

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: RFBHQC-WTW-P22060972A

FCC ID: XCNUBN2310

Product: GPON

Brand: 
altice

Model No.: UBN2310

Series Model: GR140IG

Received Date: 2022/12/31

Test Date: 2022/12/31 ~ 2023/6/1

Issued Date: 2023/7/3

Applicant: Ubee Interactive Holding Corp. Taiwan Branch

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

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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:** 2023/7/3
May Chen / Manager

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Prepared by : Vito Lung / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBHQC-WTW-P22060972A	Original release.	2023/7/3

1 Certificate

Product: GPON

Brand: 
altice

Test Model: UBN2310

Series Model: GR140IG

Sample Status: Mass product

Applicant: Ubee Interactive Holding Corp. Taiwan Branch

Test Date: 2022/12/31 ~ 2023/6/1

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

Measurement ANSI C63.10-2013

procedure:

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 -8.29 dB at 0.43906 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -10.4 dB at 64.27 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -0.1 dB at 2390.00, 2483.50, 7311.00 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	GPON
Brand	
Test Model	UBN2310
Series Model	GR140IG
Status of EUT	Mass product
Power Supply Rating	12 Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT mode 1024QAM for OFDMA in 11ax mode only
Modulation Technology	DSSS, OFDM, OFDMA
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 802.11ax: up to 573.5 Mbps
Operating Frequency	2.412 GHz ~ 2.462 GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7
Output Power	CDD Mode: 410.727 mW (26.14 dBm) Beamforming Mode: 361.504 mW (25.58 dBm)

Note:

1. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4 GHz)	WLAN (5 GHz)

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

2. The EUT has below model names which are identical to each other in all aspects except for the following table:

Product Name	Model Name	Description
GPON	UBN2310	For marketing
GPON	GR140IG	

Note: From the above models, model: **UBN2310** was selected as representative model for the test and its data was recorded in this report.

3. The EUT uses following accessories.

AC Adapter		
Brand	Model	Specification
MOSO	MS-V2000R120-024Q0-US	AC Input : 100-240V~ 50/60Hz, 0.7A DC Output : 12.0V, 2.0A DC Output Cable : Non-shielded, without core. 1.8M
Fiber Cable		
Brand	Model	Specification
ETC	MFOA10010-B3	Signal Line : 1550mm

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

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
1	2.4G chain 0 / 5G chain 3	Whayu	UBN2310	3.14	2.4~2.4835GHz	Monopole	ipex(MHF)
				3.77	5.15~5.25GHz		
				3.86	5.25~5.53GHz		
				3.94	5.47~5.725GHz		
				3.84	5.725~5.85GHz		
2	2.4G chain 1 / 5G chain 2	Whayu	UBN2310	3.10	2.4~2.4835GHz	Dipole	ipex(MHF)
				3.80	5.15~5.25GHz		
				3.88	5.25~5.53GHz		
				3.91	5.47~5.725GHz		
				3.87	5.725~5.85GHz		
3	5G chain 1	Whayu	UBN2310	3.38	5.15~5.25GHz	Dipole	ipex(MHF)
				3.34	5.25~5.53GHz		
				3.45	5.47~5.725GHz		
				3.44	5.725~5.85GHz		
4	5G chain 0	Whayu	UBN2310	3.42	5.15~5.25GHz	Dipole	ipex(MHF)
				3.38	5.25~5.53GHz		
				3.46	5.47~5.725GHz		
				3.46	5.725~5.85GHz		

* 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
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX

Note:

1. All of modulation mode support beamforming function except 802.11b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), VHT mode for 20MHz (40MHz) and 802.11ax mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax 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, 802.11ax (HE20):

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, 802.11ax (HE40):

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

Test Item	Mode	Signal Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g	CDD	1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)	CDD & Beamforming	1, 6, 11	BPSK	MCS0
	802.11ax (HE40)	CDD & Beamforming	3, 6, 9	BPSK	MCS0
Power Spectral Density / 6 dB Bandwidth / Conducted Out of Band Emissions	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g	CDD	1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)	CDD	1, 6, 11	BPSK	MCS0
	802.11ax (HE40)	CDD	3, 6, 9	BPSK	MCS0
AC Power Conducted Emissions	802.11ax (HE20)	CDD	6	BPSK	MCS0
Unwanted Emissions below 1 GHz	802.11ax (HE20)	CDD	6	BPSK	MCS0
Unwanted Emissions above 1 GHz	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g	CDD	1, 6, 11	BPSK	6Mb/s
	802.11ax (HE20)	CDD	1, 6, 11	BPSK	MCS0
	802.11ax (HE40)	CDD	3, 6, 9	BPSK	MCS0

Note:
 Partial RU (resource unit) reduction mechanisms are not supported.

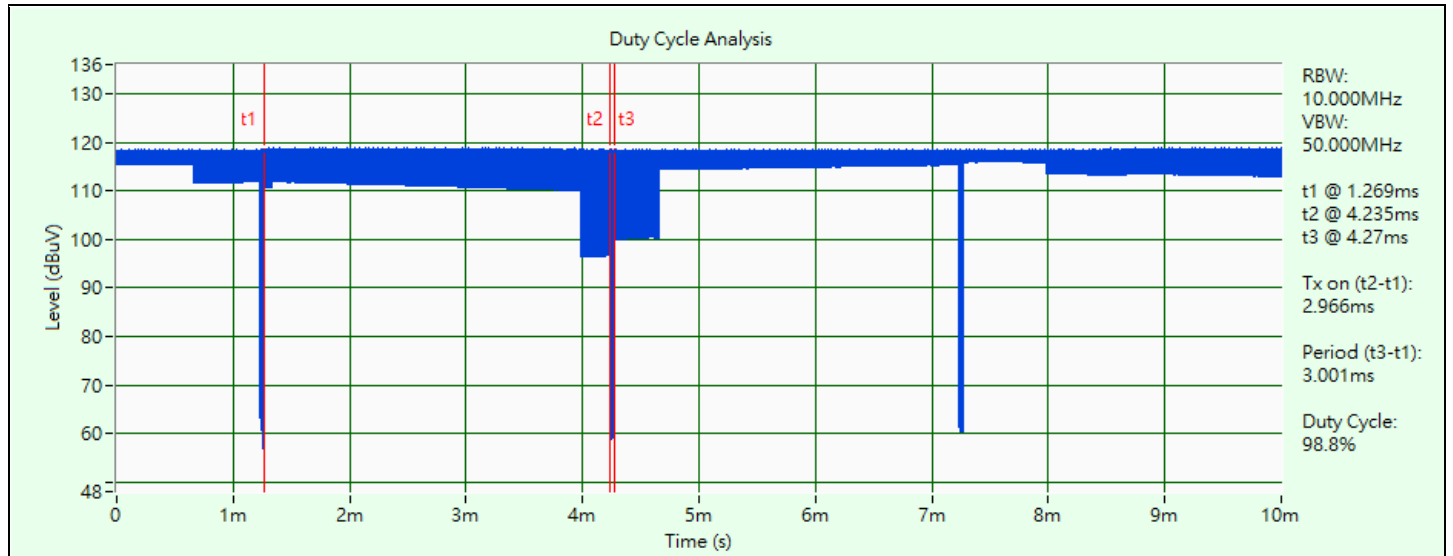
3.5 Duty Cycle of Test Signal

802.11b: Duty cycle = 2.966 ms / 3.001 ms x 100% = 98.8%

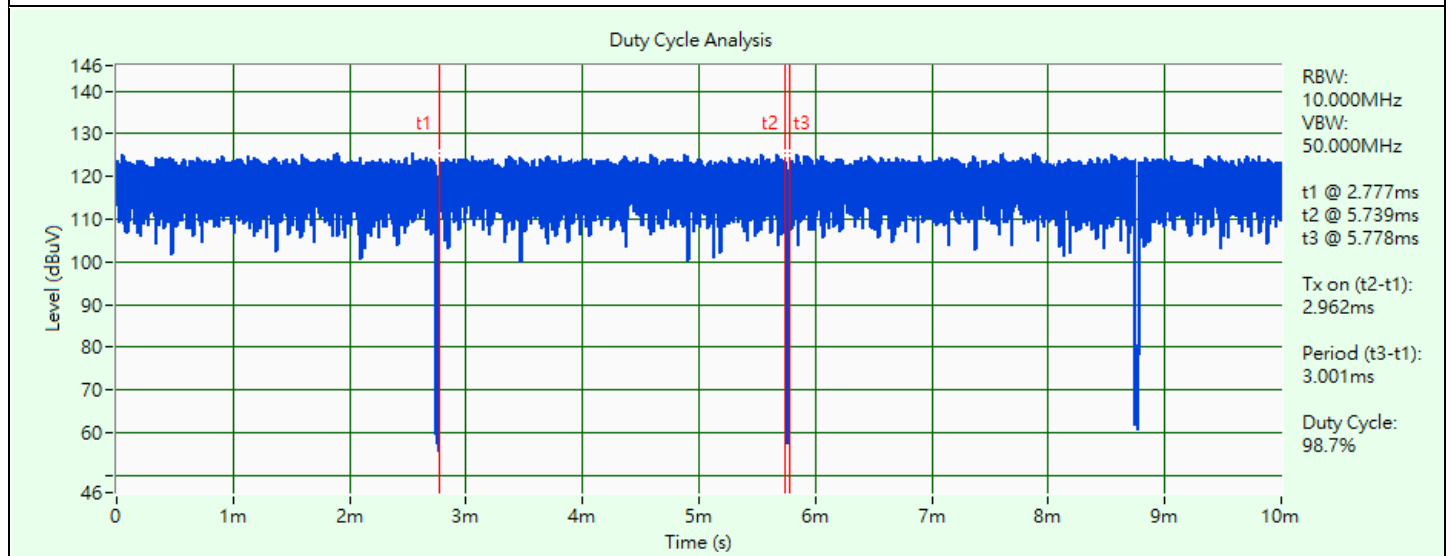
802.11g: Duty cycle = 2.962 ms / 3.001 ms x 100% = 98.7%

802.11ax (HE20): Duty cycle = 2.278 ms / 2.307 ms x 100% = 98.7%

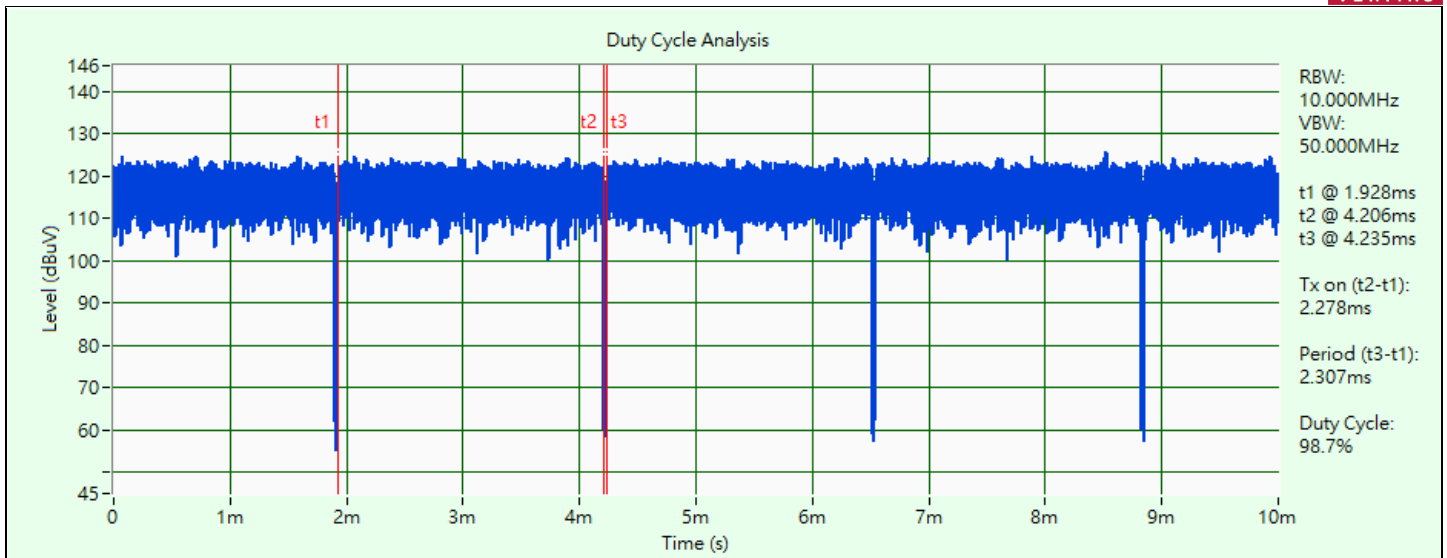
802.11ax (HE40): Duty cycle = 2.364 ms / 2.392 ms x 100% = 98.8%



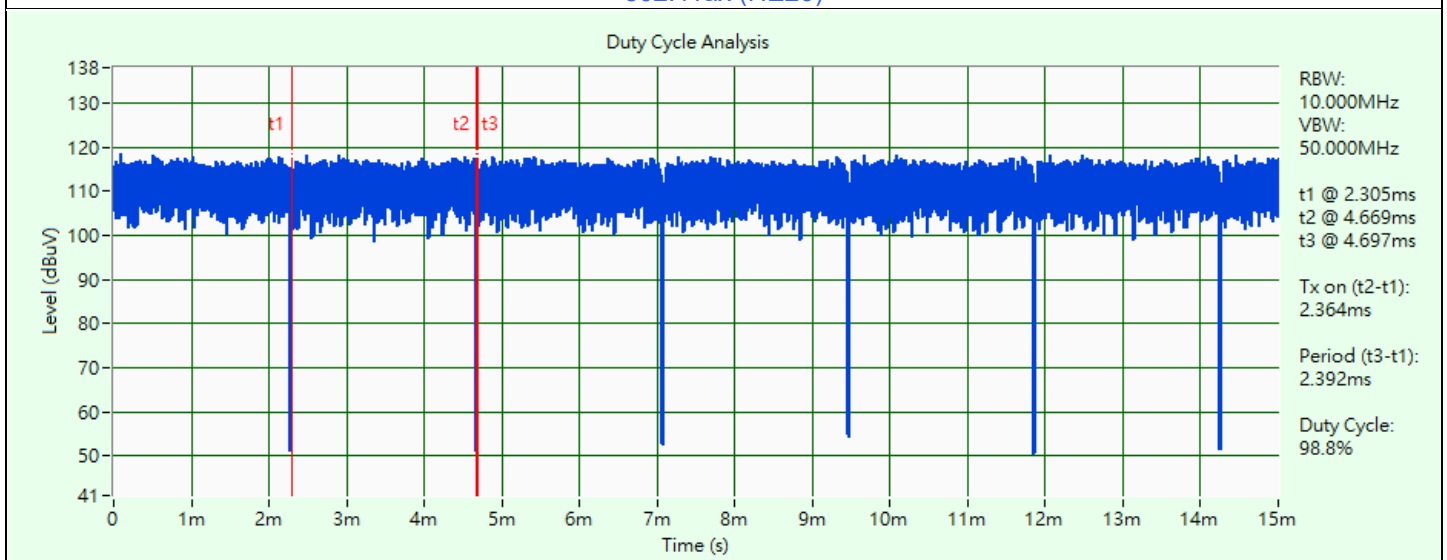
802.11b



802.11g



802.11ax (HE20)

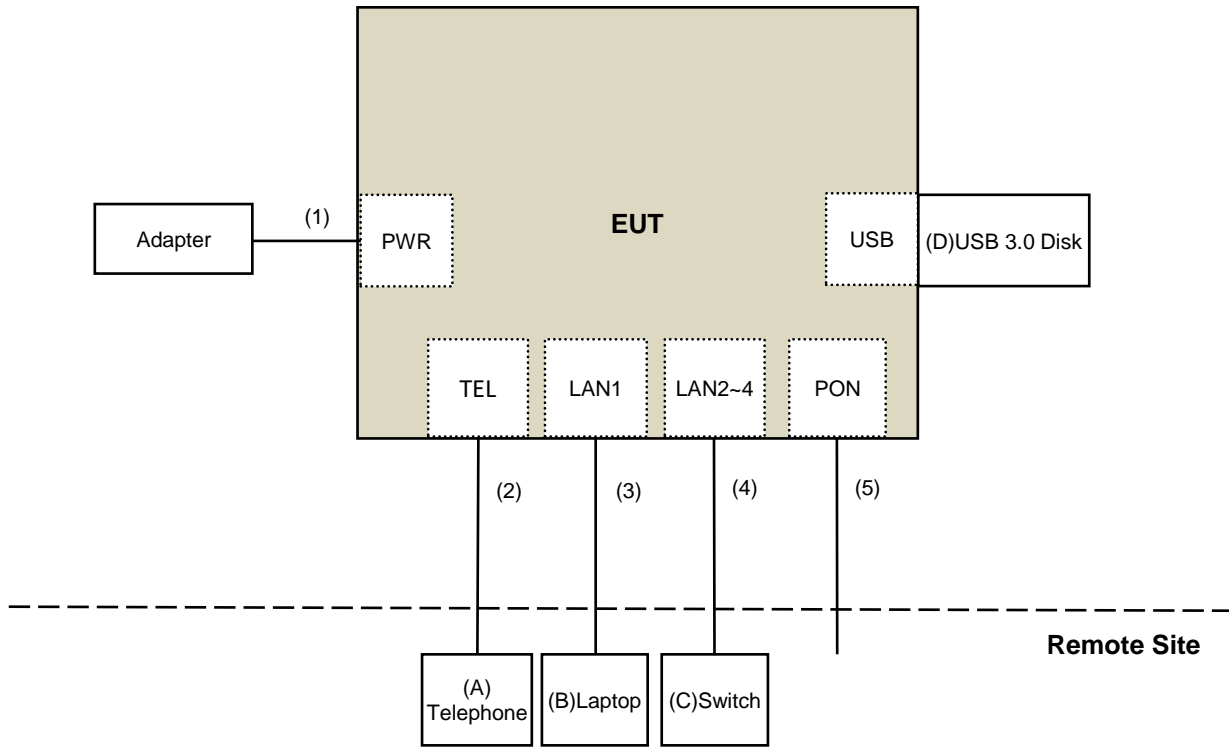


802.11ax (HE40)

3.6 Test Program Used and Operation Descriptions

Controlling software (Wi-Fi:accessMTool_REL_3_1_0_1) 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	Telephone	Romeo	TE-812	97285638	N/A	Provided by Lab
B	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	N/A	Provided by Lab
C	Switch	D-Link	DGS-1005D	DR8WC92000523	N/A	Provided by Lab
D	USB 3.0 Disk	SanDisk	BM181225896Z	N/A	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.8	No	0	Supplied by applicant
2	RJ-11 Cable	1	10	No	0	Provided by Lab
3	RJ-45 Cable	1	10	No	0	Provided by Lab
4	RJ-45 Cable	3	10	No	0	Provided by Lab
5	Fiber Cable	1	10	No	0	Provided by Lab

4 Test Instruments

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

4.1 RF Output Power

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

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/6/1

4.2 Power Spectral Density

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

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/6/1

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
EMI Test Receiver R&S	ESCS 30	847124/029	2022/10/14	2023/10/13
Fixed Attenuator STI	STI02-2200-10	005	2022/8/24	2023/8/23
LISN R&S	ESH3-Z5	848773/004	2022/10/18	2023/10/17
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2022/8/24	2023/8/23
Software BVADT	BVADT_Cond_V7.3.7.4	N/A	N/A	N/A

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2023/5/31

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-406	2022/10/21	2023/10/20
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	2023/2/21	2024/2/20
MXE EMI Receiver Keysight	N9038A	MY54450088	2022/7/11	2023/7/10
Preamplifier Agilent	8447D	2944A10636	2023/3/12	2024/3/11
Preamplifier EMCI	EMC330N	980701	2023/2/18	2024/2/17
PXA Signal Analyzer Keysight	N9030B	MY57142938	2023/4/6	2024/4/5
RF Coaxial Cable COMMATE/PEWC	8D	966-4-1	2023/2/18	2024/2/17
		966-4-2	2023/2/18	2024/2/17
		966-4-3	2023/2/18	2024/2/17
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

Notes:

1. The test was performed in 966 Chamber No. 4.
2. Tested Date: 2023/5/24

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
Preamplifier EMCI	EMC12630SE	980688	2022/10/4	2023/10/3
	EMC184045SE	980387	2022/12/28	2023/12/27
PXA Signal Analyzer Keysight	N9030B	MY57142938	2022/4/26 2023/4/6	2023/4/25 2024/4/5
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2022/3/8 2023/2/20	2023/3/7 2024/2/19
	EMC102-KM-KM-1200	160924	2022/12/28	2023/12/27
	EMC104-SM-SM-1200	160922	2022/12/15	2023/12/14
	EMC104-SM-SM-2000	180502	2022/4/25 2023/3/27	2023/4/24 2024/3/26
	EMC104-SM-SM-6000	210704	2022/11/4	2023/11/3
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 4.
2. Tested Date: 2022/12/31 ~ 2023/5/31

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 30 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 30 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 30 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
Above 960	500	3

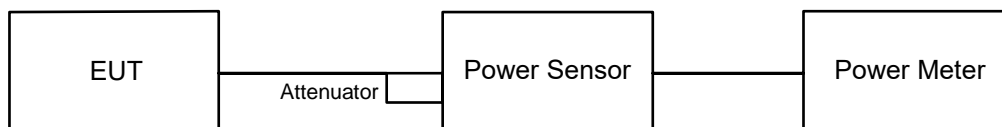
Notes:

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



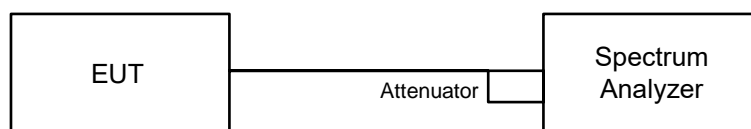
6.1.2 Test Procedure

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

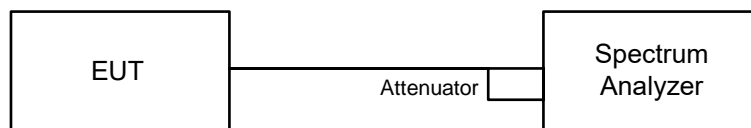


6.2.2 Test Procedure

- a. Measure the duty cycle (x).
- b. Set instrument center frequency to DTS channel center frequency.
- c. Set span to at least 1.5 times the OBW.
- d. Set RBW to: 3 kHz.
- e. Set VBW $\geq 3 \times$ RBW.
- f. Detector = power averaging (RMS) or sample detector (when RMS not available).
- g. Ensure that the number of measurement points in the sweep $\geq 2 \times$ span/RBW.
- h. Sweep time = auto couple.
- i. Do not use sweep triggering. Allow sweep to "free run".
- j. Employ trace averaging (RMS) mode over a minimum of 100 traces.
- k. Use the peak marker function to determine the maximum amplitude level.
- l. Note: If Duty cycle < 98%, Add $10 \log (1/x)$, where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.

