FCC Test Report

Report No.:	RFBBQZ-WTW-P21060012
FCC ID:	PY321100531
Test Model:	MR70
Series Model:	MS70
Received Date:	2021/6/7
Test Date:	2021/6/15 ~ 2021/10/15
Issued Date:	2021/10/29
Applicant and Manufacturer:	NETGEAR, INC.
Address:	350 East Plumeria Drive San Jose, CA 95134
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RFBBQZ-WTW-P21060012	Original release.	2021/10/29

1 Certificate of Conformity

Product:	Mesh WiFi 6 Router, Mesh WiFi 6 Satellite
Brand:	NETGEAR
Test Model:	MR70
Series Model:	MS70
Sample Status:	Engineering sample
Applicant and Manufacturer:	NETGEAR, INC.
Test Date:	2021/6/15 ~ 2021/10/15
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : Evy Chen , **Date:** 2021/10/29

Evy Chen / Specialist

Approved by : , **Date:** 2021/10/29

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -10.44 dB at 0.27104 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1 dB at 2385.50, 2485.10 and 2486.00 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is ipex (MHF) not a standard connector.

Note:

1. For 2.4 GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Conducted emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Mesh WiFi 6 Router, Mesh WiFi 6 Satellite
Brand	NETGEAR
Test Model	MR70
Series Model	MS70
Status of EUT	Engineering sample
Power Supply Rating	12 Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT (20/40) mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 300 Mbps VHT: up to 400 Mbps 802.11ax: up to 573.5 Mbps
Operating Frequency	2.412 ~ 2.462GHz
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:** 893.878 mW **Beamforming Mode:** 602.659 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. The EUT has two model names, which are identical to each other in all aspects except for the following information:

Brand Name	Model Name	Description
Mesh WiFi 6 Router	MR70	Function: Master, WAN port and single GPHY
Mesh WiFi 6 Satellite	MS70	Function: Master+Client
Note: From the above models, the worst model was found in **MR70**.Therefore only the test data of the modes were recorded in this report.		

2. The EUT has below radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz	WLAN 5GHz

3. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)_Ant0	WLAN (5GHz)_Ant1
2	WLAN (2.4GHz)_Ant1	WLAN (5GHz)_Ant0
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

4. The EUT must be supplied one power adapter and following different models could be chosen as following table:

No.	Brand	Model name	Part Number	Spec	plug	Difference
1	NETGEAR	2ABB018F 1	332-10927-01 & 332-10927-02	Intput: 100-120Vac, 50/60Hz, 0.6A Output: 12Vdc, 1.5A Output Cable: Unshielded, 1.8m, Without core	US	Design are identical, the only difference is manufacture location.
2	NETGEAR	AD2076F10	332-10993-01 & 332-10993-03	Intput: 100-120Vac, 50/60Hz, 0.56A Output: 12Vdc, 1.5A Output Cable: Unshielded, 1.8m, Without core	US	Design are identical , the differences are: 1)manufacture location 2)-01 has BSMI logo, and -03 does not have BSMI logo.

Note:
1. From the above adapters, the worst Radiated Emissions was found in Adapter 2 and the worst Conducted Emissions test was found in Adapter 1. Therefore only the test data of the modes were recorded in this report.

5. The antennas provided to the EUT, please refer to the following table:

Antenna NO.	RF Chain NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connecter Type
2.4G_0	0	2.85	2.4~2.4835GHz	PIFA	ipex(MHF)
2.4G_1	1	2.8	2.4~2.4835GHz	PIFA	ipex(MHF)
5G_0	0	2.11	5.15~5.25GHz	PIFA	ipex(MHF)
		2.11	5.25~5.35GHz		
		2.45	5.47~5.725GHz		
		2.31	5.725~5.85GHz		
5G_1	1	2.82	5.15~5.25GHz	PIFA	ipex(MHF)
		2.82	5.25~5.35GHz		
		2.65	5.47~5.725GHz		
		2.74	5.725~5.85GHz		

6. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX

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

7. 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.
8. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20):

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

7 channels are provided for 802.11n (HT40), VHT40, 802.11ax (HE40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

☒ 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.

CDD Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Radiated Emission Test (Below 1GHz):

☒ 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.

CDD Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	1 to 11	6	OFDMA	BPSK	MCS0

Power Line Conducted Emission Test:

☒ 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.

CDD Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	1 to 11	6	OFDMA	BPSK	MCS0

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

CDD Mode					
Mode	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
VHT20 (output power only)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40 (output power only)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
Beamforming Mode (output power only)					
Mode	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Test Condition:

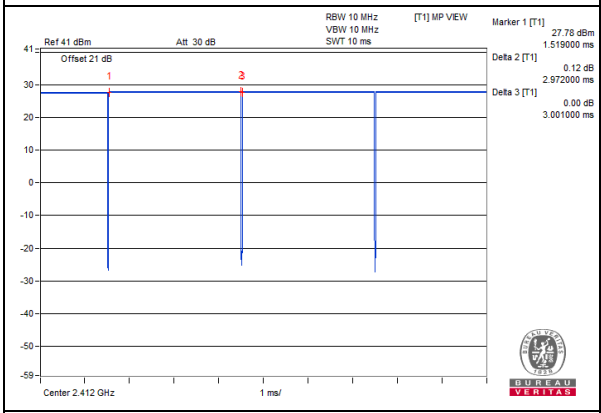
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Carter Lin
RE<1G	25deg. C, 66%RH	120Vac, 60Hz	Tom Yang
PLC	25deg. C, 66%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Leon Dai

3.3 Duty Cycle of Test Signal

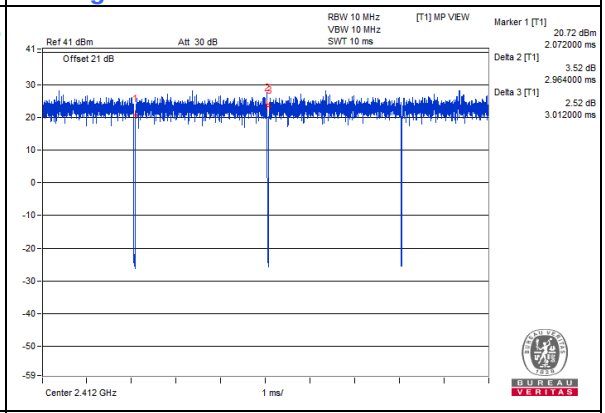
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11b: Duty cycle = 2.972 ms/3.001 ms = 0.99
802.11g: Duty cycle = 2.964 ms/3.012 ms = 0.984
802.11ax (HE20): Duty cycle = 2.963 ms/3.011 ms = 0.984
802.11ax (HE40): Duty cycle = 2.969 ms/3.007 ms = 0.987

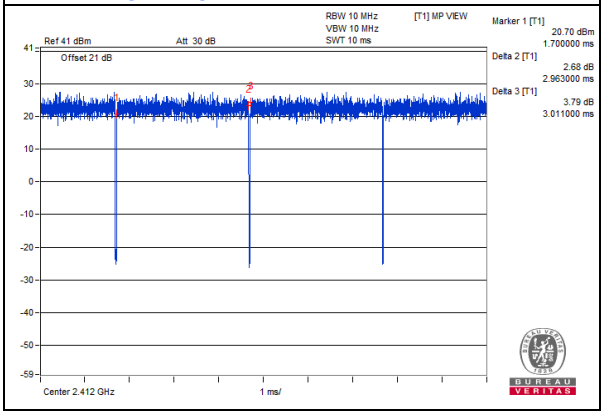
802.11b



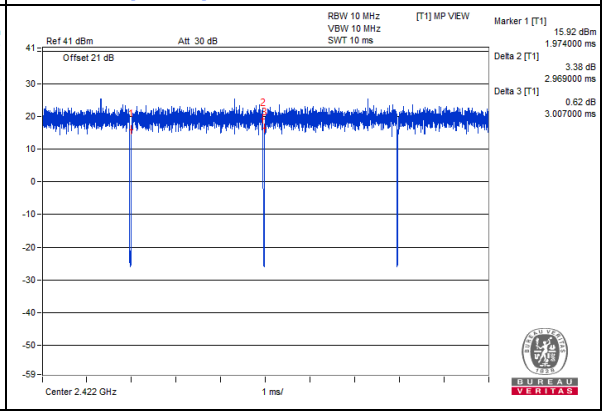
802.11g



802.11ax (HE20)



802.11ax (HE40)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

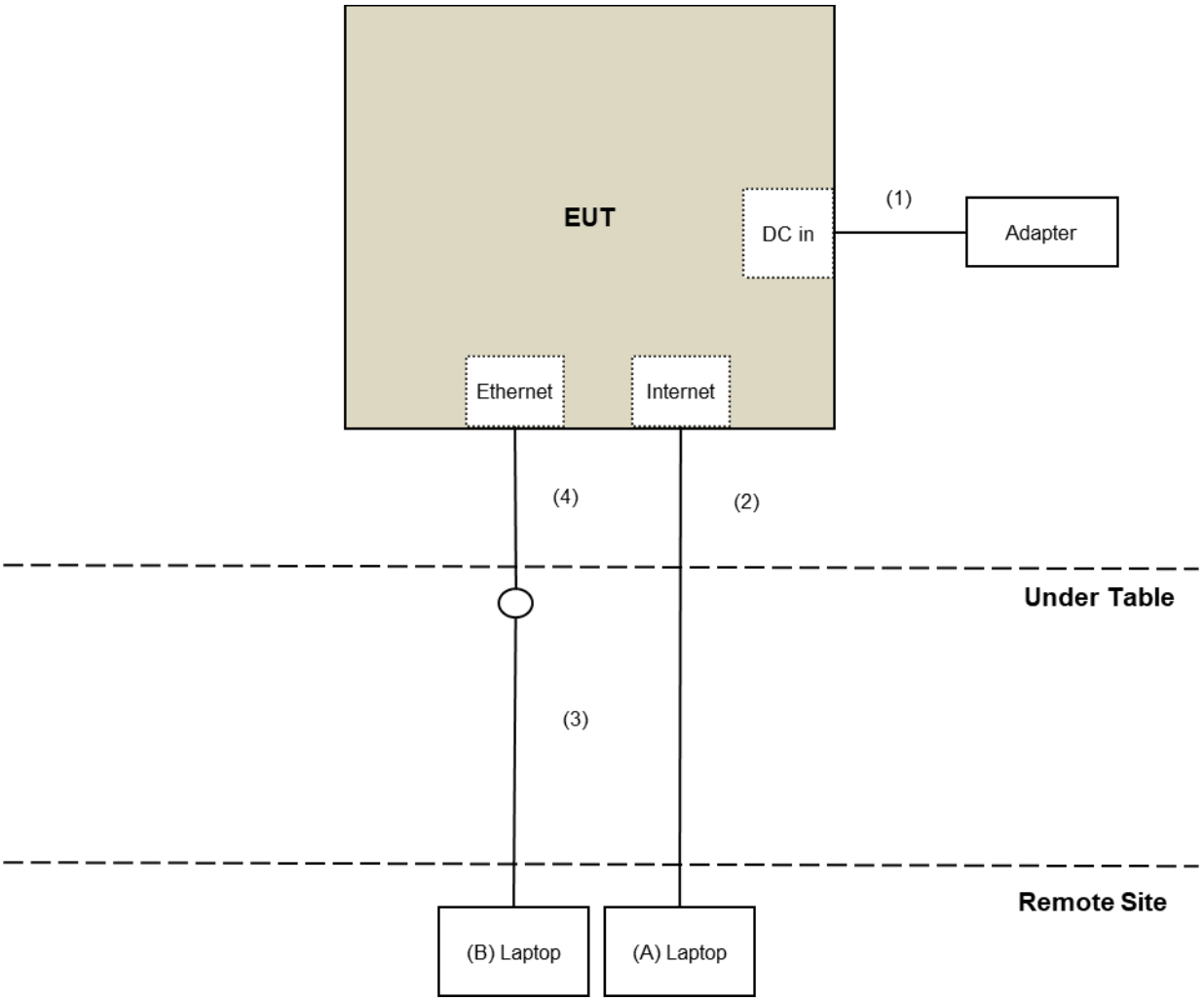
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test Standard:

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

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, 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 20dB under any condition of modulation.

4.1.2 Test Instruments

For Radiated emission & Bandedge test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	2020/12/1	2021/11/30
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Pre_Amplifier EMCI	EMC001340	980142	2021/5/24	2022/5/23
LOOP ANTENNA Electro-Metrics	EM-6879	264	2021/3/5	2022/3/4
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2021/1/7	2022/1/6
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-002	2021/1/7	2022/1/6
Pre_Amplifier EMCI	EMC330N	980701	2021/3/10	2022/3/9
Trilog Broadband Antenna Schwarzbeck	VULB 9168	9168-406	2020/11/6	2021/11/5
RF Coaxial Cable COMMATE/PEWC	8D	966-4-1	2021/3/17	2022/3/16
RF Coaxial Cable COMMATE/PEWC	8D	966-4-2	2021/3/17	2022/3/16
RF Coaxial Cable COMMATE/PEWC	8D	966-4-3	2021/3/17	2022/3/16
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-03	2021/1/11	2022/1/10
Horn Antenna SCHWARZBECK	BBHA 9120D	9120D-783	2020/11/22	2021/11/21
Pre_Amplifier EMCI	EMC 12630 SE	980638	2021/4/7	2022/4/6
RF Cable-Frequency Range : 1-26.5GHz EMCI	EMC104-SM-SM-1200	160922	2020/12/25	2021/12/24
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180502	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	180418	2021/4/26	2022/4/25
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170519	2020/11/22	2021/11/21
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: 2021/6/15 ~ 2021/10/13

For other test items test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	2021/3/8	2022/3/7
Power Meter Anritsu	ML2495A	1529002	2021/6/21	2022/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2021/5/31	2022/5/30
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2021/4/13	2022/4/12
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: 2021/10/15

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

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

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

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

f. The test-receiver system was set to peak and average 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.

