



FCC TEST REPORT

REPORT NO.: RF950622H02C

MODEL NO.: RSG2500

RECEIVED: Aug. 13, 2007

TESTED: Sep. 12 to 19, 2007

ISSUED: Sep. 21, 2007

APPLICANT: Motorola Inc.

ADDRESS: 101 Tournament Drive, Horsham, PA 19044

ISSUED BY: Advance Data Technology Corporation

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

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No. 2177-01

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1. CERTIFICATION

PRODUCT: Residential Seamless Mobility Gateway
BRAND NAME: Motorola
MODEL NO.: RSG2500
TEST SAMPLE: ENGINEERING SAMPLE
TESTED: Sep. 12 to 19, 2007
APPLICANT: Motorola Inc.
STANDARDS: 47 CFR Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003

The above equipment (Model: RSG2500) has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Carol Liao , **DATE:** Sep. 21, 2007
(Carol Liao, Specialist)

TECHNICAL ACCEPTANCE : Hank Chung , **DATE:** Sep. 21, 2007
Responsible for RF (Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Sep. 21, 2007
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.09dB at 2390.0MHz
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

NOTE:

1. This report is prepared for FCC class II permissive change. Only radiated emission, Maximum Peak Output Power and Band Edge Measurement were presented in this test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Radiated emissions (30MHz-1GHz)	3.89 dB
Radiated emissions (1GHz -18GHz)	2.21 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Residential Seamless Mobility Gateway
MODEL NO.	RSG2500
FCC ID	ACQRSG2500
POWER SUPPLY	DC 12V from power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps
FREQUENCY RANGE	2412 ~ 2462MHz
NUMBER OF CHANNEL	11
CHANNEL SPACING	5MHz
OUTPUT POWER	For 802.11b: 73.790mW For 802.11g: 81.658mW
ANTENNA TYPE	Please see note 1 (on next page)
DATA CABLE	NA
I/O PORT	LAN port *4 (10/100 Mbps) WAN port *1 (10/100 Mbps)
ASSOCIATED DEVICES	NA

NOTE:

1. This report is prepared for FCC class II permissive change. The difference compared with the original design is as the following:

u Dipole antenna has been changed.

Original Antenna			
No.	Antenna Type	Gain	Connector
1	Dipole antenna	0 dBi	Reverse polarity SMA
2	Printed antenna (only Rx function)	3.8dBi (Max)	NA
New Antenna			
No.	Antenna Type	Gain	Connector
1	Dipole antenna	5 dBi	Reverse polarity SMA
2	Printed antenna (only Rx function)	3.8dBi (Max)	NA

2. The EUT could be supplied with the following power adapter:

Brand:	LEI
Model No.:	NU20-5120125-I3
Input power :	AC100-240V, 50/60Hz, 1.0A
Output power :	DC12V,1.25A

3. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.
4. The EUT complies with IEEE 802.11g standards, and backwards compatible with IEEE 802.11b products.
5. 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: Eleven channels are provided to this EUT.

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

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE [≥] 1G	APCM	
-	x	√	√	√	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

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	11	DSSS	CCK	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	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	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Residential Seamless Mobility Gateway. 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 test items have been performed and recorded as per the above standards.



3.4 DESCRIPTION OF SUPPORT UNITS

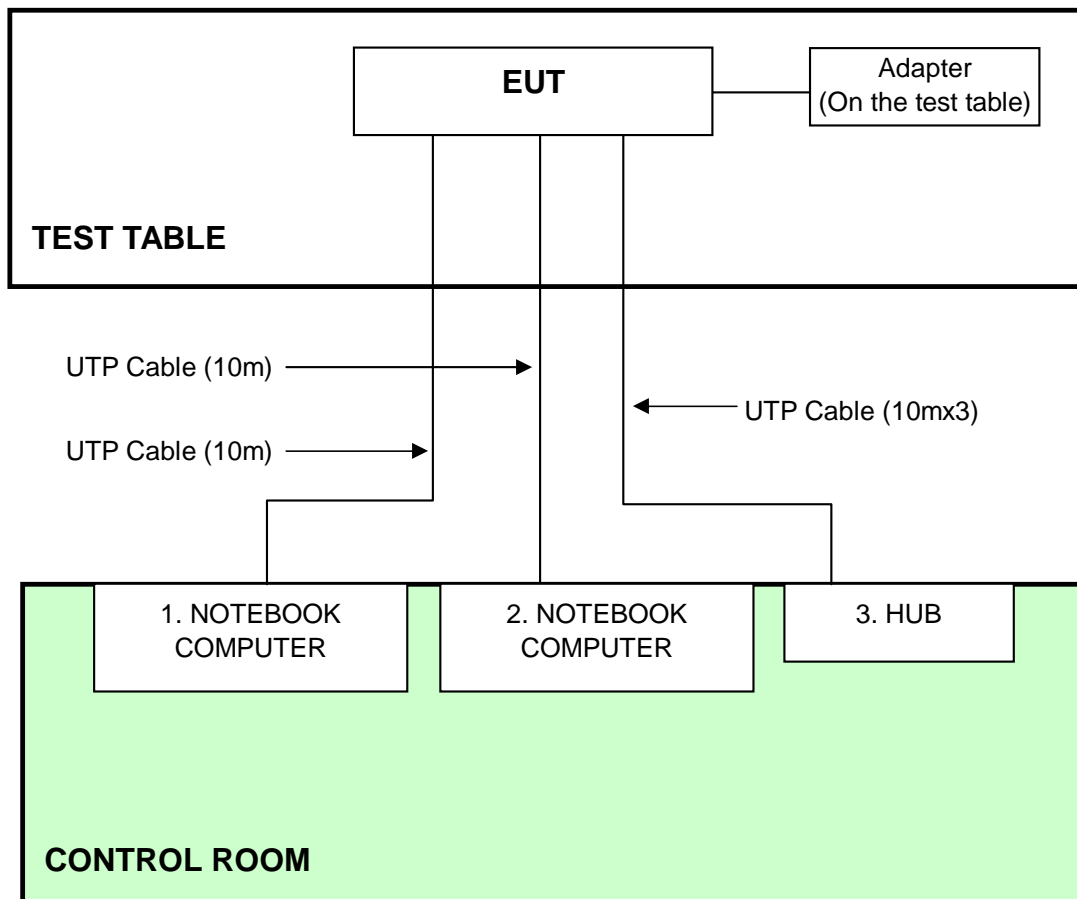
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	Dell	PP01L	TW-09c748-12800-165-3171	DoC
2	NOTEBOOK COMPUTER	Dell	PP01L	TW-0791UH-12800-0CK-3735	DoC
3	HUB	AVSYS	110H8	01-20E-000002	DoC

No.	Signal cable description
1	NA
2	NA
3	NA

Note: 1. The power cords of the above support units were unshielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



NOTE: 1. Support units 1-3 were kept in the control room during the test.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 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.



4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 15, 2008
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2008
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2008
CHASE Broadband Antenna	VULB 9168	138	July 26, 2008
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 25, 2008
TRILOG Broad Band Antenna	VULB 9168	138	July 26, 2008
RF Switches (ARNITSU)	CS-201	1565157	Aug. 13, 2008
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Aug. 13, 2008
Software	ADT_Radiated_V 7.6.15.7	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.

4.1.3 TEST PROCEDURES

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

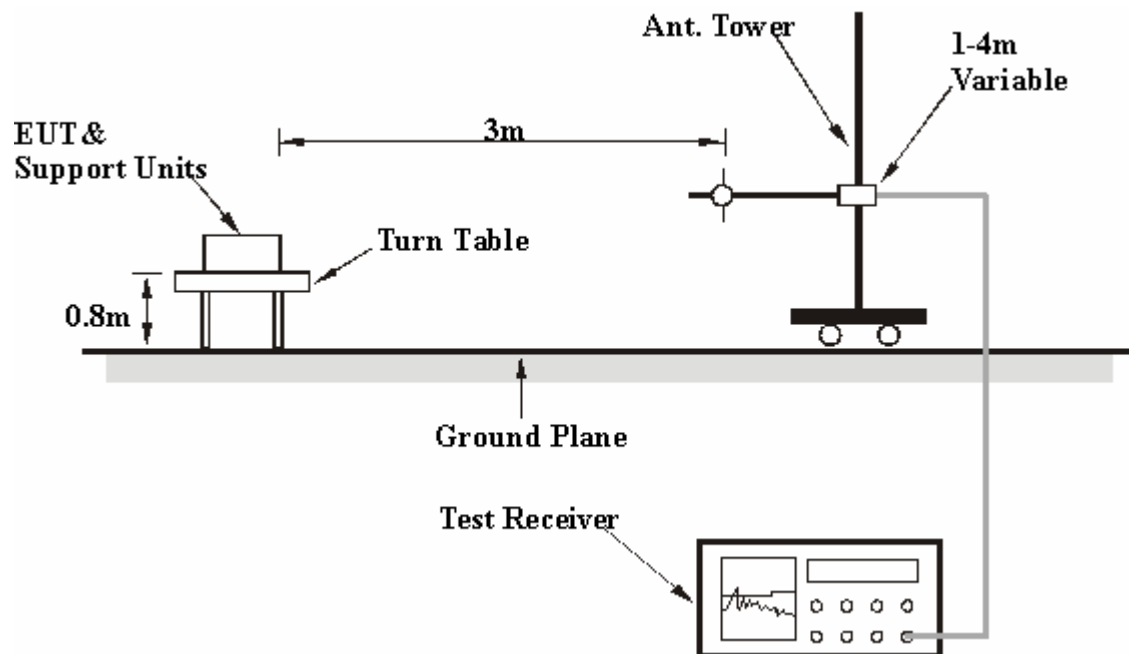
NOTE:

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

- a. Turn on the power of all equipment.
- b. Prepared other computer system (support units 1-2) to act as communication partner and placed it outside of testing area.
- c. The communication partner runs the test program "Ping.exe" to enable EUT under transmission/receiving condition continuously via wireless and UTP cables.
- d. Repeat steps b-c.

