FCC TEST REPORT (15.247)
(For WLAN)

REPORT NO.:	RF110923D13
MODEL NO.:	MODAT-100
FCC ID:	RFHMODAT-100
RECEIVED:	Sep. 23, 2011
TESTED:	Sep. 28, 2011 ~ Jan. 16, 2012
ISSUED:	Feb. 13, 2012

APPLICANT:	ICP Electronics, Inc.
ADDRESS:	3F., No.22, Zhongxing Rd., Xizhi Dist., New Taipei City 221, Taiwan

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
LAB ADDRESS:	No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)

Testing Laboratory
2021

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110923D13	Original release	Feb. 13, 2012

1. CERTIFICATION

PRODUCT:	HANDHELD COMPUTER
BRAND NAME:	iEi
MODEL NO.:	MODAT-100
APPLICANT:	ICP Electronics, Inc.
TEST ITEM:	R&D SAMPLE
TESTED:	Sep. 28, 2011 ~ Jan. 16, 2012
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)**
	ANSI C63.4-2003
	ANSI C63.10-2009

The above equipment 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 : Annie Chang , **DATE:** Feb. 13, 2012
(Annie Chang / Senior Specialist)

APPROVED BY : Ken Liu , **DATE:** Feb. 13, 2012
(Ken Liu / 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**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -20.34dB at 0.154MHz
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 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 -5.1dB at 2483.50MHz
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.
15.203	Antenna Requirement	PASS	Antenna connector is U.FL not a standard connector.

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:

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.41 dB
Radiated emissions	30MHz ~ 1GHz	3.87 dB
	Above 1GHz	3.36 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	HANDHELD COMPUTER
MODEL NO.	MODAT-100
FCC ID	RFHMODAT-100
NOMINAL VOLTAGE	12Vdc from adapter or cradle 7.4Vdc from battery
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps
OPERATING FREQUENCY	2412.0 ~ 2462.0MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	57.5mW
ANTENNA TYPE	Dipole antenna with 2dBi gain
ANTENNA CONNECTER	U.FL connector
DATA CABLE	NA
I/O PORTS	Refer to User's manual
ACCESSORY DEVICES	Refer to note as below

NOTE:

1. The EUT is a HANDHELD COMPUTER. The functions of EUT listed as below:

Function		**Test Standard**	**Reference Report**
WiFi + Bluetooth module (AzureWave, Model: AW-GH381)	**WLAN 802.11bg**	FCC Part 15, Subpart C (Section 15.247)	RF110923D13
	Bluetooth		RF110923D13-1
2G/ 3G Module (HSDPA 850/1900/2100) (Brand: Siemens, Model: HC25)		FCC Part 22	RF110923D13-2
2G/ 3G Module (GSM/GPRS 850/900/1800/1900) Brand: Siemens, Model: HC25)		FCC Part 24	RF110923D13-3
RFID (Brand: TI, Model: TRF7960-61)	-	FCC Part 15, Subpart C (Section 15.225)	RF110923D13-4

Note: WLAN & Bluetooth function can't transmit simultaneously.

2. The EUT consumes power from an AC adapter, cradle or battery, as follows:

Item	Brand	Model No.	Spec.
Adapter	FSP	FSP036-RAB613	AC I/P: 90-264V, 1.5A, 50-60Hz DC O/P: 12V, 3A, 36W Non-shielded AC 3-pin (1.8m) Non-shielded DC (1.5m) with one ferrite core
Cradle	iEi	MODAT-100-CR01-R10	-
Battery	-	-	7.4Vdc

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

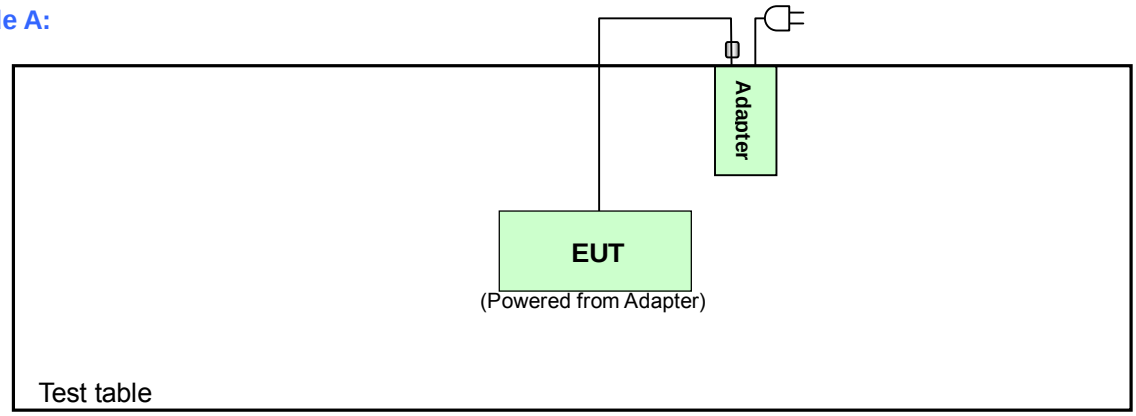
3.2 DESCRIPTION OF TEST MODES

11 channels are provided for 802.11b/g:

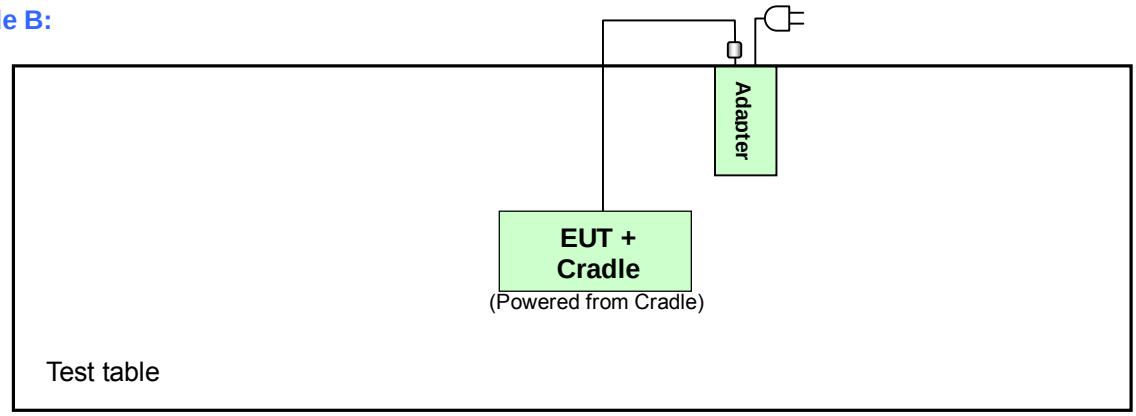
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

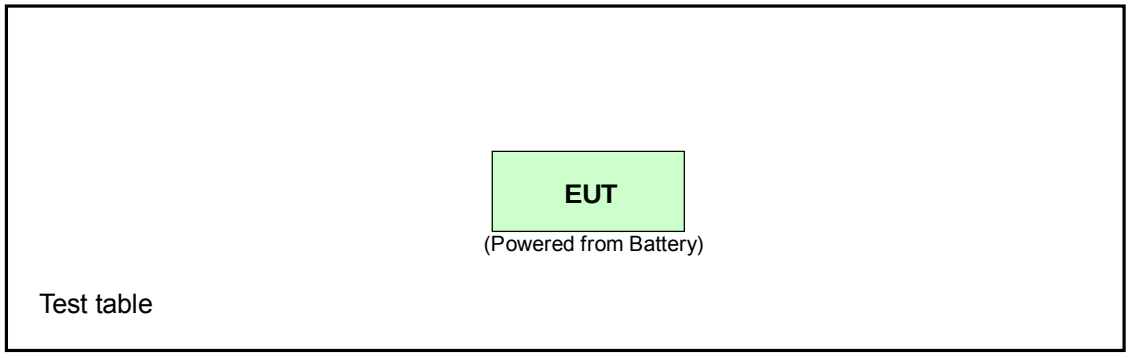
Mode A:



Mode B:



Mode C:



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE≥1G	RE<1G	APCM	
A	√	√	√	√	EUT + Adapter
B	√	-	√	-	EUT + Cradle + Adapter
C	Note	-	√	-	EUT only

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

Note: 1. No need to concern of Conducted Emission due to the EUT is powered by battery.

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 & B	802.11b	1 to 11	1	DSSS	DBPSK	1.0

RADIATED EMISSION TEST (ABOVE 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X,Y,Z 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	1.0	Z
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	Z

RADIATED EMISSION TEST (BELOW 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X,Y,Z 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 & C	802.11b	1 to 11	1	DSSS	DBPSK	1.0	Z
B	802.11b	1 to 11	1	DSSS	DBPSK	1.0	-

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ 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	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0

TEST CONDITION:

APPLICABLE TO	EUT CONFIGURE MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	A & B	25deg. C, 75% RH	120Vac, 60Hz	Nick Chen
RE[3] 1G	A	26deg. C, 71% RH	120Vac, 60Hz	Chad Lee
RE <1G	A & B	26deg. C, 71% RH	120Vac, 60Hz	Chad Lee
	C	26deg. C, 71% RH	7.4Vdc	Chad Lee
APCM	A	23deg. C, 80% RH	120Vac, 60Hz	Jun Wu

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
ANSI C63.10-2009

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 its adapter or cradle.

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	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 0.50MHz.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100276	Jan. 04, 2012	Jan. 03, 2013
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100219	Nov. 24, 2011	Nov. 23, 2012
LISN With Adapter (for EUT)	AD10	C10Ada-001	Nov. 24, 2011	Nov. 23, 2012
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Dec. 08, 2011	Dec. 07, 2012
Software	ADT_Cond_V7.3.7	NA	NA	NA
Software	ADT_ISN_V7.3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	Feb. 22, 2011	Feb. 21, 2012
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Feb. 26, 2011	Feb. 25, 2012

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 Shielded Room No. 10.

3. The VCCI Site Registration No. C-1852.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

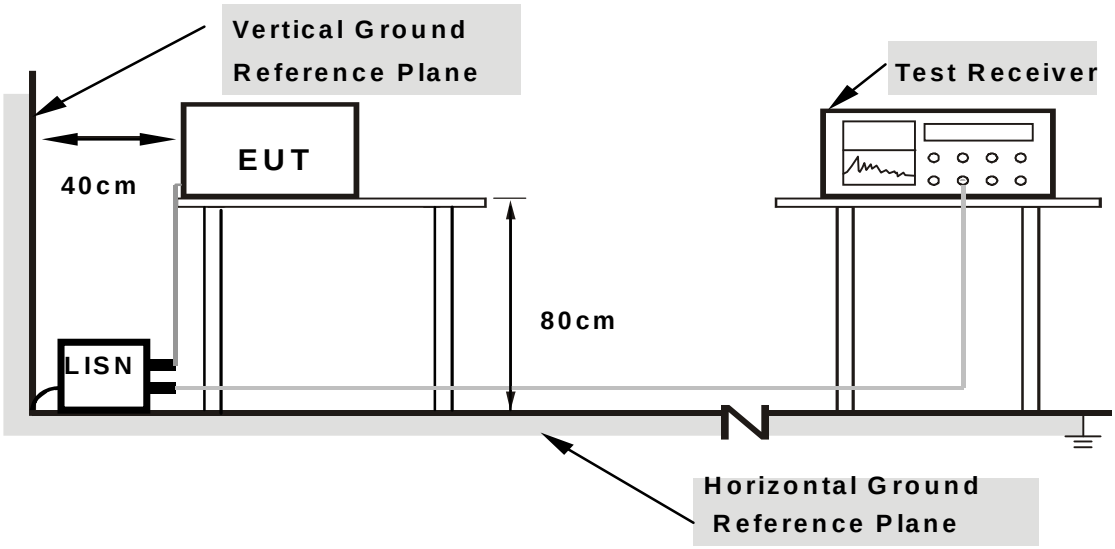
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: 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



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).

