TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: **47 CFR FCC Part 15, Subpart C (Section 15.247)**

Report No.: RFBDKG-WTW-P23060048

FCC ID: JNZVR0035

Product: Shared Desk Docking Station

Brand: logi

Model No.: VR0035

Received Date: 2023/4/20

Test Date: 2023/5/5 ~ 2023/6/27

Issued Date: 2023/7/20

Applicant: Logitech Far East Ltd.

Address: 3930 North First Street, San Jose, California 95134

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan

FCC Registration / Designation Number: 723255 / TW2022

Approved by: Wen Yu , **Date:** **2023/7/20**

Wen Yu / Assistant Manager

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Prepared by : Vito Lung / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBDKG-WTW-P23060048	Original release.	2023/7/20

1 Certificate

Product:	Shared Desk Docking Station
Brand:	logi
Test Model:	VR0035
Sample Status:	PB2
Applicant:	Logitech Far East Ltd.
Test Date:	2023/5/5 ~ 2023/6/27
Standard:	47 CFR FCC Part 15, Subpart C (Section 15.247)
Measurement procedure:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02

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.

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Standard / Clause	Test Item	Result	Remark
15.247(b)	RF Output Power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(d)	Conducted Out of Band Emissions	Pass	Meet the requirement of limit.
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -21.42 dB at 0.15000 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -4.1 dB at 149.99, 503.00 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -4.1 dB at 4924.00 MHz
15.203	Antenna Requirement	Pass	Antenna connector is ipex(MHF) not a standard connector.

Note: 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	Specification	Expanded Uncertainty (k=2) (±)
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.5 dB
AC Power Conducted Emissions	150 kHz ~ 30 MHz	1.9 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.1 dB
	30 MHz ~ 1 GHz	5.1 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	5.0 dB
	18 GHz ~ 40 GHz	5.3 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description

Product	Shared Desk Docking Station
Brand	logi
Test Model	VR0035
Status of EUT	PB2
Power Supply Rating	Refer to Note
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 72.2 Mbps
Operating Frequency	2.412 GHz ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11
Output Power	373.25 mW (25.72 dBm)

Note:

1. There are WLAN (2.4 GHz & 5 GHz) technology used for the EUT.
2. The EUT uses following accessories.

AC Adapter			
Brand	Model	Part Number	Specification
FSP GROUP INC.	FSP180-AJAN3	534-000947	AC Input : 100-240V,2.3A,50/60Hz DC Output : 19.5V, 9.23A, 50/60Hz, 180.0W DC Output Cable : 1.76m with one core Plug : US Manufacturer : FSP Group Inc.

USB type C to type C Cable		
Brand	Model	Specification
logi	502-001494	Signal Line : shielded with one core,150cm

Power cable		
Brand	Model	Specification
logi	US:502-001445	Signal Line : unshielded, 1.6m

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

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
1	chain0	INPAQ	WA-P-LB-02-974	3.68	2.4~2.4835GHz	PIFA	ipex(MHF)
				4.36	5.15~5.25GHz		
				4.36	5.25~5.35GHz		
				4.4	5.47~5.725GHz		
				4.32	5.725~5.85GHz		
2nd source antenna	chain0	AWAN	AVP6Y 100000	2.08	2.4~2.4835GHz	PIFA	ipex(MHF)
				3.44	5.15~5.25GHz		
				3.44	5.25~5.35GHz		
				3.1	5.47~5.725GHz		
				2.41	5.725~5.85GHz		
Note: Max. gain was selected for the final test.							

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2. The EUT incorporates a SISO function:

2.4 GHz Band		
Modulation Mode	**TX & RX Configuration**	
802.11b	1TX	1RX
802.11g	1TX	1RX
802.11n (HT20)	1TX	1RX

3.3 Channel List

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20):

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

3.4 Test Mode Applicability and Tested Channel Detail

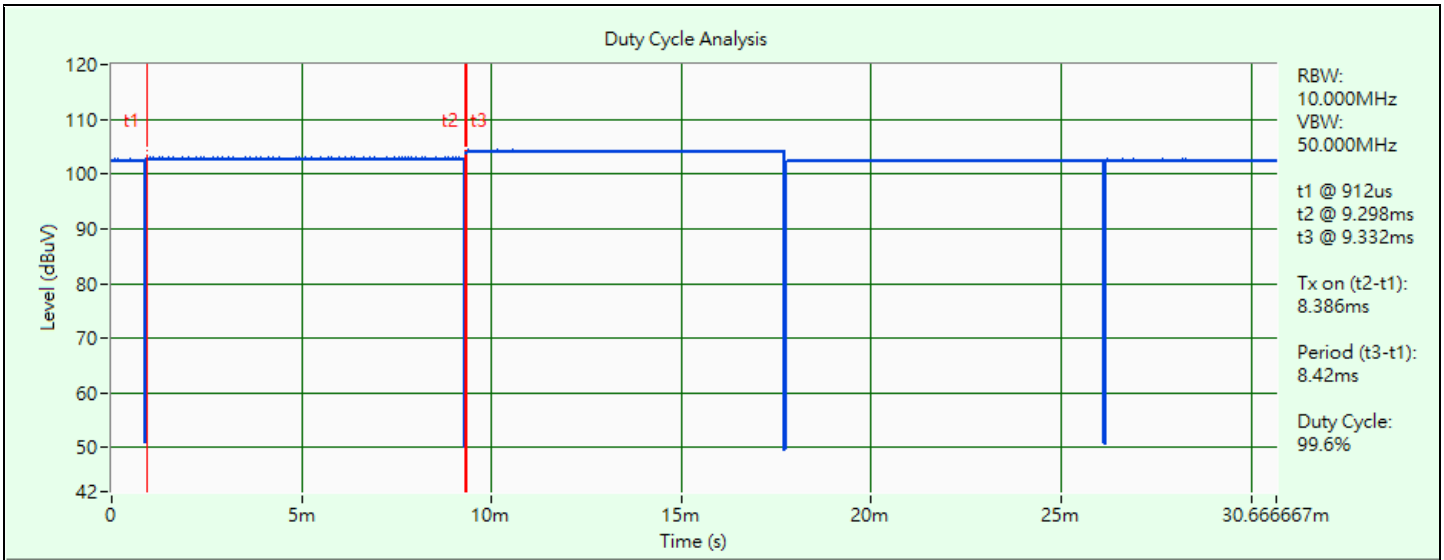
Pre-Scan:	1. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Following channel(s) was (were) selected for the final test as listed below:

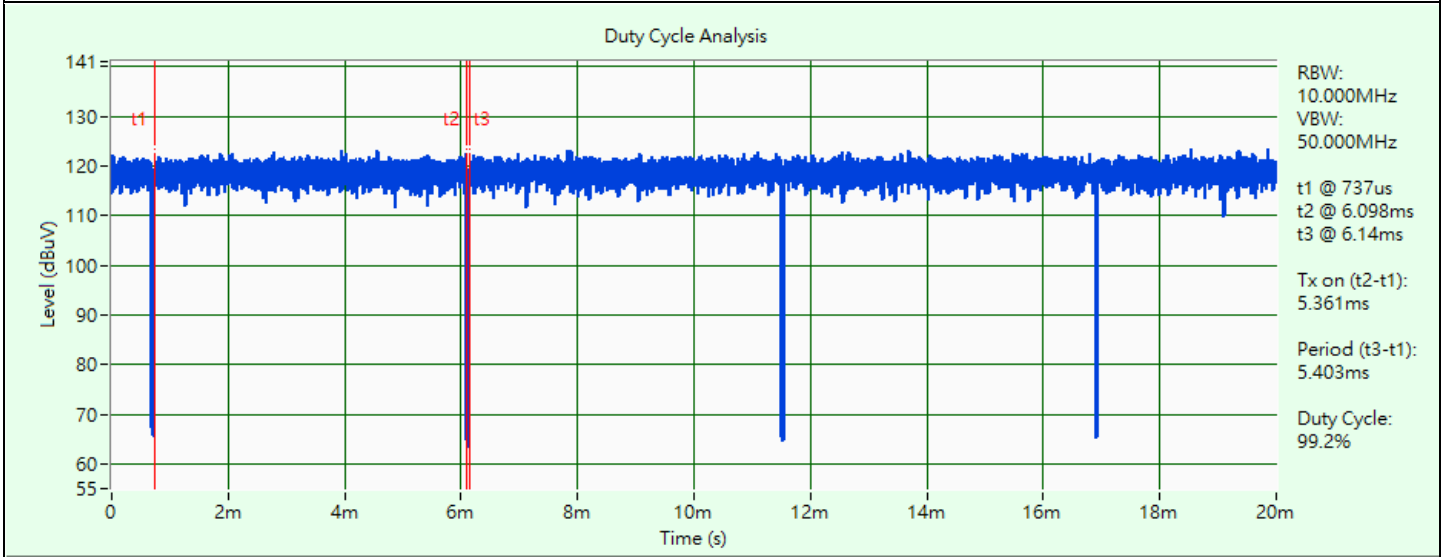
Test Item	Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power / Power Spectral Density	802.11b	1, 6, 11	DBPSK	1Mb/s
	802.11g	1, 6, 11	BPSK	6Mb/s
	802.11n (HT20)	1, 6, 11	BPSK	MCS0
6 dB Bandwidth / Conducted Out of Band Emissions	802.11b	1, 6, 11	DBPSK	1Mb/s
	802.11g	1, 6, 11	BPSK	6Mb/s
	802.11n (HT20)	1, 6, 11	BPSK	MCS0
AC Power Conducted Emissions	802.11g	6	BPSK	6Mb/s
Unwanted Emissions below 1 GHz	802.11g	6	BPSK	6Mb/s
Unwanted Emissions above 1 GHz	802.11b	1, 6, 11	DBPSK	1Mb/s
	802.11g	1, 6, 11	BPSK	6Mb/s
	802.11n (HT20)	1, 6, 11	BPSK	MCS0

3.5 Duty Cycle of Test Signal

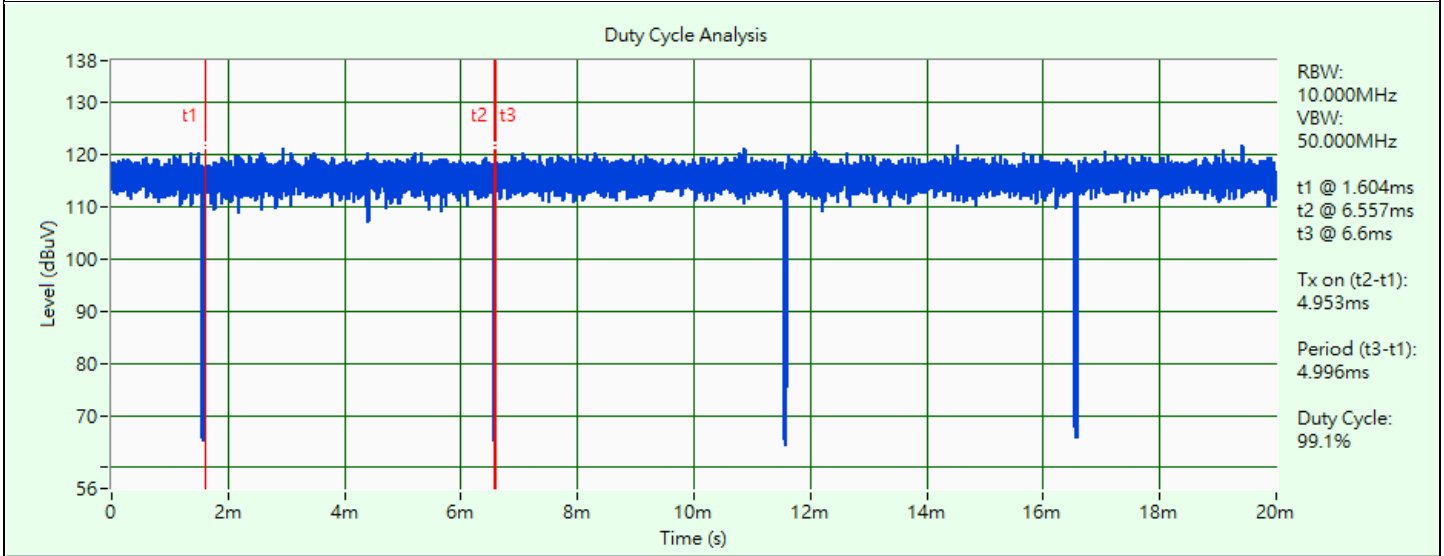
802.11b: Duty cycle = 8.386 ms / 8.42 ms x 100% = 99.6%
802.11g: Duty cycle = 5.361 ms / 5.403 ms x 100% = 99.2%
802.11n (HT20): Duty cycle = 4.953 ms / 4.996 ms x 100% = 99.1%



802.11b



802.11g

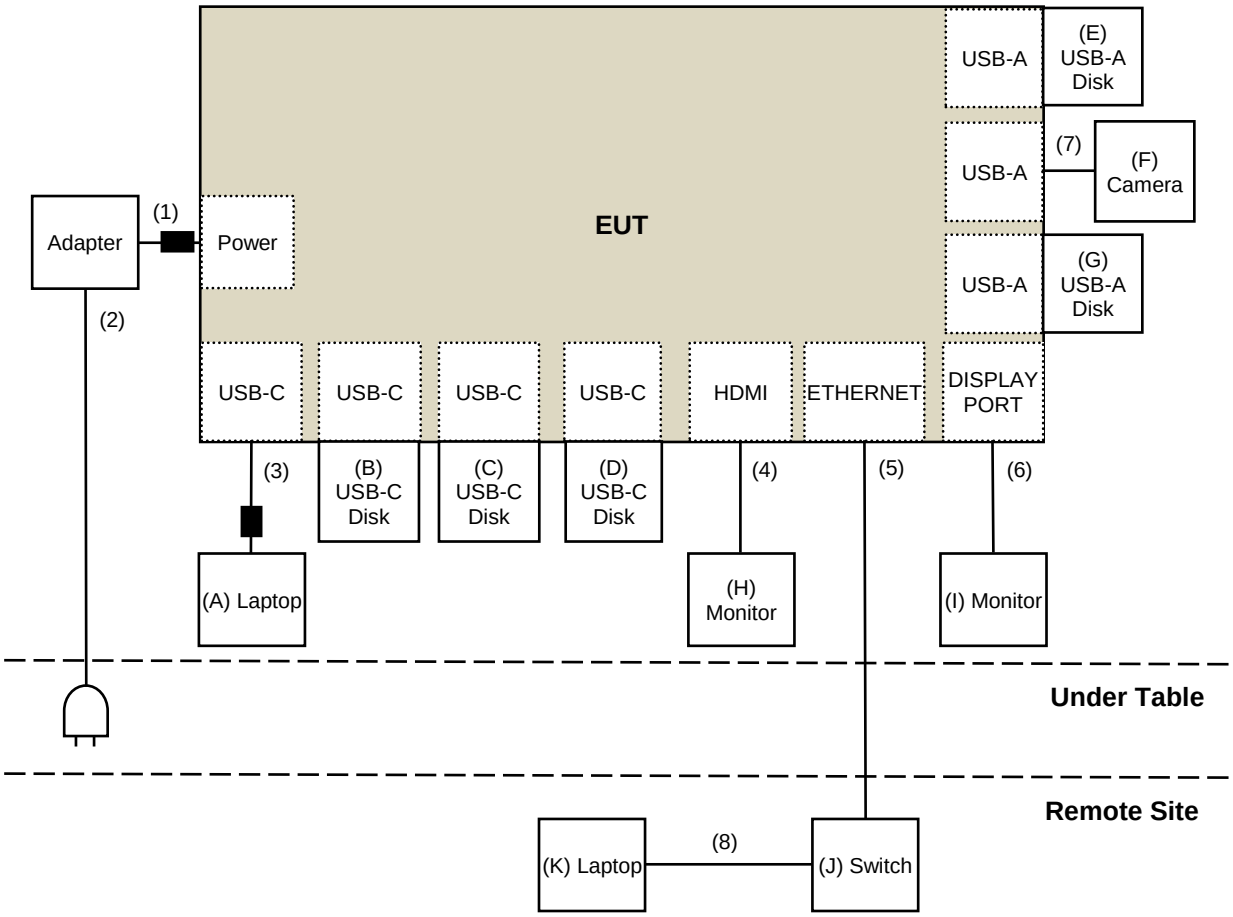


802.11n (HT20)