Note:

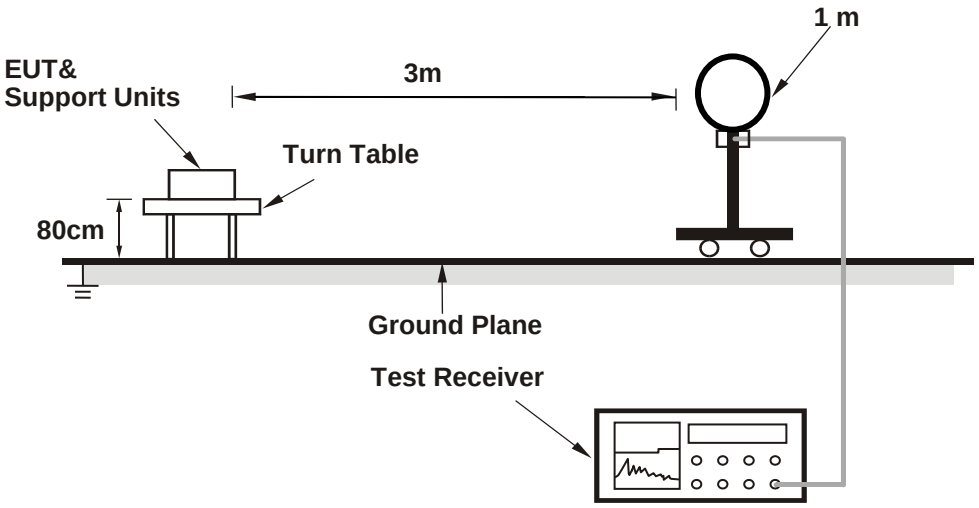
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

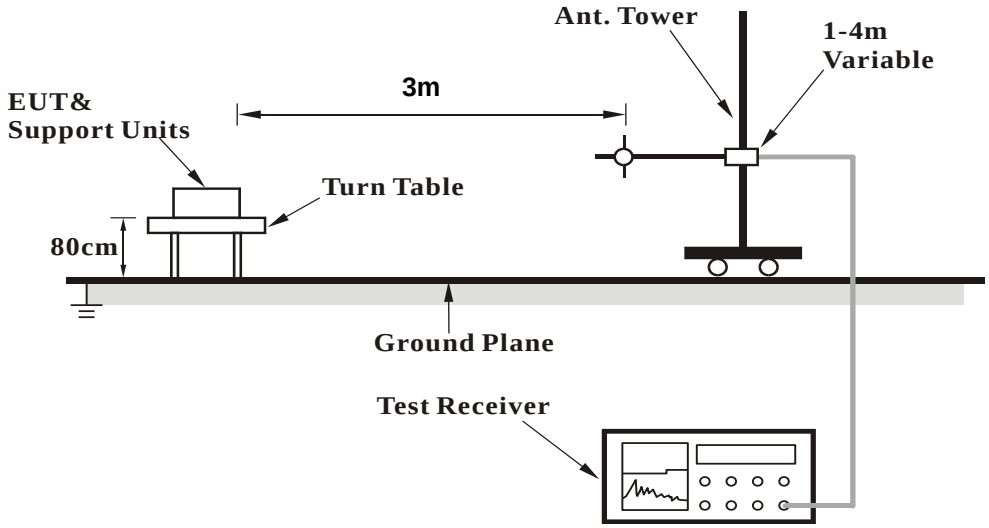
No deviation.

4.1.5 Test Setup

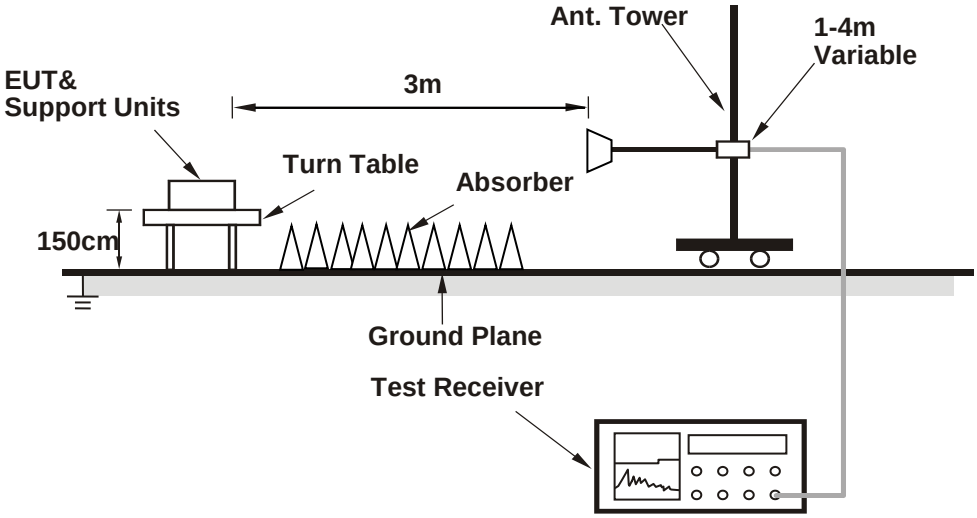
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop Computer which is placed on remote site.
b. Controlling software (TOOL: Mtool 3.1.0.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

RF Mode	TX 802.11b	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	2385.21	55.9 PK	74.0	-18.1	1.52 H	299	60.1	-4.2
2	2385.21	44.7 AV	54.0	-9.3	1.52 H	299	48.9	-4.2
3	*2412.00	109.4 PK			1.52 H	299	113.7	-4.3
4	*2412.00	107.3 AV			1.52 H	299	111.6	-4.3
5	4824.00	41.1 PK	74.0	-32.9	3.65 H	123	40.6	0.5
6	4824.00	35.5 AV	54.0	-18.5	3.65 H	123	35.0	0.5
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	2385.50	63.2 PK	74.0	-10.8	1.01 V	77	67.4	-4.2
2	**2385.50**	**53.9 AV**	**54.0**	**-0.1**	**1.01 V**	**77**	**58.1**	**-4.2**
3	*2412.00	120.1 PK			1.01 V	77	124.4	-4.3
4	*2412.00	117.3 AV			1.01 V	77	121.6	-4.3
5	4824.00	49.4 PK	74.0	-24.6	2.38 V	163	48.9	0.5
6	4824.00	44.5 AV	54.0	-9.5	2.38 V	163	44.0	0.5

Remarks:

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

RF Mode	TX 802.11b	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.0 PK	74.0	-18.0	1.01 H	57	60.3	-4.3
2	2390.00	44.0 AV	54.0	-10.0	1.01 H	57	48.3	-4.3
3	*2437.00	112.7 PK			1.01 H	57	117.0	-4.3
4	*2437.00	110.4 AV			1.01 H	57	114.7	-4.3
5	2483.50	56.3 PK	74.0	-17.7	1.01 H	57	60.7	-4.4
6	2483.50	43.9 AV	54.0	-10.1	1.01 H	57	48.3	-4.4
7	4874.00	43.3 PK	74.0	-30.7	3.61 H	134	42.8	0.5
8	4874.00	37.5 AV	54.0	-16.5	3.61 H	134	37.0	0.5
9	7311.00	41.7 PK	74.0	-32.3	1.48 H	254	34.9	6.8
10	7311.00	31.7 AV	54.0	-22.3	1.48 H	254	24.9	6.8
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	59.9 PK	74.0	-14.1	1.00 V	127	64.2	-4.3
2	2390.00	47.1 AV	54.0	-6.9	1.00 V	127	51.4	-4.3
3	*2437.00	121.3 PK			1.00 V	127	125.6	-4.3
4	*2437.00	119.2 AV			1.00 V	127	123.5	-4.3
5	2483.50	60.8 PK	74.0	-13.2	1.00 V	127	65.2	-4.4
6	2483.50	49.1 AV	54.0	-4.9	1.00 V	127	53.5	-4.4
7	4874.00	50.2 PK	74.0	-23.8	2.46 V	171	49.7	0.5
8	4874.00	45.8 AV	54.0	-8.2	2.46 V	171	45.3	0.5
9	7311.00	41.9 PK	74.0	-32.1	1.51 V	9	35.1	6.8
10	7311.00	32.0 AV	54.0	-22.0	1.51 V	9	25.2	6.8

Remarks:

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

RF Mode	TX 802.11b	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	109.8 PK			1.39 H	60	114.1	-4.3
2	*2462.00	107.5 AV			1.39 H	60	111.8	-4.3
3	2486.32	57.4 PK	74.0	-16.6	1.39 H	60	61.8	-4.4
4	2486.32	44.4 AV	54.0	-9.6	1.39 H	60	48.8	-4.4
5	4924.00	41.3 PK	74.0	-32.7	3.59 H	110	40.6	0.7
6	4924.00	35.6 AV	54.0	-18.4	3.59 H	110	34.9	0.7
7	7386.00	41.4 PK	74.0	-32.6	1.42 H	243	34.2	7.2
8	7386.00	31.6 AV	54.0	-22.4	1.42 H	243	24.4	7.2
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	120.0 PK			1.02 V	77	124.3	-4.3
2	*2462.00	117.2 AV			1.02 V	77	121.5	-4.3
3	2486.00	63.0 PK	74.0	-11.0	1.02 V	77	67.4	-4.4
4	**2486.00**	**53.9 AV**	**54.0**	**-0.1**	**1.02 V**	**77**	**58.3**	**-4.4**
5	4924.00	48.7 PK	74.0	-25.3	2.40 V	160	48.0	0.7
6	4924.00	44.1 AV	54.0	-9.9	2.40 V	160	43.4	0.7
7	7386.00	42.0 PK	74.0	-32.0	1.53 V	5	34.8	7.2
8	7386.00	32.3 AV	54.0	-21.7	1.53 V	5	25.1	7.2

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.

RF Mode	TX 802.11g	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	2387.90	62.9 PK	74.0	-11.1	1.41 H	4	67.1	-4.2
2	2387.90	43.7 AV	54.0	-10.3	1.41 H	4	47.9	-4.2
3	*2412.00	108.6 PK			1.41 H	4	112.9	-4.3
4	*2412.00	98.3 AV			1.41 H	4	102.6	-4.3
5	4824.00	44.5 PK	74.0	-29.5	1.45 H	198	44.0	0.5
6	4824.00	32.4 AV	54.0	-21.6	1.45 H	198	31.9	0.5
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	73.8 PK	74.0	-0.2	1.14 V	78	78.1	-4.3
2	2390.00	50.8 AV	54.0	-3.2	1.14 V	78	55.1	-4.3
3	*2412.00	116.9 PK			1.14 V	78	121.2	-4.3
4	*2412.00	106.6 AV			1.14 V	78	110.9	-4.3
5	4824.00	48.7 PK	74.0	-25.3	1.27 V	38	48.2	0.5
6	4824.00	37.1 AV	54.0	-16.9	1.27 V	38	36.6	0.5

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	61.4 PK	74.0	-12.6	1.46 H	16	65.7	-4.3
2	2390.00	43.5 AV	54.0	-10.5	1.46 H	16	47.8	-4.3
3	*2437.00	113.8 PK			1.46 H	16	118.1	-4.3
4	*2437.00	103.2 AV			1.46 H	16	107.5	-4.3
5	2483.50	62.3 PK	74.0	-11.7	1.46 H	16	66.7	-4.4
6	2483.50	44.8 AV	54.0	-9.2	1.46 H	16	49.2	-4.4
7	4874.00	48.8 PK	74.0	-25.2	1.41 H	214	48.3	0.5
8	4874.00	37.1 AV	54.0	-16.9	1.41 H	214	36.6	0.5
9	7311.00	43.1 PK	74.0	-30.9	1.37 H	254	36.3	6.8
10	7311.00	34.8 AV	54.0	-19.2	1.37 H	254	28.0	6.8
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	70.2 PK	74.0	-3.8	1.01 V	76	74.5	-4.3
2	2390.00	53.1 AV	54.0	-0.9	1.01 V	76	57.4	-4.3
3	*2437.00	121.3 PK			1.01 V	76	125.6	-4.3
4	*2437.00	111.5 AV			1.01 V	76	115.8	-4.3
5	**2485.10**	**73.9 PK**	**74.0**	**-0.1**	**1.01 V**	**76**	**78.3**	**-4.4**
6	2485.10	53.6 AV	54.0	-0.4	1.01 V	76	58.0	-4.4
7	4874.00	54.5 PK	74.0	-19.5	1.00 V	31	54.0	0.5
8	4874.00	42.6 AV	54.0	-11.4	1.00 V	31	42.1	0.5
9	7311.00	41.9 PK	74.0	-32.1	2.37 V	24	35.1	6.8
10	7311.00	31.6 AV	54.0	-22.4	2.37 V	24	24.8	6.8

Remarks:

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

RF Mode	TX 802.11g	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	108.5 PK			1.38 H	4	112.8	-4.3
2	*2462.00	98.9 AV			1.38 H	4	103.2	-4.3
3	2484.29	63.9 PK	74.0	-10.1	1.38 H	4	68.3	-4.4
4	2484.29	45.5 AV	54.0	-8.5	1.38 H	4	49.9	-4.4
5	4924.00	44.3 PK	74.0	-29.7	1.45 H	213	43.6	0.7
6	4924.00	32.4 AV	54.0	-21.6	1.45 H	213	31.7	0.7
7	7386.00	39.5 PK	74.0	-34.5	1.38 H	244	32.3	7.2
8	7386.00	31.1 AV	54.0	-22.9	1.38 H	244	23.9	7.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	117.2 PK			1.14 V	78	121.5	-4.3
2	*2462.00	106.5 AV			1.14 V	78	110.8	-4.3
3	2483.50	73.5 PK	74.0	-0.5	1.14 V	78	77.9	-4.4
4	2483.50	50.7 AV	54.0	-3.3	1.14 V	78	55.1	-4.4
5	4924.00	49.1 PK	74.0	-24.9	1.21 V	40	48.4	0.7
6	4924.00	37.3 AV	54.0	-16.7	1.21 V	40	36.6	0.7
7	7386.00	41.3 PK	74.0	-32.7	2.39 V	38	34.1	7.2
8	7386.00	31.2 AV	54.0	-22.8	2.39 V	38	24.0	7.2

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	2388.51	60.0 PK	74.0	-14.0	1.40 H	4	64.2	-4.2
2	2388.51	45.3 AV	54.0	-8.7	1.40 H	4	49.5	-4.2
3	*2412.00	110.7 PK			1.40 H	4	115.0	-4.3
4	*2412.00	98.1 AV			1.40 H	4	102.4	-4.3
5	4824.00	43.9 PK	74.0	-30.1	1.37 H	185	43.4	0.5
6	4824.00	32.5 AV	54.0	-21.5	1.37 H	185	32.0	0.5
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	73.0 PK	74.0	-1.0	1.21 V	78	77.3	-4.3
2	2390.00	53.8 AV	54.0	-0.2	1.21 V	78	58.1	-4.3
3	*2412.00	118.3 PK			1.21 V	78	122.6	-4.3
4	*2412.00	106.1 AV			1.21 V	78	110.4	-4.3
5	4824.00	49.2 PK	74.0	-24.8	1.24 V	50	48.7	0.5
6	4824.00	37.2 AV	54.0	-16.8	1.24 V	50	36.7	0.5

