

FCC Test Report

Report No.: RFBCWK-WTW-P22030669

FCC ID: MSQ-RTAX5Y00

Test Model: RT-AX57

Series Model: RT-AX55 V2/RT-AX3000P

Received Date: Mar. 21, 2022

Test Date: Jul. 14, 2022 ~ Aug.12, 2022

Issued Date: Sep. 21, 2022

Applicant: ASUSTeK COMPUTER INC.

Address: 1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location (1): No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, Taiwan

Test Location (2): No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan

FCC Registration / 788550 / TW0003

Designation Number: 281270 / TW0032



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Release Control Record

Issue No.	Description	Date Issued
RFBCWK-WTW-P22030669	Original Release	Sep. 21, 2022

1 Certificate of Conformity

Product: Wireless AX3000 Dual Band WiFi 6 Router

Brand: ASUS

Test Model: RT-AX57

Series Model: RT-AX55 V2/RT-AX3000P

Sample Status: Engineering Sample

Applicant: ASUSTeK COMPUTER INC.

Test Date: Jul. 14, 2022 ~ Aug.12, 2022

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 RF characteristics under the conditions specified in this report.

Prepared by : Vera Huang, **Date:** Sep. 21, 2022
Vera Huang / Specialist

Approved by : Jeremy Lin, **Date:** Sep. 21, 2022
Jeremy Lin / Project Engineer

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 -8.30 dB at 0.37000 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.2 dB at 2483.50 MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Reference only
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	No antenna connector is used.

Note:

- For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
- 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	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.00 dB
	30MHz ~ 200MHz	2.91 dB
	200MHz ~ 1000MHz	2.93 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.76 dB
	18GHz ~ 40GHz	1.77 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless AX3000 Dual Band WiFi 6 Router
Brand	ASUS
Test Model	RT-AX57
Series Model	RT-AX55 V2/RT-AX3000P
Status of EUT	Engineering Sample
Power Supply Rating	12 Vdc (from adapter)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDMA
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps VHT: up to 500Mbps 802.11ax: up to 573.5Mbps
Operating Frequency	2412 ~ 2462 MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20) 7 for 802.11n (HT40), VHT40, 802.11ax (HE40)
Output Power	CDD Mode: 988.38 mW Beamforming Mode: 817.886 mW
Antenna Type	Dipole antenna with 2 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	N/A

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX Function	Beamforming Mode
802.11b	2TX	Not Support
802.11g	2TX	Not Support
802.11n (HT20)	2TX (NSS 1 / NSS / 2)	Support
802.11n (HT40)	2TX (NSS 1 / NSS / 2)	Support
VHT20	2TX (NSS 1 / NSS / 2)	Support
VHT40	2TX (NSS 1 / NSS / 2)	Support
802.11ax (HE20)	2TX (NSS 1 / NSS / 2)	Support
802.11ax (HE40)	2TX (NSS 1 / NSS / 2)	Support

* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40 on 256QAM and HE20/HE40 on 802.11ax mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)

* CDD mode is the worst case for final tests after pretesting CDD mode and Beamforming mode except output power test.

2. All models are listed as below.

Brand	Model	Difference
ASUS	RT-AX57	For marketing purpose
	RT-AX55 V2	
	RT-AX3000P	

3. The EUT contains following accessory devices.

Adapter 1	
Brand	SHENZHEN GONGJIN ELECTRONICS CO.,LTD
Model	S18B22-120A150-C4
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 1.5A
DC Output Cable	1.43m without core

Adapter 2	
Brand	SHENZHEN RUIDE ELECTRONIC INDUSTRIAL CO.,LTD
Model	RD1201500-C55-198MG
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 1.5A
DC Output Cable	1.52m without core

4. Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.
5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
6. WLAN 2.4G and 5G can transmit at same time.
7. Spurious emission of the simultaneous operation WLAN 2.4G and 5G has been evaluated and no non-compliance was found.

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

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE \geq 1G	RE<1G	PLC	APCM	
A	√	√	√	√	NSS 1
B	√	-	-	√	NSS 2

Where **RE \geq 1G**: Radiated Emission above 1 GHz **RE<1G**: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. For radiated emission (below 1GHz) and power line conducted emission test items chosen the worst maximum power.
3. "-" means no effect.

Radiated Emission Test (Above 1 GHz):

- 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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
B	802.11ax (HE20)	1 to 11	11	OFDMA	BPSK	MCS0

Radiated Emission Test (Below 1 GHz):

- 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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	6	DSSS	DBPSK	1.0

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	6	DSSS	DBPSK	1.0

Bandedge Measurement:

- 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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
	802.11ax (HE20)	1 to 11	1, 11	OFDMA	BPSK	MCS0
	802.11ax (HE40)	3 to 9	3, 9	OFDMA	BPSK	MCS0
B	802.11ax (HE20)	1 to 11	11	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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
B	802.11ax (HE20)	1 to 11	11	OFDMA	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 66 % RH	120 Vac, 60 Hz	Titan Hsu
RE<1G	23 deg. C, 66 % RH	120 Vac, 60 Hz	Titan Hsu
PLC	23 deg. C, 66 % RH	120 Vac, 60 Hz	Titan Hsu
APCM	25 deg. C, 60 % RH	120 Vac, 60 Hz	Jisyong Wang

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.

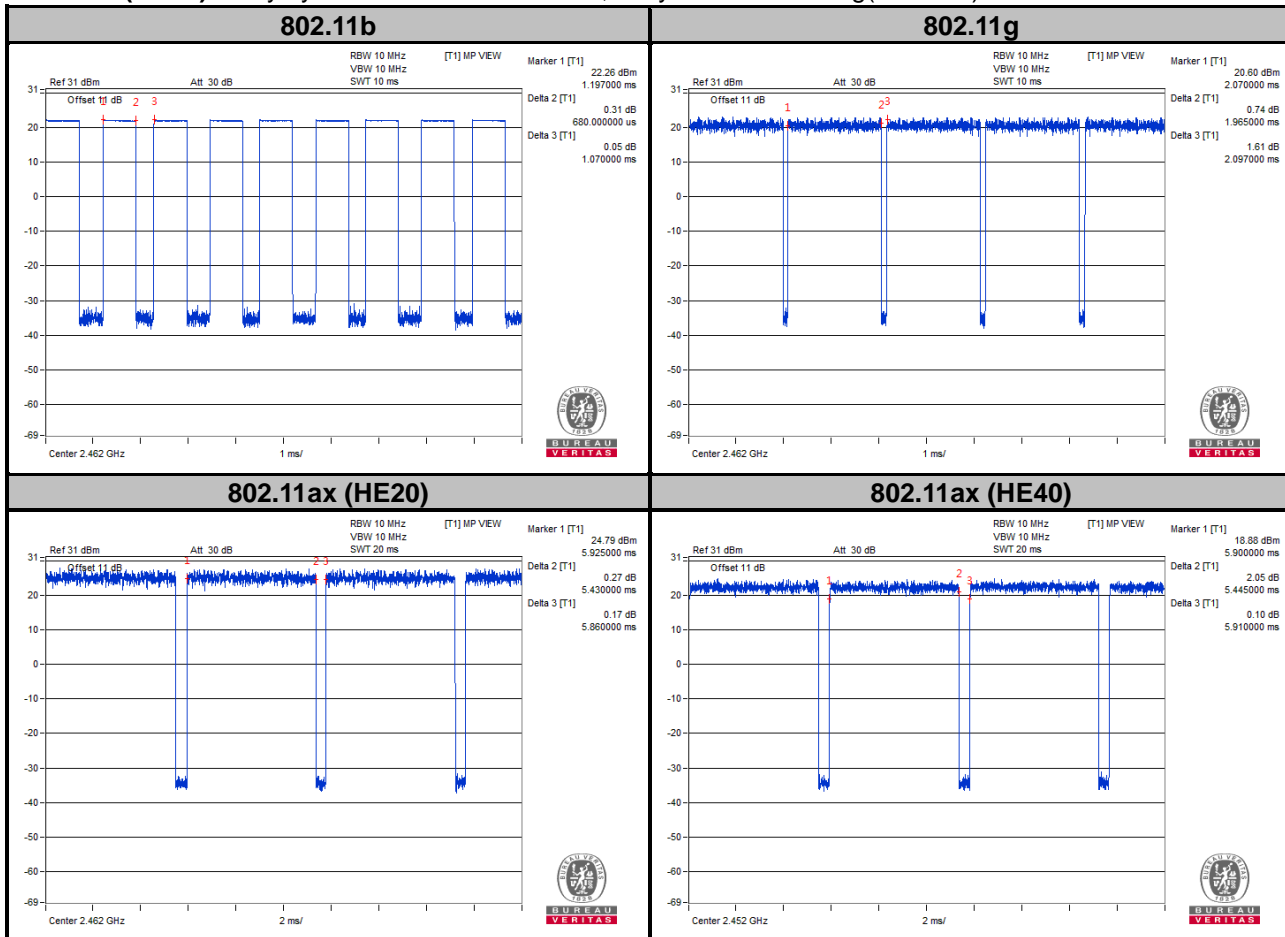
Mode A

802.11b: Duty cycle = 0.68/1.07 = 0.636, Duty factor = $10 * \log(1/0.636) = 1.97$

802.11g: Duty cycle = 1.965/2.097 = 0.937, Duty factor = $10 * \log(1/0.937) = 0.28$

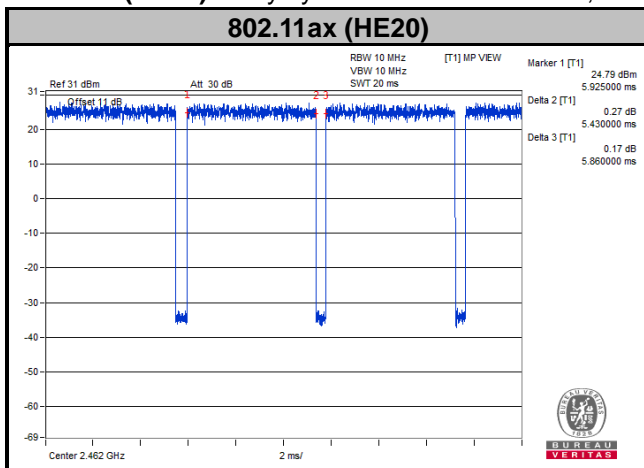
802.11ax (HE20): Duty cycle = 5.43/5.86 = 0.927, Duty factor = $10 * \log(1/0.927) = 0.33$

802.11ax (HE40): Duty cycle = 5.445/5.91 = 0.921, Duty factor = $10 * \log(1/0.921) = 0.36$



Mode B

802.11ax (HE20): Duty cycle = 5.43/5.86 = 0.927, Duty factor = $10 * \log(1/0.927) = 0.33$



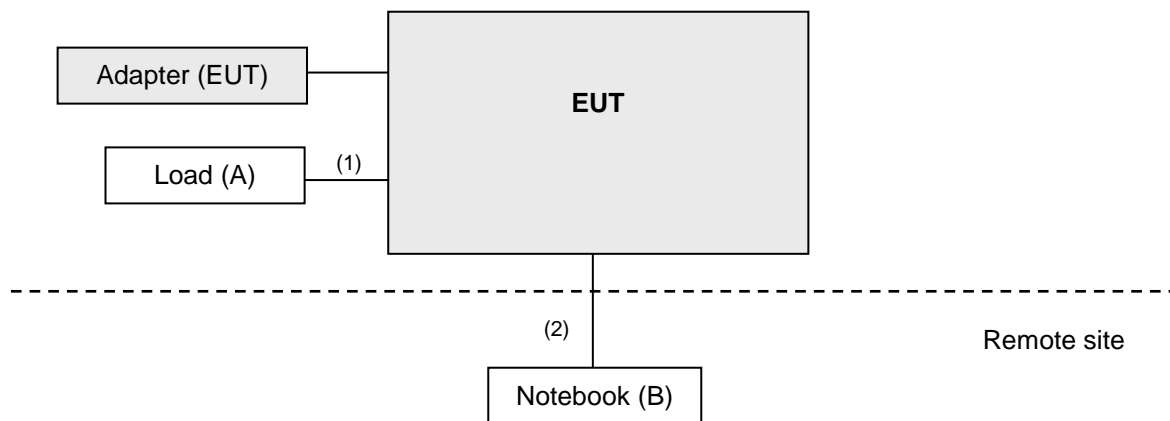
3.4 Description of Support Units

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	Load	N/A	N/A	N/A	N/A	Provided by Lab
B	Notebook	Lenovo	X250	PC06887H	N/A	Provided by Lab

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN Cable	4	1.5	N	0	Provided by Lab
2.	LAN Cable	1	10	N	0	Provided by Lab

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 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 20 dB below the highest level of the desired power:

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

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 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.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102782	Dec. 10, 2021	Dec. 09, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSW43	101866	Jan. 14, 2022	Jan. 13, 2023
BILOG Antenna SCHWARZBECK	VULB9168	9168-1213	Oct. 27, 2021	Oct. 26, 2022
HORN Antenna RF SPIN	DRH18-E	210103A18E	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9170	9170-1048	Nov. 14, 2021	Nov. 13, 2022
Loop Antenna TESEQ	HLA 6121	45745	Jul. 21, 2021	Jul. 20, 2022
			Jul. 27, 2022	Jul. 26, 2023
Preamplifier EMCI (Below 1GHz)	EMC330N	980782	Jan. 17, 2022	Jan. 16, 2023
Preamplifier EMCI (Above 1GHz)	EMC118A45SE	980808	Dec. 30, 2021	Dec. 29, 2022
Preamplifier EMCI (18GHz~40GHz)	EMC184045SE	980788	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC104-SM-SM-(9 000+2000+1000)	201243+ 201231+ 210102	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMCCFD400-NM-N M-(9000+300+500)	201236+ 201235+ 201233	Jan. 17, 2022	Jan. 16, 2023
RF signal cable EMCI	EMC101G-KM-KM- (5000+3000+2000)	201260+201257+20125 4	Jan. 17, 2022	Jan. 16, 2023
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower & Turn Max-Full	MFT-151SS-0.5T	NA	NA	NA
Turn Table Max-Full	MF-7802BS	NA	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
Turn Table Controller Max-Full	MF-7802BS	MF780208674	NA	NA
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 18, 2022	Jan. 17, 2023
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 17, 2022	Jan. 16, 2023

- 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 WM Chamber 8.

4.1.3 Test Procedures

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 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 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:

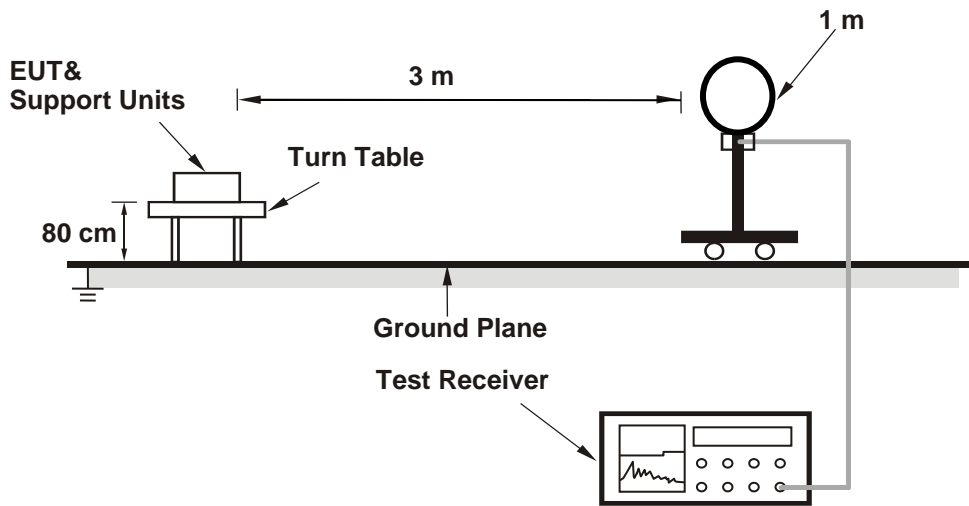
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
(Mode A: 11b: RBW = 1 MHz, VBW = 3 kHz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;
802.11ax (HE20): RBW = 1 MHz, VBW = 1 kHz ; 802.11ax (HE40): RBW = 1 MHz, VBW = 1 kHz;
Mode B: 802.11ax (HE20): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

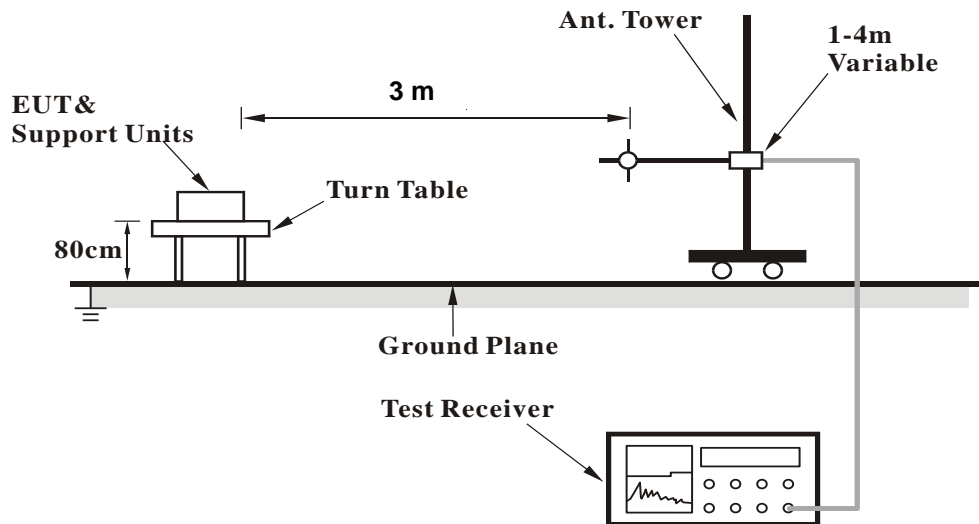
No deviation.

4.1.5 Test Set Up

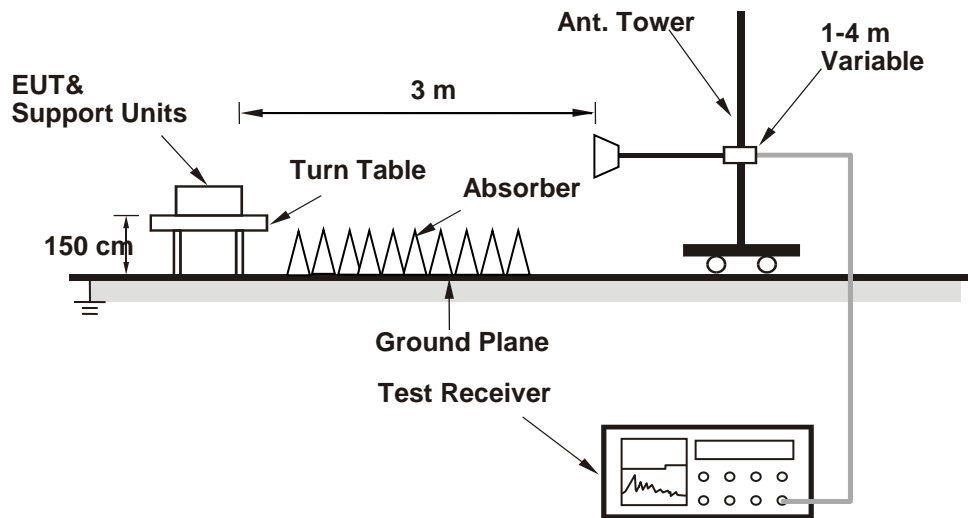
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.6 EUT Operating Conditions

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Mode A

Above 1GHz data:

RF Mode	TX 802.11b	Channel	CH 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.7 PK	74.0	-15.3	1.47 H	229	26.7	32.0
2	2390.00	46.2 AV	54.0	-7.8	1.47 H	229	14.2	32.0
3	*2412.00	111.9 PK			1.47 H	229	79.9	32.0
4	*2412.00	109.8 AV			1.47 H	229	77.8	32.0
5	4824.00	52.4 PK	74.0	-21.6	1.32 H	14	49.4	3.0
6	4824.00	47.0 AV	54.0	-7.0	1.32 H	14	44.0	3.0

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	2390.00	66.2 PK	74.0	-7.8	1.59 V	175	34.2	32.0
2	2390.00	53.2 AV	54.0	-0.8	1.59 V	175	21.2	32.0
3	*2412.00	123.5 PK			1.59 V	175	91.5	32.0
4	*2412.00	121.1 AV			1.59 V	175	89.1	32.0
5	4824.00	56.6 PK	74.0	-17.4	3.59 V	44	53.6	3.0
6	4824.00	53.0 AV	54.0	-1.0	3.59 V	44	50.0	3.0

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.

