FCC TEST REPORT

REPORT NO.: RF990407D09

MODEL NO.: MS-3822

RECEIVED: April 7, 2010

TESTED: April 14 ~ May 11, 2010

ISSUED: May 24, 2010

APPLICANT: Micro-Star International Co., Ltd.

ADDRESS: No.69, Lide St, Jhonghe City, Taipei County, Taiwan

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

LAB LOCATION: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien, 244 Taiwan

Testing Laboratory
2021

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1. CERTIFICATION

PRODUCT: WLAN 802.11b/g/n 1T1R Slim Module
BRAND NAME: MSI
MODEL NO.: MS-3822
APPLICANT: Micro-Star International Co., Ltd.
TEST SAMPLE: ENGINEERING SAMPLE
TESTED: April 14 ~ May 11, 2010
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.4-2003

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:** May 24, 2010
(Annie Chang / Senior Specialist)

TECHNICAL ACCEPTANCE : Jamison Chan , **DATE:** May 24, 2010
Responsible for RF
(Jamison Chan / Supervisor)

APPROVED BY : Ken Liu , **DATE:** May 24, 2010
(Ken Liu / Assistant 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 -19.39dB at 0.170MHz
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 -0.4dB 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	No antenna connector is used.

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	3.67 dB
	Above 1GHz	2.89 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	WLAN 802.11b/g/n 1T1R Slim Module
MODEL NO.	MS-3822
FCC ID	I4L-MS3822
POWER SUPPLY	3.3Vdc
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 802.11n: up to 150Mbps
OPERATING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
OUTPUT POWER	50.0mW
ANTENNA TYPE	Printed antenna with 3.07dBi gain
ANTENNA CONNECTOR	NA
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

Note:

1. The EUT is a WLAN 802.11b/g/n 1T1R Slim Module

2. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

Modulation Mode	Tx Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

3. The EUT has three samples:

Sample	Aluminum Foil	Photo
1	Long	
2	Short	
3	Without	

After pre-tested, **sample 1 (long aluminum foil)** was selected as a worst-case representative one.

4. 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

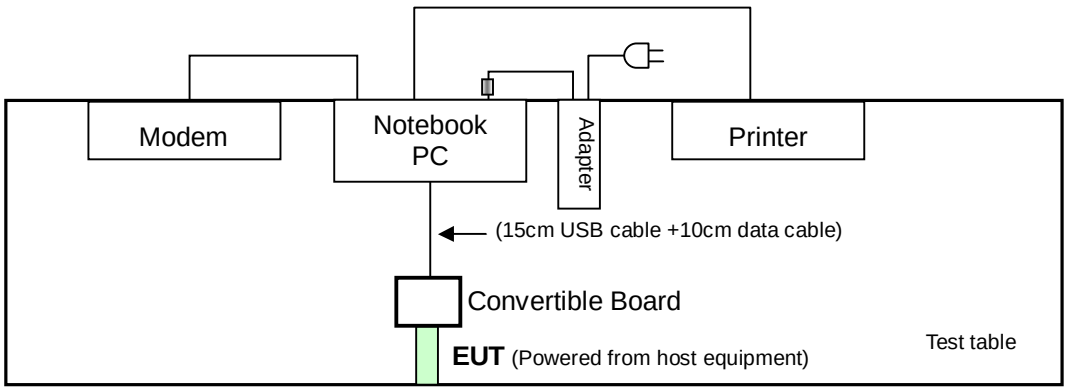
11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

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		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		

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≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Long aluminum foil
B	-	√	-	-	Short aluminum foil
C	-	√	-	-	Without aluminum foil

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

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, 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	1.0	X
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	X
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	X
A	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.0	X

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, 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 ~ C	802.11g	1 to 11	11	OFDM	BPSK	6.0	X

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	11	OFDM	BPSK	6.0

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
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5
A	802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.0

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
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
A	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.0

TEST CONDITION:

APPLICABLE TO	EUT CONFIGURE MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE[3] 1G	A	19deg. C, 76% RH, 1018hPa	120Vac, 60Hz	Chad Lee
RE <1G	A & B	19deg. C, 76% RH, 1018hPa	120Vac, 60Hz	Chad Lee
	C	21deg. C, 84% RH, 1013hPa	120Vac, 60Hz	Nick Chen
PLC	A	25deg. C, 86% RH, 1008hPa	120Vac, 60Hz	Nick Chen
APCM	A	23deg. C, 71% RH, 1008hPa	120Vac, 60Hz	Chad Lee

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	NOTEBOOK COMPUTER	DELL	PP05L	20375526736	FCC DoC Approved
2	PRINTER	EPSON	LQ-300+	DCGY017054	FCC DoC Approved
3	MODEM	ACEEX	1414	980020520	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	1.8m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

NOTE: 1. All power cords of the above support units are non shielded (1.8m).
2. One 15cm USB cable & one 10cm data cable were connected from EUT to Notebook PC.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	May 06, 2010	May 05, 2011
HP Preamplifier	8449B	3008A01924	Aug. 31, 2009	Aug. 30, 2010
HP Preamplifier	8449B	3008A01292	Aug. 10, 2009	Aug. 09, 2010
ROHDE & SCHWARZ TEST RECEIVER	ESU26	100005	Jun. 06, 2009	Jun. 05, 2010
Schwarzbeck Antenna	VULB 9168	137	Apr. 29, 2010	Apr. 28, 2011
Schwarzbeck Antenna	VHBA 9123	480	Apr. 29, 2010	Apr. 28, 2011
EMCO Horn Antenna	3115	6714	Oct. 26, 2009	Oct. 25, 2010
EMCO Horn Antenna	3115	9312-4192	Apr. 23, 2010	Apr. 22, 2011
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	SF104-26.5	CABLE-CH6-17m -01	Aug. 20, 2009	Aug. 19, 2010
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Apr. 06, 2010	Apr. 05, 2011

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.

4.1.3 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 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. 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.

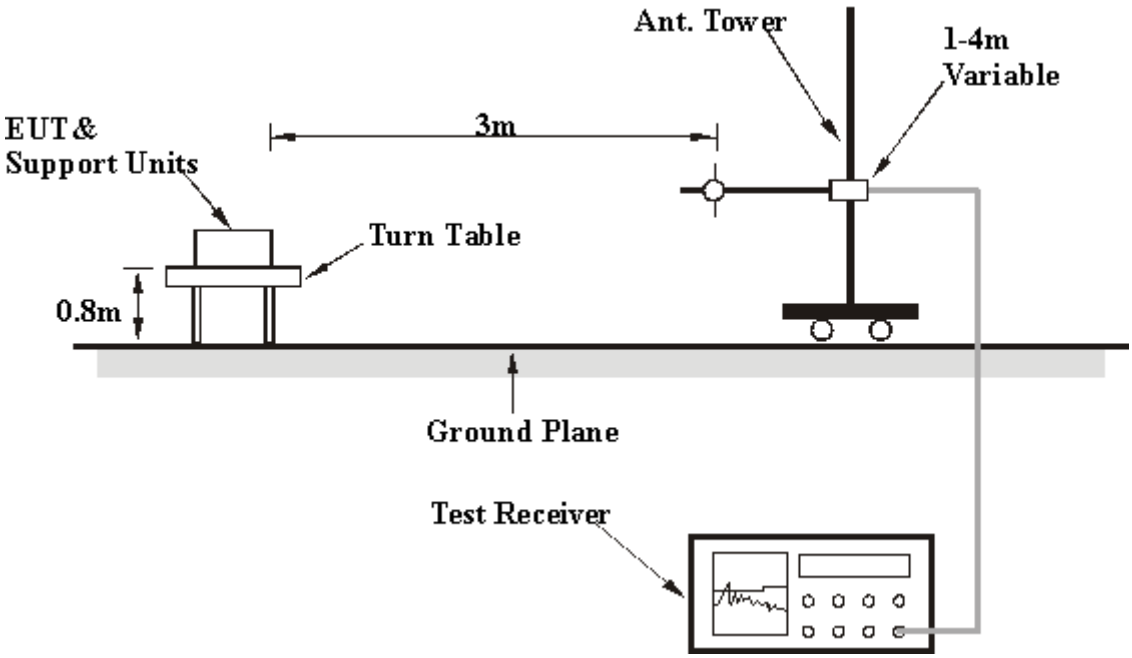
NOTE:

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 1MHz and video bandwidth is 3MHz 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.

4.1.4 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. Turn on the power of all equipment.
b. Notebook PC ran a test program (provided by manufacture) to enable EUT under transmitting condition at specific channel continuously.
c. Notebook PC read and wrote messages to/ from HDD.
d. Notebook PC sent messages to panel and displayed on the screen.
e. Notebook PC sent messages to printer, and the printer printed them out.
f. Notebook PC sent messages to modem.
g. Repeated c ~ g.

4.1.7 TEST RESULTS

802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1608.00	45.3 PK	74.0	-28.7	1.00 H	89	16.01	29.23
2	1608.00	40.4 AV	54.0	-13.6	1.00 H	89	11.13	29.23
3	2390.00	59.6 PK	74.0	-14.4	1.00 H	14	28.04	31.55
4	2390.00	45.2 AV	54.0	-8.8	1.00 H	14	13.68	31.55
5	*2412.00	110.7 PK			1.00 H	14	79.01	31.64
6	*2412.00	106.3 AV			1.00 H	14	74.65	31.64
7	4824.00	48.0 PK	74.0	-26.0	1.00 H	136	10.23	37.73
8	4824.00	39.1 AV	54.0	-14.9	1.00 H	136	1.33	37.73
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	41.6 PK	74.0	-32.4	1.34 V	273	12.31	29.23
2	1608.00	34.3 AV	54.0	-19.7	1.34 V	273	5.06	29.23
3	2390.00	64.3 PK	74.0	-9.7	1.00 V	180	32.71	31.55
4	2390.00	53.1 AV	54.0	-1.0	1.00 V	180	21.50	31.55
5	*2412.00	108.6 PK			1.00 V	180	77.00	31.64
6	*2412.00	104.0 AV			1.00 V	180	72.31	31.64
7	4824.00	54.5 PK	74.0	-19.5	1.00 V	194	16.76	37.73
8	4824.00	52.0 AV	54.0	-2.0	1.00 V	194	14.29	37.73

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1624.00	45.0 PK	74.0	-29.0	1.00 H	89	15.70	29.26
2	1624.00	43.7 AV	54.0	-10.3	1.00 H	89	14.40	29.26
3	*2437.00	113.3 PK			1.00 H	145	81.55	31.73
4	*2437.00	108.9 AV			1.00 H	145	77.17	31.73
5	4874.00	49.5 PK	74.0	-24.5	1.00 H	138	11.60	37.91
6	4874.00	43.2 AV	54.0	-10.8	1.00 H	138	5.30	37.91
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	40.8 PK	74.0	-33.2	1.00 V	240	11.52	29.26
2	1624.00	31.8 AV	54.0	-22.2	1.00 V	240	2.53	29.26
3	*2437.00	108.9 PK			1.00 V	187	77.15	31.73
4	*2437.00	104.2 AV			1.00 V	187	72.51	31.73
5	4874.00	53.8 PK	74.0	-20.2	1.00 V	214	15.91	37.91
6	4874.00	50.0 AV	54.0	-4.0	1.00 V	214	12.13	37.91

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	#1641.00	47.8 PK	92.6	-44.8	1.00 H	272	18.55	29.28
2	#1641.00	44.4 AV	88.0	-43.6	1.00 H	272	15.11	29.28
3	*2462.00	112.6 PK			1.00 H	144	80.77	31.83
4	*2462.00	108.0 AV			1.00 H	144	76.15	31.83
5	2487.65	63.7 PK	74.0	-10.3	1.00 H	144	31.74	31.92
6	2487.65	53.2 AV	54.0	-0.8	1.00 H	144	21.27	31.92
7	4924.00	49.2 PK	74.0	-24.8	1.00 H	285	11.14	38.04
8	4924.00	41.7 AV	54.0	-12.3	1.00 H	285	3.65	38.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1641.00	40.4 PK	85.3	-44.9	1.00 V	175	11.12	29.28
2	#1641.00	32.0 AV	80.4	-48.4	1.00 V	175	2.73	29.28
3	*2462.00	105.3 PK			1.00 V	187	73.46	31.83
4	*2462.00	100.4 AV			1.00 V	187	68.58	31.83
5	2487.65	62.6 PK	74.0	-11.4	1.00 V	187	30.66	31.92
6	2487.65	50.0 AV	54.0	-4.0	1.00 V	187	18.05	31.92
7	4924.00	52.6 PK	74.0	-21.4	1.00 V	197	14.54	38.04
8	4924.00	48.6 AV	54.0	-5.4	1.00 V	197	10.58	38.04

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

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

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1608.00	43.0 PK	74.0	-31.0	1.02 H	73	13.80	29.23
2	1608.00	35.4 AV	54.0	-18.6	1.02 H	73	6.11	29.23
3	2390.00	71.6 PK	74.0	-2.4	1.00 H	143	40.03	31.55
4	2390.00	53.3 AV	54.0	-0.7	1.00 H	143	21.71	31.55
5	*2412.00	112.8 PK			1.00 H	143	81.14	31.64
6	*2412.00	101.8 AV			1.00 H	143	70.11	31.64
7	4824.00	45.0 PK	74.0	-29.0	1.11 H	156	7.23	37.73
8	4824.00	31.9 AV	54.0	-22.1	1.11 H	156	-5.88	37.73
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	35.9 PK	74.0	-38.1	1.00 V	311	6.61	29.23
2	1608.00	26.0 AV	54.0	-28.0	1.00 V	311	-3.21	29.23
3	2390.00	66.2 PK	74.0	-7.8	1.00 V	185	34.61	31.55
4	2390.00	50.8 AV	54.0	-3.2	1.00 V	185	19.22	31.55
5	*2412.00	107.9 PK			1.00 V	185	76.23	31.64
6	*2412.00	96.3 AV			1.00 V	185	64.65	31.64
7	4824.00	44.4 PK	74.0	-29.6	1.00 V	59	6.69	37.73
8	4824.00	31.6 AV	54.0	-22.4	1.00 V	59	-6.15	37.73

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1624.00	44.6 PK	74.0	-29.4	1.00 H	89	15.32	29.26
2	1624.00	39.6 AV	54.0	-14.4	1.00 H	89	10.33	29.26
3	*2437.00	113.8 PK			1.00 H	144	82.06	31.73
4	*2437.00	103.3 AV			1.00 H	144	71.55	31.73
5	4874.00	46.1 PK	74.0	-27.9	1.00 H	113	8.15	37.91
6	4874.00	32.5 AV	54.0	-21.5	1.00 H	113	-5.46	37.91
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	40.6 PK	74.0	-33.4	1.14 V	239	11.37	29.26
2	1624.00	29.0 AV	54.0	-25.0	1.14 V	239	-0.24	29.26
3	*2437.00	108.3 PK			1.00 V	181	76.58	31.73
4	*2437.00	96.8 AV			1.00 V	181	65.11	31.73
5	4874.00	45.6 PK	74.0	-28.4	1.08 V	152	7.68	37.91
6	4874.00	31.7 AV	54.0	-22.3	1.08 V	152	-6.24	37.91

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	#1641.00	42.9 PK	90.9	-48.0	1.00 H	271	13.56	29.28
2	#1641.00	37.1 AV	80.5	-43.4	1.00 H	271	7.77	29.28
3	*2462.00	110.9 PK			1.00 H	144	79.10	31.83
4	*2462.00	100.5 AV			1.00 H	144	68.65	31.83
5	2483.50	70.1 PK	74.0	-3.9	1.00 H	144	38.15	31.91
6	**2483.50**	**53.6 AV**	**54.0**	**-0.4**	**1.00 H**	**144**	**21.64**	**31.91**
7	4924.00	45.1 PK	74.0	-28.9	1.00 H	187	7.10	38.04
8	4924.00	31.4 AV	54.0	-22.6	1.00 H	187	-6.64	38.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1641.00	41.7 PK	88.0	-46.3	1.00 V	2	12.46	29.28
2	#1641.00	33.5 AV	78.3	-44.8	1.00 V	2	4.25	29.28
3	*2462.00	108.0 PK			1.00 V	190	76.15	31.83
4	*2462.00	98.3 AV			1.00 V	190	66.48	31.83
5	2483.50	69.4 PK	74.0	-4.6	1.00 V	190	37.48	31.91
6	2483.50	52.0 AV	54.0	-2.0	1.00 V	190	20.13	31.91
7	4924.00	44.1 PK	74.0	-29.9	1.00 V	186	6.07	38.04
8	4924.00	31.3 AV	54.0	-22.7	1.00 V	186	-6.77	38.04

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

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

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1608.00	40.8 PK	74.0	-33.2	1.00 H	276	11.51	29.23
2	1608.00	31.8 AV	54.0	-22.2	1.00 H	276	2.58	29.23
3	2390.00	67.6 PK	74.0	-6.4	1.00 H	144	36.09	31.55
4	2390.00	48.4 AV	54.0	-5.6	1.00 H	144	16.80	31.55
5	*2412.00	107.7 PK			1.00 H	144	76.08	31.64
6	*2412.00	96.8 AV			1.00 H	144	65.14	31.64
7	4824.00	44.8 PK	74.0	-29.2	1.00 H	64	7.07	37.73
8	4824.00	31.6 AV	54.0	-22.4	1.00 H	64	-6.12	37.73
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	38.0 PK	74.0	-36.0	1.00 V	135	8.80	29.23
2	1608.00	25.4 AV	54.0	-28.6	1.00 V	135	-3.80	29.23
3	2390.00	64.3 PK	74.0	-9.7	1.00 V	183	32.72	31.55
4	2390.00	46.8 AV	54.0	-7.2	1.00 V	183	15.27	31.55
5	*2412.00	102.4 PK			1.00 V	183	70.73	31.64
6	*2412.00	91.5 AV			1.00 V	183	59.88	31.64
7	4824.00	44.6 PK	74.0	-29.4	1.00 V	224	6.87	37.73
8	4824.00	31.5 AV	54.0	-22.5	1.00 V	224	-6.25	37.73

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1624.00	40.0 PK	74.0	-34.0	1.00 H	73	10.72	29.26
2	1624.00	30.1 AV	54.0	-23.9	1.00 H	73	0.88	29.26
3	*2437.00	107.1 PK			1.00 H	143	75.34	31.73
4	*2437.00	95.9 AV			1.00 H	143	64.13	31.73
5	4874.00	46.1 PK	74.0	-27.9	1.00 H	112	8.19	37.91
6	4874.00	32.7 AV	54.0	-21.3	1.00 H	112	-5.26	37.91
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	38.4 PK	74.0	-35.6	1.00 V	152	9.10	29.26
2	1624.00	24.7 AV	54.0	-29.3	1.00 V	152	-4.52	29.26
3	*2437.00	102.8 PK			1.00 V	185	71.06	31.73
4	*2437.00	91.7 AV			1.00 V	185	59.96	31.73
5	4874.00	45.0 PK	74.0	-29.0	1.00 V	183	7.12	37.91
6	4874.00	31.9 AV	54.0	-22.1	1.00 V	183	-5.97	37.91

