FCC Test Report

Report No.:	RFBDYS-WTW-P20110911
FCC ID:	TVE-371CBE0271
Test Model:	FAP-U234F
Series Model:	FortiAP U234Fxxxxxx, FAP-U234Fxxxxxx, FORTIAP-U234Fxxxxxx (Where “x” can be used as “A-Z”, or “0-9”, or “- “, or blank for software changes or marketing purposes only)
Received Date:	Nov. 29, 2020
Test Date:	Dec. 25, 2020 ~ Jan. 05, 2021
Issued Date:	Feb. 24, 2021
Applicant:	Fortinet Inc.
Address:	899 Kifer Road Sunnyvale, CA 94086 USA
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:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RFBDYS-WTW-P20110911	Original release.	Feb. 24, 2021

1 Certificate of Conformity

Product:	Secured Wireless Access Point Point
Brand:	Fortinet
Test Model:	FAP-U234F
Series Model:	FortiAP U234Fxxxxxx, FAP-U234Fxxxxxx, FORTIAP-U234Fxxxxxx (Where “x” can be used as “A-Z”, or “0-9”, or “- “, or blank for software changes or marketing purposes only)
Sample Status:	Engineering sample
Applicant:	Fortinet Inc.
Test Date:	Dec. 25, 2020 ~ Jan. 05, 2021
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 : Pettie Chen , **Date:** Feb. 24, 2021

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Feb. 24, 2021

Bruce Chen / Senior 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 -5.31dB at 0.48063MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2390.00, 2483.50, 4874.00MHz.
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 not a standard connector.

Note:

1. 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.
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	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Secured Wireless Access Point
Brand	Fortinet
Test Model	FAP-U234F
Series Model	FortiAP U234Fxxxxxx, FAP-U234Fxxxxxx, FORTIAP-U234Fxxxxxx (Where "x" can be used as "A-Z", or "0-9", or "- ", or blank for software changes or marketing purposes only)
Model Difference	Refer to note
Sample Status	Engineering sample
Power Supply rating	54Vdc from PoE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 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 (HT20/40): up to 300Mbps 802.11ac (VHT20/40): up to 400Mbps 802.11ax: up to 573.5Mbps
Operating Frequency	2412~2462MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 11 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 7
Output Power	2G traffic radio (Radio 1): CDD Mode: 363.949mW Beamforming Mode: 130.860mW Scanning radio (Radio 3): CDD Mode: 655.376mW Beamforming Mode: 123.604mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	POE
Cable Supplied	0.5m non-shielded AC Power cable 1.75m non-shielded Grounding cable

Note:

1. The following models are provided to this EUT. The model FAP-U234F was chosen for final test.

Brand	Model	Description
Fortinet	FAP-U234F	where "x" can be used as "A-Z", or "-0-9", or "-", or blank for software changes or marketing purposes only
	FortiAP U234Fxxxxxx	
	FAP-U234Fxxxxxx	
	FORTIAP-U234Fxxxxxx	

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

Radio	Modulation Mode	Beamforming Mode	TX Function
2G traffic radio (Radio 1)	802.11b	Not Support	2TX
	802.11g	Not Support	2TX
	802.11n (HT20)	Not Support	2TX
	802.11n (HT40)	Not Support	2TX
	802.11ac (VHT20)	Support	2TX
	802.11ac (VHT40)	Support	2TX
	802.11ax (HE20)	Support	2TX
	802.11ax (HE40)	Support	2TX
Scanning radio (Radio 3)	802.11b	Not Support	2TX
	802.11g	Not Support	2TX
	802.11n (HT20)	Not Support	2TX
	802.11n (HT40)	Not Support	2TX
	802.11ac (VHT20)	Support	2TX
	802.11ac (VHT40)	Support	2TX
	802.11ax (HE20)	Support	2TX
	802.11ax (HE40)	Support	2TX

* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40 on 802.11ac mode 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)

* For 802.11n, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

3. The EUT consumes power from the following POE.

POE	
Brand	SENAO
Model	EPA5006GPR-4P
Input Power	100-240Vac, 50-60Hz, 0.8A
Output Power	54V, 0.6A

4. The following antennas were provided to the EUT.

No.	Type	Connector	Gain (dBi)						Remark
			2400MHz	2450MHz	2500MHz	5150MHz	5500MHz	5850MHz	
1	Patch Array	IPEX	9.45	10.15	9.77	-	-	-	2G traffic radio (Radio 1)
2	Patch Array	IPEX	9.21	10.12	10.33	-	-	-	
3	Patch Array	IPEX	-	-	-	9.55	10.23	10.13	5G traffic radio (Radio 1) (Band 4)
4	Patch Array	IPEX	-	-	-	9.87	10.39	10.82	
5	Patch Array	IPEX	-	-	-	9.52	10.29	10.16	5G traffic radio (Radio 2)
6	Patch Array	IPEX	-	-	-	9.79	10.21	10.54	
7	Dipole	IPEX	4.21	4.23	4.64	4.56	4.00	4.12	Scanning radio (Radio 3)
8	Dipole	IPEX	3.28	4.33	4.05	4.51	4.45	4.91	
9	Dipole	IPEX	3.68	4.22	4.00	-	-	-	BT LE / Zigbee

* 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.

5. The simultaneous operation mode was determined by client.

No	Mode
1	2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + BLE
2	5G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 2G Scanning radio (Radio 3) + BLE
3	5G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + BLE
4	2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + Zigbee
5	5G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 2G Scanning radio (Radio 3) + Zigbee
5	5G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + Zigbee

* 5GHz traffic radio (Radio 2) and 5G Scanning radio (Radio 3) cannot transmit in the same band at same time. 2G traffic radio (Radio 1) and 2G Scanning radio (Radio 3) cannot transmit at same time.
* 5GHz traffic radio (Radio1) and 5GHz traffic radio (Radio2) cannot transmit at the same time in the UNII-3 band.
* Zigbee and BT technologies cannot transmit at same time.
* Spurious emission of the simultaneous operation 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), 802.11ac (VHT20), 802.11ax (HE20):

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

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

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

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

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
2. Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Remark
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 1
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
-	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	MCS0	8.6	
-	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	MCS0	17.2	
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 3
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
-	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	MCS0	8.6	
-	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	MCS0	17.2	

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Remark
-	802.11g	1 to 11	6	OFDM	BPSK	6.0	Radio 1
-	802.11b	1 to 11	6	DSSS	DBPSK	1.0	Radio 3

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)	Remark
-	802.11g	1 to 11	6	OFDM	BPSK	6.0	Radio 1
-	802.11b	1 to 11	6	DSSS	DBPSK	1.0	Radio 3

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)	Remark
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 1
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	
-	802.11ac (VHT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2	
-	802.11ac (VHT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0	
-	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	MCS0	8.6	
-	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	MCS0	17.2	
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0	Radio 3
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0	
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	
-	802.11ac (VHT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2	
-	802.11ac (VHT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0	
-	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	MCS0	8.6	
-	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	MCS0	17.2	

*802.11n (HT20), 802.11n (HT40) 802.11ac (VHT20), 802.11ac (VHT40) are for Conducted Power Measurement only.

Test Condition:

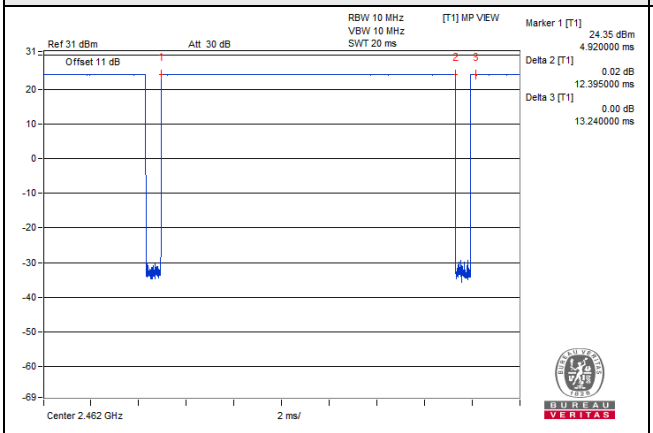
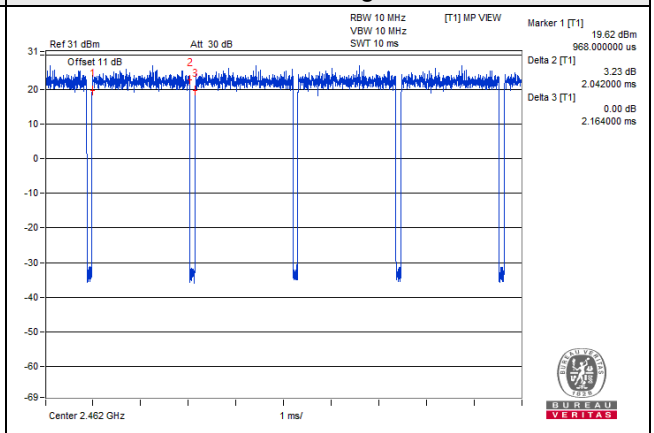
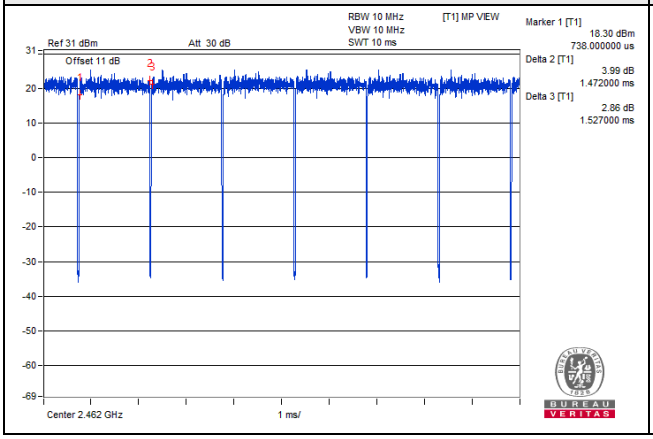
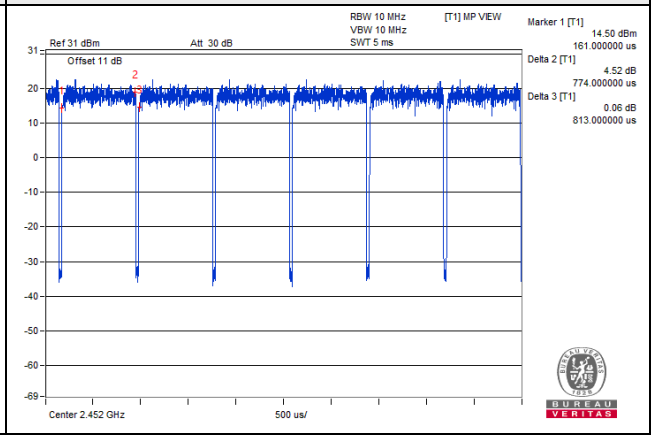
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 66% RH	54Vdc	Titan Hsu
RE<1G	23 deg. C, 66% RH	54Vdc	Adair Peng
PLC	23 deg. C, 67% RH	54Vdc	Adair Peng
APCM	25 deg. C, 60% RH	54Vdc	Alan Wu

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98%, duty factor is required.

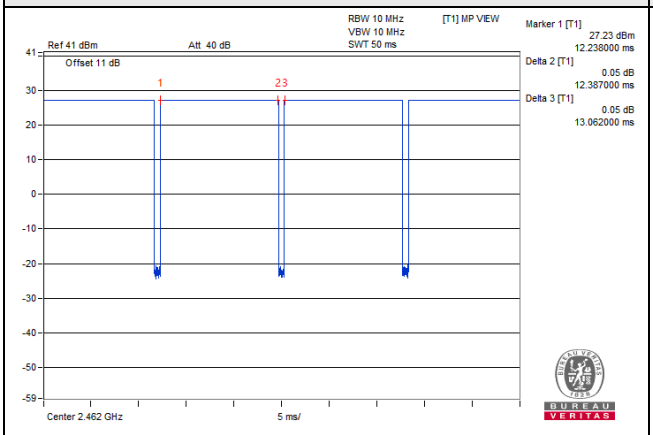
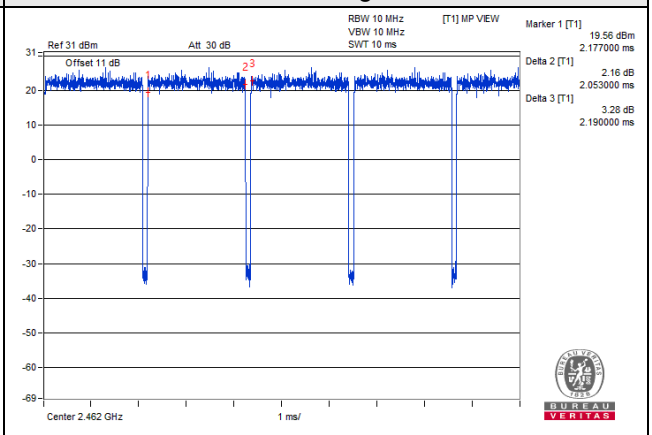
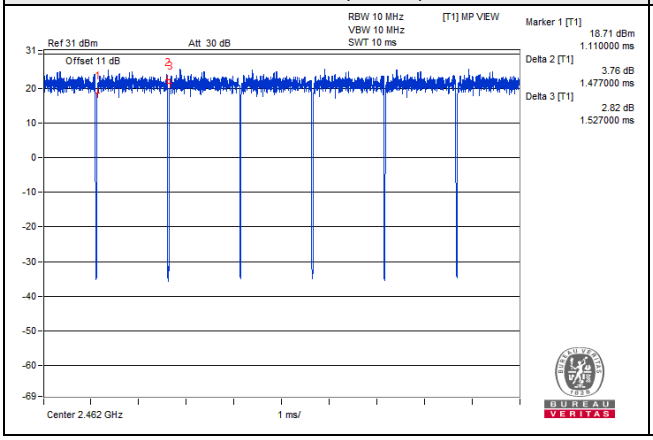
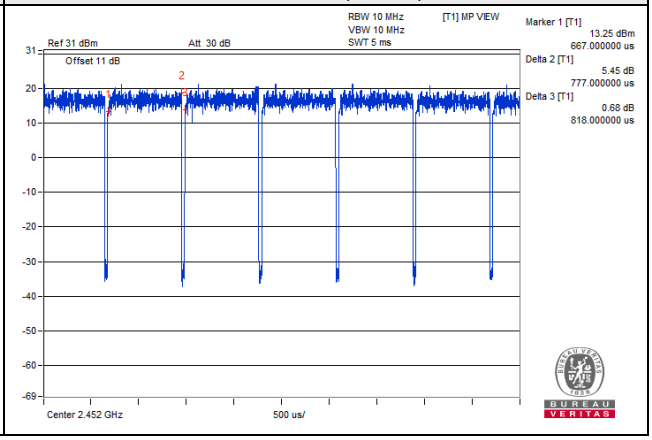
2G traffic radio (Radio 1)

802.11b: Duty cycle = 12.395/13.24 = 0.936, Duty factor = 10 * log (1/0.936) = 0.29
802.11g: Duty cycle = 2.042/2.164 = 0.944, Duty factor = 10 * log (1/0.944) = 0.25
802.11ax (HE20): Duty cycle = 1.472/1.527 = 0.964, Duty factor = 10 * log (1/0.964) = 0.16
802.11ax (HE40): Duty cycle = 0.774/0.813 = 0.952, Duty factor = 10 * log (1/0.952) = 0.21

802.11b	802.11g
	
802.11ax (HE20)	802.11ax (HE40)
	

Scanning radio (Radio 3)

802.11b: Duty cycle = 12.387/13.062 = 0.946, Duty factor = 10 * log (1/0.946) = 0.23
802.11g: Duty cycle = 2.053/2.19 = 0.937, Duty factor = 10 * log (1/0.937) = 0.28
802.11ax (HE20): Duty cycle = 1.477/1.527 = 0.967, Duty factor = 10 * log (1/0.967) = 0.14
802.11ax (HE40): Duty cycle = 0.777/0.818 = 0.95, Duty factor = 10 * log (1/0.95) = 0.22

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.

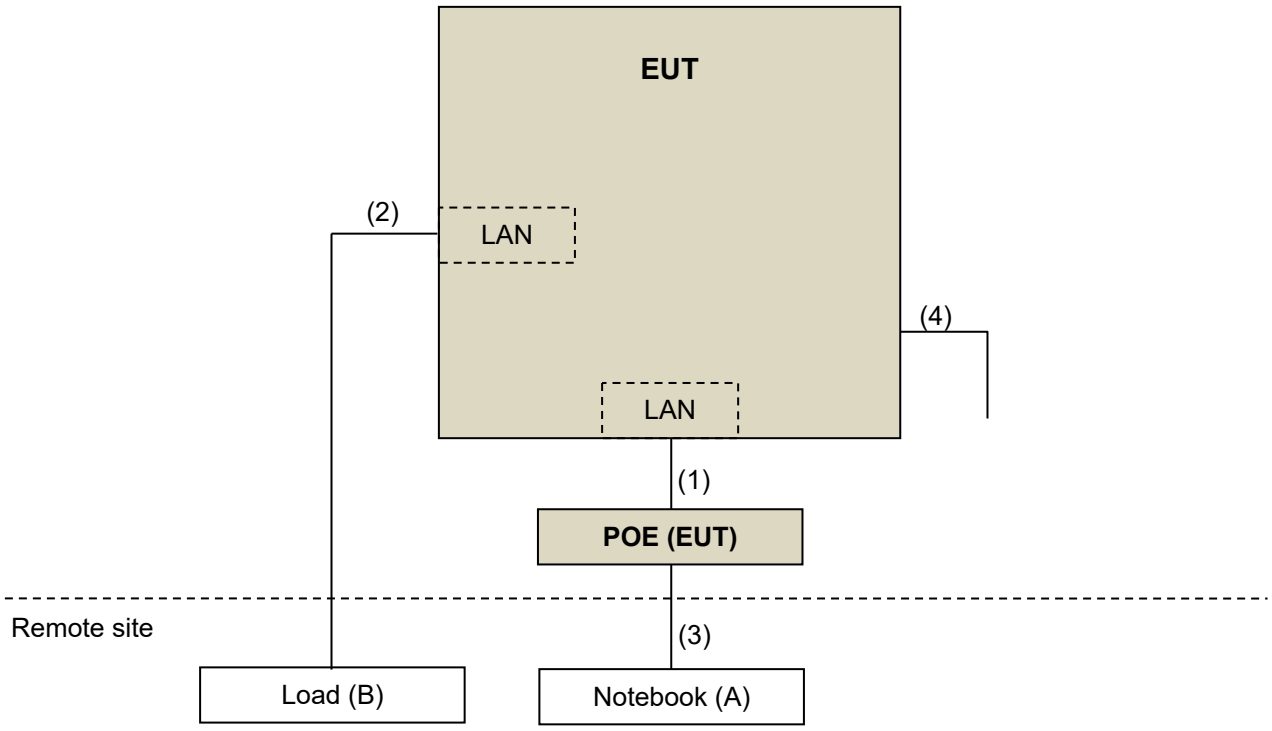
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	1.5	N	0	RJ45, Cat5e
2.	LAN	1	1.5	N	0	RJ45, Cat5e
3.	LAN	1	6	N	0	RJ45, Cat5e
4.	Console	1	1.5	N	0	-

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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100980	Apr. 20, 2020	Apr. 19, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-S M-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY5519 0004/MY55190007/MY 55210005	Jul. 13, 2020	Jul. 12, 2021

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 Chamber 3.

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 detect 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.

   For Radia 1 (802.11b: RBW = 1MHz, VBW = 100Hz; 802.11g: RBW = 1MHz, VBW = 1kHz; 802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz, VBW = 3kHz)

   For Radia 3 (802.11b: RBW = 1MHz, VBW = 100Hz; 802.11g: RBW = 1MHz, VBW = 1kHz; 802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz, VBW = 3kHz)

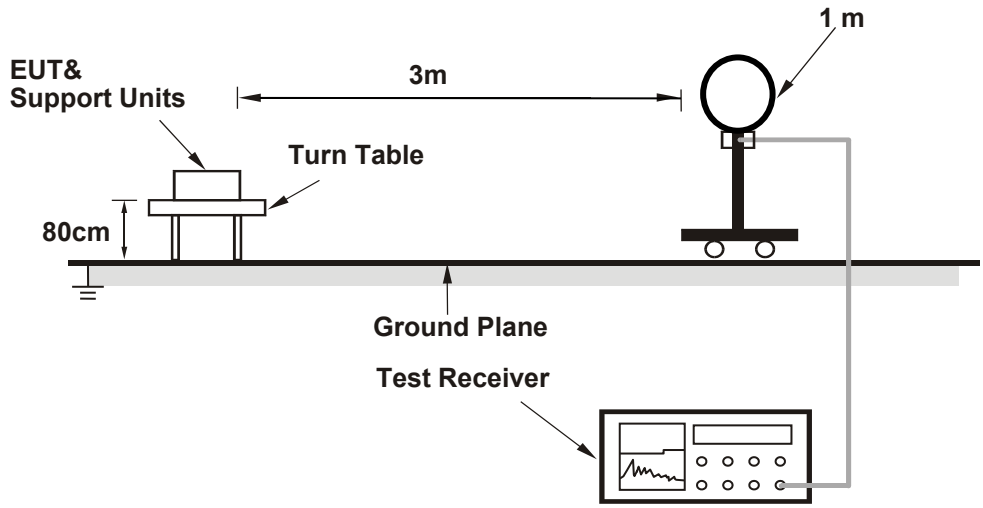
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

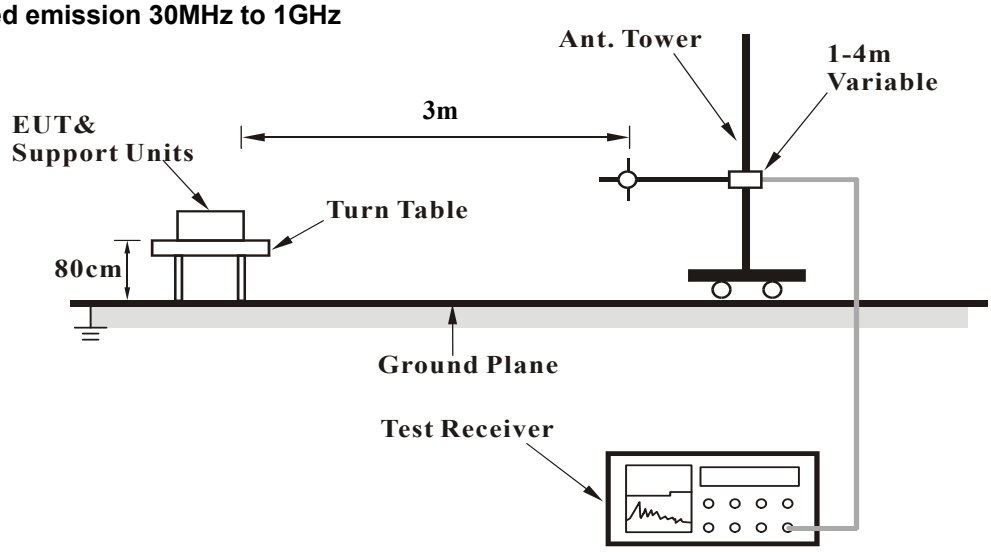
No deviation.

4.1.5 Test Setup

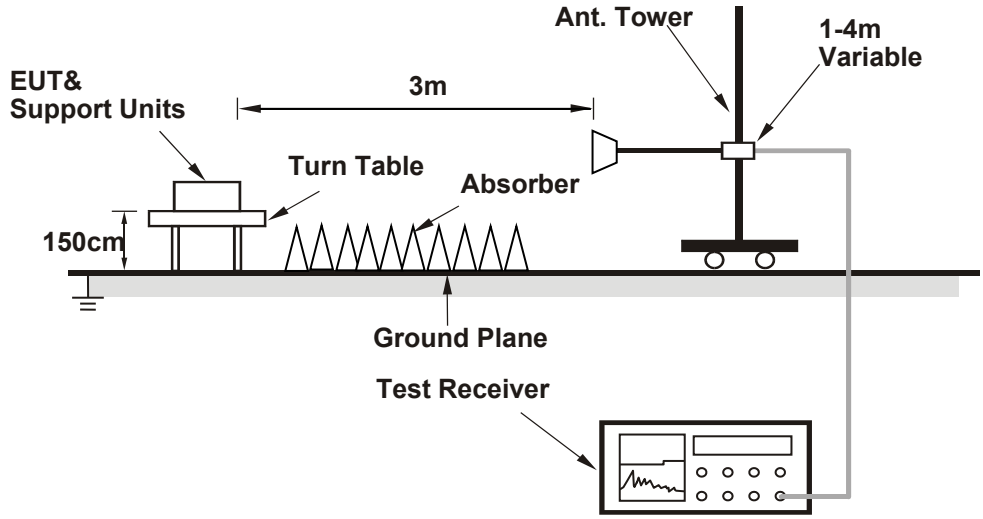
For Radiated emission below 30MHz



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. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Radio 1

Above 1GHz worst-Case data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	61.6 PK	74.0	-12.4	1.52 H	360	27.2	34.4
2	2390.00	49.9 AV	54.0	-4.1	1.52 H	360	15.5	34.4
3	*2412.00	120.0 PK			1.46 H	356	85.7	34.3
4	*2412.00	116.4 AV			1.46 H	356	82.1	34.3
5	4824.00	55.2 PK	74.0	-18.8	3.62 H	6	49.0	6.2
6	4824.00	50.9 AV	54.0	-3.1	3.62 H	6	44.7	6.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.7 PK	74.0	-13.3	1.88 V	12	26.3	34.4
2	2390.00	49.9 AV	54.0	-4.1	1.88 V	12	15.5	34.4
3	*2412.00	114.8 PK			1.82 V	7	80.5	34.3
4	*2412.00	111.4 AV			1.82 V	7	77.1	34.3
5	4824.00	56.4 PK	74.0	-17.6	1.44 V	19	50.2	6.2
6	4824.00	52.9 AV	54.0	-1.1	1.44 V	19	46.7	6.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	119.7 PK			1.51 H	7	85.4	34.3
2	*2437.00	116.1 AV			1.51 H	7	81.8	34.3
3	4874.00	55.7 PK	74.0	-18.3	3.45 H	340	49.6	6.1
4	4874.00	52.3 AV	54.0	-1.7	3.45 H	340	46.2	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	113.2 PK			1.43 V	1	78.9	34.3
2	*2437.00	109.6 AV			1.43 V	1	75.3	34.3
3	4874.00	56.7 PK	74.0	-17.3	1.48 V	19	50.6	6.1
4	**4874.00**	**53.0 AV**	**54.0**	**-1.0**	**1.48 V**	**19**	**46.9**	**6.1**

Remarks:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	118.6 PK			1.69 H	13	84.2	34.4
2	*2462.00	115.0 AV			1.69 H	13	80.6	34.4
3	2483.50	62.2 PK	74.0	-11.8	1.28 H	13	27.8	34.4
4	2483.50	50.3 AV	54.0	-3.7	1.28 H	13	15.9	34.4
5	4924.00	55.2 PK	74.0	-18.8	3.52 H	19	49.1	6.1
6	4924.00	51.2 AV	54.0	-2.8	3.52 H	19	45.1	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.7 PK			1.62 V	1	80.3	34.4
2	*2462.00	111.1 AV			1.62 V	1	76.7	34.4
3	2483.50	61.1 PK	74.0	-12.9	1.66 V	6	26.7	34.4
4	2483.50	50.2 AV	54.0	-3.8	1.66 V	6	15.8	34.4
5	4924.00	55.8 PK	74.0	-18.2	1.39 V	19	49.7	6.1
6	4924.00	52.9 AV	54.0	-1.1	1.39 V	19	46.8	6.1

Remarks:

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

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.9 PK	74.0	-1.1	1.70 H	343	38.5	34.4
2	2390.00	51.3 AV	54.0	-2.7	1.70 H	343	16.9	34.4
3	*2412.00	119.4 PK			1.50 H	337	85.1	34.3
4	*2412.00	110.0 AV			1.50 H	337	75.7	34.3
5	4824.00	57.1 PK	74.0	-16.9	3.82 H	341	50.9	6.2
6	4824.00	42.6 AV	54.0	-11.4	3.82 H	341	36.4	6.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.0 PK	74.0	-2.0	1.74 V	3	37.6	34.4
2	2390.00	51.2 AV	54.0	-2.8	1.74 V	3	16.8	34.4
3	*2412.00	118.8 PK			1.54 V	1	84.5	34.3
4	*2412.00	109.3 AV			1.54 V	1	75.0	34.3
5	4824.00	56.6 PK	74.0	-17.4	1.44 V	19	50.4	6.2
6	4824.00	43.2 AV	54.0	-10.8	1.44 V	19	37.0	6.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	1.53 H	337	34.0	34.4
2	2390.00	52.0 AV	54.0	-2.0	1.53 H	337	17.6	34.4
3	*2437.00	121.9 PK			1.55 H	342	87.6	34.3
4	*2437.00	111.9 AV			1.55 H	342	77.6	34.3
5	2483.50	65.5 PK	74.0	-8.5	1.44 H	339	31.1	34.4
6	2483.50	51.8 AV	54.0	-2.2	1.44 H	339	17.4	34.4
7	4874.00	57.4 PK	74.0	-16.6	3.52 H	1	51.3	6.1
8	4874.00	43.1 AV	54.0	-10.9	3.52 H	1	37.0	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.5 PK	74.0	-8.5	1.43 V	6	31.1	34.4
2	2390.00	51.5 AV	54.0	-2.5	1.43 V	6	17.1	34.4
3	*2437.00	120.8 PK			1.40 V	1	86.5	34.3
4	*2437.00	111.4 AV			1.40 V	1	77.1	34.3
5	2483.50	65.9 PK	74.0	-8.1	1.46 V	10	31.5	34.4
6	2483.50	51.6 AV	54.0	-2.4	1.46 V	10	17.2	34.4
7	4874.00	59.6 PK	74.0	-14.4	1.36 V	21	53.5	6.1
8	4874.00	45.9 AV	54.0	-8.1	1.36 V	21	39.8	6.1

Remarks:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	119.0 PK			1.64 H	343	84.6	34.4
2	*2462.00	109.2 AV			1.64 H	343	74.8	34.4
3	2483.50	72.7 PK	74.0	-1.3	1.45 H	340	38.3	34.4
4	2483.50	51.4 AV	54.0	-2.6	1.45 H	340	17.0	34.4
5	4924.00	51.5 PK	74.0	-22.5	3.59 H	341	45.4	6.1
6	4924.00	38.1 AV	54.0	-15.9	3.59 H	341	32.0	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	118.2 PK			1.33 V	2	83.8	34.4
2	*2462.00	108.9 AV			1.33 V	2	74.5	34.4
3	2483.50	72.4 PK	74.0	-1.6	1.36 V	10	38.0	34.4
4	2483.50	51.2 AV	54.0	-2.8	1.36 V	10	16.8	34.4
5	4924.00	52.1 PK	74.0	-21.9	1.51 V	16	46.0	6.1
6	4924.00	38.3 AV	54.0	-15.7	1.51 V	16	32.2	6.1

Remarks:

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

802.11ax (HE20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	70.8 PK	74.0	-3.2	1.70 H	341	36.4	34.4
2	**2390.00**	**53.0 AV**	**54.0**	**-1.0**	**1.70 H**	**341**	**18.6**	**34.4**
3	*2412.00	122.7 PK			1.48 H	342	88.4	34.3
4	*2412.00	109.5 AV			1.48 H	342	75.2	34.3
5	4824.00	55.3 PK	74.0	-18.7	3.83 H	339	49.1	6.2
6	4824.00	41.4 AV	54.0	-12.6	3.83 H	339	35.2	6.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	35.2 PK	74.0	-38.8	1.66 V	13	37.3	-2.1
2	2390.00	52.7 AV	54.0	-1.3	1.66 V	13	18.3	34.4
3	*2412.00	121.3 PK			1.62 V	1	87.0	34.3
4	*2412.00	109.0 AV			1.62 V	1	74.7	34.3
5	4824.00	56.2 PK	74.0	-17.8	1.49 V	22	50.0	6.2
6	4824.00	43.0 AV	54.0	-11.0	1.49 V	22	36.8	6.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	70.8 PK	74.0	-3.2	1.51 H	344	36.4	34.4
2	**2390.00**	**53.0 AV**	**54.0**	**-1.0**	**1.51 H**	**344**	**18.6**	**34.4**
3	*2437.00	123.8 PK			1.47 H	340	89.5	34.3
4	*2437.00	111.9 AV			1.47 H	340	77.6	34.3
5	2483.50	67.4 PK	74.0	-6.6	1.41 H	336	33.0	34.4
6	2483.50	52.6 AV	54.0	-1.4	1.41 H	336	18.2	34.4
7	4874.00	57.2 PK	74.0	-16.8	3.57 H	19	51.1	6.1
8	4874.00	42.1 AV	54.0	-11.9	3.57 H	19	36.0	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.4 PK	74.0	-4.6	1.36 V	6	35.0	34.4
2	2390.00	51.8 AV	54.0	-2.2	1.36 V	6	17.4	34.4
3	*2437.00	123.2 PK			1.34 V	2	88.9	34.3
4	*2437.00	111.0 AV			1.34 V	2	76.7	34.3
5	2483.50	68.2 PK	74.0	-5.8	1.41 V	10	33.8	34.4
6	2483.50	51.8 AV	54.0	-2.2	1.41 V	10	17.4	34.4
7	4874.00	58.9 PK	74.0	-15.1	1.39 V	22	52.8	6.1
8	4874.00	44.7 AV	54.0	-9.3	1.39 V	22	38.6	6.1

Remarks:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	122.0 PK			1.66 H	341	87.6	34.4
2	*2462.00	108.1 AV			1.66 H	341	73.7	34.4
3	2483.50	72.6 PK	74.0	-1.4	1.45 H	335	38.2	34.4
4	2483.50	51.7 AV	54.0	-2.3	1.45 H	335	17.3	34.4
5	4924.00	52.1 PK	74.0	-21.9	3.62 H	345	46.0	6.1
6	4924.00	37.9 AV	54.0	-16.1	3.62 H	345	31.8	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	117.9 PK			1.34 V	1	83.5	34.4
2	*2462.00	107.3 AV			1.34 V	1	72.9	34.4
3	2483.50	71.0 PK	74.0	-3.0	1.42 V	1	36.6	34.4
4	2483.50	51.2 AV	54.0	-2.8	1.42 V	1	16.8	34.4
5	4924.00	51.9 PK	74.0	-22.1	1.55 V	20	45.8	6.1
6	4924.00	37.7 AV	54.0	-16.3	1.55 V	20	31.6	6.1

