FCC TEST REPORT

REPORT NO.: RF960207H01
MODEL NO.: AR5BCB-00055
RECEIVED: Feb. 07, 2007
TESTED: Feb. 12 to March 02, 2007
ISSUED: March 13, 2007

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.

0536

No. 2177-01

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1 CERTIFICATION

PRODUCT :	802.11 b/g CardBus
BRAND NAME :	Atheros
MODEL NO. :	AR5BCB-00055
TESTED:	Feb. 12 to March 02, 2007
APPLICANT :	Atheros Communications, Inc.
TEST ITEM:	ENGINEERING SAMPLE
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247) ANSI C63.4-2003

The above equipment (Model: AR5BCB-00055) 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 : _____ , **DATE:** March 13, 2007
(Midoli Peng)

TECHNICAL ACCEPTANCE : _____ , **DATE:** March 13, 2007
Responsible for RF
(Moris Lin)

APPROVED BY : _____ , **DATE:** March 13, 2007
(Hank Chung, 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 –14.28 dB at 3.867 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(c)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –0.5 dB at 4924.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	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	2.26 dB
Radiated emissions (30MHz-1GHz)	2.98 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~40GHz)	1.88 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11 b/g CardBus
MODEL NO.	AR5BCB-00055
FCC ID	PPD-AR5BCB-00055
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: 83.946 mW 802.11g: 87.096 mW (measured per 15.247(b)(3) power option 2: Trace average 100 traces in power averaging mode)
ANTENNA TYPE	Print Antenna (Antenna gain : 0dBi)
DATA CABLE	NA
I/O PORT	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.

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

3. 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 RE: 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	CCK	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	OFDM	BPSK	6

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	CCK	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	CCK	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	CCK	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 CardBus. 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

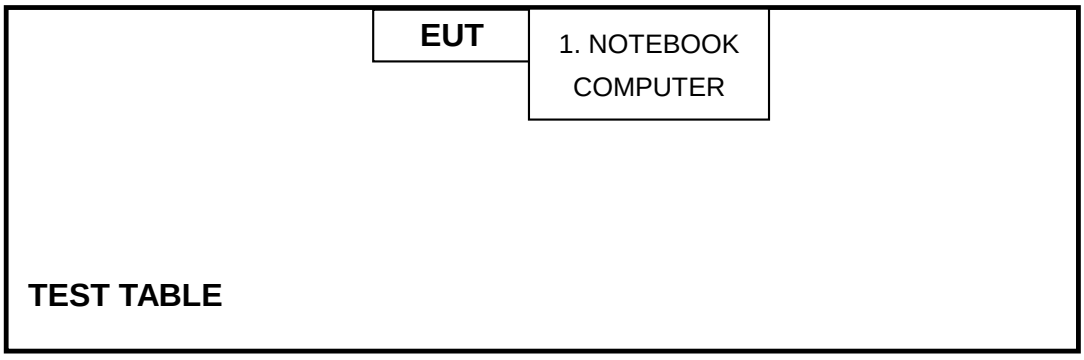
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	Lenovo	L3R4939	00 15 58 2F FE FB	NA

No.	Signal cable description
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)	ENV-216	100071	Nov. 26, 2007
Line-Impedance Stabilization Network(for Peripheral)	ESH3-Z5	848773/004	Oct. 26, 2007
RF Cable (JETBAO)	RG233/U	Cable_CB_01	Dec. 09, 2007
Terminator	50	2	Oct. 30, 2007
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.

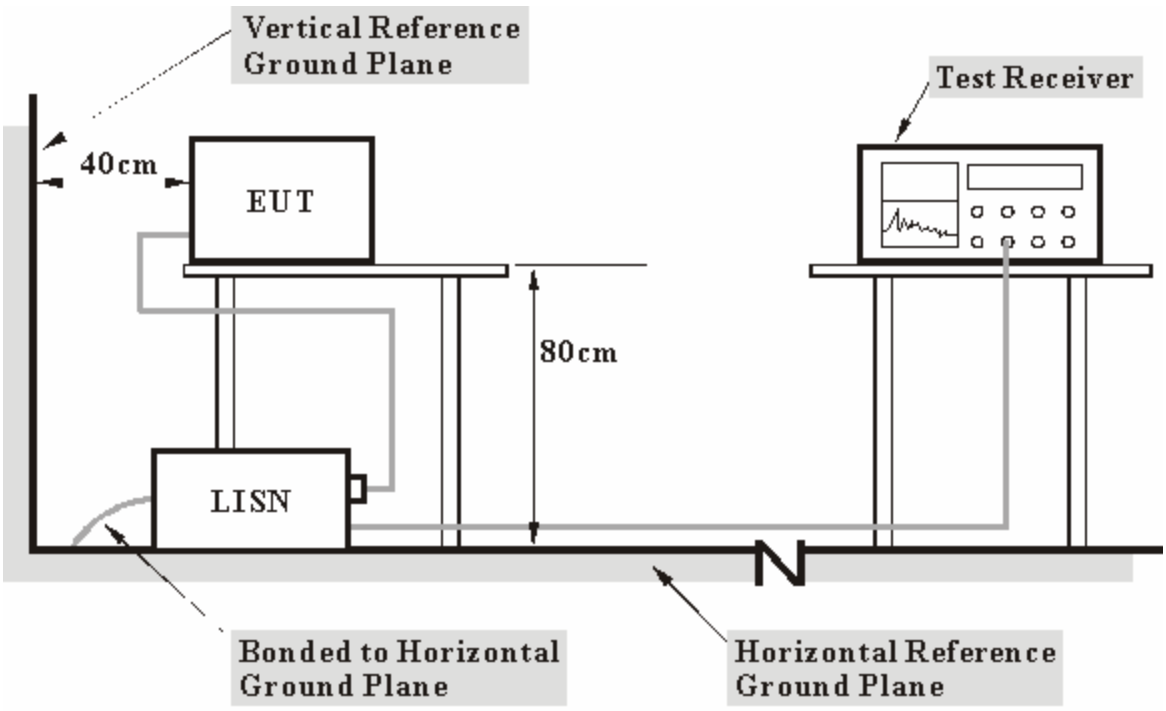
4.1.3 TEST PROCEDURES

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

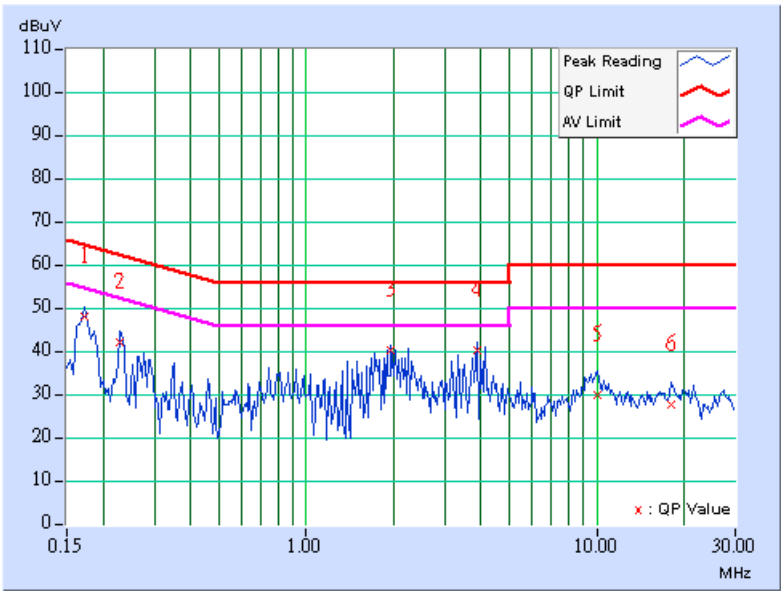
1. Connect the EUT with the support unit 1 (Notebook computer) and placed it on the testing table.
2. The support unit 1 (Notebook computer) ran a test program “ART 53b36” to enable EUT under transmission condition continuously.

4.1.6 TEST RESULTS

MODULATION TYPE	CCK	**CHANNEL**	Channel 1
PHASE	Line (L)	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TRANSFER RATE**	1Mbps
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 970hPa	**TESTED BY**	Rex 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	0.173	9.60	37.93	-	47.53	-	64.79	54.79	-17.26	-
2	0.228	9.60	32.16	-	41.76	-	62.52	52.52	-20.76	-
3	1.965	9.70	30.13	-	39.83	-	56.00	46.00	-16.17	-
4	3.867	9.70	30.33	-	40.03	-	56.00	46.00	-15.97	-
5	10.109	9.90	20.05	-	29.95	-	60.00	50.00	-30.05	-
6	18.070	10.10	17.70	-	27.80	-	60.00	50.00	-32.20	-

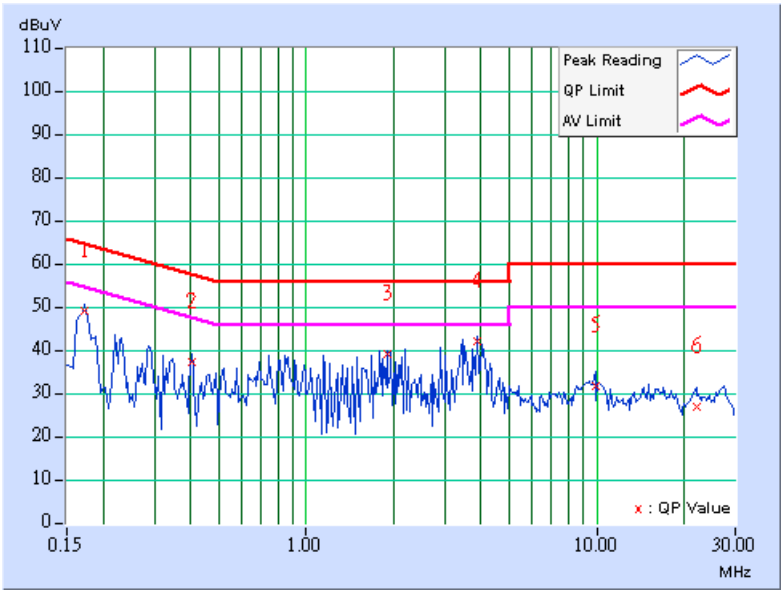
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



MODULATION TYPE	CCK	**CHANNEL**	Channel 1
PHASE	Neutral (N)	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TRANSFER RATE**	1Mbps
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 970hPa	**TESTED BY**	Rex 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	0.173	9.60	38.99	-	48.59	-	64.79	54.79	-16.20	-
2	0.404	9.60	27.25	-	36.85	-	57.77	47.77	-20.92	-
3	1.902	9.69	29.14	-	38.83	-	56.00	46.00	-17.17	-
4	**3.867**	**9.70**	**32.02**	**-**	**41.72**	**-**	**56.00**	**46.00**	**-14.28**	**-**
5	9.926	9.90	21.80	-	31.70	-	60.00	50.00	-28.30	-
6	22.047	10.10	16.94	-	27.04	-	60.00	50.00	-32.96	-

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 03, 2007
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB 9168	138	Dec. 11, 2007
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 05, 2008
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 08, 2009
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 08, 2009
R&S Loop Antenna	HFH2-Z2	881058/15	Nov. 29, 2007
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Jul. 15, 2007
Software	ADT_Radiated_V 5.14	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 (36 months for Biconical and Periodic Antenna)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.

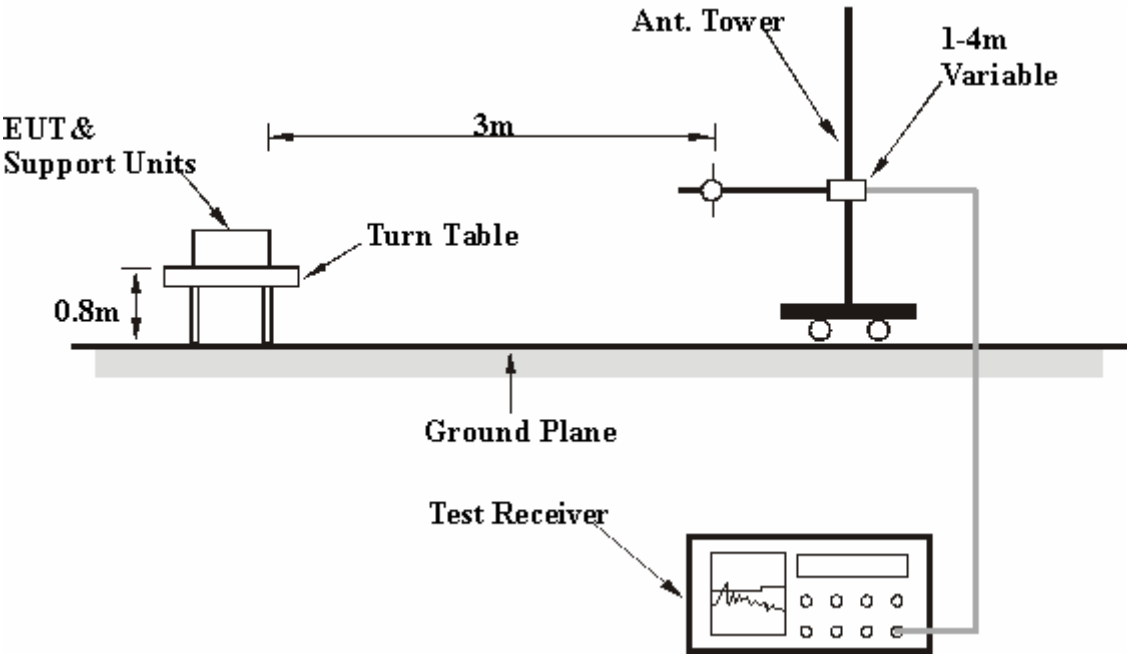
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

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

MODULATION TYPE	DSSS	**CHANNEL**	Channel 11
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**FREQUENCY RANGE**	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH, 965hPa	**TRANSFER RATE**	1Mbps
TESTED BY	Rex Huang	**DETECTOR FUNCTION**	Quasi-Peak, 120kHz

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	199.96	28.60 QP	43.50	-14.90	1.85 H	195	17.00	11.60
2	239.96	26.60 QP	46.00	-19.40	1.74 H	55	13.30	13.30
3	400.02	28.60 QP	46.00	-17.40	1.58 H	66	9.60	19.00
4	480.03	31.30 QP	46.00	-14.70	1.00 H	171	10.00	21.20
5	640.02	31.20 QP	46.00	-14.80	1.37 H	326	6.20	24.90
6	960.00	33.60 QP	46.00	-12.40	1.18 H	236	3.70	29.90

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	200.03	30.00 QP	43.50	-13.50	1.00 V	85	18.40	11.60
2	240.03	24.90 QP	46.00	-21.10	1.00 V	254	11.60	13.30
3	400.04	29.00 QP	46.00	-17.00	1.00 V	54	10.00	19.00
4	480.05	31.90 QP	46.00	-14.10	1.00 V	147	10.70	21.20
5	640.02	29.30 QP	46.00	-16.70	1.00 V	218	4.40	24.90
6	960.00	31.20 QP	46.00	-14.80	1.23 V	344	1.30	29.90

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.

