FCC TEST REPORT (15.247)

REPORT NO.:	RF111005C22
MODEL NO.:	EMP7618-FT, EMP7618
FCC ID:	TVE-0120201
RECEIVED:	Oct. 05, 2011
TESTED:	Nov. 09 to 18, 2011
ISSUED:	Nov. 30, 2011

APPLICANT:	Fortinet, Inc.
ADDRESS:	1090 Kifer Road Sunnyvale, CA 94086, USA, 94086

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS :	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF111005C22	Original release	Nov. 30, 2011

1. CERTIFICATION

PRODUCT:	802.11 abgn RF Module Card
BRAND NAME:	Fortinet
MODEL NO.:	EMP7618-FT, EMP7618
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Fortinet, Inc.
TESTED:	Nov. 09 to 18, 2011
STANDARDS:	FCC Part 15, Subpart C (Section 15.247) ANSI C63.4-2003 ANSI C63.10-2009

The above equipment (Model: EMP7618-FT) 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 : _____ , **DATE:** Nov. 30, 2011
(Claire Kuan, Specialist)

APPROVED BY : _____ , **DATE:** Nov. 30, 2011
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2412~2462MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.20dB at 0.189MHz
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 4874.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is RSMA not standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.60dB at 0.189MHz
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 -0.6dB at 11490.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is RSMA not standard connector.

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.25GHz 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 5.15~5.25GHz RF parameters was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.89 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.56 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11 abgn RF Module Card
MODEL NO.	EMP7618-FT, EMP7618
FCC ID	TVE-0120201
POWER SUPPLY	3.3Vdc (Host equipment)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
OPERATING FREQUENCY	**For 15.407** 5GHz: 5.18 ~ 5.24GHz
	For 15.247 2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	**For 15.407** 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) **For 15.247(5GHz)** 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 21.9mW 802.11n (20MHz): 31.4mW 802.11n (40MHz): 46.9mW **For 15.247(2.4GHz)** 802.11b: 41.6mW 802.11g: 423.0mW 802.11n (20MHz): 390.4mW 802.11n (40MHz): 135.3mW **For 15.247(5GHz)** 802.11a: 219.3mW 802.11n (20MHz): 234.5mW 802.11n (40MHz): 290.9mW
ANTENNA TYPE	Refer to note for more details

DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT has two model names which are identical to each other in all aspects except for the following table:

Brand	Model Name	Description
Fortinet	EMP7618-FT	For marketing requirement
	EMP7618	

From the above models, model: **EMP7618-FT** was selected as representative model for the test and its data was recorded in this report.

2. The frequency bands used in this EUT are listed as below.

Frequency Band (MHz)	2412~2462	5180~5240	5745~5825
802.11b	√	-	-
802.11g	√	-	-
802.11a	-	√	√
802.11n (20MHz)	√	√	√
802.11n (40MHz)	√	√	√

3. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

MODULATION MODE	TX FUNCTION
802.11b	2TX
802.11g	2TX
802.11a	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

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

Set	Transmitter Circuit	ANTENNA TYPE	ANTENNA CONNECTOR	GAIN (dBi)	
				2.4GHz BAND	5.0GHz BAND
1	Chain (0)	Dipole	RSMA	2	4.5
	Chain (1)	Dipole	RSMA	2	4.5
2	Chain (0)	Dipole	RSMA	2	1
	Chain (1)	Dipole	RSMA	2	1
3	Chain (0)	Dipole	RSMA	2	2
	Chain (1)	Dipole	RSMA	2	2

From above antennas, **Set 1** was chosen for final test.

5. 2.4GHz and 5GHz technology can not transmit at same time.
6. The EUT incorporates CDD function with 802.11a, 802.11b, 802.11g.

7. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

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

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

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

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

Operated in 5725 ~ 5850MHz band:

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

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

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

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ³ 1G	APCM	OB	
-	√	√	√	√	√	-

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

RE ³ 1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

OB: Conducted Out-Band Emission Measurement

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)
802.11g	1 to 11	6	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149	OFDM	BPSK	6.5

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	MODULATIO N TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149	OFDM	BPSK	6.5

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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5

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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5

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)
802.11b	1 to 11	1, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 165	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	26deg. C, 61%RH	120Vac, 60Hz	Kent Liu
RE≥1G	24deg. C, 63%RH	120Vac, 60Hz	Nelson Teng
RE<1G	24deg. C, 67%RH	120Vac, 60Hz	Nelson Teng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)
ANSI C63.4-2003
ANSI C63.10-2009

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

3.4 DESCRIPTION OF SUPPORT UNITS

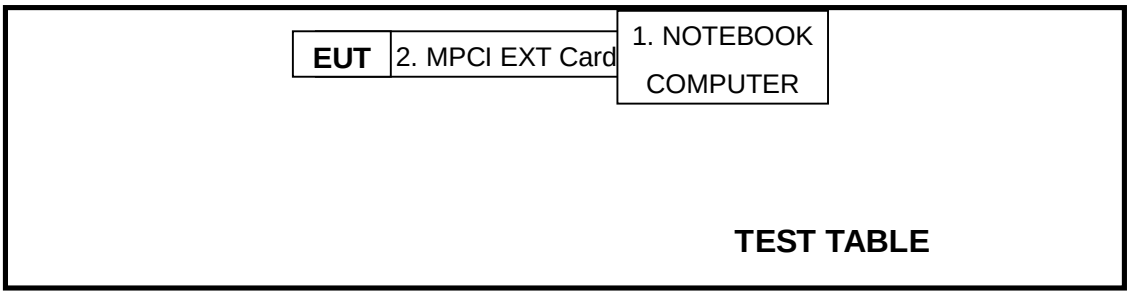
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC
2	MPCI EXT CARD	Senao	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4.TEST TYPES AND RESULTS (2400 ~ 2483.5MHz Band)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

Test date: Nov. 18, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 01, 2011	Oct. 31, 2012
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
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. C.
3 The VCCI Con C Registration No. is C-3611.

4.1.3 TEST PROCEDURES

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

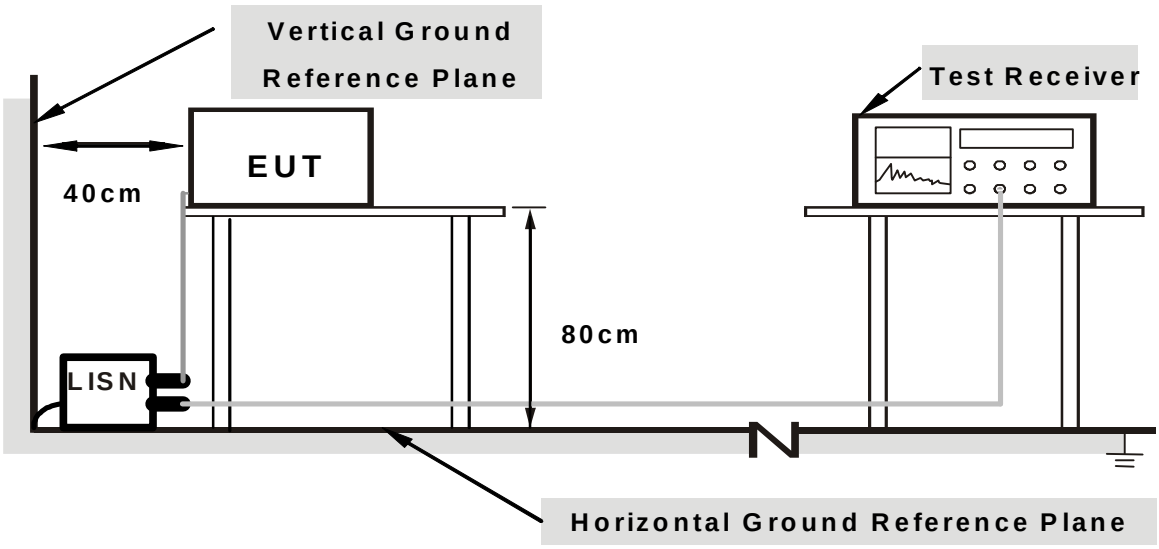
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

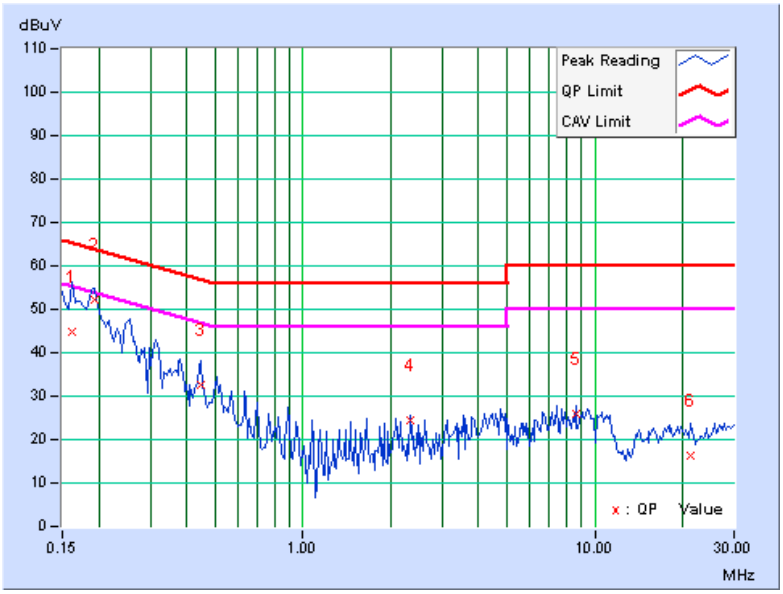
1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “artgui.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.09	44.69	17.52	44.78	17.61	65.38	55.38	-20.60	-37.77
2	0.193	0.10	52.15	44.60	52.25	44.70	63.91	53.91	-11.66	-9.21
3	0.447	0.11	32.59	27.82	32.70	27.93	56.93	46.93	-24.23	-19.00
4	2.344	0.22	24.29	20.54	24.51	20.76	56.00	46.00	-31.49	-25.24
5	8.621	0.50	25.52	19.92	26.02	20.42	60.00	50.00	-33.98	-29.58
6	21.254	0.80	15.48	7.79	16.28	8.59	60.00	50.00	-43.72	-41.41

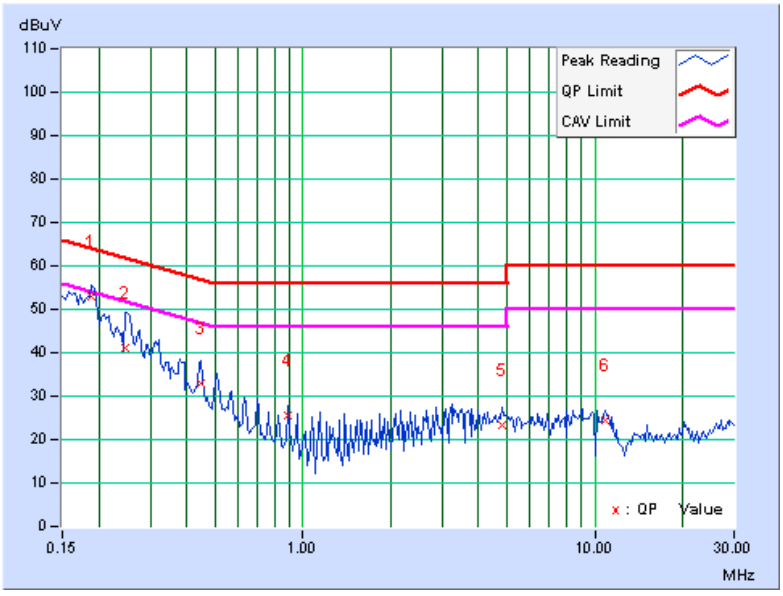
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.189**	**0.09**	**52.86**	**45.79**	**52.95**	**45.88**	**64.08**	**54.08**	**-11.13**	**-8.20**
2	0.248	0.09	40.86	30.99	40.95	31.08	61.84	51.84	-20.88	-20.75
3	0.447	0.11	32.71	27.84	32.82	27.95	56.93	46.93	-24.11	-18.98
4	0.888	0.13	25.36	22.66	25.49	22.79	56.00	46.00	-30.51	-23.21
5	4.813	0.26	23.08	17.00	23.34	17.26	56.00	46.00	-32.66	-28.74
6	10.902	0.43	24.03	18.97	24.46	19.40	60.00	50.00	-35.54	-30.60

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.

4.2.2 TEST INSTRUMENTS

Test date: Nov. 09 to 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 28, 2011	Feb. 27, 2012
Miteq Pre-Amplifier	AFS33-18002650-30-8P-44	881786	Nov. 16, 2010	Nov. 15, 2011
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 22, 2010	Nov. 21, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meters chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

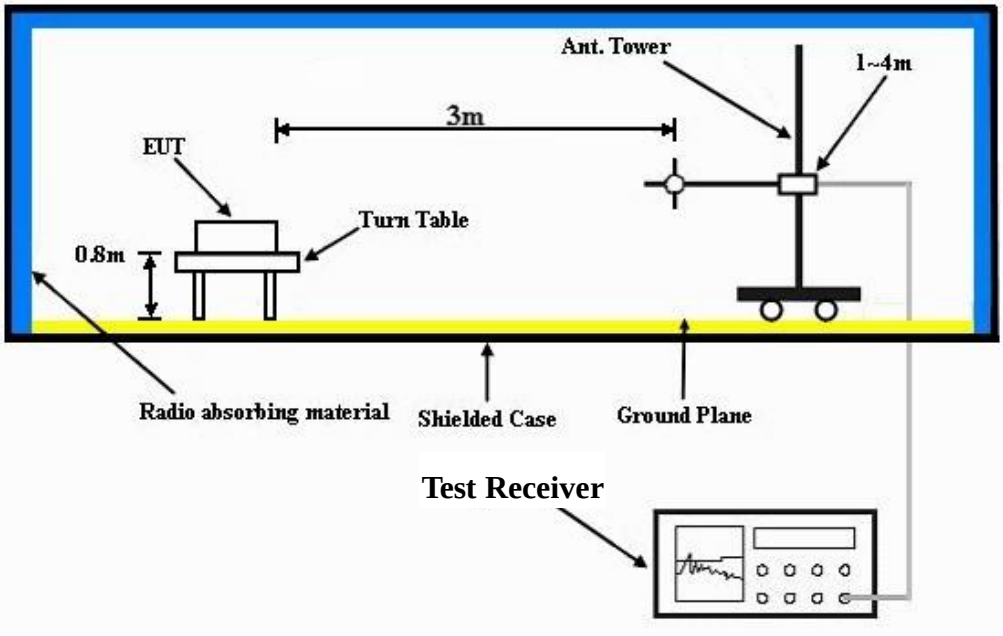
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 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. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “artgui.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	91.58	36.6 QP	43.5	-6.9	1.50 H	0	28.05	8.57
2	175.07	37.6 QP	43.5	-5.9	1.00 H	180	24.18	13.45
3	433.23	38.0 QP	46.0	-8.0	2.00 H	229	19.49	18.47
4	499.90	39.8 QP	46.0	-6.2	1.50 H	46	19.74	20.06
5	600.32	42.6 QP	46.0	-3.5	1.00 H	283	20.30	22.25
6	796.08	41.5 QP	46.0	-4.5	1.00 H	226	16.04	25.47
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	36.04	31.3 QP	40.0	-8.7	1.50 V	360	17.73	13.58
2	299.89	32.6 QP	46.0	-13.4	1.00 V	330	17.24	15.40
3	366.44	34.2 QP	46.0	-11.8	1.50 V	337	17.27	16.90
4	432.04	36.0 QP	46.0	-10.0	1.00 V	249	17.59	18.44
5	796.19	42.7 QP	46.0	-3.3	1.00 V	249	17.26	25.47
6	954.17	40.3 QP	46.0	-5.7	1.00 V	40	12.60	27.73

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

ABOVE 1GHz WORST-CASE DATA

802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	56.3 PK	74.0	-17.7	1.00 H	76	24.42	31.88
2	2390.00	44.1 AV	54.0	-9.9	1.00 H	76	12.22	31.88
3	*2412.00	90.3 PK			1.00 H	76	58.35	31.95
4	*2412.00	87.2 AV			1.00 H	76	55.25	31.95
5	4824.00	55.4 PK	74.0	-18.6	1.10 H	66	14.18	41.22
6	4824.00	52.6 AV	54.0	-1.4	1.10 H	66	11.38	41.22
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.13	61.0 PK	74.0	-13.0	1.50 V	67	29.13	31.87
2	2386.13	52.7 AV	54.0	-1.3	1.50 V	67	20.83	31.87
3	*2412.00	107.9 PK			1.55 V	92	75.95	31.95
4	*2412.00	105.8 AV			1.55 V	92	73.85	31.95
5	4824.00	60.8 PK	74.0	-13.2	1.02 V	57	19.58	41.22
6	4824.00	53.4 AV	54.0	-0.6	1.02 V	57	12.18	41.22

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	88.8 PK			1.00 H	74	56.76	32.04
2	*2437.00	85.5 AV			1.00 H	74	53.46	32.04
3	4874.00	52.6 PK	74.0	-21.4	1.09 H	64	11.24	41.36
4	4874.00	50.5 AV	54.0	-3.5	1.09 H	64	9.14	41.36
5	7311.00	53.9 PK	74.0	-20.1	1.09 H	69	8.23	45.67
6	7311.00	46.3 AV	54.0	-7.7	1.09 H	69	0.63	45.67
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	*2437.00	105.3 PK			1.48 V	53	73.26	32.04
2	*2437.00	103.2 AV			1.48 V	53	71.16	32.04
3	4874.00	56.7 PK	74.0	-17.3	1.00 V	65	15.34	41.36
4	**4874.00**	**53.5 AV**	**54.0**	**-0.5**	**1.00 V**	**65**	**12.14**	**41.36**
5	7311.00	54.3 PK	74.0	-19.7	1.11 V	69	8.63	45.67
6	7311.00	47.6 AV	54.0	-6.4	1.11 V	69	1.93	45.67

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	88.3 PK			1.00 H	239	56.18	32.12
2	*2462.00	85.0 AV			1.00 H	239	52.88	32.12
3	2487.73	56.7 PK	74.0	-17.3	1.00 H	239	24.49	32.21
4	2487.73	43.9 AV	54.0	-10.1	1.00 H	239	11.69	32.21
5	4924.00	54.1 PK	74.0	-19.9	1.00 H	46	12.62	41.48
6	4924.00	50.2 AV	54.0	-3.8	1.00 H	46	8.72	41.48
7	7386.00	56.1 PK	74.0	-17.9	1.24 H	71	10.19	45.91
8	7386.00	44.5 AV	54.0	-9.5	1.24 H	71	-1.41	45.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.4 PK			1.48 V	94	71.28	32.12
2	*2462.00	101.0 AV			1.48 V	94	68.88	32.12
3	2487.73	58.8 PK	74.0	-15.2	1.44 V	117	26.59	32.21
4	2487.73	52.3 AV	54.0	-1.7	1.44 V	117	20.09	32.21
5	4924.00	55.8 PK	74.0	-18.2	1.08 V	63	14.32	41.48
6	4924.00	53.1 AV	54.0	-0.9	1.08 V	63	11.62	41.48
7	7386.00	54.4 PK	74.0	-19.6	1.09 V	69	8.49	45.91
8	7386.00	47.3 AV	54.0	-6.7	1.09 V	69	1.39	45.91

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

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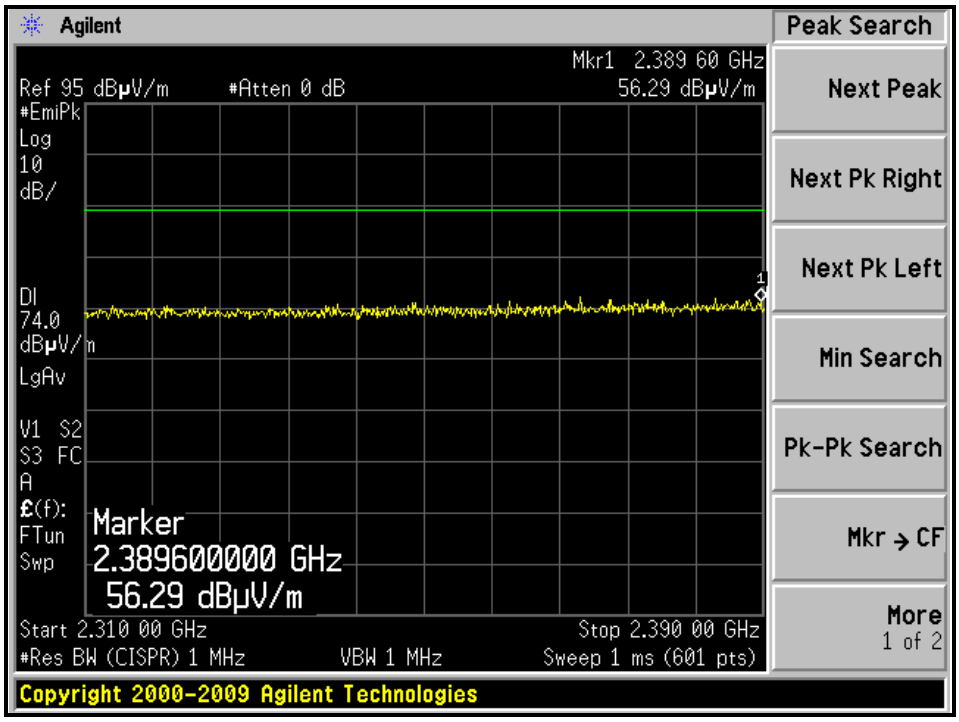

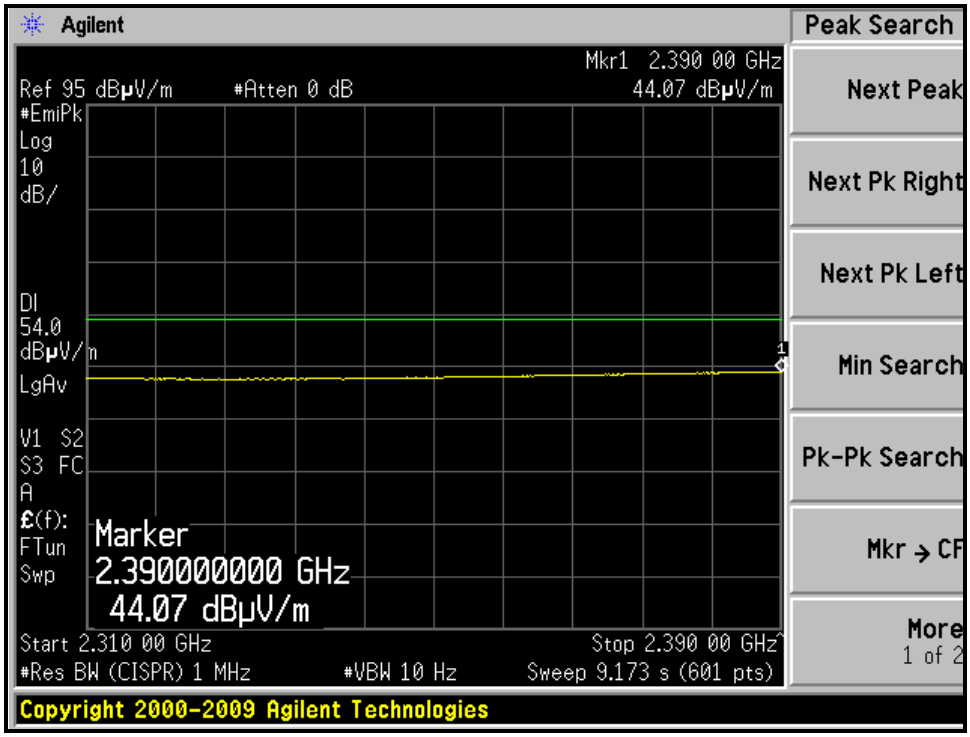

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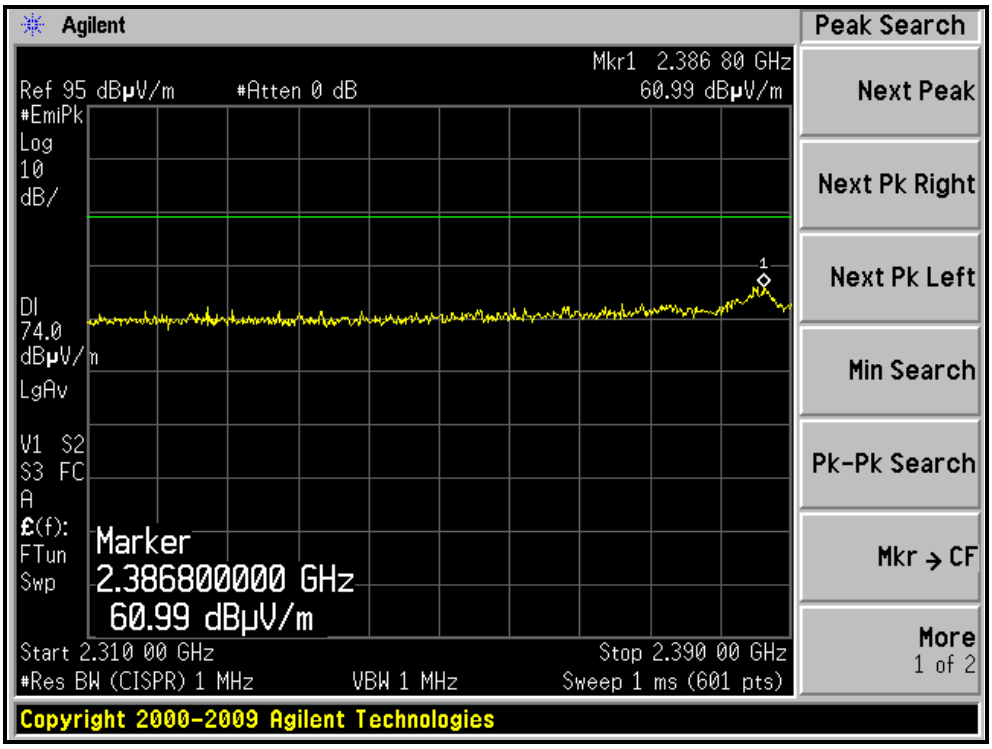

