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FCC PART 15 SUBPART C TEST REPORT

FCC Part 15.247

Report Reference No. : CTL11078411-S-WW

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Date of issue : July 26, 2011

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Test Firm : Bontek Compliance Testing Laboratory Ltd

Address : 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

Applicant's name : Livall Network Co., Ltd

Address : 9/F, Jiuzhou Electric Building, Southern NO., 12 rd. Technology Park, Shenzhen

Test specification:

Standard : FCC Part 15.247: Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.

TRF Originator : Shenzhen CTL Electromagnetic Technology Co., Ltd.

Master TRF : Dated 2011-01

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Test item description : MID

Trade Mark : /

Model/Type reference : N71

Modulation : DSSS, OFDM

Work Frequency Range : 2412~2462MHz

Antenna Type : Internal

FCC ID : ZRD-N71

Result : Positive

TEST REPORT

Test Report No. : CTL11078411-S-WW	July 26, 2011 Date of issue
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Equipment under Test : MID

Model /Type : N71

Listed Models : /

Applicant : Livall Network Co.,Ltd

Address : 9/F, Jiuzhou Electric Building, Southern NO.,12
rd.Technology Park, Shenzhen

Manufacturer Best System (HK) Limited

Address Chiling Industrial Zone, Hou Jie Town, Dongguan City,
Guangdong Province

Test Result according to the standards on page 4:	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.4-2003

KDB Publication No. 558074 Guidance on Measurements for Digital Transmission Systems

ANSI C63.10-2009: American National Standard for Testing Unlicensed Wireless Devices.



2. SUMMARY

2.1. General Remarks

Date of receipt of test sample : July 01, 2011

Testing commenced on : July 01, 2010

Testing concluded on : July 21, 2010

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : ☒ 120V / 60 Hz ☐ 115V / 60Hz
☐ 12 V DC ☐ 24 V DC
☐ Other (specified in blank below)

2.3. Short description of the Equipment under Test (EUT)

MID with Bluetooth and Wi-fi function.

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.4. EUT operation mode

Test Mode:

1. The EUT has been tested under normal operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel low (2412MHz), mid (2437MHz) and high (2462MHz) with highest data rate are chosen for full testing.

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

☐ - supplied by the manufacturer

☐ - supplied by the lab

☐ Manufacturer :
Model No. :

☐ Manufacturer :
Model No. :

2.6. NOTE

1. The EUT is an 802.11b/g/n MID(only HT20 for N),The functions of the EUT listed as below:

	Test Standards	Reference Report
WLAN 802.11b/g, 802.11n	FCC Part 15 Subpart C (Section15.247)	CTL11078411-S-WW
WLAN 802.11b/g, 802.11n	FCC Per 47 CFR 2.1091(b)	CTL11078411-S-WM

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	✓	—	—	—
802.11g	✓	—	—	—
802.11n(20MHz)	✓	—	—	—
802.11n(40MHz)	—	—	—	—

3. The EUT incorporates a SISO function,Physically,the EUT provides one completed transmitter and receivers.

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

2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **ZRD-N71** filing to comply with of the FCC Part 15.247 Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Bontek Compliance Testing Laboratory Ltd
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 7631A

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2008.

FCC-Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

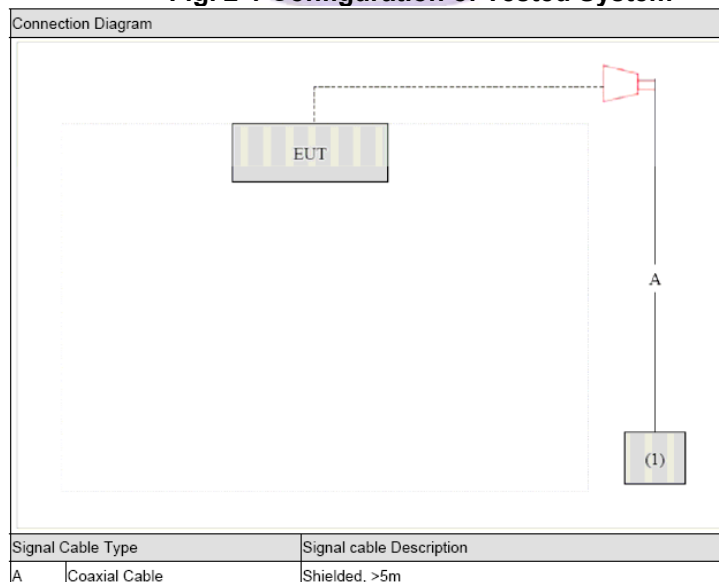
3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Bontek Compliance Testing Laboratory Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Bontek laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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

3.6. Equipments Used during the Test

Item	Test Equipment	Manufacturer	Model No.	Last Cal.	Due. Date
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	2011/04/14	2012/04/13
2	Radio Communication Tester	ROHDE & SCHWARZ	CMU200	2011/04/14	2012/04/13
3	Dual Directional Coupler	Agilent	778D	2011/04/14	2012/04/13
4	10dB attenuator	SCHWARZBECK	MTAIMP-136	2011/04/14	2012/04/13
5	Tunable Bandreject filter	K&L	3TNF-800	2011/04/14	2012/04/13
6	Tunable Bandreject filter	K&L	5TNF-1700	2011/04/14	2012/04/13
7	High-Pass Filter	K&L	9SH10-2700/X12750-O/O	2011/04/14	2012/04/13
8	High-Pass Filter	K&L	41H10-1375/U12750-O/O	2011/04/14	2012/04/13
9	Coaxial Cable	Huber+Suhner	AC4-RF-H	2011/04/14	2012/04/13
10	AC Power Supply	IDRC	CF-500TP	2011/04/14	2012/04/13
11	DC Power Supply	IDRC	CD-035-020PR	2011/04/14	2012/04/13
12	RF Current Probe	FCC	F-33-4	2011/04/14	2012/04/13
13	Temperature /Humidity Meter	zhicheng	ZC1-2	2011/04/14	2012/04/13
14	MICROWAVE AMPLIFIER	HP	8349B	2011/04/14	2012/04/13
15	Amplifier	HP	8447D	2011/04/14	2012/04/13
16	SIGNAL GENERATOR	HP	8647A	2011/04/14	2012/04/13
17	Log Periodic Antenna	ELECTRO-METRICS	EM-6950	2011/04/14	2012/04/13
18	Horn Antenna	Schwarzbeck	BBHA9120A	2011/04/14	2012/04/13
19	EMI Test Receiver	R&S	ESPI	2011/04/14	2012/04/13

3.7. Summary of Test Result

FCC PART 15		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF conducted emissions	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band edge compliance of RF emissions	PASS

Remark: The measurement uncertainty is not included in the test result.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

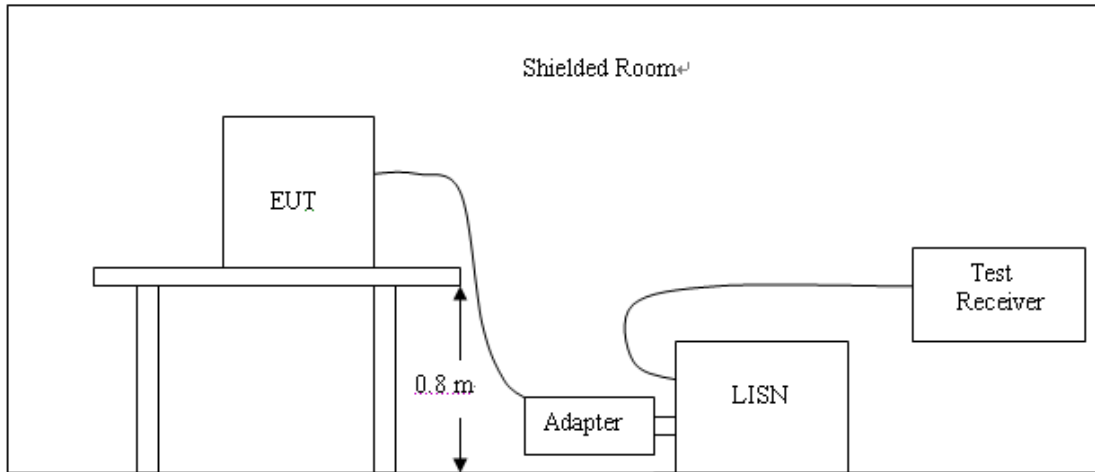
Test Items	Mode	Data Rate	Channel
AC Power Conducted Emission	Normal Link	11 Mbps	1
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
	11n(40MHz)/OFDM	/	/
Radiated Emission 30MHz~1GHz	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
	11n(40MHz)/OFDM	/	/
Radiated Emission 1GHz~10th Harmonic	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
	11n(40MHz)/OFDM	/	/
Band Edge Compliance of RF Emission	11b/DSSS	11 Mbps	1/11
	11g/OFDM	54 Mbps	1/11
	11n(20MHz)/OFDM	65Mbps	1/11
	11n(40MHz)/OFDM	/	/

Note1: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following:

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

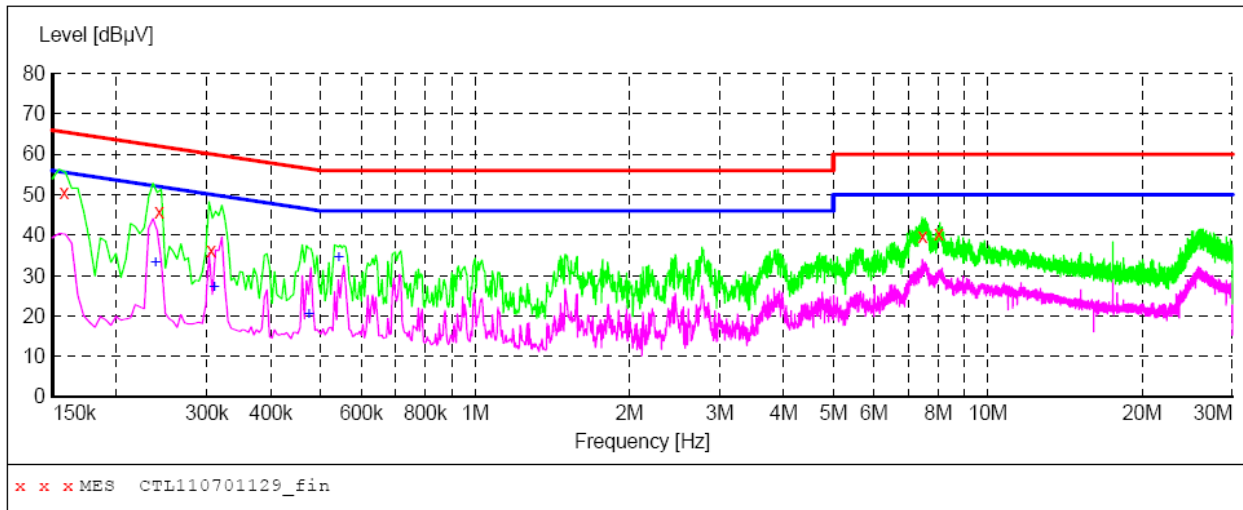
The RBW/VBW for 150KHz to 30MHz: 9KHz

TEST RESULTS

See the following plots:

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL110701129_fin"**

7/1/2011 5:06PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.158000	50.50	10.2	66	15.1	QP	N	GND
0.242000	45.80	10.2	62	16.2	QP	N	GND
0.306000	36.20	10.2	60	23.9	QP	N	GND
7.472000	39.70	10.5	60	20.3	QP	N	GND
8.024000	40.50	10.5	60	19.5	QP	N	GND

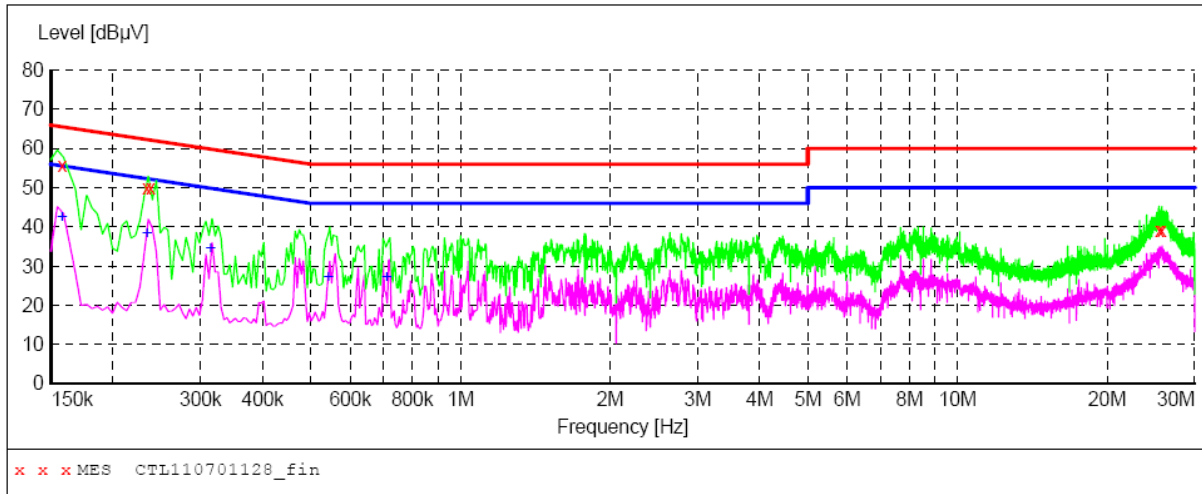
MEASUREMENT RESULT: "CTL110701129_fin2"

7/1/2011 5:06PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.238000	33.30	10.2	52	18.9	AV	N	GND
0.310000	27.20	10.2	50	22.8	AV	N	GND
0.474000	20.50	10.2	46	25.9	AV	N	GND
0.542000	34.50	10.2	46	11.5	AV	N	GND