4.2.7 TEST RESULTS - DSSS

802.11b DSSS modulation

MODE	Channel 1	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 63%RH, 965hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2288.00	49.20 PK	74.00	-24.80	1.74 H	312	17.70	31.50
1	2288.00	44.70 AV	54.00	-9.30	1.74 H	312	13.20	31.50
2	2386.00	59.70 PK	74.00	-14.30	1.34 H	266	27.80	31.90
2	2386.00	49.50 AV	54.00	-4.50	1.34 H	266	17.60	31.90
3	*2412.00	105.80 PK			1.34 H	266	73.80	32.00
3	*2412.00	101.10 AV			1.34 H	266	69.10	32.00
4	2640.00	54.70 PK	74.00	-19.30	1.73 H	320	22.10	32.60
4	2640.00	51.70 AV	54.00	-2.30	1.73 H	320	19.10	32.60
5	4824.00	54.50 PK	74.00	-19.50	1.81 H	259	18.50	36.00
5	4824.00	51.60 AV	54.00	-2.40	1.81 H	259	15.60	36.00
6	7236.00	55.80 PK	74.00	-18.20	1.48 H	242	13.60	42.20
6	7236.00	43.80 AV	54.00	-10.20	1.48 H	242	1.60	42.20

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	47.90 PK	74.00	-26.10	1.51 V	18	16.40	31.50
1	2288.00	43.00 AV	54.00	-11.00	1.51 V	18	11.50	31.50
2	2386.00	59.40 PK	74.00	-14.60	1.20 V	69	27.50	31.90
2	2386.00	47.90 AV	54.00	-6.10	1.20 V	69	16.00	31.90
3	*2412.00	103.70 PK			1.20 V	69	71.70	32.00
3	*2412.00	99.10 AV			1.20 V	69	67.10	32.00
4	2640.00	54.90 PK	74.00	-19.10	1.27 V	21	22.30	32.60
4	2640.00	52.10 AV	54.00	-1.90	1.27 V	21	19.50	32.60
5	4824.00	55.20 PK	74.00	-18.80	1.84 V	298	19.20	36.00
5	4824.00	52.30 AV	54.00	-1.70	1.84 V	298	16.30	36.00
6	7236.00	53.70 PK	74.00	-20.30	1.26 V	243	11.50	42.20
6	7236.00	39.60 AV	54.00	-14.40	1.26 V	243	-2.60	42.20

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. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

MODE	Channel 6	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 63%RH, 965hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2288.00	50.10 PK	74.00	-23.90	1.75 H	312	18.60	31.50
1	2288.00	46.50 AV	54.00	-7.50	1.75 H	312	15.00	31.50
2	*2437.00	104.60 PK			1.34 H	267	72.50	32.10
2	*2437.00	99.80 AV			1.34 H	267	67.70	32.10
3	2640.00	54.70 PK	74.00	-19.30	1.73 H	320	22.10	32.60
3	2640.00	51.70 AV	54.00	-2.30	1.73 H	320	19.10	32.60
4	4874.00	54.80 PK	74.00	-19.20	1.72 H	245	18.70	36.10
4	4874.00	51.90 AV	54.00	-2.10	1.72 H	245	15.80	36.10
5	7311.00	55.60 PK	74.00	-18.40	1.46 H	273	13.10	42.50
5	7311.00	43.80 AV	54.00	-10.20	1.46 H	273	1.30	42.50

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	47.80 PK	74.00	-26.20	1.51 V	19	16.30	31.50
1	2288.00	43.00 AV	54.00	-11.00	1.51 V	19	11.50	31.50
2	*2437.00	102.20 PK			1.22 V	126	70.10	32.10
2	*2437.00	97.50 AV			1.22 V	126	65.40	32.10
3	2640.00	54.70 PK	74.00	-19.30	1.27 V	22	22.10	32.60
3	2640.00	51.90 AV	54.00	-2.10	1.27 V	22	19.30	32.60
4	4874.00	55.60 PK	74.00	-18.40	1.85 V	294	19.50	36.10
4	4874.00	52.90 AV	54.00	-1.10	1.85 V	294	16.80	36.10
5	7311.00	53.50 PK	74.00	-20.50	1.31 V	249	11.00	42.50
5	7311.00	39.80 AV	54.00	-14.20	1.31 V	249	-2.70	42.50

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. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

MODE	Channel 11	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 63%RH, 965hPa	**TESTED BY**	Phoenix Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

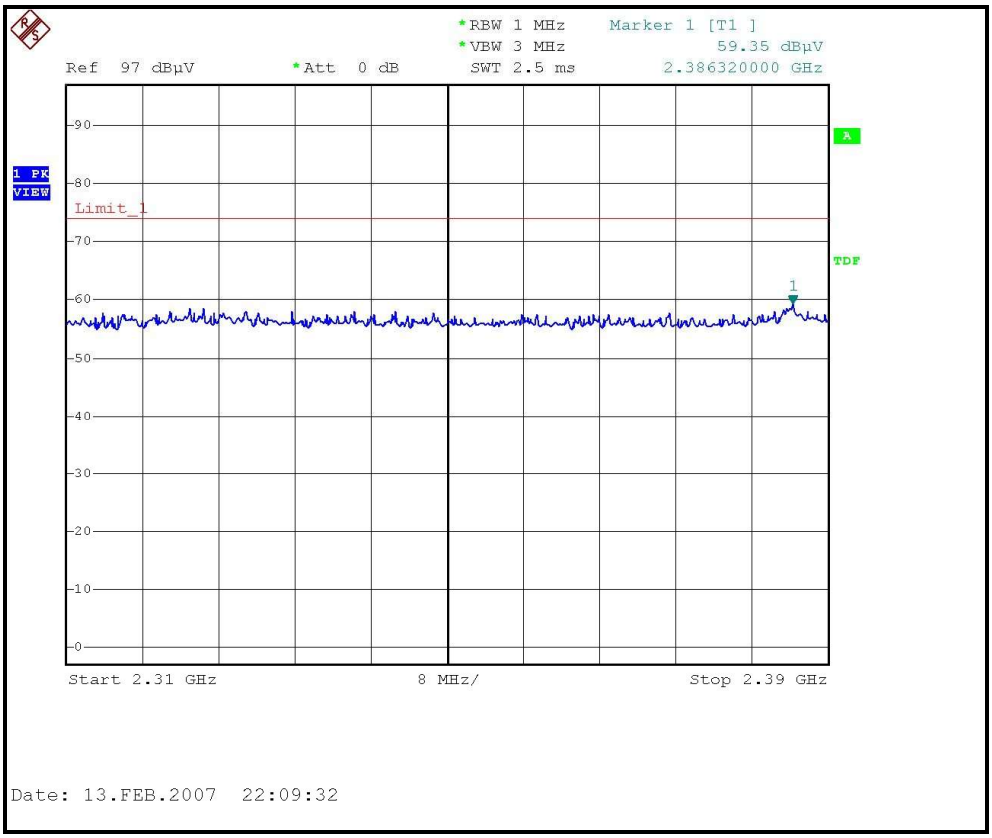
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2288.00	50.70 PK	74.00	-23.30	1.75 H	312	19.20	31.50
1	2288.00	46.70 AV	54.00	-7.30	1.75 H	312	15.20	31.50
2	*2462.00	102.30 PK			1.34 H	293	70.10	32.20
2	*2462.00	98.40 AV			1.34 H	293	66.20	32.20
3	2483.50	60.10 PK	74.00	-13.90	1.34 H	293	27.80	32.30
3	2483.50	47.90 AV	54.00	-6.10	1.34 H	293	15.60	32.30
4	2640.00	54.60 PK	74.00	-19.40	1.74 H	319	22.00	32.60
4	2640.00	51.50 AV	54.00	-2.50	1.74 H	319	18.90	32.60
5	4924.00	52.70 PK	74.00	-21.30	1.81 H	329	16.50	36.20
5	4924.00	49.80 AV	54.00	-4.20	1.81 H	329	13.60	36.20
6	7386.00	55.30 PK	74.00	-18.70	1.35 H	287	12.50	42.80
6	7386.00	43.50 AV	54.00	-10.50	1.35 H	287	0.70	42.80

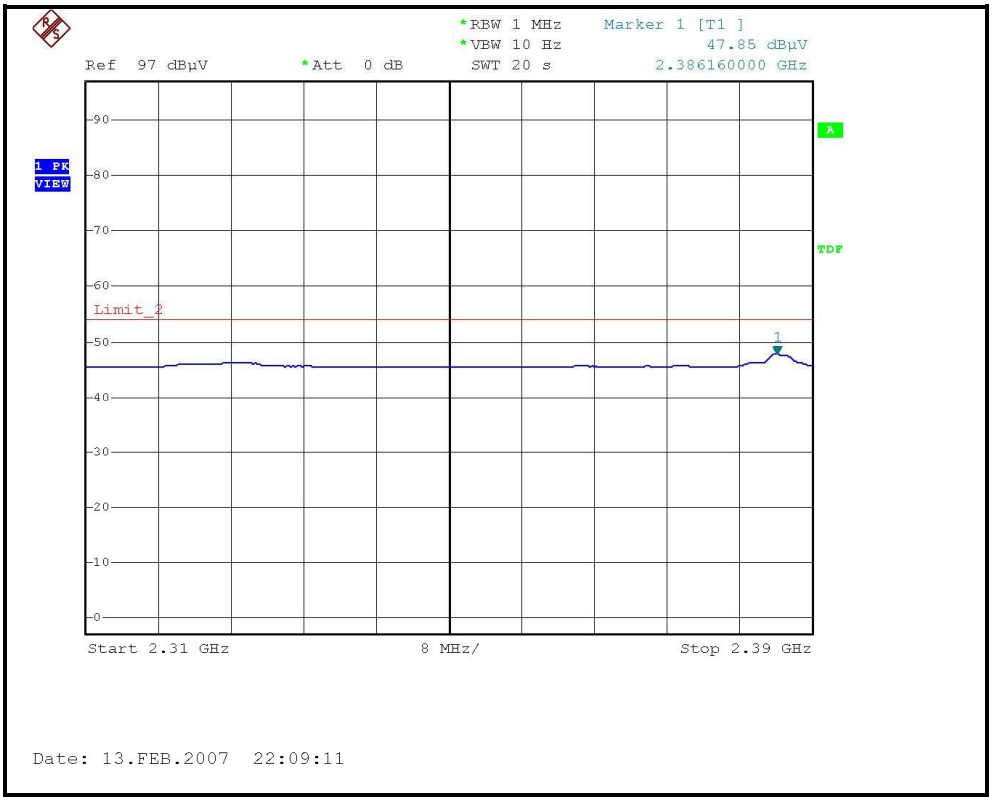
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

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	2288.00	48.00 PK	74.00	-26.00	1.52 V	18	16.50	31.50
1	2288.00	43.10 AV	54.00	-10.90	1.52 V	18	11.60	31.50
2	*2462.00	101.90 PK			1.17 V	113	69.70	32.20
2	*2462.00	97.10 AV			1.17 V	113	64.90	32.20
3	2483.50	58.50 PK	74.00	-15.50	1.17 V	113	26.20	32.30
3	2483.50	47.10 AV	54.00	-6.90	1.17 V	113	14.80	32.30
4	2640.00	54.50 PK	74.00	-19.50	1.27 V	21	21.90	32.60
4	2640.00	51.80 AV	54.00	-2.20	1.27 V	21	19.20	32.60
5	4924.00	55.50 PK	74.00	-18.50	1.48 V	291	19.30	36.20
5	**4924.00**	**53.50 AV**	**54.00**	**-0.50**	**1.48 V**	**291**	**17.30**	**36.20**
6	7386.00	53.10 PK	74.00	-20.90	1.34 V	271	10.30	42.80
6	7386.00	39.50 AV	54.00	-14.50	1.34 V	271	-3.30	42.80

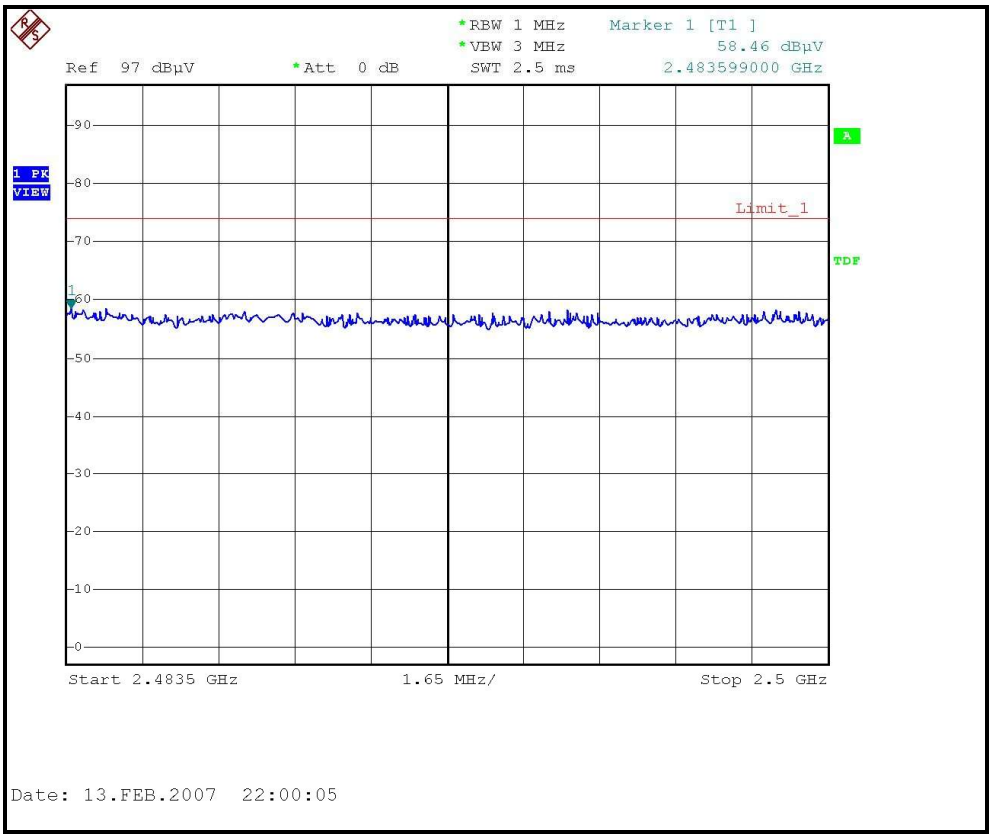
REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247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