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	2388.21	59.3 PK	74.0	-14.7	1.41 H	11	63.5	-4.2
2	2388.21	44.7 AV	54.0	-9.3	1.41 H	11	48.9	-4.2
3	*2437.00	115.1 PK			1.41 H	11	119.4	-4.3
4	*2437.00	101.5 AV			1.41 H	11	105.8	-4.3
5	2484.50	61.4 PK	74.0	-12.6	1.41 H	11	65.8	-4.4
6	2484.50	45.1 AV	54.0	-8.9	1.41 H	11	49.5	-4.4
7	4874.00	44.4 PK	74.0	-29.6	1.36 H	196	43.9	0.5
8	4874.00	32.7 AV	54.0	-21.3	1.36 H	196	32.2	0.5
9	7311.00	40.0 PK	74.0	-34.0	1.32 H	261	33.2	6.8
10	7311.00	31.4 AV	54.0	-22.6	1.32 H	261	24.6	6.8
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	2388.21	66.5 PK	74.0	-7.5	1.01 V	76	70.7	-4.2
2	2388.21	52.5 AV	54.0	-1.5	1.01 V	76	56.7	-4.2
3	*2437.00	123.4 PK			1.01 V	76	127.7	-4.3
4	*2437.00	109.9 AV			1.01 V	76	114.2	-4.3
5	2484.50	66.9 PK	74.0	-7.1	1.01 V	76	71.3	-4.4
6	**2484.50**	**53.9 AV**	**54.0**	**-0.1**	**1.01 V**	**76**	**58.3**	**-4.4**
7	4874.00	49.2 PK	74.0	-24.8	1.18 V	54	48.7	0.5
8	4874.00	37.4 AV	54.0	-16.6	1.18 V	54	36.9	0.5
9	7311.00	41.1 PK	74.0	-32.9	2.42 V	42	34.3	6.8
10	7311.00	30.8 AV	54.0	-23.2	2.42 V	42	24.0	6.8

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 11：2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	111.3 PK			1.37 H	5	115.6	-4.3
2	*2462.00	98.6 AV			1.37 H	5	102.9	-4.3
3	2483.84	63.4 PK	74.0	-10.6	1.37 H	5	67.8	-4.4
4	2483.84	46.3 AV	54.0	-7.7	1.37 H	5	50.7	-4.4
5	4924.00	44.0 PK	74.0	-30.0	1.42 H	200	43.3	0.7
6	4924.00	32.2 AV	54.0	-21.8	1.42 H	200	31.5	0.7
7	7386.00	39.8 PK	74.0	-34.2	1.33 H	251	32.6	7.2
8	7386.00	31.5 AV	54.0	-22.5	1.33 H	251	24.3	7.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	118.1 PK			1.00 V	80	122.4	-4.3
2	*2462.00	106.0 AV			1.00 V	80	110.3	-4.3
3	2483.50	71.6 PK	74.0	-2.4	1.00 V	80	76.0	-4.4
4	2483.50	53.5 AV	54.0	-0.5	1.00 V	80	57.9	-4.4
5	4924.00	49.3 PK	74.0	-24.7	1.19 V	46	48.6	0.7
6	4924.00	37.6 AV	54.0	-16.4	1.19 V	46	36.9	0.7
7	7386.00	40.9 PK	74.0	-33.1	2.35 V	33	33.7	7.2
8	7386.00	30.7 AV	54.0	-23.3	2.35 V	33	23.5	7.2

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.

RF Mode	TX 802.11ax (HE40)	Channel	CH 3：2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	2388.62	62.3 PK	74.0	-11.7	1.17 H	4	66.5	-4.2
2	2388.62	45.5 AV	54.0	-8.5	1.17 H	4	49.7	-4.2
3	*2422.00	106.2 PK			1.17 H	4	110.5	-4.3
4	*2422.00	95.7 AV			1.17 H	4	100.0	-4.3
5	4844.00	44.5 PK	74.0	-29.5	1.38 H	189	44.0	0.5
6	4844.00	32.5 AV	54.0	-21.5	1.38 H	189	32.0	0.5
7	7266.00	40.0 PK	74.0	-34.0	1.29 H	239	33.3	6.7
8	7266.00	31.4 AV	54.0	-22.6	1.29 H	239	24.7	6.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	67.3 PK	74.0	-6.7	1.21 V	77	71.6	-4.3
2	2390.00	53.5 AV	54.0	-0.5	1.21 V	77	57.8	-4.3
3	*2422.00	114.4 PK			1.21 V	77	118.7	-4.3
4	*2422.00	102.0 AV			1.21 V	77	106.3	-4.3
5	4844.00	49.4 PK	74.0	-24.6	1.17 V	40	48.9	0.5
6	4844.00	37.5 AV	54.0	-16.5	1.17 V	40	37.0	0.5
7	7266.00	41.1 PK	74.0	-32.9	2.33 V	39	34.4	6.7
8	7266.00	30.8 AV	54.0	-23.2	2.33 V	39	24.1	6.7

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 6：2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	2388.54	61.2 PK	74.0	-12.8	1.12 H	12	65.4	-4.2
2	2388.54	45.0 AV	54.0	-9.0	1.12 H	12	49.2	-4.2
3	*2437.00	107.5 PK			1.12 H	12	111.8	-4.3
4	*2437.00	95.7 AV			1.12 H	12	100.0	-4.3
5	2484.60	62.1 PK	74.0	-11.9	1.12 H	12	66.5	-4.4
6	2484.60	45.6 AV	54.0	-8.4	1.12 H	12	50.0	-4.4
7	4874.00	44.7 PK	74.0	-29.3	1.48 H	196	44.2	0.5
8	4874.00	32.6 AV	54.0	-21.4	1.48 H	196	32.1	0.5
9	7311.00	39.5 PK	74.0	-34.5	1.31 H	254	32.7	6.8
10	7311.00	31.5 AV	54.0	-22.5	1.31 H	254	24.7	6.8
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	2388.54	72.2 PK	74.0	-1.8	1.33 V	75	76.4	-4.2
2	2388.54	53.1 AV	54.0	-0.9	1.33 V	75	57.3	-4.2
3	*2437.00	116.2 PK			1.33 V	75	120.5	-4.3
4	*2437.00	104.0 AV			1.33 V	75	108.3	-4.3
5	2484.60	71.4 PK	74.0	-2.6	1.33 V	75	75.8	-4.4
6	2484.60	53.8 AV	54.0	-0.2	1.33 V	75	58.2	-4.4
7	4874.00	49.5 PK	74.0	-24.5	1.14 V	32	49.0	0.5
8	4874.00	38.0 AV	54.0	-16.0	1.14 V	32	37.5	0.5
9	7311.00	40.6 PK	74.0	-33.4	2.33 V	34	33.8	6.8
10	7311.00	30.4 AV	54.0	-23.6	2.33 V	34	23.6	6.8

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 9：2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 75% RH
Tested By	Carter Lin		

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	107.3 PK			1.38 H	3	111.6	-4.3
2	*2452.00	96.2 AV			1.38 H	3	100.5	-4.3
3	2483.88	63.5 PK	74.0	-10.5	1.38 H	3	67.9	-4.4
4	2483.88	46.5 AV	54.0	-7.5	1.38 H	3	50.9	-4.4
5	4904.00	44.5 PK	74.0	-29.5	1.37 H	210	43.9	0.6
6	4904.00	32.7 AV	54.0	-21.3	1.37 H	210	32.1	0.6
7	7356.00	39.9 PK	74.0	-34.1	1.28 H	264	32.9	7.0
8	7356.00	31.7 AV	54.0	-22.3	1.28 H	264	24.7	7.0
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	115.3 PK			1.21 V	78	119.6	-4.3
2	*2452.00	102.4 AV			1.21 V	78	106.7	-4.3
3	2483.50	73.5 PK	74.0	-0.5	1.21 V	78	77.9	-4.4
4	2483.50	53.0 AV	54.0	-1.0	1.21 V	78	57.4	-4.4
5	4904.00	49.8 PK	74.0	-24.2	1.19 V	39	49.2	0.6
6	4904.00	38.1 AV	54.0	-15.9	1.19 V	39	37.5	0.6
7	7356.00	40.3 PK	74.0	-33.7	2.31 V	49	33.3	7.0
8	7356.00	30.2 AV	54.0	-23.8	2.31 V	49	23.2	7.0

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.

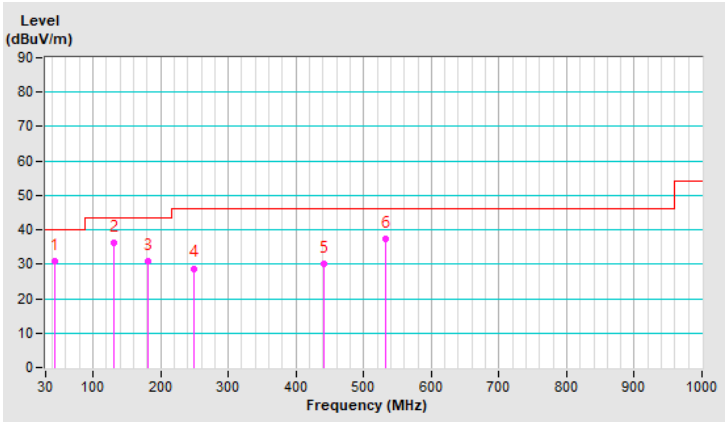
Below 1GHz Data:

RF Mode	TX 802.11ax (HE20)	Channel	CH 6：2437 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °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	44.43	30.9 QP	40.0	-9.1	2.00 H	338	43.4	-12.5
2	131.10	36.2 QP	43.5	-7.3	3.00 H	96	49.3	-13.1
3	182.27	31.0 QP	43.5	-12.5	1.50 H	92	44.9	-13.9
4	250.02	28.8 QP	46.0	-17.2	1.00 H	159	41.5	-12.7
5	440.50	30.2 QP	46.0	-15.8	2.00 H	239	36.5	-6.3
6	533.09	37.2 QP	46.0	-8.8	1.50 H	99	41.5	-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 of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

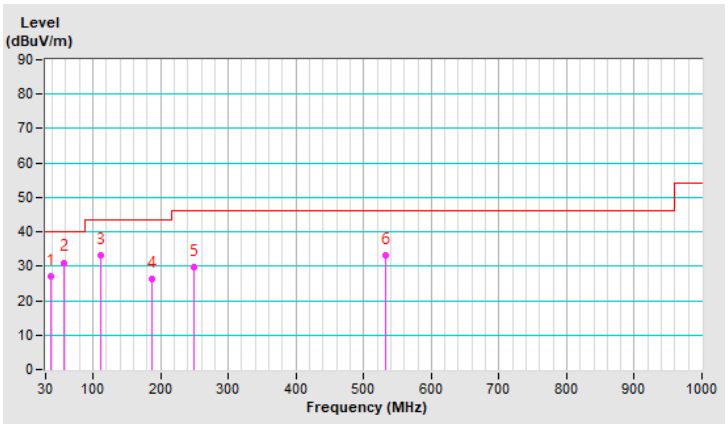


RF Mode	TX 802.11ax (HE20)	Channel	CH 6：2437 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)
Input Power	120Vac, 60Hz	Environmental Conditions	25 °C, 66% RH
Tested By	Tom Yang		

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	37.42	27.2 QP	40.0	-12.8	1.50 V	186	40.3	-13.1
2	56.80	31.1 QP	40.0	-8.9	1.50 V	184	44.1	-13.0
3	111.14	33.3 QP	43.5	-10.2	1.50 V	276	48.3	-15.0
4	186.36	26.3 QP	43.5	-17.2	1.50 V	159	40.6	-14.3
5	250.02	29.8 QP	46.0	-16.2	1.50 V	184	42.5	-12.7
6	532.75	33.0 QP	46.0	-13.0	1.00 V	251	37.3	-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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 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 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	2021/10/13	2022/10/12
LISN R&S	ESH3-Z5	848773/004	2020/10/27	2021/10/26
LISN R & S	ESH3-Z5	835239/001	2021/3/26	2022/3/25
50 ohms Terminator	50	3	2020/10/26	2021/10/25
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2021/9/25	2022/9/24
Fixed attenuator STI	STI02-2200-10	005	2021/8/27	2022/8/26
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: 2021/10/14

4.2.3 Test Procedures

a. The EUT was 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/ 50uH of coupling impedance for the measuring instrument.

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

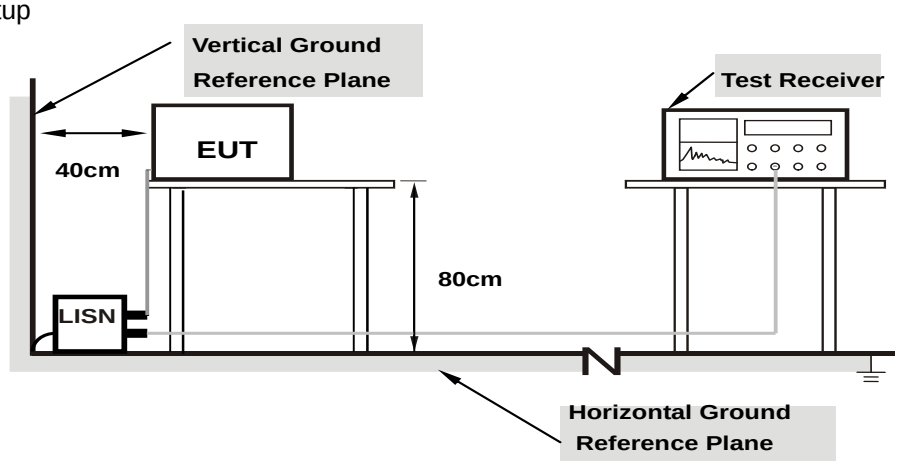
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 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).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

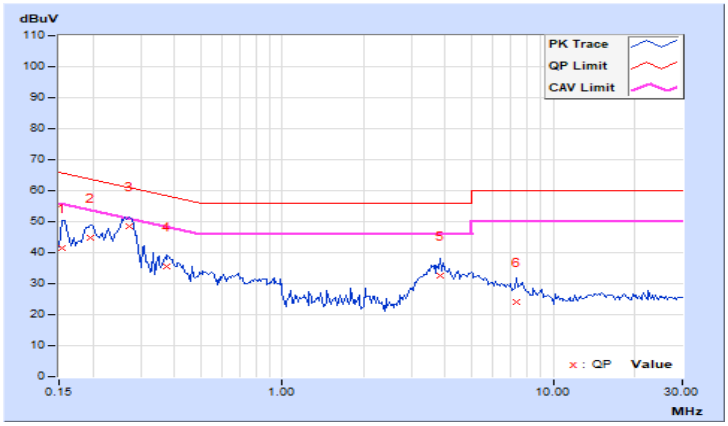
4.2.7 Test Results

RF Mode	TX 802.11ax (HE20)	Channel	CH 6：2437 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	Environmental Conditions	25 °C, 68% RH
Tested By	Sampson Chen		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.05	31.37	18.43	41.42	28.48	65.79	55.79	-24.37	-27.31
2	0.19687	10.07	34.63	27.47	44.70	37.54	63.74	53.74	-19.04	-16.20
3	**0.27109**	**10.08**	**38.41**	**30.56**	**48.49**	**40.64**	**61.08**	**51.08**	**-12.59**	**-10.44**
4	0.37656	10.09	25.40	17.71	35.49	27.80	58.35	48.35	-22.86	-20.55
5	3.82422	10.33	22.08	15.56	32.41	25.89	56.00	46.00	-23.59	-20.11
6	7.32031	10.60	13.46	8.30	24.06	18.90	60.00	50.00	-35.94	-31.10