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "CTL110701128_fin"**

7/1/2011 5:03PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.158000	55.80	10.2	66	9.8	QP	L1	GND
0.234000	49.80	10.2	62	12.5	QP	L1	GND
0.238000	50.10	10.2	62	12.1	QP	L1	GND
25.484000	39.00	11.1	60	21.0	QP	L1	GND
25.760000	39.20	11.1	60	20.8	QP	L1	GND

MEASUREMENT RESULT: "CTL110701128_fin2"

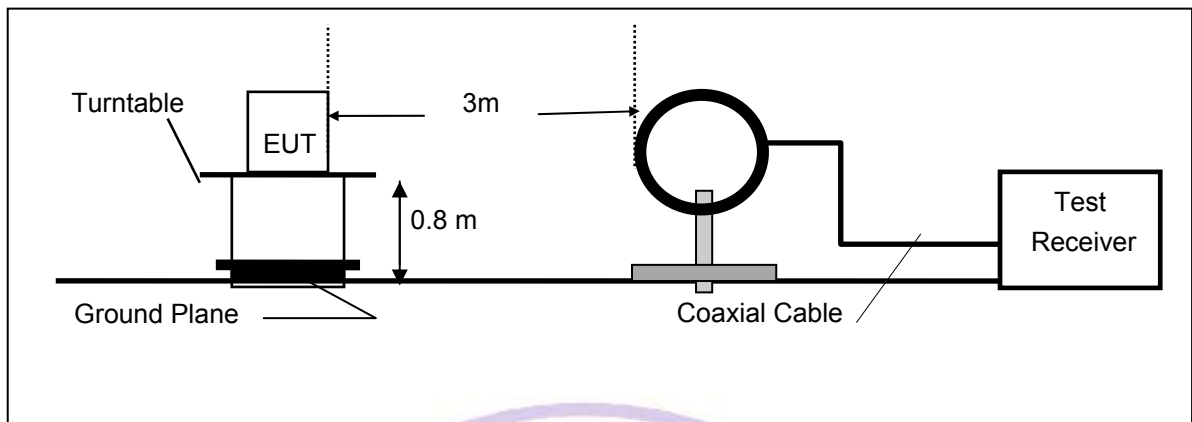
7/1/2011 5:03PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.158000	42.60	10.2	56	13.0	AV	L1	GND
0.234000	38.60	10.2	52	13.7	AV	L1	GND
0.314000	34.60	10.2	50	15.3	AV	L1	GND
0.542000	27.20	10.2	46	18.8	AV	L1	GND
0.710000	27.40	10.2	46	18.6	AV	L1	GND

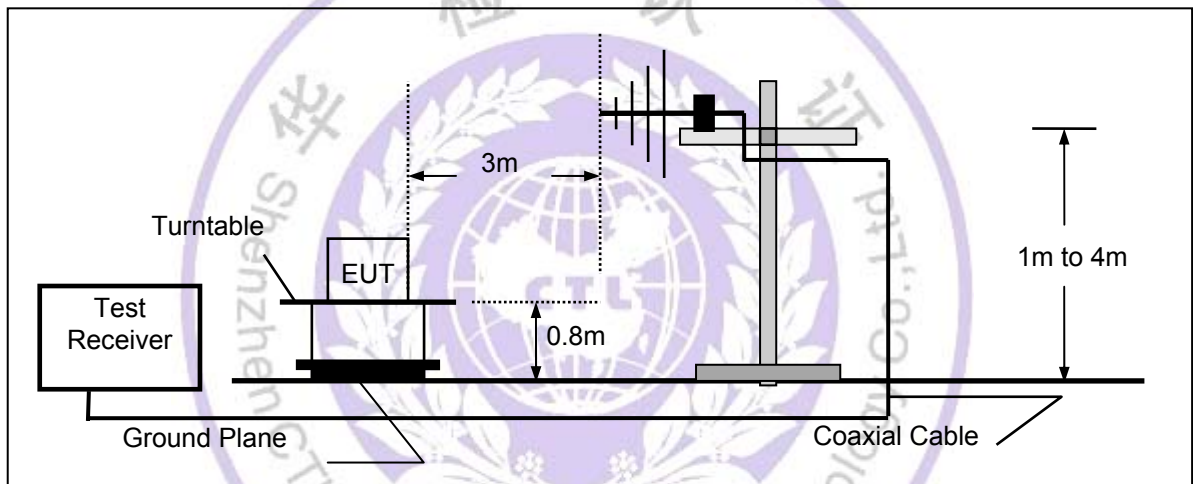
4.2. Radiated Emission Test

TEST CONFIGURATION

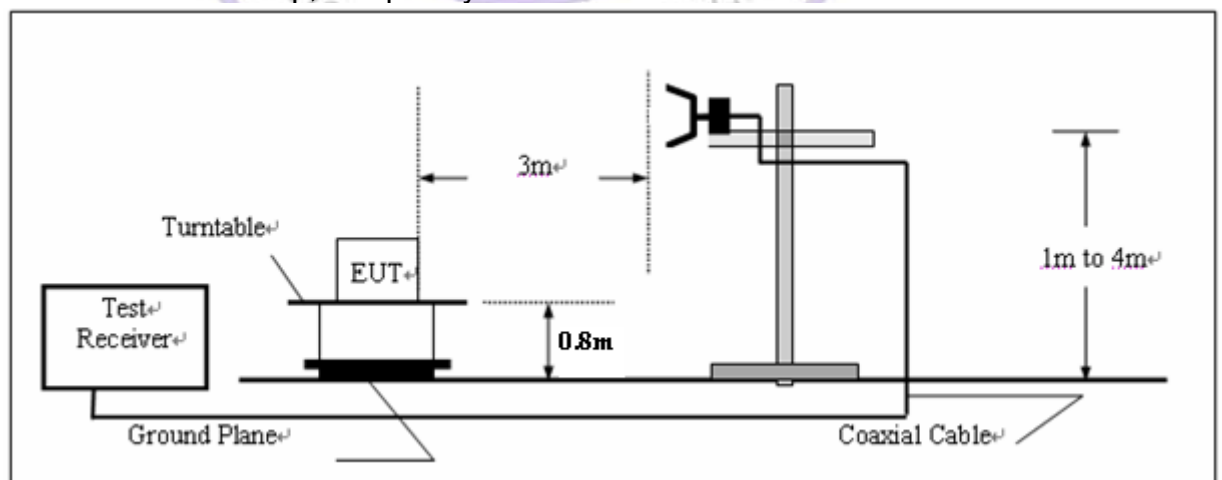
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

TEST PROCEDURE

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0° to 360° to acquire the highest emissions from EUT
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW = RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. Repeat above procedures until all frequency measurements have been completed.

LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

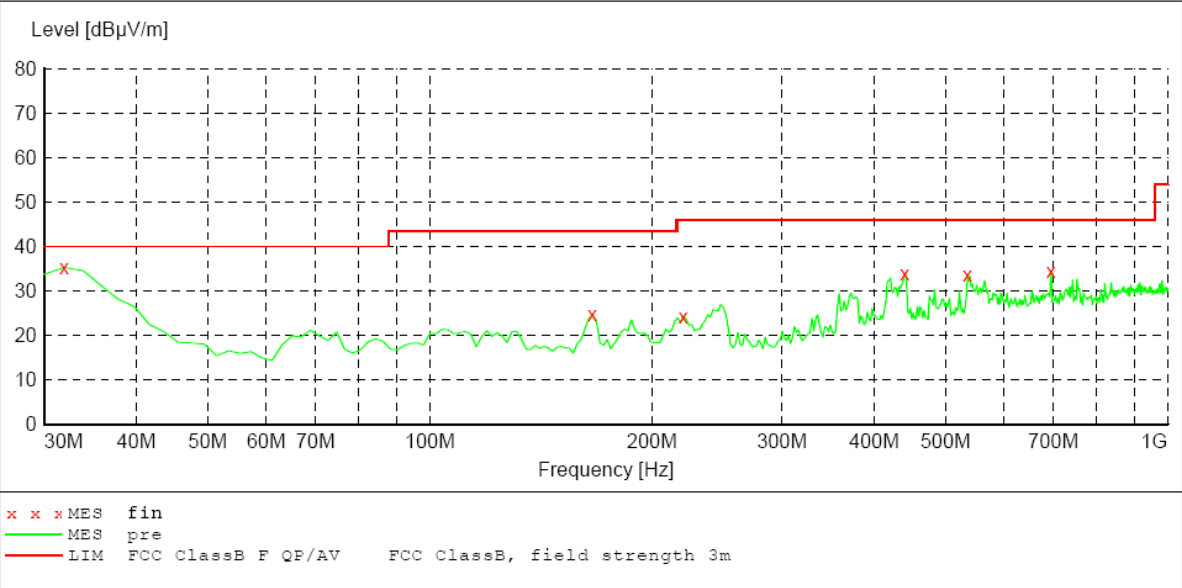
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

TEST RESULTS

Below 1GHz:

SWEEP TABLE: "test (30M-1G)"
Short Description: Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
30.0 MHz 1.0 GHz MaxPeak Coupled 120 kHz HL562 10

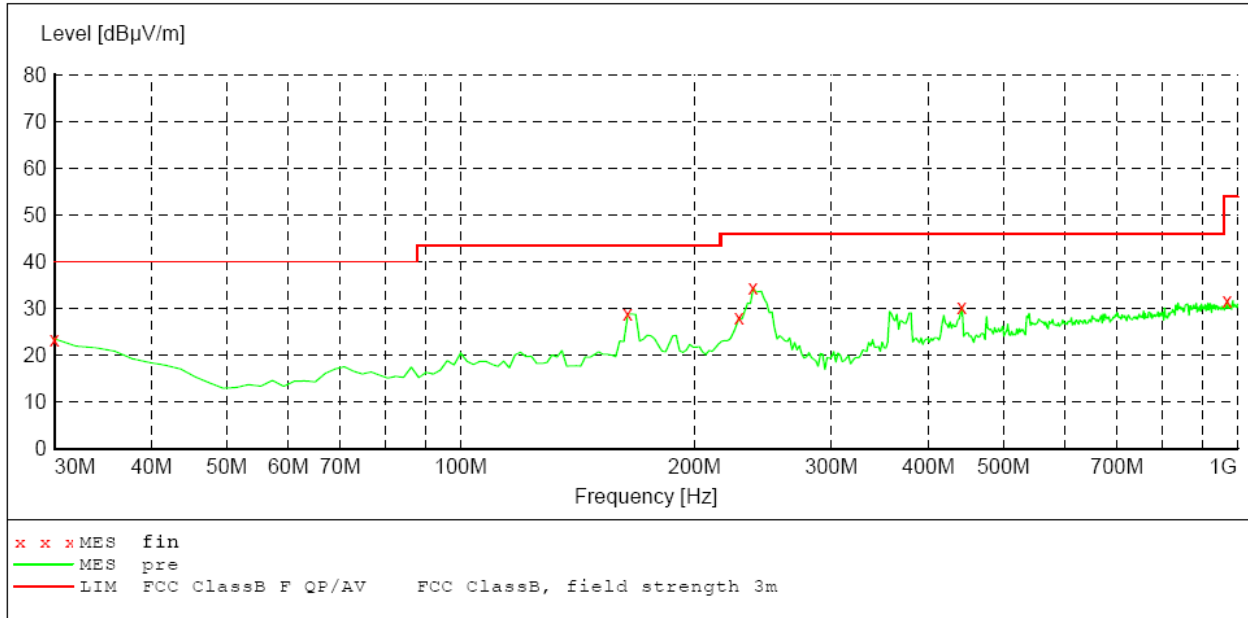


MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.900000	35.30	20.1	40.0	4.7	QP	100.0	268.00	VERTICAL
166.000000	24.70	10.7	43.5	18.8	QP	100.0	291.00	VERTICAL
220.500000	24.20	11.3	46.0	21.8	QP	100.0	79.00	VERTICAL
440.100000	33.80	20.2	46.0	12.2	QP	100.0	291.00	VERTICAL
535.400000	33.50	21.1	46.0	12.5	QP	100.0	268.00	VERTICAL
694.800000	34.40	24.0	46.0	11.6	QP	100.0	358.00	VERTICAL

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	120 kHz	HL562 10

***MEASUREMENT RESULT:***

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	23.50	21.2	40.0	16.5	QP	300.0	124.00	HORIZONTAL
164.100000	28.80	10.6	43.5	14.7	QP	100.0	3.00	HORIZONTAL
228.200000	28.00	11.5	46.0	18.0	QP	100.0	360.00	HORIZONTAL
237.900000	34.40	11.8	46.0	11.6	QP	100.0	196.00	HORIZONTAL
442.100000	30.40	20.2	46.0	15.6	QP	100.0	57.00	HORIZONTAL
970.800000	31.70	25.6	54.0	22.3	QP	300.0	99.00	HORIZONTAL

REMARKS :

- *Undetectable
- The IF bandwidth of EMI Test Receiver was 120KHz for measuring from 30 MHz to 1 GHz and 1 MHz for measuring above 1 GHz

Above 1GHz:
802.11b CH1

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	50.83	PK	74.00	23.17	1.00 H	200	54.23	28.3	4.90	36.6	-3.40
1	2390.00	42.11	AV	54.00	11.89	1.00 H	200	45.41	28.3	4.90	36.6	-3.40
2	*2412.00	106.46	PK			1.00 H	333	109.86	28.3	4.90	36.6	-3.40
2	*2412.00	93.10	AV			1.00 H	333	96.50	28.3	4.90	36.6	-3.40
3	4824.00	49.23	PK	74.00	24.77	1.00 H	125	46.03	32.7	7.00	36.5	3.20
3	4824.00	39.00	AV	54.00	15.00	1.00 H	125	35.80	32.7	7.00	36.5	3.20
4	7236.00	57.21	PK	74.00	16.79	1.00 H	66	47.81	35.8	8.90	35.3	9.40
4	7236.00	43.35	AV	54.00	10.65	1.00 H	66	33.95	35.8	8.90	35.3	9.40
5	9648.00	55.23	PK	74.00	18.77	1.00 H	264	42.63	37.2	10.20	34.8	12.60
5	9648.00	43.00	AV	54.00	11.00	1.00 H	264	30.40	037.2	10.20	34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	53.89	PK	74.00	20.11	1.0	236	57.29	28.3	4.90	36.6	-3.40
1	2390.00	44.49	AV	54.00	9.51	1.0	236	47.89	28.3	4.90	36.6	-3.40
2	*2412.00	109.96	PK			1.0	100	113.36	28.3	4.90	36.6	-3.40
2	*2412.00	96.21	AV			1.0	100	99.55	28.3	4.90	36.6	-3.40
3	4824.00	58.23	PK	74.00	15.77	1.0	312	55.03	32.7	7.00	36.5	3.20
3	4824.00	43.00	AV	54.00	11.00	1.0	312	39.80	32.7	7.00	36.5	3.20
4	7236.00	60.12	PK	74.00	13.88	1.0	46	50.72	35.8	8.90	35.3	9.40
4	7236.00	45.17	AV	54.00	8.83	1.0	46	35.77	35.8	8.90	35.3	9.40
5	9648.00	58.64	PK	74.00	15.36	1.0	108	46.04	37.2	10.20	34.8	12.60
5	9648.00	43.57	AV	54.00	10.43	1.0	108	30.97	37.2	10.20	34.8	12.60

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor
3. The other emission levels were very low against the limit.
4. Margin value = Limit value - Emission level.
5. The limit value is defined as per 15.247
6. "*" : Fundamental frequency
7. For Wireless 802.11b mode at 11Mbps.

