TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: RFBHQC-WTW-P22080379

FCC ID: XCNUBN2309

Product: XGS-PON

Brand: altice

Model No.: UBN2309

Series Model: XSR250GK

Received Date: 2022/7/28

Test Date: 2022/11/28 ~ 2023/2/3

Issued Date: 2023/7/25

Applicant: Ubee Interactive Holding Corp. Taiwan Branch

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / Designation Number: 723255 / TW2022

Approved by: _____ , **Date:** 2023/7/25

May Chen / Manager

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Prepared by : Claire Kuan / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBHQC-WTW-P22080379	Original release.	2023/7/25

1 Certificate

Product:	XGS-PON
Brand:	altice
Test Model:	UBN2309
Series Model:	XSR250GK
Sample Status:	Mass product
Applicant:	Ubee Interactive Holding Corp. Taiwan Branch
Test Date:	2022/11/28 ~ 2023/2/3
Standard:	47 CFR FCC Part 15, Subpart C (Section 15.247)
Measurement procedure:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02 KDB 662911 D01 Multiple Transmitter Output v02r01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Standard / Clause	Test Item	Result	Remark
15.247(b)	RF Output Power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(d)	Conducted Out of Band Emissions	Pass	Meet the requirement of limit.
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -12.39 dB at 0.15000 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -3.2 dB at 650.00 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -0.1 dB at 2390.00 MHz
15.203	Antenna Requirement	Pass	Antenna connector is ipex(MHF) not a standard connector.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

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

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

2.2 Supplementary Information

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

3 General Information

3.1 General Description

Product	XGS-PON
Brand	altice
Test Model	UBN2309
Series Model	XSR250GK
Status of EUT	Mass product
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT mode 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 450 Mbps VHT: up to 600 Mbps 802.11ax: up to 860.3 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:** 587.347 mW (27.69 dBm) **Beamforming Mode:** 341.093 mW (25.33 dBm)

Note:

1. All models are listed as below.

Brand	Model	Difference
altice	UBN2309	All models are electrically identical, different model names are for marketing purpose.
	XSR250GK	

From the above models, model: UBN2309 was selected as representative model for the test and its data was recorded in this report.

2. The EUT has three radios as following table:

Radio 1	Radio 2	Radio 3
WLAN(2.4GHz)	WLAN(5GHz)	WLAN(6GHz)

3. Simultaneously transmission condition.

Condition	Technology		
1	WLAN(2.4GHz)	WLAN(5GHz)	WLAN(6GHz)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.			

4. The EUT uses following accessories.

Brand	Model	Specification
MOSO	MSS-V3500WR120-042A0-US	AC Input : 100-240Vac, 50/60Hz 1.2A DC Output : 12.0Vdc, 3.5A DC Output Cable : 1.8m non-shielded, without core.

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

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna NO.	RF Chain NO.	Brand	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
DB1	5G Chain 3	WHA YU	3.72	5.15~5.85GHz	Dipole	ipex(MHF)
DB2	2.4G Chain 0 5G Chain 0	WHA YU	3.32	2.4~2.4835GHz	Dipole	ipex(MHF)
		WHA YU	3.8	5.15~5.85GHz	Dipole	ipex(MHF)
DB3	2.4G Chain 1 5G Chain 1	WHA YU	2.93	2.4~2.4835GHz	Dipole	ipex(MHF)
		WHA YU	3.79	5.15~5.85GHz	Dipole	ipex(MHF)
DB4	2.4G Chain 2 5G Chain 2	WHA YU	3.40	2.4~2.4835GHz	Dipole	ipex(MHF)
		WHA YU	3.79	5.15~5.85GHz	Dipole	ipex(MHF)
6G5	6G Chain 3	WHA YU	3.34	5.925GHz~7.125GHz	Dipole	ipex(MHF)
6G6	6G Chain 2	WHA YU	3.49	5.925GHz~7.125GHz	Dipole	ipex(MHF)
6G7	6G Chain 1	WHA YU	3.47	5.925GHz~7.125GHz	Dipole	ipex(MHF)
6G8	6G Chain 0	WHA YU	3.49	5.925GHz~7.125GHz	Dipole	ipex(MHF)

* 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	3TX	3RX
802.11g	3TX	3RX
802.11n (HT20)	3TX	3RX
802.11n (HT40)	3TX	3RX
VHT20	3TX	3RX
VHT40	3TX	3RX
802.11ax (HE20)	3TX	3RX
802.11ax (HE40)	3TX	3RX

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 20 MHz (40 MHz), VHT mode for 20 MHz (40 MHz) and 802.11ax mode for 20 MHz (40 MHz), therefore the manufacturer will control the power for 802.11n/VHT mode is the same as the 802.11ax 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

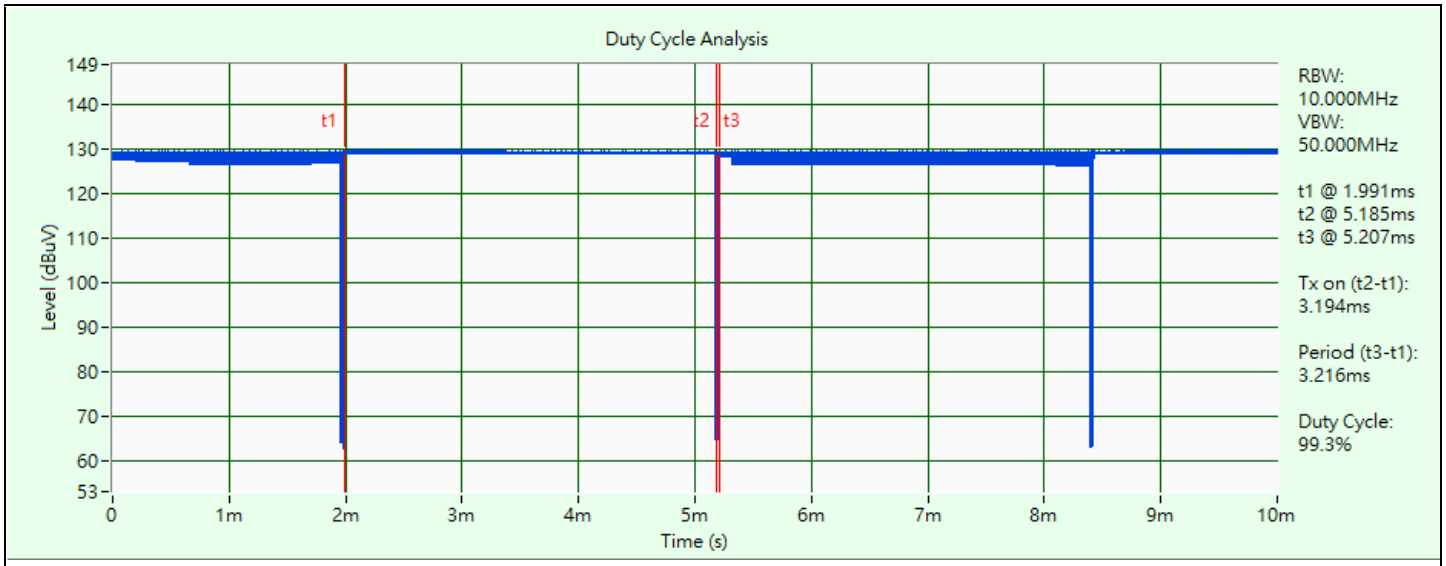
Pre-Scan:	1. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

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

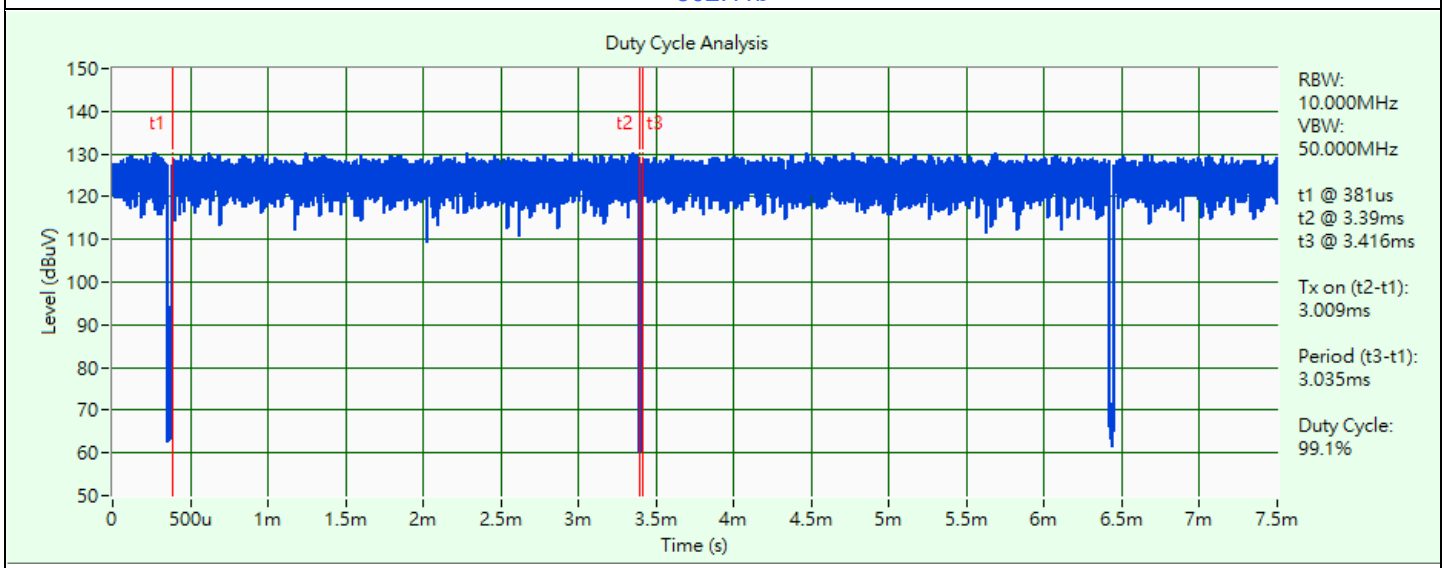
Test Item	Mode	Signal Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power	802.11b	CDD	1, 6, 11	DBPSK	1Mb/s
	802.11g	CDD	1, 6, 11	BPSK	6Mb/s
	VHT20	CDD & Beamforming	1, 6, 11	BPSK	MCS0
	VHT40	CDD & Beamforming	3, 6, 9	BPSK	MCS0
	802.11ax (HE20)	CDD & Beamforming	1, 6, 11	BPSK	MCS0
	802.11ax (HE40)	CDD & Beamforming	3, 6, 9	BPSK	MCS0
Power Spectral Density	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
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	802.11b	CDD	6	BPSK	1Mb/s
Unwanted Emissions below 1 GHz	802.11b	CDD	6	BPSK	1Mb/s
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

3.5 Duty Cycle of Test Signal

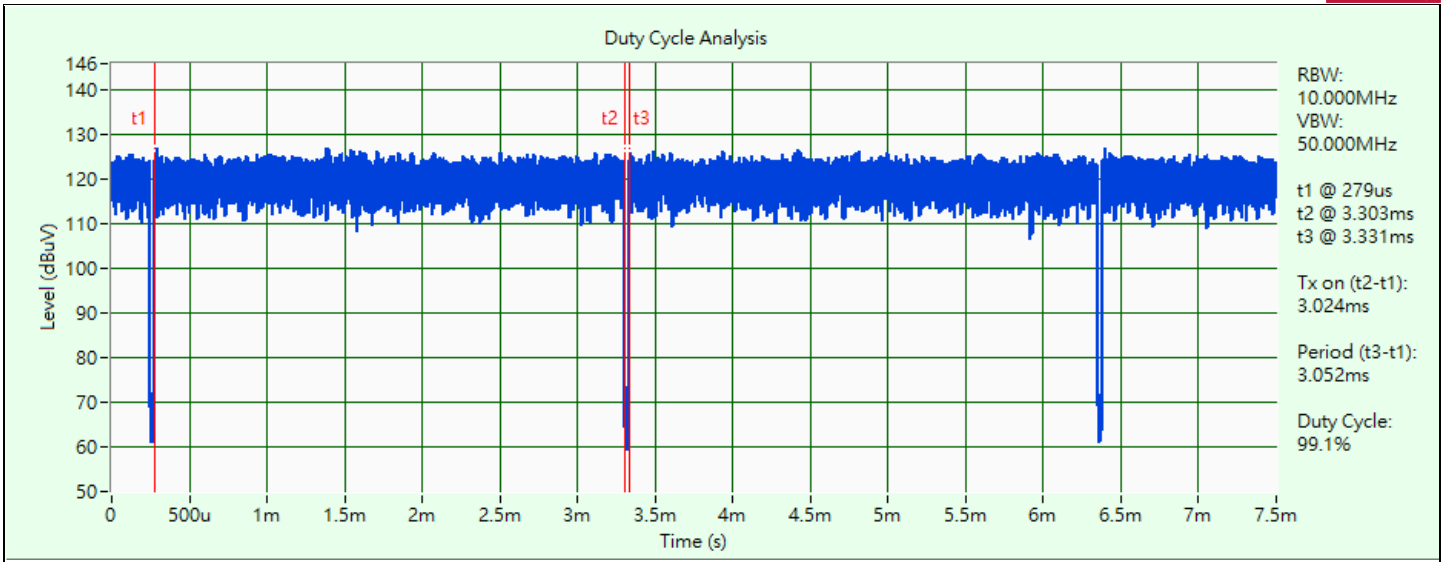
802.11b: Duty cycle = 3.194 ms / 3.216 ms x 100% = 99.3%
802.11g: Duty cycle = 3.009 ms / 3.035 ms x 100% = 99.1%
802.11ax (HE20): Duty cycle = 3.024 ms / 3.052 ms x 100% = 99.1%
802.11ax (HE40): Duty cycle = 3.011 ms / 3.038 ms x 100% = 99.1%



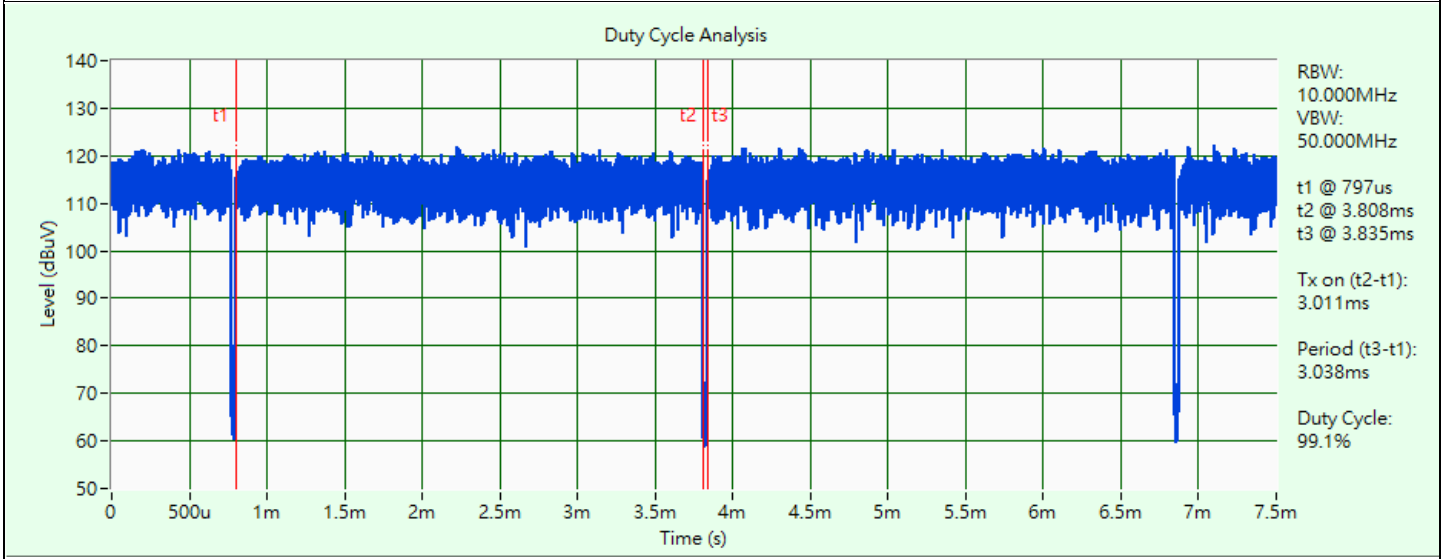
802.11b



802.11g



802.11ax (HE20)

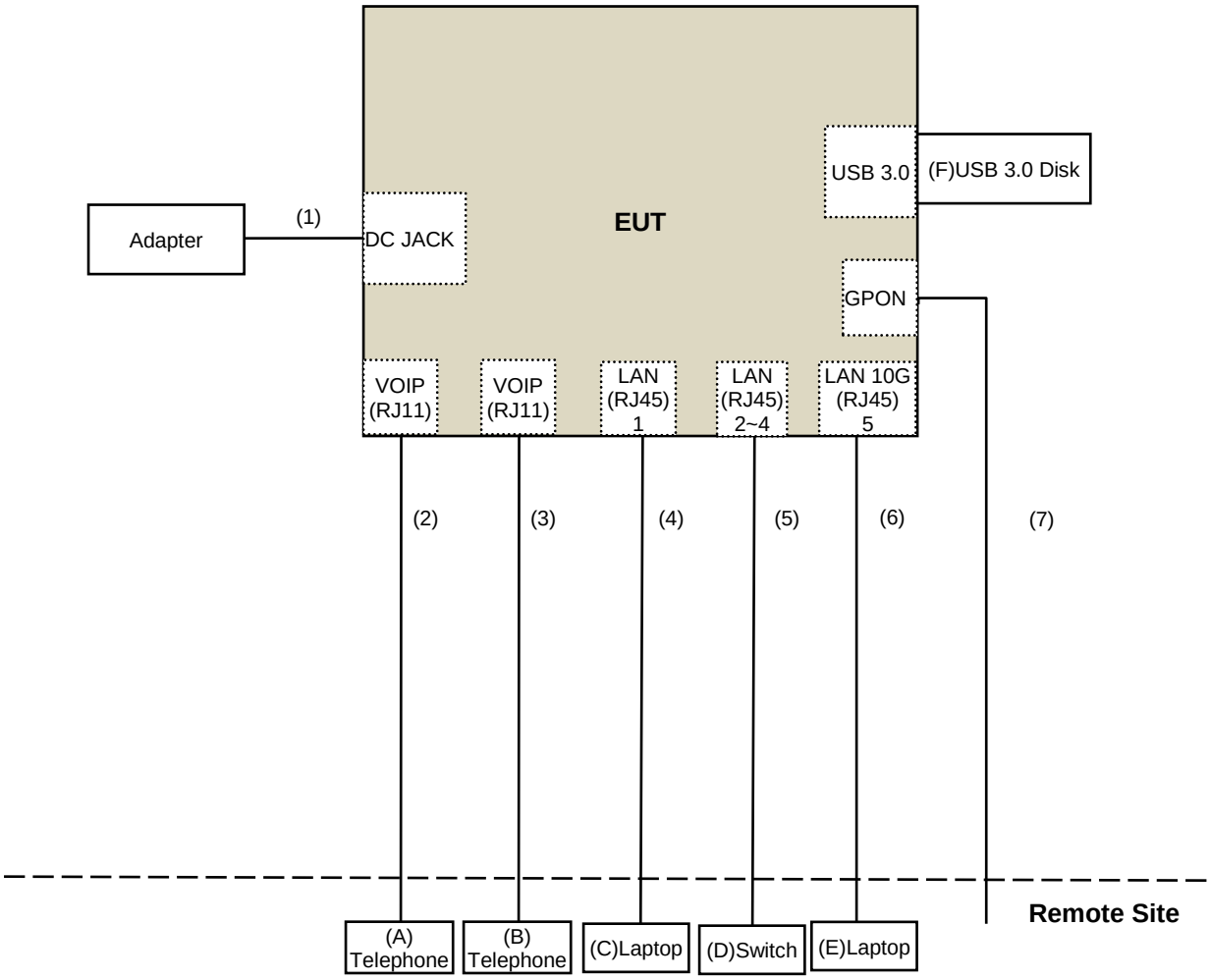


802.11ax (HE40)

3.6 Test Program Used and Operation Descriptions

Controlling software (accessMTool_REL_3_3_0_0) 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	TELEPHONE	Romeo	TE-812	97280903	N/A	Provided by Lab
C	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	N/A	Provided by Lab
D	Switch	D-Link	DGS-1005D	DR8WC92000523	N/A	Provided by Lab
E	Laptop	Lenovo	20U5S01X00 L14	PF-28LKK7	N/A	Provided by Lab
F	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-11 Cable	1	10	No	0	Provided by Lab
4	RJ-45 Cable	1	10	No	0	Provided by Lab
5	RJ-45 Cable	3	10	No	0	Provided by Lab
6	RJ-45 Cable	1	10	No	0	Provided by Lab
7	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
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: 2023/2/3

4.2 Power Spectral Density

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

Notes:

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

4.3 6 dB Bandwidth

Refer to section 4.2 to get information of the instruments.

4.4 Conducted Out of Band Emissions

Refer to section 4.2 to get information of the instruments.

