Variant FCC Test Report

Report No.:	RFBGSN-WTW-P21080119-2
FCC ID:	I4L-BM25SD
Test Model:	BM25
Received Date:	Aug. 13, 2021
Test Date:	Aug. 19, 2021 ~ Sep. 24, 2021
Issued Date:	Oct. 15, 2021
Applicant:	Micro-Star INT'L Co., Ltd
Address:	No. 69, Lide St., Zhonghe Dist., 235 New Taipei City Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location (1):	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
Test Location (2):	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan
FCC Registration / Designation Number:	788550 / TW0003 427177 / TW0011

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBGSN-WTW-P21080119-2	Original Release	Oct. 15, 2021

1 Certificate of Conformity

Product:	802.11a/b/g/n/ac + BT 4.2 Module
Brand:	MSI
Test Model:	BM25
Sample Status:	Identical Prototype
Applicant:	Micro-Star INT'L Co., Ltd
Test Date:	Aug. 19, 2021 ~ Sep. 24, 2021
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013

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 RF characteristics under the conditions specified in this report.

Prepared by : Vera Huang , **Date:** Oct. 15, 2021

Vera Huang / Specialist

Approved by : , **Date:** Oct. 15, 2021

Dylan Chiou / Senior Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	**Test Item**	**Result**	**Remarks**
15.207	AC Power Conducted Emission	N/A	Refer to Note 1
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -7.12 dB at 51.44 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note 1
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note 1
---	Occupied Bandwidth Measurement	N/A	Refer to Note 1
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	N/A	Refer to Note 1
15.203	Antenna Requirement	N/A	No antenna connector is used.

Note:

1. Only conducted output power and radiated emissions tests were performed for this addendum. Refer to BV CPS report no.: RF180518C15 for other test data.
2. For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	**Frequency**	**Expanded Uncertainty (k=2) (±)**
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	802.11a/b/g/n/ac + BT 4.2 Module
Brand	MSI
Test Model	BM25
Status of EUT	Identical Prototype
Power Supply Rating	3.6 Vdc (host equipment)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to 72.2 Mbps
Operating Frequency	2412 ~ 2462 MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20)
Output Power	204.644 mW
Antenna Type	Refer to Note as below
Antenna Connector	N/A
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to BV CPS report no. RF180518C15. The difference compared with original report are adding End-product and reducing power. Therefore, only conducted output power and radiated emissions tests were verified and recorded in this report.
2. The EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	Tx Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX

3. The EUT is authorized for use in specific End-product. All models are electrically identical, different model names are for marketing purpose. The model 137000-99 and 134000-99 were chosen for final test. Please refer to below for more details.

Sample	Product Name	Brand Name	Model Name	Remark
A	Display System	Trimble	137000-99, GFX-1260, XCN-1260, TME-1260	12 inch
B	Display System	Trimble	134000-99, GFX-1060, XCN-1060, TME-1060	10 inch

4. The antenna information is listed as below.

Sample	Antenna type	Antenna Gain (dBi)				
		BT / 2412 ~ 2462 MHz	5180 ~ 5240 MHz	5260 ~ 5320 MHz	5500 ~ 5700 MHz	5745 ~ 5825 MHz
A	PIFA	**1.67**	**2.14**	0.79	2.37	**2.37**
B	PIFA	-0.09	1.24	**1.44**	**2.95**	2.29

5. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
6. The above EUT information is declared by manufacturer and for more detailed features description, please refers 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 (HT20):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description	Axis
	RE≥1G	RE<1G	PLC	APCM		
A	√	√	-	√	Sample A	Z-plane
B	√	√	-	√	Sample B	X-plane

Where **RE≥1G:** Radiated Emission above 1 GHz **RE<1G:** Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement
NOTE: "-"means no effect.

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A, B	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A, B	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11g	1 to 11	6	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, B	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A, B	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A, B	802.11n (HT20)	1 to 11	1, 11	OFDM	BPSK	6.5

Conducted Output Power 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, B	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A, B	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A, B	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

Test Condition:

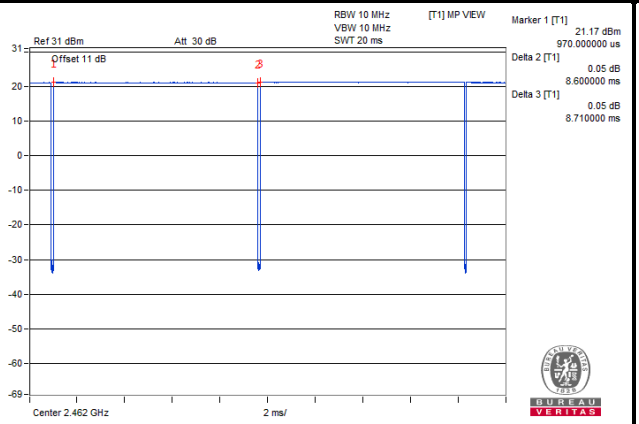
Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 62 % RH	120 Vac, 60 Hz	Karl Lee / Harry Hsueh
RE<1G	25 deg. C, 62 % RH	120 Vac, 60 Hz	Karl Lee / Harry Hsueh
APCM	25 deg. C, 60 % RH	120 Vac, 60 Hz	Jisyong Wang

3.3 Duty Cycle of Test Signal

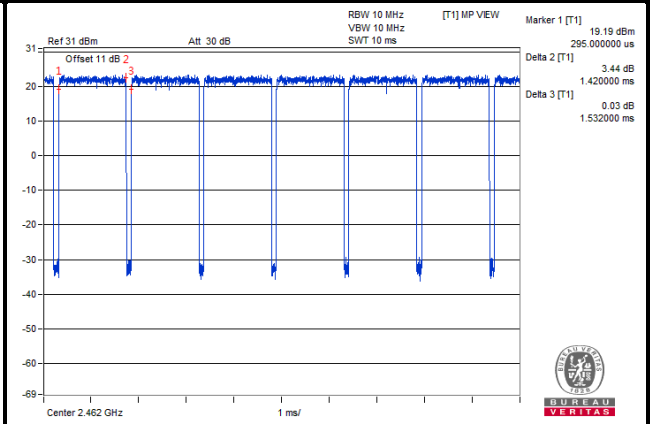
Duty cycle of test signal is ≥ 98 %, duty factor is not required.
Duty cycle of test signal is < 98 %, duty factor shall be considered.

802.11b: Duty cycle = 8.600/8.710 = 0.987, Duty cycle of test signal is ≥ 98 %, duty factor is not required.
802.11g: Duty cycle = 1.420/1.532 = 0.927, Duty factor = 10 * log(1/0.927) = 0.33
802.11n (HT20): Duty cycle = 1.335/1.437 = 0.929, Duty factor = 10 * log(1/0.929) = 0.32

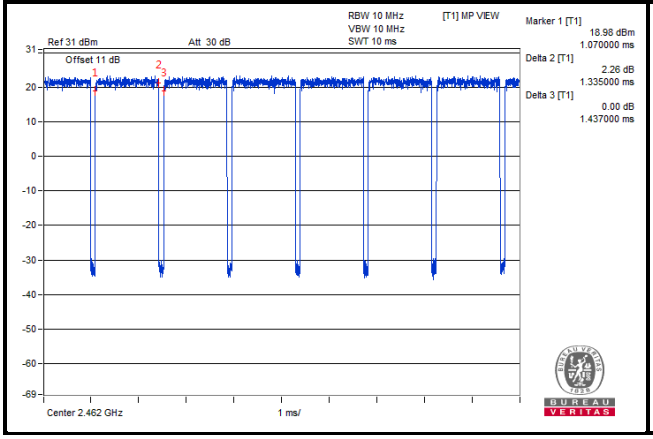
802.11b



802.11g



802.11n (HT20)



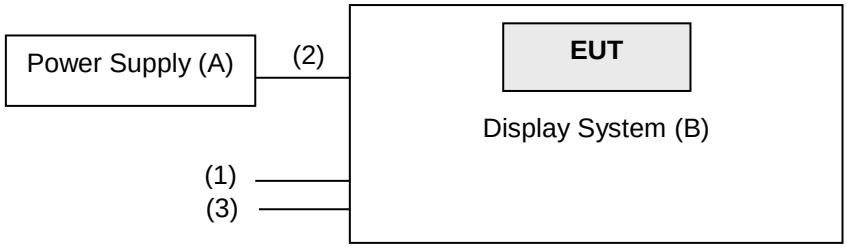
3.4 Description of Support Units

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.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Power Supply	TOPWARD	3303D	N/A	N/A	--
B	Display System	Trimble	137000-99	N/A	N/A	Sample A, Provided by client
		Trimble	134000-99	N/A	N/A	Sample B, Provided by client

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Console Cable	1	0.4	N	0	Provided by client
2.	Power Cable	1	1.95	N	0	Provided by client
3.	Debug Cable	1	1.95	N	0	Provided by client

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test Standard:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

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. For frequencies above 1000 MHz, 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 20 dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY55420137	Apr. 09, 2021	Apr. 08, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 22, 2020	Nov. 21, 2021
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 09, 2020	Nov. 08, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Loop Antenna	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
Preamplifier Agilent	310N	187226	Jun. 17, 2021	Jun. 16, 2022
Preamplifier Agilent	83017A	MY39501357	Jun. 17, 2021	Jun. 16, 2022
Preamplifier EMCI	EMC 184045	980116	Oct. 07, 2020	Oct. 06, 2021
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 17, 2021	Jun. 16, 2022
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 17, 2021	Jun. 16, 2022
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower &Turn Table Controller MF	MF-7802	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HsinTien Chamber 1.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case 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 Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

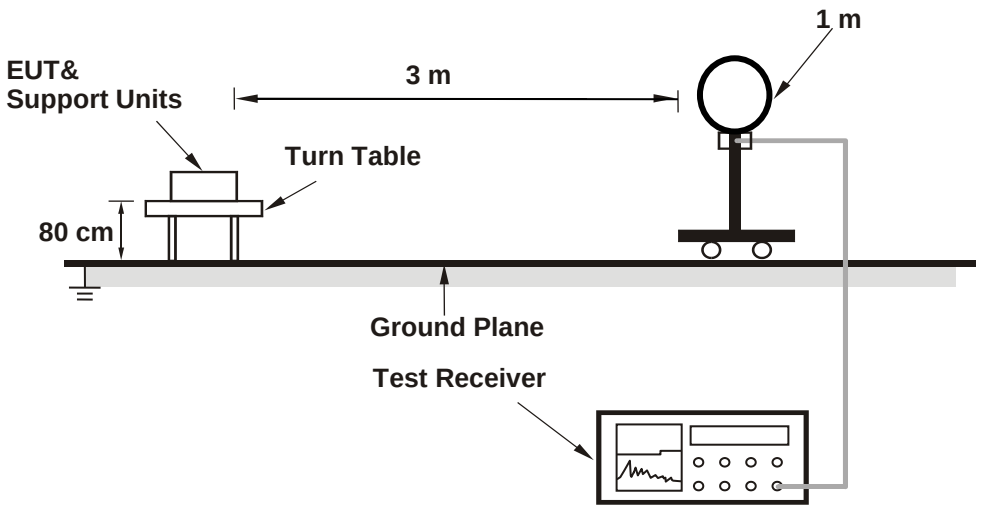
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz. (11b: RBW = 1 MHz, VBW =1 kHz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;
   11n (HT20): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