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

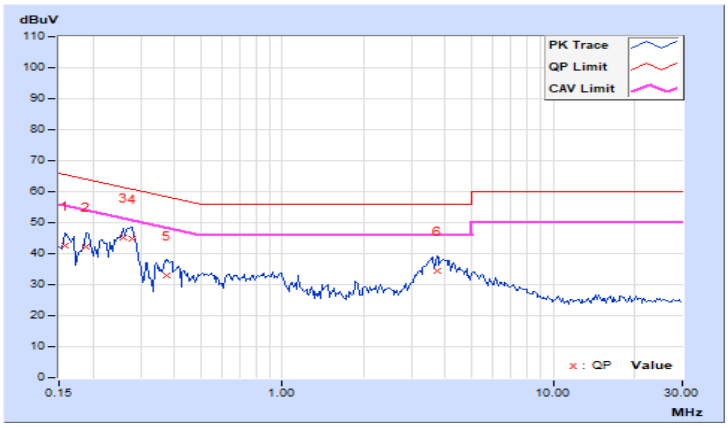


RF Mode	TX 802.11ax (HE20)	**Channel**	CH 6：2437 MHz
Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power (System)	120Vac, 60Hz	**Environmental Conditions**	25 °C, 68% RH
Tested By	Sampson Chen		

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.15781	10.07	32.55	21.23	42.62	31.30	65.58	55.58	-22.96	-24.28
2	0.18906	10.09	32.01	24.02	42.10	34.11	64.08	54.08	-21.98	-19.97
3	0.25938	10.10	35.26	28.92	45.36	39.02	61.45	51.45	-16.09	-12.43
4	0.27891	10.10	34.61	27.13	44.71	37.23	60.85	50.85	-16.14	-13.62
5	0.37266	10.12	22.76	14.98	32.88	25.10	58.44	48.44	-25.56	-23.34
6	3.71484	10.34	23.93	17.74	34.27	28.08	56.00	46.00	-21.73	-17.92

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

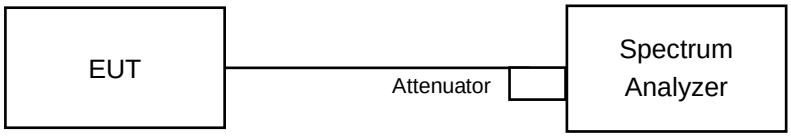


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.11	7.04	0.5	Pass
6	2437	7.1	7.09	0.5	Pass
11	2462	6.64	7.11	0.5	Pass

802.11g

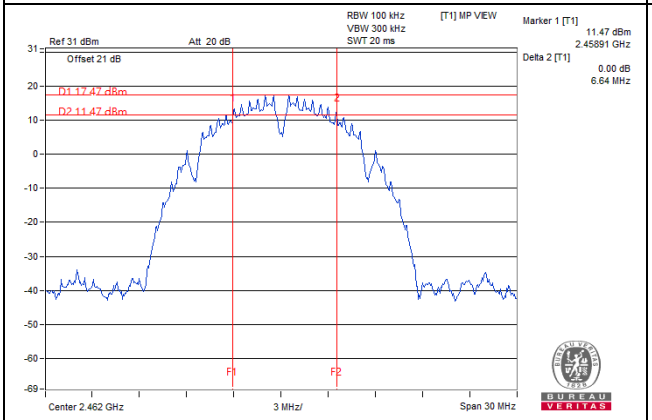
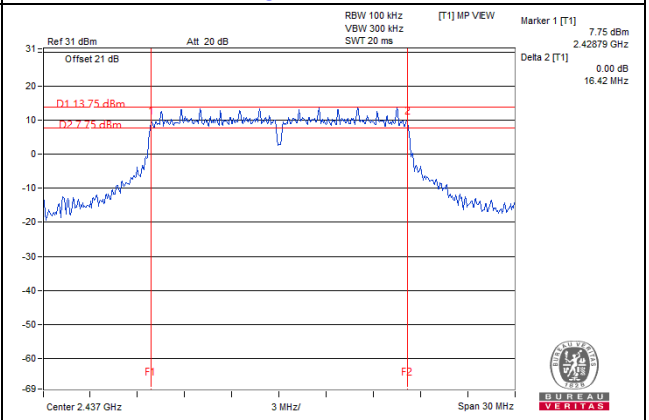
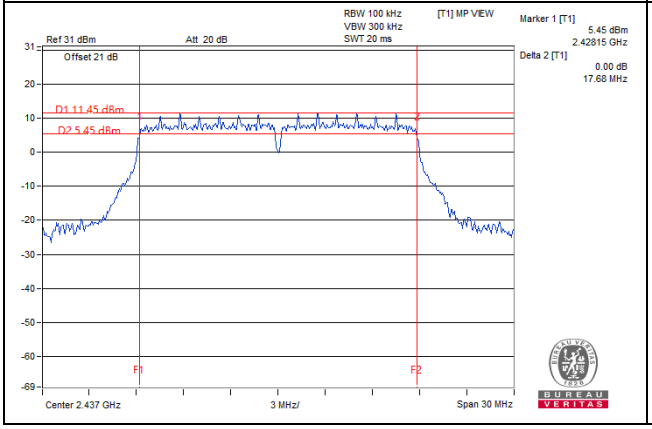
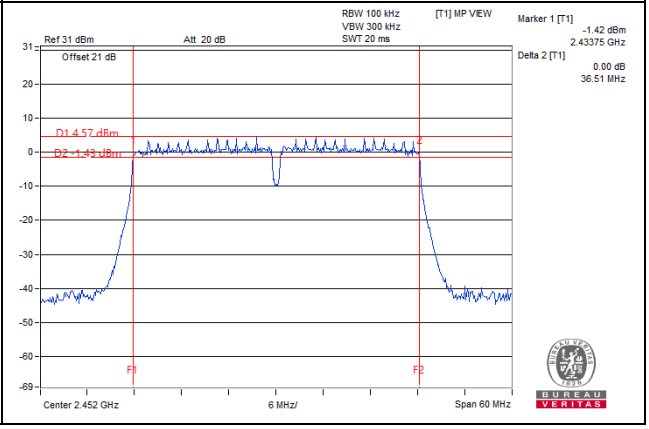
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.46	16.43	0.5	Pass
6	2437	16.43	16.42	0.5	Pass
11	2462	16.45	16.44	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.69	17.7	0.5	Pass
6	2437	17.68	17.7	0.5	Pass
11	2462	17.7	17.71	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.53	36.54	0.5	Pass
6	2437	36.52	36.54	0.5	Pass
9	2452	36.51	36.57	0.5	Pass

Spectrum Plot of Worst Value	
802.11b_Chain 0 / CH11	**802.11g_Chain 1 / CH6**
	
802.11ax (HE20)_Chain 0 / CH6	**802.11ax (HE40)_Chain 0 / CH9**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

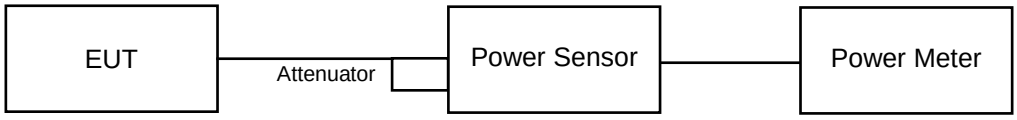
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

CDD Mode:

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	25.14	25.12	651.675	28.14	30	Pass
6	2437	26.24	26.75	893.878	29.51	30	Pass
11	2462	24.87	24.90	615.932	27.90	30	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.09	19.82	177.036	22.48	30	Pass
6	2437	24.95	25.23	646.034	28.10	30	Pass
11	2462	19.07	19.76	175.347	22.44	30	Pass

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.97	19.76	173.51	22.39	30	Pass
6	2437	24.68	24.87	600.667	27.79	30	Pass
11	2462	18.77	19.63	167.169	22.23	30	Pass

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.48	19.63	162.303	22.10	30	Pass
6	2437	20.03	20.75	219.543	23.42	30	Pass
9	2452	18.68	19.89	171.289	22.34	30	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.28	20.11	187.288	22.73	30	Pass
6	2437	24.73	24.85	602.659	27.80	30	Pass
11	2462	19.19	20.15	186.499	22.71	30	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.75	19.99	174.759	22.42	30	Pass
6	2437	19.94	20.91	221.938	23.46	30	Pass
9	2452	19.02	20.14	183.076	22.63	30	Pass

Beamforming Mode:

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.97	19.76	173.51	22.39	30	Pass
6	2437	24.68	24.87	600.667	27.79	30	Pass
11	2462	18.77	19.63	167.169	22.23	30	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power limit shall not be reduced.

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.48	19.63	162.303	22.10	30	Pass
6	2437	20.03	20.75	219.543	23.42	30	Pass
9	2452	18.68	19.89	171.289	22.34	30	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.28	20.11	187.288	22.73	30	Pass
6	2437	24.73	24.85	602.659	27.80	30	Pass
11	2462	19.19	20.15	186.499	22.71	30	Pass

Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.75	19.99	174.759	22.42	30	Pass
6	2437	19.94	20.91	221.938	23.46	30	Pass
9	2452	19.02	20.14	183.076	22.63	30	Pass

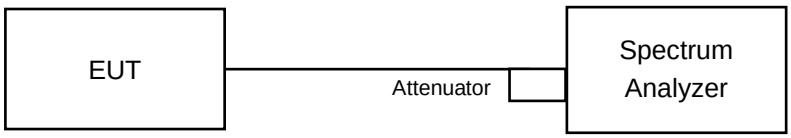
Note: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power limit shall not be reduced.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-7.18	-6.72	-3.93	8.00	Pass
6	2437	-6.01	-5.70	-2.84	8.00	Pass
11	2462	-7.24	-7.04	-4.13	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power density limit shall not be reduced.

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-14.26	-13.33	-10.76	8.00	Pass
6	2437	-8.94	-8.47	-5.69	8.00	Pass
11	2462	-13.95	-14.03	-10.98	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power density limit shall not be reduced.

802.11ax (HE20)

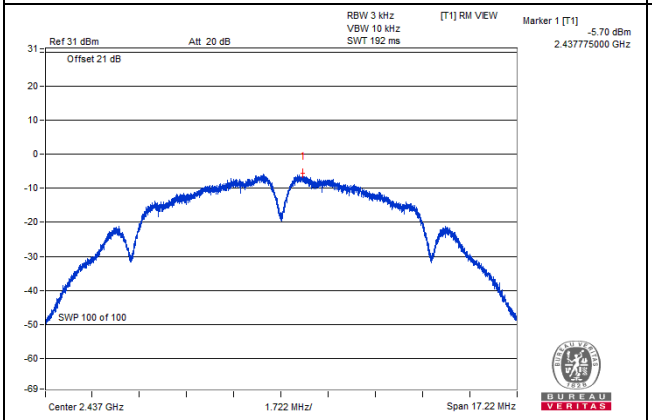
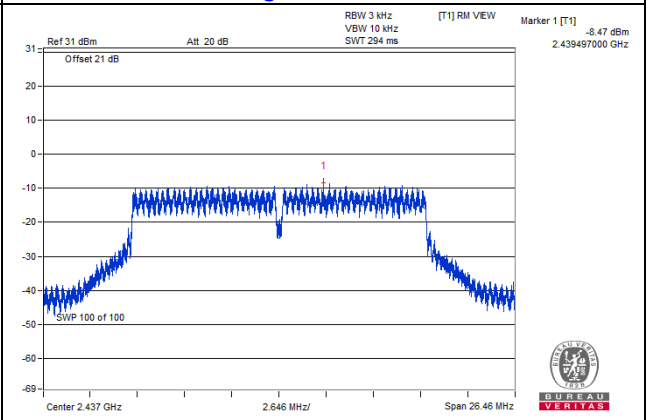
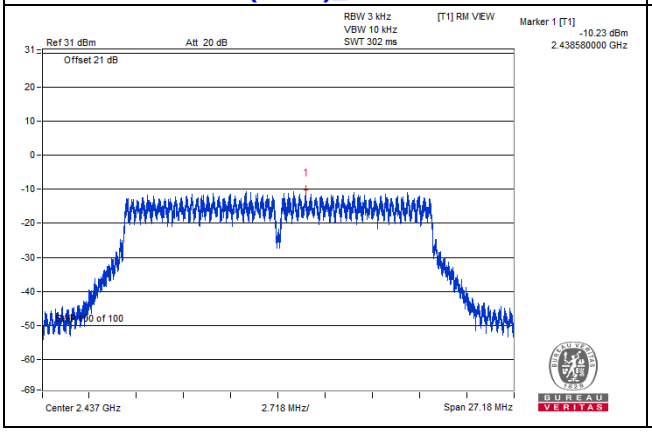
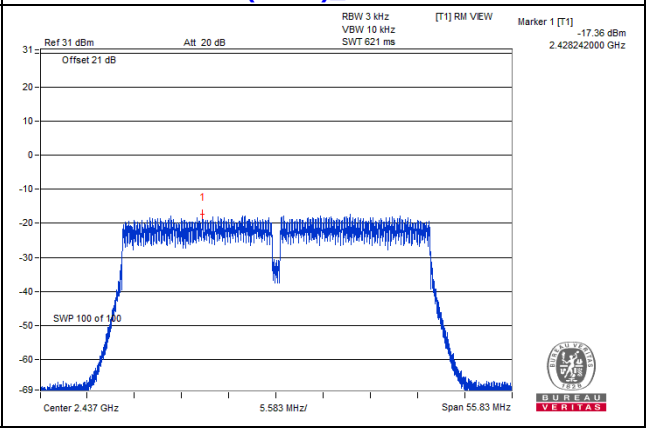
Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-15.14	-13.88	-11.45	8.00	Pass
6	2437	-11.15	-10.23	-7.66	8.00	Pass
11	2462	-15.17	-13.36	-11.16	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power density limit shall not be reduced.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
3	2422	-17.71	-17.78	-14.73	8.00	Pass
6	2437	-17.84	-17.36	-14.58	8.00	Pass
9	2452	-18.15	-17.84	-14.98	8.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.84 dBi < 6dBi, so the power density limit shall not be reduced.