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	#1641.00	40.6 PK	85.5	-44.9	1.00 H	273	11.32	29.28
2	#1641.00	30.3 AV	75.3	-45.0	1.00 H	273	0.97	29.28
3	*2462.00	105.5 PK			1.00 H	145	73.67	31.83
4	*2462.00	95.3 AV			1.00 H	145	63.48	31.83
5	2483.50	66.2 PK	74.0	-7.8	1.00 H	145	34.30	31.91
6	2483.50	48.5 AV	54.0	-5.5	1.00 H	145	16.58	31.91
7	4924.00	45.3 PK	74.0	-28.7	1.00 H	122	7.27	38.04
8	4924.00	32.0 AV	54.0	-22.0	1.00 H	122	-6.07	38.04
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1641.00	38.0 PK	82.0	-44.0	1.00 V	36	8.68	29.28
2	#1641.00	26.8 AV	70.5	-43.7	1.00 V	36	-2.53	29.28
3	*2462.00	102.0 PK			1.00 V	183	70.12	31.83
4	*2462.00	90.5 AV			1.00 V	183	58.71	31.83
5	2483.50	62.0 PK	74.0	-12.0	1.00 V	183	30.05	31.91
6	2483.50	48.2 AV	54.0	-5.8	1.00 V	183	16.27	31.91
7	4924.00	45.0 PK	74.0	-29.0	1.00 V	157	6.93	38.04
8	4924.00	31.8 AV	54.0	-22.2	1.00 V	157	-6.21	38.04

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

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

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1614.00	40.7 PK	74.0	-33.3	1.00 H	74	11.41	29.24
2	1614.00	30.0 AV	54.0	-24.0	1.00 H	74	0.80	29.24
3	2390.00	69.7 PK	74.0	-4.3	1.00 H	142	38.13	31.55
4	2390.00	50.5 AV	54.0	-3.5	1.00 H	142	18.99	31.55
5	*2422.00	104.0 PK			1.00 H	142	72.34	31.67
6	*2422.00	92.5 AV			1.00 H	142	60.81	31.67
7	4844.00	45.0 PK	74.0	-29.0	1.00 H	143	7.21	37.80
8	4844.00	31.7 AV	54.0	-22.3	1.00 H	143	-6.08	37.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	1614.00	36.4 PK	74.0	-37.6	1.00 V	151	7.17	29.24
2	1614.00	25.3 AV	54.0	-28.7	1.00 V	151	-3.94	29.24
3	2390.00	65.0 PK	74.0	-9.0	1.00 V	182	33.43	31.55
4	2390.00	48.0 AV	54.0	-6.0	1.00 V	182	16.42	31.55
5	*2422.00	100.2 PK			1.00 V	182	68.56	31.67
6	*2422.00	87.8 AV			1.00 V	182	56.13	31.67
7	4844.00	44.4 PK	74.0	-29.6	1.00 V	112	6.63	37.80
8	4844.00	31.0 AV	54.0	-23.0	1.00 V	112	-6.78	37.80

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	1624.00	39.8 PK	74.0	-34.2	1.00 H	276	10.50	29.26
2	1624.00	29.9 AV	54.0	-24.1	1.00 H	276	0.63	29.26
3	*2437.00	104.8 PK			1.00 H	142	73.10	31.73
4	*2437.00	92.9 AV			1.00 H	142	61.17	31.73
5	4874.00	45.2 PK	74.0	-28.8	1.00 H	162	7.30	37.91
6	4874.00	32.2 AV	54.0	-21.8	1.00 H	162	-5.74	37.91
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	36.8 PK	74.0	-37.2	1.00 V	54	7.50	29.26
2	1624.00	25.5 AV	54.0	-28.5	1.00 V	54	-3.81	29.26
3	*2437.00	100.5 PK			1.00 V	185	68.76	31.73
4	*2437.00	88.3 AV			1.00 V	185	56.52	31.73
5	4874.00	44.9 PK	74.0	-29.1	1.00 V	113	6.95	37.91
6	4874.00	31.7 AV	54.0	-22.3	1.00 V	113	-6.24	37.91

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 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	19deg. C, 76% RH 1018hPa	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	#1634.00	38.2 PK	83.9	-45.7	1.00 H	1	8.92	29.27
2	#1634.00	26.5 AV	72.6	-46.1	1.00 H	1	-2.73	29.27
3	*2452.00	103.9 PK			1.00 H	144	72.14	31.79
4	*2452.00	92.6 AV			1.00 H	144	60.82	31.79
5	2483.50	70.8 PK	74.0	-3.2	1.00 H	144	38.92	31.91
6	2483.50	50.5 AV	54.0	-3.5	1.00 H	144	18.57	31.91
7	4904.00	45.5 PK	74.0	-28.5	1.00 H	174	7.51	38.01
8	4904.00	32.0 AV	54.0	-22.0	1.00 H	174	-6.05	38.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#1634.00	37.9 PK	79.6	-41.7	1.00 V	0	8.60	29.27
2	#1634.00	26.7 AV	68.4	-41.7	1.00 V	0	-2.58	29.27
3	*2452.00	99.6 PK			1.00 V	183	67.80	31.79
4	*2452.00	88.4 AV			1.00 V	183	56.63	31.79
5	2483.50	66.7 PK	74.0	-7.3	1.00 V	183	34.75	31.91
6	2483.50	48.3 AV	54.0	-5.7	1.00 V	183	16.36	31.91
7	4904.00	45.1 PK	74.0	-28.9	1.00 V	156	7.06	38.01
8	4904.00	31.8 AV	54.0	-22.2	1.00 V	156	-6.20	38.01

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

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

BELOW 1GHz WORST-CASE DATA：802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	18deg. C, 75% RH 1020hPa	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	120.16	38.9 QP	43.5	-4.6	1.50 H	235	27.55	11.39
2	208.77	40.0 QP	43.5	-3.6	1.12 H	178	28.41	11.54
3	242.96	38.1 QP	46.0	-7.9	1.96 H	265	25.27	12.79
4	359.55	40.8 QP	46.0	-5.2	1.23 H	202	23.83	16.98
5	600.50	38.6 QP	46.0	-7.5	1.50 H	142	15.32	23.23
6	841.44	38.8 QP	46.0	-7.2	1.62 H	106	11.51	27.26
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	54.87	34.9 QP	40.0	-5.1	1.00 V	1	22.16	12.72
2	120.16	36.6 QP	43.5	-6.9	1.36 V	211	25.18	11.39
3	208.77	39.1 QP	43.5	-4.4	1.00 V	166	27.58	11.54
4	359.55	40.3 QP	46.0	-5.7	1.55 V	259	23.35	16.98
5	600.50	38.1 QP	46.0	-7.9	1.36 V	223	14.91	23.23
6	841.44	40.2 QP	46.0	-5.8	1.11 V	187	12.98	27.26

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 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	18deg. C, 75% RH 1020hPa	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	120.16	40.6 QP	43.5	-3.0	1.00 H	52	29.16	11.39
2	239.86	38.8 QP	46.0	-7.3	1.00 H	259	26.07	12.68
3	359.55	35.9 QP	46.0	-10.1	1.56 H	343	18.95	16.98
4	600.50	39.5 QP	46.0	-6.5	1.63 H	97	16.31	23.23
5	732.63	39.4 QP	46.0	-6.6	1.42 H	292	13.97	25.45
6	841.44	41.7 QP	46.0	-4.3	1.00 H	148	14.40	27.26
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	82.85	36.1 QP	40.0	-3.9	1.53 V	127	26.83	9.28
2	120.16	36.8 QP	43.5	-6.7	1.63 V	10	25.38	11.39
3	129.49	38.5 QP	43.5	-5.1	1.42 V	190	26.06	12.39
4	359.55	38.2 QP	46.0	-7.8	1.89 V	196	21.26	16.98
5	600.50	40.0 QP	46.0	-6.0	1.74 V	127	16.81	23.23
6	841.44	39.6 QP	46.0	-6.4	1.66 V	124	12.37	27.26

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 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 84% RH 1013hPa	TESTED BY	Nick Chen
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	110.83	39.9 QP	43.5	-3.6	1.07 H	325	29.65	10.23
2	176.12	38.8 QP	43.5	-4.7	1.11 H	10	25.33	13.47
3	449.71	37.9 QP	46.0	-8.1	1.25 H	304	18.24	19.62
4	581.84	36.6 QP	46.0	-9.4	1.23 H	52	13.75	22.85
5	598.94	39.3 QP	46.0	-6.7	1.08 H	67	16.07	23.20
6	729.52	37.4 QP	46.0	-8.7	1.10 H	241	11.96	25.39
7	866.31	39.6 QP	46.0	-6.4	1.00 H	211	11.99	27.61
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	82.85	36.3 QP	40.0	-3.7	1.05 V	163	27.02	9.28
2	129.49	34.2 QP	43.5	-9.3	1.17 V	178	21.85	12.39
3	183.89	32.9 QP	43.5	-10.6	1.39 V	259	20.61	12.25
4	449.71	39.3 QP	46.0	-6.7	1.22 V	262	19.67	19.62
5	665.79	36.3 QP	46.0	-9.7	1.12 V	13	12.03	24.28
6	732.63	37.4 QP	46.0	-8.6	1.27 V	199	11.99	25.45
7	866.31	40.7 QP	46.0	-5.3	1.50 V	229	13.11	27.61

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 0.50MHz.

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.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100276	Dec. 15, 2009	Dec. 14, 2010
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Nov. 24, 2009	Nov. 23, 2010
LISN With Adapter (for EUT)	AD10	C10Ada-001	Nov. 24, 2009	Nov. 23, 2010
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Nov. 23, 2009	Nov. 22, 2010
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. 23, 2010	Feb. 22, 2011
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Feb. 23, 2010	Feb. 22, 2011

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.

4.2.3 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.

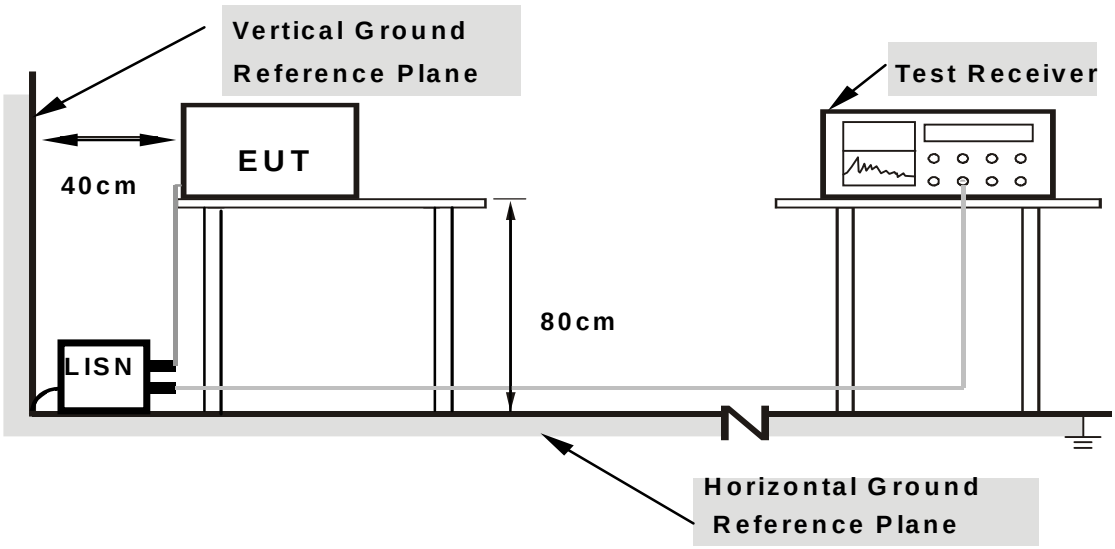
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

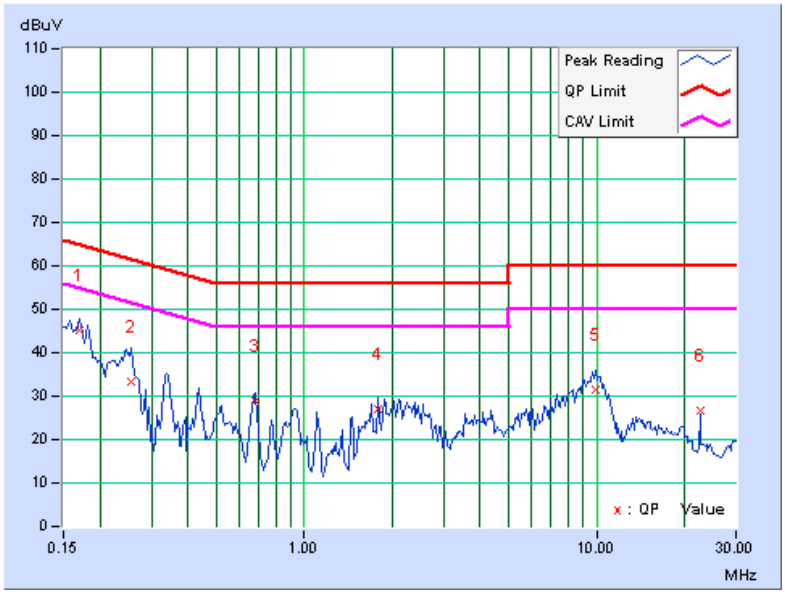
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA： 802.11g

CHANNEL	Channel 11	PHASE	Line 1
TEST MODE	A	6dB BANDWIDTH	9kHz

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	0.170	0.19	44.92	-	45.11	-	64.98	54.98	-19.87	-
2	0.254	0.22	33.13	-	33.35	-	61.62	51.62	-28.27	-
3	0.677	0.30	28.63	-	28.93	-	56.00	46.00	-27.07	-
4	1.793	0.33	26.55	-	26.88	-	56.00	46.00	-29.12	-
5	9.965	0.71	30.63	-	31.34	-	60.00	50.00	-28.66	-
6	22.570	1.30	25.23	-	26.53	-	60.00	50.00	-33.47	-

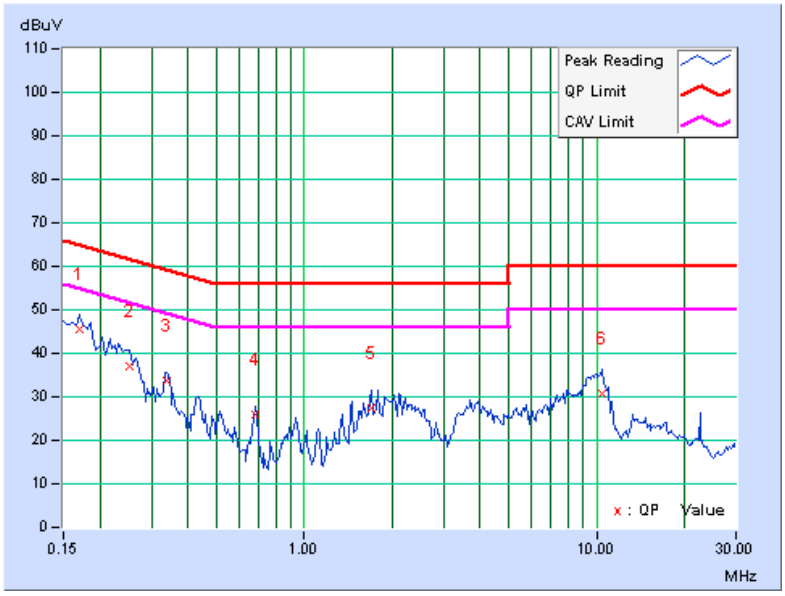
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



CHANNEL	Channel 11	PHASE	Line 2
TEST MODE	A	6dB BANDWIDTH	9kHz

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	0.170	0.29	45.25	-	45.54	-	64.98	54.98	-19.45	-
2	0.252	0.31	36.68	-	36.99	-	61.71	51.71	-24.72	-
3	0.338	0.35	33.51	-	33.86	-	59.26	49.26	-25.41	-
4	0.681	0.38	25.73	-	26.11	-	56.00	46.00	-29.89	-
5	1.699	0.40	27.17	-	27.57	-	56.00	46.00	-28.43	-
6	10.410	0.72	29.95	-	30.67	-	60.00	50.00	-29.33	-

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	FSP 40	100036	Apr. 27, 2010	Apr. 26, 2011

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

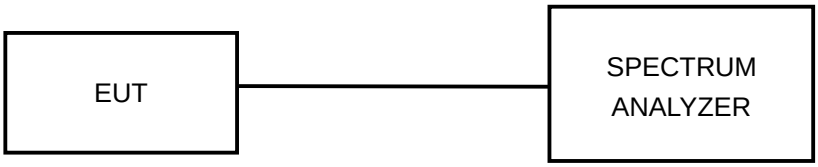
4.3.3 TEST PROCEDURE

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.