4.5 AC Power Conducted Emissions

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

Notes:

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

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bilog Antenna Schwarzbeck	VULB 9168	9168-0942	2022/10/20	2023/10/19
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-01	2022/12/28	2023/12/27
LOOP ANTENNA Electro-Metrics	EM-6879	264	2022/3/18	2023/3/17
Pre_Amplifier EMCI	EMC001340	980142	2022/6/2	2023/6/1
Pre_Amplifier(20M-3G) EMCI	EMC330N	980852	2022/3/28	2023/3/27
RF Coaxial Cable COMMATE/PEWC	8D	966-6-1	2022/4/25	2023/4/24
		966-6-2	2022/4/25	2023/4/24
		966-6-3	2022/4/25	2023/4/24
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2022/12/19	2023/12/18
		LOOPCAB-002	2022/12/19	2023/12/18
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Spectrum Analyzer Keysight	N9020B	MY60112410	2022/3/13	2023/3/12
Test Receiver KEYSIGHT	N9038A	MY59050100	2022/6/20	2023/6/19

Notes:

1. The test was performed in 966 Chamber No. 6.
2. Tested Date: 2023/2/3

4.7 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-2035	2022/11/13	2023/11/12
	BBHA 9170	BBHA9170519	2022/11/13	2023/11/12
Pre_Amplifier EMCI	EMC12630SE	980385	2022/8/15	2023/8/14
	EMC184045SE	980387	2022/12/28	2023/12/27
RF Cable EMCI	EMC104-SM-SM-1300	210205	2022/5/10	2023/5/9
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2022/1/10 2022/12/28	2023/1/9 2023/12/27
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2022/3/8	2023/3/7
	EMC101G-KM-KM-10000	210708	2022/11/4	2023/11/3
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A
Spectrum Analyzer Keysight	N9020B	MY60112410	2022/3/13	2023/3/12
Test Receiver KEYSIGHT	N9038A	MY59050100	2022/6/20	2023/6/19

Notes:

1. The test was performed in 966 Chamber No. 6.
2. Tested Date: 2022/11/28 ~ 2023/1/19

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

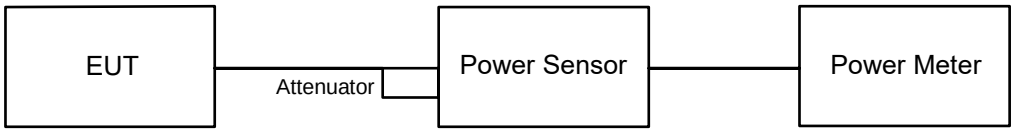
Notes:

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

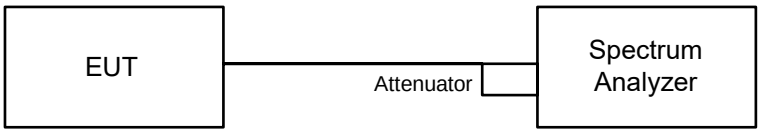


6.1.2 Test Procedure

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

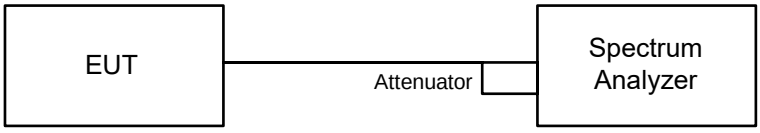


6.2.2 Test Procedure

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 ≥3 x RBW.
f. Detector = power averaging (RMS) or sample detector (when RMS not available).
g. Ensure that the number of measurement points in the sweep ≥ 2 x 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

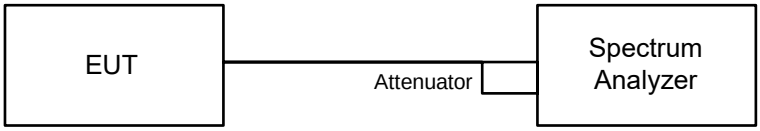


6.3.2 Test Procedure

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

6.4 Conducted Out of Band Emissions

6.4.1 Test Setup



6.4.2 Test Procedure

MEASUREMENT PROCEDURE REF

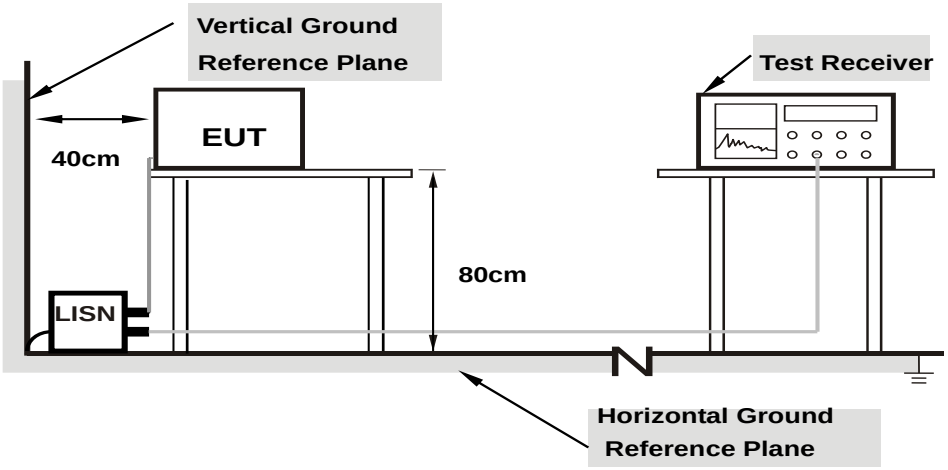
a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

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

6.5 AC Power Conducted Emissions

6.5.1 Test Setup



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

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

6.5.2 Test Procedure

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

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

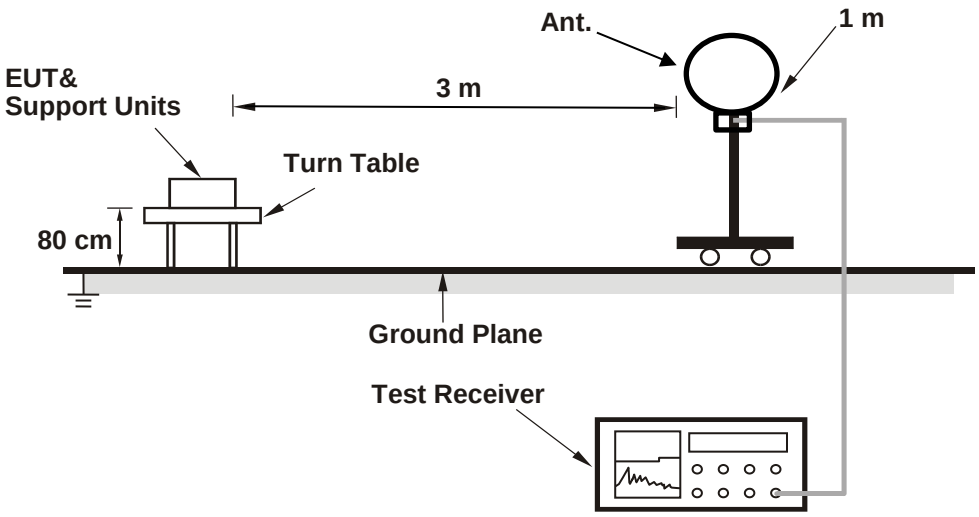
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

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

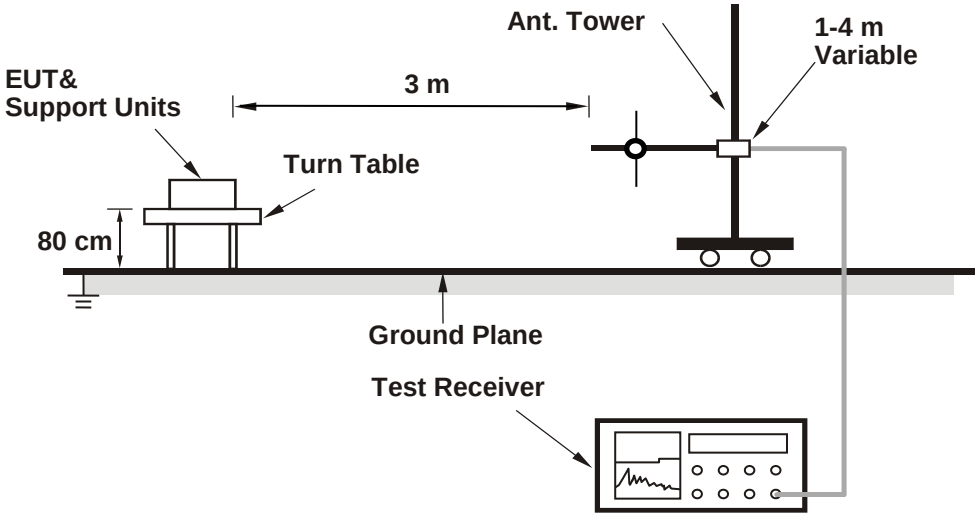
6.6 Unwanted Emissions below 1 GHz

6.6.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



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

6.6.2 Test Procedure

For Radiated emission below 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

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

For Radiated emission above 30 MHz

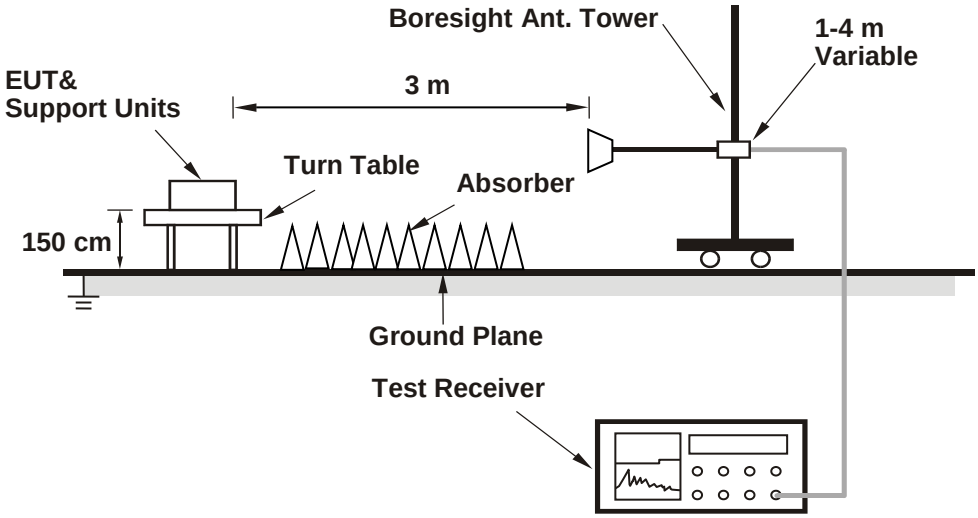
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Notes:

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

6.7 Unwanted Emissions above 1 GHz

6.7.1 Test Setup



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

6.7.2 Test Procedure

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Notes:

1. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
2. For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10 Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1 GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

7 Test Results of Test Item

7.1 RF Output Power

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 65% RH	Tested By:	Katina Lu

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	Chain 2				
1	2412	19.15	19.36	19.28	253.245	24.04	30	Pass
6	2437	22.98	22.78	22.99	587.347	27.69	30	Pass
11	2462	19.29	19.66	19.63	269.221	24.30	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.4 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	Chain 2				
1	2412	17.23	17.20	17.12	156.848	21.95	30	Pass
6	2437	21.06	20.98	21.00	378.851	25.78	30	Pass
11	2462	16.37	16.35	16.45	130.66	21.16	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.4 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	Chain 2				
1	2412	16.01	16.25	16.35	125.224	20.98	30	Pass
6	2437	20.45	20.56	20.66	341.093	25.33	30	Pass
11	2462	16.12	16.35	16.28	126.54	21.02	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.4 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	Chain 2				
3	2422	15.75	15.86	15.70	113.285	20.54	30	Pass
6	2437	17.25	17.35	17.20	159.894	22.04	30	Pass
9	2452	15.26	15.15	15.36	100.664	20.03	30	Pass

Notes:

1. Directional gain is the maximum gain of antennas.
2. The maximum gain is 3.4 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	Chain 2				
1	2412	16.01	16.25	16.35	125.224	20.98	28.01	Pass
6	2437	20.45	20.56	20.66	341.093	25.33	28.01	Pass
11	2462	16.12	16.35	16.28	126.54	21.02	28.01	Pass

Notes:

1. Directional gain = $10 \log[(10^{Chain0/20} + 10^{Chain1/20} + 10^{Chain2/20})^2 / 3]$
2. The directional gain is 7.99 dBi > 6 dBi, so the output power limit shall be reduced to 30-(8.1-6) = 27.9 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	Chain 2				
3	2422	15.75	15.86	15.70	113.285	20.54	28.01	Pass
6	2437	17.25	17.35	17.20	159.894	22.04	28.01	Pass
9	2452	15.26	15.15	15.36	100.664	20.03	28.01	Pass

Notes:

1. Directional gain = $10 \log[(10^{Chain0/20} + 10^{Chain1/20} + 10^{Chain2/20})^2 / 3]$
2. The directional gain is 7.99 dBi > 6 dBi, so the output power limit shall be reduced to 30-(8.1-6) = 27.9 dBm.

7.2 Power Spectral Density

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 65% RH	Tested By:	Katina Lu

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)			Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1	Chain 2			
1	2412	-13.07	-13.05	-13.57	-8.45	6.01	Pass
6	2437	-8.74	-10.02	-9.17	-4.51	6.01	Pass
11	2462	-12.51	-13.01	-13.64	-8.26	6.01	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[$(10^{Chain0/20} + 10^{Chain1/20} + 10^{Chain2/20})^2$ / 3]
3. The directional gain is 7.99 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.99-6) = 6.01 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	Chain 2			
1	2412	-16.15	-16.69	-16.05	-11.52	6.01	Pass
6	2437	-12.74	-13.40	-13.76	-8.51	6.01	Pass
11	2462	-16.71	-17.15	-16.84	-12.12	6.01	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[$(10^{Chain0/20} + 10^{Chain1/20} + 10^{Chain2/20})^2$ / 3]
3. The directional gain is 7.99 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.99-6) = 6.01 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	Chain 2			
1	2412	-17.99	-17.66	-17.99	-13.11	6.01	Pass
6	2437	-14.19	-14.74	-15.01	-9.86	6.01	Pass
11	2462	-17.28	-17.39	-17.64	-12.66	6.01	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[$(10^{Chain0/20} + 10^{Chain1/20} + 10^{Chain2/20})^2$ / 3]
3. The directional gain is 7.99 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.99-6) = 6.01 dBm/3kHz.

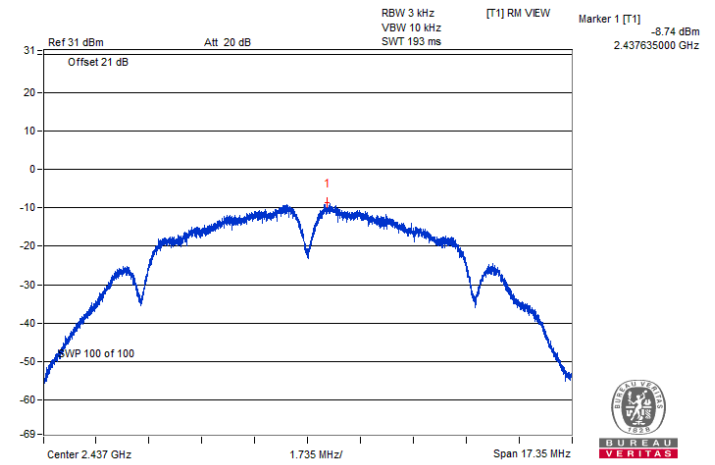
802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)			Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
		Chain 0	Chain 1	Chain 2			
3	2422	-21.36	-21.06	-22.30	-16.77	6.01	Pass
6	2437	-19.71	-18.73	-18.87	-14.31	6.01	Pass
9	2452	-20.76	-21.19	-22.64	-16.69	6.01	Pass

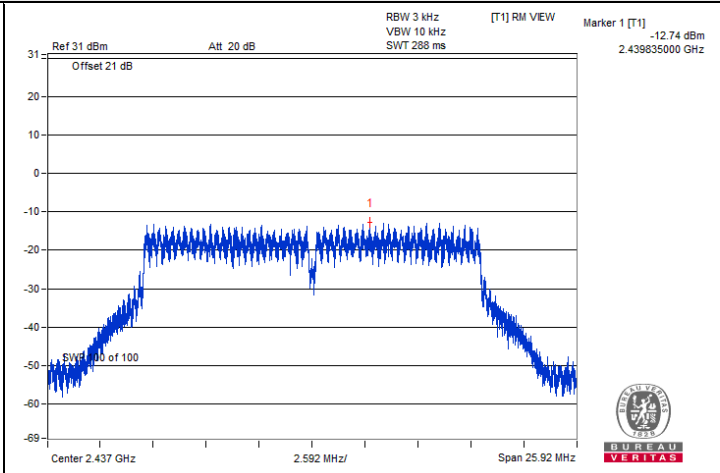
Notes:

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[$(10^{Chain0/20} + 10^{Chain1/20} + 10^{Chain2/20})^2$ / 3]
3. The directional gain is 7.99 dBi > 6 dBi, so the power density limit shall be reduced to 8-(7.99-6) = 6.01 dBm/3kHz.

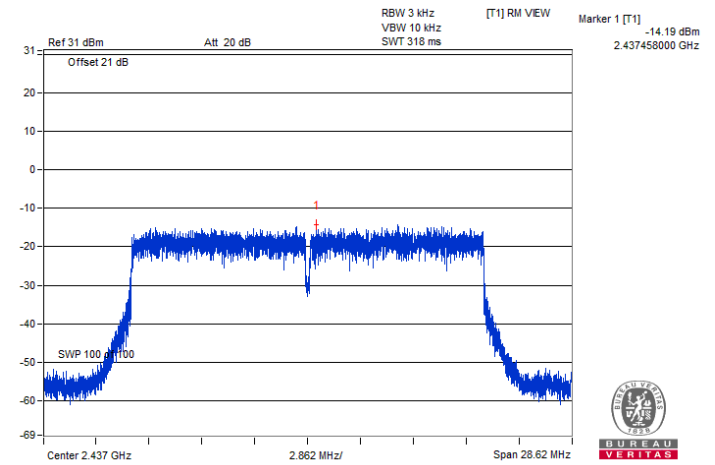
Spectrum Plot of Maximum Value



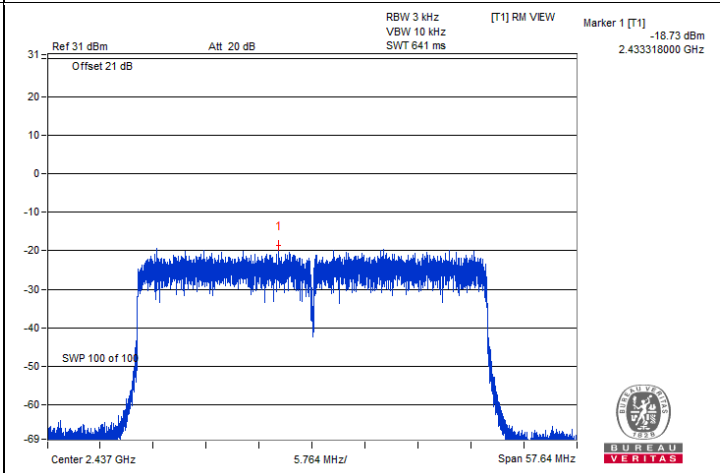
802.11b / Chain 0 : CH 6



802.11g / Chain 0 : CH 6



802.11ax (HE20) / Chain 0 : CH 6



802.11ax (HE40) / Chain 1 : CH 6

7.3 6 dB Bandwidth

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 65% RH	Tested By:	Katina Lu

802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)			Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2		
1	2412	6.62	7.11	7.10	0.5	Pass
6	2437	7.10	7.09	7.59	0.5	Pass
11	2462	7.09	7.11	7.09	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)			Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2		
1	2412	16.40	16.42	16.42	0.5	Pass
6	2437	16.41	16.43	16.38	0.5	Pass
11	2462	16.41	16.42	16.41	0.5	Pass

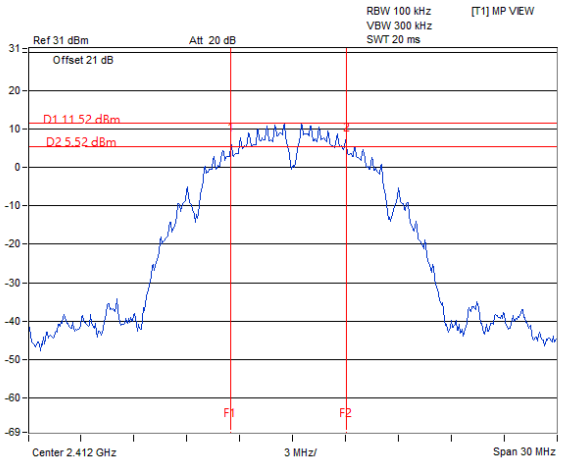
802.11ax (HE20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)			Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2		
1	2412	19.03	19.08	18.96	0.5	Pass
6	2437	19.06	19.07	18.98	0.5	Pass
11	2462	19.01	19.06	19.00	0.5	Pass

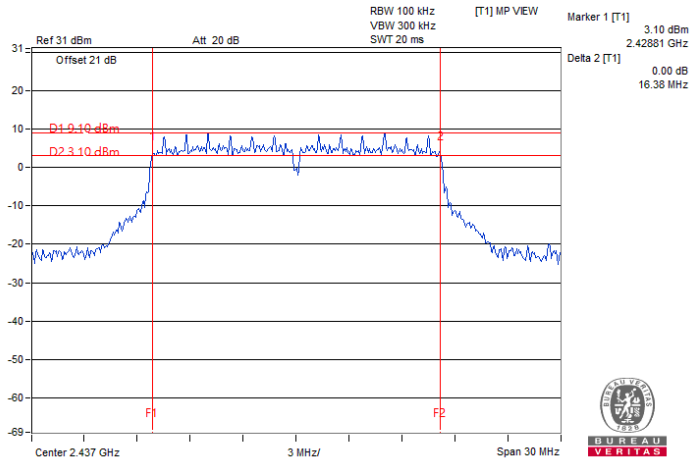
802.11ax (HE40)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)			Minimum Limit (MHz)	Test Result
		Chain 0	Chain 1	Chain 2		
3	2422	37.53	37.59	37.52	0.5	Pass
6	2437	37.51	37.35	36.91	0.5	Pass
9	2452	37.74	37.48	37.52	0.5	Pass