3.6 Test Program Used and Operation Descriptions

Controlling software (spmeta_cotms_20220117_addhqa Meta2) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	DELL	P80F	5GMFM33	DoC	Provided by Lab
B	USB-C Disk	SanDisk	NA	NA	NA	Provided by Lab
C	USB-C Disk	SanDisk	NA	NA	NA	Provided by Lab
D	USB-C Disk	SanDisk	NA	NA	NA	Provided by Lab
E	USB-A Disk	SanDisk	NA	NA	NA	Provided by Lab
F	Camera	logitech	V-U0040	NA	NA	Supplied by applicant
G	USB-A Disk	SanDisk	NA	NA	NA	Provided by Lab
H	Monitor	DELL	P2415Q	CN-0J1P7F-QDC00-85L-13GB-A09	DoC	Provided by Lab
I	Monitor	ASUS	PA279	N5LMTF047641	NA	Provided by Lab
J	Switch	D-Link	DGS-1005D	DR8WC92000523	NA	Provided by Lab
K	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	NA	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.76	No	1	Supplied by applicant
2	AC Cable	1	1.6	No	0	Supplied by applicant
3	USB type C to type C Cable	1	1.5	Yes	1	Supplied by applicant
4	HDMI Cable	1	2	Yes	0	Provided by Lab
5	RJ45 Cable	1	10	No	0	Provided by Lab
6	Display Cable	1	2	Yes	0	Provided by Lab
7	USB type A to type C Cable	1	2.2	Yes	0	Supplied by applicant
8	RJ45 Cable	1	3	No	0	Provided by Lab

4 Test Instruments

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

4.1 RF Output Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Fixed Attenuator Woken	MDCS18N-10	MDCS18N-10-01	2023/3/27	2024/3/26
Power Meter Anritsu	ML2495A	1529002	2022/6/22	2023/6/21
Pulse Power Sensor Anritsu	MA2411B	1726434	2022/6/22	2023/6/21

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/5/29

4.2 Power Spectral Density

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Fixed Attenuator Woken	MDCS18N-10	MDCS18N-10-01	2023/3/27	2024/3/26
MXA Signal Analyzer Keysight	N9020B	MY60112409	2023/2/18	2024/2/17
Software	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/5/29

4.3 6 dB Bandwidth

Refer to section 4.2 to get information of the instruments.

4.4 Conducted Out of Band Emissions

Refer to section 4.2 to get information of the instruments.

4.5 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance	N/A	EMC-01	2022/9/27	2023/9/26
EMI Test Receiver R&S	ESCS 30	847124/029	2022/10/14	2023/10/13
Fixed Attenuator STI	STI02-2200-10	005	2022/8/24	2023/8/23
LISN R&S	ESH3-Z5	848773/004	2022/10/18	2023/10/17
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2022/8/24	2023/8/23
Software BVADT	BVADT_Cond_V7.3.7.4	N/A	N/A	N/A

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2023/6/20

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-0942	2022/10/20	2023/10/19
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-01	2022/12/28	2023/12/27
Loop Antenna Electro-Metrics	EM-6879	264	2023/2/21	2024/2/20
MXA Signal Analyzer Keysight	N9020B	MY60112410	2023/3/6	2024/3/5
MXE EMI Receiver Keysight	N9038A	MY59050100	2023/6/13	2024/6/12
Preamplifier EMCI	EMC330N	980852	2023/2/20	2024/2/19
	EMC001340	980142	2023/5/8	2024/5/7
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2022/12/19	2023/12/18
		LOOPCAB-002	2022/12/19	2023/12/18
RF Coaxial Cable PEWC	8D	966-6-1	2023/4/6	2024/4/5
		966-6-2	2023/4/6	2024/4/5
		966-6-3	2023/4/6	2024/4/5
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 6.
2. Tested Date: 2023/6/27

4.7 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-2035	2022/11/13	2023/11/12
	BBHA 9170	BBHA9170519	2022/11/13	2023/11/12
MXA Signal Analyzer Keysight	N9020B	MY60112410	2023/3/6	2024/3/5
MXE EMI Receiver Keysight	N9038A	MY59050100	2022/6/20 2023/6/13	2023/6/19 2024/6/12
Preamplifier EMCI	EMC12630SE	980385	2022/8/15	2023/8/14
	EMC184045SE	980387	2022/12/28	2023/12/27
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2023/2/20	2024/2/19
	EMC101G-KM-KM-10000	210708	2022/11/4	2023/11/3
	EMC102-KM-KM-1200	160924	2022/12/28	2023/12/27
	EMC104-SM-SM-1300	210205	2022/5/10 2023/5/8	2023/5/9 2024/5/7
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 6.
2. Tested Date: 2023/5/5 ~ 2023/6/26

5 Limits of Test Items

5.1 RF Output Power

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

5.2 Power Spectral Density

The Maximum of Power Spectral Density Measurement is 8 dBm in any 3 kHz.

5.3 6 dB Bandwidth

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

5.4 Conducted Out of Band Emissions

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

5.5 AC Power Conducted Emissions

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Notes:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.6 Unwanted Emissions below 1 GHz

Radiated emissions up to 1 GHz 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

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

5.7 Unwanted Emissions above 1 GHz

Radiated emissions above 1 GHz 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)
Above 960	500	3

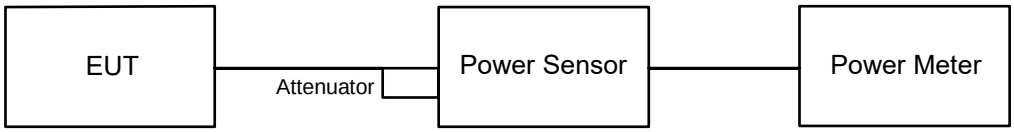
Notes:

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.

6 Test Arrangements

6.1 RF Output Power

6.1.1 Test Setup



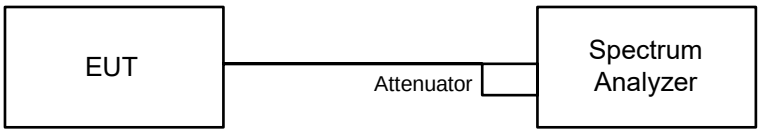
6.1.2 Test Procedure

Peak Power:
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:
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.

6.2 Power Spectral Density

6.2.1 Test Setup

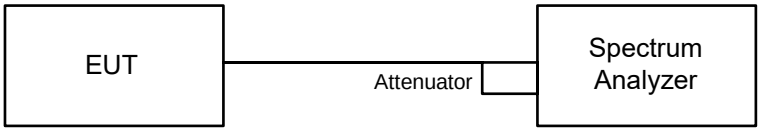


6.2.2 Test Procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

6.3 6 dB Bandwidth

6.3.1 Test Setup

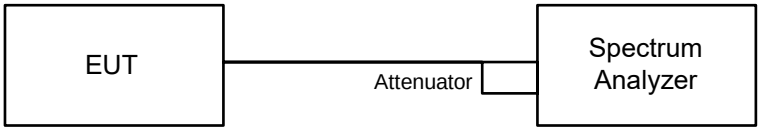


6.3.2 Test Procedure

a. Set resolution bandwidth (RBW) = 100 kHz.
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.4 Conducted Out of Band Emissions

6.4.1 Test Setup



6.4.2 Test Procedure

MEASUREMENT PROCEDURE REF

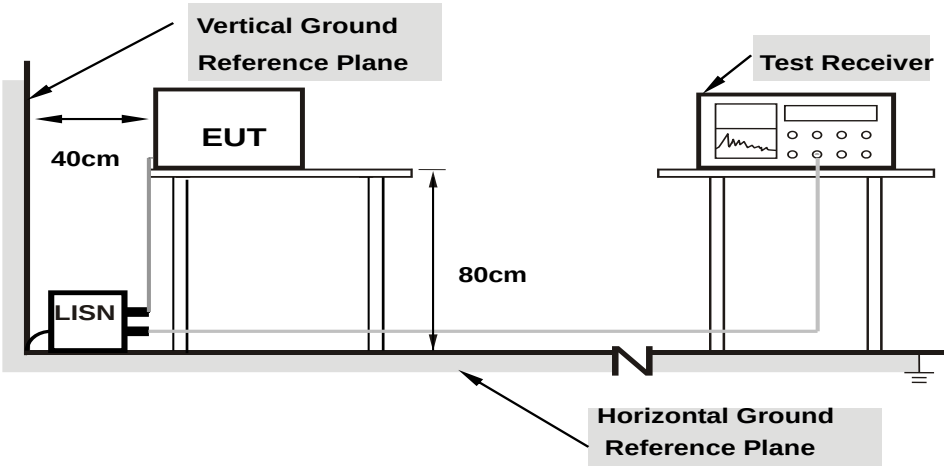
a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep = auto couple.
e. Trace Mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum amplitude level.

6.5 AC Power Conducted Emissions

6.5.1 Test Setup



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

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

6.5.2 Test Procedure

a. The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.

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

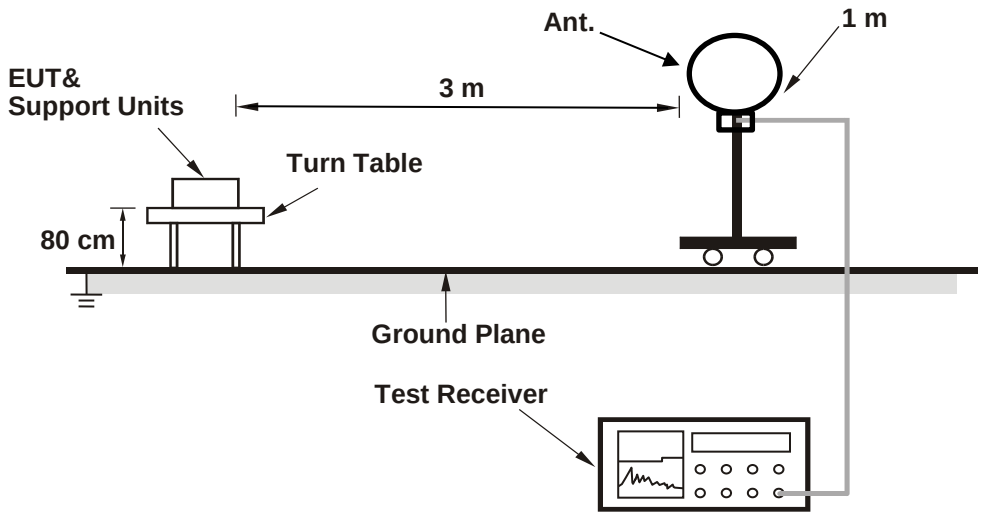
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.

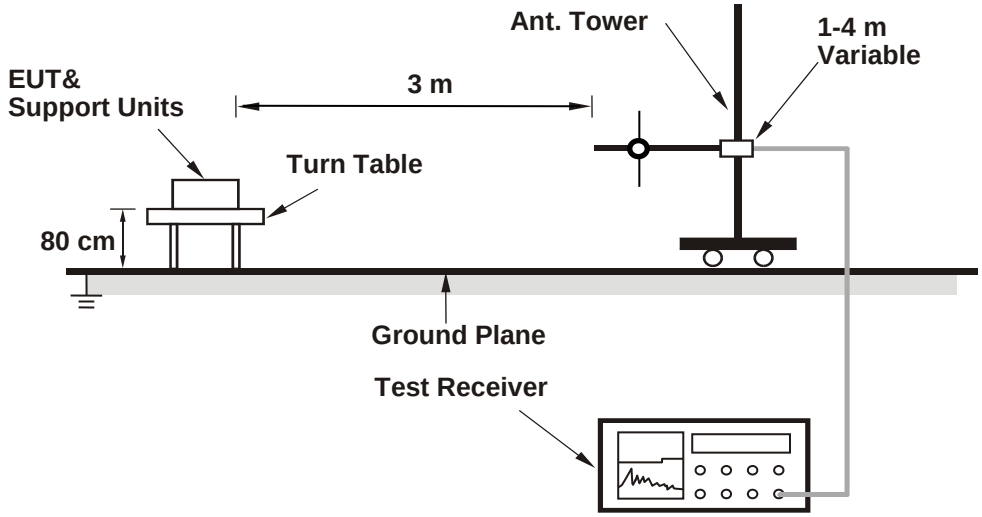
6.6 Unwanted Emissions below 1 GHz

6.6.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



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

6.6.2 Test Procedure

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 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. 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, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated emission above 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters 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.

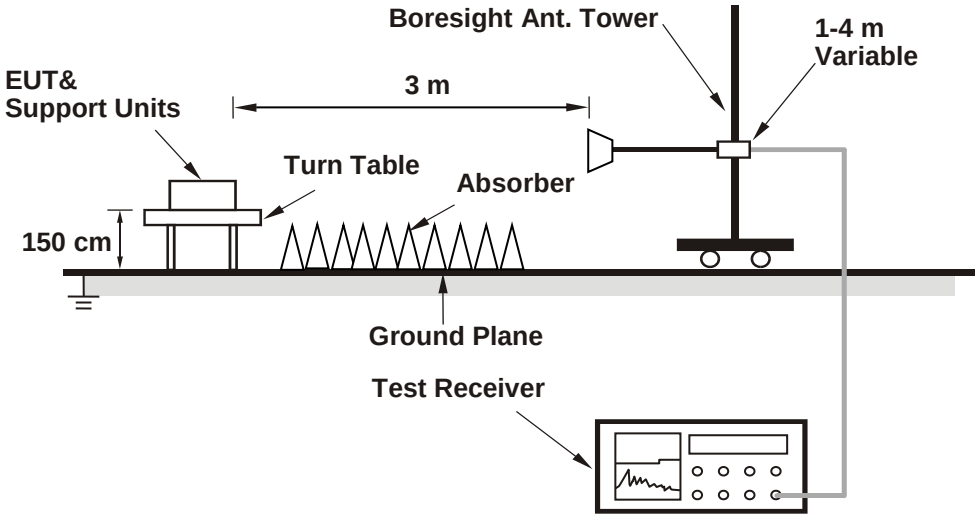
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Notes:

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

6.7 Unwanted Emissions above 1 GHz

6.7.1 Test Setup



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

6.7.2 Test Procedure

a. The EUT was placed on the top of a rotating table 1.5 meters 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 peak and average detects 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.

