# FCC TEST REPORT

**REPORT NO.:** RF970108H02
**MODEL NO.:** AR670W
**RECEIVED:** Jan. 08, 2008
**TESTED:** Feb. 05 to March 11, 2008
**ISSUED:** March 12, 2008

**APPLICANT:** Alpha Networks Inc.

**ADDRESS:** No.8 Li-shing 7th Rd., Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

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



Testing Laboratory 0536

ACCREDITED TESTING CERT #2177-01

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# 1. CERTIFICATION

| | |
|---|---|
| **PRODUCT:** | Wireless 11n Router |
| **BRAND NAME:** | AirLink101 |
| **MODEL NO.:** | AR670W |
| **TEST SAMPLE:** | MASS-PRODUCTION |
| **TESTED:** | Feb. 05 to March 11, 2008 |
| **APPLICANT:** | Alpha Networks Inc. |
| **STANDARDS:** | FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003 |

The above equipment (Model: AR670W) has been tested by **Advance Data Technology Corporation**, 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** : _____ , **DATE:** *March 12, 2008*
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE** : _____ , **DATE:** *March 12, 2008*
Responsible for RF
( Hank Chung, Deputy Manager )

**APPROVED BY** : _____ , **DATE:** *March 12, 2008*
(May Chen, Deputy 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 and Limit** | **Result** | **Remark** |
| 15.207 | AC Power Conducted Emission | PASS | Meet the requirement of limit.<br>Minimum passing margin is –1.56dB at 12.474MHz |
| 15.247(a)(2) | Spectrum Bandwidth of a Direct Sequence Spread Spectrum System<br>Limit: min. 500kHz | PASS | Meet the requirement of limit. |
| 15.247(b) | Maximum Peak Output Power<br>Limit: max. 30dBm | PASS | Meet the requirement of limit. |
| 15.247(d) | Radiated Emissions<br>Limit: Table 15.209 | PASS | Meet the requirement of limit.<br>Minimum passing margin is –0.80dB at 4824.00MHz |
| 15.247(e) | Power Spectral Density<br>Limit: max. 8dBm | PASS | Meet the requirement of limit. |
| 15.247(d) | Band Edge Measurement<br>Limit: 20dB less than the peak value of fundamental frequency | PASS | Meet the requirement of limit. |

## 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:

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

| Measurement | Value |
|---|---|
| Conducted emissions | 2.44 dB |
| Radiated emissions (30MHz-1GHz) | 3.94 dB |
| Radiated emissions (1GHz -18GHz) | 2.33 dB |
| Radiated emissions (18GHz -40GHz) | 2.55 dB |

# 3. GENERAL INFORMATION

## 3.1 GENERAL DESCRIPTION OF EUT

| | |
|---|---|
| **PRODUCT** | Wireless 11n Router |
| **MODEL NO.** | AR670W |
| **FCC ID** | RRK-WRGN16 |
| **POWER SUPPLY** | DC 5V from power adapter |
| **MODULATION TYPE** | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM |
| **MODULATION TECHNOLOGY** | DSSS, OFDM |
| **TRANSFER RATE** | 802.11b: 11 / 5.5 / 2 / 1Mbps<br>802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps<br>Draft 802.11n (20MHz, 800ns GI): 130 / 117 / 104 / 78 / 65 / 58.5 / 52 / 39 / 26 / 19.5 /13 / 6.5Mbps<br>Draft 802.11n (40MHz, 800ns GI): 270 / 243 / 216 / 162 / 135 / 121.5 / 108 / 81 /54 / 40.5 / 27 / 13.5Mbps<br>Draft 802.11n (20MHz, 400ns GI): 144.4 / 130 / 115.6/ 86.7 / 72.2 / 65 / 57.8 / 43.3 / 28.9 / 21.7 / 14.4 / 7.2Mbps<br>Draft 802.11n (40MHz, 400ns GI): 300 / 270 / 240 / 180 / 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps |
| **FREQUENCY RANGE** | 2412 ~ 2462MHz |
| **NUMBER OF CHANNEL** | 11 for 802.11b, 802.11g, draft 802.11n (20MHz)<br>7 for draft 802.11n (40MHz) |
| **MAXIMUM OUTPUT POWER** | 802.11b: 87.096mW<br>802.11g: 140.605mW<br>draft 802.11n (20MHz): 153.727mW<br>draft 802.11n (40MHz): 144.926mW |
| **ANTENNA TYPE** | Please see note 1 |
| **DATA CABLE** | RJ 45 cable(Unshielded, 1.85m) |
| **I/O PORT** | WAN Port x 1, LAN Port x 4 |

**NOTE:**

1. There are three antennas provided to this EUT, please refer to the following table:

| Transmitter Circuit | Antenna Type | Antenna Connector | Gain(dBi) | Cable lose(dB) | Net Gain(dBi) |
|---|---|---|---|---|---|
| Chain(0) | Dipole | I-PEX | 1.8 | 0.9 | 0.9 |
| Chain(1) | Dipole | I-PEX | 1.8 | 0.4 | 1.4 |
| Chain(2) | Dipole | I-PEX | 1.8 | 0.7 | 1.1 |

2. The EUT incorporates a MIMO function with 802.11b, 802.11g, draft 802.11n. Physically, the EUT provides two completed transmit and three completed receivers.

3. The EUT is 2 * 3 spatial MIMO without beam forming function. The antenna configurations are two transmitter antennas and three receiver antennas, as there are 3 Dipole antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 3 antennas.

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

5. The EUT complies with draft 802.11n standards and backwards compatible with 802.11b, 802.11g products.

6. The EUT was operated with the following power adapter :

| | |
|---|---|
| **Brand:** | JENTEC |
| **Model No.:** | AF1205-B |
| **Input power :** | 100-120V, 50-60Hz, 0.3A |
| **Output power :** | DC 5.0V, 2.0A<br>1.85m / Unshielded / Without core / 2PIN |

7. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b and draft 802.11n technique devices to the network.

8. The above EUT information was 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

Eleven channels are provided for 802.11b, 802.11g, draft 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 | | |

Seven channels are provided for draft 802.11n (40MHz):

| CHANNEL | FREQUENCY | CHANNEL | FREQUENCY |
|---|---|---|---|
| 1 | 2422MHz | 5 | 2442MHz |
| 2 | 2427MHz | 6 | 2447MHz |
| 3 | 2432MHz | 7 | 2452MHz |
| 4 | 2437MHz | | |

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

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

Where **PLC:** Power Line Conducted Emission **RE < 1G:** Radiated Emission below 1GHz

**RE ≥ 1G:** Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

## COMBINATION MODE:

### ANTENNA COMBINATION MODE:

| COMBINATION MODE | OPERATION MODE | TX CHAIN(0) | TX CHAIN(1) |
|---|---|---|---|
| A | 802.11 b | ✓ | |
| B | 802.11 g | ✓ | |
| C | DRAFT 802.11n(20MHz) | ✓ | |
| D | | ✓ | ✓ |
| E | DRAFT 802.11n(40MHz) | ✓ | |
| F | | ✓ | ✓ |

Note:
1. The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
2. From above mode, the different modes were chosen for pretest.
3. Mode A, B, D, F the worst modes, was selected as representative mode for the report.

**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.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) | TX COMBINATION |
|---|---|---|---|---|---|---|
| 802.11g | 1 to 11 | 1 | OFDM | BPSK | 6 | B |

**RADIATED EMISSION TEST (BELOW 1 GHz):**

☒ 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.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) | TX COMBINATION |
|---|---|---|---|---|---|---|
| 802.11g | 1 to 11 | 1 | OFDM | BPSK | 6 | B |

**RADIATED EMISSION TEST (ABOVE 1 GHz):**

☒ 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.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION N TYPE | DATA RATE (Mbps) | TX COMBINATION |
|---|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | DBPSK | 1 | A |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6 | B |
| Draft 802.11n (20MHz) | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 13 | D |
| Draft 802.11n (40MHz) | 1 to 7 | 1, 4, 7 | OFDM | BPSK | 27 | F |

**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.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) | TX COMBINATION |
|---|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 11 | DSSS | DBPSK | 1 | A |
| 802.11g | 1 to 11 | 1, 11 | OFDM | BPSK | 6 | B |
| Draft 802.11n (20MHz) | 1 to 11 | 1, 11 | OFDM | BPSK | 13 | D |
| Draft 802.11n (40MHz) | 1 to 7 | 1, 7 | OFDM | BPSK | 27 | F |

**ANTENNA PORT CONDUCTED 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.

| MODE | AVAILABLE CHANNEL | TESTED CHANNEL | MODULATION TECHNOLOGY | MODULATION TYPE | DATA RATE (Mbps) | TX COMBINATION |
|---|---|---|---|---|---|---|
| 802.11b | 1 to 11 | 1, 6, 11 | DSSS | DBPSK | 1 | A |
| 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6 | B |
| Draft 802.11n (20MHz) | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 13 | D |
| Draft 802.11n (40MHz) | 1 to 7 | 1, 4, 7 | OFDM | BPSK | 27 | F |

## 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Wireless 11n Router. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C. (15.247)**
**ANSI C63.4-2003**

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

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

## 3.4 DESCRIPTION OF SUPPORT UNITS

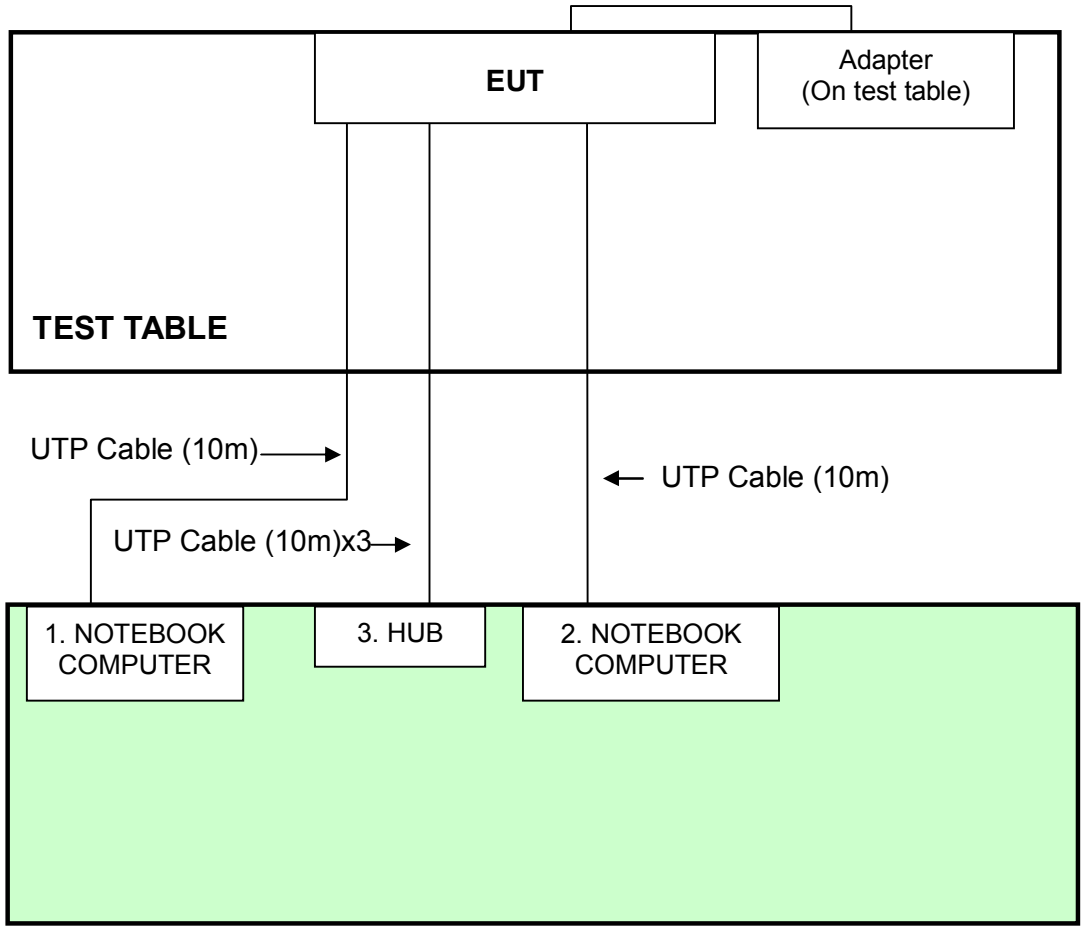
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT | BRAND | MODEL NO. | SERIAL NO. | FCC ID |
|---|---|---|---|---|---|
| 1 | NOTEBOOK COMPUTER | DELL | PP18L | 6976685584 | FCC DoC |
| 2 | NOTEBOOK COMPUTER | DELL | PP19L | CN-OHC416-70166-5CA-0448 | PIW632500516610 |
| 3 | HUB | AVSYS | 110H8 | 01-20E-000006 | FCC DoC |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|---|---|
| 1 | RJ-45 cable, Unshielded, 10m |
| 2 | RJ-45 cable, Unshielded, 10m |
| 3 | NA |

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

## 3.5 CONFIGURATION OF SYSTEM UNDER TEST




**NOTE:** 1. Support units 1-3 were kept in the control room during the test.

# 4.TEST TYPES AND RESULTS

## 4.1 CONDUCTED EMISSION MEASUREMENT

### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 | 56 to 46 |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

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

### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ROHDE & SCHWARZ Test Receiver | ESCS 30 | 100287 | Mar. 06, 2009 |
| Line-Impedance Stabilization Network(for EUT) | KNW-407 | 8-1395-12 | Aug. 19, 2008 |
| Line-Impedance Stabilization Network(for Peripheral) | ENV-216 | 100072 | Nov. 08, 2008 |
| RF Cable (JETBAO) | RG5B/U-6m | COACAB-9KHz-30MHz | Aug. 15, 2008 |
| 50 ohms Terminator | 50 | 3 | Nov. 15, 2008 |
| Software | ADT_Cond_V7.3.2 | 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 ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

### 4.1.3 TEST PROCEDURES

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

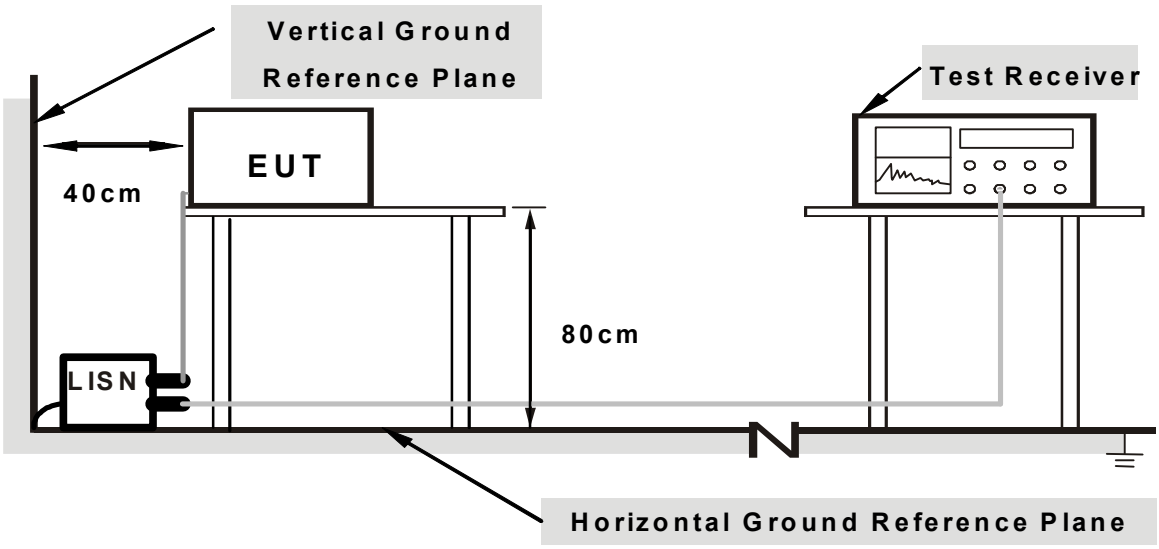
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 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 related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared other computer systems (support unit 1 ~ 2) to act as communication partners and placed them outside of testing area.
3. The communication partners run test program “RT2880QA.exe ” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

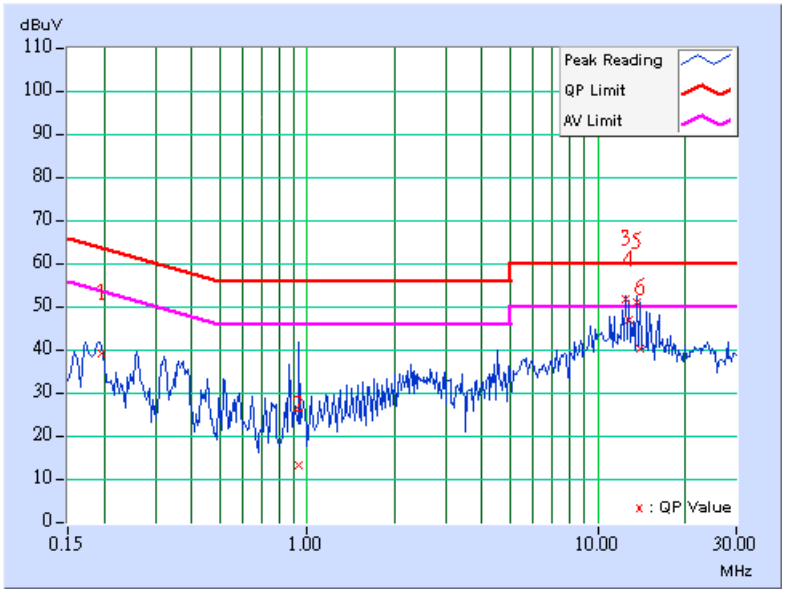
## 4.1.7 TEST RESULTS

### 802.11g OFDM MODULATION:

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 1 | PHASE | Line (L) |
| MODULATION TYPE | BPSK | 6dB BANDWIDTH | 9 kHz |
| TRANSFER RATE | 6Mbps | INPUT POWER | 120Vac, 60 Hz |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 955hPa | TESTED BY | Andy Ho |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.196 | 0.34 | 38.33 | - | 38.67 | - | 63.77 | 53.77 | -25.10 | - |
| 2 | 0.939 | 0.30 | 12.69 | - | 12.99 | - | 56.00 | 46.00 | -43.01 | - |
| **3** | **12.474** | **0.70** | **50.99** | **47.74** | **51.69** | **48.44** | **60.00** | **50.00** | **-8.31** | **-1.56** |
| 4 | 12.849 | 0.73 | 46.25 | - | 46.98 | - | 60.00 | 50.00 | -13.02 | - |
| 5 | 13.612 | 0.77 | 50.35 | 46.68 | 51.12 | 47.45 | 60.00 | 50.00 | -8.88 | -2.55 |
| 6 | 14.008 | 0.80 | 39.51 | - | 40.31 | - | 60.00 | 50.00 | -19.69 | - |

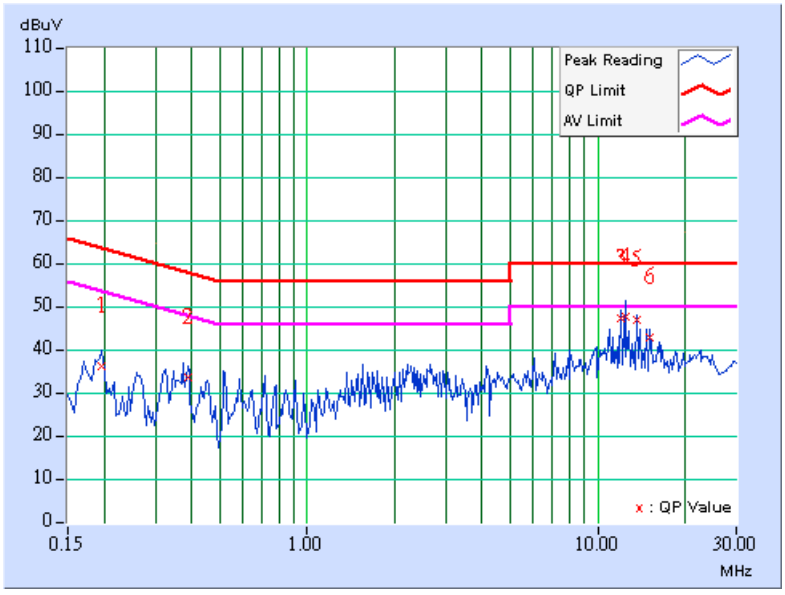
**REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value =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



| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 1 | PHASE | Neutral (N) |
| MODULATION TYPE | BPSK | 6dB BANDWIDTH | 9 kHz |
| TRANSFER RATE | 6Mbps | INPUT POWER | 120Vac, 60 Hz |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 60%RH, 955hPa | TESTED BY | Andy Ho |

| No | Freq. | Corr. Factor | Reading Value [dB (uV)] | | Emission Level [dB (uV)] | | Limit [dB (uV)] | | Margin (dB) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | [MHz] | (dB) | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. | Q.P. | AV. |
| 1 | 0.197 | 0.36 | 35.55 | - | 35.91 | - | 63.76 | 53.76 | -27.85 | - |
| 2 | 0.391 | 0.10 | 32.94 | - | 33.04 | - | 58.05 | 48.05 | -25.01 | - |
| 3 | 12.061 | 0.67 | 46.73 | - | 47.40 | - | 60.00 | 50.00 | -12.60 | - |
| 4 | 12.441 | 0.70 | 47.09 | - | 47.79 | - | 60.00 | 50.00 | -12.21 | - |
| 5 | 13.567 | 0.77 | 46.10 | - | 46.87 | - | 60.00 | 50.00 | -13.13 | - |
| 6 | 15.070 | 0.86 | 42.28 | - | 43.14 | - | 60.00 | 50.00 | -16.86 | - |

**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.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequencies (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 | 3 |

**NOTE**:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

## 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER | MODEL NO. | SERIAL NO. | CALIBRATED UNTIL |
|---|---|---|---|
| ADVANTEST Spectrum Analyzer | R3271A | 85060311 | July 15, 2008 |
| HP Pre_Amplifier | 8449B | 3008A01922 | Oct. 04, 2008 |
| ROHDE & SCHWARZ Test Receiver | ESCS30 | 100375 | Mar. 26, 2008 |
| SCHWARZBECK TRILOG Broadband Antenna | VULB 9168 | 138 | July 26, 2008 |
| Schwarzbeck Horn_Antenna | BBHA9120 | D124 | Dec. 16, 2008 |
| Schwarzbeck Horn_Antenna | BBHA 9170 | BBHA9170153 | Jan. 27, 2009 |
| RF Switches (ARNITSU) | CS-201 | 1565157 | Aug. 13, 2008 |
| RF CABLE (Chaintek) | SF102 | 22054-2 | Dec. 06. 2008 |
| RF Cable(RICHTEC) | 9913-30M N-N Cable | STCCAB-30M-1 GHz | Aug. 13, 2008 |
| Software | ADT_Radiated_V 7.6.15.8 | NA | NA |
| CHANCE MOST Antenna Tower | AT-100 | 0203 | NA |
| CHANCE MOST Turn Table | TT-100 | 0203 | NA |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824A-3.

### 4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10-meter open field site. 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 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

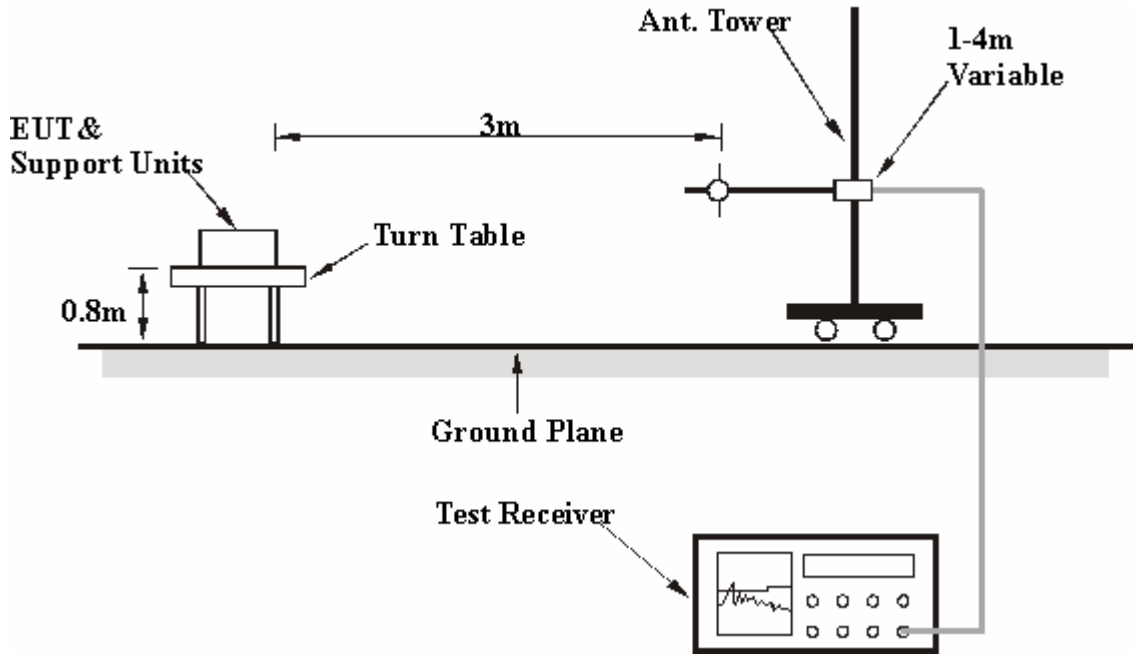
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.2.5 TEST SETUP




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

### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

## 4.2.7 TEST RESULTS

**BELOW 1GHz WORST-CASE DATA：802.11g OFDM MODULATION**

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 1 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 20deg. C, 72%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 110.77 | 29.14 QP | 43.50 | -14.36 | 1.57 H | 91 | 17.08 | 12.06 |
| 2 | 125.00 | 28.69 QP | 43.50 | -14.81 | 1.69 H | 312 | 15.46 | 13.23 |
| 3 | 133.33 | 38.45 QP | 43.50 | -5.05 | 2.09 H | 105 | 24.62 | 13.83 |
| 4 | 250.00 | 35.67 QP | 46.00 | -10.33 | 1.00 H | 289 | 22.84 | 12.83 |
| 5 | 400.00 | 31.61 QP | 46.00 | -14.39 | 2.20 H | 45 | 13.56 | 18.05 |
| 6 | 500.00 | 26.33 QP | 46.00 | -19.67 | 2.20 H | 288 | 5.28 | 21.05 |
| 7 | 533.29 | 30.55 QP | 46.00 | -15.45 | 1.54 H | 180 | 9.61 | 20.94 |
| 8 | 666.66 | 32.20 QP | 46.00 | -13.80 | 1.13 H | 14 | 7.72 | 24.48 |
| 9 | 699.25 | 43.06 QP | 46.00 | -2.94 | 1.36 H | 1 | 18.54 | 24.52 |
| 10 | 800.00 | 35.26 QP | 46.00 | -10.74 | 2.02 H | 12 | 7.21 | 28.05 |
| 11 | 960.00 | 30.11 QP | 46.00 | -15.89 | 1.46 H | 7 | 0.44 | 29.67 |
| 12 | 1000.06 | 30.27 QP | 54.00 | -23.73 | 1.24 H | 0 | -0.26 | 30.53 |

| 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 | 54.51 | 37.22 QP | 40.00 | -2.78 | 1.00 V | 341 | 22.25 | 14.97 |
| 2 | 110.60 | 26.85 QP | 43.50 | -16.65 | 1.00 V | 1 | 14.80 | 12.05 |
| 3 | 125.00 | 30.23 QP | 43.50 | -13.27 | 1.00 V | 348 | 17.00 | 13.23 |
| 4 | 133.33 | 36.65 QP | 43.50 | -6.85 | 1.00 V | 291 | 22.82 | 13.83 |
| 5 | 250.00 | 31.33 QP | 46.00 | -14.67 | 1.00 V | 4 | 18.50 | 12.83 |
| 6 | 266.65 | 26.28 QP | 46.00 | -19.72 | 1.00 V | 173 | 12.03 | 14.25 |
| 7 | 375.00 | 29.97 QP | 46.00 | -16.03 | 1.00 V | 213 | 12.49 | 17.48 |
| 8 | 400.00 | 34.07 QP | 46.00 | -11.93 | 1.26 V | 258 | 16.02 | 18.05 |
| 9 | 500.00 | 30.77 QP | 46.00 | -15.23 | 1.00 V | 90 | 9.72 | 21.05 |
| 10 | 533.29 | 31.23 QP | 46.00 | -14.77 | 1.00 V | 198 | 10.29 | 20.94 |
| 11 | 699.25 | 40.71 QP | 46.00 | -5.29 | 1.51 V | 42 | 16.19 | 24.52 |
| 12 | 800.00 | 34.54 QP | 46.00 | -11.46 | 1.61 V | 196 | 6.49 | 28.05 |
| 13 | 960.00 | 28.73 QP | 46.00 | -17.27 | 1.42 V | 215 | -0.94 | 29.67 |
| 14 | 1000.00 | 30.42 QP | 54.00 | -23.58 | 1.00 V | 311 | -0.11 | 30.53 |

**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.

## 802.11b DSSS MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 1 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 2386.00 | 55.61 PK | 74.00 | -18.39 | 1.33 H | 252 | 25.23 | 30.38 |
| 2 | 2386.00 | 44.56 AV | 54.00 | -9.44 | 1.33 H | 252 | 14.18 | 30.38 |
| 3 | *2412.00 | 100.48 PK | | | 1.35 H | 181 | 69.99 | 30.49 |
| 4 | *2412.00 | 96.20 AV | | | 1.35 H | 181 | 65.71 | 30.49 |
| 5 | 4824.00 | 54.49 PK | 74.00 | -19.51 | 1.71 H | 16 | 18.80 | 35.69 |
| 6 | 4824.00 | 49.38 AV | 54.00 | -4.62 | 1.71 H | 16 | 13.69 | 35.69 |
| 7 | 7236.00 | 58.06 PK | 80.48 | -22.42 | 1.40 H | 315 | 15.82 | 42.24 |
| 8 | 7236.00 | 47.54 AV | 76.20 | -28.66 | 1.40 H | 315 | 5.30 | 42.24 |
| 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 | 2386.00 | 60.31 PK | 74.00 | -13.69 | 1.00 V | 109 | 29.93 | 30.38 |
| 2 | 2386.00 | 48.89 AV | 54.00 | -5.11 | 1.00 V | 109 | 18.51 | 30.38 |
| 3 | *2412.00 | 110.86 PK | | | 1.00 V | 295 | 80.37 | 30.49 |
| 4 | *2412.00 | 106.69 AV | | | 1.00 V | 295 | 76.20 | 30.49 |
| 5 | 4824.00 | 55.74 PK | 74.00 | -18.26 | 1.32 V | 92 | 20.05 | 35.69 |
| **6** | **4824.00** | **53.20 AV** | **54.00** | **-0.80** | **1.32 V** | **92** | **17.51** | **35.69** |
| 7 | 7236.00 | 57.34 PK | 90.86 | -33.52 | 1.45 V | 239 | 15.10 | 42.24 |
| 8 | 7236.00 | 48.21 AV | 86.69 | -38.48 | 1.45 V | 239 | 5.97 | 42.24 |