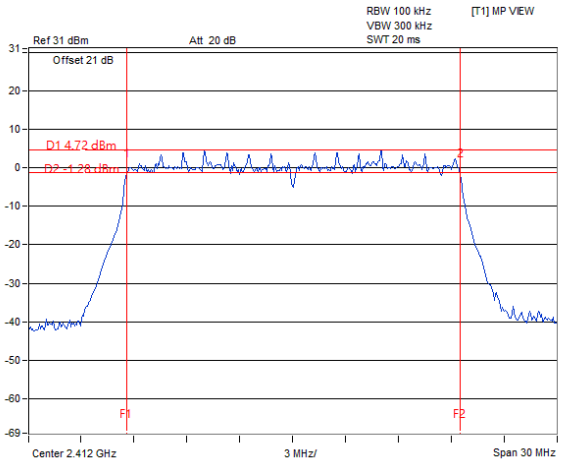
Spectrum Plot of Minimum Value



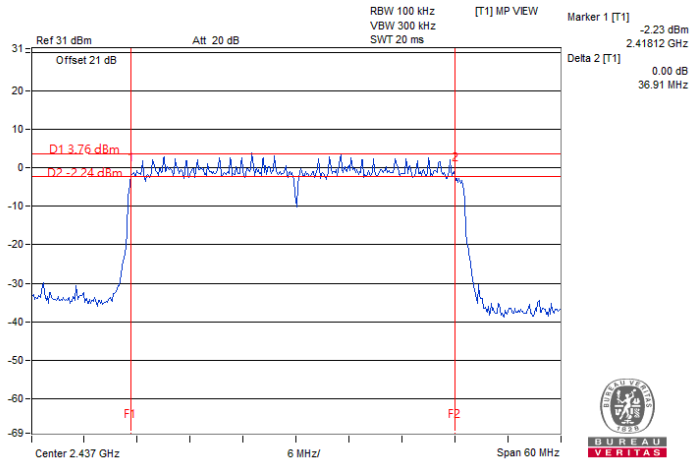
802.11b / Chain 0 : CH 1



802.11g / Chain 2 : CH 6



802.11ax (HE20) / Chain 2 : CH 1

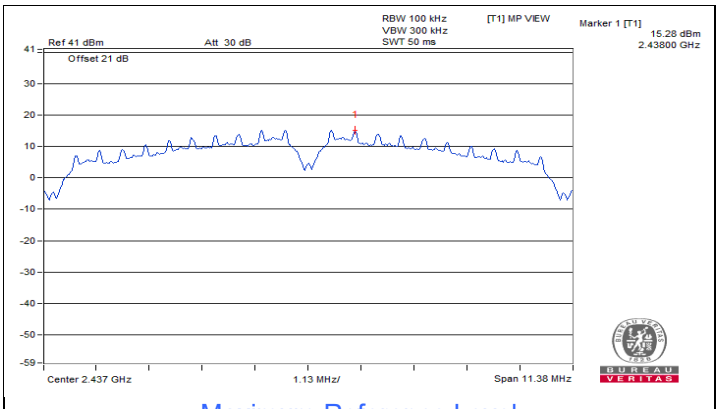


802.11ax (HE40) / Chain 2 : CH 6

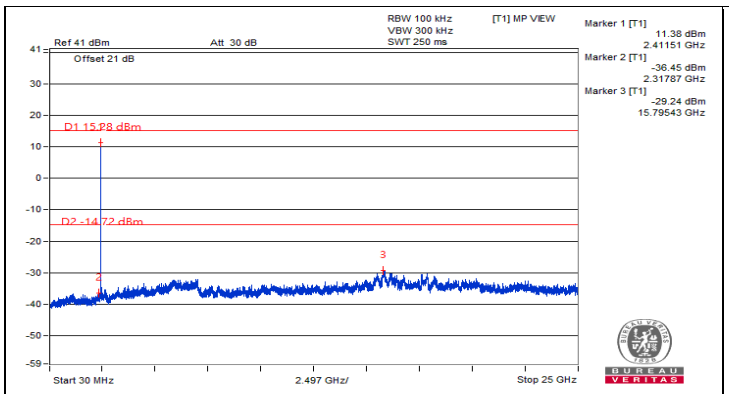
7.4 Conducted Out of Band Emissions

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 65% RH	Tested By:	Katina Lu

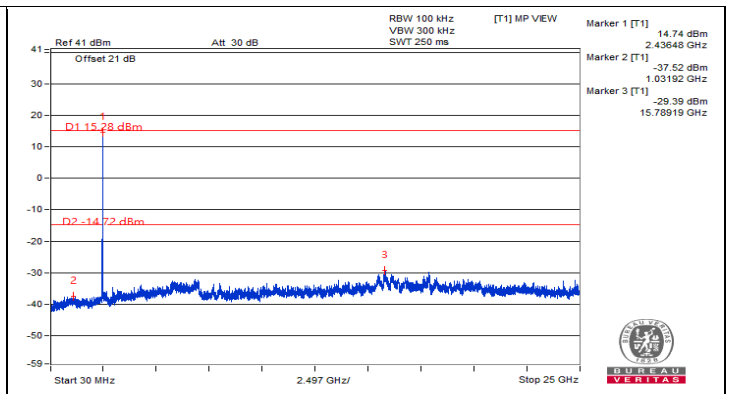
802.11b



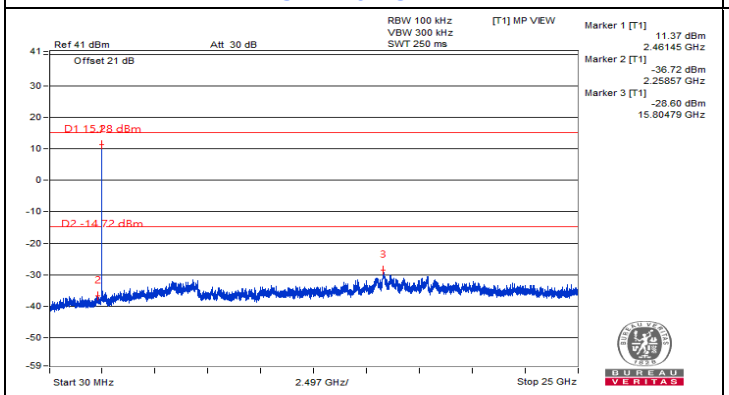
Maximum Reference Level



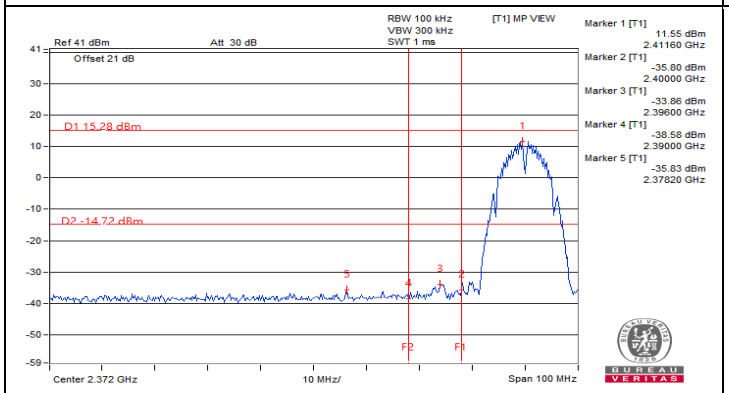
Chain 0 : CH 1



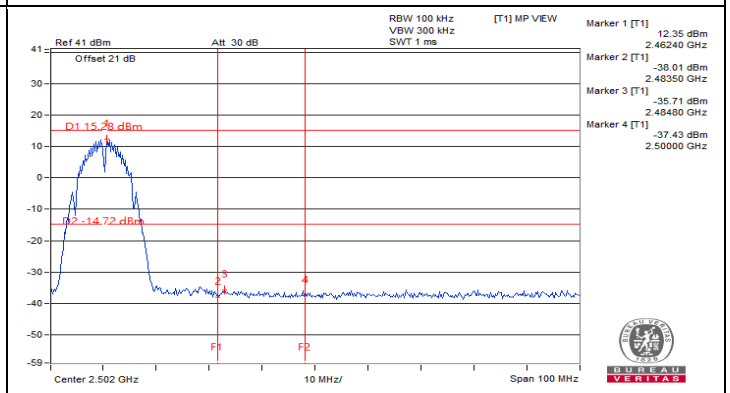
Chain 0 : CH 6



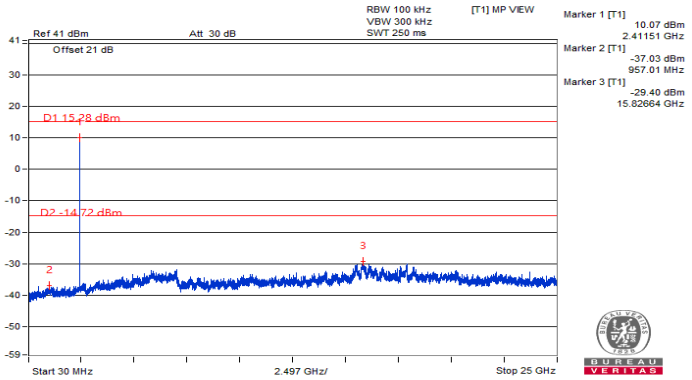
Chain 0 : CH 11



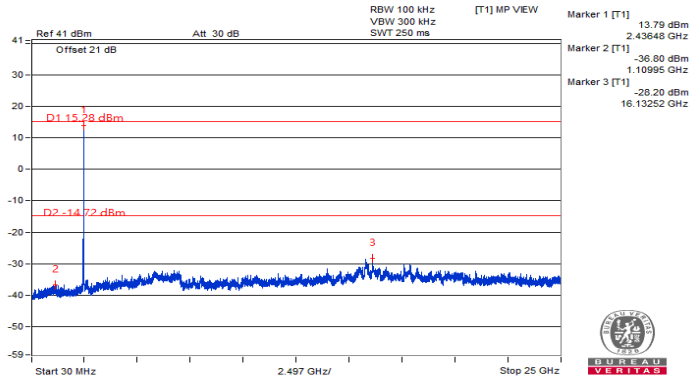
Chain 0 : CH 1 Band edge



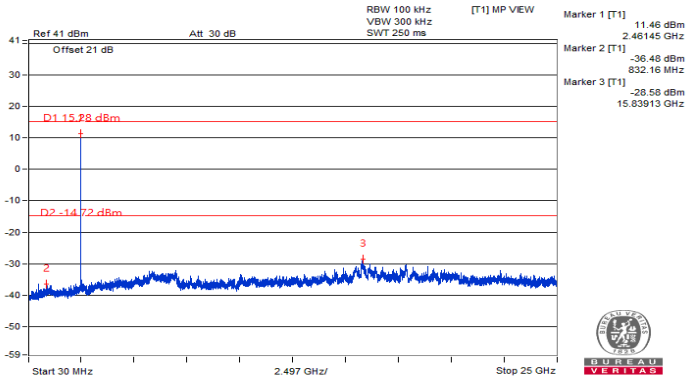
Chain 0 : CH 11 Band edge



Chain 1 : CH 1



Chain 1 : CH 6



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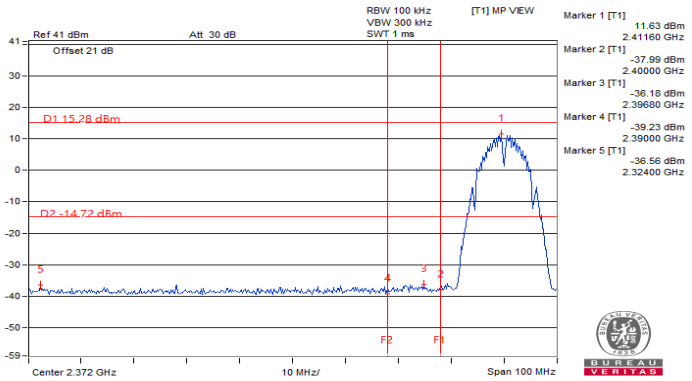

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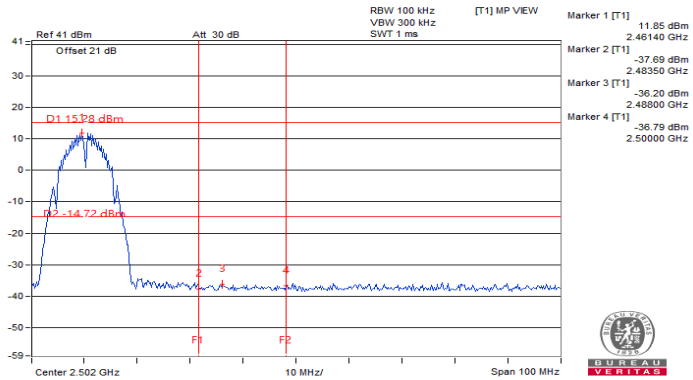
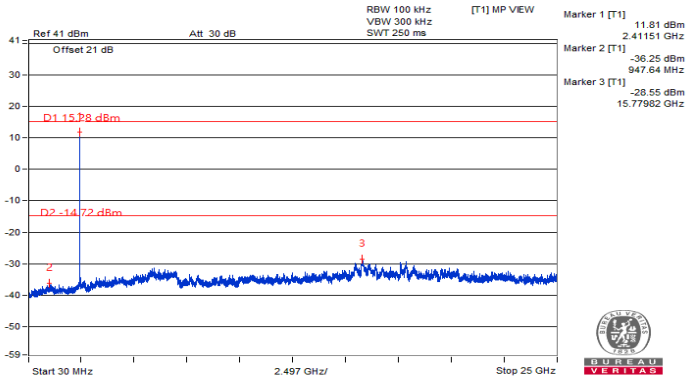
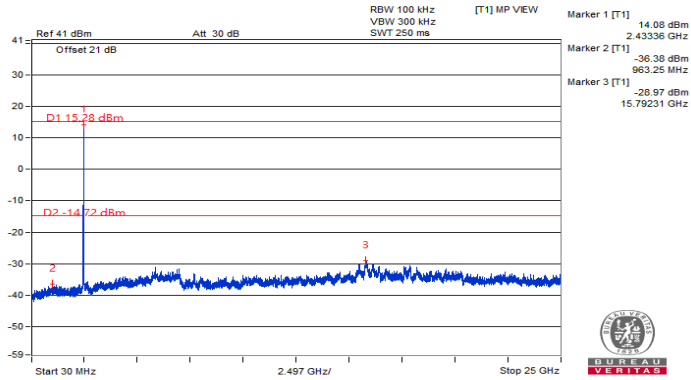


Chain 1 : CH 11 Band edge



Chain 2 : CH 1



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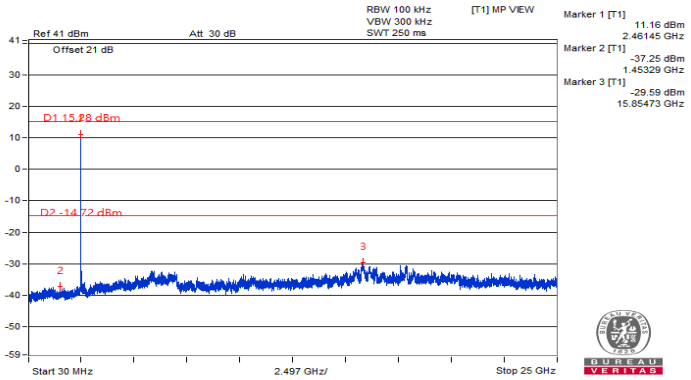

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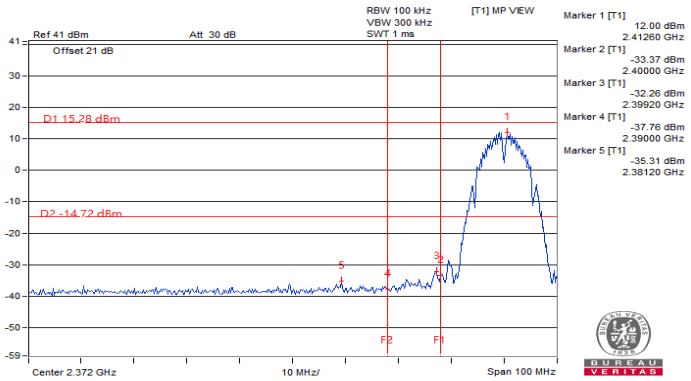
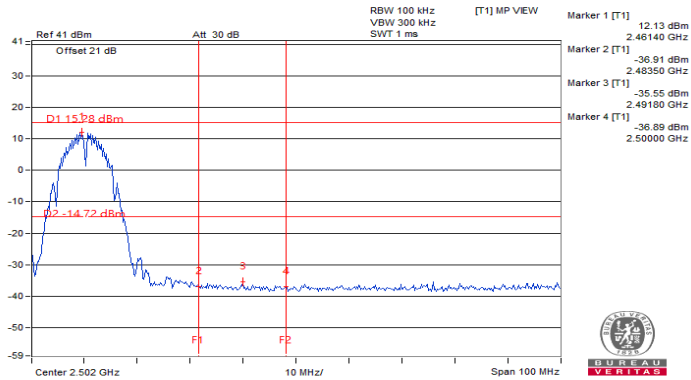
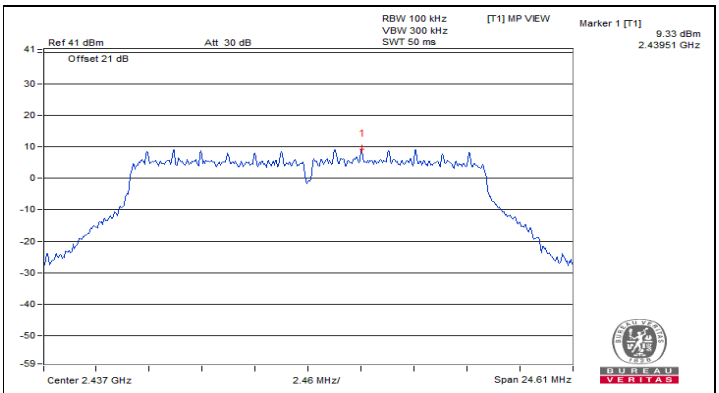


Chain 2 : CH 1 Band edge

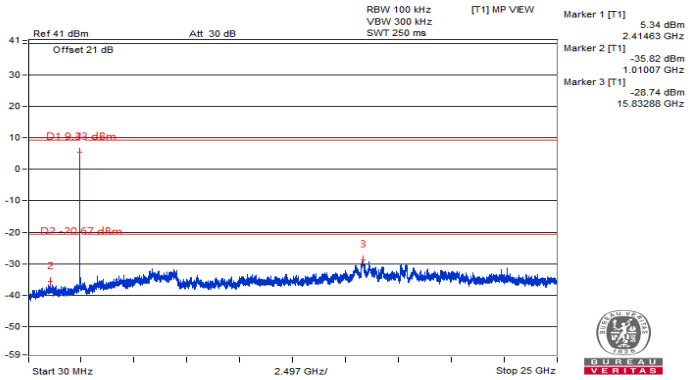


Chain 2 : CH 11 Band edge

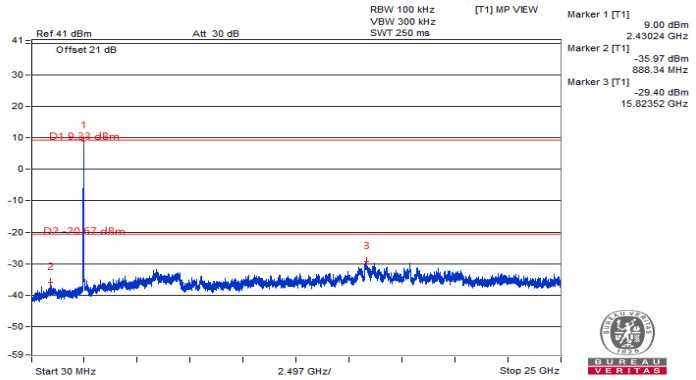
802.11g



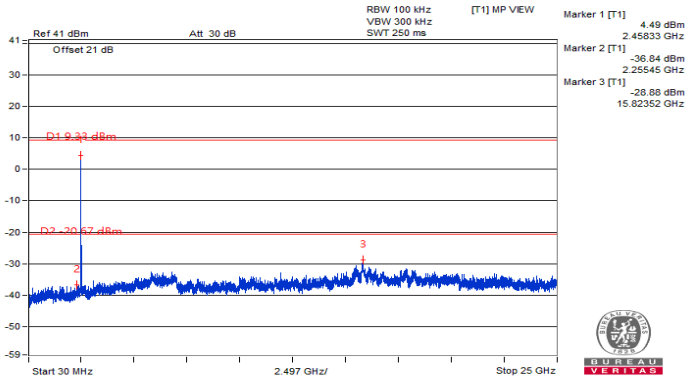
Maximum Reference Level



Chain 0 : CH 1



Chain 0 : CH 6



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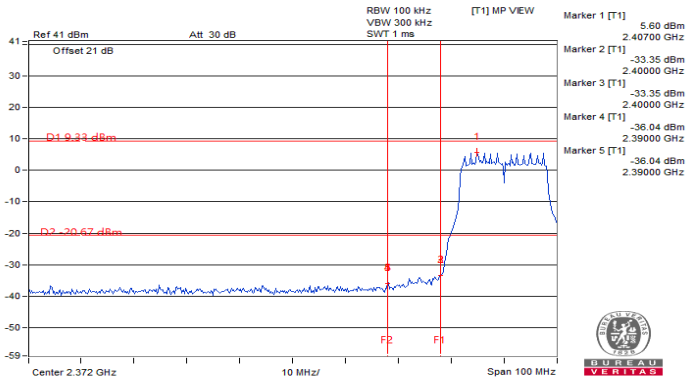
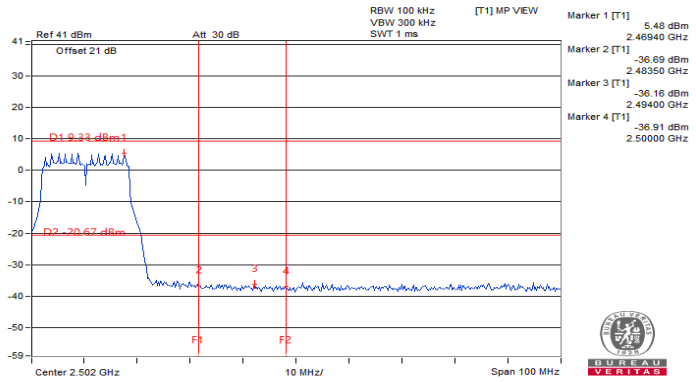