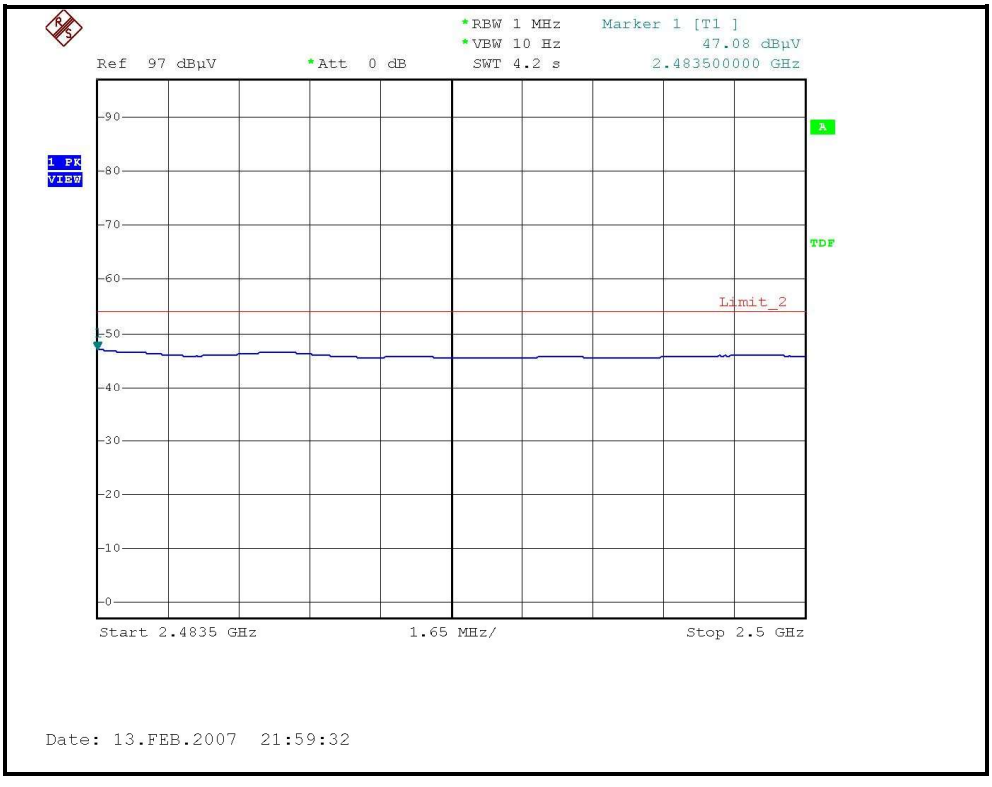
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)





RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL)





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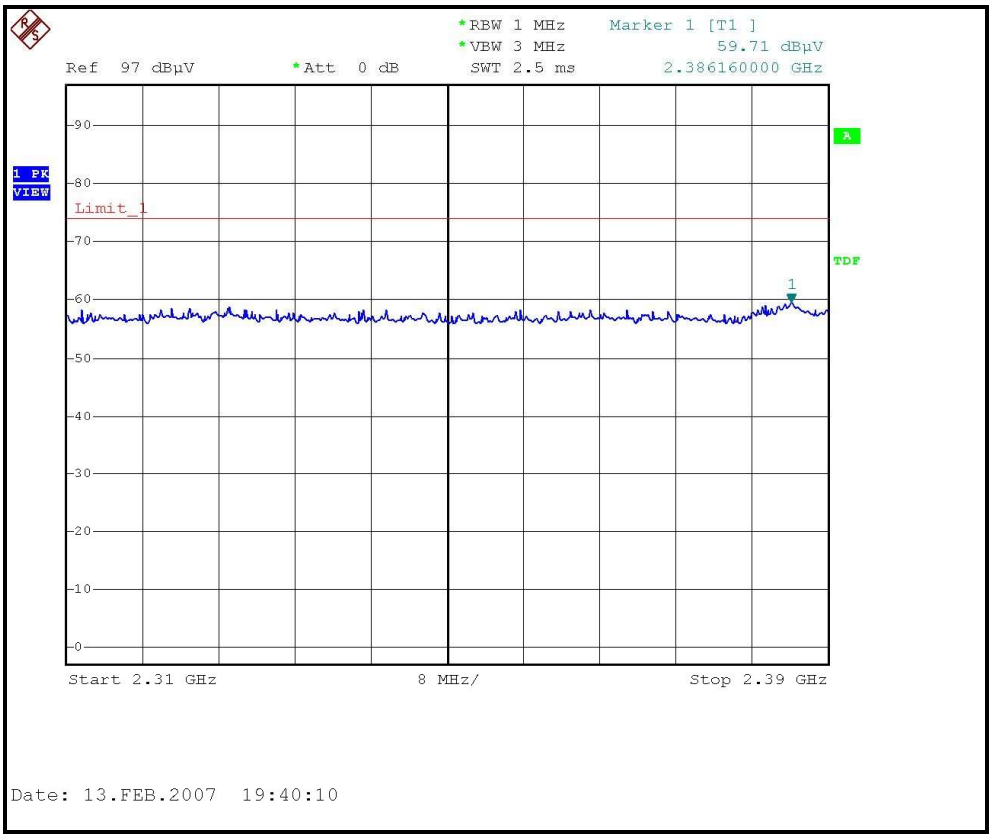
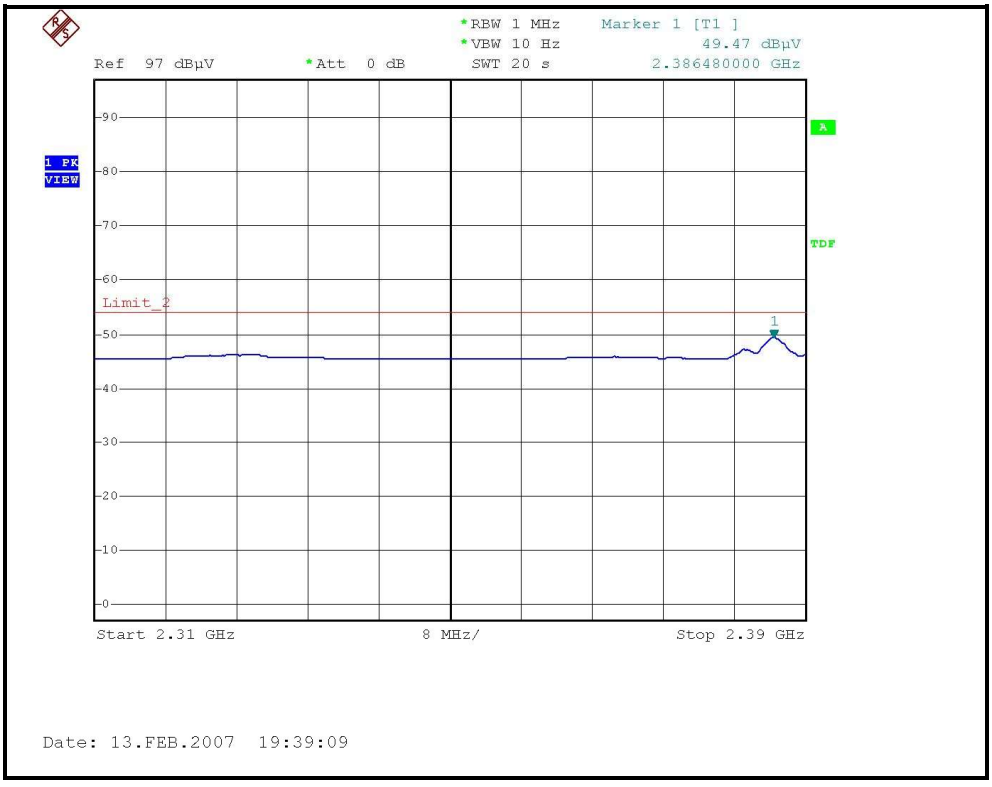
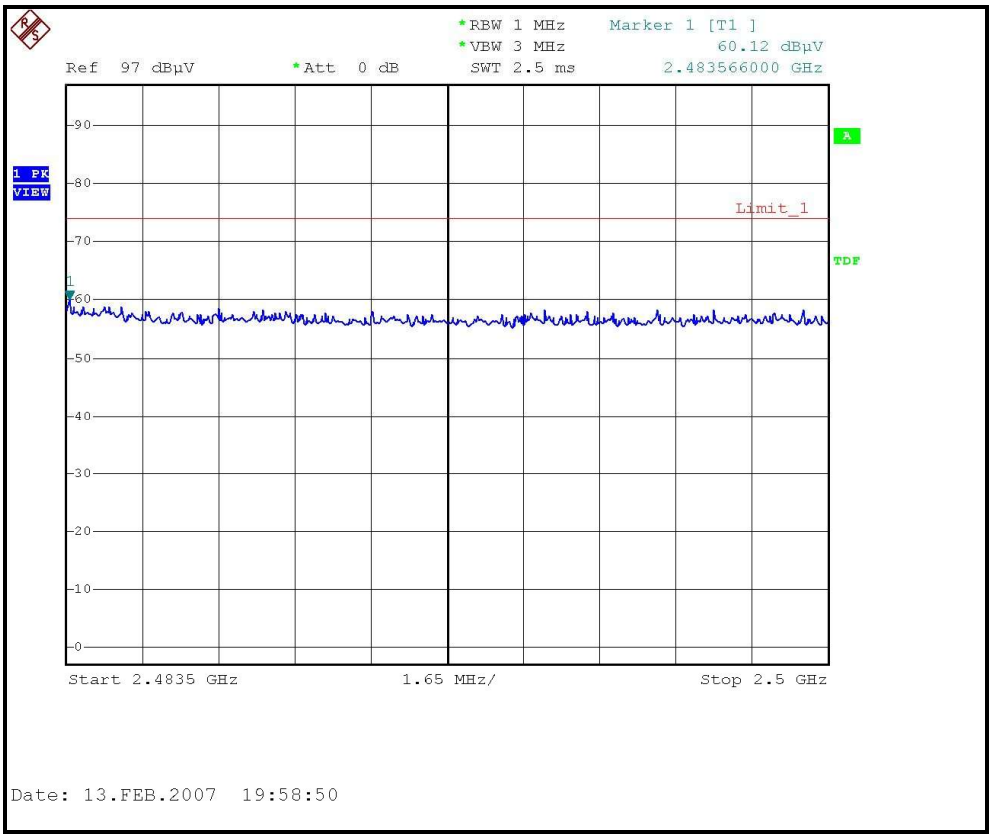
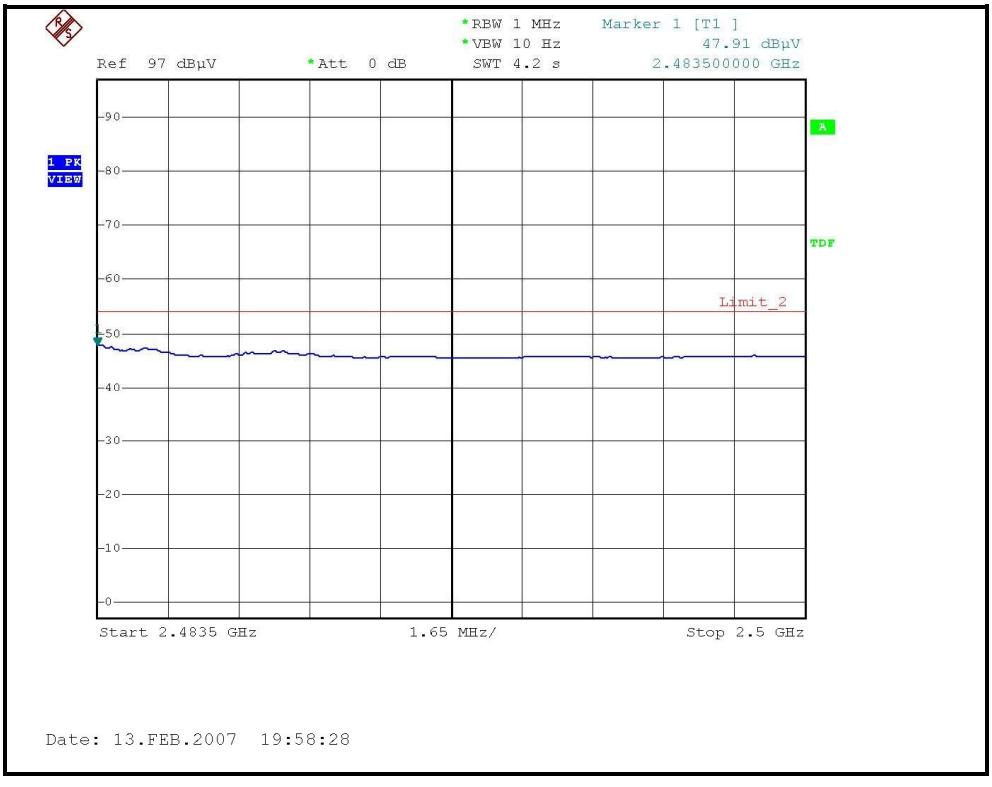




RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL)





4.2.8 TEST RESULTS - OFDM

802.11g Normal OFDM modulation

MODE	Channel 1	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 63%RH, 965hPa	**TESTED BY**	Rex Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2288.00	52.00 PK	74.00	-22.00	1.75 H	311	20.50	31.50
1	2288.00	48.20 AV	54.00	-5.80	1.75 H	311	16.70	31.50
2	2390.00	67.00 PK	74.00	-7.00	1.32 H	267	35.10	31.90
2	2390.00	52.80 AV	54.00	-1.20	1.32 H	267	20.90	31.90
3	*2412.00	105.50 PK			1.49 H	96	73.50	32.00
3	*2412.00	95.00 AV			1.49 H	96	63.00	32.00
4	2640.00	54.40 PK	74.00	-19.60	1.73 H	320	21.80	32.60
4	2640.00	51.40 AV	54.00	-2.60	1.73 H	320	18.80	32.60
5	4824.00	58.70 PK	74.00	-15.30	1.80 H	256	22.70	36.00
5	4824.00	42.20 AV	54.00	-11.80	1.80 H	256	6.20	36.00
6	7236.00	59.20 PK	74.00	-14.80	1.49 H	238	17.00	42.20
6	7236.00	43.40 AV	54.00	-10.60	1.49 H	238	1.20	42.20

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	49.70 PK	74.00	-24.30	1.52 V	18	18.20	31.50
1	2288.00	45.30 AV	54.00	-8.70	1.52 V	18	13.80	31.50
2	2390.00	66.00 PK	74.00	-8.00	1.20 V	68	34.10	31.90
2	2390.00	51.60 AV	54.00	-2.40	1.20 V	68	19.70	31.90
3	*2412.00	104.20 PK			1.52 V	100	72.20	32.00
3	*2412.00	93.70 AV			1.52 V	100	61.70	32.00
4	2640.00	54.80 PK	74.00	-19.20	1.27 V	22	22.20	32.60
4	2640.00	52.30 AV	54.00	-1.70	1.27 V	22	19.70	32.60
5	4824.00	60.60 PK	74.00	-13.40	1.51 V	299	24.60	36.00
5	4824.00	45.10 AV	54.00	-8.90	1.51 V	299	9.10	36.00
6	7236.00	53.40 PK	74.00	-20.60	1.29 V	253	11.20	42.20
6	7236.00	39.30 AV	54.00	-14.70	1.29 V	253	-2.90	42.20

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. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

MODE	Channel 6	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	23 deg. C, 63%RH, 965hPa	**TESTED BY**	Rex Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2288.00	50.40 PK	74.00	-23.60	1.75 H	312	18.90	31.50
1	2288.00	46.60 AV	54.00	-7.40	1.75 H	312	15.10	31.50
2	*2437.00	105.90 PK			1.49 H	96	73.80	32.10
2	*2437.00	95.30 AV			1.49 H	96	63.20	32.10
3	2640.00	54.60 PK	74.00	-19.40	1.73 H	319	22.00	32.60
3	2640.00	51.40 AV	54.00	-2.60	1.73 H	319	18.80	32.60
4	4874.00	56.60 PK	74.00	-17.40	1.73 H	247	20.50	36.10
4	4874.00	40.80 AV	54.00	-13.20	1.73 H	247	4.70	36.10
5	7311.00	58.60 PK	74.00	-15.40	1.39 H	285	16.10	42.50
5	7311.00	42.90 AV	54.00	-11.10	1.39 H	285	0.40	42.50