4.1.7 TEST RESULTS

Below 1GHz Worst-Case Data

MODULATION TYPE	CCK	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TRANSFER RATE	1Mbps
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH, 955hPa	DETECTOR FUNCTION	Quasi-Peak
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	124.99	30.23 QP	43.50	-13.27	1.45 H	273	16.76	13.47
2	199.99	41.96 QP	43.50	-1.54	1.36 H	64	29.53	12.43
3	249.99	45.31 QP	46.00	-0.69	1.00 H	292	31.93	13.38
4	299.99	45.23 QP	46.00	-0.77	1.00 H	310	28.37	16.86
5	374.99	33.58 QP	46.00	-12.42	1.00 H	112	15.85	17.73
6	399.99	41.64 QP	46.00	-4.36	1.00 H	61	23.33	18.31
7	499.99	43.06 QP	46.00	-2.94	1.55 H	320	21.52	21.54
8	599.98	42.31 QP	46.00	-3.69	1.35 H	323	18.00	24.31
9	699.98	39.53 QP	46.00	-6.47	1.20 H	164	14.38	25.15
10	799.98	43.77 QP	46.00	-2.23	1.00 H	21	15.10	28.67
11	899.98	44.68 QP	46.00	-1.32	1.00 H	89	14.64	30.04

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	125.00	28.98 QP	43.50	-14.52	1.00 V	132	15.51	13.47
2	200.00	38.54 QP	43.50	-4.96	1.00 V	198	26.11	12.43
3	250.00	35.56 QP	46.00	-10.44	1.00 V	69	22.18	13.38
4	299.99	38.63 QP	46.00	-7.37	1.00 V	31	21.77	16.86
5	375.00	36.17 QP	46.00	-9.83	1.00 V	49	18.44	17.73
6	399.99	39.78 QP	46.00	-6.22	1.00 V	326	21.47	18.31
7	499.98	40.59 QP	46.00	-5.41	1.00 V	110	19.05	21.54
8	599.98	40.38 QP	46.00	-5.62	1.00 V	237	16.07	24.31
9	699.98	35.93 QP	46.00	-10.07	1.75 V	181	10.78	25.15
10	799.98	38.85 QP	46.00	-7.15	1.66 V	178	10.18	28.67
11	899.97	39.11 QP	46.00	-6.89	1.49 V	333	9.07	30.04

- 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

802.11b DSSS modulation

CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	CCK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH, 955hPa	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	1608.00	43.10 PK	74.00	-30.90	1.11 H	325	14.99	28.11
2	1608.00	37.50 AV	54.00	-16.50	1.11 H	325	9.39	28.11
3	2389.50	56.39 PK	74.00	-17.61	1.26 H	259	26.08	30.31
4	2389.50	44.11 AV	54.00	-9.89	1.26 H	259	13.80	30.31
5	*2412.00	99.70 PK			1.26 H	259	69.29	30.41
6	*2412.00	95.00 AV			1.26 H	259	64.59	30.41
7	4824.00	49.40 PK	74.00	-24.60	1.22 H	1	13.61	35.79
8	4824.00	40.40 AV	54.00	-13.60	1.22 H	1	4.61	35.79
9	7236.00	53.30 PK	74.00	-20.70	1.41 H	339	11.70	41.60
10	7236.00	39.10 AV	54.00	-14.90	1.41 H	339	-2.50	41.60

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	1608.00	45.10 PK	74.00	-28.90	1.14 V	235	16.99	28.11
2	1608.00	39.30 AV	54.00	-14.70	1.14 V	235	11.19	28.11
3	2389.50	61.53 PK	74.00	-12.47	1.40 V	84	31.22	30.31
4	2389.50	49.57 AV	54.00	-4.43	1.40 V	84	19.26	30.31
5	*2412.00	113.90 PK			1.40 V	84	83.49	30.41
6	*2412.00	109.50 AV			1.40 V	84	79.09	30.41
7	4824.00	60.30 PK	74.00	-13.70	1.21 V	11	24.51	35.79
8	4824.00	53.60 AV	54.00	-0.40	1.21 V	11	17.81	35.79
9	7236.00	56.10 PK	74.00	-17.90	1.32 V	14	14.50	41.60
10	7236.00	44.70 AV	54.00	-9.30	1.32 V	14	3.10	41.60

- 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

CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	CCK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH, 955hPa	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	1624.60	44.70 PK	74.00	-29.30	1.08 H	255	16.57	28.13
2	1624.60	38.40 AV	54.00	-15.60	1.08 H	255	10.27	28.13
3	*2437.00	99.20 PK			1.25 H	318	68.68	30.52
4	*2437.00	94.70 AV			1.25 H	318	64.18	30.52
5	4874.00	48.90 PK	74.00	-25.10	1.24 H	3	12.98	35.92
6	4874.00	38.70 AV	54.00	-15.30	1.24 H	3	2.78	35.92
7	7311.00	52.90 PK	74.00	-21.10	1.37 H	342	11.09	41.81
8	7311.00	38.80 AV	54.00	-15.20	1.37 H	342	-3.01	41.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1624.60	53.30 PK	74.00	-20.70	1.21 V	188	25.17	28.13
2	1624.60	48.90 AV	54.00	-5.10	1.21 V	188	20.77	28.13
3	*2437.00	113.20 PK			1.37 V	96	82.68	30.52
4	*2437.00	108.80 AV			1.37 V	96	78.28	30.52
5	4874.00	55.10 PK	74.00	-18.90	1.17 V	8	19.18	35.92
6	4874.00	50.10 AV	54.00	-3.90	1.17 V	8	14.18	35.92
7	7311.00	55.60 PK	74.00	-18.40	1.32 V	17	13.79	41.81
8	7311.00	43.80 AV	54.00	-10.20	1.32 V	17	1.99	41.81

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

CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	CCK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH, 955hPa	TESTED BY	Rex Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

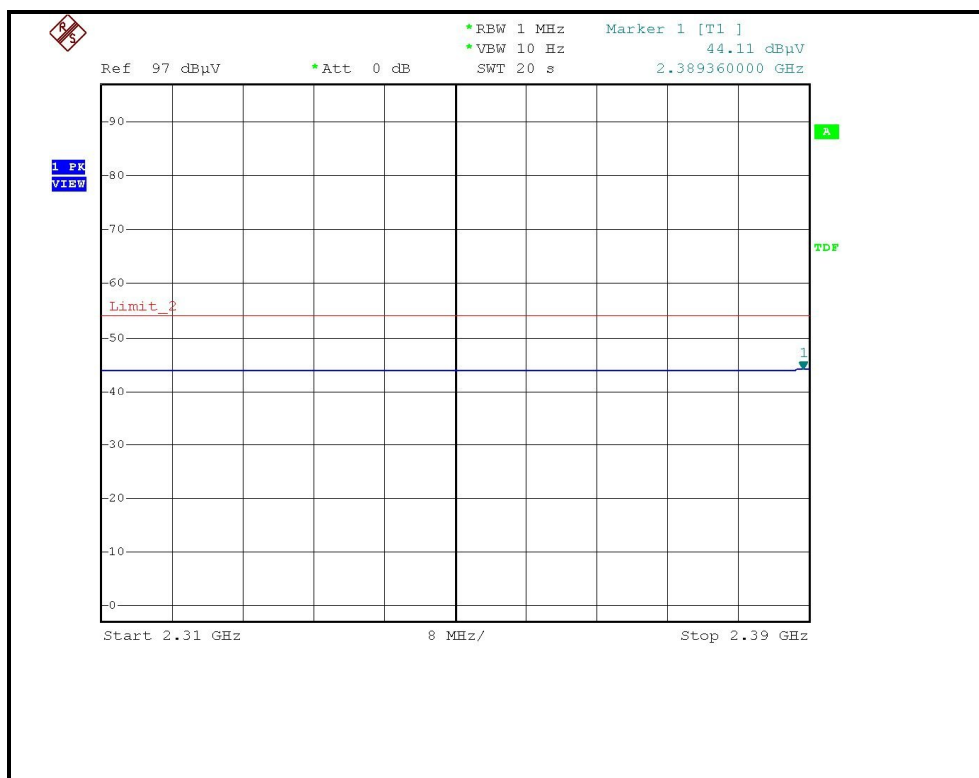
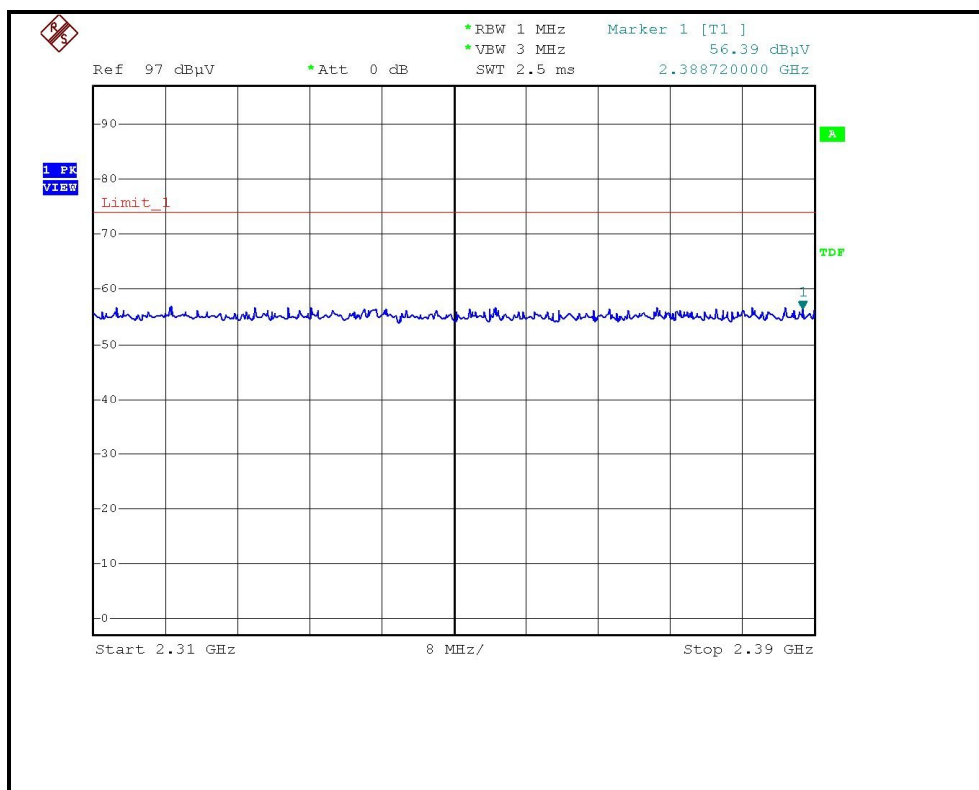
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	97.90 PK			1.24 H	319	67.27	30.63
2	*2462.00	93.30 AV			1.24 H	319	62.67	30.63
3	2484.50	57.17 PK	74.00	-16.83	1.24 H	319	26.45	30.72
4	2484.50	45.11 AV	54.00	-8.89	1.24 H	319	14.39	30.72
5	4924.00	47.70 PK	74.00	-26.30	1.23 H	2	11.64	36.06
6	4924.00	36.20 AV	54.00	-17.80	1.23 H	2	0.14	36.06
7	7386.00	53.20 PK	74.00	-20.80	1.33 H	329	11.19	42.01
8	7386.00	38.90 AV	54.00	-15.10	1.33 H	329	-3.11	42.01

