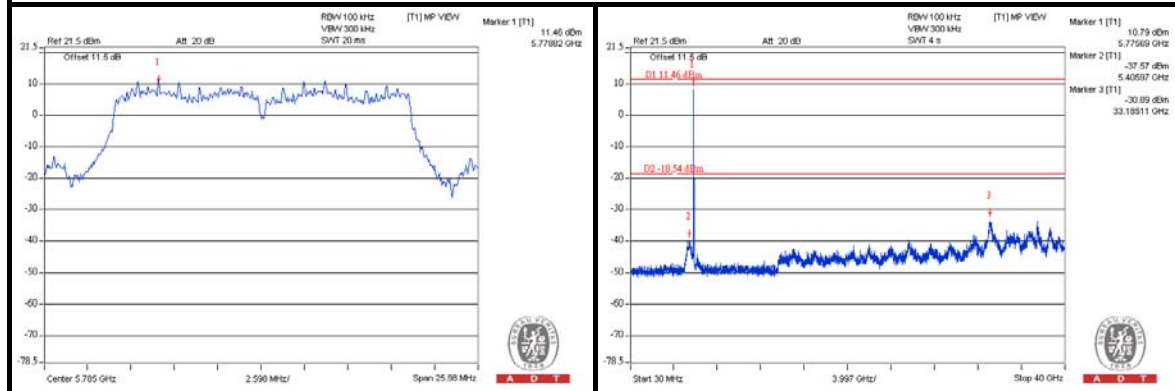
A D T

CHAIN 2

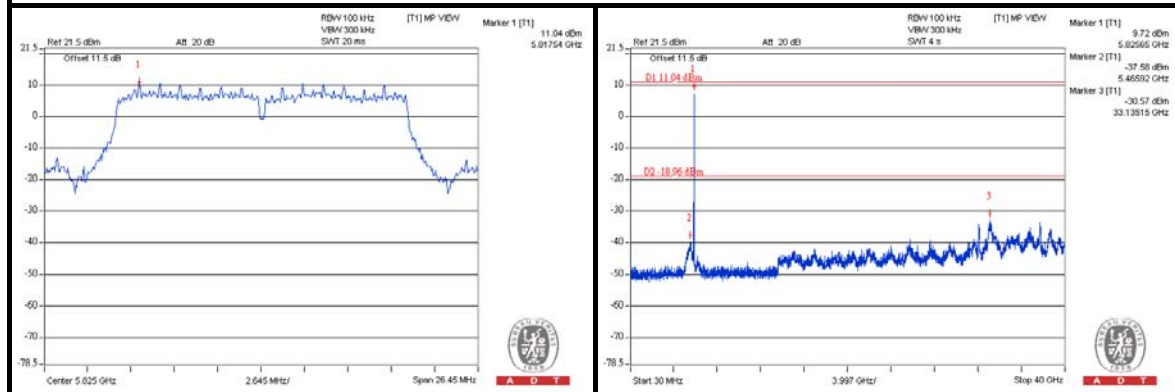
CH 149



CH 157



CH 165



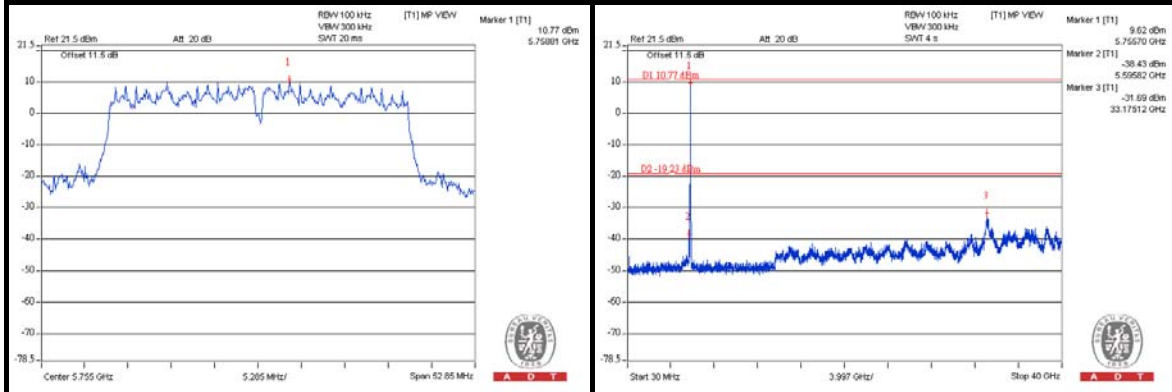


A D T

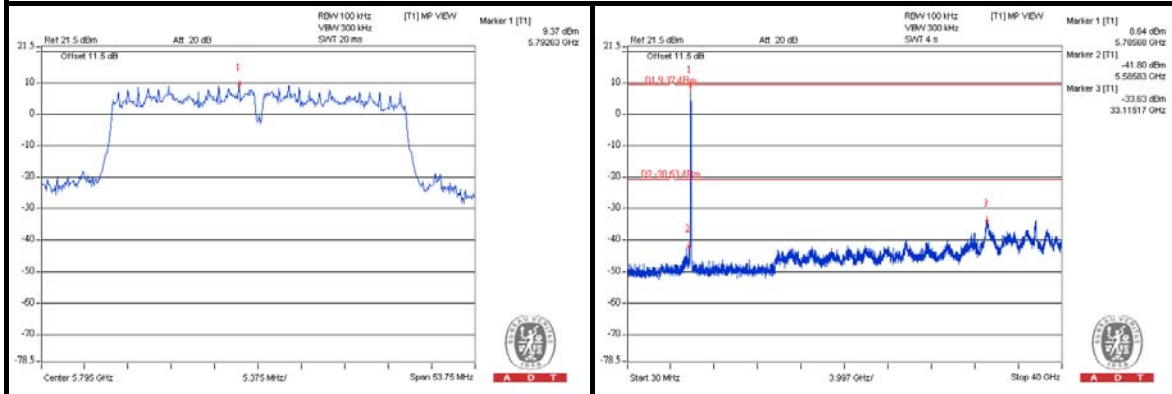
802.11n (40MHz)

