

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: RFBCKS-WTW-P23010439

FCC ID: 2AAAS-CP07

Product: Vivint Smart Hub Pro

Brand: Vivint

Model No.: CP07

Received Date: 2023/1/29

Test Date: 2023/2/3 ~ 2023/3/1

Issued Date: 2023/3/31

Applicant: Vivint, Inc.

Address: 4931 N. 300 W., Provo, UT 84604 USA

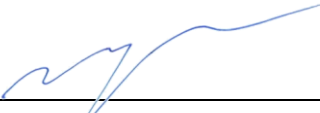
Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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 / 723255 / TW2022

Designation Number:

Approved by:  _____, **Date:** _____ 2023/3/31

May Chen / Manager

This test report consists of 73 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The test results in the report only apply to the tested sample. The test results in this report are traceable to the national or international standards.

Prepared by : Vivian Huang / Specialist



This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

Table of Contents

Release Control Record	4
1 Certificate	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Supplementary Information	6
3 General Information	7
3.1 General Description	7
3.2 Antenna Description of EUT	8
3.3 Channel List	9
3.4 Test Mode Applicability and Tested Channel Detail	10
3.5 Duty Cycle of Test Signal	11
3.6 Test Program Used and Operation Descriptions	13
3.7 Connection Diagram of EUT and Peripheral Devices	13
3.8 Configuration of Peripheral Devices and Cable Connections	14
4 Test Instruments	15
4.1 RF Output Power	15
4.2 Power Spectral Density	15
4.3 6 dB Bandwidth	15
4.4 Conducted Out of Band Emissions	15
4.5 AC Power Conducted Emissions	16
4.6 Unwanted Emissions below 1 GHz	16
4.7 Unwanted Emissions above 1 GHz	17
5 Limits of Test Items	18
5.1 RF Output Power	18
5.2 Power Spectral Density	18
5.3 6 dB Bandwidth	18
5.4 Conducted Out of Band Emissions	18
5.5 AC Power Conducted Emissions	18
5.6 Unwanted Emissions below 1 GHz	19
5.7 Unwanted Emissions above 1 GHz	19
6 Test Arrangements	20
6.1 RF Output Power	20
6.1.1 Test Setup	20
6.1.2 Test Procedure	20
6.2 Power Spectral Density	20
6.2.1 Test Setup	20
6.2.2 Test Procedure	20
6.3 6 dB Bandwidth	21
6.3.1 Test Setup	21
6.3.2 Test Procedure	21
6.4 Conducted Out of Band Emissions	21
6.4.1 Test Setup	21
6.4.2 Test Procedure	21
6.5 AC Power Conducted Emissions	22
6.5.1 Test Setup	22
6.5.2 Test Procedure	22
6.6 Unwanted Emissions below 1 GHz	23
6.6.1 Test Setup	23
6.6.2 Test Procedure	24
6.7 Unwanted Emissions above 1 GHz	25
6.7.1 Test Setup	25
6.7.2 Test Procedure	25
7 Test Results of Test Item	26



7.1	RF Output Power.....	26
7.2	Power Spectral Density	28
7.3	6 dB Bandwidth	30
7.4	Conducted Out of Band Emissions	32
7.5	AC Power Conducted Emissions	40
7.6	Unwanted Emissions below 1 GHz	42
7.7	Unwanted Emissions above 1 GHz.....	44
8	Pictures of Test Arrangements	72
9	Information of the Testing Laboratories	73



Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P23010439	Original release.	2023/3/31

1 Certificate

Product: Vivint Smart Hub Pro
Brand: Vivint
Test Model: CP07
Sample Status: Engineering sample
Applicant: Vivint, Inc.
Test Date: 2023/2/3 ~ 2023/3/1
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
KDB 662911 D01 Multiple Transmitter Output v02r01

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 -10.91 dB at 0.43125 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -4.0 dB at 42.00, 68.78 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -0.5 dB at 2389.20, 2483.50, 2484.00 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	5.5 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	5.1 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	Vivint Smart Hub Pro
Brand	Vivint
Test Model	CP07
Status of EUT	Engineering sample
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 300 Mbps VHT: up to 400 Mbps
Operating Frequency	2.412 GHz ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), VHT20): 11 802.11n (HT40), VHT40: 7
Output Power	633.915 mW (28.02 dBm)

Note:

1. The EUT uses following accessories.

Battery 1		
Brand	Model	Specification
EVE	HB1021	Power Rating : 3.6V
AC Adapter 1		
Brand	Model	Specification
ZB-Power	ZB-H120020A-88	AC Input : 100-240V, 50/60Hz, 0.6A DC Output : 12V, 2.0A DC Output Cable : 1.51m Plug : US
AC Adapter 2		
Brand	Model	Specification
Honor	ADS-24FUD-12 12024EPCU	AC Input : 100-240V, 50/60Hz, 0.6A DC Output : 12V, 2.0A DC Output Cable : 1.51m Plug : US
SIM Card		
	Brand	
	VZW	
SIM Card		
	Brand	
	AT&T	

2. There are Bluetooth, WLAN (2.4 GHz & 5 GHz), WWAN(LTE), Z-wave and DECT technology used for the EUT.

3. Simultaneously transmission condition.

Condition	Technology			
1	Bluetooth	WWAN	Z-wave	DECT
2	WLAN (2.4 GHz)	Bluetooth	Z-wave	DECT
3	WLAN (5 GHz)	Bluetooth	Z-wave	DECT

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

4. The EUT contains certified WWAN module which FCC ID: XMR201909EG91NAX (Brand: QUECTEL; Model: EG91-NAX).

5. 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.

RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
WLAN (chain 0)	WNC	95XKAB15.GA4	2.76	2.4~2.4835GHz	Dipole	ipex(MHF)
			2.65	5.15~5.85GHz		
WLAN (chain 1)	WNC	95XKAB15.GA5	2.90	2.4~2.4835GHz	Dipole	ipex(MHF)
			2.06	5.15~5.85GHz		
BT 2.4G	WNC	On board	0.15	2.4~2.4835GHz	PIFA	none
Z-Wave	WNC	48XKAB2C.0GAFHYE	0.77	908-916MHz	PIFA	none
345MHz (Rx Only)	WNC	3S.004KJ.111	1.02	345 MHz	Dipole	none
LTE Main	WNC	48XKAB20.0GAFHYE	1.23	1850 -1910MHz	PIFA	none
			0.21	1710-1755MHz		
			0.41	824-849 MHz		
			0.00	698-716MHz		
LTE AUX	WNC	95XKAB15.GA3	1.12	1850 -1910MHz	PIFA	ipex(MHF)
			0.80	1710-1755MHz		
			-1.14	824-849 MHz		
			-3.42	698-716MHz		
DECT (ANT0)	WNC	95XKAB15.0GA	3.40	1920MHz-1930MHz	Dipole	none
DECT (ANT1)	WNC	95XKAB15.0GA	3.60	1920MHz-1930MHz	Dipole	none

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

2. The EUT incorporates a MIMO function:

2.4 GHz Band		
Modulation Mode	TX & RX Configuration	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX

Note:

- The modulation and bandwidth are similar for 802.11n mode for 20 MHz (40 MHz) and VHT mode for 20 MHz (40 MHz), therefore the manufacturer will control the power for 802.11n mode is the same as the VHT mode or more lower than it and investigated worst case to representative mode in test report.

3.3 Channel List

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), VHT20:

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		

7 channels are provided for 802.11n (HT40), VHT40:

Channel	Frequency	Channel	Frequency
3	2422 MHz	7	2442 MHz
4	2427 MHz	8	2447 MHz
5	2432 MHz	9	2452 MHz
6	2437 MHz		

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	<p>1. The Power Supply has the following models: Adapter (ZB-Power) / Adapter (Honor). Pre-scan these models of AC Adapters and find the worst case as a representative test condition.</p> <p>2. EUT can be used in the following ways: X-axis/ Y-axis/ Z-axis. Pre-scan these ways and find the worst case as a representative test condition.</p> <p>3. 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).</p>
Worst Case:	<p>1. AC Adapter Worst Condition: Adapter (Honor)</p> <p>2. X-axis/ Y-axis/ Z-axis Worst Condition: X-axis</p>

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
	VHT20	1, 6, 11	BPSK	MCS0
	VHT40	3, 6, 9	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
	VHT20	1, 6, 11	BPSK	MCS0
	VHT40	3, 6, 9	BPSK	MCS0
AC Power Conducted Emissions	802.11b	6	DBPSK	1Mb/s
Unwanted Emissions below 1 GHz	802.11b	6	DBPSK	1Mb/s
Unwanted Emissions above 1 GHz	802.11b	1, 6, 11	DBPSK	1Mb/s
	802.11g	1, 6, 11	BPSK	6Mb/s
	VHT20	1, 6, 11	BPSK	MCS0
	VHT40	3, 6, 9	BPSK	MCS0

Note: Battery (EVE) only can use in 5min, so evaluation with adapter mode.

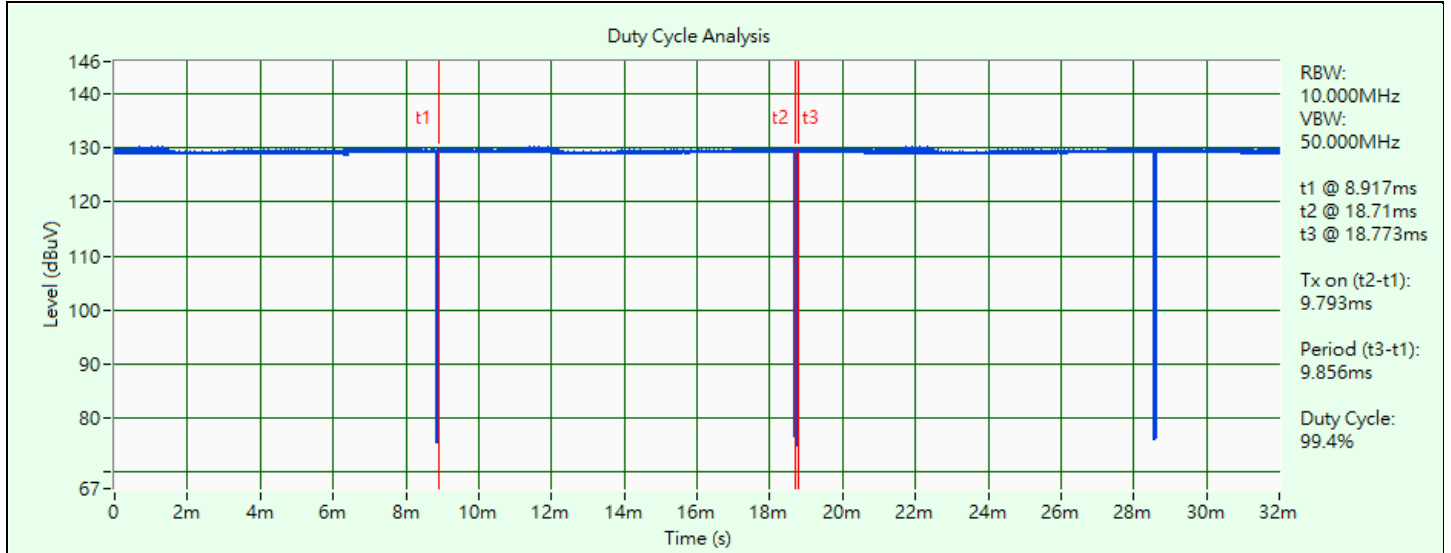
3.5 Duty Cycle of Test Signal

802.11b: Duty cycle = 9.793 ms / 9.856 ms x 100% = 99.4%

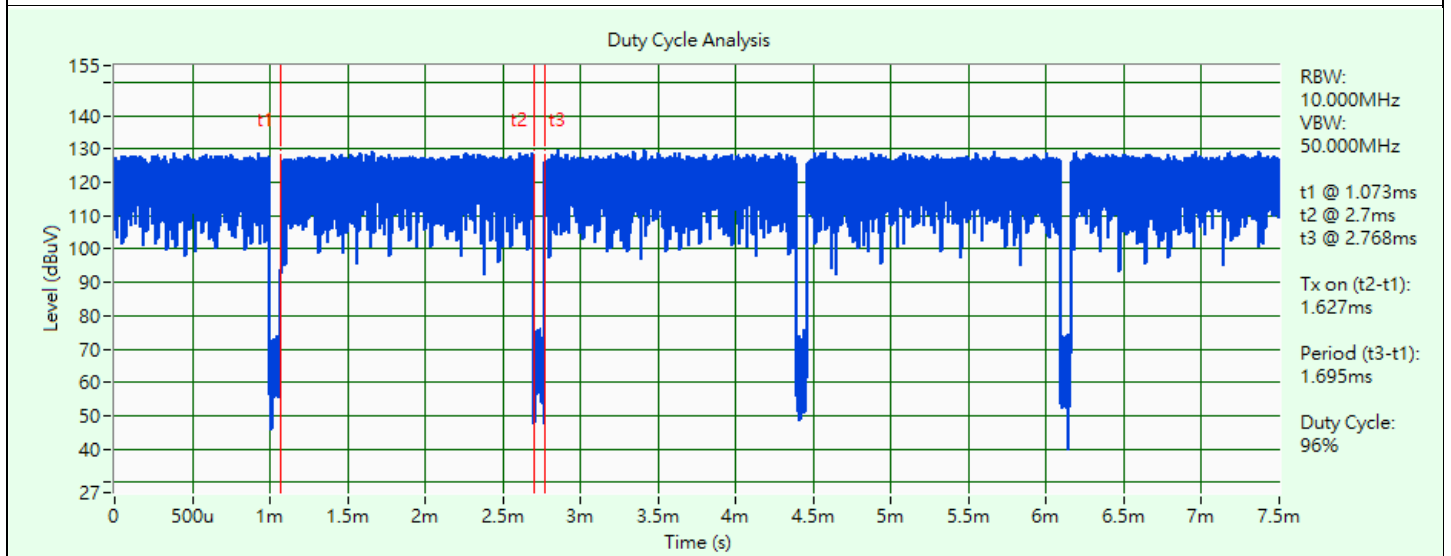
802.11g: Duty cycle = 1.627 ms / 1.695 ms x 100% = 96.0%, duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.18 \text{ dB}$

VHT20: Duty cycle = 1.528 ms / 1.599 ms x 100% = 95.6%, duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.20 \text{ dB}$

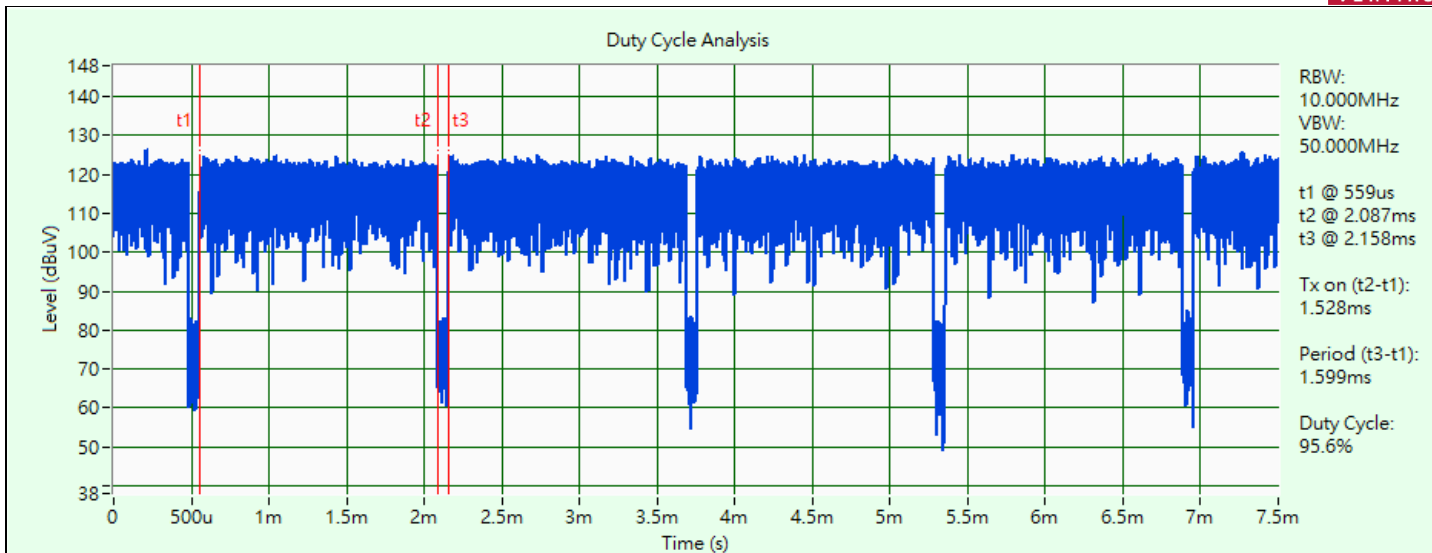
VHT40: Duty cycle = 0.758 ms / 0.827 ms x 100% = 91.7%, duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.38 \text{ dB}$



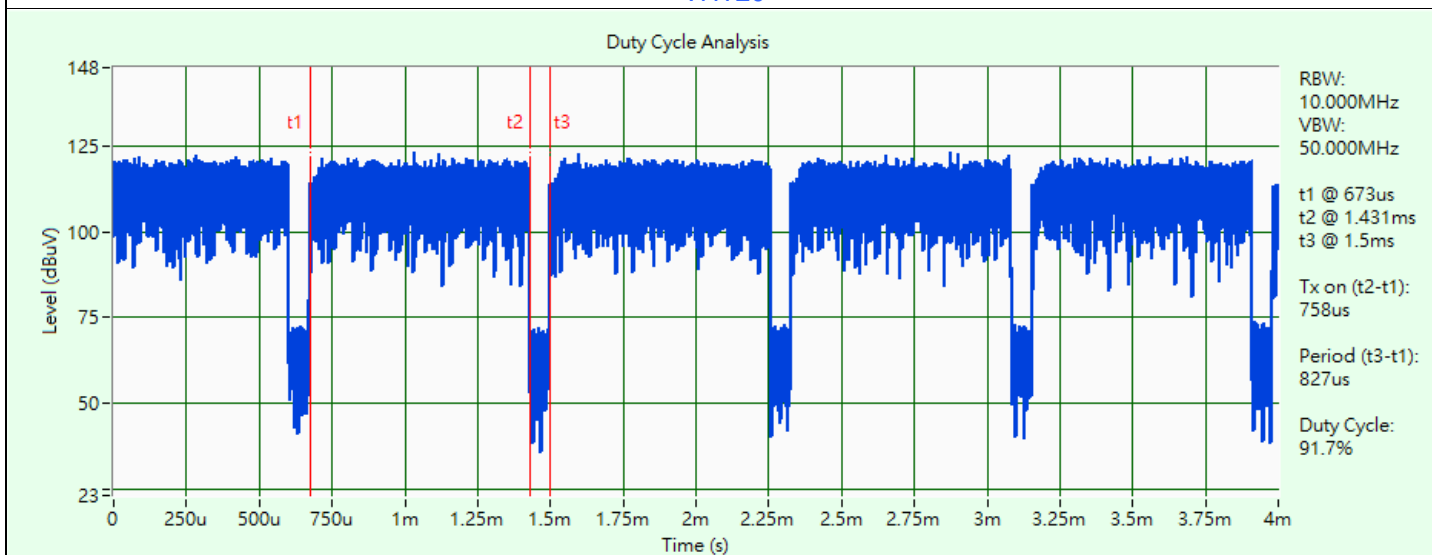
802.11b



802.11g



VHT20

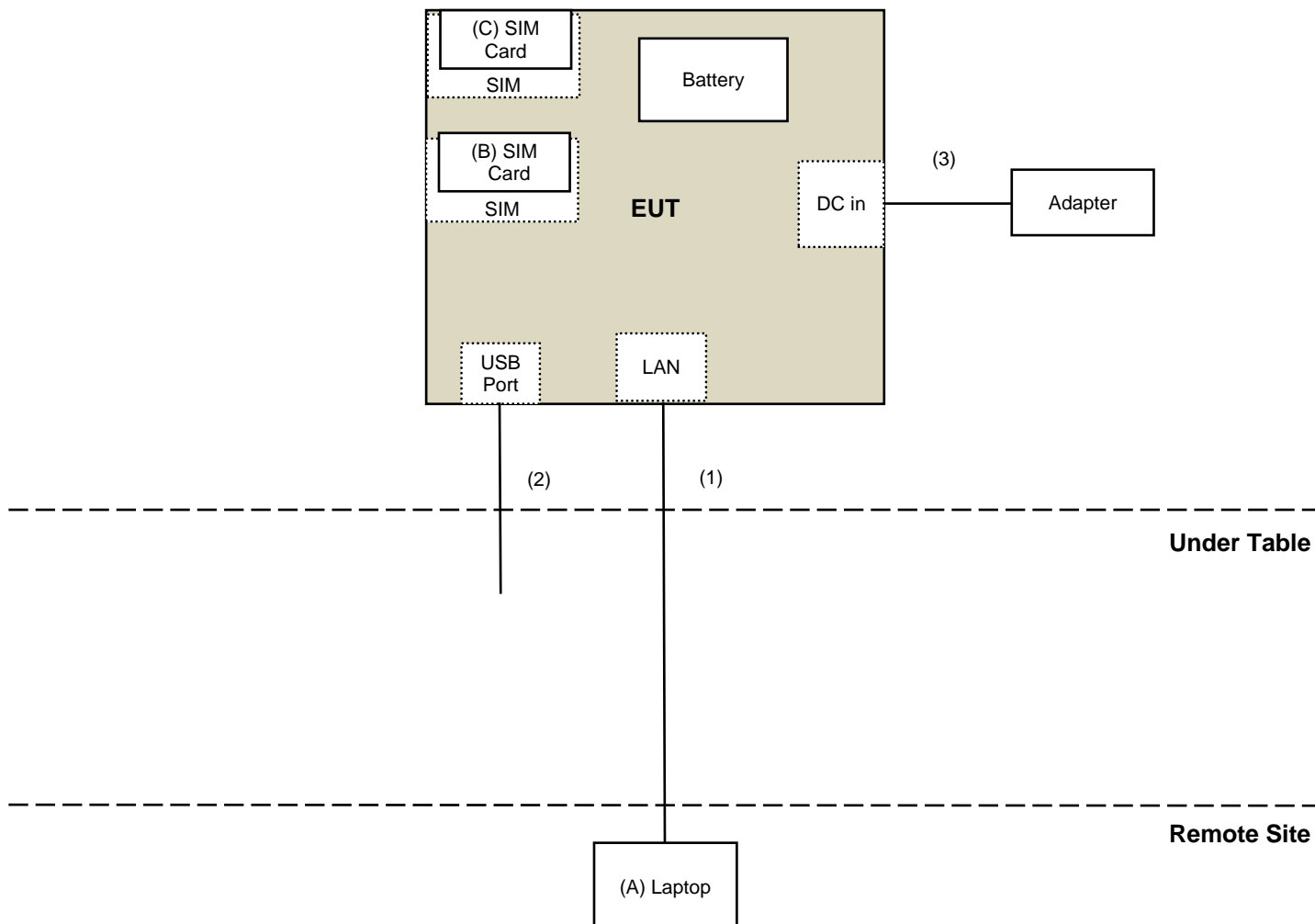


VHT40

3.6 Test Program Used and Operation Descriptions

Controlling software (MT7663 QA 0.0.2.8) 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	Lenovo	20U5S01X00 L14	PF-1ANPYA	N/A	Provided by Lab
B	Sim Card	VZW	N/A	N/A	N/A	Supplied by applicant
C	Sim Card	AT&T	N/A	N/A	N/A	Supplied by applicant
D	Simulator	Anritsu	MT8820C	6201127458	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	RJ 45	1	10	No	0	Provided by Lab
2	Micro USB Cable	1	1	No	0	Provided by Lab
3	DC Cable	1	1.51	No	0	Supplied by applicant