Remarks:

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

802.11ax (HE40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.5 PK	74.0	-4.5	1.46 H	343	35.1	34.4
2	2390.00	52.3 AV	54.0	-1.7	1.46 H	343	17.9	34.4
3	*2422.00	116.6 PK			1.63 H	336	82.3	34.3
4	*2422.00	105.4 AV			1.63 H	336	71.1	34.3
5	4844.00	51.2 PK	74.0	-22.8	3.82 H	338	45.1	6.1
6	4844.00	37.6 AV	54.0	-16.4	3.82 H	338	31.5	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	67.2 PK	74.0	-6.8	1.58 V	348	32.8	34.4
2	2390.00	51.3 AV	54.0	-2.7	1.58 V	348	16.9	34.4
3	*2422.00	116.3 PK			1.55 V	345	82.0	34.3
4	*2422.00	105.4 AV			1.55 V	345	71.1	34.3
5	4844.00	51.6 PK	74.0	-22.4	1.51 V	19	45.5	6.1
6	4844.00	38.1 AV	54.0	-15.9	1.51 V	19	32.0	6.1

Remarks:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.4 PK	74.0	-1.6	1.47 H	342	38.0	34.4
2	2390.00	52.5 AV	54.0	-1.5	1.47 H	342	18.1	34.4
3	*2437.00	118.3 PK			1.51 H	334	84.0	34.3
4	*2437.00	106.0 AV			1.51 H	334	71.7	34.3
5	2483.50	72.9 PK	74.0	-1.1	1.56 H	339	38.5	34.4
6	2483.50	52.4 AV	54.0	-1.6	1.56 H	339	18.0	34.4
7	4874.00	52.6 PK	74.0	-21.4	3.56 H	333	46.5	6.1
8	4874.00	38.8 AV	54.0	-15.2	3.56 H	333	32.7	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.4 PK	74.0	-3.6	1.58 V	347	36.0	34.4
2	2390.00	51.6 AV	54.0	-2.4	1.58 V	347	17.2	34.4
3	*2437.00	117.9 PK			1.61 V	350	83.6	34.3
4	*2437.00	105.6 AV			1.61 V	350	71.3	34.3
5	2483.50	34.3 PK	74.0	-39.7	1.60 V	353	36.3	-2.0
6	2483.50	15.0 AV	54.0	-39.0	1.60 V	353	17.0	-2.0
7	4874.00	53.2 PK	74.0	-20.8	1.55 V	17	47.1	6.1
8	4874.00	39.4 AV	54.0	-14.6	1.55 V	17	33.3	6.1

Remarks:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	117.7 PK			1.51 H	340	83.4	34.3
2	*2452.00	105.1 AV			1.51 H	340	70.8	34.3
3	2483.50	72.4 PK	74.0	-1.6	1.47 H	341	38.0	34.4
4	2483.50	51.2 AV	54.0	-2.8	1.47 H	341	16.8	34.4
5	4904.00	50.6 PK	74.0	-23.4	3.52 H	337	44.5	6.1
6	4904.00	37.0 AV	54.0	-17.0	3.52 H	337	30.9	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	117.7 PK			1.49 V	344	83.4	34.3
2	*2452.00	105.2 AV			1.49 V	344	70.9	34.3
3	2483.50	72.9 PK	74.0	-1.1	1.59 V	339	38.5	34.4
4	2483.50	51.2 AV	54.0	-2.8	1.59 V	339	16.8	34.4
5	4904.00	50.0 PK	74.0	-24.0	1.47 V	23	43.9	6.1
6	4904.00	36.9 AV	54.0	-17.1	1.47 V	23	30.8	6.1

Remarks:

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

Below 1GHz worst-case data:

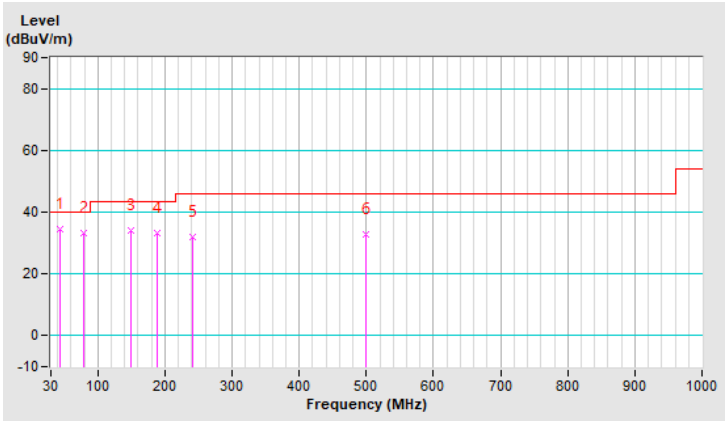
802.11g

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	44.06	34.6 QP	40.0	-5.4	1.00 H	229	43.8	-9.2
2	79.20	33.2 QP	40.0	-6.8	1.50 H	152	46.3	-13.1
3	149.49	34.2 QP	43.5	-9.3	1.50 H	173	42.8	-8.6
4	187.45	33.2 QP	43.5	-10.3	1.00 H	243	43.9	-10.7
5	240.87	31.8 QP	46.0	-14.2	2.00 H	61	40.9	-9.1
6	499.54	32.8 QP	46.0	-13.2	1.50 H	210	35.1	-2.3

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

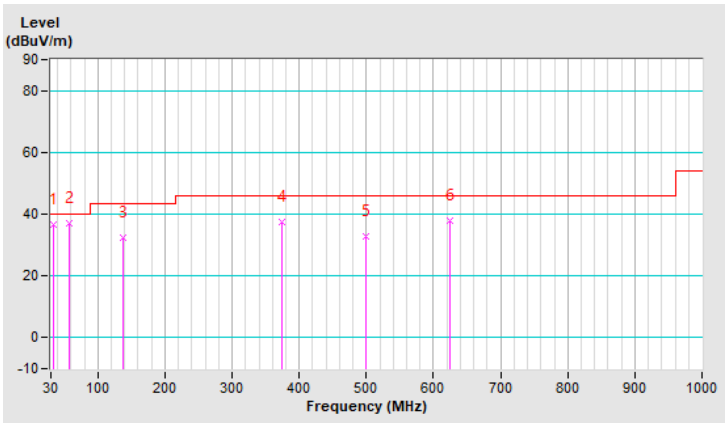


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	34.22	36.6 QP	40.0	-3.4	1.00 V	187	47.1	-10.5
2	56.71	37.0 QP	40.0	-3.0	1.50 V	315	46.3	-9.3
3	138.25	32.4 QP	43.5	-11.1	1.00 V	300	41.5	-9.1
4	374.42	37.3 QP	46.0	-8.7	1.50 V	145	42.4	-5.1
5	499.54	32.7 QP	46.0	-13.3	1.50 V	322	35.0	-2.3
6	624.65	38.0 QP	46.0	-8.0	2.00 V	166	37.2	0.8

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



Radio 3

Above 1GHz worst-Case data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.6 PK	74.0	-13.4	1.60 H	319	26.2	34.4
2	2390.00	49.0 AV	54.0	-5.0	1.60 H	319	14.6	34.4
3	*2412.00	113.4 PK			1.57 H	315	79.1	34.3
4	*2412.00	110.0 AV			1.57 H	315	75.7	34.3
5	4824.00	52.4 PK	74.0	-21.6	1.45 H	24	46.2	6.2
6	4824.00	47.1 AV	54.0	-6.9	1.45 H	24	40.9	6.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.8 PK	74.0	-11.2	1.69 V	349	28.4	34.4
2	2390.00	52.4 AV	54.0	-1.6	1.69 V	349	18.0	34.4
3	*2412.00	121.1 PK			1.68 V	358	86.8	34.3
4	*2412.00	117.4 AV			1.68 V	358	83.1	34.3
5	4824.00	53.9 PK	74.0	-20.1	1.31 V	328	47.7	6.2
6	4824.00	49.8 AV	54.0	-4.2	1.31 V	328	43.6	6.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	111.7 PK			1.54 H	331	77.4	34.3
2	*2437.00	108.3 AV			1.54 H	331	74.0	34.3
3	2483.50	62.6 PK	74.0	-11.4	1.56 H	339	28.2	34.4
4	2483.50	49.7 AV	54.0	-4.3	1.56 H	339	15.3	34.4
5	4874.00	49.3 PK	74.0	-24.7	1.49 H	31	43.2	6.1
6	4874.00	38.1 AV	54.0	-15.9	1.49 H	31	32.0	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	120.6 PK			1.82 V	356	86.3	34.3
2	*2437.00	117.0 AV			1.82 V	356	82.7	34.3
3	2483.50	64.9 PK	74.0	-9.1	1.87 V	360	30.5	34.4
4	2483.50	52.1 AV	54.0	-1.9	1.87 V	360	17.7	34.4
5	4874.00	50.7 PK	74.0	-23.3	1.56 V	327	44.6	6.1
6	4874.00	43.2 AV	54.0	-10.8	1.56 V	327	37.1	6.1

Remarks:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.8 PK			1.40 H	335	76.4	34.4
2	*2462.00	107.4 AV			1.40 H	335	73.0	34.4
3	2483.50	61.6 PK	74.0	-12.4	1.42 H	339	27.2	34.4
4	2483.50	49.4 AV	54.0	-4.6	1.42 H	339	15.0	34.4
5	4924.00	48.9 PK	74.0	-25.1	1.52 H	33	42.8	6.1
6	4924.00	36.3 AV	54.0	-17.7	1.52 H	33	30.2	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	121.1 PK			1.37 V	321	86.7	34.4
2	*2462.00	117.6 AV			1.37 V	321	83.2	34.4
3	2483.50	64.0 PK	74.0	-10.0	1.40 V	324	29.6	34.4
4	2483.50	52.9 AV	54.0	-1.1	1.40 V	324	18.5	34.4
5	4924.00	49.4 PK	74.0	-24.6	1.39 V	316	43.3	6.1
6	4924.00	38.7 AV	54.0	-15.3	1.39 V	316	32.6	6.1

Remarks:

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

802.11g

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	67.7 PK	74.0	-6.3	1.39 H	330	33.3	34.4
2	2390.00	50.3 AV	54.0	-3.7	1.39 H	330	15.9	34.4
3	*2412.00	109.6 PK			1.33 H	327	75.3	34.3
4	*2412.00	100.9 AV			1.33 H	327	66.6	34.3
5	4824.00	48.4 PK	74.0	-25.6	1.48 H	28	42.2	6.2
6	4824.00	35.2 AV	54.0	-18.8	1.48 H	28	29.0	6.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.8 PK	74.0	-1.2	1.18 V	336	38.4	34.4
2	2390.00	52.2 AV	54.0	-1.8	1.18 V	336	17.8	34.4
3	*2412.00	116.4 PK			1.11 V	337	82.1	34.3
4	*2412.00	107.2 AV			1.11 V	337	72.9	34.3
5	4824.00	48.4 PK	74.0	-25.6	1.42 V	336	42.2	6.2
6	4824.00	35.2 AV	54.0	-18.8	1.42 V	336	29.0	6.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	110.2 PK			1.53 H	318	75.9	34.3
2	*2437.00	100.7 AV			1.53 H	318	66.4	34.3
3	2483.50	63.3 PK	74.0	-10.7	1.55 H	325	28.9	34.4
4	2483.50	49.8 AV	54.0	-4.2	1.55 H	325	15.4	34.4
5	4874.00	48.3 PK	74.0	-25.7	1.52 H	39	42.2	6.1
6	4874.00	35.3 AV	54.0	-18.7	1.52 H	39	29.2	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	118.5 PK			1.27 V	338	84.2	34.3
2	*2437.00	108.9 AV			1.27 V	338	74.6	34.3
3	2483.50	70.7 PK	74.0	-3.3	1.15 V	345	36.3	34.4
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.15 V**	**345**	**18.6**	**34.4**
5	4874.00	48.4 PK	74.0	-25.6	1.36 V	336	42.3	6.1
6	4874.00	35.3 AV	54.0	-18.7	1.36 V	336	29.2	6.1

Remarks:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	106.9 PK			1.78 H	317	72.5	34.4
2	*2462.00	97.2 AV			1.78 H	317	62.8	34.4
3	2483.50	63.2 PK	74.0	-10.8	1.82 H	322	28.8	34.4
4	2483.50	49.5 AV	54.0	-4.5	1.82 H	322	15.1	34.4
5	4924.00	48.2 PK	74.0	-25.8	1.55 H	31	42.1	6.1
6	4924.00	35.2 AV	54.0	-18.8	1.55 H	31	29.1	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	116.2 PK			1.22 V	342	81.8	34.4
2	*2462.00	106.7 AV			1.22 V	342	72.3	34.4
3	**2483.50**	**73.0 PK**	**74.0**	**-1.0**	**1.18 V**	**340**	**38.6**	**34.4**
4	2483.50	51.6 AV	54.0	-2.4	1.18 V	340	17.2	34.4
5	4924.00	48.4 PK	74.0	-25.6	1.39 V	335	42.3	6.1
6	4924.00	35.4 AV	54.0	-18.6	1.39 V	335	29.3	6.1

Remarks:

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

802.11ax (HE20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.0 PK	74.0	-10.0	1.69 H	335	29.6	34.4
2	2390.00	49.7 AV	54.0	-4.3	1.69 H	335	15.3	34.4
3	*2412.00	111.3 PK			1.58 H	321	77.0	34.3
4	*2412.00	99.0 AV			1.58 H	321	64.7	34.3
5	4824.00	48.8 PK	74.0	-25.2	2.22 H	218	42.6	6.2
6	4824.00	35.2 AV	54.0	-18.8	2.22 H	218	29.0	6.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	70.1 PK	74.0	-3.9	1.73 V	352	35.7	34.4
2	2390.00	52.7 AV	54.0	-1.3	1.73 V	352	18.3	34.4
3	*2412.00	119.2 PK			1.15 V	339	84.9	34.3
4	*2412.00	106.6 AV			1.15 V	339	72.3	34.3
5	4824.00	48.5 PK	74.0	-25.5	2.56 V	223	42.3	6.2
6	4824.00	34.8 AV	54.0	-19.2	2.56 V	223	28.6	6.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	111.2 PK			1.74 H	316	76.9	34.3
2	*2437.00	99.5 AV			1.74 H	316	65.2	34.3
3	2483.50	61.3 PK	74.0	-12.7	1.79 H	322	26.9	34.4
4	2483.50	49.1 AV	54.0	-4.9	1.79 H	322	14.7	34.4
5	4874.00	49.4 PK	74.0	-24.6	2.21 H	219	43.3	6.1
6	4874.00	35.1 AV	54.0	-18.9	2.21 H	219	29.0	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	120.0 PK			2.09 V	355	85.7	34.3
2	*2437.00	108.2 AV			2.09 V	355	73.9	34.3
3	2483.50	68.6 PK	74.0	-5.4	1.82 V	357	34.2	34.4
4	2483.50	52.6 AV	54.0	-1.4	1.82 V	357	18.2	34.4
5	4874.00	49.6 PK	74.0	-24.4	1.56 V	319	43.5	6.1
6	4874.00	35.9 AV	54.0	-18.1	1.56 V	319	29.8	6.1

Remarks:

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

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	109.0 PK			1.81 H	356	74.6	34.4
2	*2462.00	96.7 AV			1.81 H	356	62.3	34.4
3	2483.50	63.2 PK	74.0	-10.8	1.85 H	344	28.8	34.4
4	2483.50	51.0 AV	54.0	-3.0	1.85 H	344	16.6	34.4
5	4924.00	49.4 PK	74.0	-24.6	2.64 H	186	43.3	6.1
6	4924.00	34.9 AV	54.0	-19.1	2.64 H	186	28.8	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	118.9 PK			1.21 V	344	84.5	34.4
2	*2462.00	106.7 AV			1.21 V	344	72.3	34.4
3	2483.50	72.8 PK	74.0	-1.2	1.83 V	358	38.4	34.4
4	2483.50	52.4 AV	54.0	-1.6	1.83 V	358	18.0	34.4
5	4924.00	48.7 PK	74.0	-25.3	1.59 V	318	42.6	6.1
6	4924.00	34.6 AV	54.0	-19.4	1.59 V	318	28.5	6.1

Remarks:

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

802.11ax (HE40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.1 PK	74.0	-11.9	1.63 H	326	27.7	34.4
2	2390.00	49.8 AV	54.0	-4.2	1.63 H	326	15.4	34.4
3	*2422.00	107.6 PK			1.59 H	321	73.3	34.3
4	*2422.00	95.9 AV			1.59 H	321	61.6	34.3
5	4874.00	49.3 PK	74.0	-24.7	1.99 H	326	43.2	6.1
6	4874.00	35.2 AV	54.0	-18.8	1.99 H	326	29.1	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	67.1 PK	74.0	-6.9	1.42 V	319	32.7	34.4
2	2390.00	52.4 AV	54.0	-1.6	1.42 V	319	18.0	34.4
3	*2422.00	116.4 PK			1.17 V	340	82.1	34.3
4	*2422.00	103.8 AV			1.17 V	340	69.5	34.3
5	4844.00	48.9 PK	74.0	-25.1	1.62 V	310	42.8	6.1
6	4844.00	34.5 AV	54.0	-19.5	1.62 V	310	28.4	6.1

Remarks:

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

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	107.5 PK			1.74 H	319	73.2	34.3
2	*2437.00	95.2 AV			1.74 H	319	60.9	34.3
3	2483.50	62.0 PK	74.0	-12.0	1.79 H	326	27.6	34.4
4	2483.50	49.0 AV	54.0	-5.0	1.79 H	326	14.6	34.4
5	4874.00	49.3 PK	74.0	-24.7	2.06 H	269	43.2	6.1
6	4874.00	34.9 AV	54.0	-19.1	2.06 H	269	28.8	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	118.0 PK			1.22 V	346	83.7	34.3
2	*2437.00	104.4 AV			1.22 V	346	70.1	34.3
3	2483.50	71.1 PK	74.0	-2.9	1.16 V	345	36.7	34.4
4	2483.50	52.4 AV	54.0	-1.6	1.16 V	345	18.0	34.4
5	4874.00	48.5 PK	74.0	-25.5	1.52 V	339	42.4	6.1
6	4874.00	34.4 AV	54.0	-19.6	1.52 V	339	28.3	6.1

Remarks:

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

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	104.9 PK			1.75 H	319	70.6	34.3
2	*2452.00	92.8 AV			1.75 H	319	58.5	34.3
3	2483.50	61.0 PK	74.0	-13.0	1.64 H	322	26.6	34.4
4	2483.50	48.9 AV	54.0	-5.1	1.64 H	322	14.5	34.4
5	4904.00	48.6 PK	74.0	-25.4	1.86 H	264	42.5	6.1
6	4904.00	34.6 AV	54.0	-19.4	1.86 H	264	28.5	6.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (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	114.1 PK			2.05 V	352	79.8	34.3
2	*2452.00	102.5 AV			2.05 V	352	68.2	34.3
3	2483.50	67.2 PK	74.0	-6.8	2.02 V	359	32.8	34.4
4	2483.50	52.8 AV	54.0	-1.2	2.02 V	359	18.4	34.4
5	4904.00	48.8 PK	74.0	-25.2	1.58 V	309	42.7	6.1
6	4904.00	34.7 AV	54.0	-19.3	1.58 V	309	28.6	6.1

Remarks:

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

Below 1GHz worst-case data:

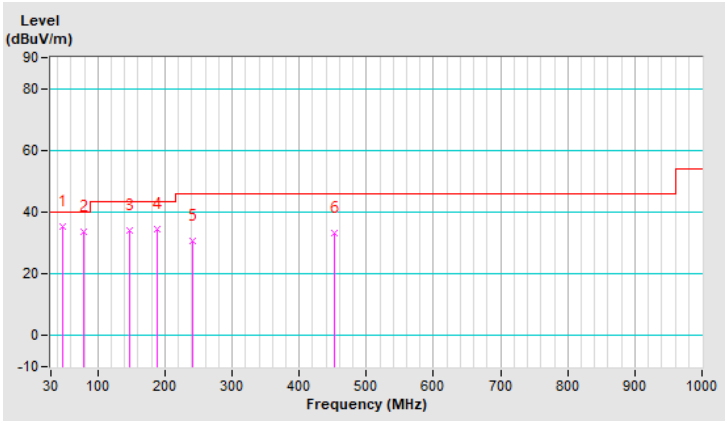
802.11b

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	46.87	35.3 QP	40.0	-4.7	1.00 H	254	44.5	-9.2
2	79.20	33.7 QP	40.0	-6.3	1.50 H	130	46.8	-13.1
3	146.68	34.1 QP	43.5	-9.4	1.00 H	168	42.7	-8.6
4	187.45	34.4 QP	43.5	-9.1	1.50 H	248	45.1	-10.7
5	240.87	30.8 QP	46.0	-15.2	1.50 H	260	39.9	-9.1
6	453.14	33.1 QP	46.0	-12.9	2.00 H	154	36.3	-3.2

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

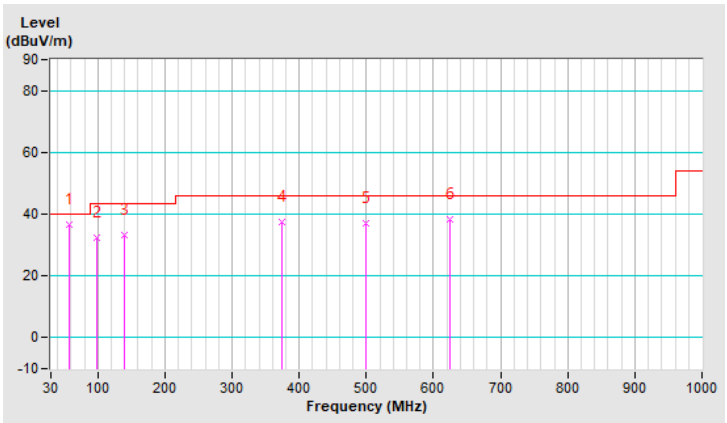


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	56.71	36.8 QP	40.0	-3.2	1.00 V	15	46.1	-9.3
2	98.88	32.5 QP	43.5	-11.0	1.00 V	73	46.0	-13.5
3	139.65	33.4 QP	43.5	-10.1	1.00 V	324	42.4	-9.0
4	374.42	37.4 QP	46.0	-8.6	1.50 V	139	42.5	-5.1
5	499.54	36.9 QP	46.0	-9.1	2.00 V	340	39.2	-2.3
6	624.65	38.1 QP	46.0	-7.9	1.00 V	345	37.3	0.8

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 emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20dB 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

Test Date: Dec. 25, 2020

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Dec. 31, 2019	Dec. 30, 2020
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 04, 2020	Sep. 03, 2021
V-LISN SCHWARZBECK (EUT)	ENV216	101826	Feb. 20, 2020	Feb. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 28, 2020	Aug. 27, 2021
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 1 (Conduction 1).
3. The VCCI Site Registration No. is C-12040.

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.

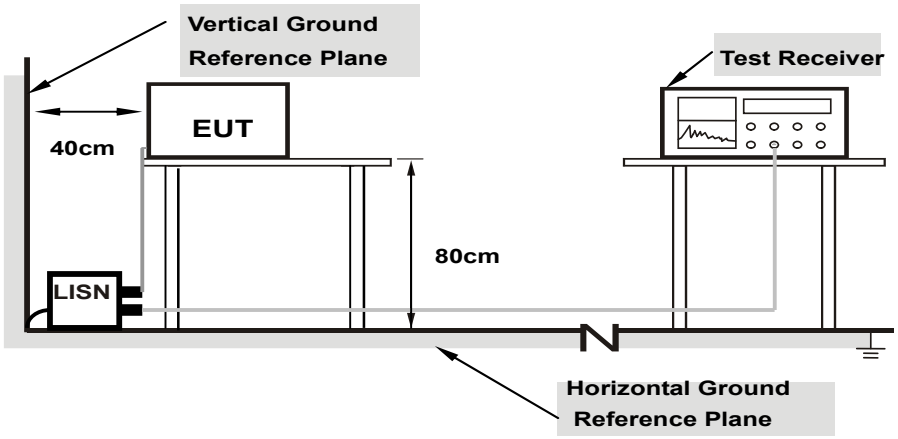
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

Radio 1

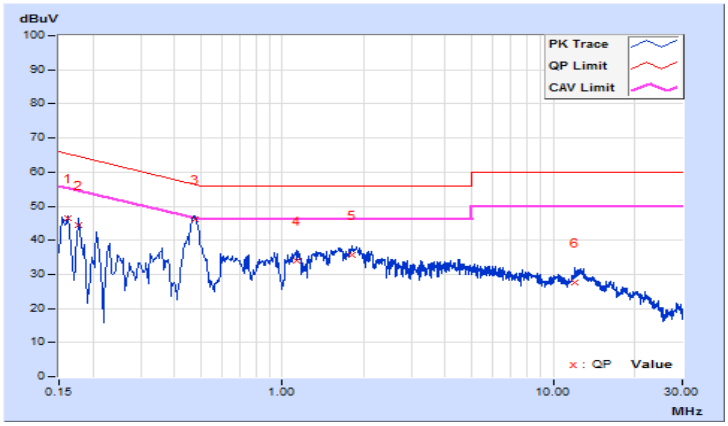
Worst-case data: 802.11g

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16200	9.65	36.72	22.60	46.37	32.25	65.36	55.36	-18.99	-23.11
2	0.17800	9.66	34.79	21.13	44.45	30.79	64.58	54.58	-20.13	-23.79
3	0.47400	9.66	36.60	31.28	46.26	40.94	56.44	46.44	-10.18	-5.50
4	1.12600	9.67	24.50	20.54	34.17	30.21	56.00	46.00	-21.83	-15.79
5	1.80600	9.69	25.96	21.84	35.65	31.53	56.00	46.00	-20.35	-14.47
6	12.07000	9.81	17.74	13.17	27.55	22.98	60.00	50.00	-32.45	-27.02

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.

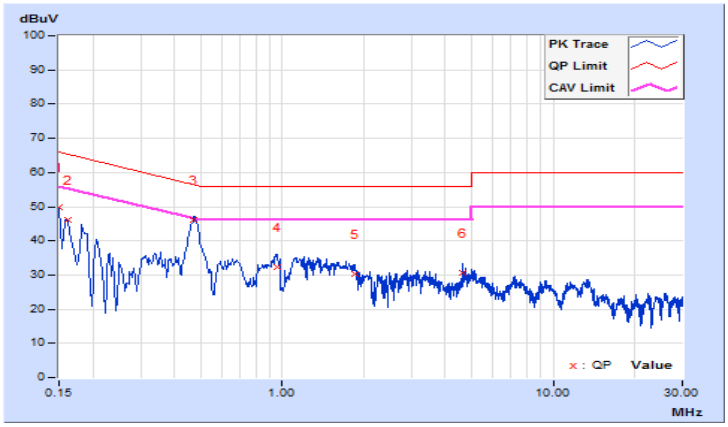


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.68	40.04	27.14	49.72	36.82	66.00	56.00	-16.28	-19.18
2	0.16200	9.68	36.52	22.46	46.20	32.14	65.36	55.36	-19.16	-23.22
3	0.47000	9.68	36.55	31.01	46.23	40.69	56.51	46.51	-10.28	-5.82
4	0.96101	9.69	22.48	17.32	32.17	27.01	56.00	46.00	-23.83	-18.99
5	1.85000	9.72	20.46	15.93	30.18	25.65	56.00	46.00	-25.82	-20.35
6	4.65000	9.78	20.90	11.95	30.68	21.73	56.00	46.00	-25.32	-24.27

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.



Radio 3

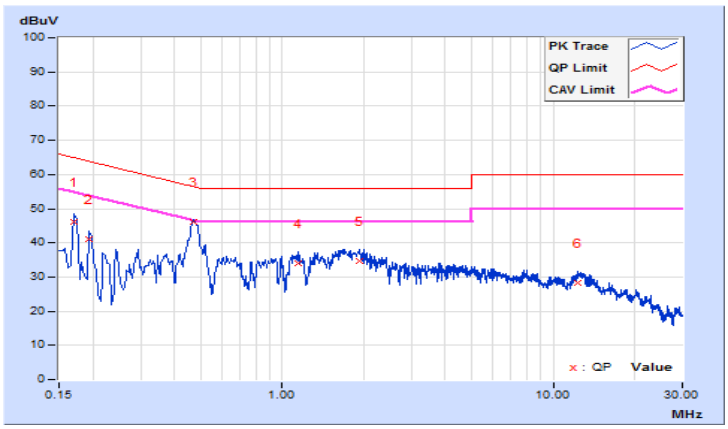
Worst-case data: 802.11b

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17000	9.65	36.56	23.23	46.21	32.88	64.96	54.96	-18.75	-22.08
2	0.19400	9.66	31.25	17.26	40.91	26.92	63.86	53.86	-22.95	-26.94
3	0.46936	9.66	36.35	30.76	46.01	40.42	56.53	46.53	-10.52	-6.11
4	1.14200	9.67	24.36	20.05	34.03	29.72	56.00	46.00	-21.97	-16.28
5	1.93400	9.70	24.93	20.54	34.63	30.24	56.00	46.00	-21.37	-15.76
6	12.40200	9.82	18.32	13.61	28.14	23.43	60.00	50.00	-31.86	-26.57

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.

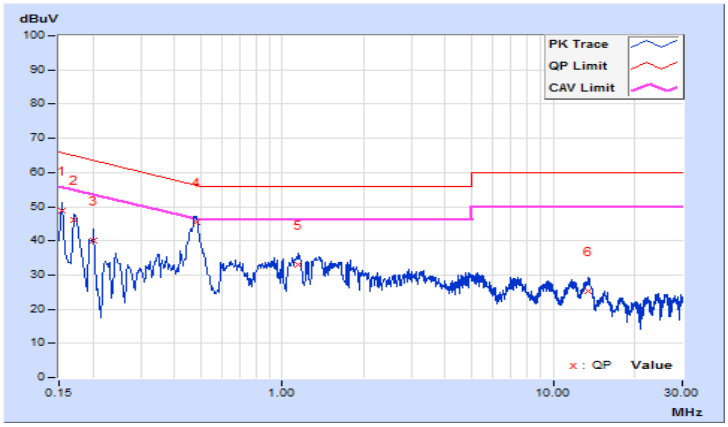


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	9.68	39.20	26.18	48.88	35.86	65.78	55.78	-16.90	-19.92
2	0.17000	9.68	36.44	22.89	46.12	32.57	64.96	54.96	-18.84	-22.39
3	0.20200	9.68	30.45	16.41	40.13	26.09	63.53	53.53	-23.40	-27.44
4	**0.48063**	**9.68**	**35.93**	**31.34**	**45.61**	**41.02**	**56.33**	**46.33**	**-10.72**	**-5.31**
5	1.14200	9.70	23.21	18.96	32.91	28.66	56.00	46.00	-23.09	-17.34
6	13.44600	9.90	15.27	10.55	25.17	20.45	60.00	50.00	-34.83	-29.55

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.