**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.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 6 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 101.63 PK | | | 1.35 H | 181 | 71.02 | 30.61 |
| 2 | *2437.00 | 97.81 AV | | | 1.35 H | 181 | 67.20 | 30.61 |
| 3 | 4874.00 | 52.97 PK | 74.00 | -21.03 | 1.68 H | 15 | 17.17 | 35.80 |
| 4 | 4874.00 | 47.92 AV | 54.00 | -6.08 | 1.68 H | 15 | 12.12 | 35.80 |
| 5 | 7311.00 | 57.97 PK | 74.00 | -16.03 | 1.38 H | 312 | 15.45 | 42.52 |
| 6 | 7311.00 | 47.34 AV | 54.00 | -6.66 | 1.38 H | 312 | 4.82 | 42.52 |
| 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 | 111.14 PK | | | 1.00 V | 269 | 80.53 | 30.61 |
| 2 | *2437.00 | 106.92 AV | | | 1.00 V | 269 | 76.31 | 30.61 |
| 3 | 4874.00 | 55.36 PK | 74.00 | -18.64 | 1.46 V | 94 | 19.56 | 35.80 |
| 4 | 4874.00 | 52.49 AV | 54.00 | -1.51 | 1.46 V | 94 | 16.69 | 35.80 |
| 5 | 7311.00 | 58.97 PK | 74.00 | -15.03 | 1.42 V | 152 | 16.45 | 42.52 |
| 6 | 7311.00 | 51.06 AV | 54.00 | -2.94 | 1.42 V | 152 | 8.54 | 42.52 |

**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.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 11 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 101.55 PK | | | 1.34 H | 182 | 70.83 | 30.72 |
| 2 | *2462.00 | 97.29 AV | | | 1.34 H | 182 | 66.57 | 30.72 |
| 3 | 2487.00 | 57.23 PK | 74.00 | -16.77 | 1.25 H | 168 | 26.40 | 30.83 |
| 4 | 2487.00 | 45.68 AV | 54.00 | -8.32 | 1.25 H | 168 | 14.85 | 30.83 |
| 5 | 4924.00 | 52.58 PK | 74.00 | -21.42 | 1.70 H | 14 | 16.68 | 35.90 |
| 6 | 4924.00 | 47.42 AV | 54.00 | -6.58 | 1.70 H | 14 | 11.52 | 35.90 |
| 7 | 7386.00 | 57.75 PK | 74.00 | -16.25 | 1.39 H | 311 | 14.95 | 42.80 |
| 8 | 7386.00 | 47.18 AV | 54.00 | -6.82 | 1.39 H | 311 | 4.38 | 42.80 |
| 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 | 111.82 PK | | | 1.00 V | 271 | 81.10 | 30.72 |
| 2 | *2462.00 | 107.46 AV | | | 1.00 V | 271 | 76.74 | 30.72 |
| 3 | 2487.00 | 62.56 PK | 74.00 | -11.44 | 1.00 V | 269 | 31.73 | 30.83 |
| 4 | 2487.00 | 50.44 AV | 54.00 | -3.56 | 1.00 V | 269 | 19.61 | 30.83 |
| 5 | 4924.00 | 55.11 PK | 74.00 | -18.89 | 1.51 V | 121 | 19.21 | 35.90 |
| 6 | 4924.00 | 51.72 AV | 54.00 | -2.28 | 1.51 V | 121 | 15.82 | 35.90 |
| 7 | 7386.00 | 58.47 PK | 74.00 | -15.53 | 1.73 V | 250 | 15.67 | 42.80 |
| 8 | 7386.00 | 50.42 AV | 54.00 | -3.58 | 1.73 V | 250 | 7.62 | 42.80 |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

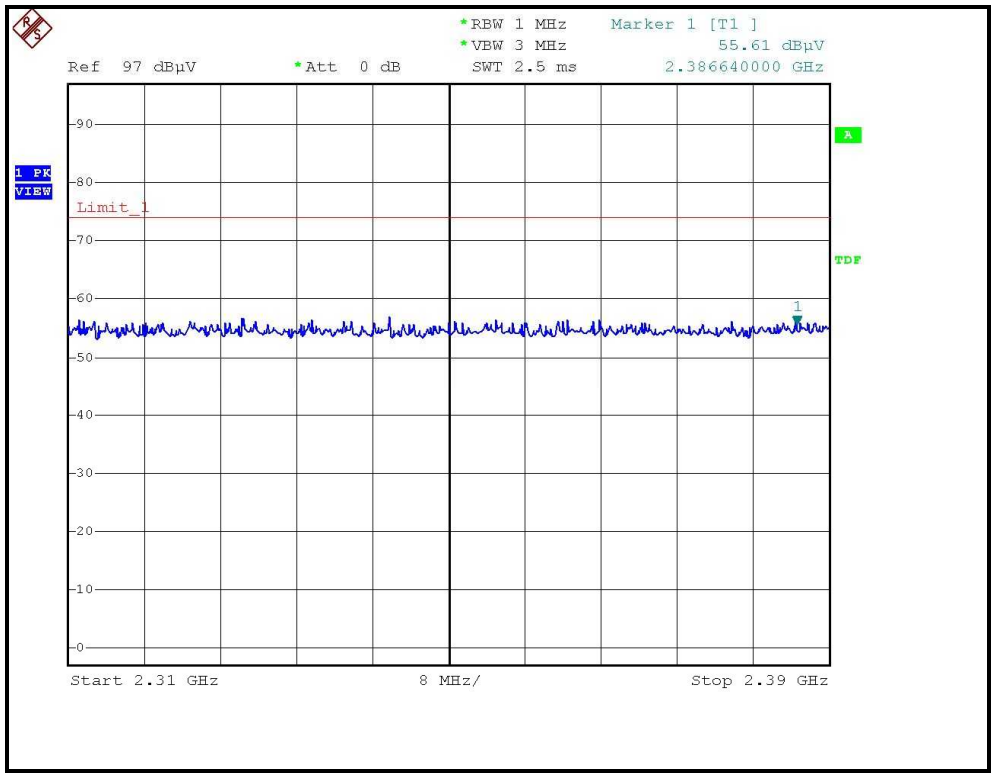
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

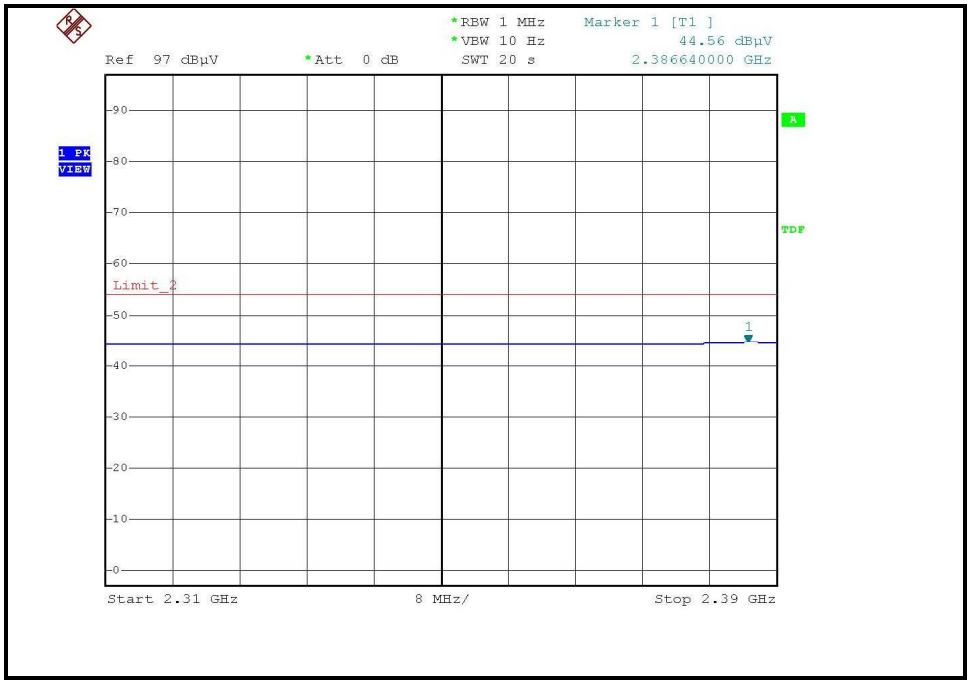
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

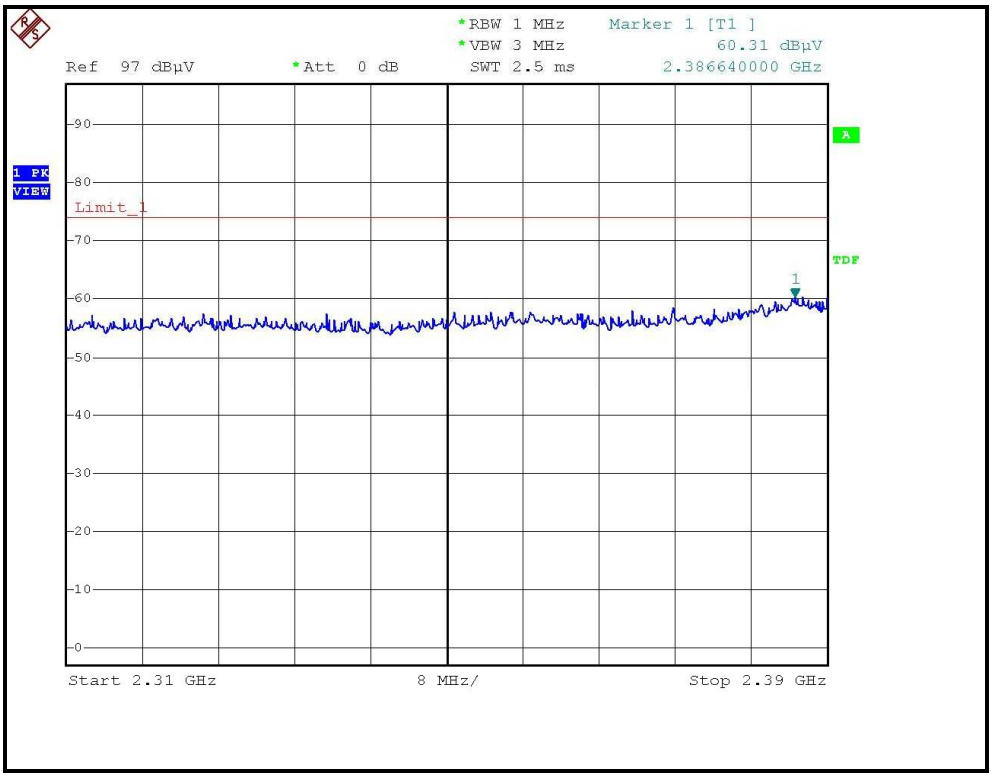
5. " * ": Fundamental frequency.

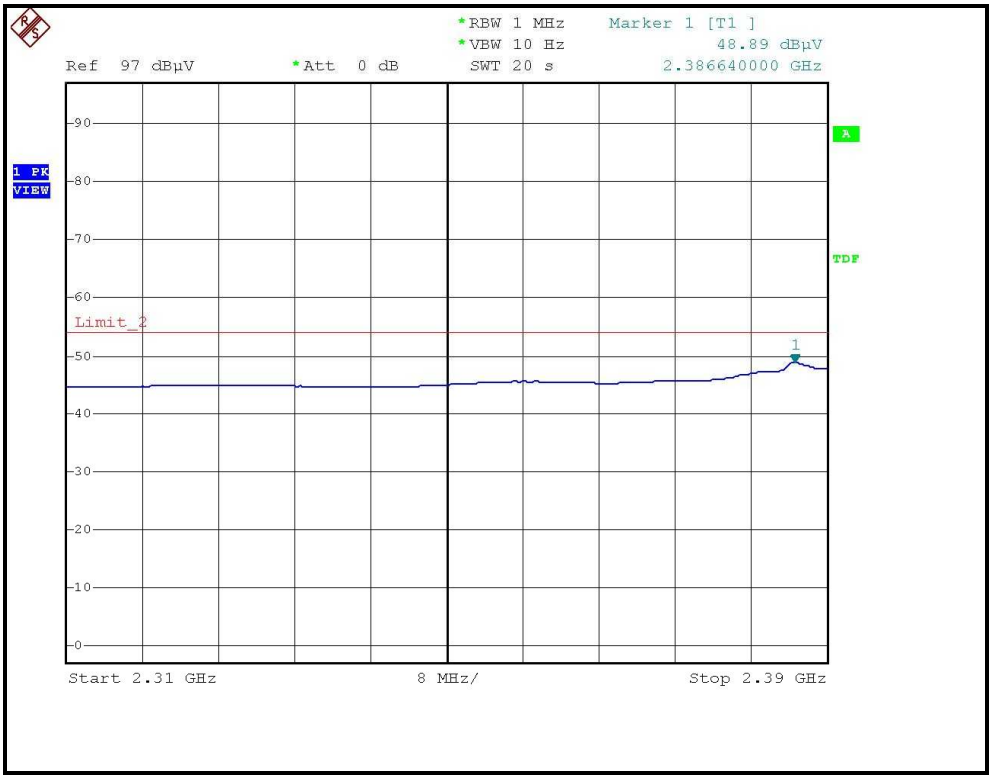
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL )



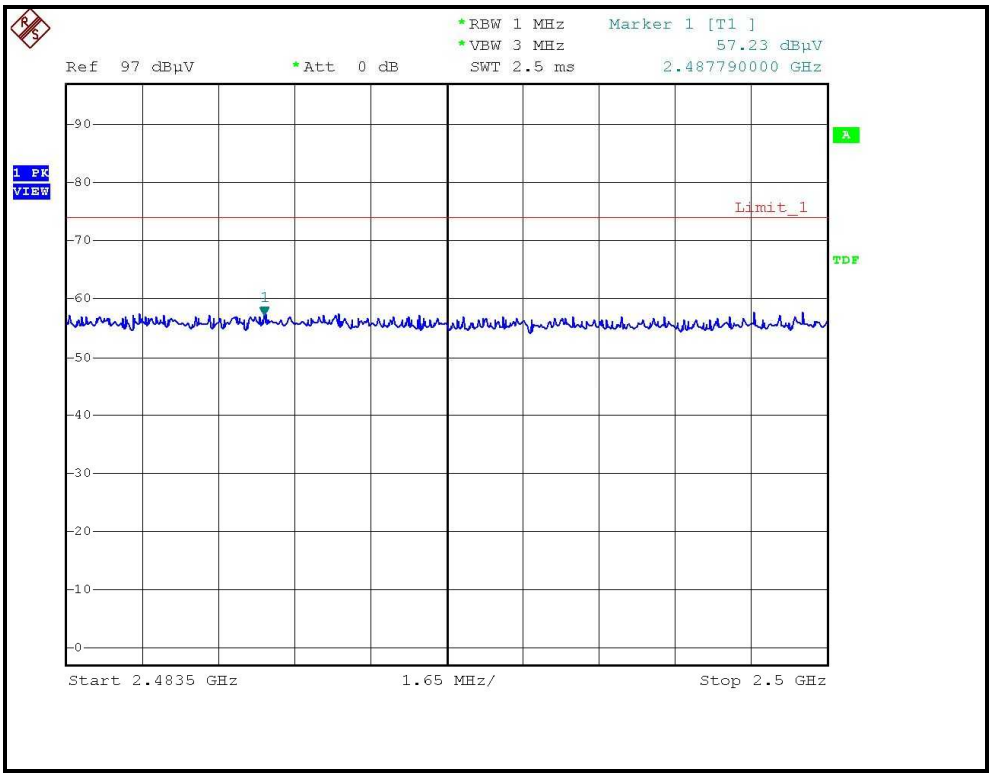



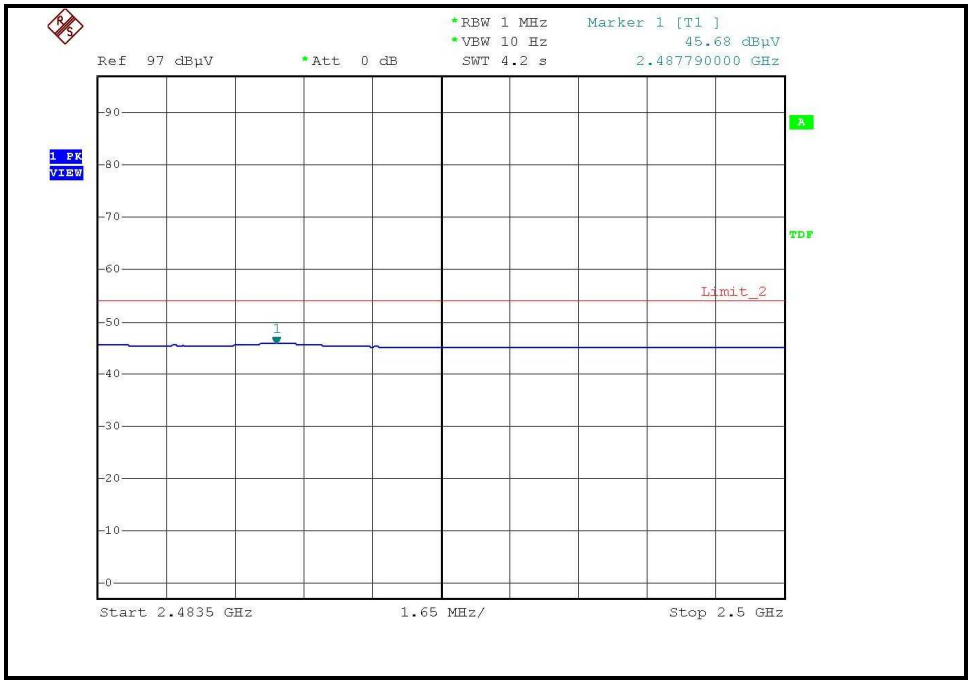
RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL )



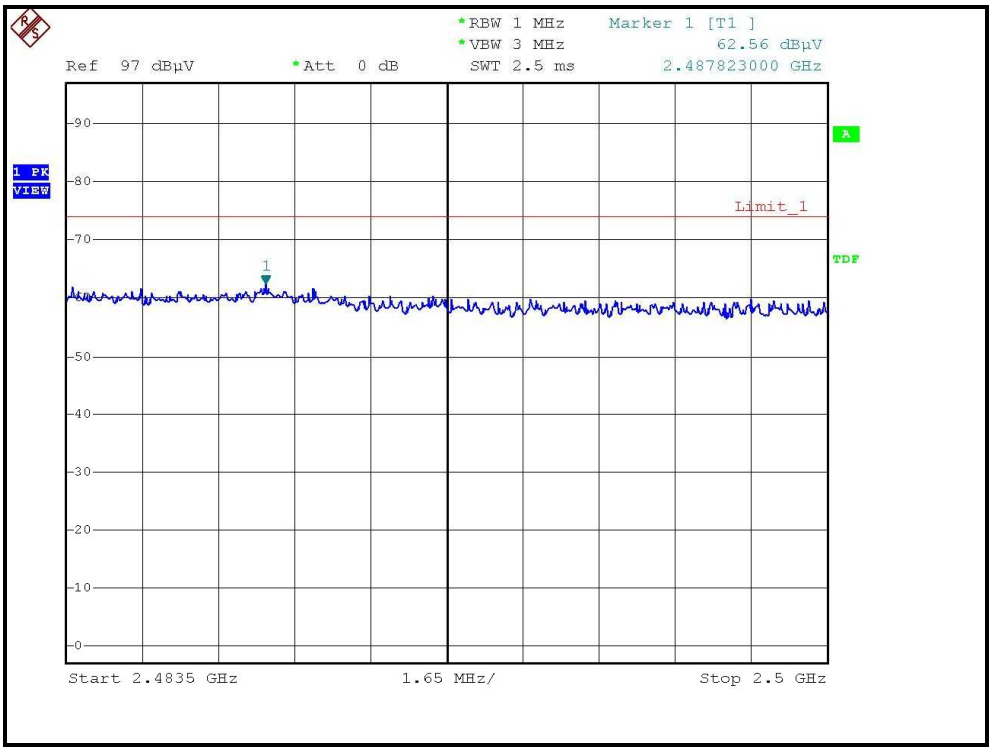



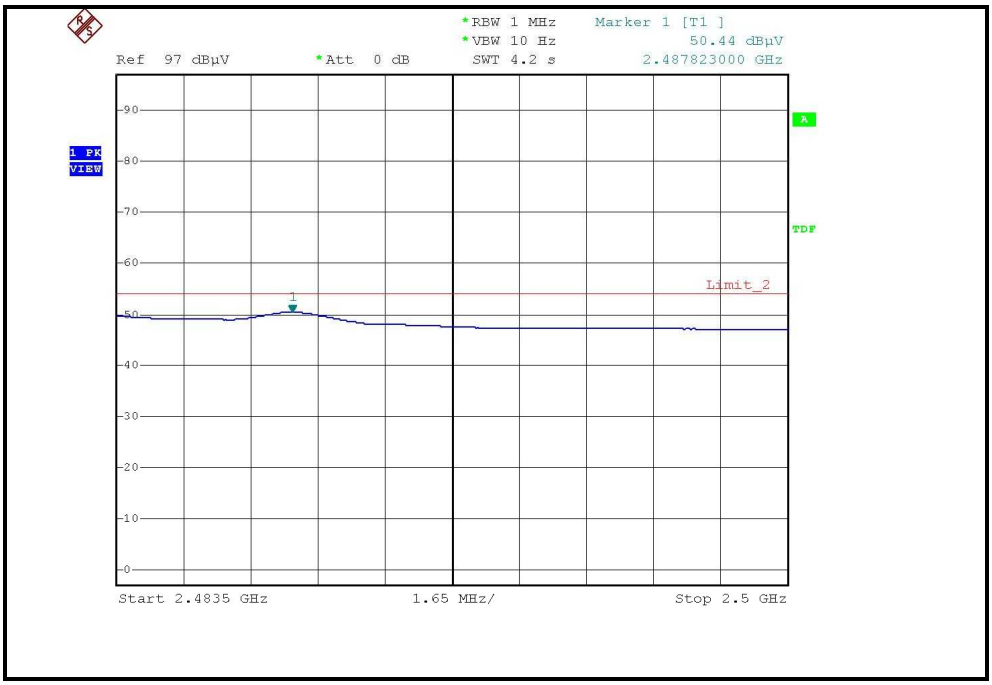
RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL )



RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL )



## 802.11g OFDM MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 1 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 59.67 PK | 74.00 | -14.33 | 1.26 H | 252 | 29.27 | 30.40 |
| 2 | 2390.00 | 45.59 AV | 54.00 | -8.41 | 1.26 H | 252 | 15.20 | 30.40 |
| 3 | *2412.00 | 103.32 PK | | | 1.26 H | 252 | 72.83 | 30.49 |
| 4 | *2412.00 | 93.38 AV | | | 1.26 H | 252 | 62.89 | 30.49 |
| 5 | 4824.00 | 52.47 PK | 74.00 | -21.53 | 1.66 H | 14 | 16.78 | 35.69 |
| 6 | 4824.00 | 38.32 AV | 54.00 | -15.68 | 1.66 H | 14 | 2.63 | 35.69 |
| 7 | 7236.00 | 60.01 PK | 83.32 | -23.31 | 1.39 H | 315 | 17.77 | 42.24 |
| 8 | 7236.00 | 45.56 AV | 73.38 | -27.82 | 1.39 H | 315 | 3.32 | 42.24 |
| 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 | 71.82 PK | 74.00 | -2.18 | 1.00 V | 28 | 41.42 | 30.40 |
| 2 | 2390.00 | 52.80 AV | 54.00 | -1.20 | 1.00 V | 28 | 22.40 | 30.40 |
| 3 | *2412.00 | 113.52 PK | | | 1.08 V | 110 | 83.03 | 30.49 |
| 4 | *2412.00 | 102.93 AV | | | 1.08 V | 110 | 72.44 | 30.49 |
| 5 | 4824.00 | 54.61 PK | 74.00 | -19.39 | 1.32 V | 87 | 18.92 | 35.69 |
| 6 | 4824.00 | 40.46 AV | 54.00 | -13.54 | 1.32 V | 87 | 4.77 | 35.69 |
| 7 | 7236.00 | 62.85 PK | 93.52 | -30.67 | 1.46 V | 115 | 20.61 | 42.24 |
| 8 | 7236.00 | 46.77 AV | 82.93 | -36.16 | 1.46 V | 115 | 4.53 | 42.24 |

**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.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 6 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 104.99 PK | | | 1.25 H | 252 | 74.38 | 30.61 |
| 2 | *2437.00 | 94.61 AV | | | 1.25 H | 252 | 64.00 | 30.61 |
| 3 | 4874.00 | 52.66 PK | 74.00 | -21.34 | 1.68 H | 15 | 16.86 | 35.80 |
| 4 | 4874.00 | 38.41 AV | 54.00 | -15.59 | 1.68 H | 15 | 2.61 | 35.80 |
| 5 | 7311.00 | 60.38 PK | 74.00 | -13.62 | 1.37 H | 312 | 17.86 | 42.52 |
| 6 | 7311.00 | 45.73 AV | 54.00 | -8.27 | 1.37 H | 312 | 3.21 | 42.52 |
| 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 | 112.96 PK | | | 1.08 V | 110 | 82.35 | 30.61 |
| 2 | *2437.00 | 102.54 AV | | | 1.08 V | 110 | 71.93 | 30.61 |
| 3 | 4874.00 | 55.88 PK | 74.00 | -18.12 | 1.40 V | 207 | 20.08 | 35.80 |
| 4 | 4874.00 | 41.83 AV | 54.00 | -12.17 | 1.40 V | 207 | 6.03 | 35.80 |
| 5 | 7311.00 | 65.43 PK | 74.00 | -8.57 | 1.70 V | 239 | 22.91 | 42.52 |
| 6 | 7311.00 | 49.14 AV | 54.00 | -4.86 | 1.70 V | 239 | 6.62 | 42.52 |

**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.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 11 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 103.91 PK | | | 1.25 H | 173 | 73.19 | 30.72 |
| 2 | *2462.00 | 93.43 AV | | | 1.25 H | 173 | 62.71 | 30.72 |
| 3 | 2483.50 | 65.73 PK | 74.00 | -8.27 | 1.25 H | 181 | 34.91 | 30.82 |
| 4 | 2483.50 | 47.67 AV | 54.00 | -6.33 | 1.25 H | 181 | 16.85 | 30.82 |
| 5 | 4924.00 | 52.37 PK | 74.00 | -21.63 | 1.67 H | 13 | 16.47 | 35.90 |
| 6 | 4924.00 | 38.23 AV | 54.00 | -15.77 | 1.67 H | 13 | 2.33 | 35.90 |
| 7 | 7386.00 | 60.15 PK | 74.00 | -13.85 | 1.38 H | 316 | 17.35 | 42.80 |
| 8 | 7386.00 | 45.43 AV | 54.00 | -8.57 | 1.38 H | 316 | 2.63 | 42.80 |
| 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 | 112.26 PK | | | 1.00 V | 269 | 81.54 | 30.72 |
| 2 | *2462.00 | 101.78 AV | | | 1.00 V | 269 | 71.06 | 30.72 |
| 3 | 2483.50 | 71.77 PK | 74.00 | -2.23 | 1.00 V | 154 | 40.95 | 30.82 |
| 4 | 2483.50 | 52.16 AV | 54.00 | -1.84 | 1.00 V | 154 | 21.34 | 30.82 |
| 5 | 4924.00 | 54.84 PK | 74.00 | -19.16 | 1.39 V | 88 | 18.94 | 35.90 |
| 6 | 4924.00 | 40.83 AV | 54.00 | -13.17 | 1.39 V | 88 | 4.93 | 35.90 |
| 7 | 7386.00 | 64.57 PK | 74.00 | -9.43 | 1.53 V | 119 | 21.77 | 42.80 |
| 8 | 7386.00 | 47.40 AV | 54.00 | -6.60 | 1.53 V | 119 | 4.60 | 42.80 |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

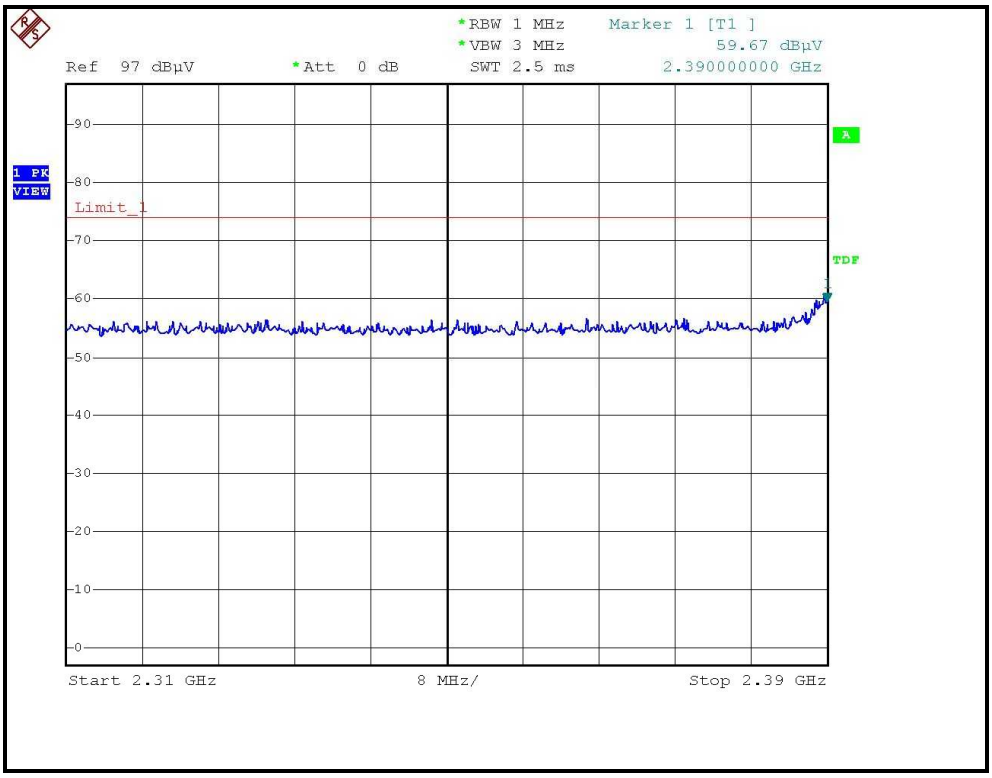
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

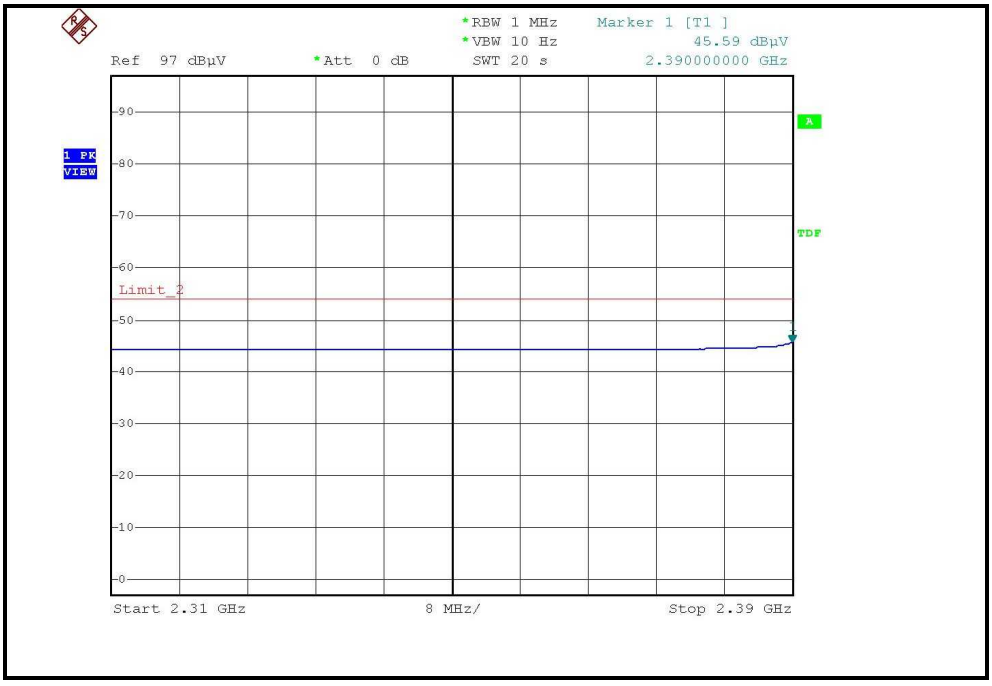
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

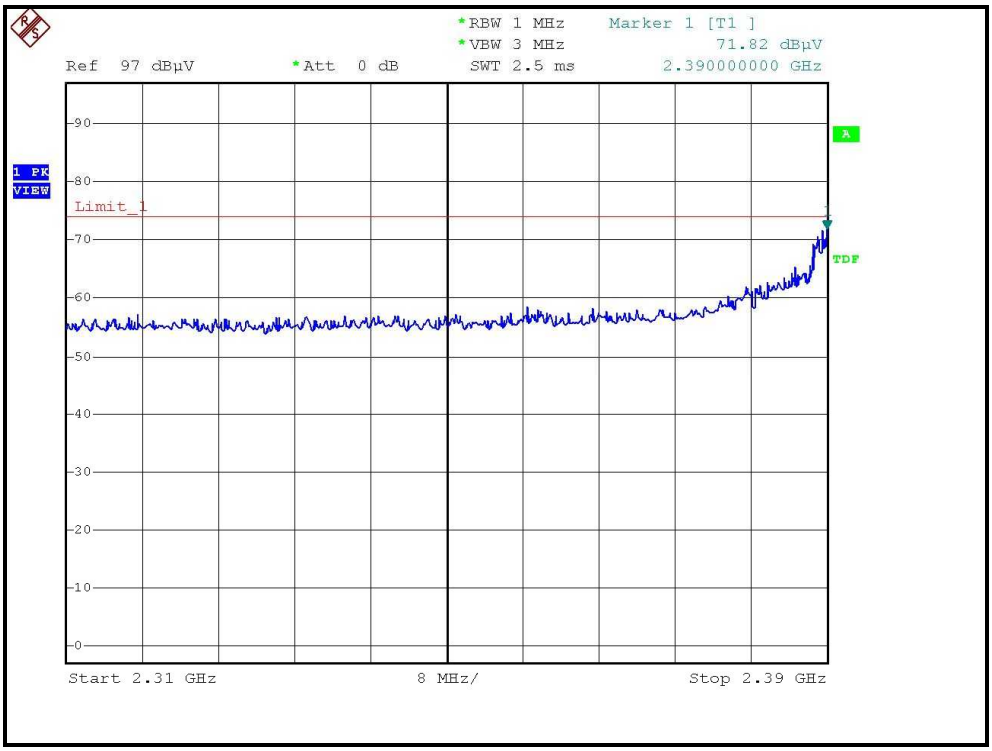
5. " * ": Fundamental frequency.

