FCC TEST REPORT

REPORT NO.: RF961109H06
MODEL NO.: AR5BMB55
RECEIVED: Nov. 09, 2007
TESTED: Dec. 24, 2007 to Jan. 14, 2008
ISSUED: Jan. 21, 2008

APPLICANT: Atheros Communications, Inc.

ADDRESS: 5480 Great America Parkway Santa Clara, CA 95054

ISSUED BY: Advance Data Technology Corporation

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

No. 2177-01

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1 CERTIFICATION

PRODUCT :	802.11 b/g MPCI Module
BRAND NAME :	Atheros
MODEL NO. :	AR5BMB55
TESTED :	Dec. 24, 2007 to Jan. 14, 2008
APPLICANT :	Atheros Communications, Inc.
TEST ITEM :	R&D SAMPLE
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247) ANSI C63.4-2003

The above equipment (Model: AR5BMB55) 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 : Sunny Wen , **DATE:** Jan. 21, 2008
(Sunny Wen, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Jan. 21, 2008
Responsible for RF
(Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Jan. 21, 2008
(May Chen, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -12.42 dB at 0.197 MHz
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
-	Maximum Average Output Power	N/A	Reference only
15.247(d)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -0.48 dB at 2385.80 MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(d)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

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
Radiated emissions (18GHz -40GHz)	2.55 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11 b/g MPCI Module
MODEL NO.	AR5BMB55
FCC ID	PPD-AR5BMB55
POWER SUPPLY	DC 3.3V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
RADIO TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
CHANNEL SPACING	5MHz
OUTPUT POWER	802.11b: 209.411mW 802.11g: 214.289mW
ANTENNA TYPE	Dipole antenna with IPEX connector (Antenna gain : 2dBi)
DATA CABLE	NA

NOTE:

1. The EUT complies with IEEE 802.11g standards, and backwards compatible with IEEE 802.11b products.

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

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

For 802.11b/g normal mode: Eleven channels are provided to this EUT.

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

3.3 TEST MODE APPLICABLITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	√	√	√	√	NA

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

Power Line Conducted Emission Test:

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

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)
802.11b	1 to 11	1	DSSS	DBPSK	1

Radiated Emission Test (Above 1 GHz):

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

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)
802.11b	1 to 11	1, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 11	OFDM	BPSK	6

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)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 802.11 b/g MPCI Module. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

47 CFR Part 15, Subpart C. (15.247)
ANSI C63.4 : 2003

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

3.5 DESCRIPTION OF SUPPORT UNITS

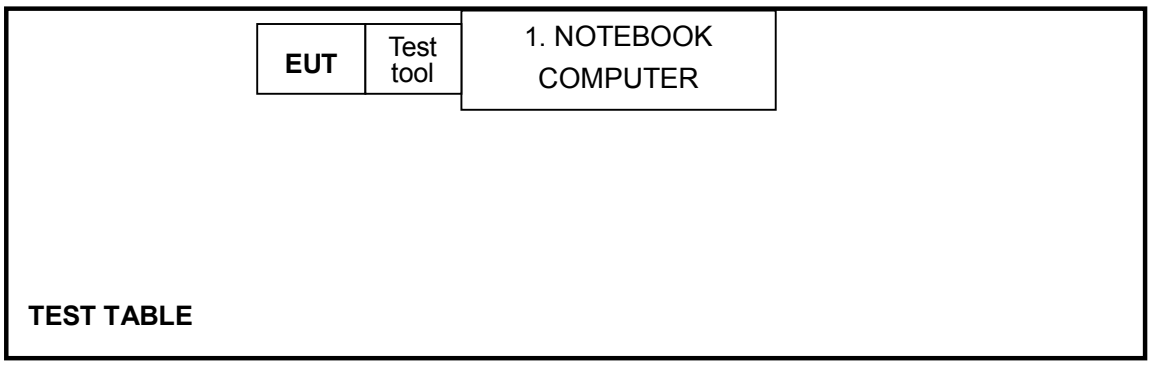
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	DoC

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

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

3.6 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 (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. All emanations from a class 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.

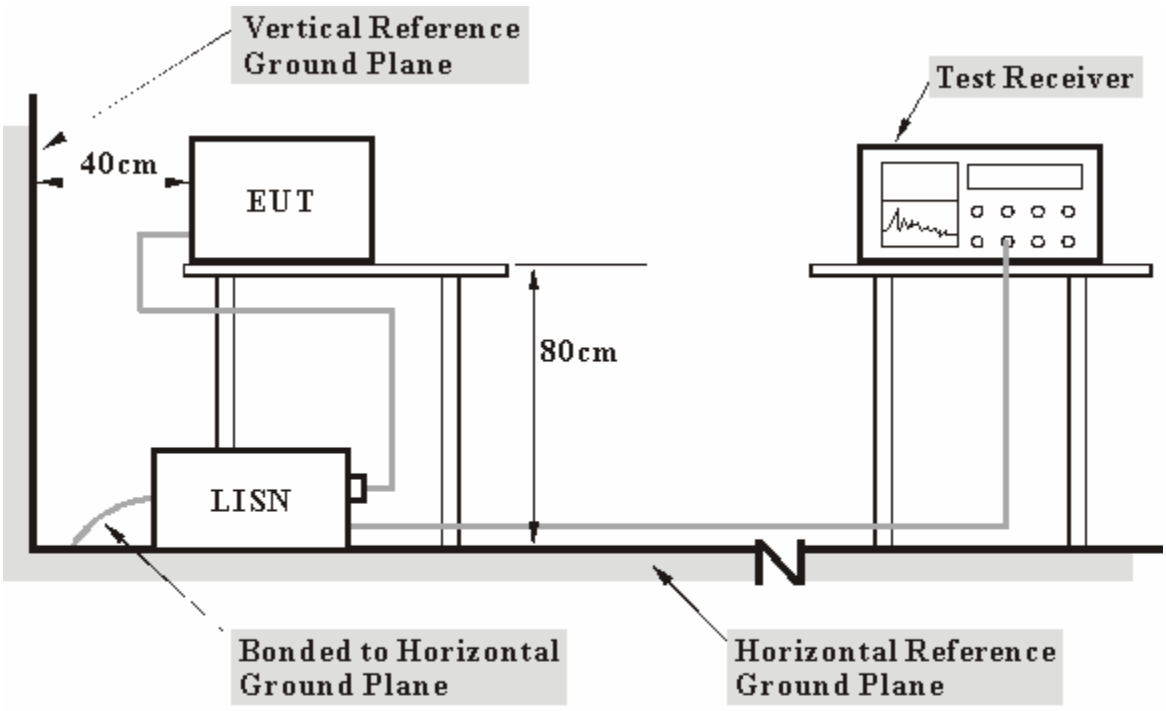
4.1.3 TEST PROCEDURES

a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST 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/HOST were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 TEST SETUP



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

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

4.1.5 EUT OPERATING CONDITIONS

a. Plug the EUT into test board and placed on the testing table.

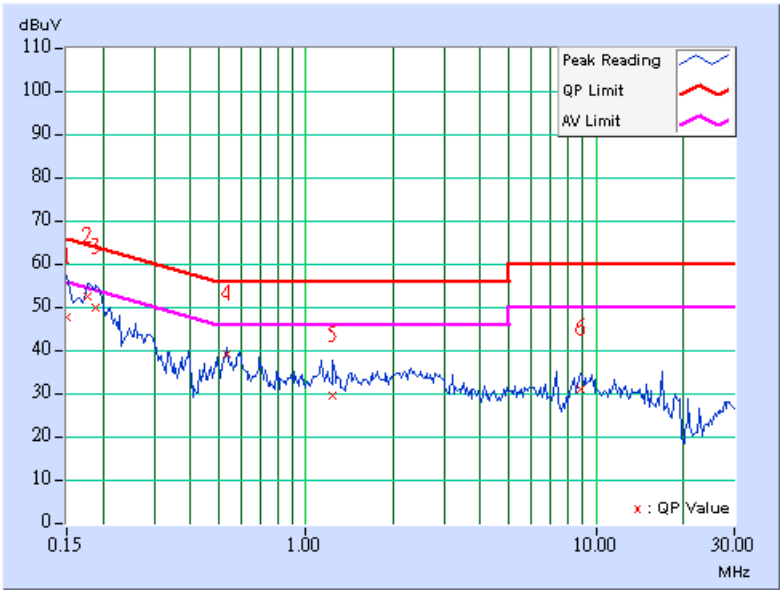
b. The support unit 1 (Notebook Computer) ran a test program “ART V5 3 b50.2464” to enable EUT under transmission condition continuously at specific channel frequency.

4.1.6 TEST RESULTS

INPUT POWER	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
PHASE	Line (L)	**TRANSFER RATE**	1Mbps
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 959hPa	**TESTED BY**	Phoenix Huang

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	0.14	47.04	-	47.18	-	66.00	56.00	-18.82	-
2	0.177	0.15	51.95	-	52.10	-	64.61	54.61	-12.51	-
3	0.189	0.16	49.08	-	49.24	-	64.08	54.08	-14.84	-
4	0.533	0.19	38.54	-	38.73	-	56.00	46.00	-17.27	-
5	1.240	0.31	28.75	-	29.06	-	56.00	46.00	-26.94	-
6	8.867	0.76	30.30	-	31.06	-	60.00	50.00	-28.94	-

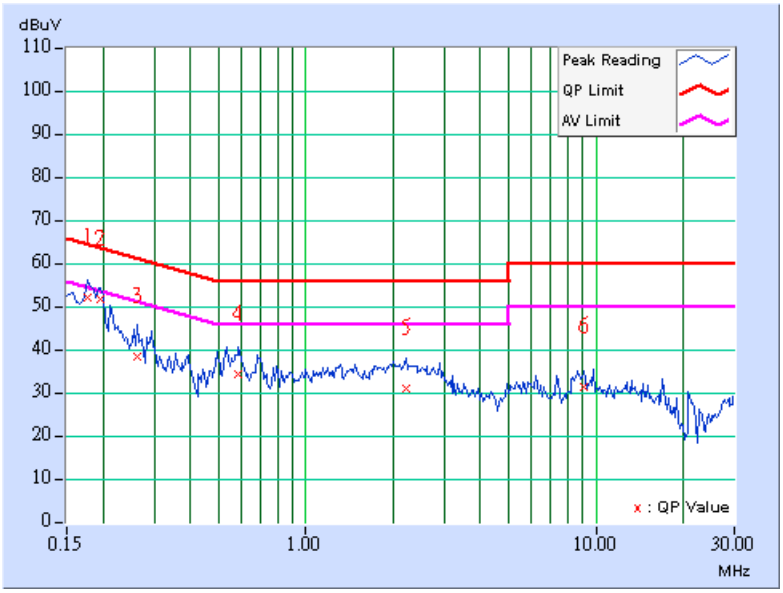
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



INPUT POWER	120Vac, 60 Hz	**6dB BANDWIDTH**	9 kHz
PHASE	Neutral (N)	**TRANSFER RATE**	1Mbps
ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 959hPa	**TESTED BY**	Phoenix Huang

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	0.177	0.08	51.65	-	51.73	-	64.61	54.61	-12.88	-
2	**0.197**	**0.08**	**51.24**	**-**	**51.32**	**-**	**63.74**	**53.74**	**-12.42**	**-**
3	0.263	0.08	37.90	-	37.98	-	61.33	51.33	-23.35	-
4	0.588	0.11	33.78	-	33.89	-	56.00	46.00	-22.11	-
5	2.224	0.32	30.45	-	30.77	-	56.00	46.00	-25.23	-
6	9.047	0.70	30.87	-	31.57	-	60.00	50.00	-28.43	-

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
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	July 26, 2008
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 16, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 25, 2008
RF Switches (ARNITSU)	CS-201	1565157	Aug. 13, 2008
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 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 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.

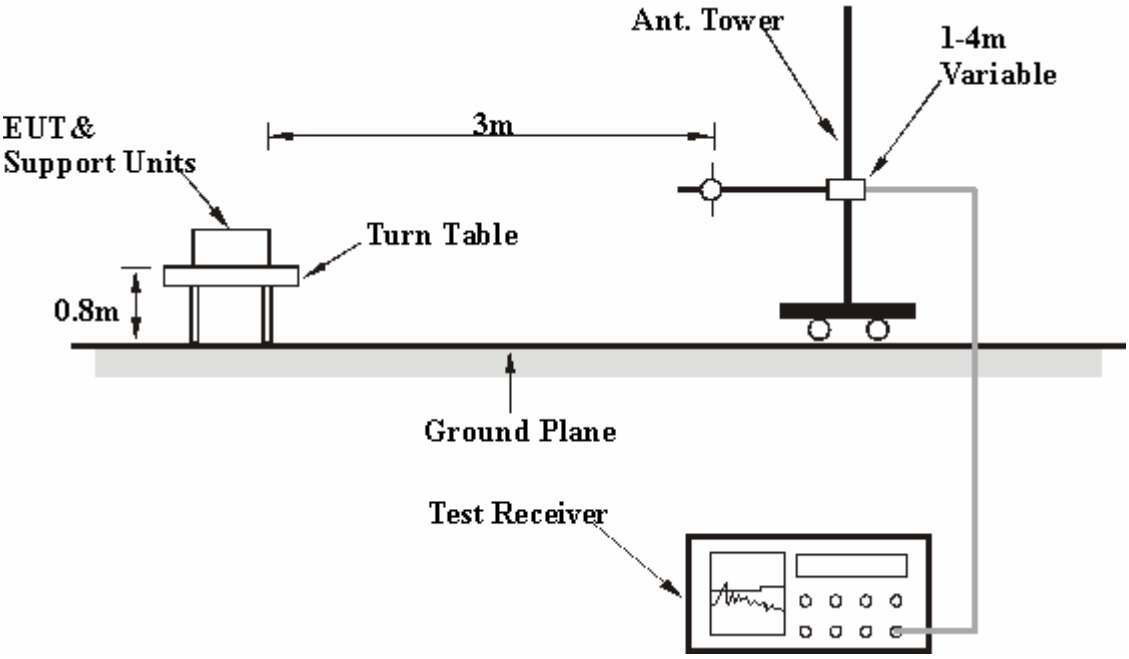
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 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 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 Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection 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 TEST SETUP



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

4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5

4.2.6 TEST RESULTS

BELOW 1GHz WORST-CASE DATA：802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	15deg. C, 62%RH 959hPa	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	126.14	34.93 QP	43.50	-8.57	1.61 H	1	21.62	13.31
2	161.75	35.81 QP	43.50	-7.69	1.54 H	329	20.73	15.08
3	188.00	34.99 QP	43.50	-8.51	1.40 H	5	22.18	12.81
4	240.00	30.15 QP	46.00	-15.85	1.18 H	185	17.48	12.67
5	360.00	22.55 QP	46.00	-23.45	1.40 H	25	5.41	17.14
6	480.00	20.90 QP	46.00	-25.10	1.68 H	228	0.32	20.58
7	600.00	22.41 QP	46.00	-23.59	1.46 H	26	-1.13	23.54
8	720.00	23.94 QP	46.00	-22.06	1.50 H	84	-1.68	25.62
9	800.00	28.12 QP	46.00	-17.88	1.31 H	102	0.07	28.05
10	960.00	28.02 QP	54.00	-25.98	1.60 H	266	-1.65	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	120.00	22.69 QP	43.50	-20.81	1.00 V	350	9.82	12.87
2	200.01	23.60 QP	43.50	-19.90	1.00 V	153	11.57	12.03
3	360.00	22.69 QP	46.00	-23.31	1.00 V	158	5.55	17.14
4	480.00	23.06 QP	46.00	-22.94	1.00 V	21	2.48	20.58
5	600.00	24.43 QP	46.00	-21.57	1.00 V	78	0.89	23.54
6	720.00	24.02 QP	46.00	-21.98	1.00 V	204	-1.60	25.62
7	800.00	25.49 QP	46.00	-20.51	1.12 V	336	-2.56	28.05
8	960.00	30.43 QP	46.00	-15.57	1.32 V	41	0.76	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.