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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	*2437.00	107.2 PK			1.51 H	185	75.3	31.9
2	*2437.00	104.8 AV			1.51 H	185	72.9	31.9
3	4874.00	53.3 PK	74.0	-20.7	1.21 H	219	50.5	2.8
4	4874.00	48.3 AV	54.0	-5.7	1.21 H	219	45.5	2.8

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	*2437.00	123.6 PK			1.62 V	175	91.7	31.9
2	*2437.00	121.2 AV			1.62 V	175	89.3	31.9
3	4874.00	56.2 PK	74.0	-17.8	3.81 V	45	53.4	2.8
4	4874.00	53.0 AV	54.0	-1.0	3.81 V	45	50.2	2.8

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)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.1 PK			1.20 H	154	74.1	32.0
2	*2462.00	103.6 AV			1.20 H	154	71.6	32.0
3	2483.50	58.8 PK	74.0	-15.2	1.20 H	154	26.8	32.0
4	2483.50	46.7 AV	54.0	-7.3	1.20 H	154	14.7	32.0
5	4924.00	52.5 PK	74.0	-21.5	1.56 H	219	49.7	2.8
6	4924.00	46.9 AV	54.0	-7.1	1.56 H	219	44.1	2.8

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	*2462.00	123.3 PK			1.50 V	170	91.3	32.0
2	*2462.00	120.9 AV			1.50 V	170	88.9	32.0
3	2483.50	66.8 PK	74.0	-7.2	1.50 V	170	34.8	32.0
4	2483.50	53.4 AV	54.0	-0.6	1.50 V	170	21.4	32.0
5	4924.00	55.2 PK	74.0	-18.8	3.69 V	46	52.4	2.8
6	4924.00	51.7 AV	54.0	-2.3	3.69 V	46	48.9	2.8

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 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.9 PK	74.0	-16.1	1.26 H	196	25.9	32.0
2	2390.00	44.8 AV	54.0	-9.2	1.26 H	196	12.8	32.0
3	*2412.00	104.3 PK			1.26 H	196	72.3	32.0
4	*2412.00	93.6 AV			1.26 H	196	61.6	32.0
5	4824.00	50.6 PK	74.0	-23.4	1.52 H	144	47.6	3.0
6	4824.00	37.6 AV	54.0	-16.4	1.52 H	144	34.6	3.0

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	2390.00	66.7 PK	74.0	-7.3	1.58 V	139	34.7	32.0
2	2390.00	53.3 AV	54.0	-0.7	1.58 V	139	21.3	32.0
3	*2412.00	121.4 PK			1.58 V	139	89.4	32.0
4	*2412.00	111.4 AV			1.58 V	139	79.4	32.0
5	4824.00	51.1 PK	74.0	-22.9	3.69 V	38	48.1	3.0
6	4824.00	38.6 AV	54.0	-15.4	3.69 V	38	35.6	3.0

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.

RF Mode	TX 802.11g	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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	*2437.00	107.7 PK			1.50 H	188	75.8	31.9
2	*2437.00	98.2 AV			1.50 H	188	66.3	31.9
3	2483.50	57.7 PK	74.0	-16.3	1.50 H	188	25.7	32.0
4	2483.50	46.6 AV	54.0	-7.4	1.50 H	188	14.6	32.0
5	4874.00	51.1 PK	74.0	-22.9	1.21 H	165	48.3	2.8
6	4874.00	40.0 AV	54.0	-14.0	1.21 H	165	37.2	2.8

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	*2437.00	123.6 PK			1.68 V	158	91.7	31.9
2	*2437.00	113.8 AV			1.68 V	158	81.9	31.9
3	2483.50	67.3 PK	74.0	-6.7	1.68 V	158	35.3	32.0
4	2483.50	53.8 AV	54.0	-0.2	1.68 V	158	21.8	32.0
5	4874.00	52.3 PK	74.0	-21.7	3.65 V	41	49.5	2.8
6	4874.00	40.3 AV	54.0	-13.7	3.65 V	41	37.5	2.8

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)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	105.5 PK			1.81 H	281	73.5	32.0
2	*2462.00	94.8 AV			1.81 H	281	62.8	32.0
3	2483.50	58.8 PK	74.0	-15.2	1.81 H	281	26.8	32.0
4	2483.50	46.9 AV	54.0	-7.1	1.81 H	281	14.9	32.0
5	4924.00	49.9 PK	74.0	-24.1	1.36 H	275	47.1	2.8
6	4924.00	37.9 AV	54.0	-16.1	1.36 H	275	35.1	2.8

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	*2462.00	120.5 PK			1.73 V	157	88.5	32.0
2	*2462.00	110.5 AV			1.73 V	157	78.5	32.0
3	2483.50	67.4 PK	74.0	-6.6	1.73 V	157	35.4	32.0
4	2483.50	53.8 AV	54.0	-0.2	1.73 V	157	21.8	32.0
5	4924.00	50.6 PK	74.0	-23.4	3.59 V	45	47.8	2.8
6	4924.00	38.1 AV	54.0	-15.9	3.59 V	45	35.3	2.8

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 1 : 2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.4 PK	74.0	-15.6	2.49 H	296	26.4	32.0
2	2390.00	45.5 AV	54.0	-8.5	2.49 H	296	13.5	32.0
3	*2412.00	106.2 PK			2.49 H	296	74.2	32.0
4	*2412.00	94.3 AV			2.49 H	296	62.3	32.0
5	4824.00	50.0 PK	74.0	-24.0	1.21 H	143	47.0	3.0
6	4824.00	37.5 AV	54.0	-16.5	1.21 H	143	34.5	3.0

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	2390.00	68.4 PK	74.0	-5.6	1.69 V	142	36.4	32.0
2	2390.00	53.7 AV	54.0	-0.3	1.69 V	142	21.7	32.0
3	*2412.00	120.0 PK			1.69 V	142	88.0	32.0
4	*2412.00	108.7 AV			1.69 V	142	76.7	32.0
5	4824.00	50.5 PK	74.0	-23.5	3.65 V	38	47.5	3.0
6	4824.00	38.0 AV	54.0	-16.0	3.65 V	38	35.0	3.0

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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	*2437.00	112.7 PK			2.93 H	297	80.8	31.9
2	*2437.00	100.4 AV			2.93 H	297	68.5	31.9
3	2483.50	58.4 PK	74.0	-15.6	2.93 H	297	26.4	32.0
4	2483.50	47.1 AV	54.0	-6.9	2.93 H	297	15.1	32.0
5	4874.00	50.7 PK	74.0	-23.3	1.19 H	152	47.9	2.8
6	4874.00	39.7 AV	54.0	-14.3	1.19 H	152	36.9	2.8

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	*2437.00	125.4 PK			1.71 V	142	93.5	31.9
2	*2437.00	113.3 AV			1.71 V	142	81.4	31.9
3	2483.50	67.6 PK	74.0	-6.4	1.71 V	142	35.6	32.0
4	2483.50	53.6 AV	54.0	-0.4	1.71 V	142	21.6	32.0
5	4874.00	52.1 PK	74.0	-21.9	3.65 V	42	49.3	2.8
6	4874.00	40.0 AV	54.0	-14.0	3.65 V	42	37.2	2.8

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)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.6 PK			2.59 H	278	74.6	32.0
2	*2462.00	94.8 AV			2.59 H	278	62.8	32.0
3	2483.50	58.8 PK	74.0	-15.2	2.59 H	278	26.8	32.0
4	2483.50	47.1 AV	54.0	-6.9	2.59 H	278	15.1	32.0
5	4924.00	50.2 PK	74.0	-23.8	1.43 H	188	47.4	2.8
6	4924.00	37.4 AV	54.0	-16.6	1.43 H	188	34.6	2.8

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	*2462.00	120.9 PK			1.55 V	141	88.9	32.0
2	*2462.00	108.8 AV			1.55 V	141	76.8	32.0
3	2483.50	66.3 PK	74.0	-7.7	1.55 V	141	34.3	32.0
4	2483.50	53.1 AV	54.0	-0.9	1.55 V	141	21.1	32.0
5	4924.00	50.4 PK	74.0	-23.6	3.68 V	48	47.6	2.8
6	4924.00	37.9 AV	54.0	-16.1	3.68 V	48	35.1	2.8

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 3 : 2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.5 PK	74.0	-15.5	2.38 H	298	26.5	32.0
2	2390.00	45.6 AV	54.0	-8.4	2.38 H	298	13.6	32.0
3	*2422.00	103.7 PK			2.38 H	298	71.8	31.9
4	*2422.00	91.1 AV			2.38 H	298	59.2	31.9
5	4844.00	49.6 PK	74.0	-24.4	1.42 H	126	46.7	2.9
6	4844.00	36.1 AV	54.0	-17.9	1.42 H	126	33.2	2.9

Antenna Polarity & Test Distance : Vertical at 3 m

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.6 PK	74.0	-7.4	1.55 V	141	34.6	32.0
2	2390.00	53.7 AV	54.0	-0.3	1.55 V	141	21.7	32.0
3	*2422.00	117.1 PK			1.55 V	141	85.2	31.9
4	*2422.00	104.9 AV			1.55 V	141	73.0	31.9
5	4844.00	50.1 PK	74.0	-23.9	3.61 V	39	47.2	2.9
6	4844.00	36.4 AV	54.0	-17.6	3.61 V	39	33.5	2.9

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 6 : 2437 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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	*2437.00	105.4 PK			2.92 H	295	73.5	31.9
2	*2437.00	92.7 AV			2.92 H	295	60.8	31.9
3	2483.50	58.6 PK	74.0	-15.4	2.92 H	295	26.6	32.0
4	2483.50	46.8 AV	54.0	-7.2	2.92 H	295	14.8	32.0
5	4874.00	50.1 PK	74.0	-23.9	1.31 H	188	47.3	2.8
6	4874.00	35.9 AV	54.0	-18.1	1.31 H	188	33.1	2.8

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	*2437.00	117.7 PK			1.51 V	155	85.8	31.9
2	*2437.00	105.4 AV			1.51 V	155	73.5	31.9
3	2483.50	73.5 PK	74.0	-0.5	1.51 V	155	41.5	32.0
4	2483.50	53.6 AV	54.0	-0.4	1.51 V	155	21.6	32.0
5	4874.00	50.3 PK	74.0	-23.7	3.62 V	42	47.5	2.8
6	4874.00	36.5 AV	54.0	-17.5	3.62 V	42	33.7	2.8

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)

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	102.4 PK			2.60 H	298	70.4	32.0
2	*2452.00	91.4 AV			2.60 H	298	59.4	32.0
3	2483.50	58.5 PK	74.0	-15.5	1.60 H	298	26.5	32.0
4	2483.50	46.0 AV	54.0	-8.0	1.60 H	298	14.0	32.0
5	4904.00	49.5 PK	74.0	-24.5	1.40 H	132	46.6	2.9
6	4904.00	36.1 AV	54.0	-17.9	1.40 H	132	33.2	2.9

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	117.8 PK			1.63 V	141	85.8	32.0
2	*2452.00	105.1 AV			1.63 V	141	73.1	32.0
3	2483.50	66.0 PK	74.0	-8.0	1.63 V	141	34.0	32.0
4	2483.50	53.5 AV	54.0	-0.5	1.63 V	141	21.5	32.0
5	4904.00	50.0 PK	74.0	-24.0	3.62 V	44	47.1	2.9
6	4904.00	36.5 AV	54.0	-17.5	3.62 V	44	33.6	2.9

Remarks:

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

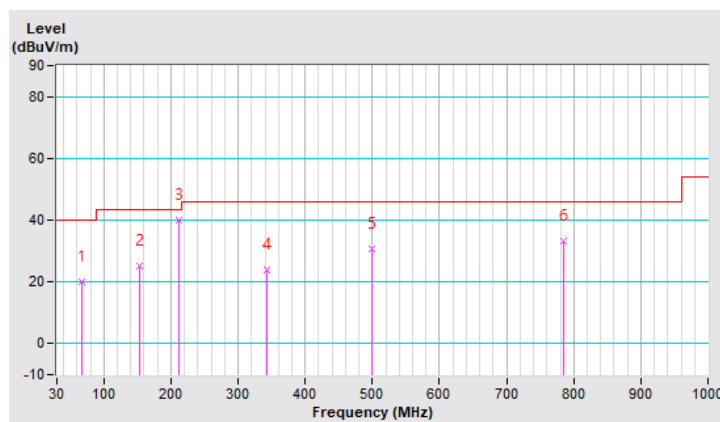
Below 1GHz worst-case data:

RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	67.96	19.9 QP	40.0	-20.1	1.99 H	333	35.1	-15.2
2	152.30	25.1 QP	43.5	-18.4	1.99 H	108	38.1	-13.0
3	212.75	39.9 QP	43.5	-3.6	1.49 H	156	56.6	-16.7
4	342.09	23.8 QP	46.0	-22.2	1.00 H	146	35.4	-11.6
5	499.54	30.5 QP	46.0	-15.5	1.49 H	249	38.3	-7.8
6	784.91	33.3 QP	46.0	-12.7	1.99 H	118	35.8	-2.5

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 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.

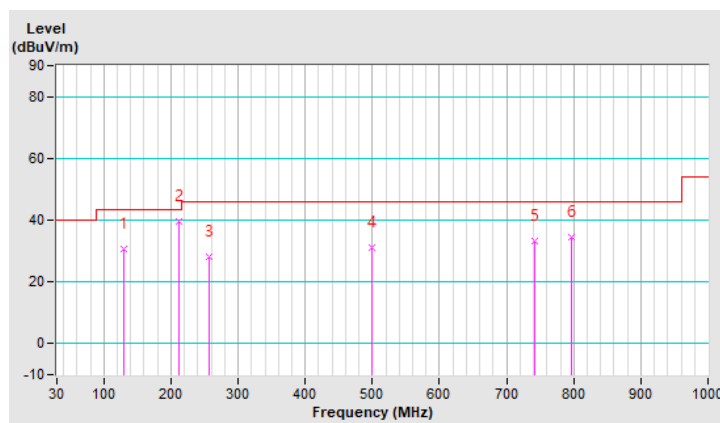


RF Mode	TX 802.11b	Channel	CH 6 : 2437 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	129.81	30.5 QP	43.5	-13.0	1.01 V	230	45.0	-14.5
2	211.35	39.6 QP	43.5	-3.9	1.01 V	7	56.4	-16.8
3	256.33	28.3 QP	46.0	-17.7	1.01 V	2	42.5	-14.2
4	499.54	31.0 QP	46.0	-15.0	1.01 V	185	38.8	-7.8
5	742.74	33.4 QP	46.0	-12.6	1.01 V	147	36.5	-3.1
6	796.16	34.6 QP	46.0	-11.4	1.01 V	213	37.1	-2.5

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 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.



Mode B

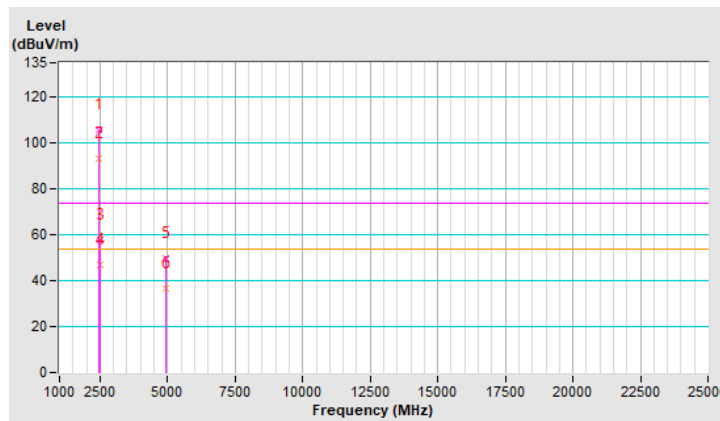
Above 1GHz data:

RF Mode	TX 802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	105.9 PK			2.09 H	285	73.9	32.0
2	*2462.00	93.3 AV			2.09 H	285	61.3	32.0
3	2483.50	57.7 PK	74.0	-16.3	2.09 H	285	25.7	32.0
4	2483.50	46.9 AV	54.0	-7.1	2.09 H	285	14.9	32.0
5	4924.00	50.0 PK	74.0	-24.0	1.45 H	192	47.2	2.8
6	4924.00	36.8 AV	54.0	-17.2	1.45 H	192	34.0	2.8

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.

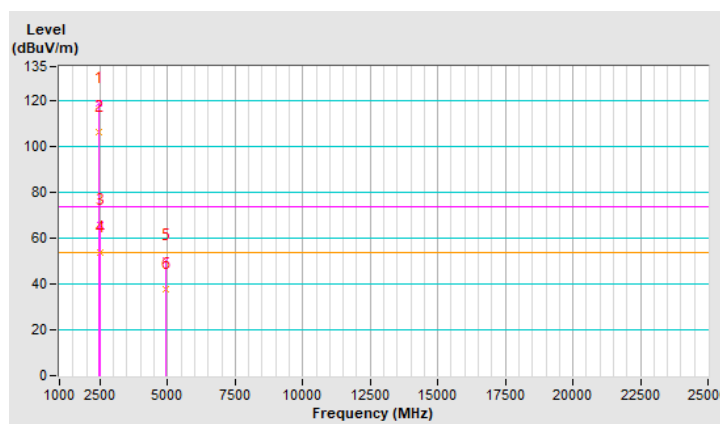


RF Mode	TX 802.11ax (HE20)	Channel	CH 11 : 2462 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

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	118.8 PK			1.50 V	149	86.8	32.0
2	*2462.00	106.5 AV			1.50 V	149	74.5	32.0
3	2483.50	65.5 PK	74.0	-8.5	1.50 V	149	33.5	32.0
4	2483.50	53.5 AV	54.0	-0.5	1.50 V	149	21.5	32.0
5	4924.00	50.1 PK	74.0	-23.9	3.65 V	51	47.3	2.8
6	4924.00	37.5 AV	54.0	-16.5	3.65 V	51	34.7	2.8

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.