6.3 6 dB Bandwidth

6.3.1 Test Setup

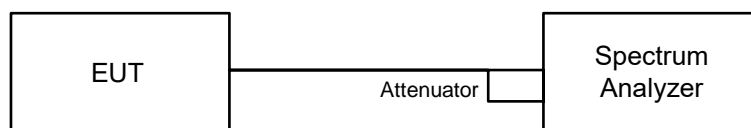


6.3.2 Test Procedure

- 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

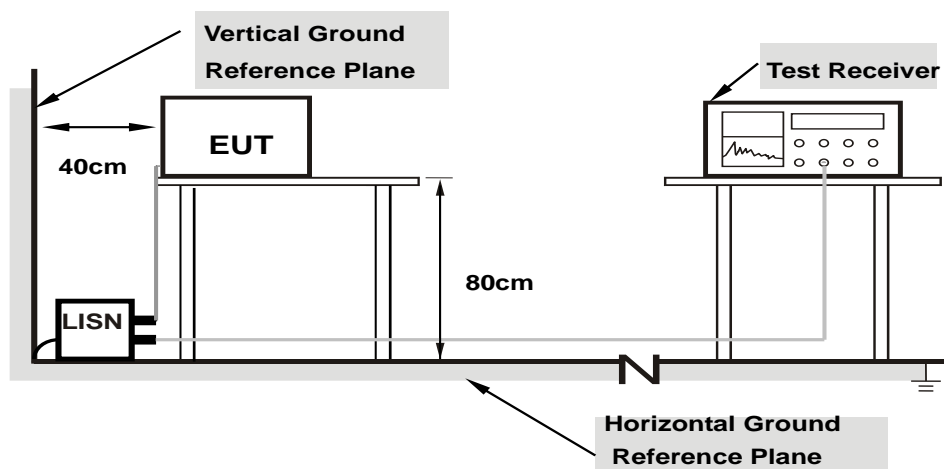
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

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

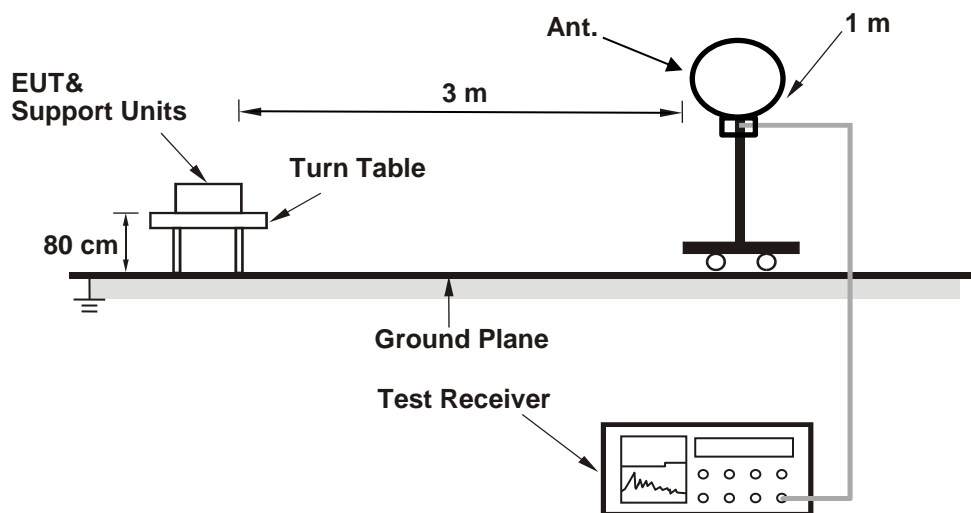
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The 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.

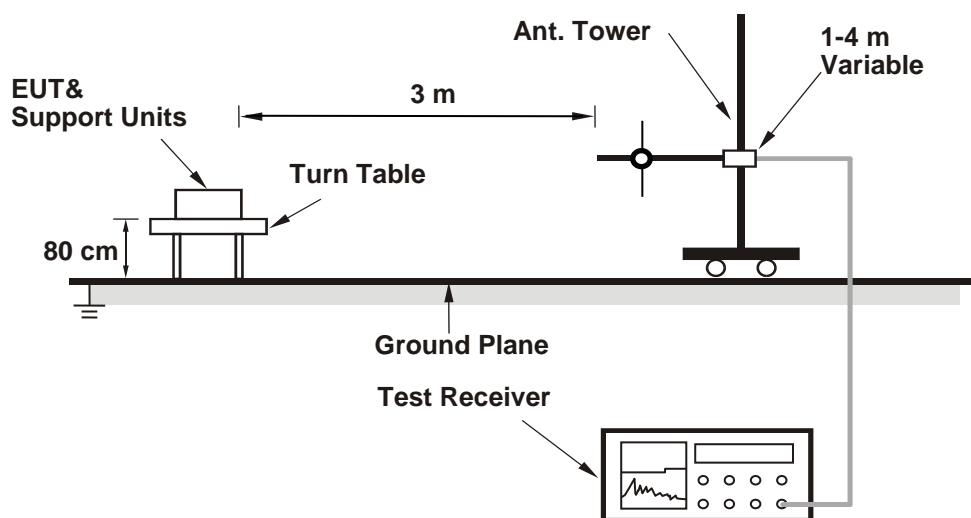
6.6 Unwanted Emissions below 1 GHz

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

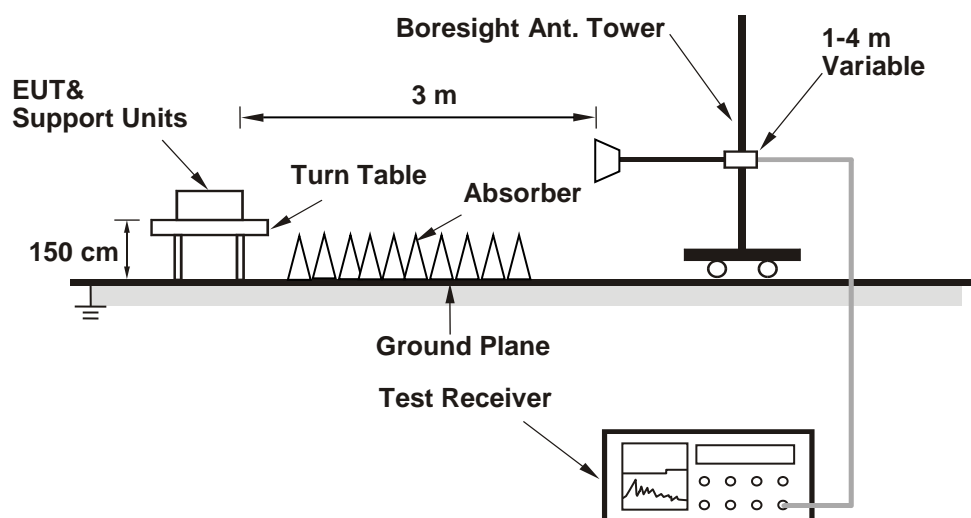
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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:	24°C, 64% RH	Tested By:	Katina Lu
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802.11b CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	21.52	21.66	288.461	24.60	30	Pass
6	2437	20.16	20.35	212.146	23.27	30	Pass
11	2462	19.68	19.52	182.433	22.61	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.14 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11g CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	20.98	20.84	246.653	23.92	30	Pass
6	2437	23.08	23.17	410.727	26.14	30	Pass
11	2462	20.26	20.39	215.565	23.34	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.14 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE20) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	19.74	20.13	197.228	22.95	30	Pass
6	2437	22.34	22.79	361.504	25.58	30	Pass
11	2462	19.83	20.15	199.675	23.00	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.14 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE40) CDD

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
3	2422	18.69	18.92	151.944	21.82	30	Pass
6	2437	19.23	19.24	167.699	22.25	30	Pass
9	2452	18.95	18.90	156.148	21.94	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.14 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11ax (HE20) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
1	2412	19.74	20.13	197.228	22.95	29.87	Pass
6	2437	22.34	22.79	361.504	25.58	29.87	Pass
11	2462	19.83	20.15	199.675	23.00	29.87	Pass

Notes:

1. Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
2. The directional gain is 6.13 dBi > 6 dBi, so the output power limit shall be reduced to $30 - (6.13 - 6) = 29.87$ dBm.

802.11ax (HE40) Beamforming

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
3	2422	18.69	18.92	151.944	21.82	29.87	Pass
6	2437	19.23	19.24	167.699	22.25	29.87	Pass
9	2452	18.95	18.90	156.148	21.94	29.87	Pass

Notes:

1. Directional gain = $10 \log[(10^{\text{Chain0}/20} + 10^{\text{Chain1}/20})^2 / 2]$
2. The directional gain is 6.13 dBi > 6 dBi, so the output power limit shall be reduced to $30 - (6.13 - 6) = 29.87$ dBm.

7.2 Power Spectral Density

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	24°C, 64% RH	Tested By:	Katina Lu
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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	-11.08	-11.47	-8.26	7.87	Pass
6	2437	-12.31	-12.79	-9.53	7.87	Pass
11	2462	-13.21	-13.35	-10.27	7.87	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 6.13 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (6.13 - 6) = 7.87$ dBm/3kHz.

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	-13.28	-13.79	-10.52	7.87	Pass
6	2437	-11.55	-10.98	-8.25	7.87	Pass
11	2462	-14.25	-13.22	-10.69	7.87	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 6.13 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (6.13 - 6) = 7.87$ dBm/3kHz.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
1	2412	-15.64	-15.98	-12.80	7.87	Pass
6	2437	-13.75	-13.03	-10.36	7.87	Pass
11	2462	-15.33	-15.84	-12.57	7.87	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 6.13 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (6.13 - 6) = 7.87$ dBm/3kHz.

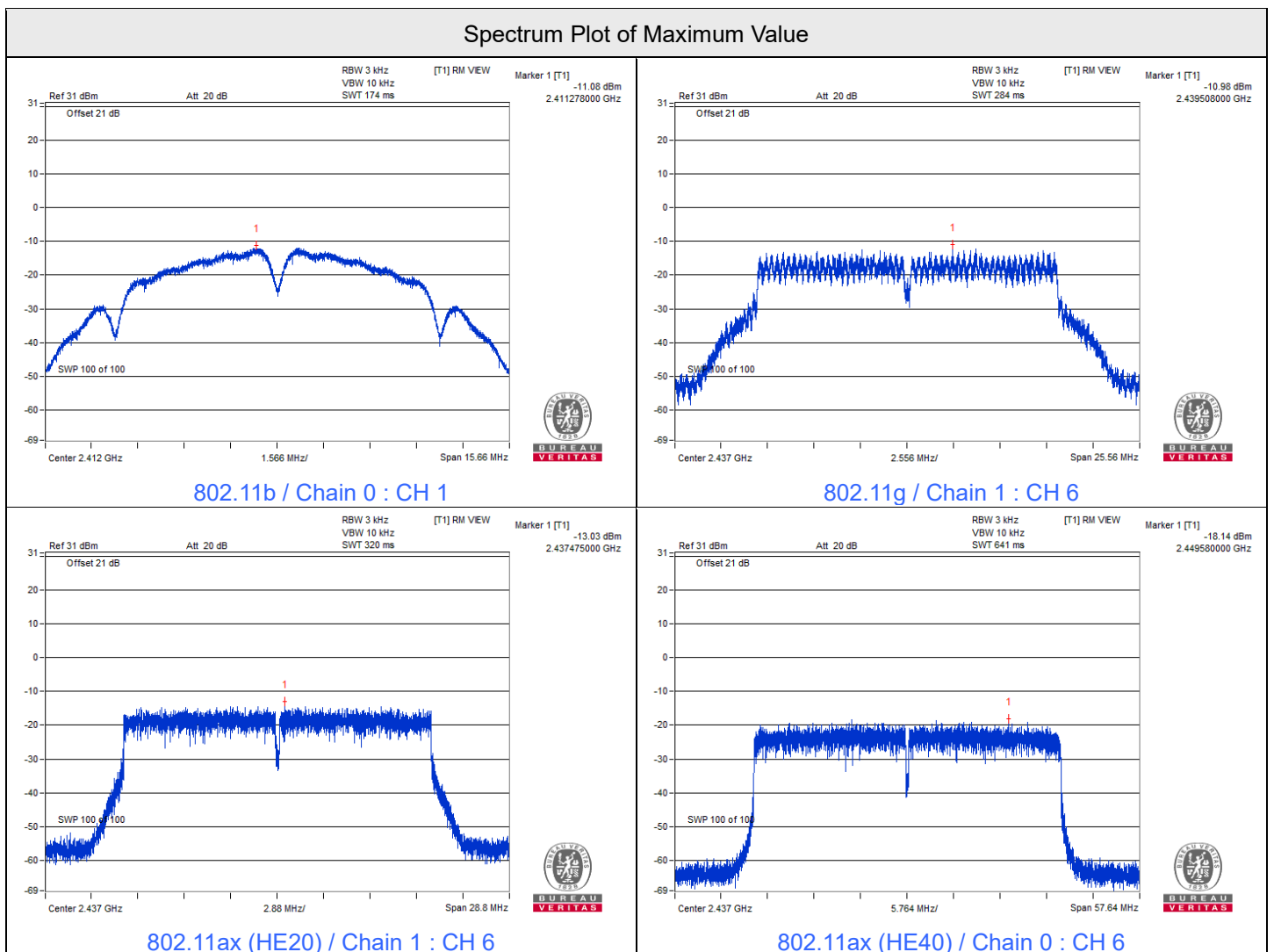


802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1			
3	2422	-18.66	-18.70	-15.67	7.87	Pass
6	2437	-18.14	-18.47	-15.29	7.87	Pass
9	2452	-18.46	-18.95	-15.69	7.87	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 6.13 dBi > 6 dBi, so the power density limit shall be reduced to $8 - (6.13 - 6) = 7.87$ dBm/3kHz.



7.3 6 dB Bandwidth

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	24°C, 64% RH	Tested By:	Katina Lu
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802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	7.11	7.11	0.5	Pass
6	2437	7.12	7.11	0.5	Pass
11	2462	7.10	7.12	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	16.39	16.40	0.5	Pass
6	2437	16.41	16.42	0.5	Pass
11	2462	16.40	16.40	0.5	Pass

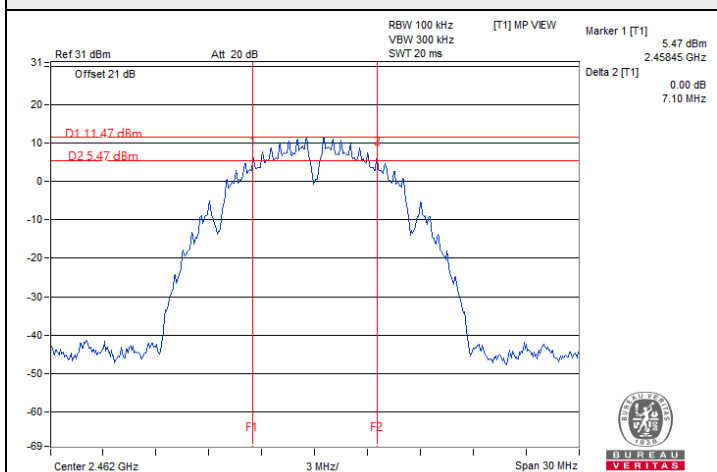
802.11ax (HE20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
1	2412	19.05	18.93	0.5	Pass
6	2437	18.96	18.90	0.5	Pass
11	2462	19.00	18.88	0.5	Pass

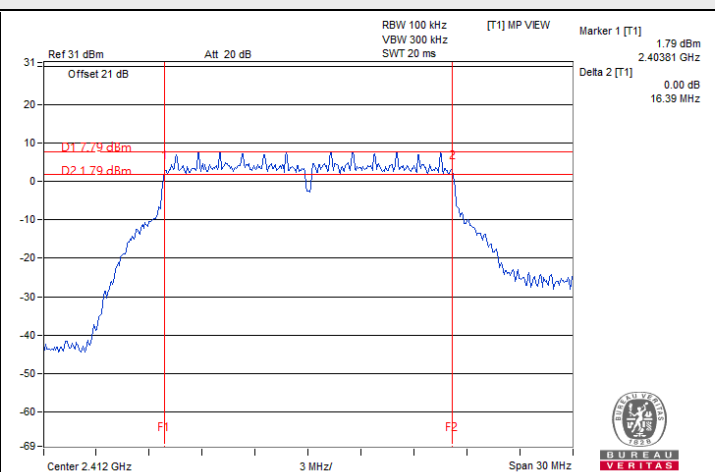
802.11ax (HE40)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1		
3	2422	37.78	37.62	0.5	Pass
6	2437	37.77	37.59	0.5	Pass
9	2452	37.75	37.63	0.5	Pass

