



FCC TEST REPORT (15.247)

REPORT NO.: RF961108H01

MODEL NO.: DWA-160

RECEIVED: Nov. 08, 2007

TESTED: Nov. 08, 2007 to Jan. 28, 2008

ISSUED: Jan. 31, 2008

APPLICANT: D-Link Co.

ADDRESS: No.289, Shinhu 3rd Rd., Neihu District,
Taipei City 114, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

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No. 2177-01



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1. CERTIFICATION

PRODUCT: Xtreme N Dual Band USB Adapter
BRAND NAME: D-Link
MODEL NO.: DWA-160
TEST SAMPLE: ENGINEERING SAMPLE
TESTED: Nov. 08, 2007 to Jan. 28, 2008
APPLICANT: D-Link Co.
STANDARDS: FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment (Model: DWA-160) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Carol Liao , **DATE:** Jan 31, 2008
(Carol Liao, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Jan 31, 2008
Responsible for RF (Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Jan 31, 2008
(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 -10.94dB at 0.150MHz
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 -0.42dB at 2483.5MHz
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 2.412 ~ 2.462GHz, 5.15~5.35GHz, 5.47~5.725GHz and 5.725~5.825GHz frequencies band. This report was recorded the RF parameters including 2.412 ~ 2.462GHz. For the 5.15~5.35GHz, 5.47~5.725GHz and 5.725~5.825GHz 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:

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

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Xtreme N Dual Band USB Adapter
MODEL NO.	DWA-160
FCC ID	KA2WA160A1
POWER SUPPLY	DC 5V from host equipment
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): 130 / 117 / 104 / 78 / 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps Draft 802.11n (40MHz): 270 / 243 / 216 / 162 / 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps
FREQUENCY RANGE	802.11b & 802.11g: 2412 ~ 2462MHz 802.11a: 5.18 ~ 5.32GHz, 5.50 ~ 5.70GHz and 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz) For 15.407(5GHz) 23 for 802.11a, draft 802.11n (20MHz) 12 for draft 802.11n (40MHz)

MAXIMUM OUTPUT POWER	For 15.247(2.4GHz) 802.11b: 187.499mW 802.11g: 239.332mW draft 802.11n (20MHz): 273.569mW draft 802.11n (40MHz): 198.316mW For 15.407(5GHz) 802.11a: 41.783mW draft 802.11n (20MHz): 61.626mW draft 802.11n (40MHz): 49.106mW
ANTENNA TYPE	Please see note 1
DATA CABLE	NA
INTERFACE	USB
ASSOCIATED DEVICES	Cradle (with 1.5m cable, Unshielded)

NOTE:

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

No.	Antenna Type	For 2.4GHz Gain (dBi)	For 5GHz Gain (dBi)	Antenna Connector
1	PCB Print	0.7	0.5	NA
2	PCB Print	0.7	0.5	NA

2. The EUT incorporates a MIMO function with 802.11a, 802.11b, 802.11g, draft 802.11n. Physically, the EUT provides two completed transmit and two completed receivers.
3. The EUT is 2 * 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The antenna configurations are two transmitter antennas and two receiver antennas, as there are 2 PCB Print antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 2 antennas. 11bg and legacy 11a mode is limited to single transmitter mode only.
4. When the EUT operating in draft 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
5. The EUT complies with draft 802.11n standards and backwards compatible with 802.11a, 802.11b, 802.11g products.
6. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

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

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

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

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

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

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

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

ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	CHAIN(0) (TX/RX)	CHAIN(1) (TX/RX)
A	802.11a, b, g	√	
B	DRAFT 802.11n(20MHz)	√	√
C	DRAFT 802.11n(40MHz)	√	√

Note:

- The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
- Antenna 1 and Antenna 2 are PCB Print antennas.

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	13	B

- The EUT was pre-tested in chamber as the following test modes:

TEST MODE	DESCRIPTION
Mode A	With Cradle
Mode B	Without Cradle

The worse case was found in Mode A. Its test data were recorded in this report individually.

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	13	B

- The EUT was pre-tested in chamber as the following test modes:

TEST MODE	DESCRIPTION
Mode A	With Cradle
Mode B	Without Cradle

The worse case was found in Mode A. Its test data were recorded in this report individually.

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	A
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13	B
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	27	C

- The EUT was pre-tested in chamber as the following test modes:

TEST MODE	DESCRIPTION
Mode A	With Cradle
Mode B	Without Cradle

The worse case was found in Mode A. Its test data were recorded in this report individually.

BANDEDGE MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	TX COMBINATION
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 11	OFDM	BPSK	6	A
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	13	B
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	27	C

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	CCK	11	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	A
For 2.4 GHz Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13	B
For 2.4 GHz Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	27	C



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Xtreme N Dual Band USB Adapter. 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

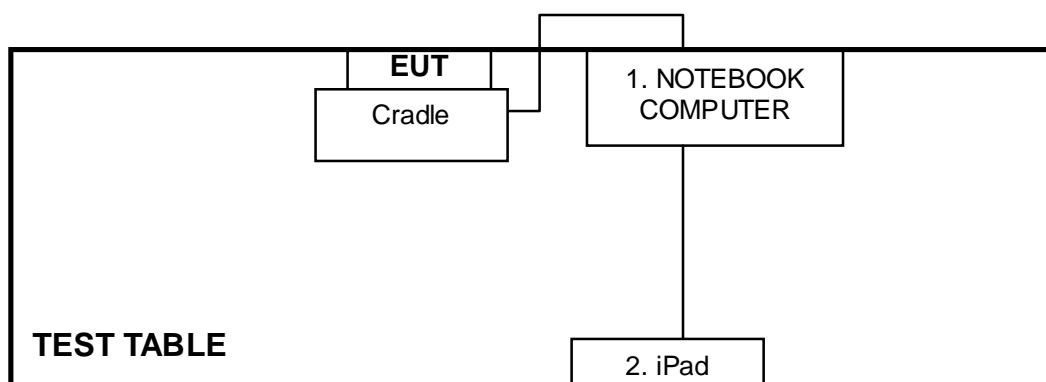
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70166-5 CA-0448	PIW632500516610
2	iPod nano 2GB	Apple	A1199	6U6426MTVQS	FCC DoC

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

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver	ESCS 30	847124/029	Mar. 28, 2008
Line-Impedance Stabilization Network(for EUT)	ESH3-Z5	848773/004	Nov. 08, 2008
Line-Impedance Stabilization Network(for Peripheral)	ENV-216	100071	Nov. 26, 2008
RF Cable (JETBAO)	RG233/U	Cable_CB_01	Dec. 09, 2008
50 ohms Terminator	50	3	Nov. 15, 2008
Software	ADT_Cond_V7.3.2	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in ADT Shielded Room No. B.
 3. The VCCI Con B Registration No. is C-2193.

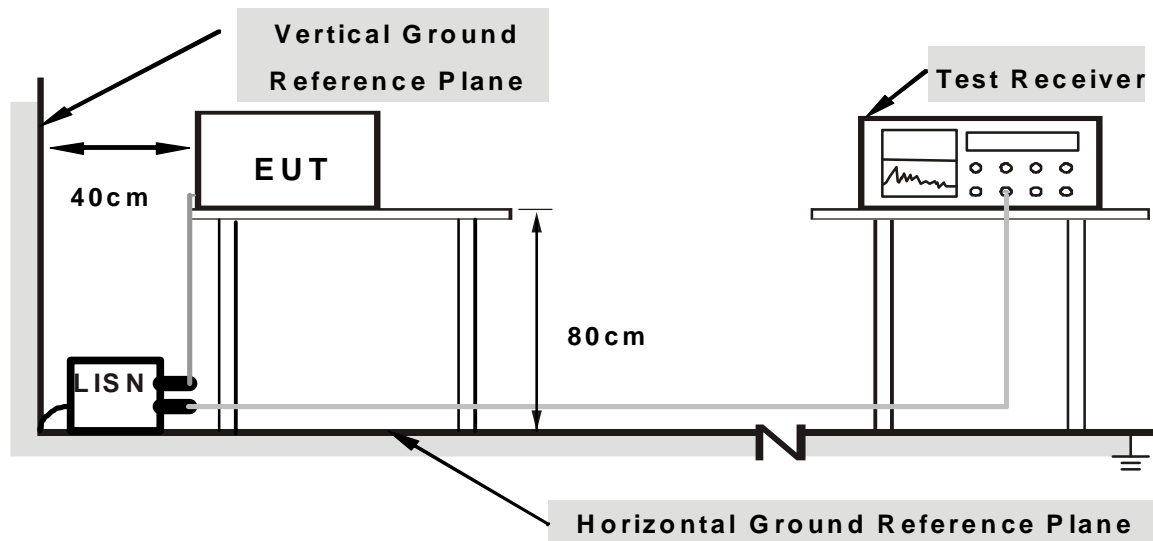
4.1.3 TEST PROCEDURES

- 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

- a. Connect the EUT with the support unit 1 (Notebook computer) which placed on a testing table.
- b. The support unit 1 (Notebook computer) ran a test program “ART V80 b26” to enable EUT under transmission condition continuously.

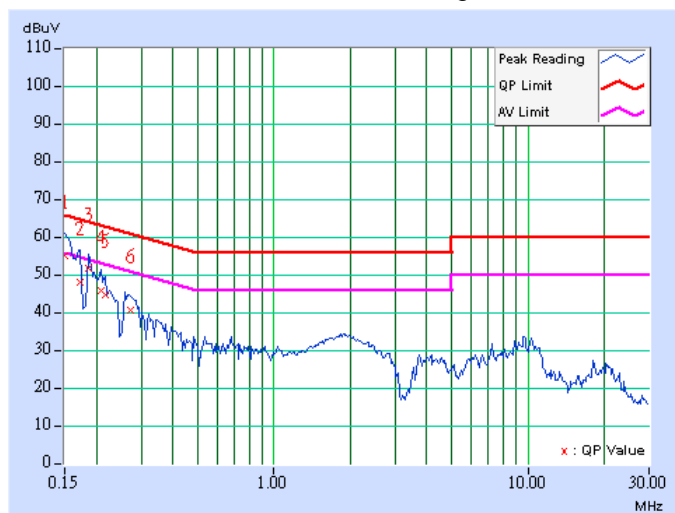
4.1.7 TEST RESULTS

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	13Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	19deg. C, 70%RH, 971hPa	TESTED BY	Wen Yu

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.150	0.14	54.92	-	55.06	-	66.00	56.00	-10.94
2	0.173	0.15	48.04	-	48.19	-	64.79	54.79	-16.60	-
3	0.185	0.16	51.72	-	51.88	-	64.25	54.25	-12.38	-
4	0.209	0.16	45.65	-	45.81	-	63.26	53.26	-17.45	-
5	0.216	0.16	44.61	-	44.77	-	62.96	52.96	-18.18	-
6	0.271	0.16	40.40	-	40.56	-	61.08	51.08	-20.52	-

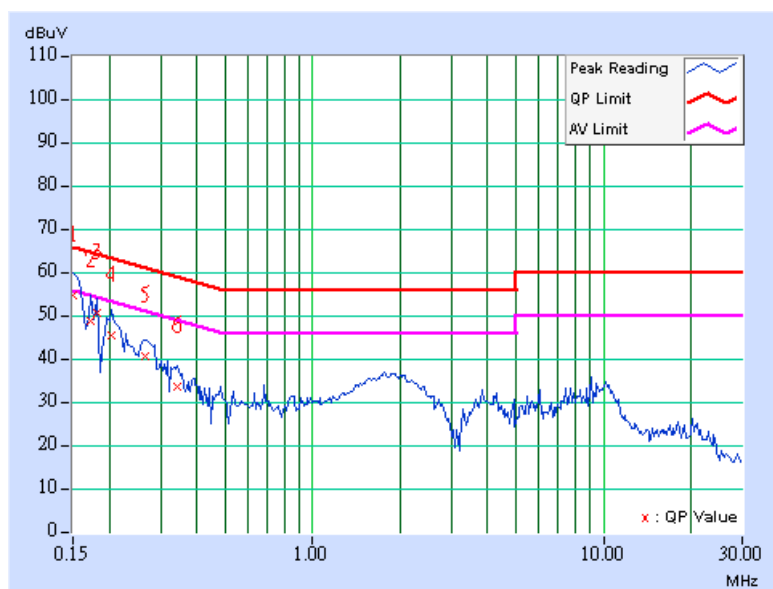
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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	13Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	19deg. C, 70%RH, 971hPa	TESTED BY	Wen Yu

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.150	0.07	54.64	-	54.71	-	66.00	56.00	-11.29
2	0.173	0.08	48.64	-	48.72	-	64.79	54.79	-16.08	-
3	0.181	0.08	50.66	-	50.74	-	64.43	54.43	-13.69	-
4	0.205	0.08	45.47	-	45.55	-	63.42	53.42	-17.87	-
5	0.267	0.08	40.60	-	40.68	-	61.20	51.20	-20.52	-
6	0.341	0.08	33.48	-	33.56	-	59.17	49.17	-25.61	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 15, 2008
HP Pre_Amplifier	8449B	3008A01922	Oct. 04, 2008
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Mar. 26, 2008
CHASE Broadband Antenna	VULB 9168	138	July 26, 2008
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 16, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 25, 2009
TRILOG Broad Band Antenna	VULB 9168	138	July 26, 2008
RF Switches (ARNITSU)	CS-201	1565157	Aug. 13, 2008
RF CABLE (Chaintek)	SF102	22054-2	Dec. 06, 2008
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Aug. 13, 2008
Software	ADT_Radiated_V 7.6.15.8	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

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

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

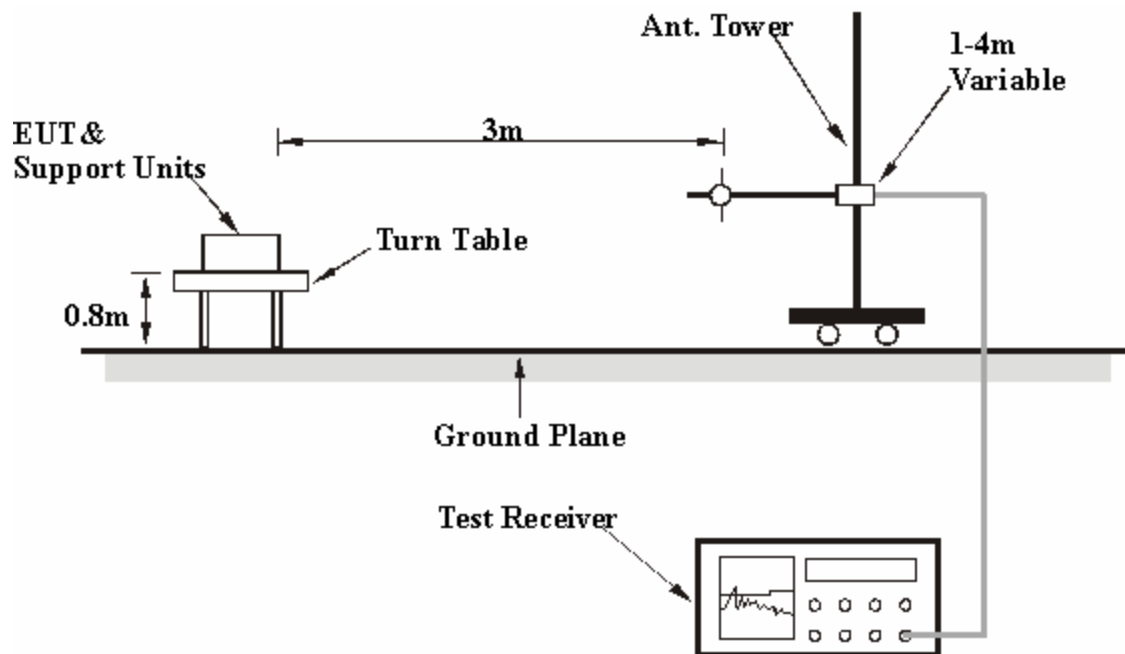
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

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	20deg. C, 62%RH 971hPa	TESTED BY	Wen Yu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	168.00	25.63 QP	43.50	-17.87	1.45 H	315	11.15	14.48
2	240.00	25.68 QP	46.00	-20.32	1.44 H	196	13.01	12.67
3	504.00	30.15 QP	46.00	-15.85	1.34 H	115	9.11	21.04
4	804.00	31.69 QP	46.00	-14.31	1.22 H	263	3.61	28.08
5	900.00	30.41 QP	46.00	-15.59	1.19 H	219	0.74	29.67
6	960.00	34.12 QP	46.00	-11.88	1.07 H	65	4.45	29.67
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	168.00	38.58 QP	43.50	-4.92	1.00 V	158	24.10	14.48
2	240.00	35.29 QP	46.00	-10.71	1.02 V	321	22.62	12.67
3	504.00	35.89 QP	46.00	-10.11	1.13 V	214	14.85	21.04
4	744.00	30.85 QP	46.00	-15.15	1.29 V	268	3.92	26.93
5	804.00	34.12 QP	46.00	-11.88	1.23 V	124	6.04	28.08
6	960.00	38.42 QP	46.00	-7.58	1.34 V	180	8.75	29.67

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



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	26deg. C, 68%RH 971hPa	TESTED BY	Sky Liao

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	60.57 PK	74.00	-13.43	1.43 H	6	30.17	30.40
2	2390.00	51.21 AV	54.00	-2.79	1.43 H	6	20.81	30.40
3	*2412.00	103.80 PK			1.32 H	8	73.31	30.49
4	*2412.00	98.60 AV			1.32 H	8	68.11	30.49
5	4824.00	48.20 PK	74.00	-25.80	1.42 H	45	12.51	35.69
6	4824.00	40.20 AV	54.00	-13.80	1.42 H	45	4.51	35.69
7	7236.00	52.20 PK	83.80	-31.60	1.26 H	206	9.96	42.24
8	7236.00	39.00 AV	78.60	-39.60	1.26 H	206	-3.24	42.24
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.30	62.30 PK	74.00	-11.70	1.07 V	92	31.92	30.38
2	2386.30	53.19 AV	54.00	-0.81	1.07 V	92	22.81	30.38
3	*2412.00	104.50 PK			1.08 V	86	74.01	30.49
4	*2412.00	99.70 AV			1.08 V	86	69.21	30.49
5	4824.00	49.50 PK	74.00	-24.50	1.60 V	215	13.81	35.69
6	4824.00	41.50 AV	54.00	-12.50	1.60 V	215	5.81	35.69
7	7236.00	52.50 PK	84.50	-32.00	1.42 V	20	10.26	42.24
8	7236.00	39.20 AV	79.70	-40.50	1.42 V	20	-3.04	42.24

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH 971hPa	TESTED BY	Sky Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.60 PK			1.32 H	8	75.99	30.61
2	*2437.00	101.80 AV			1.32 H	8	71.19	30.61
3	4874.00	51.30 PK	74.00	-22.70	1.73 H	62	15.50	35.80
4	4874.00	44.60 AV	54.00	-9.40	1.73 H	62	8.80	35.80
5	7311.00	53.60 PK	74.00	-20.40	1.36 H	225	11.08	42.52
6	7311.00	40.30 AV	54.00	-13.70	1.36 H	225	-2.22	42.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.20 PK			1.08 V	80	77.59	30.61
2	*2437.00	103.40 AV			1.08 V	80	72.79	30.61
3	4874.00	53.10 PK	74.00	-20.90	1.28 V	2	17.30	35.80
4	4874.00	45.80 AV	54.00	-8.20	1.28 V	2	10.00	35.80
5	7311.00	54.00 PK	74.00	-20.00	1.50 V	25	11.48	42.52
6	7311.00	41.00 AV	54.00	-13.00	1.50 V	25	-1.52	42.52

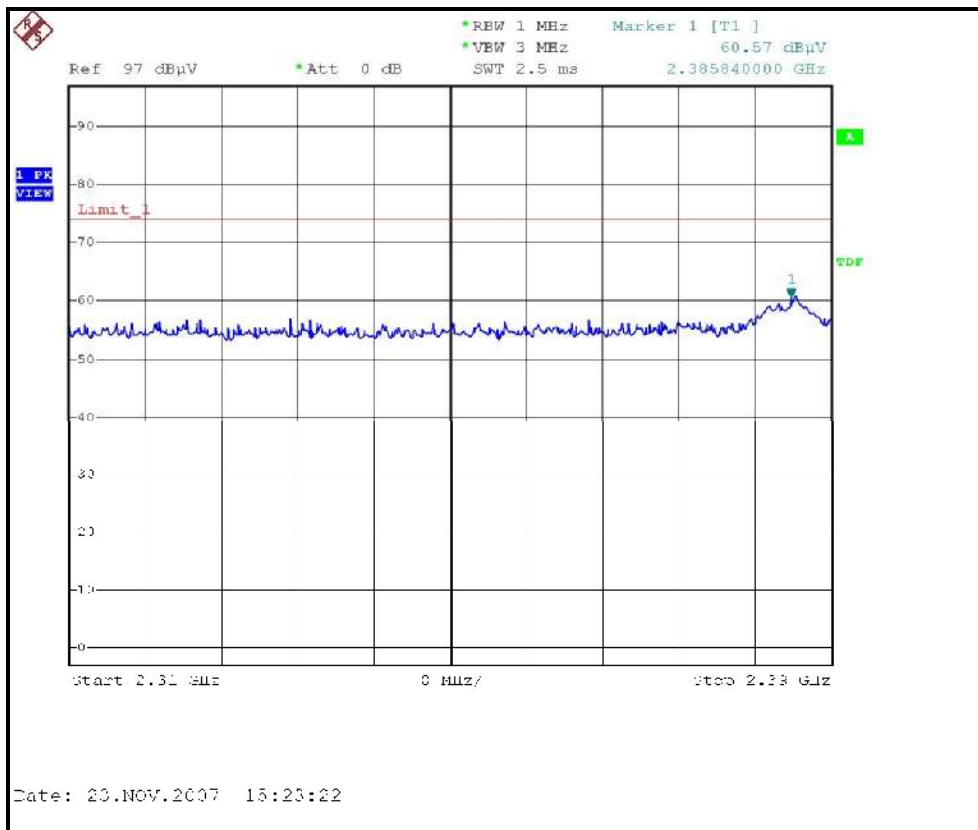
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH 971hPa	TESTED BY	Sky Liao