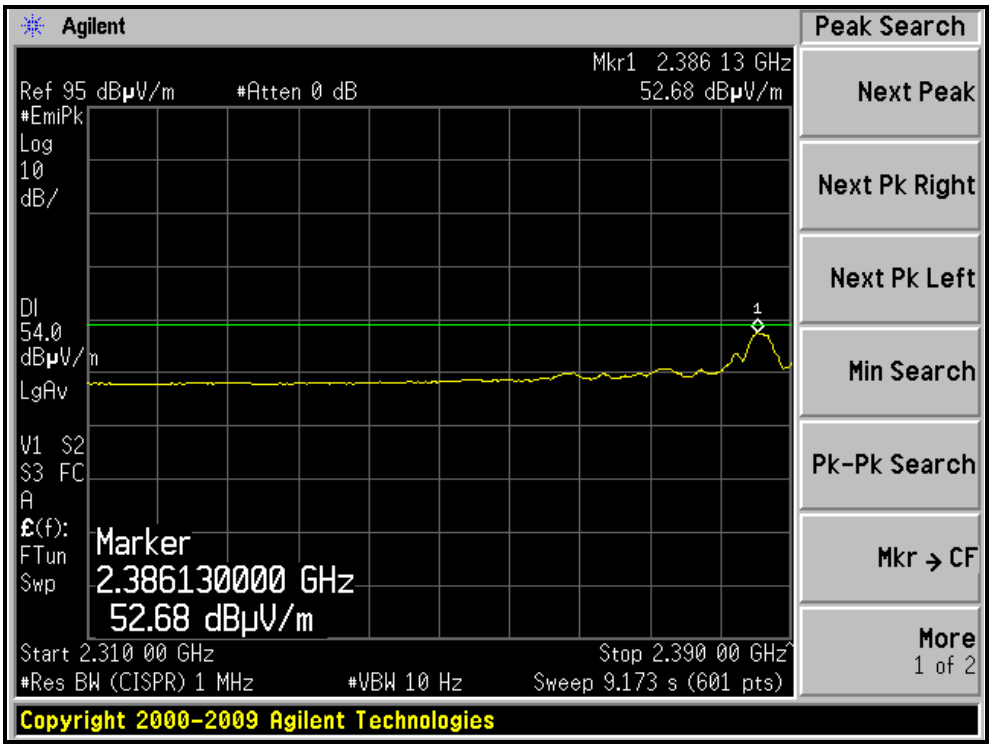

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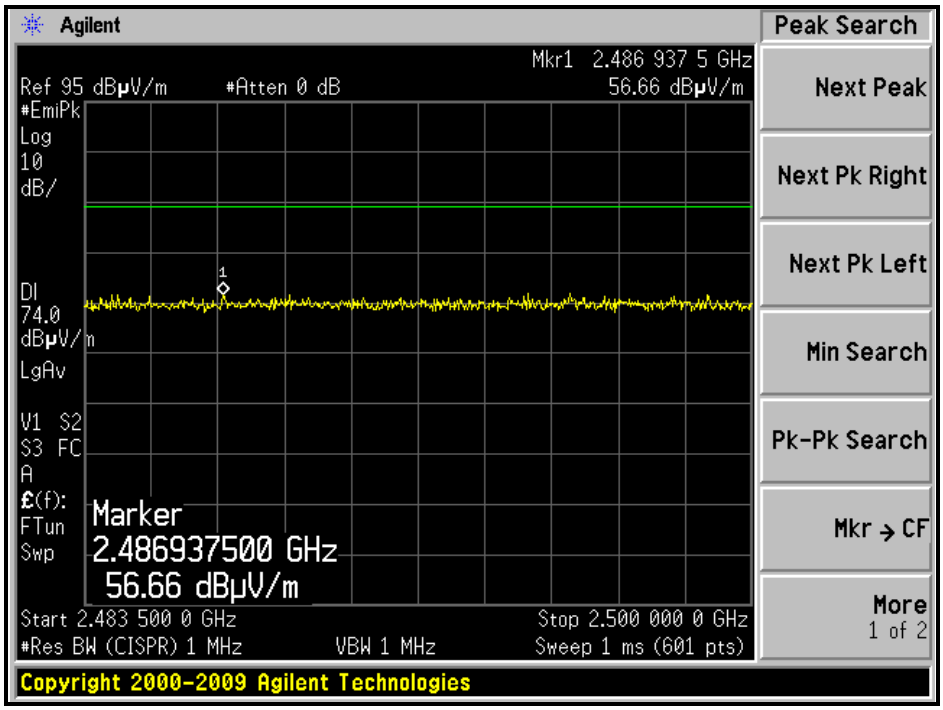

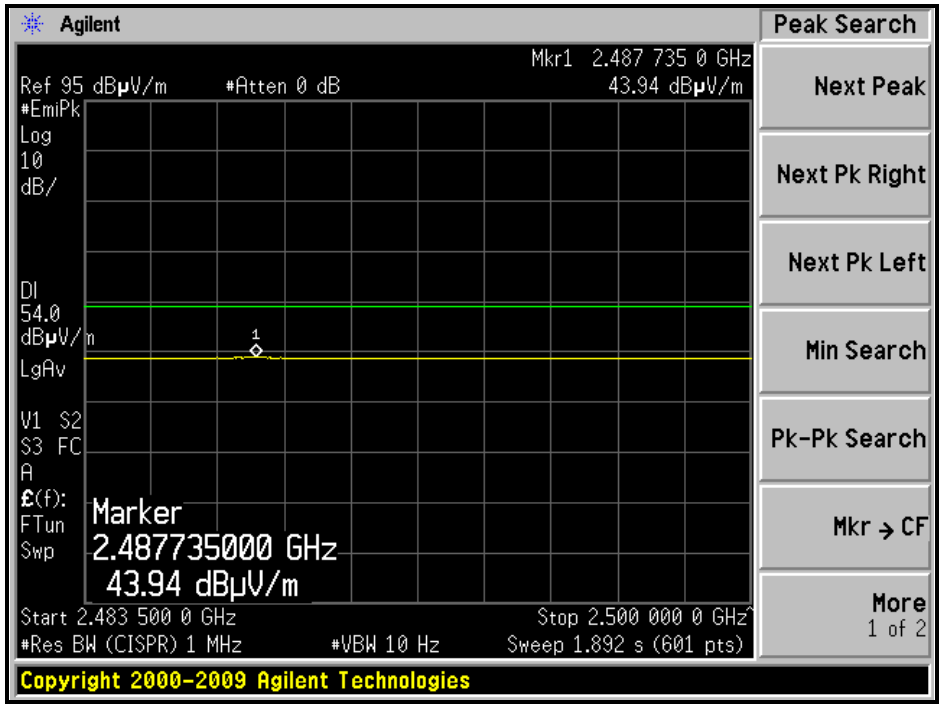

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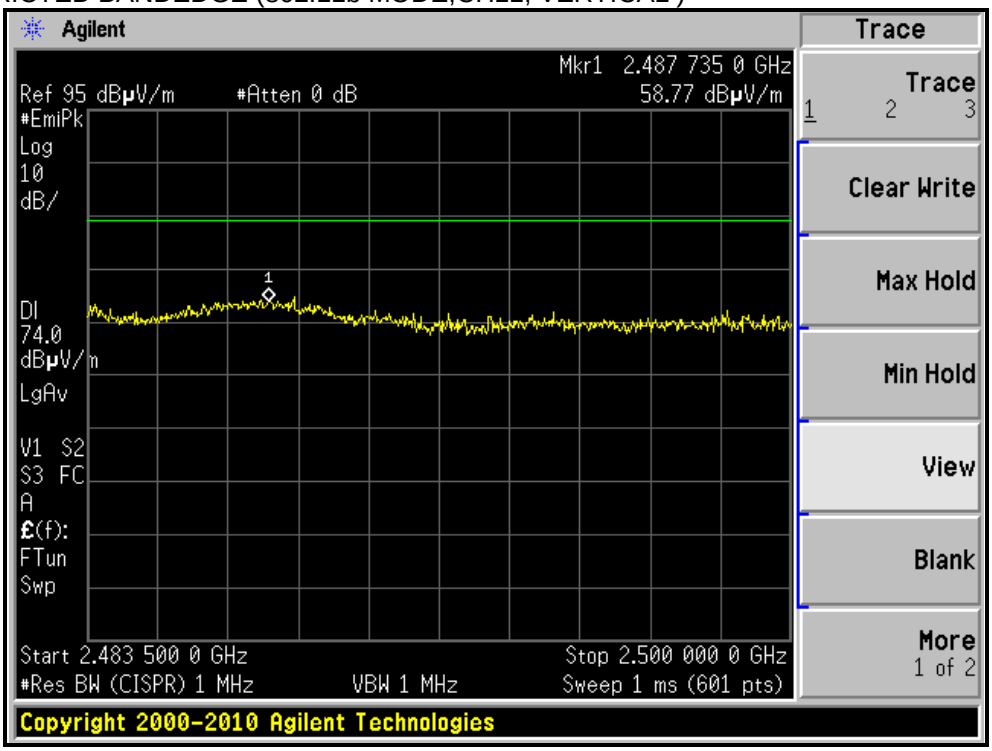
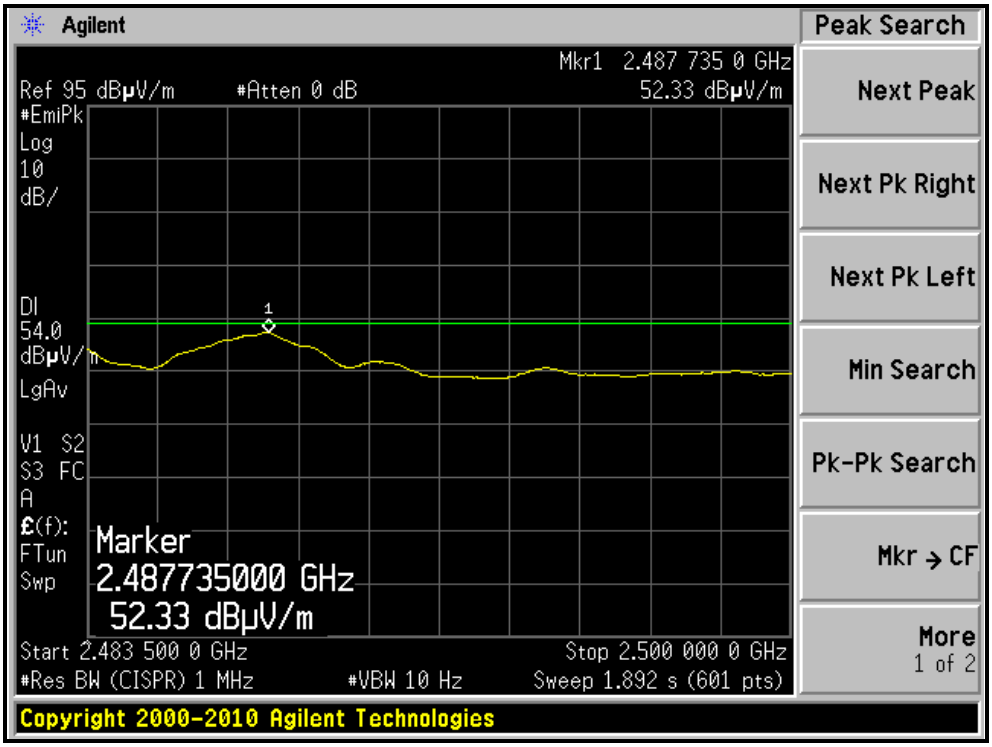




802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	1.04 H	235	25.62	31.88
2	2390.00	44.9 AV	54.0	-9.1	1.04 H	235	13.02	31.88
3	*2412.00	94.1 PK			1.04 H	235	62.15	31.95
4	*2412.00	84.3 AV			1.04 H	235	52.35	31.95
5	4824.00	52.2 PK	74.0	-21.8	1.00 H	66	10.98	41.22
6	4824.00	38.8 AV	54.0	-15.2	1.00 H	66	-2.42	41.22
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	64.4 PK	74.0	-9.6	1.51 V	57	32.52	31.88
2	2390.00	53.2 AV	54.0	-0.8	1.51 V	57	21.32	31.88
3	*2412.00	110.4 PK			1.47 V	86	78.45	31.95
4	*2412.00	101.3 AV			1.47 V	86	69.35	31.95
5	4824.00	52.5 PK	74.0	-21.5	1.00 V	47	11.28	41.22
6	4824.00	39.3 AV	54.0	-14.7	1.00 V	47	-1.92	41.22

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	102.4 PK			1.00 H	239	70.36	32.04
2	*2437.00	92.5 AV			1.00 H	239	60.46	32.04
3	4874.00	59.1 PK	74.0	-14.9	1.00 H	66	17.74	41.36
4	4874.00	45.4 AV	54.0	-8.6	1.00 H	66	4.04	41.36
5	7311.00	57.4 PK	74.0	-16.6	1.52 H	103	11.73	45.67
6	7311.00	44.7 AV	54.0	-9.3	1.52 H	103	-0.97	45.67
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	2390.00	67.4 PK	74.0	-6.6	1.53 V	89	35.52	31.88
2	2390.00	53.1 AV	54.0	-0.9	1.53 V	89	21.22	31.88
3	*2437.00	118.2 PK			1.48 V	92	86.16	32.04
4	*2437.00	108.4 AV			1.48 V	92	76.36	32.04
5	2483.50	68.4 PK	74.0	-5.6	1.45 V	103	36.21	32.19
6	2483.50	49.3 AV	54.0	-4.7	1.45 V	103	17.11	32.19
7	4874.00	59.9 PK	74.0	-14.1	1.16 V	67	18.54	41.36
8	4874.00	50.4 AV	54.0	-3.6	1.16 V	67	9.04	41.36
9	7311.00	64.3 PK	74.0	-9.7	1.01 V	67	18.63	45.67
10	7311.00	53.3 AV	54.0	-0.7	1.01 V	67	7.63	45.67

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	90.6 PK			1.02 H	244	58.48	32.12
2	*2462.00	81.6 AV			1.02 H	244	49.48	32.12
3	2483.50	56.9 PK	74.0	-17.1	1.02 H	244	24.71	32.19
4	2483.50	44.2 AV	54.0	-9.8	1.02 H	244	12.01	32.19
5	4924.00	52.1 PK	74.0	-21.9	1.00 H	46	10.62	41.48
6	4924.00	39.4 AV	54.0	-14.6	1.00 H	46	-2.08	41.48
7	7386.00	55.3 PK	74.0	-18.7	1.51 H	119	9.39	45.91
8	7386.00	42.2 AV	54.0	-11.8	1.51 H	119	-3.71	45.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.3 PK			1.48 V	92	77.18	32.12
2	*2462.00	99.4 AV			1.48 V	92	67.28	32.12
3	2483.50	65.9 PK	74.0	-8.1	1.47 V	98	33.71	32.19
4	2483.50	52.1 AV	54.0	-1.9	1.47 V	98	19.91	32.19
5	4924.00	55.5 PK	74.0	-18.5	1.12 V	111	14.02	41.48
6	4924.00	42.4 AV	54.0	-11.6	1.12 V	111	0.92	41.48
7	7386.00	56.6 PK	74.0	-17.4	1.00 V	103	10.69	45.91
8	7386.00	44.4 AV	54.0	-9.6	1.00 V	103	-1.51	45.91

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

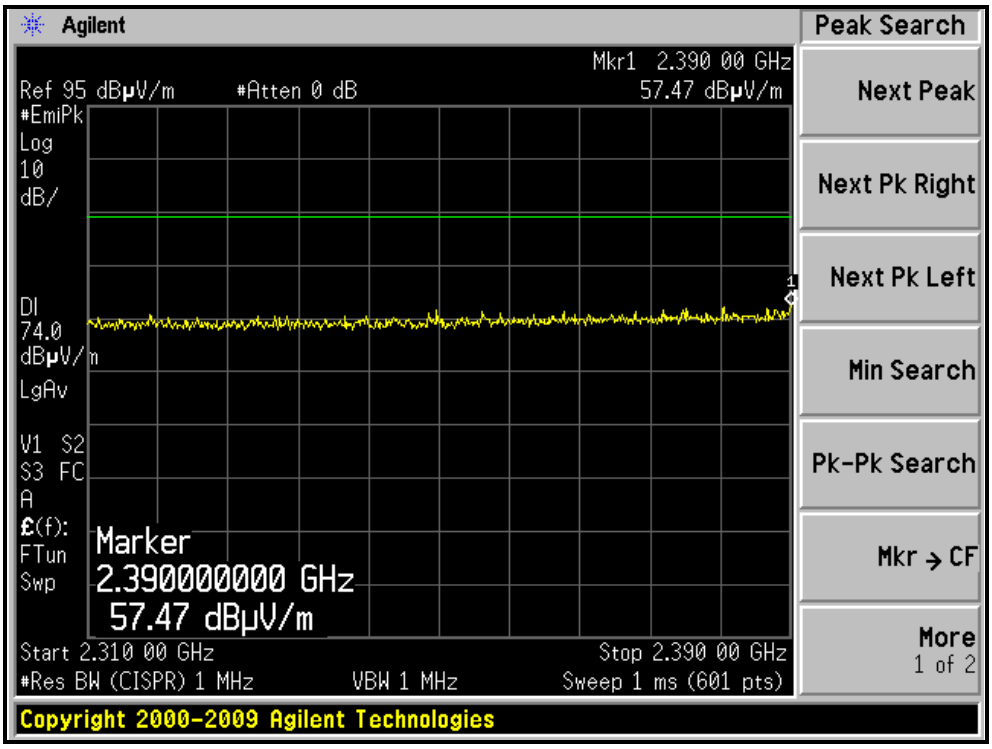
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

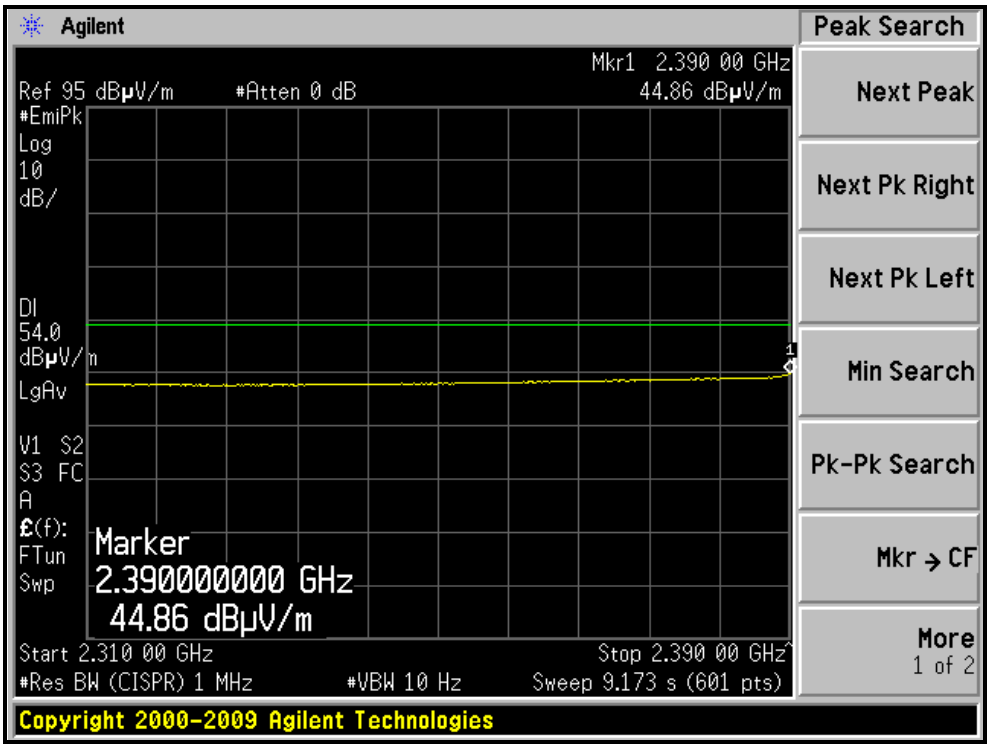
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

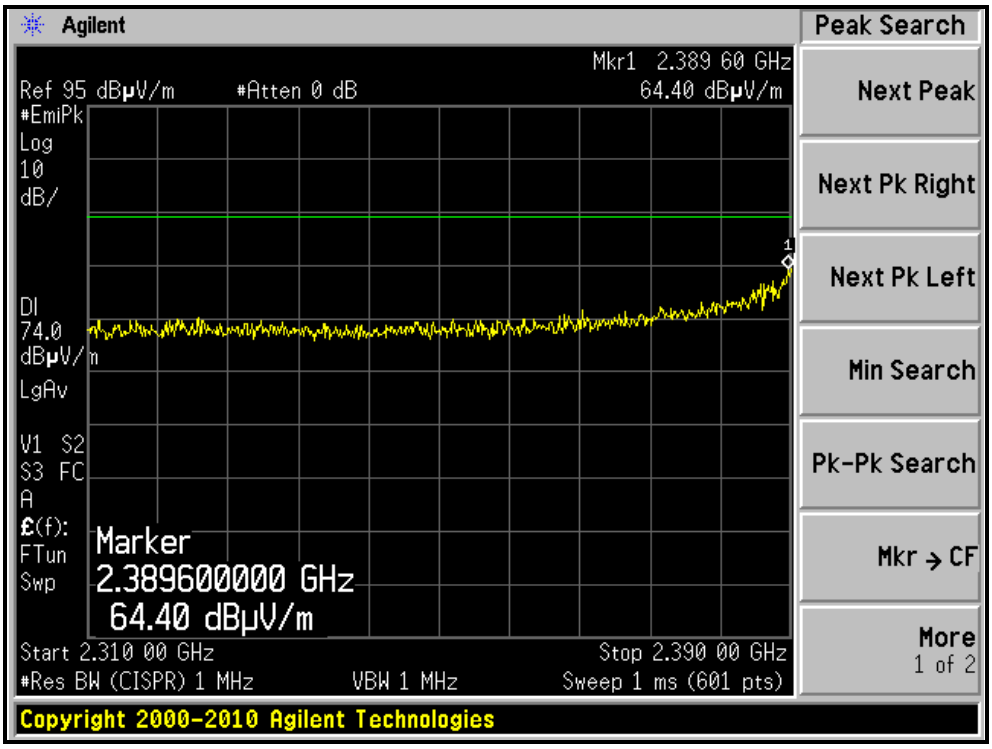
5. " * ": Fundamental frequency.

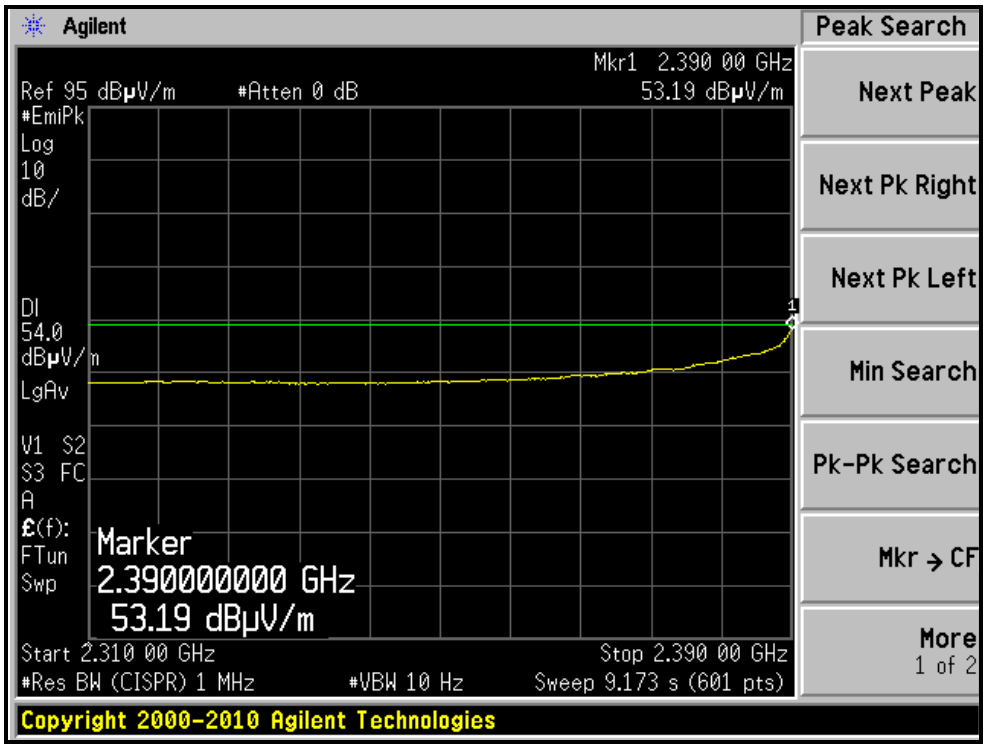
RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL)





RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)





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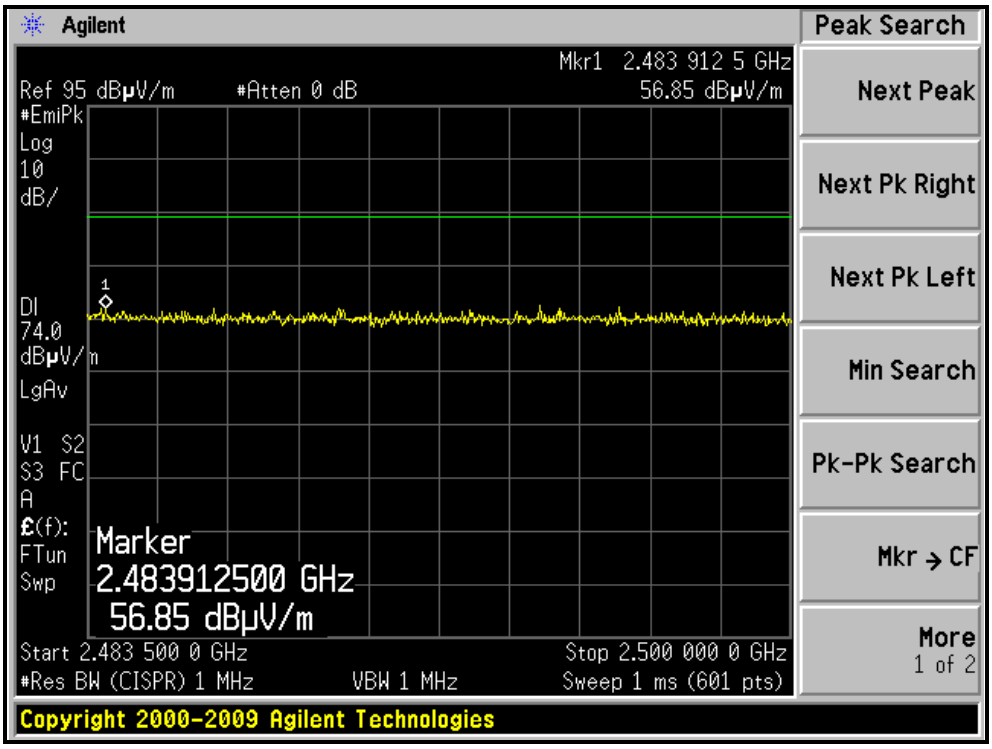