CHAIN 0

CH 151



CH 159

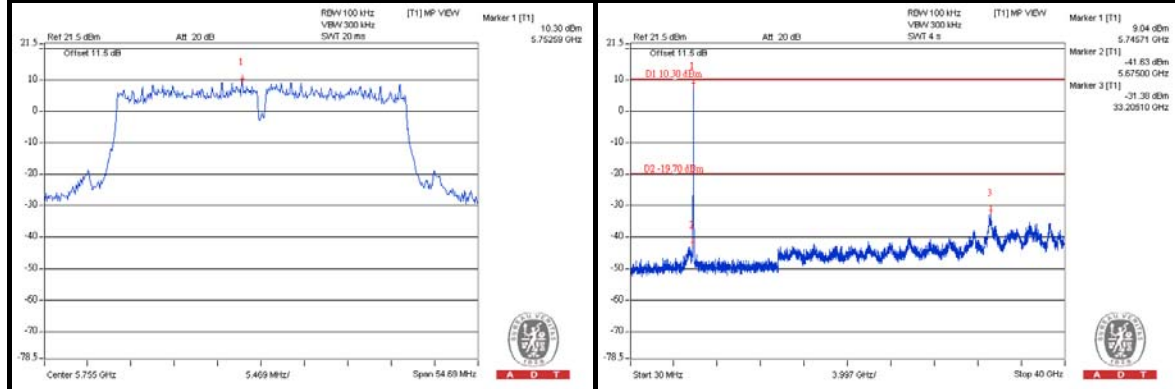




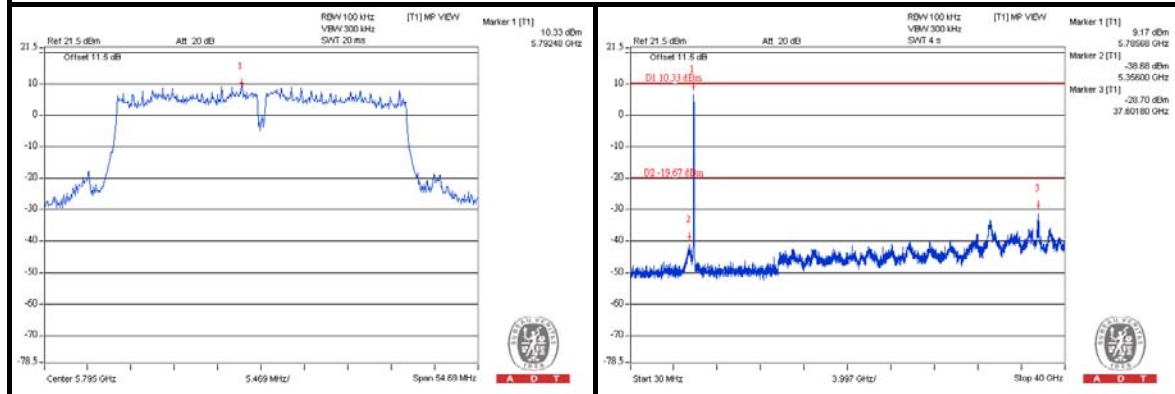
A D T

CHAIN 1

CH 151



CH 159

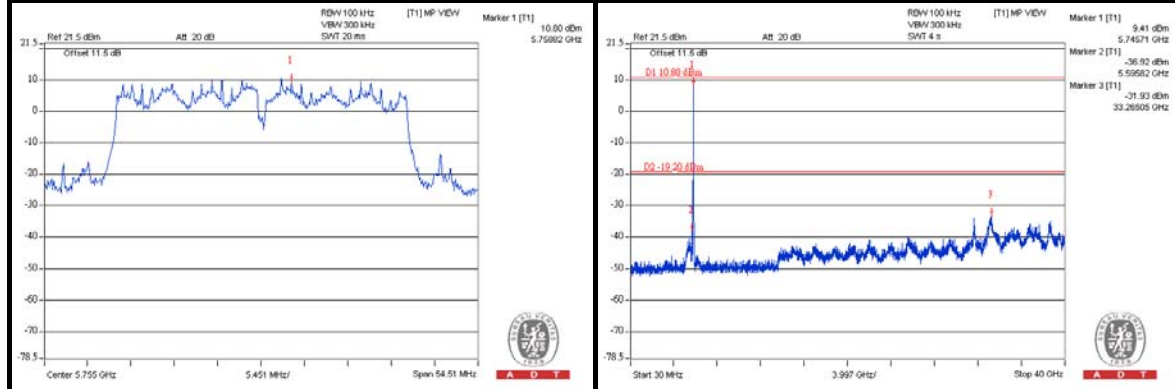




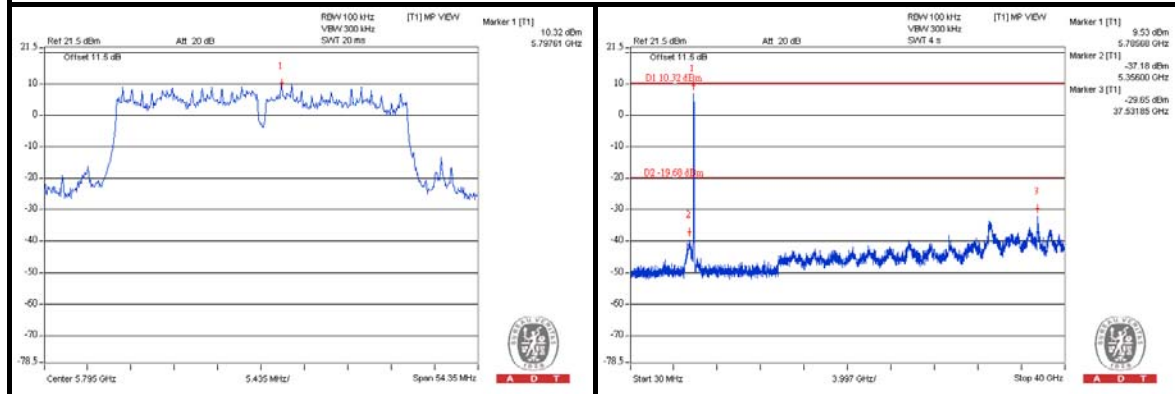
A D T

CHAIN 2

CH 151



CH 159





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6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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7. 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

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



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8. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END---