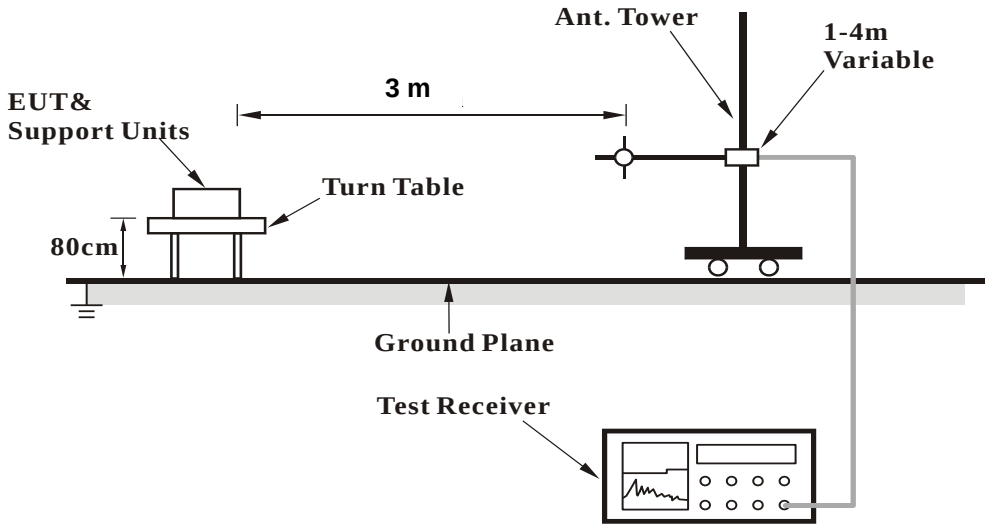
No deviation.

4.1.5 Test Set Up

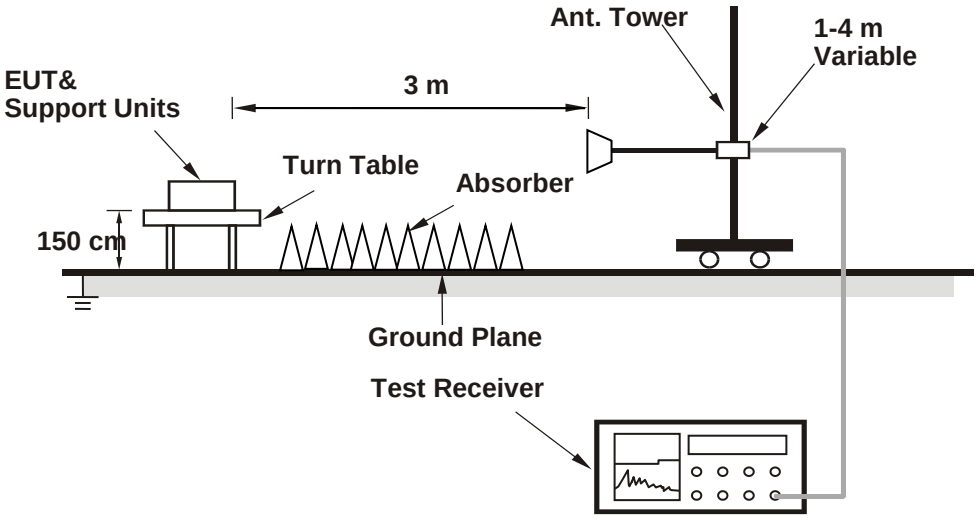
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Mode A

Above 1 GHz Data：

RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	52.00 PK	74.00	-22.00	3.39 H	15	15.02	36.98
2	2390.00	41.78 AV	54.00	-12.22	3.39 H	15	4.80	36.98
3	*2412.00	96.78 PK			3.39 H	11	59.67	37.11
4	*2412.00	95.16 AV			3.39 H	11	58.05	37.11
5	4824.00	48.42 PK	74.00	-25.58	1.36 H	219	38.57	9.85
6	4824.00	42.11 AV	54.00	-11.89	1.36 H	219	32.26	9.85
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)	Correction Factor (dB/m)
1	2390.00	53.17 PK	74.00	-20.83	1.62 V	188	16.19	36.98
2	2390.00	42.93 AV	54.00	-11.07	1.62 V	188	5.95	36.98
3	*2412.00	102.52 PK			1.62 V	188	65.41	37.11
4	*2412.00	100.90 AV			1.62 V	188	63.79	37.11
5	4824.00	48.47 PK	74.00	-25.53	2.04 V	132	38.62	9.85
6	4824.00	42.22 AV	54.00	-11.78	2.04 V	132	32.37	9.85

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	53.09 PK	74.00	-20.91	3.43 H	12	16.11	36.98
2	2390.00	43.00 AV	54.00	-11.00	3.43 H	12	6.02	36.98
3	*2437.00	99.56 PK			3.43 H	12	62.32	37.24
4	*2437.00	97.88 AV			3.43 H	12	60.64	37.24
5	2483.50	53.27 PK	74.00	-20.73	3.43 H	12	15.90	37.37
6	2483.50	43.29 AV	54.00	-10.71	3.43 H	12	5.92	37.37
7	4874.00	48.96 PK	74.00	-25.04	1.95 H	112	38.62	10.34
8	4874.00	42.70 AV	54.00	-11.30	1.95 H	112	32.36	10.34
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)	Correction Factor (dB/m)
1	2390.00	53.18 PK	74.00	-20.82	1.77 V	202	16.20	36.98
2	2390.00	43.14 AV	54.00	-10.86	1.77 V	202	6.16	36.98
3	*2437.00	104.87 PK			1.77 V	202	67.63	37.24
4	*2437.00	103.18 AV			1.77 V	202	65.94	37.24
5	2483.50	53.58 PK	74.00	-20.42	1.77 V	202	16.21	37.37
6	2483.50	43.46 AV	54.00	-10.54	1.77 V	202	6.09	37.37
7	4874.00	48.80 PK	74.00	-25.20	1.53 V	141	38.46	10.34
8	4874.00	42.51 AV	54.00	-11.49	1.53 V	141	32.17	10.34

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	*2462.00	96.62 PK			3.18 H	12	59.29	37.33
2	*2462.00	95.03 AV			3.18 H	12	57.70	37.33
3	2483.50	52.70 PK	74.00	-21.30	3.18 H	12	15.33	37.37
4	2483.50	42.71 AV	54.00	-11.29	3.18 H	12	5.34	37.37
5	4924.00	48.62 PK	74.00	-25.38	1.21 H	258	38.24	10.38
6	4924.00	42.44 AV	54.00	-11.56	1.21 H	258	32.06	10.38
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)	Correction Factor (dB/m)
1	*2462.00	102.72 PK			1.77 V	202	65.39	37.33
2	*2462.00	101.04 AV			1.77 V	202	63.71	37.33
3	2483.50	54.31 PK	74.00	-19.69	1.77 V	202	16.94	37.37
4	2483.50	43.62 AV	54.00	-10.38	1.77 V	202	6.25	37.37
5	4924.00	49.07 PK	74.00	-24.93	2.61 V	73	38.69	10.38
6	4924.00	42.84 AV	54.00	-11.16	2.61 V	73	32.46	10.38

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	51.85 PK	74.00	-22.15	3.39 H	11	14.87	36.98
2	2390.00	41.85 AV	54.00	-12.15	3.39 H	11	4.87	36.98
3	*2412.00	96.47 PK			3.39 H	11	59.36	37.11
4	*2412.00	89.62 AV			3.39 H	11	52.51	37.11
5	4824.00	48.44 PK	74.00	-25.56	1.67 H	103	38.59	9.85
6	4824.00	42.20 AV	54.00	-11.80	1.67 H	103	32.35	9.85
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)	Correction Factor (dB/m)
1	2390.00	53.66 PK	74.00	-20.34	1.62 V	188	16.68	36.98
2	2390.00	43.28 AV	54.00	-10.72	1.62 V	188	6.30	36.98
3	*2412.00	102.08 PK			1.62 V	188	64.97	37.11
4	*2412.00	95.20 AV			1.62 V	188	58.09	37.11
5	4824.00	48.29 PK	74.00	-25.71	2.27 V	108	38.44	9.85
6	4824.00	42.14 AV	54.00	-11.86	2.27 V	108	32.29	9.85

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	52.54 PK	74.00	-21.46	3.43 H	12	15.56	36.98
2	2390.00	41.44 AV	54.00	-12.56	3.43 H	12	4.46	36.98
3	*2437.00	97.49 PK			3.43 H	12	60.25	37.24
4	*2437.00	90.47 AV			3.43 H	12	53.23	37.24
5	2483.50	52.80 PK	74.00	-21.20	3.43 H	12	15.43	37.37
6	2483.50	42.36 AV	54.00	-11.64	3.43 H	12	4.99	37.37
7	4874.00	48.58 PK	74.00	-25.42	1.53 H	28	38.24	10.34
8	4874.00	42.45 AV	54.00	-11.55	1.53 H	28	32.11	10.34
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)	Correction Factor (dB/m)
1	2390.00	51.95 PK	74.00	-22.05	1.77 V	202	14.97	36.98
2	2390.00	41.84 AV	54.00	-12.16	1.77 V	202	4.86	36.98
3	*2437.00	102.72 PK			1.77 V	202	65.48	37.24
4	*2437.00	95.69 AV			1.77 V	202	58.45	37.24
5	2483.50	53.31 PK	74.00	-20.69	1.77 V	202	15.94	37.37
6	2483.50	42.90 AV	54.00	-11.10	1.77 V	202	5.53	37.37
7	4874.00	48.96 PK	74.00	-25.04	1.98 V	136	38.62	10.34
8	4874.00	42.82 AV	54.00	-11.18	1.98 V	136	32.48	10.34

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	*2462.00	95.74 PK			3.12 H	12	58.41	37.33
2	*2462.00	88.83 AV			3.12 H	12	51.50	37.33
3	2483.50	52.25 PK	74.00	-21.75	1.77 H	12	14.88	37.37
4	2483.50	42.67 AV	54.00	-11.33	1.77 H	12	5.30	37.37
5	4924.00	49.07 PK	74.00	-24.93	2.24 H	173	38.69	10.38
6	4924.00	42.69 AV	54.00	-11.31	2.24 H	173	32.31	10.38
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)	Correction Factor (dB/m)
1	*2462.00	101.72 PK			1.77 V	202	64.39	37.33
2	*2462.00	94.91 AV			1.77 V	202	57.58	37.33
3	2483.50	54.18 PK	74.00	-19.82	1.77 V	202	16.81	37.37
4	2483.50	43.39 AV	54.00	-10.61	1.77 V	202	6.02	37.37
5	4924.00	49.06 PK	74.00	-24.94	1.73 V	89	38.68	10.38
6	4924.00	42.89 AV	54.00	-11.11	1.73 V	89	32.51	10.38