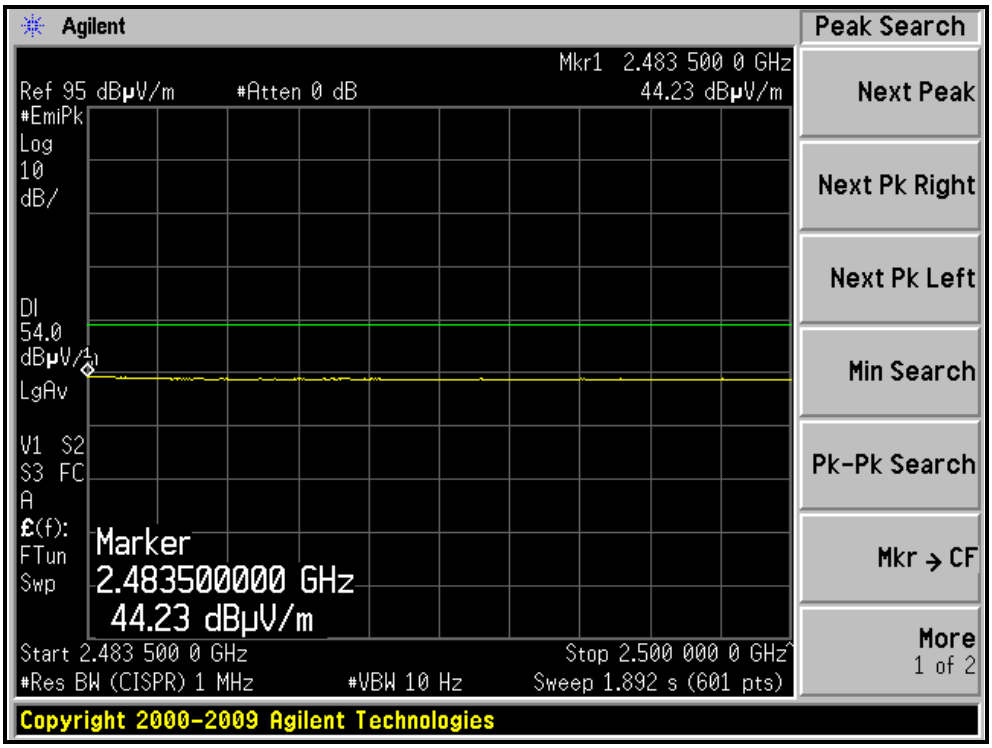

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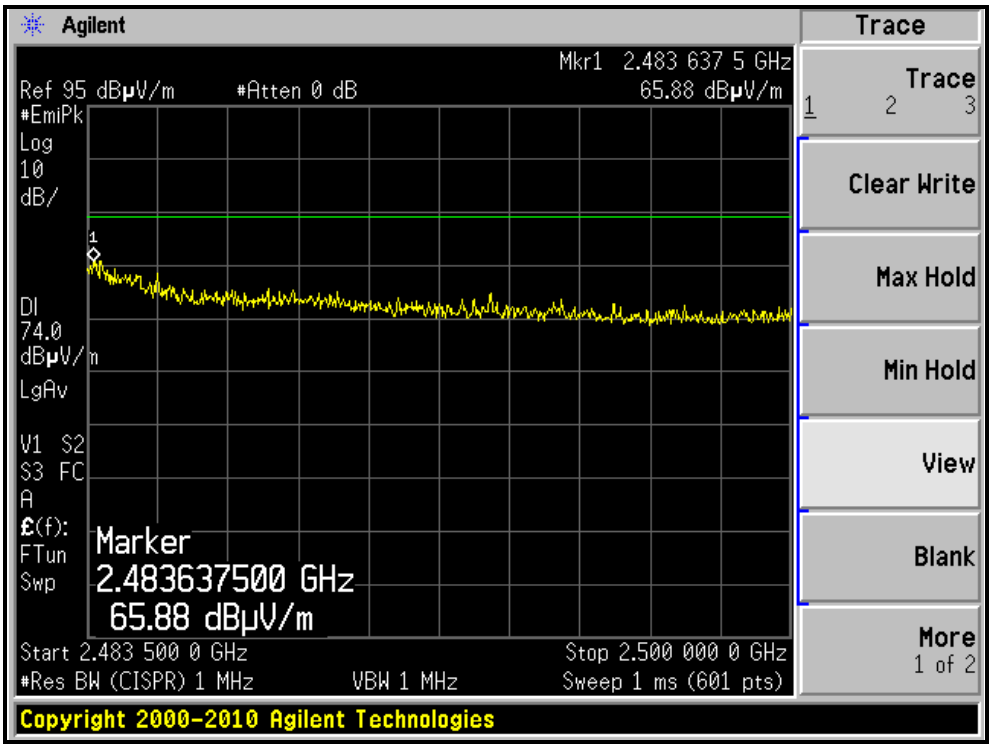
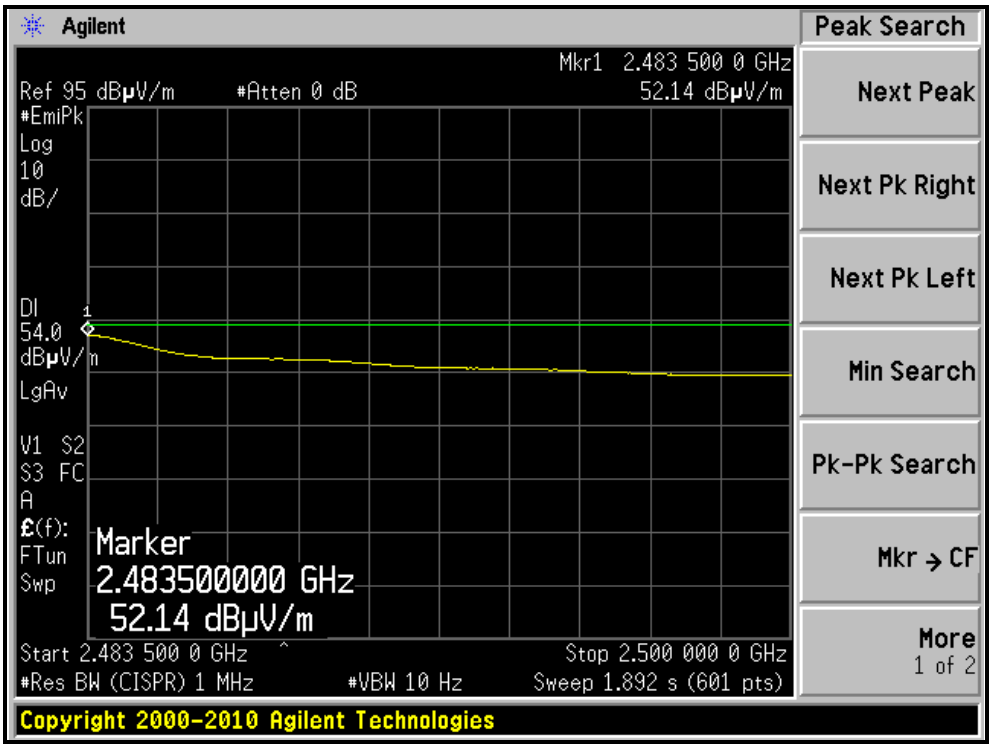




802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	56.7 PK	74.0	-17.3	1.03 H	246	24.82	31.88
2	2390.00	44.2 AV	54.0	-9.8	1.03 H	246	12.32	31.88
3	*2412.00	93.0 PK			1.03 H	238	61.05	31.95
4	*2412.00	82.8 AV			1.03 H	238	50.85	31.95
5	4824.00	52.2 PK	74.0	-21.8	1.03 H	66	10.98	41.22
6	4824.00	39.0 AV	54.0	-15.0	1.03 H	66	-2.22	41.22
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	70.0 PK	74.0	-4.0	1.51 V	97	38.12	31.88
2	2390.00	53.4 AV	54.0	-0.6	1.51 V	97	21.52	31.88
3	*2412.00	110.3 PK			1.51 V	97	78.35	31.95
4	*2412.00	100.4 AV			1.51 V	97	68.45	31.95
5	4824.00	52.3 PK	74.0	-21.7	1.06 V	43	11.08	41.22
6	4824.00	39.1 AV	54.0	-14.9	1.06 V	43	-2.12	41.22

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	99.8 PK			1.01 H	234	67.76	32.04
2	*2437.00	90.8 AV			1.01 H	234	58.76	32.04
3	4874.00	58.5 PK	74.0	-15.5	1.00 H	73	17.14	41.36
4	4874.00	45.0 AV	54.0	-9.0	1.00 H	73	3.64	41.36
5	7311.00	57.9 PK	74.0	-16.1	1.58 H	90	12.23	45.67
6	7311.00	45.1 AV	54.0	-8.9	1.58 H	90	-0.57	45.67
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	2390.00	68.4 PK	74.0	-5.6	1.54 V	88	36.52	31.88
2	2390.00	53.2 AV	54.0	-0.8	1.54 V	88	21.32	31.88
3	*2437.00	117.4 PK			1.54 V	87	85.36	32.04
4	*2437.00	107.3 AV			1.54 V	87	75.26	32.04
5	2483.50	67.3 PK	74.0	-6.7	1.44 V	102	35.11	32.19
6	2483.50	48.4 AV	54.0	-5.6	1.44 V	102	16.21	32.19
7	4874.00	60.4 PK	74.0	-13.6	1.21 V	60	19.04	41.36
8	4874.00	50.7 AV	54.0	-3.3	1.21 V	60	9.34	41.36
9	7311.00	64.7 PK	74.0	-9.3	1.04 V	59	19.03	45.67
10	7311.00	53.2 AV	54.0	-0.8	1.04 V	59	7.53	45.67

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	92.5 PK			1.00 H	229	60.38	32.12
2	*2462.00	82.7 AV			1.00 H	229	50.58	32.12
3	2483.50	57.7 PK	74.0	-16.3	1.00 H	229	25.51	32.19
4	2483.50	44.5 AV	54.0	-9.5	1.00 H	229	12.31	32.19
5	4924.00	51.7 PK	74.0	-22.3	1.00 H	51	10.22	41.48
6	4924.00	39.1 AV	54.0	-14.9	1.00 H	51	-2.38	41.48
7	7386.00	54.8 PK	74.0	-19.2	1.48 H	120	8.89	45.91
8	7386.00	41.8 AV	54.0	-12.2	1.48 H	120	-4.11	45.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.4 PK			1.47 V	86	76.28	32.12
2	*2462.00	98.3 AV			1.47 V	86	66.18	32.12
3	2483.50	68.0 PK	74.0	-6.0	1.43 V	113	35.81	32.19
4	2483.50	53.5 AV	54.0	-0.5	1.43 V	113	21.31	32.19
5	4924.00	55.7 PK	74.0	-18.3	1.11 V	99	14.22	41.48
6	4924.00	42.8 AV	54.0	-11.2	1.11 V	99	1.32	41.48
7	7386.00	56.7 PK	74.0	-17.3	1.06 V	90	10.79	45.91
8	7386.00	44.7 AV	54.0	-9.3	1.06 V	90	-1.21	45.91

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

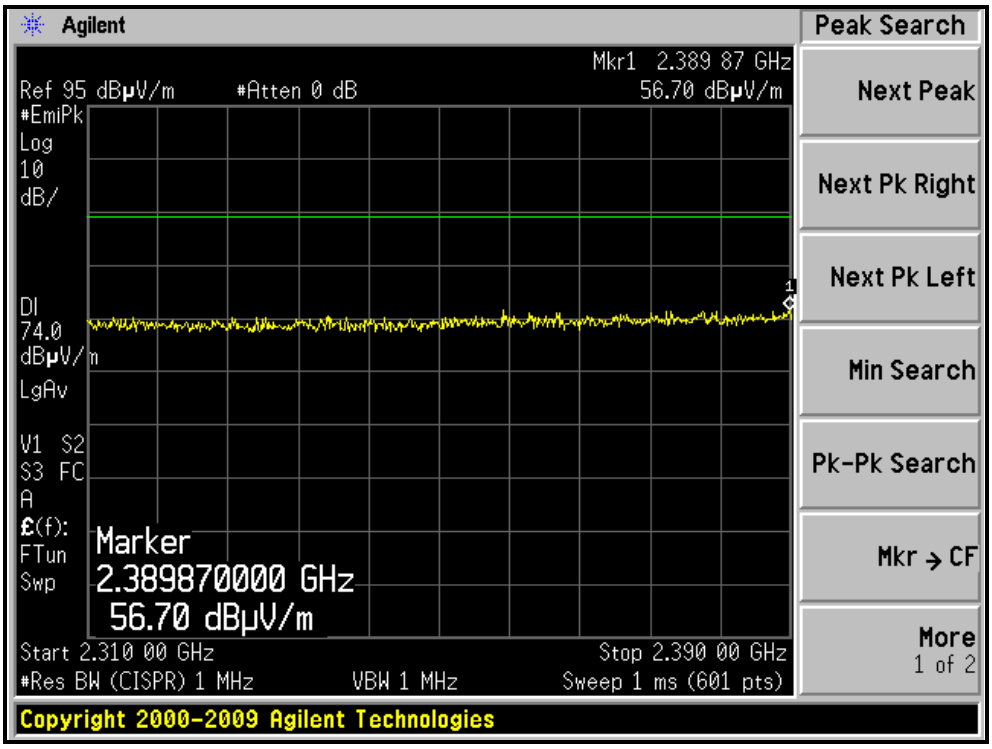
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

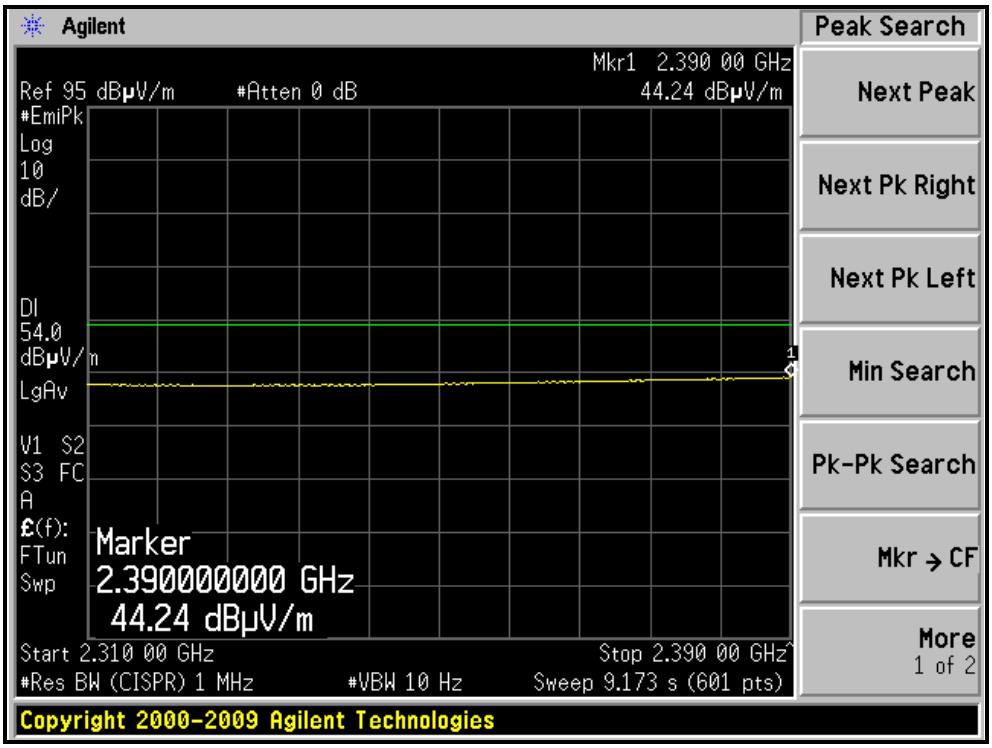
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

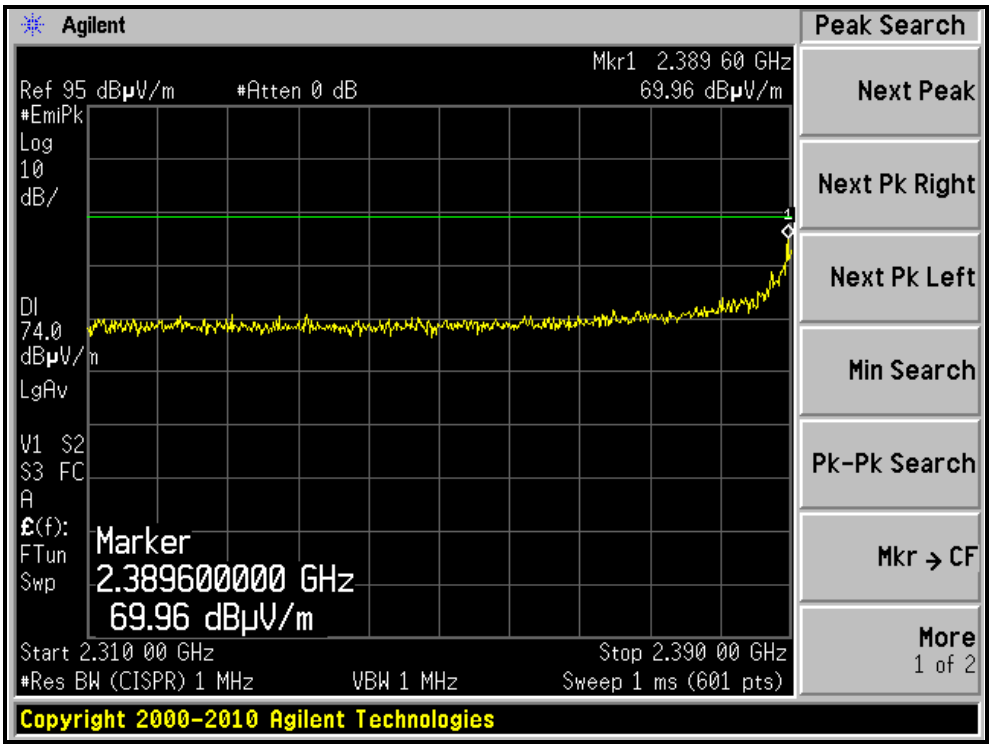
5. " * ": Fundamental frequency.

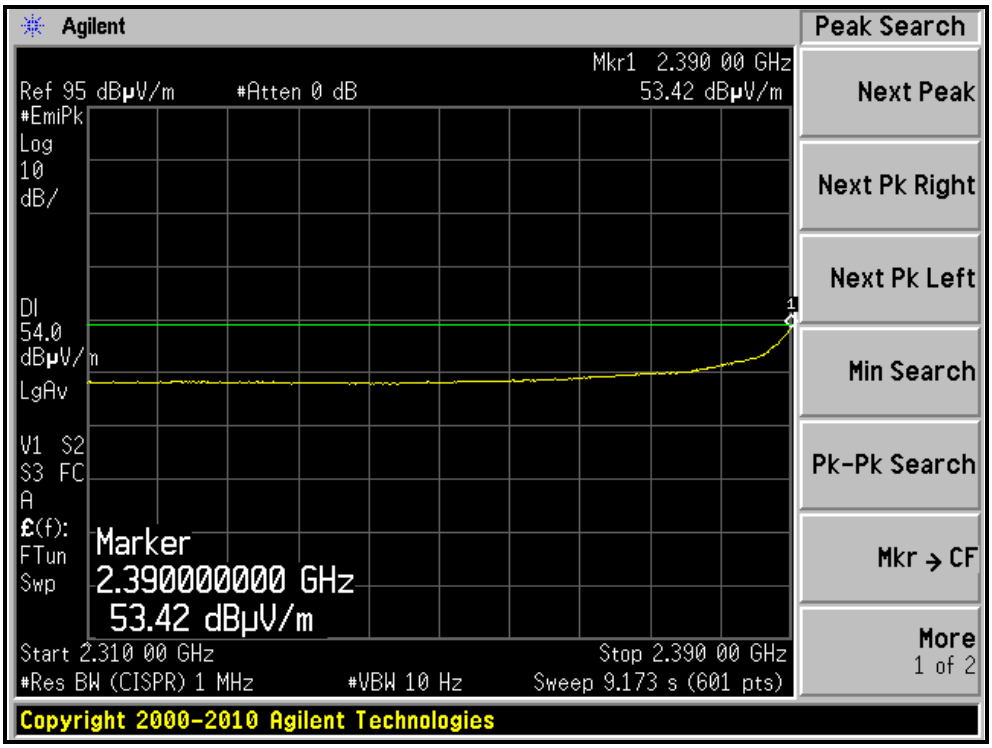
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL)



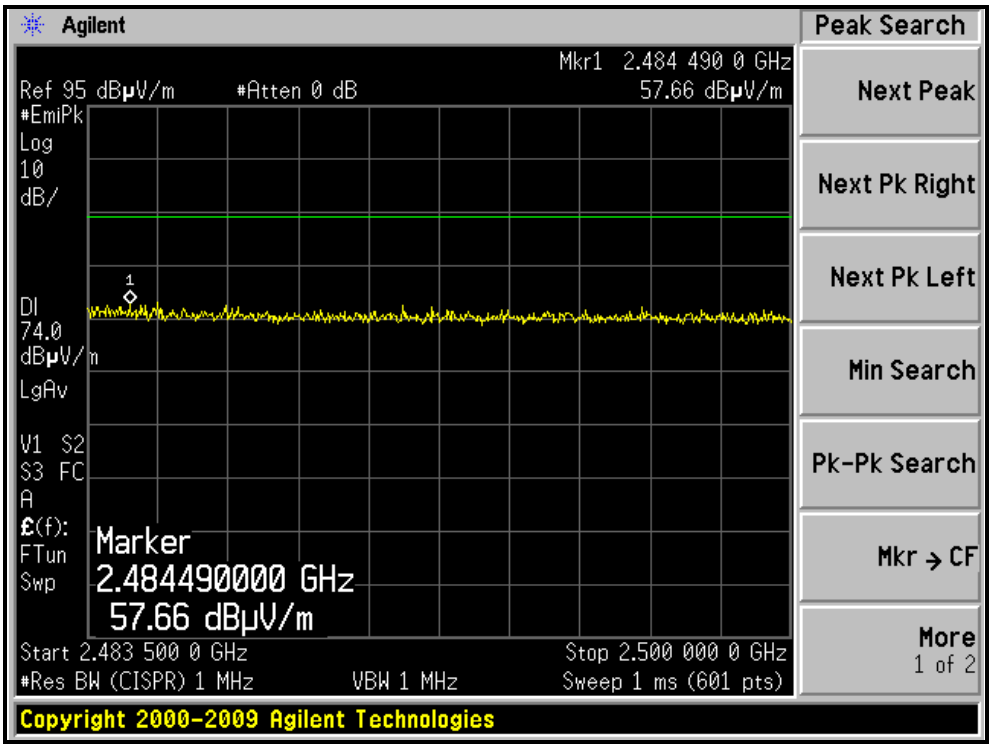


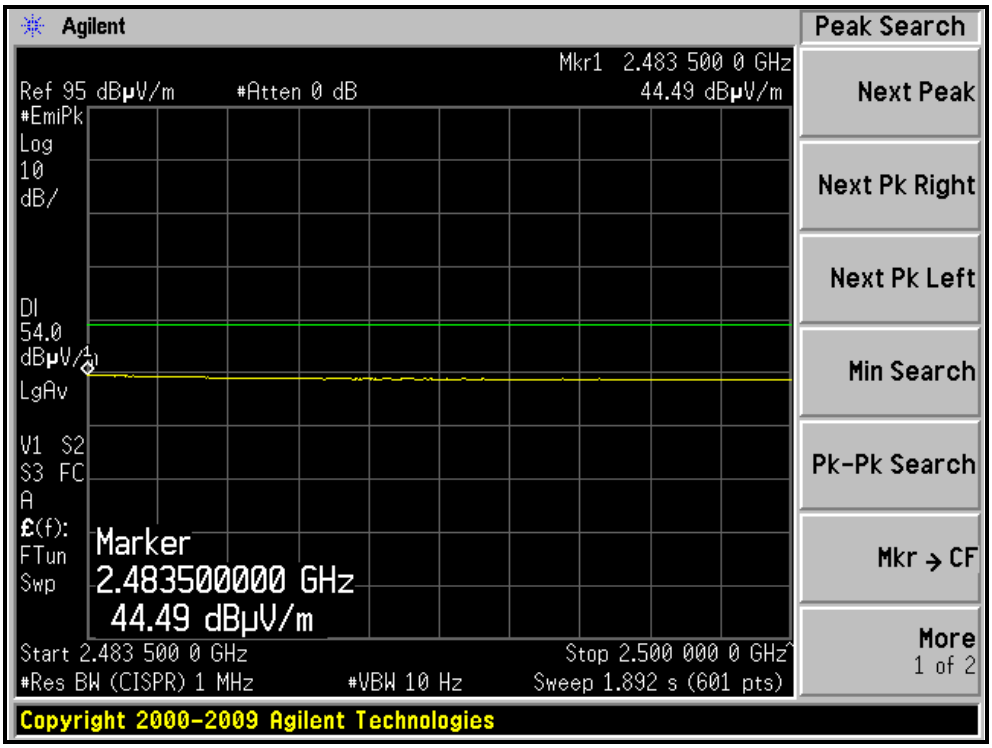
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL)