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 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 20, 2021	Dec. 19, 2022
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2021	Sep. 03, 2022
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Feb. 17, 2022	Feb. 16, 2023
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Sep. 17, 2021	Sep. 16, 2022
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

- 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 HwaYa Shielded Room 2. (Conduction 2)
 3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

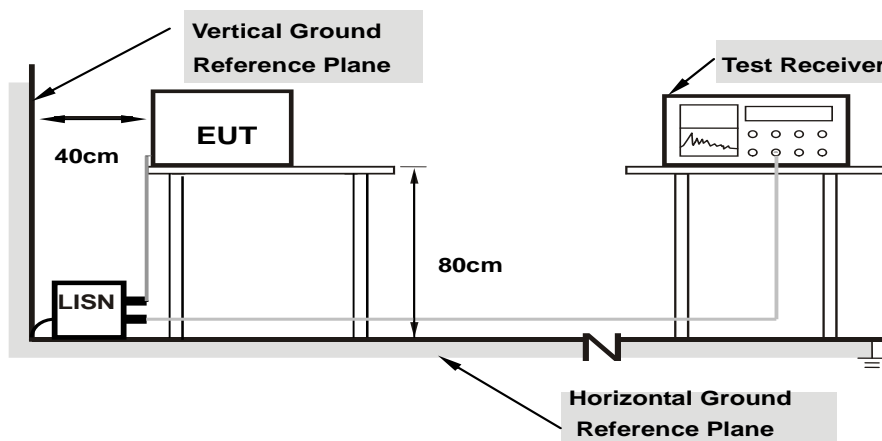
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling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

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

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

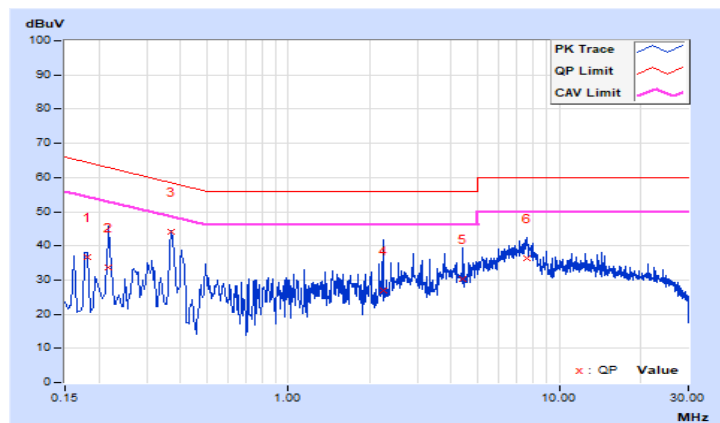
4.2.7 Test Results

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 66% RH
Tested by	Titan Hsu		

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	0.18037	10.15	26.40	10.57	36.55	20.72	64.47	54.47	-27.92	-33.75
2	0.21800	10.17	23.47	8.40	33.64	18.57	62.89	52.89	-29.25	-34.32
3	0.37000	10.23	33.73	29.97	43.96	40.20	58.50	48.50	-14.54	-8.30
4	2.23800	10.37	16.67	8.24	27.04	18.61	56.00	46.00	-28.96	-27.39
5	4.41786	10.40	20.07	11.49	30.47	21.89	56.00	46.00	-25.53	-24.11
6	7.59000	10.44	25.95	19.26	36.39	29.70	60.00	50.00	-23.61	-20.30

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

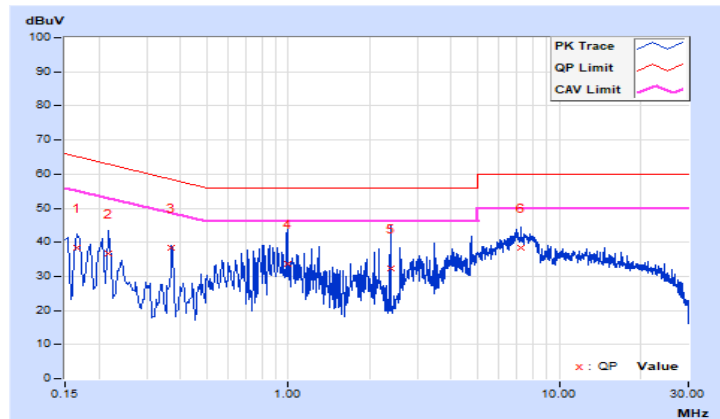


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23°C, 66% RH
Tested by	Titan Hsu		

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	0.16600	10.16	28.32	18.42	38.48	28.58	65.16	55.16	-26.68	-26.58
2	0.21800	10.20	26.34	13.11	36.54	23.31	62.89	52.89	-26.35	-29.58
3	0.37000	10.25	28.16	21.81	38.41	32.06	58.50	48.50	-20.09	-16.44
4	0.99000	10.31	23.31	14.03	33.62	24.34	56.00	46.00	-22.38	-21.66
5	2.38600	10.37	22.01	1.59	32.38	11.96	56.00	46.00	-23.62	-34.04
6	7.23000	10.46	27.91	20.88	38.37	31.34	60.00	50.00	-21.63	-18.66

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

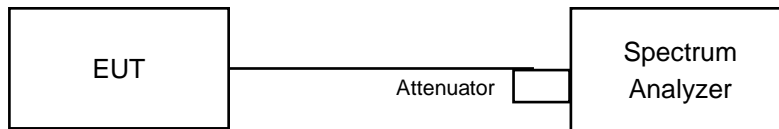


4.3 6 dB Bandwidth Measurement

4.3.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB 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

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

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 Results

Mode A

802.11b

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	8.06	7.09	0.5	Pass
6	2437	7.64	7.57	0.5	Pass
11	2462	7.54	7.58	0.5	Pass

802.11g

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.13	15.12	0.5	Pass
6	2437	15.12	15.13	0.5	Pass
11	2462	15.09	15.07	0.5	Pass

802.11ax (HE20)

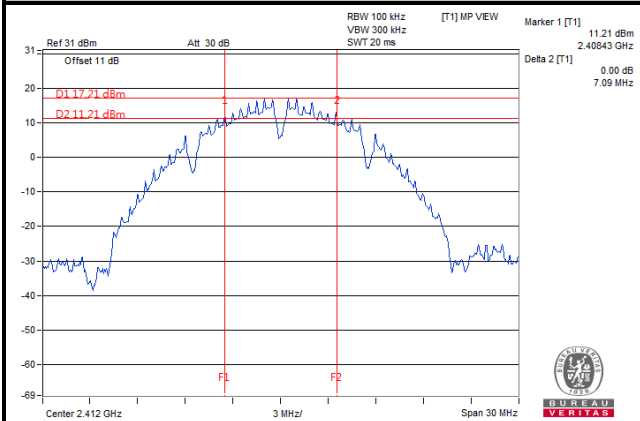
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.03	13.94	0.5	Pass
6	2437	15.11	15.11	0.5	Pass
11	2462	13.79	15.05	0.5	Pass

802.11ax (HE40)

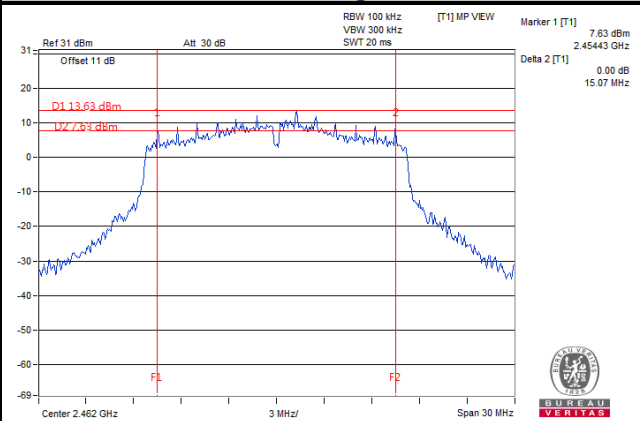
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	31.68	32.51	0.5	Pass
6	2437	30.09	33.92	0.5	Pass
9	2452	28.99	31.39	0.5	Pass

Spectrum Plot of Worst Value

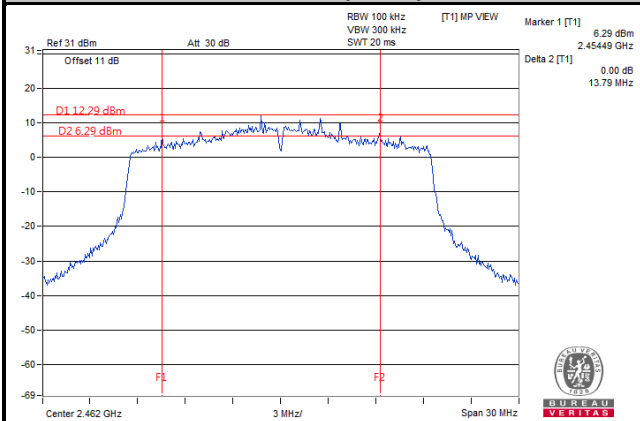
802.11b



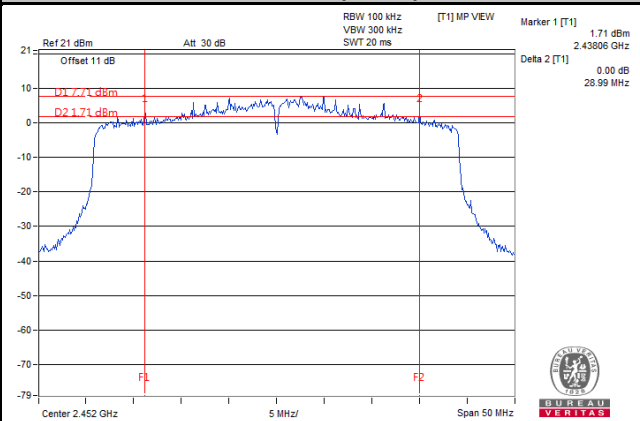
802.11g



802.11ax (HE20)



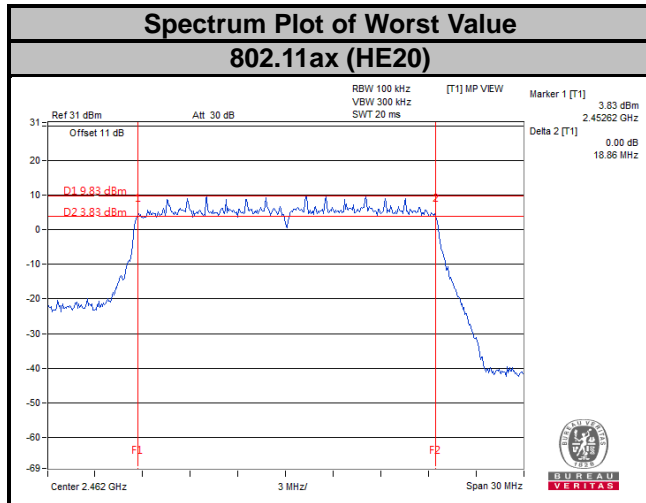
802.11ax (HE40)



Mode B

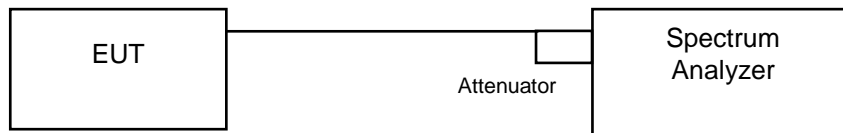
802.11ax (HE20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
11	2462	18.86	18.99	0.5	Pass



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.4.4 Deviation from Test Standard

No deviation.

4.4.5 EUT Operating Conditions

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

4.4.6 Test Results

Mode A

802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
1	2412	13.36	13.65	Pass
6	2437	13.36	13.65	Pass
11	2462	13.07	13.17	Pass

802.11g

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
1	2412	16.73	18.46	Pass
6	2437	17.12	20.48	Pass
11	2462	16.25	16.16	Pass

802.11ax (HE20)

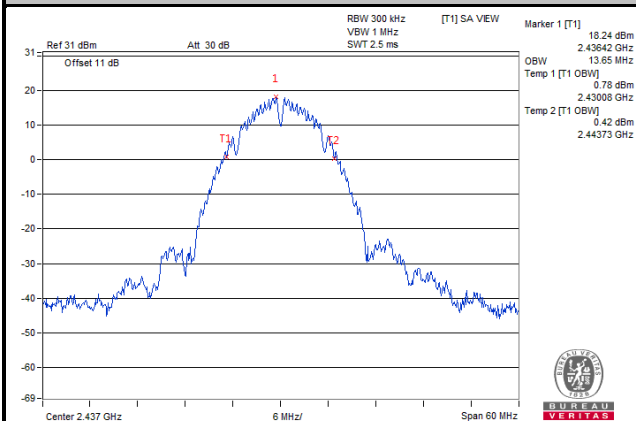
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
1	2412	18.84	18.75	Pass
6	2437	19.14	18.94	Pass
11	2462	18.75	18.75	Pass

802.11ax (HE40)

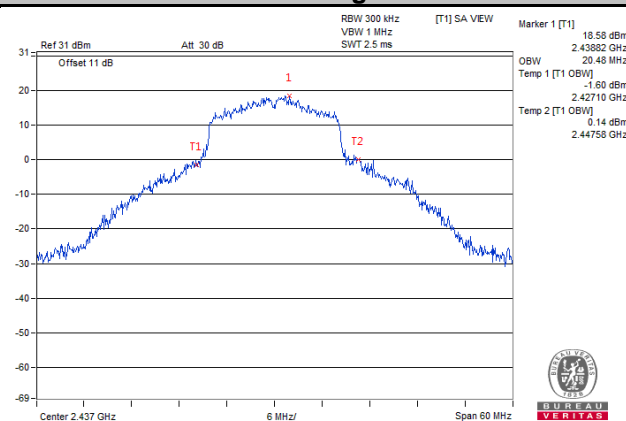
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
3	2422	37.89	38.08	Pass
6	2437	37.70	37.69	Pass
9	2452	38.08	38.08	Pass

Spectrum Plot of Worst Value

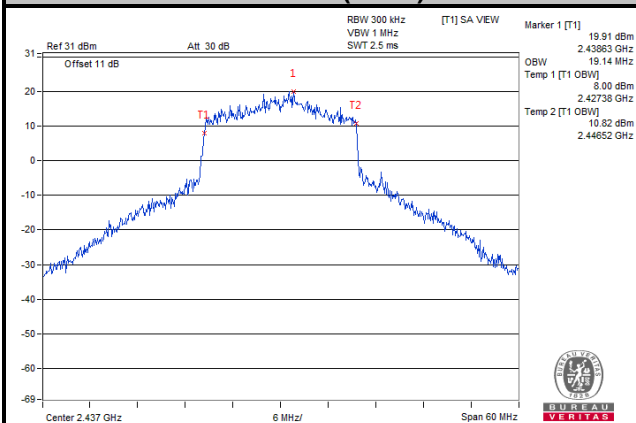
802.11b



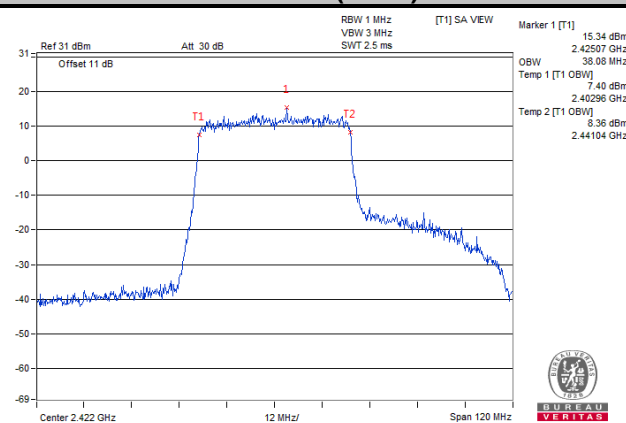
802.11g



802.11ax (HE20)



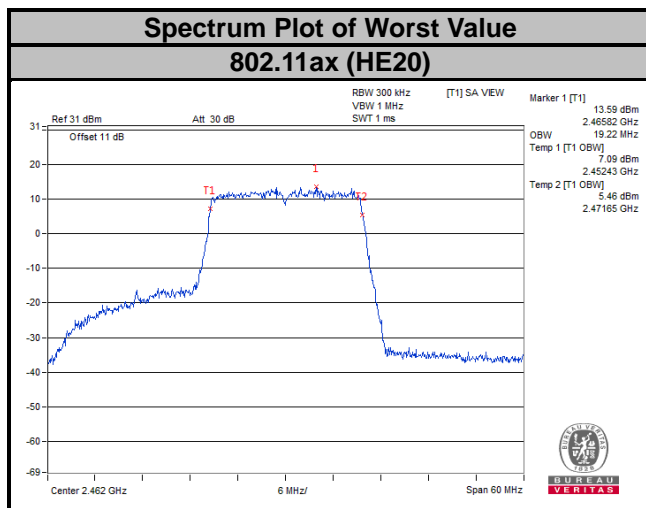
802.11ax (HE40)



Mode B

802.11ax (HE20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
11	2462	19.22	19.22	Pass



4.5 Conducted Output Power Measurement

4.5.1 Limits of Conducted Output Power Measurement

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,

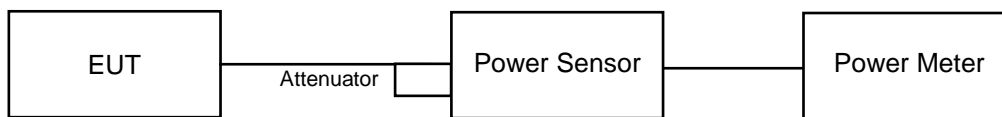
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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.

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 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

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

4.5.7 Test Results

CDD Mode
Mode A
802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	27.03	26.78	981.092	29.92	30	Pass
6	2437	27.12	26.75	988.38	29.95	30	Pass
11	2462	27.02	26.76	977.743	29.90	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.25	22.65	351.958	25.46	30	Pass
6	2437	25.65	26.31	794.845	29.00	30	Pass
11	2462	21.81	22.16	316.142	25.00	30	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.53	20.95	237.431	23.76	30	Pass
6	2437	25.87	26.35	817.886	29.13	30	Pass
11	2462	20.65	21.02	242.618	23.85	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.72	19.65	186.013	22.70	30	Pass
6	2437	20.66	20.72	234.445	23.70	30	Pass
9	2452	19.73	19.68	186.869	22.72	30	Pass

Mode B

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
11	2462	20.82	21.21	252.911	24.03	30	Pass

Beamforming Mode

Mode A

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.53	20.95	237.431	23.76	30	Pass
6	2437	25.87	26.35	817.886	29.13	30	Pass
11	2462	20.65	21.02	242.618	23.85	30	Pass

802.11ax (HE40)

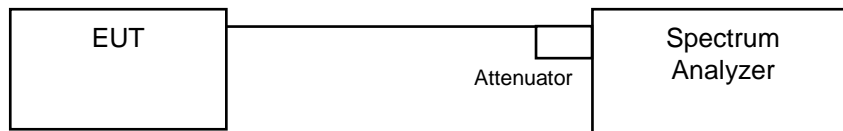
Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.72	19.65	186.013	22.70	30	Pass
6	2437	20.66	20.72	234.445	23.70	30	Pass
9	2452	19.73	19.68	186.869	22.72	30	Pass

4.6 Power Spectral Density Measurement

4.6.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm in any 3 kHz band during any time interval of continuous transmission.