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	49.60 PK	74.00	-24.40	1.51 V	19	18.10	31.50
1	2288.00	45.40 AV	54.00	-8.60	1.51 V	19	13.90	31.50
2	*2437.00	105.60 PK			1.22 V	127	73.50	32.10
2	*2437.00	95.00 AV			1.22 V	127	62.90	32.10
3	2640.00	54.40 PK	74.00	-19.60	1.27 V	22	21.80	32.60
3	2640.00	51.80 AV	54.00	-2.20	1.27 V	22	19.20	32.60
4	4874.00	59.30 PK	74.00	-14.70	1.63 V	275	23.20	36.10
4	4874.00	43.90 AV	54.00	-10.10	1.63 V	275	7.80	36.10
5	7311.00	53.60 PK	74.00	-20.40	1.28 V	248	11.10	42.50
5	7311.00	39.70 AV	54.00	-14.30	1.28 V	248	-2.80	42.50

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. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

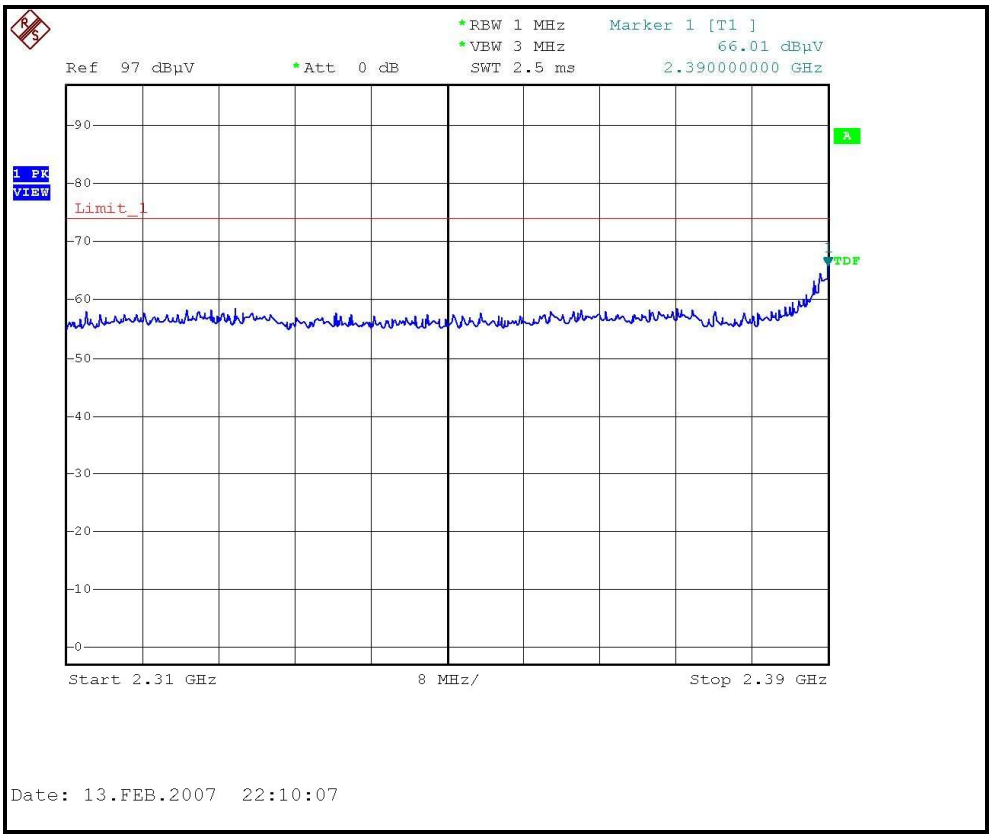
MODE	Channel 11	**FREQUENCY RANGE**	1000~25000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV) 1 MHz
ENVIRONMENTAL CONDITIONS	21 deg. C, 63%RH, 965hPa	**TESTED BY**	Rex Huang

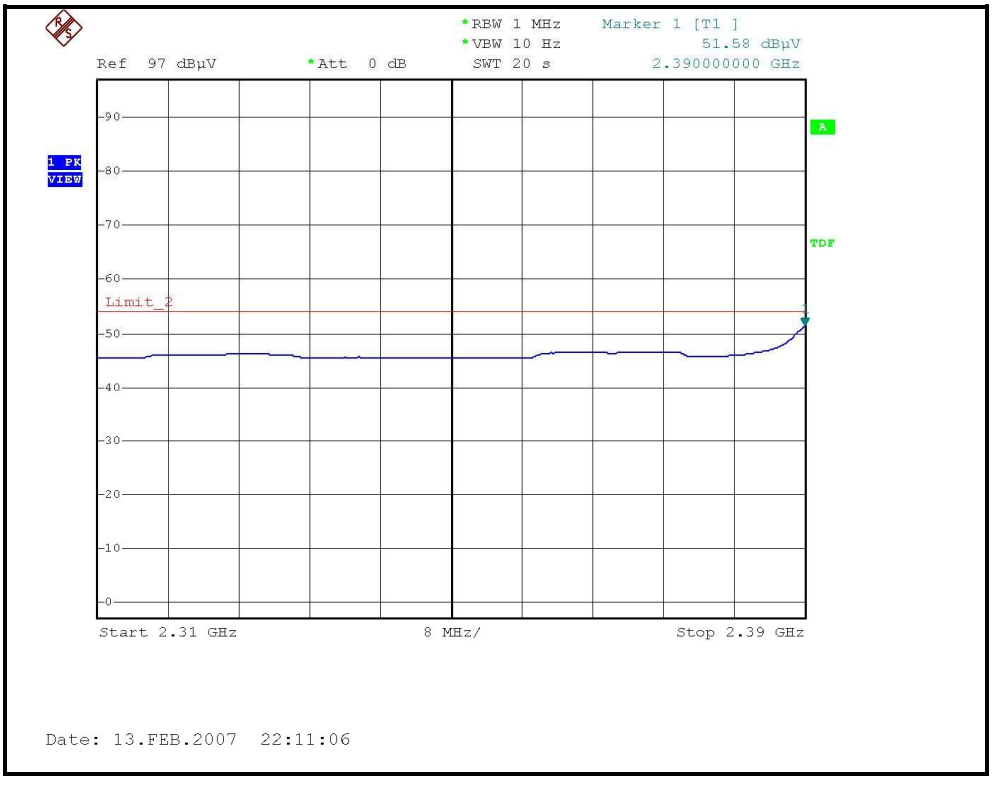
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2288.00	50.70 PK	74.00	-23.30	1.74 H	311	19.20	31.50
1	2288.00	46.50 AV	54.00	-7.50	1.74 H	311	15.00	31.50
2	*2462.00	103.90 PK			1.54 H	108	71.70	32.20
2	*2462.00	93.20 AV			1.54 H	108	60.90	32.20
3	2483.50	67.00 PK	74.00	-7.00	1.34 H	292	34.70	32.30
3	2483.50	52.80 AV	54.00	-1.20	1.34 H	292	20.50	32.30
4	2640.00	54.60 PK	74.00	-19.40	1.73 H	320	22.00	32.60
4	2640.00	51.50 AV	54.00	-2.50	1.73 H	320	18.90	32.60
5	4924.00	56.10 PK	74.00	-17.90	1.48 H	266	19.90	36.20
5	4924.00	41.40 AV	54.00	-12.60	1.48 H	266	5.20	36.20
6	7386.00	58.90 PK	74.00	-15.10	1.37 H	293	16.10	42.80
6	7386.00	43.00 AV	54.00	-11.00	1.37 H	293	0.20	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	2288.00	49.50 PK	74.00	-24.50	1.51 V	18	18.00	31.50
1	2288.00	45.20 AV	54.00	-8.80	1.51 V	18	13.70	31.50
2	*2462.00	103.80 PK			1.14 V	146	71.50	32.20
2	*2462.00	92.80 AV			1.14 V	146	60.60	32.20
3	2483.50	63.00 PK	74.00	-11.00	1.17 V	114	30.70	32.30
3	2483.50	49.10 AV	54.00	-4.90	1.17 V	114	16.80	32.30
4	2640.00	54.60 PK	74.00	-19.40	1.26 V	22	22.00	32.60
4	2640.00	52.00 AV	54.00	-2.00	1.26 V	22	19.40	32.60
5	4924.00	61.60 PK	74.00	-12.40	1.58 V	315	25.40	36.20
5	4924.00	44.60 AV	54.00	-9.40	1.58 V	315	8.40	36.20
6	7386.00	53.30 PK	74.00	-20.70	1.32 V	264	10.50	42.80
6	7386.00	39.60 AV	54.00	-14.40	1.32 V	264	-3.20	42.80

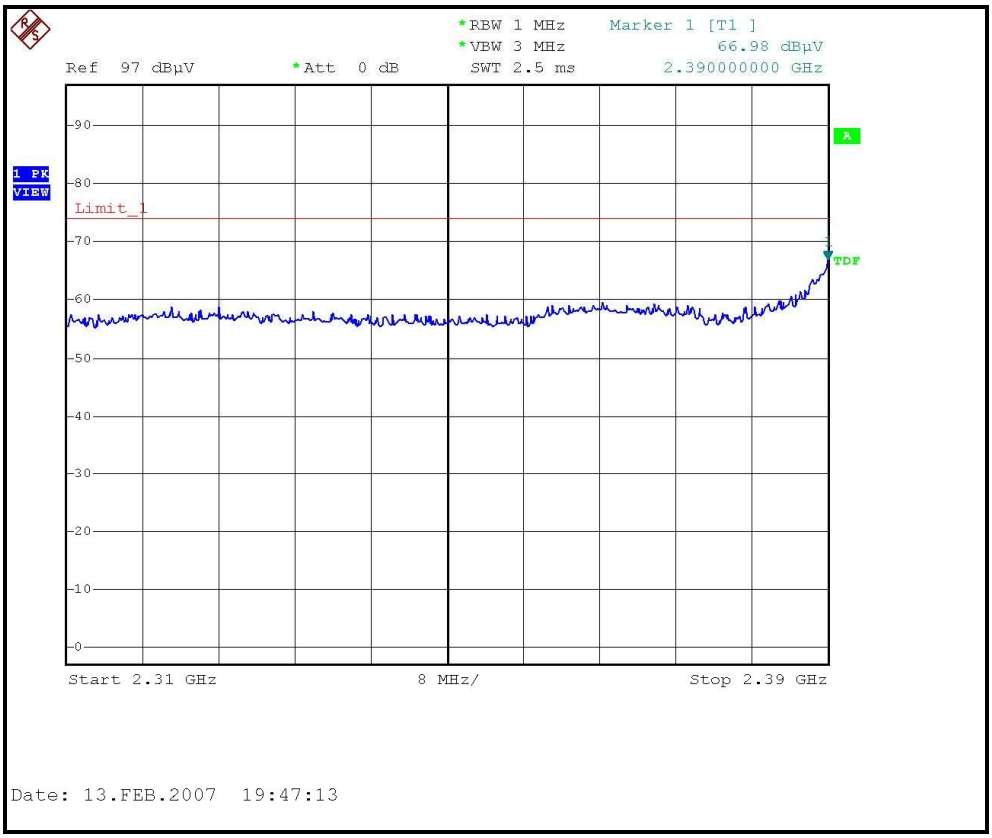
REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247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

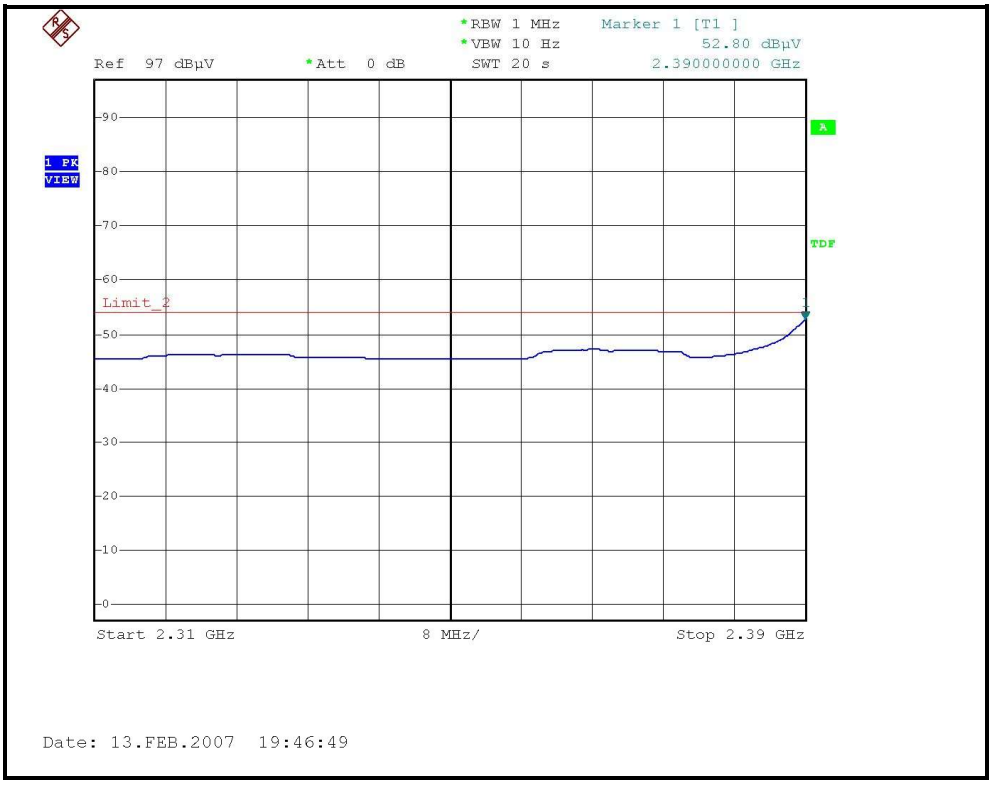
RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL)





RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)