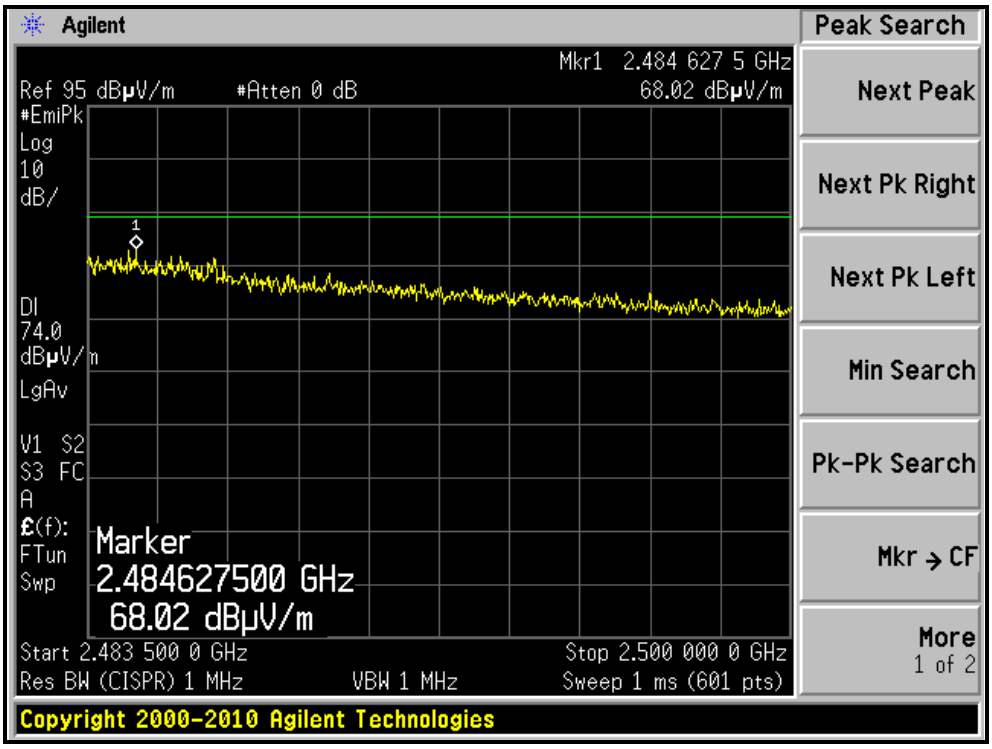


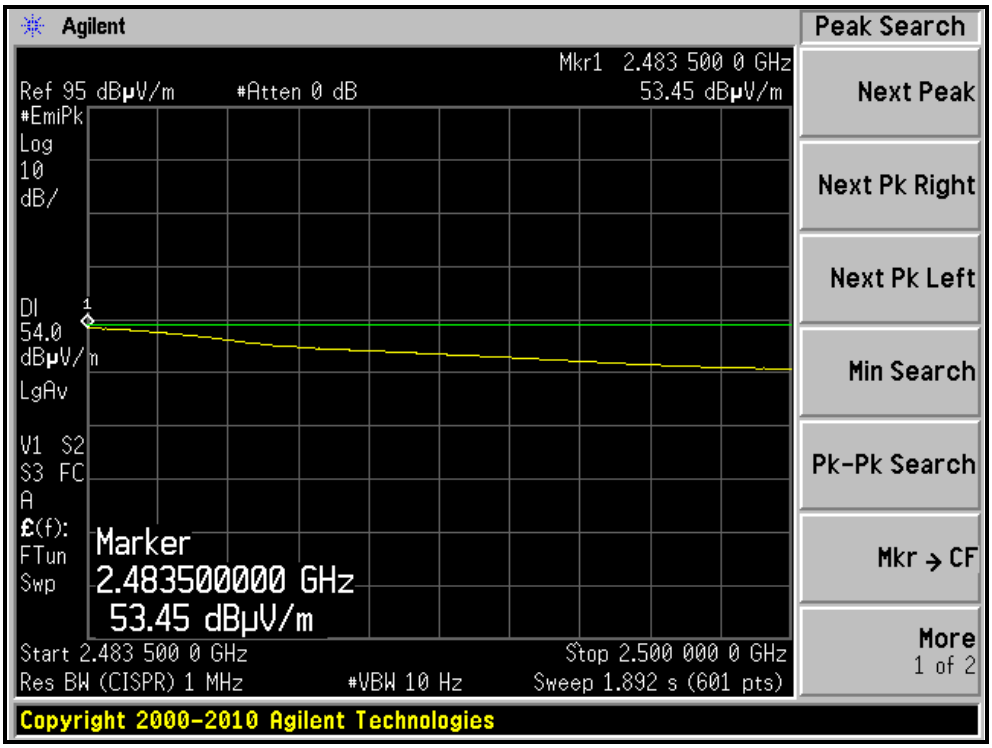
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL)





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





802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	1.00 H	238	25.62	31.88
2	2390.00	44.3 AV	54.0	-9.7	1.00 H	238	12.42	31.88
3	*2422.00	88.2 PK			1.00 H	238	56.22	31.98
4	*2422.00	78.6 AV			1.00 H	238	46.62	31.98
5	4844.00	47.6 PK	74.0	-26.4	1.00 H	63	6.32	41.28
6	4844.00	35.4 AV	54.0	-18.6	1.00 H	63	-5.88	41.28
7	7266.00	54.6 PK	74.0	-19.4	1.48 H	118	9.05	45.55
8	7266.00	42.2 AV	54.0	-11.8	1.48 H	118	-3.35	45.55
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	66.2 PK	74.0	-7.8	1.50 V	107	34.32	31.88
2	2390.00	53.0 AV	54.0	-1.0	1.50 V	107	21.12	31.88
3	*2422.00	102.4 PK			1.51 V	91	70.42	31.98
4	*2422.00	92.6 AV			1.51 V	91	60.62	31.98
5	4844.00	48.4 PK	74.0	-25.6	1.00 V	52	7.12	41.28
6	4844.00	35.8 AV	54.0	-18.2	1.00 V	52	-5.48	41.28
7	7266.00	54.8 PK	74.0	-19.2	1.06 V	78	9.25	45.55
8	7266.00	42.3 AV	54.0	-11.7	1.06 V	78	-3.25	45.55

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	91.1 PK			1.00 H	237	59.06	32.04
2	*2437.00	81.7 AV			1.00 H	237	49.66	32.04
3	4874.00	48.0 PK	74.0	-26.0	1.00 H	72	6.64	41.36
4	4874.00	35.5 AV	54.0	-18.5	1.00 H	72	-5.86	41.36
5	7311.00	55.0 PK	74.0	-19.0	1.43 H	103	9.33	45.67
6	7311.00	42.5 AV	54.0	-11.5	1.43 H	103	-3.17	45.67
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	2390.00	67.4 PK	74.0	-6.6	1.51 V	83	35.52	31.88
2	2390.00	53.1 AV	54.0	-0.9	1.51 V	83	21.22	31.88
3	*2437.00	106.2 PK			1.55 V	91	74.16	32.04
4	*2437.00	96.2 AV			1.55 V	91	64.16	32.04
5	2483.50	63.1 PK	74.0	-10.9	1.54 V	63	30.91	32.19
6	2483.50	52.6 AV	54.0	-1.4	1.54 V	63	20.41	32.19
7	4874.00	49.3 PK	74.0	-24.7	1.03 V	55	7.94	41.36
8	4874.00	36.2 AV	54.0	-17.8	1.03 V	55	-5.16	41.36
9	7311.00	55.2 PK	74.0	-18.8	1.01 V	81	9.53	45.67
10	7311.00	43.1 AV	54.0	-10.9	1.01 V	81	-2.57	45.67

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nelson Teng

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	86.6 PK			1.00 H	239	54.51	32.09
2	*2452.00	76.7 AV			1.00 H	239	44.61	32.09
3	2483.50	56.6 PK	74.0	-17.4	1.00 H	239	24.41	32.19
4	2483.50	44.1 AV	54.0	-9.9	1.00 H	239	11.91	32.19
5	4904.00	47.3 PK	74.0	-26.7	1.00 H	83	5.86	41.44
6	4904.00	35.1 AV	54.0	-18.9	1.00 H	83	-6.34	41.44
7	7356.00	54.6 PK	74.0	-19.4	1.38 H	102	8.79	45.81
8	7356.00	42.3 AV	54.0	-11.7	1.38 H	102	-3.51	45.81
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	100.6 PK			1.52 V	90	68.51	32.09
2	*2452.00	90.7 AV			1.52 V	90	58.61	32.09
3	2483.50	66.2 PK	74.0	-7.8	1.49 V	240	34.01	32.19
4	2483.50	53.0 AV	54.0	-1.0	1.49 V	240	20.81	32.19
5	4904.00	47.4 PK	74.0	-26.6	1.00 V	56	5.96	41.44
6	4904.00	35.1 AV	54.0	-18.9	1.00 V	56	-6.34	41.44
7	7356.00	55.1 PK	74.0	-18.9	1.02 V	96	9.29	45.81
8	7356.00	42.8 AV	54.0	-11.2	1.02 V	96	-3.01	45.81

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

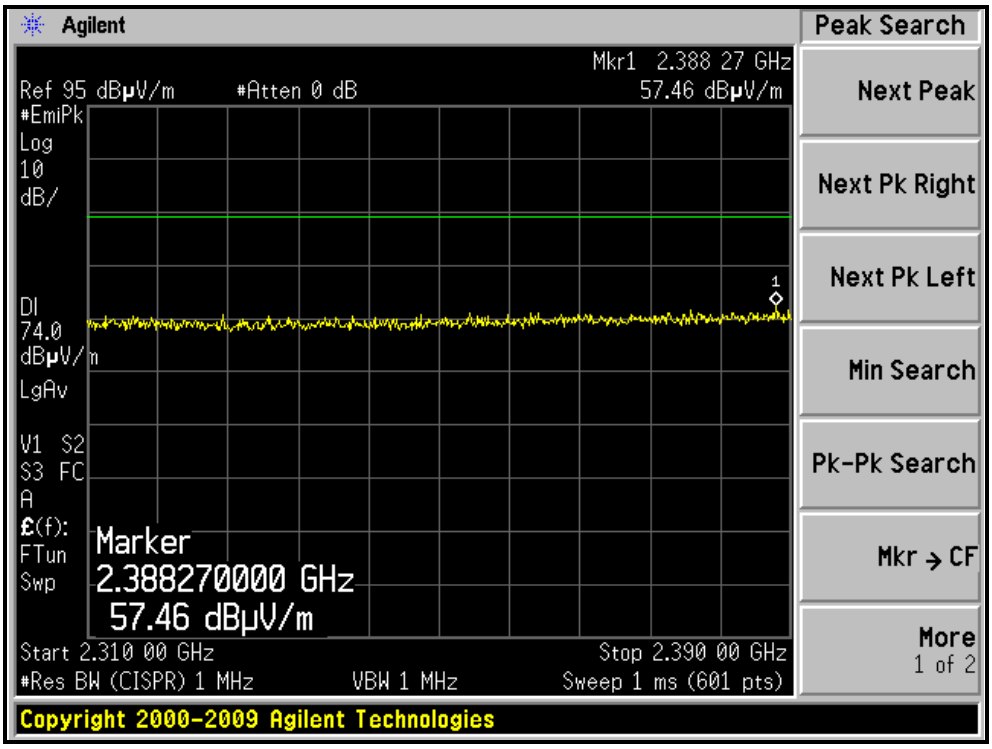
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

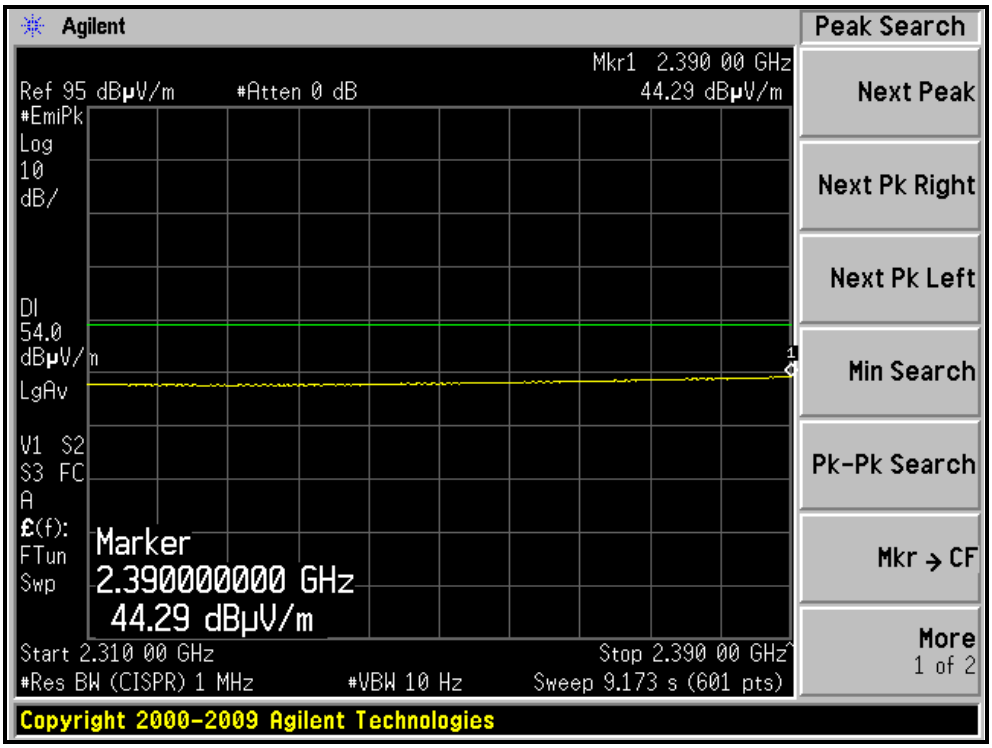
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

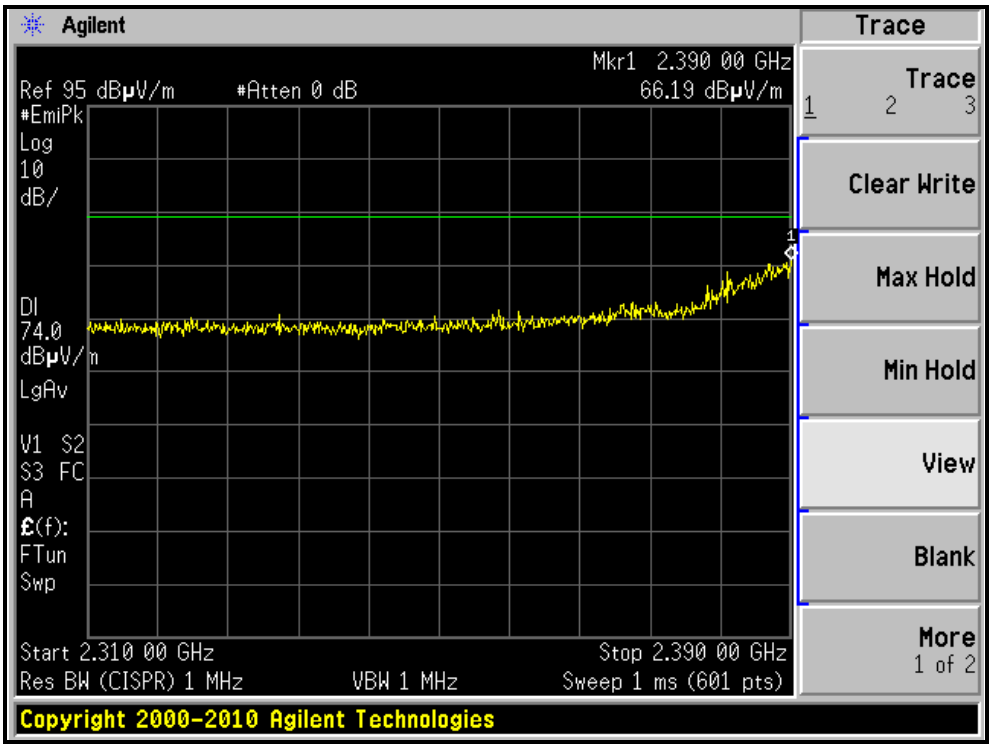
5. " * ": Fundamental frequency.

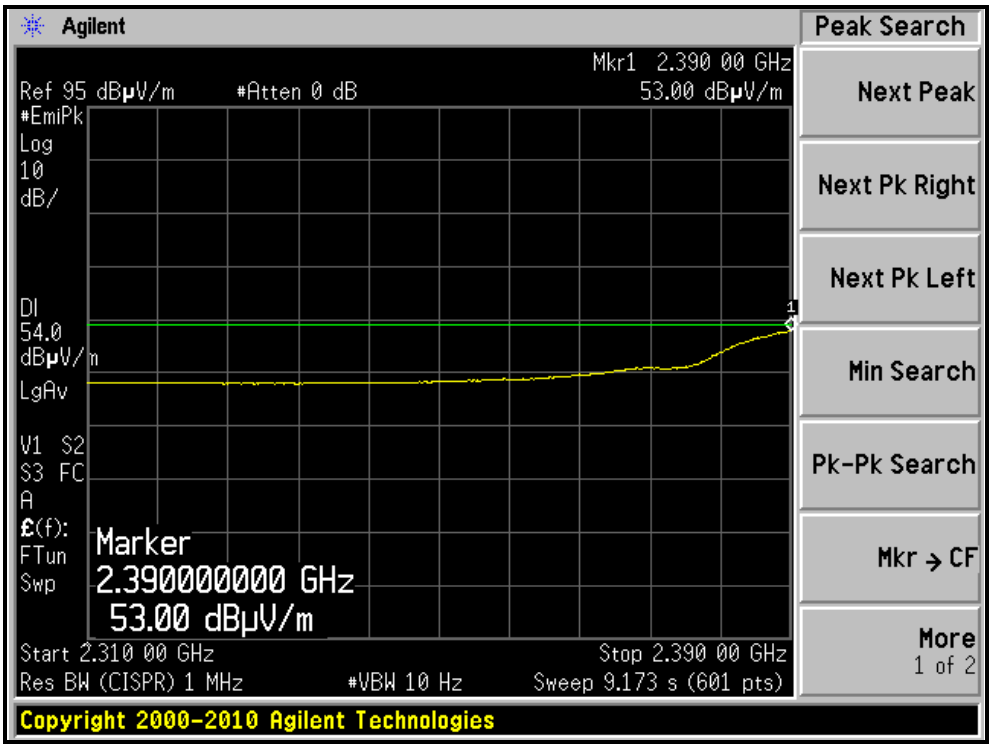
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, HORIZONTAL)



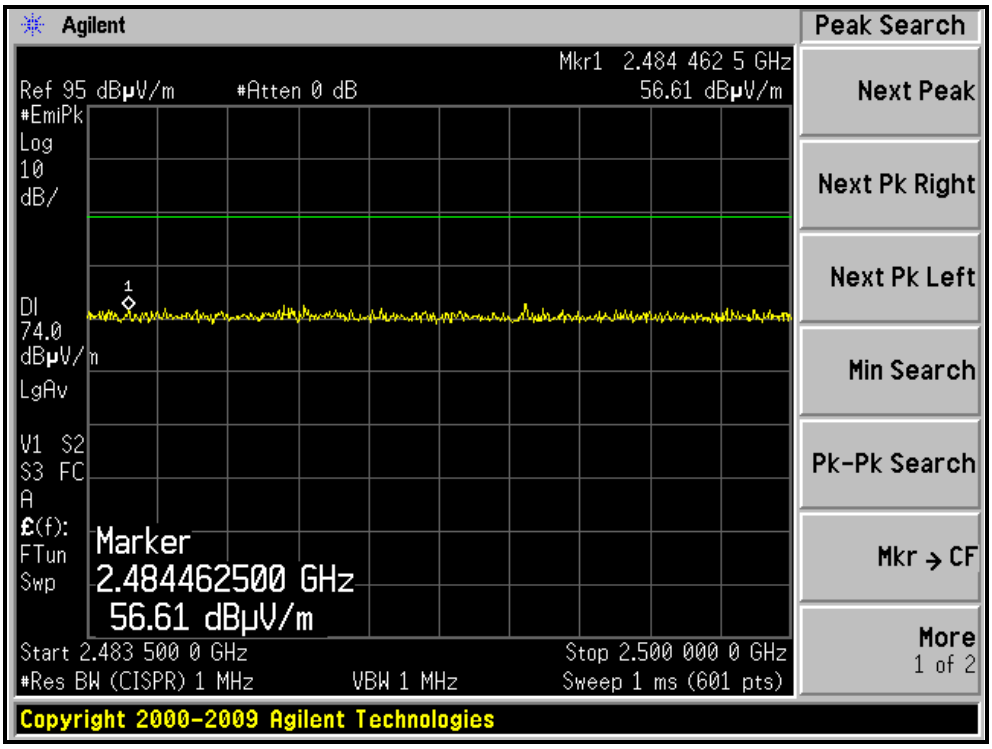


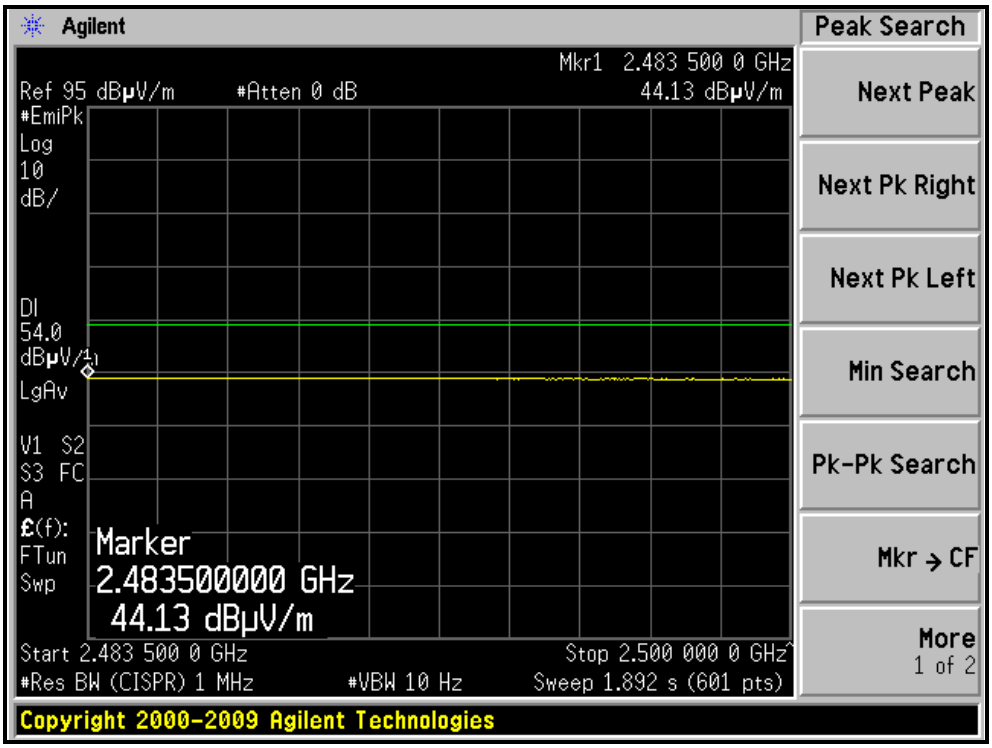
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, VERTICAL)



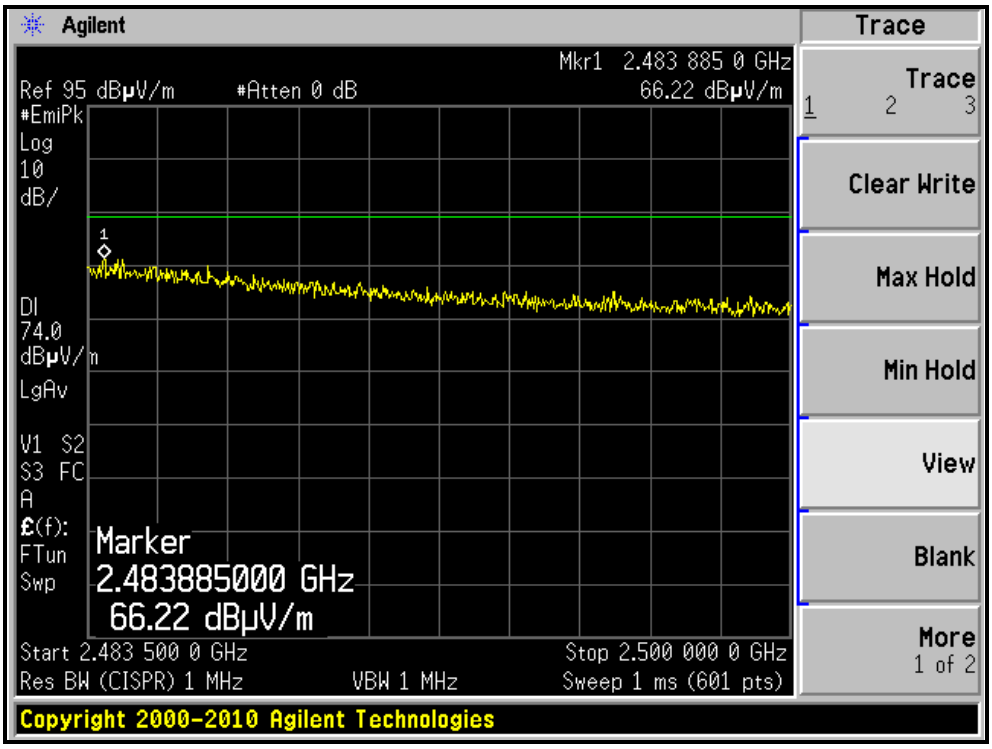


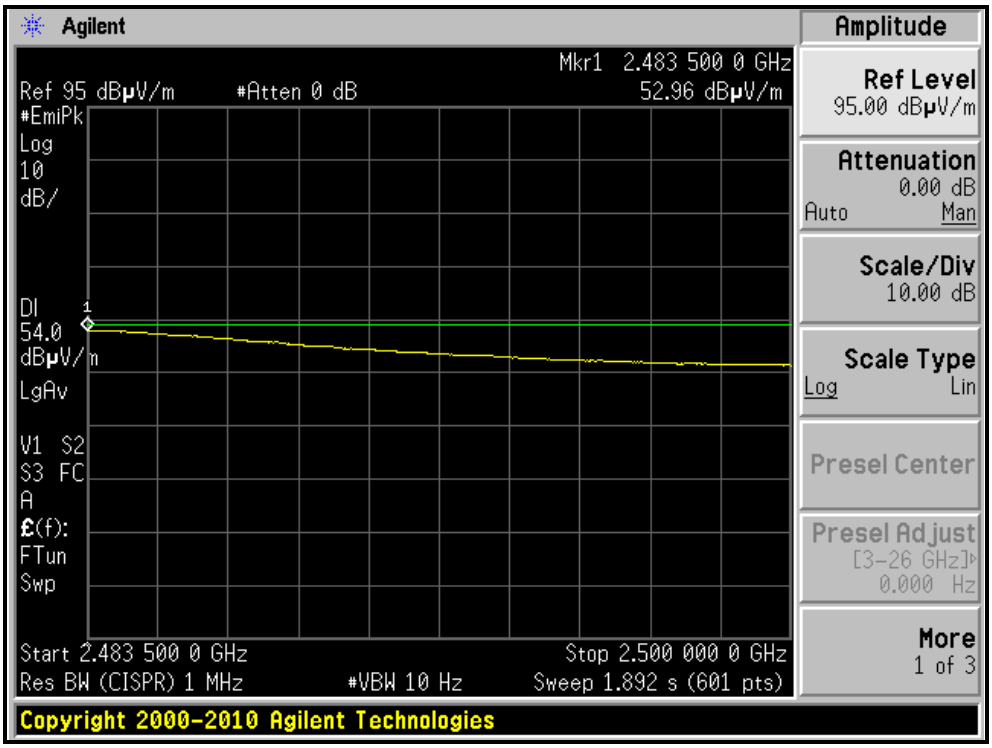
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH9, HORIZONTAL)