Notes:

1. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
2. For fundamental and harmonic signal measurement, 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.
3. All modes of operation were investigated and the worst-case emissions are reported.

7 Test Results of Test Item

7.1 RF Output Power

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	John Peng

For Peak Power

802.11b

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
1	2412	38.194	15.82	30	Pass
6	2437	39.628	15.98	30	Pass
11	2462	38.282	15.83	30	Pass

Note: The antenna gain is 3.68 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
1	2412	225.424	23.53	30	Pass
6	2437	372.392	25.71	30	Pass
11	2462	226.986	23.56	30	Pass

Note: The antenna gain is 3.68 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
1	2412	200.447	23.02	30	Pass
6	2437	373.25	25.72	30	Pass
11	2462	181.552	22.59	30	Pass

Note: The antenna gain is 3.68 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	21.827	13.39
6	2437	21.677	13.36
11	2462	21.979	13.42

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	34.594	15.39
6	2437	122.18	20.87
11	2462	42.462	16.28

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	34.754	15.41
6	2437	119.674	20.78
11	2462	34.514	15.38

7.2 Power Spectral Density

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	John Peng

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
1	2412	-6.94	8	Pass
6	2437	-7.69	8	Pass
11	2462	-6.69	8	Pass

Note: The antenna gain is 3.68 dBi < 6 dBi, so the power density limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
1	2412	-7.72	8	Pass
6	2437	-2.24	8	Pass
11	2462	-6.76	8	Pass

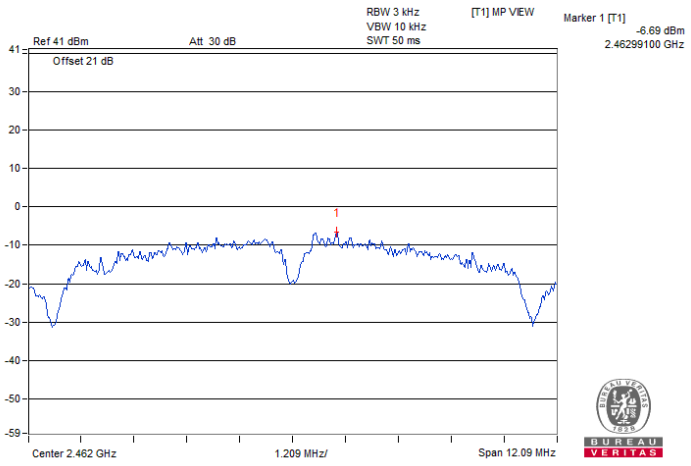
Note: The antenna gain is 3.68 dBi < 6 dBi, so the power density limit shall not be reduced.

802.11n (HT20)

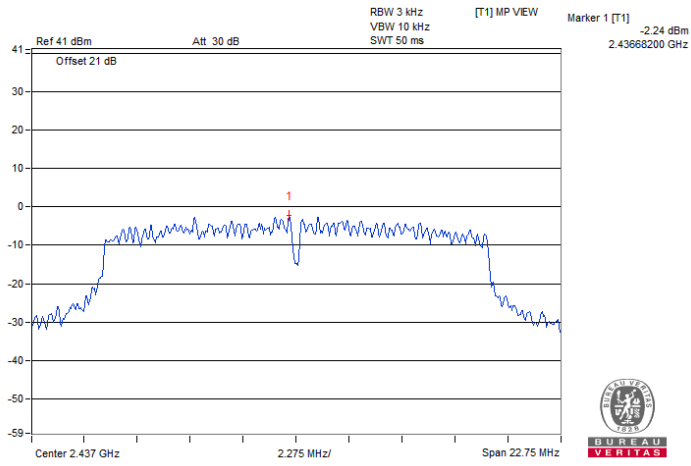
Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
1	2412	-8.48	8	Pass
6	2437	-2.08	8	Pass
11	2462	-8.29	8	Pass

Note: The antenna gain is 3.68 dBi < 6 dBi, so the power density limit shall not be reduced.

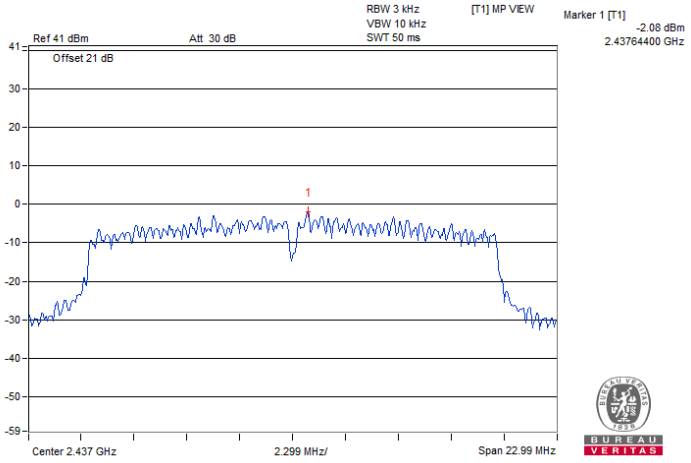
Spectrum Plot of Maximum Value



802.11b : CH 11



802.11g : CH 6



802.11n (HT20) : CH 6

7.3 6 dB Bandwidth

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	John Peng

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
1	2412	8.05	0.5	Pass
6	2437	8.06	0.5	Pass
11	2462	8.06	0.5	Pass

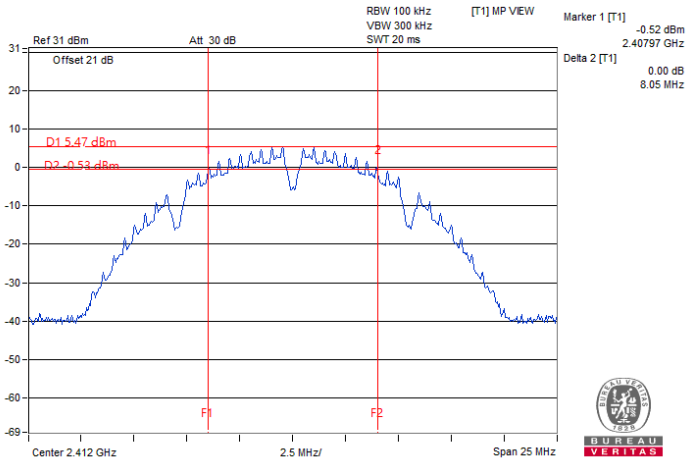
802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
1	2412	15.16	0.5	Pass
6	2437	15.17	0.5	Pass
11	2462	15.34	0.5	Pass

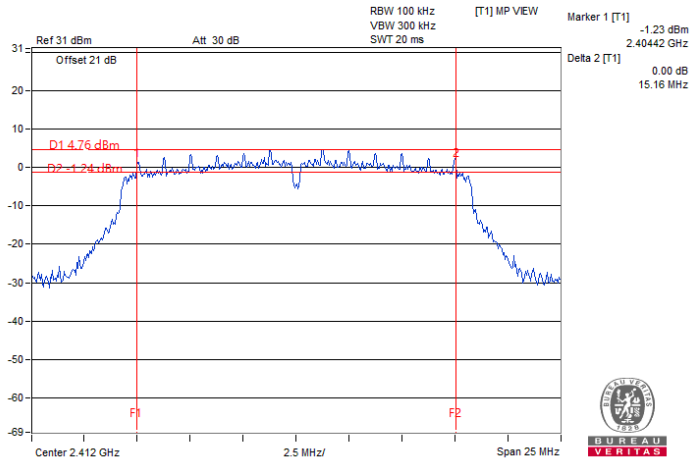
802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
1	2412	15.16	0.5	Pass
6	2437	15.33	0.5	Pass
11	2462	15.49	0.5	Pass

