

# FCC TEST REPORT (15.247)

**REPORT NO.:** RF110616E05

**MODEL NO.:** RT3572

**FCC ID:** VQF-RT3572

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**TESTED:** June 22 to Aug. 11, 2011

**ISSUED:** Aug. 23, 2011

**APPLICANT:** Ralink Technology Corporation

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110616E05	Original release	Aug. 23, 2011

## 1. CERTIFICATION

**PRODUCT:** 802.11a/b/g/n USB Dongle  
**BRAND NAME:** Ralink  
**MODEL NO.:** RT3572  
**TEST SAMPLE:** MASS-PRODUCTION  
**APPLICANT:** Ralink Technology Corporation  
**TESTED:** June 22 to Aug. 11, 2011  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003  
ANSI C63.10-2009

The above equipment (Model: RT3572) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY :** Midoli Peng **DATE:** Aug. 23, 2011  
( Midoli Peng, Specialist )

**APPROVED BY :** May Chen **DATE:** Aug. 23, 2011  
( May Chen, Deputy Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2412~2462MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -9.75dB at 0.478MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2483.5MHz & 2483.74MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is I-PEX not a standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.27dB at 0.412MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -2.7dB at 11490.0MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is I-PEX not a standard connector.

**NOTE:**

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5.725~5.850GHz. For the 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz RF parameters was recorded in another test report.



## 2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.81 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.56 dB

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	802.11a/b/g/n USB Dongle
<b>MODEL NO.</b>	RT3572
<b>FCC ID</b>	VQF-RT3572
<b>POWER SUPPLY</b>	DC 5V $\pm$ 10% from host equipment
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	<b>802.11b:</b> 11 / 5.5 / 2 / 1Mbps <b>802.11g:</b> 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps <b>HT20 MCS0~7 (800ns GI):</b> 6.5Mbps, 13Mbps, 19.5Mbps, 26Mbps, 39Mbps, 52Mbps, 58.5Mbps, 65Mbps <b>HT20 MCS8~15 (800ns GI):</b> 13Mbps, 26Mbps, 39Mbps, 52Mbps, 78Mbps, 104Mbps, 117Mbps, 130Mbps <b>HT40 MCS0~7 (800ns GI):</b> 13.5Mbps, 27Mbps, 40.5Mbps, 54Mbps, 81Mbps, 108Mbps, 121.5Mbps, 135Mbps <b>HT40 MCS8~15 (800ns GI):</b> 27Mbps, 54Mbps, 81Mbps, 108Mbps, 162Mbps, 216Mbps, 243Mbps, 270Mbps <b>HT20 MCS0~7 (400ns GI):</b> 7.2Mbps, 14.4Mbps, 21.7Mbps, 28.9Mbps, 43.3Mbps, 57.8Mbps, 65Mbps, 72.2Mbps <b>HT20 MCS8~15 (400ns GI):</b> 14.444Mbps, 28.889Mbps, 43.333Mbps, 57.778Mbps, 86.667Mbps, 115.556Mbps, 130Mbps, 144.444Mbps <b>HT40 MCS0~7 (400ns GI):</b> 15Mbps, 30Mbps, 45Mbps, 60Mbps, 90Mbps, 120Mbps, 135Mbps, 150Mbps <b>HT40 MCS8~15 (400ns GI):</b> 30Mbps, 60Mbps, 90Mbps, 120Mbps, 180Mbps, 240Mbps, 270Mbps, 300Mbps
<b>OPERATING FREQUENCY</b>	<b>For 15.407</b> 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.58GHz, 5.66~5.7GHz
	<b>For 15.247</b> 802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz

<b>NUMBER OF CHANNEL</b>	<b>For 15.407</b> 16 for 802.11a, 802.11n (20MHz) 8 for 802.11n (40MHz)
	<b>For 15.247(2.4GHz)</b> 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) <b>For 15.247(5GHz)</b> 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
<b>MAXIMUM OUTPUT POWER</b>	<b>For 15.407</b> 802.11a: 93.3mW 802.11n (20MHz): 135.2mW 802.11n (40MHz): 100.3mW <b>For 15.247(2.4GHz)</b> 802.11b: 131.8mW 802.11g: 316.2mW 802.11n (20MHz): 570.2mW 802.11n (40MHz): 432.8mW <b>For 15.247(5GHz)</b> 802.11a: 138.0mW 802.11n (20MHz): 269.8mW 802.11n (40MHz): 266.7mW
<b>ANTENNA TYPE</b>	Please see note
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	NA
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

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

Transmitter Circuit	Brand	Model	Gain (dBi) include cable loss	Antenna Type	Cable length(mm)	Connector
Chain (0)	ACON	APP6P-700119	2.4G: 3.25 5G: 5.01	PIFA	225	I-PEX
Chain (1)	ACON	APP6P-700119	2.4G: 3.25 5G: 5.01	PIFA	225	I-PEX

- 2.4GHz and 5GHz technology cannot transmit at same time.

3. For radiated : The EUT's antenna was pre-tested under the following modes:

Test Mode	Description
Mode A	X-Y axis
<b>Mode B</b>	<b>Y-Z axis</b>
Mode C	X-Z axis

From the above modes, the worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

4. The EUT is 2 \* 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The 11a/b/g legacy mode is limited to single transmitter only.
5. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
6. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

#### Operated in 2400 ~ 2483.5MHz band:

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

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

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

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

#### Operated in 5725 ~ 5850MHz band:

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

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

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

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

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

### ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	TX CHAIN(0)	TX CHAIN(1)
A	802.11 b	√	
B	802.11 g	√	
C	802.11 a	√	
D	802.11n(20MHz) for MCS0~15	√	√
E	802.11n(40MHz) for MCS0~15	√	√

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.

### 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)	COMBINATION
For 2.4 GHz 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (20MHz)	149 to 165	157	OFDM	BPSK	6.5	D

### **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)	COMBINATION
For 2.4 GHz 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (40MHz)	149 to 165	157	OFDM	BPSK	6.5	D

### **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 TYPE	DATA RATE (Mbps)	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
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	E
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	C
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	E

#### **ANTENNA PORT CONDUCTED MEASUREMENT:**

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	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
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	E
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	C
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.	D
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	E

#### **CONDUCTED OUT-BAND EMISSION 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)	COMBINATION MODE
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 11	OFDM	BPSK	6	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	13.5	E
802.11a	149 to 165	149, 165	OFDM	BPSK	6	C
For 5 GHz 802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	6.	D
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	E





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**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	27deg. C, 66%RH	120Vac, 60Hz	Kyle Huang
RE<1G	25deg. C, 72%RH	120Vac, 60Hz	Frank Liu
RE <sup>3</sup> 1G	25deg. C, 66%RH	120Vac, 60Hz	Frank Liu
APCM	27deg. C, 67%RH	120Vac, 60Hz	Rex Huang
OB	27deg. C, 67%RH	120Vac, 60Hz	Rex Huang

### **3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

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

**FCC Part 15, Subpart C. (15.247)**

**ANSI C63.4-2003**

**ANSI C63.10-2009**

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

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

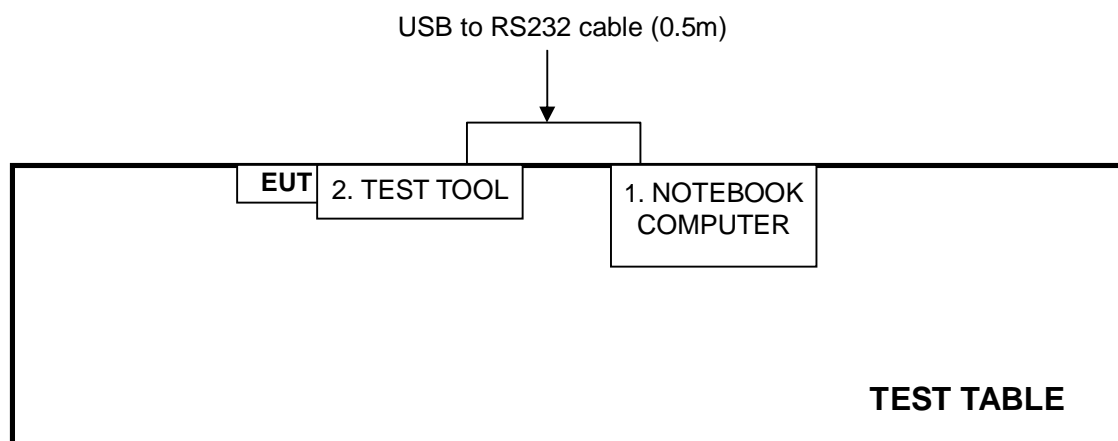
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	TEST TOOL	Ralink	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	USB to RS232 cable(0.5m)

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

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST



## 4. TEST TYPES AND RESULTS (802.11b & g, 2400 ~ 2483.5MHz Band)

### 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

Test date: June 22, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 02, 2011	Mar. 01, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 17, 2010	Sep. 16, 2011
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYEBAO)	5DFB	CONCAB-003	Aug. 06, 2010	Aug. 05, 2011
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

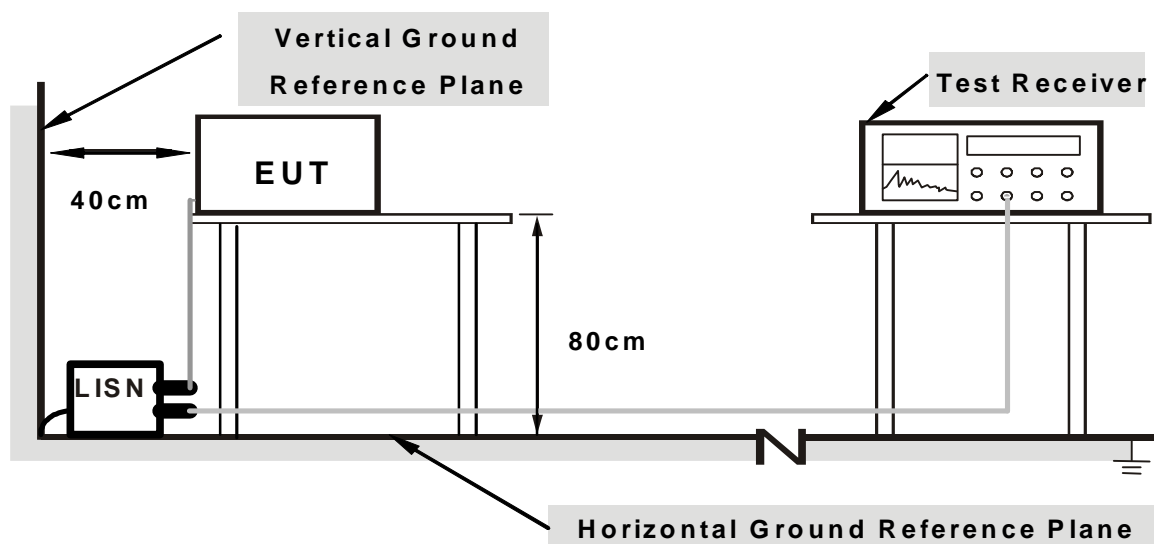
#### 4.1.3 TEST PROCEDURES

- 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

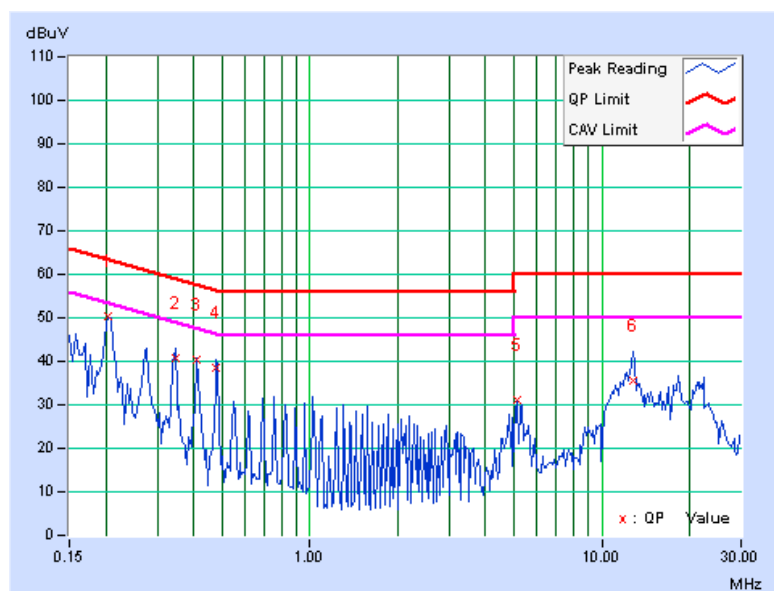
1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “RT3x7XQA.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

#### 4.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.205	0.36	49.88	40.44	50.24	40.80	63.42	53.42	-13.18	-12.62
2	0.345	0.36	40.41	35.73	40.77	36.09	59.07	49.07	-18.30	-12.98
3	0.412	0.36	39.92	35.51	40.28	35.87	57.61	47.61	-17.33	-11.74
4	0.478	0.37	38.13	36.25	38.50	36.62	56.37	46.37	-17.87	-9.75
5	5.141	0.54	30.55	23.05	31.09	23.59	60.00	50.00	-28.91	-26.41
6	12.773	0.86	34.71	27.52	35.57	28.38	60.00	50.00	-24.43	-21.62

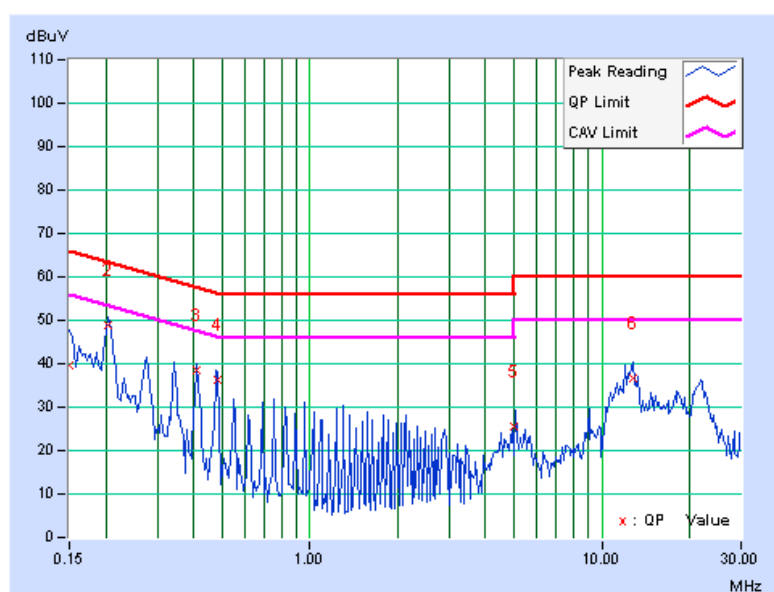
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. The emission levels of other frequencies were very low against the limit.
  3. Margin value = Emission level - Limit value
  4. Correction factor = Insertion loss + Cable loss
  5. Emission Level = Correction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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor [dB]	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	39.64	15.89	39.74	15.99	66.00	56.00	-26.26	-40.01
2	0.205	0.10	48.94	40.34	49.04	40.44	63.42	53.42	-14.38	-12.98
3	0.412	0.11	38.44	34.77	38.55	34.88	57.61	47.61	-19.06	-12.73
4	0.482	0.12	36.04	34.98	36.16	35.10	56.30	46.30	-20.15	-11.21
5	5.000	0.28	25.37	19.55	25.65	19.83	56.00	46.00	-30.35	-26.17
6	12.848	0.74	35.79	27.32	36.53	28.06	60.00	50.00	-23.47	-21.94

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





## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.

## 4.2.2 TEST INSTRUMENTS

For below 1GHz: Test date: July 15, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 12, 2011	July 11, 2012
Agilent Pre-Selector	N9039A	MY46520311	July 12, 2011	July 11, 2012
Agilent Signal Generator	N5181A	MY49060517	July 12, 2011	July 11, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 04, 2011	July 03, 2012
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_ V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.



A D T

**For above 1GHz: Test date: Aug. 08, 2011**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 23, 2010	Aug. 22, 2011
Agilent Pre-Selector	N9039A	MY46520310	Aug. 23, 2010	Aug. 22, 2011
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
LIG NEX1 Test Receiver	ER-265	L09068005	Oct. 25, 2010	Oct. 24, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 28, 2011	Feb. 27, 2012
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 22, 2010	Nov. 21, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	NA	NA
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. H.

4. The FCC Site Registration No. is 797305.

5. The CANADA Site Registration No. is IC 7450H-3.

#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

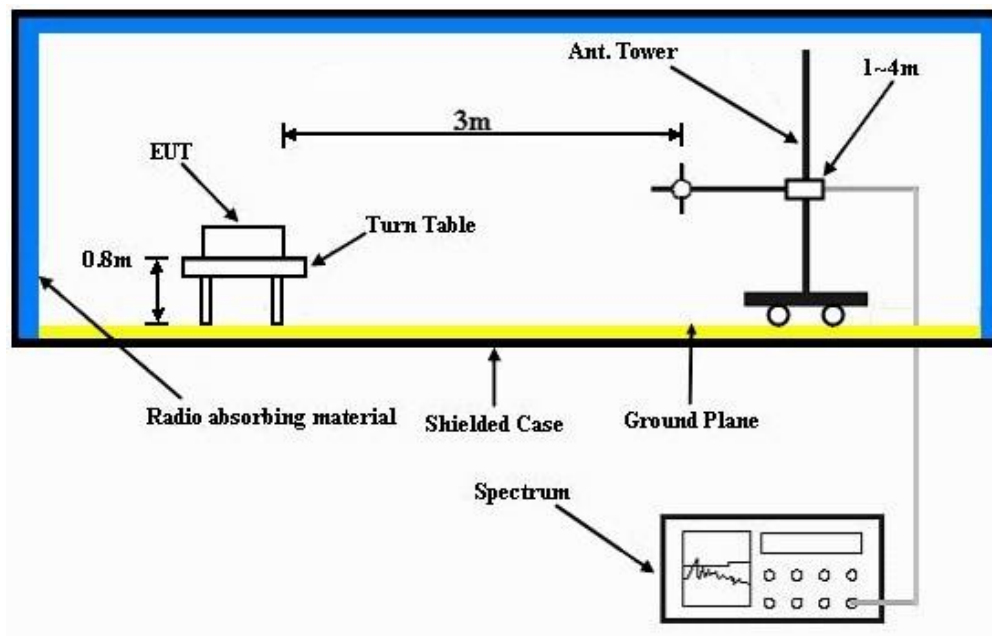
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 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 : 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 72%RH	TESTED BY	Frank Liu

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	73.11	33.2 QP	40.0	-6.8	2.00 H	22	21.51	11.66
2	120.00	36.4 QP	43.5	-7.1	1.50 H	228	23.75	12.64
3	217.46	35.2 QP	46.0	-10.8	1.00 H	277	23.17	12.03
4	240.02	39.1 QP	46.0	-6.9	1.00 H	275	26.25	12.88
5	317.41	39.9 QP	46.0	-6.2	1.00 H	110	24.24	15.61
6	840.01	39.5 QP	46.0	-6.5	1.00 H	237	13.79	25.73
7	959.97	37.5 QP	46.0	-8.5	1.50 H	156	10.56	26.97
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	30.00	33.3 QP	40.0	-6.7	1.00 V	287	20.31	13.01
2	192.00	33.0 QP	43.5	-10.5	1.00 V	293	20.97	12.04
3	302.49	34.4 QP	46.0	-11.6	1.50 V	276	19.13	15.24
4	840.01	39.2 QP	46.0	-6.8	2.00 V	307	13.46	25.73
5	959.97	38.2 QP	46.0	-7.8	1.00 V	146	11.22	26.97

- 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.

## ABOVE 1GHz WORST-CASE DATA

### 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	2386.27	59.3 PK	74.0	-14.7	1.39 H	86	28.10	31.20
2	2386.27	50.9 AV	54.0	-3.1	1.39 H	86	19.70	31.20
3	*2412.00	105.3 PK			1.39 H	86	74.03	31.27
4	*2412.00	102.4 AV			1.39 H	86	71.13	31.27
5	4824.00	54.9 PK	74.0	-19.1	1.55 H	104	15.48	39.42
6	4824.00	52.8 AV	54.0	-1.2	1.55 H	104	13.38	39.42
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	2386.13	59.8 PK	74.0	-14.2	1.50 V	57	28.60	31.20
2	2386.13	52.3 AV	54.0	-1.7	1.50 V	57	21.10	31.20
3	*2412.00	107.3 PK			1.48 V	57	76.03	31.27
4	*2412.00	104.8 AV			1.48 V	57	73.53	31.27
5	4824.00	48.7 PK	74.0	-25.3	1.17 V	119	9.28	39.42
6	4824.00	39.4 AV	54.0	-14.6	1.17 V	119	-0.02	39.42

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	106.3 PK			1.34 H	79	74.96	31.34
2	*2437.00	103.4 AV			1.34 H	79	72.06	31.34
3	4874.00	55.7 PK	74.0	-18.3	1.55 H	107	16.08	39.62
4	4874.00	53.0 AV	54.0	-1.0	1.55 H	107	13.38	39.62
5	7311.00	51.6 PK	74.0	-22.4	1.00 H	63	7.50	44.10
6	7311.00	40.3 AV	54.0	-13.7	1.00 H	63	-3.80	44.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.5 PK			1.48 V	63	77.16	31.34
2	*2437.00	105.5 AV			1.48 V	63	74.16	31.34
3	4874.00	48.4 PK	74.0	-25.6	1.54 V	63	8.78	39.62
4	4874.00	39.3 AV	54.0	-14.7	1.54 V	63	-0.32	39.62
5	7311.00	51.8 PK	74.0	-22.2	1.00 V	53	7.70	44.10
6	7311.00	40.6 AV	54.0	-13.4	1.00 V	53	-3.50	44.10

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





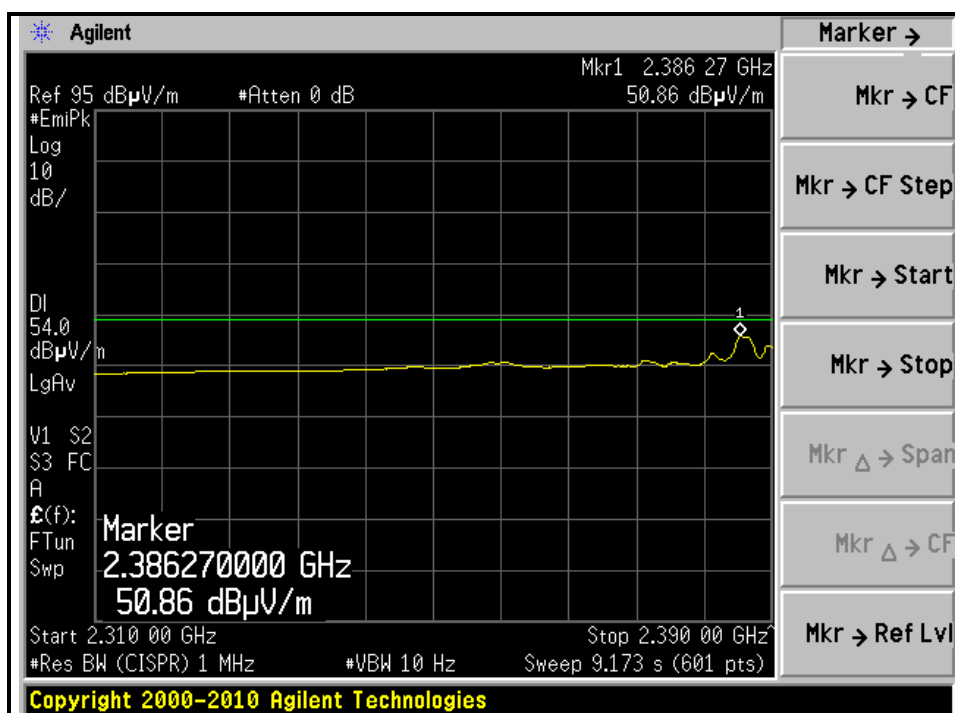
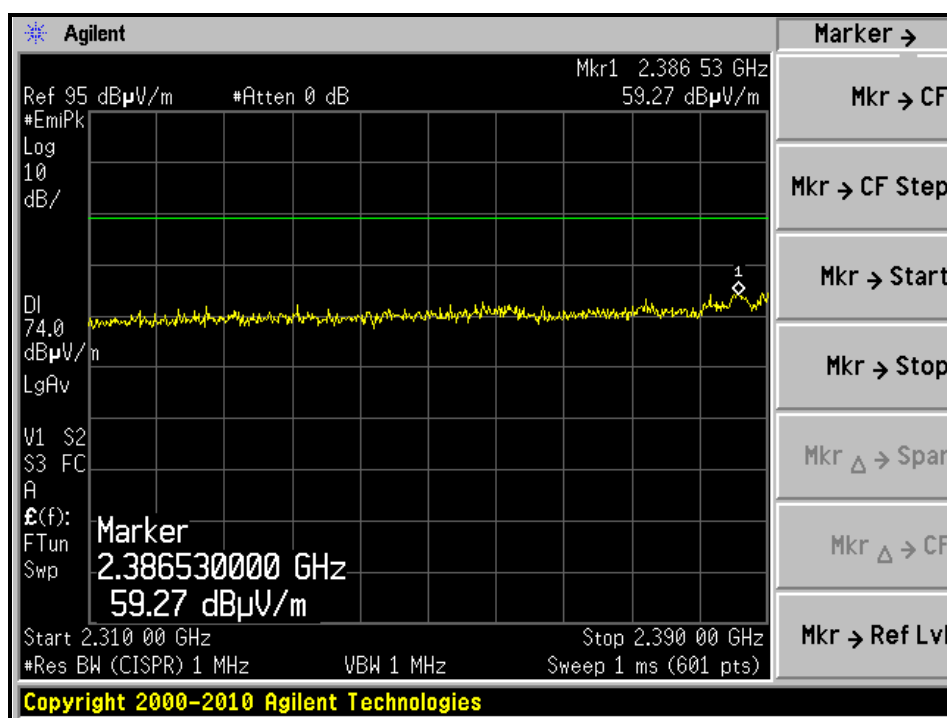
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

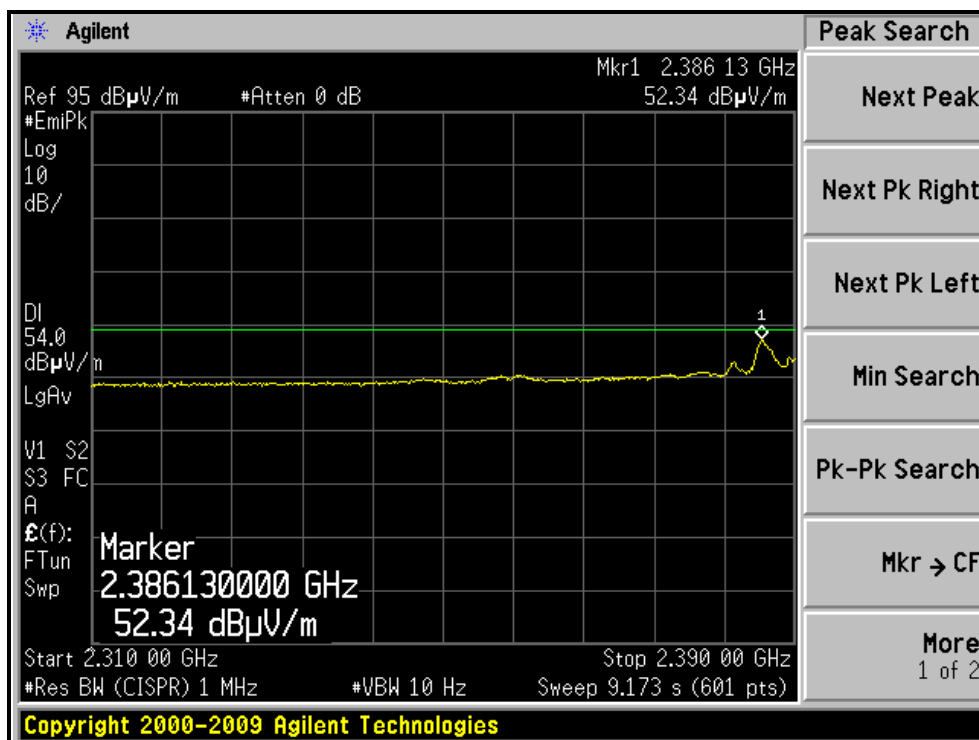
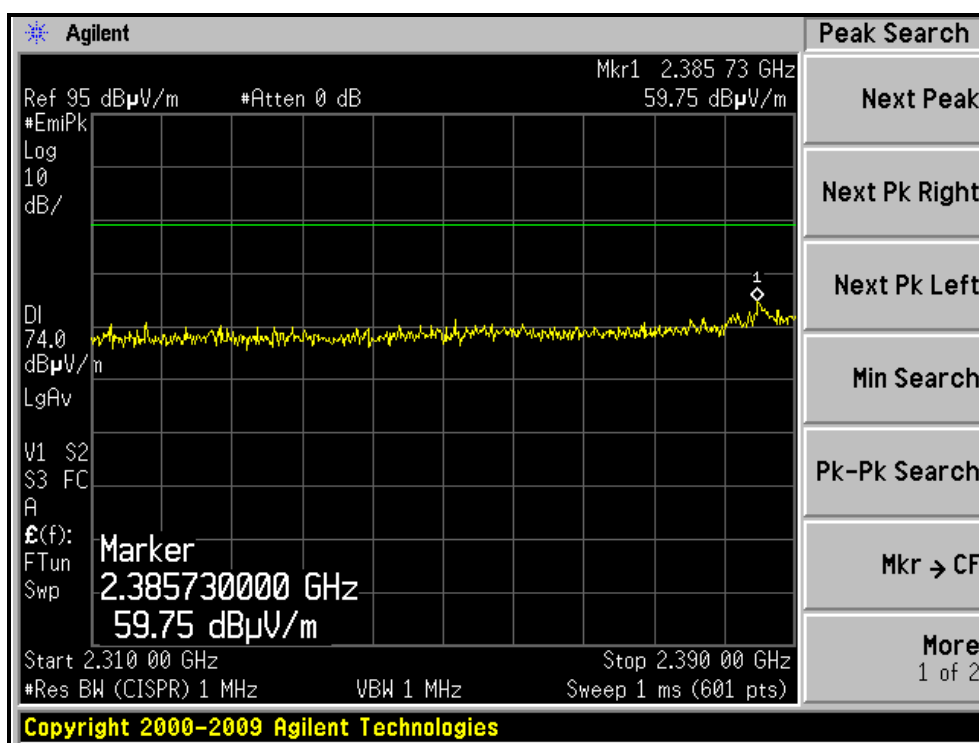
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.4 PK			1.32 H	86	76.00	31.40
2	*2462.00	104.3 AV			1.32 H	86	72.90	31.40
3	2483.50	58.1 PK	74.0	-15.9	1.38 H	84	26.64	31.46
4	2483.50	49.6 AV	54.0	-4.4	1.38 H	84	18.14	31.46
5	4924.00	55.5 PK	74.0	-18.5	1.58 H	104	15.68	39.82
6	4924.00	52.9 AV	54.0	-1.1	1.58 H	104	13.08	39.82
7	7386.00	51.7 PK	74.0	-22.3	1.00 H	59	7.52	44.18
8	7386.00	40.6 AV	54.0	-13.4	1.00 H	59	-3.58	44.18
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.3 PK			1.42 V	23	77.90	31.40
2	*2462.00	106.0 AV			1.42 V	23	74.60	31.40
3	2483.50	60.2 PK	74.0	-13.8	1.50 V	57	28.74	31.46
4	2483.50	52.9 AV	54.0	-1.1	1.50 V	57	21.44	31.46
5	4924.00	48.6 PK	74.0	-25.4	1.41 V	269	8.78	39.82
6	4924.00	39.6 AV	54.0	-14.4	1.41 V	269	-0.22	39.82
7	7386.00	51.7 PK	74.0	-22.3	1.00 V	63	7.52	44.18
8	7386.00	40.7 AV	54.0	-13.3	1.00 V	63	-3.48	44.18