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





4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Test date: Nov. 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

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

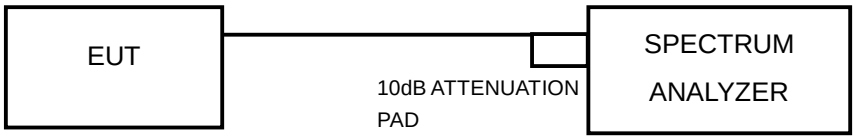
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

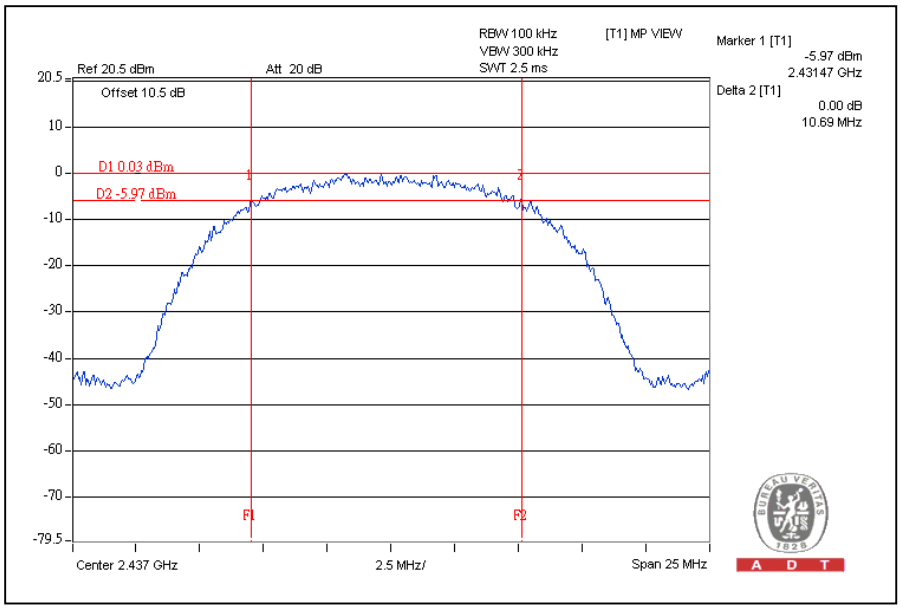
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	10.45	10.40	0.5	PASS
6	2437	10.69	10.27	0.5	PASS
11	2462	10.50	10.57	0.5	PASS

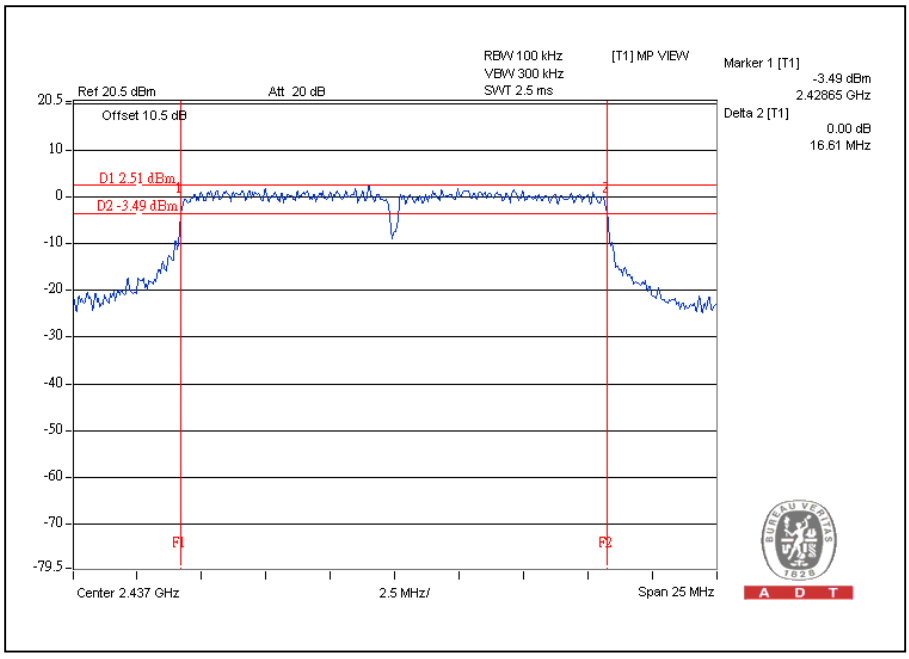
For CHAIN(0)
CH6



802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	16.61	16.59	0.5	PASS
6	2437	16.61	16.59	0.5	PASS
11	2462	16.61	16.61	0.5	PASS

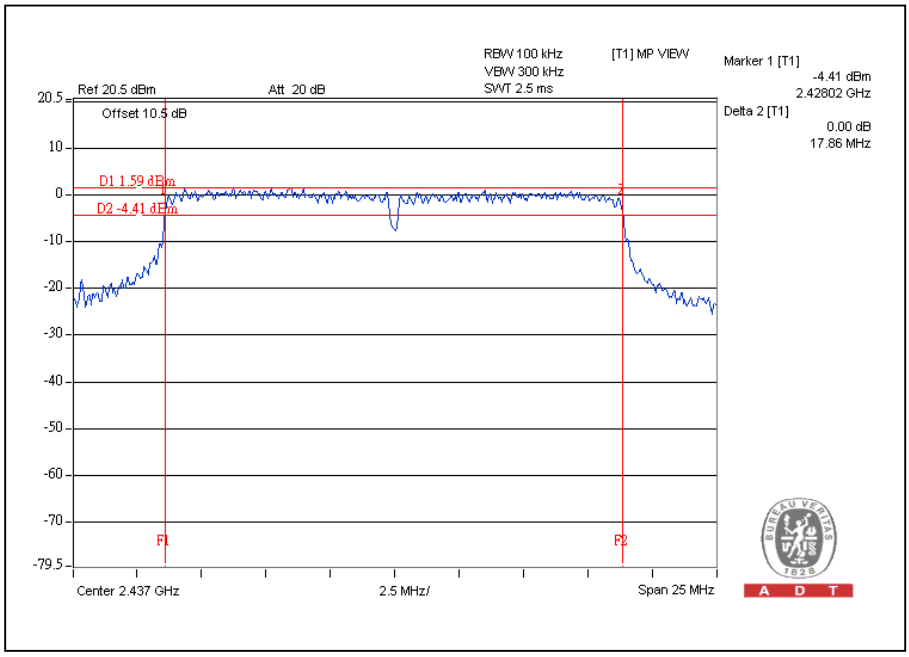
For CHAIN(0)
CH6



802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	17.84	17.85	0.5	PASS
6	2437	17.86	17.82	0.5	PASS
11	2462	17.81	17.84	0.5	PASS

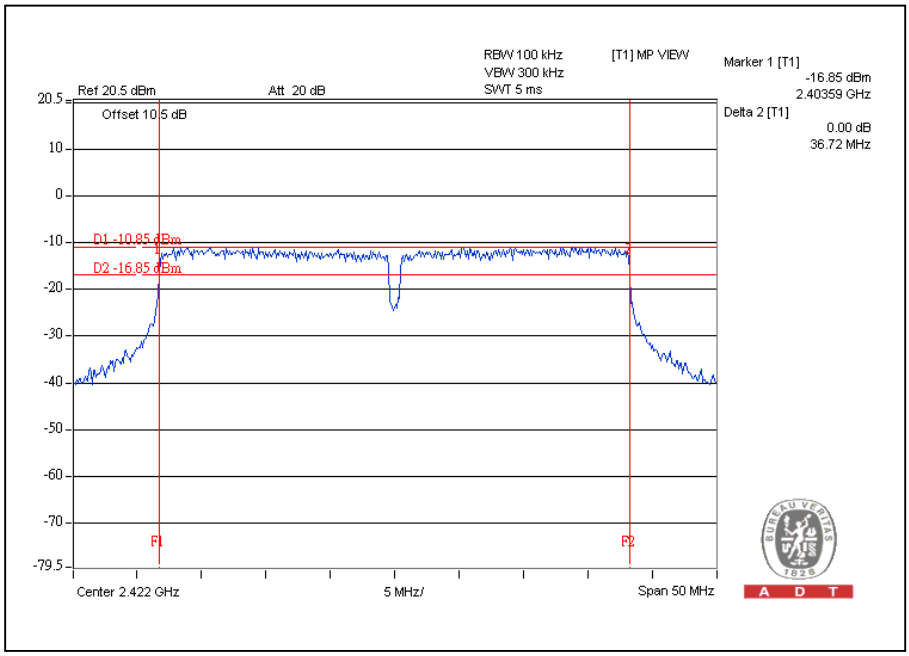
For CHAIN(0)
CH6



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
3	2422	36.70	36.72	0.5	PASS
6	2437	36.70	36.69	0.5	PASS
9	2452	36.68	36.70	0.5	PASS

For CHAIN(1)
CH3



4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Test date: Nov. 10, 2011

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

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

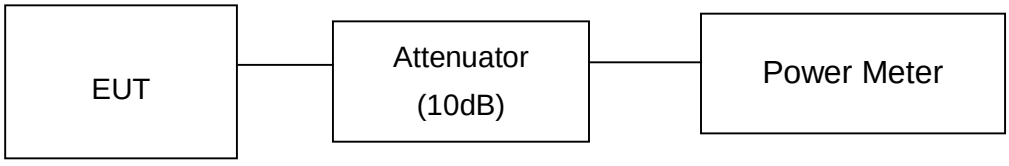
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	12.7	13.5	41.0	16.1	30	PASS
6	2437	12.6	13.7	41.6	16.2	30	PASS
11	2462	8.2	9.4	15.3	11.8	30	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]
Effective Legacy Gain (dBi) = 5
The effective legacy gain is 5dBi, therefore the limit doesn't reduce.

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	18.3	19.7	160.9	22.1	30	PASS
6	2437	23.4	23.1	423.0	26.3	30	PASS
11	2462	14.2	15.7	63.5	18.0	30	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]
Effective Legacy Gain (dBi) = 5
The effective legacy gain is 5dBi, therefore the limit doesn't reduce.

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	17.2	18.1	117.0	20.7	30	PASS
6	2437	22.7	23.1	390.4	25.9	30	PASS
11	2462	15.4	16.7	81.4	19.1	30	PASS

802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
3	2422	14.1	14.5	53.9	17.3	30	PASS
6	2437	18.2	18.4	135.3	21.3	30	PASS
9	2452	13.1	13.6	43.3	16.4	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

Test date: Nov. 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

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

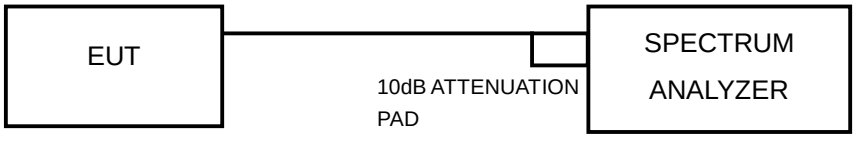
4.5.3 TEST PROCEDURE

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

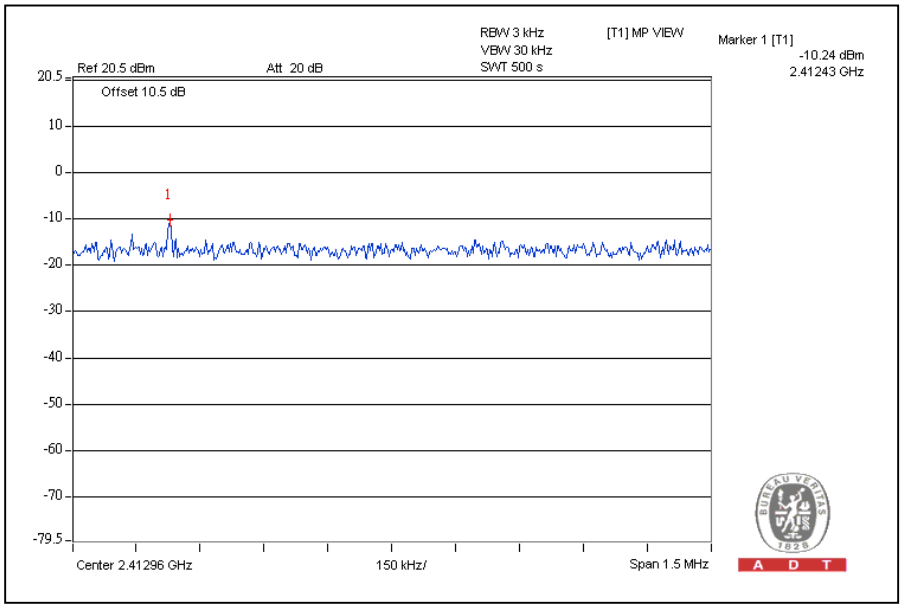
802.11b DSSS MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-10.2	3.0	-7.2	8	PASS
	6	2437	-13.9	3.0	-10.9	8	PASS
	11	2462	-17.5	3.0	-14.5	8	PASS
1	1	2412	-11.6	3.0	-8.6	8	PASS
	6	2437	-11.0	3.0	-8.0	8	PASS
	11	2462	-16.3	3.0	-13.3	8	PASS

Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$)^2 / 2]
Effective Legacy Gain (dBi) = 5
The effective legacy gain is 5dBi, therefore the limit doesn't reduce.

For CHAIN(0)

CH1



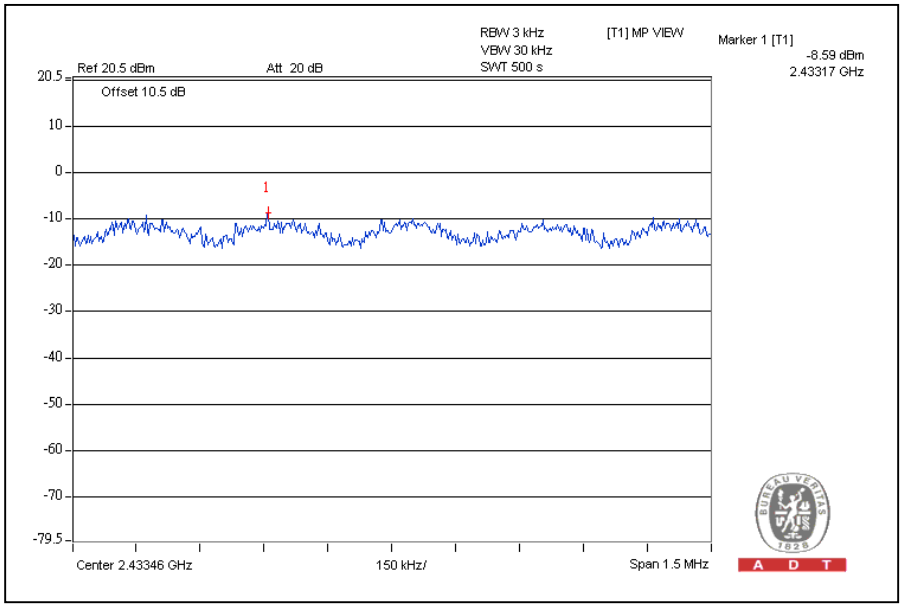
802.11g OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-15.0	3.0	-12.0	8	PASS
	6	2437	-9.9	3.0	-6.9	8	PASS
	11	2462	-17.9	3.0	-14.9	8	PASS
1	1	2412	-12.7	3.0	-9.7	8	PASS
	6	2437	-8.6	3.0	-5.6	8	PASS
	11	2462	-17.6	3.0	-14.6	8	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]
Effective Legacy Gain (dBi) = 5
The effective legacy gain is 5dBi, therefore the limit doesn't reduce.

For CHAIN(1)

CH6

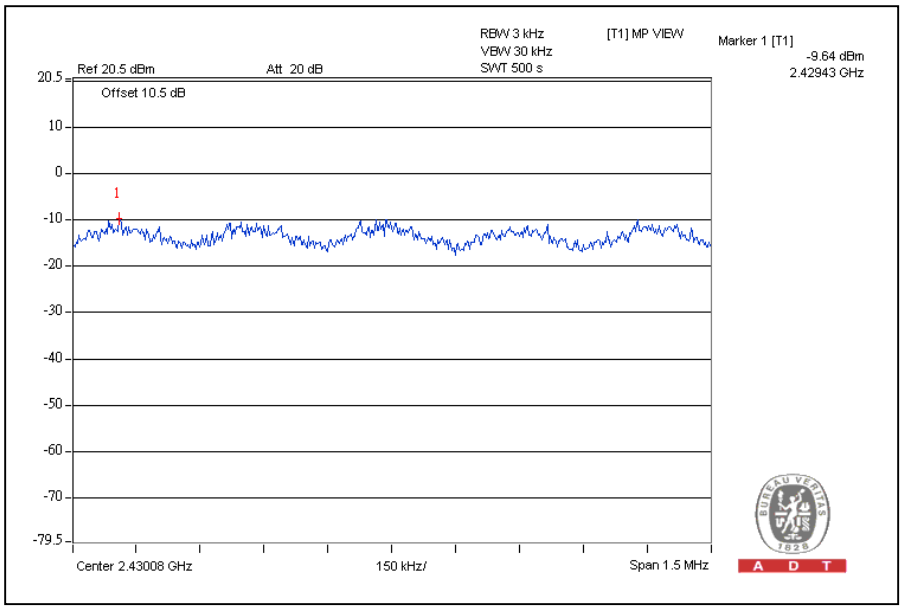


802.11n (20MHz) OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-15.7	3.0	-12.7	8	PASS
	6	2437	-9.6	3.0	-6.6	8	PASS
	11	2462	-17.1	3.0	-14.1	8	PASS
1	1	2412	-15.2	3.0	-12.2	8	PASS
	6	2437	-9.6	3.0	-6.6	8	PASS
	11	2462	-17.2	3.0	-14.2	8	PASS

For CHAIN(0)

CH6

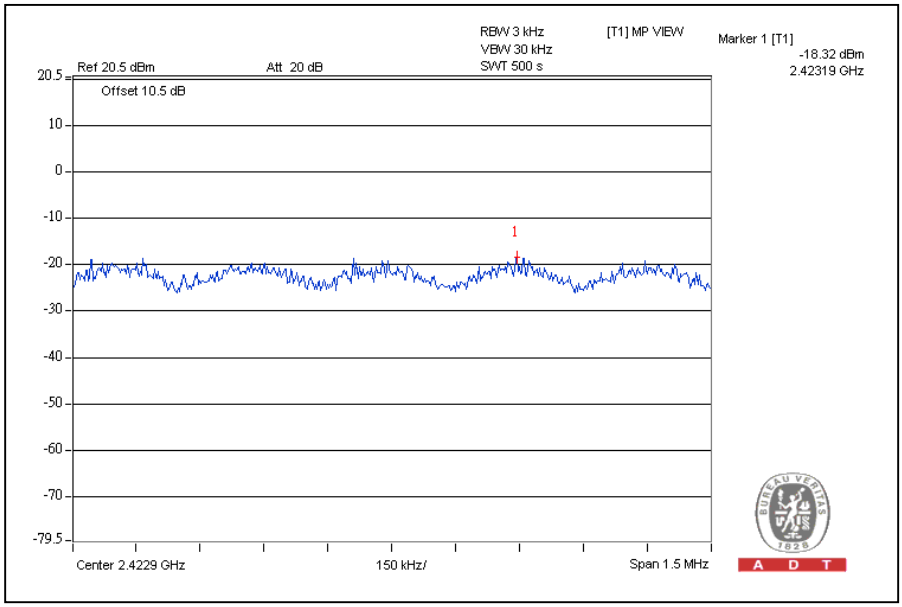


802.11n (40MHz) OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-21.9	3.0	-18.9	8	PASS
	6	2437	-18.6	3.0	-15.6	8	PASS
	9	2452	-23.8	3.0	-20.8	8	PASS
1	3	2422	-22.2	3.0	-19.2	8	PASS
	6	2437	-18.3	3.0	-15.3	8	PASS
	9	2452	-22.4	3.0	-19.4	8	PASS

For CHAIN(1)

CH6



4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

Test date: Nov. 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

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

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose 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

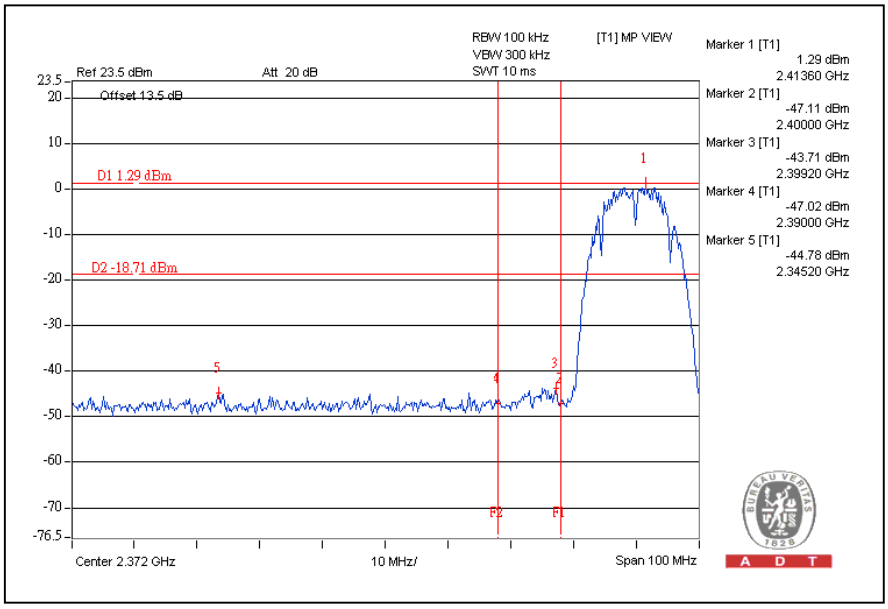
Same as Item 4.3.6

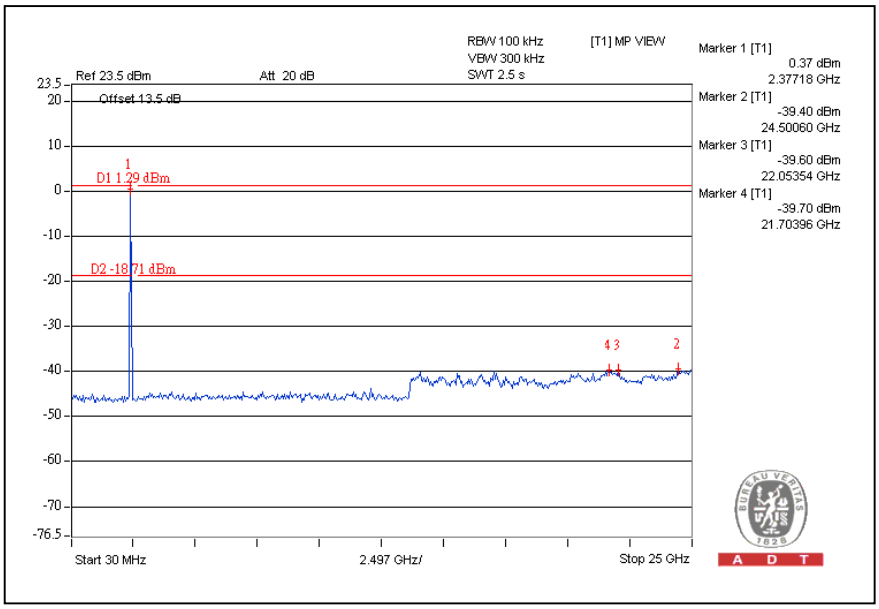
4.6.6 TEST RESULTS

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).

