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FCC TEST REPORT

REPORT NO.: RF971127L09

MODEL NO.: DDR2201 v1

RECEIVED: Nov. 27, 2008

TESTED: Jan. 22 ~ Mar. 03, 2009

ISSUED: Mar. 04, 2009

APPLICANT: Gemtek Technology Co., Ltd.

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ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

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1 CERTIFICATION

PRODUCT: DDR2201 v1 ADSL2+ Residential Gateway
MODEL: DDR2201 v1
BRAND: Cisco Systems, Inc.
APPLICANT: Gemtek Technology Co., Ltd.
TESTED: Jan. 22 ~ Mar. 03, 2009
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.4-2003

The above equipment (model: DDR2201 v1) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Peggy Chen , **DATE** : Mar. 04, 2009
Peggy Chen / Specialist

TECHNICAL ACCEPTANCE : Long Chen , **DATE** : Mar. 04, 2009
Responsible for RF Long Chen / Senior Engineer

APPROVED BY : Gary Chang , **DATE** : Mar. 04, 2009
Gary Chang / Assistant Manager



2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC 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 -5.41dB at 0.185MHz.
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.02dB at 2390.00 and 576.00MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44 dB
	30MHz ~ 200MHz	3.34 dB
Radiated emissions	200MHz ~1000MHz	3.35 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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



3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	DDR2201 v1 ADSL2+ Residential Gateway
MODEL NO.	DDR2201 v1
FCC ID	MXF-ADV980114G
POWER SUPPLY	12Vdc from 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	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
MAXIMUM OUTPUT POWER	149.624mW
ANTENNA TYPE	Dipole antenna with 1.5dBi gain
DATA CABLE	NA
I/O PORTS	Refers to users' manual
ACCESSORY DEVICES	Adapter

NOTE:

1. The EUT was operated with following adapters:

Adapter 1	
BRAND:	OEM
MODEL:	ADS0202-U120167
INPUT:	100-240Vac, 50-60Hz, 0.6A Max
OUTPUT:	12Vdc, 1.67A
POWER LINE:	DC: 1.8m non-shielded cable without core AC: 1.4m non-shielded cable without core

Adapter 2	
BRAND:	APD
MODEL:	DA-30H12
INPUT:	100-240Vac, 50-60Hz, 0.7A Max
OUTPUT:	12Vdc, 2.5A
POWER LINE:	DC: 1.2m non-shielded cable with one core AC: 1.8m non-shielded cable without core

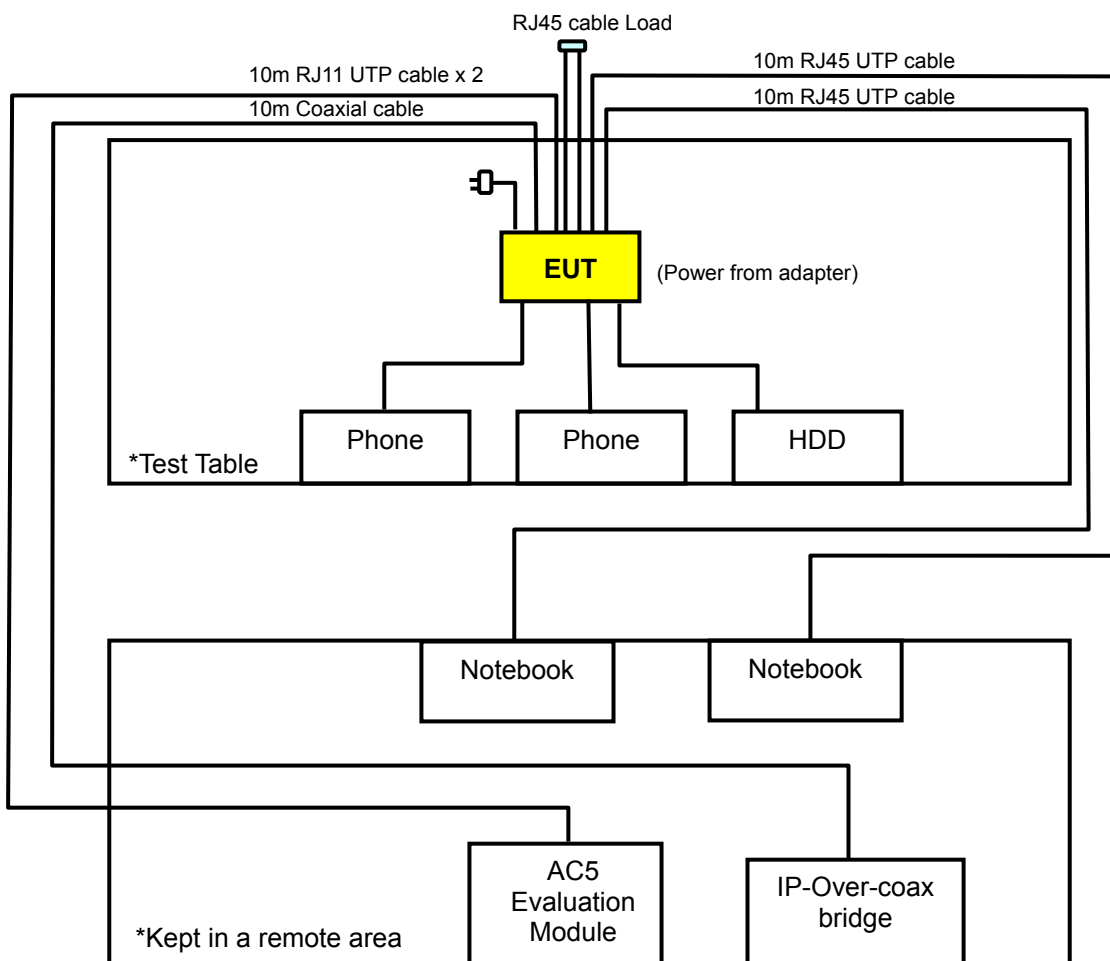
2. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions of up to 54Mbps.
3. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

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		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT Configure Mode	Applicable to				Description
	RE \geq 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2

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

NOTE: "-": Means no effect.

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, XYZ Axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

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

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, XYZ Axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Axis
A	802.11g	1 to 11	6	OFDM	BPSK	6	Z
B	802.11g	1 to 11	6	OFDM	BPSK	6	Z



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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11g	1 to 11	6	OFDM	BPSK	6
B	802.11g	1 to 11	6	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, XYZ axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

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

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.

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



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3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

ANSI C63.4- 2003

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

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



3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	TELEPHONE	WONDER	WD-303	1F01017	NA
2	TELEPHONE	WONDER	WD-303	1F01520	NA
3	EXTERNAL HARD DISK	Terasys	F12-UF	A0100222 -4A60012	FCC DoC Approved
4	NOTEBOOK	DELL	D531	CN-0XM006 -48643-81U-2610	QDS-BRCM1020
5	NOTEBOOK	ASUS	A8M	74N0AS279702	MSQBT183
6	AC5 EVALUATION MODULE	TEXAS INSTRUMENTS	AC5-ANNCXA	NA	NA
7	IP-OVER-COAX BRIDGE	Scientific Atlanta	DPH548	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8 m Non-shielded cable, RJ11 connector, w/o core.
2	1.8 m Non-shielded cable, RJ11 connector, w/o core.
3	1.5 m shielded cable, terminated with USB connector, w/o core.
4	10 m RJ45 cable
5	10 m RJ45 cable
6	10 m RJ11 cable x 2
7	10 m coaxial cable

NOTE:

- 1. All power cords of the above support units are non shielded (1.8m).
- 2. Item 4-7 acted as communication partners to transfer data.

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.



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4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	100033	Jun. 30, 2008	Jun. 29, 2009
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 02, 2008	May 01, 2009
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 24, 2008	Jun. 23, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 25, 2008	Dec. 24, 2009
Preamplifier Agilent	8447D	2944A10633	Nov. 03, 2008	Nov. 02, 2009
Preamplifier Agilent	8449B	3008A01964	Oct. 23, 2008	Oct. 22, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	238141/4	May 20, 2008	May 19, 2009
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	12738/6	May 20, 2008	May 19, 2009
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100.	TT93021703	NA	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC 7450F-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 meters semi-anechoic chamber. 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 lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak method or average method as specified and then reported in data sheet.

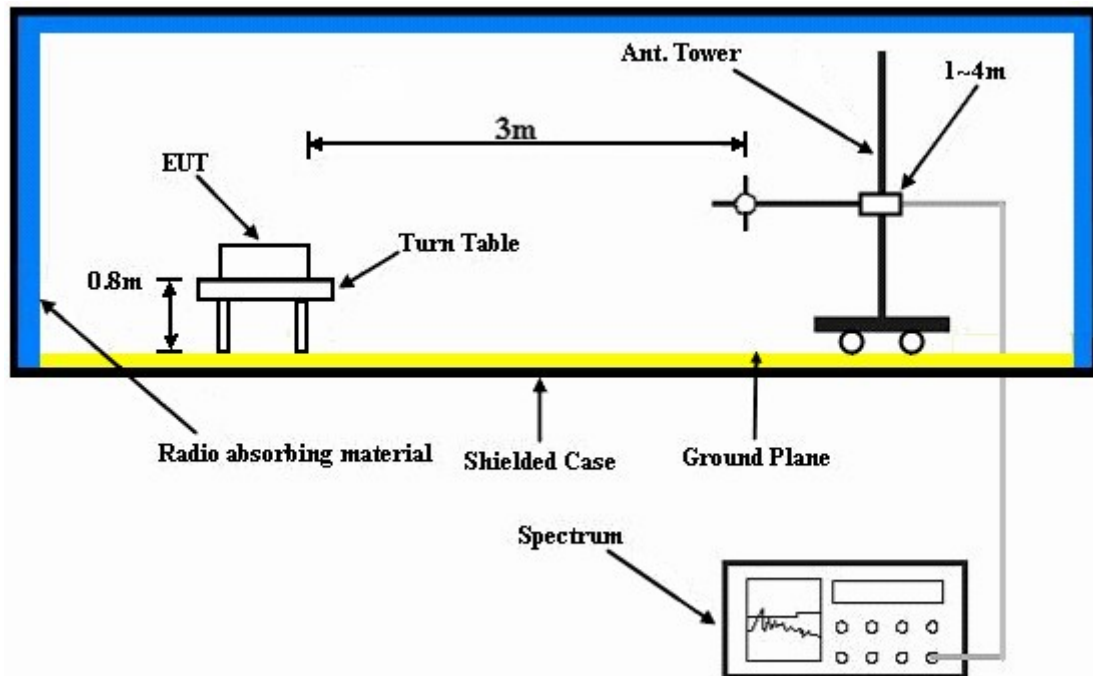
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth 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. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared notebook systems to act as communication partners and placed it outside of testing area.
- c. The communication partners run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency via an RJ45 cable.
- d. The communication partner sent data to EUT by command "PING".
- e. The necessary accessories enable the EUT in full functions.