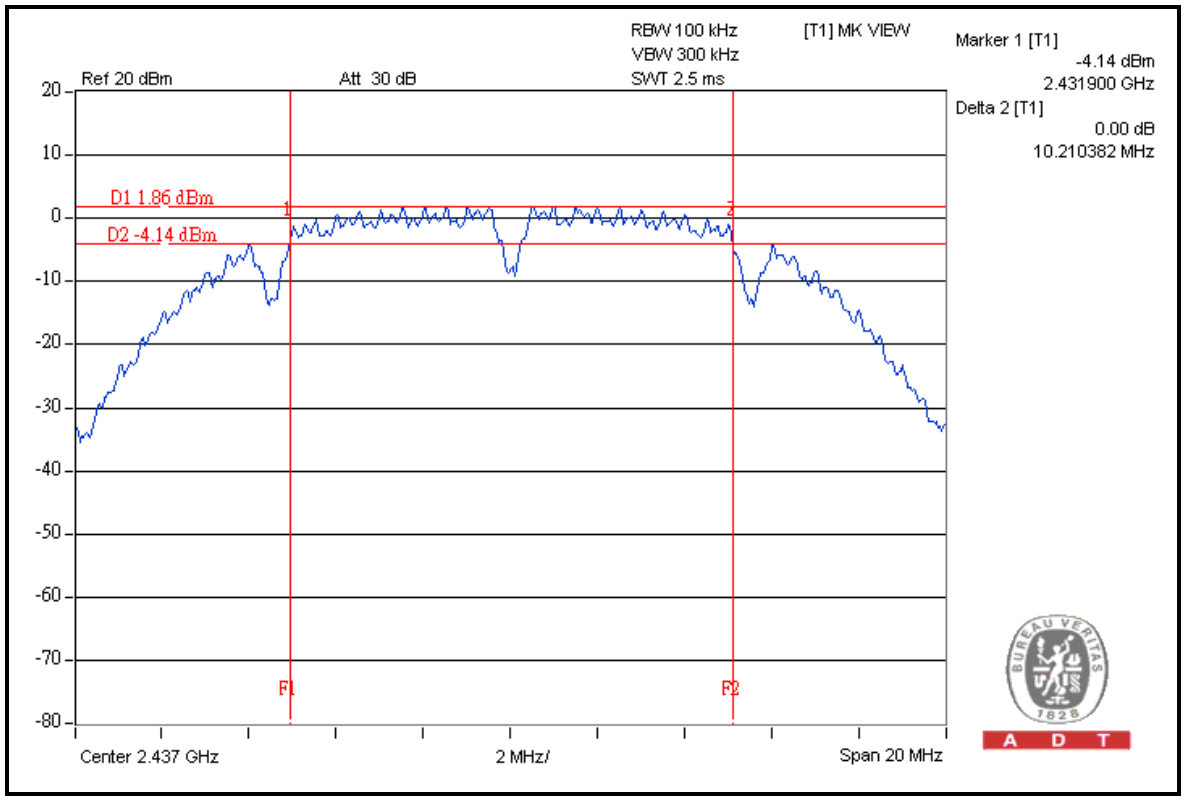
4.3.7 TEST RESULTS

MODE A:

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.21	0.5	PASS
6	2437	10.21	0.5	PASS
11	2462	10.18	0.5	PASS

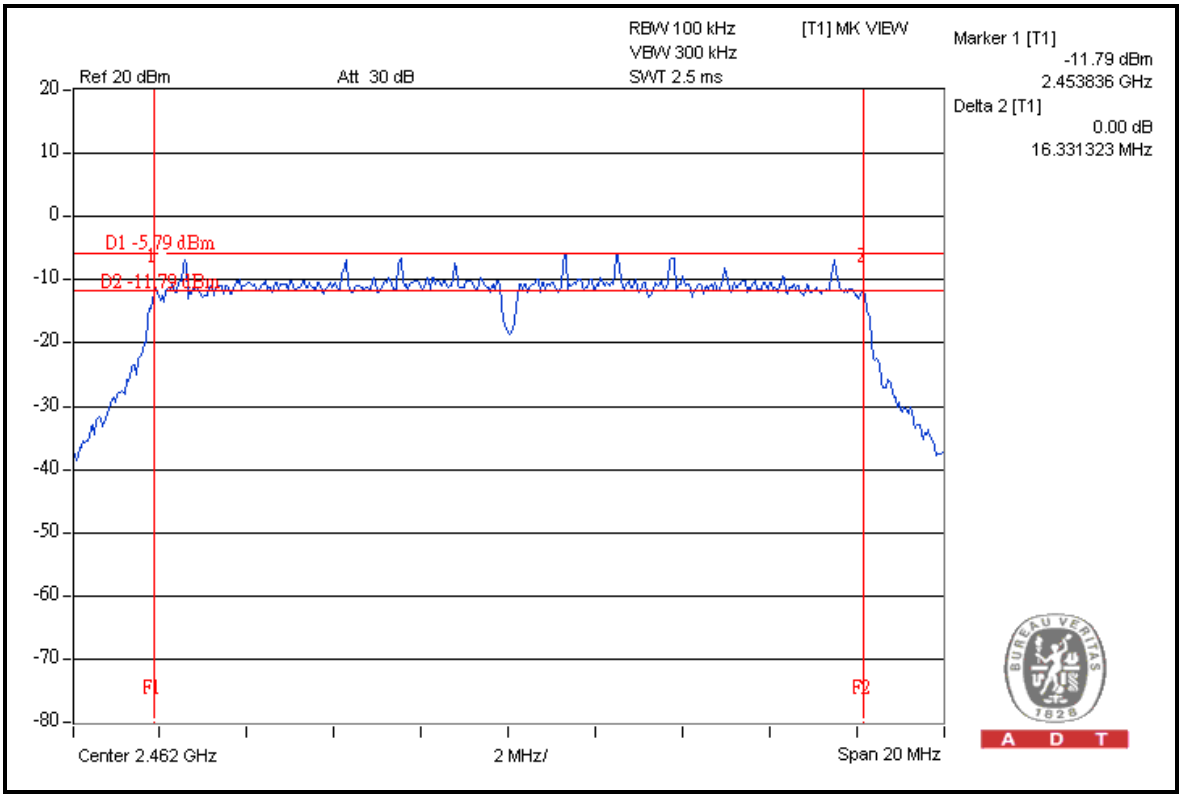
CH 6



802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.10	0.5	PASS
6	2437	16.32	0.5	PASS
11	2462	16.33	0.5	PASS

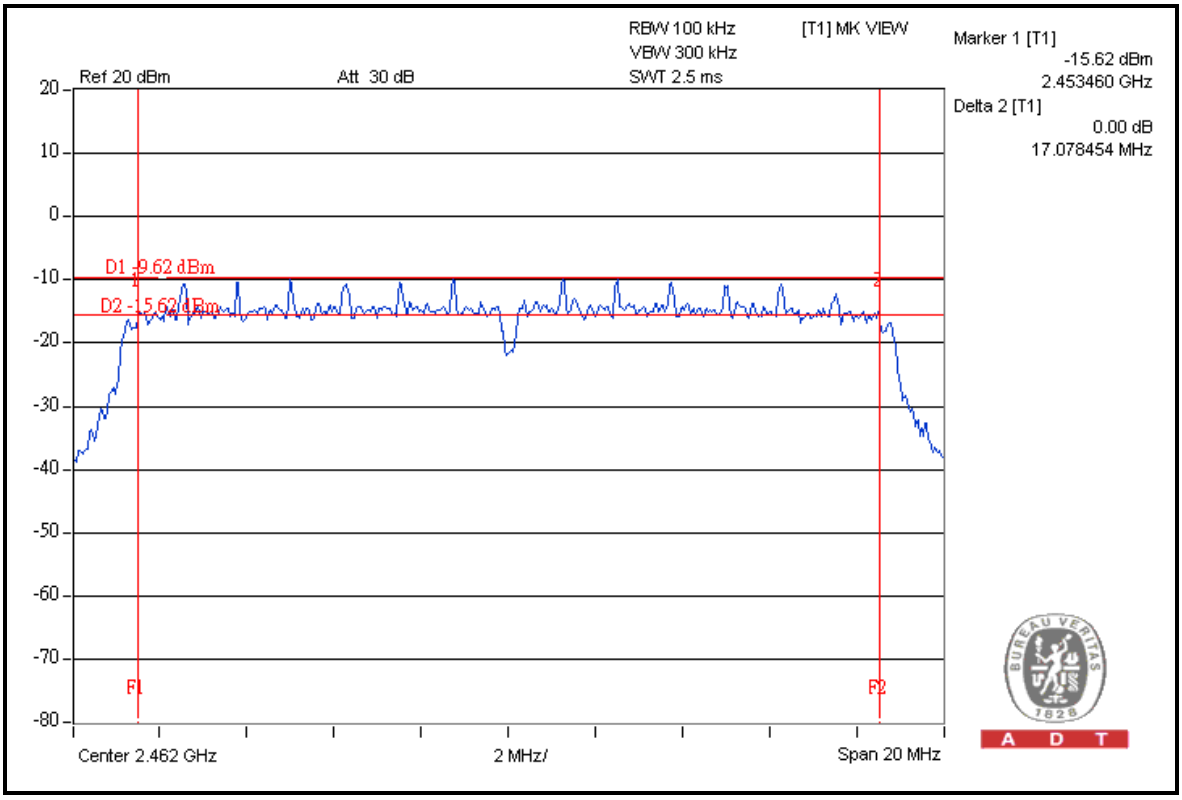
CH 11



802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.06	0.5	PASS
6	2437	16.97	0.5	PASS
11	2462	17.08	0.5	PASS

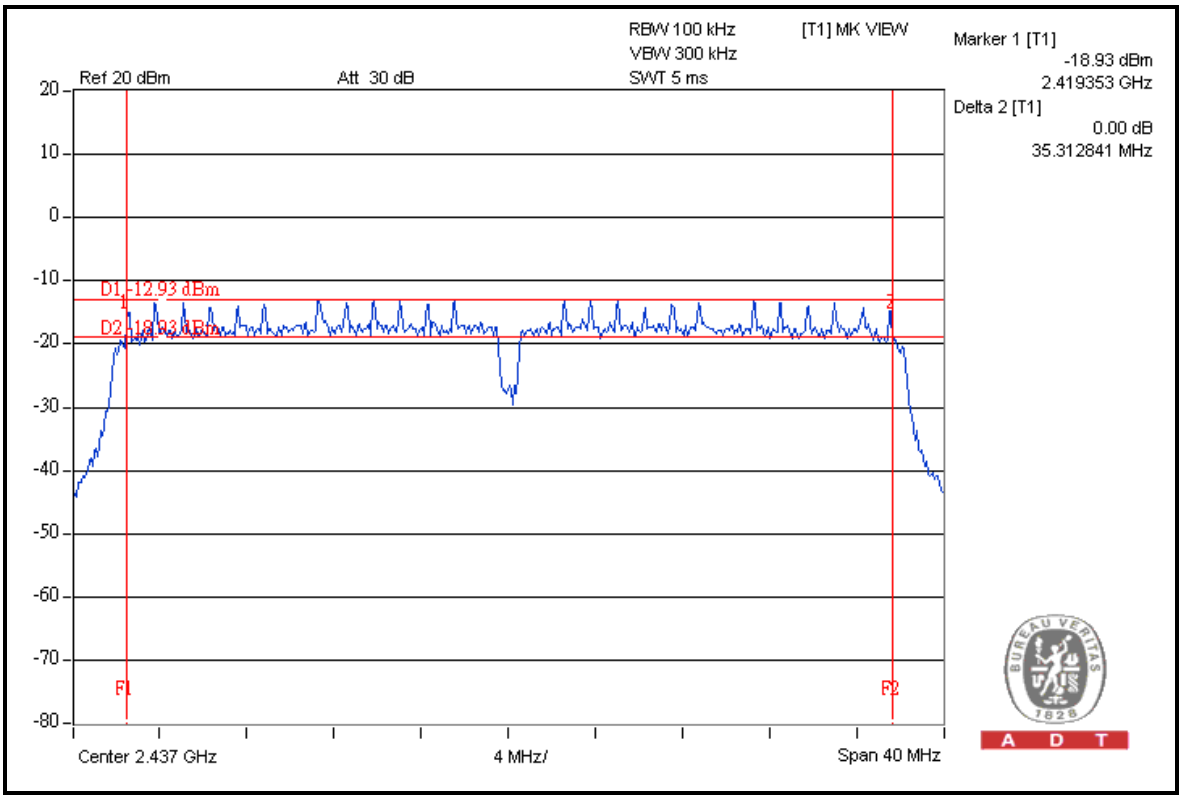
CH 11



802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	35.31	0.5	PASS
4	2437	35.31	0.5	PASS
7	2452	35.28	0.5	PASS

CH 4



4.4 MAXIMUM OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK 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. 21, 2010	Apr. 20, 2011
Anritsu Power Meter	ML2495A	0842014	Apr. 21, 2010	Apr. 20, 2011

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.

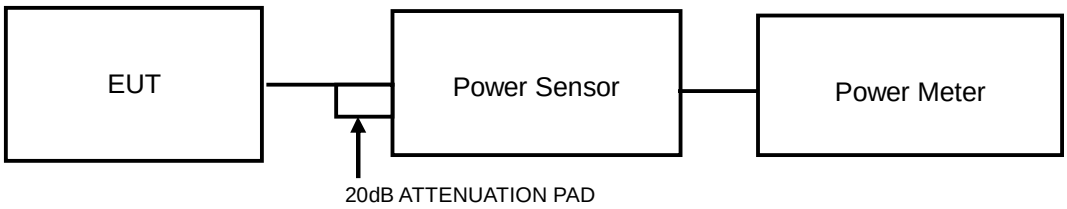
4.4.3 TEST PROCEDURES

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK OUTPUT POWER (dBm)	PEAK OUTPUT POWER (mW)	PEAK OUTPUT POWER (dBm)	PASS / FAIL
1	2412	16.4	43.7	30	PASS
6	2437	17.0	**50.1**	30	PASS
11	2462	16.3	42.7	30	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK OUTPUT POWER (dBm)	PEAK OUTPUT POWER (mW)	PEAK OUTPUT POWER (dBm)	PASS / FAIL
1	2412	11.5	14.1	30	PASS
6	2437	14.0	25.1	30	PASS
11	2462	11.3	13.5	30	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK OUTPUT POWER (dBm)	PEAK OUTPUT POWER (mW)	PEAK OUTPUT POWER (dBm)	PASS / FAIL
1	2412	13.0	20.0	30	PASS
6	2437	13.0	20.0	30	PASS
11	2462	13.0	20.0	30	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK OUTPUT POWER (dBm)	PEAK OUTPUT POWER (mW)	PEAK OUTPUT POWER (dBm)	PASS / FAIL
1	2422	13.0	20.0	30	PASS
4	2437	13.0	20.0	30	PASS
7	2452	13.0	20.0	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	FSP 40	100036	Apr. 27, 2010	Apr. 26, 2011

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

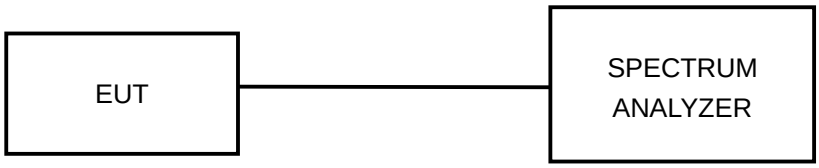
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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 CONDITION

Same as Item 4.3.6

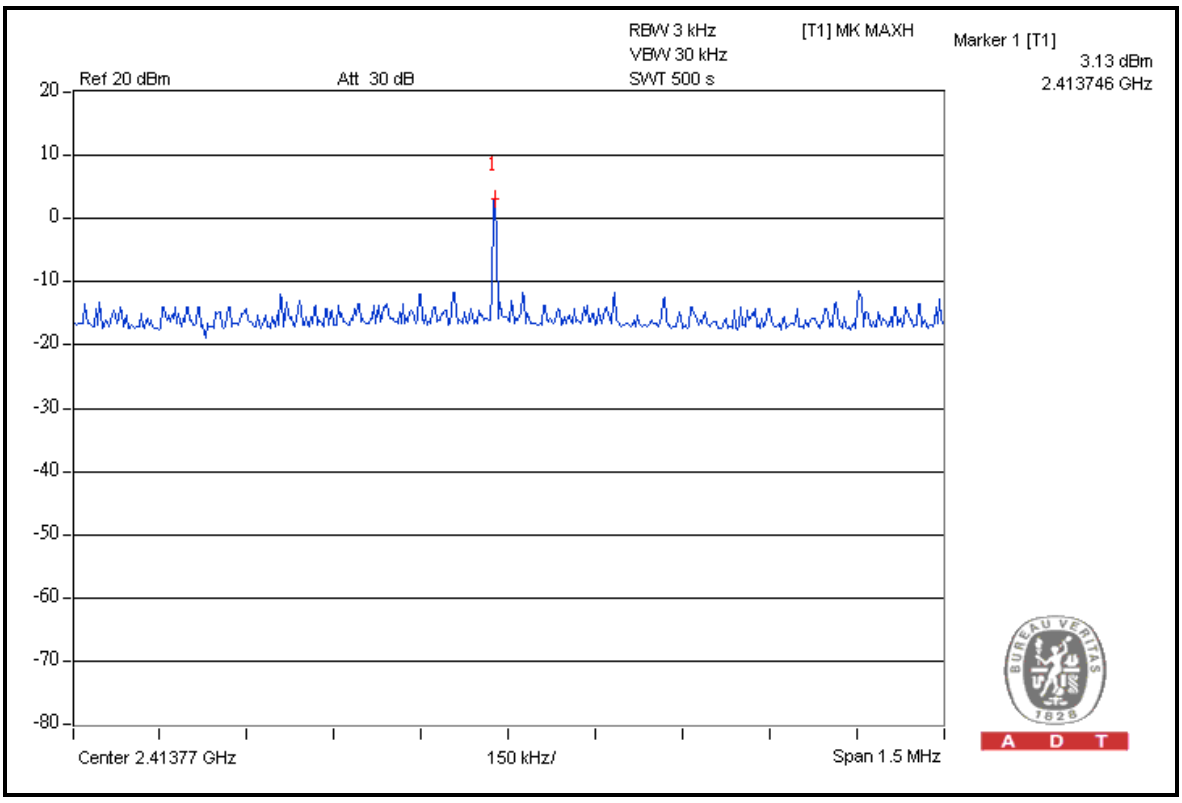
4.5.7 TEST RESULTS

MODE A:

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	3.1	8	PASS
6	2437	1.4	8	PASS
11	2462	1.7	8	PASS

