FCC TEST REPORT (15.247)

REPORT NO.:	RF980606H02A
MODEL NO.:	E3000
RECEIVED:	June 06, 2009
TESTED:	June 23 to July 03, 2009
ISSUED:	Dec. 16, 2009

APPLICANT:	Cisco-Linksys LLC
ADDRESS:	121 Theory Drive Irvine, CA 92617(USA)

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

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1. CERTIFICATION

PRODUCT:	Simultaneous Dual-Band Wireless-N Gigabit Router
BRAND NAME:	Linksys
MODEL NO.:	E3000
TEST SAMPLE:	ENGINEERING SAMPLE
TESTED:	June 23 to July 03, 2009
APPLICANT:	Cisco-Linksys LLC
STANDARDS:	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment (Model: E3000) 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 : Carol Liao , **DATE:** Dec. 16, 2009
(Carol Liao, Specialist)

TECHNICAL ACCEPTANCE : , **DATE:** Dec. 16, 2009
(Hank Chung, Deputy Manager)

APPROVED BY : , **DATE:** Dec. 16, 2009
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 802.11b & g, 2412~2462MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.39dB 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 -0.51dB At 2483.8MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

For 802.11a, 5725~5850MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.90dB at 0.187MHz
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 -0.50dB at 11650MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

NOTE:

1. The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.85GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835MHz and 5.725~5.85GHz. 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)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Simultaneous Dual-Band Wireless-N Gigabit Router
MODEL NO.	E3000
FCC ID	Q87-E3000
POWER SUPPLY	DC 12V from power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps 802.11a: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps Draft 802.11n (20MHz, 800ns GI): 130 / 117 / 104 / 78 / 52 / 39 / 26/ 13 / 65 / 58.5 / 52 / 39 / 26 / 19.5 /13 / 6.5Mbps Draft 802.11n (40MHz, 800ns GI): 270 / 243 / 216 / 162 / 108 /81 / 54 / 27 /135 / 121.5 / 108 / 81 /54 / 40.5 / 27 / 13.5Mbps
FREQUENCY RANGE	**For 15.407** 802.11a: 5.18 ~ 5.24GHz
	For 15.247 802.11b & 802.11g: 2412 ~ 2462MHz 802.11a: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	**For 15.407** 4 for 802.11a, draft 802.11n (20MHz) 2 for draft 802.11n (40MHz)
	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz) **For 15.247(5GHz)** 5 for 802.11a, draft 802.11n (20MHz) 2 for draft 802.11n (40MHz)

MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 32.4mW draft 802.11n (20MHz): 32.9mW draft 802.11n (40MHz): 42.3mW **For 15.247(2.4GHz)** 802.11b: 398.1mW 802.11g: 691.8mW draft 802.11n (20MHz): 979.8mW draft 802.11n (40MHz): 583.8mW **For 15.247(5GHz)** 802.11a: 398.1mW draft 802.11n (20MHz): 789.7mW draft 802.11n (40MHz): 743.9mW
ANTENNA TYPE	Please see note 1
DATA CABLE	RJ45 cable x 1 (Unshielded, 1.8m)
I/O PORT	LAN port x 4 ,WAN port x 1, USB port x 1
ASSOCIATED DEVICES	NA

NOTE:

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

Transmitter / Circuit	Antenna Gain		Antenna Type	Connector
	For 2.4GHz Gain (dBi)	For 5GHz Gain (dBi)		
Chain(0)	4	3.5	PIFA	NA
Chain(1)	4	3.5	PIFA	NA
Chain(2)	4	3.5	PIFA	NA

2. There are two power adapters provided to this EUT, please refer to the following table:

Adapter	Brand	Model No.	Spec.
Adapter 1	Bestec	NA0241WAA	Input: 100-240V, 0.5A, 50-60Hz Output: DC12V, 2A DC output cable (unshielded, 1.5m)
Adapter 2	LEADER	MU24-B120200-A1	Input: 100-240V, 0.5A, 50-60Hz Output: DC12V, 2A DC output cable (unshielded, 1.5m)

For radiated test, the EUT was pre-tested with above adapters, the worse case was found in adapter 1. Therefore only the test data of the adapter was recorded in this report.

3. For radiated test, The EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Level-set
Mode B	Tower-set

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

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

5. The EUT is 2 * 3 spatial MIMO (2Tx & 3Rx) without beam forming function. The antenna configurations are two transmitter antennas and three receiver antennas, as there are 3 PIFA antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 3 antennas. The 11a and 11bg legacy mode is limited to single transmitter only.

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

7. The EUT complies with draft 802.11n standards and backwards compatible with 802. 11a, 802.11b, 802.11g products.

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

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

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

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

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

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

Operated in 5725 ~ 5850MHz band:

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

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

Two channels are provided for draft 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	
-	√	√	√	√	-

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

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

ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	CHAIN(0) (TX)	CHAIN(1) (TX)	CHAIN(2) (TX)
A	802.11 b	√		
B			√	
C	802.11 g	√		
D			√	
E	802.11 a	√		
F			√	
G	DRAFT 802.11n(20MHz) for MCS0~15	√	√	
H			√	√
I		√		√
J	DRAFT 802.11n(40MHz) for MCS0~15	√	√	
K			√	√
N		√		√

Note:
1. The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
2. Antenna 1 ~3 are PIFA antennas.
3. We choose the worst mode (decided by pre-test) for final test. Mode A, C, E, G and J the worst modes, was selected as representative mode for this report.

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX COMBINATION
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	G
For 5 GHz Draft 802.11n (20MHz)	149 to 165	149	OFDM	BPSK	6.5	G

☒ The EUT was tested with the following test modes:

Test Mode	Description
Mode A	Adapter 1
Mode B	Adapter 2

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX COMBINATION
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	G
For 5 GHz Draft 802.11n (20MHz)	149 to 165	149	OFDM	BPSK	6.5	G

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

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)	TX COMBINATION
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 11	OFDM	BPSK	6	C
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	G
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5	J
802.11a	149 to 165	149, 165	OFDM	BPSK	6	E
For 5 GHz Draft 802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	6.5	G
For 5 GHz Draft 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	J

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	G
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	J
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	E
For 5 GHz Draft 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	G
For 5 GHz Draft 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	J

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Simultaneous Dual-Band Wireless-N Gigabit Router. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

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

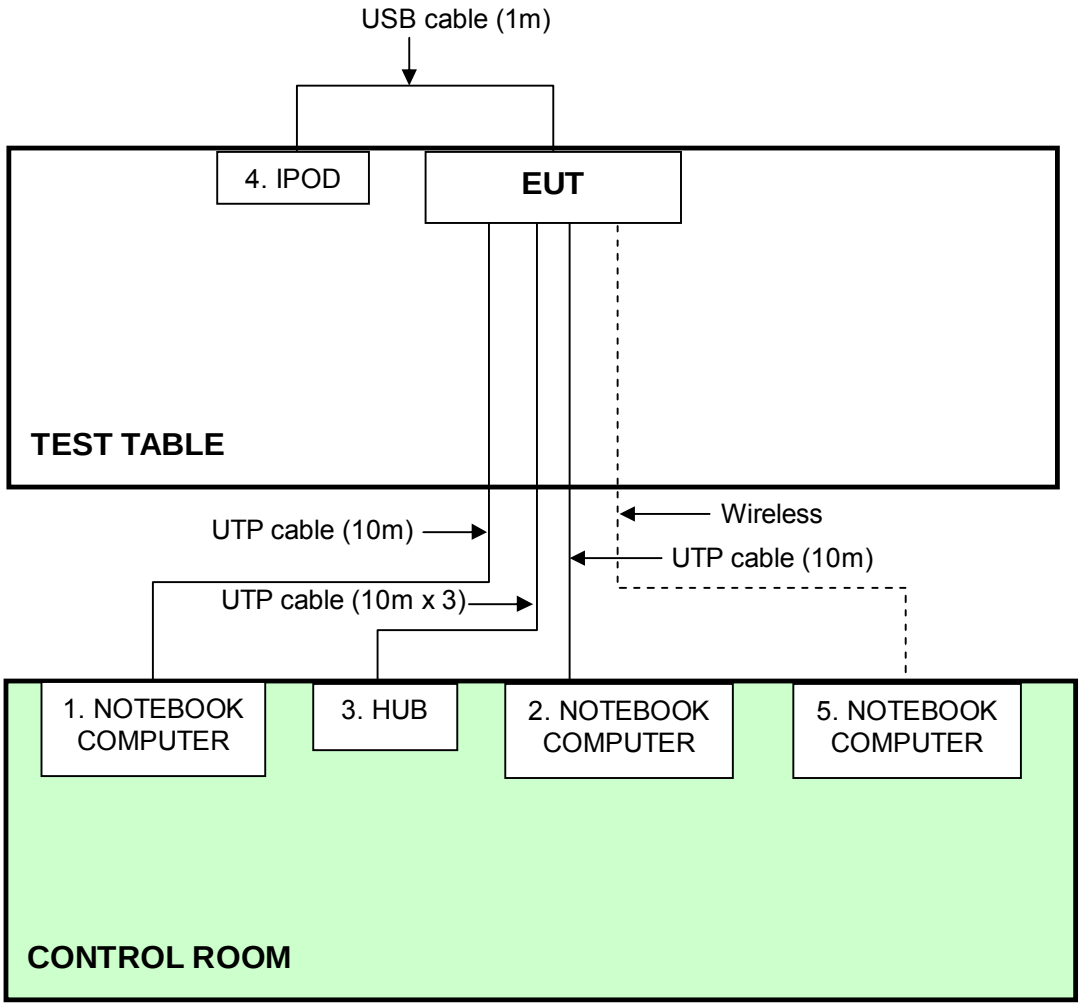
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70166-5CA-0448	PIW632500516610
3	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC
4	IPOD	Apple	A1137	6U6078FMUPR	FCC DoC
5	NOTEBOOK COMPUTER (For conducted emission test only)	DELL	PP05L	CN-04Y212-48643-38E-0145	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable (Unshielded, 10m)
2	UTP cable (Unshielded, 10m)
3	UTP cable (Unshielded, 10m)
4	1 m shielded cable, terminated with USB connector, w/o core.
5	Wireless

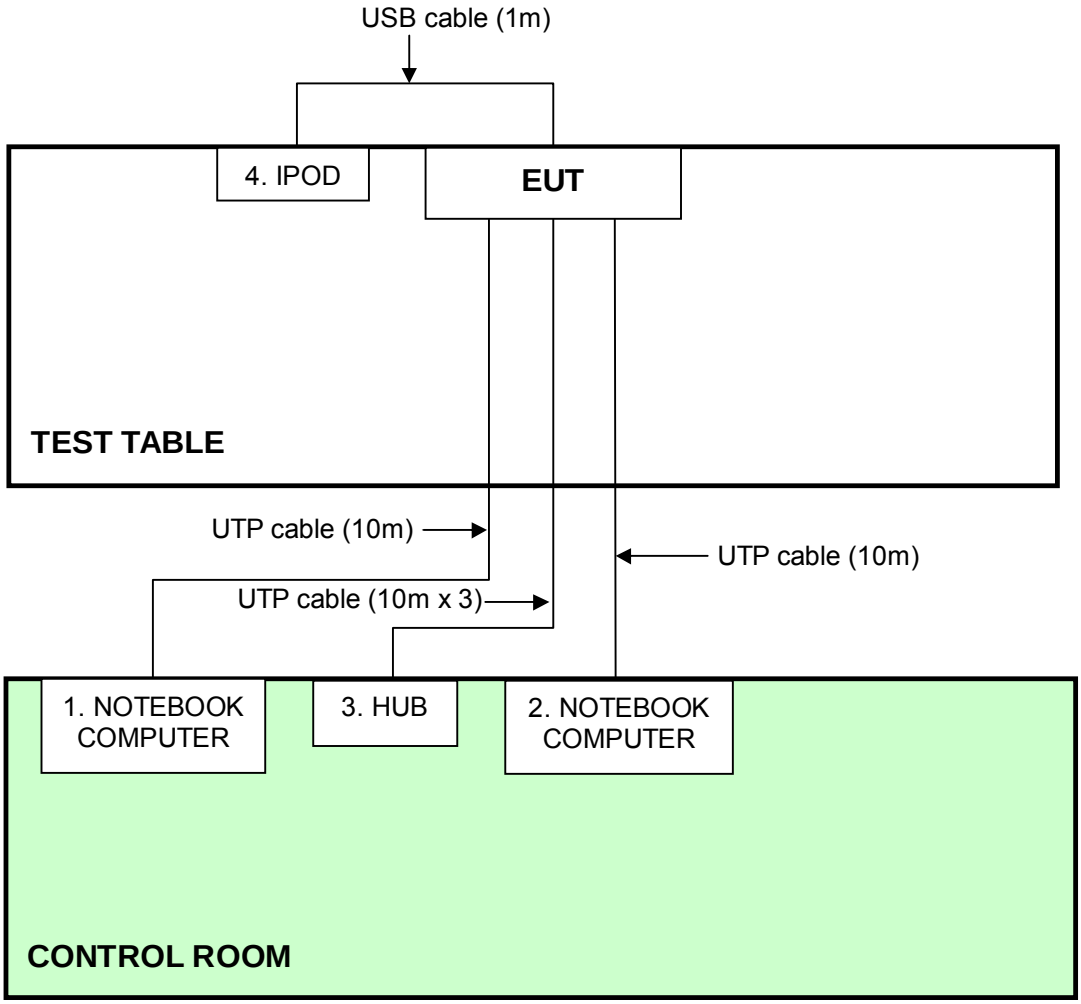
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission test:



For other test:



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

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 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.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 05, 2009	Mar. 04, 2010
Line-Impedance Stabilization Network (for EUT)	KNW-407	8-1395-12	May 04, 2009	May 03, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 08, 2009	June 07, 2010
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec 15, 2008	Dec 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_ V7.3.7	NA	NA	NA

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

4.1.3 TEST PROCEDURES

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

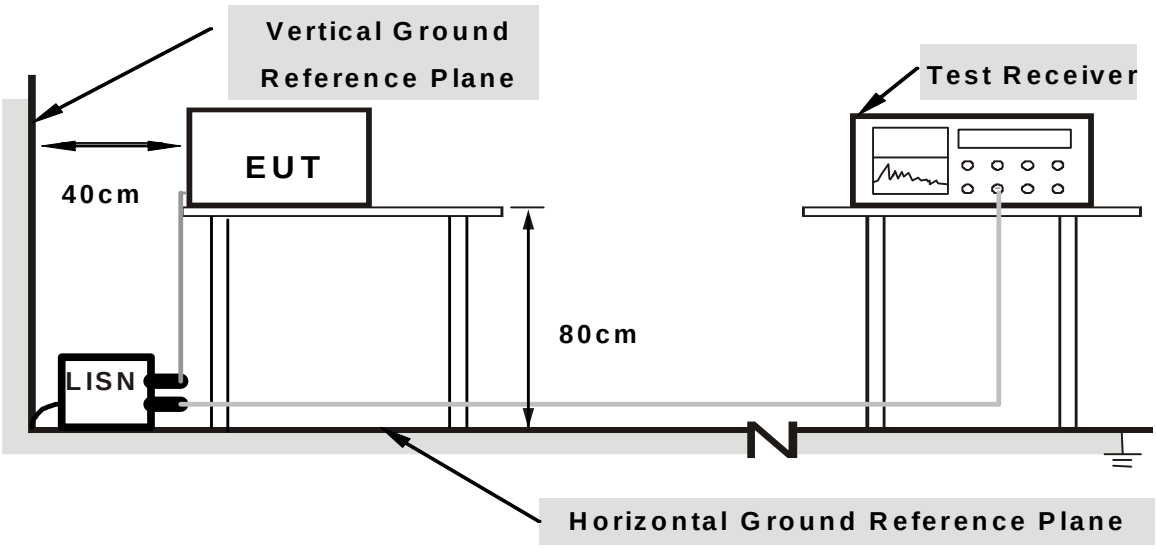
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared other computer systems (support units 1 ~ 3, 5) to act as communication partners and placed them outside of testing area.
3. The communication partners run test program “Ping.exe” to enable EUT under transmission/receiving condition continuously via UTP cables and wireless transmission.

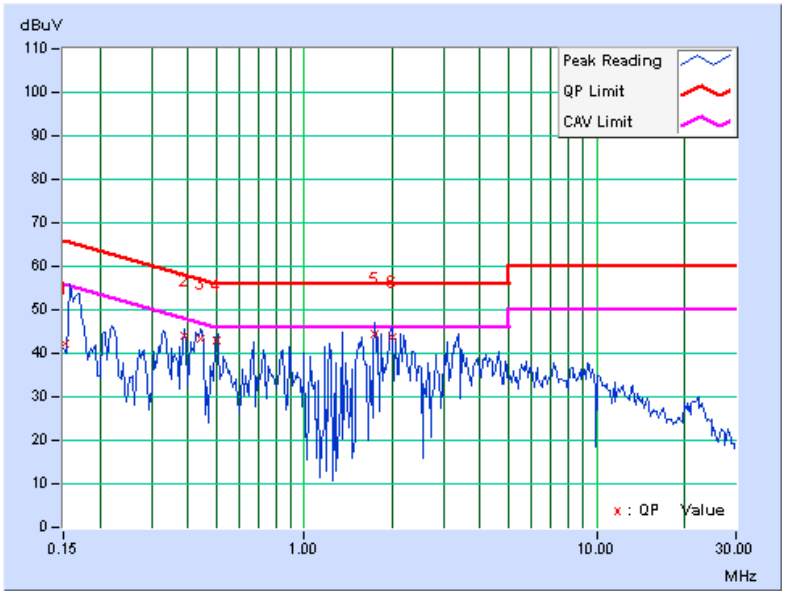
4.1.7 TEST RESULTS-Adapter 1

DRAFT 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line (L)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6.5Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 965hPa	TESTED BY	Timmy Hu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.152	0.27	41.86	-	42.13	-	65.87	55.87	-23.74	-
2	0.388	0.09	43.81	-	43.90	-	58.10	48.10	-14.21	-
3	0.443	0.08	43.09	-	43.17	-	57.01	47.01	-13.84	-
4	0.500	0.08	43.00	-	43.08	-	56.00	46.00	-12.92	-
5	1.750	0.07	44.45	-	44.52	-	56.00	46.00	-11.48	-
6	2.000	0.07	43.64	-	43.71	-	56.00	46.00	-12.29	-

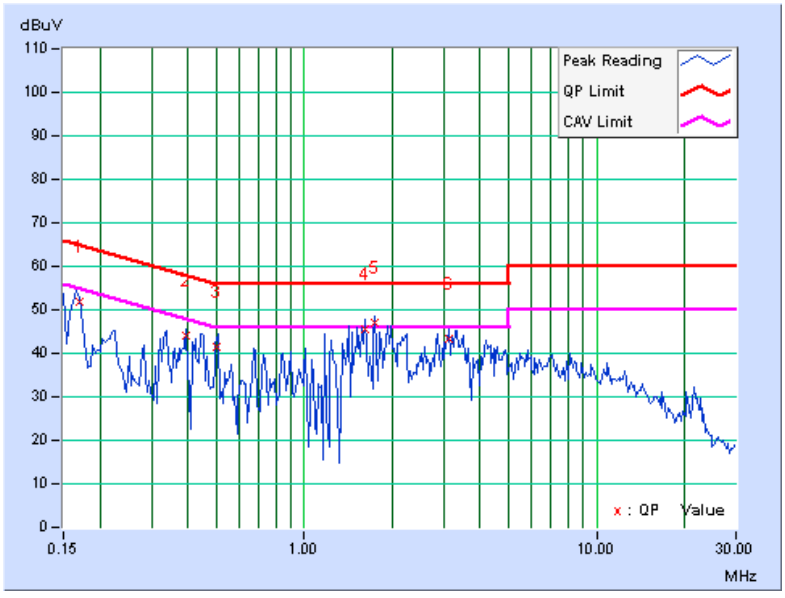
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Neutral (N)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6.5Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 965hPa	TESTED BY	Timmy Hu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.24	51.63	-	51.87	-	64.98	54.98	-13.12	-
2	0.392	0.09	43.87	-	43.96	-	58.02	48.02	-14.05	-
3	0.500	0.09	41.22	-	41.31	-	56.00	46.00	-14.69	-
4	1.621	0.09	45.32	-	45.41	-	56.00	46.00	-10.59	-
5	1.750	0.09	46.97	34.83	47.06	34.92	56.00	46.00	-8.94	-11.08
6	3.137	0.13	43.06	-	43.19	-	56.00	46.00	-12.81	-

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



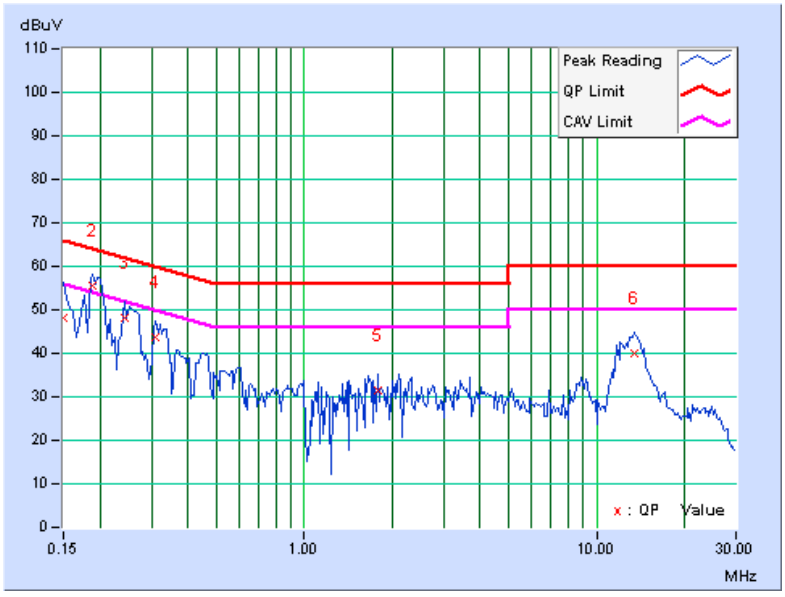
4.1.8 TEST RESULTS-Adapter 2

DRAFT 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	**PHASE**	Line (L)
MODULATION TYPE	BPSK	**6dB BANDWIDTH**	9 kHz
TRANSFER RATE	6.5Mbps	**INPUT POWER**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 965hPa	**TESTED BY**	Timmy Hu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.28	47.76	-	48.04	-	66.00	56.00	-17.96	-
2	**0.189**	**0.19**	**55.49**	**42.14**	**55.68**	**42.33**	**64.08**	**54.08**	**-8.39**	**-11.74**
3	0.244	0.15	48.09	-	48.24	-	61.97	51.97	-13.73	-
4	0.310	0.12	43.70	-	43.82	-	59.97	49.97	-16.15	-
5	1.777	0.07	31.23	-	31.30	-	56.00	46.00	-24.70	-
6	13.512	0.32	39.86	-	40.18	-	60.00	50.00	-19.82	-

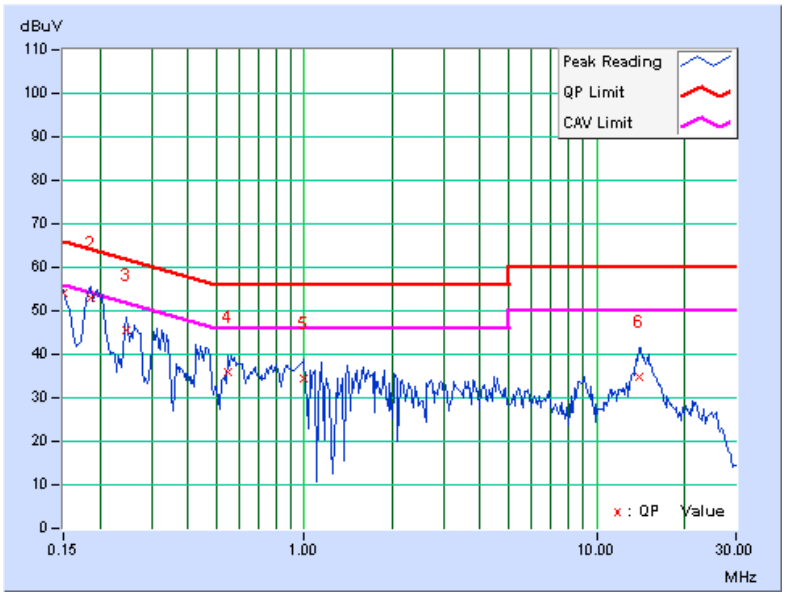
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Neutral (N)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6.5Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 965hPa	TESTED BY	Timmy Hu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.28	53.94	-	54.22	-	66.00	56.00	-11.78	-
2	0.185	0.21	52.81	-	53.02	-	64.25	54.25	-11.23	-
3	0.248	0.16	45.56	-	45.72	-	61.84	51.84	-16.12	-
4	0.548	0.09	35.91	-	36.00	-	56.00	46.00	-20.00	-
5	0.998	0.08	34.41	-	34.49	-	56.00	46.00	-21.51	-
6	14.059	0.36	34.39	-	34.75	-	60.00	50.00	-25.25	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 9, 2008	Dec. 8, 2009
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 9, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 9, 2008	Sep. 8, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
R&S Loop Antenna	HFH2-Z2	100070	Jan. 14, 2008	Jan. 13, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 15, 2008	Aug. 14, 2009
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	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, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

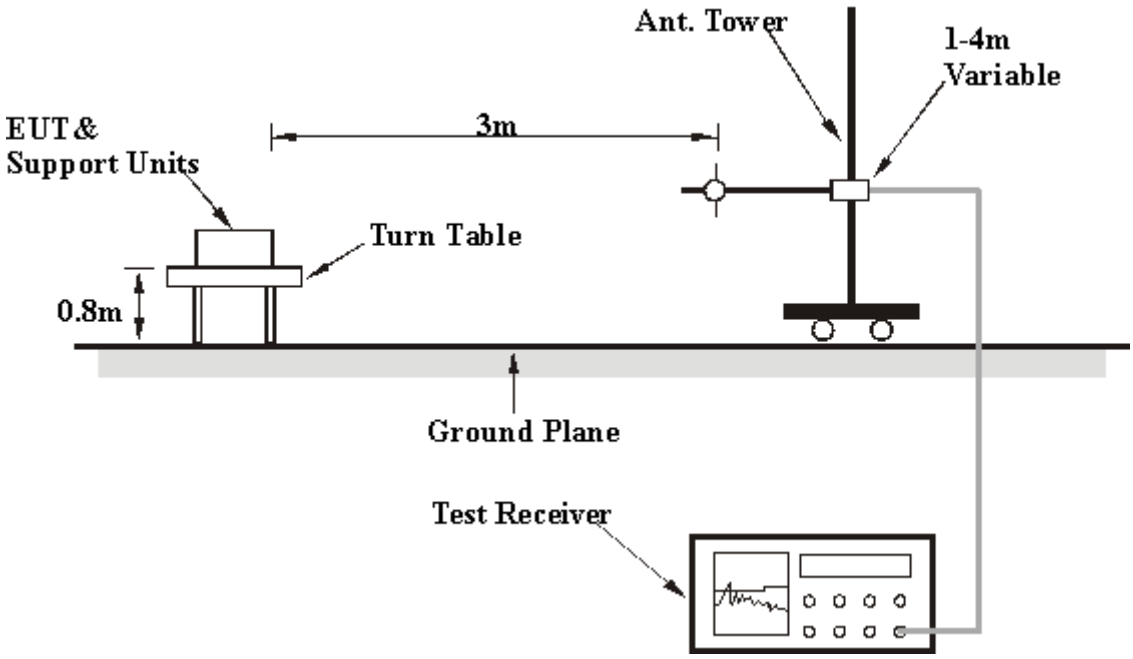
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared other computer systems (support units 1 ~ 3) to act as communication partners and placed them outside of testing area.
3. The communication partner runs test program" MFGTEST" to enable EUT under transmission condition continuously at specific channel frequency via UTP cables.

Below 1GHz Test Data

4.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	30.0deg. C, 61.0%RH 965hPa	TESTED BY	Eric Lee

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	125.00	25.46 QP	43.50	-18.04	1.45 H	139	12.39	13.07
2	200.00	24.88 QP	43.50	-18.62	1.56 H	106	12.49	12.39
3	250.00	40.99 QP	46.00	-5.01	1.00 H	89	26.74	14.25
4	375.00	36.14 QP	46.00	-9.86	1.00 H	211	17.33	18.81
5	500.01	35.49 QP	46.00	-10.51	1.62 H	224	13.00	22.49
6	625.00	38.48 QP	46.00	-7.52	1.81 H	114	13.20	25.28
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	125.00	28.82 QP	43.50	-14.68	1.05 V	167	15.75	13.07
2	200.01	24.25 QP	43.50	-19.25	1.29 V	334	11.86	12.39
3	240.00	24.64 QP	46.00	-21.36	1.73 V	216	10.76	13.88
4	250.00	31.74 QP	46.00	-14.26	1.47 V	221	17.49	14.25
5	375.01	36.47 QP	46.00	-9.53	1.73 V	14	17.66	18.81
6	500.01	33.66 QP	46.00	-12.34	1.97 V	146	11.17	22.49
7	625.00	40.46 QP	46.00	-5.54	1.75 V	27	15.18	25.28
8	875.00	43.81 QP	46.00	-2.19	1.11 V	355	14.52	29.29

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 Test Data

4.2.8 TEST RESULTS

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	25.0deg. C, 72.0%RH 965hPa	TESTED BY	Eric Lee

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	62.48 PK	74.00	-11.52	1.40 H	102	32.42	30.06
2	2390.00	52.11 AV	54.00	-1.89	1.40 H	102	22.05	30.06
3	*2412.00	115.83 PK			1.66 H	102	85.68	30.15
4	*2412.00	111.80 AV			1.66 H	102	81.65	30.15
5	4824.00	53.63 PK	74.00	-20.37	1.38 H	226	18.17	35.46
6	4824.00	47.85 AV	54.00	-6.15	1.38 H	226	12.39	35.46
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	59.70 PK	74.00	-14.30	1.34 V	266	29.64	30.06
2	2390.00	48.98 AV	54.00	-5.02	1.34 V	266	18.92	30.06
3	*2412.00	109.00 PK			1.22 V	38	78.85	30.15
4	*2412.00	104.86 AV			1.22 V	38	74.71	30.15
5	4824.00	53.11 PK	74.00	-20.89	1.12 V	221	17.65	35.46
6	4824.00	46.63 AV	54.00	-7.37	1.12 V	221	11.17	35.46

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	25.0deg. C, 72.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	117.62 PK			1.68 H	76	87.38	30.24
2	*2437.00	113.33 AV			1.68 H	76	83.09	30.24
3	2483.50	62.67 PK	74.00	-11.33	1.70 H	132	32.24	30.43
4	2483.50	51.42 AV	54.00	-2.58	1.70 H	132	20.99	30.43
5	4874.00	55.61 PK	74.00	-18.39	1.82 H	312	20.06	35.55
6	4874.00	50.48 AV	54.00	-3.52	1.82 H	312	14.93	35.55
7	7311.00	61.08 PK	74.00	-12.92	1.70 H	56	19.04	42.04
8	7311.00	52.77 AV	54.00	-1.23	1.70 H	56	10.73	42.04
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	107.14 PK			1.80 V	288	76.90	30.24
2	*2437.00	104.02 AV			1.80 V	288	73.78	30.24
3	4874.00	55.22 PK	74.00	-18.78	1.17 V	310	19.67	35.55
4	4874.00	49.11 AV	54.00	-4.89	1.17 V	310	13.56	35.55
5	7311.00	58.22 PK	74.00	-15.78	1.16 V	173	16.18	42.04
6	7311.00	46.29 AV	54.00	-7.71	1.16 V	173	4.25	42.04

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

2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
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	25.0deg. C, 72.0%RH 965hPa	TESTED BY	Eric Lee

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	115.43 PK			1.65 H	143	85.09	30.34
2	*2462.00	111.67 AV			1.65 H	143	81.33	30.34
3	2483.50	64.74 PK	74.00	-9.26	1.67 H	103	34.31	30.43
4	2483.50	53.19 AV	54.00	-0.81	1.67 H	103	22.76	30.43
5	4924.00	53.11 PK	74.00	-20.89	1.74 H	289	17.48	35.63
6	4924.00	47.11 AV	54.00	-6.89	1.74 H	289	11.48	35.63
7	7386.00	59.75 PK	74.00	-14.25	1.52 H	73	17.52	42.23
8	7386.00	52.17 AV	54.00	-1.83	1.52 H	73	9.94	42.23
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	108.64 PK			1.80 V	152	78.30	30.34
2	*2462.00	104.52 AV			1.80 V	152	74.18	30.34
3	2483.50	58.31 PK	74.00	-15.69	1.39 V	158	27.88	30.43
4	2483.50	46.39 AV	54.00	-7.61	1.39 V	158	15.96	30.43
5	4924.00	54.65 PK	74.00	-19.35	1.18 V	229	19.02	35.63
6	4924.00	48.67 AV	54.00	-5.33	1.18 V	229	13.04	35.63
7	7386.00	57.84 PK	74.00	-16.16	1.17 V	200	15.61	42.23
8	7386.00	45.91 AV	54.00	-8.09	1.17 V	200	3.68	42.23

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

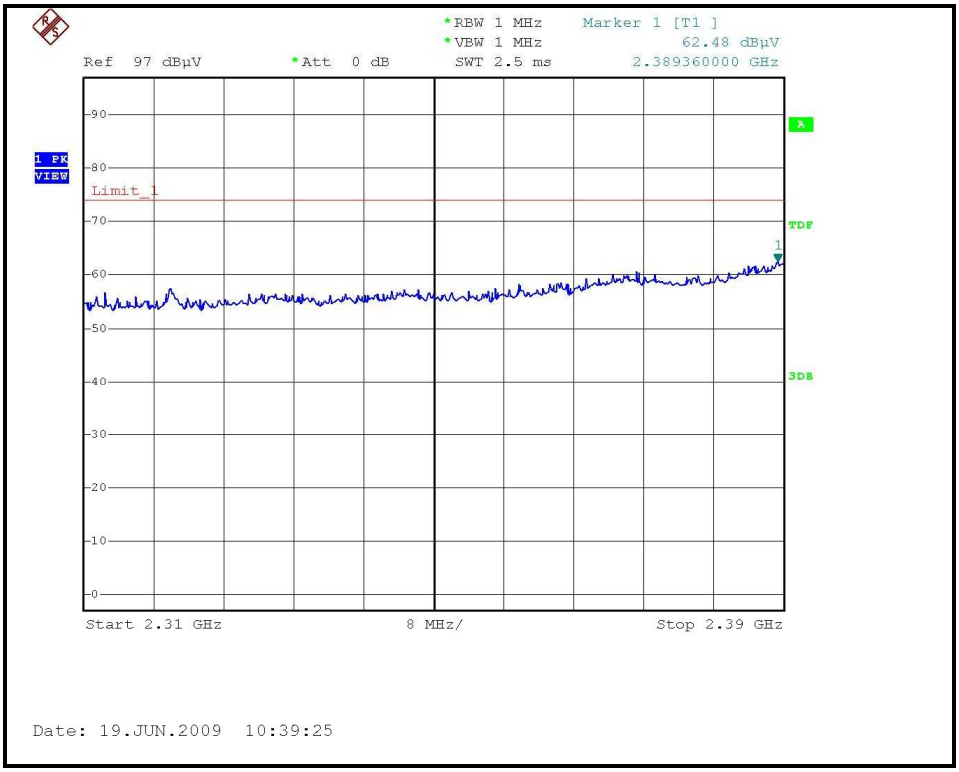
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

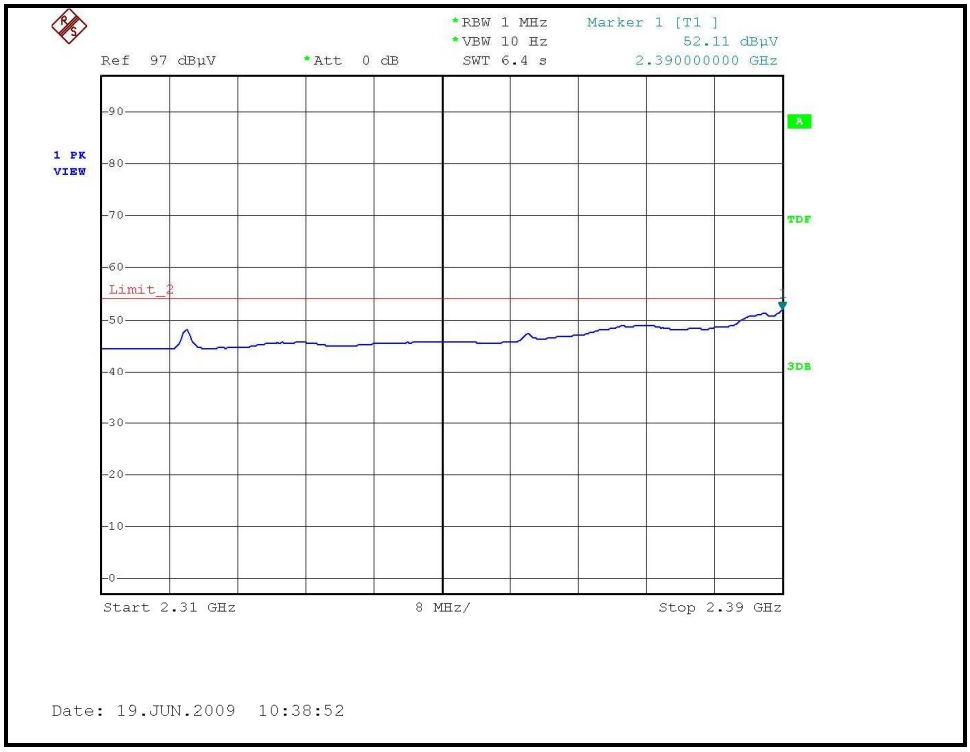
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

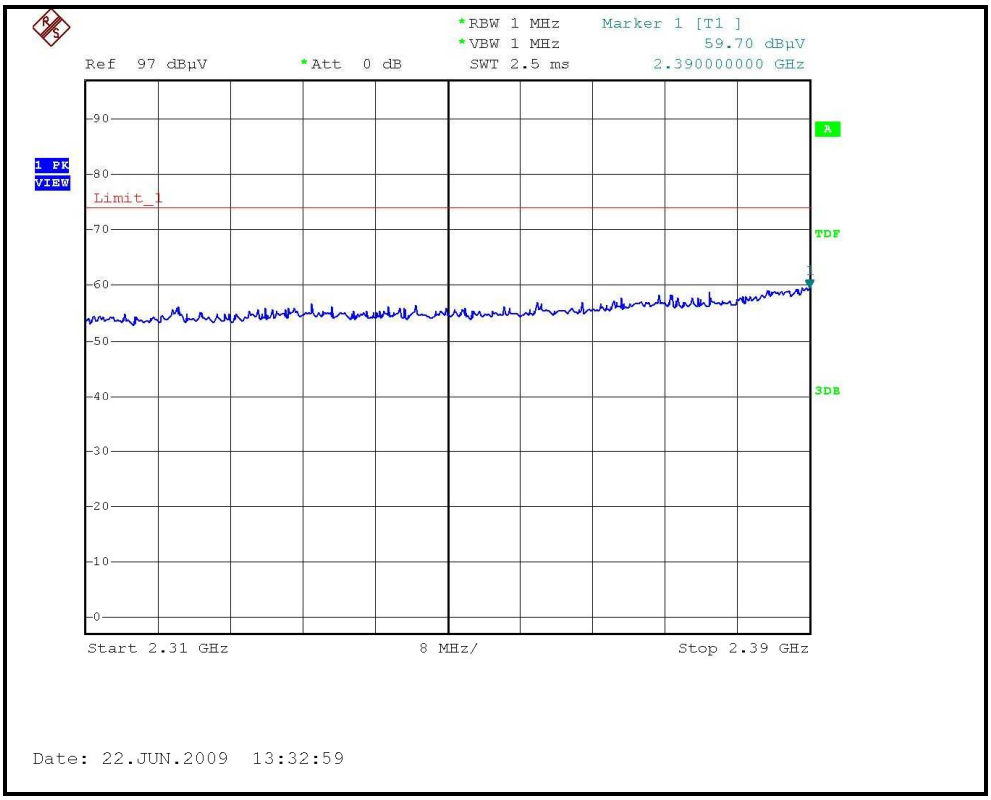
5. " * ": Fundamental frequency.