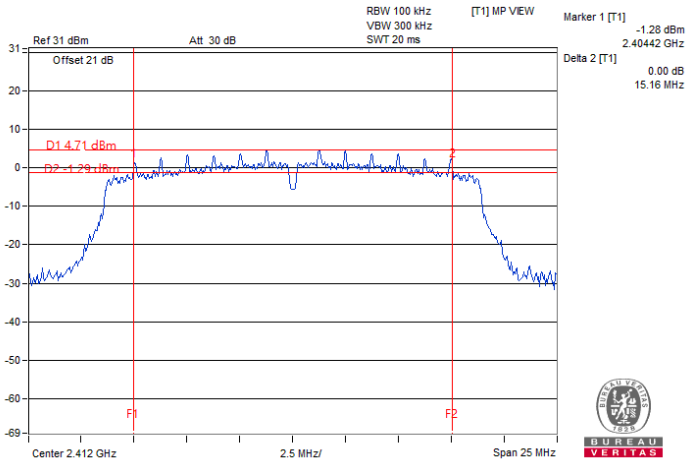
Spectrum Plot of Minimum Value



802.11b : CH 1



802.11g : CH 1

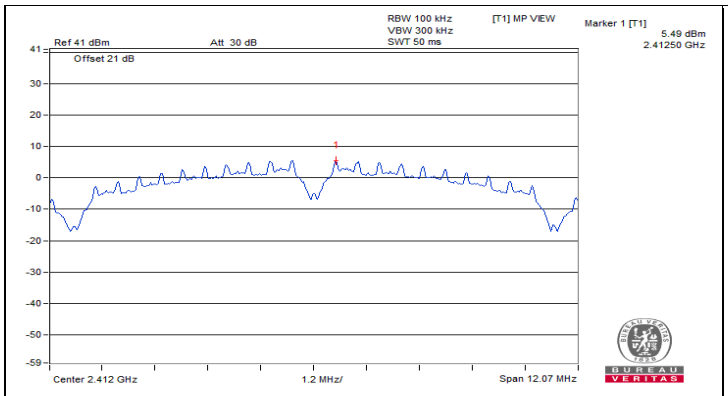


802.11n (HT20) : CH 1

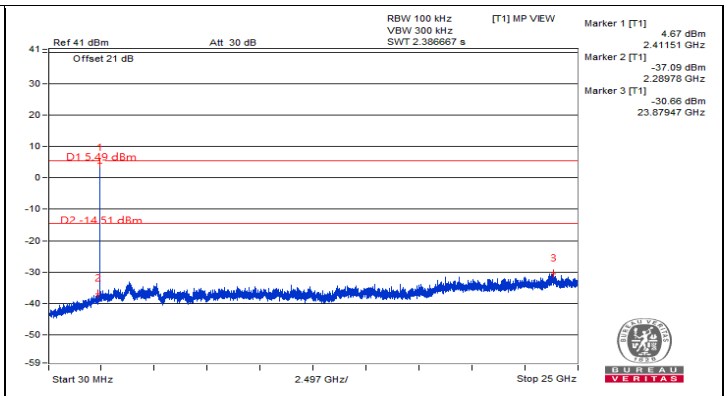
7.4 Conducted Out of Band Emissions

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	John Peng

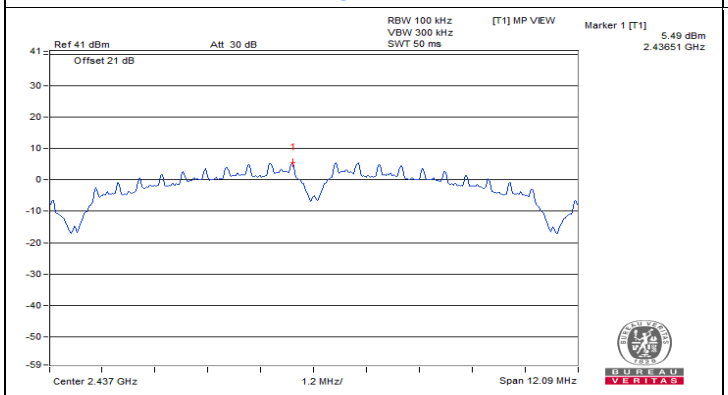
802.11b



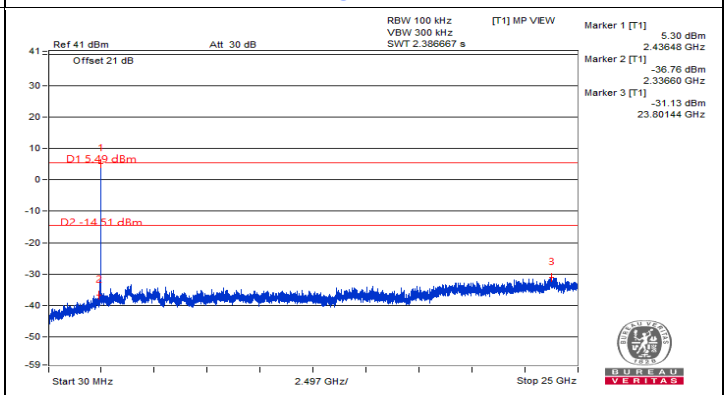
CH 1



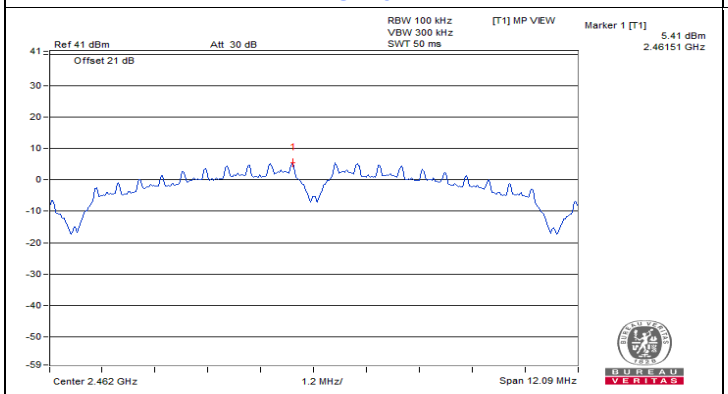
CH 1



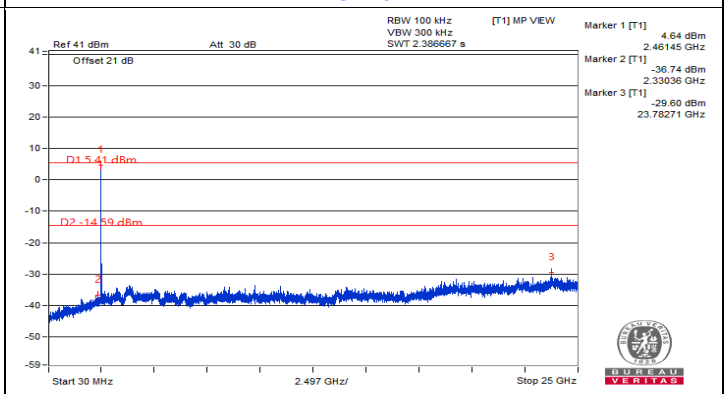
CH 6



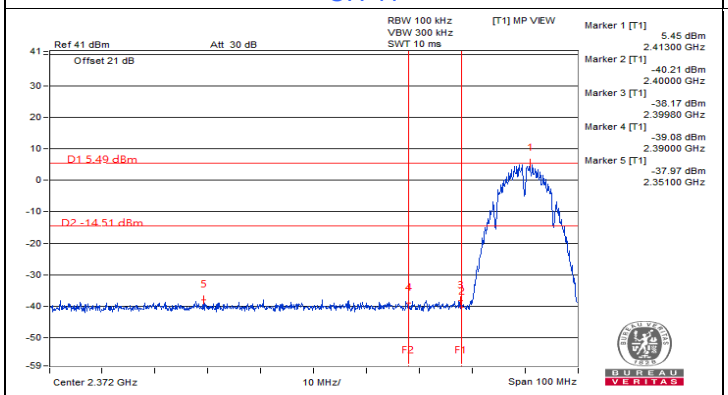
CH 6



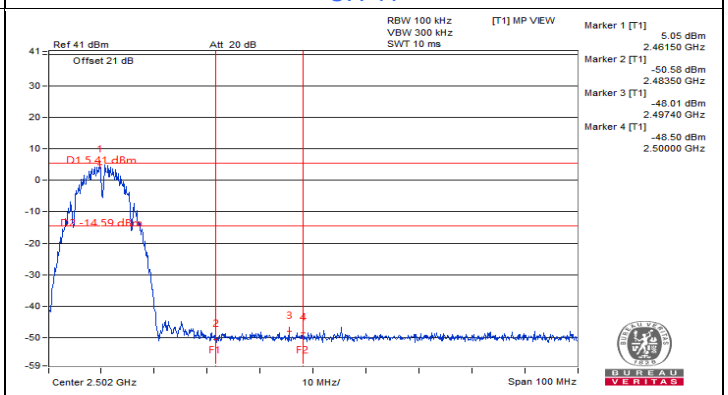
CH 11



CH 11

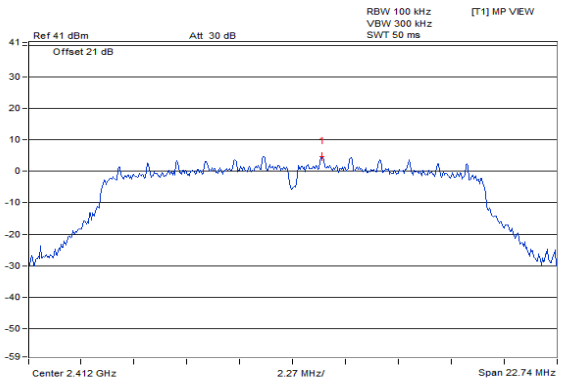


CH 1 Band edge

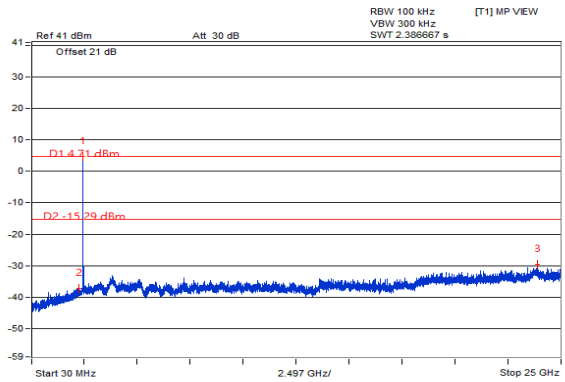


CH 11 Band edge

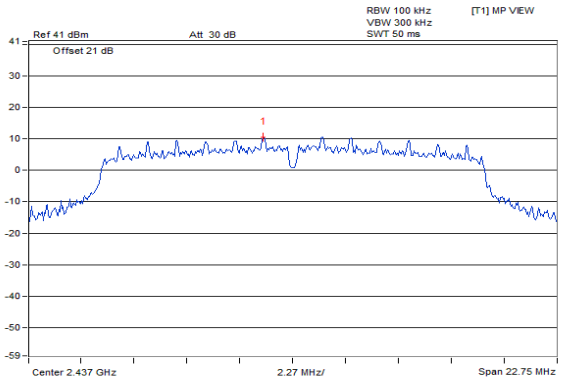
802.11g



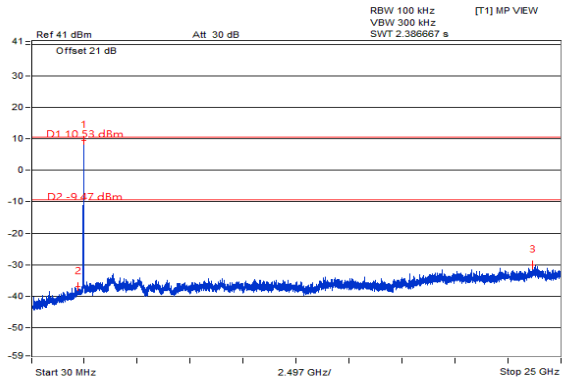
CH 1



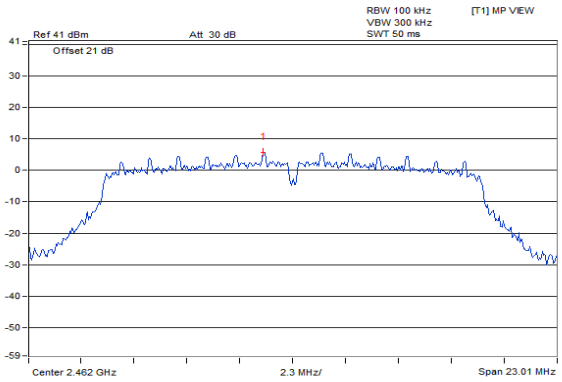
CH 1



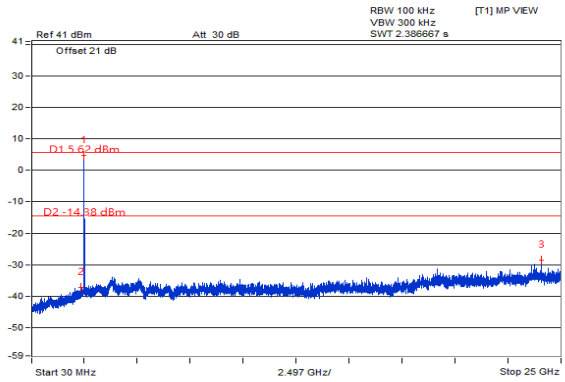
CH 6



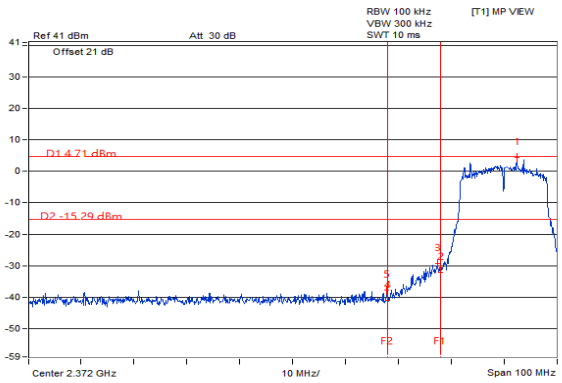
CH 6



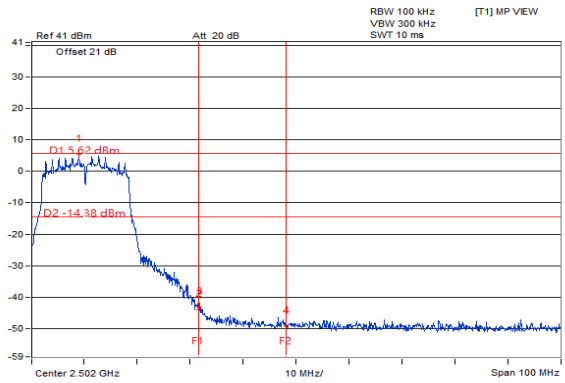
CH 11



CH 11

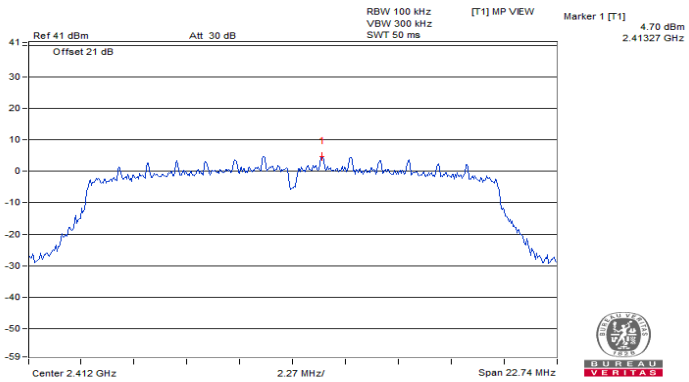


CH 1 Band edge

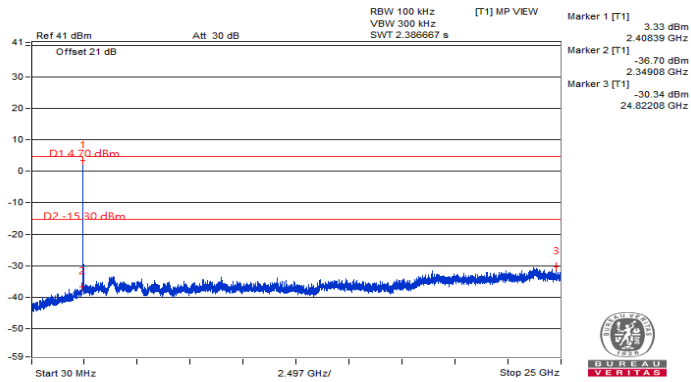


CH 11 Band edge

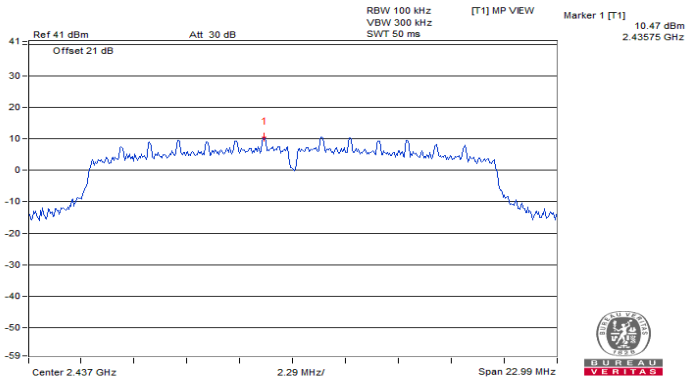
802.11n (HT20)



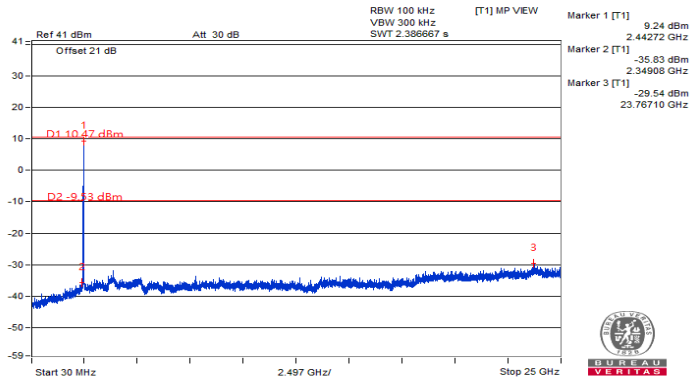
CH 1



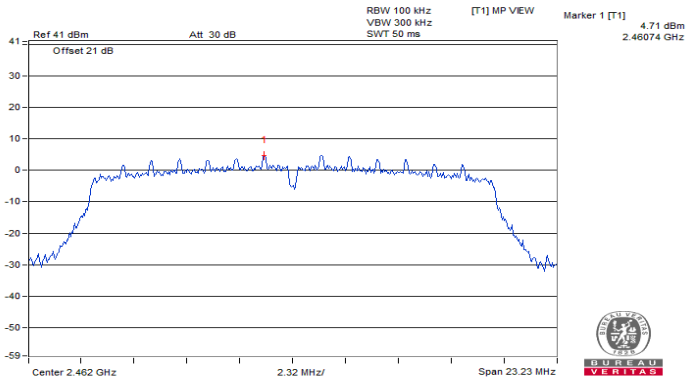
CH 1



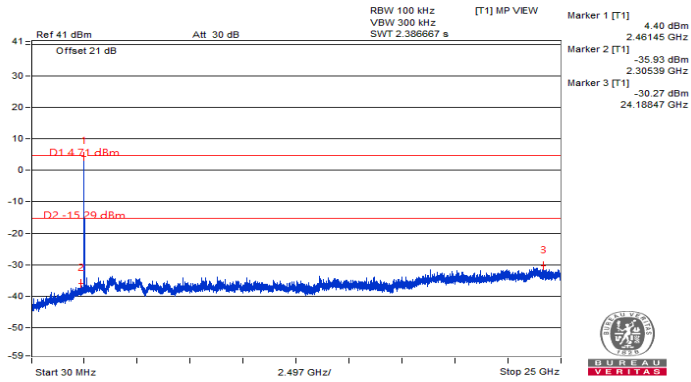
CH 6



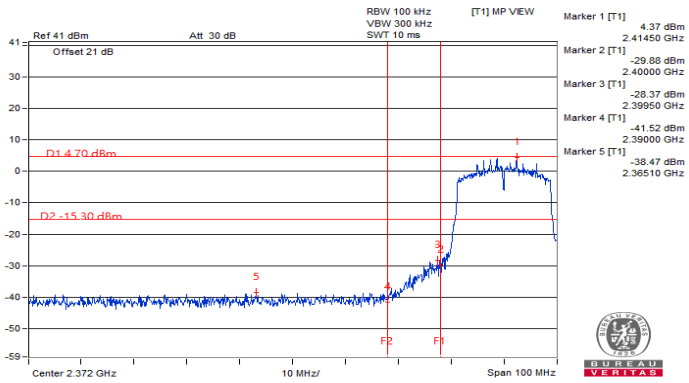
CH 6



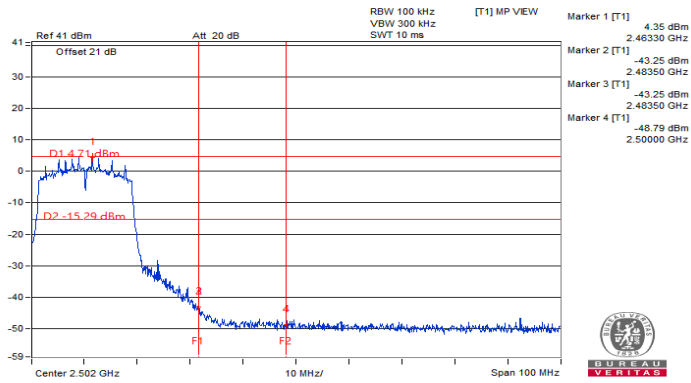
CH 11



CH 11



CH 1 Band edge



CH 11 Band edge

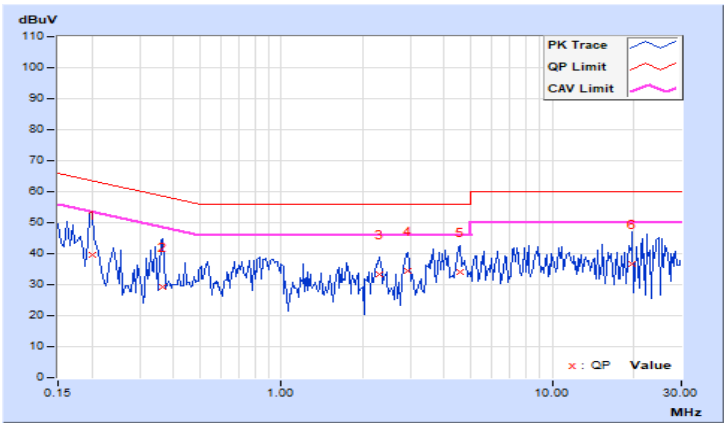
7.5 AC Power Conducted Emissions

RF Mode	802.11g	**Channel**	CH 6：2437 MHz
Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	23°C, 68% RH
Tested By	Sampson Chen		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.20078	9.97	29.72	11.52	39.69	21.49	63.58	53.58	-23.89	-32.09
2	0.36484	9.98	19.35	7.61	29.33	17.59	58.62	48.62	-29.29	-31.03
3	2.30469	10.08	23.14	8.42	33.22	18.50	56.00	46.00	-22.78	-27.50
4	2.93750	10.12	24.32	7.62	34.44	17.74	56.00	46.00	-21.56	-28.26
5	4.57422	10.21	23.79	9.15	34.00	19.36	56.00	46.00	-22.00	-26.64
6	19.66797	10.98	25.71	8.57	36.69	19.55	60.00	50.00	-23.31	-30.45