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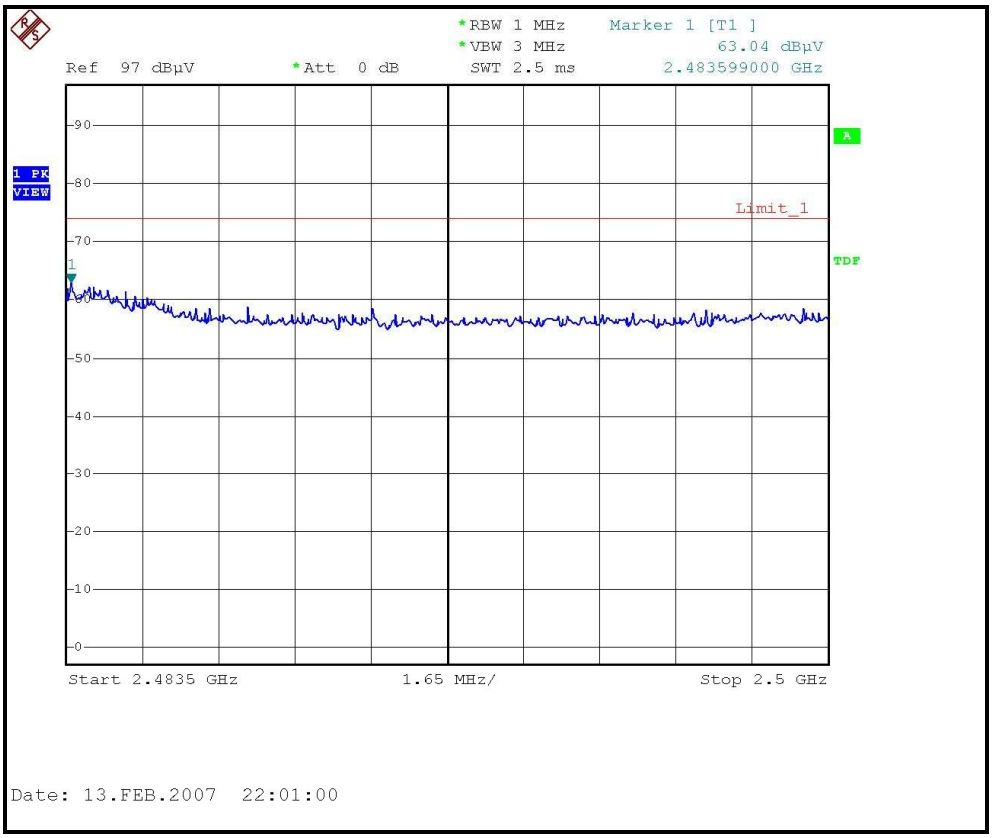
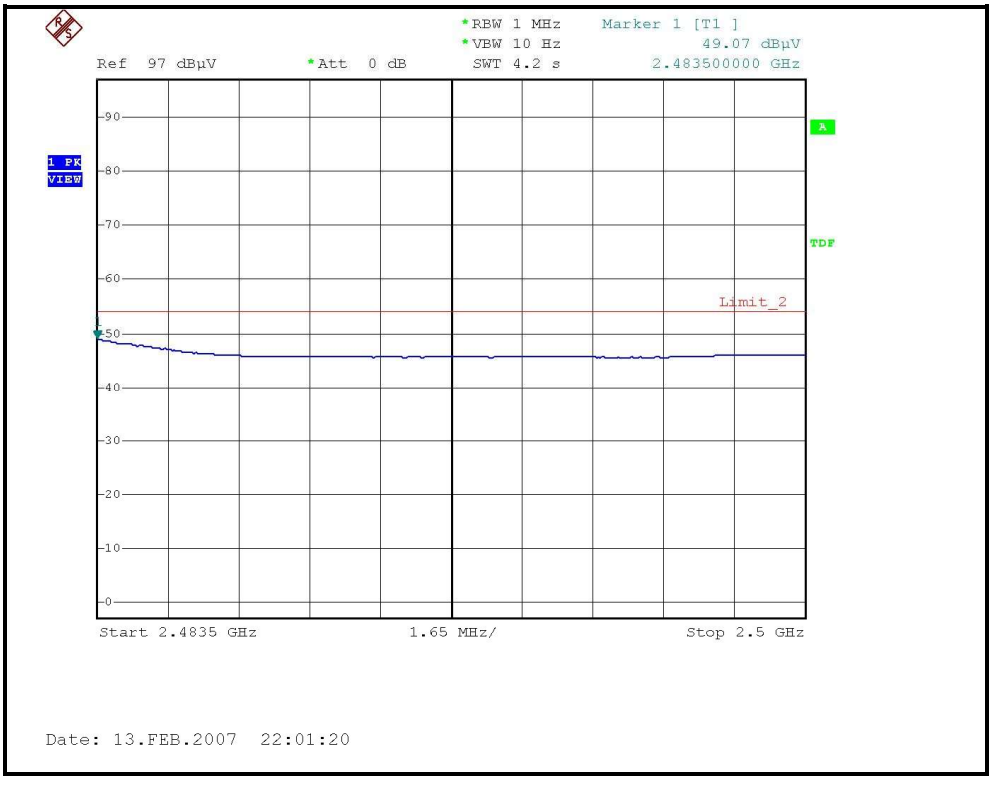
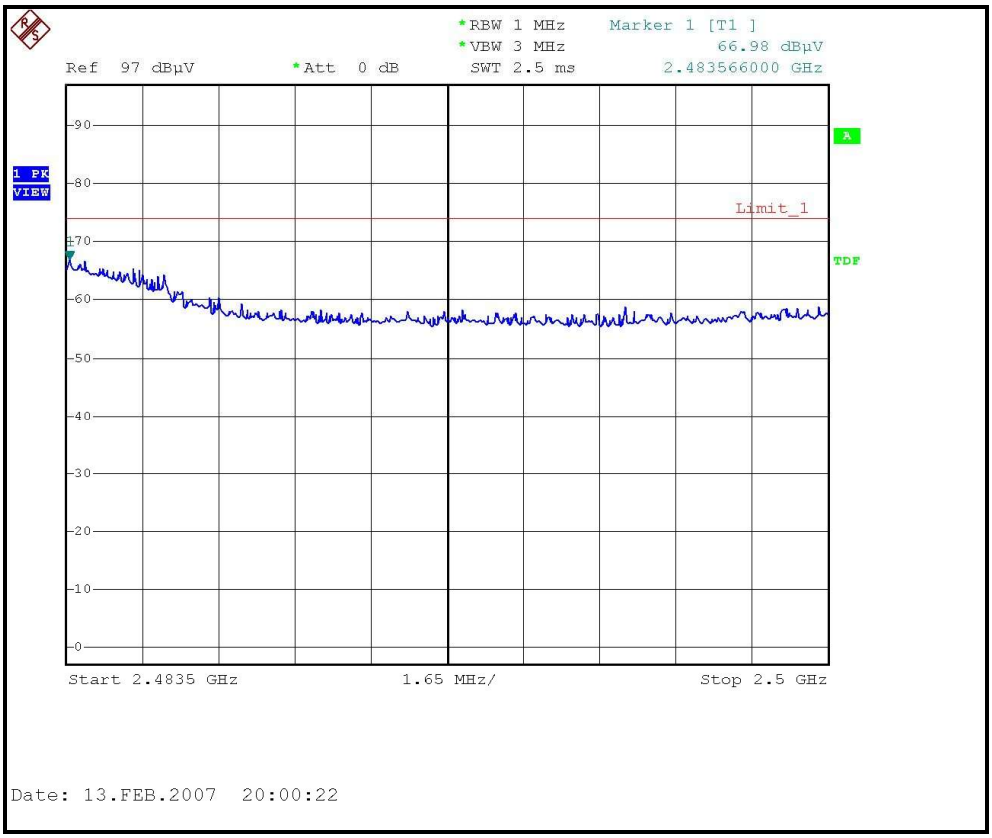
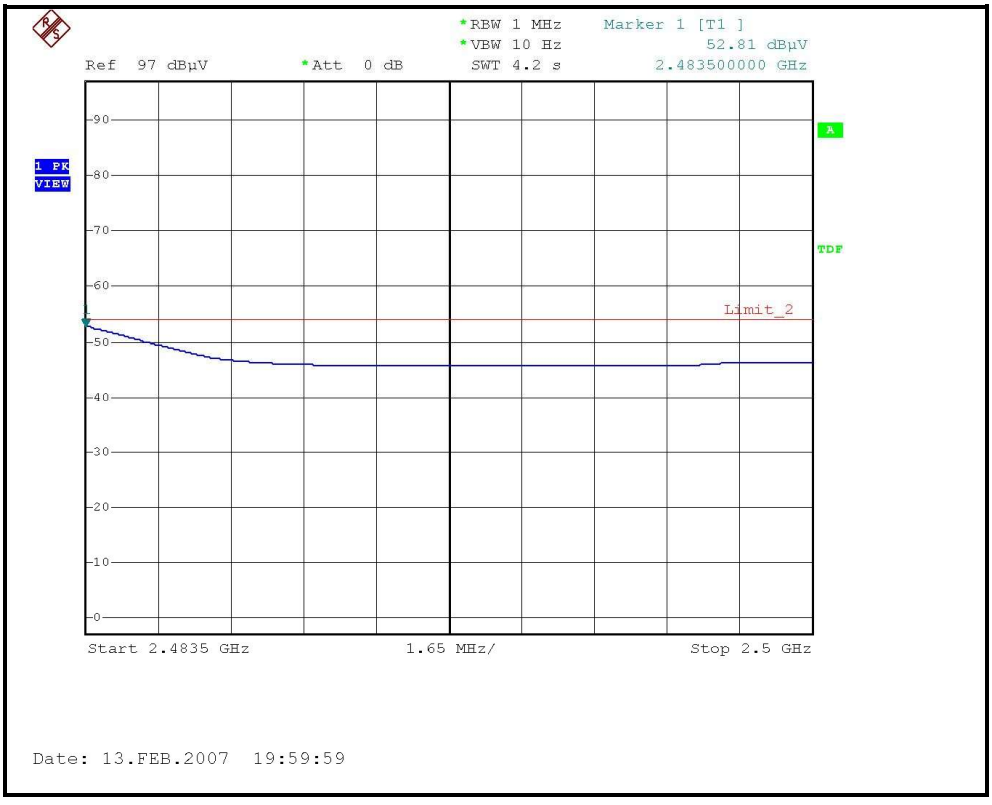




RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL)





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. 15, 2007

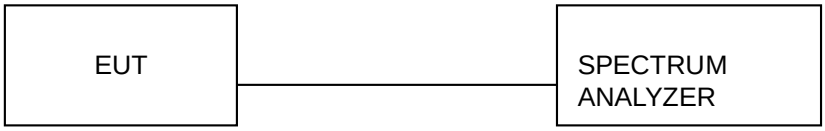
NOTE:

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.

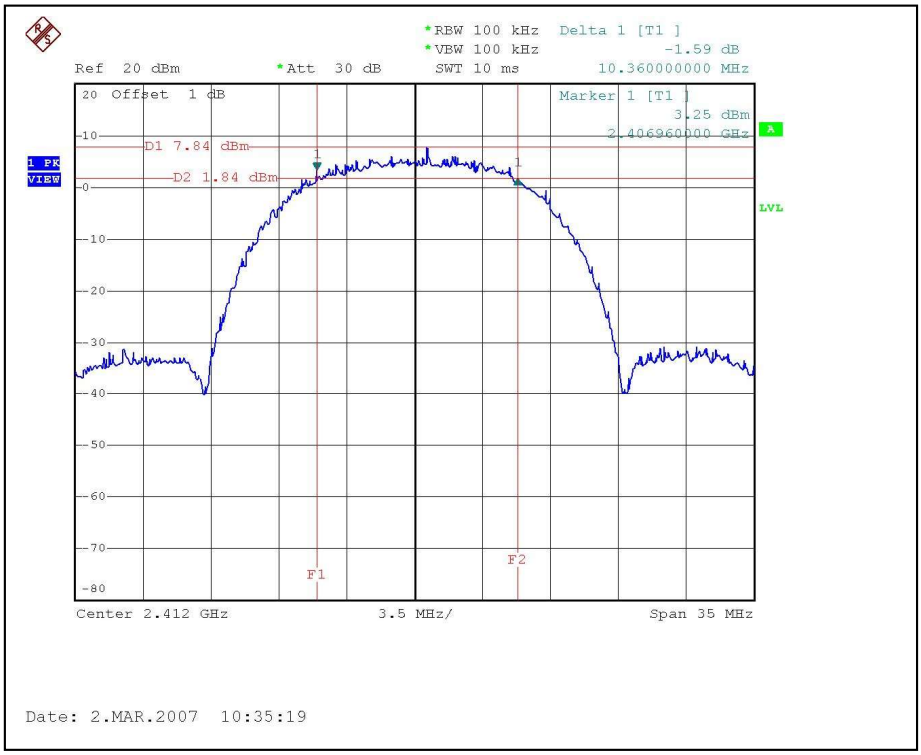
4.3.6 TEST RESULTS –DSSS

802.11b DSSS modulation

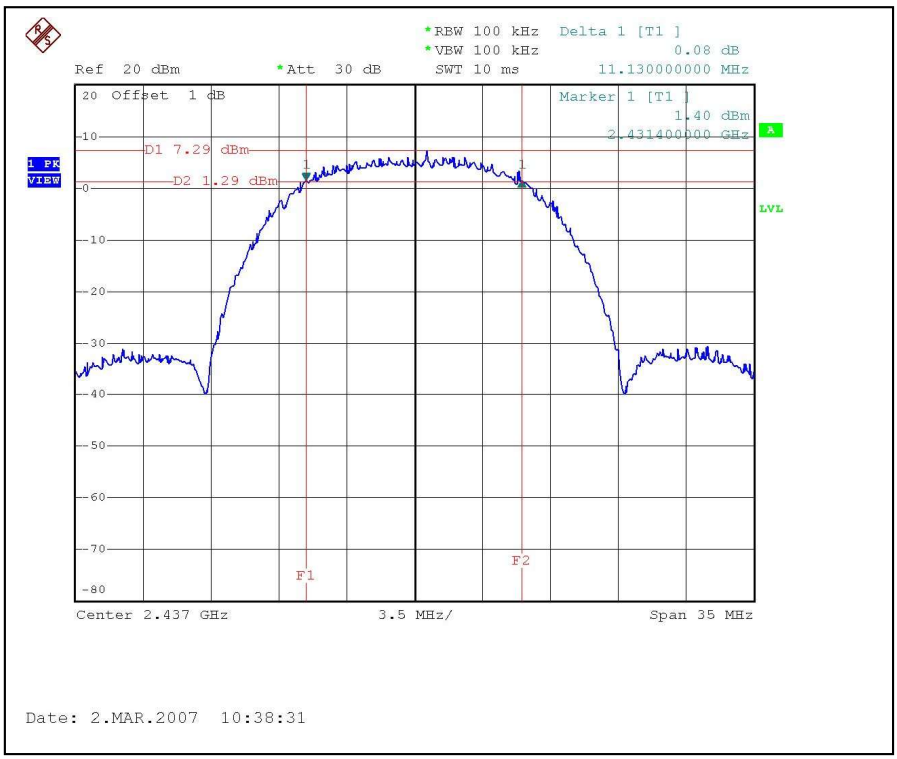
MODULATION TYPE	CCK	**TRANSFER RATE**	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.36	0.5	PASS
6	2437	11.13	0.5	PASS
11	2462	12.04	0.5	PASS