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

- 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- e. Set VBW $\geq 3 \times \text{RBW}$.
- f. Detector = power averaging (RMS) or sample detector (when RMS not available).
- g. Ensure that the number of measurement points in the sweep $\geq 2 \times \text{span}/\text{RBW}$.
- 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. 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.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Mode A

802.11b

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	1	2412	-12.65	3.01	1.97	-7.67	8	Pass
	6	2437	-12.66	3.01	1.97	-7.68	8	Pass
	11	2462	-13.30	3.01	1.97	-8.32	8	Pass
1	1	2412	-12.17	3.01	1.97	-7.19	8	Pass
	6	2437	-12.01	3.01	1.97	-7.03	8	Pass
	11	2462	-12.59	3.01	1.97	-7.61	8	Pass

NOTE:

1. Method F) 2) f) i) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 2 dBi + 10log(2) = 5.01dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11g

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	1	2412	-8.76	3.01	0.28	-5.47	8	Pass
	6	2437	-8.39	3.01	0.28	-5.1	8	Pass
	11	2462	-11.78	3.01	0.28	-8.49	8	Pass
1	1	2412	-8.42	3.01	0.28	-5.13	8	Pass
	6	2437	-9.01	3.01	0.28	-5.72	8	Pass
	11	2462	-12.78	3.01	0.28	-9.49	8	Pass

NOTE:

1. Method F) 2) f) i) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 2 dBi + 10log(2) = 5.01dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	1	2412	-15.47	3.01	0.33	-12.13	8	Pass
	6	2437	-12.13	3.01	0.33	-8.79	8	Pass
	11	2462	-16.36	3.01	0.33	-13.02	8	Pass
1	1	2412	-15.04	3.01	0.33	-11.7	8	Pass
	6	2437	-12.01	3.01	0.33	-8.67	8	Pass
	11	2462	-16.03	3.01	0.33	-12.69	8	Pass

NOTE:

1. Method F) 2) f) i) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 2 dBi + 10log(2) = 5.01dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

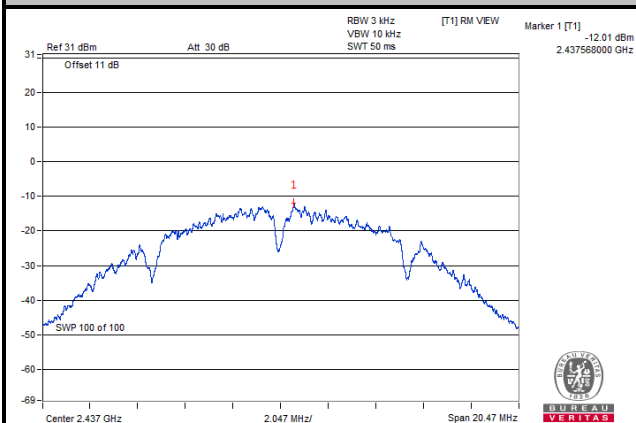
TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	3	2422	-17.83	3.01	0.36	-14.46	8	Pass
	6	2437	-17.33	3.01	0.36	-13.96	8	Pass
	9	2452	-18.39	3.01	0.36	-15.02	8	Pass
1	3	2422	-18.10	3.01	0.36	-14.73	8	Pass
	6	2437	-17.14	3.01	0.36	-13.77	8	Pass
	9	2452	-18.61	3.01	0.36	-15.24	8	Pass

NOTE:

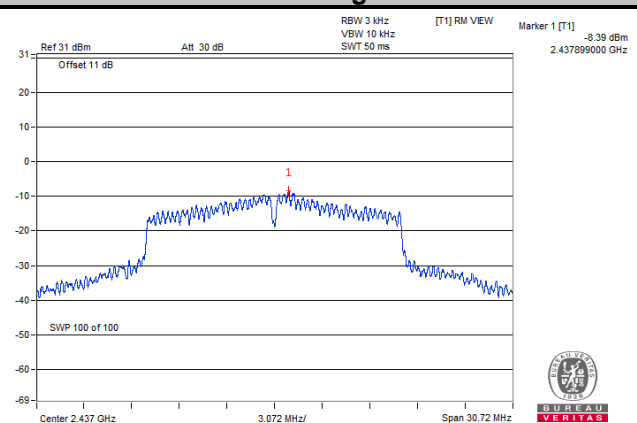
1. Method F) 2) f) i) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 2 dBi + 10log(2) = 5.01dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

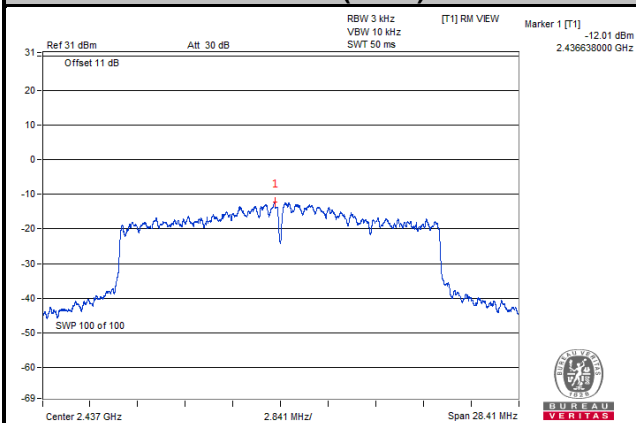
802.11b



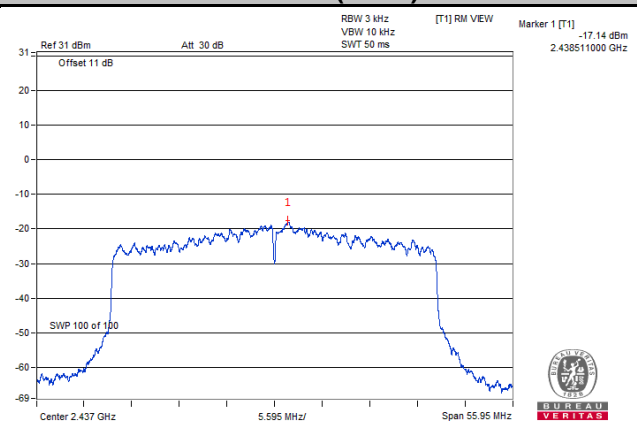
802.11g



802.11ax (HE20)



802.11ax (HE40)



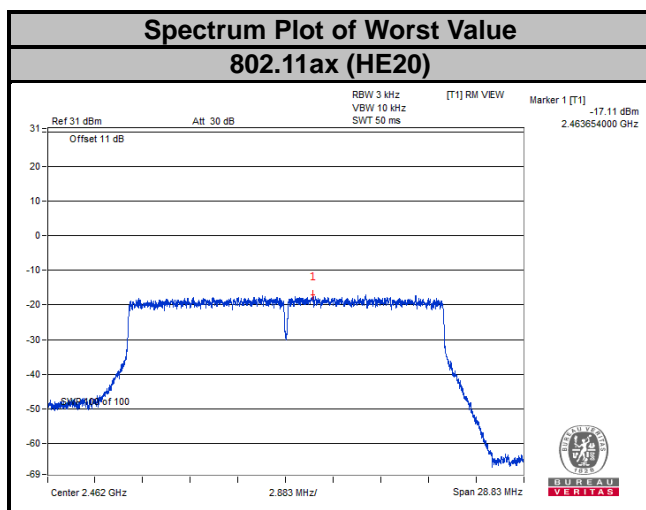
Mode B

802.11ax (HE20)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/3 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	11	2462	-17.38	3.01	0.33	-14.04	8	Pass
1	11	2462	-17.11	3.01	0.33	-13.77	8	Pass

NOTE:

1. Method F) 2) f) i) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 2 dBi + 10log(2/2) = 2dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

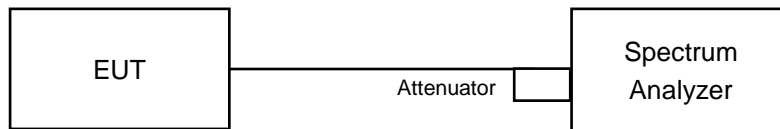


4.7 Conducted Out of Band Emission Measurement

4.7.1 Limits of Conducted Out of Band Emission Measurement

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

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 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 OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 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.

4.7.5 Deviation from Test Standard

No deviation.

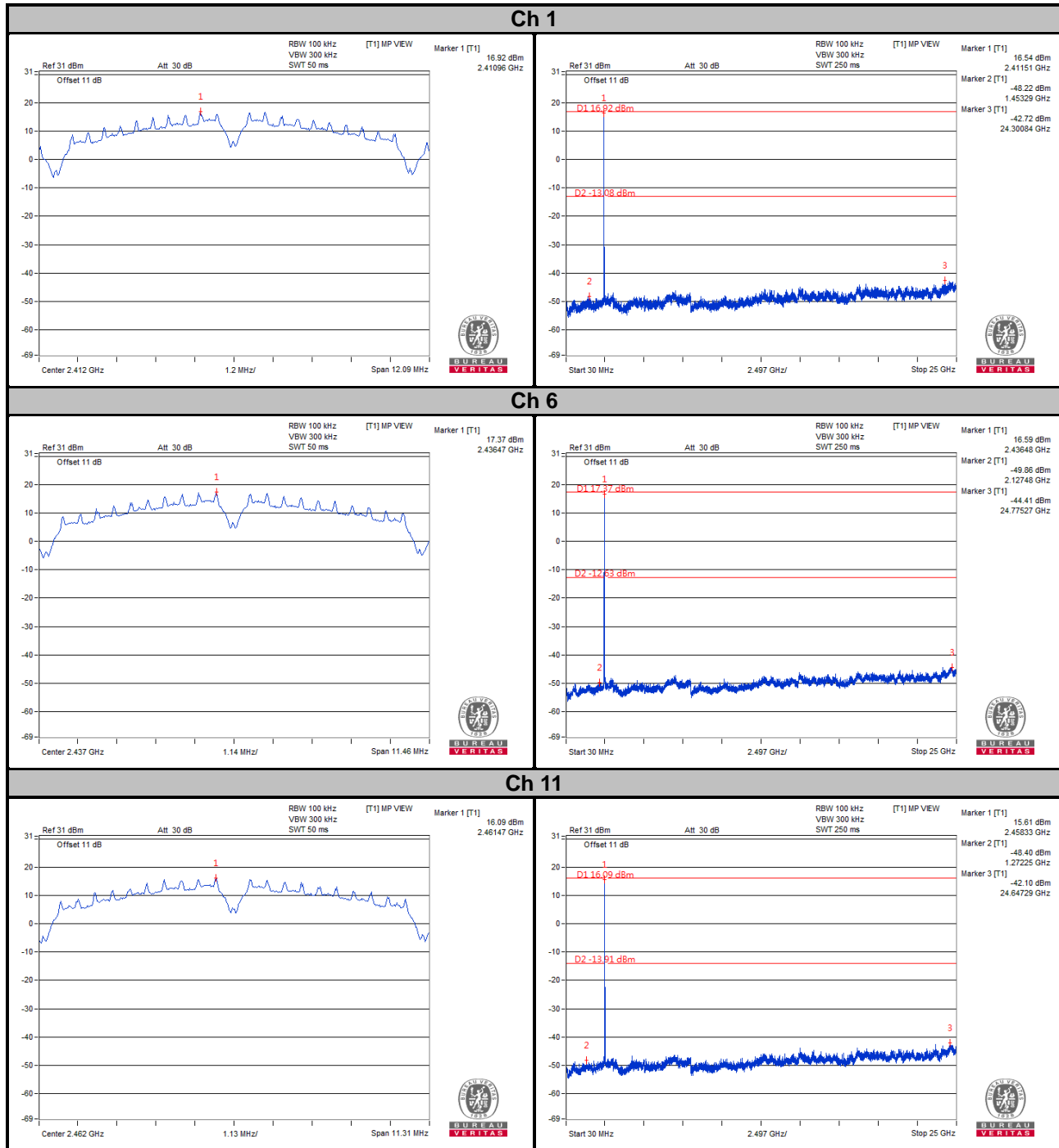
4.7.6 EUT Operating Condition

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

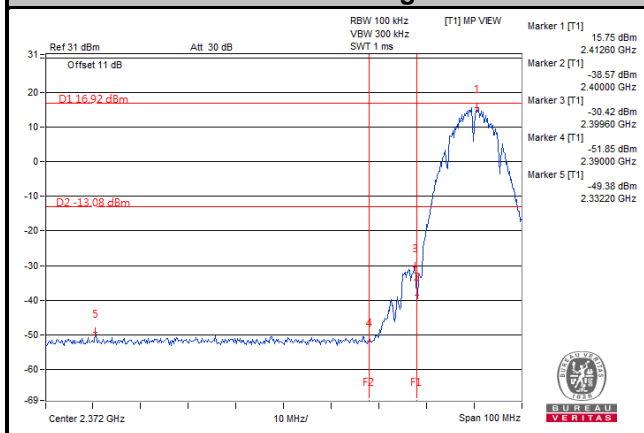
4.7.7 Test Results

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

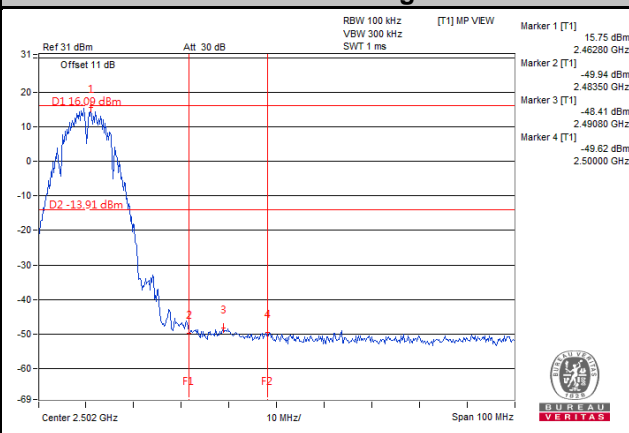
Mode A
802.11b
CHAIN 0



Ch 1 Band Edge

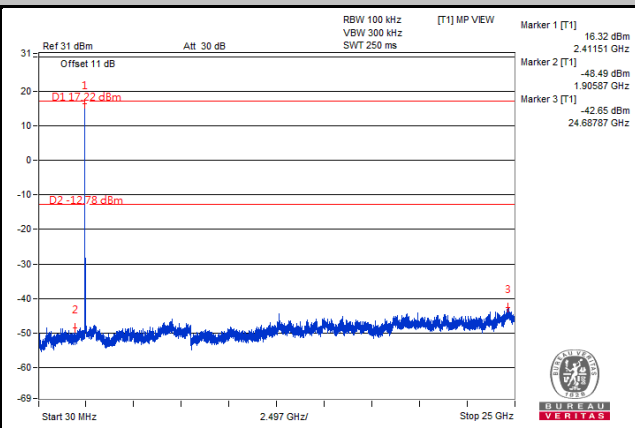
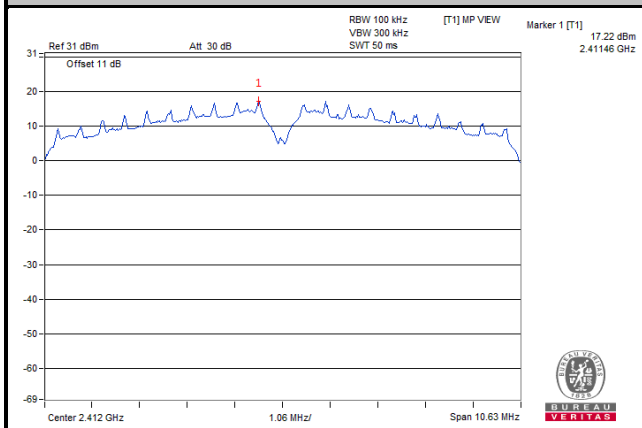


Ch 11 Band Edge

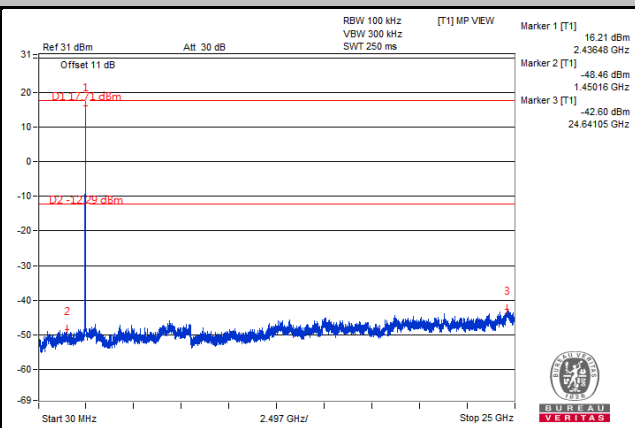
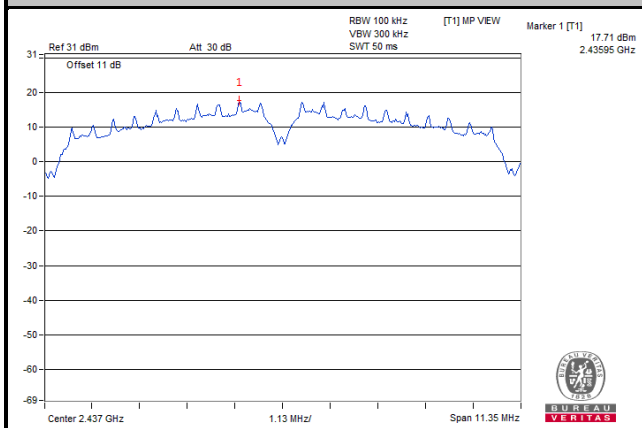


CHAIN 1

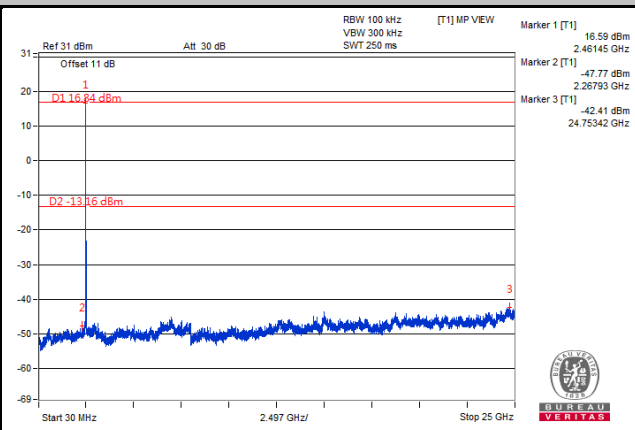
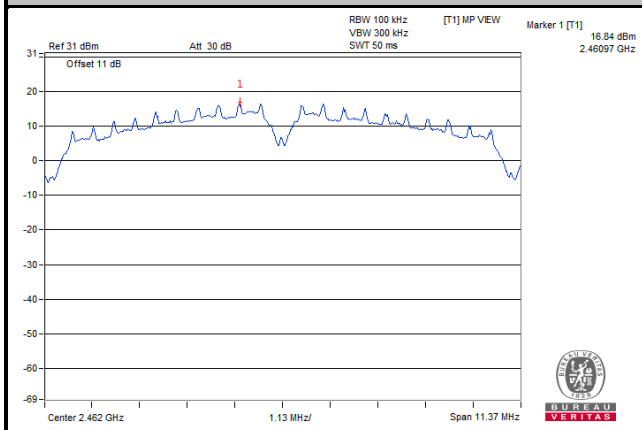
Ch 1



