



# FCC TEST REPORT (15.247)

**REPORT NO.:** RF990810E06

**MODEL NO.:** 2100X

**FCC ID:** TC22100X

**RECEIVED:** Aug. 11, 2010

**TESTED:** Aug. 23 to 25, 2010

**ISSUED:** Sep. 06, 2010

**APPLICANT:** Roku, LLC

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
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## 1. CERTIFICATION

**PRODUCT:** IP Set Top Box  
**BRAND NAME:** Roku  
**MODEL NO.:** 2100X  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**TESTED:** Aug. 23 to 25, 2010  
**APPLICANT:** Roku, LLC  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003

The above equipment (Model: 2100X) 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:** Sep. 06, 2010  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE** : Hank Chung , **DATE:** Sep. 06, 2010  
( Hank Chung, Deputy Manager )

**APPROVED BY** : May Chen , **DATE:** Sep. 06, 2010  
( 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

<b>APPLIED STANDARD: FCC Part 15, Subpart C</b>			
<b>Standard Section</b>	<b>Test Type and Limit</b>	<b>Result</b>	<b>Remark</b>
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -11.99dB at 4.453MHz
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 4824.0MHz
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	No antenna connector is used.



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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 -11.99dB at 4.453MHz
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 -0.1dB at 11570.0MHz
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	No antenna connector is used.

**NOTE:**

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.725GHz 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 and 5.47~5.725GHz RF parameters was recorded in another test report.



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## 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)	3.3 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.55 dB





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### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	IP Set Top Box
<b>MODEL NO.</b>	2100X
<b>FCC ID</b>	TC22100X
<b>POWER SUPPLY</b>	DC 5V from power adapter
<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>802.11a/g</b> : 54/48/36/24/18/12/9/6Mbps <b>802.11n (20MHz, 800ns GI)</b> : 130 / 117 / 104 / 78 / 52 / 39 / 26 / 13 / 6.5 / 5.5 / 5.2 / 3.9 / 2.6 / 1.9 / 1.3 / 0.9 / 0.6Mbps <b>802.11n (40MHz, 800ns GI)</b> : 270 / 243 / 216 / 162 / 108 / 81 / 54 / 27 / 13.5 / 11.25 / 9 / 6.75 / 5.25 / 3.9 / 2.7 / 1.95 / 1.35Mbps
<b>OPERATING FREQUENCY</b>	<b>For 15.407</b> 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz <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> 19 for 802.11a, 802.11n (20MHz) 9 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)



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<b>MAXIMUM OUTPUT POWER</b>	<p><b>For 15.407</b>              802.11a: 147.9mW              802.11n (20MHz): 119.1mW              802.11n (40MHz): 188.8mW  <b>For 15.247(2.4GHz)</b>              802.11b: 234.4mW              802.11g: 883.7mW              802.11n (20MHz): 873.3mW              802.11n (40MHz): 317.1mW  <b>For 15.247(5GHz)</b>              802.11a: 199.5mW              802.11n (20MHz): 413.1mW              802.11n (40MHz): 376.8mW</p>
<b>ANTENNA TYPE</b>	Please see note 1
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	<p>USB port (USB 2.0) x 1              COMPNT VIDEO port (Y/Pb/Pr) x 1              OPTICAL AUDIO port x 1              HDMI port x 1              ETHERNET port x 1              VIDEO R-AUDIO-L port x 1(VIDEO(yellow), Right channel(Red), Left channel(White))</p>
<b>ASSOCIATED DEVICES</b>	Remote control x 1

**NOTE:**

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

Chain	Antenna Type	Antenna Connector	Antenna Gain (dBi)	Frequency range (MHz to MHz)
Chain (0)	PCB Printed(Main)	NA	-1.51	2400 to 2483.5
	PCB Printed(Main)	NA	3.88	5150 to 5750
Chain (1)	PCB Printed(Aux)	NA	0.34	2400 to 2483.5
	PCB Printed(Aux)	NA	3.03	5150 to 5750



2. The EUT must be supplied with a power adapter and following two different models could be chosen:

Adapter 1	
<b>Brand:</b>	RoKu
<b>Model No.:</b>	FA-0502500SU
<b>Input power :</b>	AC100-240V, 0.5A, 50/60Hz
<b>Output power :</b>	DC 5V, 2.5A DC output cable (Unshielded, 1.5m)
Adapter 2	
<b>Brand:</b>	RoKu
<b>Model No.:</b>	DSA-15P-05 US 050125
<b>Input power :</b>	AC100-240V, 0.5A, 50/60Hz
<b>Output power :</b>	DC 5V, 2.5A DC output cable (Unshielded, 1.8m)

For radiated test, the EUT was pre-tested with above adapters, the worse case was found in adapter 2. Therefore only the test data of the adapter was recorded in this report.

3. The EUT incorporates a MIMO function with 802.11n. Physically, the EUT provides two completed transmitters and two completed receivers.
4. The EUT is 2 \* 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The antenna configurations are two transmitter antennas and two receiver antennas, as there are 2 PCB Printed antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 2 antennas. The 11a/b legacy mode is limited to single transmitter only.
5. The EUT complies with 802.11n standards and backwards compatible with 802. 11a, 802.11b, 802.11g products.
6. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 3.2 DESCRIPTION OF TEST MODES

#### 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
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	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



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### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	
1	√				With adapter 1
2	√	√	√	√	With adapter 2

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

### ANTENNA COMBINATION MODE:

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

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.
2. Mode A, C, E, F & G the worst modes, were selected as representative mode for the report.

### POWER LINE CONDUCTED EMISSION TEST:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
Worst Channel	-	-	-	-	-	-



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**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 MODE
802.11g	1 to 11	6	OFDM	BPSK	6	E
For 5 GHz 802.11n (20MHz)	151 to 159	149	OFDM	BPSK	6.5	F

**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 MODE
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	C
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	E
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	F
802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	G
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	A
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	F
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	G

**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	C
802.11g	1 to 11	1, 11	OFDM	BPSK	6	E
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	F
For 2.4 GHz 802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5	G
802.11a	149 to 165	149, 165	OFDM	BPSK	6	A
For 5 GHz 802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	6.5	F
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	G

- ⌘ After verification, conducted out band emission as show worst chain in report by investigations.



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**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 MODE
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	C
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	E
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	F
For 2.4 GHz 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	G
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	A
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	F
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	G

※ After verification, bandwidth as show worst chain in report by investigations.

※ **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE <sup>3</sup> 1G	28deg. C, 72%RH, 1013 hPa	120Vac, 60Hz	Duke Tseng
RE<1G	28deg. C, 72%RH, 1013 hPa	120Vac, 60Hz	Rex Huang
PLC	26deg. C, 66%RH, 1013 hPa	120Vac, 60Hz	Max Tseng
APCM	28deg. C, 68%RH, 1013 hPa	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**

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

**NOTE:** The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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### 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.

For conducted test					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D600	CN-0G5152-48643-47H-7672	NA
2	TV MONITOR	Panasonic	TH-L26K10W	9540684	NA
3	TV MONITOR	Toshiba	21D7GT	87000018	NA
4	LCD MONITOR	DELL	U2410F	CNOJ257M728729 AG159L	FCC DoC
5	SPEAKERS	J-S	JY2003	090404619	FCC DoC
6	USB AUDIO 8 SOUND CARD	CASE	DSA-0101F-05 UP	5204	NA
7	USB Flash Drive	SanDisk	SDCZ2-512-A10	5482374371	FCC DoC

For conducted test	
No.	Signal cable description
1	UTP cable (10m)
2	HDMI cable (1.5m)
3	Y/Pb/Pr cable (1.8m)
4	AV cable (1.8m)
5	NA
6	Fiber cable (1 m)
7	NA

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



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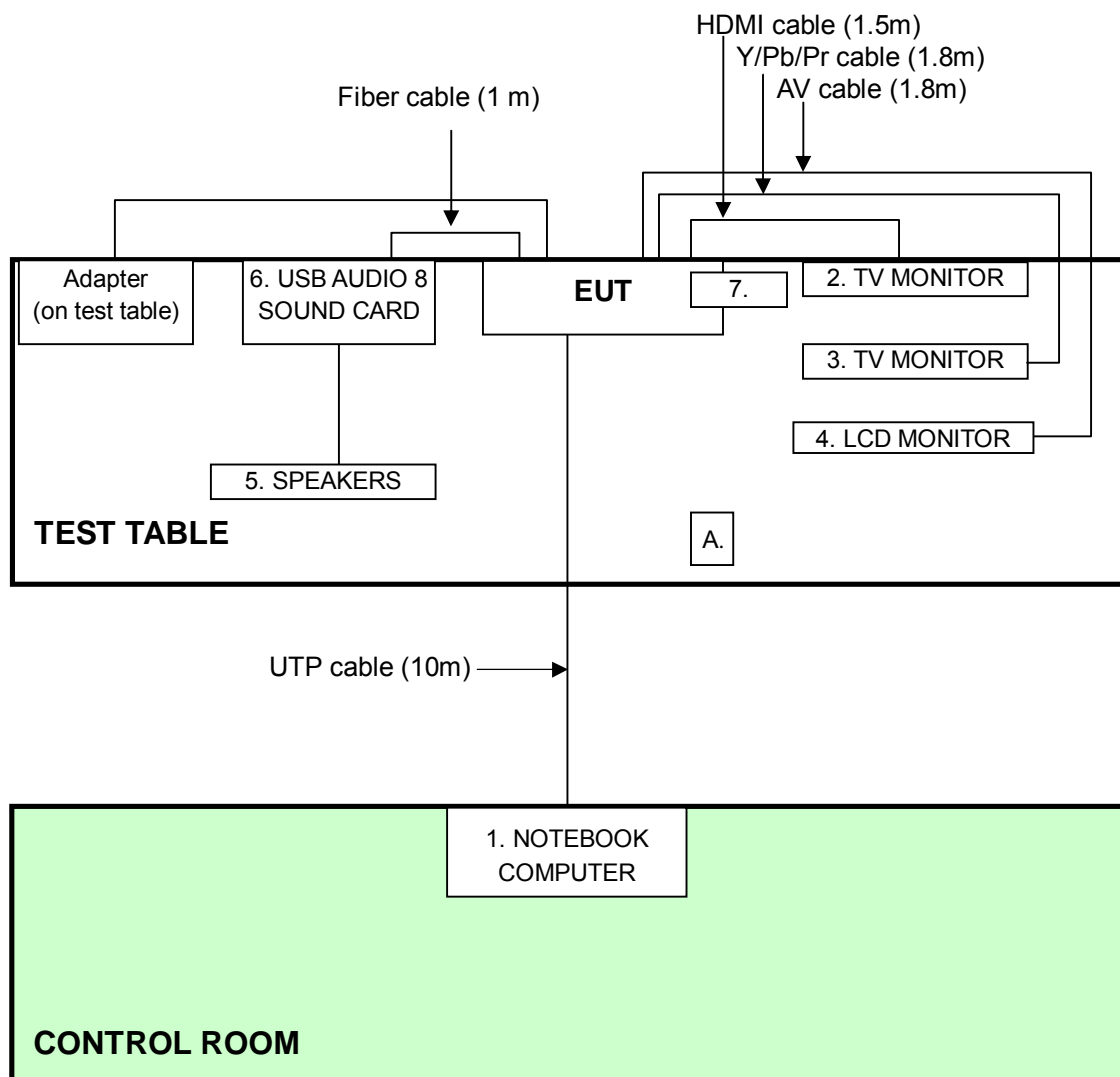
For other test items					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D600	CN-0G5152-48643-47H-7672	NA
2	TV MONITOR	Panasonic	TH-L26K10W	9540684	NA
3	LCD MONITOR	DELL	U2410F	CNOJ257M728729 AG14ML	FCC DoC
4	LCD MONITOR	DELL	U2410F	CNOJ257M728729 AG159L	FCC DoC
5	SPEAKERS	J-S	JY2003	090404619	FCC DoC
6	SPEAKERS	J-S	JY2003	090404576	FCC DoC
7	USB AUDIO 8 SOUND CARD	CASE	DSA-0101F-05 UP	5204	NA
8	USB Flash Drive	SanDisk	SDCZ2-512-A10	5482374371	FCC DoC

For other test items	
No.	Signal cable description
1	UTP cable (10m)
2	HDMI cable (1.5m)
3	Y/Pb/Pr cable (1.8m)
4	AV cable (1.8m)
5	NA
6	NA
7	Fiber cable (1 m)
8	NA

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

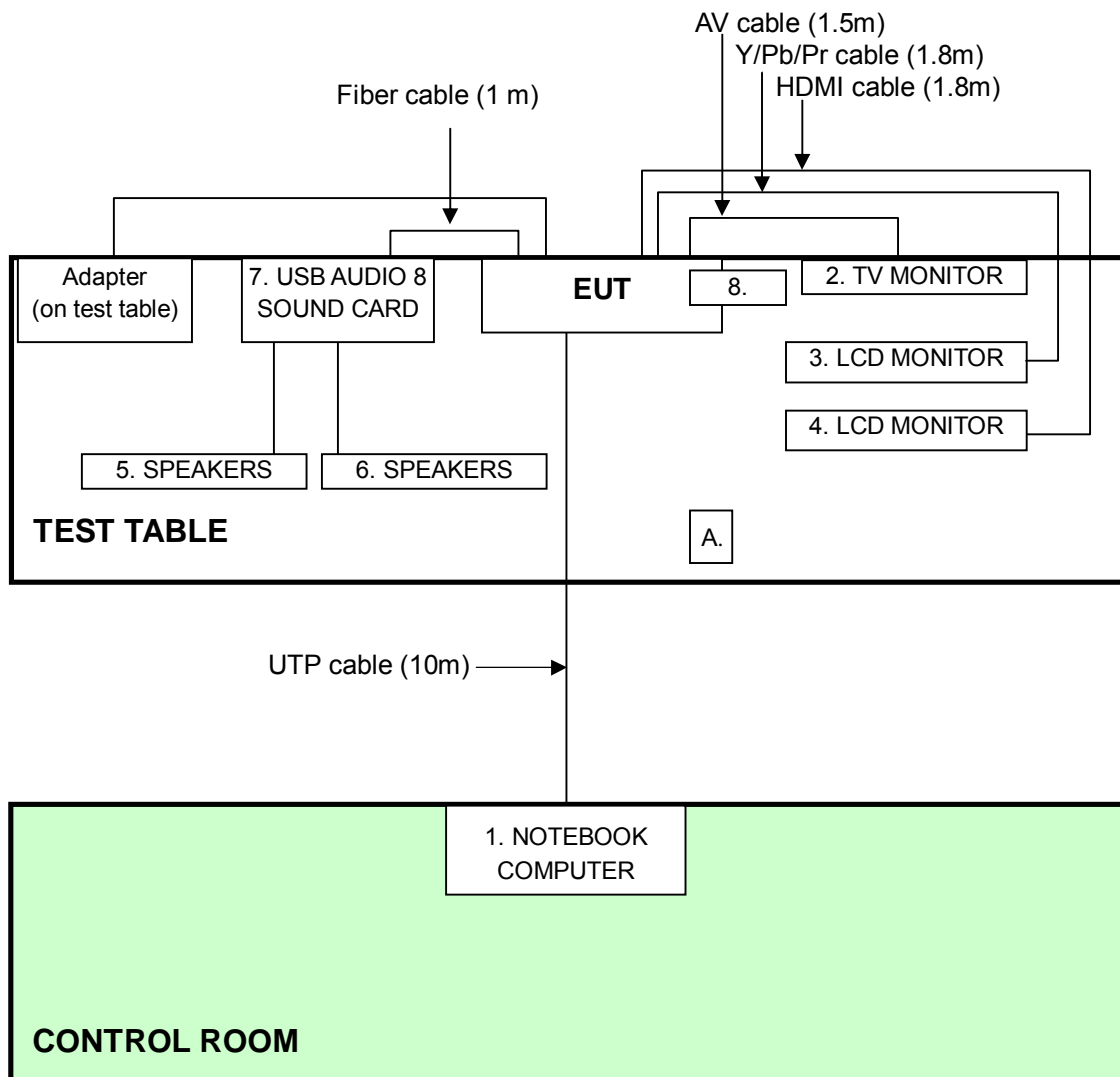
### 3.5 CONFIGURATION OF SYSTEM UNDER TEST

For conducted test:



**NOTE:** 1. Item A is the remote control of the EUT.  
 2. Item 7 is USB Flash Drive.

**For other test items:**



**NOTE:** 1. Item A is the remote control of the EUT.  
 2. Item 8 is USB Flash Drive.



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## 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)	
0.15-0.5	Quasi-peak	Average
0.5-5	66 to 56	56 to 46
5-30	56	46
	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 01, 2010	Feb. 28, 2011
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 23, 2009	Sep. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 11, 2010	June 10, 2011
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec. 14, 2009	Dec. 13, 2010
50 ohms Terminator	50	3	Oct. 28, 2009	Oct. 27, 2010
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.

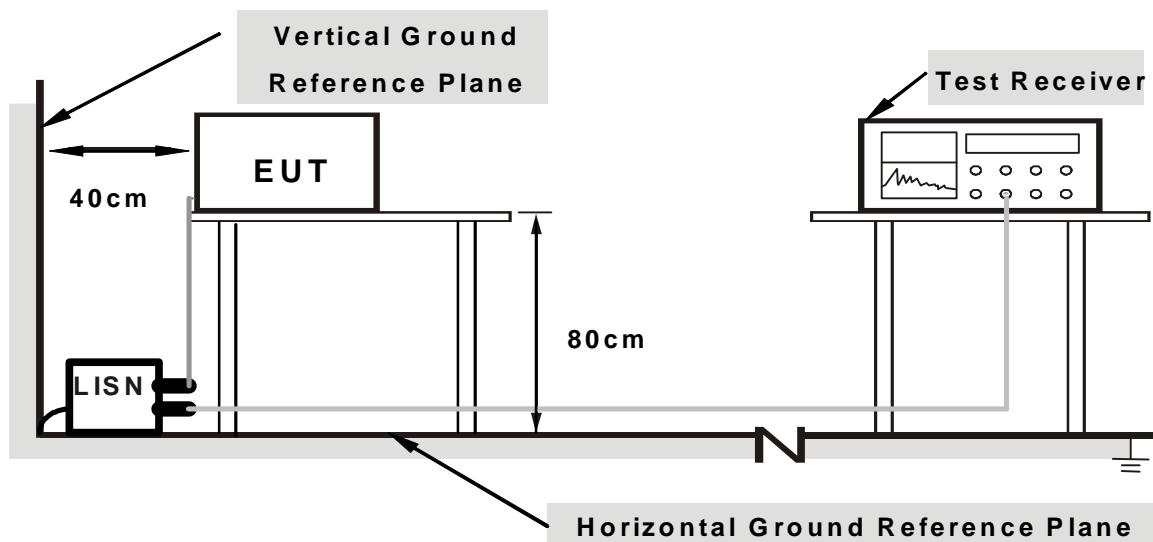
#### 4.1.3 TEST PROCEDURES

- 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. Turned on the power of all equipment.
2. Prepared other computer system (support unit 1) to act as communication partners and placed them outside of testing area.
3. The communication partners run test program "Telnet Broadcom command.exe" to enable EUT under transmission/receiving condition continuously at specific channel frequency.
4. Support unit 1 (NB) sends video/Audio messages to Support units 2, 3 & 4 (TV\*2 / LCD monitor) / Support unit 5 (speaker) via EUT.
5. Support unit 1 (NB) ran "Telnet command.exe" to RW from Support unit 7 (USB Flash Drive) via EUT.

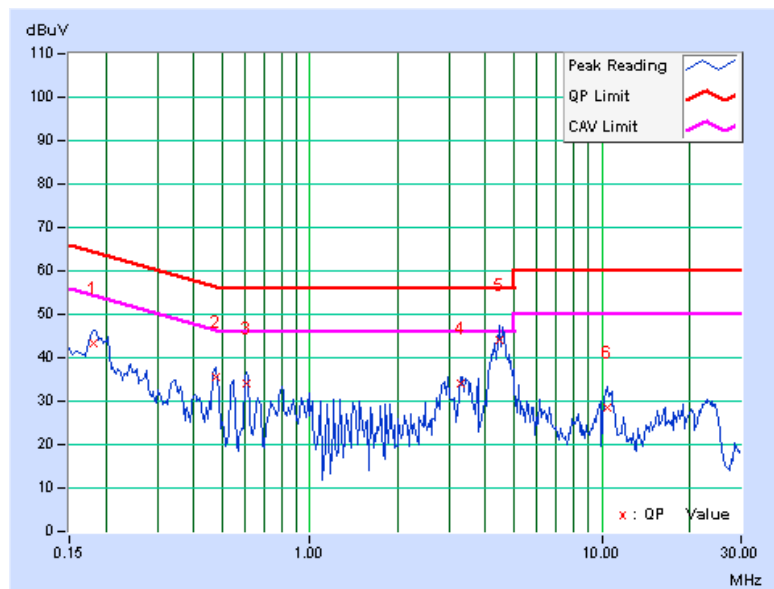


### 4.1.7 TEST RESULTS

<b>TEST MODE</b>	With adapter 1		
<b>PHASE</b>	Line (L)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.181	0.04	43.18	28.85	43.22	28.89	64.43
2	0.474	0.07	35.54	29.11	35.61	29.18	56.44	46.44	-20.83	-17.26
3	0.607	0.11	34.08	30.36	34.19	30.47	56.00	46.00	-21.81	-15.53
4	3.297	0.20	33.82	19.90	34.02	20.10	56.00	46.00	-21.98	-25.90
<b>5</b>	<b>4.453</b>	<b>0.22</b>	<b>43.79</b>	<b>28.44</b>	<b>44.01</b>	<b>28.66</b>	<b>56.00</b>	<b>46.00</b>	<b>-11.99</b>	<b>-17.34</b>
6	10.512	0.58	27.90	19.62	28.48	20.20	60.00	50.00	-31.52	-29.80

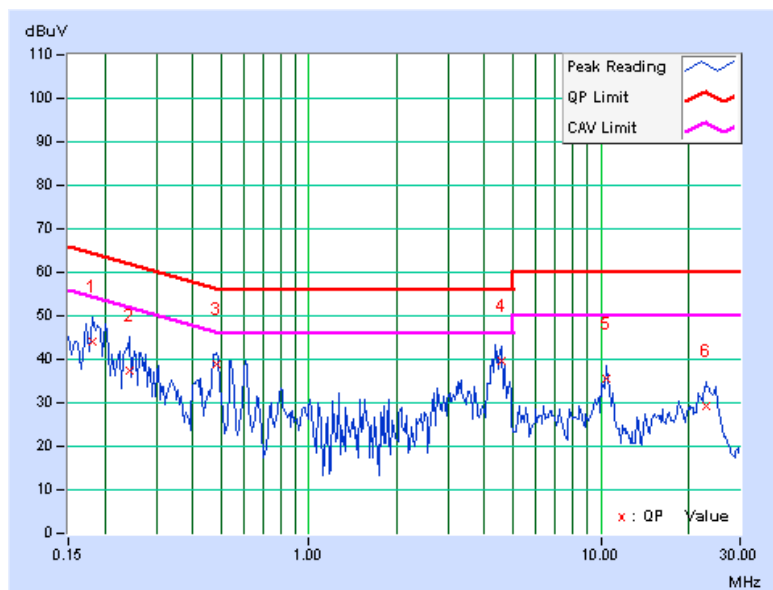
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	With adapter 1		
<b>PHASE</b>	Neutral (N)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.181	0.05	44.10	29.99	44.15	30.04	64.43	54.43	-20.28	-24.39
2	0.244	0.05	37.43	24.43	37.48	24.48	61.97	51.97	-24.49	-27.49
3	0.482	0.08	38.86	34.98	38.94	35.06	56.30	46.30	-17.36	-11.24
4	4.559	0.25	39.29	24.59	39.54	24.84	56.00	46.00	-16.46	-21.16
5	10.430	0.59	35.14	30.65	35.73	31.24	60.00	50.00	-24.27	-18.76
6	22.895	0.65	28.51	20.37	29.16	21.02	60.00	50.00	-30.84	-28.98

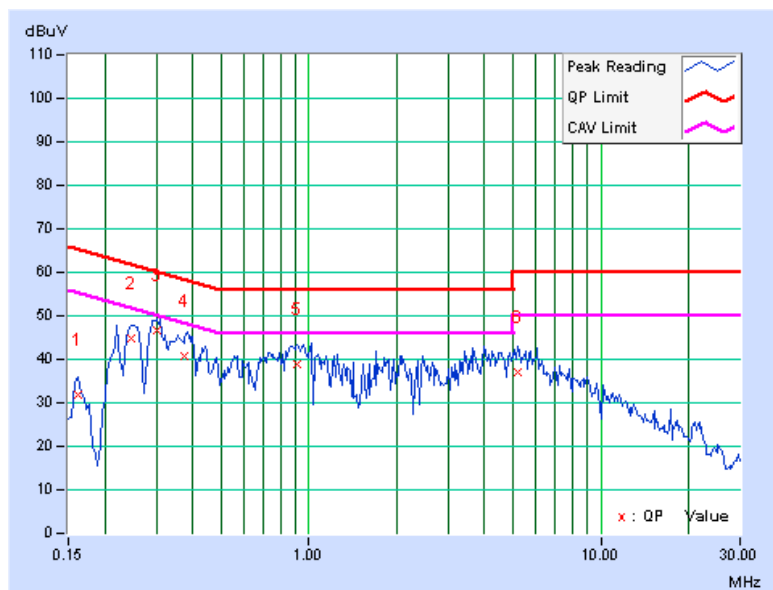
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	With adapter 2		
<b>PHASE</b>	Line (L)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.04	31.98	21.32	32.02	21.36	65.38	55.38	-33.36	-34.02
2	0.248	0.04	44.77	33.34	44.81	33.38	61.84	51.84	-17.02	-18.45
3	0.303	0.05	46.44	34.88	46.49	34.93	60.17	50.17	-13.69	-15.25
4	0.377	0.05	40.54	27.94	40.59	27.99	58.35	48.35	-17.77	-20.37
5	0.912	0.19	38.63	26.78	38.82	26.97	56.00	46.00	-17.18	-19.03
6	5.203	0.27	36.85	28.47	37.12	28.74	60.00	50.00	-22.88	-21.26

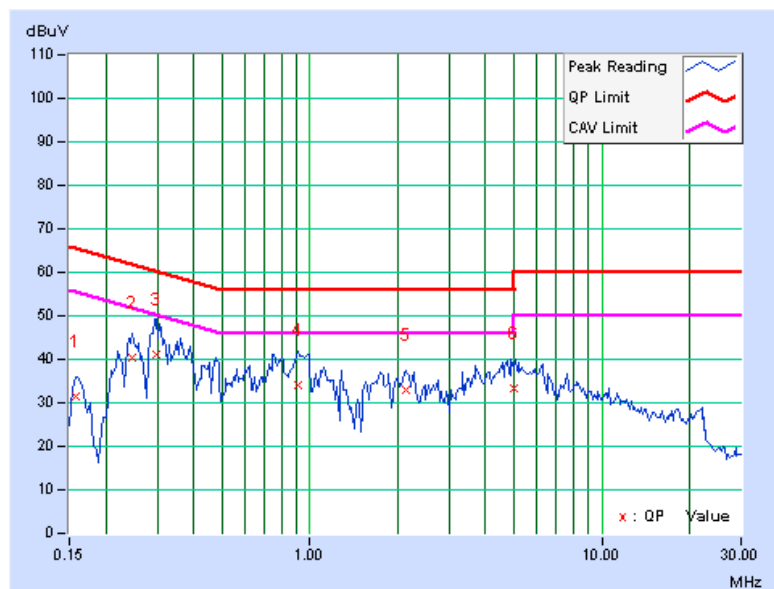
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	With adapter 2		
<b>PHASE</b>	Neutral (N)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.158	0.05	31.32	10.55	31.37	10.60	65.58
2	0.248	0.05	40.46	28.08	40.51	28.13	61.84	51.84	-21.32	-23.70
3	0.298	0.05	41.13	28.00	41.18	28.05	60.29	50.29	-19.10	-22.23
4	0.908	0.20	33.83	21.53	34.03	21.73	56.00	46.00	-21.97	-24.27
5	2.133	0.24	32.90	22.90	33.14	23.14	56.00	46.00	-22.86	-22.86
6	5.000	0.27	33.22	25.39	33.49	25.66	56.00	46.00	-22.51	-20.34

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



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

**NOTE:**

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



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#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 02, 2010	Aug. 01, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 18, 2009	Nov. 17, 2010
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Sep. 30, 2009	Sep. 29, 2010
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 16, 2009	Nov. 15, 2010
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Sep. 30, 2009	Sep. 29, 2010
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 24, 2009	Dec. 23, 2010
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.

### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 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 antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to 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.

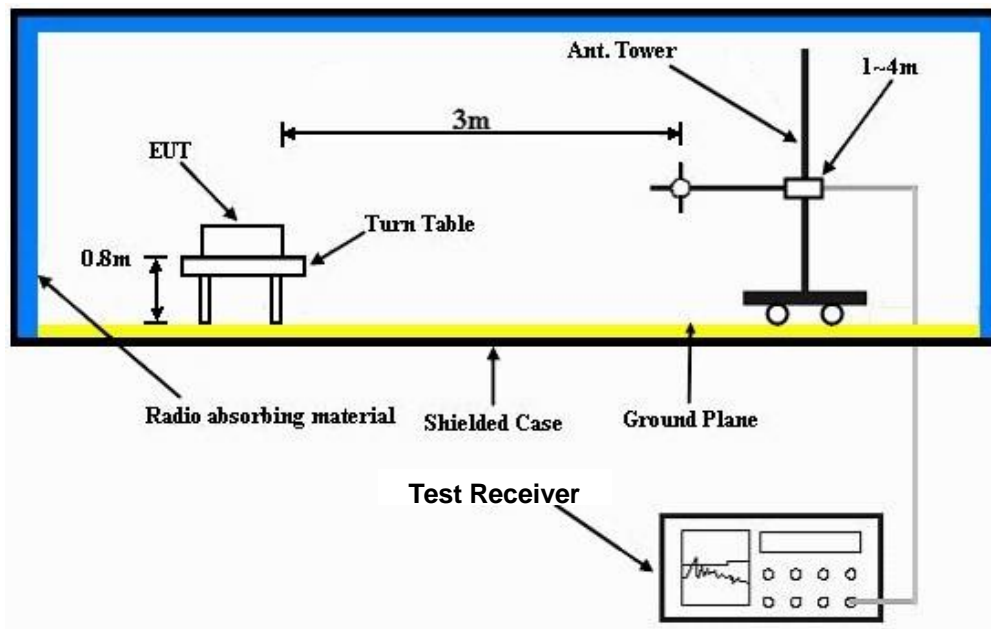
**NOTE:**

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

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



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

#### 4.2.6 EUT OPERATING CONDITIONS

1. Turned on the power of all equipment.
2. Prepared other computer system (support unit 1) to act as communication partners and placed them outside of testing area.
3. The communication partners run test program "Telnet Broadcom command.exe" to enable EUT under transmission/receiving condition continuously at specific channel frequency.
4. Support unit 1 (NB) sends video/Audio messages to Support units 2, 3 & 4 (TV / LCD monitor \*2) / Support units 5 & 6 (speaker) via EUT.
5. Support unit 1 (NB) ran "Telnet command.exe" to R/W from Support unit 8 (USB Flash Drive) via EUT.





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### 4.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Rex Huang

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	119.41	38.6 QP	43.5	-4.9	1.75 H	256	26.26	12.36
2	231.32	40.6 QP	46.0	-5.4	1.00 H	52	28.38	12.21
3	324.64	40.3 QP	46.0	-5.7	1.00 H	100	24.60	15.73
4	590.97	43.0 QP	46.0	-3.0	1.75 H	311	21.28	21.76
5	914.26	42.1 QP	46.0	-4.0	1.25 H	360	15.70	26.35
6	1000.00	48.7 QP	54.0	-5.3	2.00 H	24	21.60	27.08

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	37.50	38.4 QP	40.0	-1.6	1.00 V	274	24.79	13.57
2	79.74	37.2 QP	40.0	-2.8	1.25 V	360	27.92	9.27
3	115.86	39.8 QP	43.5	-3.7	1.00 V	205	28.02	11.79
4	157.78	39.3 QP	43.5	-4.3	1.00 V	183	24.91	14.34
5	324.75	42.4 QP	46.0	-3.6	1.25 V	319	26.63	15.74
6	1000.00	50.8 QP	54.0	-3.2	1.00 V	342	23.70	27.08

- 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.



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**ABOVE 1GHz WORST-CASE DATA**

**802.11b DSSS MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	2389.33	60.0 PK	74.0	-14.0	1.00 H	251	28.35	31.65
2	2389.33	50.3 AV	54.0	-3.7	1.00 H	251	18.65	31.65
3	*2412.00	106.0 PK			1.00 H	248	74.27	31.73
4	*2412.00	103.1 AV			1.00 H	248	71.37	31.73
5	4824.00	54.7 PK	74.0	-19.3	1.00 H	52	15.73	38.97
6	4824.00	51.5 AV	54.0	-2.5	1.00 H	52	12.53	38.97
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	2389.20	59.2 PK	74.0	-14.8	1.05 V	299	27.55	31.65
2	2389.20	49.4 AV	54.0	-4.6	1.05 V	299	17.75	31.65
3	*2412.00	104.1 PK			1.04 V	300	72.37	31.73
4	*2412.00	101.8 AV			1.04 V	300	70.07	31.73
5	4824.00	56.0 PK	74.0	-18.0	1.06 V	15	17.03	38.97
6	4824.00	53.5 AV	54.0	-0.5	1.06 V	15	14.53	38.97

- 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.
  5. “ \* “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	109.9 PK			1.00 H	249	78.09	31.81
2	*2437.00	107.0 AV			1.00 H	249	75.19	31.81
3	4874.00	55.4 PK	74.0	-18.6	1.00 H	50	16.26	39.14
4	4874.00	53.3 AV	54.0	-0.7	1.00 H	50	14.16	39.14
5	7311.00	55.0 PK	74.0	-19.0	1.00 H	247	8.37	46.63
6	7311.00	44.2 AV	54.0	-9.8	1.00 H	247	-2.43	46.63

**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	106.8 PK			1.00 V	296	74.99	31.81
2	*2437.00	103.9 AV			1.00 V	296	72.09	31.81
3	4874.00	55.3 PK	74.0	-18.7	1.00 V	51	16.16	39.14
4	4874.00	53.4 AV	54.0	-0.6	1.00 V	51	14.26	39.14
5	7311.00	55.1 PK	74.0	-18.9	1.00 V	307	8.47	46.63
6	7311.00	44.2 AV	54.0	-9.8	1.00 V	307	-2.43	46.63

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.0 PK			1.00 H	250	73.11	31.89
2	*2462.00	102.1 AV			1.00 H	250	70.21	31.89
3	2483.50	61.4 PK	74.0	-12.6	1.00 H	250	29.43	31.97
4	2483.50	50.6 AV	54.0	-3.4	1.00 H	250	18.63	31.97
5	4924.00	51.0 PK	74.0	-23.0	1.00 H	63	11.69	39.31
6	4924.00	47.1 AV	54.0	-6.9	1.00 H	63	7.79	39.31
7	7386.00	53.8 PK	74.0	-20.2	1.00 H	20	7.20	46.60
8	7386.00	41.5 AV	54.0	-12.5	1.00 H	20	-5.10	46.60

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

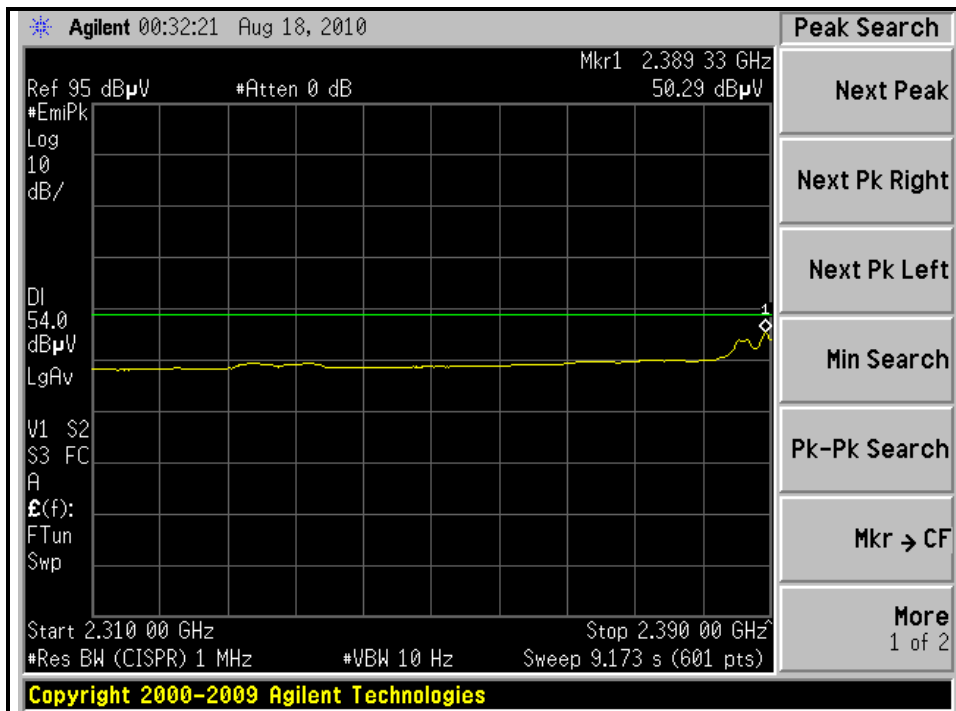
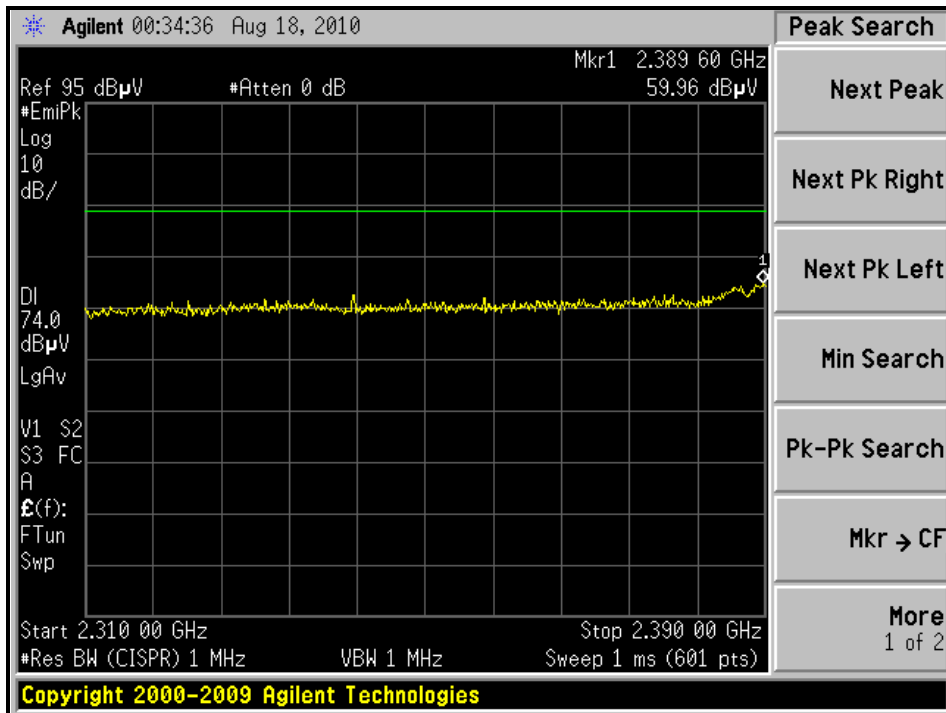
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.0 PK			1.00 V	295	70.11	31.89
2	*2462.00	99.1 AV			1.00 V	295	67.21	31.89
3	2483.50	59.0 PK	74.0	-15.0	1.00 V	296	27.03	31.97
4	2483.50	48.5 AV	54.0	-5.5	1.00 V	296	16.53	31.97
5	4924.00	53.6 PK	74.0	-20.4	1.05 V	13	14.29	39.31
6	4924.00	49.8 AV	54.0	-4.2	1.05 V	13	10.49	39.31
7	7386.00	53.7 PK	74.0	-20.3	1.00 V	10	7.10	46.60
8	7386.00	41.6 AV	54.0	-12.4	1.00 V	10	-5.00	46.60

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



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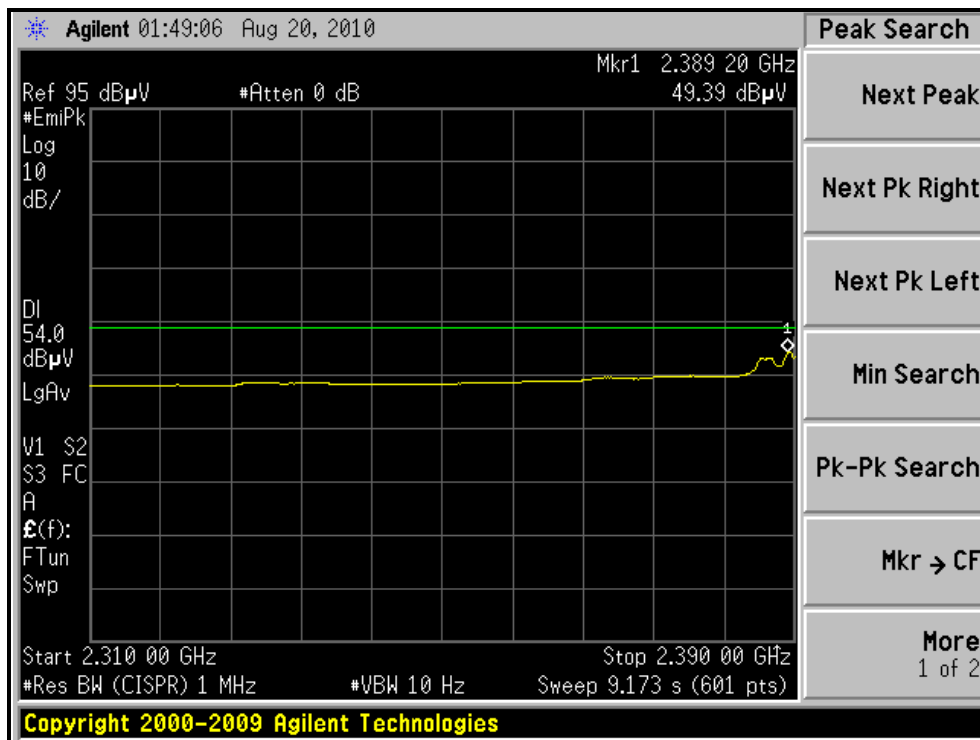
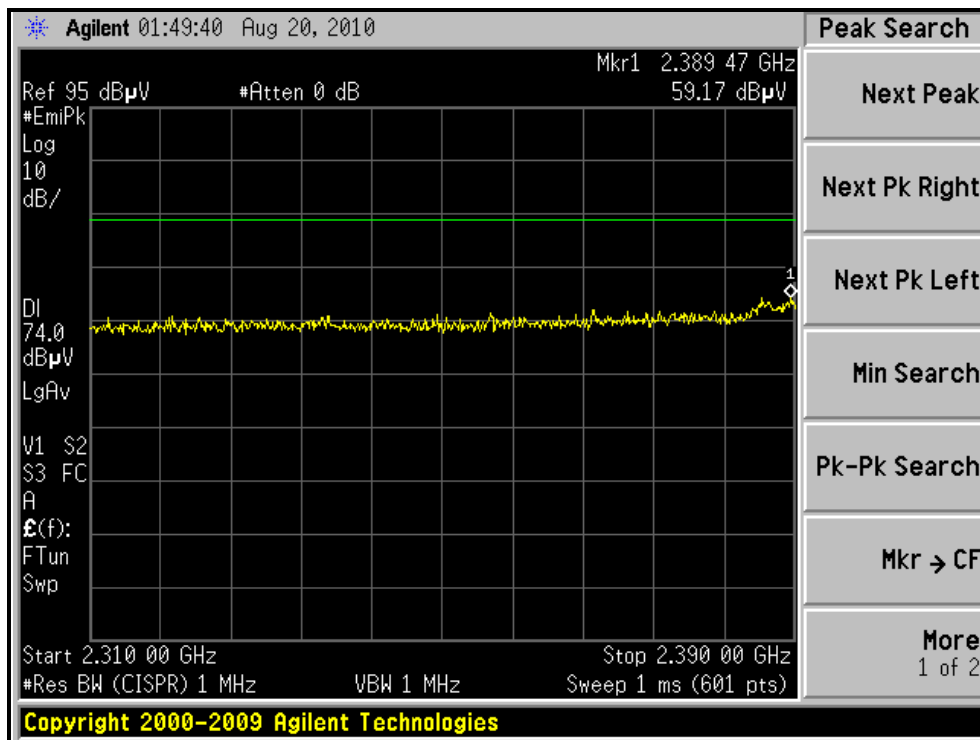
RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL )





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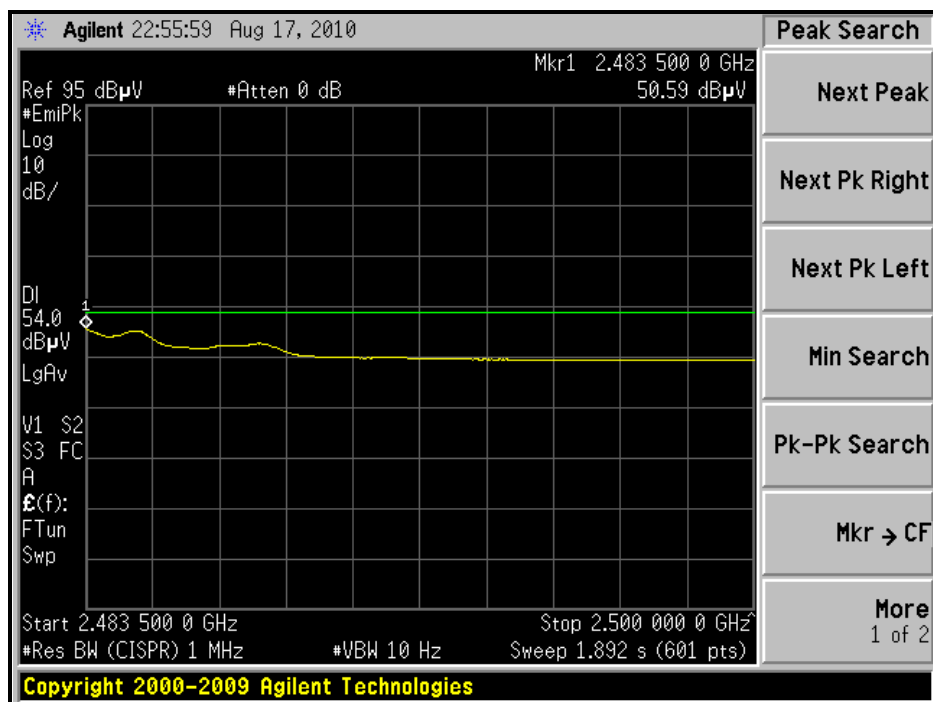
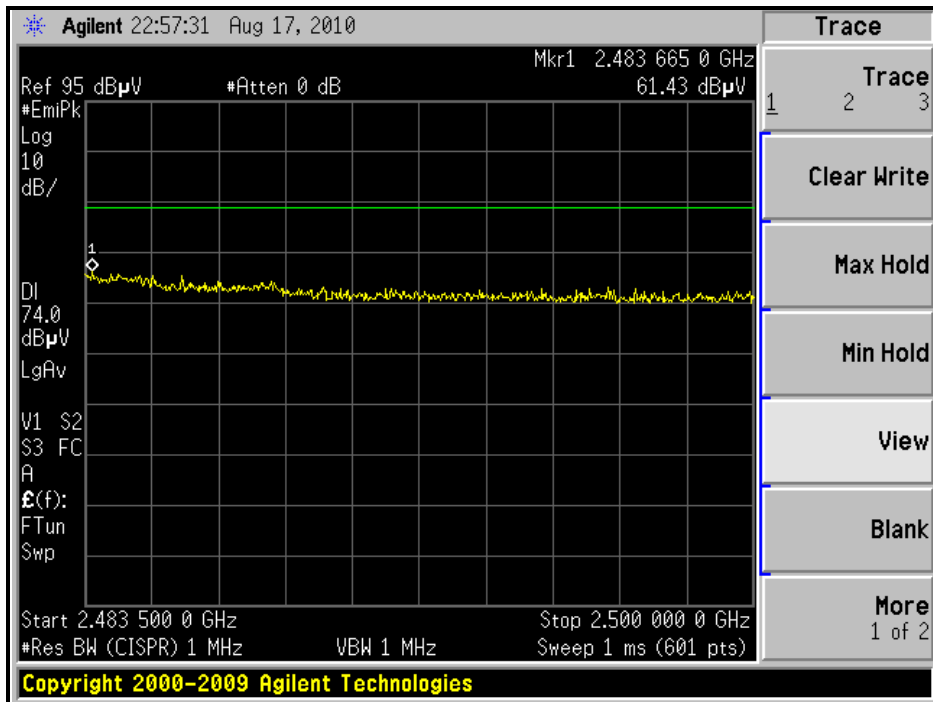
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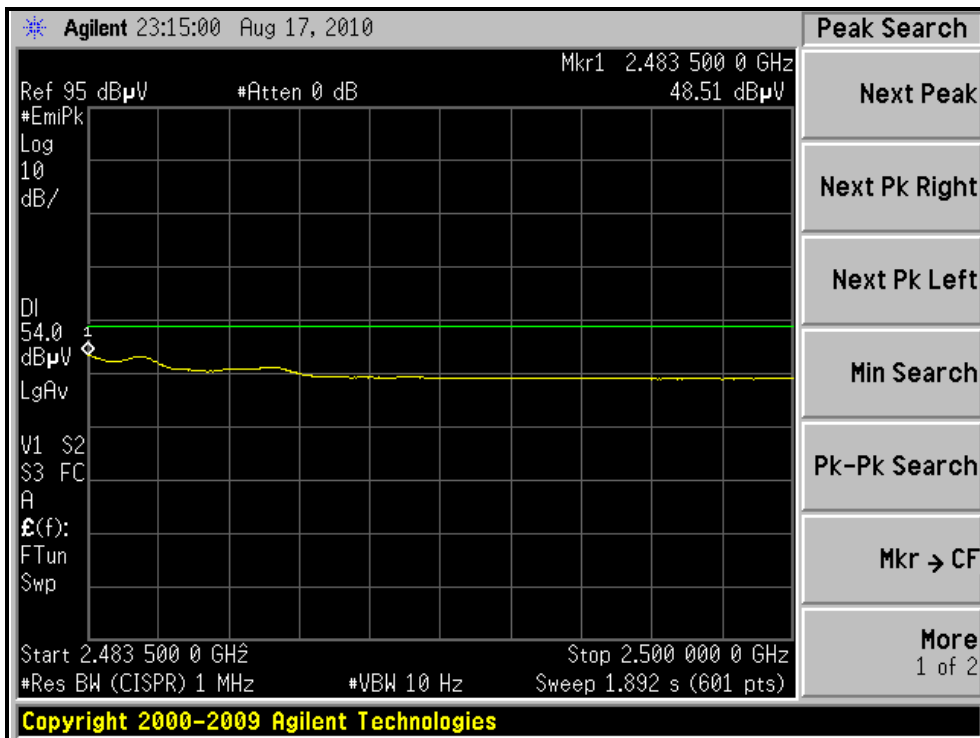
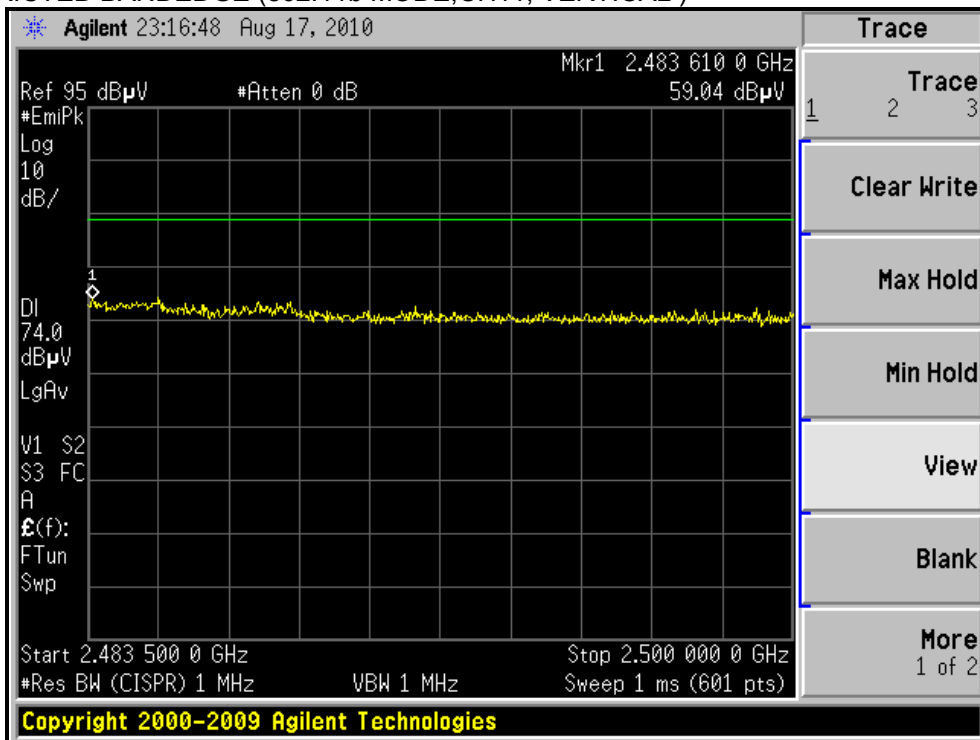
### RESTRICTED BANDEDGE (802.11b MODE, CH11, HORIZONTAL )





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







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**802.11g OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	2388.00	68.5 PK	74.0	-5.5	1.00 H	245	36.85	31.65
2	2388.00	53.4 AV	54.0	-0.6	1.00 H	245	21.75	31.65
3	*2412.00	112.7 PK			1.00 H	249	80.97	31.73
4	*2412.00	103.1 AV			1.00 H	249	71.37	31.73
5	4824.00	48.5 PK	74.0	-25.5	1.36 H	249	9.53	38.97
6	4824.00	35.8 AV	54.0	-18.2	1.36 H	249	-3.17	38.97

**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	2390.00	63.3 PK	74.0	-10.7	1.04 V	299	31.64	31.66
2	2390.00	50.2 AV	54.0	-3.8	1.04 V	299	18.54	31.66
3	*2412.00	109.7 PK			1.02 V	298	77.97	31.73
4	*2412.00	100.1 AV			1.02 V	298	68.37	31.73
5	4824.00	50.2 PK	74.0	-23.8	1.08 V	359	11.23	38.97
6	4824.00	38.0 AV	54.0	-16.0	1.08 V	359	-0.97	38.97