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (HT20)	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	52.22 PK	74.00	-21.78	3.39 H	11	15.24	36.98
2	2390.00	41.83 AV	54.00	-12.17	3.39 H	11	4.85	36.98
3	*2412.00	97.69 PK			3.39 H	11	60.58	37.11
4	*2412.00	90.11 AV			3.39 H	11	53.00	37.11
5	4824.00	48.57 PK	74.00	-25.43	1.96 H	256	38.72	9.85
6	4824.00	42.30 AV	54.00	-11.70	1.96 H	256	32.45	9.85
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)	Correction Factor (dB/m)
1	2390.00	54.48 PK	74.00	-19.52	1.62 V	188	17.50	36.98
2	2390.00	43.77 AV	54.00	-10.23	1.62 V	188	6.79	36.98
3	*2412.00	102.97 PK			1.62 V	188	65.86	37.11
4	*2412.00	95.50 AV			1.62 V	188	58.39	37.11
5	4824.00	48.30 PK	74.00	-25.70	1.65 V	171	38.45	9.85
6	4824.00	42.12 AV	54.00	-11.88	1.65 V	171	32.27	9.85

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (HT20)	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	51.88 PK	74.00	-22.12	3.43 H	12	14.90	36.98
2	2390.00	41.59 AV	54.00	-12.41	3.43 H	12	4.61	36.98
3	*2437.00	97.29 PK			3.43 H	12	60.05	37.24
4	*2437.00	89.94 AV			3.43 H	12	52.70	37.24
5	2483.50	52.95 PK	74.00	-21.05	3.43 H	12	15.58	37.37
6	2483.50	42.16 AV	54.00	-11.84	3.43 H	12	4.79	37.37
7	4874.00	48.85 PK	74.00	-25.15	2.43 H	162	38.51	10.34
8	4874.00	42.67 AV	54.00	-11.33	2.43 H	162	32.33	10.34
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)	Correction Factor (dB/m)
1	2390.00	52.17 PK	74.00	-21.83	1.77 V	204	15.19	36.98
2	2390.00	41.76 AV	54.00	-12.24	1.77 V	204	4.78	36.98
3	*2437.00	102.50 PK			1.77 V	202	65.26	37.24
4	*2437.00	95.19 AV			1.77 V	202	57.95	37.24
5	2483.50	53.20 PK	74.00	-20.80	1.77 V	204	15.83	37.37
6	2483.50	42.87 AV	54.00	-11.13	1.77 V	204	5.50	37.37
7	4874.00	48.70 PK	74.00	-25.30	2.35 V	101	38.36	10.34
8	4874.00	42.52 AV	54.00	-11.48	2.35 V	101	32.18	10.34

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (HT20)	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	*2462.00	96.49 PK			3.18 H	12	59.16	37.33
2	*2462.00	89.43 AV			3.18 H	12	52.10	37.33
3	2483.50	54.38 PK	74.00	-19.62	3.18 H	12	17.01	37.37
4	2483.50	43.00 AV	54.00	-11.00	3.18 H	12	5.63	37.37
5	4924.00	48.84 PK	74.00	-25.16	2.31 H	304	38.46	10.38
6	4924.00	42.62 AV	54.00	-11.38	2.31 H	304	32.24	10.38
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)	Correction Factor (dB/m)
1	*2462.00	102.76 PK			1.77 V	202	65.43	37.33
2	*2462.00	95.40 AV			1.77 V	202	58.07	37.33
3	2483.50	55.24 PK	74.00	-18.76	1.77 V	202	17.87	37.37
4	2483.50	43.81 AV	54.00	-10.19	1.77 V	202	6.44	37.37
5	4924.00	48.72 PK	74.00	-25.28	1.61 V	157	38.34	10.38
6	4924.00	42.58 AV	54.00	-11.42	1.61 V	157	32.20	10.38

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

9 kHz ~ 30 MHz Data:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

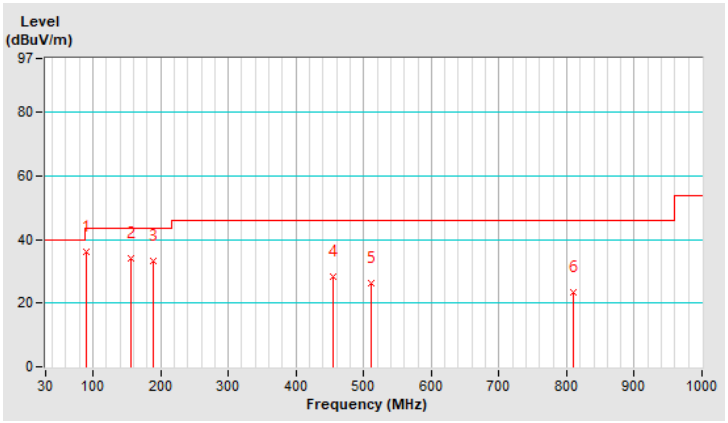
30 MHz ~ 1 GHz Worst-Case Data:

RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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)	Correction Factor (dB/m)
1	89.64	36.23 QP	43.50	-7.27	1.84 H	157	59.03	-22.80
2	155.44	33.98 QP	43.50	-9.52	1.85 H	185	50.35	-16.37
3	188.20	33.32 QP	43.50	-10.18	1.38 H	125	52.42	-19.10
4	455.65	28.55 QP	46.00	-17.45	1.32 H	26	39.96	-11.41
5	511.14	26.42 QP	46.00	-19.58	1.34 H	156	37.07	-10.65
6	810.49	23.56 QP	46.00	-22.44	1.15 H	116	28.91	-5.35

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

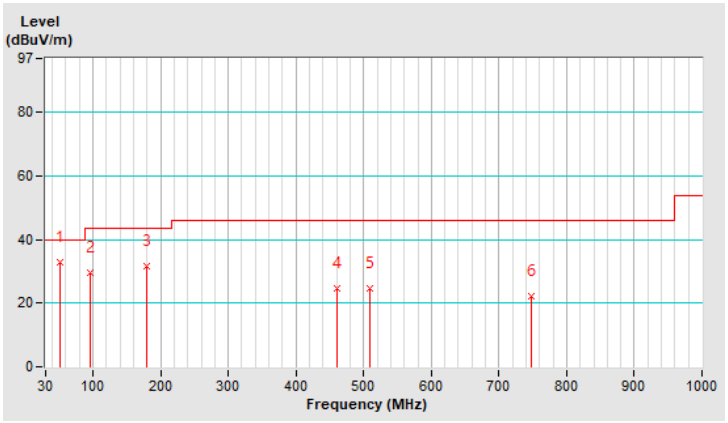


RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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)	Correction Factor (dB/m)
1	**51.44**	**32.88 QP**	**40.00**	**-7.12**	**1.32 V**	**166**	**49.90**	**-17.02**
2	95.55	29.42 QP	43.50	-14.08	1.95 V	55	51.50	-22.08
3	180.17	31.66 QP	43.50	-11.84	1.17 V	159	49.71	-18.05
4	460.22	24.50 QP	46.00	-21.50	1.47 V	355	35.84	-11.34
5	509.54	24.76 QP	46.00	-21.24	1.88 V	243	35.45	-10.69
6	748.54	22.05 QP	46.00	-23.95	1.58 V	119	28.12	-6.07

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



Mode B

Above 1 GHz Data：

RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	53.33 PK	74.00	-20.67	1.02 H	30	16.35	36.98
2	2390.00	40.28 AV	54.00	-13.72	1.02 H	30	3.30	36.98
3	*2412.00	100.09 PK			1.02 H	30	62.98	37.11
4	*2412.00	96.36 AV			1.02 H	30	59.25	37.11
5	4824.00	48.95 PK	74.00	-25.05	1.45 H	282	39.10	9.85
6	4824.00	42.72 AV	54.00	-11.28	1.45 H	282	32.87	9.85
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)	Correction Factor (dB/m)
1	2390.00	53.99 PK	74.00	-20.01	1.19 V	184	17.01	36.98
2	2390.00	45.03 AV	54.00	-8.97	1.19 V	184	8.05	36.98
3	*2412.00	105.94 PK			1.19 V	184	68.83	37.11
4	*2412.00	102.69 AV			1.19 V	184	65.58	37.11
5	4824.00	48.95 PK	74.00	-25.05	1.45 V	282	39.10	9.85
6	4824.00	42.72 AV	54.00	-11.28	1.45 V	282	32.87	9.85

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	53.07 PK	74.00	-20.93	1.00 H	100	16.09	36.98
2	2390.00	41.87 AV	54.00	-12.13	1.00 H	100	4.89	36.98
3	*2437.00	102.96 PK			1.00 H	100	65.72	37.24
4	*2437.00	100.15 AV			1.00 H	100	62.91	37.24
5	2483.50	53.91 PK	74.00	-20.09	1.00 H	100	16.54	37.37
6	2483.50	42.63 AV	54.00	-11.37	1.00 H	100	5.26	37.37
7	4874.00	50.12 PK	74.00	-23.88	2.26 H	135	39.78	10.34
8	4874.00	40.92 AV	54.00	-13.08	2.26 H	135	30.58	10.34
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)	Correction Factor (dB/m)
1	2390.00	53.31 PK	74.00	-20.69	1.50 V	217	16.33	36.98
2	2390.00	44.72 AV	54.00	-9.28	1.50 V	217	7.74	36.98
3	*2437.00	108.20 PK			1.50 V	217	70.96	37.24
4	*2437.00	106.22 AV			1.50 V	217	68.98	37.24
5	2483.50	53.74 PK	74.00	-20.26	1.50 V	217	16.37	37.37
6	2483.50	43.09 AV	54.00	-10.91	1.50 V	217	5.72	37.37
7	4874.00	48.60 PK	74.00	-25.40	1.86 V	253	38.26	10.34
8	4874.00	41.42 AV	54.00	-12.58	1.86 V	253	31.08	10.34