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

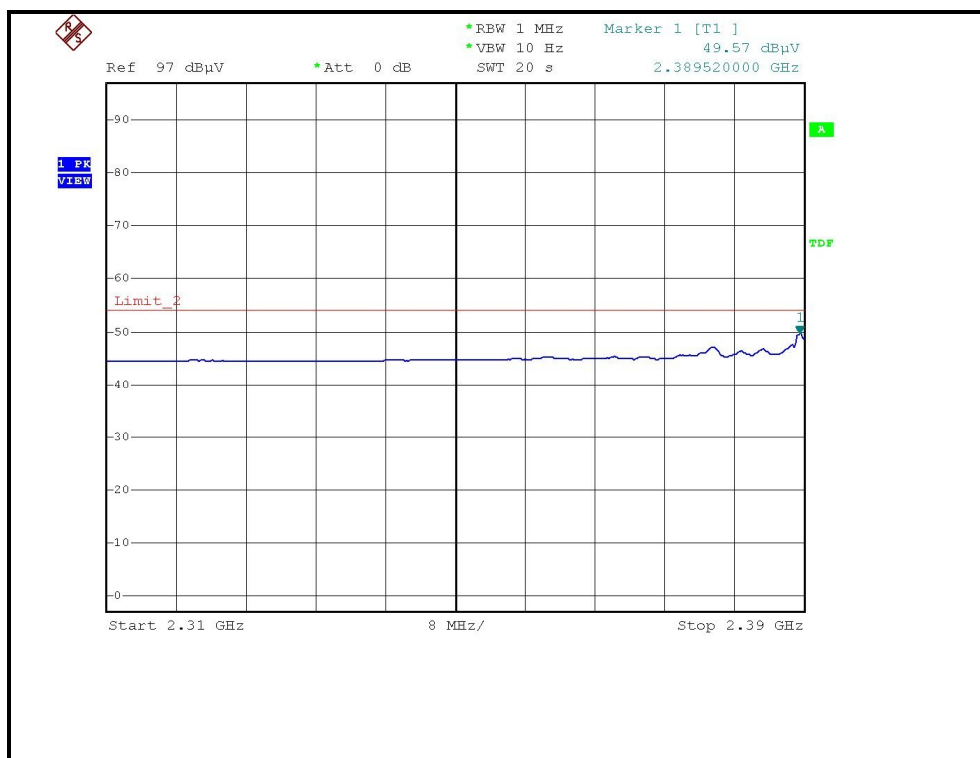
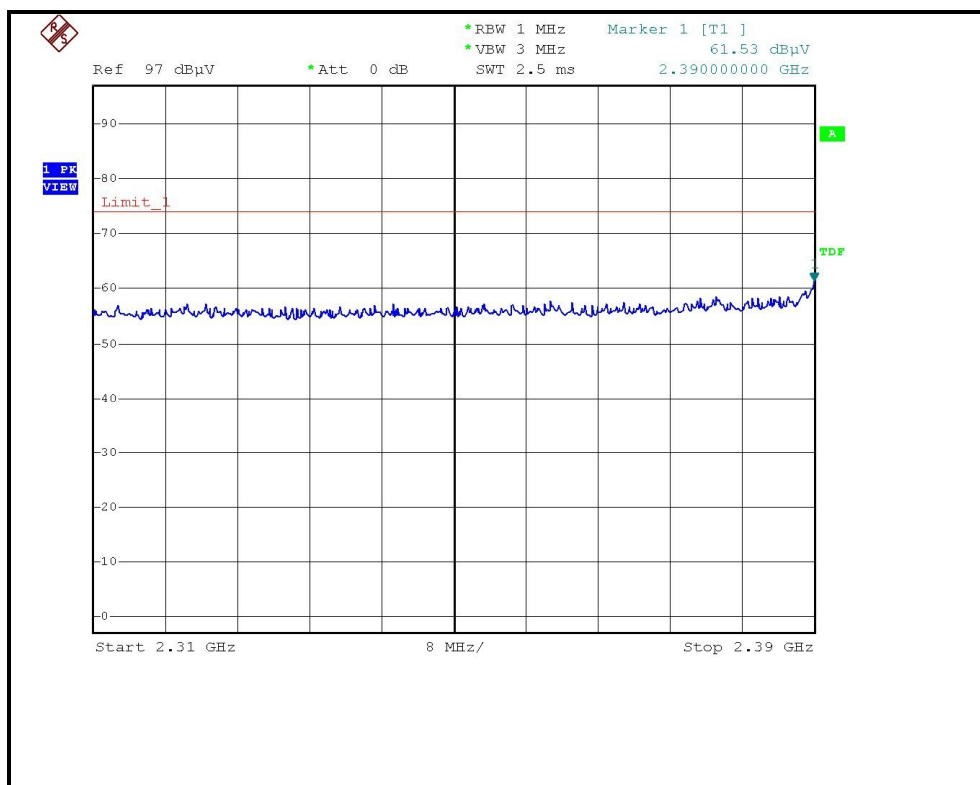
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	112.40 PK			1.35 V	95	81.77	30.63
2	*2462.00	108.10 AV			1.35 V	95	77.47	30.63
3	2484.50	61.72 PK	74.00	-12.28	1.35 V	95	31.00	30.72
4	2484.50	50.90 AV	54.00	-3.10	1.35 V	95	20.18	30.72
5	4924.00	52.90 PK	74.00	-21.10	1.31 V	18	16.84	36.06
6	4924.00	47.90 AV	54.00	-6.10	1.31 V	18	11.84	36.06
7	7386.00	53.70 PK	74.00	-20.30	1.38 V	20	11.69	42.01
8	7386.00	40.90 AV	54.00	-13.10	1.38 V	20	-1.11	42.01

- 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

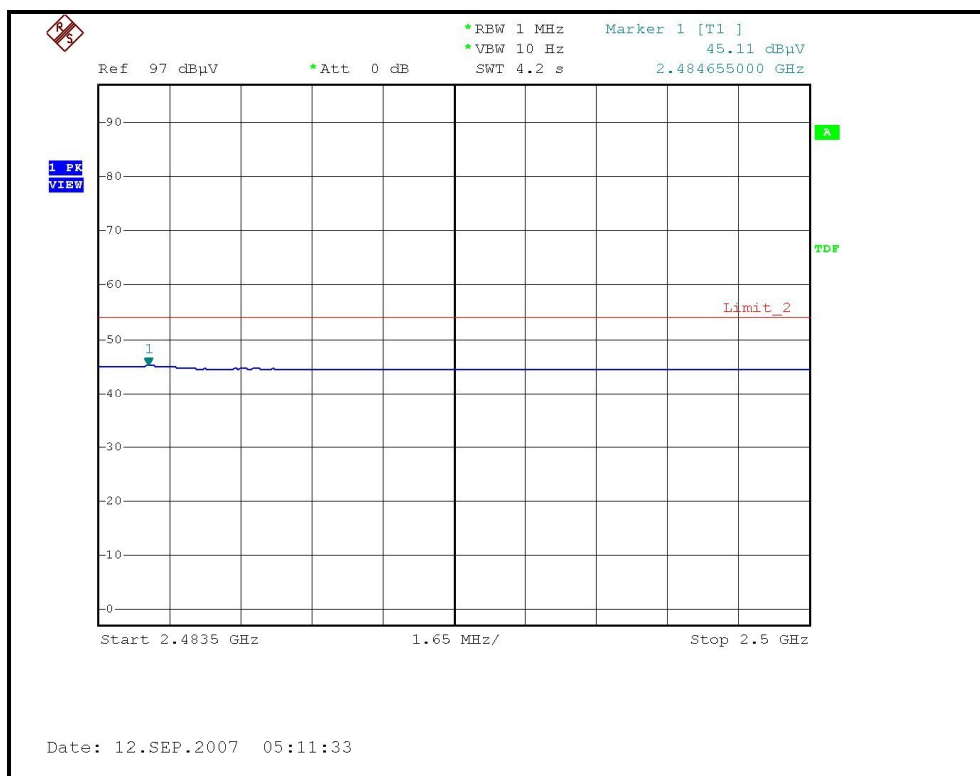
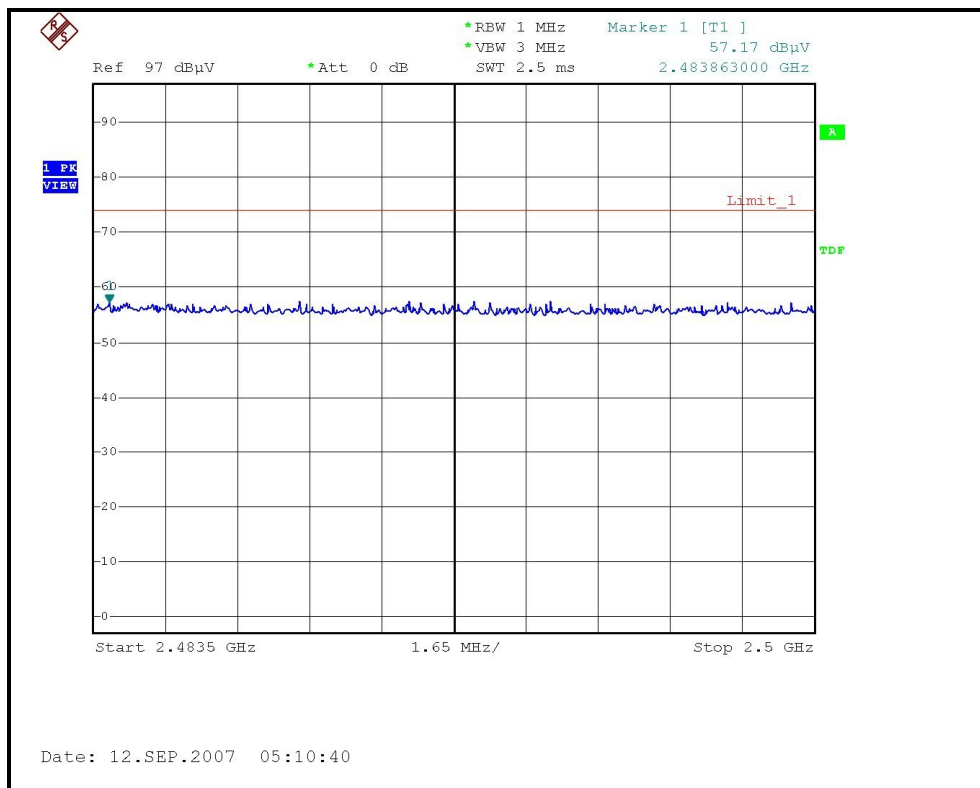
RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL)