**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.

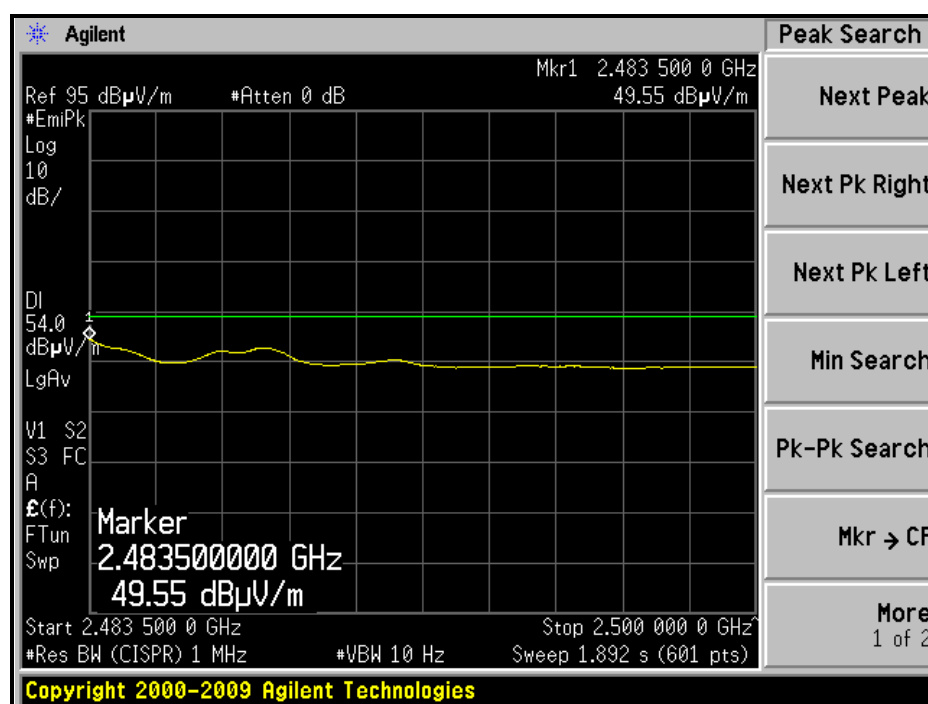
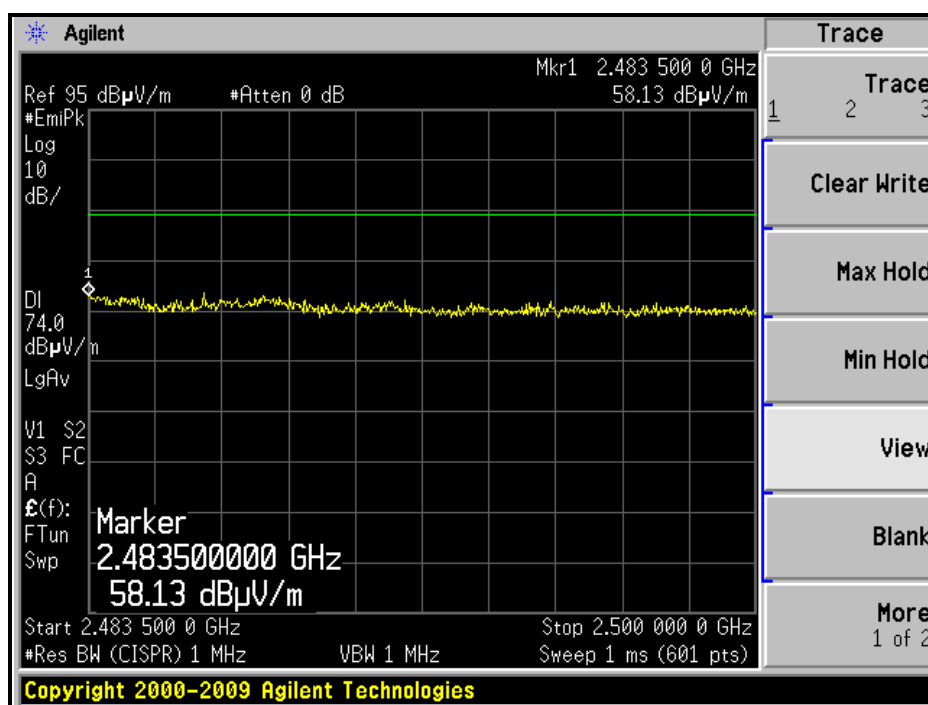
# RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL )



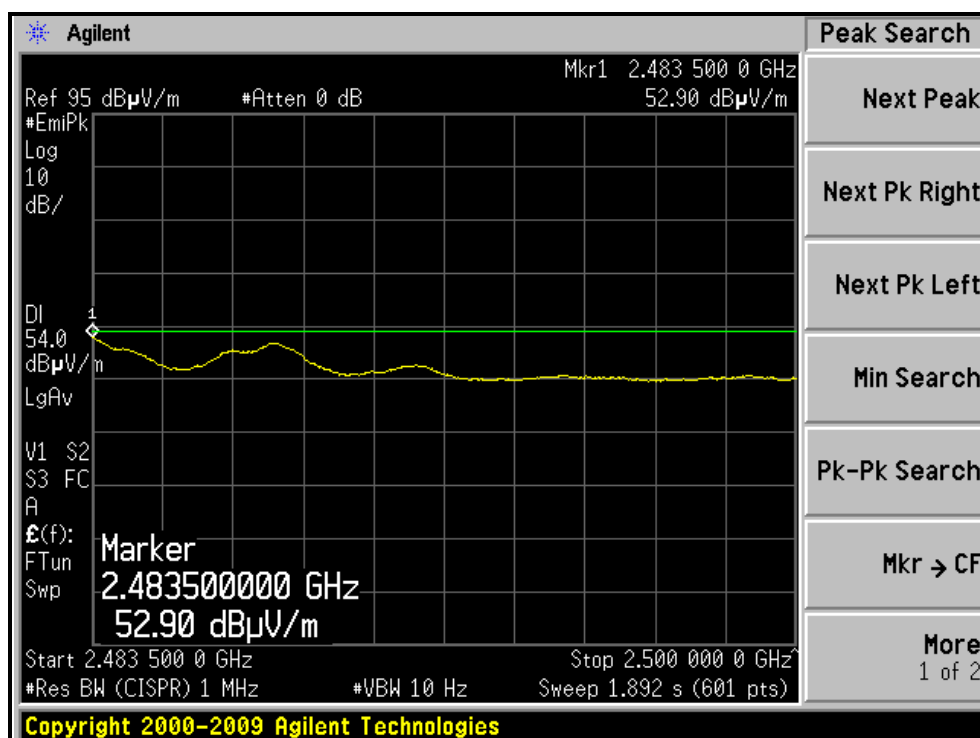
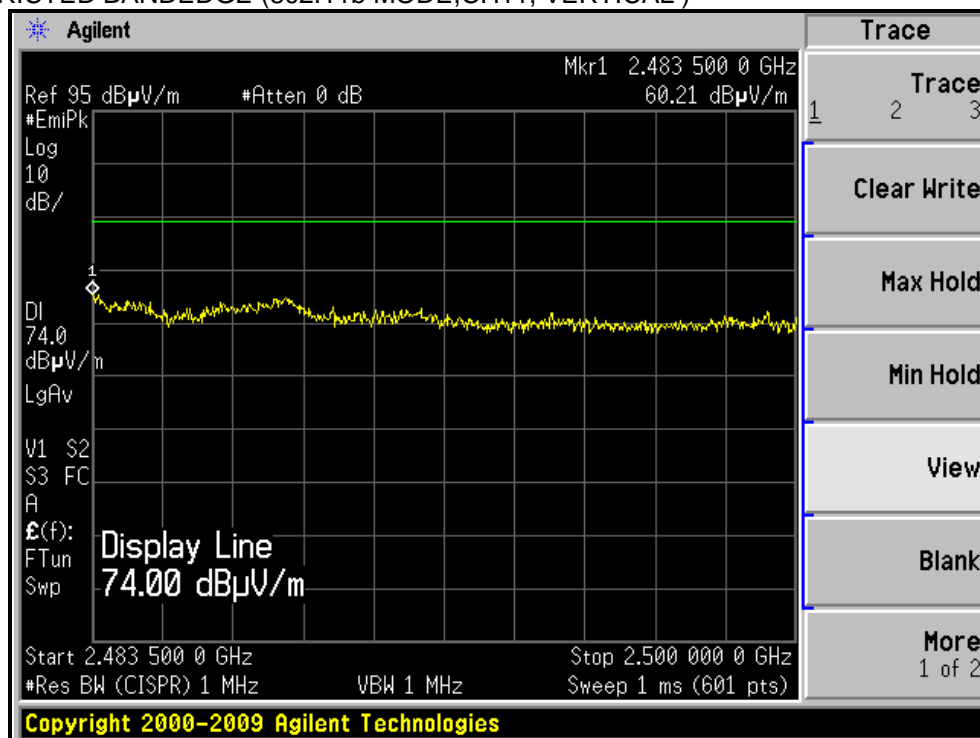
# RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL )



# 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.1 PK	74.0	-7.9	1.46 H	57	34.89	31.21
2	2390.00	51.1 AV	54.0	-2.9	1.46 H	57	19.89	31.21
3	*2412.00	109.3 PK			1.34 H	57	78.03	31.27
4	*2412.00	99.4 AV			1.34 H	57	68.13	31.27
5	4824.00	54.3 PK	74.0	-19.7	1.36 H	219	14.88	39.42
6	4824.00	43.1 AV	54.0	-10.9	1.36 H	219	3.68	39.42
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	69.3 PK	74.0	-4.7	1.40 V	270	38.09	31.21
2	2390.00	53.4 AV	54.0	-0.6	1.40 V	270	22.19	31.21
3	*2412.00	111.5 PK			1.38 V	267	80.23	31.27
4	*2412.00	101.3 AV			1.38 V	267	70.03	31.27
5	4824.00	48.5 PK	74.0	-25.5	1.00 V	59	9.08	39.42
6	4824.00	39.4 AV	54.0	-14.6	1.00 V	59	-0.02	39.42

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	112.3 PK			1.31 H	56	80.96	31.34
2	*2437.00	101.9 AV			1.31 H	56	70.56	31.34
3	4874.00	55.3 PK	74.0	-18.7	1.31 H	79	15.68	39.62
4	4874.00	46.4 AV	54.0	-7.6	1.31 H	79	6.78	39.62
5	7311.00	54.3 PK	74.0	-19.7	1.34 H	211	10.20	44.10
6	7311.00	40.6 AV	54.0	-13.4	1.34 H	211	-3.50	44.10
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	2384.50	63.2 PK	74.0	-10.8	1.36 V	264	32.00	31.20
2	2384.50	53.3 AV	54.0	-0.7	1.36 V	264	22.10	31.20
3	*2437.00	113.4 PK			1.34 V	269	82.06	31.34
4	*2437.00	102.4 AV			1.34 V	269	71.06	31.34
5	4874.00	50.4 PK	74.0	-23.6	1.00 V	63	10.78	39.62
6	4874.00	41.3 AV	54.0	-12.7	1.00 V	63	1.68	39.62
7	7311.00	52.1 PK	74.0	-21.9	1.00 V	59	8.00	44.10
8	7311.00	39.7 AV	54.0	-14.3	1.00 V	59	-4.40	44.10

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



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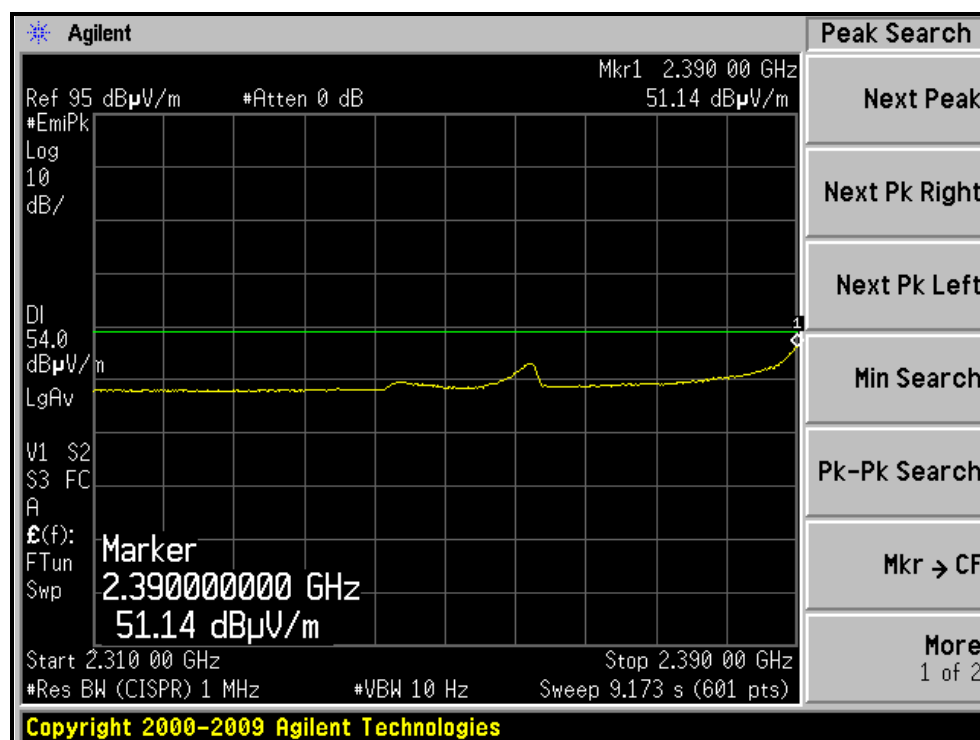
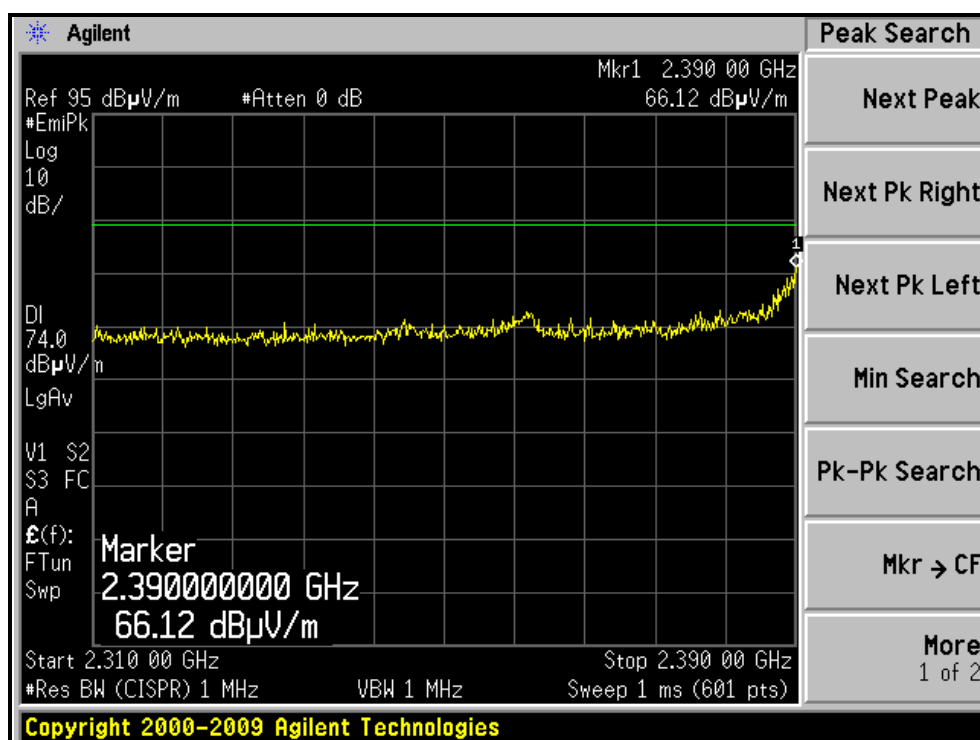
EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.2 PK			1.34 H	261	78.80	31.40
2	*2462.00	98.8 AV			1.34 H	261	67.40	31.40
3	2483.50	66.9 PK	74.0	-7.1	1.50 H	57	35.44	31.46
4	2483.50	52.0 AV	54.0	-2.0	1.50 H	57	20.54	31.46
5	4924.00	54.1 PK	74.0	-19.9	1.31 H	244	14.28	39.82
6	4924.00	42.7 AV	54.0	-11.3	1.31 H	244	2.88	39.82
7	7386.00	54.1 PK	74.0	-19.9	1.31 H	219	9.92	44.18
8	7386.00	40.3 AV	54.0	-13.7	1.31 H	219	-3.88	44.18
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	110.6 PK			1.34 V	267	79.20	31.40
2	*2462.00	100.8 AV			1.34 V	267	69.40	31.40
3	2483.50	71.2 PK	74.0	-2.8	1.39 V	266	39.74	31.46
4	2483.50	53.5 AV	54.0	-0.5	1.39 V	266	22.04	31.46
5	4924.00	48.6 PK	74.0	-25.4	1.00 V	50	8.78	39.82
6	4924.00	39.3 AV	54.0	-14.7	1.00 V	50	-0.52	39.82
7	7386.00	51.7 PK	74.0	-22.3	1.00 V	48	7.52	44.18
8	7386.00	39.5 AV	54.0	-14.5	1.00 V	48	-4.68	44.18

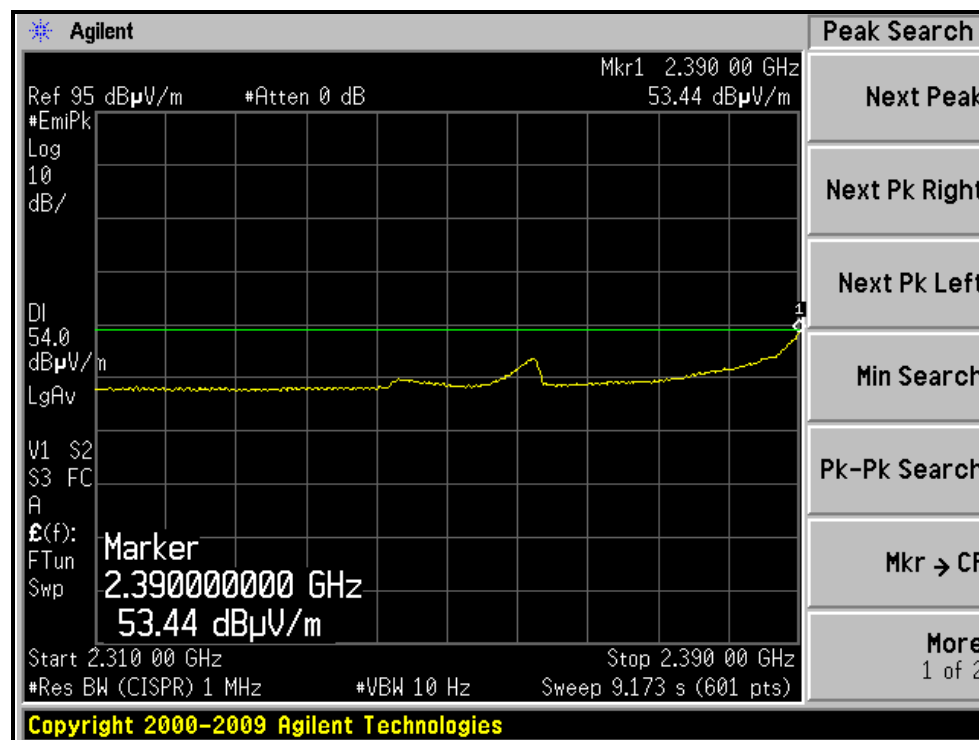
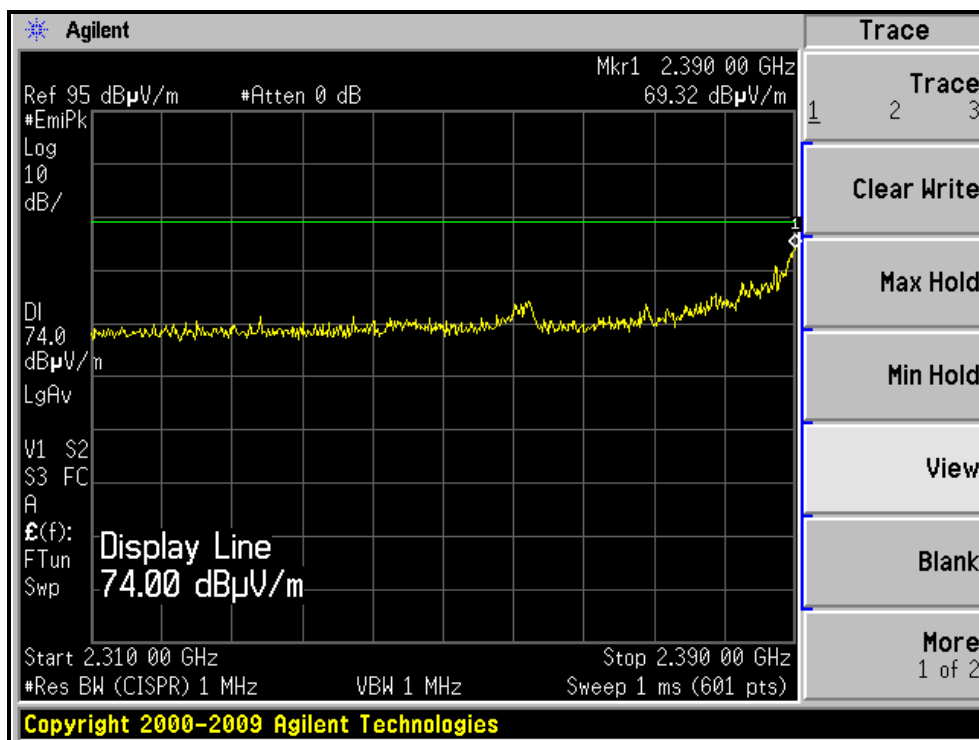
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental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



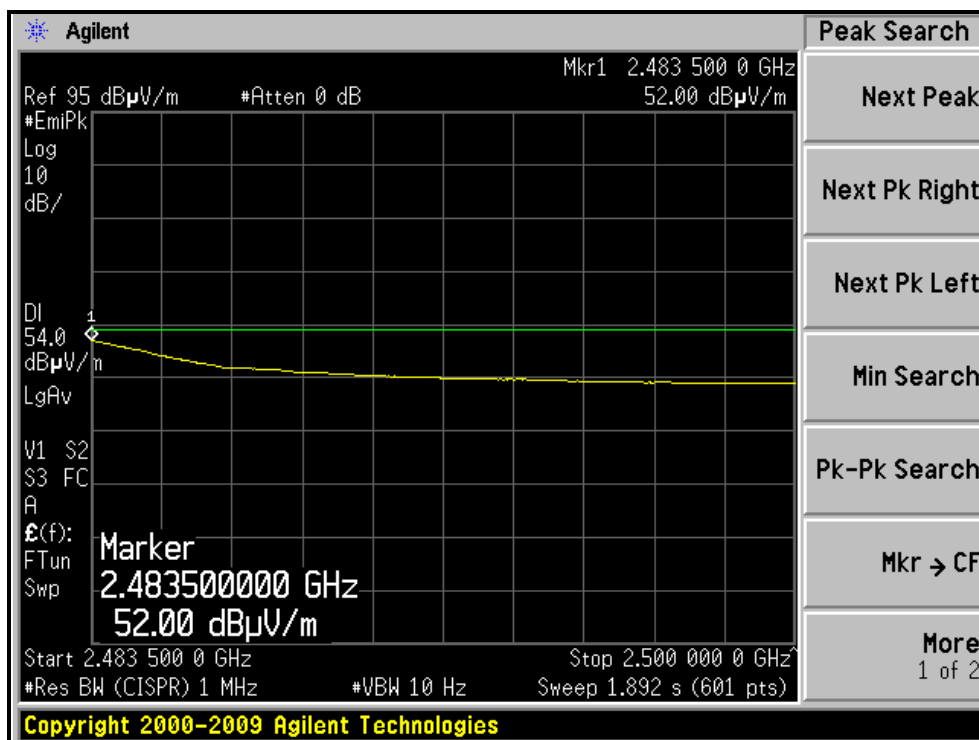
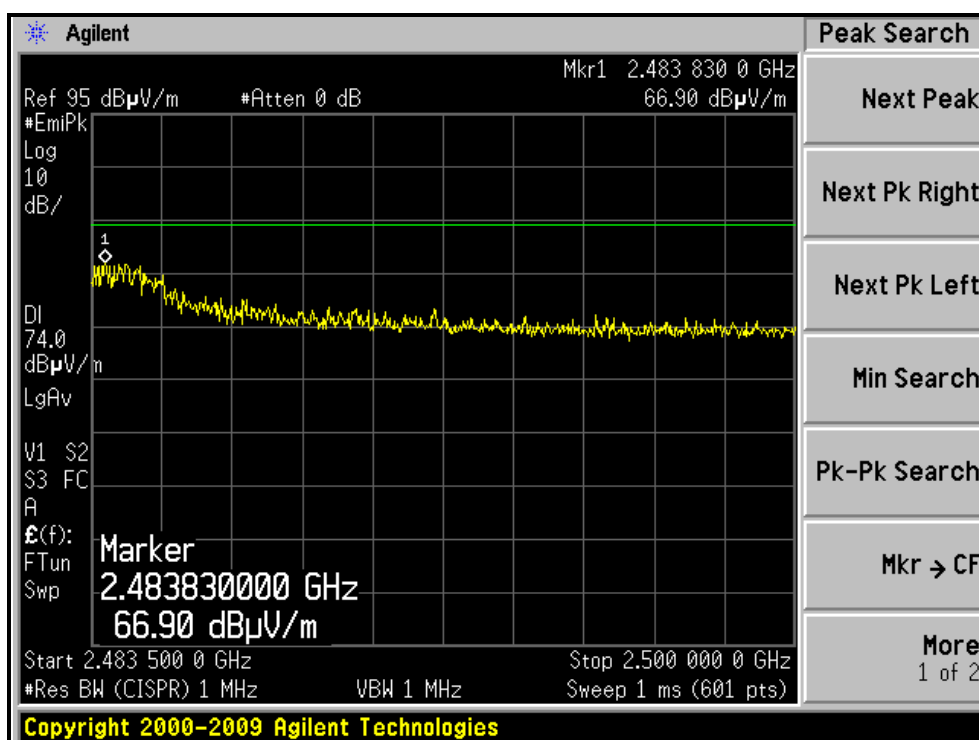
# RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL )



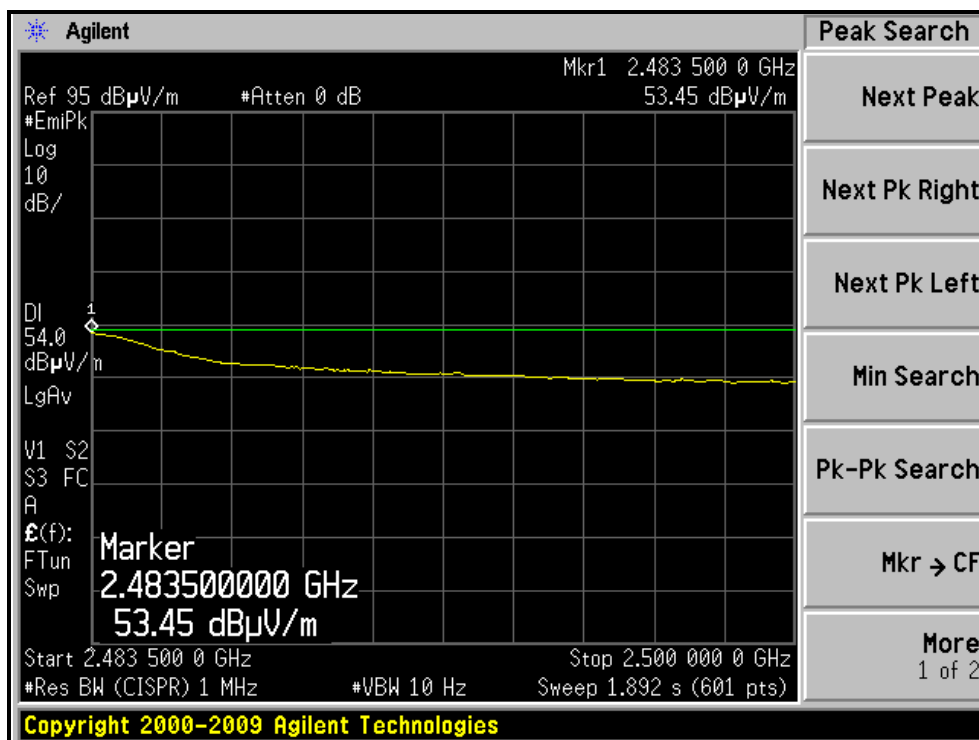
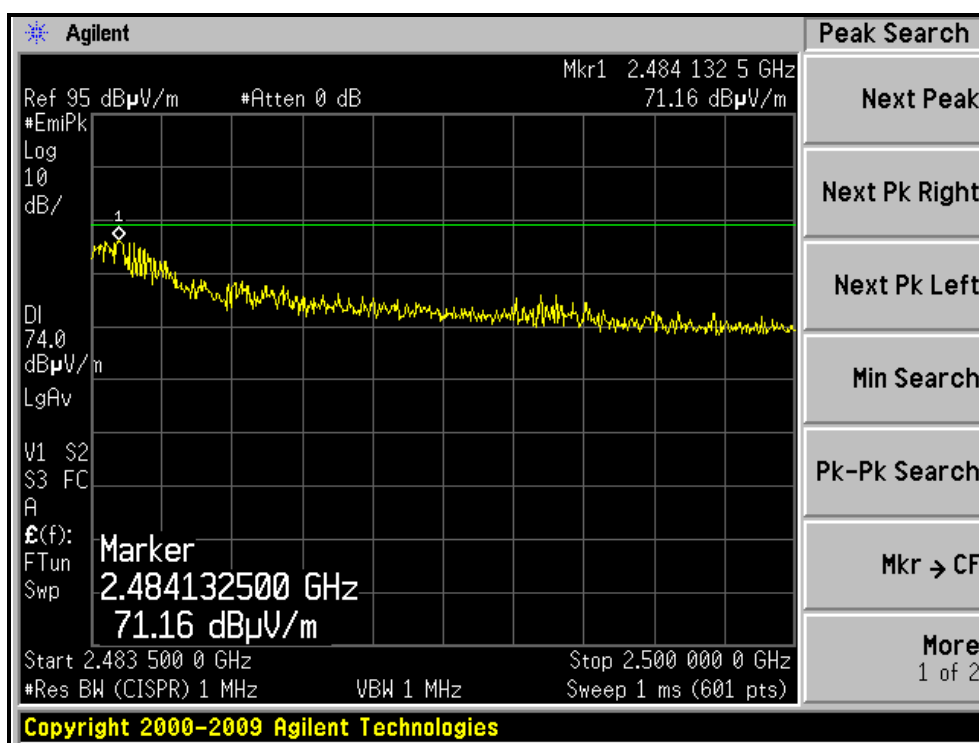
# RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL )



# RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL )



# RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL )



# 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.4 PK	74.0	-5.6	1.30 H	269	37.19	31.21
2	2390.00	53.3 AV	54.0	-0.7	1.30 H	269	22.09	31.21
3	*2412.00	112.4 PK			1.31 H	264	81.13	31.27
4	*2412.00	100.4 AV			1.31 H	264	69.13	31.27
5	4824.00	54.2 PK	74.0	-19.8	1.36 H	255	14.78	39.42
6	4824.00	42.6 AV	54.0	-11.4	1.36 H	255	3.18	39.42
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	67.4 PK	74.0	-6.6	1.32 V	266	36.19	31.21
2	2390.00	53.3 AV	54.0	-0.7	1.32 V	266	22.09	31.21
3	*2412.00	111.3 PK			1.31 V	264	80.03	31.27
4	*2412.00	99.5 AV			1.31 V	264	68.23	31.27
5	4824.00	48.6 PK	74.0	-25.4	1.03 V	40	9.18	39.42
6	4824.00	39.2 AV	54.0	-14.8	1.03 V	40	-0.22	39.42

**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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	113.9 PK			1.32 H	270	82.56	31.34
2	*2437.00	102.2 AV			1.32 H	270	70.86	31.34
3	2485.30	64.2 PK	74.0	-9.8	1.32 H	270	32.74	31.46
4	2485.30	52.6 AV	54.0	-1.4	1.32 H	270	21.14	31.46
5	2488.80	64.9 PK	74.0	-9.1	1.33 H	271	33.43	31.47
6	2488.80	53.1 AV	54.0	-0.9	1.33 H	271	21.63	31.47
7	4874.00	54.0 PK	74.0	-20.0	1.32 H	246	14.38	39.62
8	4874.00	42.5 AV	54.0	-11.5	1.32 H	246	2.88	39.62
9	7311.00	54.5 PK	74.0	-19.5	1.32 H	223	10.40	44.10
10	7311.00	40.4 AV	54.0	-13.6	1.32 H	223	-3.70	44.10
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	112.9 PK			1.34 V	261	81.56	31.34
2	*2437.00	101.3 AV			1.34 V	261	69.96	31.34
3	4874.00	49.0 PK	74.0	-25.0	1.00 V	36	9.38	39.62
4	4874.00	39.4 AV	54.0	-14.6	1.00 V	36	-0.22	39.62
5	7311.00	51.3 PK	74.0	-22.7	1.01 V	48	7.20	44.10
6	7311.00	39.4 AV	54.0	-14.6	1.01 V	48	-4.70	44.10

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



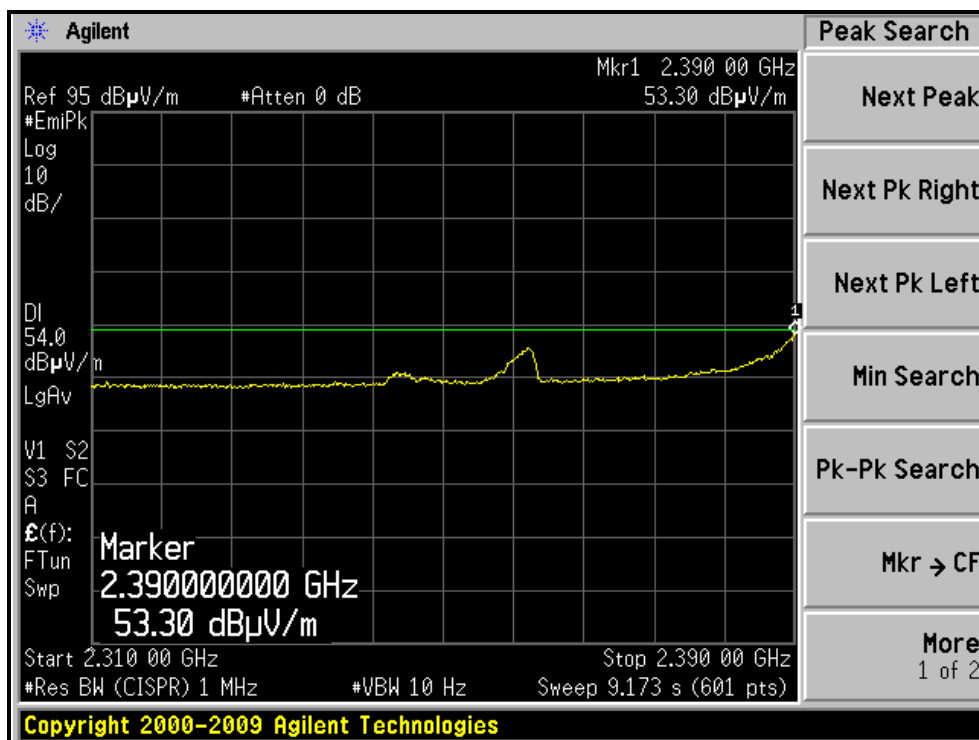
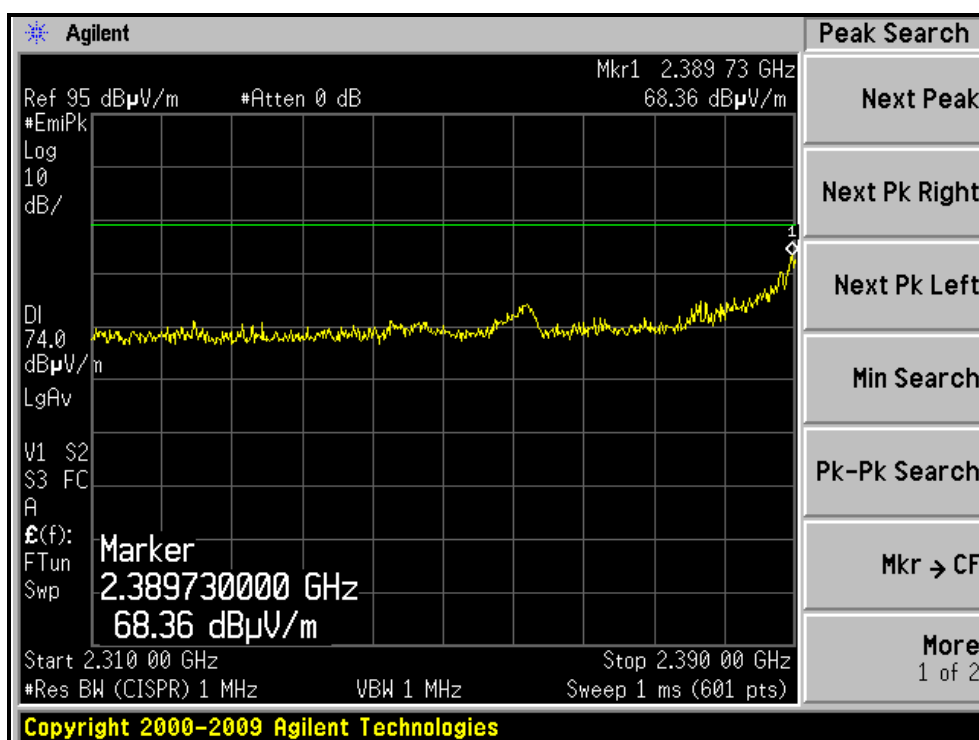
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	111.4 PK			1.31 H	273	80.00	31.40
2	*2462.00	100.8 AV			1.31 H	273	69.40	31.40
3	2483.50	70.8 PK	74.0	-3.2	1.36 H	266	39.34	31.46
4	2483.50	52.6 AV	54.0	-1.4	1.36 H	266	21.14	31.46
5	4924.00	54.1 PK	74.0	-19.9	1.36 H	242	14.28	39.82
6	4924.00	42.5 AV	54.0	-11.5	1.36 H	242	2.68	39.82
7	7386.00	54.1 PK	74.0	-19.9	1.26 H	217	9.92	44.18
8	7386.00	40.3 AV	54.0	-13.7	1.26 H	217	-3.88	44.18
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	110.7 PK			1.39 V	264	79.30	31.40
2	*2462.00	99.8 AV			1.39 V	264	68.40	31.40
3	2483.50	72.1 PK	74.0	-1.9	1.34 V	264	40.64	31.46
4	2483.50	53.4 AV	54.0	-0.6	1.34 V	264	21.94	31.46
5	4924.00	48.9 PK	74.0	-25.1	1.00 V	39	9.08	39.82
6	4924.00	39.4 AV	54.0	-14.6	1.00 V	39	-0.42	39.82
7	7386.00	51.7 PK	74.0	-22.3	1.06 V	56	7.52	44.18
8	7386.00	39.5 AV	54.0	-14.5	1.06 V	56	-4.68	44.18

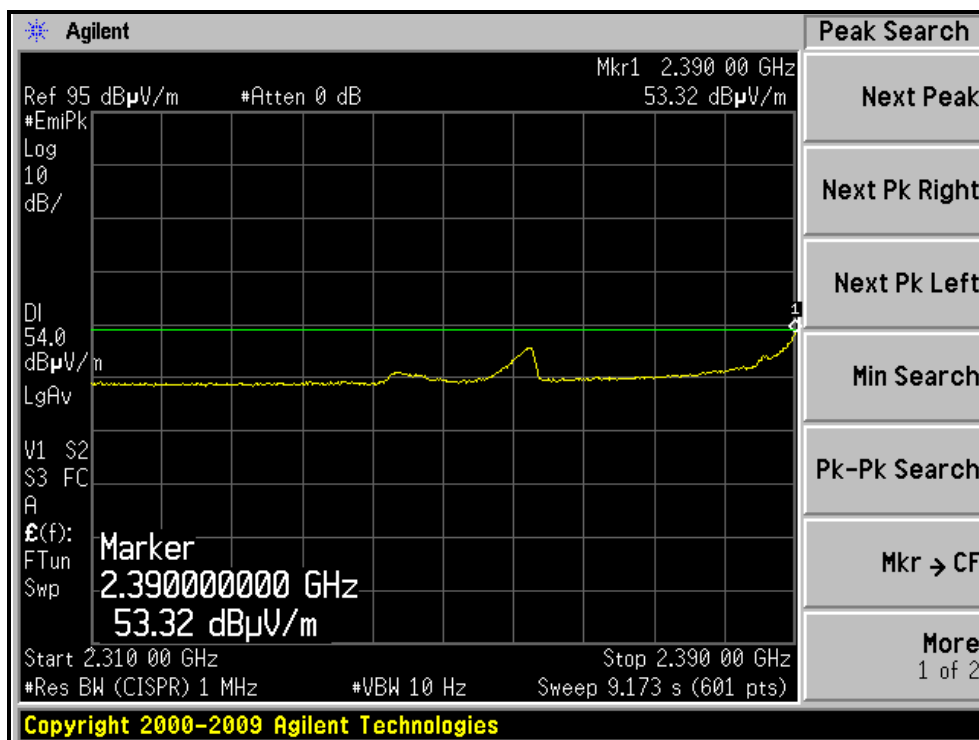
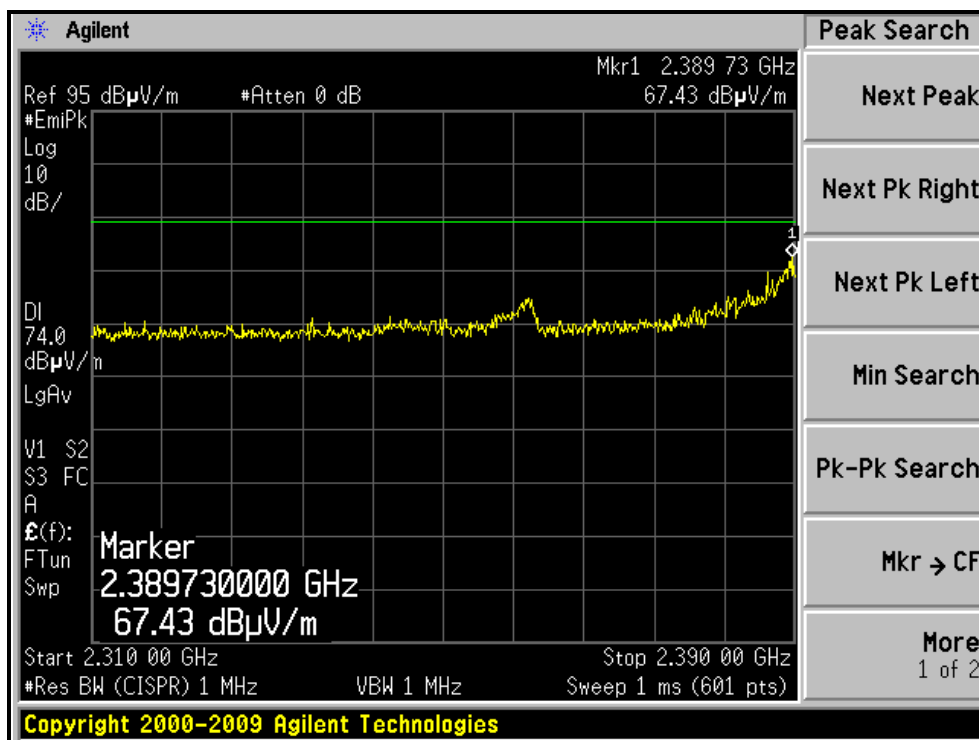
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental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

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

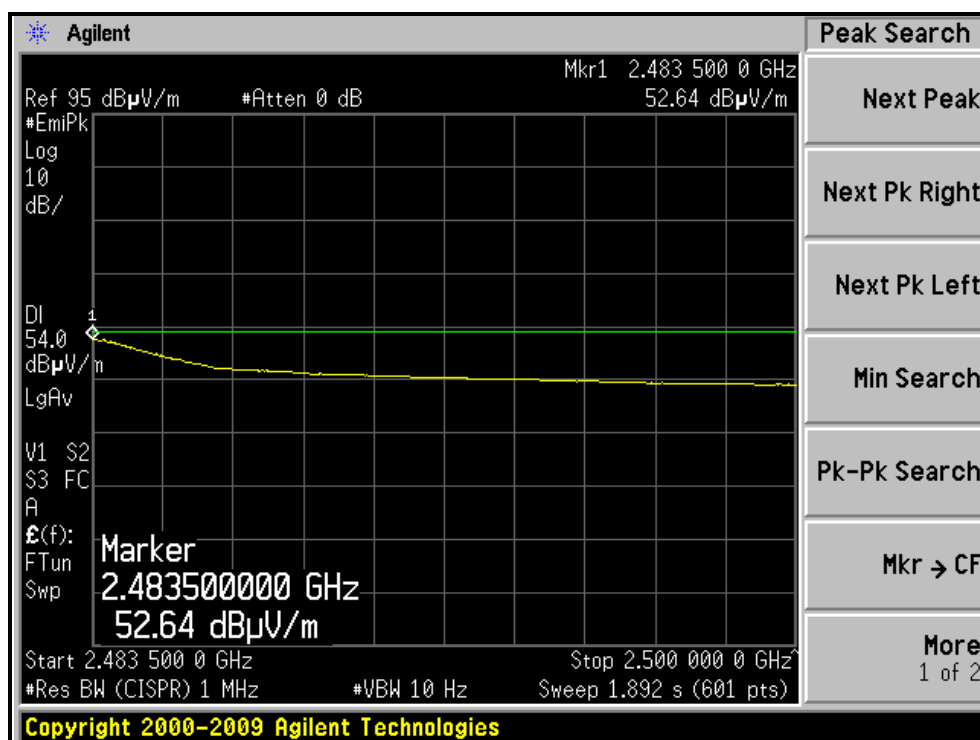
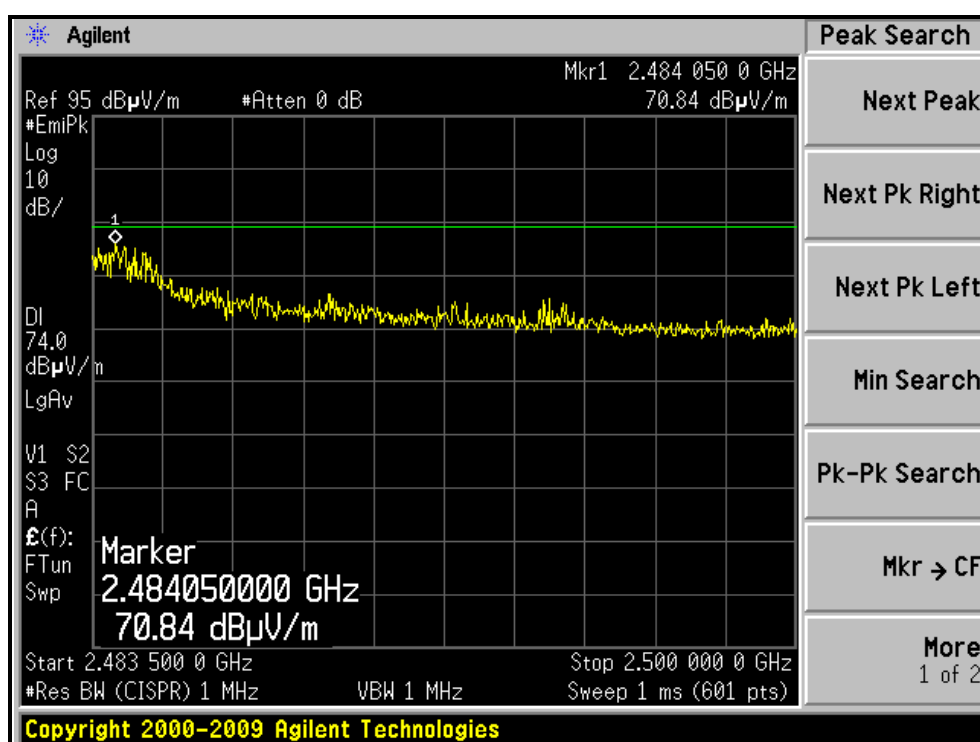




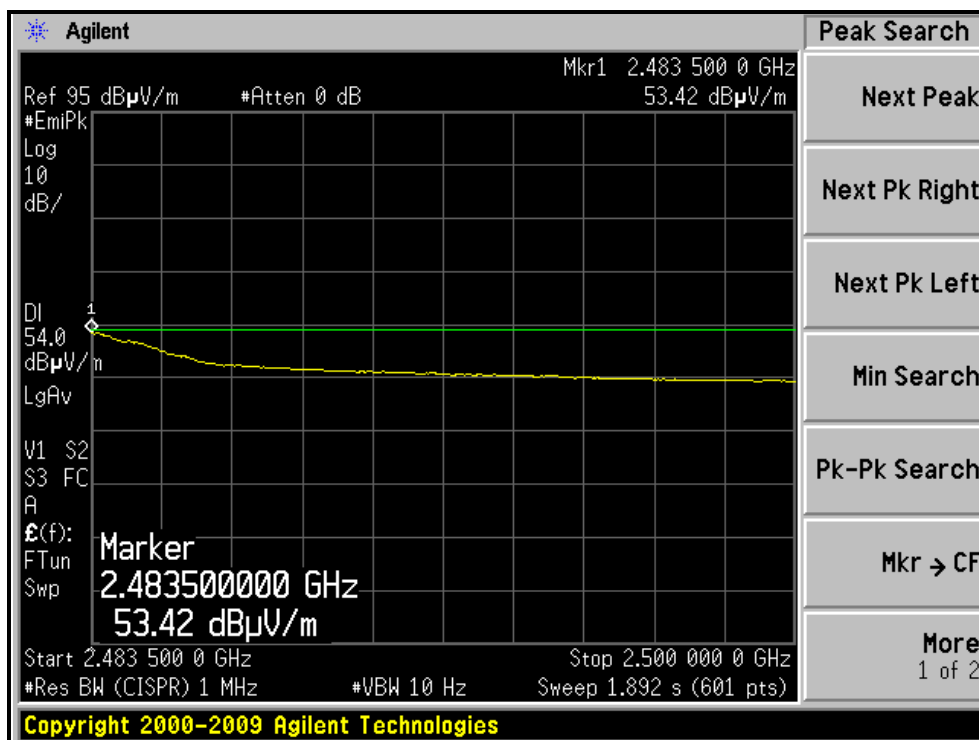
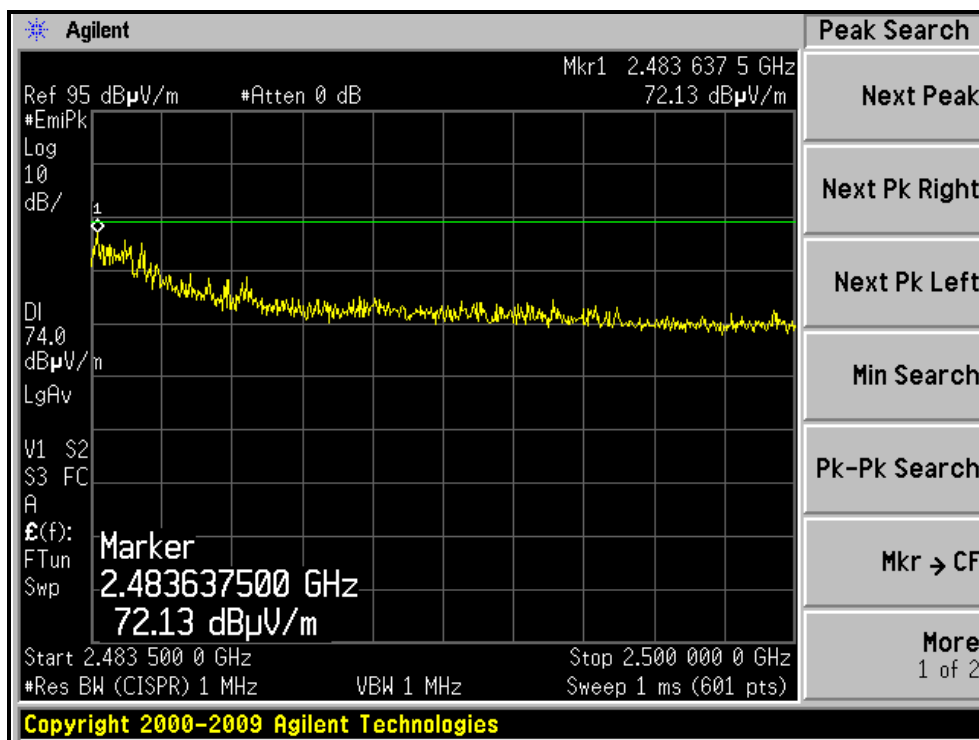
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL )



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



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





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**802.11n (40MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	71.7 PK	74.0	-2.3	1.34 H	261	40.49	31.21
2	2390.00	53.1 AV	54.0	-0.9	1.34 H	261	21.89	31.21
3	*2422.00	103.3 PK			1.36 H	244	72.00	31.30
4	*2422.00	91.3 AV			1.36 H	244	60.00	31.30
5	4844.00	54.4 PK	74.0	-19.6	1.37 H	240	14.90	39.50
6	4844.00	42.8 AV	54.0	-11.2	1.37 H	240	3.30	39.50
7	7266.00	54.9 PK	74.0	-19.1	1.32 H	233	10.84	44.06
8	7266.00	40.6 AV	54.0	-13.4	1.32 H	233	-3.46	44.06
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	71.7 PK	74.0	-2.3	1.31 V	267	40.49	31.21
2	2390.00	53.2 AV	54.0	-0.8	1.31 V	267	21.99	31.21
3	*2422.00	101.4 PK			1.34 V	265	70.10	31.30
4	*2422.00	89.8 AV			1.34 V	265	58.50	31.30
5	4844.00	49.0 PK	74.0	-25.0	1.00 V	39	9.50	39.50
6	4844.00	39.4 AV	54.0	-14.6	1.00 V	39	-0.10	39.50
7	7266.00	51.0 PK	74.0	-23.0	1.00 V	35	6.94	44.06
8	7266.00	39.3 AV	54.0	-14.7	1.00 V	35	-4.76	44.06

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	69.8 PK	74.0	-4.2	1.33 H	126	38.59	31.21
2	2390.00	52.2 AV	54.0	-1.8	1.33 H	126	20.99	31.21
3	*2437.00	106.1 PK			1.34 H	243	74.76	31.34
4	*2437.00	95.1 AV			1.34 H	243	63.76	31.34
5	2483.50	72.3 PK	74.0	-1.7	1.33 H	128	40.84	31.46
6	2483.50	53.2 AV	54.0	-0.8	1.33 H	128	21.74	31.46
7	4874.00	54.5 PK	74.0	-19.5	1.32 H	251	14.88	39.62
8	4874.00	43.1 AV	54.0	-10.9	1.32 H	251	3.48	39.62
9	7311.00	54.6 PK	74.0	-19.4	1.33 H	224	10.50	44.10
10	7311.00	40.4 AV	54.0	-13.6	1.33 H	224	-3.70	44.10
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	104.3 PK			1.36 V	244	72.96	31.34
2	*2437.00	93.2 AV			1.36 V	244	61.86	31.34
3	4874.00	49.1 PK	74.0	-24.9	1.01 V	42	9.48	39.62
4	4874.00	39.5 AV	54.0	-14.5	1.01 V	42	-0.12	39.62
5	7311.00	50.9 PK	74.0	-23.1	1.00 V	31	6.80	44.10
6	7311.00	39.4 AV	54.0	-14.6	1.00 V	31	-4.70	44.10

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



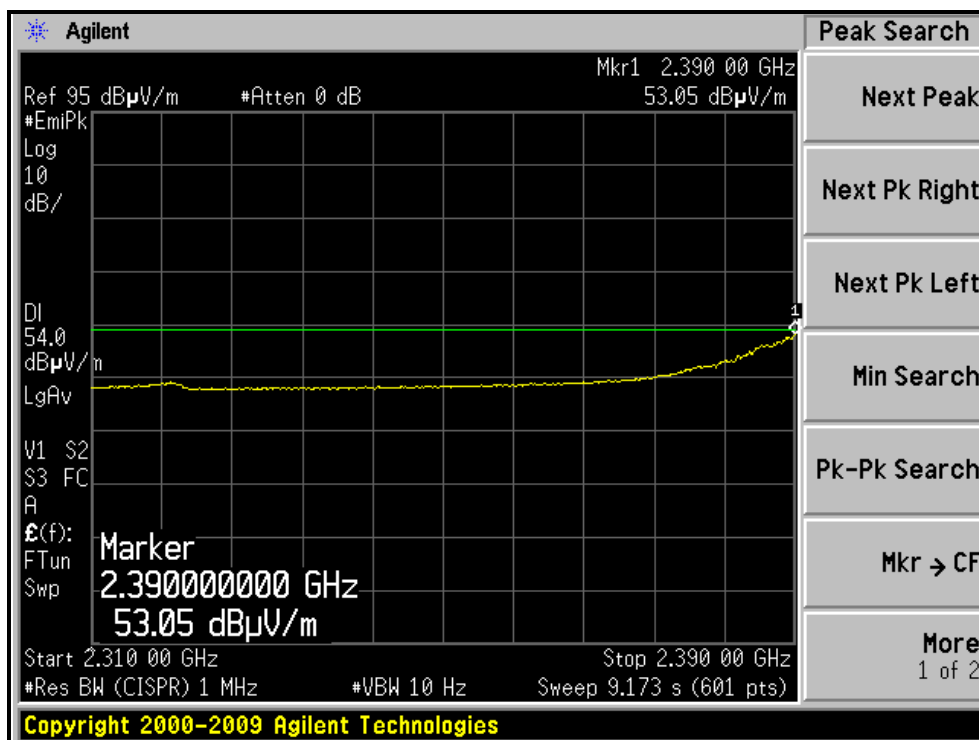
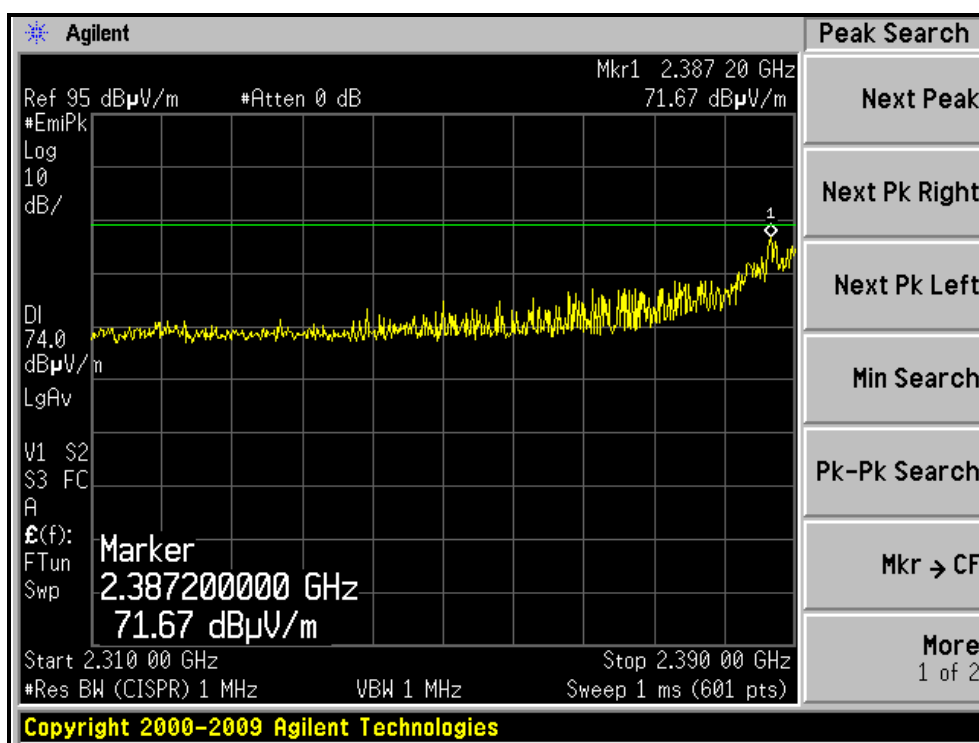
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