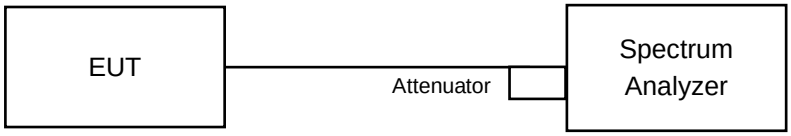
Spectrum Plot of Worst Value	
802.11b_Chain 1 / CH6	**802.11g_Chain 1 / CH6**
	
802.11ax (HE20)_Chain 1 / CH6	**802.11ax (HE40)_Chain 1 / CH6**
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

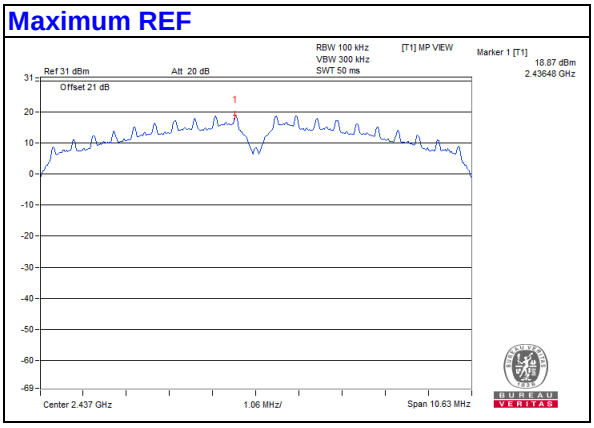
Same as Item 4.3.6

4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

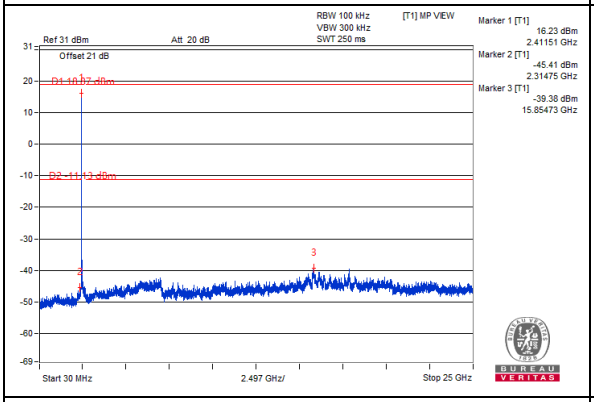
802.11b

Maximum REF

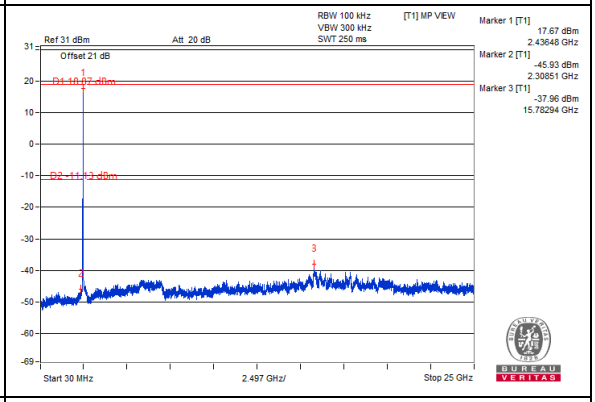


Chain 0

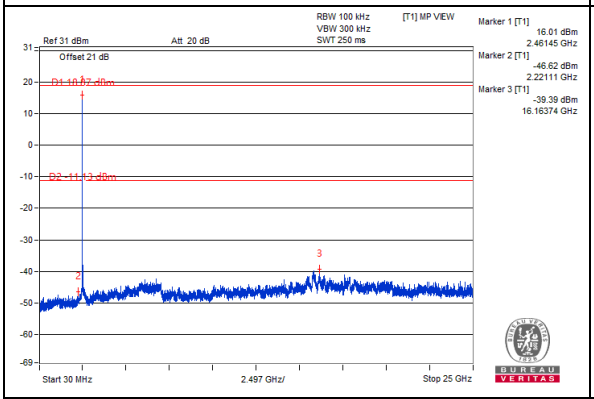
CH 1



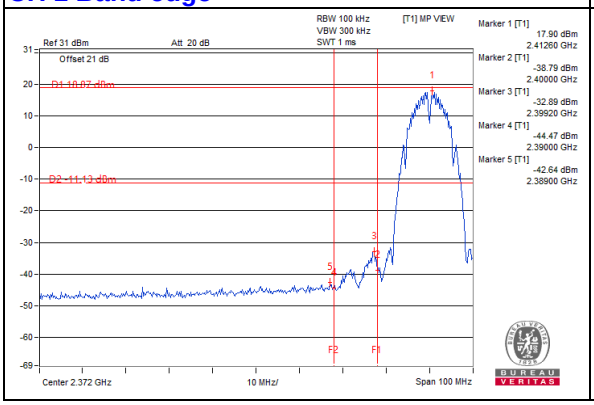
CH 6



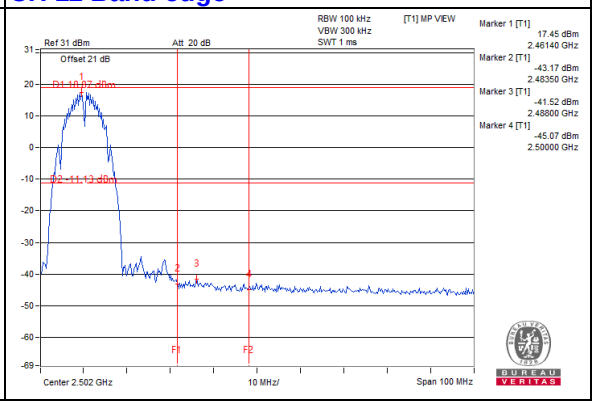
CH 11



CH 1 Band edge

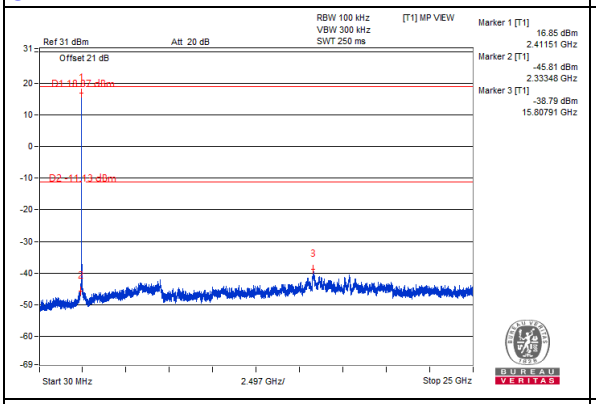


CH 11 Band edge

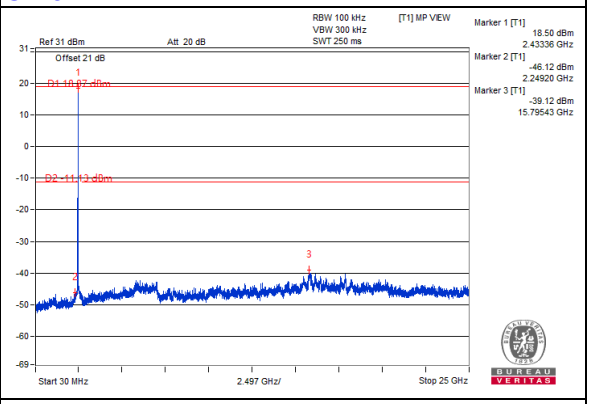


Chain 1

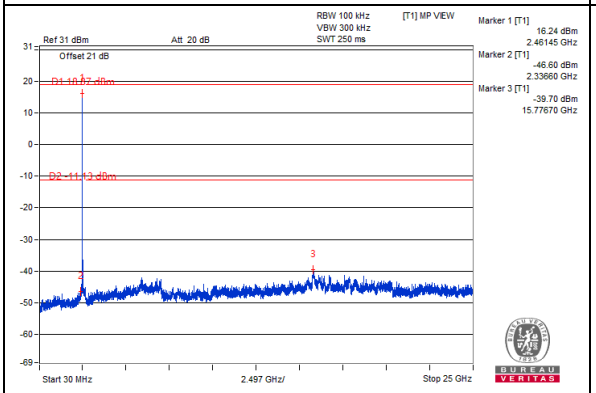
CH 1



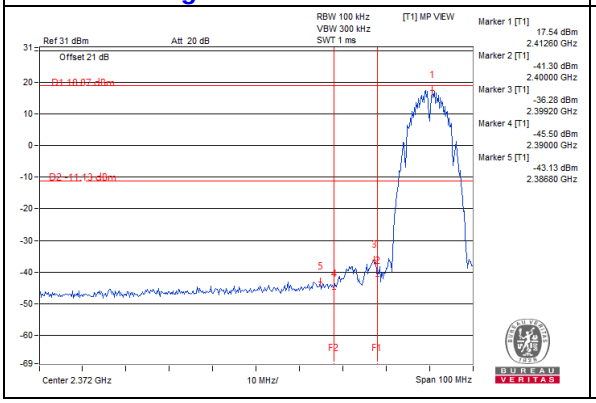
CH 6



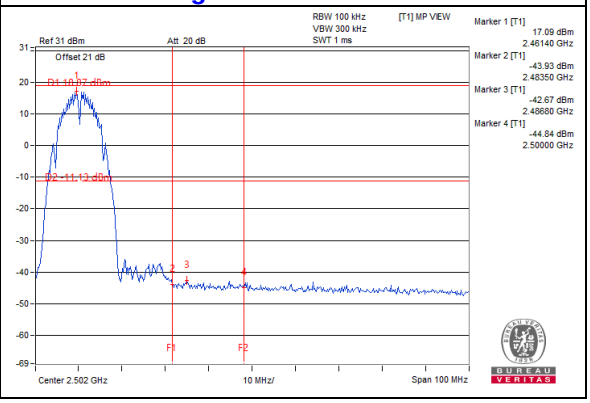
CH 11



CH 1 Band edge

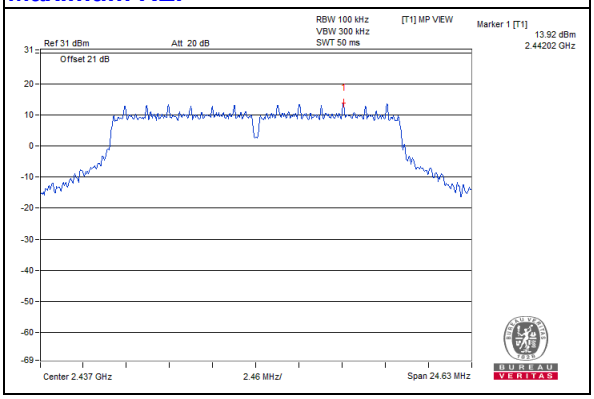


CH 11 Band edge



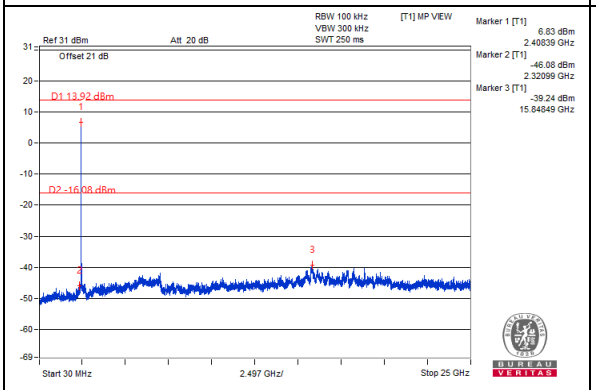
802.11g

Maximum REF

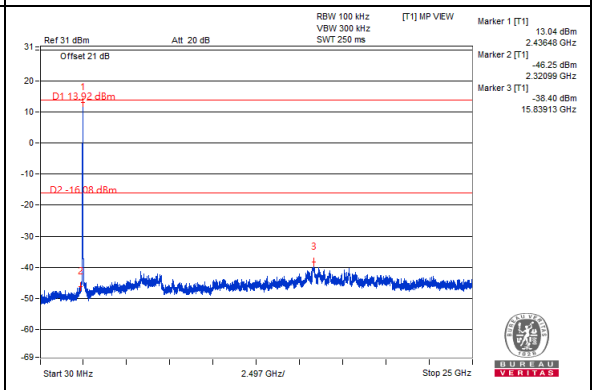


Chain 0

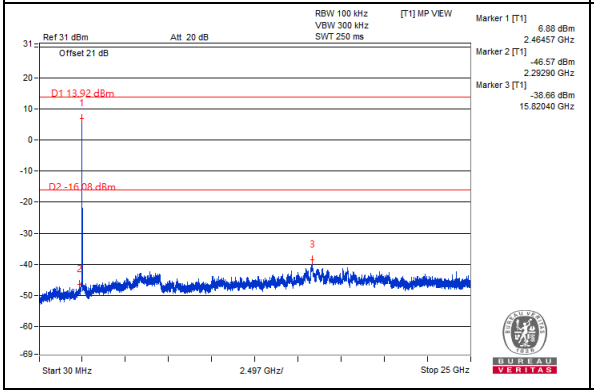
CH 1