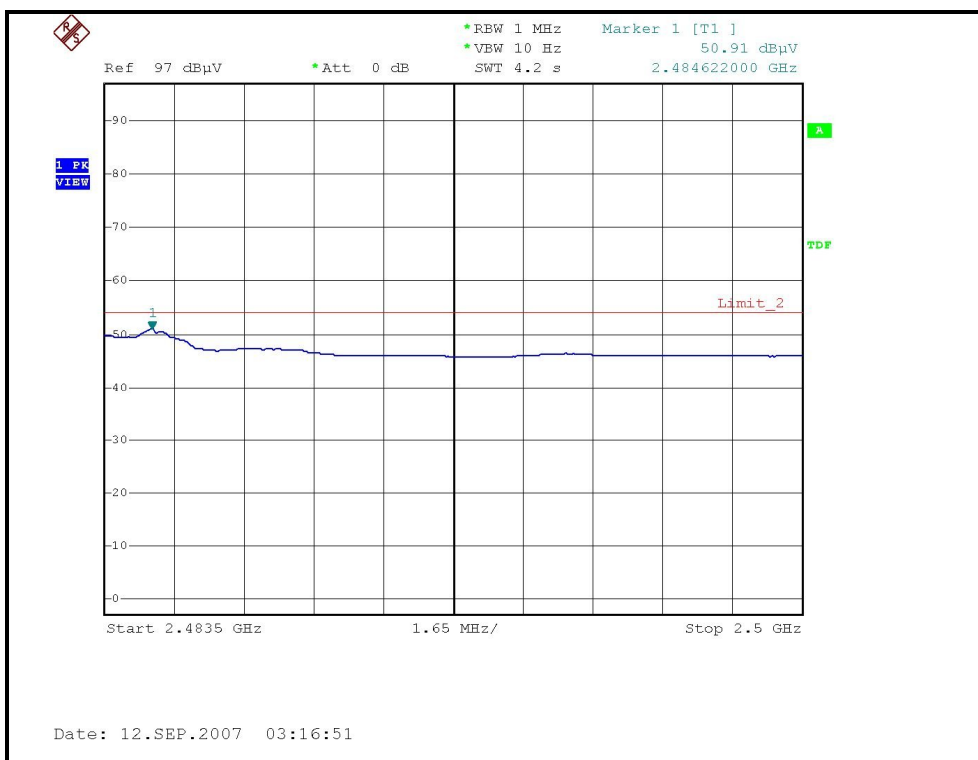
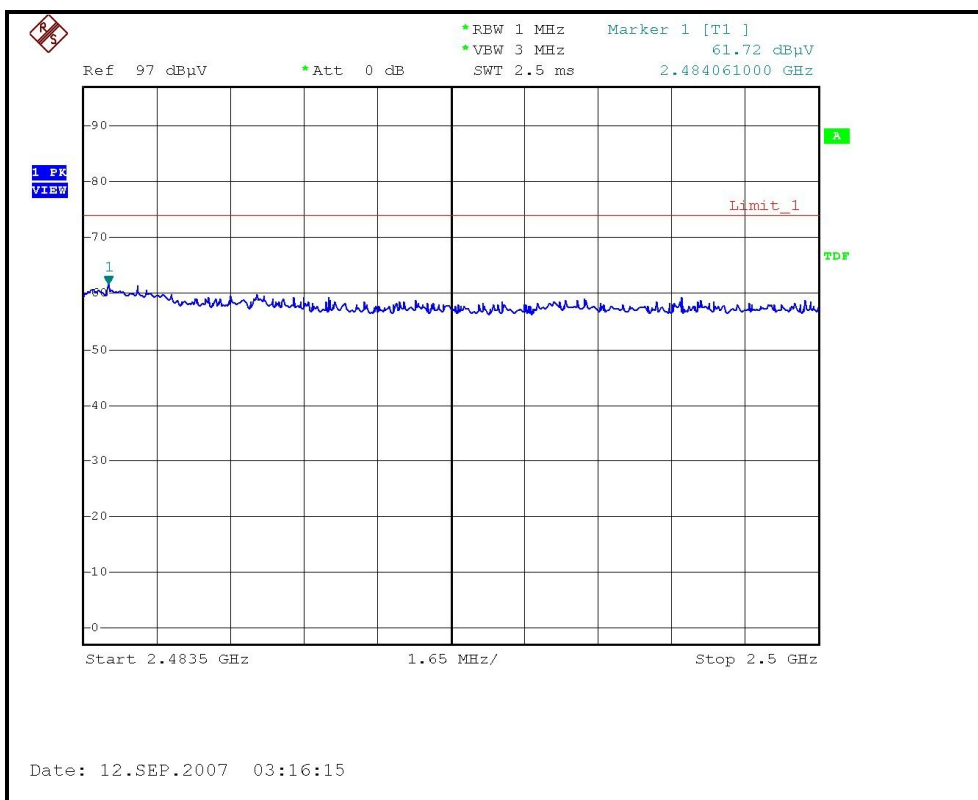
RESTRICTED BANDEDGE (802.11b MODE, CH1, VERTICAL)



RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL)



802.11g OFDM modulation

CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH, 955hPa	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	1608.00	44.90 PK	74.00	-29.10	1.12 H	323	16.79	28.11
2	1608.00	38.10 AV	54.00	-15.90	1.12 H	323	9.99	28.11
3	2390.00	58.88 PK	74.00	-15.12	1.26 H	259	28.56	30.32
4	2390.00	45.18 AV	54.00	-8.82	1.26 H	259	14.86	30.32
5	*2412.00	101.10 PK			1.26 H	259	70.69	30.41
6	*2412.00	89.40 AV			1.26 H	259	58.99	30.41
7	4824.00	48.20 PK	74.00	-25.80	1.22 H	3	12.41	35.79
8	4824.00	34.10 AV	54.00	-19.90	1.22 H	3	-1.69	35.79
9	7236.00	53.70 PK	74.00	-20.30	1.39 H	347	12.10	41.60
10	7236.00	38.90 AV	54.00	-15.10	1.39 H	347	-2.70	41.60

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	1608.00	49.90 PK	74.00	-24.10	1.16 V	233	21.79	28.11
2	1608.00	44.20 AV	54.00	-9.80	1.16 V	233	16.09	28.11
3	2390.00	72.68 PK	74.00	-1.32	1.40 V	85	42.36	30.32
4	2390.00	53.91 AV	54.00	-0.09	1.40 V	85	23.59	30.32
5	*2412.00	114.50 PK			1.40 V	85	84.09	30.41
6	*2412.00	102.40 AV			1.40 V	85	71.99	30.41
7	4824.00	59.30 PK	74.00	-14.70	1.21 V	9	23.51	35.79
8	4824.00	40.80 AV	54.00	-13.20	1.21 V	9	5.01	35.79
9	7236.00	57.70 PK	74.00	-16.30	1.31 V	12	16.10	41.60
10	7236.00	41.20 AV	54.00	-12.80	1.31 V	12	-0.40	41.60

- 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

CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH, 955hPa	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	1624.60	45.50 PK	74.00	-28.50	1.07 H	254	17.37	28.13
2	1624.60	40.10 AV	54.00	-13.90	1.07 H	254	11.97	28.13
3	*2437.00	102.10 PK			1.25 H	318	71.58	30.52
4	*2437.00	90.10 AV			1.25 H	318	59.58	30.52
5	4874.00	48.30 PK	74.00	-25.70	1.21 H	2	12.38	35.92
6	4874.00	34.30 AV	54.00	-19.70	1.21 H	2	-1.62	35.92
7	7311.00	54.10 PK	74.00	-19.90	1.36 H	341	12.29	41.81
8	7311.00	39.20 AV	54.00	-14.80	1.36 H	341	-2.61	41.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1624.60	53.40 PK	74.00	-20.60	1.20 V	188	25.27	28.13
2	1624.60	48.70 AV	54.00	-5.30	1.20 V	188	20.57	28.13
3	*2437.00	105.50 PK			1.36 V	96	74.98	30.52
4	*2437.00	103.50 AV			1.36 V	96	72.98	30.52
5	4874.00	55.30 PK	74.00	-18.70	1.18 V	9	19.38	35.92
6	4874.00	40.20 AV	54.00	-13.80	1.18 V	9	4.28	35.92
7	7311.00	56.20 PK	74.00	-17.80	1.33 V	16	14.39	41.81
8	7311.00	40.40 AV	54.00	-13.60	1.33 V	16	-1.41	41.81