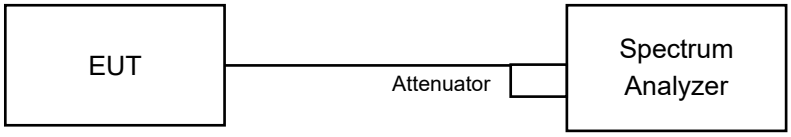


4.3 6dB Bandwidth Measurement

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 fromTest 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

Radio 1

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.10	7.09	0.5	Pass
6	2437	7.10	7.11	0.5	Pass
11	2462	7.11	7.09	0.5	Pass

802.11g

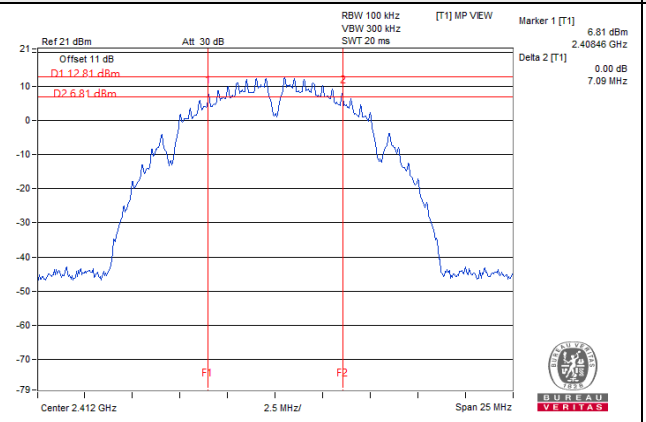
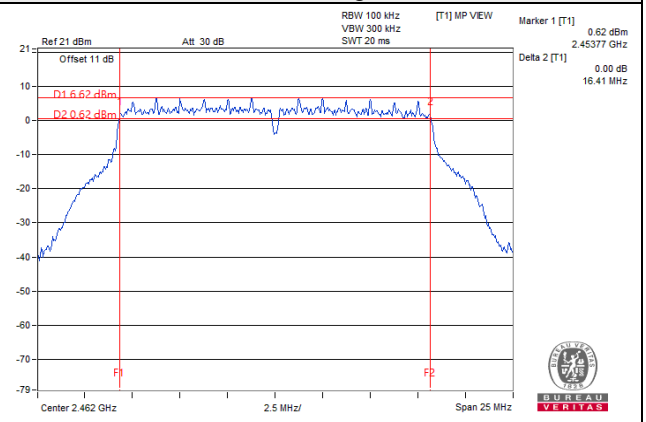
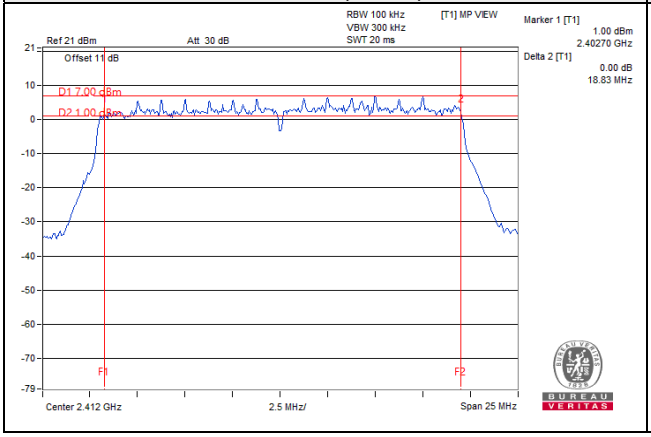
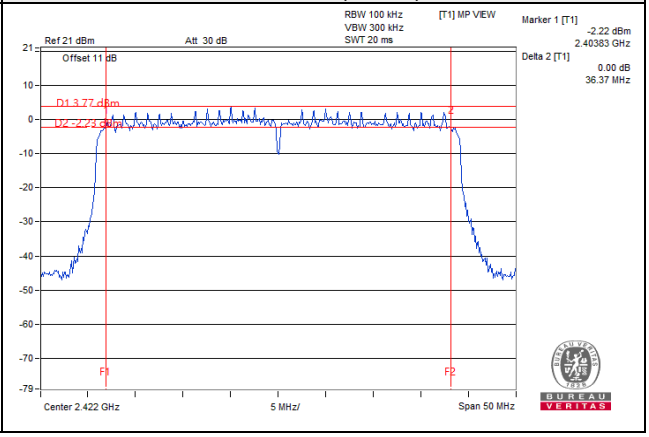
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.42	16.41	0.5	Pass
6	2437	16.43	16.43	0.5	Pass
11	2462	16.41	16.42	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	18.99	18.83	0.5	Pass
6	2437	19.06	19.05	0.5	Pass
11	2462	19.01	19.03	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	37.61	36.37	0.5	Pass
6	2437	37.81	37.66	0.5	Pass
9	2452	37.42	36.46	0.5	Pass

Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11ax (HE20)	802.11ax (HE40)
	

Radio 3

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.06	7.10	0.5	Pass
6	2437	7.11	7.09	0.5	Pass
11	2462	7.09	7.09	0.5	Pass

802.11g

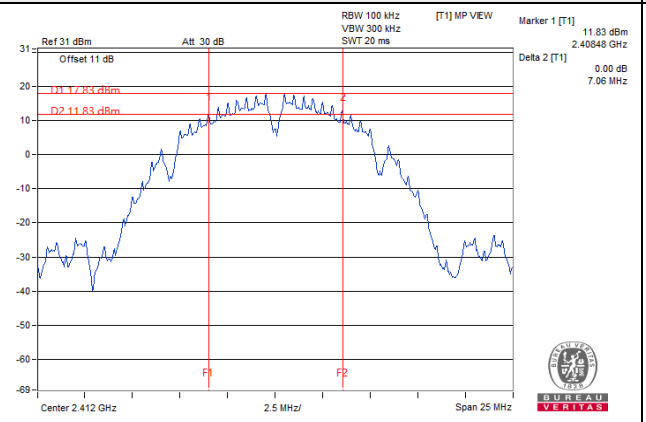
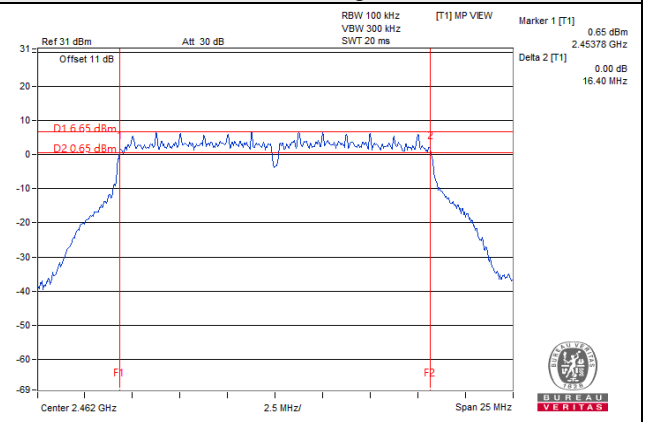
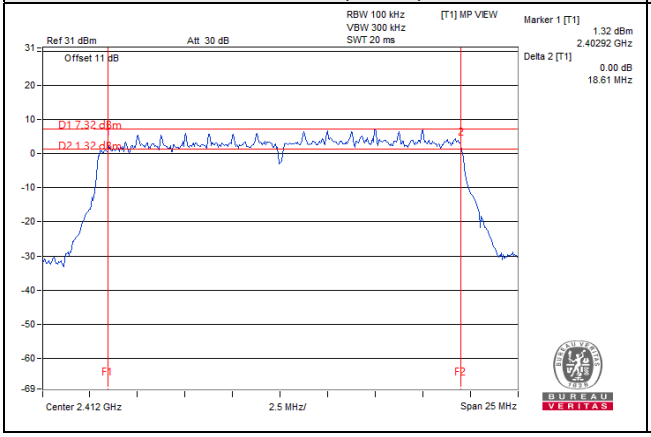
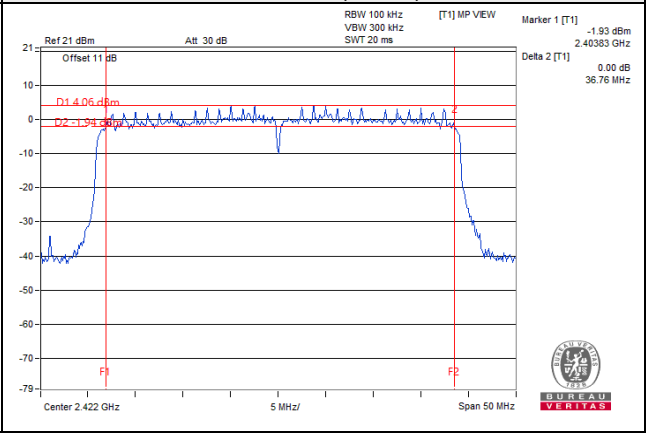
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.41	16.43	0.5	Pass
6	2437	16.42	16.41	0.5	Pass
11	2462	16.40	16.40	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	18.89	18.61	0.5	Pass
6	2437	19.03	19.06	0.5	Pass
11	2462	19.05	19.00	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.79	36.76	0.5	Pass
6	2437	37.75	37.37	0.5	Pass
9	2452	37.48	36.78	0.5	Pass

Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11ax (HE20)	802.11ax (HE40)
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

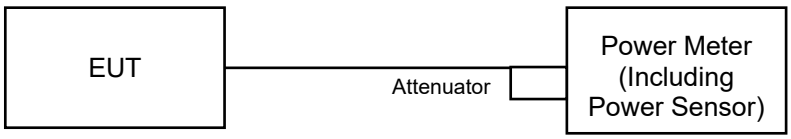
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

Radio 1

CDD Mode

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.61	19.43	179.111	22.53	25.67	Pass
6	2437	19.96	19.82	195.023	22.90	25.67	Pass
11	2462	20.26	19.95	205.025	23.12	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.03	17.83	124.207	20.94	25.67	Pass
6	2437	22.57	22.63	**363.949**	25.61	25.67	Pass
11	2462	17.33	17.21	106.677	20.28	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.20	17.17	104.600	20.20	25.67	Pass
6	2437	21.17	20.80	251.145	24.00	25.67	Pass
11	2462	16.31	16.28	85.218	19.31	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	16.80	16.73	94.961	19.78	25.67	Pass
6	2437	18.48	18.32	138.390	21.41	25.67	Pass
9	2452	16.76	16.78	95.067	19.78	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

802.11ac (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.37	17.25	107.664	20.32	25.67	Pass
6	2437	21.25	20.91	256.663	24.09	25.67	Pass
11	2462	16.47	16.35	87.513	19.42	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

802.11ac (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	16.91	16.86	97.620	19.90	25.67	Pass
6	2437	18.53	18.48	141.755	21.52	25.67	Pass
9	2452	16.88	16.80	96.616	19.85	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

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	17.43	17.32	109.286	20.39	25.67	Pass
6	2437	21.32	21.01	261.702	24.18	25.67	Pass
11	2462	16.52	16.41	88.627	19.48	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

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	17.01	16.97	100.008	20.00	25.67	Pass
6	2437	18.67	18.53	144.906	21.61	25.67	Pass
9	2452	16.99	16.91	99.094	19.96	25.67	Pass

*Max. Gain = 10.33dBi > 6dBi, so the power limit shall be reduced to 30-(10.33-6) = 25.67dBm.

Beamforming Mode

802.11ac (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.36	14.24	53.836	17.31	22.75	Pass
6	2437	18.24	17.90	128.340	21.08	22.75	Pass
11	2462	13.46	13.34	43.759	16.41	22.75	Pass

*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the power limit shall be reduced to 30-(13.25-6) = 22.75dBm.

802.11ac (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	13.90	13.85	48.813	16.89	22.75	Pass
6	2437	15.52	15.47	70.882	18.51	22.75	Pass
9	2452	13.87	13.79	48.311	16.84	22.75	Pass

*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the power limit shall be reduced to 30-(13.25-6) = 22.75dBm.

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	14.42	14.31	54.647	17.38	22.75	Pass
6	2437	18.31	18.00	**130.860**	21.17	22.75	Pass
11	2462	13.51	13.40	44.316	16.47	22.75	Pass

*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the power limit shall be reduced to 30-(13.25-6) = 22.75dBm.

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	14.00	13.96	50.007	16.99	22.75	Pass
6	2437	15.66	15.52	72.458	18.60	22.75	Pass
9	2452	13.98	13.90	49.551	16.95	22.75	Pass

*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the power limit shall be reduced to 30-(13.25-6) = 22.75dBm.

Radio 3

CDD Mode

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.68	24.37	567.292	27.54	30	Pass
6	2437	25.35	24.95	**655.376**	28.16	30	Pass
11	2462	23.89	23.59	473.466	26.75	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.03	18.97	158.869	22.01	30	Pass
6	2437	22.01	21.93	314.810	24.98	30	Pass
11	2462	17.61	17.67	116.156	20.65	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.88	17.93	123.463	20.92	30	Pass
6	2437	20.70	20.78	237.164	23.75	30	Pass
11	2462	17.04	16.98	100.471	20.02	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.67	17.57	115.627	20.63	30	Pass
6	2437	17.75	17.80	119.822	20.79	30	Pass
9	2452	15.70	15.74	74.651	18.73	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

802.11ac (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	17.99	18.03	126.484	21.02	30	Pass
6	2437	20.82	20.80	241.008	23.82	30	Pass
11	2462	17.13	17.08	102.692	20.12	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

802.11ac (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.70	17.61	116.561	20.67	30	Pass
6	2437	17.87	17.91	123.037	20.90	30	Pass
9	2452	15.82	15.86	76.742	18.85	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

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	18.09	18.12	129.280	21.12	30	Pass
6	2437	20.93	20.91	247.190	23.93	30	Pass
11	2462	17.21	17.17	104.721	20.20	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

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	17.82	17.74	119.963	20.79	30	Pass
6	2437	17.98	18.01	126.047	21.01	30	Pass
9	2452	15.93	15.97	78.711	18.96	30	Pass

*Max. Gain = 4.64dBi < 6dBi, so the limit no need to reduced.

Beamforming Mode

802.11ac (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.98	15.02	63.246	18.01	28.5	Pass
6	2437	17.81	17.79	120.512	20.81	28.5	Pass
11	2462	14.12	14.07	51.350	17.11	28.5	Pass

*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 7.50dBi > 6dBi, so the power limit shall be reduced to 30-(7.50-6) = 28.5dBm.

802.11ac (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	14.69	14.60	58.285	17.66	28.5	Pass
6	2437	14.86	14.90	61.523	17.89	28.5	Pass
9	2452	12.81	12.85	38.374	15.84	28.5	Pass

*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 7.50dBi > 6dBi, so the power limit shall be reduced to 30-(7.50-6) = 28.5dBm.

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	15.08	15.11	64.645	18.11	28.5	Pass
6	2437	17.92	17.90	**123.604**	20.92	28.5	Pass
11	2462	14.20	14.16	52.364	17.19	28.5	Pass

*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 7.50dBi > 6dBi, so the power limit shall be reduced to 30-(7.50-6) = 28.5dBm.

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	14.81	14.73	59.986	17.78	28.5	Pass
6	2437	14.97	15.00	63.028	18.00	28.5	Pass
9	2452	12.92	12.96	39.358	15.95	28.5	Pass

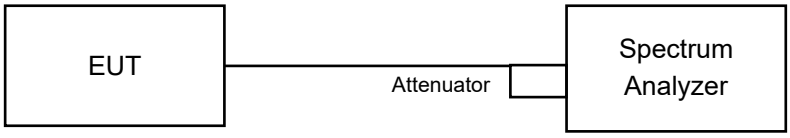
*Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 7.50dBi > 6dBi, so the power limit shall be reduced to 30-(7.50-6) = 28.5dBm.

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 band during any time interval of continuous transmission.

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

For Average Power (Duty cycle ≥ 98%)
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.

For Average Power (Duty cycle < 98%)
a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as item 4.3.6.

4.5.7 Test Results

Radio 1

802.11b

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-12.52	3.01	0.29	-9.22	0.75	Pass
	6	2437	-11.53	3.01	0.29	-8.23	0.75	Pass
	11	2462	-11.22	3.01	0.29	-7.92	0.75	Pass
1	1	2412	-12.48	3.01	0.29	-9.18	0.75	Pass
	6	2437	-12.51	3.01	0.29	-9.21	0.75	Pass
	11	2462	-11.70	3.01	0.29	-8.40	0.75	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Max. Directional Gain =10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the limit shall be reduced to 8-(13.25-6) = 0.75dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-17.13	3.01	0.25	-13.87	0.75	Pass
	6	2437	-13.71	3.01	0.25	-10.45	0.75	Pass
	11	2462	-17.98	3.01	0.25	-14.72	0.75	Pass
1	1	2412	-17.98	3.01	0.25	-14.72	0.75	Pass
	6	2437	-14.04	3.01	0.25	-10.78	0.75	Pass
	11	2462	-17.69	3.01	0.25	-14.43	0.75	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Max. Directional Gain =10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the limit shall be reduced to 8-(13.25-6) = 0.75dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

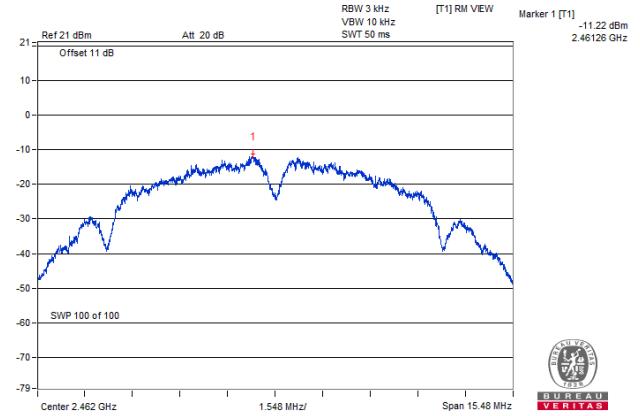
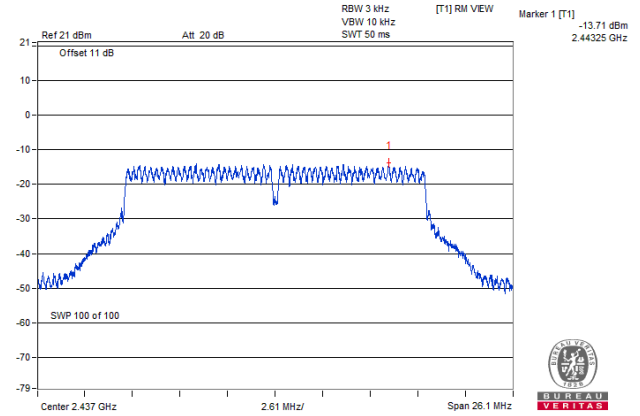
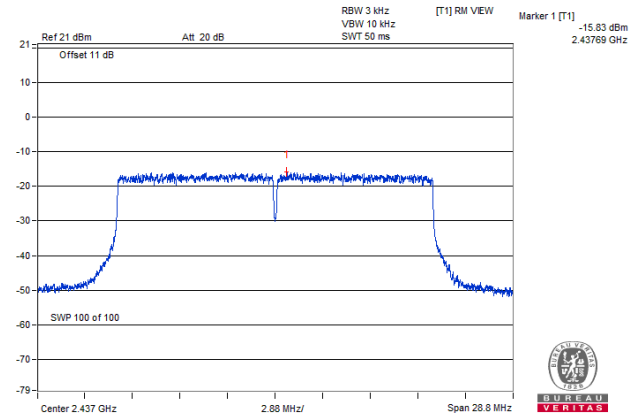
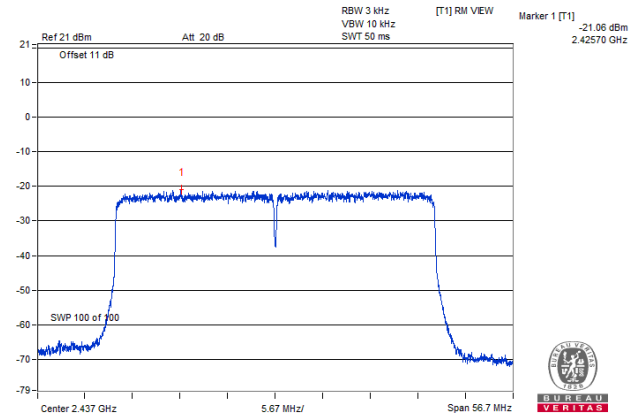
TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-18.95	3.01	0.16	-15.78	0.75	Pass
	6	2437	-15.83	3.01	0.16	-12.66	0.75	Pass
	11	2462	-20.21	3.01	0.16	-17.04	0.75	Pass
1	1	2412	-19.36	3.01	0.16	-16.19	0.75	Pass
	6	2437	-15.91	3.01	0.16	-12.74	0.75	Pass
	11	2462	-20.34	3.01	0.16	-17.17	0.75	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Max. Directional Gain =10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the limit shall be reduced to 8-(13.25-6) = 0.75dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-22.50	3.01	0.21	-19.28	0.75	Pass
	6	2437	-21.54	3.01	0.21	-18.32	0.75	Pass
	9	2452	-22.37	3.01	0.21	-19.15	0.75	Pass
1	3	2422	-22.35	3.01	0.21	-19.13	0.75	Pass
	6	2437	-21.06	3.01	0.21	-17.84	0.75	Pass
	9	2452	-22.30	3.01	0.21	-19.08	0.75	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Max. Directional Gain =10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 13.25dBi > 6dBi, so the limit shall be reduced to 8-(13.25-6) = 0.75dBm.
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)
	

Radio 3

802.11b

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.53	3.01	0.23	-5.29	6.50	Pass
	6	2437	-8.13	3.01	0.23	-4.89	6.50	Pass
	11	2462	-8.45	3.01	0.23	-5.21	6.50	Pass
1	1	2412	-8.01	3.01	0.23	-4.77	6.50	Pass
	6	2437	-8.41	3.01	0.23	-5.17	6.50	Pass
	11	2462	-9.31	3.01	0.23	-6.07	6.50	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 7.50dBi > 6dBi, so the limit shall be reduced to 8-(7.50-6) = 6.5dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-16.35	3.01	0.28	-13.06	6.50	Pass
	6	2437	-13.83	3.01	0.28	-10.54	6.50	Pass
	11	2462	-17.94	3.01	0.28	-14.65	6.50	Pass
1	1	2412	-17.03	3.01	0.28	-13.74	6.50	Pass
	6	2437	-13.92	3.01	0.28	-10.63	6.50	Pass
	11	2462	-18.14	3.01	0.28	-14.85	6.50	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 7.50dBi > 6dBi, so the limit shall be reduced to 8-(7.50-6) = 6.5dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-18.88	3.01	0.14	-15.73	6.50	Pass
	6	2437	-16.45	3.01	0.14	-13.30	6.50	Pass
	11	2462	-20.18	3.01	0.14	-17.03	6.50	Pass
1	1	2412	-18.96	3.01	0.14	-15.81	6.50	Pass
	6	2437	-16.23	3.01	0.14	-13.08	6.50	Pass
	11	2462	-19.96	3.01	0.14	-16.81	6.50	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$]= 7.50dBi > 6dBi, so the limit shall be reduced to 8-(7.50-6) = 6.5dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

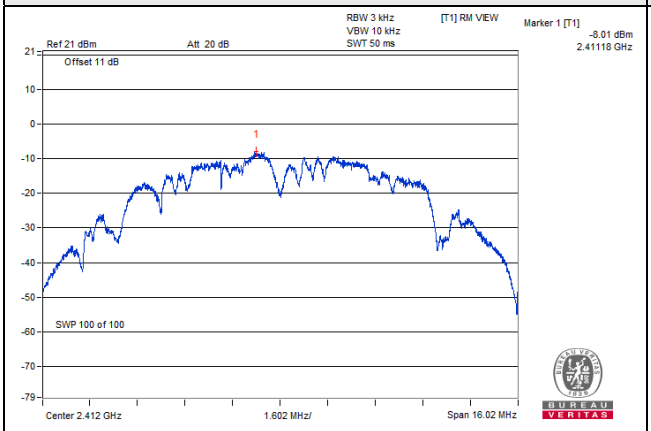
802.11ax (HE40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-22.30	3.01	0.22	-19.07	6.50	Pass
	6	2437	-21.84	3.01	0.22	-18.61	6.50	Pass
	9	2452	-24.02	3.01	0.22	-20.79	6.50	Pass
1	3	2422	-21.90	3.01	0.22	-18.67	6.50	Pass
	6	2437	-21.84	3.01	0.22	-18.61	6.50	Pass
	9	2452	-23.71	3.01	0.22	-20.48	6.50	Pass

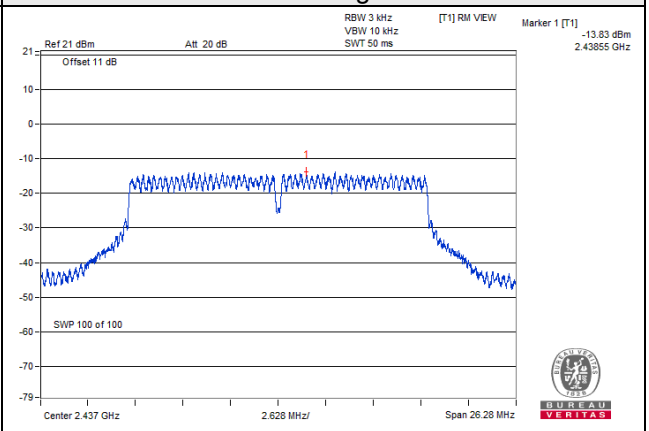
Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 10 log[($10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20}$)^2/2]= 7.50dBi > 6dBi, so the limit shall be reduced to 8-(7.50-6) = 6.5dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

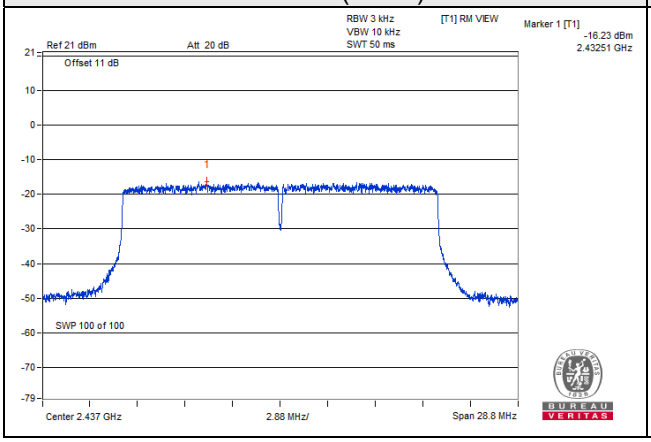
802.11b



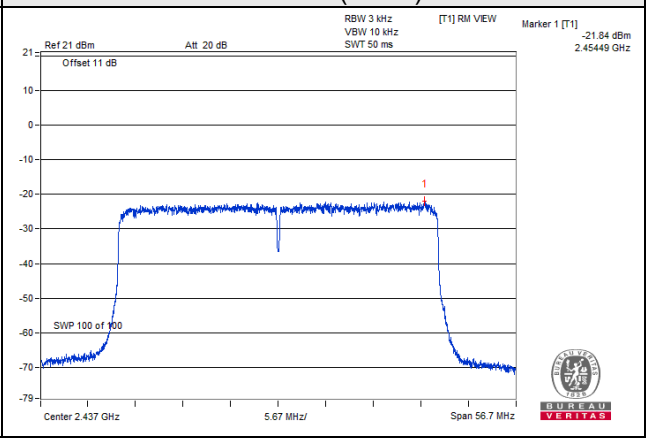
802.11g



802.11ax (HE20)



802.11ax (HE40)

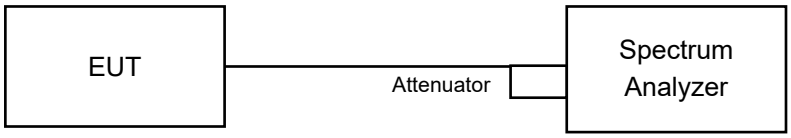


4.6 Conducted Out of Band Emission Measurement

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.

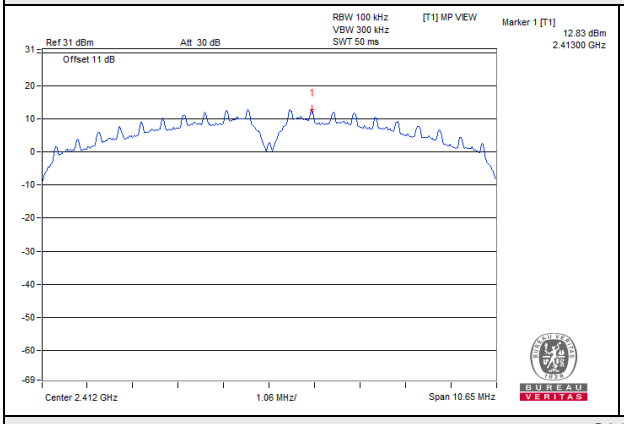
4.6.7 Test Results

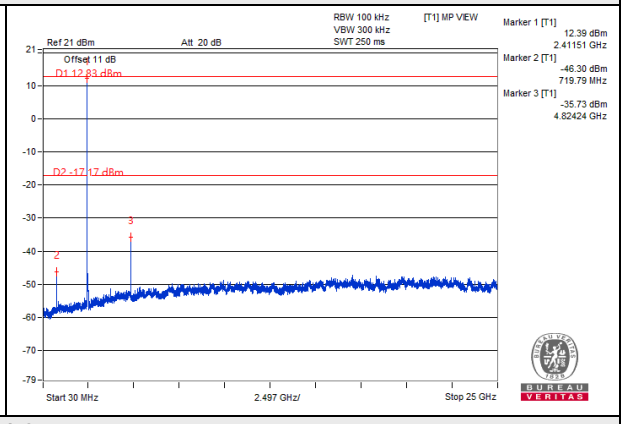
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