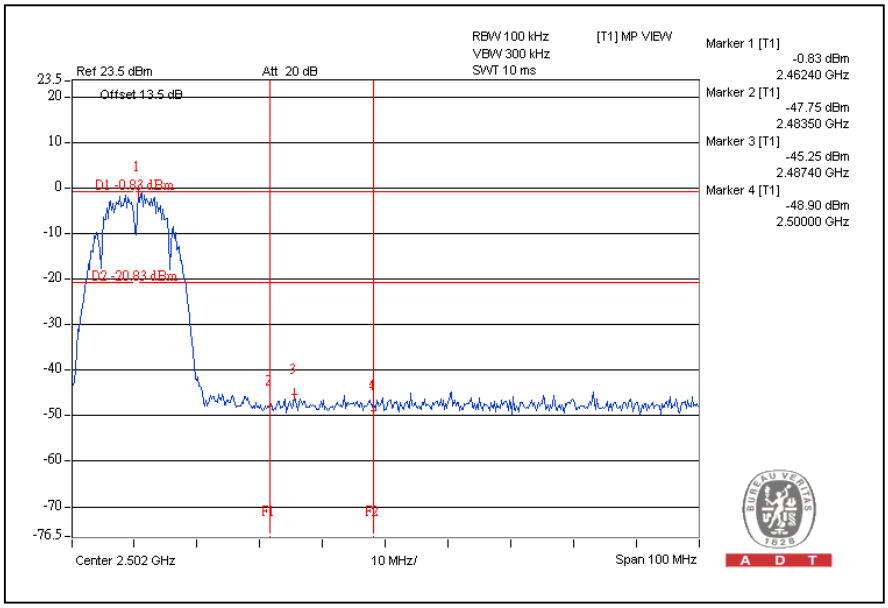
Performing measurements: Measure and add 10 log(N) dB
802.11b DSSS MODULATION:

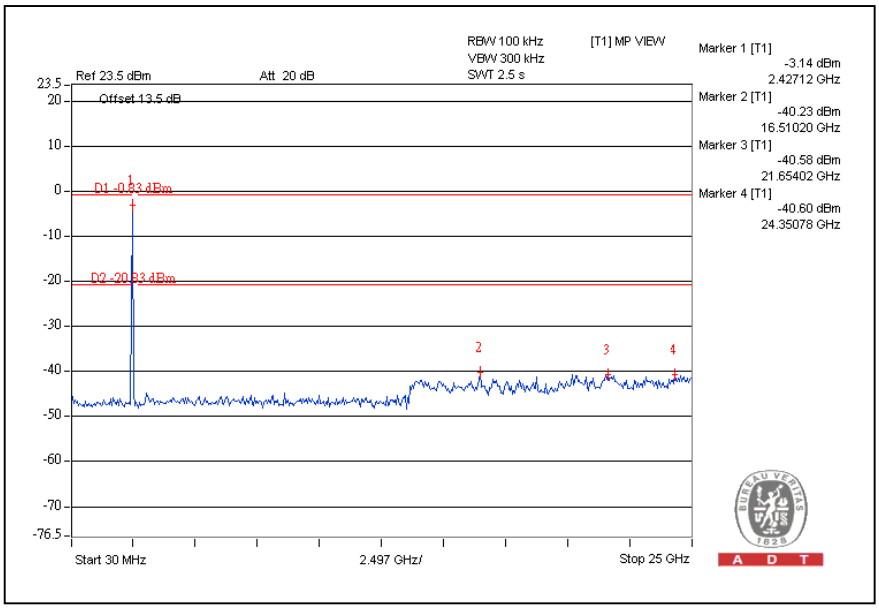
CH1





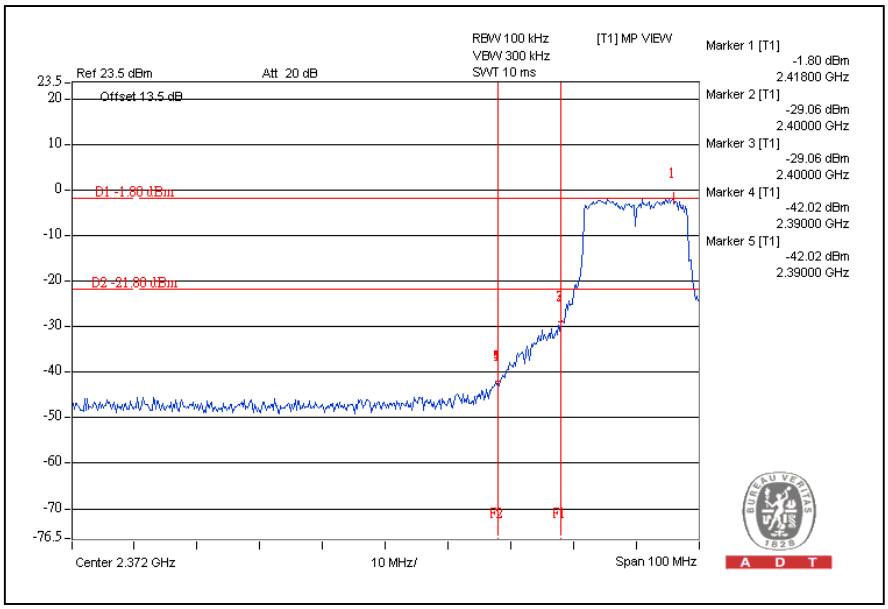
CH11

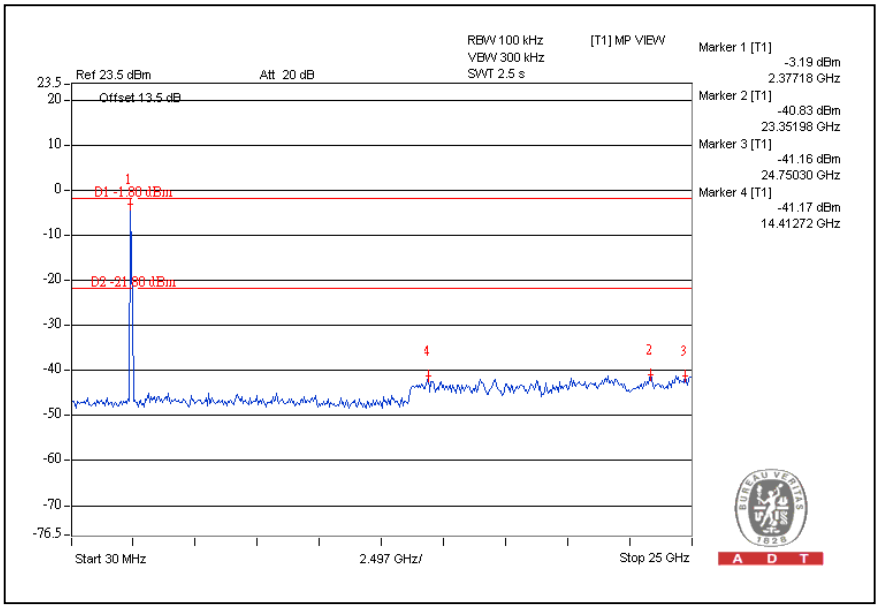

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -0.83 dBm
D2 -20.83 dBm
Marker 1 [T1]
-0.83 dBm
2.46240 GHz
Marker 2 [T1]
-47.75 dBm
2.48350 GHz
Marker 3 [T1]
-45.25 dBm
2.48740 GHz
Marker 4 [T1]
-48.90 dBm
2.50000 GHz
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -0.83 dBm
D2 -20.83 dBm
Marker 1 [T1]
-3.14 dBm
2.42712 GHz
Marker 2 [T1]
-40.23 dBm
16.51020 GHz
Marker 3 [T1]
-40.58 dBm
21.65402 GHz
Marker 4 [T1]
-40.60 dBm
24.35078 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz

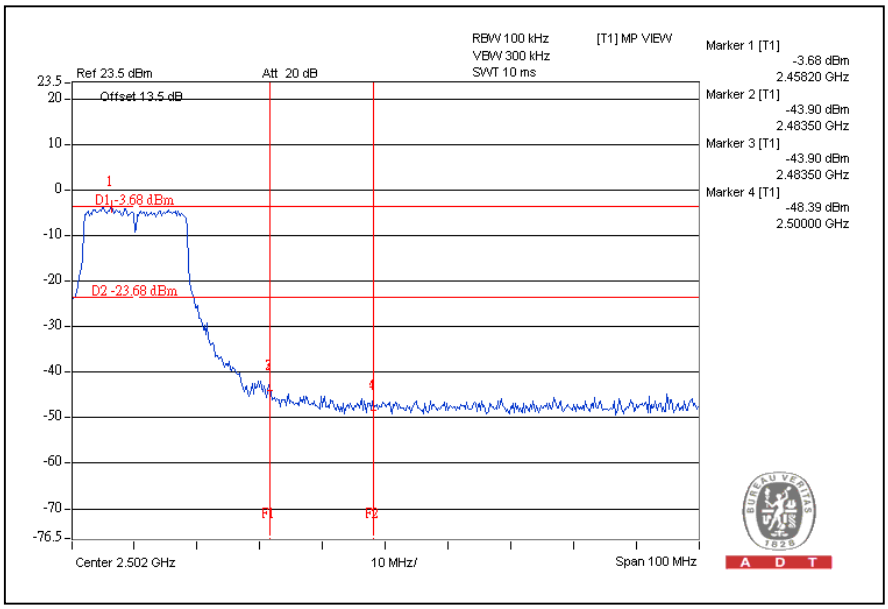
802.11g OFDM MODULATION:

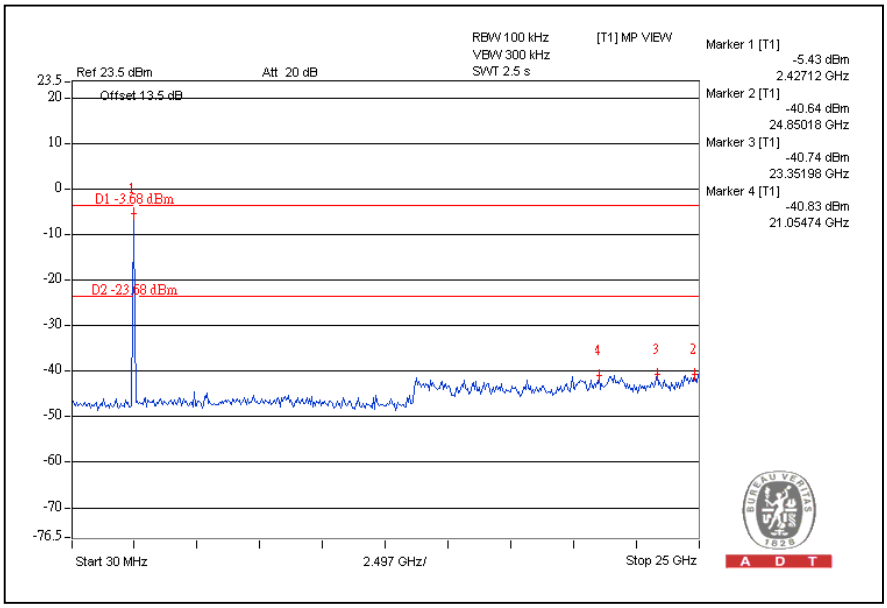
CH1





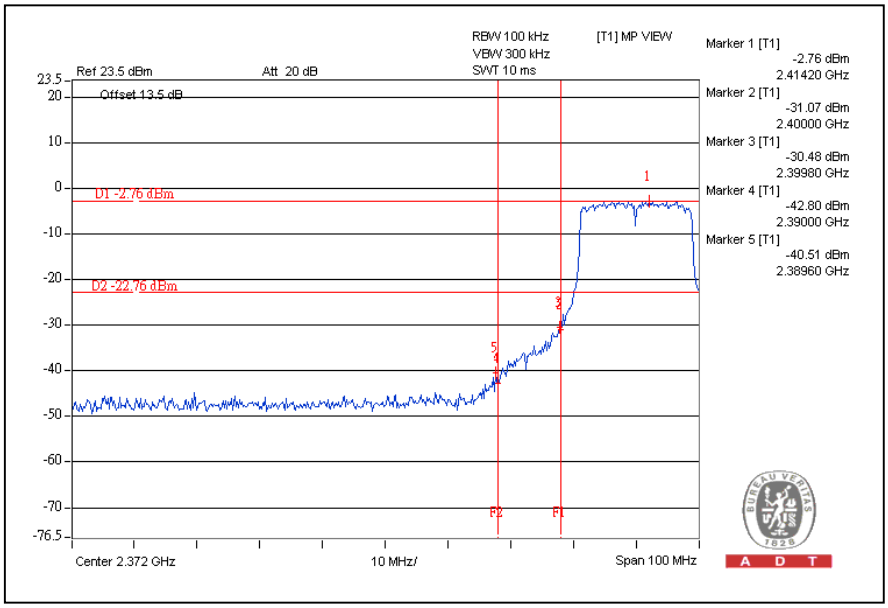
CH11

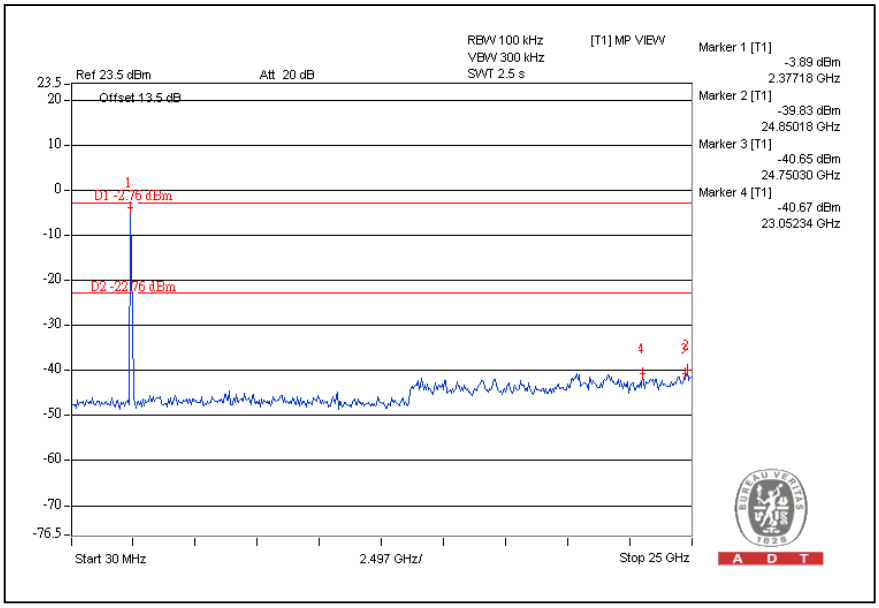

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -3.68 dBm
D2 -23.68 dBm
Marker 1 [T1]
-3.68 dBm
2.45820 GHz
Marker 2 [T1]
-43.90 dBm
2.48350 GHz
Marker 3 [T1]
-43.90 dBm
2.48350 GHz
Marker 4 [T1]
-48.39 dBm
2.50000 GHz
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -3.68 dBm
D2 -23.68 dBm
Marker 1 [T1]
-5.43 dBm
2.42712 GHz
Marker 2 [T1]
-40.64 dBm
24.85018 GHz
Marker 3 [T1]
-40.74 dBm
23.35198 GHz
Marker 4 [T1]
-40.83 dBm
21.05474 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz

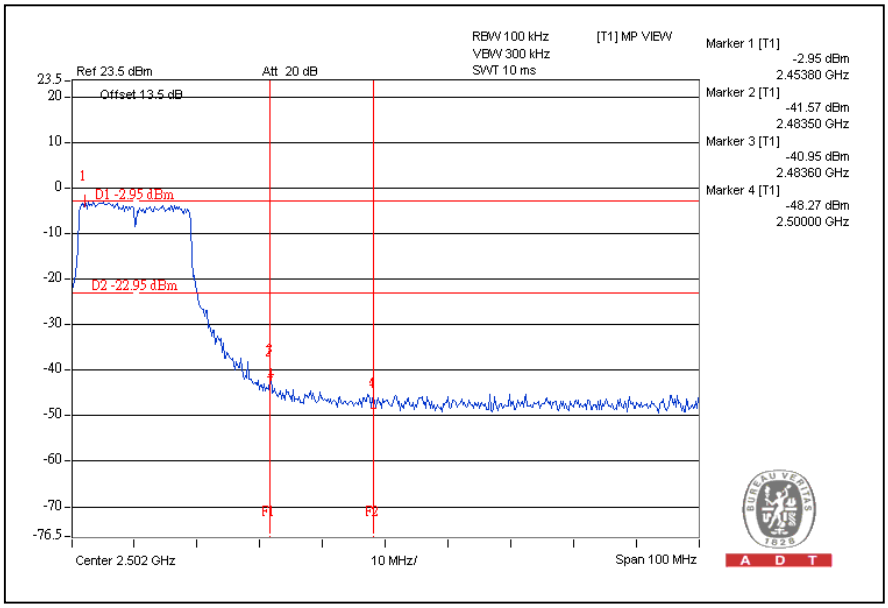
802.11n (20MHz) OFDM MODULATION:

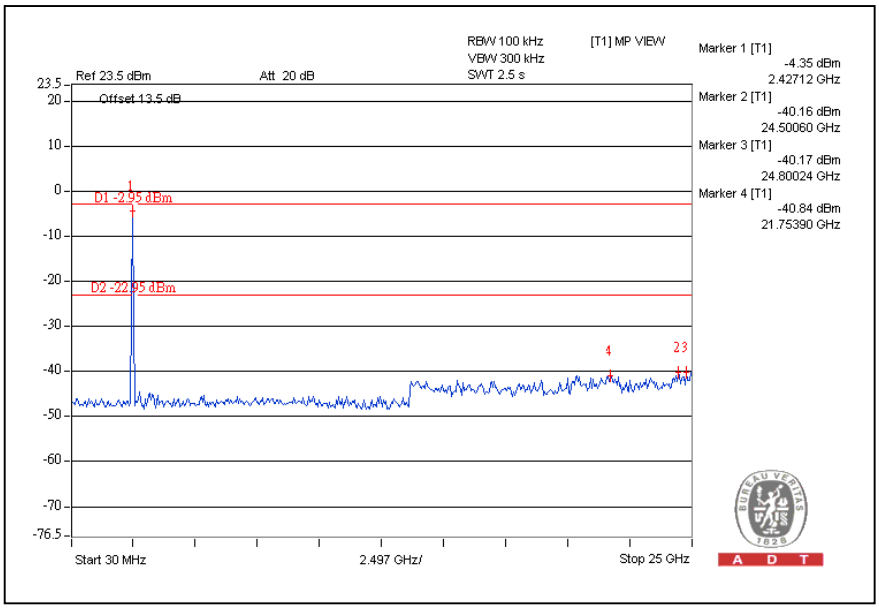
CH1





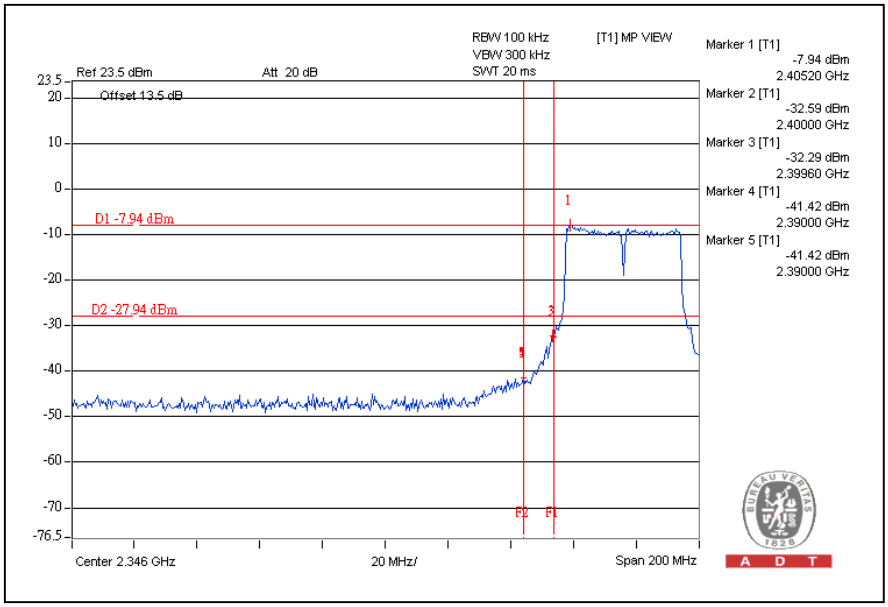
CH11

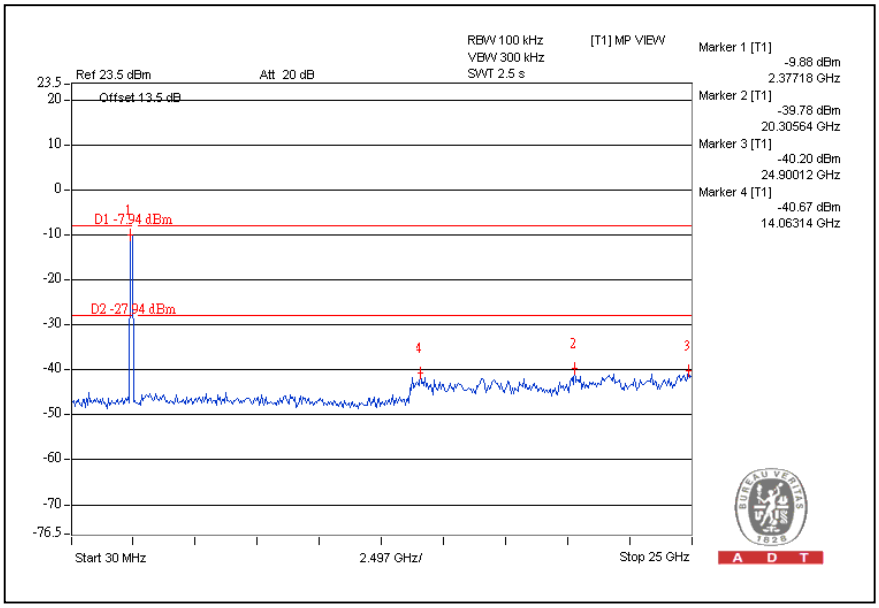

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -2.95 dBm
D2 -22.95 dBm
Marker 1 [T1]
-2.95 dBm
2.45380 GHz
Marker 2 [T1]
-41.57 dBm
2.48350 GHz
Marker 3 [T1]
-40.95 dBm
2.48360 GHz
Marker 4 [T1]
-48.27 dBm
2.50000 GHz
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -2.95 dBm
D2 -22.95 dBm
Marker 1 [T1]
-4.35 dBm
2.42712 GHz
Marker 2 [T1]
-40.16 dBm
24.50060 GHz
Marker 3 [T1]
-40.17 dBm
24.80024 GHz
Marker 4 [T1]
-40.84 dBm
21.75390 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz

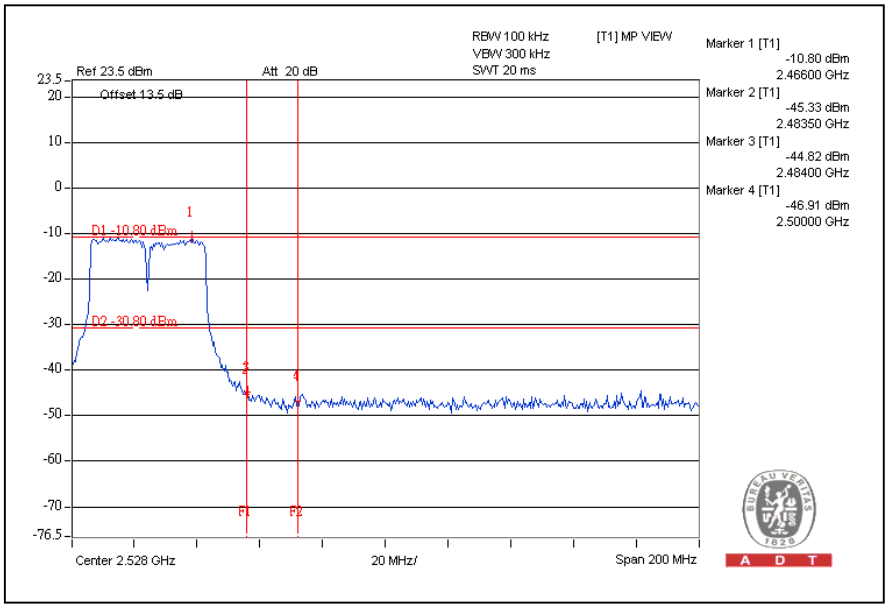
802.11n (40MHz) OFDM MODULATION:

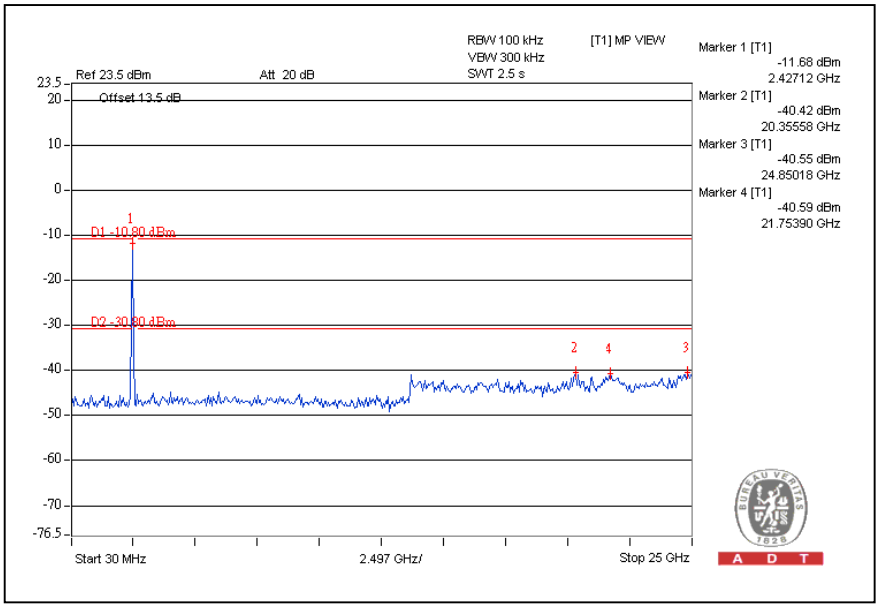
CH3





CH9


RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -10.80 dBm
D2 -30.80 dBm
Marker 1 [T1]
-10.80 dBm
2.46600 GHz
Marker 2 [T1]
-45.33 dBm
2.48350 GHz
Marker 3 [T1]
-44.82 dBm
2.48400 GHz
Marker 4 [T1]
-46.91 dBm
2.50000 GHz
Center 2.528 GHz
20 MHz/
Span 200 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MP VIEW
Ref 23.5 dBm
Att 20 dB
Offset 13.5 dB
D1 -10.80 dBm
D2 -30.80 dBm
Marker 1 [T1]
-11.68 dBm
2.42712 GHz
Marker 2 [T1]
-40.42 dBm
20.35558 GHz
Marker 3 [T1]
-40.55 dBm
24.85018 GHz
Marker 4 [T1]
-40.59 dBm
21.75390 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz

5. TEST TYPES AND RESULTS (5725~5850MHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

5.1.2 TEST INSTRUMENTS

Test date: Nov. 18, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 01, 2011	Oct. 31, 2012
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
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. C.
3 The VCCI Con C Registration No. is C-3611.