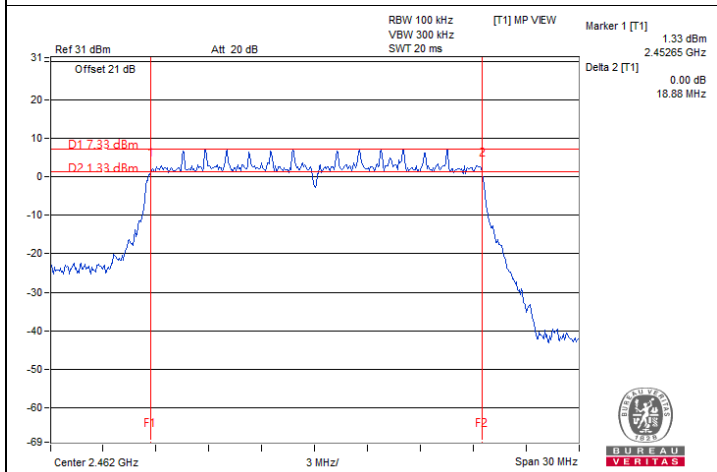
Spectrum Plot of Minimum Value



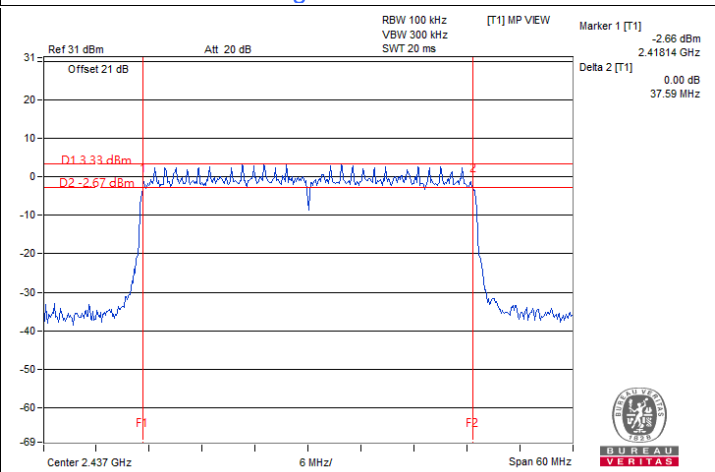
802.11b / Chain 0 : CH 11



802.11g / Chain 0 : CH 1



802.11ax (HE20) / Chain 1 : CH 11

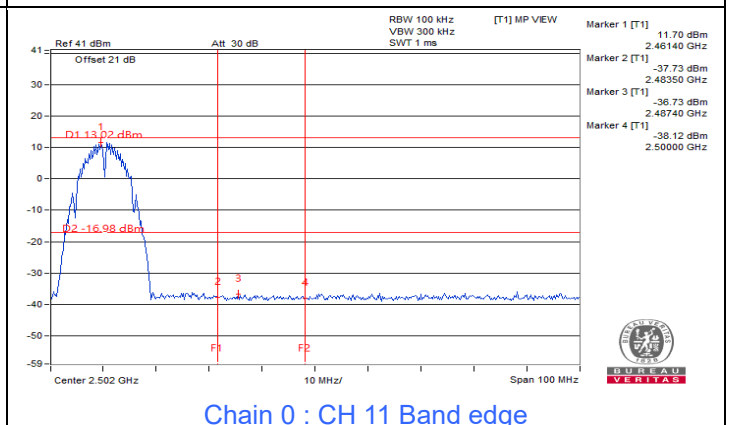
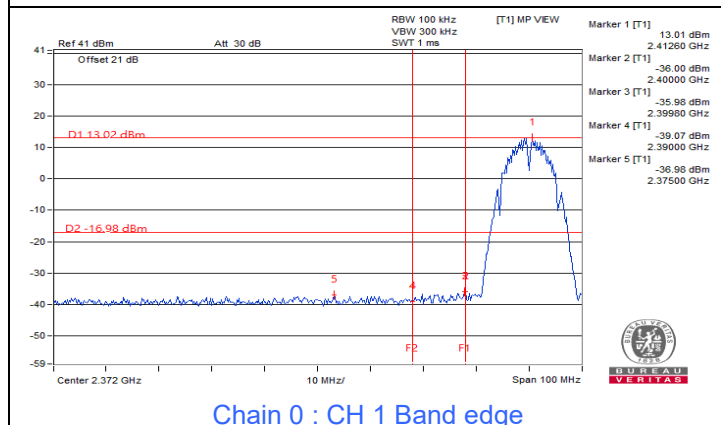
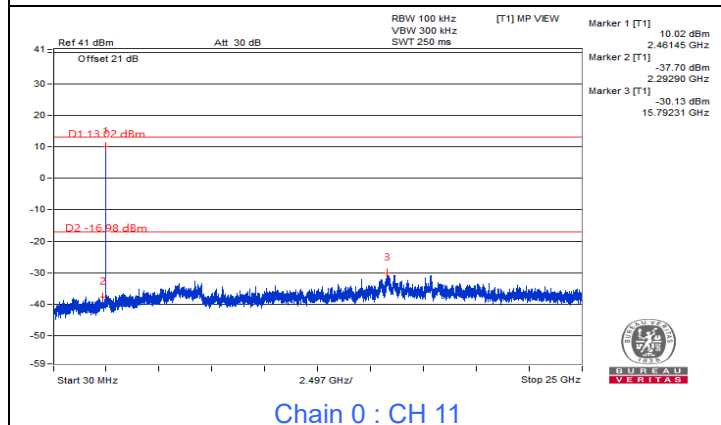
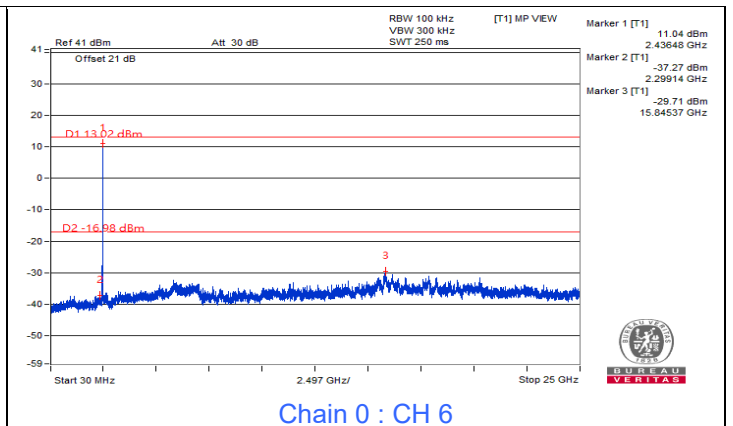
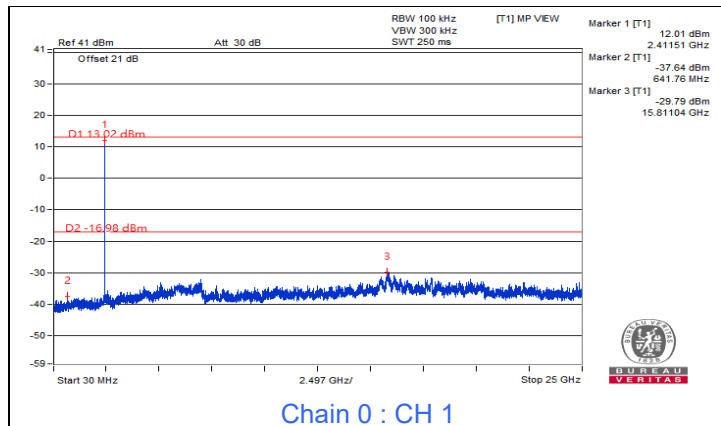
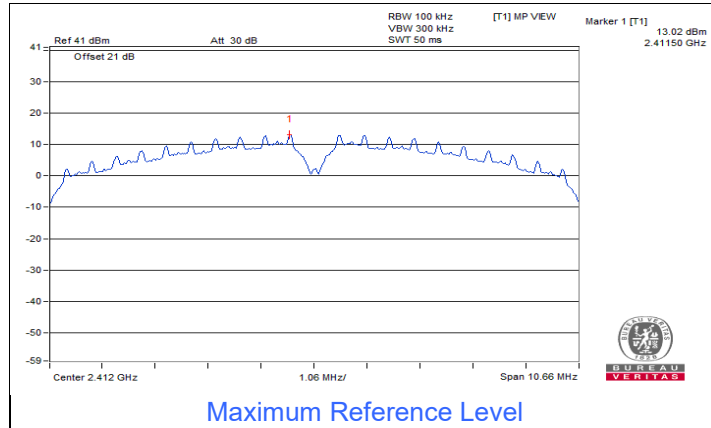


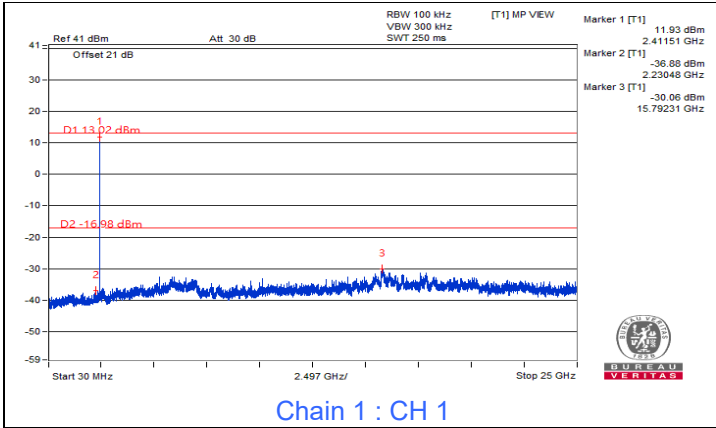
802.11ax (HE40) / Chain 1 : CH 6

7.4 Conducted Out of Band Emissions

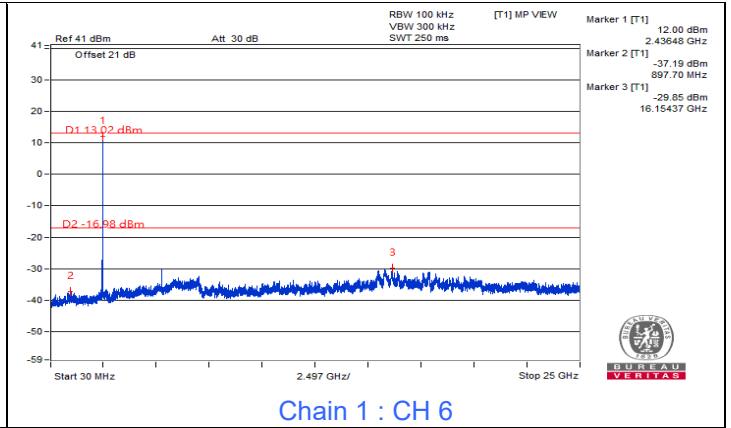
Input Power:	120 Vac, 60 Hz	Environmental Conditions:	24°C, 64% RH	Tested By:	Katina Lu
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802.11b

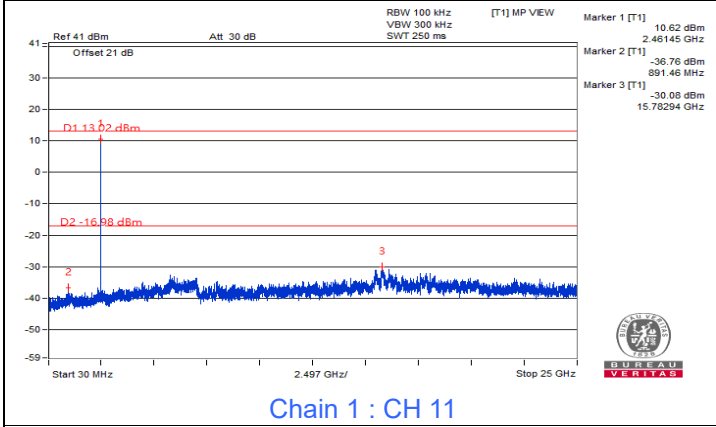




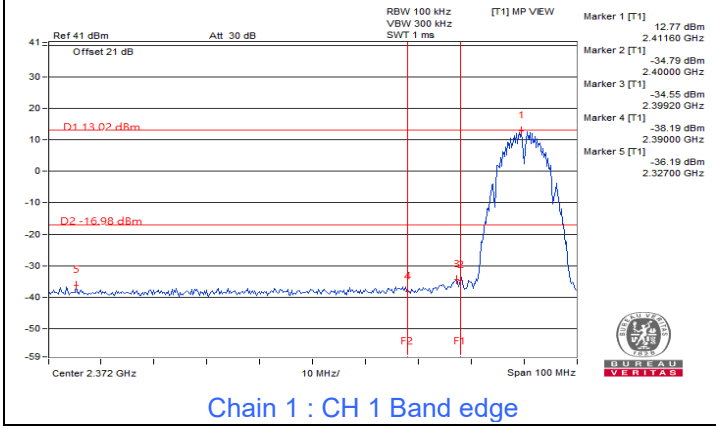
Chain 1 : CH 1



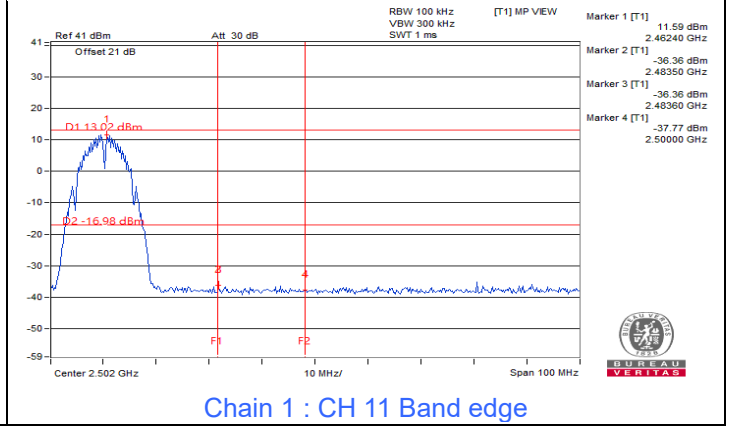
Chain 1 : CH 6



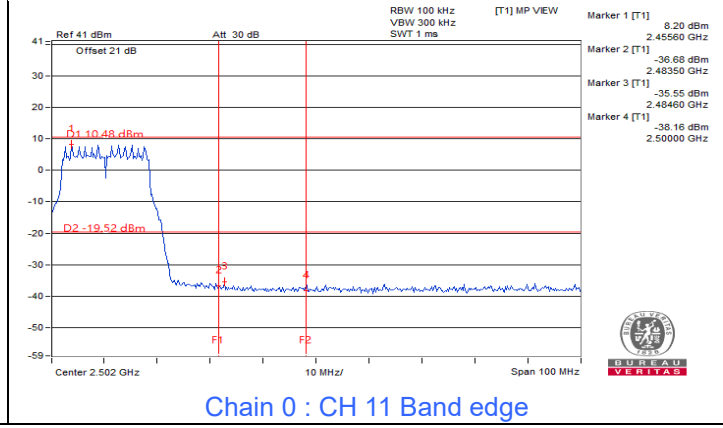
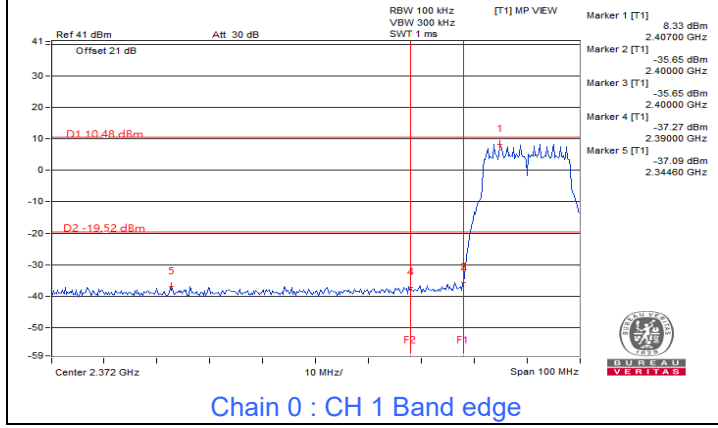
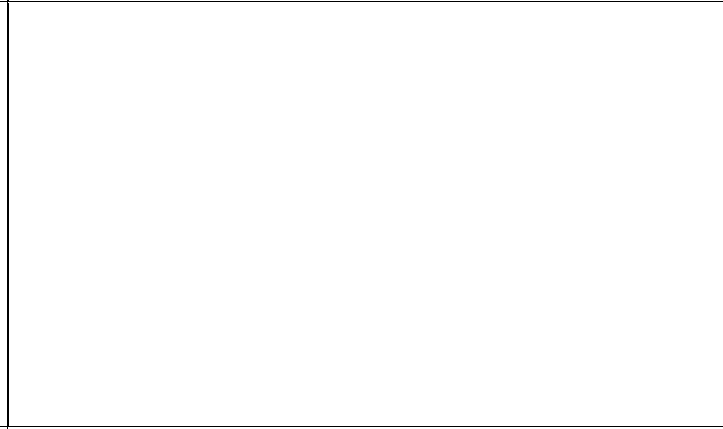
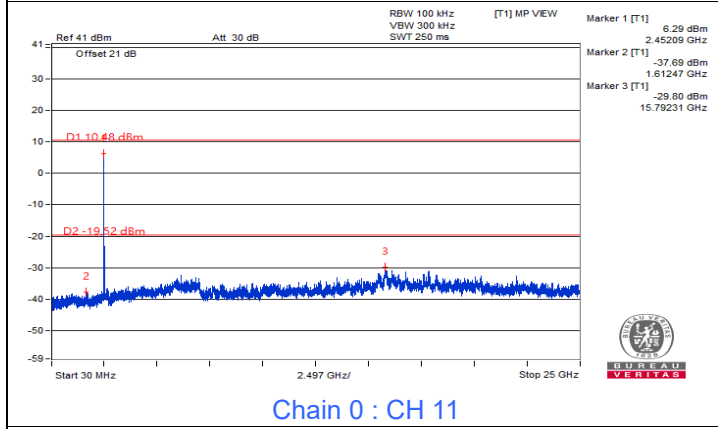
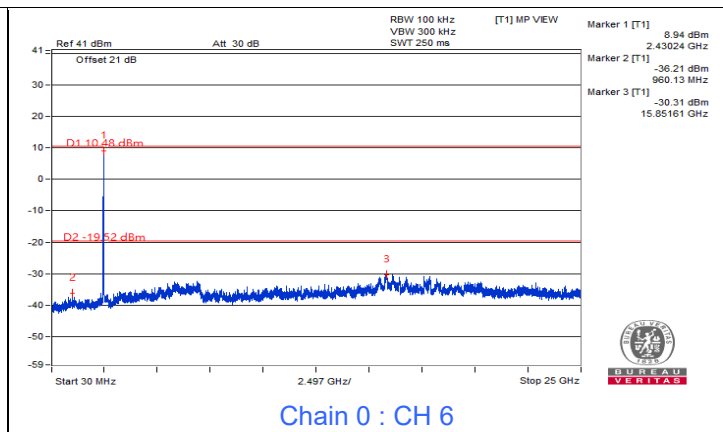
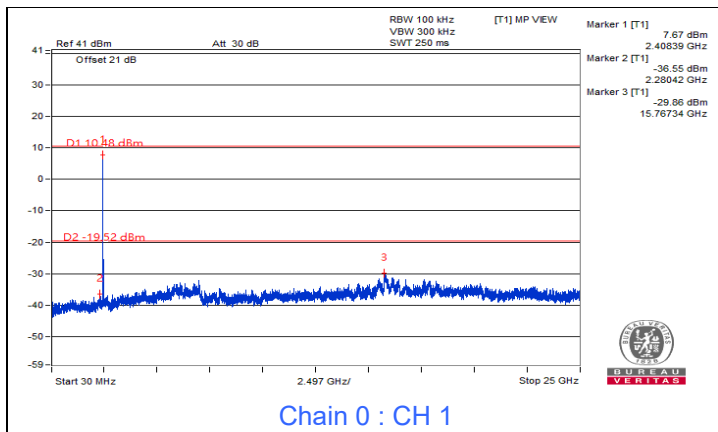
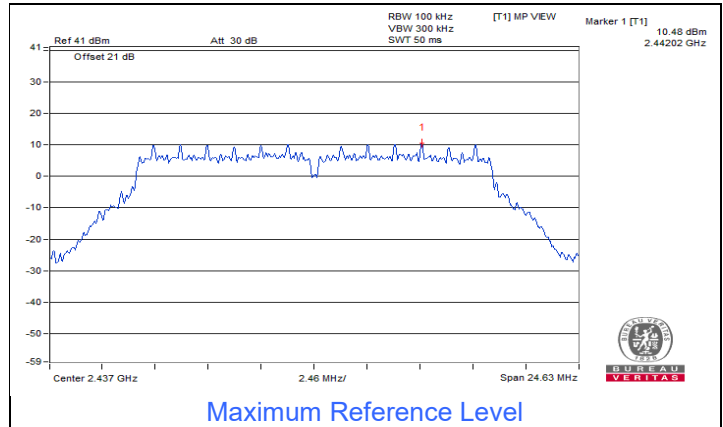
Chain 1 : CH 11