Radio 1

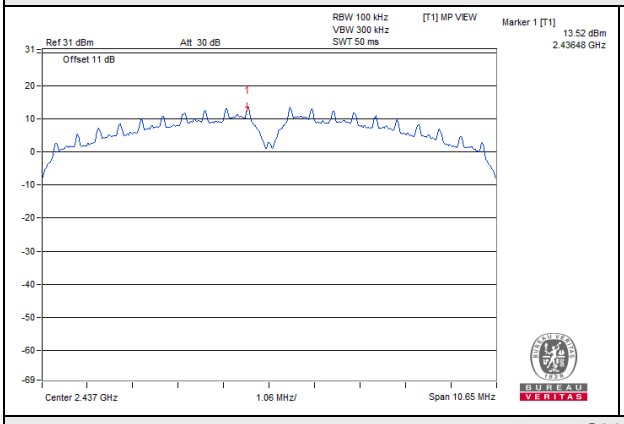
802.11b_Chain 0

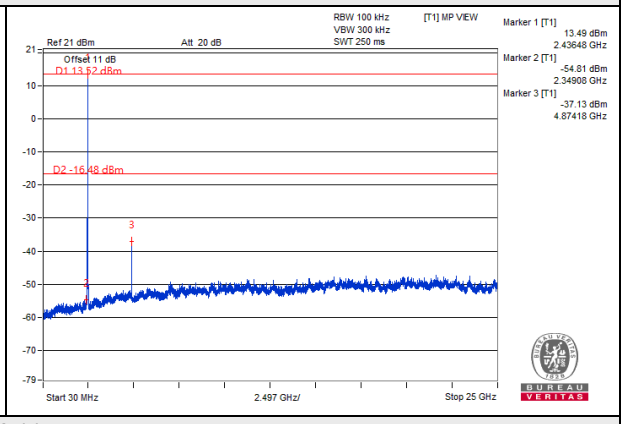
CH 1



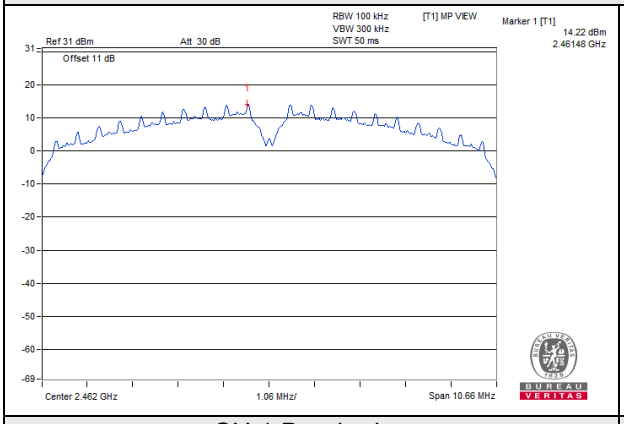


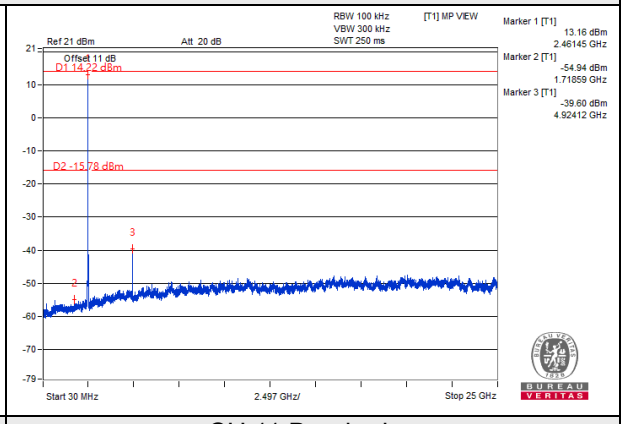
CH 6



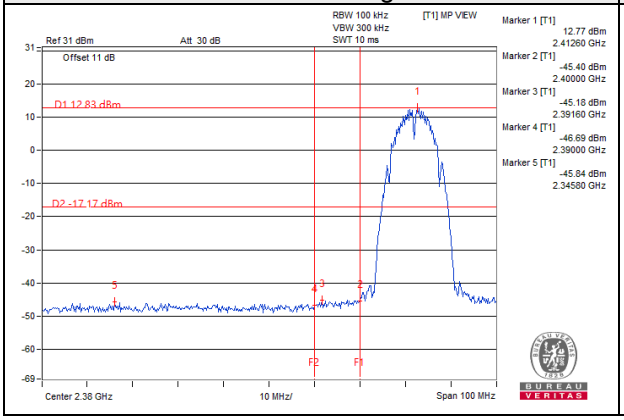


CH 11

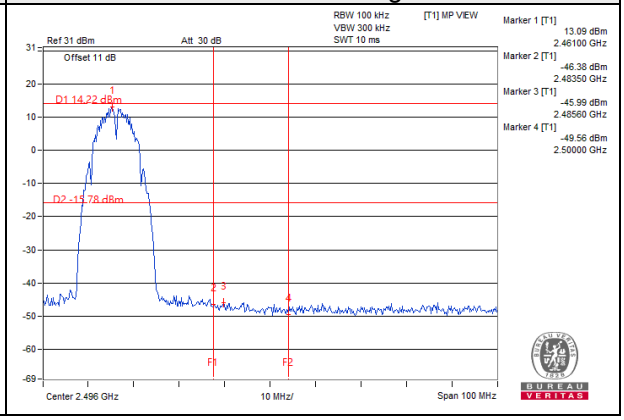




CH 1 Band edge

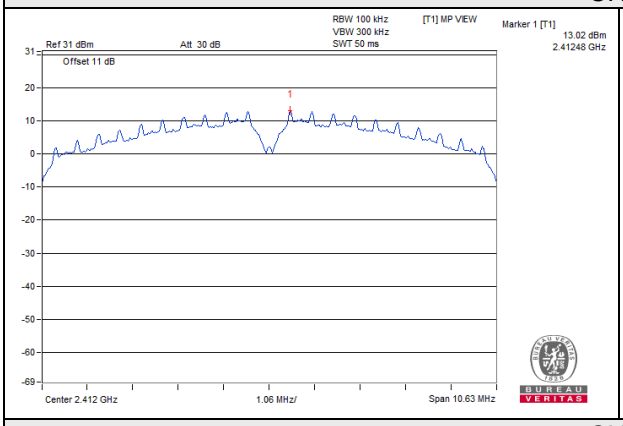


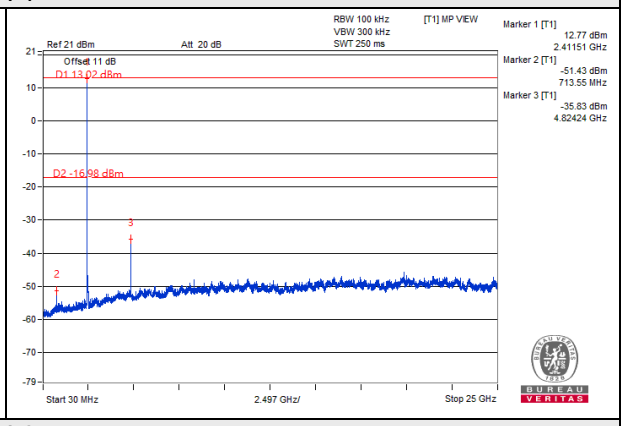
CH 11 Band edge



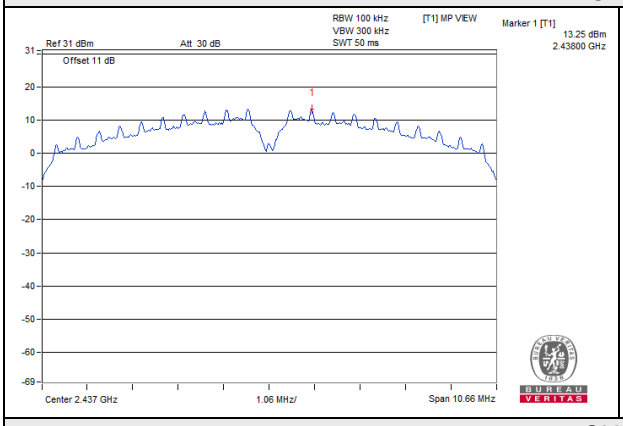
802.11b_Chain 1

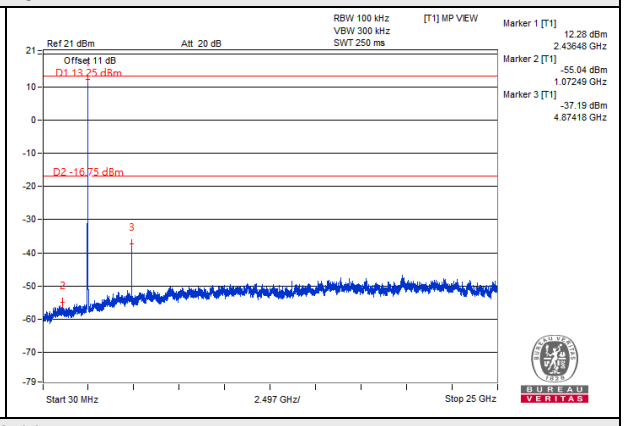
CH 1



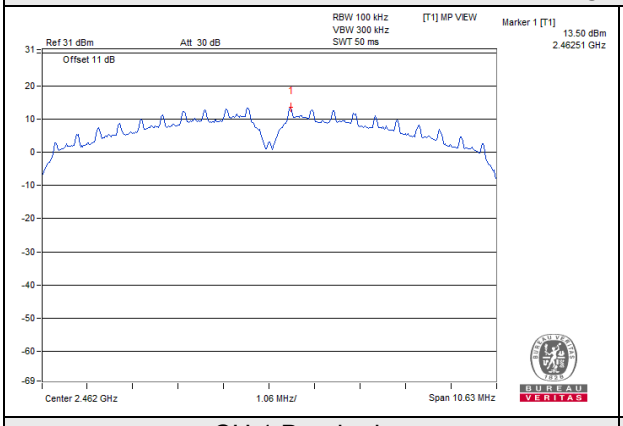


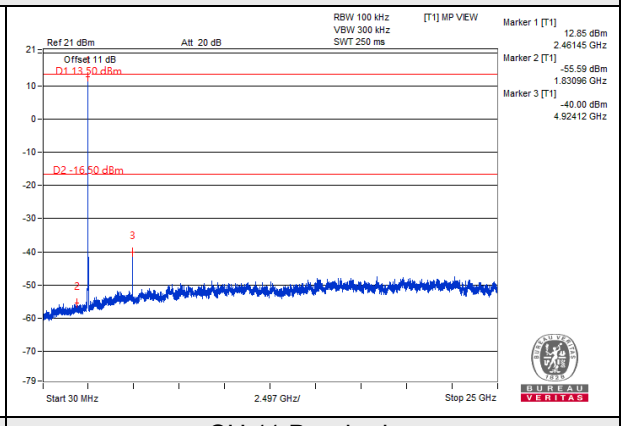
CH 6



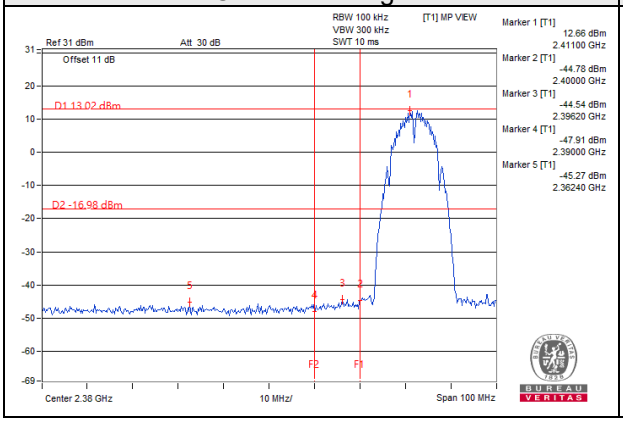


CH 11

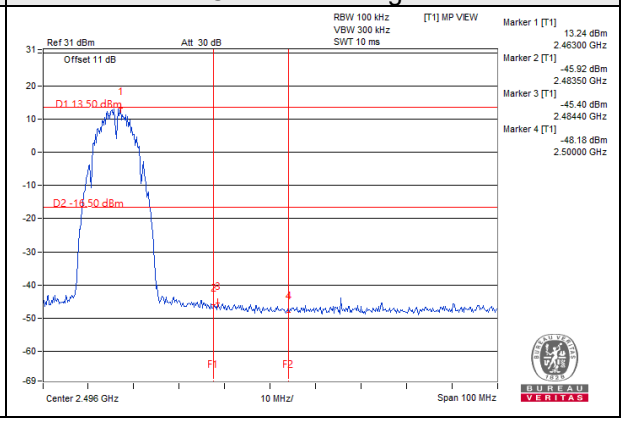




CH 1 Band edge

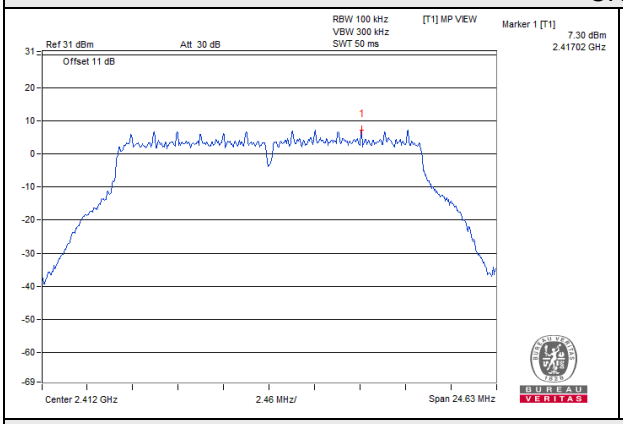


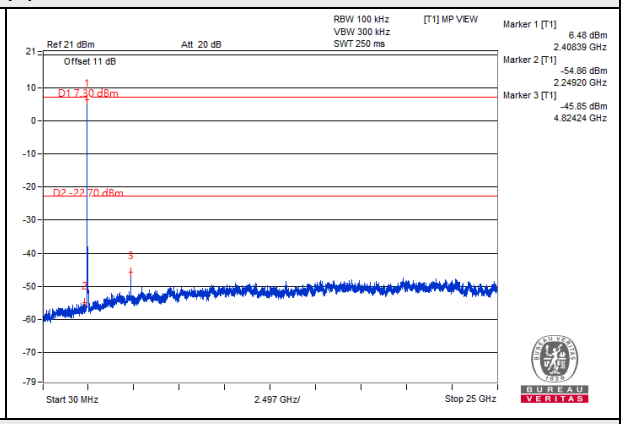
CH 11 Band edge



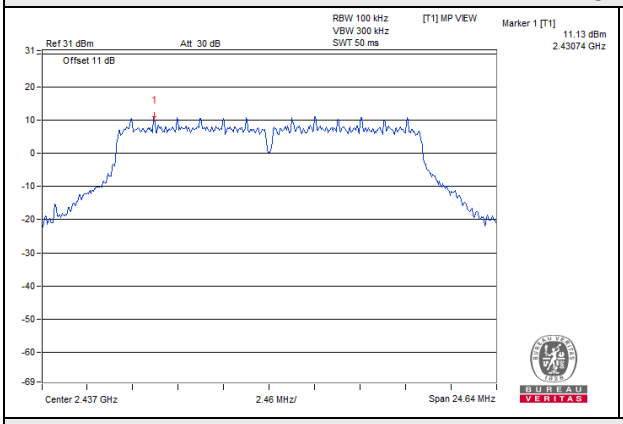
802.11g_Chain 0

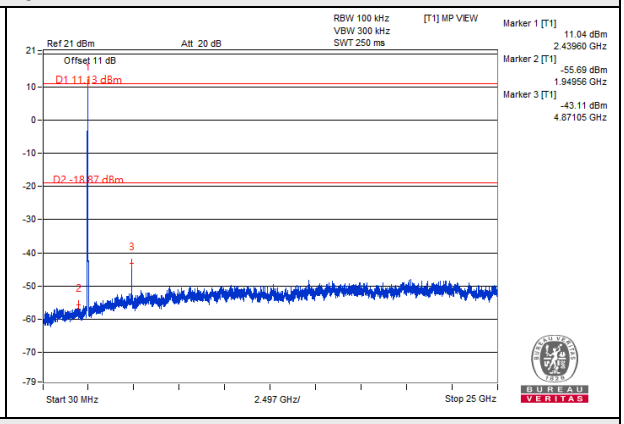
CH 1



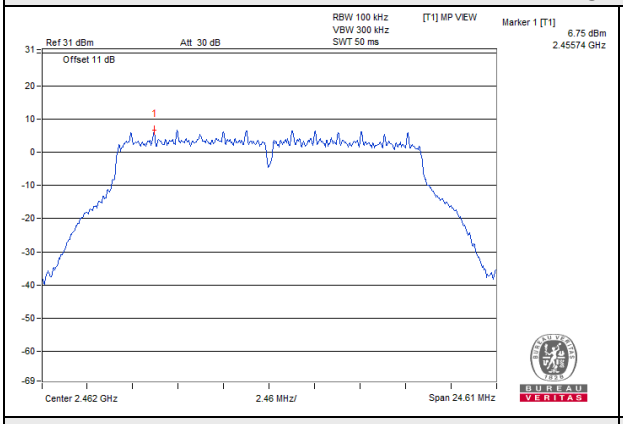


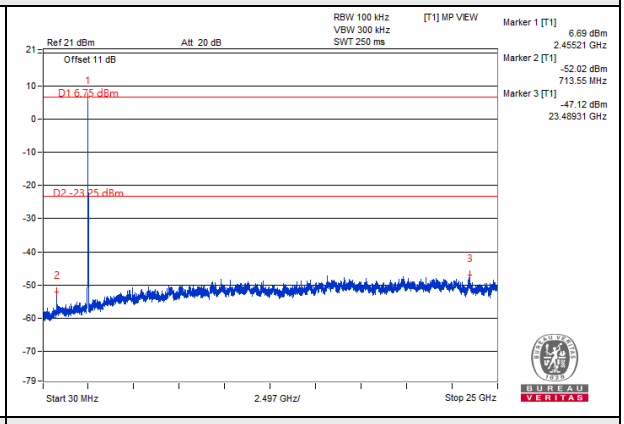
CH 6



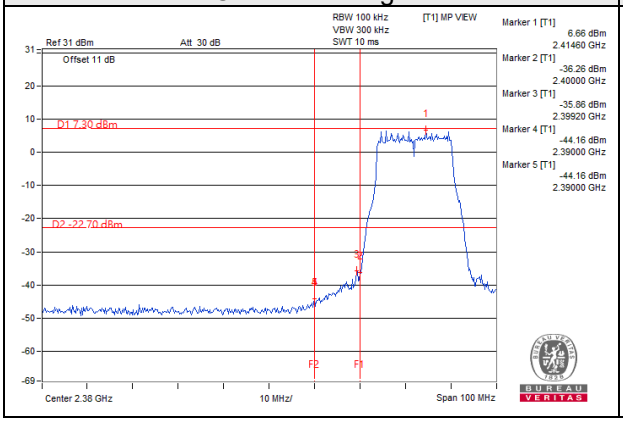


CH 11

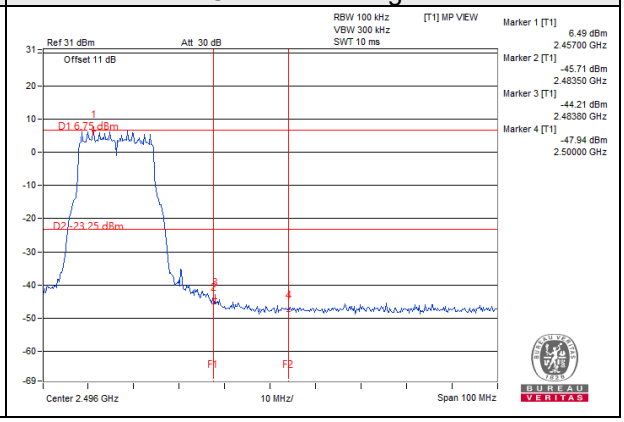




CH 1 Band edge

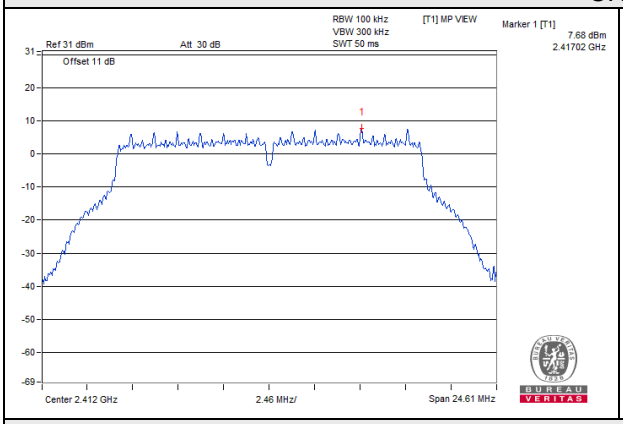


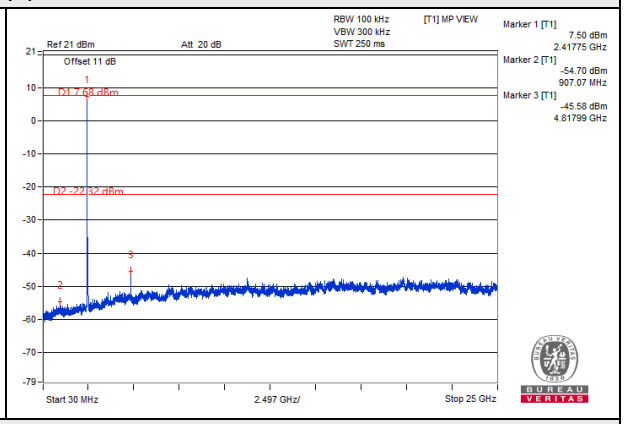
CH 11 Band edge



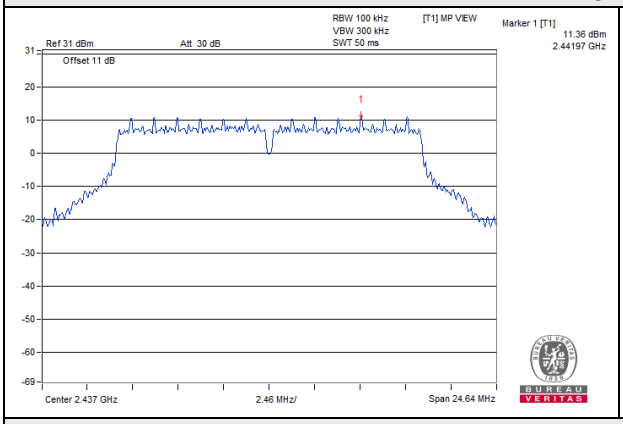
802.11g_Chain 1

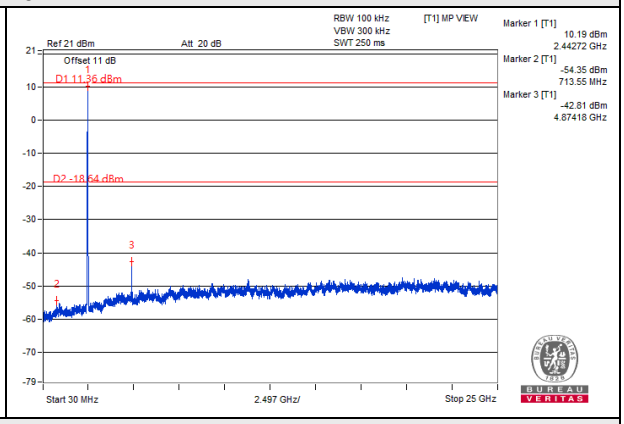
CH 1



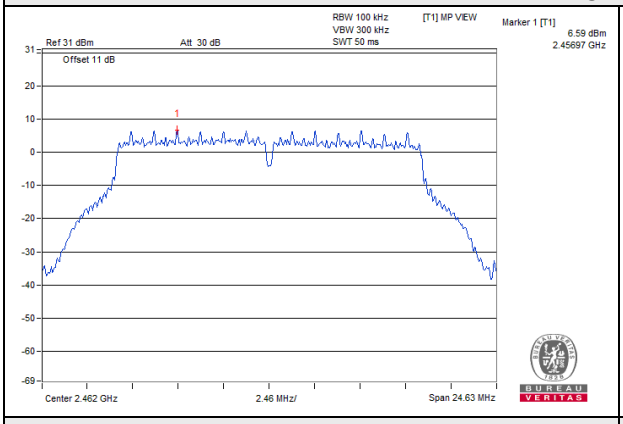


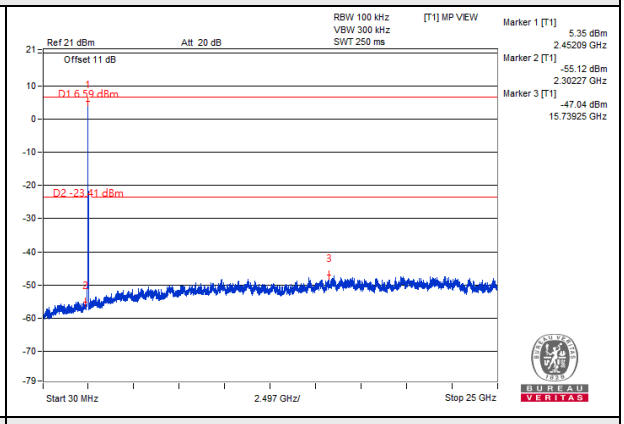
CH 6



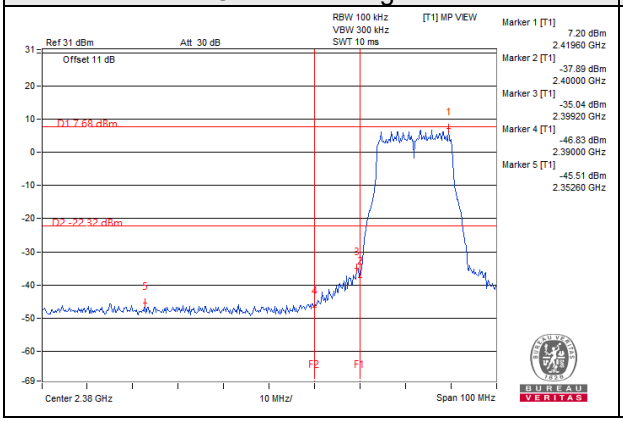


CH 11

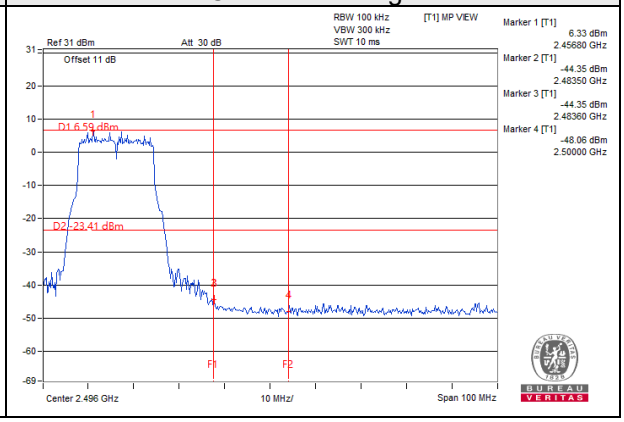




CH 1 Band edge

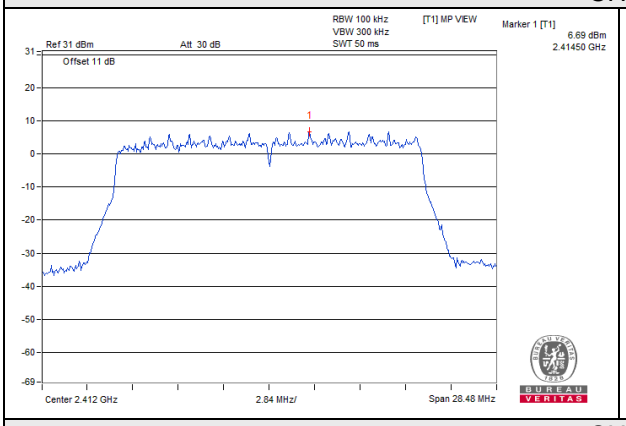


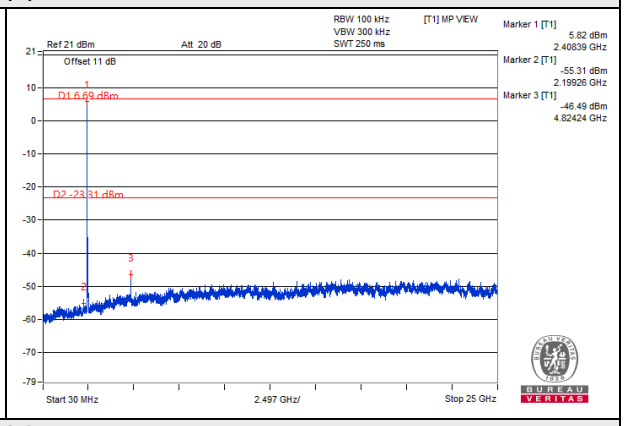
CH 11 Band edge



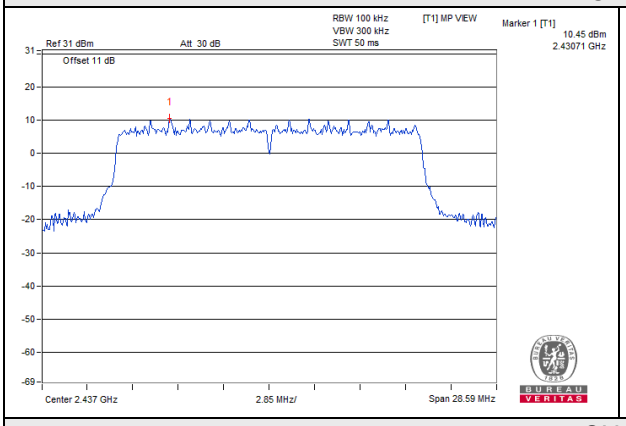
802.11ax (HE20)_Chain 0

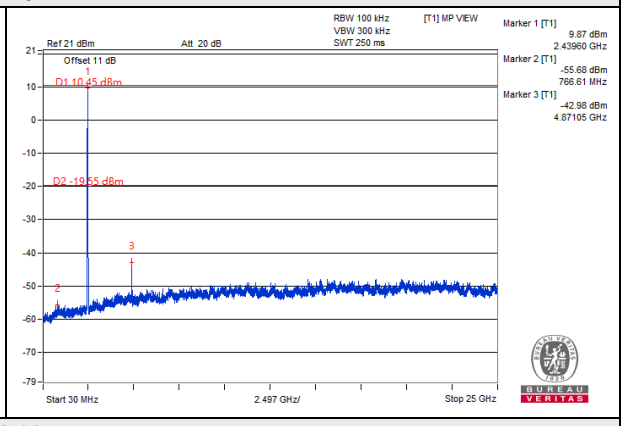
CH 1



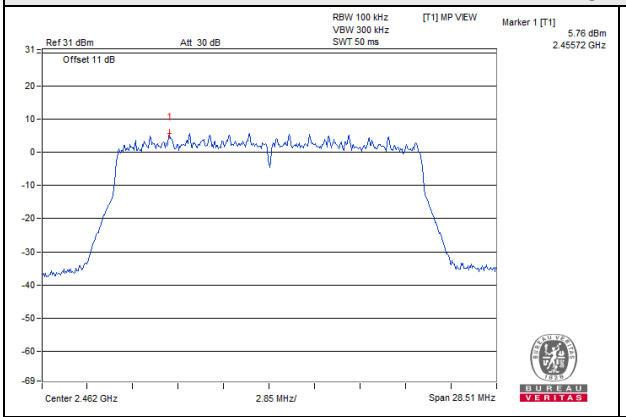


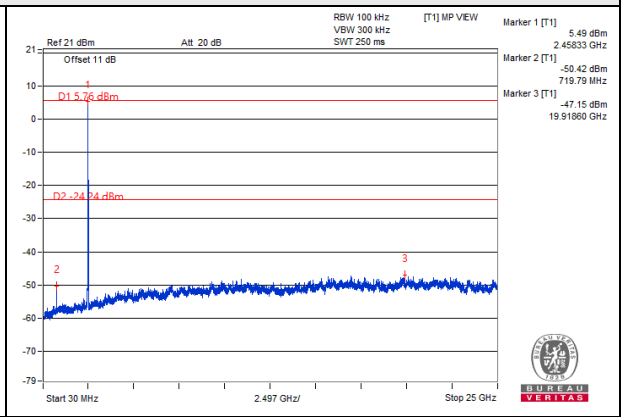
CH 6



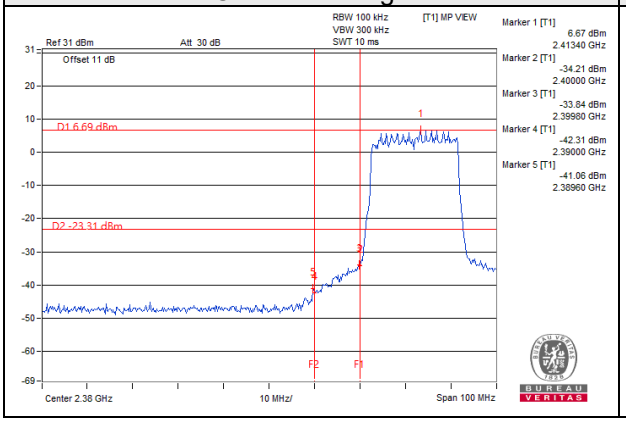


CH 11

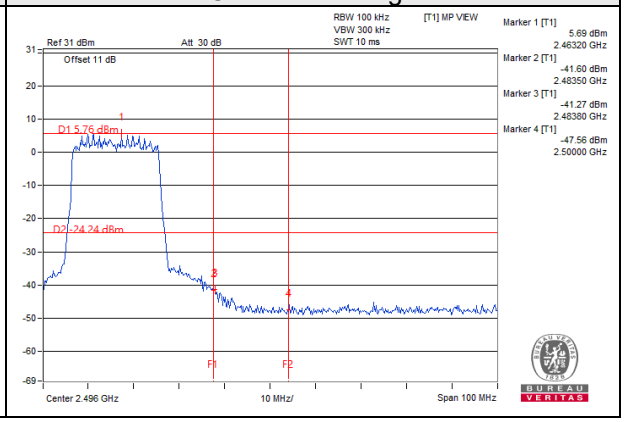




CH 1 Band edge

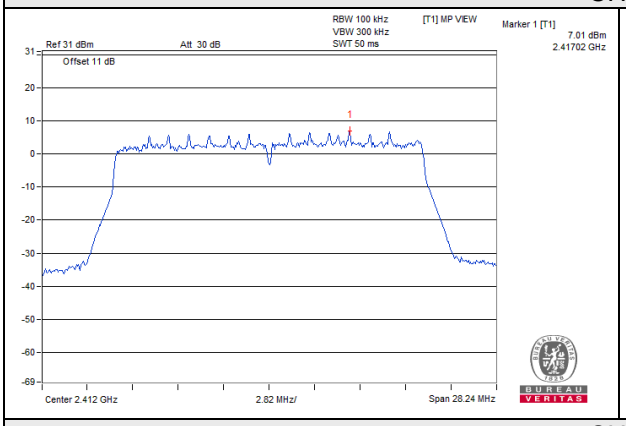


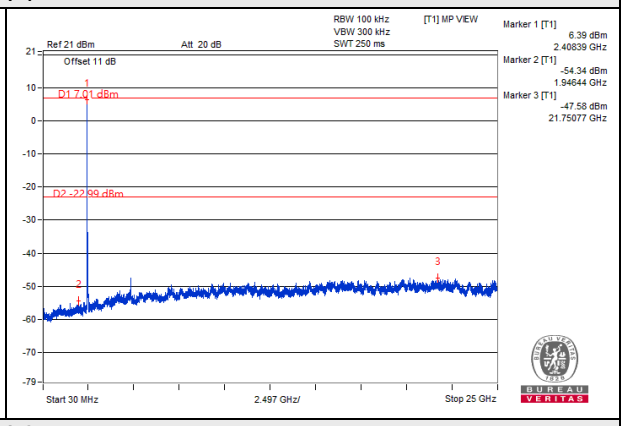
CH 11 Band edge



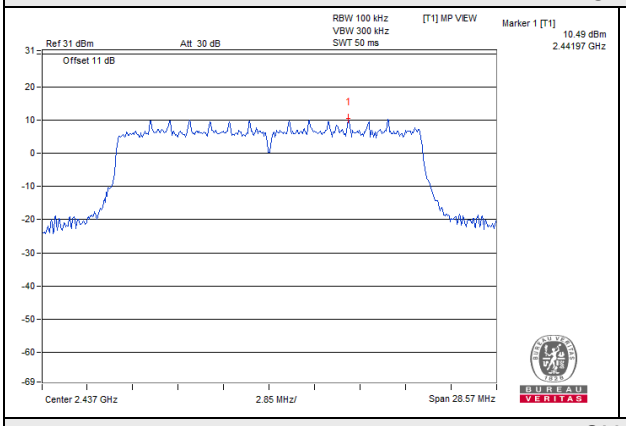
802.11ax (HE20)_Chain 1

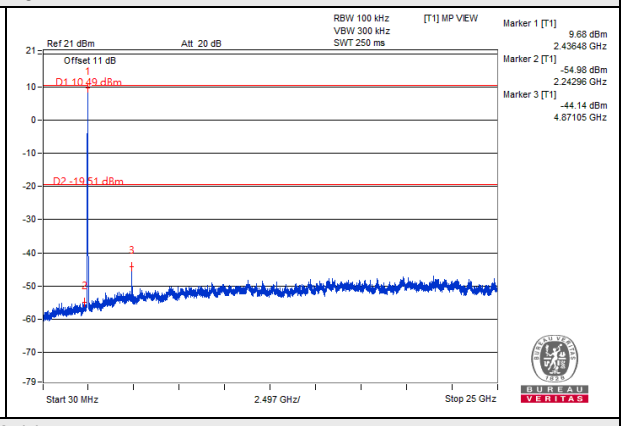
CH 1



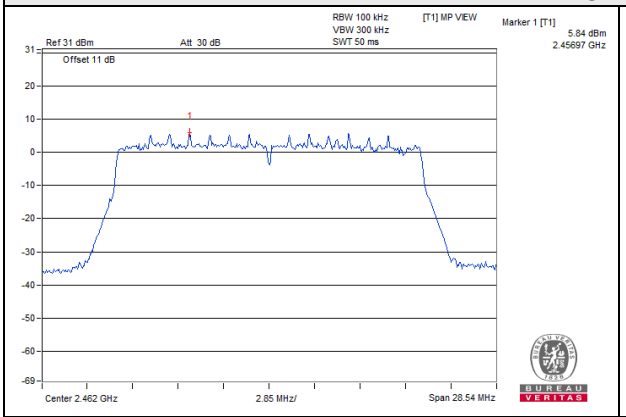