Chain 0 : CH 1 Band edge



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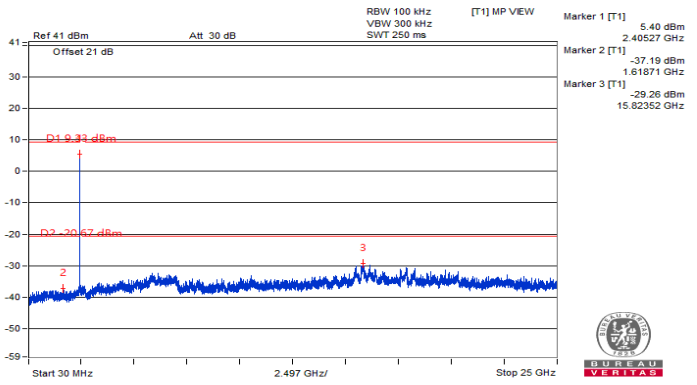
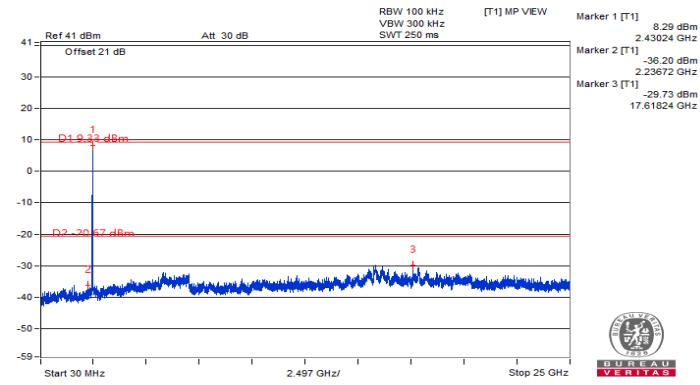


Chain 1 : CH 1



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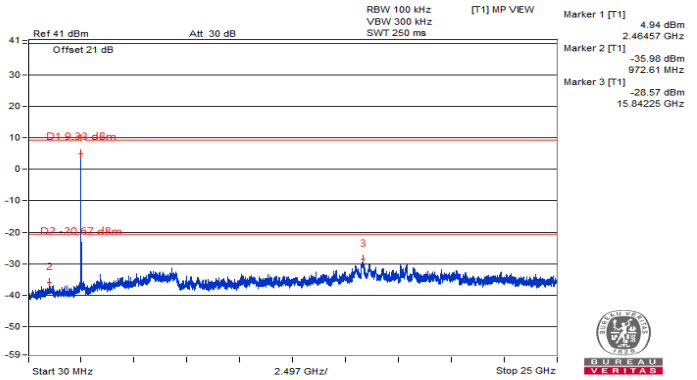
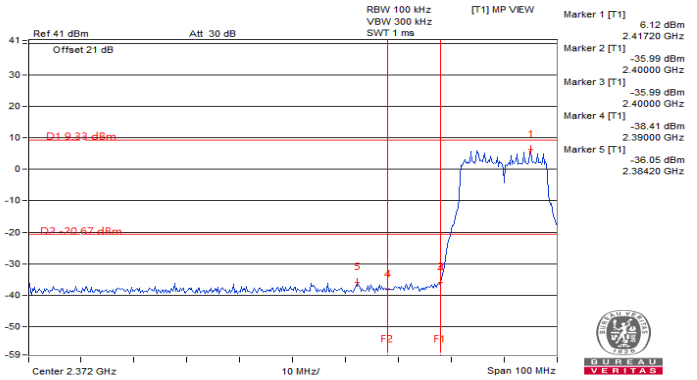
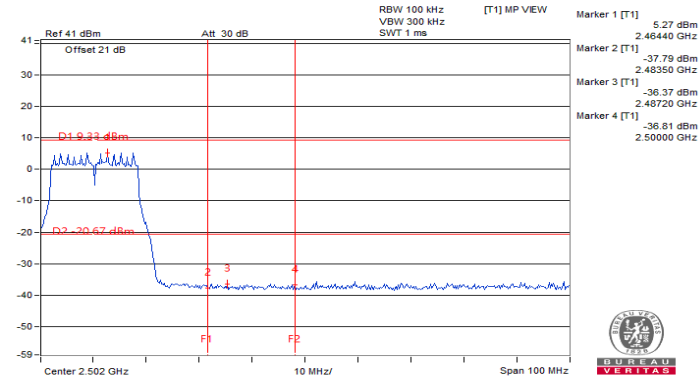


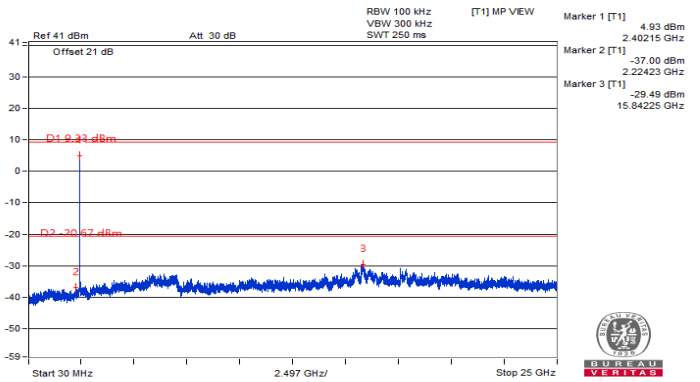
Chain 1 : CH 11



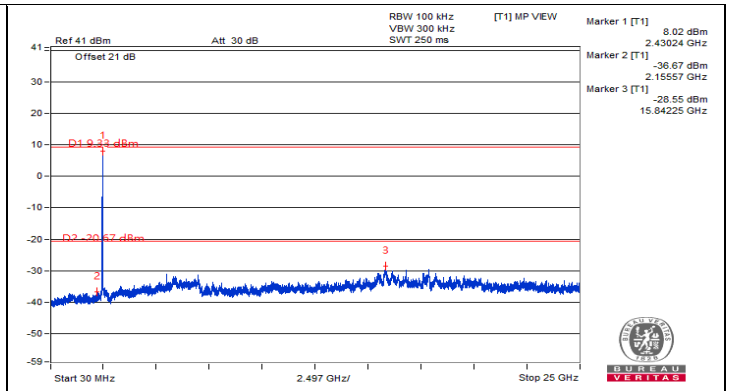
Chain 1 : CH 1 Band edge



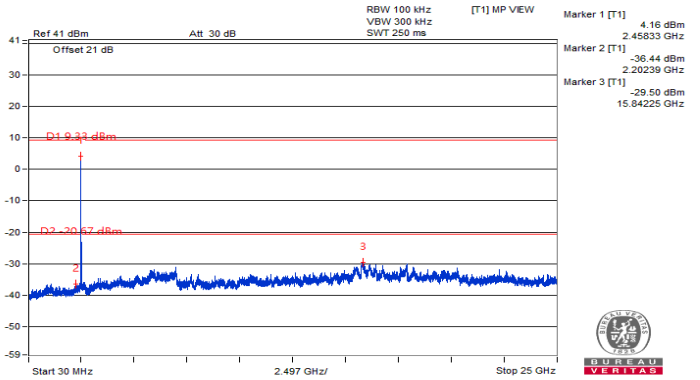
Chain 1 : CH 11 Band edge



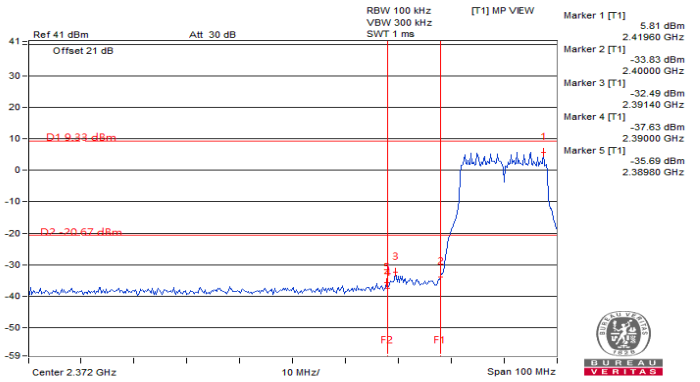
Chain 2 : CH 1



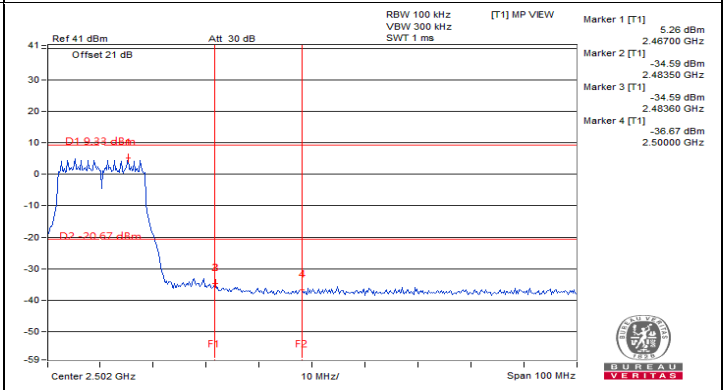
Chain 2 : CH 6



Chain 2 : CH 11

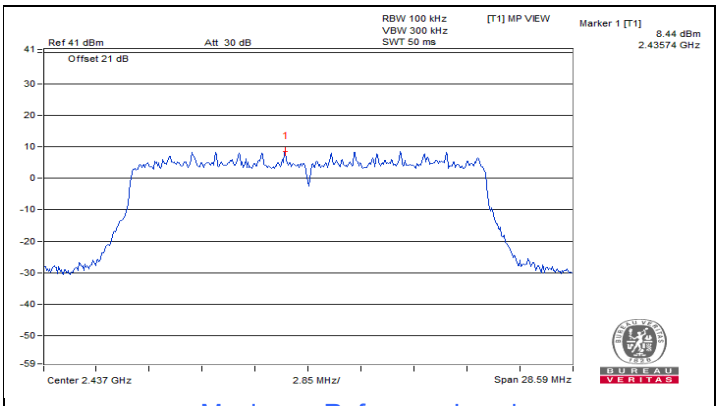


Chain 2 : CH 1 Band edge

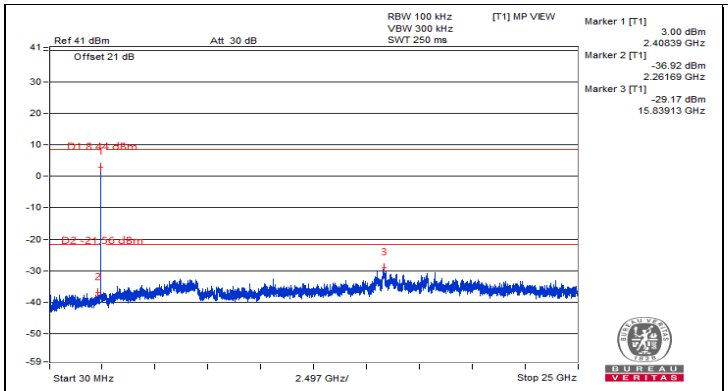


Chain 2 : CH 11 Band edge

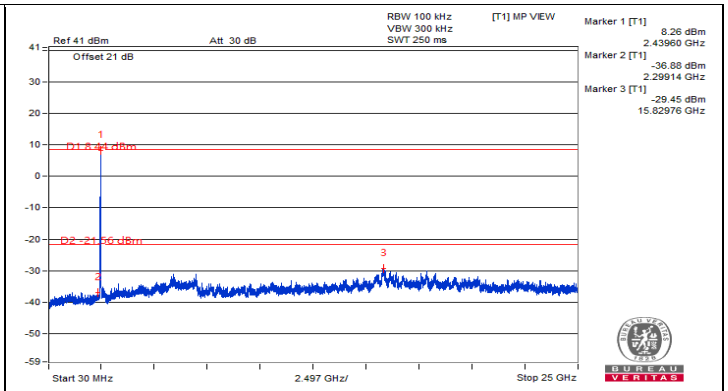
802.11ax (HE20)