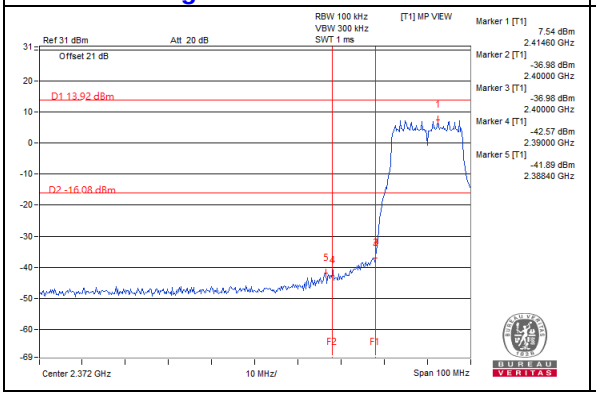
CH 6



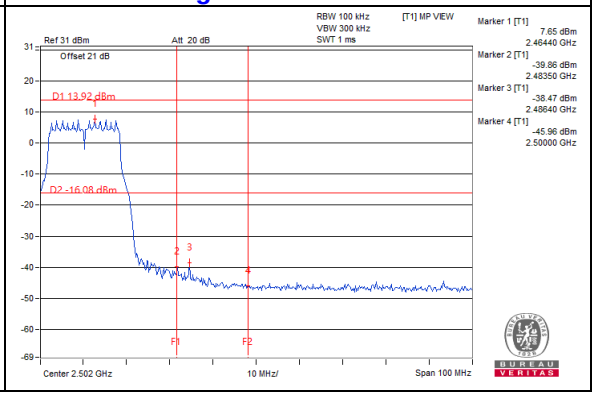
CH 11



CH 1 Band edge

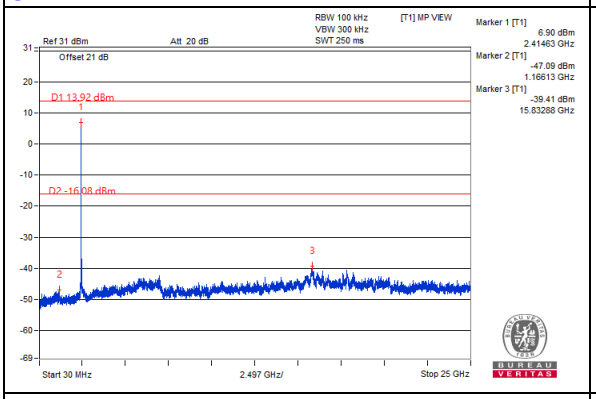


CH 11 Band edge

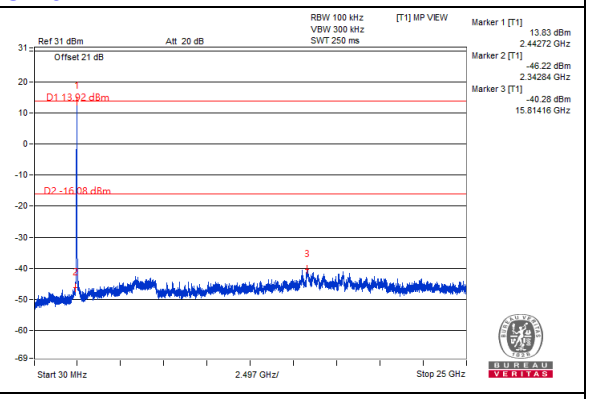


Chain 1

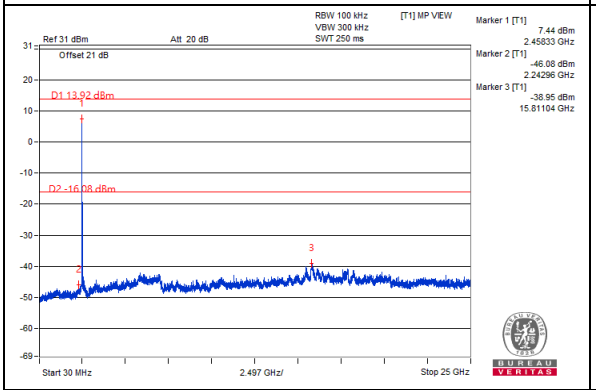
CH 1



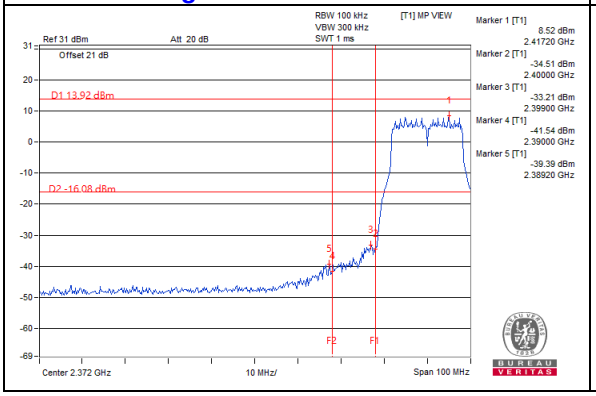
CH 6



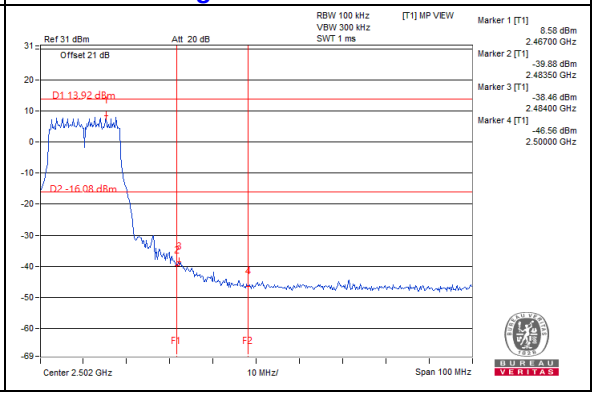
CH 11



CH 1 Band edge

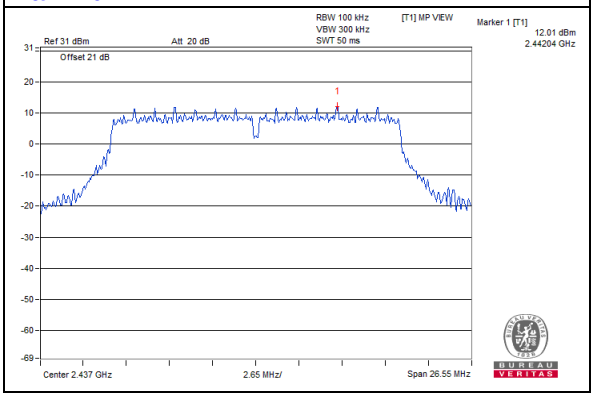


CH 11 Band edge



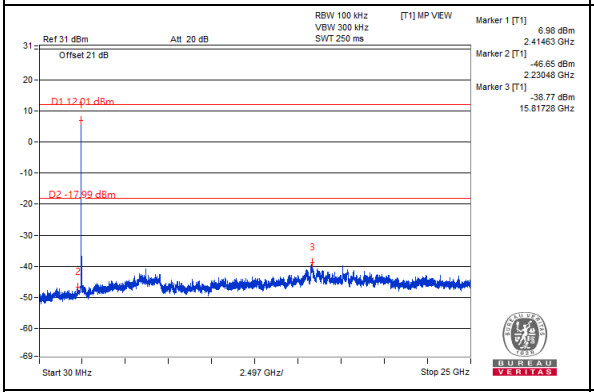
802.11ax (HE20)

Maximum REF

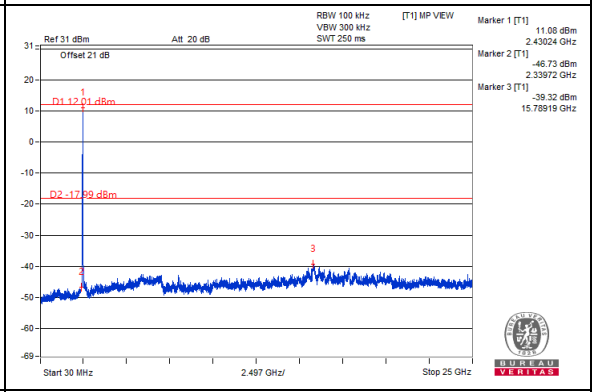


Chain 0

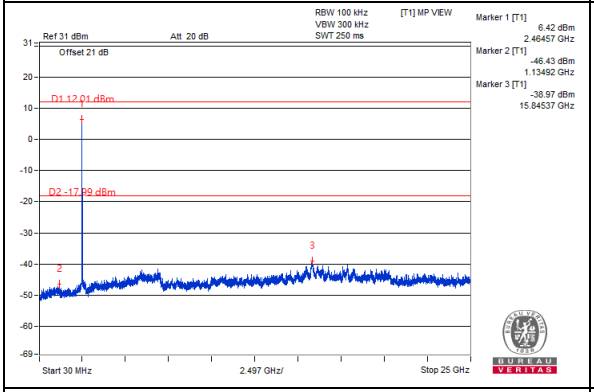
CH 1



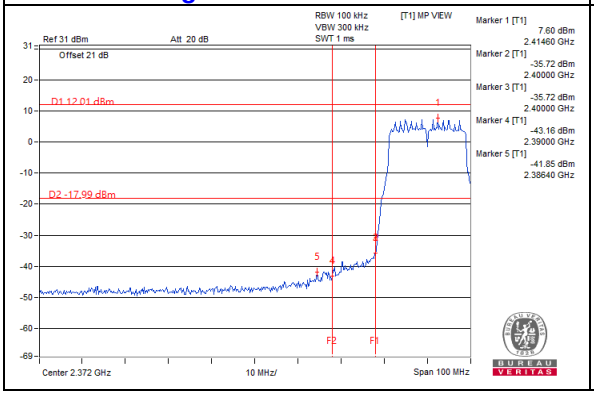
CH 6



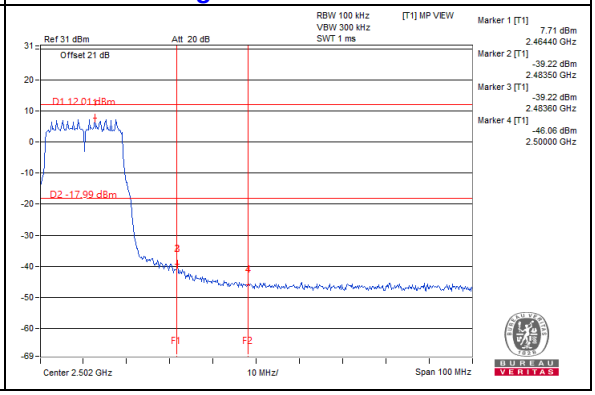
CH 11



CH 1 Band edge

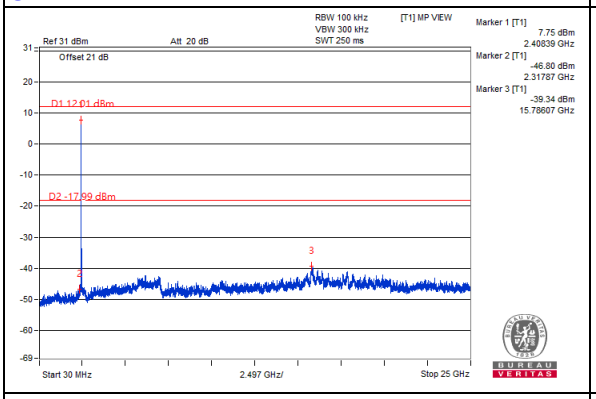


CH 11 Band edge

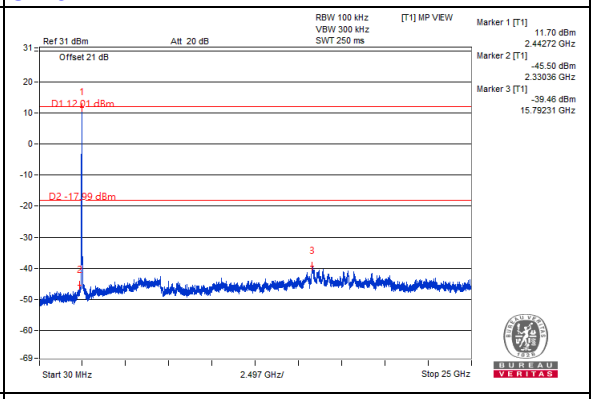


Chain 1

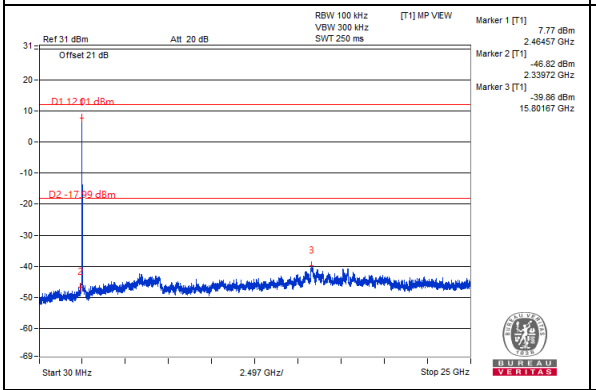
CH 1



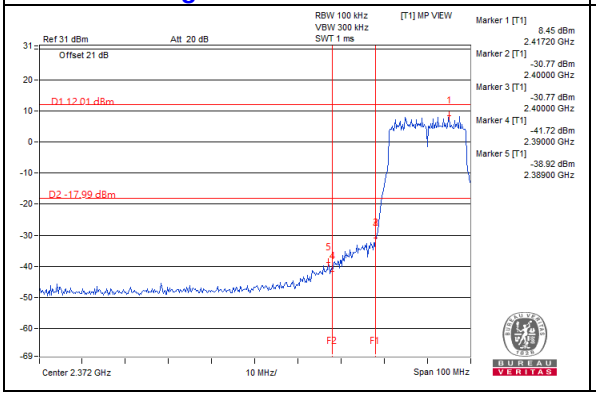
CH 6



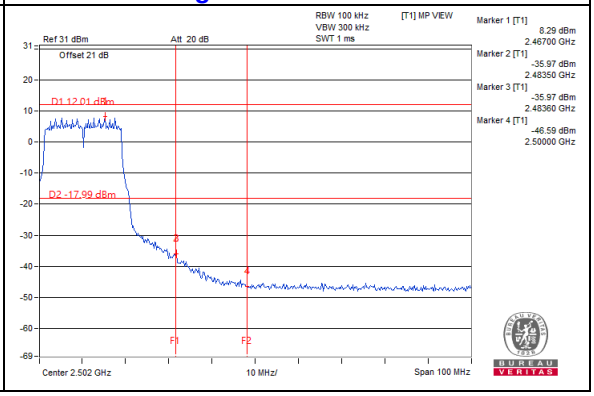
CH 11



CH 1 Band edge

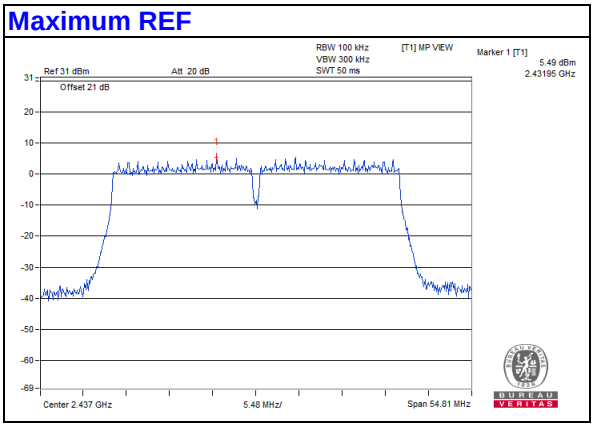


CH 11 Band edge



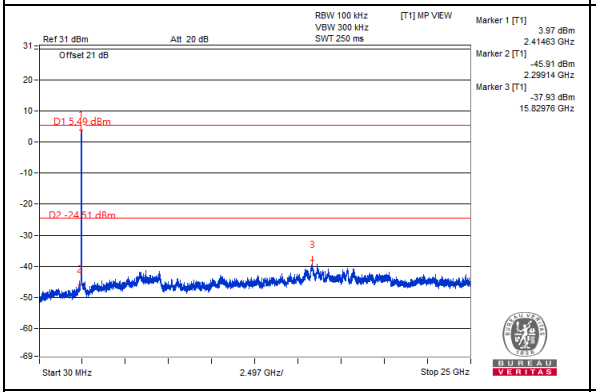
802.11ax (HE40)