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	21deg. C, 62%RH 959hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	47.00 PK	74.00	-27.00	1.75 H	308	22.86	24.14
2	2288.00	43.00 AV	54.00	-11.00	1.75 H	308	18.86	24.14
3	2386.00	58.20 PK	74.00	-15.80	1.99 H	292	33.99	24.21
4	2386.00	47.00 AV	54.00	-7.00	1.99 H	292	22.79	24.21
5	*2412.00	103.20 PK			1.99 H	292	78.97	24.23
6	*2412.00	98.00 AV			1.99 H	292	73.77	24.23
7	4824.00	50.00 PK	74.00	-24.00	1.43 H	360	24.32	25.68
8	4824.00	44.50 AV	54.00	-9.50	1.43 H	360	18.82	25.68
9	7236.00	52.00 PK	74.00	-22.00	1.48 H	249	24.96	27.04
10	7236.00	38.00 AV	54.00	-16.00	1.48 H	249	10.96	27.04
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	2288.00	54.60 PK	74.00	-19.40	1.38 V	220	30.46	24.14
2	2288.00	52.00 AV	54.00	-2.00	1.38 V	220	27.86	24.14
3	2385.80	62.03 PK	74.00	-11.97	1.30 V	220	37.82	24.21
4	**2385.80**	**53.52 AV**	**54.00**	**-0.48**	**1.30 V**	**220**	**29.31**	**24.21**
5	*2412.00	111.40 PK			1.30 V	224	87.17	24.23
6	*2412.00	106.70 AV			1.30 V	224	82.47	24.23
7	4824.00	54.20 PK	74.00	-19.80	1.54 V	226	28.52	25.68
8	4824.00	50.60 AV	54.00	-3.40	1.54 V	226	24.92	25.68
9	7236.00	53.80 PK	74.00	-20.20	1.46 V	16	26.76	27.04
10	7236.00	39.70 AV	54.00	-14.30	1.46 V	16	12.66	27.04

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
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	21deg. C, 62%RH 959hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	46.00 PK	74.00	-28.00	1.75 H	307	21.86	24.14
2	2288.00	41.00 AV	54.00	-13.00	1.75 H	307	16.86	24.14
3	*2437.00	103.00 PK			2.01 H	293	78.75	24.25
4	*2437.00	97.50 AV			2.01 H	293	73.25	24.25
5	4874.00	51.00 PK	74.00	-23.00	1.45 H	360	25.30	25.70
6	4874.00	46.80 AV	54.00	-7.20	1.45 H	360	21.10	25.70
7	7311.00	52.40 PK	74.00	-21.60	1.42 H	277	25.34	27.06
8	7311.00	38.60 AV	54.00	-15.40	1.42 H	277	11.54	27.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	52.50 PK	74.00	-21.50	1.38 V	220	28.36	24.14
2	2288.00	50.10 AV	54.00	-3.90	1.38 V	220	25.96	24.14
3	*2437.00	109.00 PK			1.88 V	313	84.75	24.25
4	*2437.00	104.00 AV			1.88 V	313	79.75	24.25
5	4874.00	54.40 PK	74.00	-19.60	1.40 V	270	28.70	25.70
6	4874.00	51.80 AV	54.00	-2.20	1.40 V	270	26.10	25.70
7	7311.00	53.00 PK	74.00	-21.00	1.45 V	23	25.94	27.06
8	7311.00	39.20 AV	54.00	-14.80	1.45 V	23	12.14	27.06

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

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

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

4. Margin value = Emission level – Limit value.

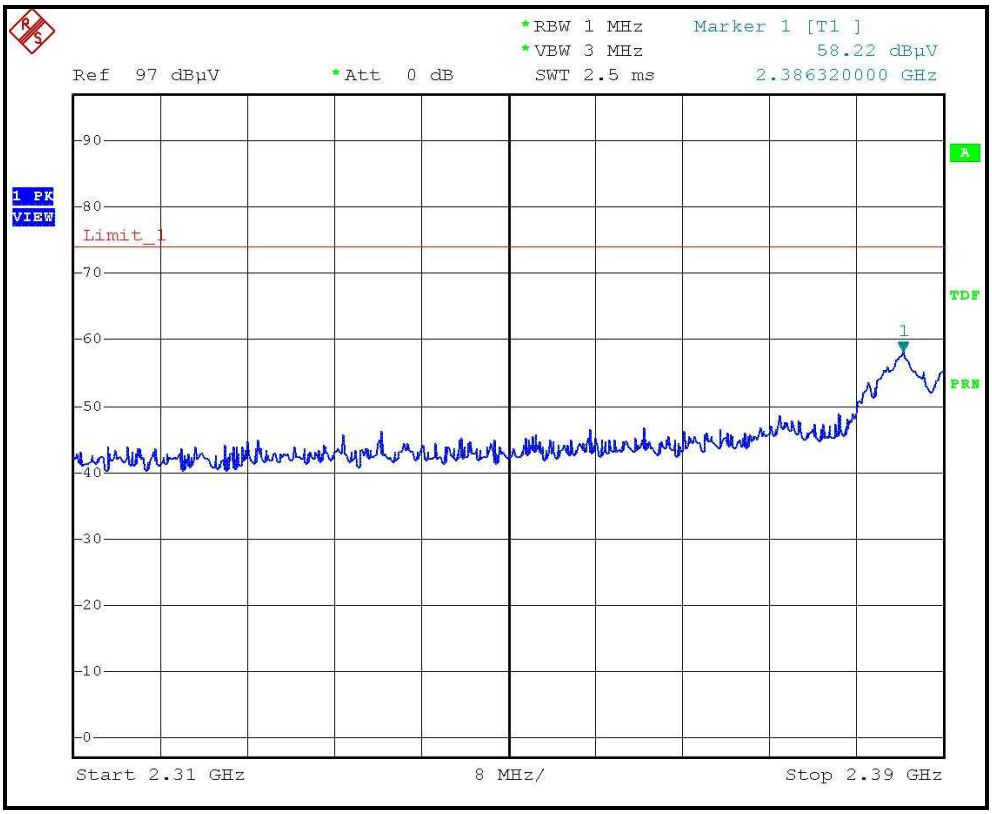
5. " * ": Fundamental frequency.

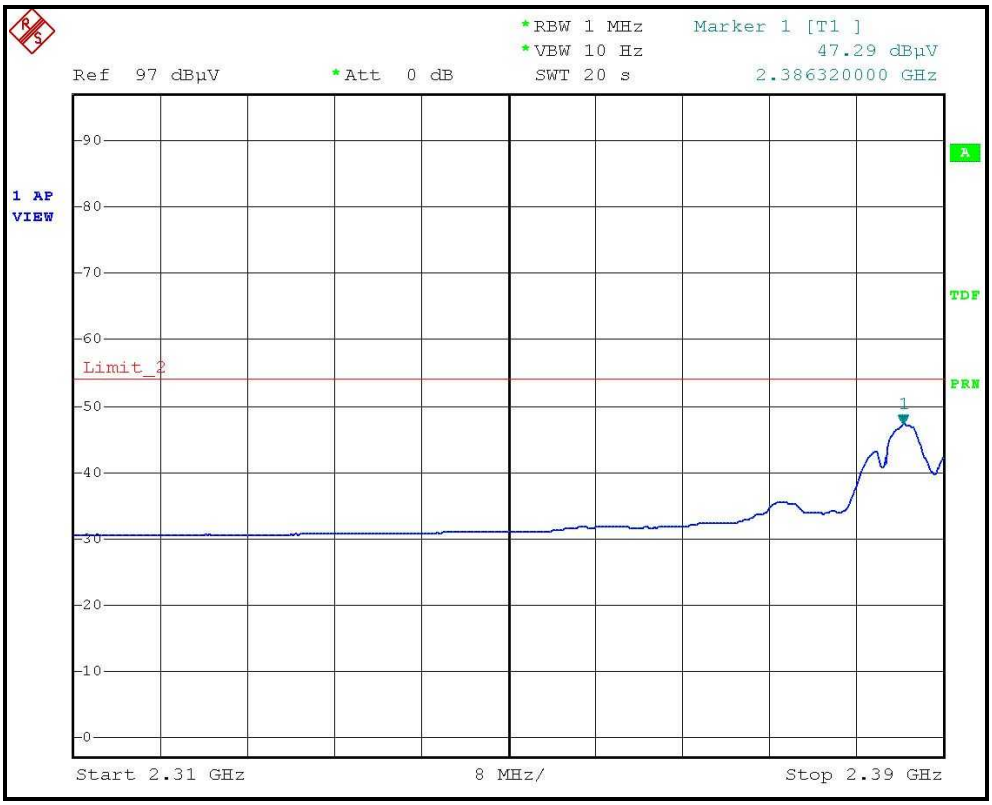
EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 62%RH 959hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	44.00 PK	74.00	-30.00	1.75 H	306	19.86	24.14
2	2288.00	37.00 AV	54.00	-17.00	1.75 H	306	12.86	24.14
3	*2462.00	102.30 PK			2.02 H	290	78.04	24.26
4	*2462.00	96.20 AV			2.02 H	290	71.94	24.26
5	2483.50	56.90 PK	74.00	-17.10	2.00 H	290	32.62	24.28
6	2483.50	44.00 AV	54.00	-10.00	2.00 H	290	19.72	24.28
7	4924.00	51.60 PK	74.00	-22.40	2.14 H	153	25.88	25.72
8	4924.00	47.30 AV	54.00	-6.70	2.14 H	153	21.58	25.72
9	7386.00	52.10 PK	74.00	-21.90	1.39 H	257	25.02	27.08
10	7386.00	38.40 AV	54.00	-15.60	1.39 H	257	11.32	27.08
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	50.80 PK	74.00	-23.20	1.36 V	220	26.66	24.14
2	2288.00	46.60 AV	54.00	-7.40	1.36 V	220	22.46	24.14
3	*2462.00	112.20 PK			1.32 V	65	87.94	24.26
4	*2462.00	107.40 AV			1.32 V	65	83.14	24.26
5	2483.50	58.17 PK	74.00	-15.83	1.32 V	65	33.89	24.28
6	2483.50	47.09 AV	54.00	-6.91	1.32 V	65	22.81	24.28
7	4924.00	55.30 PK	74.00	-18.70	1.38 V	280	29.58	25.72
8	4924.00	52.60 AV	54.00	-1.40	1.38 V	280	26.88	25.72
9	7386.00	53.00 PK	74.00	-21.00	1.36 V	33	25.92	27.08
10	7386.00	39.50 AV	54.00	-14.50	1.36 V	33	12.42	27.08

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

RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL)





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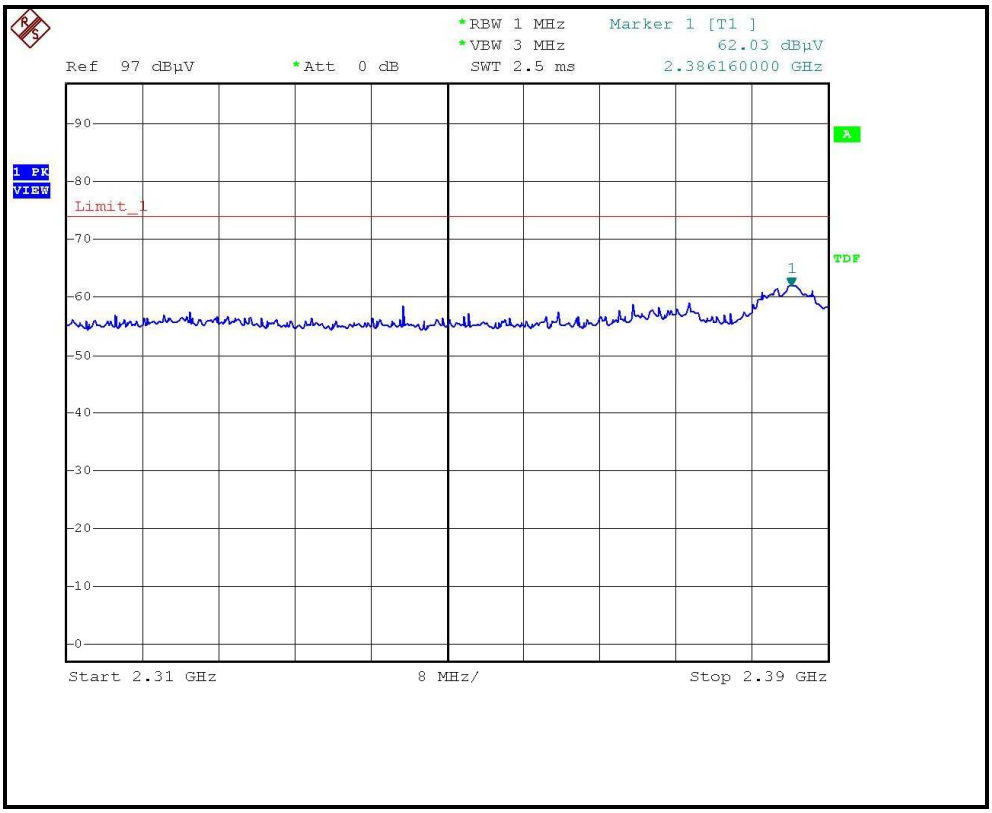

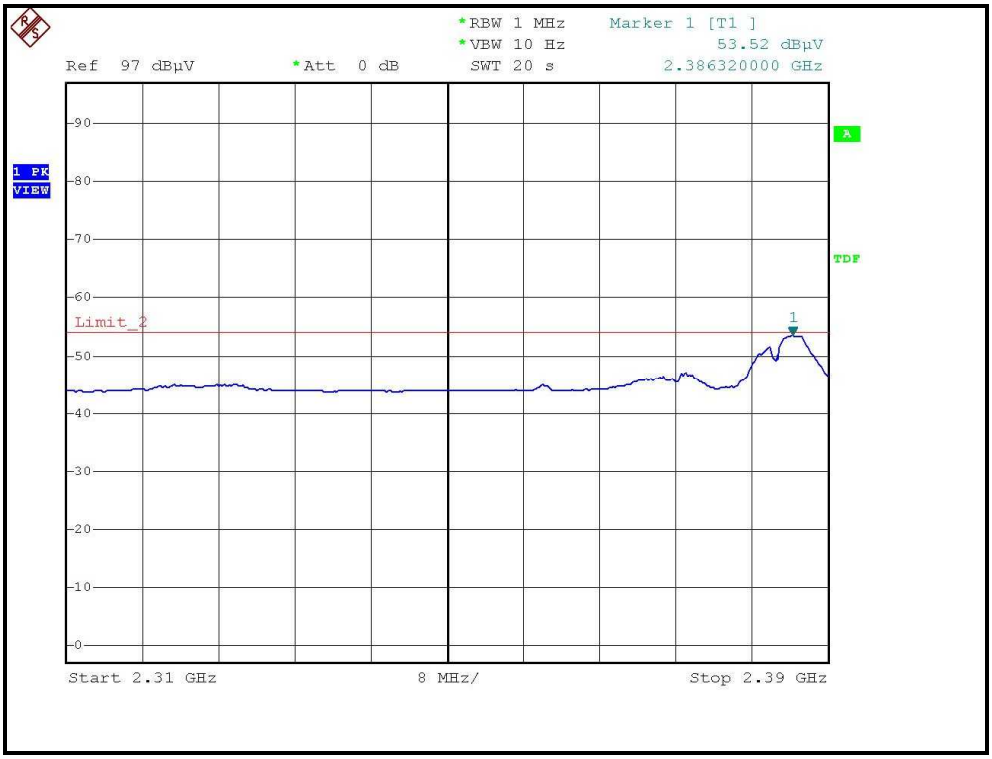

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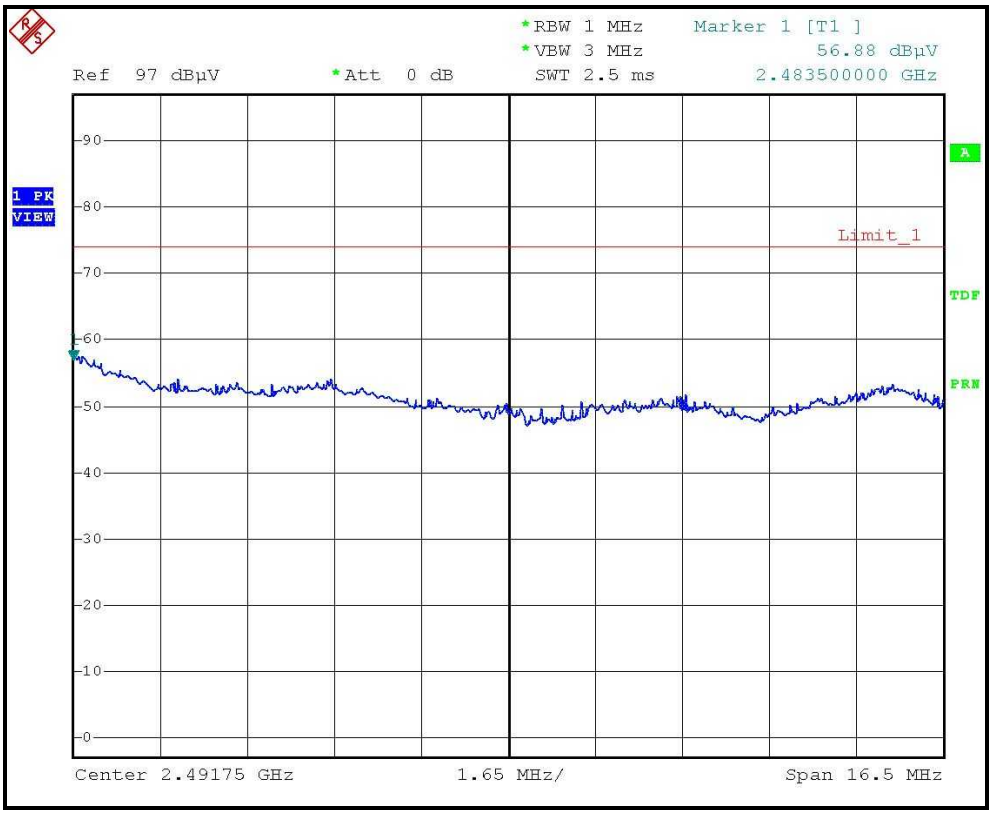