802.11b CH6

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2437.00	105.30 PK			1.00 H	153	108.50	28.3	5.10	-36.6	-3.20
1	*2437.00	92.30 AV			1.00 H	153	95.50	28.3	5.10	-36.6	-3.20
2	4874.00	46.40 PK	74.00	27.60	1.00 H	202	43.20	32.3	7.60	-36.5	3.40
2	4874.00	35.00 AV	54.00	19.00	1.00 H	202	31.60	32.3	7.60	-36.5	3.40
3	7311.00	51.10 PK	74.00	22.90	1.00 H	355	41.70	36.1	8.60	-35.3	9.40
3	7311.00	39.00 AV	54.00	15.00	1.00 H	355	29.60	36.1	8.60	-35.3	9.40
4	9748.00	58.20 PK	74.00	15.80	1.00 H	28	45.60	37.2	10.20	-34.8	12.60
4	9748.00	46.20 AV	54.00	7.80	1.00 H	28	33.60	37.2	10.20	-34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2437.00	107.70 PK			1.00 V	121	110.90	28.3	5.10	-36.6	-3.20
1	*2437.00	96.20 AV			1.00 V	121	98.40	28.3	5.10	-36.6	-3.20
2	4874.00	47.00 PK	74.00	27.00	1.00 V	97	43.60	32.3	7.60	-36.5	3.40
2	4874.00	35.10 AV	54.00	18.90	1.00 V	97	32.10	32.3	7.60	-36.5	3.40
3	7311.00	55.10 PK	74.00	22.90	1.00 V	288	45.70	36.1	8.60	-35.3	9.40
3	7311.00	39.10 AV	54.00	14.90	1.00 V	288	29.70	36.1	8.60	-35.3	9.40
4	9748.00	59.30 PK	74.00	14.70	1.00 V	89	46.70	37.2	10.20	-34.8	12.60
4	9748.00	46.20 AV	54.00	7.80	1.00 V	89	33.60	37.2	10.20	-34.8	12.60

REMARKS:

1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB))+ Pre-amplifier Factor
3. The other emission levels were very low against the limit.
4. Margin value = Limit value- Emission level.
5. The limit value is defined as per 15.247
6. “* “: Fundamental frequency
7. For Wireless 802.11b mode at 11Mbps.

802.11b CH11

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2462.00	104.90 PK			1.00 H	154	108.20	28.6	4.70	-36.6	-3.30
1	*2462.00	91.70 AV			1.00 H	154	95.00	28.6	4.70	-36.6	-3.30
2	2483.50	36.70 PK	74.00	37.30	1.00 H	146	40.00	28.6	4.70	-36.6	-3.30
2	2483.50	23.10 AV	54.00	30.90	1.00 H	146	26.40	28.6	4.70	-36.6	-3.30
3	4022.04	45.20 PK	74.00	28.80	1.00 H	341	43.30	32.2	6.20	-36.5	1.90
3	4022.04	33.30 AV	54.00	20.70	1.00 H	341	31.40	32.2	6.20	-36.5	1.90
4	4924.00	47.10 PK	74.00	26.90	1.00 H	100	43.30	33.0	7.00	-36.2	3.80
4	4924.00	35.10 AV	54.00	18.90	1.00 H	100	31.30	33.0	7.00	-36.2	3.80
5	7386.00	54.40 PK	74.00	19.60	1.00 H	190	45.00	36.2	8.50	-35.3	9.40
5	7386.00	42.30 AV	54.00	11.70	1.00 H	190	32.90	36.2	8.50	-35.3	9.40
6	9848.00	59.00 PK	74.00	15.00	1.00 H	113	46.40	37.2	10.20	-34.8	12.60
6	9848.00	46.40 AV	54.00	7.60	1.00 H	113	33.80	37.2	10.20	-34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2462.00	107.90 PK			1.00 V	247	111.20	28.6	4.70	-36.6	-3.30
1	*2462.00	97.60 AV			1.00 V	247	100.90	28.6	4.70	-36.6	-3.30
2	2483.50	53.40 PK	74.00	20.60	1.00 V	150	56.70	28.6	4.70	-36.6	-3.30
2	2483.50	40.80 AV	54.00	13.20	1.00 V	150	44.10	28.6	4.70	-36.6	-3.30
3	4022.04	45.10 PK	74.00	28.90	1.00 V	299	43.20	32.2	6.20	-36.5	1.90
3	4022.04	33.30 AV	54.00	20.70	1.00 V	299	31.40	32.2	6.20	-36.5	1.90
4	4924.00	46.40 PK	74.00	27.60	1.00 V	90	42.60	33.0	7.00	-36.2	3.80
4	4924.00	35.10 AV	54.00	18.90	1.00 V	90	31.30	33.0	7.00	-36.2	3.80
5	7386.00	55.00 PK	74.00	19.00	1.00 V	29	45.60	36.2	8.50	-35.3	9.40
5	7386.00	42.60 AV	54.00	11.40	1.00 V	29	33.20	36.2	8.50	-35.3	9.40
6	9848.00	58.30 PK	74.00	15.70	1.00 V	222	45.70	37.2	10.20	-34.8	12.60
6	9848.00	46.10 AV	54.00	7.90	1.00 V	222	33.50	37.2	10.20	-34.8	12.60

- REMARKS:**
1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB))+ Pre-amplifier Factor
 3. The other emission levels were very low against the limit.
 4. Margin value = Limit value- Emission level.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless 802.11b mode at 11Mbps.

802.11g CH1

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	62.83	PK	74.00	11.17	1.00 H	247	66.13	28.3	5.00	36.6	-3.30
1	2390.00	42.22	AV	54.00	11.78	1.00 H	247	45.52	28.3	5.00	36.6	-3.30
2	*2412.00	106.36	PK			1.00 H	100	109.66	28.3	5.00	36.6	-3.30
2	*2412.00	92.53	AV			1.00 H	100	95.83	28.3	5.00	36.6	-3.30
3	4824.00	50.23	PK	74.00	23.77	1.00 H	89	46.43	32.7	7.30	36.2	3.80
3	4824.00	36.88	AV	54.00	17.12	1.00 H	89	33.08	32.7	7.30	36.2	3.80
4	7236.00	54.00	PK	74.00	20.00	1.00 H	345	44.60	35.8	8.90	35.3	9.40
4	7236.00	40.13	AV	54.00	13.87	1.00 H	345	30.73	35.8	8.90	35.3	9.40
5	9648.00	51.55	PK	74.00	22.45	1.00 H	121	38.95	37.2	10.20	34.8	12.60
5	9648.00	39.78	AV	54.00	14.22	1.00 H	121	27.18	37.2	10.20	34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	69.55	PK	74.00	4.450	1.00 V	288	72.85	28.3	5.00	36.6	-3.30
1	2390.00	42.25	AV	54.00	11.75	1.00 V	288	45.55	28.3	5.00	36.6	-3.30
2	*2412.00	104.29	PK			1.00 V	69	107.59	28.3	5.00	36.6	-3.30
2	*2412.00	92.24	AV			1.00 V	69	95.54	28.3	5.00	36.6	-3.30
3	4824.00	55.54	PK	74.00	18.46	1.00 V	291	51.74	32.7	7.30	36.2	3.80
3	4824.00	40.12	AV	54.00	13.88	1.00 V	291	36.32	32.7	7.30	36.2	3.80
4	7236.00	60.45	PK	74.00	13.55	1.00 V	360	51.05	35.8	8.90	35.3	9.40
4	7236.00	42.77	AV	54.00	11.23	1.00 V	360	33.37	35.8	8.90	35.3	9.40
5	9648.00	57.68	PK	74.00	16.32	1.00 V	155	45.08	37.2	10.20	34.8	12.60
5	9648.00	40.44	AV	54.00	13.56	1.00 V	155	27.84	37.2	10.20	34.8	12.60

- REMARKS:**
1. Emission level (dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB))+ Pre-amplifier Factor
 3. The other emission levels were very low against the limit.
 4. Margin value = Limit value- Emission level.
 5. The limit value is defined as per 15.247
 6. “* “: Fundamental frequency
 7. For Wireless 802.11g mode at 54Mbps.

802.11g CH6

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2437.00	104.40 PK			1.00 H	100	107.60	28.3	5.10	-36.6	-3.20
1	*2437.00	87.00 AV			1.00 H	100	90.20	28.3	5.10	-36.6	-3.20
2	4874.00	46.40 PK	74.00	27.60	1.00 H	214	43.00	32.8	7.10	-36.5	3.40
2	4874.00	35.10 AV	54.00	18.90	1.00 H	214	31.70	32.8	7.10	-36.5	3.40
3	7311.00	54.70 PK	74.00	19.30	1.00 H	0	45.30	36.1	8.60	-35.3	9.40
3	7311.00	42.30 AV	54.00	11.70	1.00 H	0	32.90	36.1	8.60	-35.3	9.40
4	9748.00	57.80 PK	74.00	16.20	1.00 H	163	45.20	37.2	10.20	-34.8	12.60
4	9748.00	46.30 AV	54.00	7.70	1.00 H	163	33.70	37.2	10.20	-34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2437.00	107.50 PK			1.00 V	122	110.70	28.3	5.10	-36.6	-3.20
1	*2437.00	94.80 AV			1.00 V	122	98.00	28.3	5.10	-36.6	-3.20
2	4874.00	46.10 PK	74.00	27.90	1.00 V	100	42.70	32.8	7.10	-36.5	3.40
2	4874.00	35.10 AV	54.00	18.90	1.00 V	100	31.70	32.8	7.10	-36.5	3.40
3	7311.00	54.90 PK	74.00	19.10	1.00 V	356	45.50	36.1	8.60	-35.3	9.40
3	7311.00	42.40 AV	54.00	11.60	1.00 V	356	33.00	36.1	8.60	-35.3	9.40
4	9748.00	58.60 PK	74.00	15.40	1.00 V	26	46.00	37.2	10.20	-34.8	12.60
4	9748.00	48.20 AV	54.00	7.80	1.00 V	26	35.60	37.2	10.20	-34.8	12.60

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) + Pre-amplifier Factor
 3. The other emission levels were very low against the limit.
 4. Margin value = Limit value - Emission level.
 5. The limit value is defined as per 15.247
 6. "*" : Fundamental frequency
 7. For Wireless 802.11g mode at 54Mbps.

802.11g CH11

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2462.00	99.50 PK			1.00 H	156	102.80	28.2	5.10	-36.6	-3.30
1	*2462.00	85.80 AV			1.00 H	156	89.10	28.2	5.10	-36.6	-3.30
2	2483.50	47.70 PK	74.00	26.30	1.00 H	191	51.00	28.2	5.10	-36.6	-3.30
2	2483.50	30.10 AV	54.00	23.90	1.00 H	191	33.40	28.2	5.10	-36.6	-3.30
3	4924.00	46.90 PK	74.00	27.10	1.00 H	198	43.10	33.0	7.00	-36.2	3.80
3	4924.00	34.90 AV	54.00	19.10	1.00 H	198	31.10	33.0	7.00	-36.2	3.80
4	7386.00	54.70 PK	74.00	19.30	1.00 H	90	45.30	36.2	8.50	-35.3	9.40
4	7386.00	42.30 AV	54.00	11.70	1.00 H	90	32.90	36.2	8.50	-35.3	9.40
5	9848.00	58.60 PK	74.00	15.40	1.00 H	124	46.00	37.3	10.10	-34.8	12.60
5	9848.00	46.20 AV	54.00	7.80	1.00 H	124	33.60	37.3	10.10	-34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2462.00	101.50 PK			1.00 V	125	105.80	28.2	5.10	-36.6	-3.30
1	*2462.00	89.10 AV			1.00 V	125	94.40	28.2	5.10	-36.6	-3.30
2	2483.50	65.70 PK	74.00	8.30	1.00 V	348	69.00	28.2	5.10	-36.6	-3.30
2	2483.50	50.90 AV	54.00	3.10	1.00 V	348	54.20	28.2	5.10	-36.6	-3.30
3	4924.00	46.10 PK	74.00	27.90	1.00 V	96	42.30	33.0	7.00	-36.2	3.80
3	4924.00	34.80 AV	54.00	19.20	1.00 V	96	31.00	33.0	7.00	-36.2	3.80
4	7386.00	54.40 PK	74.00	19.60	1.00 V	35	45.00	36.2	8.50	-35.3	9.40
4	7386.00	42.30 AV	54.00	11.70	1.00 V	35	32.90	36.2	8.50	-35.3	9.40
5	9848.00	58.60 PK	74.00	15.40	1.00 V	37	46.00	37.3	10.10	-34.8	12.60
5	9848.00	46.20 AV	54.00	7.80	1.00 V	37	33.60	37.3	10.10	-34.8	12.60

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m)
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) + Pre-amplifier Factor
 3. The other emission levels were very low against the limit.
 4. Margin value = Limit value - Emission level.
 5. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency
 7. For Wireless 802.11g mode at 54Mbps.