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11b	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	*2462.00	99.18 PK			1.00 H	122	61.85	37.33
2	*2462.00	96.34 AV			1.00 H	122	59.01	37.33
3	2483.50	55.02 PK	74.00	-18.98	1.00 H	122	17.65	37.37
4	2483.50	42.41 AV	54.00	-11.59	1.00 H	122	5.04	37.37
5	4924.00	52.66 PK	74.00	-21.34	1.57 H	264	42.28	10.38
6	4924.00	41.39 AV	54.00	-12.61	1.57 H	264	31.01	10.38
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)	Correction Factor (dB/m)
1	*2462.00	103.20 PK			1.00 V	198	65.87	37.33
2	*2462.00	100.14 AV			1.00 V	198	62.81	37.33
3	2483.50	54.55 PK	74.00	-19.45	1.00 V	198	17.18	37.37
4	2483.50	44.66 AV	54.00	-9.34	1.00 V	198	7.29	37.37
5	4924.00	52.41 PK	74.00	-21.59	2.54 V	186	42.03	10.38
6	4924.00	40.92 AV	54.00	-13.08	2.54 V	186	30.54	10.38

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	53.23 PK	74.00	-20.77	1.02 H	30	16.25	36.98
2	2390.00	43.02 AV	54.00	-10.98	1.02 H	30	6.04	36.98
3	*2412.00	98.73 PK			1.02 H	30	61.62	37.11
4	*2412.00	91.96 AV			1.02 H	30	54.85	37.11
5	4824.00	48.69 PK	74.00	-25.31	2.18 H	307	38.84	9.85
6	4824.00	42.41 AV	54.00	-11.59	2.18 H	307	32.56	9.85
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)	Correction Factor (dB/m)
1	2390.00	53.60 PK	74.00	-20.40	1.19 V	184	16.62	36.98
2	2390.00	44.37 AV	54.00	-9.63	1.19 V	184	7.39	36.98
3	*2412.00	104.21 PK			1.19 V	184	67.10	37.11
4	*2412.00	97.31 AV			1.19 V	184	60.20	37.11
5	4824.00	49.01 PK	74.00	-24.99	1.53 V	128	39.16	9.85
6	4824.00	41.79 AV	54.00	-12.21	1.53 V	128	31.94	9.85

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	52.59 PK	74.00	-21.41	1.02 H	124	15.61	36.98
2	2390.00	42.49 AV	54.00	-11.51	1.02 H	124	5.51	36.98
3	*2437.00	99.09 PK			1.02 H	124	61.85	37.24
4	*2437.00	91.72 AV			1.02 H	124	54.48	37.24
5	2483.50	53.88 PK	74.00	-20.12	1.02 H	124	16.51	37.37
6	2483.50	43.32 AV	54.00	-10.68	1.02 H	124	5.95	37.37
7	4874.00	49.45 PK	74.00	-24.55	2.36 H	153	39.11	10.34
8	4874.00	42.21 AV	54.00	-11.79	2.36 H	153	31.87	10.34
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)	Correction Factor (dB/m)
1	2390.00	53.73 PK	74.00	-20.27	1.16 V	207	16.75	36.98
2	2390.00	42.71 AV	54.00	-11.29	1.16 V	207	5.73	36.98
3	*2437.00	104.84 PK			1.16 V	207	67.60	37.24
4	*2437.00	96.93 AV			1.16 V	207	59.69	37.24
5	2483.50	53.67 PK	74.00	-20.33	1.16 V	207	16.30	37.37
6	2483.50	42.53 AV	54.00	-11.47	1.16 V	207	5.16	37.37
7	4874.00	51.76 PK	74.00	-22.24	2.26 V	137	41.42	10.34
8	4874.00	41.95 AV	54.00	-12.05	2.26 V	137	31.61	10.34

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11g	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	*2462.00	96.53 PK			1.00 H	121	59.20	37.33
2	*2462.00	89.46 AV			1.00 H	121	52.13	37.33
3	2483.50	53.62 PK	74.00	-20.38	1.00 H	121	16.25	37.37
4	2483.50	43.27 AV	54.00	-10.73	1.00 H	121	5.90	37.37
5	4924.00	49.56 PK	74.00	-24.44	2.38 H	184	39.18	10.38
6	4924.00	42.45 AV	54.00	-11.55	2.38 H	184	32.07	10.38
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)	Correction Factor (dB/m)
1	*2462.00	102.13 PK			1.04 V	197	64.80	37.33
2	*2462.00	94.87 AV			1.04 V	197	57.54	37.33
3	2483.50	53.71 PK	74.00	-20.29	1.04 V	197	16.34	37.37
4	2483.50	43.69 AV	54.00	-10.31	1.04 V	197	6.32	37.37
5	4924.00	49.14 PK	74.00	-24.86	1.75 V	91	38.76	10.38
6	4924.00	43.07 AV	54.00	-10.93	1.75 V	91	32.69	10.38

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (HT20)	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	53.53 PK	74.00	-20.47	1.02 H	30	16.55	36.98
2	2390.00	43.44 AV	54.00	-10.56	1.02 H	30	6.46	36.98
3	*2412.00	99.14 PK			1.02 H	30	62.03	37.11
4	*2412.00	92.11 AV			1.02 H	30	55.00	37.11
5	4824.00	48.68 PK	74.00	-25.32	1.35 H	243	38.83	9.85
6	4824.00	42.46 AV	54.00	-11.54	1.35 H	243	32.61	9.85
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)	Correction Factor (dB/m)
1	2390.00	56.26 PK	74.00	-17.74	1.19 V	184	19.28	36.98
2	2390.00	45.04 AV	54.00	-8.96	1.19 V	184	8.06	36.98
3	*2412.00	104.44 PK			1.19 V	184	67.33	37.11
4	*2412.00	97.48 AV			1.19 V	184	60.37	37.11
5	4824.00	49.10 PK	74.00	-24.90	1.37 V	329	39.25	9.85
6	4824.00	41.96 AV	54.00	-12.04	1.37 V	329	32.11	9.85

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (HT20)	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	2390.00	52.86 PK	74.00	-21.14	1.02 H	124	15.88	36.98
2	2390.00	42.58 AV	54.00	-11.42	1.02 H	124	5.60	36.98
3	*2437.00	98.66 PK			1.02 H	124	61.42	37.24
4	*2437.00	90.92 AV			1.02 H	124	53.68	37.24
5	2483.50	53.59 PK	74.00	-20.41	1.02 H	124	16.22	37.37
6	2483.50	43.15 AV	54.00	-10.85	1.02 H	124	5.78	37.37
7	4874.00	49.50 PK	74.00	-24.50	1.08 H	217	39.16	10.34
8	4874.00	42.27 AV	54.00	-11.73	1.08 H	217	31.93	10.34
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)	Correction Factor (dB/m)
1	2390.00	52.98 PK	74.00	-21.02	1.15 V	202	16.00	36.98
2	2390.00	43.30 AV	54.00	-10.70	1.15 V	202	6.32	36.98
3	*2437.00	104.39 PK			1.15 V	202	67.15	37.24
4	*2437.00	96.91 AV			1.15 V	202	59.67	37.24
5	2483.50	54.14 PK	74.00	-19.86	1.15 V	202	16.77	37.37
6	2483.50	43.49 AV	54.00	-10.51	1.15 V	202	6.12	37.37
7	4874.00	49.41 PK	74.00	-24.59	2.53 V	101	39.07	10.34
8	4874.00	43.16 AV	54.00	-10.84	2.53 V	101	32.82	10.34

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11n (HT20)	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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)	Correction Factor (dB/m)
1	*2462.00	96.88 PK			1.00 H	121	59.55	37.33
2	*2462.00	89.57 AV			1.00 H	121	52.24	37.33
3	2483.50	53.77 PK	74.00	-20.23	1.00 H	121	16.40	37.37
4	2483.50	43.51 AV	54.00	-10.49	1.00 H	121	6.14	37.37
5	4924.00	49.17 PK	74.00	-24.83	1.61 H	134	38.79	10.38
6	4924.00	42.90 AV	54.00	-11.10	1.61 H	134	32.52	10.38
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)	Correction Factor (dB/m)
1	*2462.00	102.70 PK			1.04 V	197	65.37	37.33
2	*2462.00	95.18 AV			1.04 V	197	57.85	37.33
3	2483.50	55.12 PK	74.00	-18.88	1.04 V	197	17.75	37.37
4	2483.50	44.10 AV	54.00	-9.90	1.04 V	197	6.73	37.37
5	4924.00	49.23 PK	74.00	-24.77	2.30 V	172	38.85	10.38
6	4924.00	43.01 AV	54.00	-10.99	2.30 V	172	32.63	10.38

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

9 kHz ~ 30 MHz Data:

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

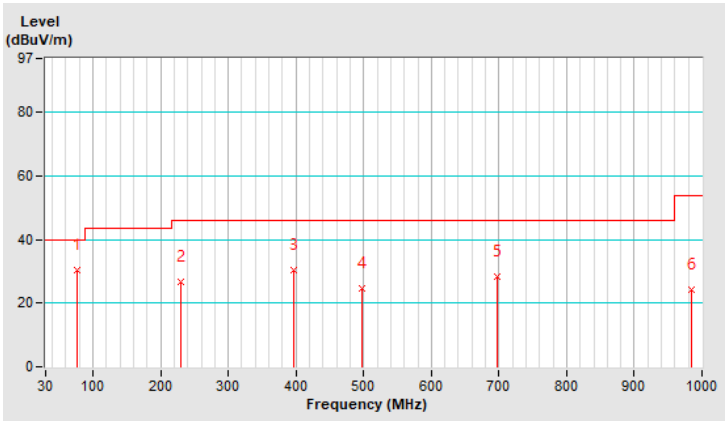
30 MHz ~ 1 GHz Worst-Case Data:

RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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)	Correction Factor (dB/m)
1	77.31	30.31 QP	40.00	-9.69	1.27 H	229	51.72	-21.41
2	229.00	26.88 QP	46.00	-19.12	2.48 H	224	45.98	-19.10
3	397.31	30.28 QP	46.00	-15.72	1.87 H	73	43.40	-13.12
4	498.13	24.59 QP	46.00	-21.41	1.04 H	237	35.37	-10.78
5	696.43	28.34 QP	46.00	-17.66	1.12 H	224	35.79	-7.45
6	984.00	24.38 QP	54.00	-29.62	2.27 H	97	26.48	-2.10

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

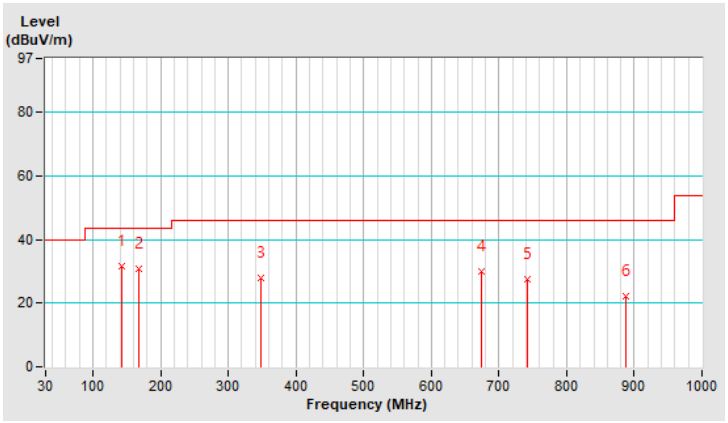


RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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)	Correction Factor (dB/m)
1	142.00	31.53 QP	43.50	-11.97	1.37 V	76	48.17	-16.64
2	167.44	30.77 QP	43.50	-12.73	2.34 V	99	47.52	-16.75
3	349.00	27.98 QP	46.00	-18.02	2.89 V	147	42.57	-14.59
4	674.00	29.91 QP	46.00	-16.09	2.13 V	173	37.68	-7.77
5	742.53	27.34 QP	46.00	-18.66	2.64 V	112	33.50	-6.16
6	887.00	22.18 QP	46.00	-23.82	1.43 V	183	26.54	-4.36