Chain 1 : CH 1 Band edge

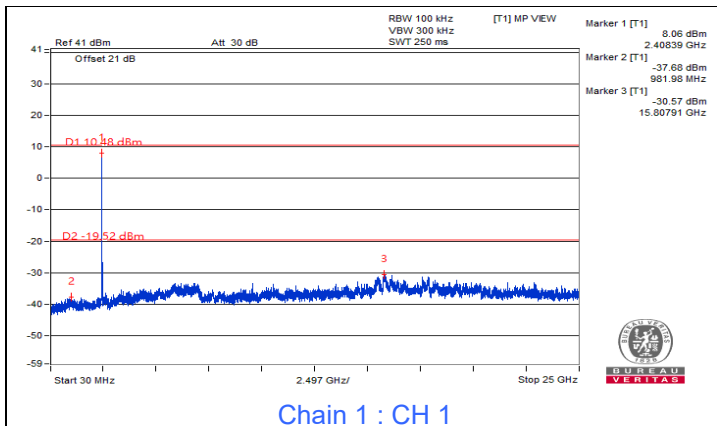


Chain 1 : CH 11 Band edge

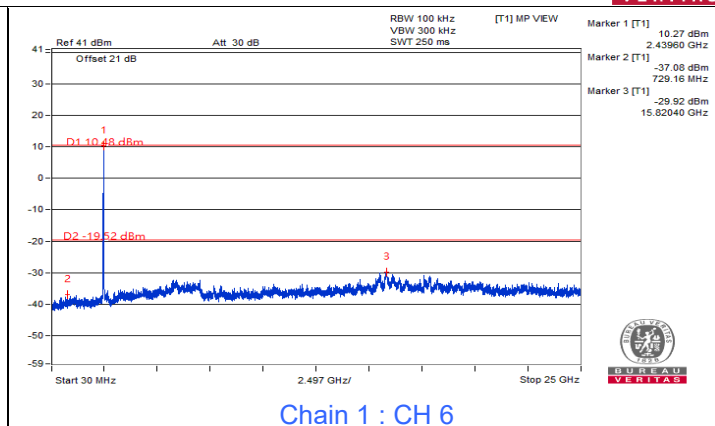




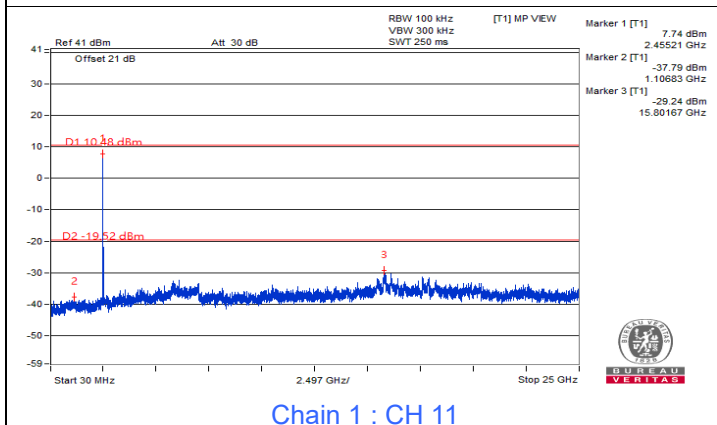
BUREAU VERITAS



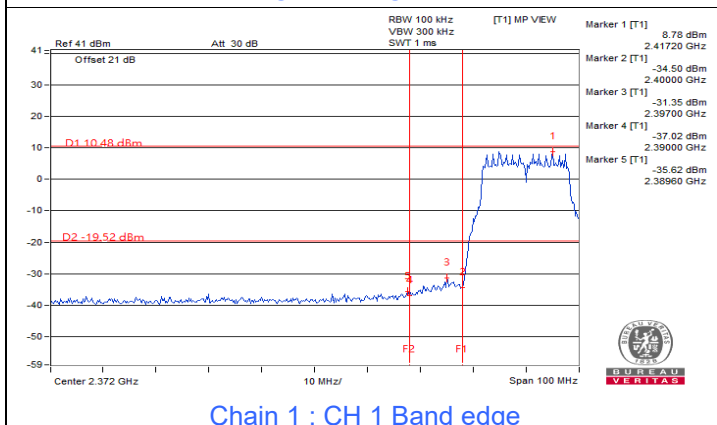
Chain 1 : CH 1



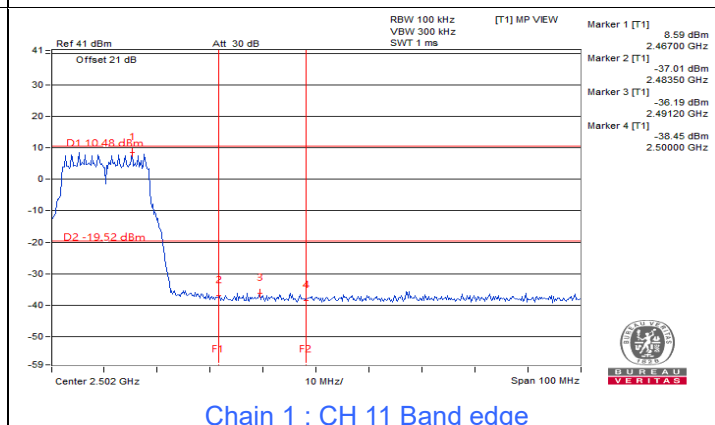
Chain 1 : CH 6



Chain 1 : CH 11

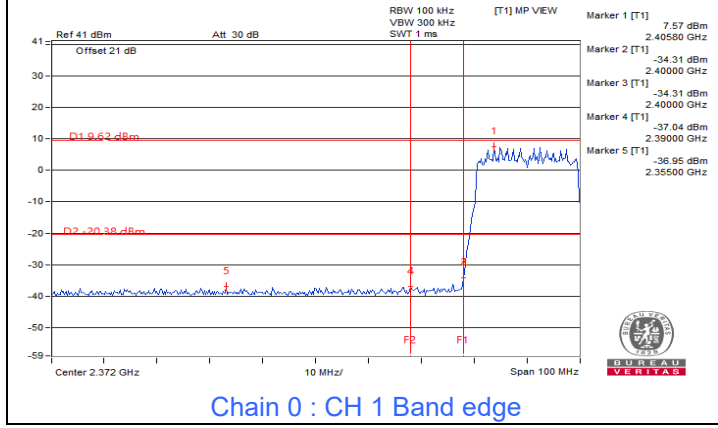
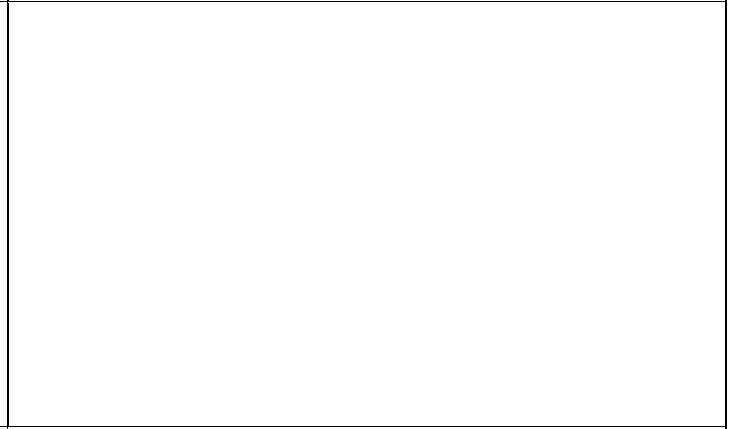
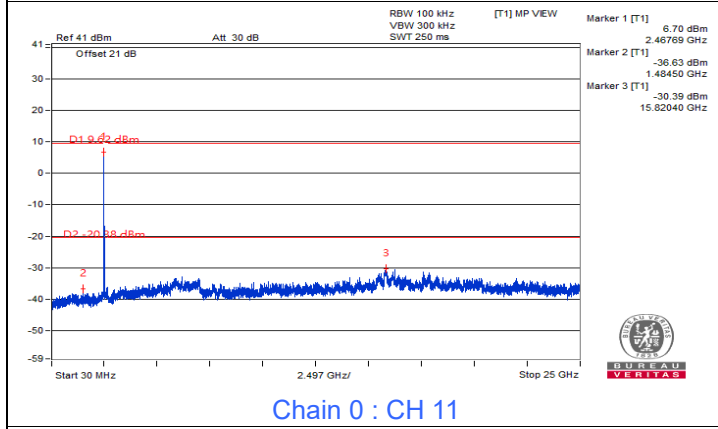
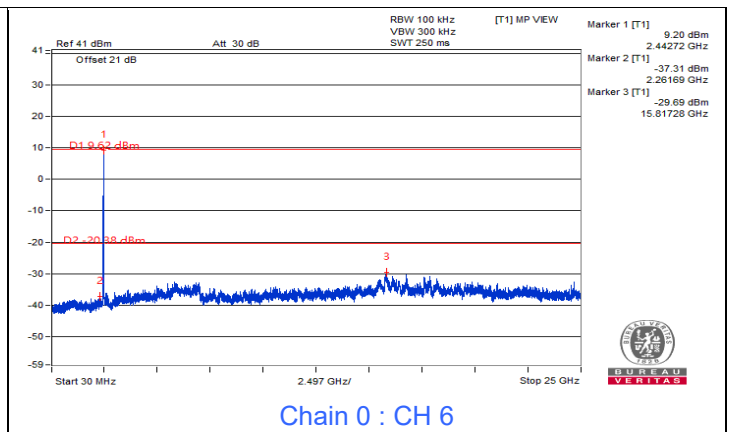
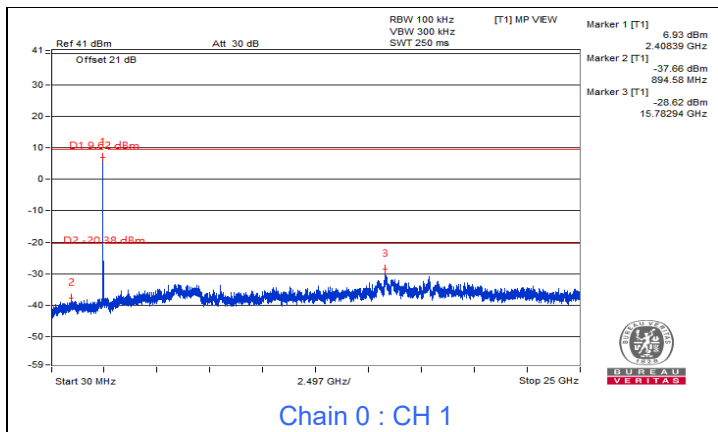
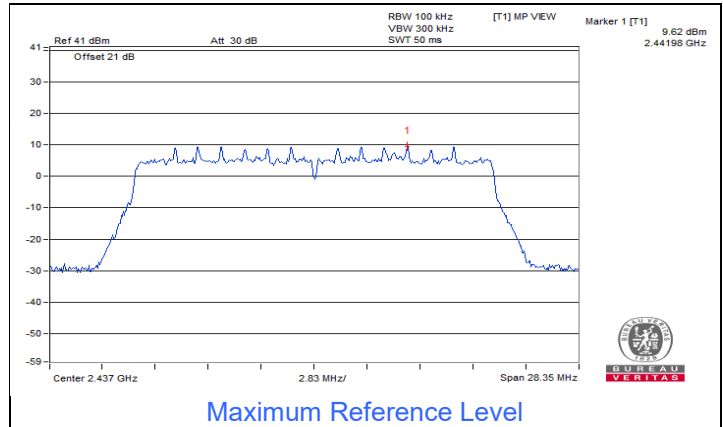


Chain 1 : CH 1 Band edge



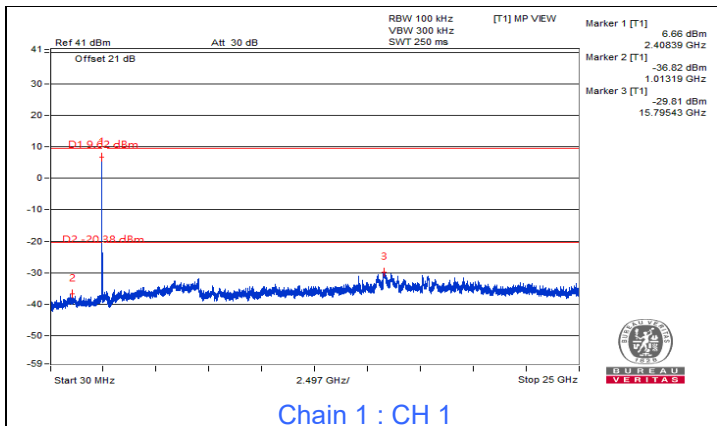
Chain 1 : CH 11 Band edge

802.11ax (HE20)

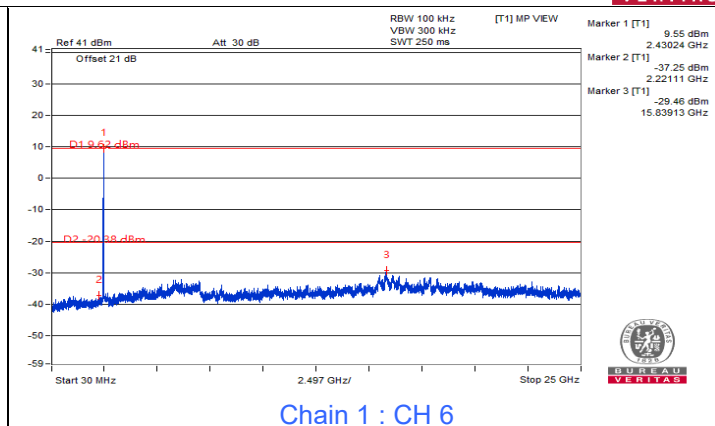




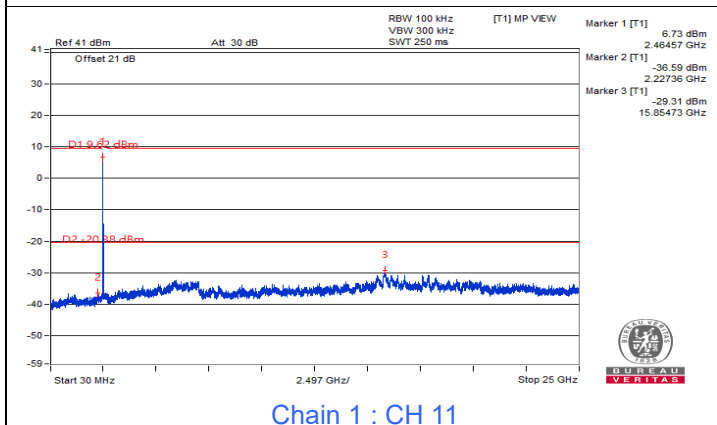
BUREAU VERITAS



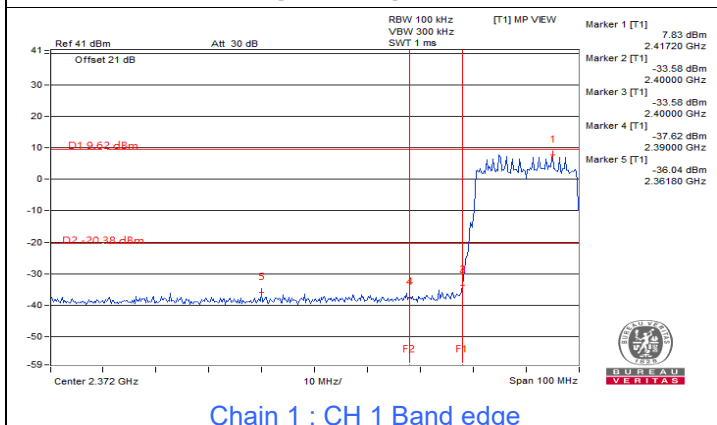
Chain 1 : CH 1



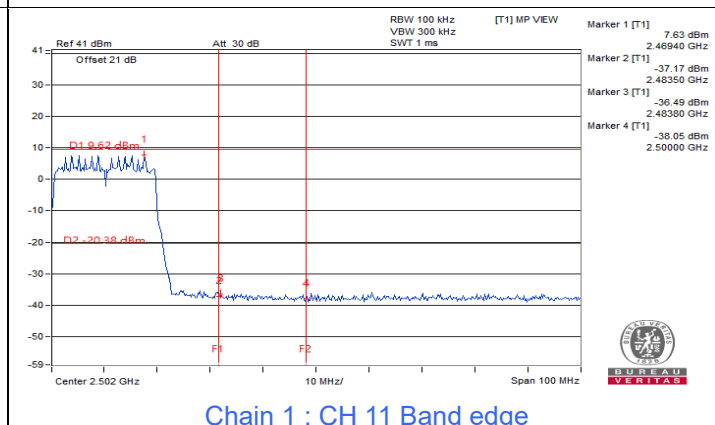
Chain 1 : CH 6



Chain 1 : CH 11

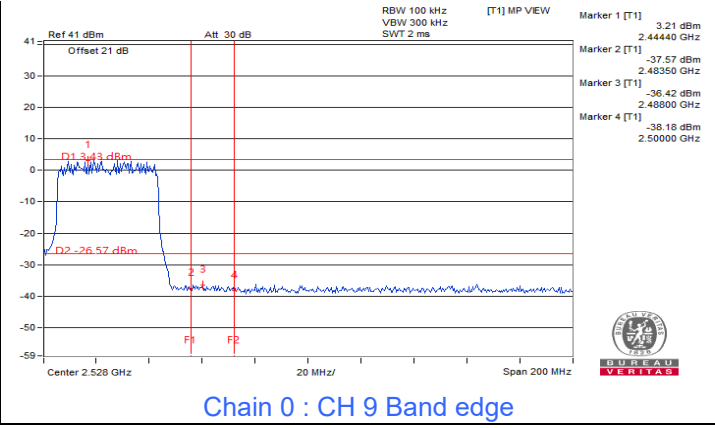
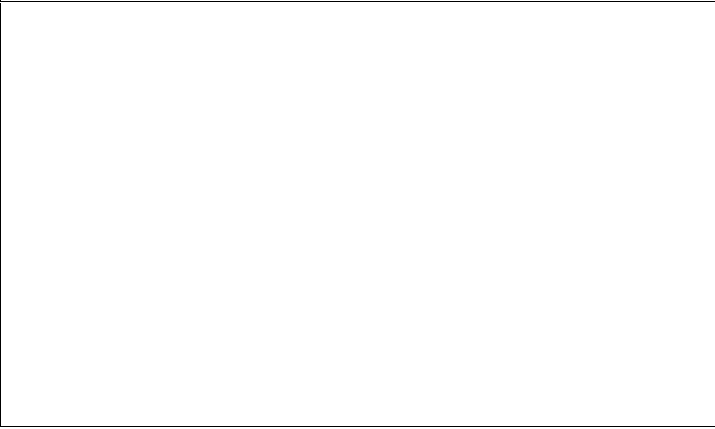
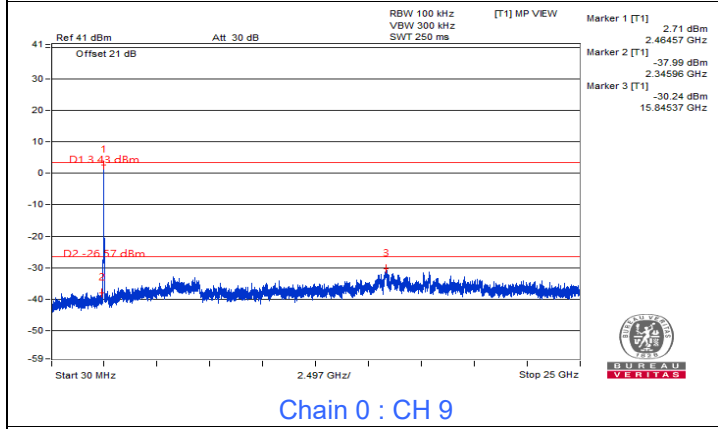
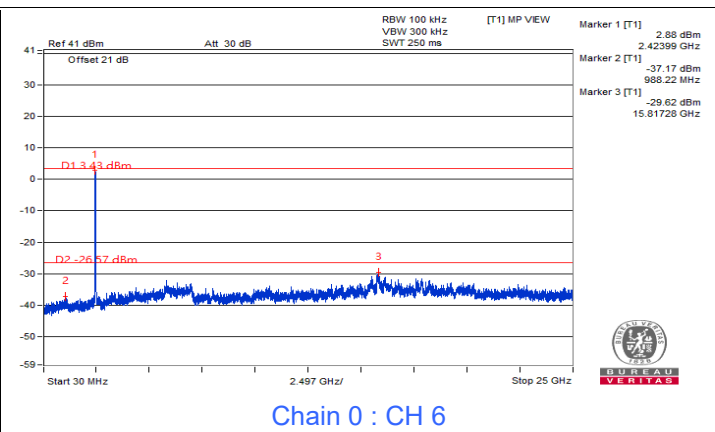
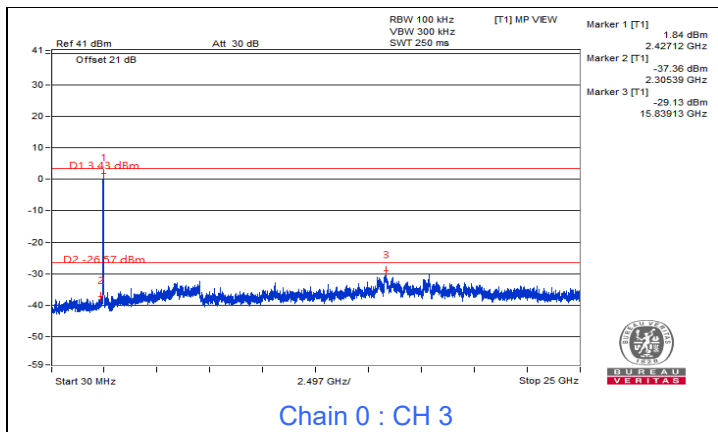
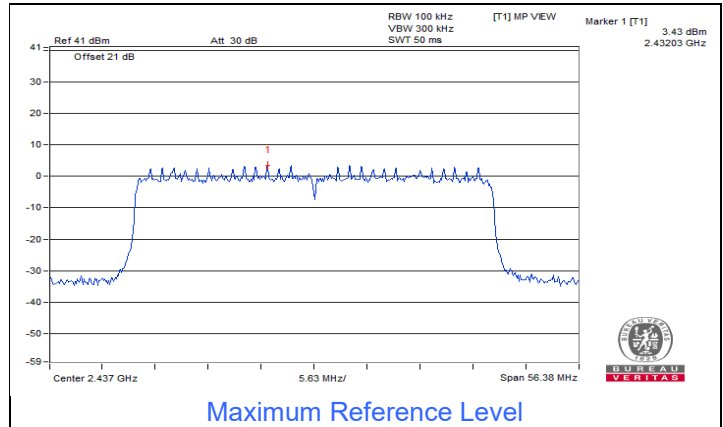