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4.1.7 TEST RESULTS

802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	51.51 PK	74.00	-22.49	1.06 H	37	20.97	30.54
2	1608.00	45.66 AV	54.00	-8.34	1.06 H	37	15.12	30.54
3	2335.00	59.48 PK	74.00	-14.52	1.00 H	22	27.25	32.23
4	2335.00	49.27 AV	54.00	-4.73	1.00 H	22	17.04	32.23
5	2390.00	59.15 PK	74.00	-14.85	1.11 H	286	26.71	32.44
6	2390.00	48.86 AV	54.00	-5.14	1.11 H	286	16.42	32.44
7	*2412.00	98.73 PK			1.11 H	286	66.21	32.52
8	*2412.00	93.93 AV			1.11 H	286	61.41	32.52
9	#3216.00	53.89 PK	78.73	-24.84	1.00 H	29	19.21	34.67
10	#3216.00	48.41 AV	73.93	-25.52	1.00 H	29	13.73	34.67
11	4824.00	50.20 PK	74.00	-23.80	1.00 H	218	11.90	38.30
12	4824.00	38.57 AV	54.00	-15.43	1.00 H	218	0.27	38.30

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	53.49 PK	74.00	-20.51	1.00 V	37	22.95	30.54
2	1608.00	47.54 AV	54.00	-6.46	1.00 V	37	17.00	30.54
3	2335.00	63.07 PK	74.00	-10.93	1.00 V	41	30.84	32.23
4	2335.00	52.91 AV	54.00	-1.09	1.00 V	41	20.68	32.23
5	2390.00	62.62 PK	74.00	-11.38	1.00 V	39	30.18	32.44
6	2390.00	51.78 AV	54.00	-2.22	1.00 V	39	19.34	32.44
7	*2412.00	106.71 PK			1.00 V	39	74.19	32.52
8	*2412.00	101.94 AV			1.00 V	39	69.42	32.52
9	#3216.00	56.22 PK	86.71	-30.49	1.06 V	34	21.54	34.67
10	#3216.00	52.87 AV	81.94	-29.07	1.06 V	34	18.19	34.67
11	4824.00	50.62 PK	74.00	-23.38	1.00 V	41	12.32	38.30
12	4824.00	39.85 AV	54.00	-14.15	1.00 V	41	1.55	38.30

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	1624.00	45.63 PK	74.00	-28.37	1.05 H	41	15.07	30.56
2	1624.00	40.29 AV	54.00	-13.71	1.05 H	41	9.73	30.56
3	2354.00	59.29 PK	74.00	-14.71	1.00 H	28	26.98	32.31
4	2354.00	49.11 AV	54.00	-4.89	1.00 H	28	16.80	32.31
5	*2437.00	100.19 PK			1.11 H	291	67.59	32.60
6	*2437.00	95.42 AV			1.11 H	291	62.82	32.60
7	#3250.00	53.02 PK	80.19	-27.17	1.00 H	33	18.32	34.70
8	#3250.00	50.14 AV	75.42	-25.28	1.00 H	33	15.44	34.70
9	4874.00	49.45 PK	74.00	-24.55	1.00 H	226	10.95	38.50
10	4874.00	39.08 AV	54.00	-14.92	1.00 H	226	0.58	38.50

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	1624.00	48.71 PK	74.00	-25.29	1.00 V	32	18.15	30.56
2	1624.00	42.31 AV	54.00	-11.69	1.00 V	32	11.75	30.56
3	2354.00	62.16 PK	74.00	-11.84	1.00 V	34	29.85	32.31
4	2354.00	52.94 AV	54.00	-1.06	1.00 V	34	20.63	32.31
5	*2437.00	108.21 PK			1.00 V	32	75.61	32.60
6	*2437.00	103.35 AV			1.00 V	32	70.75	32.60
7	#3250.00	56.93 PK	88.21	-31.28	1.05 V	36	22.22	34.70
8	#3250.00	53.91 AV	83.35	-29.44	1.05 V	36	19.20	34.70
9	4874.00	50.18 PK	74.00	-23.82	1.00 V	49	11.68	38.50
10	4874.00	39.47 AV	54.00	-14.53	1.00 V	49	0.97	38.50

- 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. “ * “: Fundamental frequency.
 6. “#”: The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	45.29 PK	74.00	-28.71	1.05 H	41	14.75	30.54
2	1608.00	37.46 AV	54.00	-16.54	1.05 H	41	6.92	30.54
3	2385.00	59.27 PK	74.00	-14.73	1.18 H	27	26.85	32.42
4	2385.00	49.13 AV	54.00	-4.87	1.18 H	27	16.71	32.42
5	*2462.00	98.39 PK			1.12 H	291	65.71	32.68
6	*2462.00	93.51 AV			1.12 H	291	60.83	32.68
7	2483.50	58.89 PK	74.00	-15.11	1.12 H	291	26.13	32.76
8	2483.50	48.72 AV	54.00	-5.28	1.12 H	291	15.96	32.76
9	#3282.00	55.38 PK	78.39	-23.01	1.00 H	32	20.65	34.73
10	#3282.00	52.89 AV	73.51	-20.62	1.00 H	32	18.16	34.73
11	4924.00	49.52 PK	74.00	-24.48	1.00 H	207	10.88	38.64
12	4924.00	38.76 AV	54.00	-15.24	1.00 H	207	0.12	38.64

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	#1641.00	45.38 PK	86.34	-40.96	1.20 V	51	14.80	30.58
2	#1641.00	39.52 AV	81.50	-41.98	1.20 V	51	8.94	30.58
3	2385.00	62.83 PK	74.00	-11.17	1.26 V	39	30.41	32.42
4	2385.00	52.89 AV	54.00	-1.11	1.26 V	39	20.47	32.42
5	*2462.00	106.34 PK			1.20 V	34	73.66	32.68
6	*2462.00	101.50 AV			1.20 V	34	68.82	32.68
7	2483.50	61.10 PK	74.00	-12.90	1.20 V	25	28.34	32.76
8	2483.50	50.96 AV	54.00	-3.04	1.20 V	25	18.20	32.76
9	#3282.00	59.10 PK	86.34	-27.24	1.00 V	80	24.37	34.73
10	#3282.00	56.54 AV	81.50	-24.96	1.00 V	80	21.81	34.73
11	4924.00	49.81 PK	74.00	-24.19	1.00 V	53	11.17	38.64
12	4924.00	38.97 AV	54.00	-15.03	1.00 V	53	0.33	38.64

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



A D T

802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	48.79 PK	74.00	-25.21	1.05 H	42	18.25	30.54
2	1608.00	37.41 AV	54.00	-16.59	1.05 H	42	6.87	30.54
3	2335.00	59.06 PK	74.00	-14.94	1.00 H	38	26.83	32.23
4	2335.00	48.86 AV	54.00	-5.14	1.00 H	38	16.63	32.23
5	2390.00	59.75 PK	74.00	-14.25	1.00 H	22	27.31	32.44
6	2390.00	49.21 AV	54.00	-4.79	1.00 H	22	16.77	32.44
7	*2412.00	99.52 PK			1.00 H	22	67.00	32.52
8	*2412.00	88.93 AV			1.00 H	22	56.41	32.52
9	#3216.00	53.76 PK	79.52	-25.76	1.00 H	33	19.09	34.67
10	#3216.00	48.29 AV	68.93	-20.64	1.00 H	33	13.62	34.67
11	4824.00	49.21 PK	74.00	-24.79	1.00 H	223	10.91	38.30
12	4824.00	37.85 AV	54.00	-16.15	1.00 H	223	-0.45	38.30

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	50.87 PK	74.00	-23.13	1.00 V	39	20.33	30.54
2	1608.00	39.45 AV	54.00	-14.55	1.00 V	39	8.91	30.54
3	2335.00	63.55 PK	74.00	-10.45	1.25 V	37	31.32	32.23
4	2335.00	52.87 AV	54.00	-1.13	1.25 V	37	20.64	32.23
5	2390.00	68.65 PK	74.00	-5.35	1.25 V	34	36.21	32.44
6	2390.00	52.98 AV	54.00	-1.02	1.25 V	34	20.53	32.44
7	*2412.00	110.73 PK			1.00 V	35	78.21	32.52
8	*2412.00	99.80 AV			1.00 V	35	67.28	32.52
9	#3216.00	56.12 PK	90.73	-34.61	1.07 V	34	21.44	34.67
10	#3216.00	52.82 AV	79.80	-26.98	1.07 V	34	18.14	34.67
11	4824.00	49.41 PK	74.00	-24.59	1.05 V	46	11.11	38.30
12	4824.00	38.07 AV	54.00	-15.93	1.05 V	46	-0.23	38.30

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	46.67 PK	74.00	-27.33	1.06 H	41	16.13	30.54
2	1608.00	35.39 AV	54.00	-18.61	1.06 H	41	4.85	30.54
3	2354.00	58.86 PK	74.00	-15.14	1.00 H	36	26.55	32.31
4	2354.00	48.79 AV	54.00	-5.21	1.00 H	36	16.48	32.31
5	*2437.00	111.96 PK			1.00 H	23	79.36	32.60
6	*2437.00	91.38 AV			1.00 H	23	58.78	32.60
7	#3250.00	52.94 PK	91.96	-39.02	1.00 H	29	18.23	34.70
8	#3250.00	50.03 AV	71.38	-21.35	1.00 H	29	15.33	34.70
9	4874.00	49.15 PK	74.00	-24.85	1.00 H	219	10.65	38.50
10	4874.00	37.85 AV	54.00	-16.15	1.00 H	219	-0.65	38.50

- 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. “ * “: Fundamental frequency.
 6. “#”:The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	1624.00	48.62 PK	74.00	-25.38	1.00 V	29	18.06	30.56
2	1624.00	37.23 AV	54.00	-16.77	1.00 V	29	6.67	30.56
3	2354.00	63.80 PK	74.00	-10.20	1.02 V	34	31.49	32.31
4	2354.00	52.83 AV	54.00	-1.17	1.02 V	34	20.52	32.31
5	*2437.00	112.98 PK			1.00 V	32	80.38	32.60
6	*2437.00	102.26 AV			1.00 V	32	69.66	32.60
7	#3250.00	56.81 PK	92.98	-36.17	1.05 V	37	22.11	34.70
8	#3250.00	53.76 AV	82.26	-28.50	1.05 V	37	19.05	34.70
9	4874.00	49.37 PK	74.00	-24.63	1.06 V	48	10.87	38.50
10	4874.00	37.96 AV	54.00	-16.04	1.06 V	48	-0.54	38.50