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
Power Meter Anritsu	ML2495A	1529002	2022/6/22	2023/6/21
Pulse Power Sensor Anritsu	MA2411B	1726434	2022/6/22	2023/6/21
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2022/4/5	2023/4/4
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: 2023/3/1

4.2 Power Spectral Density

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2022/4/5	2023/4/4
Software	ADT_RF Test Software V6.6.5.4	N/A	N/A	N/A
Spectrum Analyzer Keysight	N9020B	MY60112409	2022/3/11	2023/3/10

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/3/1

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
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
TEST RECEIVER R&S	ESCS 30	847124/029	2022/10/14	2023/10/13

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2023/2/24

4.6 Unwanted Emissions below 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
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-03	2022/12/28	2023/12/27
LOOP ANTENNA Electro-Metrics	EM-6879	264	2022/3/18	2023/3/17
Pre_Amplifier Agilent	8447D	2944A10636	2022/3/19	2023/3/18
Pre_Amplifier EMCI	EMC330N	980701	2022/3/8	2023/3/7
RF Coaxial Cable COMMATE/PEWC	8D	966-4-1	2022/3/8	2023/3/7
		966-4-2	2022/3/8	2023/3/7
		966-4-3	2022/3/8	2023/3/7
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2022/12/19	2023/12/18
		LOOPCAB-002	2022/12/19	2023/12/18
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Spectrum Analyzer KEYSIGHT	N9030B	MY57142938	2022/4/26	2023/4/25
Trilog Broadband Antenna Schwarzbeck	VULB 9168	9168-406	2022/10/21	2023/10/20

Notes:

1. The test was performed in 966 Chamber No. 4.
2. Tested Date: 2023/2/8

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-783	2022/11/13	2023/11/12
	BBHA 9170	9170-739	2022/11/13	2023/11/12
Pre_Amplifier EMCI	EMC12630SE	980688	2022/10/4	2023/10/3
	EMC184045SE	980387	2022/12/28	2023/12/27
RF Cable-Frequency Range : 1- 26.5GHz EMCI	EMC104-SM-SM-1200	160922	2022/12/15	2023/12/14
RF Cable-Frequency range: 1- 40GHz EMCI	EMC102-KM-KM-1200	160924	2022/12/28	2023/12/27
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2022/3/8 2023/2/20	2023/3/7 2024/2/19
	EMC104-SM-SM-2000	180502	2022/4/25	2023/4/24
	EMC104-SM-SM-6000	210704	2022/11/4	2023/11/3
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Spectrum Analyzer KEYSIGHT	N9030B	MY57142938	2022/4/26	2023/4/25

Notes:

1. The test was performed in 966 Chamber No. 4.
2. Tested Date: 2023/2/3 ~ 2023/2/23

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)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

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

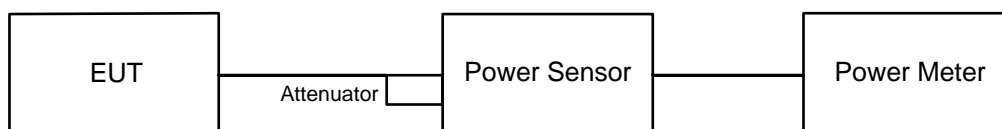
Notes:

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:

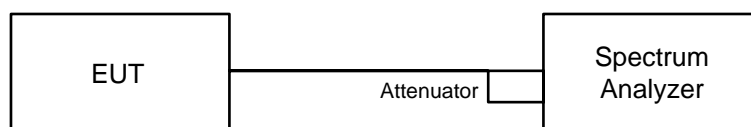
A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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

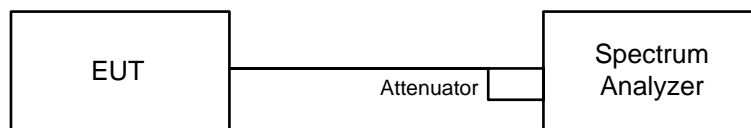


6.2.2 Test Procedure

- 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 $\geq 3 \times$ 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

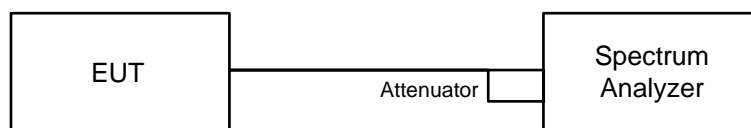


6.3.2 Test Procedure

- Set resolution bandwidth (RBW) = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

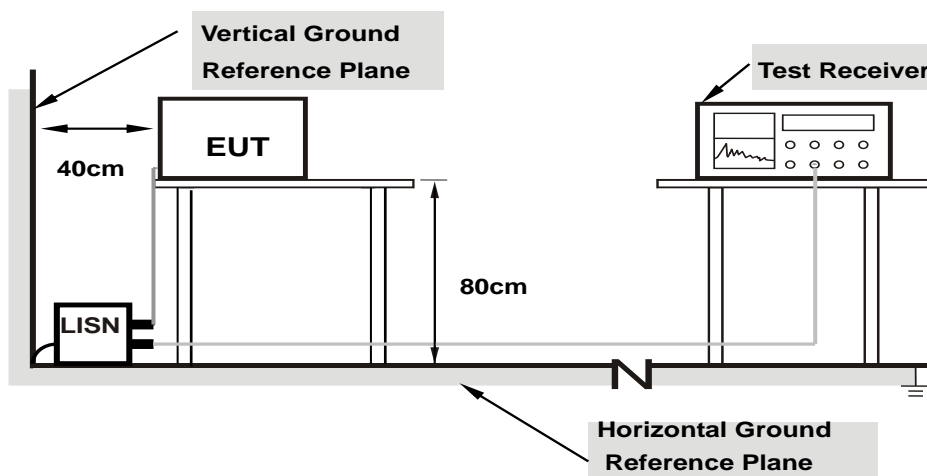
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW ≥ 300 kHz.
- Detector = peak.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- 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

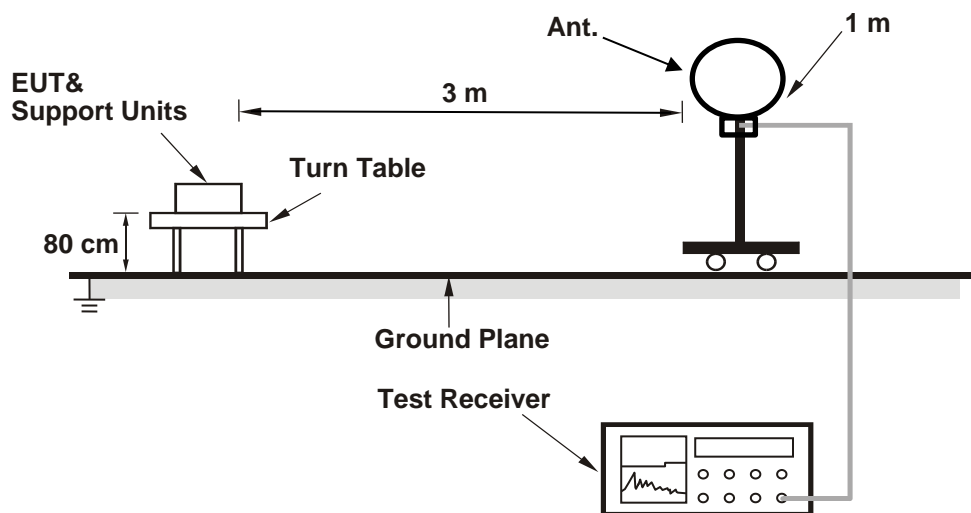
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The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

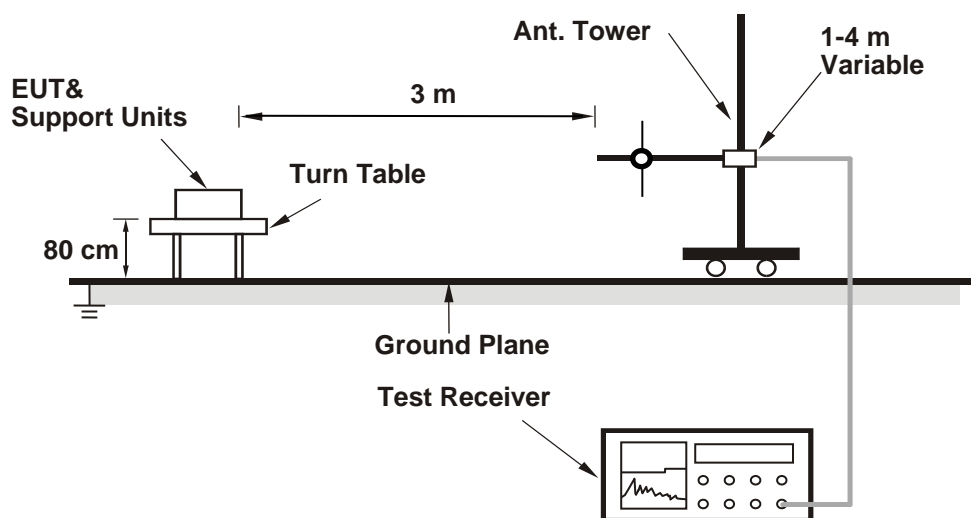
6.6 Unwanted Emissions below 1 GHz

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

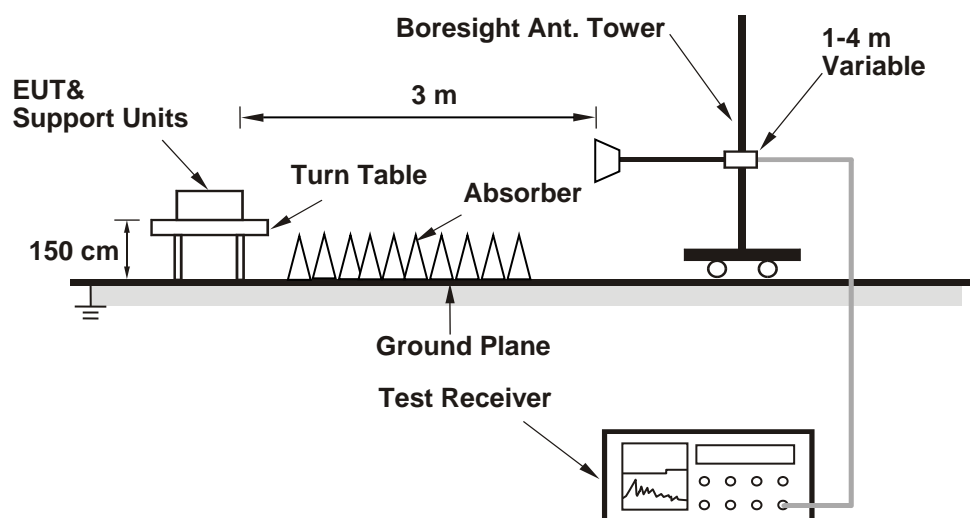
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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:

- 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.
- For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
- 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 (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	24.81	24.82	606.08	27.83	30	Pass
6	2437	24.81	24.80	604.687	27.82	30	Pass
11	2462	24.79	24.85	606.793	27.83	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 2.9 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	24.98	25.01	631.732	28.01	30	Pass
6	2437	24.86	24.87	613.099	27.88	30	Pass
11	2462	25.00	25.02	633.915	28.02	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 2.9 dBi < 6 dBi, so the output power limit shall not be reduced.

VHT20

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	24.97	24.98	628.826	27.99	30	Pass
6	2437	24.81	24.85	608.183	27.84	30	Pass
11	2462	24.98	24.96	628.103	27.98	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 2.9 dBi < 6 dBi, so the output power limit shall not be reduced.

VHT40

Chan.	Chan. Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
3	2422	24.66	24.69	586.857	27.69	30	Pass
6	2437	24.88	24.91	617.352	27.91	30	Pass
9	2452	24.70	24.62	584.855	27.67	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 2.9 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power
802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	22.92	22.96	393.581	25.95
6	2437	23.55	23.58	454.499	26.58
11	2462	22.67	22.88	379.015	25.79

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	19.42	19.55	177.655	22.50
6	2437	23.07	22.71	389.406	25.90
11	2462	18.66	19.33	159.155	22.02

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
1	2412	19.86	19.96	195.911	22.92
6	2437	23.00	22.69	385.307	25.86
11	2462	19.20	19.66	175.646	22.45

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Average Power (mW)	Total Average Power (dBm)
		Chain 0	Chain 1		
3	2422	16.40	16.70	90.425	19.56
6	2437	20.10	20.13	205.368	23.13
9	2452	15.87	16.09	79.281	18.99

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)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
1	2412	3.28	2.75	6.03	8	Pass
6	2437	3.87	3.35	6.63	8	Pass
11	2462	2.61	2.15	5.40	8	Pass

Notes:

- Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
- Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
- The directional gain is 5.84 dBi < 6 dBi, so the power density limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
1	2412	-3.04	-3.82	-0.40	8	Pass
6	2437	2.63	1.57	5.14	8	Pass
11	2462	-3.93	-3.32	-0.60	8	Pass

Notes:

- Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
- Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
- The directional gain is 5.84 dBi < 6 dBi, so the power density limit shall not be reduced.

VHT20

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
1	2412	-2.85	-3.66	-0.23	8	Pass
6	2437	2.95	1.12	5.14	8	Pass
11	2462	-4.16	-4.06	-1.10	8	Pass

Notes:

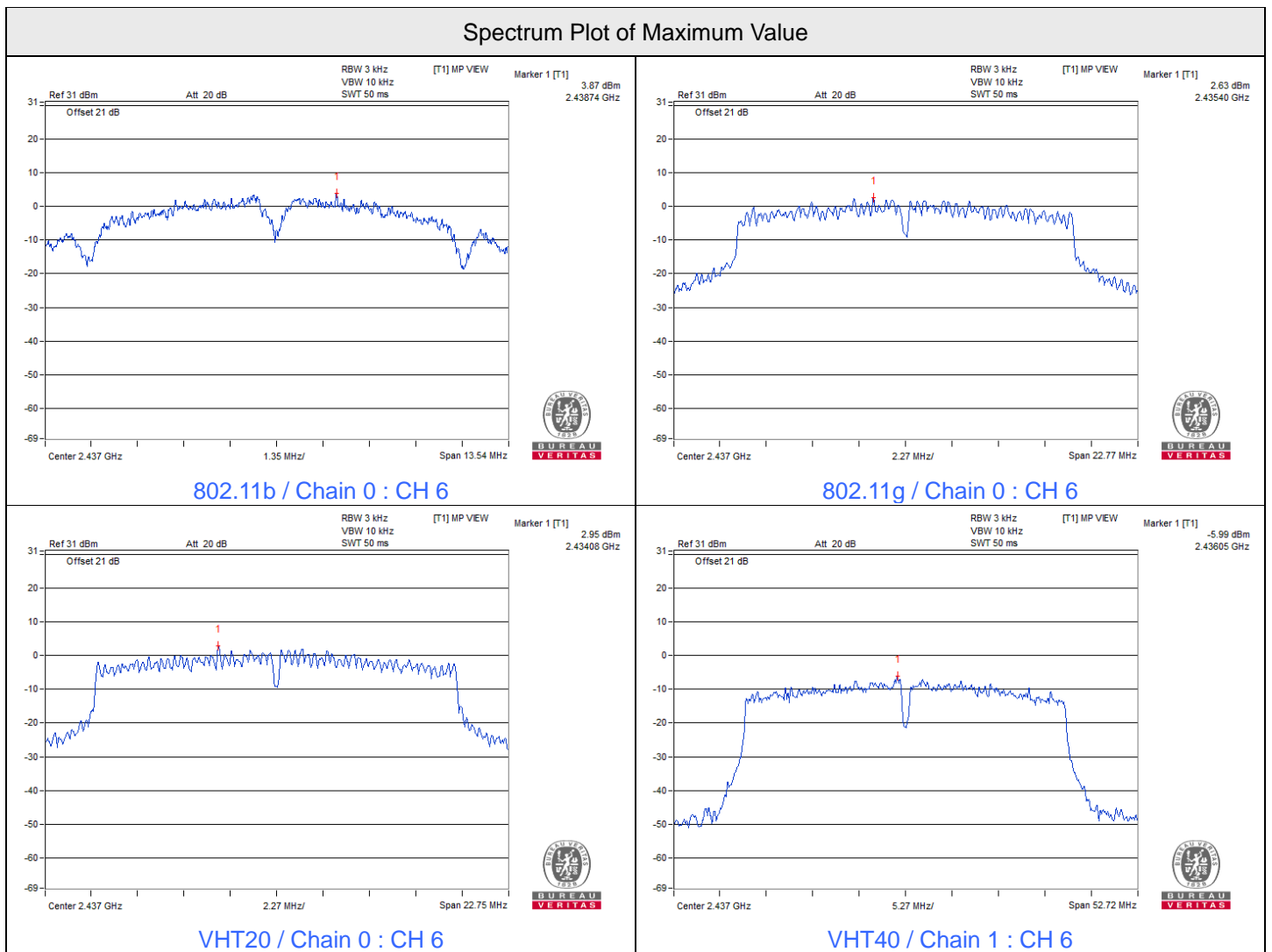
- Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
- Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
- The directional gain is 5.84 dBi < 6 dBi, so the power density limit shall not be reduced.

VHT40

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
3	2422	-9.69	-10.11	-6.88	8	Pass
6	2437	-6.21	-5.99	-3.09	8	Pass
9	2452	-9.69	-10.30	-6.97	8	Pass

Notes:

1. Method E) 2) b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
3. The directional gain is 5.84 dBi < 6 dBi, so the power density limit shall not be reduced.



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)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	9.03	9.07	0.5	Pass
6	2437	9.03	9.02	0.5	Pass
11	2462	9.03	9.07	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	15.16	15.16	0.5	Pass
6	2437	15.18	15.16	0.5	Pass
11	2462	15.15	15.15	0.5	Pass

VHT20

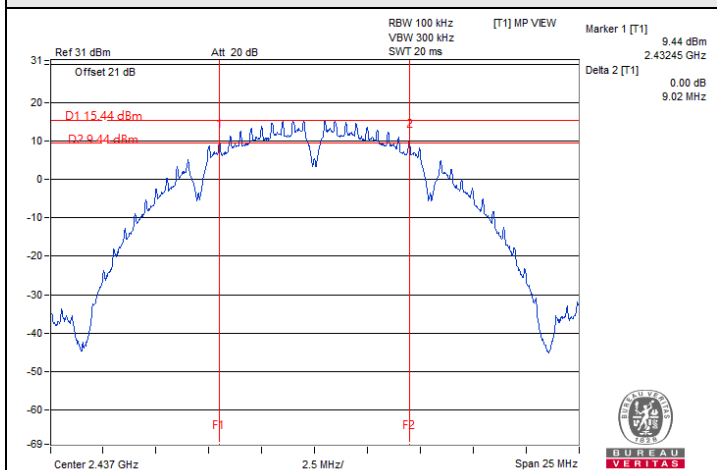
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	15.16	15.73	0.5	Pass
6	2437	15.17	16.31	0.5	Pass
11	2462	15.18	16.29	0.5	Pass

VHT40

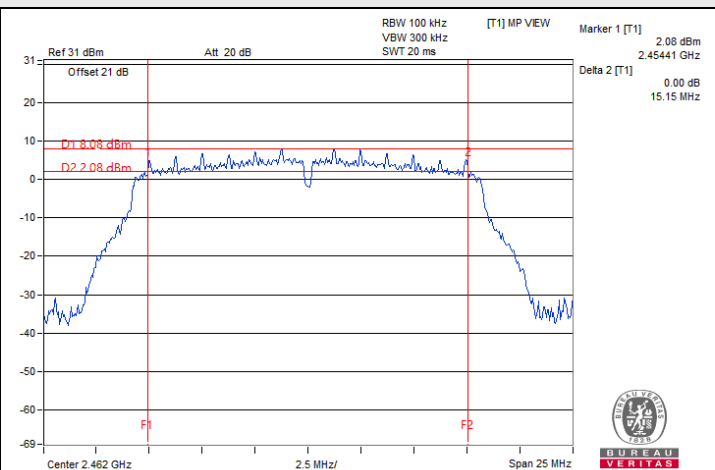
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
3	2422	35.14	35.15	0.5	Pass
6	2437	35.15	35.15	0.5	Pass
9	2452	35.15	35.16	0.5	Pass



