FCC Test Report

Report No.:	RFBBQZ-WTW-P21020623
FCC ID:	PY321100520
Test Model:	WAX630
Received Date:	Mar. 05, 2021
Test Date:	Mar. 10 ~ Apr. 23, 2021
Issued Date:	May 05, 2021
Applicant and Manufacturer:	NETGEAR, INC.
Address:	350 East Plumeria Drive San Jose, CA 95134
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch 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

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Release Control Record

Issue No.	Description	Date Issued
RFBBQZ-WTW-P21020623	Original Release	May 05, 2021

1 Certificate of Conformity

Product:	NETGEAR® Insight Managed WiFi 6 AX6000 Tri-band Multi-Gig Access Point
Brand:	NETGEAR
Test Model:	WAX630
Sample Status:	Engineering Sample
Applicant:	NETGEAR, INC.
Test Date:	Mar. 10 ~ Apr. 23, 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 : Gina Liu , **Date:** May 05, 2021

Gina Liu / Specialist

Approved by : , **Date:** May 05, 2021

Dylan Chiou / 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 -5.03dB at 0.49216MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2483.50MHz and 2390.00MHz.
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	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 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	NETGEAR® Insight Managed WiFi 6 AX6000 Tri-band Multi-Gig Access Point
Brand	NETGEAR
Test Model	WAX630
Sample Status	Engineering Sample
Power Supply Rating	12Vdc from adapter 55.5Vdc for 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: up to 800Mbps 802.11ax: up to 2294.1Mbps
Operating Frequency	2412 ~ 2462MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), 802.11n (VHT20), 802.11ax (HE20): 11 802.11n (HT40), 802.11n (VHT40), 802.11ax (HE40): 7
Output Power	CDD Mode: 962.436mW Beamforming Mode: 958.573mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Adapter
Cable Supplied	N/A

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Modulation Mode	Beamforming Mode	TX Function
802.11b	Not Support	4TX
802.11g	Not Support	4TX
802.11n (VHT20)	Support	4TX
802.11n (VHT40)	Support	4TX
802.11ax (HE20)	Support	4TX
802.11ax (HE40)	Support	4TX

* The bandwidth and modulation are similar for VHT20/VHT40 on 802.11n 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 and 802.11ax, 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.

2. The EUT consumes power from the following adapters.

Adapter 1	
Brand	NETGEAR
Model	AD2150F10
Input Power	100-120Vac, 50/60Hz, 1.0A
Output Power	+12Vdc, 3.5A
Power Line	1.8m cable without core attached on adapter

Adapter 2	
Brand	NETGEAR
Model	2ABN042F NA
Input Power	100-120Vac, 50/60Hz, 1.3A
Output Power	+12Vdc, 3.5A
Power Line	1.82m cable without core attached on adapter

* Adapter 1 was chosen for final test and presented in the test report.

POE injector (support unit only)	
Brand	BUFFALO
Model	BIJ-POE-1P/HG
Input Power	100-240Vac, 50-60Hz, 1.1A
Output Power	55.5Vdc, 0.63A

3. The following antennas were provided to the EUT.

Ant. Type	Dipole		
Connecter Type	i-pex(MHF)		
Directional Gain (dBi)			
2400-2500	5180-5240	5745-5825	
5.85	5.91	5.86	

* For detailed antenna information, please refer to the Operational Description-Antenna Specification report.

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20), 802.11n (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), 802.11n (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	
A	√	√	√	√	EUT with Adapter
B	-	√	√	-	EUT with POE

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 **Y-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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

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)
A, B	802.11b	1 to 11	1	OFDM	BPSK	1.0

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	802.11b	1 to 11	1	OFDM	BPSK	1.0

Conducted Emission Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11n (VHT20)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
	802.11n (VHT40)	3 to 9	3, 6, 9	OFDM	BPSK	15.0
	802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
	802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Bandwidth, Power Spectral Density and Conducted Out of Band Emission Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

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

Test Condition:

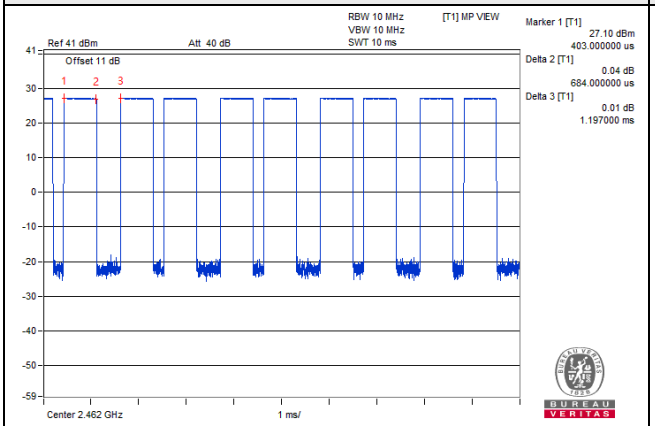
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 66% RH	120Vac, 60Hz	Hans Wu
RE<1G	25 deg. C, 70% RH	120Vac, 60Hz	Hans Wu
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Hans Wu
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Ivan Tseng

3.3 Duty Cycle of Test Signal

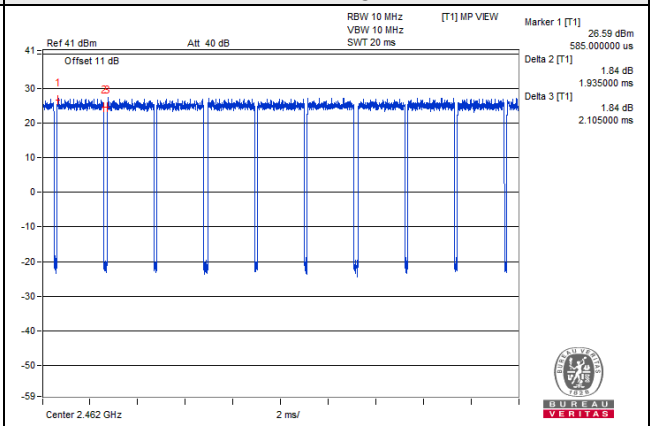
Duty cycle of test signal is < 98%, duty factor is required.

802.11b: Duty cycle = 0.684/1.197 = 0.571, Duty factor = 10 * log (1/0.571) = 2.43
802.11g: Duty cycle = 1.935/2.105 = 0.919, Duty factor = 10 * log (1/0.919) = 0.37
802.11ax (HE20): Duty cycle = 5.4/5.763 = 0.937, Duty factor = 10 * log (1/0.937) = 0.28
802.11ax (HE40): Duty cycle = 0.535/0.5763 = 0.928, Duty factor = 10 * log (1/0.928) = 0.32

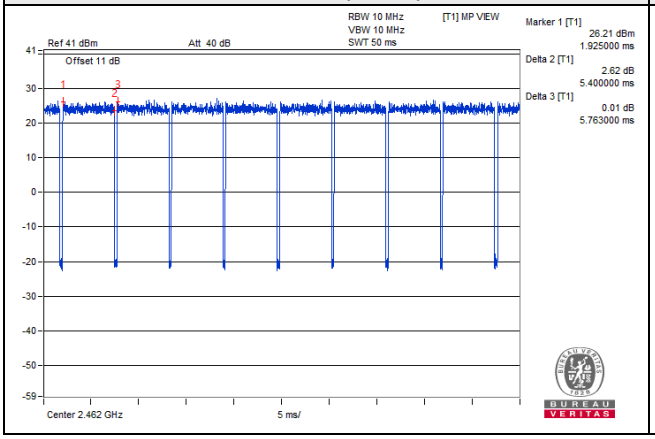
802.11b



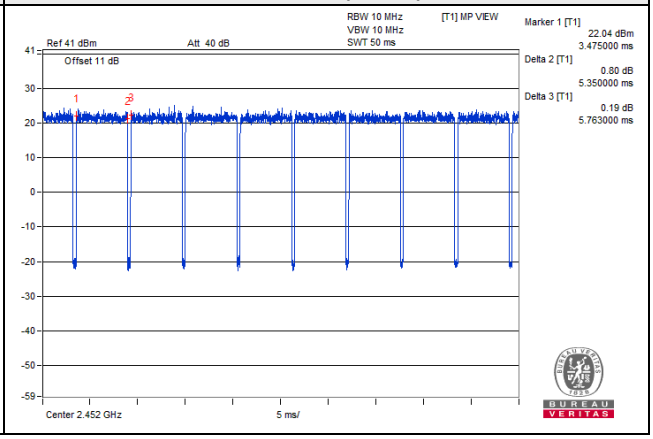
802.11g



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	N/A	-
B.	Load	N/A	N/A	N/A	N/A	-
C.	POE	BUFFALO	BIJ-POE-1P/HG	N/A	N/A	Provided by Client

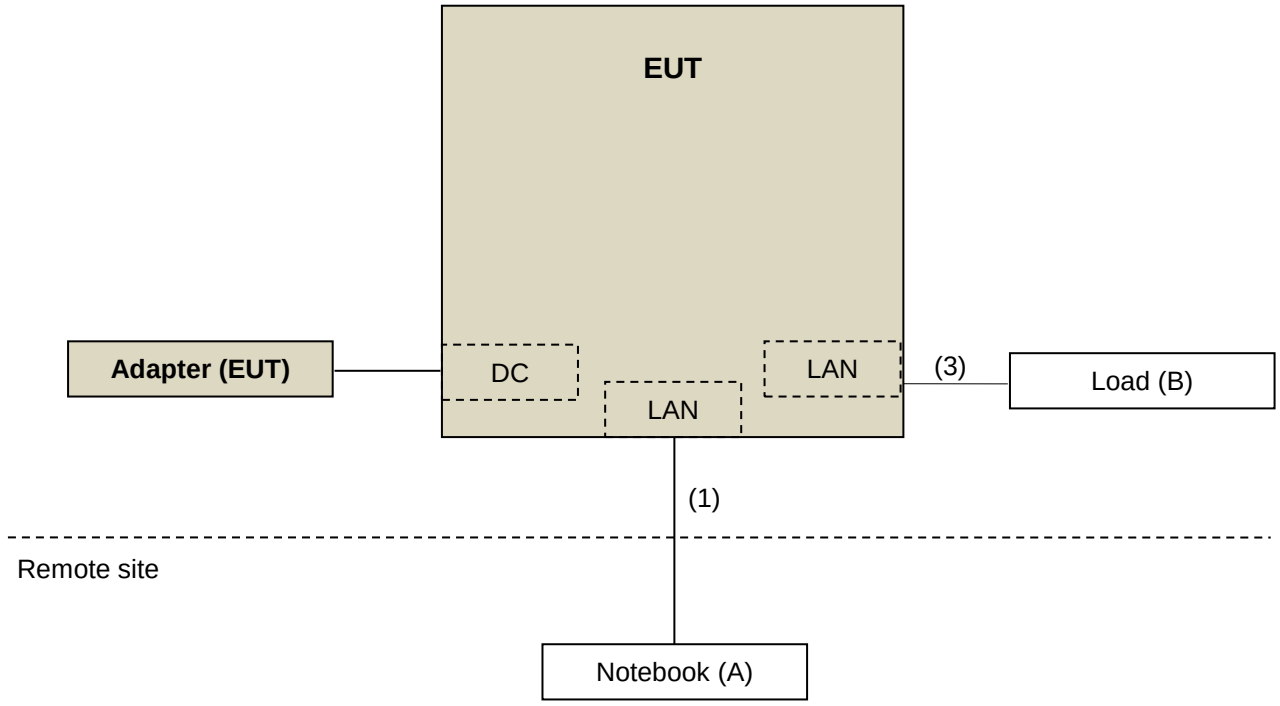
Note:

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.

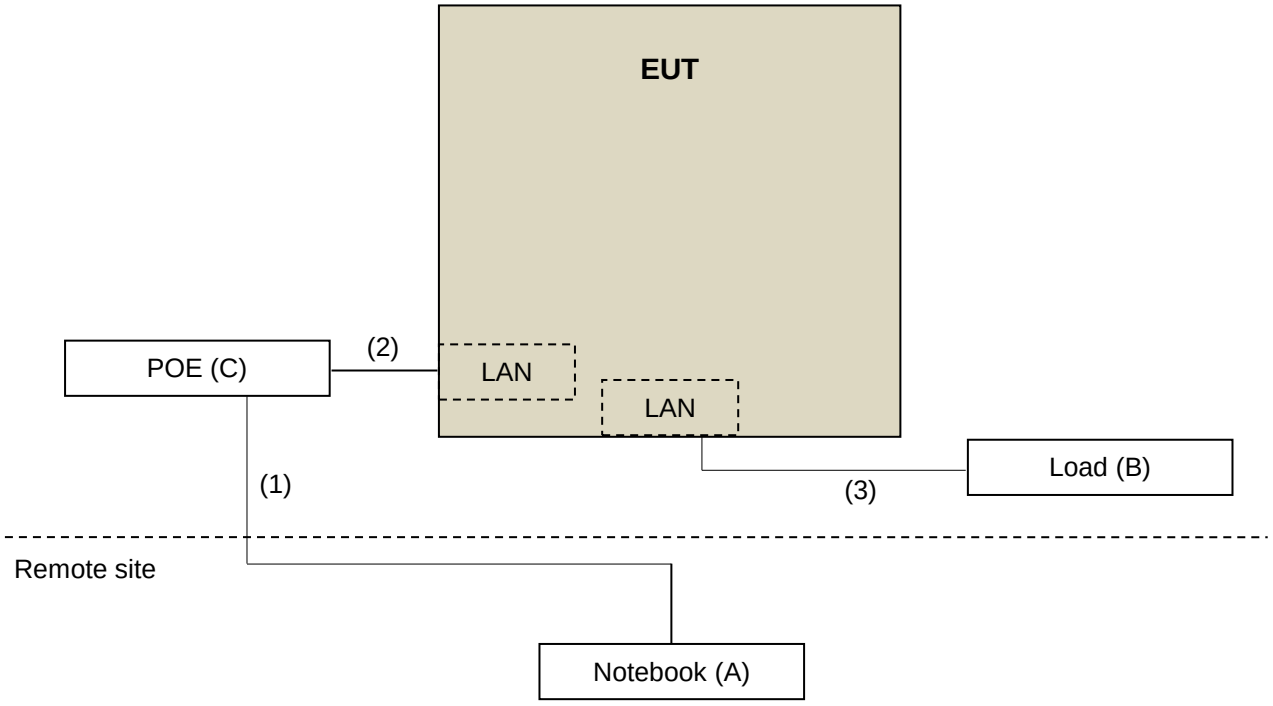
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	10	N	0	RJ45, Cat5e
2.	LAN	1	2	N	0	RJ45, Cat5e
3.	LAN	1	10	N	0	RJ45, Cat5e

3.4.1 Configuration of System under Test

Mode A



Mode B



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:

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	ESCI	100424	Dec. 31, 2020	Dec. 30, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 03, 2020	Nov. 02, 2021
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jun. 08, 2020	Jun. 07, 2021
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 08, 2020	Jun. 07, 2021
RF Coaxial Cable WORKEN With 5dB PAD	8D-FB	Cable-CH4-01	Aug. 16, 2020	Aug. 15, 2021
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Aug. 16, 2020	Aug. 15, 2021
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jun. 08, 2020	Jun. 07, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jun. 08, 2020	Jun. 07, 2021
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 04, 2020	Sep. 03, 2021
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	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 4.

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. (802.11b: RBW = 1MHz, VBW = 3kHz; 802.11g: RBW = 1MHz, VBW = 1kHz; 802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz, VBW = 3kHz)

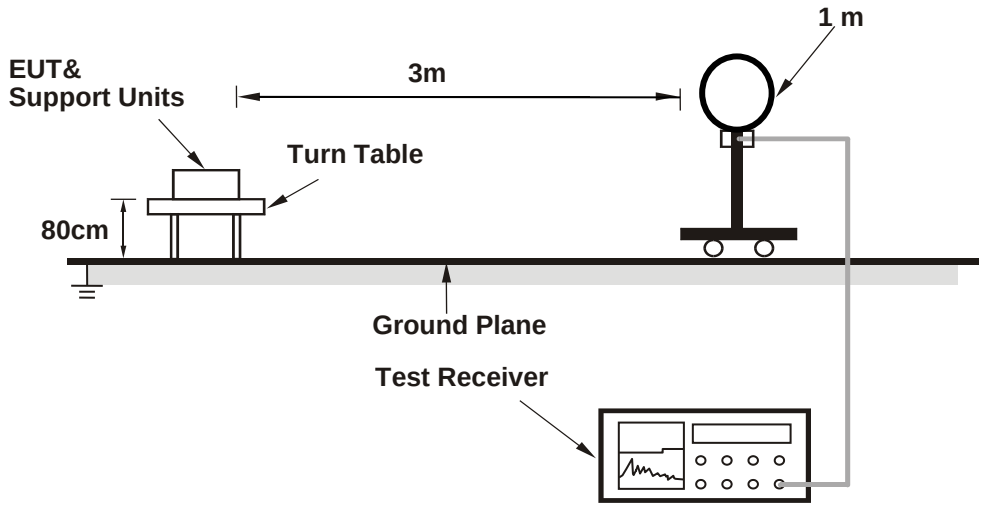
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

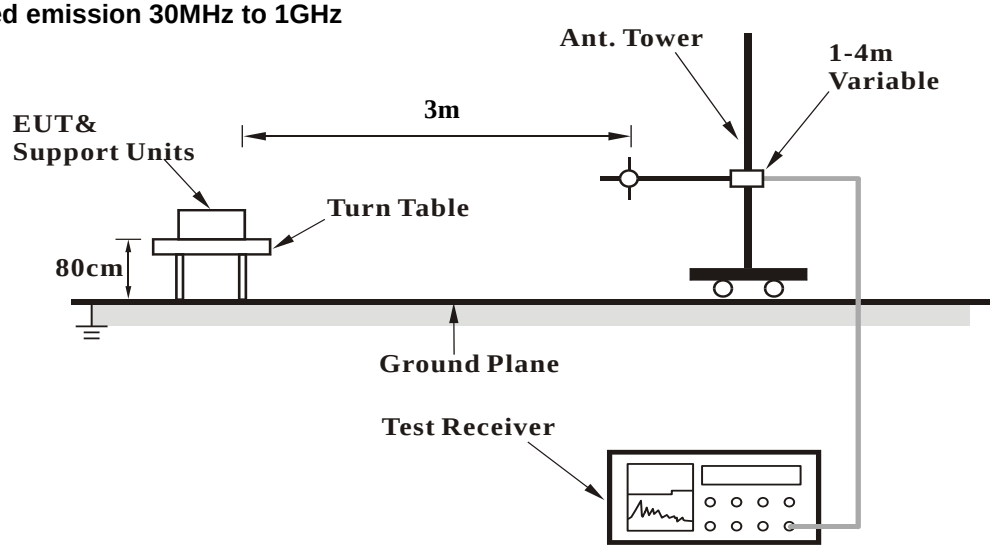
No deviation.