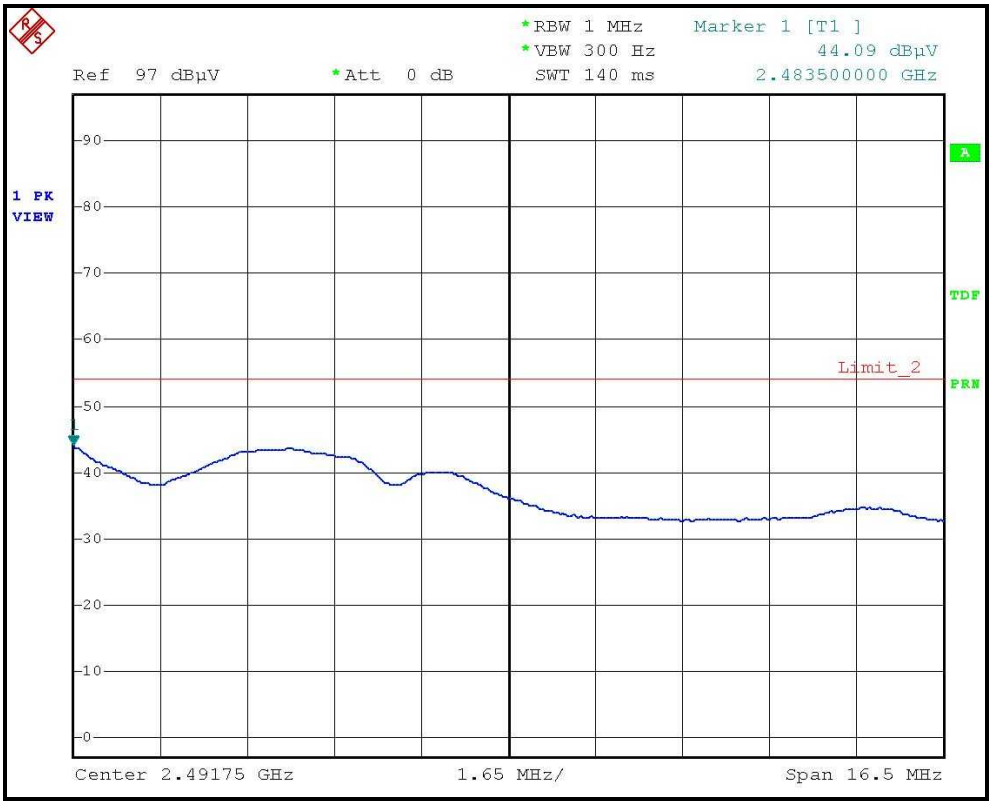

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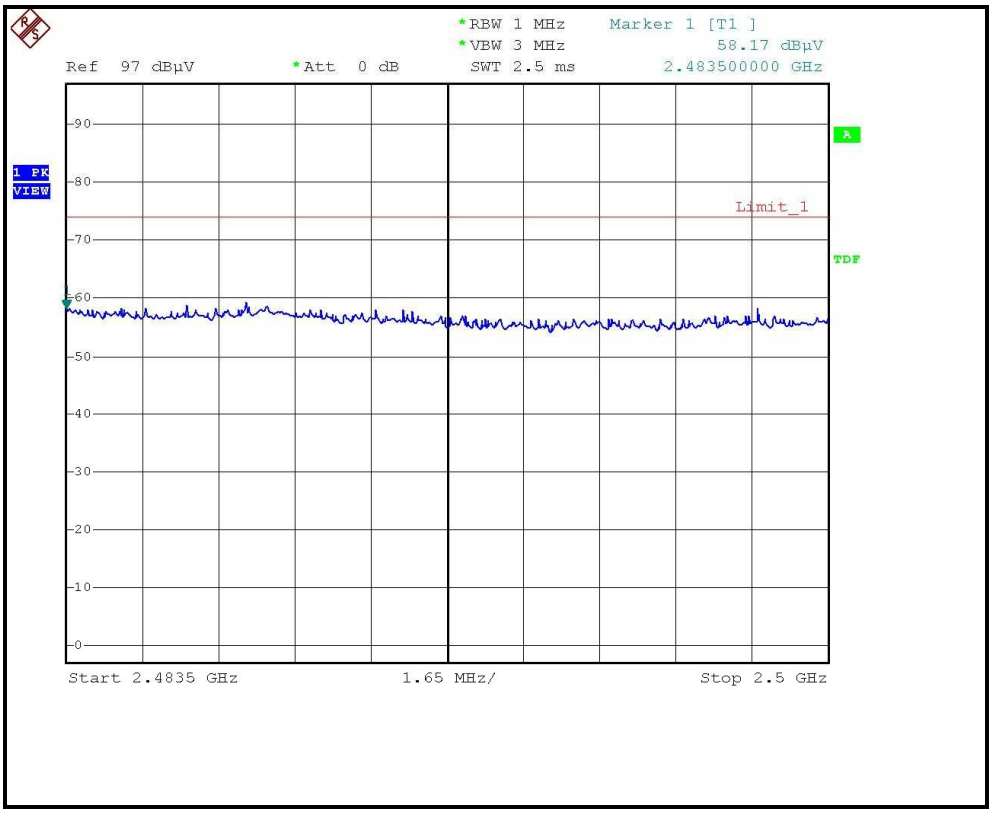
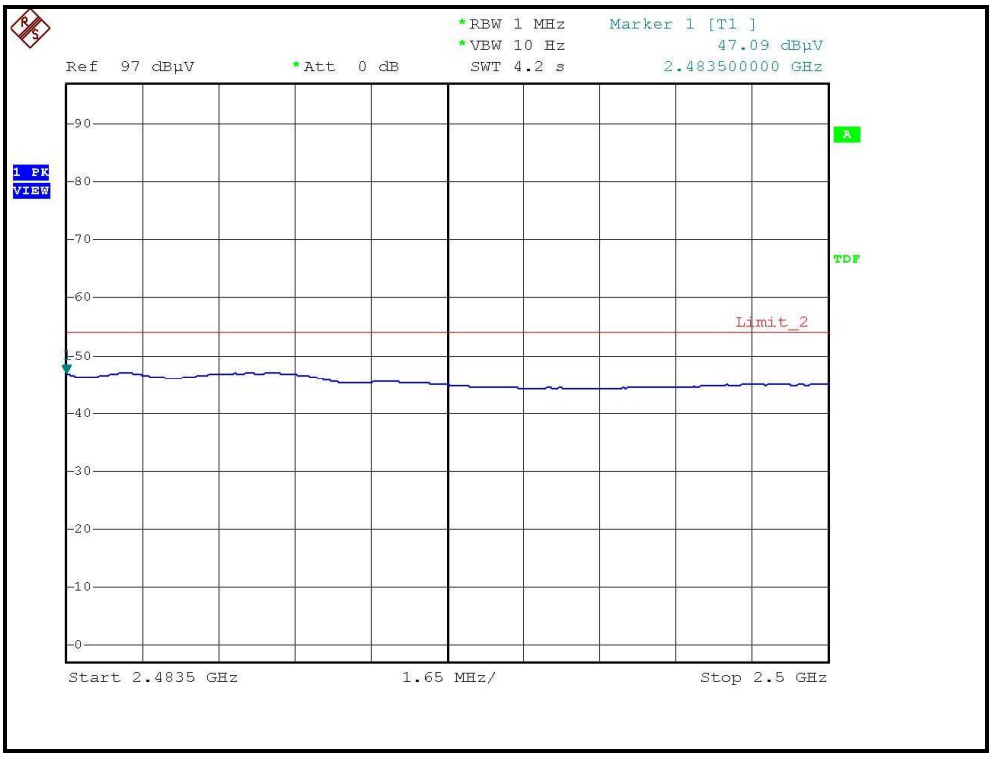




802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 62%RH 959hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	48.00 PK	74.00	-26.00	1.74 H	306	23.86	24.14
2	2288.00	44.00 AV	54.00	-10.00	1.74 H	306	19.86	24.14
3	2390.00	63.00 PK	74.00	-11.00	2.12 H	294	38.79	24.21
4	2390.00	47.10 AV	54.00	-6.90	2.12 H	294	22.89	24.21
5	*2412.00	103.00 PK			2.01 H	294	78.77	24.23
6	*2412.00	91.70 AV			2.01 H	294	67.47	24.23
7	4824.00	44.70 PK	74.00	-29.30	1.34 H	224	19.02	25.68
8	4824.00	31.00 AV	54.00	-23.00	1.34 H	224	5.32	25.68
9	7236.00	52.00 PK	74.00	-22.00	1.82 H	228	24.96	27.04
10	7236.00	37.20 AV	54.00	-16.80	1.82 H	228	10.16	27.04
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	2288.00	55.50 PK	74.00	-18.50	1.38 V	220	31.36	24.14
2	2288.00	52.50 AV	54.00	-1.50	1.38 V	220	28.36	24.14
3	2390.00	67.20 PK	74.00	-6.80	1.30 V	223	42.99	24.21
4	2390.00	52.58 AV	54.00	-1.42	1.30 V	223	28.37	24.21
5	*2412.00	111.90 PK			1.30 V	223	87.67	24.23
6	*2412.00	99.60 AV			1.30 V	223	75.37	24.23
7	4824.00	49.00 PK	74.00	-25.00	1.46 V	275	23.32	25.68
8	4824.00	34.00 AV	54.00	-20.00	1.46 V	275	8.32	25.68
9	7236.00	52.00 PK	74.00	-22.00	1.42 V	321	24.96	27.04
10	7236.00	38.00 AV	54.00	-16.00	1.42 V	321	10.96	27.04

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
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	21deg. C, 62%RH 959hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	47.00 PK	74.00	-27.00	1.75 H	307	22.86	24.14
2	2288.00	44.00 AV	54.00	-10.00	1.75 H	307	19.86	24.14
3	*2437.00	105.60 PK			2.02 H	291	81.35	24.25
4	*2437.00	93.30 AV			2.02 H	291	69.05	24.25
5	4874.00	46.50 PK	74.00	-27.50	1.23 H	213	20.80	25.70
6	4874.00	32.30 AV	54.00	-21.70	1.23 H	213	6.60	25.70
7	7311.00	52.60 PK	74.00	-21.40	1.71 H	254	25.54	27.06
8	7311.00	37.30 AV	54.00	-16.70	1.71 H	254	10.24	27.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	55.50 PK	74.00	-18.50	1.37 V	222	31.36	24.14
2	2288.00	52.30 AV	54.00	-1.70	1.37 V	222	28.16	24.14
3	*2437.00	113.20 PK			1.56 V	66	88.95	24.25
4	*2437.00	101.50 AV			1.56 V	66	77.25	24.25
5	4874.00	51.00 PK	74.00	-23.00	1.39 V	266	25.30	25.70
6	4874.00	37.00 AV	54.00	-17.00	1.39 V	266	11.30	25.70
7	7311.00	53.00 PK	74.00	-21.00	1.41 V	327	25.94	27.06
8	7311.00	38.30 AV	54.00	-15.70	1.41 V	327	11.24	27.06

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

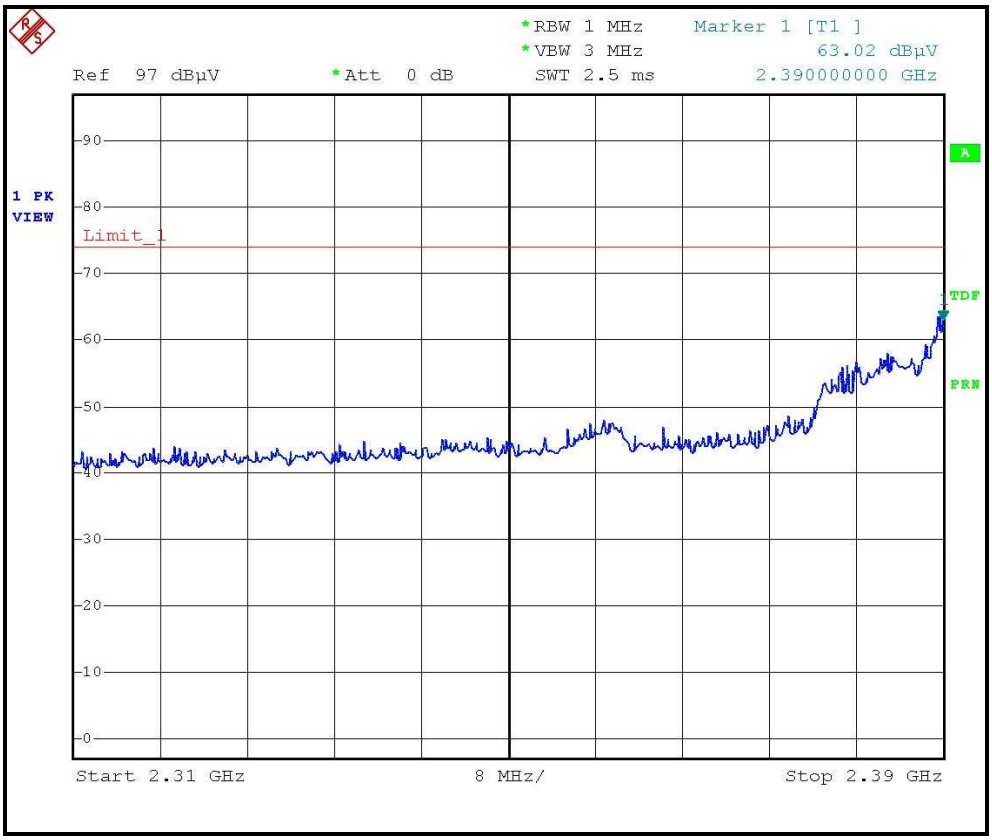
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

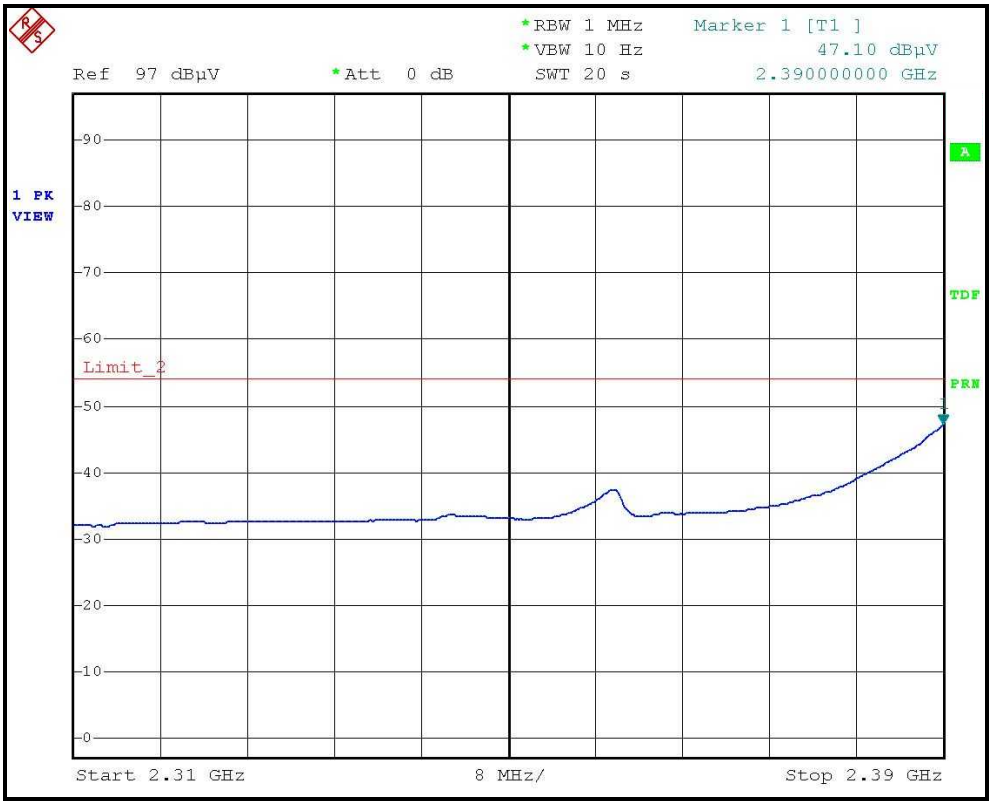
EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	21deg. C, 62%RH 959hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	44.00 PK	74.00	-30.00	1.75 H	307	19.86	24.14
2	2288.00	37.00 AV	54.00	-17.00	1.75 H	307	12.86	24.14
3	*2462.00	102.00 PK			2.02 H	290	77.74	24.26
4	*2462.00	89.80 AV			2.02 H	290	65.54	24.26
5	2483.50	60.50 PK	74.00	-13.50	1.95 H	290	36.22	24.28
6	2483.50	46.00 AV	54.00	-8.00	1.95 H	290	21.72	24.28
7	4924.00	45.00 PK	74.00	-29.00	1.75 H	213	19.28	25.72
8	4924.00	31.10 AV	54.00	-22.90	1.75 H	213	5.38	25.72
9	7386.00	52.40 PK	74.00	-21.60	1.67 H	173	25.32	27.08
10	7386.00	37.90 AV	54.00	-16.10	1.67 H	173	10.82	27.08
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2288.00	53.20 PK	74.00	-20.80	1.37 V	222	29.06	24.14
2	2288.00	50.10 AV	54.00	-3.90	1.37 V	222	25.96	24.14
3	*2462.00	111.40 PK			1.50 V	74	87.14	24.26
4	*2462.00	99.20 AV			1.50 V	74	74.94	24.26
5	2483.50	68.46 PK	74.00	-5.54	1.54 V	75	44.18	24.28
6	2483.50	52.40 AV	54.00	-1.60	1.54 V	75	28.12	24.28
7	4924.00	47.60 PK	74.00	-26.40	1.58 V	164	21.88	25.72
8	4924.00	33.00 AV	54.00	-21.00	1.58 V	164	7.28	25.72
9	7386.00	53.00 PK	74.00	-21.00	1.64 V	263	25.92	27.08
10	7386.00	38.00 AV	54.00	-16.00	1.64 V	263	10.92	27.08