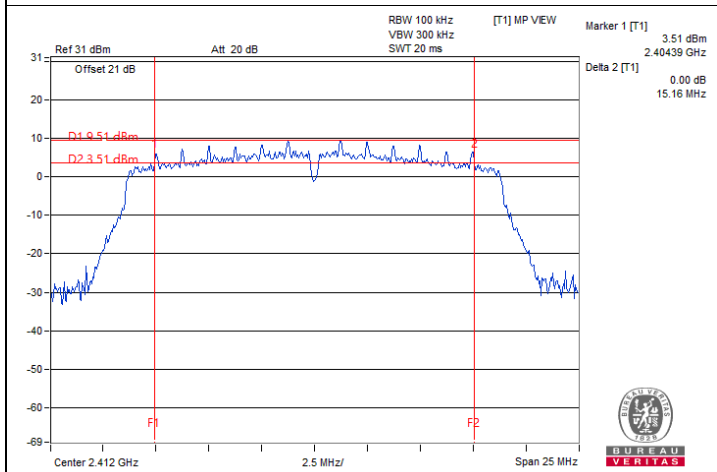
Spectrum Plot of Minimum Value



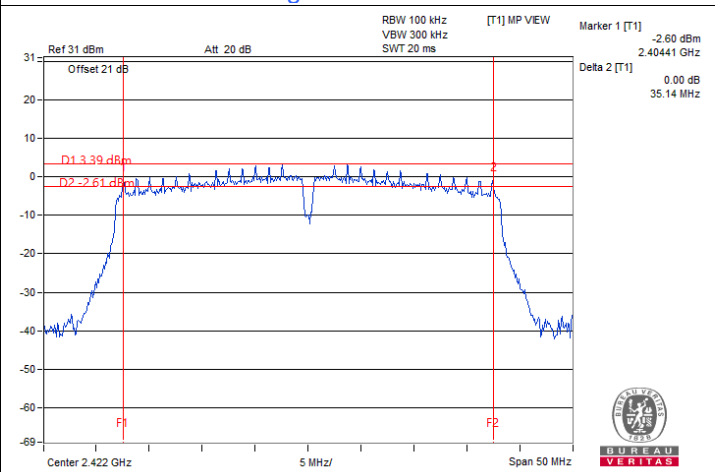
802.11b / Chain 1 : CH 6



802.11g / Chain 0 : CH 11



VHT20 / Chain 0 : CH 1



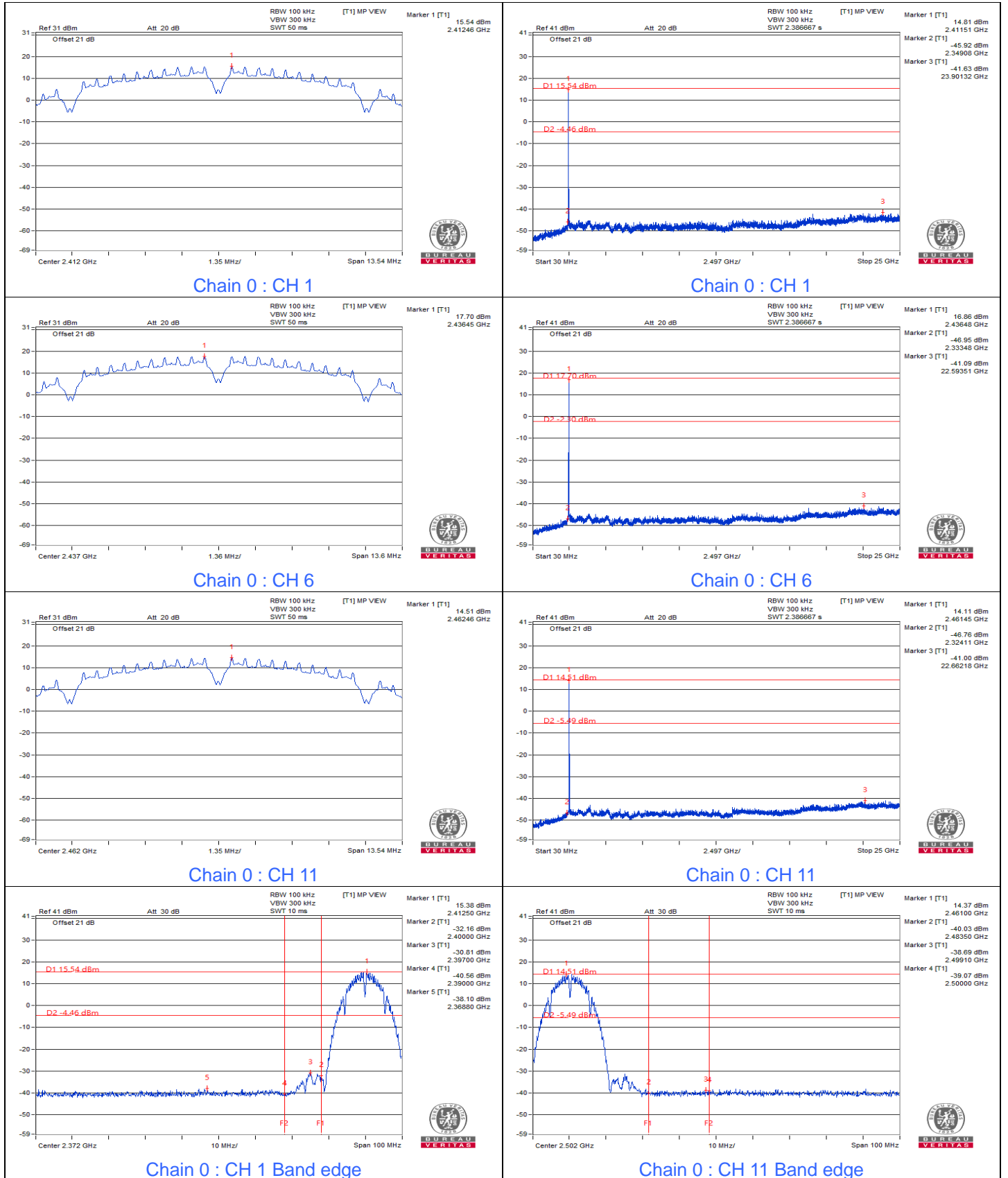
VHT40 / Chain 0 : CH 3

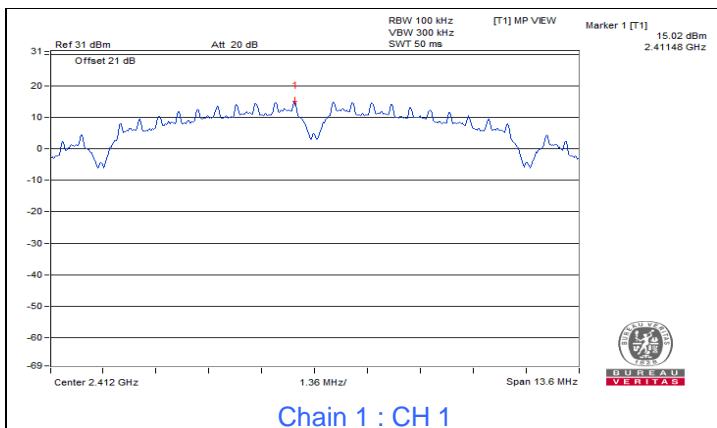


7.4 Conducted Out of Band Emissions

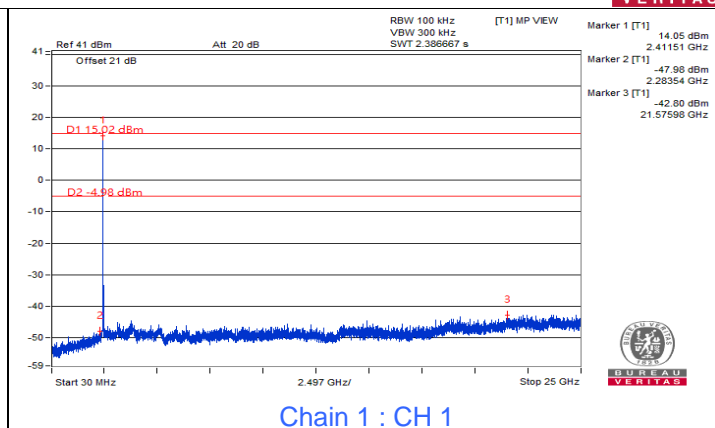
Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	John Peng
--------------	----------------	---------------------------	--------------	------------	-----------

802.11b

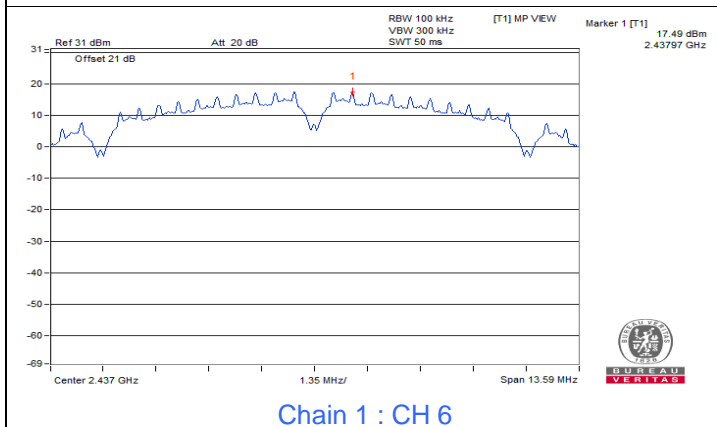




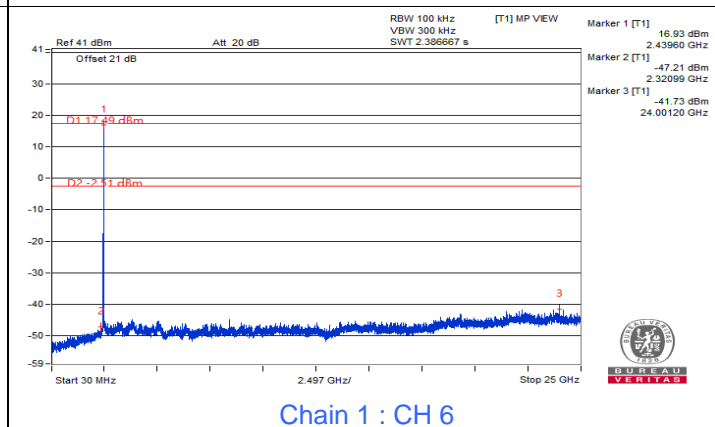
Chain 1 : CH 1



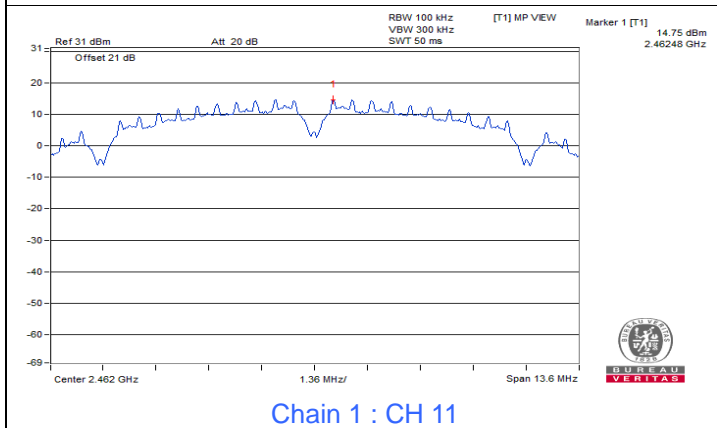
Chain 1 : CH 1



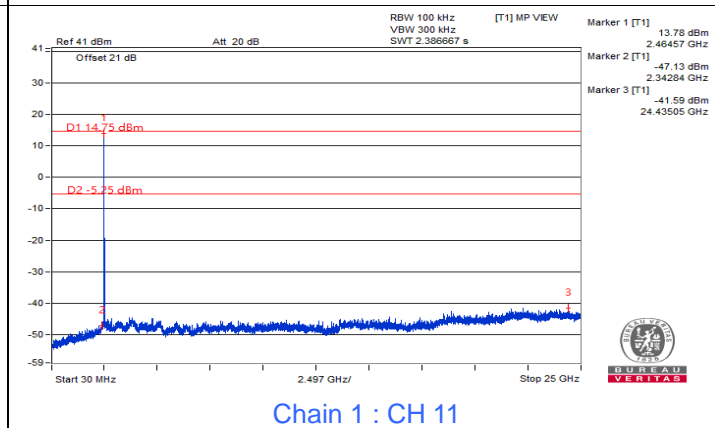
Chain 1 : CH 6



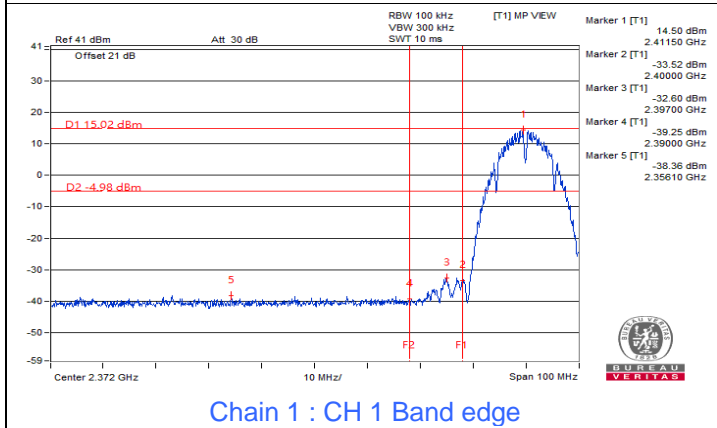
Chain 1 : CH 6



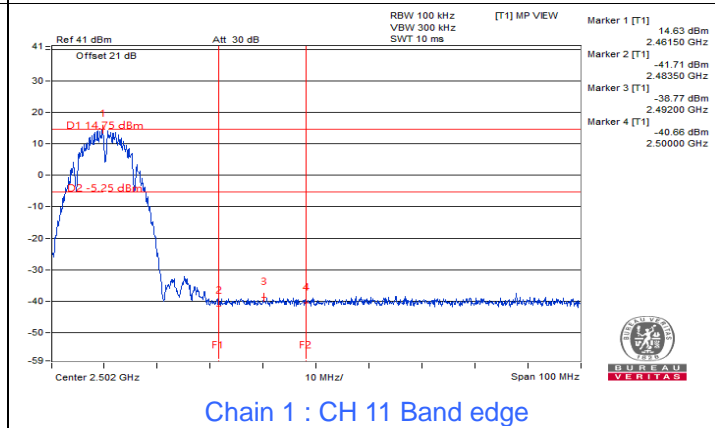
Chain 1 : CH 11



Chain 1 : CH 11



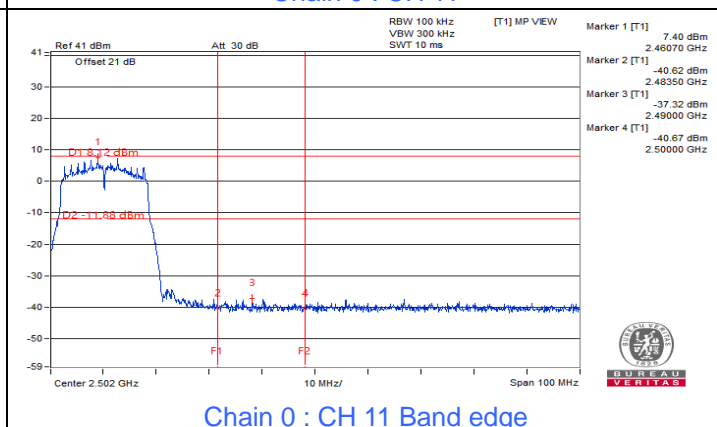
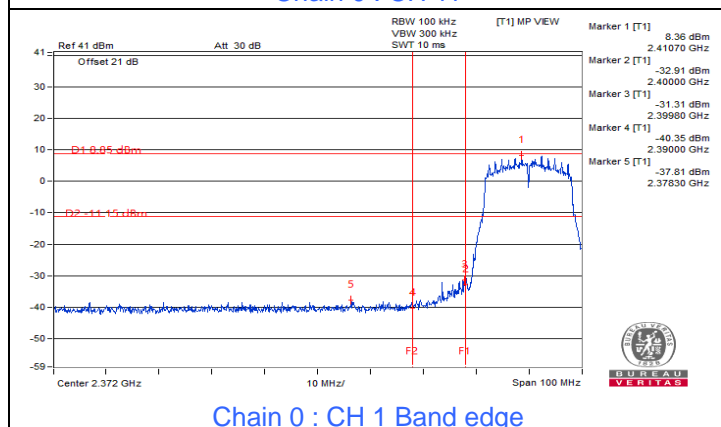
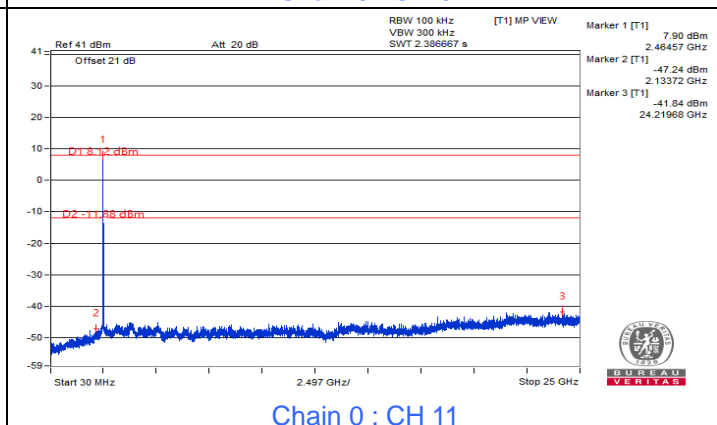
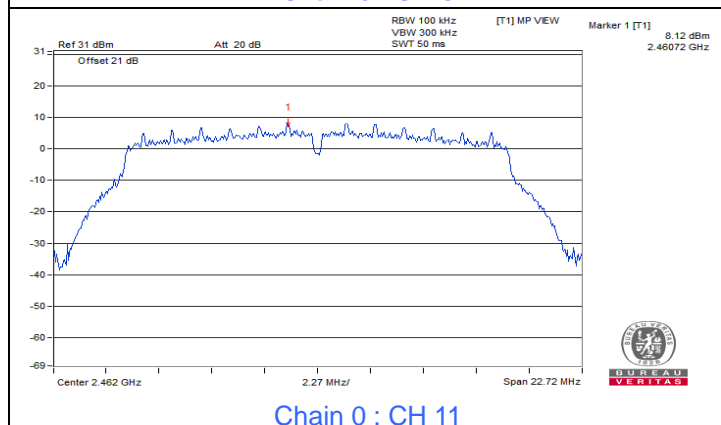
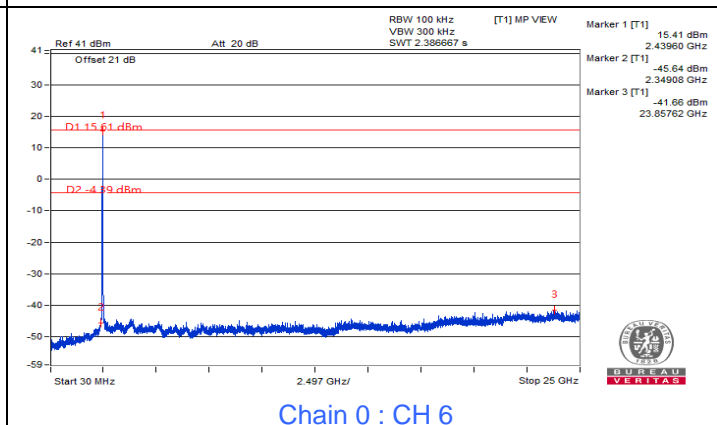
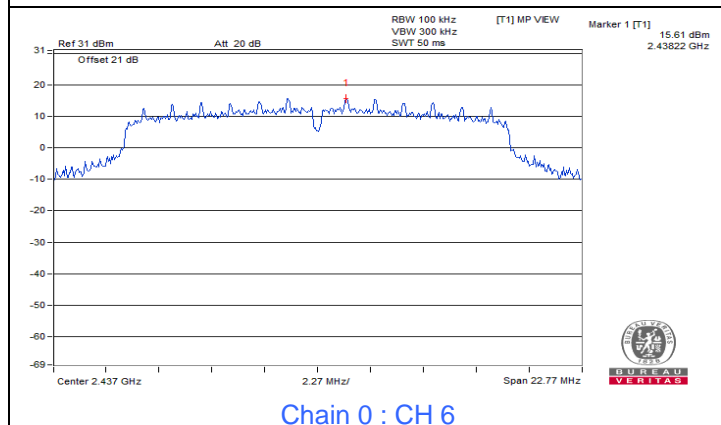
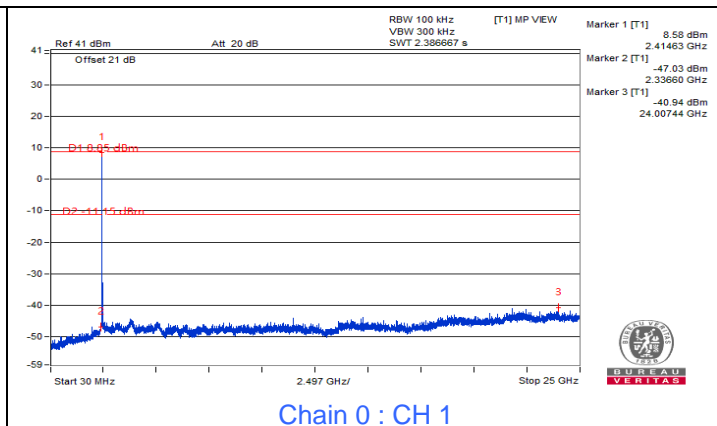
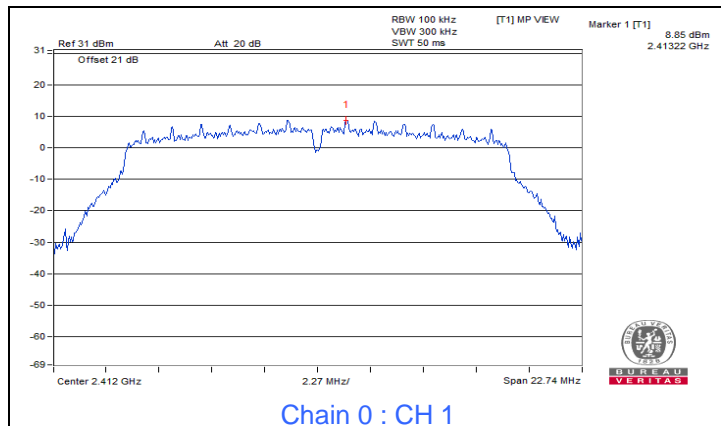
Chain 1 : CH 1 Band edge