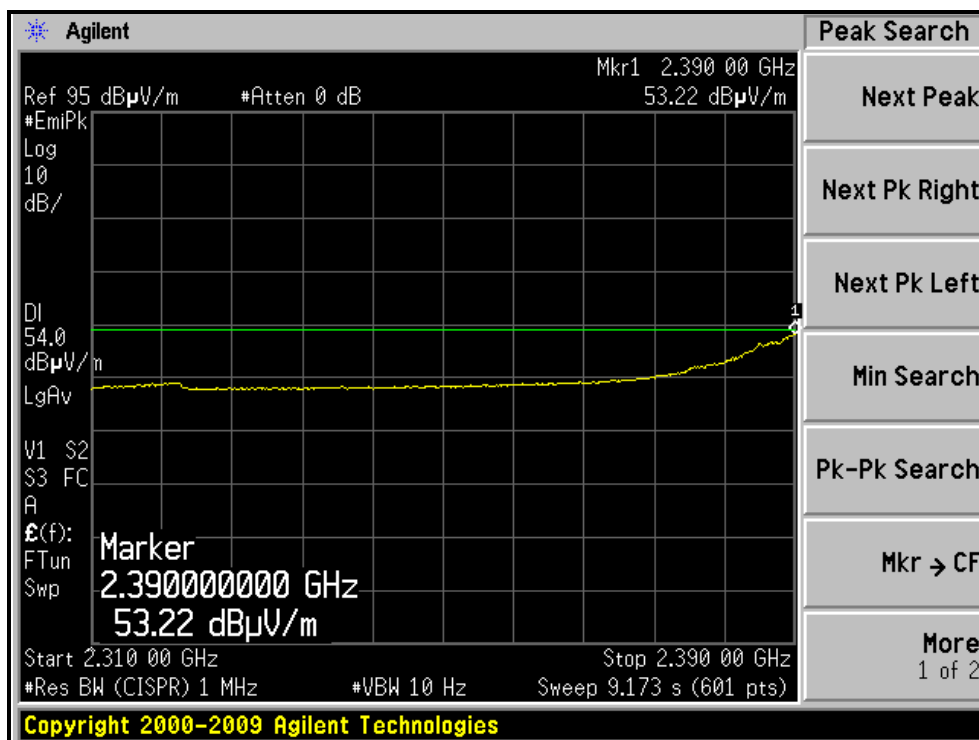
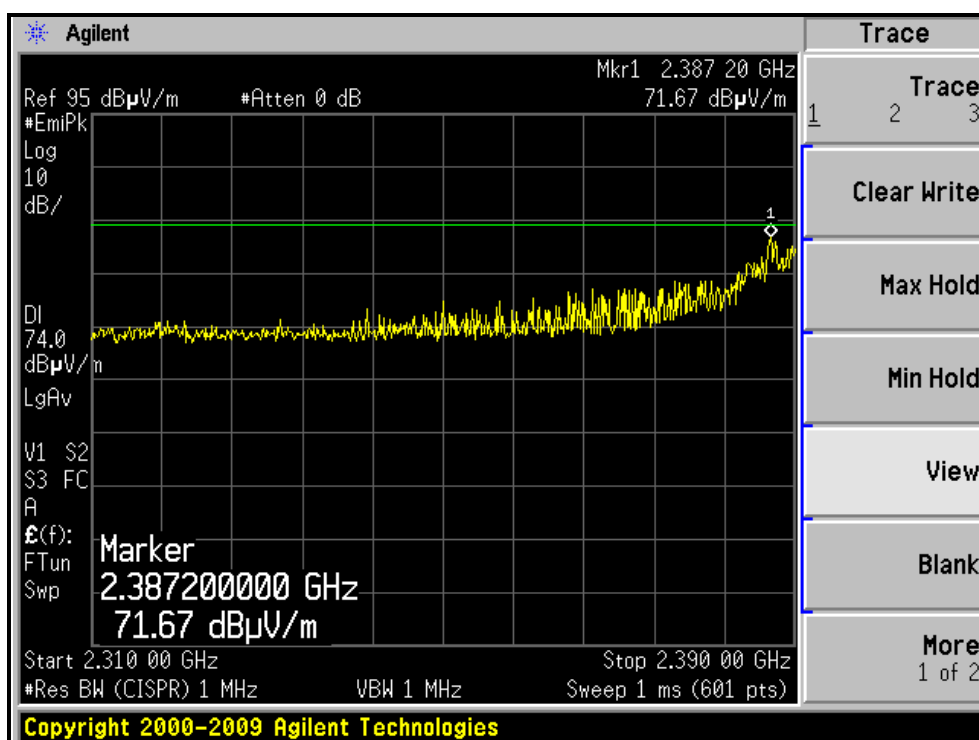
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	104.5 PK			1.36 H	244	73.12	31.38
2	*2452.00	92.3 AV			1.36 H	244	60.92	31.38
3	2483.94	69.9 PK	74.0	-4.1	1.31 H	249	38.44	31.46
4	2483.94	53.2 AV	54.0	-0.8	1.31 H	249	21.74	31.46
5	4904.00	54.1 PK	74.0	-19.9	1.38 H	262	14.36	39.74
6	4904.00	42.9 AV	54.0	-11.1	1.38 H	262	3.16	39.74
7	7356.00	54.3 PK	74.0	-19.7	1.34 H	234	10.15	44.15
8	7356.00	40.4 AV	54.0	-13.6	1.34 H	234	-3.75	44.15
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	102.4 PK			1.37 V	254	71.02	31.38
2	*2452.00	91.2 AV			1.37 V	254	59.82	31.38
3	2483.74	70.5 PK	74.0	-3.5	1.31 V	259	39.04	31.46
4	2483.74	53.5 AV	54.0	-0.5	1.31 V	259	22.04	31.46
5	4904.00	49.4 PK	74.0	-24.6	1.04 V	41	9.66	39.74
6	4904.00	39.6 AV	54.0	-14.4	1.04 V	41	-0.14	39.74
7	7356.00	51.4 PK	74.0	-22.6	1.00 V	40	7.25	44.15
8	7356.00	39.7 AV	54.0	-14.3	1.00 V	40	-4.45	44.15

**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 (802.11n (40MHz) MODE,CH3, HORIZONTAL )

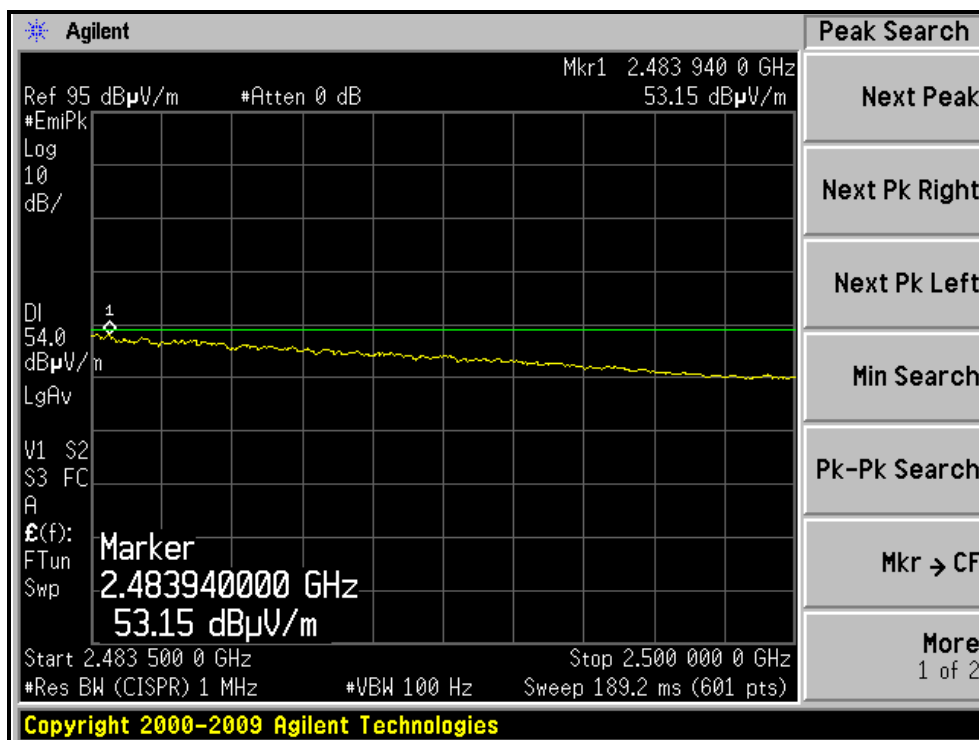
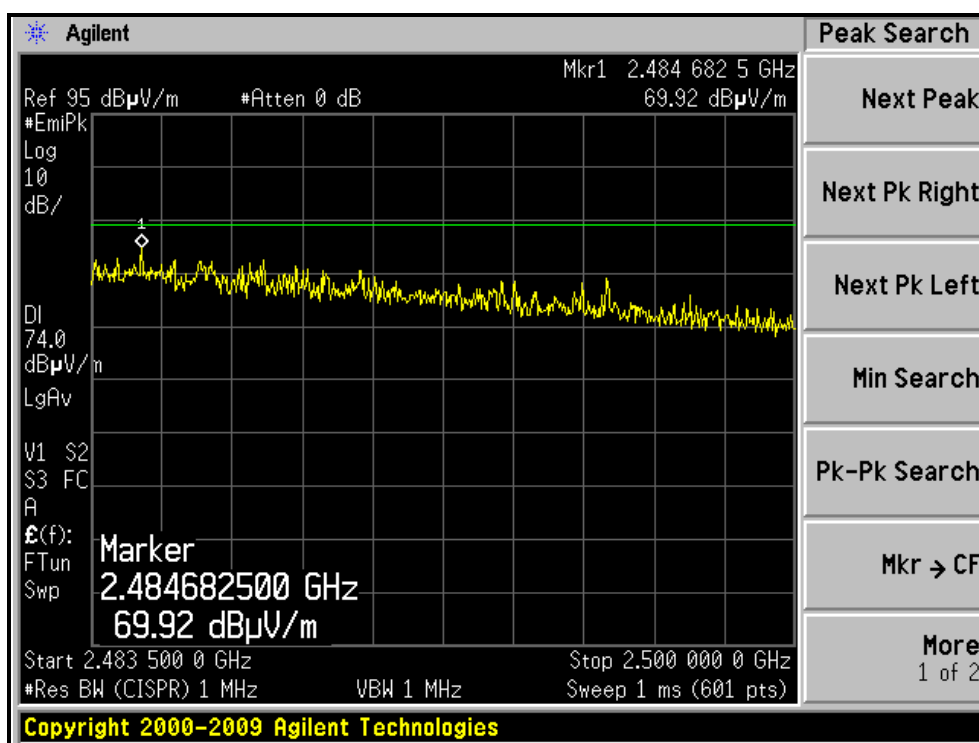


RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, VERTICAL )

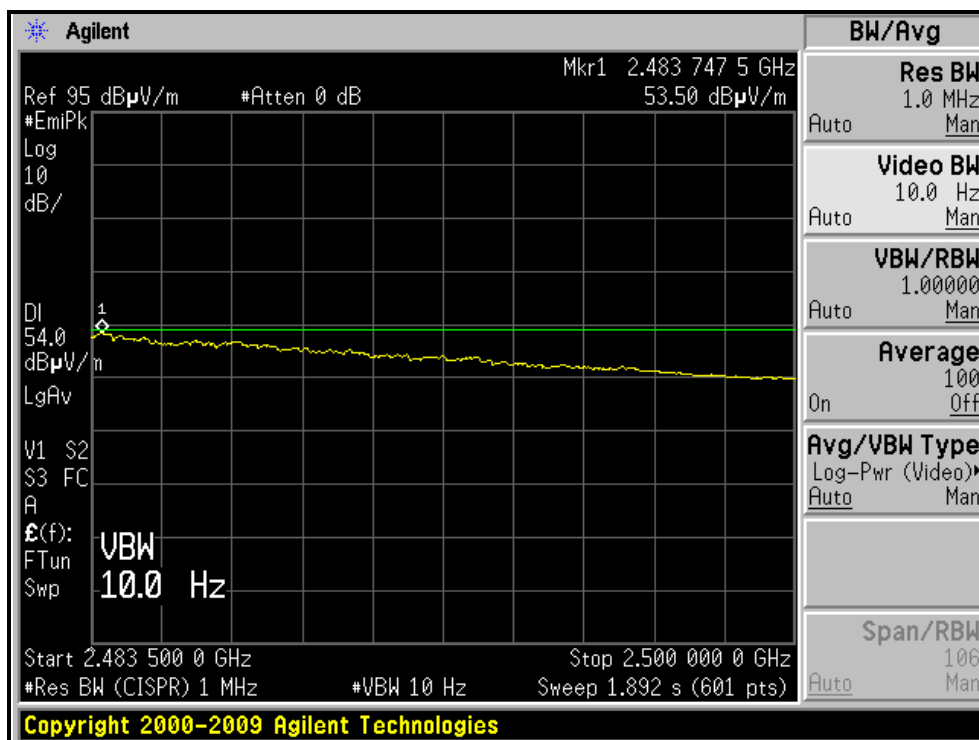
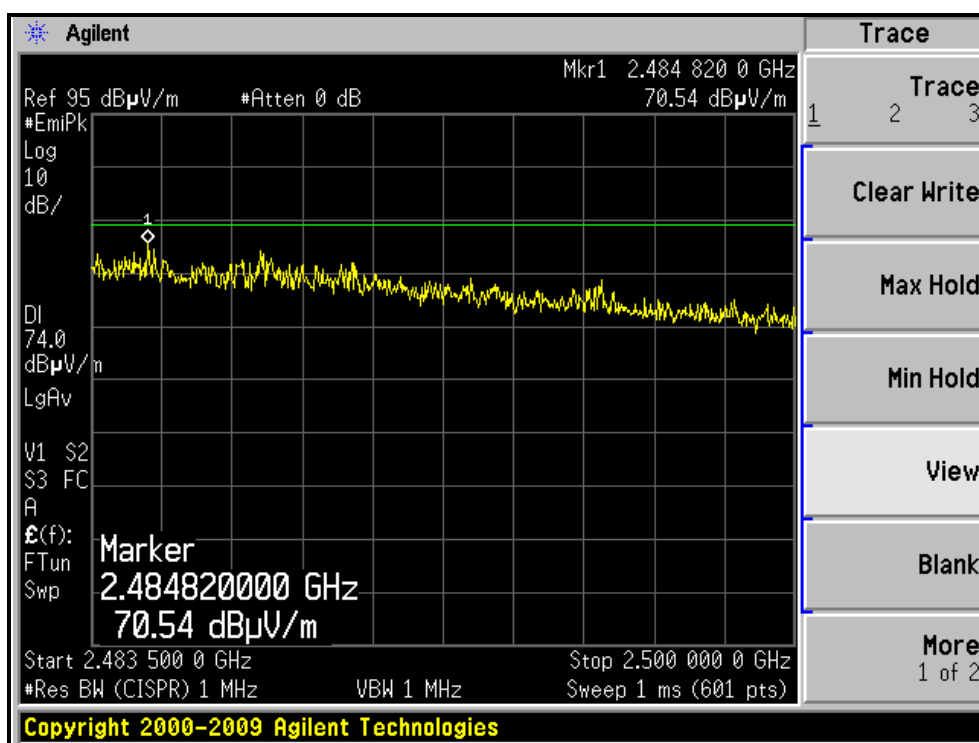




RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH9, HORIZONTAL )



RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH9, 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

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

**NOTE:** 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 300kHz 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

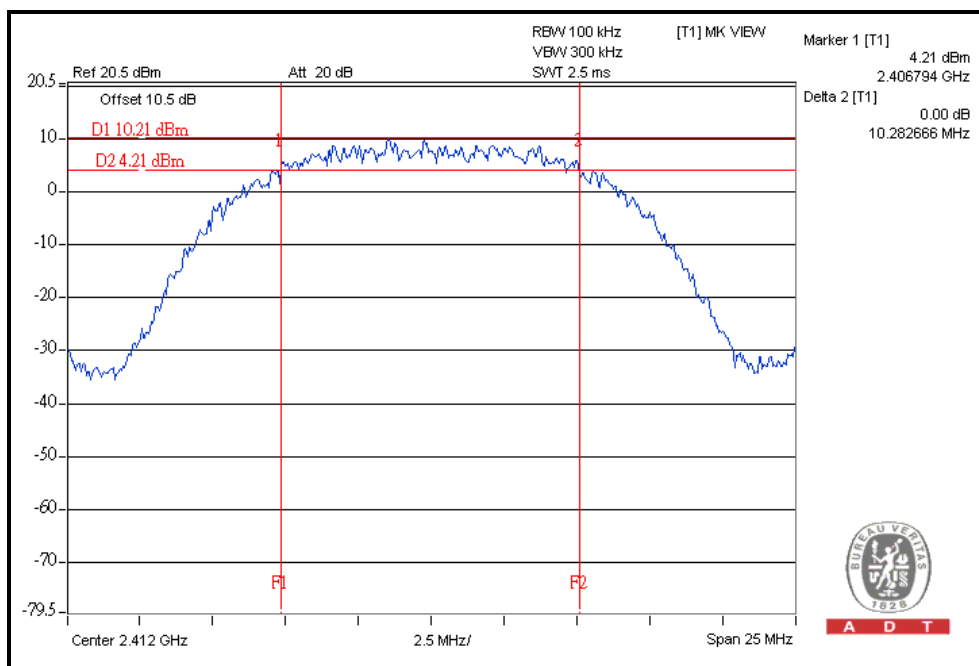
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 4.3.7 TEST RESULTS

### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.28	0.5	PASS
6	2437	8.97	0.5	PASS
11	2462	9.12	0.5	PASS

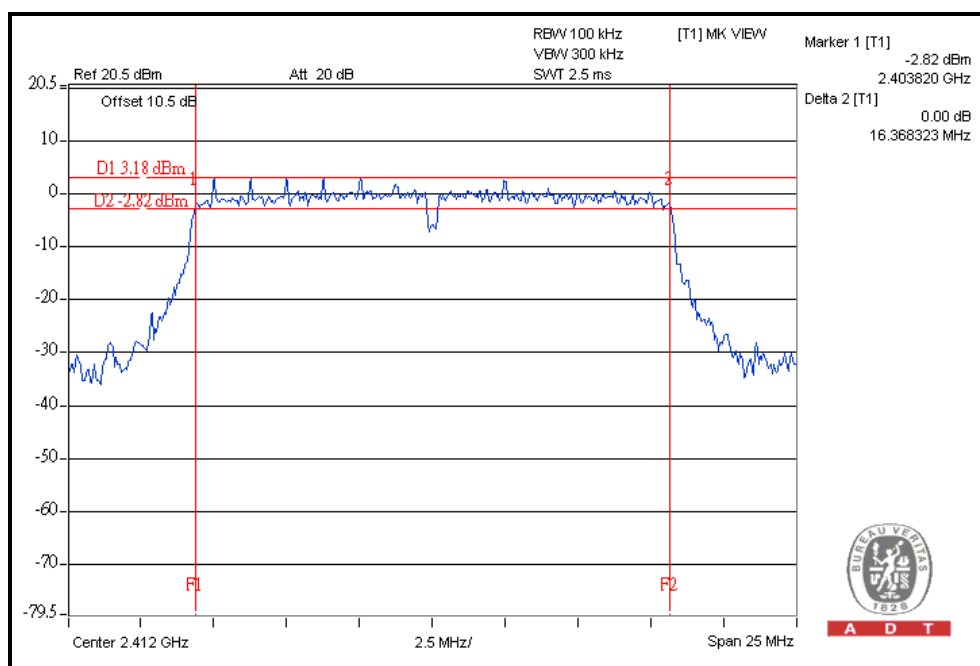
CH1



## 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.37	0.5	PASS
6	2437	16.20	0.5	PASS
11	2462	16.37	0.5	PASS

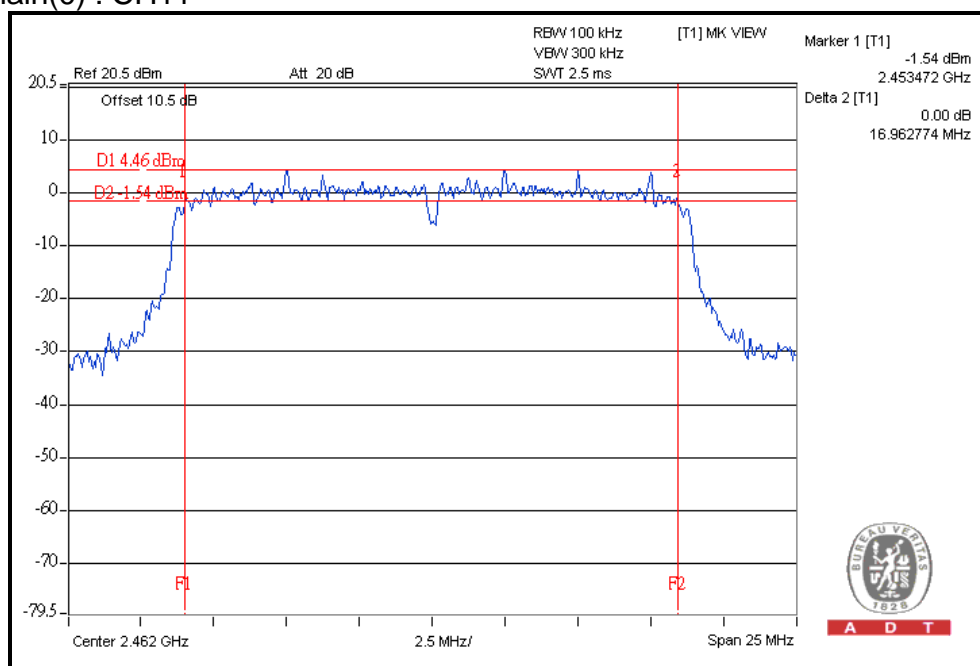
## CH1



### 802.11n (20MHz) OFDM modulation:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	16.09	16.68	0.5	PASS
6	2437	15.53	15.48	0.5	PASS
11	2462	16.96	15.79	0.5	PASS

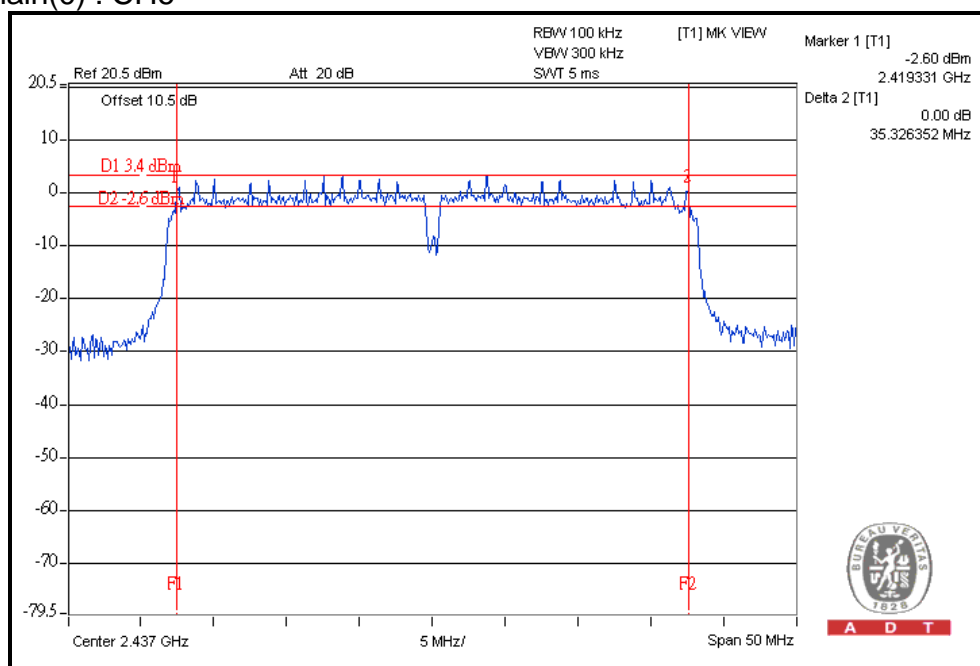
For Chain(0) : CH11



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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
3	2422	35.28	34.57	0.5	PASS
6	2437	35.33	35.21	0.5	PASS
9	2452	35.29	35.31	0.5	PASS

For Chain(0) : CH6





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#### 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

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Peak Power Meter	ML2495A	0824006	May 04, 2011	May 03, 2012
Power Sensor	MA2411B	0738172	May 03, 2011	May 02, 2012

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

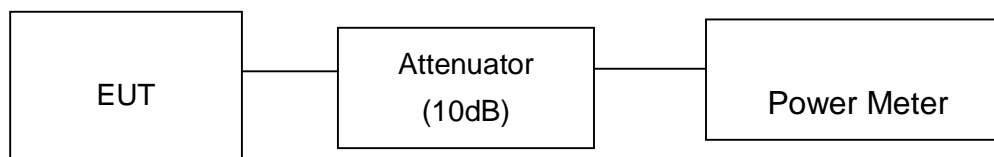
##### 4.4.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. 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:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	102.3	20.1	30	PASS
6	2437	123.0	20.9	30	PASS
11	2462	131.8	21.2	30	PASS

##### 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	275.4	24.4	30	PASS
6	2437	316.2	25.0	30	PASS
11	2462	269.2	24.3	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	22.7	23.1	390.4	25.9	30	PASS
6	2437	24.5	24.6	570.2	27.6	30	PASS
11	2462	22.8	22.8	381.1	25.8	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
3	2422	21.9	21.8	306.2	24.9	30	PASS
6	2437	23.2	23.5	432.8	26.4	30	PASS
9	2452	21.2	21.0	257.7	24.1	30	PASS



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## 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

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

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

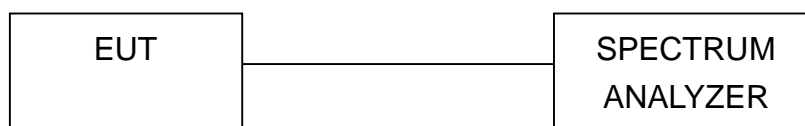
### 4.5.3 TEST PROCEDURE

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

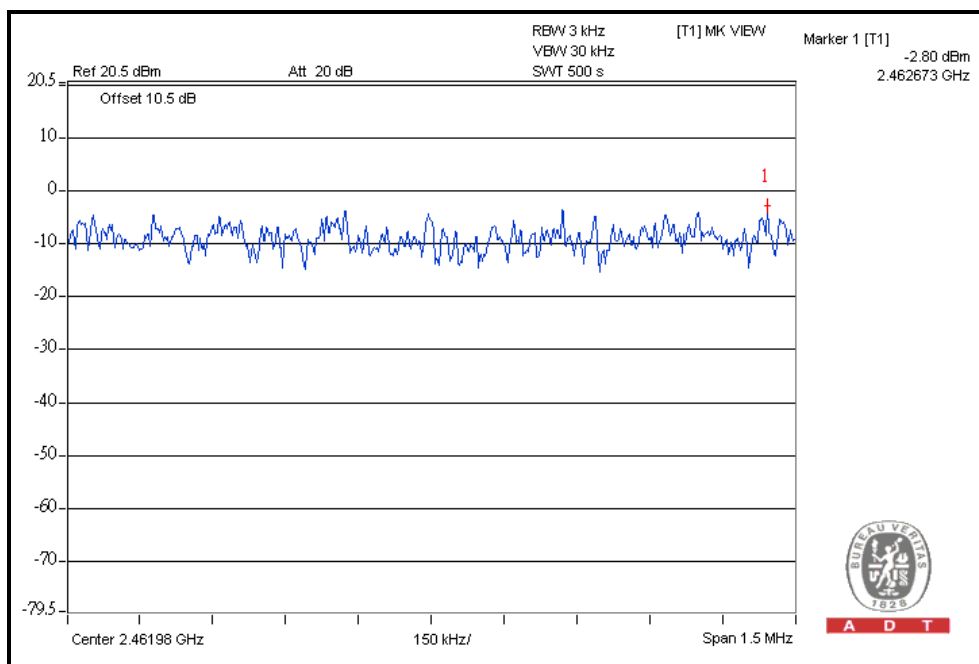
Same as Item 4.3.6

## 4.5.7 TEST RESULTS

### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-3.1	8	PASS
6	2437	-3.7	8	PASS
11	2462	-2.8	8	PASS

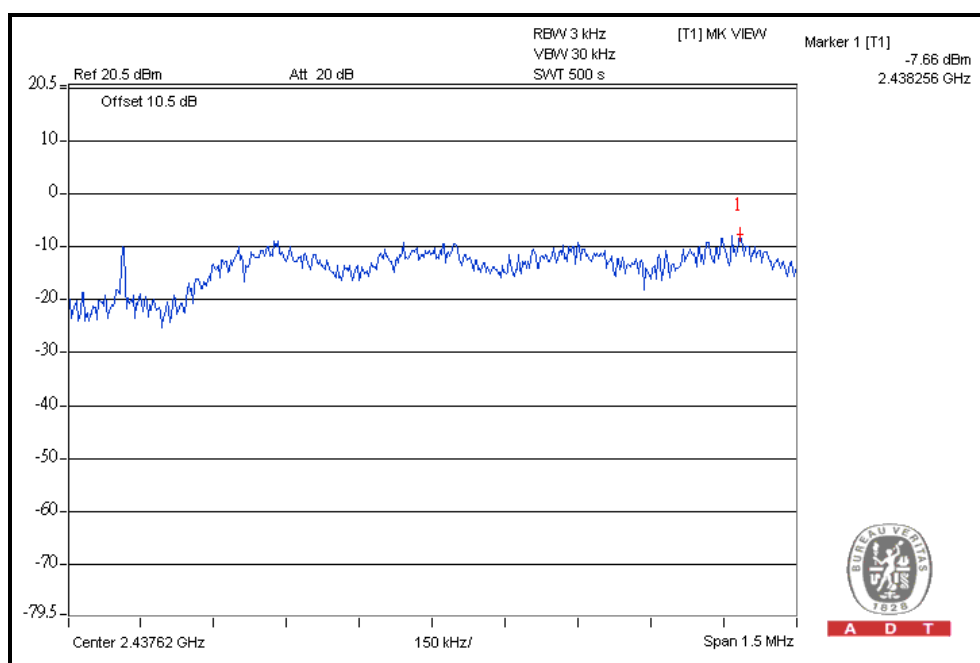
### CH11



## 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-10.4	8	PASS
6	2437	-7.7	8	PASS
11	2462	-10.4	8	PASS

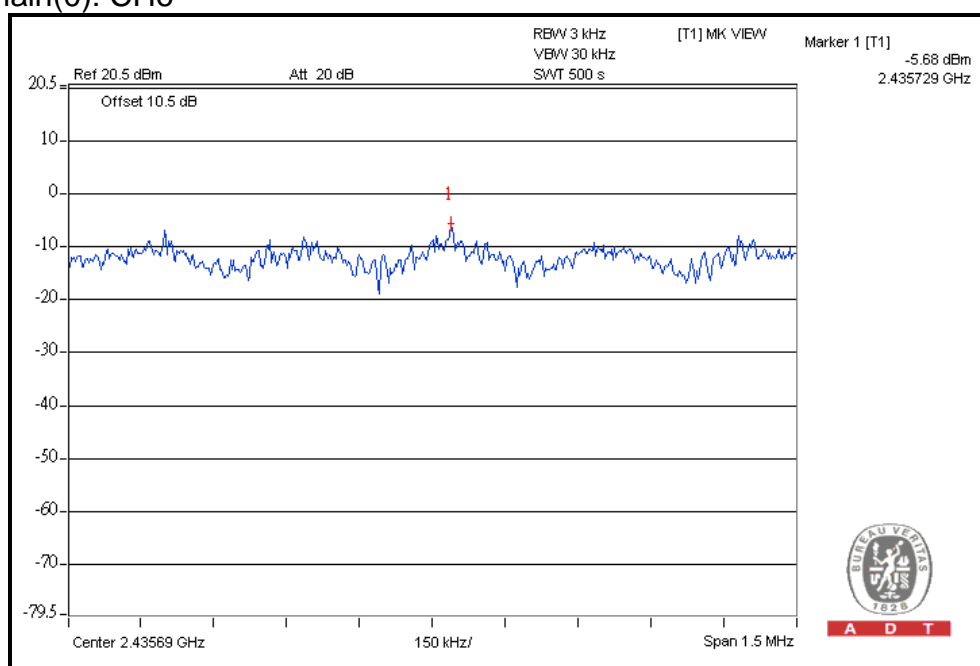
## CH6



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

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2412	-10.7	-7.5	-5.8	8	PASS
6	2437	-5.7	-6.0	-2.8	8	PASS
11	2462	-9.8	-7.7	-5.6	8	PASS