4.1.6 EUT OPERATING CONDITIONS

a. Turn on the power of all equipment.
b. Connected the EUT with adapter or cradle placed on testing table.
c. EUT ran a test program (provided by manufacture) to enable.
d. Set the EUT under transmission condition continuously at specific channel frequency.

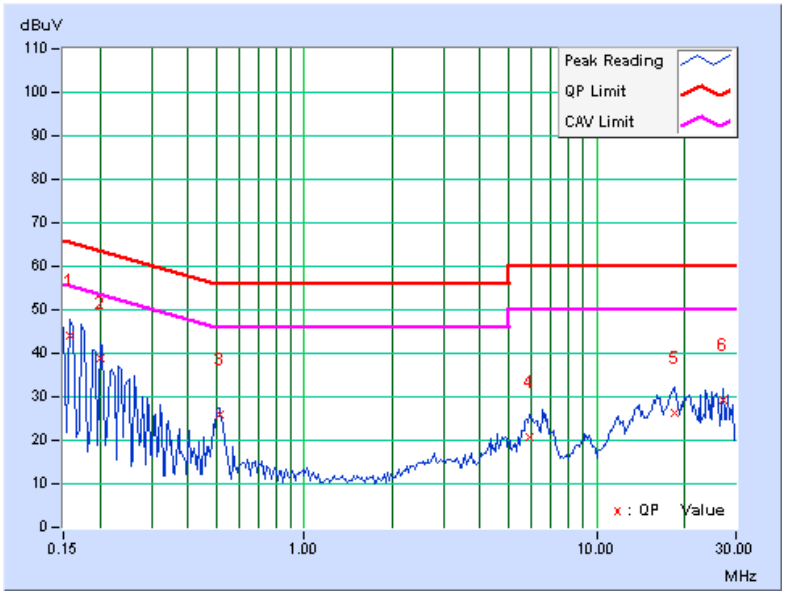
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA： 802.11b

PHASE	Line 1	6dB BANDWIDTH	9kHz
CHANNEL	Channel 1	TEST MODE	A

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.17	43.78	-	43.95	-	65.58	55.58	-21.63	-
2	0.201	0.17	38.86	-	39.03	-	63.58	53.58	-24.55	-
3	0.513	0.25	25.78	-	26.03	-	56.00	46.00	-29.97	-
4	5.887	0.58	20.29	-	20.87	-	60.00	50.00	-39.13	-
5	18.480	1.27	25.17	-	26.44	-	60.00	50.00	-33.56	-
6	27.160	1.56	27.69	-	29.25	-	60.00	50.00	-30.75	-

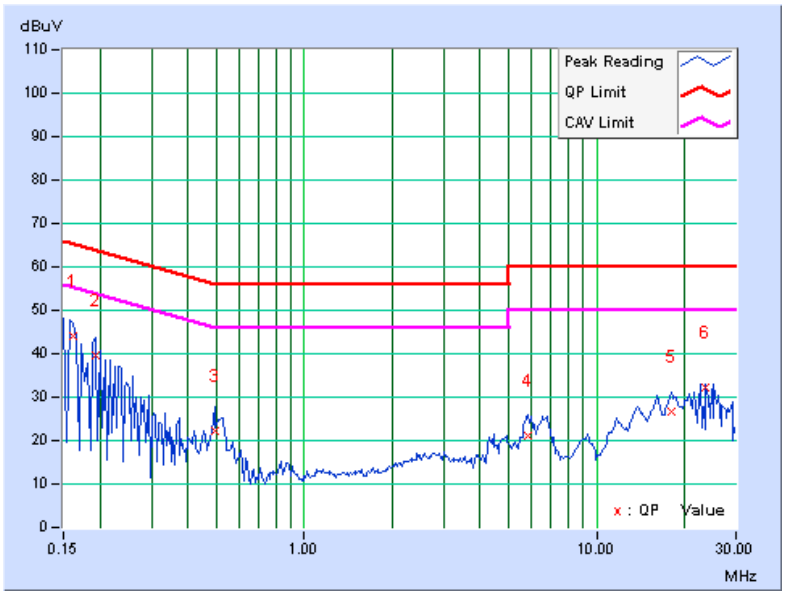
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Line 2	**6dB BANDWIDTH**	9kHz
CHANNEL	Channel 1	**TEST MODE**	A

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.18	43.94	-	44.12	-	65.38	55.38	-21.26	-
2	0.193	0.18	39.49	-	39.67	-	63.91	53.91	-24.24	-
3	0.494	0.25	21.89	-	22.14	-	56.10	46.10	-33.96	-
4	5.809	0.53	20.43	-	20.96	-	60.00	50.00	-39.04	-
5	18.056	0.94	25.64	-	26.58	-	60.00	50.00	-33.42	-
6	23.643	1.05	31.08	-	32.13	-	60.00	50.00	-27.87	-

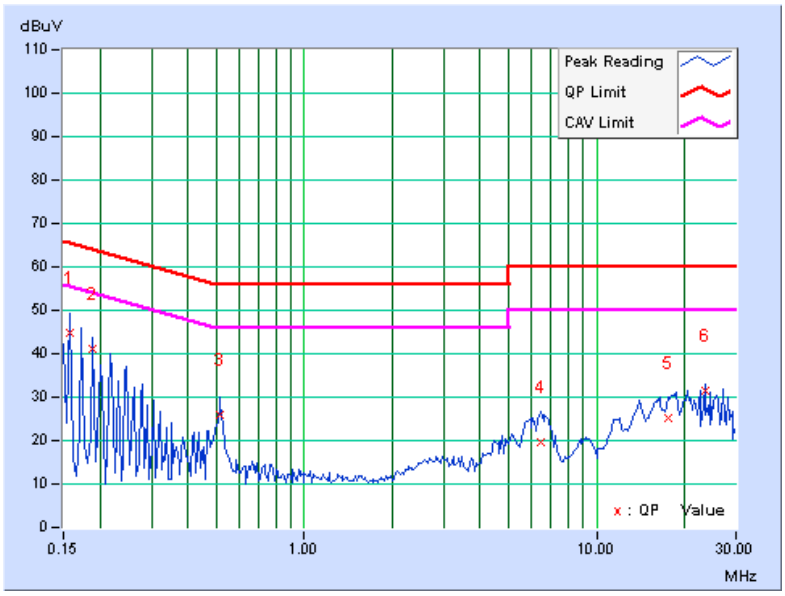
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Line 1	**6dB BANDWIDTH**	9kHz
CHANNEL	Channel 1	**TEST MODE**	B

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.17	44.53	-	44.70	-	65.58	55.58	-20.88	-
2	0.189	0.17	40.96	-	41.13	-	64.08	54.08	-22.95	-
3	0.517	0.25	25.56	-	25.81	-	56.00	46.00	-30.19	-
4	6.430	0.60	19.13	-	19.73	-	60.00	50.00	-40.27	-
5	17.547	1.22	23.90	-	25.12	-	60.00	50.00	-34.88	-
6	23.625	1.44	29.90	-	31.34	-	60.00	50.00	-28.66	-

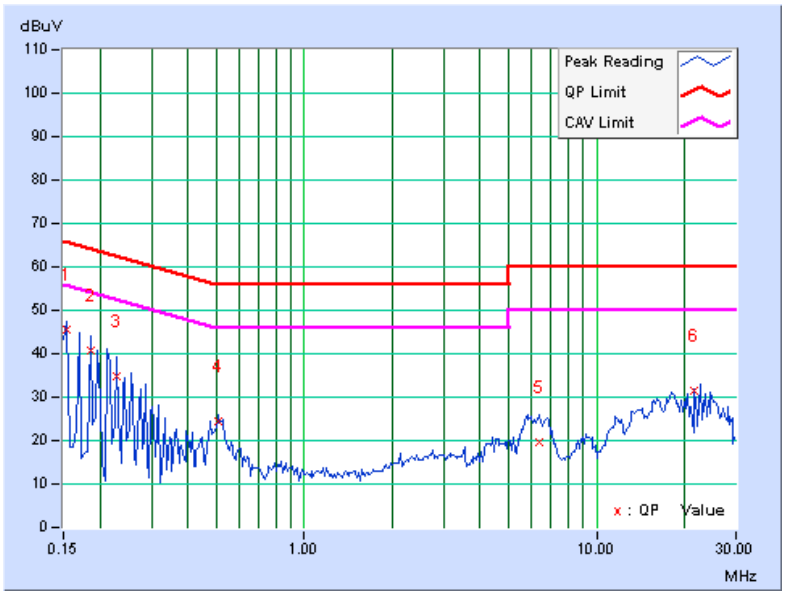
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



PHASE	Line 2	**6dB BANDWIDTH**	9kHz
CHANNEL	Channel 1	**TEST MODE**	B

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.154**	**0.18**	**45.27**	**-**	**45.45**	**-**	**65.79**	**55.79**	**-20.34**	**-**
2	0.185	0.18	40.39	-	40.57	-	64.25	54.25	-23.68	-
3	0.228	0.19	34.63	-	34.82	-	62.52	52.52	-27.70	-
4	0.511	0.26	24.04	-	24.30	-	56.00	46.00	-31.70	-
5	6.332	0.54	19.10	-	19.64	-	60.00	50.00	-40.36	-
6	21.613	1.02	30.44	-	31.46	-	60.00	50.00	-28.54	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Mar. 04, 2011	Mar. 03, 2012
HP Preamplifier	8449B	3008A01201	Mar. 04, 2011	Mar. 03, 2012
Agilent Spectrum Analyzer	E4446A	MY46180403	Jun. 22, 2011	Jun. 21, 2012
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Oct. 14, 2011	Oct. 13, 2012
Schwarzbeck Antenna	VULB 9168	137	Apr. 12, 2011	Apr. 11, 2012
Schwarzbeck Antenna	VHBA 9123	480	May 06, 2011	May 05, 2012
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V 7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF102	CABLE-CH6	Aug. 19, 2011	Aug. 18, 2012
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	May 16, 2011	May 15, 2012
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber room. 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 or average method as specified and then reported in a data sheet.

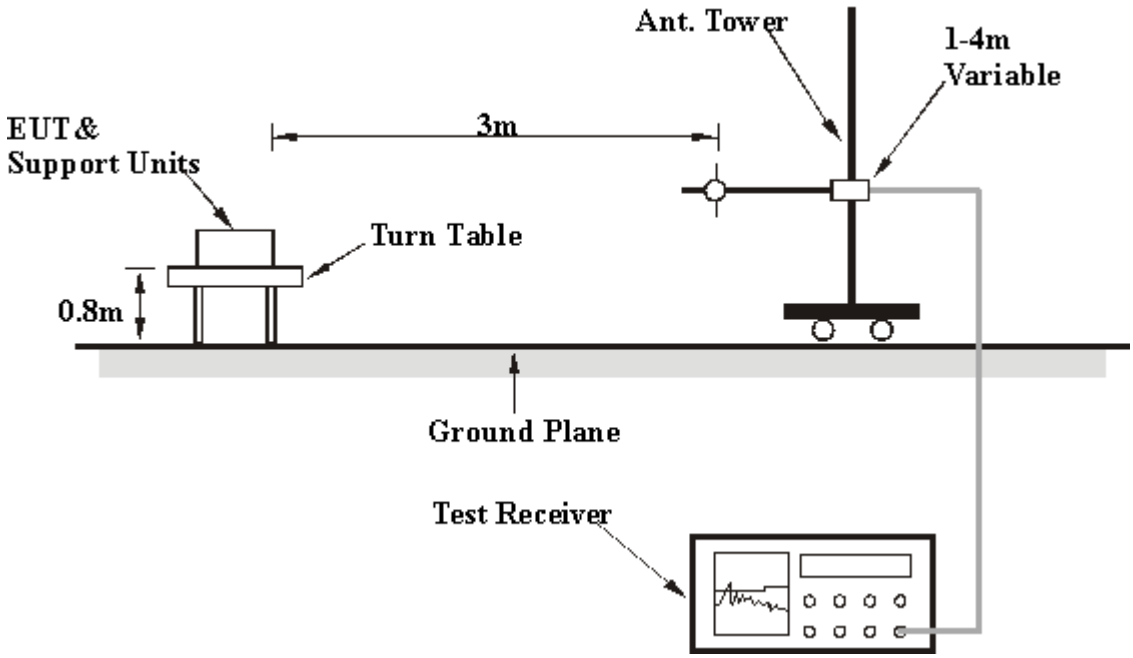
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. 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



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

4.2.6 EUT OPERATING CONDITIONS

MODE A & B:

a. Turn on the power of all equipment.
b. Connected the EUT with adapter or cradle placed on testing table.
c. EUT ran a test program (provided by manufacture) to enable.
d. Set the EUT under transmission condition continuously at specific channel frequency.