5.1.3 TEST PROCEDURES

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

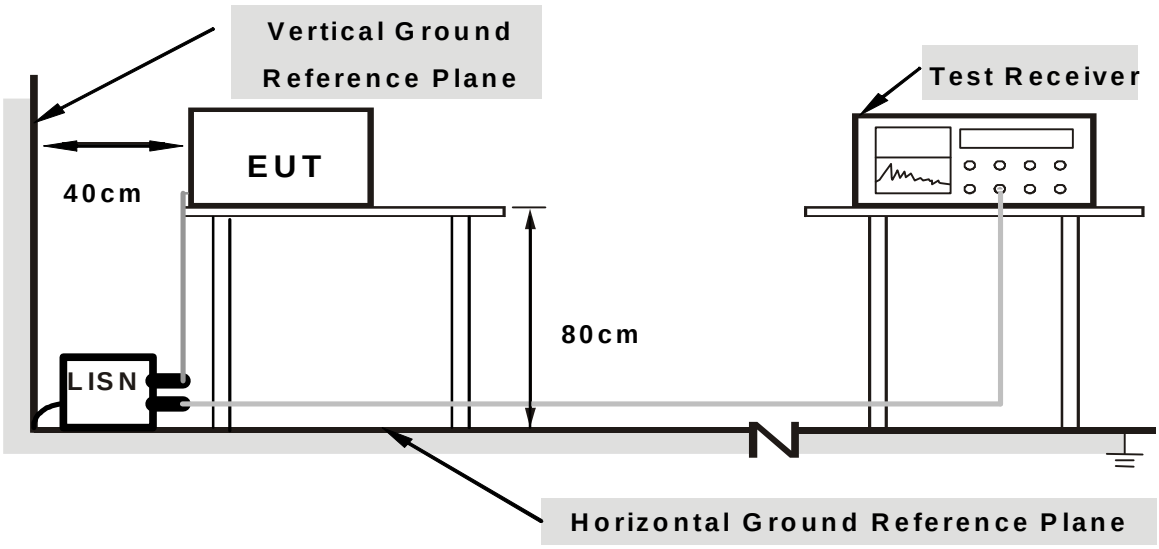
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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

5.1.6 EUT OPERATING CONDITIONS

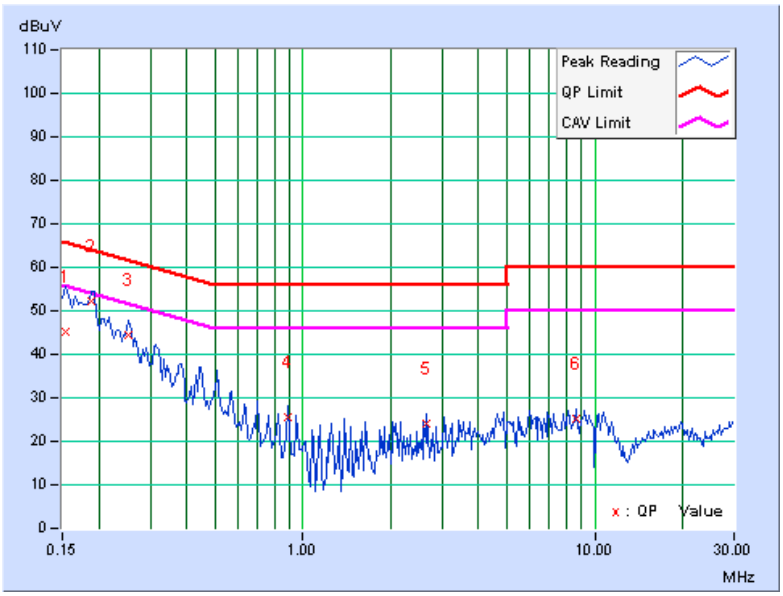
Same as the 4.1.6

5.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.09	45.19	17.63	45.28	17.72	65.79	55.79	-20.51	-38.07
2	**0.189**	**0.10**	**52.09**	**45.38**	**52.19**	**45.48**	**64.08**	**54.08**	**-11.89**	**-8.60**
3	0.252	0.10	44.41	36.93	44.51	37.03	61.71	51.71	-17.19	-14.67
4	0.888	0.14	25.40	23.02	25.54	23.16	56.00	46.00	-30.46	-22.84
5	2.660	0.24	23.90	19.57	24.14	19.81	56.00	46.00	-31.86	-26.19
6	8.621	0.50	24.56	20.28	25.06	20.78	60.00	50.00	-34.94	-29.22

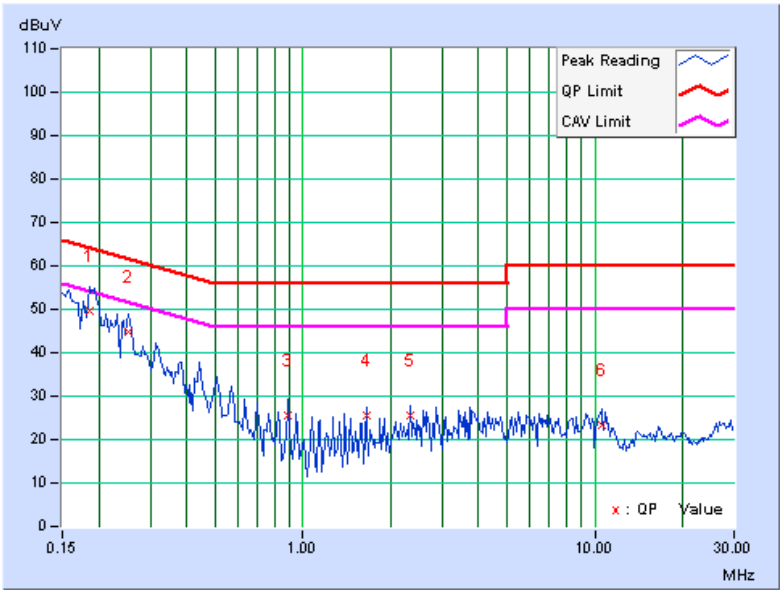
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.185	0.09	49.60	40.40	49.69	40.49	64.25	54.25	-14.57	-13.77
2	0.252	0.10	44.74	37.06	44.84	37.16	61.71	51.71	-16.87	-14.55
3	0.888	0.13	25.51	22.95	25.64	23.08	56.00	46.00	-30.36	-22.92
4	1.648	0.16	25.45	21.97	25.61	22.13	56.00	46.00	-30.39	-23.87
5	2.344	0.18	25.49	21.87	25.67	22.05	56.00	46.00	-30.33	-23.95
6	10.523	0.42	23.05	18.15	23.47	18.57	60.00	50.00	-36.53	-31.43

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



5.2 RADIATED EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.

5.2.2 TEST INSTRUMENTS

Test date: Nov. 09 to 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 28, 2011	Feb. 27, 2012
Miteq Pre-Amplifier	AFS33-18002650-30-8P-44	881786	Nov. 16, 2010	Nov. 15, 2011
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 22, 2010	Nov. 21, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.

5.2.3 TEST PROCEDURES

3. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meters chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
5. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
6. 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.
7. 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.
8. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

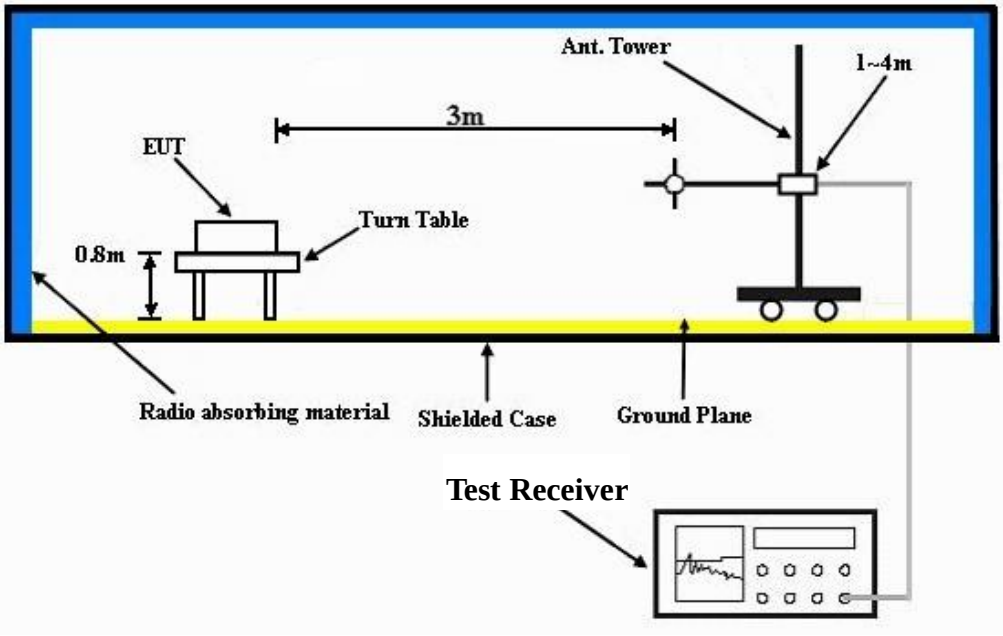
NOTE:

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

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.2.6

5.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Nelson Teng

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	91.75	36.8 QP	43.5	-6.7	1.75 H	0	28.24	8.59
2	177.15	37.7 QP	43.5	-5.8	1.00 H	90	24.45	13.21
3	433.51	37.8 QP	46.0	-8.2	2.00 H	220	19.35	18.47
4	498.99	39.8 QP	46.0	-6.2	1.51 H	46	19.73	20.04
5	600.32	42.6 QP	46.0	-3.5	1.00 H	283	20.30	22.25
6	798.15	41.6 QP	46.0	-4.5	1.24 H	225	16.03	25.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	36.54	31.4 QP	40.0	-8.6	1.25 V	360	17.78	13.65
2	299.71	32.7 QP	46.0	-13.4	1.00 V	331	17.26	15.39
3	365.93	34.2 QP	46.0	-11.8	1.50 V	215	17.35	16.89
4	433.15	36.0 QP	46.0	-10.0	1.00 V	250	17.53	18.47
5	796.83	42.8 QP	46.0	-3.2	1.00 V	0	17.28	25.49
6	953.23	40.6 QP	46.0	-5.5	1.00 V	31	12.83	27.72

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.

ABOVE 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	95.4 PK			1.66 H	258	52.70	42.70
2	*5745.00	86.1 AV			1.66 H	258	43.40	42.70
3	11490.00	63.3 PK	74.0	-10.7	1.41 H	172	13.99	49.31
4	11490.00	48.4 AV	54.0	-5.6	1.41 H	172	-0.91	49.31
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	114.9 PK			1.10 V	94	72.20	42.70
2	*5745.00	104.8 AV			1.10 V	94	62.10	42.70
3	11490.00	65.3 PK	74.0	-8.7	1.40 V	165	15.99	49.31
4	11490.00	52.7 AV	54.0	-1.3	1.40 V	165	3.39	49.31

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	100.6 PK			1.53 H	235	57.84	42.76
2	*5785.00	90.3 AV			1.53 H	235	47.54	42.76
3	11570.00	63.2 PK	74.0	-10.8	1.40 H	173	13.82	49.38
4	11570.00	48.3 AV	54.0	-5.7	1.40 H	173	-1.08	49.38
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	114.6 PK			1.11 V	92	71.84	42.76
2	*5785.00	104.9 AV			1.11 V	92	62.14	42.76
3	11570.00	65.8 PK	74.0	-8.2	1.42 V	48	16.42	49.38
4	11570.00	52.8 AV	54.0	-1.2	1.42 V	48	3.42	49.38

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	99.9 PK			1.50 H	241	57.08	42.82
2	*5825.00	89.8 AV			1.50 H	241	46.98	42.82
3	11650.00	62.8 PK	74.0	-11.2	1.40 H	182	13.45	49.35
4	11650.00	47.9 AV	54.0	-6.1	1.40 H	182	-1.45	49.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	113.6 PK			1.11 V	87	70.78	42.82
2	*5825.00	104.8 AV			1.11 V	87	61.98	42.82
3	11650.00	66.7 PK	74.0	-7.3	1.45 V	47	17.35	49.35
4	11650.00	53.0 AV	54.0	-1.0	1.45 V	47	3.65	49.35

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

802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	101.4 PK			1.53 H	236	58.70	42.70
2	*5745.00	90.6 AV			1.53 H	236	47.90	42.70
3	11490.00	64.0 PK	74.0	-10.0	1.45 H	183	14.69	49.31
4	11490.00	48.5 AV	54.0	-5.5	1.45 H	183	-0.81	49.31
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	115.6 PK			1.11 V	93	72.90	42.70
2	*5745.00	105.1 AV			1.11 V	93	62.40	42.70
3	11490.00	67.5 PK	74.0	-6.5	1.40 V	164	18.19	49.31
4	**11490.00**	**53.4 AV**	**54.0**	**-0.6**	**1.40 V**	**164**	**4.09**	**49.31**

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	100.3 PK			1.51 H	248	57.54	42.76
2	*5785.00	90.0 AV			1.51 H	248	47.24	42.76
3	11570.00	62.9 PK	74.0	-11.1	1.36 H	170	13.52	49.38
4	11570.00	48.1 AV	54.0	-5.9	1.36 H	170	-1.28	49.38
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	113.8 PK			1.11 V	92	71.04	42.76
2	*5785.00	104.8 AV			1.11 V	92	62.04	42.76
3	11570.00	66.4 PK	74.0	-7.6	1.61 V	45	17.02	49.38
4	11570.00	53.2 AV	54.0	-0.8	1.61 V	45	3.82	49.38

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	99.7 PK			1.49 H	254	56.88	42.82
2	*5825.00	89.6 AV			1.49 H	254	46.78	42.82
3	11650.00	62.1 PK	74.0	-11.9	1.40 H	181	12.75	49.35
4	11650.00	47.5 AV	54.0	-6.5	1.40 H	181	-1.85	49.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	115.4 PK			1.10 V	88	72.58	42.82
2	*5825.00	104.4 AV			1.10 V	88	61.58	42.82
3	11650.00	66.7 PK	74.0	-7.3	1.55 V	47	17.35	49.35
4	11650.00	53.0 AV	54.0	-1.0	1.55 V	47	3.65	49.35

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

802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	99.1 PK			1.55 H	233	56.38	42.72
2	*5755.00	87.7 AV			1.55 H	233	44.98	42.72
3	11510.00	63.7 PK	74.0	-10.3	1.17 H	30	14.37	49.33
4	11510.00	49.1 AV	54.0	-4.9	1.17 H	30	-0.23	49.33
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	113.1 PK			1.08 V	102	70.38	42.72
2	*5755.00	103.1 AV			1.08 V	102	60.38	42.72
3	11510.00	65.2 PK	74.0	-8.8	1.61 V	45	15.87	49.33
4	11510.00	52.4 AV	54.0	-1.6	1.61 V	45	3.07	49.33

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	97.6 PK			1.67 H	325	54.83	42.77
2	*5795.00	86.4 AV			1.67 H	325	43.63	42.77
3	11590.00	63.9 PK	74.0	-10.1	1.22 H	43	14.51	49.39
4	11590.00	48.8 AV	54.0	-5.2	1.22 H	43	-0.59	49.39
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	113.8 PK			1.13 V	94	71.03	42.77
2	*5795.00	103.2 AV			1.13 V	94	60.43	42.77
3	11590.00	65.3 PK	74.0	-8.7	1.54 V	44	15.91	49.39
4	11590.00	52.6 AV	54.0	-1.4	1.54 V	44	3.21	49.39

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

Test date: Nov. 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

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

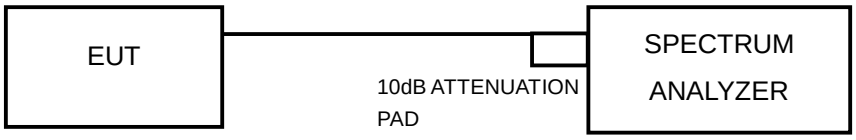
5.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

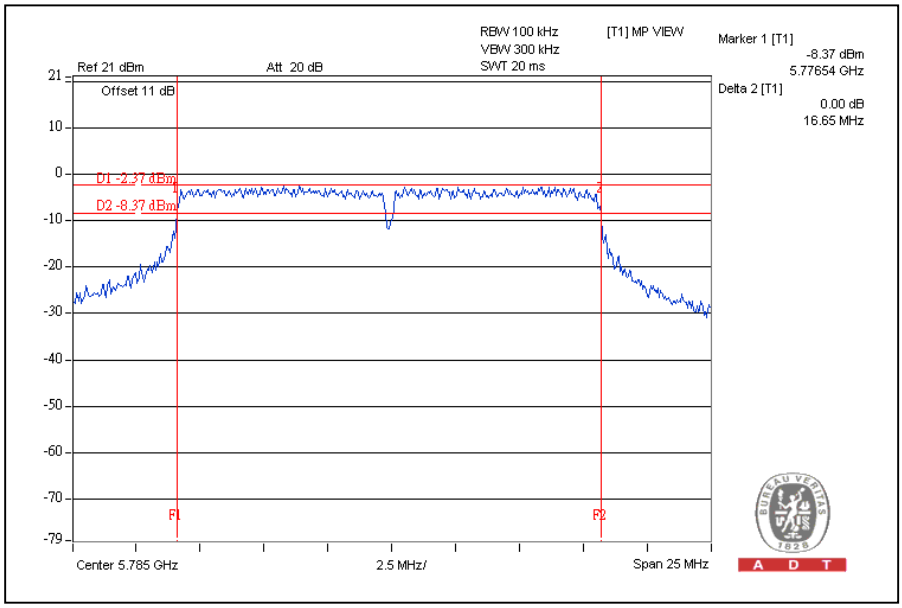
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

5.3.7 TEST RESULTS

802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
149	5745	16.64	16.59	0.5	PASS
157	5785	16.65	16.58	0.5	PASS
165	5825	16.63	16.61	0.5	PASS

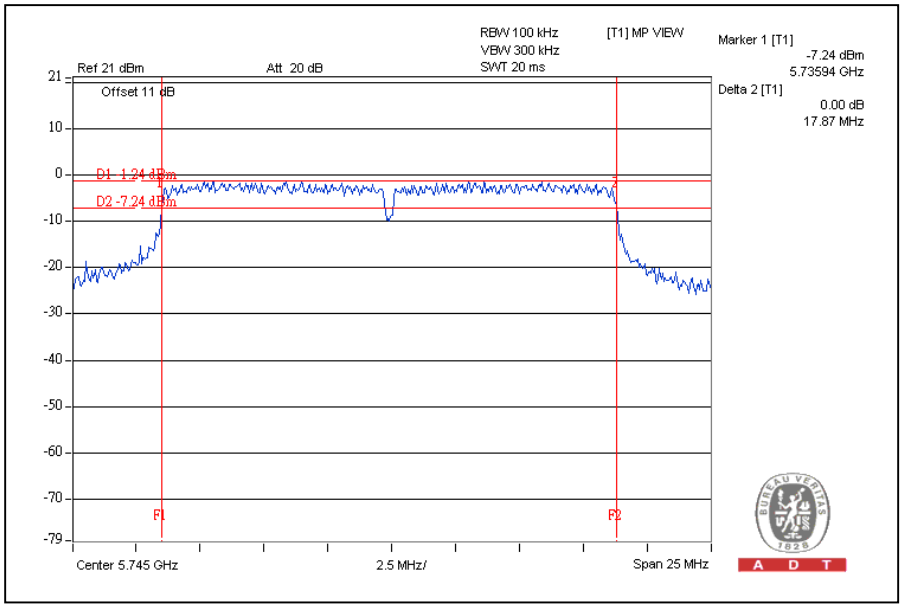
For CHAIN(0)
CH157



802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
149	5745	17.81	17.87	0.5	PASS
157	5785	17.87	17.87	0.5	PASS
165	5825	17.87	17.85	0.5	PASS

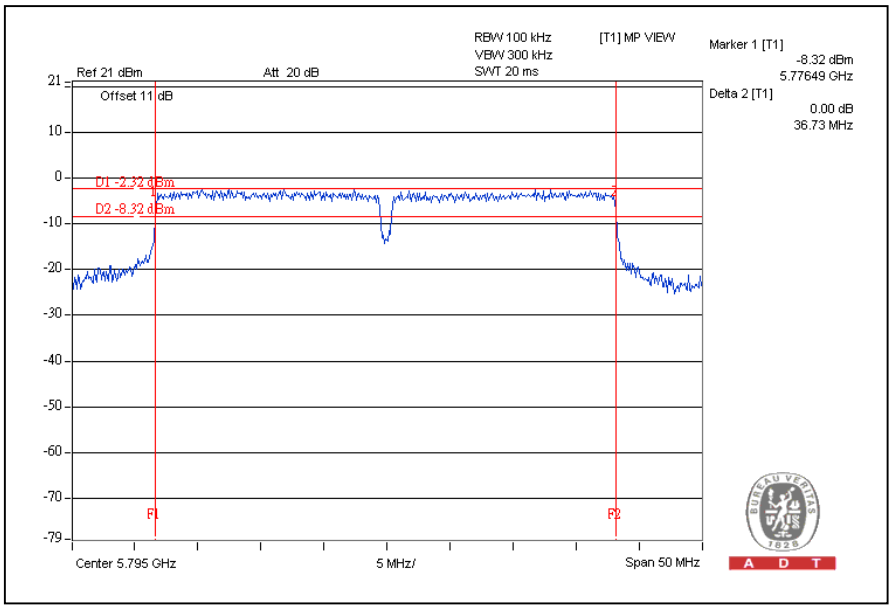
For CHAIN(1)
CH149



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
151	5755	36.64	36.66	0.5	PASS
159	5795	36.67	36.73	0.5	PASS

For CHAIN(1)
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

Test date: Nov. 10, 2011

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

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

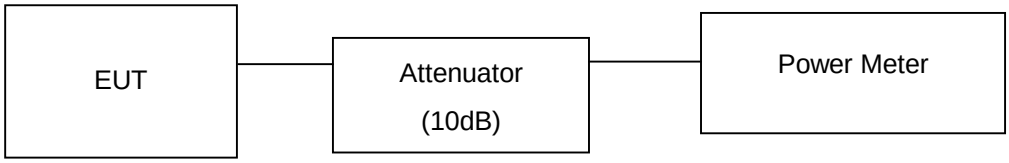
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.4.7 TEST RESULTS

802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
149	5745	19.1	21.4	219.3	23.4	28.5	PASS
157	5785	18.6	21.0	198.3	23.0	28.5	PASS
165	5825	18.1	20.4	174.2	22.4	28.5	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]

Effective Legacy Gain (dBi) = 7.5

The effective legacy gain is 7.5dBi, therefore the limit needs to reduce.

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	19.2	21.8	234.5	23.7	30	PASS
157	5785	19.1	21.6	225.8	23.5	30	PASS
165	5825	18.5	20.8	191.0	22.8	30	PASS

802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)				
151	5755	19.9	22.0	19.9	256.2	24.1	30	PASS
159	5795	20.2	22.7	20.2	290.9	24.6	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

Test date: Nov. 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

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

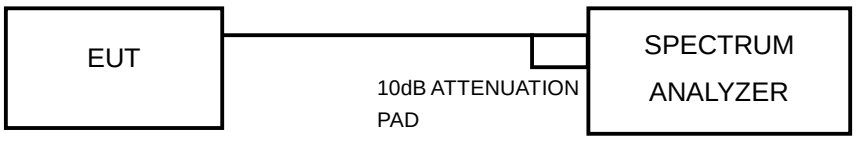
5.5.3 TEST PROCEDURE

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

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-13.7	3.0	-10.7	6.5	PASS
	157	5785	-14.0	3.0	-11.0	6.5	PASS
	165	5825	-14.5	3.0	-11.5	6.5	PASS
1	149	5745	-11.9	3.0	-8.9	6.5	PASS
	157	5785	-12.7	3.0	-9.7	6.5	PASS
	165	5825	-11.9	3.0	-8.9	6.5	PASS

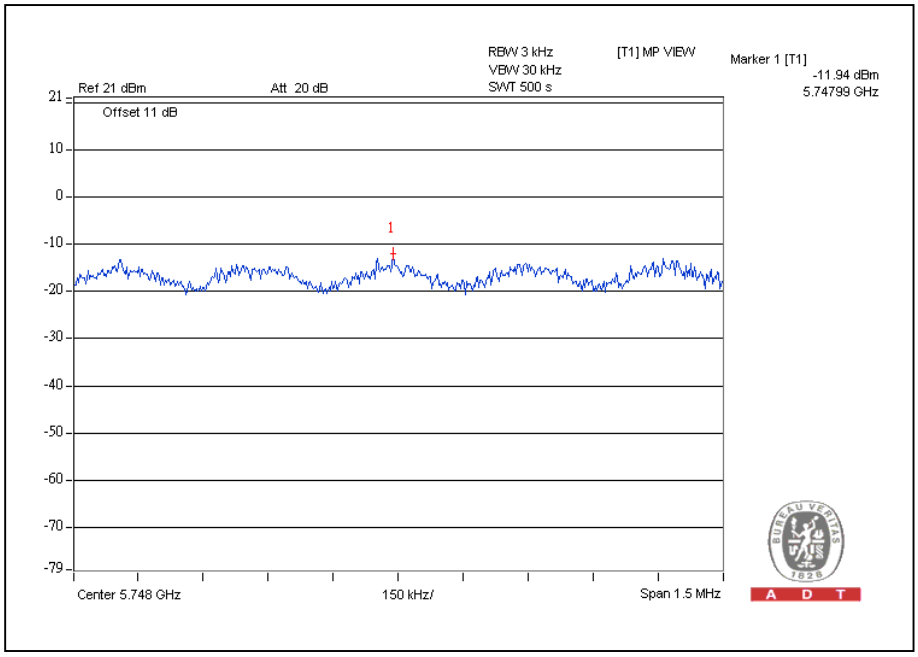
Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$

Effective Legacy Gain (dBi) = 7.5

The effective legacy gain is 7.5dBi, therefore the limit needs to reduce.