- 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.
  5. “ \* “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	119.4 PK			1.00 H	250	87.59	31.81
2	*2437.00	109.6 AV			1.00 H	250	77.79	31.81
3	2483.50	64.2 PK	74.0	-9.8	1.00 H	251	32.23	31.97
4	2483.50	52.2 AV	54.0	-1.8	1.00 H	251	20.23	31.97
5	4874.00	56.4 PK	74.0	-17.6	1.23 H	251	17.26	39.14
6	4874.00	43.1 AV	54.0	-10.9	1.23 H	251	3.96	39.14
7	7311.00	57.0 PK	74.0	-17.0	1.00 H	247	10.37	46.63
8	7311.00	45.9 AV	54.0	-8.1	1.00 H	247	-0.73	46.63

**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	116.2 PK			1.01 V	298	84.39	31.81
2	*2437.00	106.2 AV			1.01 V	298	74.39	31.81
3	4874.00	54.7 PK	74.0	-19.3	1.09 V	349	15.56	39.14
4	4874.00	42.8 AV	54.0	-11.2	1.09 V	349	3.66	39.14
5	7311.00	57.8 PK	74.0	-16.2	1.00 V	249	11.17	46.63
6	7311.00	45.9 AV	54.0	-8.1	1.00 V	249	-0.73	46.63

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	110.0 PK			1.00 H	252	78.11	31.89
2	*2462.00	100.4 AV			1.00 H	252	68.51	31.89
3	2483.50	69.3 PK	74.0	-4.7	1.00 H	251	37.33	31.97
4	2483.50	53.1 AV	54.0	-0.9	1.00 H	251	21.13	31.97
5	4924.00	48.0 PK	74.0	-26.0	1.28 H	251	8.69	39.31
6	4924.00	35.1 AV	54.0	-18.9	1.28 H	251	-4.21	39.31
7	7386.00	54.0 PK	74.0	-20.0	1.00 H	250	7.40	46.60
8	7386.00	41.6 AV	54.0	-12.4	1.00 H	250	-5.00	46.60

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

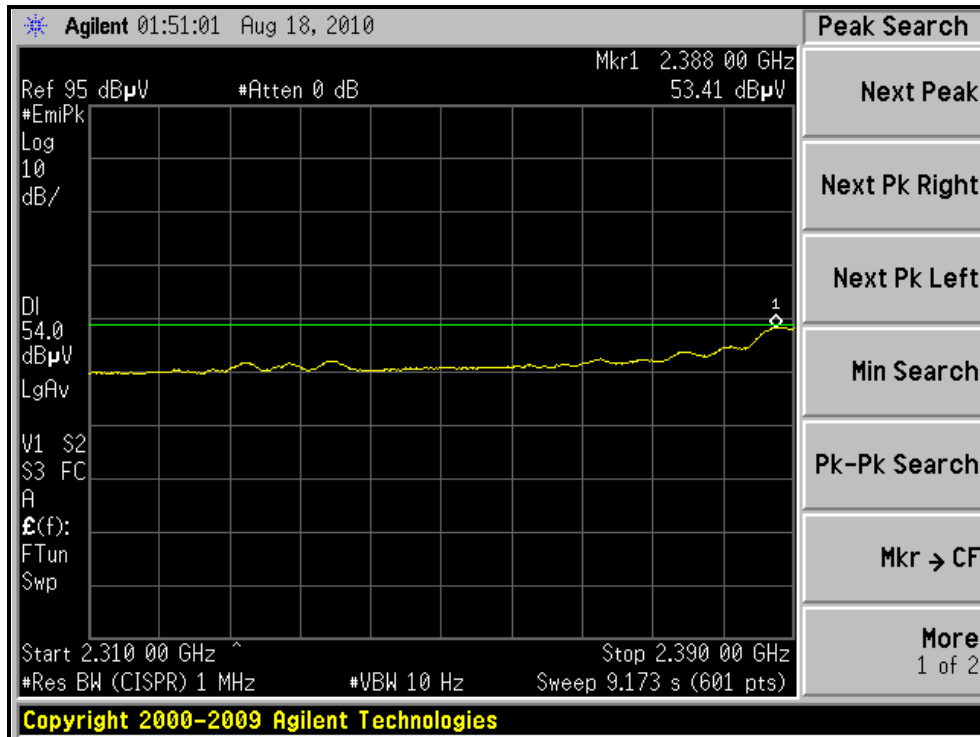
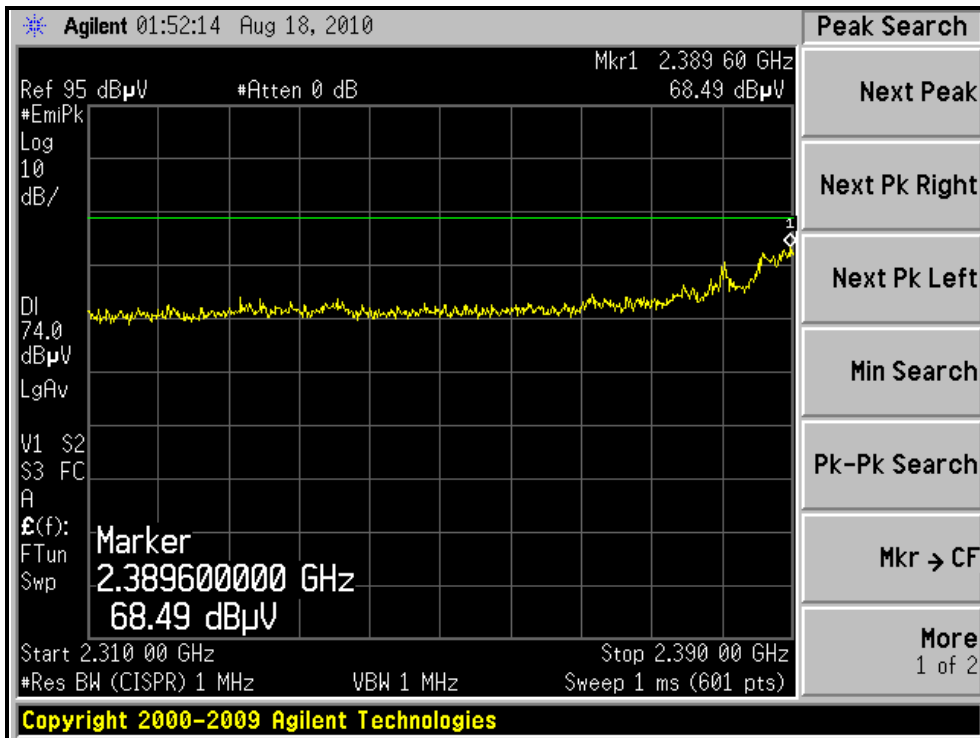
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.0 PK			1.00 V	298	74.11	31.89
2	*2462.00	96.5 AV			1.00 V	298	64.61	31.89
3	2483.50	66.8 PK	74.0	-7.2	1.01 V	298	34.83	31.97
4	2483.50	50.4 AV	54.0	-3.6	1.01 V	298	18.43	31.97
5	4924.00	48.9 PK	74.0	-25.1	1.08 V	344	9.59	39.31
6	4924.00	36.1 AV	54.0	-17.9	1.08 V	344	-3.21	39.31
7	7386.00	53.9 PK	74.0	-20.1	1.00 V	248	7.30	46.60
8	7386.00	41.6 AV	54.0	-12.4	1.00 V	248	-5.00	46.60

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



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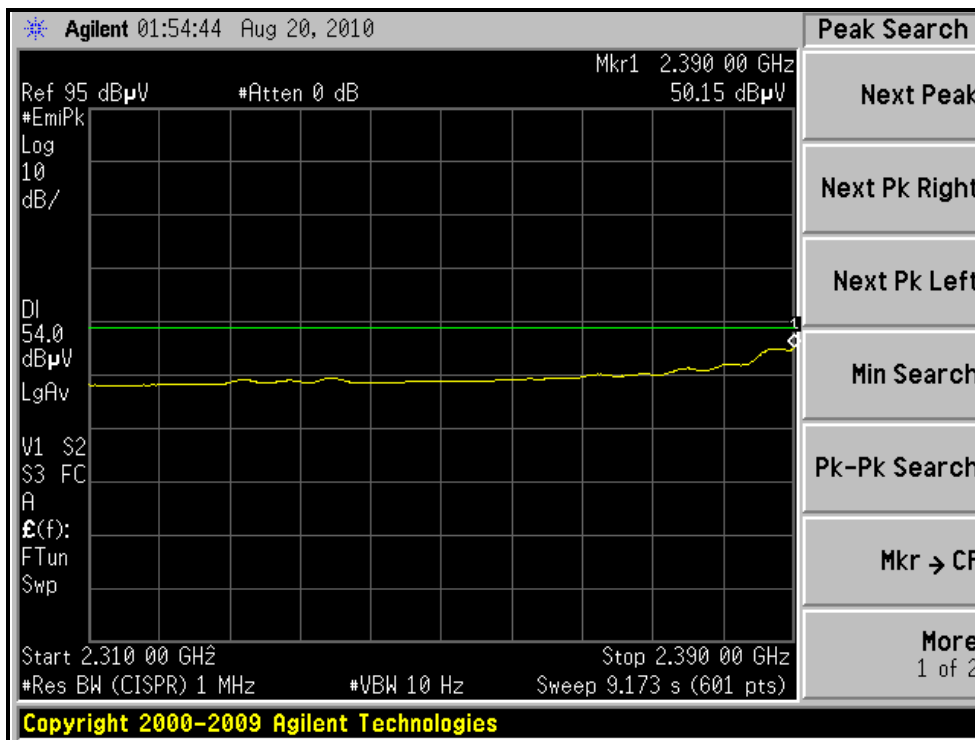
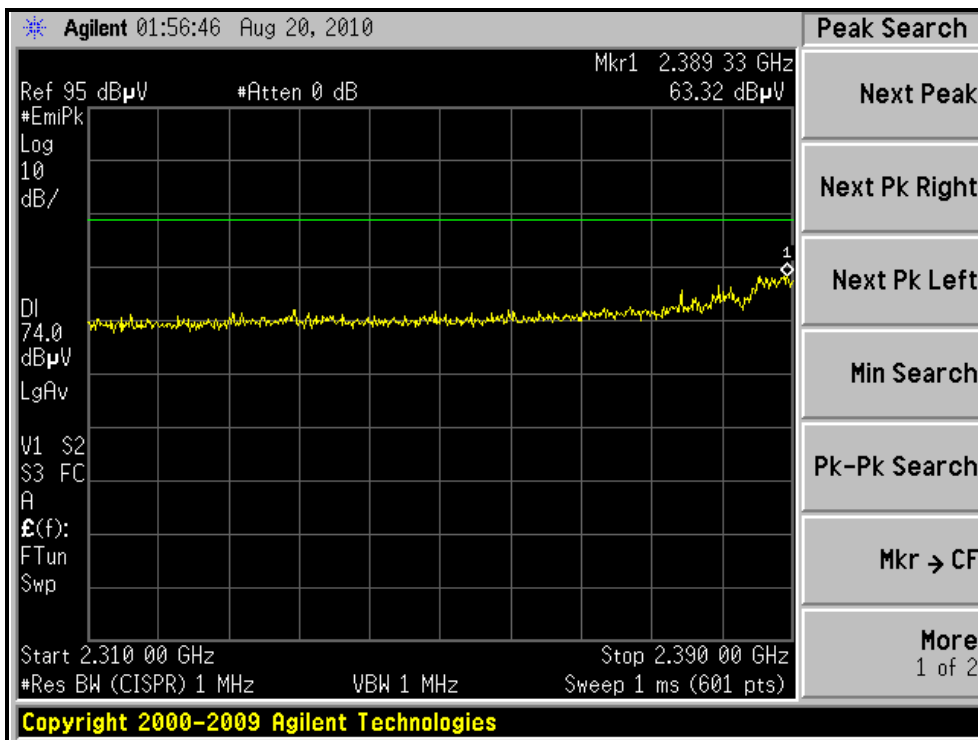
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL )





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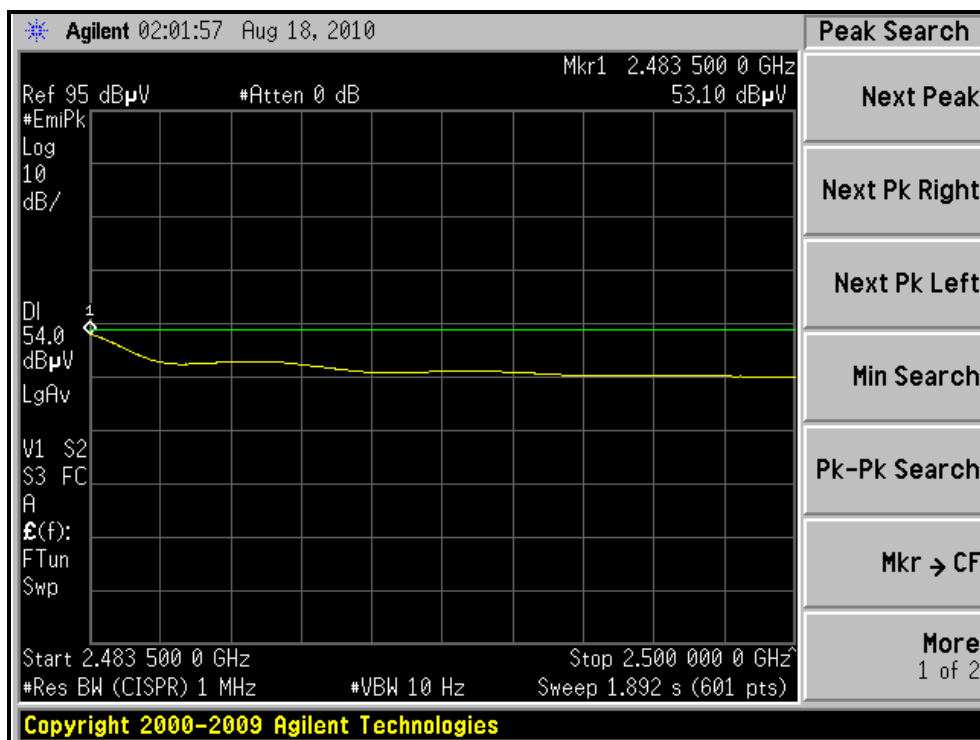
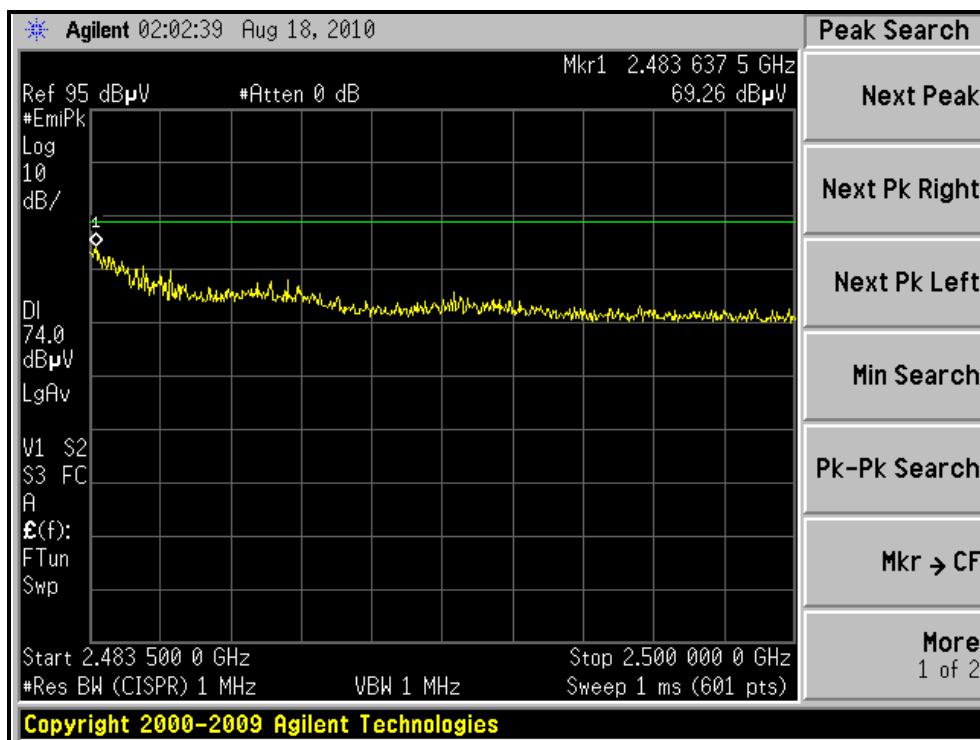
### RESTRICTED BANDEDGE (802.11g MODE, CH1, VERTICAL )





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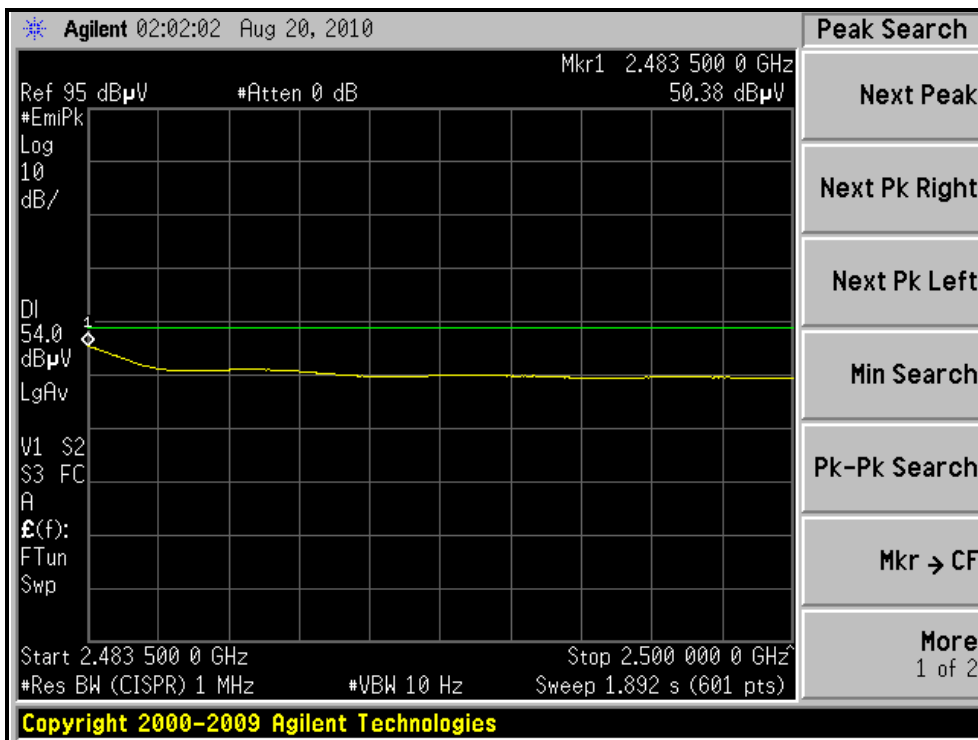
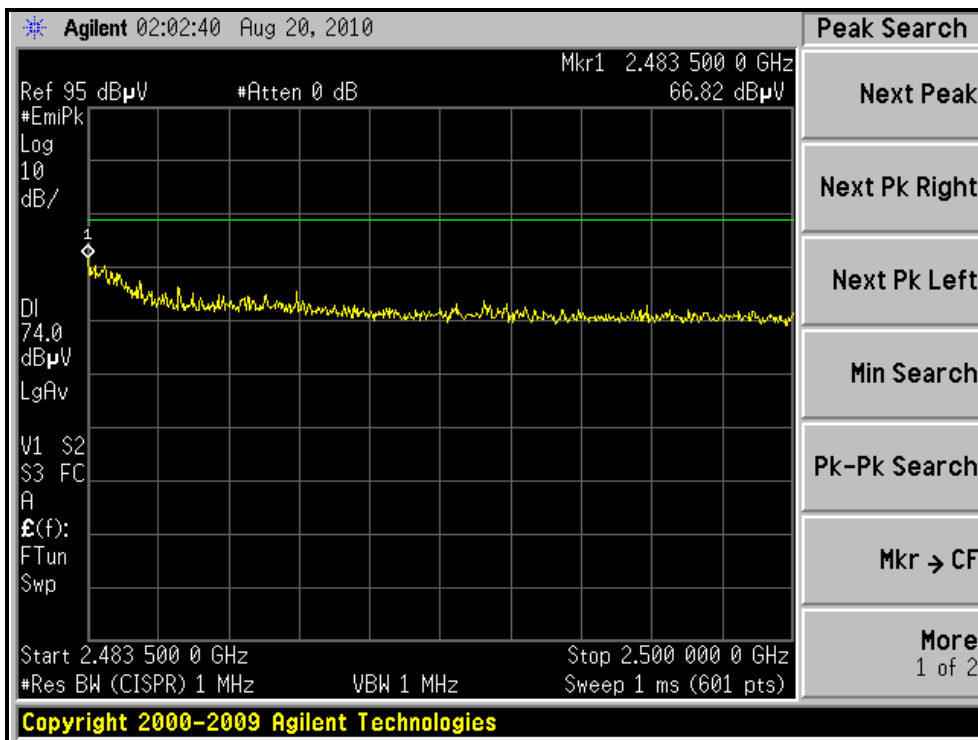
### RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL )





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RESTRICTED BANDEDGE (802.11g MODE, CH11, VERTICAL )





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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	70.5 PK	74.0	-3.5	1.00 H	244	38.84	31.66
2	2390.00	53.4 AV	54.0	-0.6	1.00 H	244	21.74	31.66
3	*2412.00	109.4 PK			1.00 H	248	77.67	31.73
4	*2412.00	99.5 AV			1.00 H	248	67.77	31.73
5	4824.00	46.8 PK	74.0	-27.2	1.35 H	249	7.83	38.97
6	4824.00	34.7 AV	54.0	-19.3	1.35 H	249	-4.27	38.97

**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	2389.87	66.4 PK	74.0	-7.6	1.01 V	299	34.74	31.66
2	2389.87	50.7 AV	54.0	-3.3	1.01 V	299	19.04	31.66
3	*2412.00	106.2 PK			1.03 V	298	74.47	31.73
4	*2412.00	96.2 AV			1.03 V	298	64.47	31.73
5	4824.00	47.4 PK	74.0	-26.6	1.09 V	348	8.43	38.97
6	4824.00	35.2 AV	54.0	-18.8	1.09 V	348	-3.77	38.97

- 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.
  5. “ \* “: Fundamental frequency.





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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	2389.90	68.5 PK	74.0	-5.5	1.00 H	247	36.84	31.66
2	2389.90	53.2 AV	54.0	-0.8	1.00 H	247	21.54	31.66
3	*2437.00	119.3 PK			1.00 H	250	87.49	31.81
4	*2437.00	109.0 AV			1.00 H	250	77.19	31.81
5	4874.00	55.2 PK	74.0	-18.8	1.36 H	251	16.06	39.14
6	4874.00	42.7 AV	54.0	-11.3	1.36 H	251	3.56	39.14
7	7311.00	58.7 PK	74.0	-15.3	1.00 H	246	12.07	46.63
8	7311.00	46.1 AV	54.0	-7.9	1.00 H	246	-0.53	46.63

**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	115.6 PK			1.01 V	298	83.79	31.81
2	*2437.00	105.3 AV			1.01 V	298	73.49	31.81
3	4874.00	55.0 PK	74.0	-19.0	1.09 V	342	15.86	39.14
4	4874.00	42.3 AV	54.0	-11.7	1.09 V	342	3.16	39.14
5	7311.00	58.4 PK	74.0	-15.6	1.36 V	248	11.77	46.63
6	7311.00	45.9 AV	54.0	-8.1	1.36 V	248	-0.73	46.63

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.3 PK			1.00 H	250	77.41	31.89
2	*2462.00	99.5 AV			1.00 H	250	67.61	31.89
3	2484.66	71.4 PK	74.0	-2.6	1.00 H	249	39.43	31.97
4	2484.66	53.2 AV	54.0	-0.8	1.00 H	249	21.23	31.97
5	4924.00	47.1 PK	74.0	-26.9	1.35 H	252	7.79	39.31
6	4924.00	34.8 AV	54.0	-19.2	1.35 H	252	-4.51	39.31
7	7386.00	54.2 PK	74.0	-19.8	1.00 H	250	7.60	46.60
8	7386.00	41.6 AV	54.0	-12.4	1.00 H	250	-5.00	46.60

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

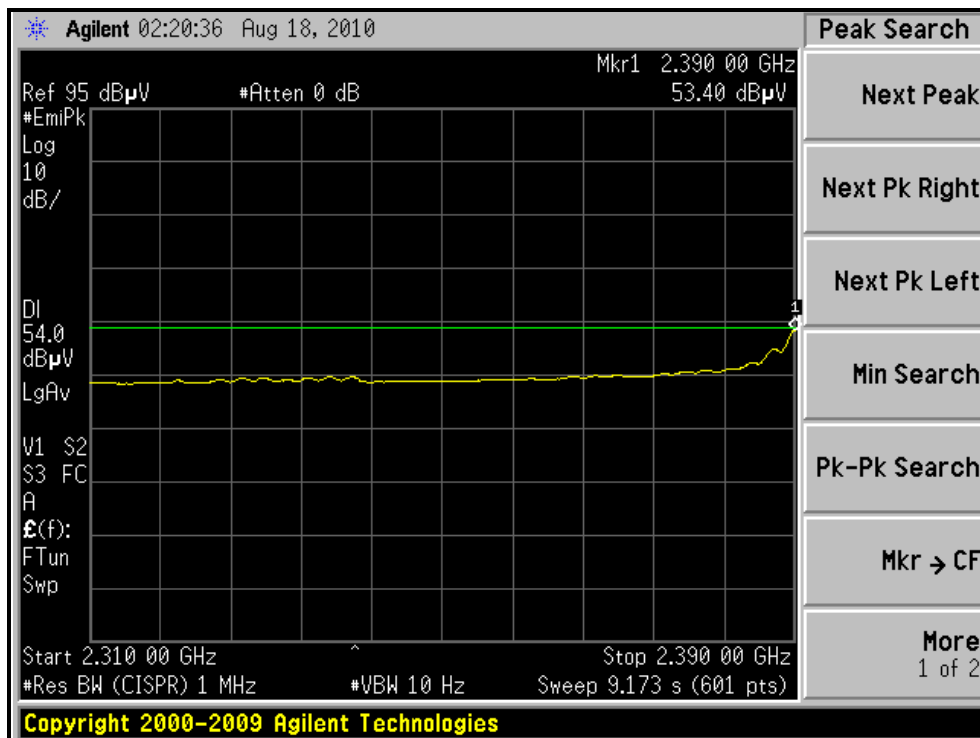
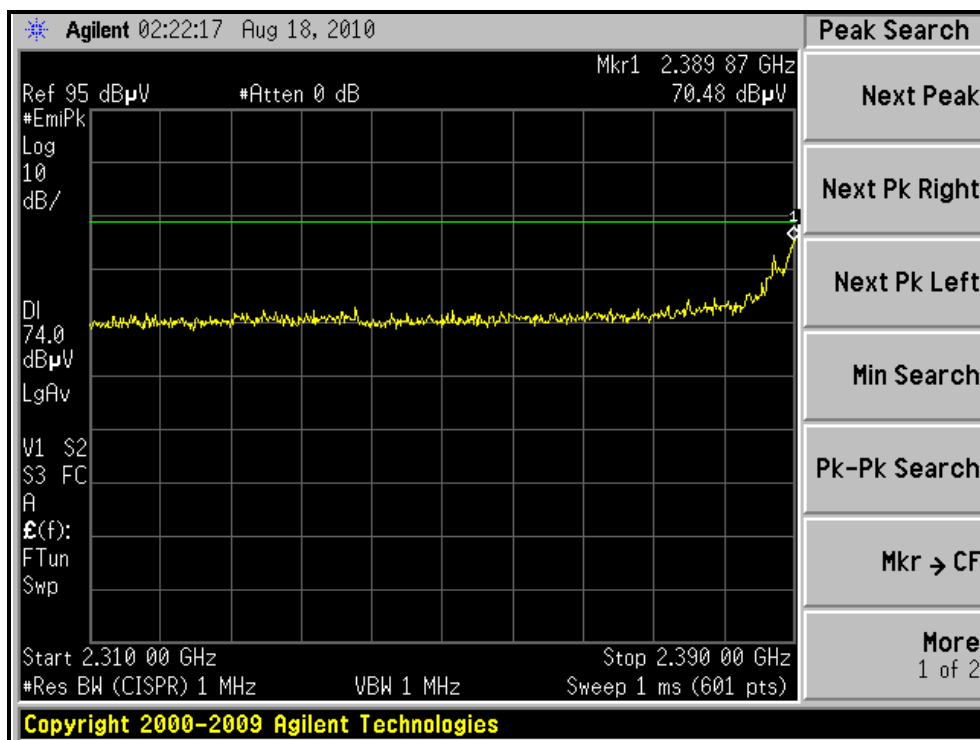
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.5 PK			1.00 V	297	73.61	31.89
2	*2462.00	95.2 AV			1.00 V	297	63.31	31.89
3	2484.63	66.7 PK	74.0	-7.3	1.00 V	299	34.73	31.97
4	2484.63	50.0 AV	54.0	-4.0	1.00 V	299	18.03	31.97
5	4924.00	47.9 PK	74.0	-26.1	1.10 V	345	8.59	39.31
6	4924.00	35.7 AV	54.0	-18.3	1.10 V	345	-3.61	39.31
7	7386.00	54.3 PK	74.0	-19.7	1.00 V	249	7.70	46.60
8	7386.00	41.6 AV	54.0	-12.4	1.00 V	249	-5.00	46.60