802.11n (20MHz) Channel 1

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	67.10	PK	74.00	6.90	1.00 H	144	70.40	28.3	5.00	36.6	-3.30
1	2390.00	34.50	AV	54.00	19.50	1.00 H	144	37.80	28.3	5.00	36.6	-3.30
2	*2412.00	104.43	PK			1.00 H	256	107.73	28.3	5.00	36.6	-3.30
2	*2412.00	84.00	AV			1.00 H	256	87.30	28.3	5.00	36.6	-3.30
3	4824.00	52.23	PK	74.00	21.77	1.00 H	88	48.43	32.7	7.30	36.2	3.80
3	4824.00	41.47	AV	54.00	12.53	1.00 H	88	37.67	32.7	7.30	36.2	3.80
4	7236.00	53.88	PK	74.00	20.12	1.00 H	331	44.48	35.8	8.90	35.3	9.40
4	7236.00	41.26	AV	54.00	12.74	1.00 H	331	31.86	35.8	8.90	35.3	9.40
5	9648.00	55.14	PK	74.00	18.86	1.00 H	105	42.54	37.2	10.20	34.8	12.60
5	9648.00	42.69	AV	54.00	11.31	1.00 H	105	30.09	37.2	10.20	34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	2390.00	68.01	PK	74.00	5.99	1.00 V	125	71.31	28.3	5.00	36.6	-3.30
1	2390.00	45.27	AV	54.00	8.73	1.00 V	125	48.57	28.3	5.00	36.6	-3.30
2	*2412.00	105.40	PK			1.00 V	236	108.70	28.3	5.00	36.6	-3.30
2	*2412.00	87.72	AV			1.00 V	236	91.02	28.3	5.00	36.6	-3.30
3	4824.00	53.39	PK	74.00	20.61	1.00 V	179	49.59	32.7	7.30	36.2	3.80
3	4824.00	42.07	AV	54.00	11.93	1.00 V	179	38.27	32.7	7.30	36.2	3.80
4	7236.00	54.51	PK	74.00	19.49	1.00 V	313	45.11	35.8	8.90	35.3	9.40
4	7236.00	41.56	AV	54.00	12.44	1.00 V	313	32.16	35.8	8.90	35.3	9.40
5	9648.00	56.71	PK	74.00	17.29	1.00 V	5	44.11	37.2	10.20	34.8	12.60
5	9648.00	43.25	AV	54.00	10.75	1.00 V	5	30.65	37.2	10.20	34.8	12.60

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

802.11n (20MHz) Channel 6

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2437.00	101.88	PK		1.00 H	223	105.08	28.3	5.10	36.6	-3.20
1	*2437.00	85.07	AV		1.00 H	122	88.27	28.3	5.10	36.6	-3.20
2	4874.00	47.56	PK	74.00	1.00 H	5	44.16	32.8	7.10	36.5	3.40
2	4874.00	36.91	AV	54.00	1.00 H	5	33.51	32.8	7.10	36.5	3.40
3	7311.00	51.72	PK	74.00	1.00 H	124	42.32	36.1	8.60	35.3	9.40
3	7311.00	40.66	AV	54.00	1.00 H	124	31.26	36.1	8.60	35.3	9.40
4	9748.00	53.78	PK	74.00	1.00 H	325	41.18	37.2	10.20	34.8	12.60
4	9748.00	42.04	AV	54.00	1.00 H	325	29.44	37.2	10.20	34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2437.00	102.97	PK		1.00 V	125	106.17	28.3	5.10	36.6	-3.20
1	*2437.00	86.11	AV		1.00 V	125	89.31	28.3	5.10	36.6	-3.20
2	4874.00	48.23	PK	74.00	1.00 V	289	44.83	32.8	7.10	36.5	3.40
2	4874.00	36.97	AV	54.00	1.00 V	289	33.57	32.8	7.10	36.5	3.40
3	7311.00	55.46	PK	74.00	1.00 V	0	46.06	36.1	8.60	35.3	9.40
3	7311.00	40.57	AV	54.00	1.00 V	0	31.17	36.1	8.60	35.3	9.40
4	9748.00	52.36	PK	74.00	1.00 V	180	39.76	37.2	10.20	34.8	12.60
4	9748.00	42.89	AV	54.00	1.00 V	180	30.29	37.2	10.20	34.8	12.60

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

802.11n (20MHz) Channel 11

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2462.00	96.84	PK			1.00 H	122	100.14	28.2	5.10	36.6	-3.30
1	*2462.00	87.73	AV			1.00 H	122	91.03	28.2	5.10	36.6	-3.30
2	2483.50	45.50	PK	74.00	28.50	1.00 H	300	48.80	28.2	5.10	36.6	-3.30
2	2483.50	37.65	AV	54.00	16.35	1.00 H	300	40.95	28.2	5.10	36.6	-3.30
3	4924.00	49.28	PK	74.00	24.72	1.00 H	156	45.48	33.0	7.00	36.2	3.80
3	4924.00	35.00	AV	54.00	19.00	1.00 H	156	31.20	33.0	7.00	36.2	3.80
4	7386.00	50.36	PK	74.00	23.64	1.00 H	334	40.96	36.2	8.50	35.3	9.40
4	7386.00	39.12	AV	54.00	14.88	1.00 H	334	29.72	36.2	8.50	35.3	9.40
5	9848.00	52.17	PK	74.00	21.83	1.00 H	278	39.57	37.3	10.10	34.8	12.60
5	9848.00	40.23	AV	54.00	13.77	1.00 H	278	27.63	37.3	10.10	34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	*2462.00	103.54	PK			1.00 V	125	106.84	28.2	5.10	36.6	-3.30
1	*2462.00	88.32	AV			1.00 V	125	91.62	28.2	5.10	36.6	-3.30
2	2483.50	58.08	PK	74.00	15.92	1.00 V	189	61.38	28.2	5.10	36.6	-3.30
2	2483.50	37.91	AV	54.00	16.09	1.00 V	189	41.21	28.2	5.10	36.6	-3.30
3	4924.00	52.12	PK	74.00	21.88	1.00 V	347	48.32	33.0	7.00	36.2	3.80
3	4924.00	36.17	AV	54.00	17.83	1.00 V	347	32.37	33.0	7.00	36.2	3.80
4	7386.00	54.12	PK	74.00	19.88	1.00 V	12	44.72	36.2	8.50	35.3	9.40
4	7386.00	40.54	AV	54.00	13.46	1.00 V	12	31.14	36.2	8.50	35.3	9.40
5	9848.00	54.10	PK	74.00	19.90	1.00 V	208	41.50	37.3	10.10	34.8	12.60
5	9848.00	41.23	AV	54.00	12.77	1.00 V	208	28.63	37.3	10.10	34.8	12.60

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

The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor.

Remark: No any other emissions level which are attenuated less than 20dB below the limit

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

Remark:

1). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

2). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

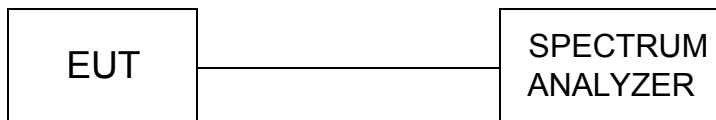
3) Pre-Scan has been conducted to determine the worst-case mode from all possible Combinations between available modulations, data rates and antenna ports, and found the EUT worse case mode: 802.11b (11MHz), 802.11g (54MHz)

4) For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the 4th harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 4th harmonic.



4.3. 6dB Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

1. The testing follows FCC KDB Publication No. 558074 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

LIMIT

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST RESULTS

1. The EUT communicationg with 802.11b Mode

CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
2412	10.00	0.5	PASS
2437	10.24	0.5	PASS
2462	10.20	0.5	PASS

2. The EUT communicationg with 802.11g Mode

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

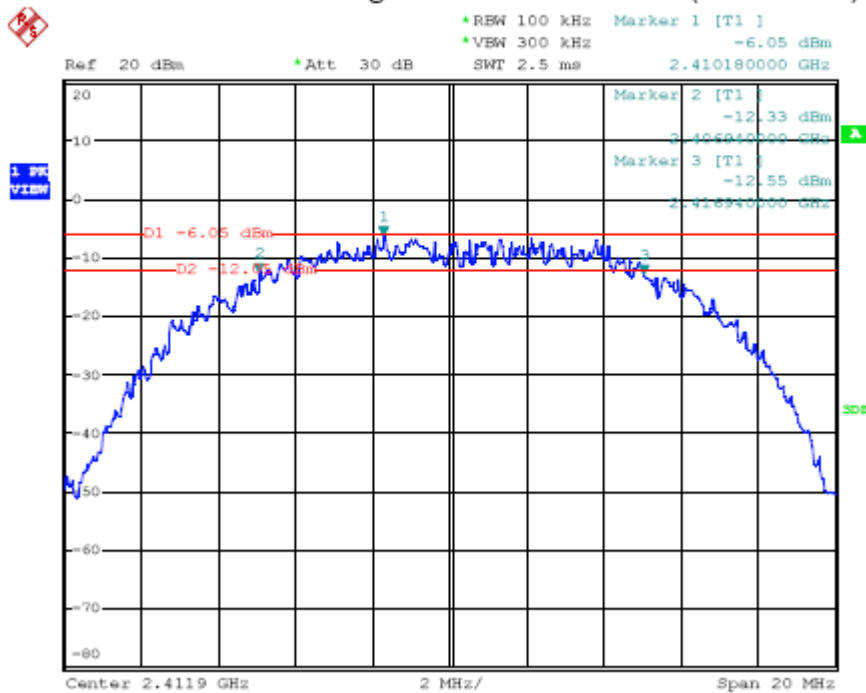
3. The EUT communicationg with 802.11n HT20 Mode

CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
2412	16.82	0.5	PASS
2437	16.82	0.5	PASS
2462	17.02	0.5	PASS

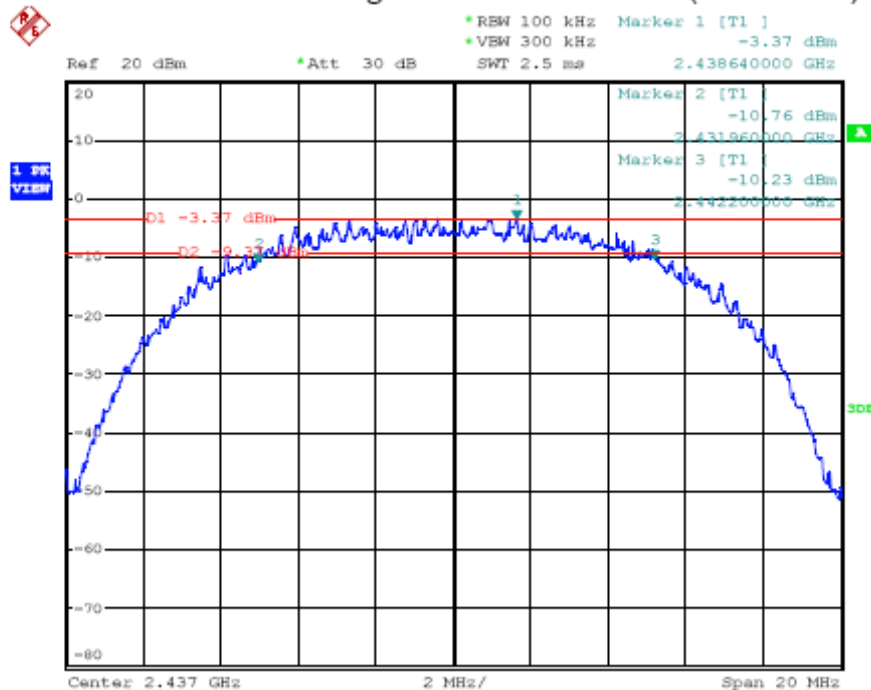
Conclusion: The unit does meet the FCC requirements.