Maximum REF

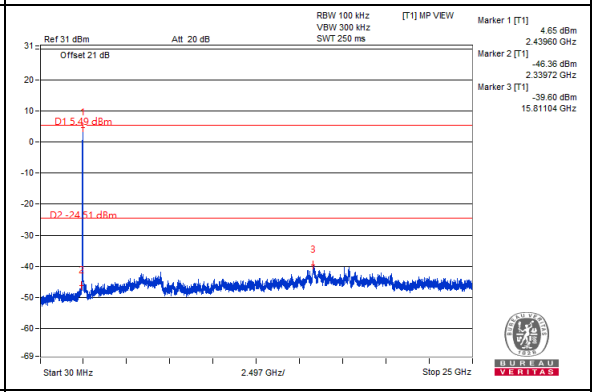


Chain 0

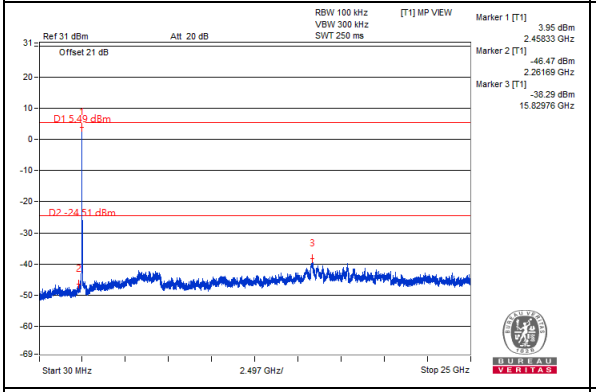
CH 3



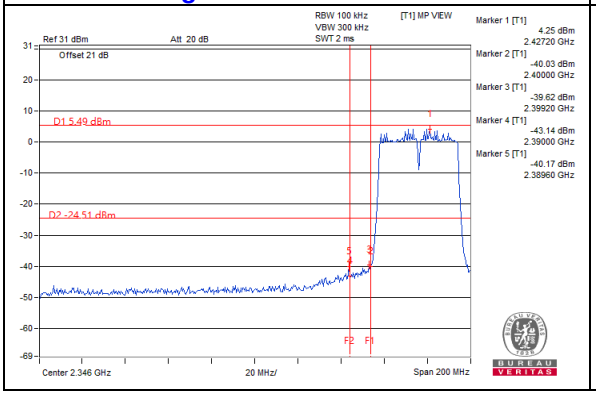
CH 6



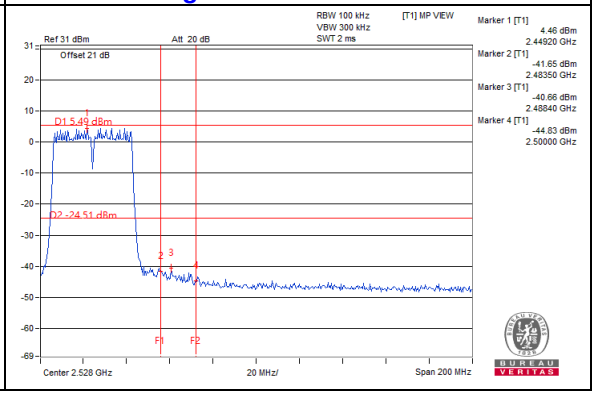
CH 9



CH 3 Band edge

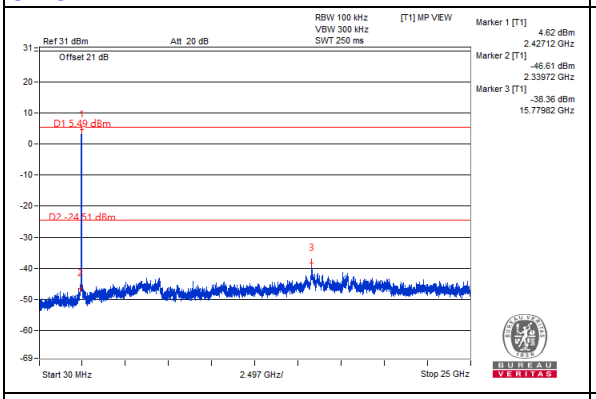


CH 9 Band edge

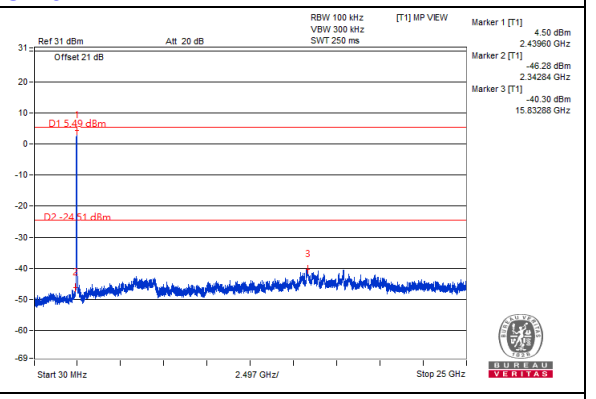


Chain 1

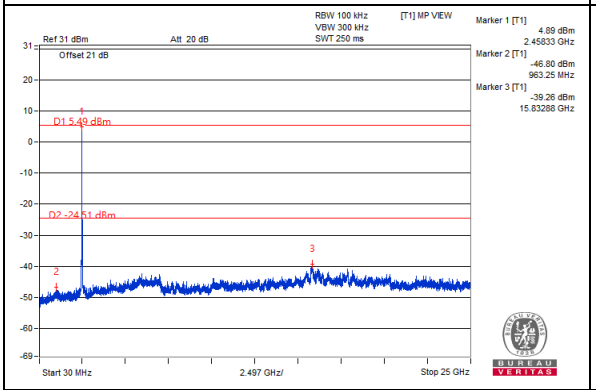
CH 3



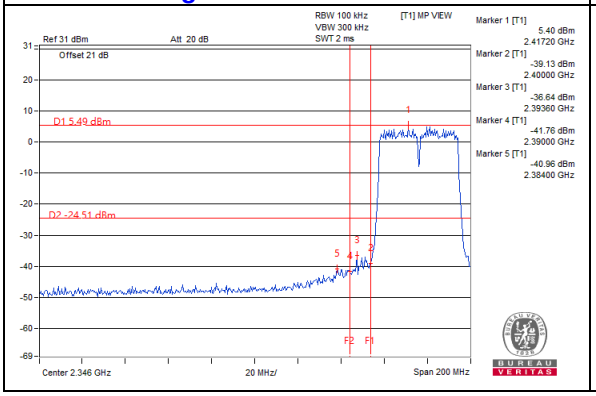
CH 6



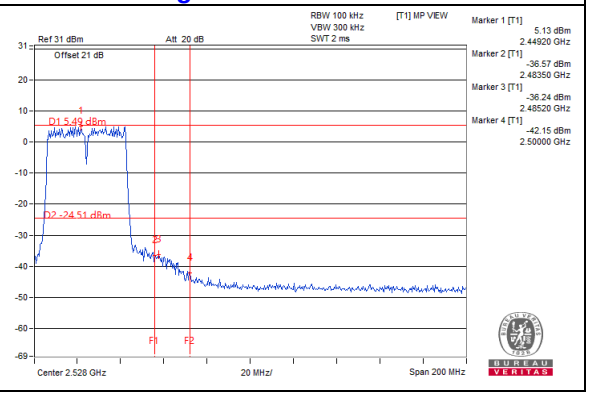
CH 9



CH 3 Band edge



CH 9 Band edge



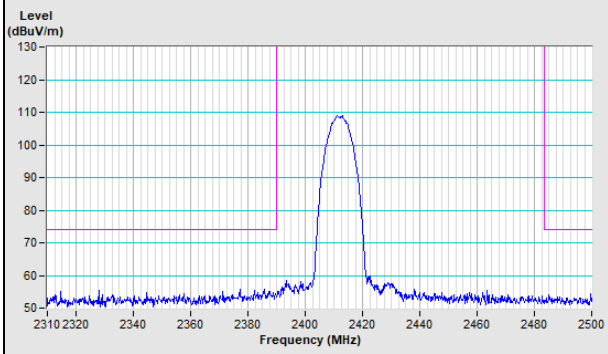
5 Pictures of Test Arrangements

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

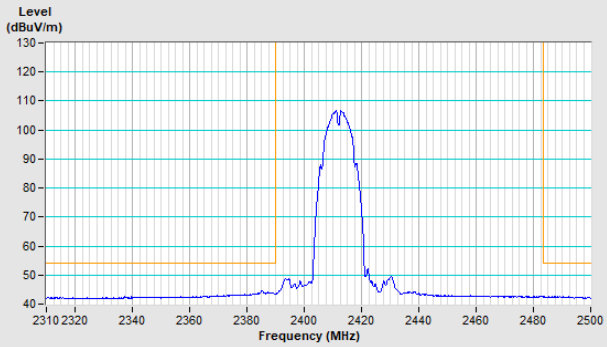
Annex A - Band-Edge Measurement

802.11b Channel 1

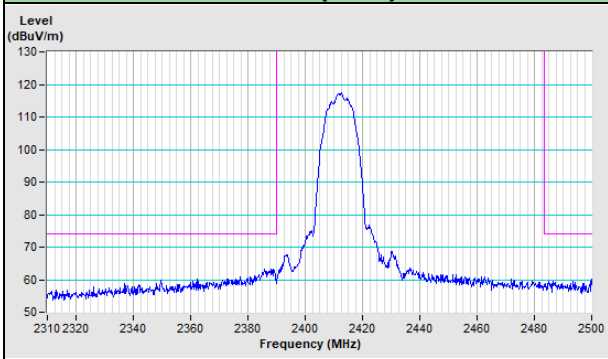
Horizontal (Peak)



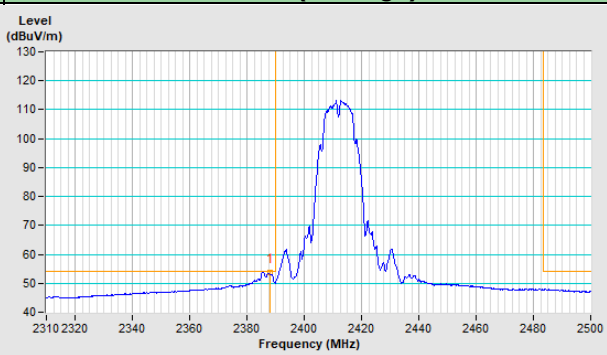
Horizontal (Average)



Vertical (Peak)

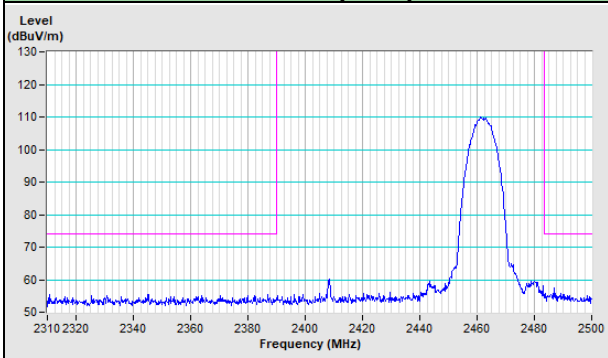


Vertical (Average)

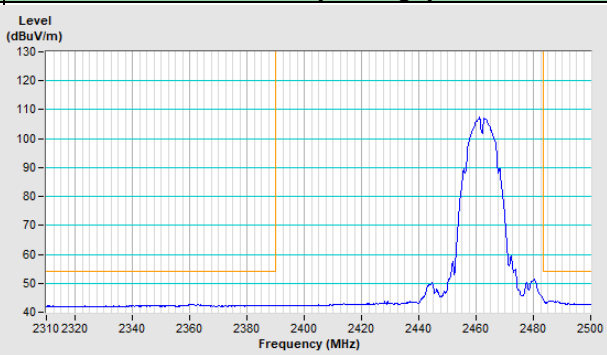


802.11b Channel 11

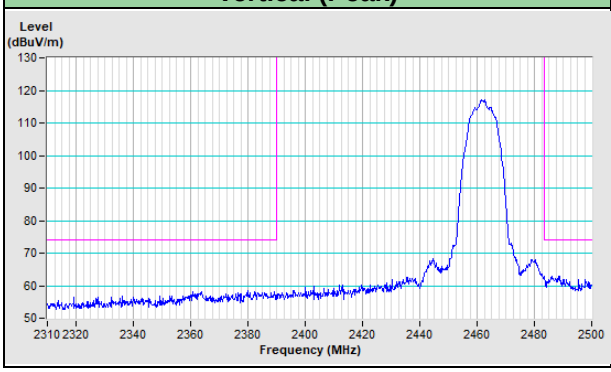
Horizontal (Peak)



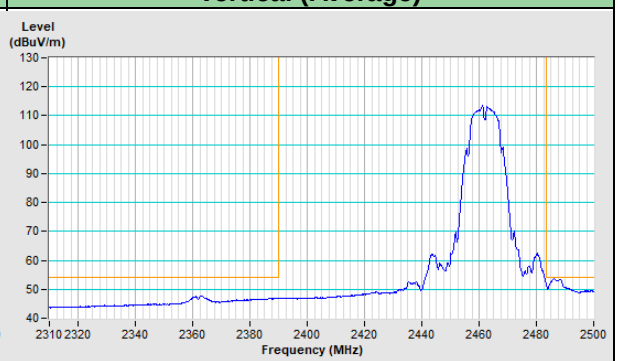
Horizontal (Average)



Vertical (Peak)

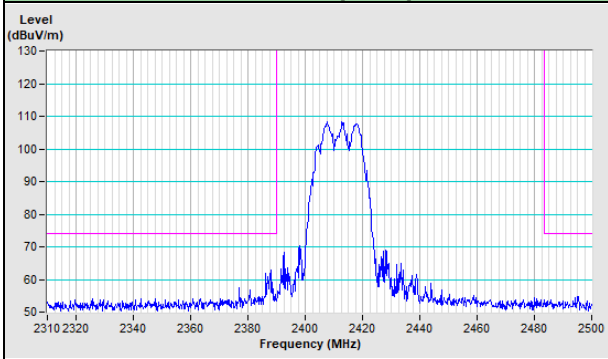


Vertical (Average)

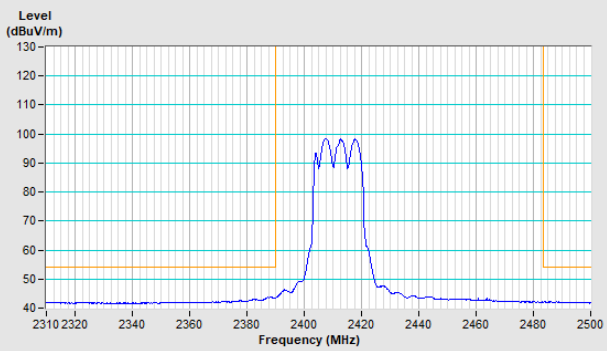


802.11g Channel 1

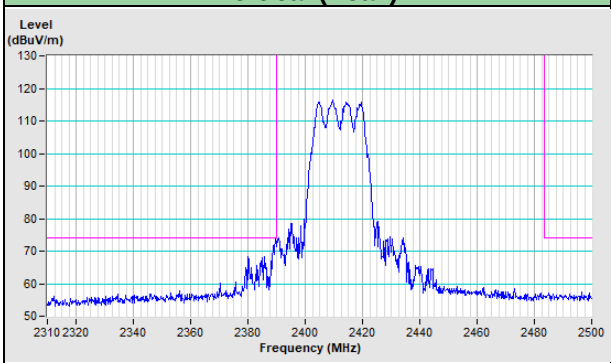
Horizontal (Peak)



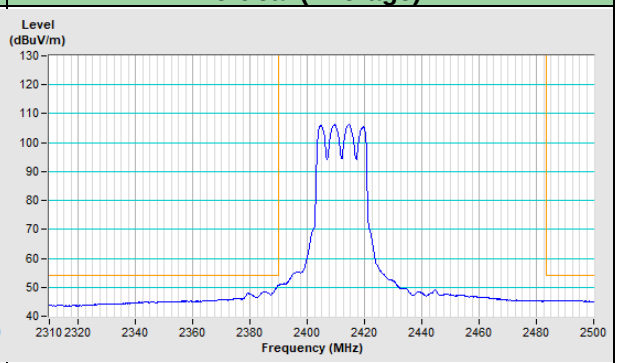
Horizontal (Average)



Vertical (Peak)