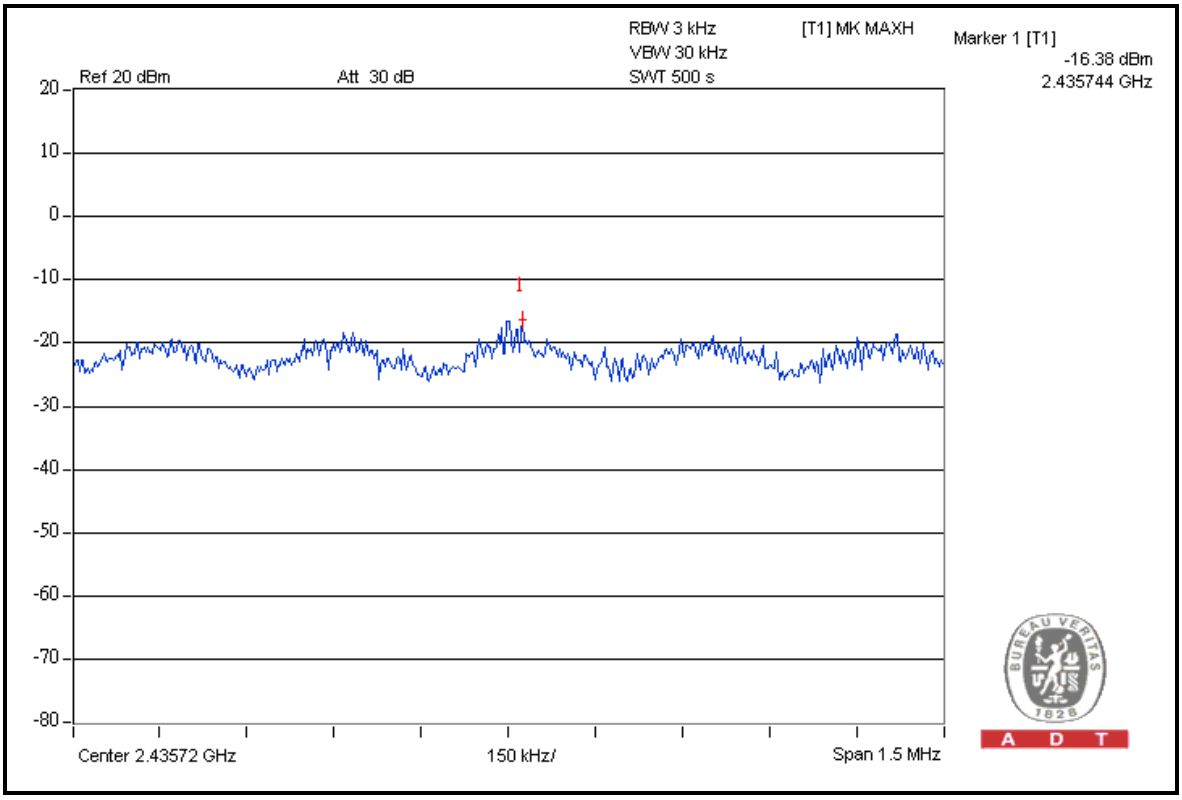
CH 1



802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-18.0	8	PASS
6	2437	-16.4	8	PASS
11	2462	-20.5	8	PASS

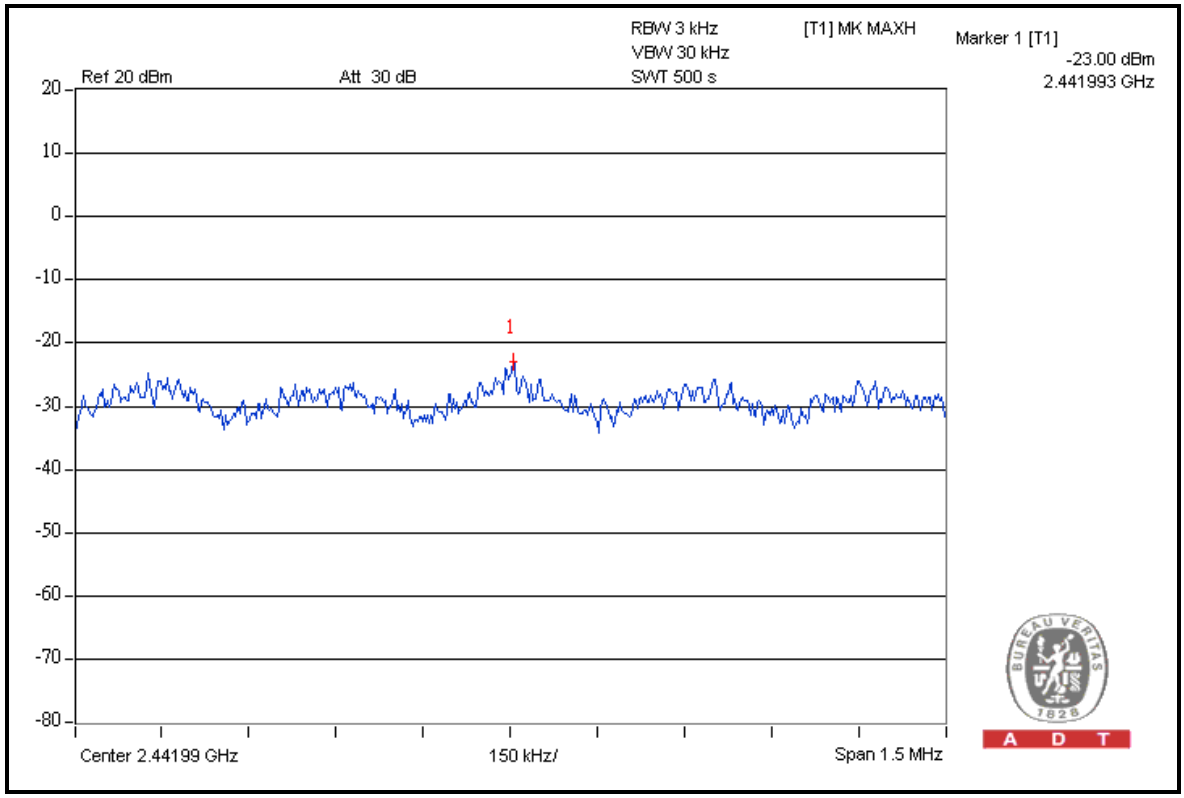
CH 6



802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-23.8	8	PASS
6	2437	-23.0	8	PASS
11	2462	-25.8	8	PASS

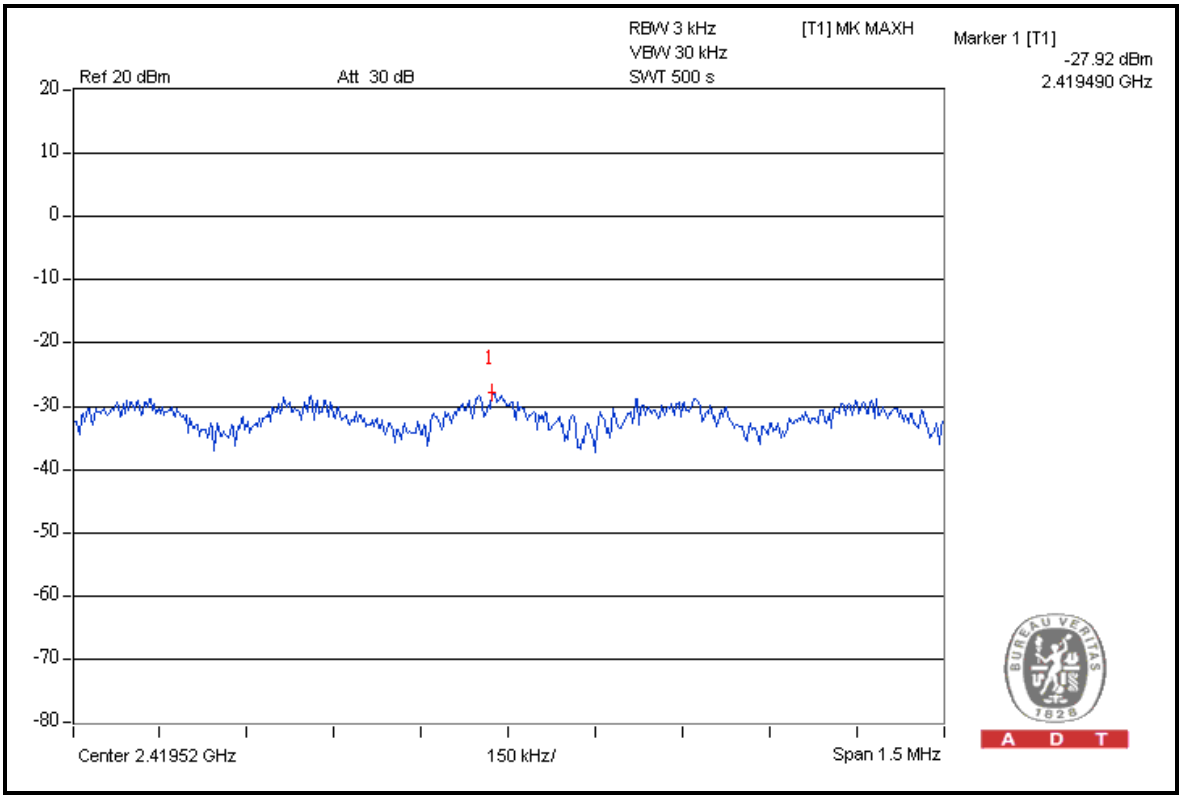
CH 6



802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2422	-27.9	8	PASS
4	2437	-28.1	8	PASS
7	2452	-29.5	8	PASS

CH 1



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 & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	CALIBRATED UNTIL
FOR CONDUCTED MEASUREMENT:				
R&S SPECTRUM ANALYZER	FSP 40	100036	Apr. 27, 2010	Apr. 26, 2011
FOR RADIATED MEASUREMENT:				
HP Preamplifier	8447D	2432A03504	May 06, 2010	May 05, 2011
HP Preamplifier	8449B	3008A01924	Aug. 31, 2009	Aug. 30, 2010
HP Preamplifier	8449B	3008A01292	Aug. 10, 2009	Aug. 09, 2010
ROHDE & SCHWARZ TEST RECEIVER	ESU26	100005	Jun. 06, 2009	Jun. 05, 2010
Schwarzbeck Antenna	VULB 9168	137	Apr. 29, 2010	Apr. 28, 2011
Schwarzbeck Antenna	VHBA 9123	480	Apr. 29, 2010	Apr. 28, 2011
EMCO Horn Antenna	3115	6714	Oct. 26, 2009	Oct. 25, 2010
EMCO Horn Antenna	3115	9312-4192	Apr. 23, 2010	Apr. 22, 2011
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	SF104-26.5	CABLE-CH6-17 m-01	Aug. 20, 2009	Aug. 19, 2010
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Apr. 06, 2010	Apr. 05, 2011

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.

4.6.3 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.

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

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 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.

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.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.6 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).

MODE A:

802.11b

RESTRICT BAND (2310 ~ 2390 MHz)

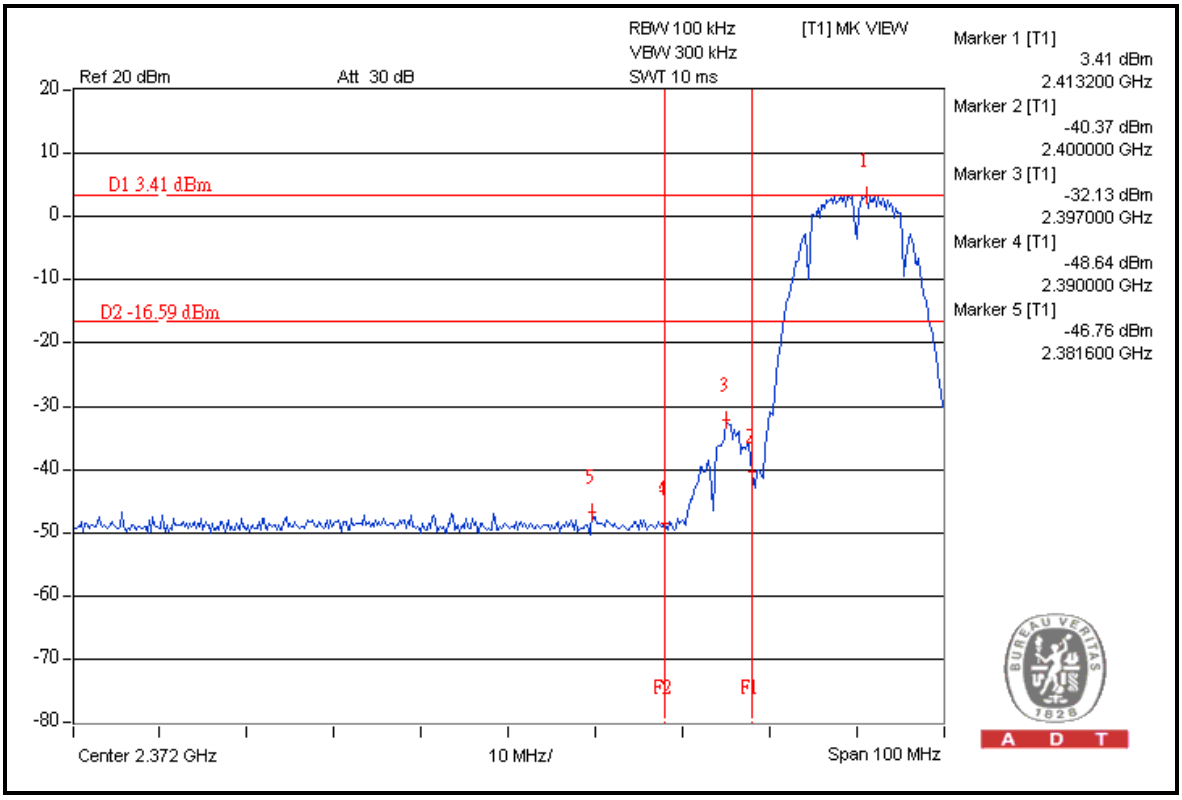
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	110.7	50.2	60.5	74.00
2412.00 (AV)	106.3	60.7	45.6	54.00

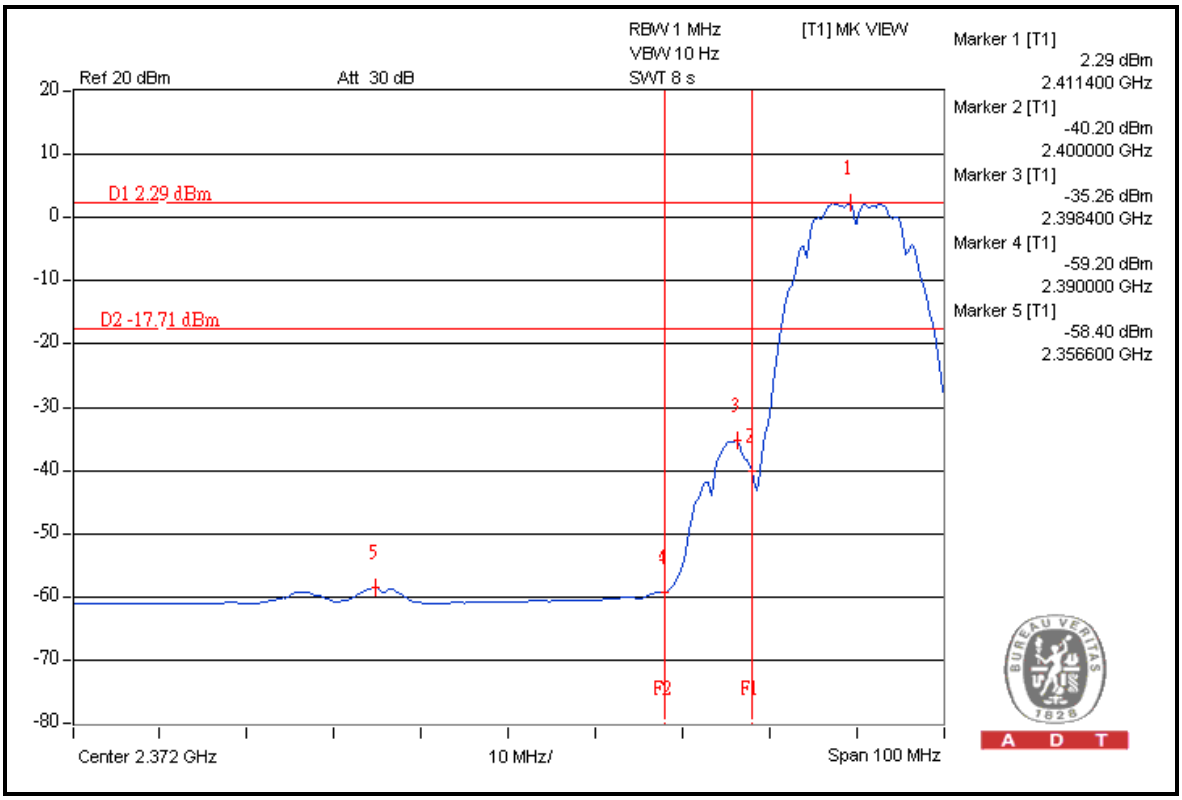
RESTRICT BAND (2483.5 ~ 2500 MHz)

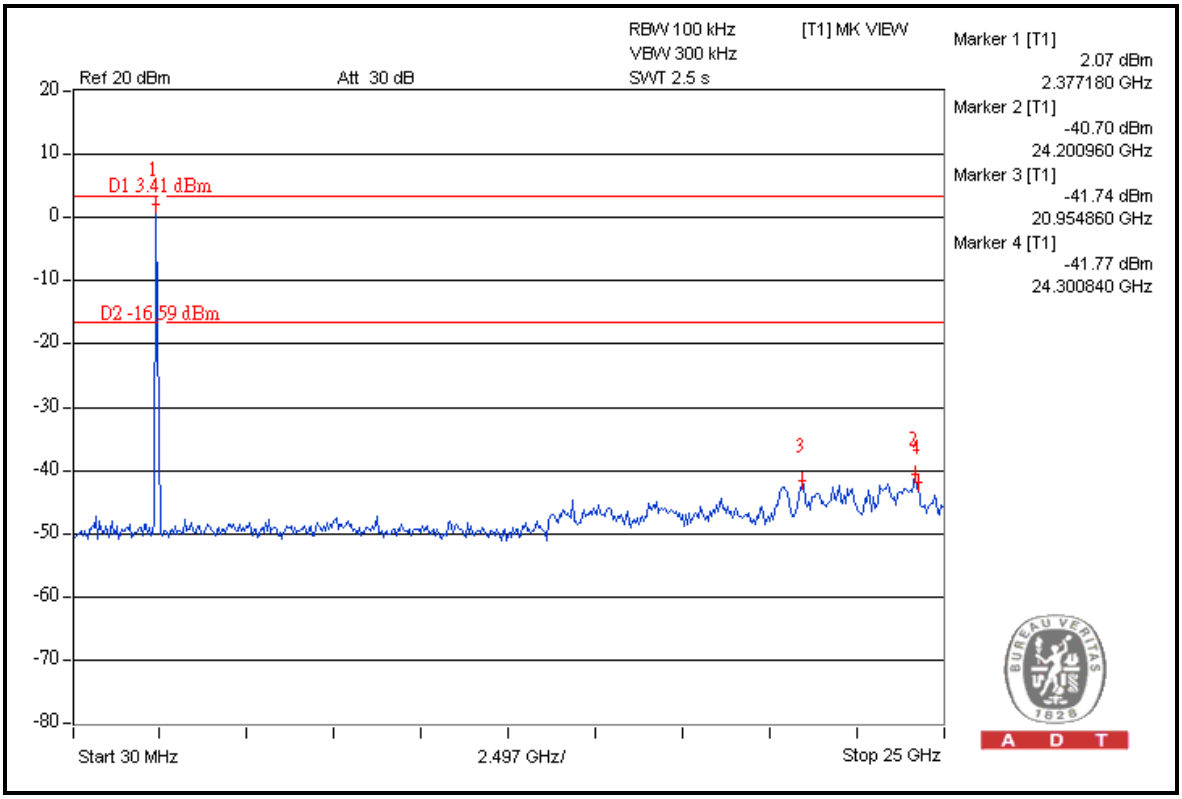
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	112.6	50.6	62.0	74.00
2462.00 (AV)	108.0	61.4	46.6	54.00