Please refer to the graph as below:

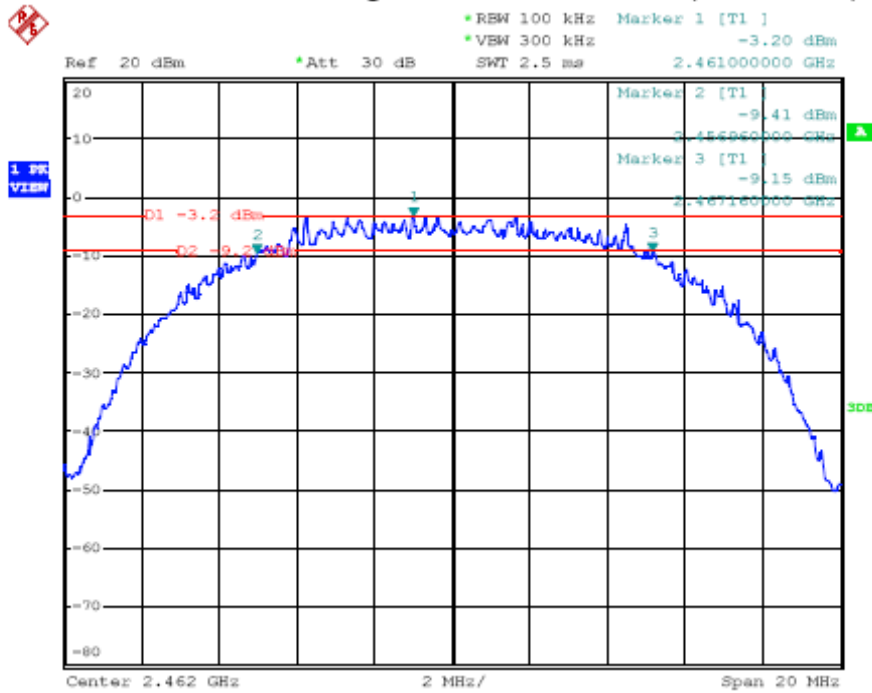
1. For EUT communicating with 802.11b mode (2.412GHz)



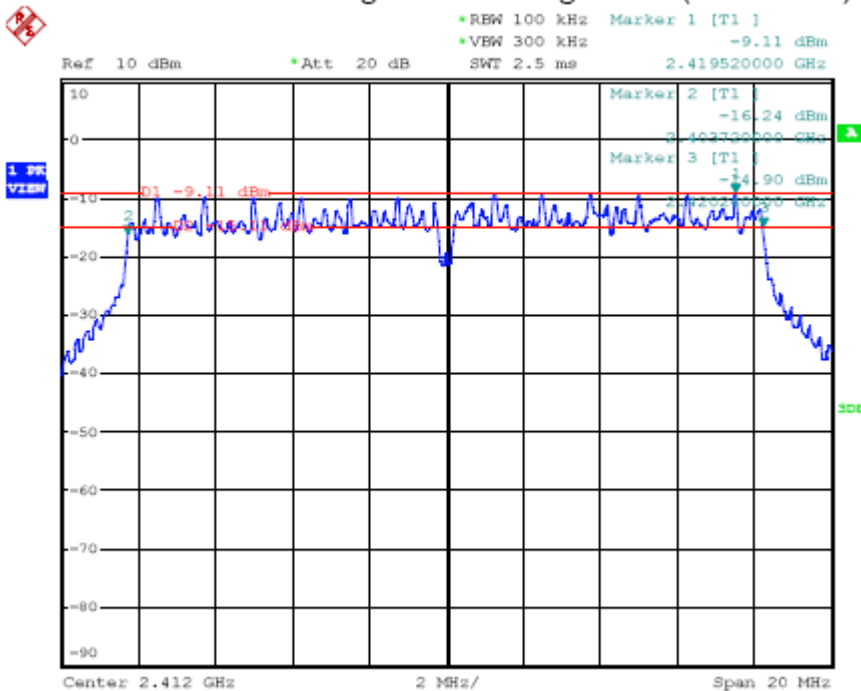
2. For EUT communicating with 802.11b mode (2.437GHz)



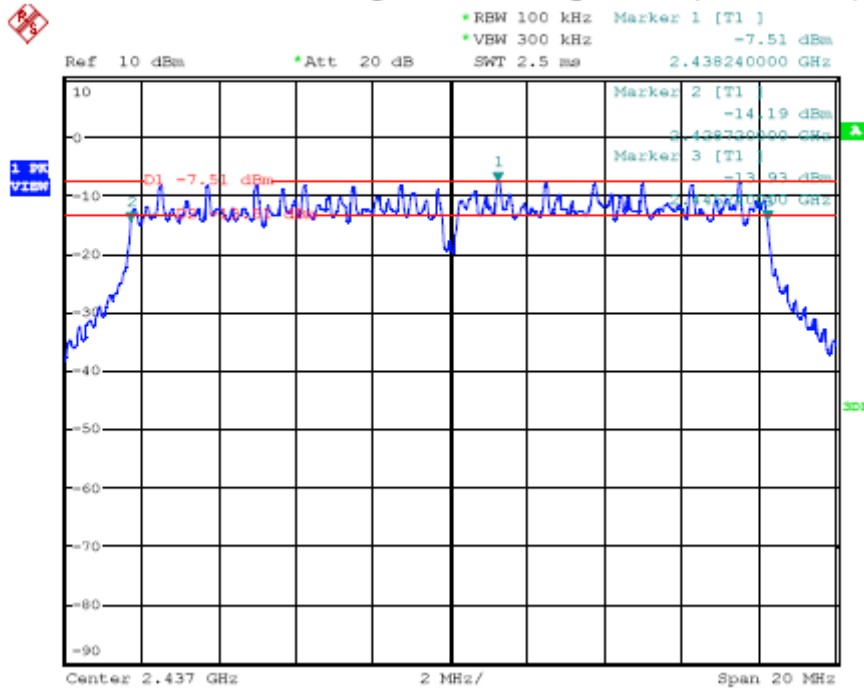
3. For EUT communicating with 802.11b mode (2.462GHz)



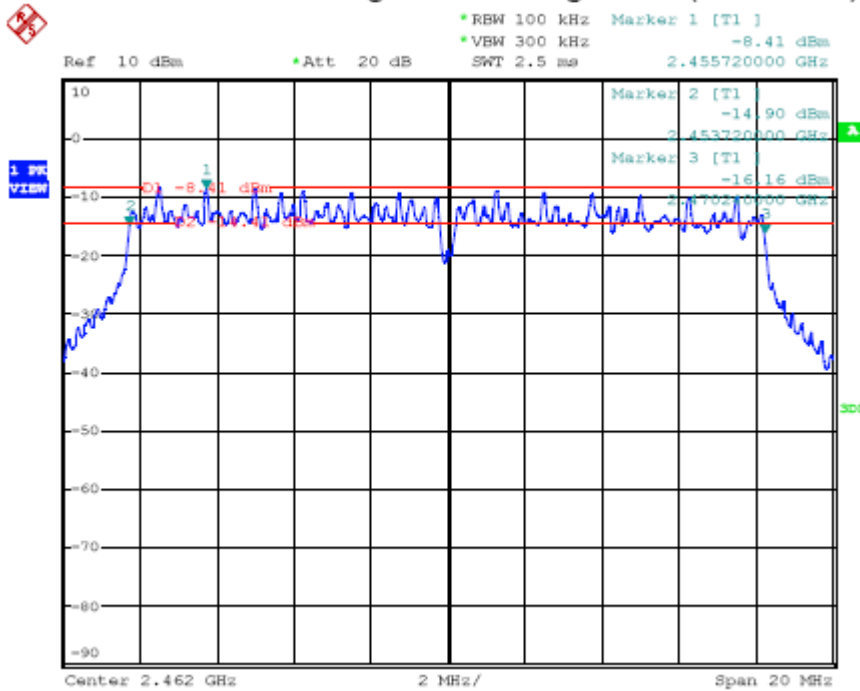
4. For EUT communicating with 802.11g mode (2.412GHz)



5. For EUT communicating with 802.11g mode (2.437GHz)



6. For EUT communicating with 802.11g Mode (2.462GHz)



Delta 2 [T1]

Ref Lvl	-6.28 dB	RBW	100 kHz	RF Att	30 dB
20.8 dBm	7.31462926 MHz	VSW	300 kHz	Unit	dBm
		SWT	12.5 ms		

0.8 dB Offset

1.57 dBm

2.41325351 GHz

7.31462926 MHz

-4.43 dBm

-9.51903908 MHz

1MAX

IN1

1MA

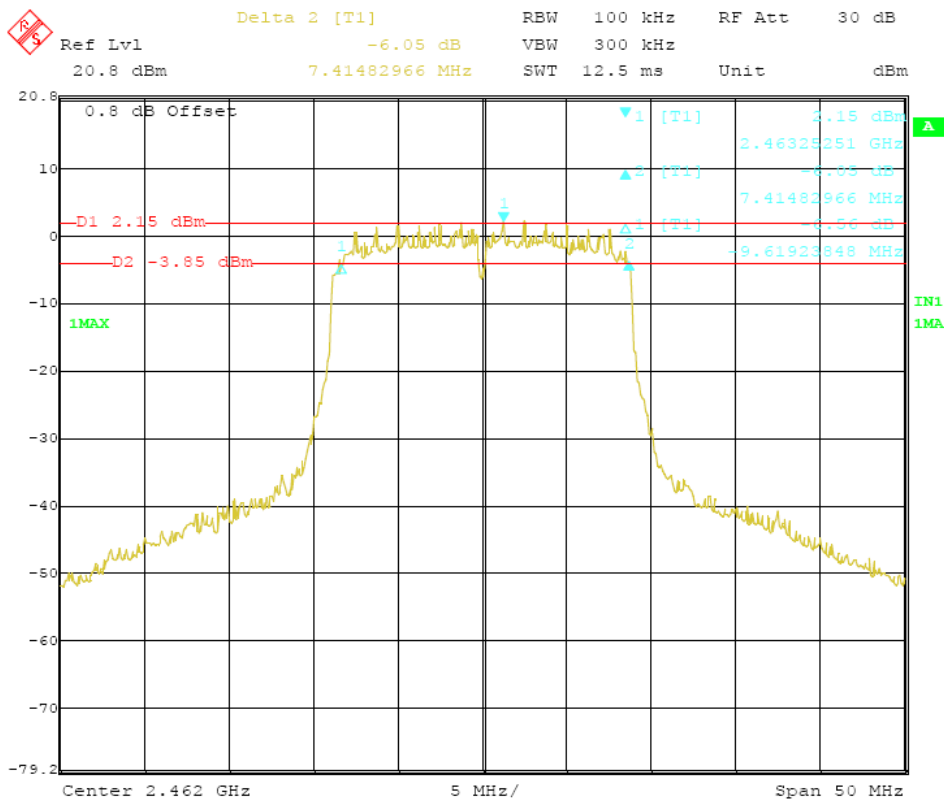
Center 2.412 GHz

5 MHz/

Span 50 MHz

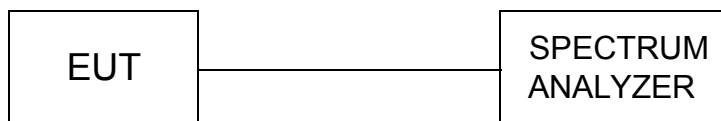
[illegible]

9. For EUT communicating with 802.11n HT20 Mode (2.462GHz)



4.4. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to C63.10 -2009, The EUT was directly connected to the power meter / spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

For IEEE 802.11b/g and IEEE802.11n HT20 mode, use a PK power meter which's bandwidth is above 26dB bandwidth of signal to measure out each test modes' PK output power.

LIMIT

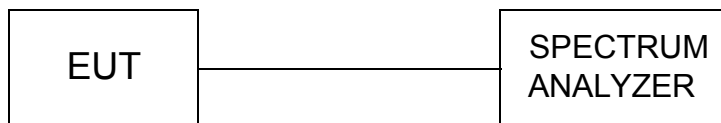
The Peak Output Power Measurement limits are 30dBm.

TEST RESULTS

Mode	Channel	Peak Power Output (dBm)	Peak Power Limit (dBm)	PASS / FAIL
802.11b	1	11.40	30	PASS
	6	12.27	30	PASS
	11	12.35	30	PASS
802.11g	1	9.83	30	PASS
	6	10.81	30	PASS
	11	10.34	30	PASS
802.11n HT20	1	9.54	30	PASS
	6	9.61	30	PASS
	11	9.51	30	PASS

4.5. Band Edge Measurement

TEST CONFIGURATION



TEST PROCEDURE

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 and FCC KDB Publication No. 558074 (Measurement Guidelines of DTS) with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBM= 300KHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100 kHz, to measure the conducted peak band edge.

LIMIT

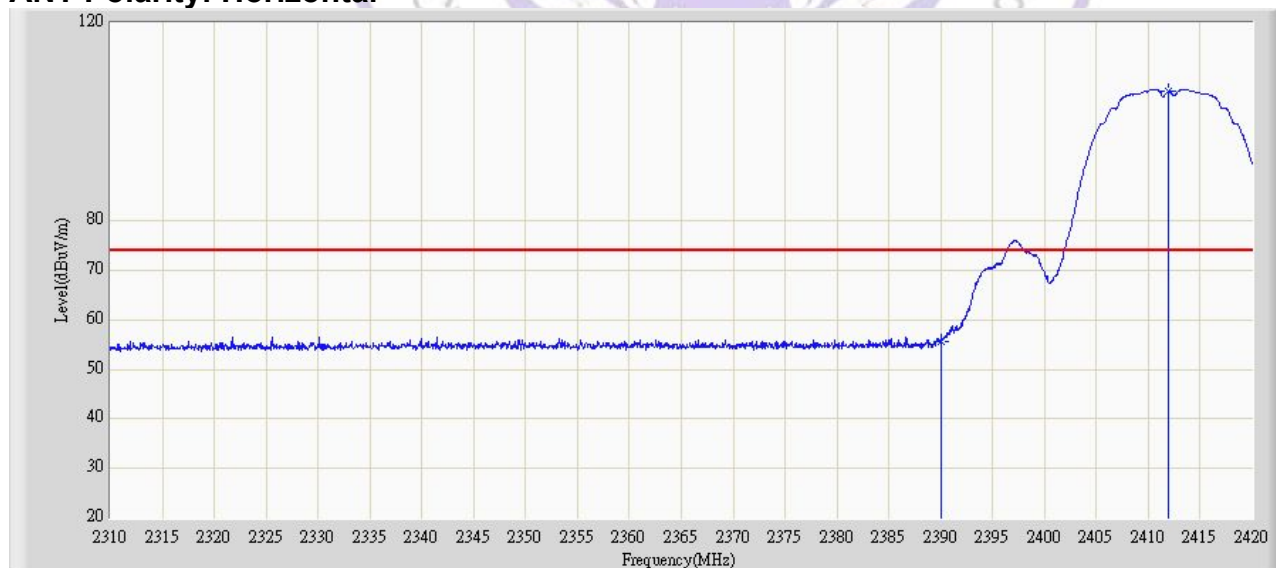
- Below -20dB of the highest emission level in operating band.
- Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209(see Section 15.205(c)).