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



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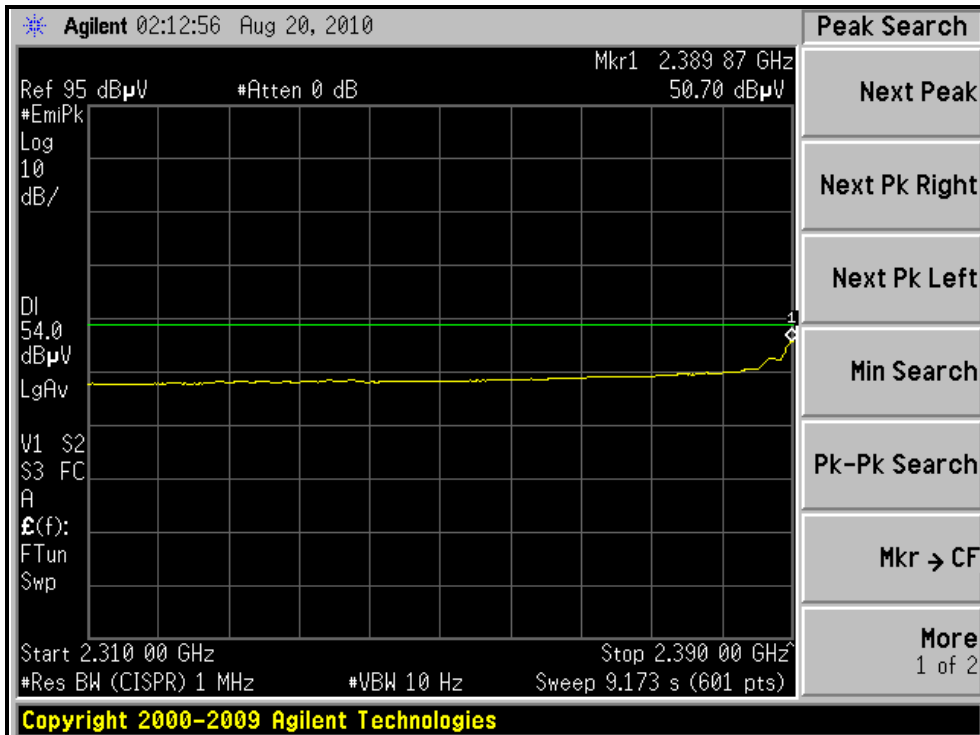
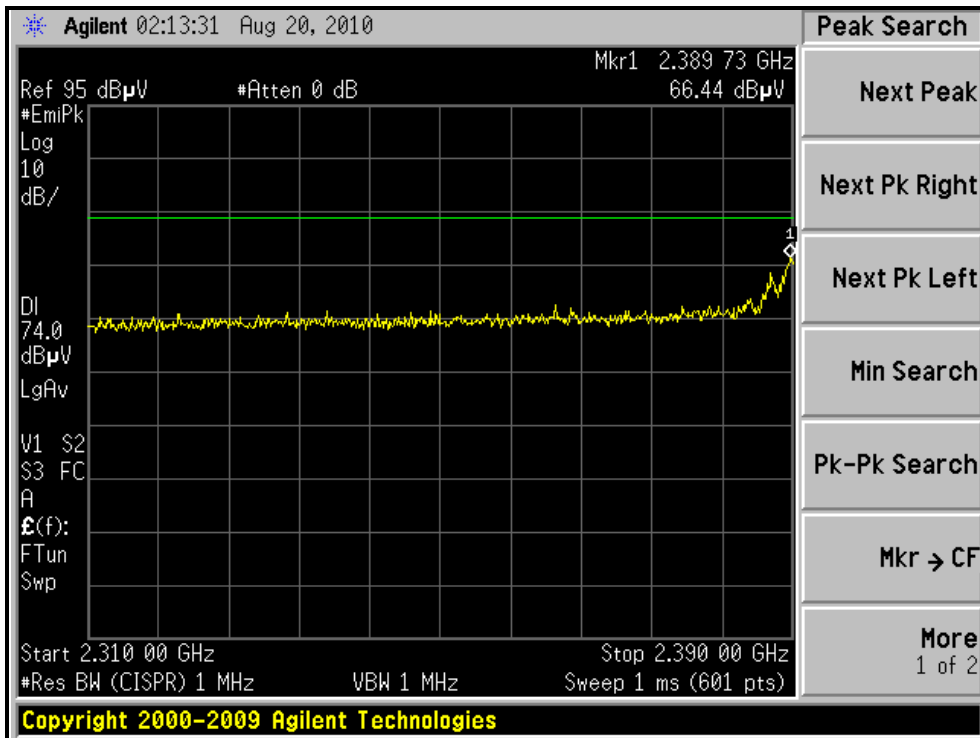
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL )





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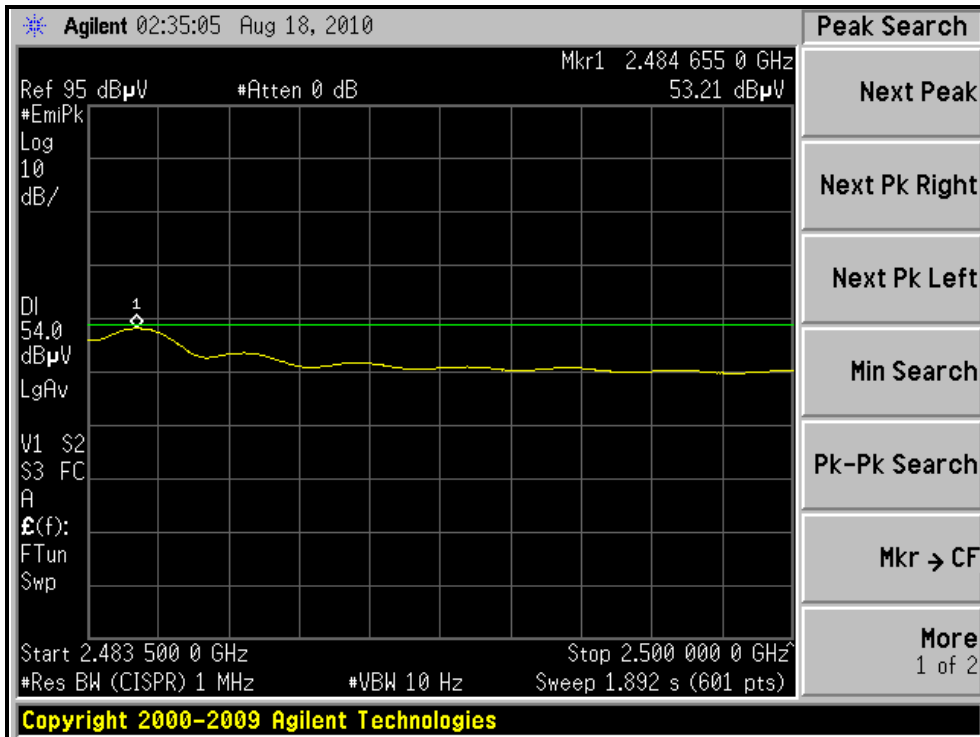
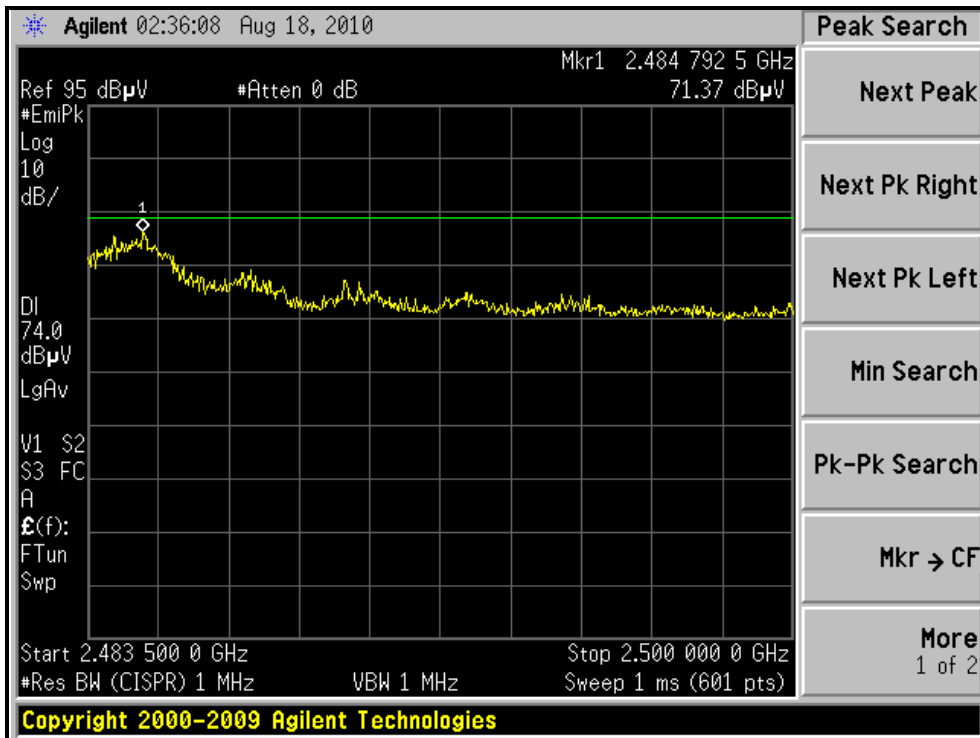
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL )





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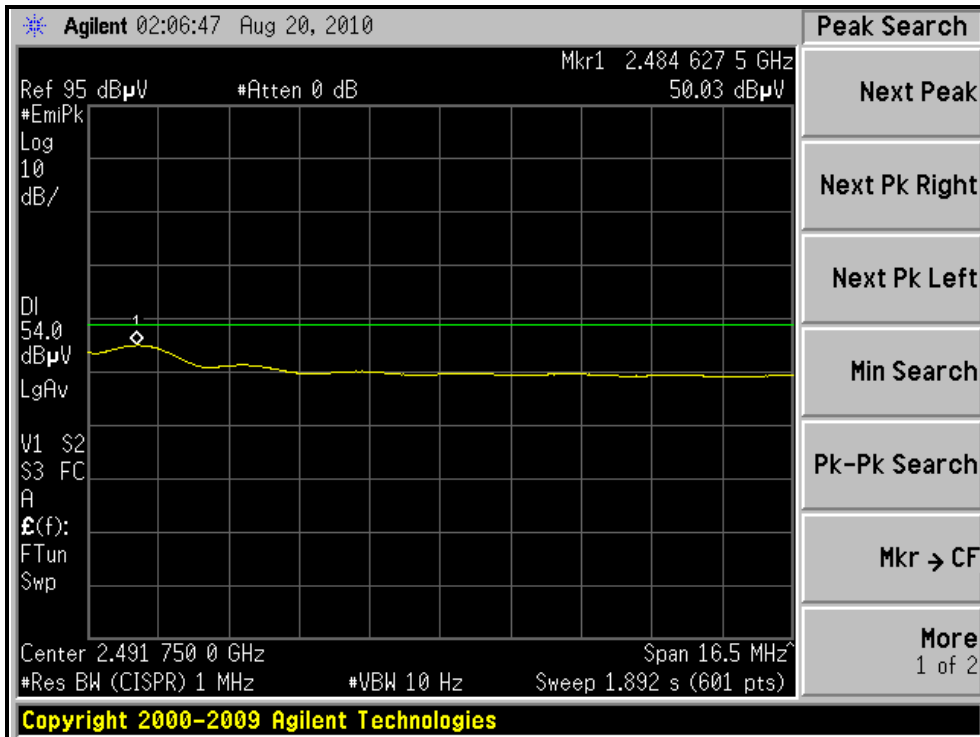
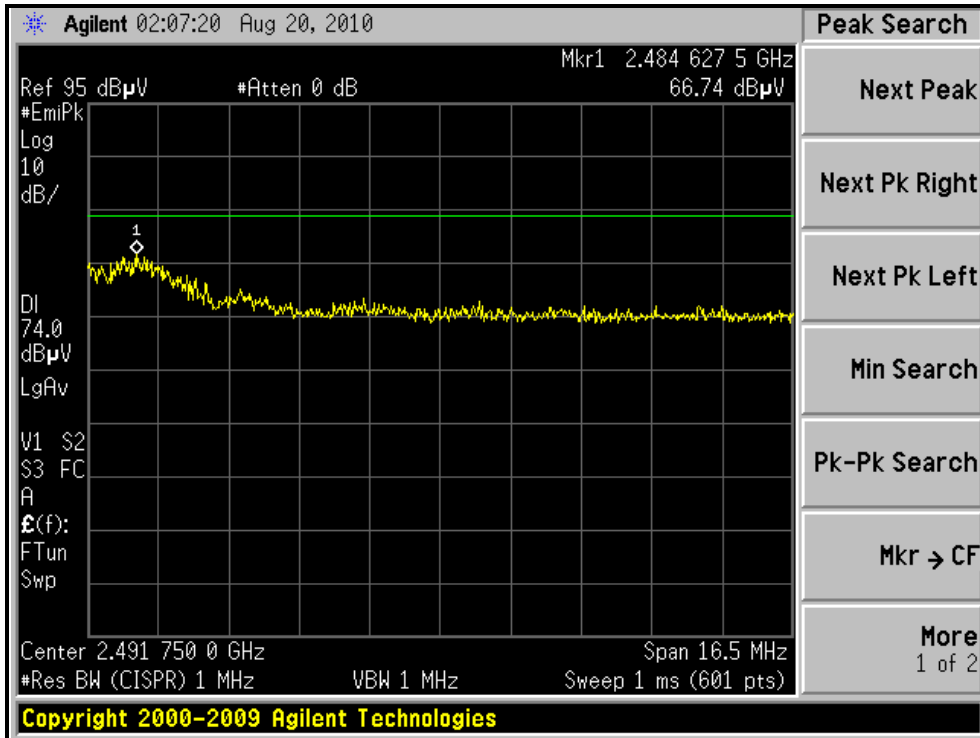
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL )





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





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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	2389.87	67.9 PK	74.0	-6.1	1.00 H	247	36.24	31.66
2	2389.87	53.0 AV	54.0	-1.0	1.00 H	247	21.34	31.66
3	*2422.00	103.9 PK			1.00 H	249	72.14	31.76
4	*2422.00	93.7 AV			1.00 H	249	61.94	31.76
5	4844.00	45.4 PK	74.0	-28.6	1.37 H	251	6.36	39.04
6	4844.00	33.7 AV	54.0	-20.3	1.37 H	251	-5.34	39.04
7	7266.00	54.4 PK	74.0	-19.6	1.00 H	253	7.73	46.67
8	7266.00	41.9 AV	54.0	-12.1	1.00 H	253	-4.77	46.67

**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	2389.87	64.8 PK	74.0	-9.2	1.04 V	300	33.14	31.66
2	2389.87	50.5 AV	54.0	-3.5	1.04 V	300	18.84	31.66
3	*2422.00	101.0 PK			1.03 V	298	69.24	31.76
4	*2422.00	90.7 AV			1.03 V	298	58.94	31.76
5	4844.00	46.7 PK	74.0	-27.3	1.10 V	346	7.66	39.04
6	4844.00	34.1 AV	54.0	-19.9	1.10 V	346	-4.94	39.04
7	7266.00	54.3 PK	74.0	-19.7	1.00 V	249	7.63	46.67
8	7266.00	41.9 AV	54.0	-12.1	1.00 V	249	-4.77	46.67

- 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 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.9 PK	74.0	-6.1	1.00 H	245	36.24	31.66
2	2390.00	53.3 AV	54.0	-0.7	1.00 H	245	21.64	31.66
3	*2437.00	108.6 PK			1.00 H	249	76.79	31.81
4	*2437.00	98.6 AV			1.00 H	249	66.79	31.81
5	2484.74	67.6 PK	74.0	-6.4	1.00 H	251	35.63	31.97
6	2484.74	53.4 AV	54.0	-0.6	1.00 H	251	21.43	31.97
7	4874.00	48.1 PK	74.0	-25.9	1.36 H	251	8.96	39.14
8	4874.00	35.5 AV	54.0	-18.5	1.36 H	251	-3.64	39.14
9	7311.00	54.0 PK	74.0	-20.0	1.00 H	249	7.37	46.63
10	7311.00	41.6 AV	54.0	-12.4	1.00 H	249	-5.03	46.63

**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	105.0 PK			1.01 V	299	73.19	31.81
2	*2437.00	95.0 AV			1.01 V	299	63.19	31.81
3	4874.00	48.6 PK	74.0	-25.4	1.09 V	343	9.46	39.14
4	4874.00	36.6 AV	54.0	-17.4	1.09 V	343	-2.54	39.14
5	7311.00	54.1 PK	74.0	-19.9	1.00 V	251	7.47	46.63
6	7311.00	41.6 AV	54.0	-12.4	1.00 V	251	-5.03	46.63

- 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 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	103.9 PK			1.00 H	249	72.04	31.86
2	*2452.00	93.7 AV			1.00 H	249	61.84	31.86
3	2484.79	67.9 PK	74.0	-6.1	1.00 H	250	35.93	31.97
4	2484.79	53.5 AV	54.0	-0.5	1.00 H	250	21.53	31.97
5	4904.00	46.8 PK	74.0	-27.2	1.00 H	247	7.56	39.24
6	4904.00	34.3 AV	54.0	-19.7	1.00 H	247	-4.94	39.24
7	7356.00	54.3 PK	74.0	-19.7	1.00 H	251	7.69	46.61
8	7356.00	41.7 AV	54.0	-12.3	1.00 H	251	-4.91	46.61

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

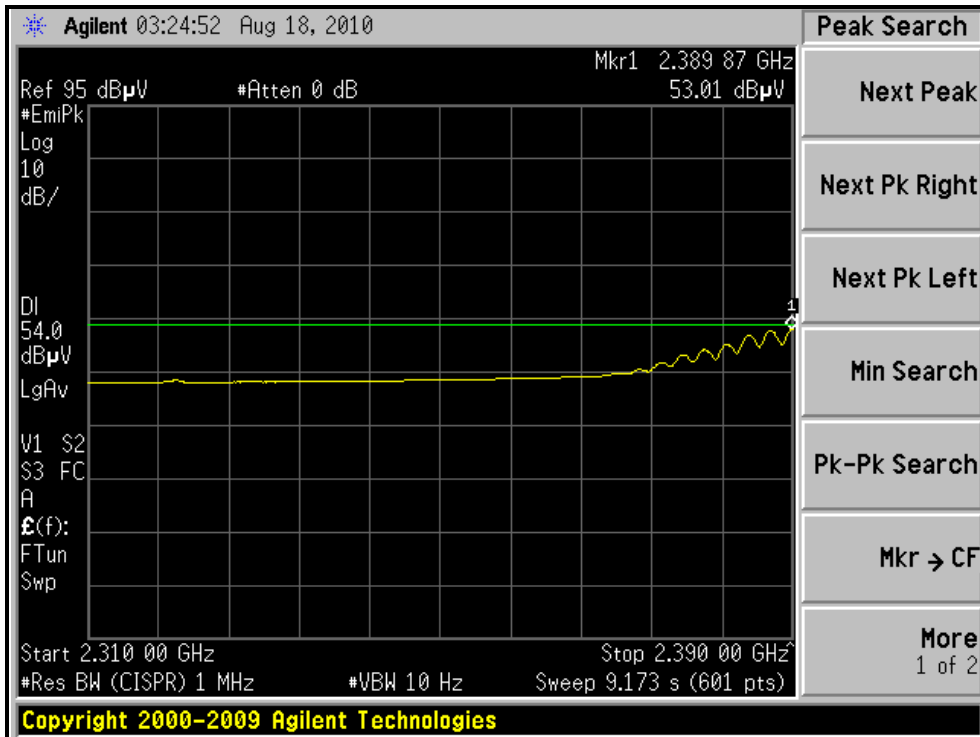
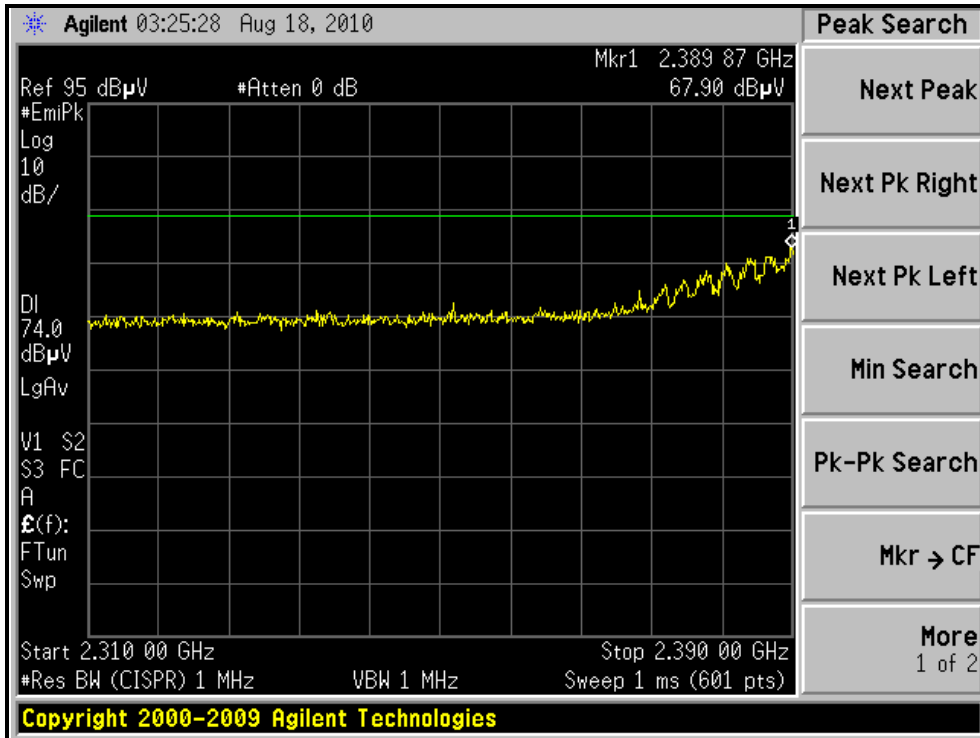
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.2 PK			1.00 V	298	68.34	31.86
2	*2452.00	89.8 AV			1.00 V	298	57.94	31.86
3	2484.85	65.5 PK	74.0	-8.5	1.00 V	297	33.53	31.97
4	2484.85	50.8 AV	54.0	-3.2	1.00 V	297	18.83	31.97
5	4904.00	47.0 PK	74.0	-27.0	1.08 V	349	7.76	39.24
6	4904.00	34.5 AV	54.0	-19.5	1.08 V	349	-4.74	39.24
7	7356.00	54.2 PK	74.0	-19.8	1.00 V	250	7.59	46.61
8	7356.00	41.7 AV	54.0	-12.3	1.00 V	250	-4.91	46.61

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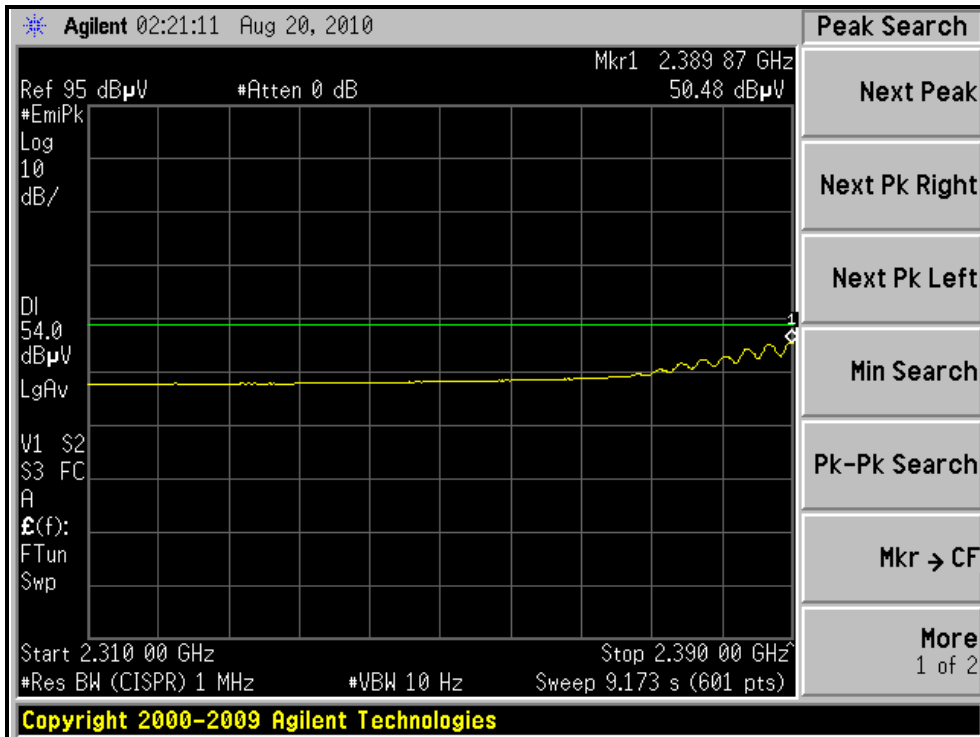
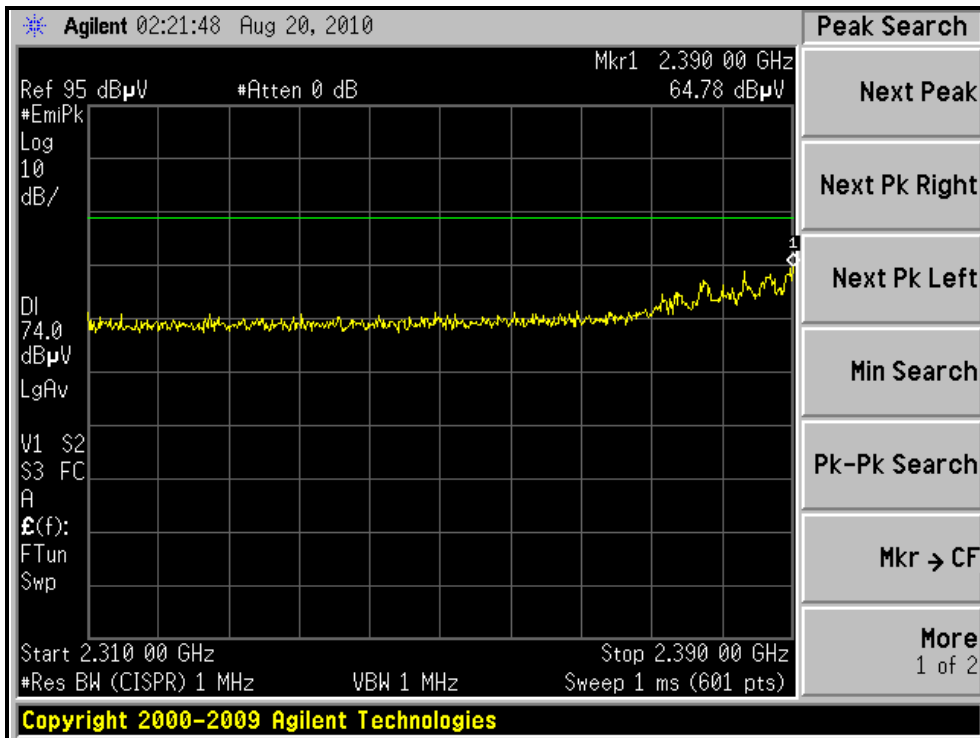
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, HORIZONTAL )