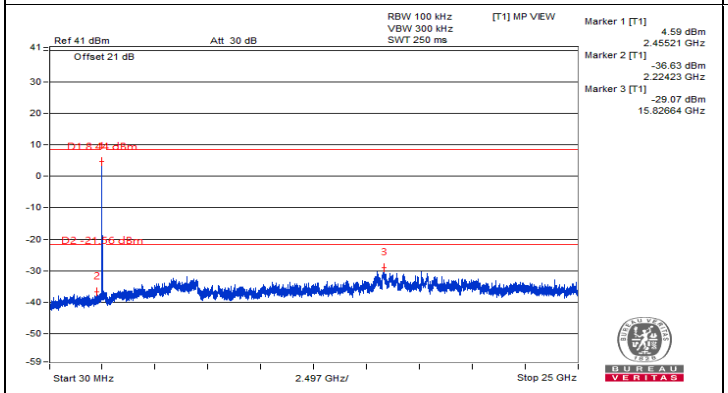
Maximum Reference Level



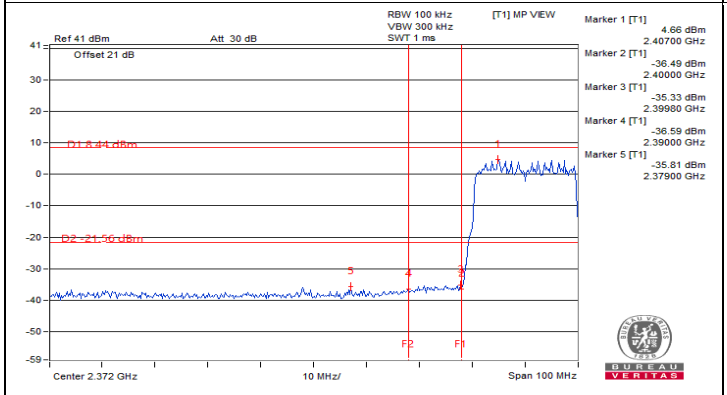
Chain 0 : CH 1



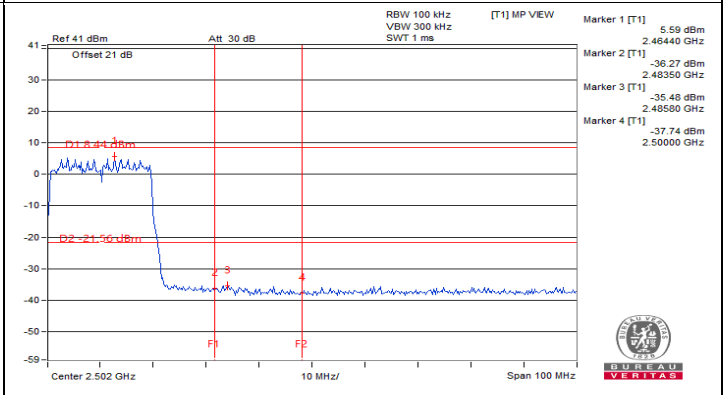
Chain 0 : CH 6



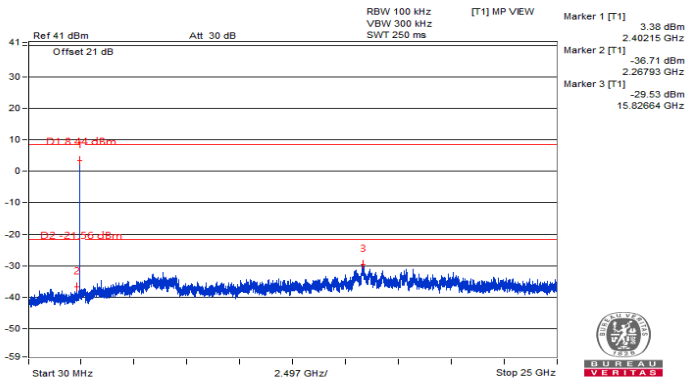
Chain 0 : CH 11



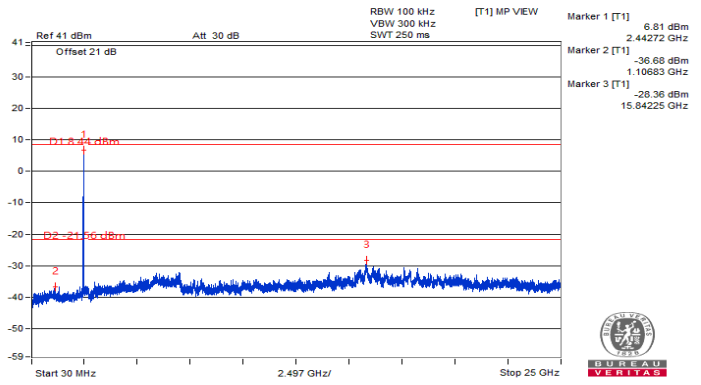
Chain 0 : CH 1 Band edge



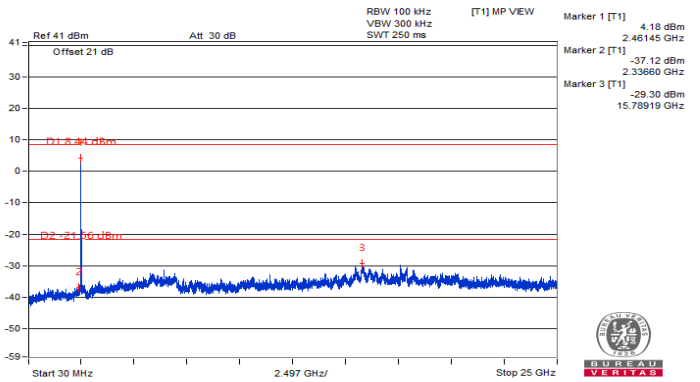
Chain 0 : CH 11 Band edge



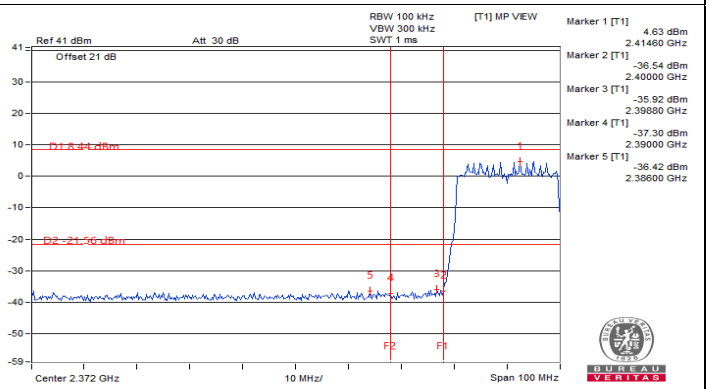
Chain 1 : CH 1



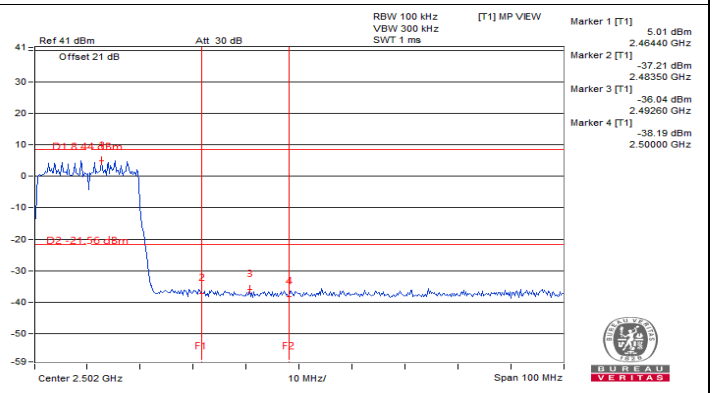
Chain 1 : CH 6



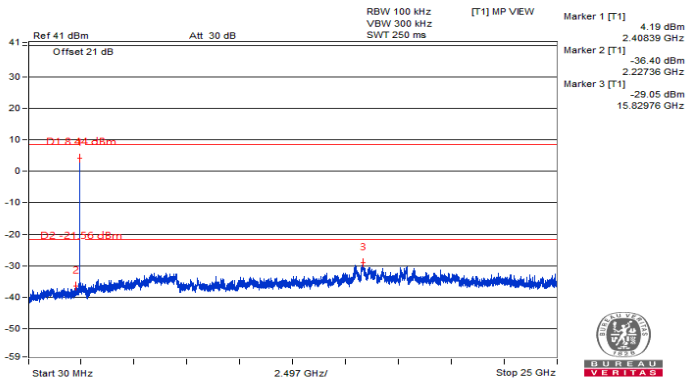
Chain 1 : CH 11



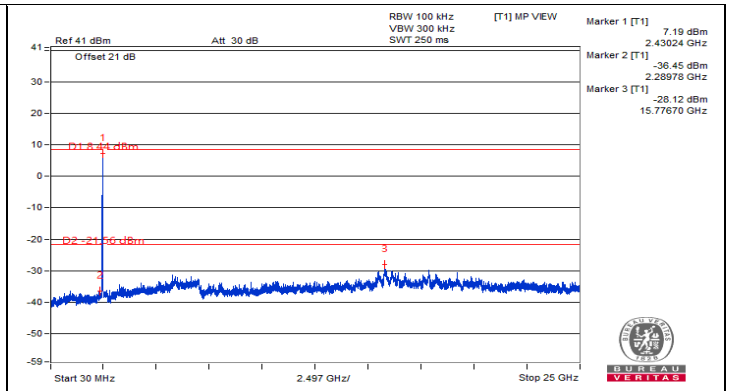
Chain 1 : CH 1 Band edge



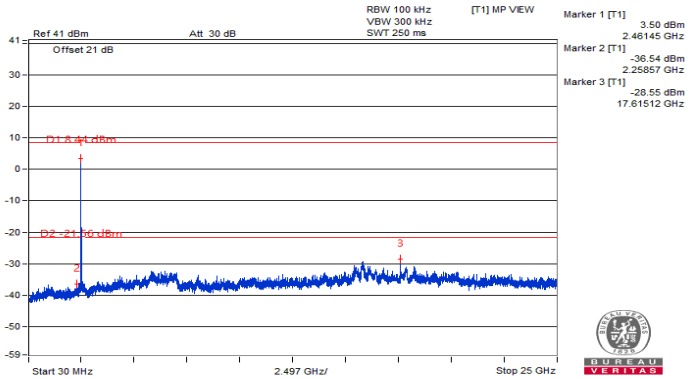
Chain 1 : CH 11 Band edge



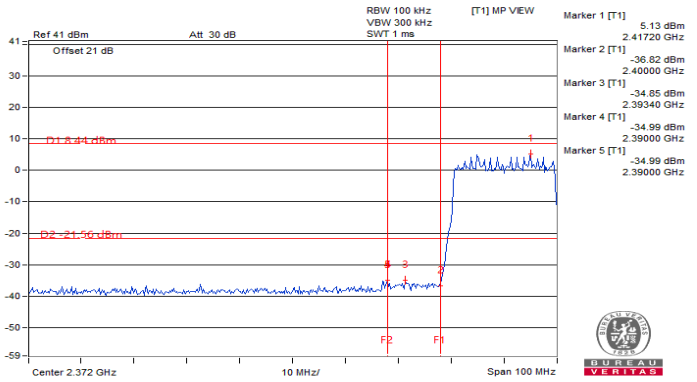
Chain 2 : CH 1



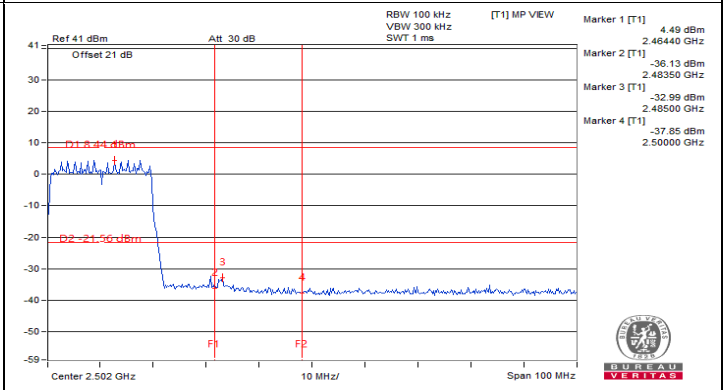
Chain 2 : CH 6



Chain 2 : CH 11

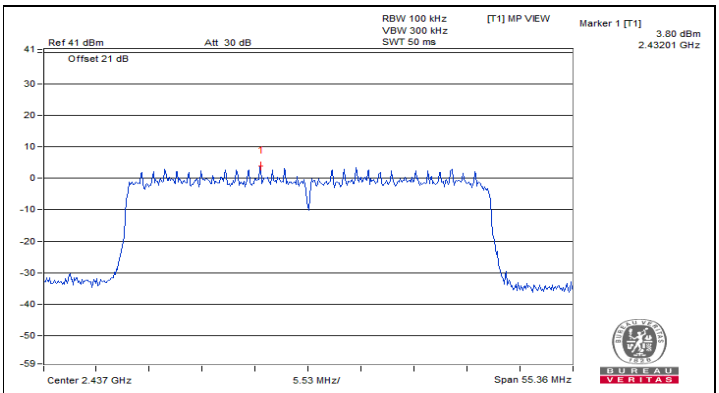


Chain 2 : CH 1 Band edge

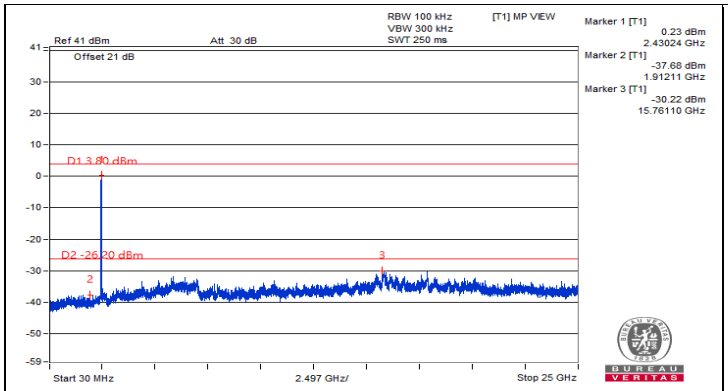


Chain 2 : CH 11 Band edge

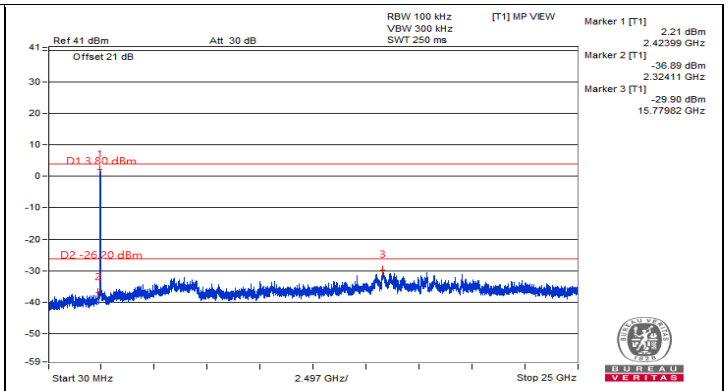
802.11ax (HE40)



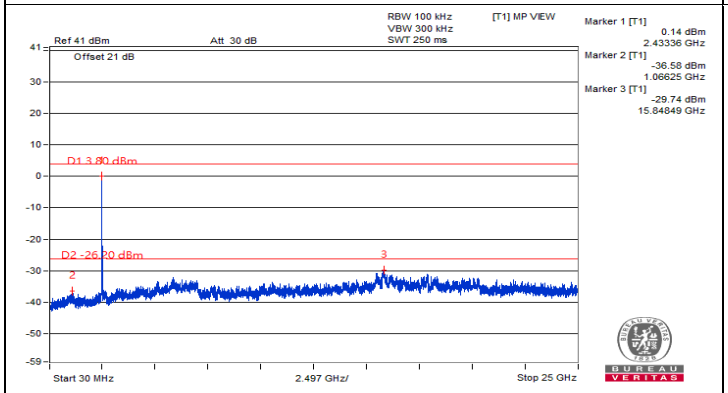
Maximum Reference Level



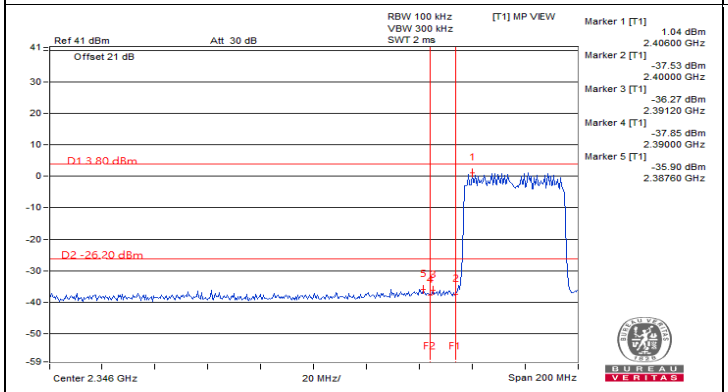
Chain 0 : CH 3



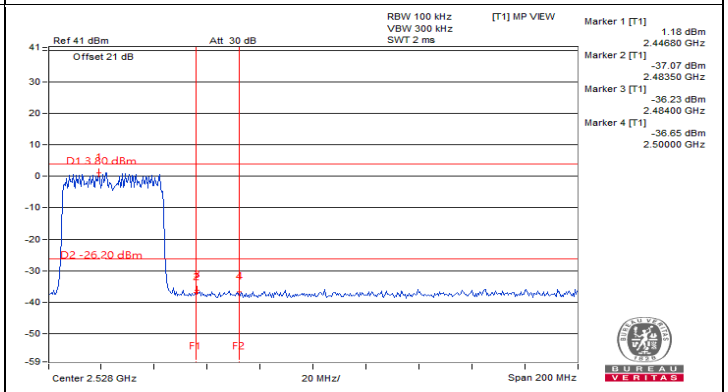
Chain 0 : CH 6



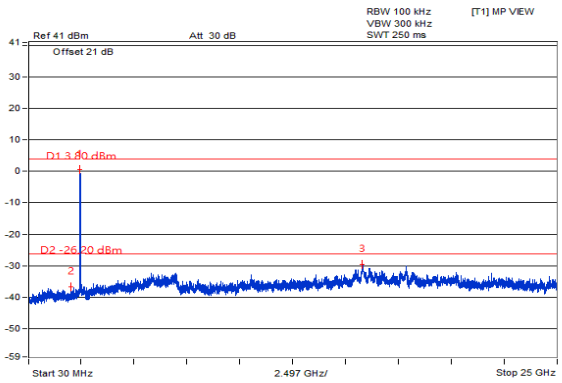
Chain 0 : CH 9



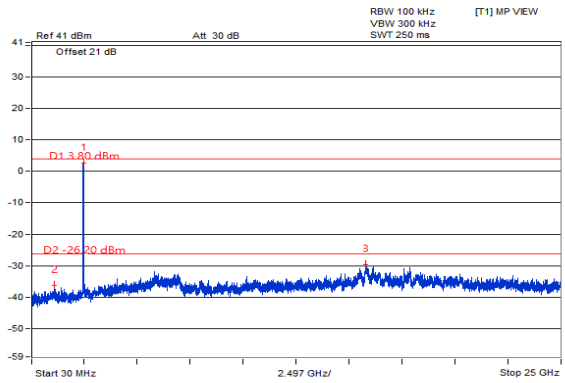
Chain 0 : CH 3 Band edge



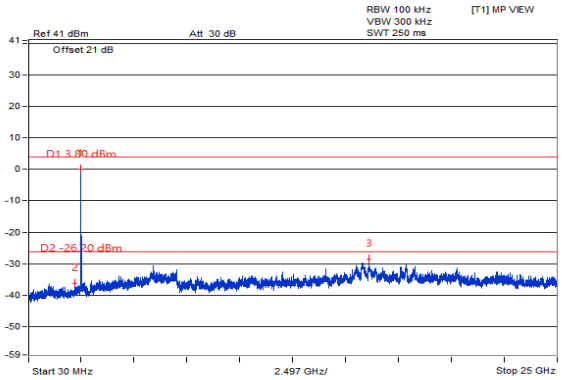
Chain 0 : CH 9 Band edge



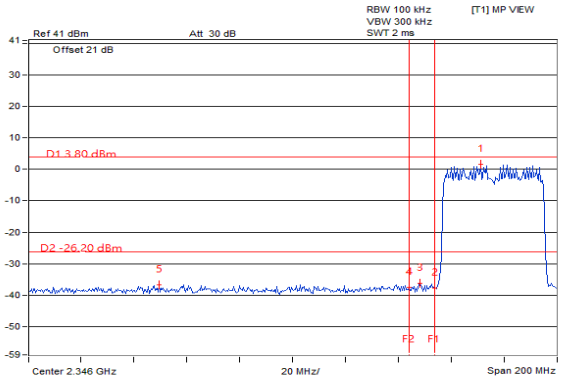
Chain 1 : CH 3



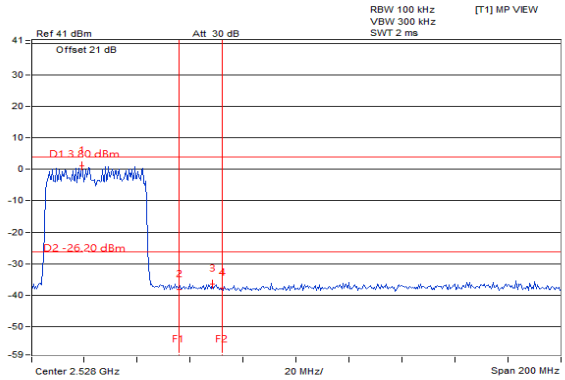
Chain 1 : CH 6



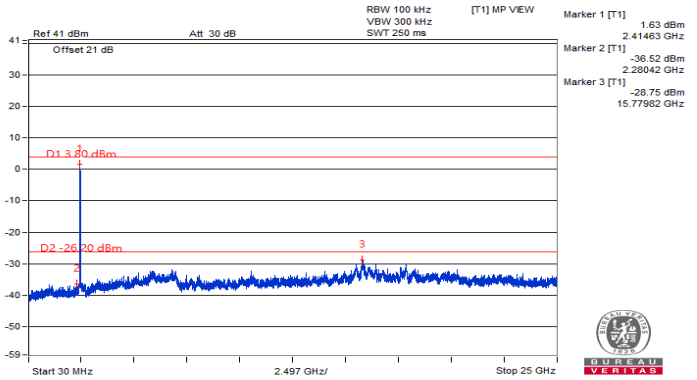
Chain 1 : CH 9



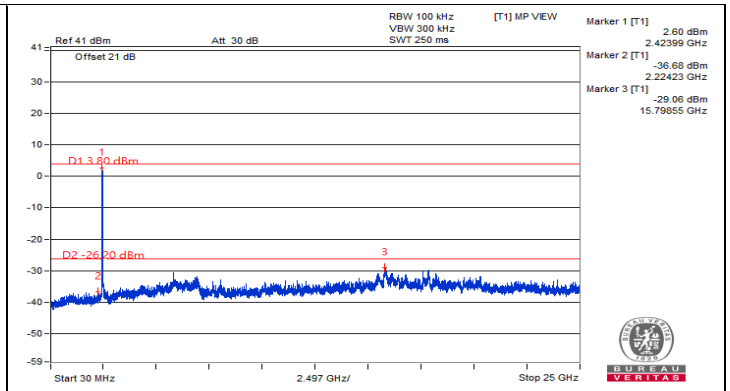
Chain 1 : CH 3 Band edge



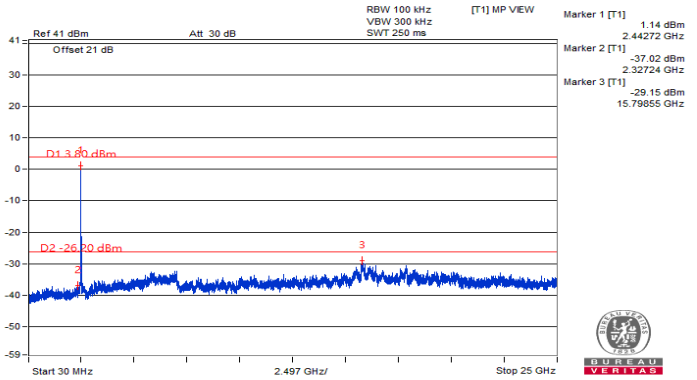
Chain 1 : CH 9 Band edge



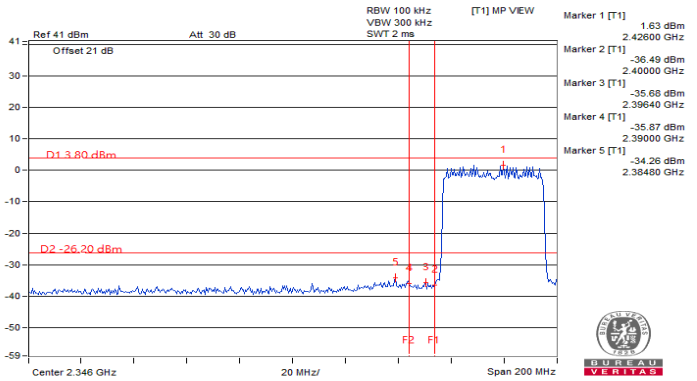
Chain 2 : CH 3



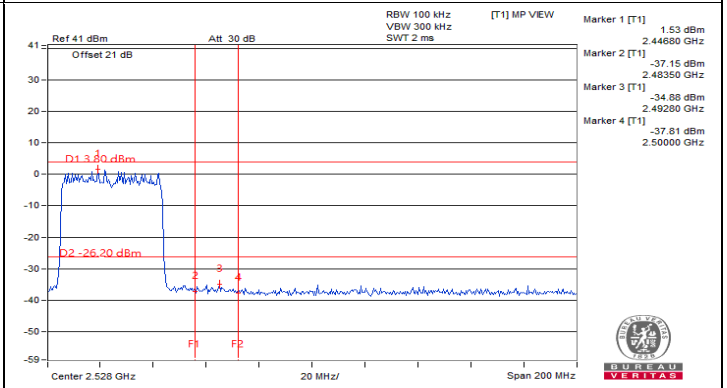
Chain 2 : CH 6



Chain 2 : CH 9



Chain 2 : CH 3 Band edge



Chain 2 : CH 9 Band edge

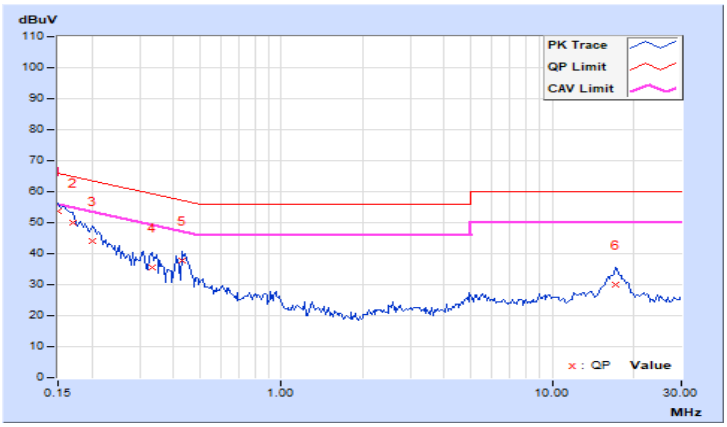
7.5 AC Power Conducted Emissions

RF Mode	802.11b	**Channel**	CH 6：2437 MHz
Frequency Range	150 kHz ~ 30 MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	24°C, 71% 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**	**9.95**	**43.66**	**28.65**	**53.61**	**38.60**	**66.00**	**56.00**	**-12.39**	**-17.40**
2	0.16953	9.95	40.20	27.74	50.15	37.69	64.98	54.98	-14.83	-17.29
3	0.20078	9.96	34.24	21.55	44.20	31.51	63.58	53.58	-19.38	-22.07
4	0.33359	9.96	25.52	17.28	35.48	27.24	59.36	49.36	-23.88	-22.12
5	0.43125	9.96	27.73	24.16	37.69	34.12	57.23	47.23	-19.54	-13.11
6	17.17969	11.04	18.83	14.83	29.87	25.87	60.00	50.00	-30.13	-24.13

Remarks:

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

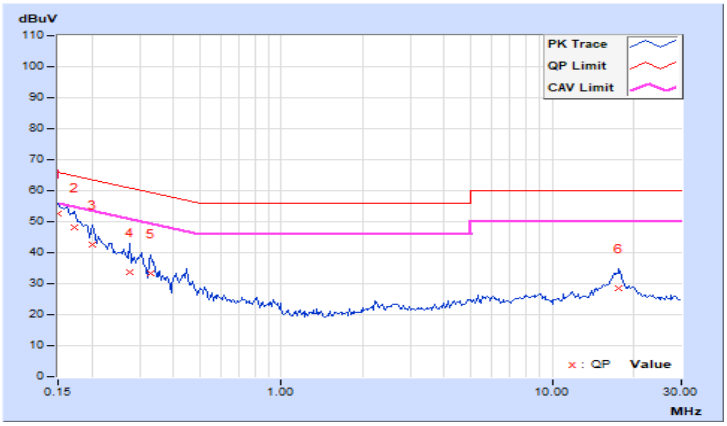


RF Mode	802.11b	Channel	CH 6：2437 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 71% RH
Tested By	Sampson Chen		

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	9.95	42.61	27.28	52.56	37.23	66.00	56.00	-13.44	-18.77
2	0.17344	9.95	38.21	25.48	48.16	35.43	64.79	54.79	-16.63	-19.36
3	0.20078	9.96	32.71	20.33	42.67	30.29	63.58	53.58	-20.91	-23.29
4	0.27500	9.96	23.78	11.45	33.74	21.41	60.97	50.97	-27.23	-29.56
5	0.32969	9.96	23.47	13.67	33.43	23.63	59.46	49.46	-26.03	-25.83
6	17.67188	10.88	17.79	13.56	28.67	24.44	60.00	50.00	-31.33	-25.56

Remarks:

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



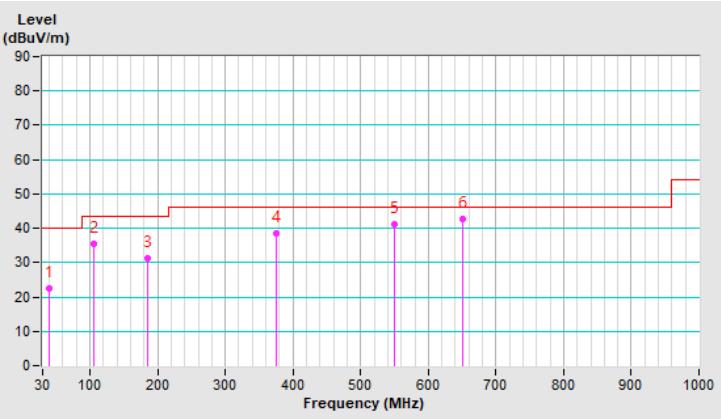
7.6 Unwanted Emissions below 1 GHz

RF Mode	802.11b	**Channel**	CH 6：2437 MHz
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	(QP) RB = 120kHz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	24°C, 66% 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	40.38	22.6 QP	40.0	-17.4	2.00 H	257	35.5	-12.9
2	105.78	35.6 QP	43.5	-7.9	3.00 H	247	51.9	-16.3
3	186.07	31.2 QP	43.5	-12.3	1.50 H	82	45.9	-14.7
4	375.44	38.5 QP	46.0	-7.5	1.00 H	293	48.8	-10.3
5	550.02	41.3 QP	46.0	-4.7	1.50 H	311	48.0	-6.7
6	**650.00**	**42.8 QP**	**46.0**	**-3.2**	**1.00 H**	**84**	**47.1**	**-4.3**

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 of frequency range 30 MHz ~ 1 GHz.
5. The emission levels were very low against the limit of frequency range 9 kHz ~ 30 MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

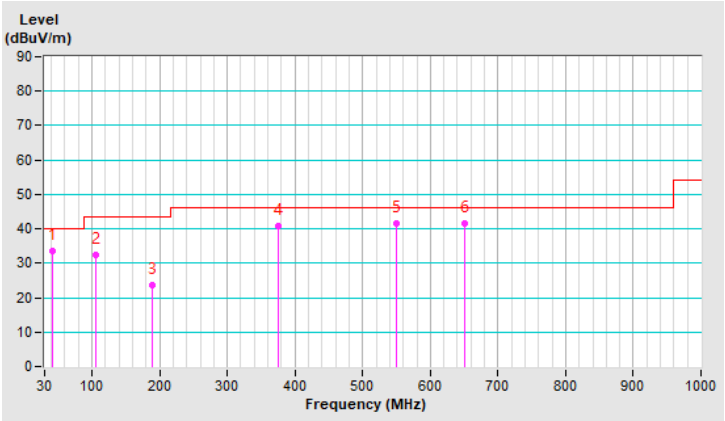


RF Mode	802.11b	Channel	CH 6：2437 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	(QP) RB = 120kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	24°C, 66% RH
Tested By	Tom Yang		

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	41.13	33.7 QP	40.0	-6.3	1.00 V	207	46.4	-12.7
2	105.81	32.5 QP	43.5	-11.0	1.00 V	278	48.8	-16.3
3	188.28	23.7 QP	43.5	-19.8	2.00 V	241	38.7	-15.0
4	375.44	40.8 QP	46.0	-5.2	1.50 V	117	51.1	-10.3
5	549.99	41.5 QP	46.0	-4.5	1.00 V	263	48.2	-6.7
6	650.02	41.7 QP	46.0	-4.3	1.00 V	248	46.0	-4.3

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 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.