MODE C:

a. Turn on the power of all equipment.
b. EUT ran a test program (provided by manufacture) to enable.
c. Set the EUT under transmission condition continuously at specific channel frequency.

4.2.7 TEST RESULTS

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Chad Lee
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	2390.00	57.8 PK	74.0	-16.2	1.00 H	277	25.61	32.15
2	2390.00	47.3 AV	54.0	-6.7	1.00 H	277	15.12	32.15
3	*2412.00	98.3 PK			1.00 H	277	66.04	32.24
4	*2412.00	95.3 AV			1.00 H	277	63.02	32.24
5	4824.00	48.1 PK	74.0	-25.9	1.00 H	16	9.48	38.66
6	4824.00	37.8 AV	54.0	-16.2	1.00 H	16	-0.88	38.66
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.3 PK	74.0	-15.7	1.11 V	206	26.19	32.15
2	2390.00	44.5 AV	54.0	-9.5	1.11 V	206	12.36	32.15
3	*2412.00	94.1 PK			1.11 V	206	61.82	32.24
4	*2412.00	90.4 AV			1.11 V	206	58.17	32.24
5	4824.00	49.5 PK	74.0	-24.5	1.00 V	278	10.85	38.66
6	4824.00	42.1 AV	54.0	-11.9	1.00 V	278	3.48	38.66

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Chad Lee
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	*2437.00	94.6 PK			1.29 H	276	62.26	32.33
2	*2437.00	91.5 AV			1.29 H	276	59.18	32.33
3	4874.00	46.8 PK	74.0	-27.2	1.00 H	13	8.06	38.78
4	4874.00	35.8 AV	54.0	-18.2	1.00 H	13	-2.97	38.78
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	92.7 PK			1.00 V	271	60.33	32.33
2	*2437.00	89.5 AV			1.00 V	271	57.12	32.33
3	4874.00	50.3 PK	74.0	-23.7	1.00 V	294	11.49	38.78
4	4874.00	43.3 AV	54.0	-10.7	1.00 V	294	4.48	38.78

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

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Chad Lee
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	*2462.00	97.7 PK			1.00 H	282	65.24	32.43
2	*2462.00	94.6 AV			1.00 H	282	62.12	32.43
3	2483.50	58.6 PK	74.0	-15.4	1.00 H	282	26.13	32.51
4	2483.50	48.7 AV	54.0	-5.4	1.00 H	282	16.14	32.51
5	4924.00	49.1 PK	74.0	-24.9	1.00 H	10	10.21	38.90
6	4924.00	37.8 AV	54.0	-16.3	1.00 H	10	-1.15	38.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	94.2 PK			1.00 V	270	61.75	32.43
2	*2462.00	90.7 AV			1.00 V	270	58.25	32.43
3	2483.50	57.9 PK	74.0	-16.1	1.00 V	270	25.40	32.51
4	2483.50	47.9 AV	54.0	-6.1	1.00 V	270	15.36	32.51
5	4924.00	51.9 PK	74.0	-22.1	1.00 V	101	12.99	38.90
6	4924.00	45.3 AV	54.0	-8.7	1.00 V	101	6.41	38.90

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

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

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Chad Lee
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	2390.00	59.3 PK	74.0	-14.7	1.00 H	283	27.16	32.15
2	2390.00	48.1 AV	54.0	-6.0	1.00 H	283	15.90	32.15
3	*2412.00	99.8 PK			1.00 H	283	67.52	32.24
4	*2412.00	87.4 AV			1.00 H	283	55.18	32.24
5	4824.00	47.5 PK	74.0	-26.5	1.00 H	3	8.80	38.66
6	4824.00	37.2 AV	54.0	-16.8	1.00 H	3	-1.42	38.66
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.2 PK	74.0	-10.8	1.00 V	262	31.05	32.15
2	2390.00	46.8 AV	54.0	-7.2	1.00 V	262	14.65	32.15
3	*2412.00	97.3 PK			1.00 V	262	65.05	32.24
4	*2412.00	85.3 AV			1.00 V	262	53.01	32.24
5	4824.00	46.3 PK	74.0	-27.7	1.00 V	2	7.68	38.66
6	4824.00	32.5 AV	54.0	-21.5	1.00 V	2	-6.15	38.66

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Chad Lee
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	*2437.00	99.4 PK			1.00 H	282	67.05	32.33
2	*2437.00	87.4 AV			1.00 H	282	55.10	32.33
3	4874.00	47.3 PK	74.0	-26.7	1.00 H	12	8.54	38.78
4	4874.00	37.1 AV	54.0	-16.9	1.00 H	12	-1.66	38.78
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.9 PK			1.00 V	272	63.59	32.33
2	*2437.00	83.7 AV			1.00 V	272	51.41	32.33
3	4874.00	46.0 PK	74.0	-28.0	1.00 V	16	7.20	38.78
4	4874.00	33.7 AV	54.0	-20.3	1.00 V	16	-5.04	38.78

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

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Chad Lee
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	*2462.00	99.7 PK			1.00 H	282	67.29	32.43
2	*2462.00	87.6 AV			1.00 H	282	55.16	32.43
3	2483.50	64.3 PK	74.0	-9.7	1.00 H	282	31.77	32.51
4	**2483.50**	**48.9 AV**	**54.0**	**-5.1**	**1.00 H**	**282**	**16.41**	**32.51**
5	4924.00	47.3 PK	74.0	-26.7	1.00 H	6	8.37	38.90
6	4924.00	37.1 AV	54.0	-16.9	1.00 H	6	-1.80	38.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	97.0 PK			1.17 V	271	64.59	32.43
2	*2462.00	84.6 AV			1.17 V	271	52.14	32.43
3	2483.50	61.7 PK	74.0	-12.3	1.17 V	271	29.18	32.51
4	2483.50	46.7 AV	54.0	-7.3	1.17 V	271	14.22	32.51
5	4924.00	46.3 PK	74.0	-27.7	1.00 V	66	7.37	38.90
6	4924.00	34.5 AV	54.0	-19.5	1.00 V	66	-4.40	38.90

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

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

BELOW 1GHz WORST-CASE DATA：802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71% RH	TESTED BY	Chad Lee
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	233.36	32.6 QP	46.0	-13.4	1.13 H	7	19.82	12.81
2	317.29	29.2 QP	46.0	-16.8	1.00 H	58	13.03	16.15
3	351.18	30.5 QP	46.0	-15.5	1.00 H	73	13.22	17.25
4	383.46	30.3 QP	46.0	-15.7	1.00 H	94	12.11	18.17
5	598.12	29.8 QP	46.0	-16.2	1.20 H	307	6.43	23.39
6	622.33	29.4 QP	46.0	-16.6	1.58 H	121	5.78	23.60
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	115.54	29.0 QP	43.5	-14.5	1.59 V	241	17.35	11.66
2	233.36	33.6 QP	46.0	-12.5	1.00 V	217	20.74	12.81
3	351.18	32.4 QP	46.0	-13.6	1.19 V	28	15.14	17.25
4	372.16	29.5 QP	46.0	-16.5	1.20 V	10	11.66	17.85
5	415.74	31.7 QP	46.0	-14.3	1.36 V	10	12.68	19.04
6	472.23	30.3 QP	46.0	-15.8	1.00 V	28	9.77	20.48

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71% RH	TESTED BY	Chad Lee
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	233.36	32.6 QP	46.0	-13.4	1.12 H	139	19.81	12.81
2	317.29	29.3 QP	46.0	-16.7	1.00 H	67	13.15	16.15
3	336.66	31.5 QP	46.0	-14.6	1.00 H	82	14.67	16.78
4	367.32	31.1 QP	46.0	-14.9	1.00 H	91	13.40	17.71
5	388.30	28.2 QP	46.0	-17.8	1.00 H	82	9.92	18.31
6	598.12	29.5 QP	46.0	-16.5	1.15 H	313	6.15	23.39
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	233.36	32.6 QP	46.0	-13.4	1.12 V	139	19.81	12.81
2	317.29	29.3 QP	46.0	-16.7	1.00 V	67	13.15	16.15
3	336.66	31.5 QP	46.0	-14.6	1.00 V	82	14.67	16.78
4	367.32	31.1 QP	46.0	-14.9	1.00 V	91	13.40	17.71
5	388.30	28.2 QP	46.0	-17.8	1.00 V	82	9.92	18.31
6	598.12	29.5 QP	46.0	-16.5	1.15 V	313	6.15	23.39

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	7.4Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71% RH	TESTED BY	Chad Lee
TEST MODE	C		

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	233.36	31.8 QP	46.0	-14.2	1.00 H	31	18.97	12.81
2	317.29	28.1 QP	46.0	-17.9	1.00 H	85	11.98	16.15
3	351.18	31.2 QP	46.0	-14.8	1.00 H	82	13.97	17.25
4	377.00	30.4 QP	46.0	-15.6	1.00 H	97	12.42	17.99
5	433.49	28.1 QP	46.0	-17.9	1.00 H	97	8.60	19.49
6	598.12	28.4 QP	46.0	-17.6	1.10 H	283	4.98	23.39
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	118.77	29.3 QP	43.5	-14.2	1.19 V	205	17.18	12.11
2	233.36	35.0 QP	46.0	-11.0	1.52 V	70	22.16	12.81
3	336.66	32.8 QP	46.0	-13.2	1.20 V	211	16.00	16.78
4	415.74	30.5 QP	46.0	-15.5	1.00 V	328	11.47	19.04
5	448.02	32.5 QP	46.0	-13.5	1.00 V	58	12.66	19.86
6	472.23	30.3 QP	46.0	-15.7	1.36 V	25	9.78	20.48

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.

4.3 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	100036	Apr. 29, 2011	Apr. 28, 2012

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

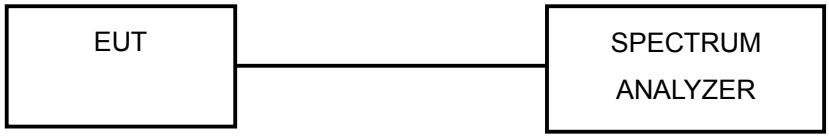
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz 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.