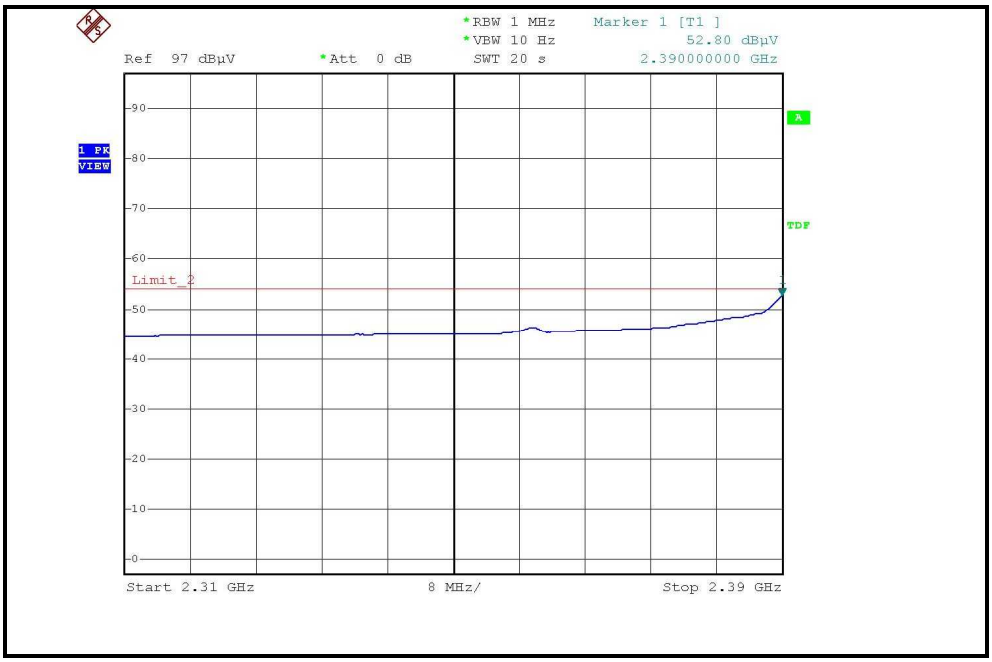
RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL )



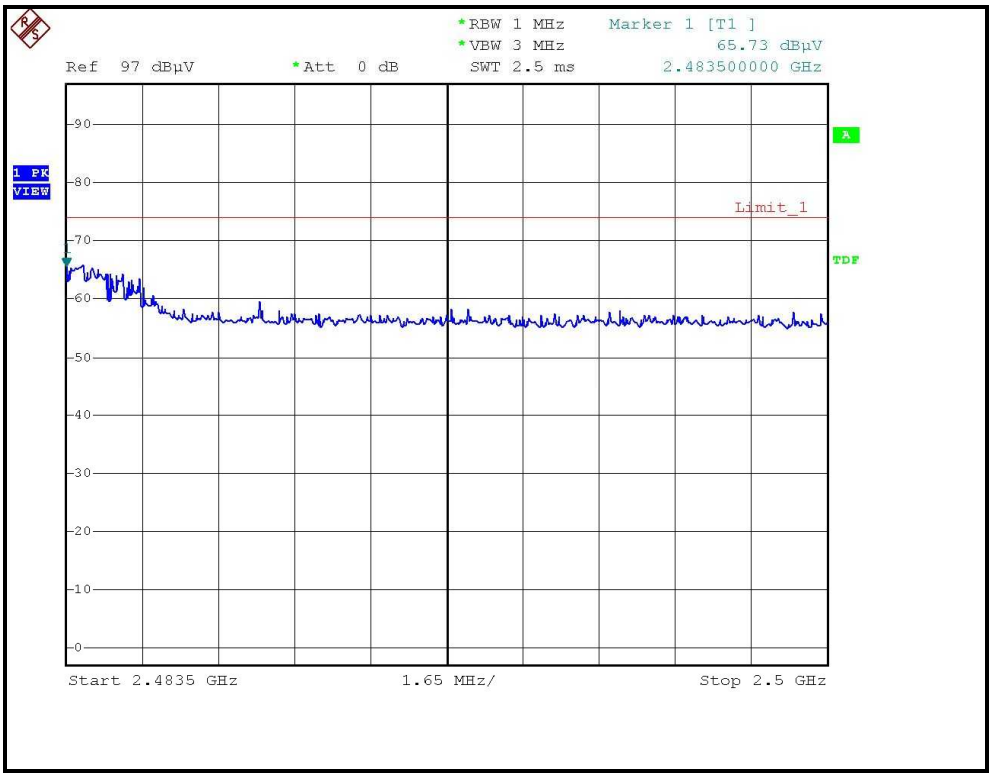



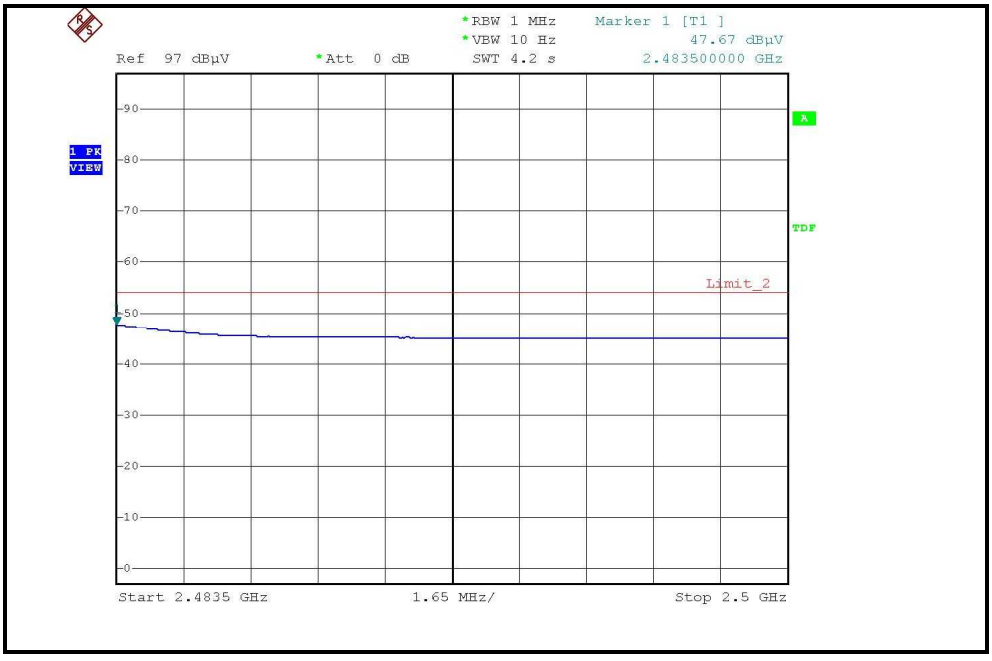
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL )



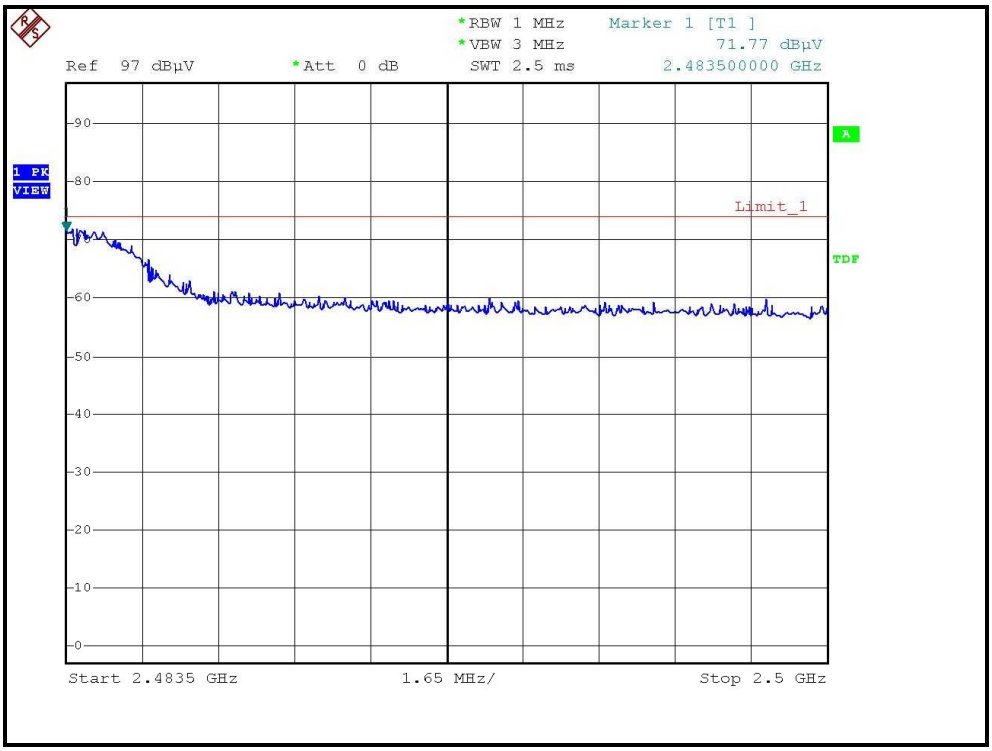



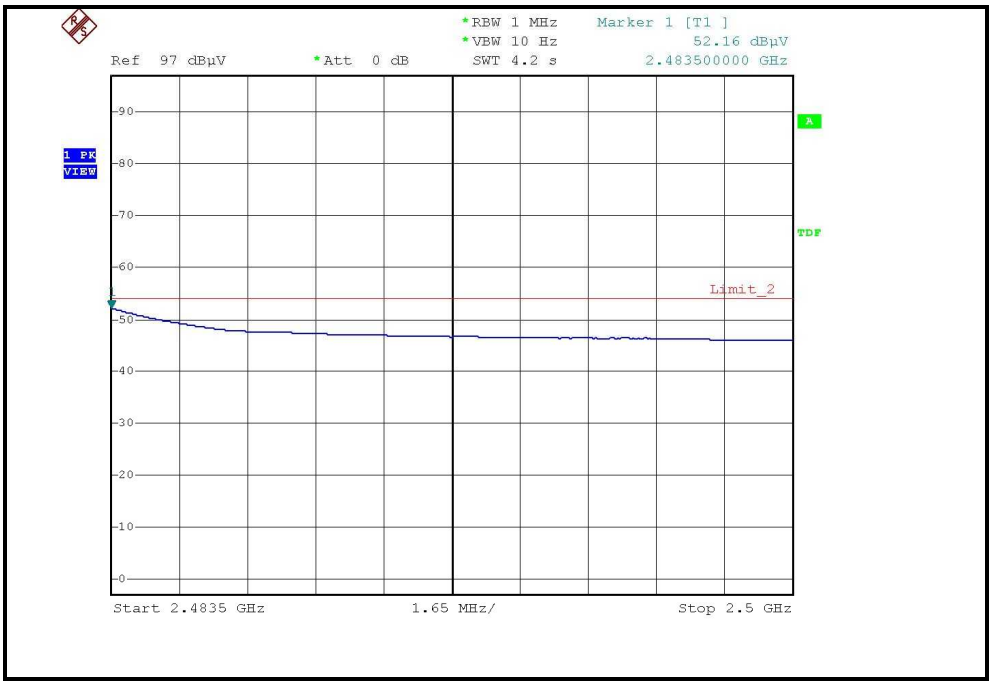
RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL )



RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL )



## DRAFT 802.11n (20MHz) OFDM MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 1 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 58.23 PK | 74.00 | -15.77 | 1.34 H | 174 | 27.83 | 30.40 |
| 2 | 2390.00 | 45.77 AV | 54.00 | -8.23 | 1.34 H | 174 | 15.37 | 30.40 |
| 3 | *2412.00 | 103.78 PK | | | 1.36 H | 266 | 73.29 | 30.49 |
| 4 | *2412.00 | 92.62 AV | | | 1.36 H | 266 | 62.13 | 30.49 |
| 5 | 4824.00 | 50.97 PK | 74.00 | -23.03 | 1.67 H | 17 | 15.28 | 35.69 |
| 6 | 4824.00 | 35.89 AV | 54.00 | -18.11 | 1.67 H | 17 | 0.20 | 35.69 |
| 7 | 7236.00 | 58.73 PK | 83.78 | -25.05 | 1.38 H | 310 | 16.49 | 42.24 |
| 8 | 7236.00 | 44.12 AV | 72.62 | -28.50 | 1.38 H | 310 | 1.88 | 42.24 |
| 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 | 67.70 PK | 74.00 | -6.30 | 1.00 V | 188 | 37.30 | 30.40 |
| 2 | 2390.00 | 52.57 AV | 54.00 | -1.43 | 1.00 V | 188 | 22.17 | 30.40 |
| 3 | *2412.00 | 113.04 PK | | | 1.00 V | 354 | 82.55 | 30.49 |
| 4 | *2412.00 | 101.64 AV | | | 1.00 V | 354 | 71.15 | 30.49 |
| 5 | 4824.00 | 55.19 PK | 74.00 | -18.81 | 1.44 V | 200 | 19.50 | 35.69 |
| 6 | 4824.00 | 40.47 AV | 54.00 | -13.53 | 1.44 V | 200 | 4.78 | 35.69 |
| 7 | 7236.00 | 62.73 PK | 93.04 | -30.31 | 1.70 V | 99 | 20.49 | 42.24 |
| 8 | 7236.00 | 47.75 AV | 81.64 | -33.89 | 1.70 V | 99 | 5.51 | 42.24 |

**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.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 6 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 104.91 PK | | | 1.35 H | 180 | 74.30 | 30.61 |
| 2 | *2437.00 | 93.53 AV | | | 1.35 H | 180 | 62.92 | 30.61 |
| 3 | 4874.00 | 50.82 PK | 74.00 | -23.18 | 1.68 H | 15 | 15.02 | 35.80 |
| 4 | 4874.00 | 35.71 AV | 54.00 | -18.29 | 1.68 H | 15 | -0.09 | 35.80 |
| 5 | 7311.00 | 58.82 PK | 74.00 | -15.18 | 1.40 H | 312 | 16.30 | 42.52 |
| 6 | 7311.00 | 44.06 AV | 54.00 | -9.94 | 1.40 H | 312 | 1.54 | 42.52 |
| 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 | 113.71 PK | | | 1.00 V | 358 | 83.10 | 30.61 |
| 2 | *2437.00 | 102.14 AV | | | 1.00 V | 358 | 71.53 | 30.61 |
| 3 | 4874.00 | 55.07 PK | 74.00 | -18.93 | 1.43 V | 200 | 19.27 | 35.80 |
| 4 | 4874.00 | 40.35 AV | 54.00 | -13.65 | 1.43 V | 200 | 4.55 | 35.80 |
| 5 | 7311.00 | 62.65 PK | 74.00 | -11.35 | 1.69 V | 100 | 20.13 | 42.52 |
| 6 | 7311.00 | 47.65 AV | 54.00 | -6.35 | 1.69 V | 100 | 5.13 | 42.52 |

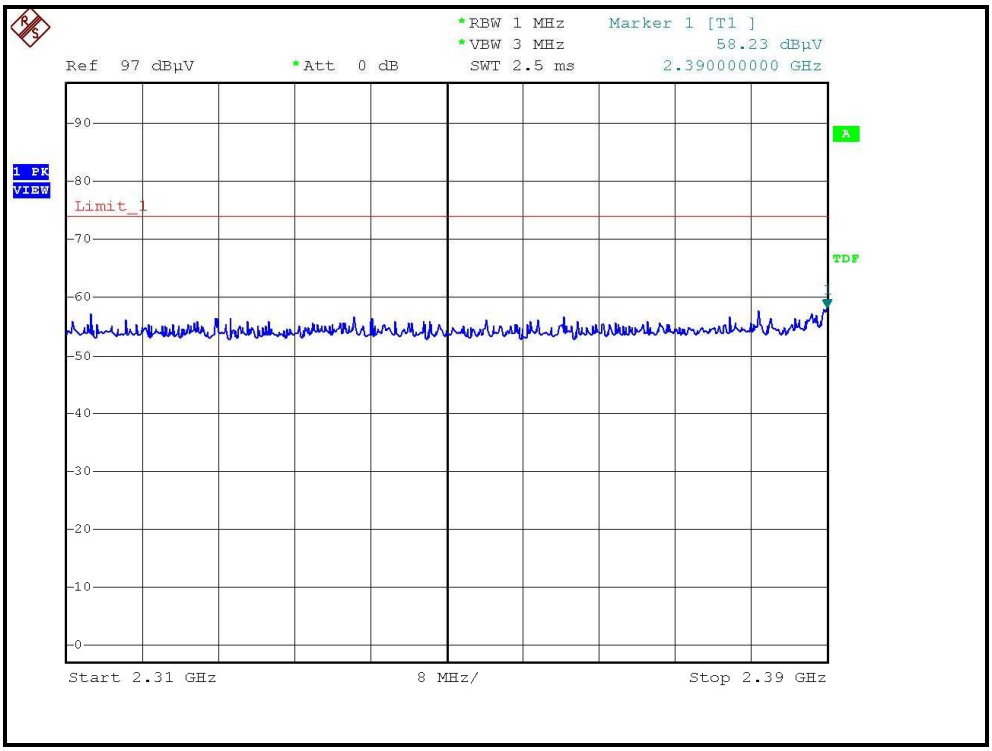
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

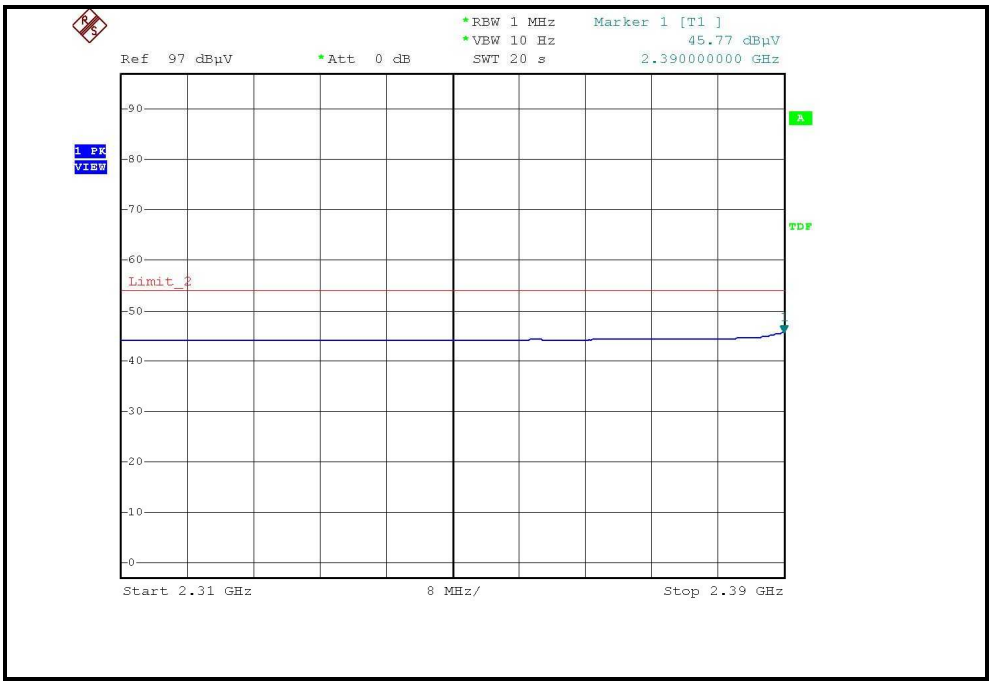
| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 11 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 103.91 PK | | | 1.24 H | 175 | 73.19 | 30.72 |
| 2 | *2462.00 | 92.69 AV | | | 1.24 H | 175 | 61.97 | 30.72 |
| 3 | 2483.50 | 59.43 PK | 74.00 | -14.57 | 1.27 H | 180 | 28.61 | 30.82 |
| 4 | 2483.50 | 46.69 AV | 54.00 | -7.31 | 1.27 H | 180 | 15.87 | 30.82 |
| 5 | 4924.00 | 50.96 PK | 74.00 | -23.04 | 1.68 H | 16 | 15.06 | 35.90 |
| 6 | 4924.00 | 35.86 AV | 54.00 | -18.14 | 1.68 H | 16 | -0.04 | 35.90 |
| 7 | 7386.00 | 58.47 PK | 74.00 | -15.53 | 1.41 H | 311 | 15.67 | 42.80 |
| 8 | 7386.00 | 43.82 AV | 54.00 | -10.18 | 1.41 H | 311 | 1.02 | 42.80 |
| 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 | 113.19 PK | | | 1.00 V | 347 | 82.47 | 30.72 |
| 2 | *2462.00 | 101.64 AV | | | 1.00 V | 347 | 70.92 | 30.72 |
| 3 | 2483.50 | 67.77 PK | 74.00 | -6.23 | 1.00 V | 349 | 36.95 | 30.82 |
| 4 | 2483.50 | 52.09 AV | 54.00 | -1.91 | 1.00 V | 349 | 21.27 | 30.82 |
| 5 | 4924.00 | 55.21 PK | 74.00 | -18.79 | 1.44 V | 199 | 19.31 | 35.90 |
| 6 | 4924.00 | 40.66 AV | 54.00 | -13.34 | 1.44 V | 199 | 4.76 | 35.90 |
| 7 | 7386.00 | 62.58 PK | 74.00 | -11.42 | 1.70 V | 99 | 19.78 | 42.80 |
| 8 | 7386.00 | 47.52 AV | 54.00 | -6.48 | 1.70 V | 99 | 4.72 | 42.80 |

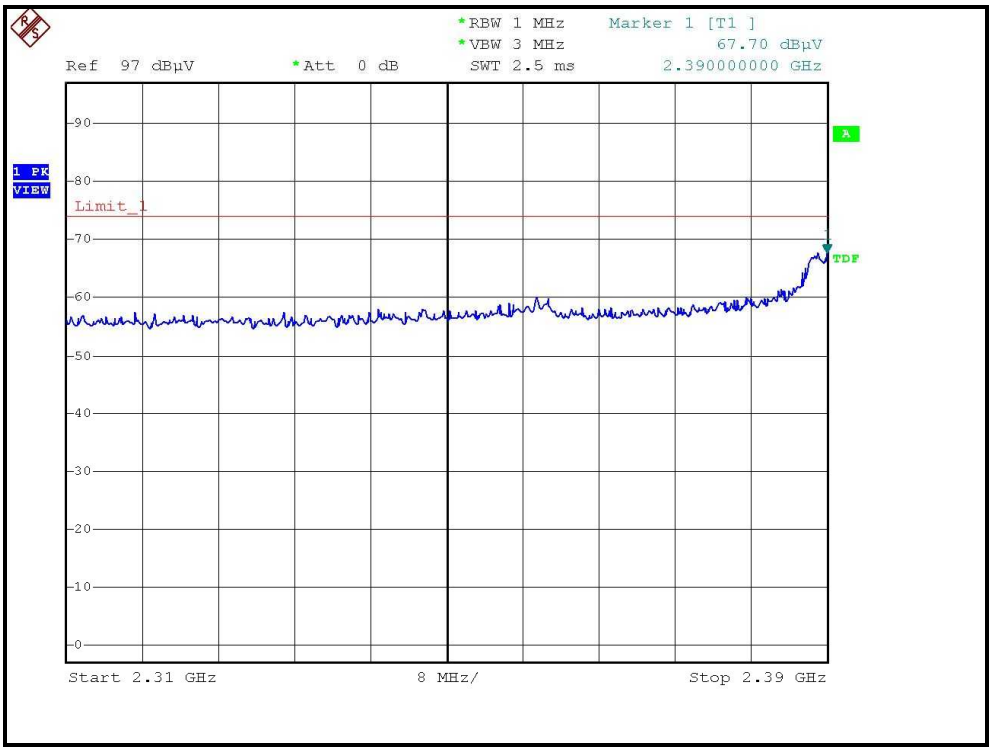
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

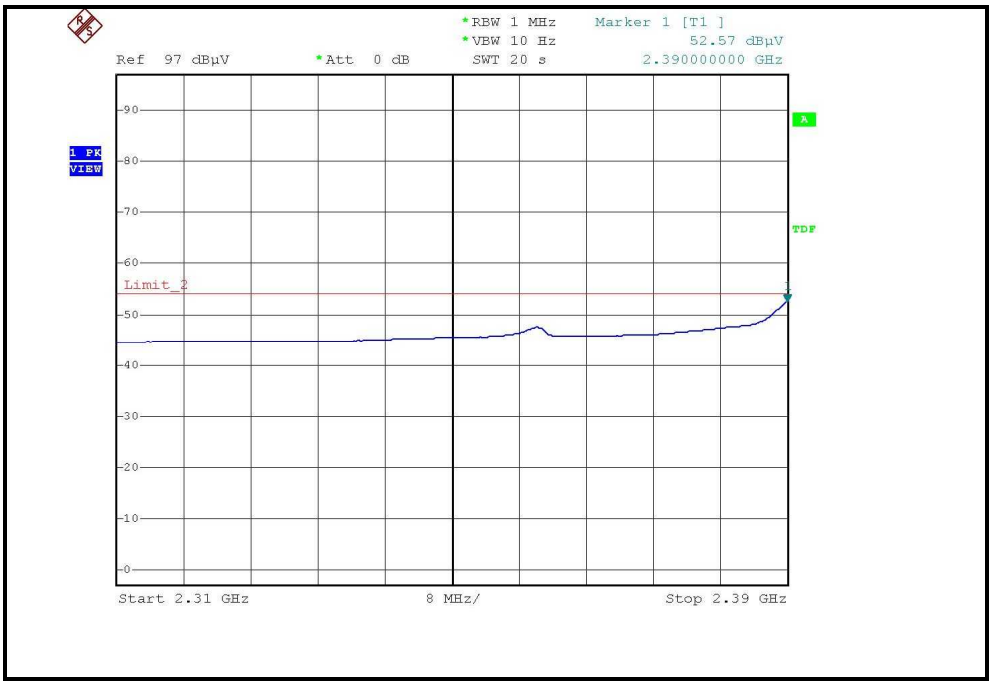
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, HORIZONTAL )