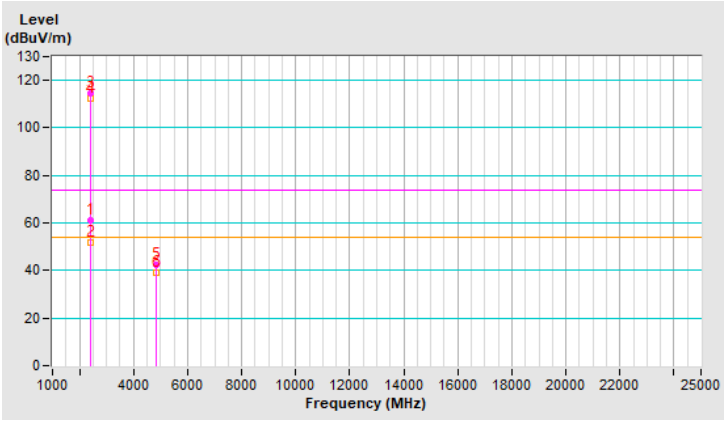
7.7 Unwanted Emissions above 1 GHz

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**	25°C, 66% 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	2388.01	61.2 PK	74.0	-12.8	2.01 H	340	62.2	-1.0
2	2388.01	52.0 AV	54.0	-2.0	2.01 H	340	53.0	-1.0
3	*2412.00	114.8 PK			2.01 H	340	115.8	-1.0
4	*2412.00	112.3 AV			2.01 H	340	113.3	-1.0
5	4824.00	42.3 PK	74.0	-31.7	1.32 H	150	38.0	4.3
6	4824.00	39.3 AV	54.0	-14.7	1.32 H	150	35.0	4.3

Remarks:

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

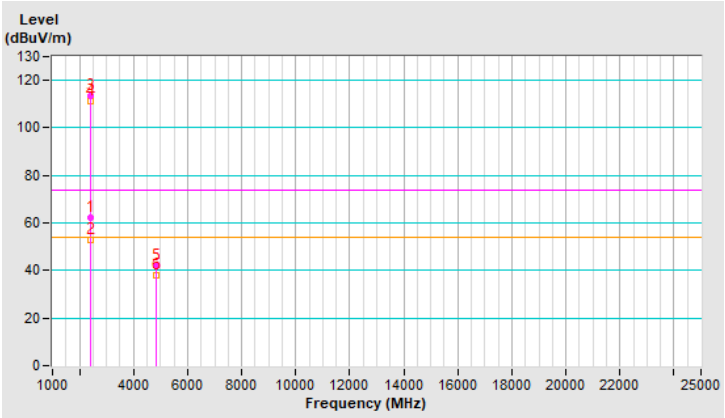


RF Mode	802.11b	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2388.00	62.3 PK	74.0	-11.7	1.27 V	32	63.3	-1.0
2	2388.00	53.1 AV	54.0	-0.9	1.27 V	32	54.1	-1.0
3	*2412.00	113.6 PK			1.27 V	32	114.6	-1.0
4	*2412.00	111.2 AV			1.27 V	32	112.2	-1.0
5	4824.00	41.8 PK	74.0	-32.2	2.79 V	60	37.5	4.3
6	4824.00	37.9 AV	54.0	-16.1	2.79 V	60	33.6	4.3

Remarks:

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

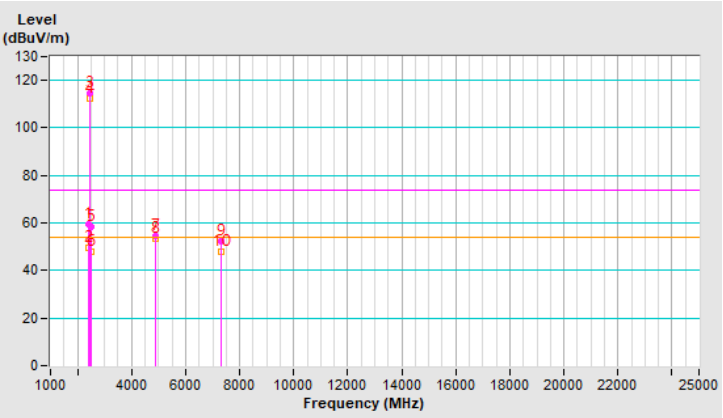


RF Mode	802.11b	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	59.3 PK	74.0	-14.7	1.88 H	171	60.3	-1.0
2	2390.00	49.4 AV	54.0	-4.6	1.88 H	171	50.4	-1.0
3	*2437.00	114.6 PK			1.88 H	171	115.5	-0.9
4	*2437.00	112.3 AV			1.88 H	171	113.2	-0.9
5	2483.50	58.2 PK	74.0	-15.8	1.88 H	171	59.1	-0.9
6	2483.50	48.0 AV	54.0	-6.0	1.88 H	171	48.9	-0.9
7	4874.00	54.7 PK	74.0	-19.3	1.77 H	136	50.4	4.3
8	4874.00	53.4 AV	54.0	-0.6	1.77 H	136	49.1	4.3
9	7311.00	52.1 PK	74.0	-21.9	1.82 H	310	41.8	10.3
10	7311.00	47.9 AV	54.0	-6.1	1.82 H	310	37.6	10.3

Remarks:

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

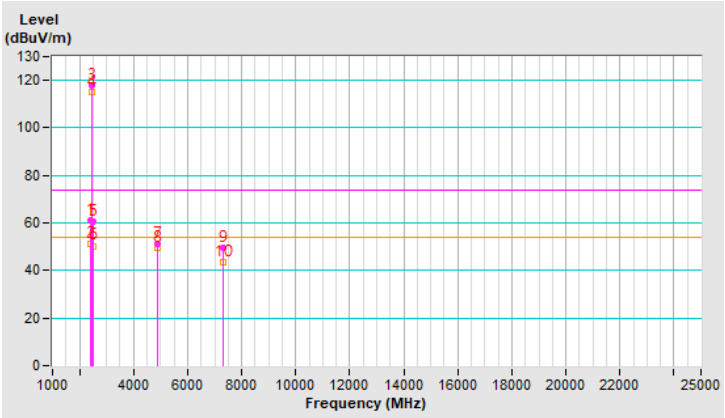


RF Mode	802.11b	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	61.2 PK	74.0	-12.8	1.13 V	341	62.2	-1.0
2	2390.00	51.4 AV	54.0	-2.6	1.13 V	341	52.4	-1.0
3	*2437.00	117.8 PK			1.13 V	341	118.7	-0.9
4	*2437.00	115.3 AV			1.13 V	341	116.2	-0.9
5	2483.50	60.8 PK	74.0	-13.2	1.13 V	341	61.7	-0.9
6	2483.50	50.4 AV	54.0	-3.6	1.13 V	341	51.3	-0.9
7	4874.00	51.3 PK	74.0	-22.7	2.84 V	75	47.0	4.3
8	4874.00	49.4 AV	54.0	-4.6	2.84 V	75	45.1	4.3
9	7311.00	49.5 PK	74.0	-24.5	1.39 V	103	39.2	10.3
10	7311.00	43.4 AV	54.0	-10.6	1.39 V	103	33.1	10.3

Remarks:

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

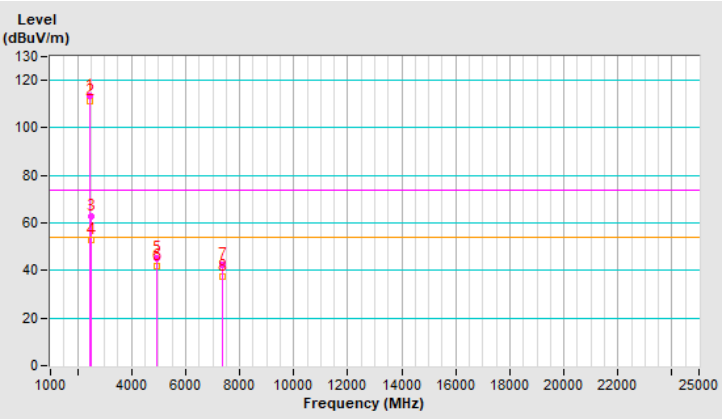


RF Mode	802.11b	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2462.00	113.6 PK			2.10 H	41	114.5	-0.9
2	*2462.00	111.2 AV			2.10 H	41	112.1	-0.9
3	2488.36	62.8 PK	74.0	-11.2	2.10 H	41	63.7	-0.9
4	2488.36	53.1 AV	54.0	-0.9	2.10 H	41	54.0	-0.9
5	4924.00	45.1 PK	74.0	-28.9	1.92 H	131	40.6	4.5
6	4924.00	41.7 AV	54.0	-12.3	1.92 H	131	37.2	4.5
7	7386.00	42.3 PK	74.0	-31.7	1.76 H	316	32.1	10.2
8	7386.00	37.5 AV	54.0	-16.5	1.76 H	316	27.3	10.2

Remarks:

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

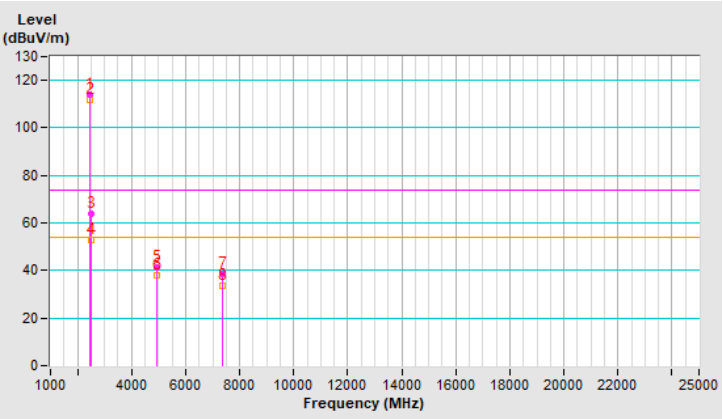


RF Mode	802.11b	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2462.00	114.2 PK			1.10 V	345	115.1	-0.9
2	*2462.00	111.8 AV			1.10 V	345	112.7	-0.9
3	2488.36	63.9 PK	74.0	-10.1	1.10 V	345	64.8	-0.9
4	2488.36	52.9 AV	54.0	-1.1	1.10 V	345	53.8	-0.9
5	4924.00	41.5 PK	74.0	-32.5	2.82 V	67	37.0	4.5
6	4924.00	37.8 AV	54.0	-16.2	2.82 V	67	33.3	4.5
7	7386.00	38.6 PK	74.0	-35.4	1.44 V	104	28.4	10.2
8	7386.00	33.8 AV	54.0	-20.2	1.44 V	104	23.6	10.2

Remarks:

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

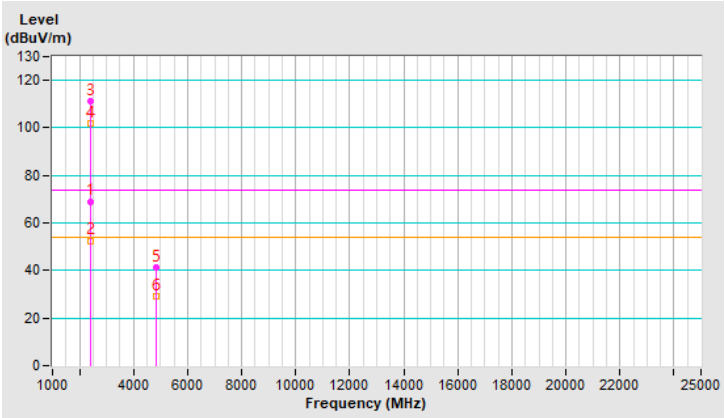


RF Mode	802.11g	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	69.1 PK	74.0	-4.9	2.03 H	338	70.1	-1.0
2	2390.00	52.6 AV	54.0	-1.4	2.03 H	338	53.6	-1.0
3	*2412.00	111.2 PK			2.03 H	338	112.2	-1.0
4	*2412.00	102.0 AV			2.03 H	338	103.0	-1.0
5	4824.00	41.1 PK	74.0	-32.9	1.86 H	111	36.8	4.3
6	4824.00	29.4 AV	54.0	-24.6	1.86 H	111	25.1	4.3

Remarks:

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

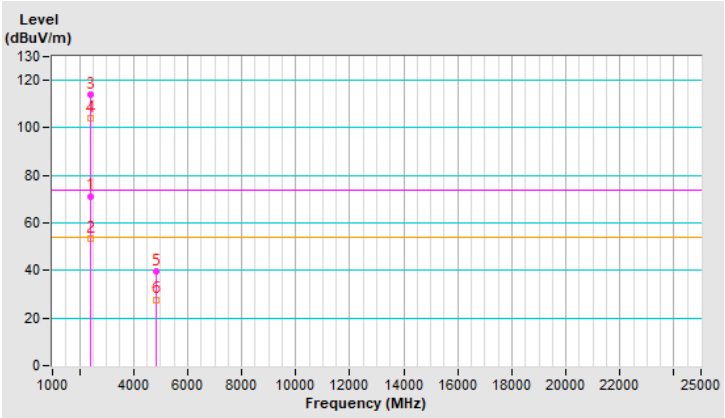


RF Mode	802.11g	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	71.3 PK	74.0	-2.7	2.82 V	356	72.3	-1.0
2	2390.00	53.5 AV	54.0	-0.5	2.82 V	356	54.5	-1.0
3	*2412.00	113.8 PK			2.82 V	356	114.8	-1.0
4	*2412.00	104.0 AV			2.82 V	356	105.0	-1.0
5	4824.00	39.6 PK	74.0	-34.4	2.63 V	58	35.3	4.3
6	4824.00	27.8 AV	54.0	-26.2	2.63 V	58	23.5	4.3

Remarks:

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

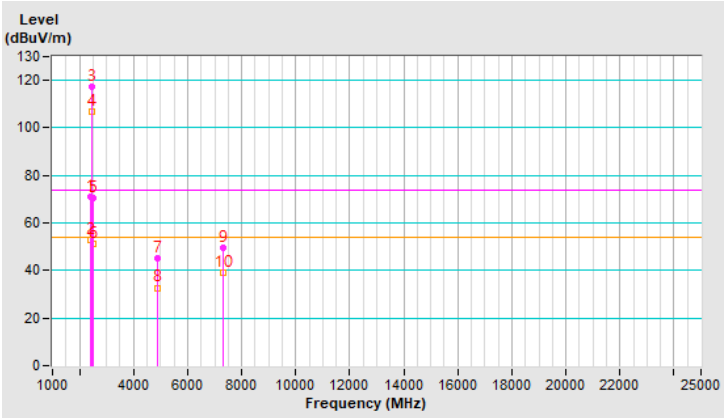


RF Mode	802.11g	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2388.33	71.1 PK	74.0	-2.9	3.26 H	360	72.1	-1.0
2	2388.33	53.0 AV	54.0	-1.0	3.26 H	360	54.0	-1.0
3	*2437.00	117.1 PK			3.26 H	360	118.0	-0.9
4	*2437.00	106.6 AV			3.26 H	360	107.5	-0.9
5	2483.50	70.4 PK	74.0	-3.6	3.26 H	360	71.3	-0.9
6	2483.50	51.3 AV	54.0	-2.7	3.26 H	360	52.2	-0.9
7	4874.00	45.0 PK	74.0	-29.0	1.89 H	135	40.7	4.3
8	4874.00	32.8 AV	54.0	-21.2	1.89 H	135	28.5	4.3
9	7311.00	49.8 PK	74.0	-24.2	2.37 H	136	39.5	10.3
10	7311.00	39.1 AV	54.0	-14.9	2.37 H	136	28.8	10.3

Remarks:

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

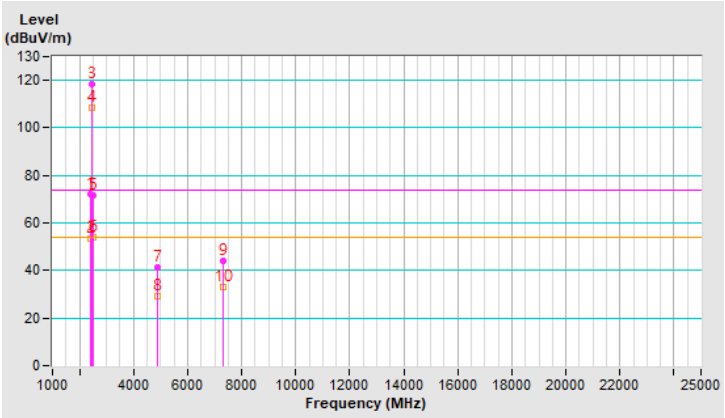


RF Mode	802.11g	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	72.2 PK	74.0	-1.8	2.62 V	340	73.2	-1.0
2	2390.00	53.6 AV	54.0	-0.4	2.62 V	340	54.6	-1.0
3	*2437.00	118.4 PK			2.62 V	340	119.3	-0.9
4	*2437.00	108.5 AV			2.62 V	340	109.4	-0.9
5	2483.50	71.5 PK	74.0	-2.5	2.62 V	340	72.4	-0.9
6	2483.50	53.8 AV	54.0	-0.2	2.62 V	340	54.7	-0.9
7	4874.00	41.5 PK	74.0	-32.5	2.71 V	75	37.2	4.3
8	4874.00	29.1 AV	54.0	-24.9	2.71 V	75	24.8	4.3
9	7311.00	44.0 PK	74.0	-30.0	1.44 V	108	33.7	10.3
10	7311.00	33.1 AV	54.0	-20.9	1.44 V	108	22.8	10.3

Remarks:

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

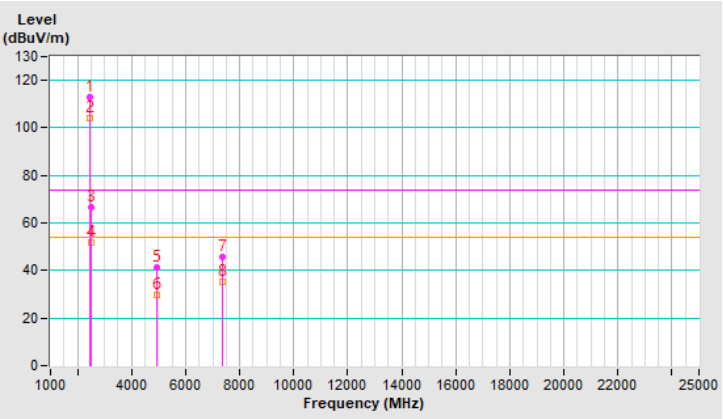


RF Mode	802.11g	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2462.00	113.1 PK			1.90 H	360	114.0	-0.9
2	*2462.00	104.1 AV			1.90 H	360	105.0	-0.9
3	2483.50	66.4 PK	74.0	-7.6	1.90 H	360	67.3	-0.9
4	2483.50	51.8 AV	54.0	-2.2	1.90 H	360	52.7	-0.9
5	4924.00	41.2 PK	74.0	-32.8	1.87 H	122	36.7	4.5
6	4924.00	29.7 AV	54.0	-24.3	1.87 H	122	25.2	4.5
7	7386.00	45.7 PK	74.0	-28.3	2.34 H	123	35.5	10.2
8	7386.00	35.4 AV	54.0	-18.6	2.34 H	123	25.2	10.2

Remarks:

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

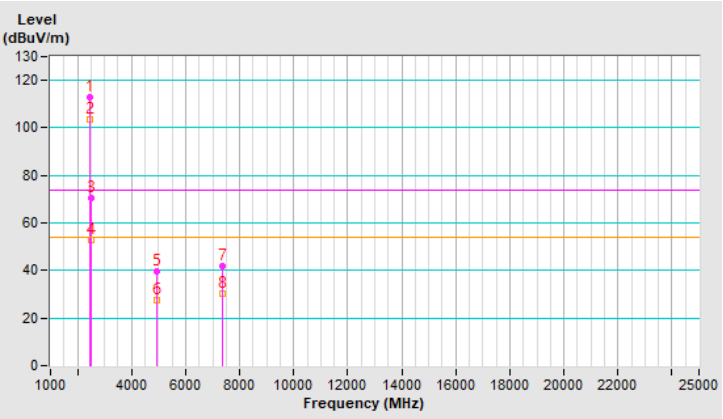


RF Mode	802.11g	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2462.00	113.1 PK			2.79 V	350	114.0	-0.9
2	*2462.00	103.7 AV			2.79 V	350	104.6	-0.9
3	2483.50	70.4 PK	74.0	-3.6	2.79 V	350	71.3	-0.9
4	2483.50	52.7 AV	54.0	-1.3	2.79 V	350	53.6	-0.9
5	4924.00	39.7 PK	74.0	-34.3	2.66 V	63	35.2	4.5
6	4924.00	27.6 AV	54.0	-26.4	2.66 V	63	23.1	4.5
7	7386.00	41.6 PK	74.0	-32.4	1.44 V	118	31.4	10.2
8	7386.00	30.4 AV	54.0	-23.6	1.44 V	118	20.2	10.2

Remarks:

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

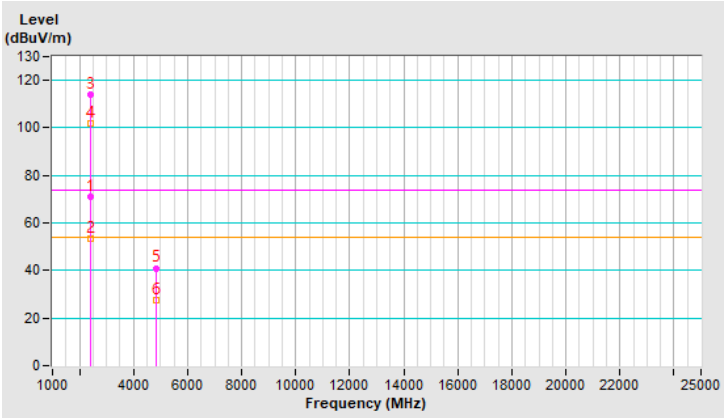


RF Mode	802.11ax (HE20)	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	71.1 PK	74.0	-2.9	3.06 H	30	72.1	-1.0
2	2390.00	53.4 AV	54.0	-0.6	3.06 H	30	54.4	-1.0
3	*2412.00	113.9 PK			3.06 H	30	114.9	-1.0
4	*2412.00	102.0 AV			3.06 H	30	103.0	-1.0
5	4824.00	41.0 PK	74.0	-33.0	1.89 H	124	36.7	4.3
6	4824.00	27.7 AV	54.0	-26.3	1.89 H	124	23.4	4.3

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.