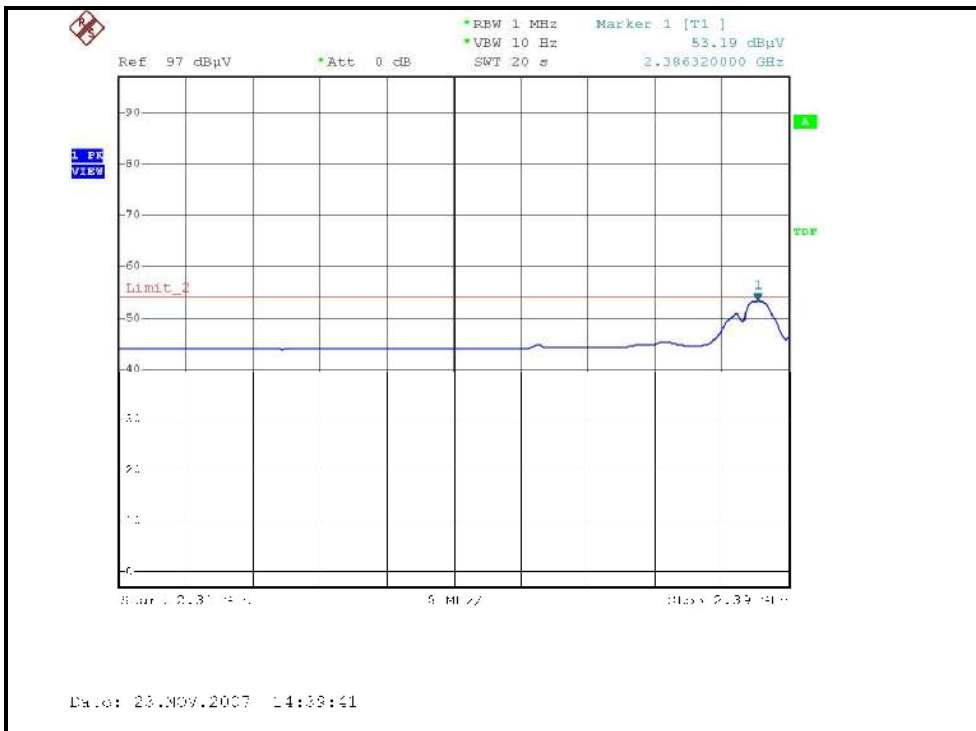
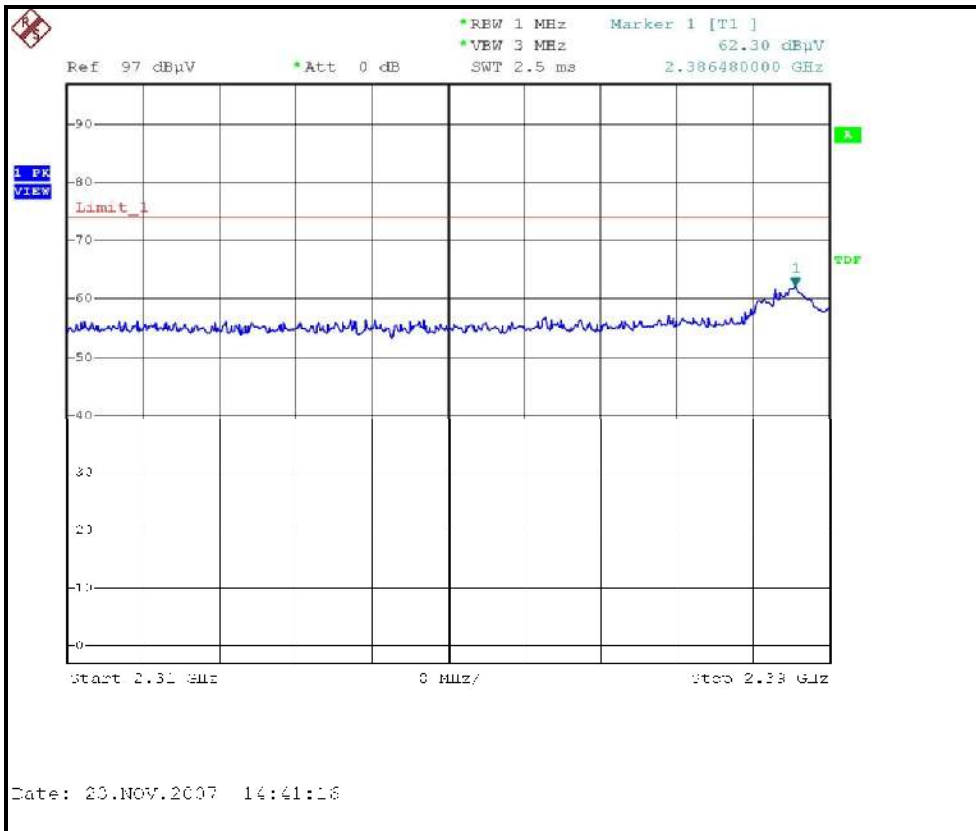
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.00 PK			1.35 H	10	69.28	30.72
2	*2462.00	94.40 AV			1.35 H	10	63.68	30.72
3	2487.75	59.35 PK	74.00	-14.65	1.25 H	10	28.52	30.83
4	2487.75	49.24 AV	54.00	-4.76	1.25 H	10	18.41	30.83
5	4924.00	48.20 PK	74.00	-25.80	1.65 H	50	12.30	35.90
6	4924.00	40.40 AV	54.00	-13.60	1.65 H	50	4.50	35.90
7	7386.00	52.60 PK	74.00	-21.40	1.32 H	212	9.80	42.80
8	7386.00	39.40 AV	54.00	-14.60	1.32 H	212	-3.40	42.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.20 PK			1.07 V	90	74.48	30.72
2	*2462.00	100.20 AV			1.07 V	90	69.48	30.72
3	2487.70	62.94 PK	74.00	-11.06	1.07 V	88	32.11	30.83
4	2487.70	53.56 AV	54.00	-0.44	1.07 V	88	22.73	30.83
5	4924.00	50.20 PK	74.00	-23.80	1.64 V	258	14.30	35.90
6	4924.00	41.60 AV	54.00	-12.40	1.64 V	258	5.70	35.90
7	7386.00	53.20 PK	74.00	-20.80	1.36 V	36	10.40	42.80
8	7386.00	39.50 AV	54.00	-14.50	1.36 V	36	-3.30	42.80

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

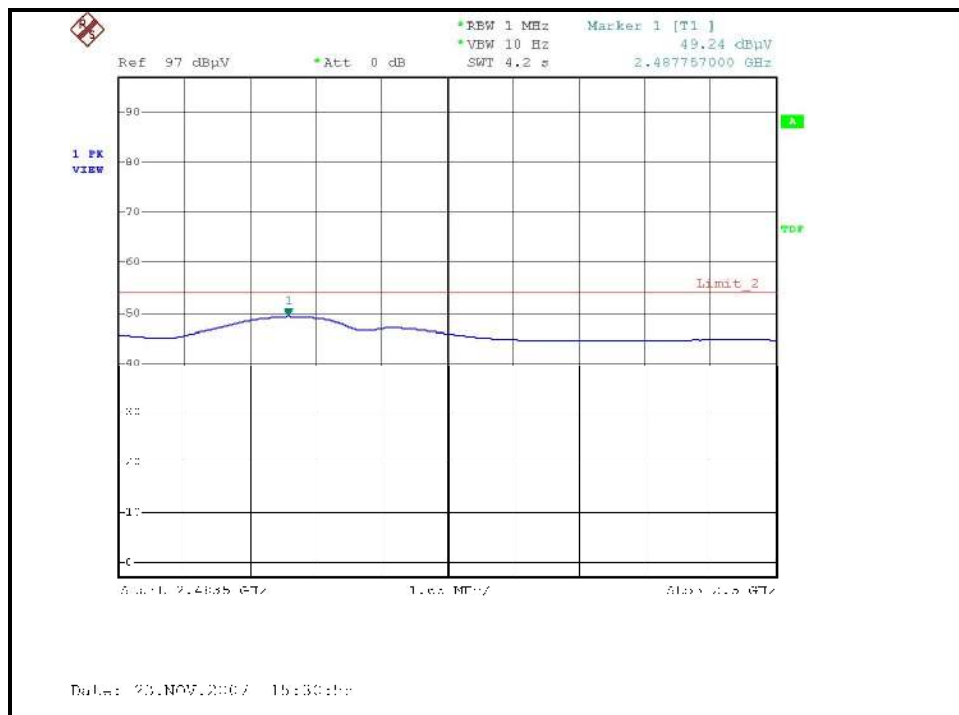
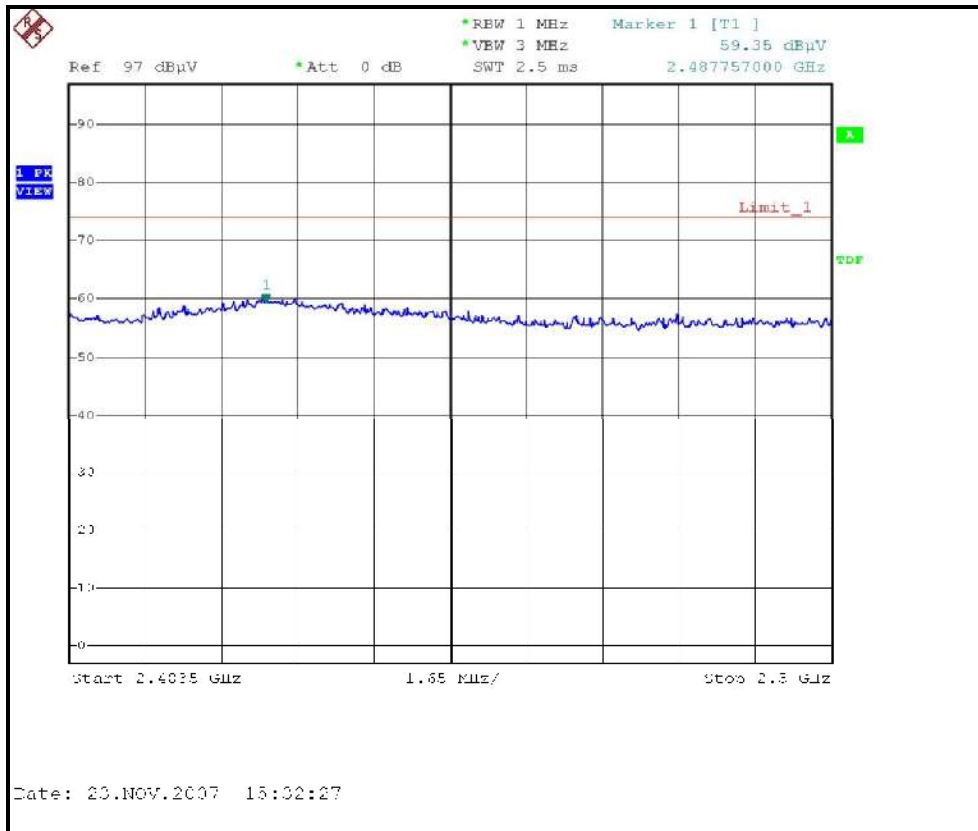
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)



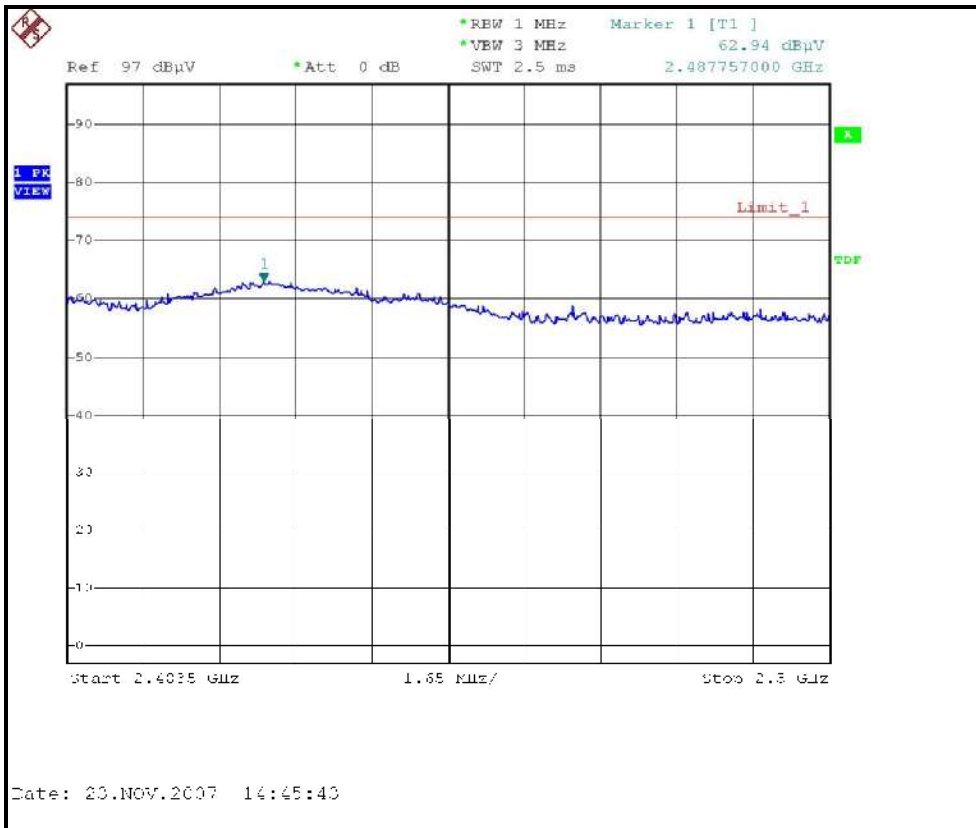
RESTRICTED BANDEDGE (802.11b MODE, CH1, VERTICAL)



RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11b MODE, CH11, VERTICAL)



802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

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	61.35 PK	74.00	-12.65	1.33 H	10	30.95	30.40
2	2390.00	49.21 AV	54.00	-4.79	1.33 H	10	18.81	30.40
3	*2412.00	106.00 PK			1.33 H	10	75.51	30.49
4	*2412.00	94.80 AV			1.33 H	10	64.31	30.49
5	4824.00	45.00 PK	74.00	-29.00	1.12 H	10	9.31	35.69
6	4824.00	31.20 AV	54.00	-22.80	1.12 H	10	-4.49	35.69
7	7236.00	52.20 PK	86.00	-33.80	1.02 H	58	9.96	42.24
8	7236.00	39.00 AV	74.80	-35.80	1.02 H	58	-3.24	42.24
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.07 PK	74.00	-7.93	1.08 V	92	35.67	30.40
2	2390.00	52.88 AV	54.00	-1.12	1.08 V	92	22.48	30.40
3	*2412.00	107.60 PK			1.20 V	246	77.11	30.49
4	*2412.00	96.40 AV			1.20 V	246	65.91	30.49
5	4824.00	48.40 PK	74.00	-25.60	1.22 V	15	12.71	35.69
6	4824.00	39.00 AV	54.00	-15.00	1.22 V	15	3.31	35.69
7	7236.00	54.50 PK	87.60	-33.10	1.05 V	2	12.26	42.24
8	7236.00	39.20 AV	76.40	-37.20	1.05 V	2	-3.04	42.24

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.00 PK			1.33 H	8	78.39	30.61
2	*2437.00	98.10 AV			1.33 H	8	67.49	30.61
3	4874.00	47.40 PK	74.00	-26.60	1.20 H	7	11.60	35.80
4	4874.00	33.80 AV	54.00	-20.20	1.20 H	7	-2.00	35.80
5	7311.00	52.60 PK	74.00	-21.40	1.08 H	48	10.08	42.52
6	7311.00	39.40 AV	54.00	-14.60	1.08 H	48	-3.12	42.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	114.30 PK			1.16 V	205	83.69	30.61
2	*2437.00	103.10 AV			1.16 V	205	72.49	30.61
3	4874.00	50.90 PK	74.00	-23.10	1.28 V	1	15.10	35.80
4	4874.00	41.30 AV	54.00	-12.70	1.28 V	1	5.50	35.80
5	7311.00	53.00 PK	74.00	-21.00	1.15 V	8	10.48	42.52
6	7311.00	39.70 AV	54.00	-14.30	1.15 V	8	-2.82	42.52

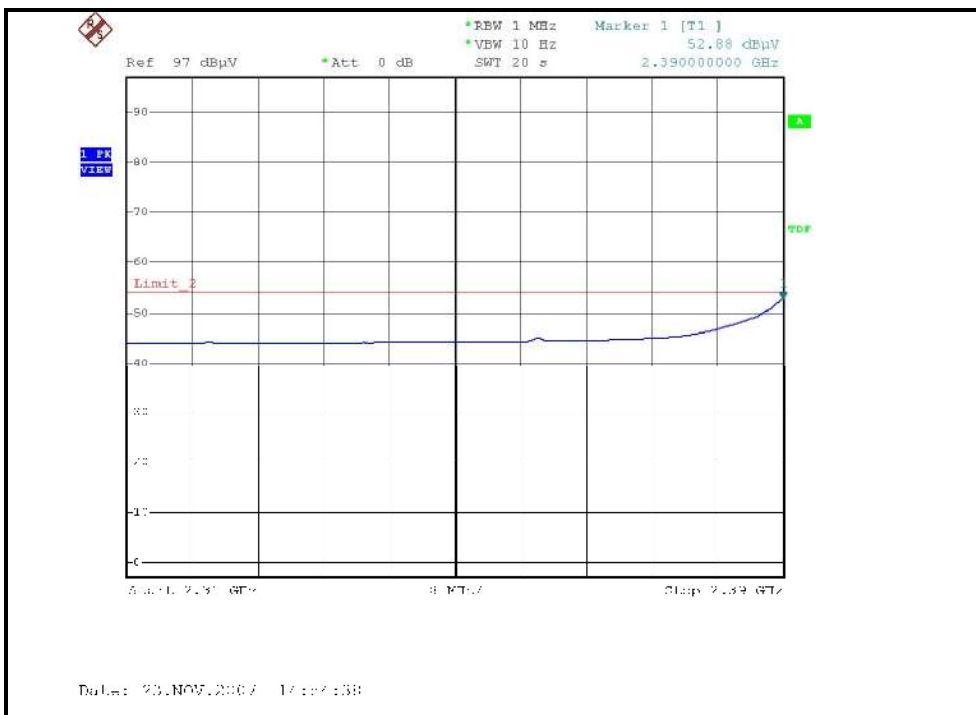
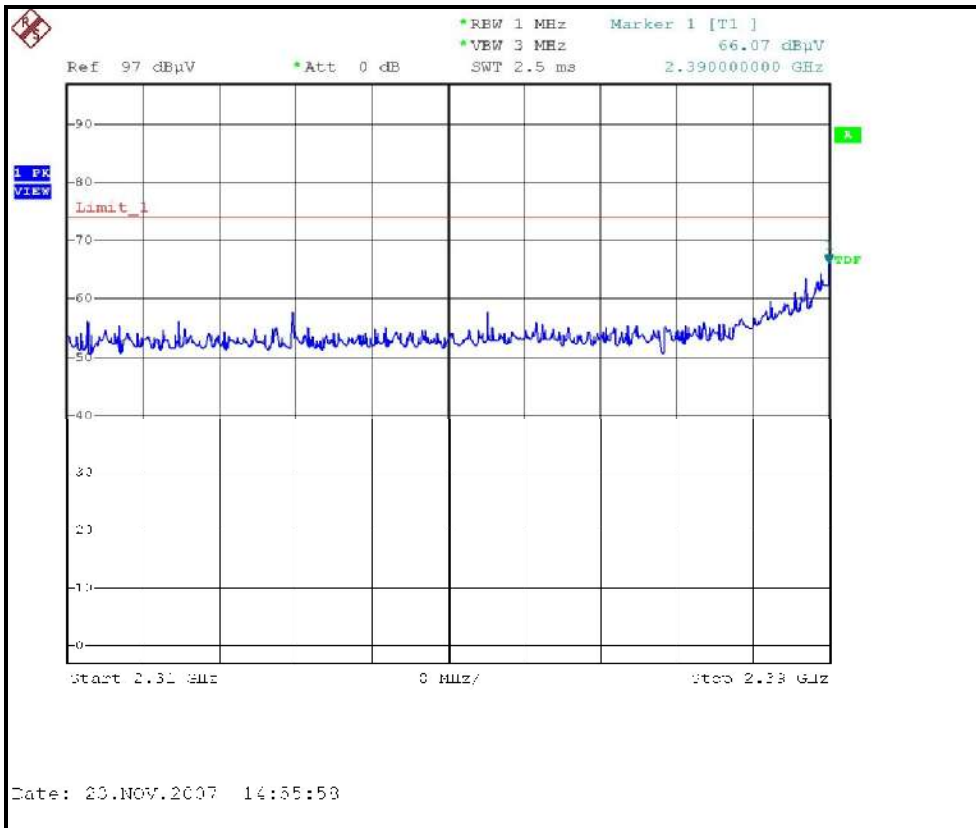
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

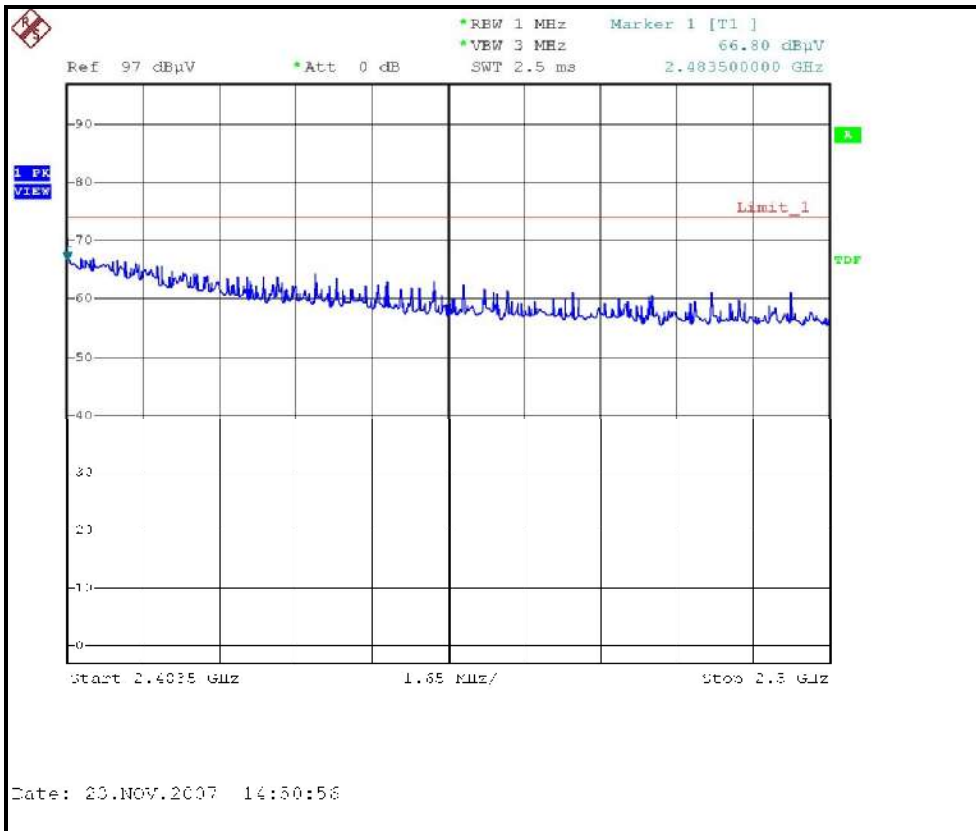
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.20 PK			1.96 H	18	71.48	30.72
2	*2462.00	91.20 AV			1.96 H	18	60.48	30.72
3	2483.50	61.26 PK	74.00	-12.74	1.33 H	20	30.44	30.82
4	2483.50	48.48 AV	54.00	-5.52	1.33 H	20	17.66	30.82
5	4924.00	45.20 PK	74.00	-28.80	1.26 H	16	9.30	35.90
6	4924.00	32.00 AV	54.00	-22.00	1.26 H	16	-3.90	35.90
7	7386.00	52.50 PK	74.00	-21.50	1.16 H	62	9.70	42.80
8	7386.00	39.60 AV	54.00	-14.40	1.16 H	62	-3.20	42.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.50 PK			1.16 V	250	76.78	30.72
2	*2462.00	96.10 AV			1.16 V	250	65.38	30.72
3	2483.50	66.80 PK	74.00	-7.20	1.04 V	90	35.98	30.82
4	2483.50	52.97 AV	54.00	-1.03	1.04 V	90	22.15	30.82
5	4924.00	48.20 PK	74.00	-25.80	1.20 V	20	12.30	35.90
6	4924.00	39.20 AV	54.00	-14.80	1.20 V	20	3.30	35.90
7	7386.00	54.20 PK	74.00	-19.80	1.28 V	12	11.40	42.80
8	7386.00	39.70 AV	54.00	-14.30	1.28 V	12	-3.10	42.80