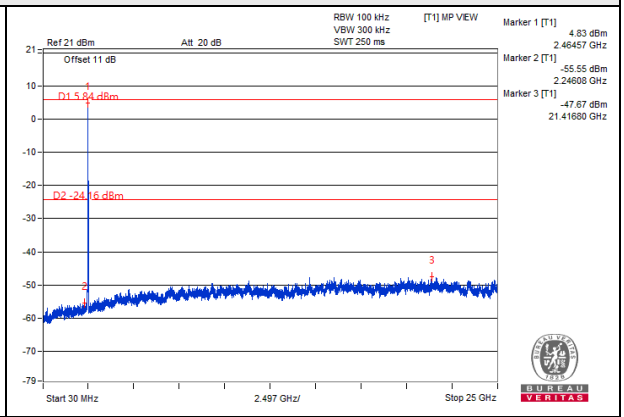
CH 6



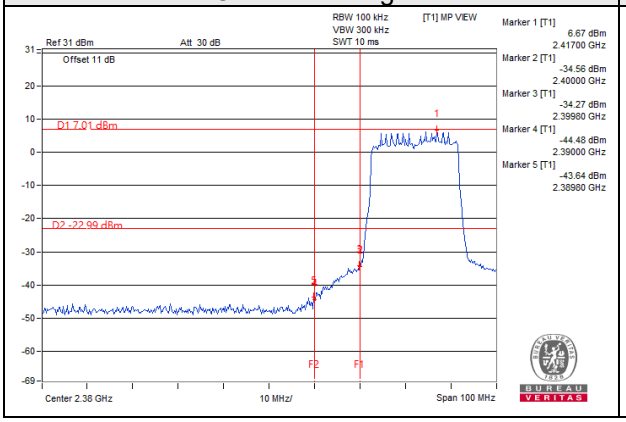


CH 11

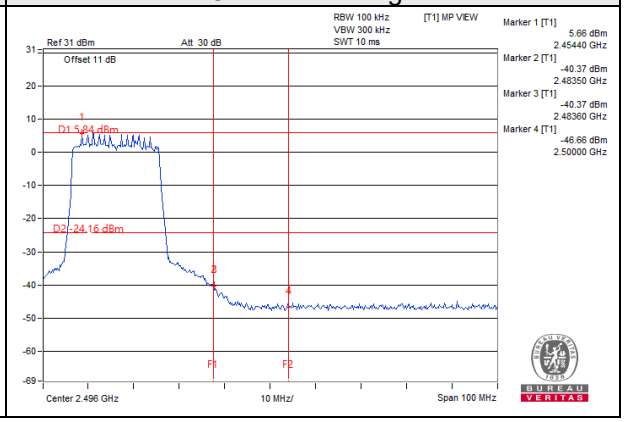




CH 1 Band edge

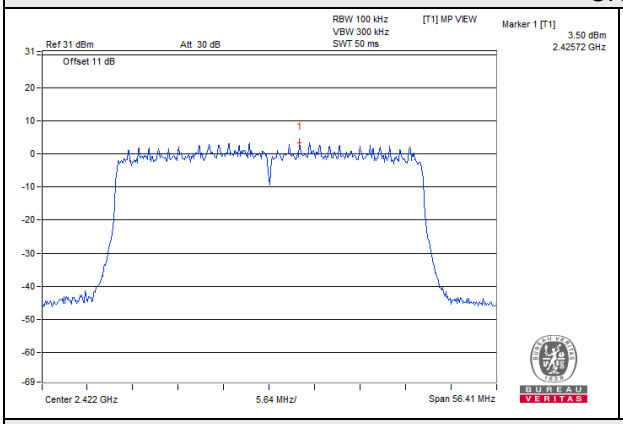


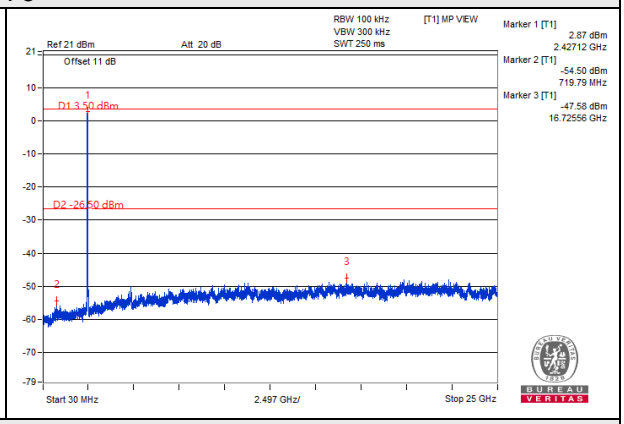
CH 11 Band edge



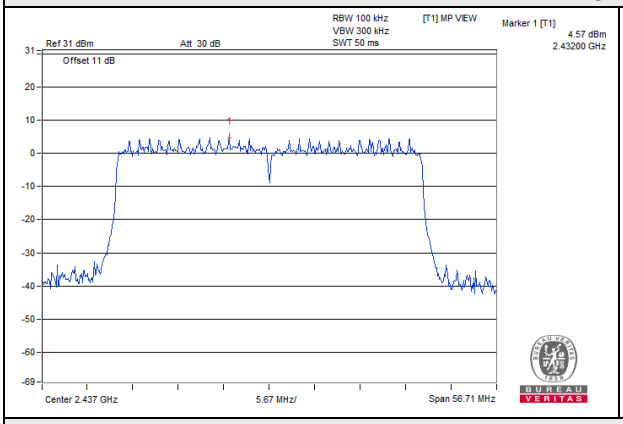
802.11ax (HE40)_Chain 0

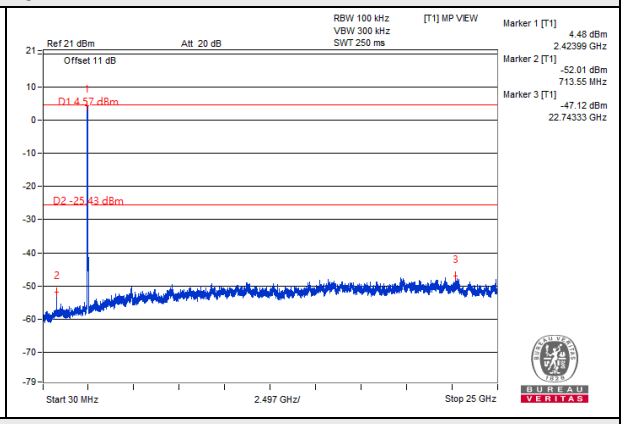
CH 3



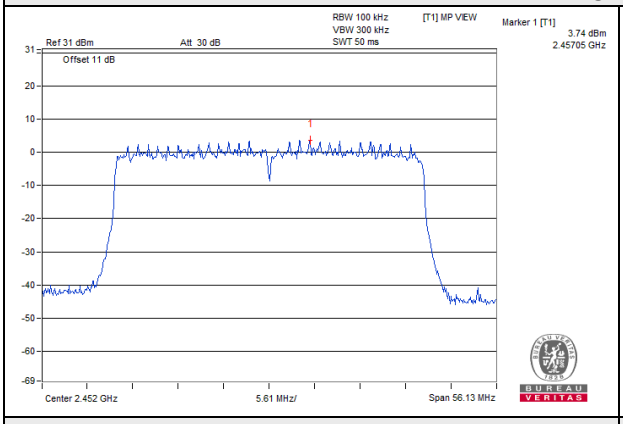


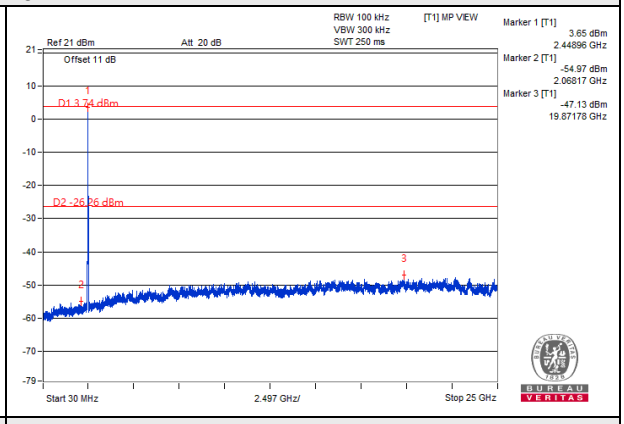
CH 6



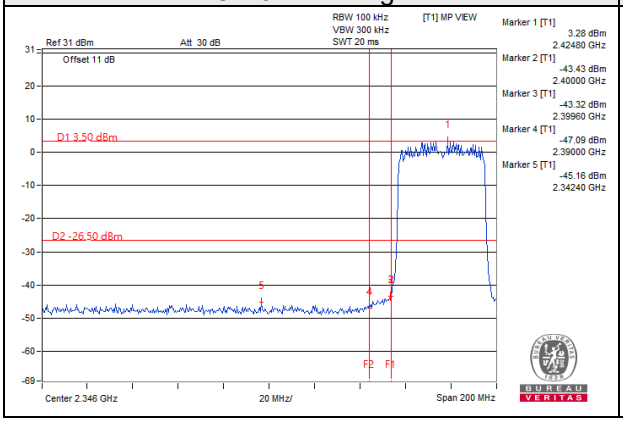


CH 9

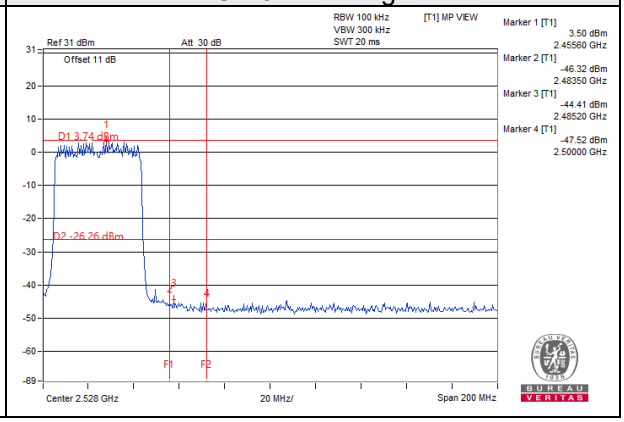




CH 3 Band edge

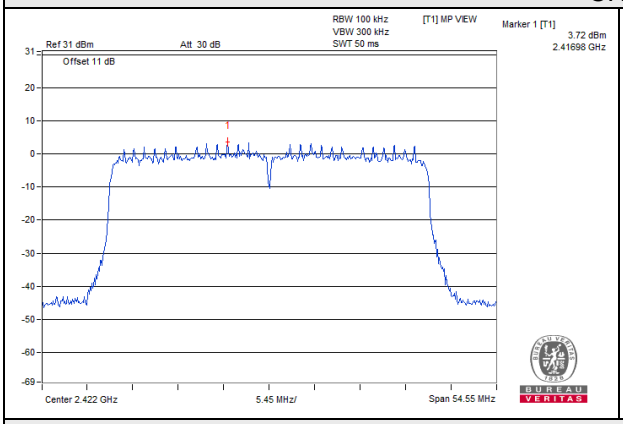


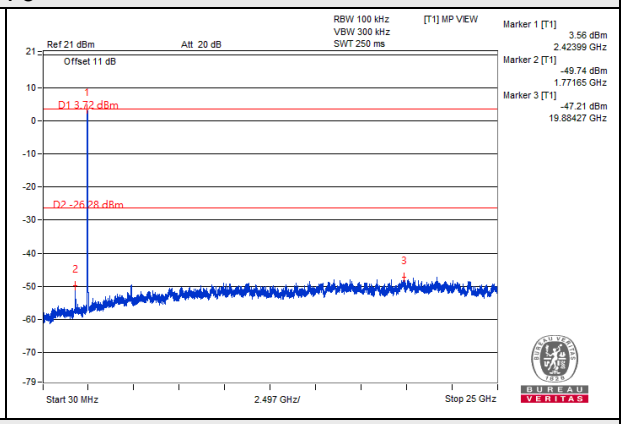
CH 9 Band edge



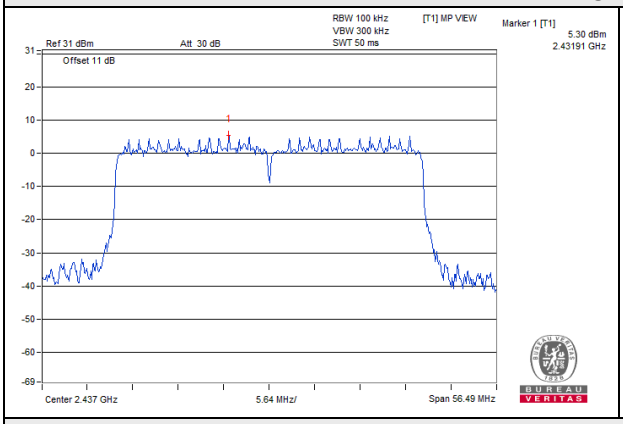
802.11ax (HE40)_Chain 1

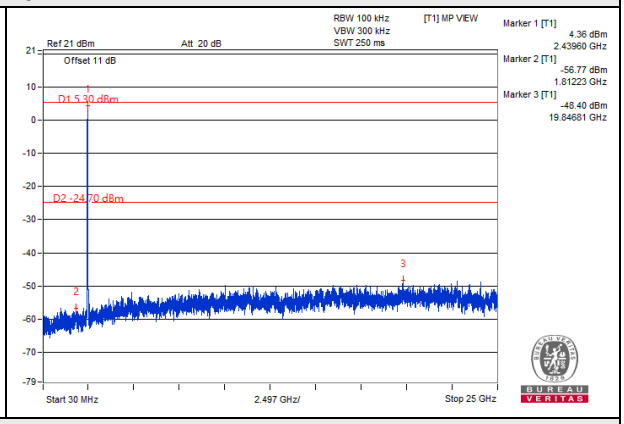
CH 3



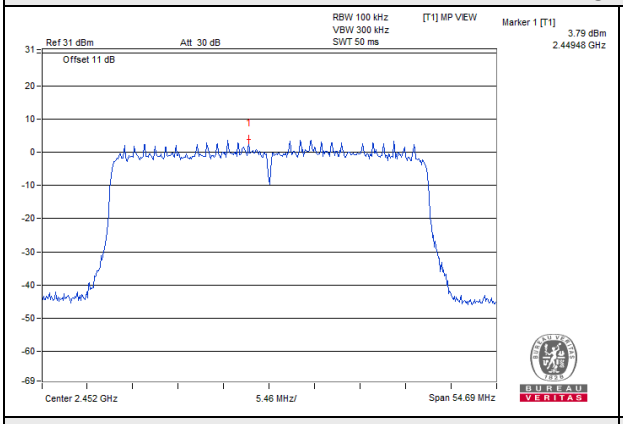


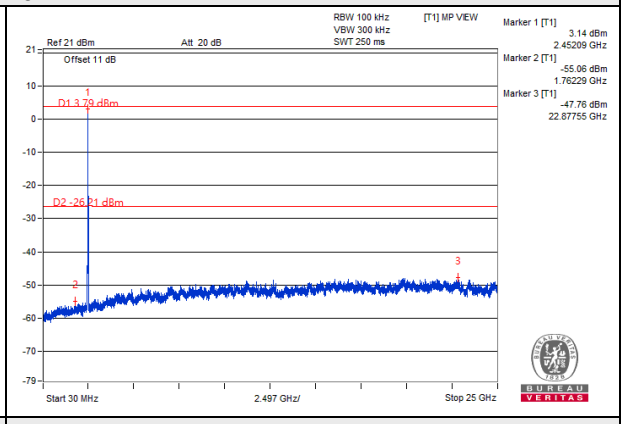
CH 6



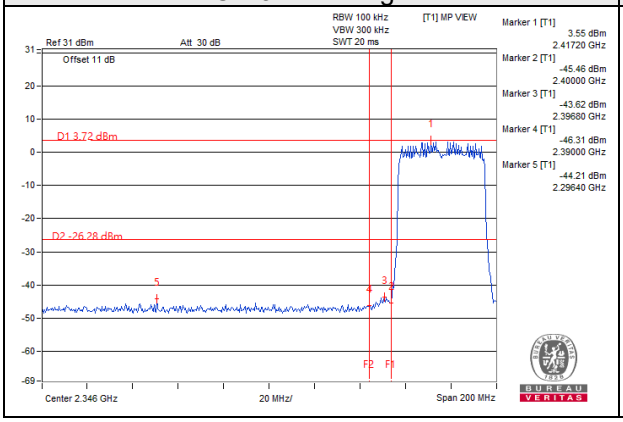


CH 9

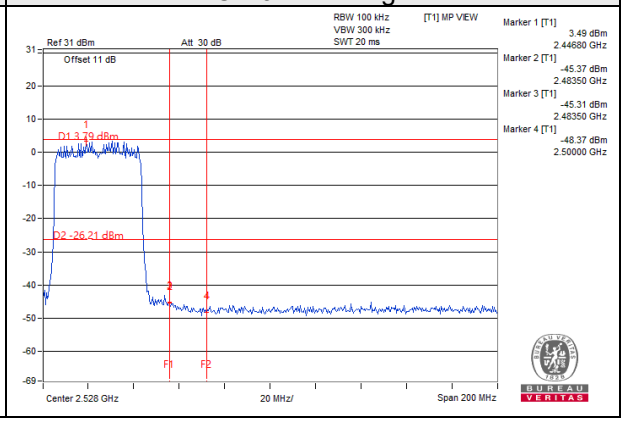




CH 3 Band edge



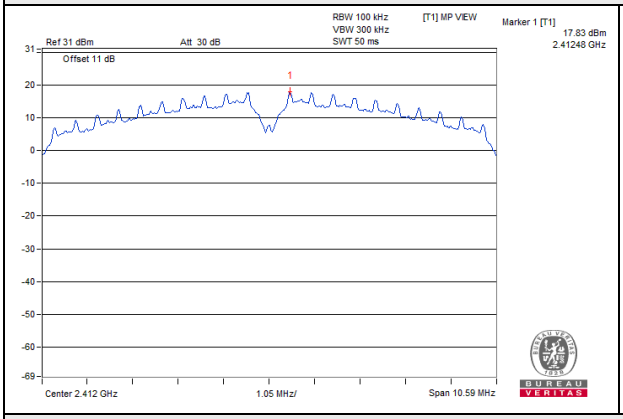
CH 9 Band edge

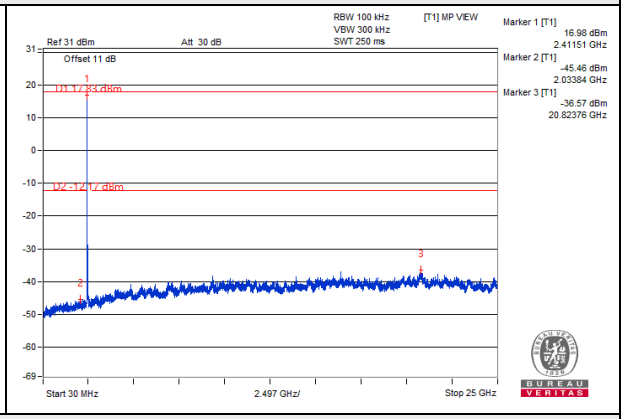


Radio 3

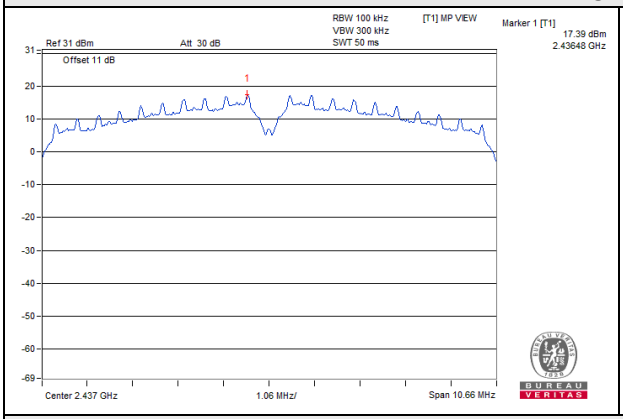
802.11b_Chain 0

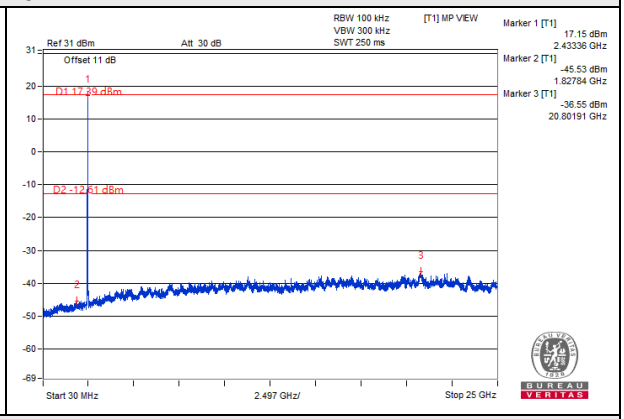
CH 1



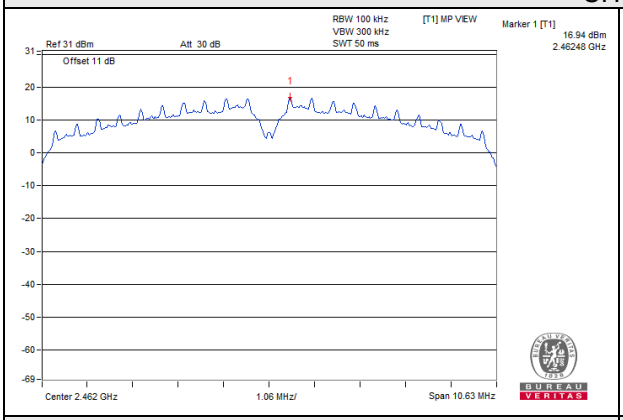


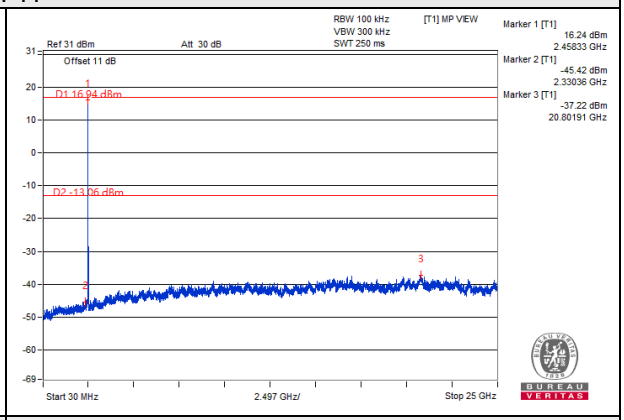
CH 6



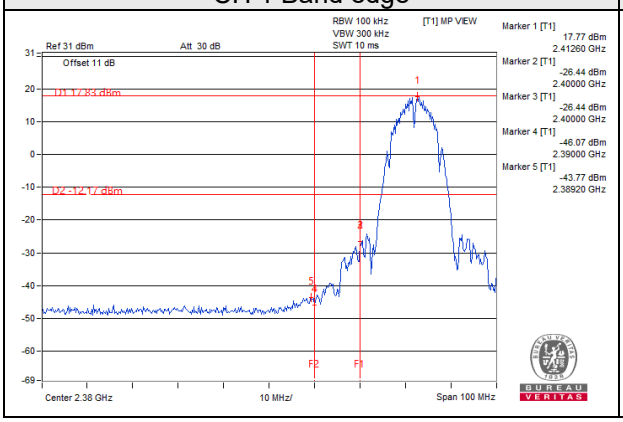


CH 11

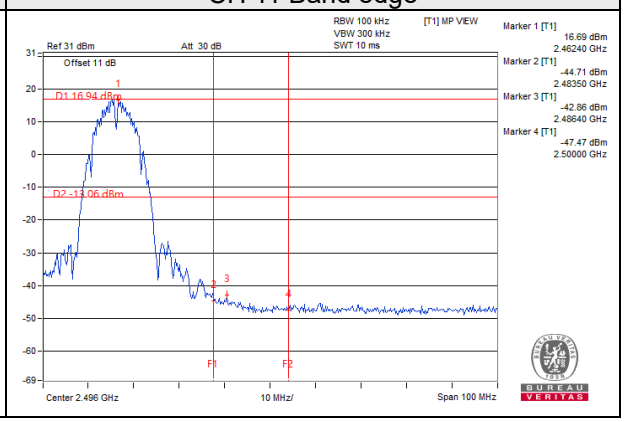




CH 1 Band edge

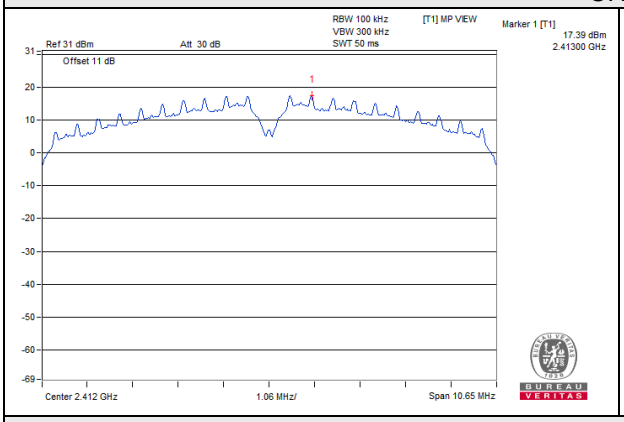


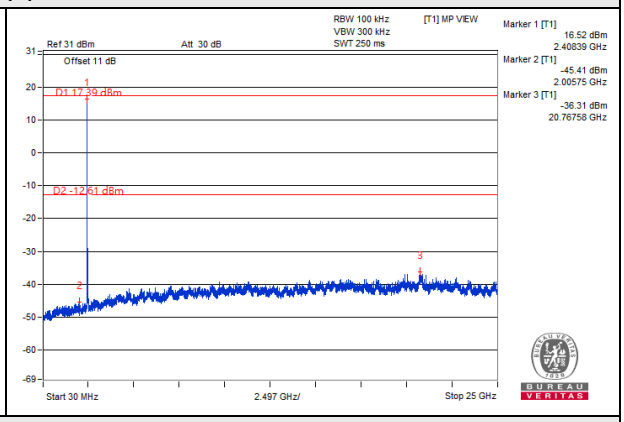
CH 11 Band edge



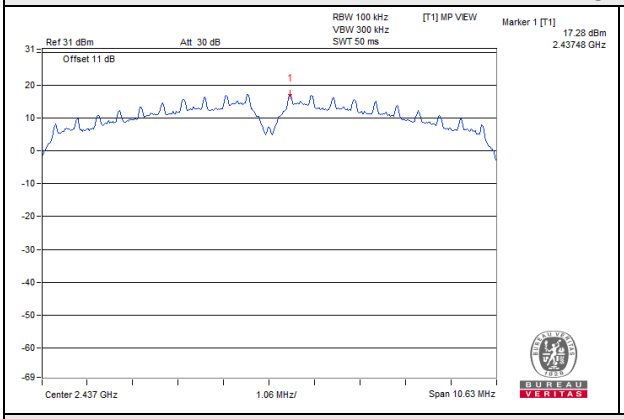
802.11b_Chain 1

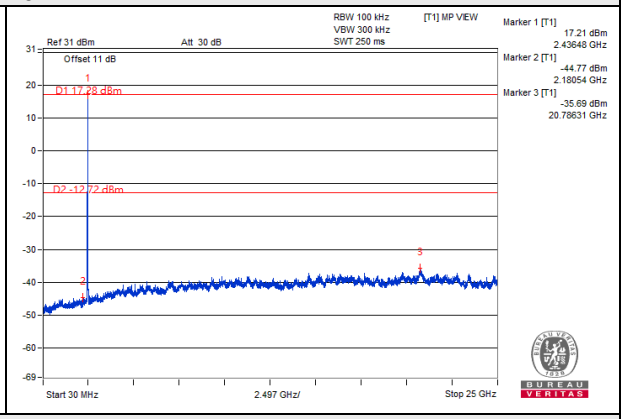
CH 1



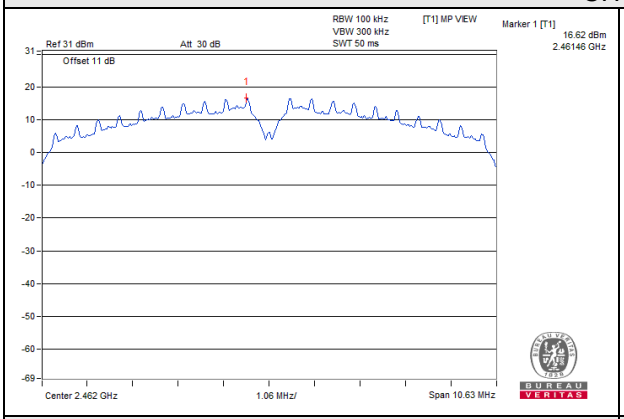


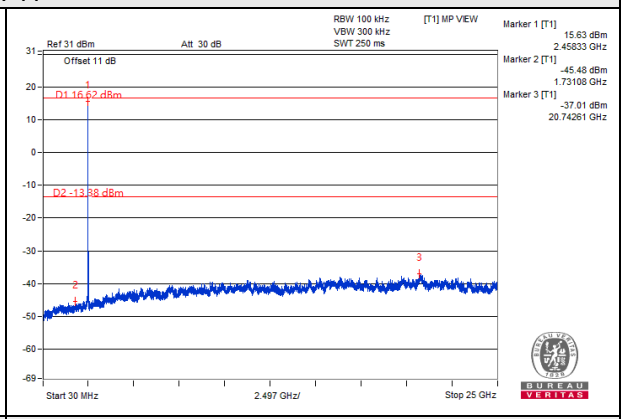
CH 6



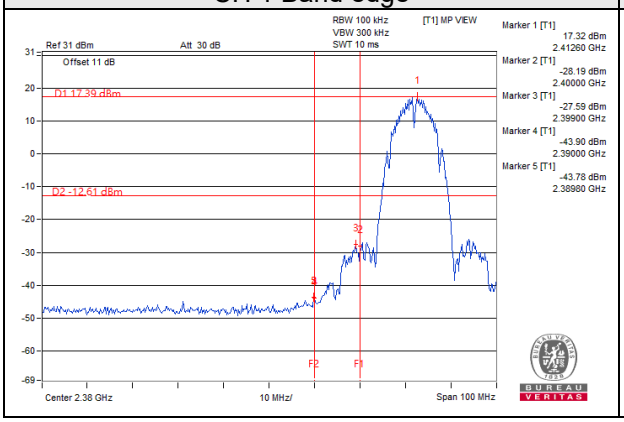


CH 11

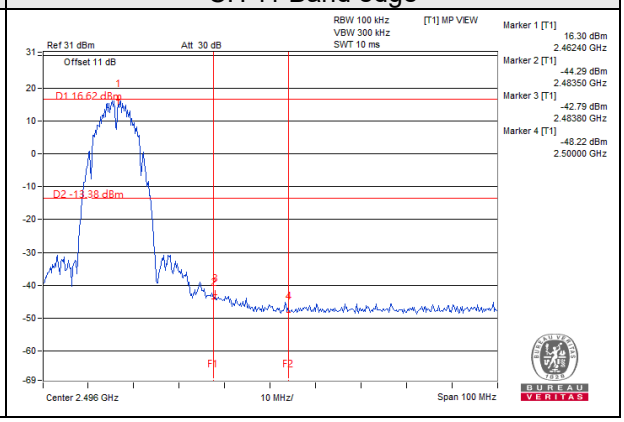




CH 1 Band edge

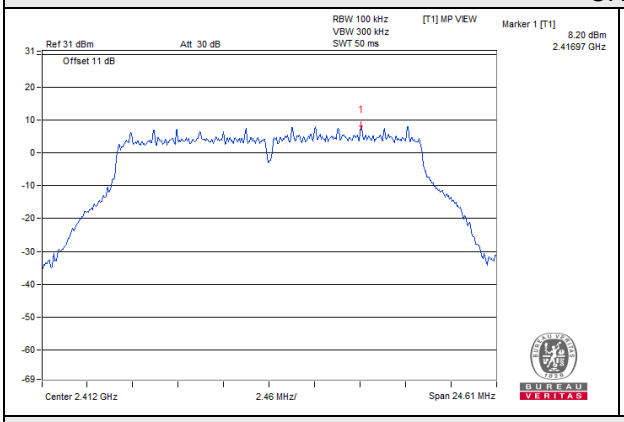


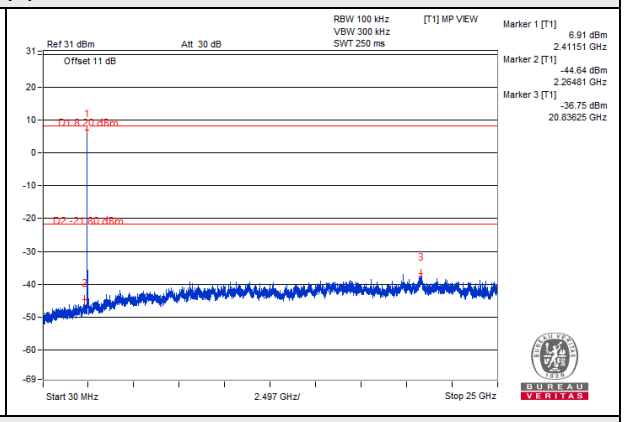
CH 11 Band edge



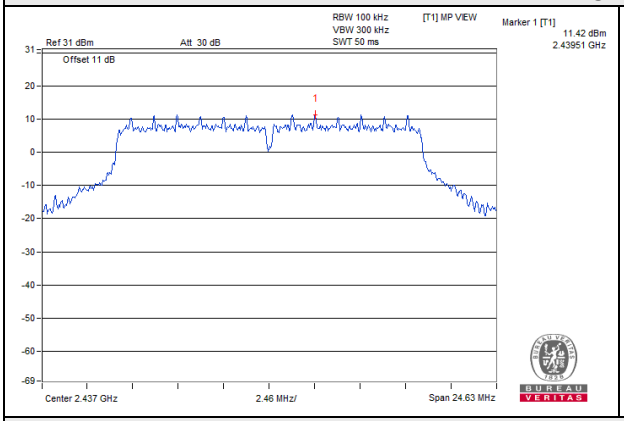
802.11g_Chain 0

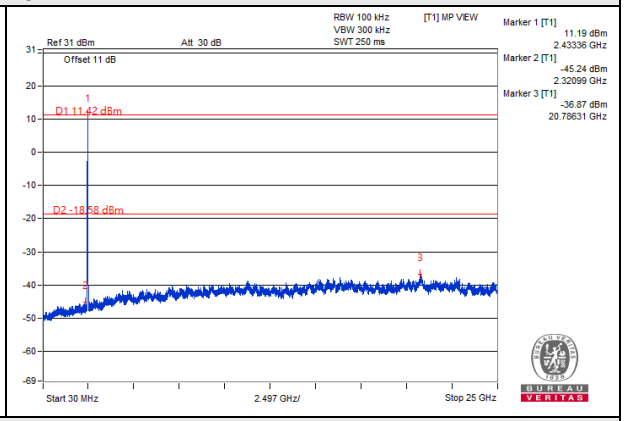
CH 1



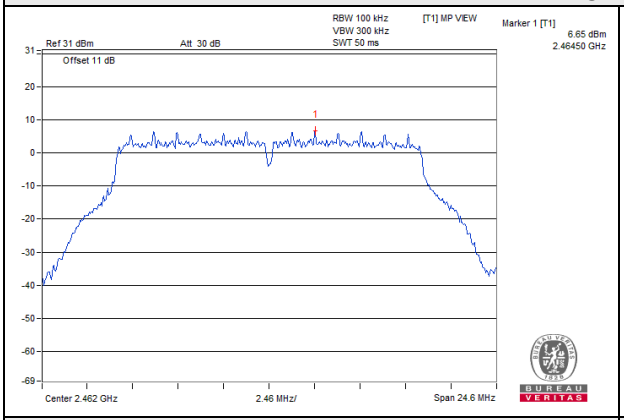


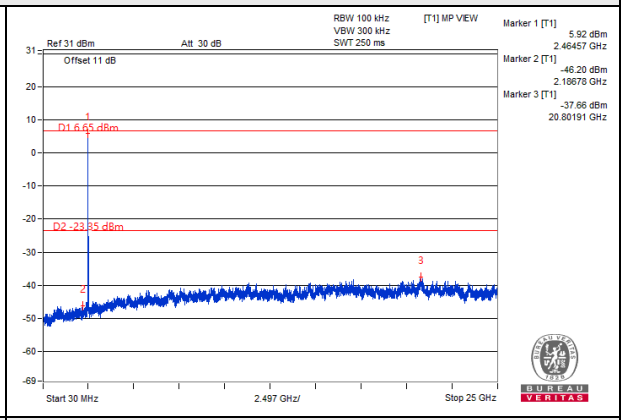
CH 6



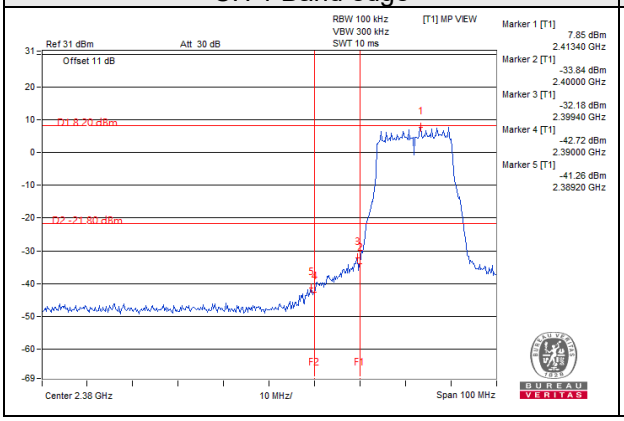


CH 11

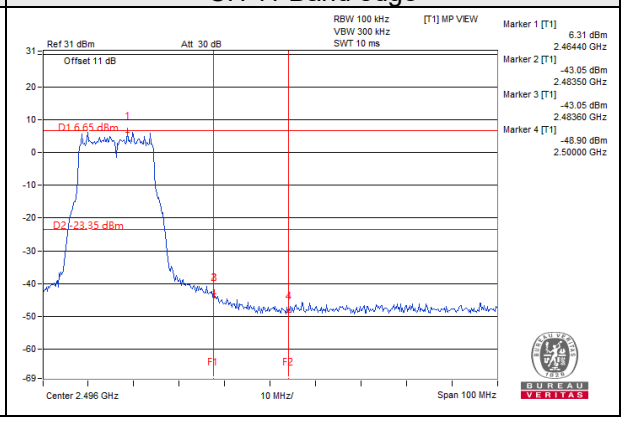