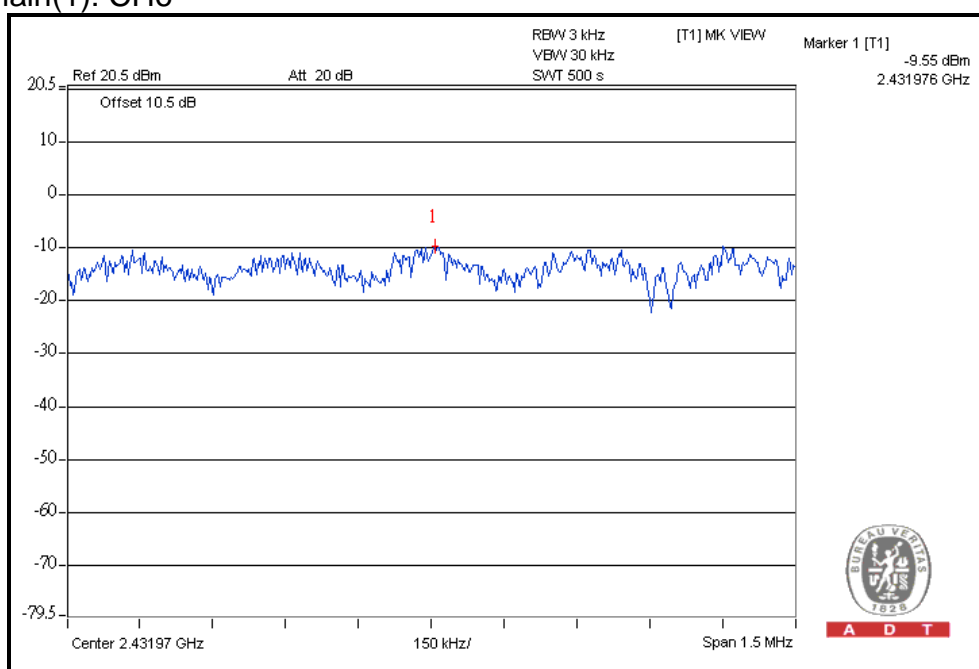
For Chain(0): CH6



## 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
3	2422	-15.0	-11.9	-10.2	8	PASS
6	2437	-11.7	-9.6	-7.5	8	PASS
9	2452	-15.9	-11.3	-10.0	8	PASS

For Chain(1): CH6





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## 4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

**NOTE:** 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 loss cable. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100MHz or 200MHz bandwidth from band edge. The band edges were 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

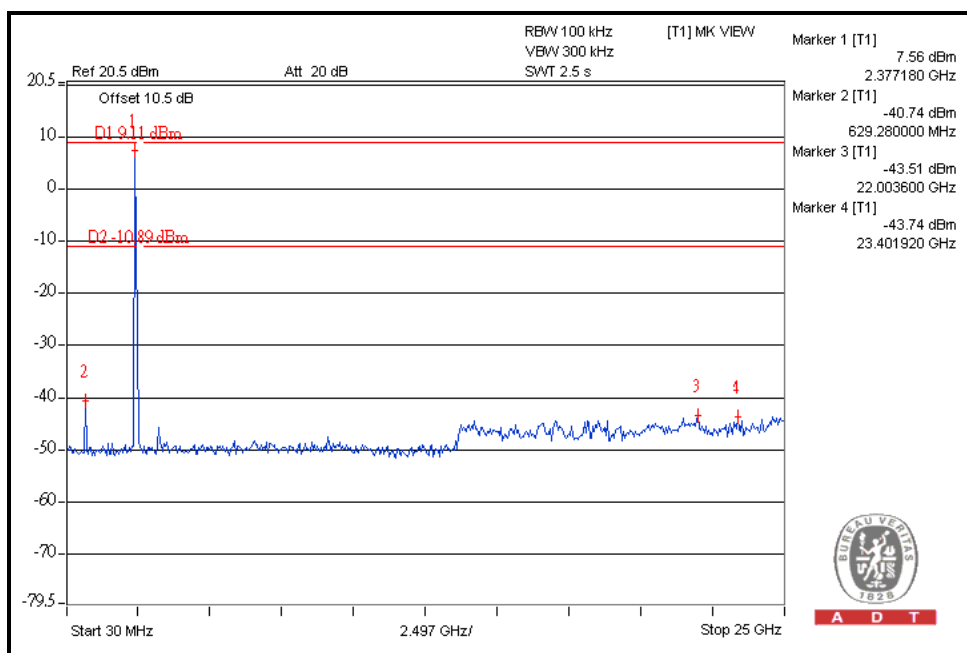
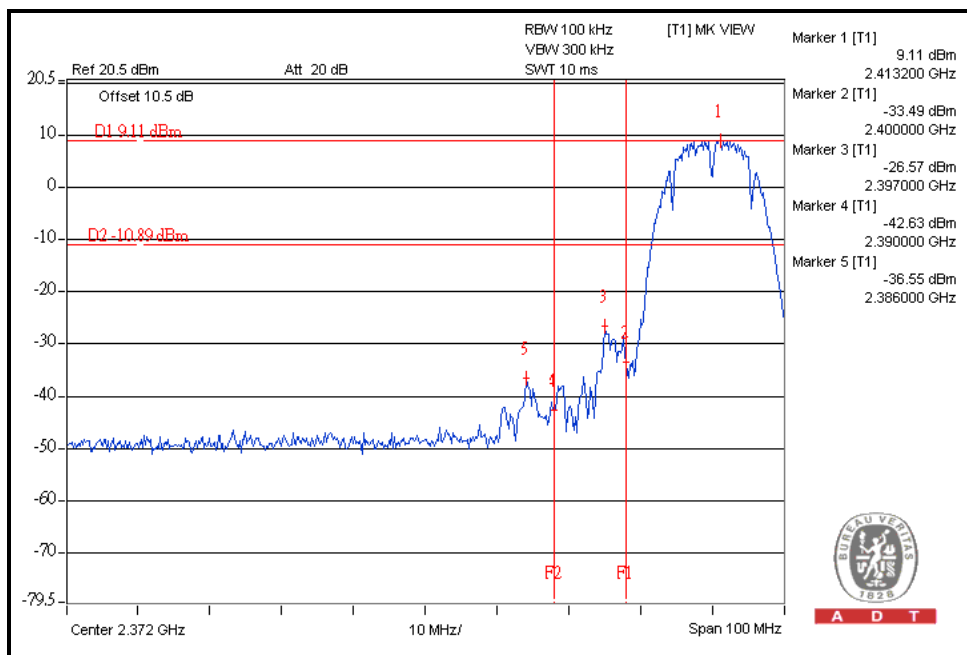
### 4.6.6 TEST RESULTS

The spectrum plots are attached on the following 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).

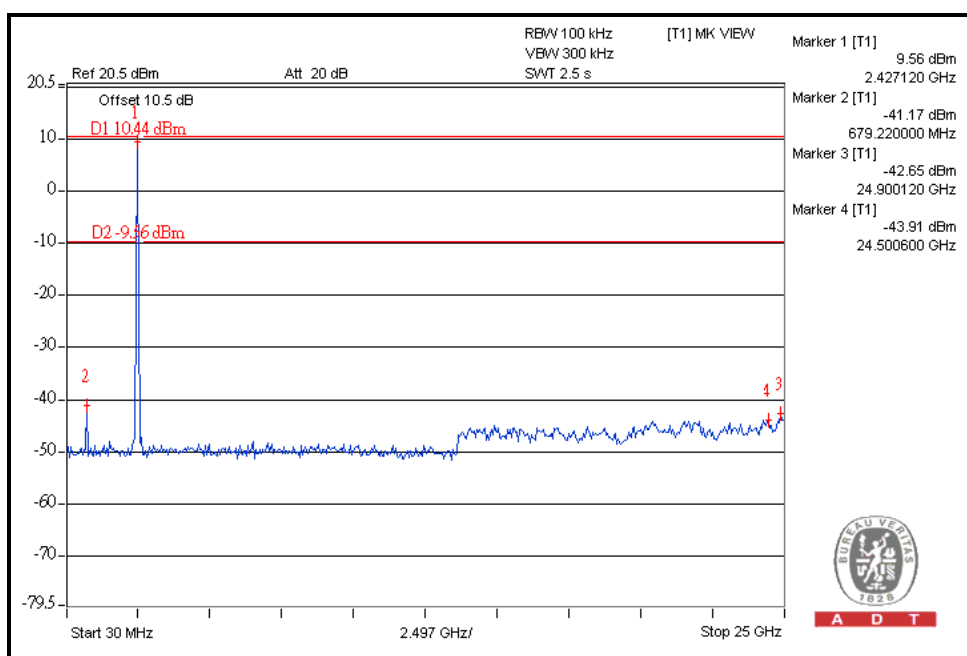
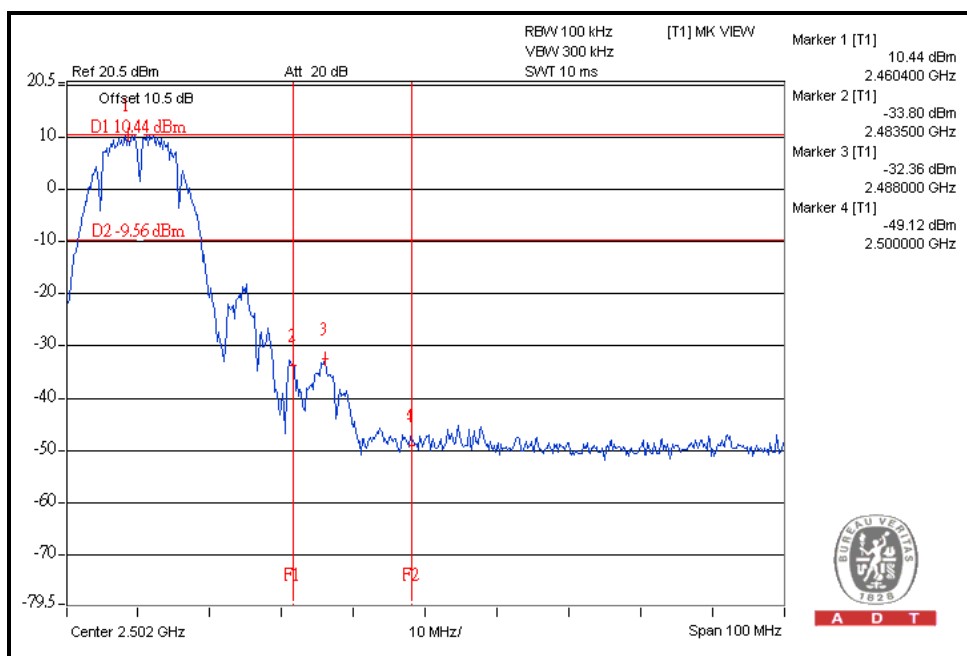


## 802.11b DSSS MODULATION:

CH1

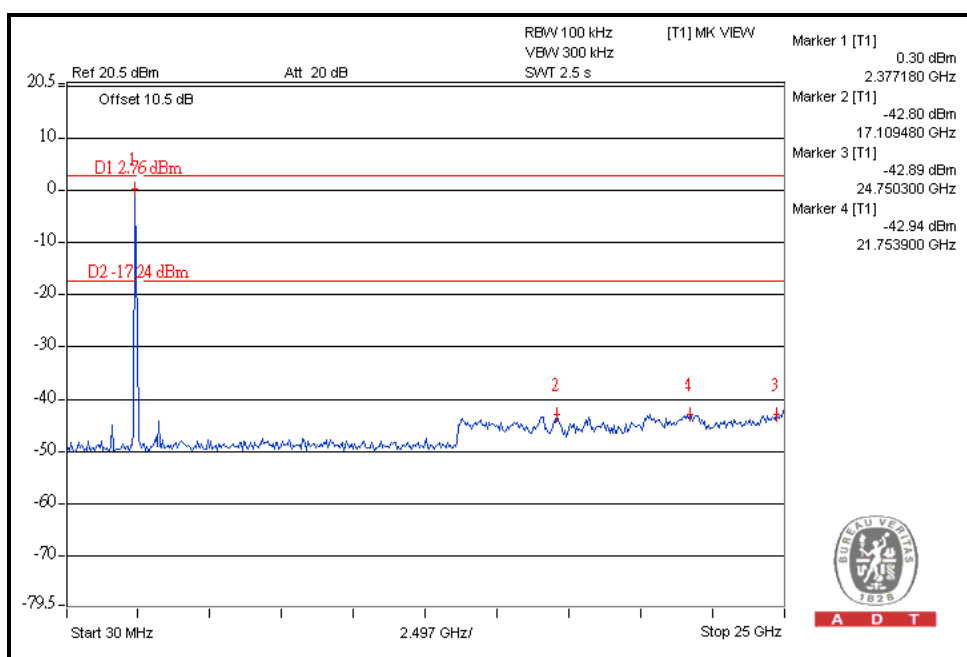
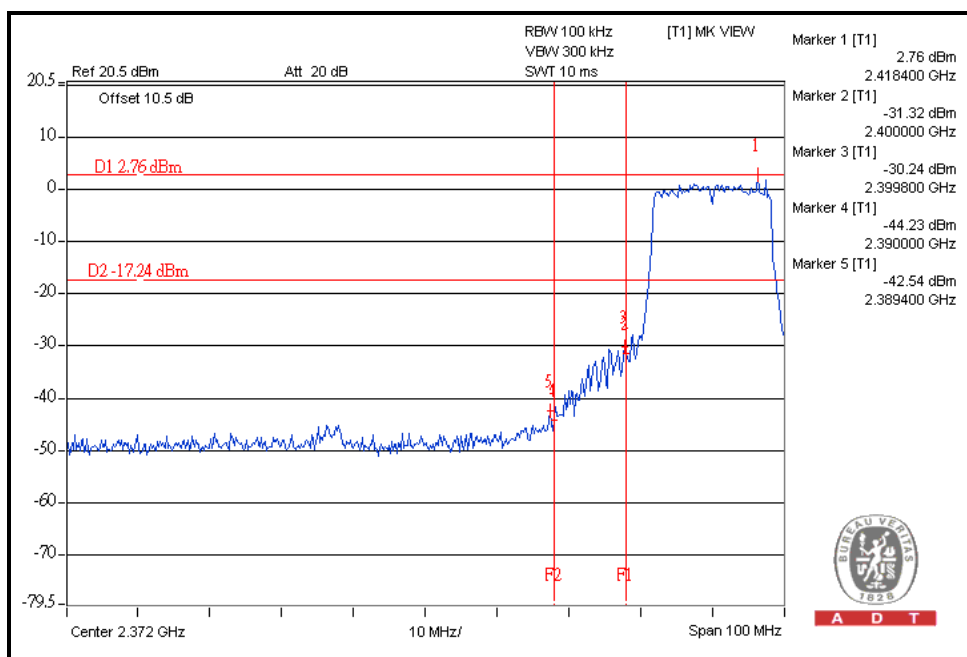


# CH11

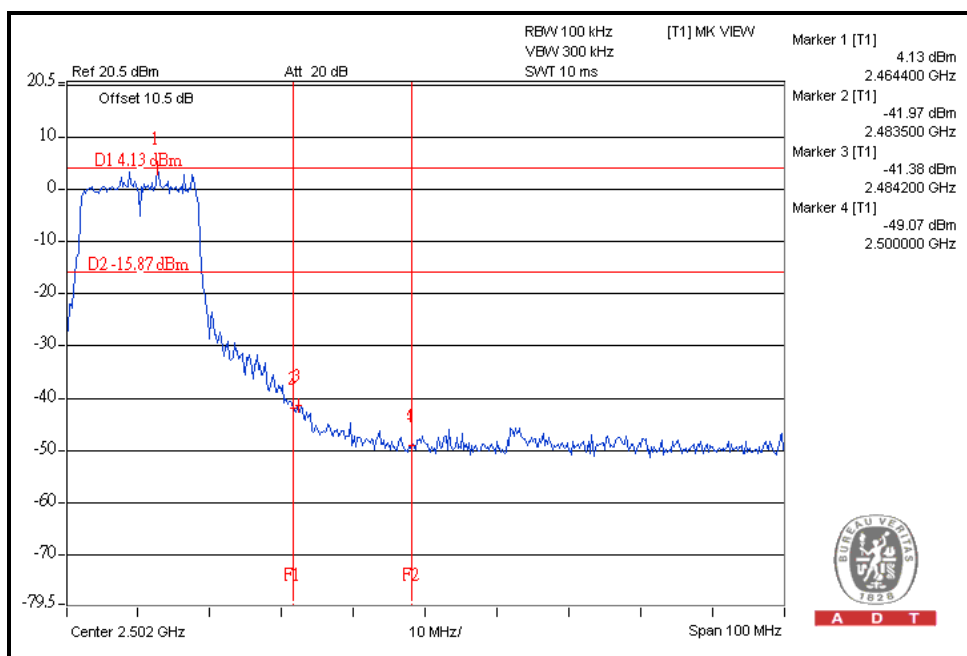


## 802.11g OFDM MODULATION:

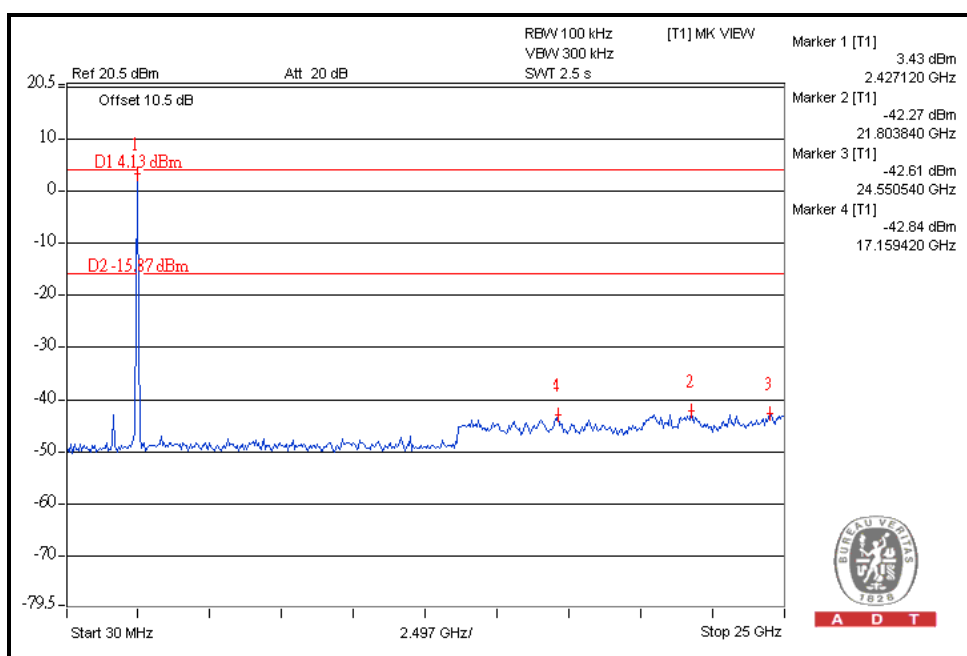
CH1



# CH11



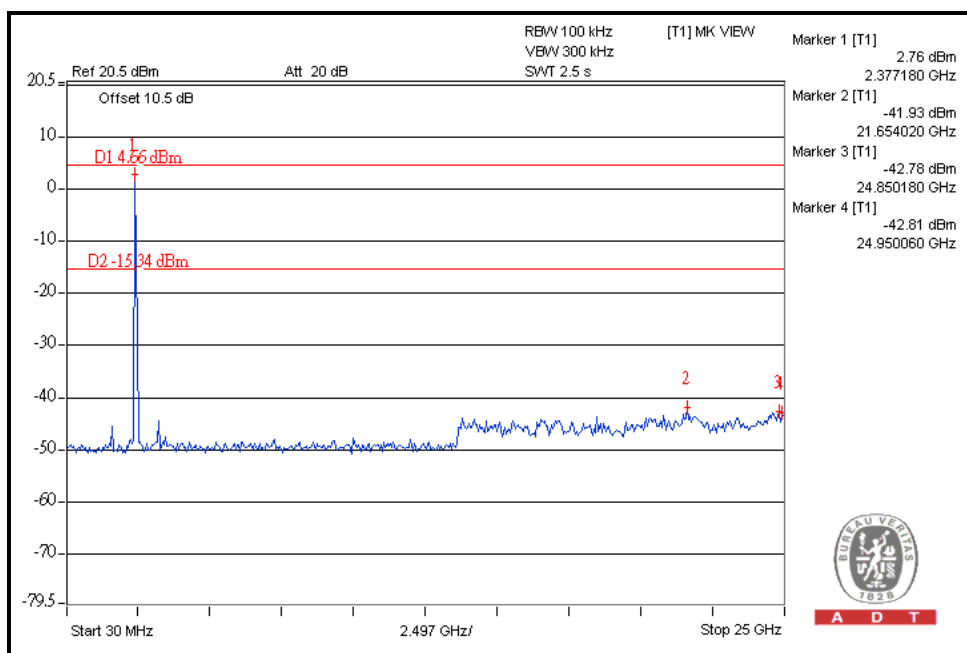
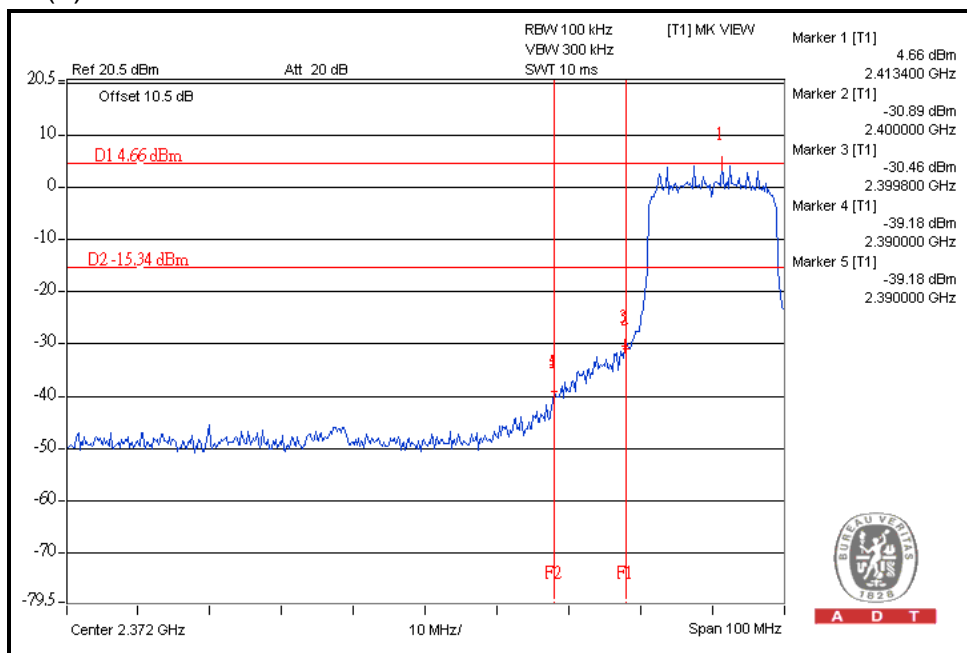
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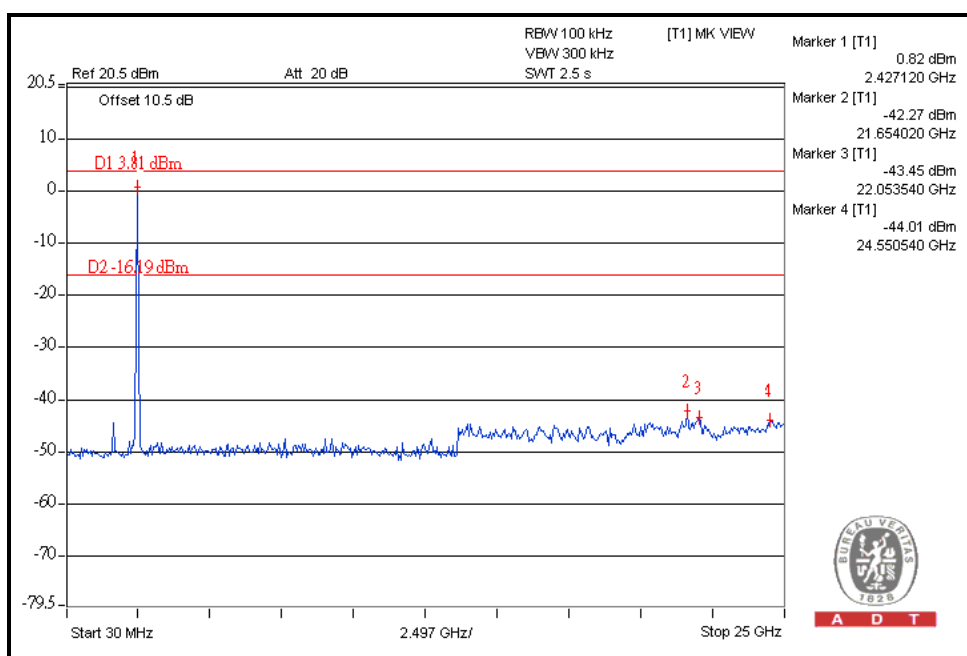
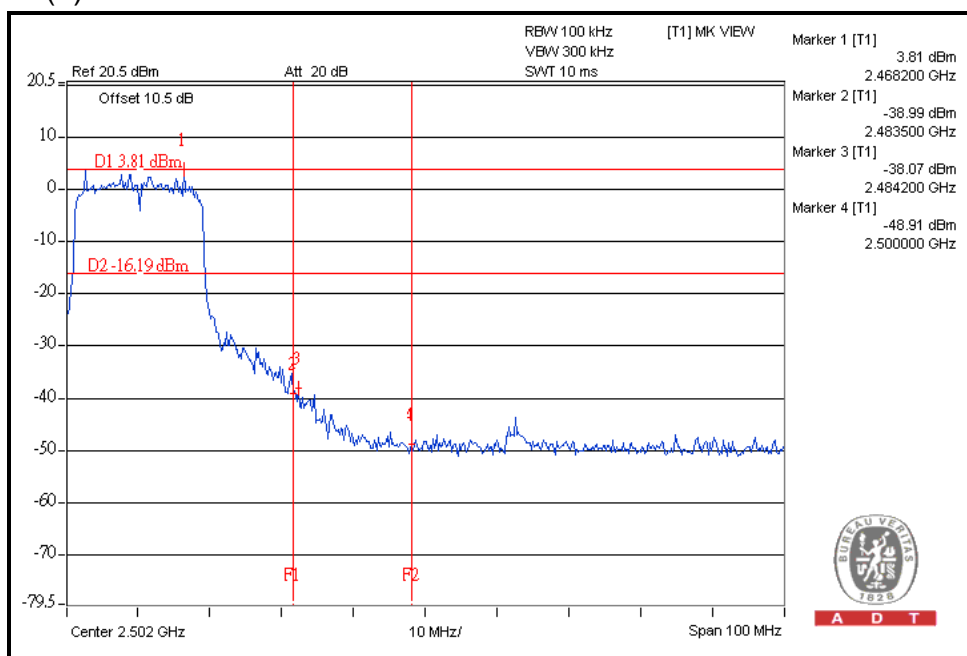
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## 802.11n (20MHz) OFDM MODULATION:

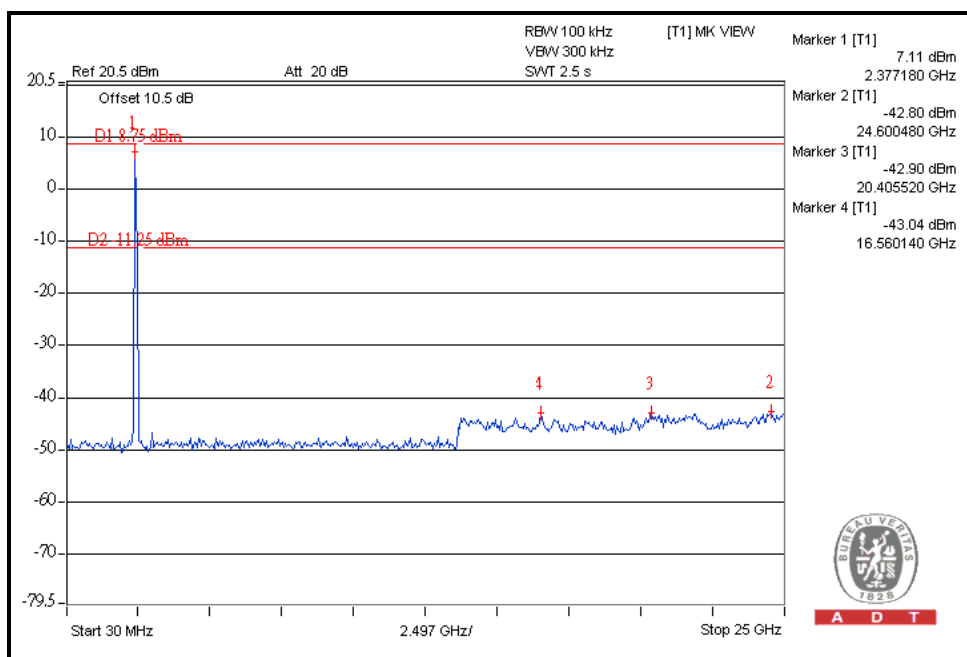
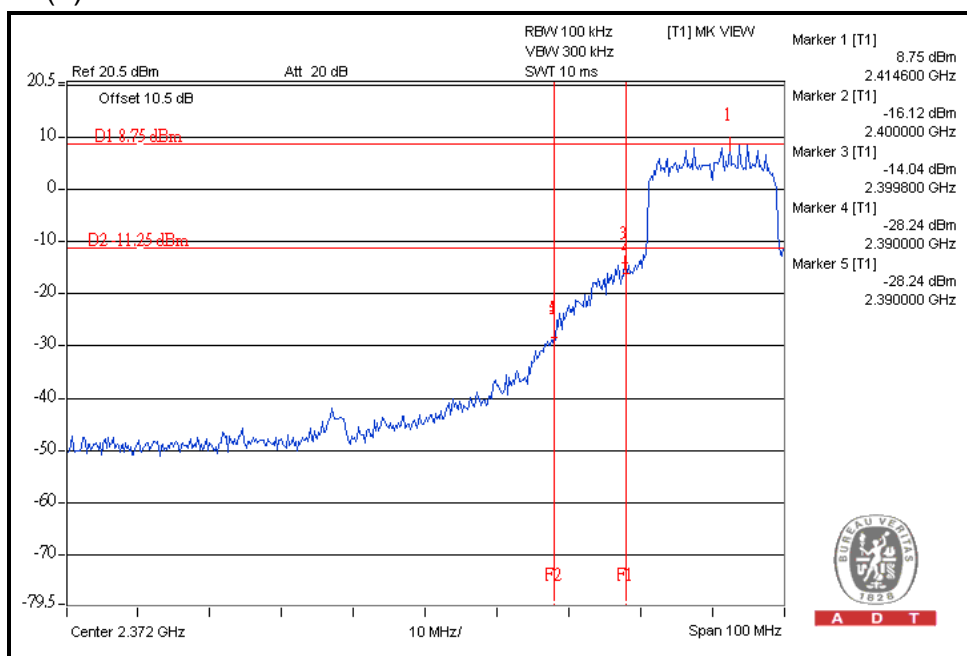
For Chain(0) : CH1