4.1.5 Test Setup

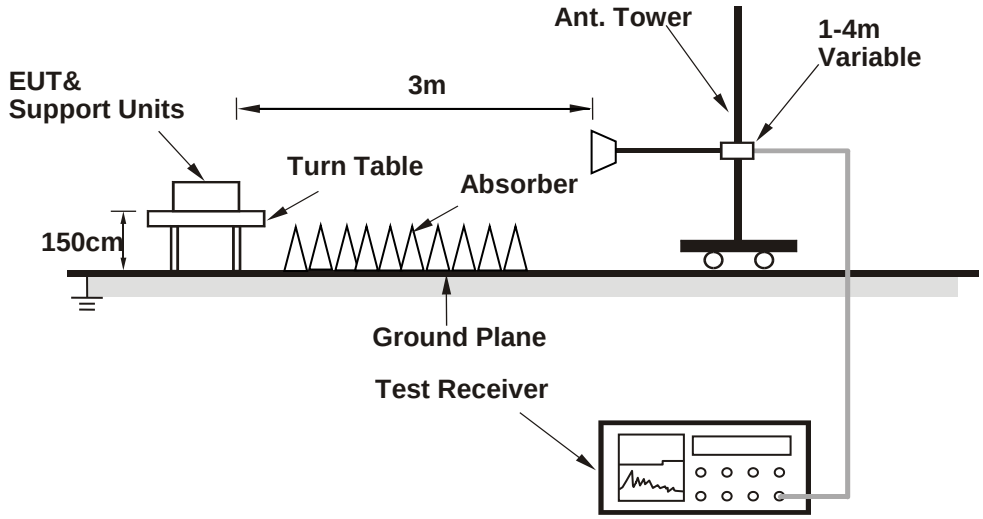
For Radiated emission below 30MHz



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

Above 1GHz 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	61.9 PK	74.0	-12.1	1.76 H	177	28.9	33.0
2	2390.00	52.2 AV	54.0	-1.8	1.76 H	177	19.2	33.0
3	*2412.00	119.0 PK			1.76 H	177	85.9	33.1
4	*2412.00	116.5 AV			1.76 H	177	83.4	33.1
5	4824.00	54.3 PK	74.0	-19.7	1.55 H	351	42.9	11.4
6	4824.00	50.6 AV	54.0	-3.4	1.55 H	351	39.2	11.4
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	63.6 PK	74.0	-10.4	1.86 V	350	29.2	34.4
2	**2390.00**	**53.8 AV**	**54.0**	**-0.2**	**1.86 V**	**350**	**19.4**	**34.4**
3	*2412.00	120.8 PK			1.86 V	350	86.5	34.3
4	*2412.00	118.4 AV			1.86 V	350	84.1	34.3
5	4824.00	53.6 PK	74.0	-20.4	1.82 V	146	47.4	6.2
6	4824.00	50.0 AV	54.0	-4.0	1.82 V	146	43.8	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	118.0 PK			1.72 H	182	85.0	33.0
2	*2437.00	115.8 AV			1.72 H	182	82.8	33.0
3	4874.00	54.5 PK	74.0	-19.5	1.53 H	342	43.2	11.3
4	4874.00	50.4 AV	54.0	-3.6	1.53 H	342	39.1	11.3
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	120.8 PK			1.74 V	346	86.5	34.3
2	*2437.00	118.8 AV			1.74 V	346	84.5	34.3
3	4874.00	53.6 PK	74.0	-20.4	1.78 V	148	47.5	6.1
4	4874.00	50.5 AV	54.0	-3.5	1.78 V	148	44.4	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	116.6 PK			1.67 H	184	83.6	33.0
2	*2462.00	114.8 AV			1.67 H	184	81.8	33.0
3	2483.50	59.8 PK	74.0	-14.2	1.67 H	184	26.7	33.1
4	2483.50	52.1 AV	54.0	-1.9	1.67 H	184	19.0	33.1
5	4924.00	54.3 PK	74.0	-19.7	1.50 H	353	43.0	11.3
6	4924.00	50.0 AV	54.0	-4.0	1.50 H	353	38.7	11.3
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	118.7 PK			1.75 V	307	84.3	34.4
2	*2462.00	116.8 AV			1.75 V	307	82.4	34.4
3	2483.50	61.4 PK	74.0	-12.6	1.75 V	307	27.0	34.4
4	2483.50	53.7 AV	54.0	-0.3	1.75 V	307	19.3	34.4
5	4924.00	52.1 PK	74.0	-21.9	1.76 V	156	46.0	6.1
6	4924.00	47.7 AV	54.0	-6.3	1.76 V	156	41.6	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	63.8 PK	74.0	-10.2	1.54 H	171	30.8	33.0
2	2390.00	52.1 AV	54.0	-1.9	1.54 H	171	19.1	33.0
3	*2412.00	115.1 PK			1.54 H	171	82.0	33.1
4	*2412.00	106.6 AV			1.54 H	171	73.5	33.1
5	4824.00	48.0 PK	74.0	-26.0	1.32 H	116	36.6	11.4
6	4824.00	37.6 AV	54.0	-16.4	1.32 H	116	26.2	11.4
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	65.9 PK	74.0	-8.1	1.56 V	359	31.5	34.4
2	**2390.00**	**53.8 AV**	**54.0**	**-0.2**	**1.56 V**	**359**	**19.4**	**34.4**
3	*2412.00	119.5 PK			1.56 V	359	85.2	34.3
4	*2412.00	109.8 AV			1.56 V	359	75.5	34.3
5	4824.00	48.6 PK	74.0	-25.4	1.83 V	151	42.4	6.2
6	4824.00	36.2 AV	54.0	-17.8	1.83 V	151	30.0	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	119.3 PK			1.63 H	150	86.3	33.0
2	*2437.00	110.5 AV			1.63 H	150	77.5	33.0
3	4874.00	50.6 PK	74.0	-23.4	1.47 H	328	39.3	11.3
4	4874.00	40.4 AV	54.0	-13.6	1.47 H	328	29.1	11.3
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	121.4 PK			1.56 V	339	87.1	34.3
2	*2437.00	112.4 AV			1.56 V	339	78.1	34.3
3	4874.00	48.3 PK	74.0	-25.7	1.82 V	150	42.2	6.1
4	4874.00	36.3 AV	54.0	-17.7	1.82 V	150	30.2	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	116.5 PK			1.61 H	156	83.5	33.0
2	*2462.00	106.8 AV			1.61 H	156	73.8	33.0
3	2483.50	65.5 PK	74.0	-8.5	1.61 H	156	32.4	33.1
4	2483.50	52.2 AV	54.0	-1.8	1.61 H	156	19.1	33.1
5	4924.00	49.4 PK	74.0	-24.6	1.53 H	332	38.1	11.3
6	4924.00	39.1 AV	54.0	-14.9	1.53 H	332	27.8	11.3
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	118.5 PK			1.58 V	335	84.1	34.4
2	*2462.00	108.6 AV			1.58 V	335	74.2	34.4
3	2483.50	67.0 PK	74.0	-7.0	1.58 V	335	32.6	34.4
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.58 V**	**335**	**19.4**	**34.4**
5	4924.00	48.2 PK	74.0	-25.8	1.79 V	160	42.1	6.1
6	4924.00	36.3 AV	54.0	-17.7	1.79 V	160	30.2	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	66.4 PK	74.0	-7.6	1.68 H	172	33.4	33.0
2	2390.00	52.0 AV	54.0	-2.0	1.68 H	172	19.0	33.0
3	*2412.00	120.8 PK			1.68 H	172	87.7	33.1
4	*2412.00	107.5 AV			1.68 H	172	74.4	33.1
5	4824.00	50.0 PK	74.0	-24.0	1.60 H	319	38.6	11.4
6	4824.00	39.5 AV	54.0	-14.5	1.60 H	319	28.1	11.4
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	68.1 PK	74.0	-5.9	1.88 V	339	33.7	34.4
2	2390.00	53.5 AV	54.0	-0.5	1.88 V	339	19.1	34.4
3	*2412.00	122.4 PK			1.88 V	339	88.1	34.3
4	*2412.00	108.9 AV			1.88 V	339	74.6	34.3
5	4824.00	47.8 PK	74.0	-26.2	1.75 V	163	41.6	6.2
6	4824.00	35.5 AV	54.0	-18.5	1.75 V	163	29.3	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	2310.00	67.2 PK	74.0	-6.8	1.73 H	167	33.9	33.3
2	2310.00	51.9 AV	54.0	-2.1	1.73 H	167	18.6	33.3
3	*2437.00	124.1 PK			1.73 H	167	91.1	33.0
4	*2437.00	110.6 AV			1.73 H	167	77.6	33.0
5	4874.00	52.6 PK	74.0	-21.4	1.52 H	324	41.3	11.3
6	4874.00	40.5 AV	54.0	-13.5	1.52 H	324	29.2	11.3
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	2310.00	68.9 PK	74.0	-5.1	1.51 V	358	34.2	34.7
2	2310.00	53.5 AV	54.0	-0.5	1.51 V	358	18.8	34.7
3	*2437.00	125.6 PK			1.51 V	358	91.3	34.3
4	*2437.00	112.2 AV			1.51 V	358	77.9	34.3
5	4874.00	47.3 PK	74.0	-26.7	1.87 V	169	41.2	6.1
6	4874.00	35.6 AV	54.0	-18.4	1.87 V	169	29.5	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	118.1 PK			1.68 H	163	85.1	33.0
2	*2462.00	105.3 AV			1.68 H	163	72.3	33.0
3	2483.50	67.7 PK	74.0	-6.3	1.68 H	163	34.6	33.1
4	2483.50	52.3 AV	54.0	-1.7	1.68 H	163	19.2	33.1
5	4924.00	53.1 PK	74.0	-20.9	1.56 H	312	41.8	11.3
6	4924.00	39.3 AV	54.0	-14.7	1.56 H	312	28.0	11.3
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	120.3 PK			1.79 V	338	85.9	34.4
2	*2462.00	107.2 AV			1.79 V	338	72.8	34.4
3	2483.50	69.4 PK	74.0	-4.6	1.79 V	338	35.0	34.4
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.79 V**	**338**	**19.4**	**34.4**
5	4924.00	47.6 PK	74.0	-26.4	1.85 V	159	41.5	6.1
6	4924.00	35.4 AV	54.0	-18.6	1.85 V	159	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	67.2 PK	74.0	-6.8	1.59 H	173	34.2	33.0
2	2390.00	51.8 AV	54.0	-2.2	1.59 H	173	18.8	33.0
3	*2422.00	114.8 PK			1.59 H	173	81.8	33.0
4	*2422.00	102.9 AV			1.59 H	173	69.9	33.0
5	4844.00	51.8 PK	74.0	-22.2	1.71 H	308	40.5	11.3
6	4844.00	40.5 AV	54.0	-13.5	1.71 H	308	29.2	11.3
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	68.9 PK	74.0	-5.1	1.54 V	356	34.5	34.4
2	2390.00	53.6 AV	54.0	-0.4	1.54 V	356	19.2	34.4
3	*2422.00	119.0 PK			1.54 V	356	84.7	34.3
4	*2422.00	105.8 AV			1.54 V	356	71.5	34.3
5	4844.00	47.3 PK	74.0	-26.7	1.77 V	161	41.2	6.1
6	4844.00	35.0 AV	54.0	-19.0	1.77 V	161	28.9	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	115.6 PK			1.60 H	163	82.6	33.0
2	*2437.00	104.0 AV			1.60 H	163	71.0	33.0
3	2483.50	67.3 PK	74.0	-6.7	1.60 H	163	34.2	33.1
4	2483.50	52.3 AV	54.0	-1.7	1.60 H	163	19.2	33.1
5	4874.00	51.0 PK	74.0	-23.0	1.66 H	315	39.7	11.3
6	4874.00	39.2 AV	54.0	-14.8	1.66 H	315	27.9	11.3
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	118.9 PK			1.59 V	340	84.6	34.3
2	*2437.00	105.6 AV			1.59 V	340	71.3	34.3
3	2483.50	69.0 PK	74.0	-5.0	1.59 V	340	34.6	34.4
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.59 V**	**340**	**19.4**	**34.4**
5	4874.00	47.2 PK	74.0	-26.8	1.66 V	155	41.1	6.1
6	4874.00	35.1 AV	54.0	-18.9	1.66 V	155	29.0	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
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	115.1 PK			1.65 H	154	82.1	33.0
2	*2452.00	103.2 AV			1.65 H	154	70.2	33.0
3	2483.50	65.1 PK	74.0	-8.9	1.65 H	154	32.0	33.1
4	2483.50	51.9 AV	54.0	-2.1	1.65 H	154	18.8	33.1
5	4904.00	50.0 PK	74.0	-24.0	1.64 H	333	38.6	11.4
6	4904.00	39.9 AV	54.0	-14.1	1.64 H	333	28.5	11.4
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	117.5 PK			1.51 V	339	83.2	34.3
2	*2452.00	105.0 AV			1.51 V	339	70.7	34.3
3	2483.50	67.0 PK	74.0	-7.0	1.51 V	357	32.6	34.4
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**1.51 V**	**357**	**19.4**	**34.4**
5	4904.00	47.7 PK	74.0	-26.3	1.91 V	160	41.6	6.1
6	4904.00	35.4 AV	54.0	-18.6	1.91 V	160	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

Below 1GHz worst-case data:

802.11b

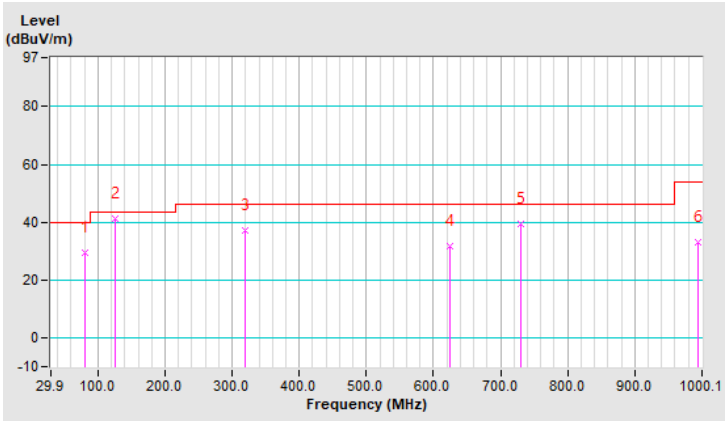
Mode A

CHANNEL	TX Channel 1	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	81.32	29.3 QP	40.0	-10.7	1.99 H	190	42.9	-13.6
2	125.01	41.2 QP	43.5	-2.3	1.00 H	303	51.9	-10.7
3	319.99	37.2 QP	46.0	-8.8	1.00 H	187	44.4	-7.2
4	623.66	31.5 QP	46.0	-14.5	1.00 H	143	32.0	-0.5
5	729.41	39.3 QP	46.0	-6.7	1.99 H	162	37.4	1.9
6	994.28	33.2 QP	54.0	-20.8	1.99 H	289	25.7	7.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

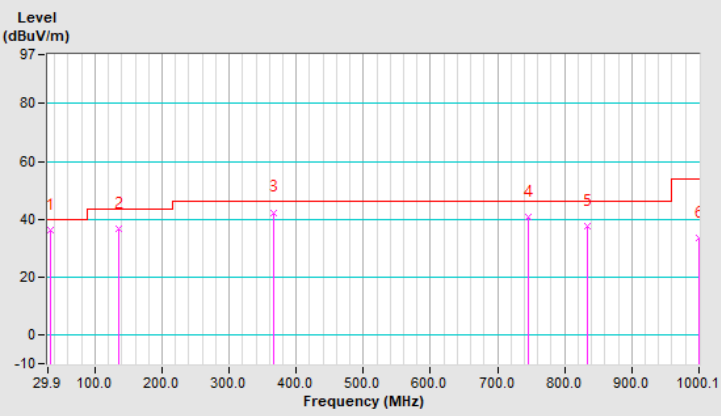


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	33.78	36.2 QP	40.0	-3.8	1.01 V	326	46.3	-10.1
2	135.65	36.7 QP	43.5	-6.8	1.01 V	253	46.3	-9.6
3	366.56	42.4 QP	46.0	-3.6	1.50 V	110	48.8	-6.4
4	745.91	41.0 QP	46.0	-5.0	2.00 V	282	38.4	2.6
5	833.23	37.7 QP	46.0	-8.3	1.01 V	4	33.1	4.6
6	1000.00	33.7 QP	54.0	-20.3	2.00 V	4	26.1	7.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



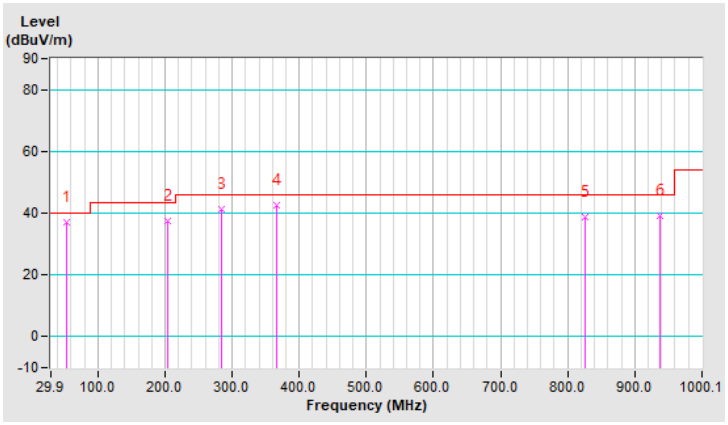
Mode B

CHANNEL	TX Channel 1	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	54.16	37.1 QP	40.0	-2.9	1.50 H	328	46.2	-9.1
2	203.57	37.3 QP	43.5	-6.2	1.50 H	300	49.1	-11.8
3	284.09	41.3 QP	46.0	-4.7	1.50 H	293	49.3	-8.0
4	366.56	42.4 QP	46.0	-3.6	1.50 H	110	48.8	-6.4
5	825.46	38.7 QP	46.0	-7.3	1.01 H	328	34.3	4.4
6	938.01	39.3 QP	46.0	-6.7	1.50 H	146	32.5	6.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

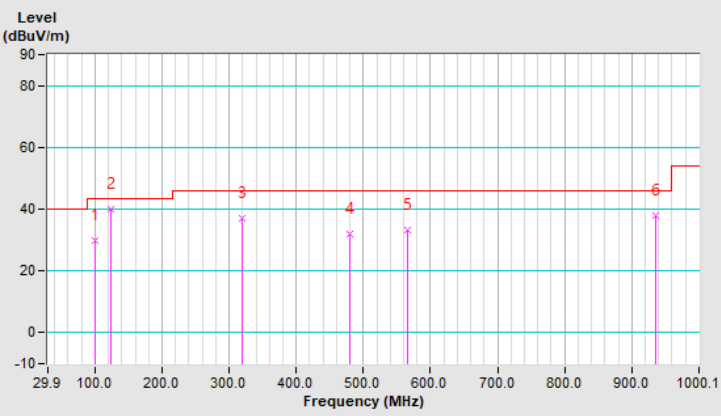


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	100.72	30.0 QP	43.5	-13.5	1.50 V	87	43.2	-13.2
2	124.01	40.2 QP	43.5	-3.3	1.00 V	303	51.0	-10.8
3	319.99	37.2 QP	46.0	-8.8	1.00 V	187	44.4	-7.2
4	480.07	32.1 QP	46.0	-13.9	1.50 V	115	36.4	-4.3
5	566.42	33.1 QP	46.0	-12.9	1.50 V	348	35.6	-2.5
6	935.10	37.8 QP	46.0	-8.2	1.00 V	117	30.9	6.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
5. The emission levels were very low against the limit of frequency range 9kHz ~ 30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 21, 2020	Dec. 20, 2021
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2020	Sep. 03, 2021
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 28, 2021	Jan. 27, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 18, 2020	Aug. 17, 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 2. (Conduction 2)
3. The VCCI Site Registration No. is C-12047.