Chain 1 : CH 11 Band edge

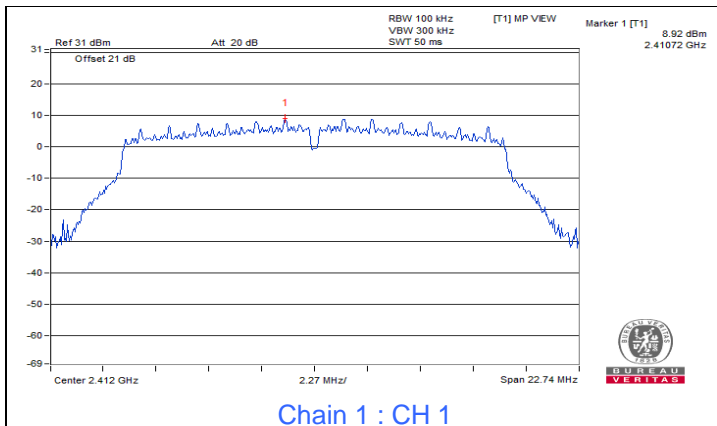


802.11g

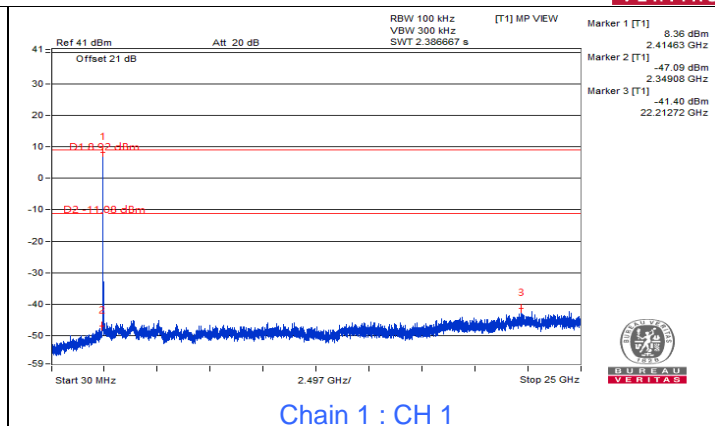




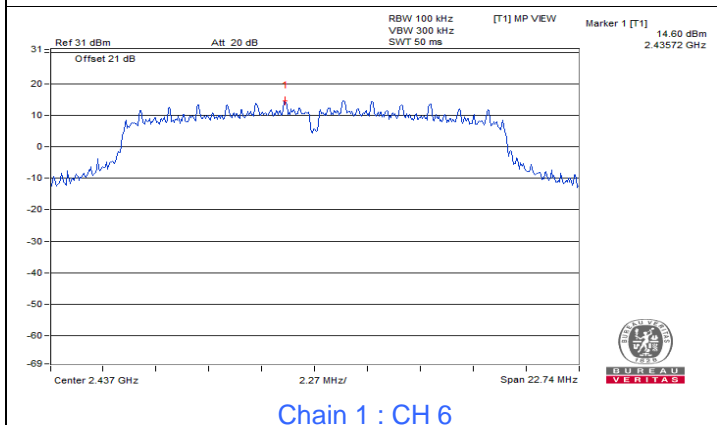
BUREAU VERITAS



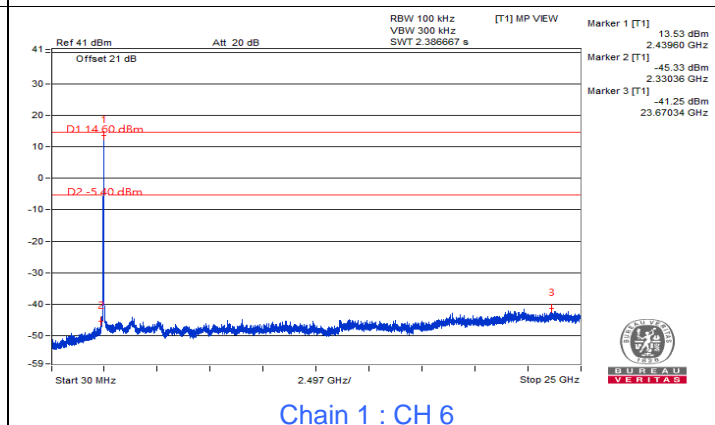
Chain 1 : CH 1



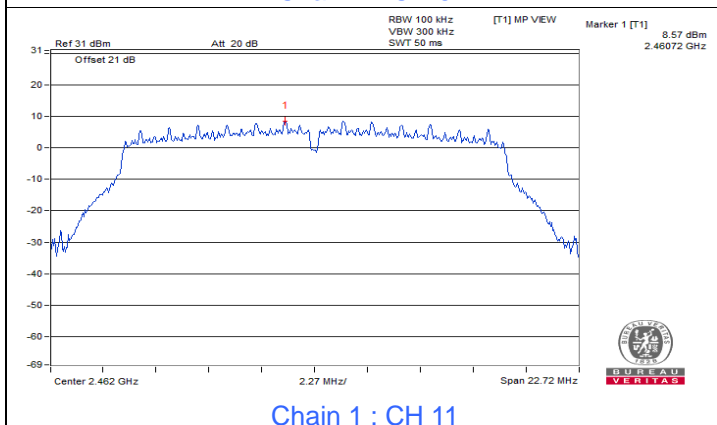
Chain 1 : CH 1



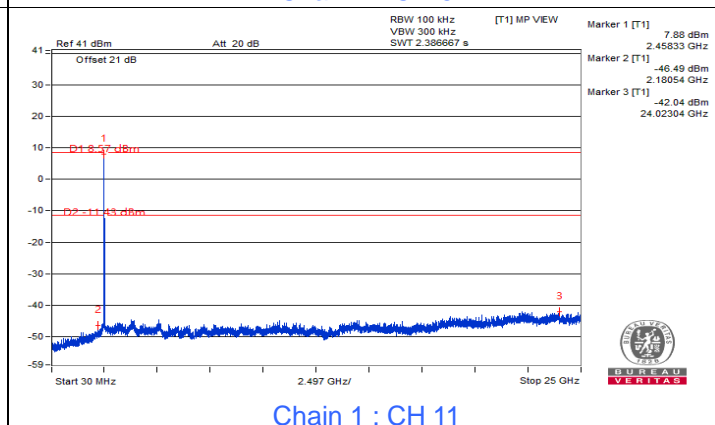
Chain 1 : CH 6



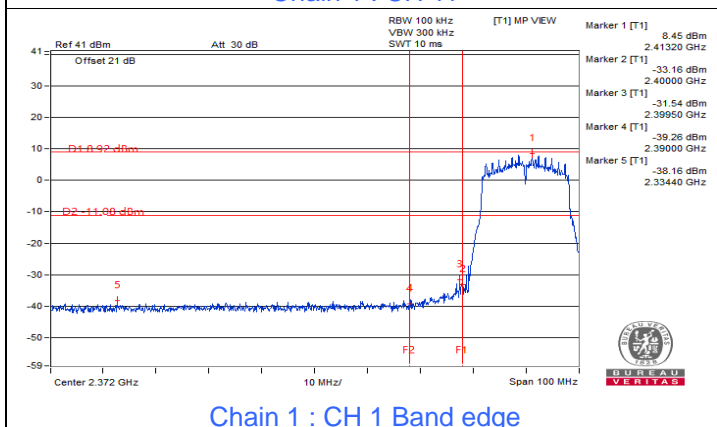
Chain 1 : CH 6



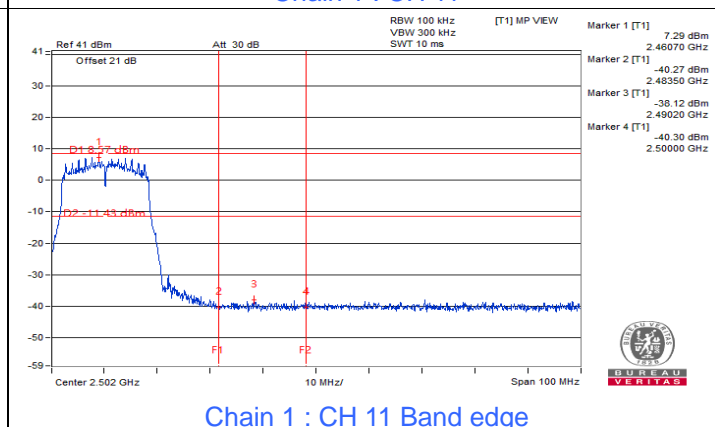
Chain 1 : CH 11



Chain 1 : CH 11



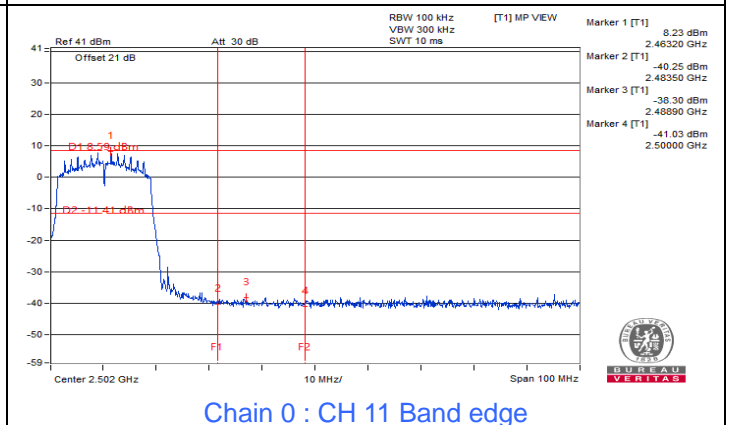
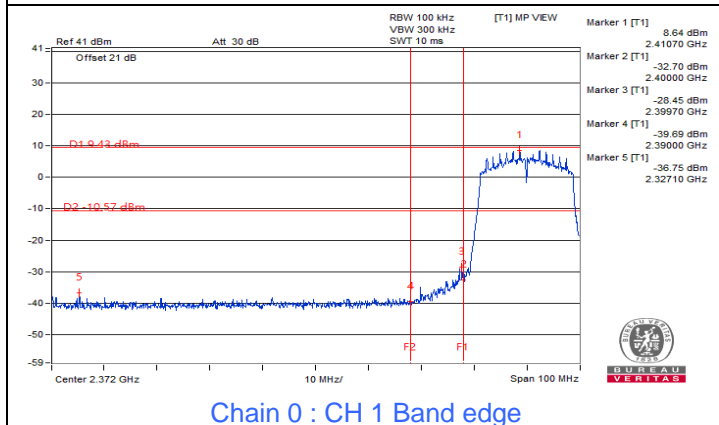
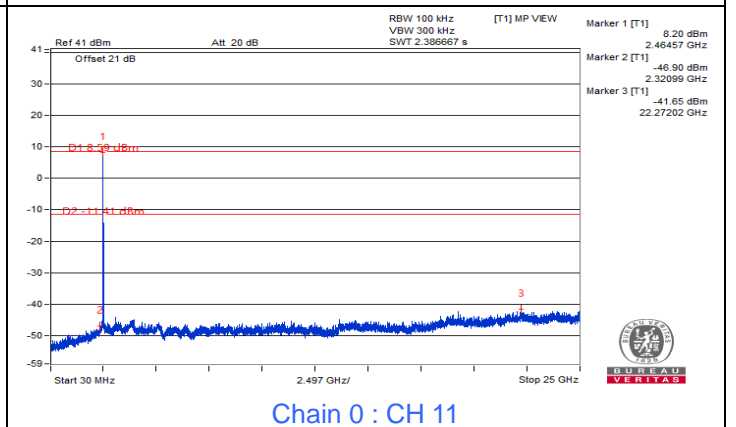
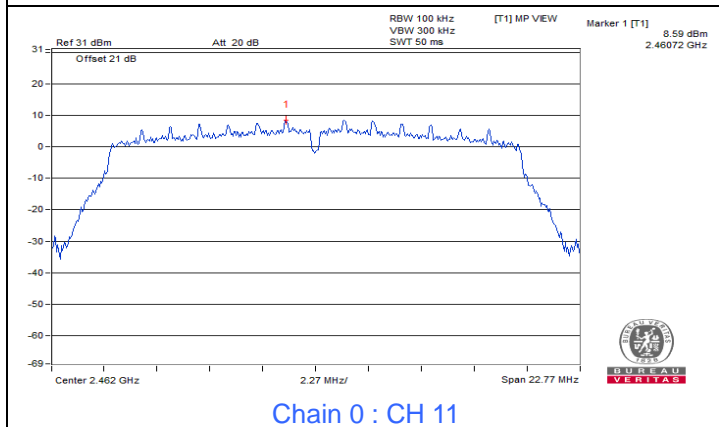
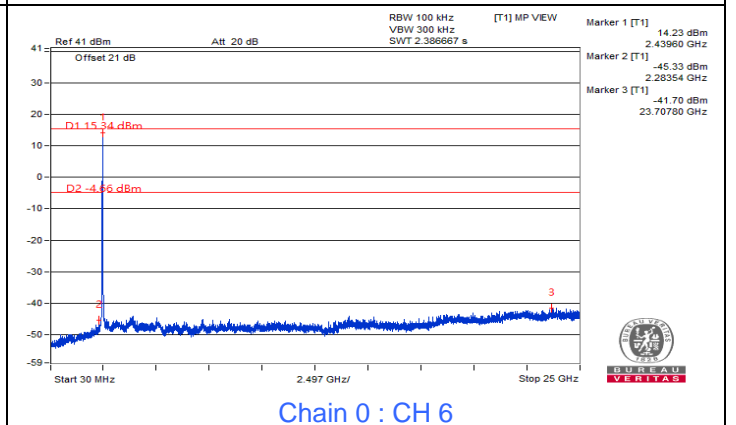
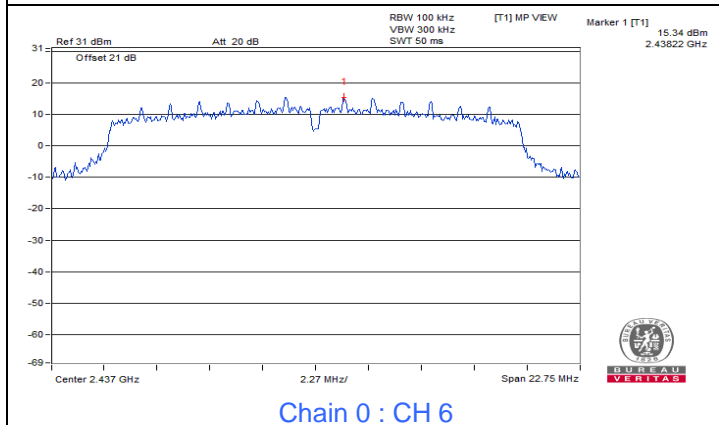
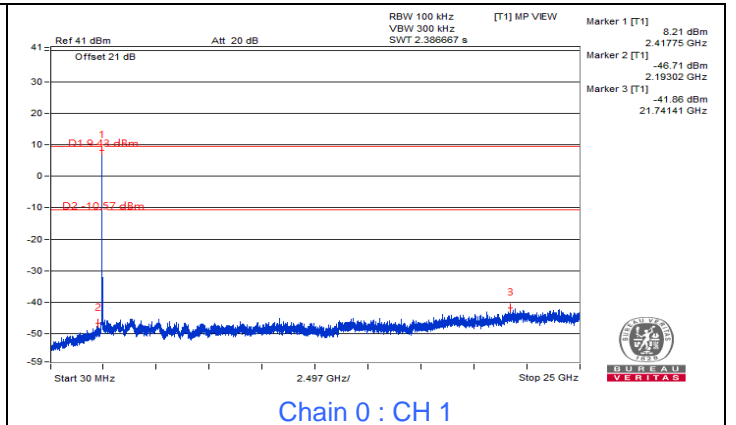
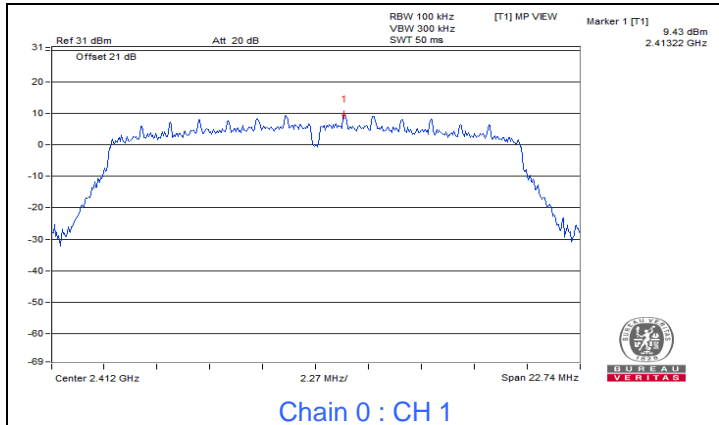
Chain 1 : CH 1 Band edge

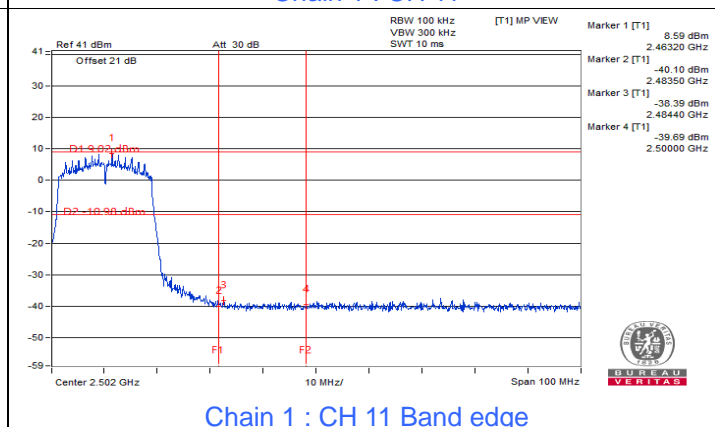
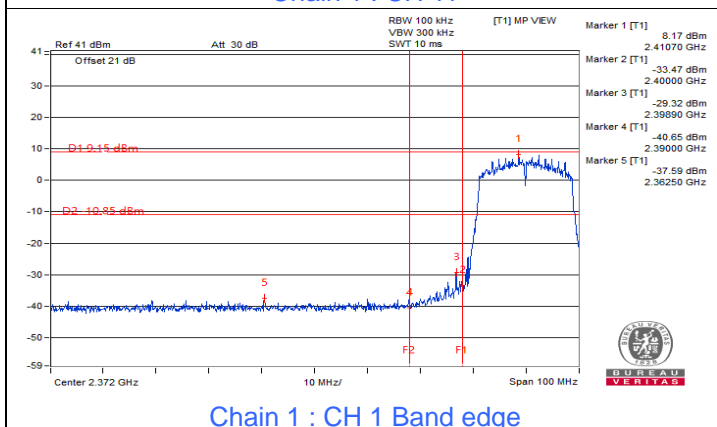
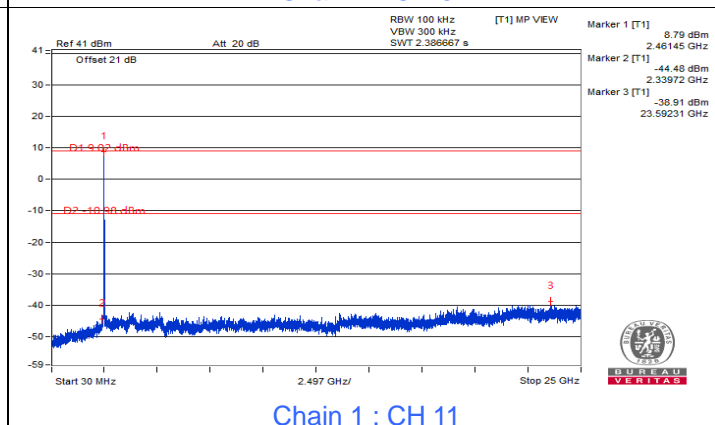
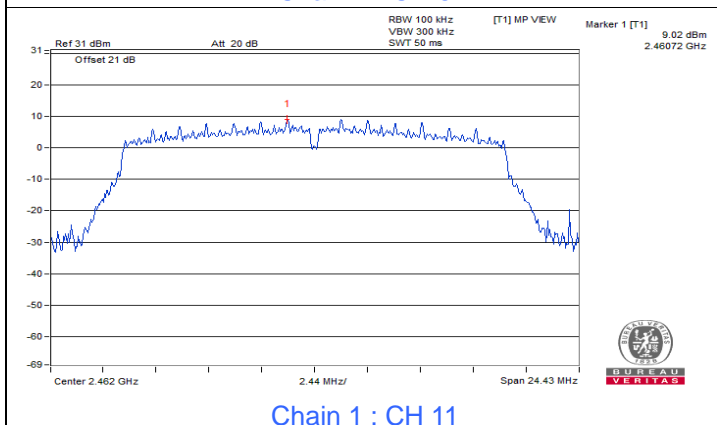
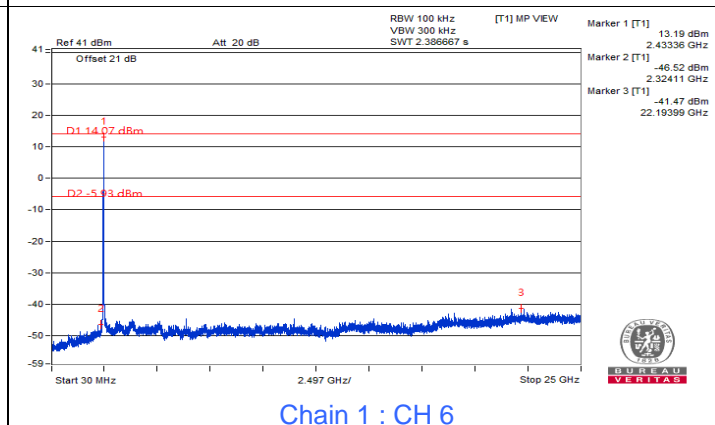
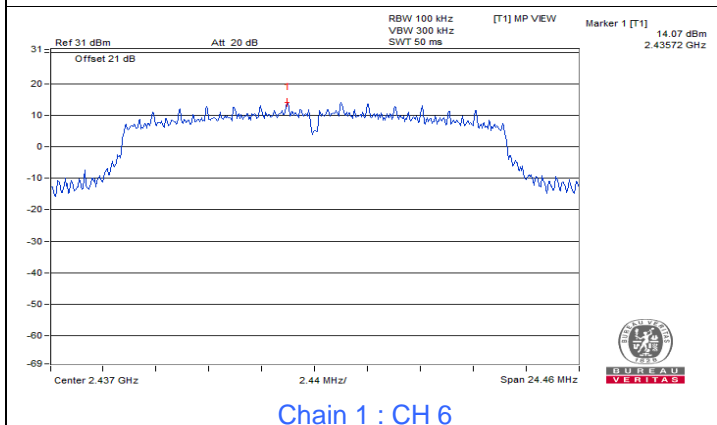
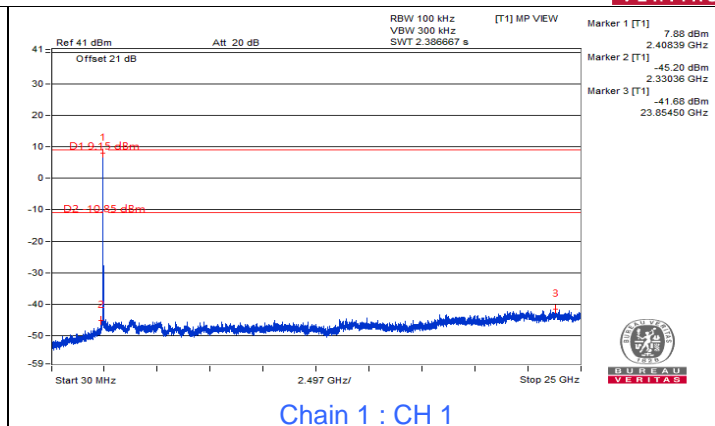
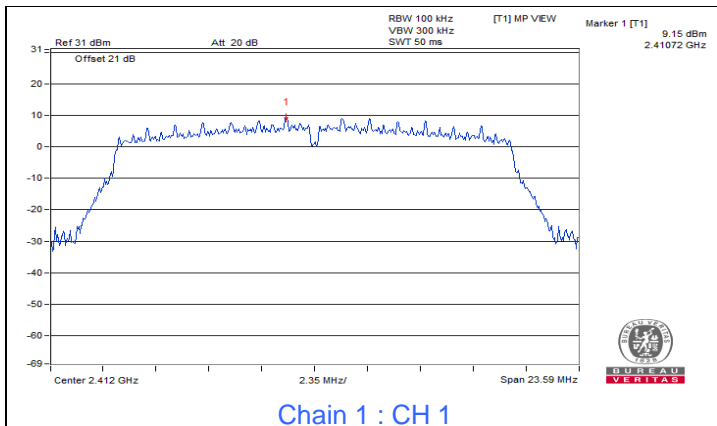