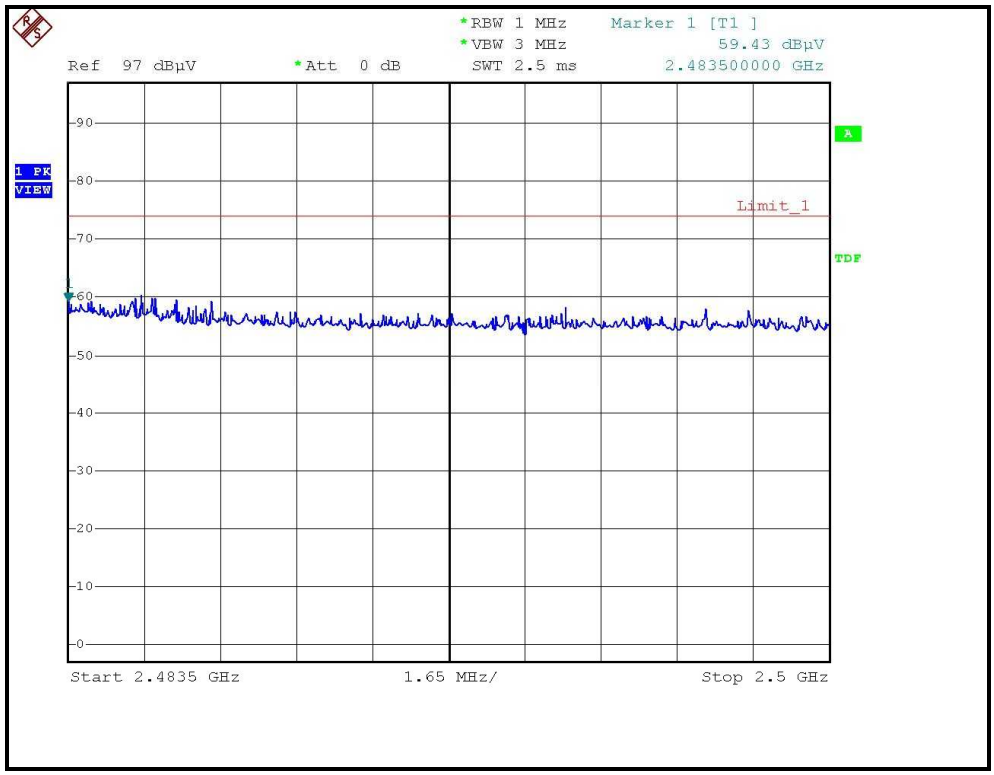



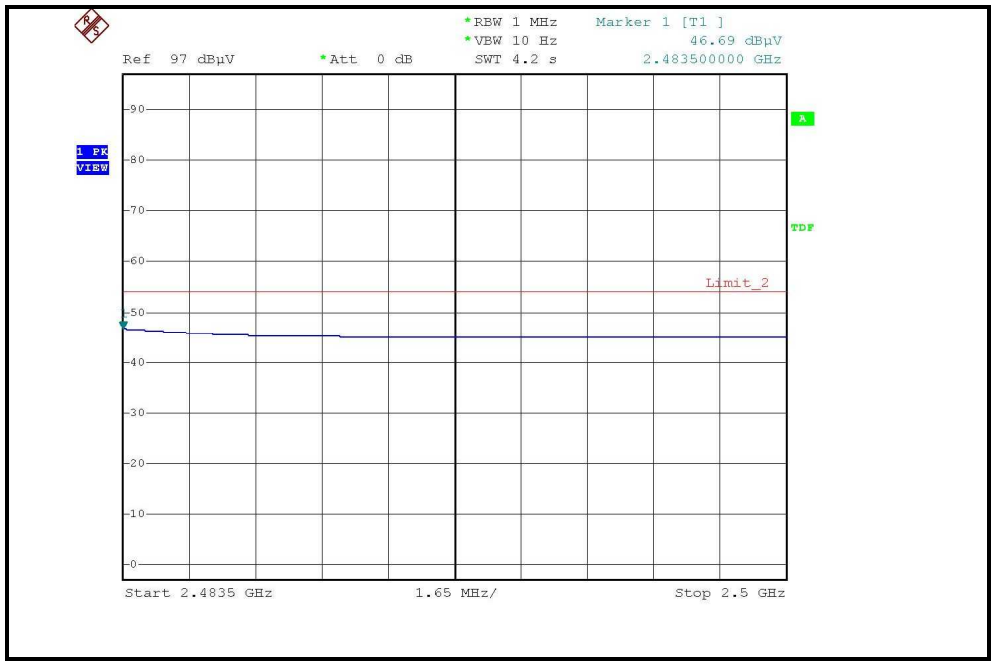
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, VERTICAL )



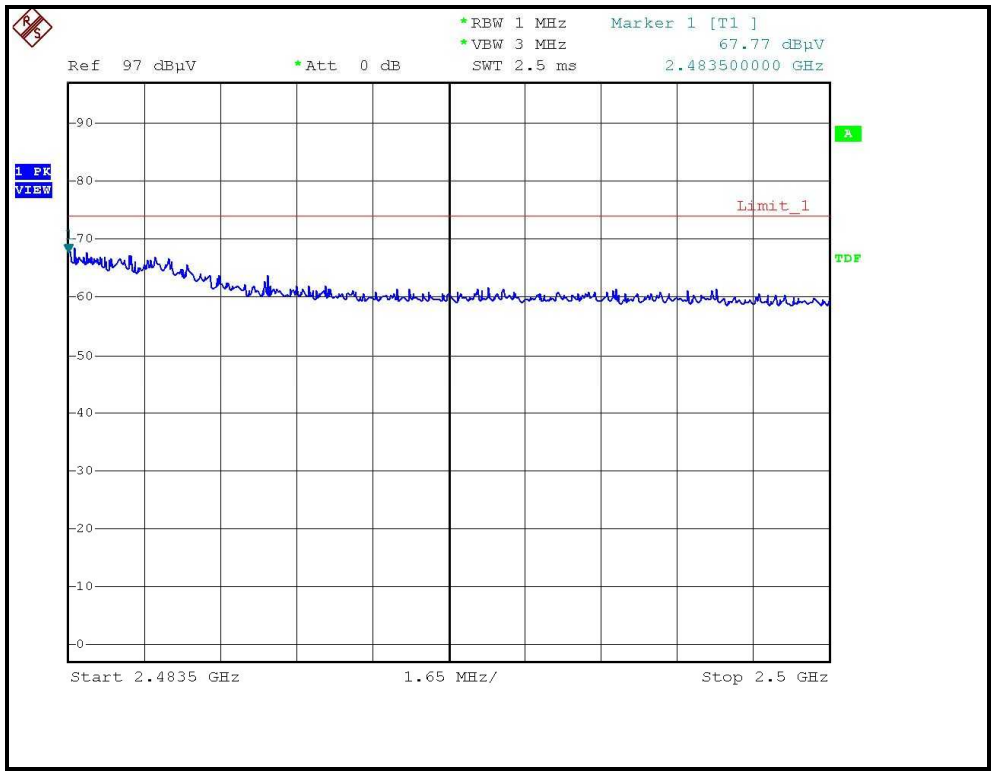



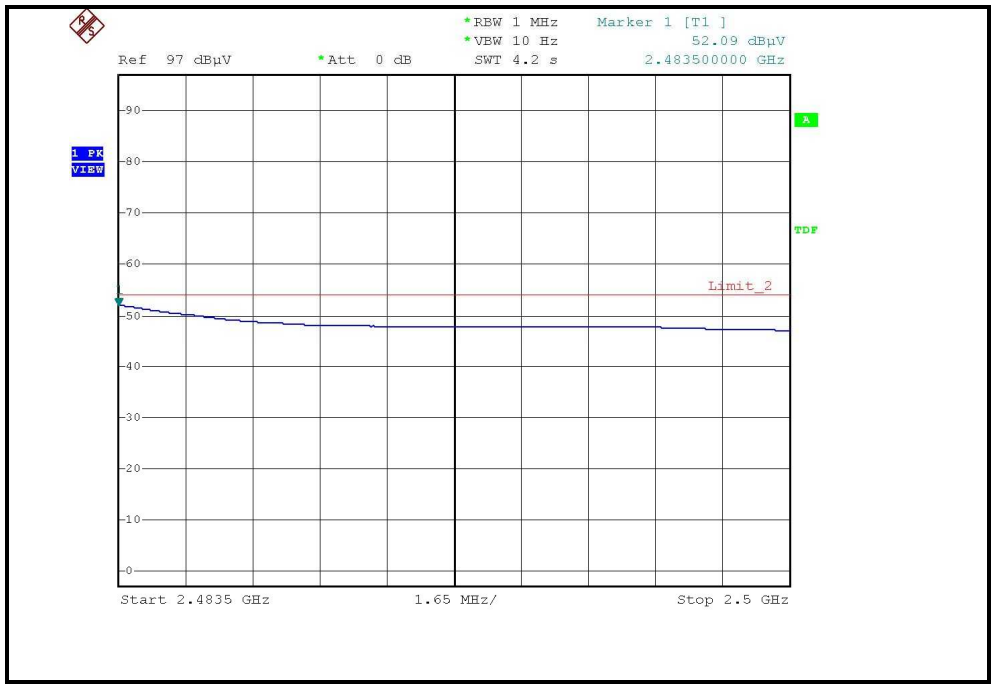
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH11, HORIZONTAL )



RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH11, VERTICAL )



## DRAFT 802.11n (40MHz) OFDM MODULATION

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 1 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 57.39 PK | 74.00 | -16.61 | 1.35 H | 187 | 26.99 | 30.40 |
| 2 | 2390.00 | 46.15 AV | 54.00 | -7.85 | 1.35 H | 187 | 15.75 | 30.40 |
| 3 | *2422.00 | 100.42 PK | | | 1.35 H | 181 | 69.88 | 30.54 |
| 4 | *2422.00 | 88.99 AV | | | 1.35 H | 181 | 58.45 | 30.54 |
| 5 | 4844.00 | 47.83 PK | 74.00 | -26.17 | 1.69 H | 15 | 12.09 | 35.74 |
| 6 | 4844.00 | 34.05 AV | 54.00 | -19.95 | 1.69 H | 15 | -1.69 | 35.74 |
| 7 | 7266.00 | 55.73 PK | 74.00 | -18.27 | 1.41 H | 309 | 13.38 | 42.35 |
| 8 | 7266.00 | 42.05 AV | 54.00 | -11.95 | 1.41 H | 309 | -0.30 | 42.35 |
| 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 | 65.34 PK | 74.00 | -8.66 | 1.00 V | 188 | 34.95 | 30.40 |
| 2 | 2390.00 | 52.82 AV | 54.00 | -1.18 | 1.00 V | 188 | 22.42 | 30.40 |
| 3 | *2422.00 | 108.85 PK | | | 1.00 V | 90 | 78.31 | 30.54 |
| 4 | *2422.00 | 97.48 AV | | | 1.00 V | 90 | 66.94 | 30.54 |
| 5 | 4844.00 | 52.58 PK | 74.00 | -21.42 | 1.44 V | 198 | 16.84 | 35.74 |
| 6 | 4844.00 | 37.96 AV | 54.00 | -16.04 | 1.44 V | 198 | 2.22 | 35.74 |
| 7 | 7266.00 | 59.77 PK | 74.00 | -14.23 | 1.71 V | 100 | 17.42 | 42.35 |
| 8 | 7266.00 | 45.43 AV | 54.00 | -8.57 | 1.71 V | 100 | 3.08 | 42.35 |

**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.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 4 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 103.79 PK | | | 1.25 H | 252 | 73.18 | 30.61 |
| 2 | *2437.00 | 91.82 AV | | | 1.25 H | 252 | 61.21 | 30.61 |
| 3 | 4874.00 | 48.08 PK | 74.00 | -25.92 | 1.68 H | 16 | 12.28 | 35.80 |
| 4 | 4874.00 | 34.30 AV | 54.00 | -19.70 | 1.68 H | 16 | -1.50 | 35.80 |
| 5 | 7311.00 | 56.00 PK | 74.00 | -18.00 | 1.40 H | 305 | 13.48 | 42.52 |
| 6 | 7311.00 | 42.21 AV | 54.00 | -11.79 | 1.40 H | 305 | -0.31 | 42.52 |
| 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 | 110.24 PK | | | 1.00 V | 358 | 79.63 | 30.61 |
| 2 | *2437.00 | 99.01 AV | | | 1.00 V | 358 | 68.40 | 30.61 |
| 3 | 4874.00 | 52.42 PK | 74.00 | -21.58 | 1.43 V | 199 | 16.62 | 35.80 |
| 4 | 4874.00 | 37.89 AV | 54.00 | -16.11 | 1.43 V | 199 | 2.09 | 35.80 |
| 5 | 7311.00 | 59.81 PK | 74.00 | -14.19 | 1.70 V | 99 | 17.29 | 42.52 |
| 6 | 7311.00 | 45.19 AV | 54.00 | -8.81 | 1.70 V | 99 | 2.67 | 42.52 |

**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.

| EUT TEST CONDITION | | MEASUREMENT DETAIL | |
|---|---|---|---|
| CHANNEL | Channel 7 | FREQUENCY RANGE | 1 ~ 25GHz |
| INPUT POWER | 120Vac, 60 Hz | DETECTOR FUNCTION | Peak (PK)<br>Average (AV) |
| ENVIRONMENTAL CONDITIONS | 21deg. C, 62%RH<br>971hPa | TESTED BY | Wen Yu |

| 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 | 99.53 PK | | | 1.26 H | 175 | 68.86 | 30.67 |
| 2 | *2452.00 | 88.14 AV | | | 1.26 H | 175 | 57.47 | 30.67 |
| 3 | 2484.00 | 58.84 PK | 74.00 | -15.16 | 1.25 H | 178 | 28.02 | 30.82 |
| 4 | 2484.00 | 46.69 AV | 54.00 | -7.31 | 1.25 H | 178 | 15.87 | 30.82 |
| 5 | 4904.00 | 48.02 PK | 74.00 | -25.98 | 1.69 H | 15 | 12.16 | 35.86 |
| 6 | 4904.00 | 34.13 AV | 54.00 | -19.87 | 1.69 H | 15 | -1.73 | 35.86 |
| 7 | 7356.00 | 55.58 PK | 74.00 | -18.42 | 1.40 H | 311 | 12.90 | 42.68 |
| 8 | 7356.00 | 41.73 AV | 54.00 | -12.27 | 1.40 H | 311 | -0.95 | 42.68 |
| 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 | 108.99 PK | | | 1.00 V | 347 | 78.32 | 30.67 |
| 2 | *2452.00 | 97.53 AV | | | 1.00 V | 347 | 66.86 | 30.67 |
| 3 | 2484.00 | 64.80 PK | 74.00 | -9.20 | 1.00 V | 349 | 33.98 | 30.82 |
| 4 | 2484.00 | 52.25 AV | 54.00 | -1.75 | 1.00 V | 349 | 21.43 | 30.82 |
| 5 | 4904.00 | 52.11 PK | 74.00 | -21.89 | 1.44 V | 200 | 16.25 | 35.86 |
| 6 | 4904.00 | 37.62 AV | 54.00 | -16.38 | 1.44 V | 200 | 1.76 | 35.86 |
| 7 | 7356.00 | 58.16 PK | 74.00 | -15.84 | 1.69 V | 100 | 15.48 | 42.68 |
| 8 | 7356.00 | 44.12 AV | 54.00 | -9.88 | 1.69 V | 100 | 1.44 | 42.68 |

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

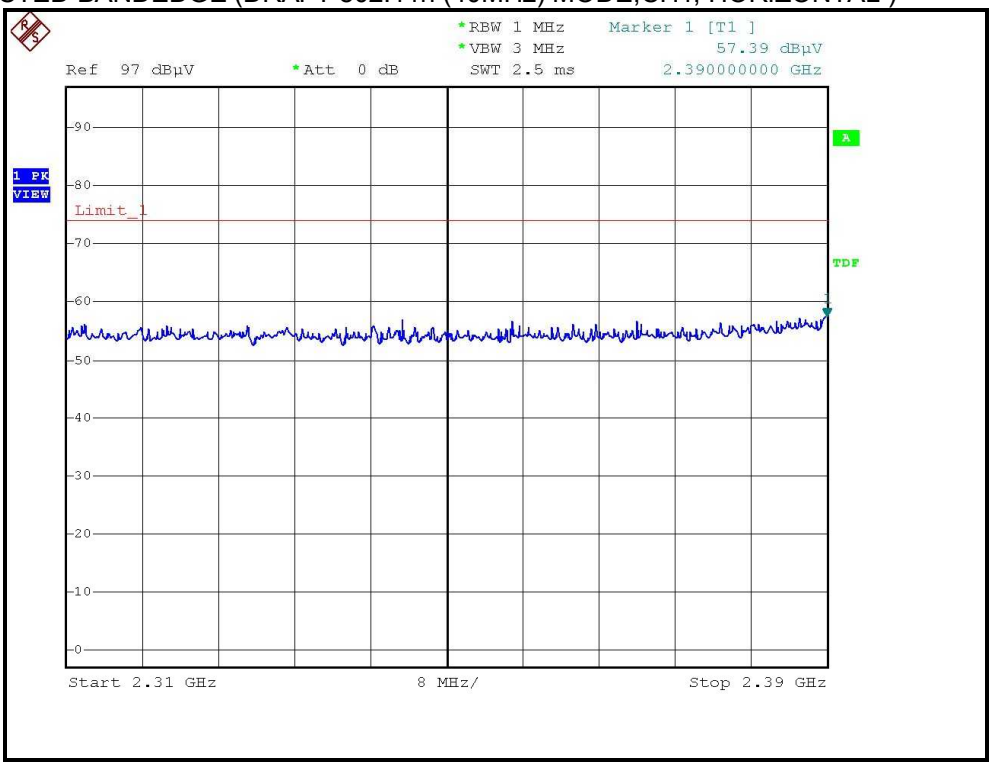
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

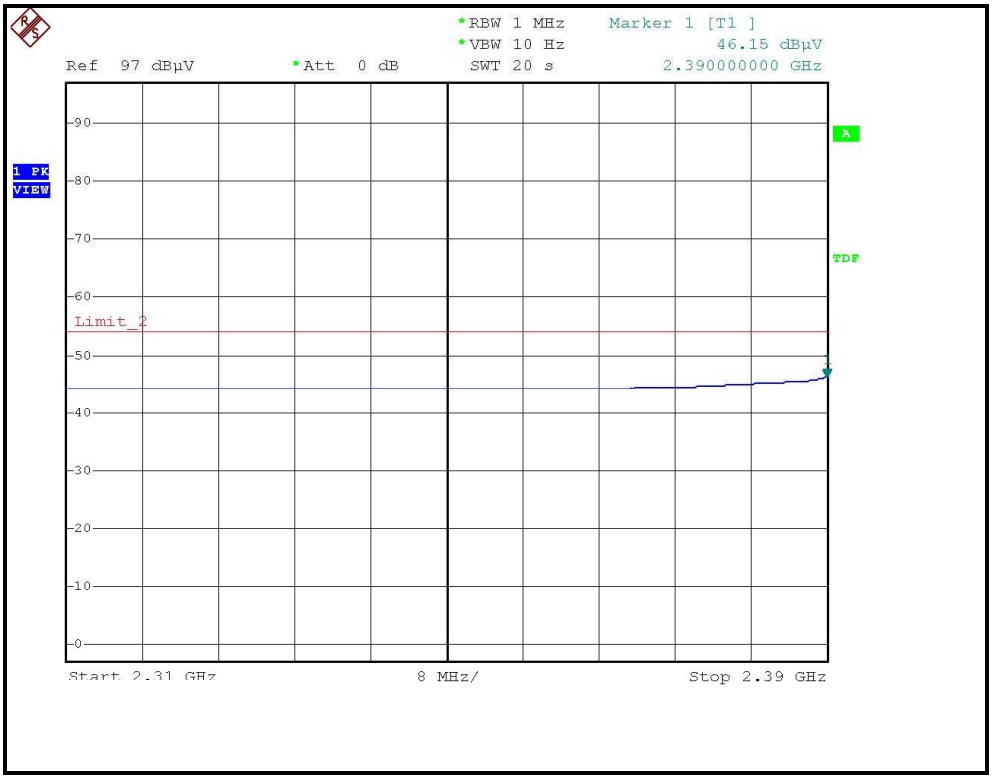
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

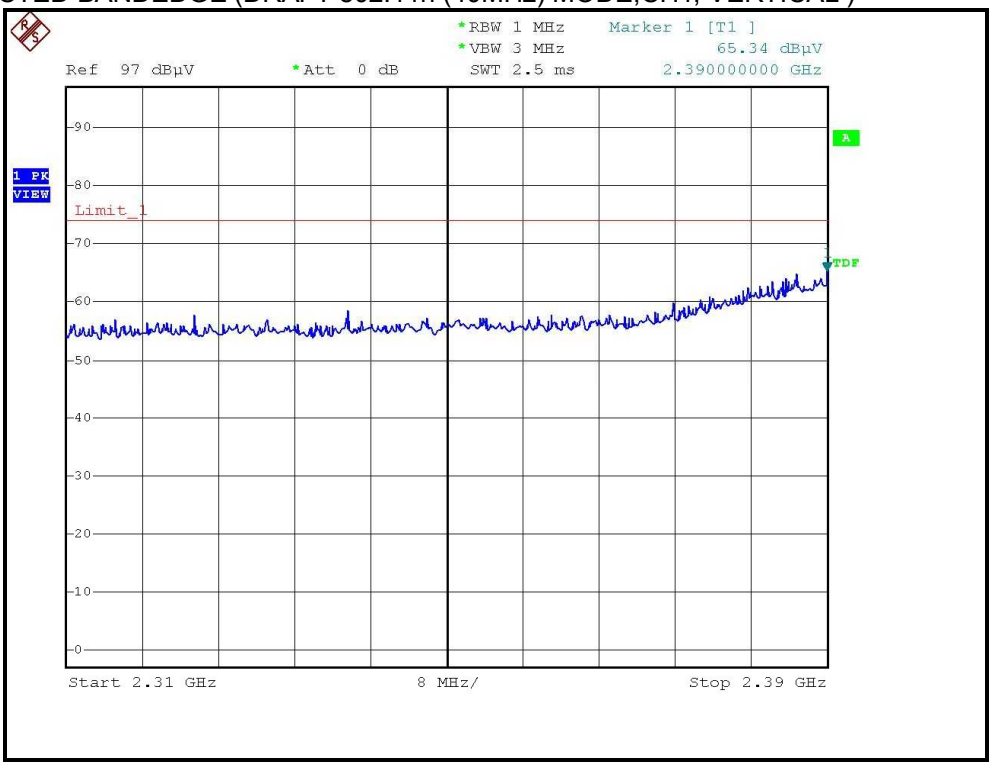
5. " * ": Fundamental frequency.

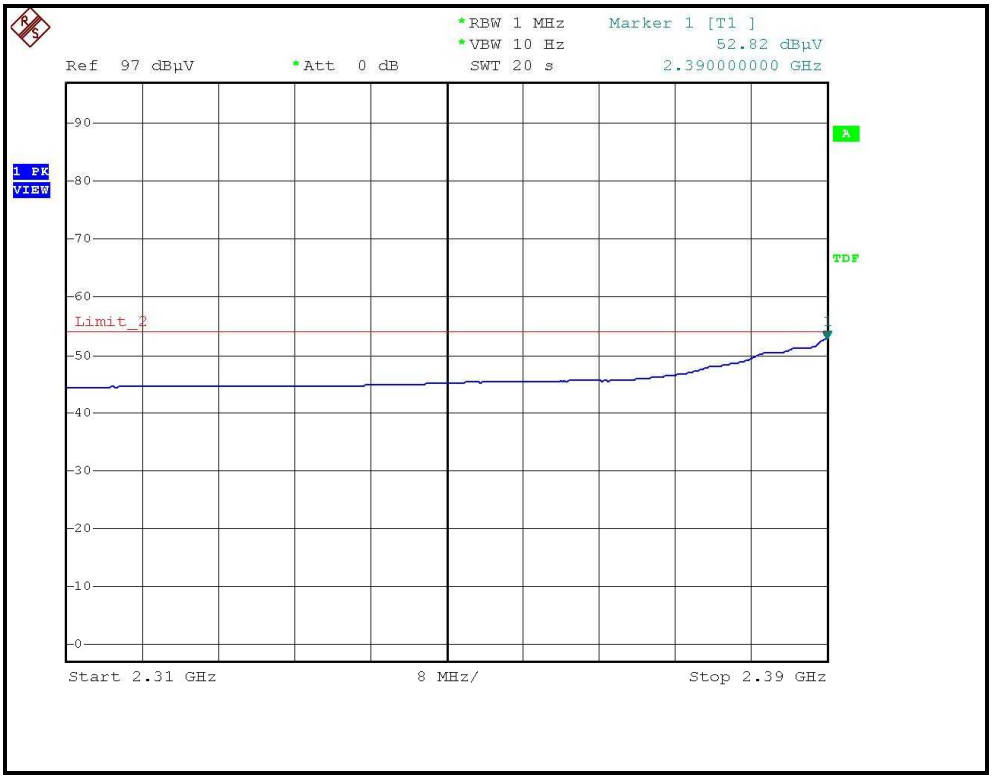
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, HORIZONTAL )



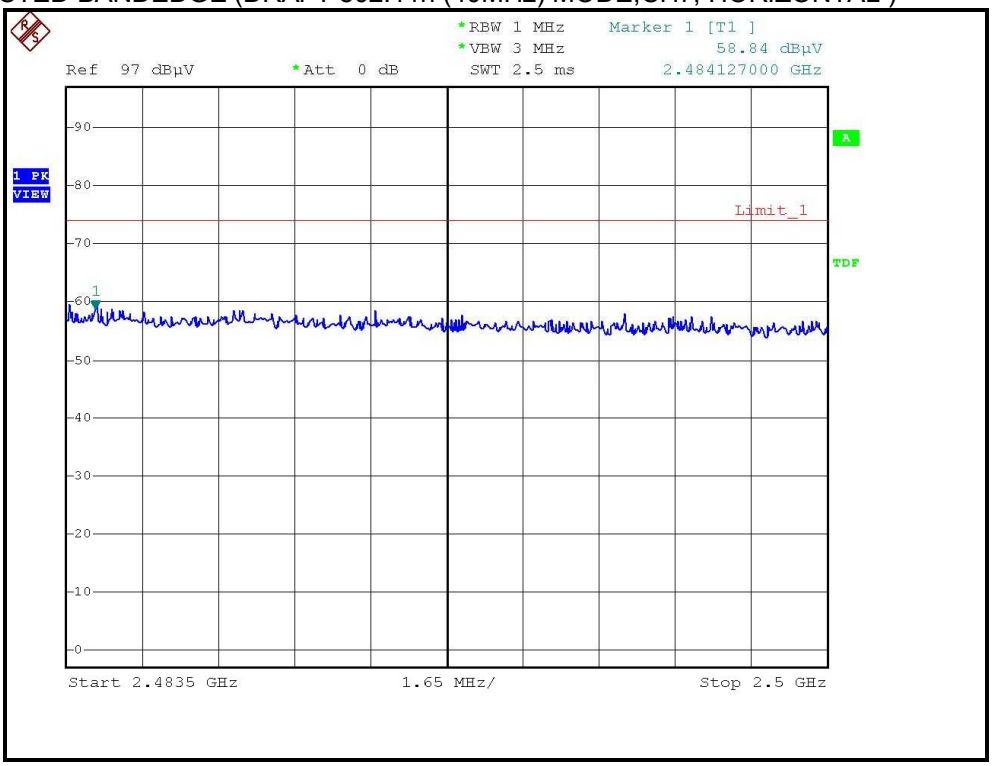



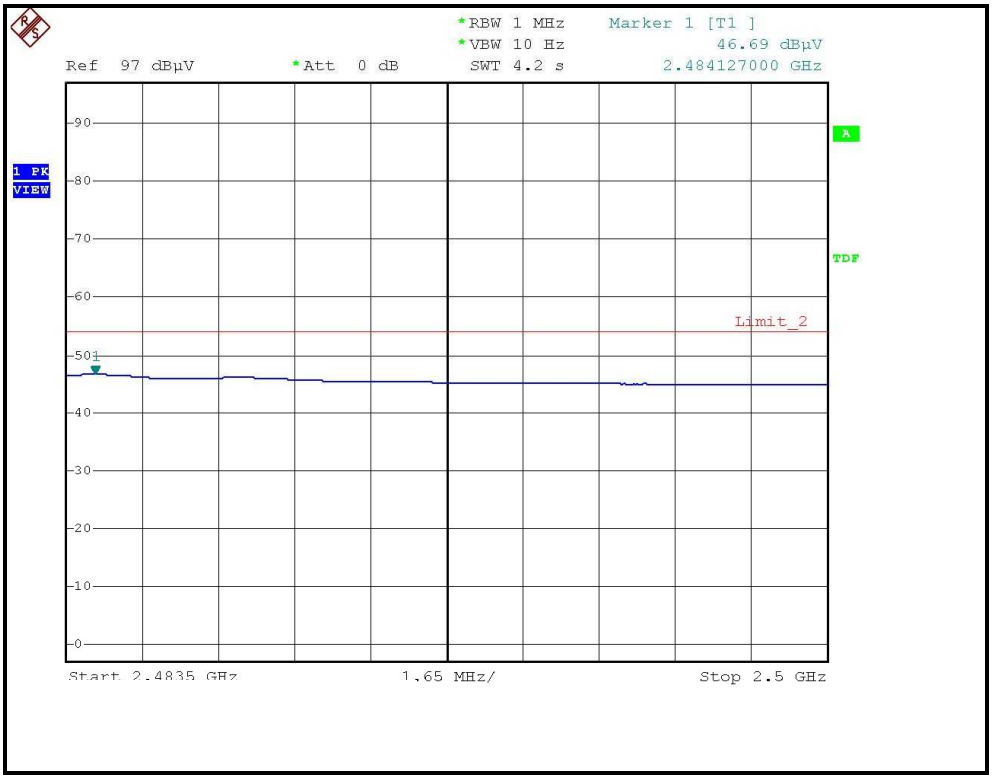
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, VERTICAL )