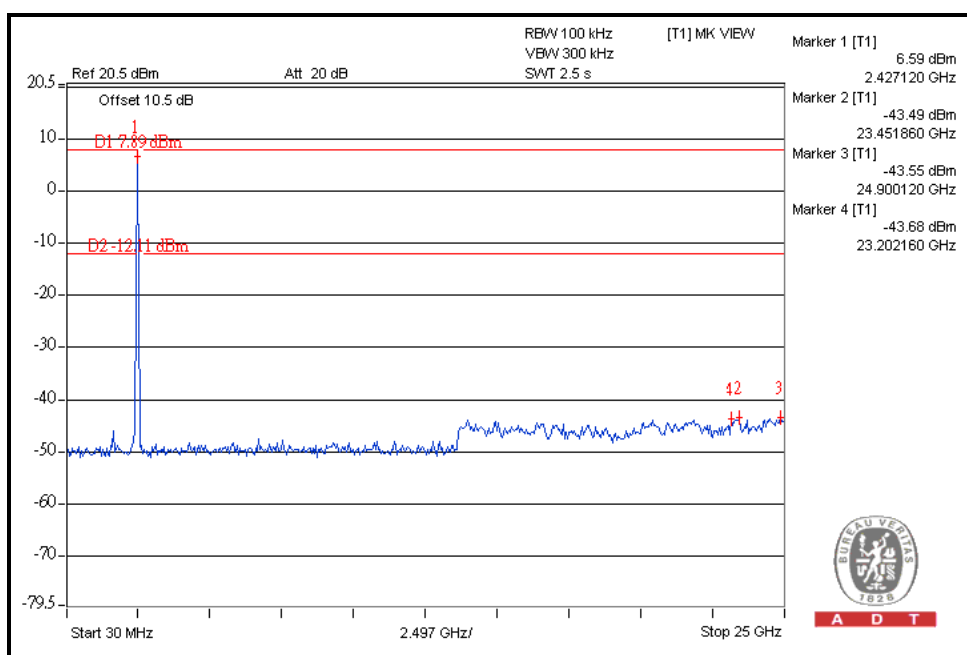
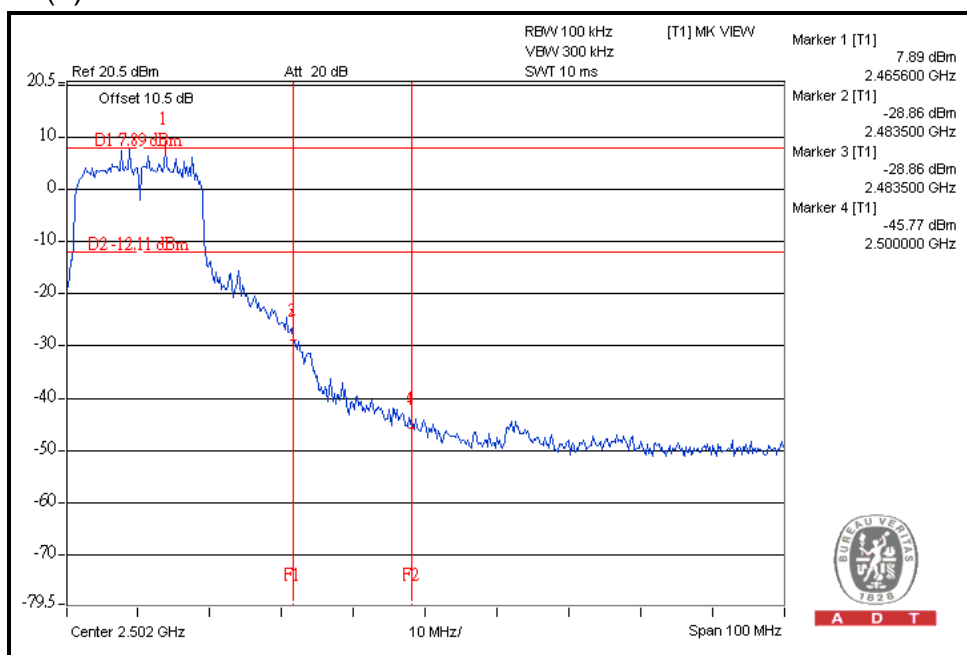
For Chain(0) : CH11



For Chain(1) : CH1



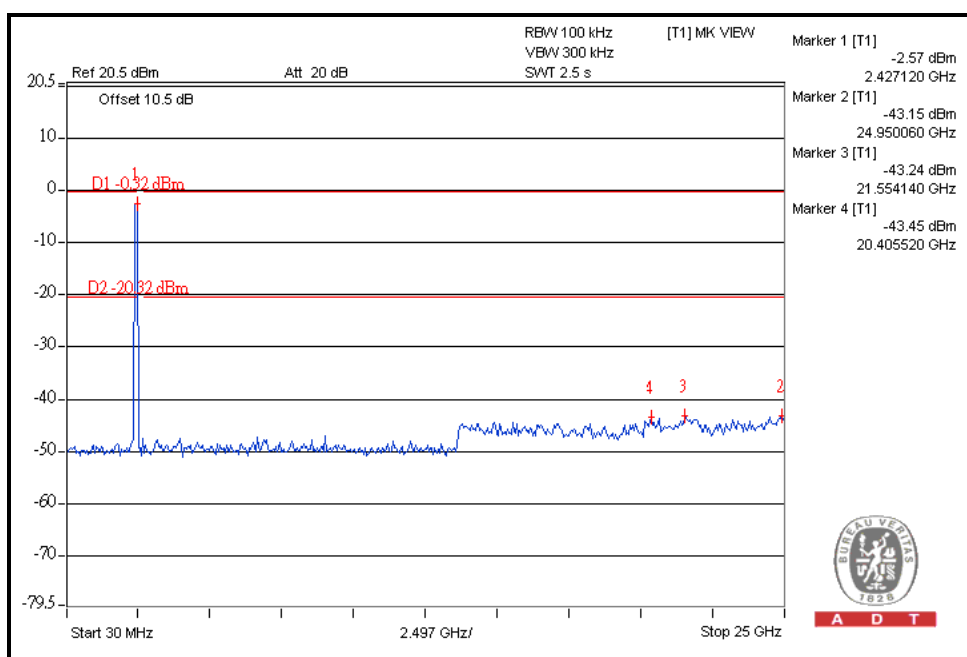
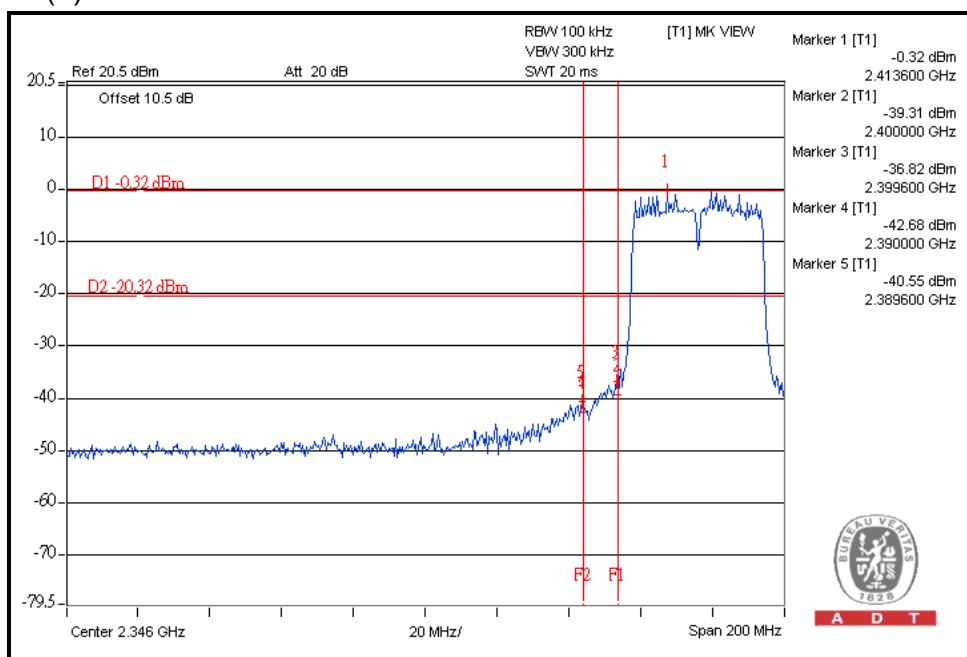
For Chain(1) : CH11



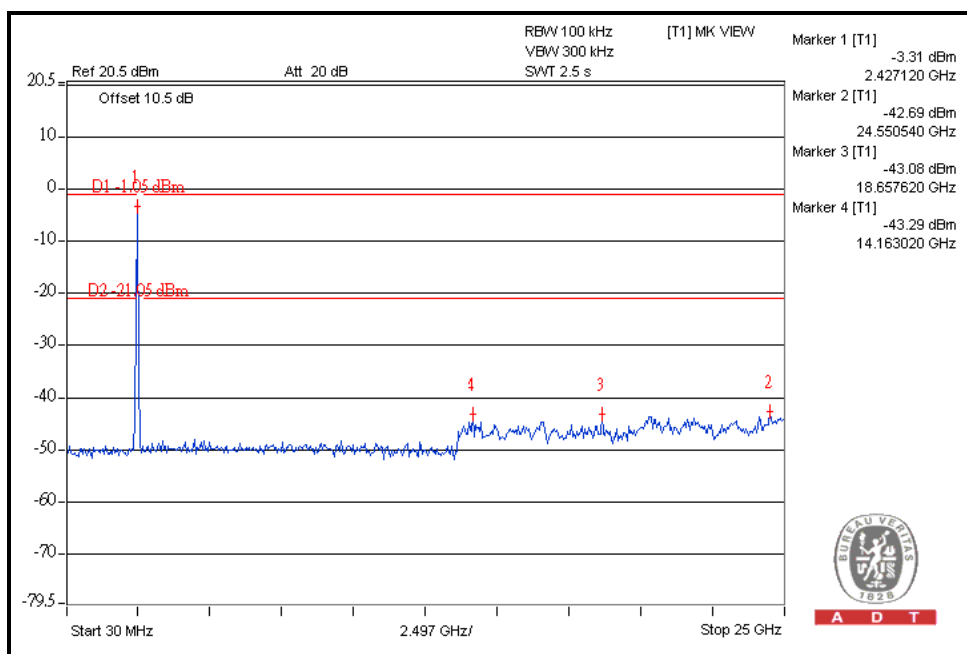
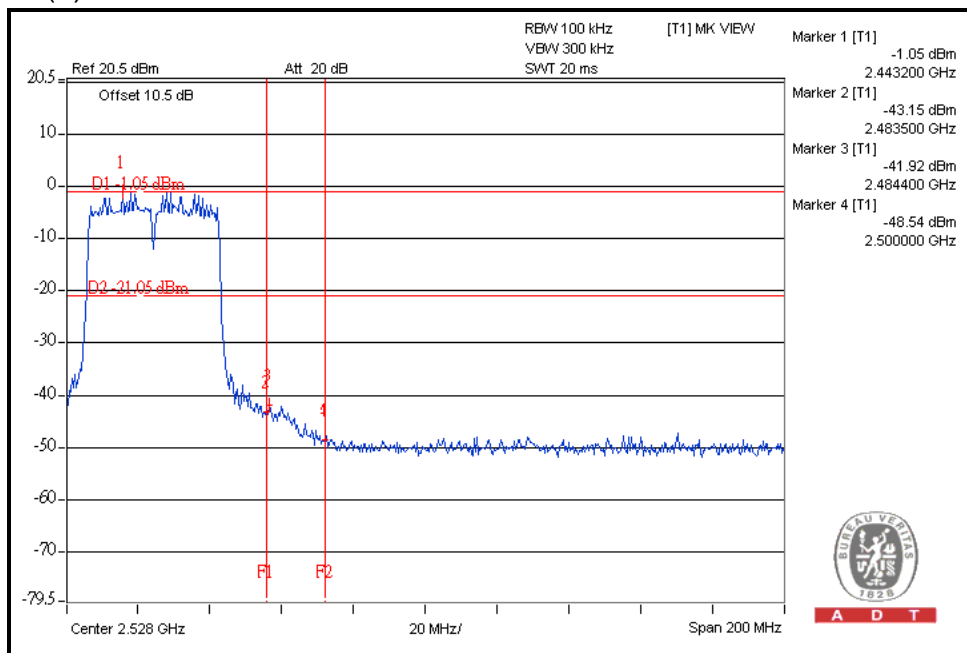


## 802.11n (40MHz) OFDM MODULATION:

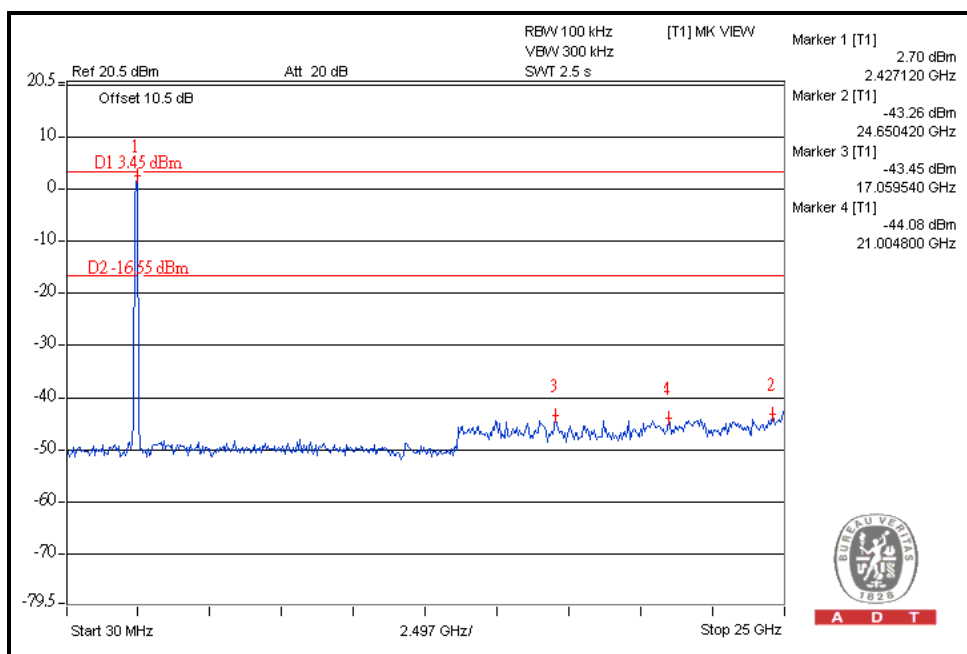
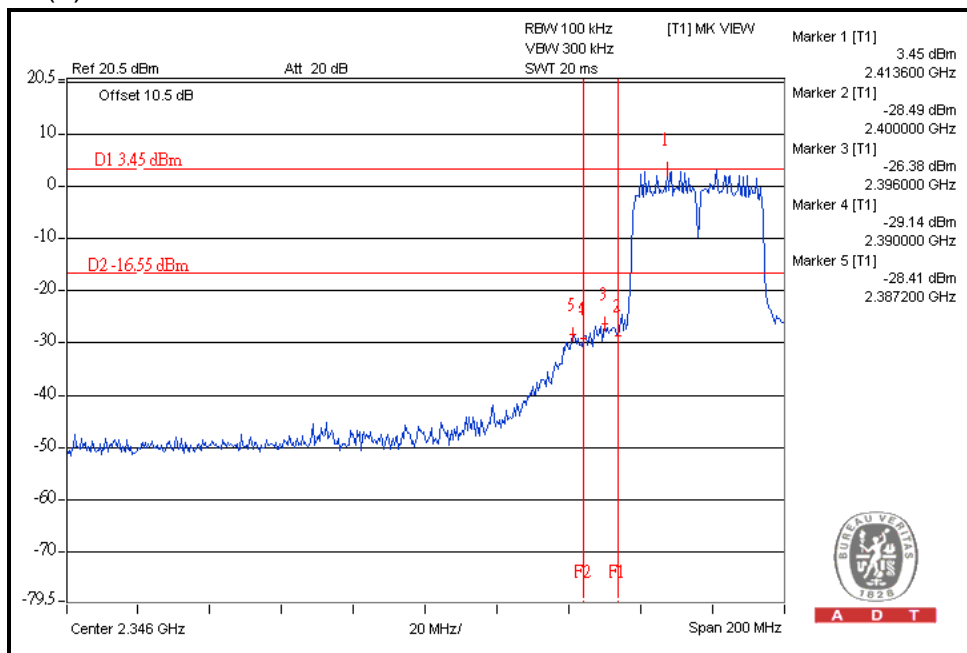
For Chain(0) : CH3



For Chain(0) : CH9



For Chain(1) : CH3



For Chain(1) : CH9



## 5. TEST TYPES AND RESULTS (802.11a, 5725~5850MHz Band)

### 5.1 CONDUCTED EMISSION MEASUREMENT

#### 5.1.1 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.

#### 5.1.2 TEST INSTRUMENTS

Test date: June 22, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 02, 2011	Mar. 01, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 17, 2010	Sep. 16, 2011
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYEBAO)	5DFB	CONCAB-003	Aug. 06, 2010	Aug. 05, 2011
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

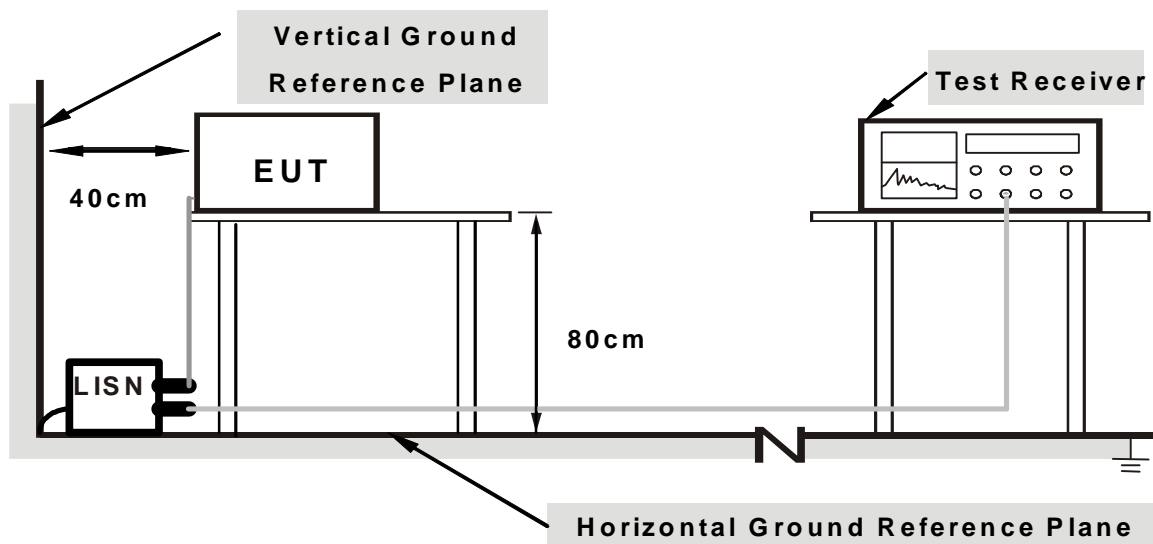
### 5.1.3 TEST PROCEDURES

- 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.

### 5.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.1.5 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.

### 5.1.6 EUT OPERATING CONDITIONS

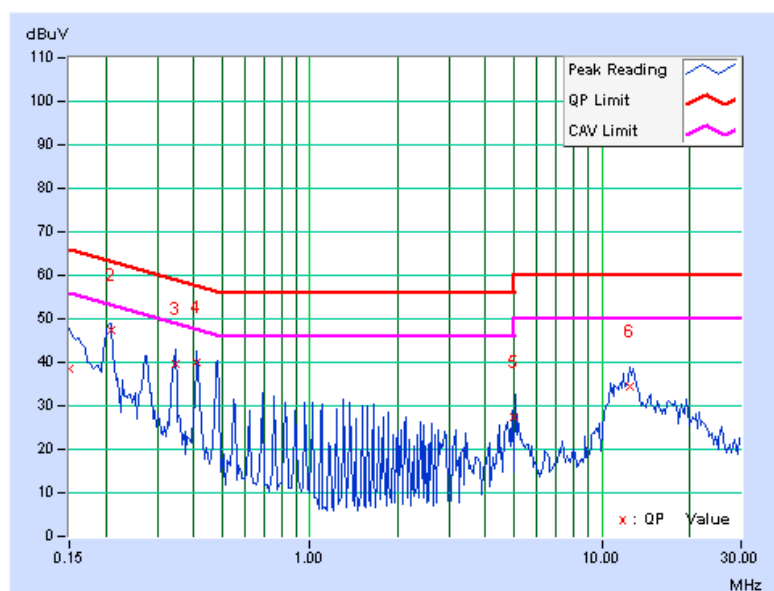
Same as the 4.1.6

## 5.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.37	38.23	15.25	38.60	15.62	66.00	56.00	-27.40	-40.38
2	0.209	0.36	47.10	38.34	47.46	38.70	63.26	53.26	-15.80	-14.56
3	0.345	0.36	39.41	35.15	39.77	35.51	59.07	49.07	-19.30	-13.56
4	0.412	0.36	39.50	34.98	39.86	35.34	57.61	47.61	-17.75	-12.27
5	5.000	0.54	26.69	20.11	27.23	20.65	56.00	46.00	-28.77	-25.35
6	12.551	0.85	33.60	26.18	34.45	27.03	60.00	50.00	-25.55	-22.97

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

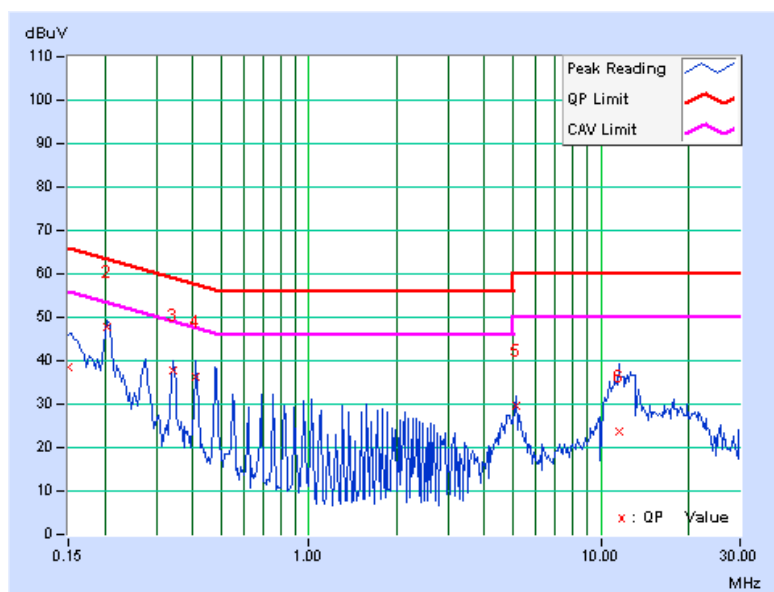




PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	38.44	15.51	38.54	15.61	66.00	56.00	-27.46	-40.39
2	0.205	0.10	47.74	39.67	47.84	39.77	63.42	53.42	-15.58	-13.65
3	0.341	0.11	37.72	33.98	37.83	34.09	59.17	49.17	-21.34	-15.08
4	0.412	0.11	36.19	33.38	36.30	33.49	57.61	47.61	-21.31	-14.12
5	5.141	0.29	29.39	23.89	29.68	24.18	60.00	50.00	-30.32	-25.82
6	11.512	0.62	23.20	17.07	23.82	17.69	60.00	50.00	-36.18	-32.31

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



## 5.2 RADIATED EMISSION MEASUREMENT

### 5.2.1 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. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.



A D T

## 5.2.2 TEST INSTRUMENTS

For below 1GHz: Test date: Aug. 08, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 12, 2011	July 11, 2012
Agilent Pre-Selector	N9039A	MY46520311	July 12, 2011	July 11, 2012
Agilent Signal Generator	N5181A	MY49060517	July 12, 2011	July 11, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 04, 2011	July 03, 2012
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_ V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.

**A D T****For above 1GHz: Test date: Aug. 08, 2011**

<b>DESCRIPTION &amp; MANUFACTURER</b>	<b>MODEL NO.</b>	<b>SERIAL NO.</b>	<b>CALIBRATED DATE</b>	<b>CALIBRATED UNTIL</b>
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 23, 2010	Aug. 22, 2011
Agilent Pre-Selector	N9039A	MY46520310	Aug. 23, 2010	Aug. 22, 2011
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
LIG NEX1 Test Receiver	ER-265	L09068005	Oct. 25, 2010	Oct. 24, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 28, 2011	Feb. 27, 2012
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 22, 2010	Nov. 21, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	NA	NA
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. H.

4. The FCC Site Registration No. is 797305.

5. The CANADA Site Registration No. is IC 7450H-3.

### 5.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

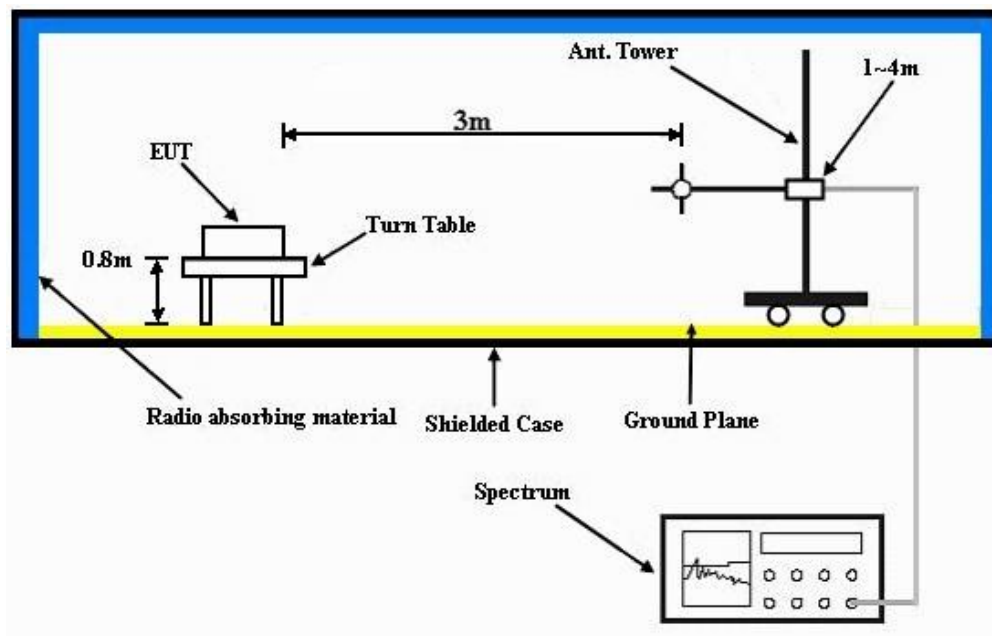
**NOTE:**

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

### 5.2.4 DEVIATION FROM TEST STANDARD

No deviation

## 5.2.5 TEST SETUP



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

## 5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

## 5.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 72%RH	TESTED BY	Frank Liu

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	73.11	33.3 QP	40.0	-6.7	2.00 H	22	21.60	11.66
2	120.00	36.1 QP	43.5	-7.4	1.50 H	228	23.49	12.64
3	240.02	39.6 QP	46.0	-6.4	1.00 H	275	26.76	12.88
4	317.41	39.3 QP	46.0	-6.7	1.00 H	110	23.65	15.61
5	840.01	39.4 QP	46.0	-6.6	1.00 H	237	13.64	25.73
6	959.97	37.6 QP	46.0	-8.4	1.50 H	156	10.61	26.97
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	30.00	33.6 QP	40.0	-6.4	1.00 V	257	20.55	13.01
2	192.00	33.9 QP	43.5	-9.6	1.00 V	213	21.85	12.04
3	302.49	34.1 QP	46.0	-11.9	1.50 V	243	18.89	15.24
4	840.01	39.4 QP	46.0	-6.6	2.00 V	357	13.70	25.73
5	959.97	38.3 QP	46.0	-7.7	1.00 V	133	11.30	26.97

- 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.