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

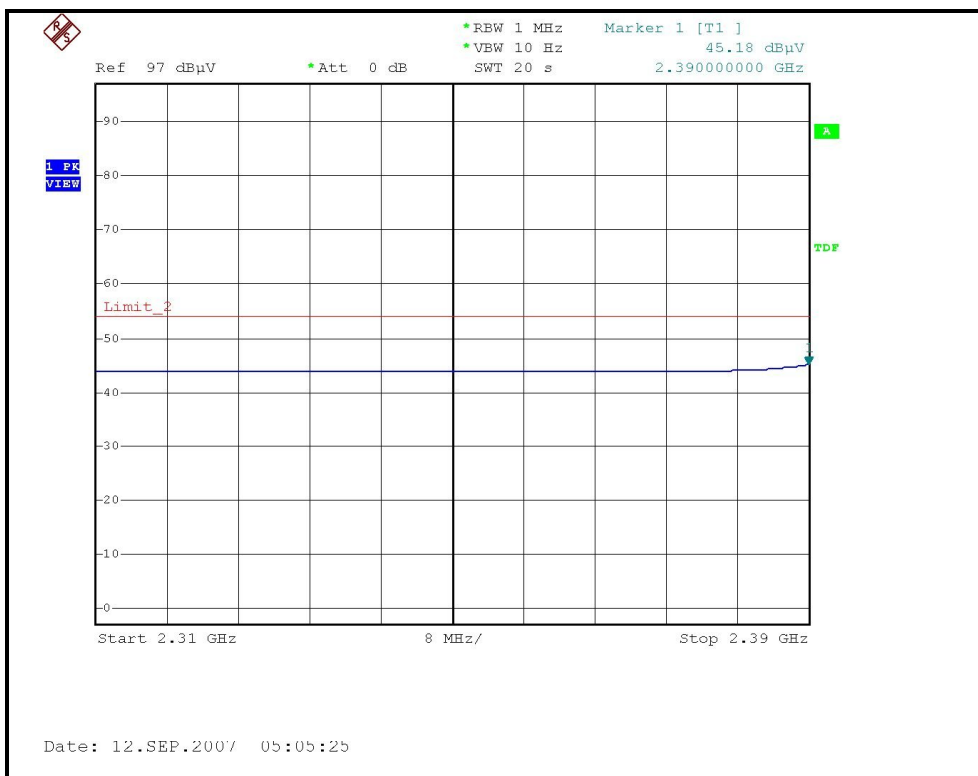
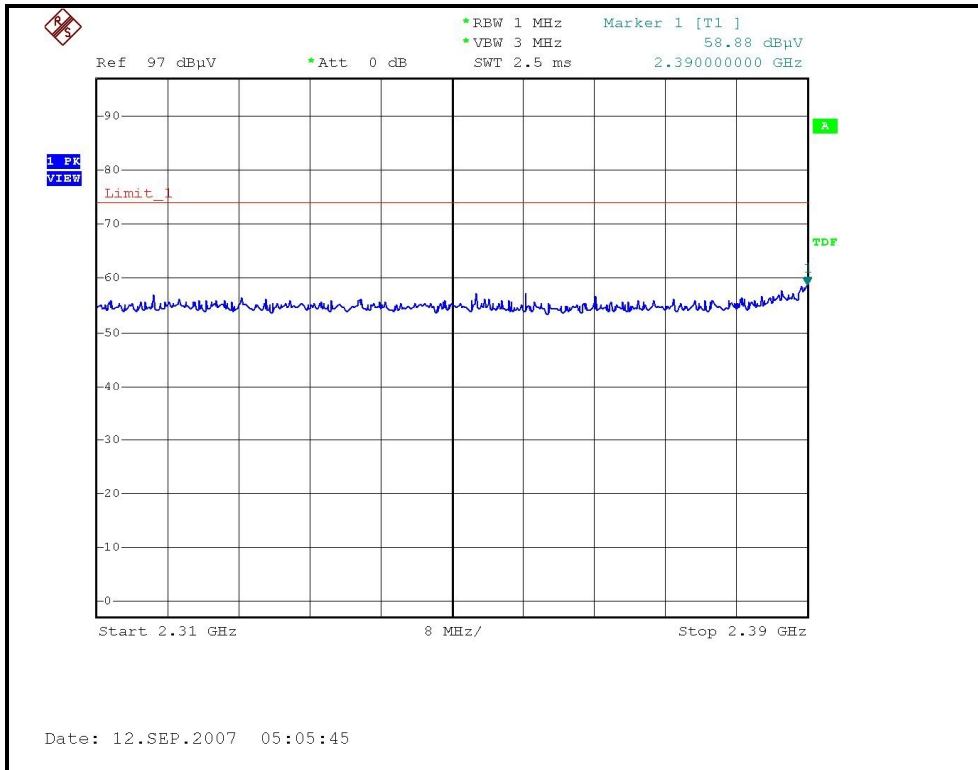
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH, 955hPa	TESTED BY	Rex Huang

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	*2462.00	98.90 PK			1.24 H	319	68.27	30.63
2	*2462.00	87.40 AV			1.24 H	319	56.77	30.63
3	2483.50	63.24 PK	74.00	-10.76	1.24 H	319	32.52	30.72
4	2483.50	46.32 AV	54.00	-7.68	1.24 H	319	15.60	30.72
5	4874.00	47.10 PK	74.00	-26.90	1.22 H	6	11.18	35.92
6	4874.00	33.00 AV	54.00	-21.00	1.22 H	6	-2.92	35.92
7	7386.00	53.10 PK	74.00	-20.90	1.34 H	336	11.09	42.01
8	7386.00	39.10 AV	54.00	-14.90	1.34 H	336	-2.91	42.01

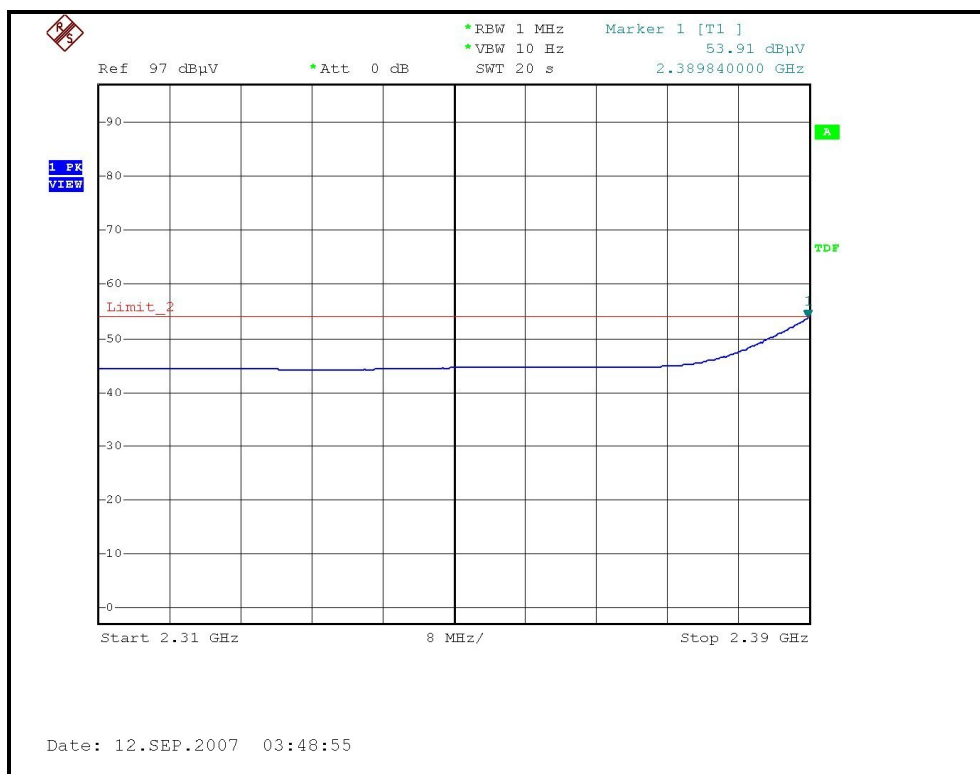
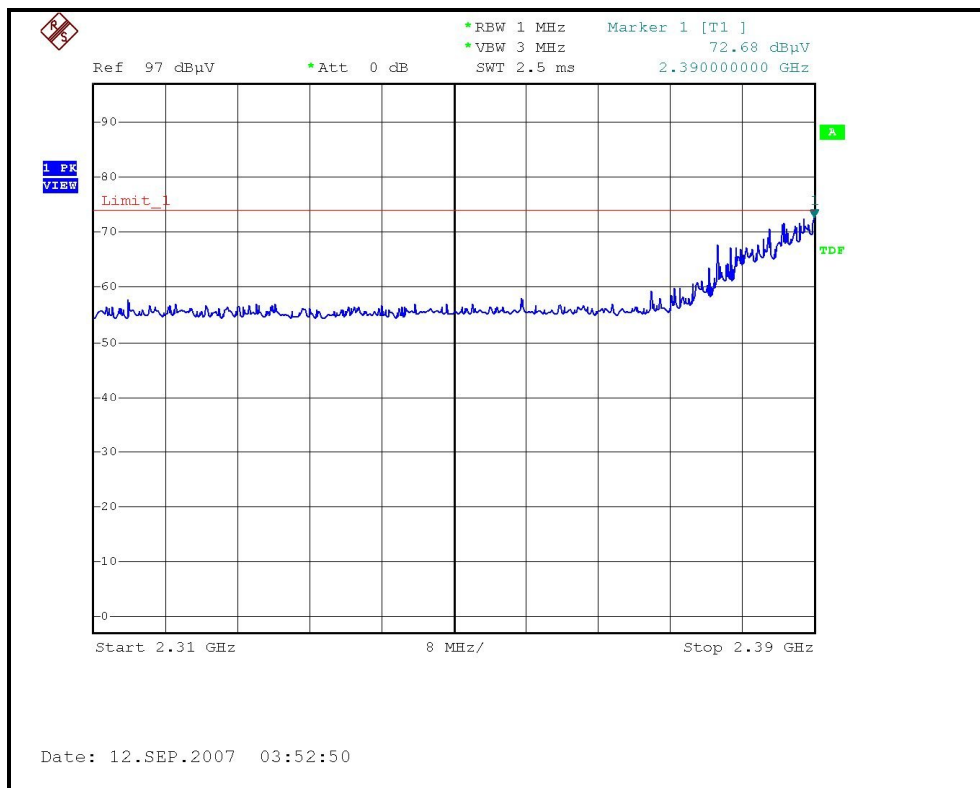
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	113.60 PK			1.35 V	95	82.97	30.63
2	*2462.00	101.80 AV			1.35 V	95	71.17	30.63
3	2483.50	71.17 PK	74.00	-2.83	1.35 V	95	40.45	30.72
4	2483.50	53.16 AV	54.00	-0.84	1.35 V	95	22.44	30.72
5	4924.00	53.10 PK	74.00	-20.90	1.31 V	18	17.04	36.06
6	4924.00	36.70 AV	54.00	-17.30	1.31 V	18	0.64	36.06
7	7386.00	53.80 PK	74.00	-20.20	1.36 V	23	11.79	42.01
8	7386.00	39.50 AV	54.00	-14.50	1.36 V	23	-2.51	42.01