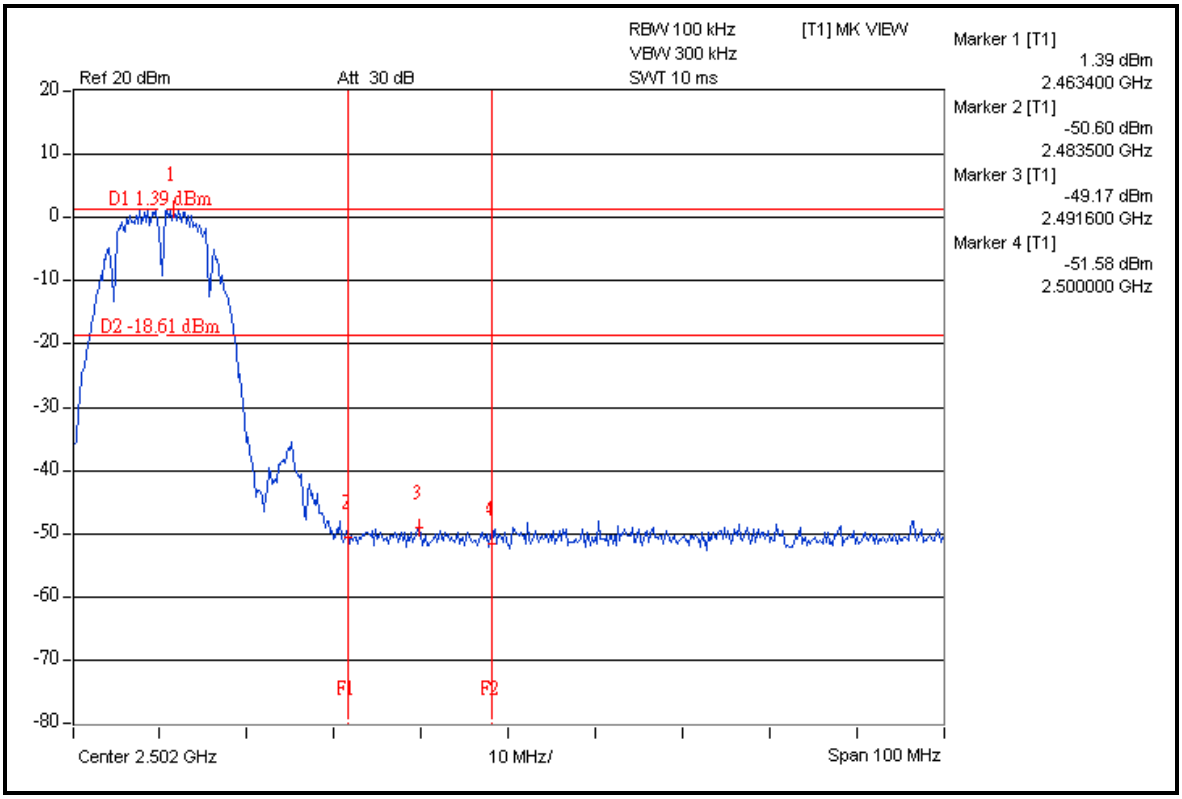
NOTE:

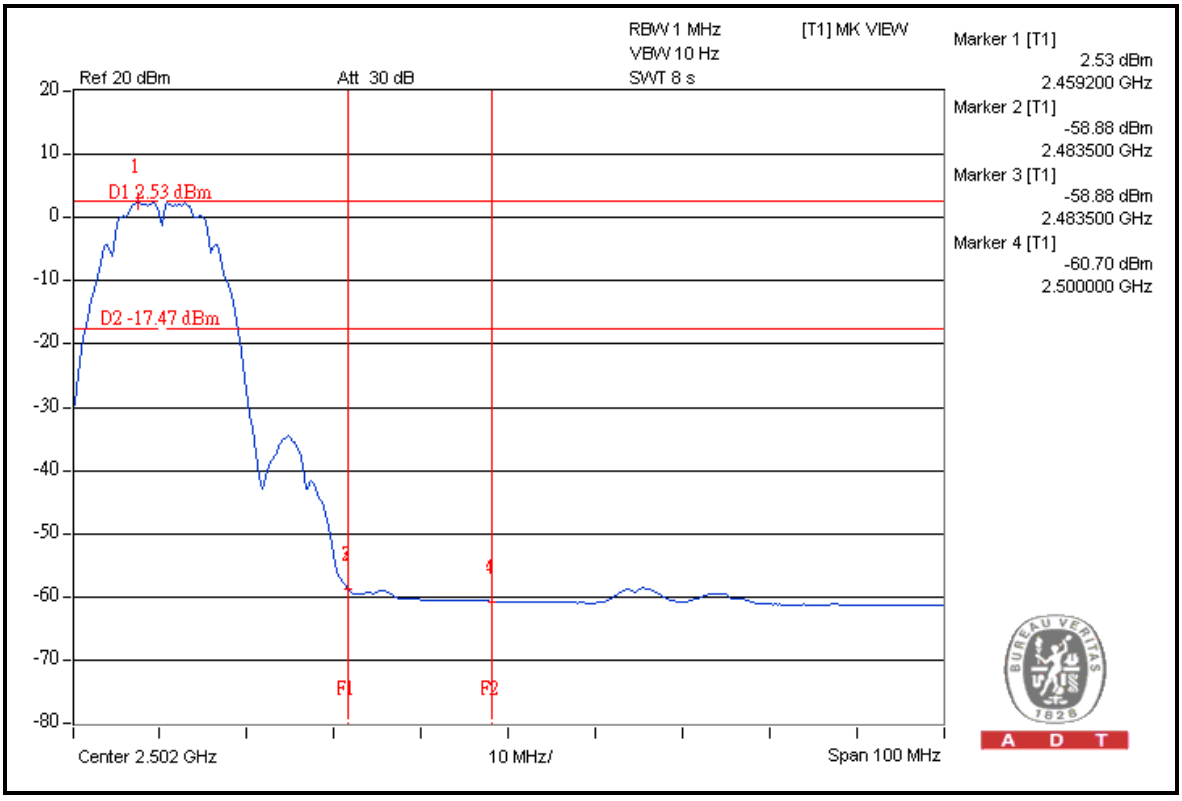
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

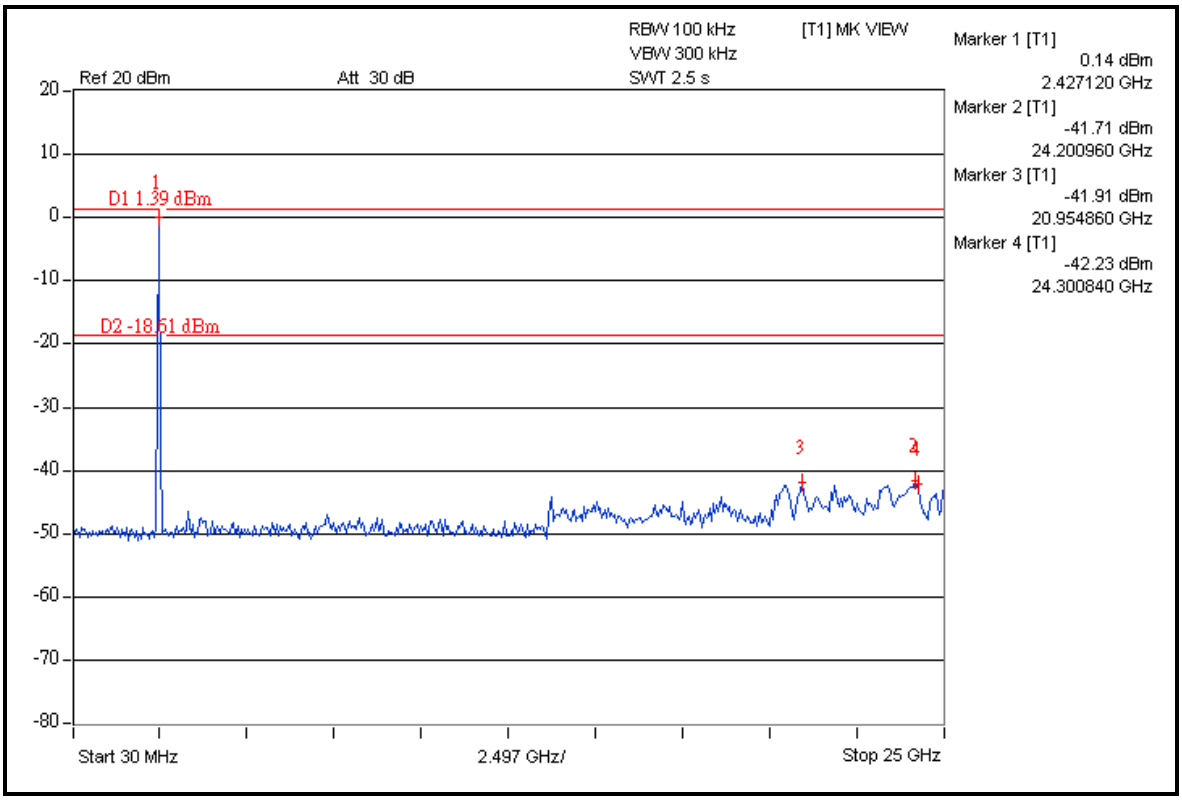

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 3.41 dBm
D2 -16.59 dBm
Marker 1 [T1]
3.41 dBm
2.413200 GHz
Marker 2 [T1]
-40.37 dBm
2.400000 GHz
Marker 3 [T1]
-32.13 dBm
2.397000 GHz
Marker 4 [T1]
-48.64 dBm
2.390000 GHz
Marker 5 [T1]
-46.76 dBm
2.381600 GHz
Center 2.372 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 2.29 dBm
D2 -17.71 dBm
Marker 1 [T1]
2.29 dBm
2.411400 GHz
Marker 2 [T1]
-40.20 dBm
2.400000 GHz
Marker 3 [T1]
-35.26 dBm
2.398400 GHz
Marker 4 [T1]
-59.20 dBm
2.390000 GHz
Marker 5 [T1]
-58.40 dBm
2.356600 GHz
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
D1 3.41 dBm
D2 -16.59 dBm
Marker 1 [T1]
2.07 dBm
2.377180 GHz
Marker 2 [T1]
-40.70 dBm
24.200960 GHz
Marker 3 [T1]
-41.74 dBm
20.954860 GHz
Marker 4 [T1]
-41.77 dBm
24.300840 GHz
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
D1 1.39 dBm
D2 -18.61 dBm
Marker 1 [T1]
1.39 dBm
2.463400 GHz
Marker 2 [T1]
-50.60 dBm
2.483500 GHz
Marker 3 [T1]
-49.17 dBm
2.491600 GHz
Marker 4 [T1]
-51.58 dBm
2.500000 GHz
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 2.53 dBm
D2 -17.47 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
Marker 1 [T1]
2.53 dBm
2.459200 GHz
Marker 2 [T1]
-58.88 dBm
2.483500 GHz
Marker 3 [T1]
-58.88 dBm
2.483500 GHz
Marker 4 [T1]
-60.70 dBm
2.500000 GHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 1.39 dBm
D2 -18.61 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Marker 1 [T1]
0.14 dBm
2.427120 GHz
Marker 2 [T1]
-41.71 dBm
24.200960 GHz
Marker 3 [T1]
-41.91 dBm
20.954860 GHz
Marker 4 [T1]
-42.23 dBm
24.300840 GHz

802.11g

RESTRICT BAND (2310 ~ 2390 MHz)

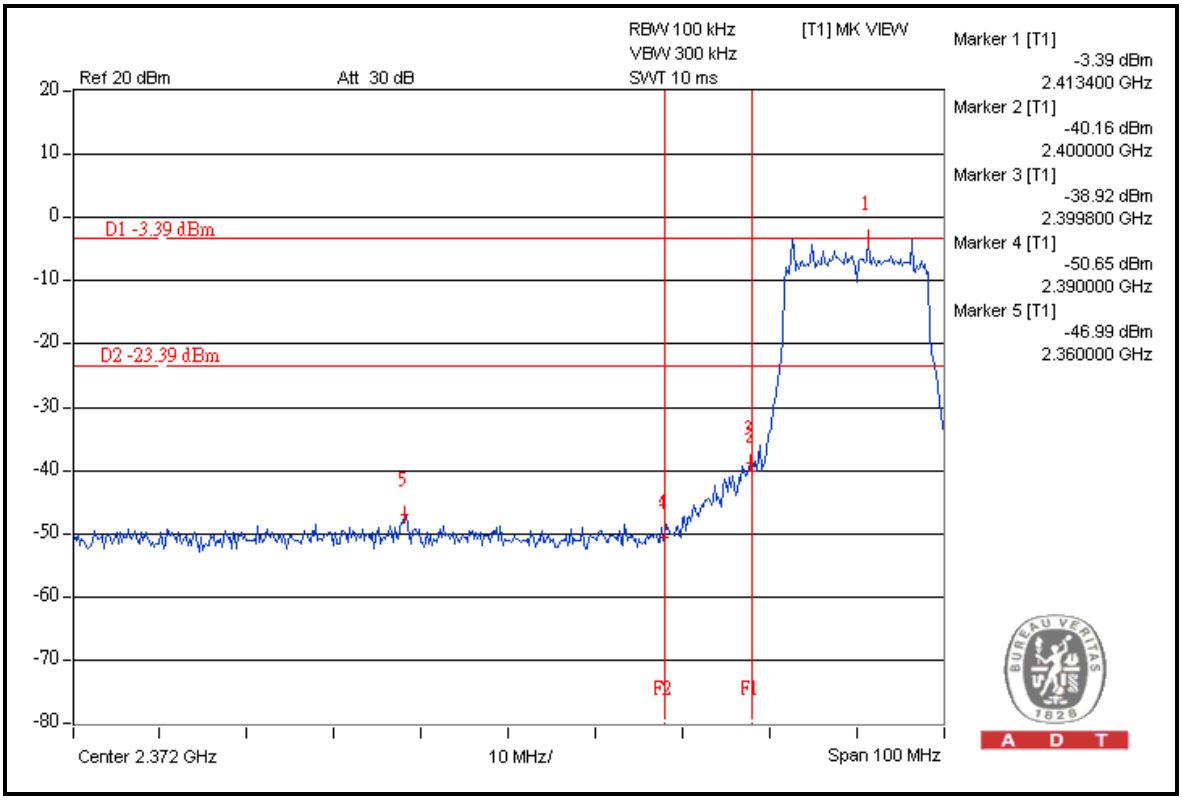
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	112.8	43.6	69.2	74.00
2412.00 (AV)	101.8	49.5	52.3	54.00

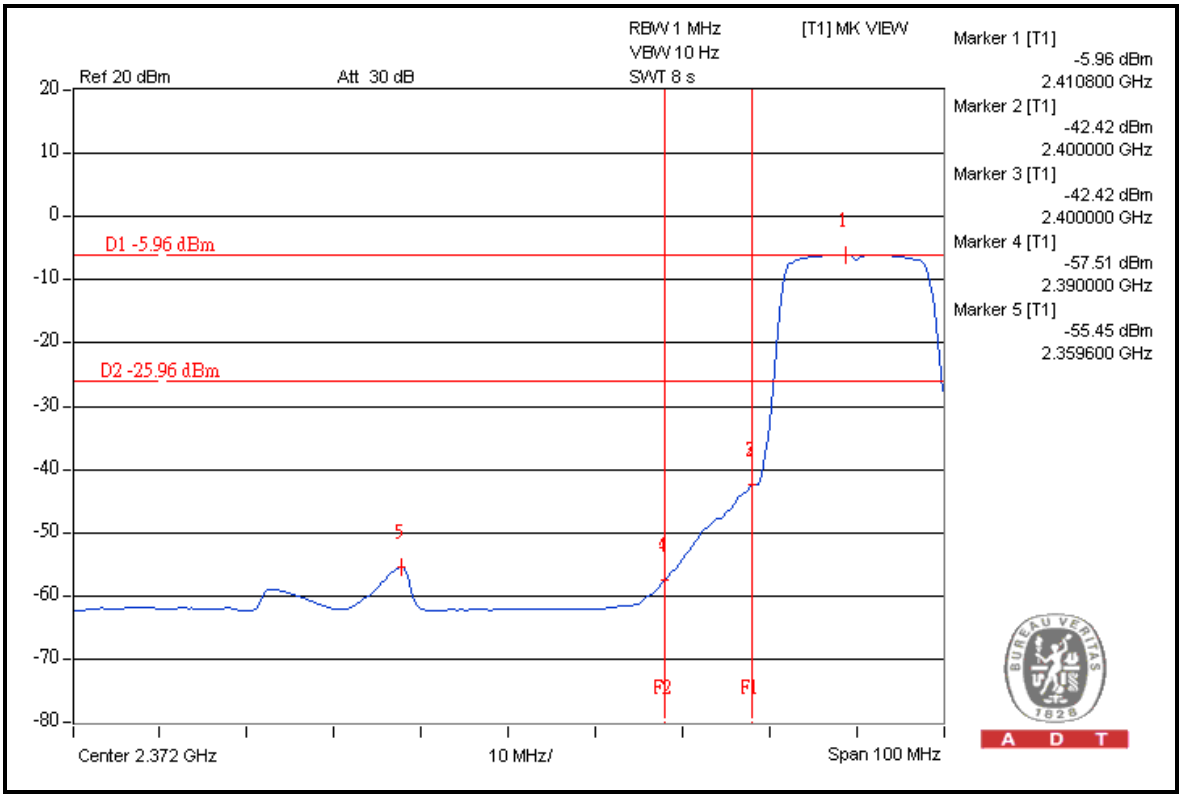
RESTRICT BAND (2483.5 ~ 2500 MHz)