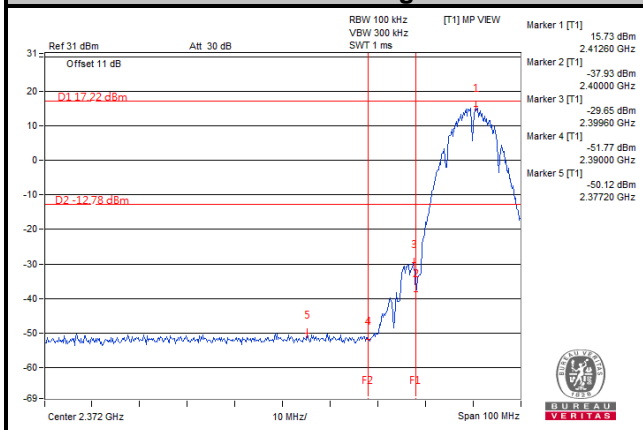
Ch 6



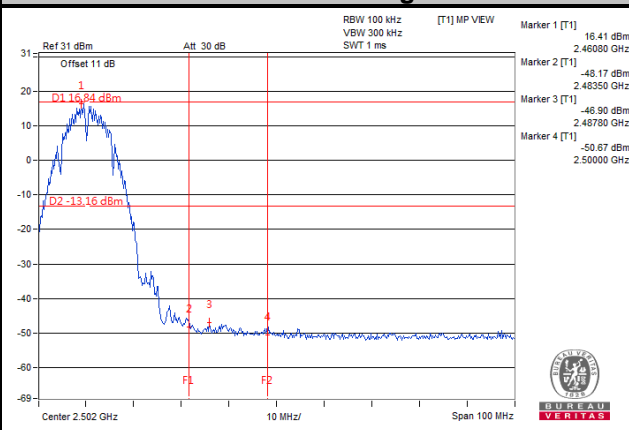
Ch 11



Ch 1 Band Edge

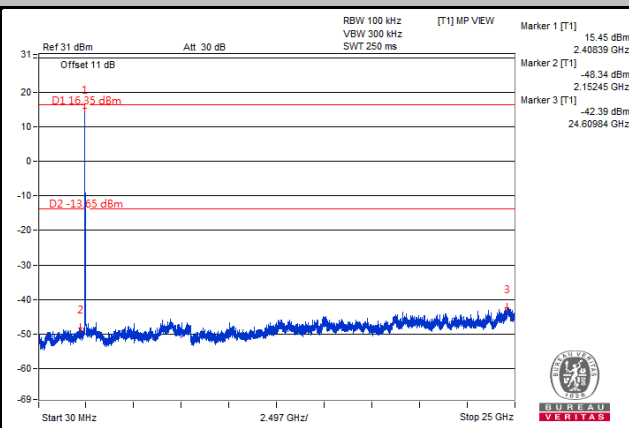
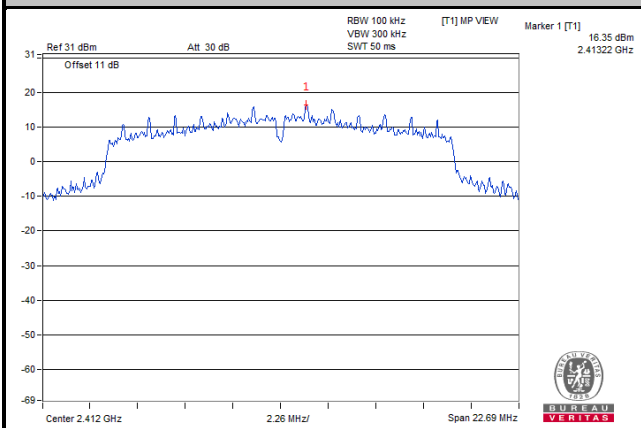


Ch 11 Band Edge

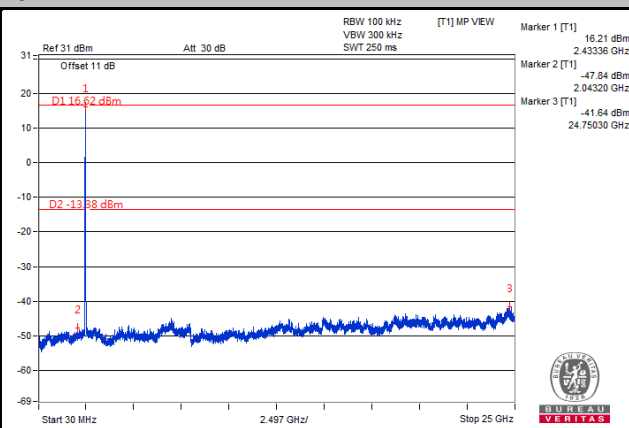
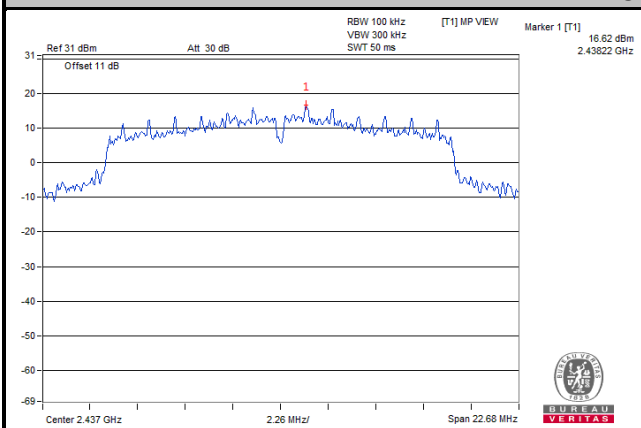


802.11g
CHAIN 0

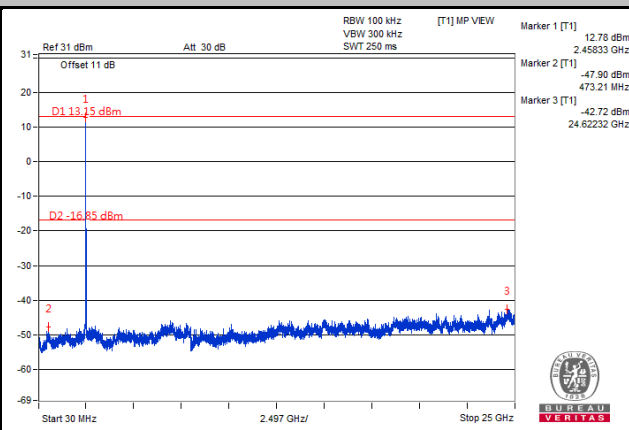
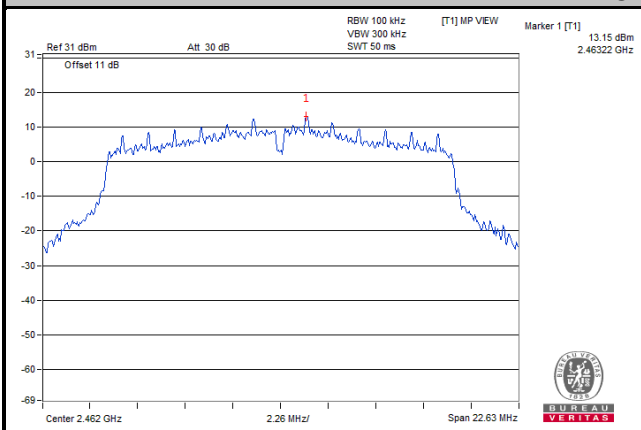
Ch 1



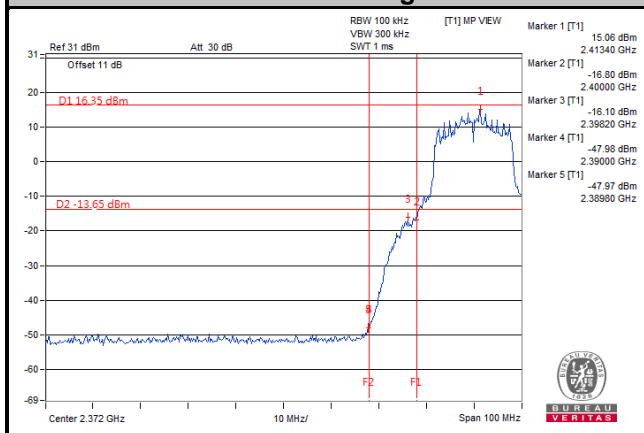
Ch 6



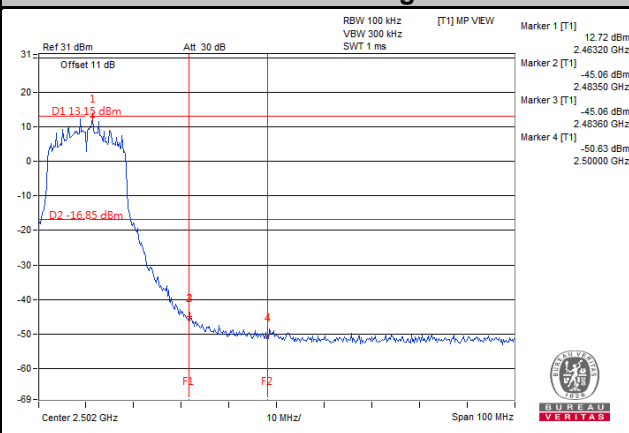
Ch 11



Ch 1 Band Edge

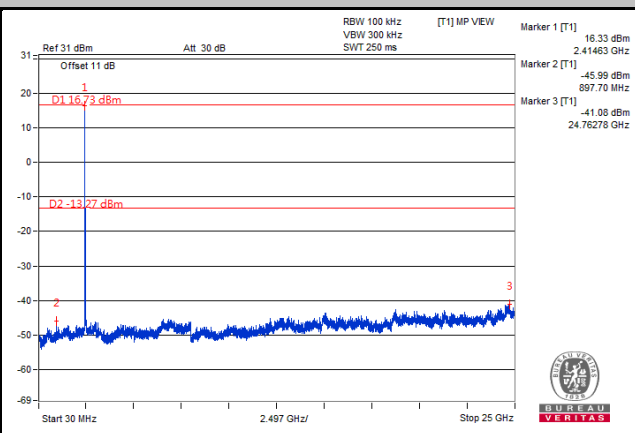
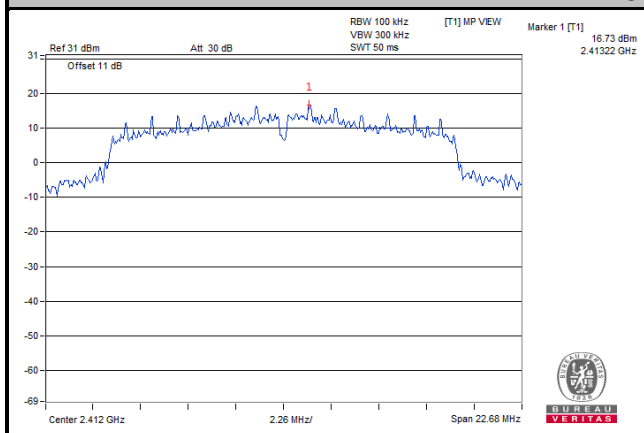


Ch 11 Band Edge

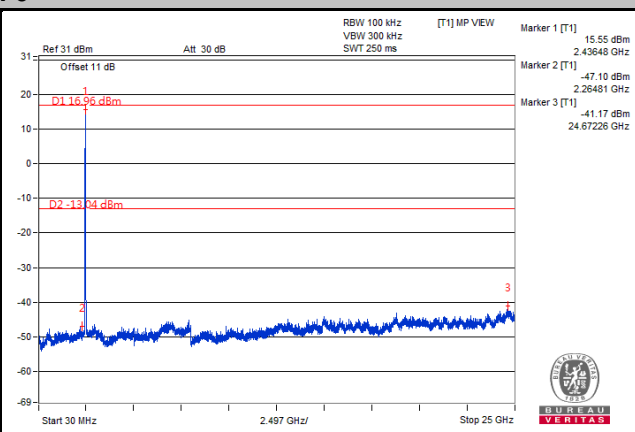
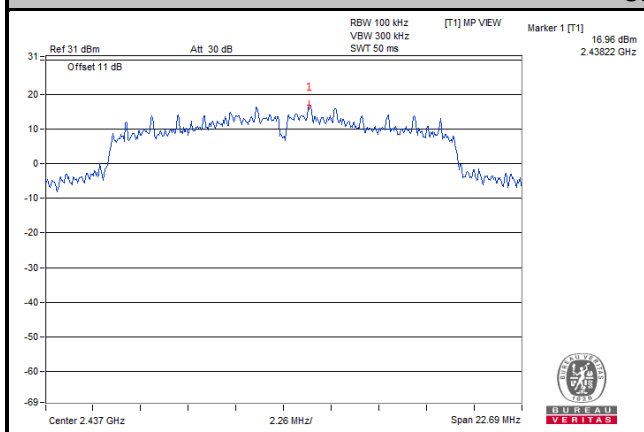


CHAIN 1

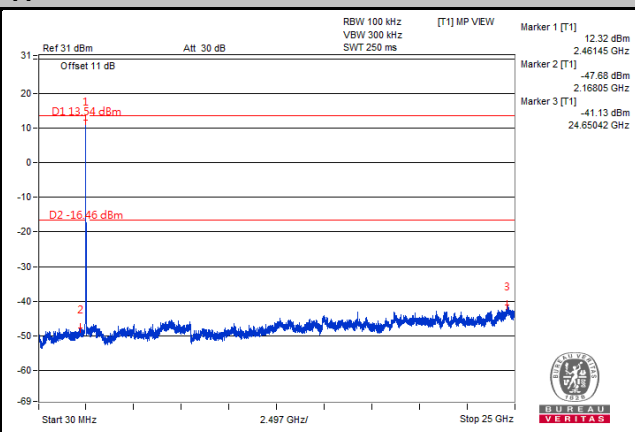
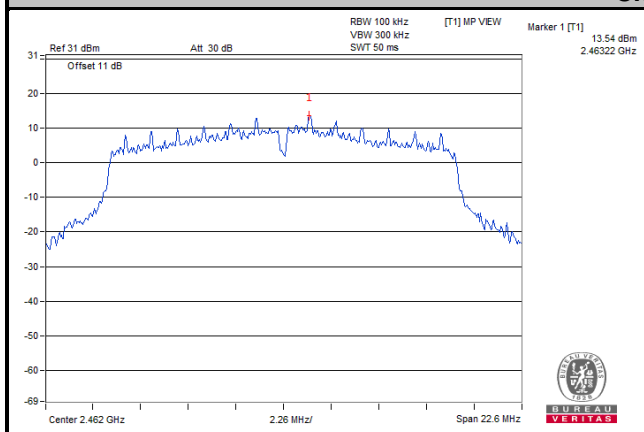
Ch 1



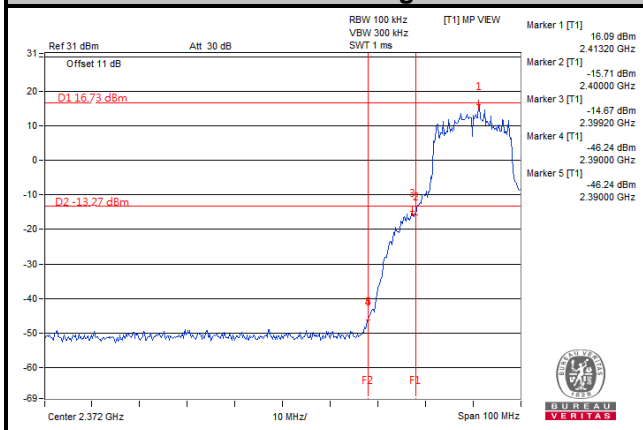
Ch 6



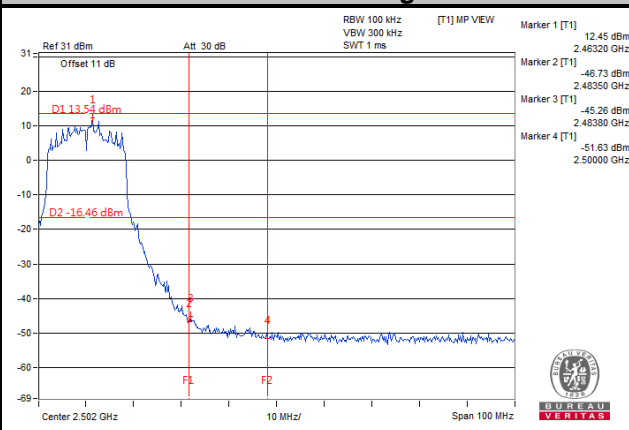
Ch 11



Ch 1 Band Edge

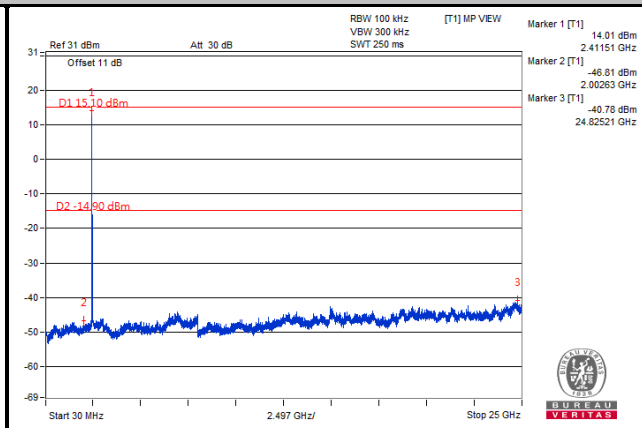
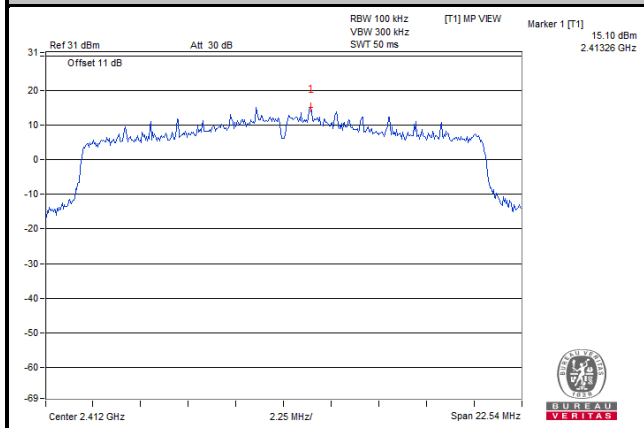


Ch 11 Band Edge

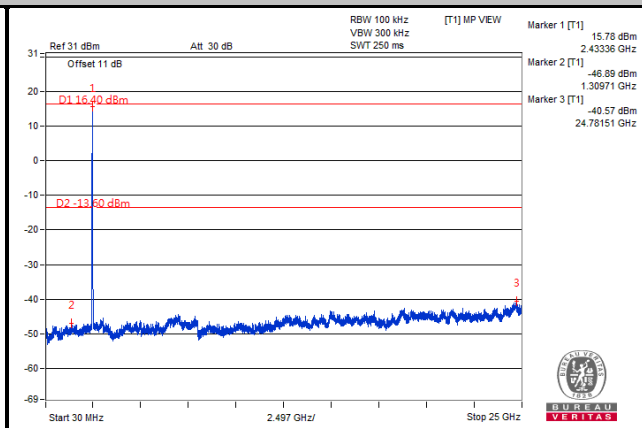
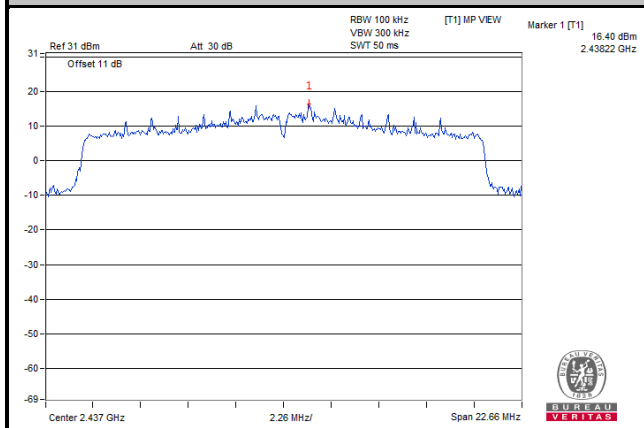