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

RESTRICTED BANDEDGE (802.11g MODE, CH1, VERTICAL)



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	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

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	64.84 PK	74.00	-9.16	1.32 H	8	34.45	30.40
2	2390.00	49.85 AV	54.00	-4.15	1.32 H	8	19.45	30.40
3	*2412.00	106.60 PK			1.32 H	8	76.11	30.49
4	*2412.00	95.00 AV			1.32 H	8	64.51	30.49
5	4824.00	49.20 PK	74.00	-24.80	1.52 H	274	13.51	35.69
6	4824.00	34.00 AV	54.00	-20.00	1.52 H	274	-1.69	35.69
7	7236.00	53.20 PK	86.60	-33.40	1.68 H	260	10.96	42.24
8	7236.00	39.40 AV	75.00	-35.60	1.68 H	260	-2.84	42.24
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.88 PK	74.00	-4.12	1.24 V	200	39.48	30.40
2	2390.00	53.49 AV	54.00	-0.51	1.24 V	200	23.09	30.40
3	*2412.00	109.30 PK			1.20 V	180	78.81	30.49
4	*2412.00	97.00 AV			1.20 V	180	66.51	30.49
5	4824.00	47.20 PK	74.00	-26.80	1.00 V	2	11.51	35.69
6	4824.00	33.50 AV	54.00	-20.50	1.00 V	2	-2.19	35.69
7	7236.00	54.00 PK	89.30	-35.30	1.52 V	16	11.76	42.24
8	7236.00	40.20 AV	77.00	-36.80	1.52 V	16	-2.04	42.24

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.30 PK			1.43 H	160	81.69	30.61
2	*2437.00	97.60 AV			1.43 H	160	66.99	30.61
3	4874.00	51.20 PK	74.00	-22.80	1.72 H	266	15.40	35.80
4	4874.00	36.50 AV	54.00	-17.50	1.72 H	266	0.70	35.80
5	7311.00	53.60 PK	74.00	-20.40	1.60 H	250	11.08	42.52
6	7311.00	40.50 AV	54.00	-13.50	1.60 H	250	-2.02	42.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	119.50 PK			1.18 V	180	88.89	30.61
2	*2437.00	105.00 AV			1.18 V	180	74.39	30.61
3	4874.00	49.20 PK	74.00	-24.80	1.04 V	7	13.40	35.80
4	4874.00	35.30 AV	54.00	-18.70	1.04 V	7	-0.50	35.80
5	7311.00	54.50 PK	74.00	-19.50	1.60 V	8	11.98	42.52
6	7311.00	40.50 AV	54.00	-13.50	1.60 V	8	-2.02	42.52

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

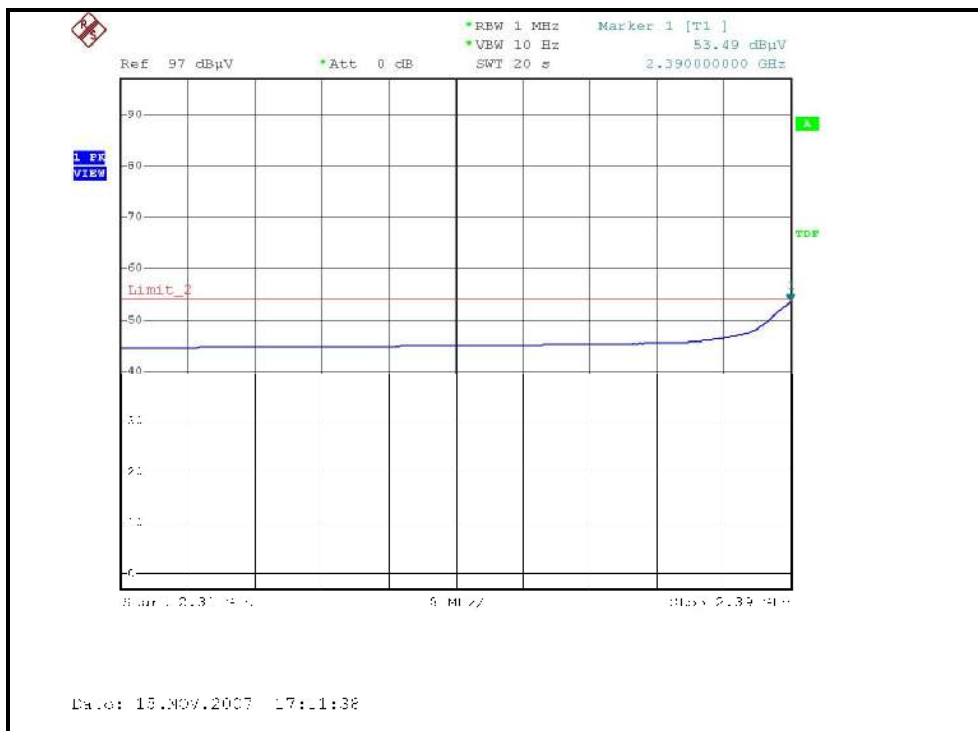
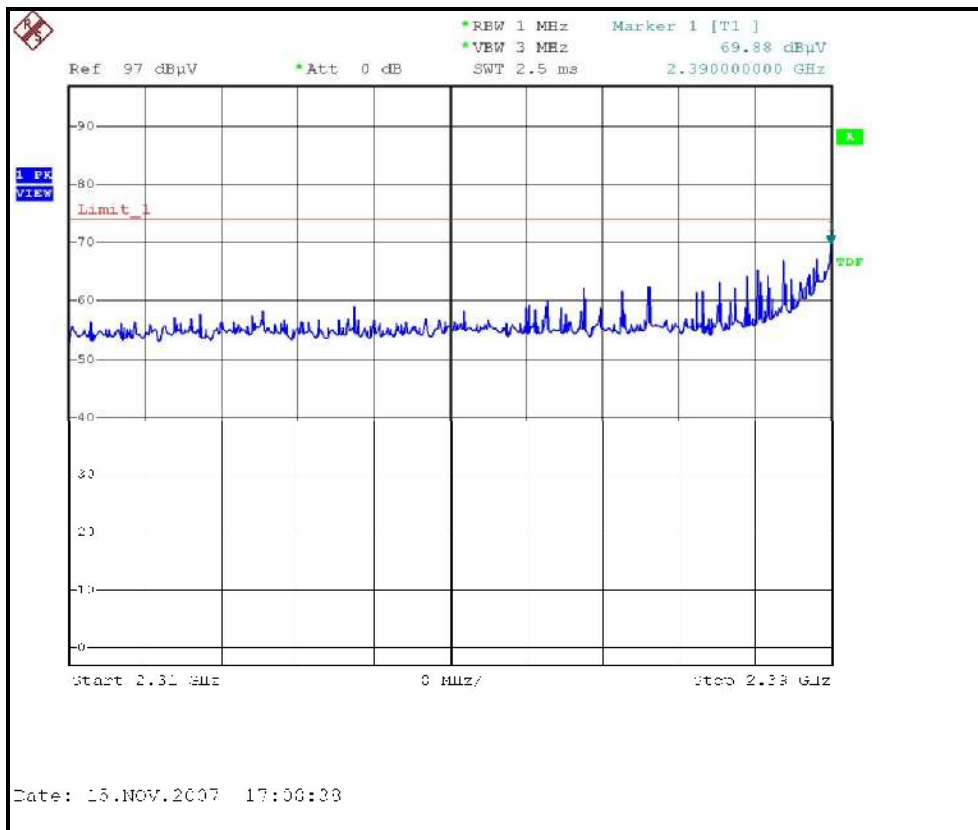


EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

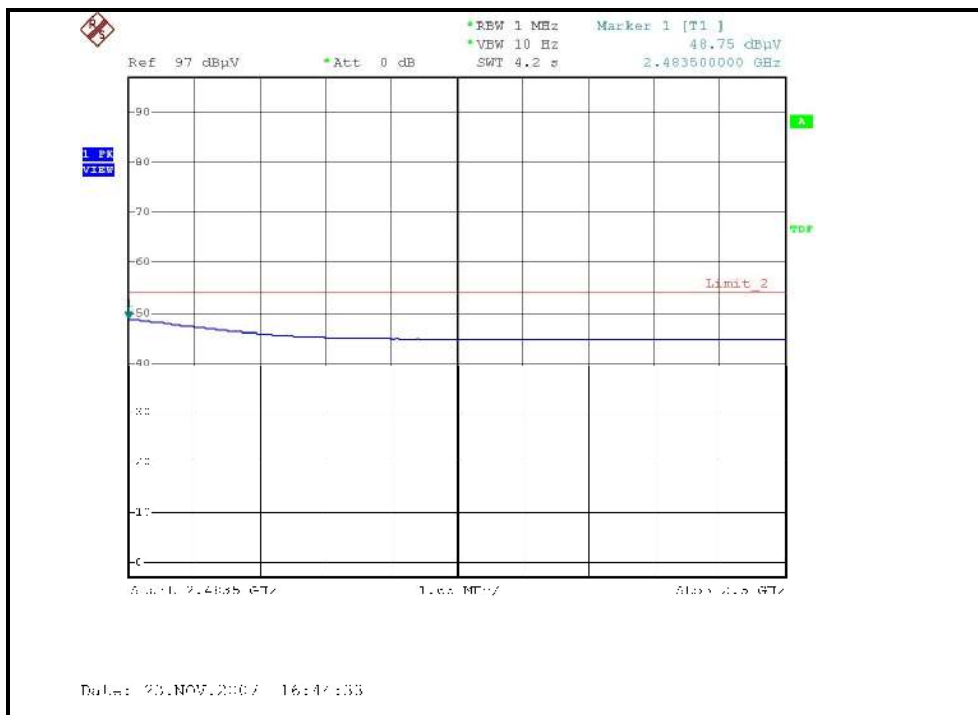
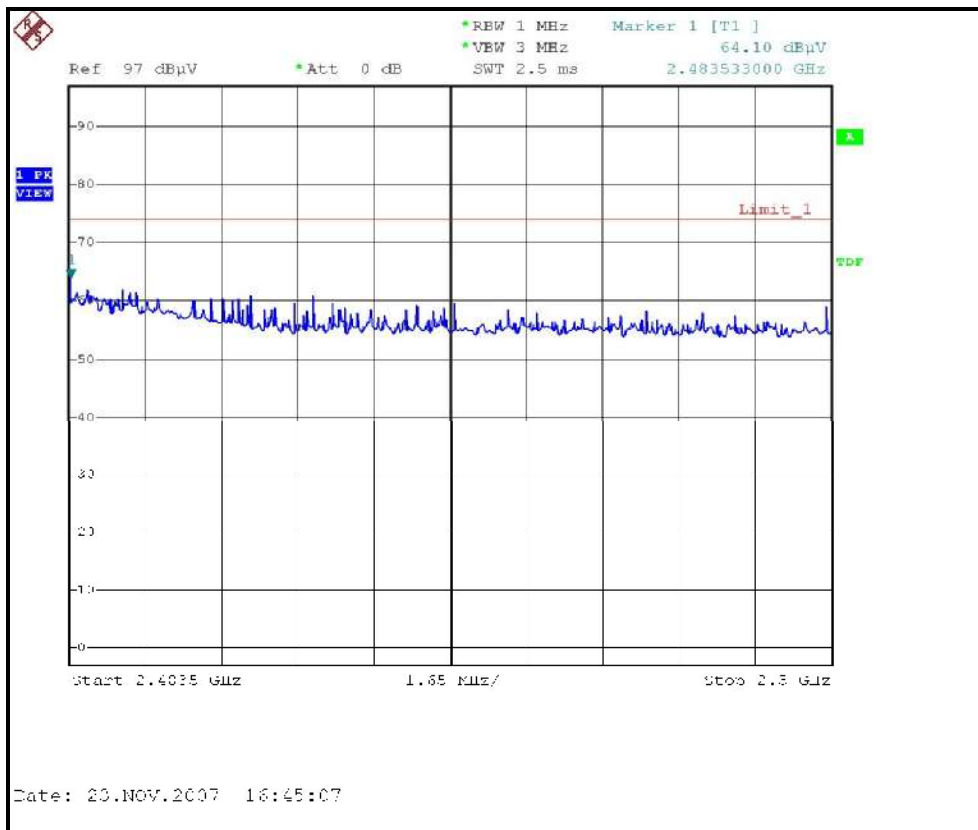
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.40 PK			1.34 H	21	73.68	30.72
2	*2462.00	91.60 AV			1.34 H	21	60.88	30.72
3	2483.50	64.10 PK	74.00	-9.90	1.34 H	21	33.28	30.82
4	2483.50	48.75 AV	54.00	-5.25	1.34 H	21	17.93	30.82
5	4924.00	49.60 PK	74.00	-24.40	1.65 H	292	13.70	35.90
6	4924.00	34.20 AV	54.00	-19.80	1.65 H	292	-1.70	35.90
7	7386.00	53.20 PK	74.00	-20.80	1.52 H	244	10.40	42.80
8	7386.00	39.50 AV	54.00	-14.50	1.52 H	244	-3.30	42.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.20 PK			1.20 V	178	78.48	30.72
2	*2462.00	96.30 AV			1.20 V	178	65.58	30.72
3	2483.50	67.11 PK	74.00	-6.89	1.18 V	180	36.29	30.82
4	2483.50	53.58 AV	54.00	-0.42	1.18 V	180	22.76	30.82
5	4924.00	47.60 PK	74.00	-26.40	1.06 V	16	11.70	35.90
6	4924.00	33.60 AV	54.00	-20.40	1.06 V	16	-2.30	35.90
7	7386.00	54.20 PK	74.00	-19.80	1.62 V	5	11.40	42.80
8	7386.00	40.40 AV	54.00	-13.60	1.62 V	5	-2.40	42.80

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

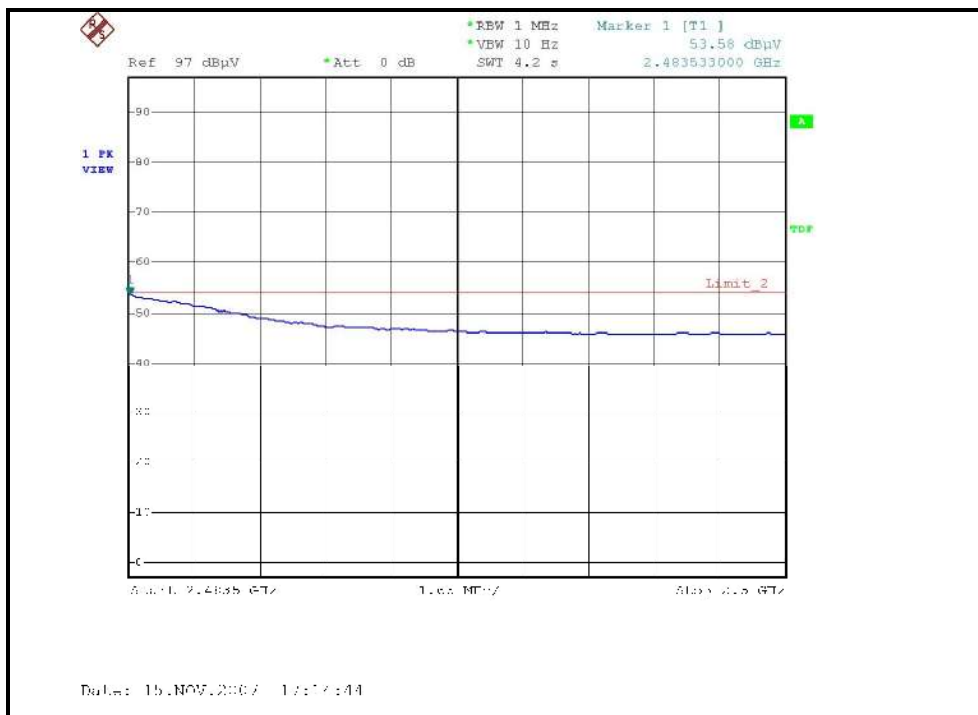
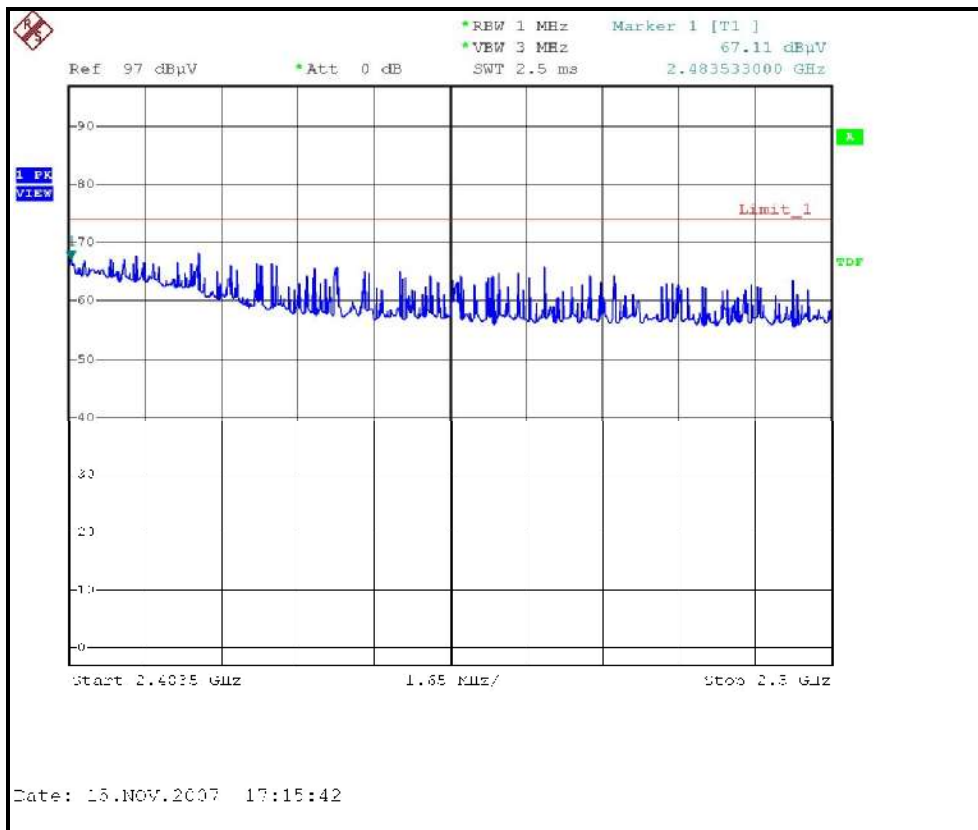
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, VERTICAL)



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	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

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	63.76 PK	74.00	-10.24	1.35 H	5	33.36	30.40
2	2390.00	50.90 AV	54.00	-3.10	1.35 H	5	20.50	30.40
3	*2422.00	103.50 PK			1.35 H	5	72.96	30.54
4	*2422.00	90.40 AV			1.35 H	5	59.86	30.54
5	4844.00	47.20 PK	74.00	-26.80	1.16 H	52	11.46	35.74
6	4844.00	33.40 AV	54.00	-20.60	1.16 H	52	-2.34	35.74
7	7266.00	54.40 PK	74.00	-19.60	1.28 H	44	12.05	42.35
8	7266.00	40.50 AV	54.00	-13.50	1.28 H	44	-1.85	42.35

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.88 PK	74.00	-8.12	1.07 V	78	35.48	30.40
2	2390.00	53.15 AV	54.00	-0.85	1.07 V	78	22.75	30.40
3	*2422.00	106.70 PK			1.17 V	246	76.16	30.54
4	*2422.00	94.40 AV			1.17 V	246	63.86	30.54
5	4844.00	47.60 PK	74.00	-26.40	1.30 V	100	11.86	35.74
6	4844.00	33.20 AV	54.00	-20.80	1.30 V	100	-2.54	35.74
7	7266.00	53.80 PK	74.00	-20.20	1.24 V	32	11.45	42.35
8	7266.00	40.00 AV	54.00	-14.00	1.24 V	32	-2.35	42.35

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.99 PK	74.00	-16.01	1.40 H	92	27.59	30.40
2	2390.00	46.51 AV	54.00	-7.49	1.40 H	92	16.11	30.40
3	*2437.00	108.50 PK			1.33 H	20	77.89	30.61
4	*2437.00	95.00 AV			1.33 H	20	64.39	30.61
5	2483.50	59.23 PK	74.00	-14.77	1.40 H	92	28.41	30.82
6	2483.50	47.31 AV	54.00	-6.69	1.40 H	92	16.49	30.82
7	4874.00	47.00 PK	74.00	-27.00	1.28 H	38	11.20	35.80
8	4874.00	33.60 AV	54.00	-20.40	1.28 H	38	-2.20	35.80
9	7311.00	54.50 PK	74.00	-19.50	1.20 H	15	11.98	42.52
10	7311.00	40.60 AV	54.00	-13.40	1.20 H	15	-1.92	42.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.43 PK	74.00	-9.57	1.09 V	92	34.04	30.40
2	2390.00	51.53 AV	54.00	-2.47	1.09 V	92	21.13	30.40
3	*2437.00	110.25 PK			1.07 V	80	79.64	30.61
4	*2437.00	97.50 AV			1.07 V	80	66.89	30.61
5	2483.50	65.91 PK	74.00	-8.09	1.07 V	90	35.09	30.82
6	2483.50	53.19 AV	54.00	-0.81	1.07 V	90	22.37	30.82
7	4874.00	48.50 PK	74.00	-25.50	1.36 V	116	12.70	35.80
8	4874.00	33.80 AV	54.00	-20.20	1.36 V	116	-2.00	35.80
9	7311.00	54.20 PK	74.00	-19.80	1.35 V	20	11.68	42.52
10	7311.00	40.50 AV	54.00	-13.50	1.35 V	20	-2.02	42.52