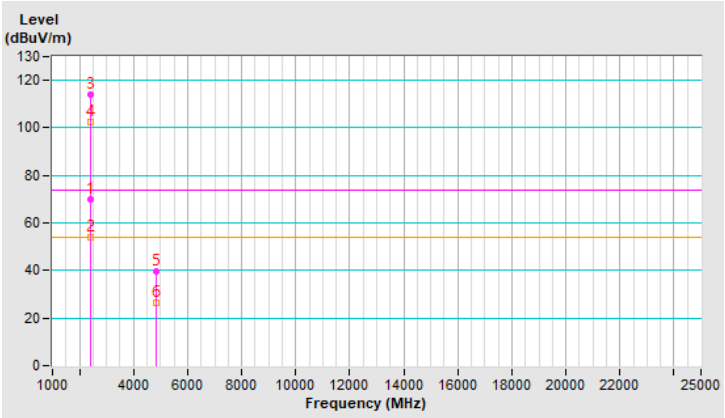


RF Mode	802.11ax (HE20)	Channel	CH 1：2412 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	70.0 PK	74.0	-4.0	2.29 V	323	71.0	-1.0
2	2390.00	53.8 AV	54.0	-0.2	2.29 V	323	54.8	-1.0
3	*2412.00	114.1 PK			2.29 V	323	115.1	-1.0
4	*2412.00	102.4 AV			2.29 V	323	103.4	-1.0
5	4824.00	39.8 PK	74.0	-34.2	2.66 V	52	35.5	4.3
6	4824.00	26.4 AV	54.0	-27.6	2.66 V	52	22.1	4.3

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.

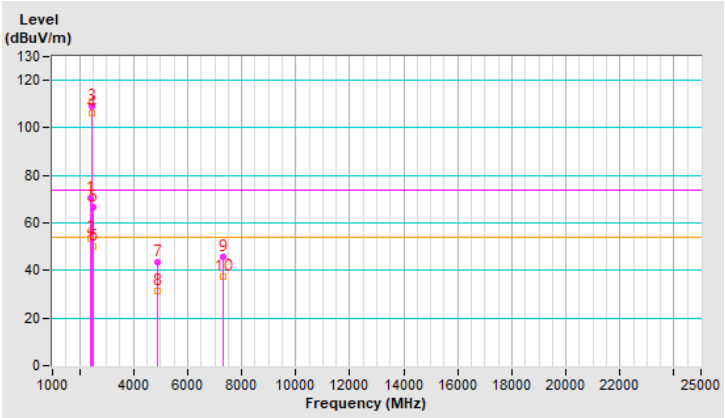


RF Mode	802.11ax (HE20)	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	70.4 PK	74.0	-3.6	2.92 H	350	71.4	-1.0
2	2390.00	53.3 AV	54.0	-0.7	2.92 H	350	54.3	-1.0
3	*2437.00	108.9 PK			2.92 H	350	109.8	-0.9
4	*2437.00	106.3 AV			2.92 H	350	107.2	-0.9
5	2483.50	66.7 PK	74.0	-7.3	2.92 H	350	67.6	-0.9
6	2483.50	50.2 AV	54.0	-3.8	2.92 H	350	51.1	-0.9
7	4874.00	43.7 PK	74.0	-30.3	1.88 H	136	39.4	4.3
8	4874.00	31.5 AV	54.0	-22.5	1.88 H	136	27.2	4.3
9	7311.00	45.9 PK	74.0	-28.1	1.85 H	138	35.6	10.3
10	7311.00	37.4 AV	54.0	-16.6	1.85 H	138	27.1	10.3

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.

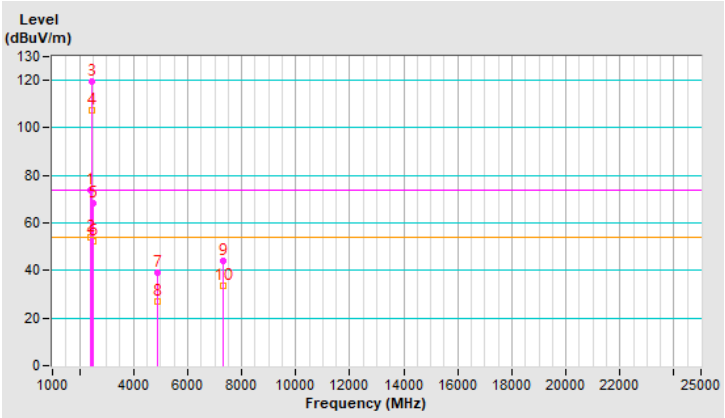


RF Mode	802.11ax (HE20)	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	**2390.00**	**73.9 PK**	**74.0**	**-0.1**	**2.50 V**	**323**	**74.9**	**-1.0**
2	2390.00	53.8 AV	54.0	-0.2	2.50 V	323	54.8	-1.0
3	*2437.00	119.3 PK			2.50 V	323	120.2	-0.9
4	*2437.00	107.5 AV			2.50 V	323	108.4	-0.9
5	2483.50	68.3 PK	74.0	-5.7	2.50 V	323	69.2	-0.9
6	2483.50	52.1 AV	54.0	-1.9	2.50 V	323	53.0	-0.9
7	4874.00	38.9 PK	74.0	-35.1	2.76 V	83	34.6	4.3
8	4874.00	27.0 AV	54.0	-27.0	2.76 V	83	22.7	4.3
9	7311.00	44.2 PK	74.0	-29.8	1.38 V	104	33.9	10.3
10	7311.00	33.5 AV	54.0	-20.5	1.38 V	104	23.2	10.3

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.

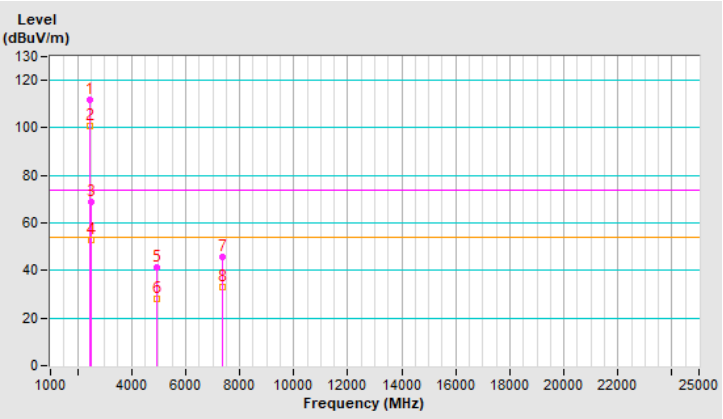


RF Mode	802.11ax (HE20)	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2462.00	111.6 PK			2.89 H	347	112.5	-0.9
2	*2462.00	100.7 AV			2.89 H	347	101.6	-0.9
3	2483.50	68.9 PK	74.0	-5.1	2.89 H	347	69.8	-0.9
4	2483.50	52.9 AV	54.0	-1.1	2.89 H	347	53.8	-0.9
5	4924.00	41.3 PK	74.0	-32.7	1.87 H	113	36.8	4.5
6	4924.00	28.1 AV	54.0	-25.9	1.87 H	113	23.6	4.5
7	7386.00	45.6 PK	74.0	-28.4	2.37 H	121	35.4	10.2
8	7386.00	33.1 AV	54.0	-20.9	2.37 H	121	22.9	10.2

Remarks:

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

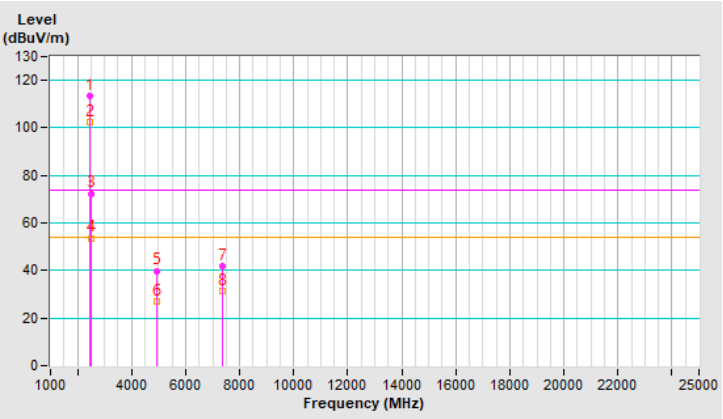


RF Mode	802.11ax (HE20)	Channel	CH 11：2462 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2462.00	113.5 PK			2.51 V	345	114.4	-0.9
2	*2462.00	102.3 AV			2.51 V	345	103.2	-0.9
3	2483.50	72.4 PK	74.0	-1.6	2.51 V	345	73.3	-0.9
4	2483.50	53.7 AV	54.0	-0.3	2.51 V	345	54.6	-0.9
5	4924.00	39.9 PK	74.0	-34.1	2.71 V	75	35.4	4.5
6	4924.00	26.9 AV	54.0	-27.1	2.71 V	75	22.4	4.5
7	7386.00	41.7 PK	74.0	-32.3	1.43 V	133	31.5	10.2
8	7386.00	31.3 AV	54.0	-22.7	1.43 V	133	21.1	10.2

Remarks:

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

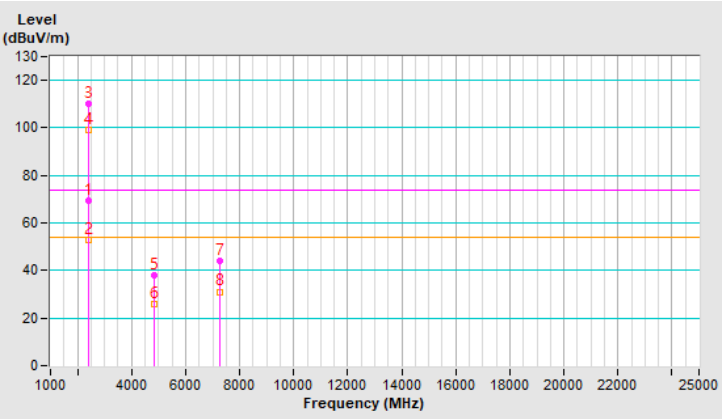


RF Mode	802.11ax (HE40)	Channel	CH 3：2422 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	69.3 PK	74.0	-4.7	3.67 H	19	70.3	-1.0
2	2390.00	52.9 AV	54.0	-1.1	3.67 H	19	53.9	-1.0
3	*2422.00	109.9 PK			3.67 H	19	110.9	-1.0
4	*2422.00	98.9 AV			3.67 H	19	99.9	-1.0
5	4844.00	38.2 PK	74.0	-35.8	1.82 H	164	33.9	4.3
6	4844.00	25.9 AV	54.0	-28.1	1.82 H	164	21.6	4.3
7	7266.00	43.8 PK	74.0	-30.2	1.87 H	148	33.4	10.4
8	7266.00	31.1 AV	54.0	-22.9	1.87 H	148	20.7	10.4

Remarks:

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

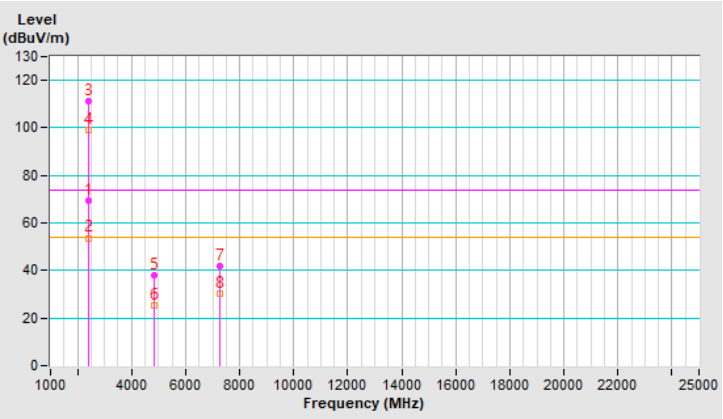


RF Mode	802.11ax (HE40)	Channel	CH 3：2422 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	69.2 PK	74.0	-4.8	2.84 V	325	70.2	-1.0
2	2390.00	53.7 AV	54.0	-0.3	2.84 V	325	54.7	-1.0
3	*2422.00	111.4 PK			2.84 V	325	112.4	-1.0
4	*2422.00	99.2 AV			2.84 V	325	100.2	-1.0
5	4844.00	37.9 PK	74.0	-36.1	2.68 V	91	33.6	4.3
6	4844.00	25.5 AV	54.0	-28.5	2.68 V	91	21.2	4.3
7	7266.00	41.7 PK	74.0	-32.3	1.47 V	146	31.3	10.4
8	7266.00	30.2 AV	54.0	-23.8	1.47 V	146	19.8	10.4

Remarks:

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

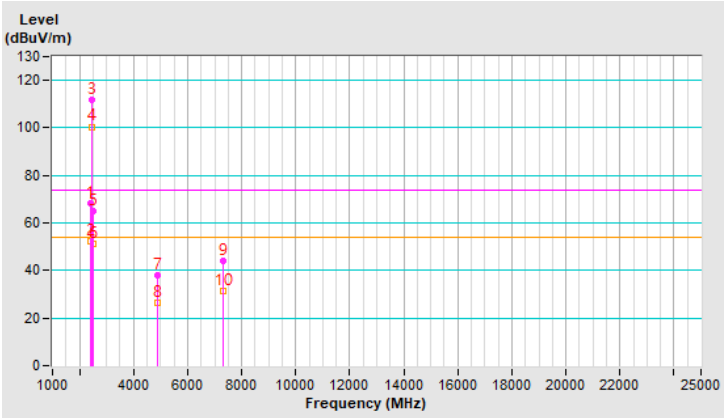


RF Mode	802.11ax (HE40)	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	68.4 PK	74.0	-5.6	3.41 H	360	69.4	-1.0
2	2390.00	52.1 AV	54.0	-1.9	3.41 H	360	53.1	-1.0
3	*2437.00	111.9 PK			3.41 H	360	112.8	-0.9
4	*2437.00	100.5 AV			3.41 H	360	101.4	-0.9
5	2483.50	65.2 PK	74.0	-8.8	3.41 H	360	66.1	-0.9
6	2483.50	51.2 AV	54.0	-2.8	3.41 H	360	52.1	-0.9
7	4874.00	38.2 PK	74.0	-35.8	1.87 H	148	33.9	4.3
8	4874.00	26.2 AV	54.0	-27.8	1.87 H	148	21.9	4.3
9	7311.00	44.0 PK	74.0	-30.0	1.82 H	140	33.7	10.3
10	7311.00	31.2 AV	54.0	-22.8	1.82 H	140	20.9	10.3

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.

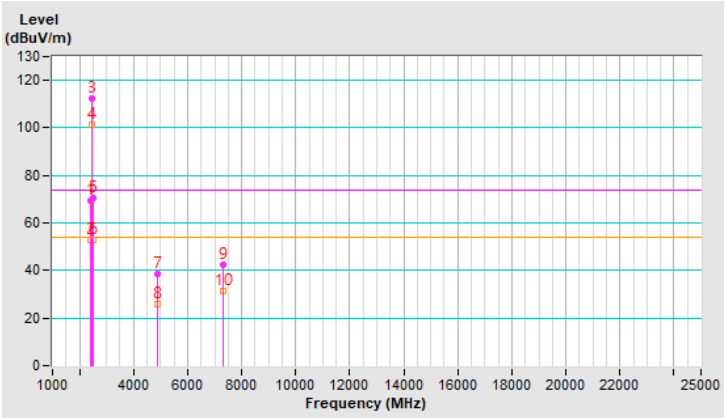


RF Mode	802.11ax (HE40)	Channel	CH 6：2437 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	2390.00	69.3 PK	74.0	-4.7	2.50 V	326	70.3	-1.0
2	2390.00	53.1 AV	54.0	-0.9	2.50 V	326	54.1	-1.0
3	*2437.00	112.6 PK			2.50 V	326	113.5	-0.9
4	*2437.00	101.1 AV			2.50 V	326	102.0	-0.9
5	2483.50	70.3 PK	74.0	-3.7	2.50 V	326	71.2	-0.9
6	2483.50	52.9 AV	54.0	-1.1	2.50 V	326	53.8	-0.9
7	4874.00	38.3 PK	74.0	-35.7	2.80 V	88	34.0	4.3
8	4874.00	25.8 AV	54.0	-28.2	2.80 V	88	21.5	4.3
9	7311.00	42.6 PK	74.0	-31.4	1.40 V	119	32.3	10.3
10	7311.00	31.2 AV	54.0	-22.8	1.40 V	119	20.9	10.3

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.

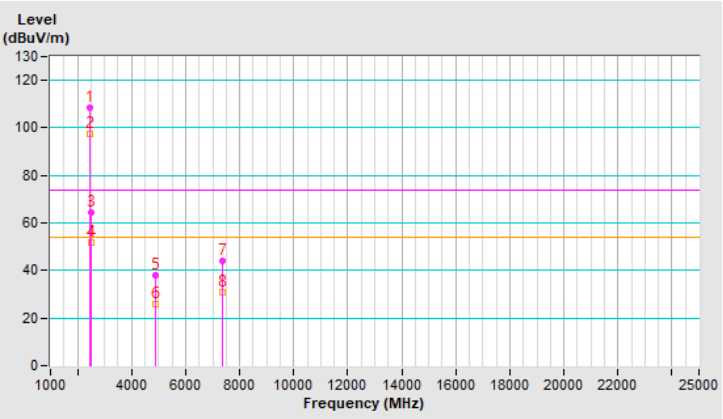


RF Mode	802.11ax (HE40)	Channel	CH 9：2452 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2452.00	108.5 PK			3.46 H	360	109.3	-0.8
2	*2452.00	97.4 AV			3.46 H	360	98.2	-0.8
3	2483.50	64.3 PK	74.0	-9.7	3.46 H	360	65.2	-0.9
4	2483.50	52.0 AV	54.0	-2.0	3.46 H	360	52.9	-0.9
5	4904.00	37.8 PK	74.0	-36.2	1.83 H	145	33.4	4.4
6	4904.00	25.7 AV	54.0	-28.3	1.83 H	145	21.3	4.4
7	7356.00	43.9 PK	74.0	-30.1	1.78 H	137	33.6	10.3
8	7356.00	30.9 AV	54.0	-23.1	1.78 H	137	20.6	10.3

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.

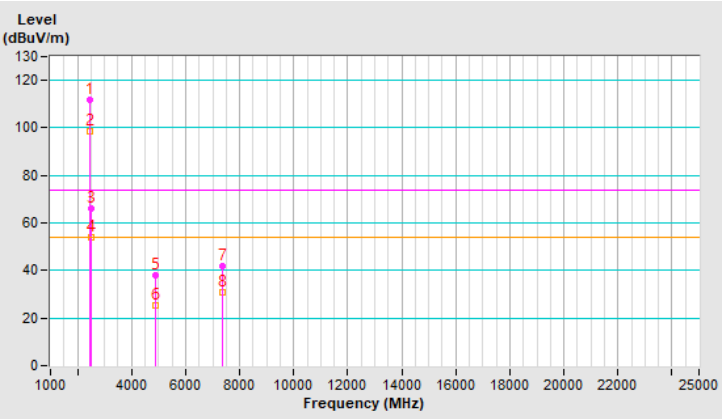


RF Mode	802.11ax (HE40)	Channel	CH 9：2452 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	(PK) RB = 1 MHz, VB = 3 MHz (AV) RB = 1 MHz, VB = 10 Hz
Input Power	120 Vac, 60 Hz	Environmental Conditions	25°C, 66% RH
Tested By	Sampson Chen		

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	*2452.00	111.8 PK			2.55 V	343	112.6	-0.8
2	*2452.00	98.7 AV			2.55 V	343	99.5	-0.8
3	2483.50	66.3 PK	74.0	-7.7	2.55 V	343	67.2	-0.9
4	2483.50	53.8 AV	54.0	-0.2	2.55 V	343	54.7	-0.9
5	4904.00	38.0 PK	74.0	-36.0	2.74 V	70	33.6	4.4
6	4904.00	25.5 AV	54.0	-28.5	2.74 V	70	21.1	4.4
7	7356.00	42.0 PK	74.0	-32.0	1.43 V	140	31.7	10.3
8	7356.00	30.7 AV	54.0	-23.3	1.43 V	140	20.4	10.3

Remarks:

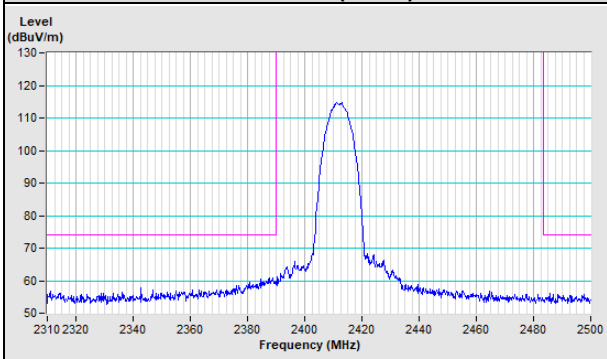
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency,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