For CHAIN(1)

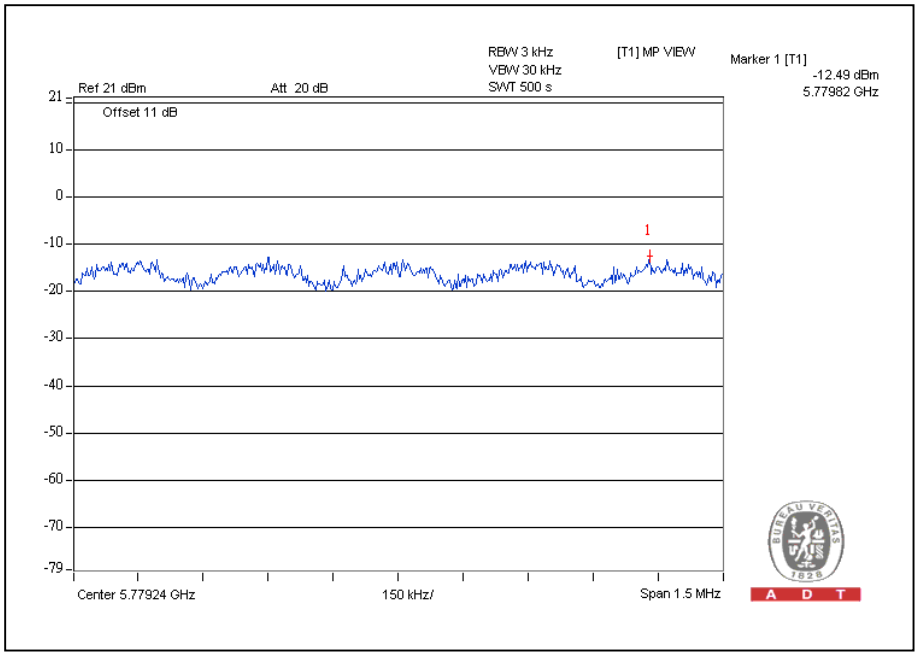
CH149



802.11n (20MHz) OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-13.2	3.0	-10.2	6.5	PASS
	157	5785	-13.1	3.0	-10.1	6.5	PASS
	165	5825	-13.5	3.0	-10.5	6.5	PASS
1	149	5745	-12.7	3.0	-9.7	6.5	PASS
	157	5785	-12.5	3.0	-9.5	6.5	PASS
	165	5825	-12.9	3.0	-9.9	6.5	PASS

For CHAIN(1)
CH157

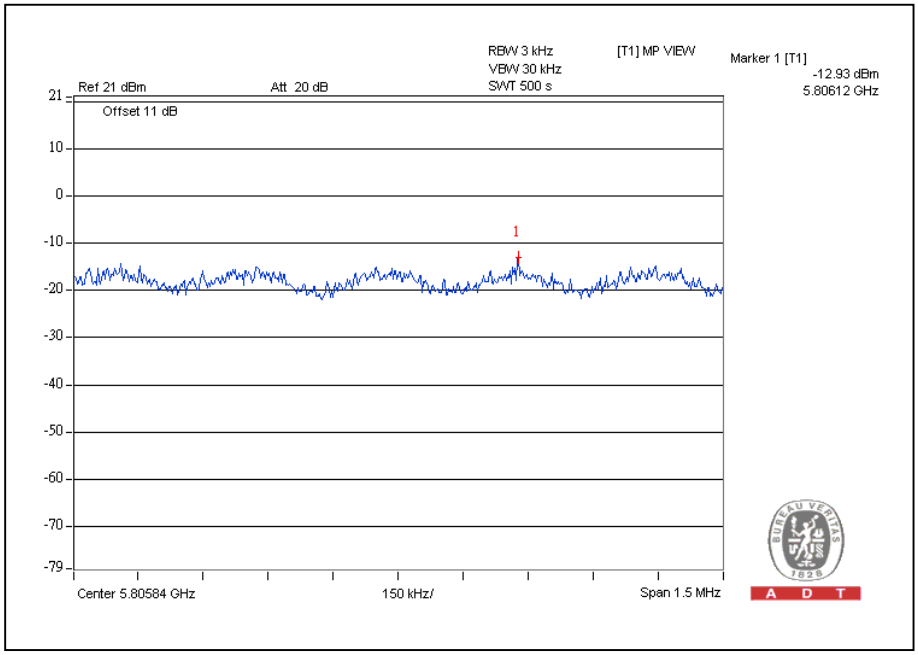


802.11n (40MHz) OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-13.5	3.0	-10.5	6.5	PASS
	159	5795	-13.1	3.0	-10.1	6.5	PASS
1	151	5755	-14.0	3.0	-11.0	6.5	PASS
	159	5795	-12.9	3.0	-9.9	6.5	PASS

For CHAIN(1)

CH159



5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.6.2 TEST INSTRUMENTS

Test date: Nov. 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

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

5.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set RBW of spectrum analyzer to 100 kHz 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.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 EUT OPERATING CONDITION

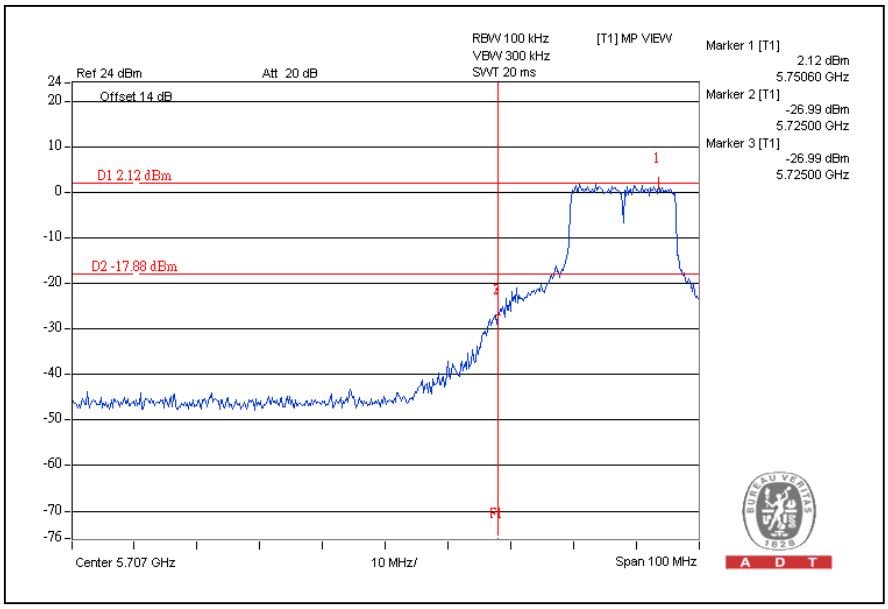
Same as Item 4.3.6

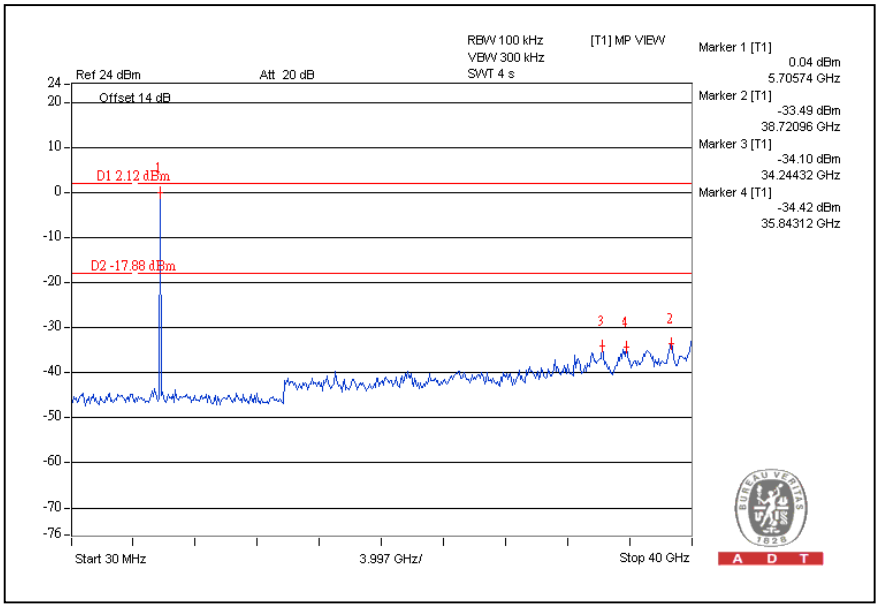
5.6.6 TEST RESULTS

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).

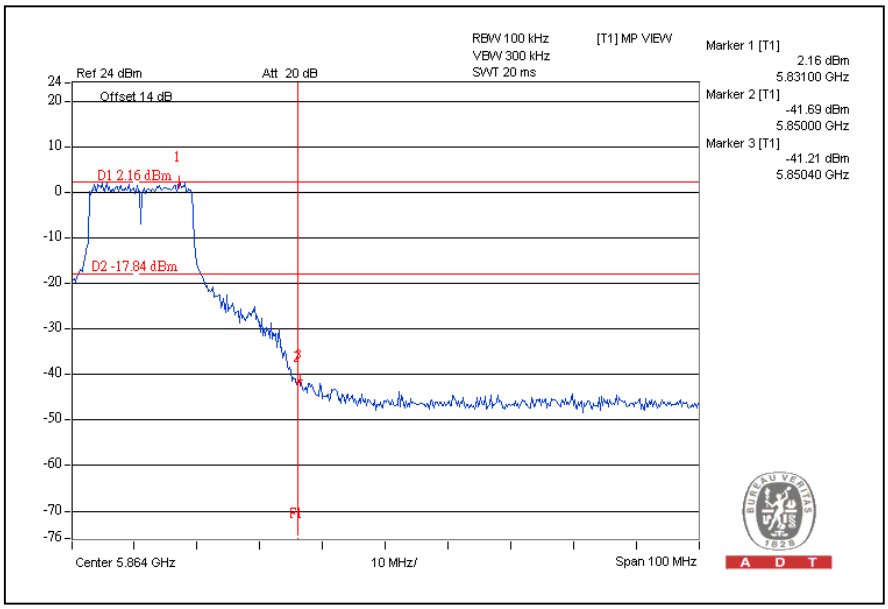
Performing measurements: Measure and add 10 log(N) dB
802.11a OFDM modulation

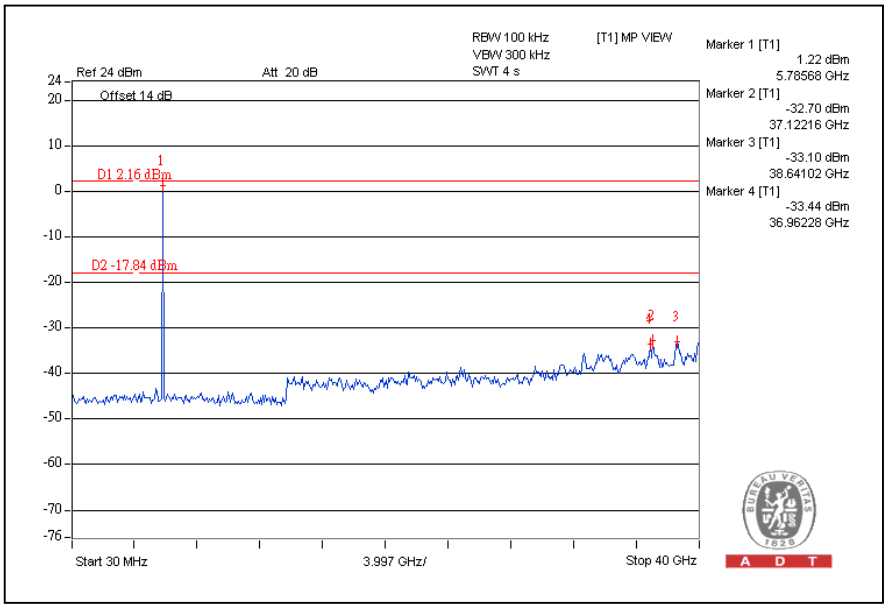
CH149





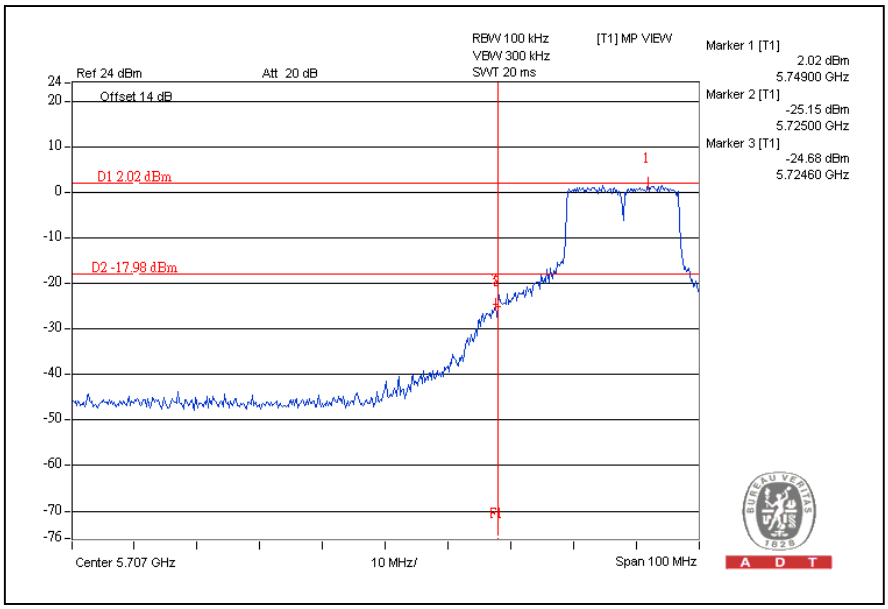
CH165

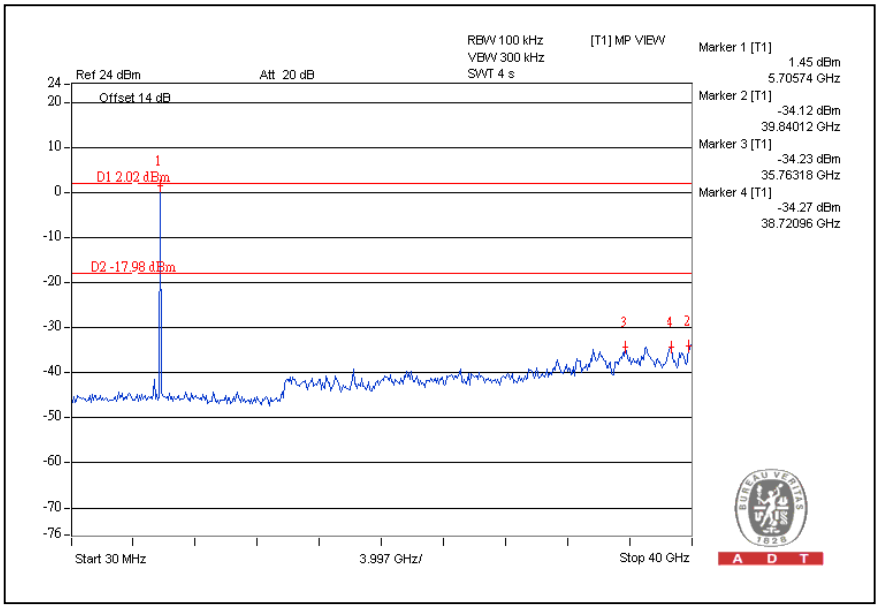

RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
D1 2.16 dBm
D2 -17.84 dBm
Marker 1 [T1]
2.16 dBm
5.83100 GHz
Marker 2 [T1]
-41.69 dBm
5.85000 GHz
Marker 3 [T1]
-41.21 dBm
5.85040 GHz
Center 5.864 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 4 s
[T1] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
D1 2.16 dBm
D2 -17.84 dBm
Marker 1 [T1]
1.22 dBm
5.78568 GHz
Marker 2 [T1]
-32.70 dBm
37.12216 GHz
Marker 3 [T1]
-33.10 dBm
38.64102 GHz
Marker 4 [T1]
-33.44 dBm
36.96228 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

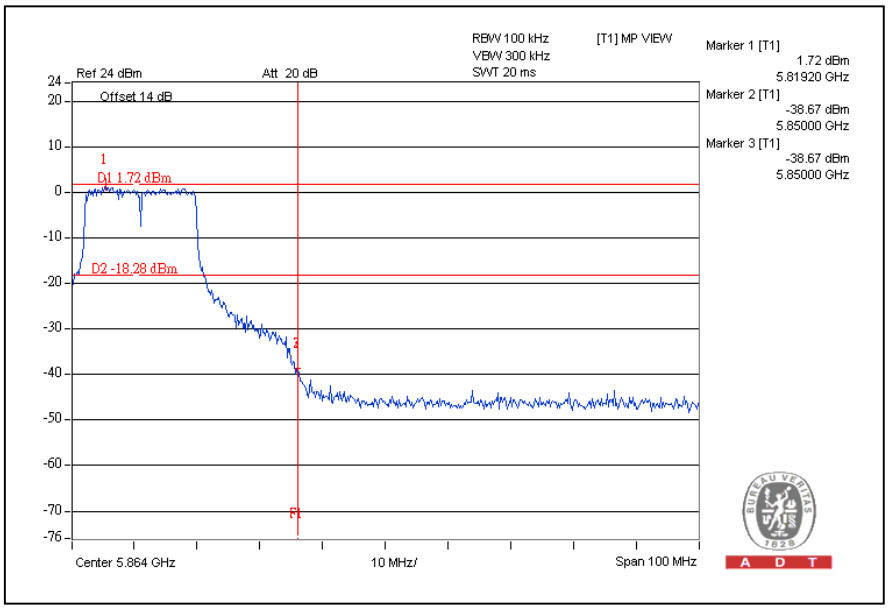
802.11n (20MHz) OFDM MODULATION:

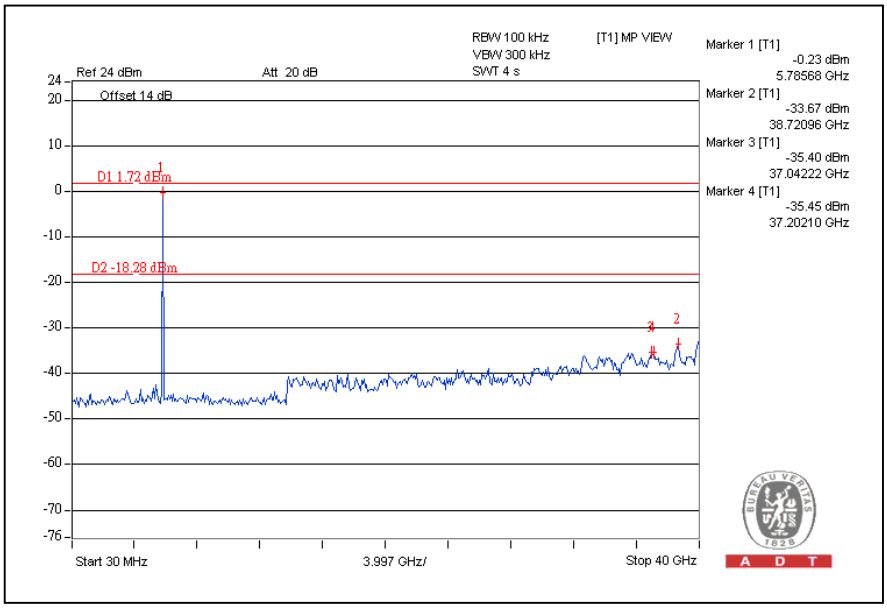
CH149





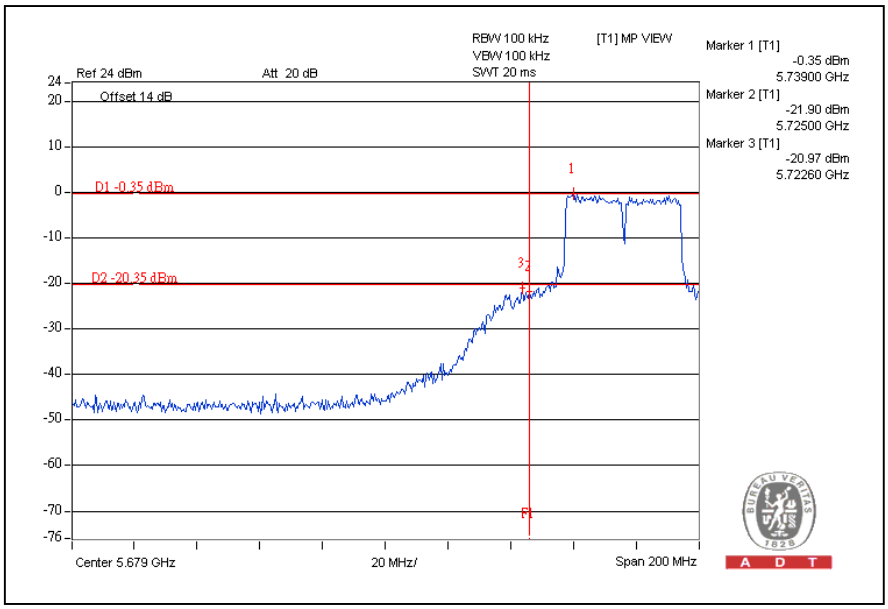
CH165

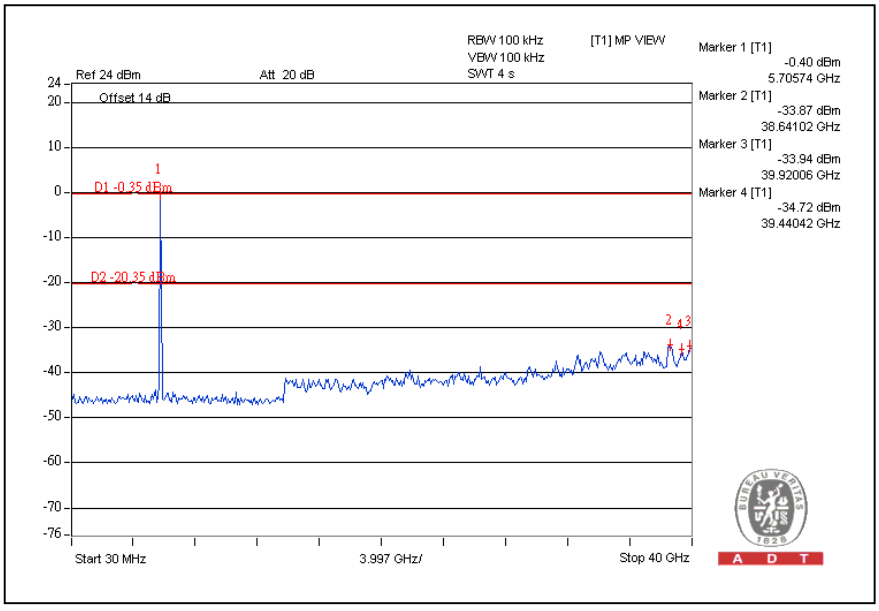

RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
D1 1.72 dBm
D2 -18.28 dBm
Marker 1 [T1]
1.72 dBm
5.81920 GHz
Marker 2 [T1]
-38.67 dBm
5.85000 GHz
Marker 3 [T1]
-38.67 dBm
5.85000 GHz
Center 5.864 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 4 s
[T1] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
D1 1.72 dBm
D2 -18.28 dBm
Marker 1 [T1]
-0.23 dBm
5.78568 GHz
Marker 2 [T1]
-33.67 dBm
38.72096 GHz
Marker 3 [T1]
-35.40 dBm
37.04222 GHz
Marker 4 [T1]
-35.45 dBm
37.20210 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

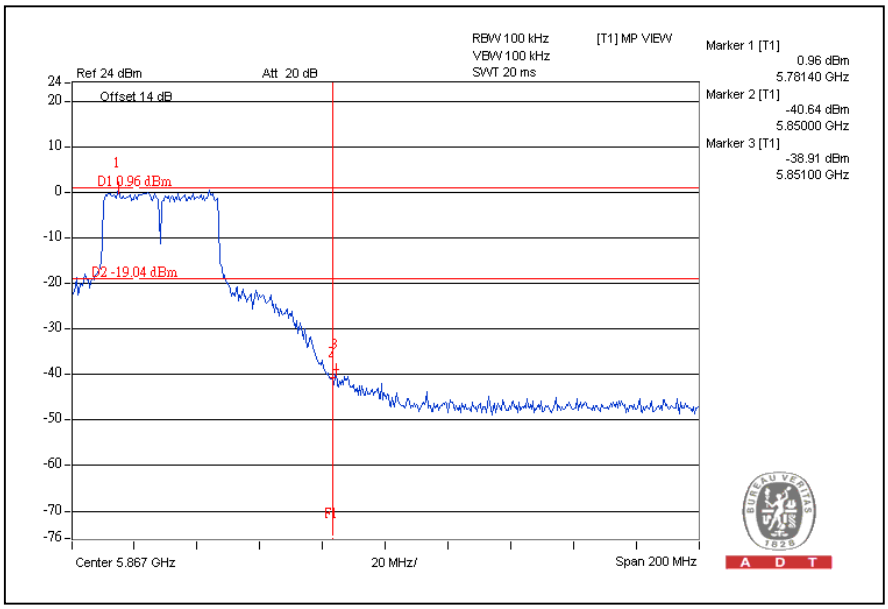
802.11n (40MHz) OFDM MODULATION:

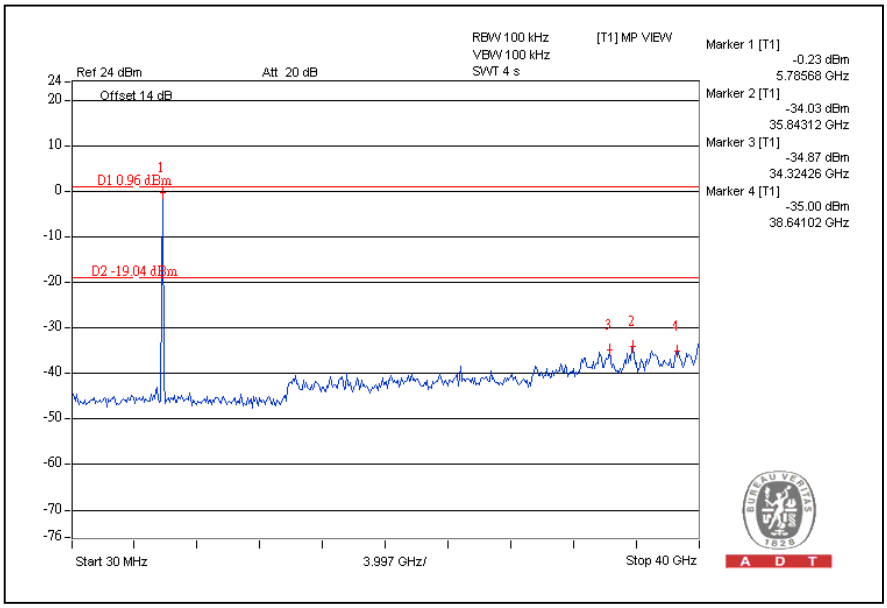
CH151





CH159


RBW 100 kHz
VBW 100 kHz
SWT 20 ms
[T1] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
D1 0.96 dBm
D2 -19.04 dBm
Marker 1 [T1]
0.96 dBm
5.78140 GHz
Marker 2 [T1]
-40.64 dBm
5.85000 GHz
Marker 3 [T1]
-38.91 dBm
5.85100 GHz
Center 5.867 GHz
20 MHz/
Span 200 MHz


RBW 100 kHz
VBW 100 kHz
SWT 4 s
[T1] MP VIEW
Ref 24 dBm
Att 20 dB
Offset 14 dB
D1 0.96 dBm
D2 -19.04 dBm
Marker 1 [T1]
-0.23 dBm
5.78568 GHz
Marker 2 [T1]
-34.03 dBm
35.84312 GHz
Marker 3 [T1]
-34.87 dBm
34.32426 GHz
Marker 4 [T1]
-35.00 dBm
38.64102 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

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

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

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

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

Email: service.adt@tw.bureauveritas.com
Web Site: www.adt.com.tw

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

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 ---