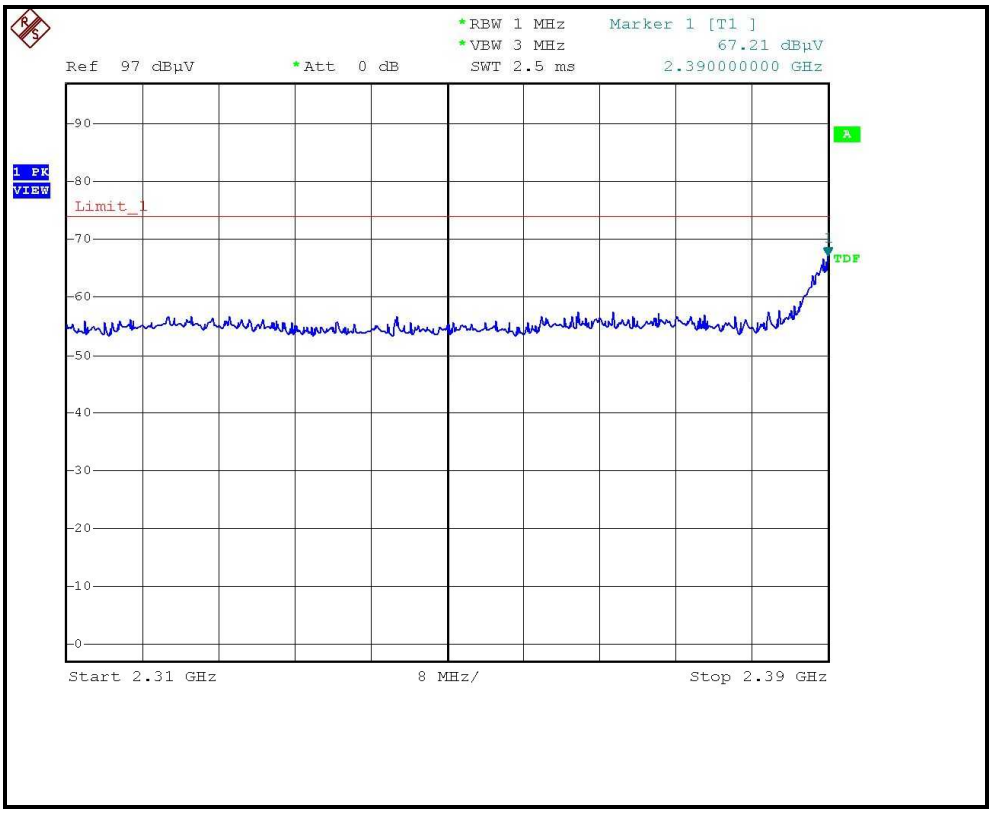
REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

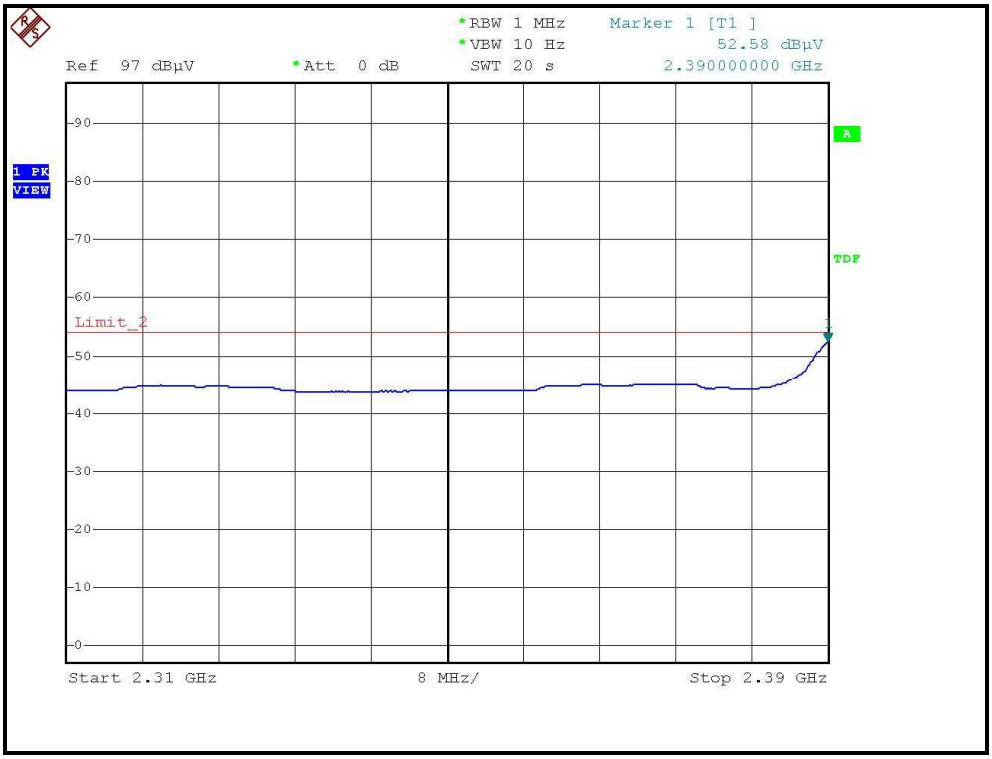
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)



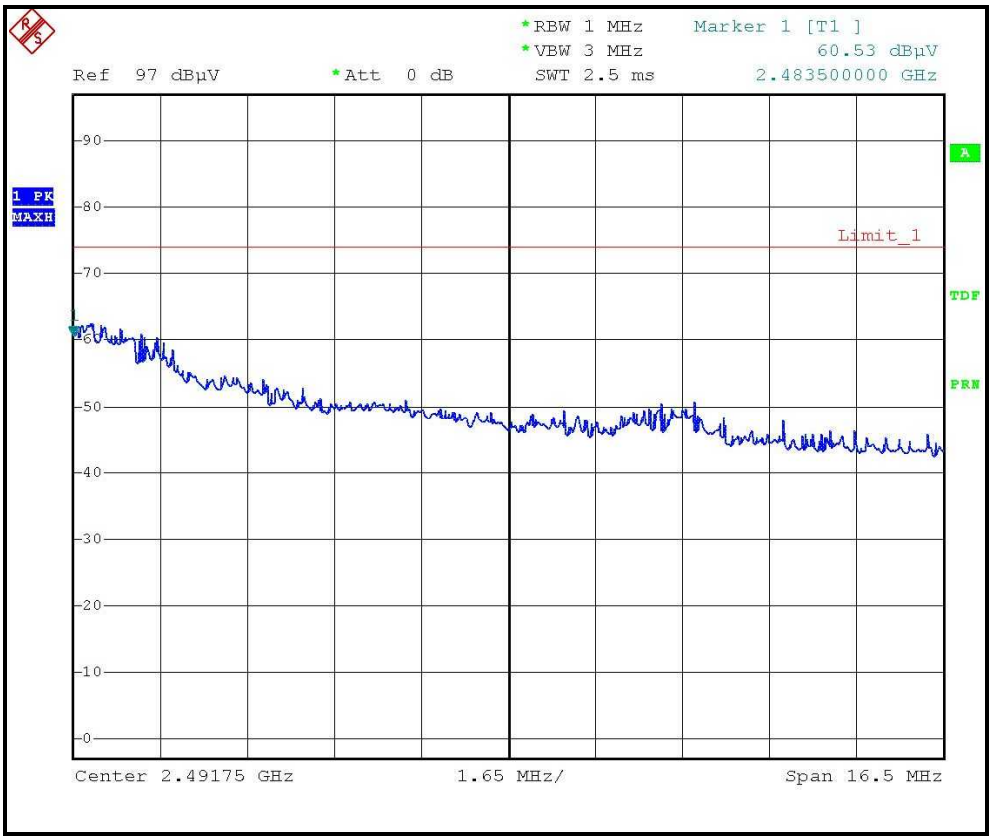


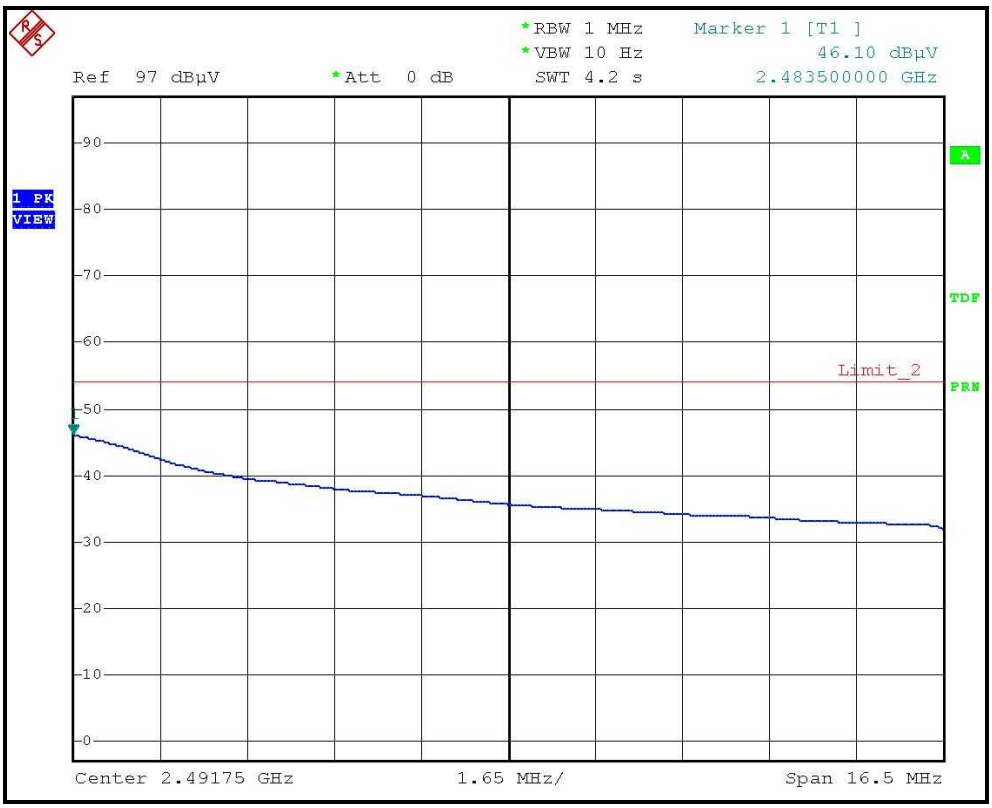
RESTRICTED BANDEDGE (802.11g MODE, CH1, VERTICAL)



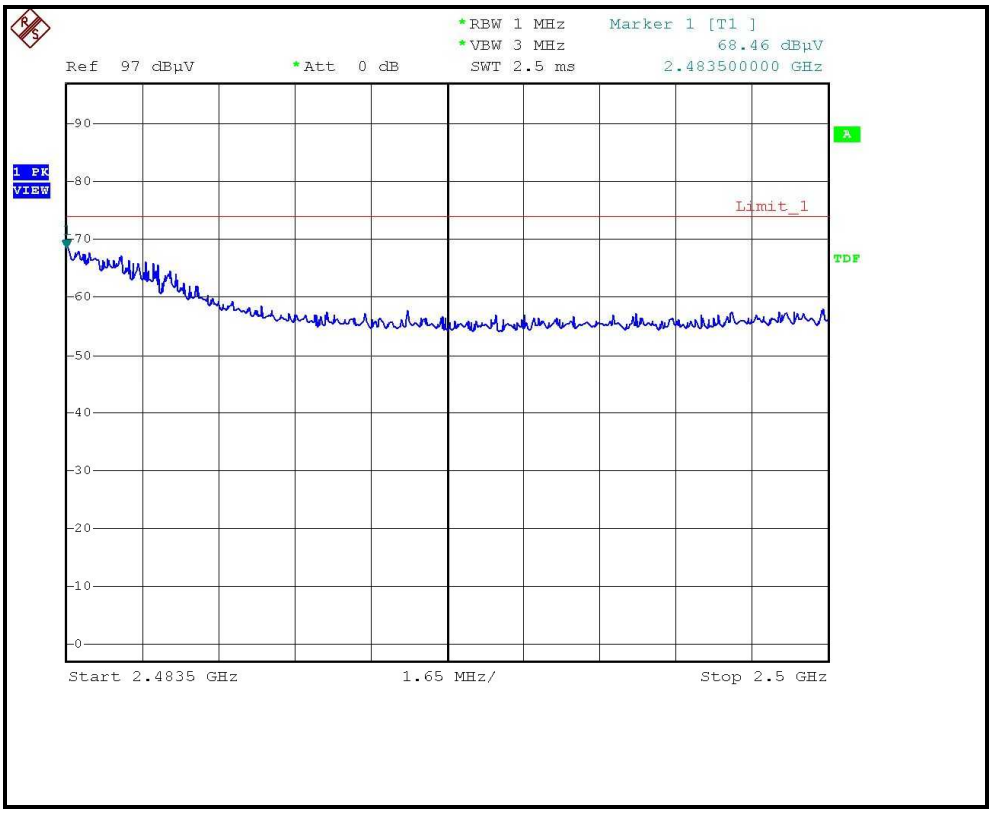


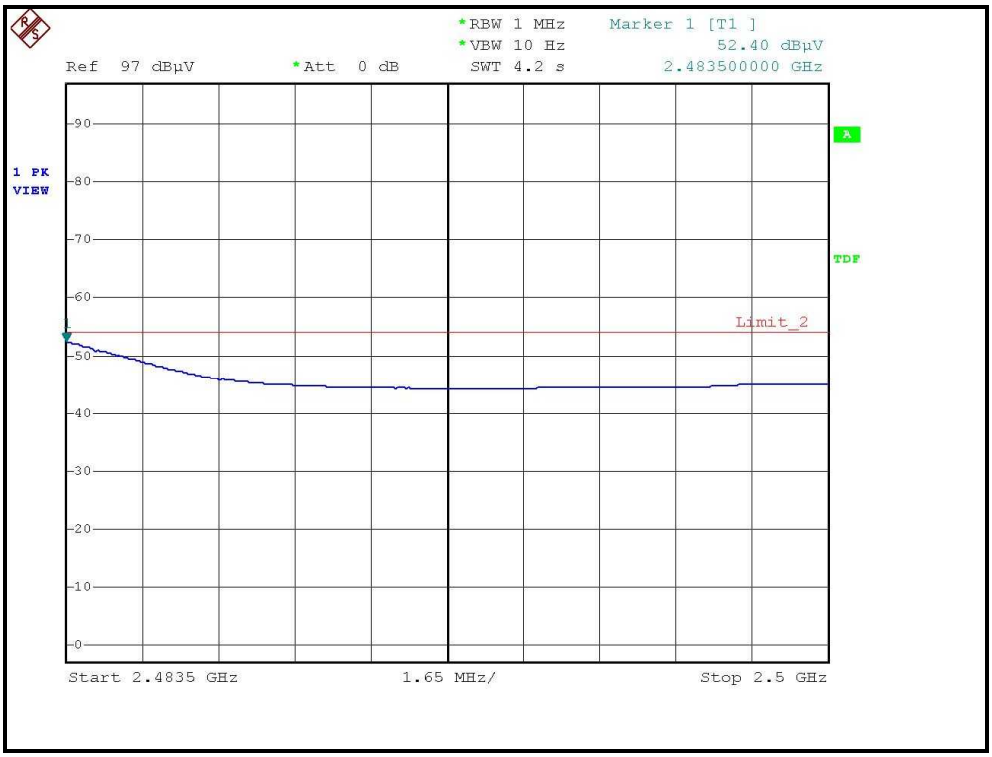
RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL)





RESTRICTED BANDEDGE (802.11g MODE, CH11, VERTICAL)





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	100036	Dec. 17, 2008

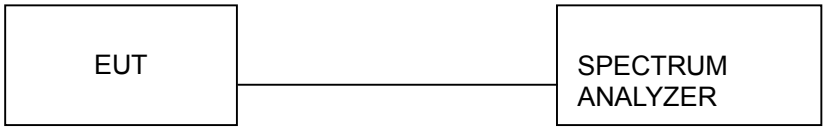
NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
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 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