Frequency (MHz)	Limit Average (dBuV/m)	Limit Peak (dBuV/m)
Below 2390 or Above 2483.5	54	74

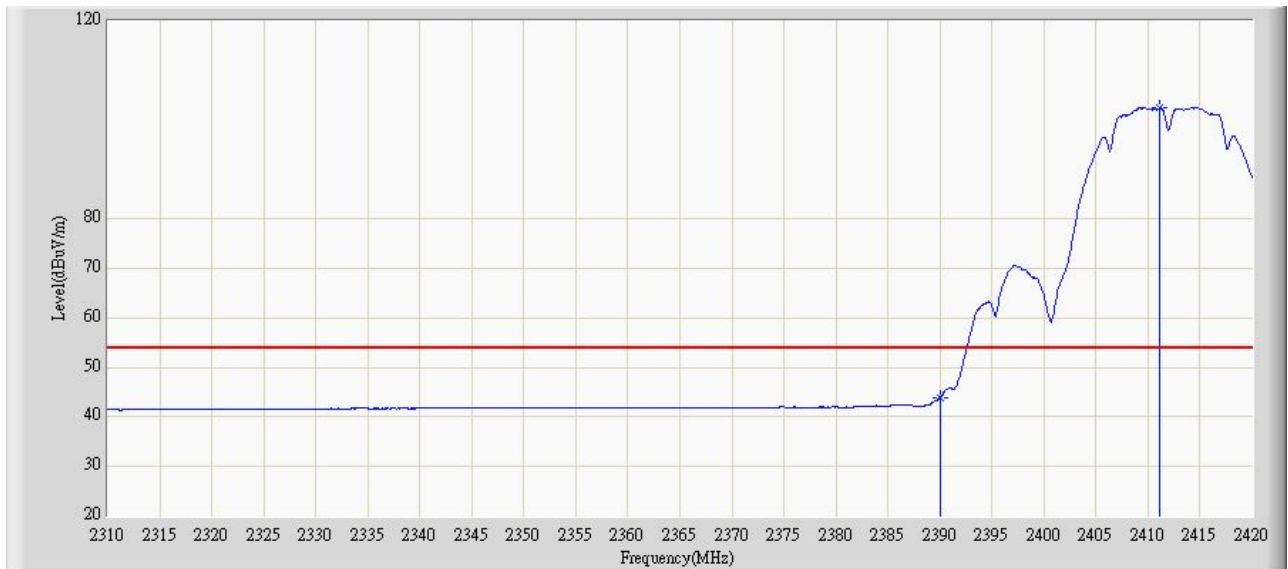
TEST RESULTS

Transmitting mode: 802.11b

ANT Polarity: Horizontal



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	55.687	25.132	-18.313	74.000	30.555	PK
2	*	2411.915	106.198	75.642	N/A	N/A	30.555	PK



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	43.935	13.380	-10.065	54.000	30.555	AV
2	*	2411.145	102.469	71.913	N/A	N/A	30.556	AV

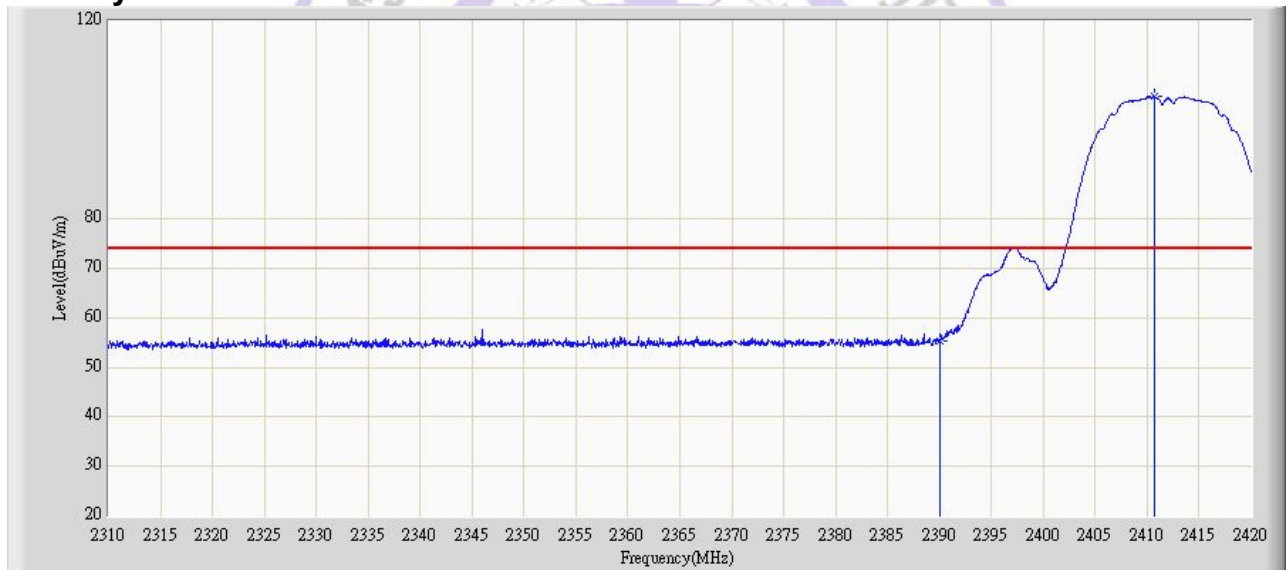


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2462.025	105.579	75.141	N/A	N/A	30.438	PK
2		2483.500	56.458	26.136	-17.542	74.000	30.321	PK

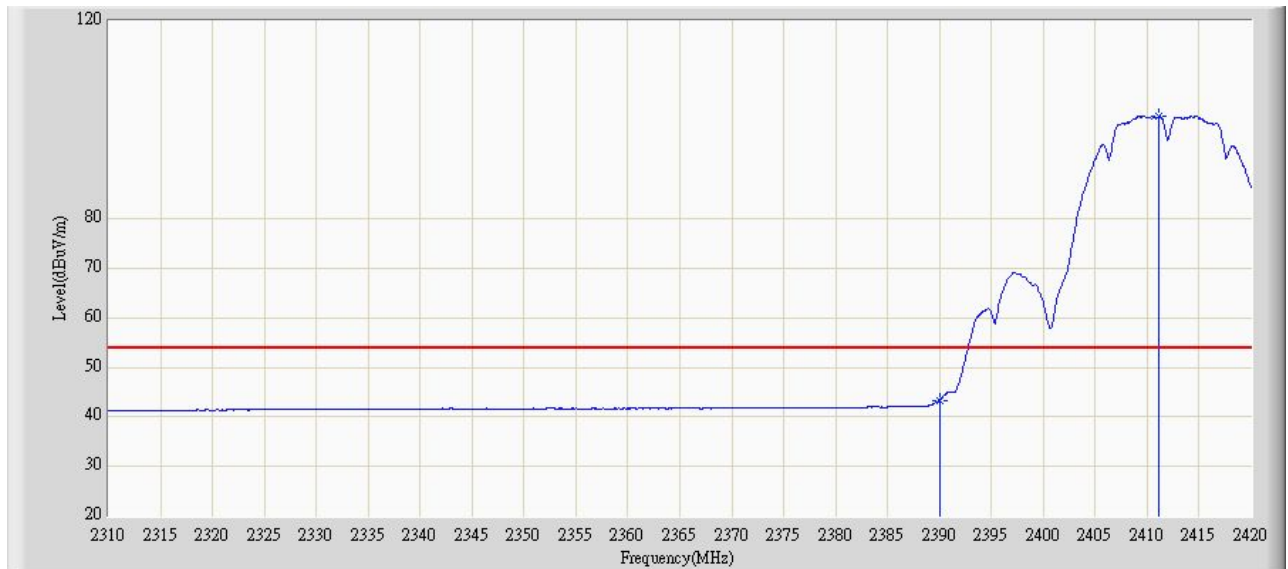


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2462.800	101.871	71.437	N/A	N/A	30.433	AV
2		2483.500	44.798	14.476	-9.202	54.000	30.321	AV

ANT Polarity: Vertical



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	55.394	24.839	-18.606	74.000	30.555	PK
2	*	2410.705	104.638	74.082	N/A	N/A	30.556	PK



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	43.335	12.780	-10.665	54.000	30.555	AV
2	*	2411.145	100.661	70.105	N/A	N/A	30.556	AV



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2460.700	104.406	73.960	N/A	N/A	30.446	PK
2		2483.500	55.315	24.993	-18.685	74.000	30.321	PK

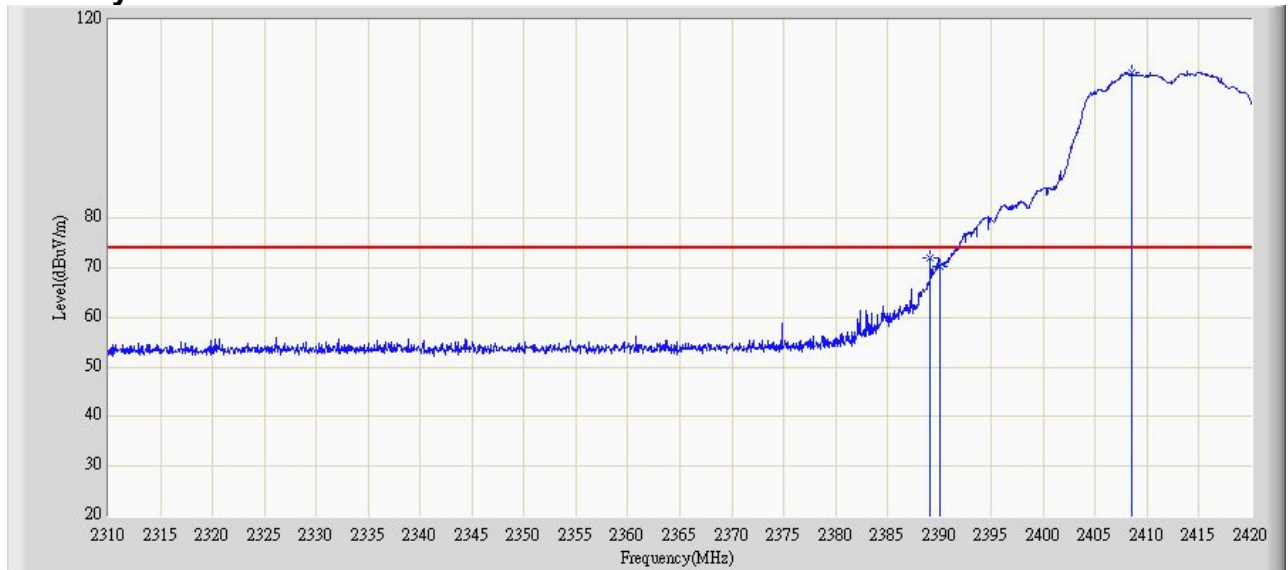


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2461.250	100.912	70.470	N/A	N/A	30.442	AV
2		2483.500	43.770	13.448	-10.230	54.000	30.321	AV