4.2.3 Test Procedures

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

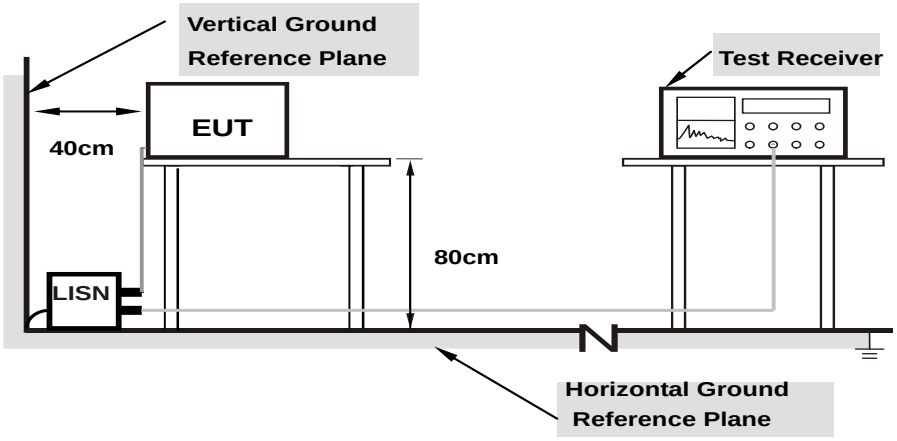
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

Worst-case data:

802.11b

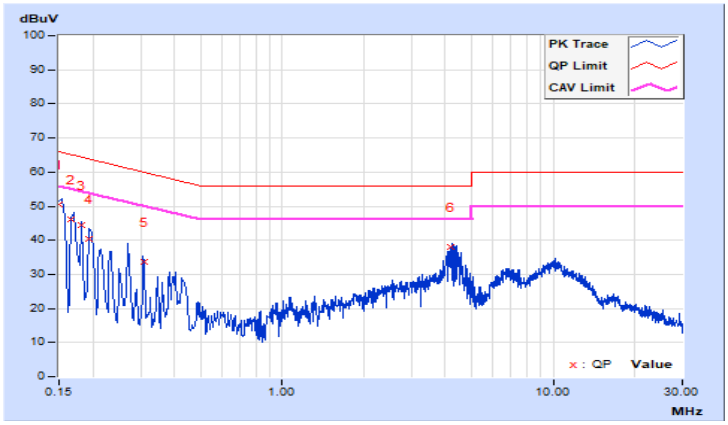
Mode A

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH
Tested by	Hans Wu	**Test Date**	2021/4/23

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.15000	10.07	40.45	22.93	50.52	33.00	66.00	56.00	-15.48	-23.00
2	0.16579	10.07	35.94	17.37	46.01	27.44	65.17	55.17	-19.16	-27.73
3	0.18180	10.07	34.54	16.52	44.61	26.59	64.40	54.40	-19.79	-27.81
4	0.19367	10.08	30.28	11.59	40.36	21.67	63.88	53.88	-23.52	-32.21
5	0.31000	10.09	23.62	8.33	33.71	18.42	59.97	49.97	-26.26	-31.55
6	4.16200	10.22	27.97	10.77	38.19	20.99	56.00	46.00	-17.81	-25.01

Remarks:

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

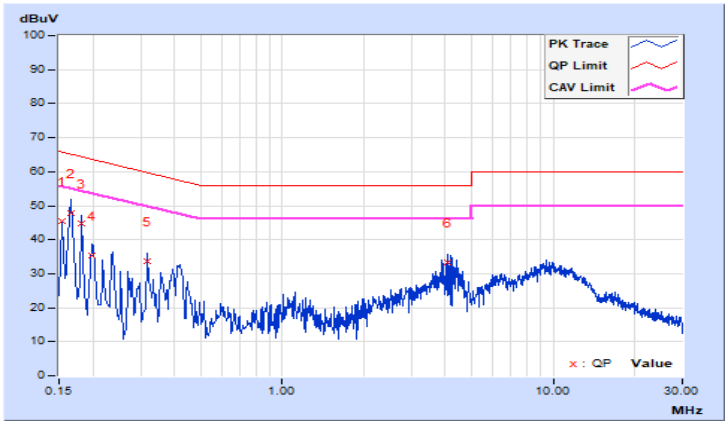


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH
Tested by	Hans Wu	**Test Date**	2021/4/23

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.15400	10.08	35.38	18.23	45.46	28.31	65.78	55.78	-20.32	-27.47
2	0.16535	10.08	37.67	18.79	47.75	28.87	65.19	55.19	-17.44	-26.32
3	0.18180	10.08	34.82	17.67	44.90	27.75	64.40	54.40	-19.50	-26.65
4	0.19728	10.08	25.43	13.56	35.51	23.64	63.72	53.72	-28.21	-30.08
5	0.31800	10.09	23.51	12.71	33.60	22.80	59.76	49.76	-26.16	-26.96
6	4.10200	10.26	23.10	11.90	33.36	22.16	56.00	46.00	-22.64	-23.84

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



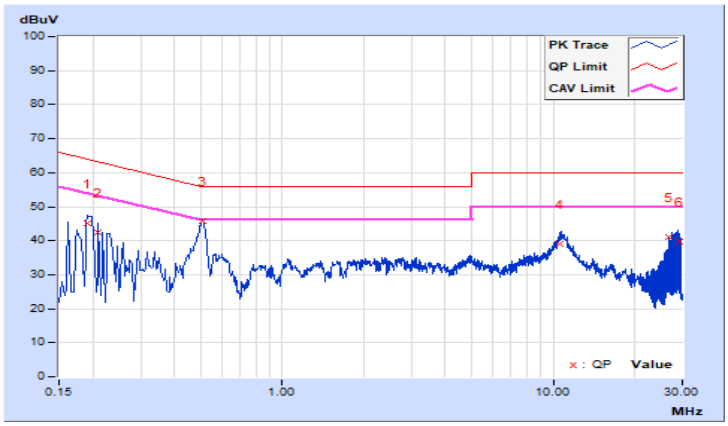
Mode B

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH
Tested by	Hans Wu	**Test Date**	2021/4/23

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.19000	10.08	35.07	20.85	45.15	30.93	64.04	54.04	-18.89	-23.11
2	0.21000	10.08	32.25	19.50	42.33	29.58	63.21	53.21	-20.88	-23.63
3	0.50600	10.10	35.64	30.05	45.74	40.15	56.00	46.00	-10.26	-5.85
4	10.63400	10.33	28.69	23.22	39.02	33.55	60.00	50.00	-20.98	-16.45
5	26.67800	10.28	30.74	26.41	41.02	36.69	60.00	50.00	-18.98	-13.31
6	29.10200	10.22	29.64	22.49	39.86	32.71	60.00	50.00	-20.14	-17.29

Remarks:

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

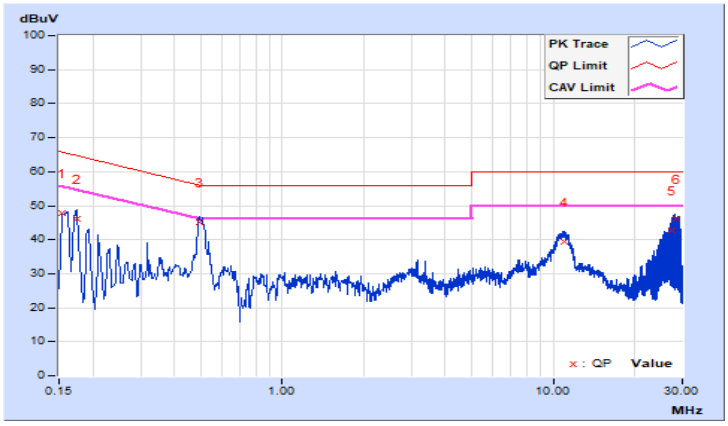


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH
Tested by	Hans Wu	**Test Date**	2021/4/23

Phase Of Power : Neutral (N)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.15400	10.08	37.81	24.10	47.89	34.18	65.78	55.78	-17.89	-21.60
2	0.17400	10.08	36.08	21.58	46.16	31.66	64.77	54.77	-18.61	-23.11
3	**0.49216**	**10.11**	**35.07**	**30.99**	**45.18**	**41.10**	**56.13**	**46.13**	**-10.95**	**-5.03**
4	10.94600	10.43	28.97	23.30	39.40	33.73	60.00	50.00	-20.60	-16.27
5	27.29400	10.45	32.29	27.47	42.74	37.92	60.00	50.00	-17.26	-12.08
6	28.50600	10.42	35.83	32.52	46.25	42.94	60.00	50.00	-13.75	-7.06

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

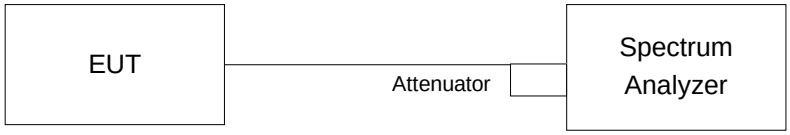


4.3 6dB Bandwidth Measurement

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

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	8.07	8.05	7.59	8.08	0.5	Pass
6	2437	8.08	7.61	8.08	8.01	0.5	Pass
11	2462	8.08	7.59	8.06	7.60	0.5	Pass

802.11g

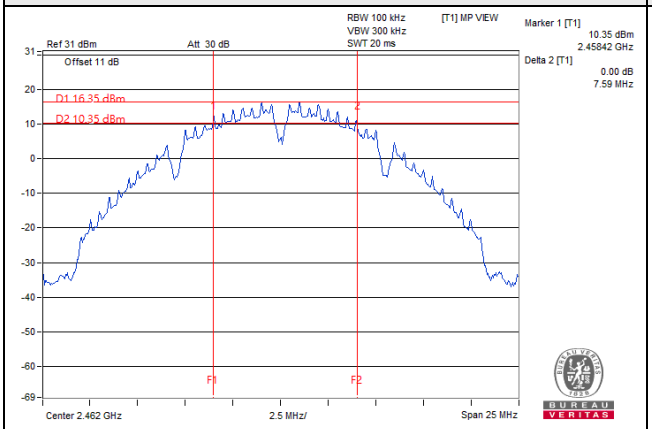
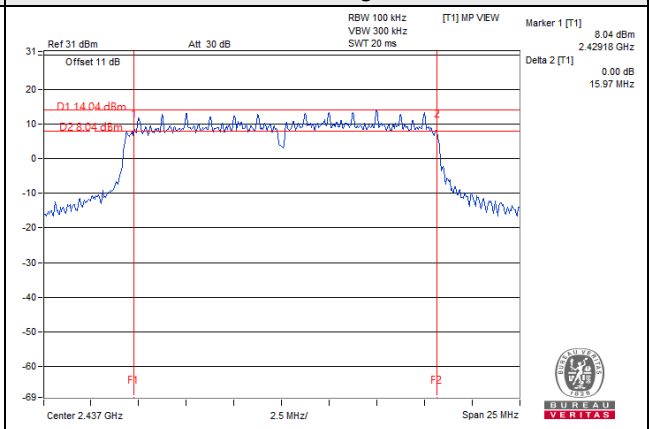
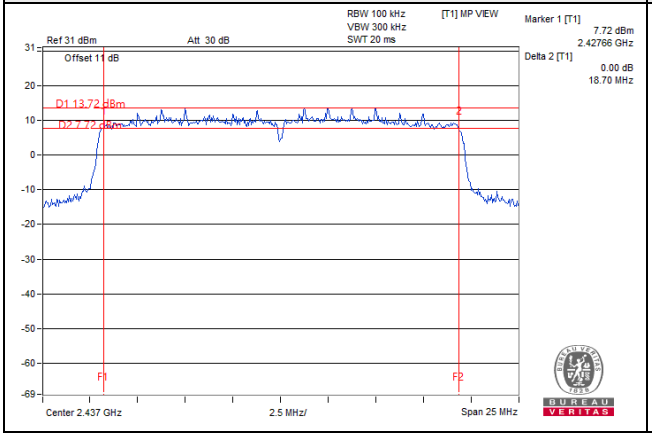
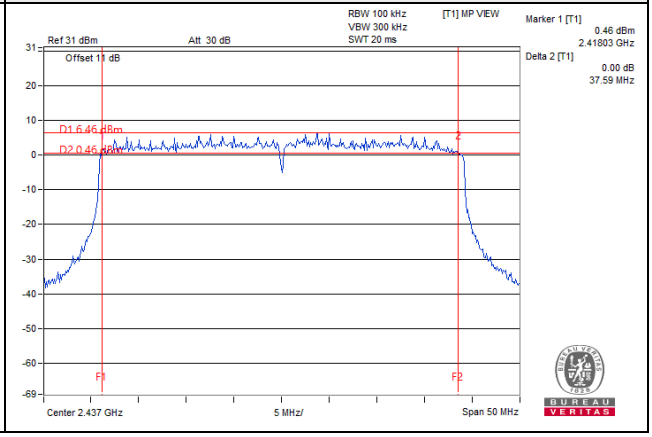
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	16.33	16.39	15.99	16.07	0.5	Pass
6	2437	15.98	15.97	15.97	16.34	0.5	Pass
11	2462	16.33	16.37	16.36	16.38	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
1	2412	18.97	18.90	18.85	18.93	0.5	Pass
6	2437	18.80	18.72	18.70	18.91	0.5	Pass
11	2462	18.74	18.91	18.78	18.80	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
3	2422	37.94	38.06	38.09	37.94	0.5	Pass
6	2437	37.96	37.59	37.86	37.99	0.5	Pass
9	2452	37.95	38.06	38.07	37.93	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

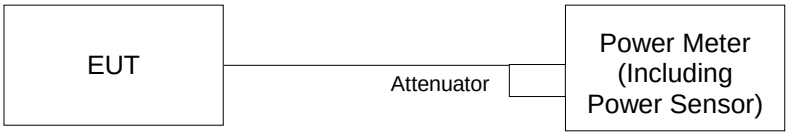
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

CDD Mode

802.11b

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	23.74	23.61	24.06	23.83	962.436	29.83	30.00	Pass
6	2437	23.58	23.46	23.97	23.72	934.818	29.71	30.00	Pass
11	2462	23.62	23.52	23.93	23.74	938.814	29.73	30.00	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	19.77	19.72	19.79	19.74	378.067	25.78	30.00	Pass
6	2437	23.84	23.72	23.69	23.62	941.636	29.74	30.00	Pass
11	2462	20.45	20.16	20.33	20.12	425.367	26.29	30.00	Pass

802.11n (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	19.88	19.69	19.90	19.57	378.682	25.78	30.00	Pass
6	2437	23.67	23.72	23.82	23.60	938.391	29.72	30.00	Pass
11	2462	18.56	18.29	18.65	18.50	283.309	24.52	30.00	Pass

802.11n (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	19.18	19.00	19.23	18.85	322.716	25.09	30.00	Pass
6	2437	19.47	19.38	19.52	19.31	350.054	25.44	30.00	Pass
9	2452	18.62	18.40	18.69	18.33	283.999	24.53	30.00	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	19.93	19.77	20.01	19.72	387.23	25.88	30.00	Pass
6	2437	23.83	23.81	23.87	23.67	958.573	29.82	30.00	Pass
11	2462	18.61	18.32	18.78	18.53	287.325	24.58	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	19.20	19.11	19.34	18.98	329.616	25.18	30.00	Pass
6	2437	19.55	19.47	19.62	19.40	357.387	25.53	30.00	Pass
9	2452	18.64	18.48	18.72	18.45	288.041	24.59	30.00	Pass

Beamforming Mode

802.11n (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	19.88	19.69	19.90	19.57	378.682	25.78	30	Pass
6	2437	23.67	23.72	23.82	23.60	938.391	29.72	30	Pass
11	2462	18.56	18.29	18.65	18.50	283.309	24.52	30	Pass

Note: Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.