802.11ax (HE20)
CHAIN 0

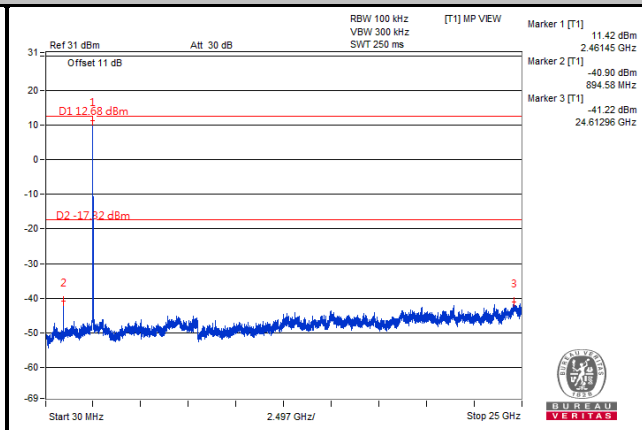
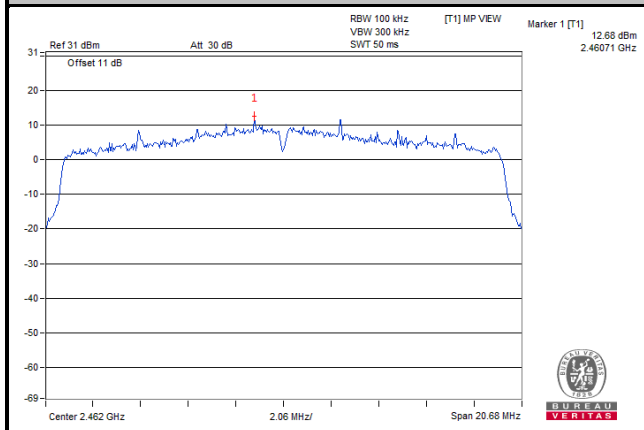
Ch 1



Ch 6



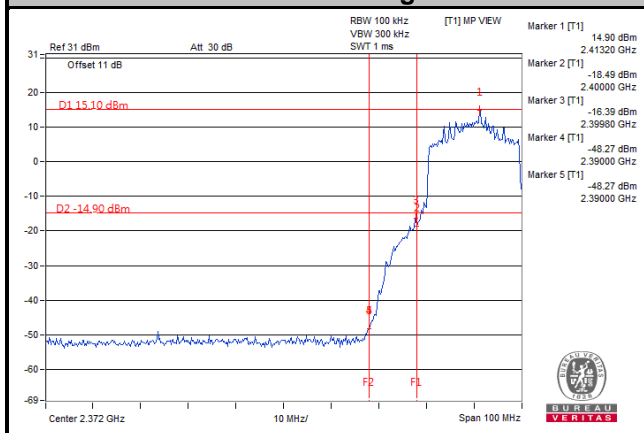
Ch 11



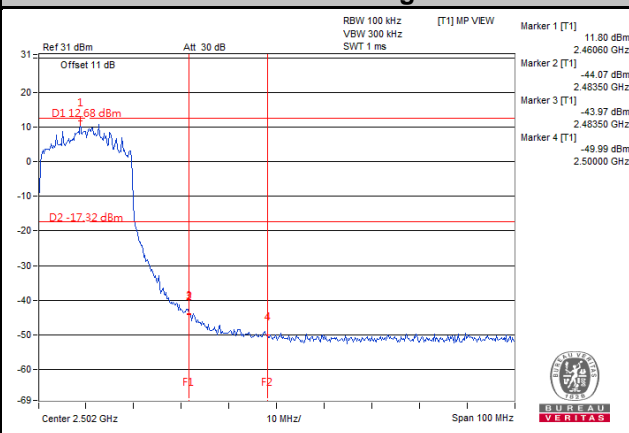


BUREAU VERITAS

Ch 1 Band Edge

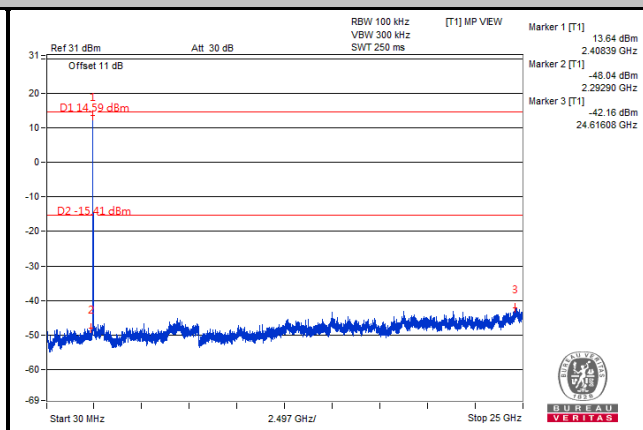
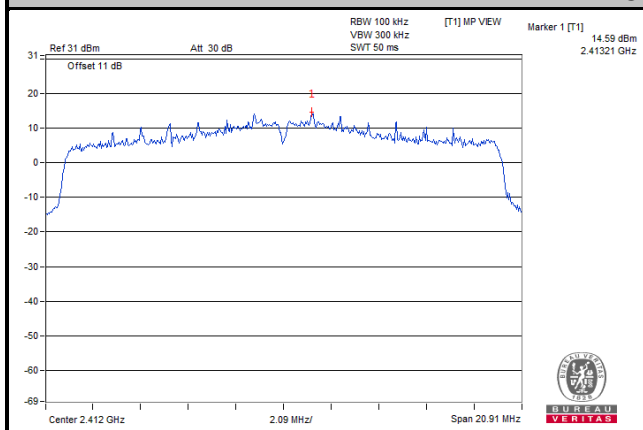


Ch 11 Band Edge

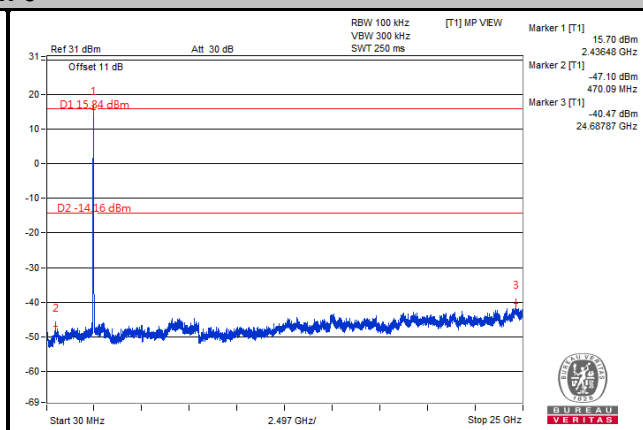
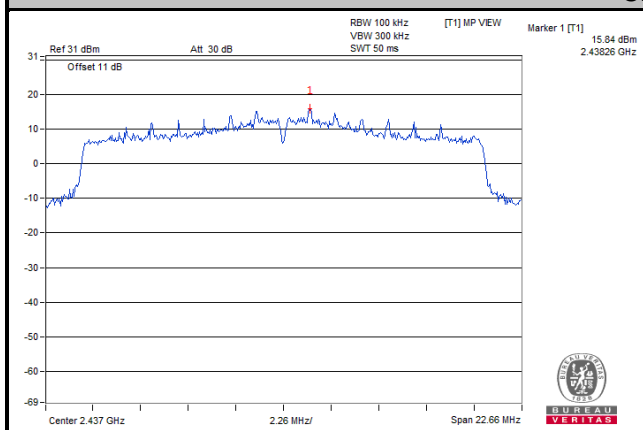


CHAIN 1

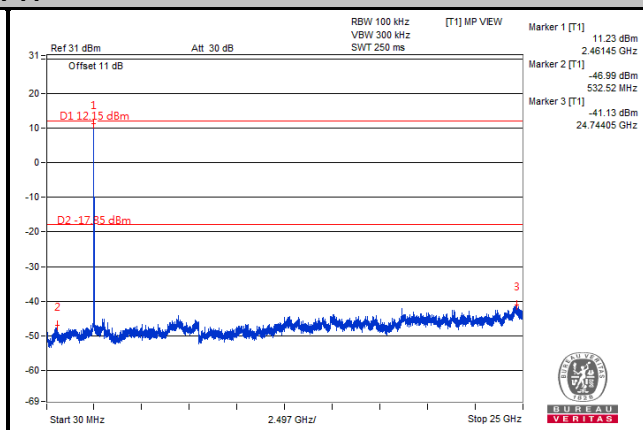
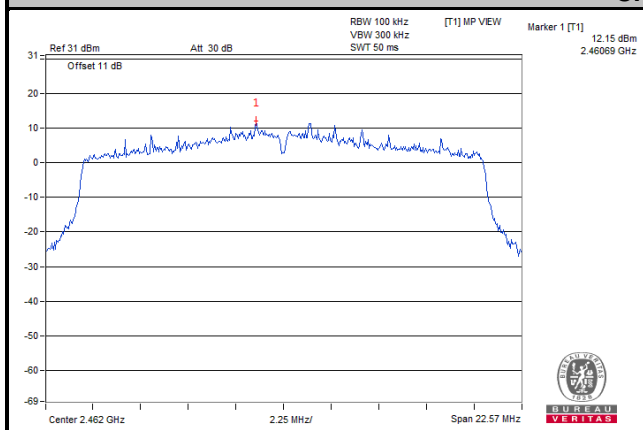
Ch 1



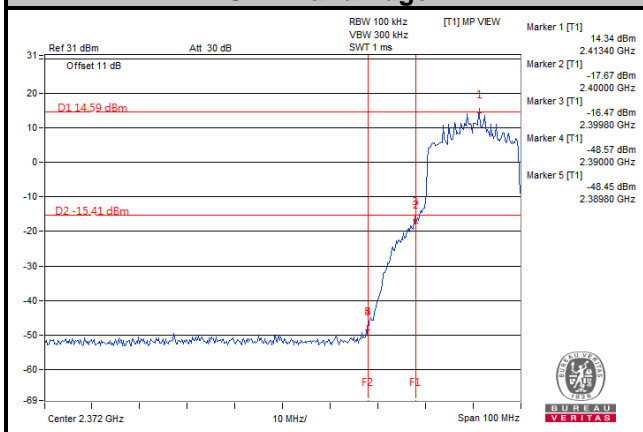
Ch 6



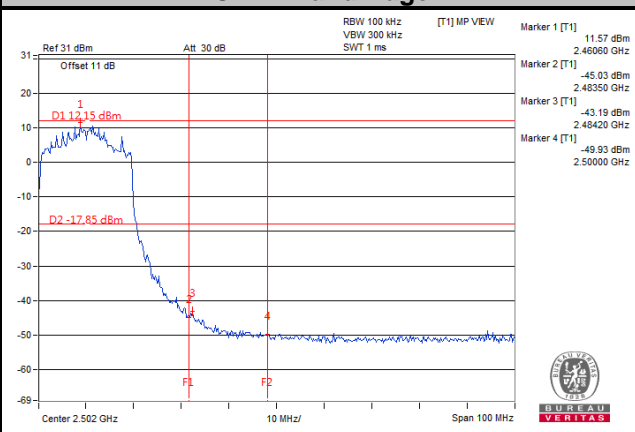
Ch 11



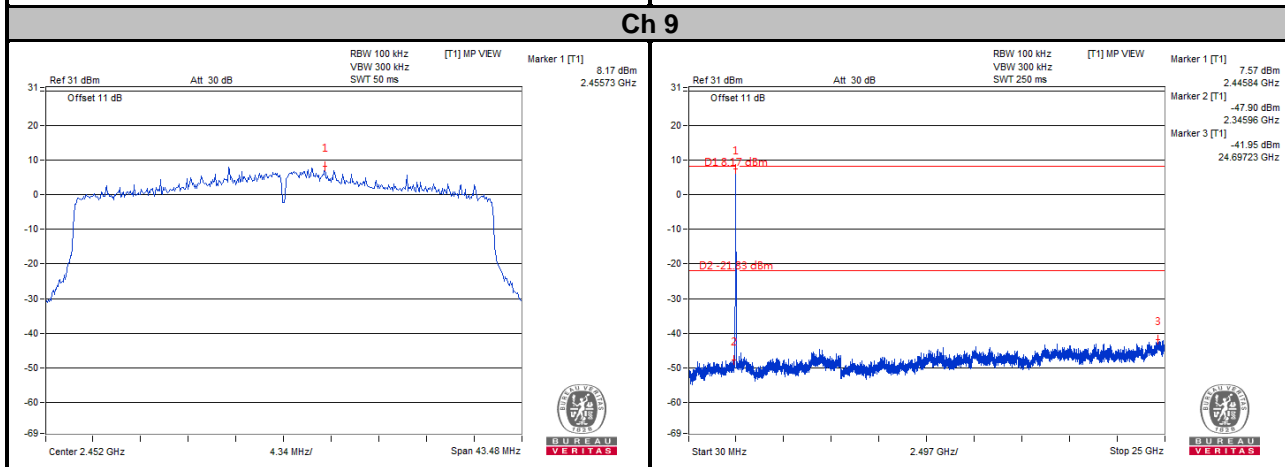
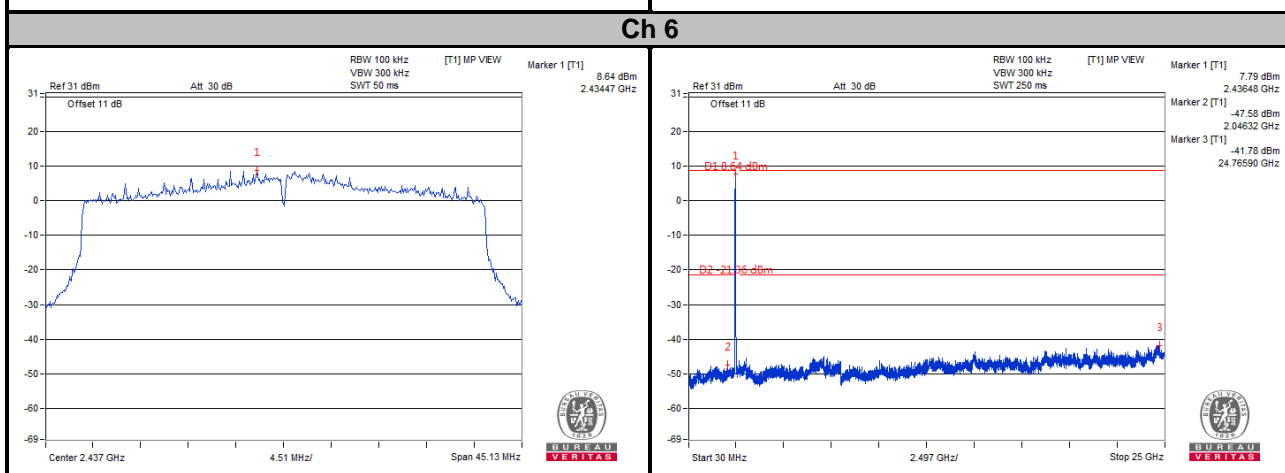
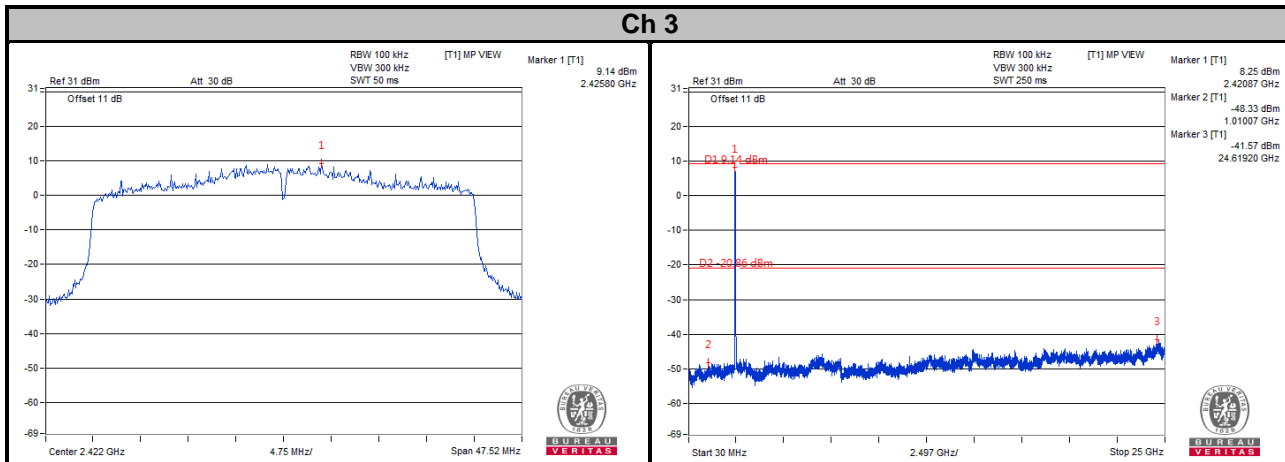
Ch 1 Band Edge



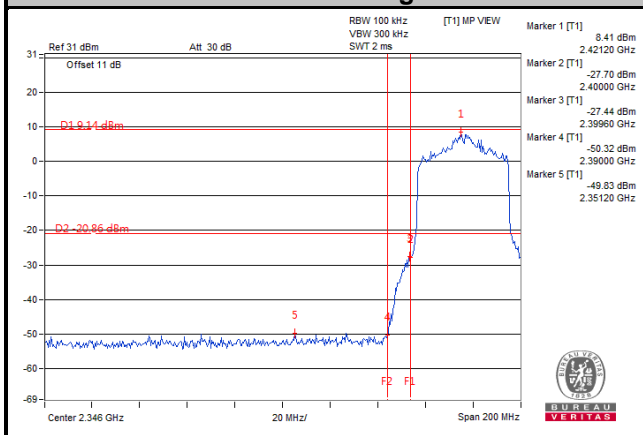
Ch 11 Band Edge



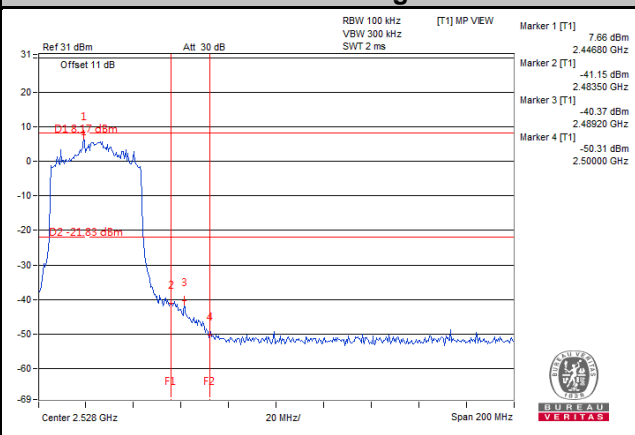
802.11ax (HE40)
CHAIN 0



Ch 3 Band Edge

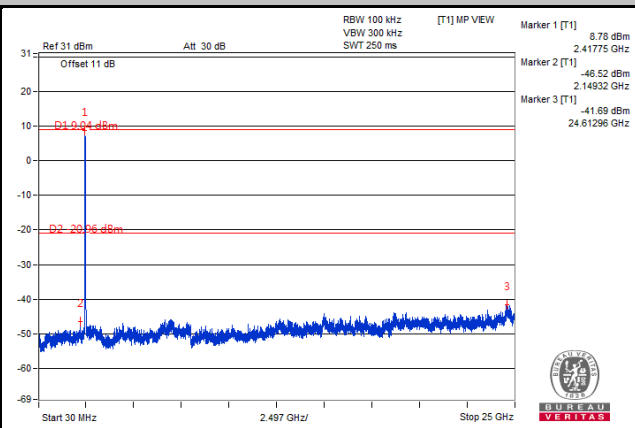
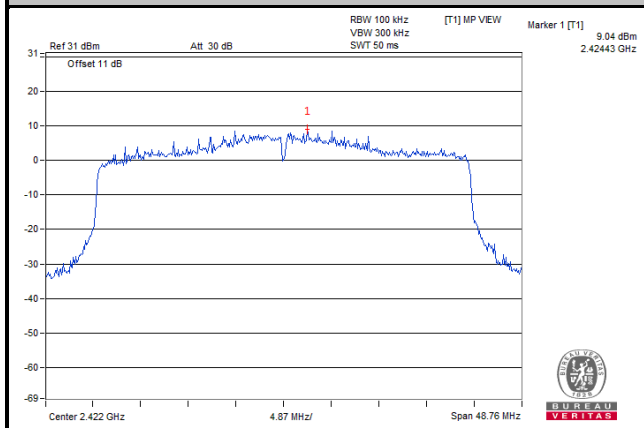