Chain 1 : CH 11 Band edge



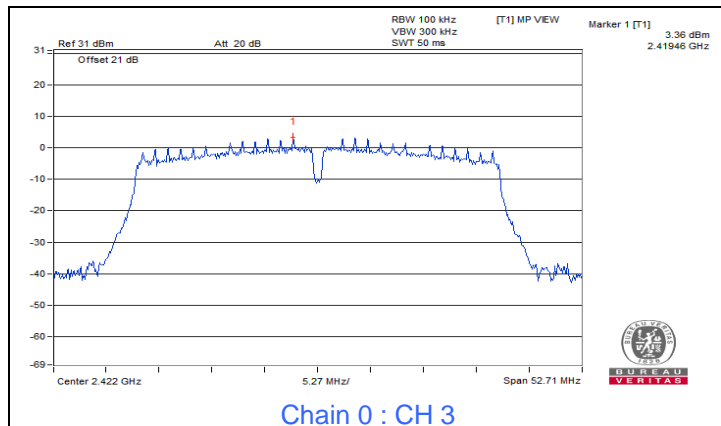
VHT20



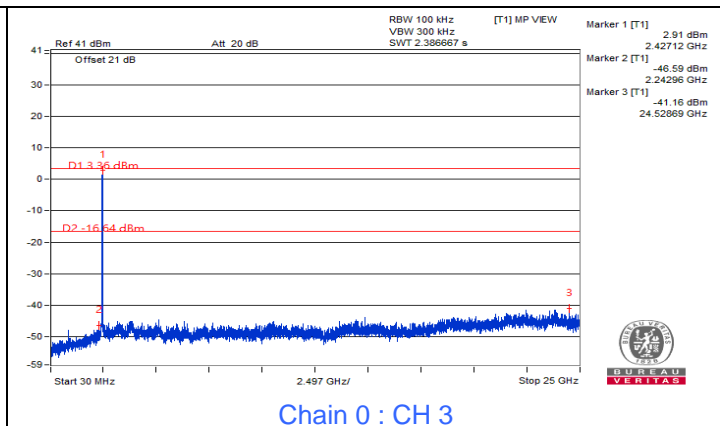




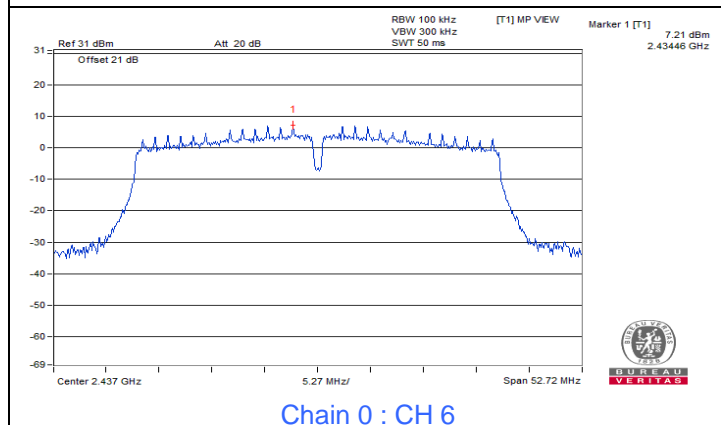
VHT40



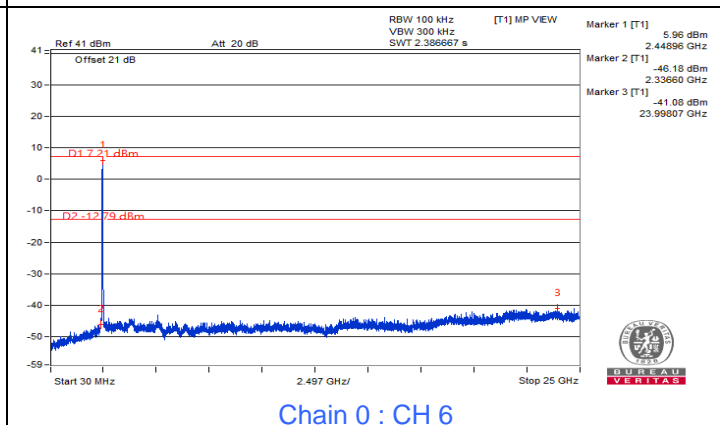
Chain 0 : CH 3



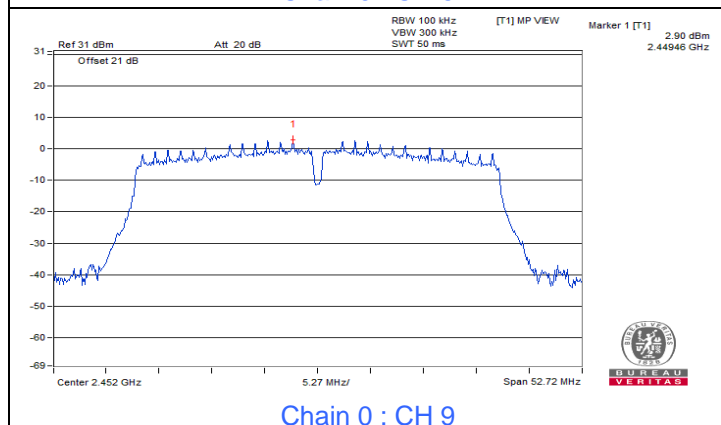
Chain 0 : CH 3



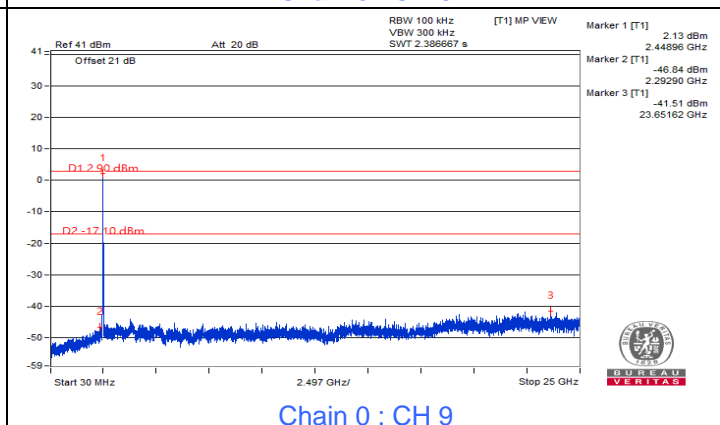
Chain 0 : CH 6



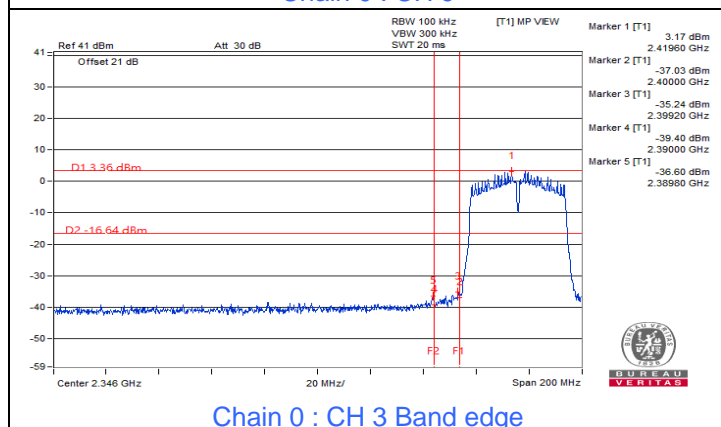
Chain 0 : CH 6



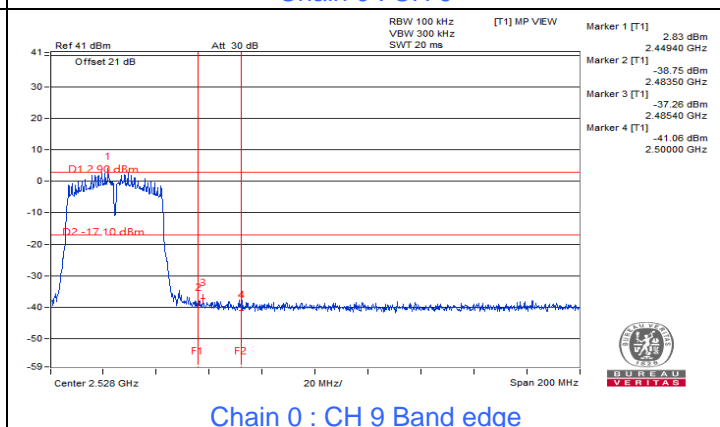
Chain 0 : CH 9



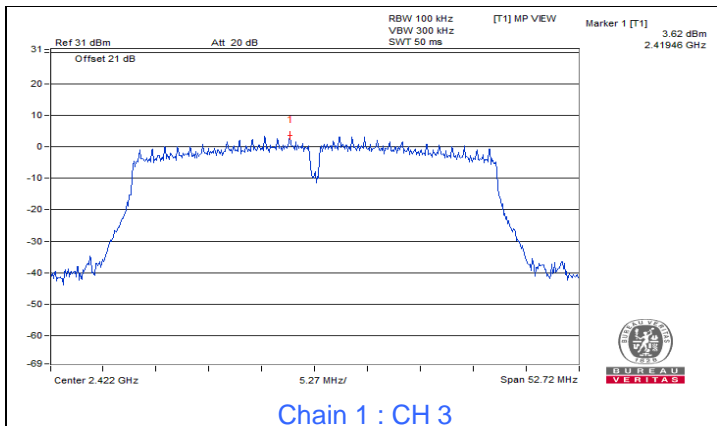
Chain 0 : CH 9



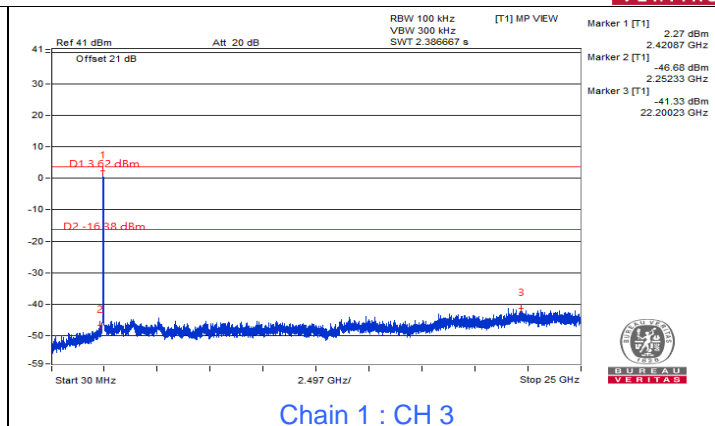
Chain 0 : CH 3 Band edge



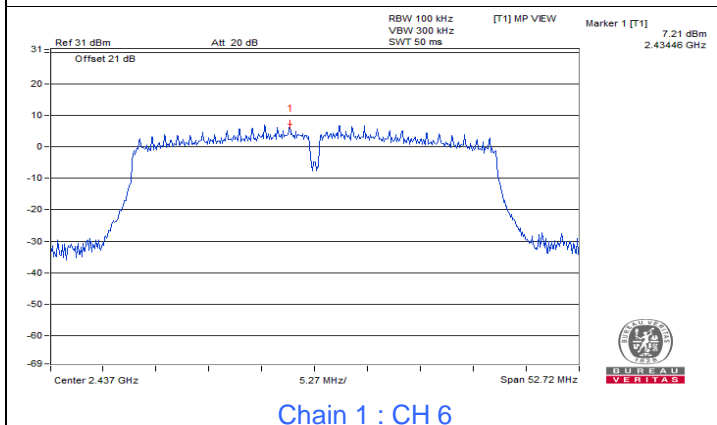
Chain 0 : CH 9 Band edge



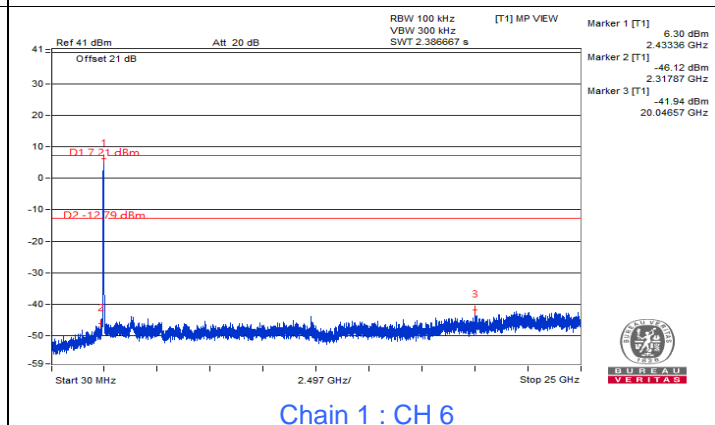
Chain 1 : CH 3



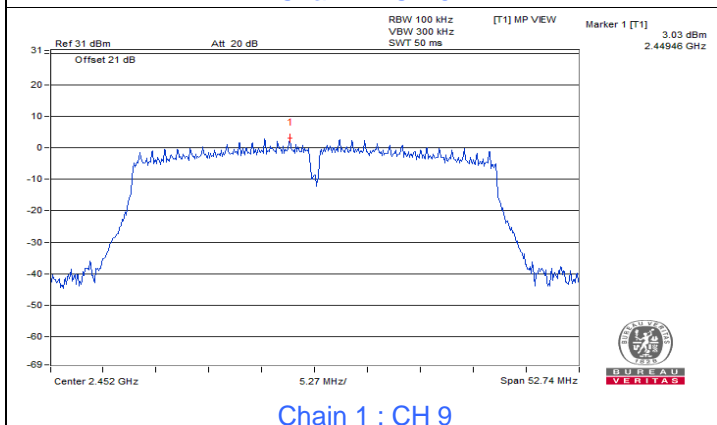
Chain 1 : CH 3



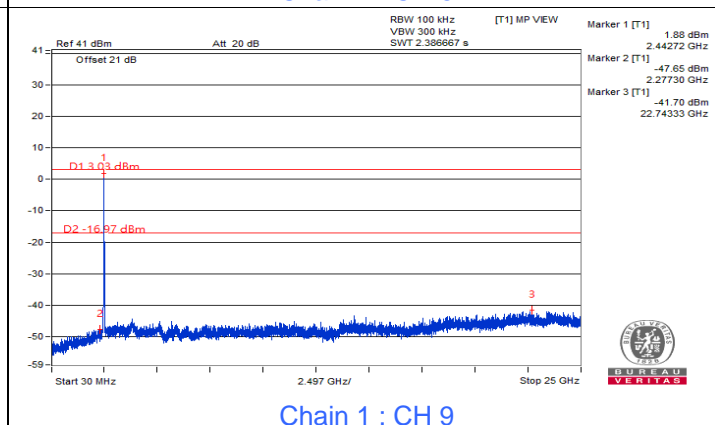
Chain 1 : CH 6



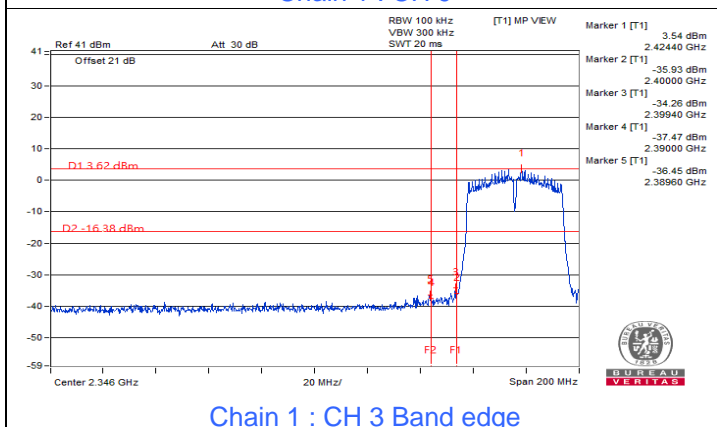
Chain 1 : CH 6



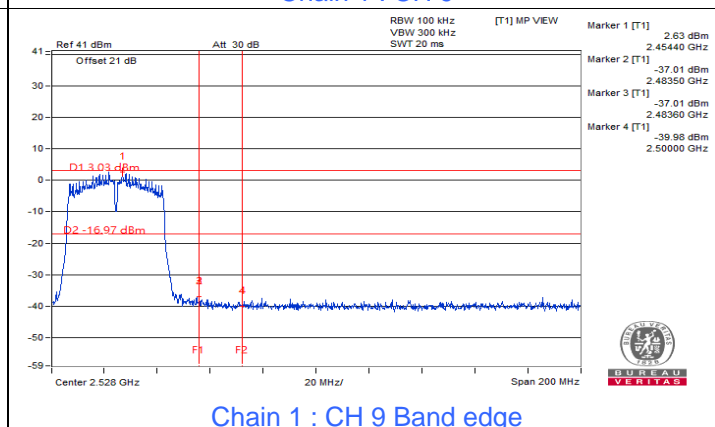
Chain 1 : CH 9



Chain 1 : CH 9



Chain 1 : CH 3 Band edge



Chain 1 : CH 9 Band edge

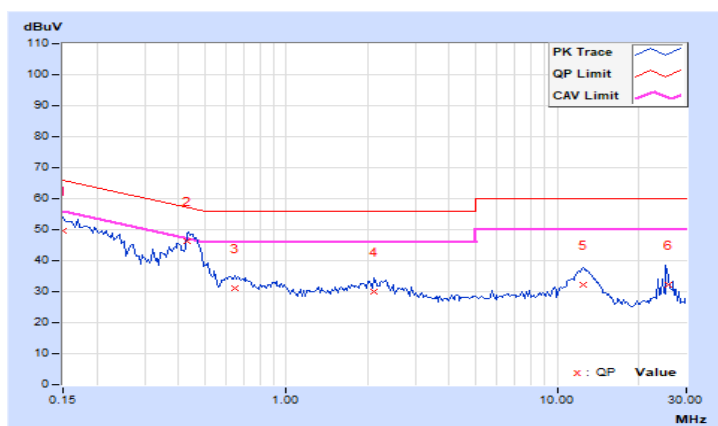
7.5 AC Power Conducted Emissions

RF Mode	802.11b	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	25°C, 75% RH
Tested By	Carter Lin		

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	0.15000	9.96	39.71	21.69	49.67	31.65	66.00	56.00	-16.33	-24.35
2	0.43125	9.97	36.35	24.72	46.32	34.69	57.23	47.23	-10.91	-12.54
3	0.65000	9.98	21.21	13.66	31.19	23.64	56.00	46.00	-24.81	-22.36
4	2.11719	10.06	20.08	13.35	30.14	23.41	56.00	46.00	-25.86	-22.59
5	12.40625	10.64	21.63	14.70	32.27	25.34	60.00	50.00	-27.73	-24.66
6	25.87500	11.19	20.96	13.19	32.15	24.38	60.00	50.00	-27.85	-25.62

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

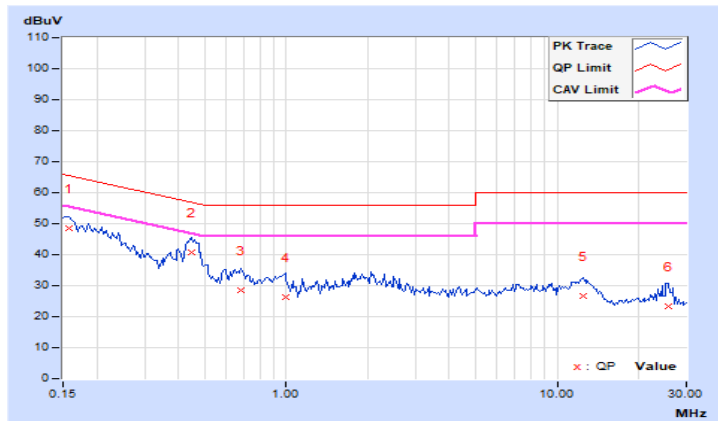


RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 75% RH
Tested By	Carter Lin		

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	0.15781	9.93	38.74	22.09	48.67	32.02	65.58	55.58	-16.91	-23.56
2	0.44688	9.94	30.64	25.80	40.58	35.74	56.93	46.93	-16.35	-11.19
3	0.68125	9.95	18.43	10.60	28.38	20.55	56.00	46.00	-27.62	-25.45
4	0.98984	9.97	16.47	9.11	26.44	19.08	56.00	46.00	-29.56	-26.92
5	12.43750	10.48	16.05	11.26	26.53	21.74	60.00	50.00	-33.47	-28.26
6	25.87109	10.86	12.62	6.78	23.48	17.64	60.00	50.00	-36.52	-32.36

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



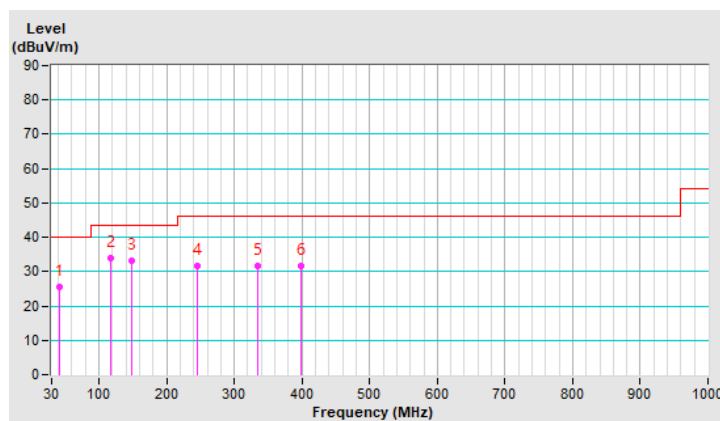
7.6 Unwanted Emissions below 1 GHz

RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
Input Power	120Vac,60Hz	Environmental Conditions	26°C, 68% RH
Tested By	Tom Yang		

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	42.56	25.6 QP	40.0	-14.4	2.00 H	226	38.4	-12.8
2	116.48	33.9 QP	43.5	-9.6	1.50 H	290	48.3	-14.4
3	148.92	33.1 QP	43.5	-10.4	1.50 H	252	45.1	-12.0
4	245.90	31.6 QP	46.0	-14.4	1.00 H	290	44.6	-13.0
5	333.85	31.5 QP	46.0	-14.5	1.00 H	304	41.3	-9.8
6	399.40	31.5 QP	46.0	-14.5	1.00 H	46	39.4	-7.9

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 emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

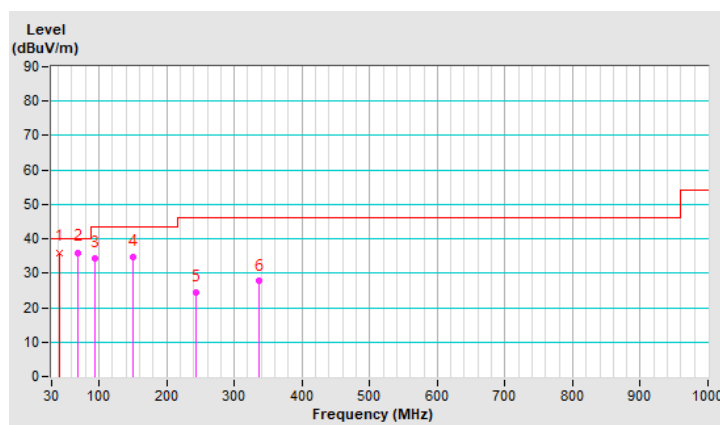


RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
Input Power	120Vac,60Hz	Environmental Conditions	26°C, 68% RH
Tested By	Tom Yang		

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	42.00	36.0 QP	40.0	-4.0	1.50 V	210	48.8	-12.8
2	68.78	36.0 QP	40.0	-4.0	2.00 V	360	50.6	-14.6
3	93.70	34.4 QP	43.5	-9.1	2.00 V	360	52.1	-17.7
4	150.98	34.7 QP	43.5	-8.8	1.00 V	73	46.6	-11.9
5	243.93	24.5 QP	46.0	-21.5	2.00 V	2	37.6	-13.1
6	336.23	27.6 QP	46.0	-18.4	1.00 V	353	37.4	-9.8

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 emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



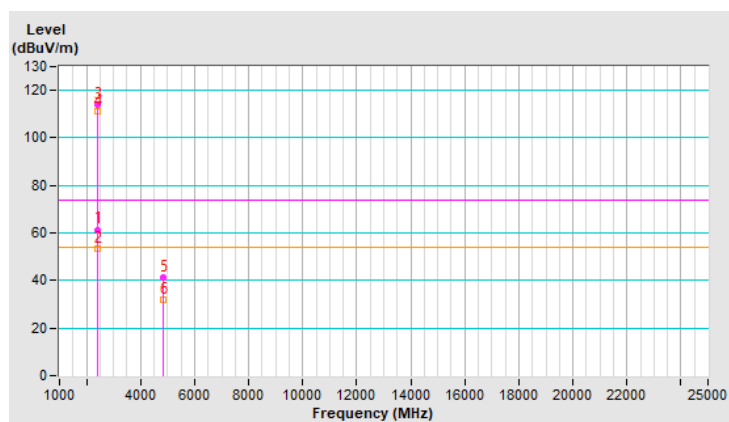
7.7 Unwanted Emissions above 1 GHz

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

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	2384.95	61.4 PK	74.0	-12.6	2.39 H	128	62.3	-0.9
2	2384.95	53.4 AV	54.0	-0.6	2.39 H	128	54.3	-0.9
3	*2412.00	114.1 PK			2.39 H	128	115.0	-0.9
4	*2412.00	111.4 AV			2.39 H	128	112.3	-0.9
5	4824.00	41.2 PK	74.0	-32.8	1.08 H	181	37.9	3.3
6	4824.00	31.7 AV	54.0	-22.3	1.08 H	181	28.4	3.3

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.