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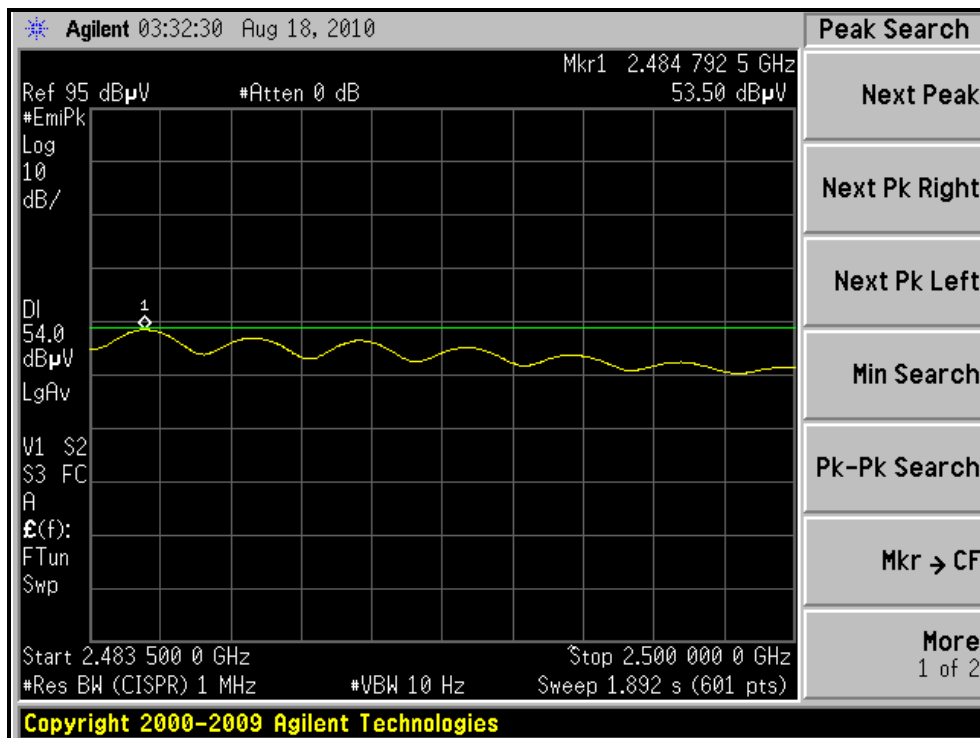
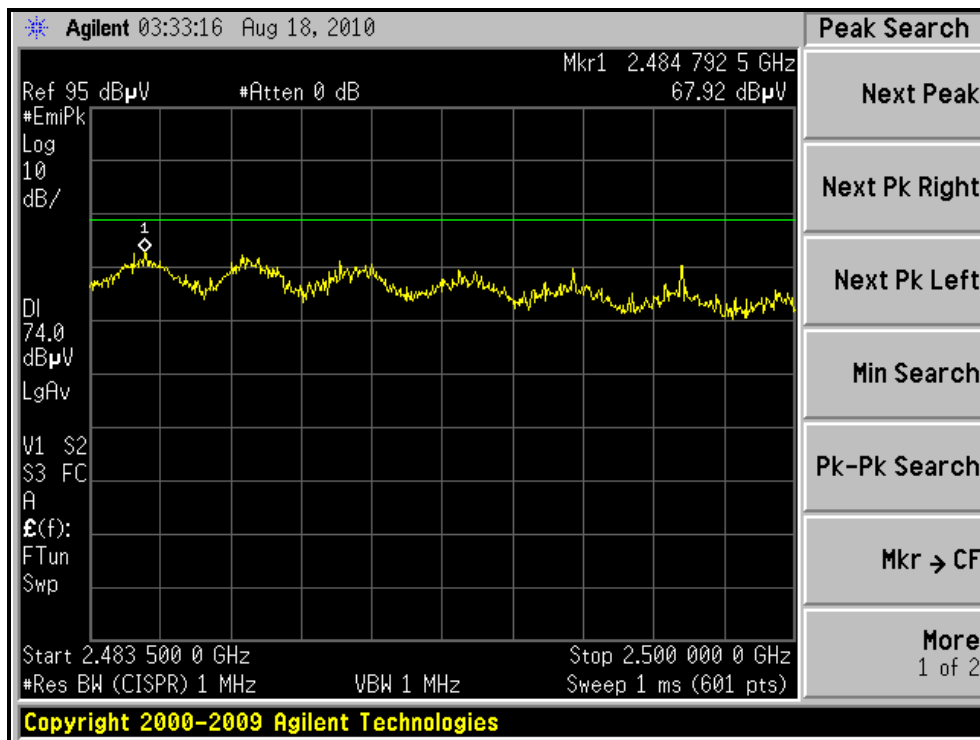
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, VERTICAL )





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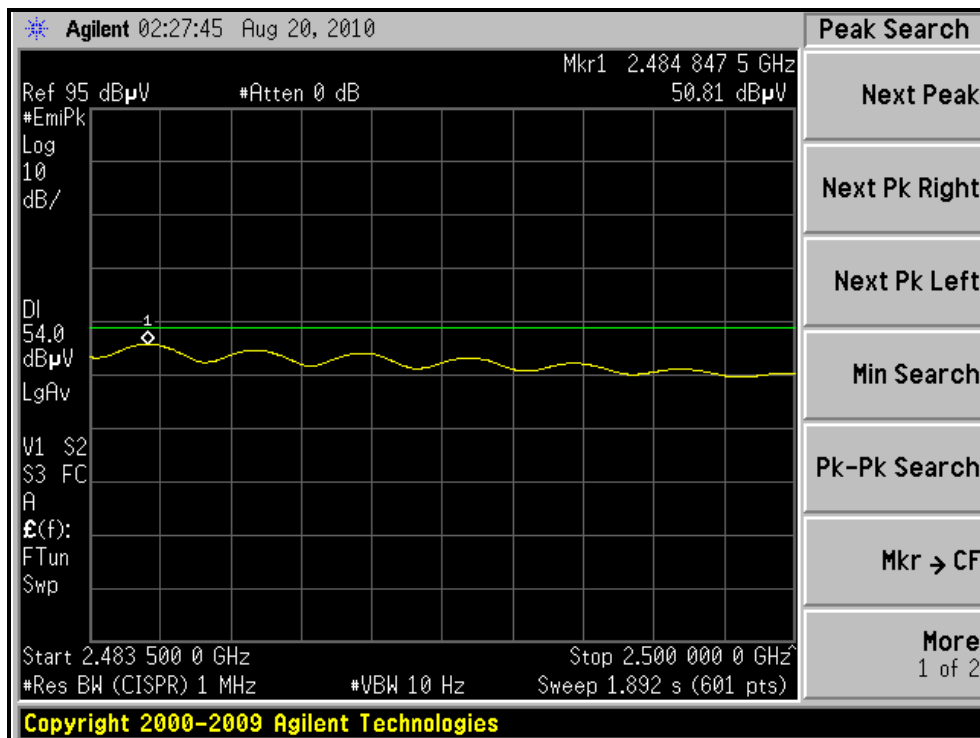
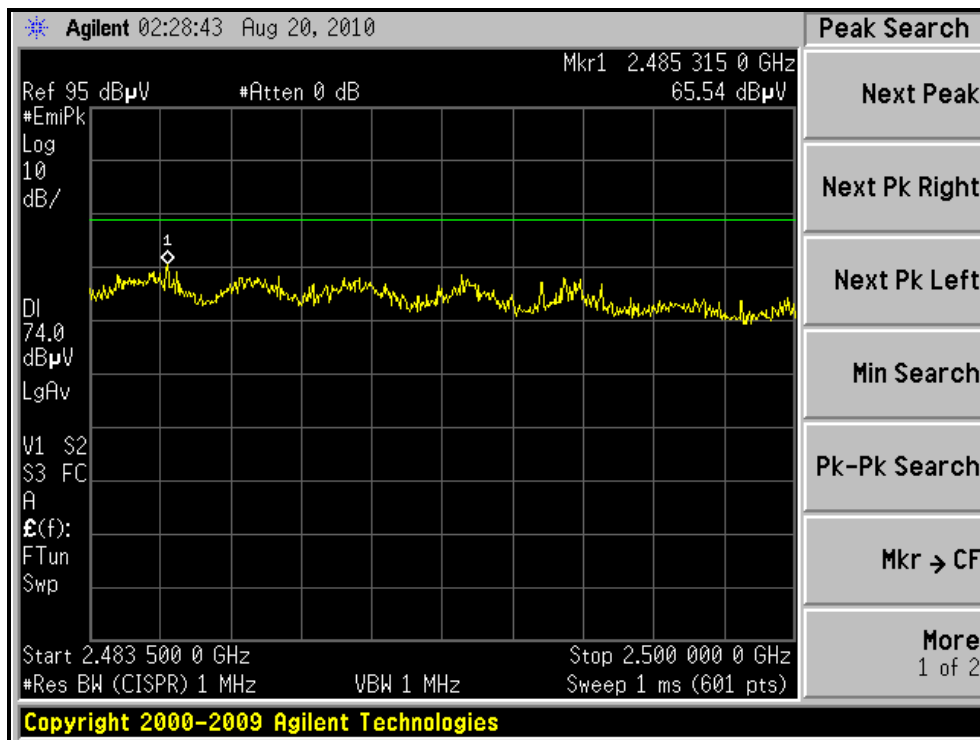
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH7, HORIZONTAL )





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



### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010

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

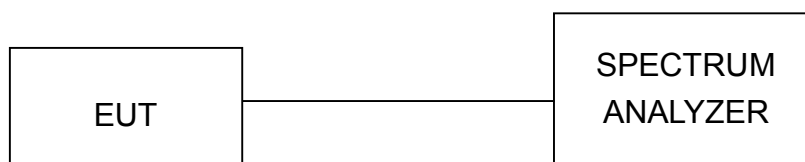
#### 4.3.3 TEST PROCEDURE

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 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



#### 4.3.6 EUT OPERATING CONDITIONS

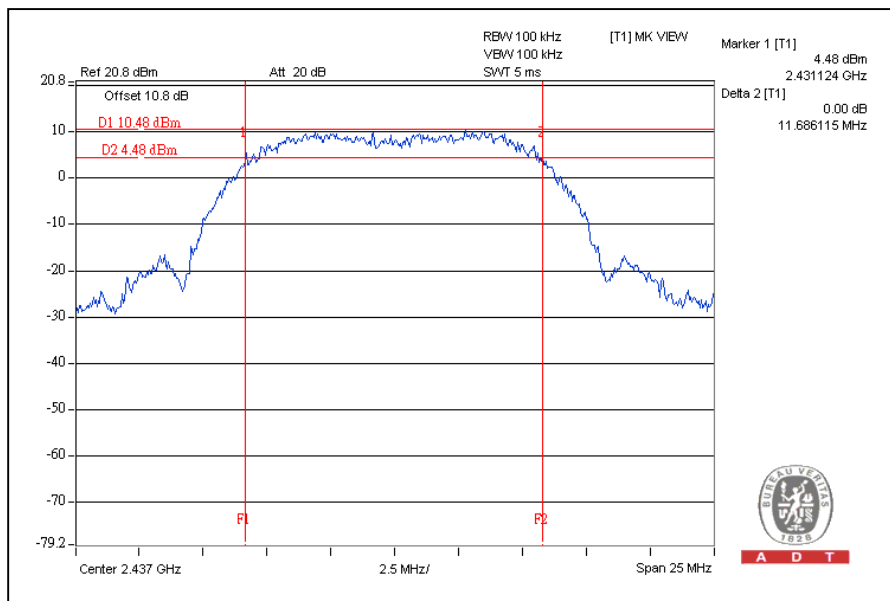
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 4.3.7 TEST RESULTS

#### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.55	0.5	PASS
6	2437	11.68	0.5	PASS
11	2462	10.94	0.5	PASS

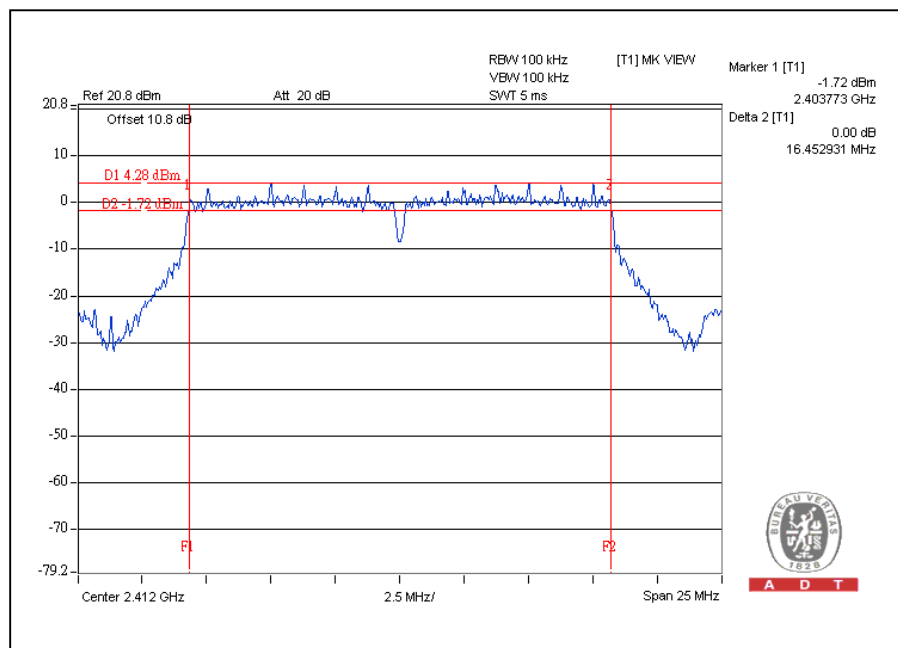
#### CH6



**802.11g OFDM MODULATION:**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.45	0.5	PASS
6	2437	16.38	0.5	PASS
11	2462	16.43	0.5	PASS

CH1





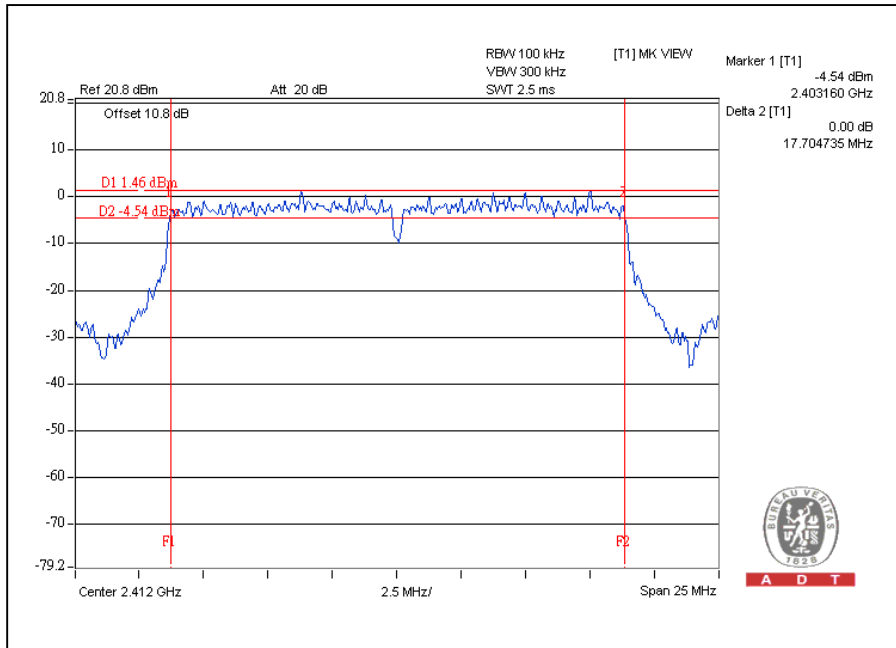


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**802.11n (20MHz) OFDM MODULATION:**

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.70	0.5	PASS
6	2437	17.61	0.5	PASS
11	2462	17.66	0.5	PASS

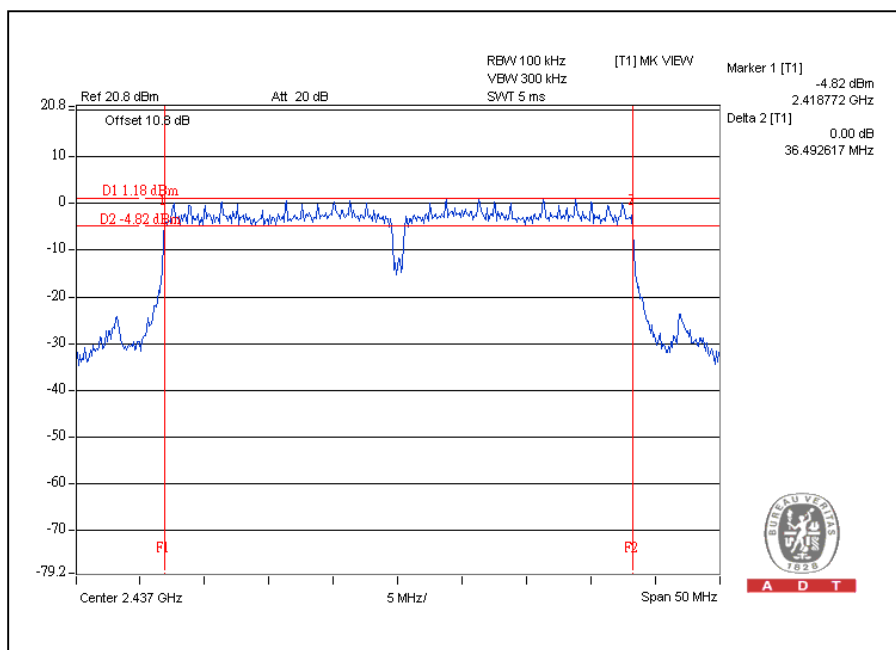
CH1



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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	36.46	0.5	PASS
4	2437	36.49	0.5	PASS
7	2452	36.47	0.5	PASS

CH4



#### 4.4 MAXIMUM PEAK OUTPUT POWER

##### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Peak Power Meter	ML2495A	0824006	May 04, 2010	May 03, 2011
Power Sensor	MA2411B	0738172	May 04, 2010	May 03, 2011

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

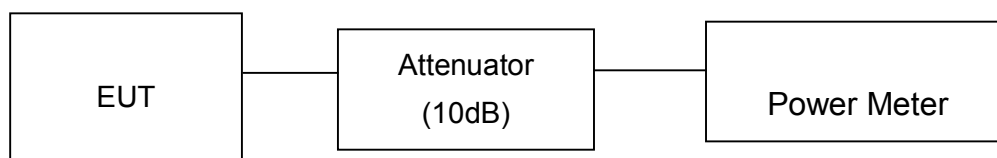
##### 4.4.3 TEST PROCEDURES

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



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#### 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	91.2	19.6	30	PASS
6	2437	234.4	23.7	30	PASS
11	2462	75.9	18.8	30	PASS

##### 802.11g 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	24.0	23.0	450.7	26.5	30	PASS
6	2437	26.6	26.3	883.7	29.5	30	PASS
11	2462	20.5	20.4	221.9	23.5	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	21.4	20.4	247.7	23.9	30	PASS
6	2437	26.5	26.3	873.3	29.4	30	PASS
11	2462	20.4	19.7	203.0	23.1	30	PASS



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### 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)				
1	2422	17.9	18.2	127.7	21.1	30	PASS
4	2437	21.9	22.1	317.1	25.0	30	PASS
7	2452	18.3	18.1	132.2	21.2	30	PASS

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010

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

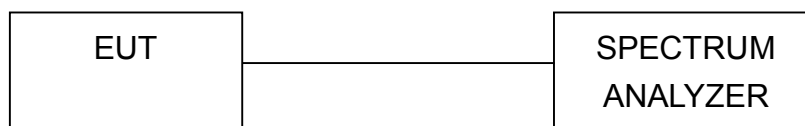
### 4.5.3 TEST PROCEDURE

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



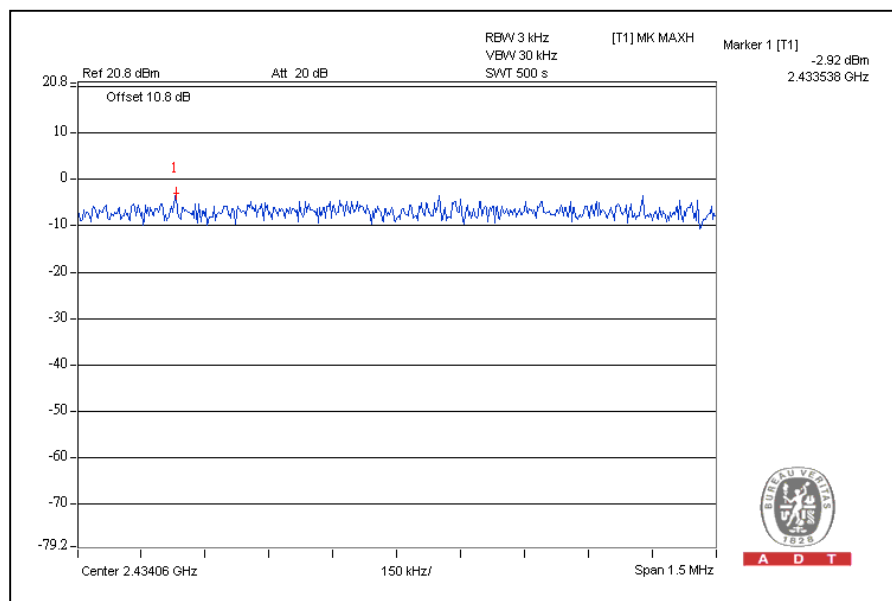
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### 4.5.7 TEST RESULTS

#### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-7.0	8	PASS
6	2437	-2.9	8	PASS
11	2462	-7.8	8	PASS

CH6



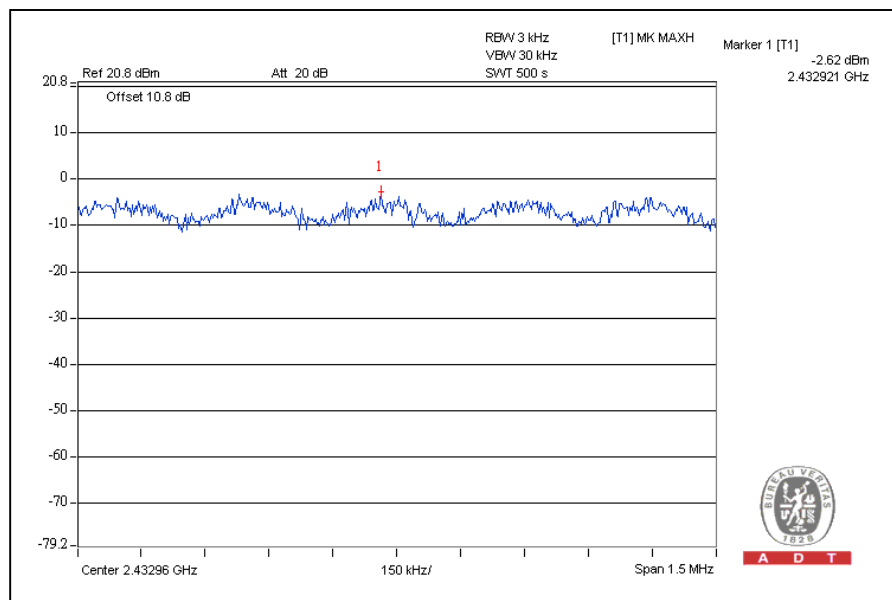


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### 802.11g OFDM MODULATION:

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	-8.7	-9.3	-6.00	8	PASS
6	2437	-2.6	-2.6	0.40	8	PASS
11	2462	-12.2	-12.5	-9.30	8	PASS

For Chain(0): CH6





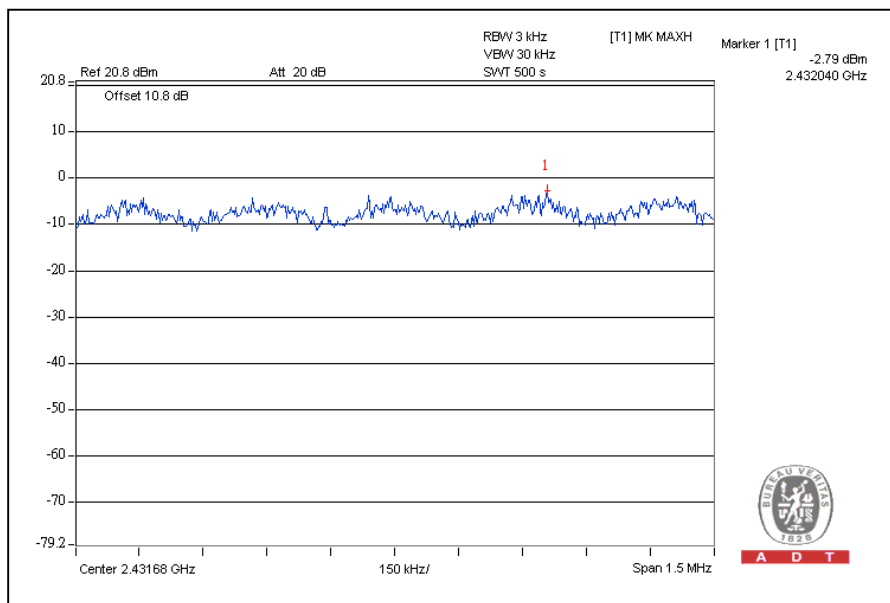


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### 802.11n (20MHz) OFDM MODULATION:

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	-11.4	-13.4	-9.30	8	PASS
6	2437	-2.8	-3.9	-0.30	8	PASS
11	2462	-11.4	-14.2	-9.60	8	PASS