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

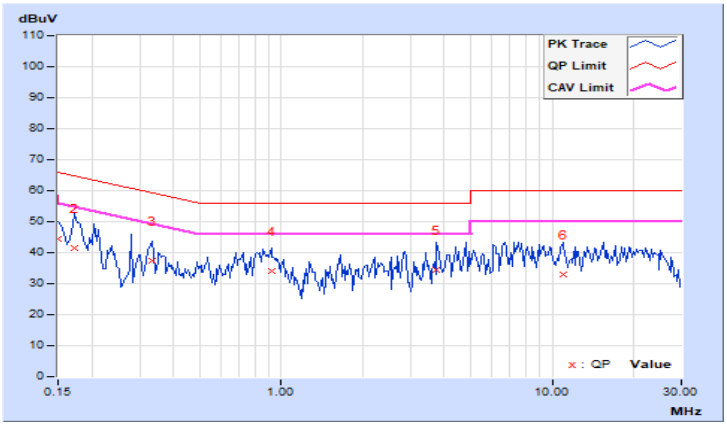


RF Mode	802.11g	Channel	CH 6：2437 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 68% RH
Tested By	Sampson Chen		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**10.01**	**34.57**	**18.45**	**44.58**	**28.46**	**66.00**	**56.00**	**-21.42**	**-27.54**
2	0.17344	10.01	31.55	16.33	41.56	26.34	64.79	54.79	-23.23	-28.45
3	0.33359	10.03	27.53	15.94	37.56	25.97	59.36	49.36	-21.80	-23.39
4	0.91953	10.06	24.03	10.72	34.09	20.78	56.00	46.00	-21.91	-25.22
5	3.75000	10.20	24.28	8.78	34.48	18.98	56.00	46.00	-21.52	-27.02
6	10.95313	10.49	22.33	10.24	32.82	20.73	60.00	50.00	-27.18	-29.27

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



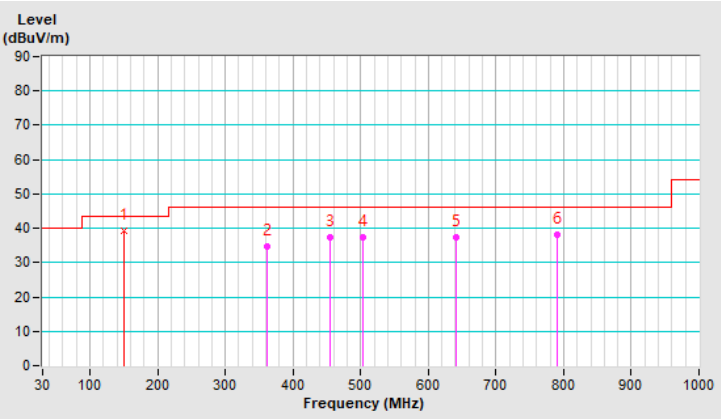
7.6 Unwanted Emissions below 1 GHz

RF Mode	802.11g	**Channel**	CH 6：2437 MHz
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	Quasi-Peak (QP), RB = 120kHz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	22°C, 62% RH
Tested By	Nick Tsou		

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	**149.99**	**39.4 QP**	**43.5**	**-4.1**	**3.00 H**	**21**	**51.8**	**-12.4**
2	361.47	34.6 QP	46.0	-11.4	1.50 H	221	45.4	-10.8
3	455.56	37.2 QP	46.0	-8.8	2.00 H	237	45.2	-8.0
4	502.90	37.5 QP	46.0	-8.5	1.50 H	109	44.8	-7.3
5	641.66	37.3 QP	46.0	-8.7	2.00 H	4	41.7	-4.4
6	790.52	38.0 QP	46.0	-8.0	1.50 H	102	40.2	-2.2

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 30 MHz ~ 1 GHz.
5 The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

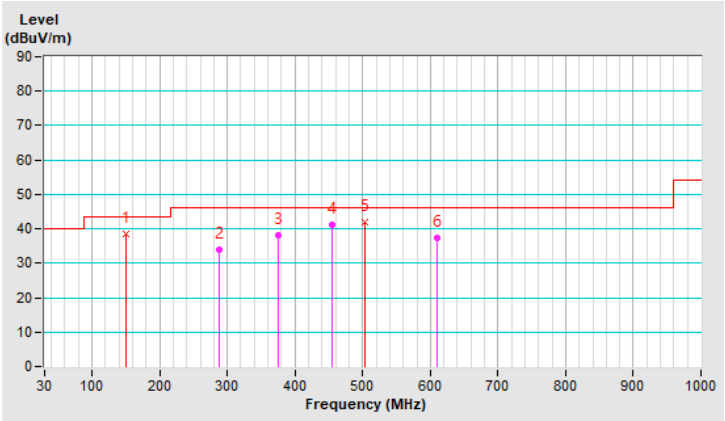


RF Mode	802.11g	Channel	CH 6：2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	Quasi-Peak (QP), RB = 120kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	22°C, 62% RH
Tested By	Nick Tsou		

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	149.99	38.6 QP	43.5	-4.9	1.00 V	352	51.0	-12.4
2	287.45	33.8 QP	46.0	-12.2	2.00 V	19	46.2	-12.4
3	374.90	38.2 QP	46.0	-7.8	1.00 V	159	48.5	-10.3
4	455.56	41.1 QP	46.0	-4.9	2.00 V	176	49.1	-8.0
5	**503.00**	**41.9 QP**	**46.0**	**-4.1**	**1.50 V**	**182**	**49.2**	**-7.3**
6	610.87	37.3 QP	46.0	-8.7	3.00 V	360	42.0	-4.7

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 30 MHz ~ 1 GHz.
5 The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



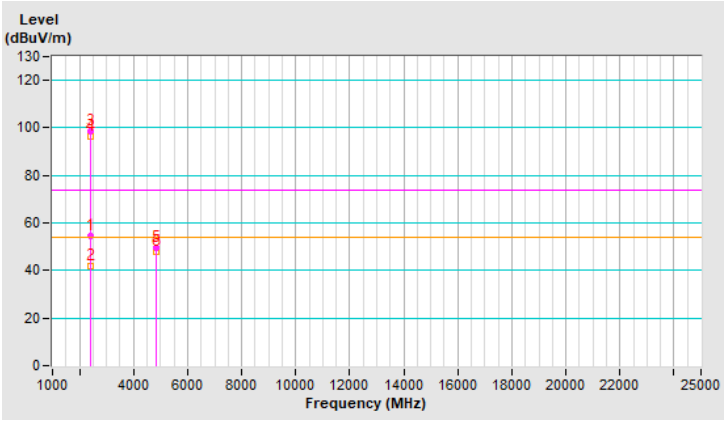
7.7 Unwanted Emissions above 1 GHz

RF Mode	802.11b	**Channel**	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	24°C, 68% RH
Tested By	Nick Tsou		

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	54.4 PK	74.0	-19.6	1.50 H	217	56.8	-2.4
2	2390.00	42.0 AV	54.0	-12.0	1.50 H	217	44.4	-2.4
3	*2412.00	98.8 PK			1.50 H	217	101.2	-2.4
4	*2412.00	96.5 AV			1.50 H	217	98.9	-2.4
5	4824.00	49.6 PK	74.0	-24.4	1.99 H	230	46.9	2.7
6	4824.00	47.8 AV	54.0	-6.2	1.99 H	230	45.1	2.7

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, the limit was restricted at the RF Output Power.

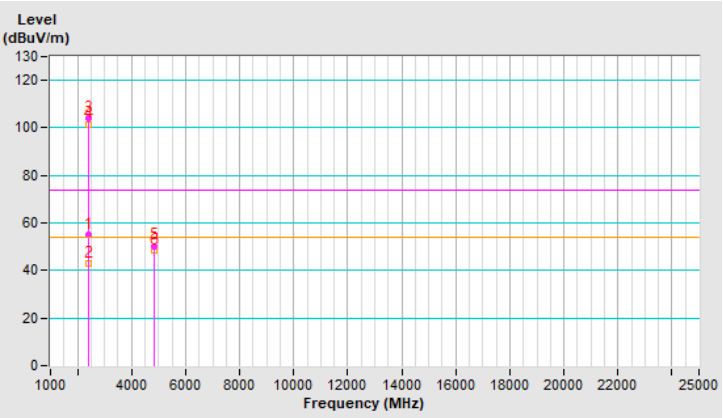


RF Mode	802.11b	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	55.2 PK	74.0	-18.8	1.17 V	183	57.6	-2.4
2	2390.00	42.7 AV	54.0	-11.3	1.17 V	183	45.1	-2.4
3	*2412.00	103.9 PK			1.17 V	183	106.3	-2.4
4	*2412.00	101.6 AV			1.17 V	183	104.0	-2.4
5	4824.00	50.4 PK	74.0	-23.6	2.02 V	149	47.7	2.7
6	4824.00	48.5 AV	54.0	-5.5	2.02 V	149	45.8	2.7

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, the limit was restricted at the RF Output Power.

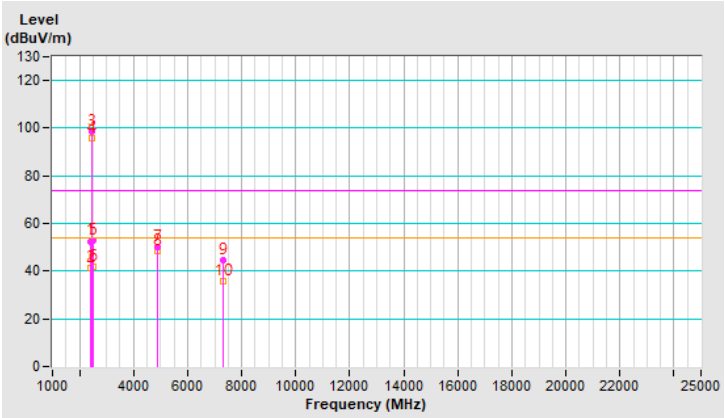


RF Mode	802.11b	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	52.6 PK	74.0	-21.4	1.62 H	209	55.0	-2.4
2	2390.00	41.5 AV	54.0	-12.5	1.62 H	209	43.9	-2.4
3	*2437.00	98.8 PK			1.62 H	209	101.1	-2.3
4	*2437.00	95.9 AV			1.62 H	209	98.2	-2.3
5	2483.50	52.8 PK	74.0	-21.2	1.62 H	209	55.1	-2.3
6	2483.50	41.6 AV	54.0	-12.4	1.62 H	209	43.9	-2.3
7	4874.00	50.0 PK	74.0	-24.0	1.99 H	226	47.3	2.7
8	4874.00	48.6 AV	54.0	-5.4	1.99 H	226	45.9	2.7
9	7311.00	44.8 PK	74.0	-29.2	1.94 H	174	36.4	8.4
10	7311.00	35.9 AV	54.0	-18.1	1.94 H	174	27.5	8.4

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, the limit was restricted at the RF Output Power.

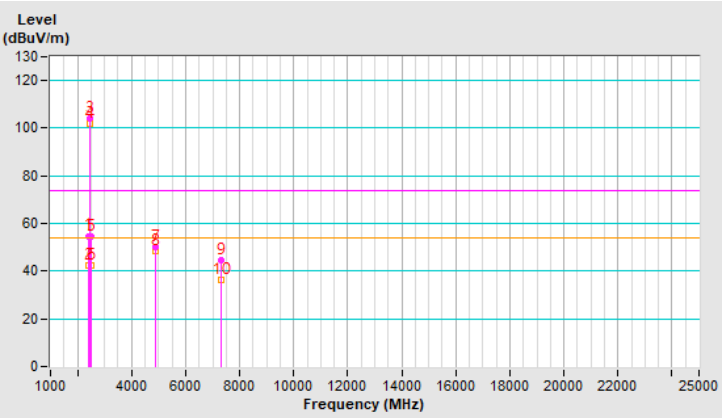


RF Mode	802.11b	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	54.8 PK	74.0	-19.2	1.08 V	192	57.2	-2.4
2	2390.00	42.4 AV	54.0	-11.6	1.08 V	192	44.8	-2.4
3	*2437.00	104.2 PK			1.08 V	192	106.5	-2.3
4	*2437.00	102.0 AV			1.08 V	192	104.3	-2.3
5	2483.50	54.3 PK	74.0	-19.7	1.08 V	192	56.6	-2.3
6	2483.50	42.4 AV	54.0	-11.6	1.08 V	192	44.7	-2.3
7	4874.00	50.2 PK	74.0	-23.8	1.61 V	151	47.5	2.7
8	4874.00	48.7 AV	54.0	-5.3	1.61 V	151	46.0	2.7
9	7311.00	44.6 PK	74.0	-29.4	2.59 V	183	36.2	8.4
10	7311.00	36.2 AV	54.0	-17.8	2.59 V	183	27.8	8.4

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, the limit was restricted at the RF Output Power.

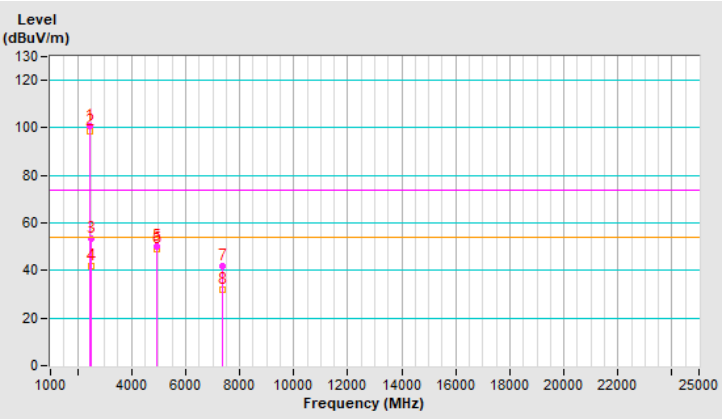


RF Mode	802.11b	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	100.8 PK			2.03 H	226	103.1	-2.3
2	*2462.00	98.6 AV			2.03 H	226	100.9	-2.3
3	2483.50	53.3 PK	74.0	-20.7	2.03 H	226	55.6	-2.3
4	2483.50	41.8 AV	54.0	-12.2	2.03 H	226	44.1	-2.3
5	4924.00	50.2 PK	74.0	-23.8	2.06 H	190	47.4	2.8
6	4924.00	49.2 AV	54.0	-4.8	2.06 H	190	46.4	2.8
7	7386.00	42.0 PK	74.0	-32.0	2.27 H	179	33.7	8.3
8	7386.00	32.1 AV	54.0	-21.9	2.27 H	179	23.8	8.3

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, the limit was restricted at the RF Output Power.