4.3.4 TEST SETUP



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

4.3.5 EUT OPERATING CONDITIONS

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

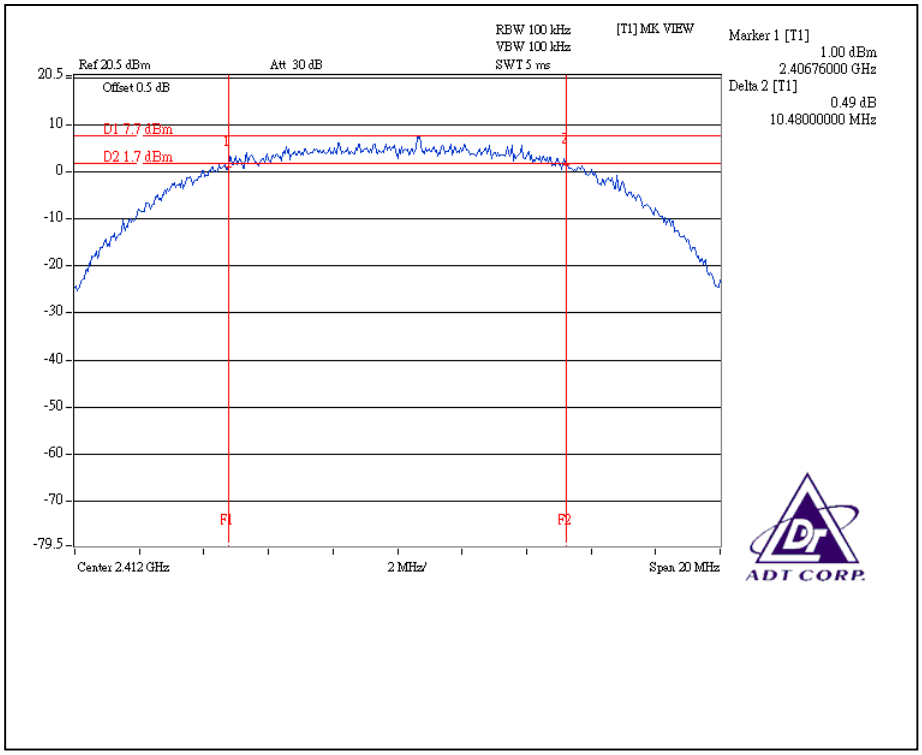
4.3.6 TEST RESULTS

802.11b DSSS modulation

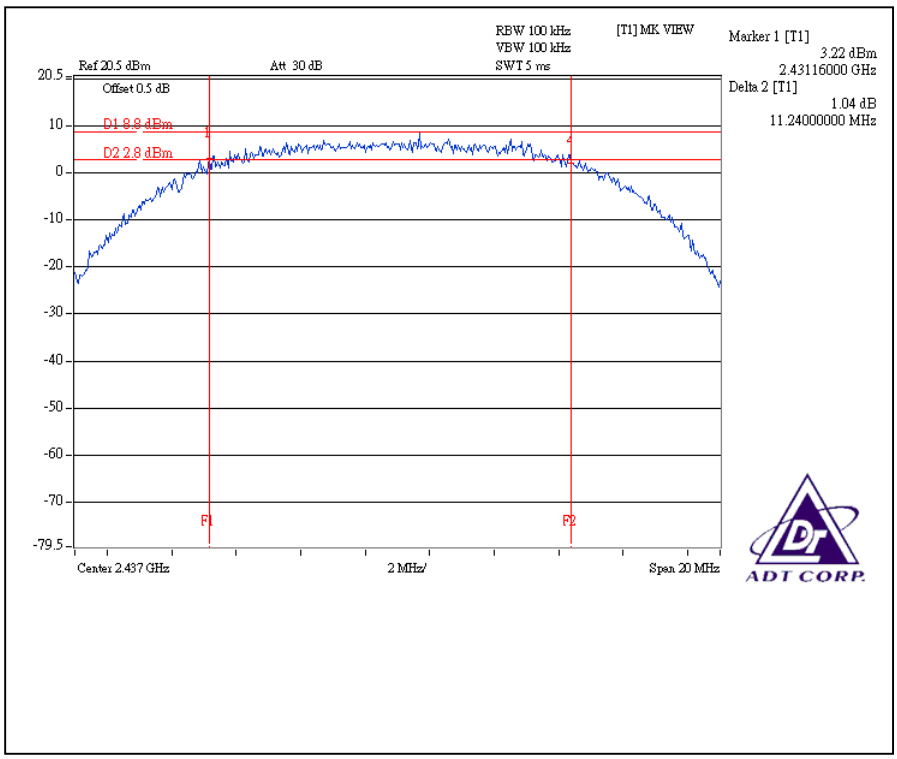
MODULATION TYPE	DBPSK	**TRANSFER RATE**	1Mbps
INPUT POWER	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.48	0.5	PASS
6	2437	11.24	0.5	PASS
11	2462	11.8	0.5	PASS

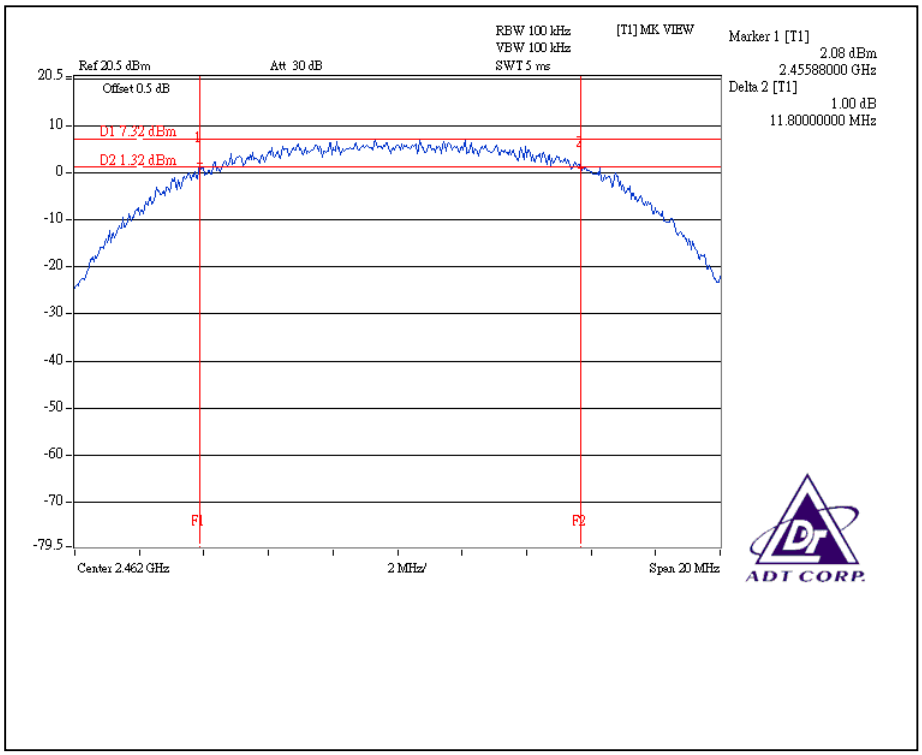
CH1


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
1.00 dBm
2.40676000 GHz
Delta 2 [T1]
0.49 dB
10.48000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 7.7 dBm
D2 1.7 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz
ADT CORP.

CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
3.22 dBm
2.43116000 GHz
Delta 2 [T1]
1.04 dB
11.24000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 8.8 dBm
D2 2.8 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
ADT CORP.

CH11

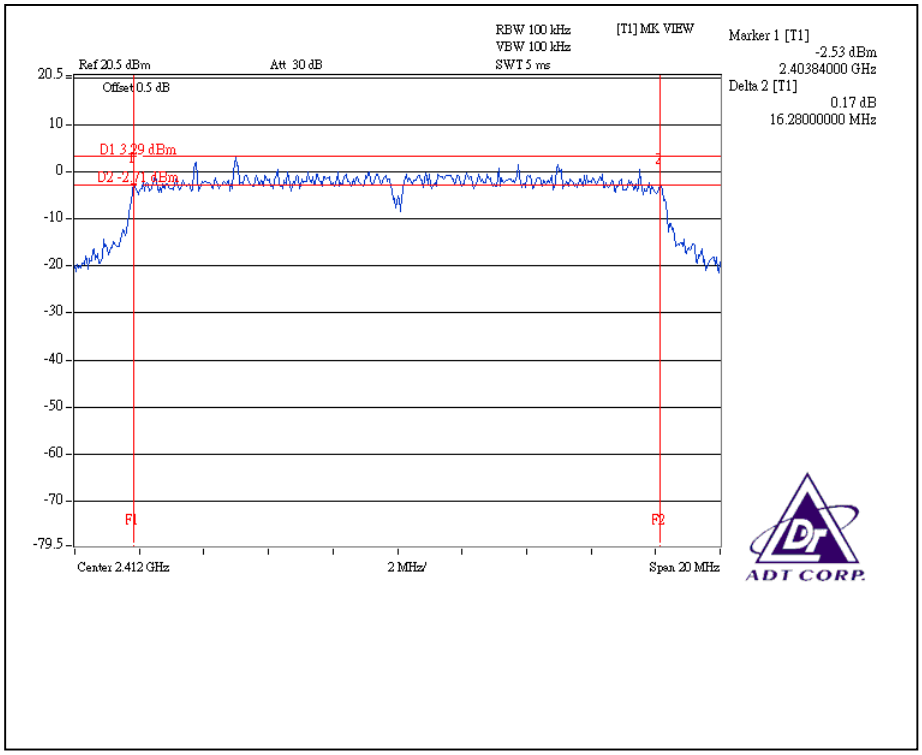

RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
2.08 dBm
2.45588000 GHz
Delta 2 [T1]
1.00 dB
11.80000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 7.32 dBm
D2 1.32 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

802.11g OFDM modulation

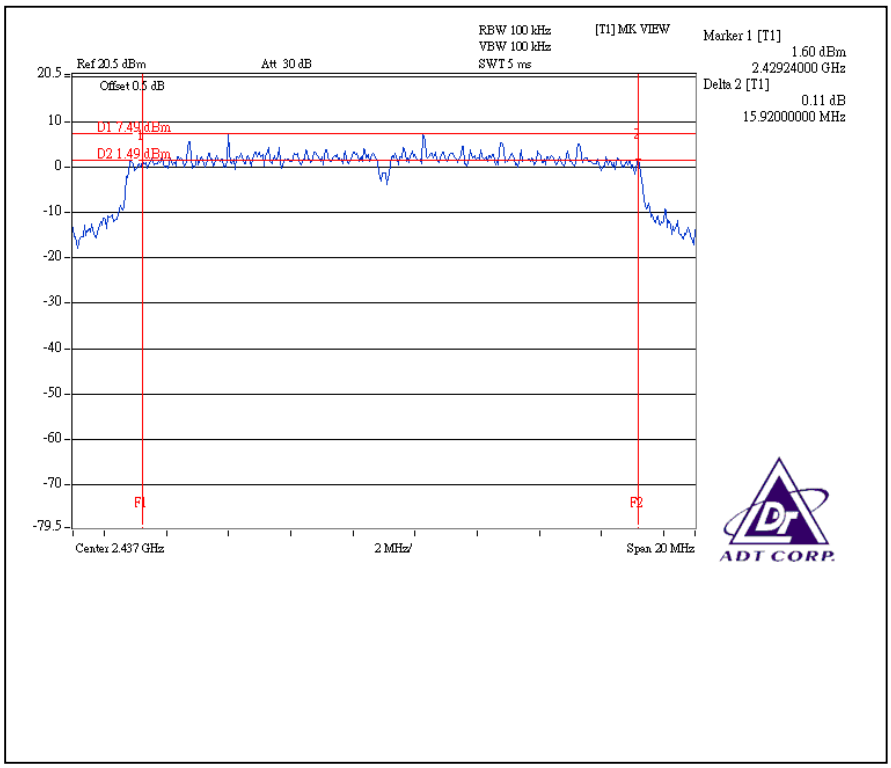
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.28	0.5	PASS
6	2437	15.92	0.5	PASS
11	2462	16.36	0.5	PASS

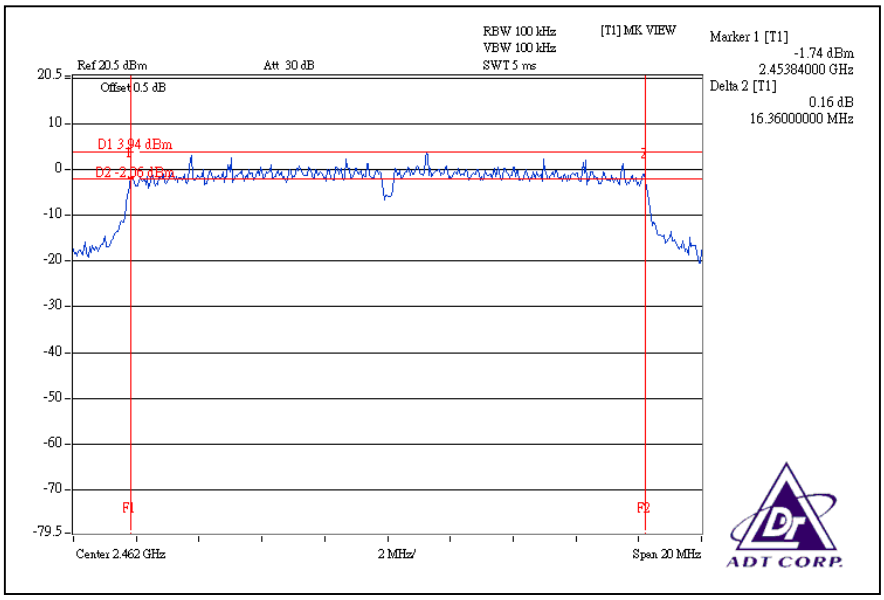
CH1


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-2.53 dBm
2.40384000 GHz
Delta 2 [T1]
0.17 dB
16.28000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 3.29 dBm
D2 -2.71 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz
ADT CORP.

CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
1.60 dBm
2.42924000 GHz
Delta 2 [T1]
0.11 dB
15.92000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 7.49 dBm
D2 1.49 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
ADT CORP.

CH11


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-1.74 dBm
2.45384000 GHz
Delta 2 [T1]
0.16 dB
16.36000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
D1 3.94 dBm
D2 -2.06 dBm
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

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 TEST INSTRUMENTS

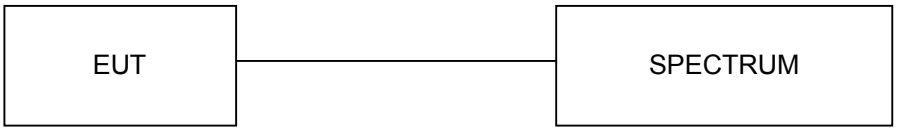
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 17, 2008
Agilent SIGNAL GENERATOR	E8257C	MY43320668	Dec. 07, 2008
TEKTRONIX OSCILLOSCOPE	TDS380	B016335	July. 15, 2008
NARDA DETECTOR	4503A	FSCM99899	NA

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. Follow DTS measurement (Power Output Option 2), the transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth (EBW) of the signal.
3. Set RBW = 1 MHz ;VBW ≧3 MHz.
4. Use peak detector mode and video trigger with the trigger level set to enable triggering only on full power pulses.
5. Trace average 100 traces in power averaging mode.
6. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
7. Record the power level.