For Chain(0): CH6



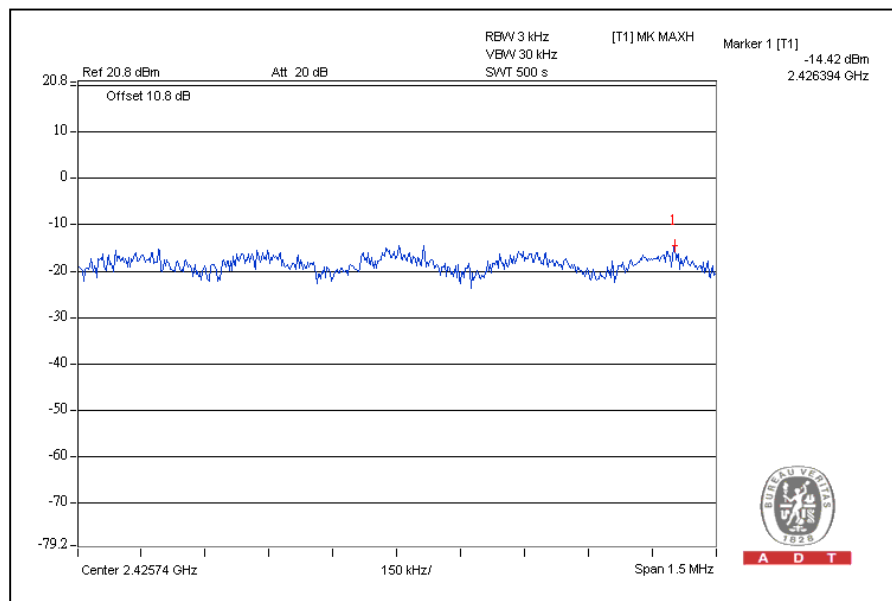


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### 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2422	-17.9	-18.0	-14.90	8	PASS
4	2437	-14.7	-14.4	-11.50	8	PASS
7	2452	-17.9	-17.3	-14.60	8	PASS

For Chain (1): CH4



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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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010

**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 was measured and recorded.

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

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.6.5 EUT OPERATING CONDITION

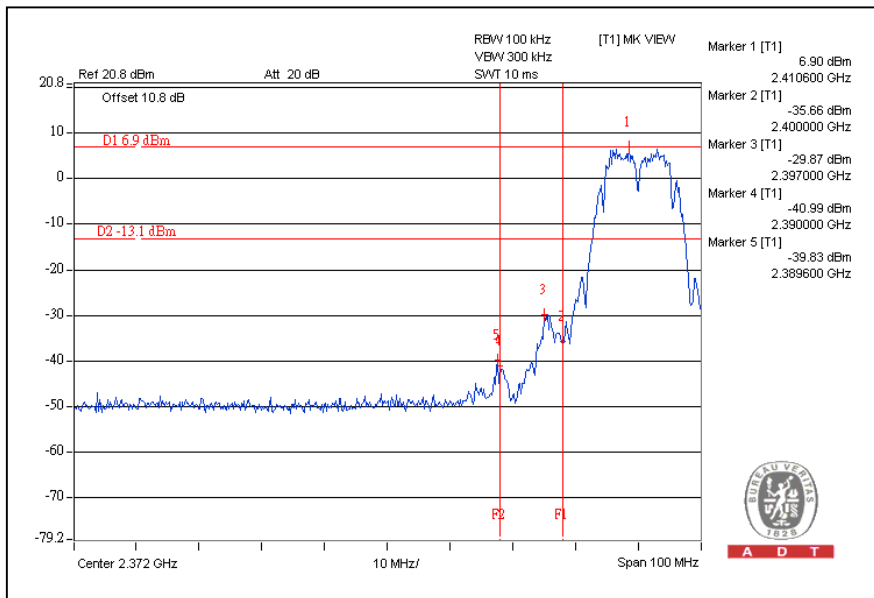
Same as Item 4.3.6

### 4.6.6 TEST RESULTS

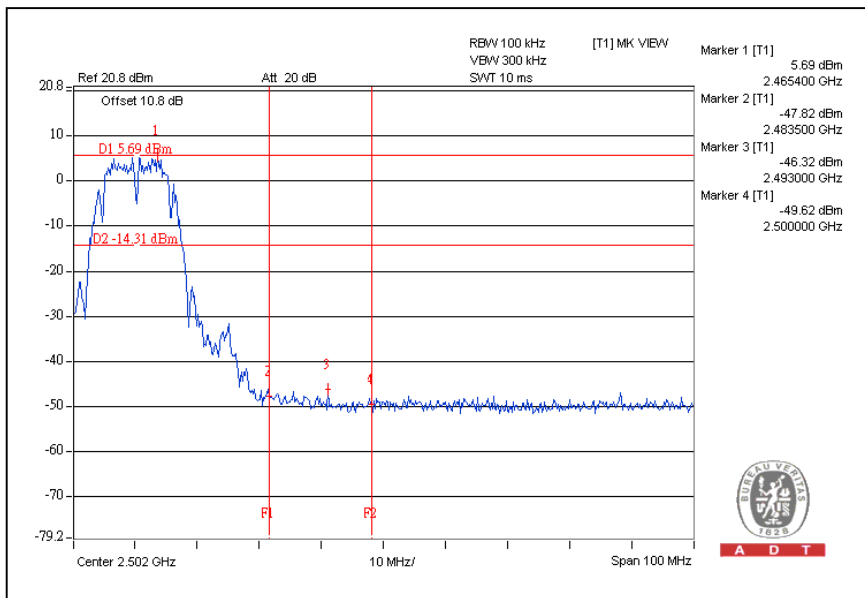
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

### 802.11b DSSS MODULATION:

#### CH1



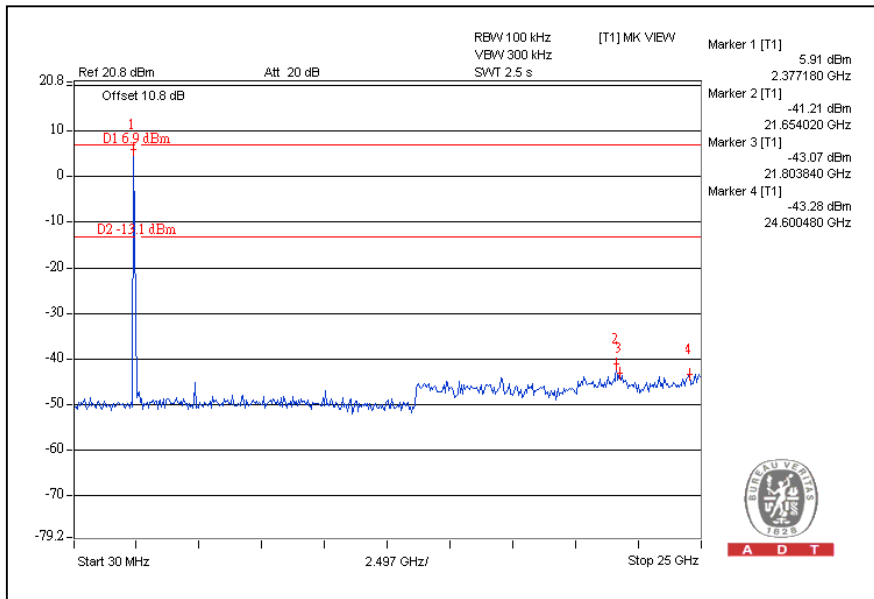
#### CH11



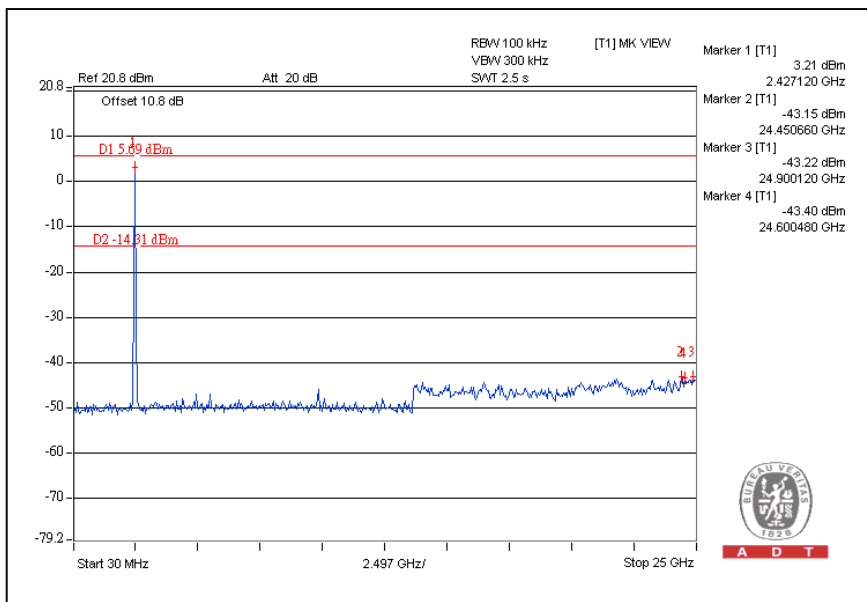


A D T

### CH1



### CH11

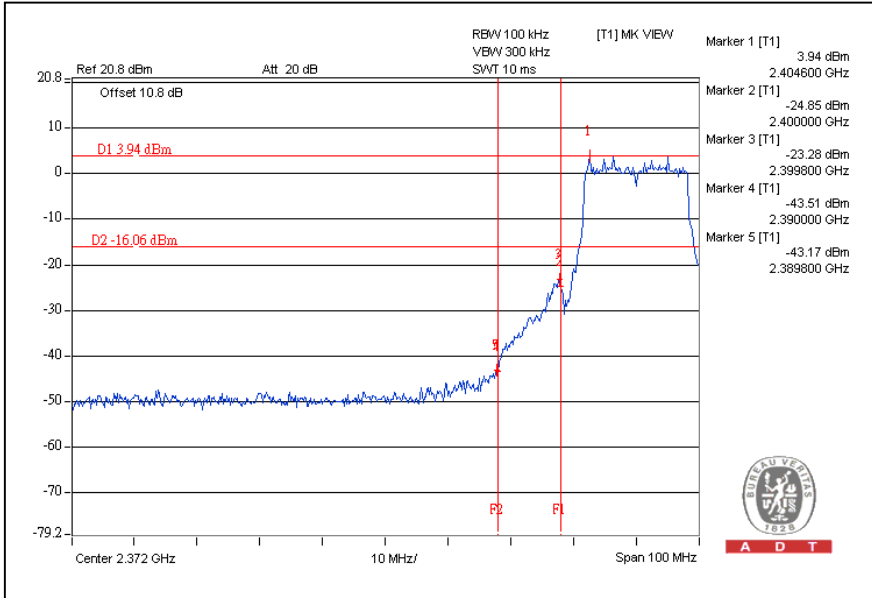




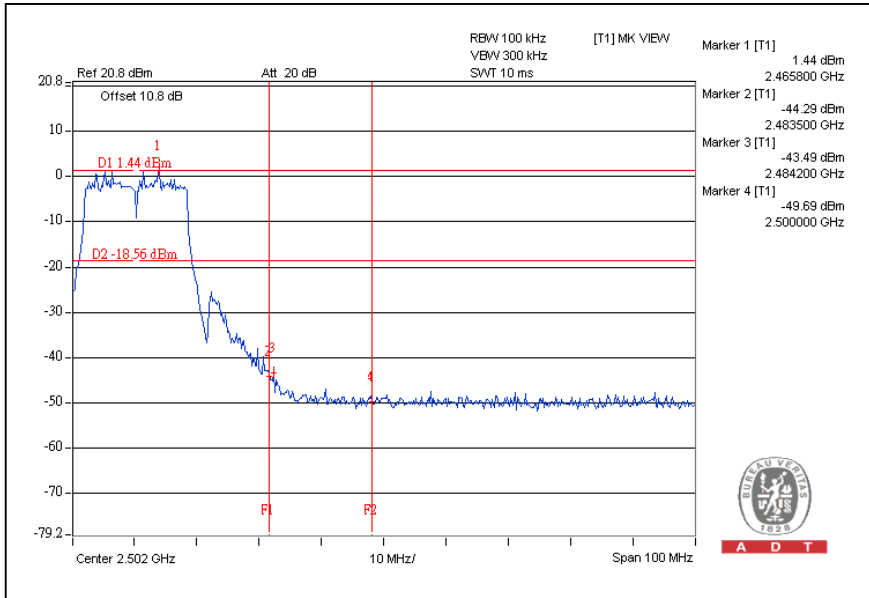
A D T

# 802.11g OFDM MODULATION:

## CH1



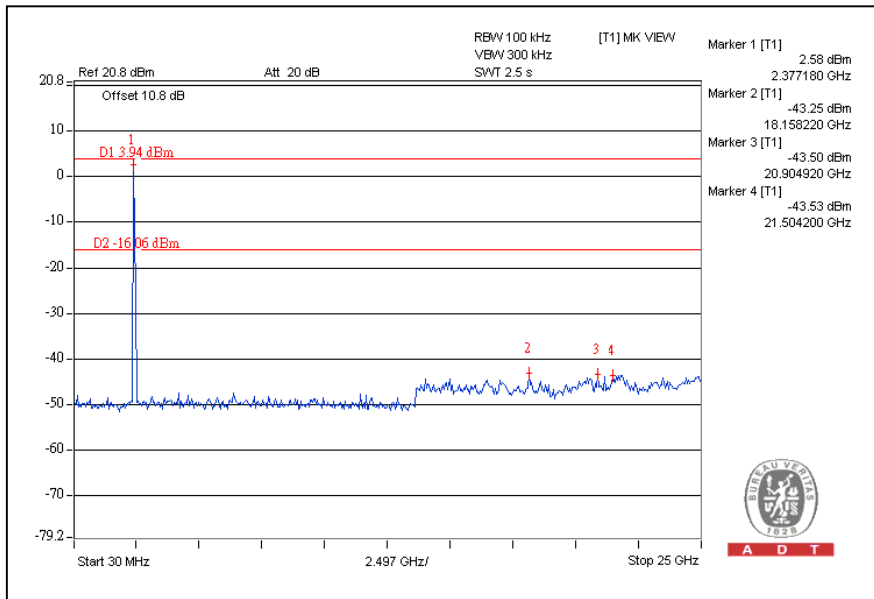
## CH11



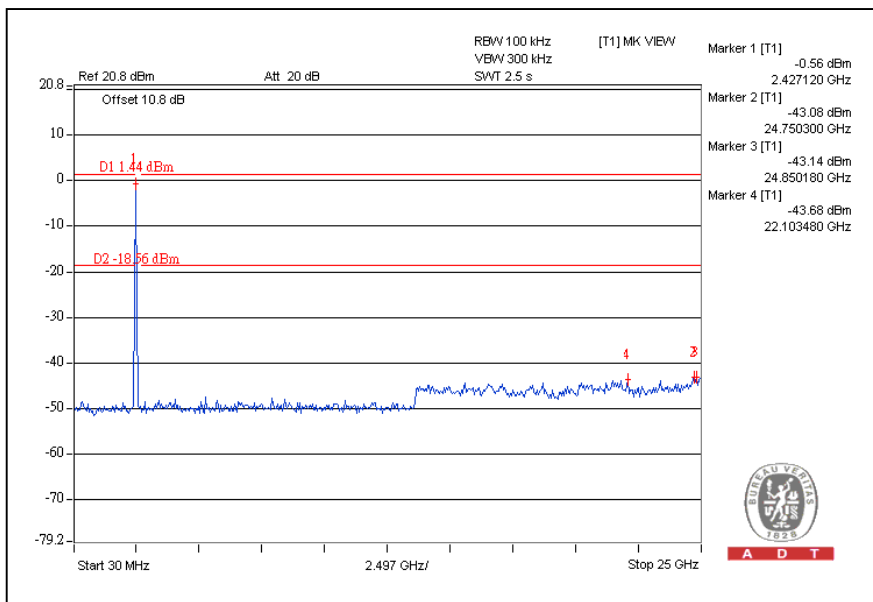


A D T

### CH1

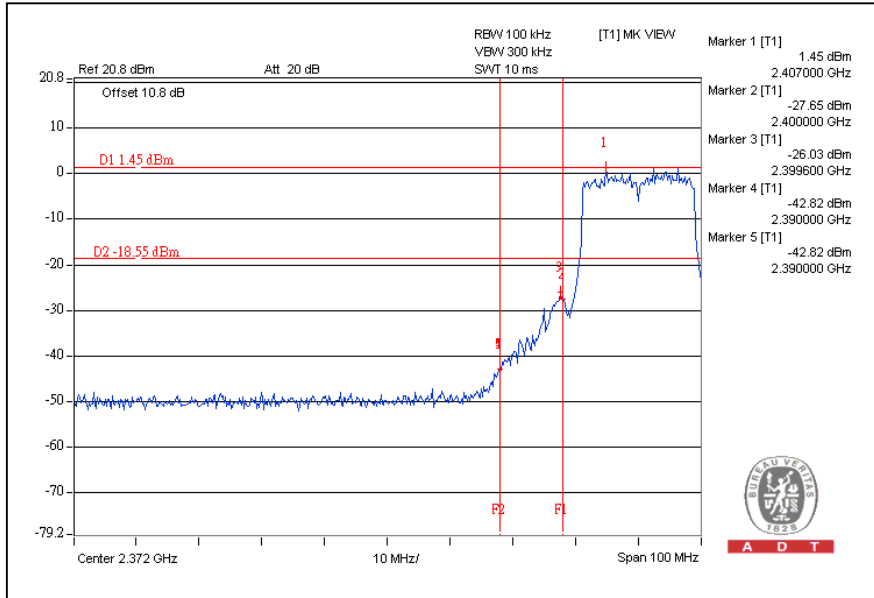


### CH11

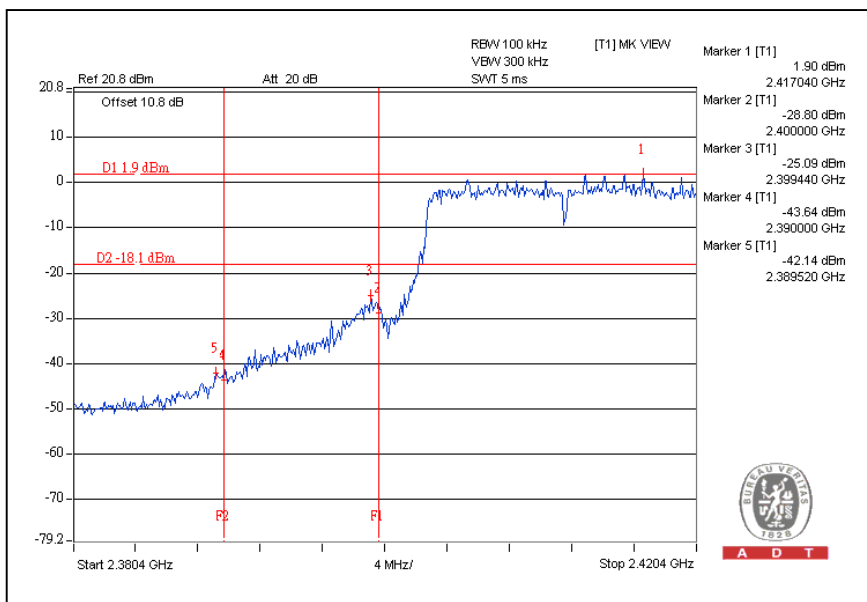


### 802.11n (20MHz) OFDM MODULATION:

CH1



CH11

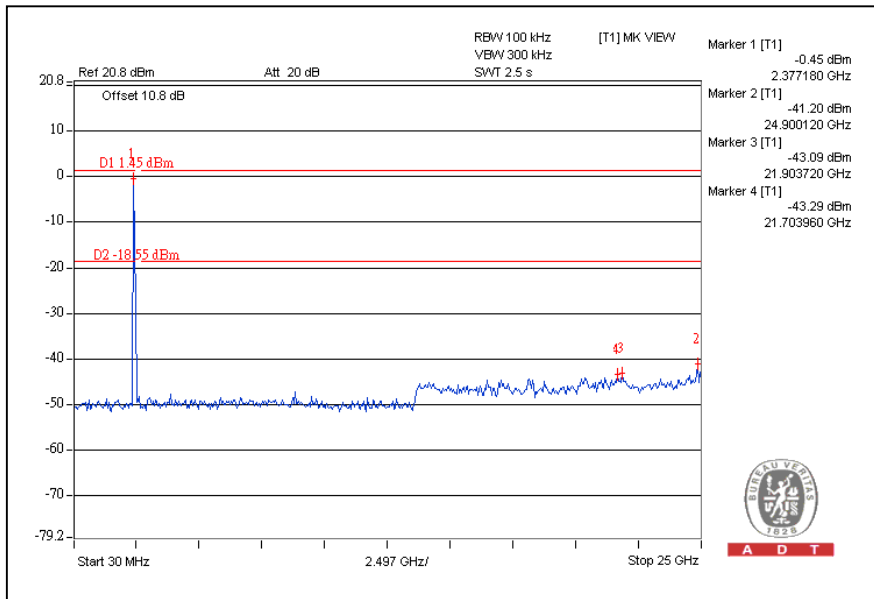




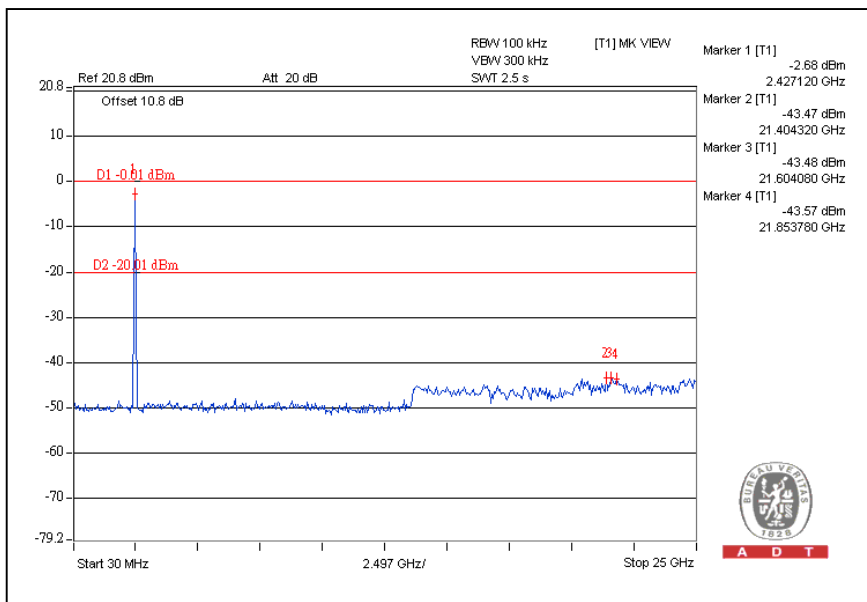


A D T

### CH1

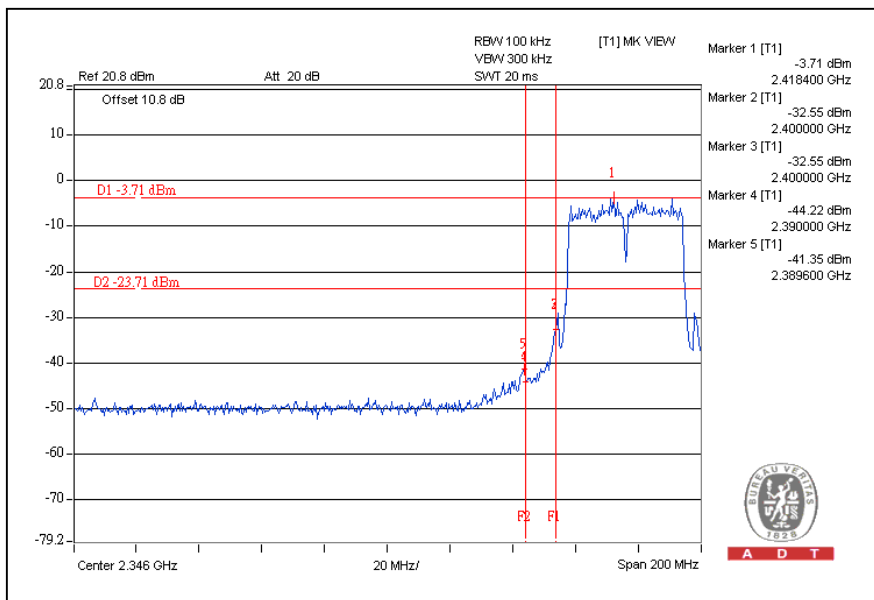


### CH11

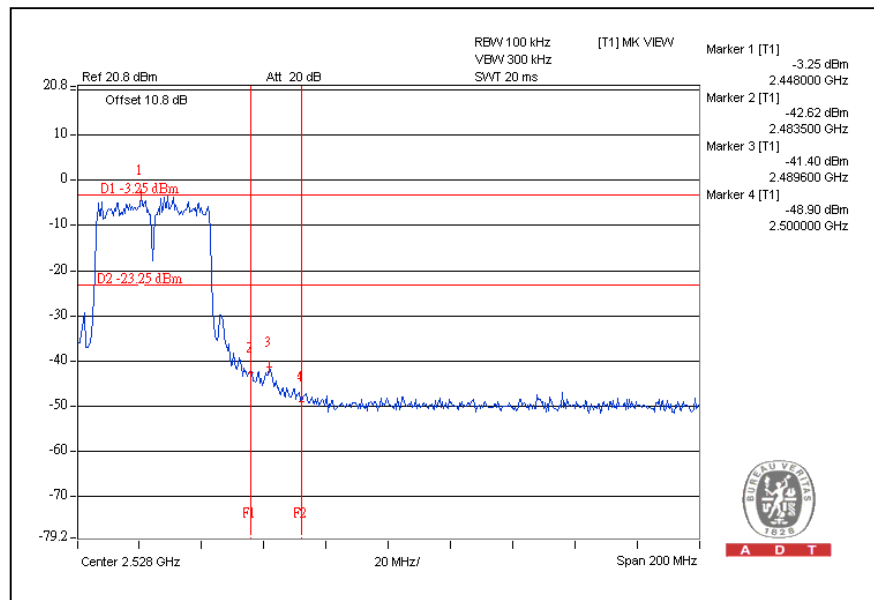


## 802.11n (40MHz) OFDM MODULATION:

### CH1



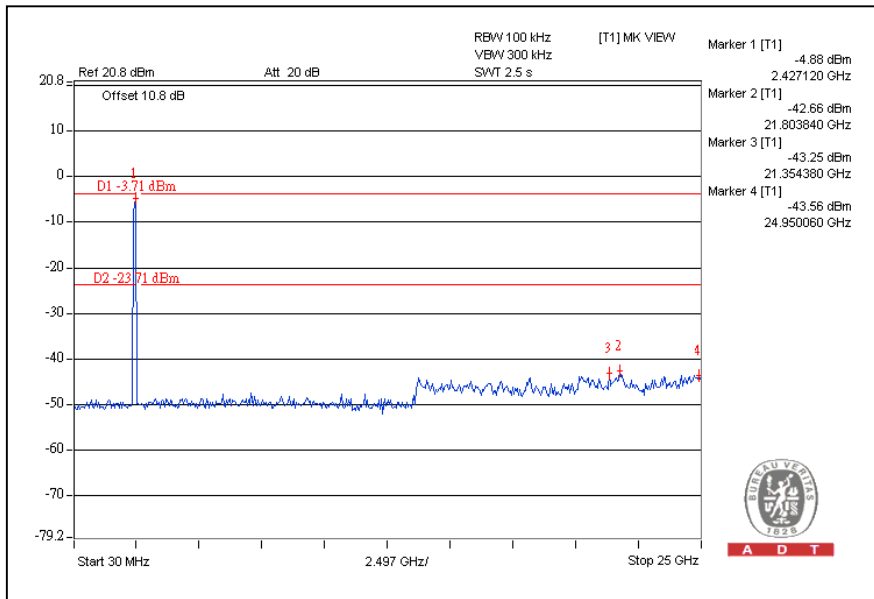
### CH7



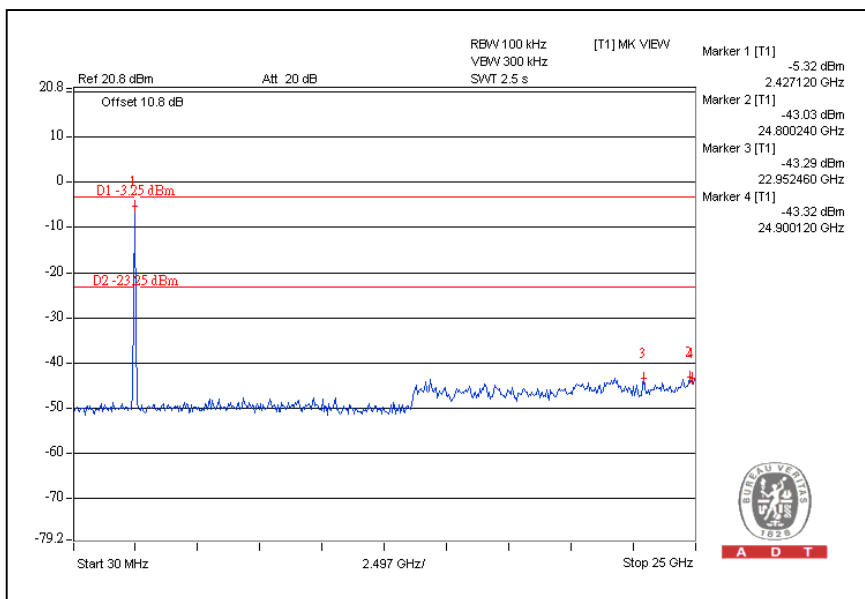


A D T

# CH1



# CH7



## 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 (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 01, 2010	Feb. 28, 2011
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 23, 2009	Sep. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 11, 2010	June 10, 2011
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec. 14, 2009	Dec. 13, 2010
50 ohms Terminator	50	3	Oct. 28, 2009	Oct. 27, 2010
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.