Ch 9 Band Edge

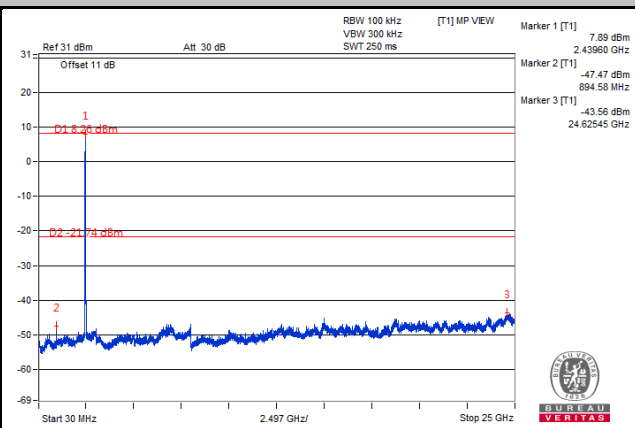
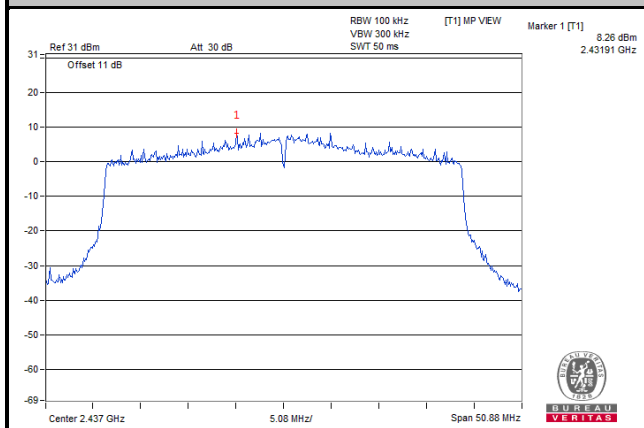


CHAIN 1

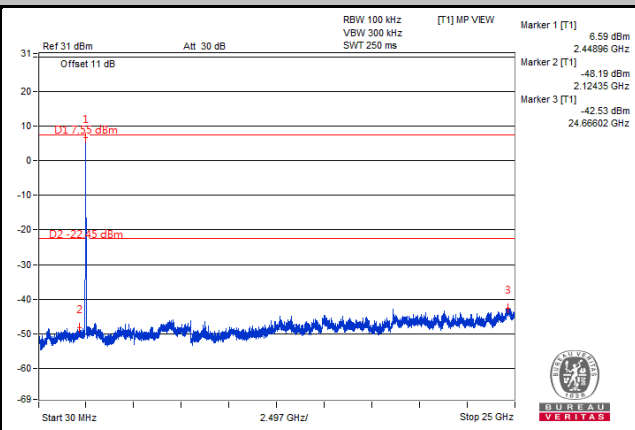
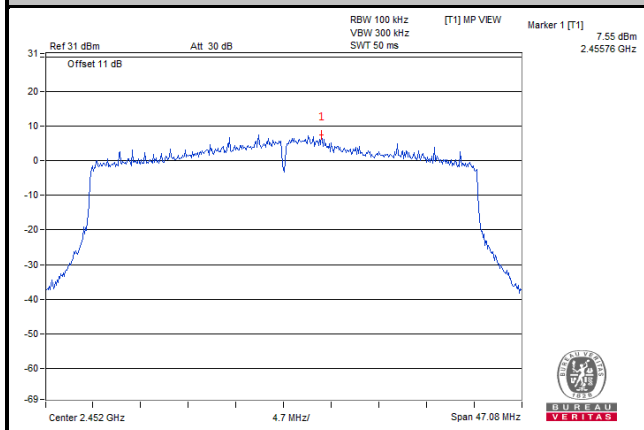
Ch 3



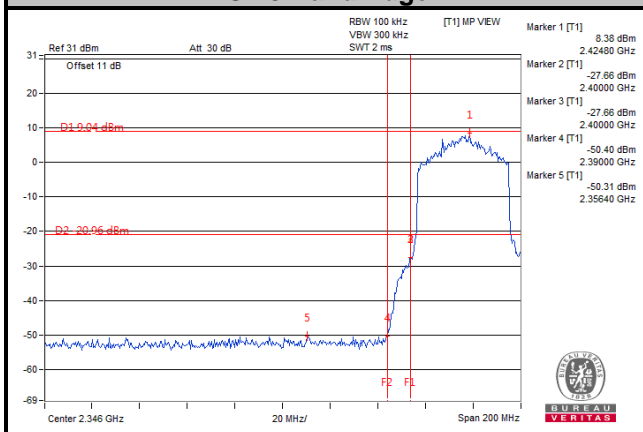
Ch 6



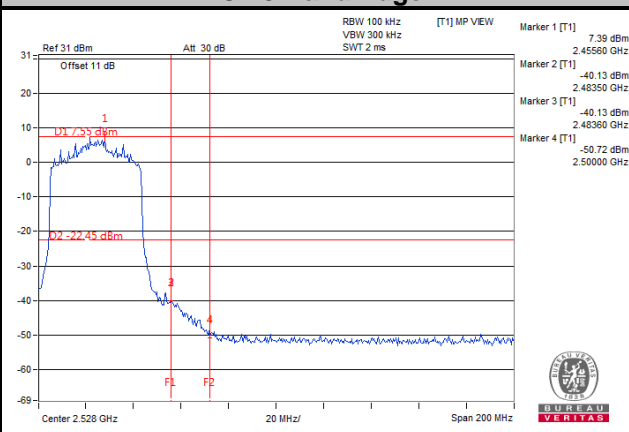
Ch 9



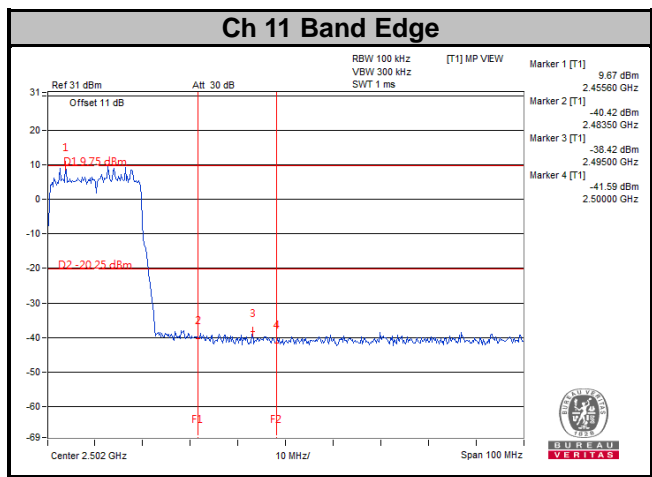
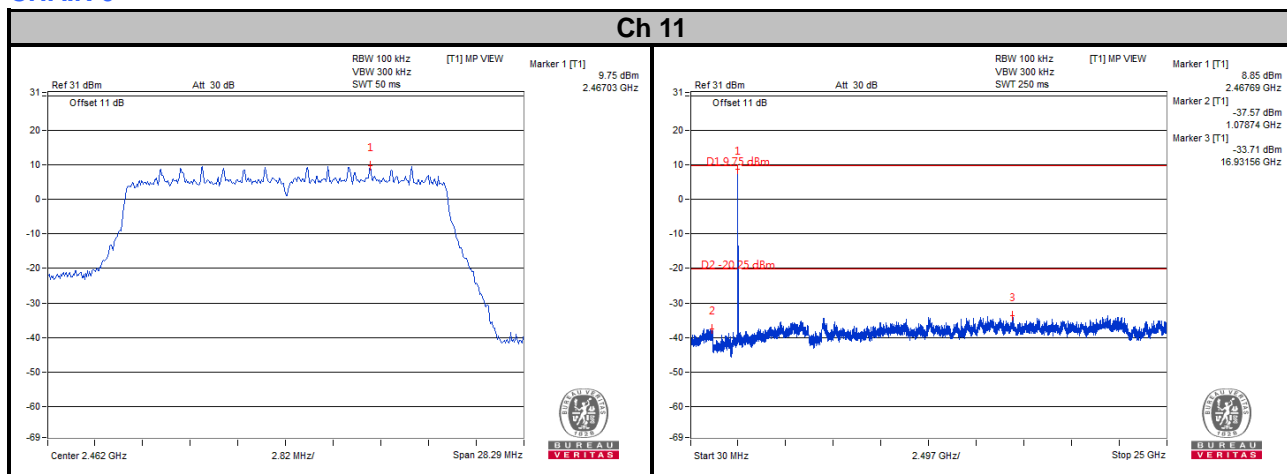
Ch 3 Band Edge