- 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. “ * “: Fundamental frequency.
 6. “#”: The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	#1641.00	43.03 PK	79.68	-36.65	1.06 H	43	12.45	30.58
2	#1641.00	32.62 AV	69.07	-36.45	1.06 H	43	2.04	30.58
3	2386.00	59.21 PK	74.00	-14.79	1.00 H	36	26.78	32.43
4	2386.00	49.30 AV	54.00	-4.70	1.00 H	36	16.87	32.43
5	*2462.00	99.68 PK			1.00 H	24	67.00	32.68
6	*2462.00	89.07 AV			1.00 H	24	56.39	32.68
7	2483.50	59.84 PK	74.00	-14.16	1.00 H	24	27.08	32.76
8	2483.50	49.26 AV	54.00	-4.74	1.00 H	24	16.50	32.76
9	#3282.00	53.65 PK	79.68	-26.03	1.00 H	32	18.92	34.73
10	#3282.00	48.21 AV	69.07	-20.86	1.00 H	32	13.48	34.73
11	4924.00	49.07 PK	74.00	-24.93	1.00 H	215	10.43	38.64
12	4924.00	37.76 AV	54.00	-16.24	1.00 H	215	-0.88	38.64

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH 998hPa	TESTED BY	Dean Wang

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	#1641.00	44.44 PK	90.79	-46.35	1.29 V	29	13.86	30.58
2	#1641.00	33.81 AV	79.77	-45.96	1.29 V	29	3.23	30.58
3	2386.00	64.57 PK	74.00	-9.43	1.21 V	39	32.14	32.43
4	2386.00	52.95 AV	54.00	-1.05	1.21 V	39	20.52	32.43
5	*2462.00	110.79 PK			1.22 V	32	78.11	32.68
6	*2462.00	99.77 AV			1.22 V	32	67.09	32.68
7	2483.50	66.19 PK	74.00	-7.81	1.00 V	28	33.43	32.76
8	2483.50	52.71 AV	54.00	-1.29	1.00 V	28	19.95	32.76
9	#3282.00	58.65 PK	90.79	-32.14	1.00 V	82	23.92	34.73
10	#3282.00	56.07 AV	79.77	-23.70	1.00 V	82	21.34	34.73
11	4924.00	49.28 PK	74.00	-24.72	1.03 V	51	10.64	38.64
12	4924.00	37.88 AV	54.00	-16.12	1.03 V	51	-0.76	38.64

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



A D T

BELOW 1GHz WORST-CASE DATA : 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1023hPa	TESTED BY	Mark Liao
TEST MODE	A		

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	249.60	38.40 QP	46.00	-7.60	1.50 H	259	24.72	13.68
2	385.70	40.54 QP	46.00	-5.46	1.00 H	310	23.59	16.95
3	576.00	44.98 QP	46.00	-1.02	1.40 H	321	22.45	22.53
4	706.51	42.94 QP	46.00	-3.06	1.00 H	319	17.63	25.31
5	834.84	40.68 QP	46.00	-5.32	1.50 H	322	13.66	27.02
6	877.61	40.45 QP	46.00	-5.55	1.50 H	106	12.72	27.74

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	47.20	37.16 QP	40.00	-2.84	1.00 V	98	23.64	13.52
2	66.14	37.48 QP	40.00	-2.52	1.00 V	190	24.82	12.66
3	401.26	42.47 QP	46.00	-3.53	1.25 V	301	25.12	17.35
4	475.14	43.51 QP	46.00	-2.49	2.00 V	328	23.76	19.74
5	576.00	44.96 QP	46.00	-1.04	1.00 V	338	22.44	22.53
6	928.16	43.69 QP	46.00	-2.31	1.00 V	139	15.27	28.42

- 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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH 1023hPa	TESTED BY	Sun Lin
TEST MODE	B		

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	92.12	37.79 QP	43.50	-5.71	2.00 H	301	28.95	8.84
2	374.04	39.63 QP	46.00	-6.37	1.00 H	229	22.97	16.65
3	475.14	40.37 QP	46.00	-5.63	2.00 H	319	20.63	19.74
4	525.69	39.61 QP	46.00	-6.39	1.50 H	226	18.40	21.20
5	576.25	43.18 QP	46.00	-2.82	1.50 H	157	20.65	22.53
6	704.57	40.64 QP	46.00	-5.36	1.00 H	154	15.35	25.29
7	926.22	39.84 QP	46.00	-6.16	1.25 H	244	11.45	28.39
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	31.84	38.36 QP	40.00	-1.64	1.00 V	121	25.79	12.57
2	80.45	38.70 QP	40.00	-1.30	2.00 V	241	27.83	10.87
3	399.31	42.57 QP	46.00	-3.43	1.50 V	64	25.28	17.29
4	475.14	44.90 QP	46.00	-1.10	1.00 V	190	25.16	19.74
5	576.25	41.80 QP	46.00	-4.20	1.50 V	187	19.27	22.53
6	825.11	41.81 QP	46.00	-4.19	1.25 V	262	14.97	26.84
7	875.67	41.02 QP	46.00	-4.98	1.00 V	313	13.31	27.71
8	926.22	42.65 QP	46.00	-3.35	1.00 V	265	14.25	28.39

- 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 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 19, 2008	Nov. 18, 2009
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 31, 2008	Dec. 30, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jun. 13, 2008	Jun. 12, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Dec. 04, 2008	Dec. 03, 2009
Software ADT	ADT_Cond_ V7.3.6	NA	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-2040.



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4.2.3 TEST PROCEDURES

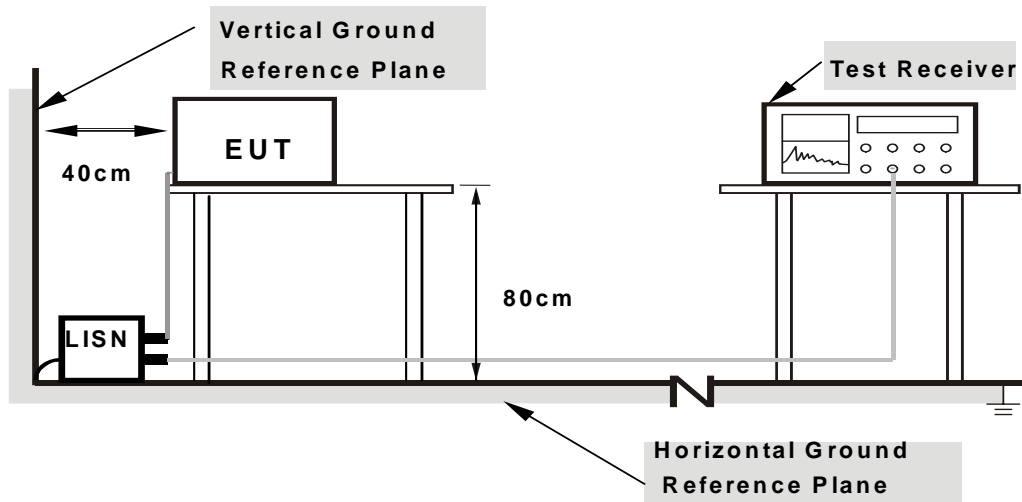
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

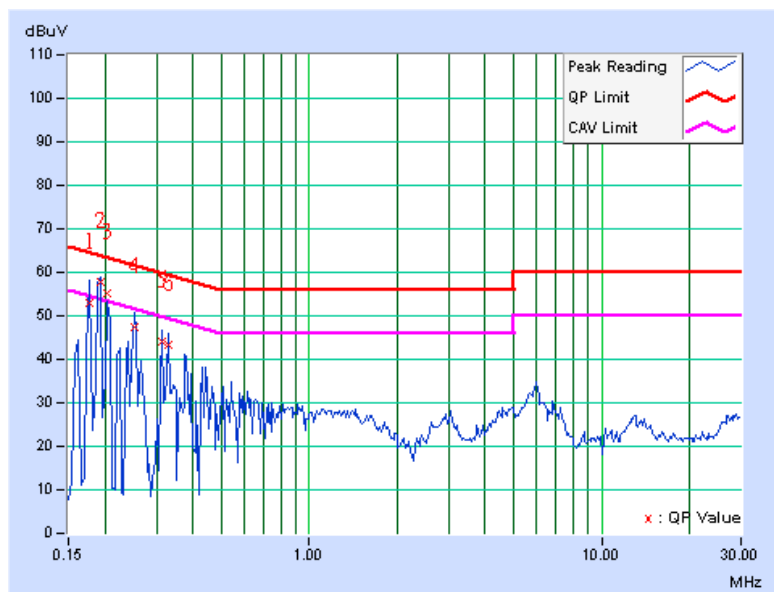
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 1016hPa
INPUT POWER	120Vac, 60 Hz	TESTED BY	Sun Lin
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.177	0.13	52.91	-	53.04	-	64.61
2	0.193	0.13	57.46	41.82	57.59	41.95	63.91	53.91	-6.32	-11.96
3	0.205	0.13	54.87	32.70	55.00	32.83	63.42	53.42	-8.42	-20.59
4	0.252	0.13	47.31	-	47.44	-	61.71	51.71	-14.26	-
5	0.314	0.14	43.83	-	43.97	-	59.86	49.86	-15.90	-
6	0.330	0.14	43.05	-	43.19	-	59.46	49.46	-16.27	-

- 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.