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(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

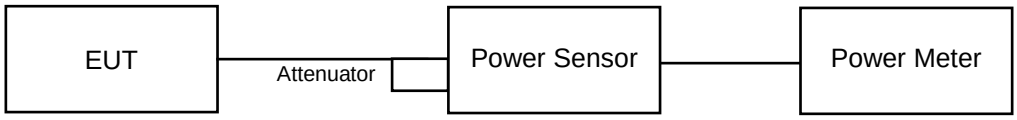


4.2 Conducted Output Power Measurement

4.2.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedures

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

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

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

4.2.7 Test Results

Mode A

802.11b

Channel	Frequency (MHz)	Peak Power		Average Power		Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2412	59.566	17.75	29.174	14.65	30	Pass
6	2437	135.207	21.31	58.479	17.67	30	Pass
11	2462	61.66	17.90	31.261	14.95	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power		Average Power		Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2412	100.693	20.03	8.072	9.07	30	Pass
6	2437	**204.644**	**23.11**	15.241	11.83	30	Pass
11	2462	102.802	20.12	7.621	8.82	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power		Average Power		Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2412	133.66	21.26	9.683	9.86	30	Pass
6	2437	200.909	23.03	14.322	11.56	30	Pass
11	2462	126.183	21.01	9.29	9.68	30	Pass

Mode B

802.11b

Channel	Frequency (MHz)	Peak Power		Average Power		Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2412	59.566	17.75	29.174	14.65	30	Pass
6	2437	135.207	21.31	58.479	17.67	30	Pass
11	2462	61.66	17.90	31.261	14.95	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power		Average Power		Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2412	100.693	20.03	8.072	9.07	30	Pass
6	2437	**204.644**	**23.11**	15.241	11.83	30	Pass
11	2462	102.802	20.12	7.621	8.82	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power		Average Power		Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2412	133.66	21.26	9.683	9.86	30	Pass
6	2437	200.909	23.03	14.322	11.56	30	Pass
11	2462	126.183	21.01	9.29	9.68	30	Pass

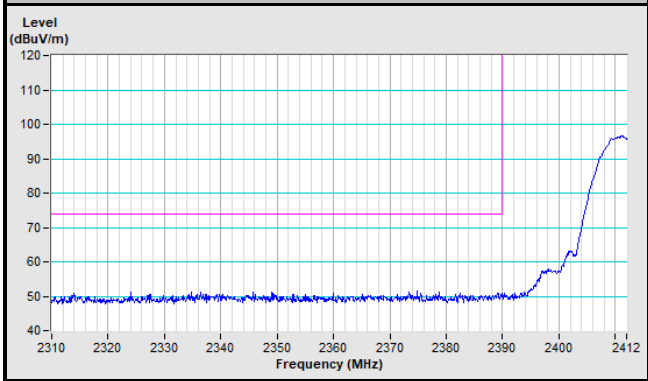
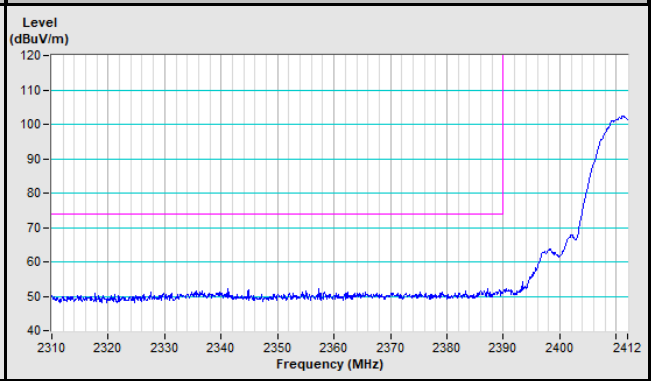
5 Pictures of Test Arrangements

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

Annex A- Band Edge Measurement

Mode A

802.11b

Ch 1	
Peak	
Horizontal	Vertical
	
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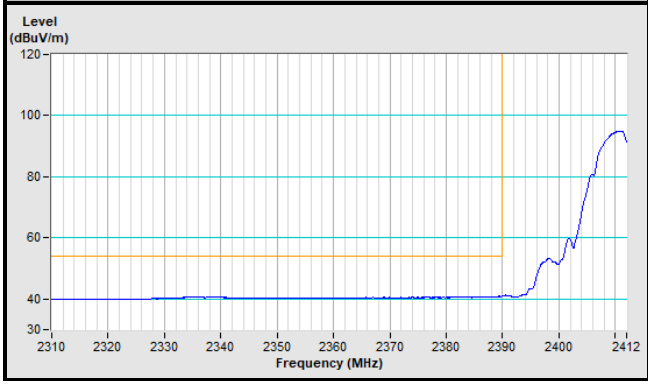
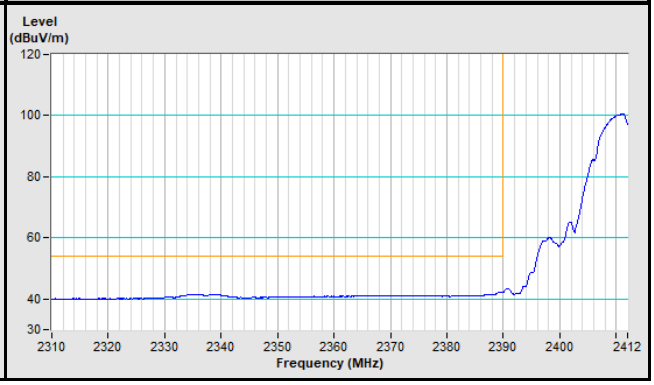
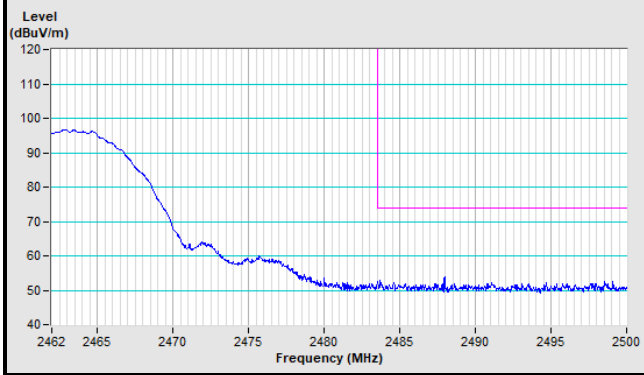
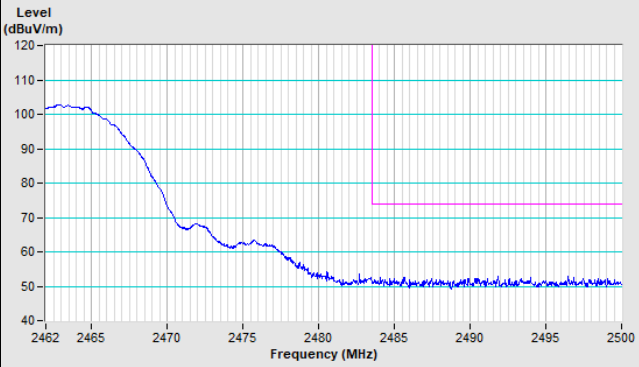
	

Ch 11	
Peak	
Horizontal	Vertical
	
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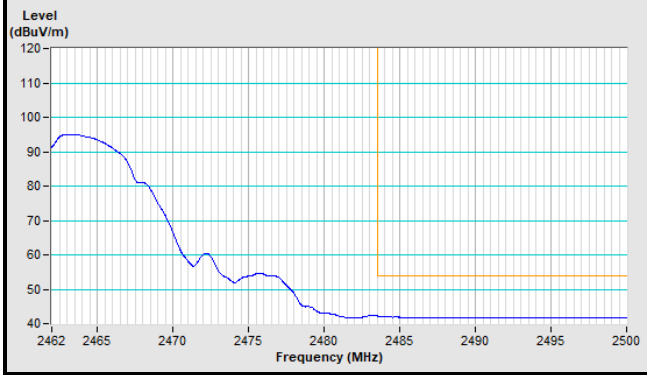
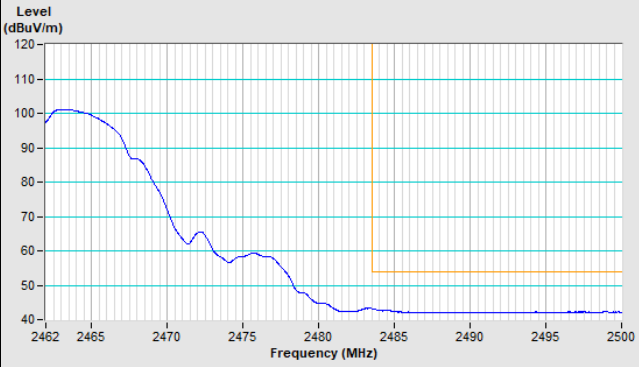
Horizontal	Vertical
	