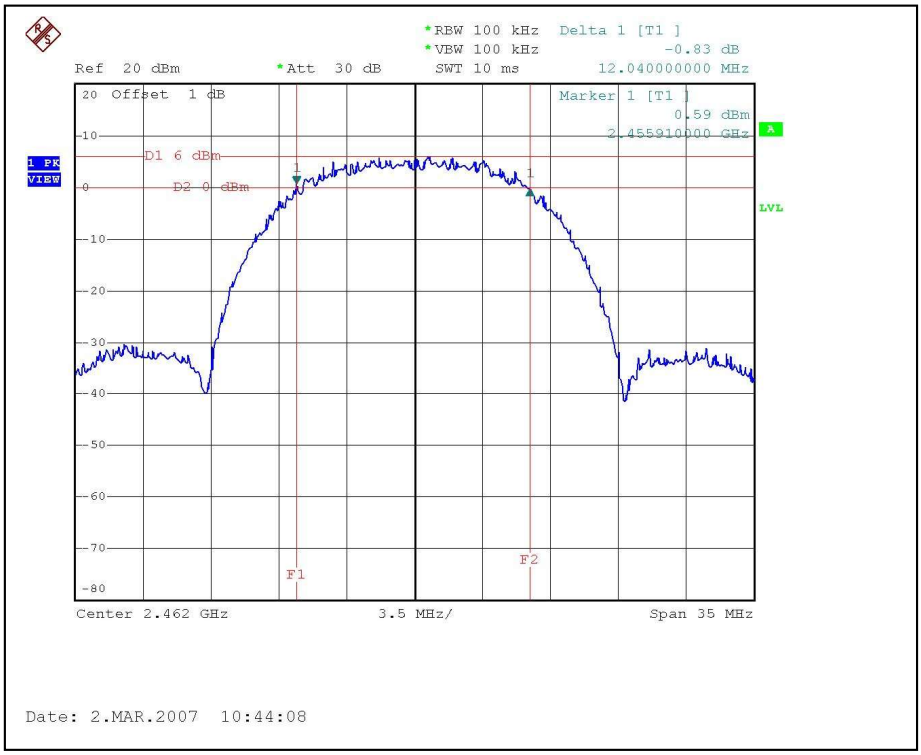
CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
-1.59 dB
10.360000000 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
3.25 dBm
2.406960000 GHz
D1 7.84 dBm
D2 1.84 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.412 GHz
3.5 MHz/
Span 35 MHz
Date: 2.MAR.2007 10:35:19

CH6


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
0.08 dB
11.130000000 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
1.40 dBm
2.431400000 GHz
D1 7.29 dBm
D2 1.29 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.437 GHz
3.5 MHz/
Span 35 MHz
Date: 2.MAR.2007 10:38:31

CH11


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
-0.83 dB
12.040000000 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
0.59 dBm
2.455910000 GHz
D1 6 dBm
D2 0 dBm
1 PK
VIEW
LVL
F1
F2
Center 2.462 GHz
3.5 MHz/
Span 35 MHz
Date: 2.MAR.2007 10:44:08

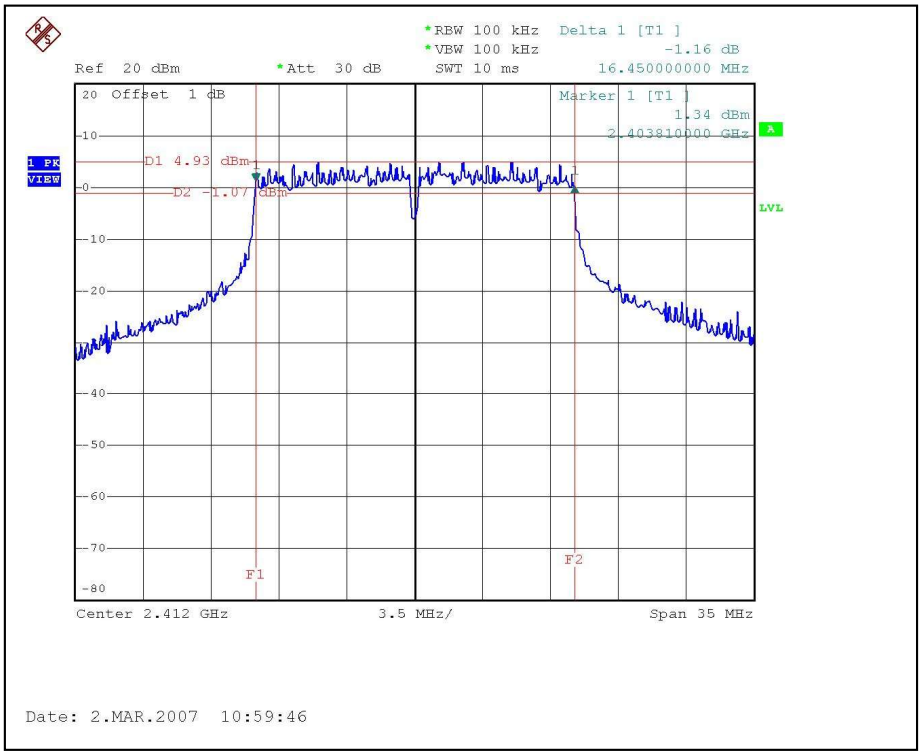
4.3.7 TEST RESULTS-OFDM

802.11g OFDM modulation

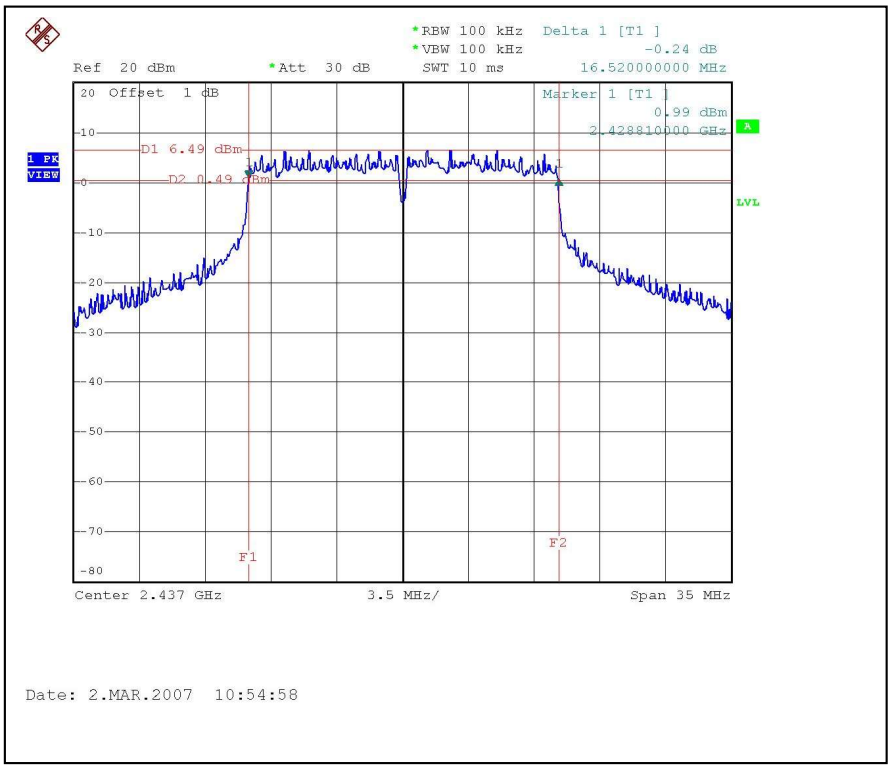
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.45	0.5	PASS
6	2437	16.52	0.5	PASS
11	2462	16.52	0.5	PASS

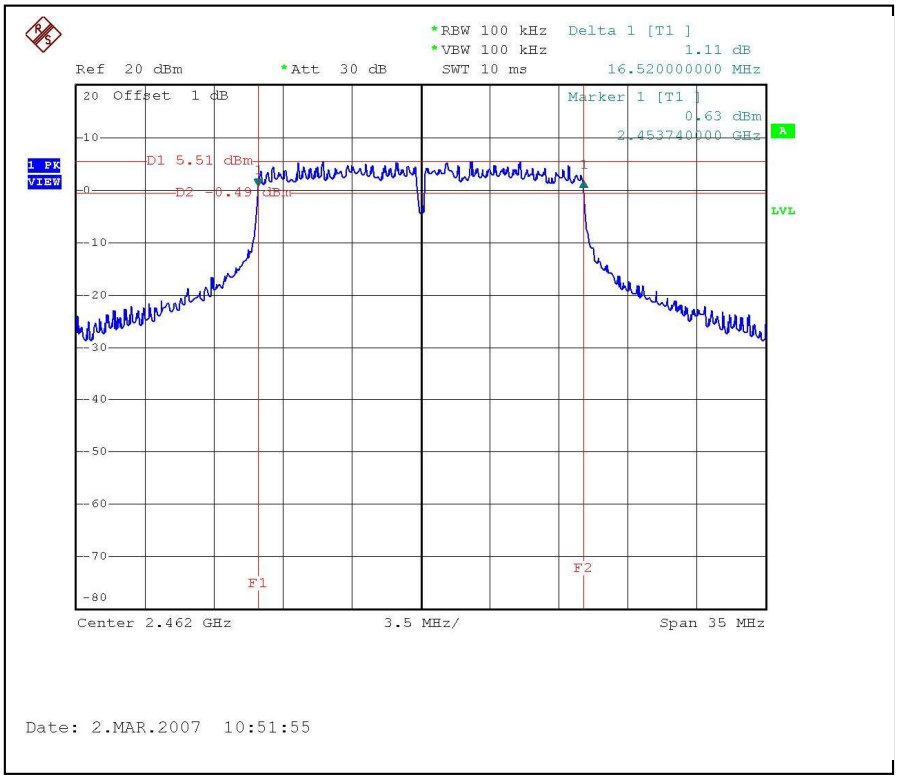
CH1


*RBW 100 kHz
Delta 1 [T1]
*VBW 100 kHz
-1.16 dB
Ref 20 dBm
*Att 30 dB
SWT 10 ms
16.450000000 MHz
20 Offset 1 dB
Marker 1 [T1]
1.34 dBm
2.403810000 GHz
D1 4.93 dBm
D2 -1.07 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.412 GHz
3.5 MHz/
Span 35 MHz
Date: 2.MAR.2007 10:59:46

CH6


*RBW 100 kHz
Delta 1 [T1]
*VBW 100 kHz
-0.24 dB
Ref 20 dBm
*Att 30 dB
SWT 10 ms
16.520000000 MHz
20 Offset 1 dB
Marker 1 [T1]
0.99 dBm
2.428810000 GHz
D1 6.49 dBm
D2 0.49 dBm
1 PK VIEW
A
LVL
F1
F2
Center 2.437 GHz
3.5 MHz/
Span 35 MHz
Date: 2.MAR.2007 10:54:58

CH11


*RBW 100 kHz
Delta 1 [T1]
*VBW 100 kHz
1.11 dB
Ref 20 dBm
*Att 30 dB
SWT 10 ms
16.520000000 MHz
20 Offset 1 dB
Marker 1 [T1]
0.63 dBm
2.453740000 GHz
D1 5.51 dBm
D2 -0.49 dBm
1 PK
VIEW
A
LVL
10
0
-10
-20
-30
-40
-50
-60
-70
-80
F1
F2
Center 2.462 GHz
3.5 MHz/
Span 35 MHz
Date: 2.MAR.2007 10:51:55

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

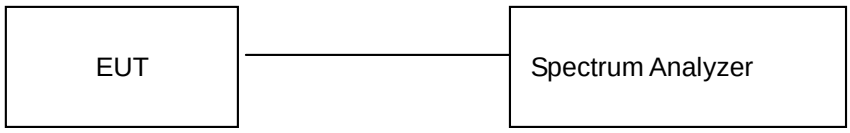
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ADVANTEST SPECTRUM ANALYZER	U3772	160100280	April 10.2007

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 sample 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

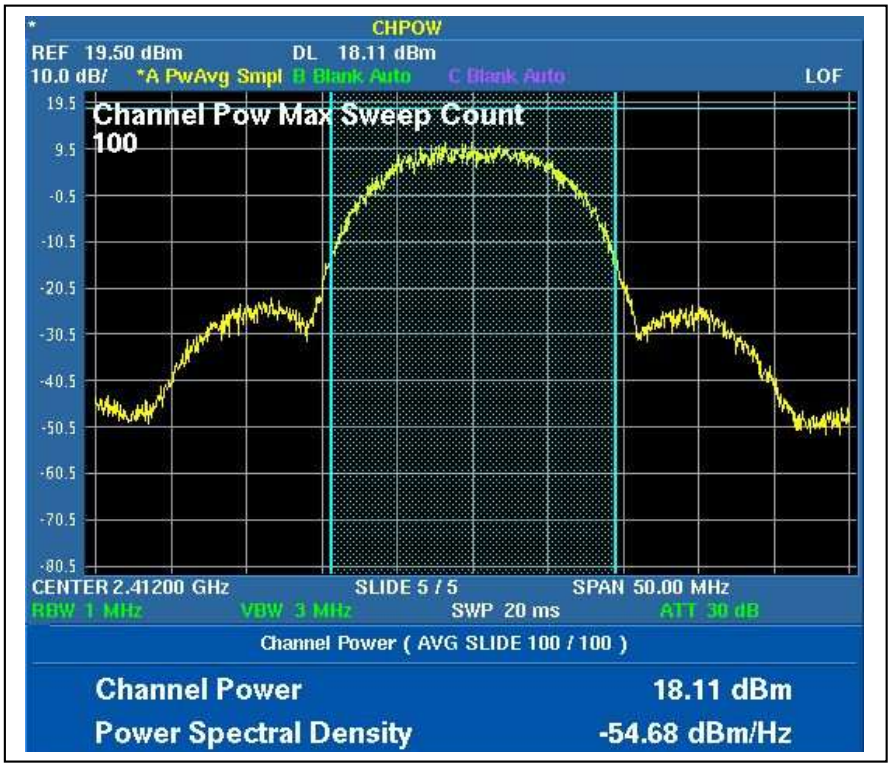
4.4.6 TEST RESULTS – DSSS

802.11b DSSS modulation

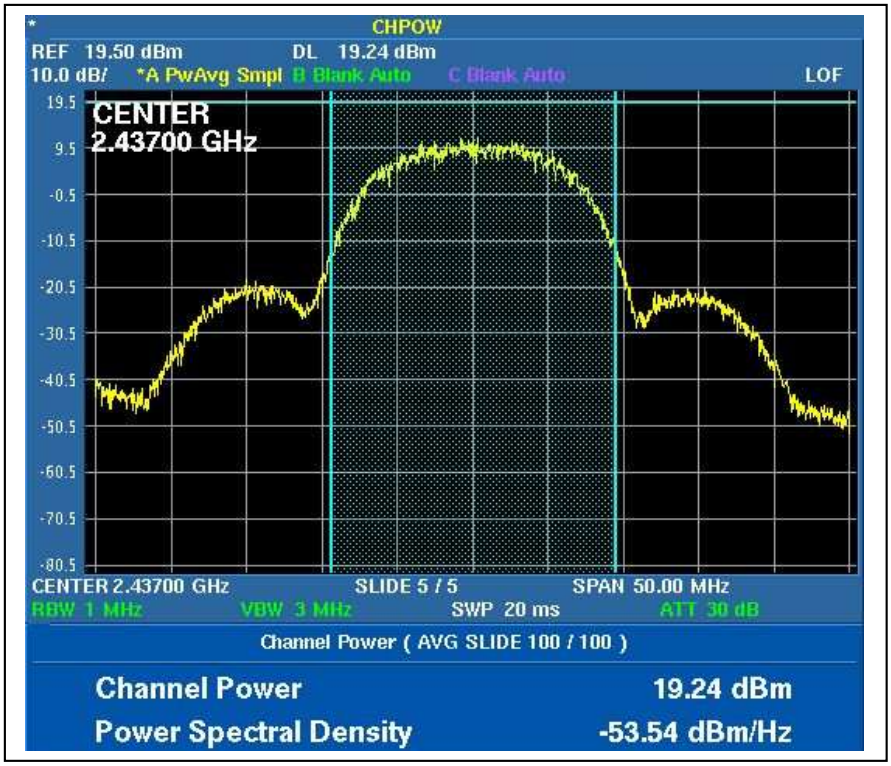
MODULATION TYPE	CCK	**TRANSFER RATE**	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	64.714	18.11	30	PASS
6	2437	83.946	19.24	30	PASS
11	2462	61.660	17.90	30	PASS