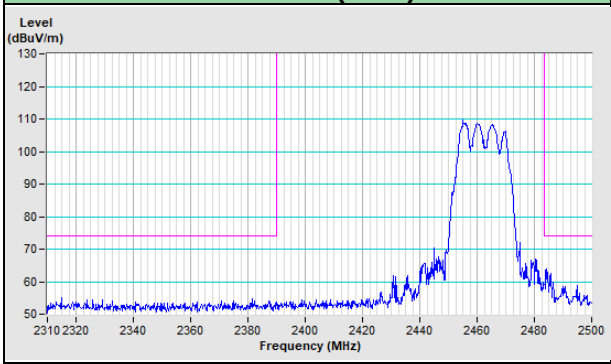


Vertical (Average)

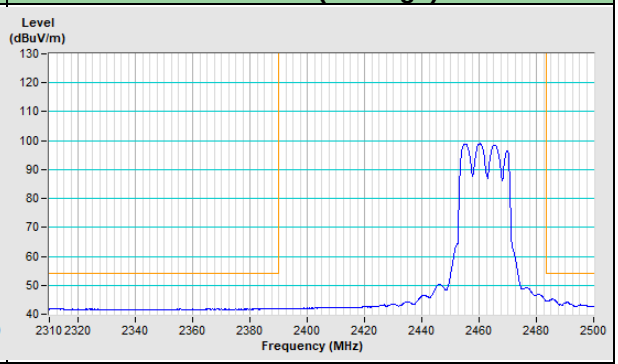


802.11g Channel 11

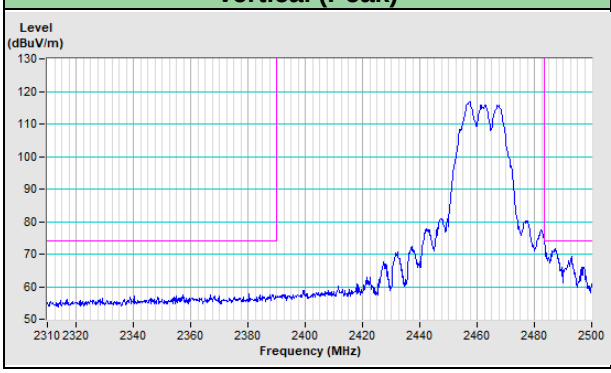
Horizontal (Peak)



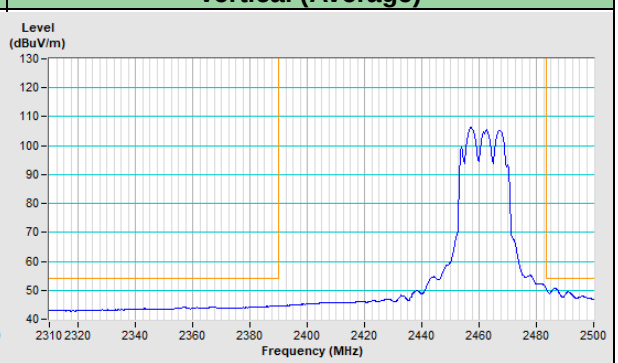
Horizontal (Average)



Vertical (Peak)

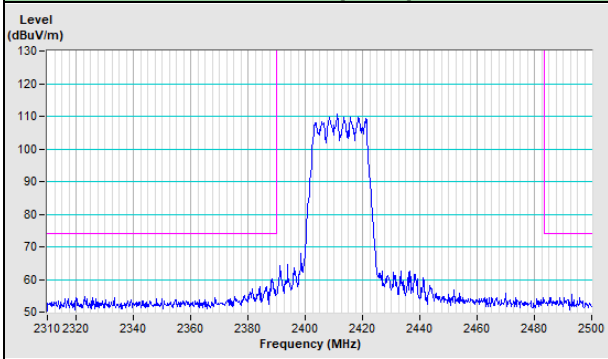


Vertical (Average)

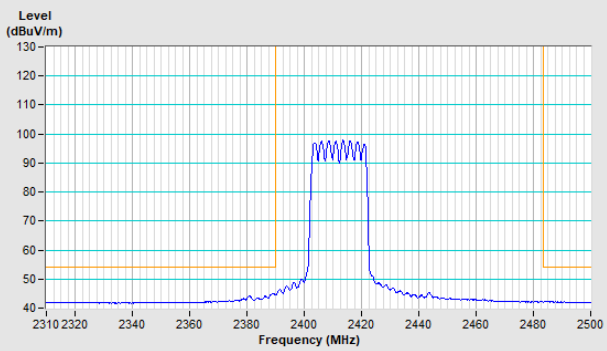


802.11ax (HE20) Channel 1

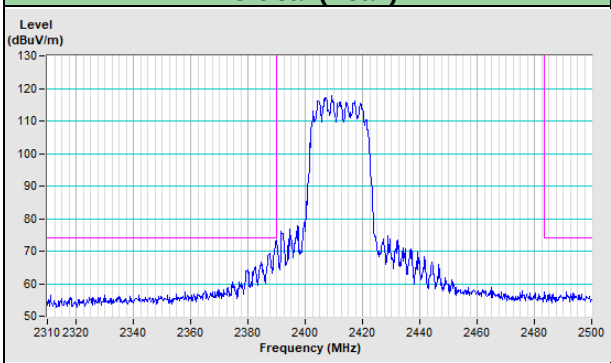
Horizontal (Peak)



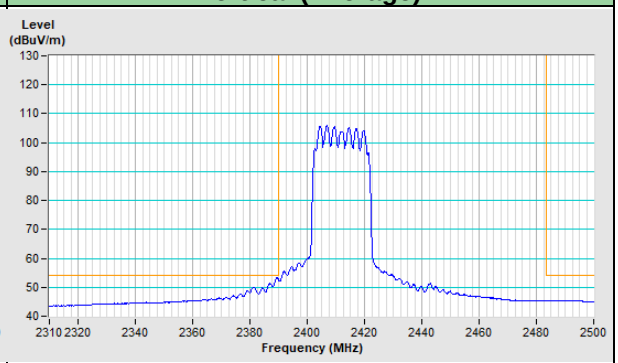
Horizontal (Average)



Vertical (Peak)

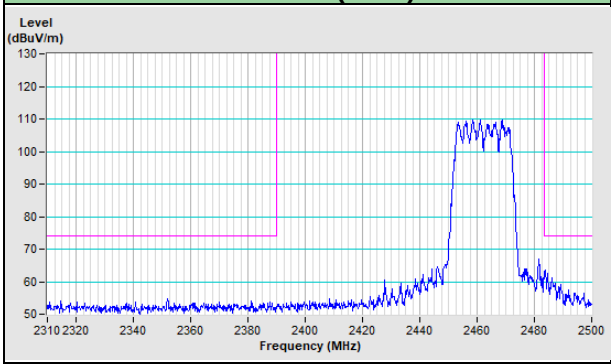


Vertical (Average)

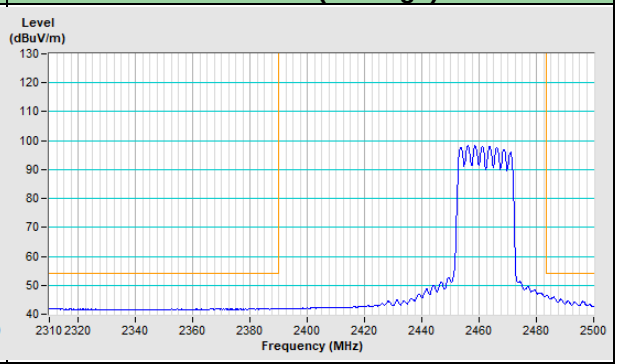


802.11ax (HE20) Channel 11

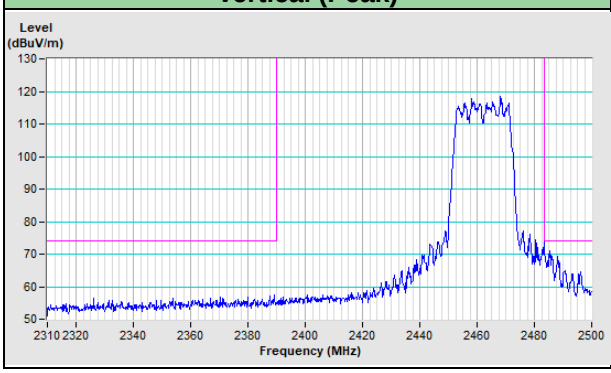
Horizontal (Peak)



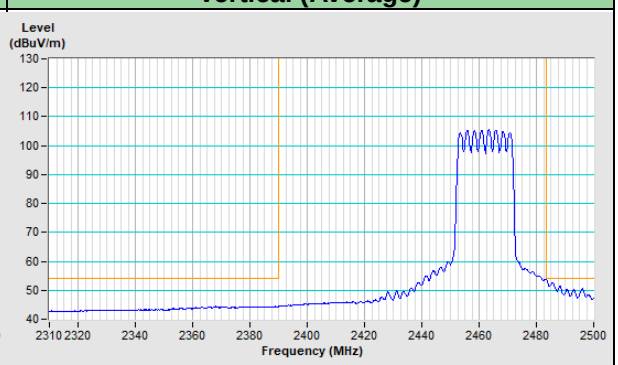
Horizontal (Average)



Vertical (Peak)

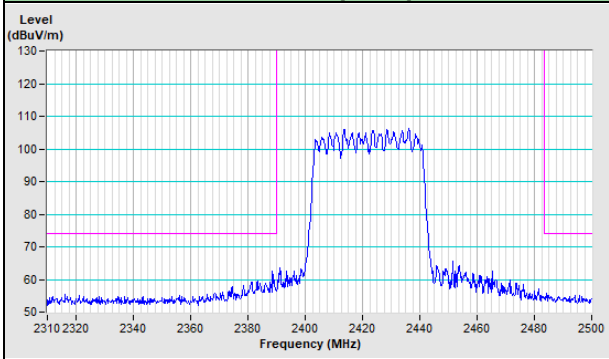


Vertical (Average)

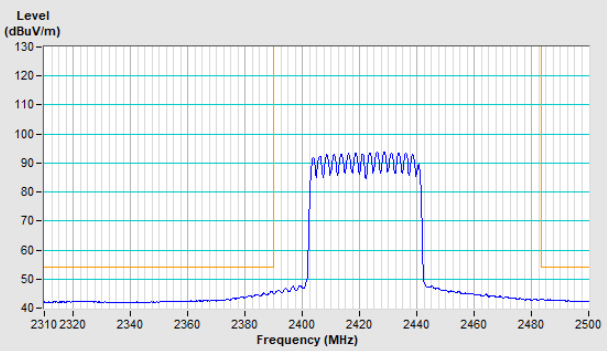


802.11ax (HE40) Channel 3

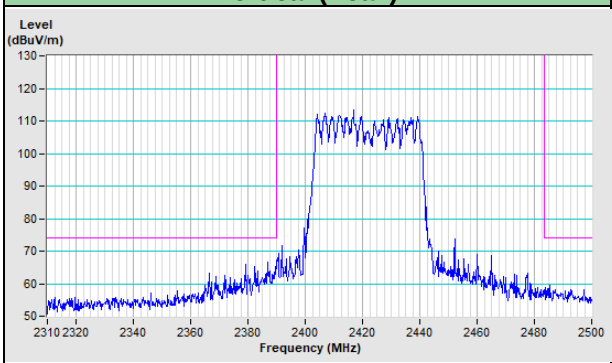
Horizontal (Peak)



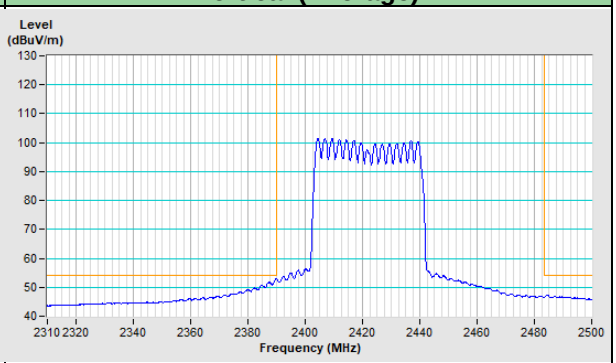
Horizontal (Average)



Vertical (Peak)

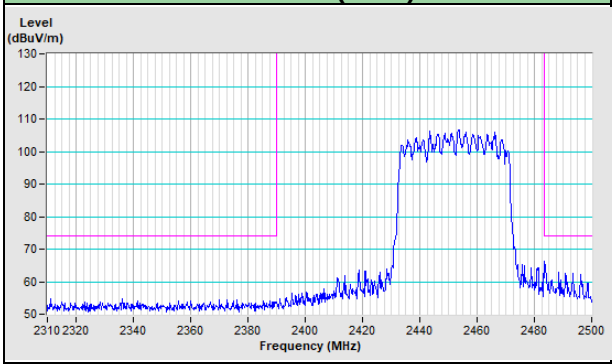


Vertical (Average)

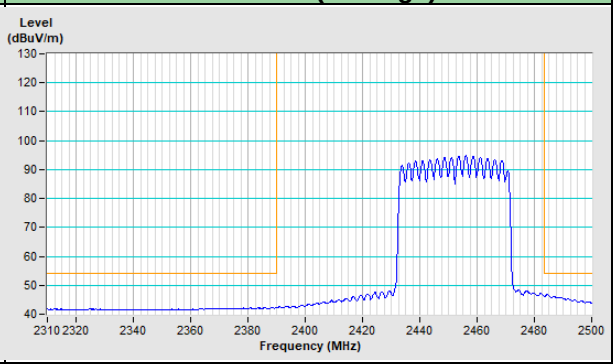


802.11ax (HE40) Channel 9

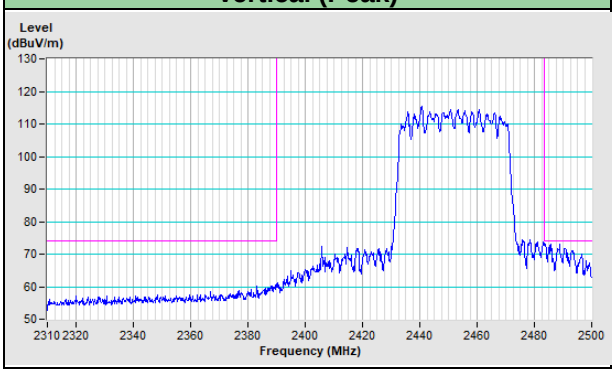
Horizontal (Peak)



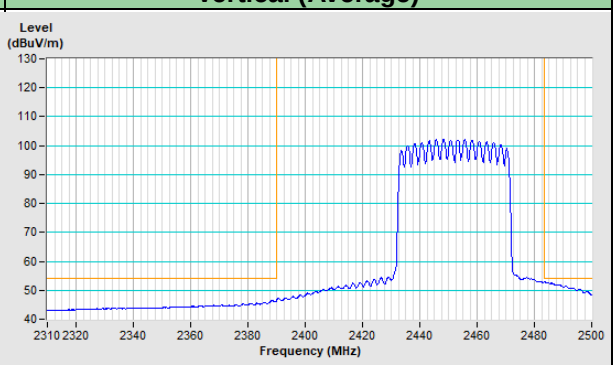
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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Web Site: www.bureauveritas-adt.com

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

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