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

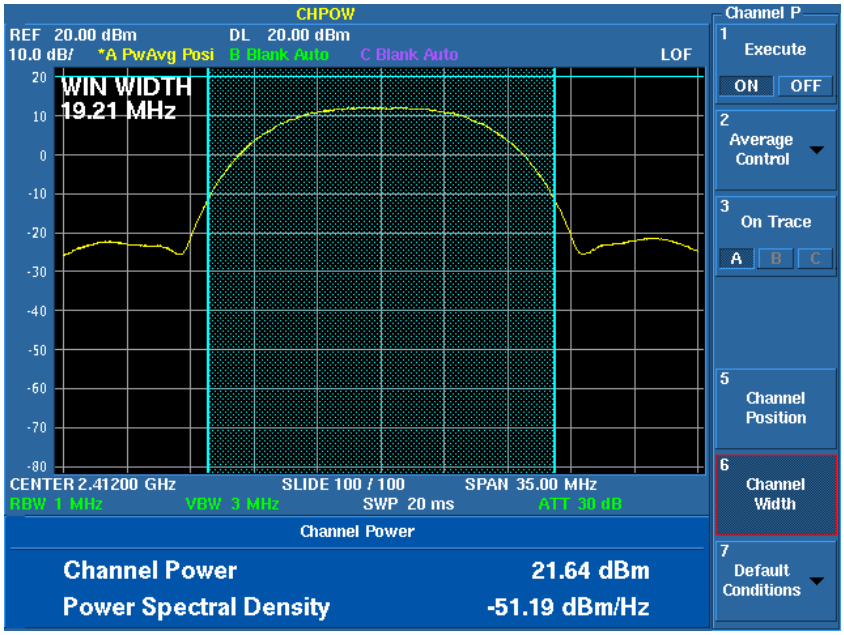
4.4.6 TEST RESULTS

802.11b DSSS modulation

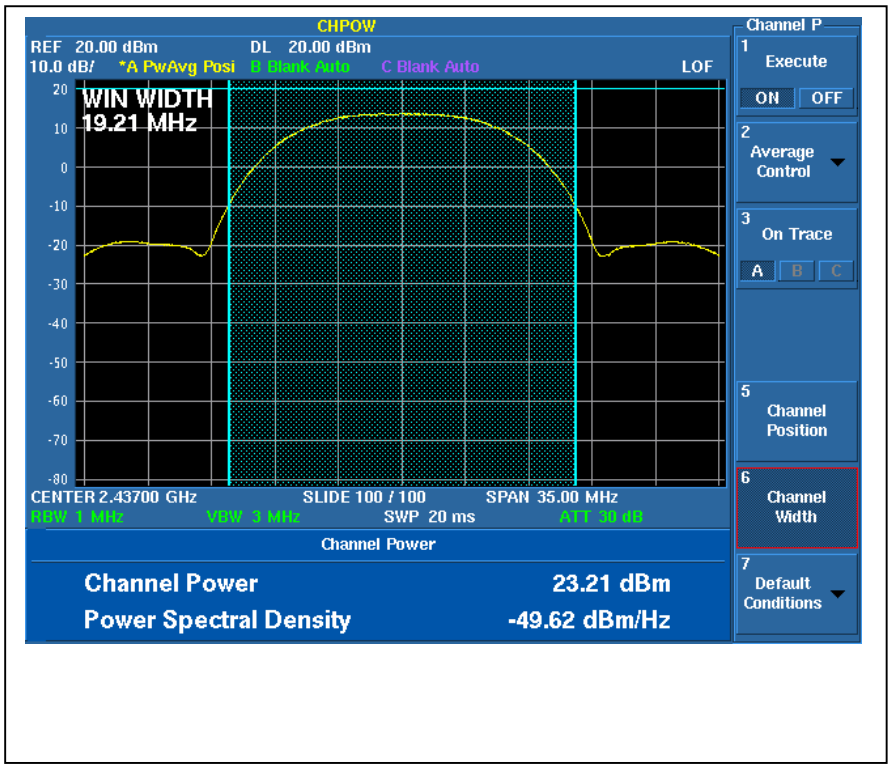
MODULATION TYPE	DBPSK	**TRANSFER RATE**	1Mbps
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	145.881	21.64	30	PASS
6	2437	209.411	23.21	30	PASS
11	2462	184.502	22.66	30	PASS

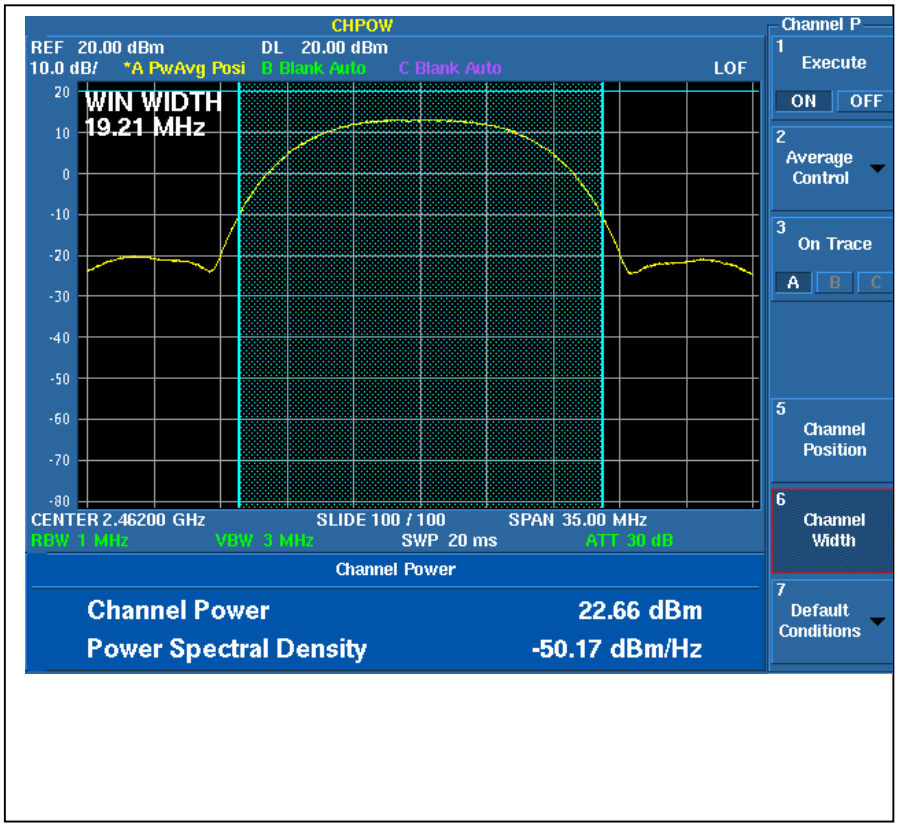
CH1


CHPOW
REF 20.00 dBm
DL 20.00 dBm
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto LOF
WIN WIDTH
19.21 MHz
CENTER 2.41200 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB
Channel Power
Channel Power 21.64 dBm
Power Spectral Density -51.19 dBm/Hz
Channel P
1 Execute
ON OFF
2 Average Control
3 On Trace
A B C
5 Channel Position
6 Channel Width
7 Default Conditions

CH6


CHPOW
REF 20.00 dBm
DL 20.00 dBm
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto LOF
WIN WIDTH
19.21 MHz
CENTER 2.43700 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB
Channel Power
Channel Power 23.21 dBm
Power Spectral Density -49.62 dBm/Hz
Channel P
1 Execute
ON OFF
2 Average Control
3 On Trace
A B C
5 Channel Position
6 Channel Width
7 Default Conditions

CH11

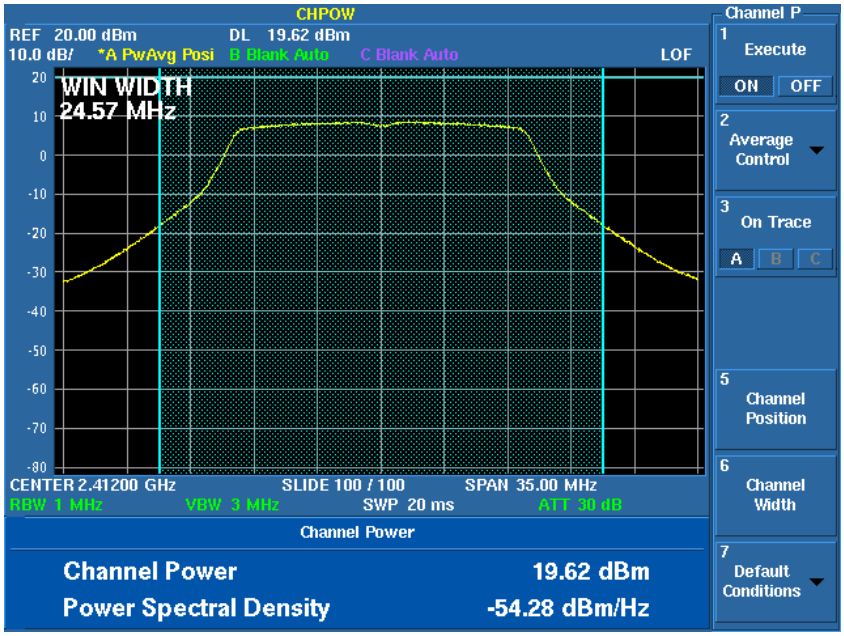

CHPOW
REF 20.00 dBm
DL 20.00 dBm
10.0 dB/
*A PwAvg Posi
B Blank Auto
C Blank Auto
LOF
WIN WIDTH
19.21 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 2.46200 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power
22.66 dBm
Power Spectral Density
-50.17 dBm/Hz
Channel P
1
Execute
ON
OFF
2
Average Control
3
On Trace
A
B
C
5
Channel Position
6
Channel Width
7
Default Conditions

802.11g OFDM modulation

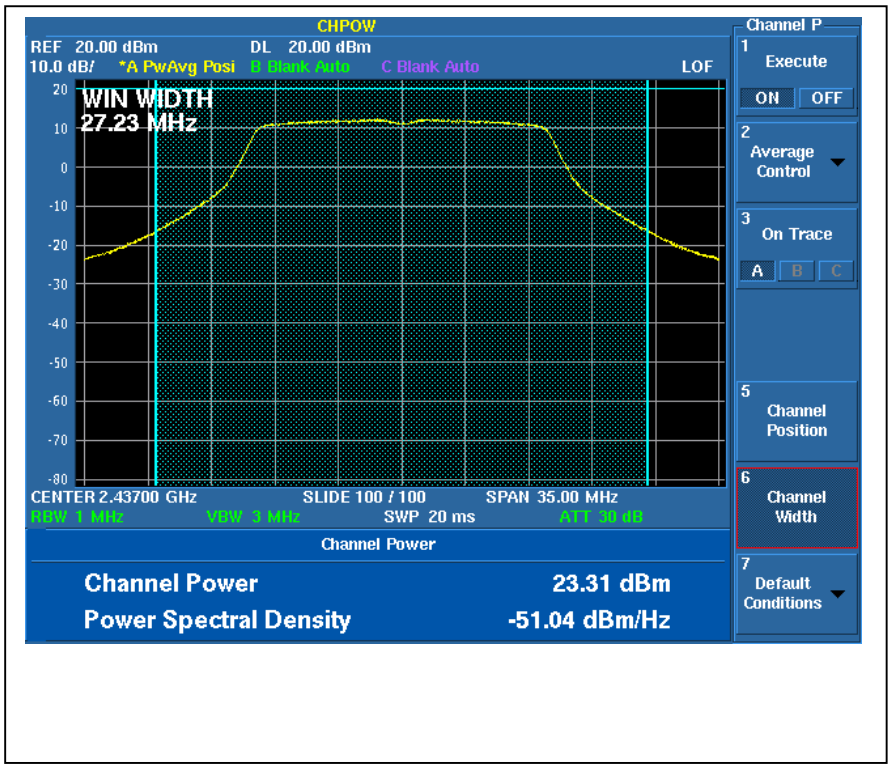
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	91.622	19.62	30	PASS
6	2437	214.289	23.31	30	PASS
11	2462	108.893	20.37	30	PASS

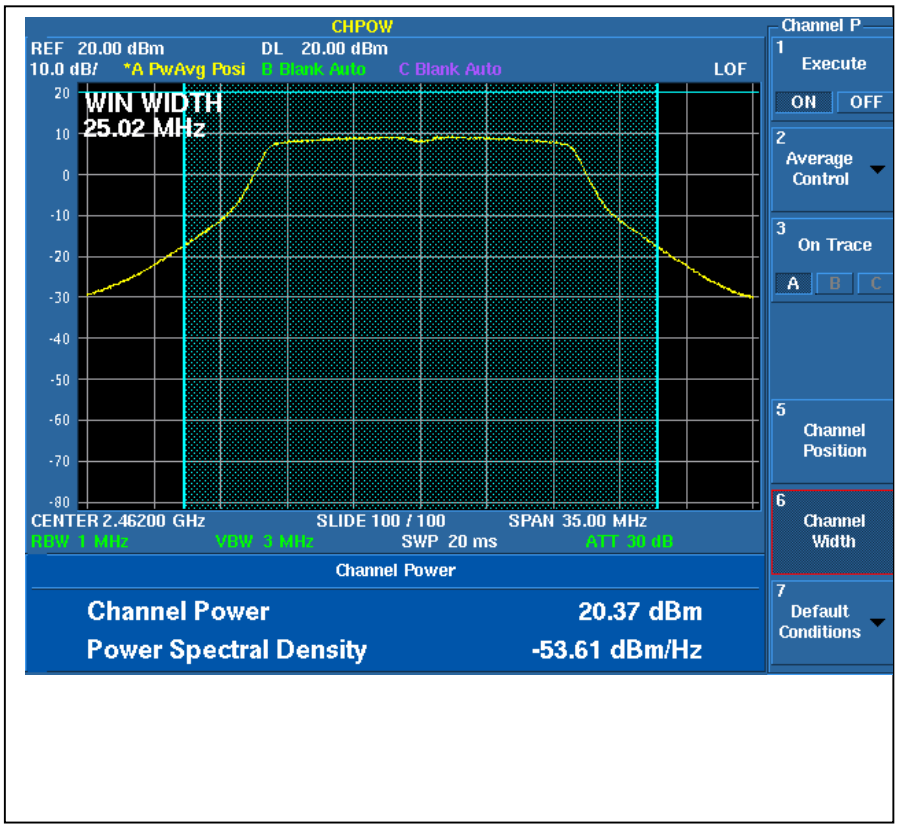
CH1


CHPOW
REF 20.00 dBm
DL 19.62 dBm
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto LOF
WIN WIDTH
24.57 MHz
CENTER 2.41200 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB
Channel Power
Channel Power 19.62 dBm
Power Spectral Density -54.28 dBm/Hz
Channel P
1 Execute
ON OFF
2 Average Control
3 On Trace
A B C
5 Channel Position
6 Channel Width
7 Default Conditions

CH6


CHPOW
REF 20.00 dBm
DL 20.00 dBm
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto LOF
WIN WIDTH
27.23 MHz
CENTER 2.43700 GHz SLIDE 100 / 100 SPAN 35.00 MHz
RBW 1 MHz VBW 3 MHz SWP 20 ms ATT 30 dB
Channel Power
Channel Power 23.31 dBm
Power Spectral Density -51.04 dBm/Hz
Channel P
1 Execute
ON OFF
2 Average Control
3 On Trace
A B C
5 Channel Position
6 Channel Width
7 Default Conditions

CH11


CHPOW
REF 20.00 dBm
DL 20.00 dBm
10.0 dB/
*A PwAvg Posi
B Blank Auto
C Blank Auto
LOF
WIN WIDTH
25.02 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 2.46200 GHz
SLIDE 100 / 100
SPAN 35.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power
Channel Power
20.37 dBm
Power Spectral Density
-53.61 dBm/Hz
Channel P
1
Execute
ON
OFF
2
Average Control
3
On Trace
A
B
C
5
Channel Position
6
Channel Width
7
Default Conditions

4.5 AVERAGE OUTPUT POWER

4.5.1 For reference.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
Anritsu Power Meter	ML2487A	6K00001472	Jan. 18.2008
Anritsu Wide Bandwidth Sensor	MA2491A	030951	Jan. 18.2008

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

4.5.3 TEST 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 average power level.

4.5.4 TEST SETUP

4.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5

4.5.6 TEST RESULTS – DSSS

802.11b DSSS modulation

MODULATION TYPE	DBPSK	**TRANSFER RATE**	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (mW)	AVERAGE POWER OUTPUT (dBm)
1	2412	60.256	17.8
6	2437	89.125	19.5
11	2462	69.183	18.4

4.5.7 TEST RESULTS –OFDM

802.11g OFDM modulation

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (mW)	AVERAGE POWER OUTPUT (dBm)
1	2412	30.200	14.8
6	2437	64.565	18.1
11	2462	33.113	15.2

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 17, 2008

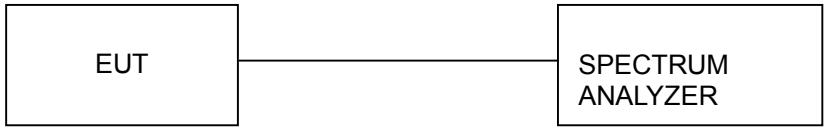
NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
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

1. Follow DTS measurement (PSD Option 2), the transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer. Locate and zoom in on emission peak(s) within the passband.
2. Set RBW = 3 kHz /VBW > 9 kHz and sweep time to Automatic.
3. Detector use peak mode and a video trigger with the trigger level set to enable triggering only on full power pulses.
4. Trace average 100 traces in power averaging mode. The power spectral density was measured and recorded.