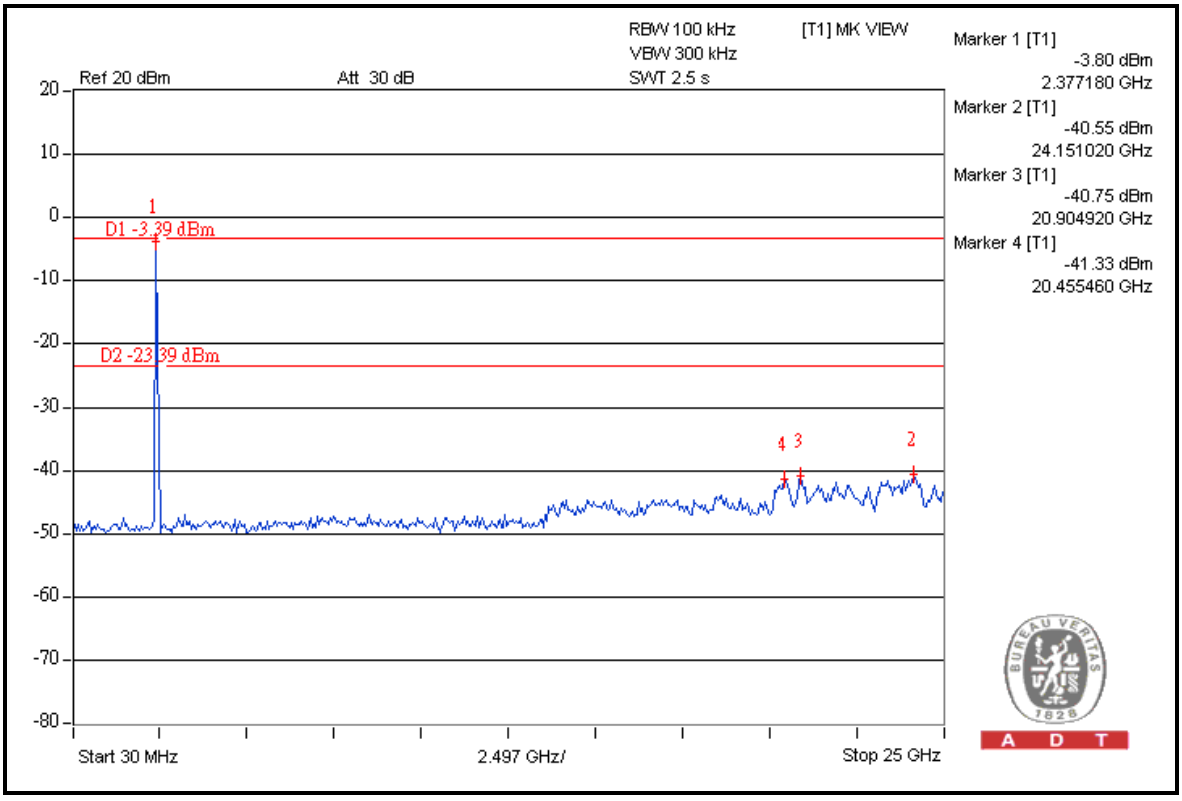
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	110.9	44.6	66.3	74.00
2462.00 (AV)	100.5	49.9	50.6	54.00

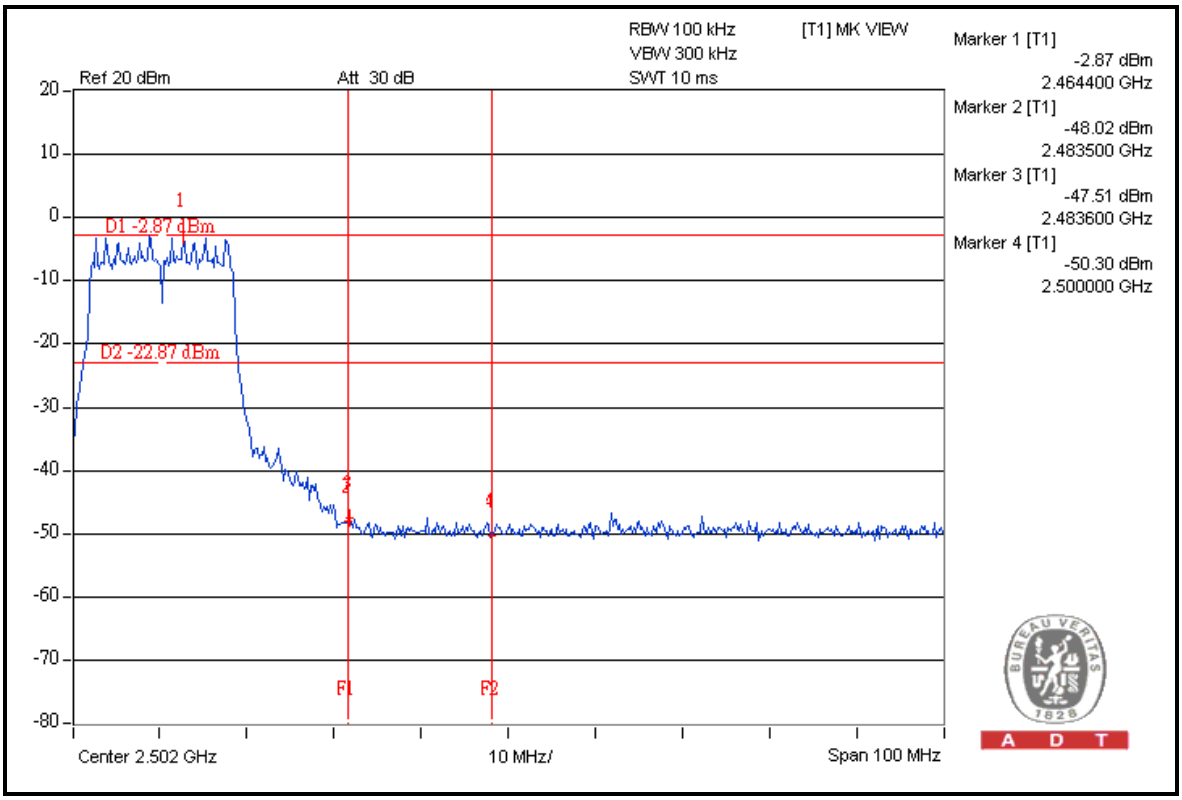
NOTE:

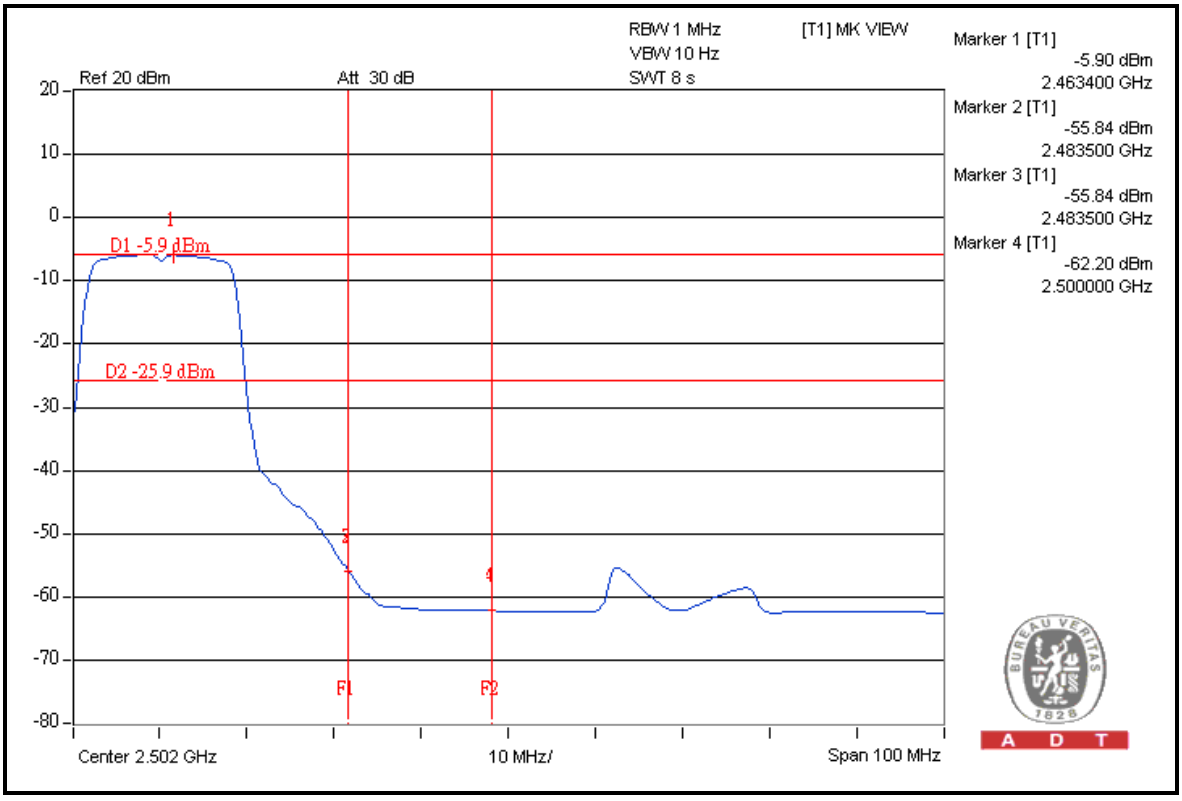
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

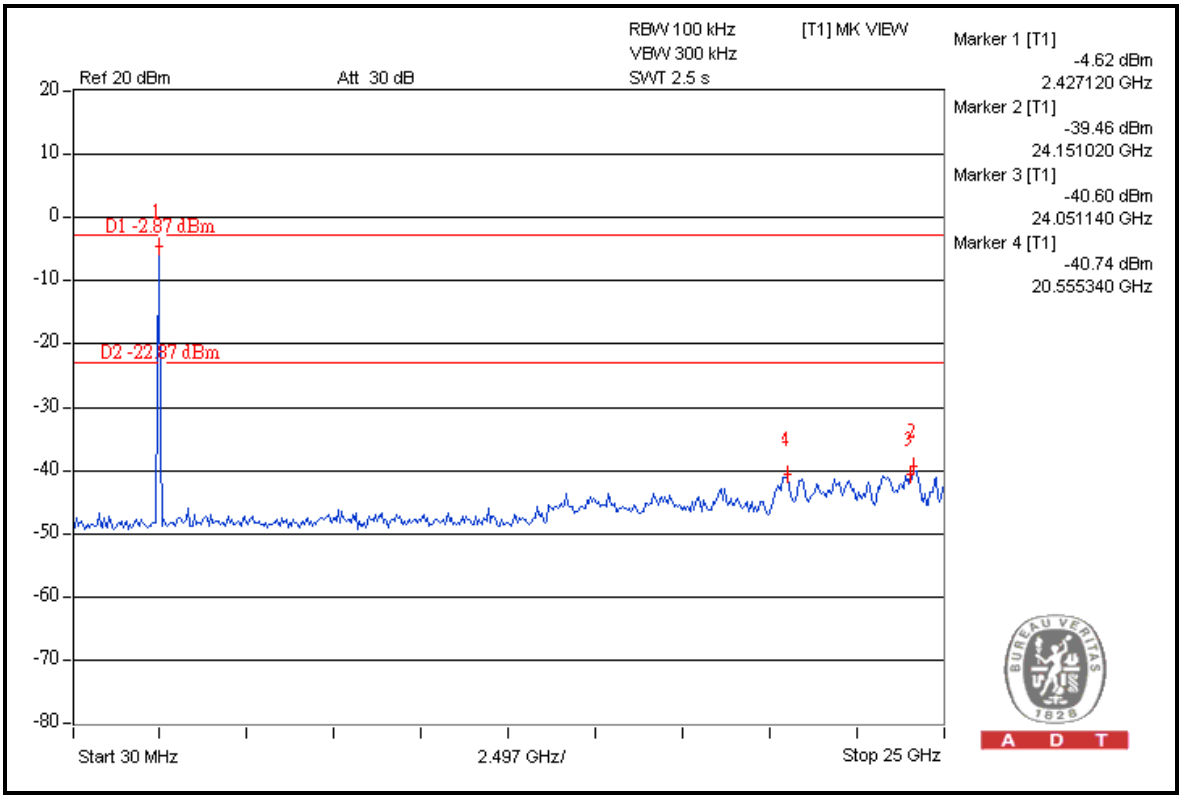

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -3.39 dBm
D2 -23.39 dBm
Marker 1 [T1]
-3.39 dBm
2.413400 GHz
Marker 2 [T1]
-40.16 dBm
2.400000 GHz
Marker 3 [T1]
-38.92 dBm
2.399800 GHz
Marker 4 [T1]
-50.65 dBm
2.390000 GHz
Marker 5 [T1]
-46.99 dBm
2.360000 GHz
Center 2.372 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -5.96 dBm
D2 -25.96 dBm
Marker 1 [T1]
-5.96 dBm
2.410800 GHz
Marker 2 [T1]
-42.42 dBm
2.400000 GHz
Marker 3 [T1]
-42.42 dBm
2.400000 GHz
Marker 4 [T1]
-57.51 dBm
2.390000 GHz
Marker 5 [T1]
-55.45 dBm
2.359600 GHz
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]
-3.80 dBm
2.377180 GHz
Marker 2 [T1]
-40.55 dBm
24.151020 GHz
Marker 3 [T1]
-40.75 dBm
20.904920 GHz
Marker 4 [T1]
-41.33 dBm
20.455460 GHz
D1 -3.39 dBm
D2 -23.39 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]
-2.87 dBm
2.464400 GHz
Marker 2 [T1]
-48.02 dBm
2.483500 GHz
Marker 3 [T1]
-47.51 dBm
2.483600 GHz
Marker 4 [T1]
-50.30 dBm
2.500000 GHz
D1 -2.87 dBm
D2 -22.87 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -5.9 dBm
D2 -25.9 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
Marker 1 [T1]
-5.90 dBm
2.463400 GHz
Marker 2 [T1]
-55.84 dBm
2.483500 GHz
Marker 3 [T1]
-55.84 dBm
2.483500 GHz
Marker 4 [T1]
-62.20 dBm
2.500000 GHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -2.87 dBm
D2 -22.87 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Marker 1 [T1]
-4.62 dBm
2.427120 GHz
Marker 2 [T1]
-39.46 dBm
24.151020 GHz
Marker 3 [T1]
-40.60 dBm
24.051140 GHz
Marker 4 [T1]
-40.74 dBm
20.555340 GHz

802.11n (20MHz)

RESTRICT BAND (2310 ~ 2390 MHz)

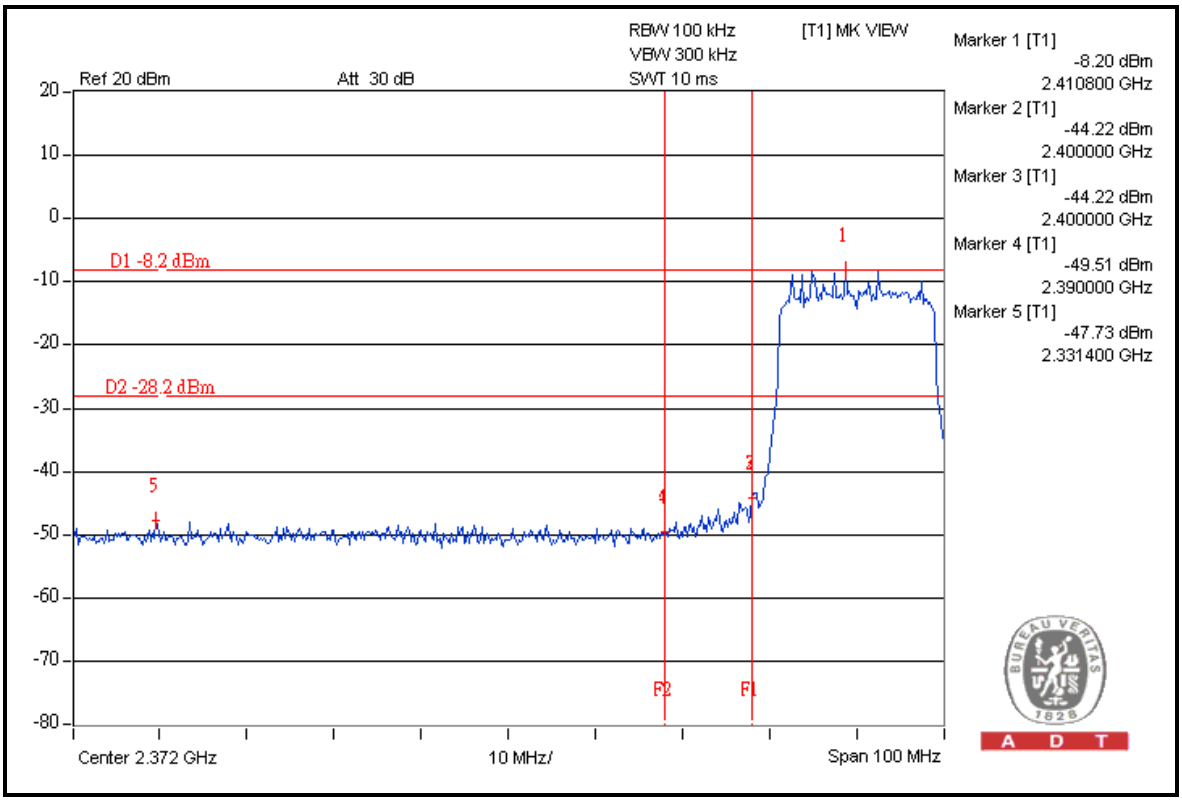
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2412.00 (PK)	107.7	39.5	68.2	74.00
2412.00 (AV)	96.8	47.3	49.5	54.00