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

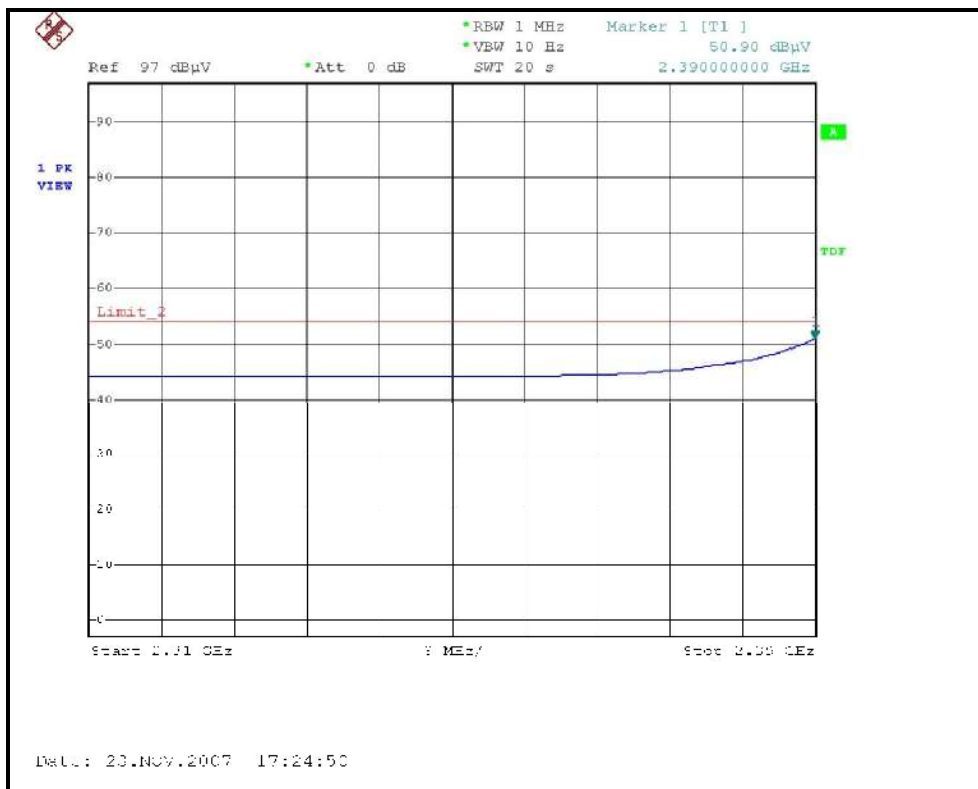
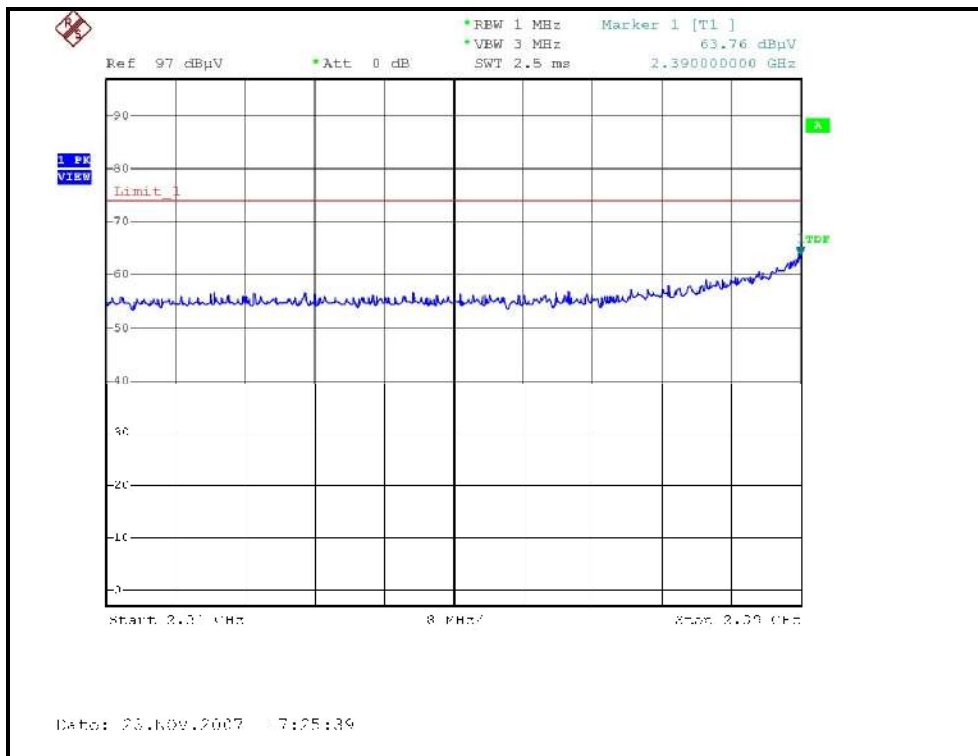


EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 67%RH 971hPa	TESTED BY	Sky Liao

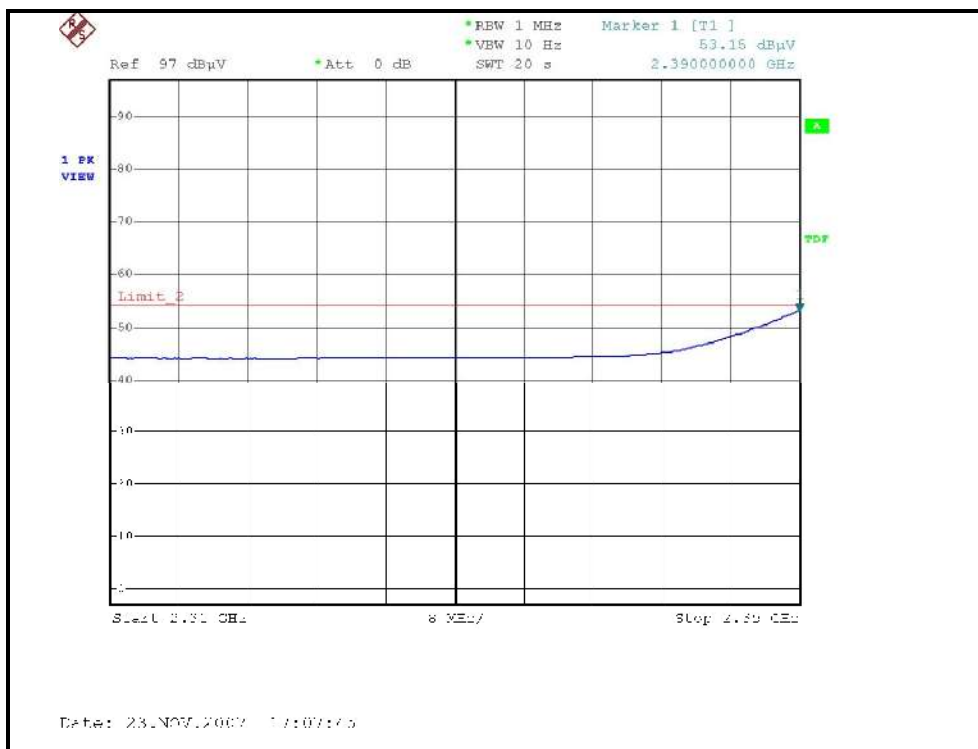
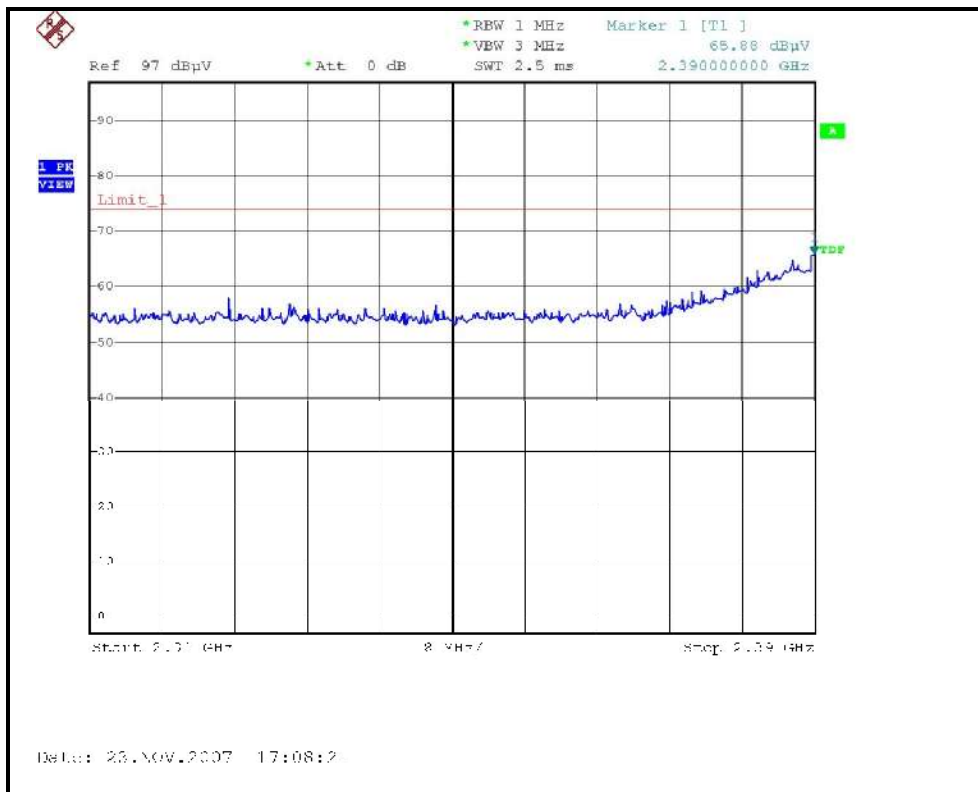
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	100.20 PK			1.45 H	160	69.53	30.67
2	*2452.00	87.60 AV			1.45 H	160	56.93	30.67
3	2483.50	60.42 PK	74.00	-13.58	1.45 H	160	29.60	30.82
4	2483.50	47.84 AV	54.00	-6.16	1.45 H	160	17.02	30.82
5	4904.00	47.00 PK	74.00	-27.00	1.28 H	42	11.14	35.86
6	4904.00	33.40 AV	54.00	-20.60	1.28 H	42	-2.46	35.86
7	7356.00	54.20 PK	74.00	-19.80	1.36 H	25	11.52	42.68
8	7356.00	40.40 AV	54.00	-13.60	1.36 H	25	-2.28	42.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	105.50 PK			1.16 V	248	74.83	30.67
2	*2452.00	93.40 AV			1.16 V	248	62.73	30.67
3	2483.50	64.88 PK	74.00	-9.12	1.07 V	78	34.06	30.82
4	2483.50	53.04 AV	54.00	-0.96	1.07 V	78	22.22	30.82
5	4904.00	48.40 PK	74.00	-25.60	1.22 V	95	12.54	35.86
6	4904.00	33.60 AV	54.00	-20.40	1.22 V	95	-2.26	35.86
7	7356.00	54.00 PK	74.00	-20.00	1.14 V	12	11.32	42.68
8	7356.00	40.20 AV	54.00	-13.80	1.14 V	12	-2.48	42.68

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

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



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





4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

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

NOTE:

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

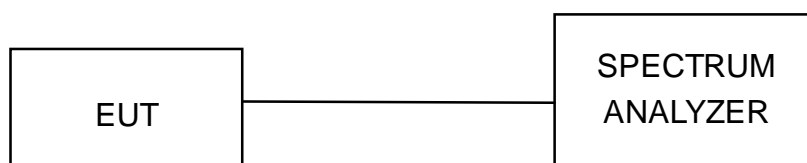
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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

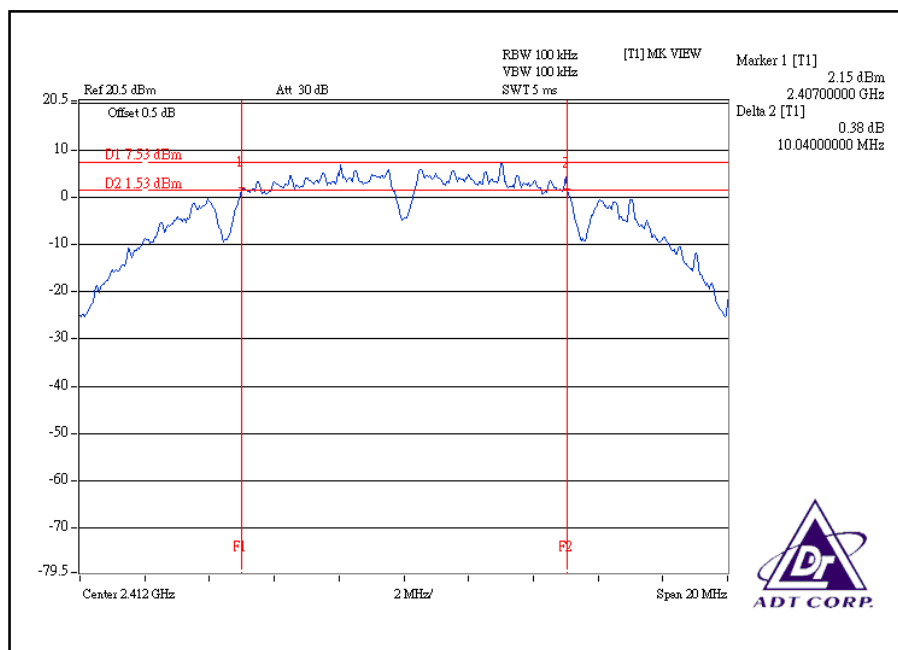
4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

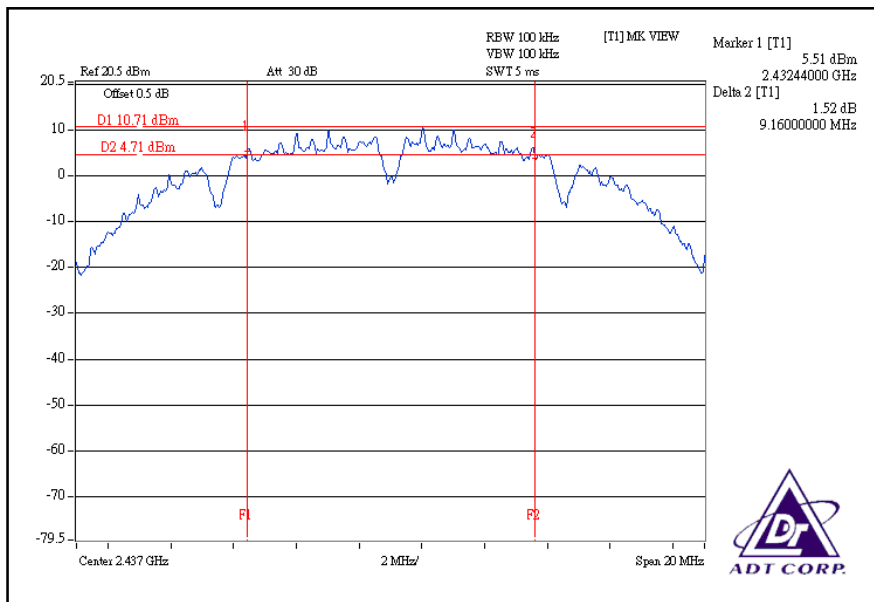
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.04	0.5	PASS
6	2437	9.16	0.5	PASS
11	2462	10.68	0.5	PASS

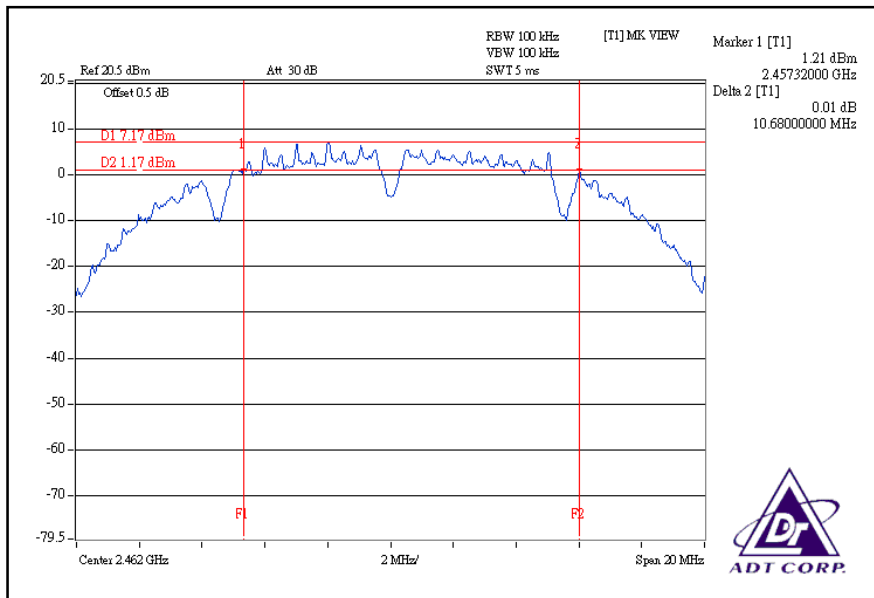
CH1



CH6



CH11

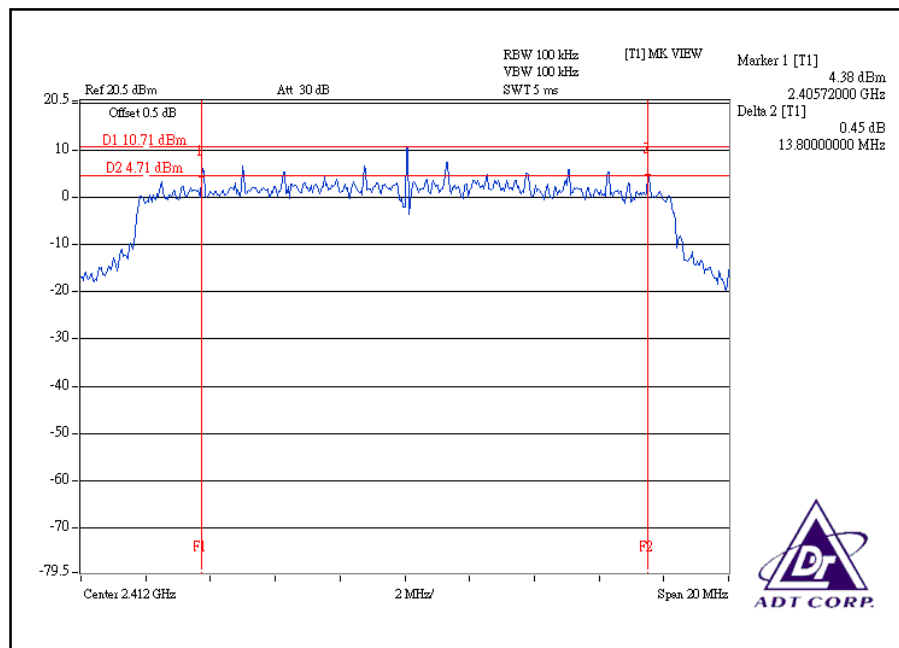


802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	13.80	0.5	PASS
6	2437	11.32	0.5	PASS
11	2462	12.56	0.5	PASS

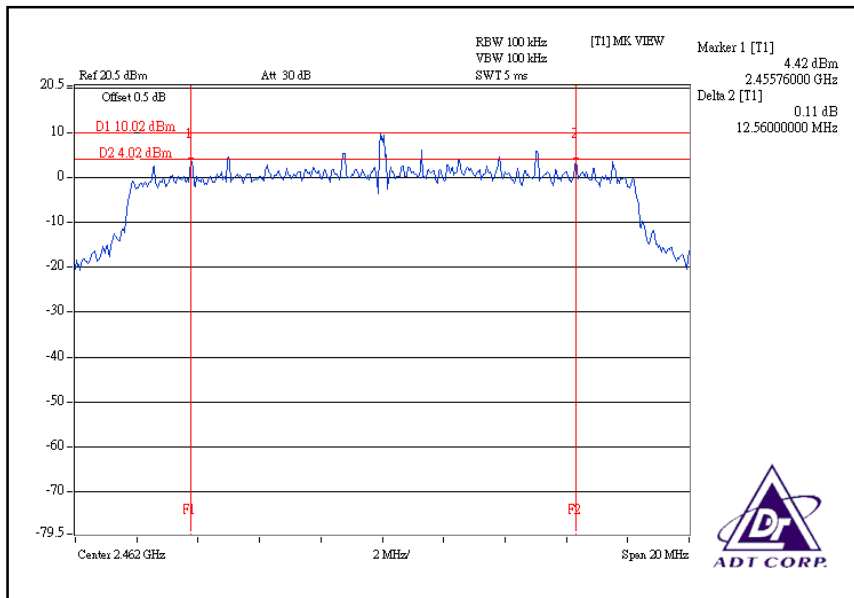
CH1



CH6



CH11

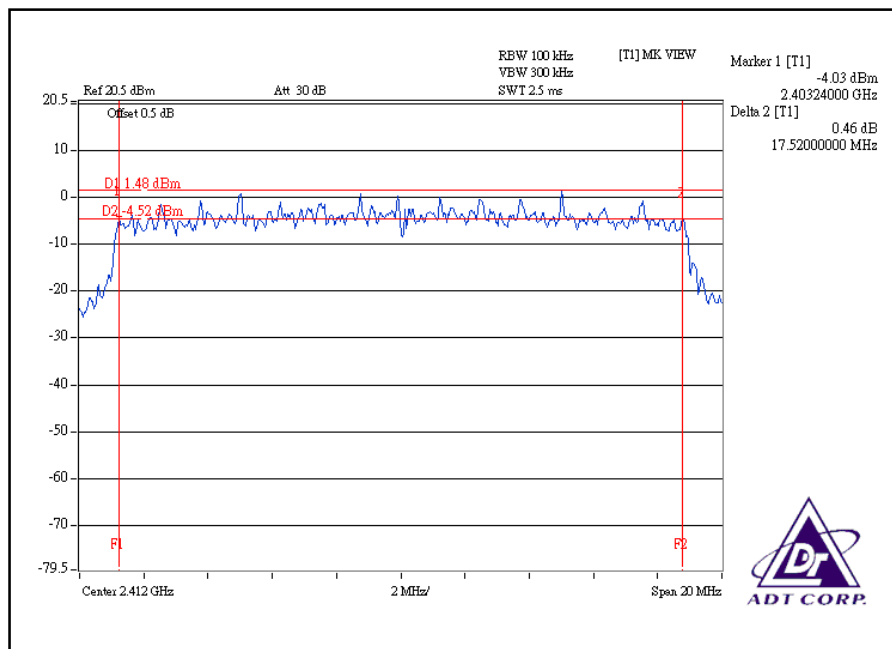


DRAFT 802.11n (20MHz) OFDM MODULATION:

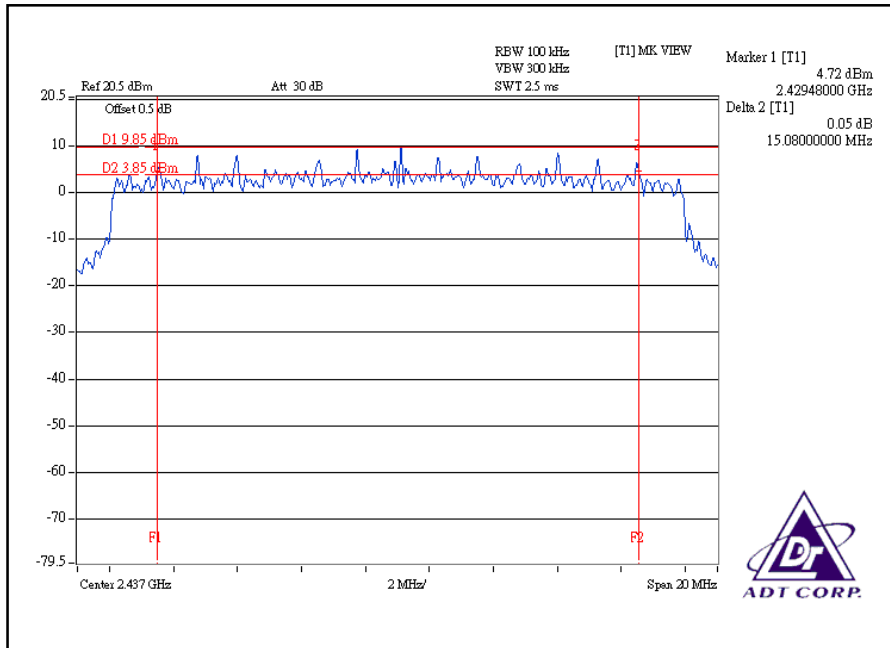
MODULATION TYPE	BPSK	TRANSFER RATE	13Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	17.52	8.88	0.5	PASS
6	2437	15.08	13.8	0.5	PASS
11	2462	12.52	16.72	0.5	PASS

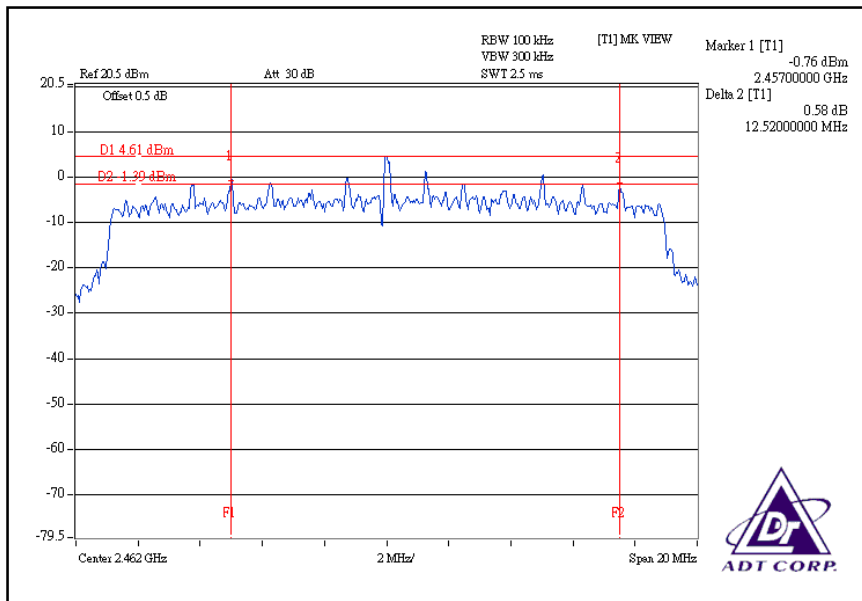
For Chain(0): CH1



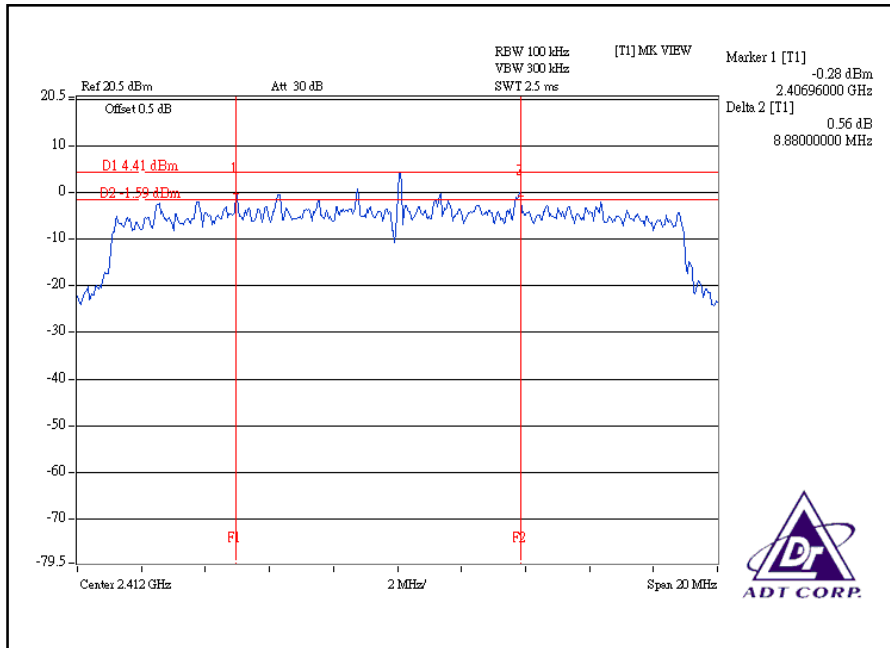
CH6



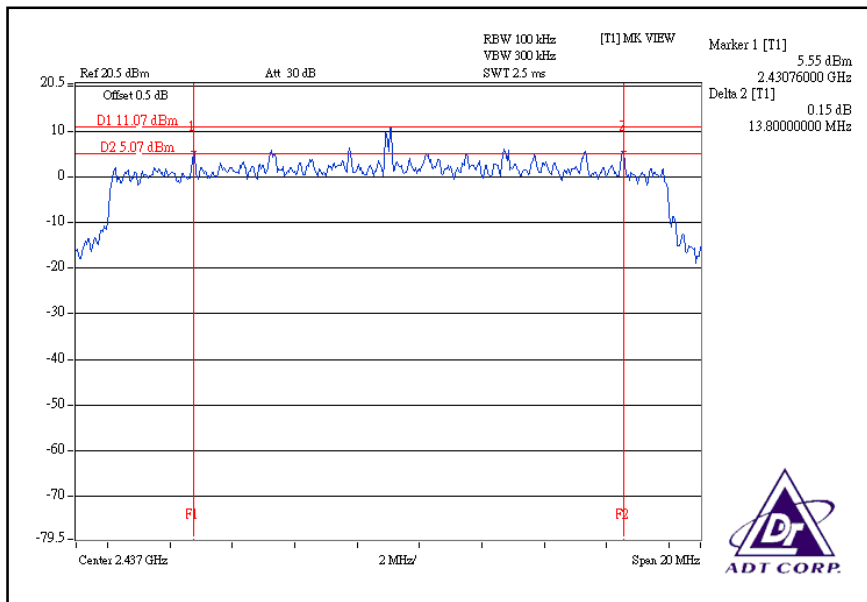
CH11



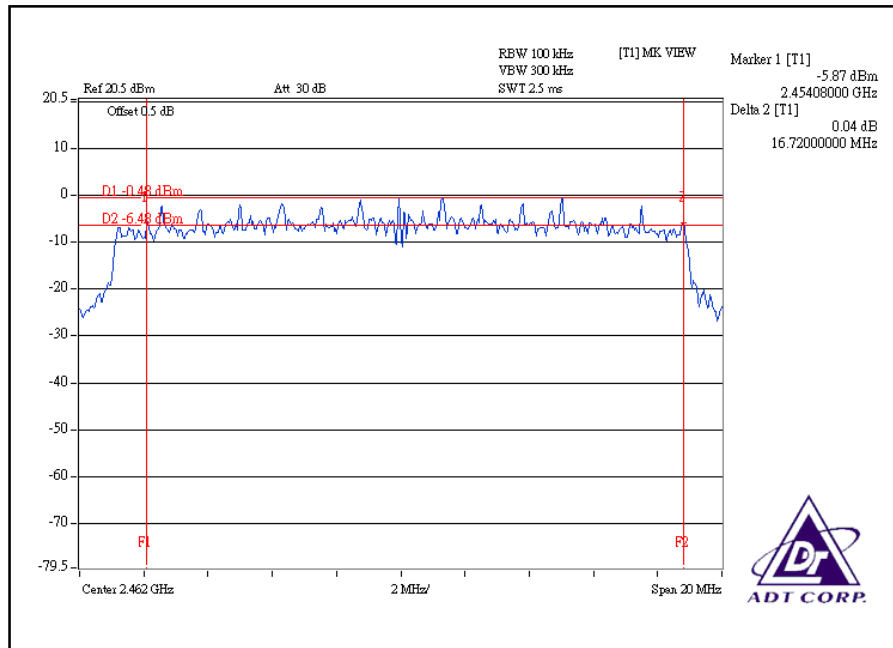
For CHAIN(1): CH1



CH6



CH11

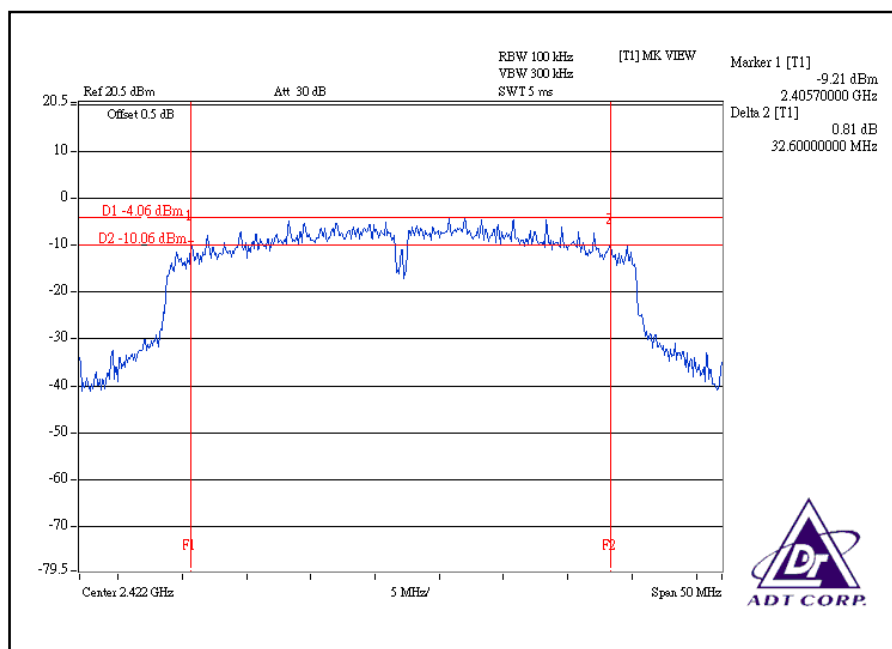


DRAFT 802.11n (40MHz) OFDM MODULATION:

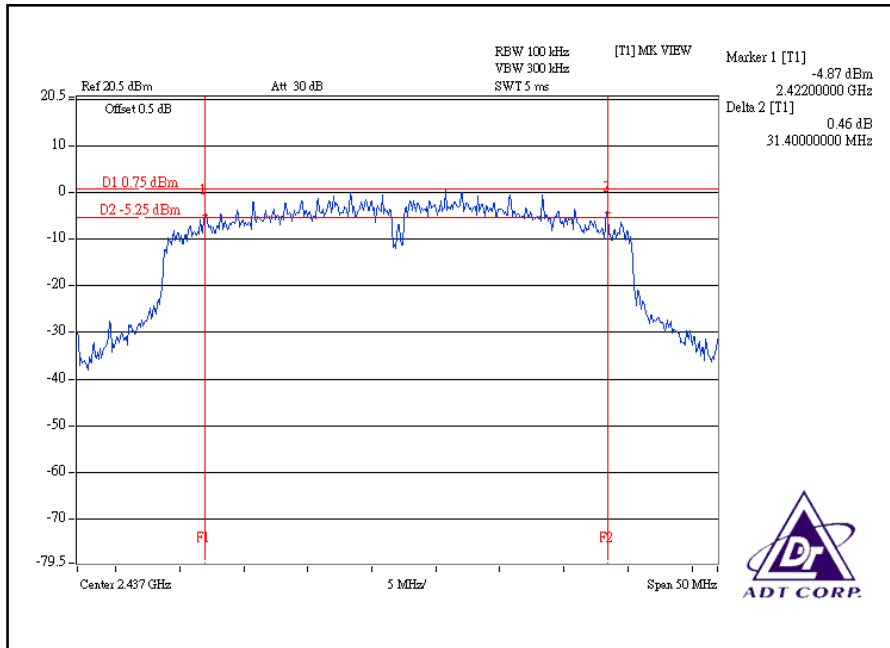
MODULATION TYPE	BPSK	TRANSFER RATE	27Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 62%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2422	32.6	31.5	0.5	PASS
4	2437	31.4	32.7	0.5	PASS
7	2452	31.3	30.2	0.5	PASS

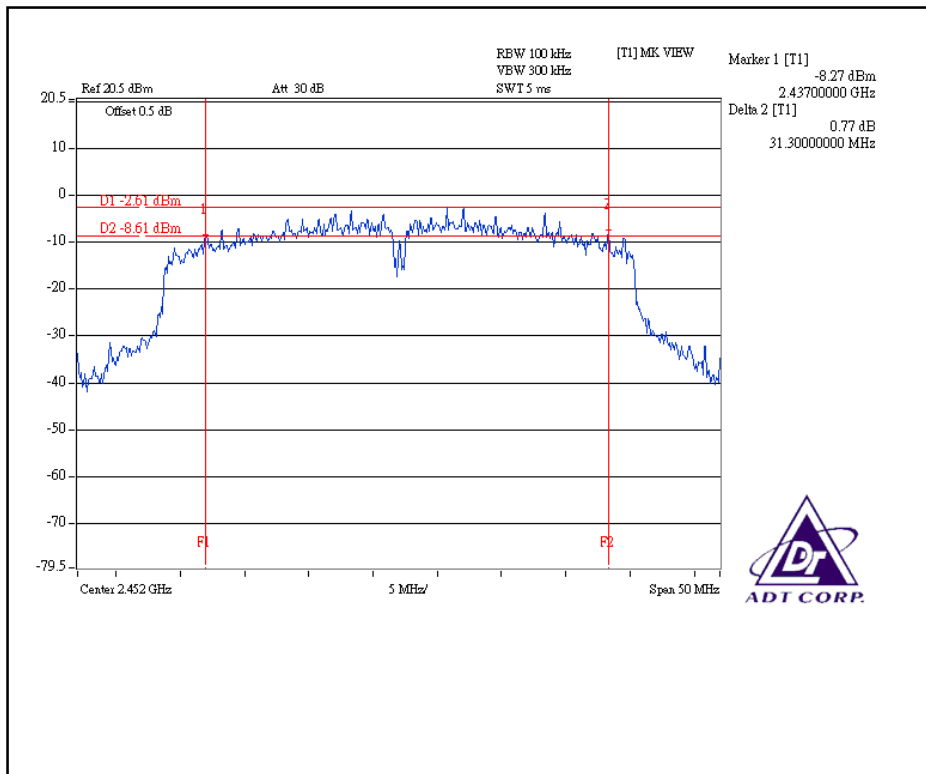
For Chain (0): CH1



CH4



CH7





4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 12, 2008
Agilent SIGNAL GENERATOR	E8257C	MY43321031	Oct. 09, 2008
TEKTRONIX OSCILLOSCOPE	TDS380	B016335	Aug. 15, 2008
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:

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

4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	118.850	20.75	30	PASS
6	2437	187.499	22.73	30	PASS
11	2462	115.878	20.64	30	PASS

802.11g OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	105.196	20.22	30	PASS
6	2437	239.332	23.79	30	PASS
11	2462	83.753	19.23	30	PASS



DRAFT 802.11n (20MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	13Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)		PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2412	35.645	28.054	15.52	14.48	63.699	18.04	30	PASS
6	2437	154.170	119.399	21.88	20.77	273.569	24.37	30	PASS
11	2462	26.122	22.542	14.17	13.53	48.664	16.87	30	PASS

DRAFT 802.11n (40MHz) OFDM MODULATION:

MODULATION TYPE	BPSK	TRANSFER RATE	27Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)		PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2422	42.364	39.811	16.27	16.00	82.175	19.15	30	PASS
4	2437	106.905	91.411	20.29	19.61	198.316	22.97	30	PASS
7	2452	47.534	37.670	16.77	15.76	85.204	19.30	30	PASS



4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

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

NOTE:

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

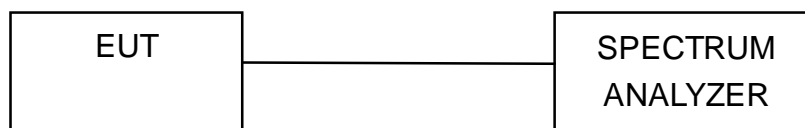
4.5.3 TEST PROCEDURE

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

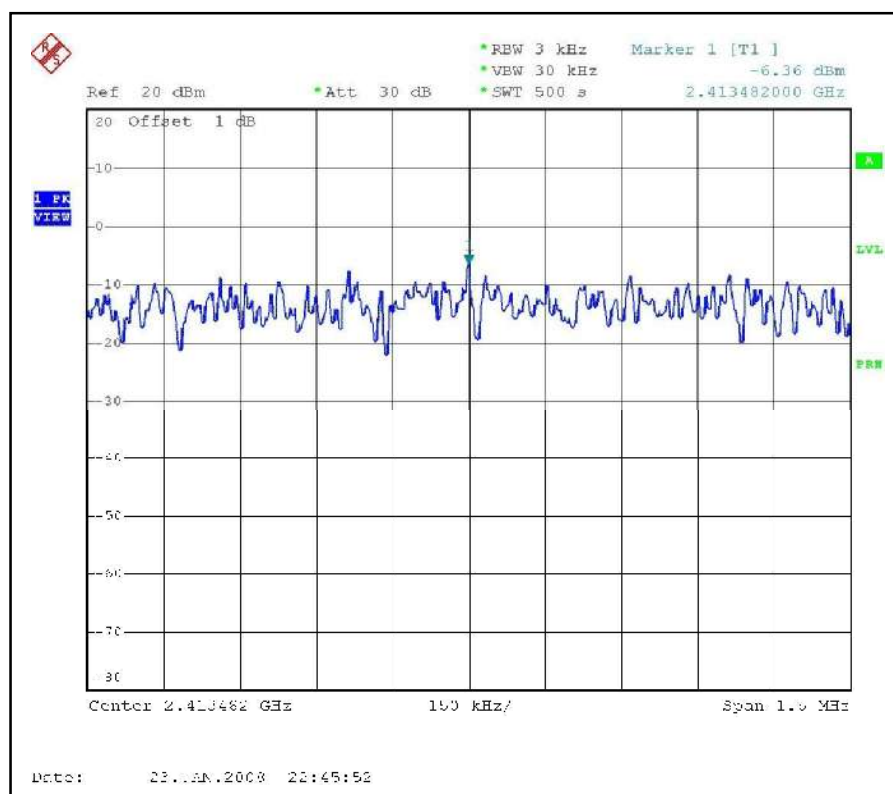
4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

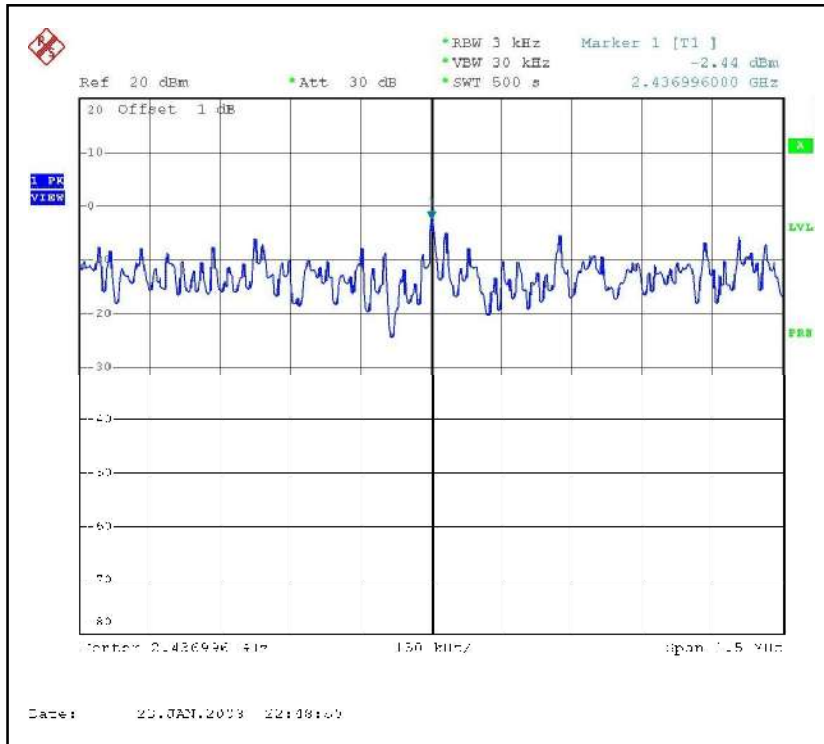
MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-6.36	8	PASS
6	2437	-2.44	8	PASS
11	2462	-7.13	8	PASS

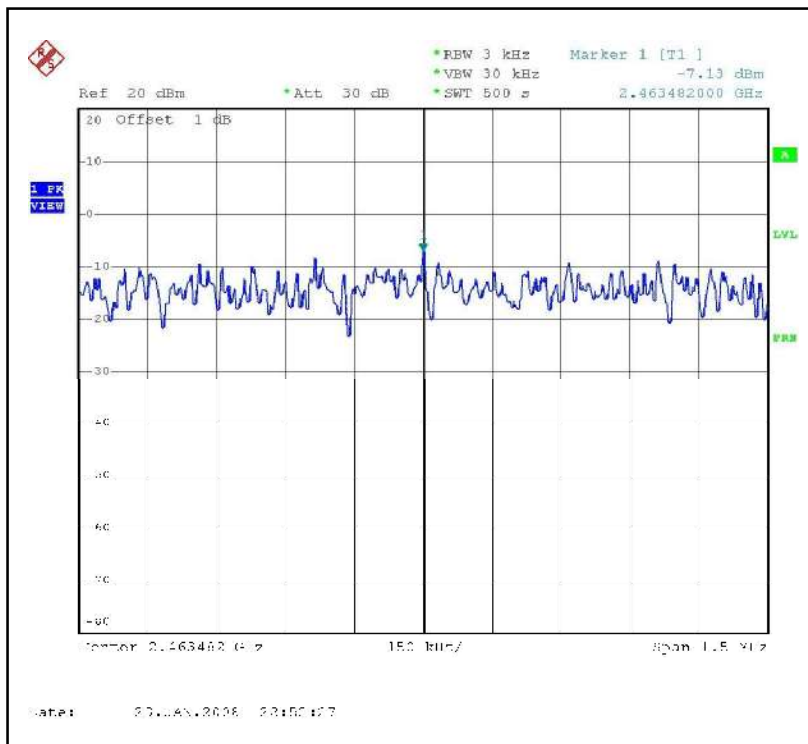
CH1



CH6



CH11

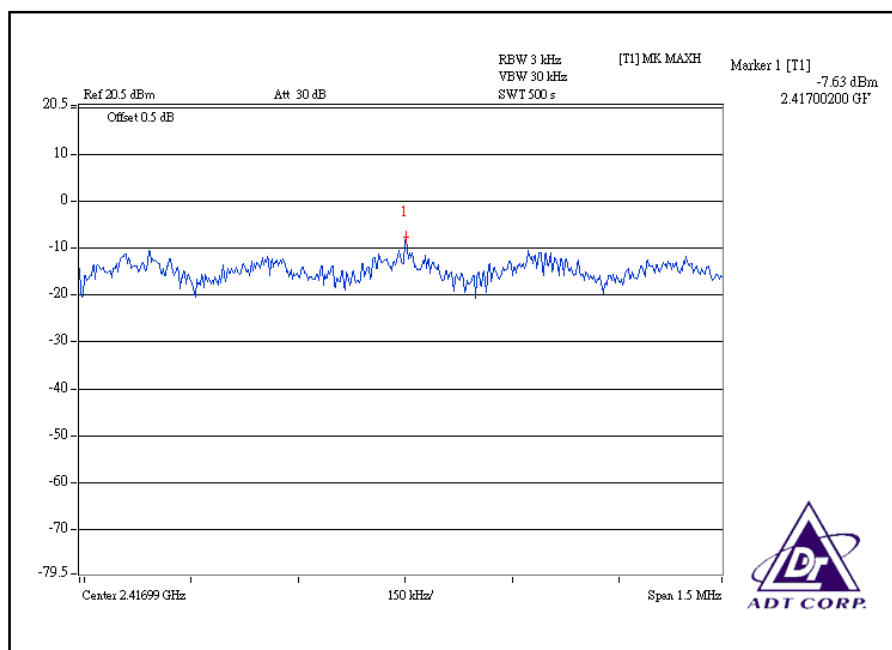


802.11g OFDM MODULATION:

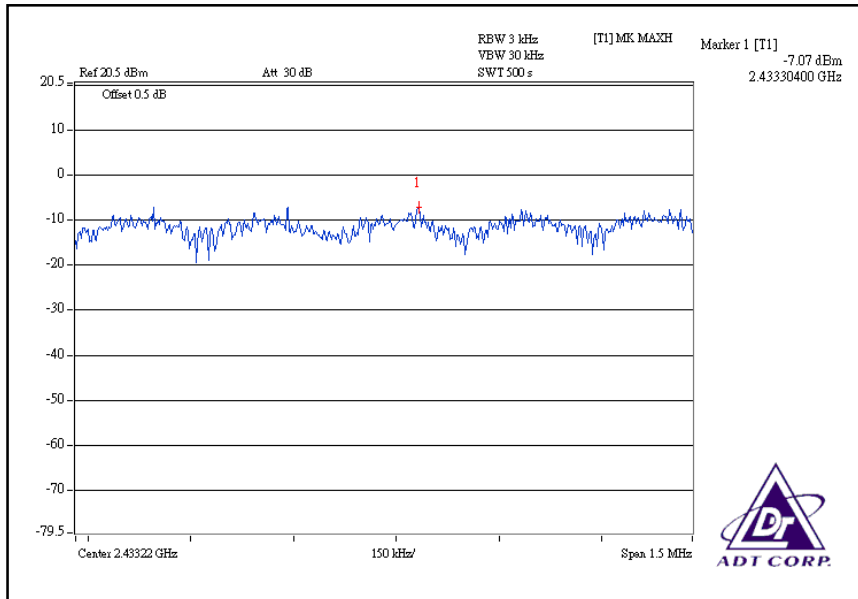
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-7.63	8	PASS
6	2437	-7.07	8	PASS
11	2462	-6.31	8	PASS

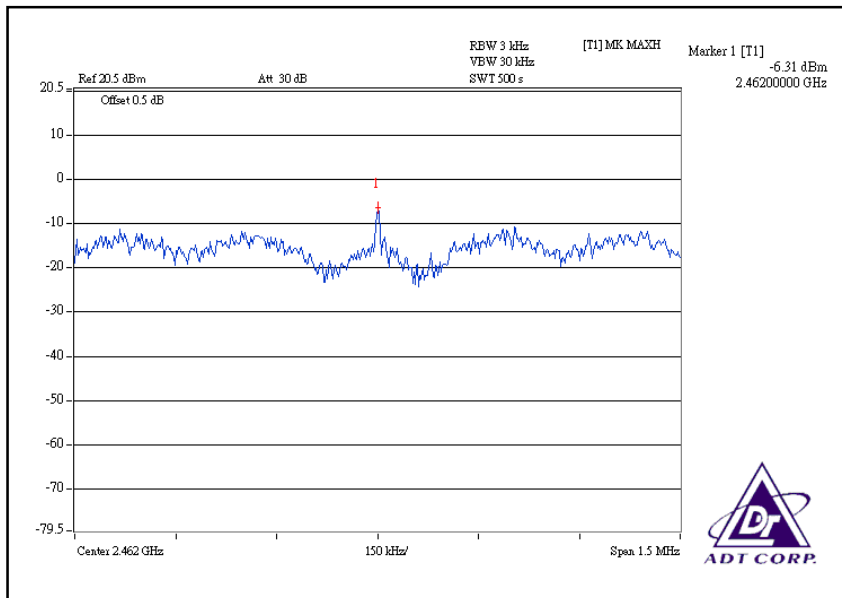
CH1



CH6



CH11

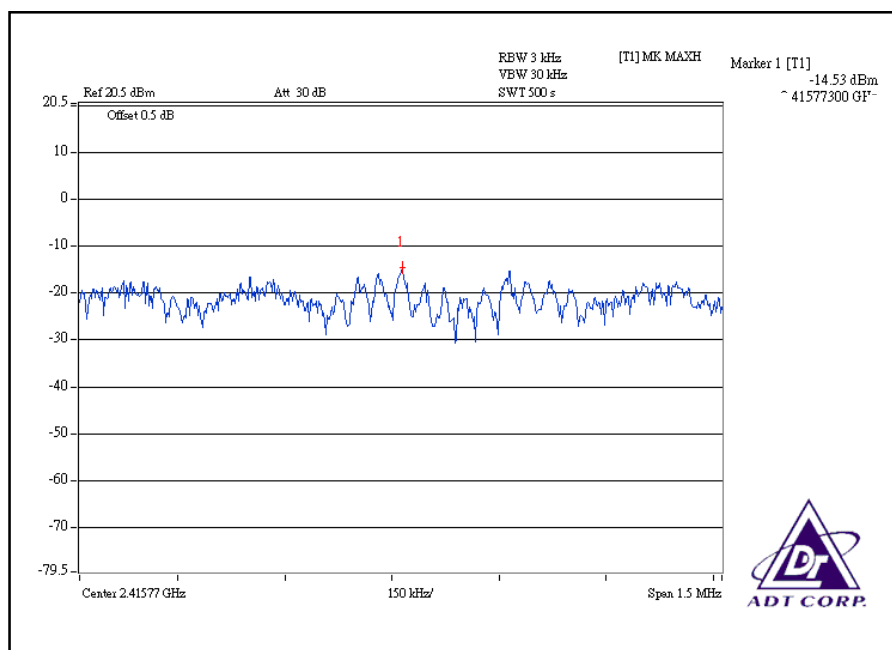


DRAFT 802.11n (20MHz) OFDM MODULATION:

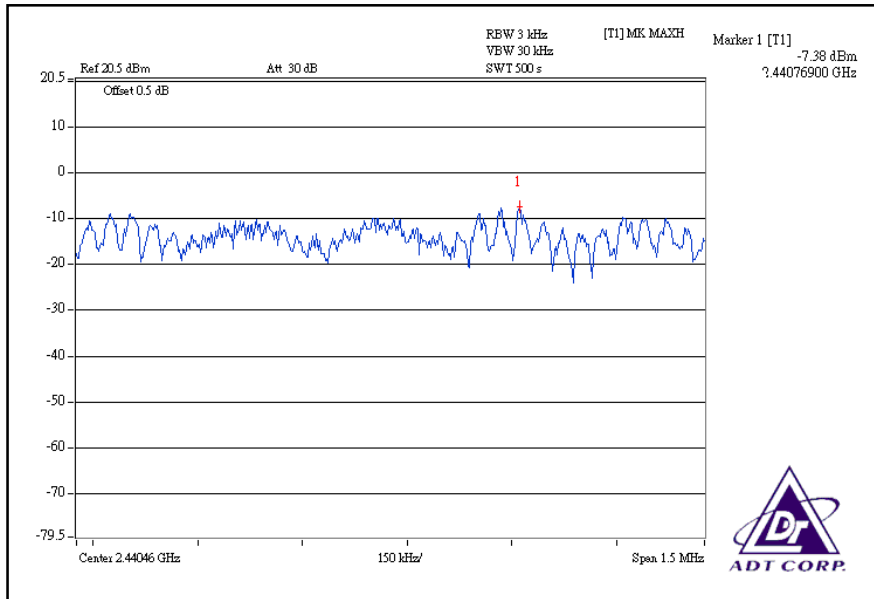
MODULATION TYPE	BPSK	TRANSFER RATE	13Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20 deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (mW)		RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2412	0.035	0.024	-14.53	-16.15	0.060	-12.255	8	PASS
6	2437	0.183	0.116	-7.38	-9.36	0.299	-5.248	8	PASS
11	2462	0.029	0.020	-15.39	-16.94	0.049	-13.086	8	PASS

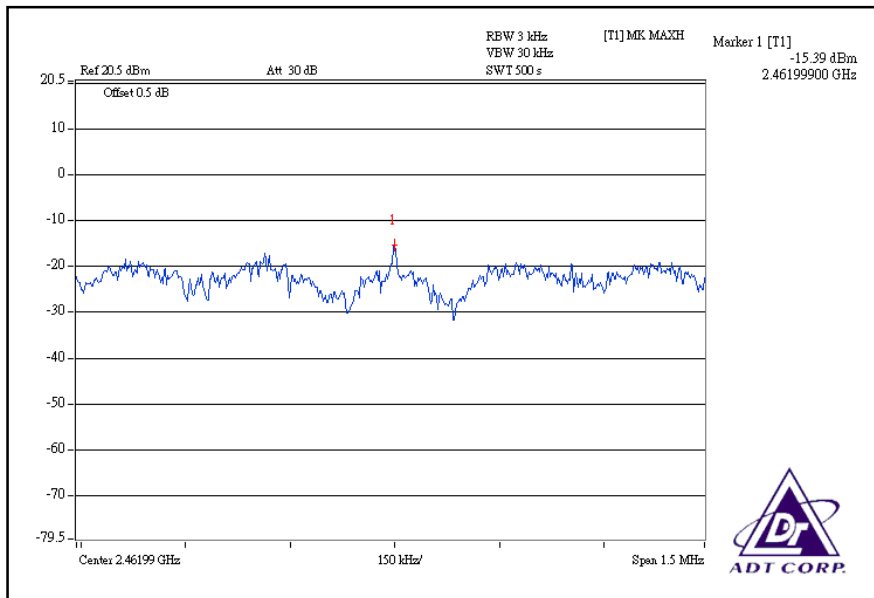
For Chain(0): CH1



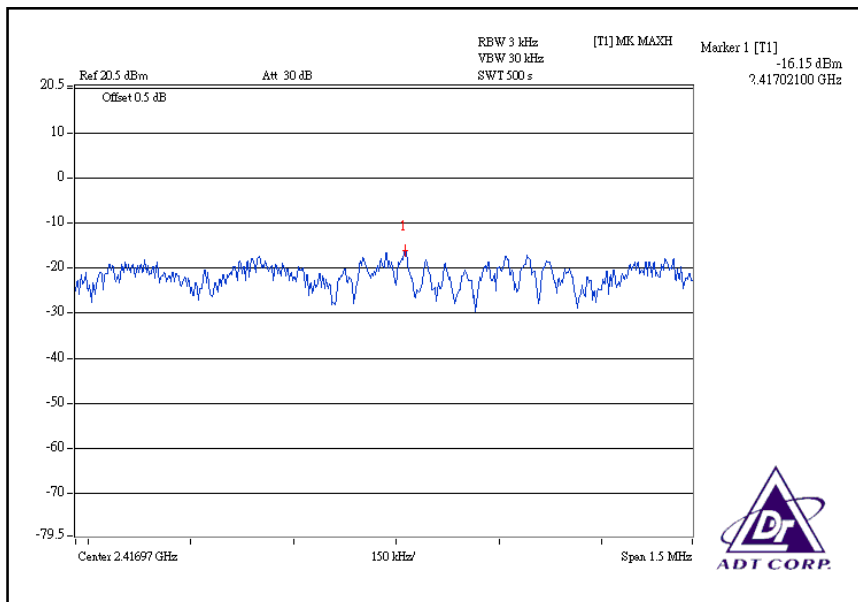
CH6



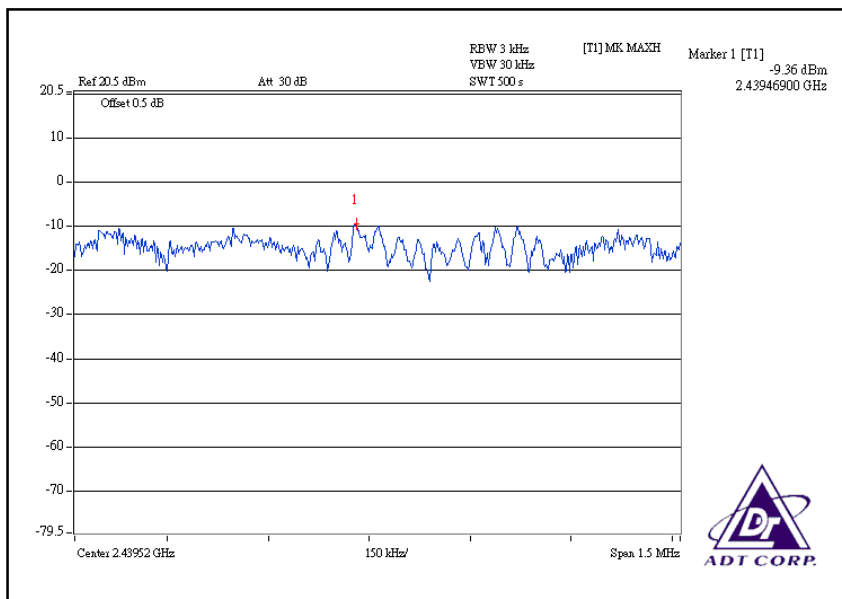
CH11



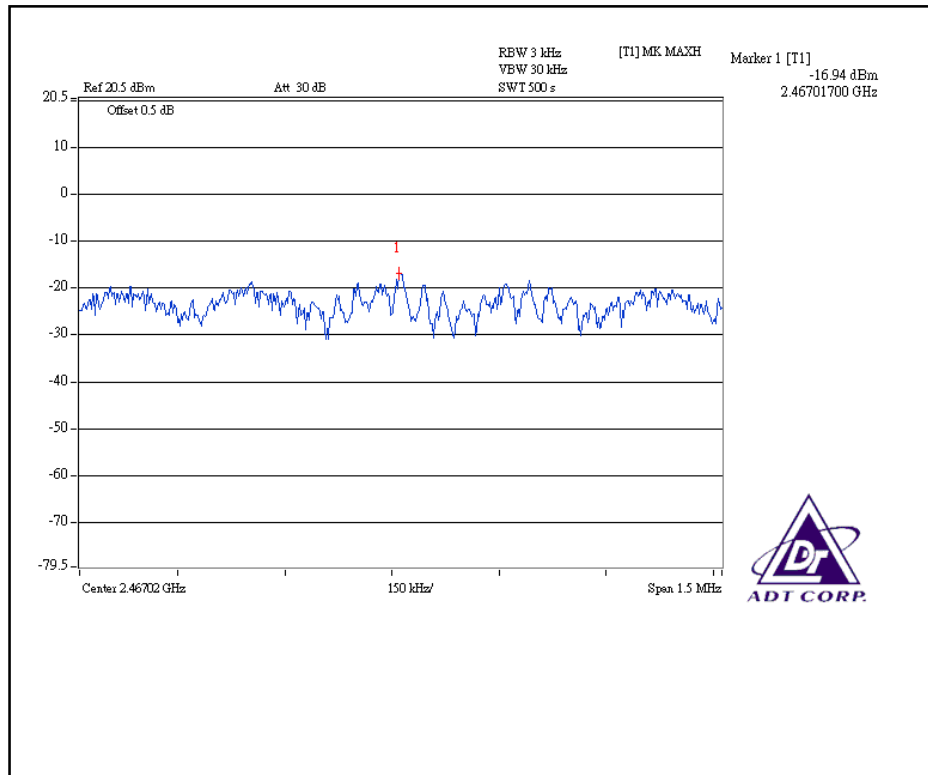
For Chain (1): CH1



CH6



CH11

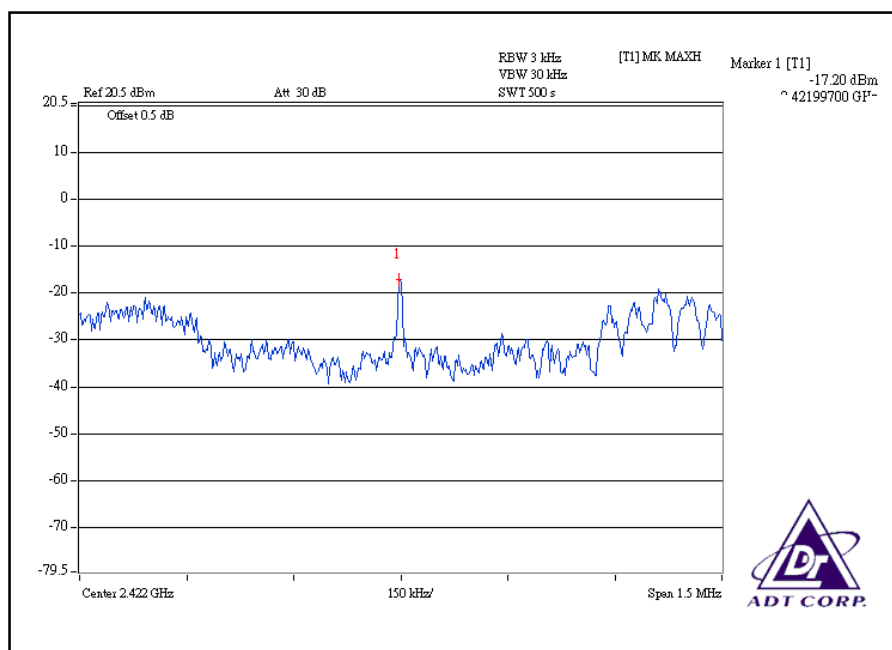


DRAFT 802.11n (40MHz) OFDM MODULATION:

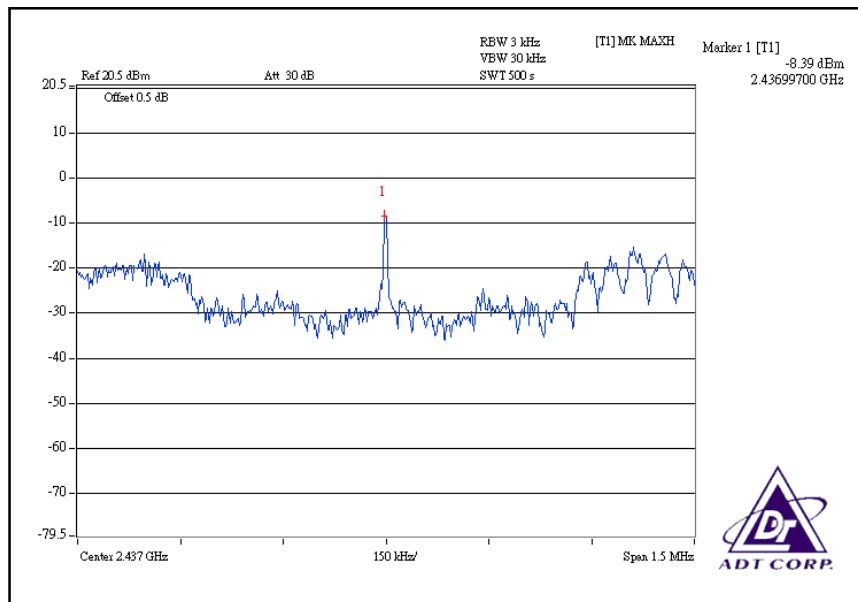
MODULATION TYPE	BPSK	TRANSFER RATE	27Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg.C, 60%RH, 971hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (mW)		RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(0)	CHAIN(1)				
1	2422	0.019	0.034	-17.20	-14.64	0.053	-12.724	8	PASS
4	2437	0.145	0.041	-8.39	-13.87	0.186	-7.307	8	PASS
7	2452	0.038	0.034	-14.21	-14.69	0.072	-11.433	8	PASS