4.6.4 TEST SETUP



4.6.5 EUT OPERATING CONDITIONS

Same as 4.3.5

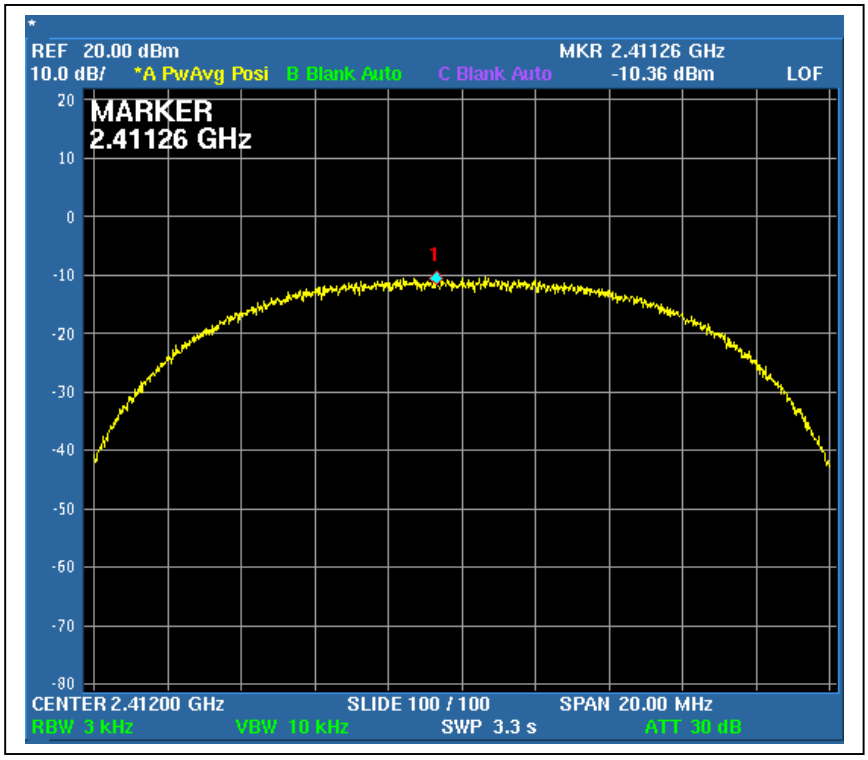
4.6.6 TEST RESULTS

802.11b DSSS modulation

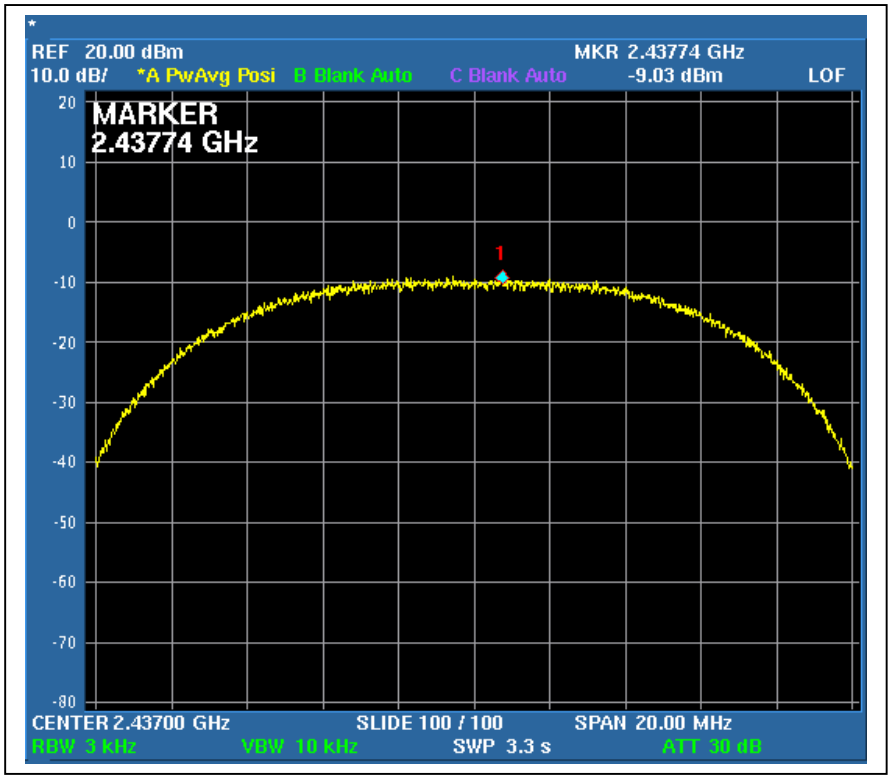
MODULATION TYPE	DBPSK	**TRANSFER RATE**	1Mbps
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-10.36	8	PASS
6	2437	-9.03	8	PASS
11	2462	-9.05	8	PASS

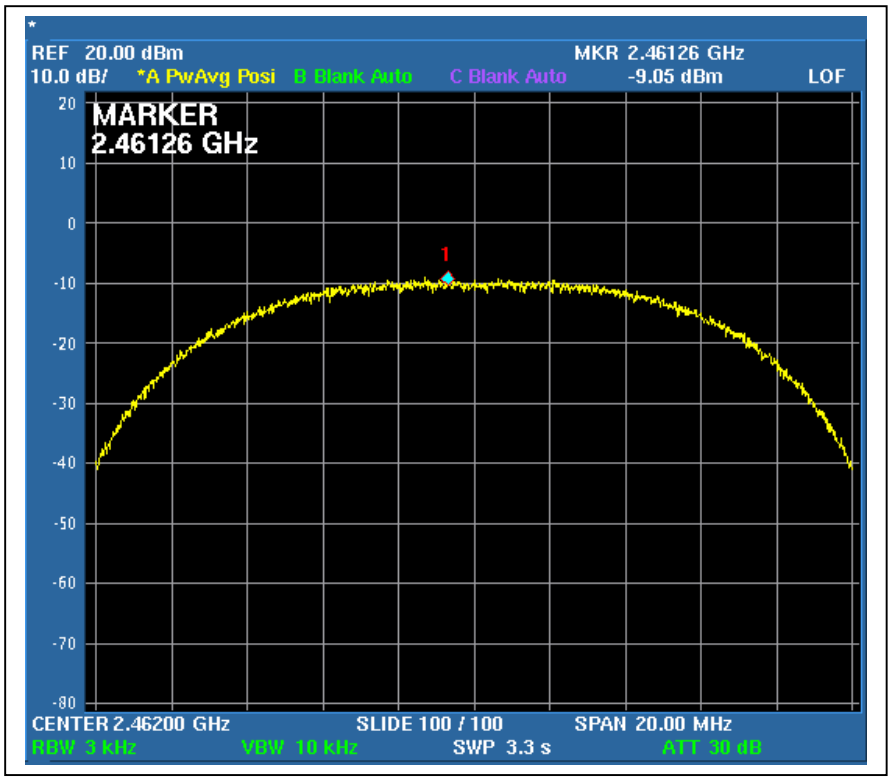
CH1


REF 20.00 dBm
MKR 2.41126 GHz
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto -10.36 dBm LOF
MARKER
2.41126 GHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 2.41200 GHz SLIDE 100 / 100 SPAN 20.00 MHz
RBW 3 kHz VBW 10 kHz SWP 3.3 s ATT 30 dB

CH6


REF 20.00 dBm
MKR 2.43774 GHz
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto -9.03 dBm LOF
MARKER
2.43774 GHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 2.43700 GHz SLIDE 100 / 100 SPAN 20.00 MHz
RBW 3 kHz VBW 10 kHz SWP 3.3 s ATT 30 dB

CH11

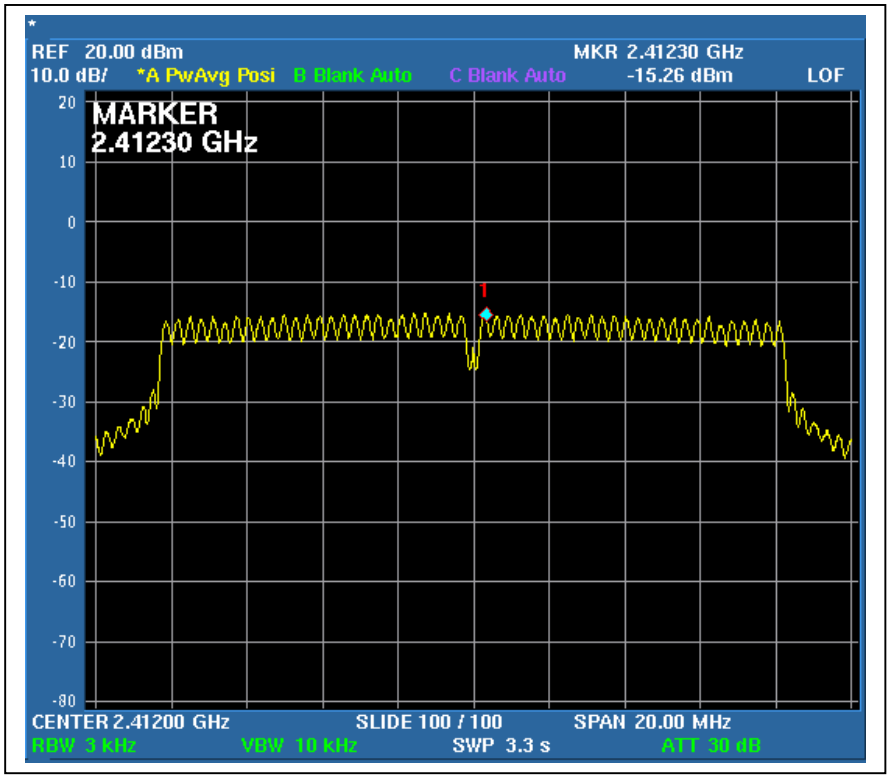

REF 20.00 dBm
MKR 2.46126 GHz
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto -9.05 dBm LOF
MARKER
2.46126 GHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
CENTER 2.46200 GHz
SLIDE 100 / 100
SPAN 20.00 MHz
RBW 3 kHz
VBW 10 kHz
SWP 3.3 s
ATT 30 dB

802.11g OFDM modulation

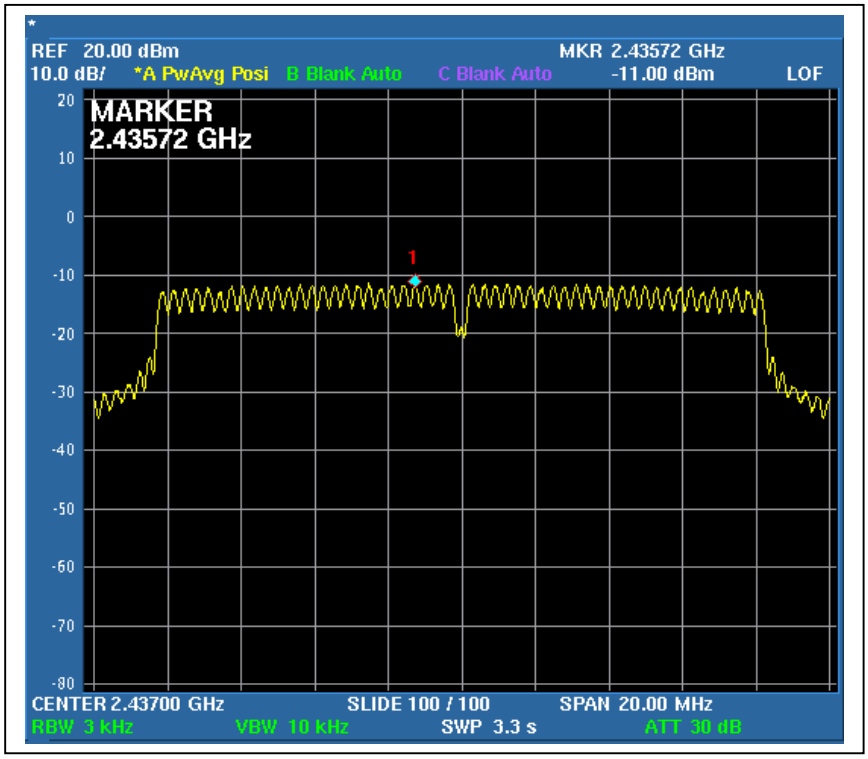
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	23deg. C, 62%RH, 959hPa
TESTED BY	Rex Huang		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-15.26	8	PASS
6	2437	-11.00	8	PASS
11	2462	-13.73	8	PASS

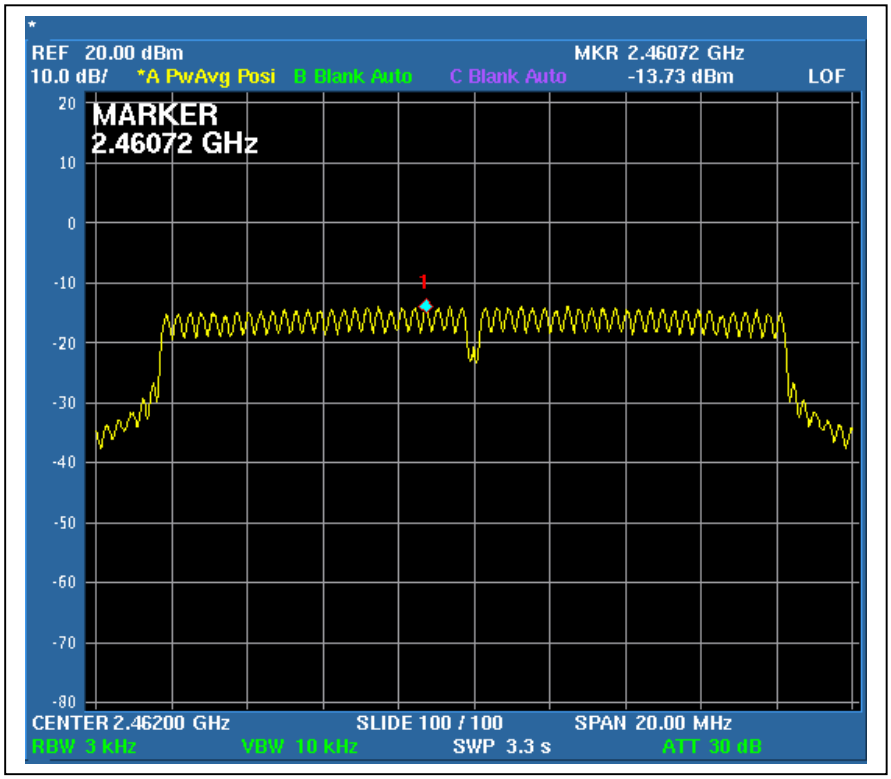
CH1


REF 20.00 dBm
MKR 2.41230 GHz
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto -15.26 dBm LOF
MARKER
2.41230 GHz
CENTER 2.41200 GHz
SLIDE 100 / 100
SPAN 20.00 MHz
RBW 3 kHz
VBW 10 kHz
SWP 3.3 s
ATT 30 dB

CH6


REF 20.00 dBm
MKR 2.43572 GHz
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto -11.00 dBm LOF
MARKER
2.43572 GHz
CENTER 2.43700 GHz
SLIDE 100 / 100
SPAN 20.00 MHz
RBW 3 kHz
VBW 10 kHz
SWP 3.3 s
ATT 30 dB

CH11


REF 20.00 dBm
MKR 2.46072 GHz
10.0 dB/ *A PwAvg Posi B Blank Auto C Blank Auto -13.73 dBm LOF
MARKER
2.46072 GHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
CENTER 2.46200 GHz
SLIDE 100 / 100
SPAN 20.00 MHz
RBW 3 kHz
VBW 10 kHz
SWP 3.3 s
ATT 30 dB

4.7 CONDUCTED EMISSION AND BAND EDGES MEASUREMENT

4.7.1 LIMITS OF CONDTCTED EMISSION AND BAND EDGES MEASUREMENT

Below –30dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

4.7.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 17, 2008

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.7.3 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.

4.7.4 EUT OPERATING CONDITION

Same as Item 4.3.5

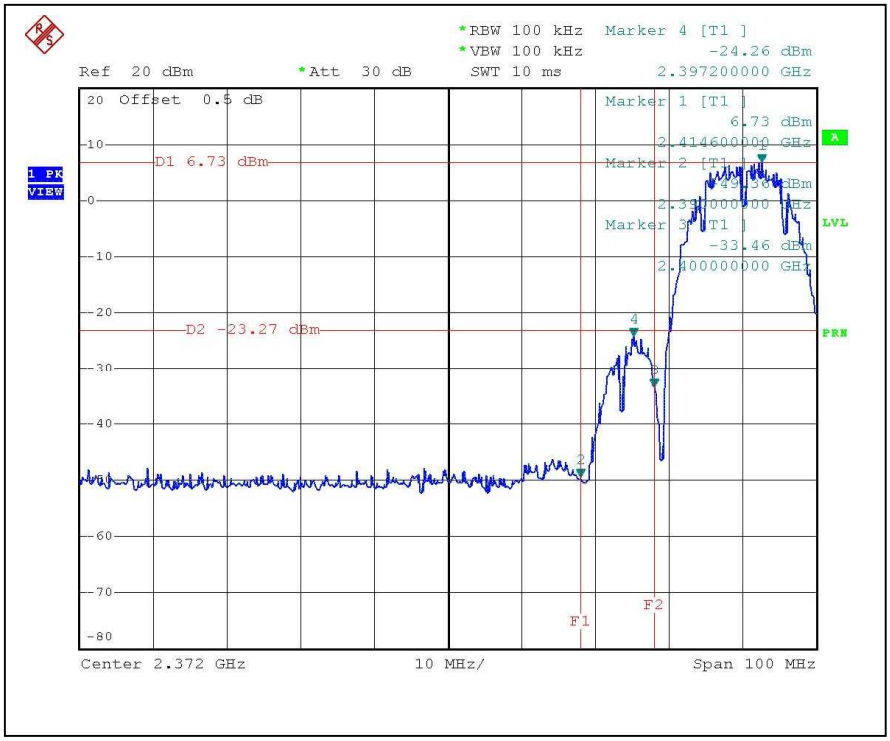
4.7.5 TEST RESULTS

The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement in part 15.247(d).