Ch 9 Band Edge

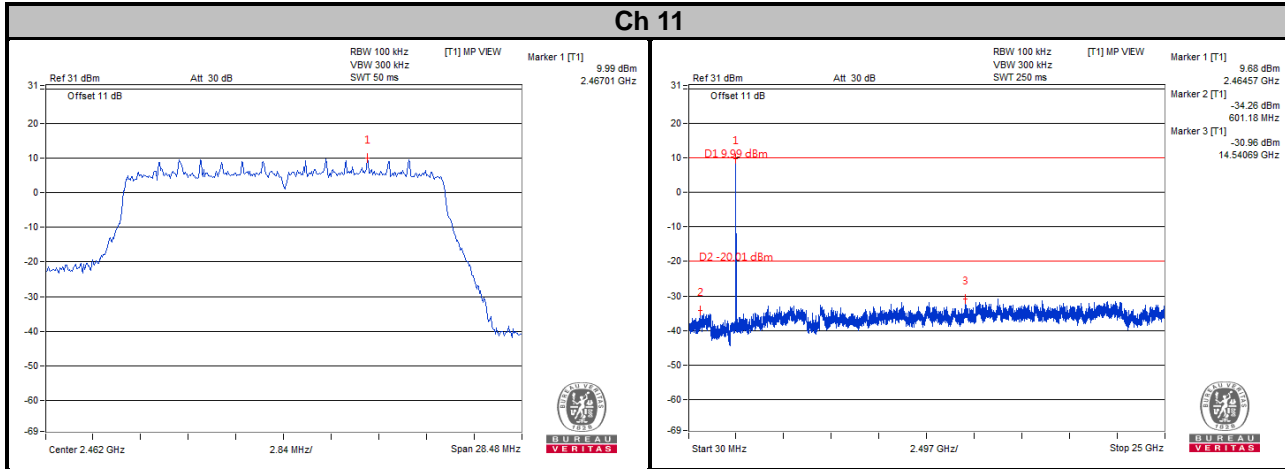


Mode B
802.11ax (HE20)
CHAIN 0

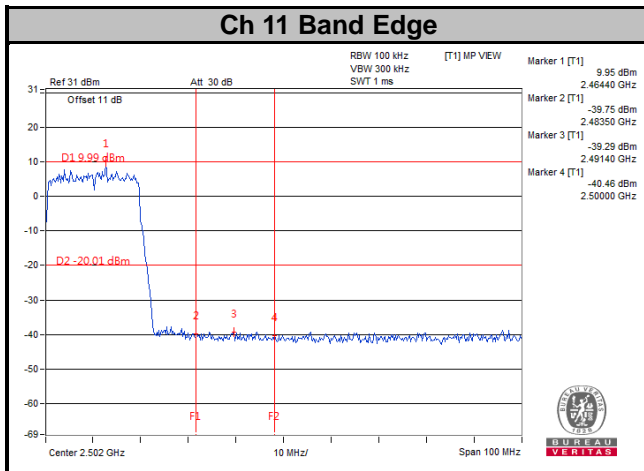


CHAIN 1

Ch 11



Ch 11 Band Edge

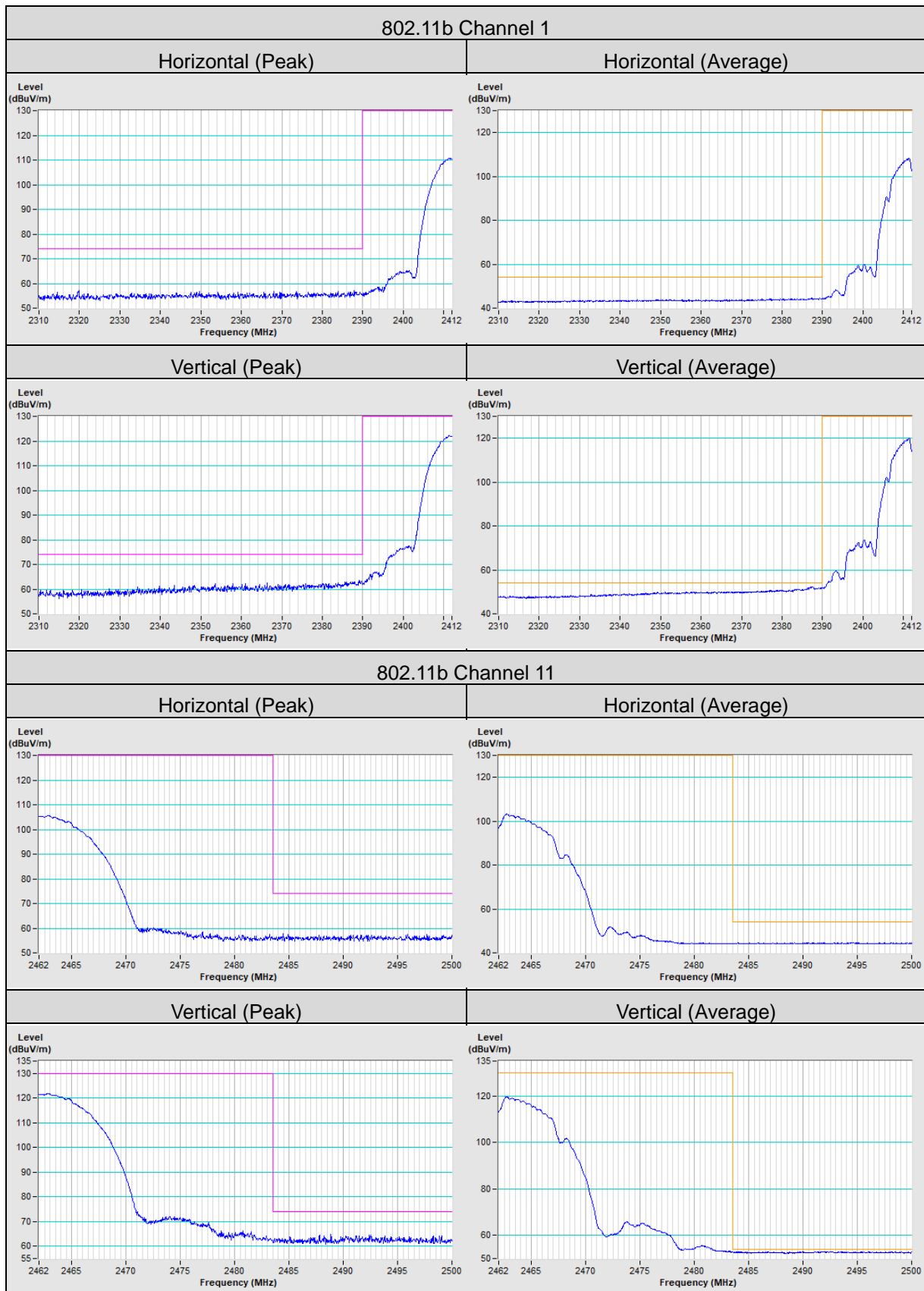


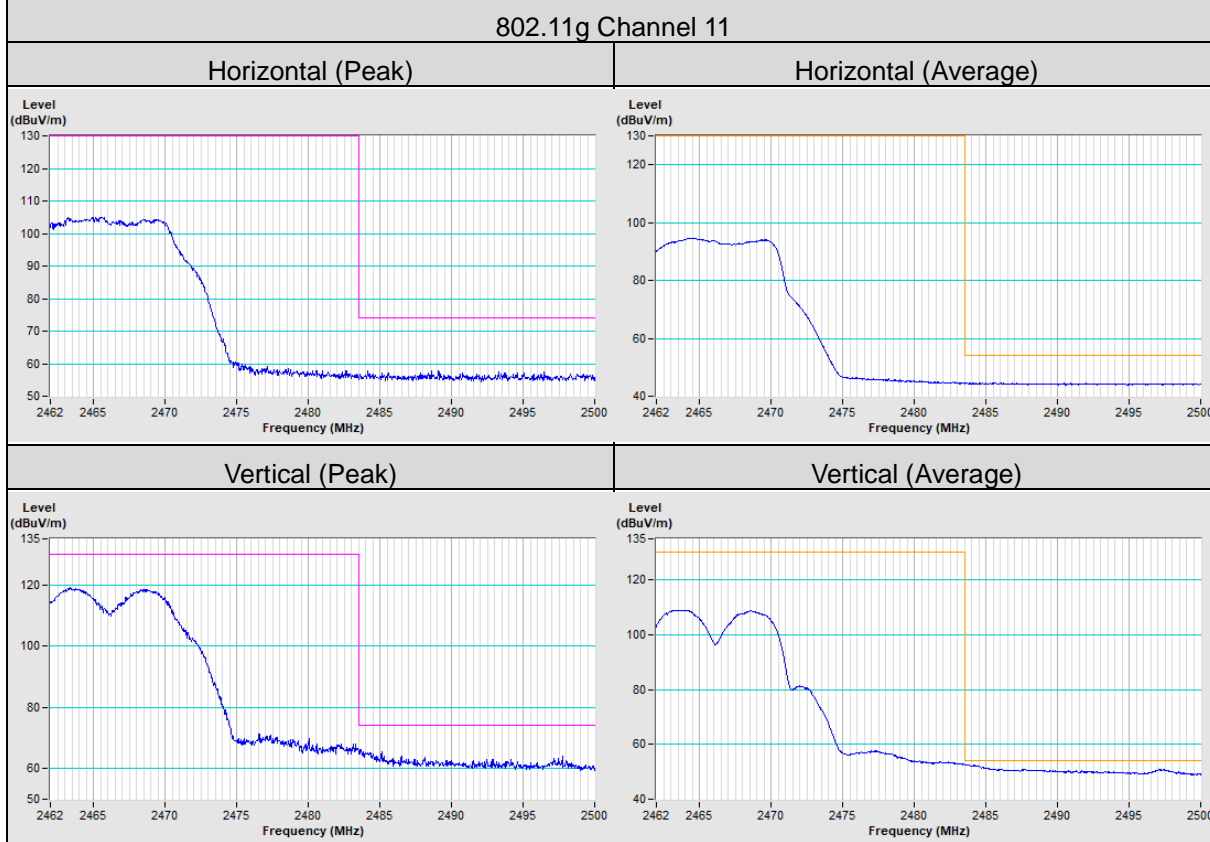
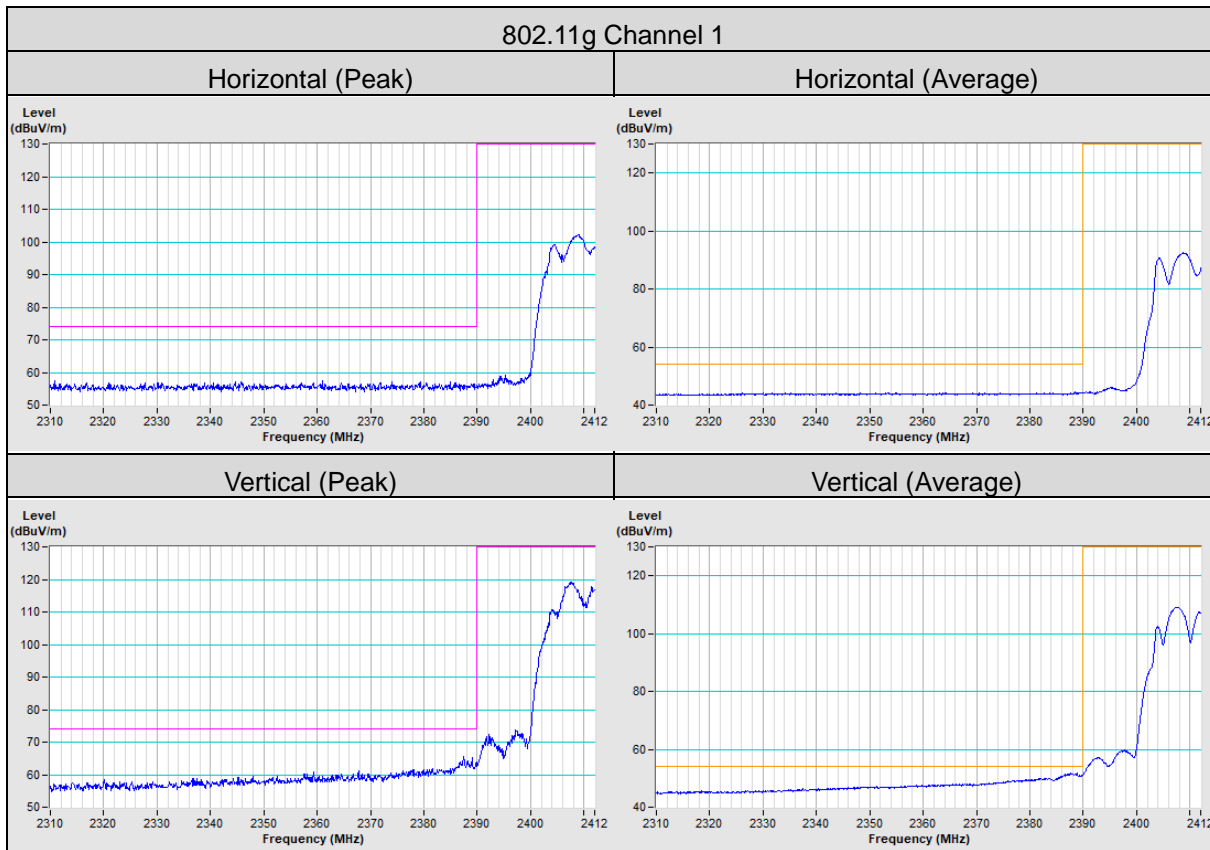
5 Pictures of Test Arrangements

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

Annex A- Band Edge Measurement

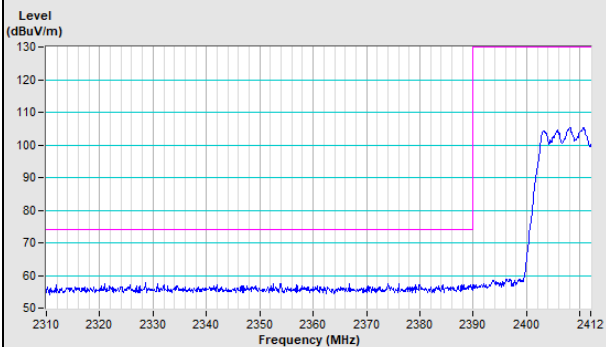
Mode A



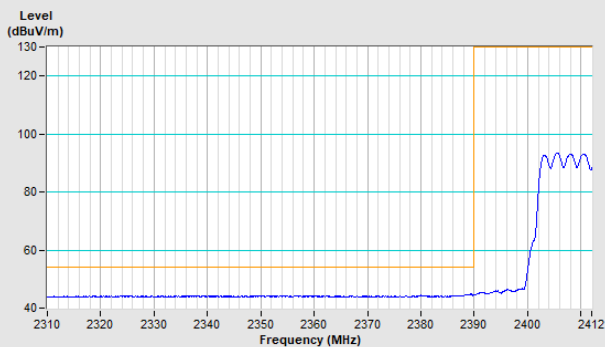


802.11ax (HE20) Channel 1

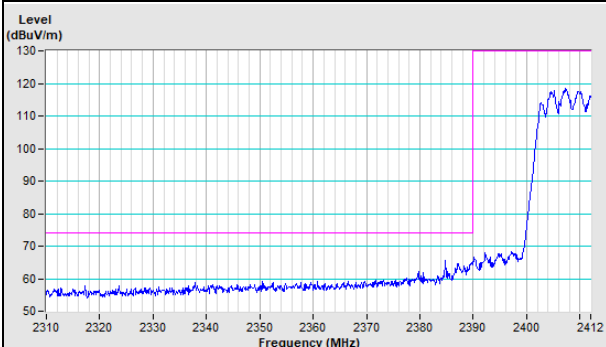
Horizontal (Peak)



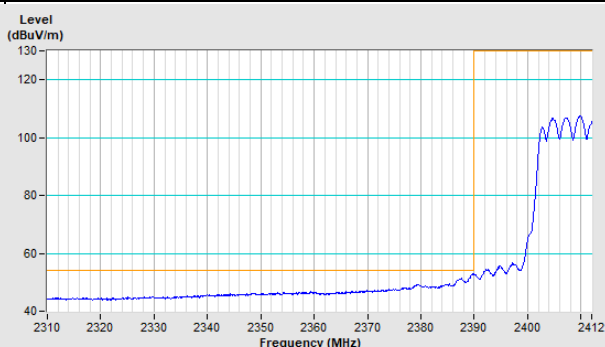
Horizontal (Average)



Vertical (Peak)

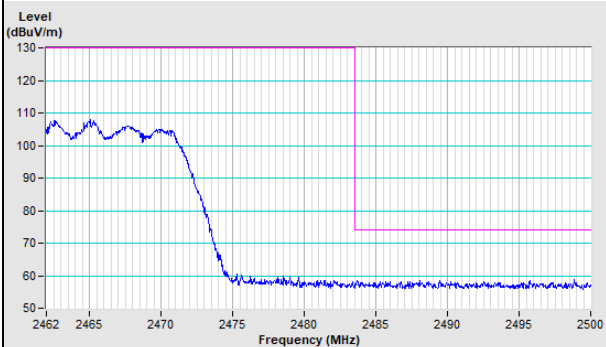


Vertical (Average)

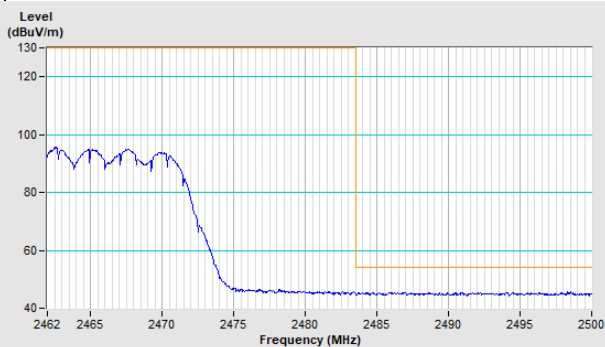


802.11ax (HE20) Channel 11

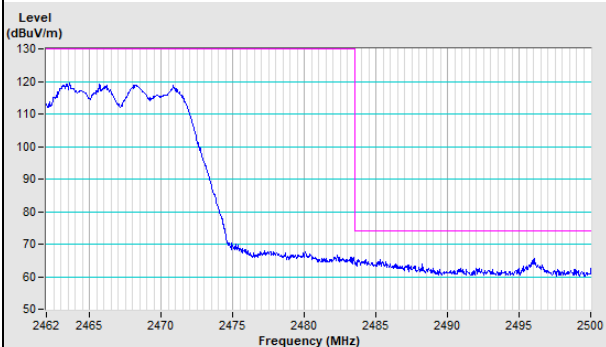
Horizontal (Peak)



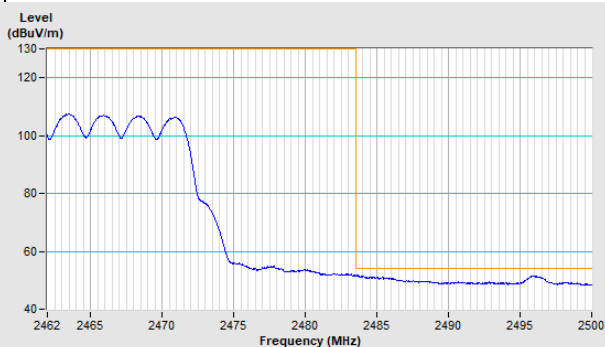
Horizontal (Average)



Vertical (Peak)

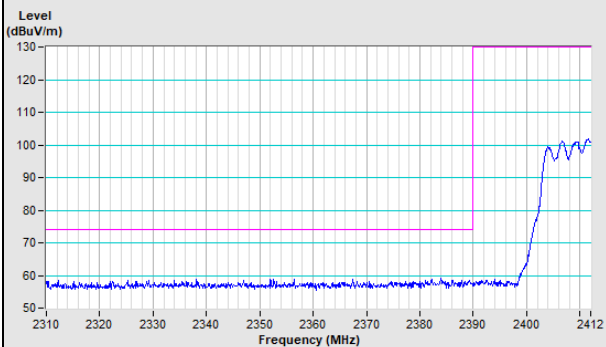


Vertical (Average)

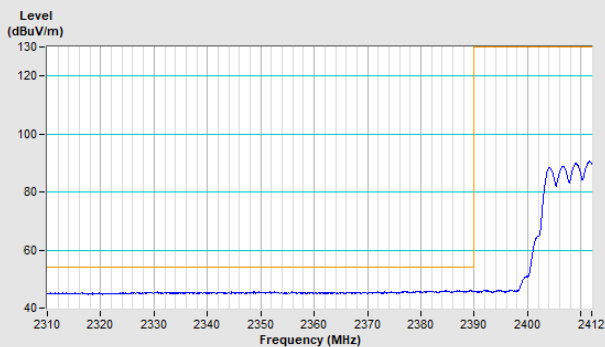


802.11ax (HE40) Channel 3

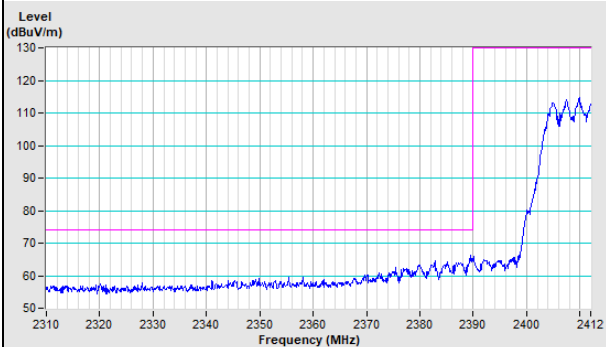
Horizontal (Peak)



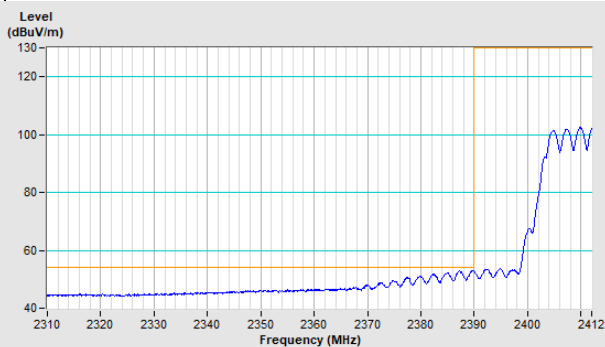
Horizontal (Average)



Vertical (Peak)

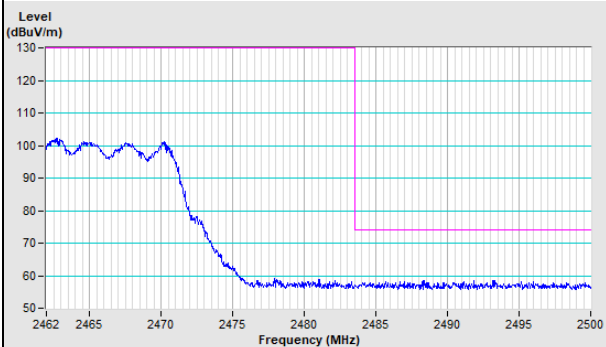


Vertical (Average)

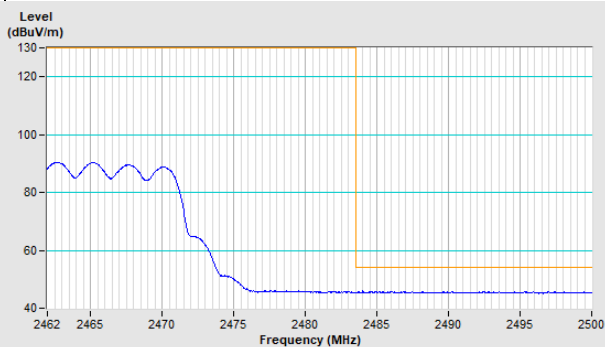


802.11ax (HE40) Channel 9

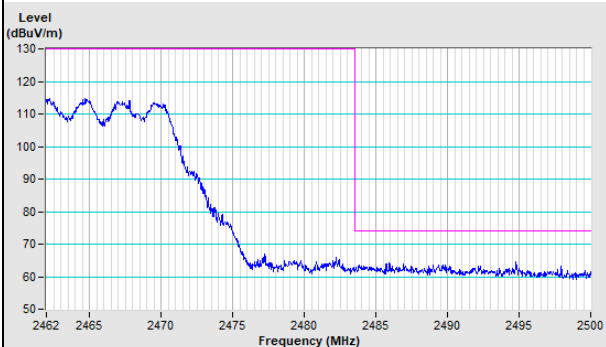
Horizontal (Peak)



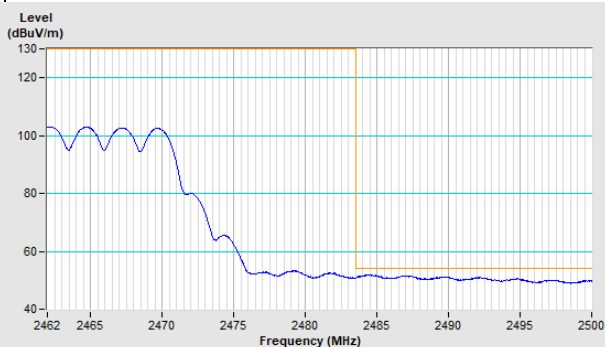
Horizontal (Average)



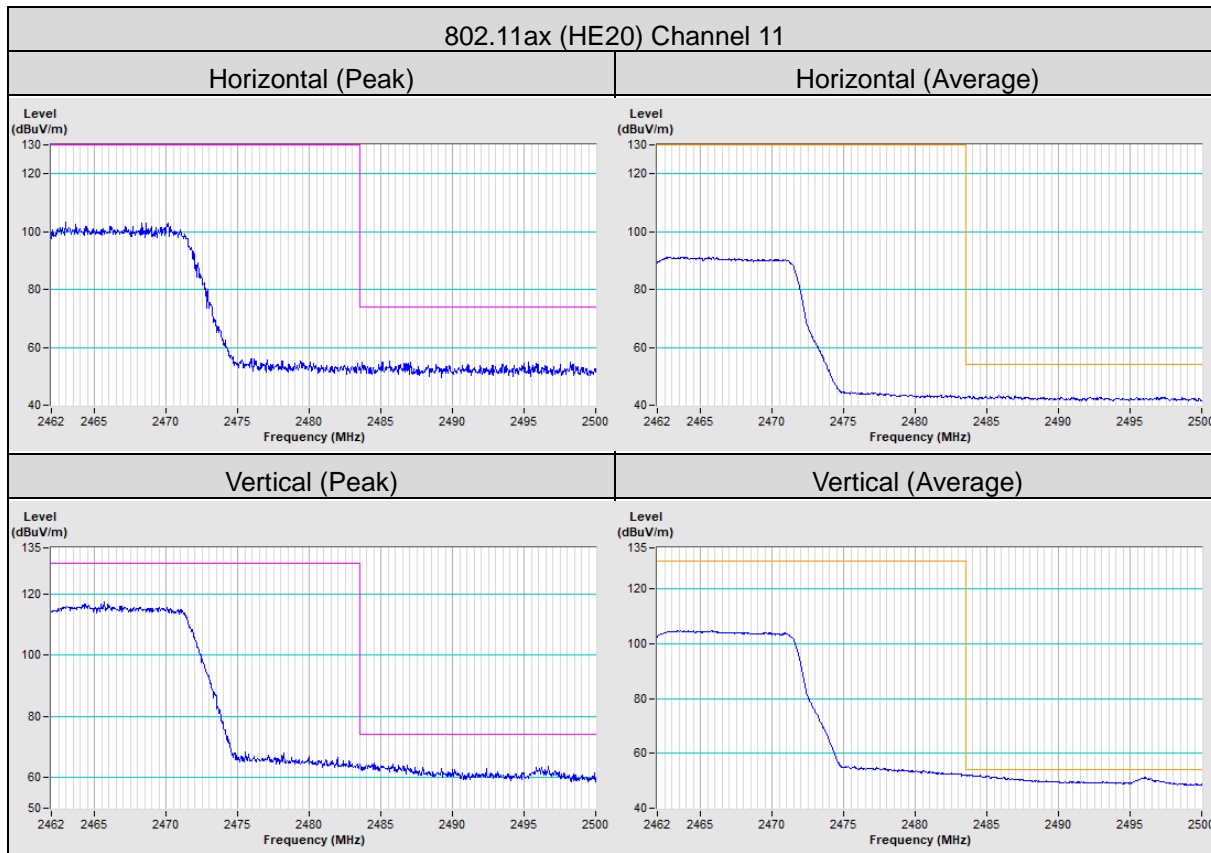
Vertical (Peak)



Vertical (Average)



Mode B



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:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

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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