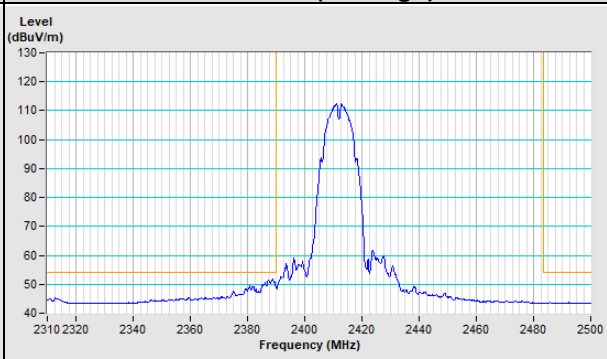
Plot of Band Edge

802.11b Channel 1

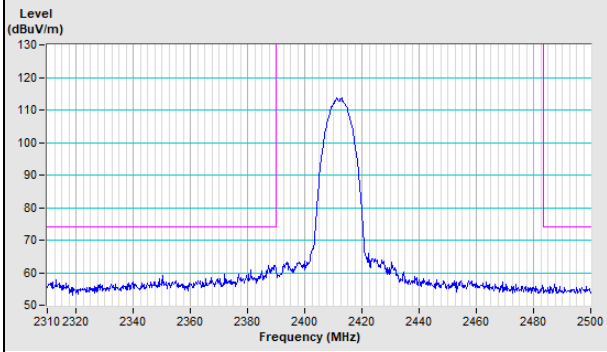
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)



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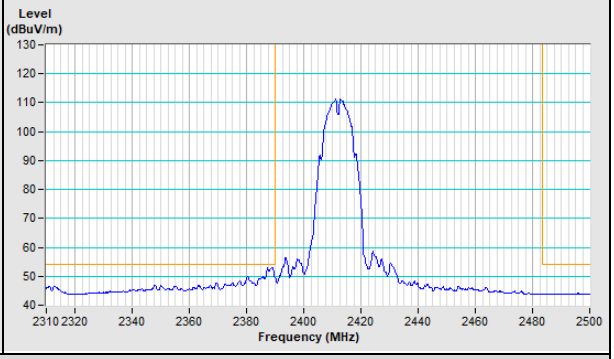
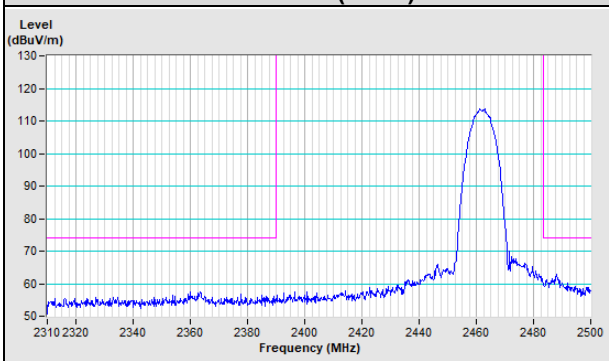


802.11b Channel 11

Horizontal (Peak)



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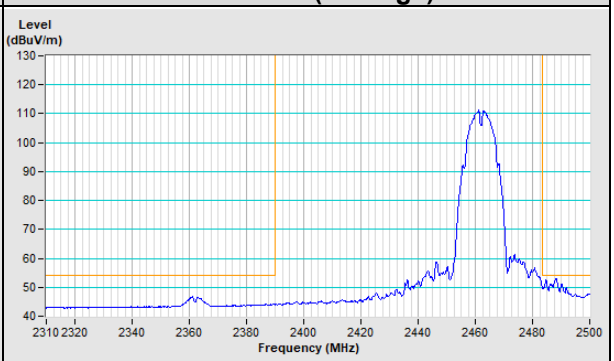
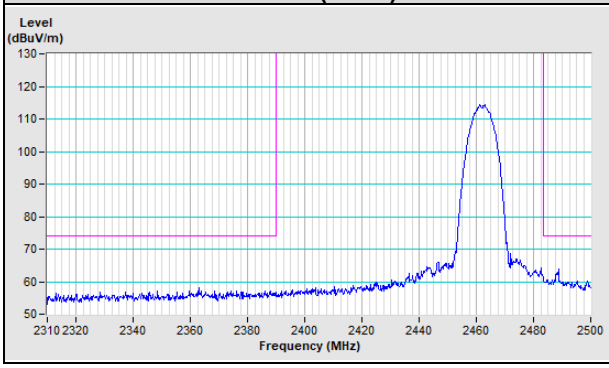
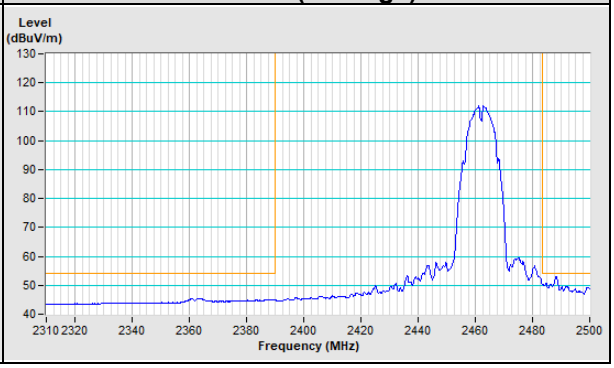


Vertical (Peak)

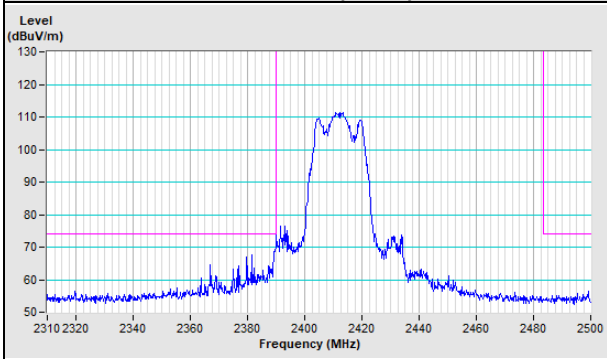


Vertical (Average)

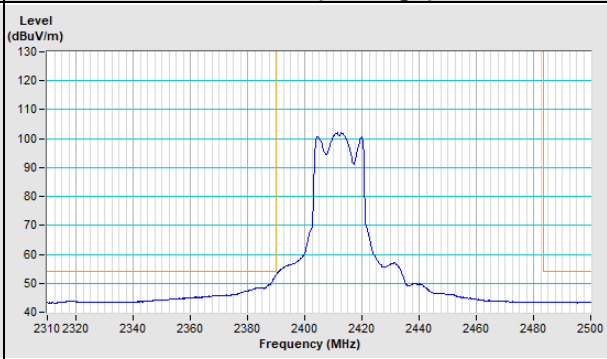


802.11g Channel 1

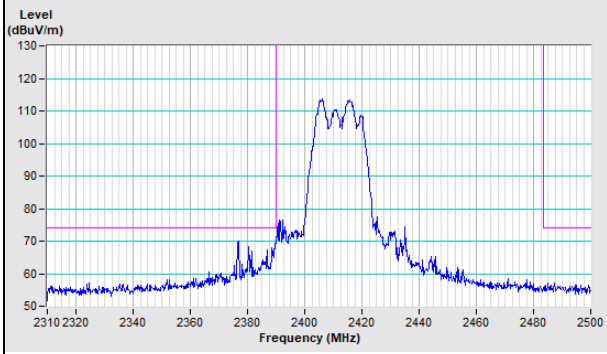
Horizontal (Peak)



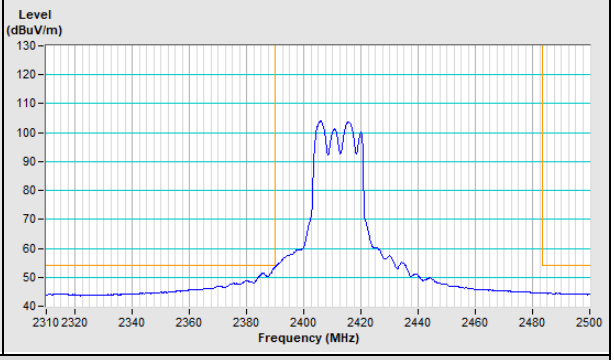
Horizontal (Average)



Vertical (Peak)

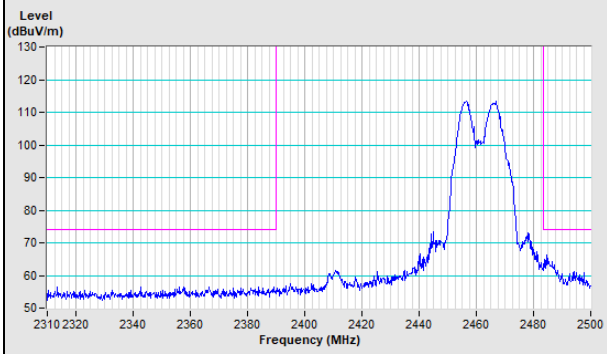


Vertical (Average)

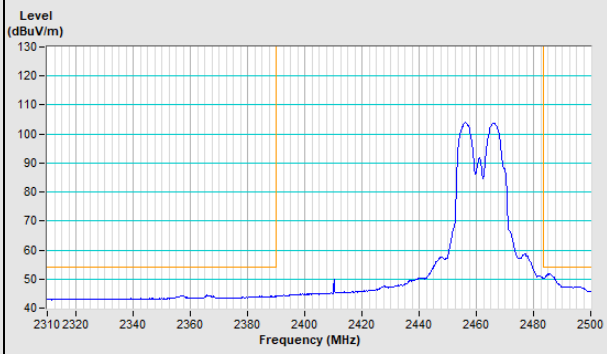


802.11g Channel 11

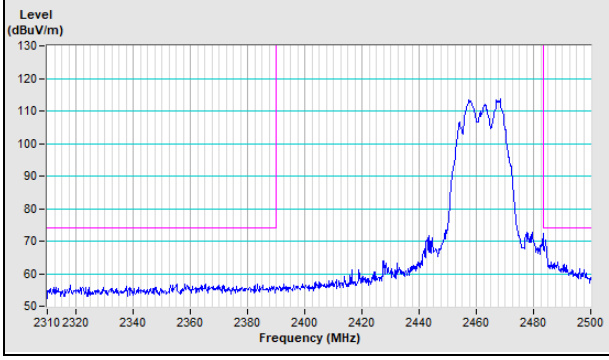
Horizontal (Peak)



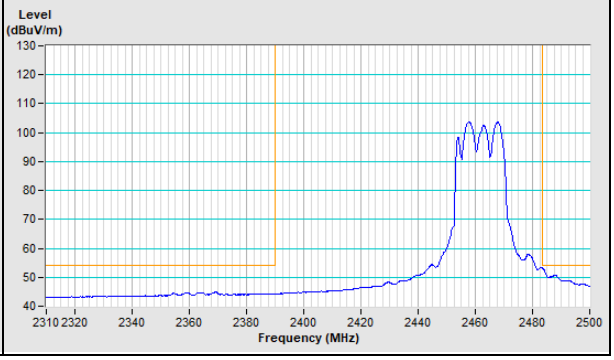
Horizontal (Average)



Vertical (Peak)

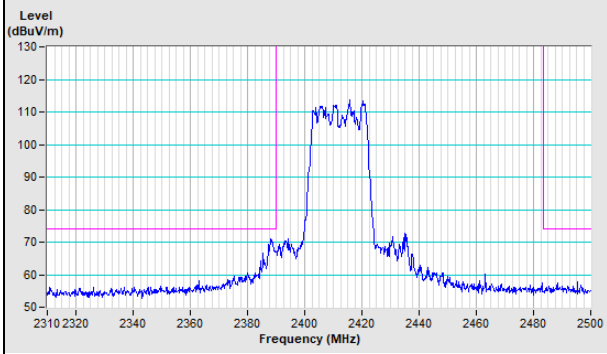


Vertical (Average)

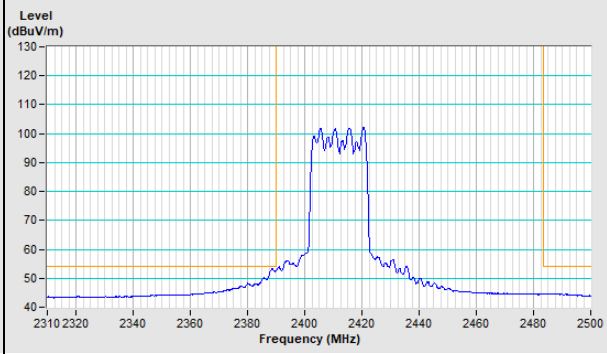


802.11ax (HE20) Channel 1

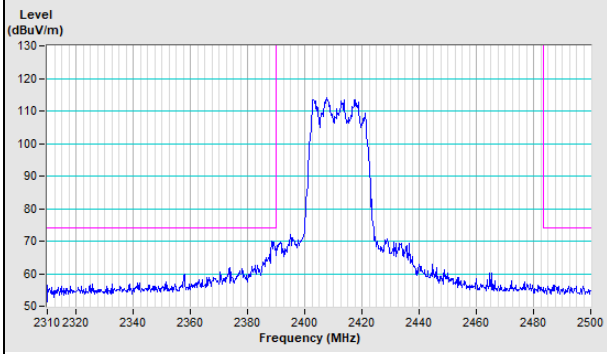
Horizontal (Peak)



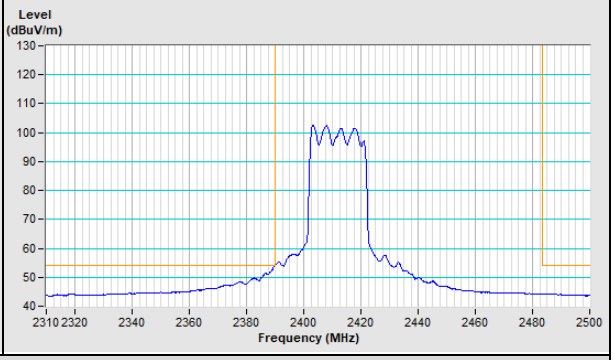
Horizontal (Average)



Vertical (Peak)

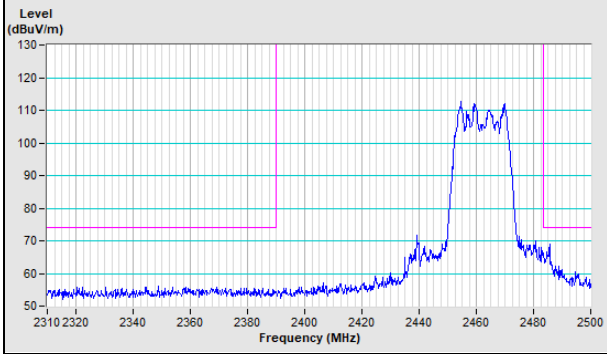


Vertical (Average)

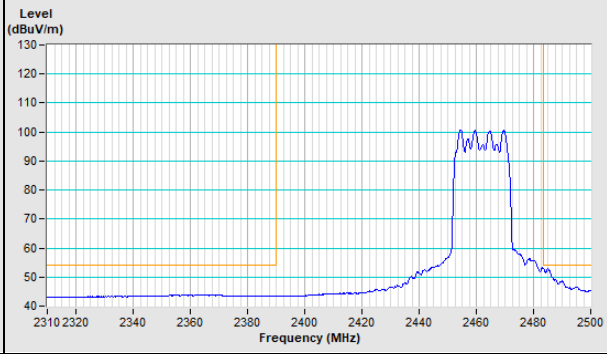


802.11ax (HE20) Channel 11

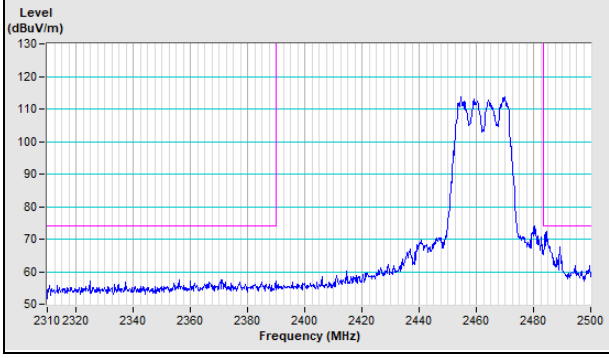
Horizontal (Peak)



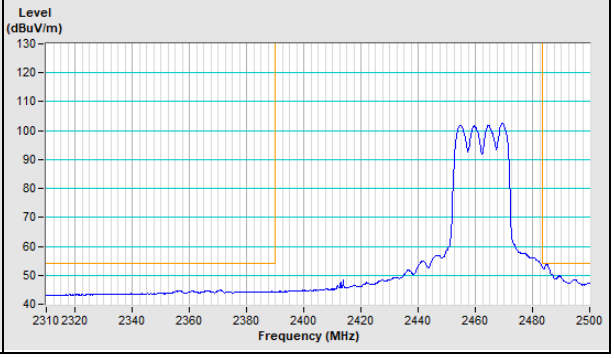
Horizontal (Average)



Vertical (Peak)

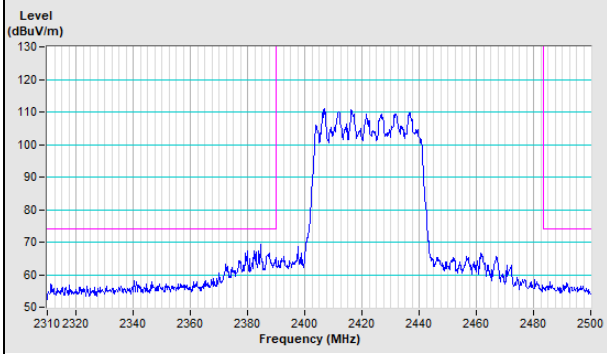


Vertical (Average)

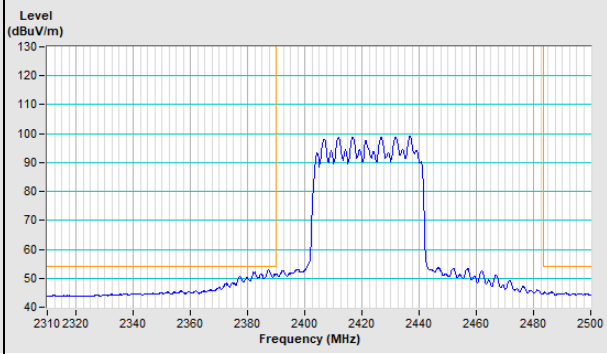


802.11ax (HE40) Channel 3

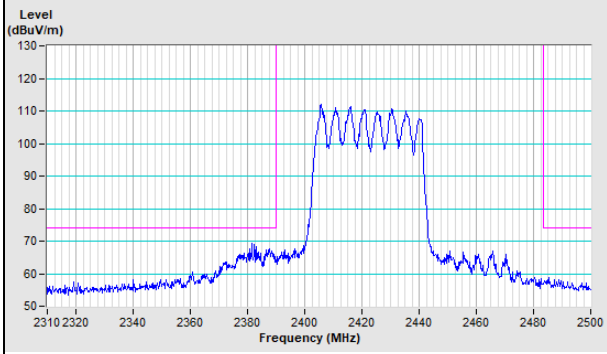
Horizontal (Peak)



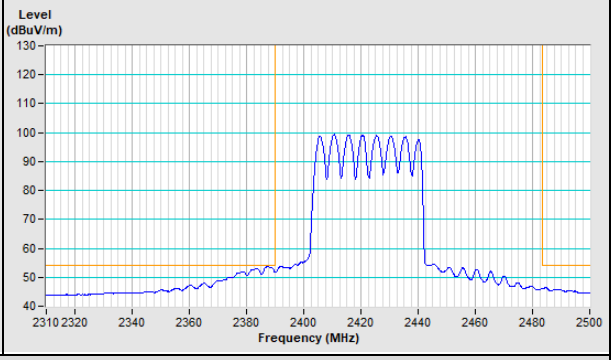
Horizontal (Average)



Vertical (Peak)

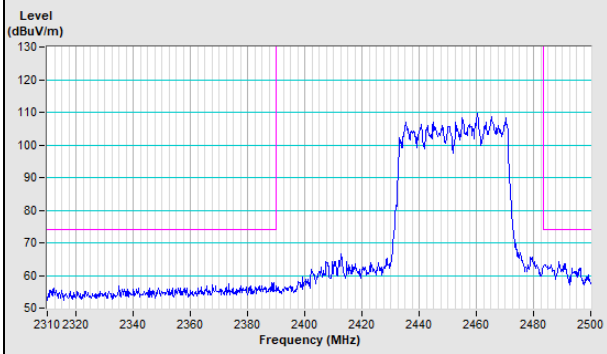


Vertical (Average)

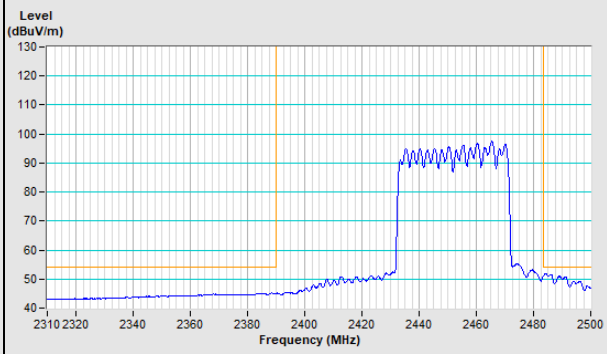


802.11ax (HE40) Channel 9

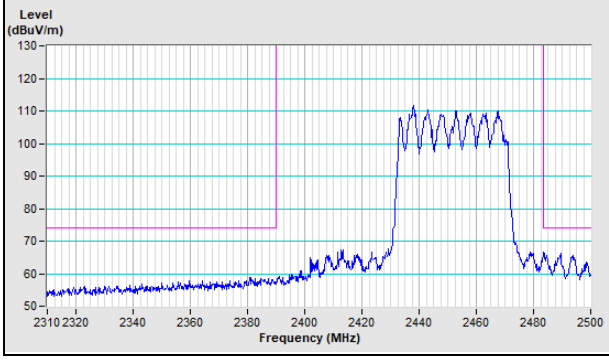
Horizontal (Peak)



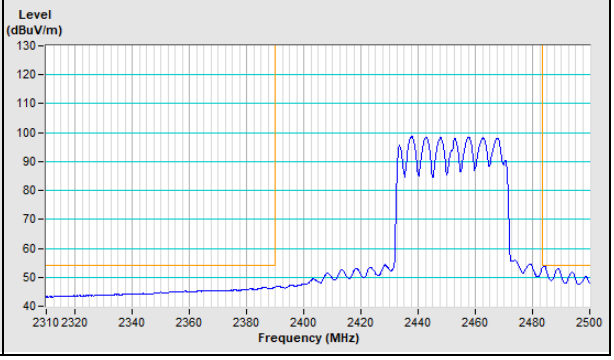
Horizontal (Average)



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

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