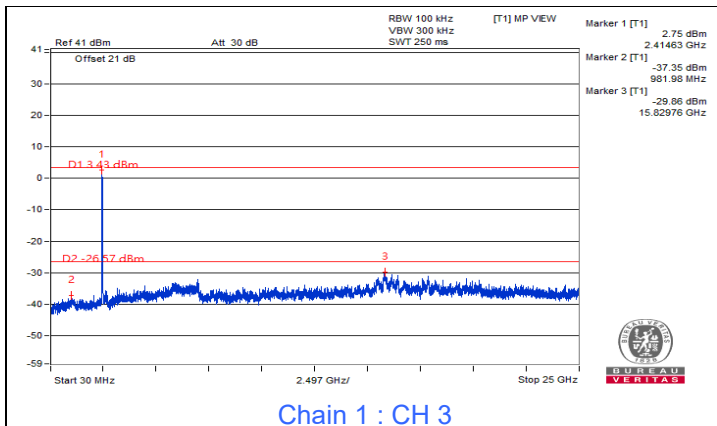
Chain 1 : CH 1 Band edge



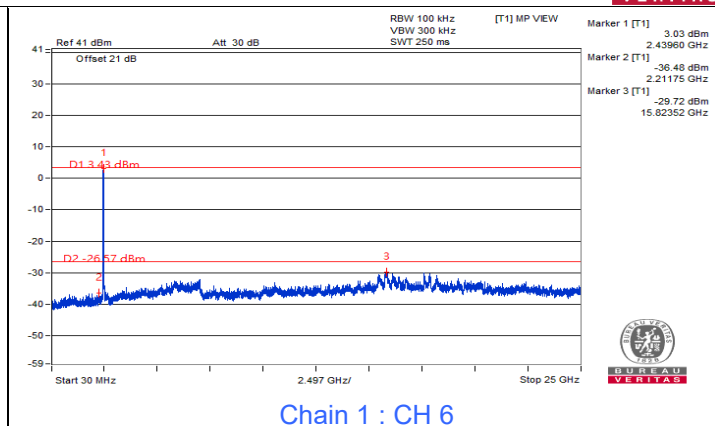
Chain 1 : CH 11 Band edge

802.11ax (HE40)

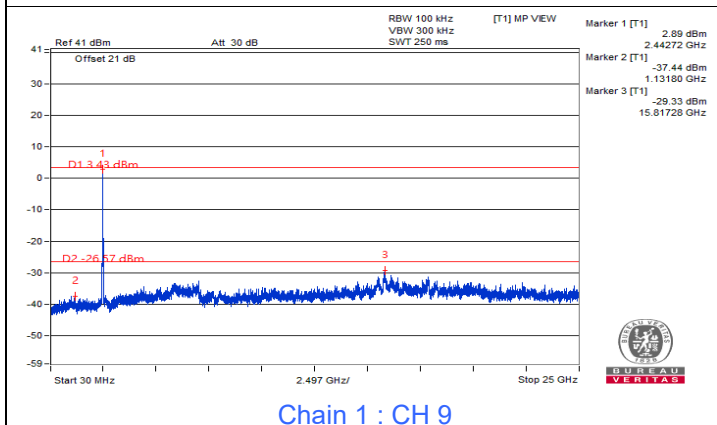




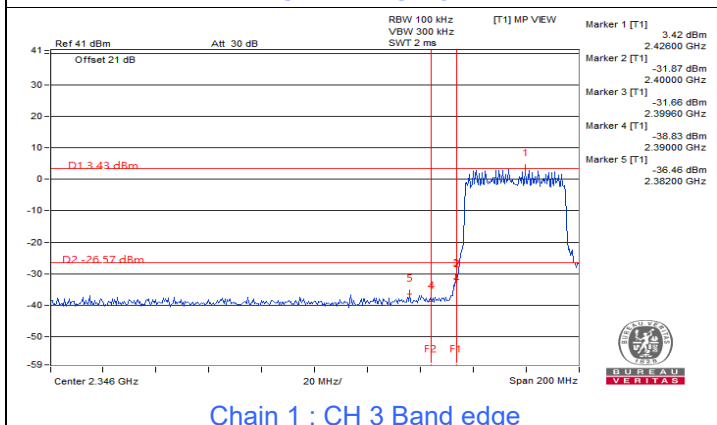
Chain 1 : CH 3



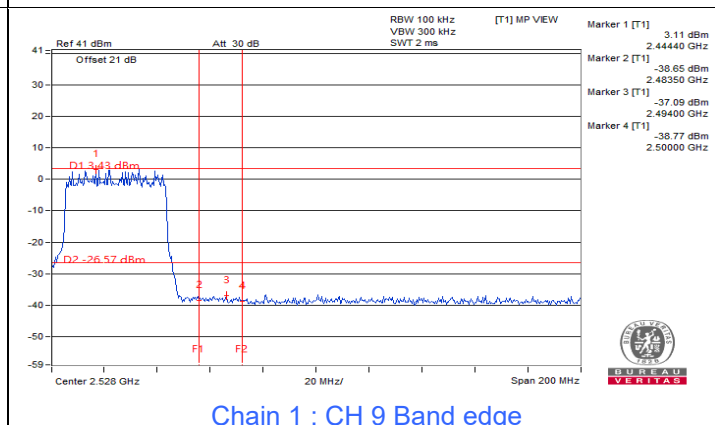
Chain 1 : CH 6



Chain 1 : CH 9



Chain 1 : CH 3 Band edge



Chain 1 : CH 9 Band edge

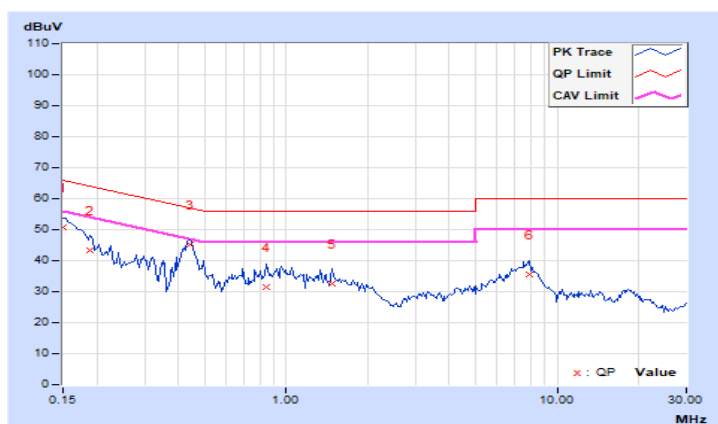
7.5 AC Power Conducted Emissions

RF Mode	802.11ax (HE20)	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	24°C, 72% RH
Tested By	Sampson Chen		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.98	40.76	27.04	50.74	37.02	66.00	56.00	-15.26	-18.98
2	0.18906	9.98	33.40	19.12	43.38	29.10	64.08	54.08	-20.70	-24.98
3	0.43906	9.99	35.08	28.80	45.07	38.79	57.08	47.08	-12.01	-8.29
4	0.84531	10.02	21.37	15.55	31.39	25.57	56.00	46.00	-24.61	-20.43
5	1.48438	10.06	22.65	17.63	32.71	27.69	56.00	46.00	-23.29	-18.31
6	7.92969	10.52	25.05	20.49	35.57	31.01	60.00	50.00	-24.43	-18.99

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

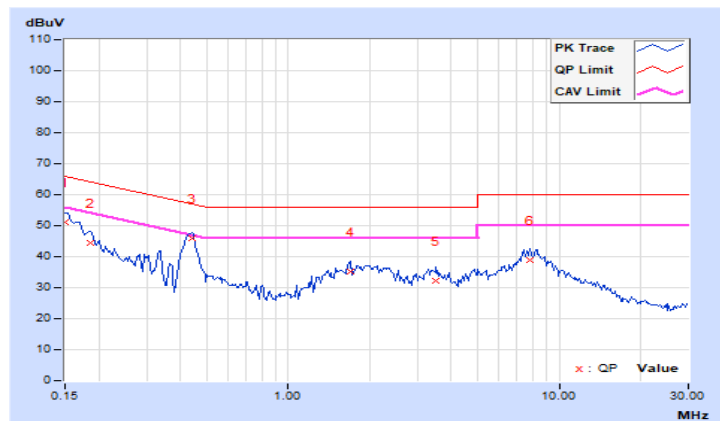


RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 72% RH
Tested By	Sampson Chen		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.02	41.18	25.91	51.20	35.93	66.00	56.00	-14.80	-20.07
2	0.18516	10.03	34.56	20.52	44.59	30.55	64.25	54.25	-19.66	-23.70
3	0.44297	10.04	35.73	25.46	45.77	35.50	57.01	47.01	-11.24	-11.51
4	1.69141	10.13	24.92	19.96	35.05	30.09	56.00	46.00	-20.95	-15.91
5	3.51172	10.26	21.97	17.13	32.23	27.39	56.00	46.00	-23.77	-18.61
6	7.82813	10.52	28.53	23.62	39.05	34.14	60.00	50.00	-20.95	-15.86

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



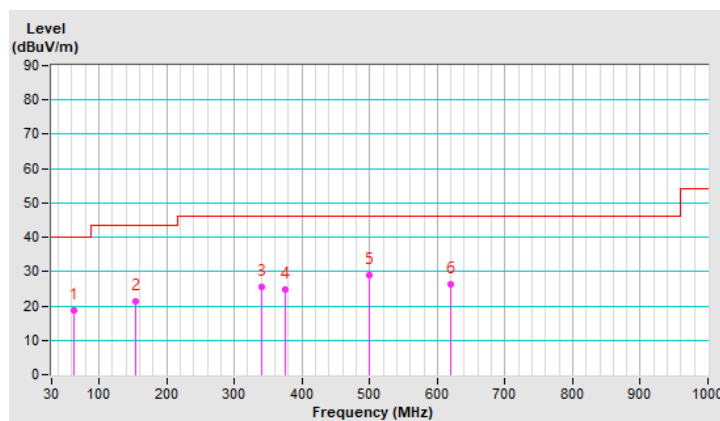
7.6 Unwanted Emissions below 1 GHz

RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 67% RH
Tested By	Sampson Chen		

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	63.39	18.7 QP	40.0	-21.3	3.00 H	255	32.8	-14.1
2	154.35	21.2 QP	43.5	-22.3	1.00 H	281	34.2	-13.0
3	339.84	25.6 QP	46.0	-20.4	1.00 H	66	37.2	-11.6
4	375.00	24.7 QP	46.0	-21.3	1.00 H	185	35.2	-10.5
5	500.01	29.1 QP	46.0	-16.9	1.50 H	155	36.7	-7.6
6	620.58	26.3 QP	46.0	-19.7	1.50 H	277	30.9	-4.6

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.

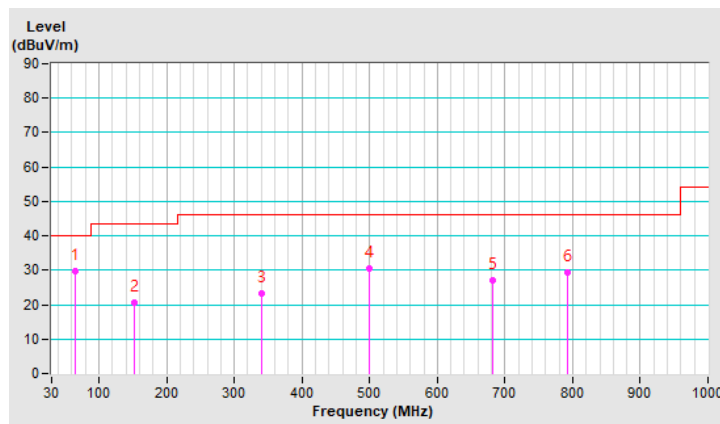


RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 67% RH
Tested By	Sampson Chen		

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	64.27	29.6 QP	40.0	-10.4	2.00 V	0	44.0	-14.4
2	153.07	20.5 QP	43.5	-23.0	1.00 V	276	33.6	-13.1
3	339.82	23.4 QP	46.0	-22.6	1.00 V	96	35.0	-11.6
4	499.99	30.4 QP	46.0	-15.6	1.00 V	300	38.0	-7.6
5	682.57	27.2 QP	46.0	-18.8	2.00 V	0	31.4	-4.2
6	792.32	29.3 QP	46.0	-16.7	1.50 V	214	31.7	-2.4

Remarks:

1. Emission Level(dBUV/m) = Raw Value(dBUV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit 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.



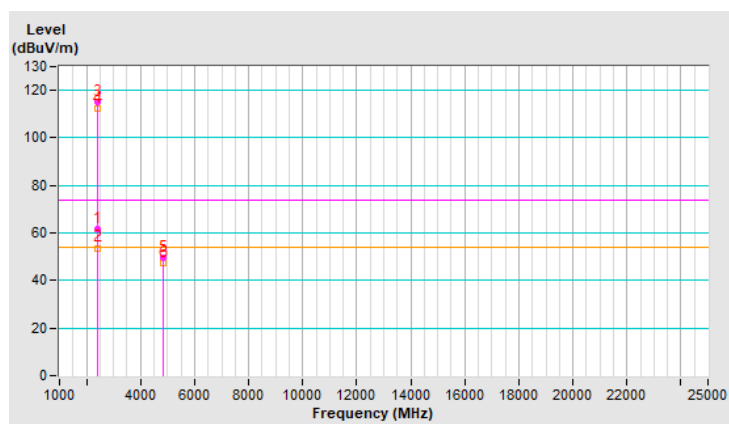
7.7 Unwanted Emissions above 1 GHz

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	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% 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	2389.33	61.7 PK	74.0	-12.3	1.82 H	349	61.8	-0.1
2	2389.33	53.7 AV	54.0	-0.3	1.82 H	349	53.8	-0.1
3	*2412.00	115.0 PK			1.82 H	349	115.1	-0.1
4	*2412.00	112.6 AV			1.82 H	349	112.7	-0.1
5	4824.00	49.6 PK	74.0	-24.4	1.74 H	169	45.1	4.5
6	4824.00	47.4 AV	54.0	-6.6	1.74 H	169	42.9	4.5

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.

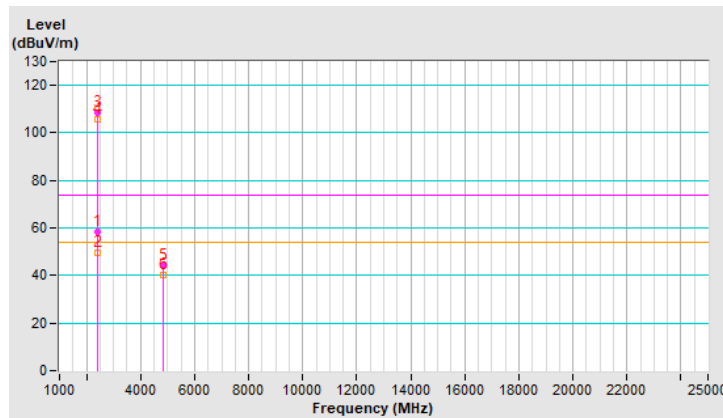


RF Mode	802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	58.5 PK	74.0	-15.5	3.61 V	314	58.6	-0.1
2	2390.00	49.7 AV	54.0	-4.3	3.61 V	314	49.8	-0.1
3	*2412.00	108.6 PK			3.61 V	314	108.7	-0.1
4	*2412.00	105.9 AV			3.61 V	314	106.0	-0.1
5	4824.00	44.2 PK	74.0	-29.8	1.62 V	246	39.7	4.5
6	4824.00	40.3 AV	54.0	-13.7	1.62 V	246	35.8	4.5

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.

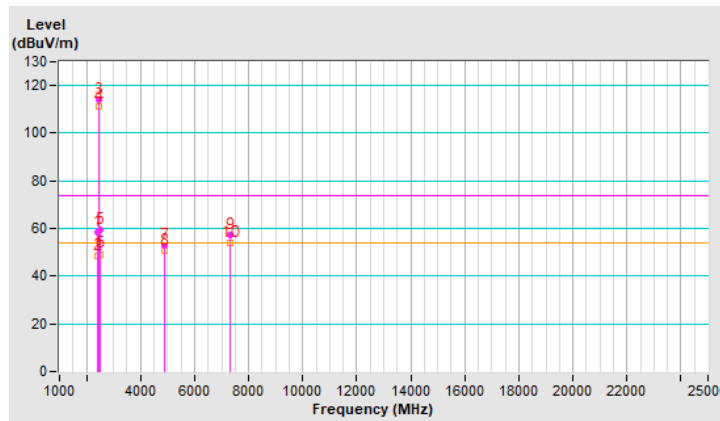


RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	58.2 PK	74.0	-15.8	1.47 H	340	58.3	-0.1
2	2390.00	48.2 AV	54.0	-5.8	1.47 H	340	48.3	-0.1
3	*2437.00	114.0 PK			1.47 H	340	114.1	-0.1
4	*2437.00	111.3 AV			1.47 H	340	111.4	-0.1
5	2483.50	59.6 PK	74.0	-14.4	1.47 H	340	59.8	-0.2
6	2483.50	49.3 AV	54.0	-4.7	1.47 H	340	49.5	-0.2
7	4874.00	52.7 PK	74.0	-21.3	1.84 H	165	48.1	4.6
8	4874.00	50.9 AV	54.0	-3.1	1.84 H	165	46.3	4.6
9	7311.00	57.2 PK	74.0	-16.8	1.65 H	146	45.6	11.6
10	7311.00	53.9 AV	54.0	-0.1	1.65 H	146	42.3	11.6

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.

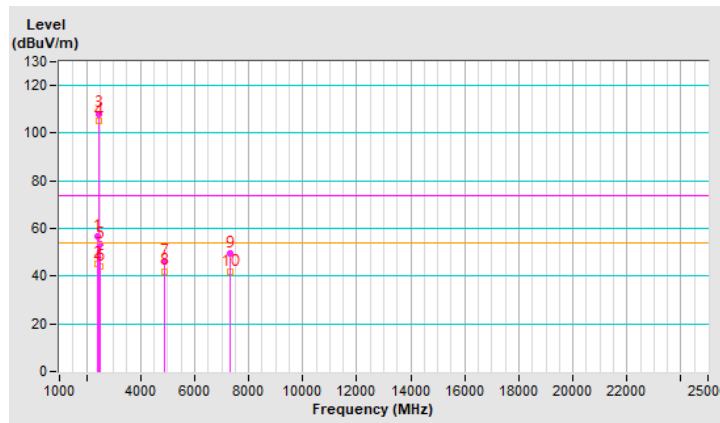


RF Mode	802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	56.7 PK	74.0	-17.3	3.62 V	307	56.8	-0.1
2	2390.00	45.3 AV	54.0	-8.7	3.62 V	307	45.4	-0.1
3	*2437.00	108.2 PK			3.62 V	307	108.3	-0.1
4	*2437.00	105.2 AV			3.62 V	307	105.3	-0.1
5	2483.50	53.6 PK	74.0	-20.4	3.62 V	307	53.8	-0.2
6	2483.50	43.8 AV	54.0	-10.2	3.62 V	307	44.0	-0.2
7	4874.00	46.1 PK	74.0	-27.9	1.60 V	254	41.5	4.6
8	4874.00	42.1 AV	54.0	-11.9	1.60 V	254	37.5	4.6
9	7311.00	49.5 PK	74.0	-24.5	1.14 V	116	37.9	11.6
10	7311.00	41.6 AV	54.0	-12.4	1.14 V	116	30.0	11.6

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.



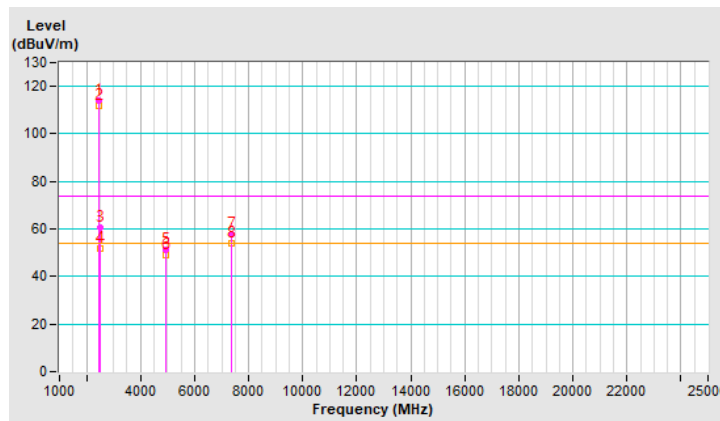
RF Mode	802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	114.1 PK			1.49 H	338	114.1	0.0
2	*2462.00	111.7 AV			1.49 H	338	111.7	0.0
3	2486.10	60.8 PK	74.0	-13.2	1.49 H	338	61.0	-0.2
4	2486.10	51.9 AV	54.0	-2.1	1.49 H	338	52.1	-0.2
5	4924.00	51.3 PK	74.0	-22.7	1.73 H	173	46.6	4.7
6	4924.00	48.9 AV	54.0	-5.1	1.73 H	173	44.2	4.7
7	7386.00	57.9 PK	74.0	-16.1	1.63 H	146	46.3	11.6
8	7386.00	53.8 AV	54.0	-0.2	1.63 H	146	42.2	11.6

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.