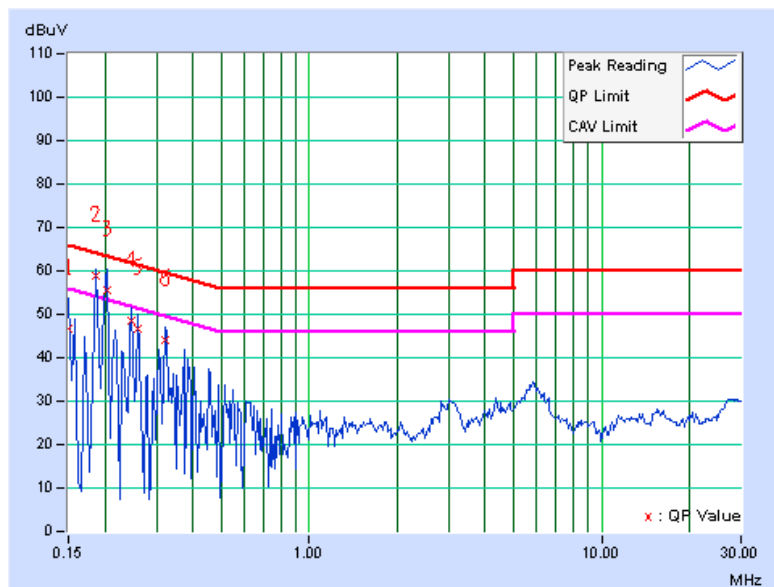


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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 1016hPa
INPUT POWER	120Vac, 60 Hz	TESTED BY	Sun Lin
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.14	46.47	-	46.61	-	66.00	56.00	-19.39	-
2	0.185	0.15	58.69	42.99	58.84	43.14	64.25	54.25	-5.41	-11.11
3	0.205	0.15	55.47	33.64	55.62	33.79	63.42	53.42	-7.80	-19.63
4	0.248	0.15	48.36	-	48.51	-	61.84	51.84	-13.32	-
5	0.259	0.15	46.54	-	46.69	-	61.45	51.45	-14.76	-
6	0.322	0.16	43.74	-	43.90	-	59.66	49.66	-15.76	-

- 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.



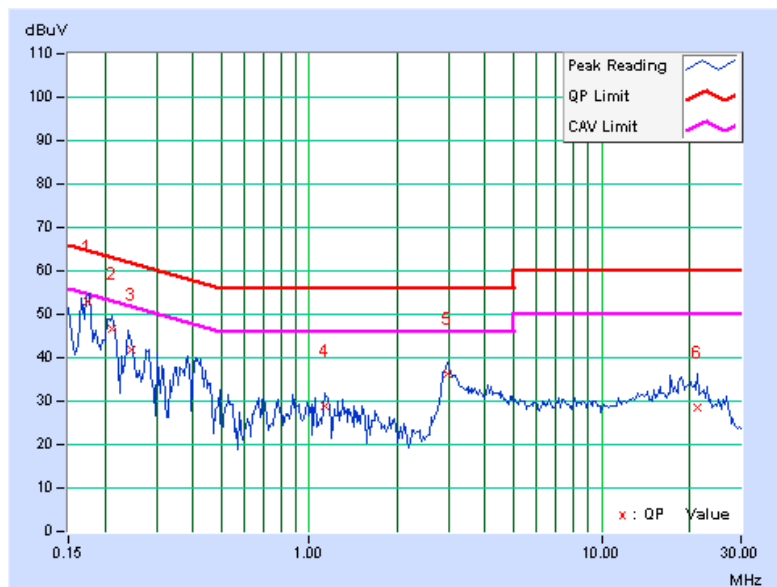


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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH, 1016hPa
INPUT POWER	120Vac, 60 Hz	TESTED BY	Mark Liao
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.175	0.13	52.68	-	52.81	-	64.73	54.73	-11.92	-
2	0.210	0.13	46.68	-	46.81	-	63.20	53.20	-16.39	-
3	0.246	0.13	41.90	-	42.03	-	61.88	51.88	-19.85	-
4	1.125	0.19	28.69	-	28.88	-	56.00	46.00	-27.12	-
5	2.984	0.30	35.89	-	36.19	-	56.00	46.00	-19.81	-
6	21.375	1.17	27.41	-	28.58	-	60.00	50.00	-31.42	-

- 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.



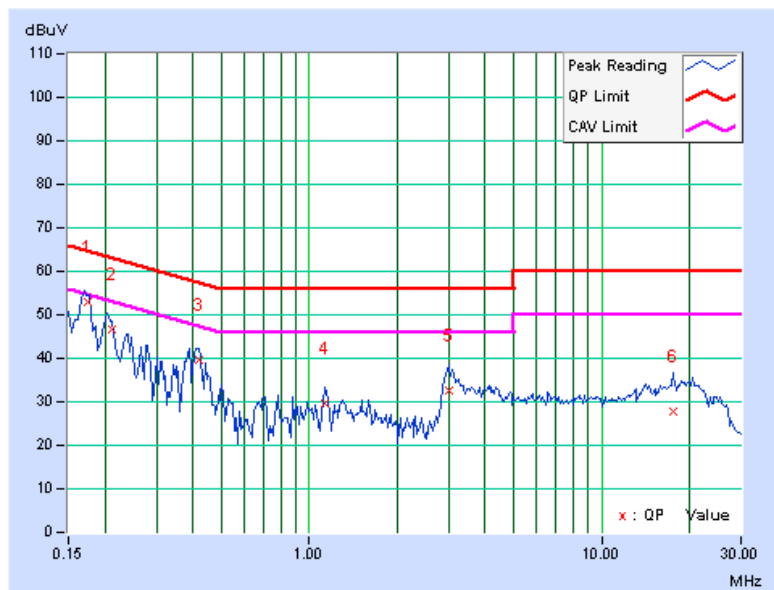


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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	18deg. C, 66%RH, 1016hPa
INPUT POWER	120Vac, 60 Hz	TESTED BY	Mark Liao
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.174	0.14	52.92	-	53.06	-	64.77	54.77	-11.70	-
2	0.211	0.15	46.45	-	46.60	-	63.18	53.18	-16.58	-
3	0.420	0.16	39.38	-	39.54	-	57.46	47.46	-17.92	-
4	1.128	0.21	29.28	-	29.49	-	56.00	46.00	-26.51	-
5	2.992	0.32	32.28	-	32.60	-	56.00	46.00	-23.40	-
6	17.527	0.90	26.81	-	27.71	-	60.00	50.00	-32.29	-

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





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.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

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

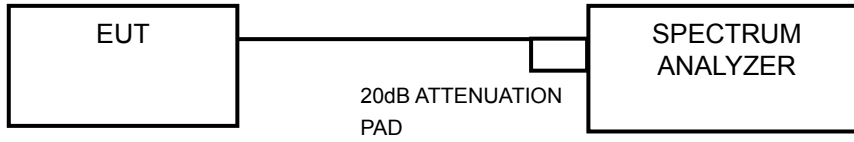
4.3.3 TEST PROCEDURE

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 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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



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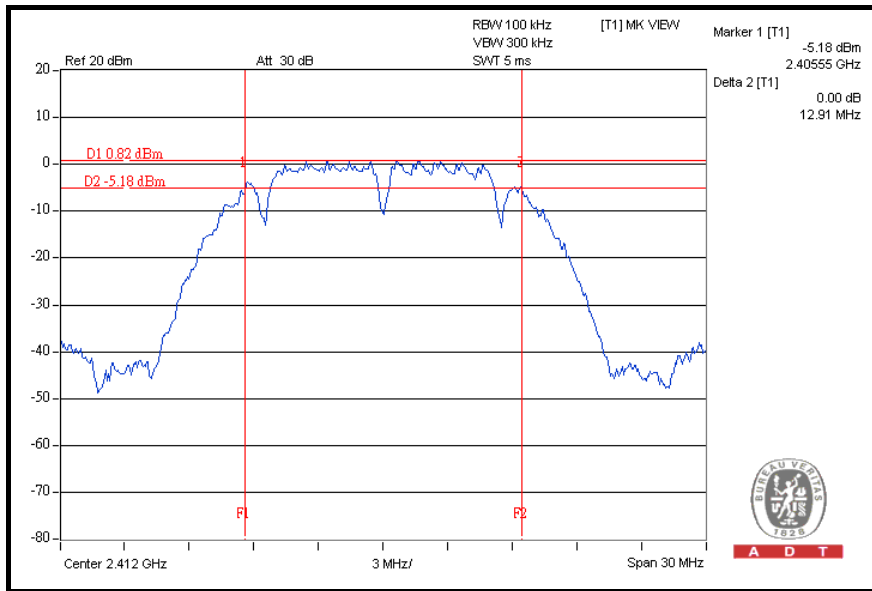
4.3.7 TEST RESULTS

802.11b DSSS MODULATION

MODULATION TYPE	DBPSK	TRANSFER RATE	1.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	18 deg.C, 66 %RH, 1021hPa
TESTED BY	Dean Wang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	12.91	0.5	PASS
6	2437	12.91	0.5	PASS
11	2462	12.90	0.5	PASS