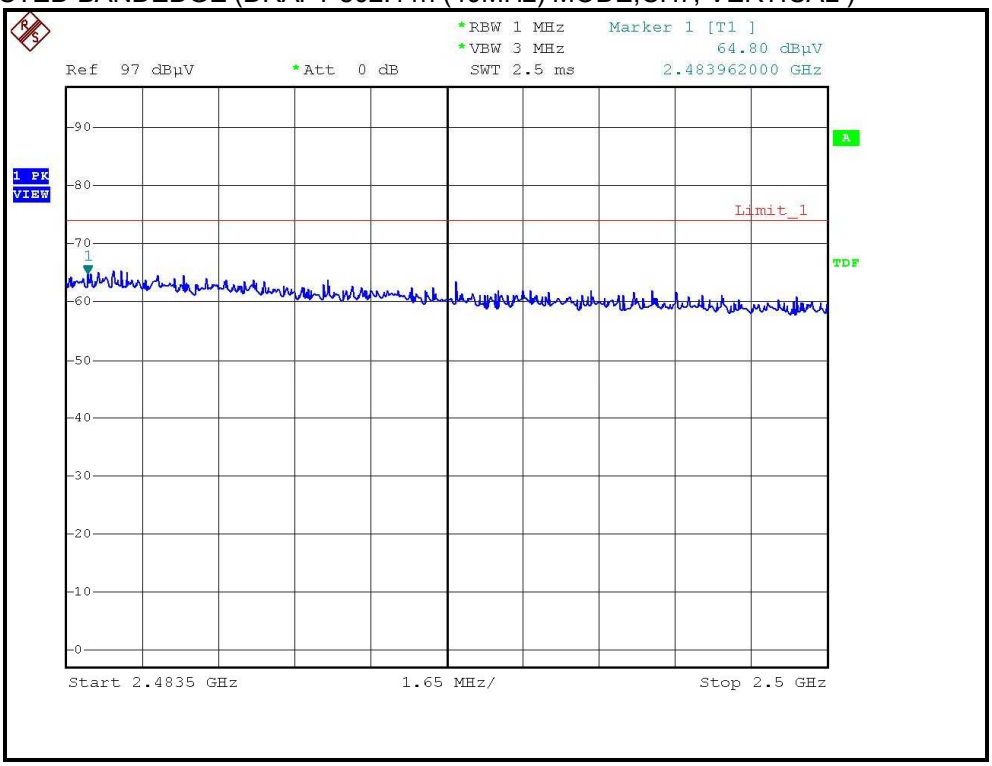



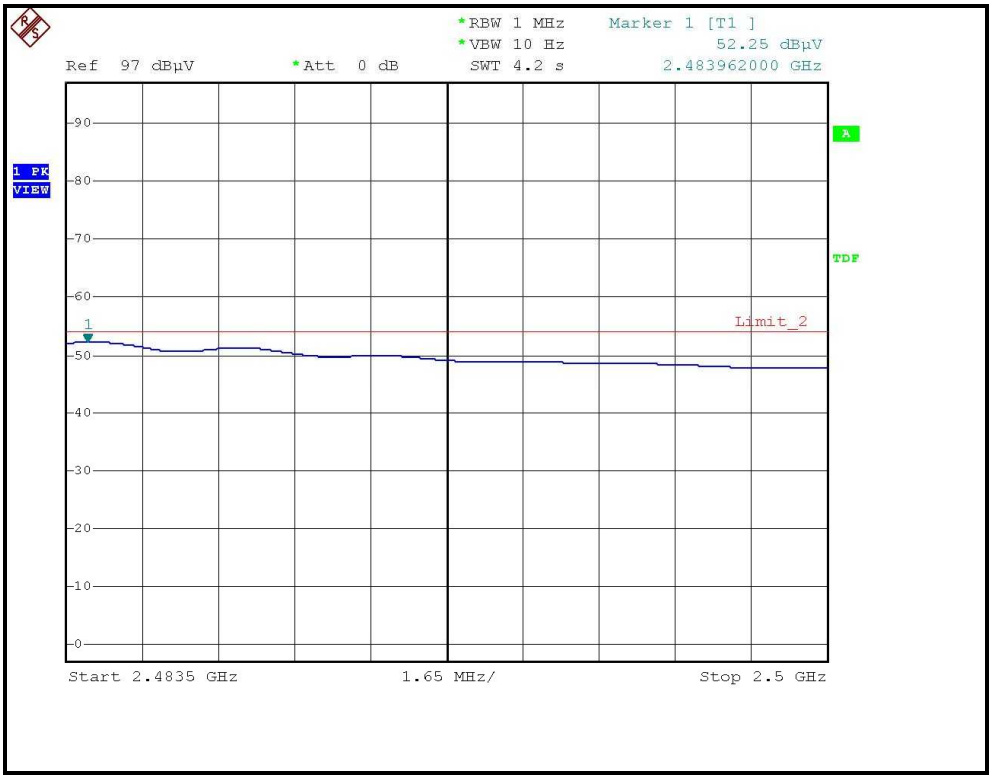
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, HORIZONTAL )



RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, VERTICAL )



## 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 INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Aug. 12, 2008 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.3.5 TEST SETUP


### 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.

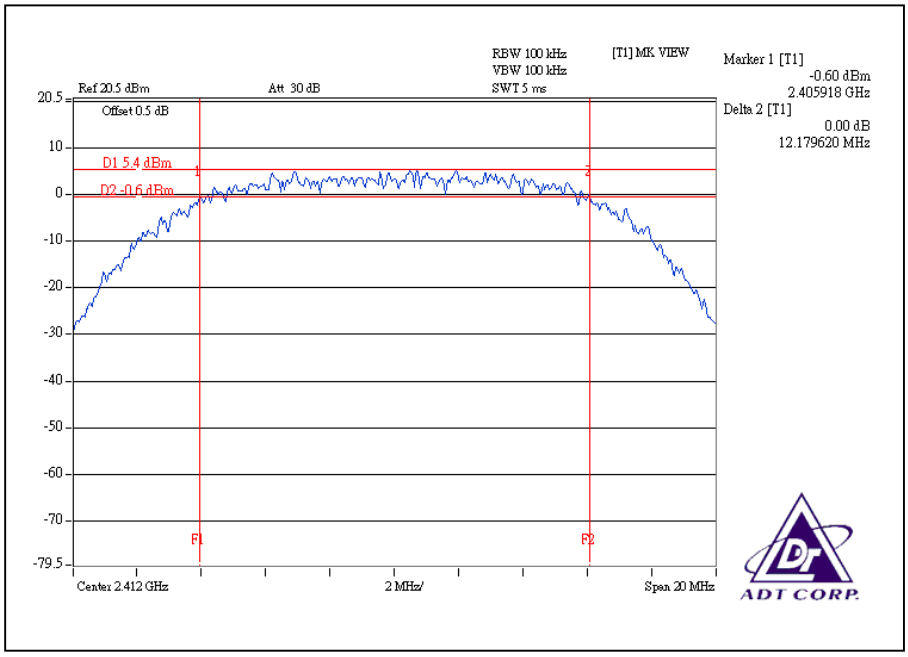
## 4.3.7 TEST RESULTS

### 802.11b DSSS MODULATION:

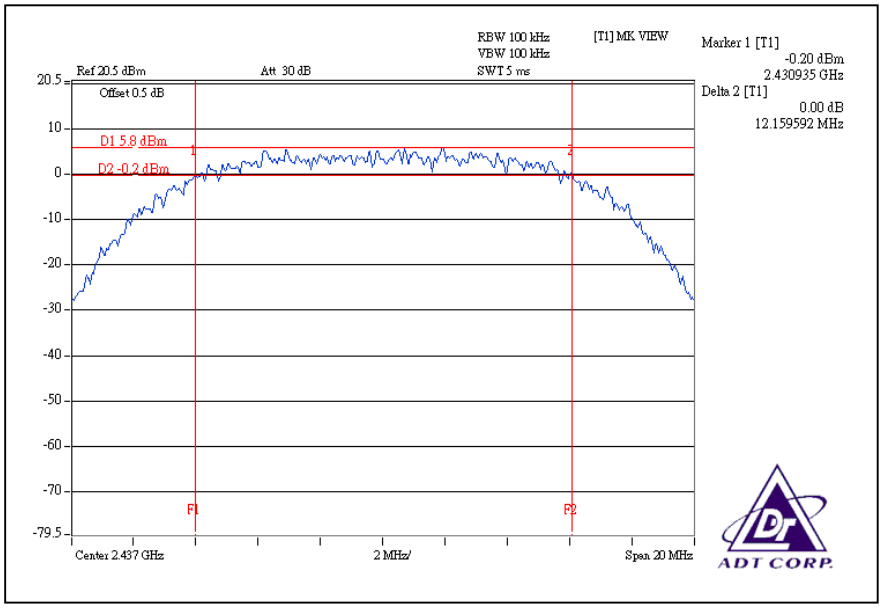
| MODULATION TYPE | DBPSK | TRANSFER RATE | 1Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---|---|---|---|---|
| 1 | 2412 | 12.180 | 0.5 | PASS |
| 6 | 2437 | 12.160 | 0.5 | PASS |
| 11 | 2462 | 12.180 | 0.5 | PASS |

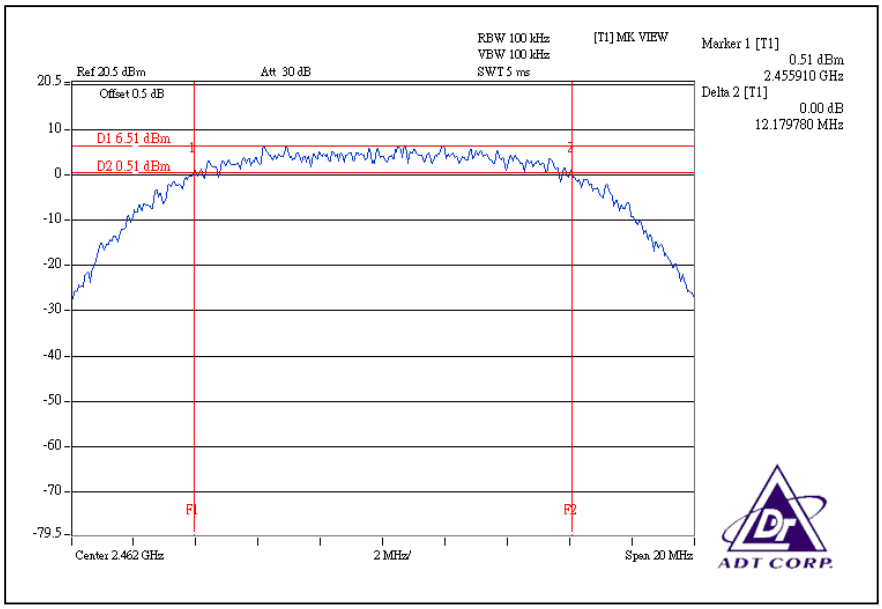
CH1



## CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-0.20 dBm
2.430935 GHz
Delta 2 [T1]
0.00 dB
12.159592 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 5.8 dBm
D2 -0.2 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
ADT CORP.

## CH11

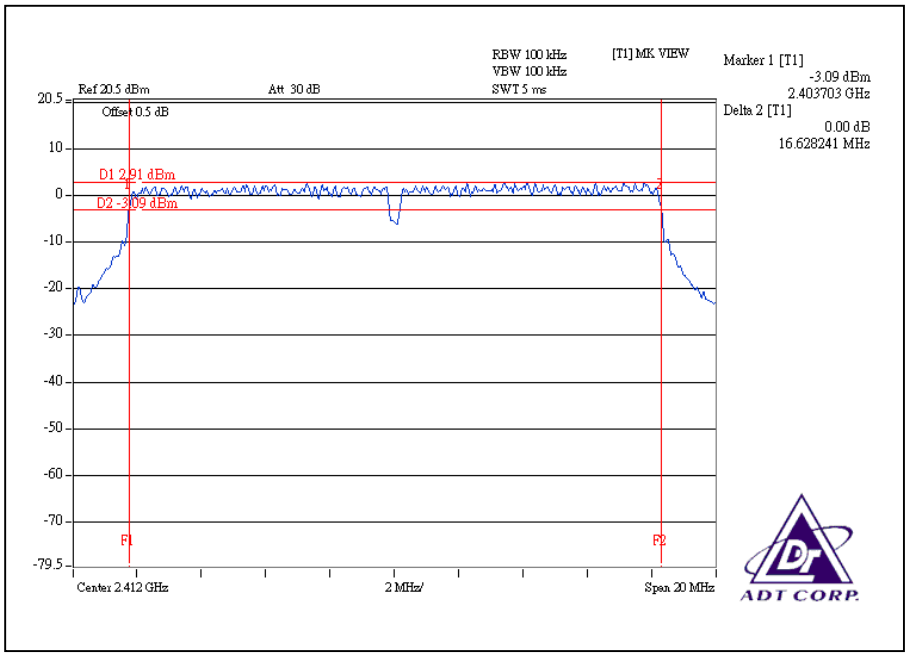

RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
0.51 dBm
2.455910 GHz
Delta 2 [T1]
0.00 dB
12.179780 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 6.51 dBm
D2 0.51 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

## 802.11g OFDM MODULATION:

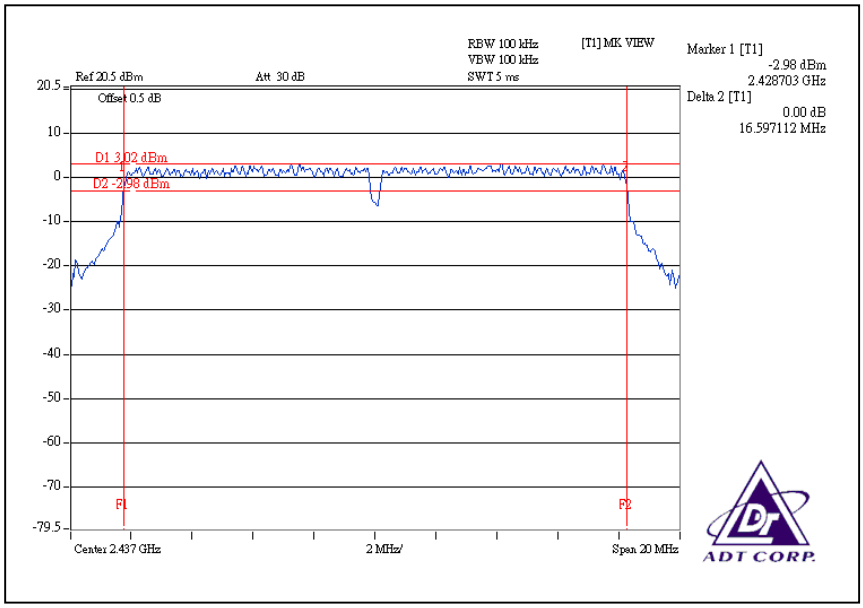
| MODULATION TYPE | BPSK | TRANSFER RATE | 6Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---|---|---|---|---|
| 1 | 2412 | 16.628 | 0.5 | PASS |
| 6 | 2437 | 16.597 | 0.5 | PASS |
| 11 | 2462 | 16.627 | 0.5 | PASS |

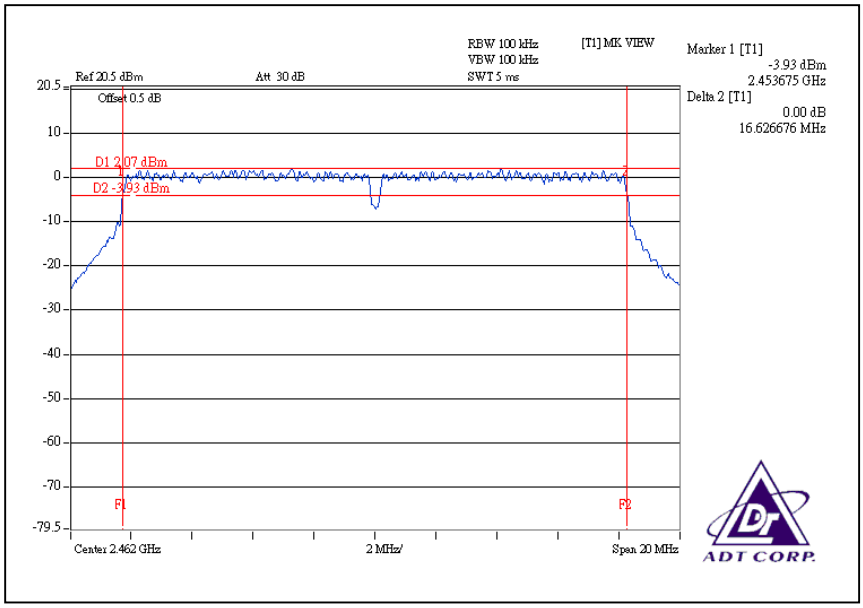
CH1



## CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-2.98 dBm
2.428703 GHz
Delta 2 [T1]
0.00 dB
16.597112 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 3.02 dBm
D2 -2.98 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
ADT CORP.

## CH11

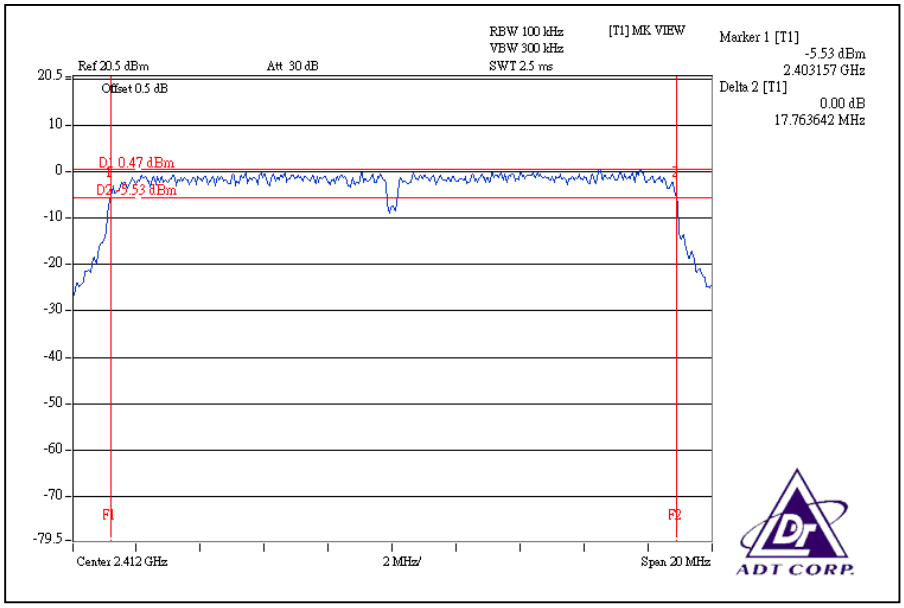

RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-3.93 dBm
2.453675 GHz
Delta 2 [T1]
0.00 dB
16.626676 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 2.07 dBm
D2 -3.93 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

## DRAFT 802.11n (20MHz) OFDM MODULATION:

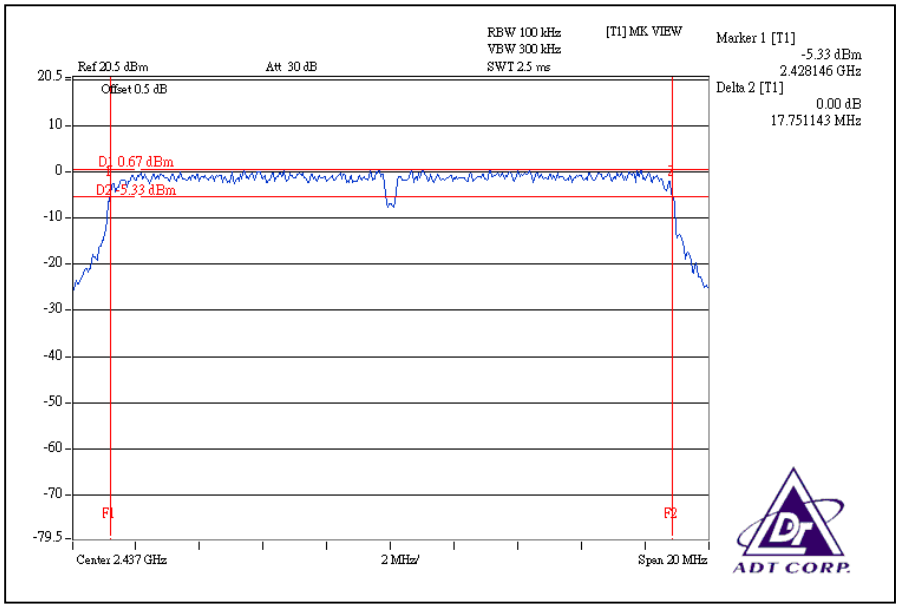
| MODULATION TYPE | BPSK | TRANSFER RATE | 13Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 54%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---|---|---|---|---|---|
| | | CHAIN(0) | CHAIN(1) | | |
| 1 | 2412 | 17.764 | 17.652 | 0.5 | PASS |
| 6 | 2437 | 17.751 | 17.682 | 0.5 | PASS |
| 11 | 2462 | 17.763 | 17.702 | 0.5 | PASS |

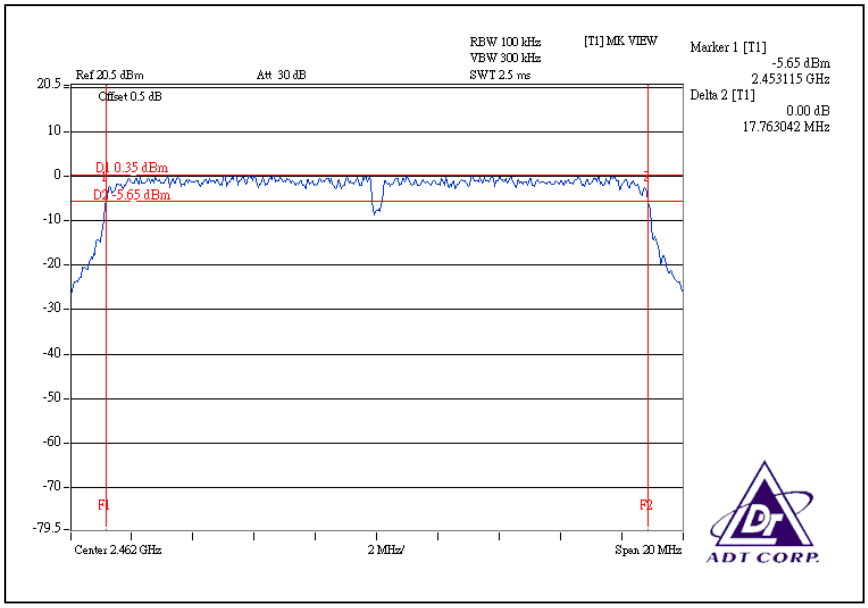
For Chain(0): CH1



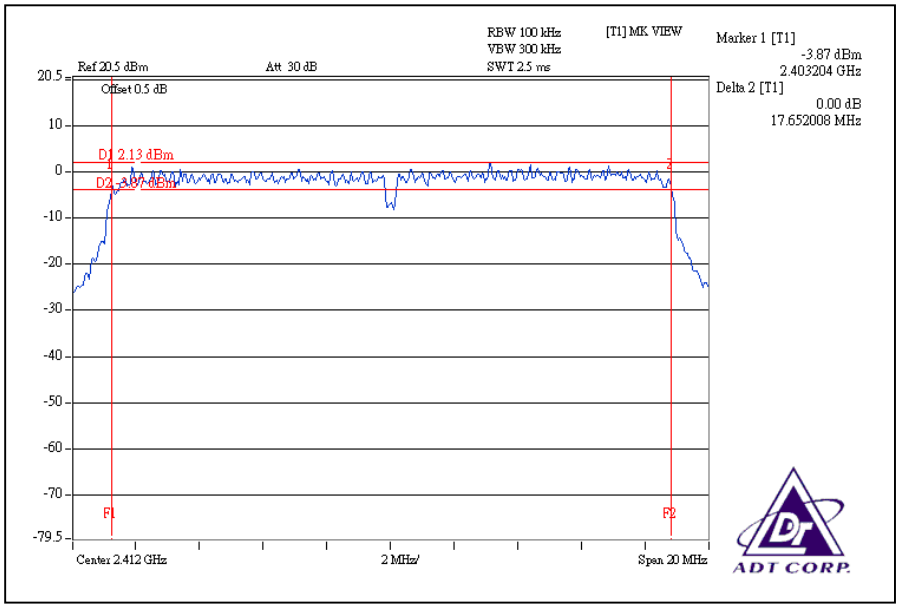
CH6


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-5.33 dBm
2.428146 GHz
Delta 2 [T1]
0.00 dB
17.751143 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 0.67 dBm
D2 -5.33 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
ADT CORP.

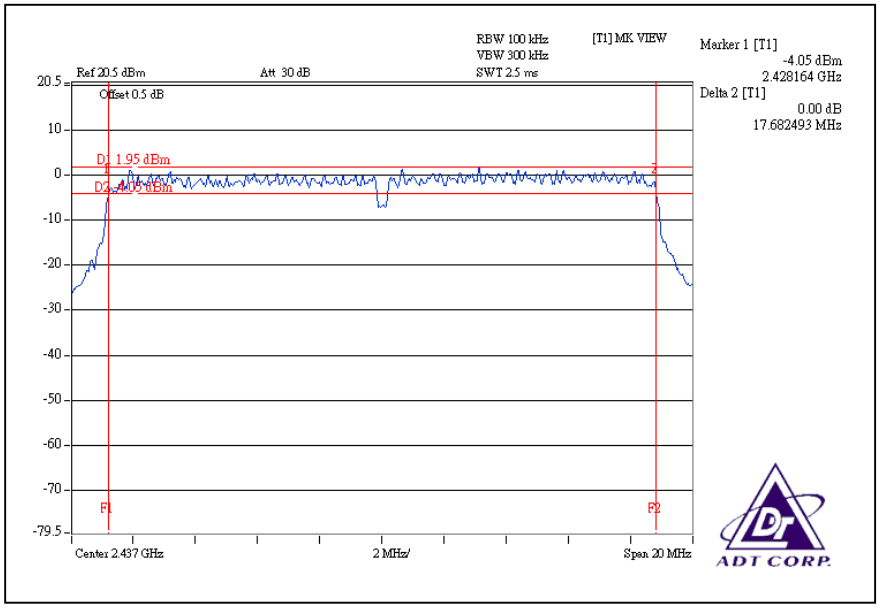
CH11


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-5.65 dBm
2.453115 GHz
Delta 2 [T1]
0.00 dB
17.763042 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 0.35 dBm
D2 -5.65 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

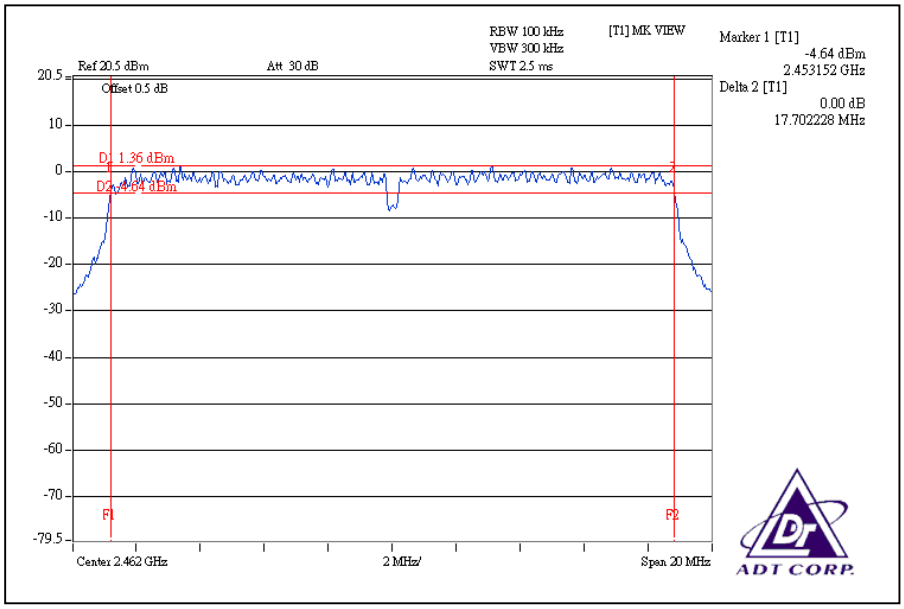
For CHAIN(1): CH1




CH6



CH11

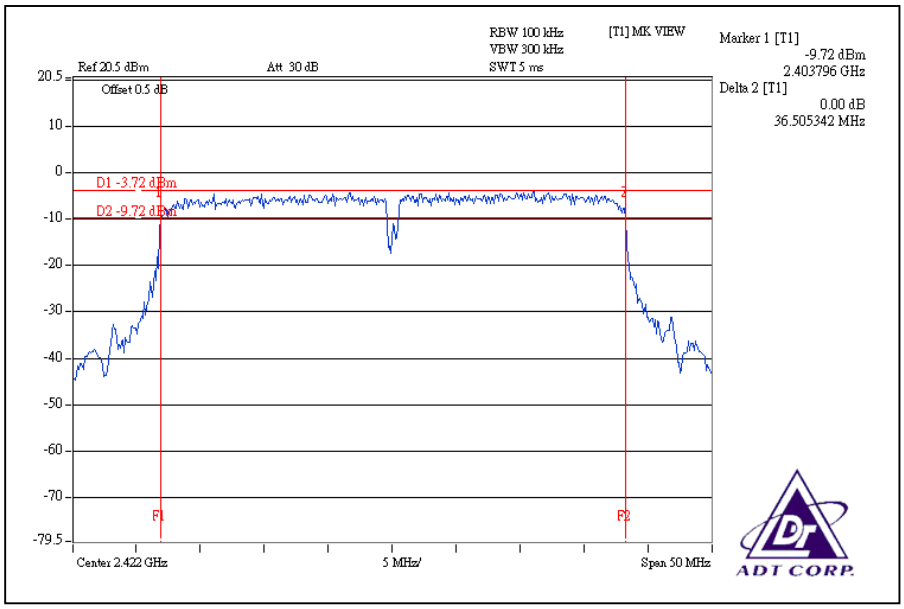

RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-4.64 dBm
2.453152 GHz
Delta 2 [T1]
0.00 dB
17.702228 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 1.36 dBm
D2 -4.64 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

## DRAFT 802.11n (40MHz) OFDM MODULATION:

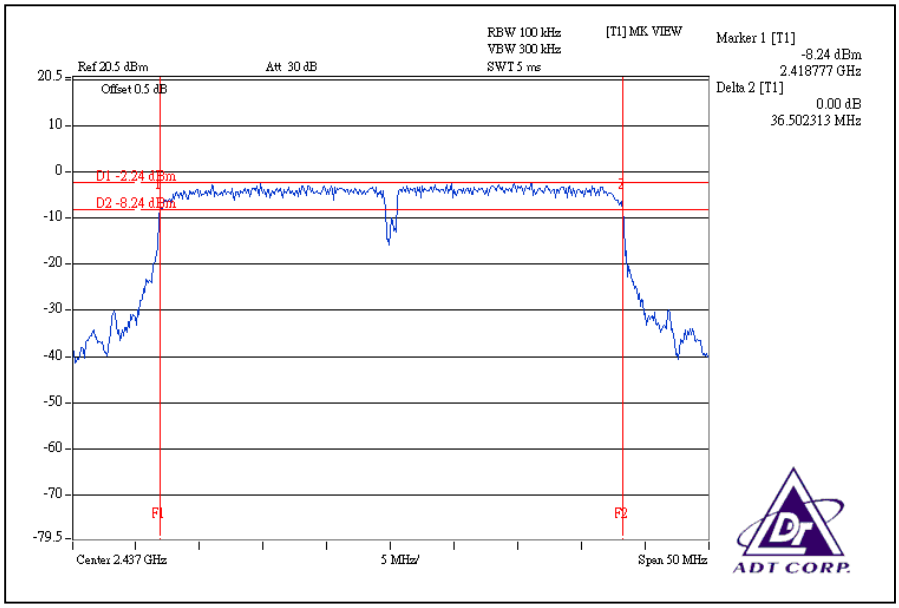
| MODULATION TYPE | BPSK | TRANSFER RATE | 27Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | 6dB BANDWIDTH (MHz) | | MINIMUM LIMIT (MHz) | PASS / FAIL |
|---|---|---|---|---|---|
| | | CHAIN(0) | CHAIN(1) | | |
| 1 | 2422 | 36.505 | 36.190 | 0.5 | PASS |
| 4 | 2437 | 36.502 | 36.498 | 0.5 | PASS |
| 7 | 2452 | 36.482 | 36.442 | 0.5 | PASS |

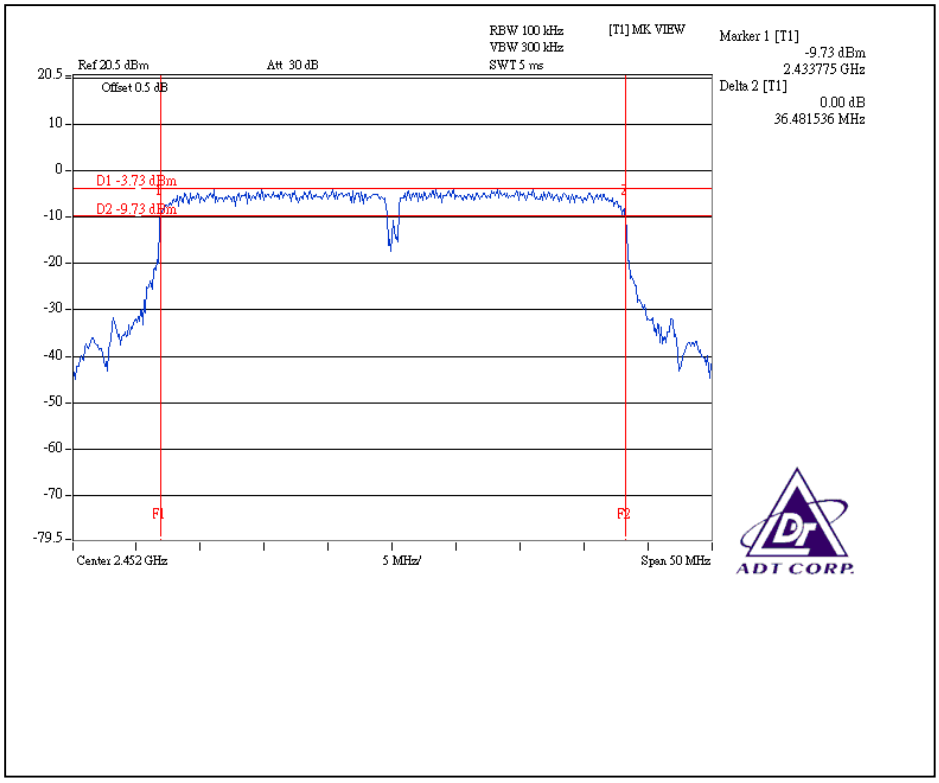
For Chain (0): CH1



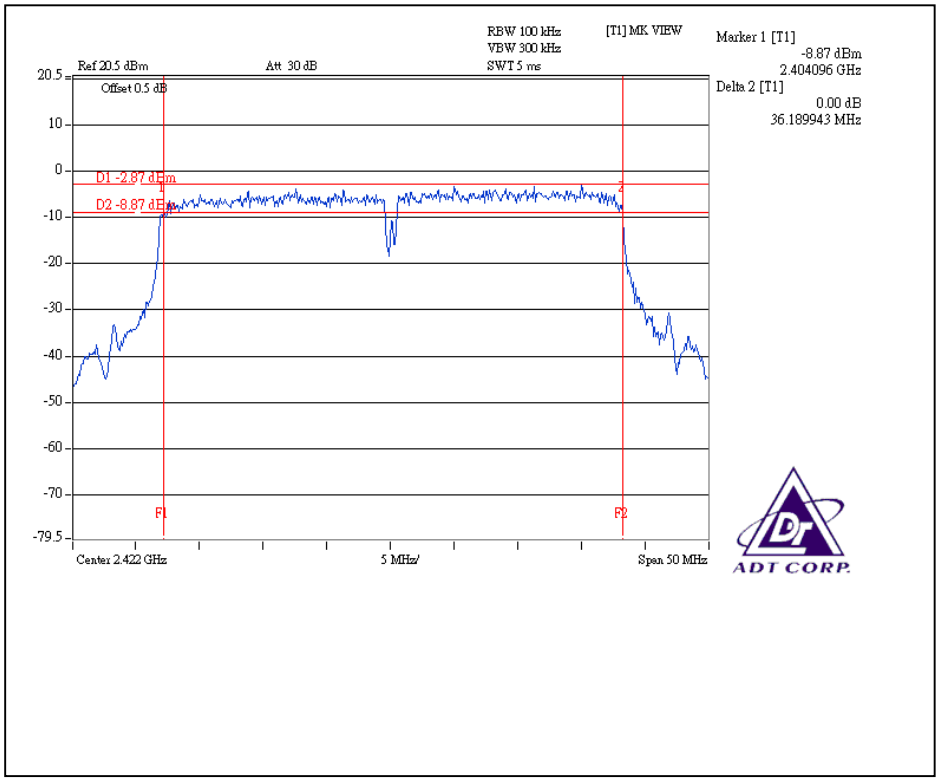
## CH4


RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-8.24 dBm
2.418777 GHz
Delta 2 [T1]
0.00 dB
36.502313 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -2.24 dBm
D2 -8.24 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
5 MHz/
Span 50 MHz
ADT CORP.