CH1


CHPOW
REF 19.50 dBm
DL 18.11 dBm
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto
LOF
Channel Pow Max Sweep Count
100
19.5
9.5
-0.5
-10.5
-20.5
-30.5
-40.5
-50.5
-60.5
-70.5
-80.5
CENTER 2.41200 GHz
SLIDE 5 / 5
SPAN 50.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power (AVG SLIDE 100 / 100)
Channel Power 18.11 dBm
Power Spectral Density -54.68 dBm/Hz

CH6


CHPOW
REF 19.50 dBm
DL 19.24 dBm
10.0 dB/ *A PwAvg Smpl B Blank Auto C Blank Auto
LOF
CENTER
2.43700 GHz
19.5
9.5
-0.5
-10.5
-20.5
-30.5
-40.5
-50.5
-60.5
-70.5
-80.5
CENTER 2.43700 GHz
SLIDE 5 / 5
SPAN 50.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power (AVG SLIDE 100 / 100)
Channel Power 19.24 dBm
Power Spectral Density -53.54 dBm/Hz

CH11


CHPOW
REF 19.50 dBm
DL 17.90 dBm
10.0 dB/
*A PwAvg Smpl
B Blank Auto
C Blank Auto
LOF
CENTER
2.46200 GHz
19.5
9.5
-0.5
-10.5
-20.5
-30.5
-40.5
-50.5
-60.5
-70.5
-80.5
CENTER 2.46200 GHz
SLIDE 5 / 5
SPAN 50.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power (AVG SLIDE 100 / 100)
Channel Power
17.90 dBm
Power Spectral Density
-54.89 dBm/Hz

4.4.7 TEST RESULTS –OFDM

802.11g OFDM modulation

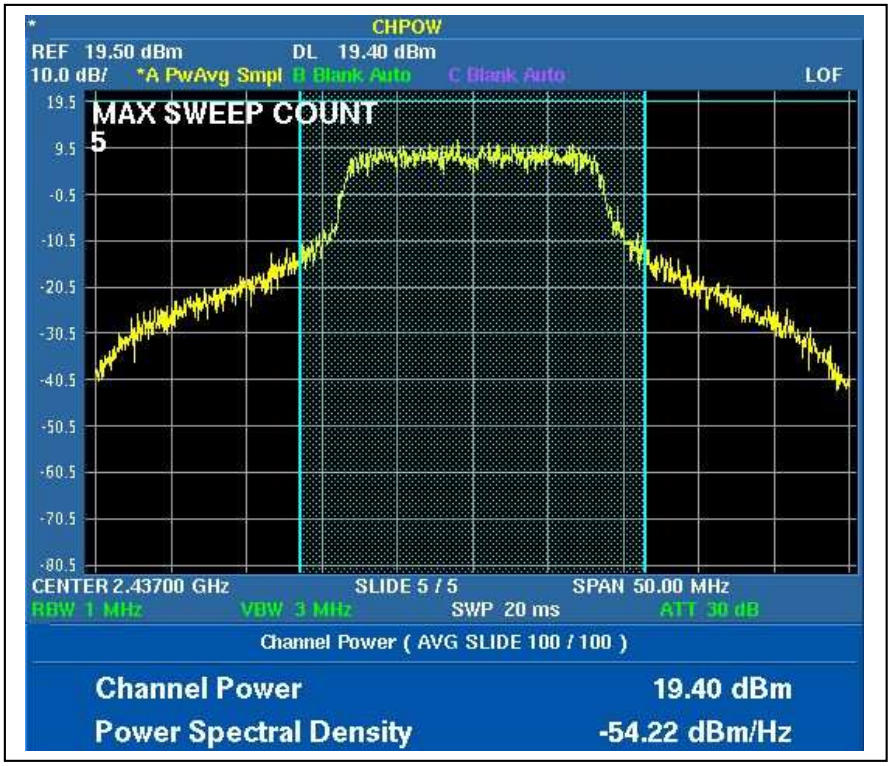
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	55.976	17.48	30	PASS
6	2437	87.096	19.40	30	PASS
11	2462	56.885	17.55	30	PASS

CH1


CHPOW
REF 20.00 dBm
DL 17.48 dBm
10.0 dB/
*A PwAvg Auto
B Blank Auto
C Blank Auto
LOF
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 2.41200 GHz
SLIDE 5 / 5
SPAN 50.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power (AVG ONCE 100 / 100)
Channel Power
17.48 dBm
Power Spectral Density
-56.14 dBm/Hz

CH6


CHPOW
REF 19.50 dBm
DL 19.40 dBm
10.0 dB/
*A PwAvg Smpl
B Blank Auto
C Blank Auto
LOF
MAX SWEEP COUNT
5
19.5
9.5
-0.5
-10.5
-20.5
-30.5
-40.5
-50.5
-60.5
-70.5
-80.5
CENTER 2.43700 GHz
SLIDE 5 / 5
SPAN 50.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power (AVG SLIDE 100 / 100)
Channel Power
19.40 dBm
Power Spectral Density
-54.22 dBm/Hz

CH11


CHPOW
REF 20.00 dBm
DL 17.55 dBm
10.0 dB/
*A PwAvg Smpl
B Blank Auto
C Blank Auto
LOF
Channel Pow Max Sweep Count
100
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
CENTER 2.46200 GHz
SLIDE 5 / 5
SPAN 50.00 MHz
RBW 1 MHz
VBW 3 MHz
SWP 20 ms
ATT 30 dB
Channel Power (AVG SLIDE 100 / 100)
Channel Power
17.55 dBm
Power Spectral Density
-56.07 dBm/Hz

4.5 AVERAGE OUTPUT POWER

4.5.1 For reference.

4.5.2 TEST INSTRUMENTS

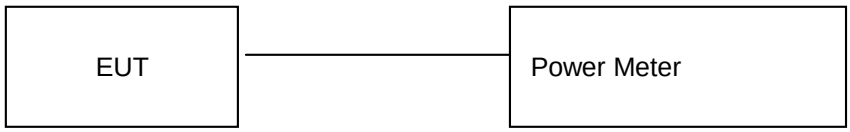
Description & Manufacturer	Model No.	Serial No.	Calibrated Until
Anritsu Power Meter	ML2487A	6K00001472	Jan. 18.2008
Anritsu Wide Bandwidth Sensor	MA2491A	030951	Jan. 18.2008

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	CCK	**TRANSFER RATE**	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (mW)	AVERAGE POWER OUTPUT (dBm)
1	2412	69.183	18.40
6	2437	69.183	18.40
11	2462	60.814	17.84

4.5.7 TEST RESULTS –OFDM

802.11g OFDM modulation

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Wen Yu		

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (mW)	AVERAGE POWER OUTPUT (dBm)
1	2412	55.463	17.44
6	2437	77.446	18.89
11	2462	56.234	17.50

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
ADVANTEST SPECTRUM ANALYZER	U3772	160100280	April. 10.2007

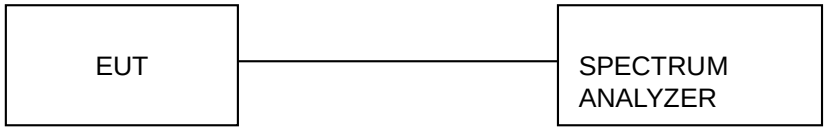
NOTE:

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 –DSSS

802.11b DSSS modulation

MODULATION TYPE	CCK	**TRANSFER RATE**	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Phoenix Huang		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-10.18	8	PASS
6	2437	-9.85	8	PASS
11	2462	-9.59	8	PASS

CH1


REF 20.00 dBm
MKR 2.41412 GHz
10.0 dB/ *A PwAvg Posi B Blank Smpl C Blank Auto -10.18 dBm LOF
MARKER
2.41412 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 2.43774 GHz
10.0 dB/ *A PwAvg Posi B Blank Smpl C Blank Auto -9.85 dBm LOF
MARKER
2.43774 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 2.46292 GHz
10.0 dB/ *A PwAvg Posi B Blank Smpl C Blank Auto -9.59 dBm LOF
MARKER
2.46292 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

4.6.7 TEST RESULTS –OFDM

802.11g OFDM modulation

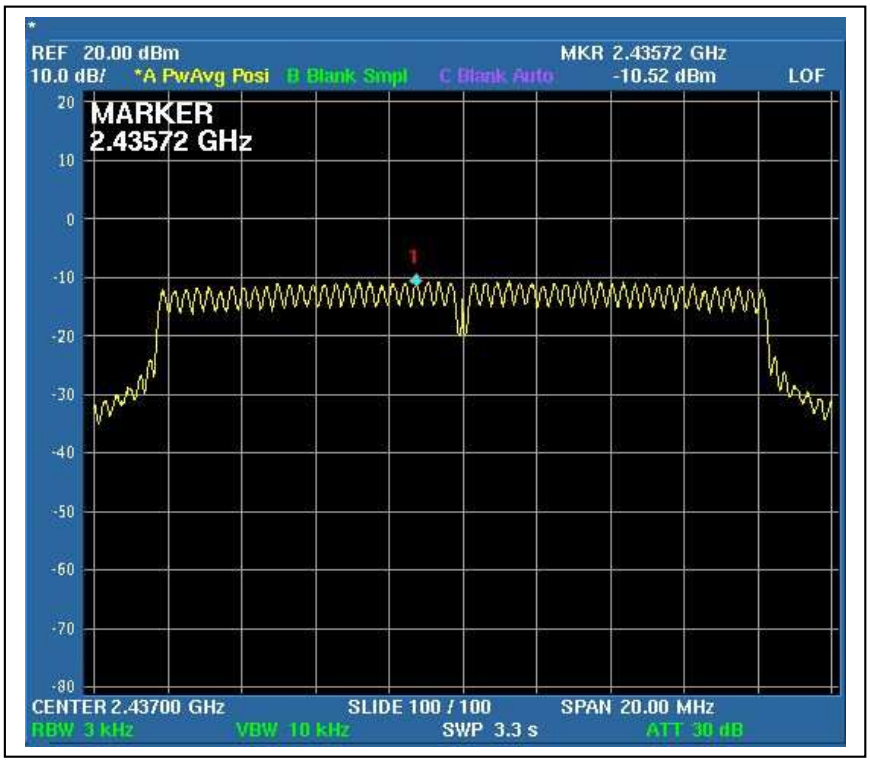
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 65%RH, 965hPa
TESTED BY	Phoenix Huang		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-11.83	8	PASS
6	2437	-10.52	8	PASS
11	2462	-10.67	8	PASS

CH1


REF 20.00 dBm
MKR 2.41448 GHz
10.0 dB/ *A PwAvg Posi B Blank Smpl C Blank Auto -11.83 dBm LOF
MARKER
2.41448 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 Smpl C Blank Auto -10.52 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 Smpl
C Blank Auto
-10.67 dBm
LOF
MARKER
2.46072 GHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
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 –20dB 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	100037	Aug. 15, 2007

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 both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

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

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 EUT OPERATING CONDITION

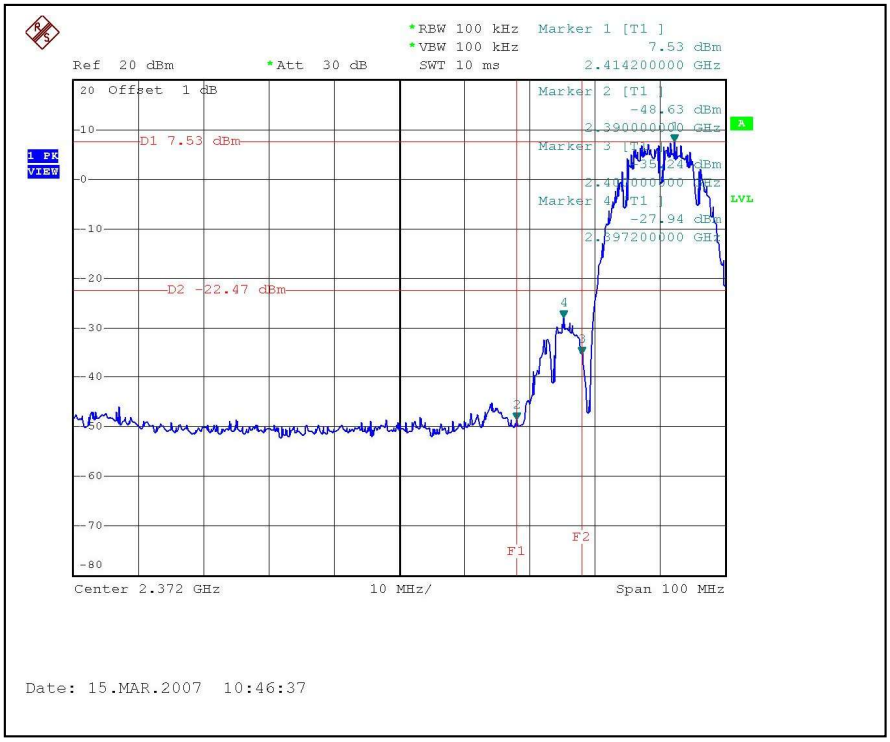
Same as Item 4.3.6

4.7.6 TEST RESULTS

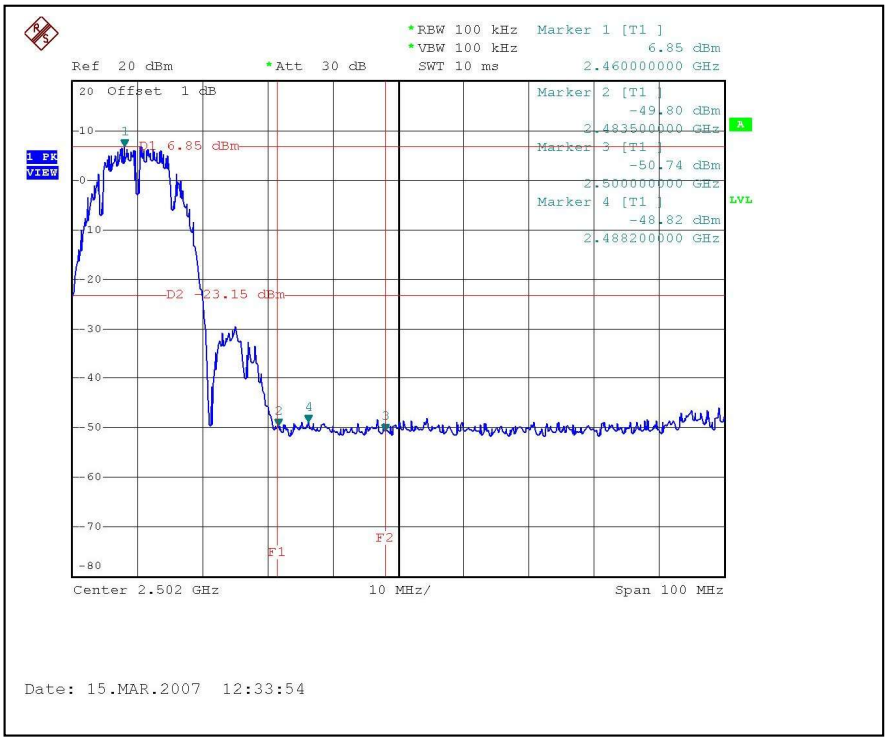
The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement in part 15.247(d).
Note: Follow DTS measurement, If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.