A D T

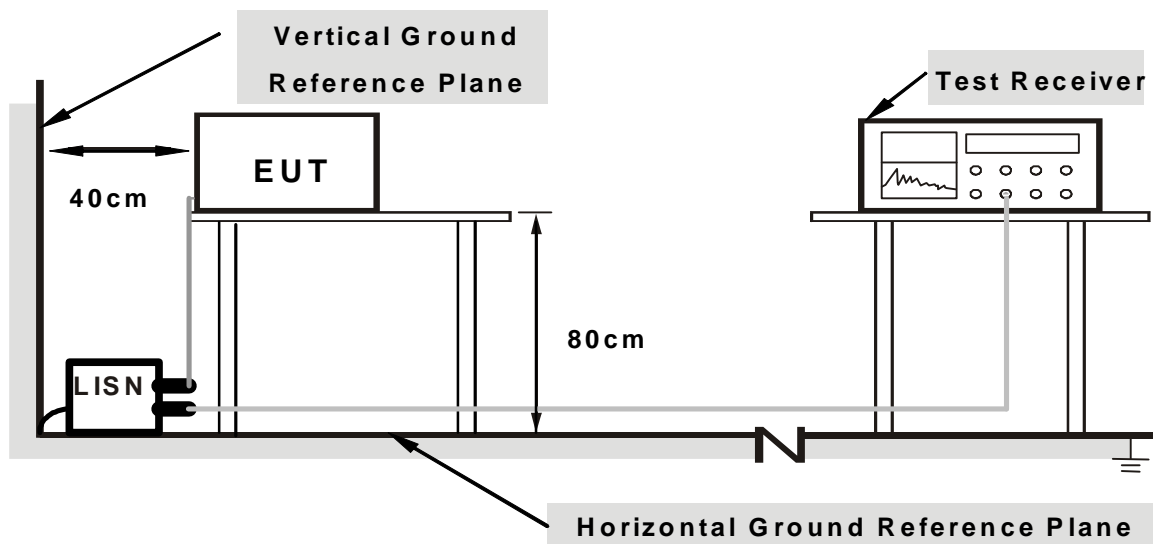
### 5.1.3 TEST PROCEDURES

- 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

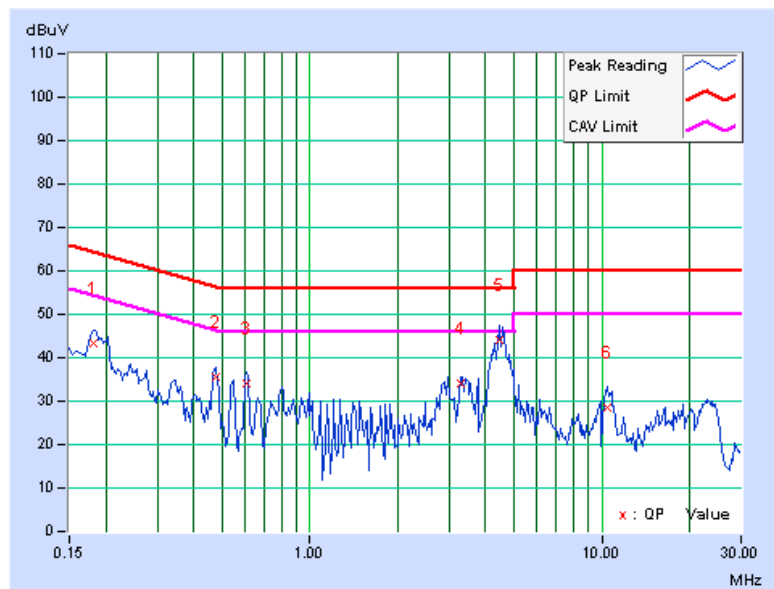
Same as the 4.1.6

### 5.1.7 TEST RESULTS

<b>TEST MODE</b>	With adapter 1		
<b>PHASE</b>	Line (L)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.181	0.04	43.18	28.85	43.22	28.89	64.43	54.43	-21.21	-25.54
2	0.474	0.07	35.54	29.11	35.61	29.18	56.44	46.44	-20.83	-17.26
3	0.607	0.11	34.08	30.36	34.19	30.47	56.00	46.00	-21.81	-15.53
4	3.297	0.20	33.82	19.90	34.02	20.10	56.00	46.00	-21.98	-25.90
<b>5</b>	<b>4.453</b>	<b>0.22</b>	<b>43.79</b>	<b>28.44</b>	<b>44.01</b>	<b>28.66</b>	<b>56.00</b>	<b>46.00</b>	<b>-11.99</b>	<b>-17.34</b>
6	10.512	0.58	27.90	19.62	28.48	20.20	60.00	50.00	-31.52	-29.80

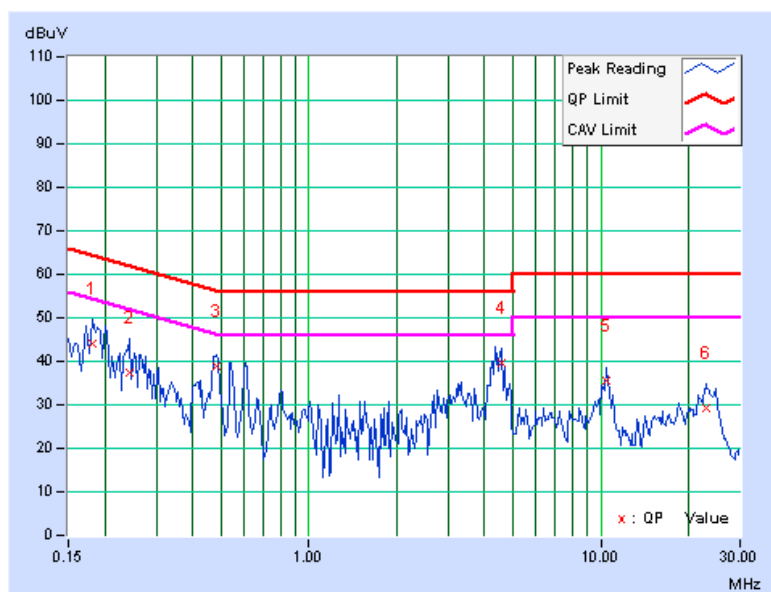
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	With adapter 1		
<b>PHASE</b>	Neutral (N)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.181	0.05	44.10	29.99	44.15	30.04	64.43	54.43	-20.28	-24.39
2	0.244	0.05	37.43	24.43	37.48	24.48	61.97	51.97	-24.49	-27.49
3	0.482	0.08	38.86	34.98	38.94	35.06	56.30	46.30	-17.36	-11.24
4	4.559	0.25	39.29	24.59	39.54	24.84	56.00	46.00	-16.46	-21.16
5	10.430	0.59	35.14	30.65	35.73	31.24	60.00	50.00	-24.27	-18.76
6	22.895	0.65	28.51	20.37	29.16	21.02	60.00	50.00	-30.84	-28.98

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

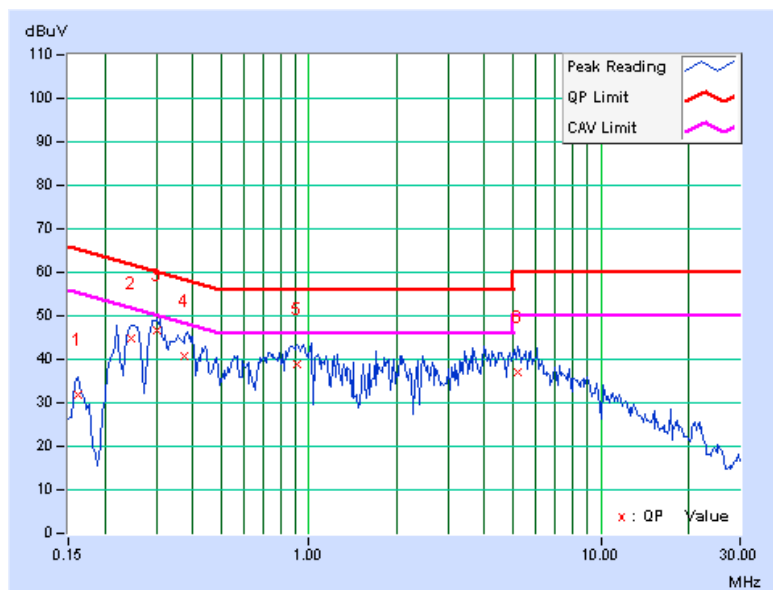




<b>TEST MODE</b>	With adapter 2		
<b>PHASE</b>	Line (L)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.04	31.98	21.32	32.02	21.36	65.38	55.38	-33.36	-34.02
2	0.248	0.04	44.77	33.34	44.81	33.38	61.84	51.84	-17.02	-18.45
3	0.303	0.05	46.44	34.88	46.49	34.93	60.17	50.17	-13.69	-15.25
4	0.377	0.05	40.54	27.94	40.59	27.99	58.35	48.35	-17.77	-20.37
5	0.912	0.19	38.63	26.78	38.82	26.97	56.00	46.00	-17.18	-19.03
6	5.203	0.27	36.85	28.47	37.12	28.74	60.00	50.00	-22.88	-21.26

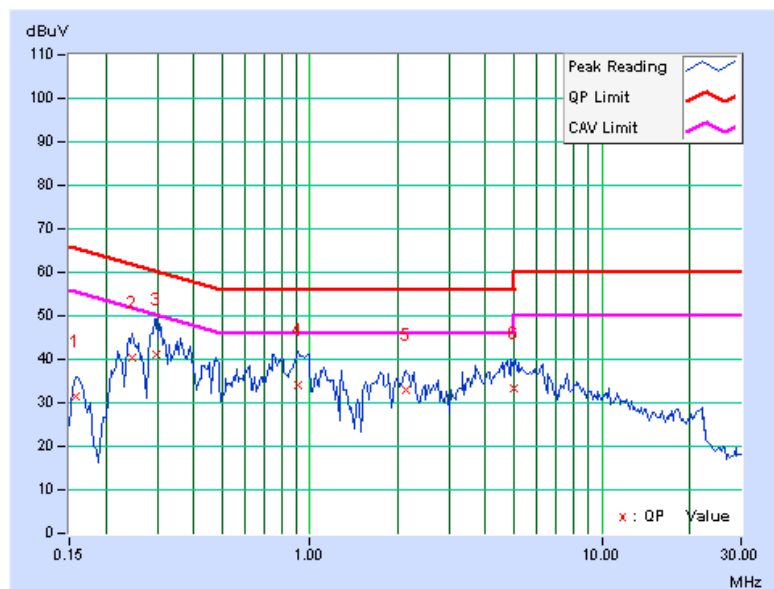
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	With adapter 2		
<b>PHASE</b>	Neutral (N)	<b>6dB BANDWIDTH</b>	9 kHz

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.05	31.32	10.55	31.37	10.60	65.58	55.58	-34.21	-44.98
2	0.248	0.05	40.46	28.08	40.51	28.13	61.84	51.84	-21.32	-23.70
3	0.298	0.05	41.13	28.00	41.18	28.05	60.29	50.29	-19.10	-22.23
4	0.908	0.20	33.83	21.53	34.03	21.73	56.00	46.00	-21.97	-24.27
5	2.133	0.24	32.90	22.90	33.14	23.14	56.00	46.00	-22.86	-22.86
6	5.000	0.27	33.22	25.39	33.49	25.66	56.00	46.00	-22.51	-20.34

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



## 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.



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## 5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 02, 2010	Aug. 01, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 18, 2009	Nov. 17, 2010
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Sep. 30, 2009	Sep. 29, 2010
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 16, 2009	Nov. 15, 2010
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Sep. 30, 2009	Sep. 29, 2010
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 24, 2009	Dec. 23, 2010
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.

### 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 antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to 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.

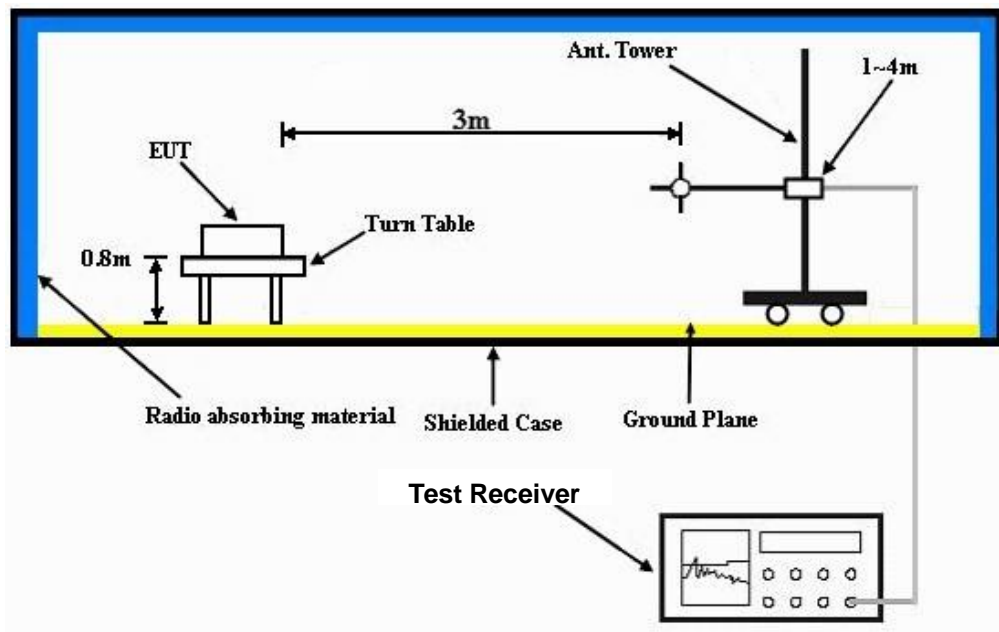
**NOTE:**

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

### 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 4.2.6

## 5.2.7 TEST RESULTS

### BELOW 1GHz WORST-CASE DATA : 802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Rex Huang

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	120.03	39.2 QP	43.5	-4.3	1.80 H	255	26.74	12.46
2	242.30	39.1 QP	46.0	-6.9	1.25 H	70	26.34	12.78
3	356.00	41.5 QP	46.0	-4.5	1.25 H	160	25.10	16.41
4	610.20	43.0 QP	46.0	-3.0	1.80 H	315	20.88	22.08
5	920.30	41.6 QP	46.0	-4.4	1.50 H	360	15.20	26.40
6	1000.00	48.3 QP	54.0	-5.7	2.25 H	50	21.23	27.08
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	37.50	36.3 QP	40.0	-3.8	1.01 V	250	22.68	13.57
2	81.56	37.5 QP	40.0	-2.5	1.30 V	355	28.43	9.09
3	118.32	40.0 QP	43.5	-3.5	1.25 V	210	27.78	12.18
4	172.00	40.3 QP	43.5	-3.3	1.00 V	231	27.35	12.90
5	348.69	40.2 QP	46.0	-5.8	1.00 V	325	23.97	16.26
6	995.30	50.1 QP	54.0	-3.9	1.00 V	360	23.06	27.04

- 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.



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**ABOVE 1GHz DATA**

**802.11a OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	111.4 PK			1.00 H	64	69.85	41.55
2	*5745.00	100.7 AV			1.00 H	64	59.15	41.55
3	11490.00	63.0 PK	74.0	-11.0	1.47 H	90	15.29	47.71
4	11490.00	51.3 AV	54.0	-2.7	1.47 H	90	3.59	47.71
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	112.9 PK			1.06 V	340	71.35	41.55
2	*5745.00	102.8 AV			1.06 V	340	61.25	41.55
3	11490.00	64.2 PK	74.0	-9.8	1.70 V	316	16.49	47.71
4	11490.00	52.5 AV	54.0	-1.5	1.70 V	316	4.79	47.71

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	111.1 PK			1.00 H	63	69.42	41.68
2	*5785.00	100.5 AV			1.00 H	63	58.82	41.68
3	11570.00	65.6 PK	74.0	-8.4	1.47 H	268	17.85	47.75
4	11570.00	53.6 AV	54.0	-0.4	1.47 H	268	5.85	47.75
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	112.5 PK			1.05 V	339	70.82	41.68
2	*5785.00	102.3 AV			1.05 V	339	60.62	41.68
3	11570.00	66.5 PK	74.0	-7.5	1.60 V	314	18.75	47.75
4	11570.00	53.9 AV	54.0	-0.1	1.60 V	314	6.15	47.75

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	110.9 PK			1.00 H	64	69.12	41.78
2	*5825.00	100.2 AV			1.00 H	64	58.42	41.78
3	11650.00	63.9 PK	74.0	-10.1	1.19 H	248	16.07	47.83
4	11650.00	51.0 AV	54.0	-3.0	1.19 H	248	3.17	47.83

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	112.8 PK			1.04 V	340	71.02	41.78
2	*5825.00	101.7 AV			1.04 V	340	59.92	41.78
3	11650.00	65.7 PK	74.0	-8.3	1.65 V	318	17.87	47.83
4	11650.00	53.8 AV	54.0	-0.2	1.65 V	318	5.97	47.83

- 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 (20MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

**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	115.1 PK			1.04 H	250	73.55	41.55
2	*5745.00	104.3 AV			1.04 H	250	62.75	41.55
3	11490.00	66.0 PK	74.0	-8.0	1.18 H	248	18.29	47.71
4	11490.00	53.1 AV	54.0	-0.9	1.18 H	248	5.39	47.71

**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	116.1 PK			1.06 V	348	74.55	41.55
2	*5745.00	105.4 AV			1.06 V	348	63.85	41.55
3	11490.00	63.1 PK	74.0	-10.9	1.26 V	316	15.39	47.71
4	11490.00	50.9 AV	54.0	-3.1	1.26 V	316	3.19	47.71

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	115.3 PK			1.04 H	251	73.62	41.68
2	*5785.00	105.0 AV			1.04 H	251	63.32	41.68
3	11570.00	66.2 PK	74.0	-7.8	1.17 H	247	18.45	47.75
4	11570.00	53.6 AV	54.0	-0.4	1.17 H	247	5.85	47.75
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	116.2 PK			1.05 V	347	74.52	41.68
2	*5785.00	105.8 AV			1.05 V	347	64.12	41.68
3	11570.00	64.1 PK	74.0	-9.9	1.65 V	316	16.35	47.75
4	11570.00	51.8 AV	54.0	-2.2	1.65 V	316	4.05	47.75

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	114.2 PK			1.05 H	250	72.42	41.78
2	*5825.00	104.0 AV			1.05 H	250	62.22	41.78
3	11650.00	67.1 PK	74.0	-6.9	1.16 H	247	19.27	47.83
4	11650.00	53.7 AV	54.0	-0.3	1.16 H	247	5.87	47.83
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	115.3 PK			1.04 V	343	73.52	41.78
2	*5825.00	104.9 AV			1.04 V	343	63.12	41.78
3	11650.00	64.4 PK	74.0	-9.6	1.65 V	316	16.57	47.83
4	11650.00	52.2 AV	54.0	-1.8	1.65 V	316	4.37	47.83

- 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	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	109.1 PK			1.09 H	249	67.51	41.59
2	*5755.00	98.7 AV			1.09 H	249	57.11	41.59
3	11510.00	62.3 PK	74.0	-11.7	1.18 H	106	14.58	47.72
4	11510.00	49.7 AV	54.0	-4.3	1.18 H	106	1.98	47.72
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	110.7 PK			1.05 V	342	69.11	41.59
2	*5755.00	99.5 AV			1.05 V	342	57.91	41.59
3	11510.00	59.5 PK	74.0	-14.5	1.53 V	313	11.78	47.72
4	11510.00	47.8 AV	54.0	-6.2	1.53 V	313	0.08	47.72

- 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 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	28deg. C, 72%RH 1013 hPa	TESTED BY	Duke Tseng

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	111.5 PK			1.09 H	250	69.80	41.70
2	*5795.00	101.2 AV			1.09 H	250	59.50	41.70
3	11590.00	63.9 PK	74.0	-10.1	1.17 H	105	16.14	47.76
4	11590.00	51.6 AV	54.0	-2.4	1.17 H	105	3.84	47.76

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	113.1 PK			1.05 V	345	71.40	41.70
2	*5795.00	101.8 AV			1.05 V	345	60.10	41.70
3	11590.00	61.7 PK	74.0	-12.3	1.52 V	311	13.94	47.76
4	11590.00	48.9 AV	54.0	-5.1	1.52 V	311	1.14	47.76

- 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.

### 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010

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

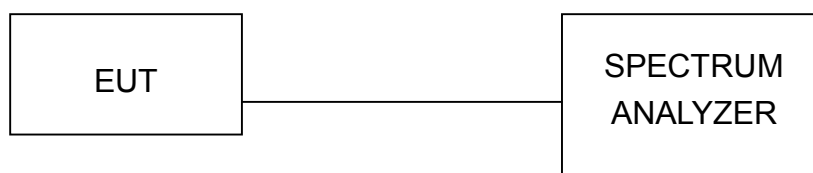
#### 5.3.3 TEST PROCEDURE

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 100kHz 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.





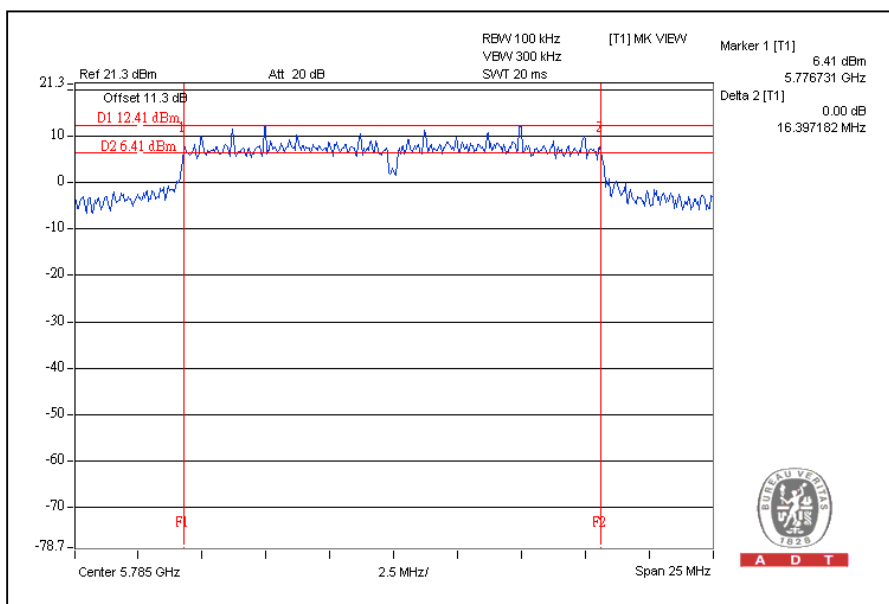
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### 5.3.7 TEST RESULTS

#### 802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.38	0.5	PASS
157	5785	16.39	0.5	PASS
165	5825	16.37	0.5	PASS

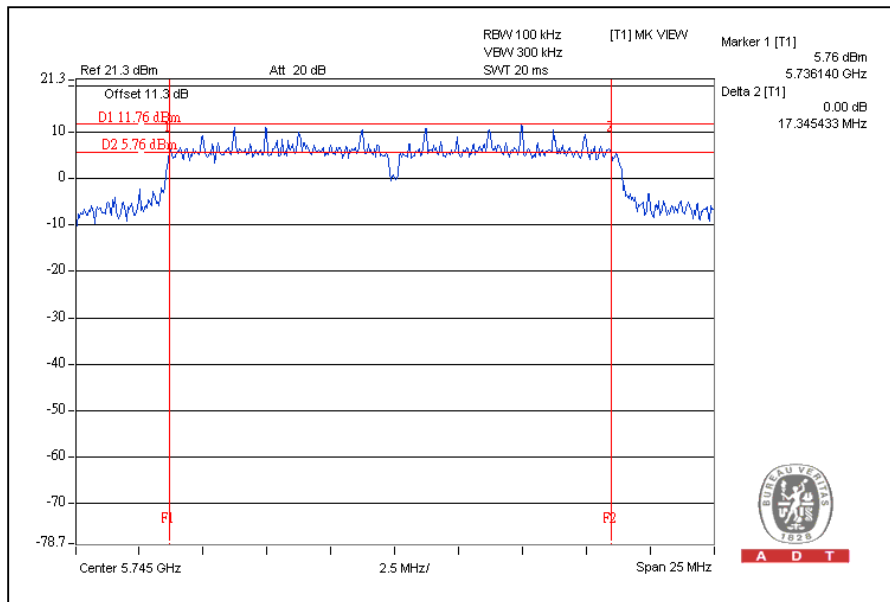
#### CH157



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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	17.34	0.5	PASS
157	5785	17.21	0.5	PASS
165	5825	16.96	0.5	PASS

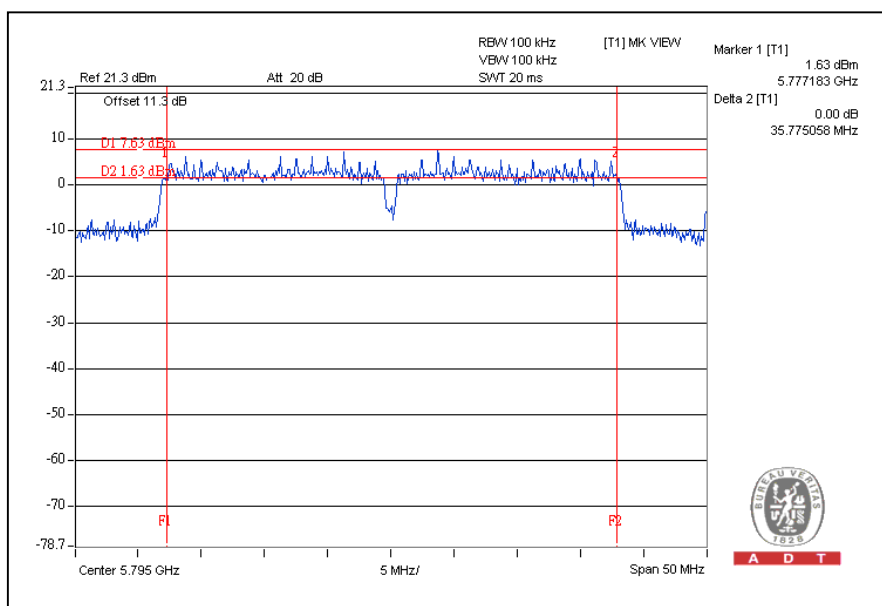
**CH149**



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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	33.56	0.5	PASS
159	5795	35.77	0.5	PASS