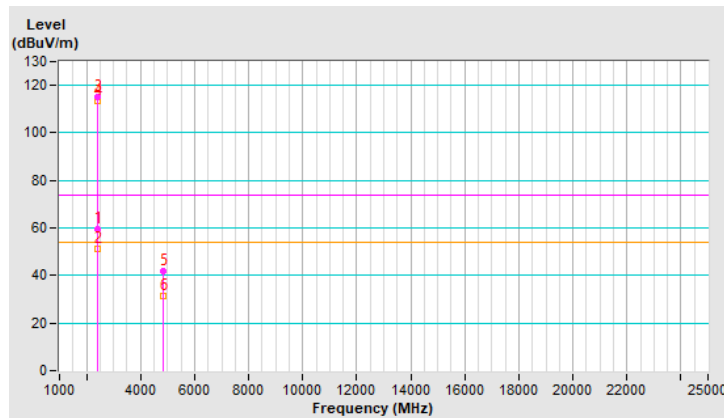


RF Mode	802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	2387.60	59.7 PK	74.0	-14.3	1.59 V	135	60.6	-0.9
2	2387.60	51.3 AV	54.0	-2.7	1.59 V	135	52.2	-0.9
3	*2412.00	115.3 PK			1.59 V	135	116.2	-0.9
4	*2412.00	113.2 AV			1.59 V	135	114.1	-0.9
5	4824.00	41.7 PK	74.0	-32.3	1.24 V	205	38.4	3.3
6	4824.00	31.2 AV	54.0	-22.8	1.24 V	205	27.9	3.3

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.

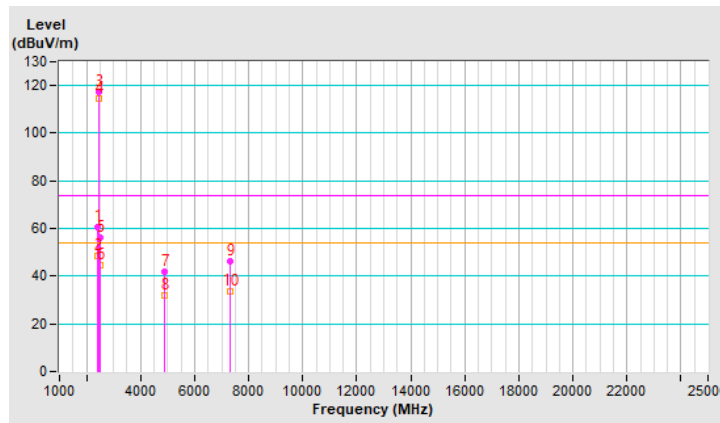


RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	60.4 PK	74.0	-13.6	1.17 H	173	61.3	-0.9
2	2390.00	48.6 AV	54.0	-5.4	1.17 H	173	49.5	-0.9
3	*2437.00	117.3 PK			1.17 H	173	118.2	-0.9
4	*2437.00	114.4 AV			1.17 H	173	115.3	-0.9
5	2483.50	56.3 PK	74.0	-17.7	1.17 H	173	57.4	-1.1
6	2483.50	44.7 AV	54.0	-9.3	1.17 H	173	45.8	-1.1
7	4874.00	41.7 PK	74.0	-32.3	1.09 H	166	38.3	3.4
8	4874.00	32.0 AV	54.0	-22.0	1.09 H	166	28.6	3.4
9	7311.00	46.1 PK	74.0	-27.9	1.43 H	97	36.0	10.1
10	7311.00	33.7 AV	54.0	-20.3	1.43 H	97	23.6	10.1

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.



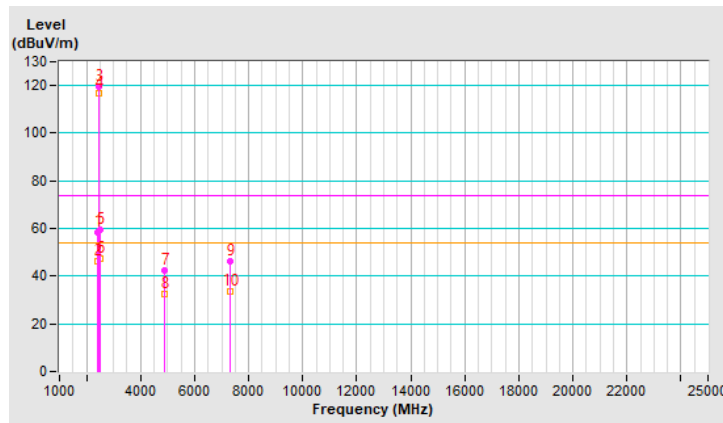
RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	58.2 PK	74.0	-15.8	1.69 V	139	59.1	-0.9
2	2390.00	46.3 AV	54.0	-7.7	1.69 V	139	47.2	-0.9
3	*2437.00	119.4 PK			1.69 V	139	120.3	-0.9
4	*2437.00	116.6 AV			1.69 V	139	117.5	-0.9
5	2483.50	59.5 PK	74.0	-14.5	1.69 V	139	60.6	-1.1
6	2483.50	47.1 AV	54.0	-6.9	1.69 V	139	48.2	-1.1
7	4874.00	42.4 PK	74.0	-31.6	1.17 V	220	39.0	3.4
8	4874.00	32.5 AV	54.0	-21.5	1.17 V	220	29.1	3.4
9	7311.00	46.3 PK	74.0	-27.7	1.62 V	135	36.2	10.1
10	7311.00	33.5 AV	54.0	-20.5	1.62 V	135	23.4	10.1

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.



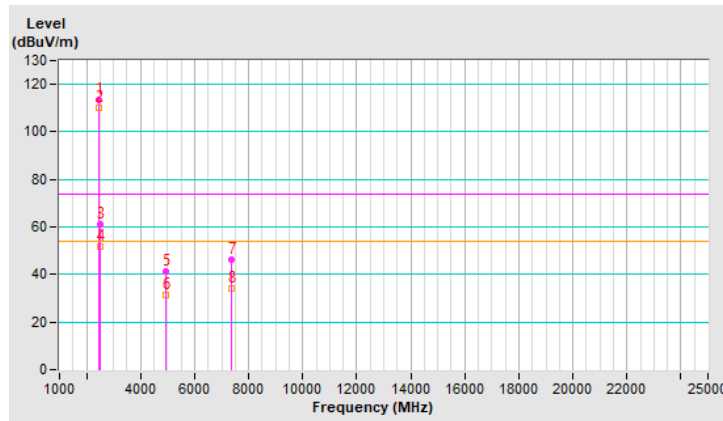
RF Mode	802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	113.3 PK			1.20 H	170	114.2	-0.9
2	*2462.00	110.4 AV			1.20 H	170	111.3	-0.9
3	2488.80	61.3 PK	74.0	-12.7	1.20 H	170	62.4	-1.1
4	2488.80	51.6 AV	54.0	-2.4	1.20 H	170	52.7	-1.1
5	4924.00	41.3 PK	74.0	-32.7	1.13 H	158	37.8	3.5
6	4924.00	31.6 AV	54.0	-22.4	1.13 H	158	28.1	3.5
7	7386.00	46.3 PK	74.0	-27.7	1.41 H	105	36.2	10.1
8	7386.00	33.9 AV	54.0	-20.1	1.41 H	105	23.8	10.1

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.

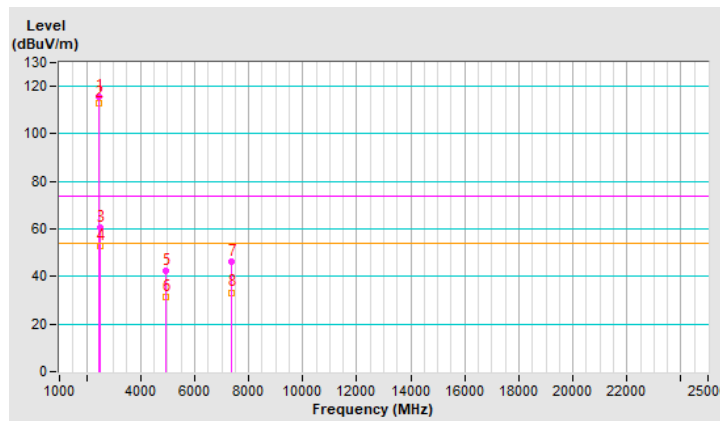


RF Mode	802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	115.6 PK			2.92 V	236	116.5	-0.9
2	*2462.00	112.8 AV			2.92 V	236	113.7	-0.9
3	2488.25	60.7 PK	74.0	-13.3	2.92 V	236	61.8	-1.1
4	2488.25	53.1 AV	54.0	-0.9	2.92 V	236	54.2	-1.1
5	4924.00	42.3 PK	74.0	-31.7	1.19 V	209	38.8	3.5
6	4924.00	31.6 AV	54.0	-22.4	1.19 V	209	28.1	3.5
7	7386.00	46.1 PK	74.0	-27.9	1.66 V	142	36.0	10.1
8	7386.00	33.3 AV	54.0	-20.7	1.66 V	142	23.2	10.1

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.



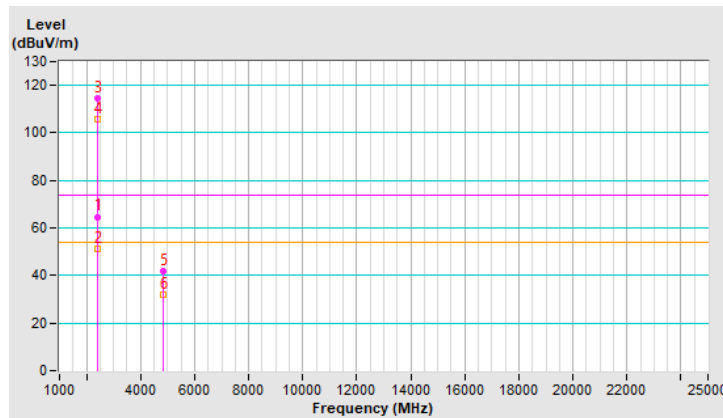
RF Mode	802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	64.7 PK	74.0	-9.3	1.91 H	142	65.6	-0.9
2	2390.00	51.3 AV	54.0	-2.7	1.91 H	142	52.2	-0.9
3	*2412.00	114.7 PK			1.91 H	142	115.6	-0.9
4	*2412.00	105.8 AV			1.91 H	142	106.7	-0.9
5	4824.00	42.0 PK	74.0	-32.0	1.08 H	160	38.7	3.3
6	4824.00	32.0 AV	54.0	-22.0	1.08 H	160	28.7	3.3

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.

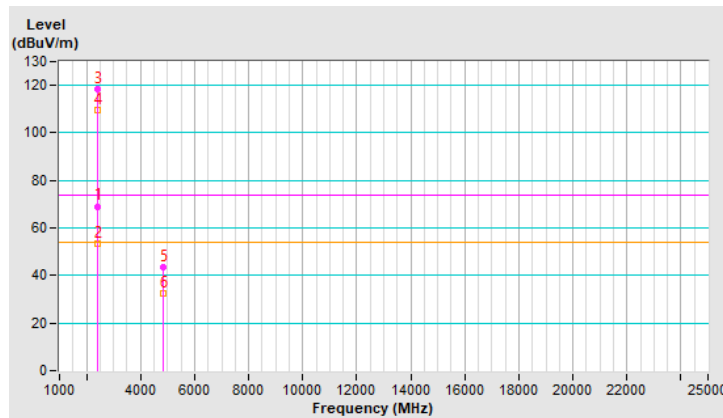


RF Mode	802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	2389.50	69.1 PK	74.0	-4.9	1.83 V	123	70.0	-0.9
2	2389.50	53.2 AV	54.0	-0.8	1.83 V	123	54.1	-0.9
3	*2412.00	118.6 PK			1.83 V	123	119.5	-0.9
4	*2412.00	109.5 AV			1.83 V	123	110.4	-0.9
5	4824.00	43.3 PK	74.0	-30.7	1.24 V	199	40.0	3.3
6	4824.00	32.5 AV	54.0	-21.5	1.24 V	199	29.2	3.3

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.



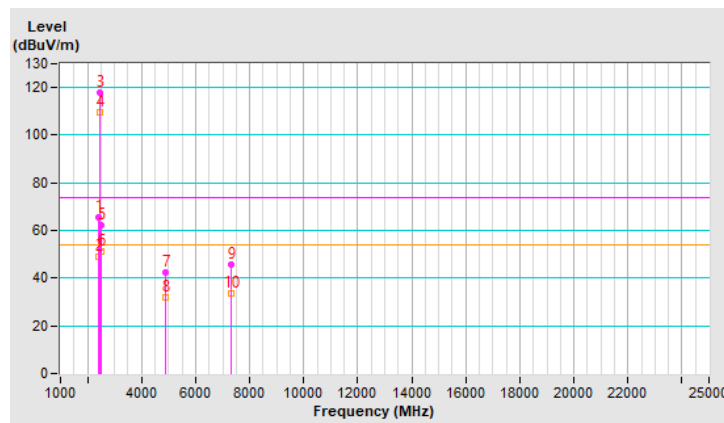
RF Mode	802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	65.7 PK	74.0	-8.3	2.03 H	163	66.6	-0.9
2	2390.00	48.9 AV	54.0	-5.1	2.03 H	163	49.8	-0.9
3	*2437.00	118.0 PK			2.03 H	163	118.9	-0.9
4	*2437.00	109.5 AV			2.03 H	163	110.4	-0.9
5	2483.50	62.3 PK	74.0	-11.7	2.03 H	163	63.4	-1.1
6	2483.50	51.3 AV	54.0	-2.7	2.03 H	163	52.4	-1.1
7	4874.00	42.2 PK	74.0	-31.8	1.12 H	142	38.8	3.4
8	4874.00	31.8 AV	54.0	-22.2	1.12 H	142	28.4	3.4
9	7311.00	45.9 PK	74.0	-28.1	1.37 H	115	35.8	10.1
10	7311.00	33.4 AV	54.0	-20.6	1.37 H	115	23.3	10.1

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.

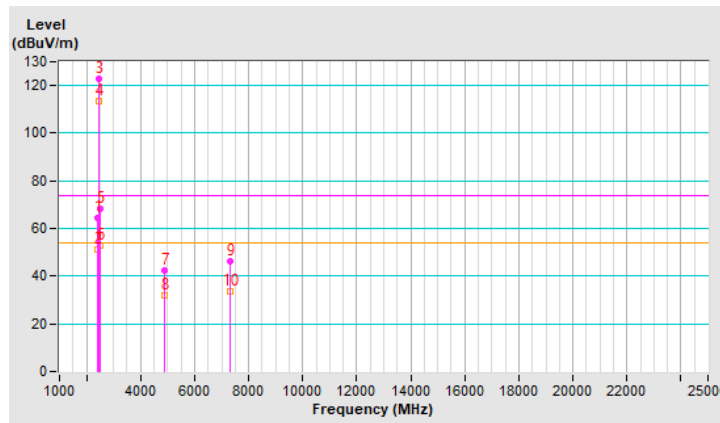


RF Mode	802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	64.3 PK	74.0	-9.7	1.75 V	142	65.2	-0.9
2	2390.00	51.1 AV	54.0	-2.9	1.75 V	142	52.0	-0.9
3	*2437.00	122.8 PK			1.75 V	142	123.7	-0.9
4	*2437.00	113.6 AV			1.75 V	142	114.5	-0.9
5	2483.50	68.1 PK	74.0	-5.9	1.75 V	142	69.2	-1.1
6	2483.50	53.0 AV	54.0	-1.0	1.75 V	142	54.1	-1.1
7	4874.00	42.2 PK	74.0	-31.8	1.19 V	199	38.8	3.4
8	4874.00	31.8 AV	54.0	-22.2	1.19 V	199	28.4	3.4
9	7311.00	46.3 PK	74.0	-27.7	1.67 V	144	36.2	10.1
10	7311.00	33.7 AV	54.0	-20.3	1.67 V	144	23.6	10.1

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.

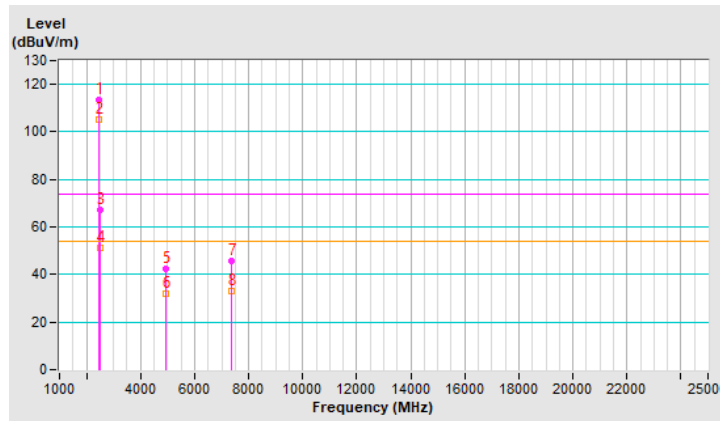


RF Mode	802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	113.6 PK			2.09 H	172	114.5	-0.9
2	*2462.00	105.1 AV			2.09 H	172	106.0	-0.9
3	2483.50	67.1 PK	74.0	-6.9	2.09 H	172	68.2	-1.1
4	2483.50	51.0 AV	54.0	-3.0	2.09 H	172	52.1	-1.1
5	4924.00	42.3 PK	74.0	-31.7	1.12 H	127	38.8	3.5
6	4924.00	32.1 AV	54.0	-21.9	1.12 H	127	28.6	3.5
7	7386.00	45.7 PK	74.0	-28.3	1.31 H	102	35.6	10.1
8	7386.00	33.0 AV	54.0	-21.0	1.31 H	102	22.9	10.1

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.

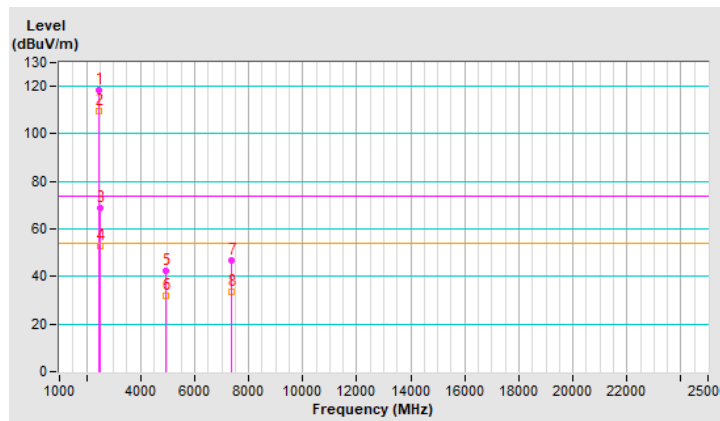


RF Mode	802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	118.2 PK			1.97 V	127	119.1	-0.9
2	*2462.00	109.4 AV			1.97 V	127	110.3	-0.9
3	2483.50	68.9 PK	74.0	-5.1	1.97 V	127	70.0	-1.1
4	2483.50	53.1 AV	54.0	-0.9	1.97 V	127	54.2	-1.1
5	4924.00	42.6 PK	74.0	-31.4	1.21 V	208	39.1	3.5
6	4924.00	31.8 AV	54.0	-22.2	1.21 V	208	28.3	3.5
7	7386.00	46.6 PK	74.0	-27.4	1.68 V	152	36.5	10.1
8	7386.00	33.5 AV	54.0	-20.5	1.68 V	152	23.4	10.1

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.



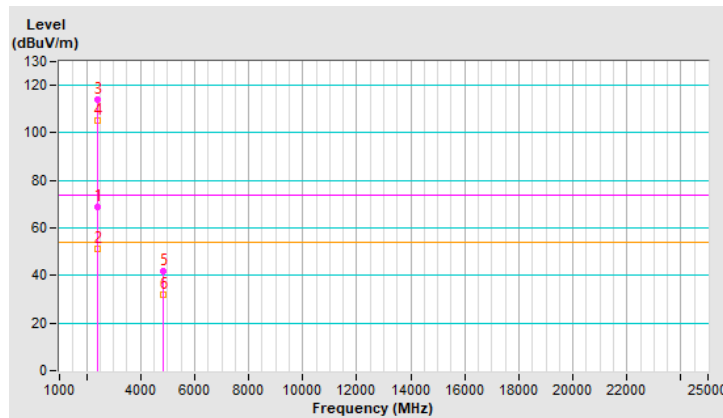
RF Mode	VHT20	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	68.6 PK	74.0	-5.4	1.58 H	169	69.5	-0.9
2	2390.00	51.4 AV	54.0	-2.6	1.58 H	169	52.3	-0.9
3	*2412.00	113.9 PK			1.58 H	169	114.8	-0.9
4	*2412.00	105.0 AV			1.58 H	169	105.9	-0.9
5	4824.00	41.9 PK	74.0	-32.1	1.02 H	122	38.6	3.3
6	4824.00	31.7 AV	54.0	-22.3	1.02 H	122	28.4	3.3

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.

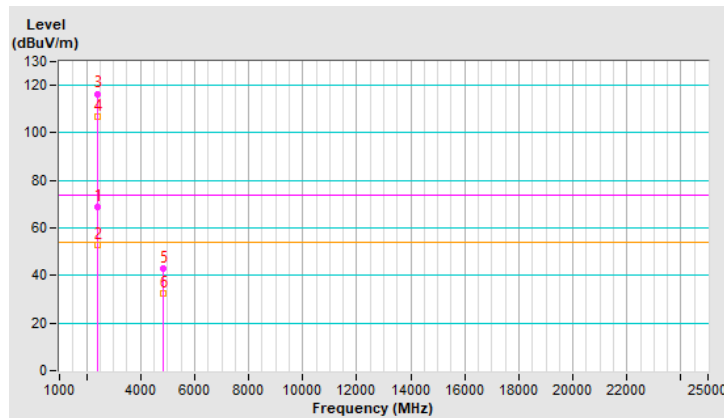


RF Mode	VHT20	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	2389.00	68.8 PK	74.0	-5.2	1.84 V	122	69.7	-0.9
2	2389.00	53.1 AV	54.0	-0.9	1.84 V	122	54.0	-0.9
3	*2412.00	116.5 PK			1.84 V	122	117.4	-0.9
4	*2412.00	106.9 AV			1.84 V	122	107.8	-0.9
5	4824.00	43.1 PK	74.0	-30.9	1.28 V	218	39.8	3.3
6	4824.00	32.4 AV	54.0	-21.6	1.28 V	218	29.1	3.3

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.

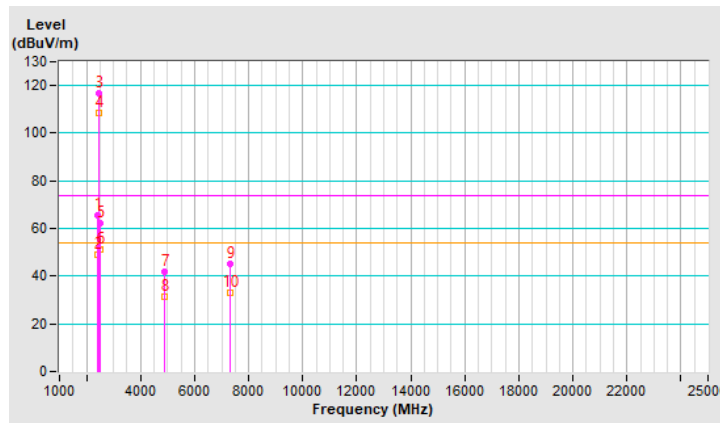


RF Mode	VHT20	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	65.4 PK	74.0	-8.6	1.67 H	173	66.3	-0.9
2	2390.00	48.9 AV	54.0	-5.1	1.67 H	173	49.8	-0.9
3	*2437.00	116.7 PK			1.67 H	173	117.6	-0.9
4	*2437.00	108.3 AV			1.67 H	173	109.2	-0.9
5	2483.50	62.3 PK	74.0	-11.7	1.67 H	173	63.4	-1.1
6	2483.50	51.3 AV	54.0	-2.7	1.67 H	173	52.4	-1.1
7	4874.00	42.0 PK	74.0	-32.0	1.15 H	156	38.6	3.4
8	4874.00	31.5 AV	54.0	-22.5	1.15 H	156	28.1	3.4
9	7311.00	45.2 PK	74.0	-28.8	1.32 H	102	35.1	10.1
10	7311.00	33.0 AV	54.0	-21.0	1.32 H	102	22.9	10.1

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.