802.11n (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	19.18	19.00	19.23	18.85	322.716	25.09	30	Pass
6	2437	19.47	19.38	19.52	19.31	350.054	25.44	30	Pass
9	2452	18.62	18.40	18.69	18.33	283.999	24.53	30	Pass

Note: Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
1	2412	19.93	19.77	20.01	19.72	387.23	25.88	30	Pass
6	2437	23.83	23.81	23.87	23.67	958.573	29.82	30	Pass
11	2462	18.61	18.32	18.78	18.53	287.325	24.58	30	Pass

Note: Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
3	2422	19.20	19.11	19.34	18.98	329.616	25.18	30	Pass
6	2437	19.55	19.47	19.62	19.40	357.387	25.53	30	Pass
9	2452	18.64	18.48	18.72	18.45	288.041	24.59	30	Pass

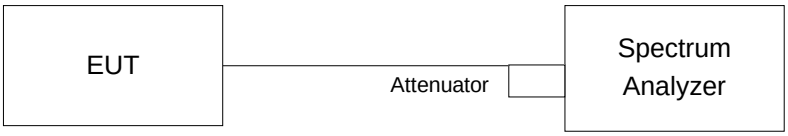
Note: Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. 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

802.11b

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-13.41	6.02	2.43	-4.96	8	Pass
	6	2437	-11.56	6.02	2.43	-3.11	8	Pass
	11	2462	-12.04	6.02	2.43	-3.59	8	Pass
1	1	2412	-13.32	6.02	2.43	-4.87	8	Pass
	6	2437	-12.82	6.02	2.43	-4.37	8	Pass
	11	2462	-12.97	6.02	2.43	-4.52	8	Pass
2	1	2412	-13.17	6.02	2.43	-4.72	8	Pass
	6	2437	-11.94	6.02	2.43	-3.49	8	Pass
	11	2462	-11.89	6.02	2.43	-3.44	8	Pass
3	1	2412	-12.99	6.02	2.43	-4.54	8	Pass
	6	2437	-11.56	6.02	2.43	-3.11	8	Pass
	11	2462	-12.04	6.02	2.43	-3.59	8	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11g

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-15.95	6.02	0.37	-9.56	8	Pass
	6	2437	-11.58	6.02	0.37	-5.19	8	Pass
	11	2462	-14.79	6.02	0.37	-8.4	8	Pass
1	1	2412	-15.93	6.02	0.37	-9.54	8	Pass
	6	2437	-11.96	6.02	0.37	-5.57	8	Pass
	11	2462	-15.52	6.02	0.37	-9.13	8	Pass
2	1	2412	-15.86	6.02	0.37	-9.47	8	Pass
	6	2437	-11.91	6.02	0.37	-5.52	8	Pass
	11	2462	-14.57	6.02	0.37	-8.18	8	Pass
3	1	2412	-15.95	6.02	0.37	-9.56	8	Pass
	6	2437	-11.58	6.02	0.37	-5.19	8	Pass
	11	2462	-14.79	6.02	0.37	-8.4	8	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

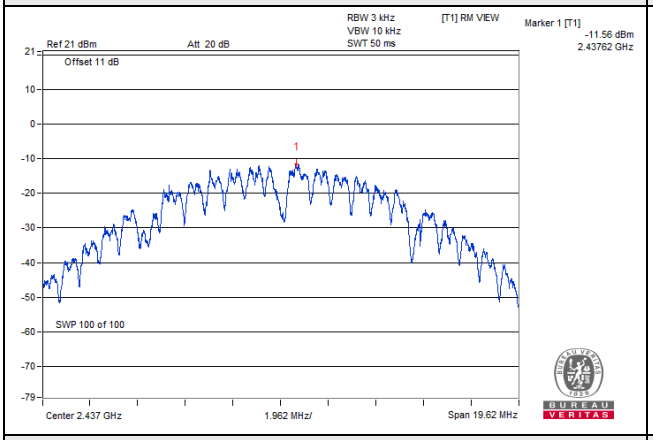
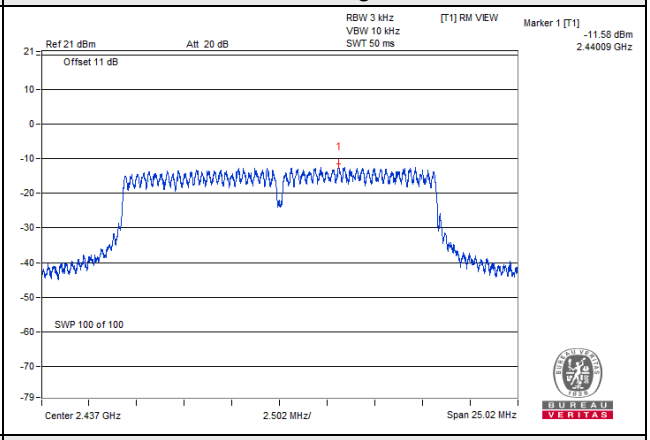
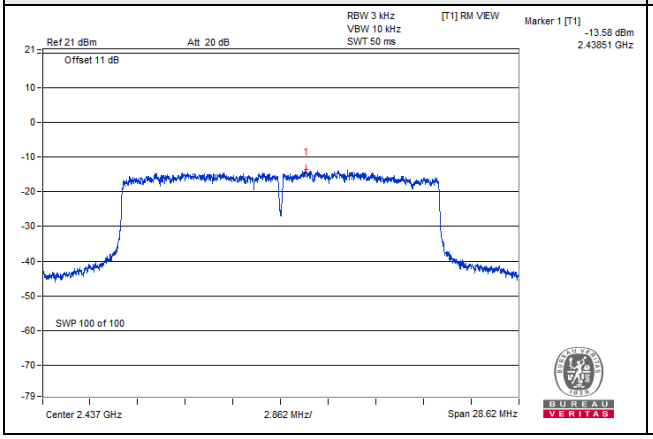
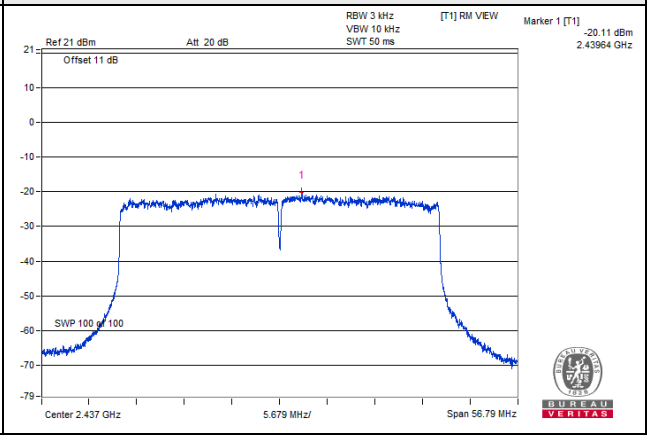
TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-17.68	6.02	0.28	-11.38	8	Pass
	6	2437	-13.67	6.02	0.28	-7.37	8	Pass
	11	2462	-18.12	6.02	0.28	-11.82	8	Pass
1	1	2412	-17.52	6.02	0.28	-11.22	8	Pass
	6	2437	-13.74	6.02	0.28	-7.44	8	Pass
	11	2462	-19.22	6.02	0.28	-12.92	8	Pass
2	1	2412	-17.54	6.02	0.28	-11.24	8	Pass
	6	2437	-13.58	6.02	0.28	-7.28	8	Pass
	11	2462	-18.69	6.02	0.28	-12.39	8	Pass
3	1	2412	-17.8	6.02	0.28	-11.5	8	Pass
	6	2437	-13.67	6.02	0.28	-7.37	8	Pass
	11	2462	-18.12	6.02	0.28	-11.82	8	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-21.08	6.02	0.32	-14.74	8	Pass
	6	2437	-20.48	6.02	0.32	-14.14	8	Pass
	9	2452	-21.16	6.02	0.32	-14.82	8	Pass
1	3	2422	-21.15	6.02	0.32	-14.81	8	Pass
	6	2437	-20.11	6.02	0.32	-13.77	8	Pass
	9	2452	-21.28	6.02	0.32	-14.94	8	Pass
2	3	2422	-21.11	6.02	0.32	-14.77	8	Pass
	6	2437	-20.7	6.02	0.32	-14.36	8	Pass
	9	2452	-21.39	6.02	0.32	-15.05	8	Pass
3	3	2422	-20.7	6.02	0.32	-14.36	8	Pass
	6	2437	-20.48	6.02	0.32	-14.14	8	Pass
	9	2452	-21.16	6.02	0.32	-14.82	8	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 5.85dBi < 6dBi, so there is no need to reduce the output power limit.
3. Refer to section 3.3 for duty cycle spectrum plot.

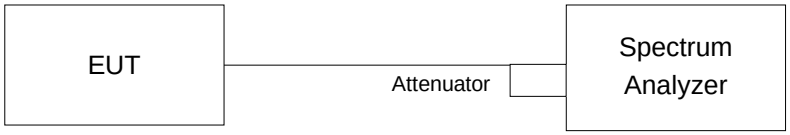
Spectrum Plot of Worst Value	
802.11b	802.11g
	
802.11ax (HE20)	802.11ax (HE40)
	

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

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

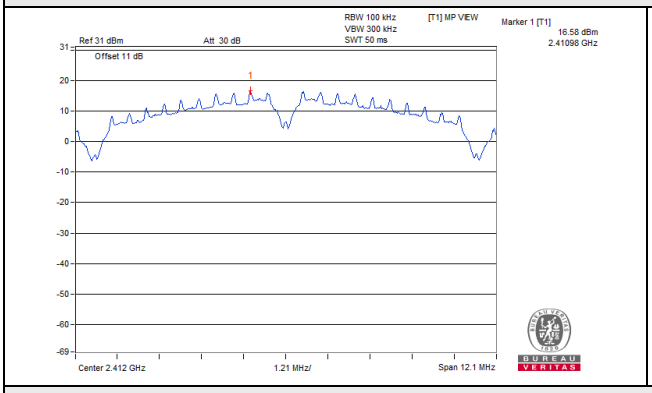
Same as item 4.3.6

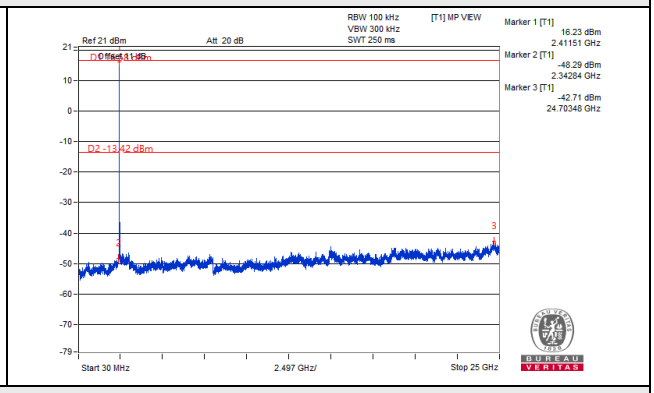
4.6.7 Test Results

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.