**CH159**



## 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Peak Power Meter	ML2495A	0824006	May 04, 2010	May 03, 2011
Power Sensor	MA2411B	0738172	May 04, 2010	May 03, 2011

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

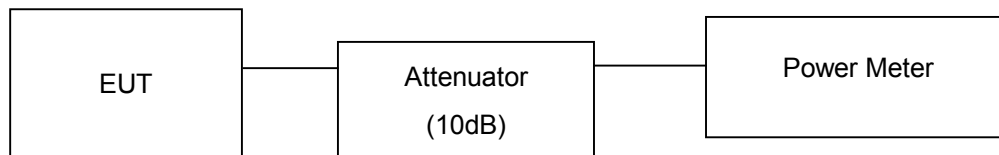
### 5.4.3 TEST PROCEDURES

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 (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
149	5745	199.5	23.0	30	PASS
157	5785	177.8	22.5	30	PASS
165	5825	173.8	22.4	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	23.1	23.2	413.1	26.2	30	PASS
157	5785	22.7	22.9	381.2	25.8	30	PASS
165	5825	22.2	22.5	343.8	25.4	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	22.7	22.8	376.8	25.8	30	PASS
159	5795	22.6	22.8	372.5	25.7	30	PASS

## 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010

**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



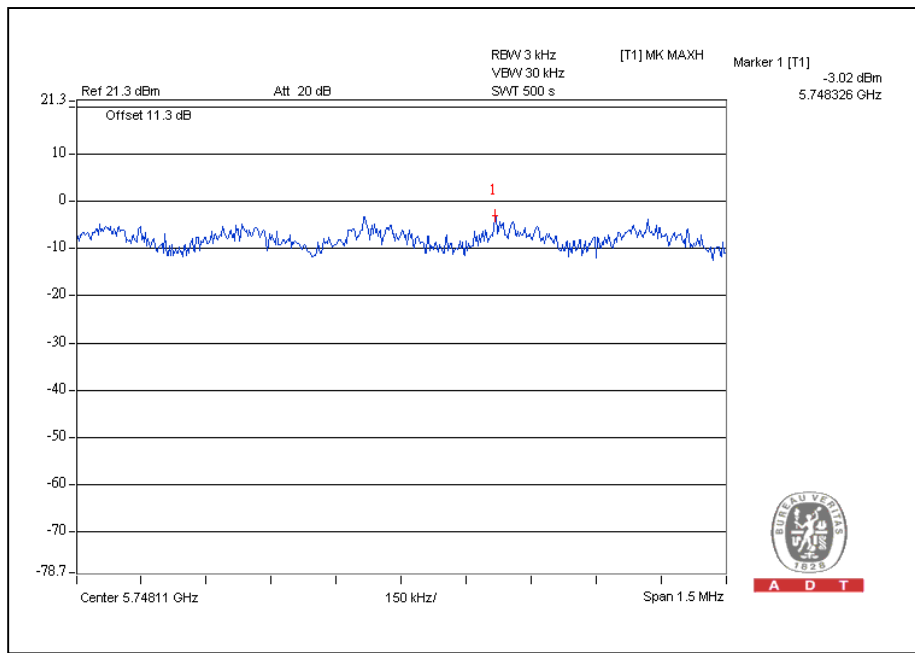
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### 5.5.7 TEST RESULTS

#### 802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
149	5745	-3.0	8	PASS
157	5785	-3.4	8	PASS
165	5825	-4.2	8	PASS

#### CH149







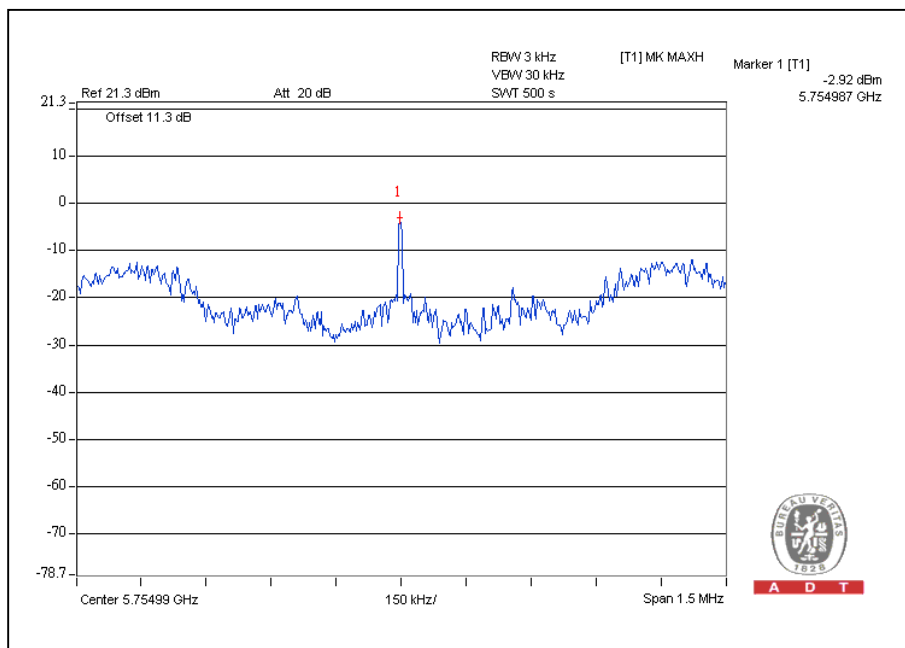


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### 802.11n (40MHz) OFDM MODULATION:

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	-2.9	-10.5	-2.20	8	PASS
159	5795	-8.5	-8.7	-5.60	8	PASS

For Chain(0): CH151





## 5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

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

### 5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010

**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

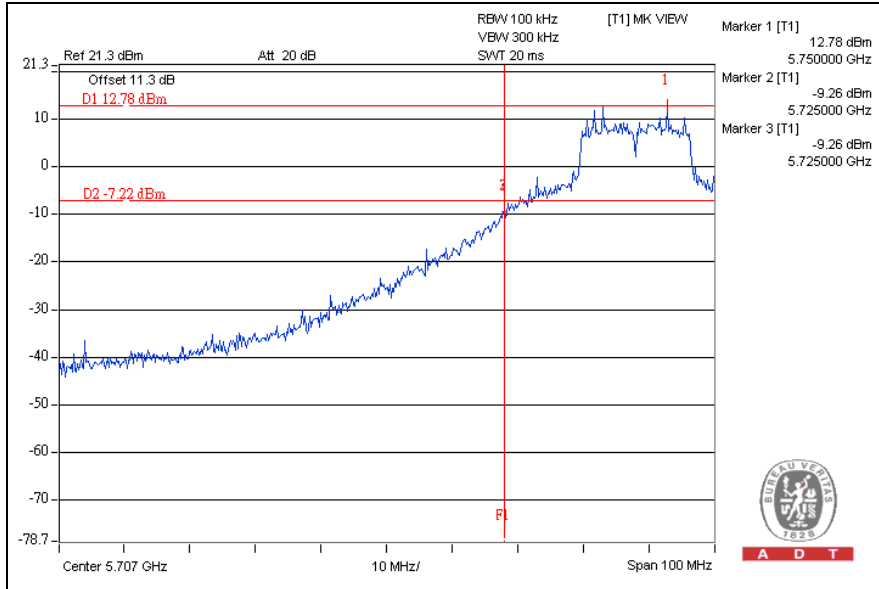
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).



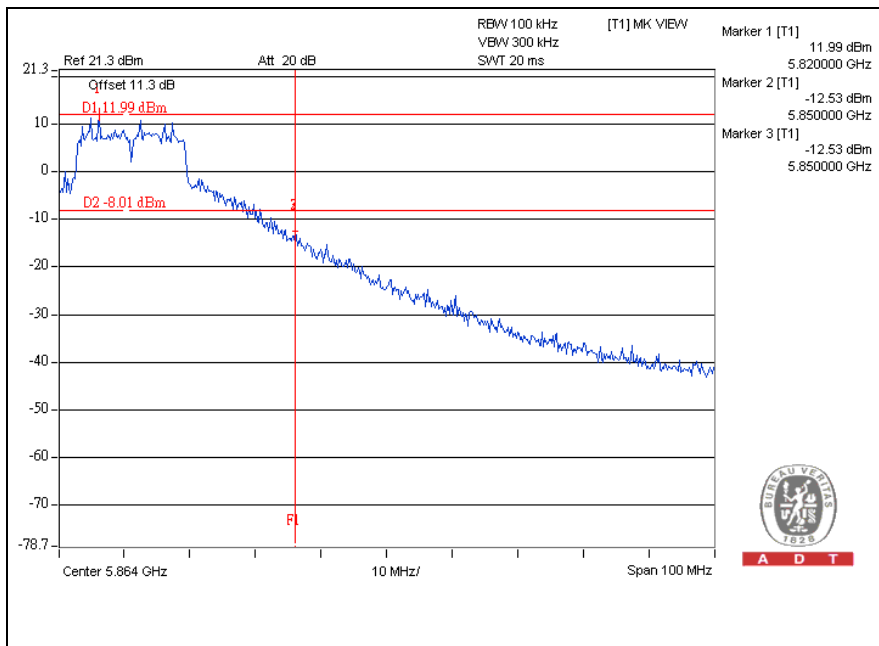
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## 802.11a OFDM modulation

### CH149



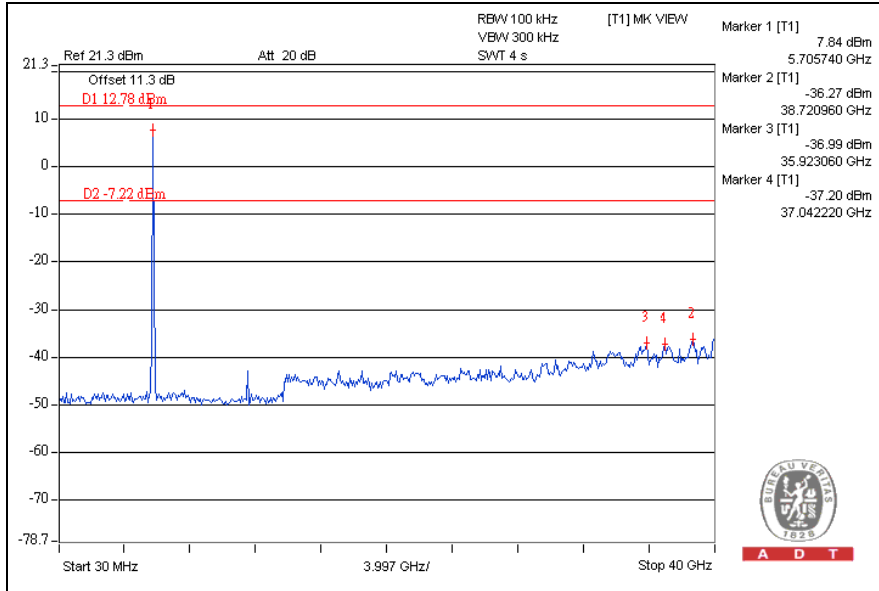
### CH165



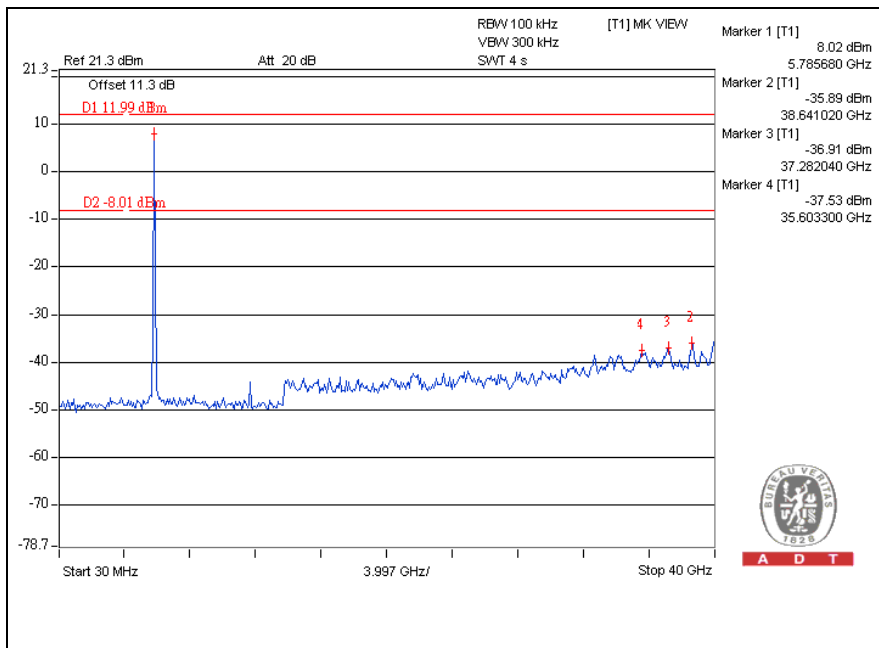


A D T

### CH149



### CH165

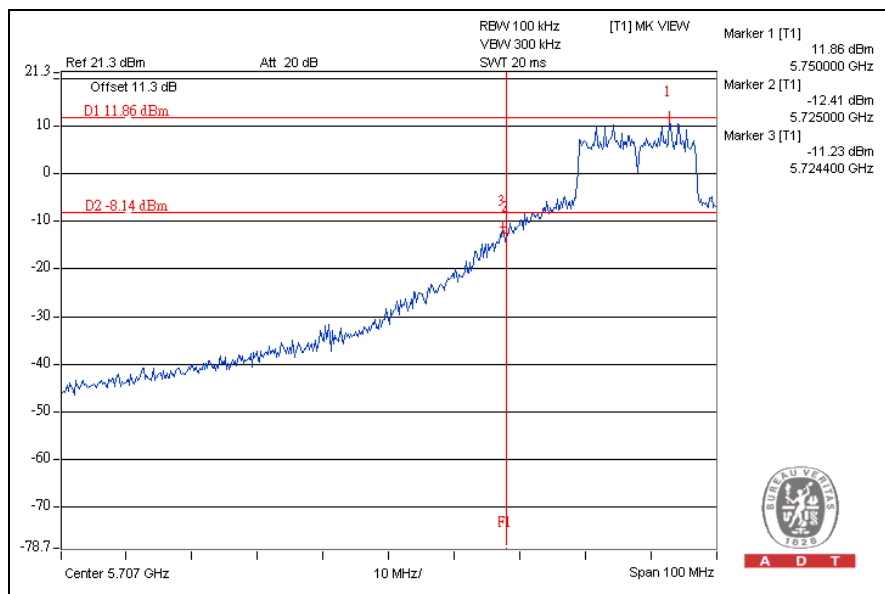




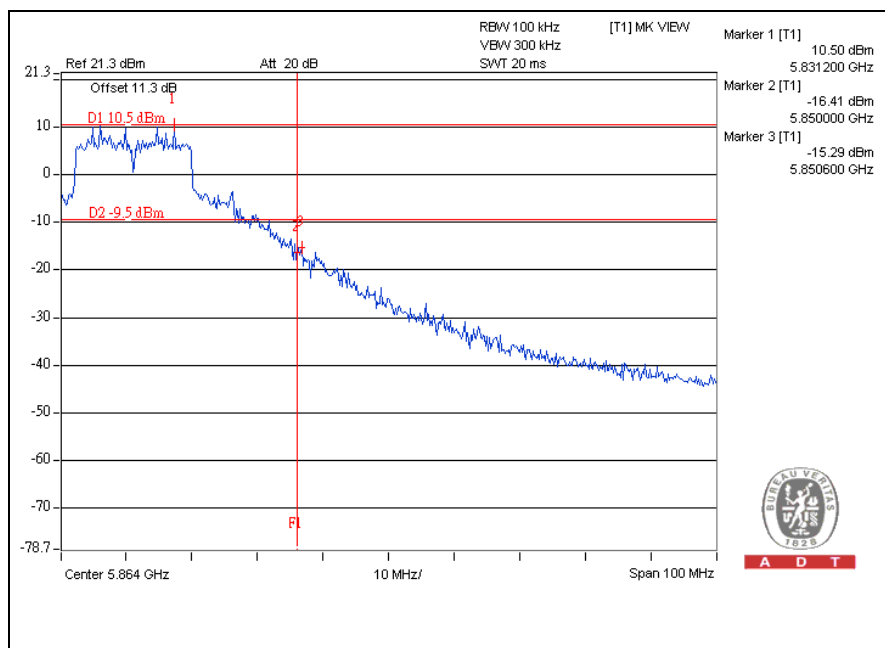
A D T

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

#### CH149



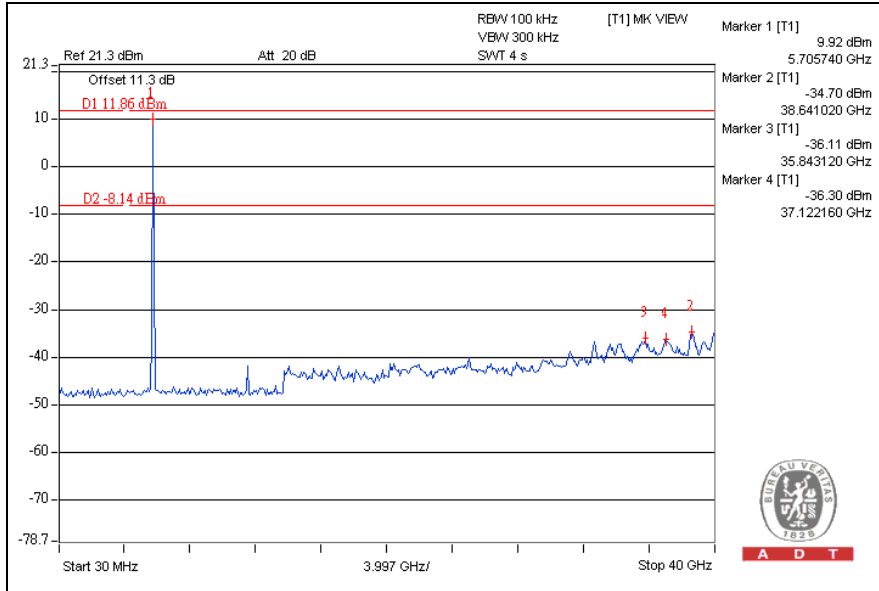
#### CH165



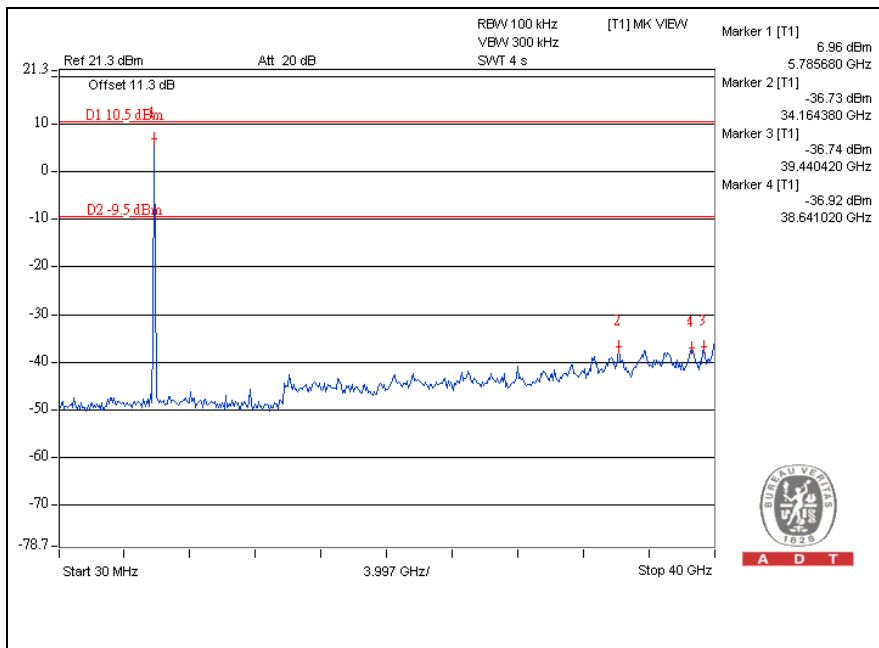


A D T

### CH149



### CH165

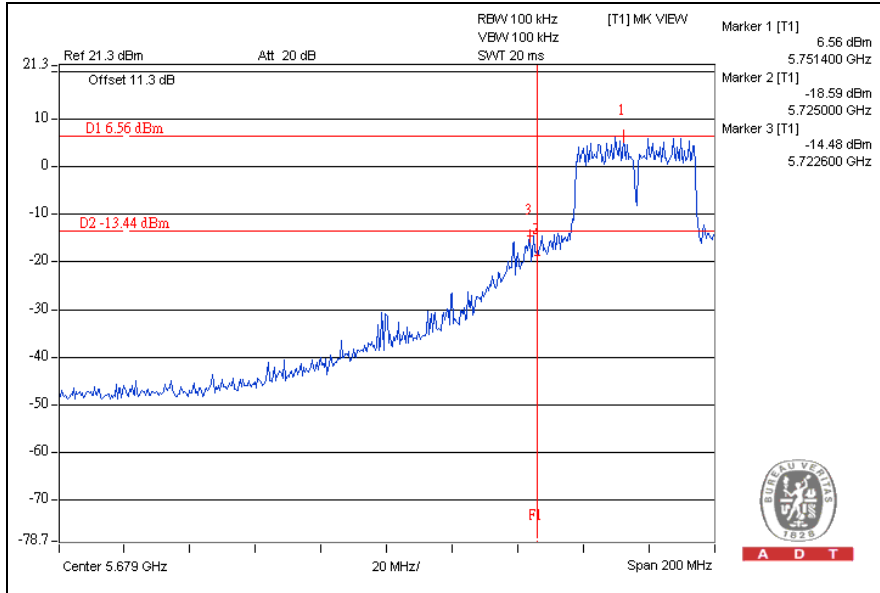




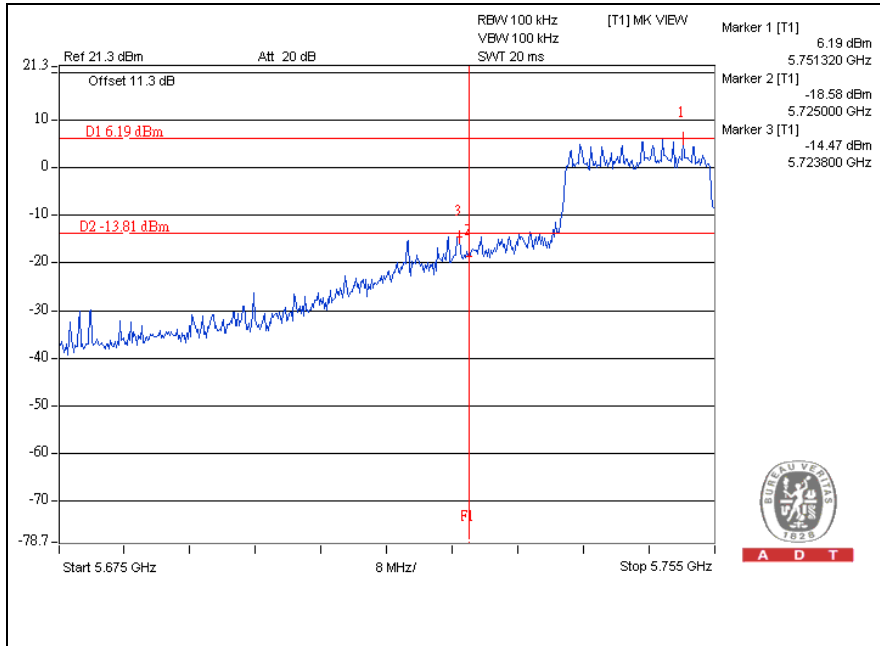
A D T

## 802.11n (40MHz) OFDM MODULATION:

### CH151



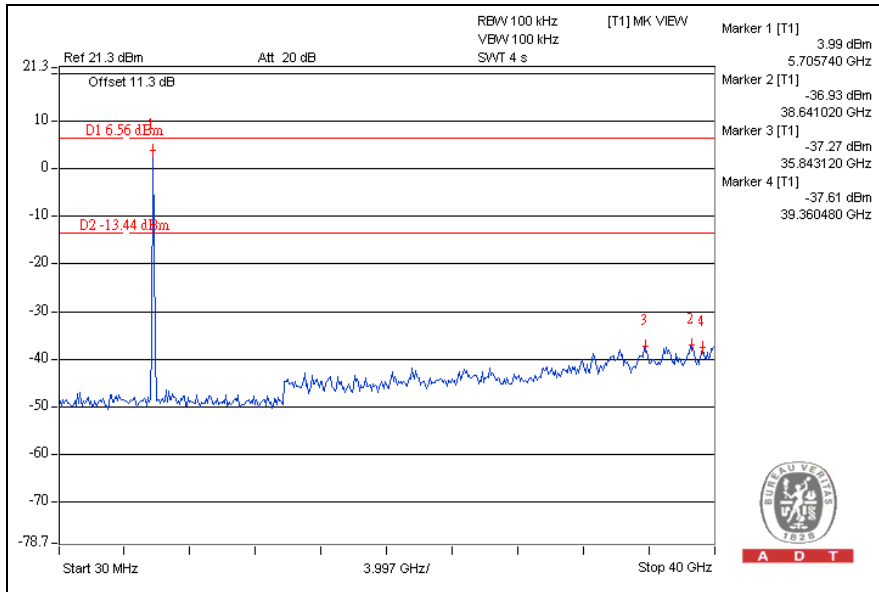
### CH159



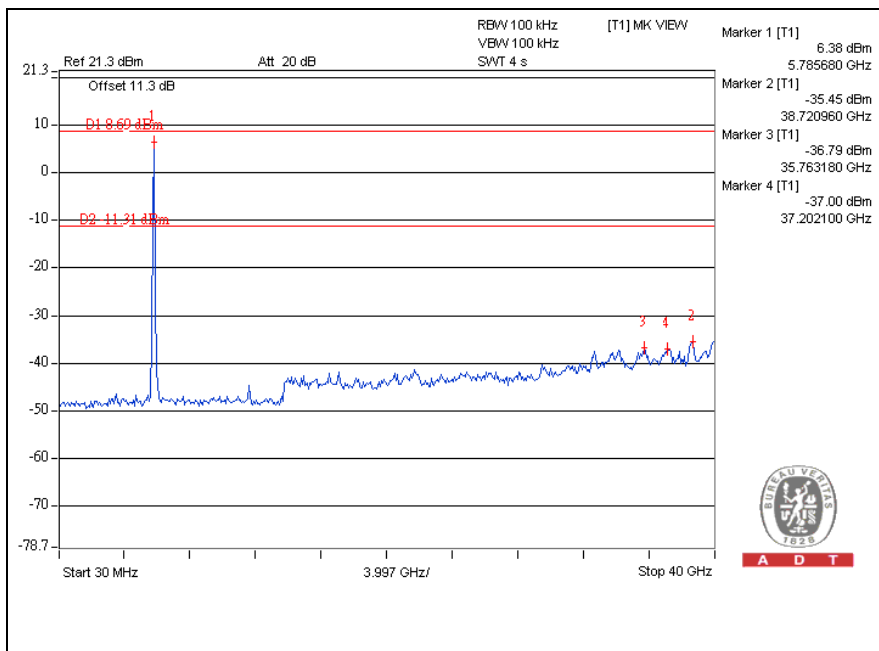


A D T

### CH151



### 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

**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 ---