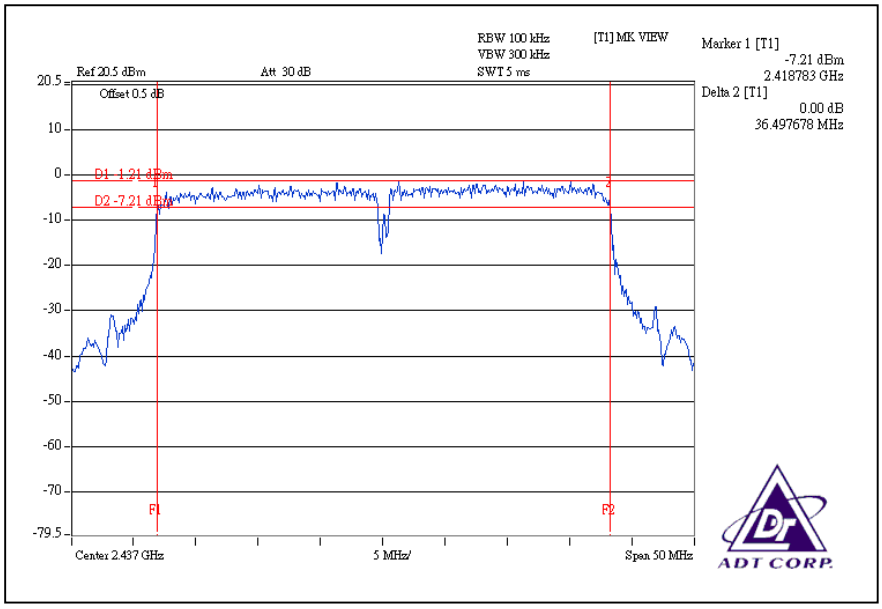
## CH7


RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-9.73 dBm
2.433775 GHz
Delta 2 [T1]
0.00 dB
36.481536 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -3.73 dBm
D2 -9.73 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.452 GHz
5 MHz/
Span 50 MHz
ADT CORP.

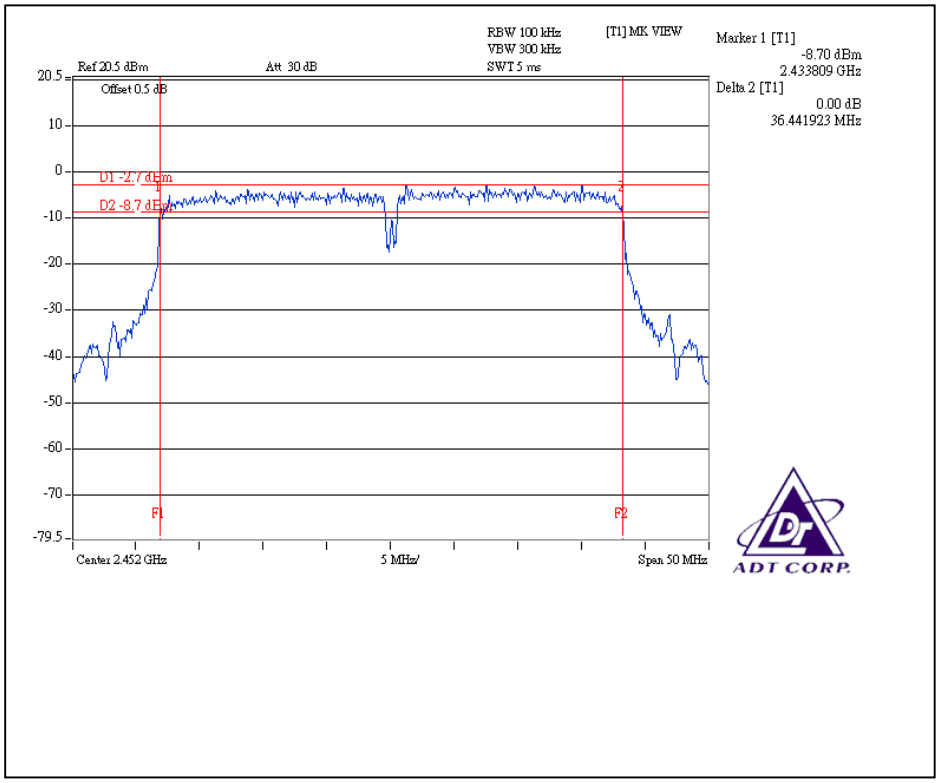
For Chain (1): CH1




CH4



CH7


RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-8.70 dBm
2.433809 GHz
Delta 2 [T1]
0.00 dB
36.441923 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
D1 -2.7 dBm
D2 -8.7 dBm
F1
F2
Center 2.452 GHz
5 MHz/
Span 50 MHz
ADT CORP.

## 4.4 MAXIMUM PEAK OUTPUT POWER

### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 4.4.2 INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Aug. 12, 2008 |
| Agilent SIGNAL GENERATOR | E8257C | MY43320668 | Dec. 25, 2008 |
| TEKTRONIX OSCILLOSCOPE | TDS380 | B016335 | Aug. 15, 2008 |
| NARDA DETECTOR | 4503A | FSCM99899 | NA |

**NOTE:**
The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.4.5 TEST SETUP


### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

## 4.4.7 TEST RESULTS

### 802.11b DSSS MODULATION:

| MODULATION TYPE | DBPSK | TRANSFER RATE | 1Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (mW) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|---|
| 1 | 2412 | 72.444 | 18.60 | 30 | PASS |
| 6 | 2437 | 72.444 | 18.60 | 30 | PASS |
| 11 | 2462 | 87.096 | 19.40 | 30 | PASS |

### 802.11g OFDM MODULATION:

| MODULATION TYPE | BPSK | TRANSFER RATE | 6Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (mW) | PEAK POWER OUTPUT (dBm) | PEAK POWER LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|---|
| 1 | 2412 | 128.825 | 21.10 | 30 | PASS |
| 6 | 2437 | 140.605 | 21.48 | 30 | PASS |
| 11 | 2462 | 117.490 | 20.70 | 30 | PASS |

## DRAFT 802.11n (20MHz) OFDM MODULATION:

| MODULATION TYPE | BPSK | TRANSFER RATE | 13Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (mW) | | PEAK POWER OUTPUT (dBm) | | TOTAL PEAK POWER (mW) | TOTAL PEAK POWER (dBm) | PEAK POWER LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|---|---|---|---|---|
| | | CHAIN(0) | CHAIN(1) | CHAIN(0) | CHAIN(1) | | | | |
| 1 | 2412 | 67.608 | 72.444 | 18.30 | 18.60 | 140.052 | 21.46 | 30 | PASS |
| 6 | 2437 | 74.131 | 77.625 | 18.70 | 18.90 | 151.756 | 21.81 | 30 | PASS |
| 11 | 2462 | 81.283 | 72.444 | 19.10 | 18.60 | 153.727 | 21.87 | 30 | PASS |

## DRAFT 802.11n (40MHz) OFDM MODULATION:

| MODULATION TYPE | BPSK | TRANSFER RATE | 27Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER OUTPUT (mW) | | PEAK POWER OUTPUT (dBm) | | TOTAL PEAK POWER (mW) | TOTAL PEAK POWER (dBm) | PEAK POWER LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|---|---|---|---|---|
| | | CHAIN(0) | CHAIN(1) | CHAIN(0) | CHAIN(1) | | | | |
| 1 | 2422 | 48.978 | 47.863 | 16.90 | 16.80 | 96.841 | 19.86 | 30 | PASS |
| 4 | 2437 | 74.131 | 70.795 | 18.70 | 18.50 | 144.926 | 21.61 | 30 | PASS |
| 7 | 2452 | 50.119 | 50.119 | 17.00 | 17.00 | 100.238 | 20.01 | 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 INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Aug. 12, 2008 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

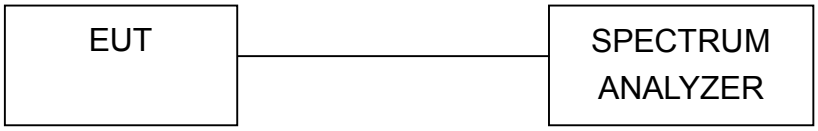
### 4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.5.5 TEST SETUP




### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

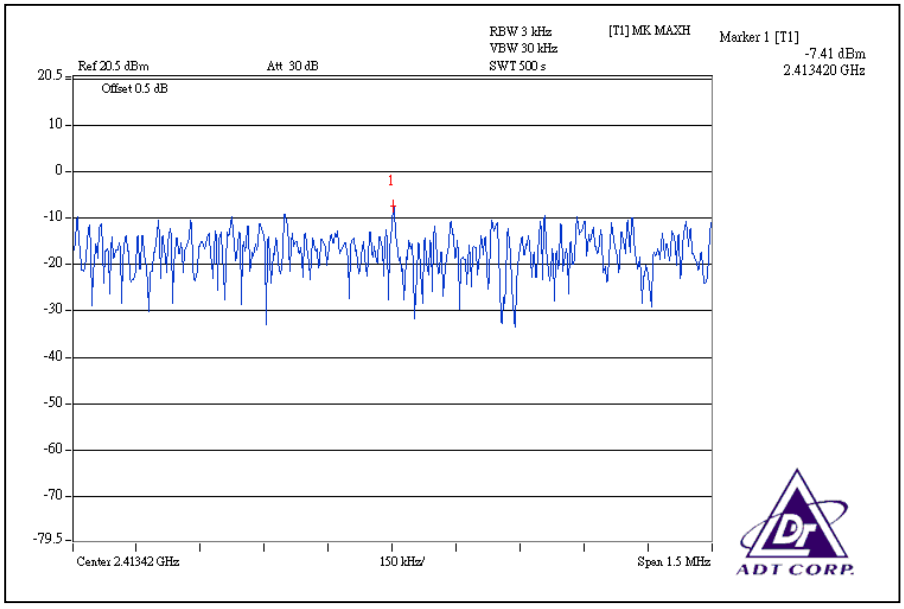
## 4.5.7 TEST RESULTS

### 802.11b DSSS MODULATION:

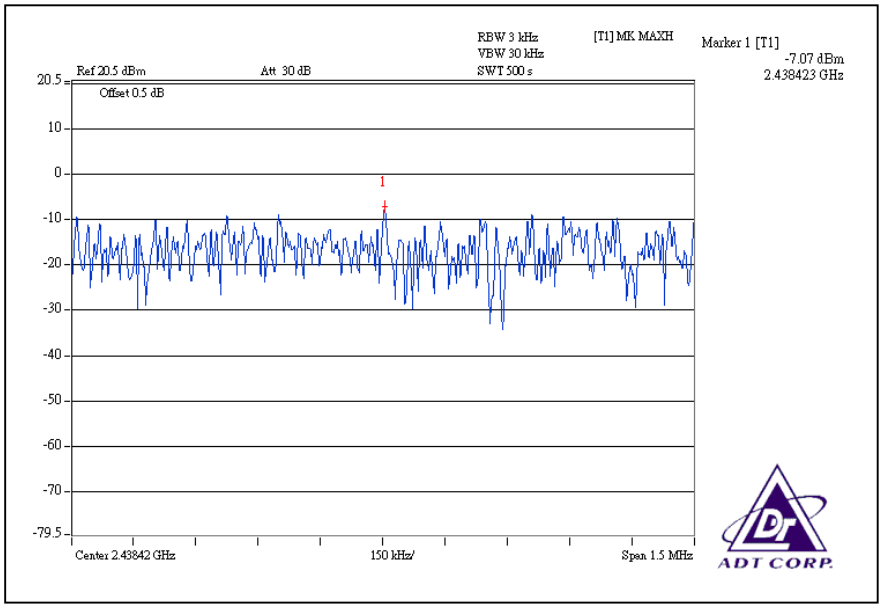
| MODULATION TYPE | DBPSK | TRANSFER RATE | 1Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|
| 1 | 2412 | -7.41 | 8 | PASS |
| 6 | 2437 | -7.07 | 8 | PASS |
| 11 | 2462 | -6.34 | 8 | PASS |

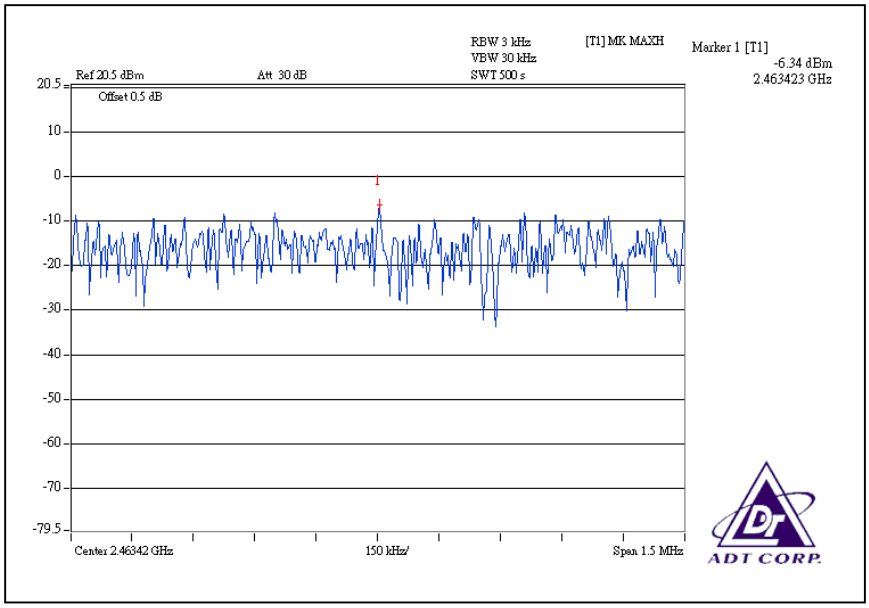
CH1



## CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-7.07 dBm
2.438423 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.43842 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

## CH11

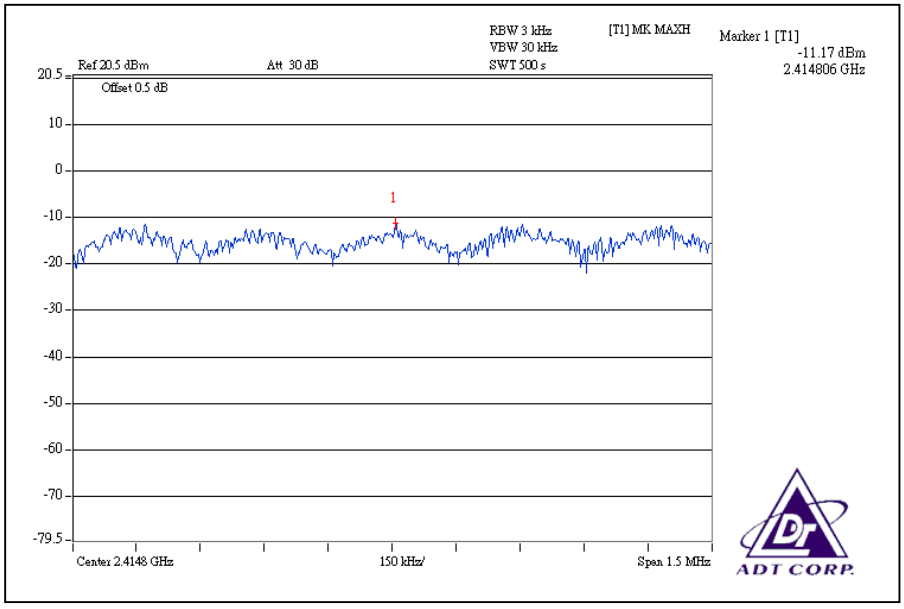

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-6.34 dBm
2.463423 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.46342 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

## 802.11g OFDM MODULATION:

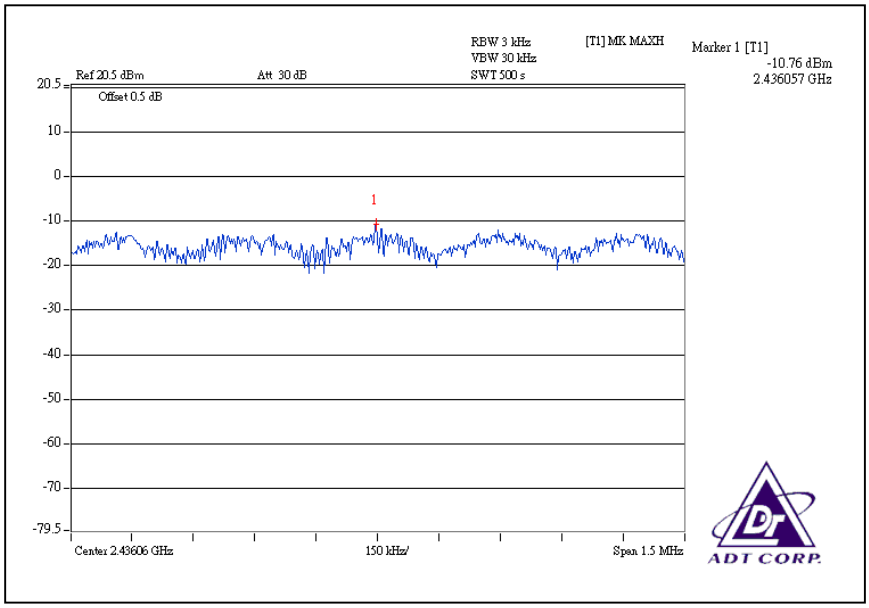
| MODULATION TYPE | BPSK | TRANSFER RATE | 6Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23deg.C, 62%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz ) | RF POWER LEVEL IN 3kHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|
| 1 | 2412 | -11.17 | 8 | PASS |
| 6 | 2437 | -10.76 | 8 | PASS |
| 11 | 2462 | -12.05 | 8 | PASS |

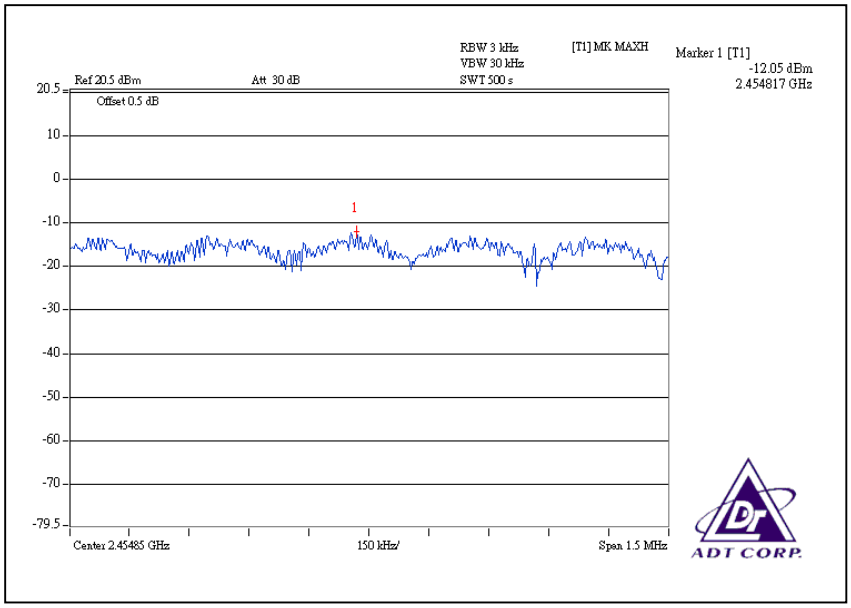
CH1



CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-10.76 dBm
2.436057 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.43606 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

CH11

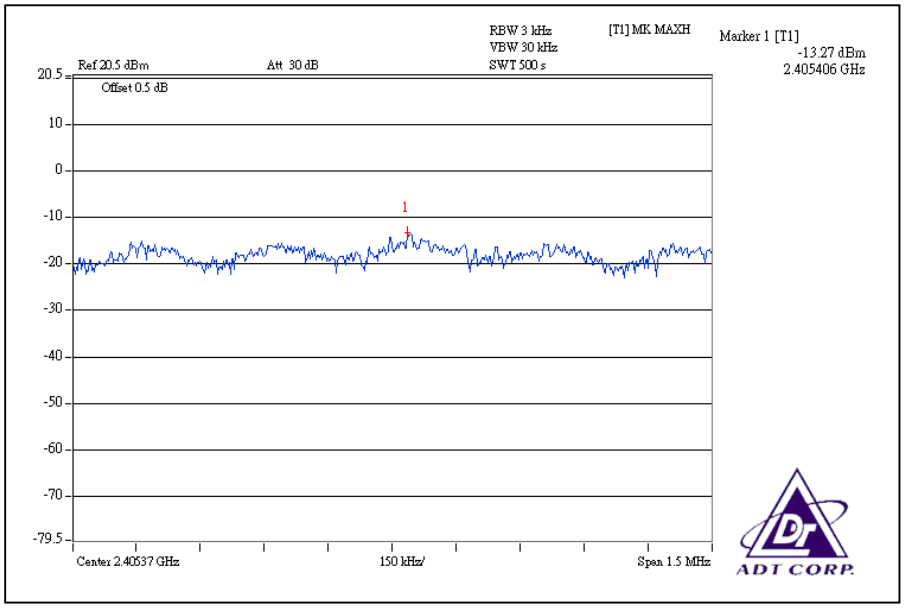

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-12.05 dBm
2.454817 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.45485 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

## DRAFT 802.11n (20MHz) OFDM MODULATION:

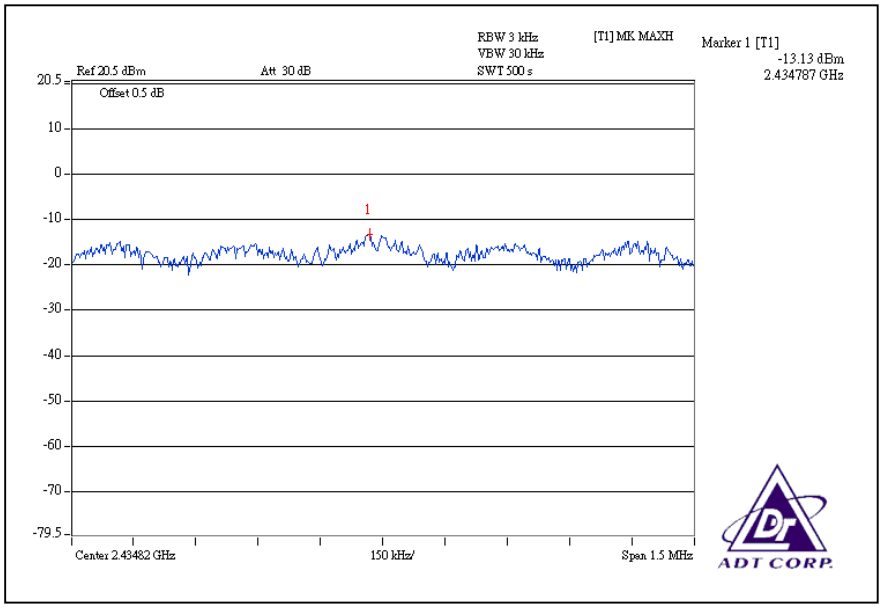
| MODULATION TYPE | BPSK | TRANSFER RATE | 13Mbps |
|---|---|---|---|
| INPUT POWER | 120Vac, 60 Hz | ENVIRONMENTAL CONDITIONS | 23 deg.C, 54%RH, 955hPa |
| TESTED BY | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (mW) | | RF POWER LEVEL IN 3kHz BW (dBm) | | TOTAL POWER DENSITY (mW) | TOTAL POWER DENSITY (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|---|---|---|---|---|
| | | CHAIN(0) | CHAIN(1) | CHAIN(0) | CHAIN(1) | | | | |
| 1 | 2412 | 0.047 | 0.045 | -13.27 | -13.45 | 0.092 | -10.36 | 8 | PASS |
| 6 | 2437 | 0.049 | 0.065 | -13.13 | -11.87 | 0.114 | -9.43 | 8 | PASS |
| 11 | 2462 | 0.065 | 0.043 | -11.90 | -13.67 | 0.108 | -9.67 | 8 | PASS |

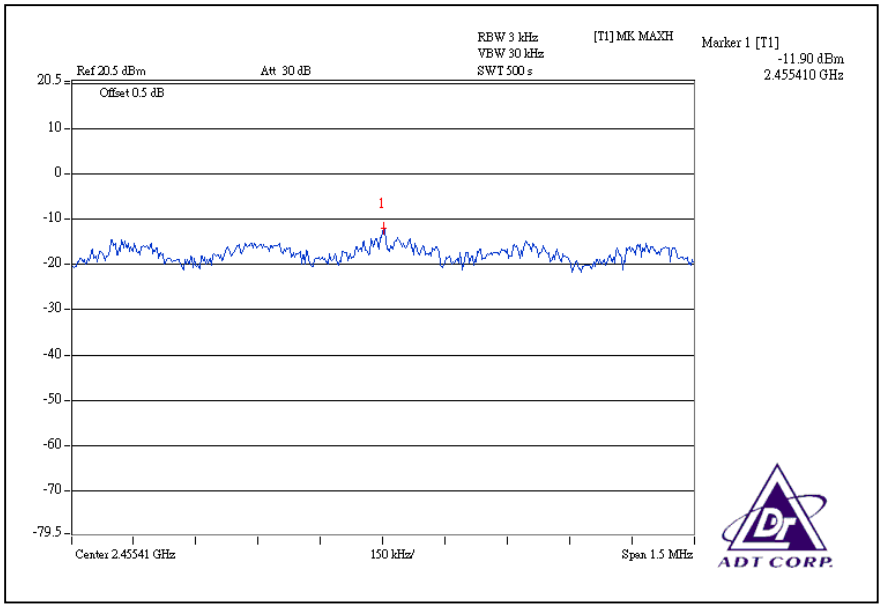
For Chain(0): CH1



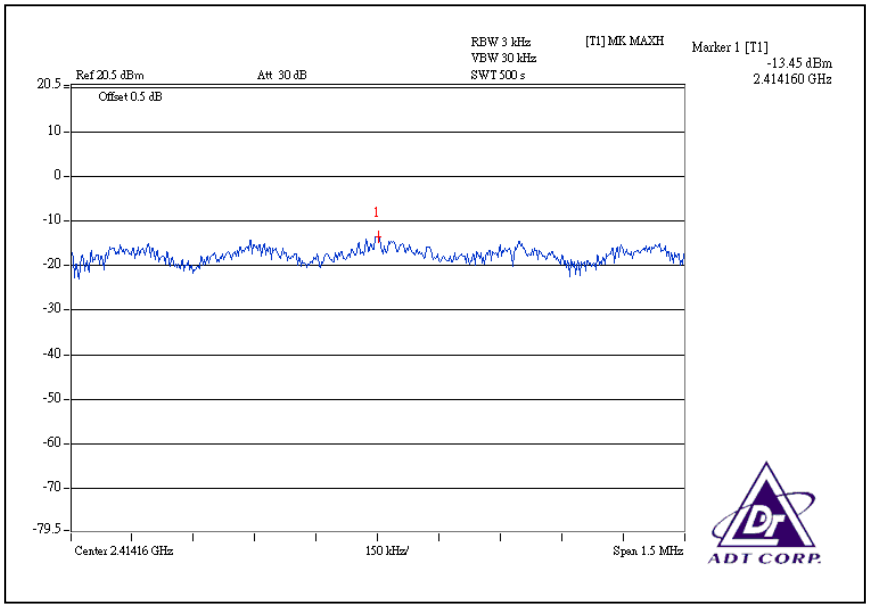
CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-13.13 dBm
2.434787 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.43482 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