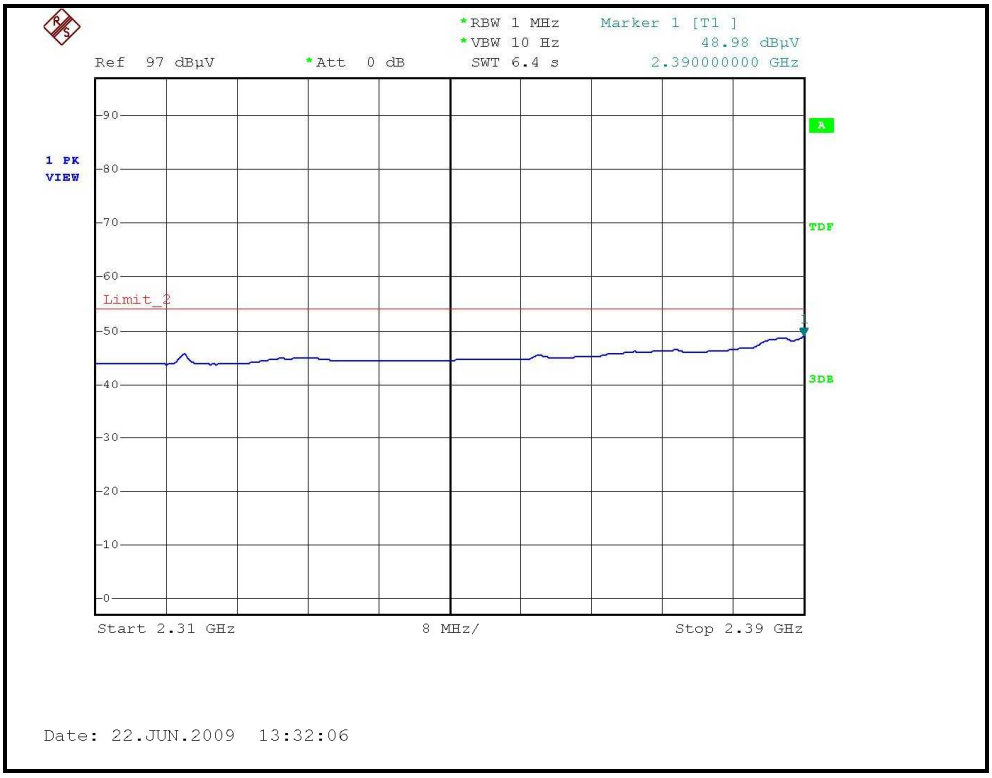
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)





RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL)





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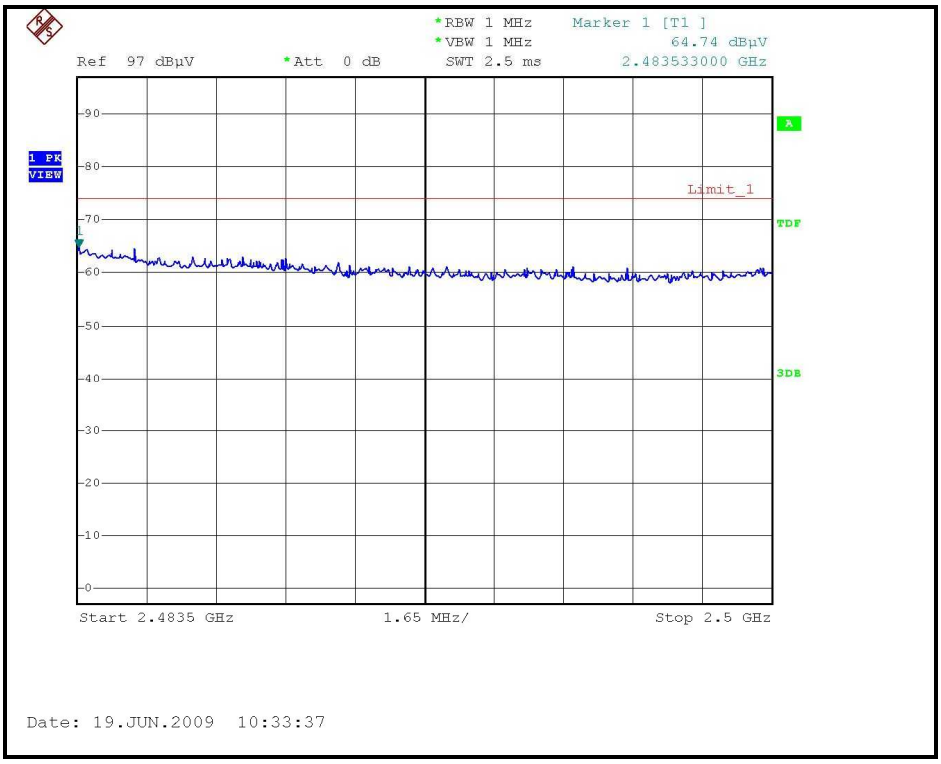
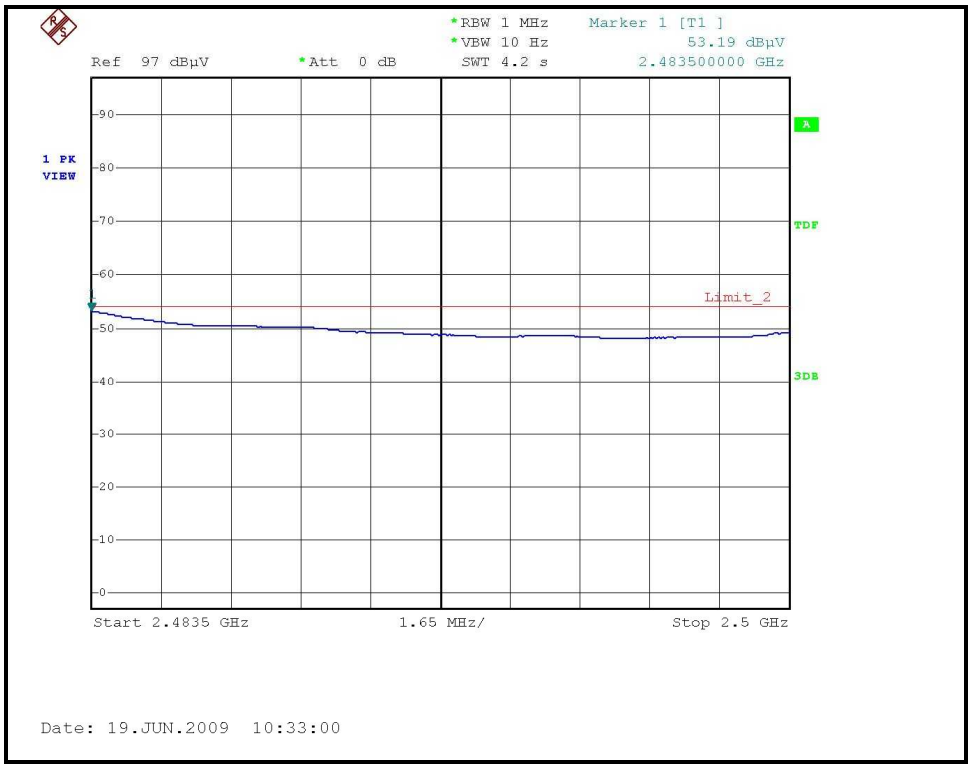
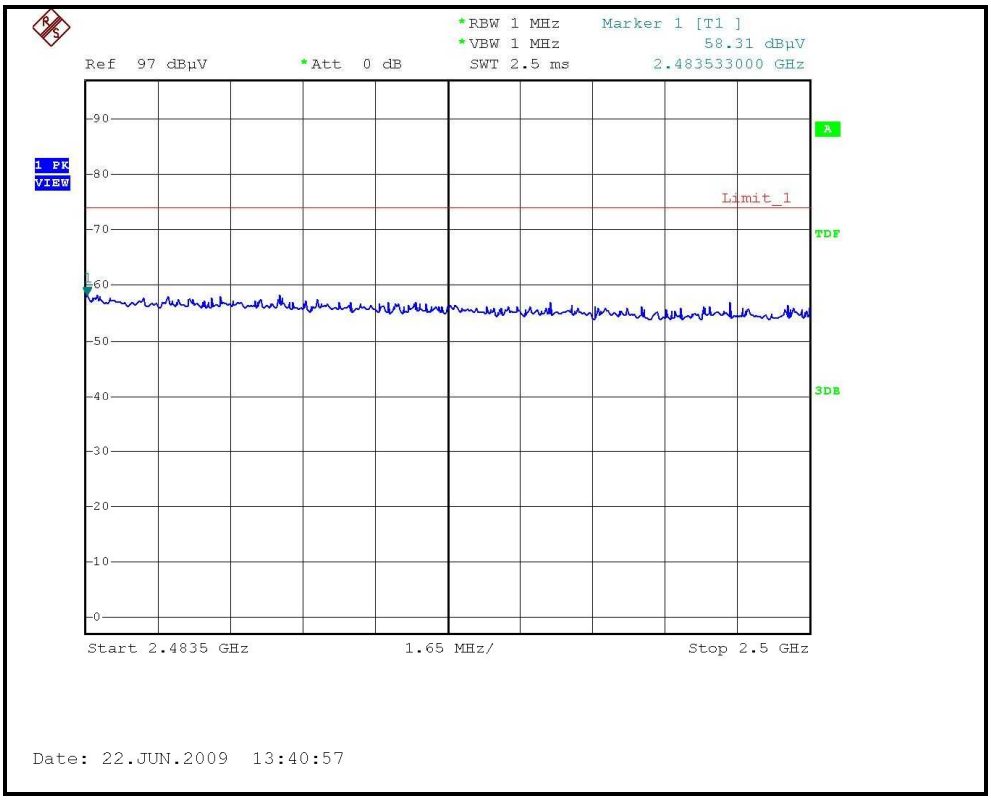
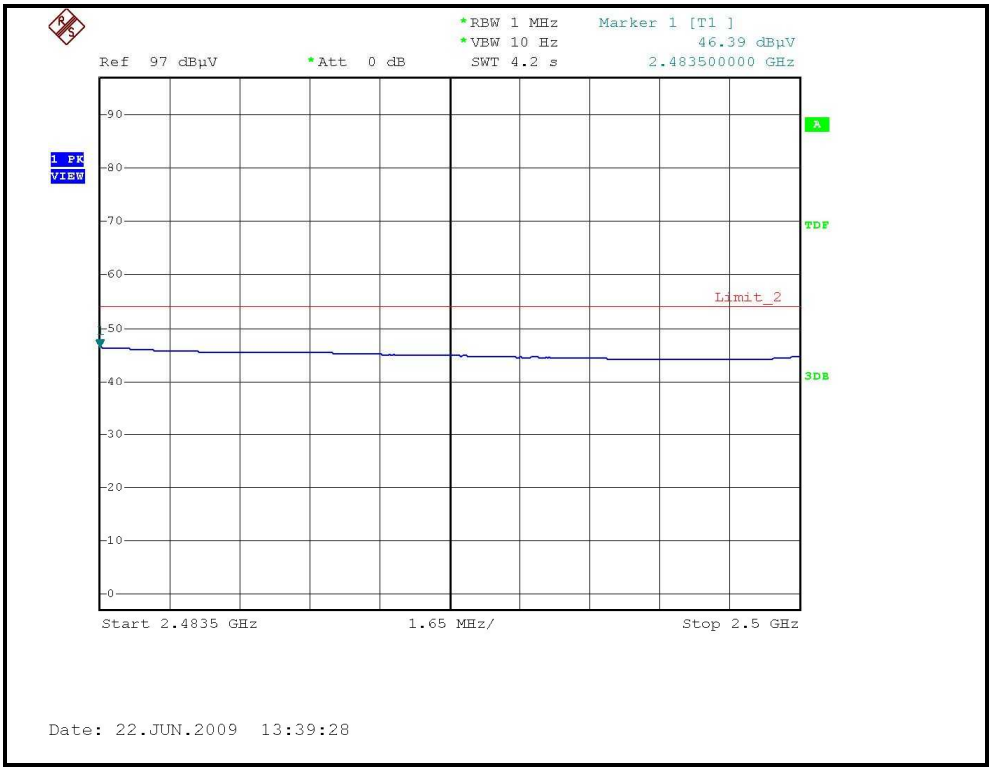




RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL)





802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.55 PK	74.00	-2.45	1.71 H	301	41.27	30.28
2	2390.00	53.39 AV	54.00	-0.61	1.71 H	301	23.11	30.28
3	*2412.00	114.33 PK			1.75 H	301	83.97	30.36
4	*2412.00	101.55 AV			1.75 H	301	71.19	30.36
5	4824.00	50.29 PK	74.00	-23.71	1.26 H	70	13.50	36.79
6	4824.00	36.75 AV	54.00	-17.25	1.26 H	70	-0.04	36.79
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	68.54 PK	74.00	-5.46	1.32 V	267	38.26	30.28
2	2390.00	50.48 AV	54.00	-3.52	1.32 V	267	20.20	30.28
3	*2412.00	105.82 PK			1.35 V	255	75.46	30.36
4	*2412.00	94.16 AV			1.35 V	255	63.80	30.36
5	4824.00	49.56 PK	74.00	-24.44	1.17 V	335	12.77	36.79
6	4824.00	39.38 AV	54.00	-14.62	1.17 V	335	2.59	36.79

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	64.80 PK	74.00	-9.20	1.65 H	301	34.52	30.28
2	2390.00	52.11 AV	54.00	-1.89	1.65 H	301	21.83	30.28
3	*2437.00	118.69 PK			1.67 H	103	88.23	30.46
4	*2437.00	106.22 AV			1.67 H	103	75.76	30.46
5	2483.50	72.57 PK	74.00	-1.43	1.67 H	98	41.94	30.63
6	2483.50	53.42 AV	54.00	-0.58	1.67 H	98	22.79	30.63
7	4874.00	55.76 PK	74.00	-18.24	1.82 H	313	18.84	36.92
8	4874.00	42.66 AV	54.00	-11.34	1.82 H	313	5.74	36.92
9	7311.00	66.73 PK	74.00	-7.27	1.79 H	317	23.59	43.14
10	7311.00	48.64 AV	54.00	-5.36	1.79 H	317	5.50	43.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.48 PK			1.35 V	168	81.02	30.46
2	*2437.00	99.71 AV			1.35 V	168	69.25	30.46
3	4874.00	53.84 PK	74.00	-20.16	1.03 V	304	16.92	36.92
4	4874.00	40.73 AV	54.00	-13.27	1.03 V	304	3.81	36.92
5	7311.00	63.22 PK	74.00	-10.78	1.24 V	31	20.08	43.14
6	7311.00	47.11 AV	54.00	-6.89	1.24 V	31	3.97	43.14

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.08 PK			1.73 H	280	80.53	30.55
2	*2462.00	99.49 AV			1.73 H	280	68.94	30.55
3	2483.70	72.63 PK	74.00	-1.37	1.51 H	300	42.00	30.63
4	2483.70	53.43 AV	54.00	-0.57	1.51 H	300	22.80	30.63
5	4924.00	52.50 PK	74.00	-21.50	1.20 H	106	15.44	37.06
6	4924.00	36.45 AV	54.00	-17.55	1.20 H	106	-0.61	37.06
7	7386.00	57.08 PK	74.00	-16.92	1.09 H	275	13.95	43.13
8	7386.00	40.55 AV	54.00	-13.45	1.09 H	275	-2.58	43.13
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	103.00 PK			1.52 V	273	72.45	30.55
2	*2462.00	92.09 AV			1.52 V	273	61.54	30.55
3	2483.50	65.18 PK	74.00	-8.82	1.48 V	283	34.55	30.63
4	2483.50	47.40 AV	54.00	-6.60	1.48 V	283	16.77	30.63
5	4924.00	49.39 PK	74.00	-24.61	1.16 V	30	12.33	37.06
6	4924.00	41.11 AV	54.00	-12.89	1.16 V	30	4.05	37.06
7	7386.00	54.53 PK	74.00	-19.47	1.00 V	20	11.40	43.13
8	7386.00	40.16 AV	54.00	-13.84	1.00 V	20	-2.97	43.13

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

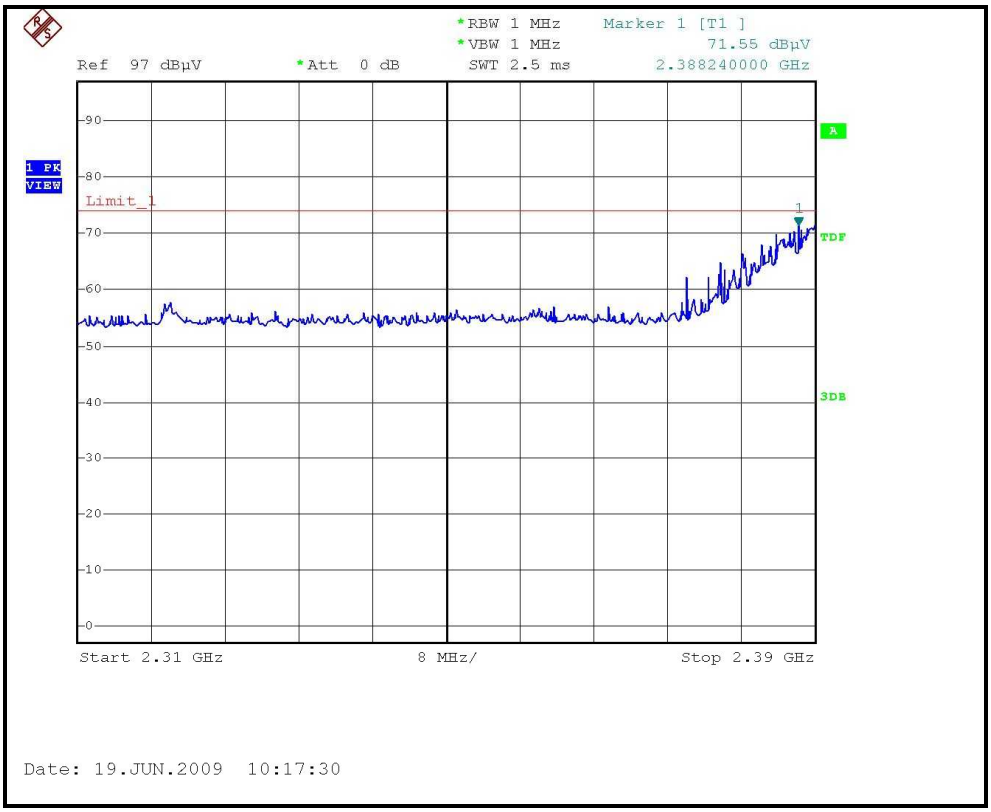
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

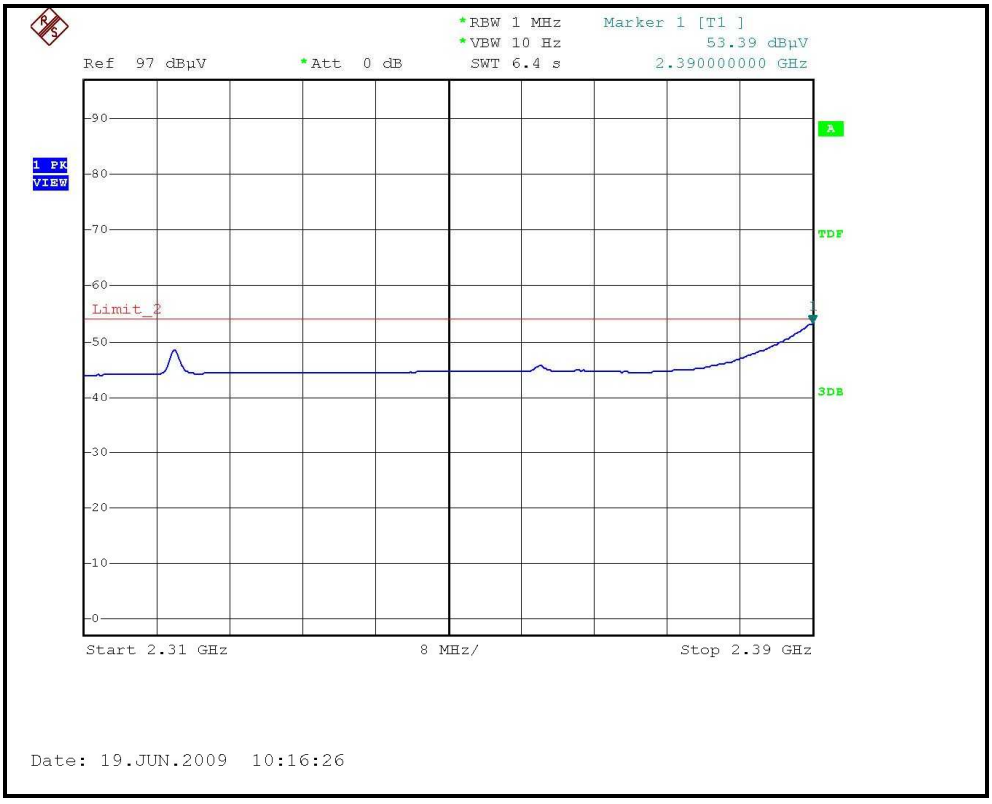
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

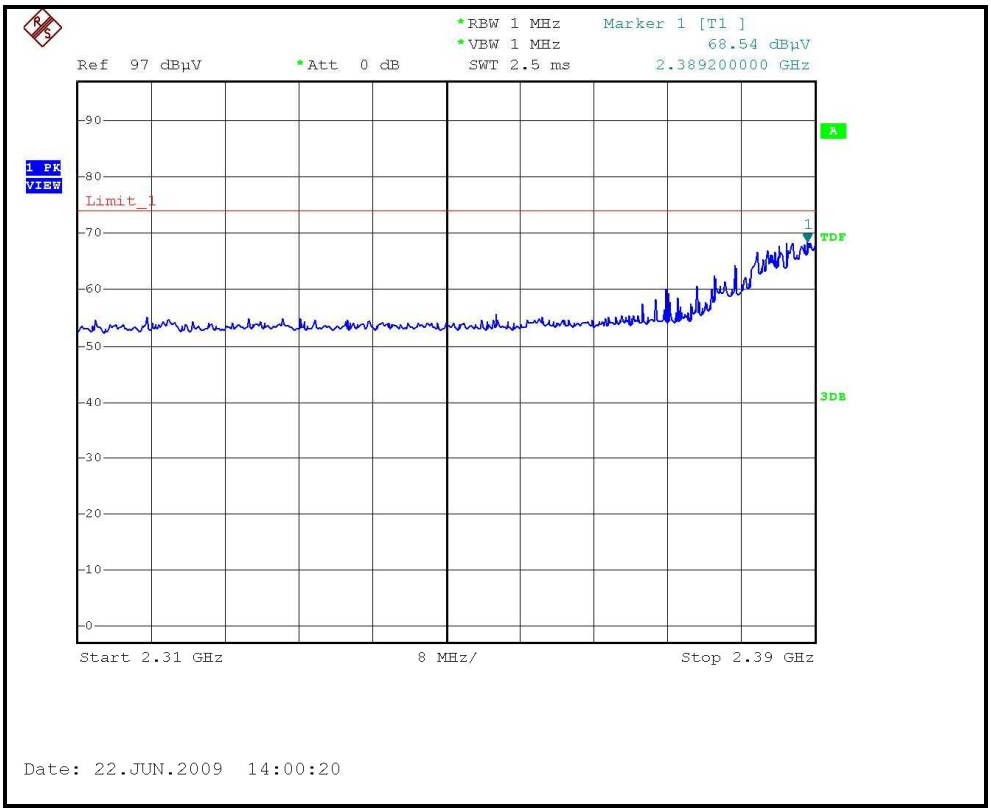
5. " * ": Fundamental frequency.

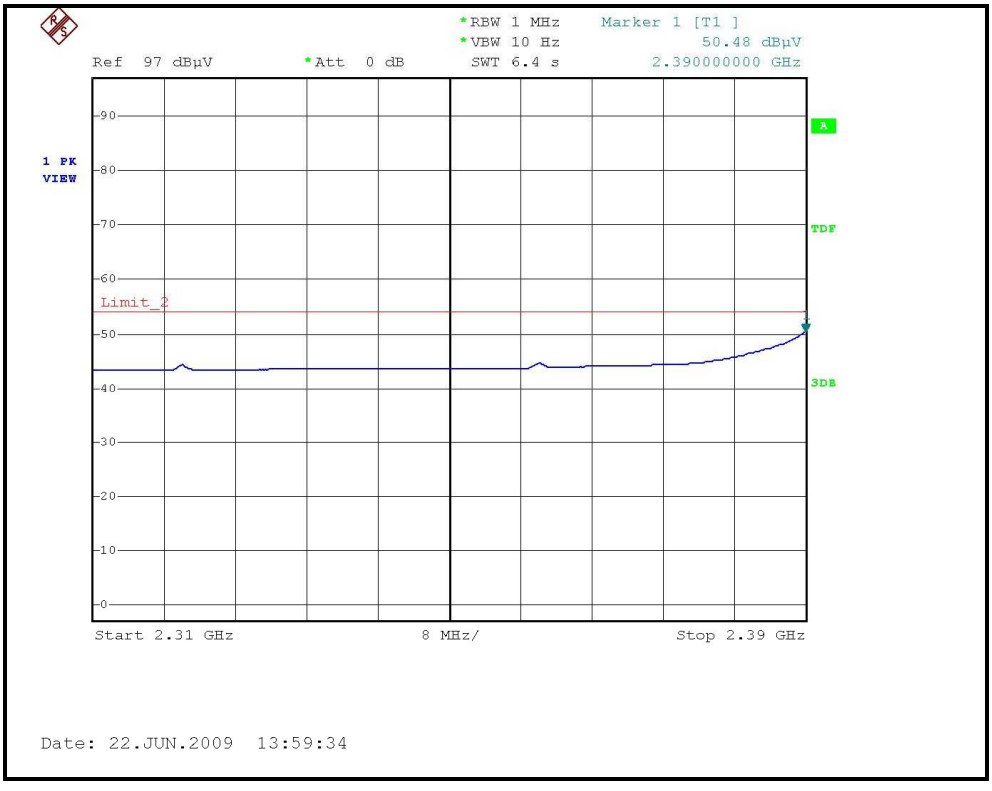
RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL)





RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)





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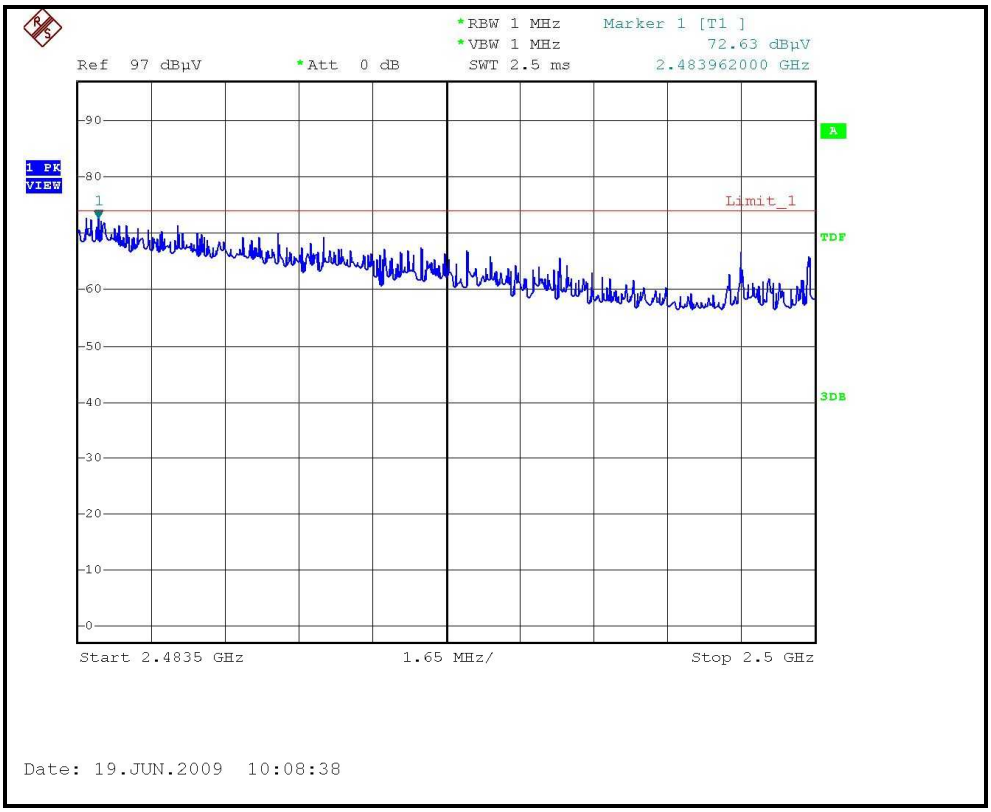
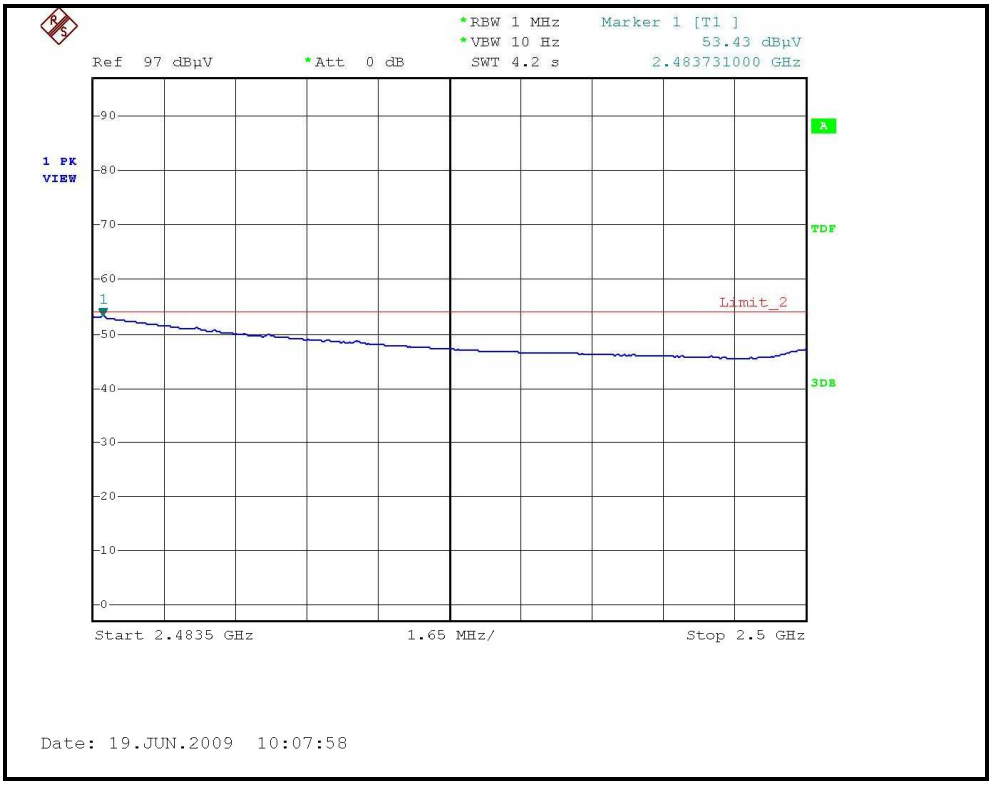
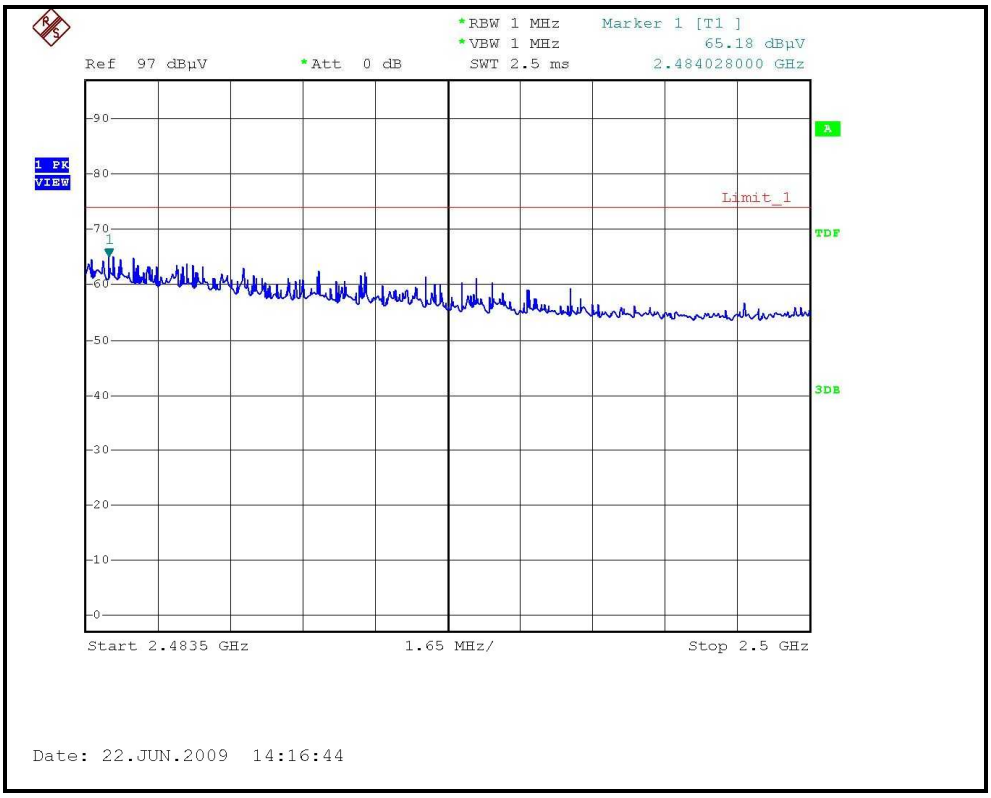
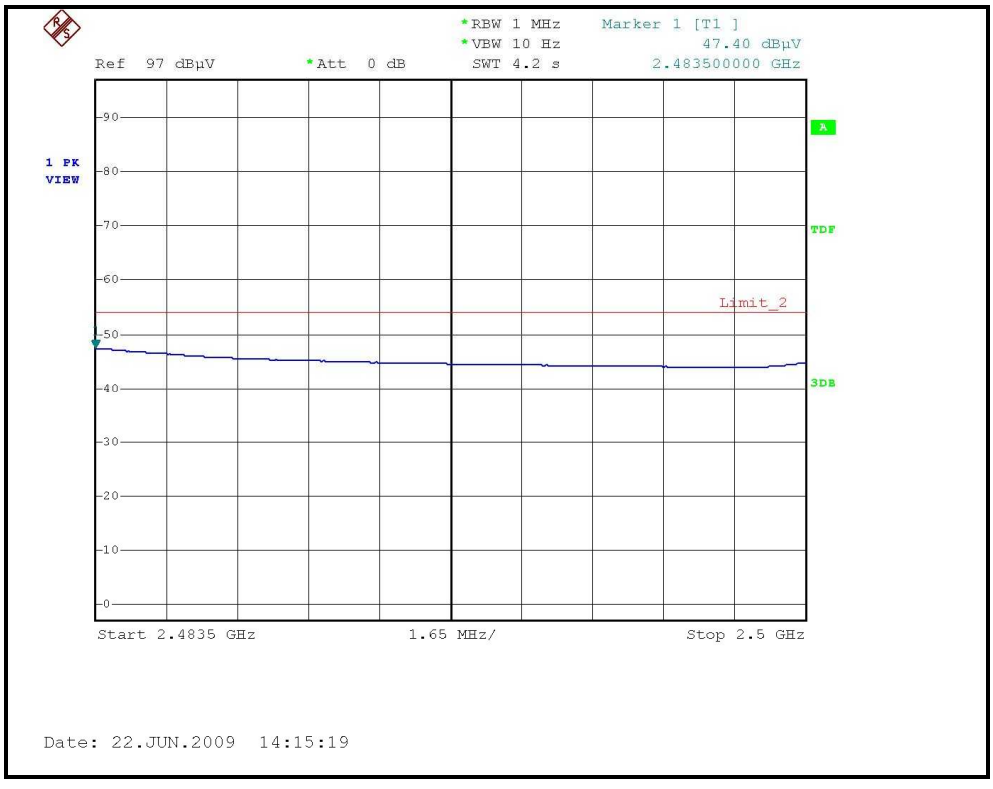




RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL)





DRAFT 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.85 PK	74.00	-2.15	1.74 H	284	41.57	30.28
2	2390.00	53.43 AV	54.00	-0.57	1.74 H	284	23.15	30.28
3	*2412.00	115.25 PK			1.71 H	74	84.89	30.36
4	*2412.00	102.86 AV			1.71 H	74	72.50	30.36
5	4824.00	49.06 PK	74.00	-24.94	1.34 H	316	12.27	36.79
6	4824.00	35.66 AV	54.00	-18.34	1.34 H	316	-1.13	36.79
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	70.26 PK	74.00	-3.74	1.46 V	284	39.98	30.28
2	2390.00	48.55 AV	54.00	-5.45	1.46 V	284	18.27	30.28
3	*2412.00	107.18 PK			1.46 V	22	76.82	30.36
4	*2412.00	95.27 AV			1.46 V	22	64.91	30.36
5	4824.00	50.60 PK	74.00	-23.40	1.05 V	24	13.81	36.79
6	4824.00	39.05 AV	54.00	-14.95	1.05 V	24	2.26	36.79

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.22 PK	74.00	-3.78	1.39 H	79	39.94	30.28
2	2390.00	52.84 AV	54.00	-1.16	1.39 H	79	22.56	30.28
3	*2437.00	121.49 PK			1.46 H	83	91.03	30.46
4	*2437.00	108.32 AV			1.46 H	83	77.86	30.46
5	2483.50	71.88 PK	74.00	-2.12	1.49 H	80	41.25	30.63
6	2483.50	53.40 AV	54.00	-0.60	1.49 H	80	22.77	30.63
7	4874.00	56.80 PK	74.00	-17.20	1.36 H	86	19.88	36.92
8	4874.00	43.27 AV	54.00	-10.73	1.36 H	86	6.35	36.92
9	7311.00	68.73 PK	74.00	-5.27	1.10 H	278	25.59	43.14
10	7311.00	50.55 AV	54.00	-3.45	1.10 H	278	7.41	43.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.35 PK			1.53 V	72	81.89	30.46
2	*2437.00	100.66 AV			1.53 V	72	70.20	30.46
3	4874.00	52.81 PK	74.00	-21.19	1.43 V	86	15.89	36.92
4	4874.00	40.11 AV	54.00	-13.89	1.43 V	86	3.19	36.92
5	7311.00	64.65 PK	74.00	-9.35	1.74 V	339	21.51	43.14
6	7311.00	46.72 AV	54.00	-7.28	1.74 V	339	3.58	43.14

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	112.75 PK			1.43 H	68	82.20	30.55
2	*2462.00	101.01 AV			1.43 H	68	70.46	30.55
3	2483.80	70.01 PK	74.00	-3.99	1.64 H	72	39.38	30.63
4	**2483.80**	**53.49 AV**	**54.00**	**-0.51**	**1.64 H**	**72**	**22.86**	**30.63**
5	4924.00	48.12 PK	74.00	-25.88	1.34 H	67	11.06	37.06
6	4924.00	35.36 AV	54.00	-18.64	1.34 H	67	-1.70	37.06
7	7386.00	53.73 PK	74.00	-20.27	1.12 H	20	10.60	43.13
8	7386.00	39.64 AV	54.00	-14.36	1.12 H	20	-3.49	43.13
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	103.96 PK			1.49 V	75	73.41	30.55
2	*2462.00	92.46 AV			1.49 V	75	61.91	30.55
3	2483.50	63.43 PK	74.00	-10.57	1.52 V	75	32.80	30.63
4	2483.50	47.39 AV	54.00	-6.61	1.52 V	75	16.76	30.63
5	4924.00	50.03 PK	74.00	-23.97	1.28 V	27	12.97	37.06
6	4924.00	40.21 AV	54.00	-13.79	1.28 V	27	3.15	37.06
7	7386.00	53.80 PK	74.00	-20.20	1.09 V	20	10.67	43.13
8	7386.00	39.90 AV	54.00	-14.10	1.09 V	20	-3.23	43.13

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

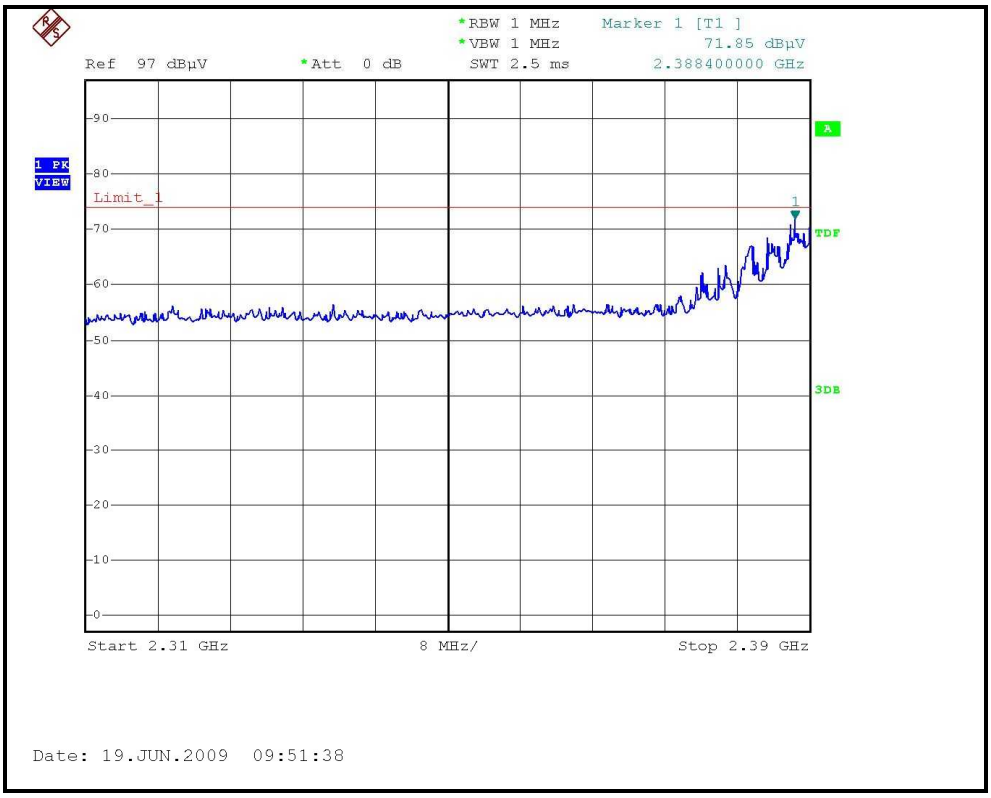
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

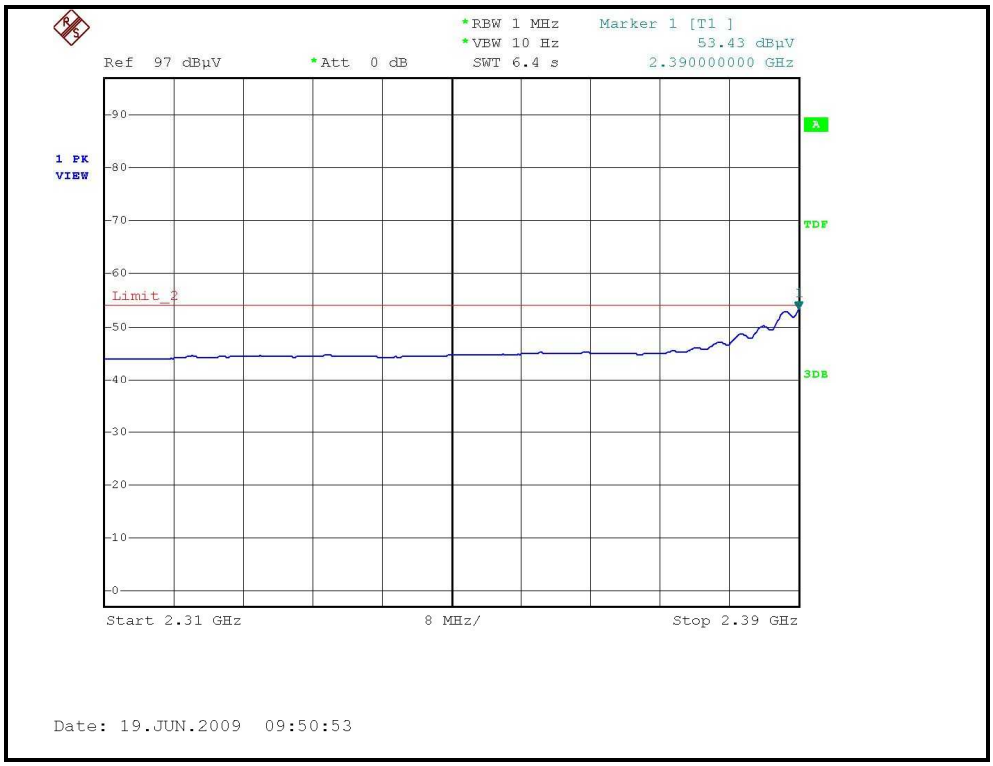
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

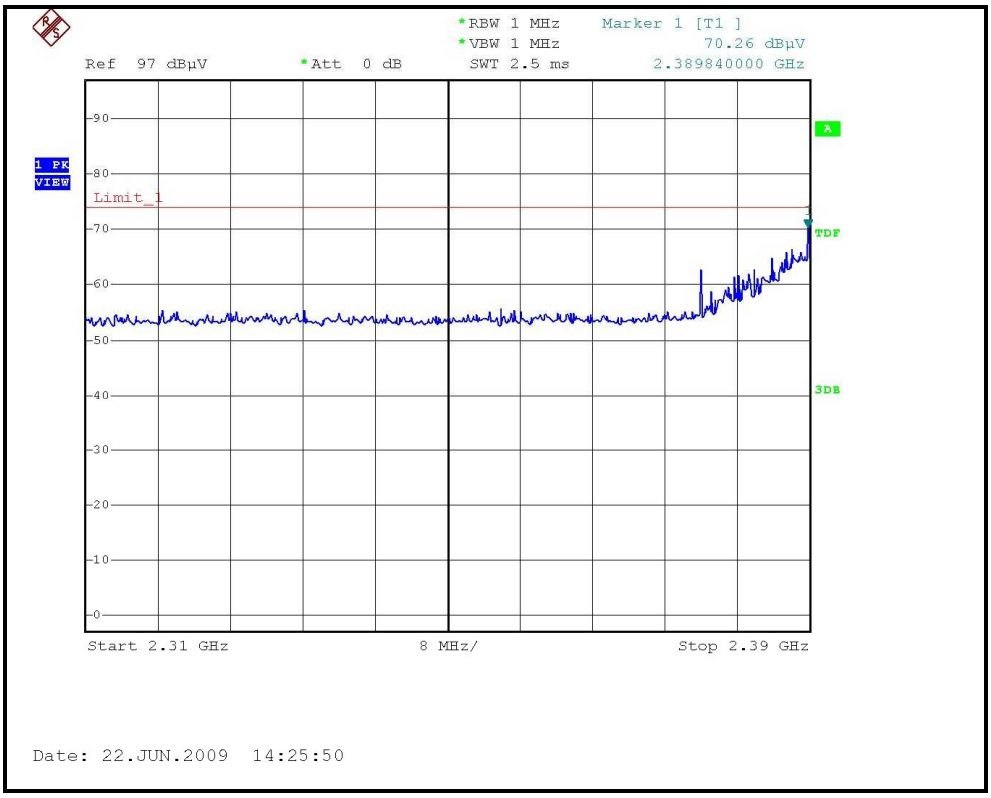
5. " * ": Fundamental frequency.

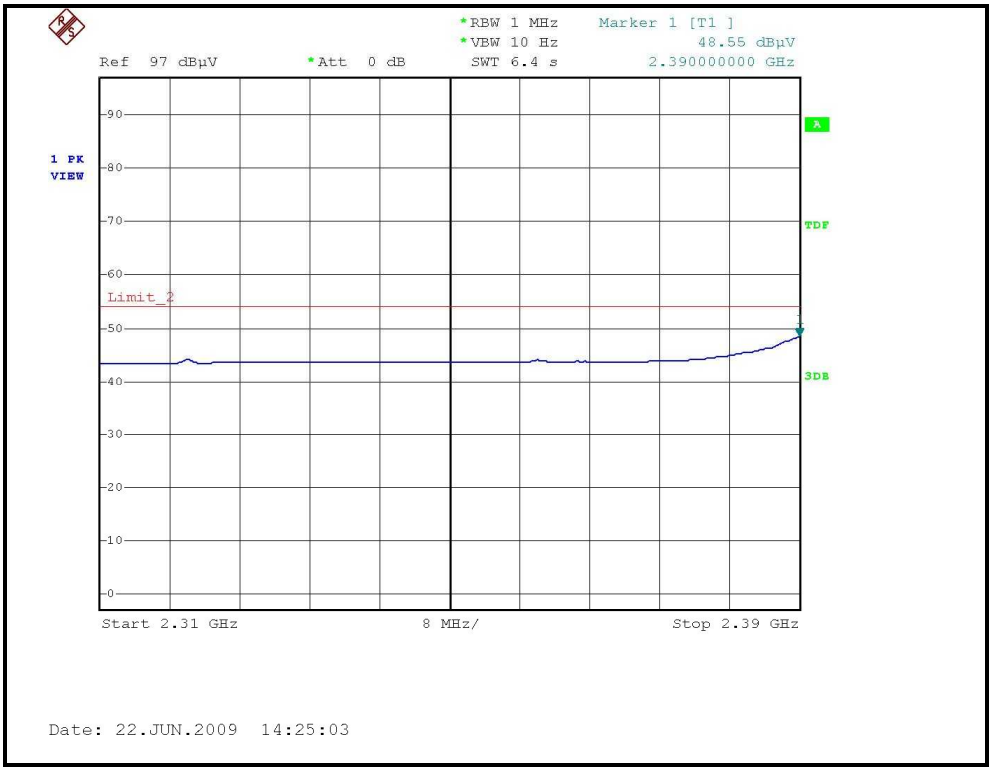
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, HORIZONTAL)



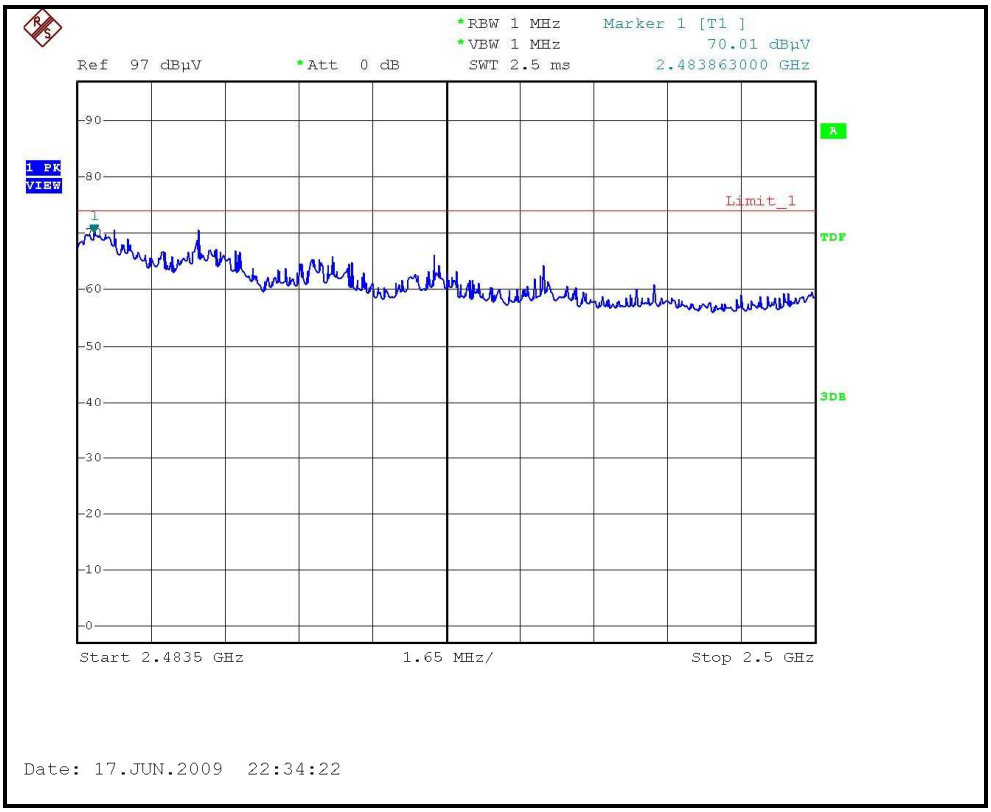


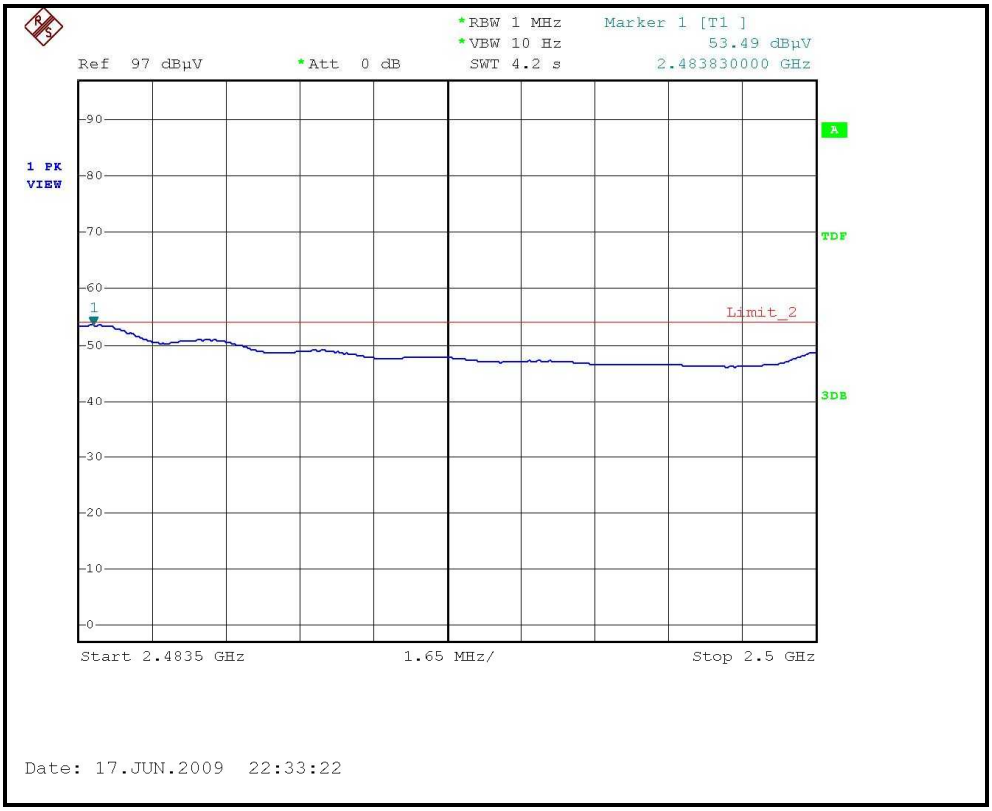
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, VERTICAL)



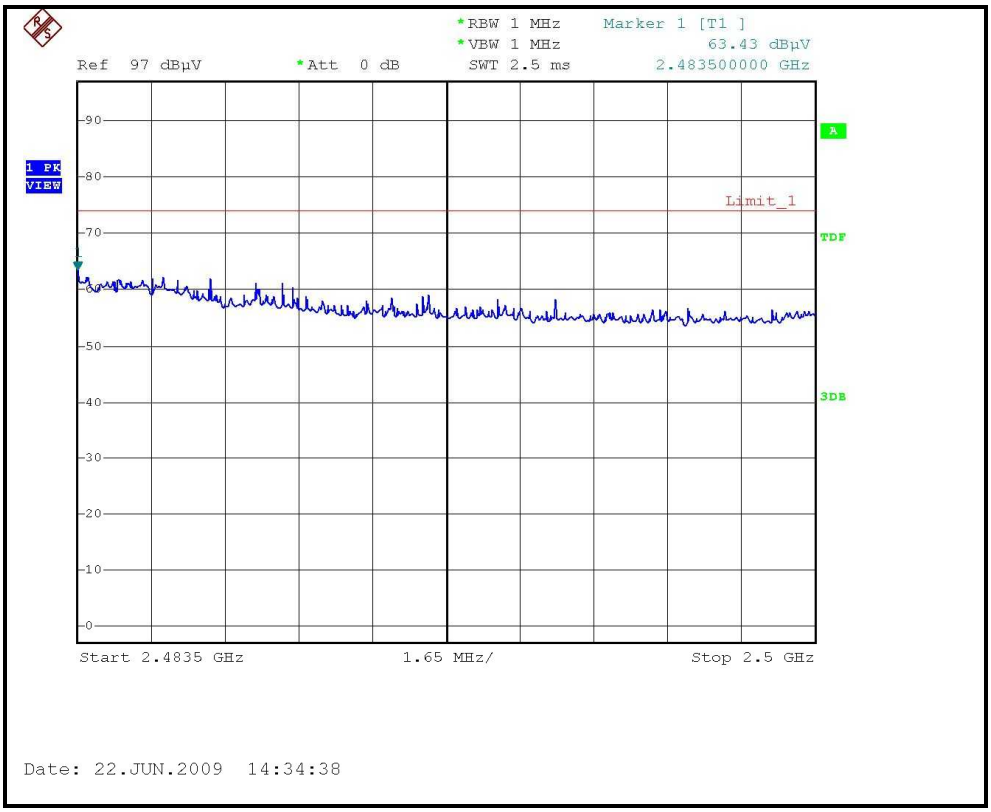


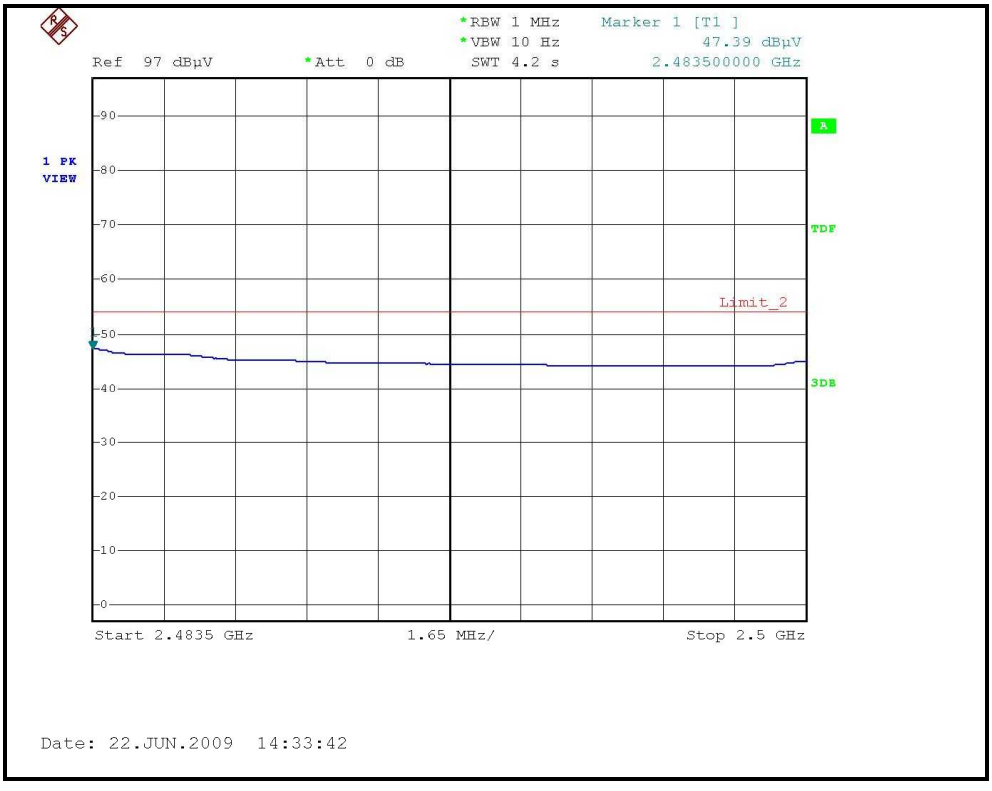
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH11, HORIZONTAL)





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





DRAFT 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.50	67.44 PK	74.00	-6.56	1.55 H	116	37.16	30.28
2	2388.50	53.32 AV	54.00	-0.68	1.55 H	116	23.04	30.28
3	*2422.00	110.16 PK			1.44 H	256	79.76	30.40
4	*2422.00	96.32 AV			1.44 H	256	65.92	30.40
5	4844.00	48.03 PK	74.00	-25.97	1.36 H	315	11.19	36.84
6	4844.00	34.86 AV	54.00	-19.14	1.36 H	315	-1.98	36.84
7	7266.00	54.16 PK	74.00	-19.84	1.20 H	20	11.02	43.14
8	7266.00	39.74 AV	54.00	-14.26	1.20 H	20	-3.40	43.14
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	60.93 PK	74.00	-13.07	1.00 V	17	30.65	30.28
2	2390.00	48.25 AV	54.00	-5.75	1.00 V	17	17.97	30.28
3	*2422.00	101.53 PK			1.00 V	17	71.13	30.40
4	*2422.00	88.57 AV			1.00 V	17	58.17	30.40
5	4844.00	48.77 PK	74.00	-25.23	1.49 V	19	11.93	36.84
6	4844.00	38.50 AV	54.00	-15.50	1.49 V	19	1.66	36.84
7	7266.00	54.30 PK	74.00	-19.70	1.30 V	20	11.16	43.14
8	7266.00	40.00 AV	54.00	-14.00	1.30 V	20	-3.14	43.14

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.89 PK	74.00	-6.11	1.45 H	80	37.61	30.28
2	2390.00	52.11 AV	54.00	-1.89	1.45 H	80	21.83	30.28
3	*2437.00	110.91 PK			1.60 H	95	80.45	30.46
4	*2437.00	97.47 AV			1.60 H	95	67.01	30.46
5	2483.50	67.99 PK	74.00	-6.01	1.64 H	80	37.36	30.63
6	2483.50	53.49 AV	54.00	-0.51	1.64 H	80	22.86	30.63
7	4874.00	47.67 PK	74.00	-26.33	1.20 H	317	10.75	36.92
8	4874.00	34.49 AV	54.00	-19.51	1.20 H	317	-2.43	36.92
9	7311.00	54.24 PK	74.00	-19.76	1.25 H	23	11.10	43.14
10	7311.00	39.59 AV	54.00	-14.41	1.25 H	23	-3.55	43.14
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.25 PK			1.56 V	147	73.79	30.46
2	*2437.00	91.35 AV			1.56 V	147	60.89	30.46
3	4874.00	50.09 PK	74.00	-23.91	1.16 V	31	13.17	36.92
4	4874.00	39.12 AV	54.00	-14.88	1.16 V	31	2.20	36.92
5	7311.00	53.60 PK	74.00	-20.40	1.10 V	20	10.46	43.14
6	7311.00	39.74 AV	54.00	-14.26	1.10 V	20	-3.40	43.14

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

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

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

4. Margin value = Emission level – Limit value.

5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	109.25 PK			1.42 H	80	78.74	30.51
2	*2452.00	96.00 AV			1.42 H	80	65.49	30.51
3	2483.70	66.10 PK	74.00	-7.90	1.44 H	278	35.47	30.63
4	2483.70	53.43 AV	54.00	-0.57	1.44 H	278	22.80	30.63
5	4904.00	47.52 PK	74.00	-26.48	1.38 H	67	10.52	37.00
6	4904.00	35.68 AV	54.00	-18.32	1.38 H	67	-1.32	37.00
7	7356.00	53.60 PK	74.00	-20.40	1.36 H	20	10.47	43.13
8	7356.00	39.75 AV	54.00	-14.25	1.36 H	20	-3.38	43.13
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	97.65 PK			1.22 V	20	67.14	30.51
2	*2452.00	85.58 AV			1.22 V	20	55.07	30.51
3	2483.53	60.63 PK	74.00	-13.37	1.46 V	20	30.00	30.63
4	2483.53	46.81 AV	54.00	-7.19	1.46 V	20	16.18	30.63
5	4904.00	48.81 PK	74.00	-25.19	1.29 V	26	11.81	37.00
6	4904.00	39.73 AV	54.00	-14.27	1.29 V	26	2.73	37.00
7	7356.00	53.12 PK	74.00	-20.88	1.25 V	20	9.99	43.13
8	7356.00	39.61 AV	54.00	-14.39	1.25 V	20	-3.52	43.13

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

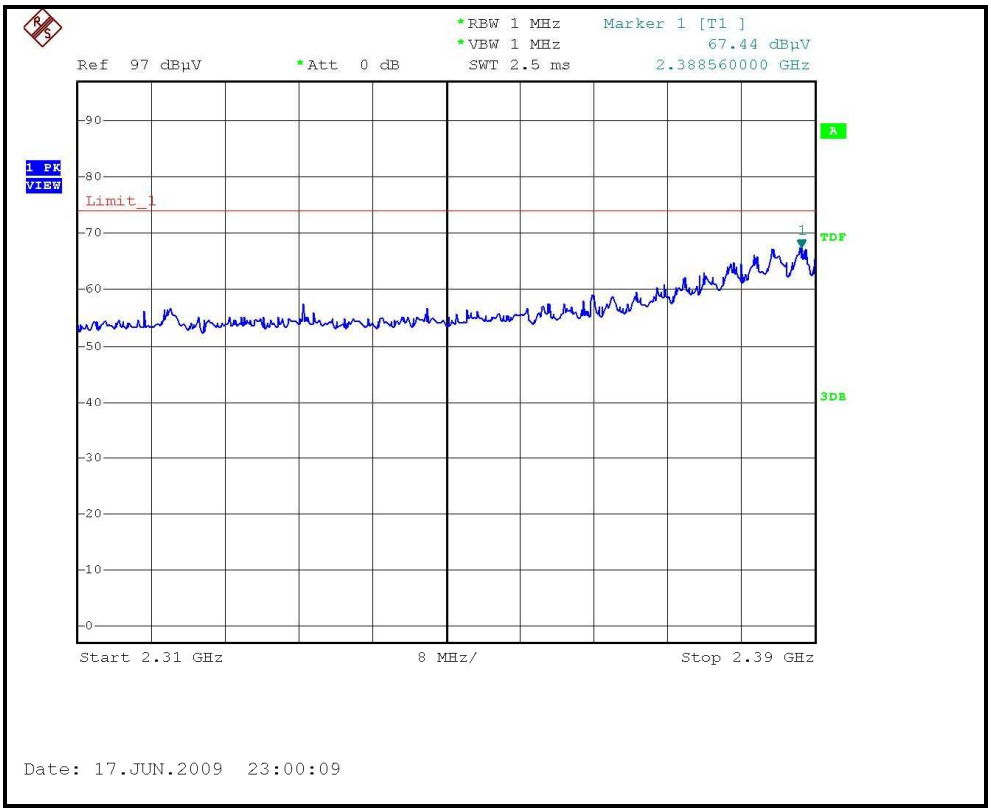
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

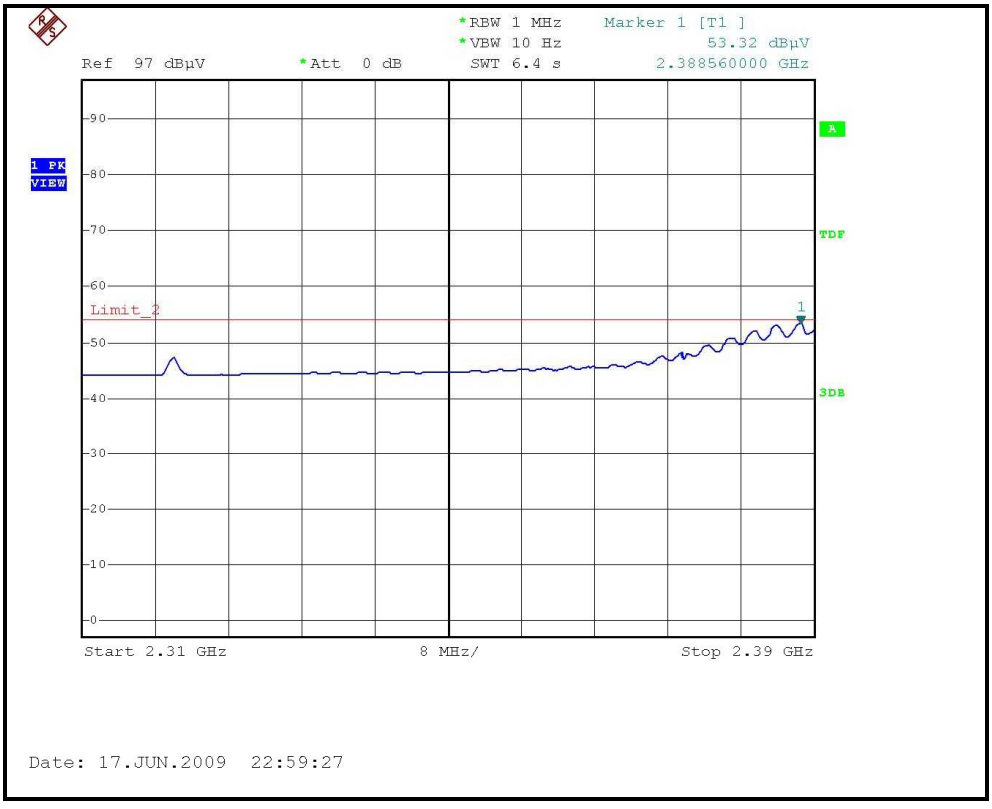
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

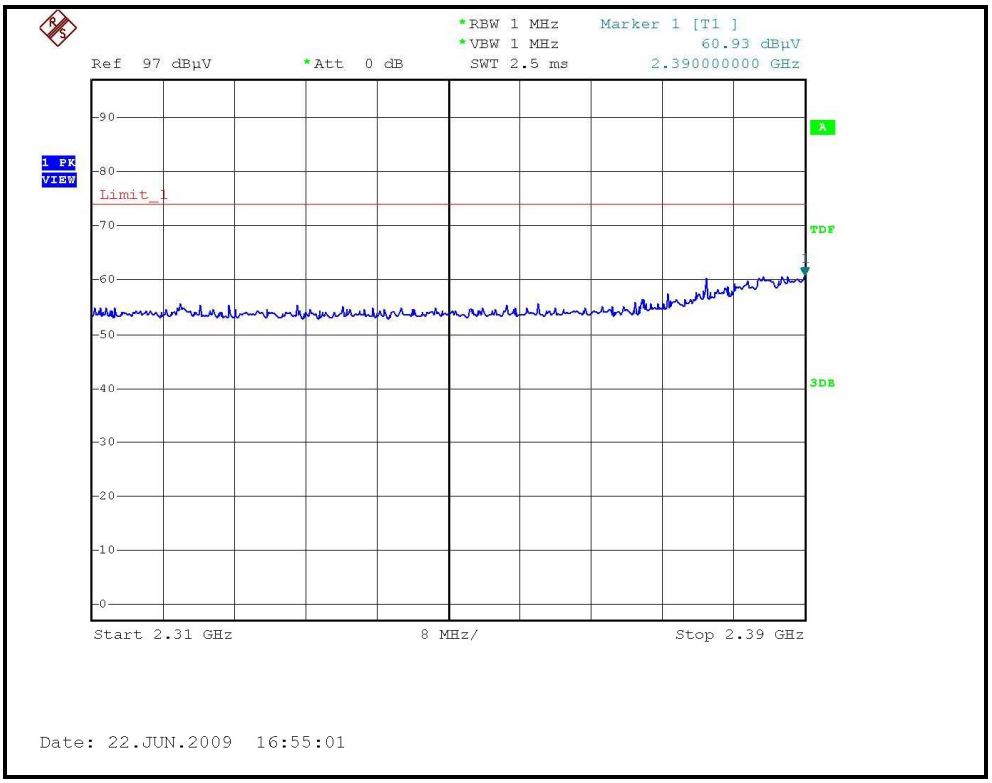
5. " * ": Fundamental frequency.