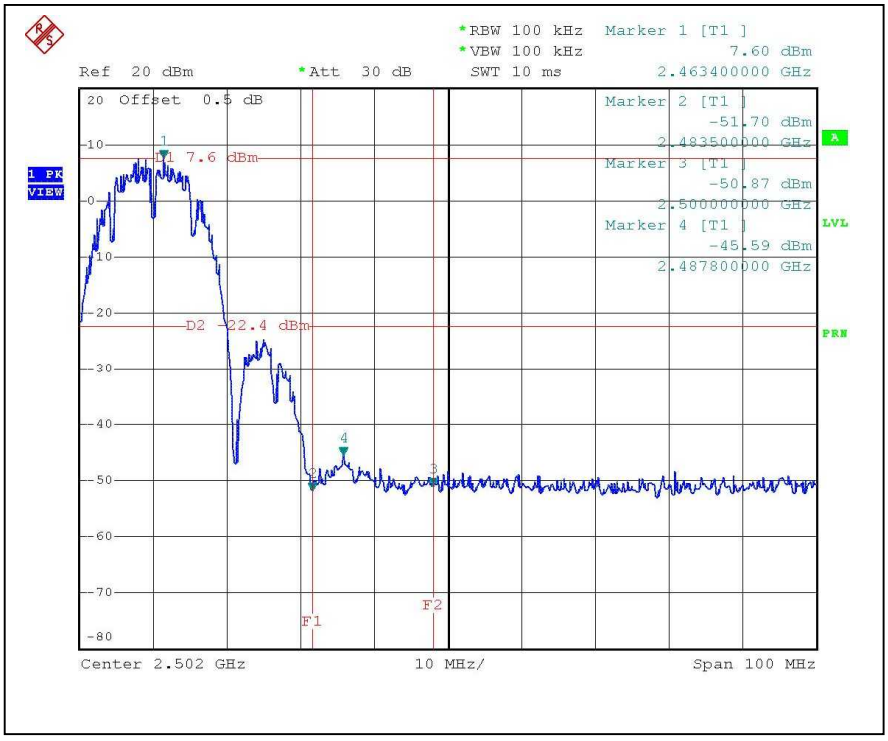
Note: Follow DTS measurement, If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.

802.11b DSSS MODULATION:

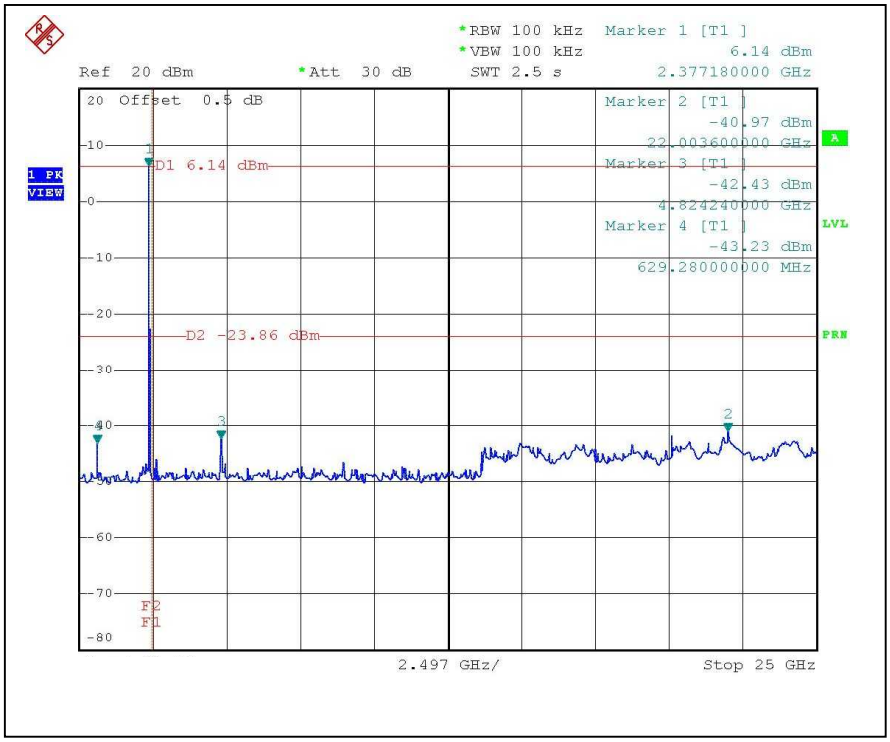
CH1



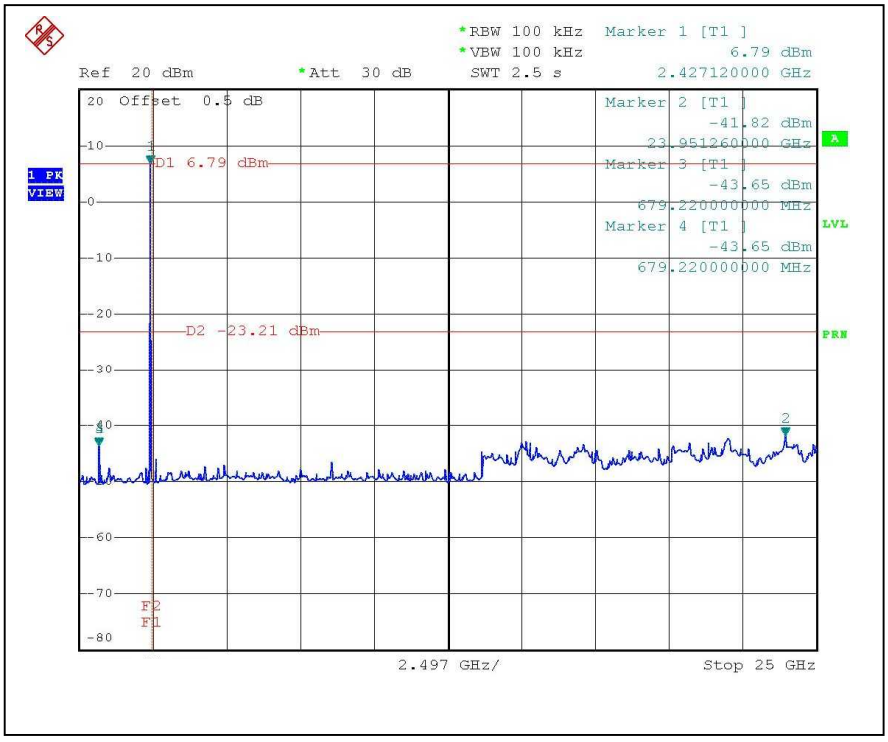
CH11



CH1

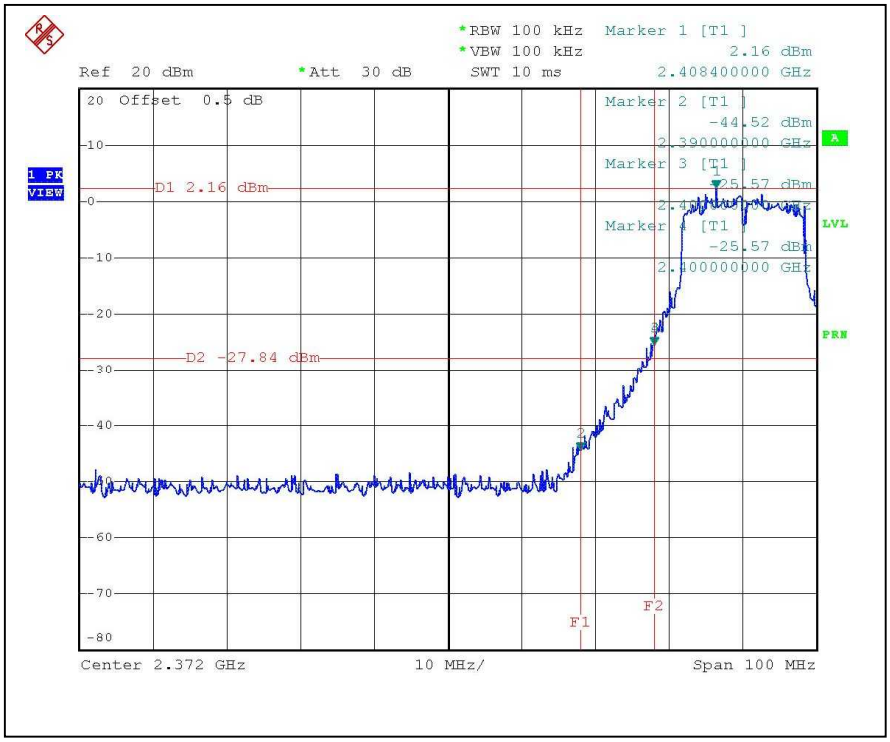

*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 2.5 s
Marker 1 [T1]
6.14 dBm
2.377180000 GHz
20 Offset 0.5 dB
D1 6.14 dBm
D2 -23.86 dBm
Marker 2 [T1]
-40.97 dBm
22.003600000 GHz
Marker 3 [T1]
-42.43 dBm
4.824240000 GHz
Marker 4 [T1]
-43.23 dBm
629.280000000 MHz
1 PK
VIEW
A
LVL
PRN
F2
F1
2.497 GHz/
Stop 25 GHz

CH11

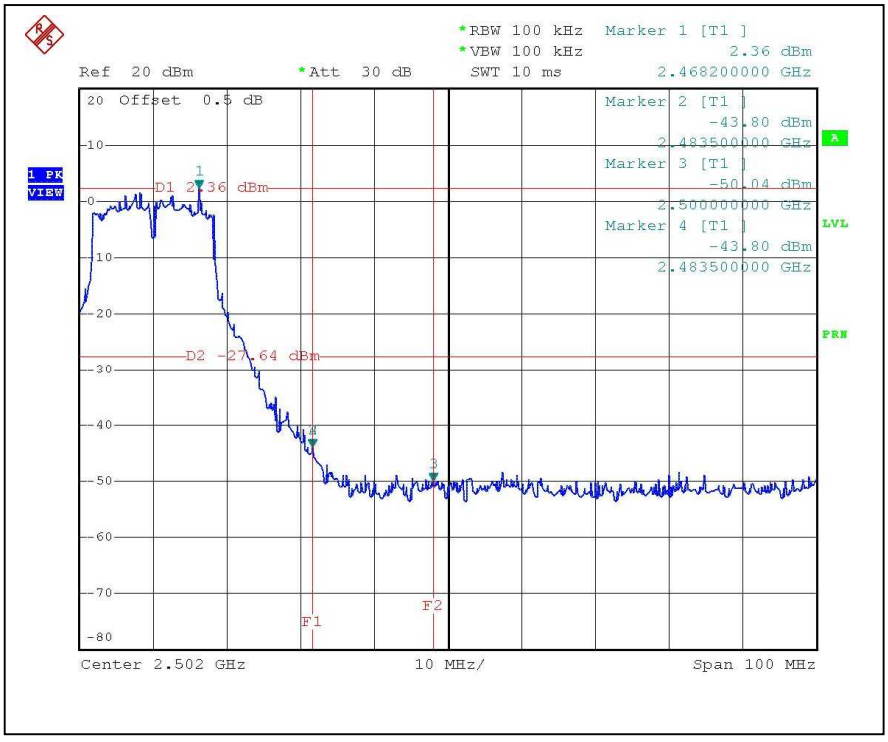

*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 2.5 s
Marker 1 [T1]
6.79 dBm
2.427120000 GHz
20 Offset 0.5 dB
D1 6.79 dBm
D2 -23.21 dBm
Marker 2 [T1]
-41.82 dBm
23.951260000 GHz
Marker 3 [T1]
-43.65 dBm
679.220000000 MHz
Marker 4 [T1]
-43.65 dBm
679.220000000 MHz
1 PK
VIEW
A
LVL
PRN
F2
F1
2.497 GHz/
Stop 25 GHz

802.11g OFDM MODULATION:

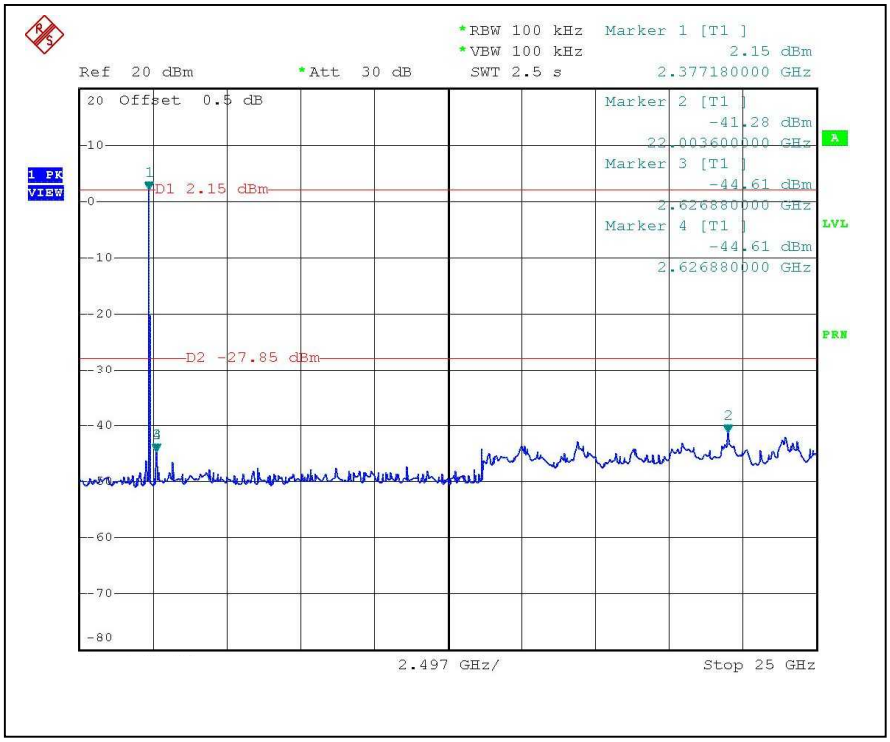
CH1



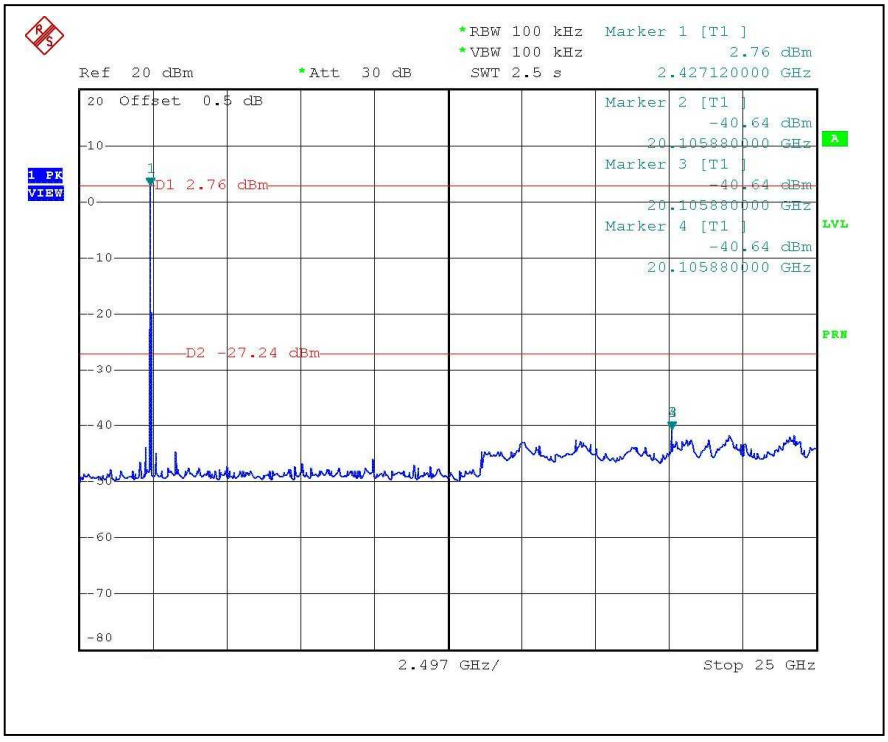
CH11



CH1


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 2.5 s
Marker 1 [T1]
2.15 dBm
2.377180000 GHz
20 Offset 0.5 dB
Marker 2 [T1]
-41.28 dBm
22.003600000 GHz
Marker 3 [T1]
-44.61 dBm
2.626880000 GHz
Marker 4 [T1]
-44.61 dBm
2.626880000 GHz
1 PK
VIEW
D1 2.15 dBm
D2 -27.85 dBm
A
LVL
PRN
2.497 GHz/
Stop 25 GHz

CH11


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
SWT 2.5 s
Marker 1 [T1]
2.76 dBm
2.427120000 GHz
20 Offset 0.5 dB
Marker 2 [T1]
-40.64 dBm
20.105880000 GHz
Marker 3 [T1]
-40.64 dBm
20.105880000 GHz
Marker 4 [T1]
-40.64 dBm
20.105880000 GHz
1 PK
VIEW
D1 2.76 dBm
D2 -27.24 dBm
A
LVL
PRN
2.497 GHz/
Stop 25 GHz

4.8 ANTENNA REQUIREMENT

4.8.1 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.

4.8.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole antenna with IPEX connector. The maximum Gain of the antenna is 2dBi

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

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

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

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

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

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.