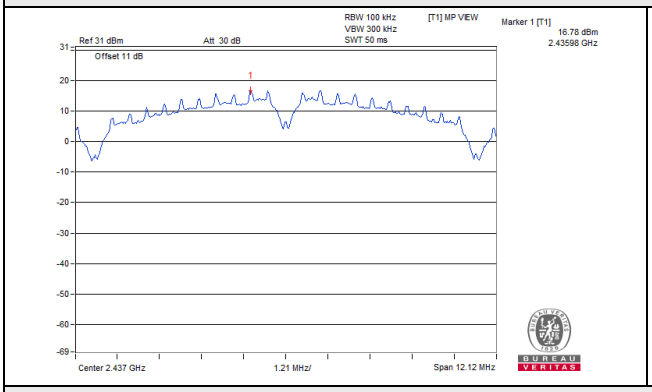
802.11b_Chain 0

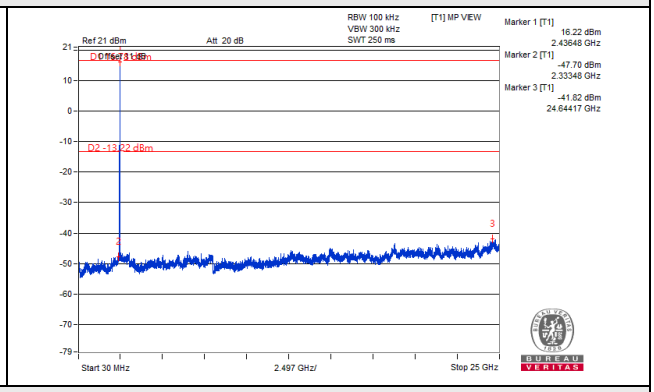
CH 1



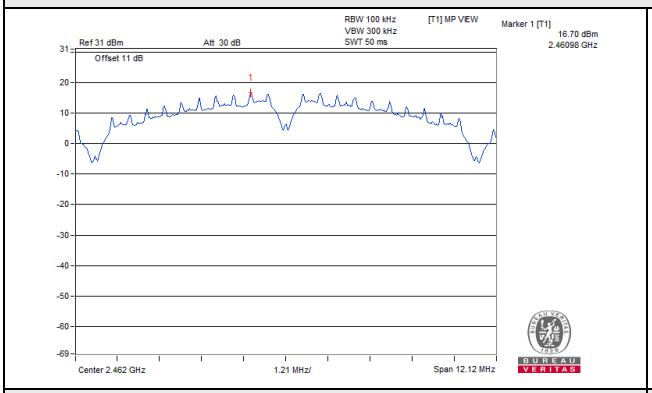


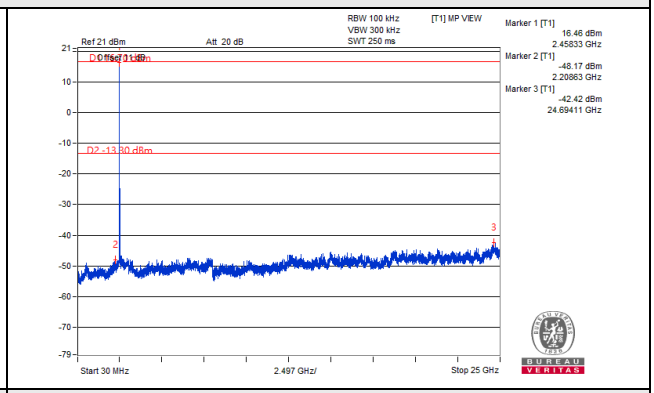
CH 6



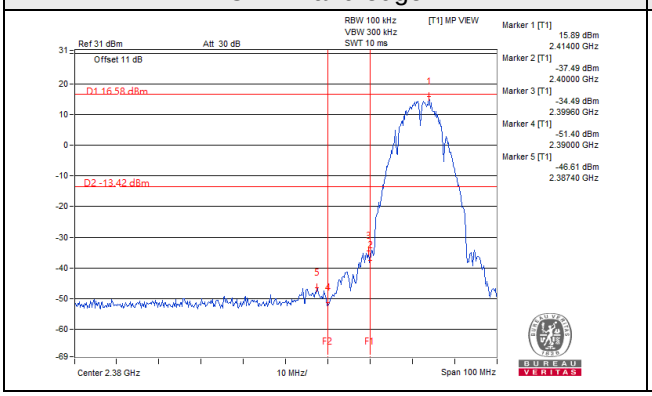


CH 11

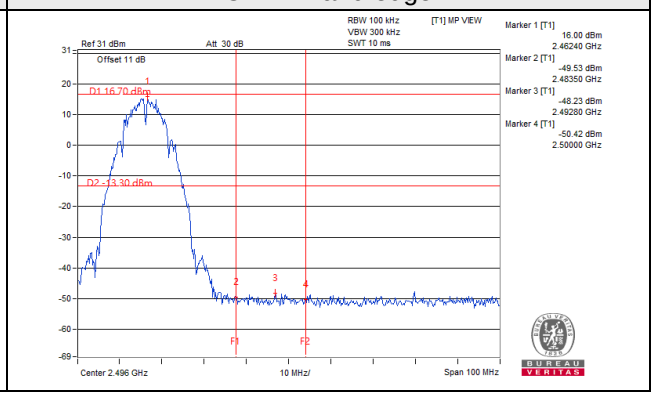




CH 1 Band edge

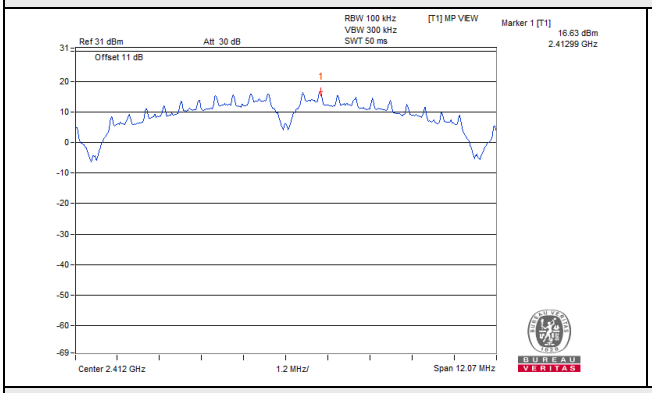


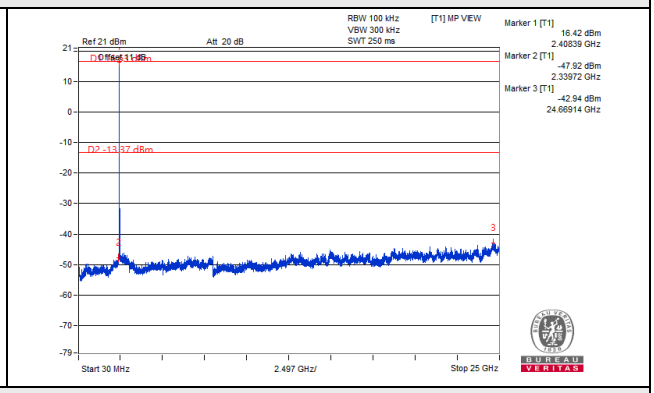
CH 11 Band edge



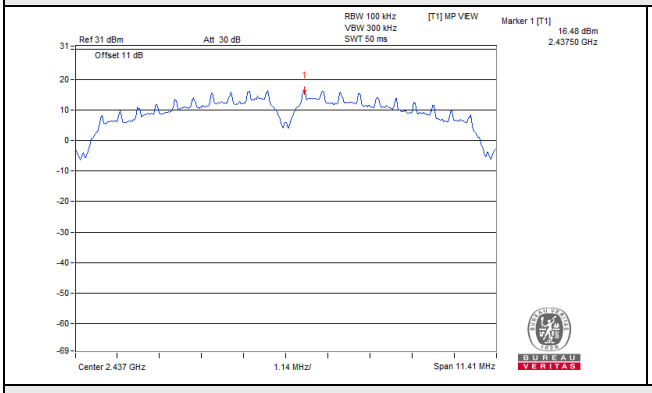
802.11b_Chain 1

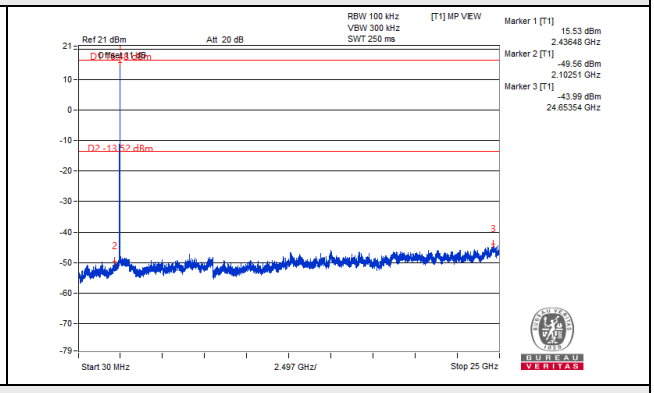
CH 1



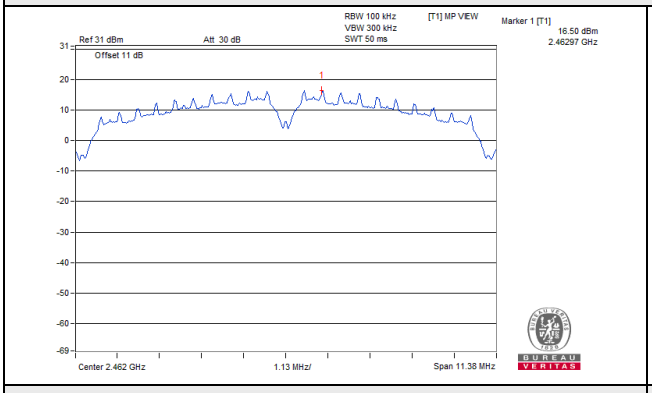


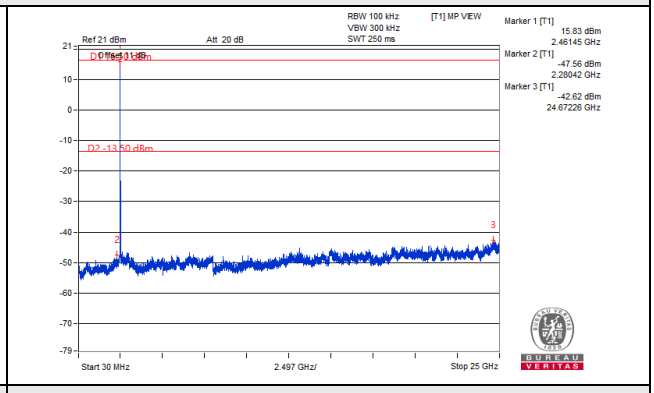
CH 6



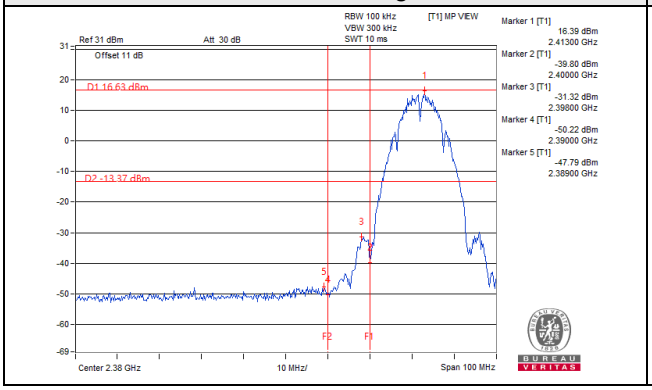


CH 11

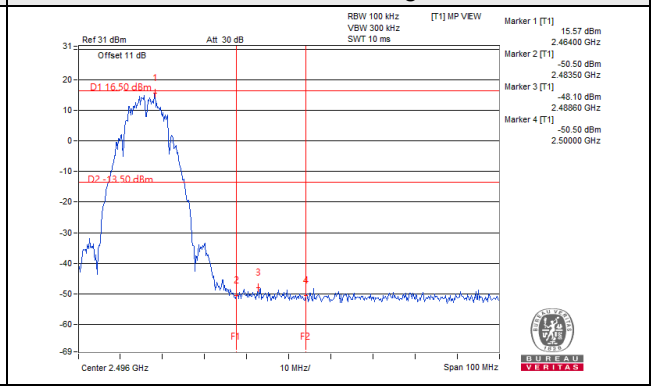




CH 1 Band edge

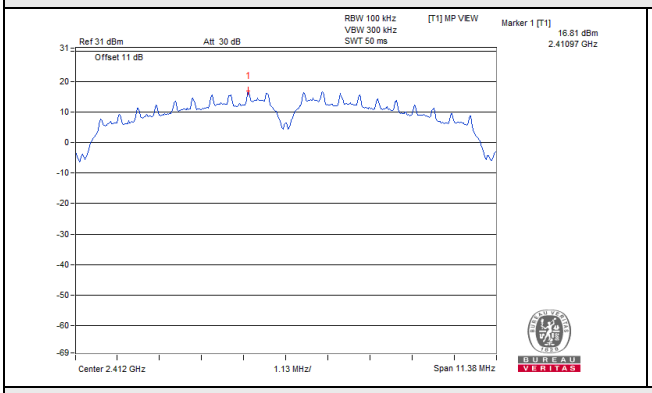


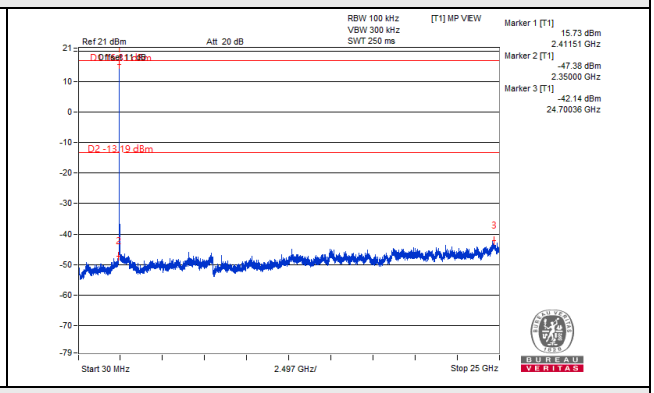
CH 11 Band edge



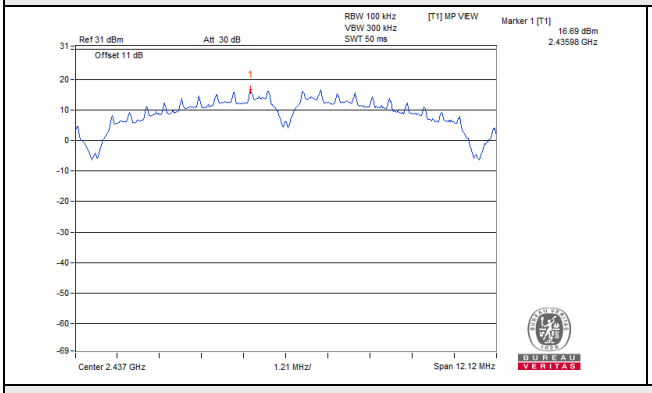
802.11b_Chain 2

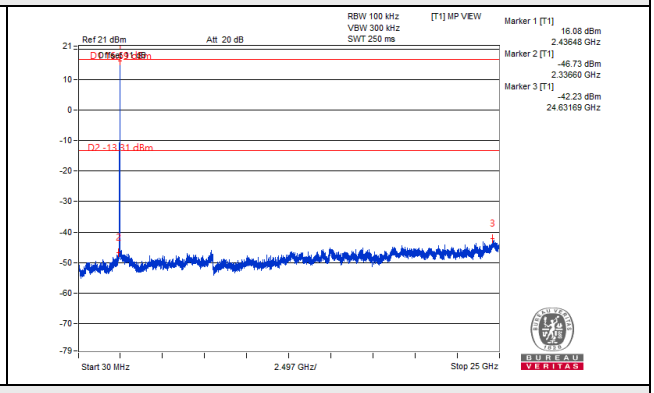
CH 1



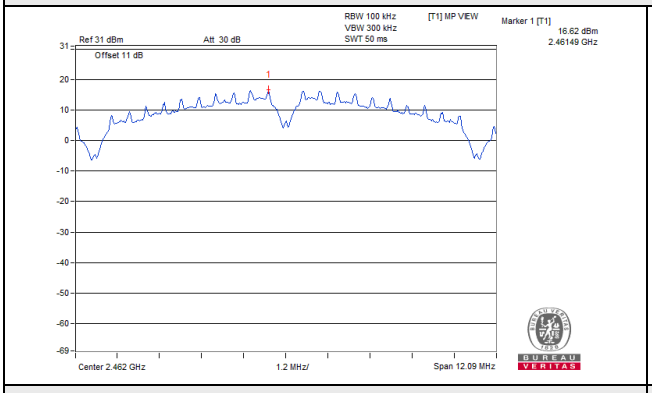


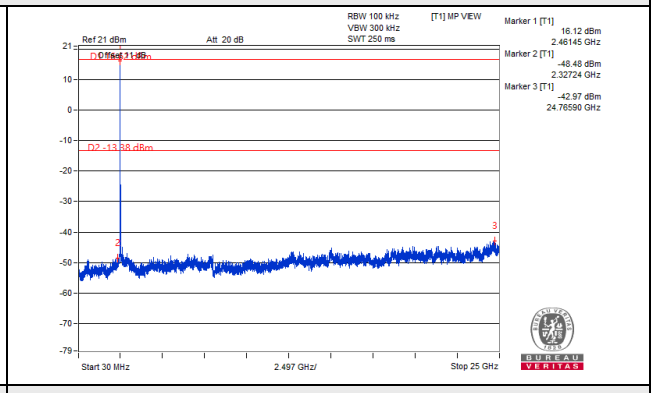
CH 6



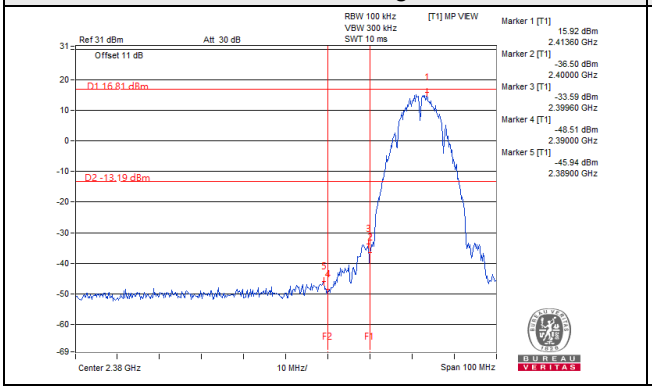


CH 11

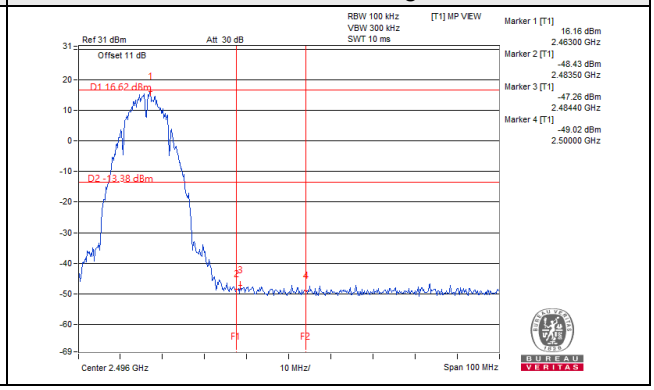




CH 1 Band edge

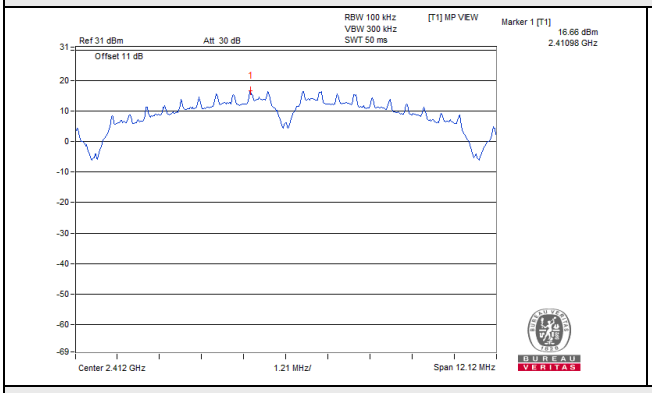


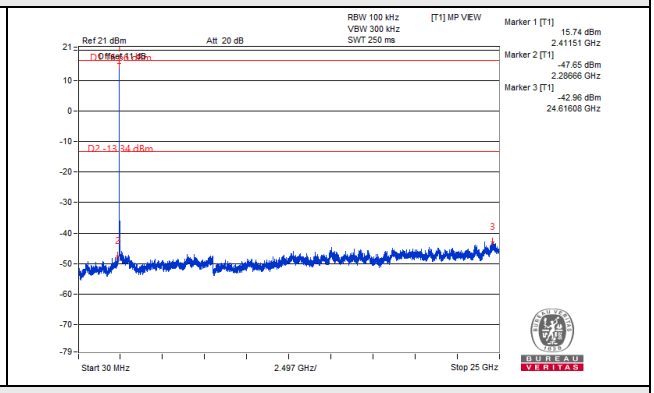
CH 11 Band edge



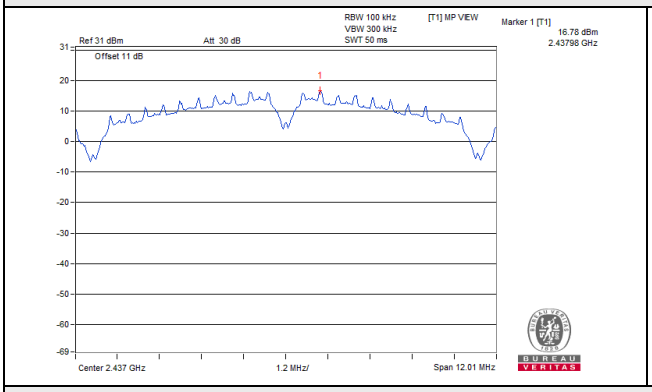