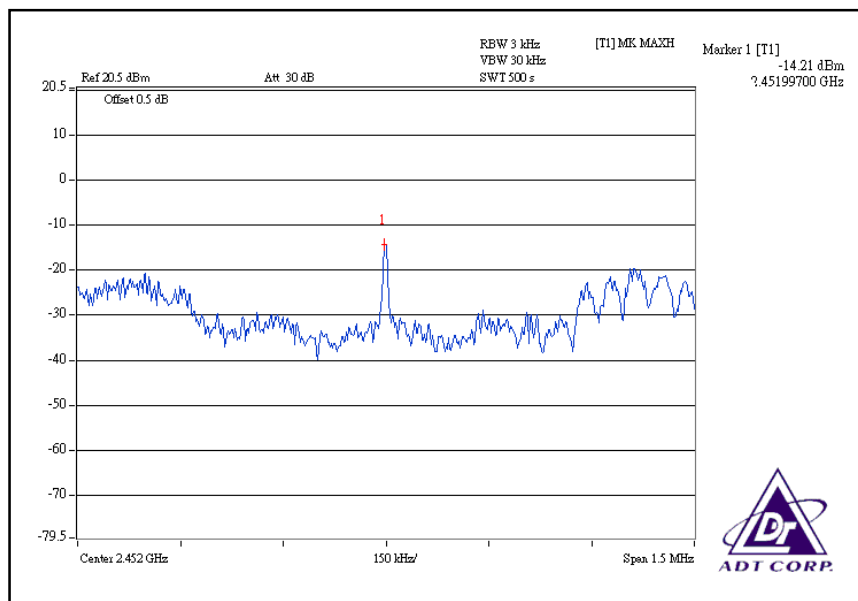
For Chain (0): CH1



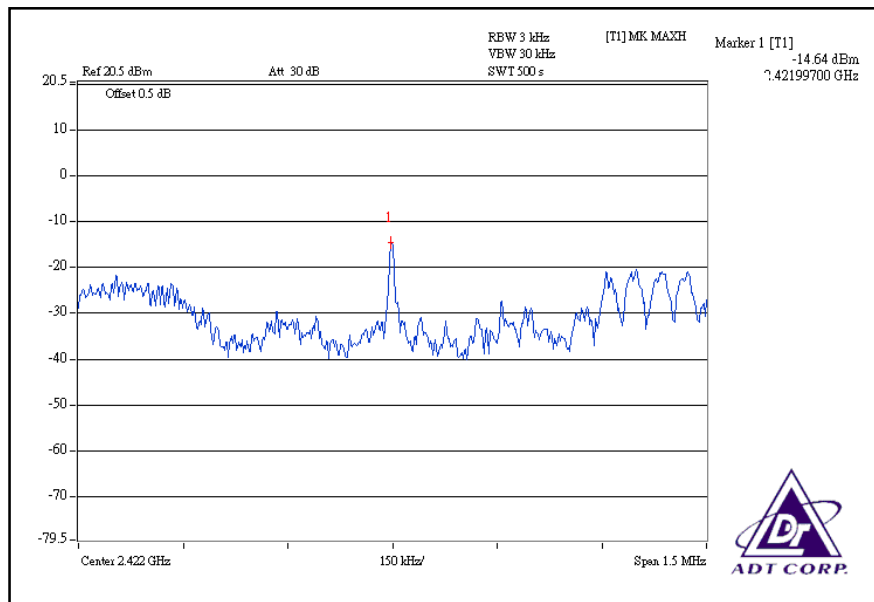
CH4



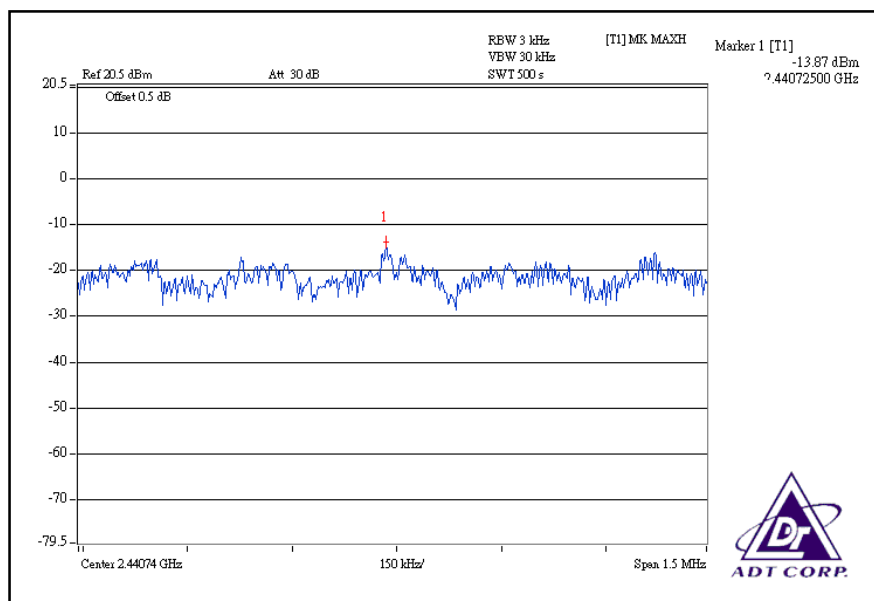
CH7



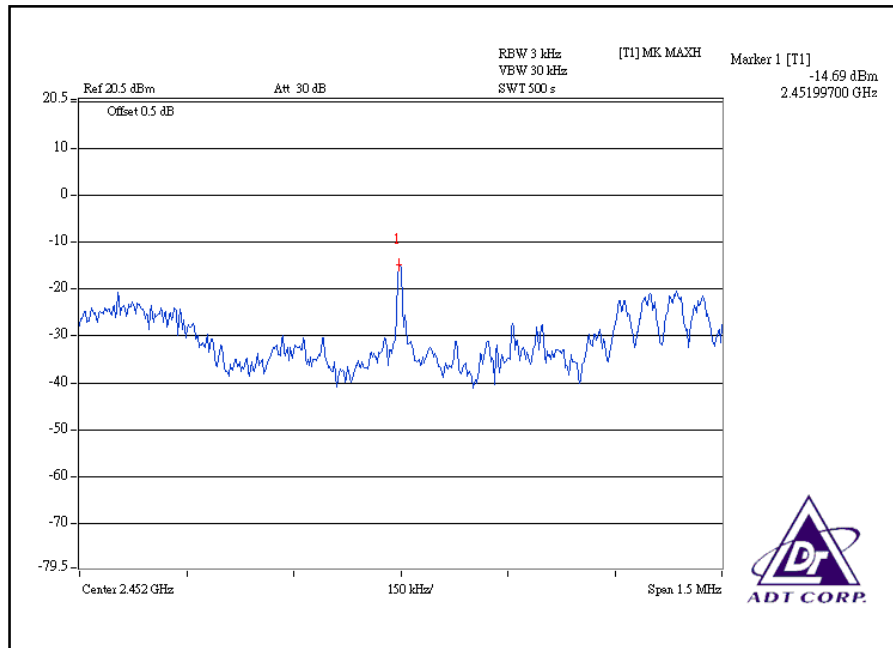
For Chain (1): CH1



CH4



CH7





4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

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

NOTE:

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

4.6.3 TEST PROCEDURE

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

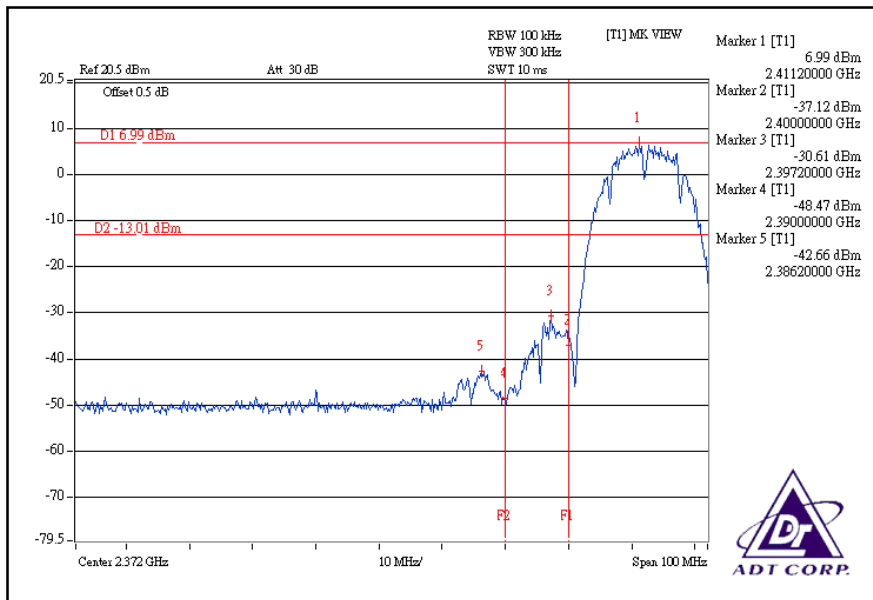
4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

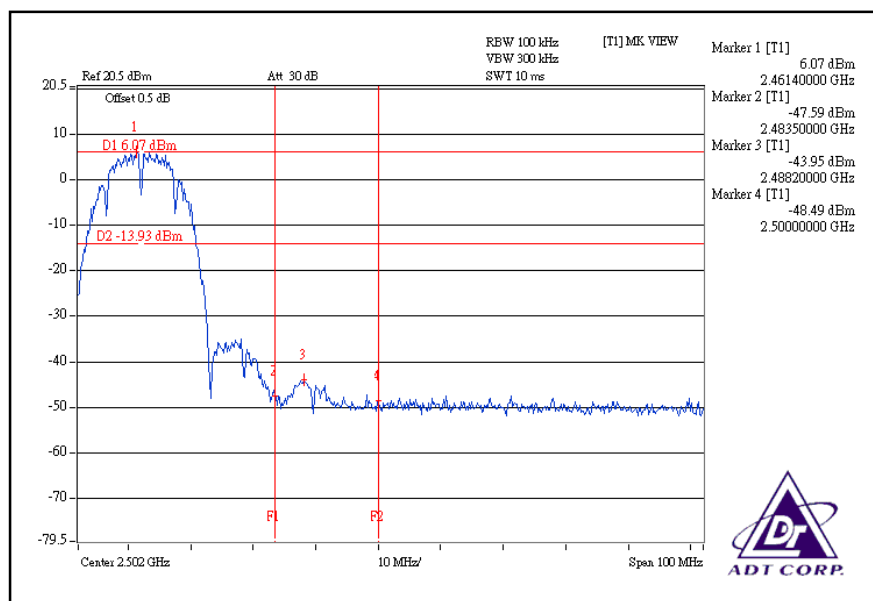
4.6.6 TEST RESULTS

The spectrum plots are attached on the following pages. 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).

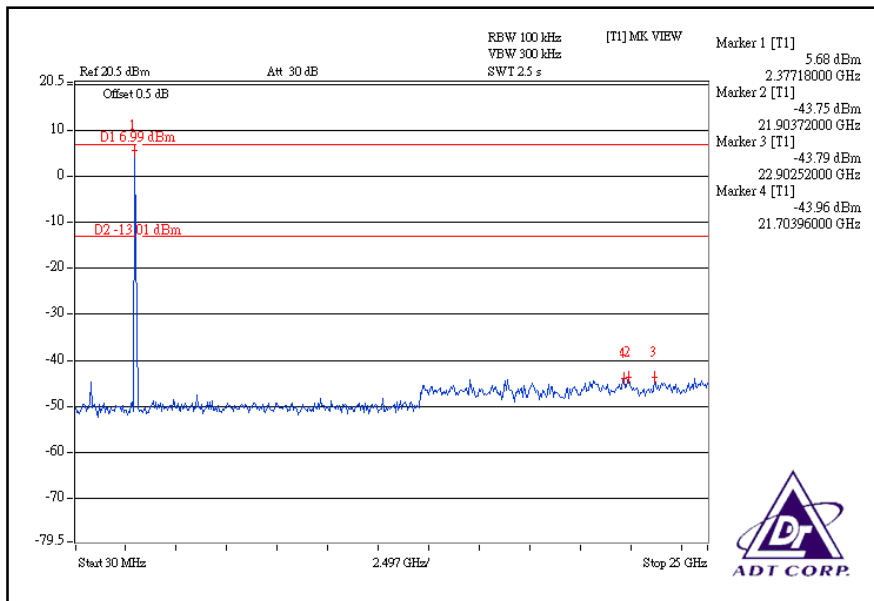
802.11b DSSS MODULATION: CH1



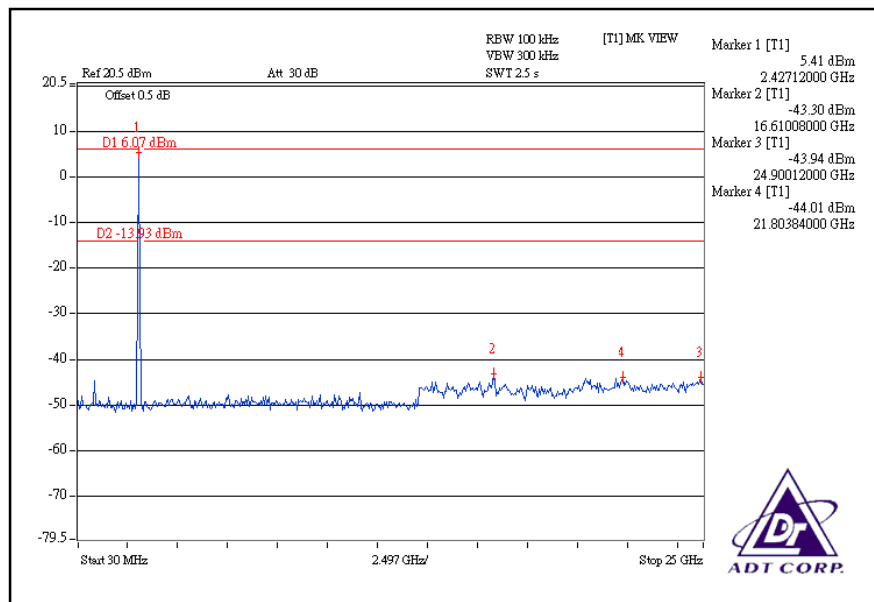
CH11



CH1

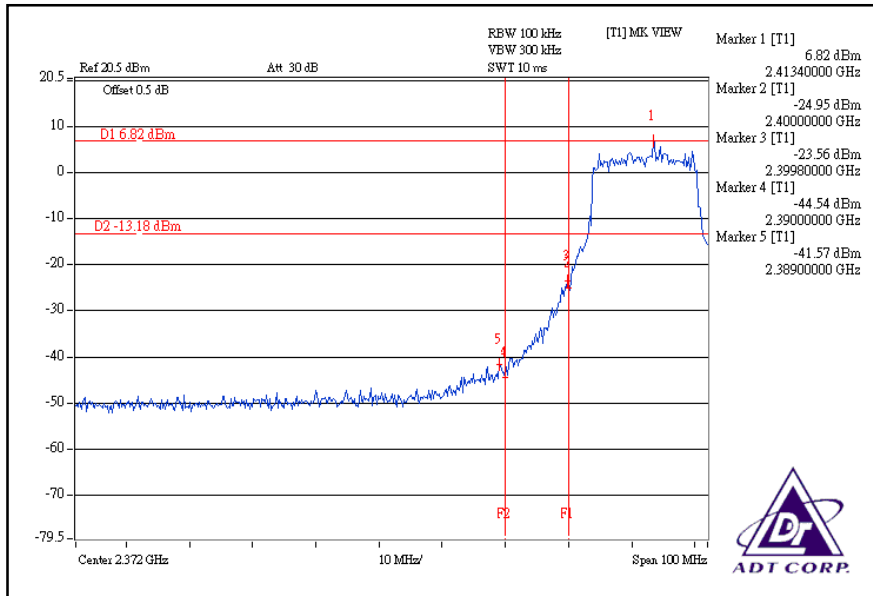


CH11

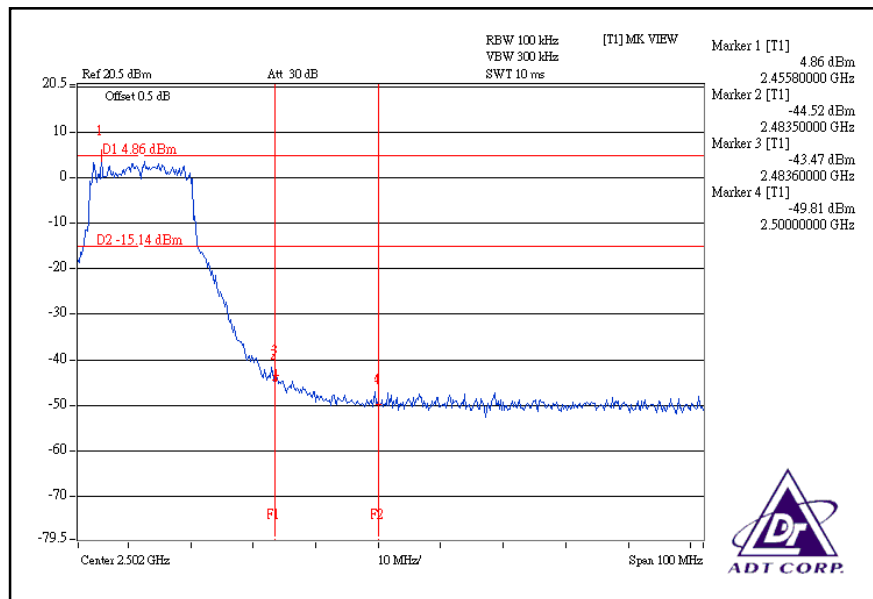


802.11g OFDM MODULATION:

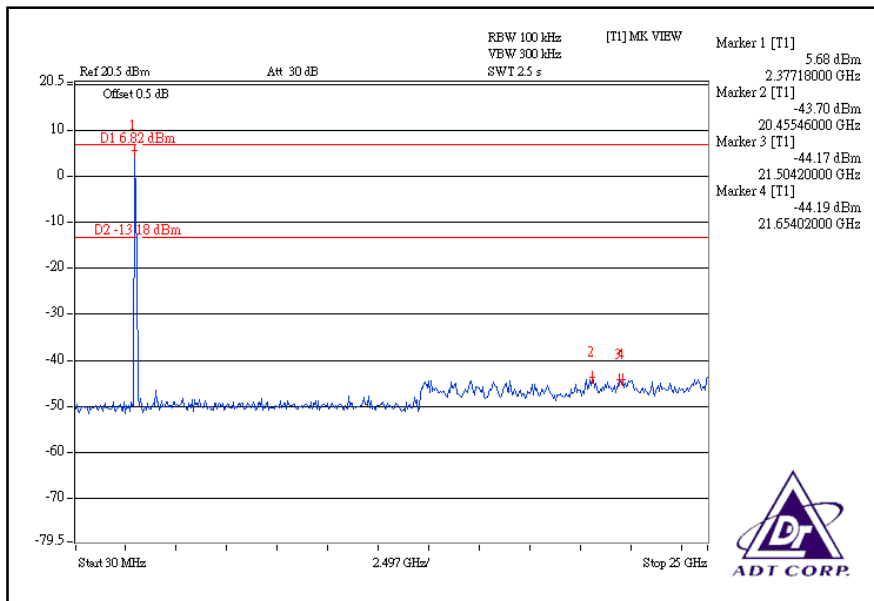
CH 1



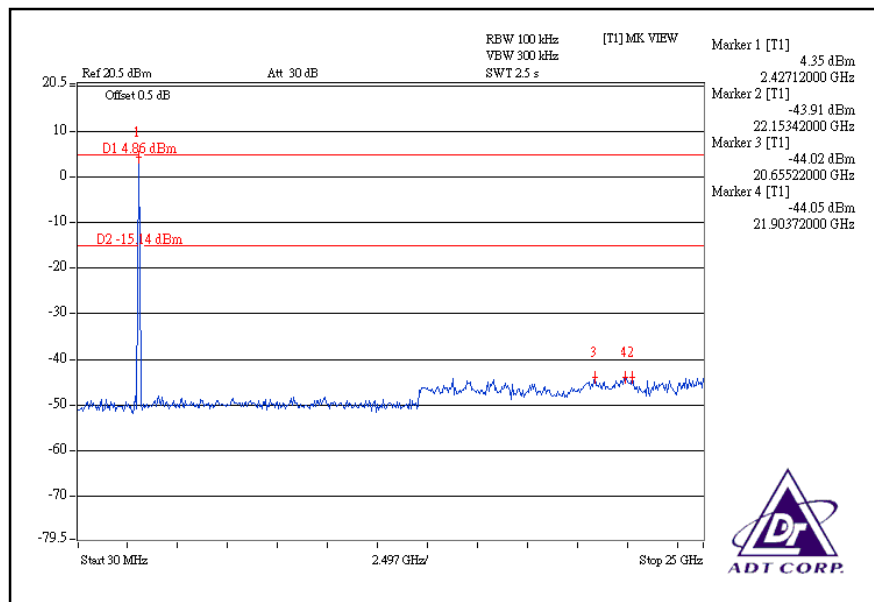
CH11



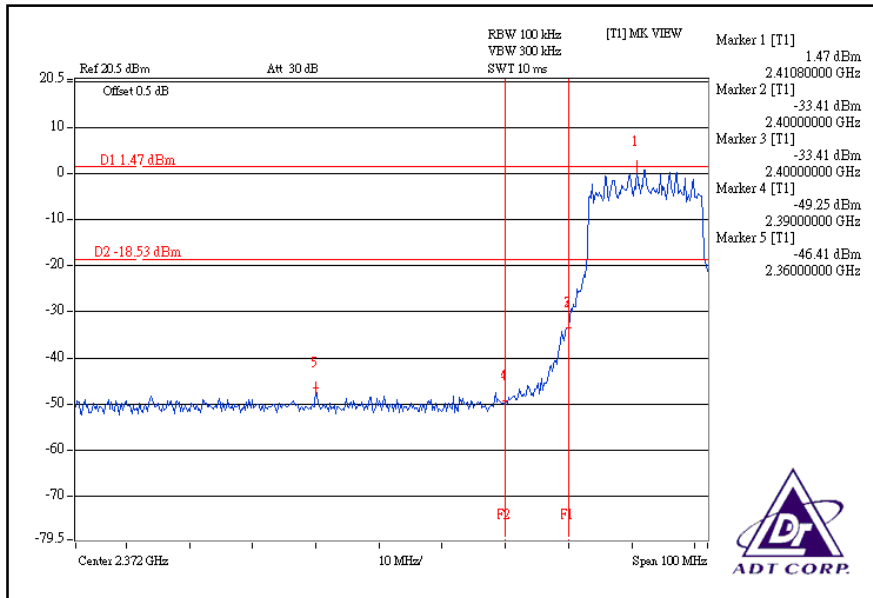
CH1



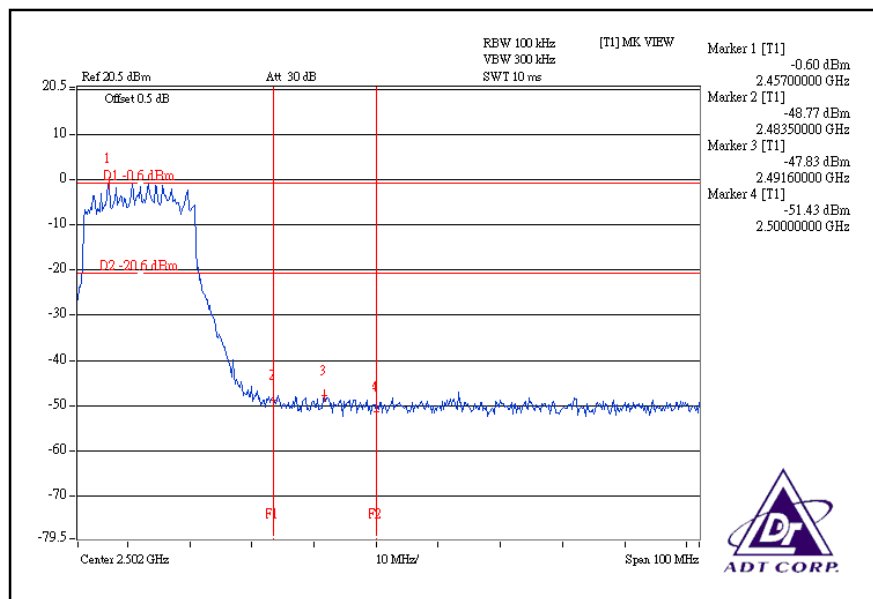
CH11



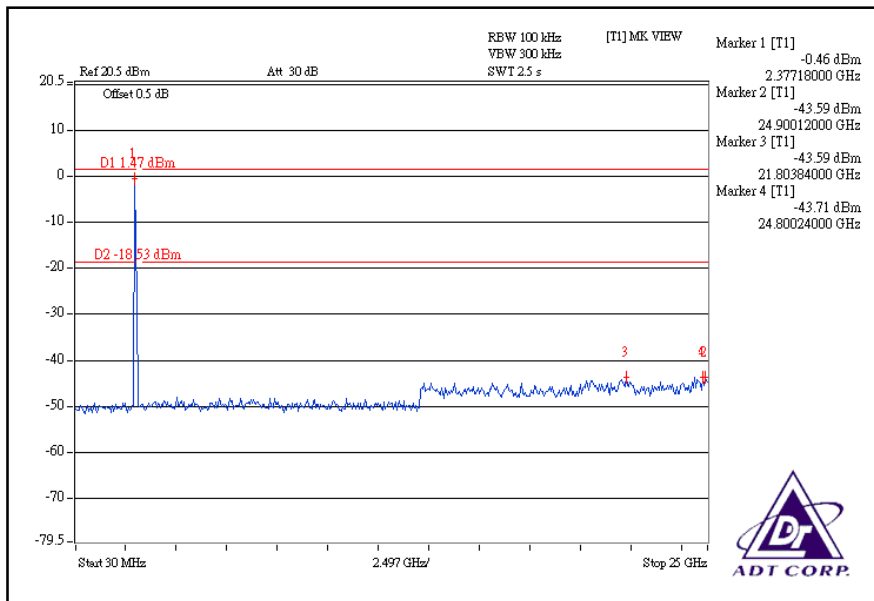
DRAFT 802.11n (20MHz) OFDM MODULATION:
For Chain (0):CH1