CH 1 Band edge

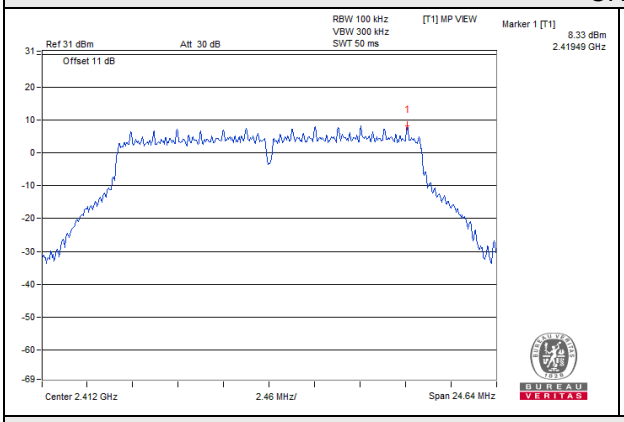


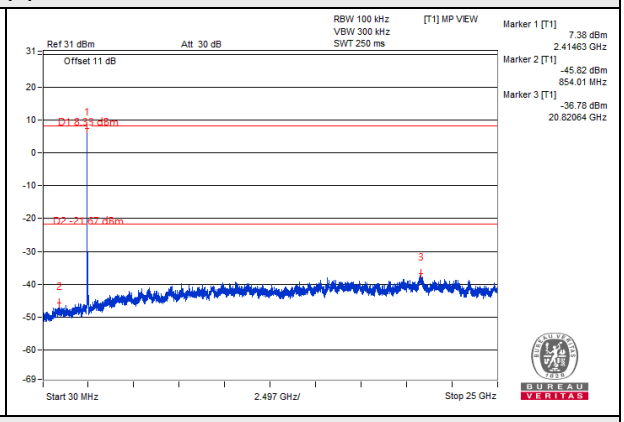
CH 11 Band edge



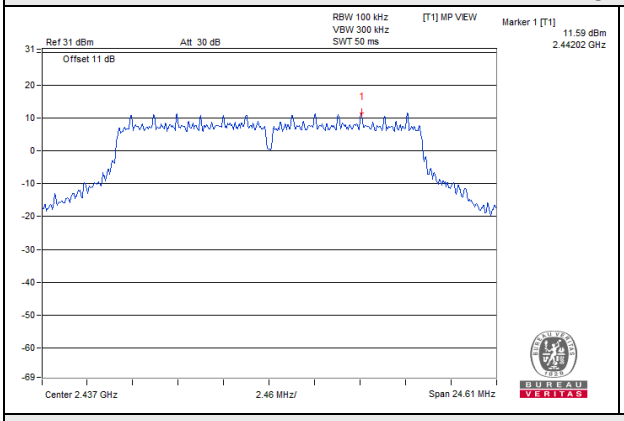
802.11g_Chain 1

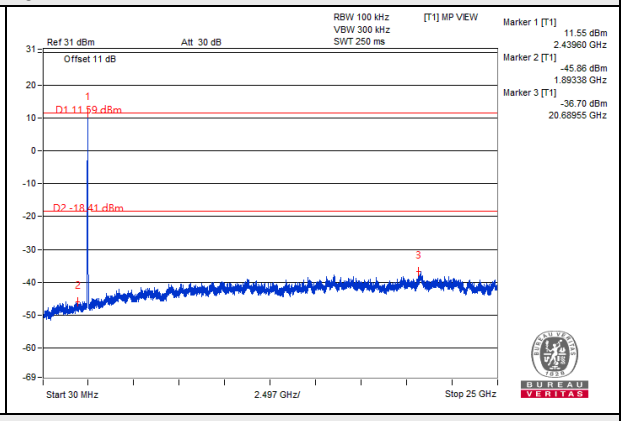
CH 1



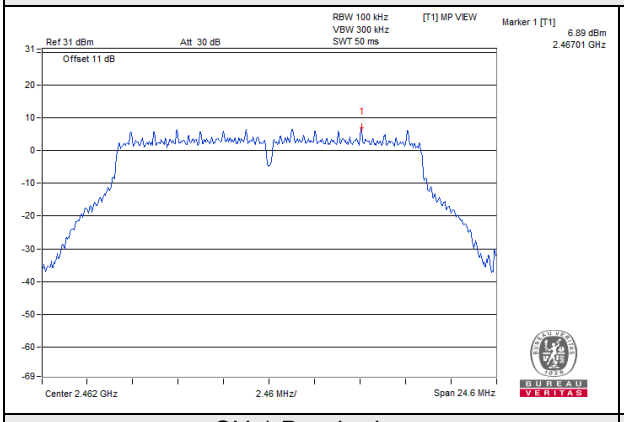


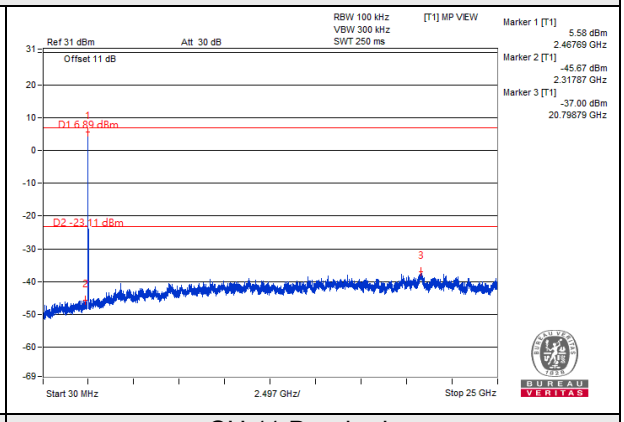
CH 6



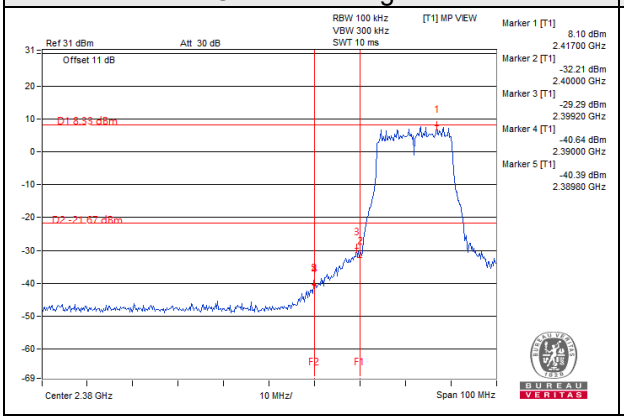


CH 11

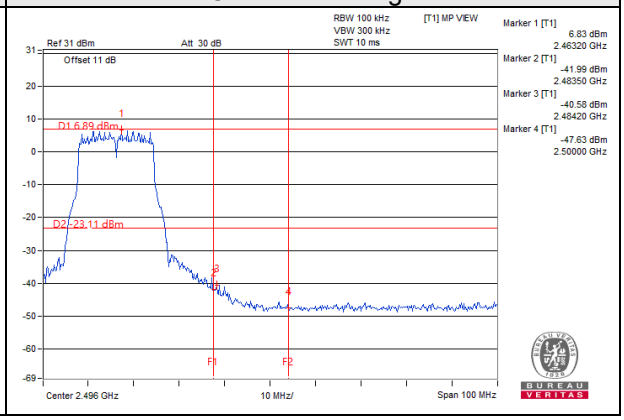




CH 1 Band edge

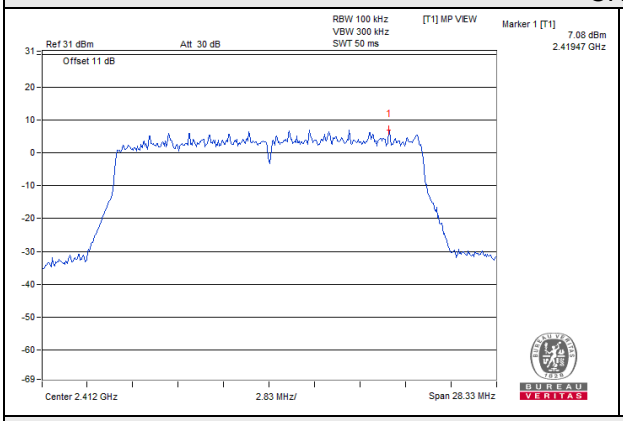


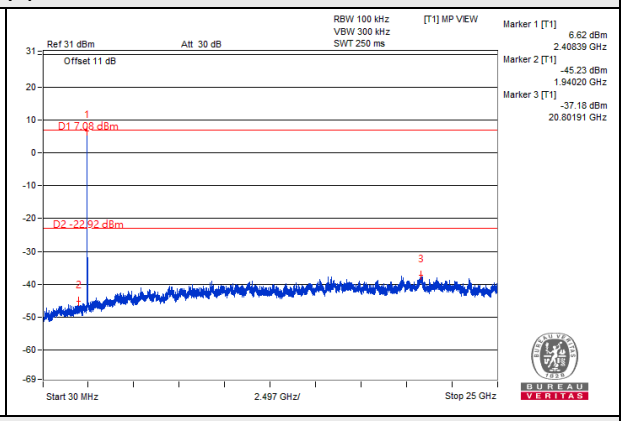
CH 11 Band edge



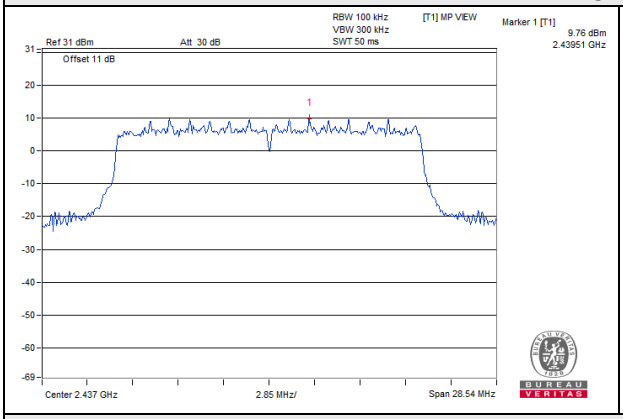
802.11ax (HE20)_Chain 0

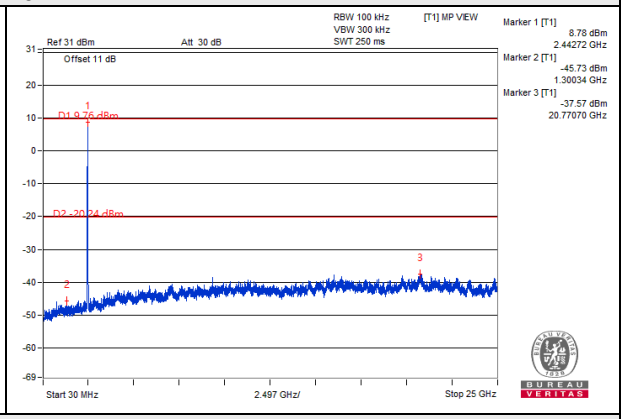
CH 1



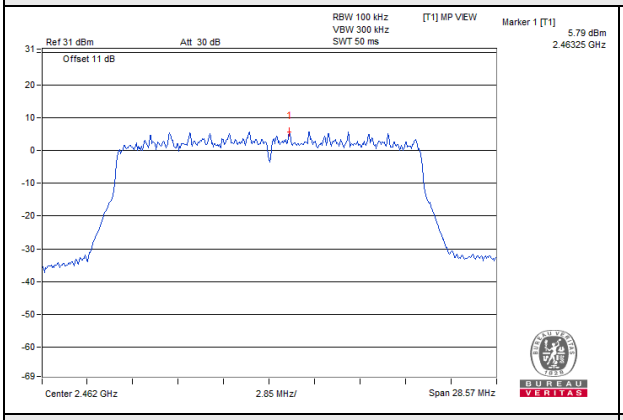


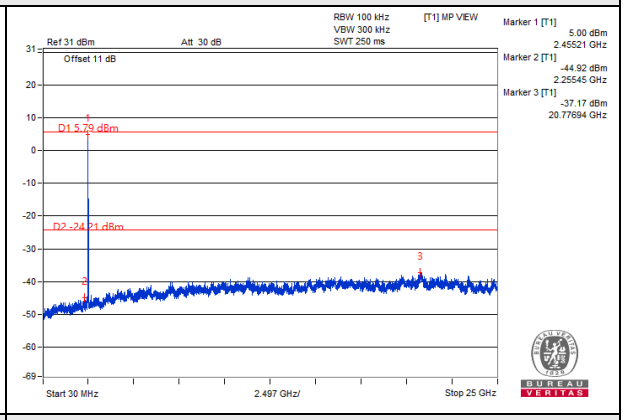
CH 6



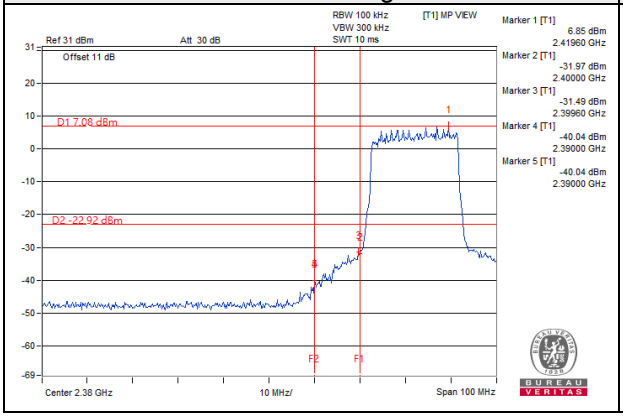


CH 11

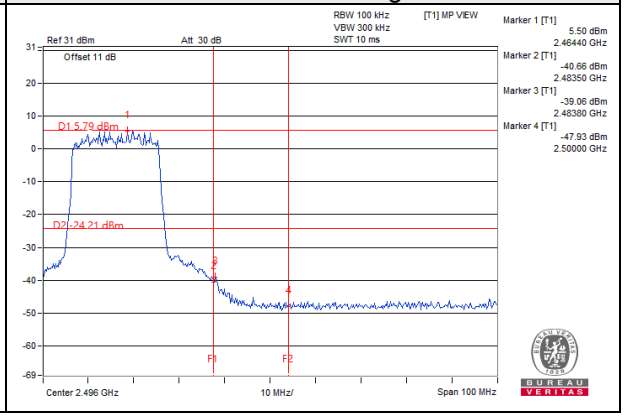




CH 1 Band edge

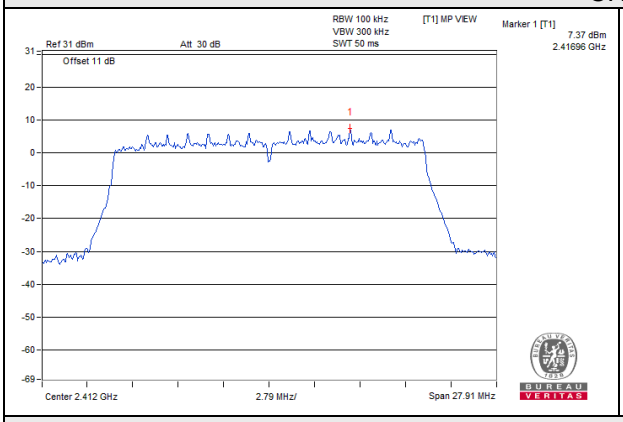


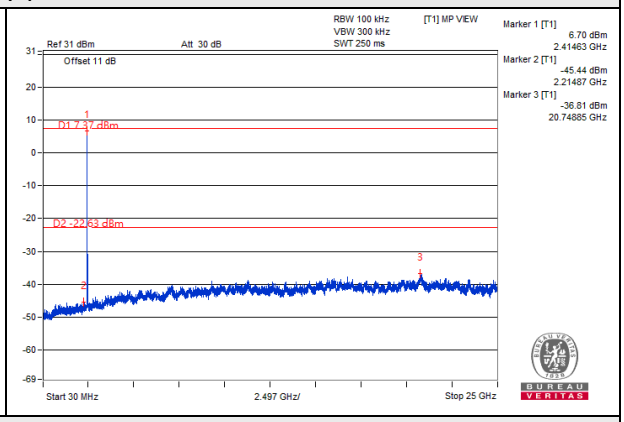
CH 11 Band edge



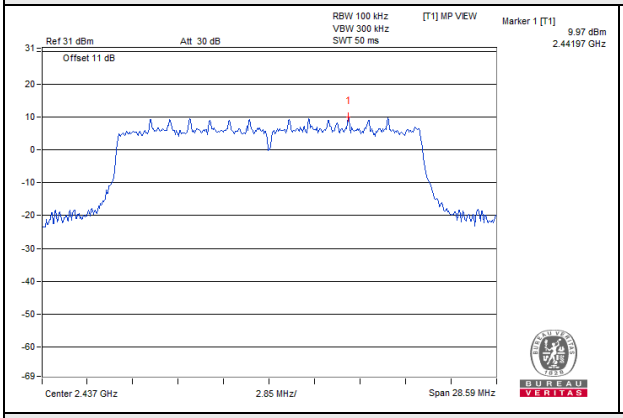
802.11ax (HE20)_Chain 1

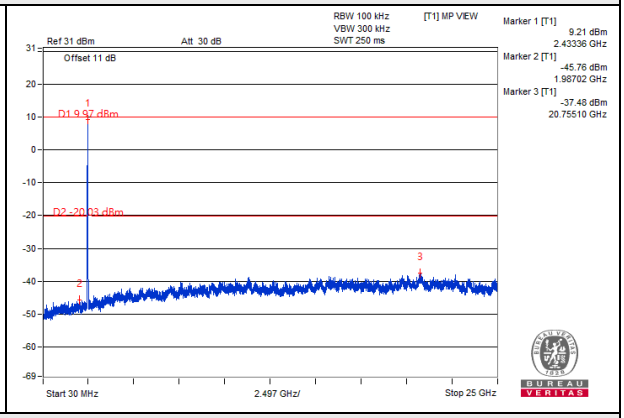
CH 1



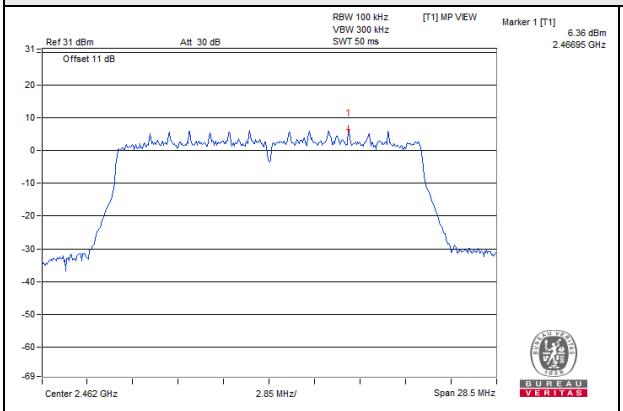


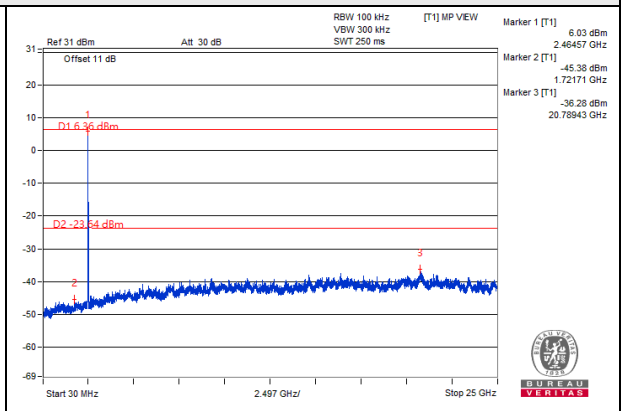
CH 6



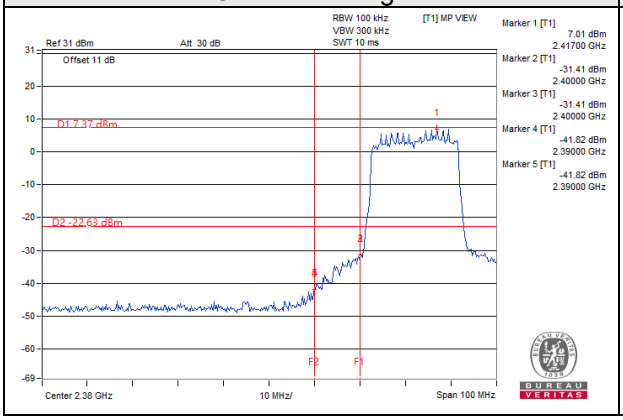


CH 11

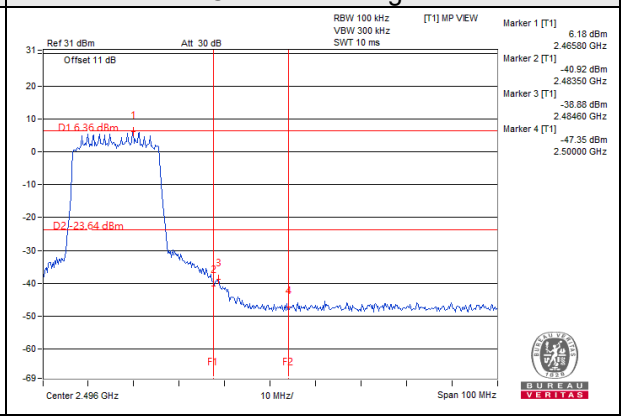




CH 1 Band edge

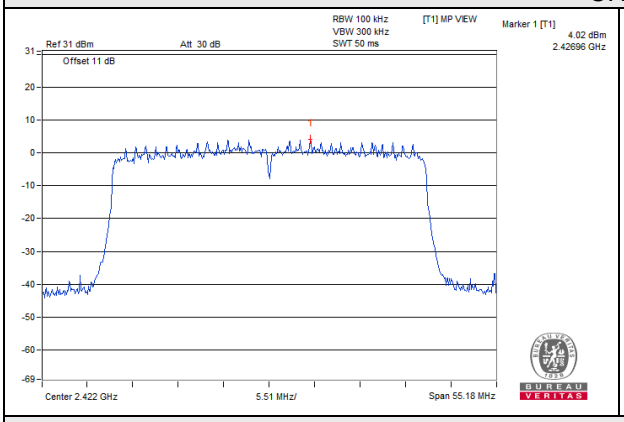


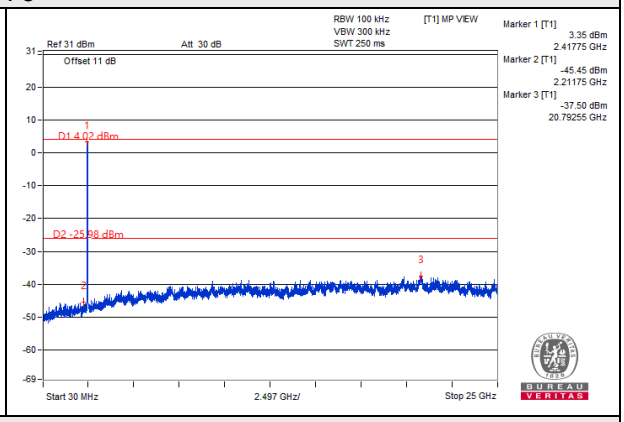
CH 11 Band edge



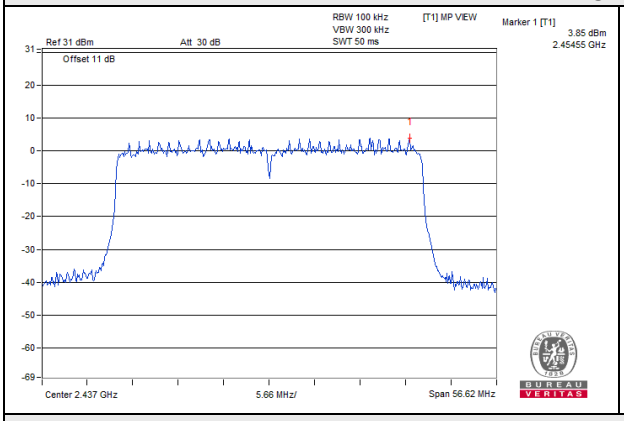
802.11ax (HE40)_Chain 0

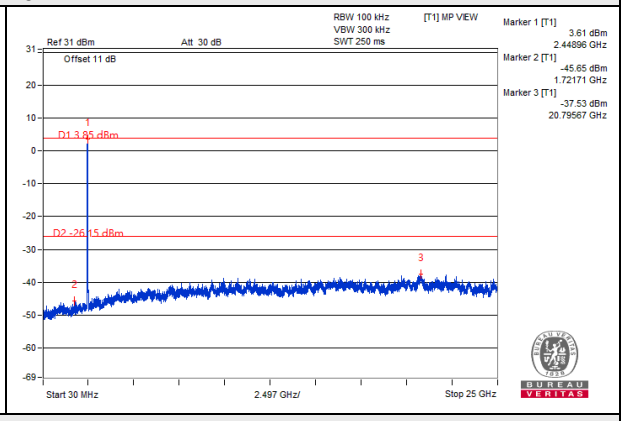
CH 3



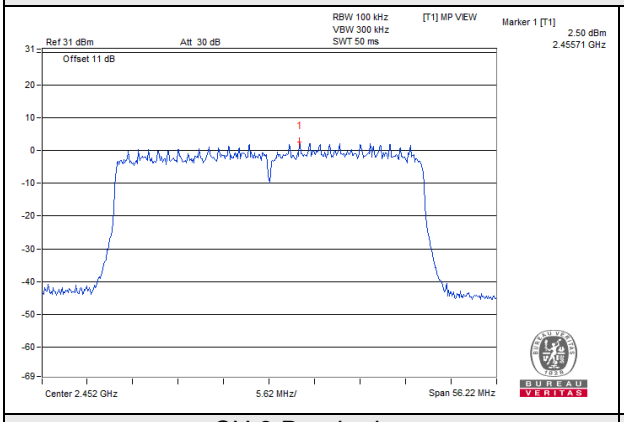


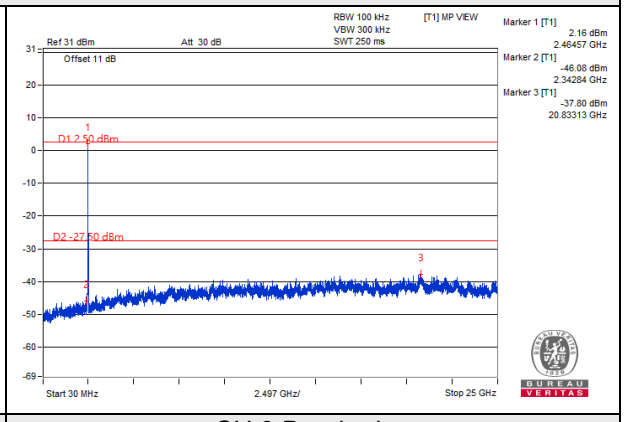
CH 6



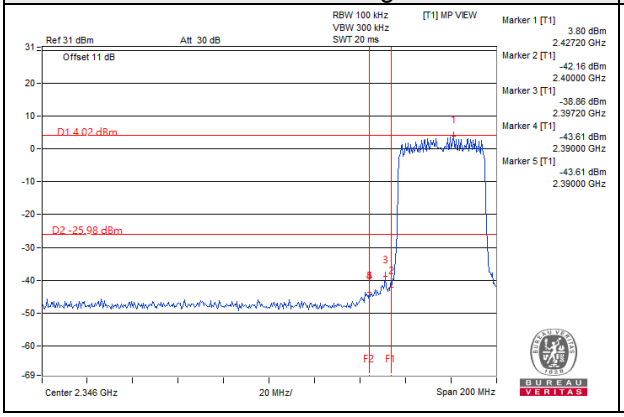


CH 9

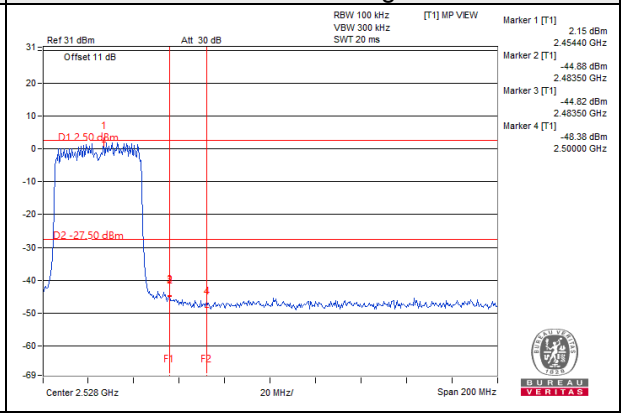




CH 3 Band edge

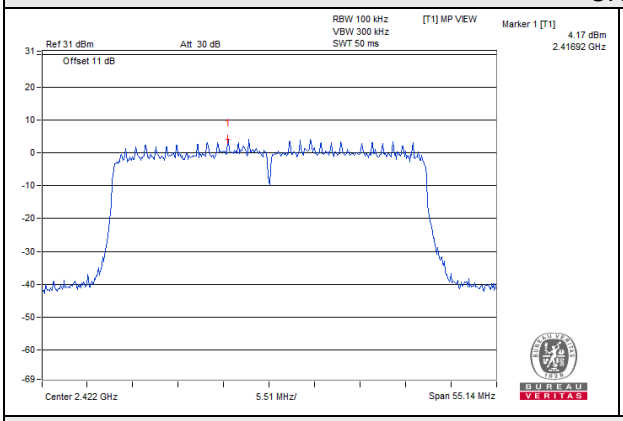


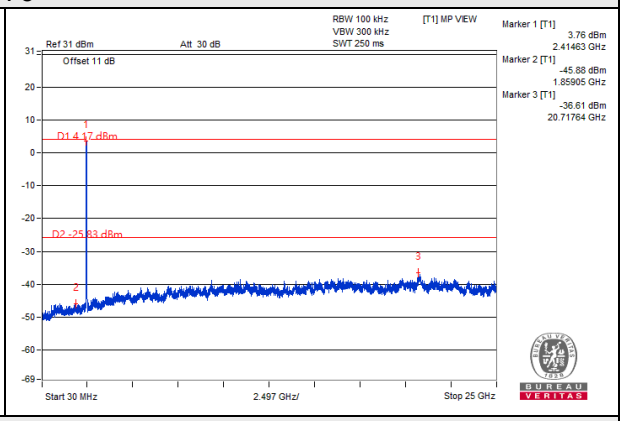
CH 9 Band edge



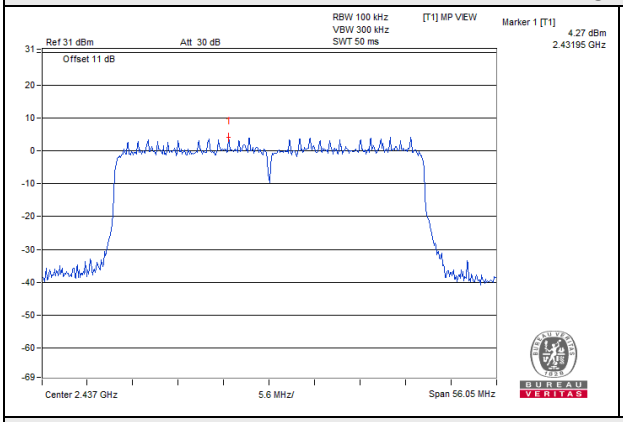
802.11ax (HE40)_Chain 1

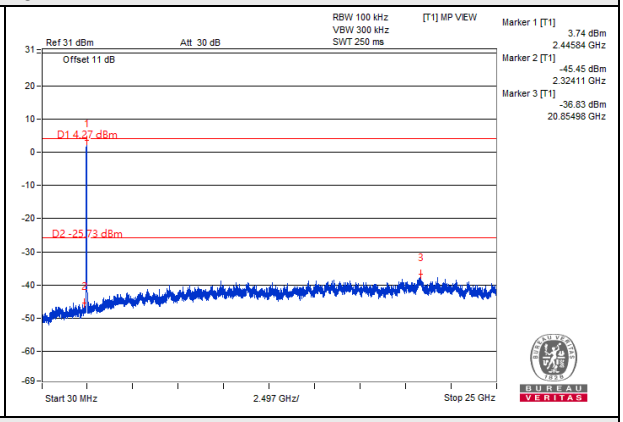
CH 3



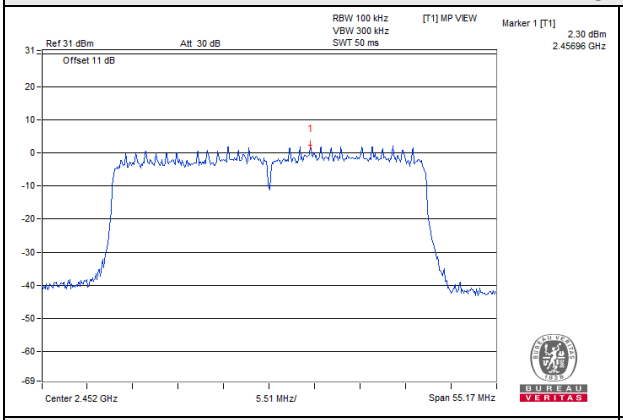


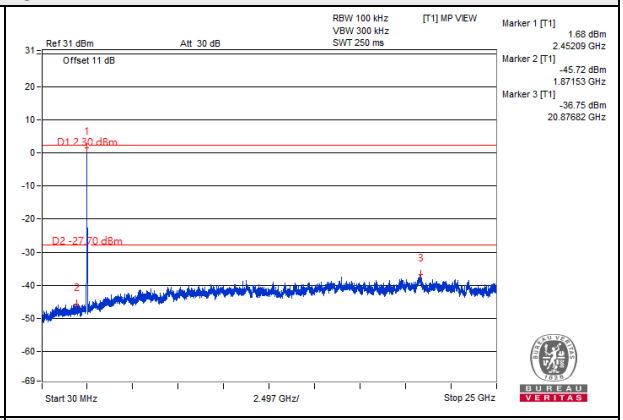
CH 6



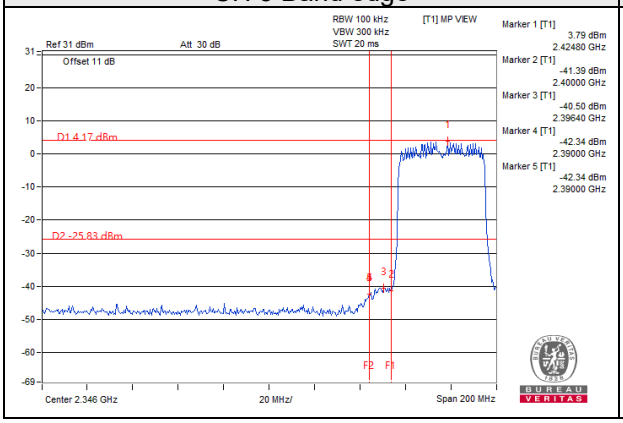


CH 9

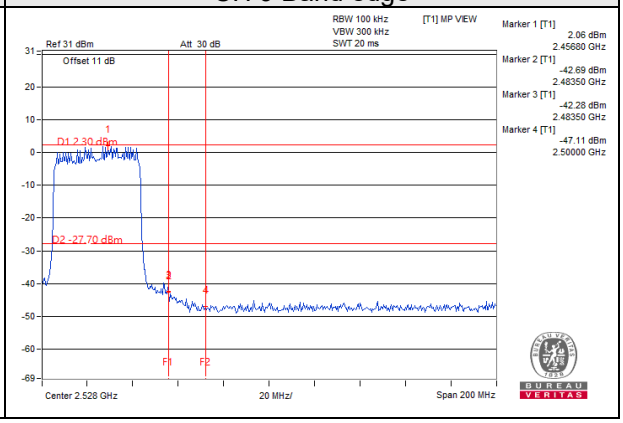




CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

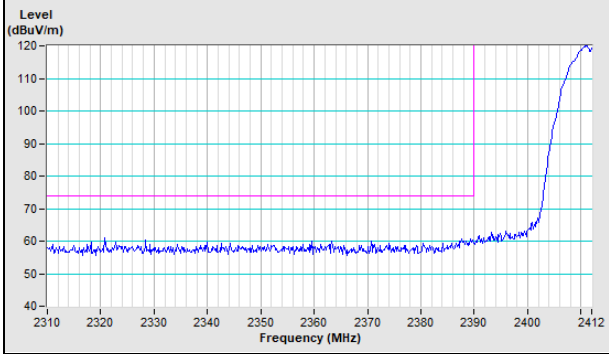
Please refer to the attached file (Test Setup Photo).