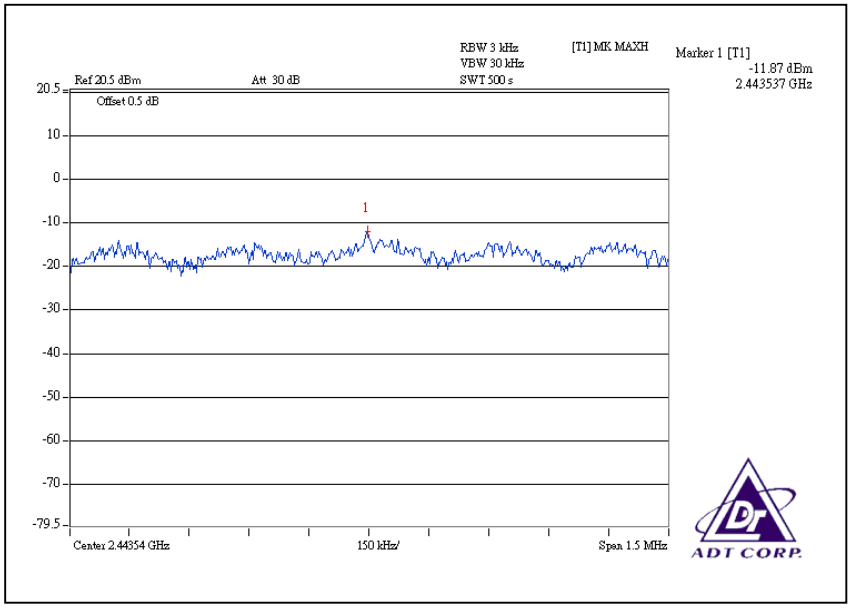
CH11


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-11.90 dBm
2.455410 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.45541 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

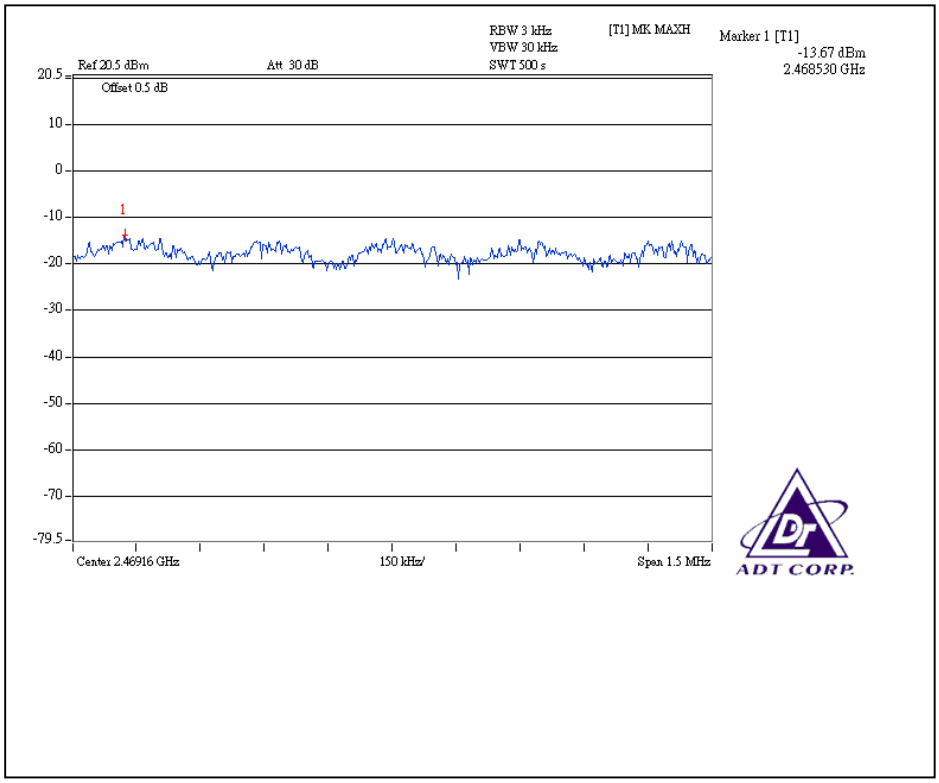
For Chain (1): CH1




CH6



CH11

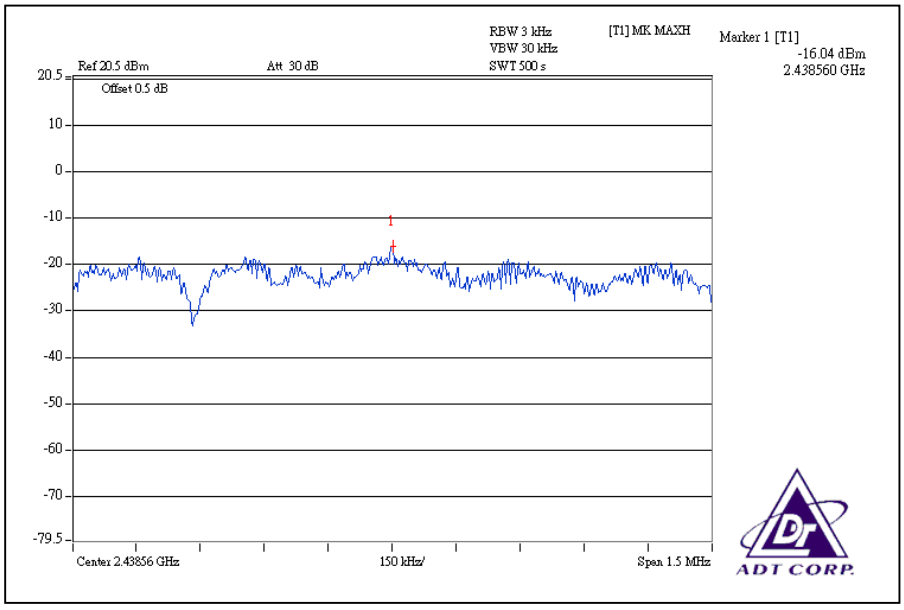

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-13.67 dBm
2.468530 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.46916 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

## DRAFT 802.11n (40MHz) OFDM MODULATION:

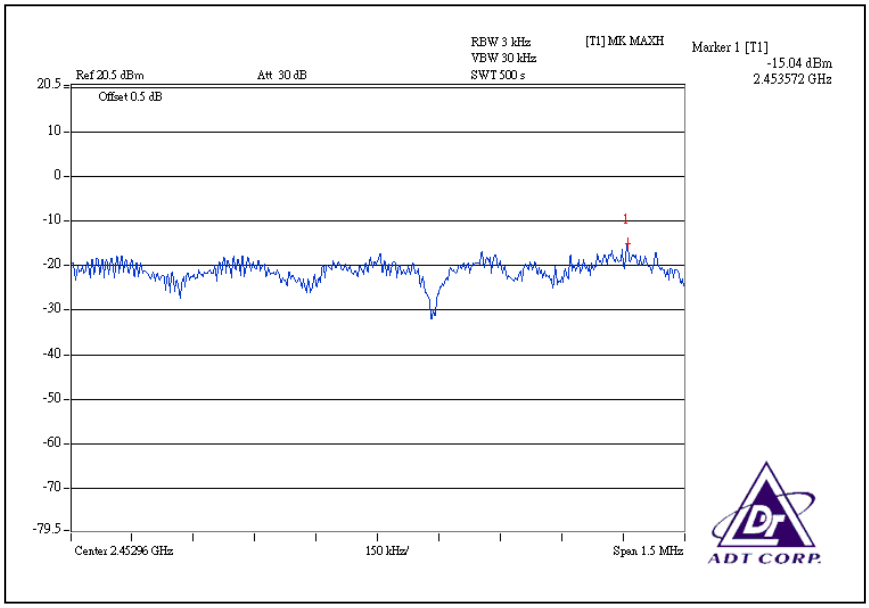
| | | | |
|---|---|---|---|
| **MODULATION TYPE** | BPSK | **TRANSFER RATE** | 27Mbps |
| **INPUT POWER** | 120Vac, 60 Hz | **ENVIRONMENTAL CONDITIONS** | 23deg.C, 54%RH, 955hPa |
| **TESTED BY** | Wen Yu | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 3kHz BW (mW) | | RF POWER LEVEL IN 3kHz BW (dBm) | | TOTAL POWER DENSITY (mW) | TOTAL POWER DENSITY (dBm) | MAXIMUM LIMIT (dBm) | PASS / FAIL |
|---|---|---|---|---|---|---|---|---|---|
| | | CHAIN(0) | CHAIN(1) | CHAIN(0) | CHAIN(1) | | | | |
| 1 | 2422 | 0.025 | 0.035 | -16.04 | -14.52 | 0.060 | -12.22 | 8 | PASS |
| 4 | 2437 | 0.031 | 0.056 | -15.04 | -12.54 | 0.087 | -10.60 | 8 | PASS |
| 7 | 2452 | 0.016 | 0.037 | -18.07 | -14.35 | 0.053 | -12.76 | 8 | PASS |

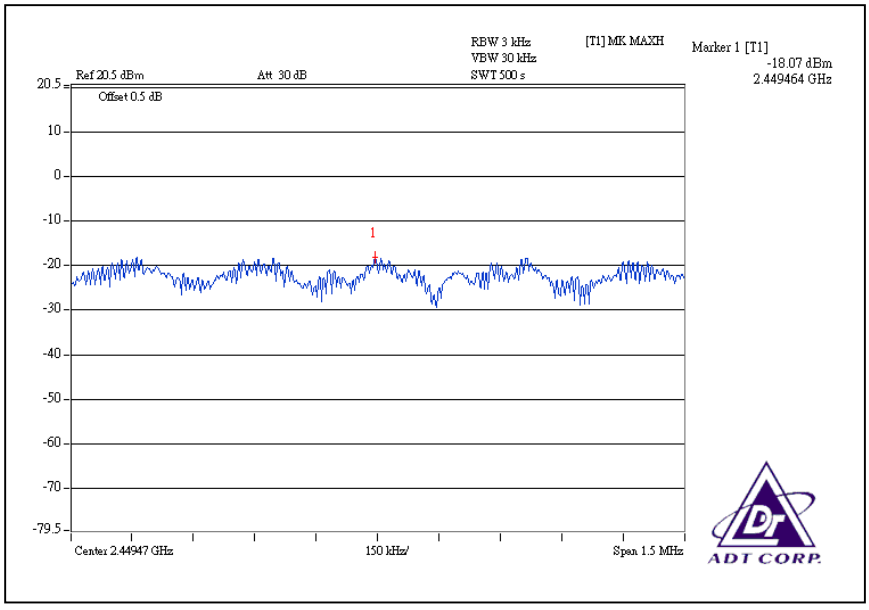
For Chain (0): CH1



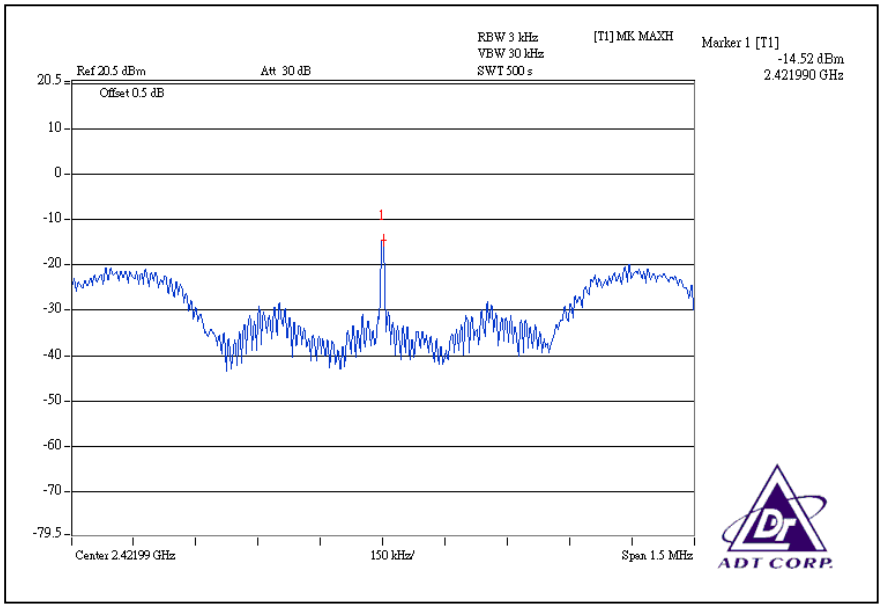
CH4


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-15.04 dBm
2.453572 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.45296 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

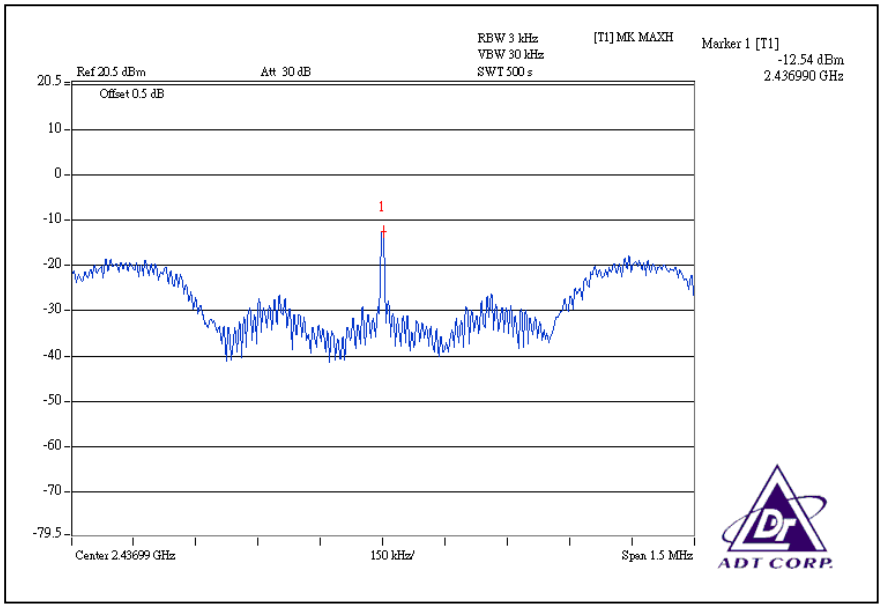
CH7


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-18.07 dBm
2.449464 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.44947 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

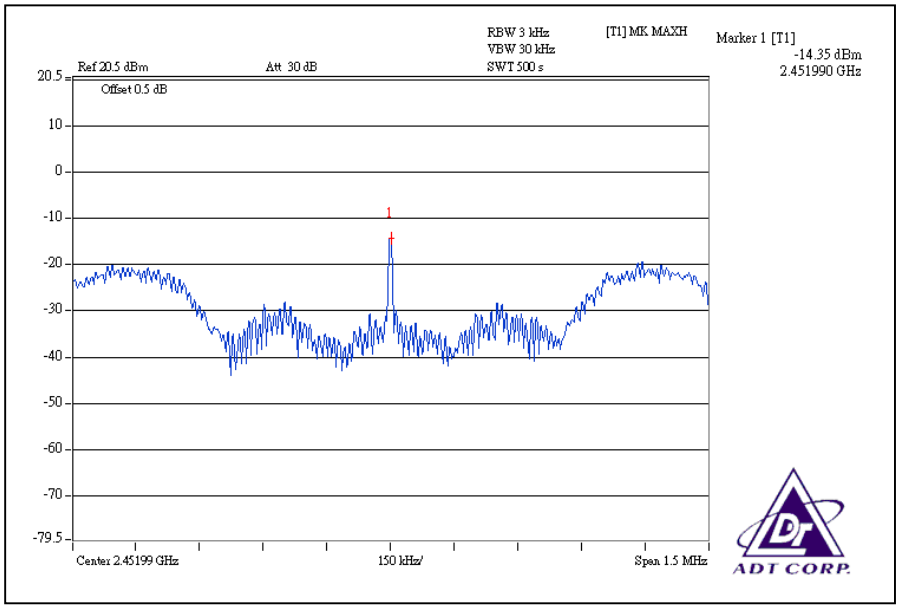
For Chain (1): CH1




CH4



CH7


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-14.35 dBm
2.451990 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.45199 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below –20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|---|---|---|---|
| R&S SPECTRUM ANALYZER | FSP40 | 100037 | Aug. 12, 2008 |

**NOTE:**

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

### 4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.6.5 EUT OPERATING CONDITION

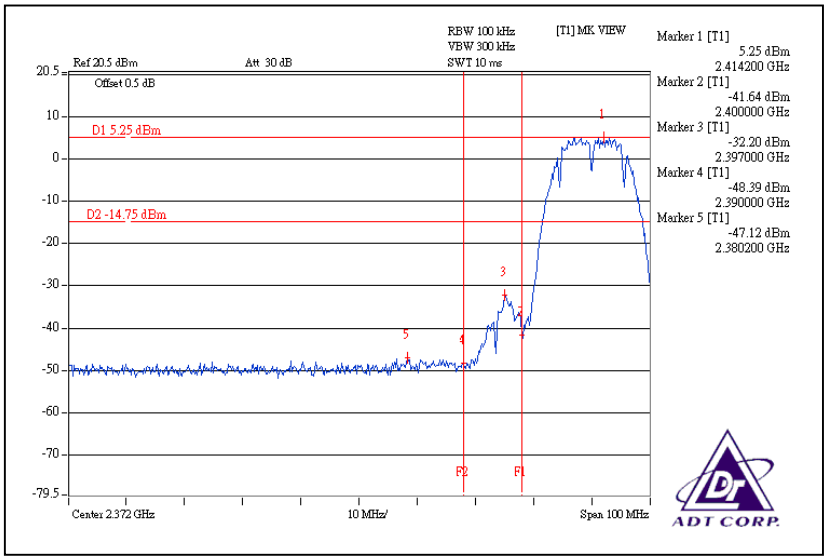
Same as Item 4.3.6

### 4.6.6 TEST RESULTS

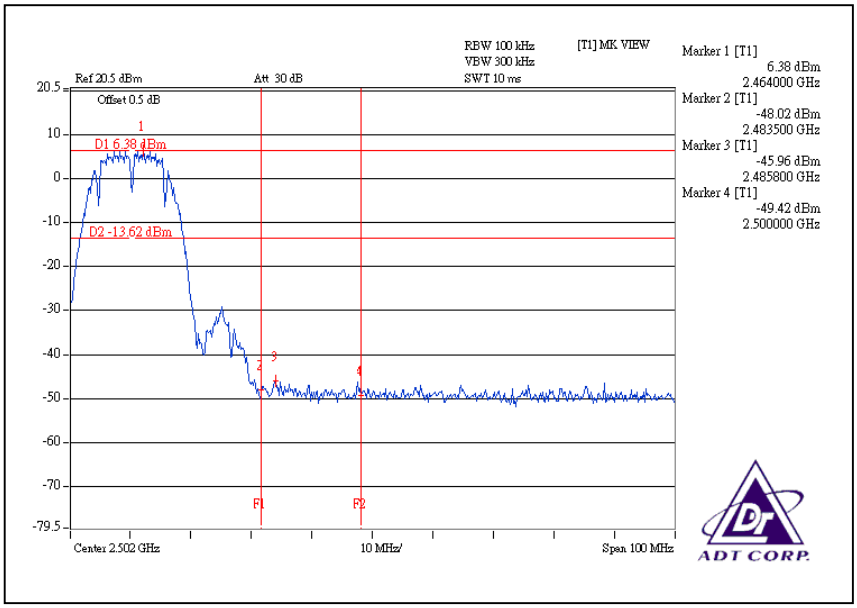
The spectrum plots are attached on the following below images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

## 802.11b DSSS MODULATION:

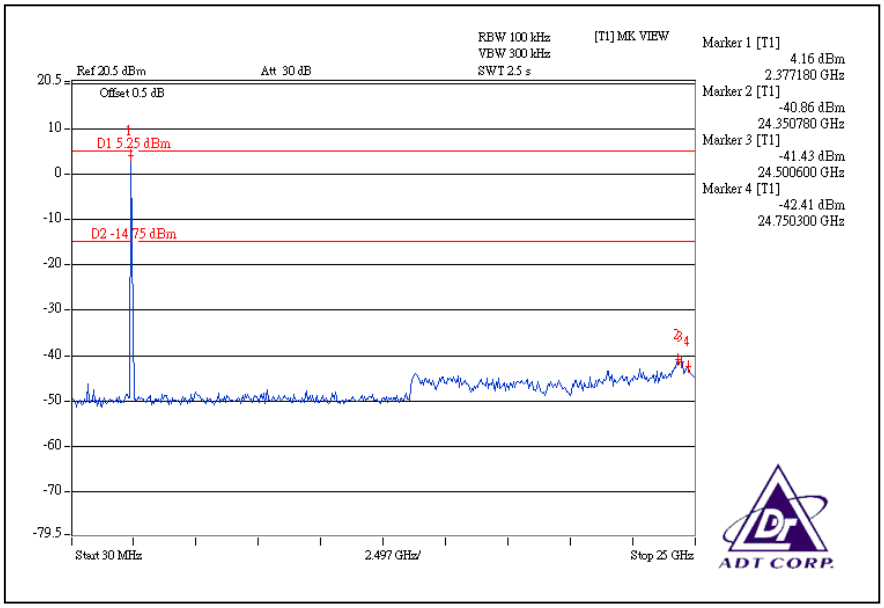
CH1



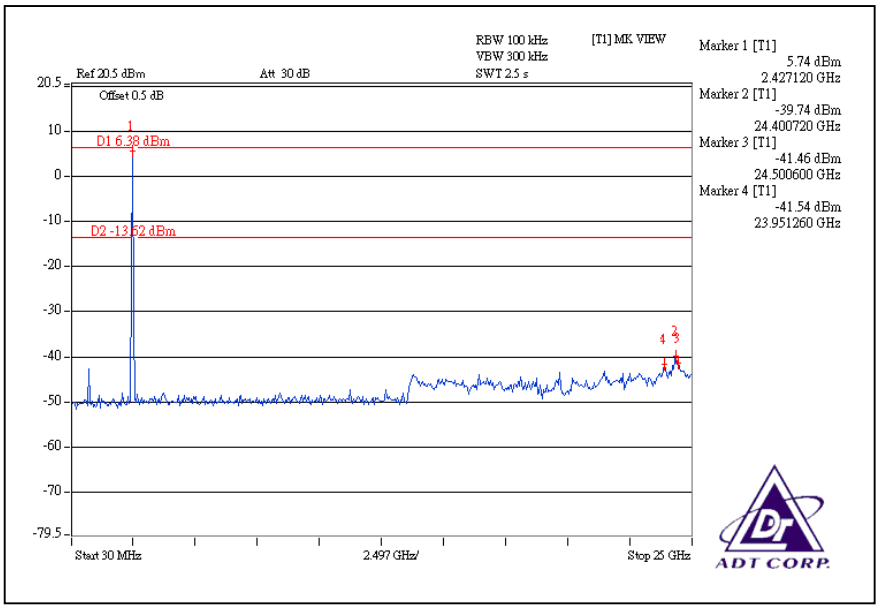

CH11



CH1

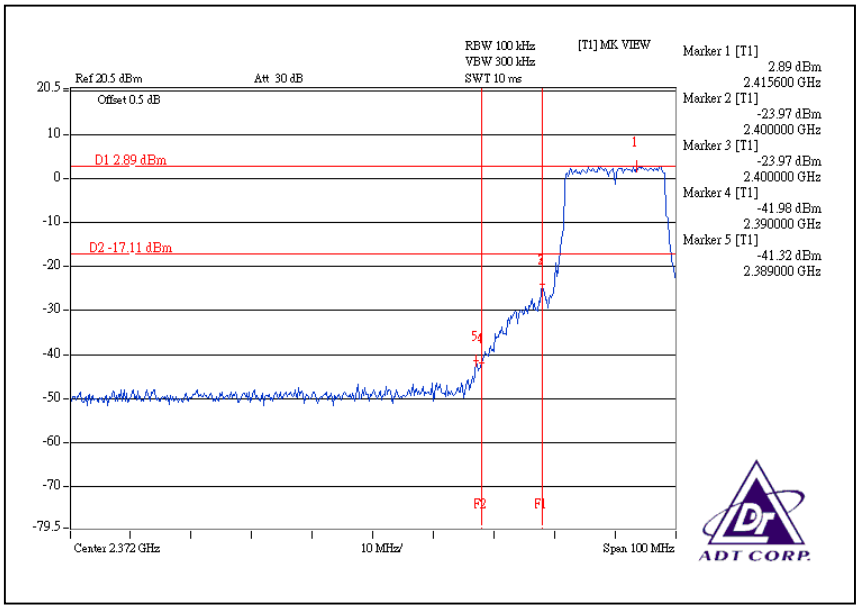

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 5.25 dBm
D2 -14.75 dBm
Marker 1 [T1]
4.16 dBm
2.377180 GHz
Marker 2 [T1]
-40.86 dBm
24.350780 GHz
Marker 3 [T1]
-41.43 dBm
24.500600 GHz
Marker 4 [T1]
-42.41 dBm
24.750300 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

CH11

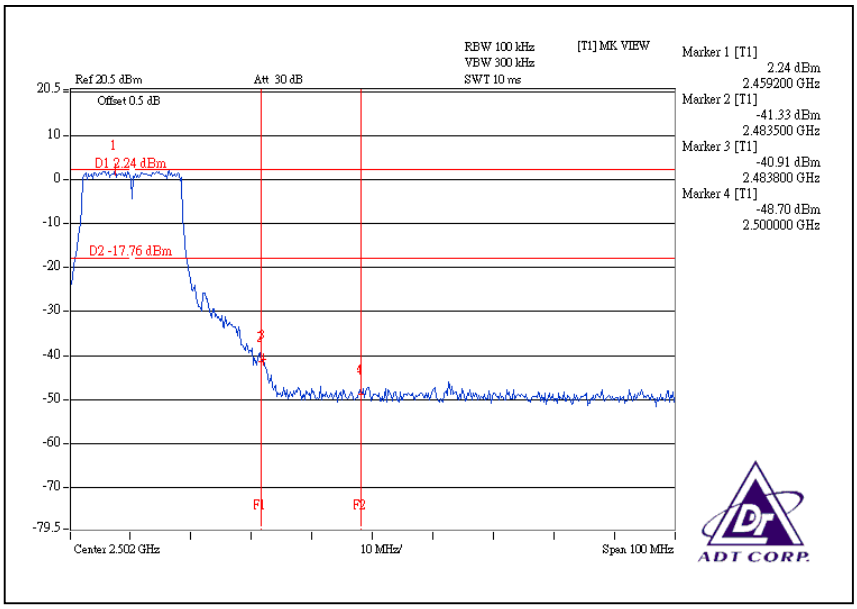

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 6.38 dBm
D2 -13.62 dBm
Marker 1 [T1]
5.74 dBm
2.427120 GHz
Marker 2 [T1]
-39.74 dBm
24.400720 GHz
Marker 3 [T1]
-41.46 dBm
24.500600 GHz
Marker 4 [T1]
-41.54 dBm
23.951260 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

## 802.11g OFDM MODULATION:

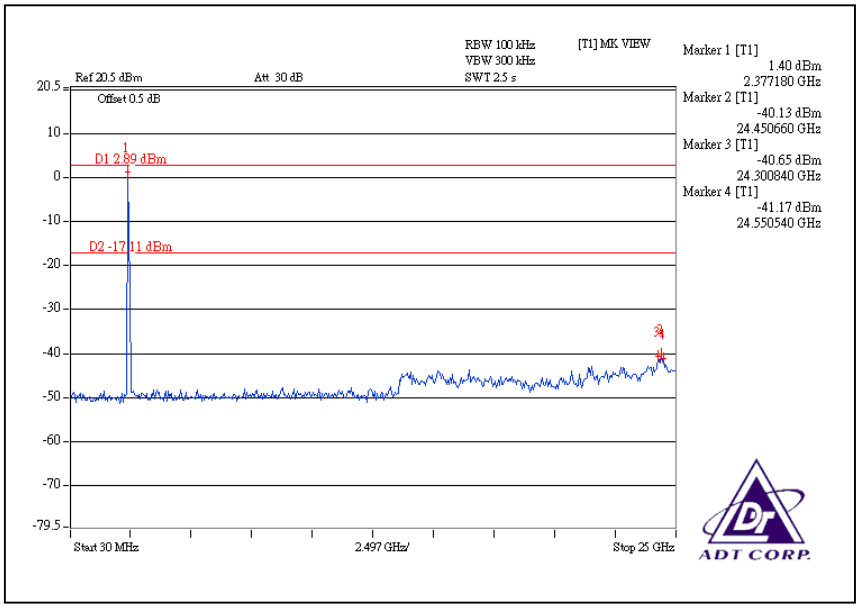
CH 1



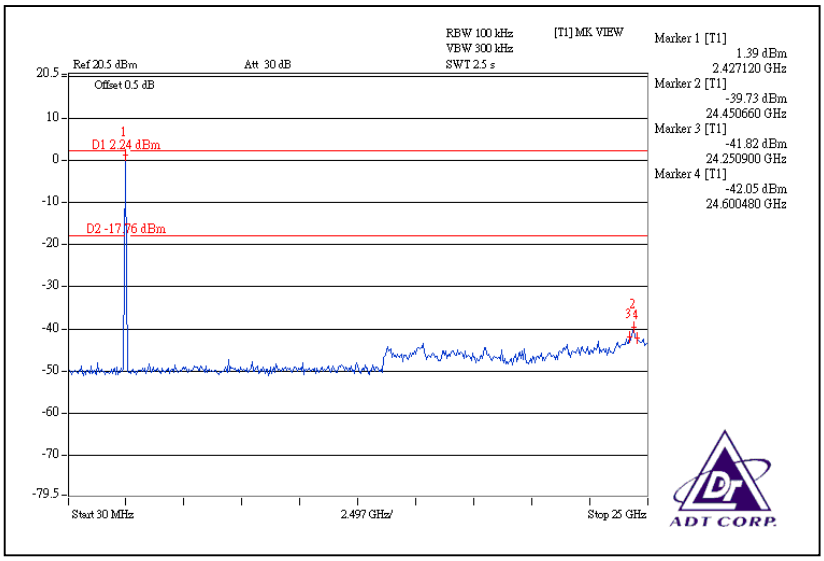

CH11



CH1

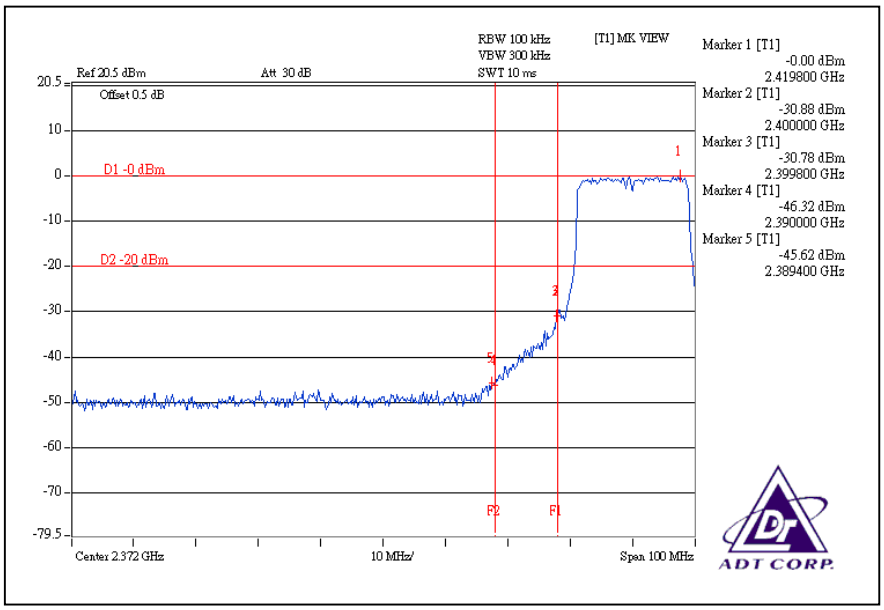

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Marker 1 [T1]
1.40 dBm
2.377180 GHz
Marker 2 [T1]
-40.13 dBm
24.450660 GHz
Marker 3 [T1]
-40.65 dBm
24.300840 GHz
Marker 4 [T1]
-41.17 dBm
24.550540 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 2.89 dBm
D2 -17.11 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