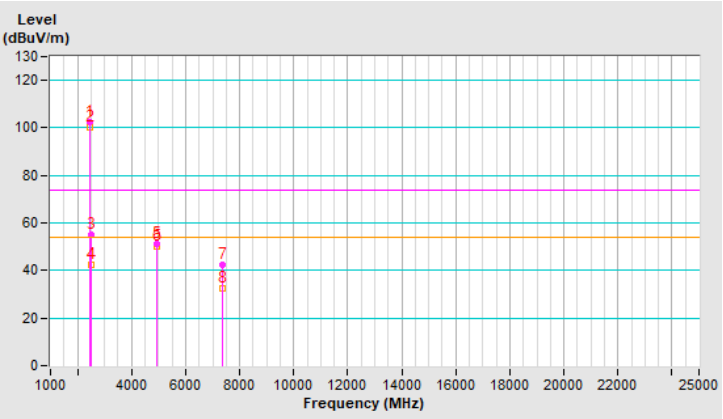


RF Mode	802.11b	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	102.5 PK			1.28 V	204	104.8	-2.3
2	*2462.00	100.3 AV			1.28 V	204	102.6	-2.3
3	2483.50	55.0 PK	74.0	-19.0	1.28 V	204	57.3	-2.3
4	2483.50	42.2 AV	54.0	-11.8	1.28 V	204	44.5	-2.3
5	4924.00	51.2 PK	74.0	-22.8	3.16 V	177	48.4	2.8
6	**4924.00**	**49.9 AV**	**54.0**	**-4.1**	**3.16 V**	**177**	**47.1**	**2.8**
7	7386.00	42.5 PK	74.0	-31.5	2.70 V	186	34.2	8.3
8	7386.00	32.7 AV	54.0	-21.3	2.70 V	186	24.4	8.3

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, the limit was restricted at the RF Output Power.

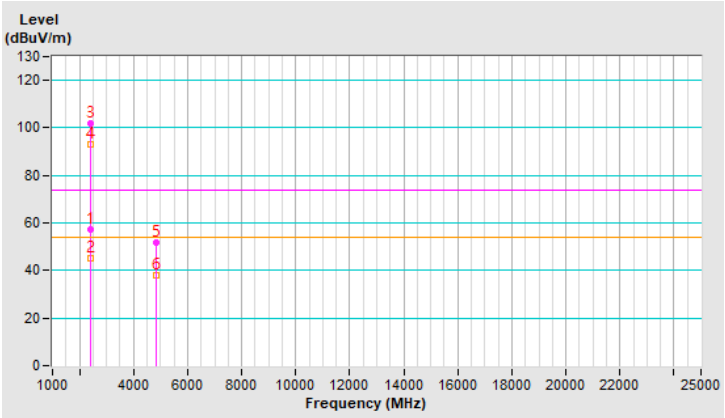


RF Mode	802.11g	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	57.4 PK	74.0	-16.6	1.00 H	0	59.8	-2.4
2	2390.00	45.4 AV	54.0	-8.6	1.00 H	0	47.8	-2.4
3	*2412.00	101.7 PK			2.47 H	181	104.1	-2.4
4	*2412.00	92.8 AV			2.47 H	181	95.2	-2.4
5	4824.00	51.6 PK	74.0	-22.4	2.51 H	171	48.9	2.7
6	4824.00	38.2 AV	54.0	-15.8	2.51 H	171	35.5	2.7

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, the limit was restricted at the RF Output Power.

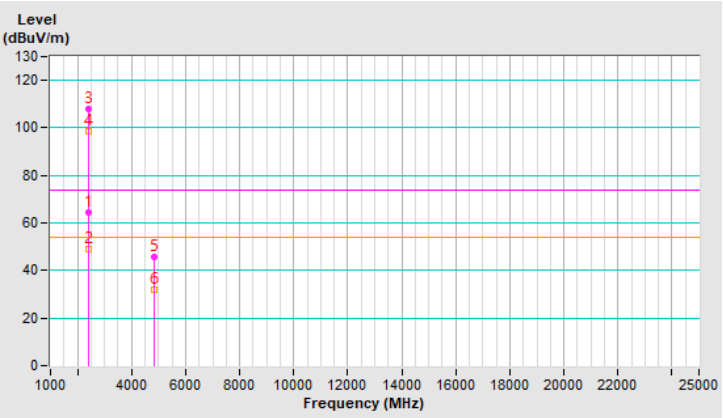


RF Mode	802.11g	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	64.2 PK	74.0	-9.8	1.54 V	189	66.6	-2.4
2	2390.00	49.1 AV	54.0	-4.9	1.54 V	189	51.5	-2.4
3	*2412.00	107.9 PK			1.54 V	189	110.3	-2.4
4	*2412.00	98.5 AV			1.54 V	189	100.9	-2.4
5	4824.00	45.8 PK	74.0	-28.2	2.38 V	146	43.1	2.7
6	4824.00	32.1 AV	54.0	-21.9	2.38 V	146	29.4	2.7

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, the limit was restricted at the RF Output Power.

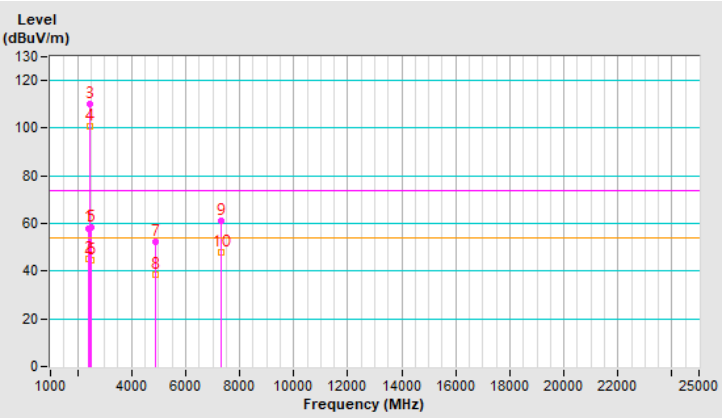


RF Mode	802.11g	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	58.1 PK	74.0	-15.9	1.00 H	0	60.5	-2.4
2	2390.00	45.0 AV	54.0	-9.0	1.00 H	0	47.4	-2.4
3	*2437.00	110.4 PK			2.72 H	179	112.7	-2.3
4	*2437.00	101.0 AV			2.72 H	179	103.3	-2.3
5	2483.50	58.3 PK	74.0	-15.7	1.00 H	0	60.6	-2.3
6	2483.50	44.4 AV	54.0	-9.6	1.00 H	0	46.7	-2.3
7	4874.00	52.2 PK	74.0	-21.8	2.49 H	169	49.5	2.7
8	4874.00	38.6 AV	54.0	-15.4	2.49 H	169	35.9	2.7
9	7311.00	61.2 PK	74.0	-12.8	2.13 H	174	52.8	8.4
10	7311.00	48.0 AV	54.0	-6.0	2.13 H	174	39.6	8.4

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, the limit was restricted at the RF Output Power.

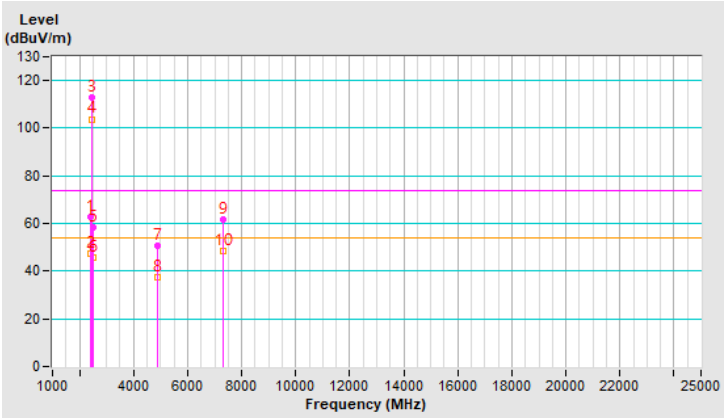


RF Mode	802.11g	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	62.7 PK	74.0	-11.3	1.53 V	190	65.1	-2.4
2	2390.00	47.5 AV	54.0	-6.5	1.53 V	190	49.9	-2.4
3	*2437.00	113.0 PK			1.53 V	190	115.3	-2.3
4	*2437.00	103.8 AV			1.53 V	190	106.1	-2.3
5	2483.50	58.2 PK	74.0	-15.8	1.53 V	190	60.5	-2.3
6	2483.50	45.6 AV	54.0	-8.4	1.53 V	190	47.9	-2.3
7	4874.00	50.9 PK	74.0	-23.1	2.23 V	135	48.2	2.7
8	4874.00	37.6 AV	54.0	-16.4	2.23 V	135	34.9	2.7
9	7311.00	61.5 PK	74.0	-12.5	2.78 V	185	53.1	8.4
10	7311.00	48.3 AV	54.0	-5.7	2.78 V	185	39.9	8.4

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, the limit was restricted at the RF Output Power.

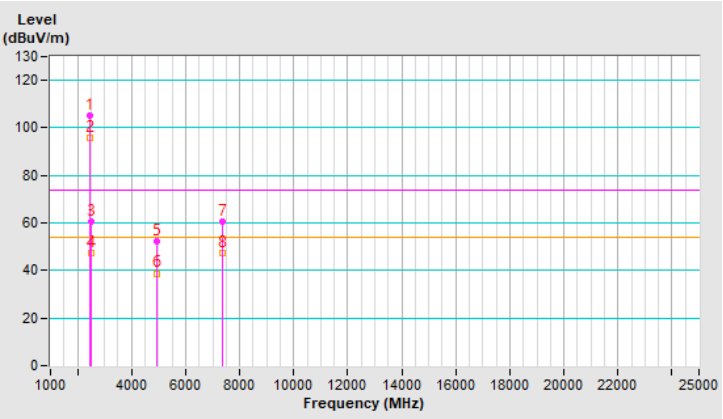


RF Mode	802.11g	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	105.2 PK			2.05 H	176	107.5	-2.3
2	*2462.00	95.8 AV			2.05 H	176	98.1	-2.3
3	2483.50	60.6 PK	74.0	-13.4	2.05 H	176	62.9	-2.3
4	2483.50	47.5 AV	54.0	-6.5	2.05 H	176	49.8	-2.3
5	4924.00	52.2 PK	74.0	-21.8	2.52 H	167	49.4	2.8
6	4924.00	38.8 AV	54.0	-15.2	2.52 H	167	36.0	2.8
7	7386.00	60.8 PK	74.0	-13.2	2.16 H	164	52.5	8.3
8	7386.00	47.5 AV	54.0	-6.5	2.16 H	164	39.2	8.3

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, the limit was restricted at the RF Output Power.

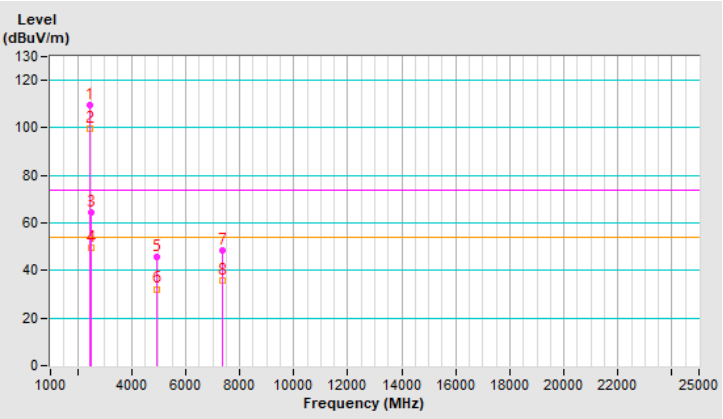


RF Mode	802.11g	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	109.4 PK			1.21 V	191	111.7	-2.3
2	*2462.00	99.8 AV			1.21 V	191	102.1	-2.3
3	2483.50	64.5 PK	74.0	-9.5	1.21 V	191	66.8	-2.3
4	2483.50	49.4 AV	54.0	-4.6	1.21 V	191	51.7	-2.3
5	4924.00	45.6 PK	74.0	-28.4	2.25 V	121	42.8	2.8
6	4924.00	32.2 AV	54.0	-21.8	2.25 V	121	29.4	2.8
7	7386.00	48.4 PK	74.0	-25.6	2.72 V	198	40.1	8.3
8	7386.00	35.8 AV	54.0	-18.2	2.72 V	198	27.5	8.3

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, the limit was restricted at the RF Output Power.

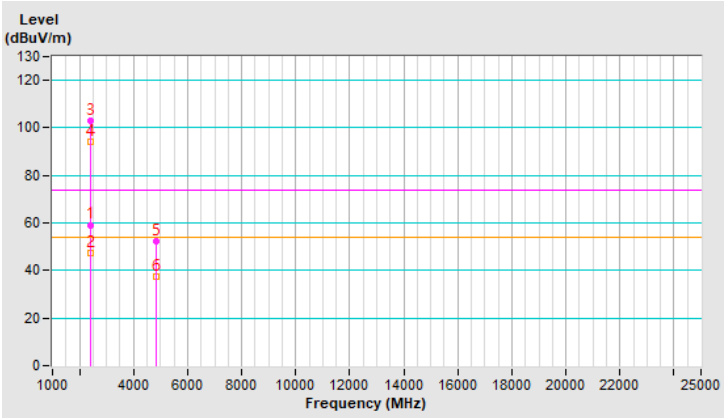


RF Mode	802.11n (HT20)	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	59.2 PK	74.0	-14.8	1.00 H	0	61.6	-2.4
2	2390.00	47.6 AV	54.0	-6.4	1.00 H	0	50.0	-2.4
3	*2412.00	103.0 PK			2.67 H	180	105.4	-2.4
4	*2412.00	94.2 AV			2.67 H	180	96.6	-2.4
5	4824.00	52.4 PK	74.0	-21.6	2.16 H	156	49.7	2.7
6	4824.00	37.6 AV	54.0	-16.4	2.16 H	156	34.9	2.7

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, the limit was restricted at the RF Output Power.

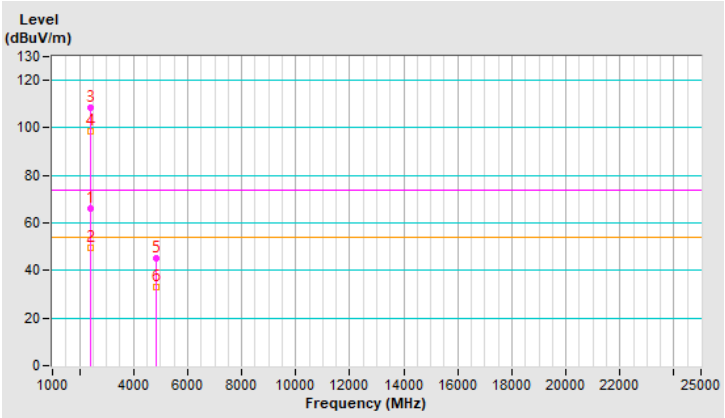


RF Mode	802.11n (HT20)	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	65.9 PK	74.0	-8.1	1.32 V	192	68.3	-2.4
2	2390.00	49.8 AV	54.0	-4.2	1.32 V	192	52.2	-2.4
3	*2412.00	108.3 PK			1.32 V	192	110.7	-2.4
4	*2412.00	98.3 AV			1.32 V	192	100.7	-2.4
5	4824.00	45.1 PK	74.0	-28.9	3.09 V	182	42.4	2.7
6	4824.00	32.9 AV	54.0	-21.1	3.09 V	182	30.2	2.7

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, the limit was restricted at the RF Output Power.