802.11b_Chain 3

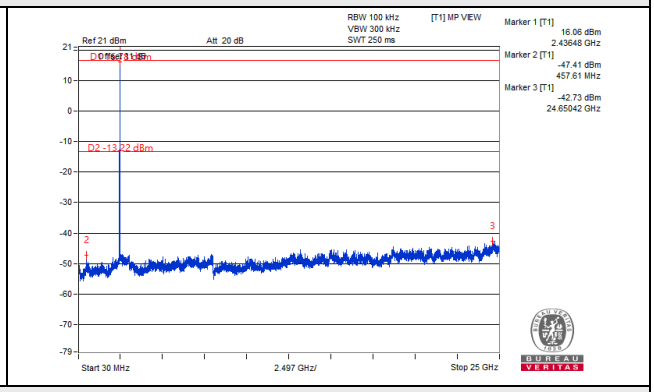
CH 1



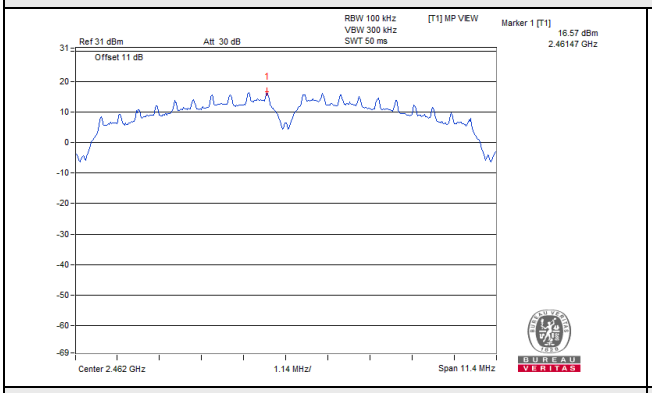


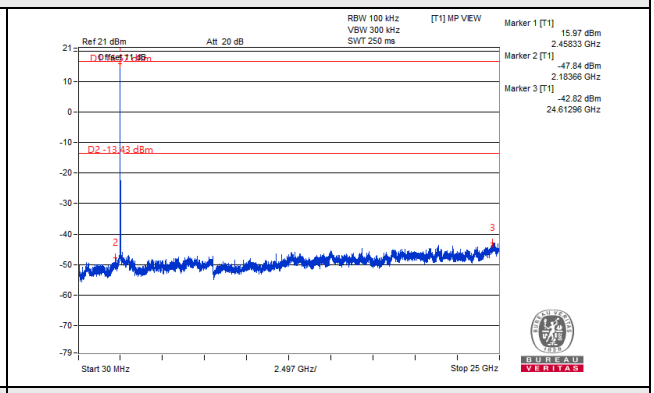
CH 6



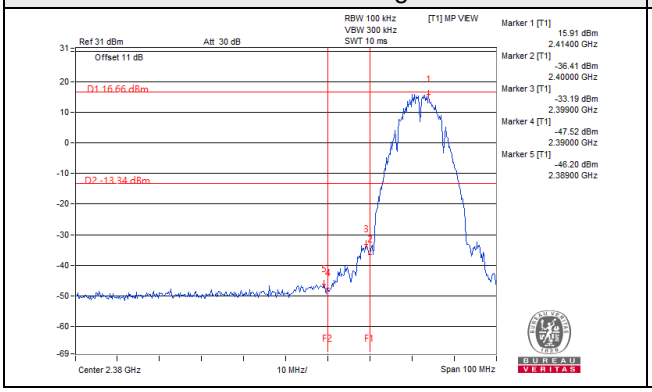


CH 11

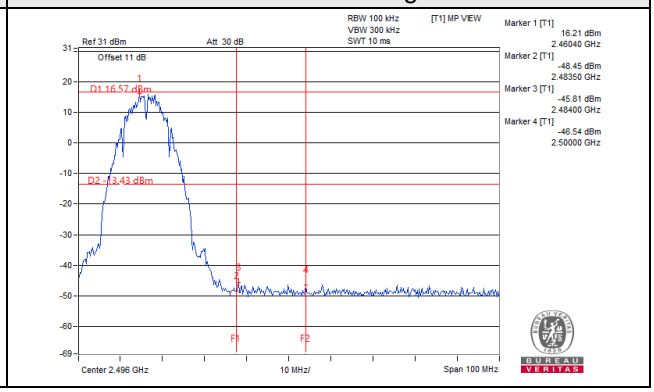




CH 1 Band edge

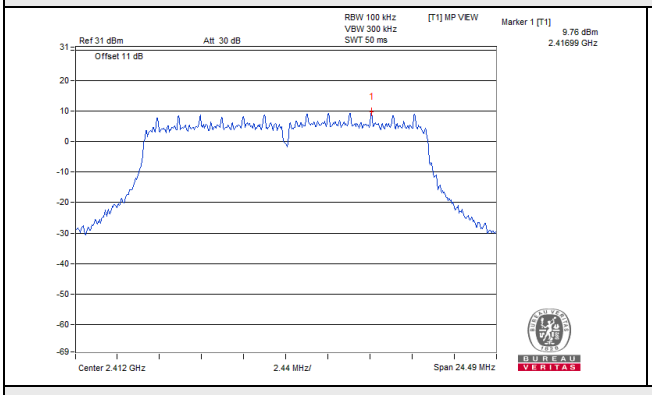


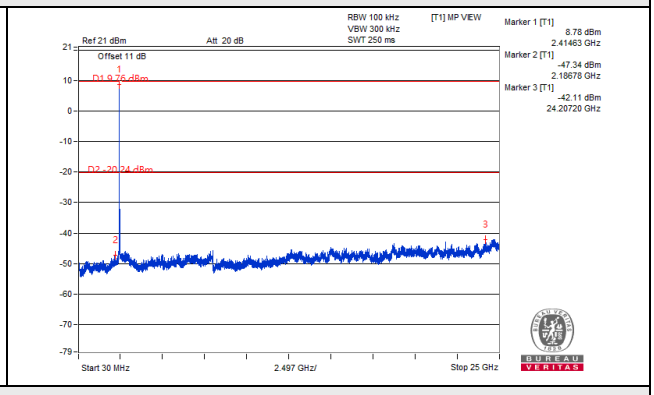
CH 11 Band edge



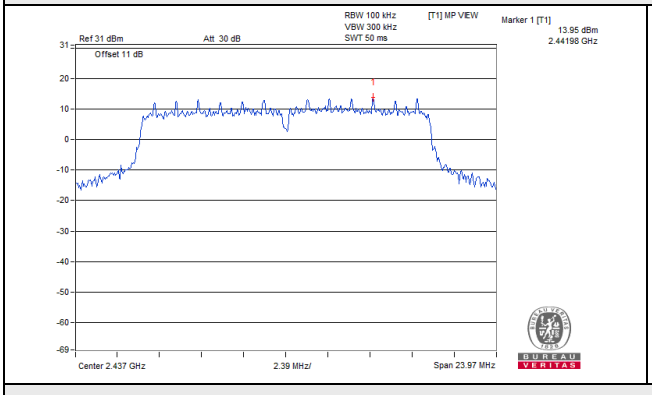
802.11g_Chain 0

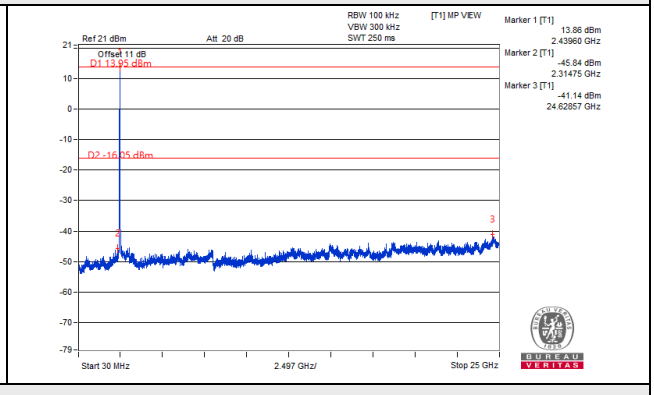
CH 1



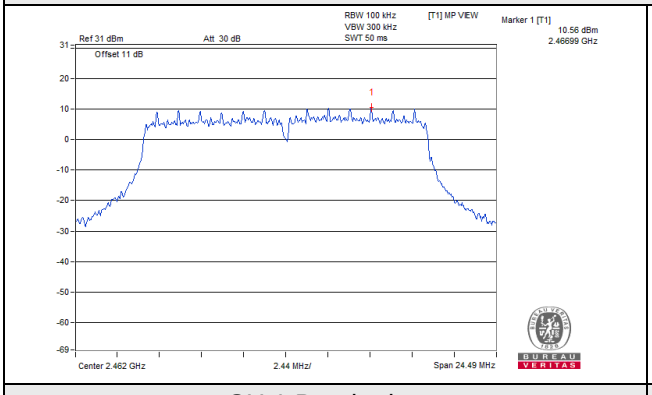


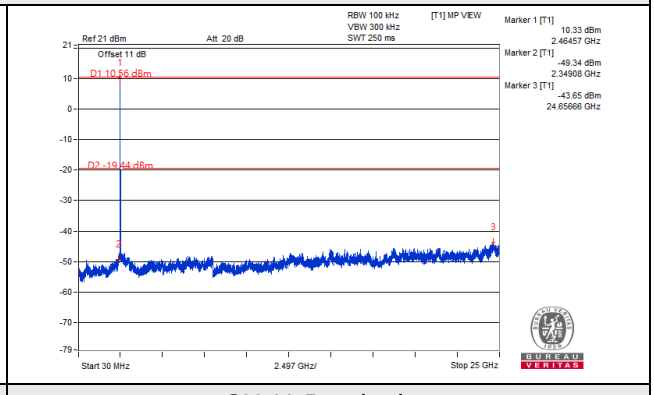
CH 6



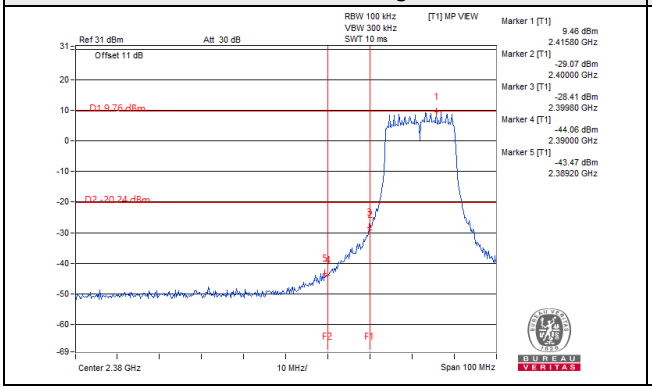


CH 11

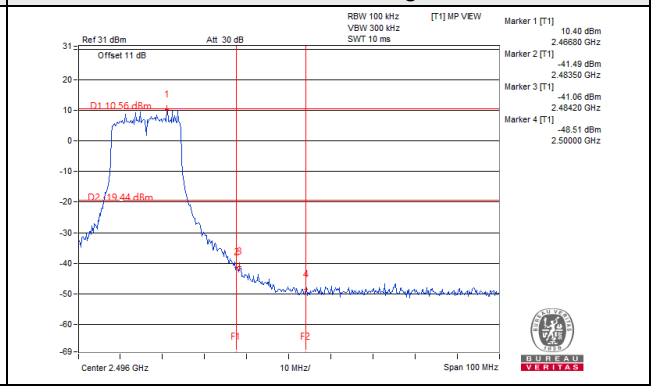




CH 1 Band edge

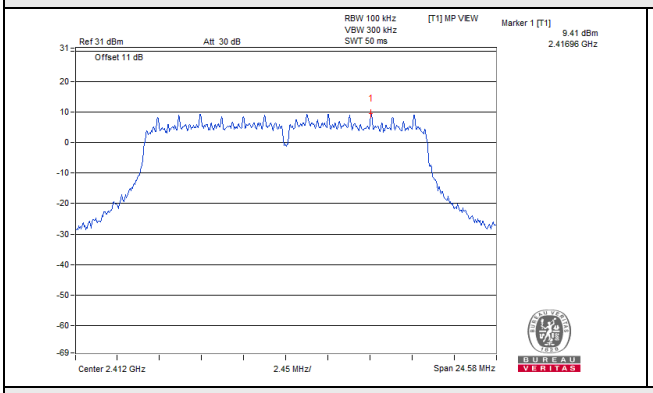


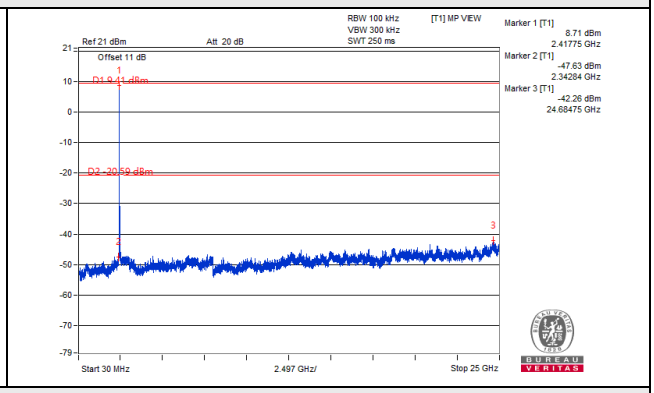
CH 11 Band edge



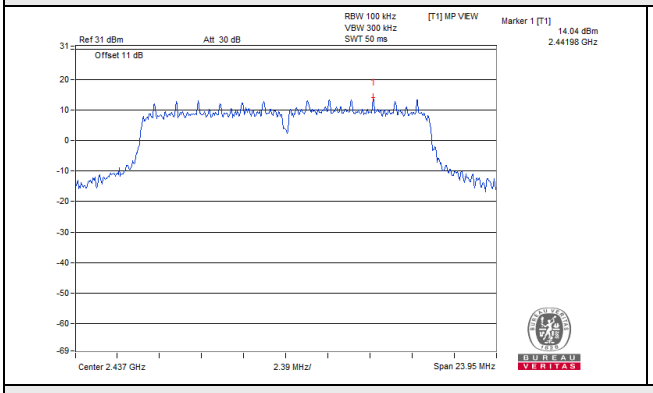
802.11g_Chain 1

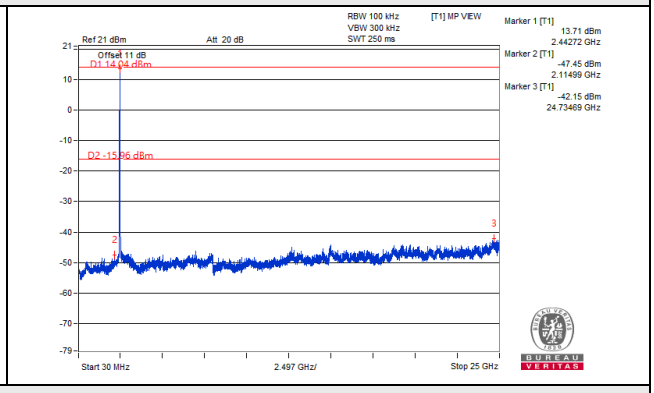
CH 1



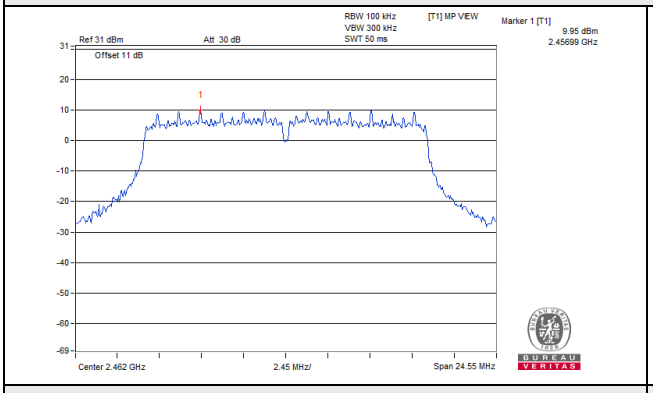


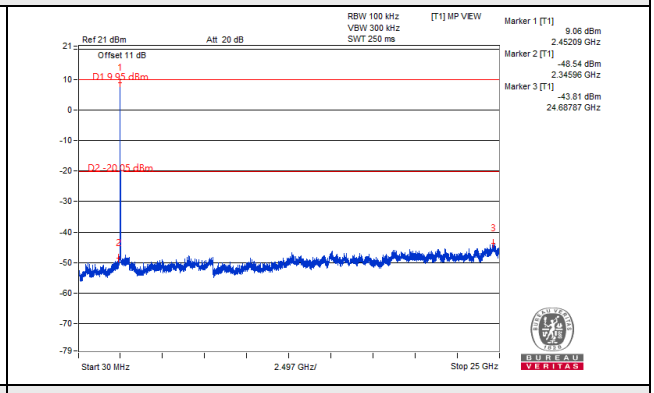
CH 6



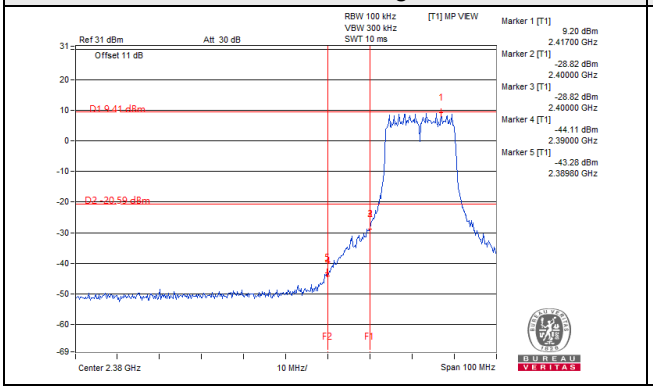


CH 11

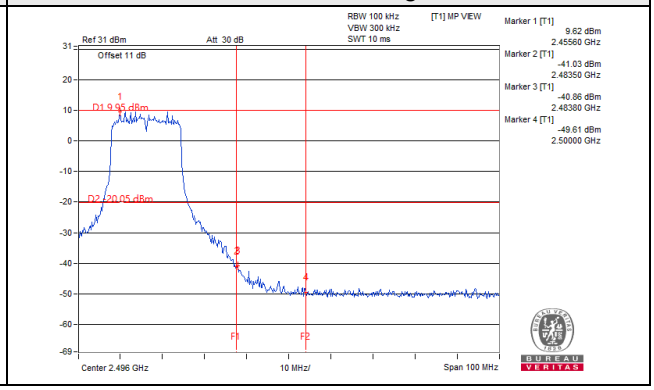




CH 1 Band edge

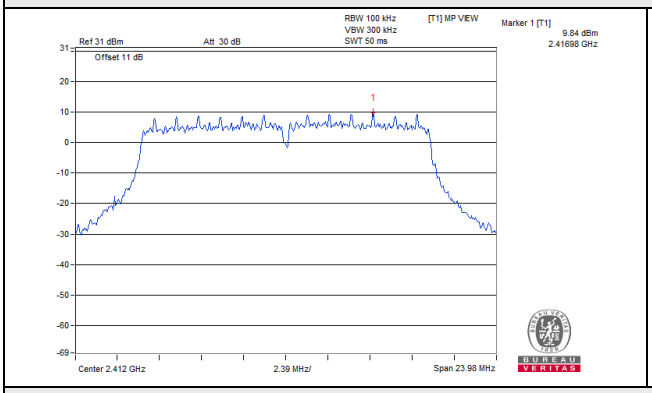


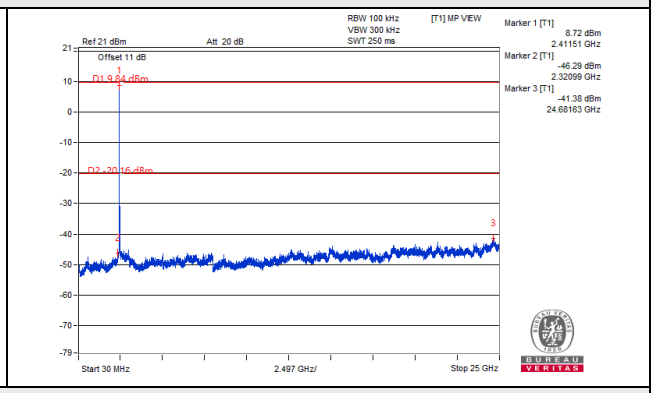
CH 11 Band edge



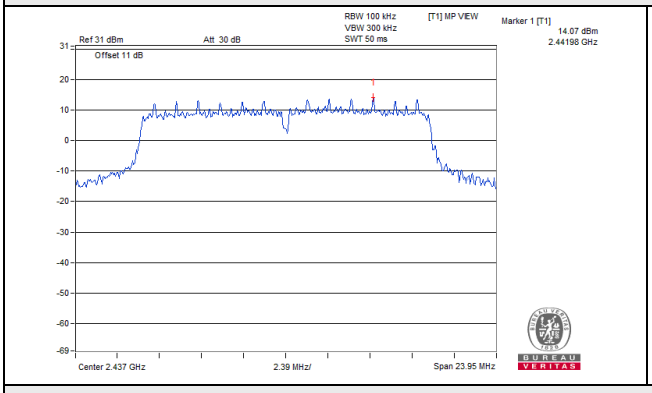