Annex A - Band Edge Measurement

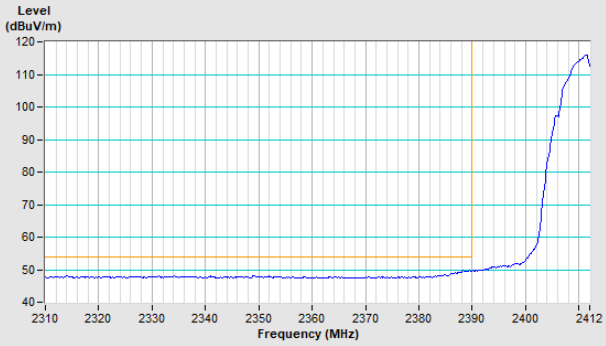
2G traffic radio (Radio 1)

802.11b Channel 1

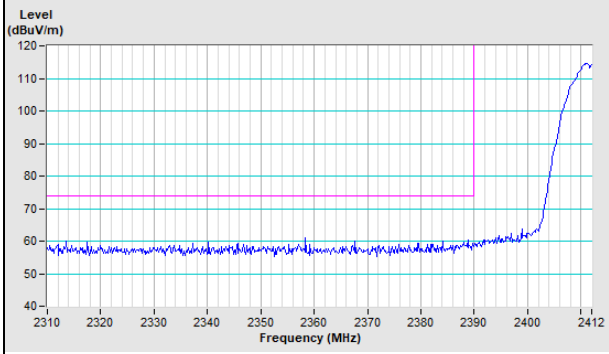
Horizontal (Peak)



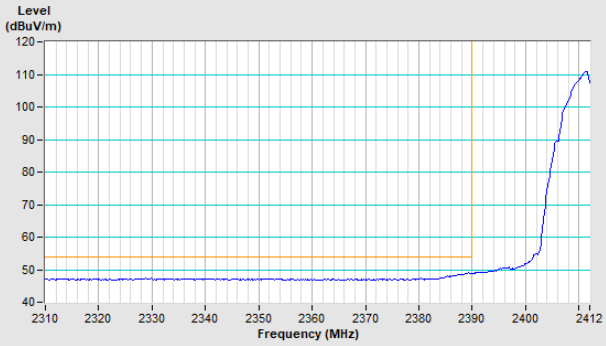
Horizontal (Average)



Vertical (Peak)

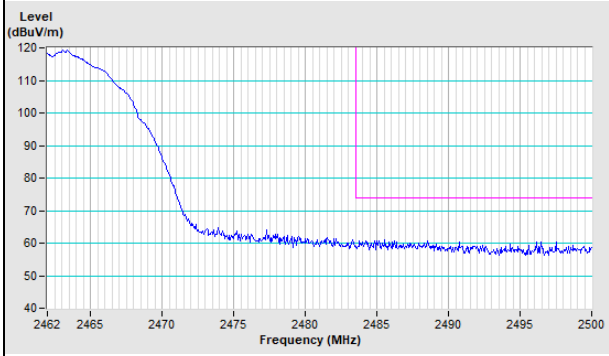


Vertical (Average)

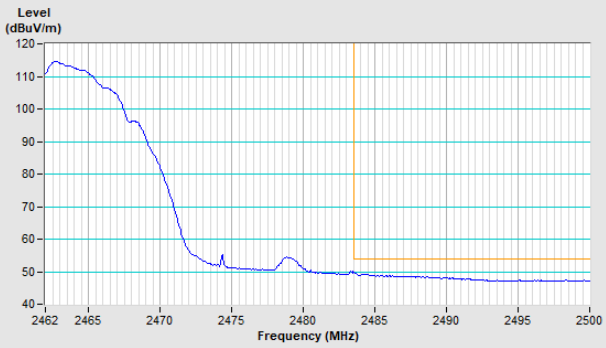


802.11b Channel 11

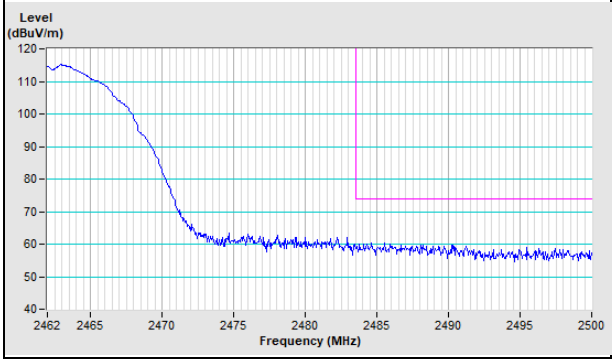
Horizontal (Peak)



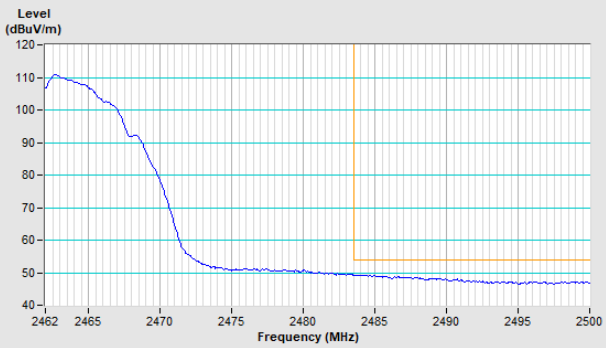
Horizontal (Average)



Vertical (Peak)

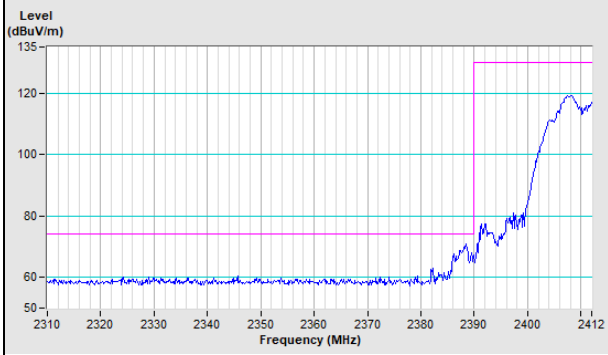


Vertical (Average)

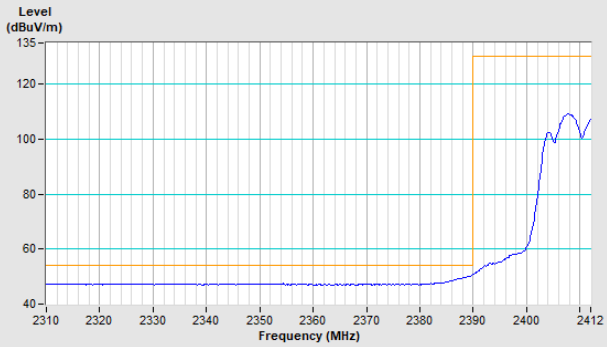


802.11g Channel 1

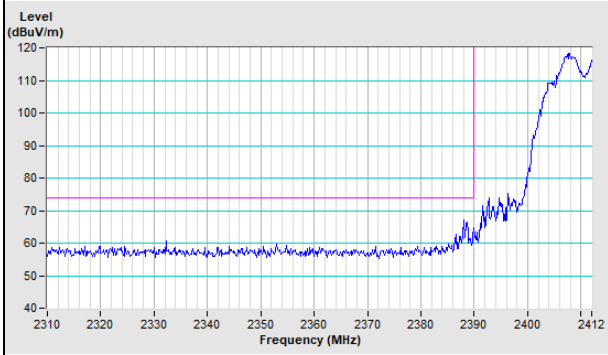
Horizontal (Peak)



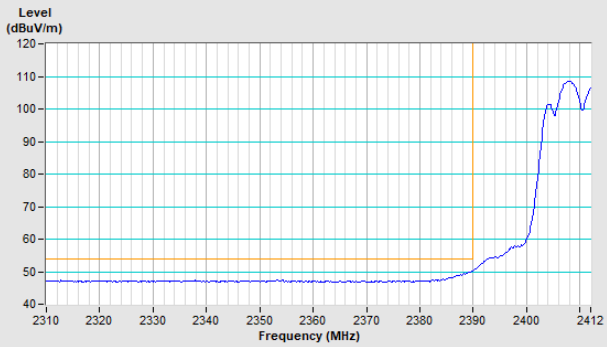
Horizontal (Average)



Vertical (Peak)

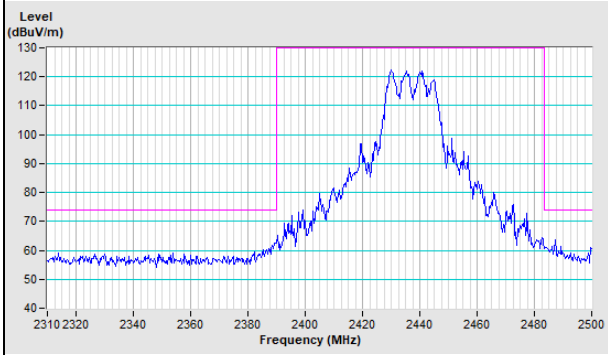


Vertical (Average)

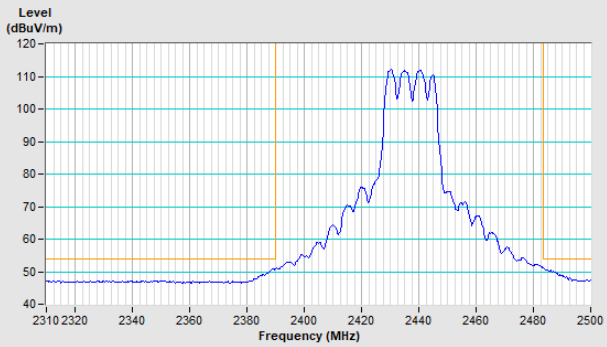


802.11g Channel 6

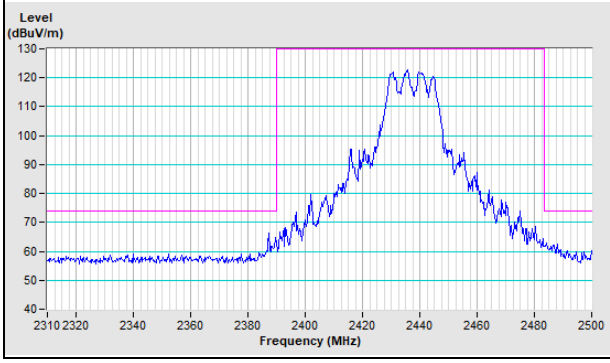
Horizontal (Peak)



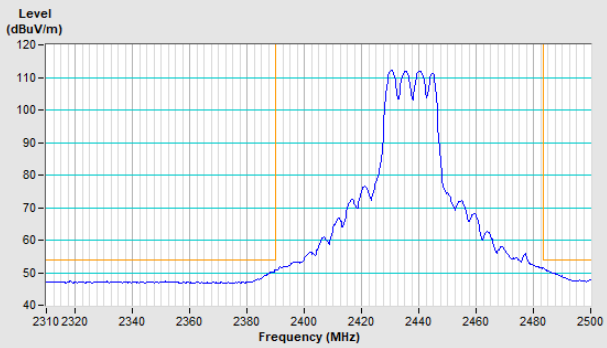
Horizontal (Average)

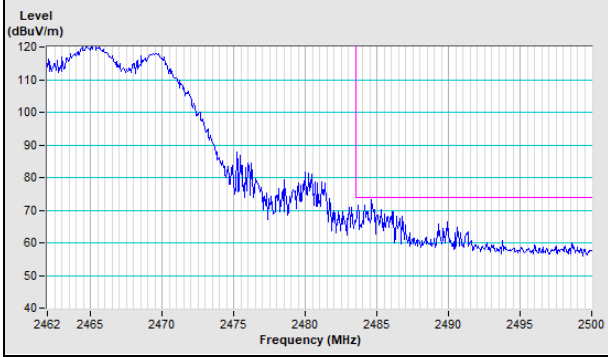
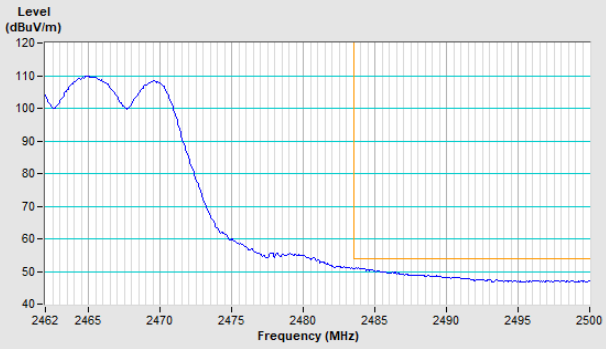
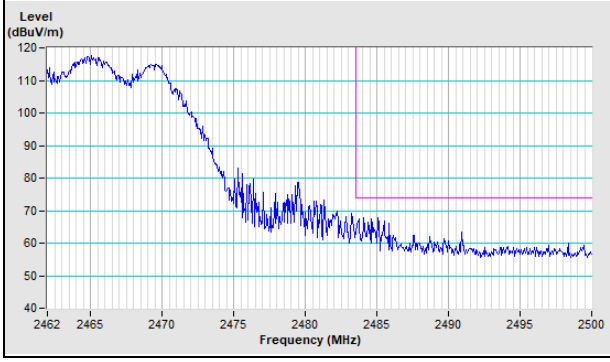
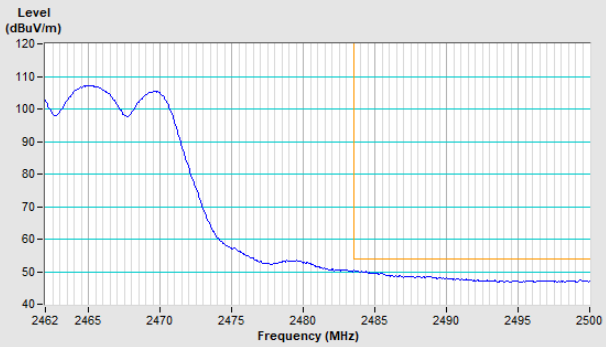


Vertical (Peak)



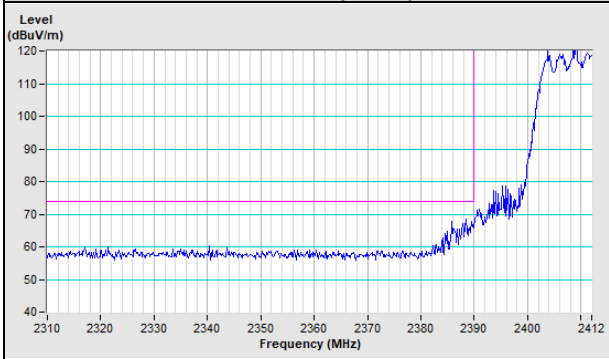
Vertical (Average)



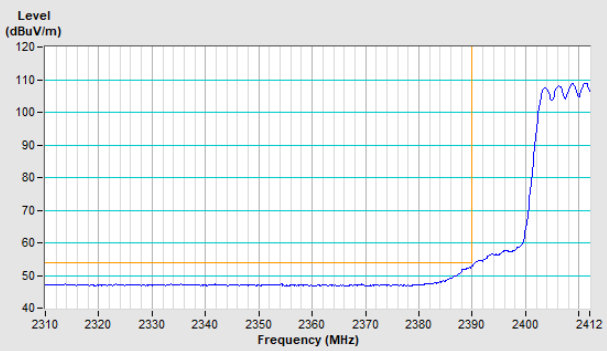
802.11g Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ax (HE20) Channel 1

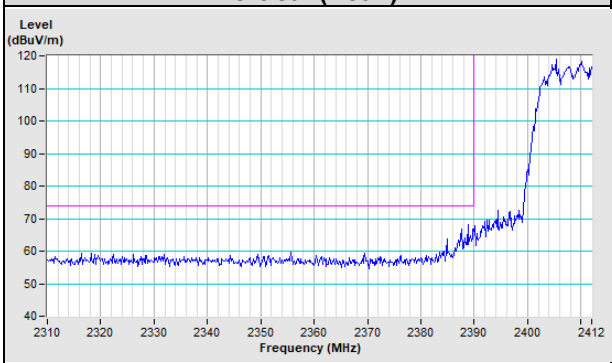
Horizontal (Peak)



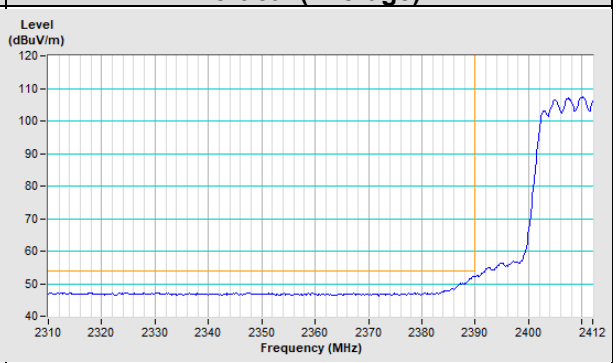
Horizontal (Average)



Vertical (Peak)

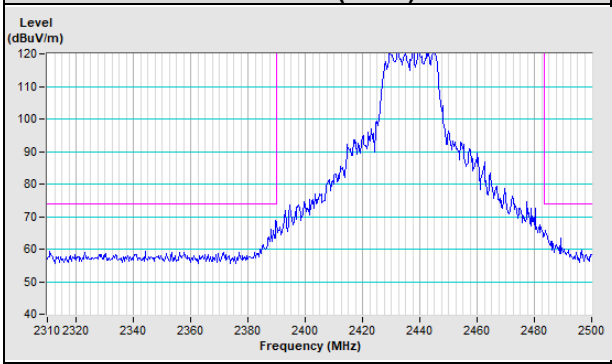


Vertical (Average)

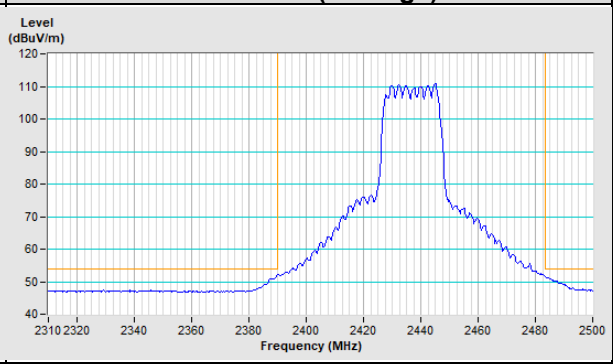


802.11ax (HE20) Channel 6

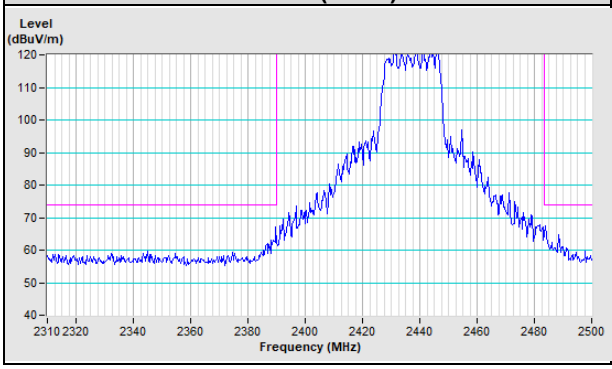
Horizontal (Peak)



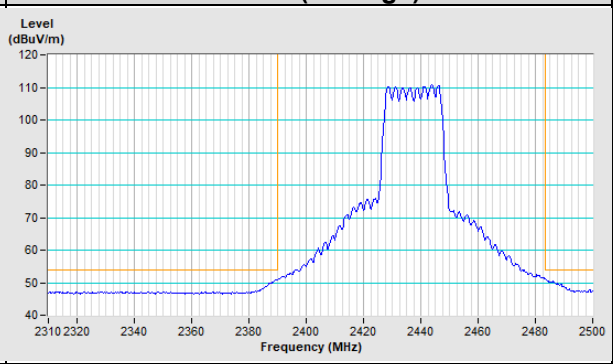
Horizontal (Average)

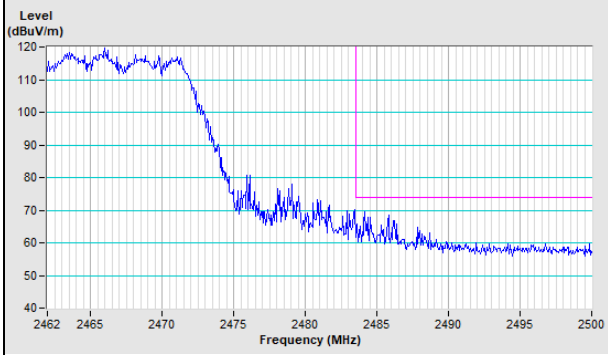
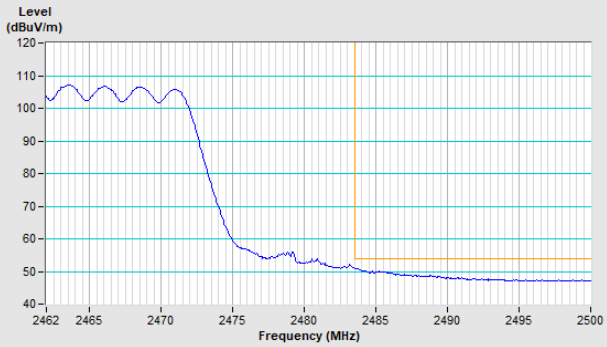
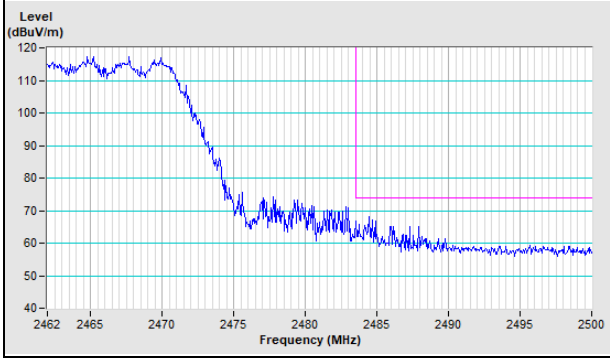
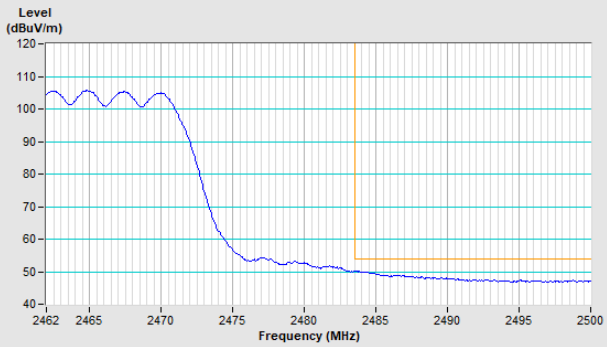


Vertical (Peak)



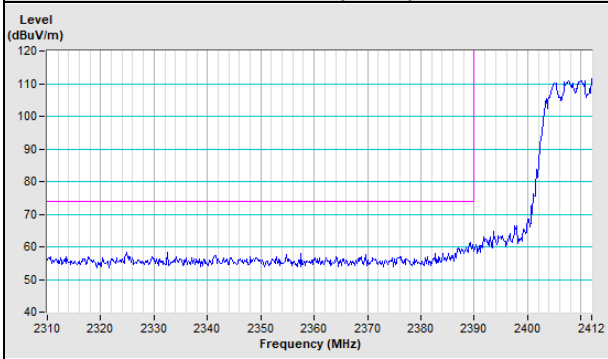
Vertical (Average)



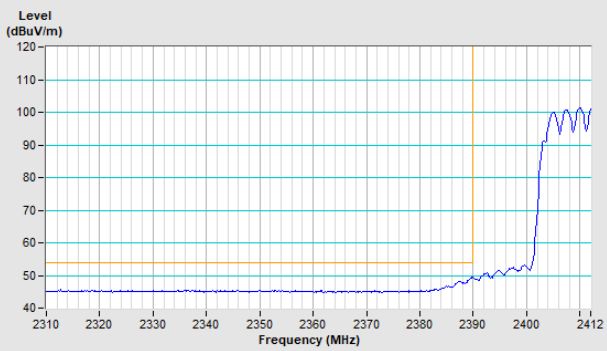
802.11ax (HE20) Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ax (HE40) Channel 3

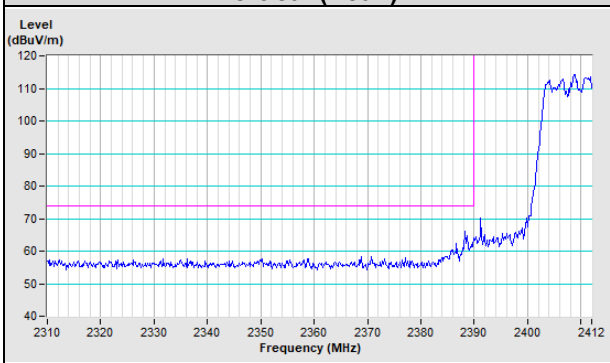
Horizontal (Peak)



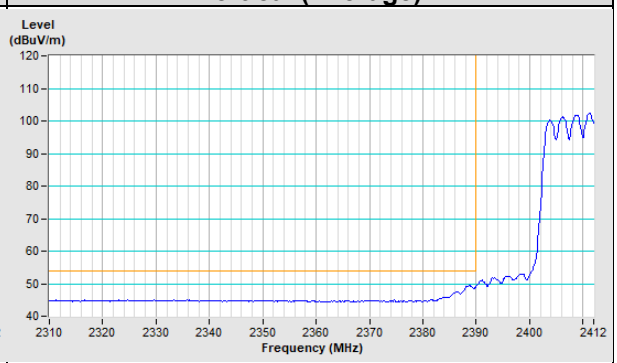
Horizontal (Average)



Vertical (Peak)

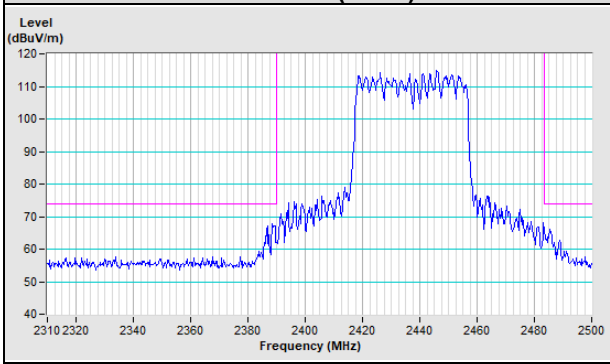


Vertical (Average)

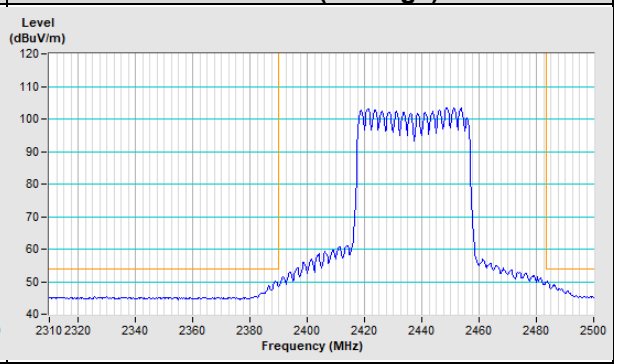


802.11ax (HE40) Channel 6

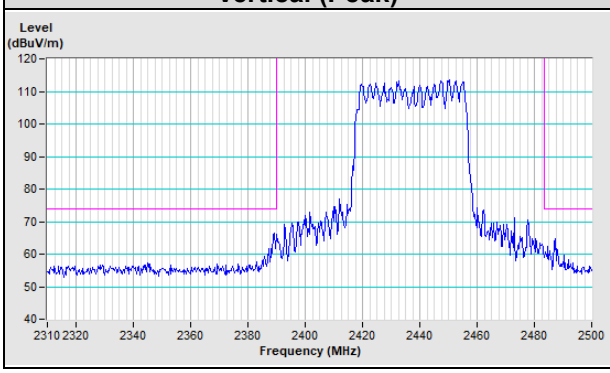
Horizontal (Peak)



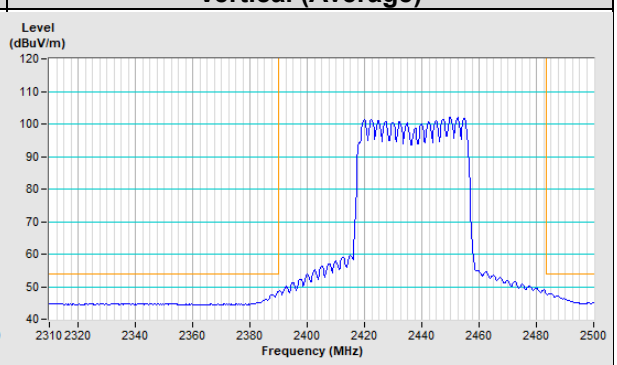
Horizontal (Average)

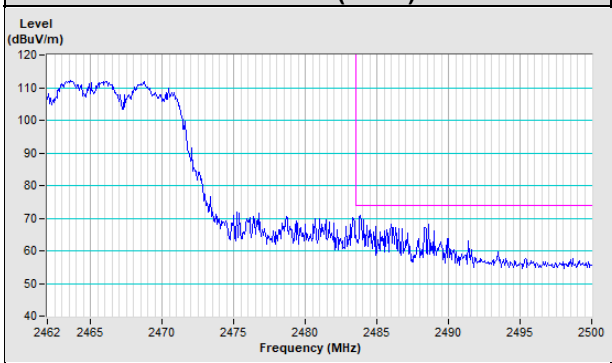
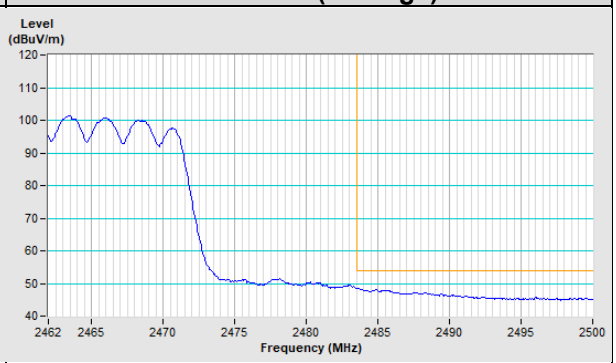
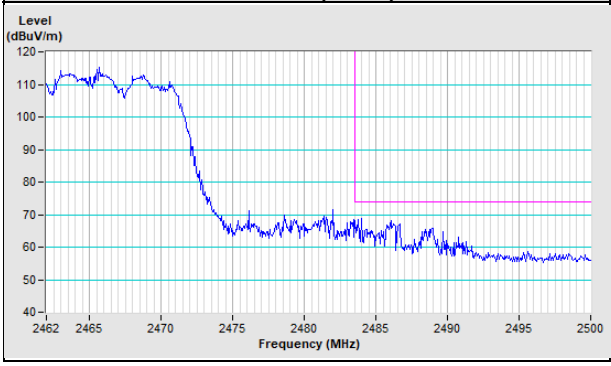
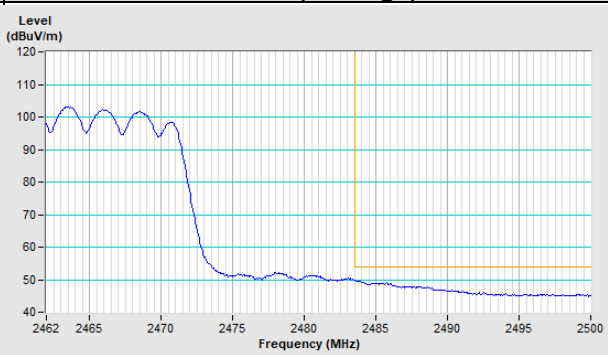


Vertical (Peak)



Vertical (Average)