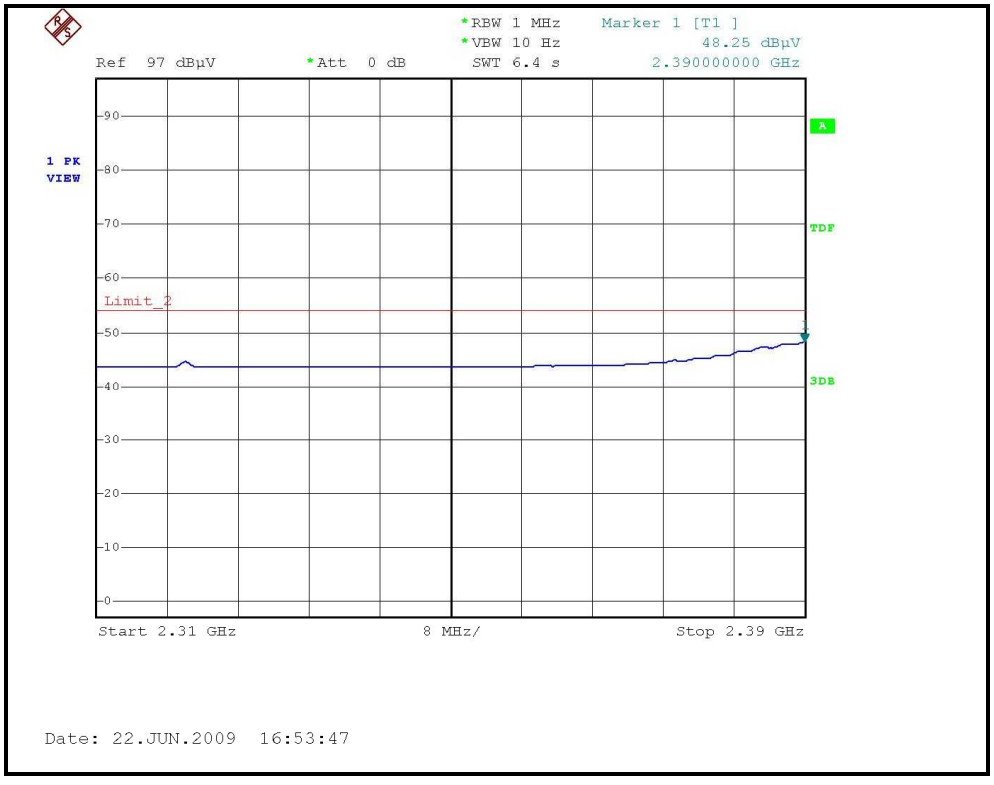
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, HORIZONTAL)



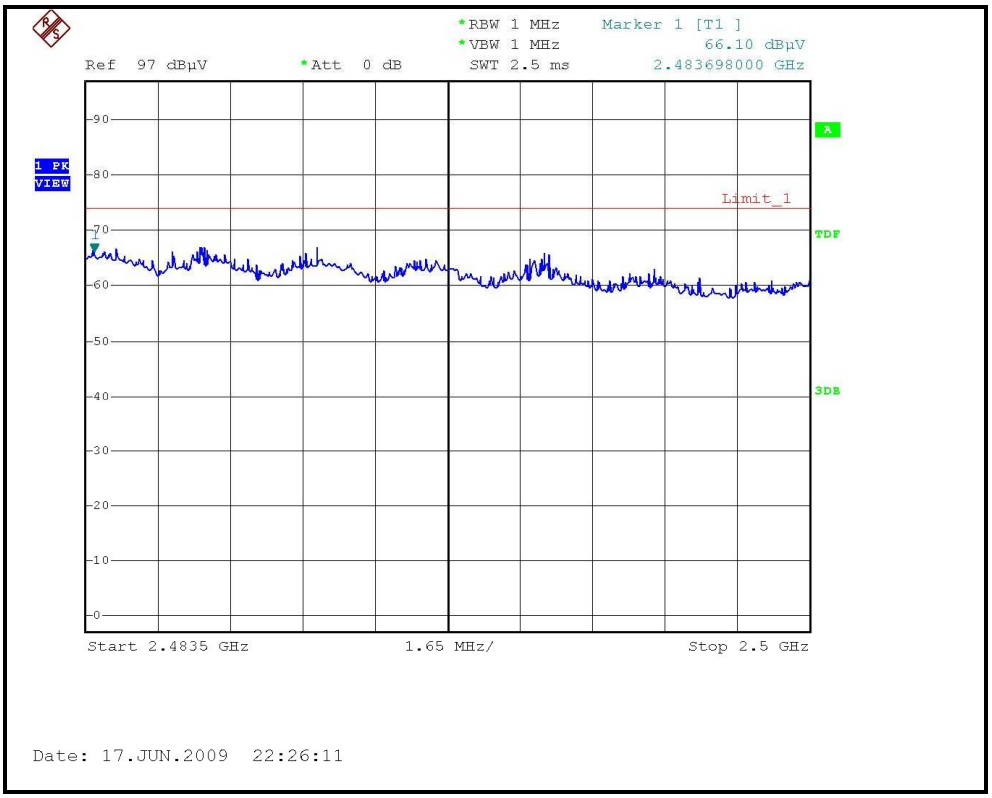


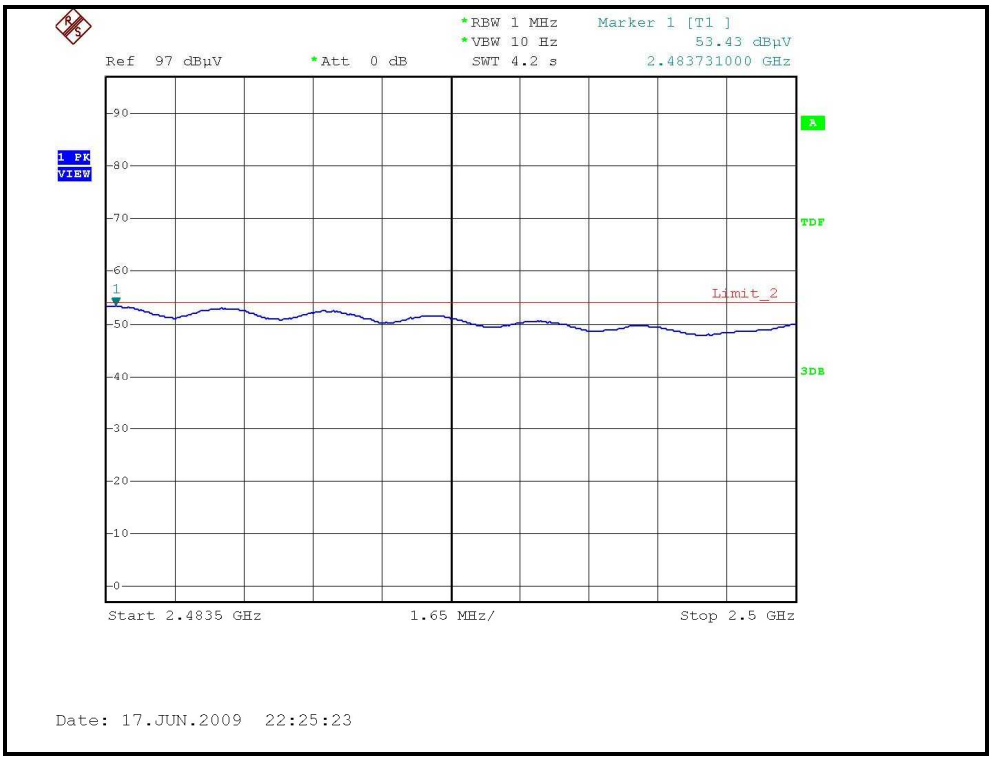
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH1, VERTICAL)



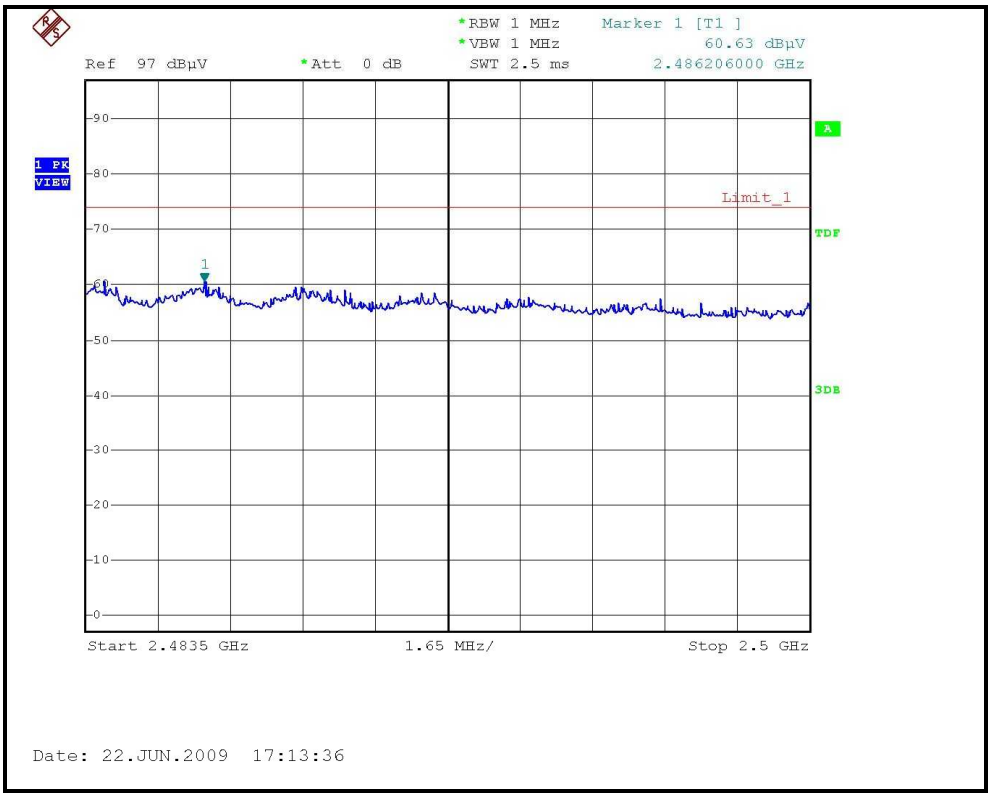


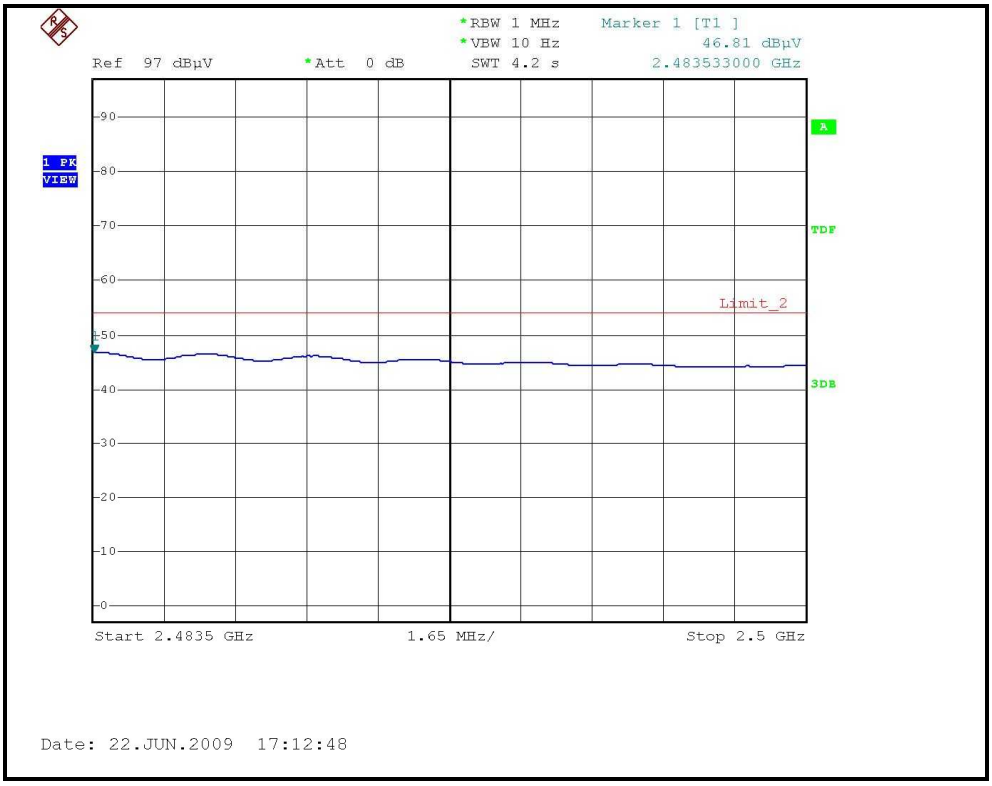
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, HORIZONTAL)





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





4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

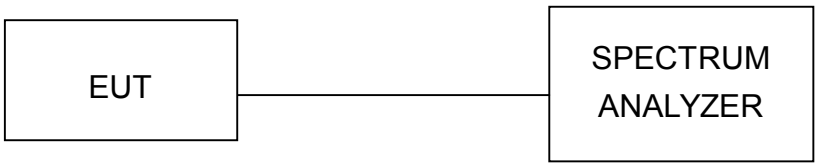
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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

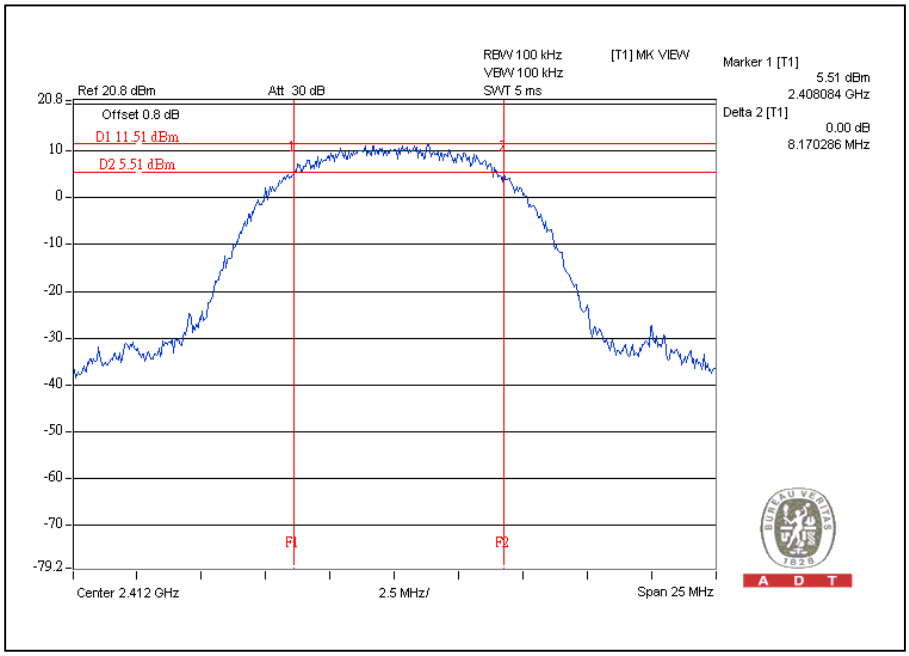
4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

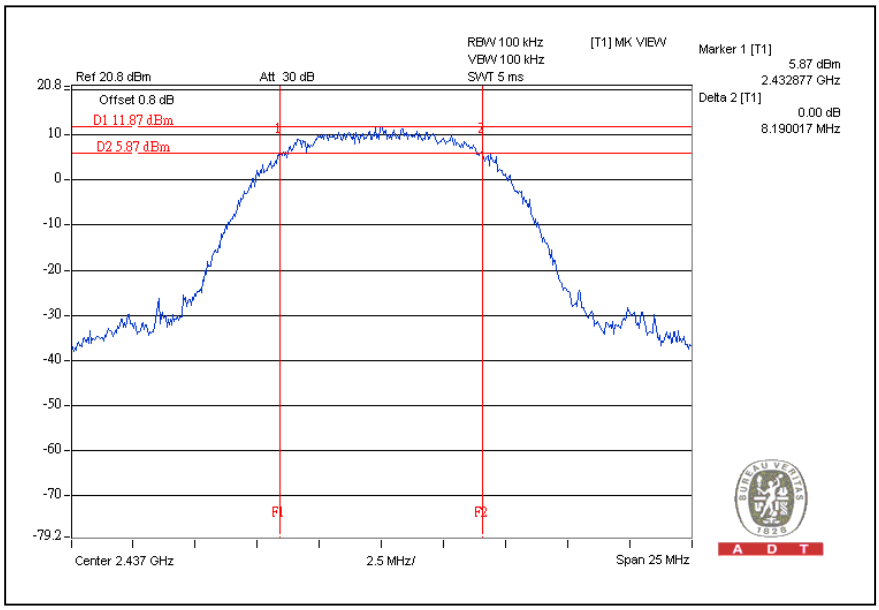
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.17	0.5	PASS
6	2437	8.19	0.5	PASS
11	2462	8.13	0.5	PASS

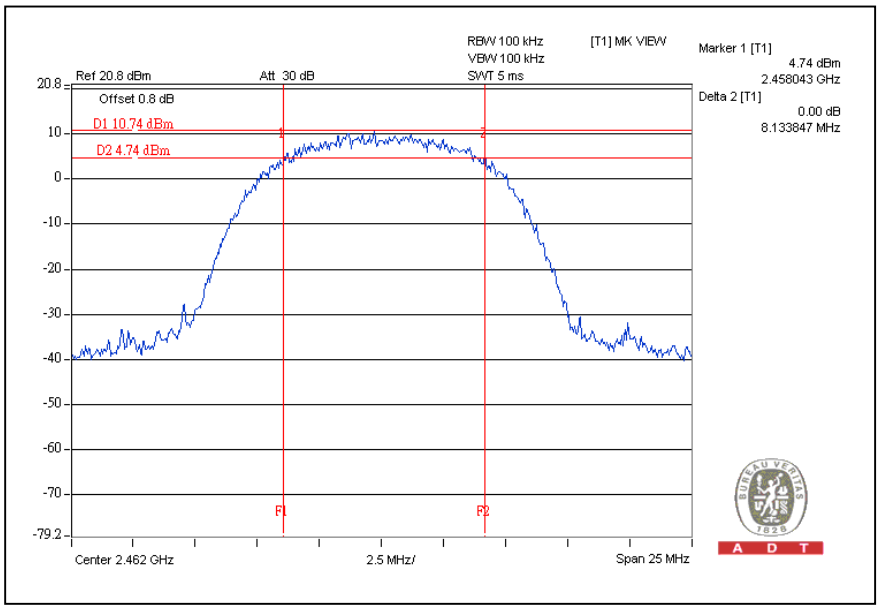
CH1



CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
5.87 dBm
2.432877 GHz
Delta 2 [T1]
0.00 dB
8.190017 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 11.87 dBm
D2 5.87 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.437 GHz
2.5 MHz/
Span 25 MHz

CH11

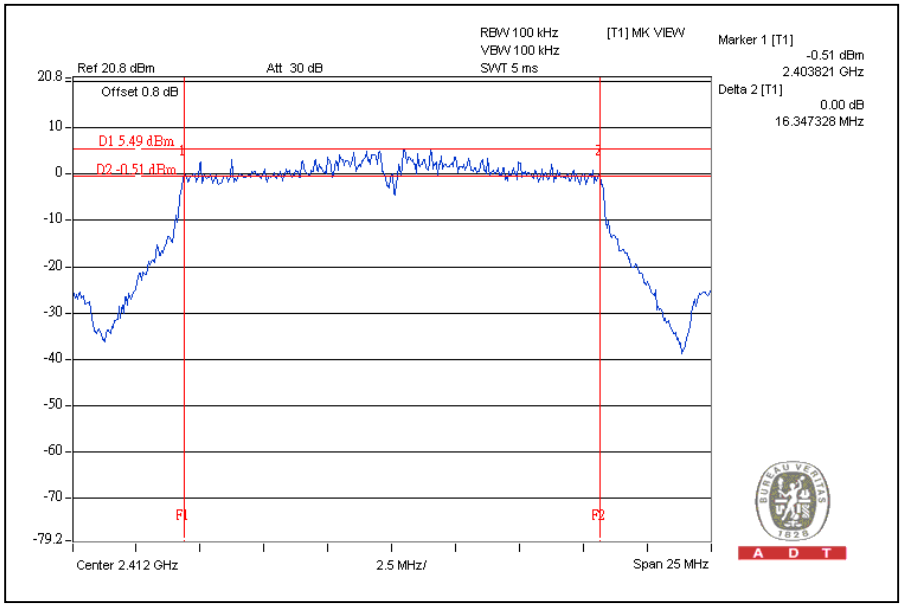

RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
4.74 dBm
2.458043 GHz
Delta 2 [T1]
0.00 dB
8.133847 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 10.74 dBm
D2 4.74 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.462 GHz
2.5 MHz/
Span 25 MHz

802.11g OFDM MODULATION:

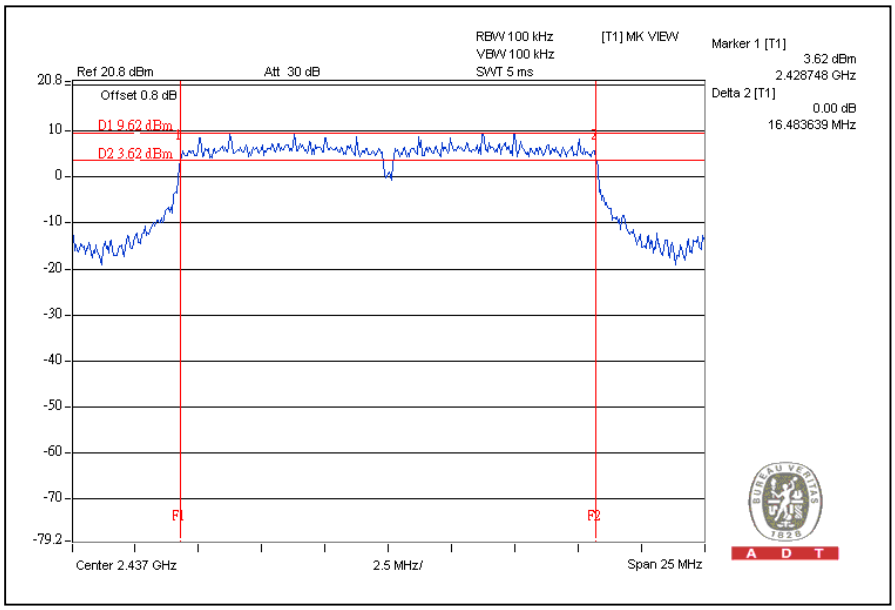
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.35	0.5	PASS
6	2437	16.48	0.5	PASS
11	2462	16.46	0.5	PASS

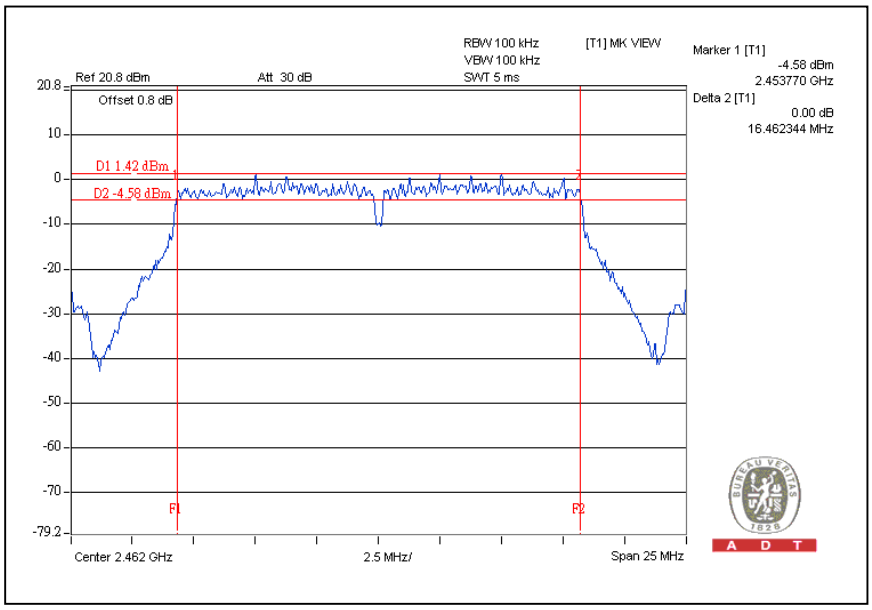
CH1



CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
3.62 dBm
2.428748 GHz
Delta 2 [T1]
0.00 dB
16.483639 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 9.62 dBm
D2 3.62 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.437 GHz
2.5 MHz/
Span 25 MHz

CH11

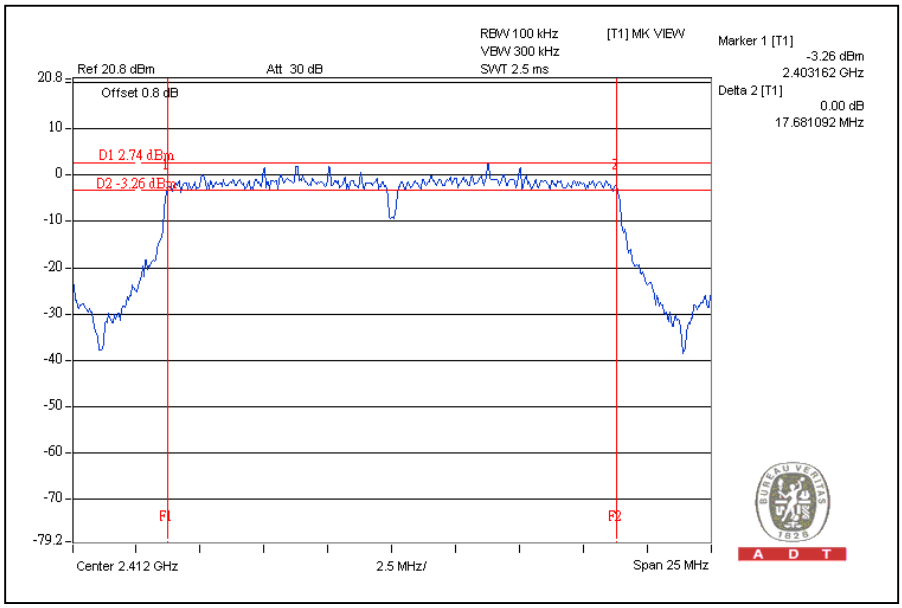

RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-4.58 dBm
2.453770 GHz
Delta 2 [T1]
0.00 dB
16.462344 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 1.42 dBm
D2 -4.58 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.462 GHz
2.5 MHz/
Span 25 MHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

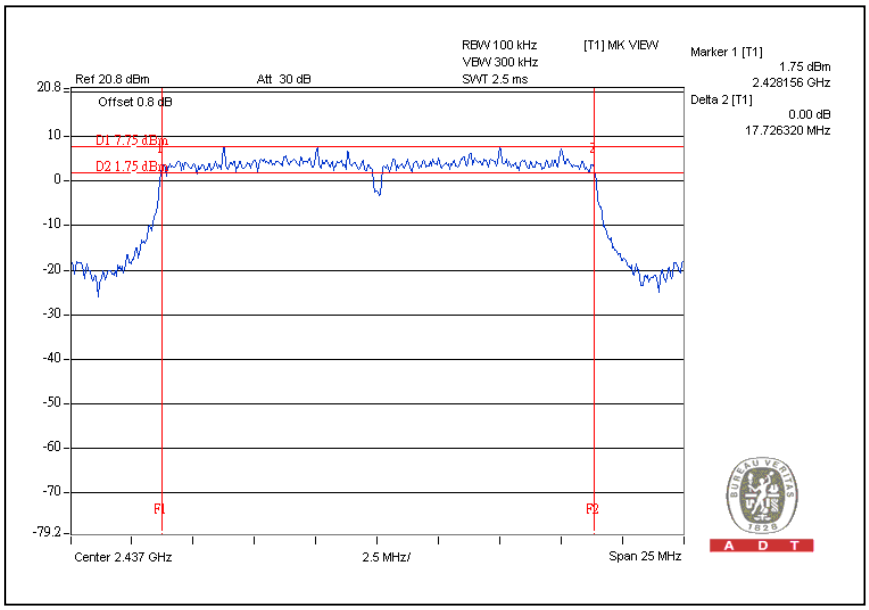
MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.68	0.5	PASS
6	2437	17.73	0.5	PASS
11	2462	17.66	0.5	PASS

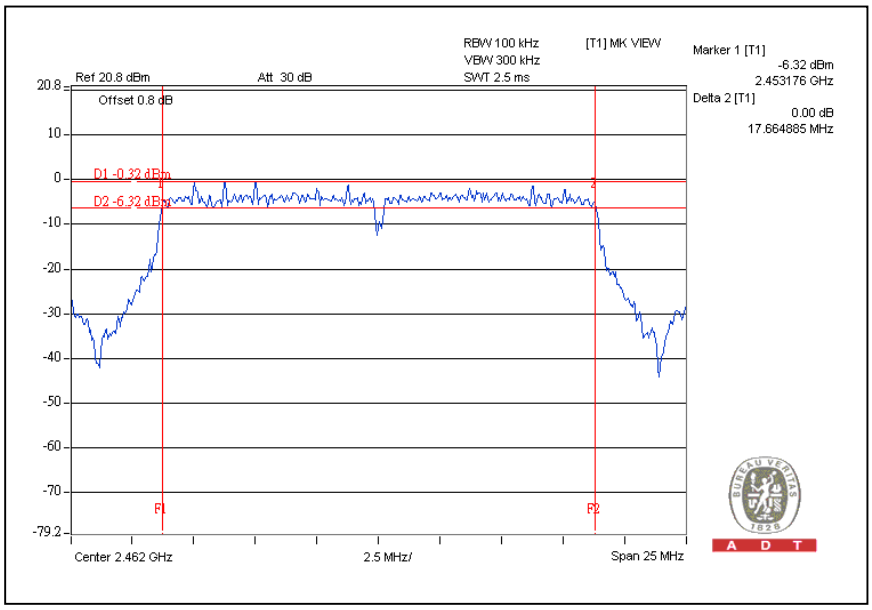
CH1



CH6


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
1.75 dBm
2.428156 GHz
Delta 2 [T1]
0.00 dB
17.726320 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 7.75 dBm
D2 1.75 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.437 GHz
2.5 MHz/
Span 25 MHz

CH11

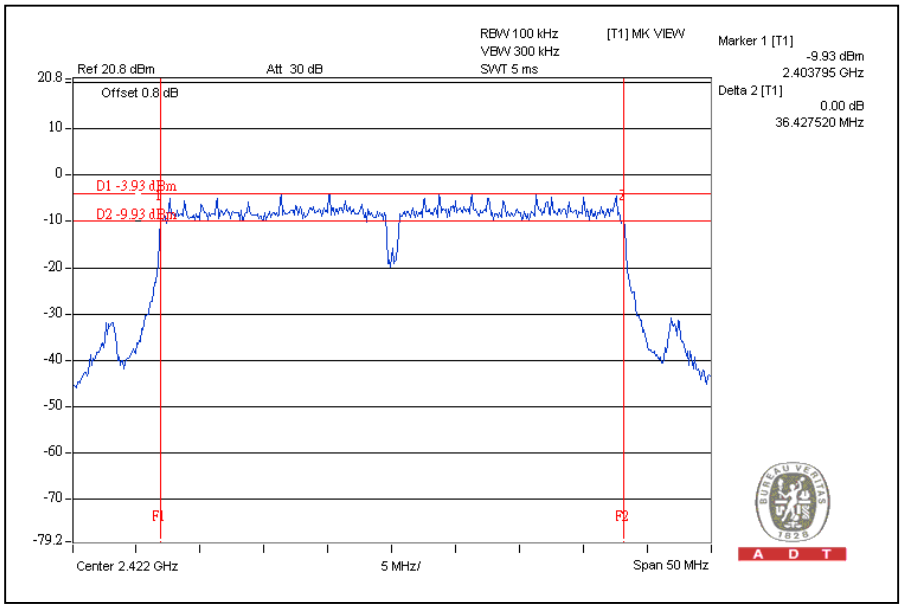

RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-6.32 dBm
2.453176 GHz
Delta 2 [T1]
0.00 dB
17.664885 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 -0.32 dBm
D2 -6.32 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.462 GHz
2.5 MHz/
Span 25 MHz

DRAFT 802.11n (40MHz) OFDM MODULATION:

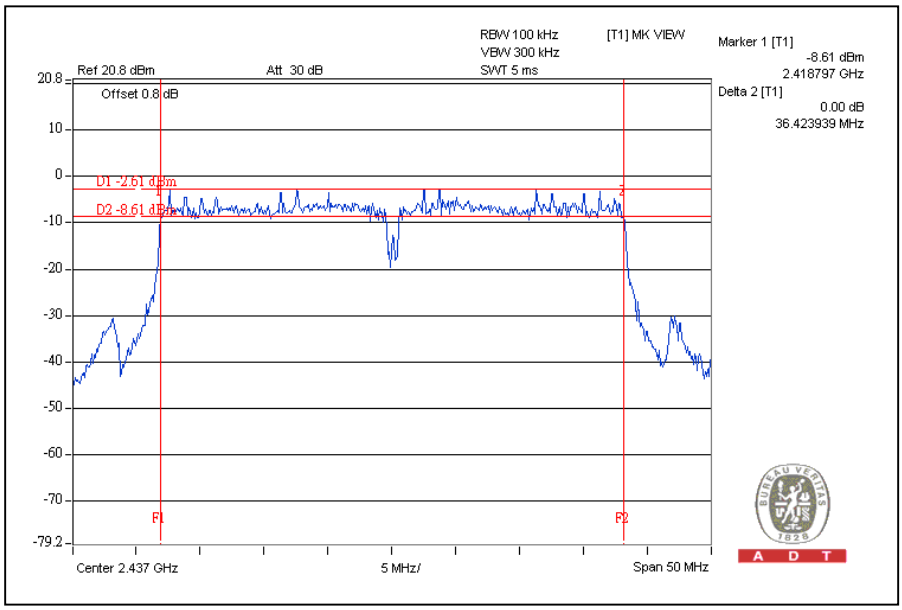
MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	36.43	0.5	PASS
4	2437	36.42	0.5	PASS
7	2452	36.47	0.5	PASS

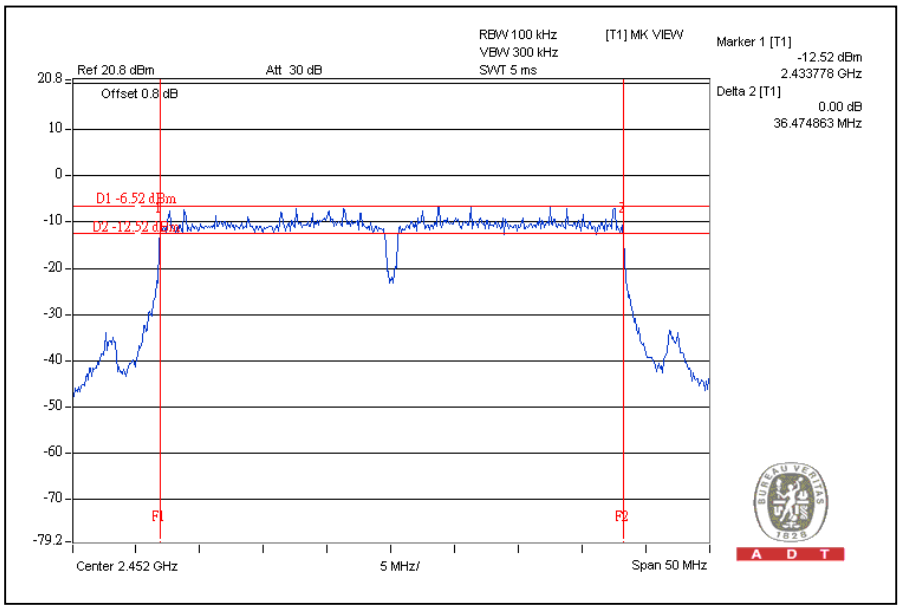
CH1



CH4


RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-8.61 dBm
2.418797 GHz
Delta 2 [T1]
0.00 dB
36.423939 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 -2.61 dBm
D2 -8.61 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.437 GHz
5 MHz/
Span 50 MHz

CH7


RBW 100 kHz
VBW 300 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-12.52 dBm
2.433778 GHz
Delta 2 [T1]
0.00 dB
36.474863 MHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 -6.52 dBm
D2 -12.52 dBm
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
F1
F2
Center 2.452 GHz
5 MHz/
Span 50 MHz

4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	April 25, 2009	April 24, 2010
Pulse Power Sensor	MA2411B	0738172	April 25, 2009	April 24, 2010

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

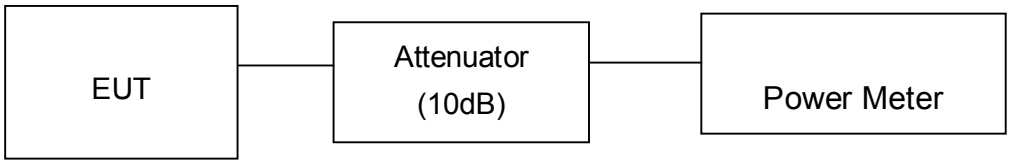
4.4.3 TEST PROCEDURES

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:

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	26.0	398.1	30	PASS
6	2437	26.0	398.1	30	PASS
11	2462	24.9	309.0	30	PASS

802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	22.10	162.2	30	PASS
6	2437	28.40	691.8	30	PASS
11	2462	20.00	100.0	30	PASS

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

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	25.1	25.4	670.3	28.3	30	PASS
6	2437	27.0	26.8	979.8	29.9	30	PASS
11	2462	22.0	21.0	284.4	24.5	30	PASS

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2422	22.1	22.2	328.1	25.2	30	PASS
4	2437	24.5	24.8	583.8	27.7	30	PASS
7	2452	21.3	21.0	260.8	24.2	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

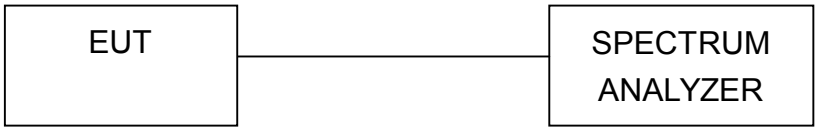
4.5.3 TEST PROCEDURE

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

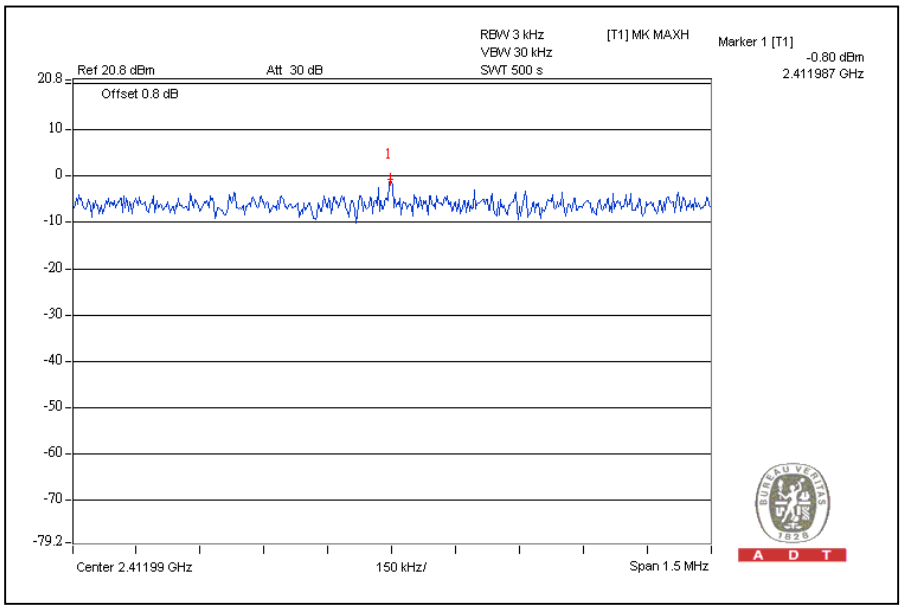
4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