802.11g_Chain 2

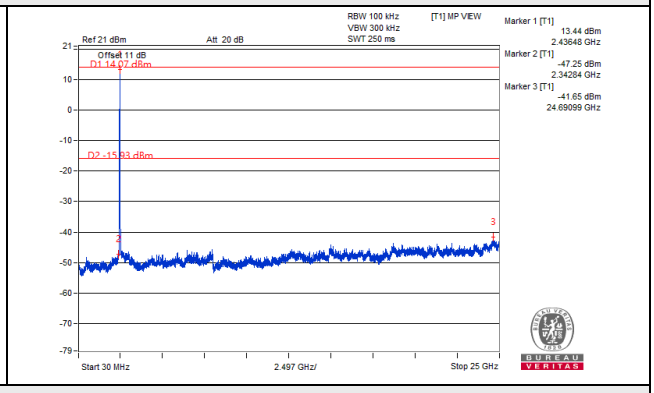
CH 1



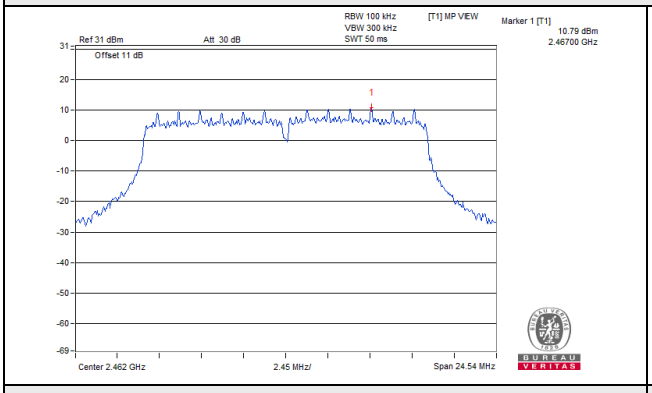


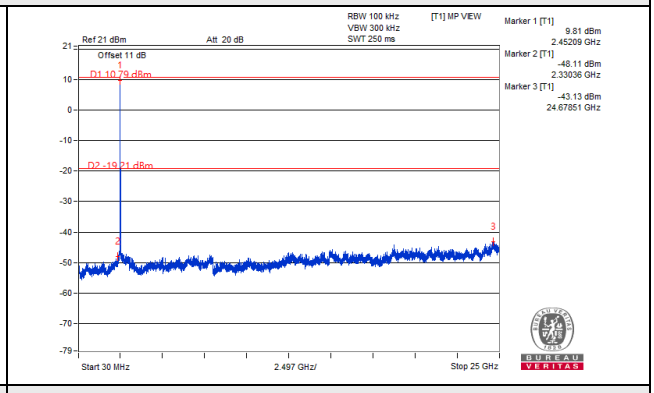
CH 6



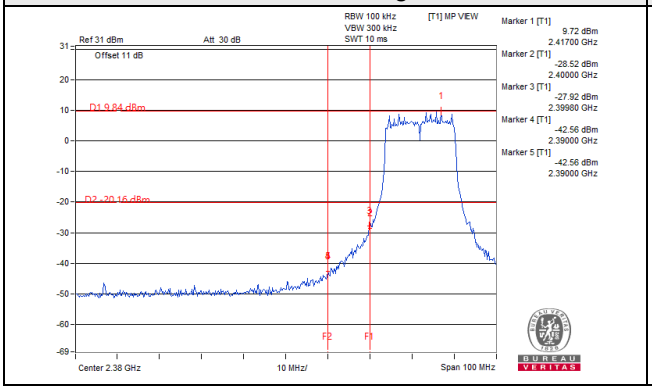


CH 11

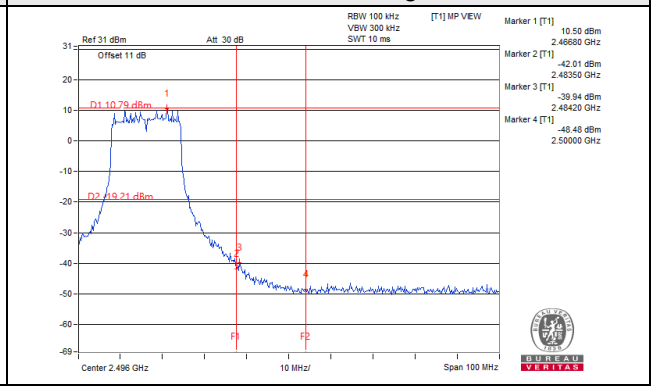




CH 1 Band edge

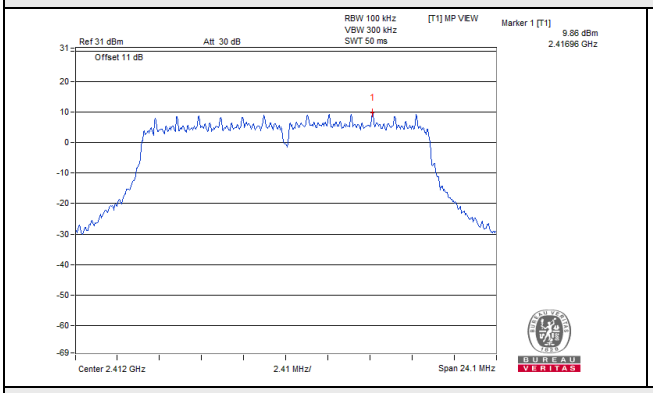


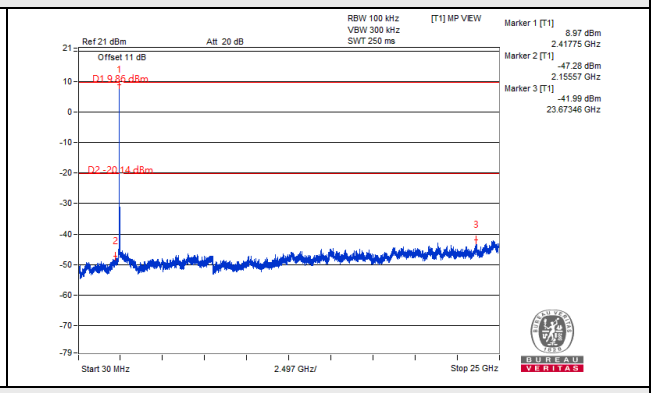
CH 11 Band edge



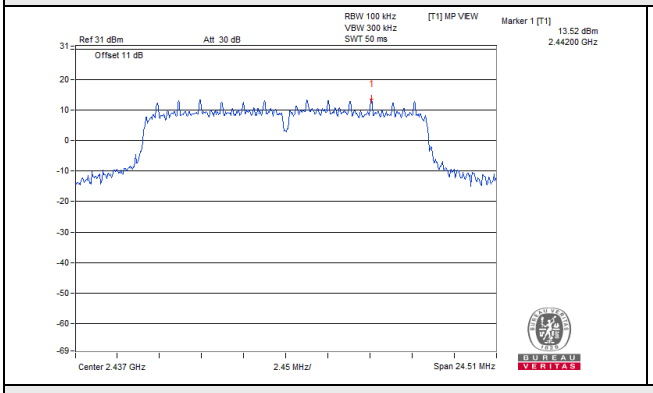
802.11g_Chain 3

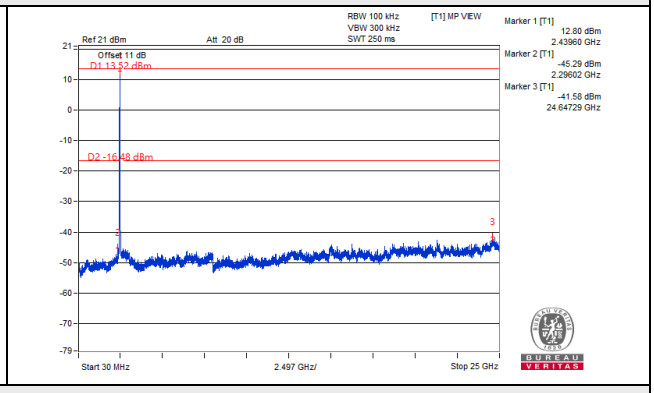
CH 1



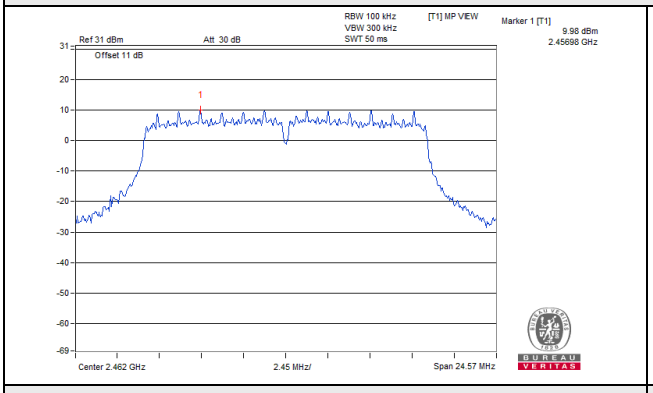


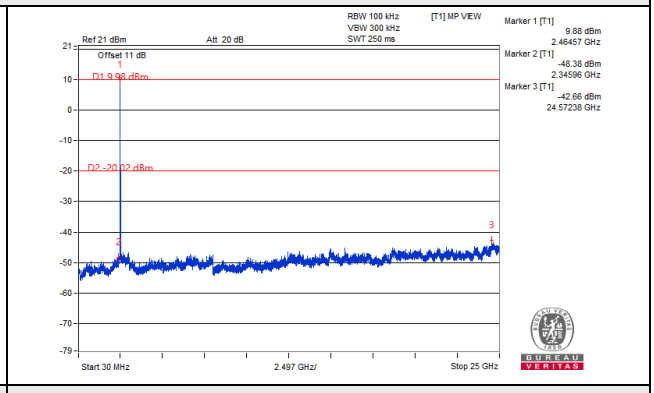
CH 6



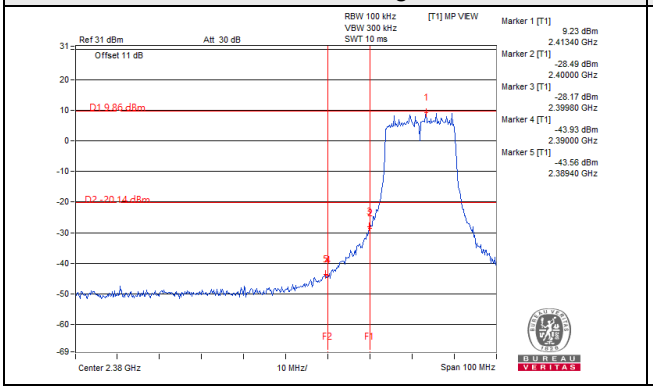


CH 11

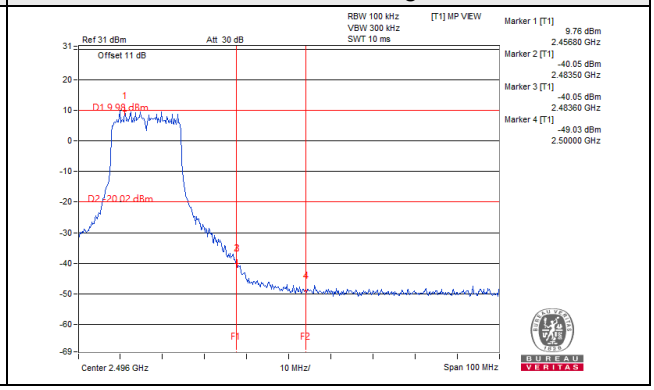




CH 1 Band edge

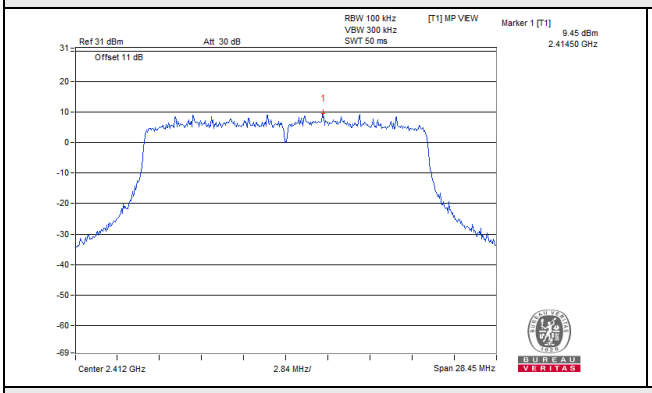


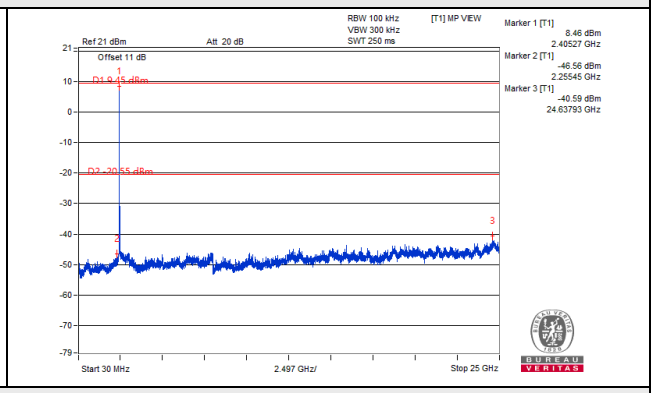
CH 11 Band edge



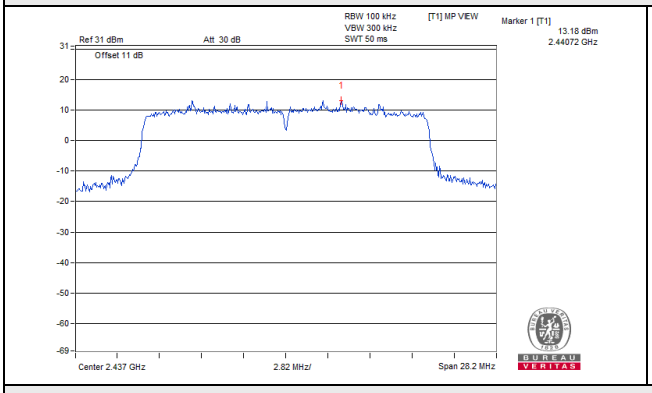
802.11ax (HE20)_Chain 0

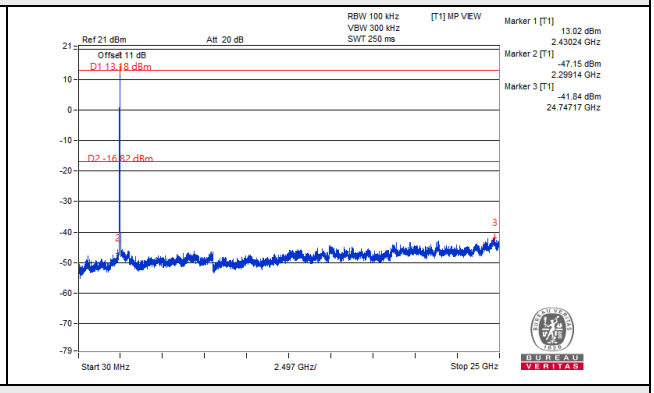
CH 1



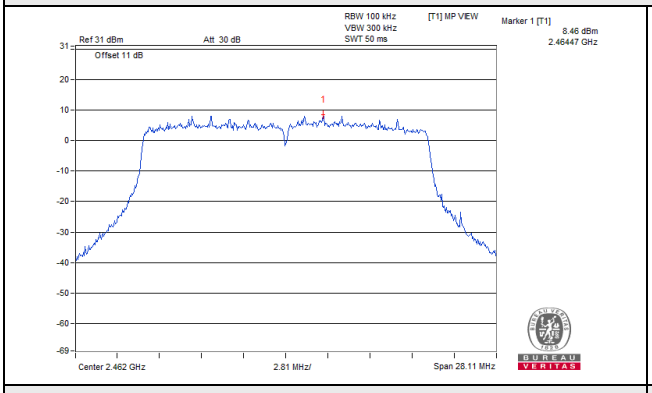


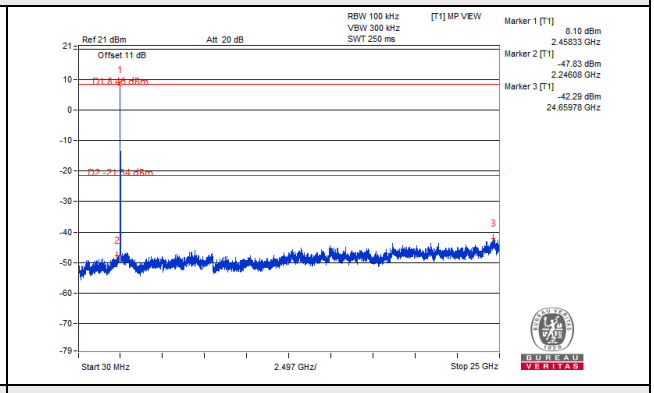
CH 6



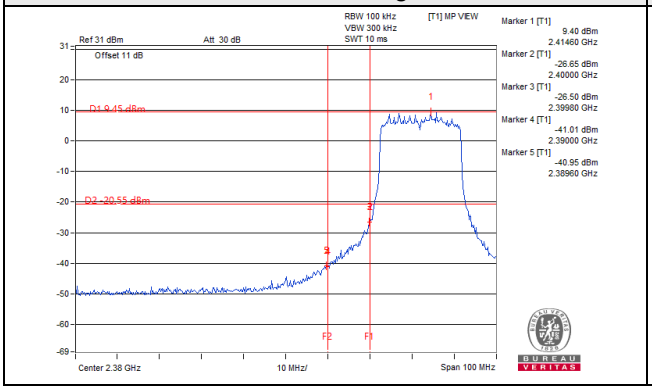


CH 11

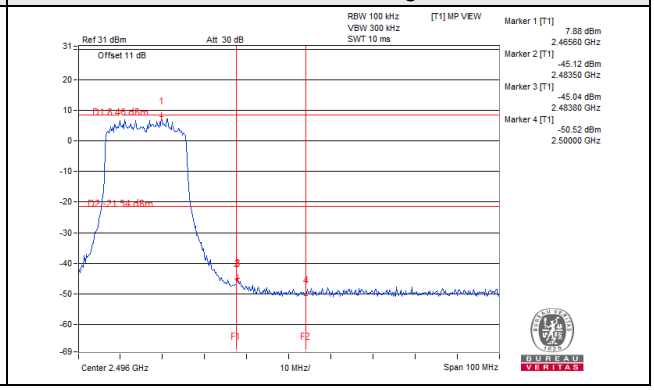




CH 1 Band edge

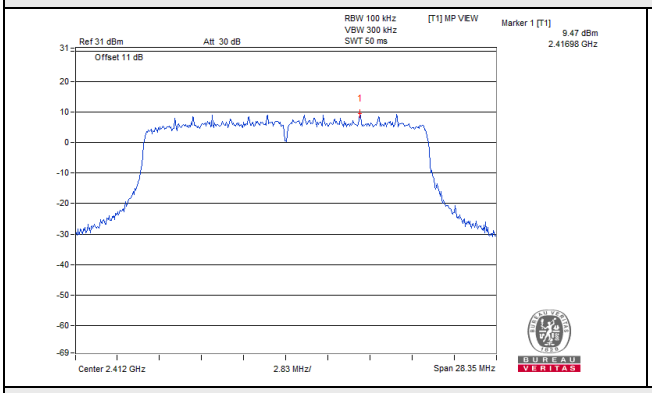


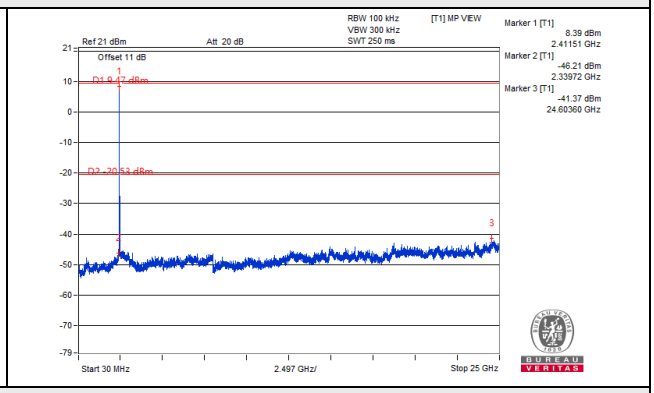
CH 11 Band edge



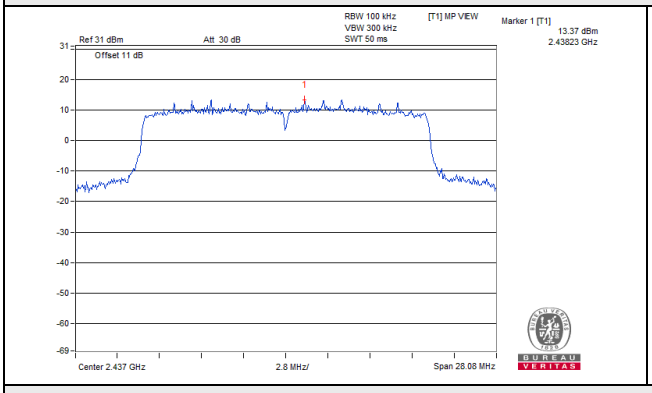
802.11ax (HE20)_Chain 1