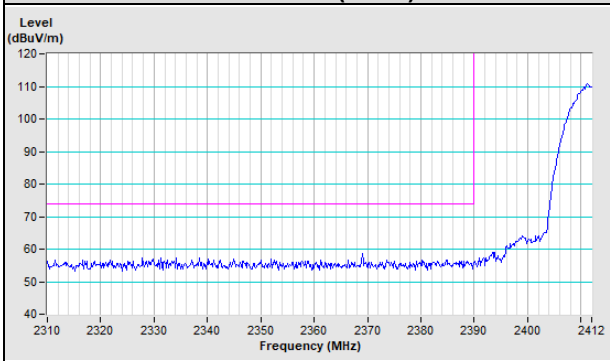


802.11ax (HE40) Channel 9	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

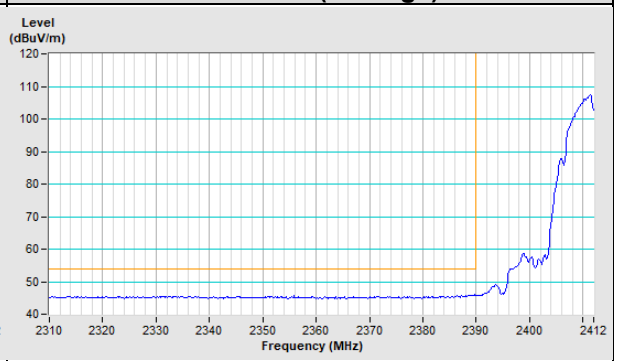
Scanning radio (Radio 3)

802.11b Channel 1

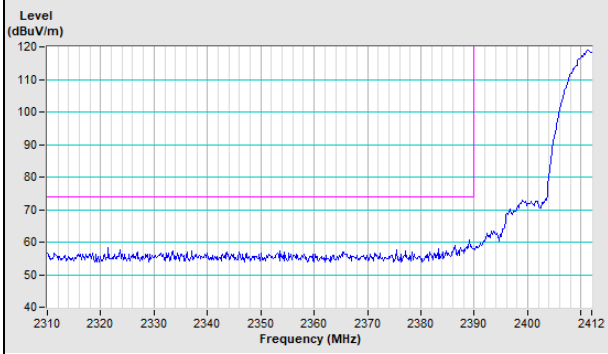
Horizontal (Peak)



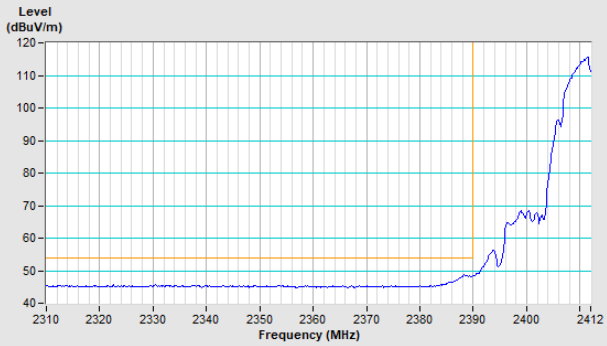
Horizontal (Average)



Vertical (Peak)

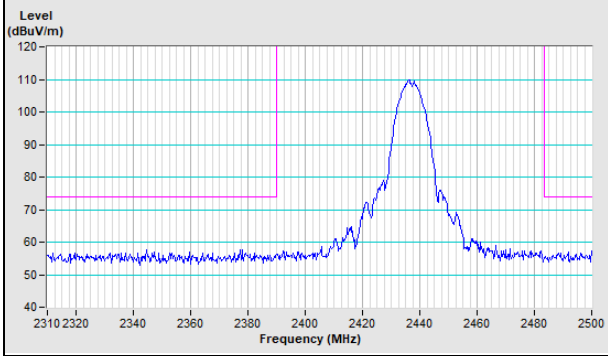


Vertical (Average)

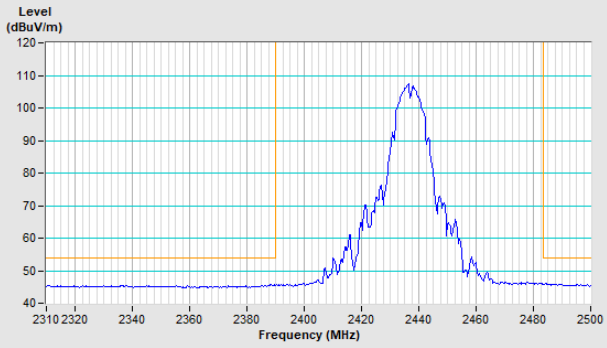


802.11b Channel 6

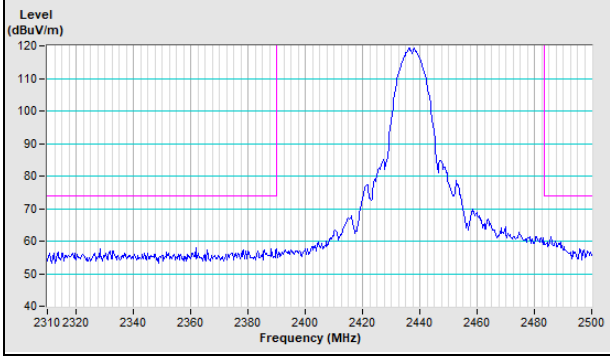
Horizontal (Peak)



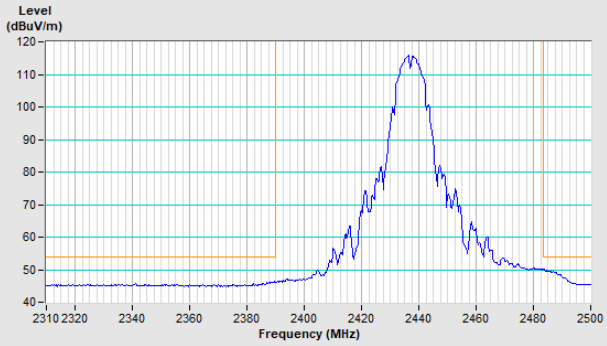
Horizontal (Average)

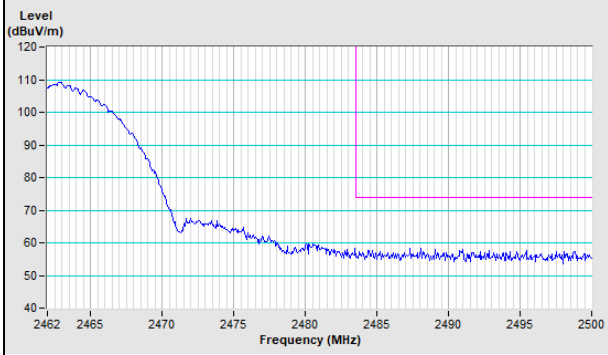
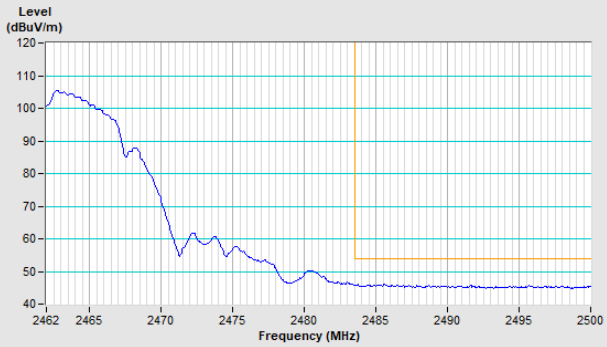
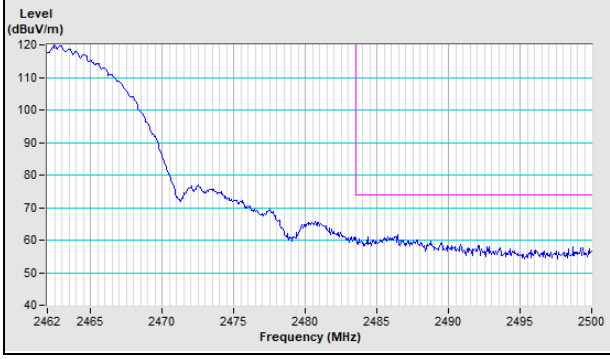
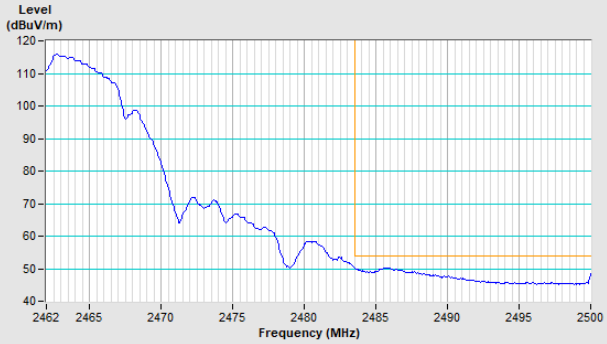


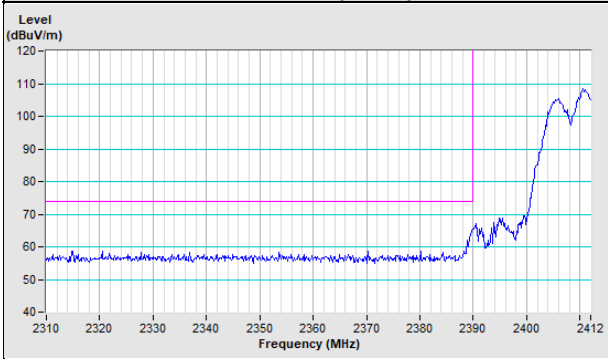
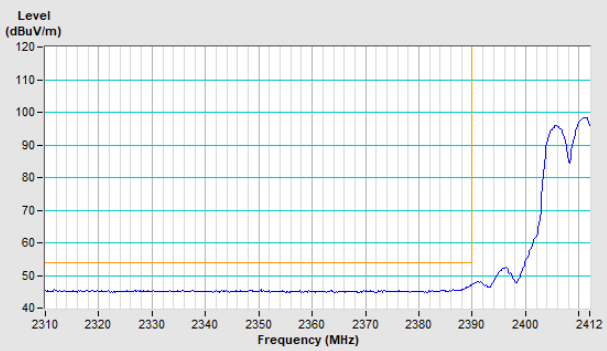
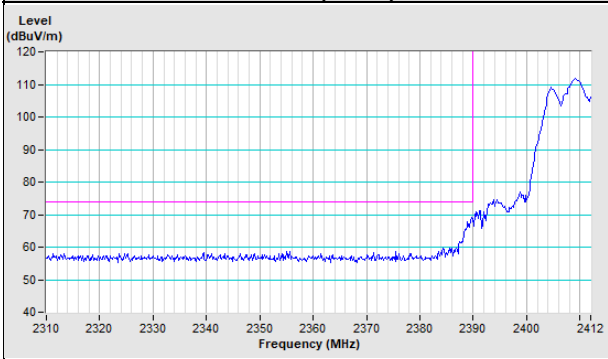
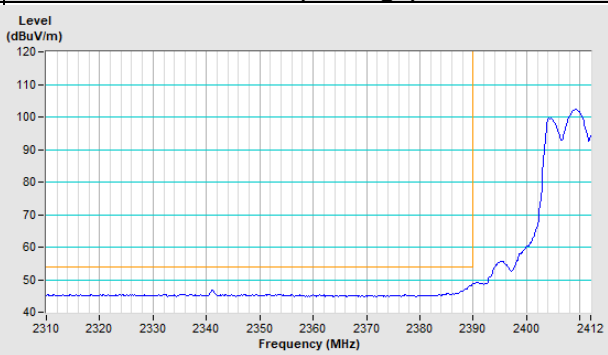
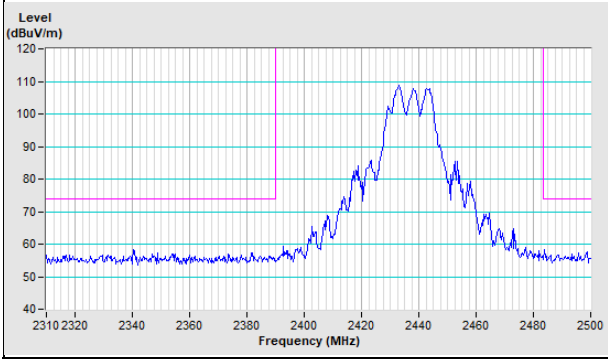
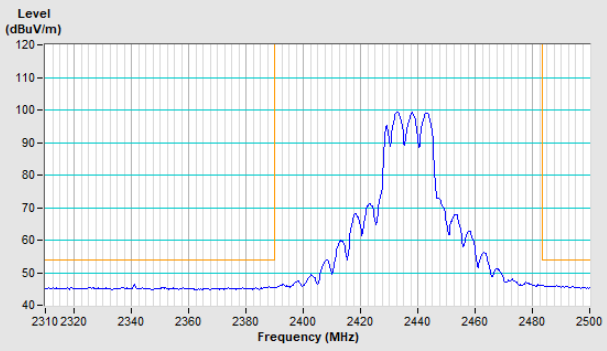
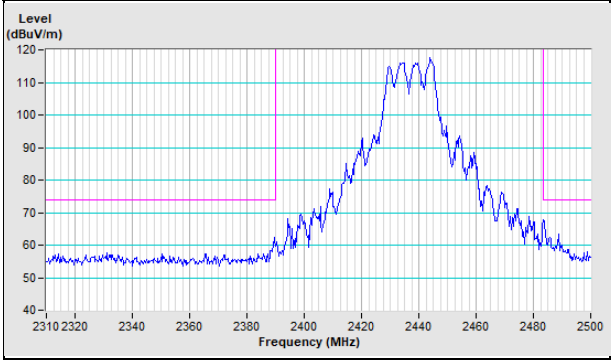
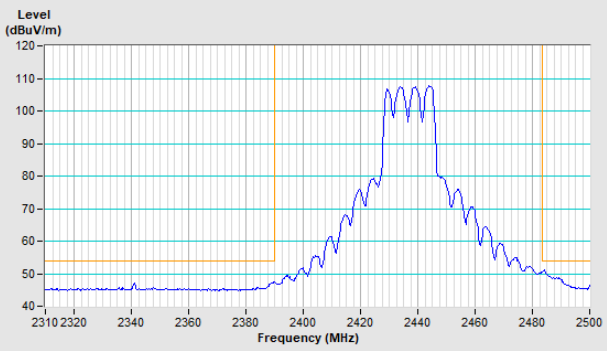
Vertical (Peak)

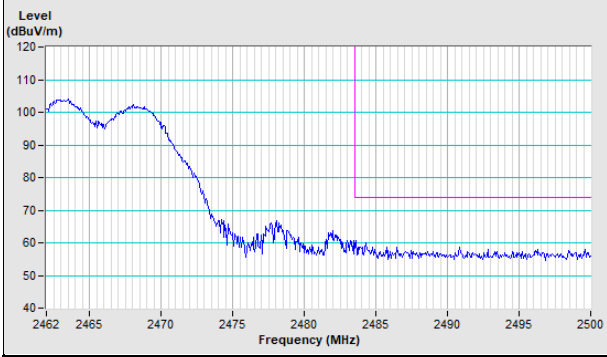
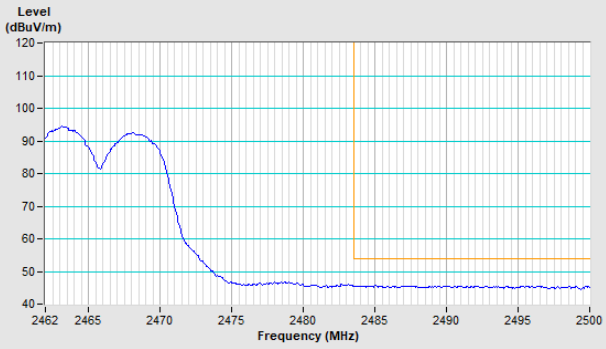
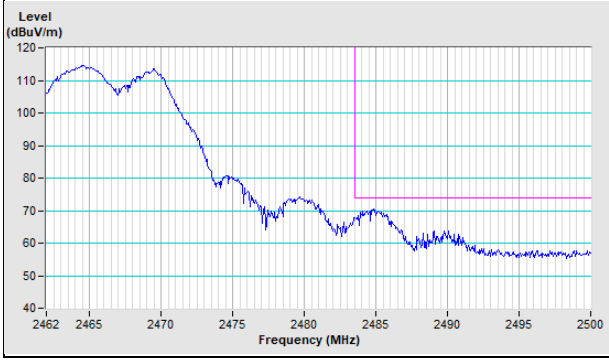
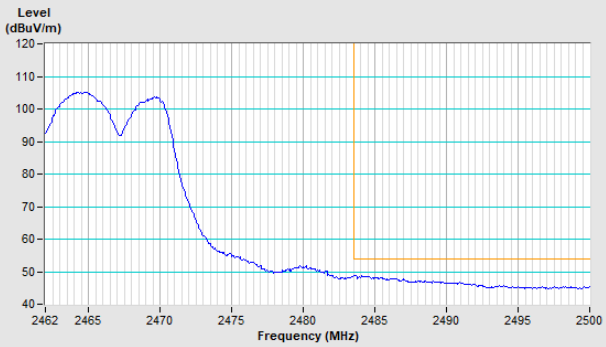


Vertical (Average)



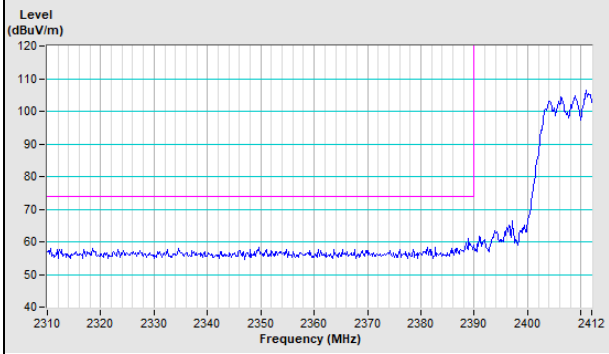
802.11b Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11g Channel 1	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
802.11g Channel 6	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

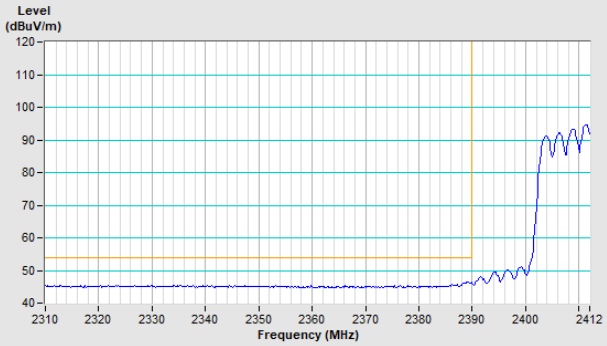
802.11g Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ax (HE20) Channel 1

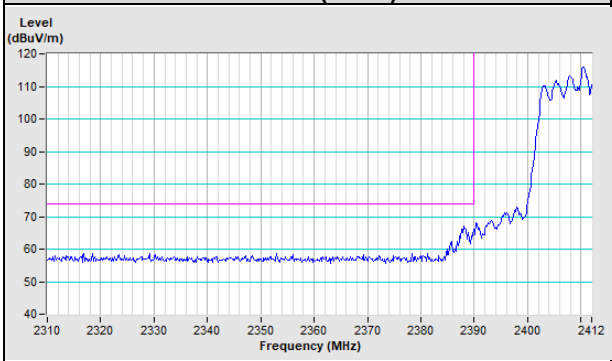
Horizontal (Peak)



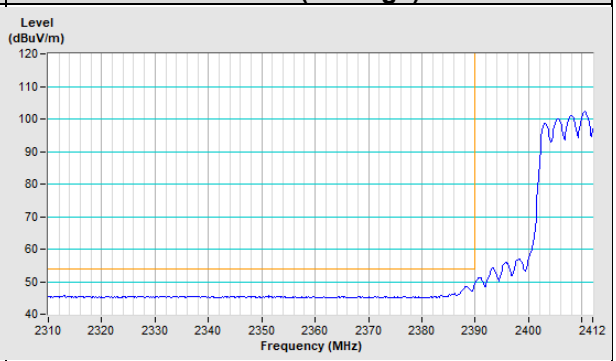
Horizontal (Average)



Vertical (Peak)

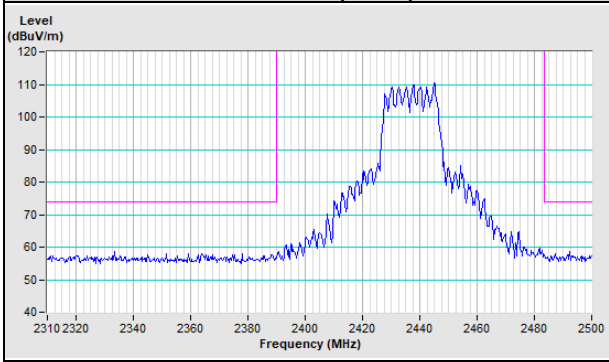


Vertical (Average)

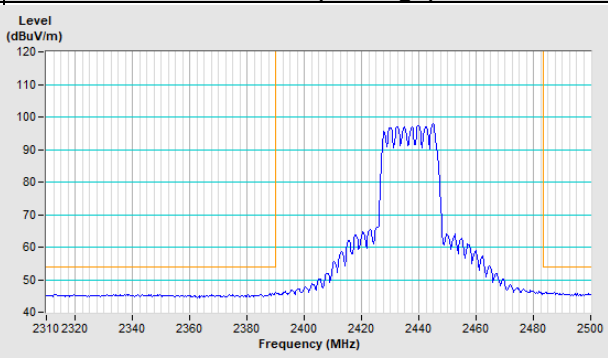


802.11ax (HE20) Channel 6

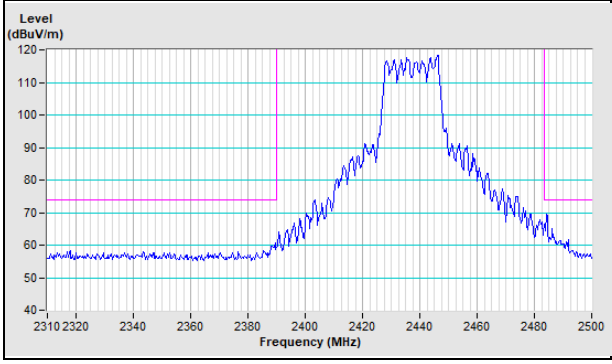
Horizontal (Peak)



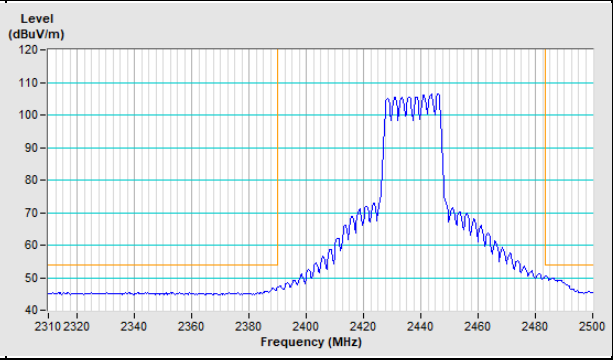
Horizontal (Average)

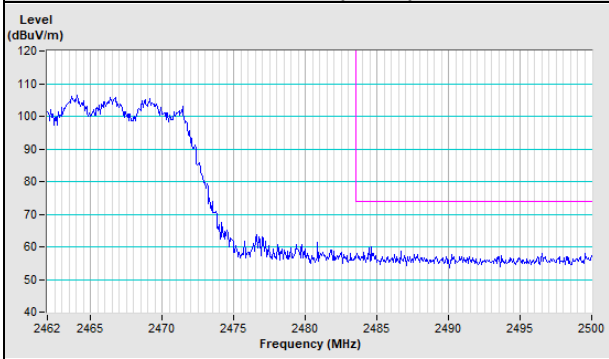
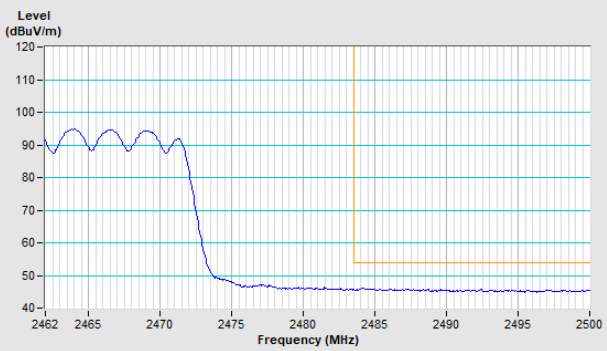
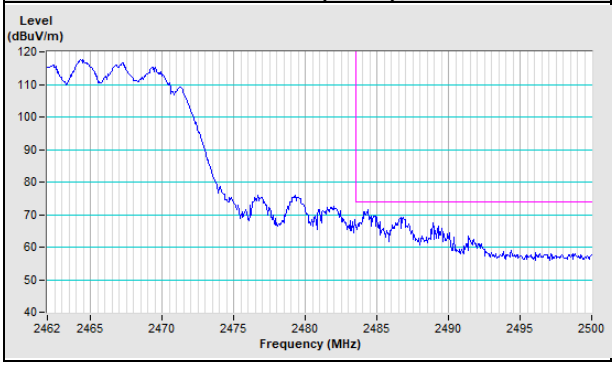
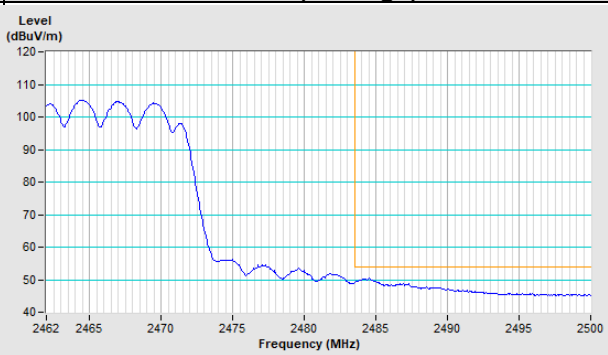


Vertical (Peak)



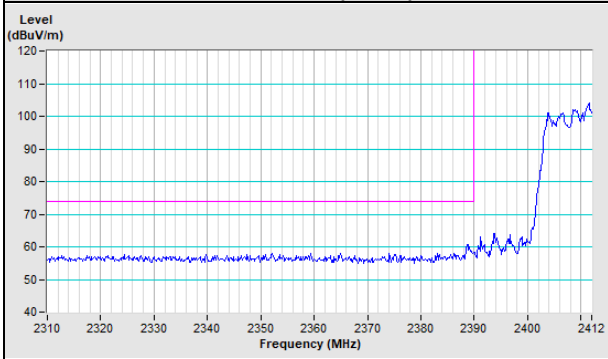
Vertical (Average)



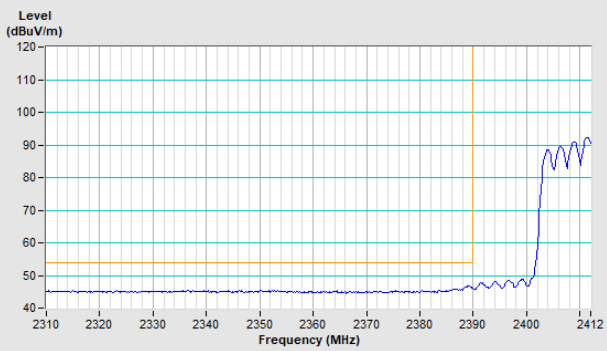
802.11ax (HE20) Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ax (HE40) Channel 3

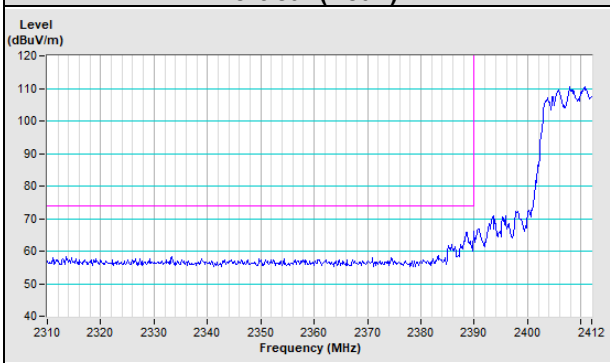
Horizontal (Peak)



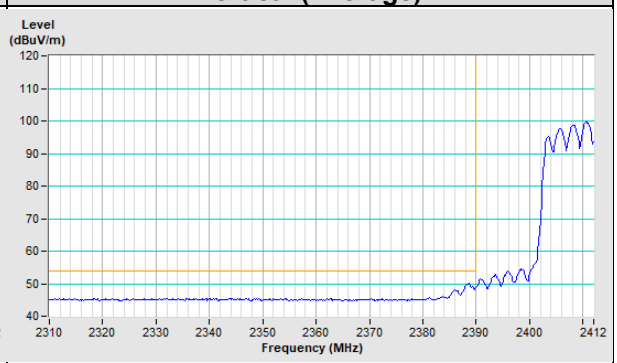
Horizontal (Average)



Vertical (Peak)

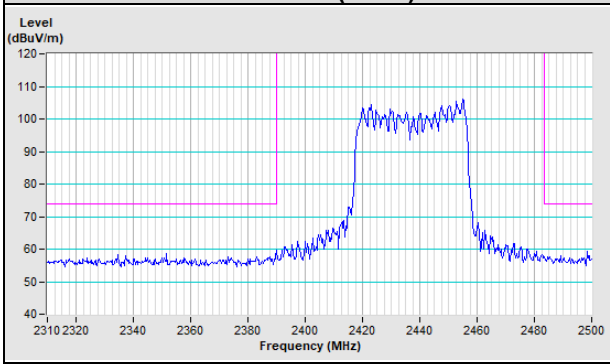


Vertical (Average)

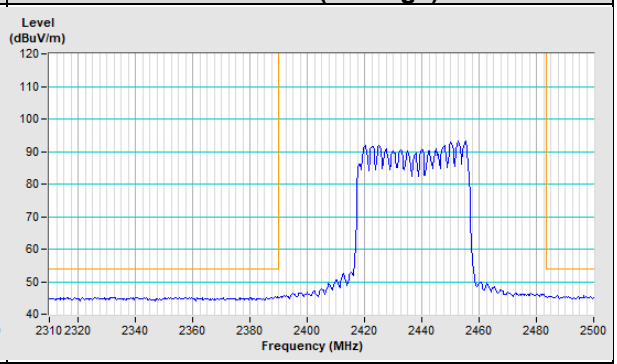


802.11ax (HE40) Channel 6

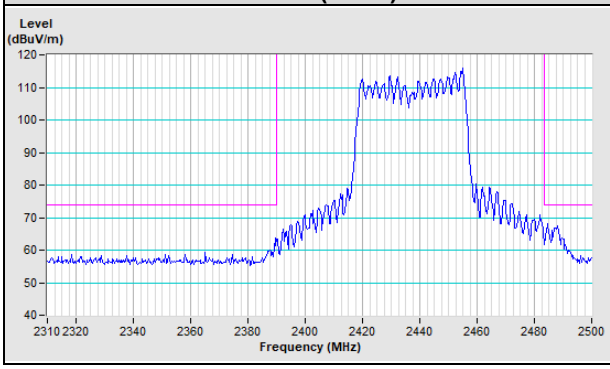
Horizontal (Peak)



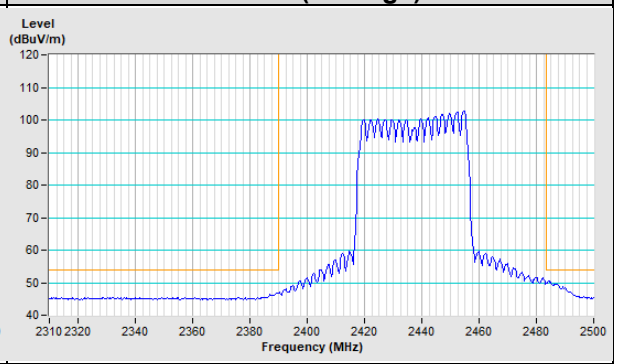
Horizontal (Average)

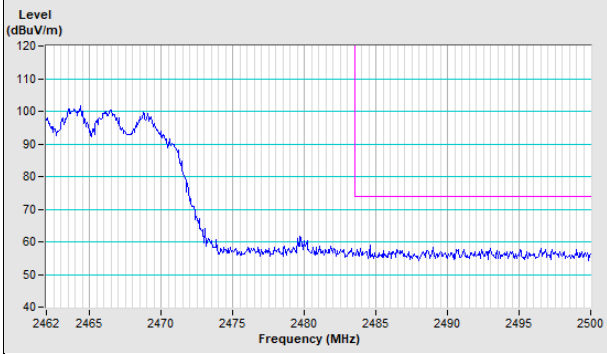
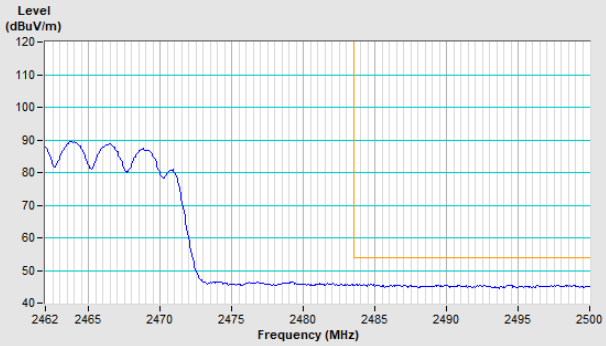
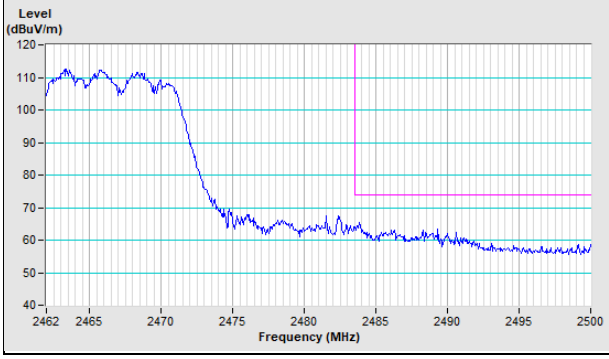
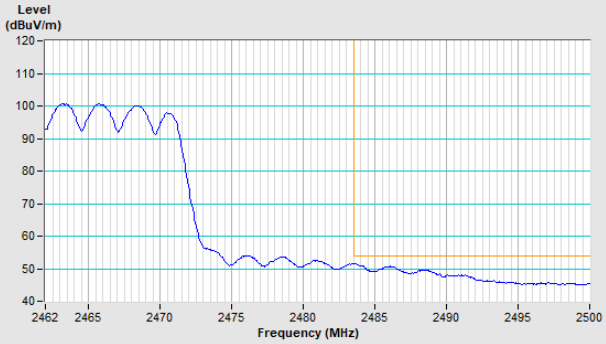


Vertical (Peak)



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 and approved according to ISO/IEC 17025.

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

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