CH11

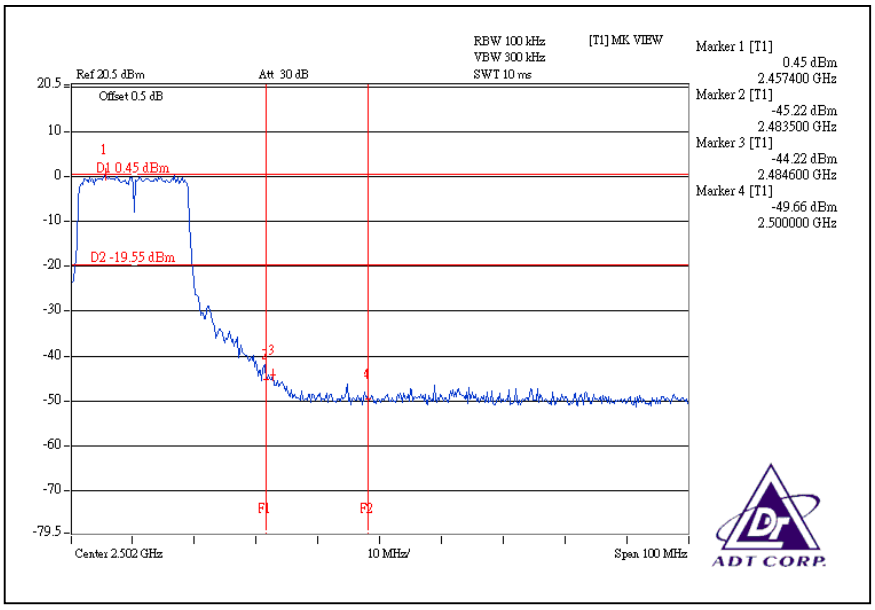

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Marker 1 [T1]
1.39 dBm
2.427120 GHz
Marker 2 [T1]
-39.73 dBm
24.450660 GHz
Marker 3 [T1]
-41.82 dBm
24.250900 GHz
Marker 4 [T1]
-42.05 dBm
24.600480 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 2.24 dBm
D2 -17.76 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

## DRAFT 802.11n (20MHz) OFDM MODULATION:

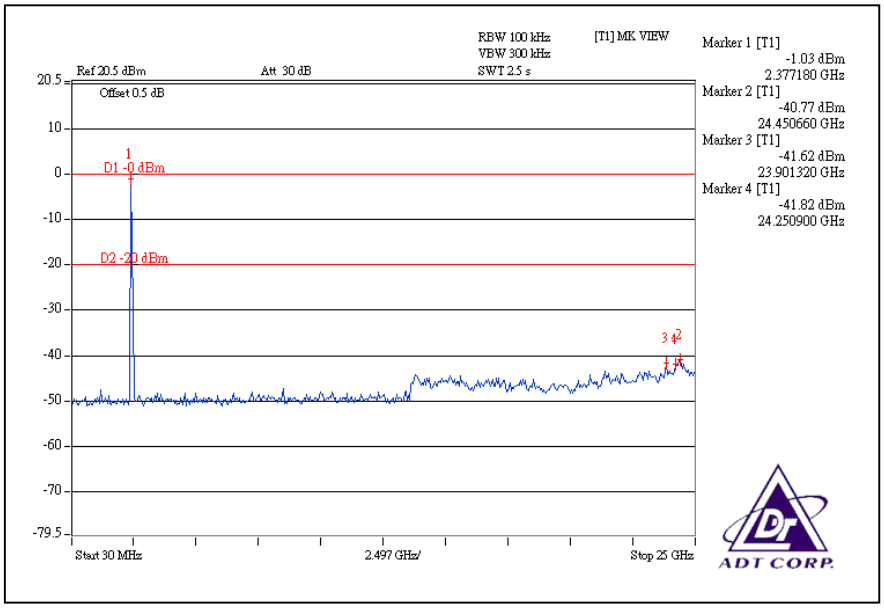
For Chain (0):CH1



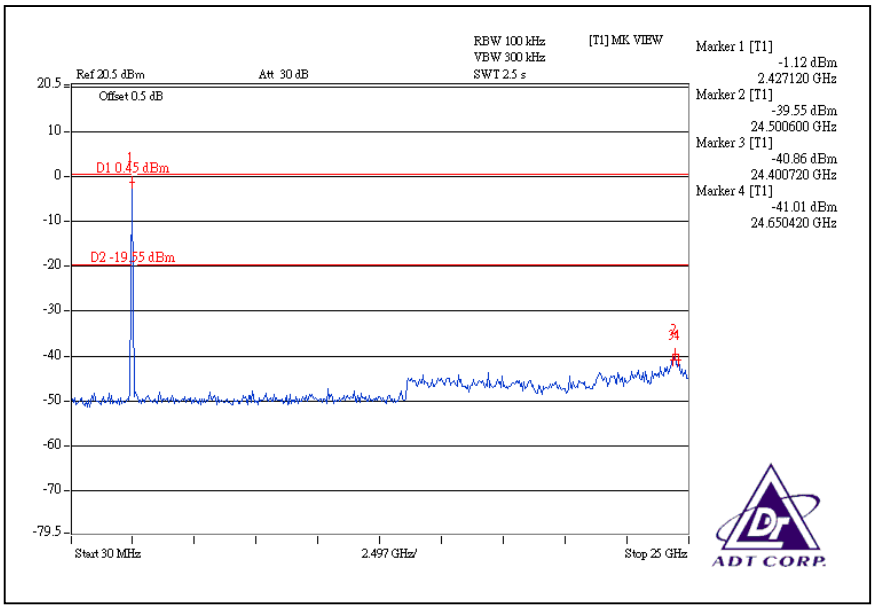

CH11



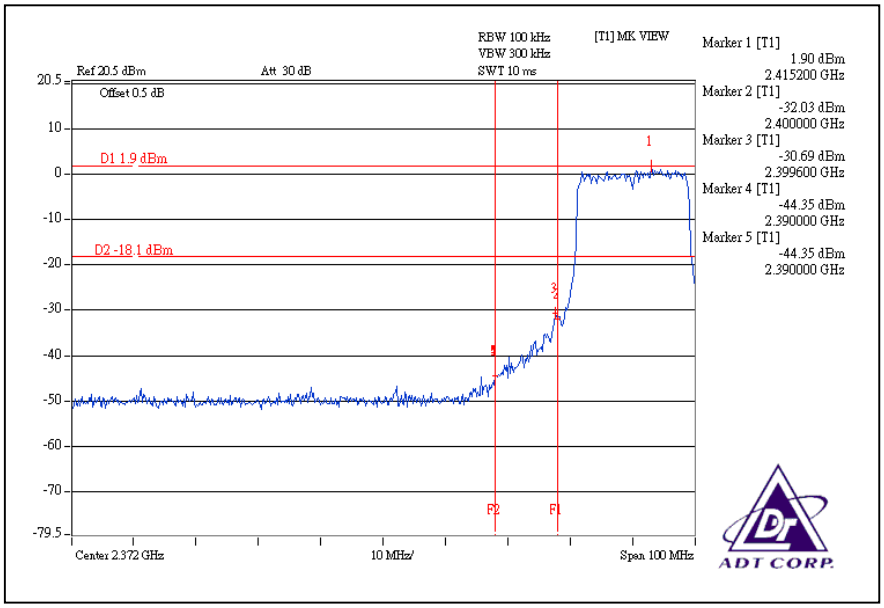
CH1


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -0 dBm
D2 -20 dBm
Marker 1 [T1]
-1.03 dBm
2.377180 GHz
Marker 2 [T1]
-40.77 dBm
24.450660 GHz
Marker 3 [T1]
-41.62 dBm
23.901320 GHz
Marker 4 [T1]
-41.82 dBm
24.250900 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

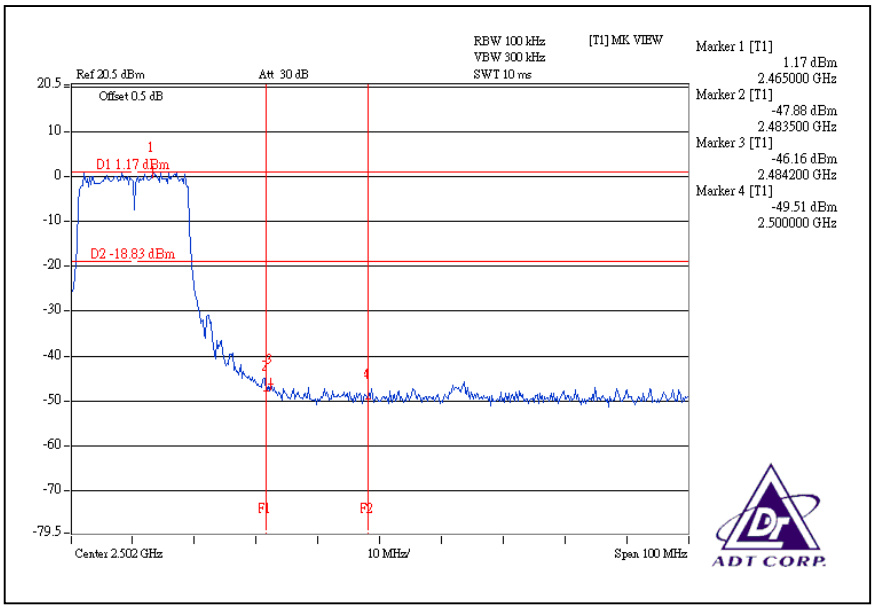
CH11


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 0.45 dBm
D2 -19.55 dBm
Marker 1 [T1]
-1.12 dBm
2.427120 GHz
Marker 2 [T1]
-39.55 dBm
24.500600 GHz
Marker 3 [T1]
-40.86 dBm
24.400720 GHz
Marker 4 [T1]
-41.01 dBm
24.650420 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

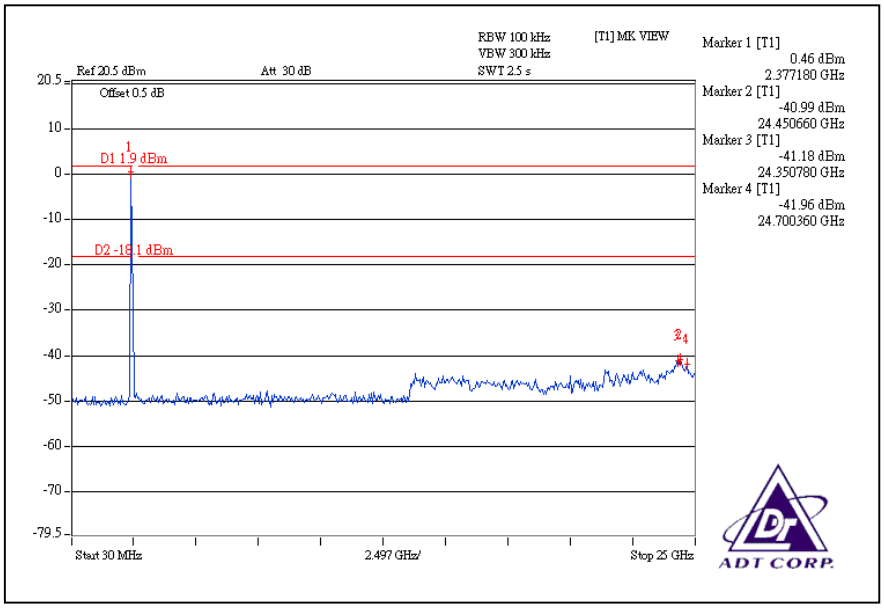
For Chain (1):CH1



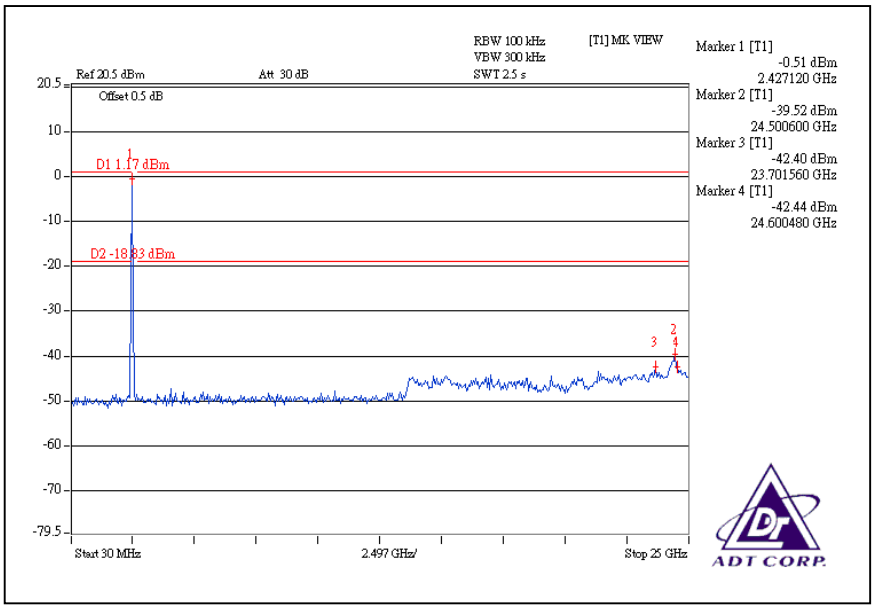

CH11



CH1

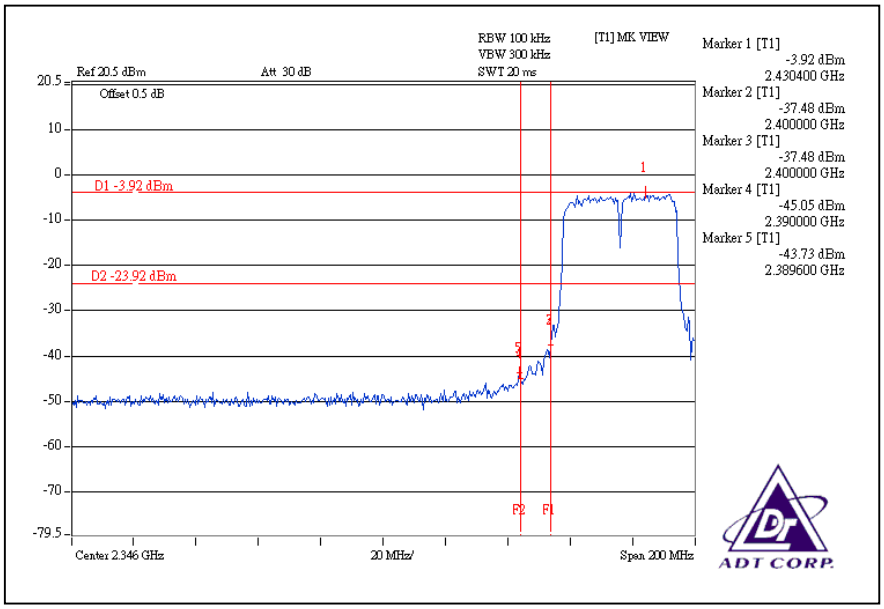

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 1.9 dBm
D2 -18.1 dBm
Marker 1 [T1]
0.46 dBm
2.377180 GHz
Marker 2 [T1]
-40.99 dBm
24.450660 GHz
Marker 3 [T1]
-41.18 dBm
24.350780 GHz
Marker 4 [T1]
-41.96 dBm
24.700360 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

CH11

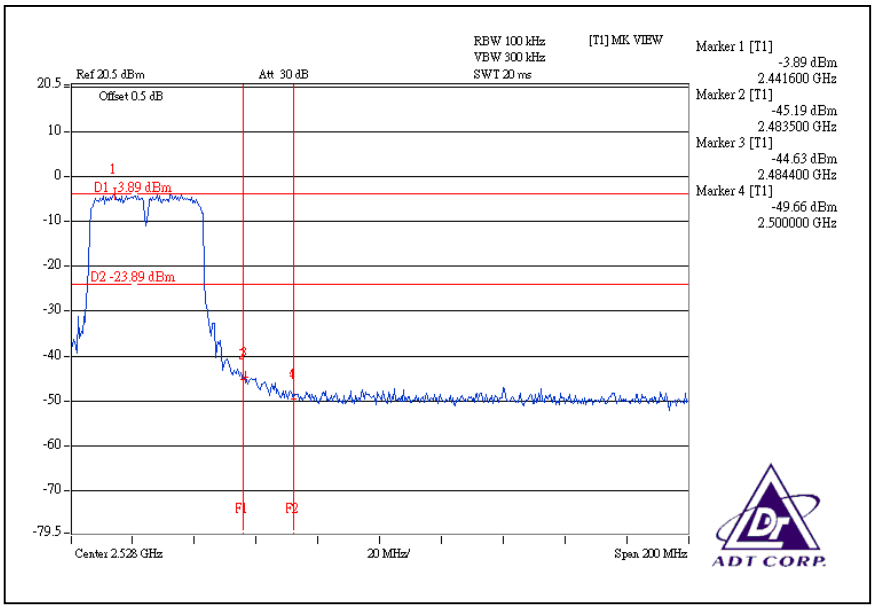

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 1.17 dBm
D2 -18.83 dBm
Marker 1 [T1]
-0.51 dBm
2.427120 GHz
Marker 2 [T1]
-39.52 dBm
24.500600 GHz
Marker 3 [T1]
-42.40 dBm
23.701560 GHz
Marker 4 [T1]
-42.44 dBm
24.600480 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

## DRAFT 802.11n (40MHz) OFDM MODULATION:

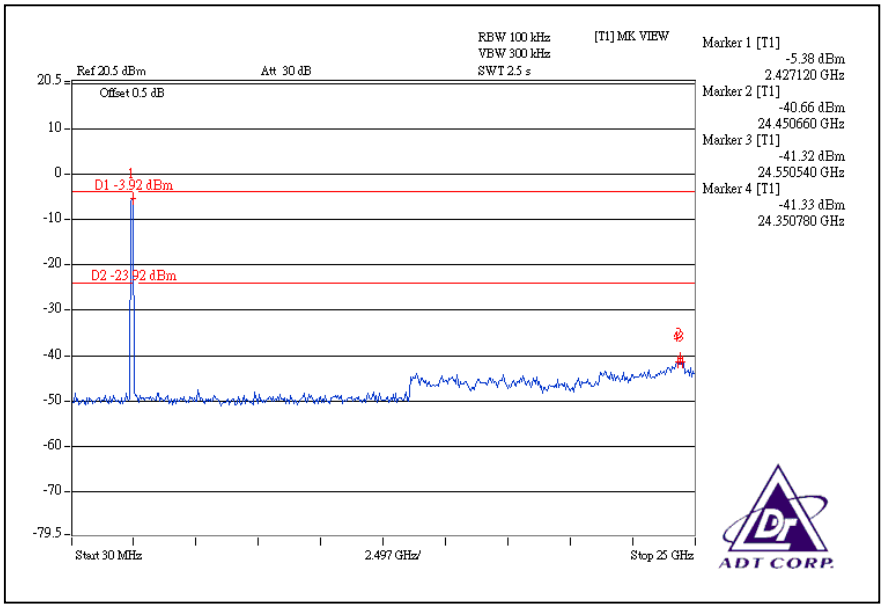
For Chain (0):CH1



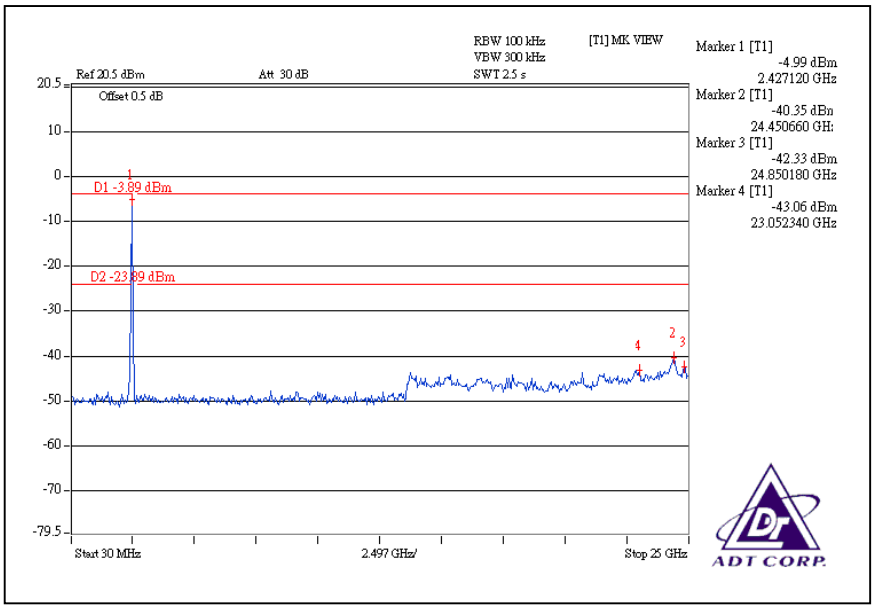

CH7



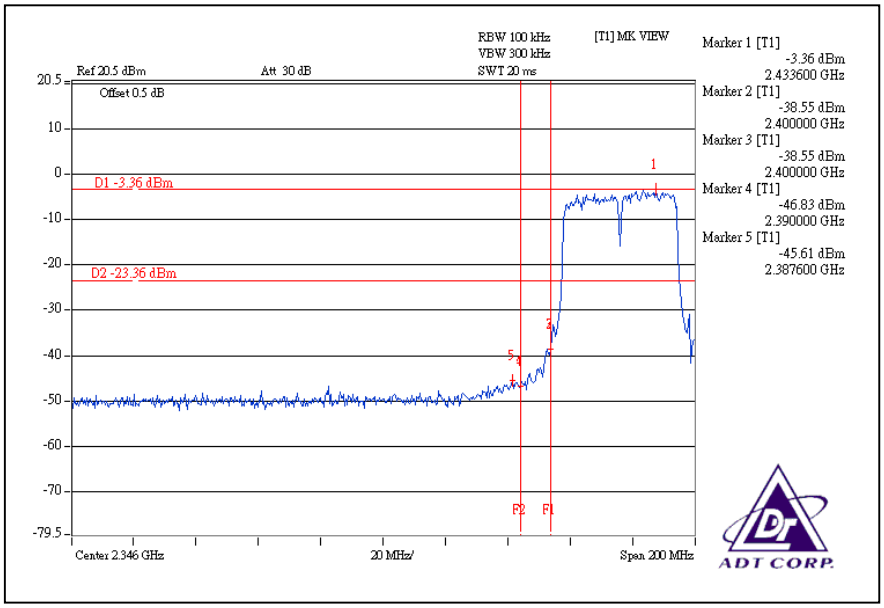
CH1


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Marker 1 [T1]
-5.38 dBm
2.427120 GHz
Marker 2 [T1]
-40.66 dBm
24.450660 GHz
Marker 3 [T1]
-41.32 dBm
24.550540 GHz
Marker 4 [T1]
-41.33 dBm
24.350780 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -3.92 dBm
D2 -23.92 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

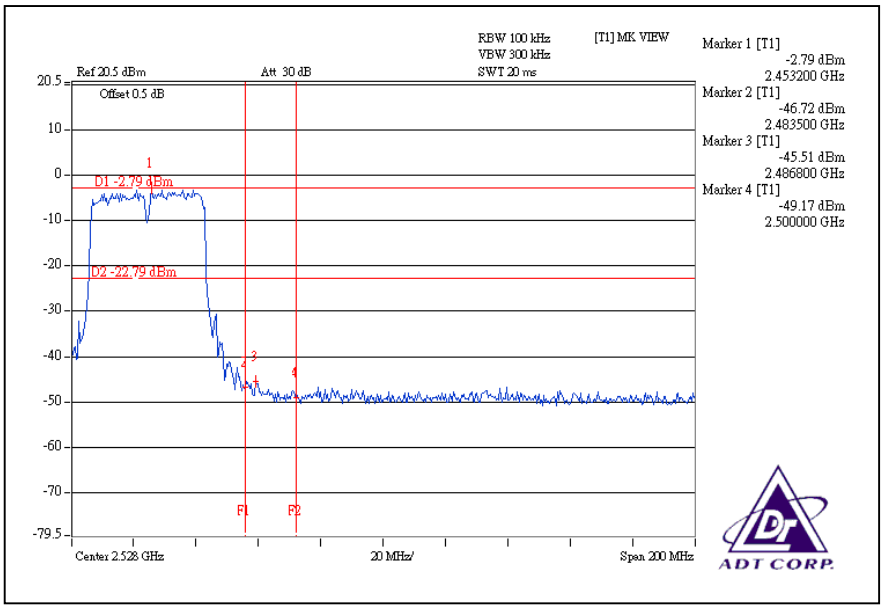
CH7


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Marker 1 [T1]
-4.99 dBm
2.427120 GHz
Marker 2 [T1]
-40.35 dBm
24.450660 GHz
Marker 3 [T1]
-42.33 dBm
24.850180 GHz
Marker 4 [T1]
-43.06 dBm
23.052340 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -3.89 dBm
D2 -23.89 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

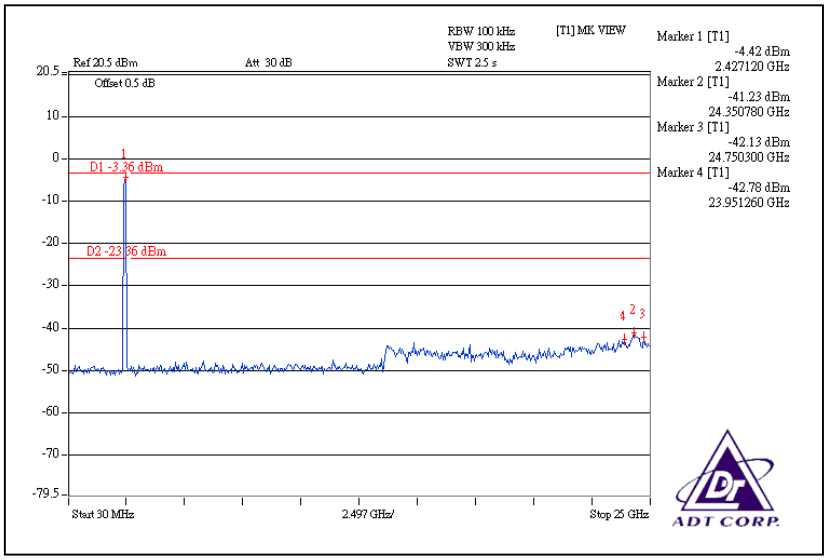
For Chain (1):CH1



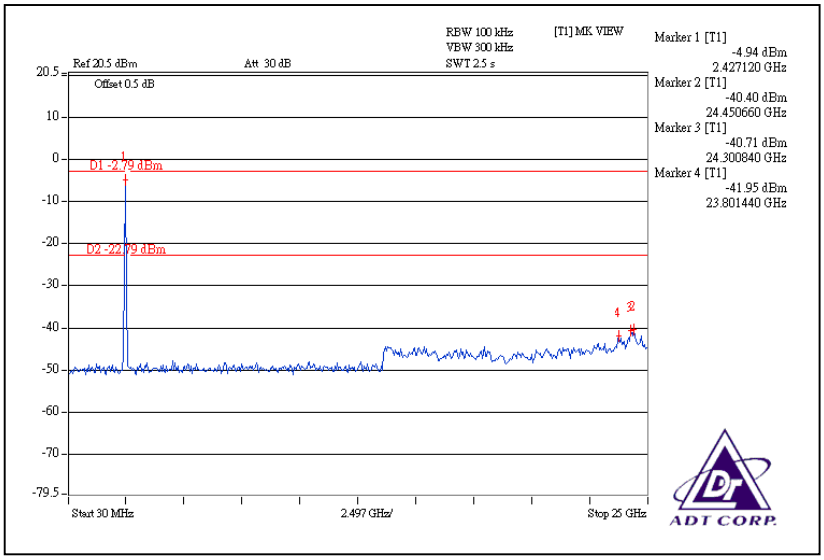

CH7



CH1


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -3.36 dBm
D2 -23.36 dBm
Marker 1 [T1]
-4.42 dBm
2.427120 GHz
Marker 2 [T1]
-41.23 dBm
24.350780 GHz
Marker 3 [T1]
-42.13 dBm
24.750300 GHz
Marker 4 [T1]
-42.78 dBm
23.951260 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

CH7


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -2.79 dBm
D2 -22.79 dBm
Marker 1 [T1]
-4.94 dBm
2.427120 GHz
Marker 2 [T1]
-40.40 dBm
24.450660 GHz
Marker 3 [T1]
-40.71 dBm
24.300840 GHz
Marker 4 [T1]
-41.95 dBm
23.801440 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

## 4.7 ANTENNA REQUIREMENT

### 4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.7.2 ANTENNA CONNECTED CONSTRUCTION

There are three antennas provided to this EUT, please refer to the following table:

| Transmitter Circuit | Antenna Type | Antenna Connector | Gain(dBi) | Cable lose(dB) | Net Gain(dBi) |
|---|---|---|---|---|---|
| Chain(0) | Dipole | I-PEX | 1.8 | 0.9 | 0.9 |
| Chain(1) | Dipole | I-PEX | 1.8 | 0.4 | 1.4 |
| Chain(2) | Dipole | I-PEX | 1.8 | 0.7 | 1.1 |

# 5. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

| | |
|---|---|
| **USA** | FCC, UL, A2LA |
| **Germany** | TUV Rheinland |
| **Japan** | VCCI |
| **Norway** | NEMKO |
| **Canada** | INDUSTRY CANADA , CSA |
| **R.O.C.** | TAF, BSMI, NCC |
| **Netherlands** | Telefication |
| **Singapore** | GOST-ASIA(MOU) |
| **Russia** | CERTIS(MOU) |

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:


**Linko EMC/RF Lab**:
Tel: 886-2-26052180
Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab**:
Tel: 886-3-5935343
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab**:
Tel: 886-3-3183232
Fax: 886-3-3185050

**Web Site**: www.adt.com.tw


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

# 6.APPENDIX-A- MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.