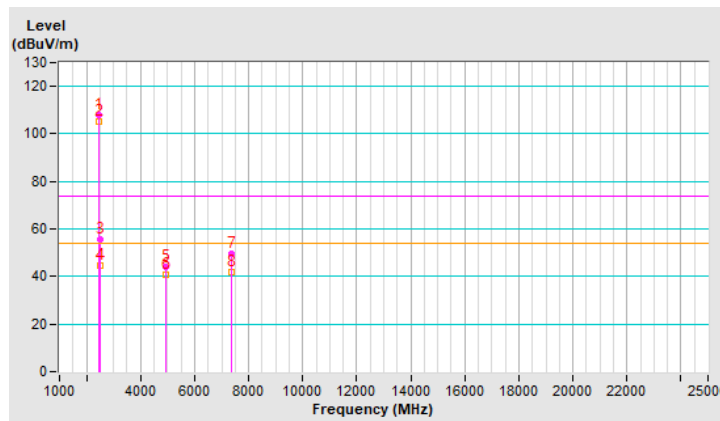


RF Mode	802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	107.7 PK			3.53 V	309	107.7	0.0
2	*2462.00	105.1 AV			3.53 V	309	105.1	0.0
3	2486.40	55.8 PK	74.0	-18.2	3.53 V	309	56.0	-0.2
4	2486.40	44.8 AV	54.0	-9.2	3.53 V	309	45.0	-0.2
5	4924.00	43.9 PK	74.0	-30.1	1.63 V	254	39.2	4.7
6	4924.00	40.8 AV	54.0	-13.2	1.63 V	254	36.1	4.7
7	7386.00	49.8 PK	74.0	-24.2	1.13 V	131	38.2	11.6
8	7386.00	41.7 AV	54.0	-12.3	1.13 V	131	30.1	11.6

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.

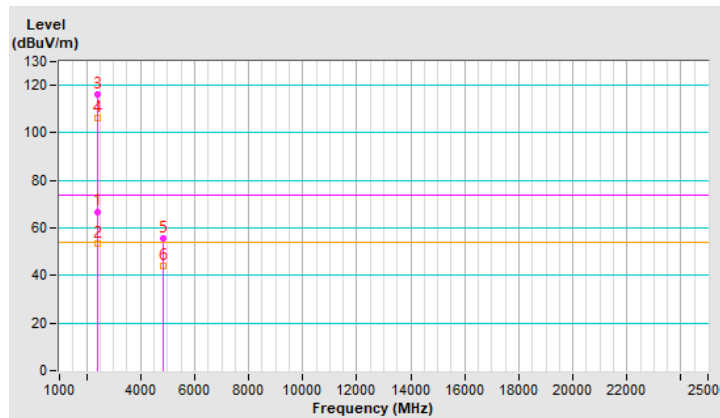


RF Mode	802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	66.9 PK	74.0	-7.1	2.20 H	171	67.0	-0.1
2	2390.00	53.6 AV	54.0	-0.4	2.20 H	171	53.7	-0.1
3	*2412.00	116.2 PK			2.20 H	171	116.3	-0.1
4	*2412.00	106.5 AV			2.20 H	171	106.6	-0.1
5	4824.00	55.7 PK	74.0	-18.3	1.69 H	171	51.2	4.5
6	4824.00	44.1 AV	54.0	-9.9	1.69 H	171	39.6	4.5

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.

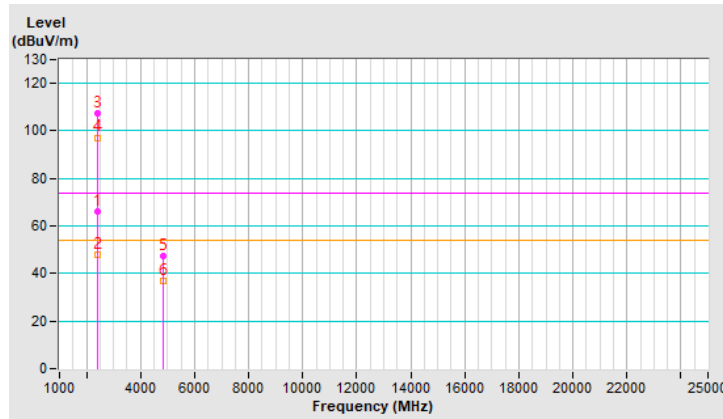


RF Mode	802.11g	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	66.3 PK	74.0	-7.7	1.27 V	140	66.4	-0.1
2	2390.00	47.8 AV	54.0	-6.2	1.27 V	140	47.9	-0.1
3	*2412.00	107.5 PK			1.27 V	140	107.6	-0.1
4	*2412.00	97.2 AV			1.27 V	140	97.3	-0.1
5	4824.00	47.3 PK	74.0	-26.7	1.63 V	248	42.8	4.5
6	4824.00	36.9 AV	54.0	-17.1	1.63 V	248	32.4	4.5

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.



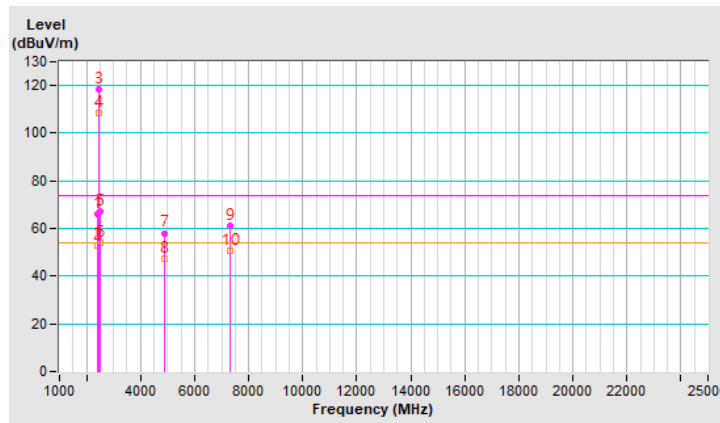
RF Mode	802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	66.1 PK	74.0	-7.9	1.50 H	350	66.2	-0.1
2	2390.00	53.0 AV	54.0	-1.0	1.50 H	350	53.1	-0.1
3	*2437.00	118.6 PK			1.50 H	350	118.7	-0.1
4	*2437.00	108.4 AV			1.50 H	350	108.5	-0.1
5	2483.50	67.0 PK	74.0	-7.0	1.50 H	350	67.2	-0.2
6	2483.50	53.9 AV	54.0	-0.1	1.50 H	350	54.1	-0.2
7	4874.00	58.1 PK	74.0	-15.9	1.77 H	179	53.5	4.6
8	4874.00	47.3 AV	54.0	-6.7	1.77 H	179	42.7	4.6
9	7311.00	61.3 PK	74.0	-12.7	1.65 H	150	49.7	11.6
10	7311.00	50.9 AV	54.0	-3.1	1.65 H	150	39.3	11.6

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.

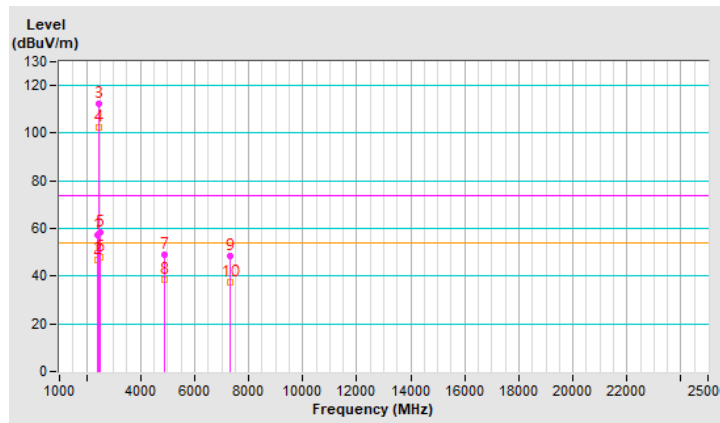


RF Mode	802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	57.2 PK	74.0	-16.8	3.57 V	301	57.3	-0.1
2	2390.00	47.0 AV	54.0	-7.0	3.57 V	301	47.1	-0.1
3	*2437.00	112.6 PK			3.57 V	301	112.7	-0.1
4	*2437.00	102.6 AV			3.57 V	301	102.7	-0.1
5	2483.50	58.3 PK	74.0	-15.7	3.57 V	301	58.5	-0.2
6	2483.50	48.0 AV	54.0	-6.0	3.57 V	301	48.2	-0.2
7	4874.00	49.1 PK	74.0	-24.9	1.59 V	243	44.5	4.6
8	4874.00	38.4 AV	54.0	-15.6	1.59 V	243	33.8	4.6
9	7311.00	48.2 PK	74.0	-25.8	1.13 V	109	36.6	11.6
10	7311.00	37.6 AV	54.0	-16.4	1.13 V	109	26.0	11.6

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.

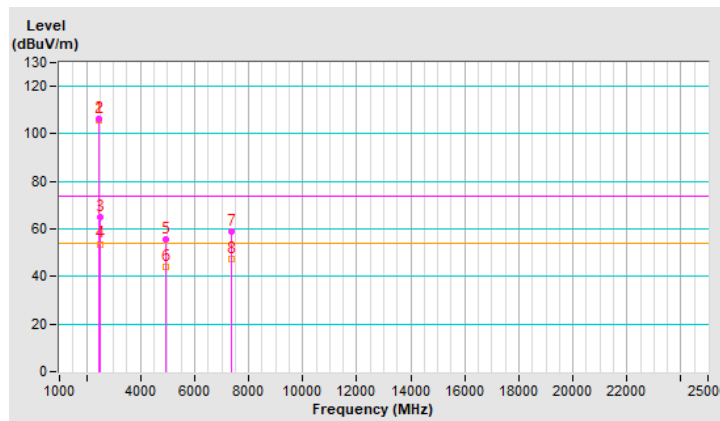


RF Mode	802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	106.2 PK			1.44 H	348	106.2	0.0
2	*2462.00	106.0 AV			1.44 H	348	106.0	0.0
3	2483.50	65.1 PK	74.0	-8.9	1.44 H	348	65.3	-0.2
4	2483.50	53.7 AV	54.0	-0.3	1.44 H	348	53.9	-0.2
5	4924.00	55.7 PK	74.0	-18.3	1.81 H	172	51.0	4.7
6	4924.00	44.3 AV	54.0	-9.7	1.81 H	172	39.6	4.7
7	7386.00	58.7 PK	74.0	-15.3	1.60 H	140	47.1	11.6
8	7386.00	47.6 AV	54.0	-6.4	1.60 H	140	36.0	11.6

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.

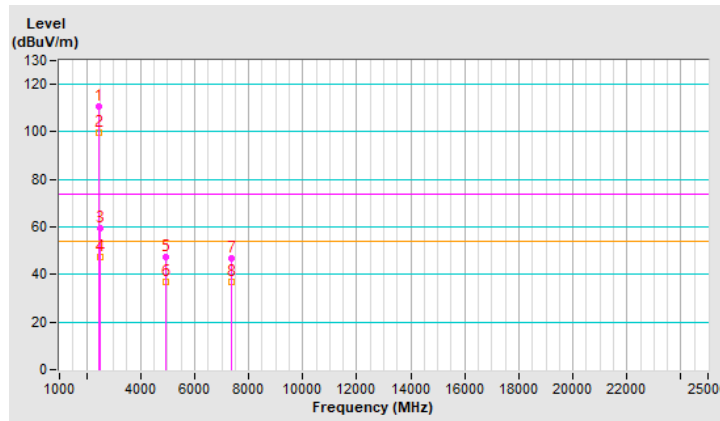


RF Mode	802.11g	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	110.5 PK			3.44 V	99	110.5	0.0
2	*2462.00	99.5 AV			3.44 V	99	99.5	0.0
3	2483.50	59.6 PK	74.0	-14.4	3.44 V	99	59.8	-0.2
4	2483.50	47.3 AV	54.0	-6.7	3.44 V	99	47.5	-0.2
5	4924.00	47.5 PK	74.0	-26.5	1.59 V	253	42.8	4.7
6	4924.00	37.1 AV	54.0	-16.9	1.59 V	253	32.4	4.7
7	7386.00	47.0 PK	74.0	-27.0	1.16 V	117	35.4	11.6
8	7386.00	36.7 AV	54.0	-17.3	1.16 V	117	25.1	11.6

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.



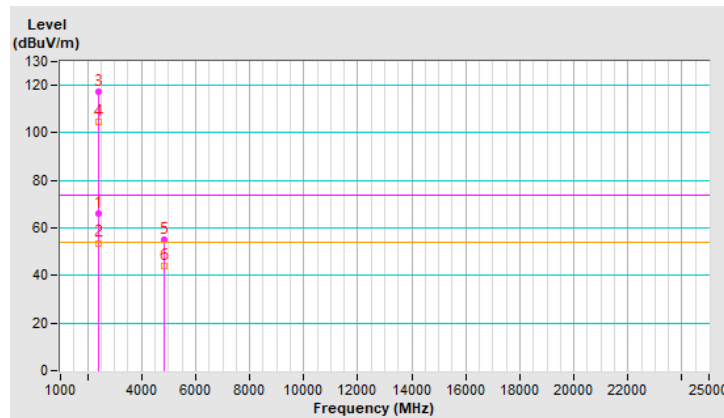
RF Mode	802.11ax (HE20)	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	2389.50	66.0 PK	74.0	-8.0	2.49 H	348	66.1	-0.1
2	2389.50	53.7 AV	54.0	-0.3	2.49 H	348	53.8	-0.1
3	*2412.00	117.2 PK			2.49 H	348	117.3	-0.1
4	*2412.00	104.8 AV			2.49 H	348	104.9	-0.1
5	4824.00	55.3 PK	74.0	-18.7	1.77 H	166	50.8	4.5
6	4824.00	44.1 AV	54.0	-9.9	1.77 H	166	39.6	4.5

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.

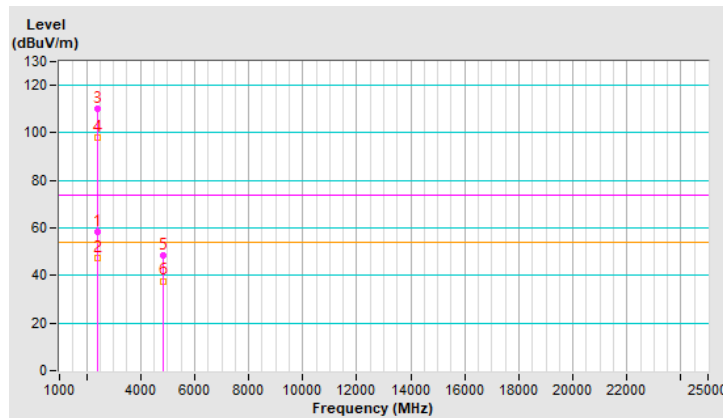


RF Mode	802.11ax (HE20)	Channel	CH 1 : 2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	58.4 PK	74.0	-15.6	3.39 V	52	58.5	-0.1
2	2390.00	47.1 AV	54.0	-6.9	3.39 V	52	47.2	-0.1
3	*2412.00	110.2 PK			3.39 V	52	110.3	-0.1
4	*2412.00	98.2 AV			3.39 V	52	98.3	-0.1
5	4824.00	48.3 PK	74.0	-25.7	1.64 V	255	43.8	4.5
6	4824.00	37.7 AV	54.0	-16.3	1.64 V	255	33.2	4.5

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.



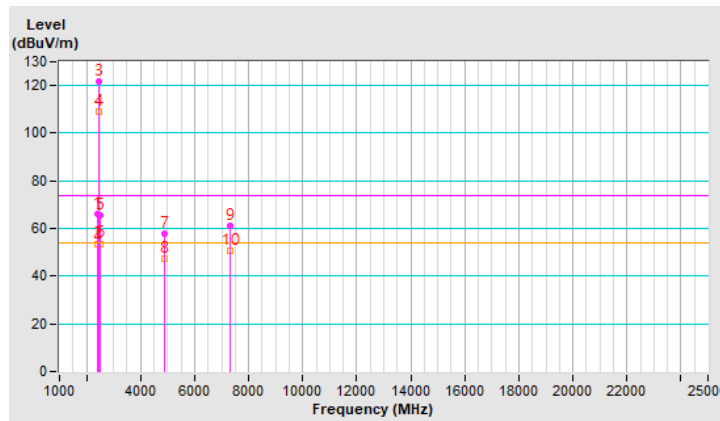
RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	66.3 PK	74.0	-7.7	2.19 H	344	66.4	-0.1
2	2390.00	53.6 AV	54.0	-0.4	2.19 H	344	53.7	-0.1
3	*2437.00	121.5 PK			2.19 H	344	121.6	-0.1
4	*2437.00	109.0 AV			2.19 H	344	109.1	-0.1
5	2483.50	65.3 PK	74.0	-8.7	2.19 H	344	65.5	-0.2
6	2483.50	53.7 AV	54.0	-0.3	2.19 H	344	53.9	-0.2
7	4874.00	58.0 PK	74.0	-16.0	1.84 H	179	53.4	4.6
8	4874.00	47.4 AV	54.0	-6.6	1.84 H	179	42.8	4.6
9	7311.00	60.9 PK	74.0	-13.1	1.59 H	135	49.3	11.6
10	7311.00	50.7 AV	54.0	-3.3	1.59 H	135	39.1	11.6

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.

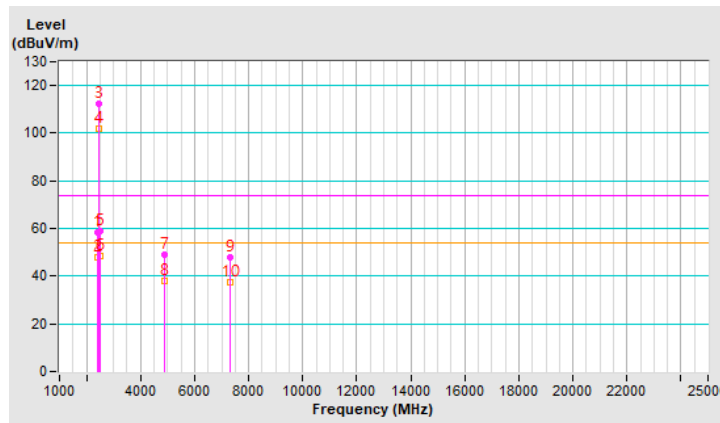


RF Mode	802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	58.3 PK	74.0	-15.7	3.64 V	317	58.4	-0.1
2	2390.00	48.0 AV	54.0	-6.0	3.64 V	317	48.1	-0.1
3	*2437.00	112.2 PK			3.64 V	317	112.3	-0.1
4	*2437.00	102.1 AV			3.64 V	317	102.2	-0.1
5	2483.50	58.9 PK	74.0	-15.1	3.64 V	317	59.1	-0.2
6	2483.50	48.5 AV	54.0	-5.5	3.64 V	317	48.7	-0.2
7	4874.00	49.0 PK	74.0	-25.0	1.65 V	260	44.4	4.6
8	4874.00	38.1 AV	54.0	-15.9	1.65 V	260	33.5	4.6
9	7311.00	47.8 PK	74.0	-26.2	1.18 V	115	36.2	11.6
10	7311.00	37.3 AV	54.0	-16.7	1.18 V	115	25.7	11.6

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.

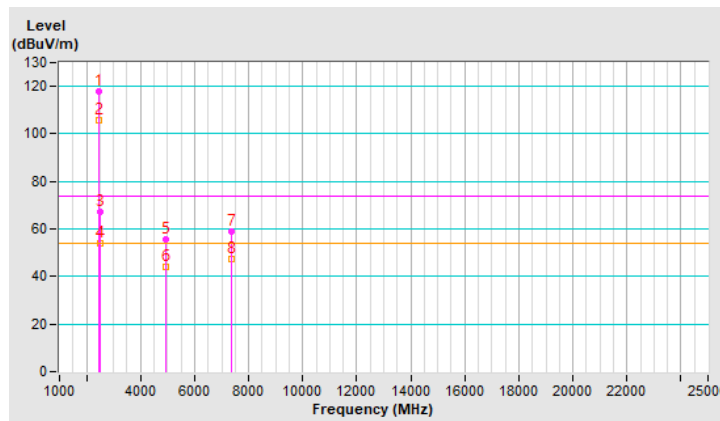


RF Mode	802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	117.7 PK			2.20 H	337	117.7	0.0
2	*2462.00	105.9 AV			2.20 H	337	105.9	0.0
3	2483.50	67.0 PK	74.0	-7.0	2.20 H	337	67.2	-0.2
4	2483.50	53.9 AV	54.0	-0.1	2.20 H	337	54.1	-0.2
5	4924.00	55.5 PK	74.0	-18.5	1.86 H	161	50.8	4.7
6	4924.00	44.3 AV	54.0	-9.7	1.86 H	161	39.6	4.7
7	7386.00	59.0 PK	74.0	-15.0	1.71 H	145	47.4	11.6
8	7386.00	47.6 AV	54.0	-6.4	1.71 H	145	36.0	11.6

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.