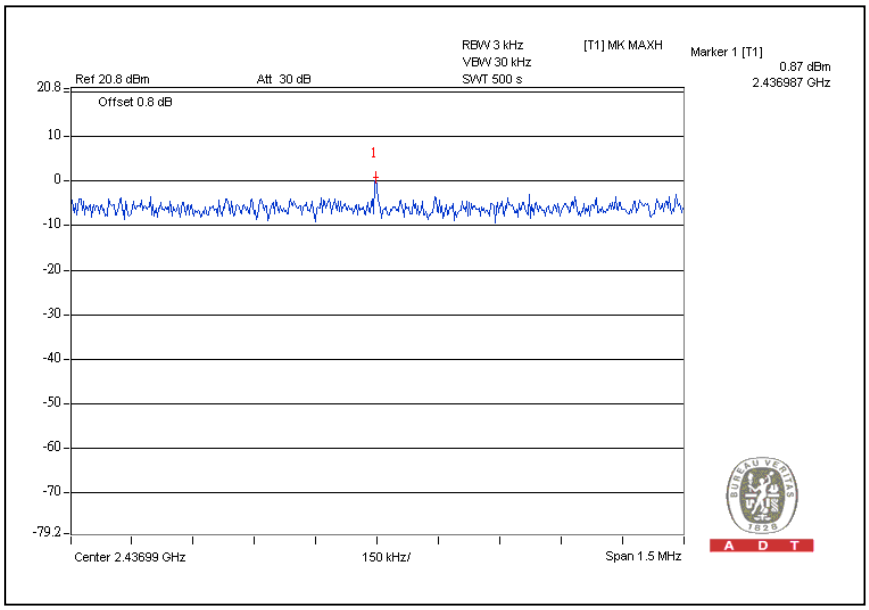
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-0.8	8	PASS
6	2437	0.9	8	PASS
11	2462	-1.8	8	PASS

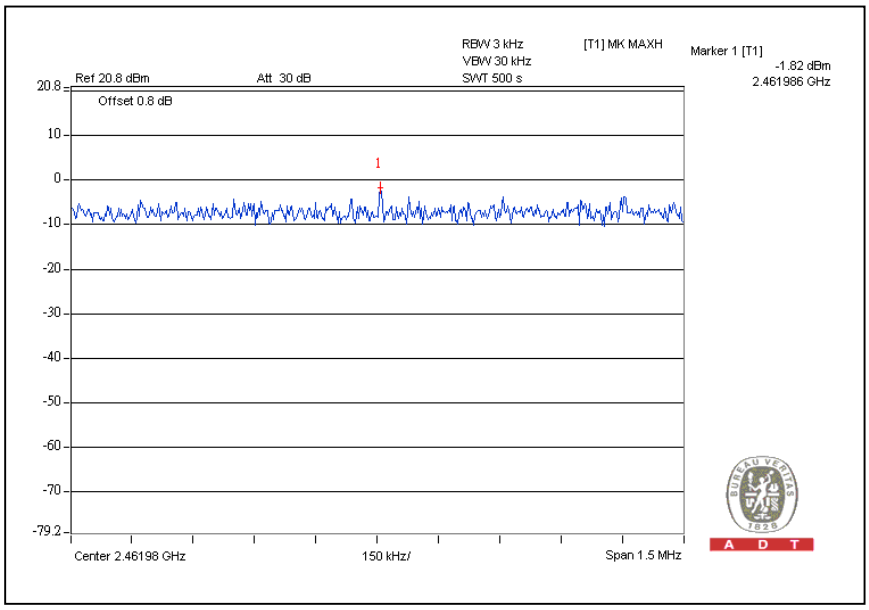
CH1



CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
0.87 dBm
2.436987 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.43699 GHz
150 kHz/
Span 1.5 MHz

CH11

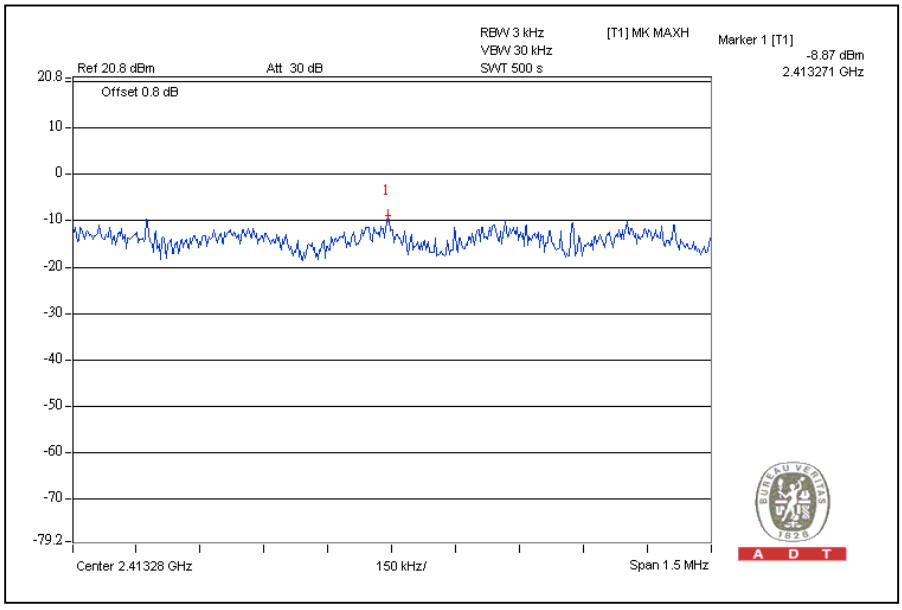

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-1.82 dBm
2.461986 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.46198 GHz
150 kHz/
Span 1.5 MHz

802.11g OFDM MODULATION:

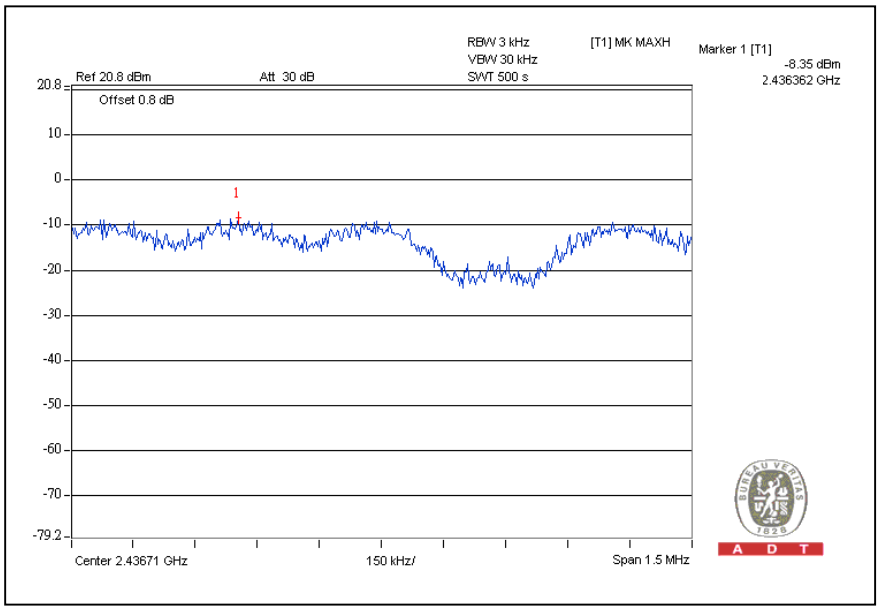
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-8.9	8	PASS
6	2437	-8.4	8	PASS
11	2462	-12.4	8	PASS

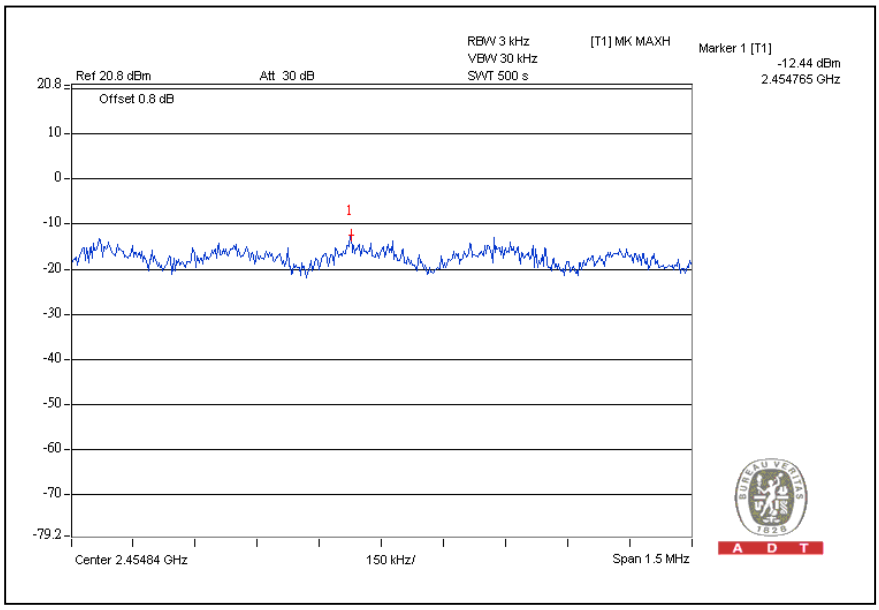
CH1



CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-8.35 dBm
2.436362 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.43671 GHz
150 kHz/
Span 1.5 MHz

CH11

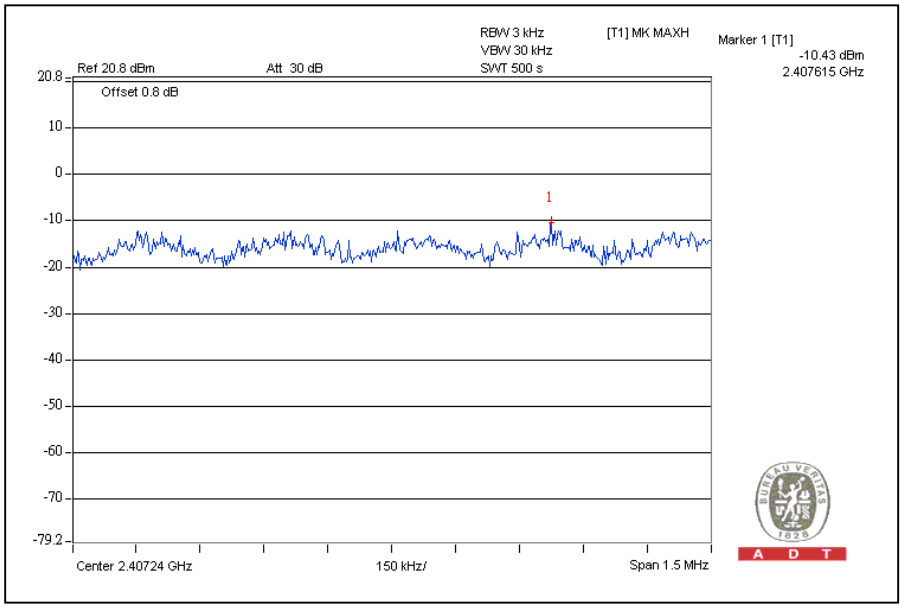

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-12.44 dBm
2.454765 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.45484 GHz
150 kHz/
Span 1.5 MHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

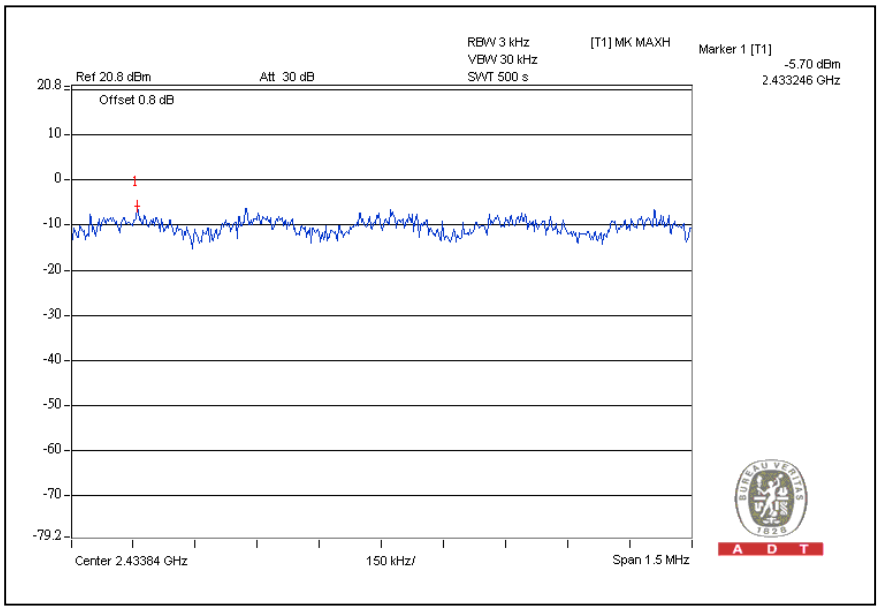
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25 deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2412	-10.4	-11.2	-7.8	8	PASS
6	2437	-5.7	-6.9	-3.2	8	PASS
11	2462	-15.3	-13.0	-11.0	8	PASS

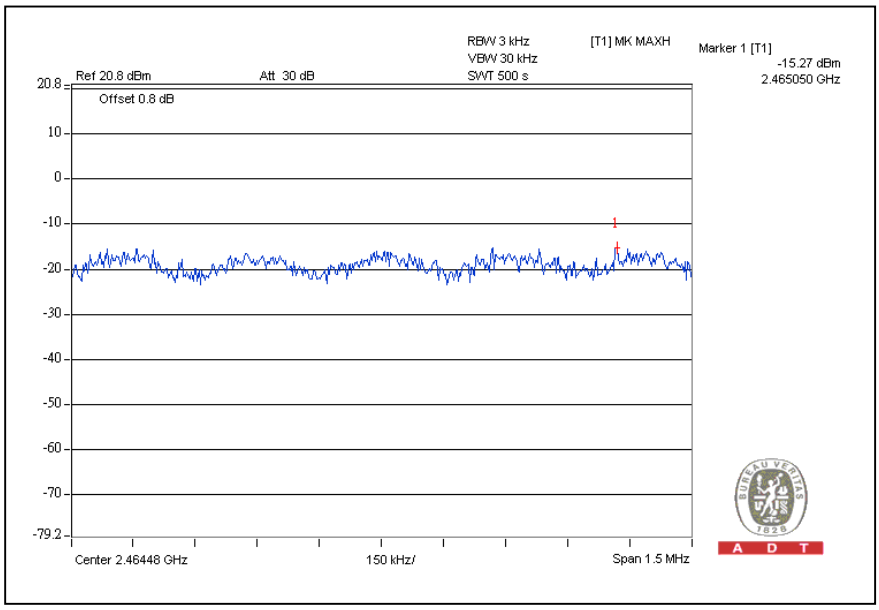
For Chain(0): CH1



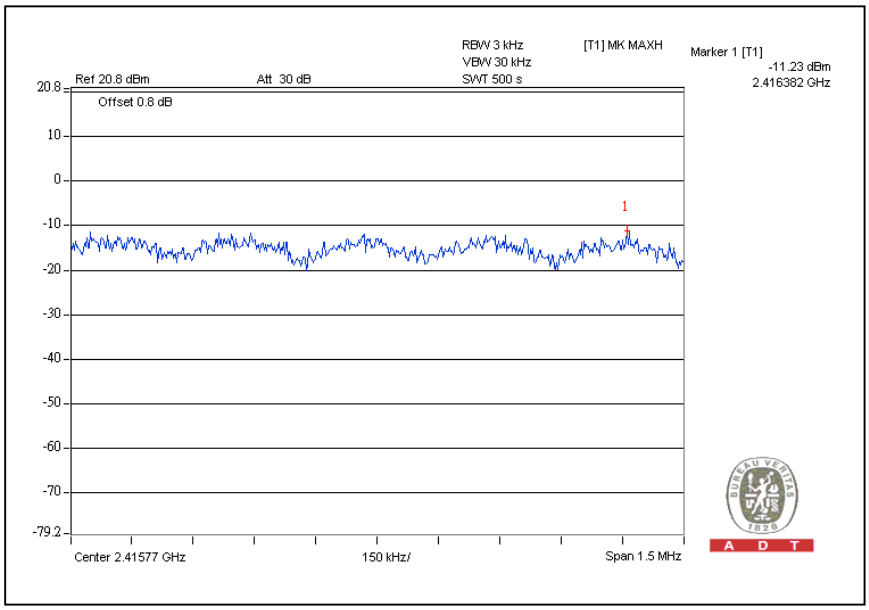
CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-5.70 dBm
2.433246 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.43384 GHz
150 kHz/
Span 1.5 MHz

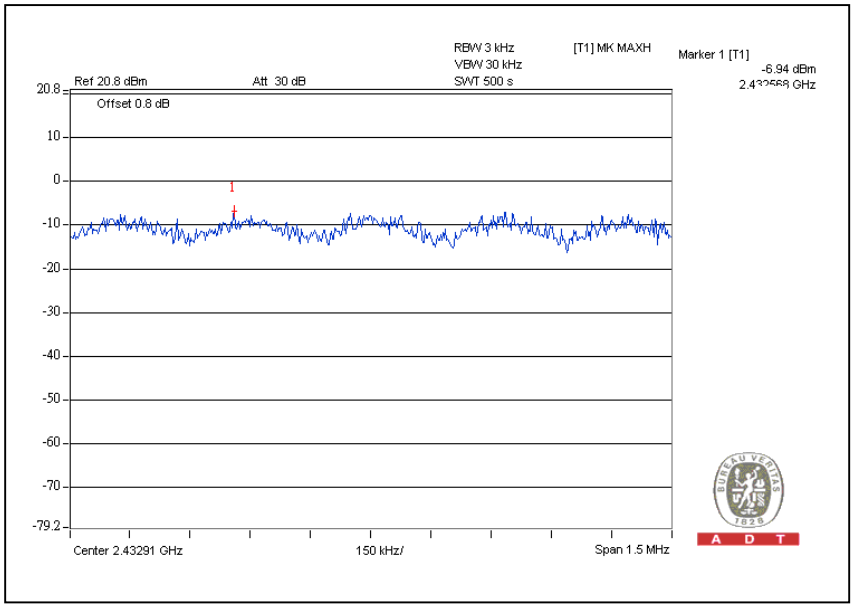
CH11


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-15.27 dBm
2.465050 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.46448 GHz
150 kHz/
Span 1.5 MHz

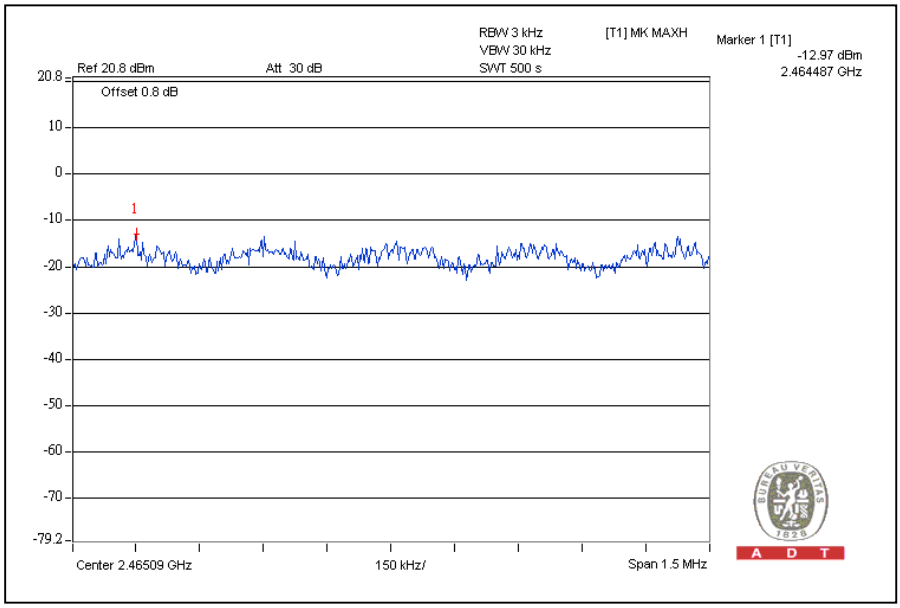
For Chain (1): CH1



CH6



CH11

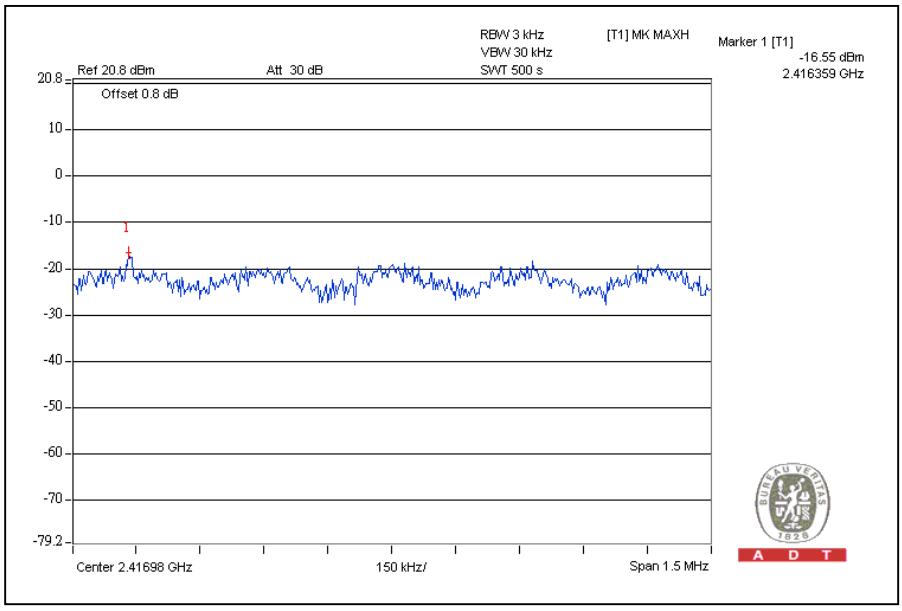

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-12.97 dBm
2.464487 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
1
Center 2.46509 GHz
150 kHz/
Span 1.5 MHz

DRAFT 802.11n (40MHz) OFDM MODULATION:

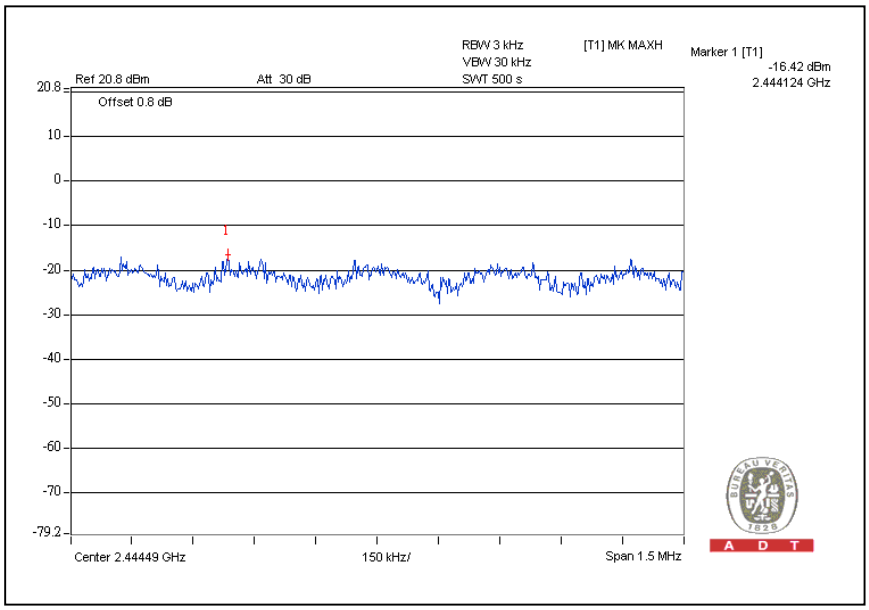
MODULATION TYPE	BPSK	TRANSFER RATE	13.5Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2422	-16.6	-14.2	-12.2	8	PASS
4	2437	-16.4	-15.6	-13.0	8	PASS
7	2452	-21.1	-19.2	-17.0	8	PASS

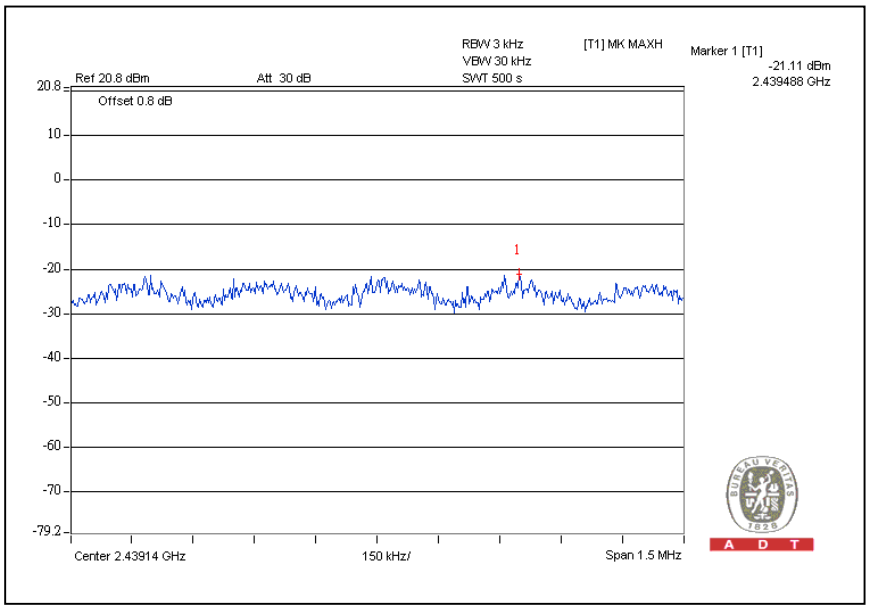
For Chain (0): CH1



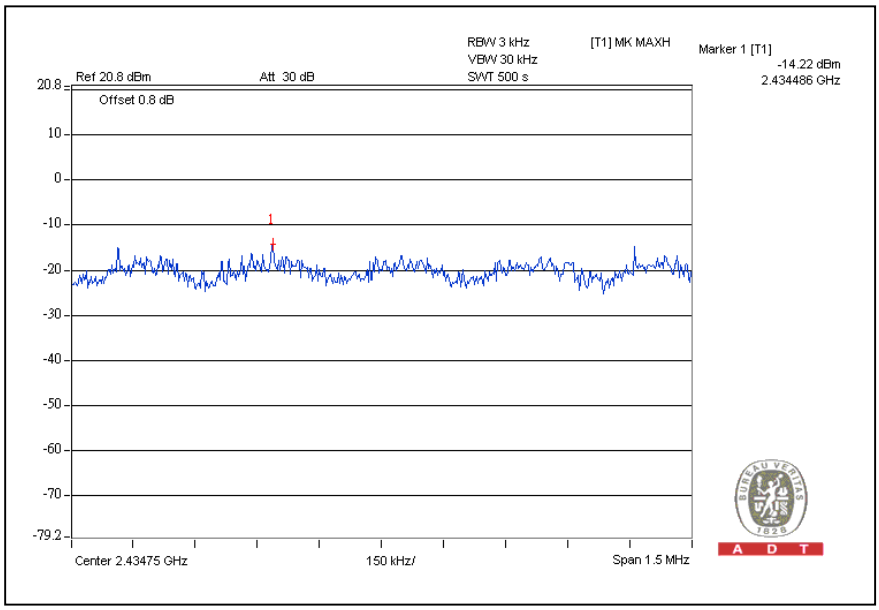
CH4


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-16.42 dBm
2.444124 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.44449 GHz
150 kHz/
Span 1.5 MHz

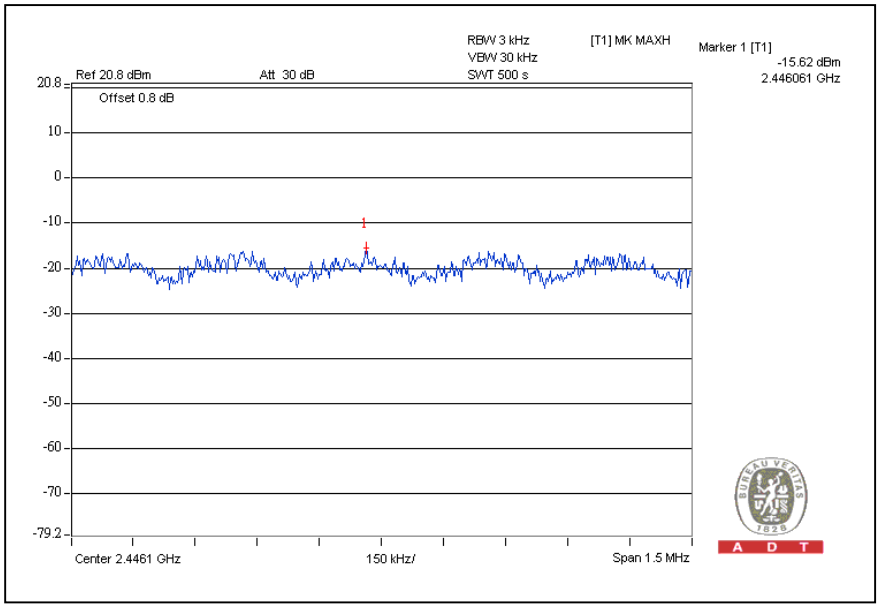
CH7


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-21.11 dBm
2.439488 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Center 2.43914 GHz
150 kHz/
Span 1.5 MHz

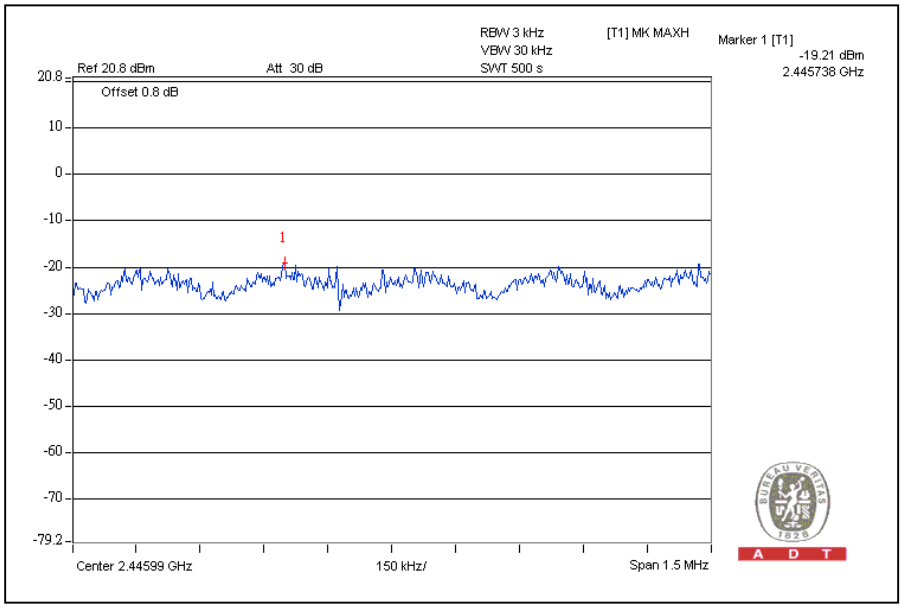
For Chain (1): CH1



CH4



CH7


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-19.21 dBm
2.445738 GHz
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
1
Center 2.44599 GHz
150 kHz/
Span 1.5 MHz

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

1. 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 100 MHz bandwidth from band edge. The band edges was measured and recorded.

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

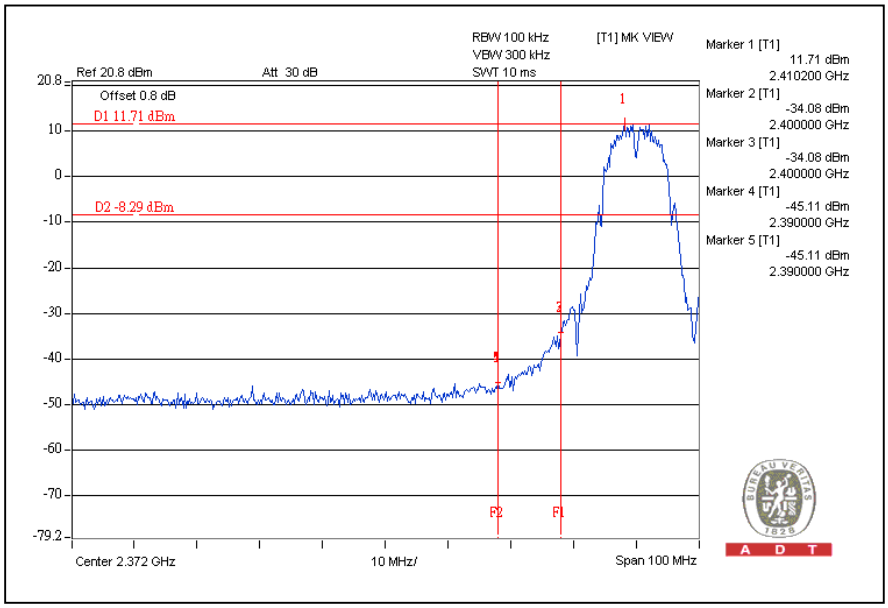
Same as Item 4.3.6

4.6.6 TEST RESULTS

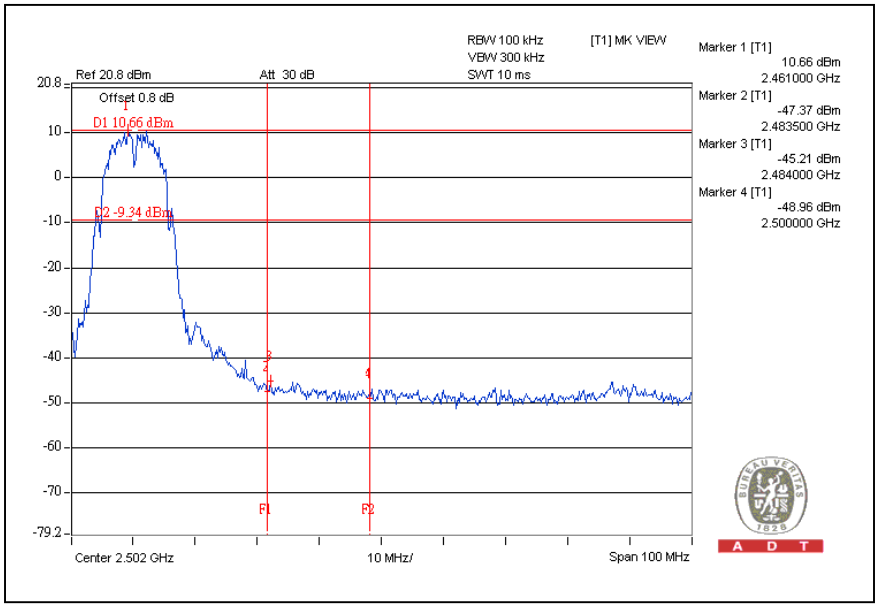
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b DSSS MODULATION:

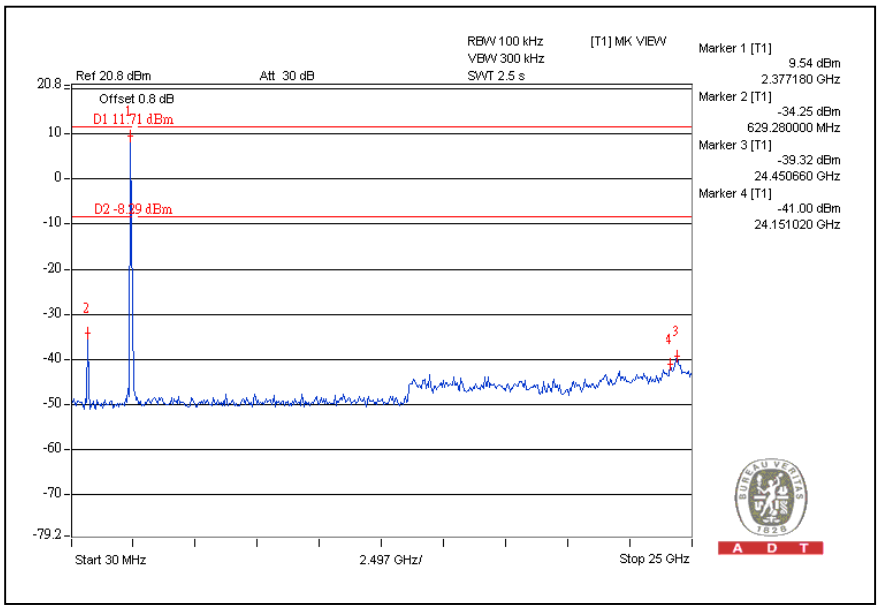
CH1



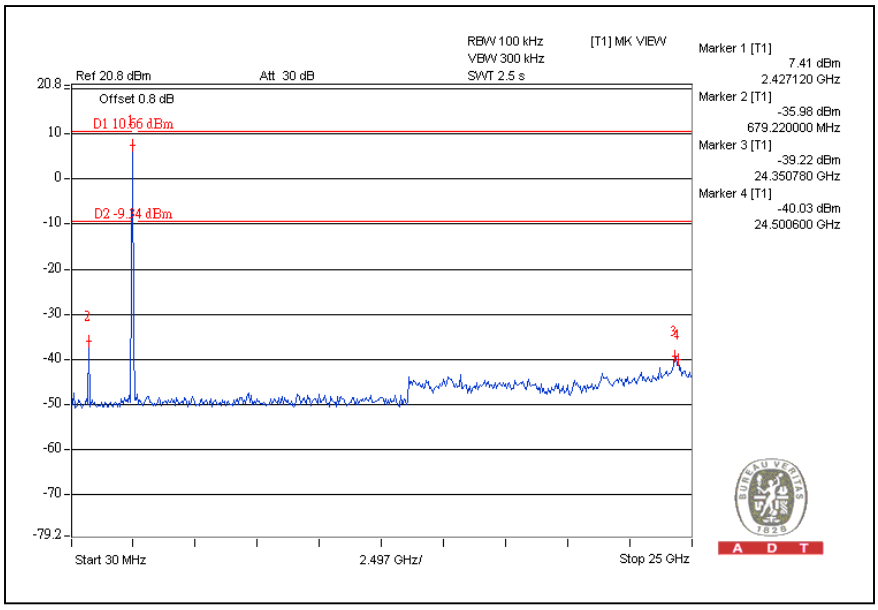
CH11



CH1

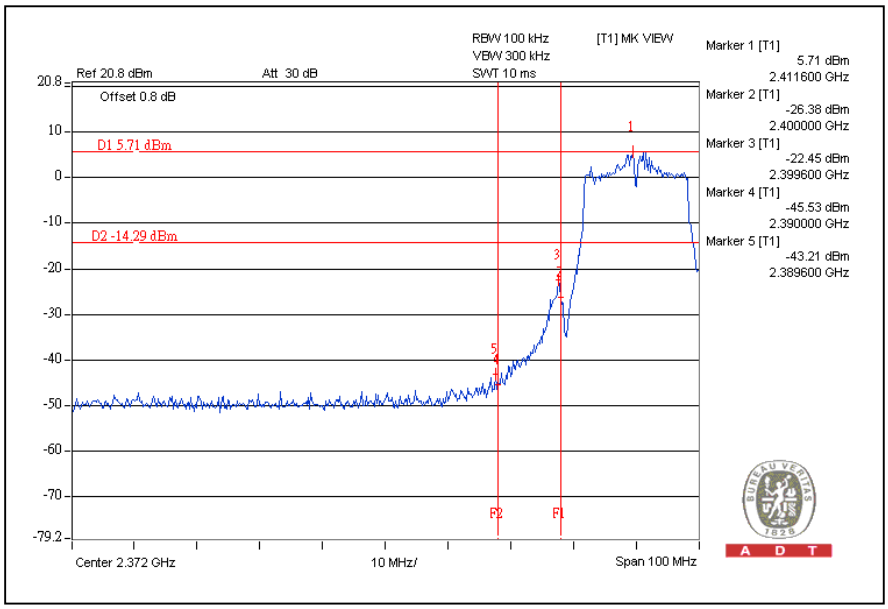

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 11.71 dBm
D2 -8.29 dBm
Marker 1 [T1]
9.54 dBm
2.377180 GHz
Marker 2 [T1]
-34.25 dBm
629.280000 MHz
Marker 3 [T1]
-39.32 dBm
24.450660 GHz
Marker 4 [T1]
-41.00 dBm
24.151020 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH11