## ABOVE 1GHz WORST-CASE DATA

### 802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	*5745.00	112.3 PK			1.37 H	114	70.96	41.34
2	*5745.00	102.1 AV			1.37 H	114	60.76	41.34
3	11490.00	62.3 PK	74.0	-11.7	1.26 H	117	14.88	47.42
4	11490.00	50.2 AV	54.0	-3.8	1.26 H	117	2.78	47.42
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	*5745.00	108.4 PK			1.34 V	259	67.06	41.34
2	*5745.00	98.8 AV			1.34 V	259	57.46	41.34
3	11490.00	54.4 PK	74.0	-19.6	1.02 V	312	6.98	47.42
4	11490.00	44.8 AV	54.0	-9.2	1.02 V	312	-2.62	47.42

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





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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	111.5 PK			1.39 H	104	70.10	41.40
2	*5785.00	102.3 AV			1.39 H	104	60.90	41.40
3	11570.00	55.7 PK	74.0	-18.3	1.26 H	112	8.21	47.49
4	11570.00	45.0 AV	54.0	-9.0	1.26 H	112	-2.49	47.49
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	108.6 PK			1.41 V	260	67.20	41.40
2	*5785.00	98.9 AV			1.41 V	260	57.50	41.40
3	11570.00	55.3 PK	74.0	-18.7	1.03 V	313	7.81	47.49
4	11570.00	45.1 AV	54.0	-8.9	1.03 V	313	-2.39	47.49

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	111.7 PK			1.43 H	116	70.25	41.45
2	*5825.00	102.4 AV			1.43 H	116	60.95	41.45
3	11650.00	55.6 PK	74.0	-18.4	1.21 H	101	8.04	47.56
4	11650.00	44.8 AV	54.0	-9.2	1.21 H	101	-2.76	47.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	108.3 PK			1.40 V	263	66.85	41.45
2	*5825.00	99.2 AV			1.40 V	263	57.75	41.45
3	11650.00	54.9 PK	74.0	-19.1	1.03 V	305	7.34	47.56
4	11650.00	45.0 AV	54.0	-9.0	1.03 V	305	-2.56	47.56

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



A D T

**802.11n (20MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	*5745.00	111.3 PK			1.37 H	111	69.96	41.34
2	*5745.00	100.9 AV			1.37 H	111	59.56	41.34
3	11490.00	59.3 PK	74.0	-14.7	1.22 H	120	11.88	47.42
4	11490.00	51.3 AV	54.0	-2.7	1.22 H	120	3.88	47.42
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	*5745.00	107.4 PK			1.33 V	258	66.06	41.34
2	*5745.00	98.0 AV			1.33 V	258	56.66	41.34
3	11490.00	55.1 PK	74.0	-18.9	1.03 V	309	7.68	47.42
4	11490.00	44.9 AV	54.0	-9.1	1.03 V	309	-2.52	47.42

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	111.6 PK			1.39 H	105	70.20	41.40
2	*5785.00	101.2 AV			1.39 H	105	59.80	41.40
3	11570.00	55.9 PK	74.0	-18.1	1.23 H	117	8.41	47.49
4	11570.00	45.1 AV	54.0	-8.9	1.23 H	117	-2.39	47.49
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	107.8 PK			1.42 V	266	66.40	41.40
2	*5785.00	98.1 AV			1.42 V	266	56.70	41.40
3	11570.00	55.3 PK	74.0	-18.7	1.06 V	311	7.81	47.49
4	11570.00	45.2 AV	54.0	-8.8	1.06 V	311	-2.29	47.49

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	111.1 PK			1.43 H	116	69.65	41.45
2	*5825.00	101.1 AV			1.43 H	116	59.65	41.45
3	11650.00	55.8 PK	74.0	-18.2	1.21 H	103	8.24	47.56
4	11650.00	44.9 AV	54.0	-9.1	1.21 H	103	-2.66	47.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	108.0 PK			1.44 V	264	66.55	41.45
2	*5825.00	98.3 AV			1.44 V	264	56.85	41.45
3	11650.00	54.5 PK	74.0	-19.5	1.05 V	310	6.94	47.56
4	11650.00	45.1 AV	54.0	-8.9	1.05 V	310	-2.46	47.56

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



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**802.11n (40MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

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	*5755.00	109.9 PK			1.38 H	116	68.54	41.36
2	*5755.00	98.4 AV			1.38 H	116	57.04	41.36
3	11510.00	56.2 PK	74.0	-17.8	1.22 H	119	8.76	47.44
4	11510.00	45.0 AV	54.0	-9.0	1.22 H	119	-2.44	47.44
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	*5755.00	105.1 PK			1.41 V	258	63.74	41.36
2	*5755.00	94.9 AV			1.41 V	258	53.54	41.36
3	11510.00	56.3 PK	74.0	-17.7	1.05 V	310	8.86	47.44
4	11510.00	44.9 AV	54.0	-9.1	1.05 V	310	-2.54	47.44

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 66%RH	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	109.5 PK			1.41 H	118	68.09	41.41
2	*5795.00	98.6 AV			1.41 H	118	57.19	41.41
3	11590.00	55.8 PK	74.0	-18.2	1.24 H	106	8.30	47.50
4	11590.00	45.2 AV	54.0	-8.8	1.24 H	106	-2.30	47.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	104.7 PK			1.40 V	267	63.29	41.41
2	*5795.00	95.3 AV			1.40 V	267	53.89	41.41
3	11590.00	55.9 PK	74.0	-18.1	1.03 V	309	8.40	47.50
4	11590.00	45.1 AV	54.0	-8.9	1.03 V	309	-2.40	47.50

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



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### 5.3 6dB BANDWIDTH MEASUREMENT

#### 5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 5.3.2 TEST INSTRUMENTS

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

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

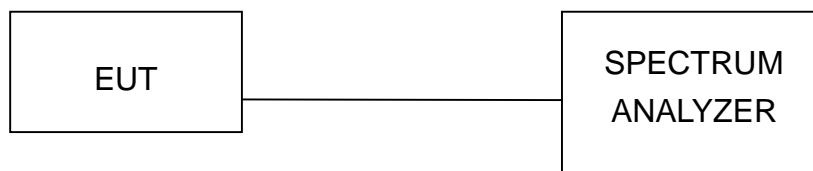
#### 5.3.3 TEST PROCEDURE

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 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 5.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 5.3.5 TEST SETUP



#### 5.3.6 EUT OPERATING CONDITIONS

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

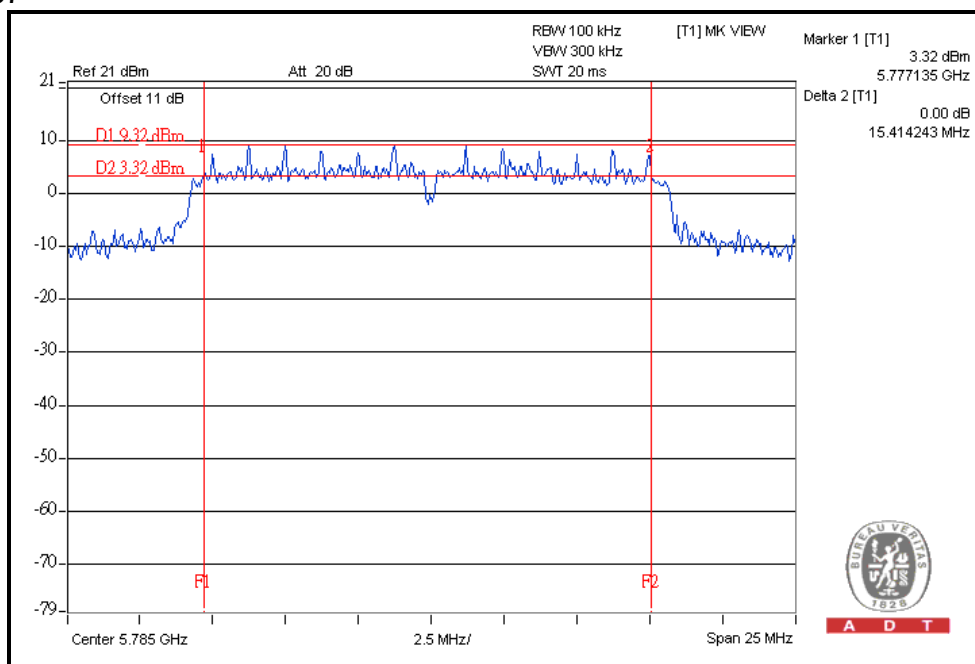


## 5.3.7 TEST RESULTS

### 802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	15.24	0.5	PASS
157	5785	15.41	0.5	PASS
165	5825	15.35	0.5	PASS

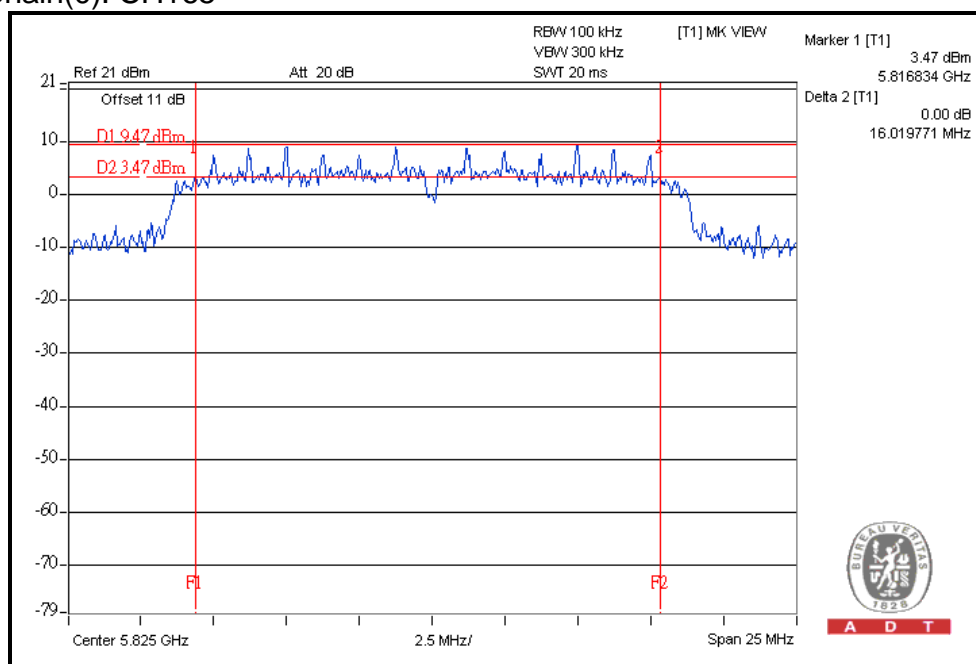
### CH157



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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
149	5745	15.81	15.81	0.5	PASS
157	5785	15.91	15.81	0.5	PASS
165	5825	16.02	15.81	0.5	PASS

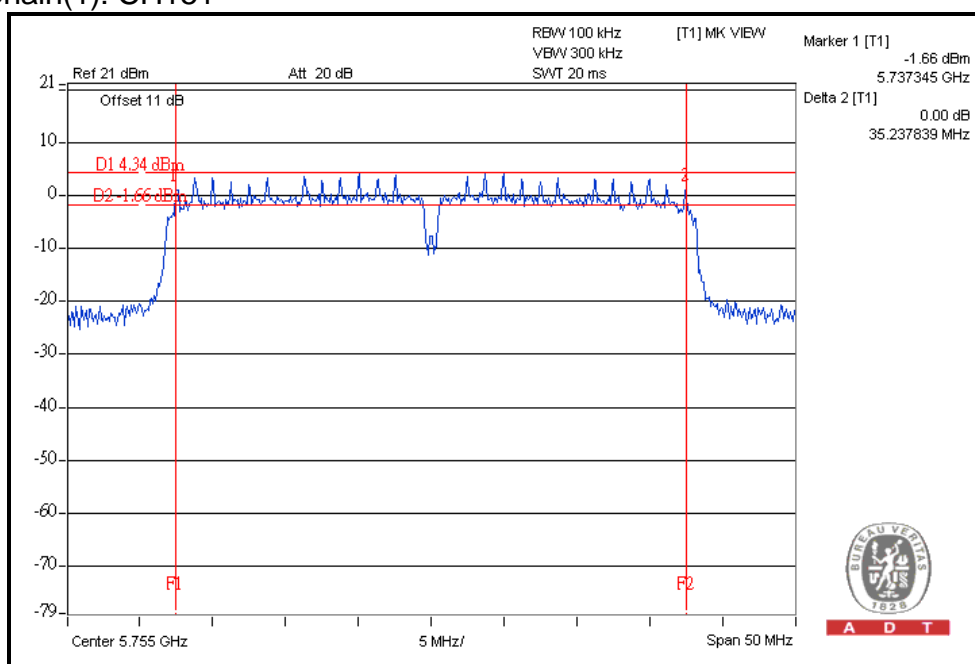
For Chain(0): CH165



# 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
151	5755	35.20	35.24	0.5	PASS
159	5795	35.19	35.22	0.5	PASS

For Chain(1): CH151



## 5.4 MAXIMUM PEAK OUTPUT POWER

### 5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 5.4.2 INSTRUMENTS

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Peak Power Meter	ML2495A	0824006	May 04, 2011	May 03, 2012
Power Sensor	MA2411B	0738172	May 03, 2011	May 02, 2012

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

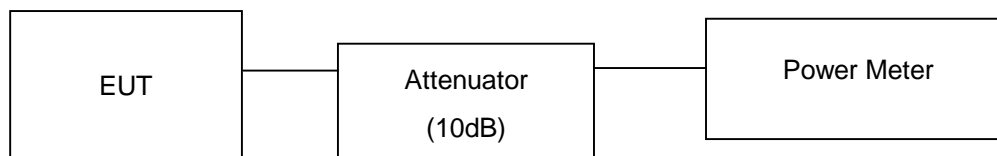
### 5.4.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

### 5.4.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.4.5 TEST SETUP



### 5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

## 5.4.7 TEST RESULTS

### 802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
149	5745	131.8	21.2	30	PASS
157	5785	138.0	21.4	30	PASS
165	5825	128.8	21.1	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
149	5745	21.0	21.1	254.7	24.1	30	PASS
157	5785	21.3	21.3	269.8	24.3	30	PASS
165	5825	21.1	21.1	257.7	24.1	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
151	5755	21.0	21.1	254.7	24.1	30	PASS
159	5795	21.2	21.3	266.7	24.3	30	PASS



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## 5.5 POWER SPECTRAL DENSITY MEASUREMENT

### 5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 5.5.2 TEST INSTRUMENTS

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

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

### 5.5.3 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 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

### 5.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.5.5 TEST SETUP



### 5.5.6 EUT OPERATING CONDITION

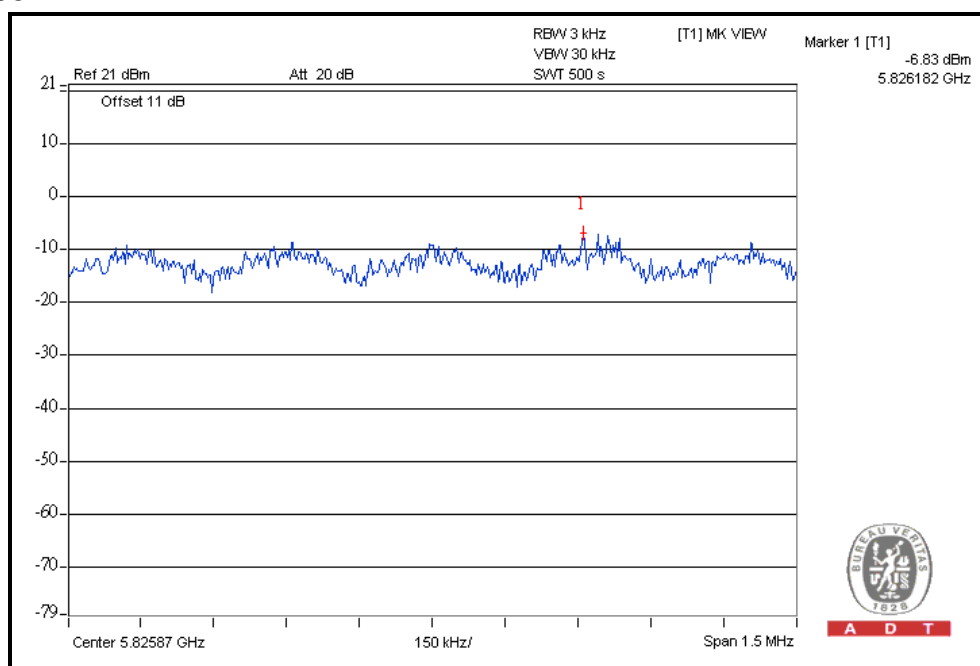
Same as Item 4.3.6

## 5.5.7 TEST RESULTS

### 802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
149	5745	-8.0	8	PASS
157	5785	-7.1	8	PASS
165	5825	-6.8	8	PASS

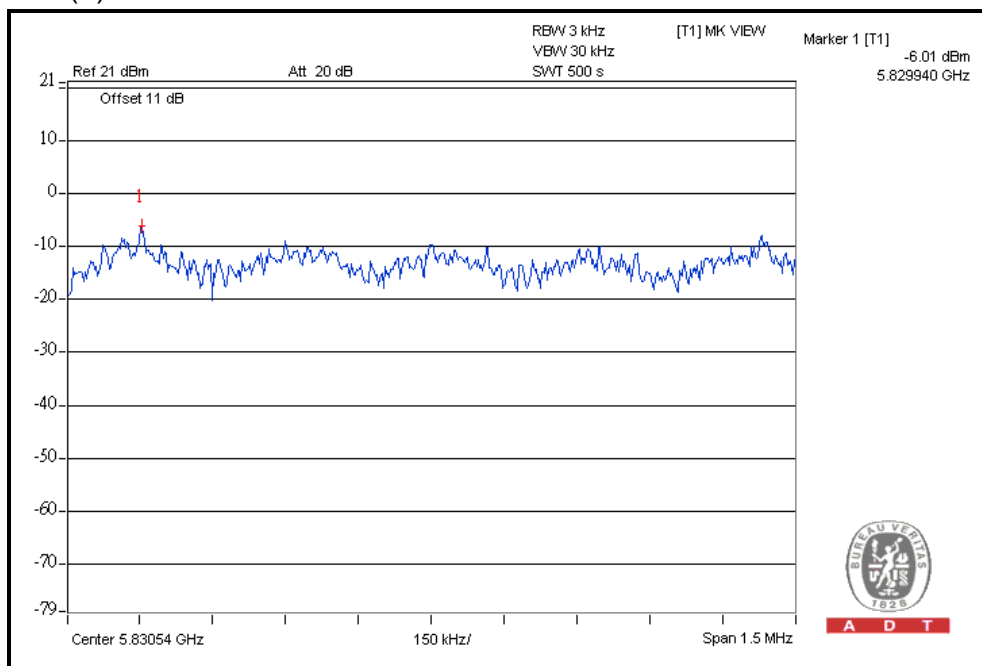
### CH165



## 802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
149	5745	-7.9	-8.4	-5.1	8	PASS
157	5785	-7.1	-7.3	-4.2	8	PASS
165	5825	-8.1	-6.0	-3.9	8	PASS

For Chain(1): CH165

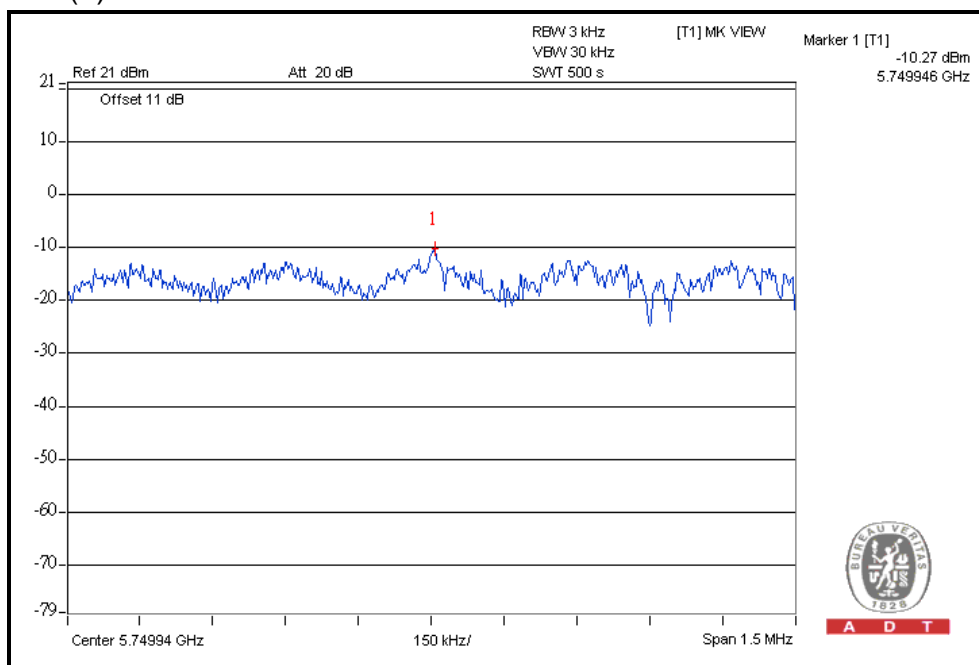




## 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
151	5755	-10.3	-11.3	-7.8	8	PASS
159	5795	-12.5	-11.6	-9.0	8	PASS

For Chain(0): CH151



## 5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

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

### 5.6.2 TEST INSTRUMENTS

Test date: Aug. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

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

### 5.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100 kHz with suitable frequency span including 100MHz or 200MHz bandwidth from band edge. The band edges was measured and recorded.

### 5.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.6.5 EUT OPERATING CONDITION

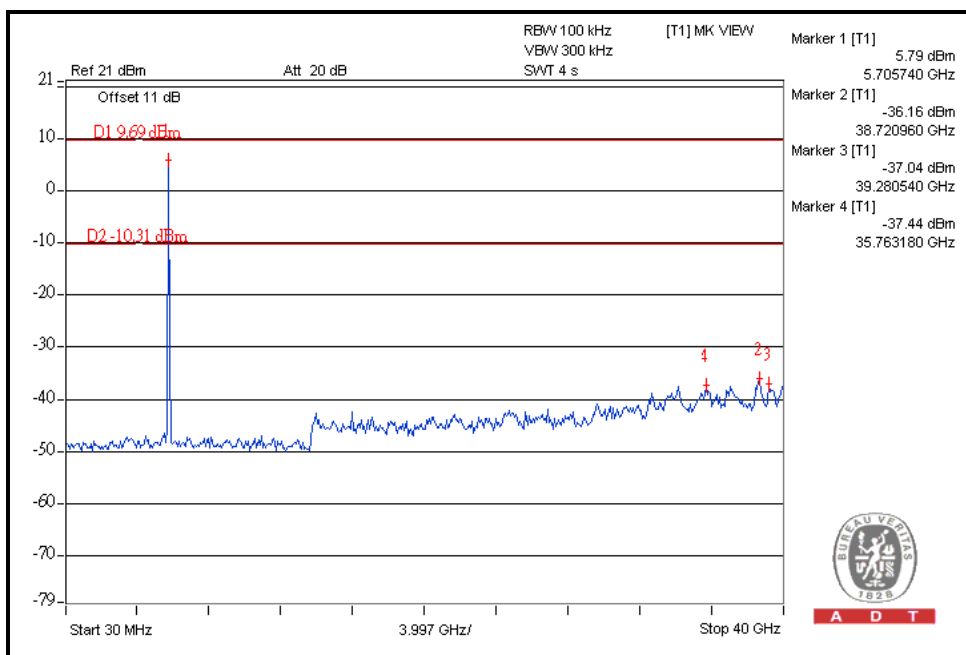
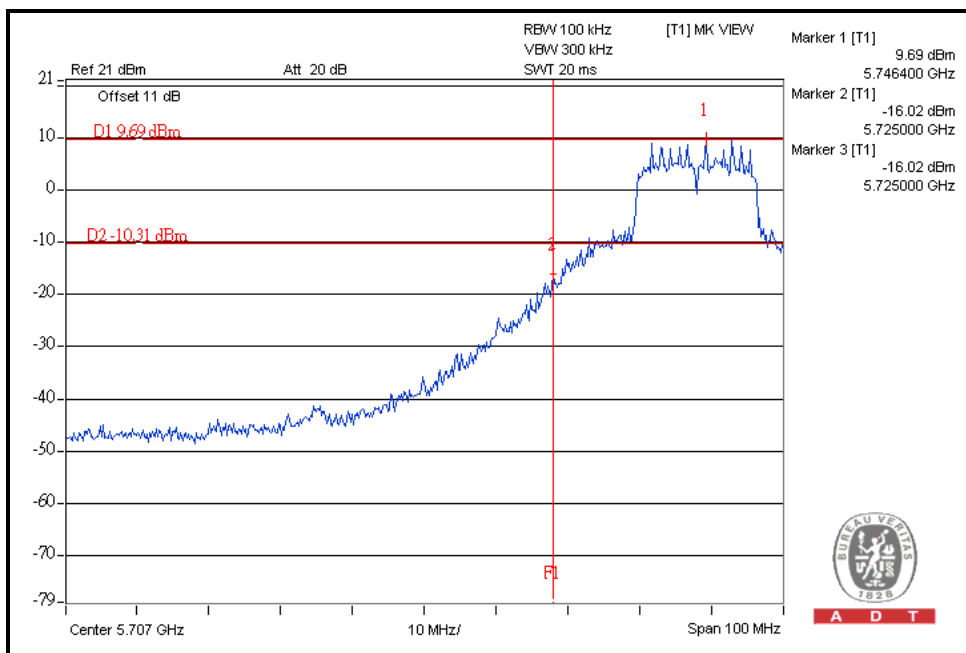
Same as Item 4.3.6

### 5.6.6 TEST RESULTS

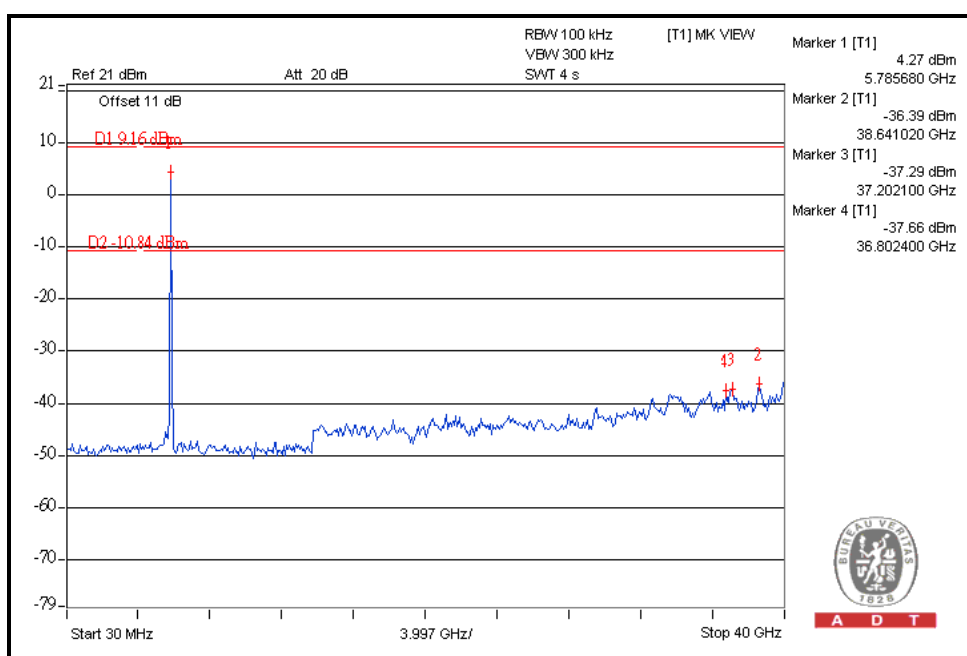
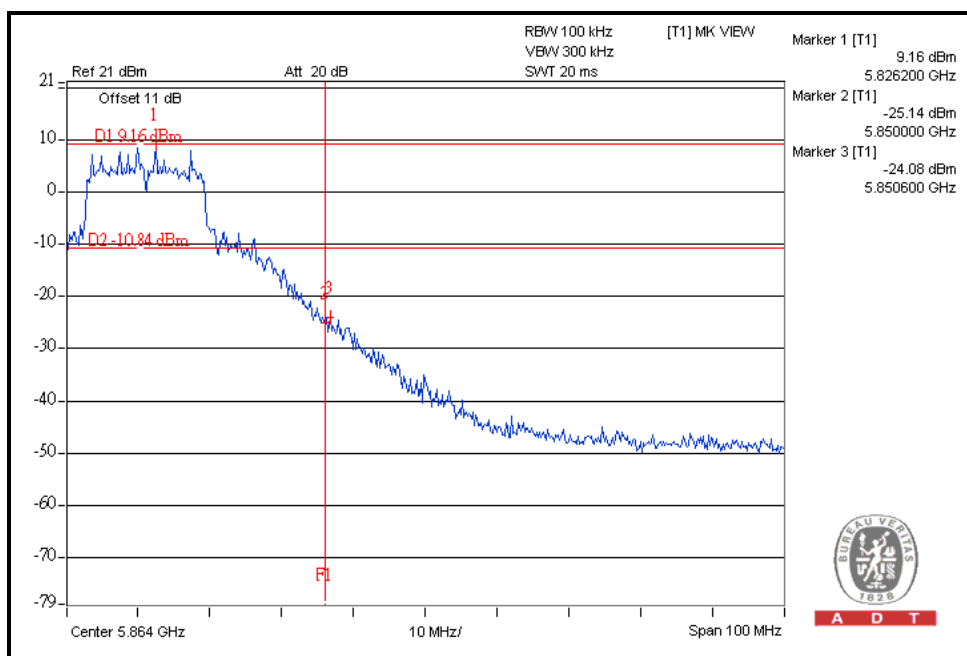
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

## 802.11a OFDM modulation

CH149

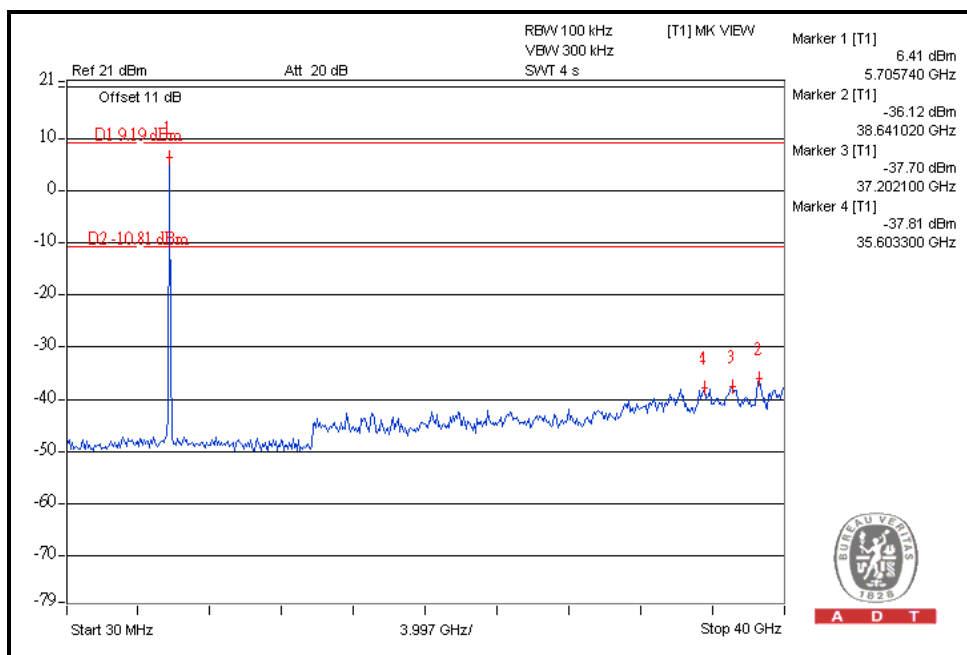
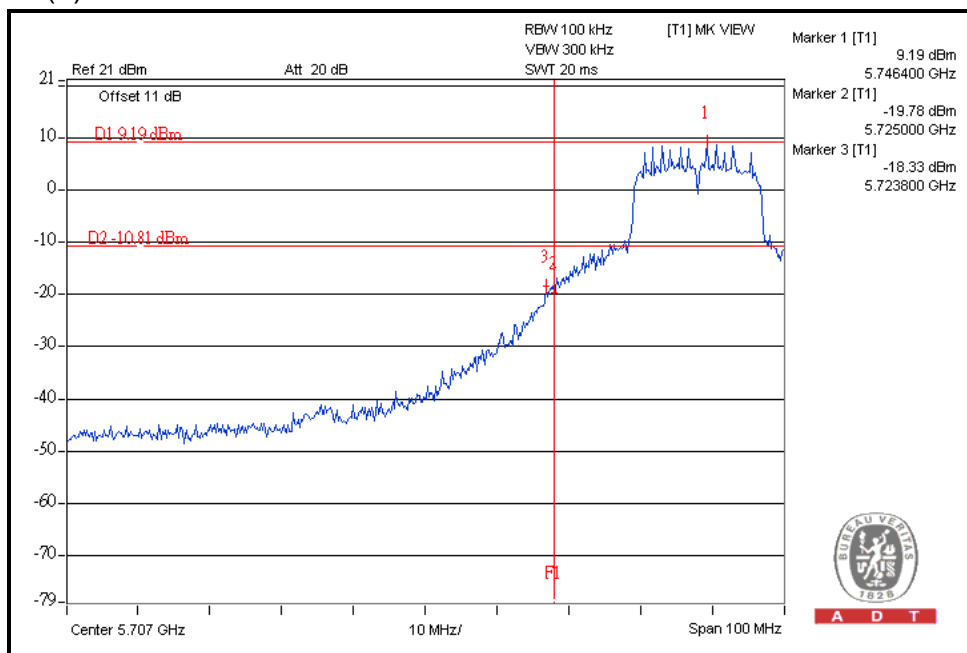