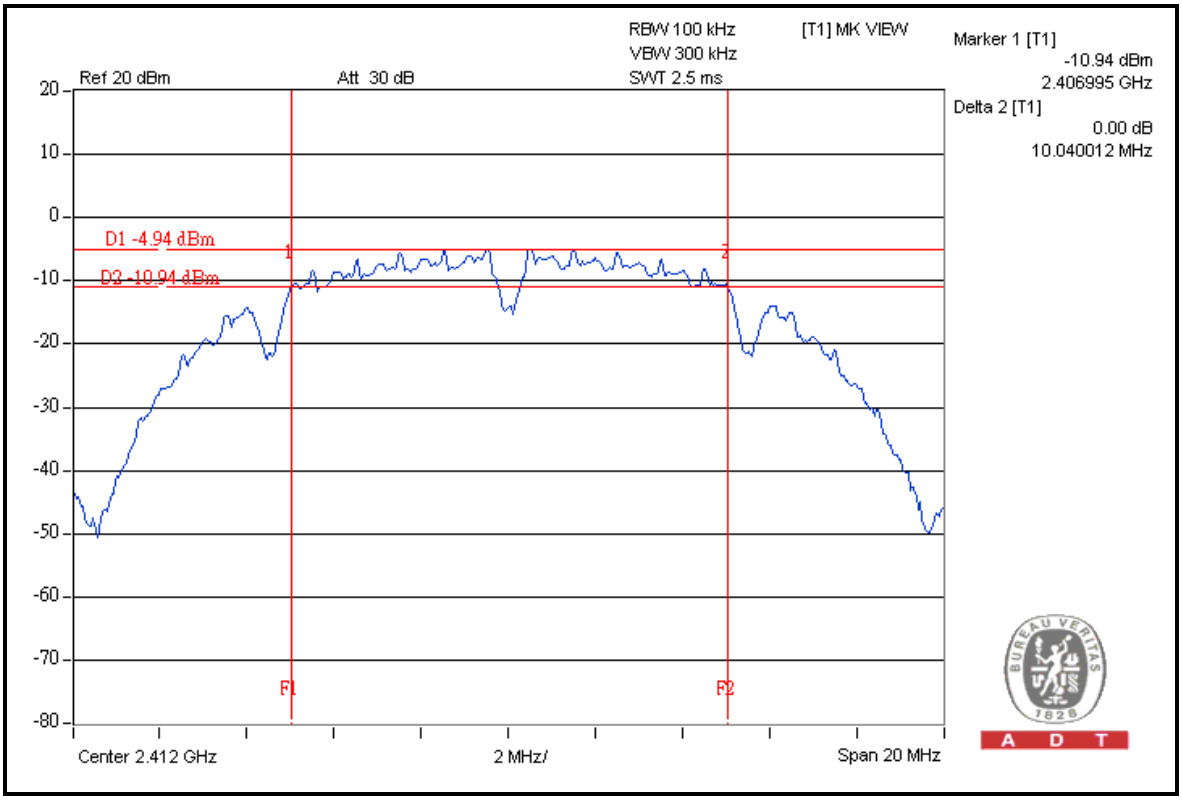
4.3.7 TEST RESULTS

MODE A:

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.04	0.5	PASS
6	2437	10.04	0.5	PASS
11	2462	10.03	0.5	PASS

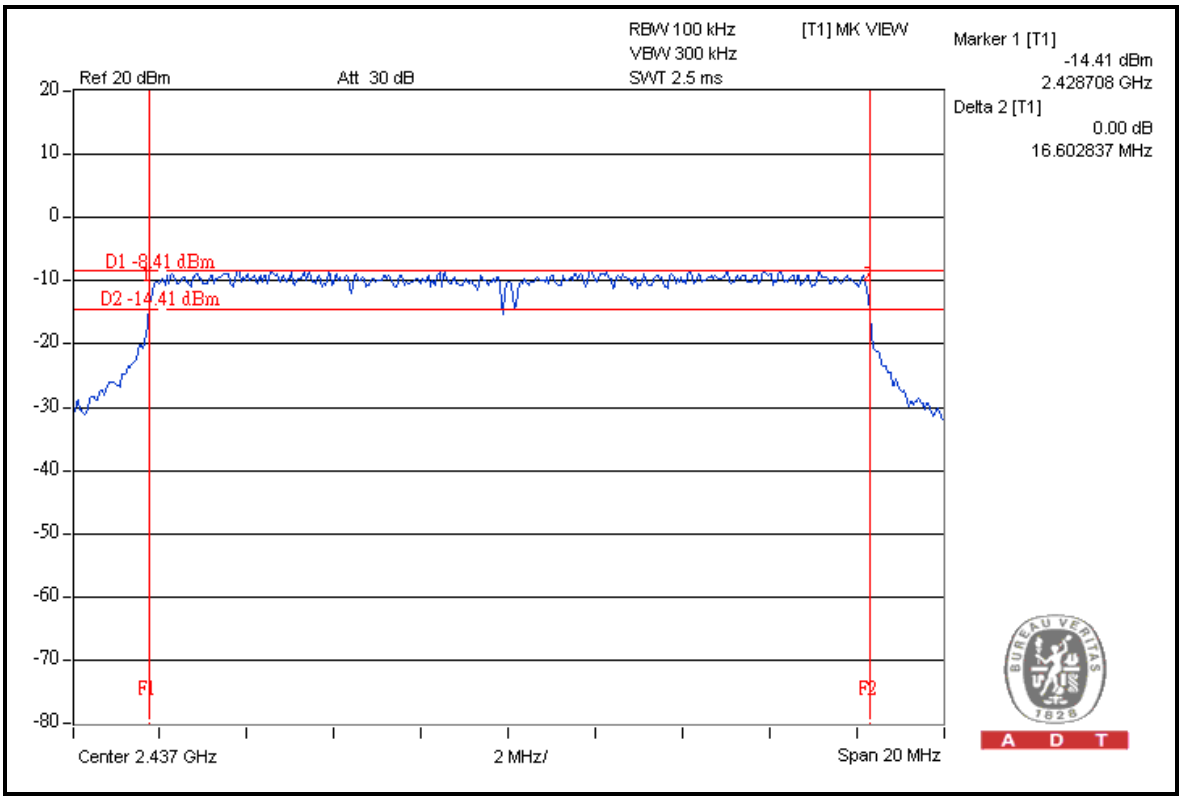
CH 1



802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.57	0.5	PASS
6	2437	16.60	0.5	PASS
11	2462	16.60	0.5	PASS

CH 6



4.4 MAXIMUM OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT

The Maximum Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Anritsu Power Sensor	MA2411B	0738404	Apr. 26, 2011	Apr. 25, 2012
Anritsu Power Meter	ML2495A	0842014	Apr. 26, 2011	Apr. 25, 2012

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.

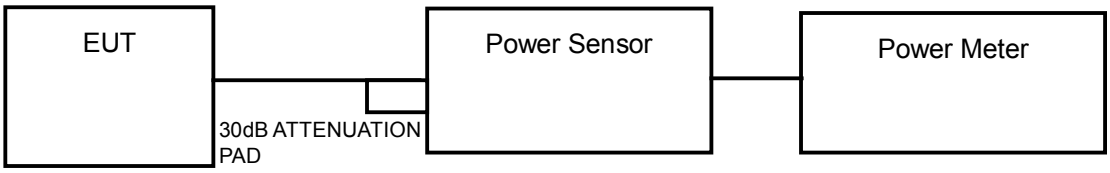
4.4.3 TEST PROCEDURES

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 Item 4.3.6.

4.4.7 TEST RESULTS

MODE A:

802.11b

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	POWER LIMIT (dBm)	PASS / FAIL
1	2412	10.5	11.2	30	PASS
6	2437	10.6	11.5	30	PASS
11	2462	11.5	14.1	30	PASS

802.11g

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	POWER LIMIT (dBm)	PASS / FAIL
1	2412	17.6	**57.5**	30	PASS
6	2437	17.4	55.0	30	PASS
11	2462	17.5	56.2	30	PASS

4.5 AVERAGE OUTPUT POWER

4.5.1 FOR REFERENCE

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Anritsu Power Sensor	MA2411B	0738404	Apr. 26, 2011	Apr. 25, 2012
Anritsu Power Meter	ML2495A	0842014	Apr. 26, 2011	Apr. 25, 2012

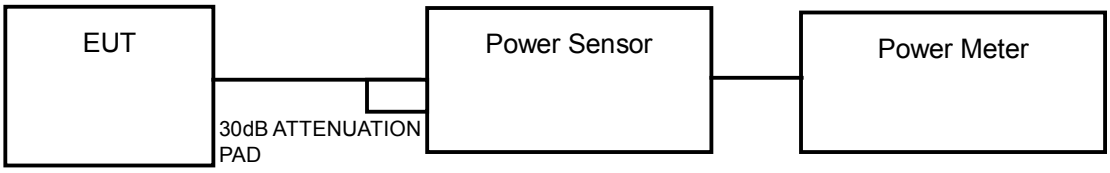
Note:

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.

4.5.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.5.6 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)
1	2412	8.0
6	2437	8.1
11	2462	8.9

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)
1	2412	8.1
6	2437	7.9
11	2462	8.6

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
R&S SPECTRUM ANALYZER	FSP40	100036	Apr. 29, 2011	Apr. 28, 2012

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

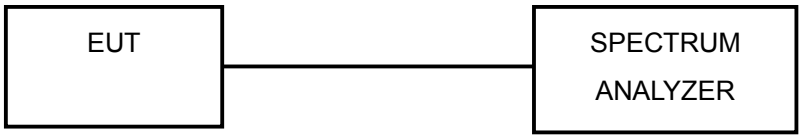
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

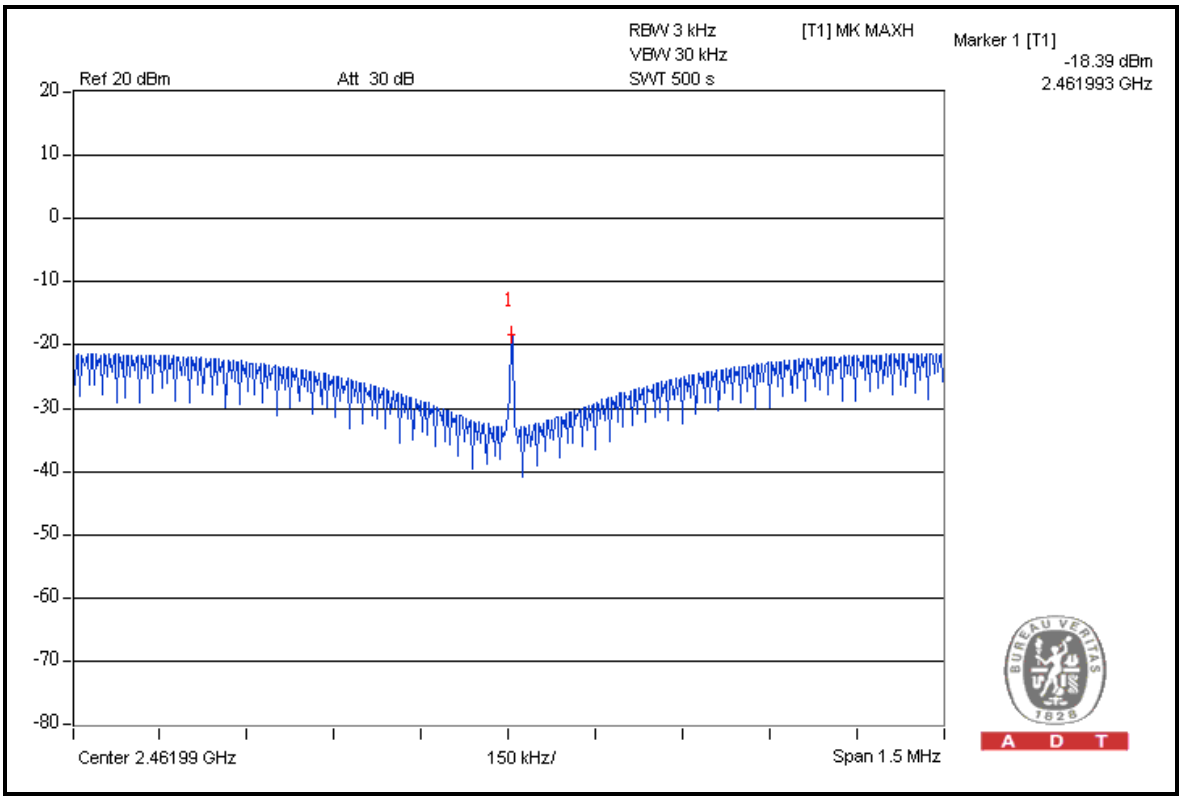
4.6.7 TEST RESULTS

MODE A:

802.11b

CHANNEL	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
1	2412	-19.4	8	PASS
6	2437	-18.6	8	PASS
11	2462	-18.4	8	PASS

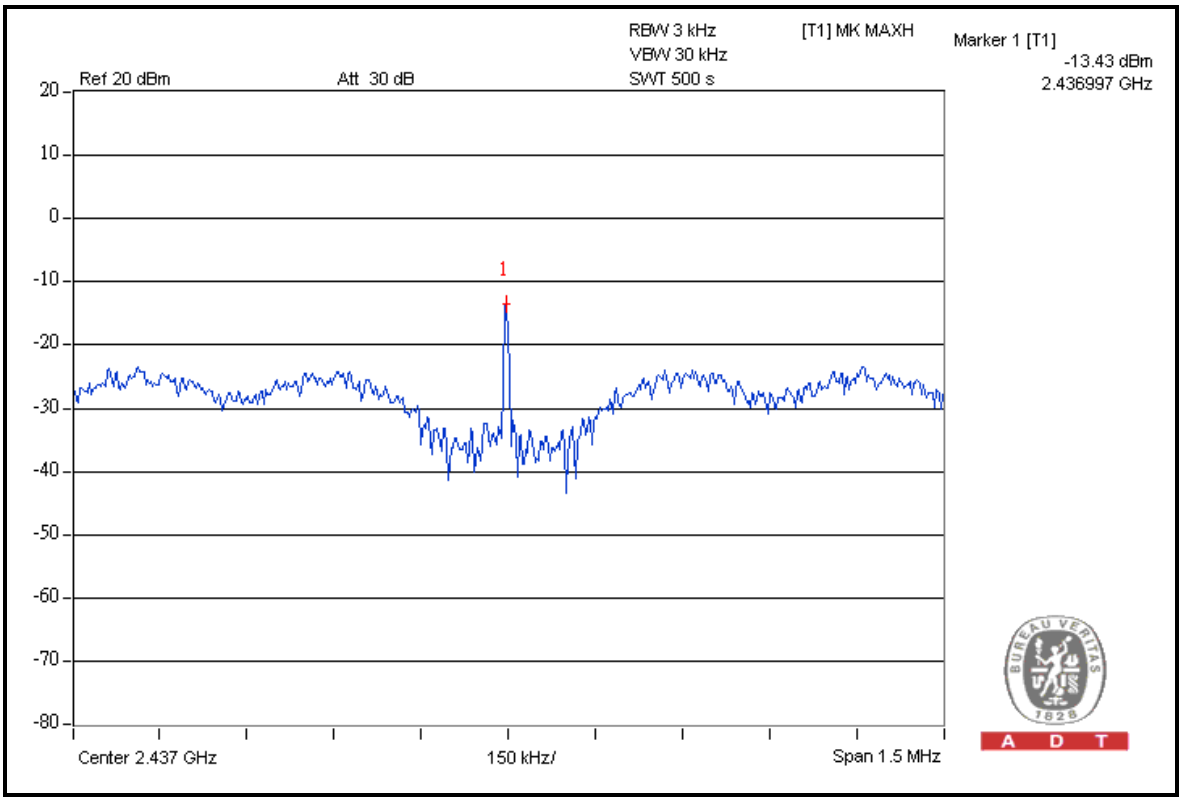
CH 11



802.11g

CHANNEL	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
1	2412	-13.9	8	PASS
6	2437	-13.4	8	PASS
11	2462	-13.6	8	PASS

CH 6



4.7 BAND EDGES MEASUREMENT

4.7.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
FOR CONDUCTED MEASUREMENT:				
R&S SPECTRUM ANALYZER	FSP 40	100036	Apr. 29, 2011	Apr. 28, 2012
FOR RADIATED MEASUREMENT:				
HP Preamplifier	8447D	2432A03504	Mar. 04, 2011	Mar. 03, 2012
HP Preamplifier	8449B	3008A01201	Mar. 04, 2011	Mar. 03, 2012
Agilent Spectrum Analyzer	E4446A	MY46180403	Jun. 22, 2011	Jun. 21, 2012
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Oct. 14, 2011	Oct. 13, 2012
Schwarzbeck Antenna	VULB 9168	137	Apr. 12, 2011	Apr. 11, 2012
Schwarzbeck Antenna	VHBA 9123	480	May 06, 2011	May 05, 2012
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF102	CABLE-CH6	Aug. 19, 2011	Aug. 18, 2012
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	May 16, 2011	May 15, 2012
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12/24 months. And the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.

4.7.3 TEST PROCEDURE

FOR CONDUCTED MEASUREMENT:

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.

FOR RADIATED MEASUREMENT:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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 height of antenna 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. Set both RBW and VBW of spectrum analyzer to 1MHz and 3MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation.

4.7.5 EUT OPERATING CONDITION

Same as Item 4.3.6.

4.7.6 TEST RESULTS

The spectrum plots are attached on the following 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).

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

MODE A:

802.11b

RESTRICT BAND (2310 ~ 2390 MHz)

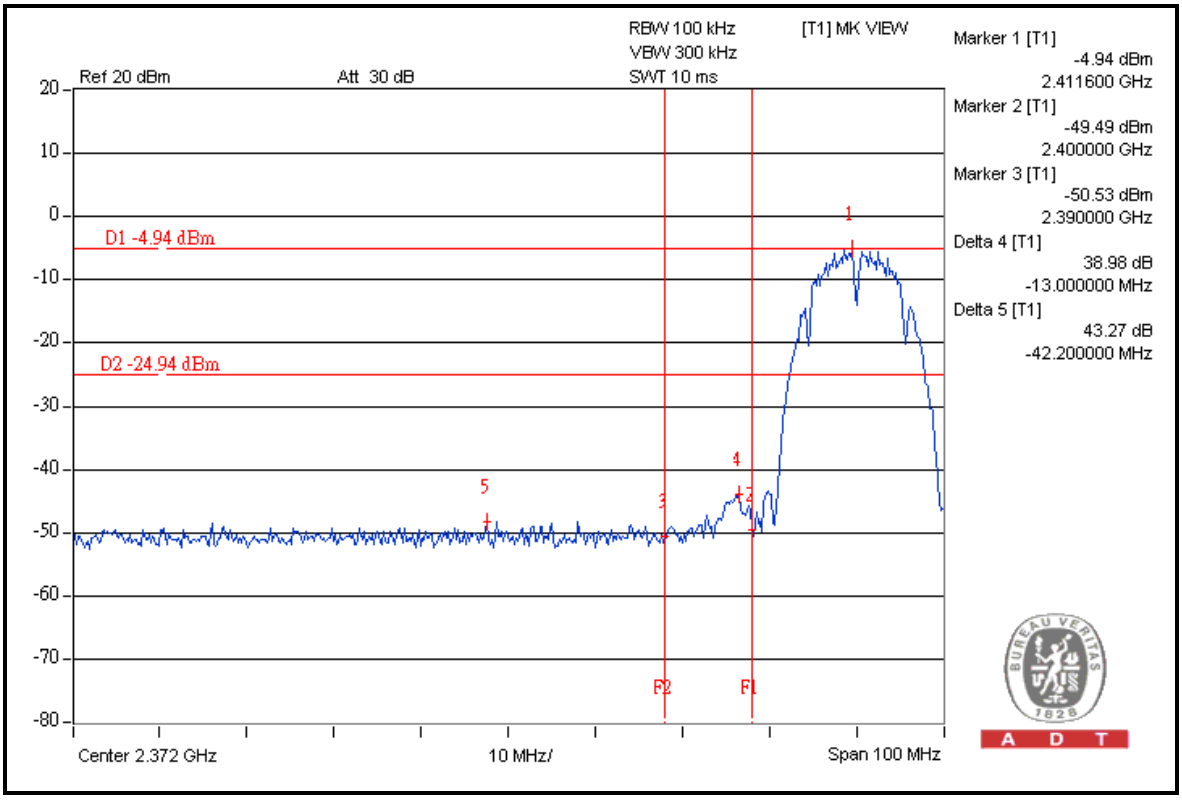
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	98.3	43.3	55.0	74.0
2412.00 (AV)	95.3	54.7	40.6	54.0

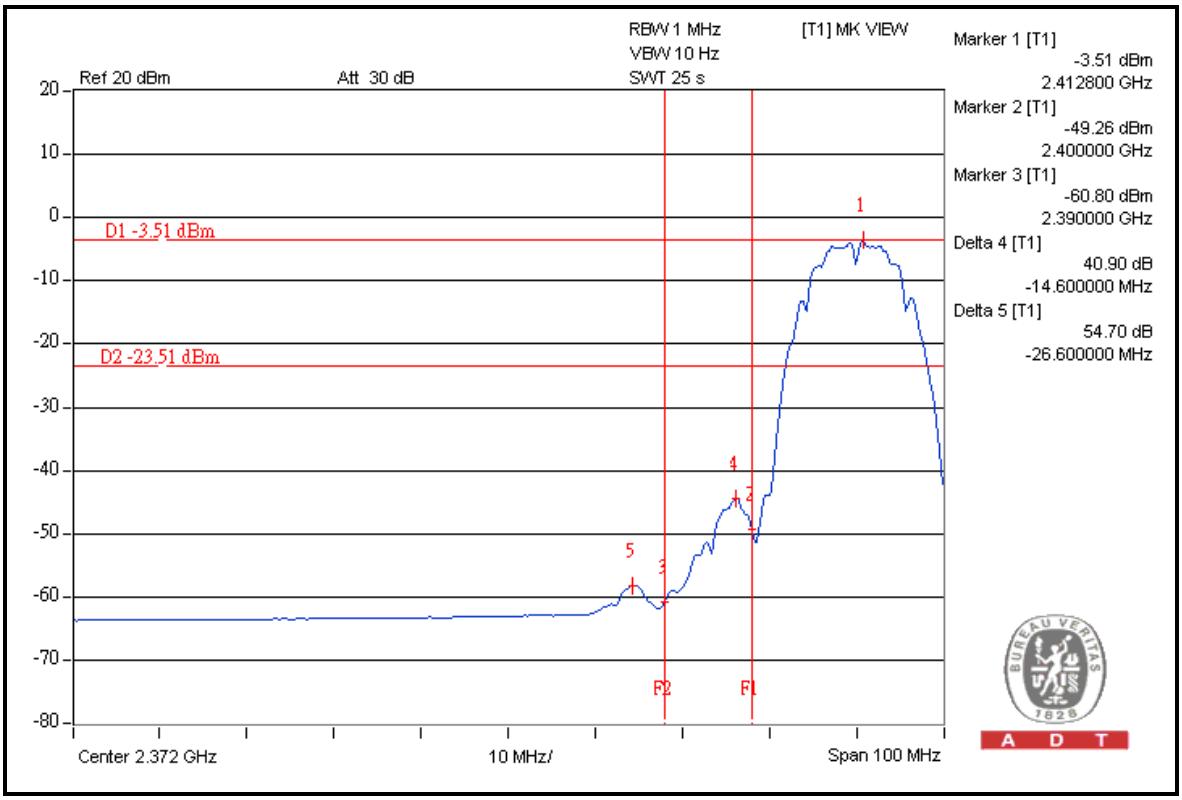
RESTRICT BAND (2483.5 ~ 2500 MHz)