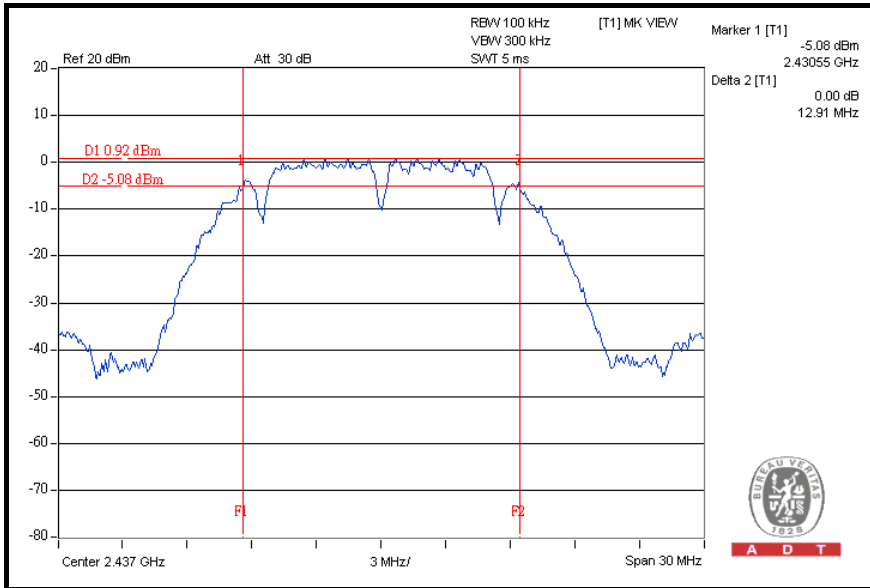
CH 1



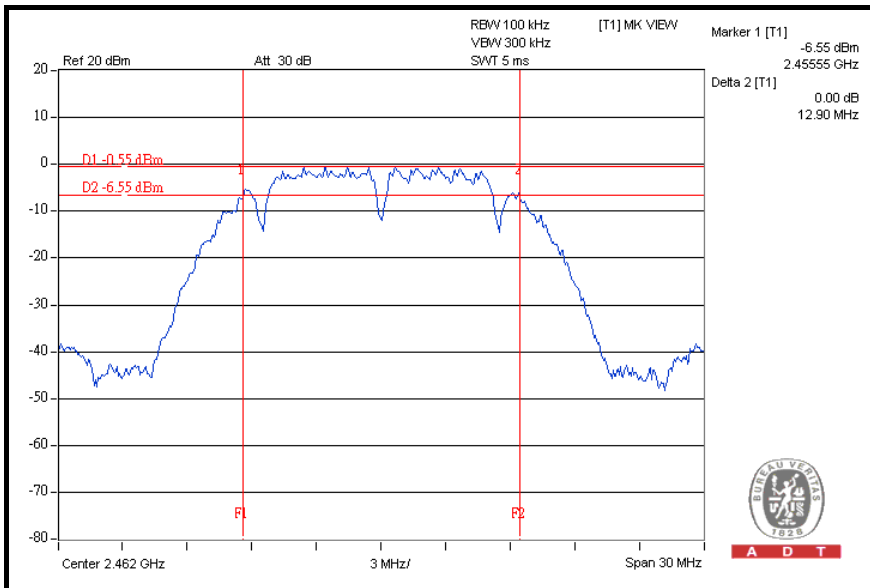


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CH 6



CH 11





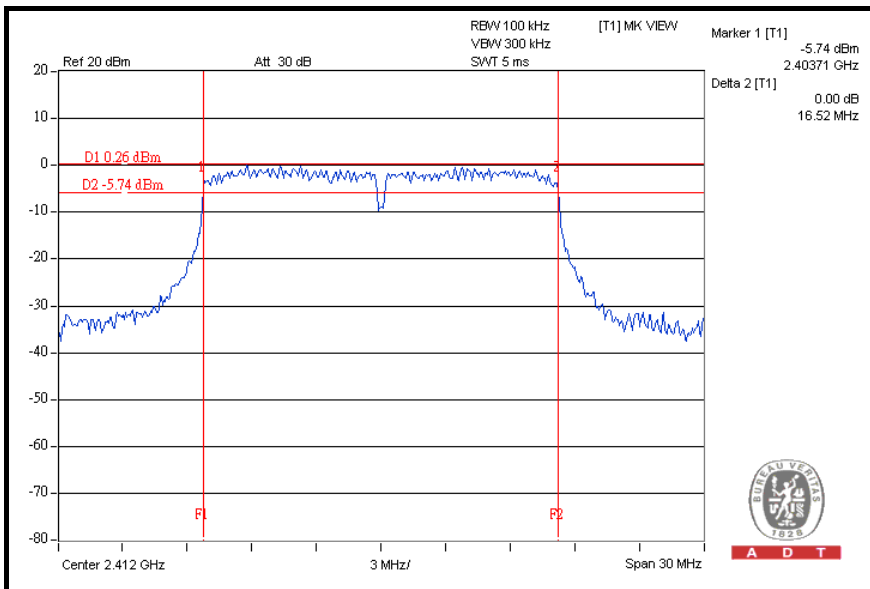
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802.11g OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	18 deg.C, 66 %RH, 1021hPa
TESTED BY	Dean Wang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.52	0.5	PASS
6	2437	16.48	0.5	PASS
11	2462	16.54	0.5	PASS

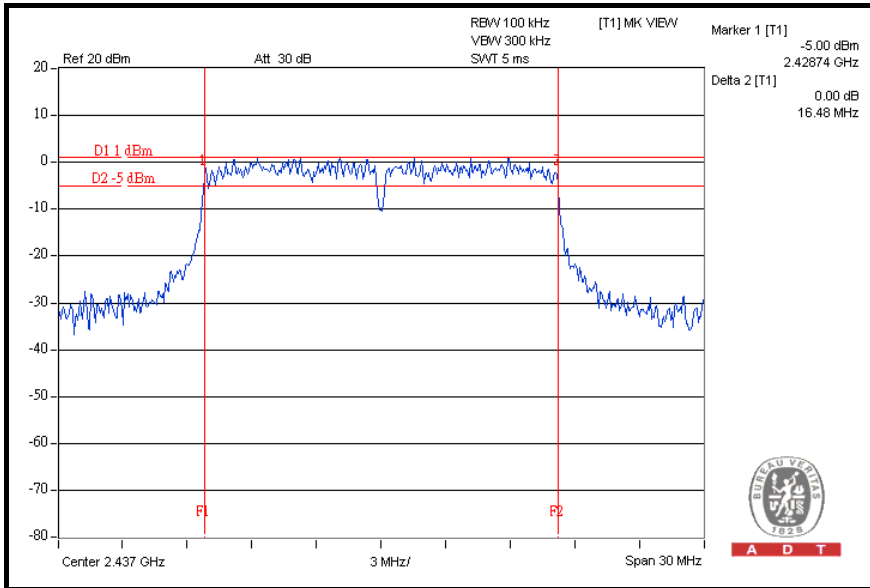
CH 1



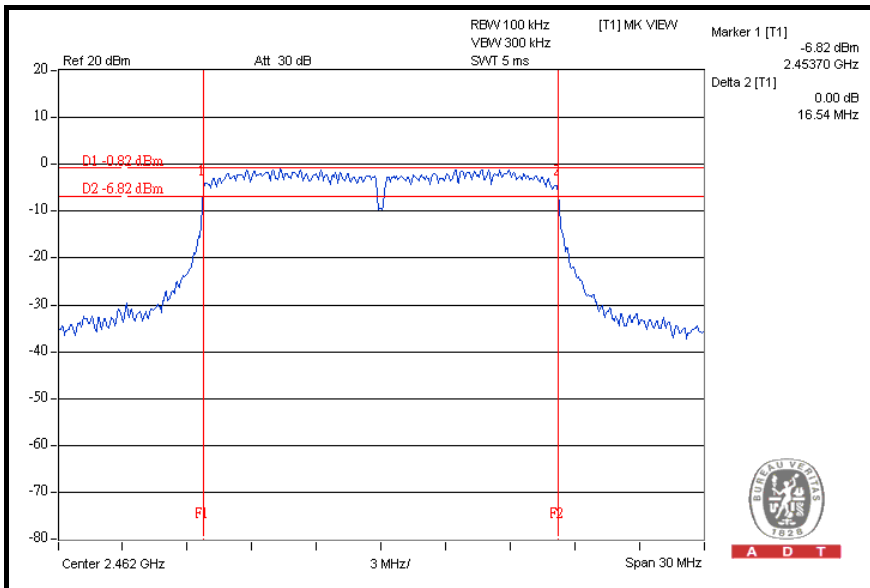


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CH 6



CH 11





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.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
High Speed Peak Power Meter	ML2495A	0824012	Aug. 04, 2008	Aug. 03, 2009
Power Sensor	MA2444B	0738138	Aug. 04, 2008	Aug. 03, 2009

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Measurement Bandwidth of ML2495A is 65MHz greater than 6dB bandwidth of emission.



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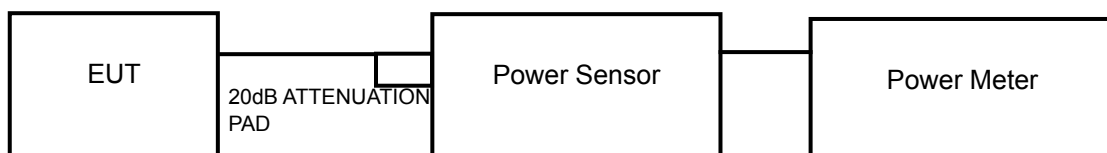
4.4.3 TEST PROCEDURES

A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6.



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4.4.7 TEST RESULTS

802.11b DSSS MODULATION

MODULATION TYPE	DBPSK	TRANSFER RATE	1.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	18 deg.C, 66 %RH, 1021hPa
TESTED BY	Dean Wang		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	15.05	31.989	30	PASS
6	2437	15.09	32.285	30	PASS
11	2462	13.56	22.699	30	PASS

802.11g OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	18 deg.C, 66 %RH, 1021hPa
TESTED BY	Dean Wang		

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	21.07	127.938	30	PASS
6	2437	21.75	149.624	30	PASS
11	2462	20.08	101.859	30	PASS



4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

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 PROCEDURE

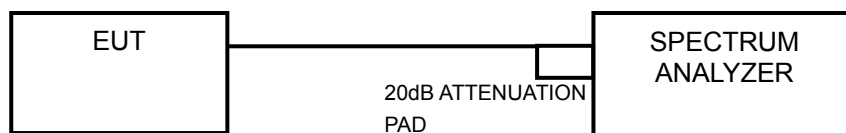
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation.

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as 4.3.6.



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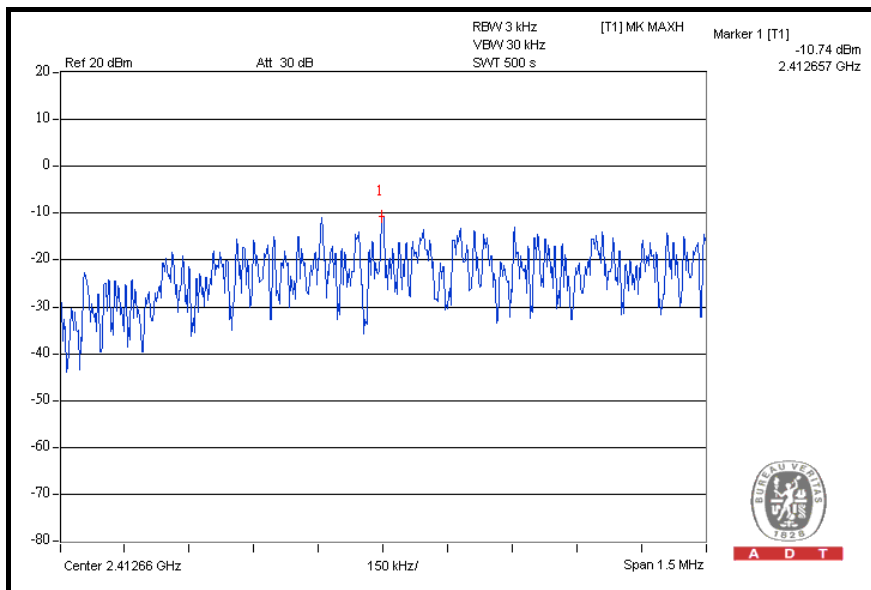
4.5.7 TEST RESULTS

802.11b DSSS MODULATION

MODULATION TYPE	DBPSK	TRANSFER RATE	1.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	18 deg.C, 66 %RH, 1021hPa
TESTED BY	Dean Wang		

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
1	2412	-10.74	8	PASS
6	2437	-10.64	8	PASS
11	2462	-12.08	8	PASS