802.11g

Ch 1	
Peak	
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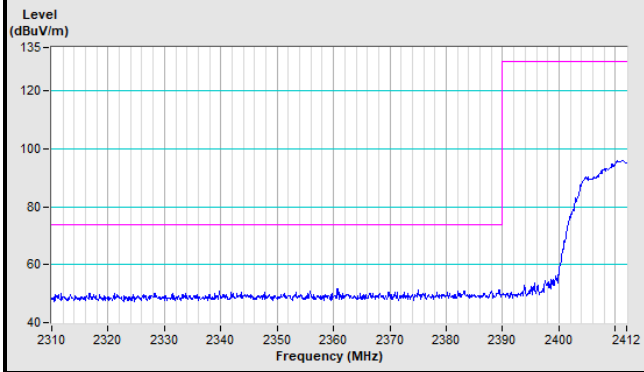	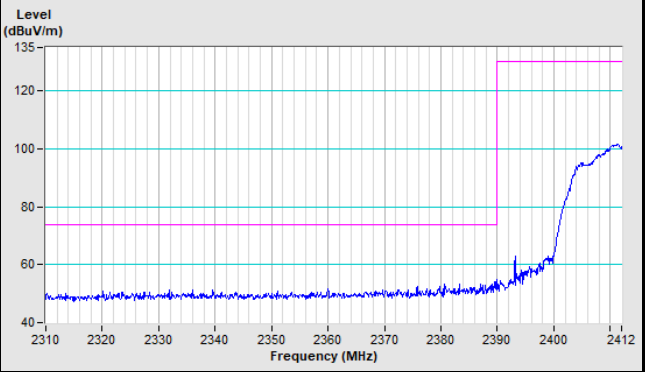
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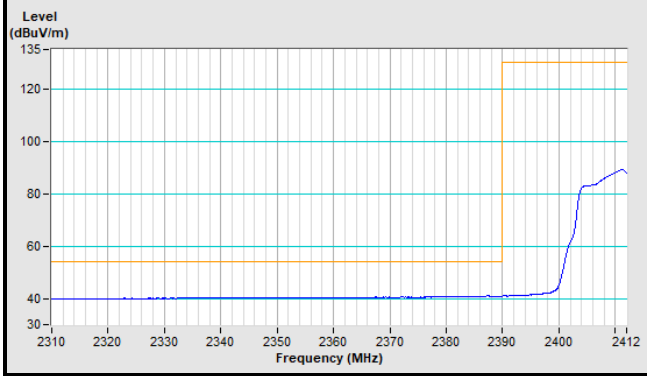
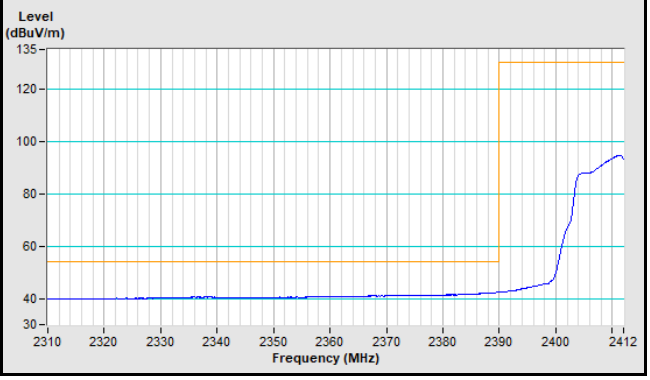
Horizontal	**Vertical**
	

Ch 11	
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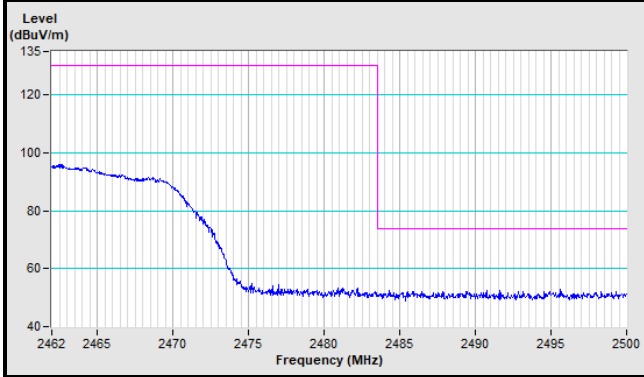	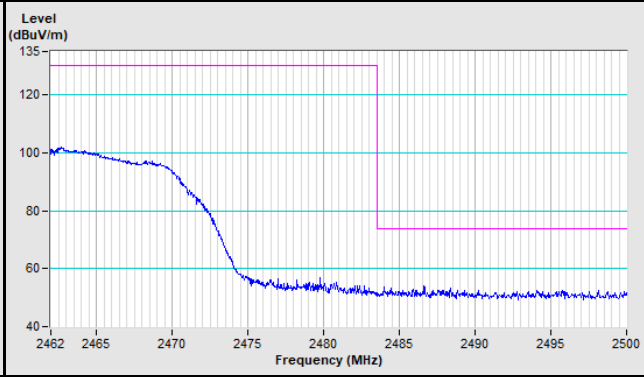
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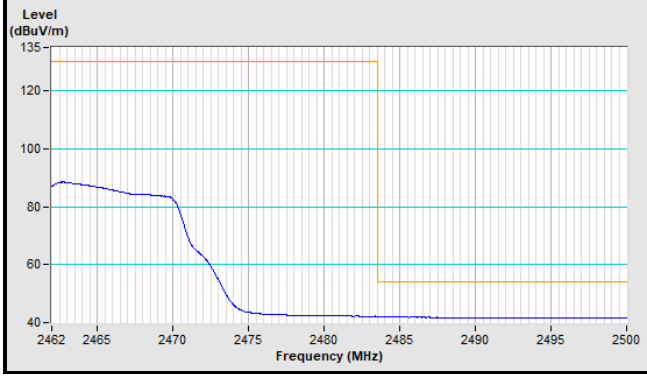
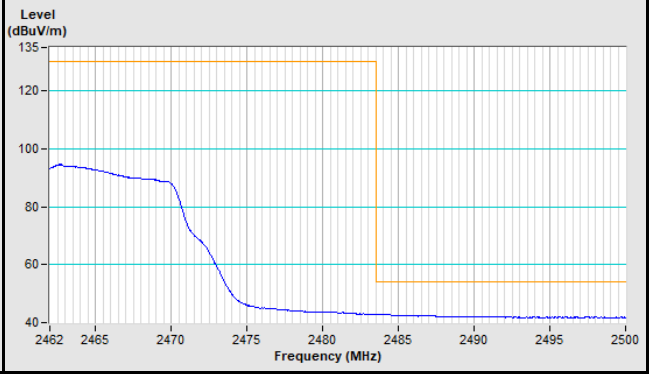
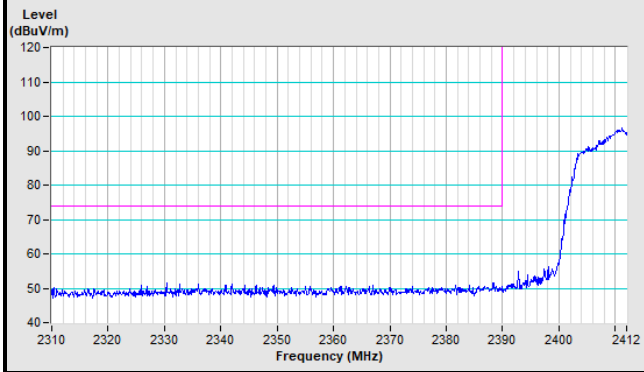
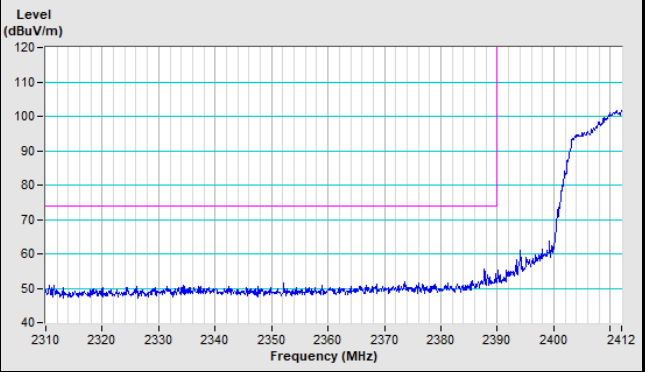
	

802.11n (HT20)

Ch 1	
Peak	
Horizontal	**Vertical**
	
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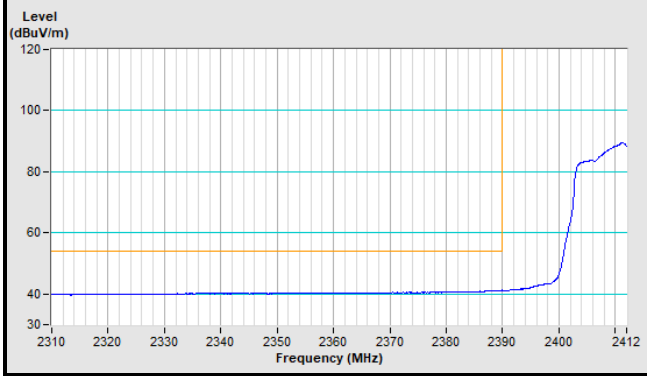
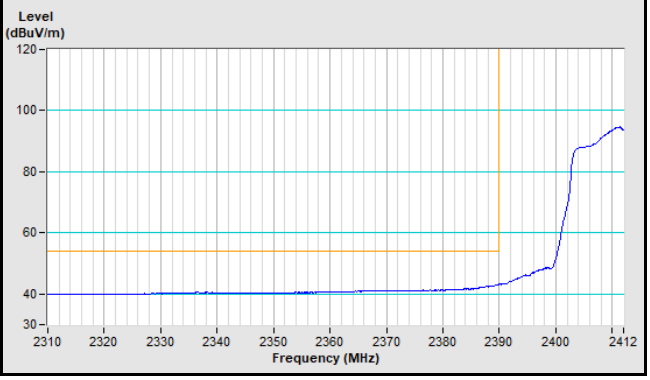
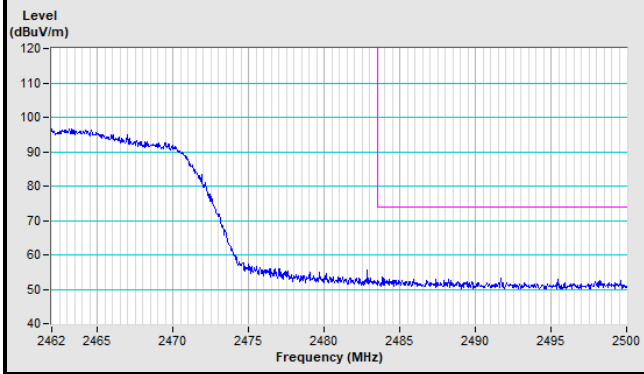
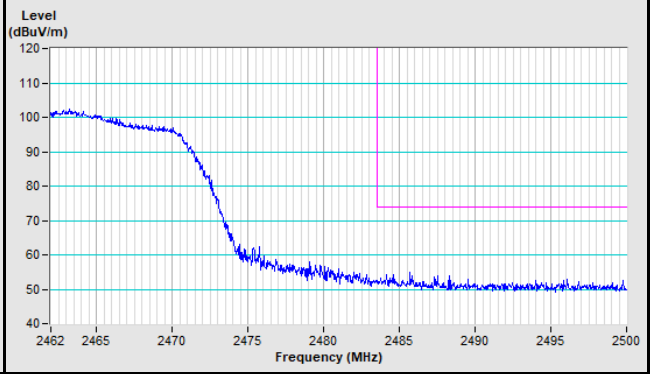
Horizontal	**Vertical**
	