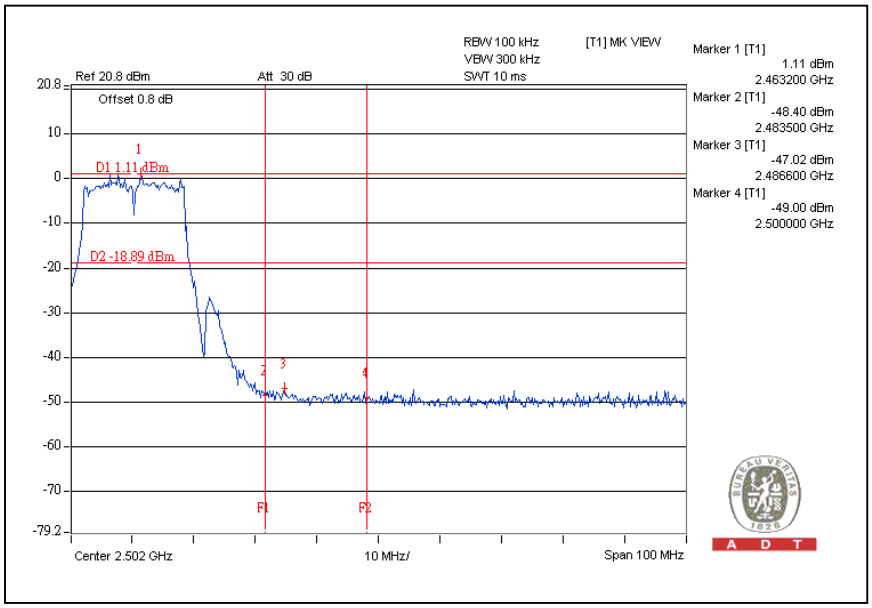

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 10.56 dBm
D2 -9.44 dBm
Marker 1 [T1]
7.41 dBm
2.427120 GHz
Marker 2 [T1]
-35.98 dBm
679.220000 MHz
Marker 3 [T1]
-39.22 dBm
24.350780 GHz
Marker 4 [T1]
-40.03 dBm
24.500600 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

802.11g OFDM MODULATION:

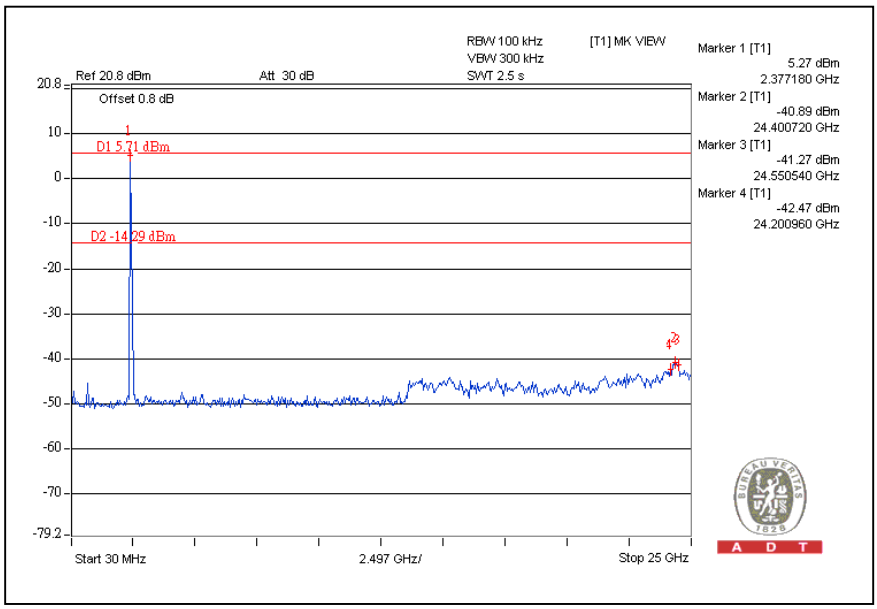
CH1



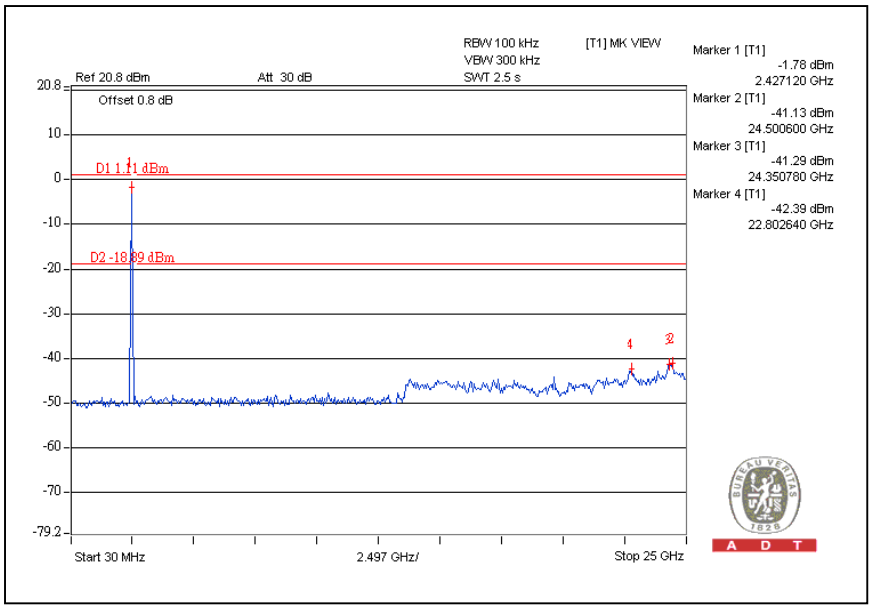
CH11



CH1

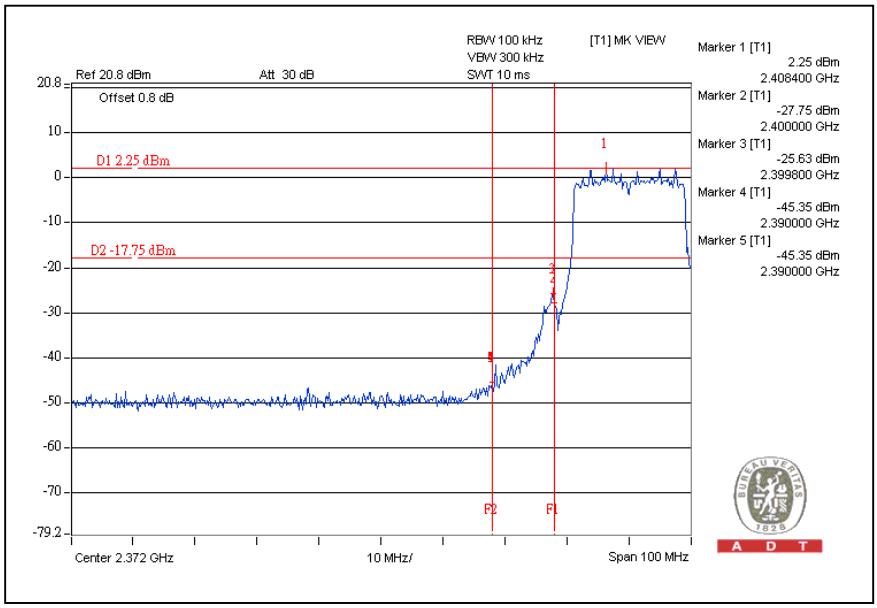

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 5.27 dBm
D2 -14.29 dBm
Marker 1 [T1]
5.27 dBm
2.377180 GHz
Marker 2 [T1]
-40.89 dBm
24.400720 GHz
Marker 3 [T1]
-41.27 dBm
24.550540 GHz
Marker 4 [T1]
-42.47 dBm
24.200960 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH11

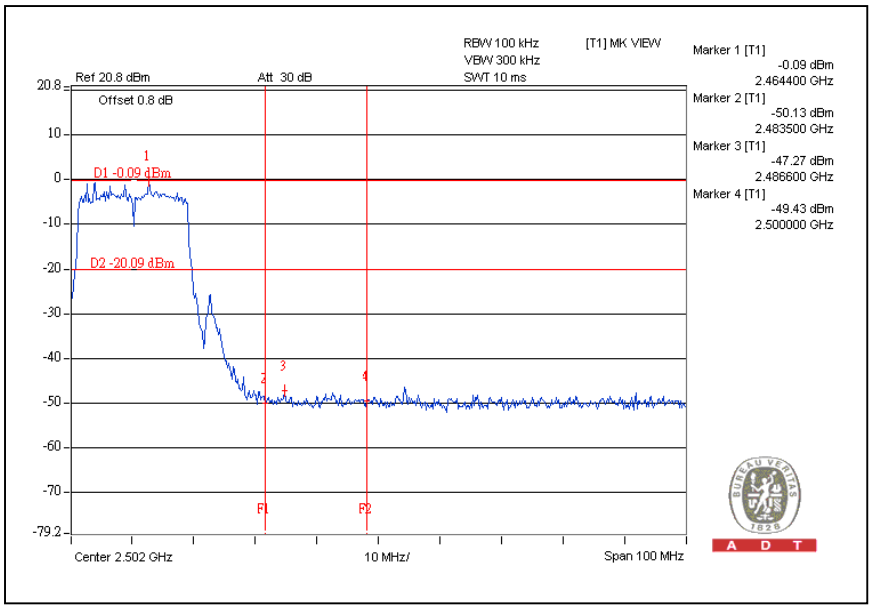

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 1.71 dBm
D2 -18.29 dBm
Marker 1 [T1]
-1.78 dBm
2.427120 GHz
Marker 2 [T1]
-41.13 dBm
24.500600 GHz
Marker 3 [T1]
-41.29 dBm
24.350780 GHz
Marker 4 [T1]
-42.39 dBm
22.802640 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

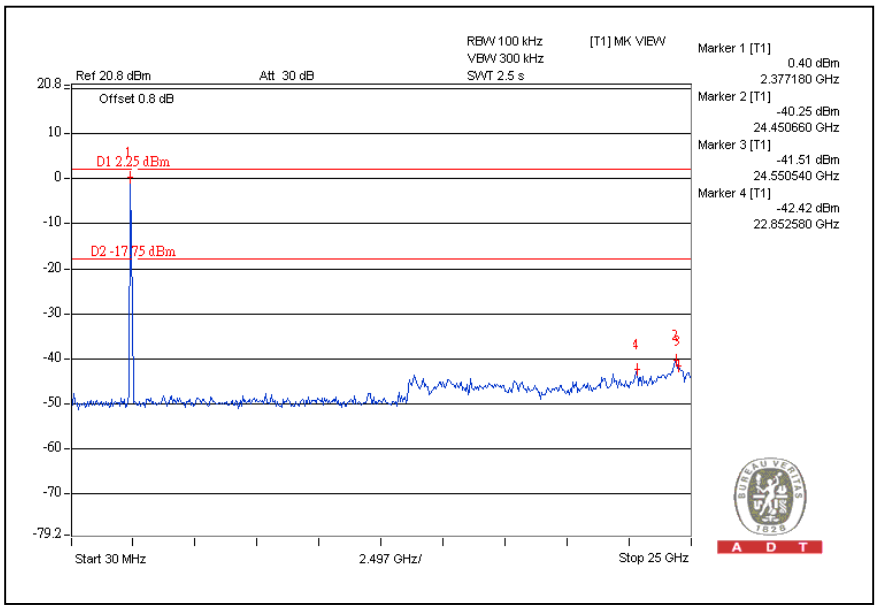
CH1



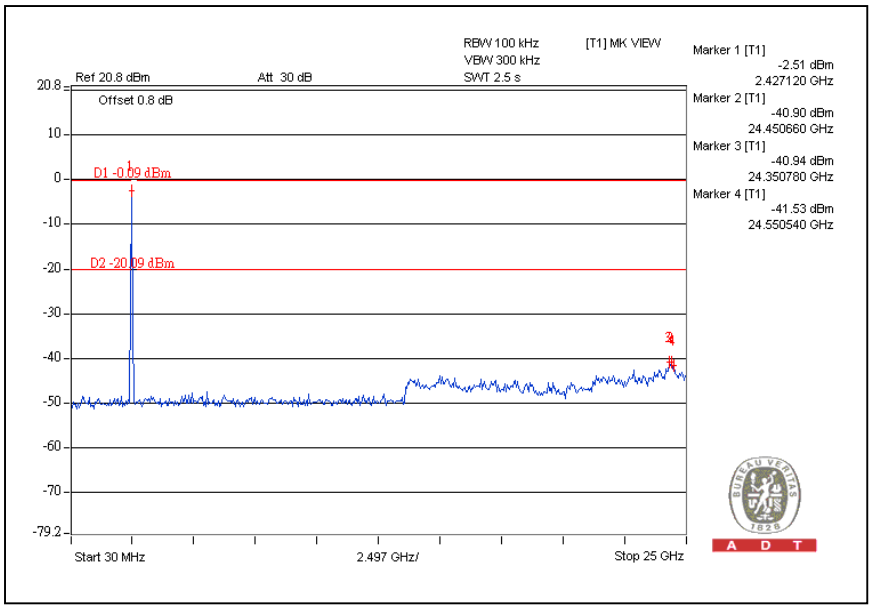
CH11



CH1

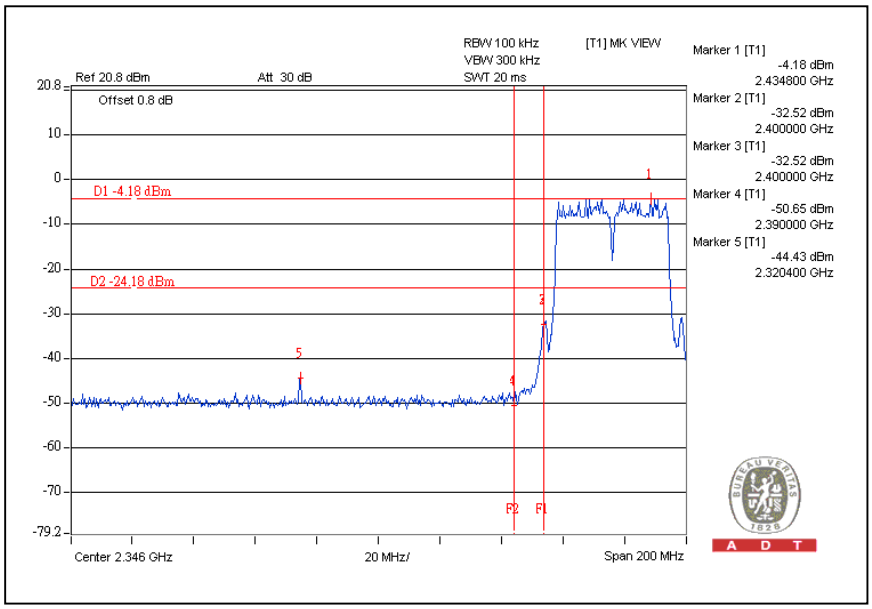

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 2.25 dBm
D2 -17.75 dBm
Marker 1 [T1]
0.40 dBm
2.377180 GHz
Marker 2 [T1]
-40.25 dBm
24.450660 GHz
Marker 3 [T1]
-41.51 dBm
24.550540 GHz
Marker 4 [T1]
-42.42 dBm
22.852580 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH11

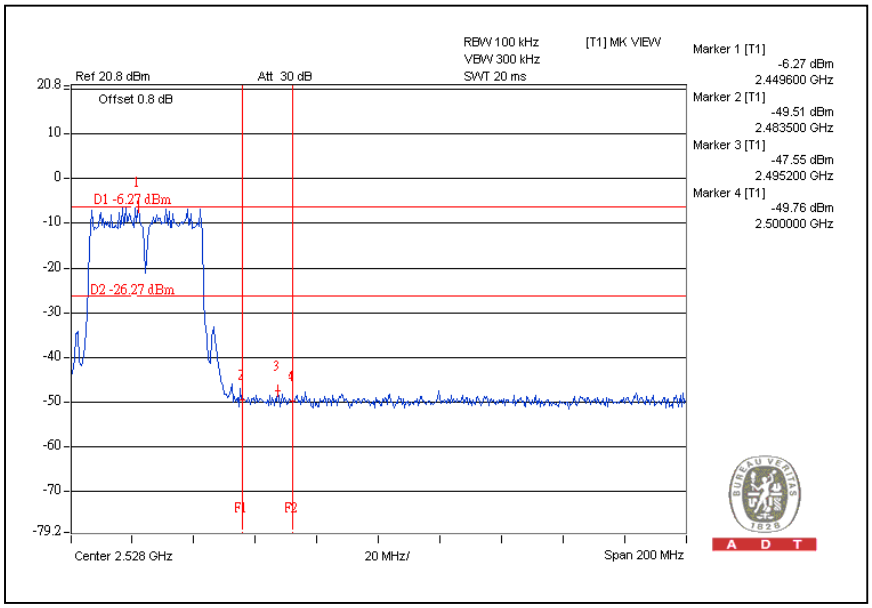

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 -0.09 dBm
D2 -20.09 dBm
Marker 1 [T1]
-2.51 dBm
2.427120 GHz
Marker 2 [T1]
-40.90 dBm
24.450660 GHz
Marker 3 [T1]
-40.94 dBm
24.350780 GHz
Marker 4 [T1]
-41.53 dBm
24.550540 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

DRAFT 802.11n (40MHz) OFDM MODULATION:

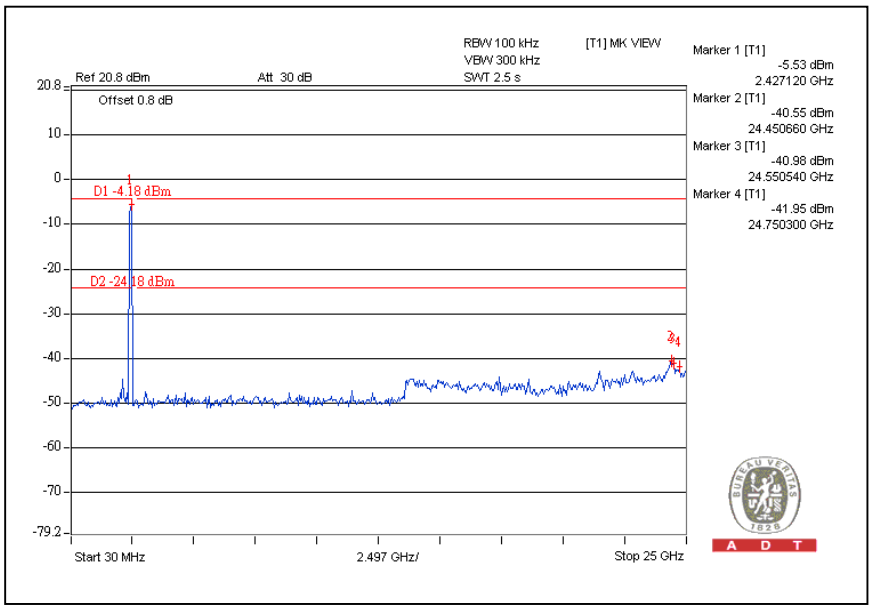
CH1



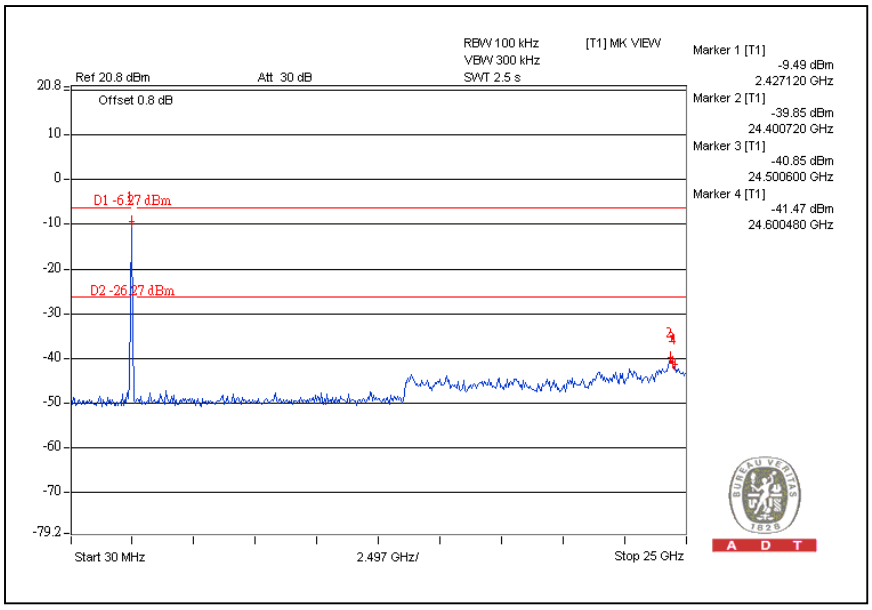
CH7



CH1


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 -4.18 dBm
D2 -24.18 dBm
Marker 1 [T1]
-5.53 dBm
2.427120 GHz
Marker 2 [T1]
-40.55 dBm
24.450660 GHz
Marker 3 [T1]
-40.98 dBm
24.550540 GHz
Marker 4 [T1]
-41.95 dBm
24.750300 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH7


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.8 dBm
Att 30 dB
Offset 0.8 dB
D1 -6.27 dBm
D2 -26.27 dBm
Marker 1 [T1]
-9.49 dBm
2.427120 GHz
Marker 2 [T1]
-39.85 dBm
24.400720 GHz
Marker 3 [T1]
-40.85 dBm
24.500600 GHz
Marker 4 [T1]
-41.47 dBm
24.600480 GHz
20.8
10
0
-10
-20
-30
-40
-50
-60
-70
-79.2
Start 30 MHz
2.497 GHz/
Stop 25 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

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

4.7.2 ANTENNA CONNECTED CONSTRUCTION

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

Transmitter / Circuit	Antenna Gain		Antenna Type	Connector
	For 2.4GHz Gain (dBi)	For 5GHz Gain (dBi)		
Chain(0)	4	3.5	PIFA	NA
Chain(1)	4	3.5	PIFA	NA
Chain(2)	4	3.5	PIFA	NA

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

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 05, 2009	Mar. 04, 2010
Line-Impedance Stabilization Network (for EUT)	KNW-407	8-1395-12	May 04, 2009	May 03, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 08, 2009	June 07, 2010
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec 15, 2008	Dec 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
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.
4. The test was performed in Shielded Room No. A.
5. The VCCI Con A Registration No. is C-817.

5.1.3 TEST PROCEDURES

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

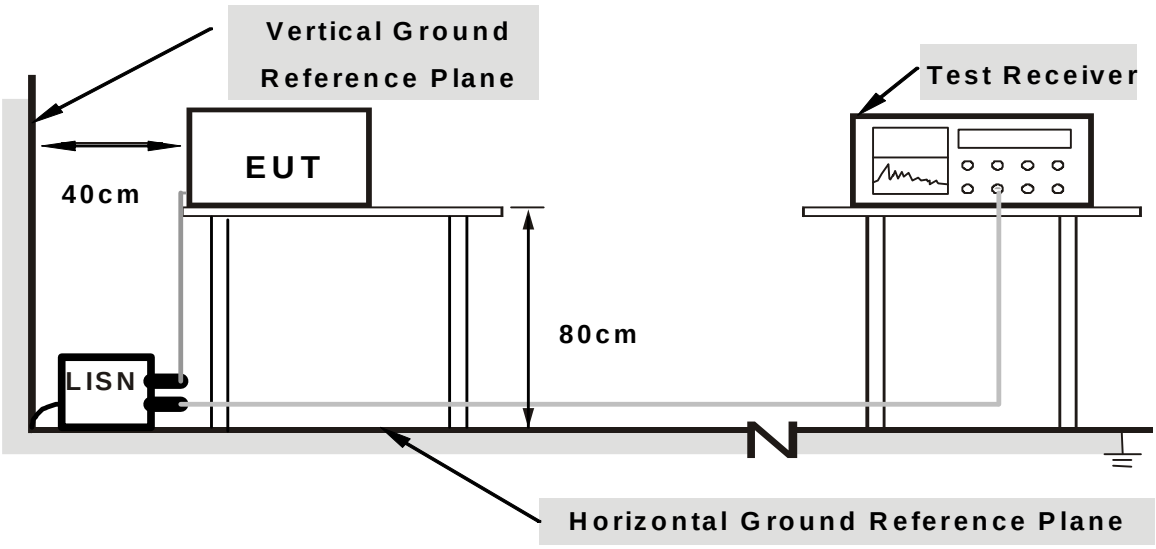
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

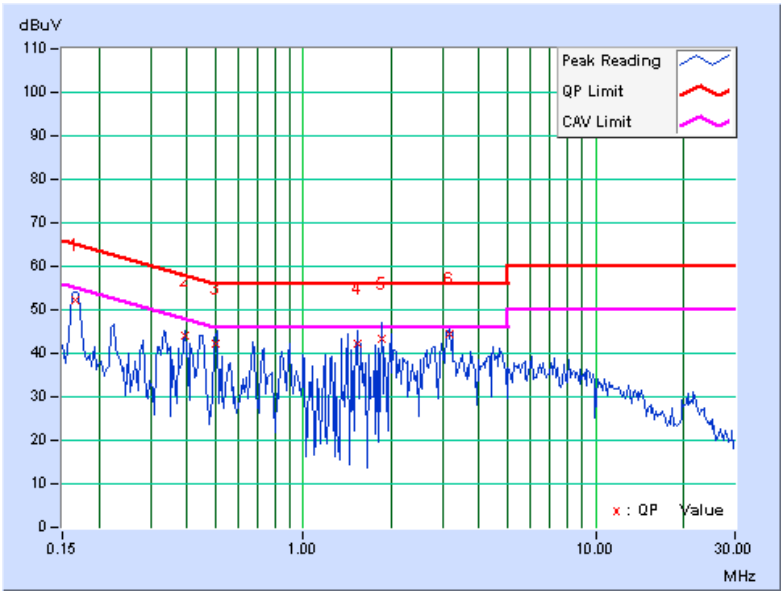
5.1.7 TEST RESULTS-ADAPTER 1

DRAFT 802.11n (20MHz) OFDM modulation:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	PHASE	Line (L)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6.5Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 965hPa	TESTED BY	Timmy Hu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.24	52.01	-	52.25	-	65.18	55.18	-12.93	-
2	0.392	0.08	43.95	-	44.03	-	58.02	48.02	-13.98	-
3	0.500	0.08	41.98	-	42.06	-	56.00	46.00	-13.94	-
4	1.531	0.07	41.99	-	42.06	-	56.00	46.00	-13.94	-
5	1.852	0.07	43.17	-	43.24	-	56.00	46.00	-12.76	-
6	3.148	0.11	44.15	-	44.26	-	56.00	46.00	-11.74	-

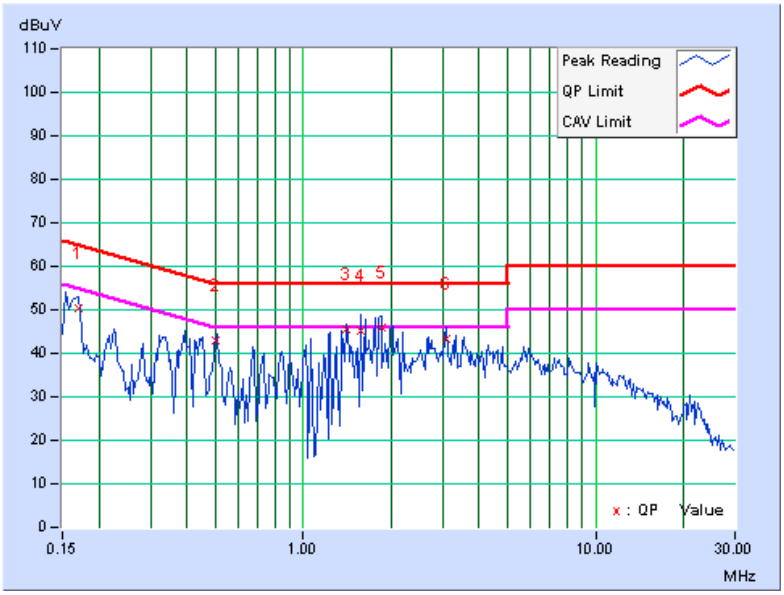
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	PHASE	Neutral (N)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	13.5Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 965hPa	TESTED BY	Timmy Hu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.171	0.23	50.17	-	50.40	-	64.89	54.89	-14.49	-
2	0.504	0.09	42.82	-	42.91	-	56.00	46.00	-13.09	-
3	1.402	0.09	45.40	-	45.49	-	56.00	46.00	-10.51	-
4	1.570	0.09	45.02	-	45.11	-	56.00	46.00	-10.89	-
5	1.848	0.10	45.68	-	45.78	-	56.00	46.00	-10.22	-
6	3.090	0.13	43.13	-	43.26	-	56.00	46.00	-12.74	-

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



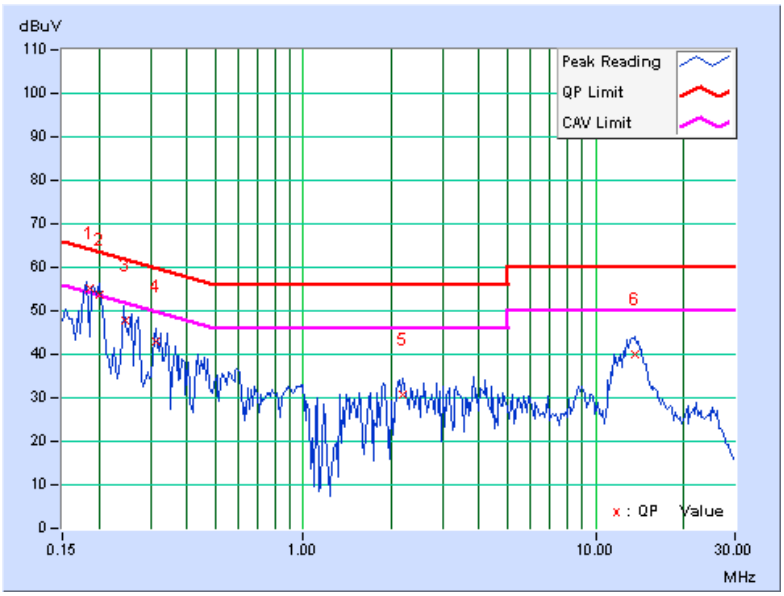
5.1.8 TEST RESULTS-ADAPTER 2

DRAFT 802.11n (20MHz) OFDM modulation:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	PHASE	Line (L)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6.5Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 965hPa	TESTED BY	Timmy Hu

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.187**	**0.20**	**55.07**	**41.50**	**55.27**	**41.70**	**64.16**	**54.16**	**-8.90**	**-12.47**
2	0.201	0.17	53.47	38.96	53.64	39.13	63.58	53.58	-9.94	-14.45
3	0.247	0.15	47.80	-	47.95	-	61.86	51.86	-13.91	-
4	0.314	0.12	42.98	-	43.10	-	59.86	49.86	-16.76	-
5	2.195	0.08	30.48	-	30.56	-	56.00	46.00	-25.44	-
6	13.688	0.32	39.77	-	40.09	-	60.00	50.00	-19.91	-

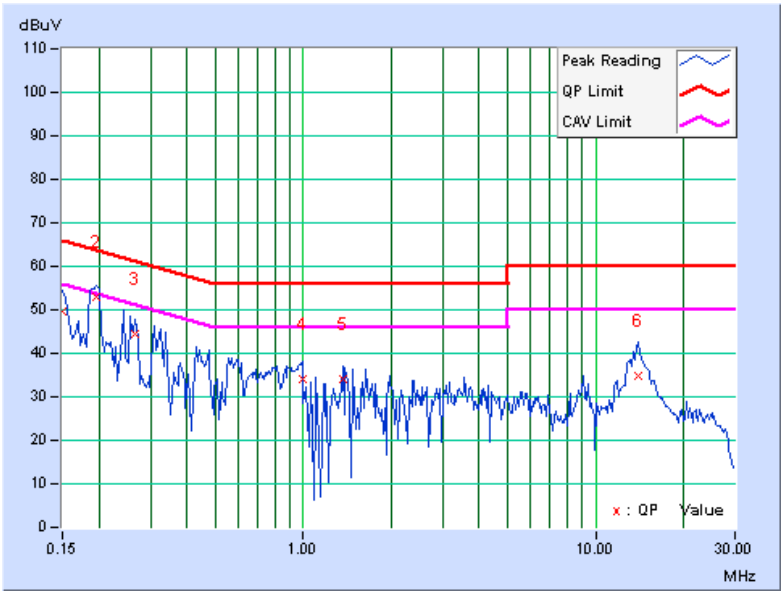
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	PHASE	Neutral (N)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	13.5Mbps	INPUT POWER	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 960hPa	TESTED BY	Leo Peng

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.28	49.20	-	49.48	-	66.00	56.00	-16.52	-
2	0.197	0.19	52.67	-	52.86	-	63.74	53.74	-10.89	-
3	0.267	0.15	44.17	-	44.32	-	61.20	51.20	-16.89	-
4	0.994	0.08	34.14	-	34.22	-	56.00	46.00	-21.78	-
5	1.367	0.09	34.08	-	34.17	-	56.00	46.00	-21.83	-
6	13.961	0.36	34.44	-	34.80	-	60.00	50.00	-25.20	-

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



5.2 RADIATED EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 9, 2008	Dec. 8, 2009
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 9, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 9, 2008	Sep. 8, 2009
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
R&S Loop Antenna	HFH2-Z2	100070	Jan. 14, 2008	Jan. 13, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 15, 2008	Aug. 14, 2009
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	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, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

5.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

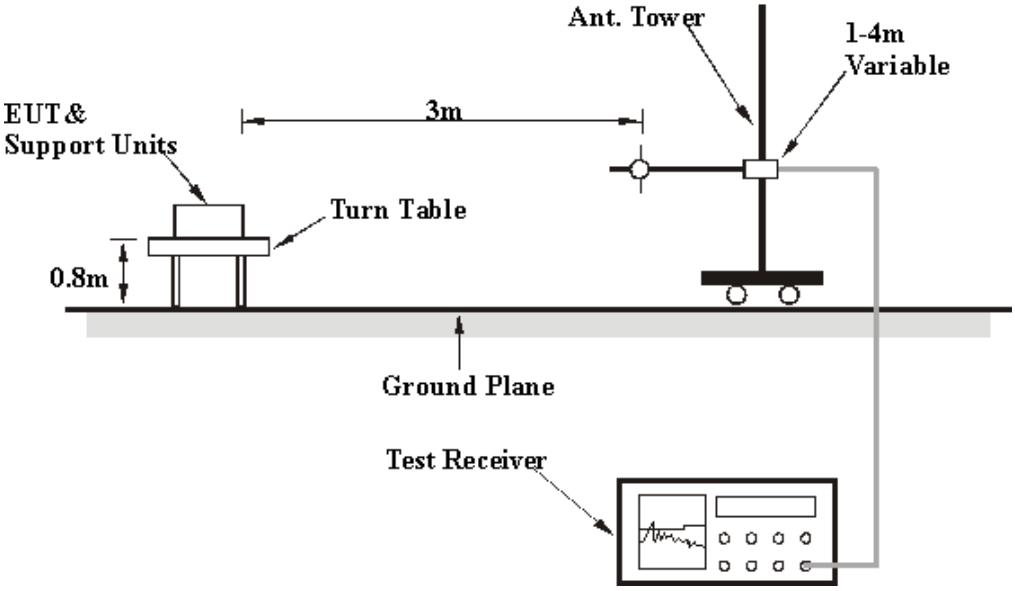
NOTE:

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

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared other computer systems (support units 1 ~ 3) to act as communication partners and placed them outside of testing area.
3. The communication partner runs test program" MFGTEST" to enable EUT under transmission condition continuously at specific channel frequency via UTP cables.