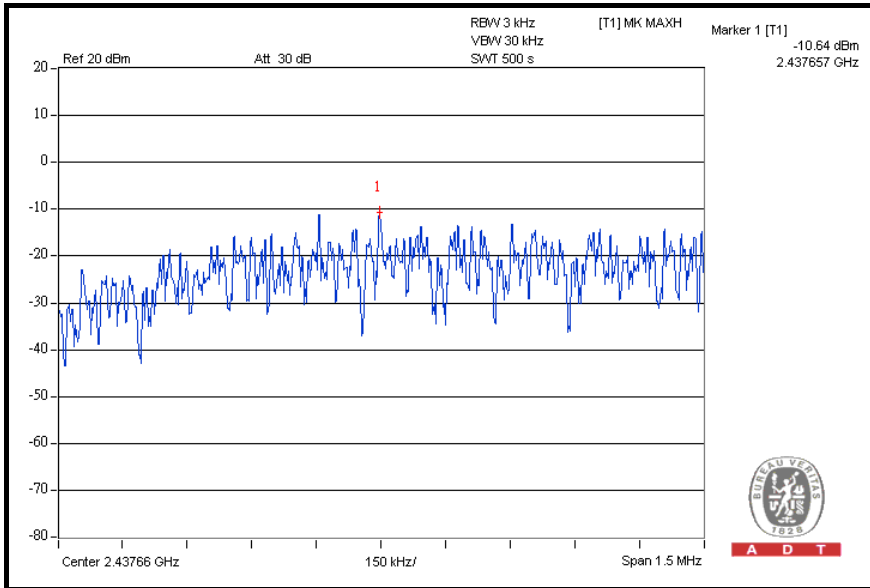
CH 1



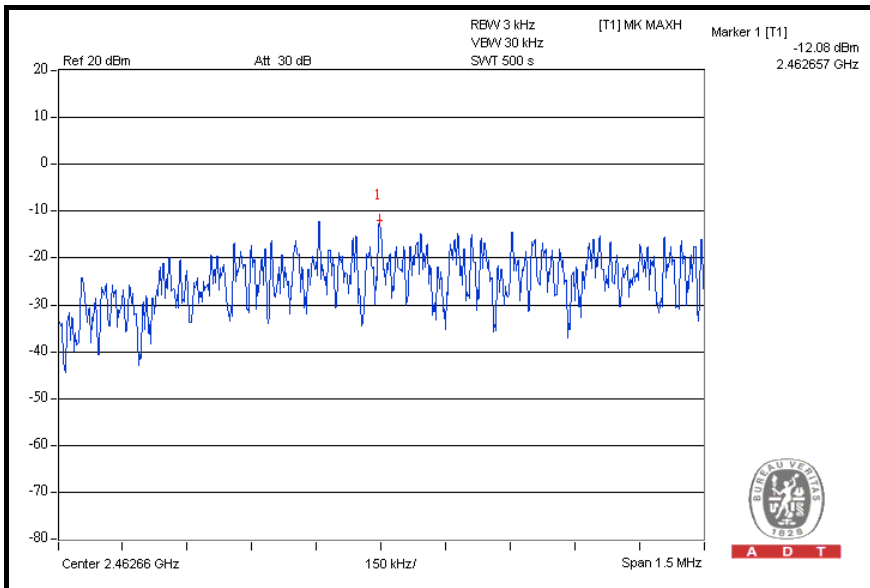


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CH 6



CH 11





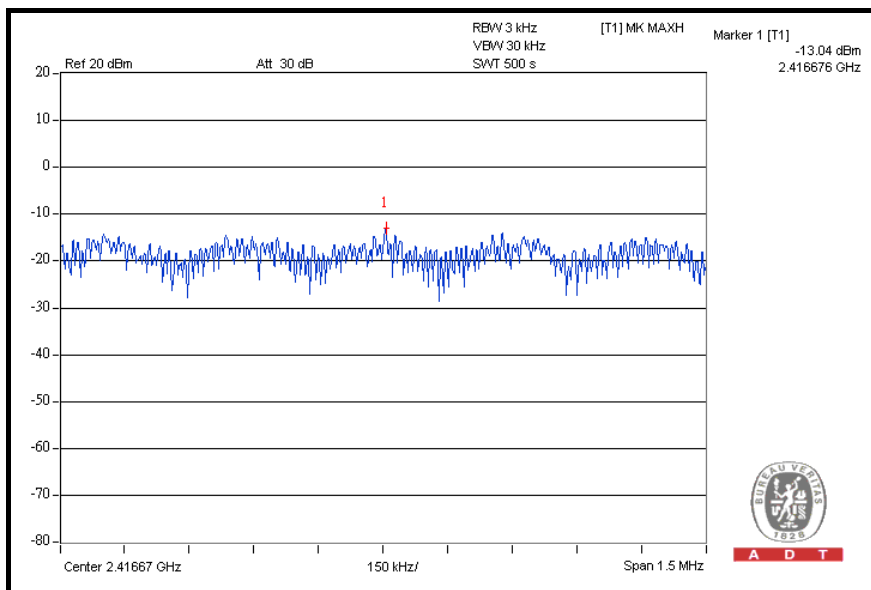
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802.11g OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6.0Mbps
INPUT POWER	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	18deg.C, 66%RH, 1021hPa
TESTED BY	Dean Wang		

CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
1	2412	-13.04	8	PASS
6	2437	-12.18	8	PASS
11	2462	-13.99	8	PASS

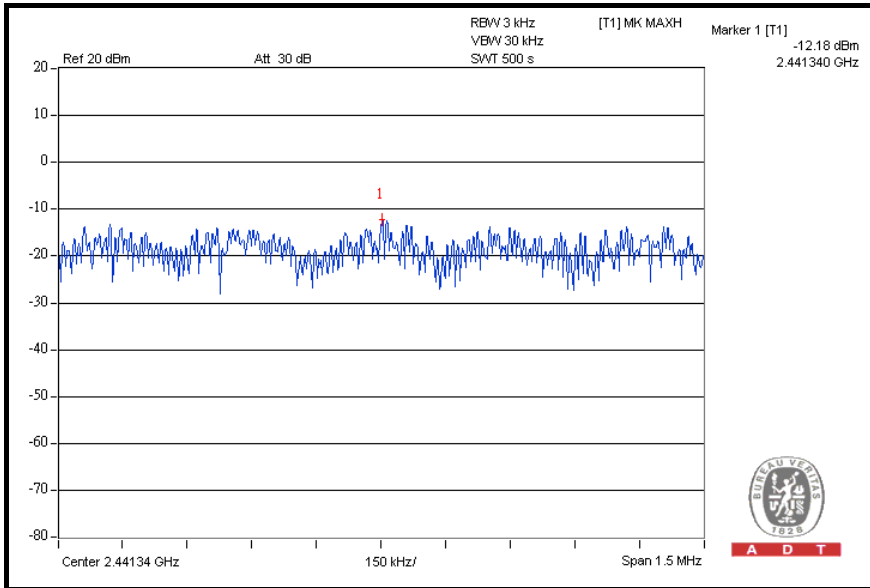
CH 1



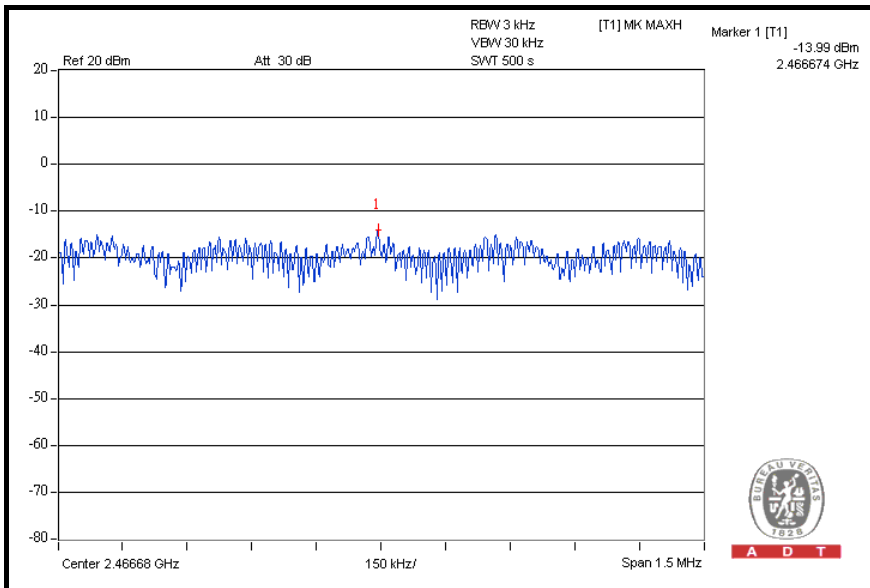


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CH 6



CH 11





4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100041	Apr. 22, 2008	Apr. 21, 2009

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

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW=100kHz, VBW=300kHz; Average RBW=1MHz, VBW= 10Hz are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 EUT OPERATING CONDITION

Same as 4.3.6.

4.6.6 TEST RESULTS

The spectrum plots are attached on the following 24 images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b DSSS MODULATION

NOTE 1: The band edge emission plot on the next page shows 45.43dBc between carrier maximum power and local maximum emission in restrict band (2.3294GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 106.71dBuV/m (Peak), so the maximum field strength in restrict band is $106.71 - 45.43 = 61.28$ dBuV/m which is under 74dBuV/m limit.