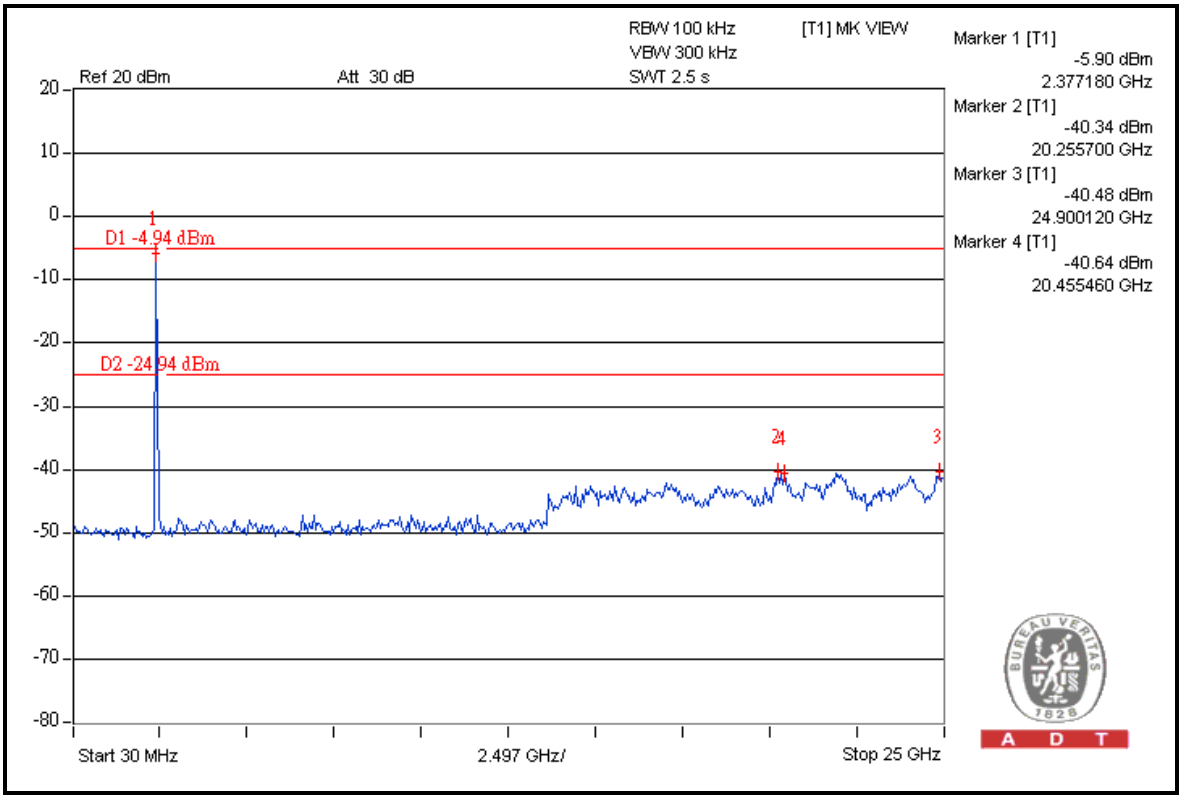
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	97.7	45.0	52.7	74.0
2462.00 (AV)	94.6	56.7	37.9	54.0

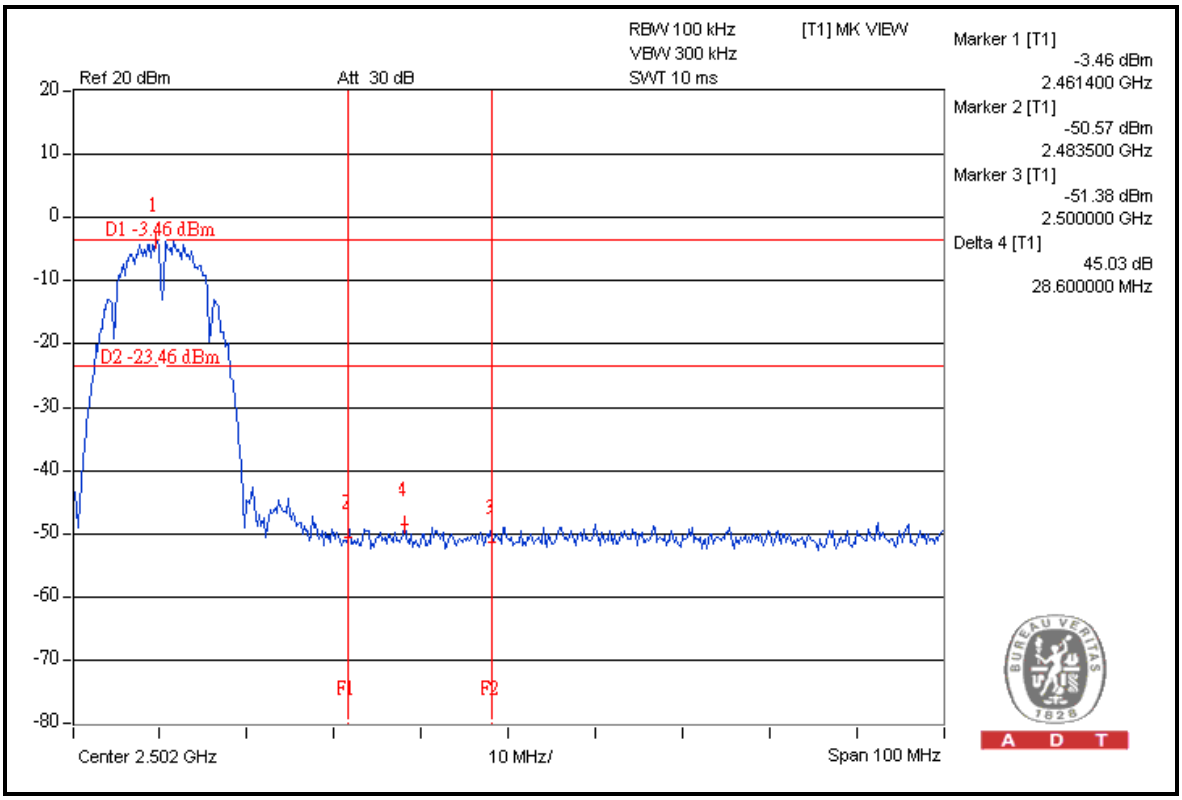
NOTE:

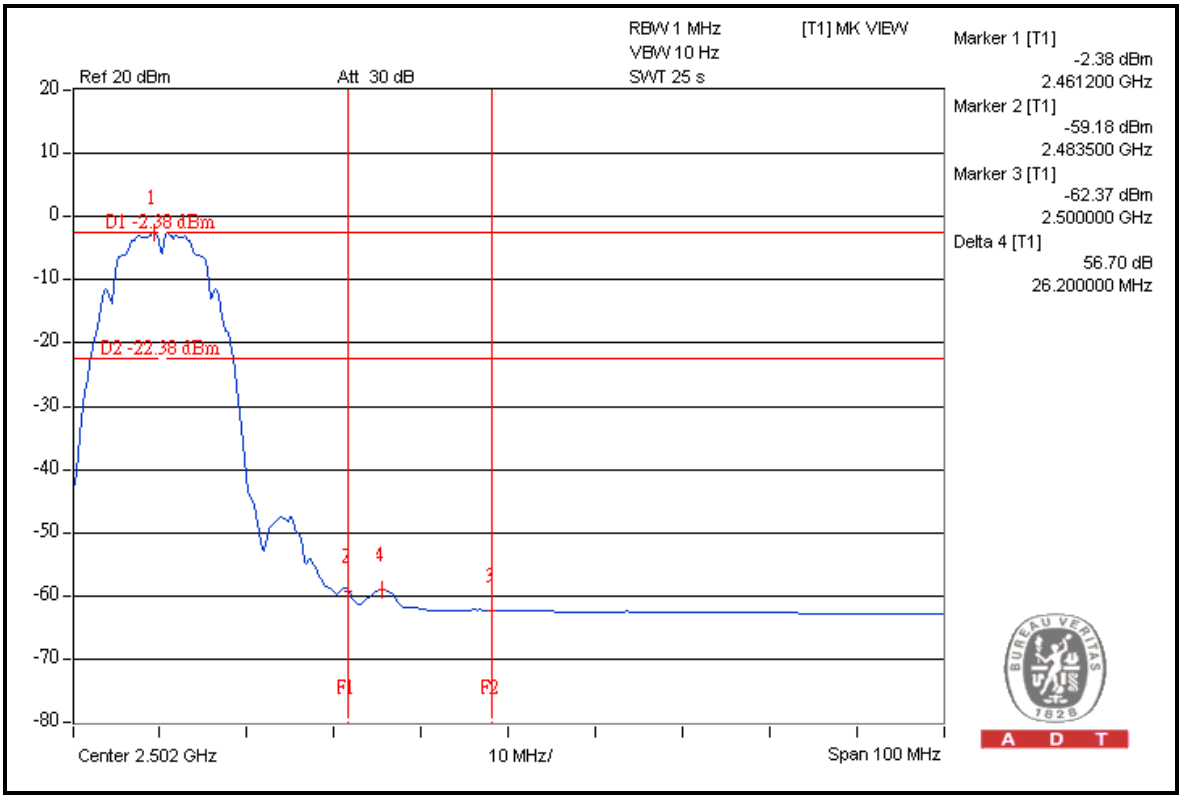
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