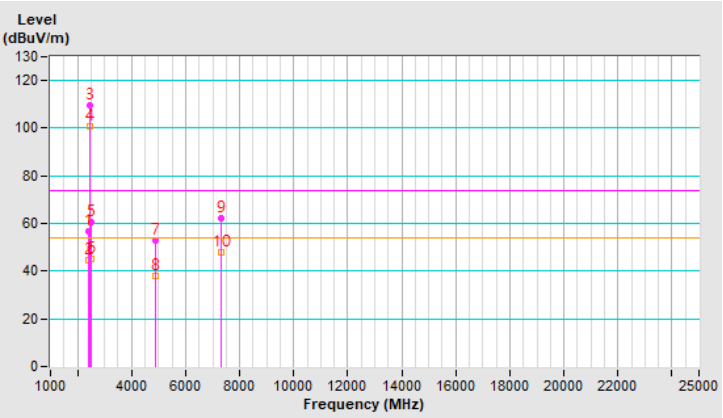


RF Mode	802.11n (HT20)	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	56.6 PK	74.0	-17.4	1.00 H	0	59.0	-2.4
2	2390.00	44.6 AV	54.0	-9.4	1.00 H	0	47.0	-2.4
3	*2437.00	109.7 PK			2.56 H	179	112.0	-2.3
4	*2437.00	100.6 AV			2.56 H	179	102.9	-2.3
5	2483.50	60.5 PK	74.0	-13.5	1.00 H	0	62.8	-2.3
6	2483.50	44.9 AV	54.0	-9.1	1.00 H	0	47.2	-2.3
7	4874.00	53.0 PK	74.0	-21.0	2.17 H	168	50.3	2.7
8	4874.00	37.9 AV	54.0	-16.1	2.17 H	168	35.2	2.7
9	7311.00	62.4 PK	74.0	-11.6	2.15 H	173	54.0	8.4
10	7311.00	47.8 AV	54.0	-6.2	2.15 H	173	39.4	8.4

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, the limit was restricted at the RF Output Power.

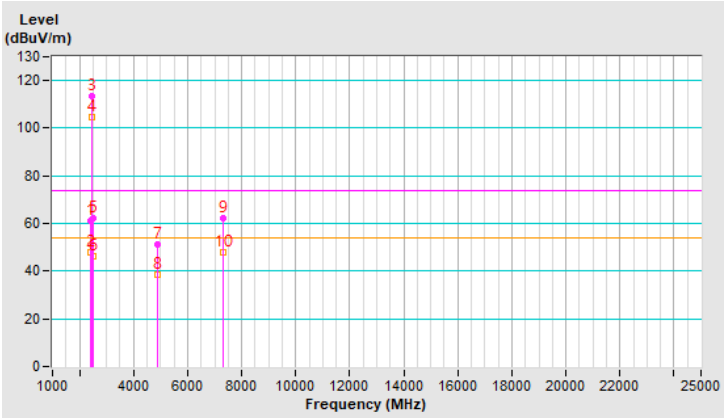


RF Mode	802.11n (HT20)	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	61.2 PK	74.0	-12.8	1.34 V	189	63.6	-2.4
2	2390.00	47.7 AV	54.0	-6.3	1.34 V	189	50.1	-2.4
3	*2437.00	113.5 PK			1.34 V	189	115.8	-2.3
4	*2437.00	104.6 AV			1.34 V	189	106.9	-2.3
5	2483.50	62.1 PK	74.0	-11.9	1.34 V	189	64.4	-2.3
6	2483.50	46.2 AV	54.0	-7.8	1.34 V	189	48.5	-2.3
7	4874.00	51.2 PK	74.0	-22.8	1.67 V	212	48.5	2.7
8	4874.00	38.6 AV	54.0	-15.4	1.67 V	212	35.9	2.7
9	7311.00	62.2 PK	74.0	-11.8	2.54 V	181	53.8	8.4
10	7311.00	47.8 AV	54.0	-6.2	2.54 V	181	39.4	8.4

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, the limit was restricted at the RF Output Power.

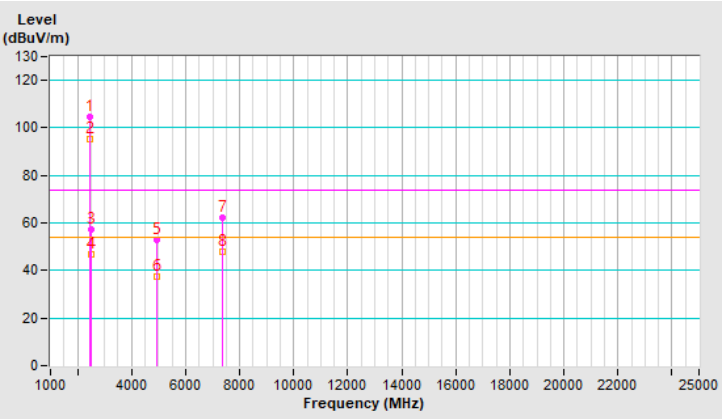


RF Mode	802.11n (HT20)	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	104.8 PK			1.96 H	179	107.1	-2.3
2	*2462.00	95.2 AV			1.96 H	179	97.5	-2.3
3	2483.50	57.4 PK	74.0	-16.6	1.96 H	179	59.7	-2.3
4	2483.50	47.0 AV	54.0	-7.0	1.96 H	179	49.3	-2.3
5	4924.00	53.0 PK	74.0	-21.0	2.19 H	158	50.2	2.8
6	4924.00	37.6 AV	54.0	-16.4	2.19 H	158	34.8	2.8
7	7386.00	62.4 PK	74.0	-11.6	2.15 H	186	54.1	8.3
8	7386.00	48.0 AV	54.0	-6.0	2.15 H	186	39.7	8.3

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, the limit was restricted at the RF Output Power.

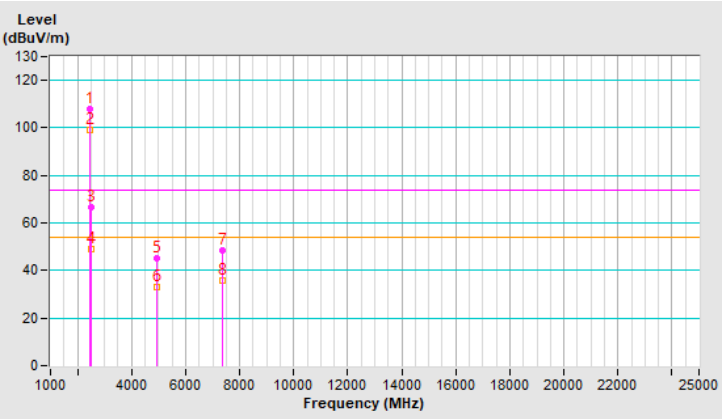


RF Mode	802.11n (HT20)	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 68% RH
Tested By	Nick Tsou		

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	107.9 PK			1.17 V	191	110.2	-2.3
2	*2462.00	99.1 AV			1.17 V	191	101.4	-2.3
3	2483.50	66.5 PK	74.0	-7.5	1.17 V	191	68.8	-2.3
4	2483.50	49.0 AV	54.0	-5.0	1.17 V	191	51.3	-2.3
5	4924.00	45.0 PK	74.0	-29.0	3.05 V	187	42.2	2.8
6	4924.00	32.8 AV	54.0	-21.2	3.05 V	187	30.0	2.8
7	7386.00	48.6 PK	74.0	-25.4	2.64 V	174	40.3	8.3
8	7386.00	35.6 AV	54.0	-18.4	2.64 V	174	27.3	8.3

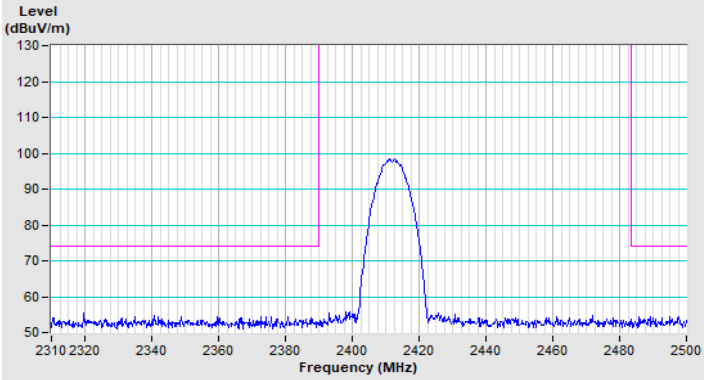
Remarks:

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, the limit was restricted at the RF Output Power.

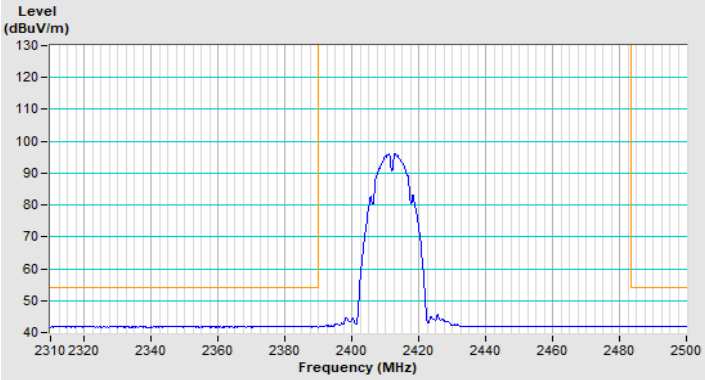


Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz

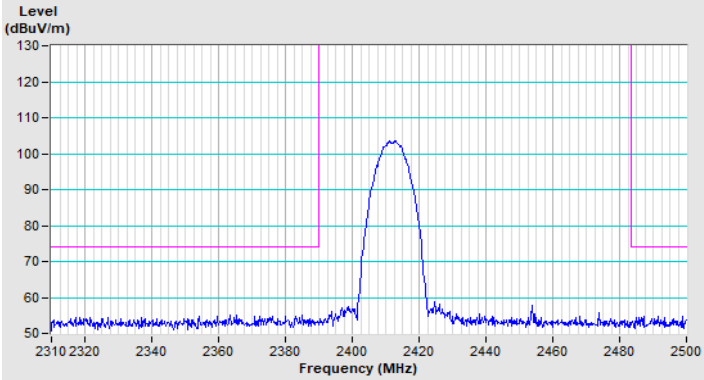
802.11b Channel 1



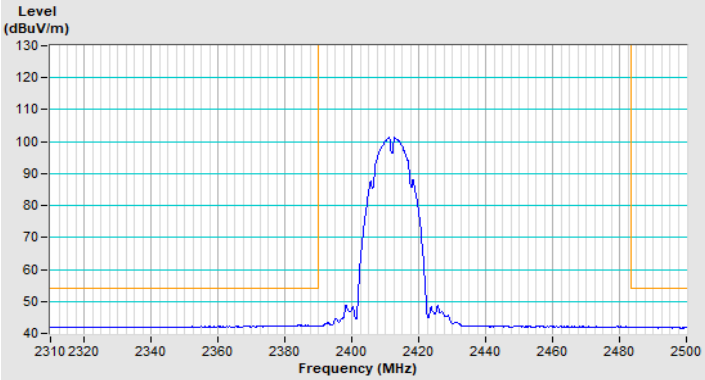
Horizontal (Peak)



Horizontal (Average)

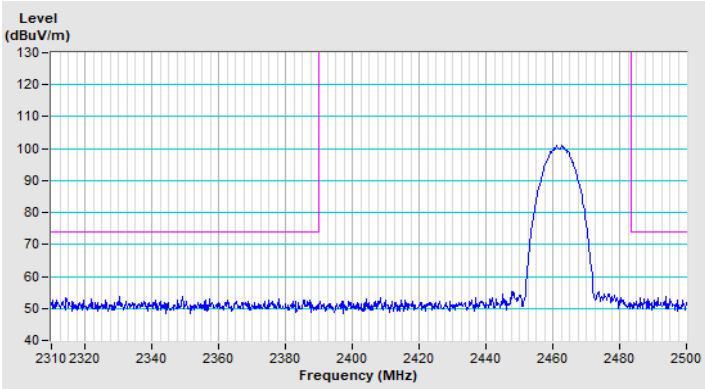


Vertical (Peak)

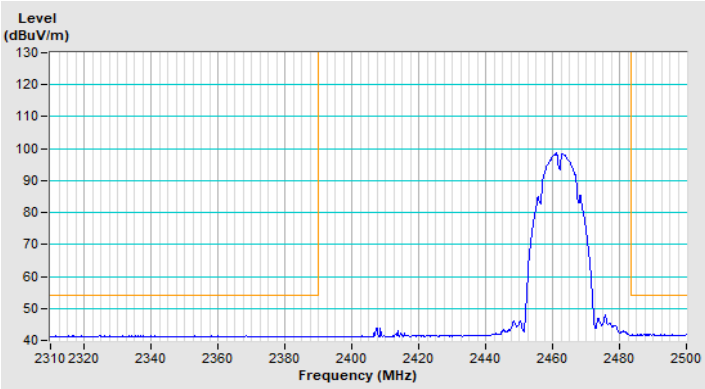


Vertical (Average)

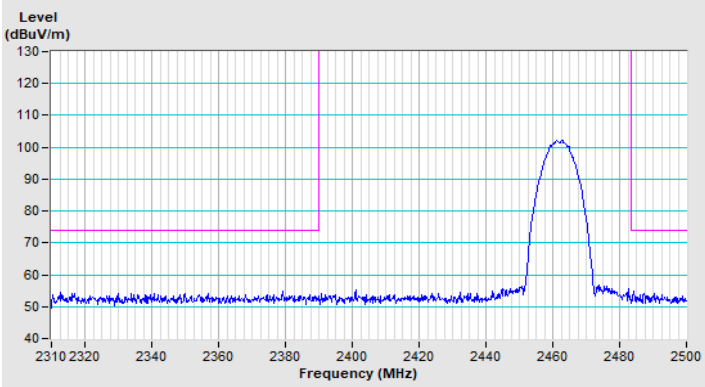
802.11b Channel 11



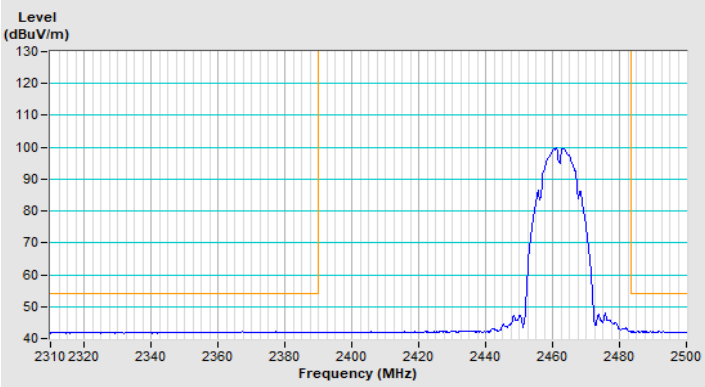
Horizontal (Peak)