Ch 11	
Peak	
Horizontal	Vertical
	
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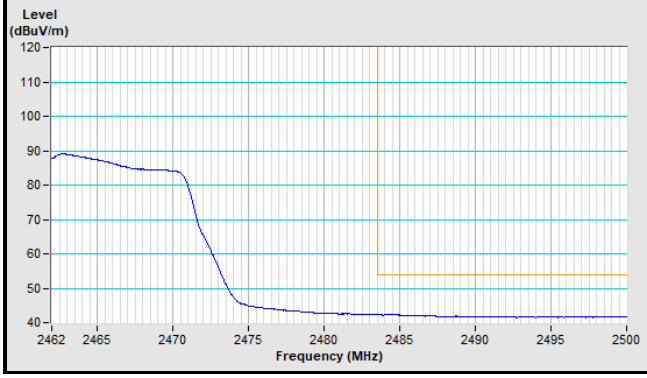	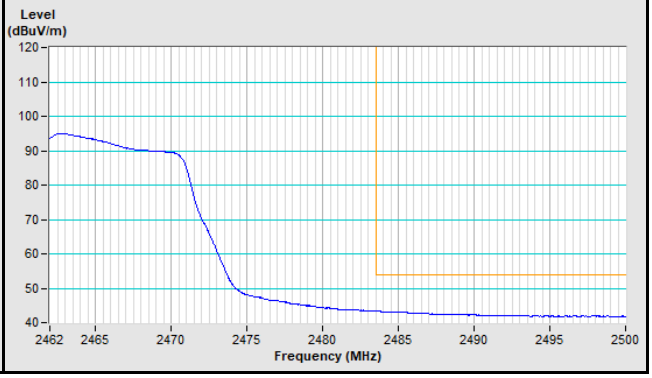

Mode B

802.11b

Ch 1	
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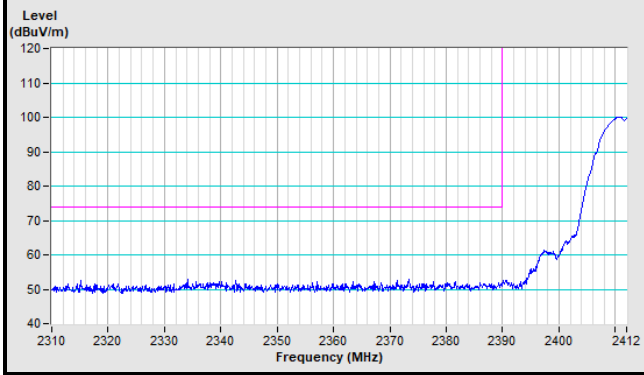
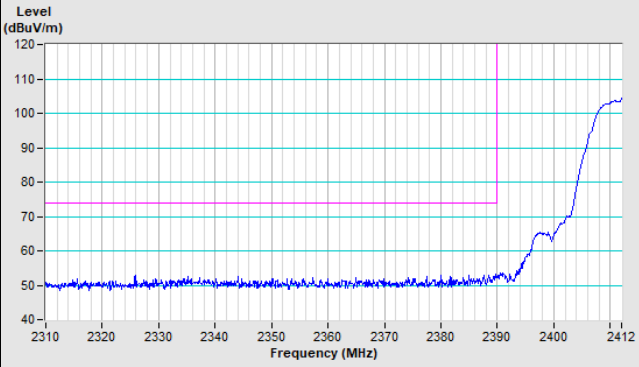
Horizontal	Vertical
	
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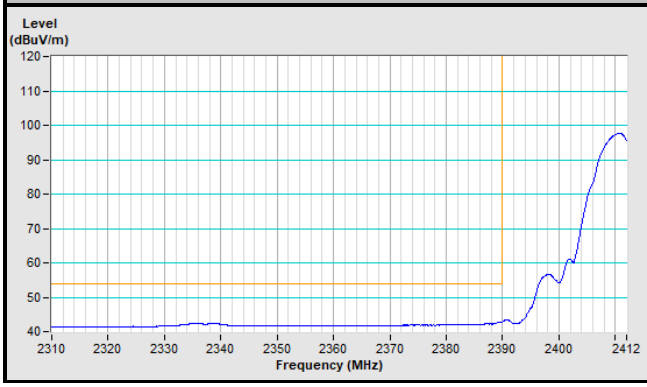
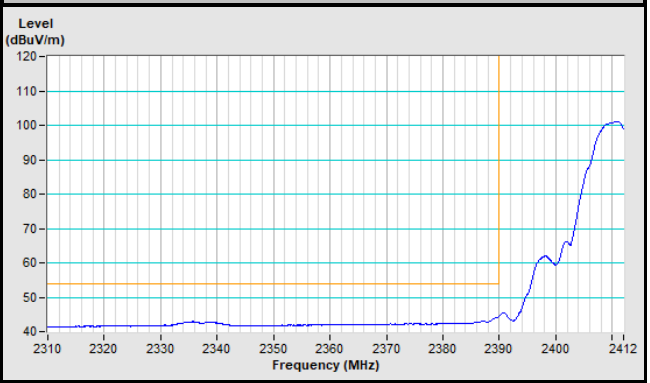
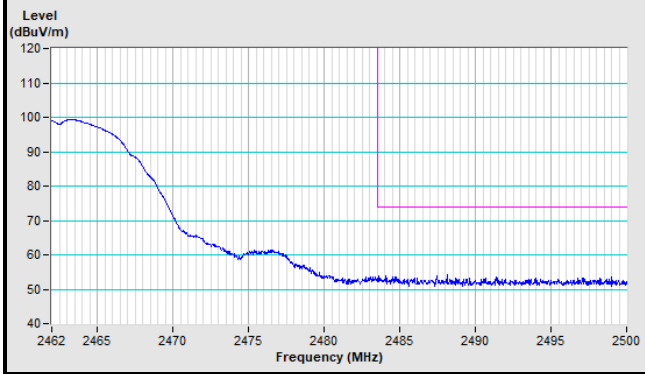
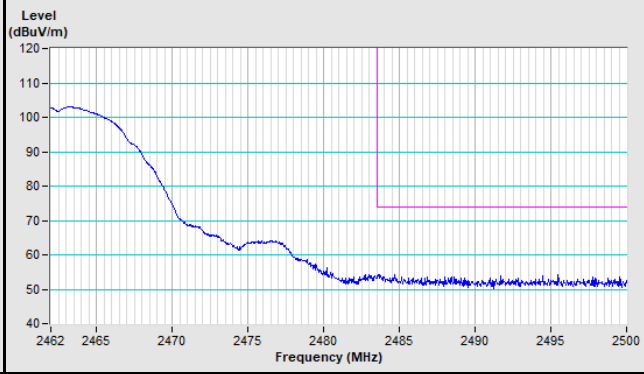
Horizontal	Vertical
	

Ch 11	
Peak	
Horizontal	Vertical
	
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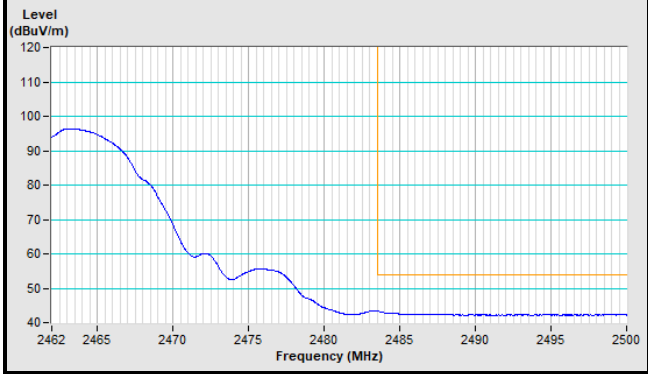
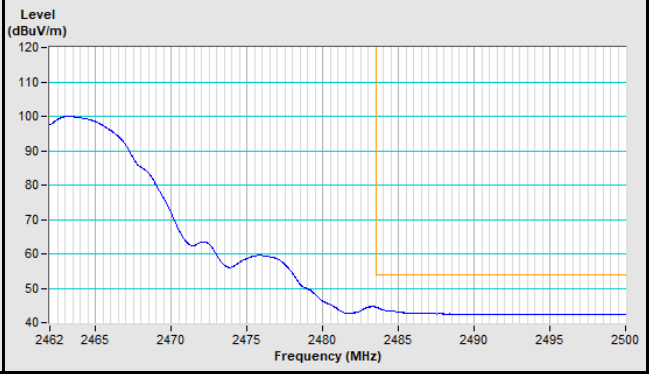
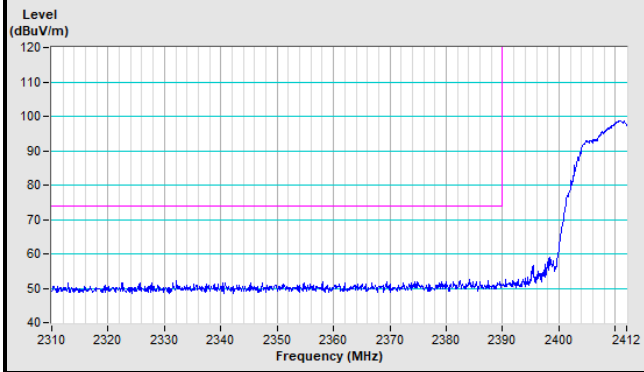
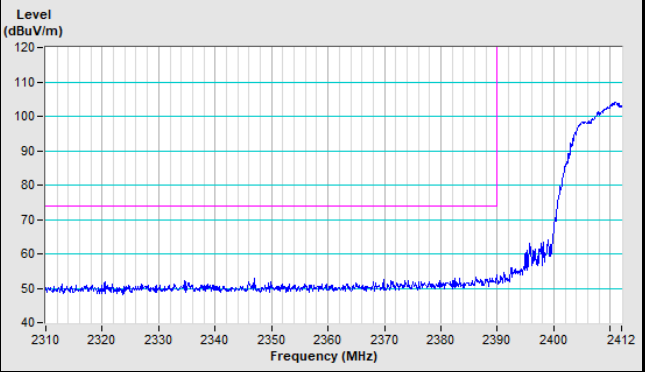
Horizontal	Vertical
	