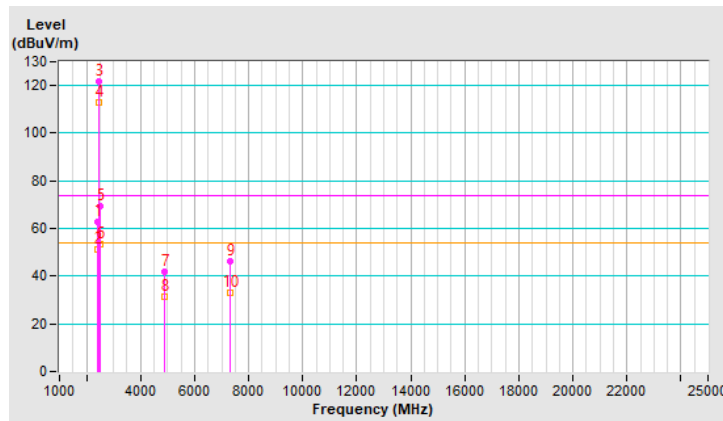
RF Mode	VHT20	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	62.9 PK	74.0	-11.1	1.90 V	119	63.8	-0.9
2	2390.00	51.1 AV	54.0	-2.9	1.90 V	119	52.0	-0.9
3	*2437.00	121.9 PK			1.90 V	119	122.8	-0.9
4	*2437.00	112.7 AV			1.90 V	119	113.6	-0.9
5	2483.50	69.2 PK	74.0	-4.8	1.90 V	119	70.3	-1.1
6	2483.50	53.2 AV	54.0	-0.8	1.90 V	119	54.3	-1.1
7	4874.00	41.8 PK	74.0	-32.2	1.24 V	200	38.4	3.4
8	4874.00	31.5 AV	54.0	-22.5	1.24 V	200	28.1	3.4
9	7311.00	46.0 PK	74.0	-28.0	1.59 V	141	35.9	10.1
10	7311.00	33.2 AV	54.0	-20.8	1.59 V	141	23.1	10.1

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.



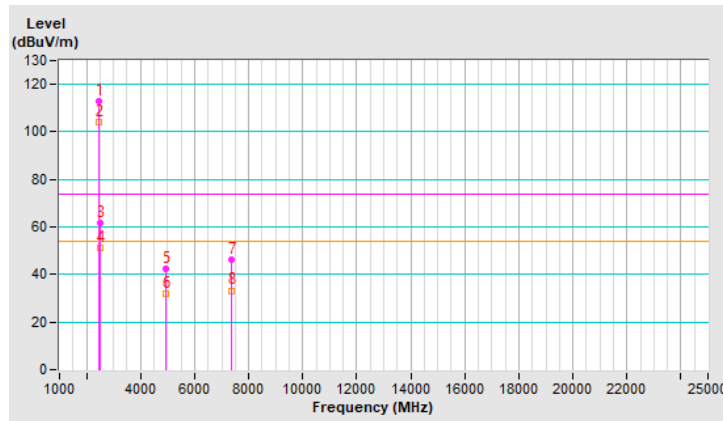
RF Mode	VHT20	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	113.1 PK			1.71 H	165	114.0	-0.9
2	*2462.00	104.2 AV			1.71 H	165	105.1	-0.9
3	2483.50	61.9 PK	74.0	-12.1	1.71 H	165	63.0	-1.1
4	2483.50	51.0 AV	54.0	-3.0	1.71 H	165	52.1	-1.1
5	4924.00	42.4 PK	74.0	-31.6	1.13 H	128	38.9	3.5
6	4924.00	31.9 AV	54.0	-22.1	1.13 H	128	28.4	3.5
7	7386.00	46.0 PK	74.0	-28.0	1.40 H	119	35.9	10.1
8	7386.00	33.3 AV	54.0	-20.7	1.40 H	119	23.2	10.1

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.



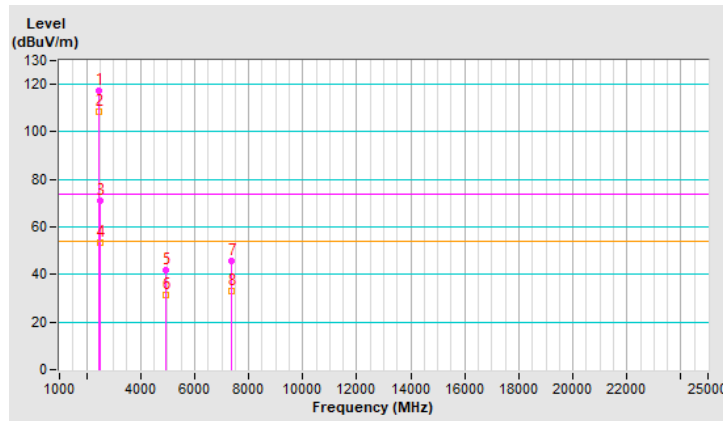
RF Mode	VHT20	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 1 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	117.4 PK			1.95 V	127	118.3	-0.9
2	*2462.00	108.3 AV			1.95 V	127	109.2	-0.9
3	2484.00	71.1 PK	74.0	-2.9	1.95 V	127	72.2	-1.1
4	2484.00	53.5 AV	54.0	-0.5	1.95 V	127	54.6	-1.1
5	4924.00	41.7 PK	74.0	-32.3	1.17 V	197	38.2	3.5
6	4924.00	31.2 AV	54.0	-22.8	1.17 V	197	27.7	3.5
7	7386.00	45.8 PK	74.0	-28.2	1.70 V	148	35.7	10.1
8	7386.00	32.9 AV	54.0	-21.1	1.70 V	148	22.8	10.1

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.



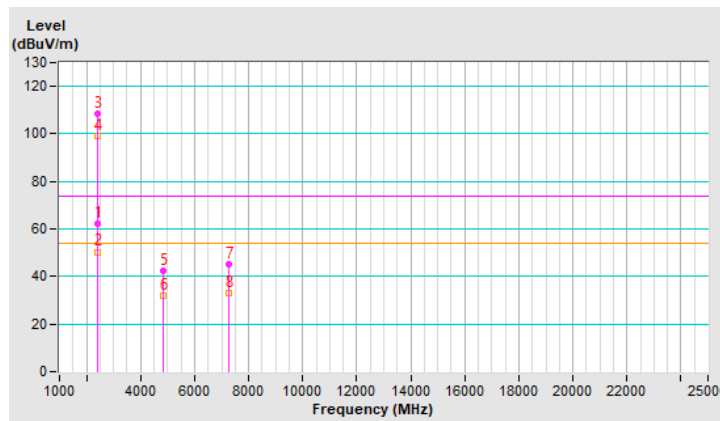
RF Mode	VHT40	Channel	CH 3 : 2422 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 2 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	2388.10	62.4 PK	74.0	-11.6	1.75 H	134	63.3	-0.9
2	2388.10	50.4 AV	54.0	-3.6	1.75 H	134	51.3	-0.9
3	*2422.00	108.5 PK			1.75 H	134	109.4	-0.9
4	*2422.00	99.0 AV			1.75 H	134	99.9	-0.9
5	4844.00	42.3 PK	74.0	-31.7	1.18 H	148	39.0	3.3
6	4844.00	31.9 AV	54.0	-22.1	1.18 H	148	28.6	3.3
7	7266.00	45.4 PK	74.0	-28.6	1.31 H	125	35.6	9.8
8	7266.00	32.9 AV	54.0	-21.1	1.31 H	125	23.1	9.8

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.



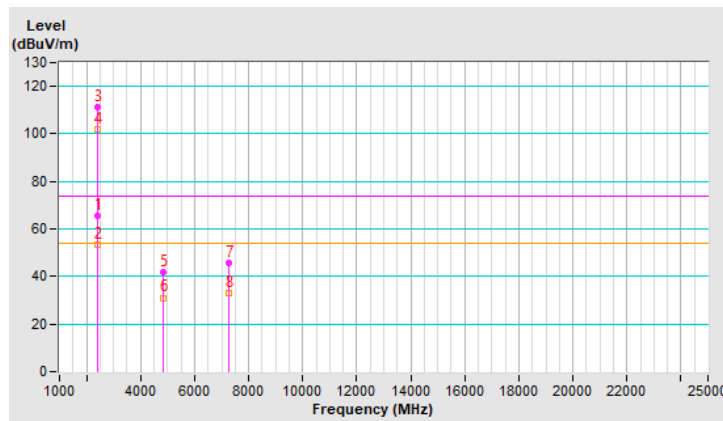
RF Mode	VHT40	Channel	CH 3 : 2422 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 2 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	2389.20	65.3 PK	74.0	-8.7	1.50 V	124	66.2	-0.9
2	2389.20	53.5 AV	54.0	-0.5	1.50 V	124	54.4	-0.9
3	*2422.00	111.3 PK			1.50 V	124	112.2	-0.9
4	*2422.00	102.0 AV			1.50 V	124	102.9	-0.9
5	4844.00	41.7 PK	74.0	-32.3	1.24 V	201	38.4	3.3
6	4844.00	31.1 AV	54.0	-22.9	1.24 V	201	27.8	3.3
7	7266.00	45.7 PK	74.0	-28.3	1.65 V	149	35.9	9.8
8	7266.00	32.8 AV	54.0	-21.2	1.65 V	149	23.0	9.8

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.



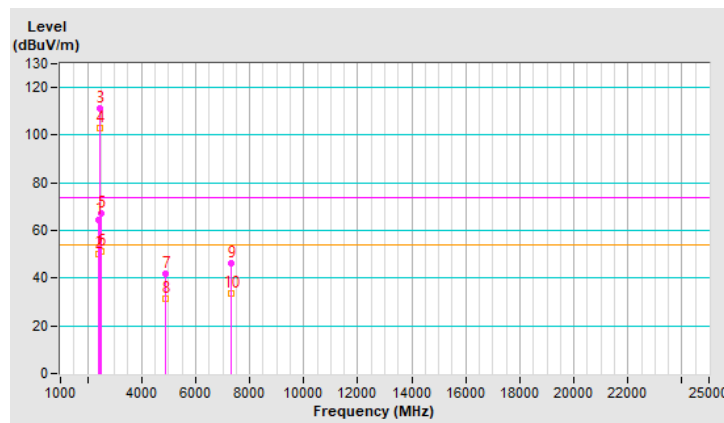
RF Mode	VHT40	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 2 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	64.5 PK	74.0	-9.5	1.68 H	146	65.4	-0.9
2	2390.00	50.1 AV	54.0	-3.9	1.68 H	146	51.0	-0.9
3	*2437.00	111.2 PK			1.68 H	146	112.1	-0.9
4	*2437.00	102.9 AV			1.68 H	146	103.8	-0.9
5	2483.50	67.1 PK	74.0	-6.9	1.68 H	146	68.2	-1.1
6	2483.50	51.4 AV	54.0	-2.6	1.68 H	146	52.5	-1.1
7	4874.00	41.8 PK	74.0	-32.2	1.06 H	134	38.4	3.4
8	4874.00	31.4 AV	54.0	-22.6	1.06 H	134	28.0	3.4
9	7311.00	46.2 PK	74.0	-27.8	1.39 H	127	36.1	10.1
10	7311.00	33.5 AV	54.0	-20.5	1.39 H	127	23.4	10.1

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.



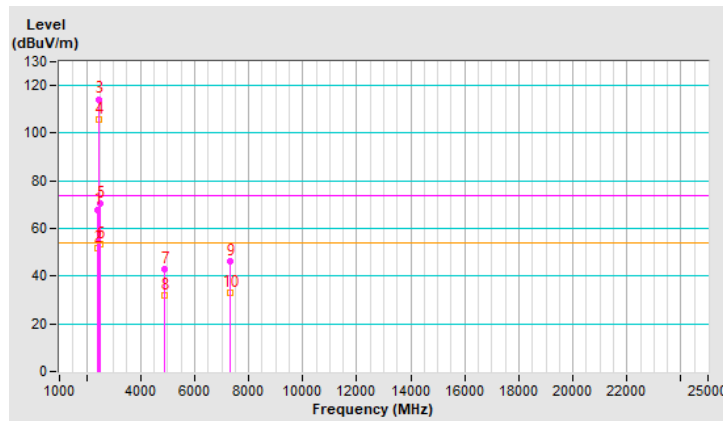
RF Mode	VHT40	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 2 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	67.5 PK	74.0	-6.5	1.71 V	125	68.4	-0.9
2	2390.00	51.9 AV	54.0	-2.1	1.71 V	125	52.8	-0.9
3	*2437.00	114.3 PK			1.71 V	125	115.2	-0.9
4	*2437.00	105.8 AV			1.71 V	125	106.7	-0.9
5	2483.50	70.7 PK	74.0	-3.3	1.71 V	125	71.8	-1.1
6	2483.50	53.5 AV	54.0	-0.5	1.71 V	125	54.6	-1.1
7	4874.00	43.1 PK	74.0	-30.9	1.25 V	210	39.7	3.4
8	4874.00	32.1 AV	54.0	-21.9	1.25 V	210	28.7	3.4
9	7311.00	46.0 PK	74.0	-28.0	1.66 V	147	35.9	10.1
10	7311.00	33.2 AV	54.0	-20.8	1.66 V	147	23.1	10.1

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.



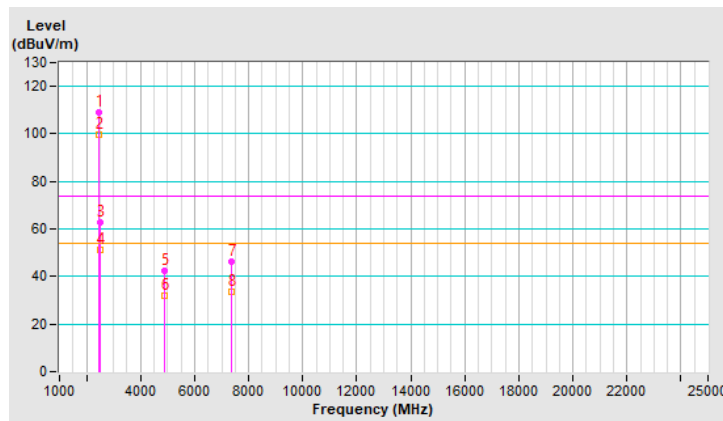
RF Mode	VHT40	Channel	CH 9 : 2452 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 2 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	*2452.00	108.9 PK			2.09 H	136	109.8	-0.9
2	*2452.00	99.6 AV			2.09 H	136	100.5	-0.9
3	2484.30	62.9 PK	74.0	-11.1	2.09 H	136	64.0	-1.1
4	2484.30	51.4 AV	54.0	-2.6	2.09 H	136	52.5	-1.1
5	4904.00	42.5 PK	74.0	-31.5	1.10 H	150	39.1	3.4
6	4904.00	32.0 AV	54.0	-22.0	1.10 H	150	28.6	3.4
7	7356.00	46.4 PK	74.0	-27.6	1.35 H	111	36.2	10.2
8	7356.00	33.7 AV	54.0	-20.3	1.35 H	111	23.5	10.2

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.



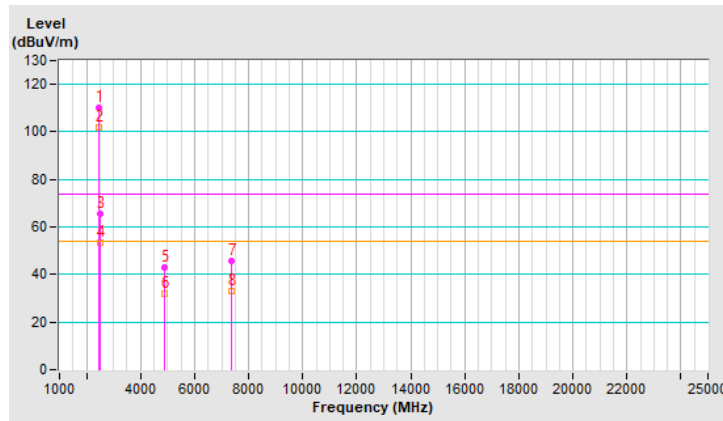
RF Mode	VHT40	Channel	CH 9 : 2452 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 2 kHz
Input Power	120Vac,60Hz	Environmental Conditions	25°C, 68% RH
Tested By	Tom Yang		

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	*2452.00	110.3 PK			1.99 V	126	111.2	-0.9
2	*2452.00	102.1 AV			1.99 V	126	103.0	-0.9
3	2484.40	65.4 PK	74.0	-8.6	1.99 V	126	66.5	-1.1
4	2484.40	53.4 AV	54.0	-0.6	1.99 V	126	54.5	-1.1
5	4904.00	42.8 PK	74.0	-31.2	1.20 V	224	39.4	3.4
6	4904.00	32.0 AV	54.0	-22.0	1.20 V	224	28.6	3.4
7	7356.00	45.9 PK	74.0	-28.1	1.68 V	134	35.7	10.2
8	7356.00	33.0 AV	54.0	-21.0	1.68 V	134	22.8	10.2

Remarks:

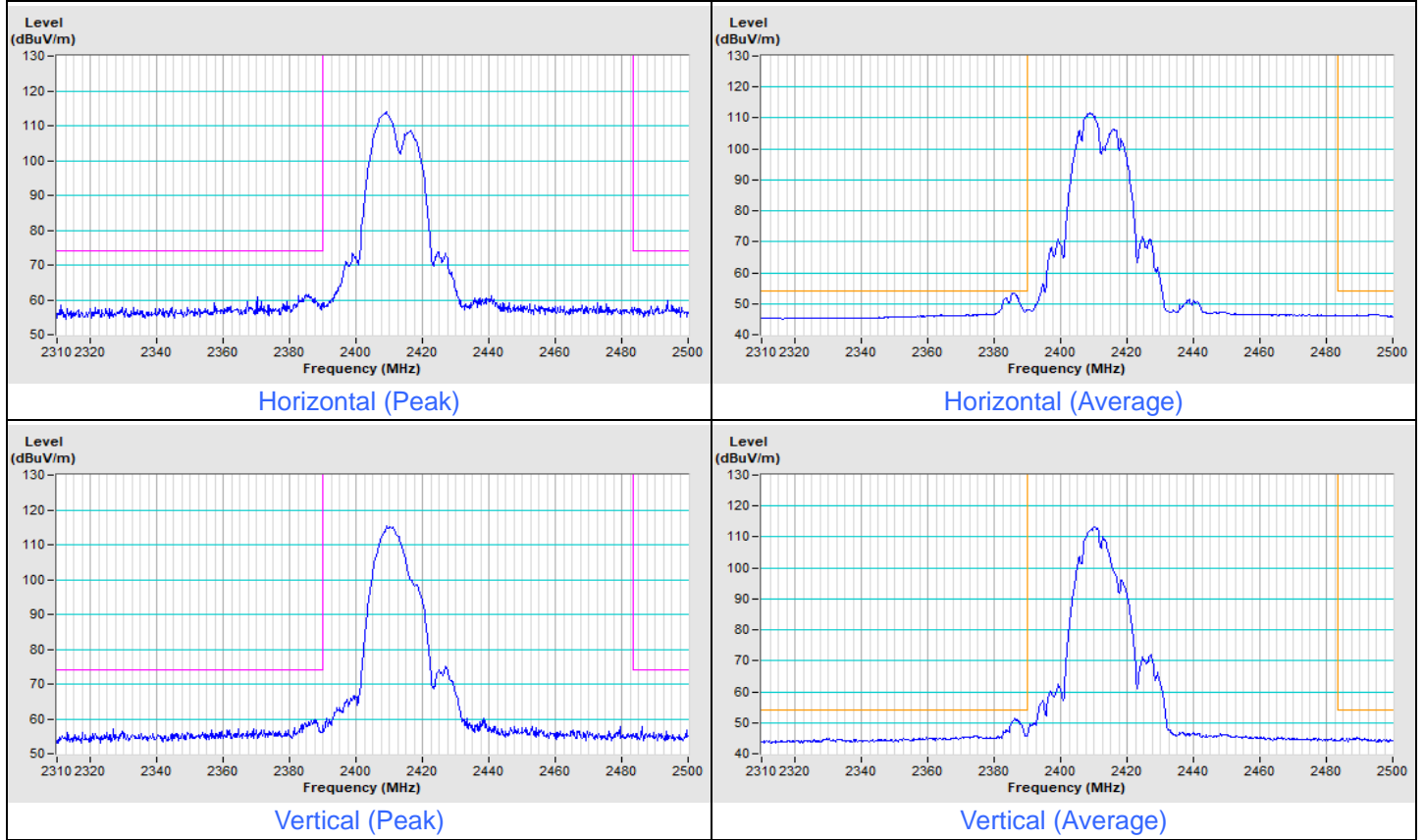
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.