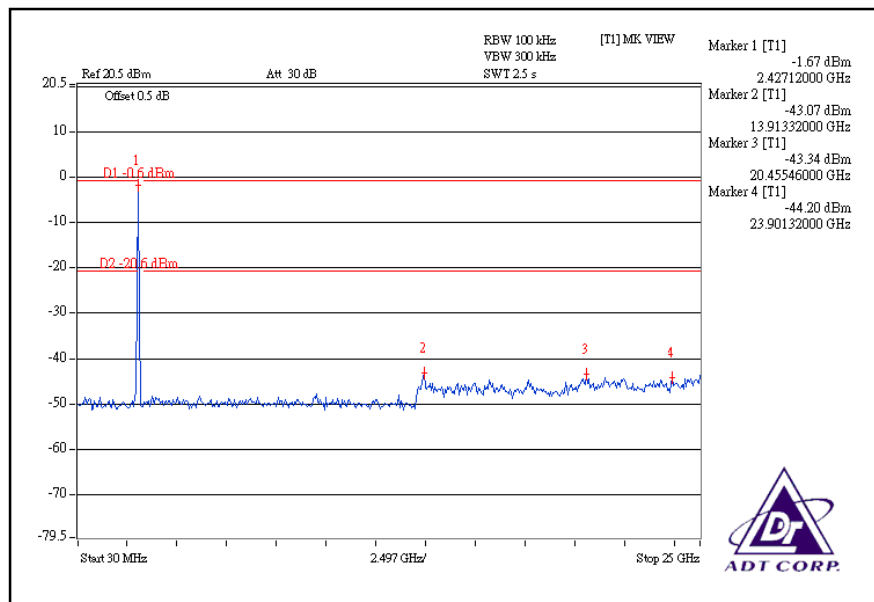
CH11



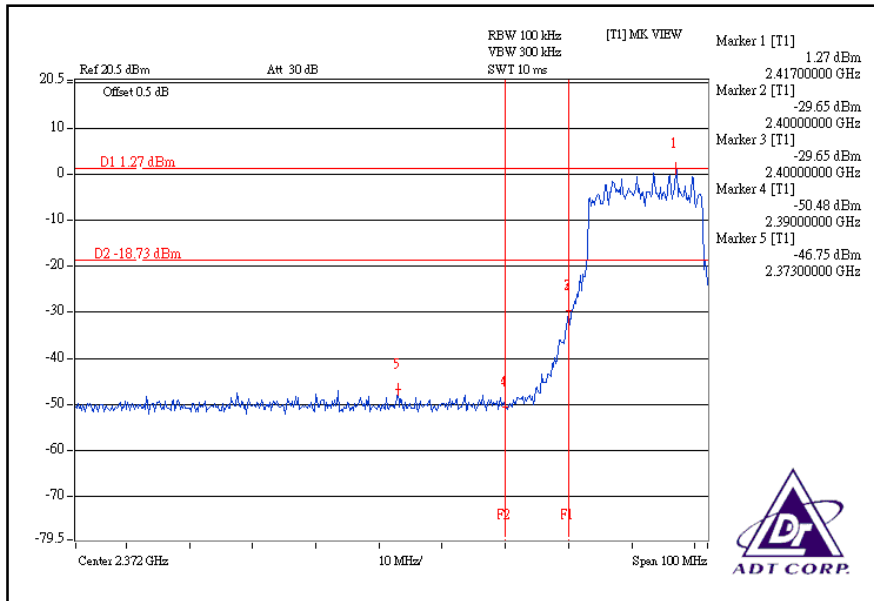
CH1



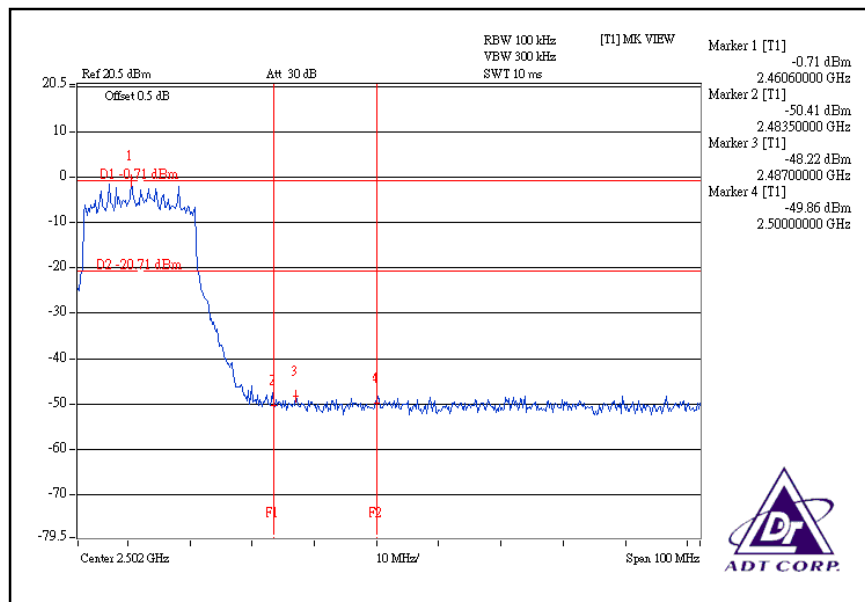
CH11



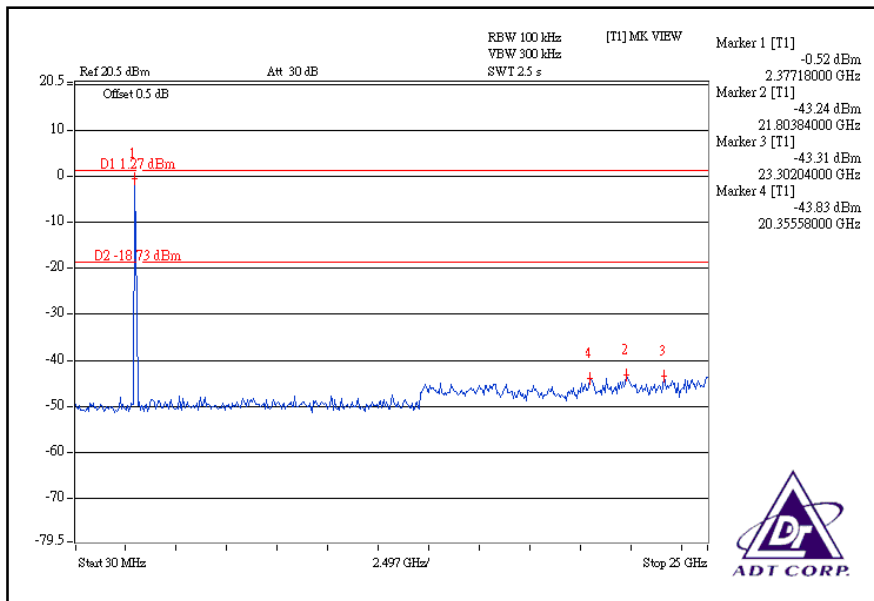
For Chain (1):CH1



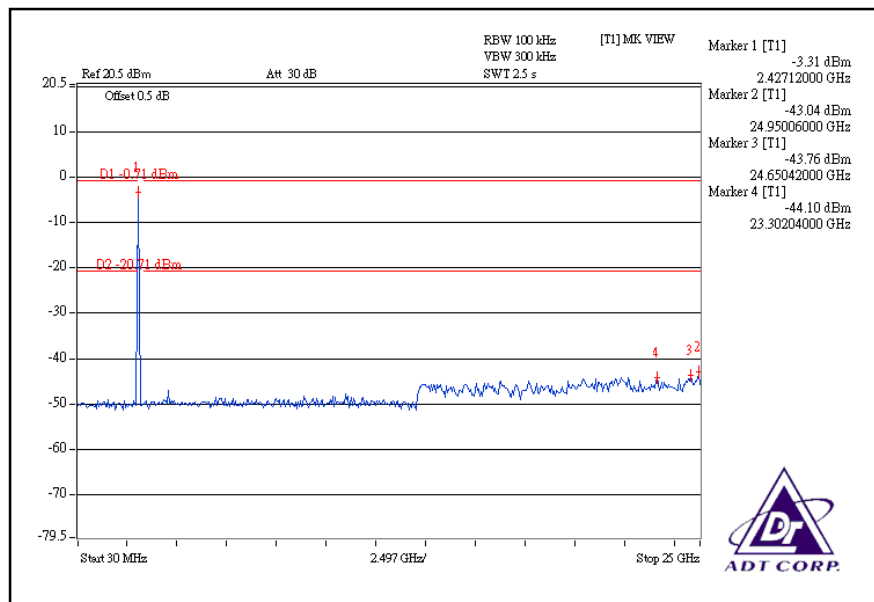
CH11



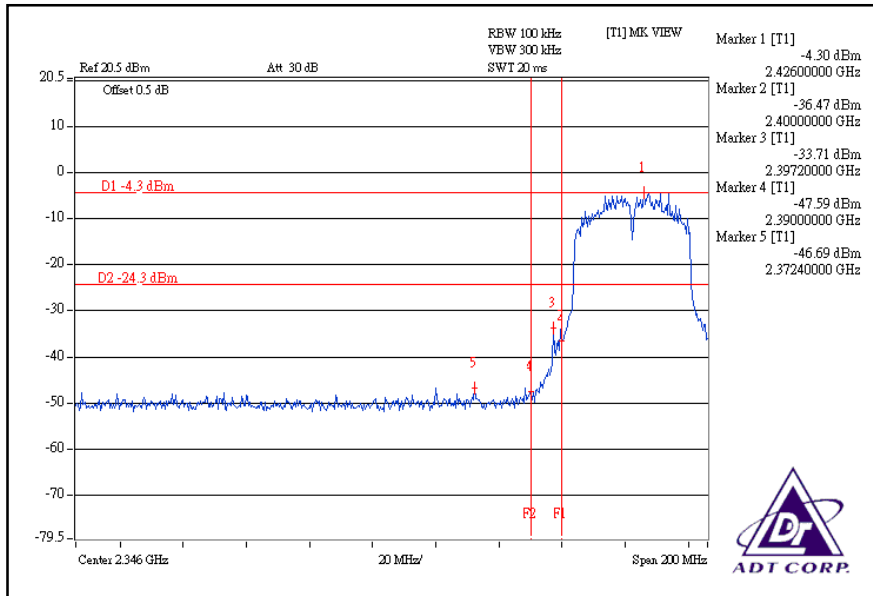
CH1



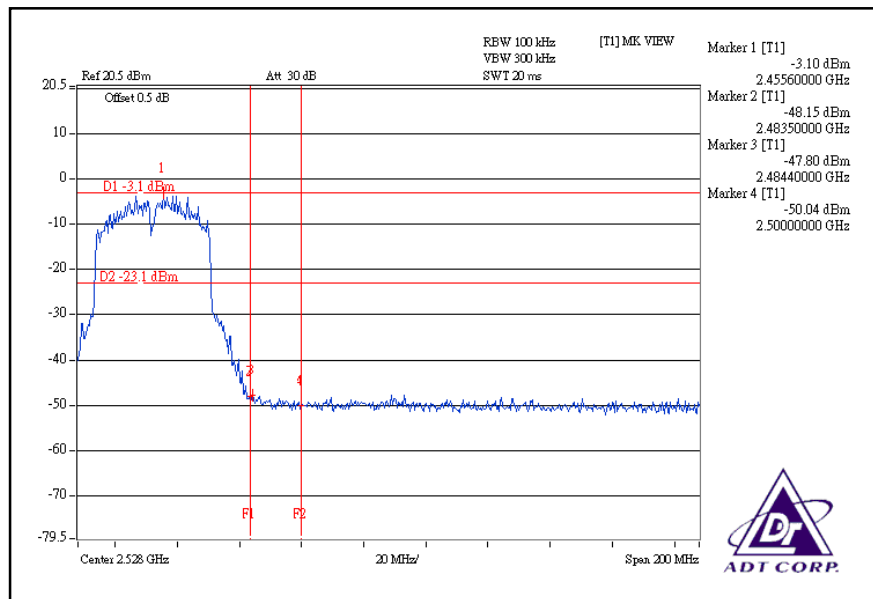
CH11



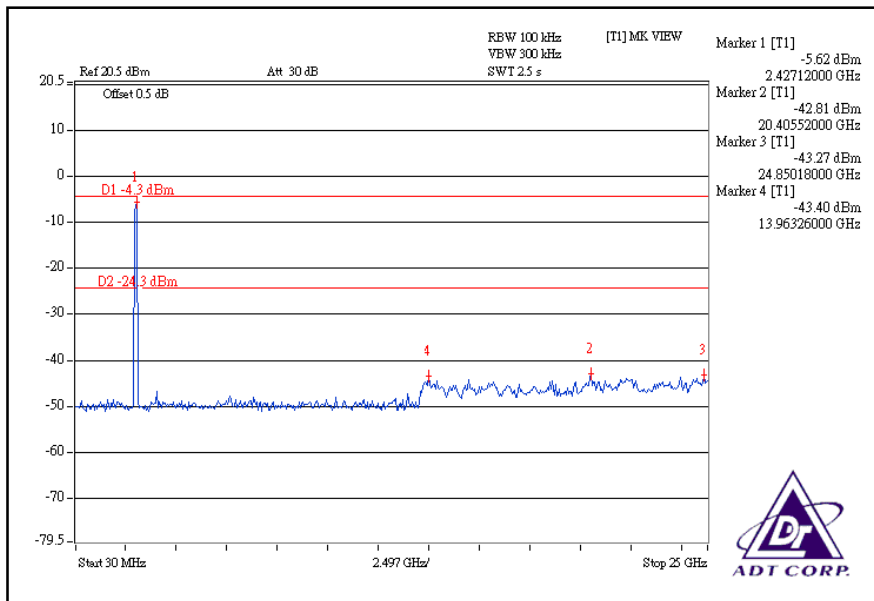
DRAFT 802.11n (40MHz) OFDM MODULATION:
For Chain (0):CH1



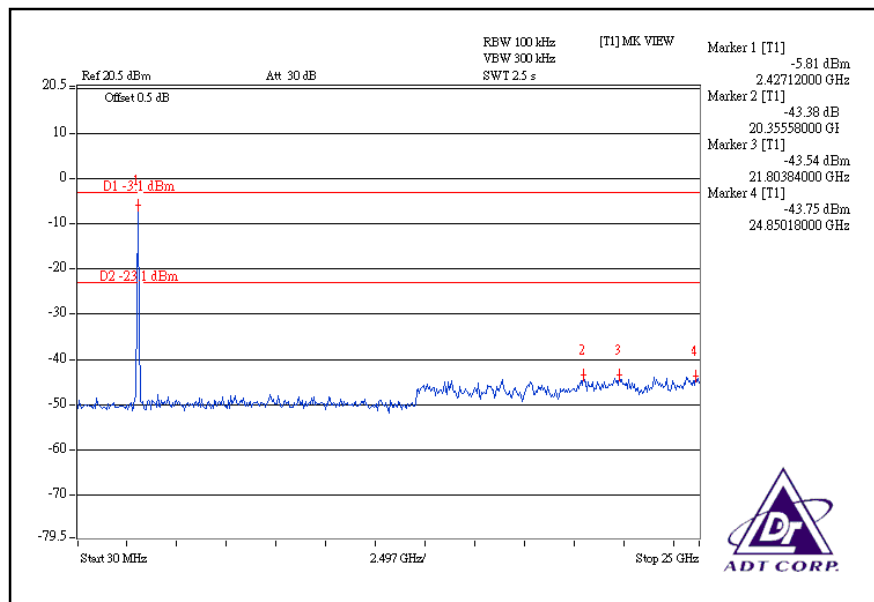
CH7



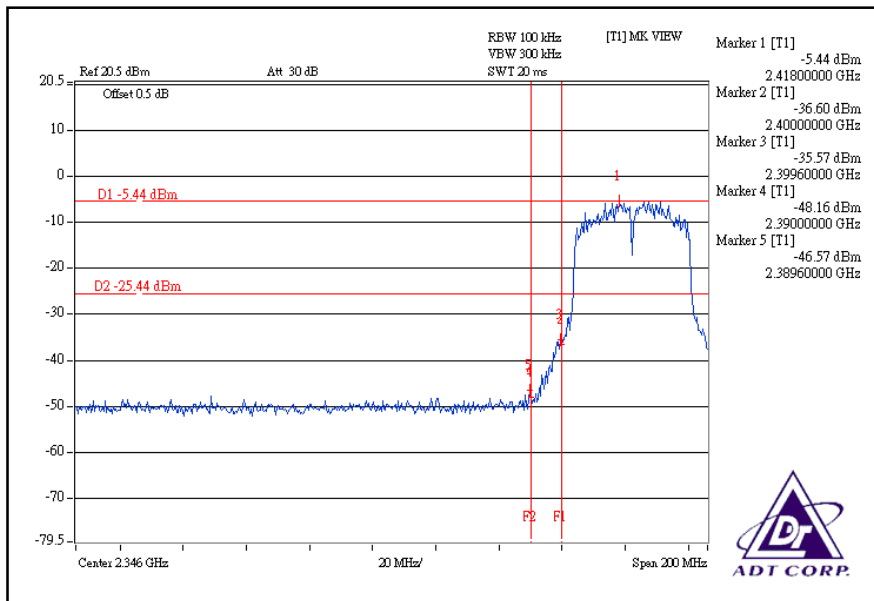
CH1



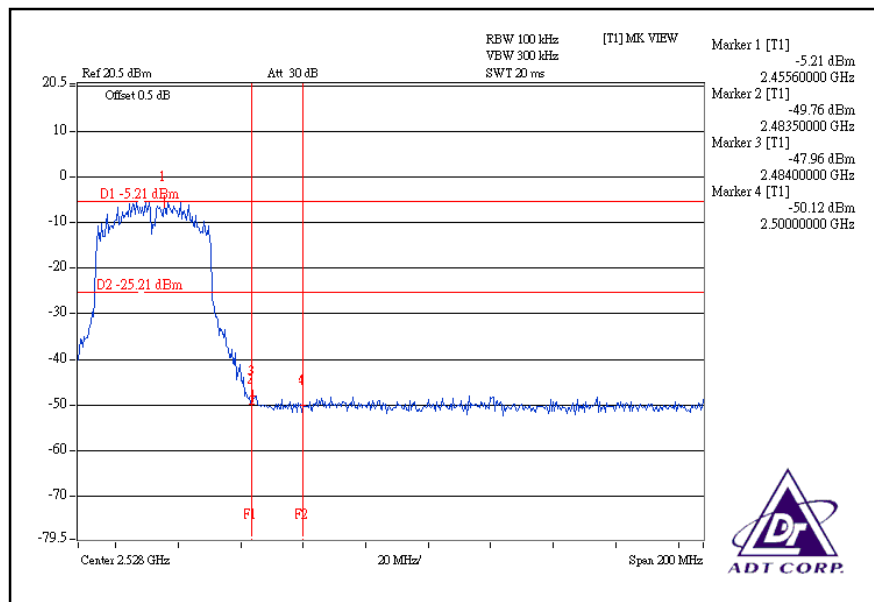
CH7



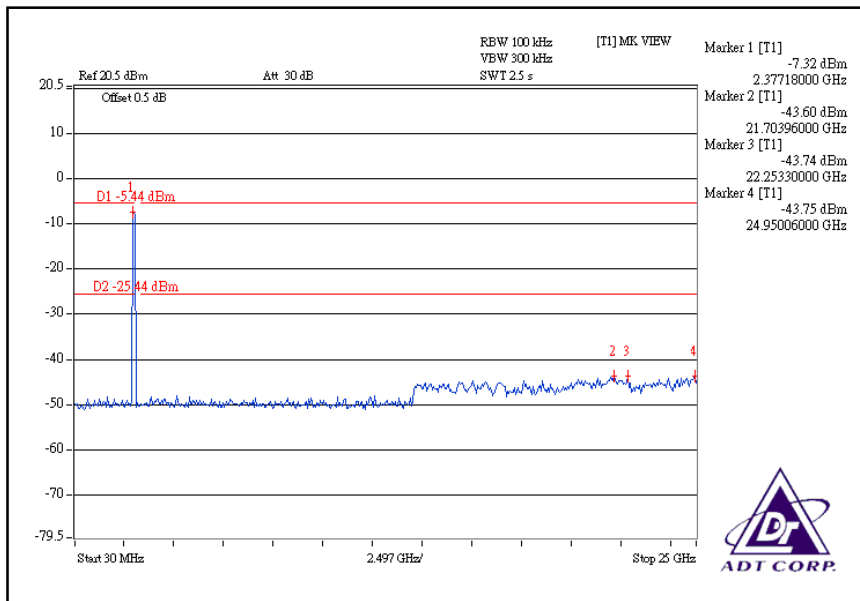
For Chain (1):CH1



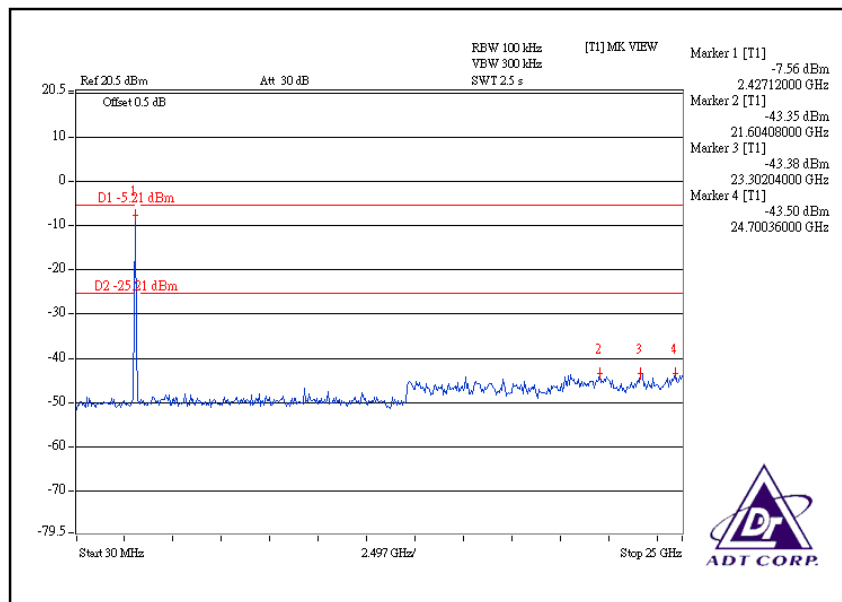
CH7



CH1



CH7



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

No.	Antenna Type	For 2.4GHz / Gain (dBi)	Antenna Connector
1	PCB Print	0.7	NA
2	PCB Print	0.7	NA



5. INFORMATION ON THE TESTING LABORATORIES

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

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

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

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

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