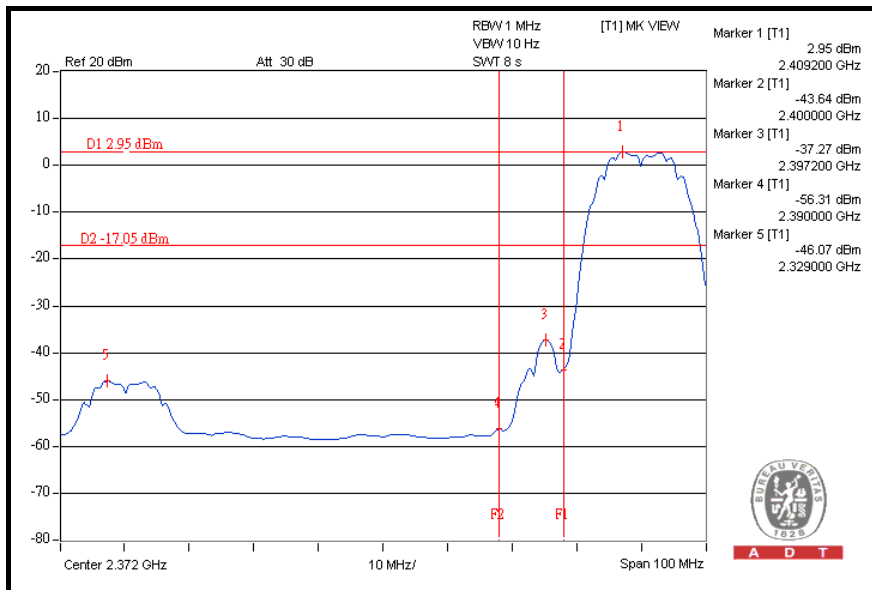
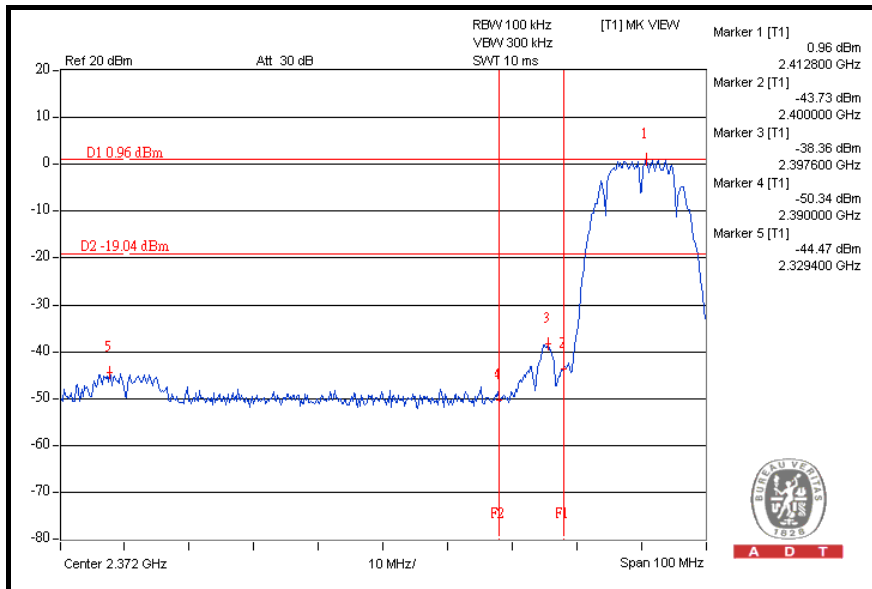
The band edge emission plot on the next page shows 49.02dBc between carrier maximum power and local maximum emission in restrict band (2.3290GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 101.94dBuV/m (Average), so the maximum field strength in restrict band is $101.94 - 49.02 = 52.92$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on the next second page shows 47.61dBc between carrier maximum power and local maximum emission in restrict band (2.4978GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 106.34dBuV/m (Peak), so the maximum field strength in restrict band is $106.34 - 47.61 = 58.73$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 59.12dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 101.50dBuV/m (Average), so the maximum field strength in restrict band is $101.50 - 59.12 = 42.38$ dBuV/m which is under 54dBuV/m limit.

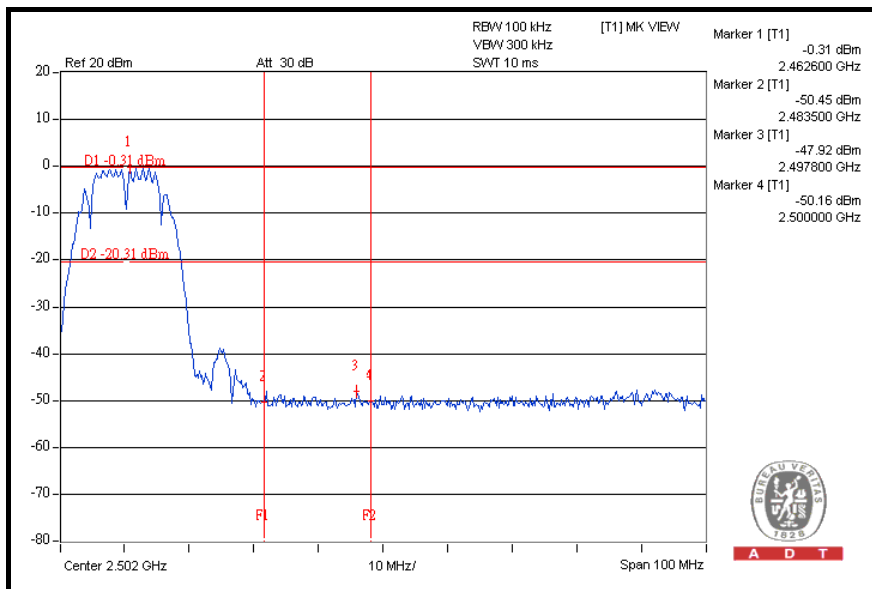
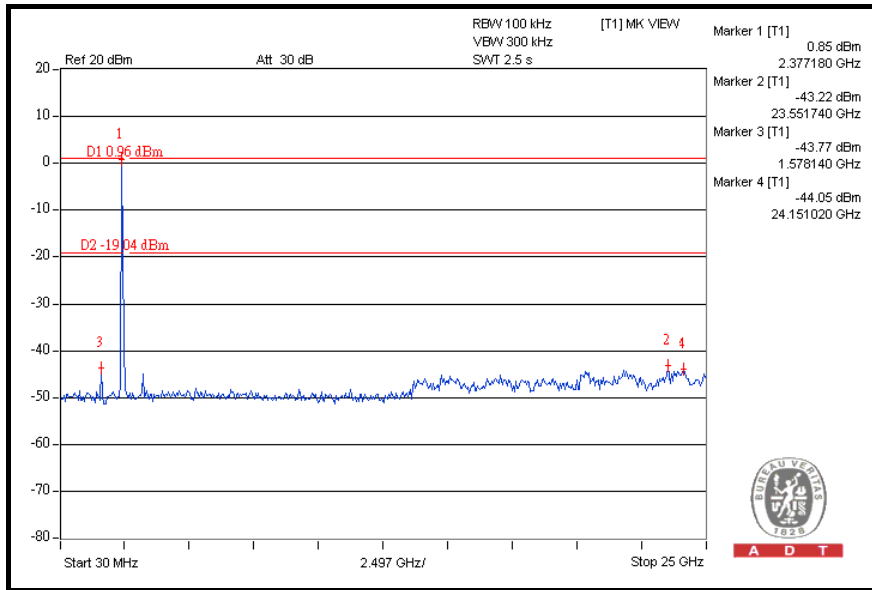


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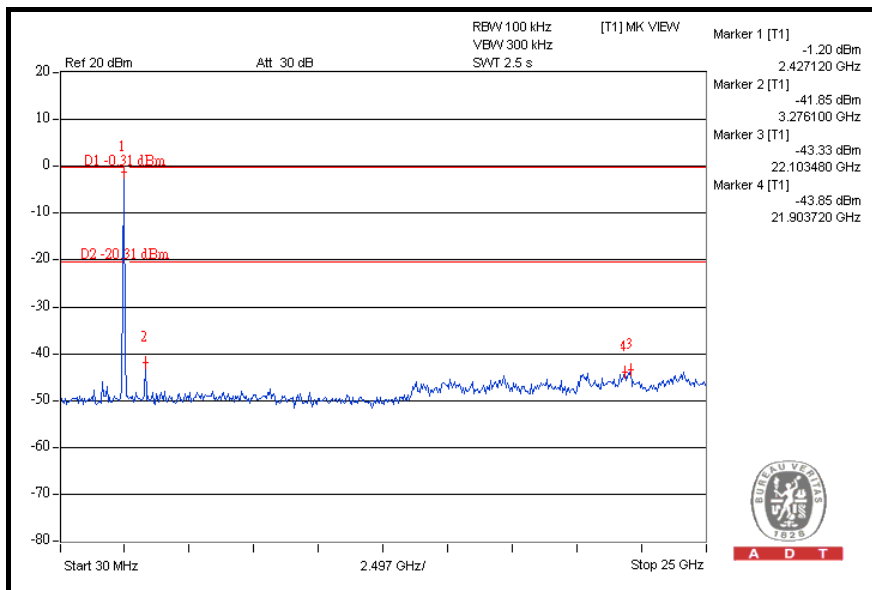
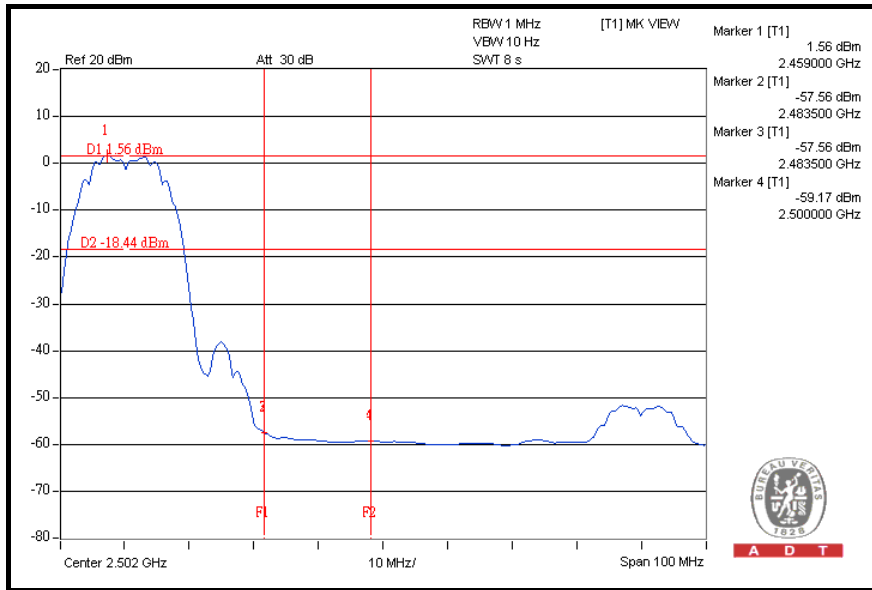


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802.11g OFDM MODULATION

NOTE 1: The band edge emission plot on the next page shows 45.22dBc between carrier maximum power and local maximum emission in restrict band (2.3366GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 110.73dBuV/m (Peak), so the maximum field strength in restrict band is $110.73 - 45.22 = 65.51$ dBuV/m which is under 74dBuV/m limit.