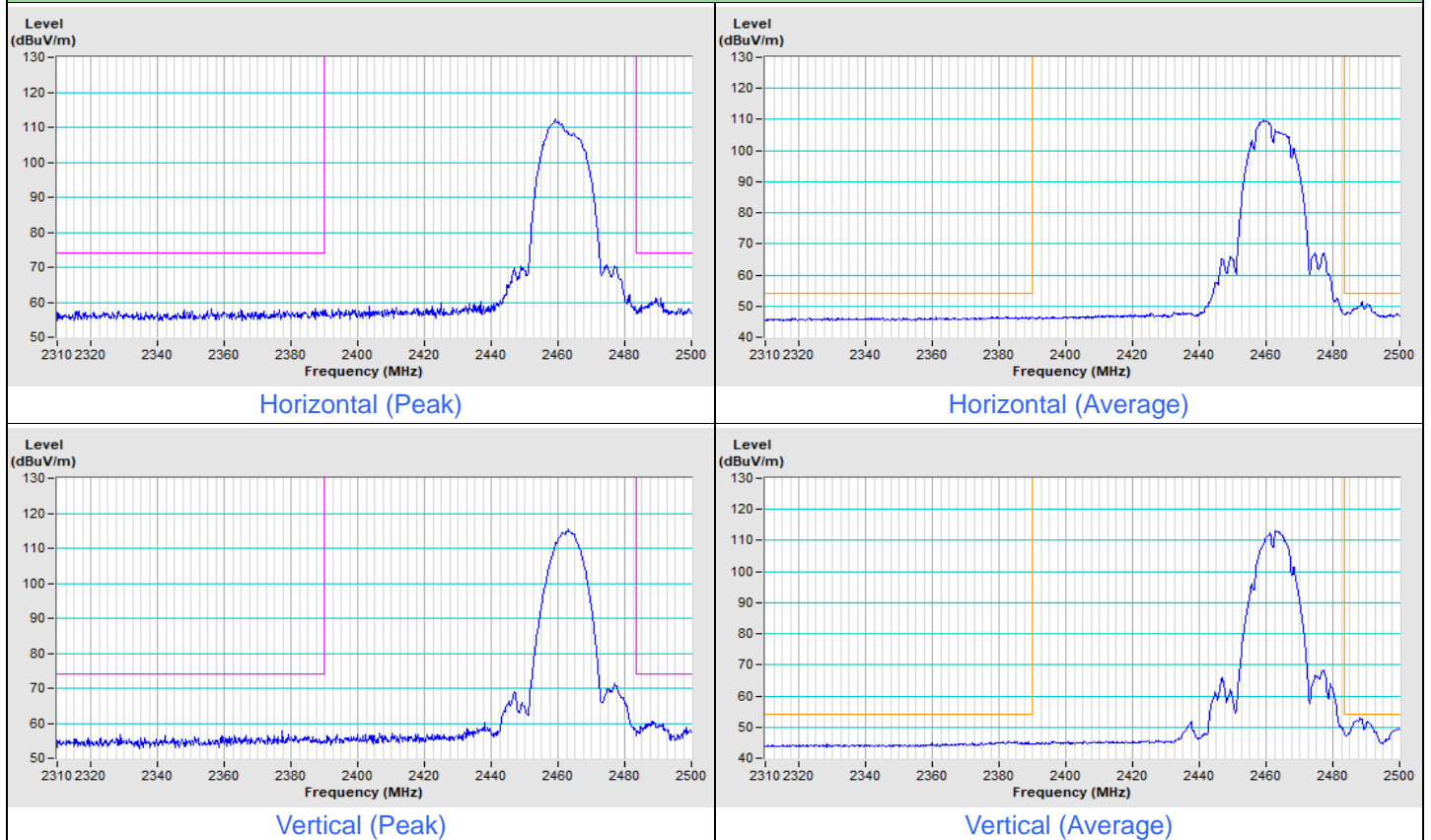


Plot of Band Edge

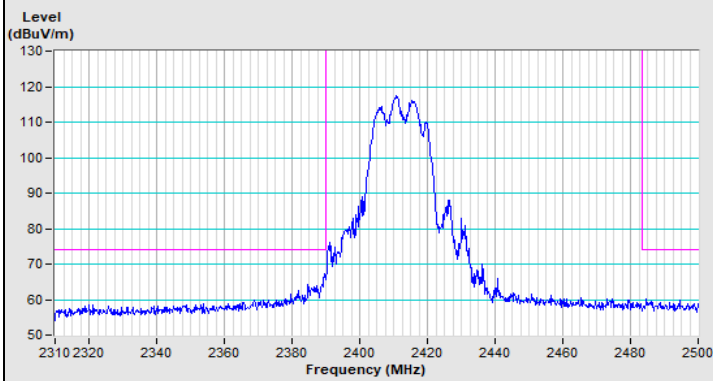
802.11b Channel 1



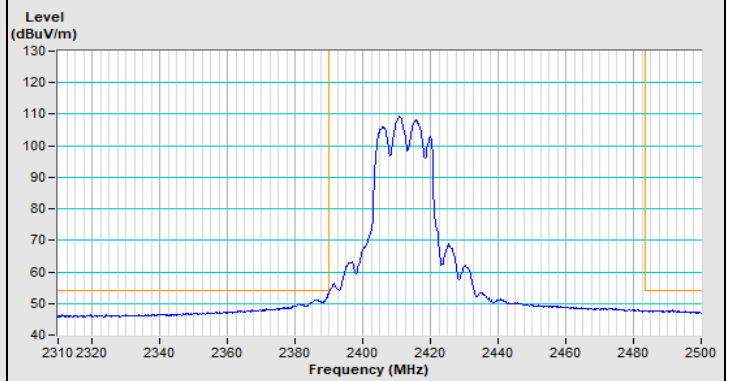
802.11b Channel 11



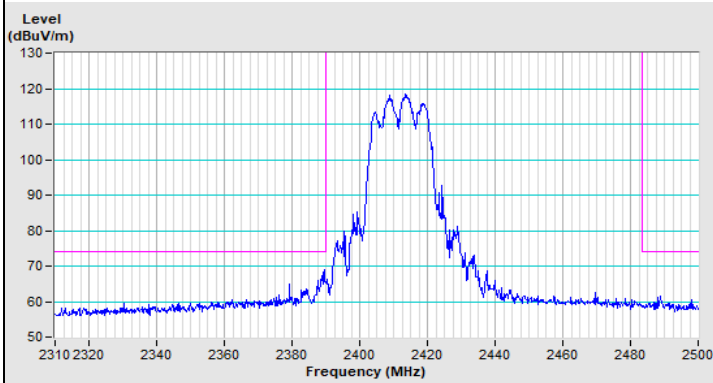
802.11g Channel 1



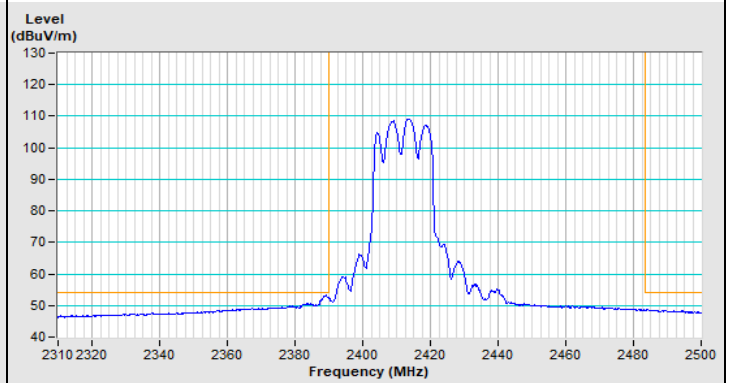
Horizontal (Peak)



Horizontal (Average)

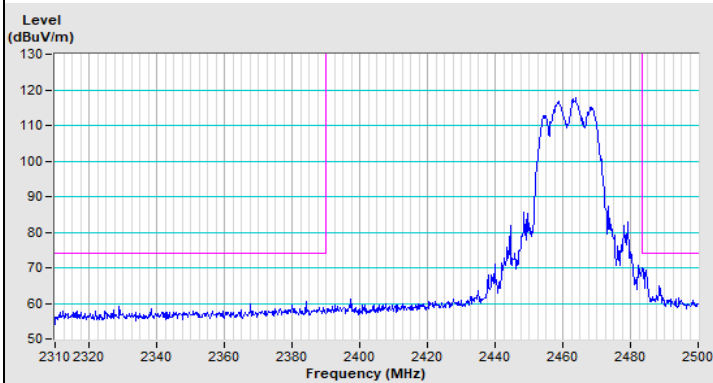


Vertical (Peak)

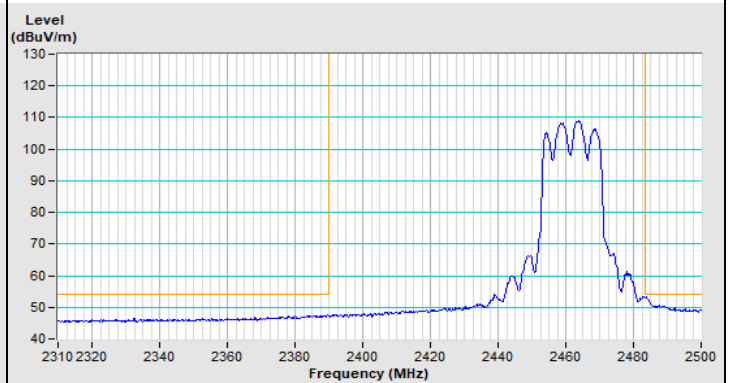


Vertical (Average)

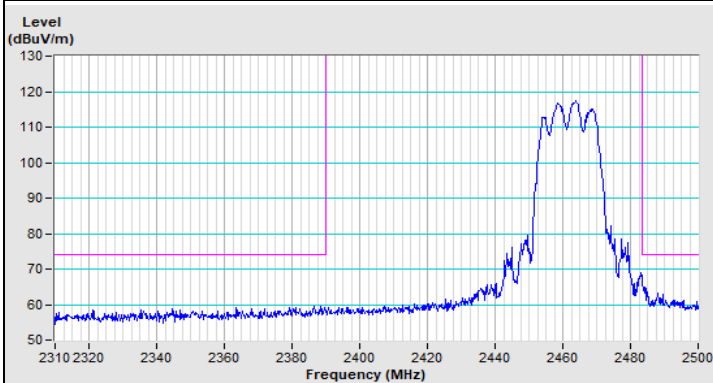
802.11g Channel 11



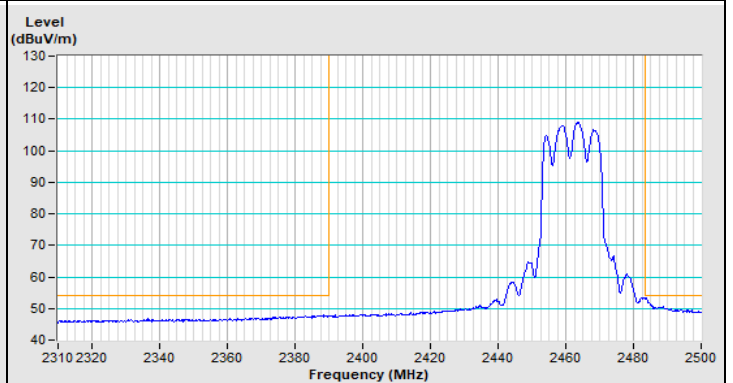
Horizontal (Peak)



Horizontal (Average)

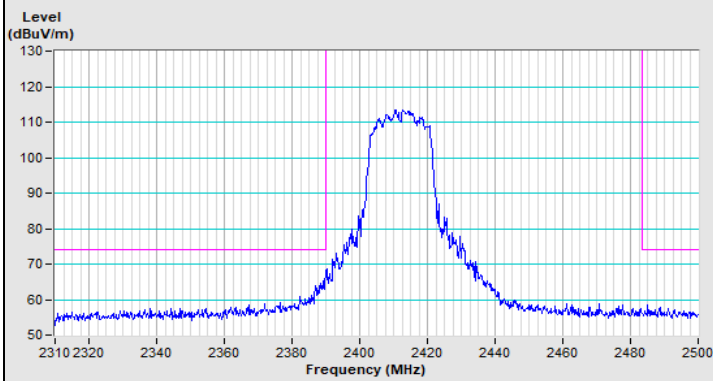


Vertical (Peak)

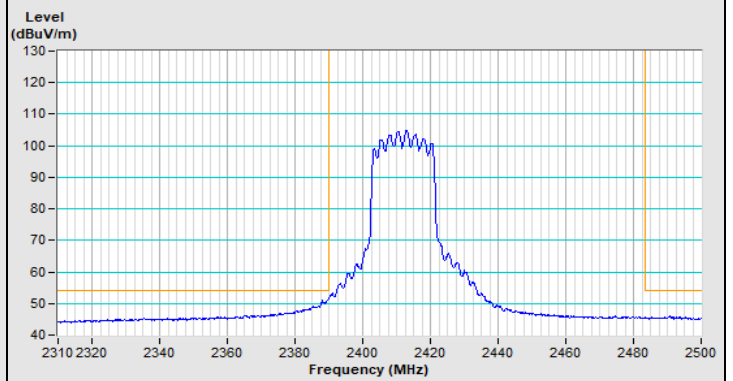


Vertical (Average)

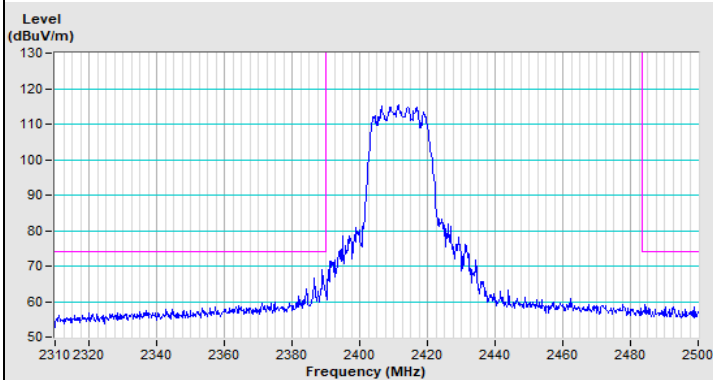
VHT20 Channel 1



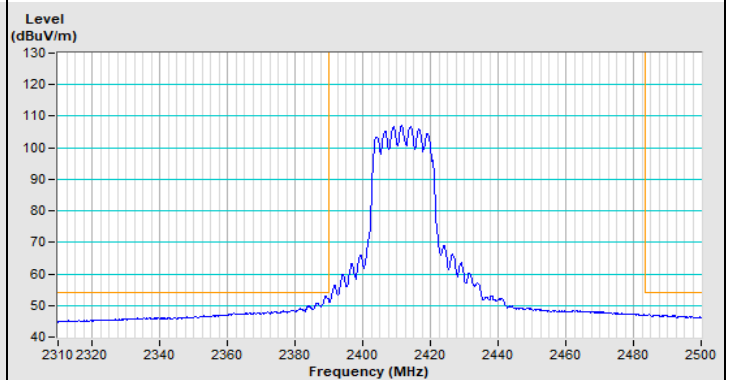
Horizontal (Peak)



Horizontal (Average)

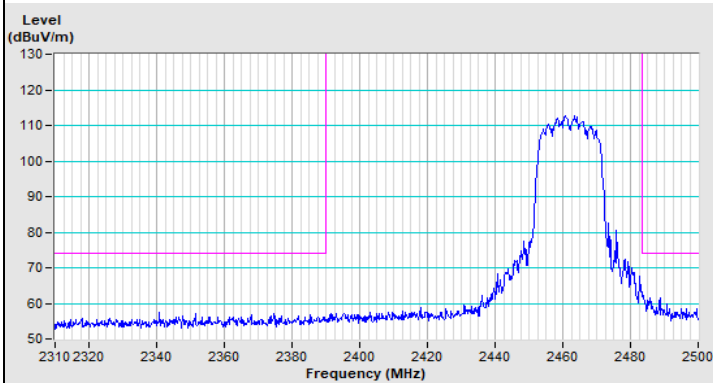


Vertical (Peak)

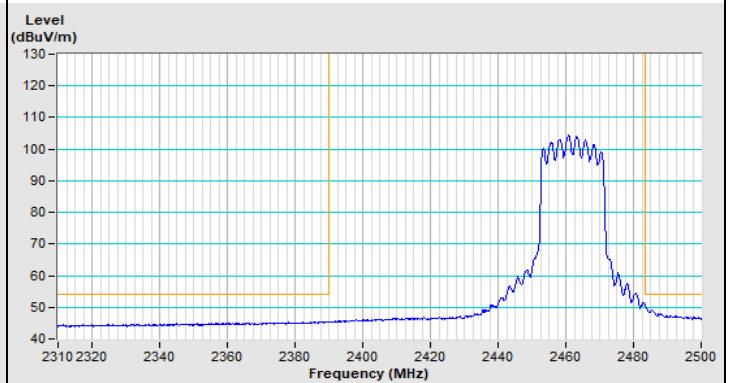


Vertical (Average)

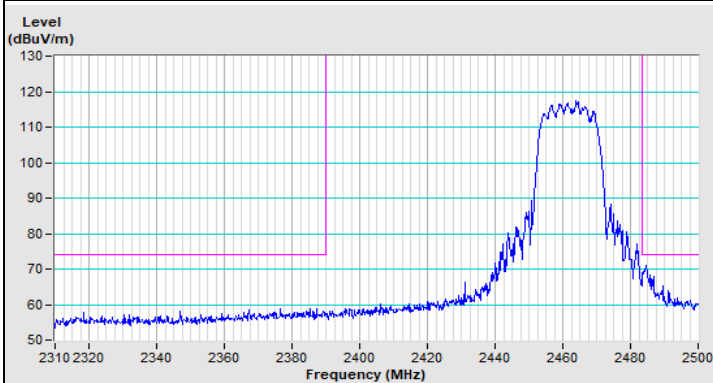
VHT20 Channel 11



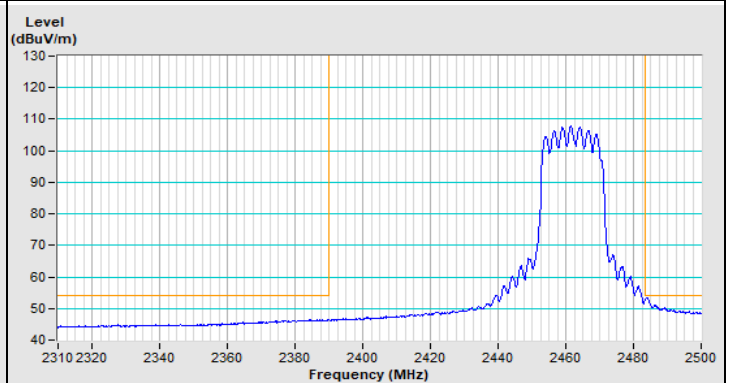
Horizontal (Peak)



Horizontal (Average)

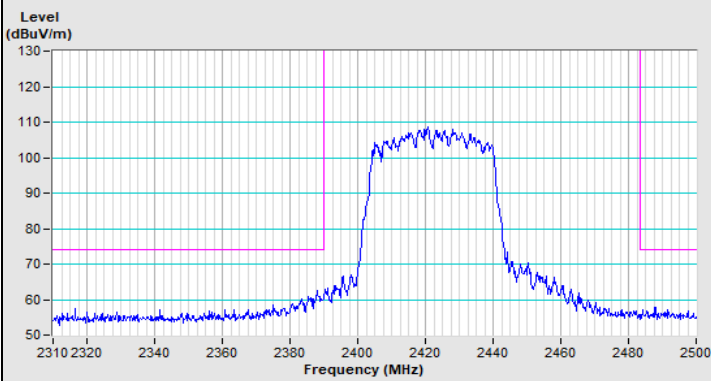


Vertical (Peak)

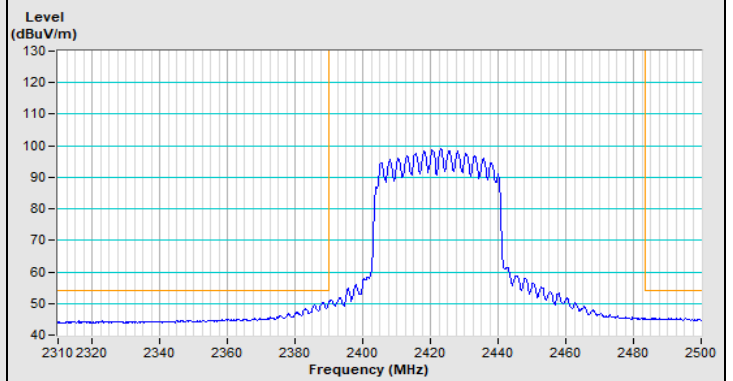


Vertical (Average)

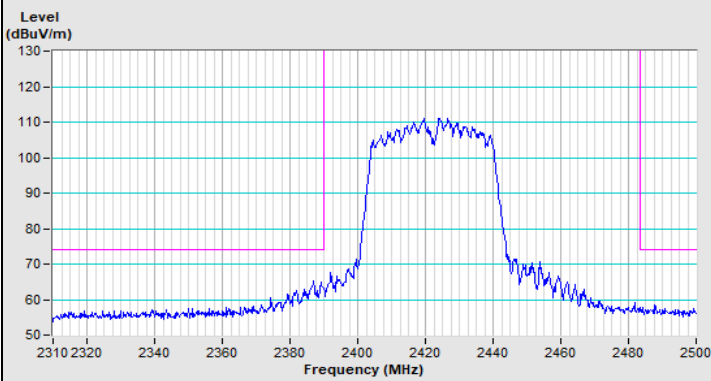
VHT40 Channel 3



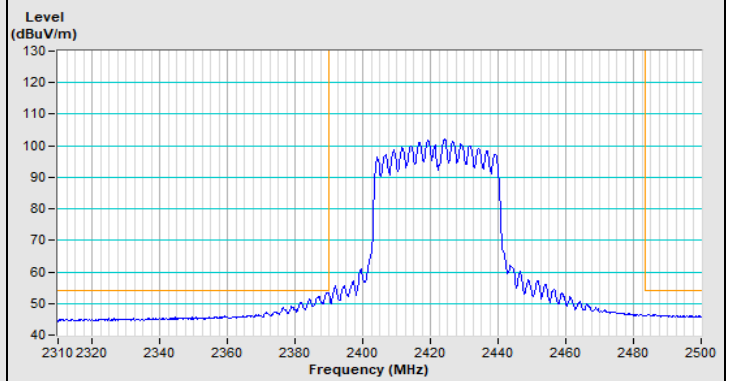
Horizontal (Peak)



Horizontal (Average)

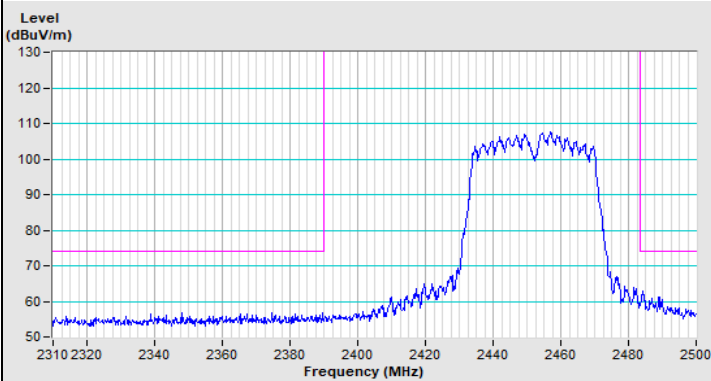


Vertical (Peak)

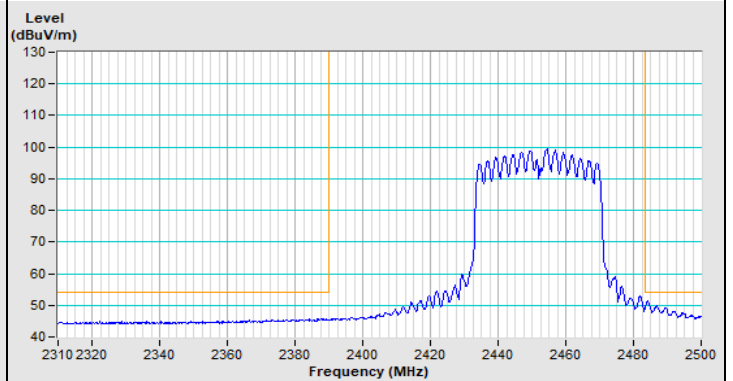


Vertical (Average)

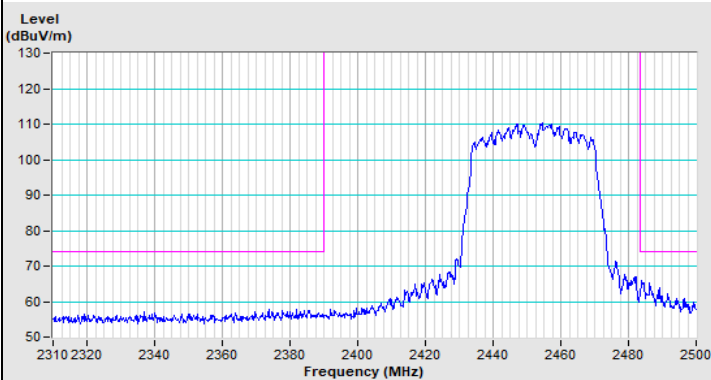
VHT40 Channel 9



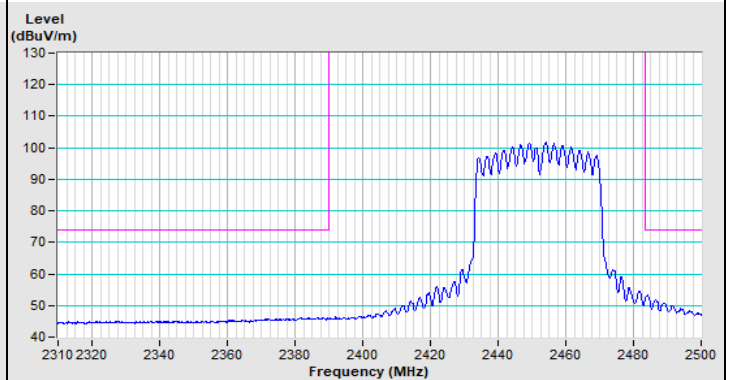
Horizontal (Peak)



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:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

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.

--- END ---