802.11g

Ch 1	
Peak	
Horizontal	Vertical
	
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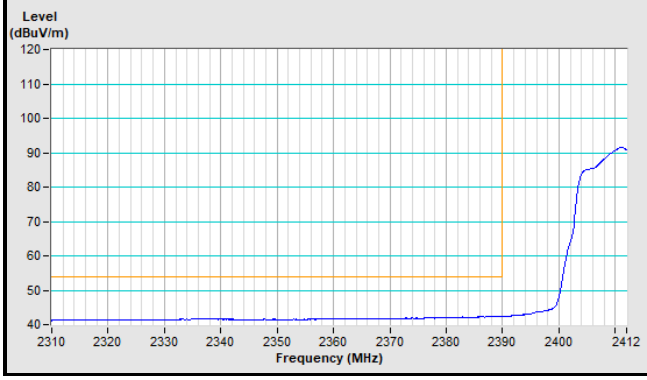
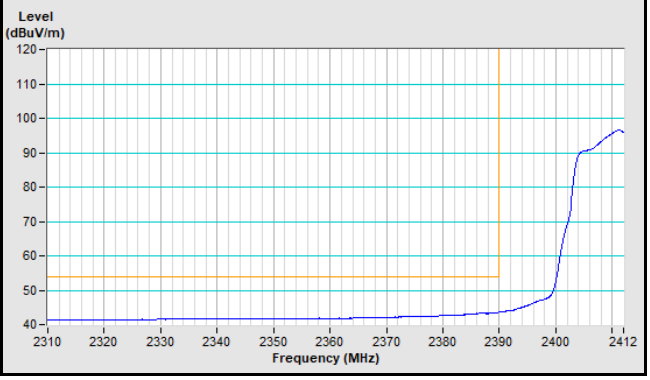
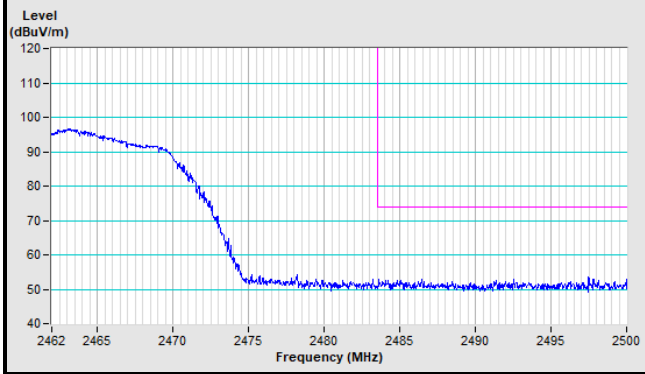
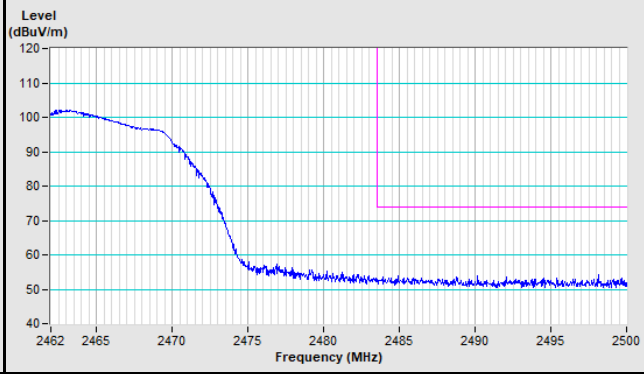
Horizontal	Vertical
	

Ch 11	
Peak	
Horizontal	Vertical
	
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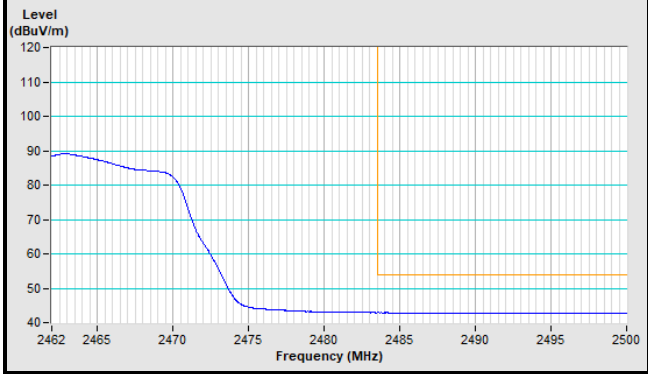
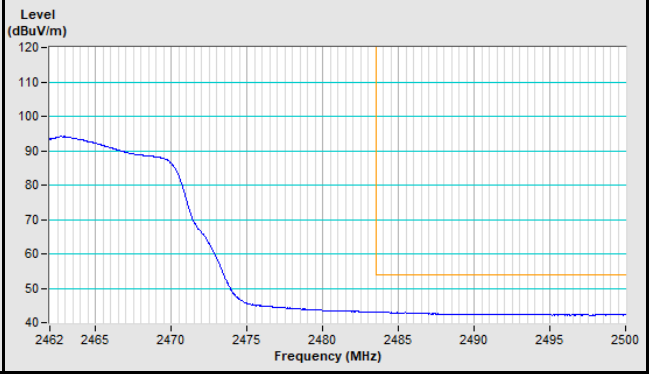
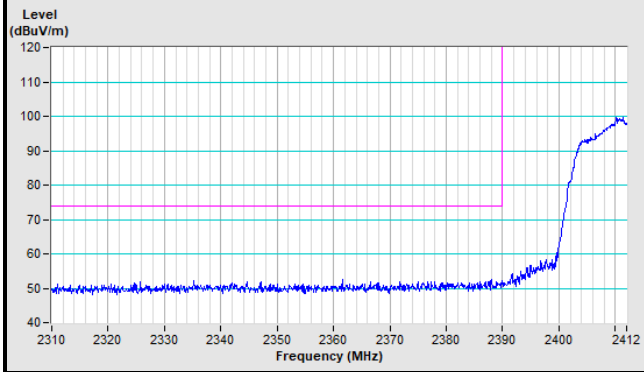
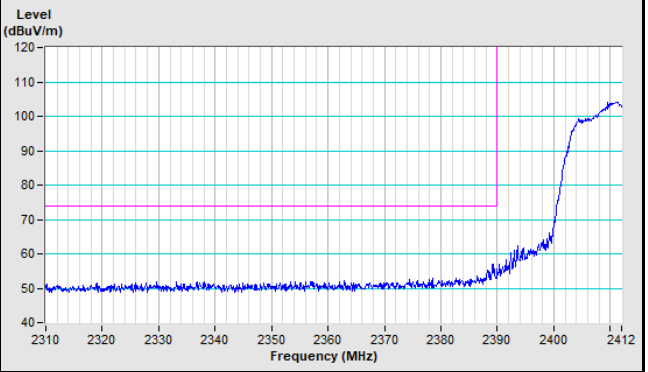
Horizontal	Vertical
	

802.11n (HT20)

Ch 1	
Peak	
Horizontal	**Vertical**
	
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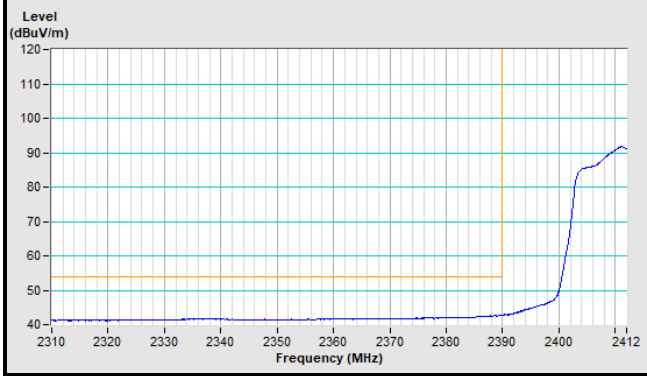
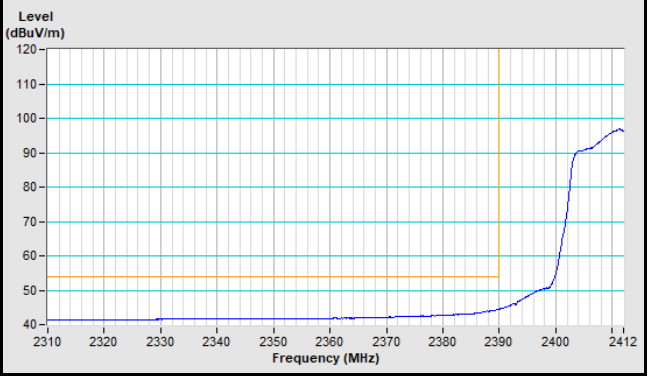
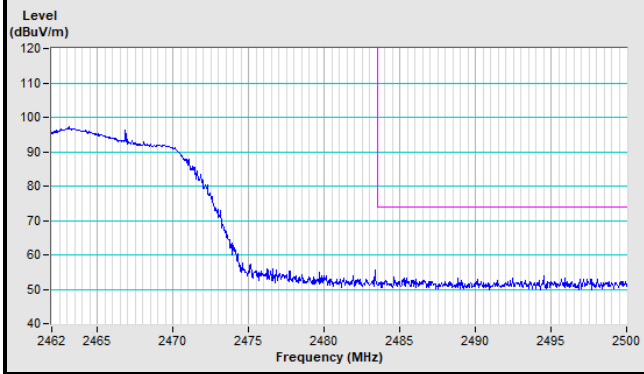
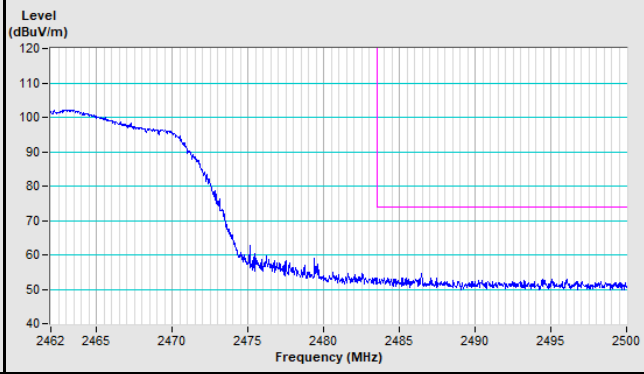
Horizontal	**Vertical**
	

Ch 11	
Peak	
Horizontal	Vertical
	
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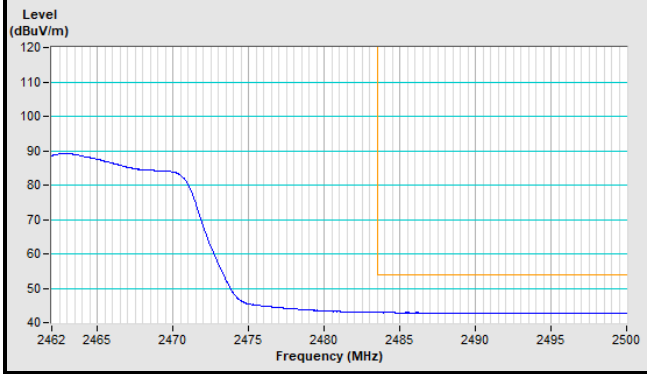
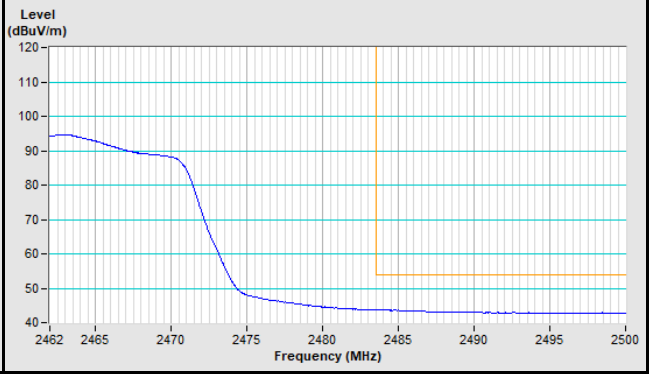
Horizontal	Vertical
	

Appendix – Information of 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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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

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

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