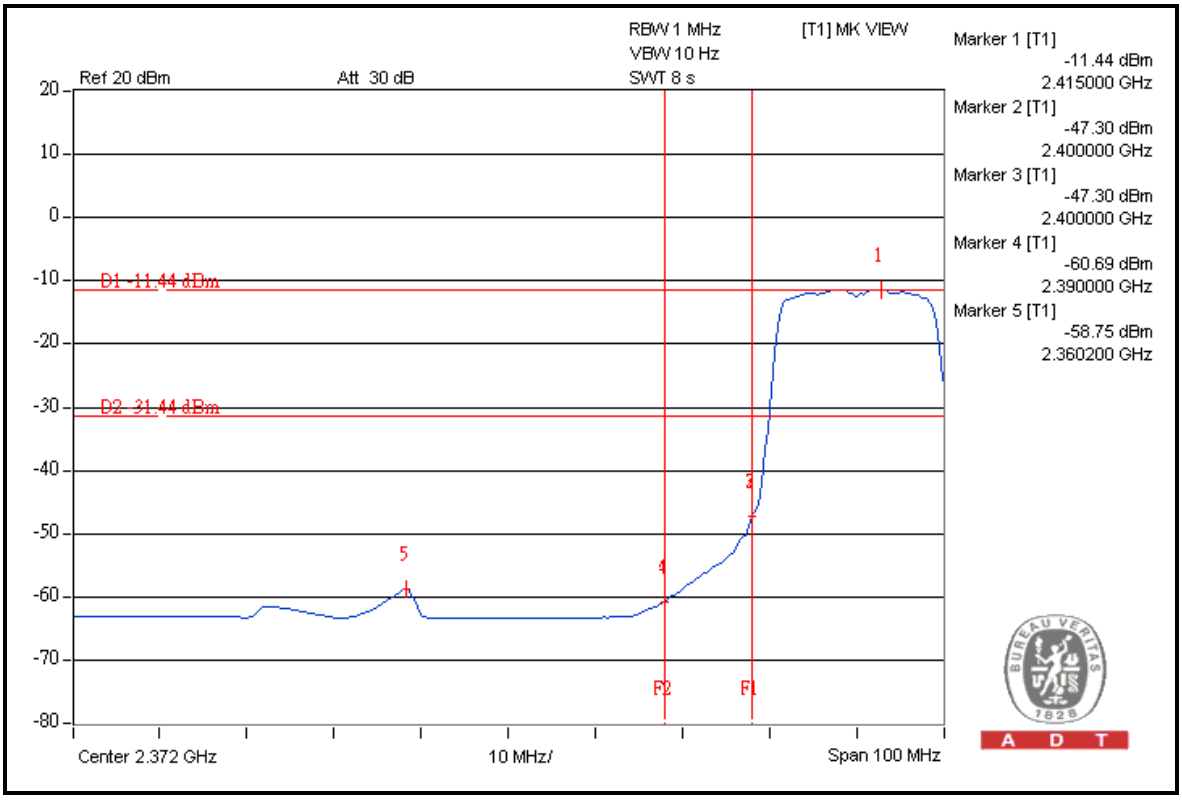
RESTRICT BAND (2483.5 ~ 2500 MHz)

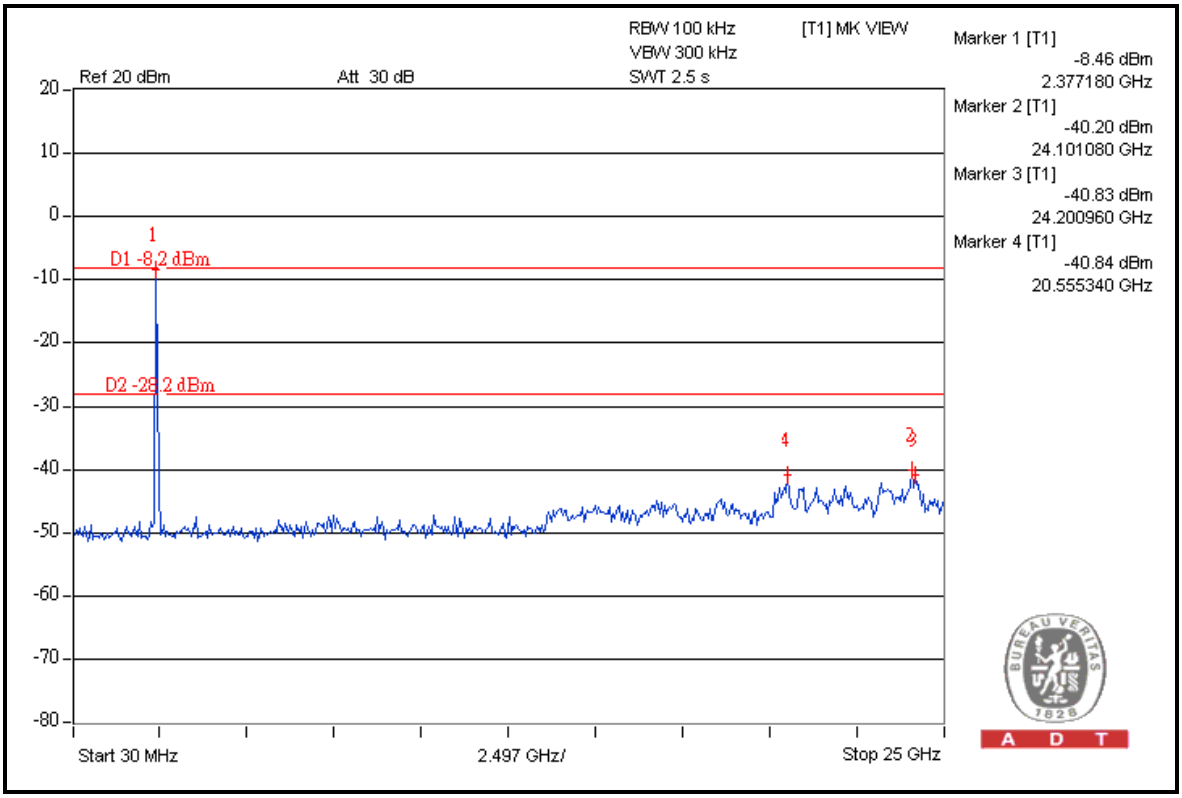
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2462.00 (PK)	105.5	39.3	66.2	74.00
2462.00 (AV)	95.3	48.1	47.2	54.00

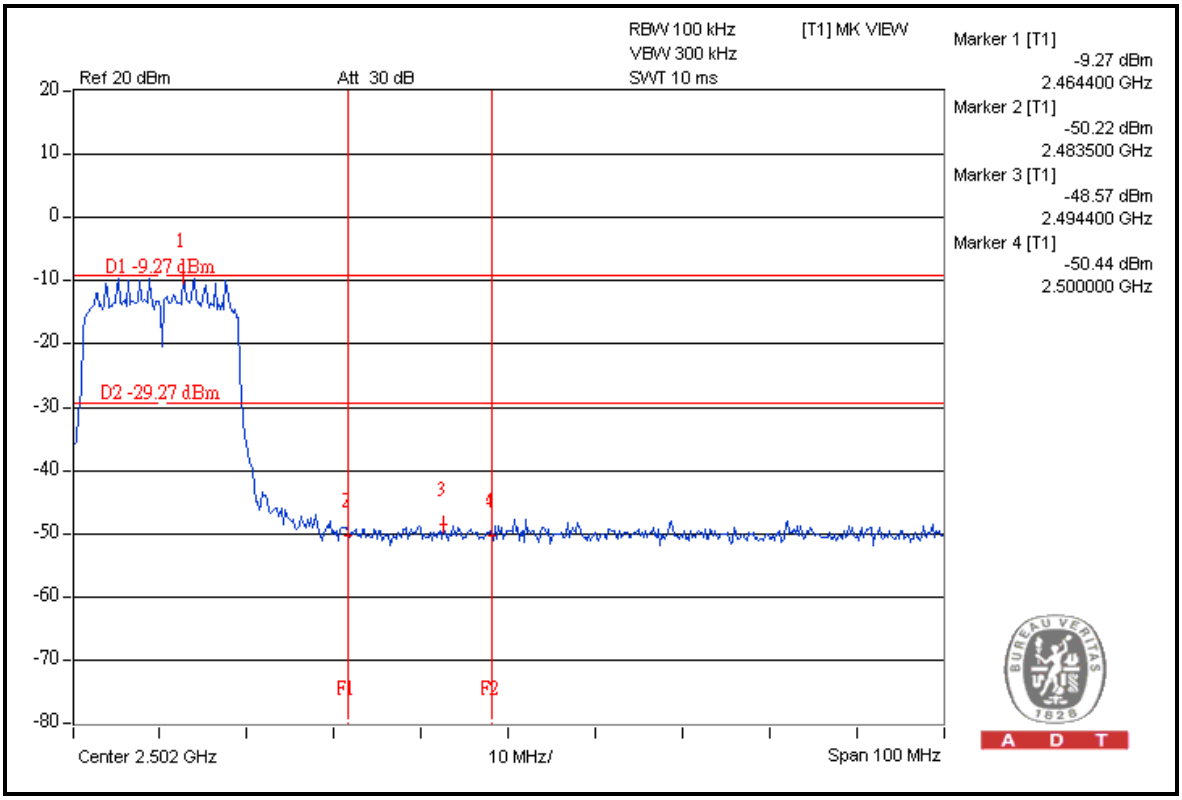
NOTE:

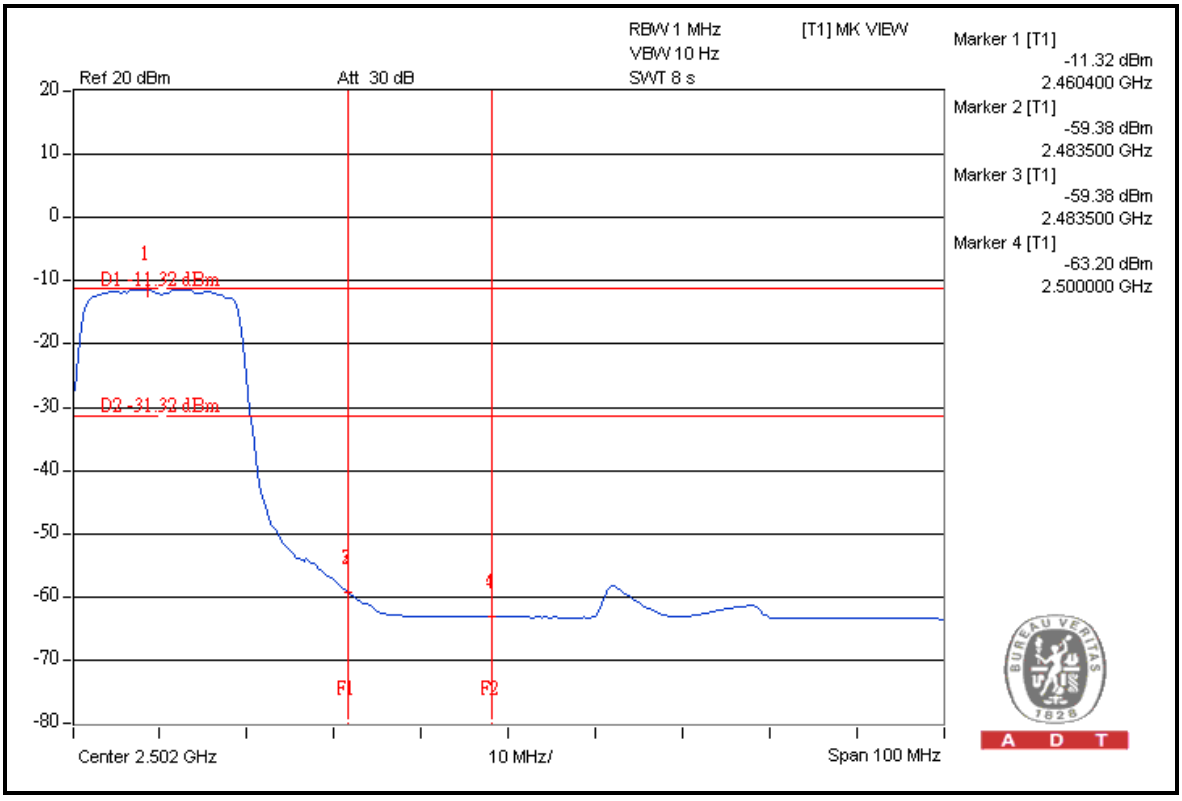
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

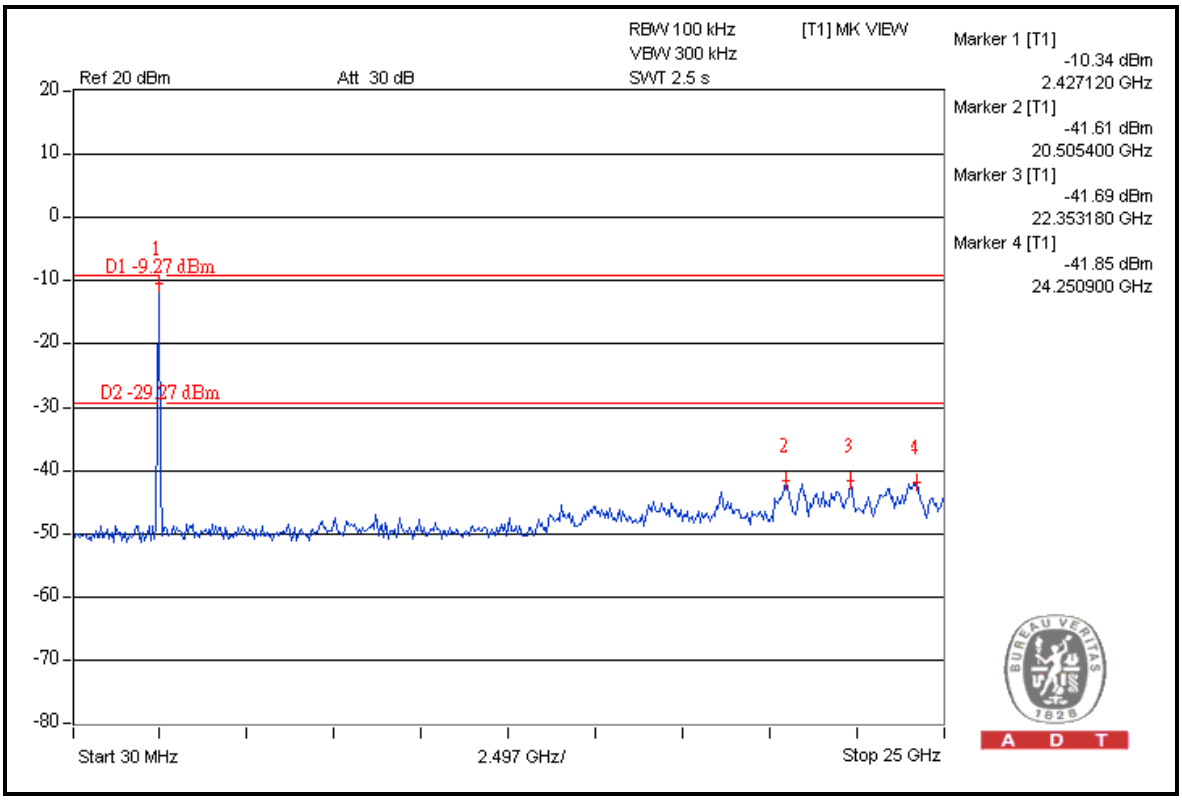

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-8.20 dBm
2.410800 GHz
Marker 2 [T1]
-44.22 dBm
2.400000 GHz
Marker 3 [T1]
-44.22 dBm
2.400000 GHz
Marker 4 [T1]
-49.51 dBm
2.390000 GHz
Marker 5 [T1]
-47.73 dBm
2.331400 GHz
D1 -8.2 dBm
D2 -28.2 dBm
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
F2
F1
Center 2.372 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-11.44 dBm
2.415000 GHz
Marker 2 [T1]
-47.30 dBm
2.400000 GHz
Marker 3 [T1]
-47.30 dBm
2.400000 GHz
Marker 4 [T1]
-60.69 dBm
2.390000 GHz
Marker 5 [T1]
-58.75 dBm
2.360200 GHz
D1 -11.44 dBm
D2 -31.44 dBm
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
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]
-8.46 dBm
2.377180 GHz
Marker 2 [T1]
-40.20 dBm
24.101080 GHz
Marker 3 [T1]
-40.83 dBm
24.200960 GHz
Marker 4 [T1]
-40.84 dBm
20.555340 GHz
D1 -8.2 dBm
D2 -28.2 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]
-9.27 dBm
2.464400 GHz
Marker 2 [T1]
-50.22 dBm
2.483500 GHz
Marker 3 [T1]
-48.57 dBm
2.494400 GHz
Marker 4 [T1]
-50.44 dBm
2.500000 GHz
D1 -9.27 dBm
D2 -29.27 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-11.32 dBm
2.460400 GHz
Marker 2 [T1]
-59.38 dBm
2.483500 GHz
Marker 3 [T1]
-59.38 dBm
2.483500 GHz
Marker 4 [T1]
-63.20 dBm
2.500000 GHz
D1 -11.32 dBm
D2 -31.32 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]
-10.34 dBm
2.427120 GHz
Marker 2 [T1]
-41.61 dBm
20.505400 GHz
Marker 3 [T1]
-41.69 dBm
22.353180 GHz
Marker 4 [T1]
-41.85 dBm
24.250900 GHz
D1 -9.27 dBm
D2 -29.27 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

802.11n (40MHz)

RESTRICT BAND (2310 ~ 2390 MHz)

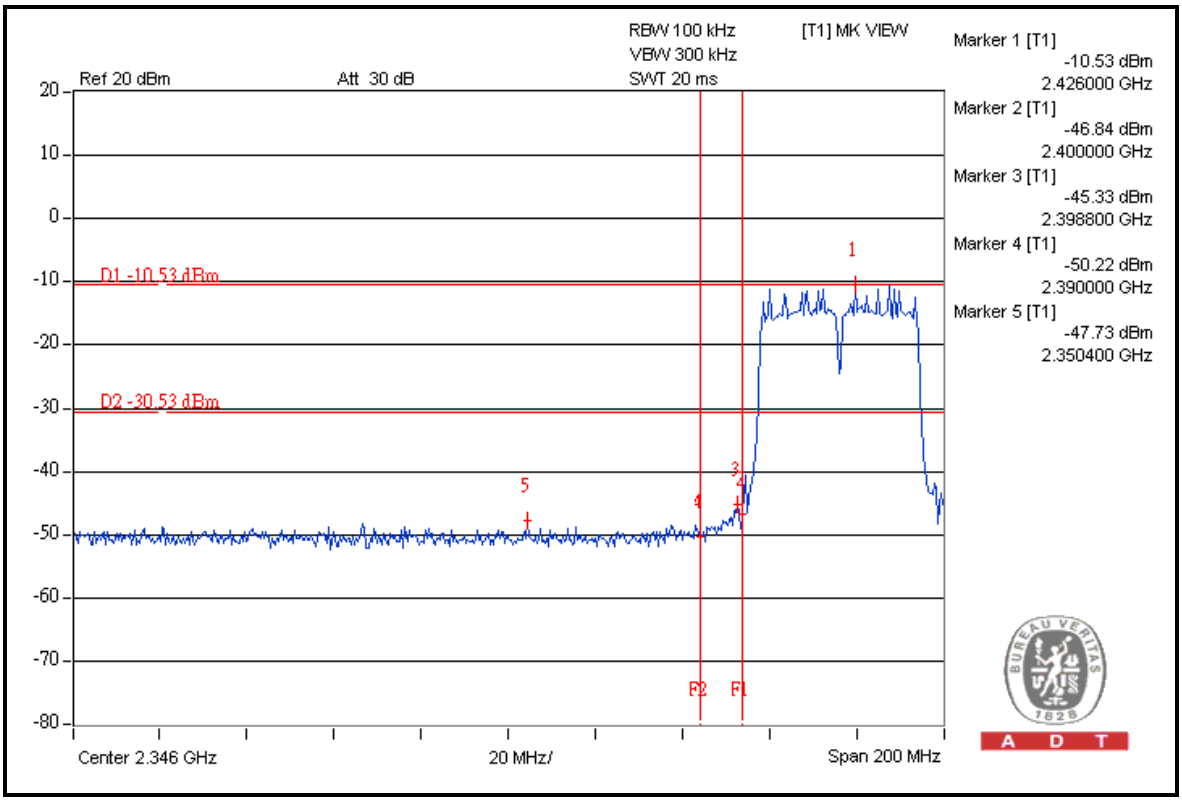
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2422.00 (PK)	104.0	37.2	66.8	74.00
2422.00 (AV)	92.5	42.3	50.2	54.00