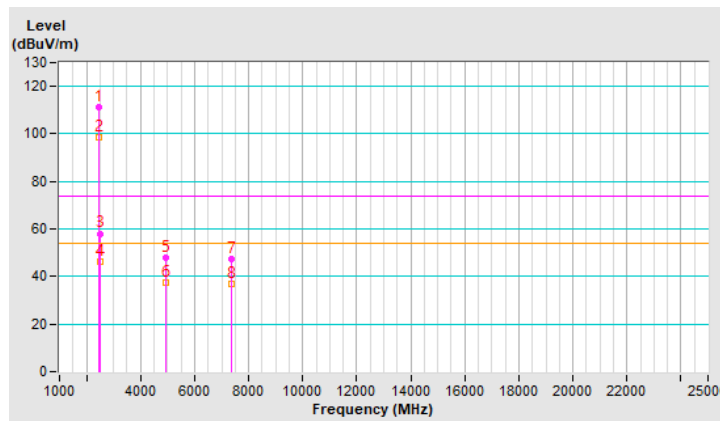


RF Mode	802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	111.5 PK			3.44 V	314	111.5	0.0
2	*2462.00	98.6 AV			3.44 V	314	98.6	0.0
3	2483.50	58.1 PK	74.0	-15.9	3.44 V	314	58.3	-0.2
4	2483.50	46.5 AV	54.0	-7.5	3.44 V	314	46.7	-0.2
5	4924.00	47.7 PK	74.0	-26.3	1.62 V	241	43.0	4.7
6	4924.00	37.3 AV	54.0	-16.7	1.62 V	241	32.6	4.7
7	7386.00	47.6 PK	74.0	-26.4	1.14 V	107	36.0	11.6
8	7386.00	37.1 AV	54.0	-16.9	1.14 V	107	25.5	11.6

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.

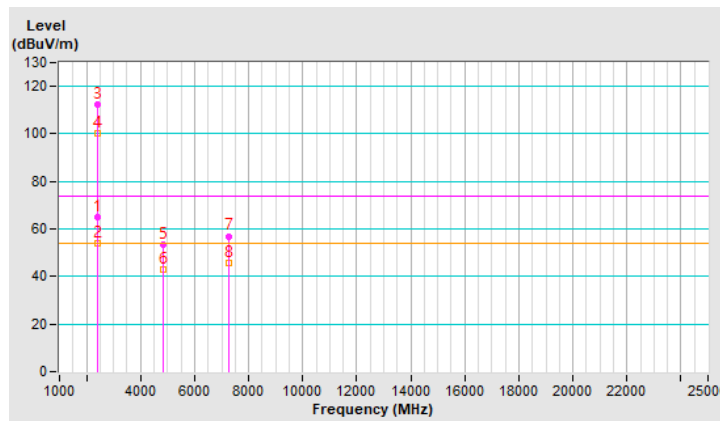


RF Mode	802.11ax (HE40)	Channel	CH 3 : 2422 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	65.2 PK	74.0	-8.8	2.46 H	344	65.3	-0.1
2	2390.00	53.9 AV	54.0	-0.1	2.46 H	344	54.0	-0.1
3	*2422.00	112.6 PK			2.46 H	344	112.7	-0.1
4	*2422.00	100.3 AV			2.46 H	344	100.4	-0.1
5	4844.00	53.2 PK	74.0	-20.8	1.87 H	172	48.7	4.5
6	4844.00	42.8 AV	54.0	-11.2	1.87 H	172	38.3	4.5
7	7266.00	57.0 PK	74.0	-17.0	1.65 H	152	45.7	11.3
8	7266.00	45.7 AV	54.0	-8.3	1.65 H	152	34.4	11.3

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.

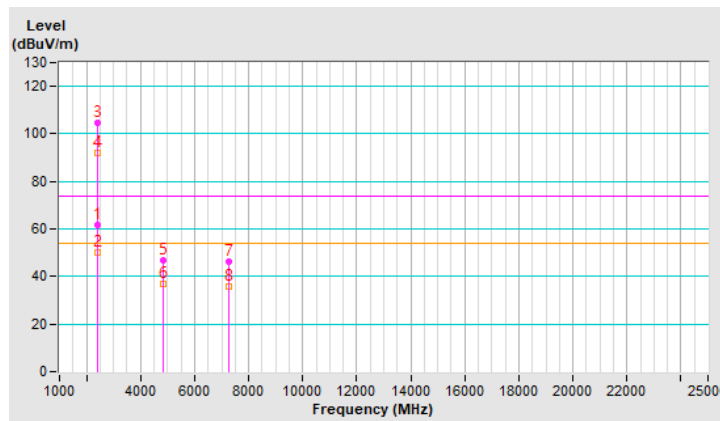


RF Mode	802.11ax (HE40)	Channel	CH 3 : 2422 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	61.8 PK	74.0	-12.2	1.27 V	146	61.9	-0.1
2	2389.00	50.1 AV	54.0	-3.9	1.27 V	146	50.2	-0.1
3	*2422.00	104.8 PK			1.27 V	146	104.9	-0.1
4	*2422.00	92.2 AV			1.27 V	146	92.3	-0.1
5	4844.00	47.0 PK	74.0	-27.0	1.54 V	252	42.5	4.5
6	4844.00	36.8 AV	54.0	-17.2	1.54 V	252	32.3	4.5
7	7266.00	46.3 PK	74.0	-27.7	1.10 V	111	35.0	11.3
8	7266.00	36.0 AV	54.0	-18.0	1.10 V	111	24.7	11.3

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.



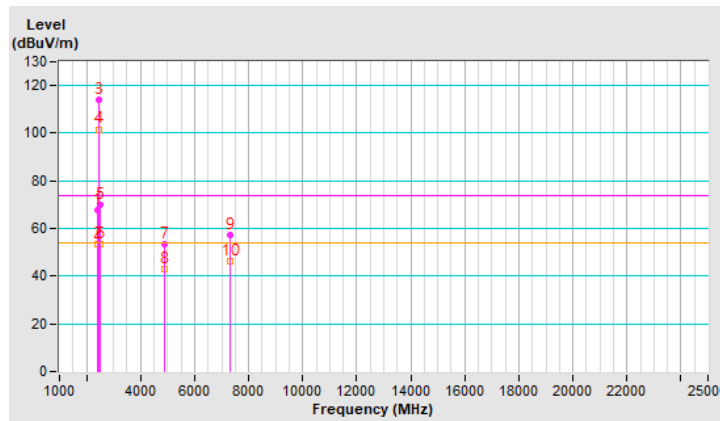
RF Mode	802.11ax (HE40)	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	67.9 PK	74.0	-6.1	2.99 H	341	68.0	-0.1
2	2390.00	53.4 AV	54.0	-0.6	2.99 H	341	53.5	-0.1
3	*2437.00	113.8 PK			2.99 H	341	113.9	-0.1
4	*2437.00	101.6 AV			2.99 H	341	101.7	-0.1
5	2483.50	69.7 PK	74.0	-4.3	2.99 H	341	69.9	-0.2
6	2483.50	53.5 AV	54.0	-0.5	2.99 H	341	53.7	-0.2
7	4874.00	53.3 PK	74.0	-20.7	1.82 H	152	48.7	4.6
8	4874.00	42.8 AV	54.0	-11.2	1.82 H	152	38.2	4.6
9	7311.00	57.4 PK	74.0	-16.6	1.66 H	131	45.8	11.6
10	7311.00	46.0 AV	54.0	-8.0	1.66 H	131	34.4	11.6

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.

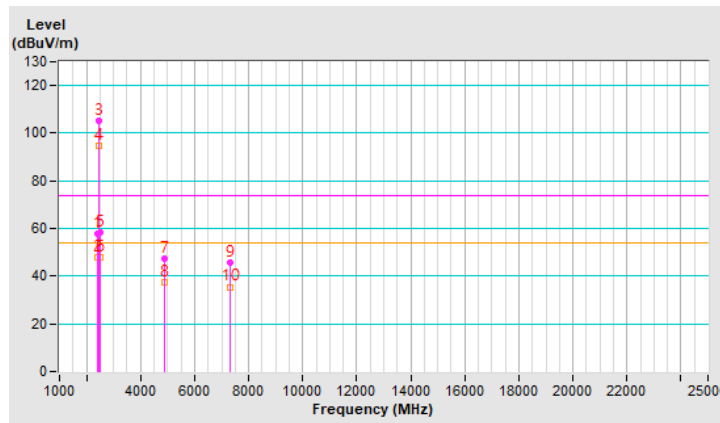


RF Mode	802.11ax (HE40)	Channel	CH 6 : 2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	57.9 PK	74.0	-16.1	3.57 V	314	58.0	-0.1
2	2390.00	47.8 AV	54.0	-6.2	3.57 V	314	47.9	-0.1
3	*2437.00	105.3 PK			3.57 V	314	105.4	-0.1
4	*2437.00	94.8 AV			3.57 V	314	94.9	-0.1
5	2483.50	58.3 PK	74.0	-15.7	3.57 V	314	58.5	-0.2
6	2483.50	48.0 AV	54.0	-6.0	3.57 V	314	48.2	-0.2
7	4874.00	47.3 PK	74.0	-26.7	1.61 V	242	42.7	4.6
8	4874.00	37.2 AV	54.0	-16.8	1.61 V	242	32.6	4.6
9	7311.00	45.5 PK	74.0	-28.5	1.12 V	102	33.9	11.6
10	7311.00	35.5 AV	54.0	-18.5	1.12 V	102	23.9	11.6

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.

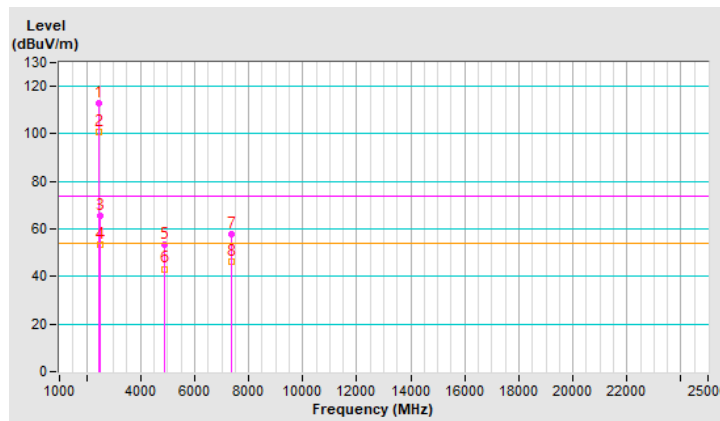


RF Mode	802.11ax (HE40)	Channel	CH 9 : 2452 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

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	113.0 PK			2.74 H	350	113.1	-0.1
2	*2452.00	100.9 AV			2.74 H	350	101.0	-0.1
3	2483.50	65.6 PK	74.0	-8.4	2.74 H	350	65.8	-0.2
4	2483.50	53.6 AV	54.0	-0.4	2.74 H	350	53.8	-0.2
5	4904.00	53.3 PK	74.0	-20.7	1.87 H	157	48.7	4.6
6	4904.00	43.2 AV	54.0	-10.8	1.87 H	157	38.6	4.6
7	7356.00	57.6 PK	74.0	-16.4	1.60 H	134	45.8	11.8
8	7356.00	46.0 AV	54.0	-8.0	1.60 H	134	34.2	11.8

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.

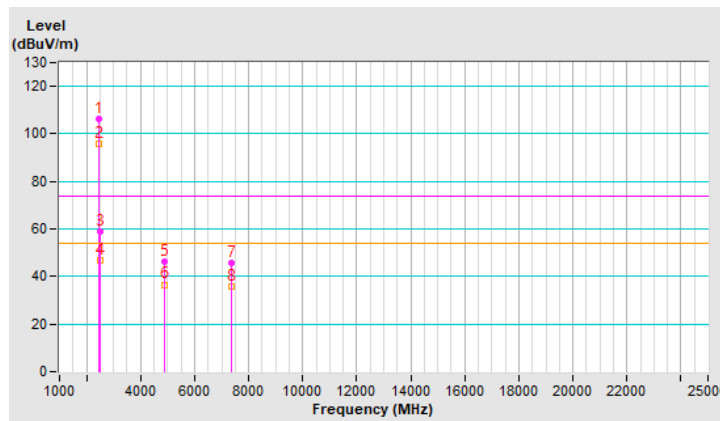


RF Mode	802.11ax (HE40)	Channel	CH 9 : 2452 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 71% RH
Tested By	Tom Yang		

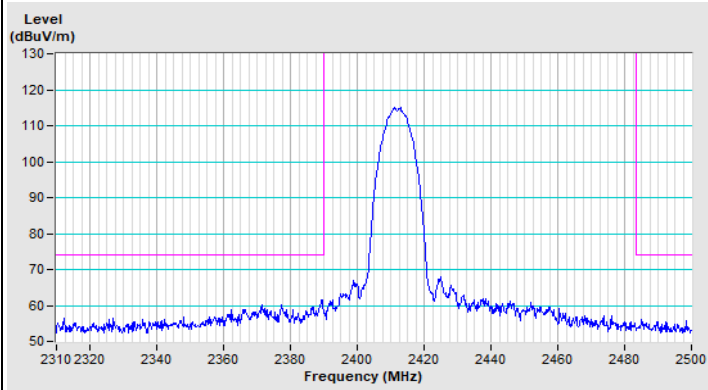
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	106.4 PK			3.31 V	51	106.5	-0.1
2	*2452.00	95.6 AV			3.31 V	51	95.7	-0.1
3	2483.50	58.8 PK	74.0	-15.2	3.31 V	51	59.0	-0.2
4	2483.50	46.6 AV	54.0	-7.4	3.31 V	51	46.8	-0.2
5	4904.00	46.5 PK	74.0	-27.5	1.58 V	239	41.9	4.6
6	4904.00	36.6 AV	54.0	-17.4	1.58 V	239	32.0	4.6
7	7356.00	45.8 PK	74.0	-28.2	1.17 V	117	34.0	11.8
8	7356.00	35.6 AV	54.0	-18.4	1.17 V	117	23.8	11.8

Remarks:

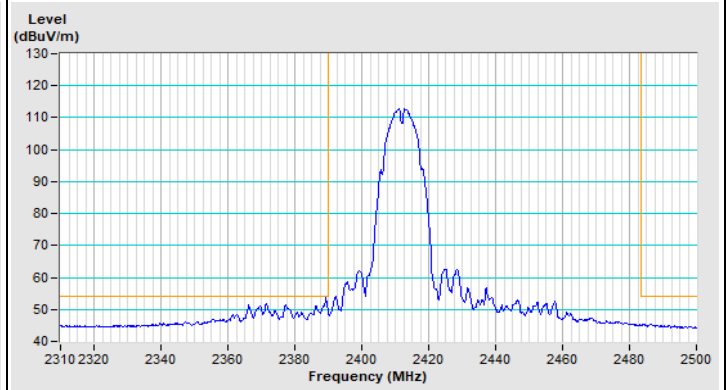
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency,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



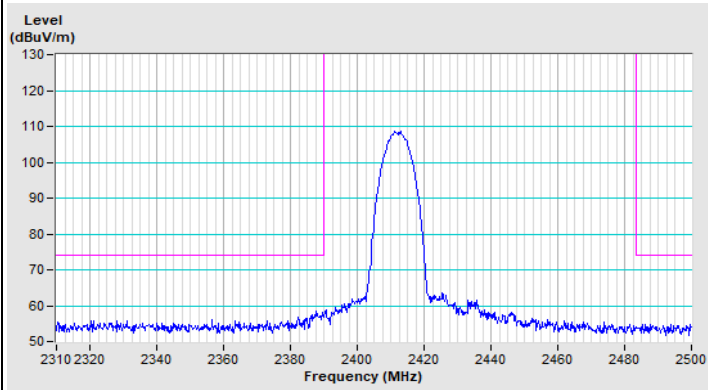
802.11b Channel 1



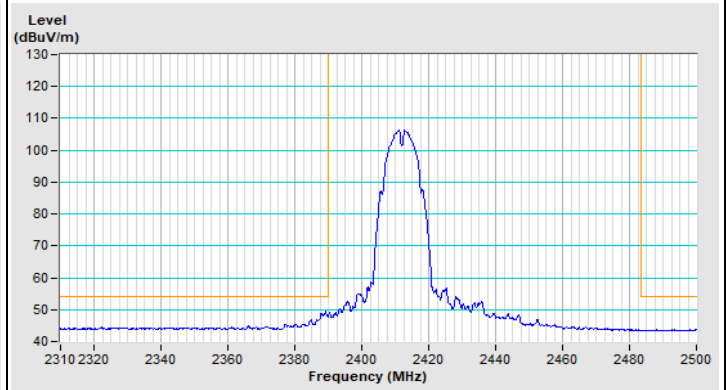
Horizontal (Peak)



Horizontal (Average)

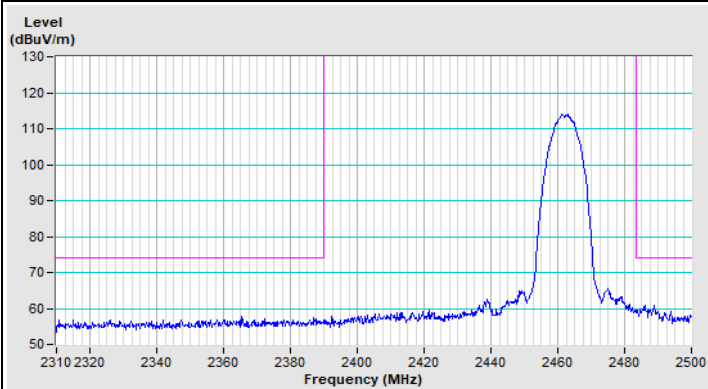


Vertical (Peak)

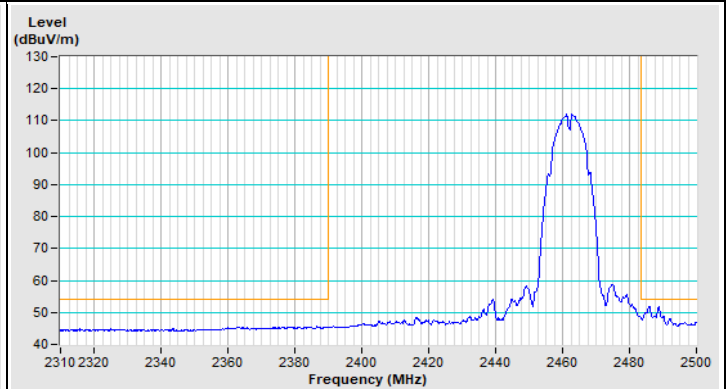


Vertical (Average)

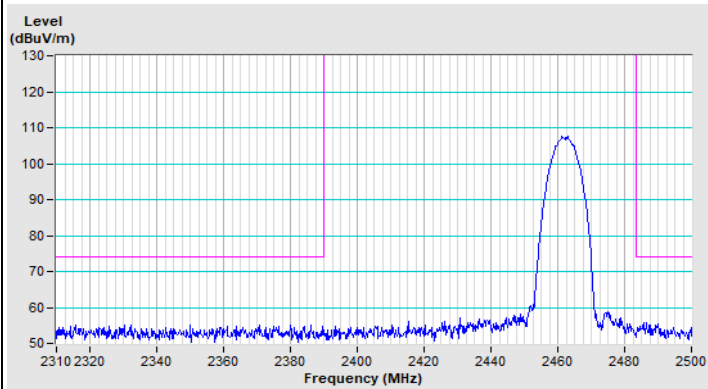
802.11b Channel 11



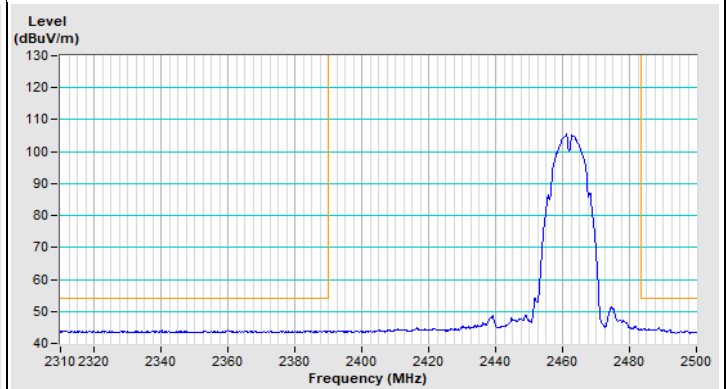
Horizontal (Peak)



Horizontal (Average)

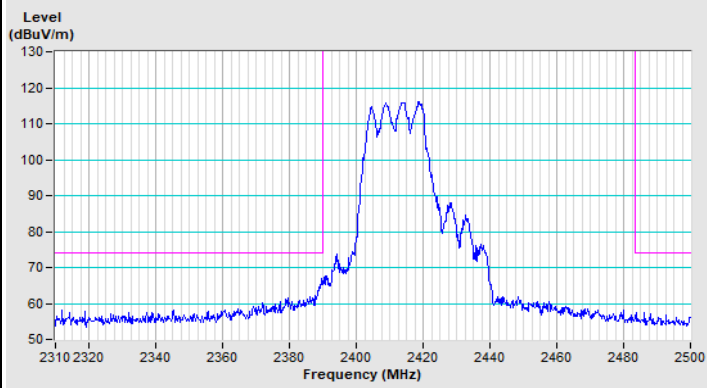


Vertical (Peak)