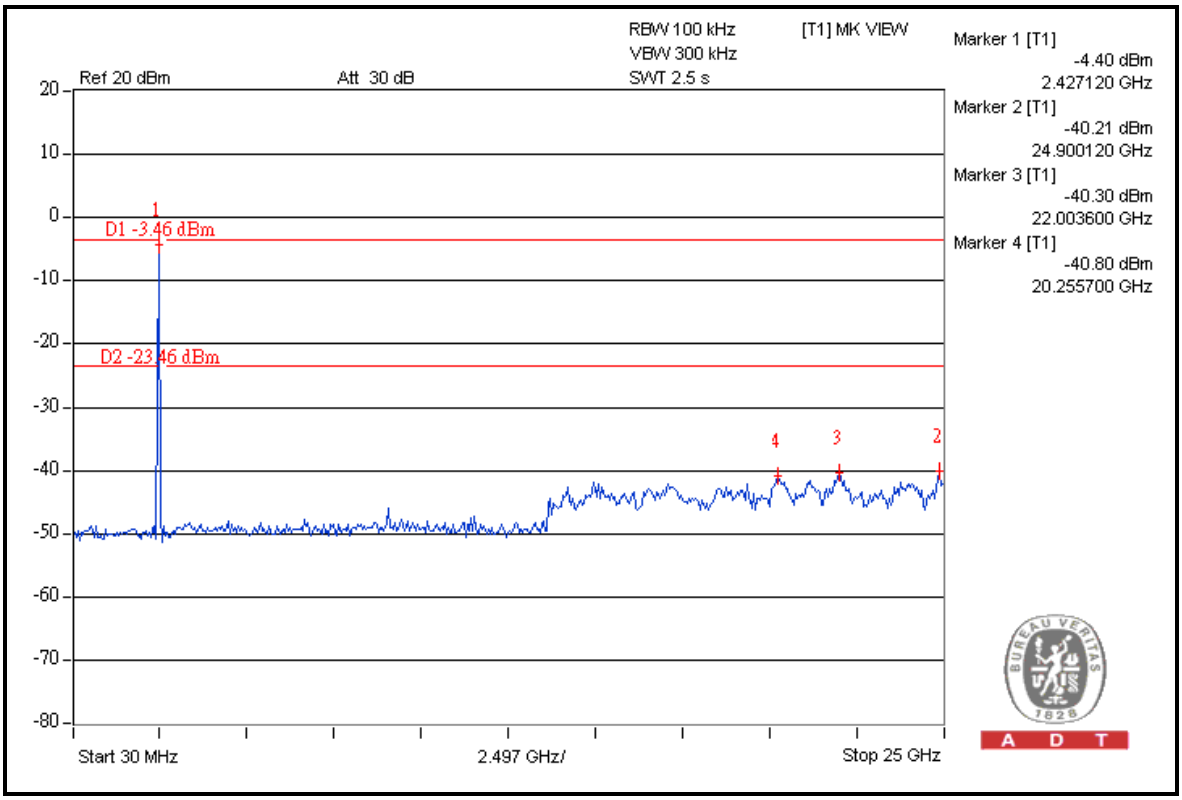

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -4.94 dBm
D2 -24.94 dBm
Marker 1 [T1]
-4.94 dBm
2.411600 GHz
Marker 2 [T1]
-49.49 dBm
2.400000 GHz
Marker 3 [T1]
-50.53 dBm
2.390000 GHz
Delta 4 [T1]
38.98 dB
-13.000000 MHz
Delta 5 [T1]
43.27 dB
-42.200000 MHz
Center 2.372 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -3.51 dBm
D2 -23.51 dBm
Marker 1 [T1]
-3.51 dBm
2.412800 GHz
Marker 2 [T1]
-49.26 dBm
2.400000 GHz
Marker 3 [T1]
-60.80 dBm
2.390000 GHz
Delta 4 [T1]
40.90 dB
-14.600000 MHz
Delta 5 [T1]
54.70 dB
-26.600000 MHz
Center 2.372 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-5.90 dBm
2.377180 GHz
Marker 2 [T1]
-40.34 dBm
20.255700 GHz
Marker 3 [T1]
-40.48 dBm
24.900120 GHz
Marker 4 [T1]
-40.64 dBm
20.455460 GHz
D1 -4.94 dBm
D2 -24.94 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-3.46 dBm
2.461400 GHz
Marker 2 [T1]
-50.57 dBm
2.483500 GHz
Marker 3 [T1]
-51.38 dBm
2.500000 GHz
Delta 4 [T1]
45.03 dB
28.600000 MHz
D1 -3.46 dBm
D2 -23.46 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-2.38 dBm
2.461200 GHz
Marker 2 [T1]
-59.18 dBm
2.483500 GHz
Marker 3 [T1]
-62.37 dBm
2.500000 GHz
Delta 4 [T1]
56.70 dB
26.200000 MHz
D1 -2.38 dBm
D2 -22.38 dBm
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-4.40 dBm
2.427120 GHz
Marker 2 [T1]
-40.21 dBm
24.900120 GHz
Marker 3 [T1]
-40.30 dBm
22.003600 GHz
Marker 4 [T1]
-40.80 dBm
20.255700 GHz
D1 -3.46 dBm
D2 -23.46 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

802.11g

RESTRICT BAND (2310 ~ 2390 MHz)

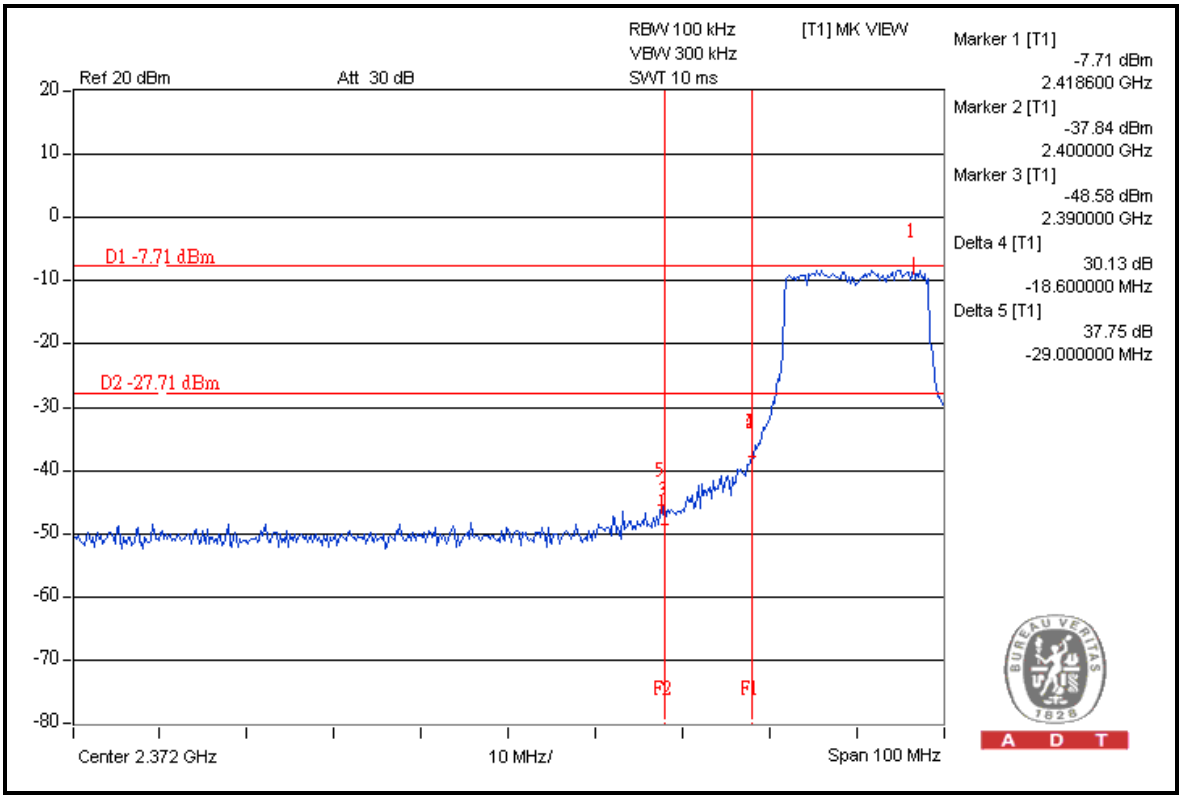
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	99.8	37.8	62.0	74.0
2412.00 (AV)	87.4	44.6	42.8	54.0

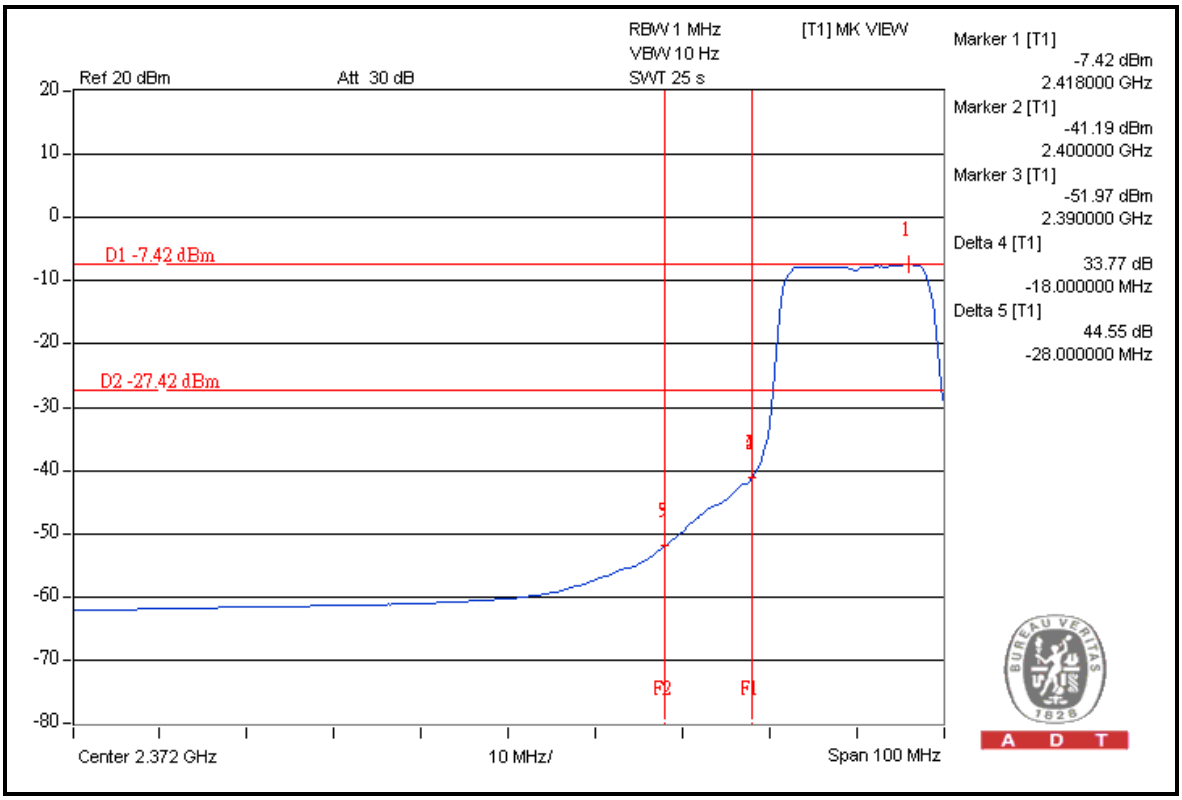
RESTRICT BAND (2483.5 ~ 2500 MHz)

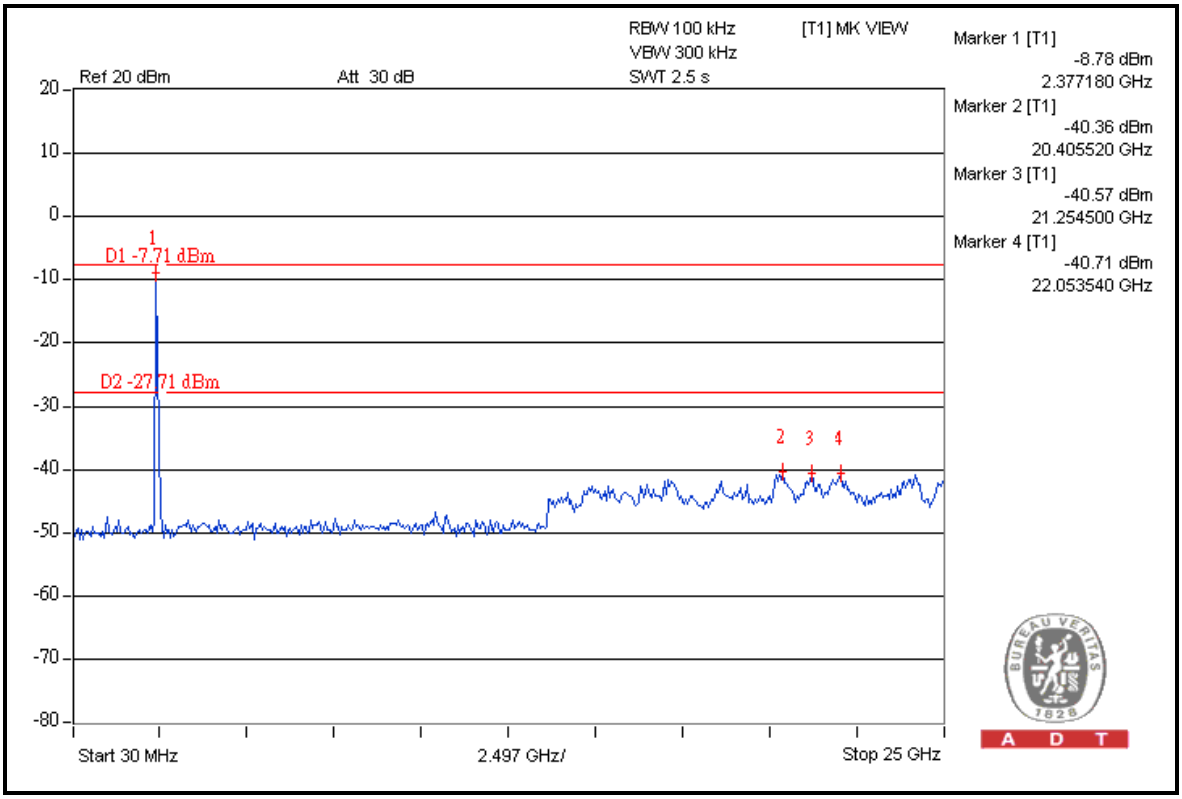
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	99.7	38.1	61.6	74.0
2462.00 (AV)	87.6	45.4	42.2	54.0