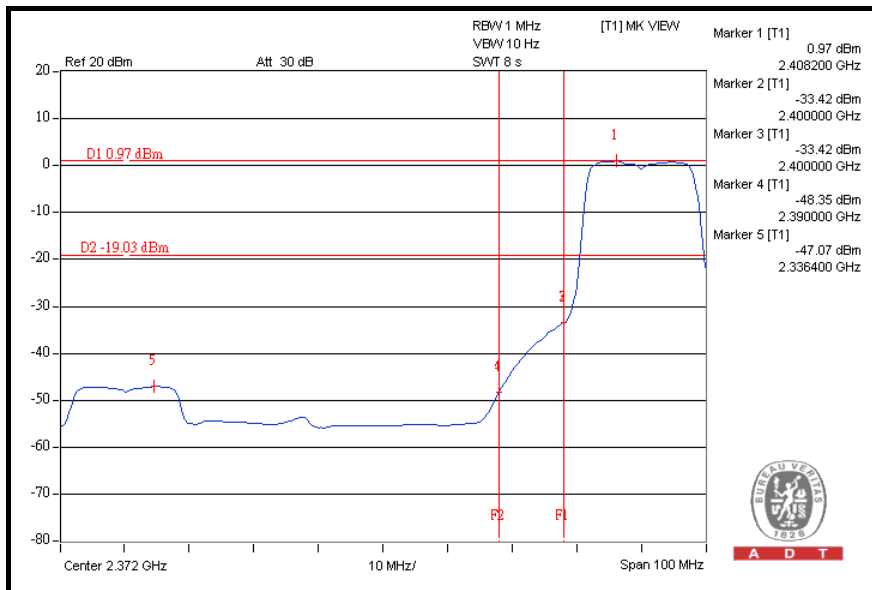
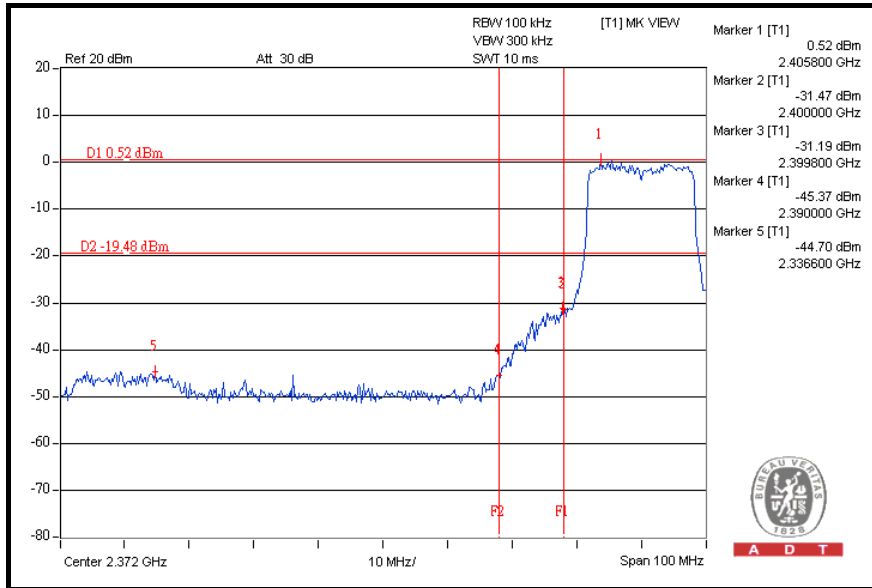
The band edge emission plot on the next page shows 48.04dBc between carrier maximum power and local maximum emission in restrict band (2.3364GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.1.7 is 99.80dBuV/m (Average), so the maximum field strength in restrict band is $99.80 - 48.04 = 51.76$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on the next second page shows 42.41dBc between carrier maximum power and local maximum emission in restrict band (2.4838GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 110.79dBuV/m (Peak), so the maximum field strength in restrict band is $110.79 - 42.41 = 68.38$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 48.15dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.1.7 is 99.77dBuV/m (Average), so the maximum field strength in restrict band is $99.77 - 48.15 = 51.62$ dBuV/m which is under 54dBuV/m limit.

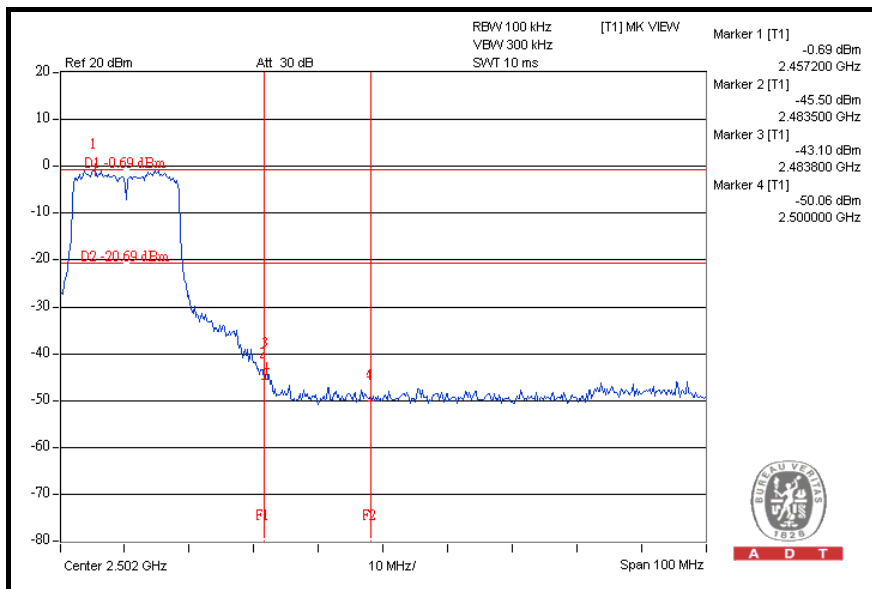
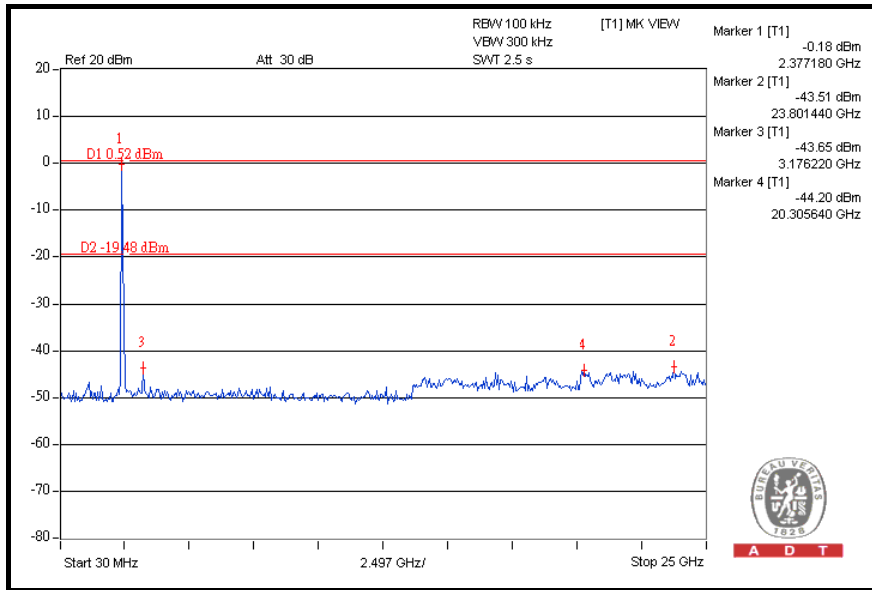


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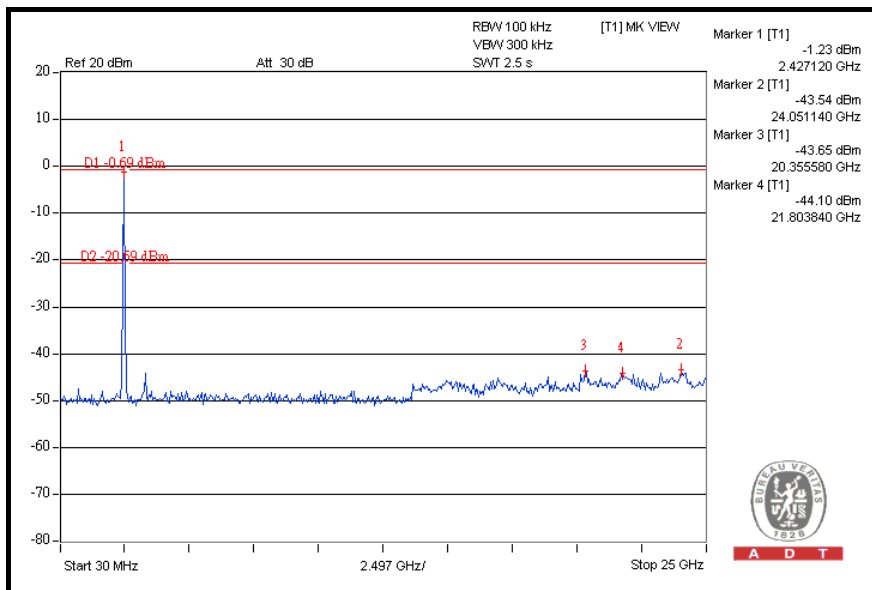
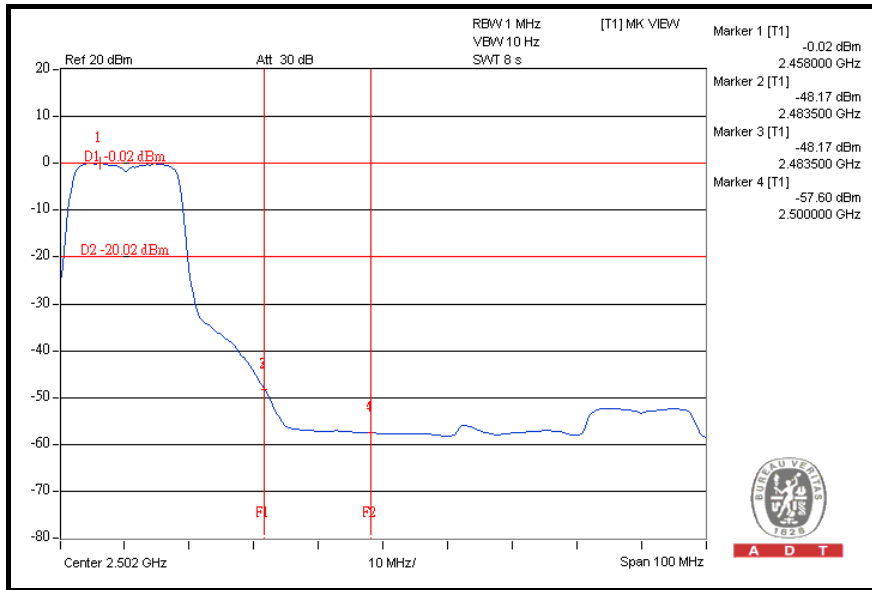


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4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

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

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

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is dipole antenna without antenna connector. The maximum Gain of the antenna is 1.5dBi.



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5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

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.



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7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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

---END---