Horizontal (Average)



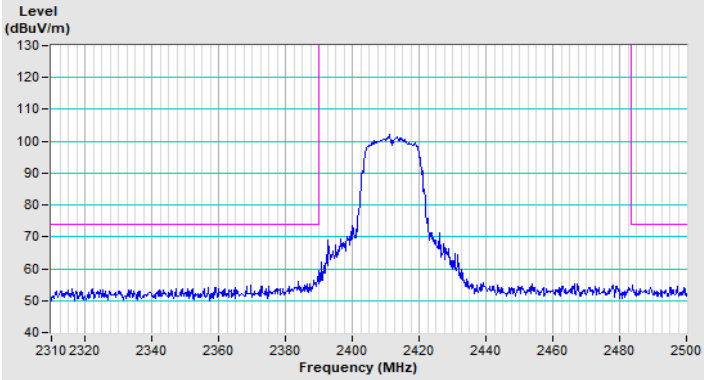
Vertical (Peak)



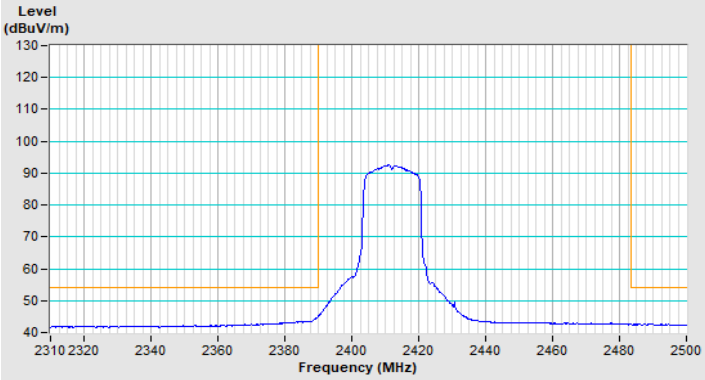
Vertical (Average)

Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz

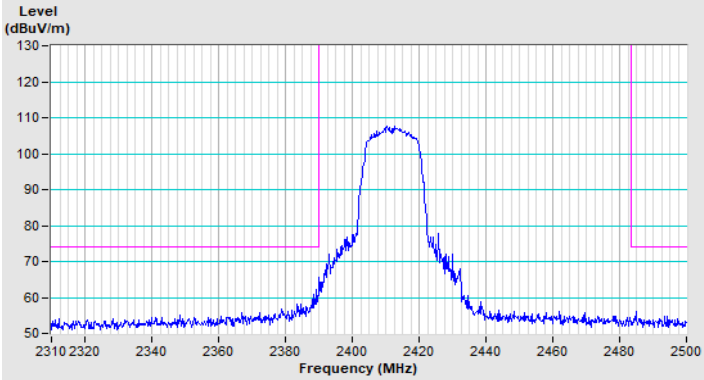
802.11g Channel 1



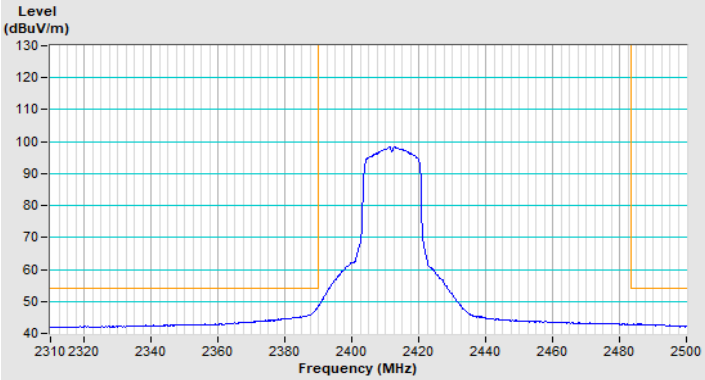
Horizontal (Peak)



Horizontal (Average)

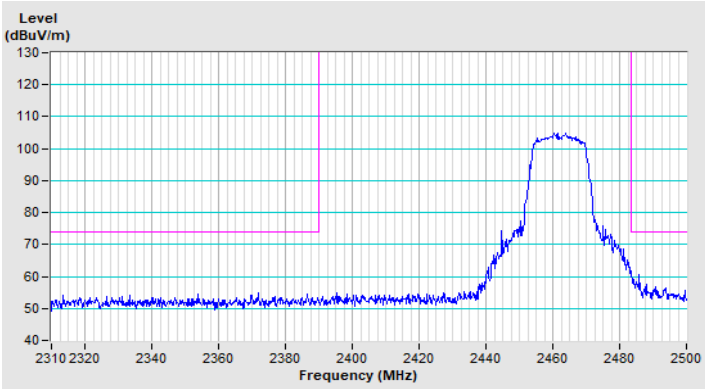


Vertical (Peak)

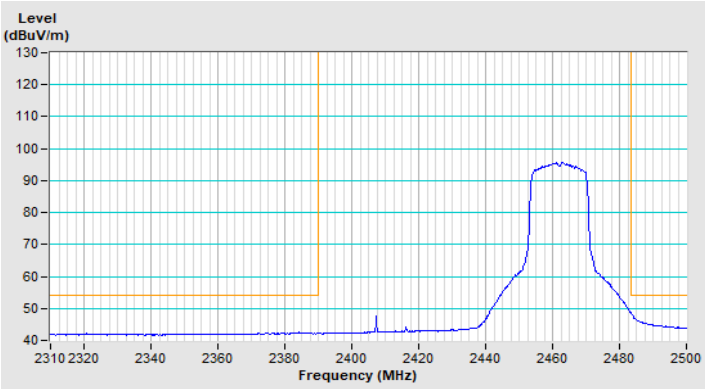


Vertical (Average)

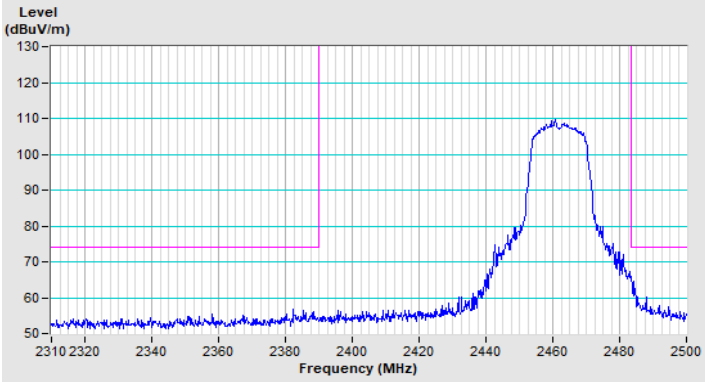
802.11g Channel 11



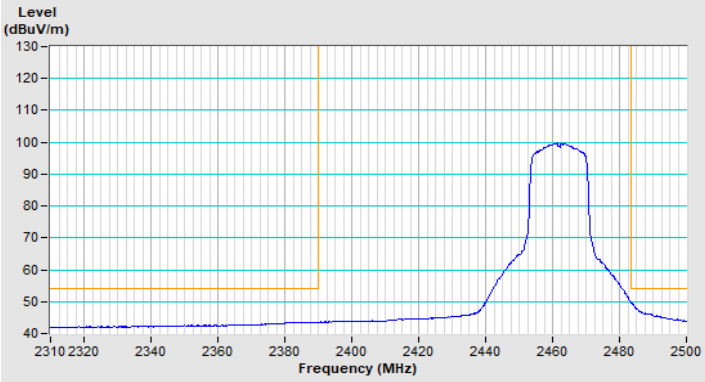
Horizontal (Peak)



Horizontal (Average)



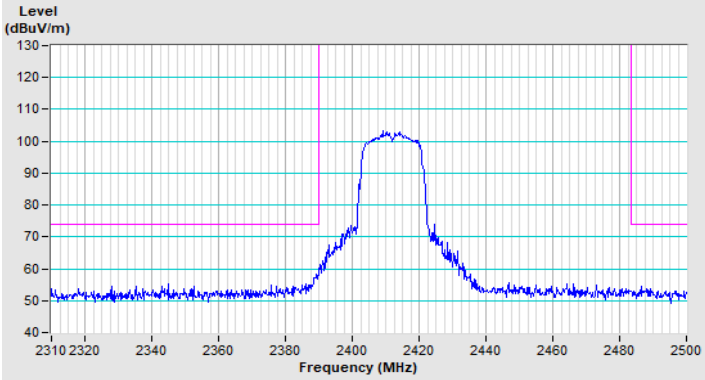
Vertical (Peak)



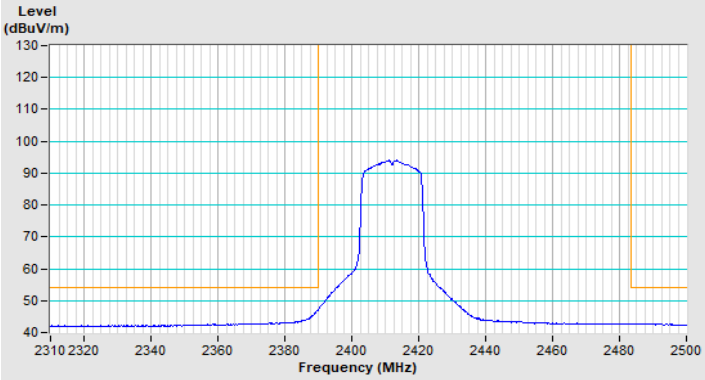
Vertical (Average)

Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	Peak (PK), RB = 1 MHz, VB = 3 MHz Peak (AV), RB = 1 MHz, VB = 10 Hz

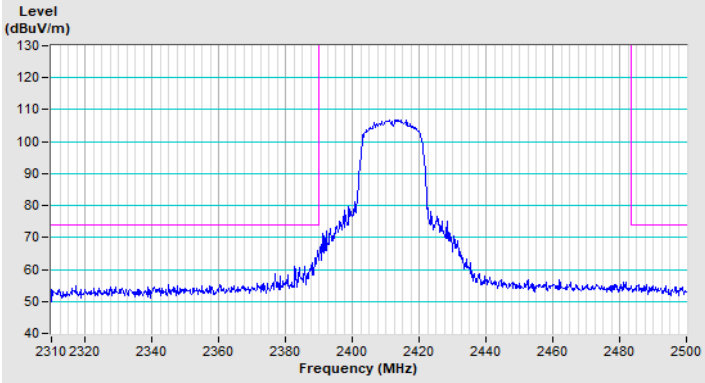
802.11n (HT20) Channel 1



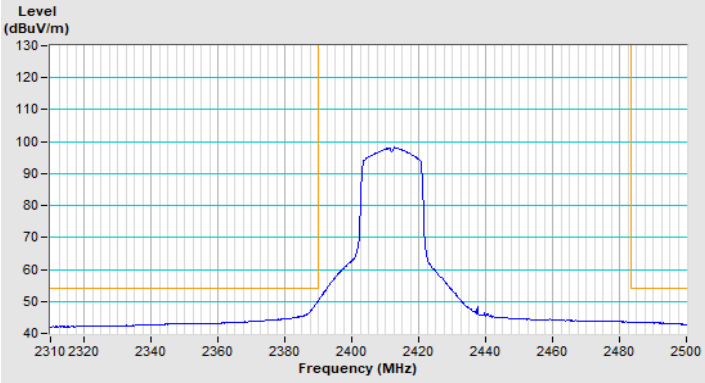
Horizontal (Peak)



Horizontal (Average)

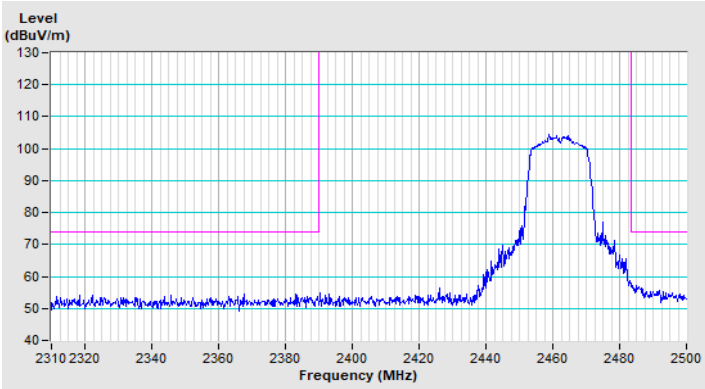


Vertical (Peak)

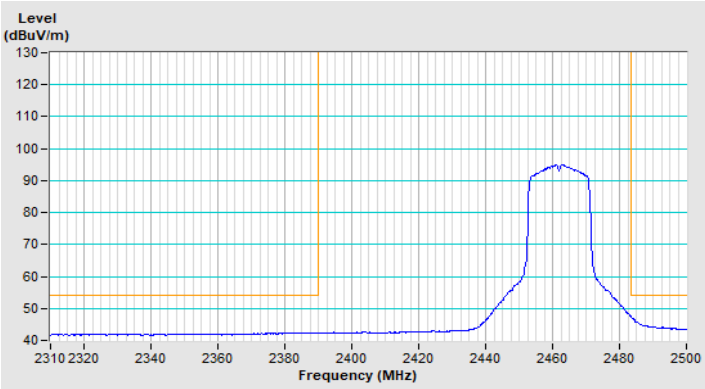


Vertical (Average)

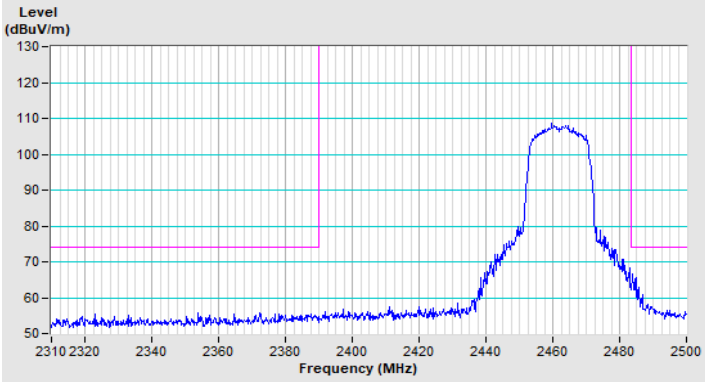
802.11n (HT20) Channel 11



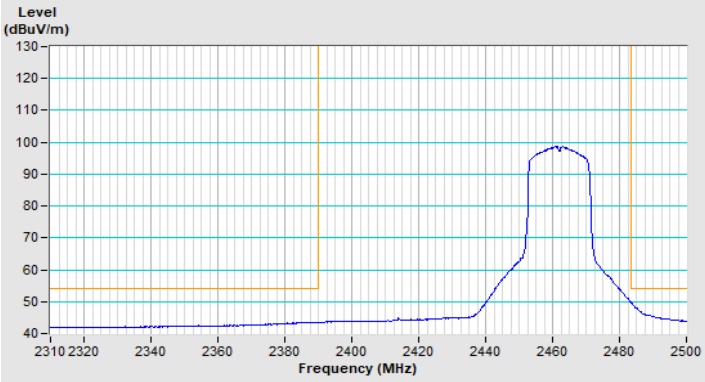
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)



Vertical (Average)

8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 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@bureauveritas.com
Web Site: http://ee.bureauveritas.com.tw

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

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