Below 1GHz Test Data

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA：DRAFT 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	30.0deg. C, 61.0%RH 965hPa	TESTED BY	Eric Lee

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	125.01	26.98 QP	43.50	-16.52	1.15 H	53	13.91	13.07
2	200.00	25.84 QP	43.50	-17.66	1.69 H	96	13.45	12.39
3	250.00	41.23 QP	46.00	-4.77	1.11 H	348	26.98	14.25
4	375.01	36.42 QP	46.00	-9.58	1.23 H	65	17.61	18.81
5	500.00	36.23 QP	46.00	-9.77	1.11 H	63	13.74	22.49
6	625.00	37.54 QP	46.00	-8.46	1.65 H	333	12.25	25.29
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	125.00	30.20 QP	43.50	-13.30	1.11 V	65	17.13	13.07
2	200.01	24.30 QP	43.50	-19.20	1.30 V	356	11.91	12.39
3	240.00	26.59 QP	46.00	-19.41	1.36 V	63	12.71	13.88
4	250.00	33.42 QP	46.00	-12.58	1.50 V	223	19.17	14.25
5	374.99	36.23 QP	46.00	-9.77	1.65 V	326	17.42	18.81
6	500.00	33.42 QP	46.00	-12.58	1.05 V	236	10.93	22.49
7	625.01	41.20 QP	46.00	-4.80	1.69 V	95	15.91	25.29
8	875.00	43.54 QP	46.00	-2.46	1.35 V	62	14.25	29.29

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 Test Data

5.2.8 TEST RESULTS

802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	113.80 PK			1.01 H	175	75.84	37.96
2	*5745.00	101.20 AV			1.01 H	175	63.24	37.96
3	11490.00	60.80 PK	74.00	-13.20	1.07 H	35	13.57	47.23
4	11490.00	44.30 AV	54.00	-9.70	1.07 H	35	-2.93	47.23
5	#17235.00	62.40 PK	93.80	-31.40	1.50 H	68	10.07	52.33
6	#17235.00	49.70 AV	81.20	-31.50	1.50 H	68	-2.63	52.33
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	*5745.00	111.42 PK			1.00 V	243	73.46	37.96
2	*5745.00	98.93 AV			1.00 V	243	60.97	37.96
3	11490.00	67.81 PK	74.00	-6.19	1.07 V	303	20.58	47.23
4	11490.00	53.00 AV	54.00	-1.00	1.07 V	303	5.77	47.23
5	#17235.00	69.26 PK	91.42	-22.16	1.02 V	36	16.93	52.33
6	#17235.00	52.90 AV	78.93	-26.03	1.02 V	36	0.57	52.33

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.
7. "#":The radiated frequency is out the restricted band.

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	113.90 PK			1.01 H	192	75.83	38.07
2	*5785.00	101.40 AV			1.01 H	192	63.33	38.07
3	11570.00	66.90 PK	74.00	-7.10	1.42 H	300	19.68	47.22
4	11570.00	51.30 AV	54.00	-2.70	1.42 H	300	4.08	47.22
5	#17355.00	62.20 PK	93.90	-31.70	1.38 H	36	9.05	53.15
6	#17355.00	48.90 AV	81.40	-32.50	1.38 H	36	-4.25	53.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	111.81 PK			1.00 V	244	73.74	38.07
2	*5785.00	99.32 AV			1.00 V	244	61.25	38.07
3	11570.00	67.46 PK	74.00	-6.54	1.04 V	331	20.24	47.22
4	11570.00	53.41 AV	54.00	-0.59	1.04 V	331	6.19	47.22
5	#17355.00	69.29 PK	91.81	-22.52	1.05 V	8	16.14	53.15
6	#17355.00	53.10 AV	79.32	-26.22	1.05 V	8	-0.05	53.15

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

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

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.20 PK			1.30 H	91	76.02	38.18
2	*5825.00	101.50 AV			1.30 H	91	63.32	38.18
3	11650.00	67.80 PK	74.00	-6.20	1.37 H	301	20.58	47.22
4	11650.00	51.63 AV	54.00	-2.37	1.37 H	301	4.41	47.22
5	#17475.00	62.60 PK	94.20	-31.60	1.08 H	301	8.62	53.98
6	#17475.00	49.10 AV	81.50	-32.40	1.08 H	301	-4.88	53.98
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	111.55 PK			1.00 V	242	73.37	38.18
2	*5825.00	99.10 AV			1.00 V	242	60.92	38.18
3	11650.00	69.34 PK	74.00	-4.66	1.03 V	332	22.12	47.22
4	**11650.00**	**53.50 AV**	**54.00**	**-0.50**	**1.03 V**	**332**	**6.28**	**47.22**
5	#17475.00	67.80 PK	91.55	-23.75	1.00 V	15	13.82	53.98
6	#17475.00	52.40 AV	79.10	-26.70	1.00 V	15	-1.58	53.98

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

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

DRAFT 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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	115.60 PK			1.36 H	89	77.64	37.96
2	*5745.00	103.20 AV			1.36 H	89	65.24	37.96
3	11490.00	65.50 PK	74.00	-8.50	1.42 H	294	18.27	47.23
4	11490.00	49.20 AV	54.00	-4.80	1.42 H	294	1.97	47.23
5	#17235.00	66.50 PK	95.60	-29.10	1.23 H	42	14.17	52.33
6	#17235.00	51.73 AV	83.20	-31.47	1.23 H	42	-0.60	52.33
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	*5745.00	112.36 PK			1.00 V	334	74.40	37.96
2	*5745.00	99.69 AV			1.00 V	334	61.73	37.96
3	11490.00	66.36 PK	74.00	-7.64	1.08 V	307	19.13	47.23
4	11490.00	52.16 AV	54.00	-1.84	1.08 V	307	4.93	47.23
5	#17235.00	72.97 PK	92.36	-19.39	1.02 V	8	20.64	52.33
6	#17235.00	50.24 AV	79.69	-29.45	1.02 V	8	-2.09	52.33

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.
7. "#":The radiated frequency is out the restricted band.

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	115.80 PK			1.34 H	93	77.73	38.07
2	*5785.00	103.60 AV			1.34 H	93	65.53	38.07
3	11570.00	65.11 PK	74.00	-8.89	1.41 H	298	17.89	47.22
4	11570.00	50.50 AV	54.00	-3.50	1.41 H	298	3.28	47.22
5	#17355.00	66.10 PK	95.80	-29.70	1.22 H	40	12.95	53.15
6	#17355.00	51.10 AV	83.60	-32.50	1.22 H	40	-2.05	53.15
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	111.79 PK			1.00 V	244	73.72	38.07
2	*5785.00	99.27 AV			1.00 V	244	61.20	38.07
3	11570.00	66.03 PK	74.00	-7.97	1.07 V	322	18.81	47.22
4	11570.00	52.25 AV	54.00	-1.75	1.07 V	322	5.03	47.22
5	#17355.00	72.20 PK	91.79	-19.59	1.02 V	25	19.05	53.15
6	#17355.00	53.10 AV	79.27	-26.17	1.02 V	25	-0.05	53.15

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

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

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	115.40 PK			1.37 H	85	77.22	38.18
2	*5825.00	103.00 AV			1.37 H	85	64.82	38.18
3	11650.00	66.40 PK	74.00	-7.60	1.32 H	55	19.18	47.22
4	11650.00	50.85 AV	54.00	-3.15	1.32 H	55	3.63	47.22
5	#17475.00	65.01 PK	95.40	-30.39	1.39 H	63	11.03	53.98
6	#17475.00	50.50 AV	83.00	-32.50	1.39 H	63	-3.48	53.98
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	111.03 PK			1.15 V	341	72.85	38.18
2	*5825.00	98.10 AV			1.15 V	341	59.92	38.18
3	11650.00	64.30 PK	74.00	-9.70	1.22 V	333	17.08	47.22
4	11650.00	50.43 AV	54.00	-3.57	1.22 V	333	3.21	47.22
5	#17475.00	65.23 PK	91.03	-25.80	1.27 V	314	11.25	53.98
6	#17475.00	49.99 AV	78.10	-28.11	1.27 V	314	-3.99	53.98

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

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

DRAFT 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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	113.40 PK			1.24 H	89	75.42	37.98
2	*5755.00	99.30 AV			1.24 H	89	61.32	37.98
3	11510.00	63.20 PK	74.00	-10.80	1.41 H	297	15.97	47.23
4	11510.00	46.81 AV	54.00	-7.19	1.41 H	297	-0.42	47.23
5	#17265.00	62.70 PK	93.40	-30.70	1.16 H	77	10.17	52.53
6	#17265.00	48.90 AV	79.30	-30.40	1.16 H	77	-3.63	52.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	109.26 PK			1.00 V	7	71.28	37.98
2	*5755.00	94.76 AV			1.00 V	7	56.78	37.98
3	11510.00	63.27 PK	74.00	-10.73	1.20 V	326	16.04	47.23
4	11510.00	49.17 AV	54.00	-4.83	1.20 V	326	1.94	47.23
5	#17265.00	70.76 PK	89.26	-18.50	1.01 V	24	18.23	52.53
6	#17265.00	50.24 AV	74.76	-24.52	1.01 V	24	-2.29	52.53

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

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	29.0deg. C, 65.0%RH 965hPa	TESTED BY	Eric Lee

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	113.10 PK			1.23 H	91	75.00	38.10
2	*5795.00	99.10 AV			1.23 H	91	61.00	38.10
3	11590.00	61.40 PK	74.00	-12.60	1.38 H	305	14.18	47.22
4	11590.00	46.70 AV	54.00	-7.30	1.38 H	305	-0.52	47.22
5	#17385.00	64.23 PK	93.10	-28.87	1.20 H	96	10.87	53.36
6	#17385.00	49.80 AV	79.10	-29.30	1.20 H	96	-3.56	53.36
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	108.70 PK			1.00 V	243	70.60	38.10
2	*5795.00	94.62 AV			1.00 V	243	56.52	38.10
3	11590.00	64.73 PK	74.00	-9.27	1.25 V	300	17.51	47.22
4	11590.00	50.53 AV	54.00	-3.47	1.25 V	300	3.31	47.22
5	#17385.00	70.54 PK	88.70	-18.16	1.02 V	52	17.18	53.36
6	#17385.00	50.34 AV	74.62	-24.28	1.02 V	52	-3.02	53.36

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

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

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP

5.3.6 EUT OPERATING CONDITIONS

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

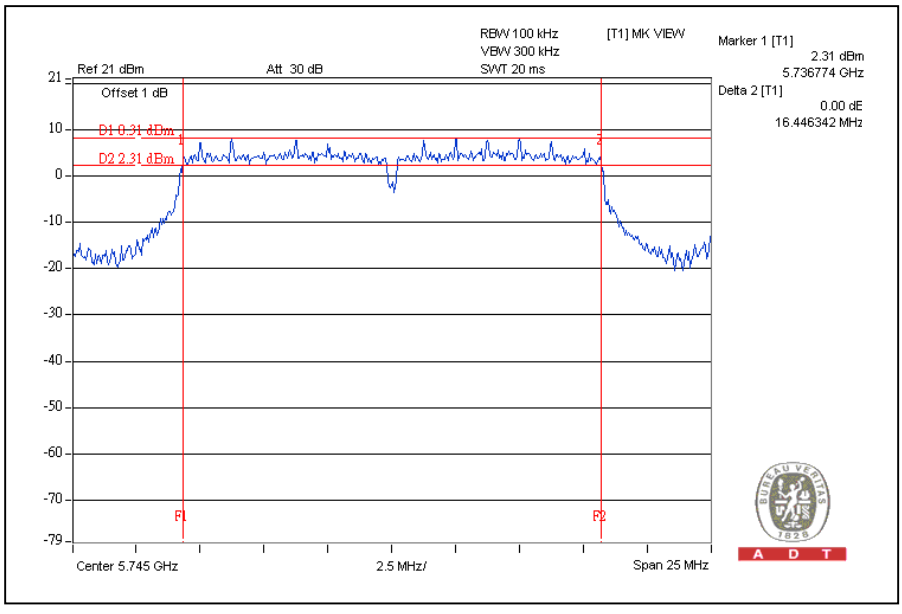
5.3.7 TEST RESULTS

802.11a OFDM MODULATION:

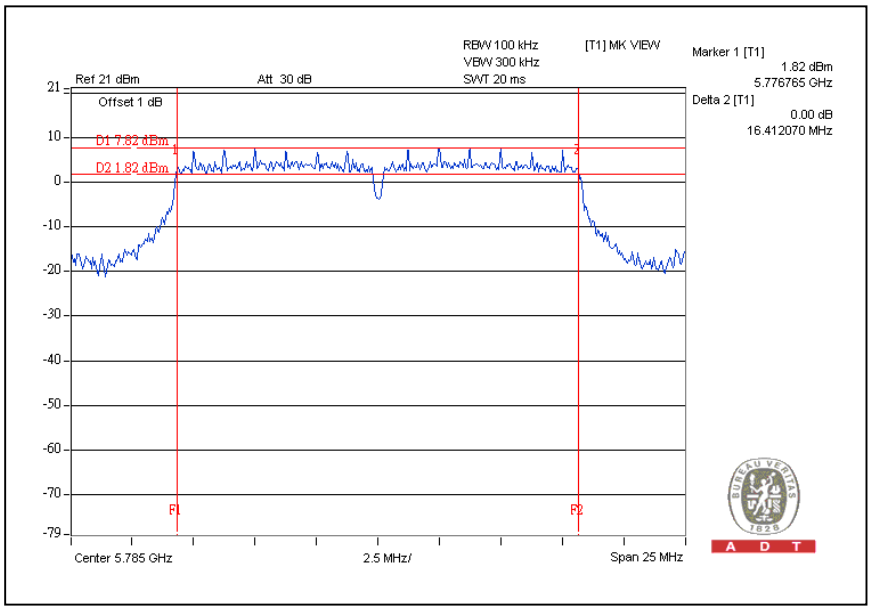
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.45	0.5	PASS
157	5785	16.41	0.5	PASS
165	5825	16.45	0.5	PASS

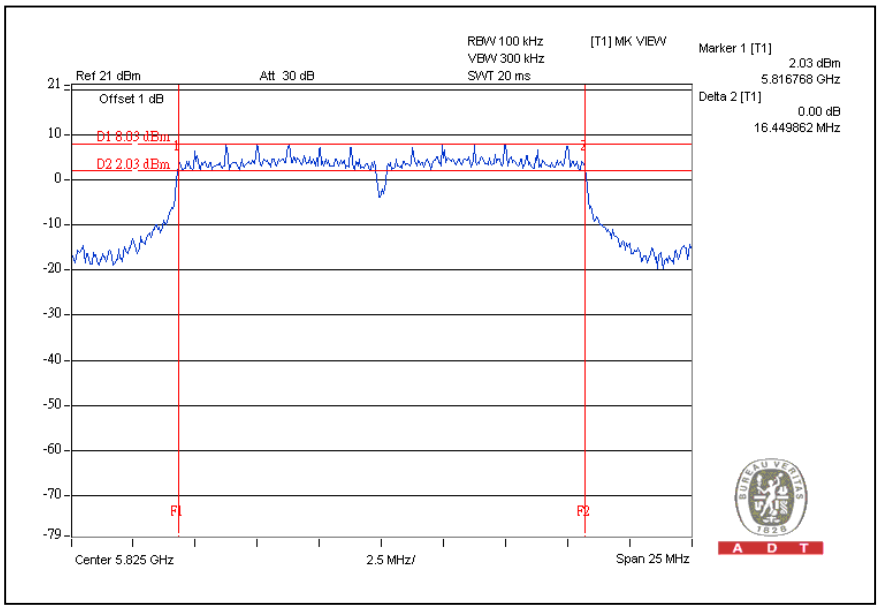
CH149



CH157


RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
1.82 dBm
5.776765 GHz
Delta 2 [T1]
0.00 dB
16.412070 MHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 7.82 dBm
D2 1.82 dBm
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
F1
F2
Center 5.785 GHz
2.5 MHz/
Span 25 MHz

CH165

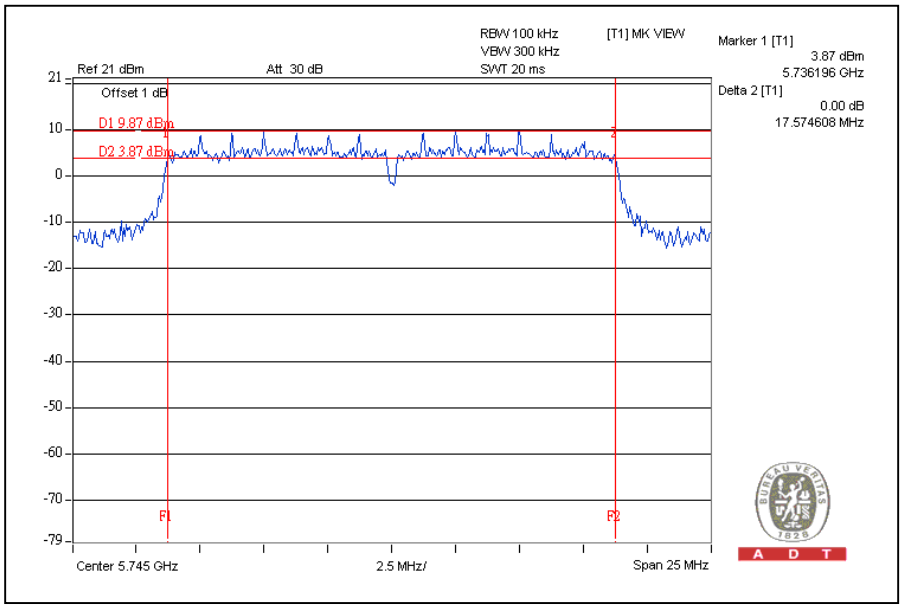

RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
2.03 dBm
5.816768 GHz
Delta 2 [T1]
0.00 dB
16.449862 MHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 8.03 dBm
D2 2.03 dBm
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
F1
F2
Center 5.825 GHz
2.5 MHz/
Span 25 MHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

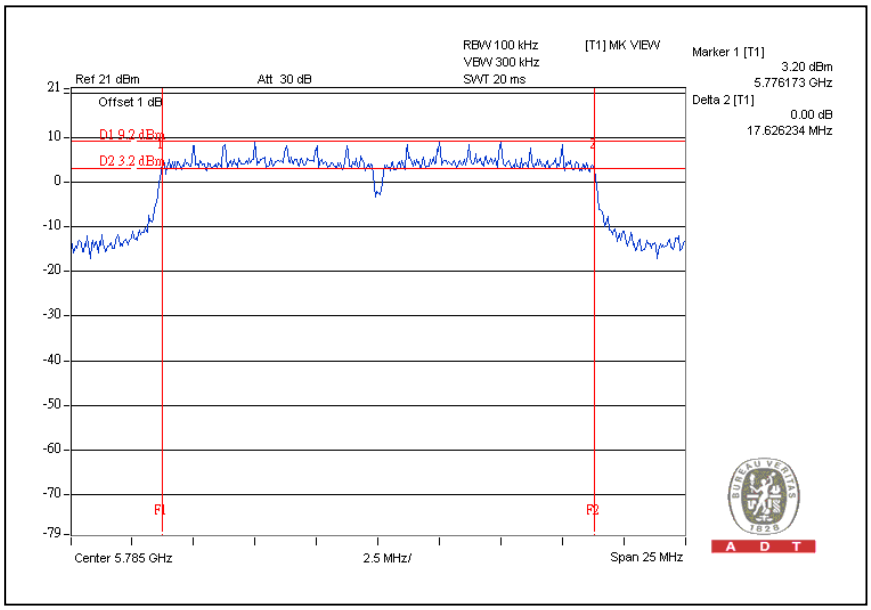
MODULATION TYPE	BPSK	**TRANSFER RATE**	6.5Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg. C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	17.57	0.5	PASS
157	5785	17.63	0.5	PASS
165	5825	17.57	0.5	PASS

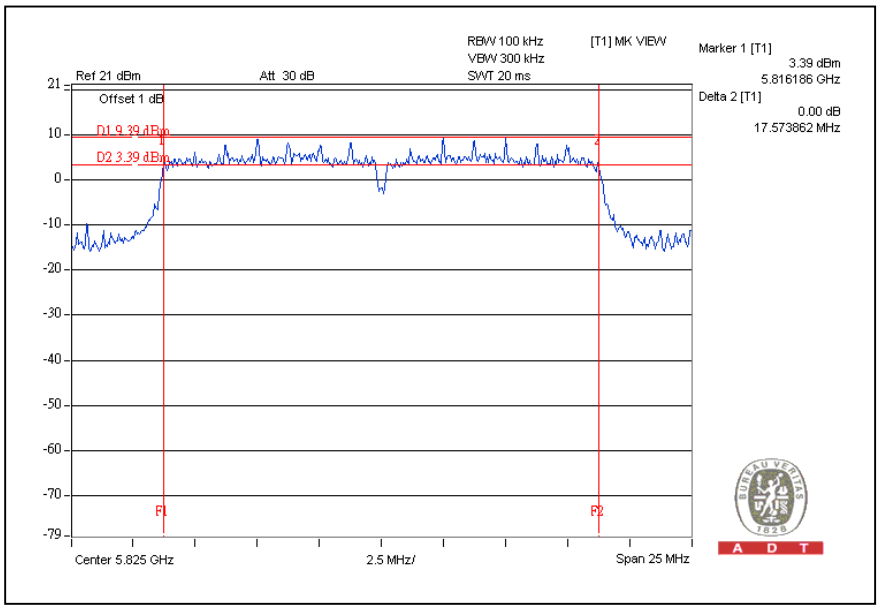
CH149



CH157


RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
3.20 dBm
5.776173 GHz
Delta 2 [T1]
0.00 dB
17.626234 MHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 9.2 dBm
D2 3.2 dBm
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
F1
F2
Center 5.785 GHz
2.5 MHz/
Span 25 MHz

CH165

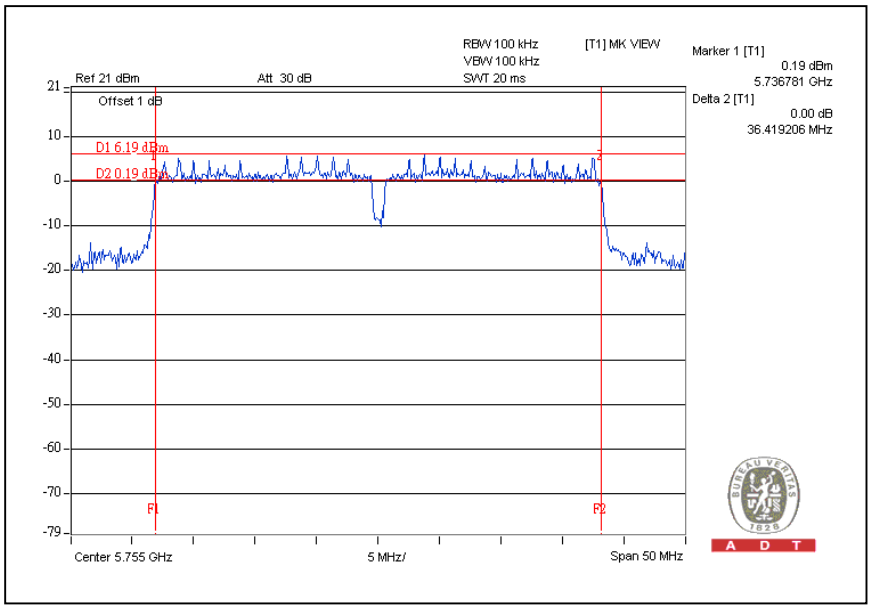

RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
3.39 dBm
5.816186 GHz
Delta 2 [T1]
0.00 dB
17.573862 MHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 9.39 dBm
D2 3.39 dBm
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
F1
F2
Center 5.825 GHz
2.5 MHz/
Span 25 MHz

DRAFT 802.11n (40MHz) OFDM MODULATION:

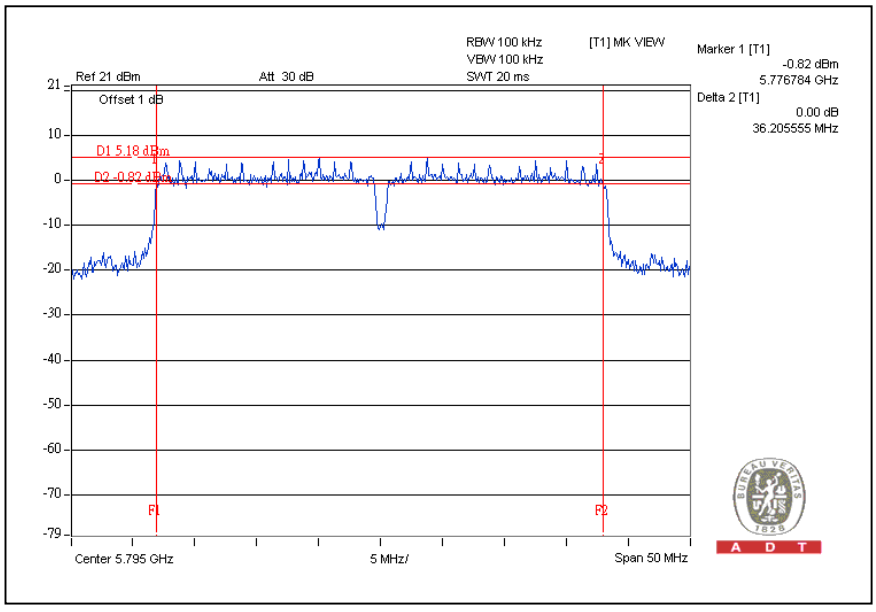
MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg. C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	36.42	0.5	PASS
159	5795	36.21	0.5	PASS

CH151


RBW 100 kHz
VBW 100 kHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
0.19 dBm
5.736781 GHz
Delta 2 [T1]
0.00 dB
36.419206 MHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 6.19 dBm
D2 0.19 dBm
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
F1
F2
Center 5.755 GHz
5 MHz/
Span 50 MHz

CH159


RBW 100 kHz
VBW 100 kHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
-0.82 dBm
5.776784 GHz
Delta 2 [T1]
0.00 dB
36.205555 MHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 5.18 dBm
D2 -0.82 dBm
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
F1
F2
Center 5.795 GHz
5 MHz/
Span 50 MHz

5.4 MAXIMUM PEAK OUTPUT POWER

5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

5.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	April 25, 2009	April 24, 2010
Pulse Power Sensor	MA2411B	0738172	April 25, 2009	April 24, 2010

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

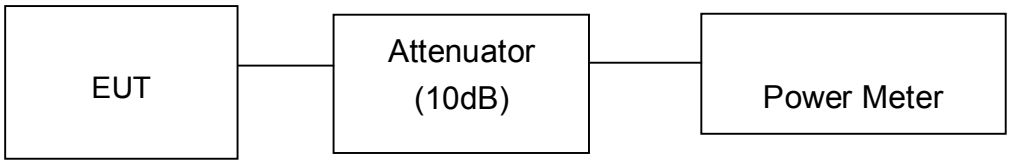
5.4.3 TEST PROCEDURES

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

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
149	5745	26.0	398.1	30	PASS
157	5785	25.9	389.0	30	PASS
165	5825	25.6	363.1	30	PASS

DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 965hPa
TESTED BY	Rex Huang		

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	26.3	25.6	789.7	29.0	30	PASS
157	5785	26.0	25.3	737.0	28.7	30	PASS
165	5825	25.7	25.0	687.8	28.4	30	PASS

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg. C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
151	5755	25.9	25.5	743.9	28.7	30	PASS
159	5795	25.7	25.1	695.1	28.4	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

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

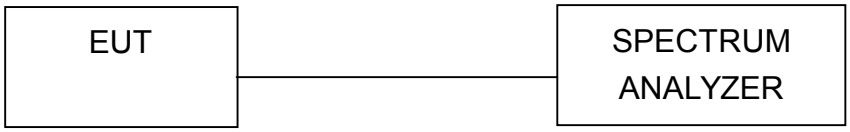
5.5.3 TEST PROCEDURE

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

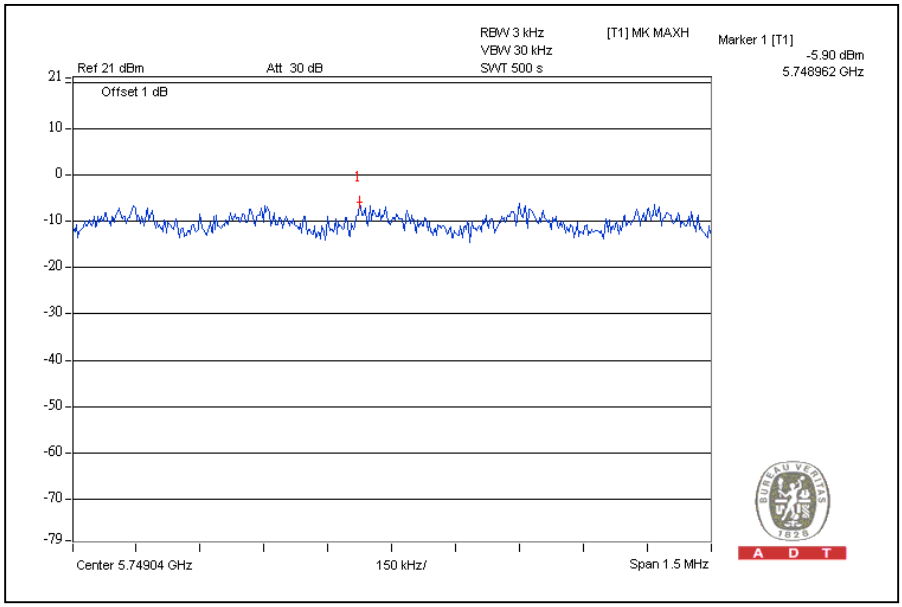
5.5.7 TEST RESULTS

802.11a OFDM modulation

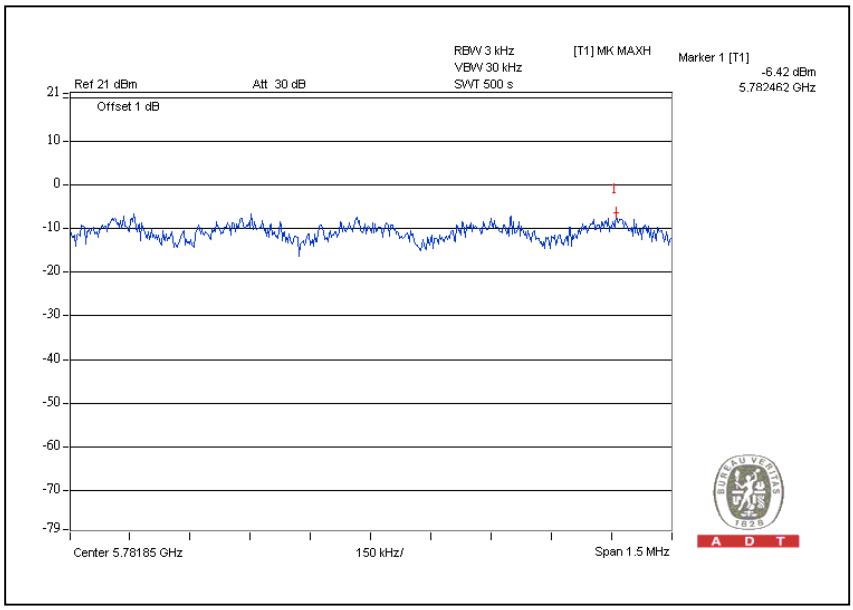
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
149	5745	-5.9	8	PASS
157	5785	-6.4	8	PASS
165	5825	-5.3	8	PASS

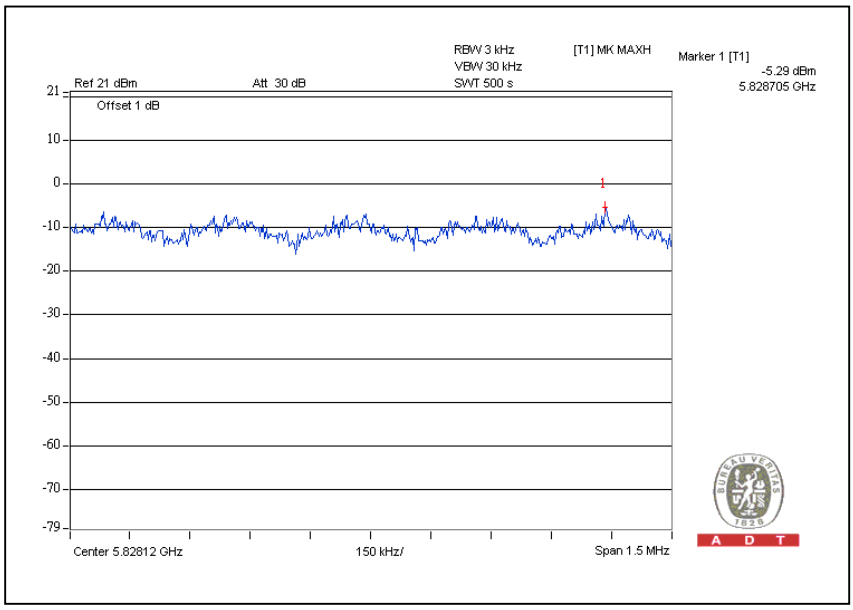
CH149



CH157


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-6.42 dBm
5.782462 GHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Center 5.78185 GHz
150 kHz/
Span 1.5 MHz

CH165

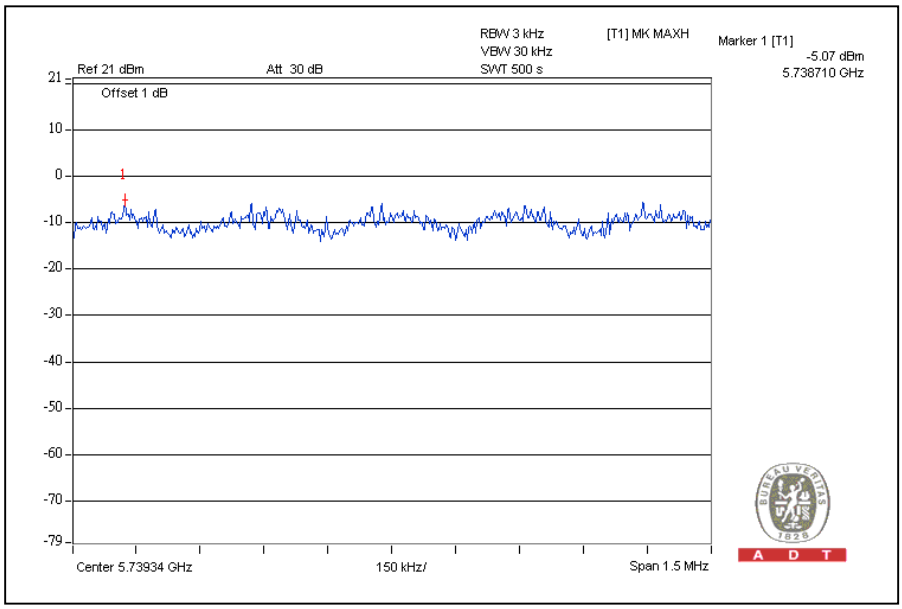

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-5.29 dBm
5.828705 GHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Center 5.82812 GHz
150 kHz/
Span 1.5 MHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

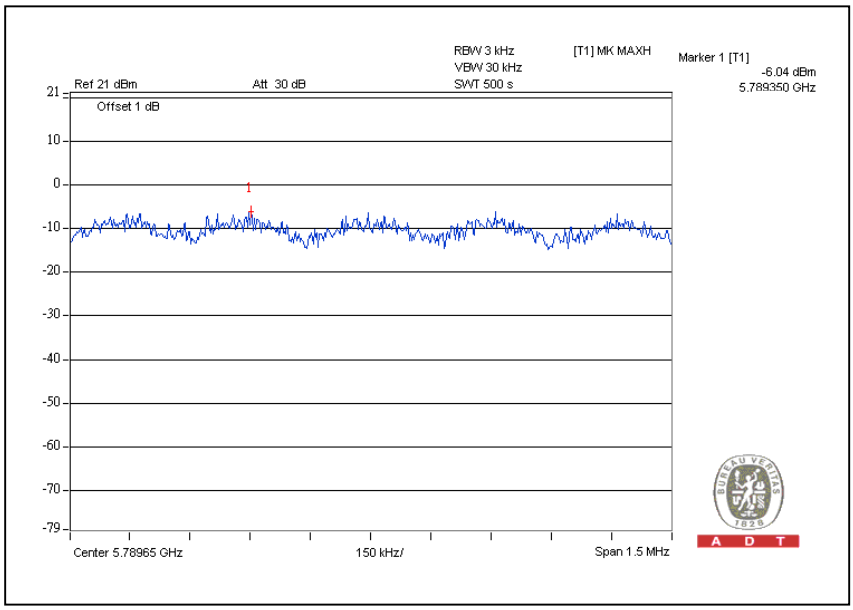
MODULATION TYPE	BPSK	TRANSFER RATE	6.5Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
149	5745	-5.1	-6.7	-2.8	8	PASS
157	5785	-6.0	-7.6	-3.7	8	PASS
165	5825	-5.4	-7.7	-3.4	8	PASS