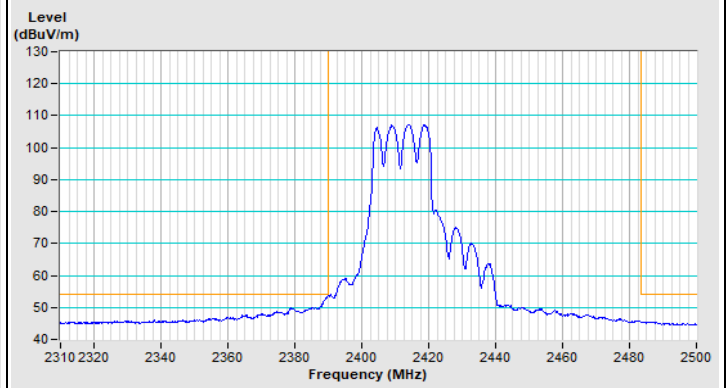


Vertical (Average)

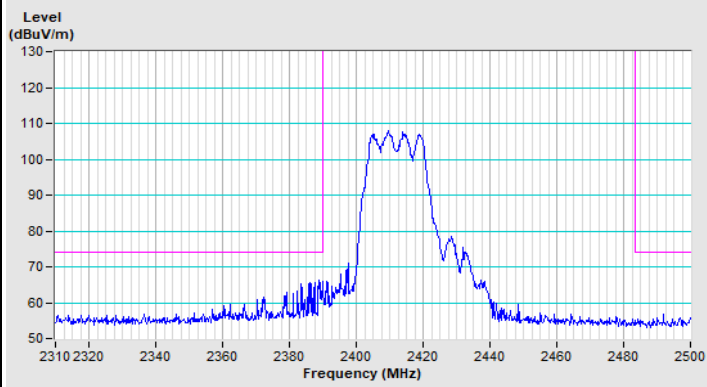
802.11g Channel 1



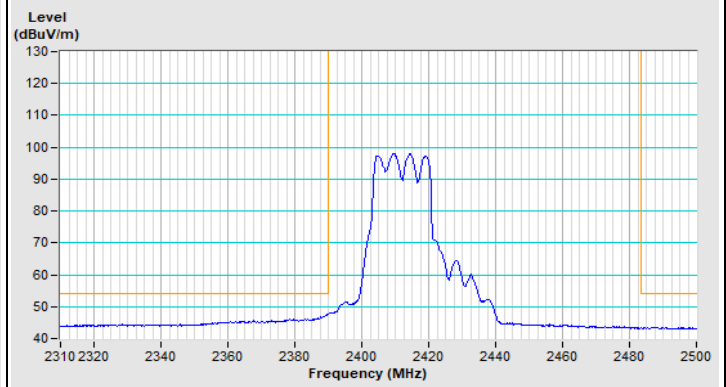
Horizontal (Peak)



Horizontal (Average)

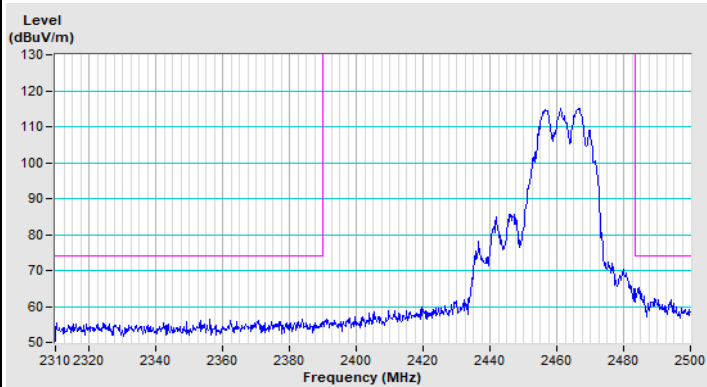


Vertical (Peak)

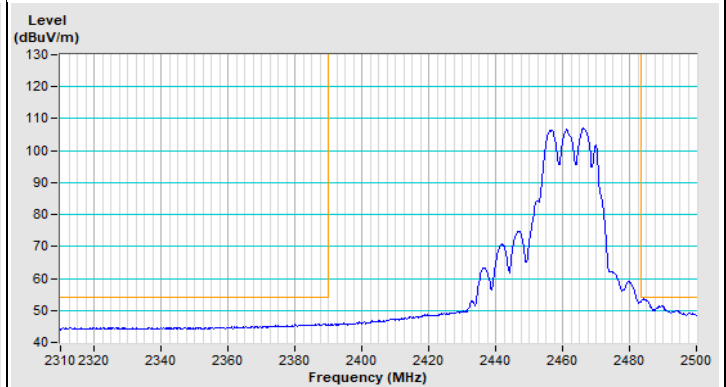


Vertical (Average)

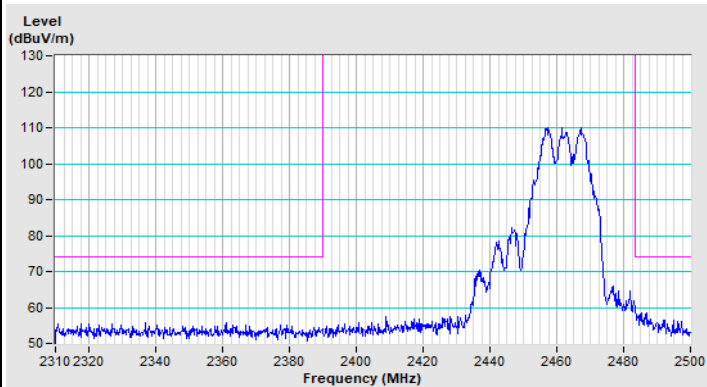
802.11g Channel 11



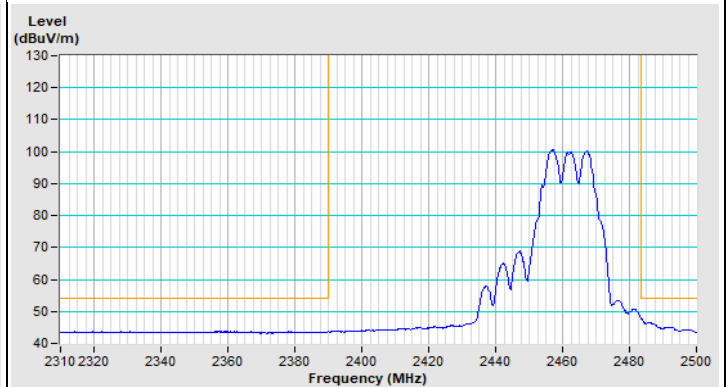
Horizontal (Peak)



Horizontal (Average)

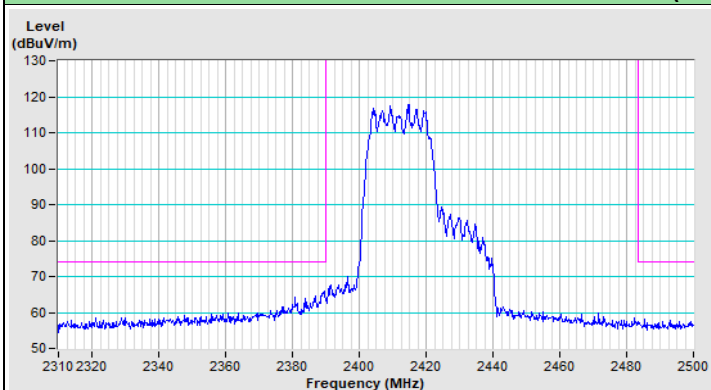


Vertical (Peak)

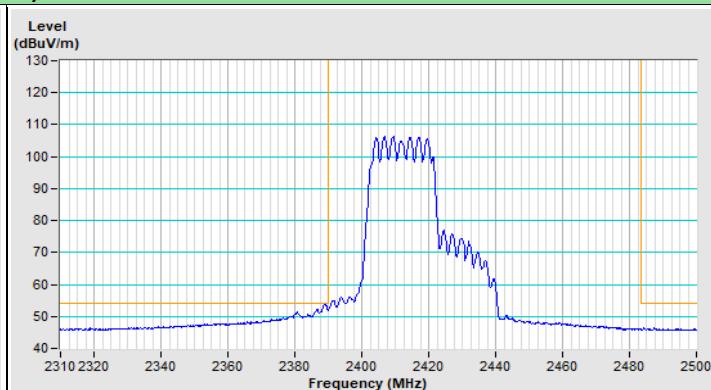


Vertical (Average)

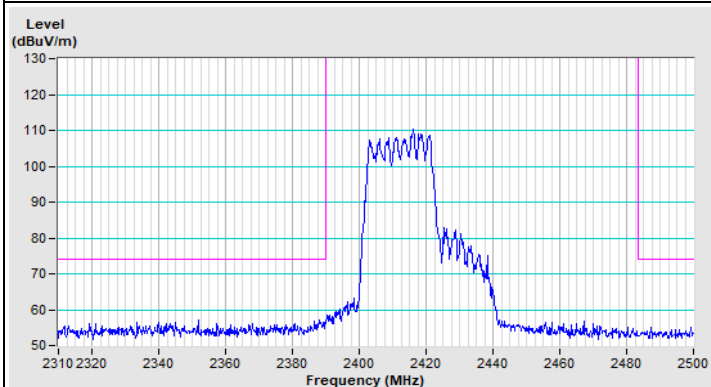
802.11ax (HE20) Channel 1



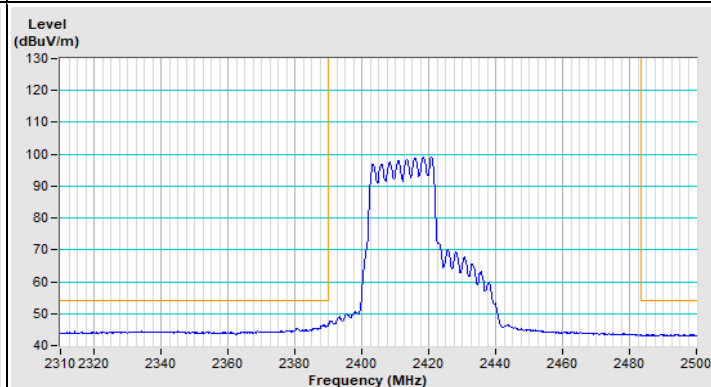
Horizontal (Peak)



Horizontal (Average)

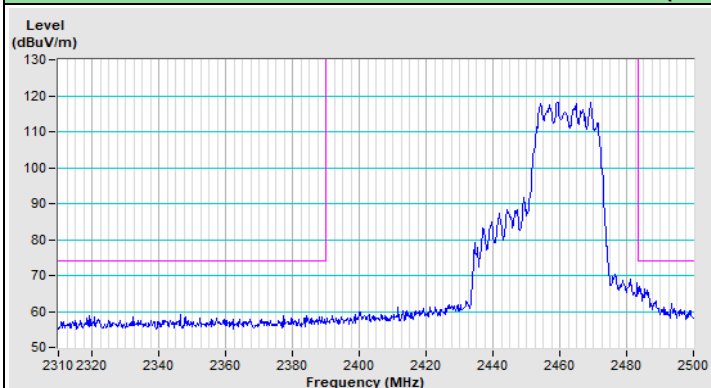


Vertical (Peak)

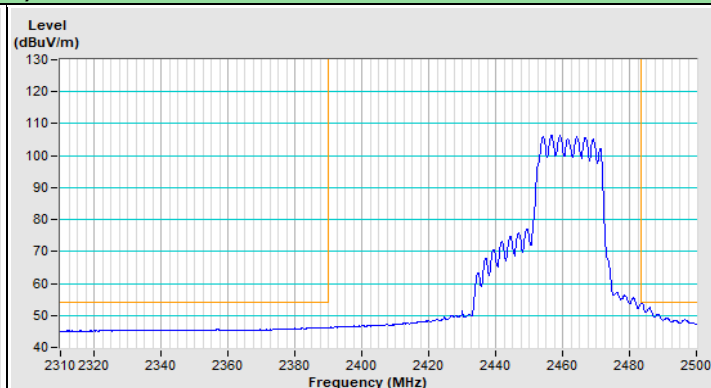


Vertical (Average)

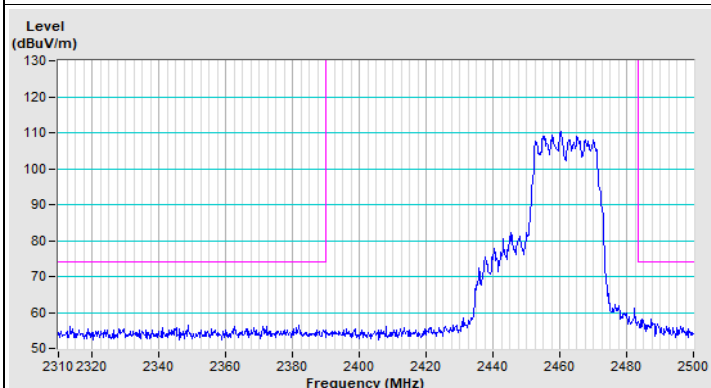
802.11ax (HE20) Channel 11



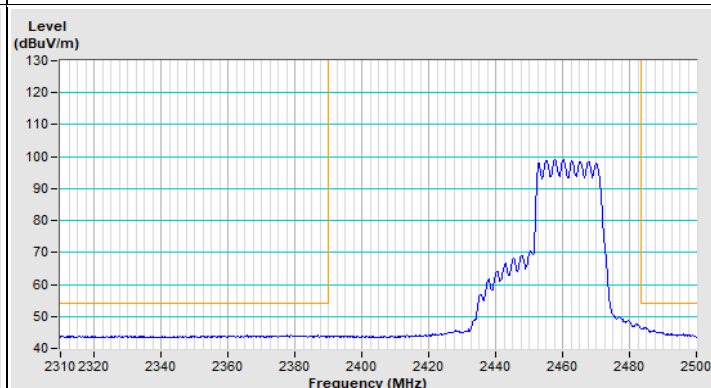
Horizontal (Peak)



Horizontal (Average)

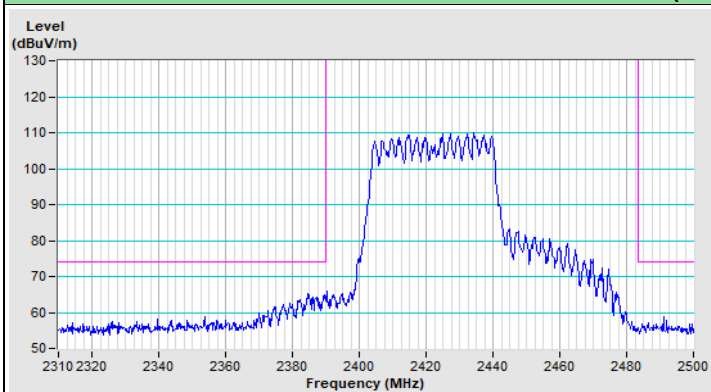


Vertical (Peak)

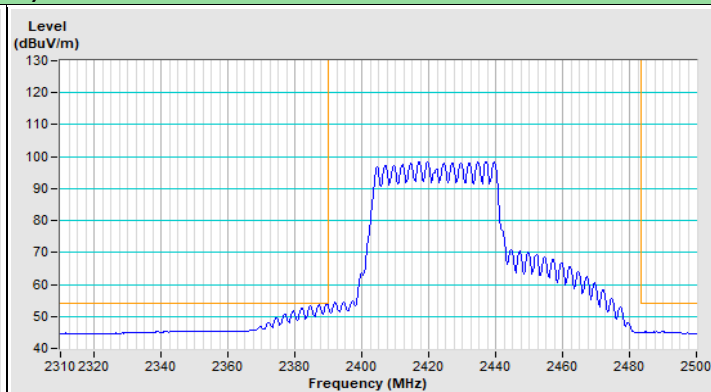


Vertical (Average)

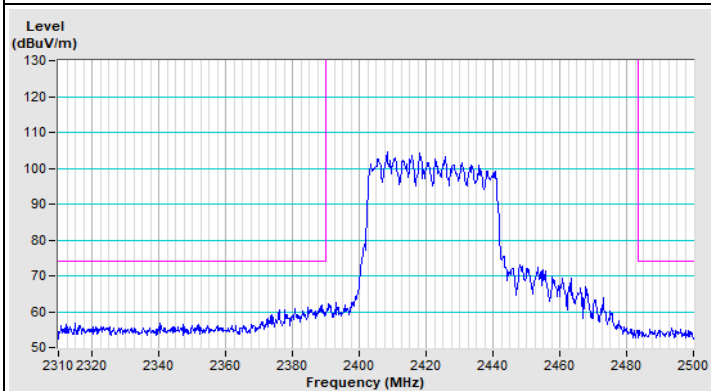
802.11ax (HE40) Channel 3



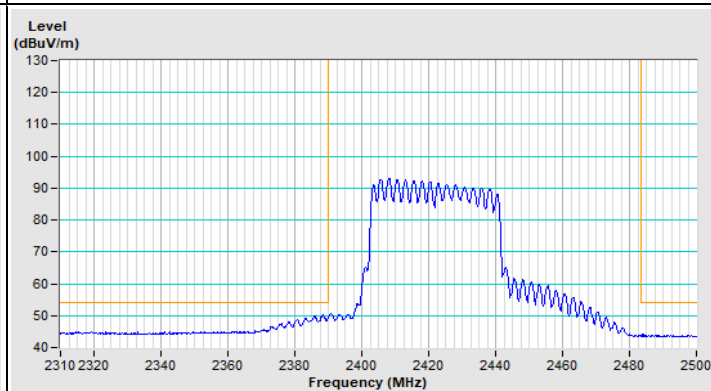
Horizontal (Peak)



Horizontal (Average)

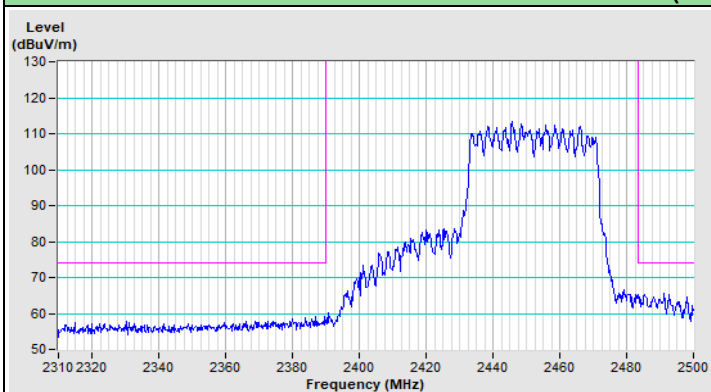


Vertical (Peak)

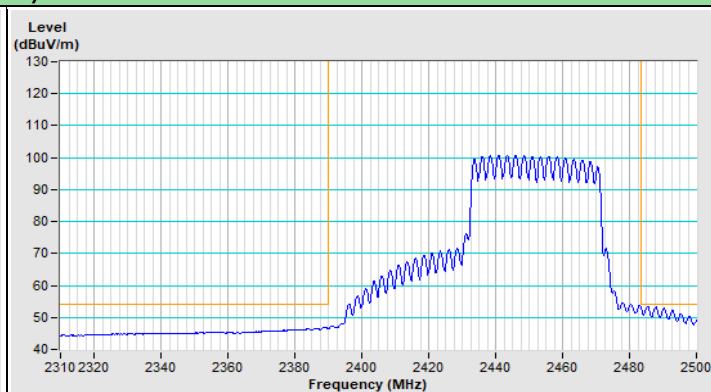


Vertical (Average)

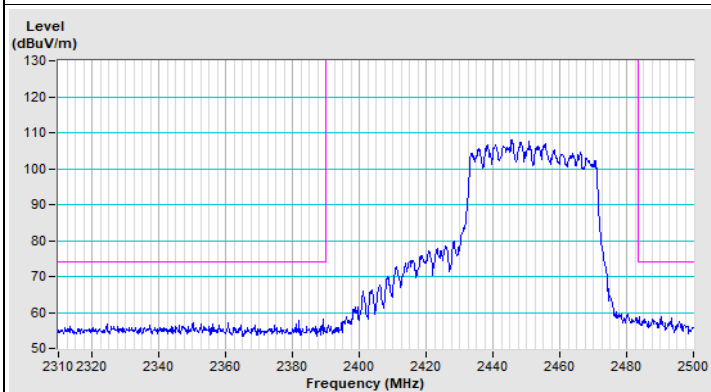
802.11ax (HE40) Channel 9



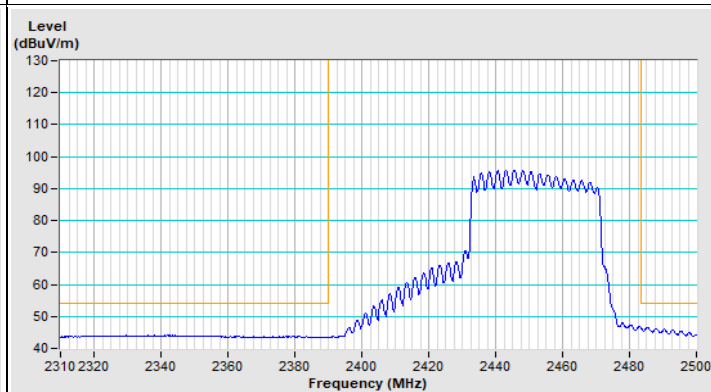
Horizontal (Peak)



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:

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Tel: 886-2-26052180

Fax: 886-2-26051924

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Email: service.adt@bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

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

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