# CH165

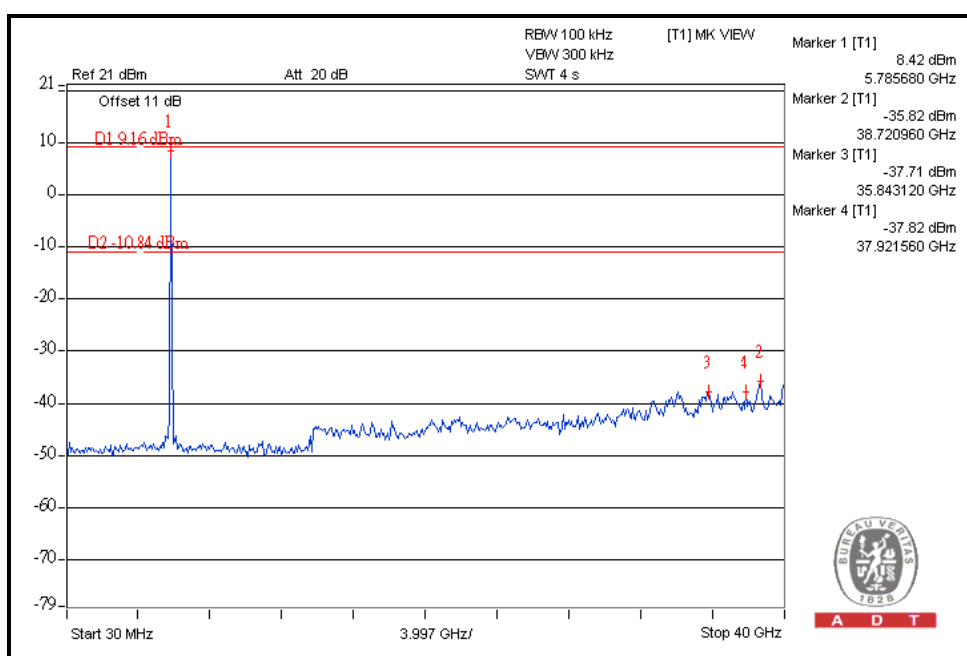
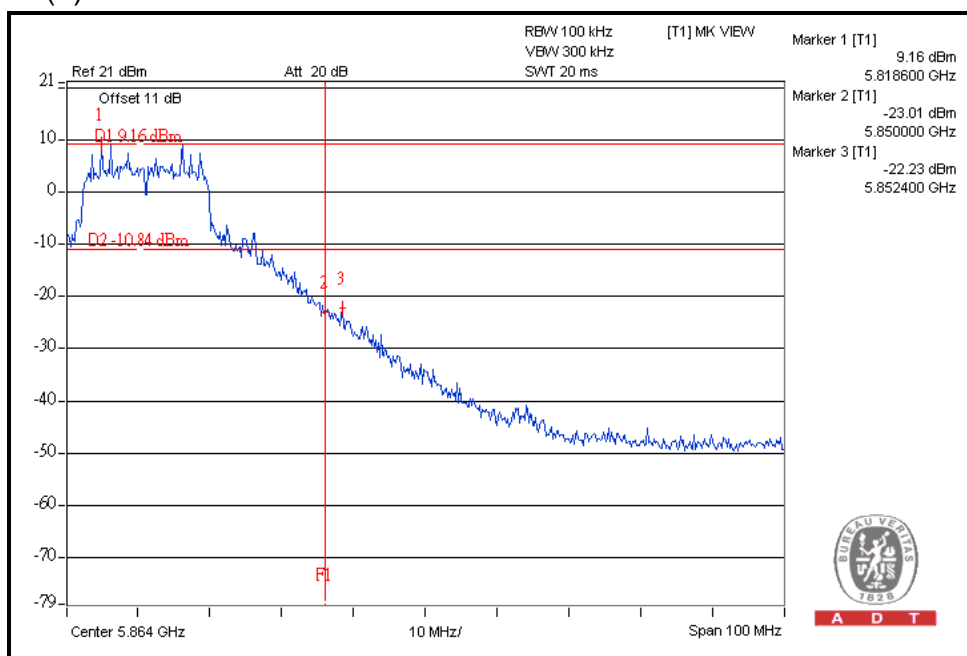


## 802.11n (20MHz) OFDM MODULATION:

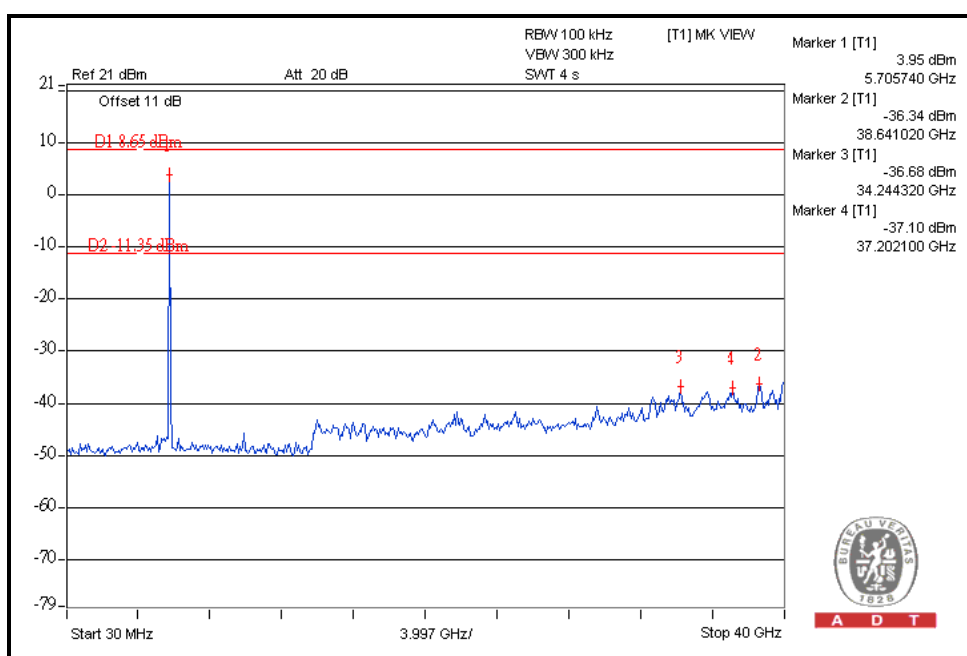
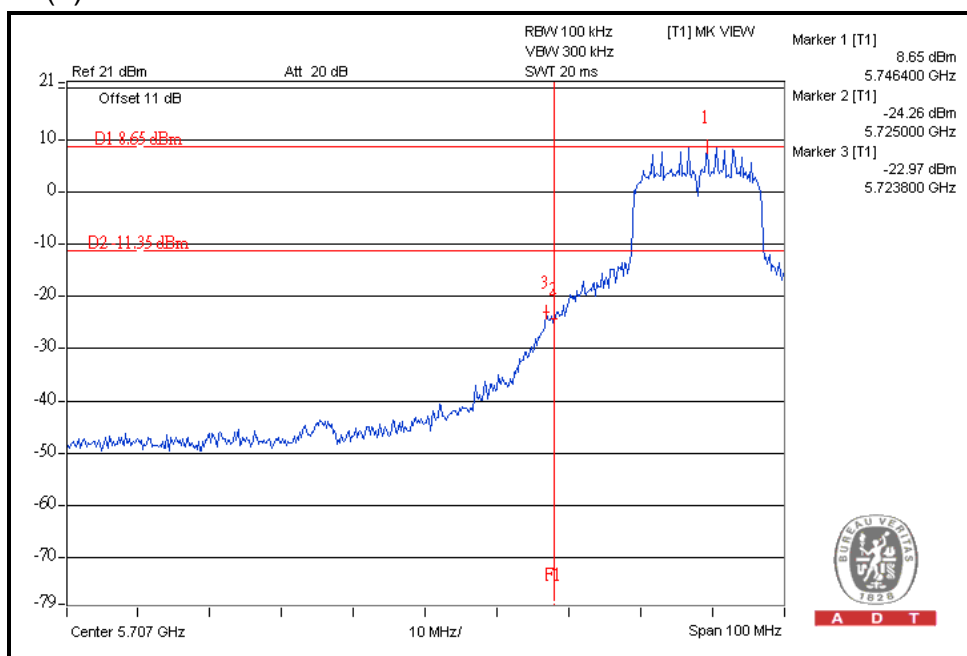
For Chain(0) : CH149



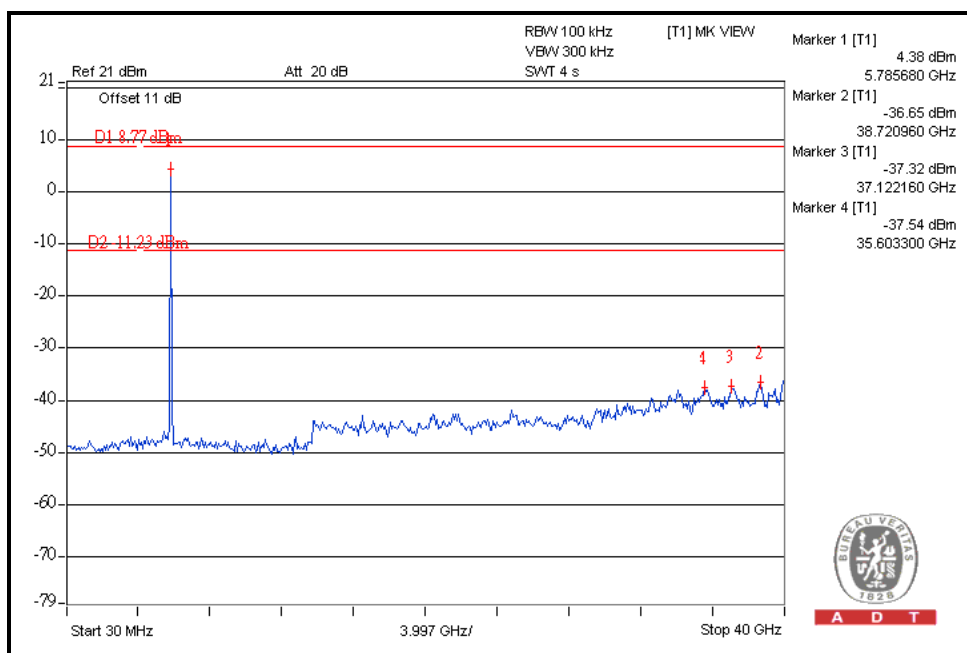
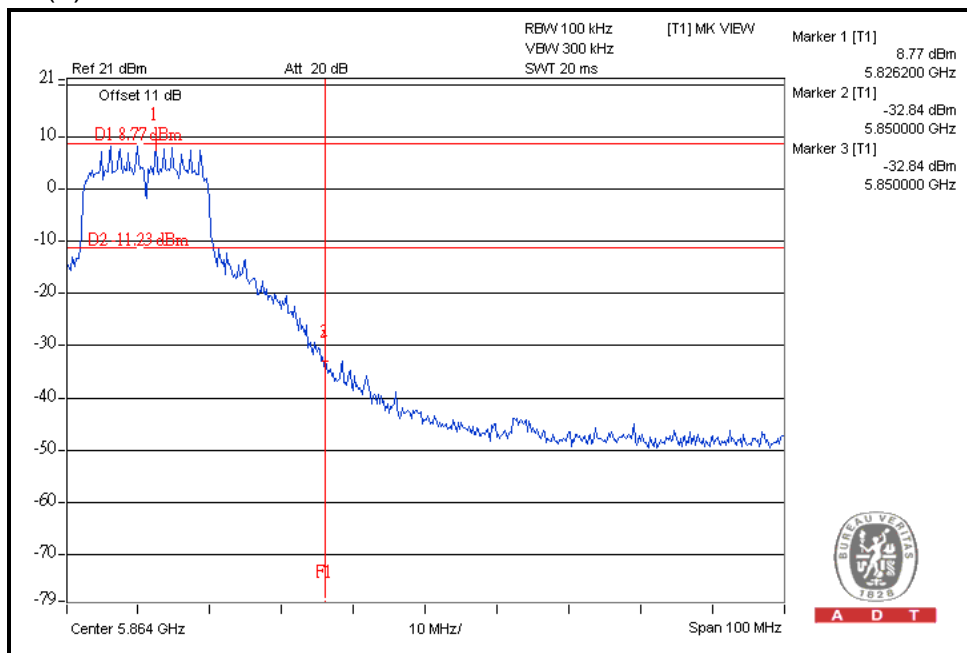
For Chain(0) : CH165



For Chain(1) : CH149



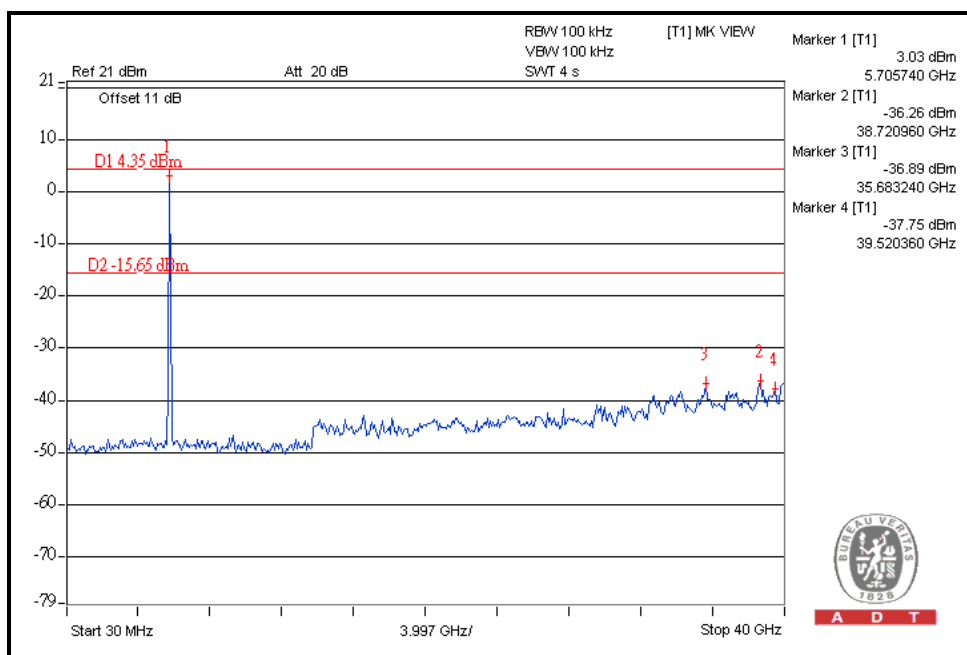
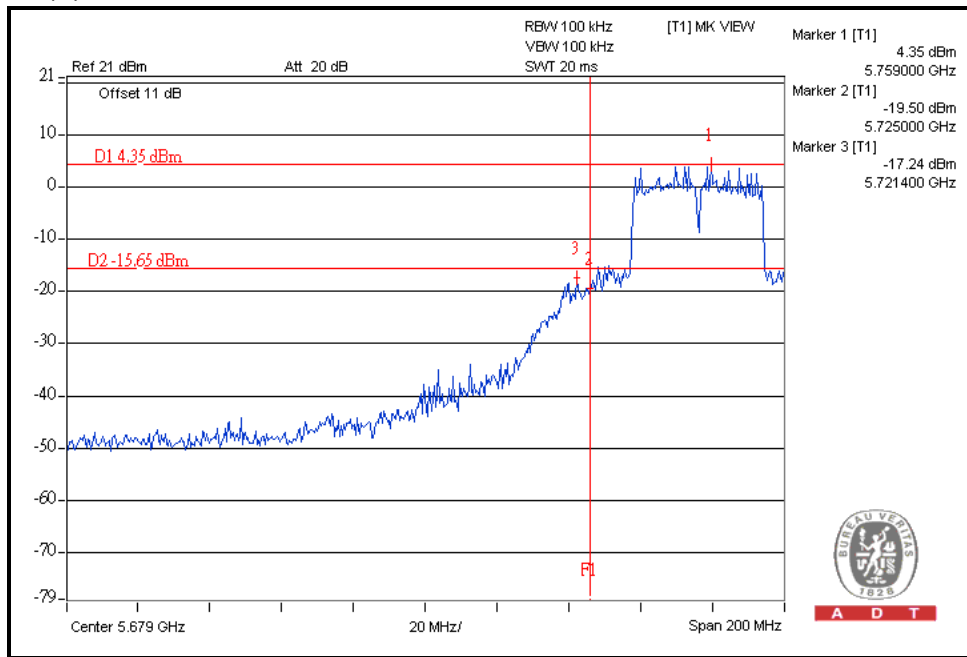
For Chain(1) : CH165



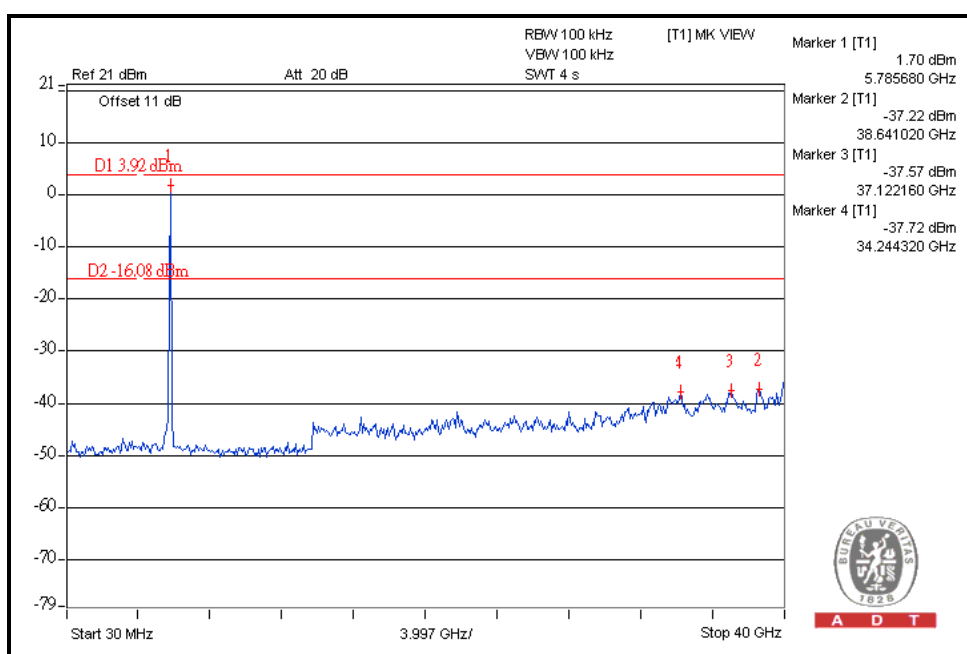
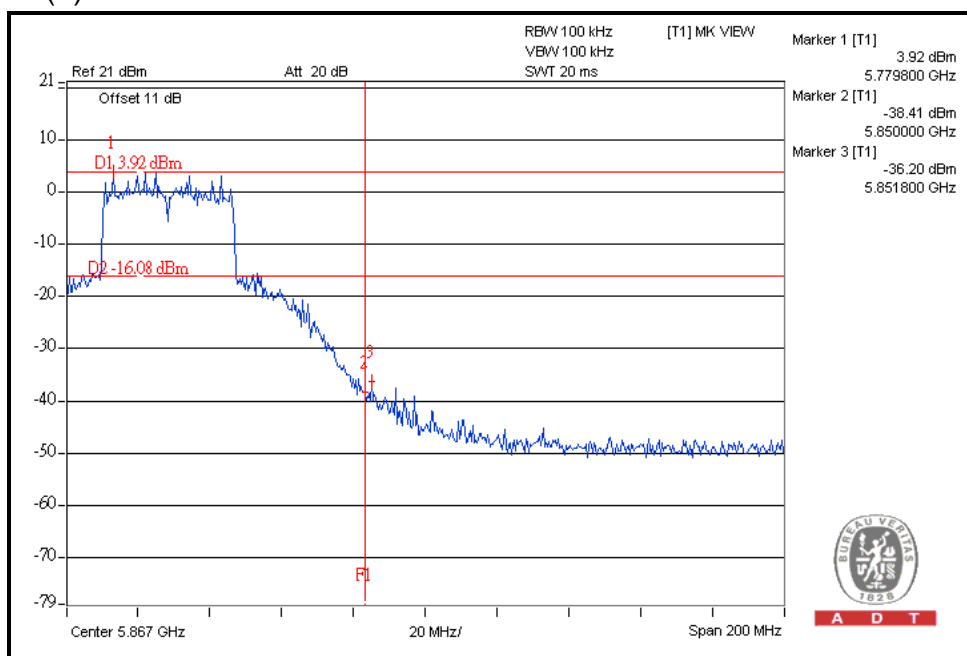


## 802.11n (40MHz) OFDM MODULATION:

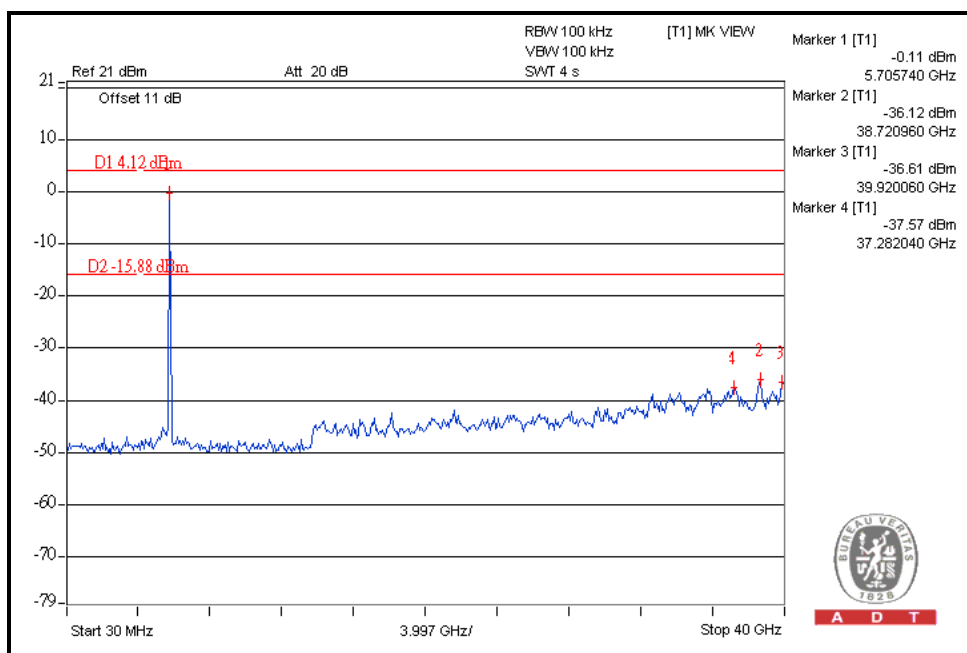
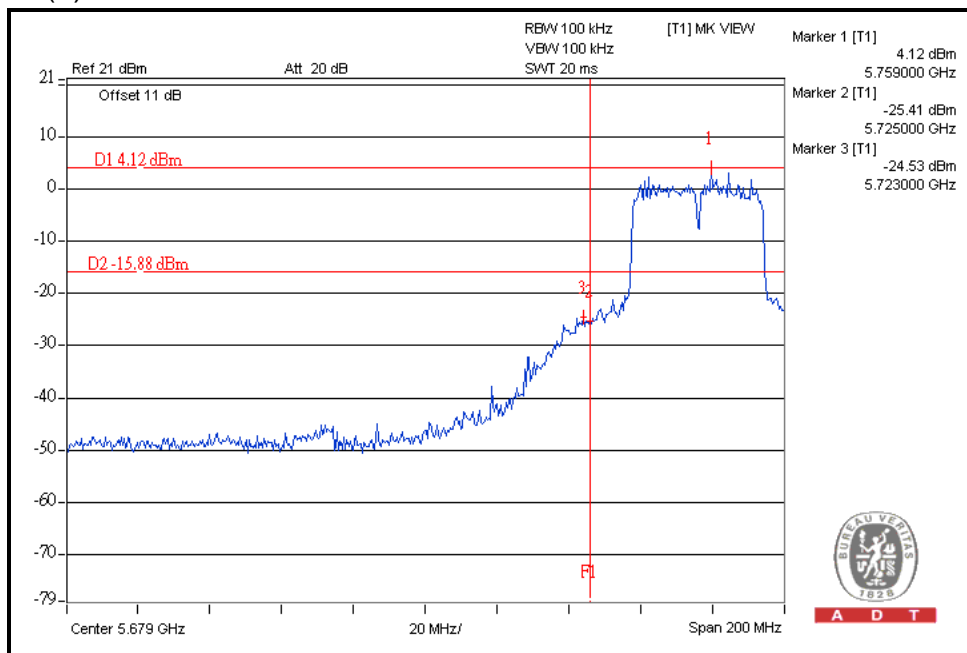
For Chain(0) : CH151



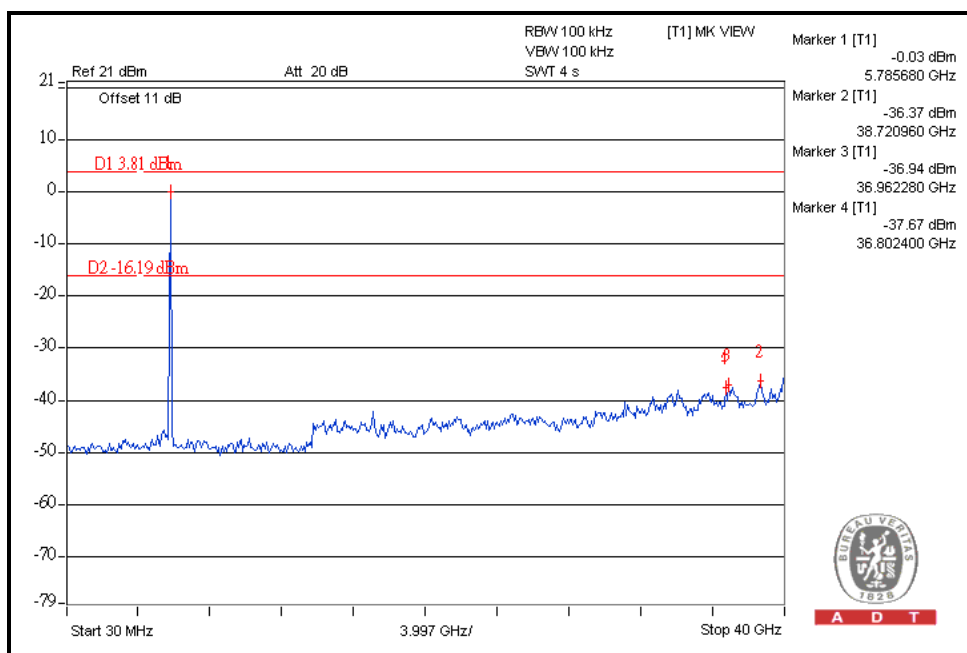
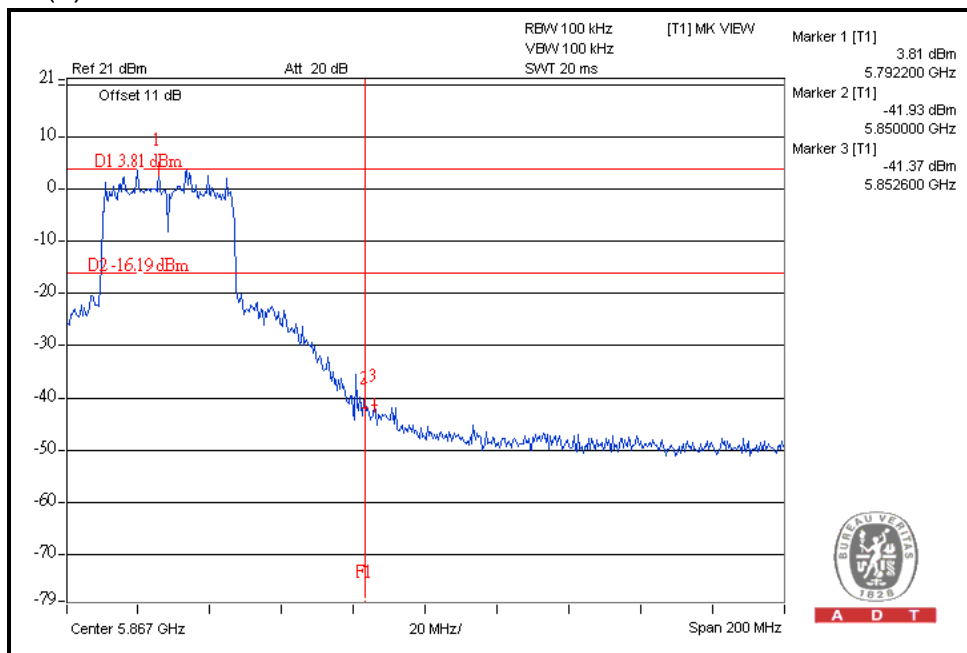
For Chain(0) : CH159



For Chain(1) : CH151



For Chain(1) : CH159



## 6. INFORMATION ON THE TESTING LABORATORIES

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

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](http://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

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

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

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



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## **7.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.

**--- END ---**