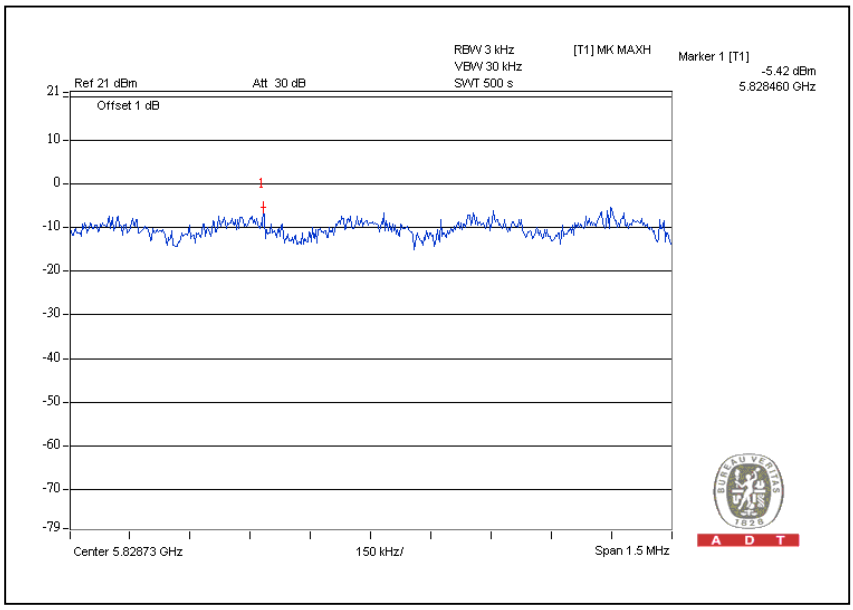
For Chain(0): CH149



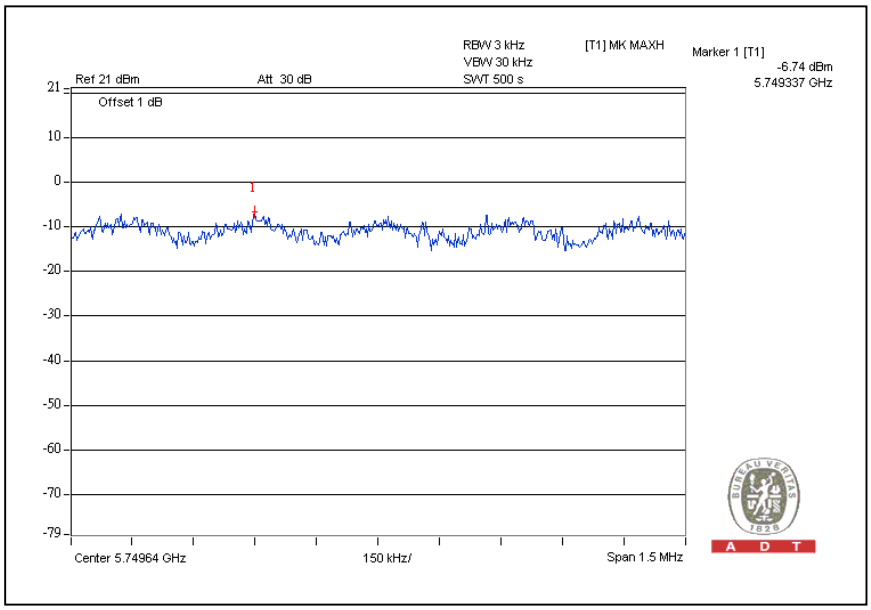
CH157


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-6.04 dBm
5.789350 GHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Center 5.78965 GHz
150 kHz/
Span 1.5 MHz

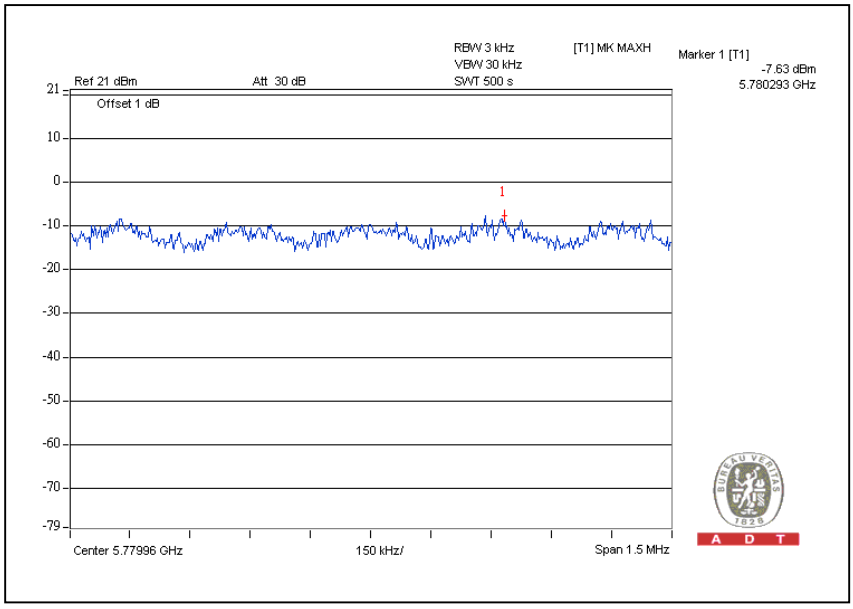
CH165


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-5.42 dBm
5.828460 GHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Center 5.82873 GHz
150 kHz/
Span 1.5 MHz

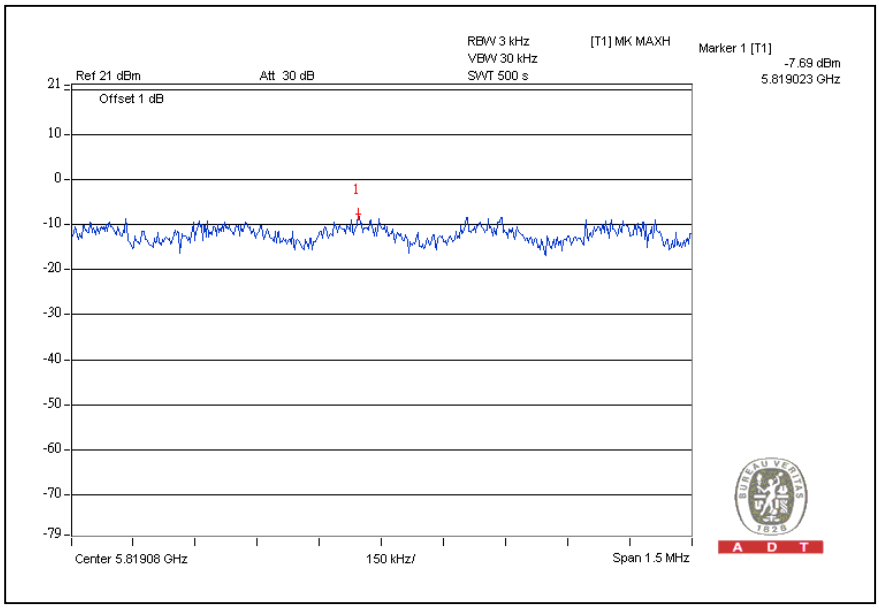
For Chain (1): CH149



CH157



CH165

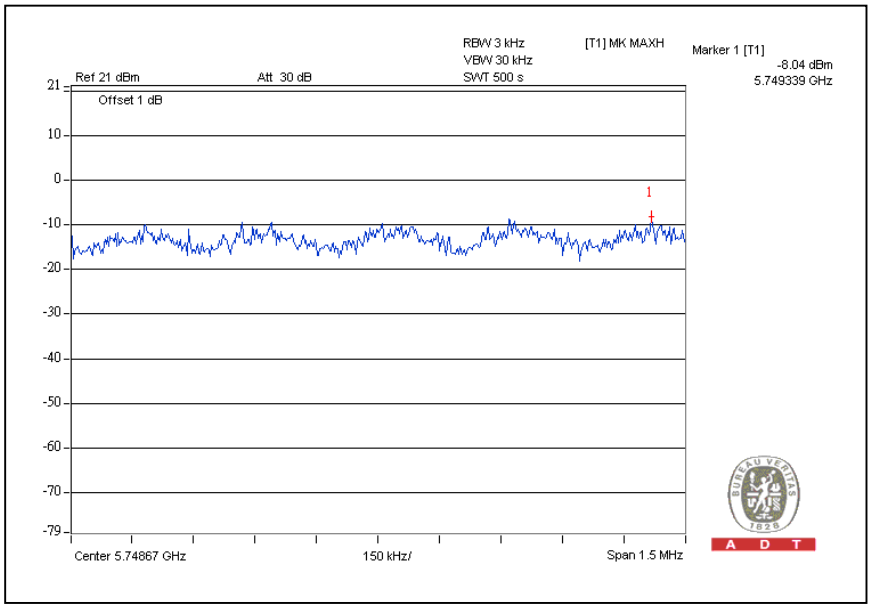

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-7.69 dBm
5.819023 GHz
Ref 21 dBm
Att 30 dB
Offset 1 dB
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
1
Center 5.81908 GHz
150 kHz/
Span 1.5 MHz

DRAFT 802.11n (40MHz) OFDM MODULATION:

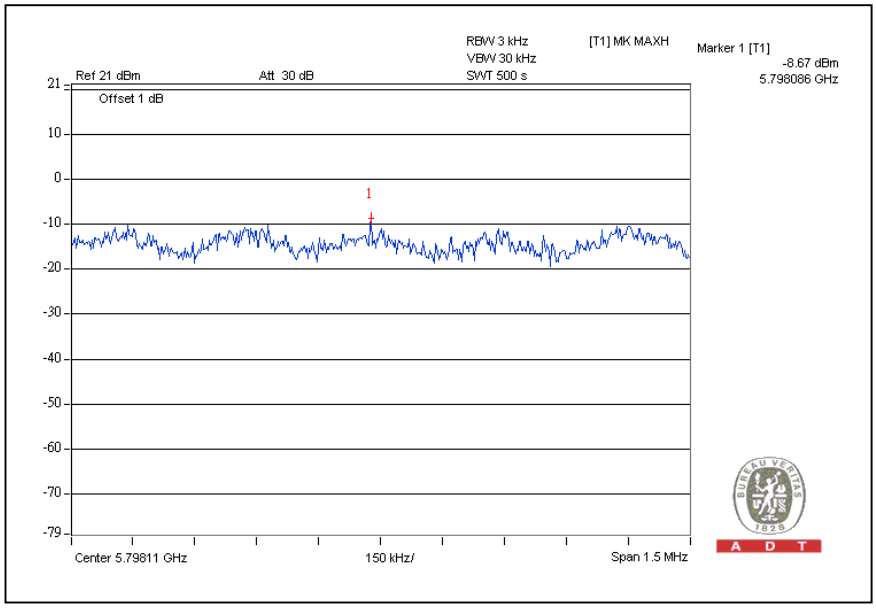
MODULATION TYPE	BPSK	**TRANSFER RATE**	13.5Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 60%RH, 965hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
151	5755	-8.0	-8.2	-5.1	8	PASS
159	5795	-8.7	-8.8	-5.7	8	PASS

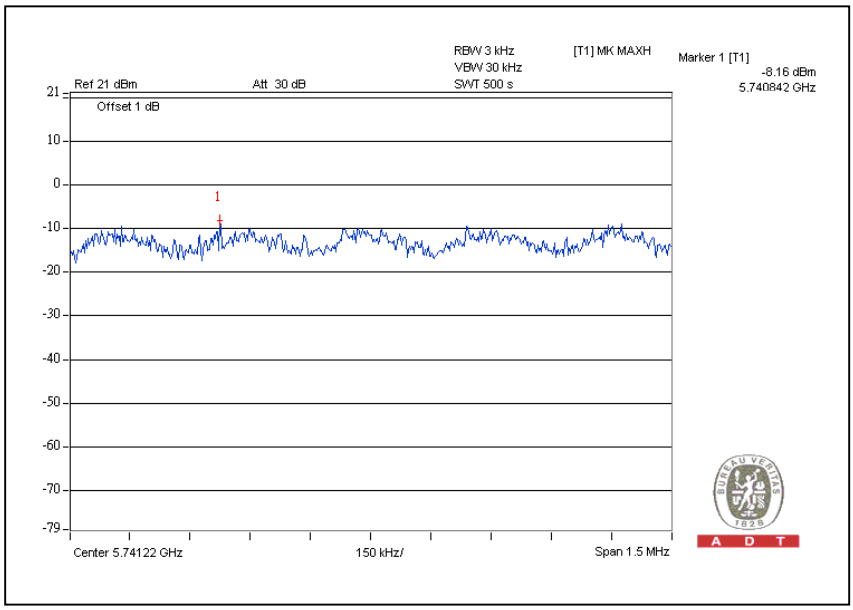
For Chain(0): CH151



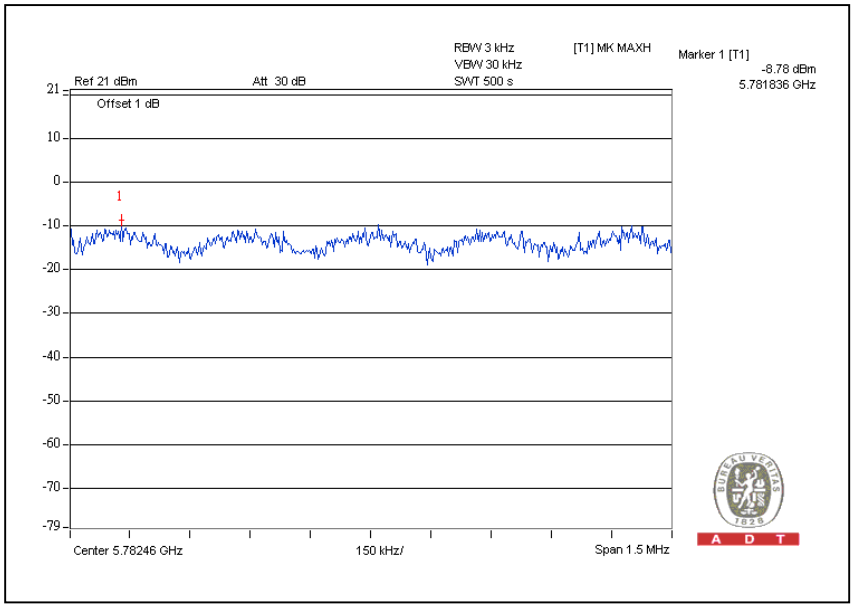
CH159



For Chain (1): CH151



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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 09, 2008	Aug. 08, 2009

NOTE:

1. 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 with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 EUT OPERATING CONDITION

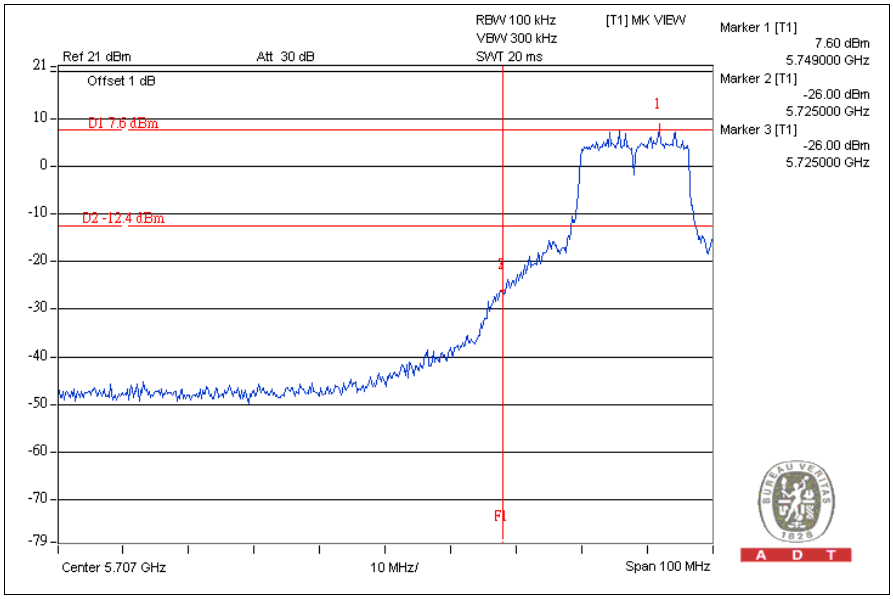
Same as Item 4.3.6

5.6.6 TEST RESULTS

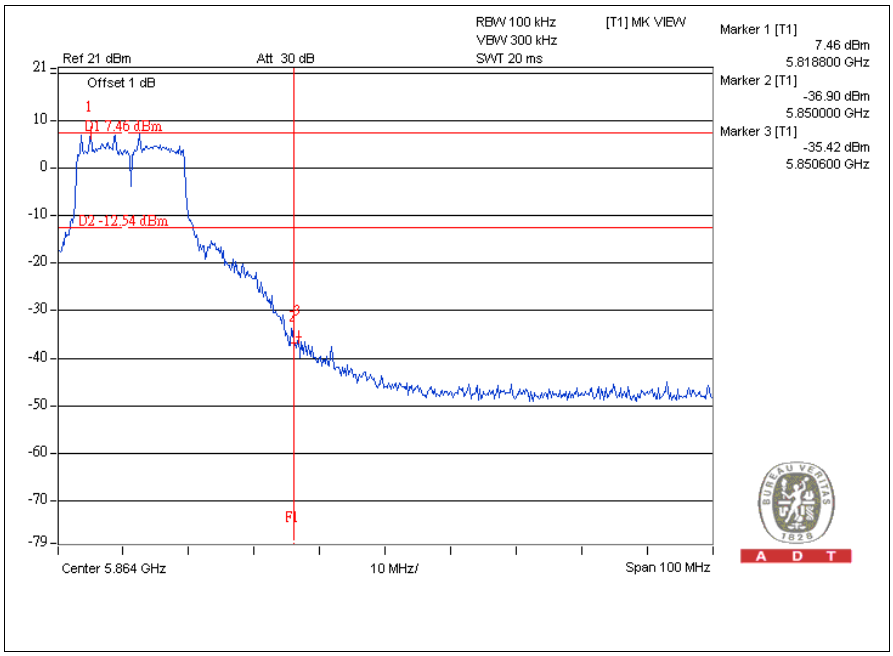
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

802.11a OFDM modulation

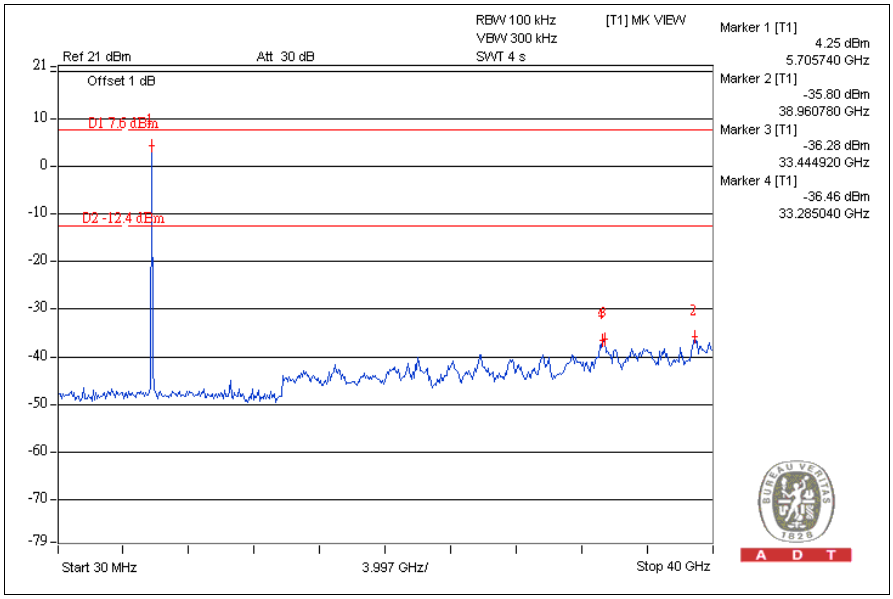
CH149



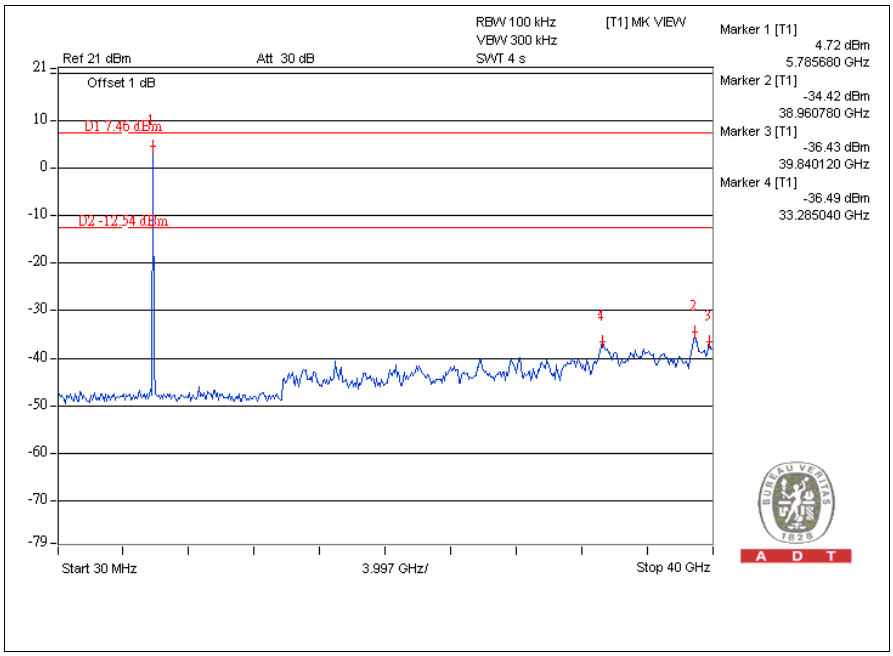
CH165



CH149

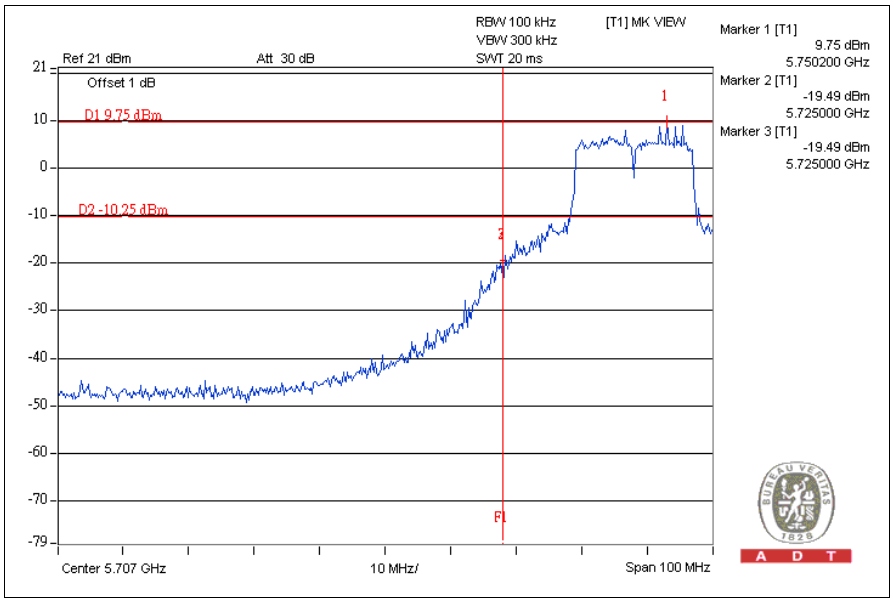

RBW 100 kHz
VBW 300 kHz
SWT 4 s
[T1] MK VIEW
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 7.6 dBm
D2 -12.4 dBm
Marker 1 [T1]
4.25 dBm
5.705740 GHz
Marker 2 [T1]
-35.80 dBm
38.960780 GHz
Marker 3 [T1]
-36.28 dBm
33.444920 GHz
Marker 4 [T1]
-36.46 dBm
33.285040 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

CH165

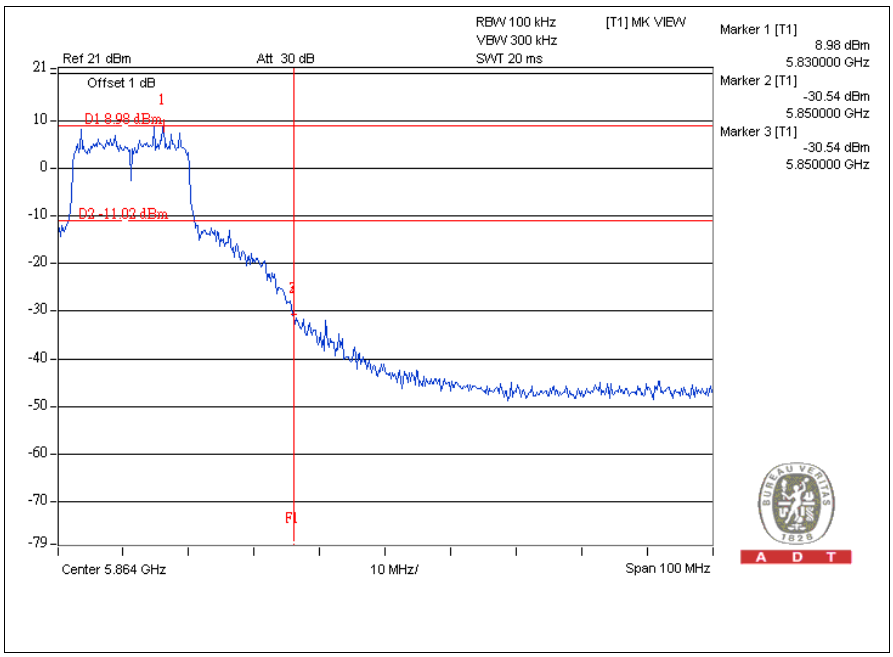

RBW 100 kHz
VBW 300 kHz
SWT 4 s
[T1] MK VIEW
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 7.46 dBm
D2 -12.54 dBm
Marker 1 [T1]
4.72 dBm
5.785680 GHz
Marker 2 [T1]
-34.42 dBm
38.960780 GHz
Marker 3 [T1]
-36.43 dBm
39.840120 GHz
Marker 4 [T1]
-36.49 dBm
33.285040 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

DRAFT 802.11n (20MHz) OFDM MODULATION:

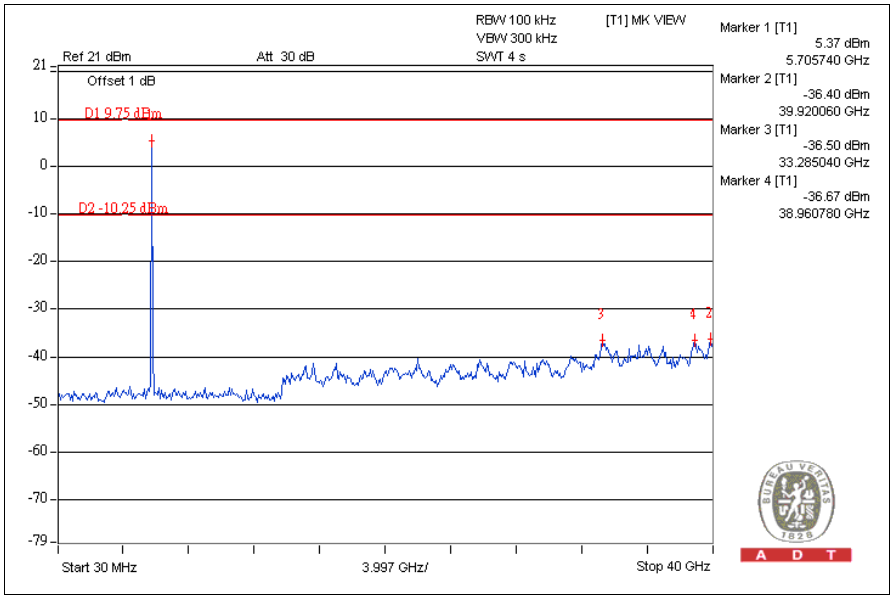
CH149



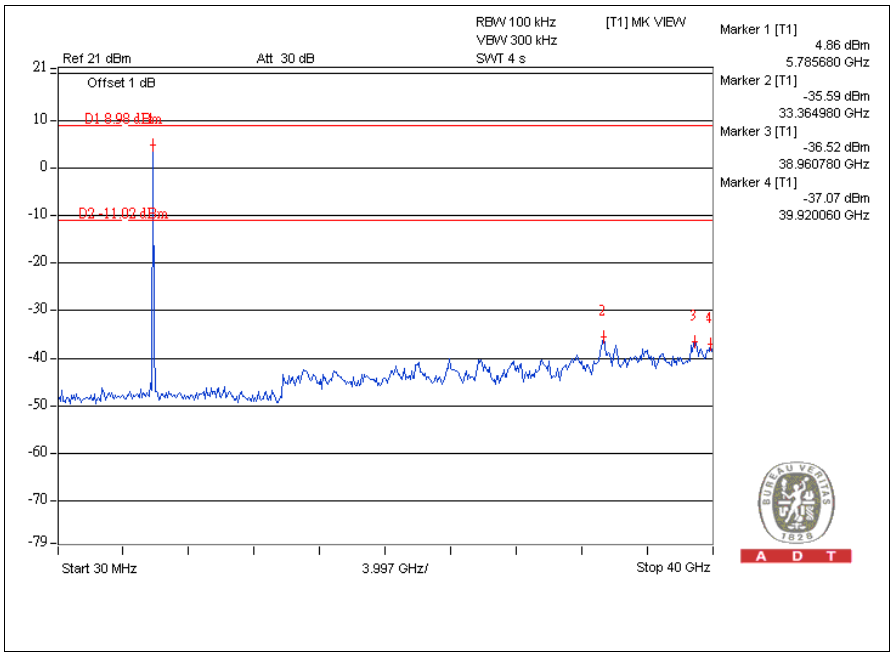
CH165



CH149

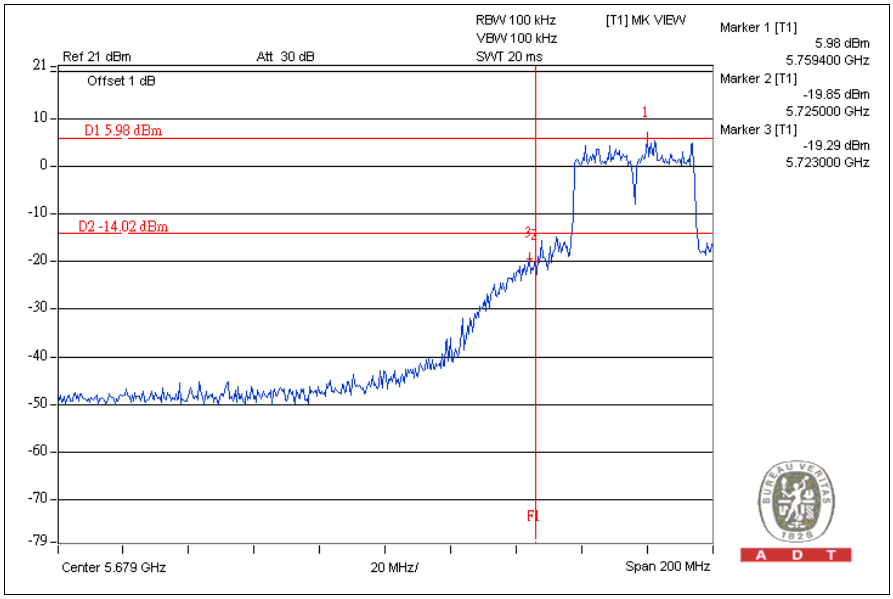

RBW 100 kHz
VBW 300 kHz
SWT 4 s
[T1] MK VIEW
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 9.75 dBm
D2 -10.25 dBm
Marker 1 [T1]
5.37 dBm
5.705740 GHz
Marker 2 [T1]
-36.40 dBm
39.920060 GHz
Marker 3 [T1]
-36.50 dBm
33.285040 GHz
Marker 4 [T1]
-36.67 dBm
38.960780 GHz
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Start 30 MHz
3.997 GHz/
Stop 40 GHz

CH165

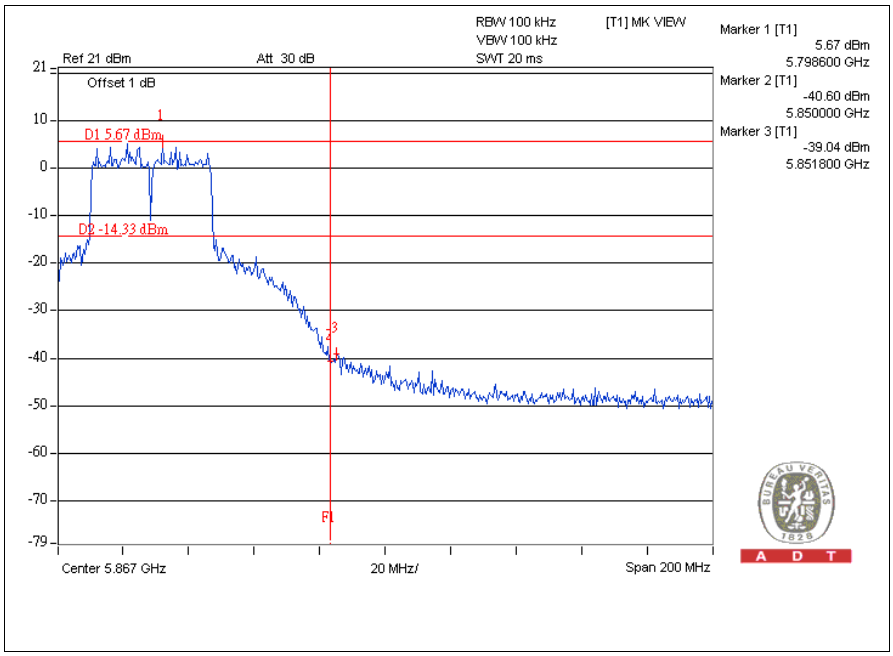

RBW 100 kHz
VBW 300 kHz
SWT 4 s
[T1] MK VIEW
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 8.99 dBm
D2 -11.01 dBm
Marker 1 [T1]
4.86 dBm
5.785680 GHz
Marker 2 [T1]
-35.59 dBm
33.364980 GHz
Marker 3 [T1]
-36.52 dBm
38.960780 GHz
Marker 4 [T1]
-37.07 dBm
39.920060 GHz
21
10
0
-10
-20
-30
-40
-50
-60
-70
-79
Start 30 MHz
3.997 GHz/
Stop 40 GHz

DRAFT 802.11n (40MHz) OFDM MODULATION:

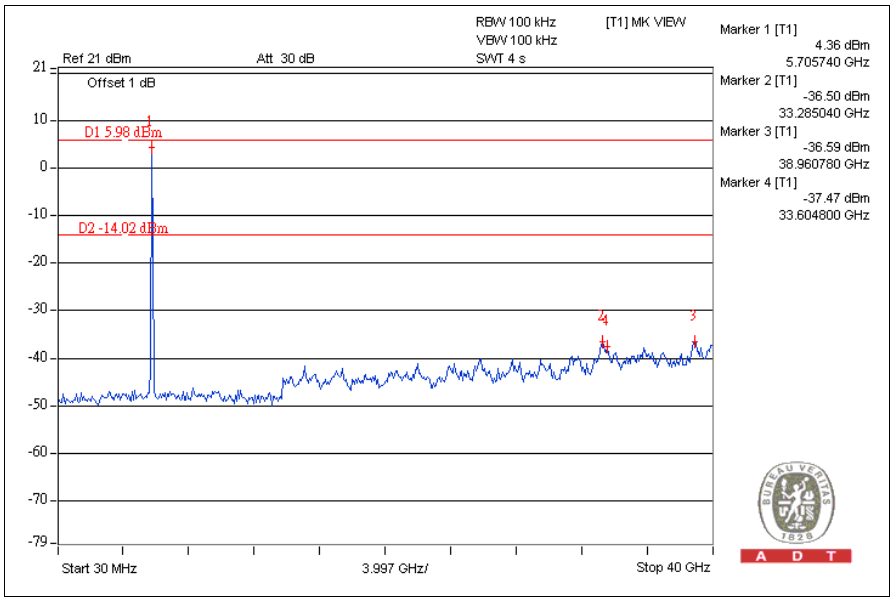
CH151



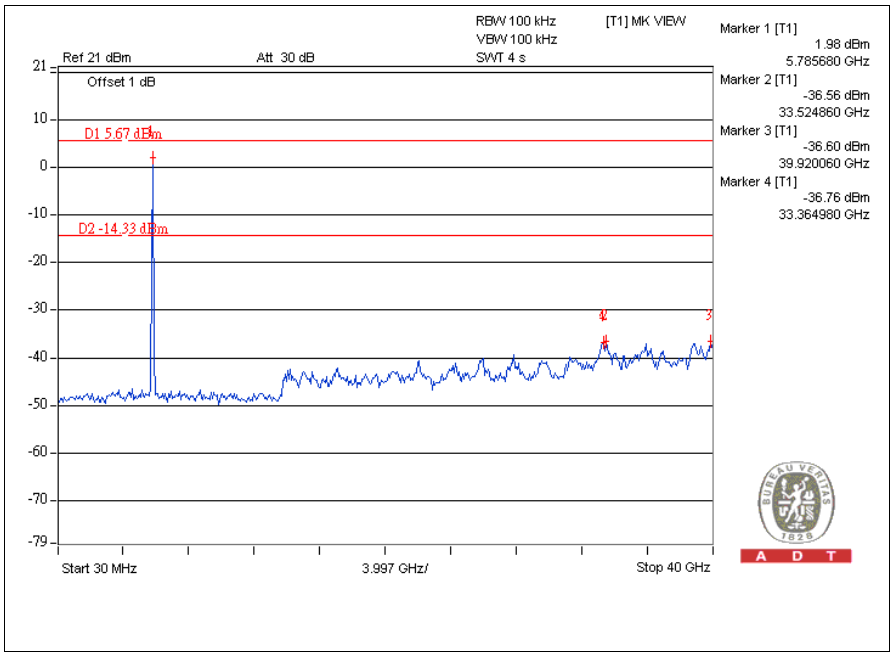
CH159



CH151


RBW 100 kHz
VBW 100 kHz
SWT 4 s
[T1] MK VIEW
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 5.98 dBm
D2 -14.02 dBm
Marker 1 [T1]
4.36 dBm
5.705740 GHz
Marker 2 [T1]
-36.50 dBm
33.285040 GHz
Marker 3 [T1]
-36.59 dBm
38.960780 GHz
Marker 4 [T1]
-37.47 dBm
33.604800 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

CH159


RBW 100 kHz
VBW 100 kHz
SWT 4 s
[T1] MK VIEW
Ref 21 dBm
Att 30 dB
Offset 1 dB
D1 5.67 dBm
D2 -14.33 dBm
Marker 1 [T1]
1.98 dBm
5.785680 GHz
Marker 2 [T1]
-36.56 dBm
33.524860 GHz
Marker 3 [T1]
-36.60 dBm
39.920060 GHz
Marker 4 [T1]
-36.76 dBm
33.364980 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz

5.7 ANTENNA REQUIREMENT

5.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247(a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.7.2 ANTENNA CONNECTED CONSTRUCTION

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

Transmitter / Circuit	Antenna Gain		Antenna Type	Connector
	For 2.4GHz Gain (dBi)	For 5GHz Gain (dBi)		
Chain(0)	4	3.5	PIFA	NA
Chain(1)	4	3.5	PIFA	NA
Chain(2)	4	3.5	PIFA	NA

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 by the following approval agencies according to ISO/IEC 17025.

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

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

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

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

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

Web Site: www.adt.com.tw

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

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 ---