- 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

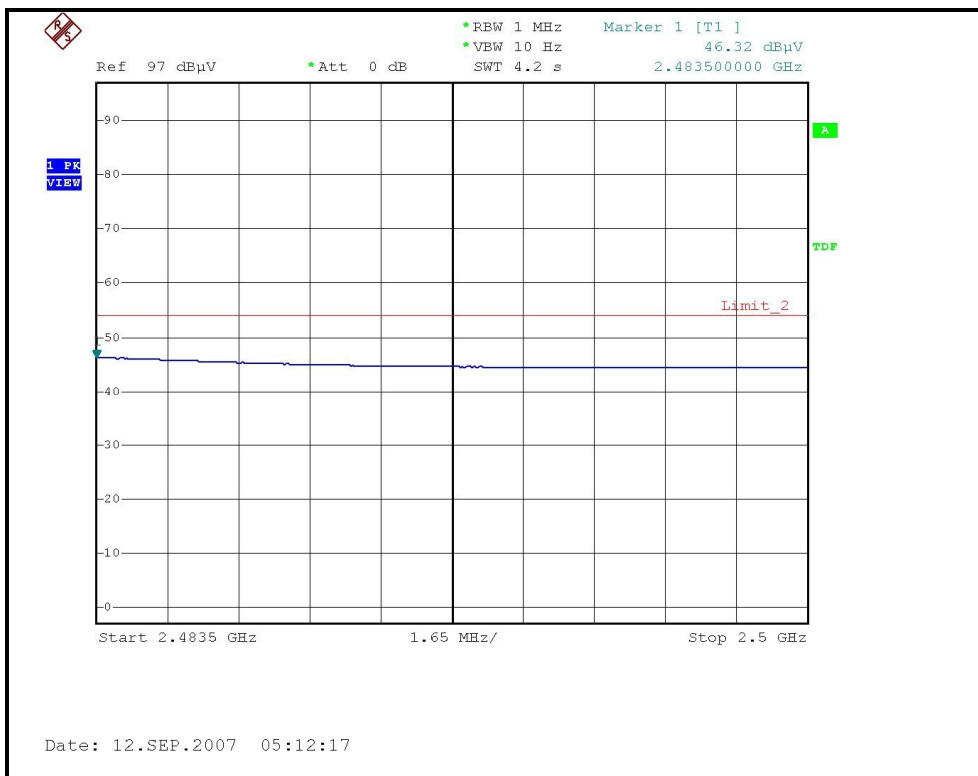
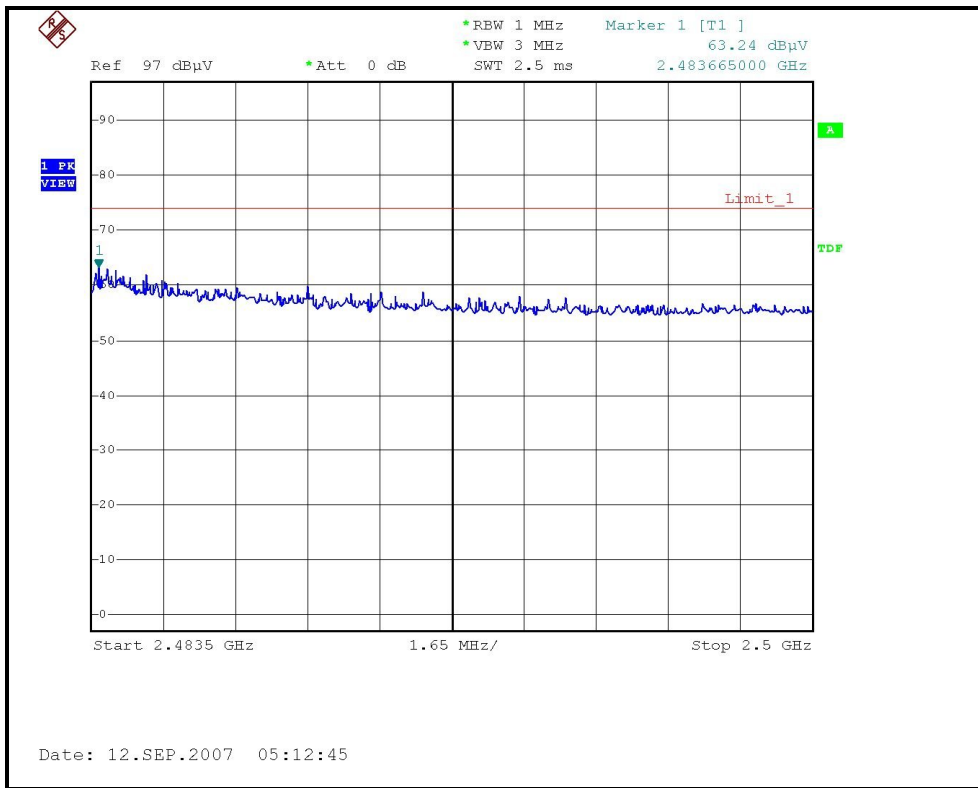
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)



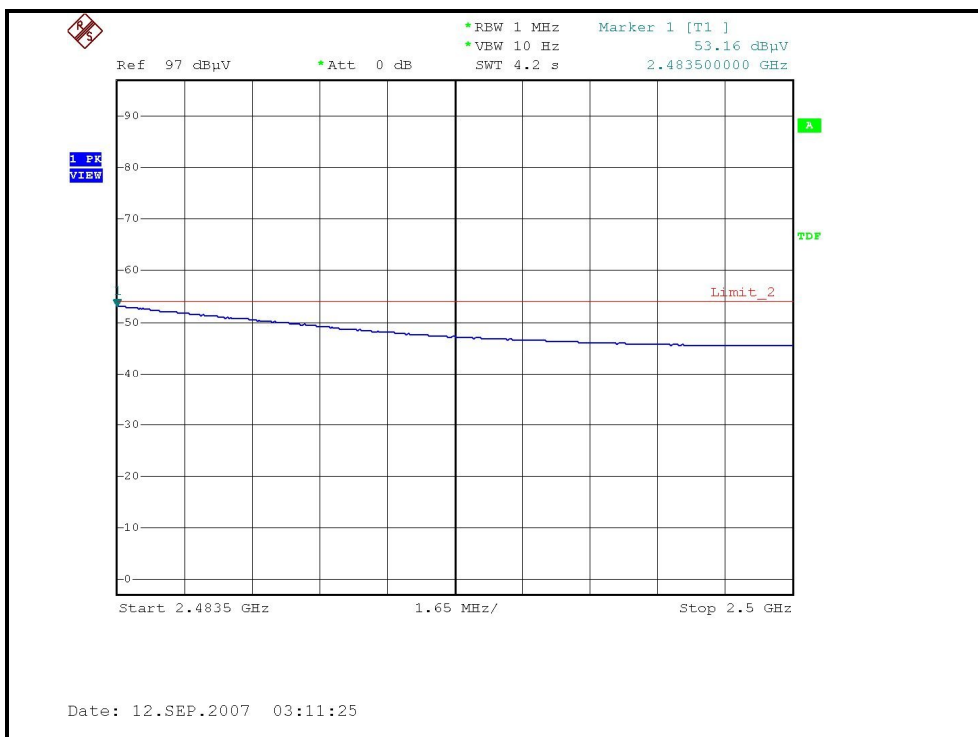
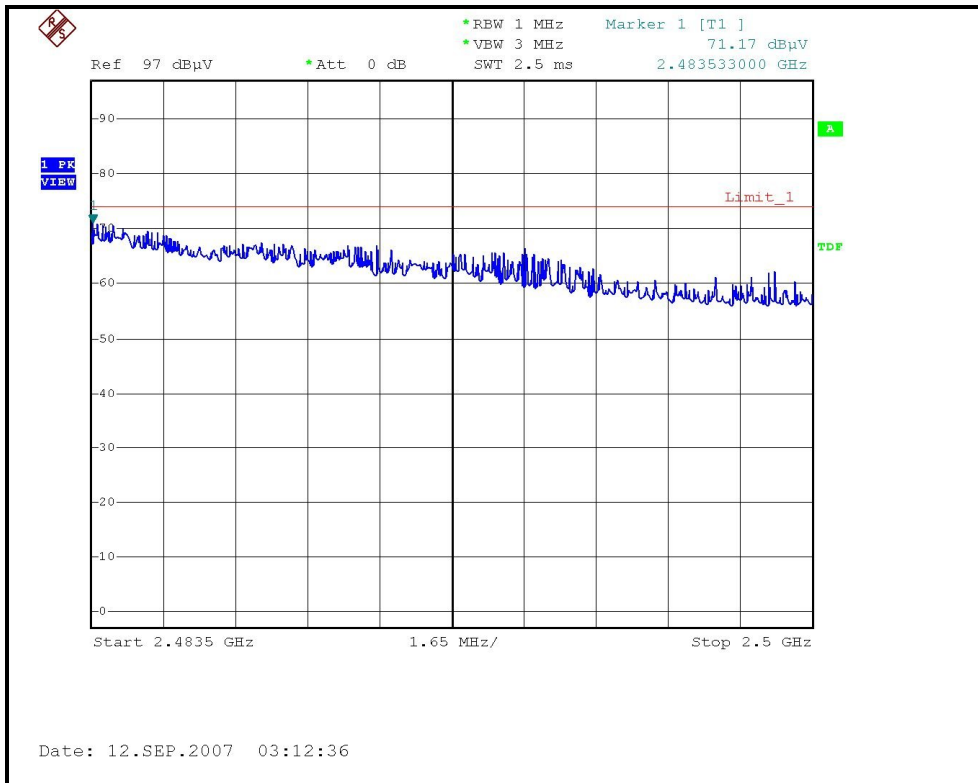
RESTRICTED BANDEDGE (802.11g MODE, CH1, VERTICAL)



RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11g MODE, CH11, VERTICAL)





4.2 MAXIMUM PEAK OUTPUT POWER

4.2.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.2.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 21, 2007

NOTE:

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

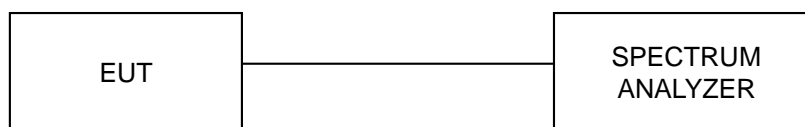
4.2.3 TEST PROCEDURES

The transmitter output was connected to the spectrum analyzer through an attenuator, the internal channel power was measured with the channel power function of spectrum analyzer that bandwidth greater than or equal to the 99% bandwidth. The maximum power was measured and recorded.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

Same as Item 4.1.6



4.2.7 TEST RESULTS

802.11b DSSS modulation

MODULATION TYPE	CCK	TRANSFER RATE	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 955hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	71.945	18.57	30	PASS
6	2437	65.163	18.14	30	PASS
11	2462	73.790	18.68	30	PASS



802.11g OFDM modulation

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 955hPa
TESTED BY	Rex Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	66.222	18.21	30	PASS
6	2437	81.658	19.12	30	PASS
11	2462	65.917	18.19	30	PASS

4.3 BAND EDGES MEASUREMENT

4.3.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.3.2 TEST INSTRUMENTS

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

NOTE:

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

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer 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.

4.3.4 EUT OPERATING CONDITION

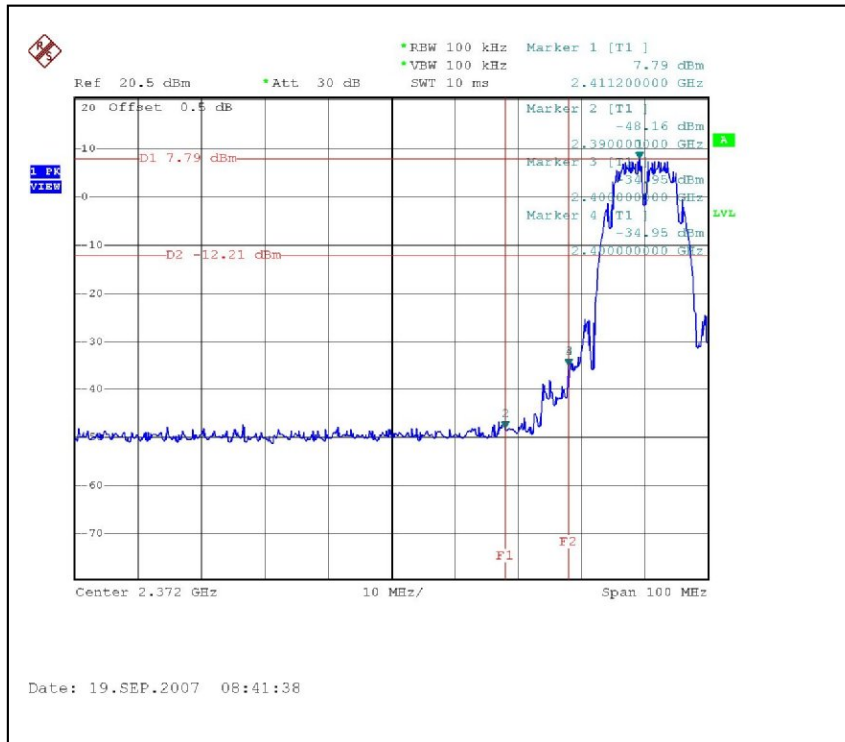
Same as Item 4.1.6

4.3.5 TEST RESULTS

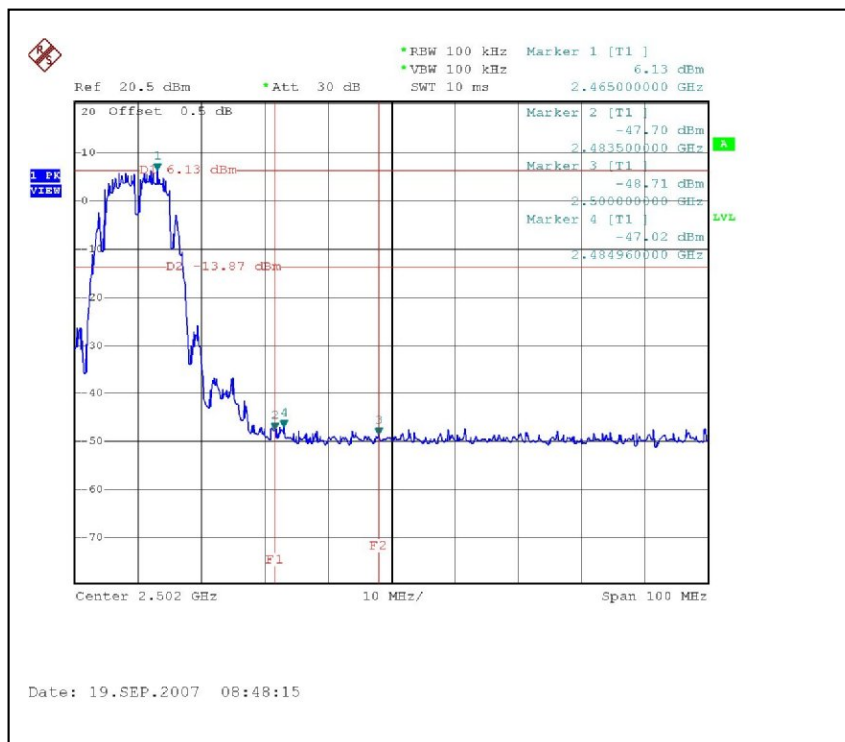
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b DSSS modulation:

CH1

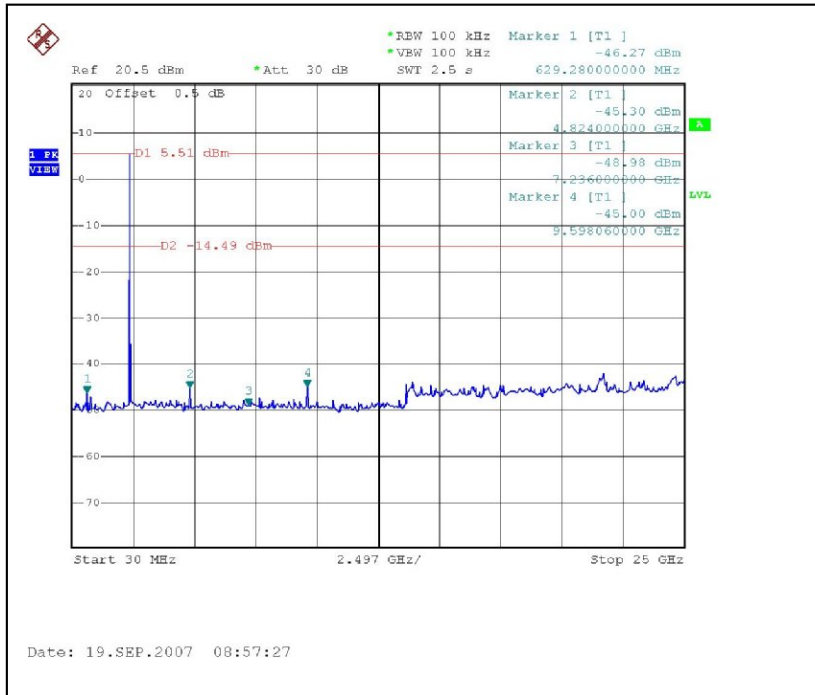


CH11

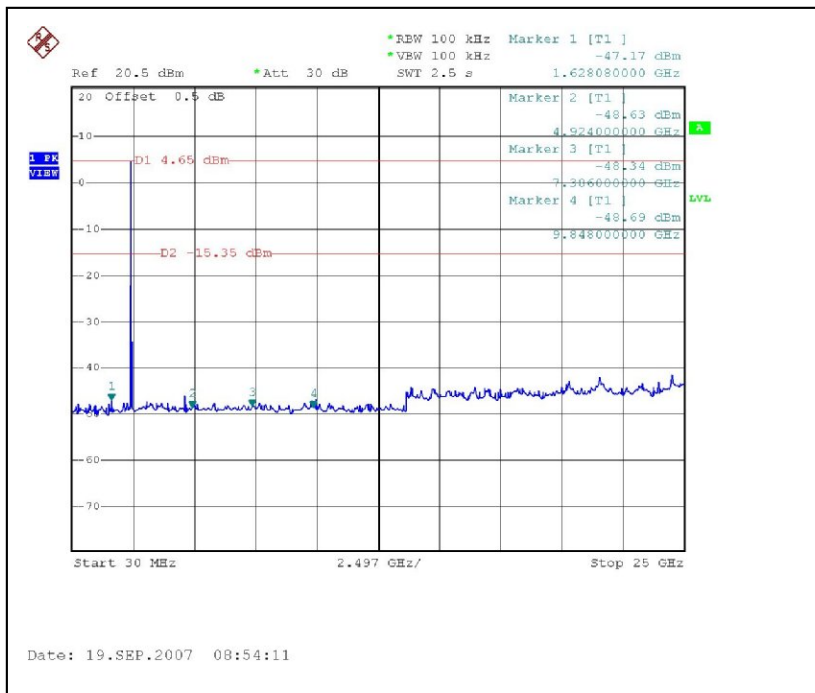


802.11b 10th conducted Harmonic

CH1

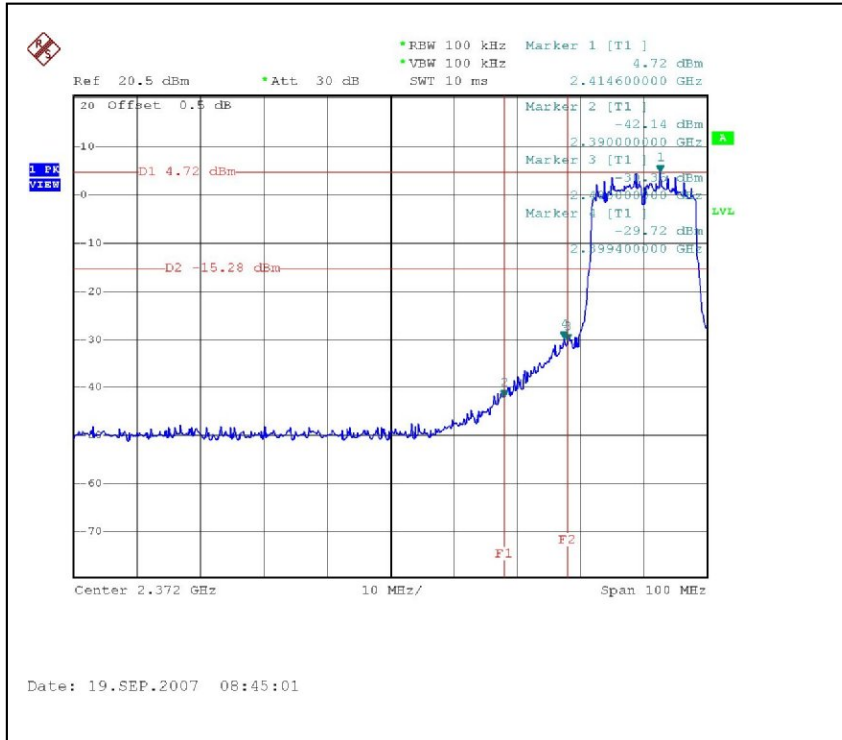


CH11

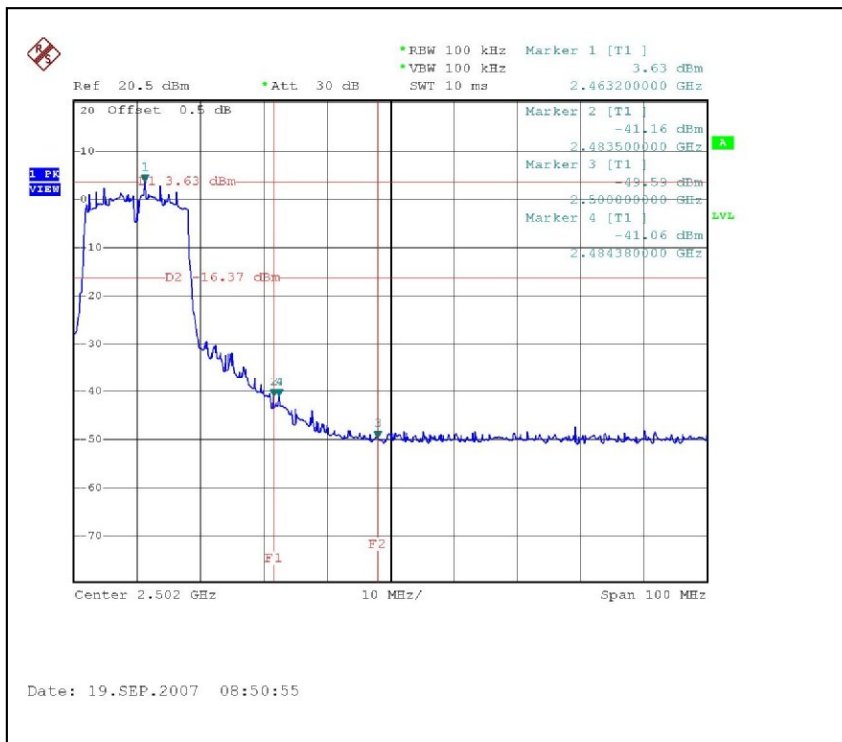


802.11g OFDM modulation:

CH1

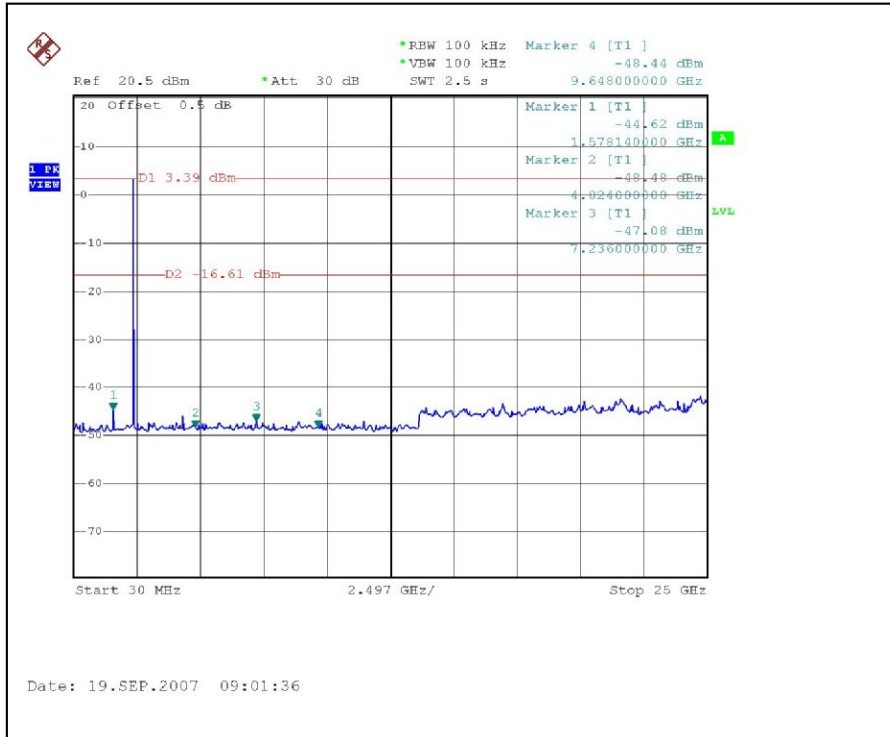


CH11

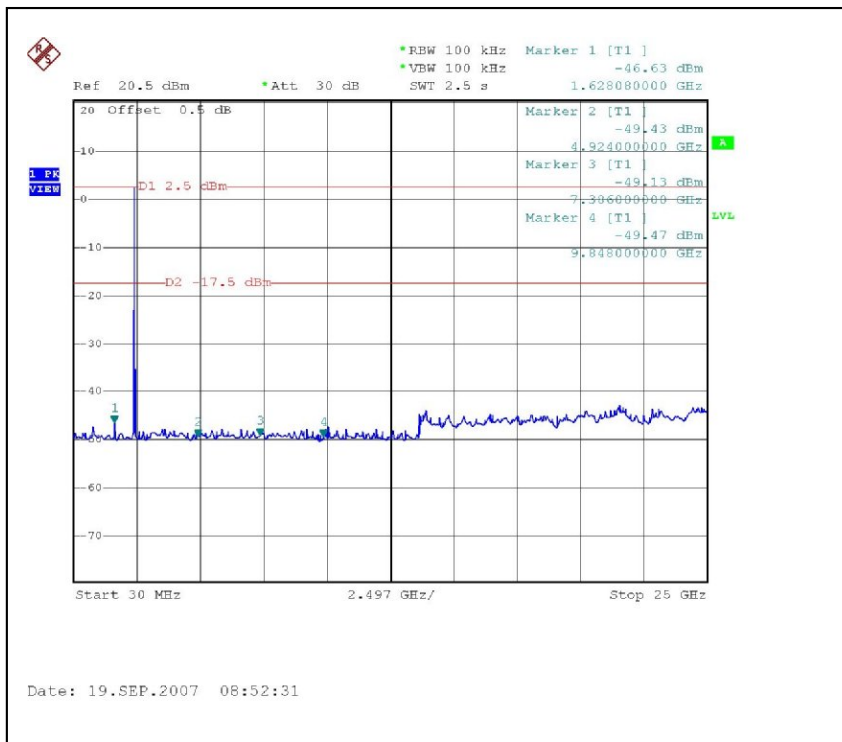


802.11g 10th conducted Harmonic

CH1



CH11



4.4 ANTENNA REQUIREMENT

4.4.1 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.

4.4.2 ANTENNA CONNECTED CONSTRUCTION

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

No.	Antenna Type	Gain (dBi)	Connector
1	Dipole antenna	5 dBi	Reverse polarity SMA
2	Printed antenna (only Rx function)	3.8dBi (Max)	NA



5. INFORMATION ON THE TESTING LABORATORIES

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

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

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Web Site: www.adt.com.tw

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



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.