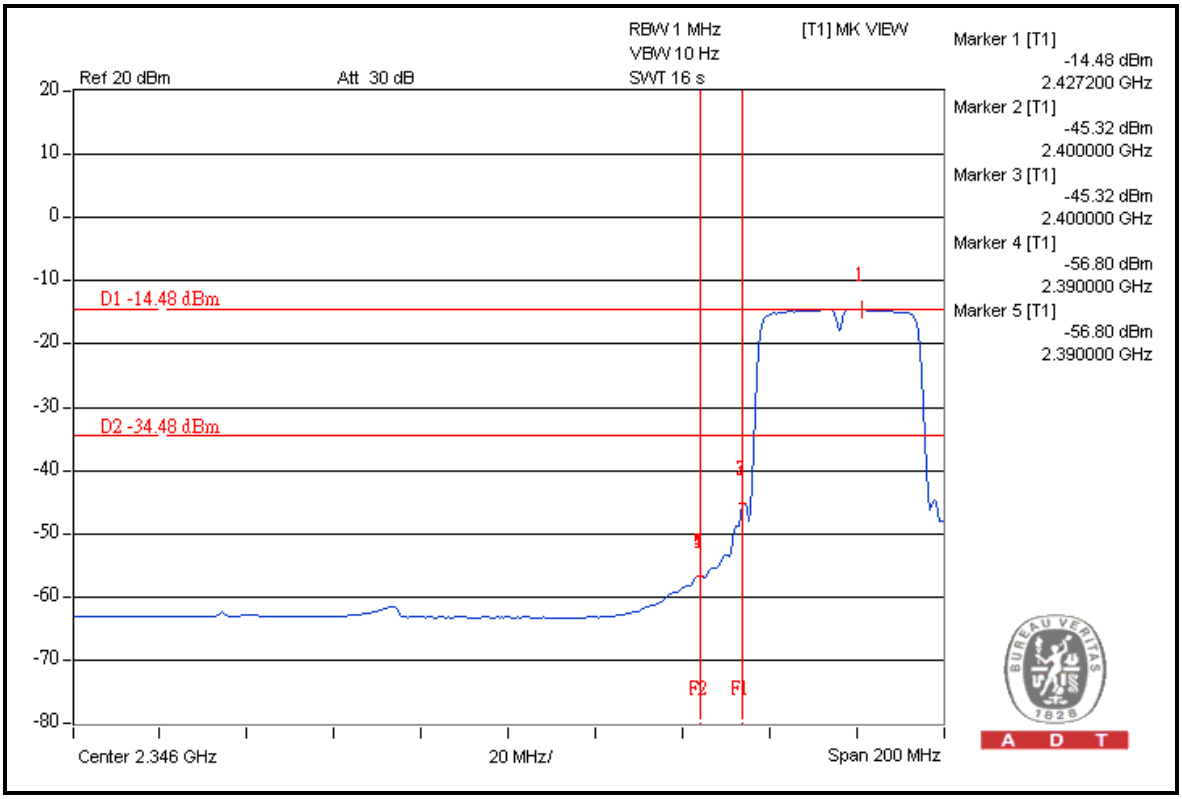
RESTRICT BAND (2483.5 ~ 2500 MHz)

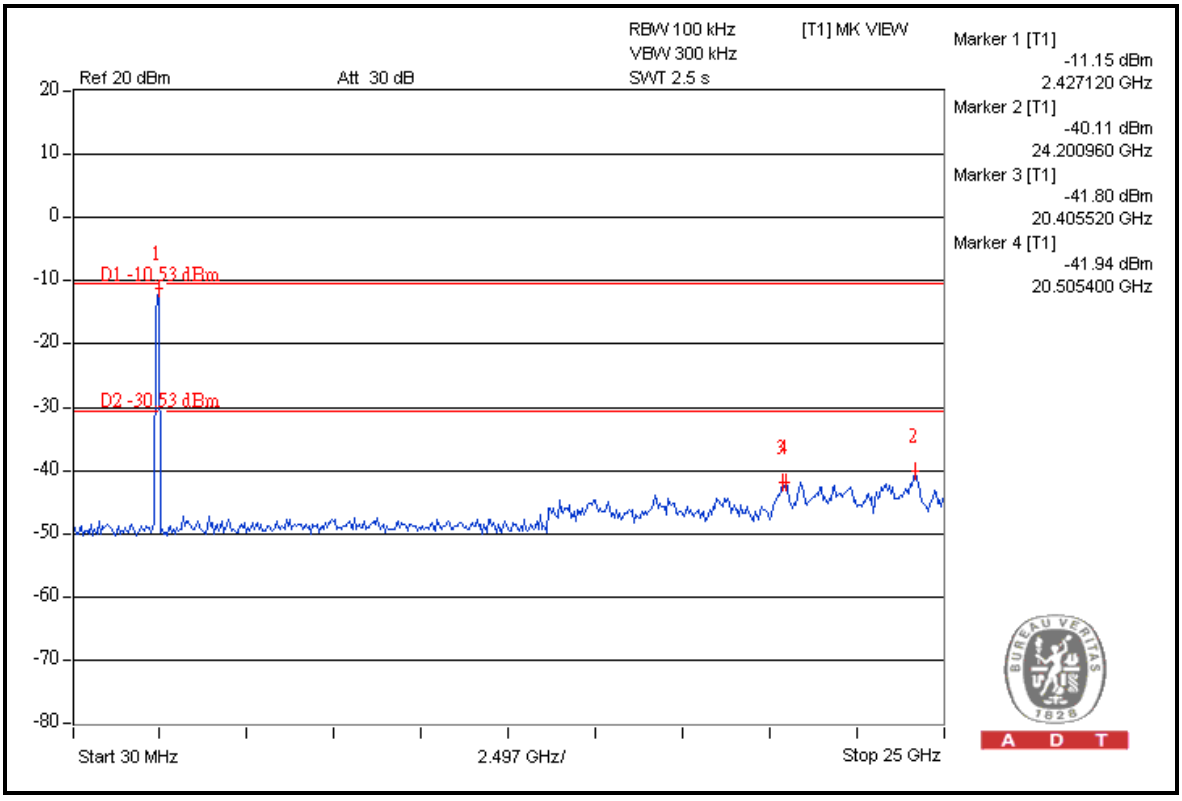
FREQUENCY (MHz)	FUNDAMENTAL EMISSION (dBuV/m)	DELTA (dB)	MAXIMUM FIELD STRENGTH IN RESTRICT BAND (dBuV/m)	LIMIT (dBuV/m)
2452.00 (PK)	103.9	35.0	68.9	74.00
2452.00 (AV)	92.6	41.5	51.1	54.00

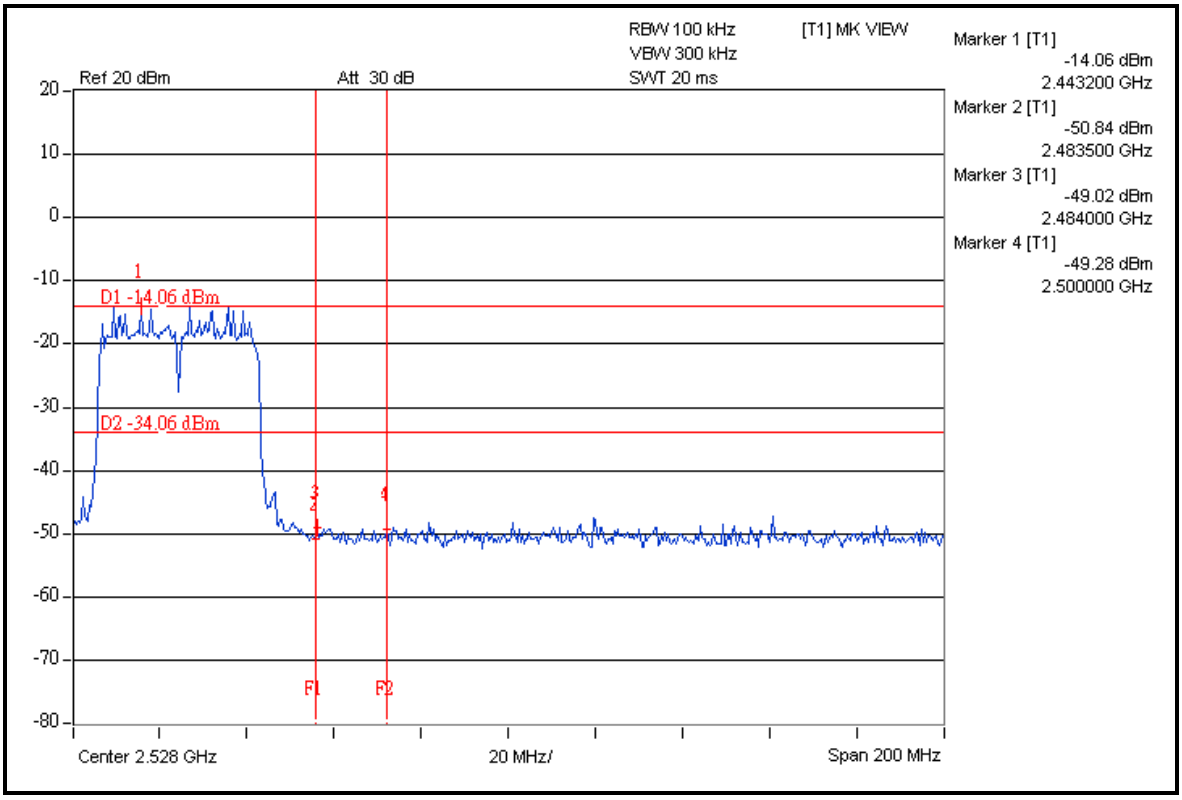
NOTE:

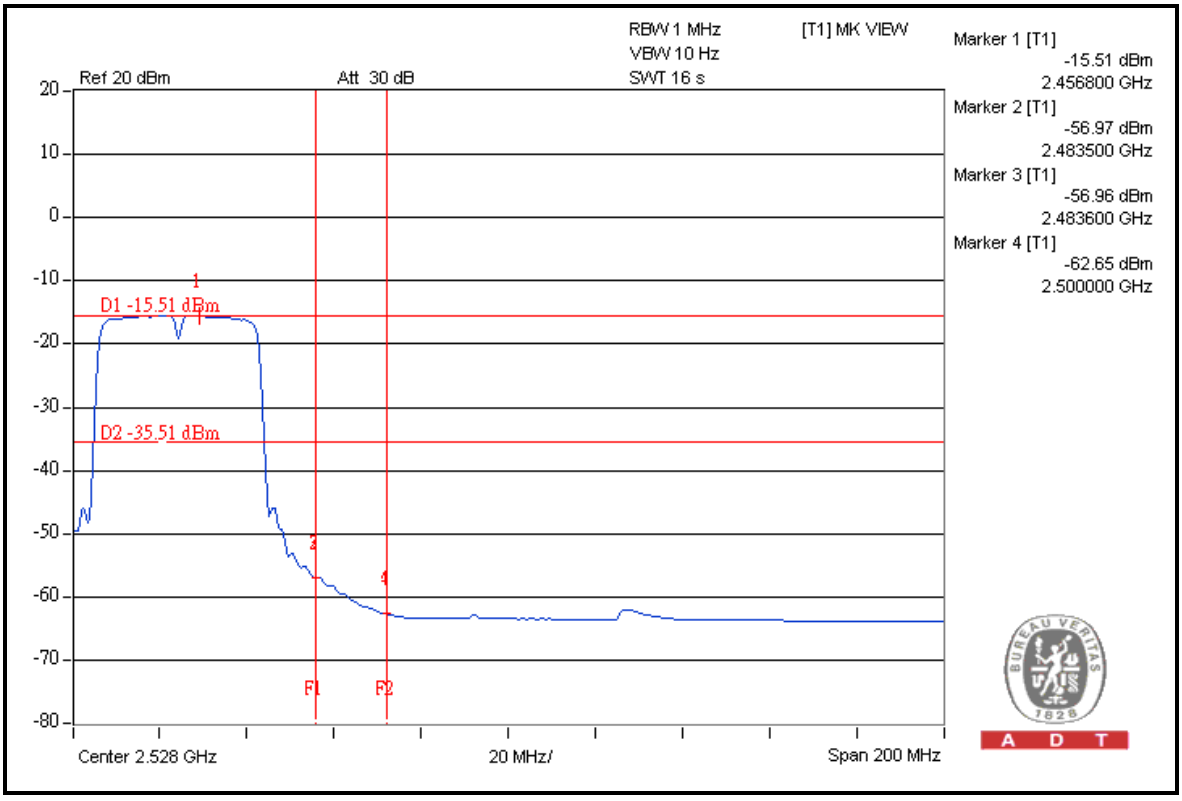
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission. Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

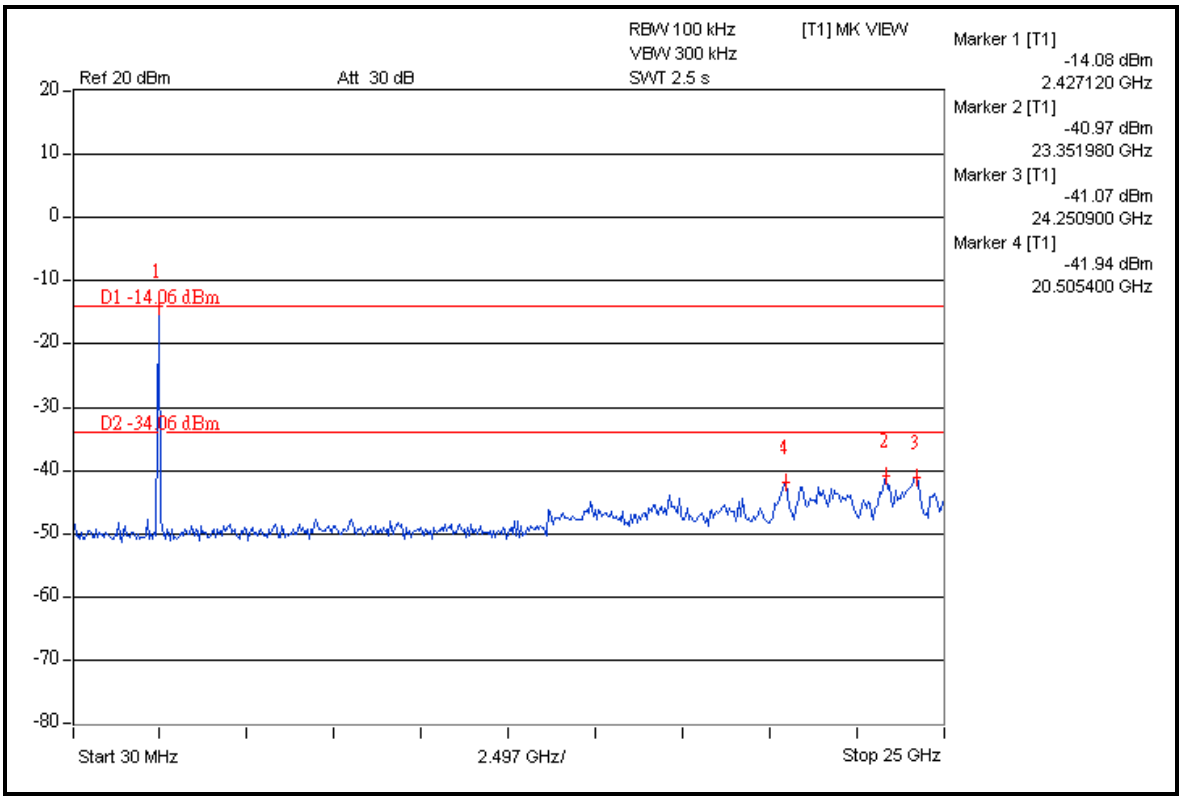

RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-10.53 dBm
2.426000 GHz
Marker 2 [T1]
-46.84 dBm
2.400000 GHz
Marker 3 [T1]
-45.33 dBm
2.398800 GHz
Marker 4 [T1]
-50.22 dBm
2.390000 GHz
Marker 5 [T1]
-47.73 dBm
2.350400 GHz
D1 -10.53 dBm
D2 -30.53 dBm
Center 2.346 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-14.48 dBm
2.427200 GHz
Marker 2 [T1]
-45.32 dBm
2.400000 GHz
Marker 3 [T1]
-45.32 dBm
2.400000 GHz
Marker 4 [T1]
-56.80 dBm
2.390000 GHz
Marker 5 [T1]
-56.80 dBm
2.390000 GHz
D1 -14.48 dBm
D2 -34.48 dBm
Center 2.346 GHz
20 MHz/
Span 200 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-11.15 dBm
2.427120 GHz
Marker 2 [T1]
-40.11 dBm
24.200960 GHz
Marker 3 [T1]
-41.80 dBm
20.405520 GHz
Marker 4 [T1]
-41.94 dBm
20.505400 GHz
D1 -10.53 dBm
D2 -30.53 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 300 kHz
SWT 20 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-14.06 dBm
2.443200 GHz
Marker 2 [T1]
-50.84 dBm
2.483500 GHz
Marker 3 [T1]
-49.02 dBm
2.484000 GHz
Marker 4 [T1]
-49.28 dBm
2.500000 GHz
D1 -14.06 dBm
D2 -34.06 dBm
F1
F2
Center 2.528 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-15.51 dBm
2.456800 GHz
Marker 2 [T1]
-56.97 dBm
2.483500 GHz
Marker 3 [T1]
-56.96 dBm
2.483600 GHz
Marker 4 [T1]
-62.65 dBm
2.500000 GHz
D1 -15.51 dBm
D2 -35.51 dBm
F1
F2
Center 2.528 GHz
20 MHz/
Span 200 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-14.08 dBm
2.427120 GHz
Marker 2 [T1]
-40.97 dBm
23.351980 GHz
Marker 3 [T1]
-41.07 dBm
24.250900 GHz
Marker 4 [T1]
-41.94 dBm
20.505400 GHz
D1 -14.06 dBm
D2 -34.06 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 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.

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---