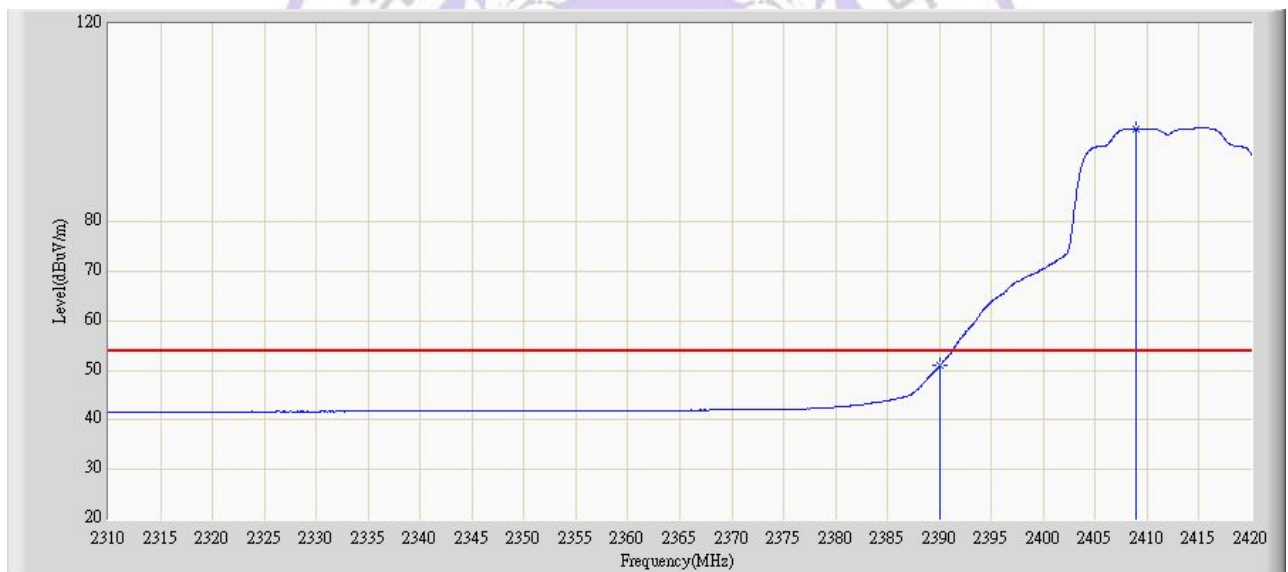


Transmitting mode: 802.11g

ANT Polarity: Horizontal



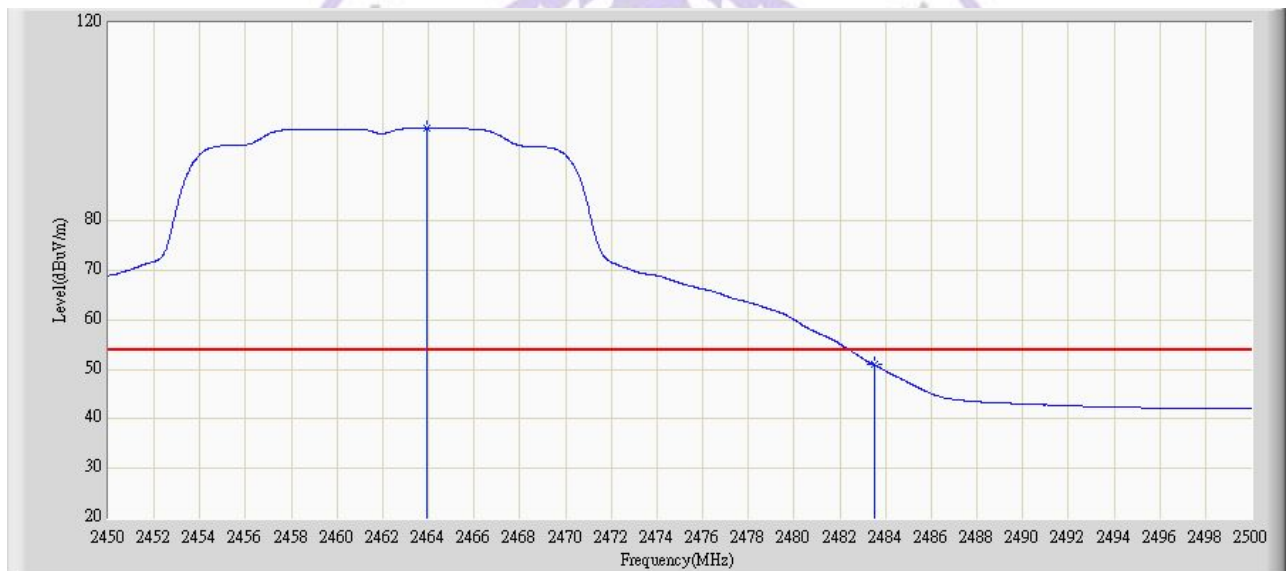
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2389.145	71.933	41.380	-2.067	74.000	30.553	PK
2		2390.000	70.169	39.614	-3.831	74.000	30.555	PK
3	*	2408.560	109.292	78.735	N/A	N/A	30.557	PK



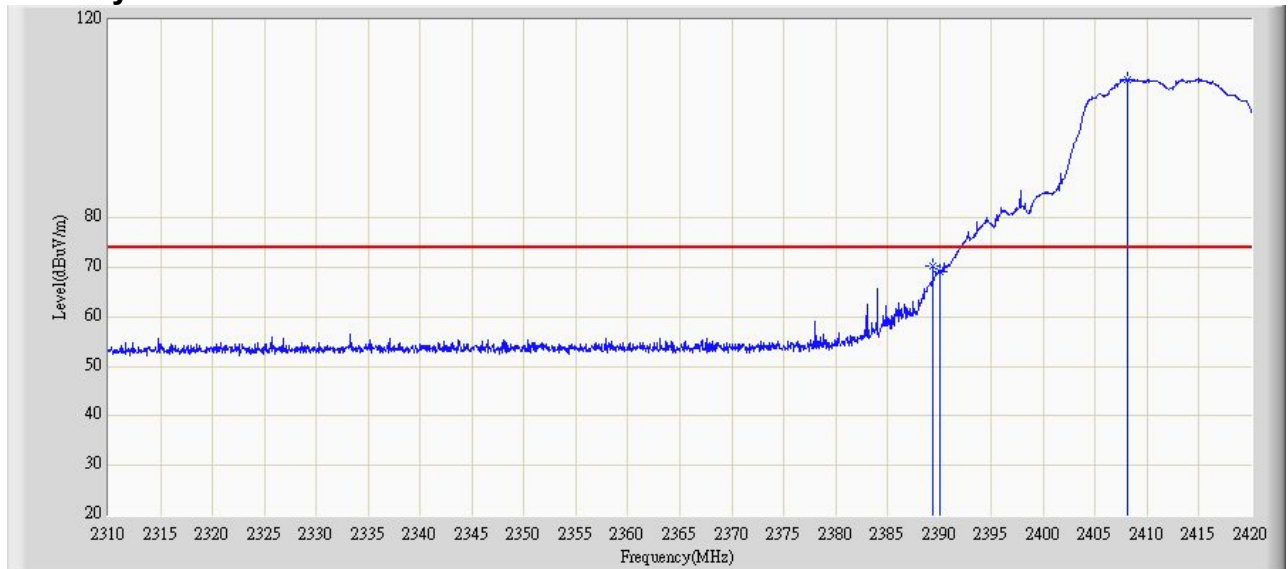
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	50.895	20.340	-3.105	54.000	30.555	AV
2	*	2408.945	98.742	68.185	N/A	N/A	30.556	AV



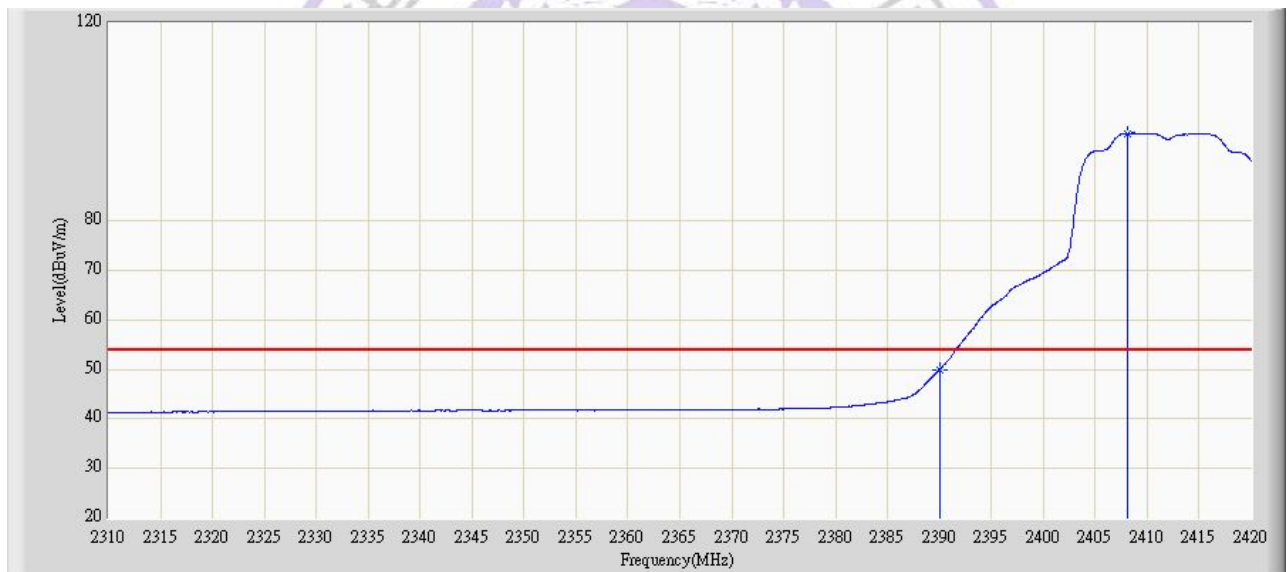
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.450	109.036	78.606	N/A	N/A	30.429	PK
2		2483.500	69.722	39.400	-4.278	74.000	30.321	PK
3		2486.550	69.565	39.255	-4.435	74.000	30.310	PK



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2463.900	98.729	68.302	N/A	N/A	30.427	AV
2		2483.500	50.939	20.617	-3.061	54.000	30.321	AV

ANT Polarity: Vertical

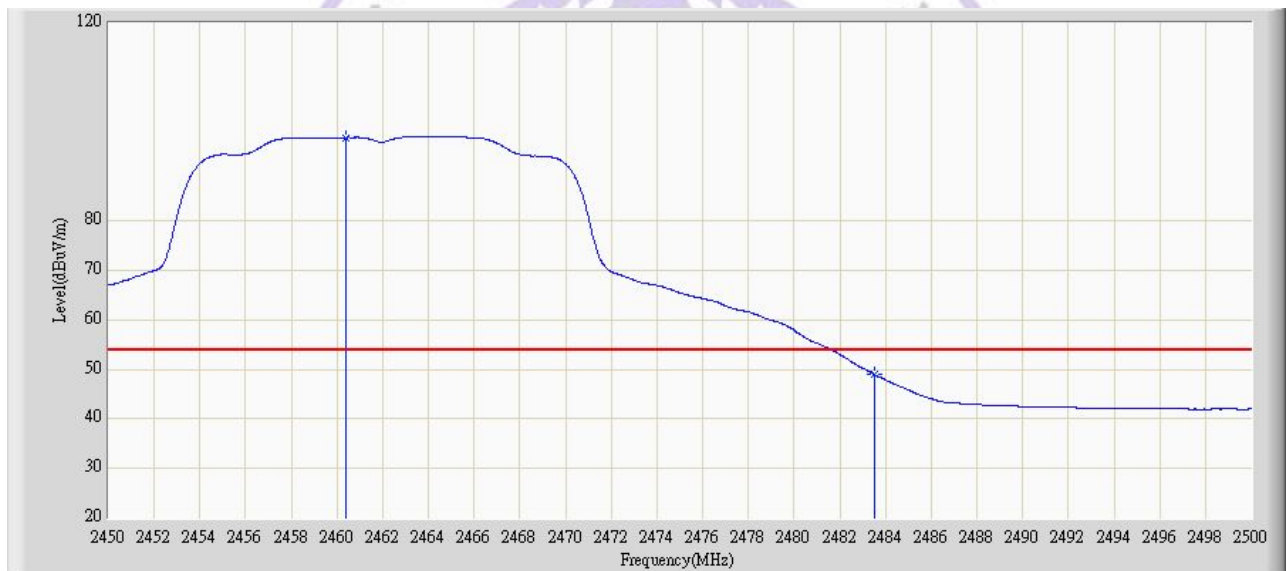
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2389.365	70.254	39.700	-3.746	74.000	30.554	PK
2		2390.000	69.053	38.498	-4.947	74.000	30.555	PK
3	*	2408.120	107.938	77.381	N/A	N/A	30.557	PK



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	49.975	19.420	-4.025	54.000	30.555	AV
2	*	2408.065	97.653	67.096	N/A	N/A	30.557	AV

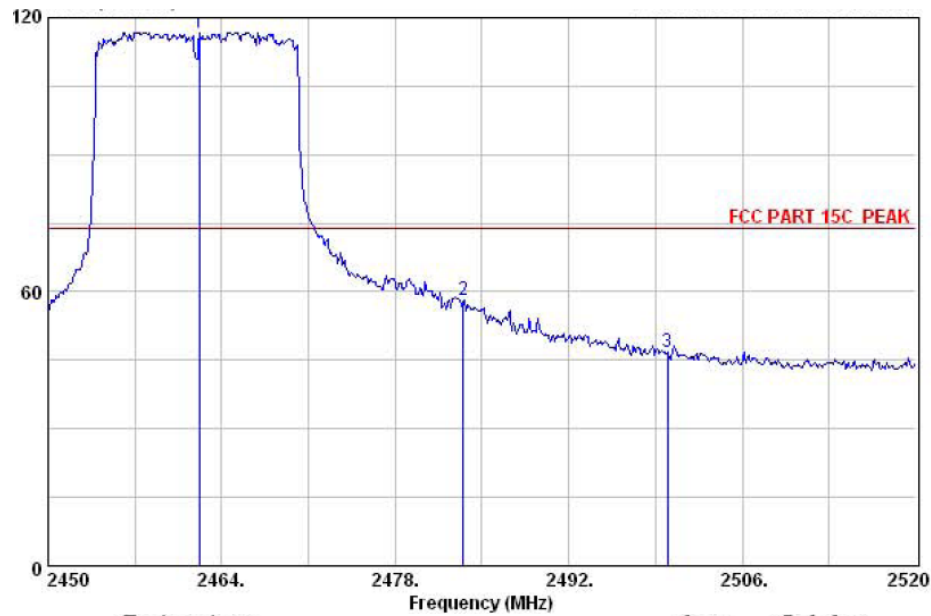


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2460.400	107.741	77.294	N/A	N/A	30.447	PK
2		2483.500	67.518	37.196	-6.482	74.000	30.321	PK
3		2484.150	68.750	38.431	-5.250	74.000	30.319	PK



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2460.375	96.867	66.420	N/A	N/A	30.448	AV
2		2483.500	49.046	18.724	-4.954	54.000	30.321	AV

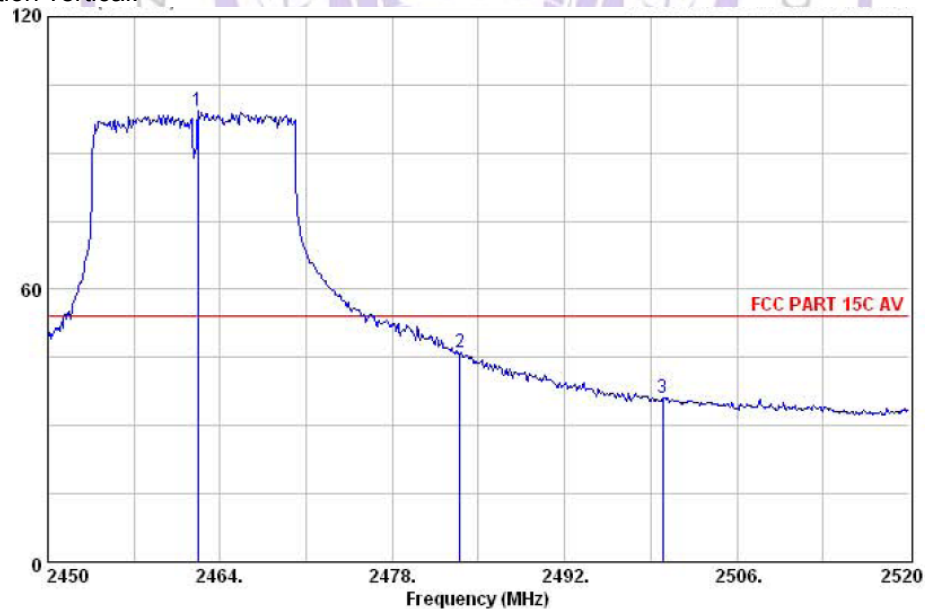
Transmitting mode: 802.11n HT20



Emission		Frequency (MHz)			Ant.	Cable	Remark	
Freq.	Level	Limits	Margin	Reading	Factor	Loss		
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB/m)	(dB)		
1	2462.18	116.78	74.00	-42.78	82.99	31.56	2.23	Peak
2	2483.50	58.28	74.00	15.72	24.47	31.58	2.23	Peak
3	2500.00	46.71	74.00	27.29	12.88	31.60	2.23	Peak