802.11b DSSS MODULATION:

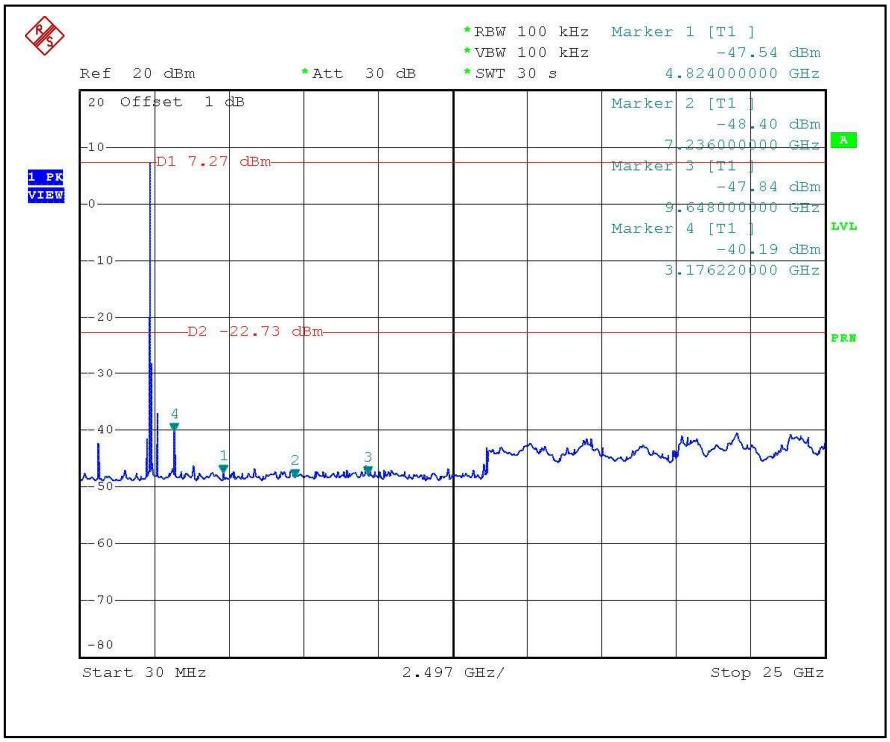
CH1



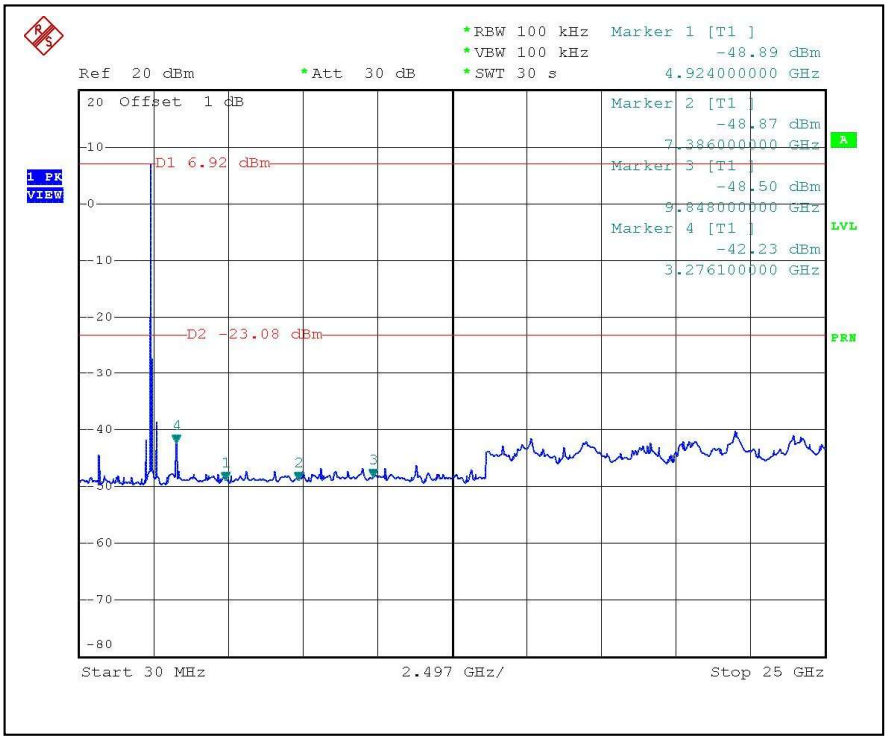
CH11



CH1

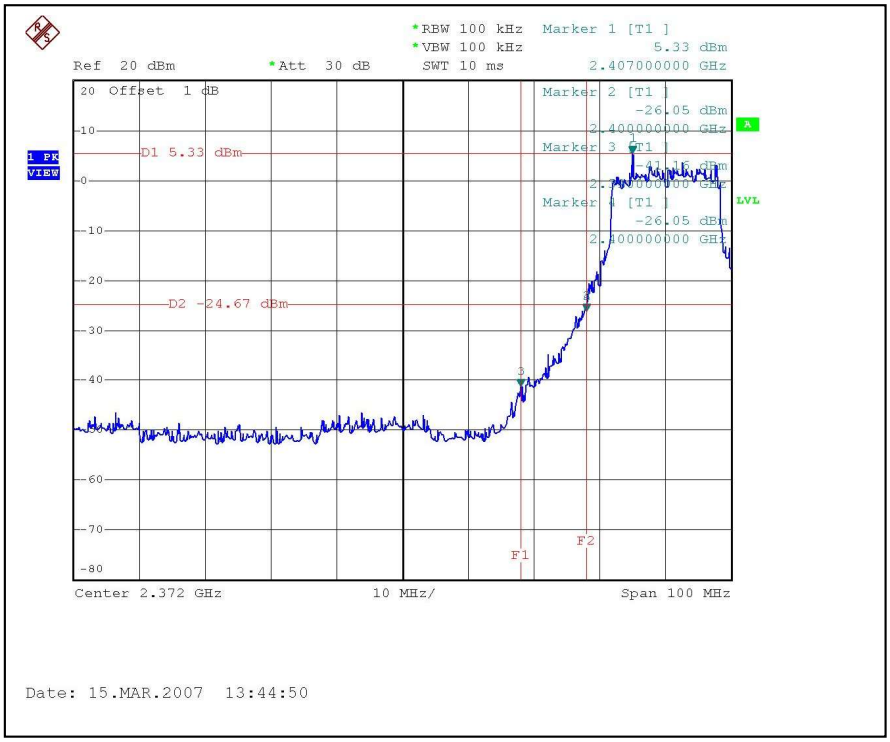

*RBW 100 kHz
*VBW 100 kHz
*SWT 30 s
Marker 1 [T1]
-47.54 dBm
4.824000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-48.40 dBm
7.236000000 GHz
Marker 3 [T1]
-47.84 dBm
9.648000000 GHz
Marker 4 [T1]
-40.19 dBm
3.176220000 GHz
D1 7.27 dBm
D2 -22.73 dBm
1 PK VIEW
A
LVL
PRN
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH11

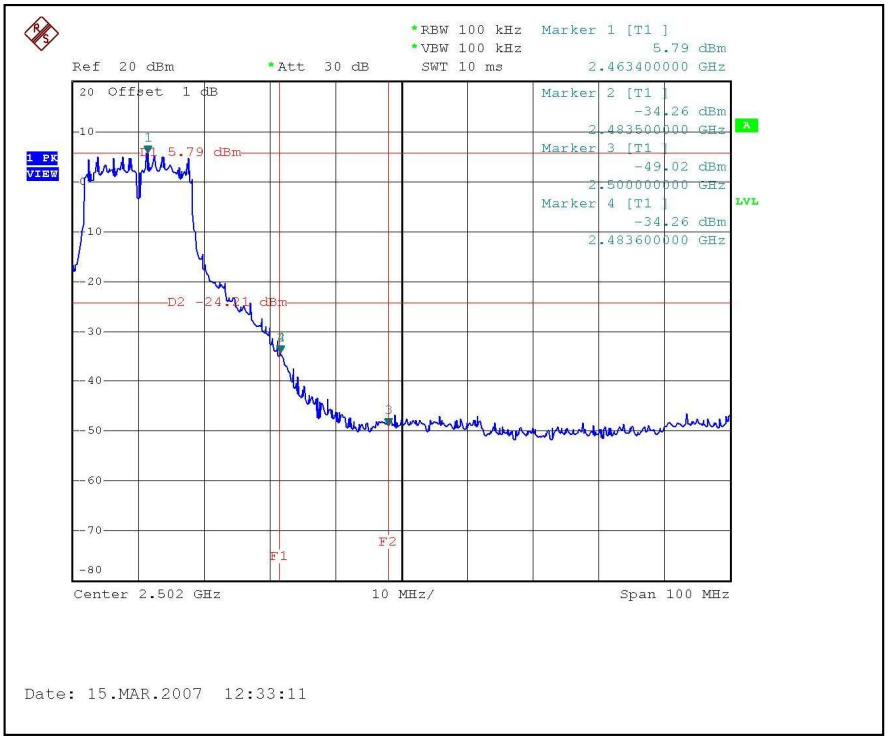

*RBW 100 kHz
*VBW 100 kHz
*SWT 30 s
Marker 1 [T1]
-48.89 dBm
4.924000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-48.87 dBm
7.386000000 GHz
Marker 3 [T1]
-48.50 dBm
9.848000000 GHz
Marker 4 [T1]
-42.23 dBm
3.276100000 GHz
D1 6.92 dBm
D2 -23.08 dBm
1 PK VIEW
A
LVL
PRN
Start 30 MHz
2.497 GHz/
Stop 25 GHz

802.11g OFDM MODULATION:

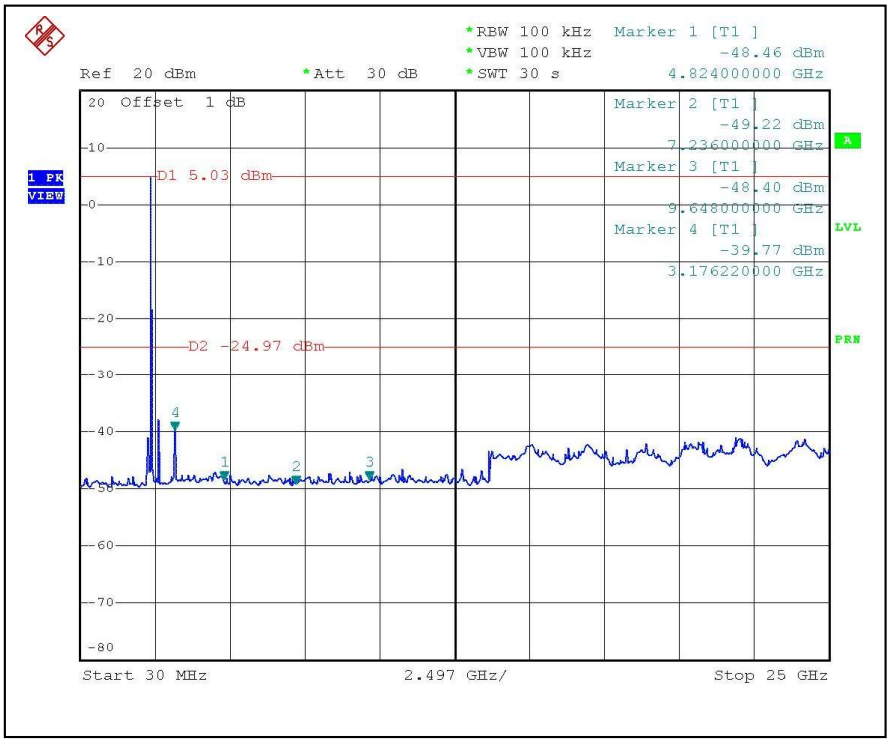
CH1



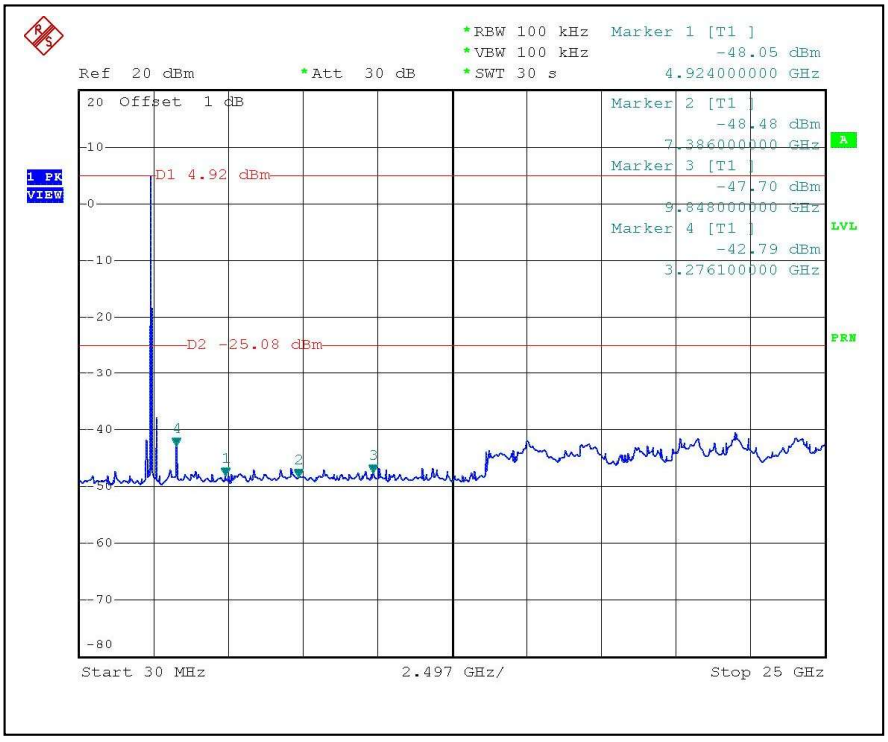
CH11



CH1


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
*SWT 30 s
Marker 1 [T1]
-48.46 dBm
4.824000000 GHz
20 Offset 1 dB
Marker 2 [T1]
-49.22 dBm
7.236000000 GHz
Marker 3 [T1]
-48.40 dBm
9.648000000 GHz
Marker 4 [T1]
-39.77 dBm
3.176220000 GHz
D1 5.03 dBm
D2 -24.97 dBm
1 PK VIEW
A
LVL
PRN
Start 30 MHz
2.497 GHz/
Stop 25 GHz

CH11


*RBW 100 kHz
*VBW 100 kHz
Ref 20 dBm
*Att 30 dB
*SWT 30 s
Marker 1 [T1]
-48.05 dBm
4.924000000 GHz
20 Offset 1 dB
Marker 2 [T1]
-48.48 dBm
7.386000000 GHz
Marker 3 [T1]
-47.70 dBm
9.848000000 GHz
Marker 4 [T1]
-42.79 dBm
3.276100000 GHz
D1 4.92 dBm
D2 -25.08 dBm
1 PK VIEW
A
LVL
PRN
Start 30 MHz
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 Print antenna without connector. The maximum Gain of the antenna is 0dBi.

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.	CNLA, BSMI, NCC
Netherlands	Telefication
Singapore	PSB, 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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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.

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.