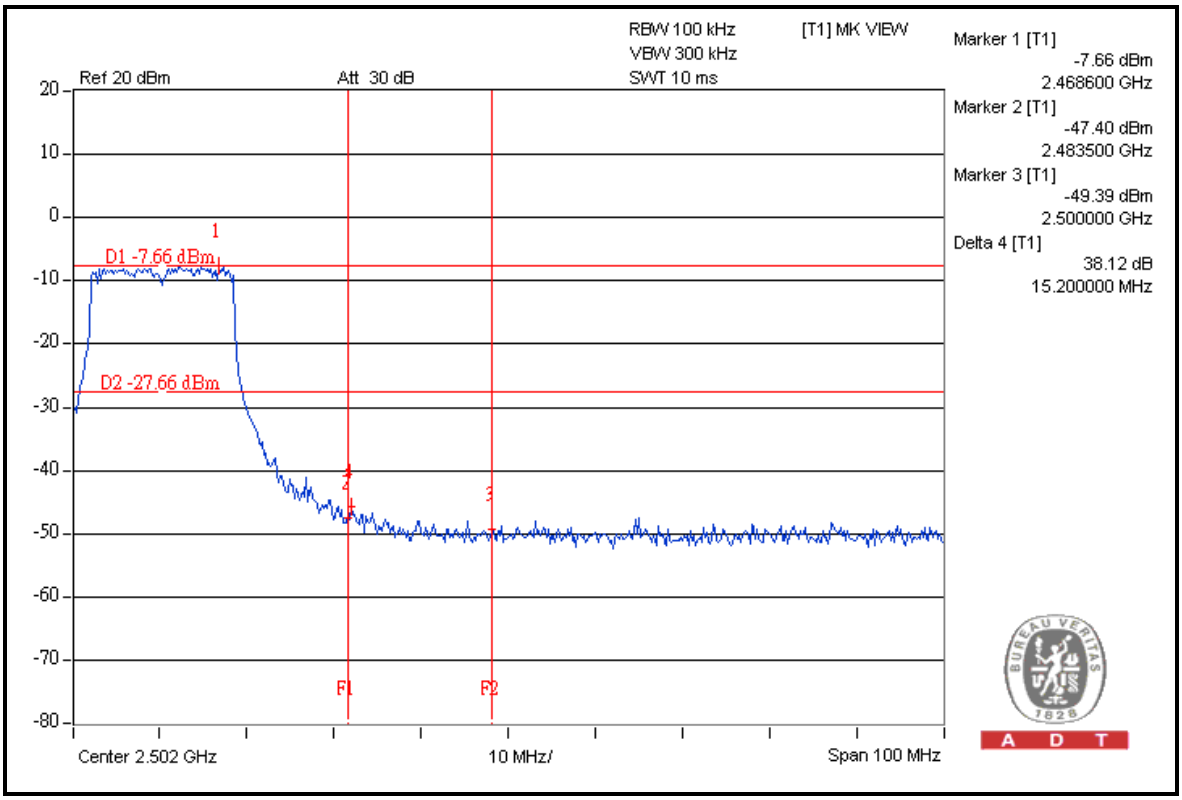
NOTE:

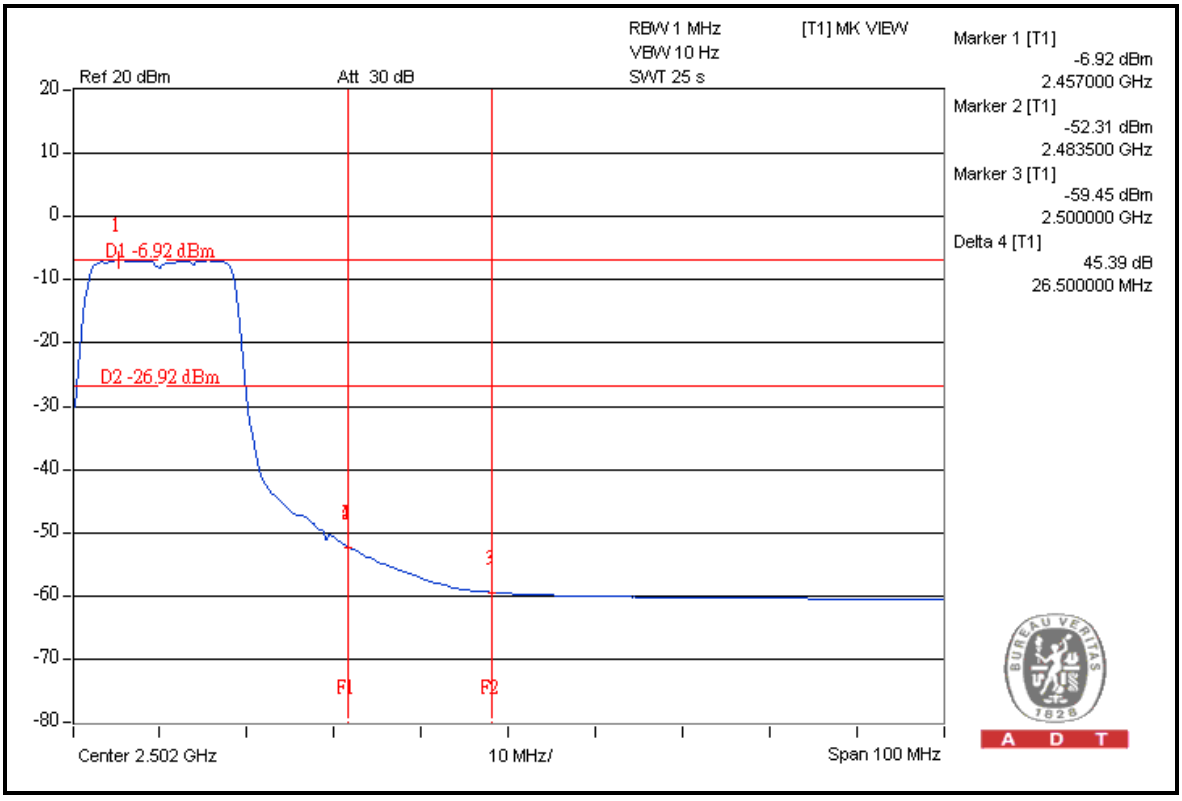
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

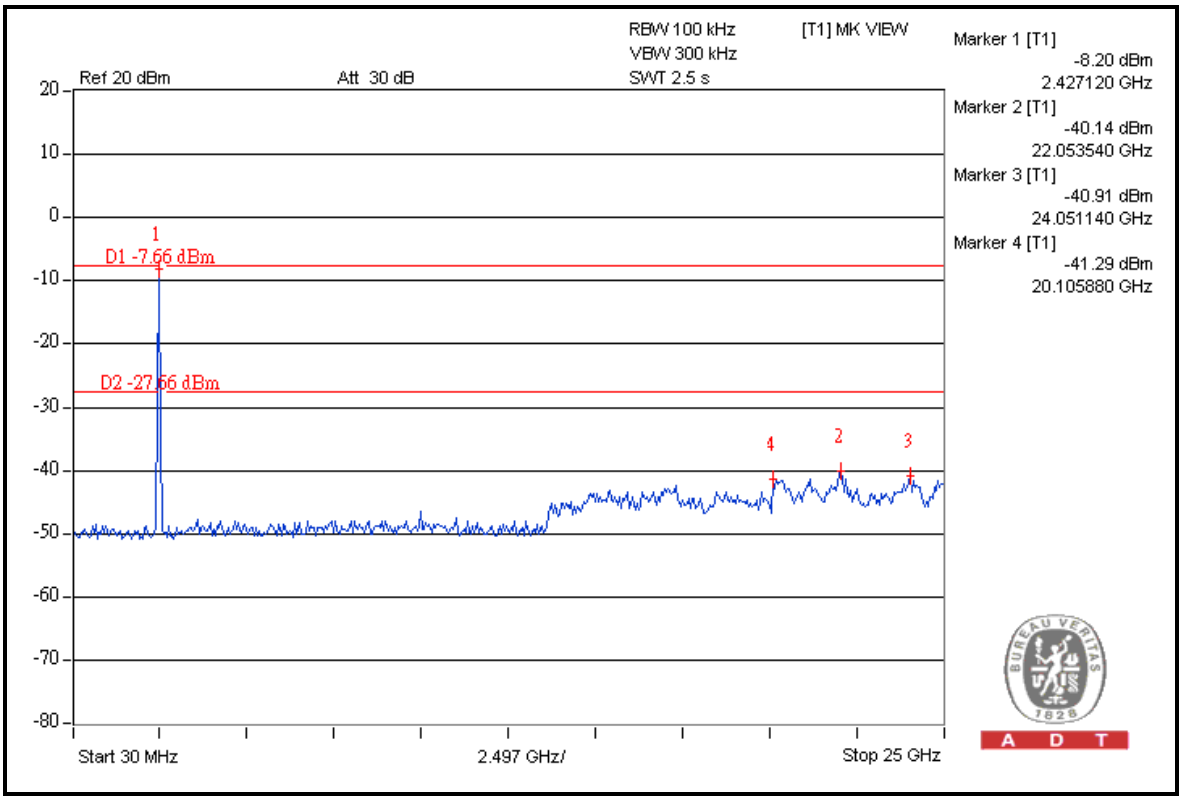

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-7.71 dBm
2.418600 GHz
Marker 2 [T1]
-37.84 dBm
2.400000 GHz
Marker 3 [T1]
-48.58 dBm
2.390000 GHz
Delta 4 [T1]
30.13 dB
-18.600000 MHz
Delta 5 [T1]
37.75 dB
-29.000000 MHz
D1 -7.71 dBm
D2 -27.71 dBm
F2
F1
Center 2.372 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-7.42 dBm
2.418000 GHz
Marker 2 [T1]
-41.19 dBm
2.400000 GHz
Marker 3 [T1]
-51.97 dBm
2.390000 GHz
Delta 4 [T1]
33.77 dB
-18.000000 MHz
Delta 5 [T1]
44.55 dB
-28.000000 MHz
D1 -7.42 dBm
D2 -27.42 dBm
F2
F1
Center 2.372 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-8.78 dBm
2.377180 GHz
Marker 2 [T1]
-40.36 dBm
20.405520 GHz
Marker 3 [T1]
-40.57 dBm
21.254500 GHz
Marker 4 [T1]
-40.71 dBm
22.053540 GHz
D1 -7.71 dBm
D2 -27.71 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-7.66 dBm
2.468600 GHz
Marker 2 [T1]
-47.40 dBm
2.483500 GHz
Marker 3 [T1]
-49.39 dBm
2.500000 GHz
Delta 4 [T1]
38.12 dB
15.200000 MHz
D1 -7.66 dBm
D2 -27.66 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-6.92 dBm
2.457000 GHz
Marker 2 [T1]
-52.31 dBm
2.483500 GHz
Marker 3 [T1]
-59.45 dBm
2.500000 GHz
Delta 4 [T1]
45.39 dB
26.500000 MHz
D1 -6.92 dBm
D2 -26.92 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-8.20 dBm
2.427120 GHz
Marker 2 [T1]
-40.14 dBm
22.053540 GHz
Marker 3 [T1]
-40.91 dBm
24.051140 GHz
Marker 4 [T1]
-41.29 dBm
20.105880 GHz
D1 -7.66 dBm
D2 -27.66 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

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 according to ISO/IEC 17025.

Copies of accreditation and authorization 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

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

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

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.

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