Note:

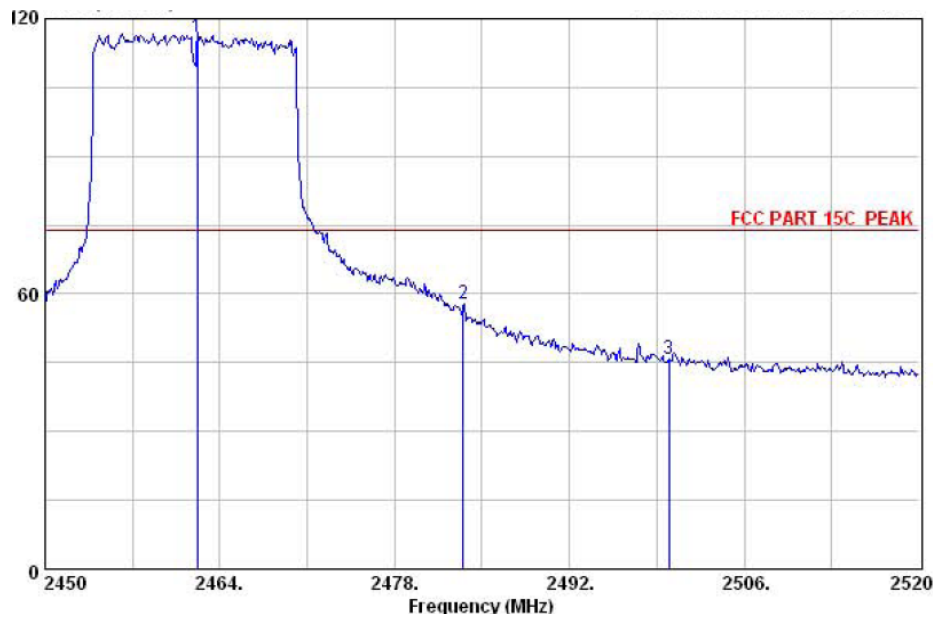
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dBuV/m.
2. Antenna Polarization vertical.



Emission			Frequency (MHz)		Ant.	Cable	Remark	
Freq.	Level	Limits	Margin	Reading	Factor	Loss		
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB/m)	(dB)		
1	2462.18	99.28	54.00	-45.28	65.49	31.56	2.23	Average
2	2483.50	46.01	54.00	7.99	12.20	31.58	2.23	Average
3	2500.00	36.25	54.00	17.75	2.42	31.60	2.23	Average

Note:

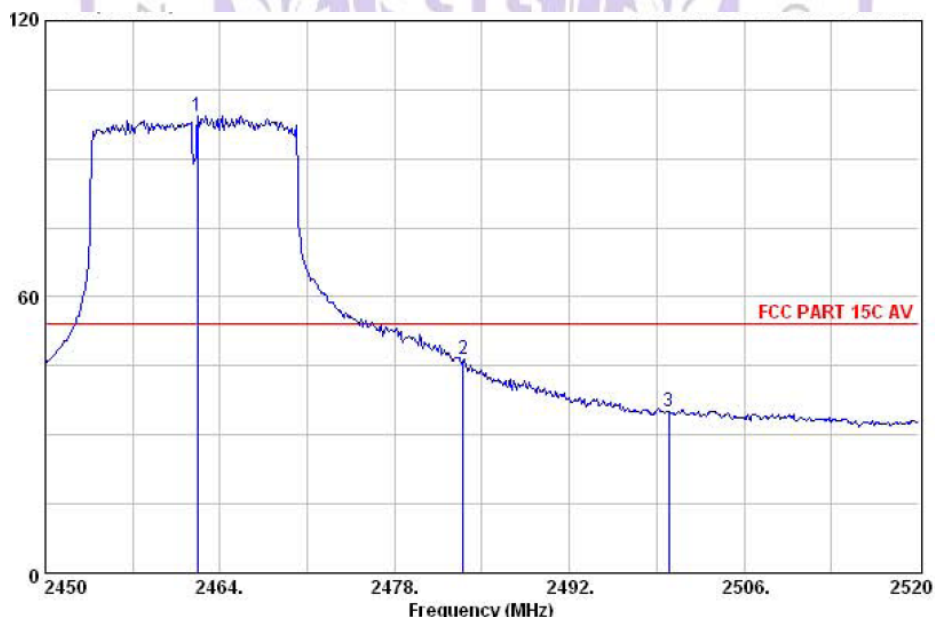
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dBuV/m.
2. Antenna Polarization vertical.



	Emission					Ant. Cable		
	Freq. (MHz)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Factor (dB/m)	Loss (dB)	Remark
1	2462.18	115.98	74.00	-41.98	82.19	31.56	2.23	Peak
2	2483.50	57.76	74.00	16.24	23.95	31.58	2.23	Peak
3	2500.00	45.83	74.00	28.17	12.00	31.60	2.23	Peak

Note:

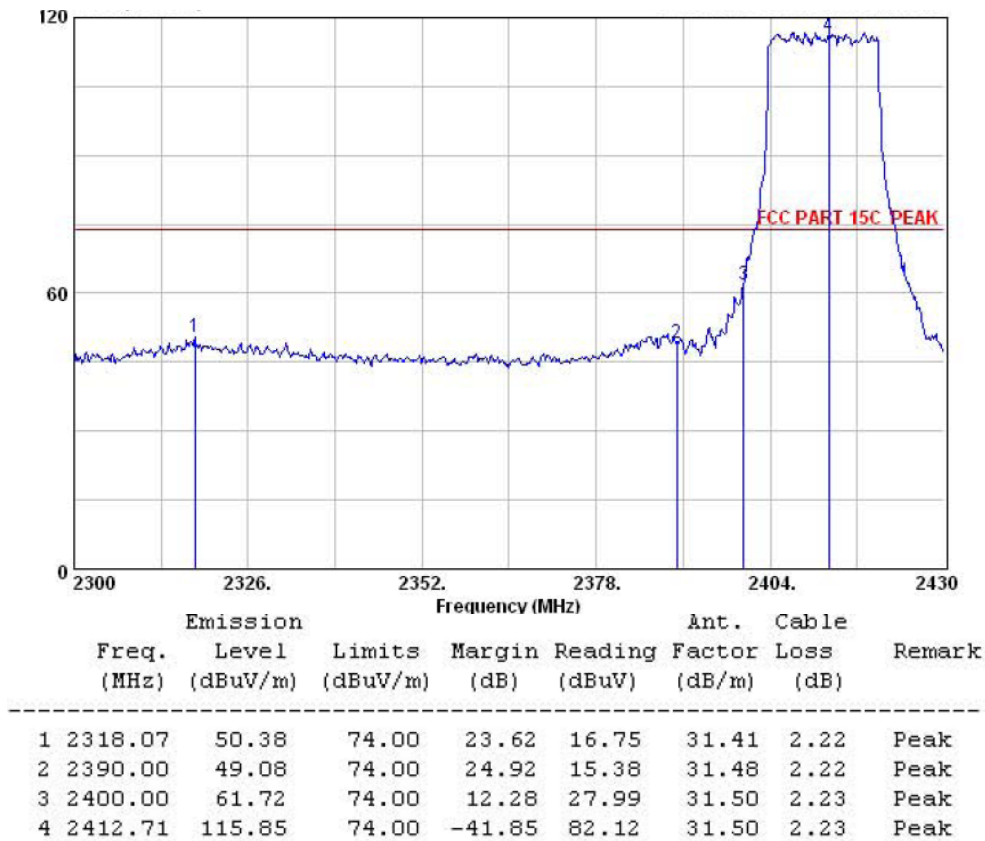
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dB μ V/m.
2. Antenna Polarization horizontal.



	Emission					Ant. Cable		
	Freq. (MHz)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Factor (dB/m)	Loss (dB)	Remark
1	2462.18	99.32	54.00	-45.32	65.53	31.56	2.23	Average
2	2483.50	46.58	54.00	7.42	12.77	31.58	2.23	Average
3	2500.00	35.07	54.00	18.93	1.24	31.60	2.23	Average

Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dB μ V/m.
2. Antenna Polarization horizontal.



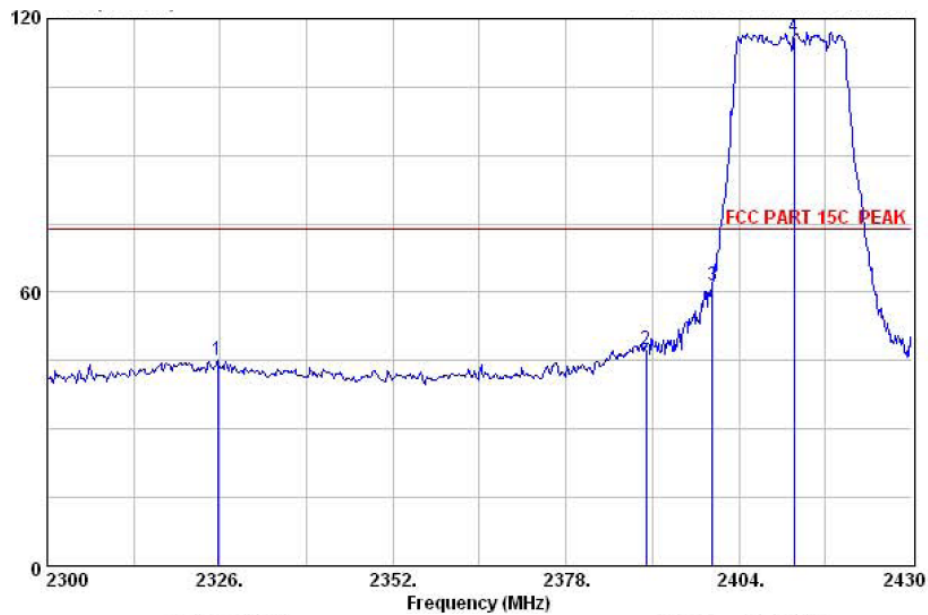
Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall be 74dBuV/m.
2. Antenna Polarization horizontal.



Note:

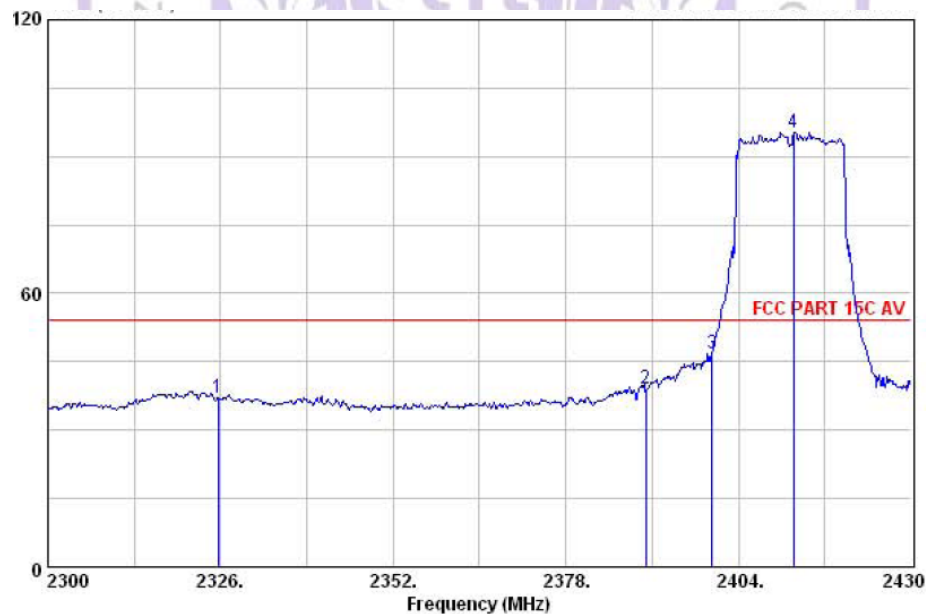
1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall be 54dBuV/m.
2. Antenna Polarization horizontal.



	Emission					Ant.	Cable	
	Freq. (MHz)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Factor (dB/m)	Loss (dB)	Remark
1	2325.61	45.25	74.00	28.75	11.60	31.43	2.22	Peak
2	2390.00	47.54	74.00	26.46	13.84	31.48	2.22	Peak
3	2400.00	61.48	74.00	12.52	27.75	31.50	2.23	Peak
4	2412.32	116.06	74.00	-42.06	82.33	31.50	2.23	Peak

Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the peak radiated field strength shall blow 74dB μ V/m.
2. Antenna Polarization vertical.



	Emission					Ant.	Cable	
	Freq. (MHz)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Reading (dBuV)	Factor (dB/m)	Loss (dB)	Remark
1	2325.61	37.25	54.00	16.75	3.60	31.43	2.22	Average
2	2390.00	39.21	54.00	14.79	5.51	31.48	2.22	Average
3	2400.00	46.83	54.00	7.17	13.10	31.50	2.23	Average
4	2412.32	95.36	54.00	-41.36	61.63	31.50	2.23	Average

Note:

1. The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209, the average radiated field strength shall blow 54dB μ V/m.
2. Antenna Polarization vertical.