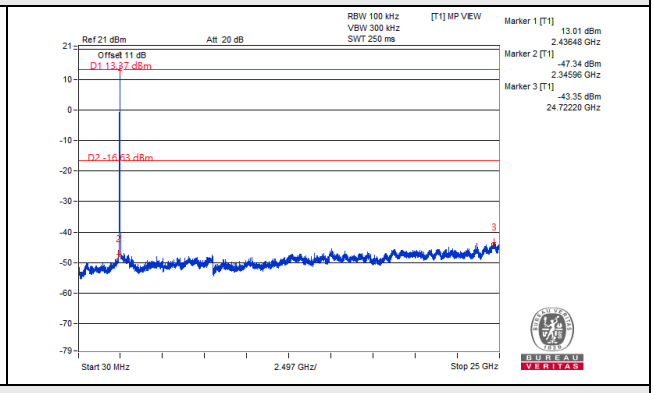
CH 1



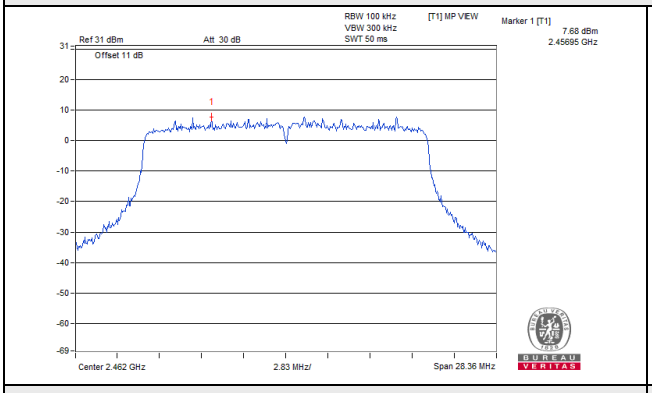


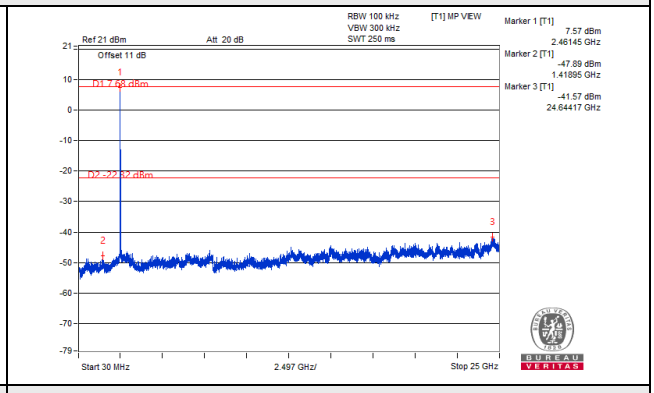
CH 6



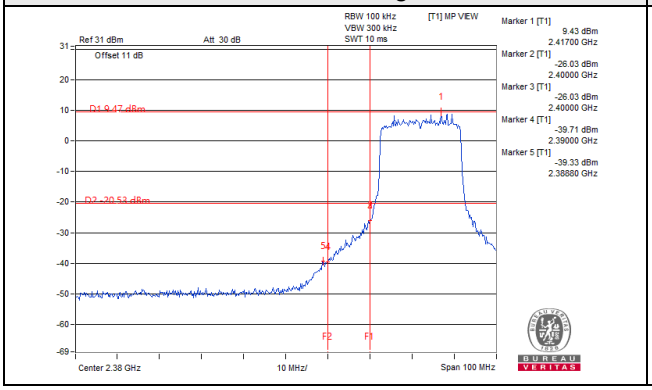


CH 11

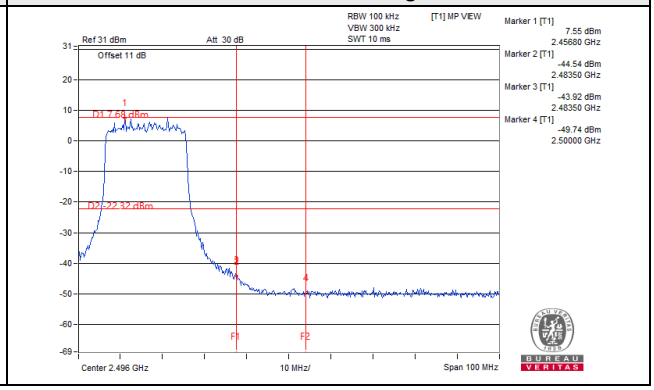




CH 1 Band edge

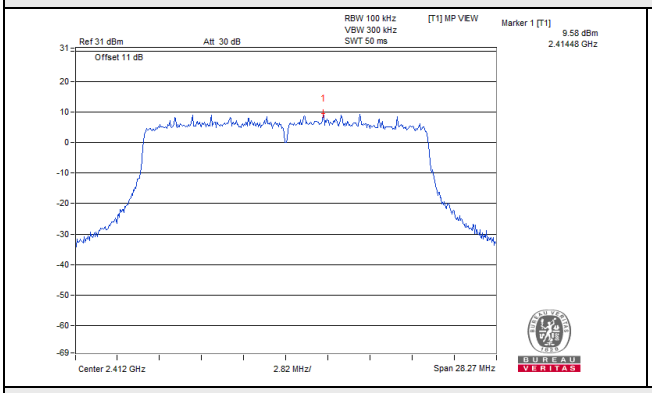


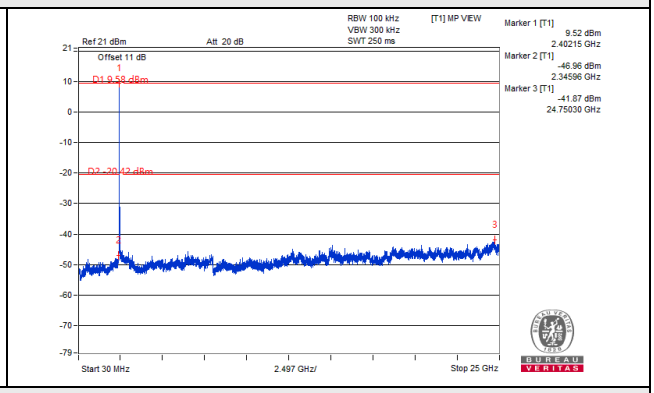
CH 11 Band edge



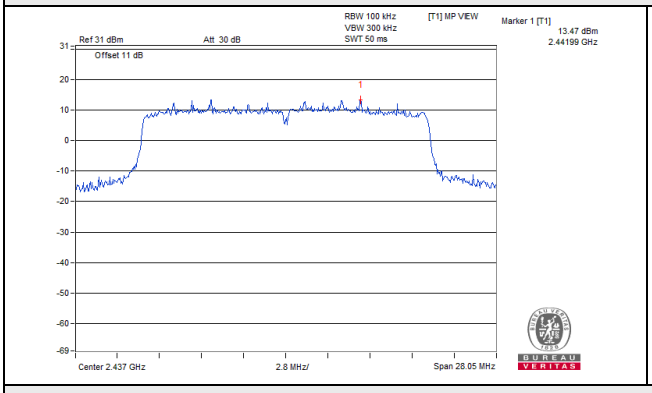
802.11ax (HE20)_Chain 2

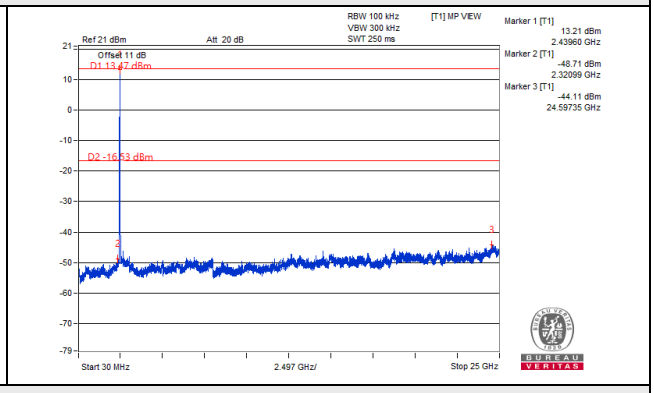
CH 1



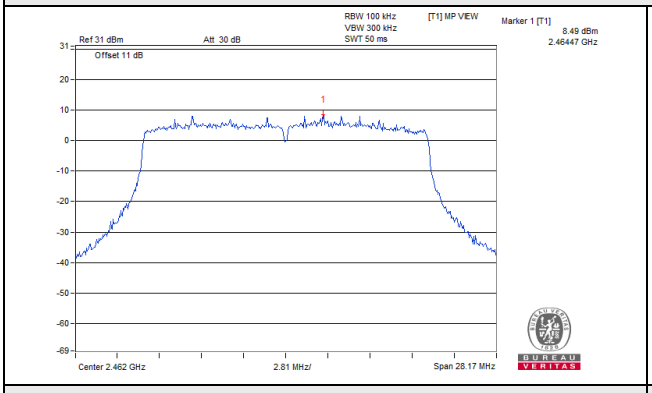


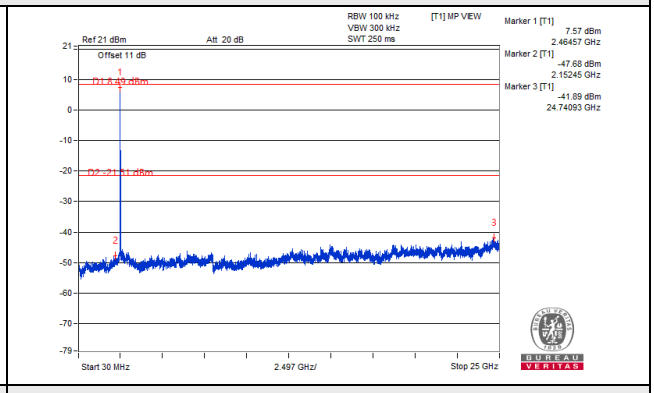
CH 6



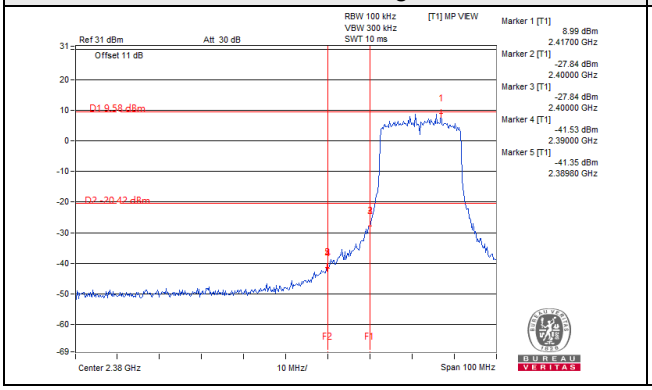


CH 11

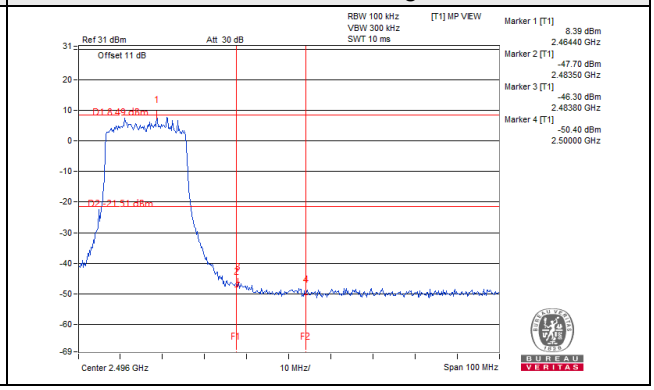




CH 1 Band edge

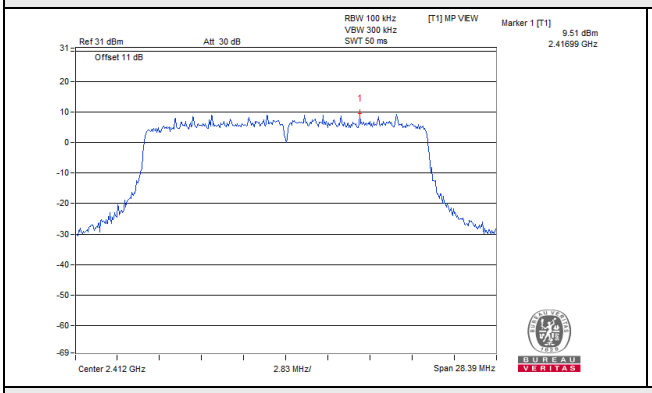


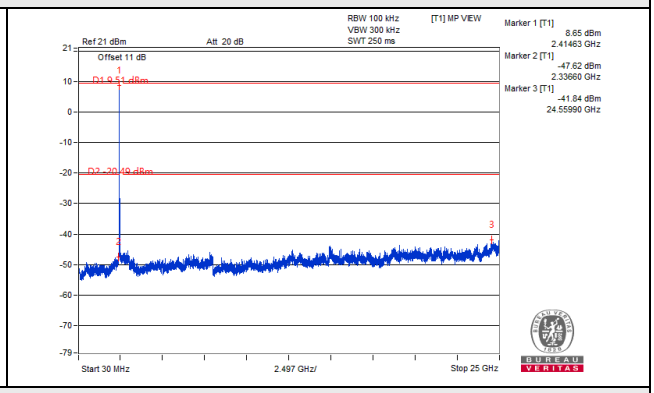
CH 11 Band edge



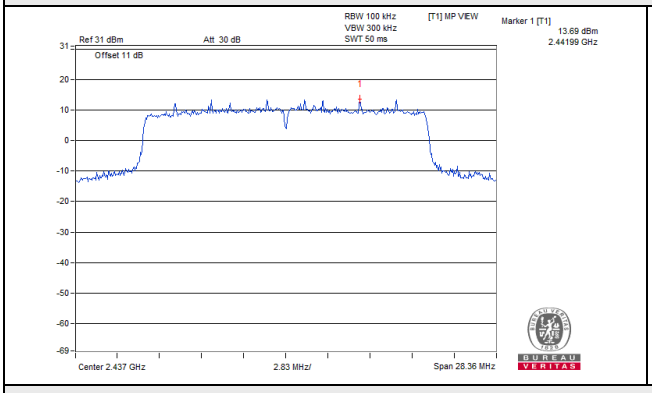
802.11ax (HE20)_Chain 3

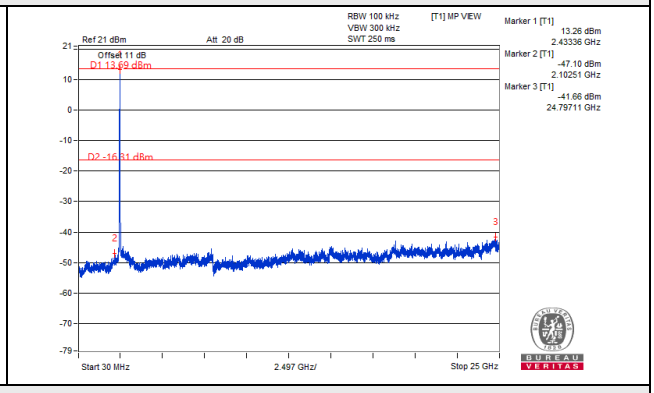
CH 1



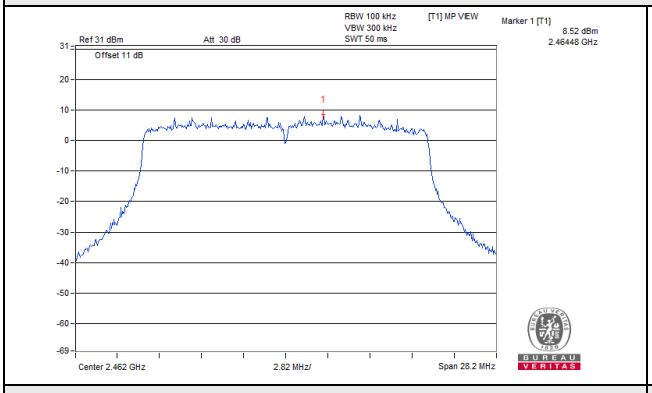


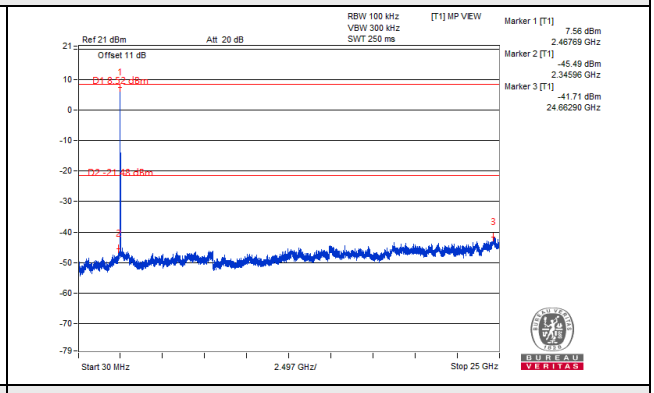
CH 6



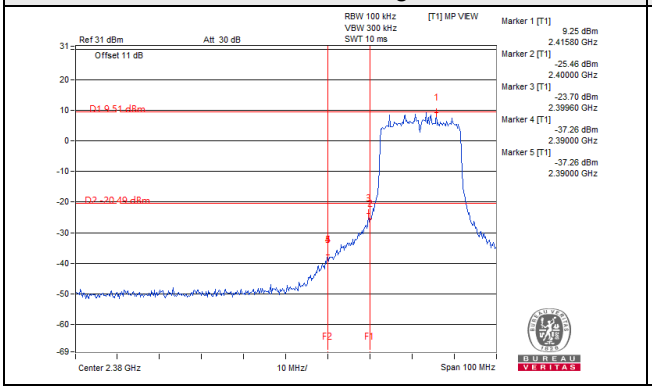


CH 11

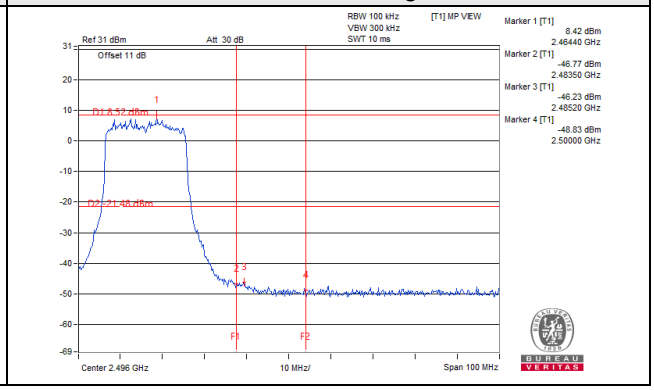




CH 1 Band edge

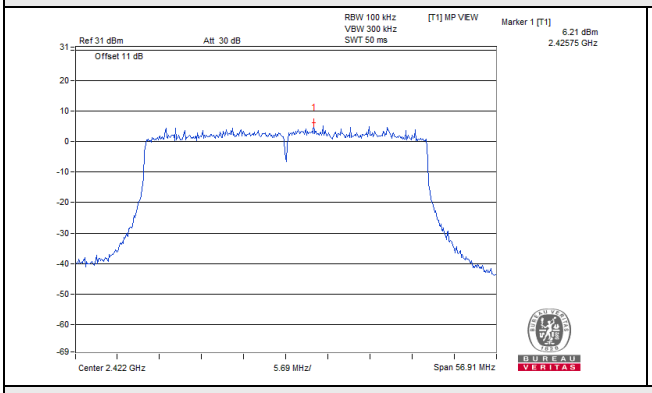


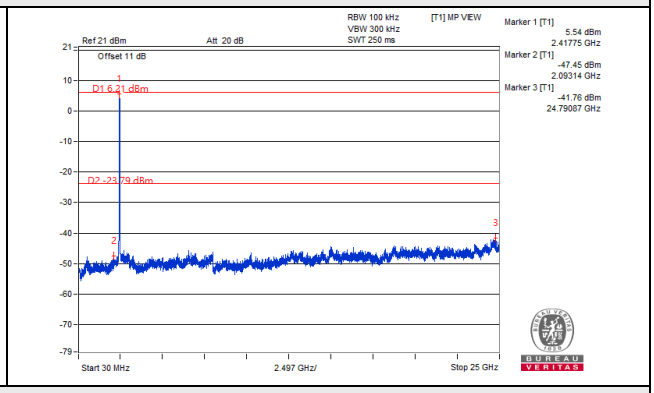
CH 11 Band edge



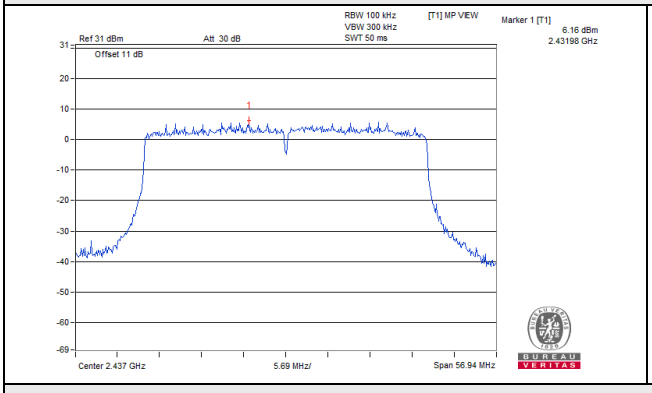
802.11ax (HE40)_Chain 0

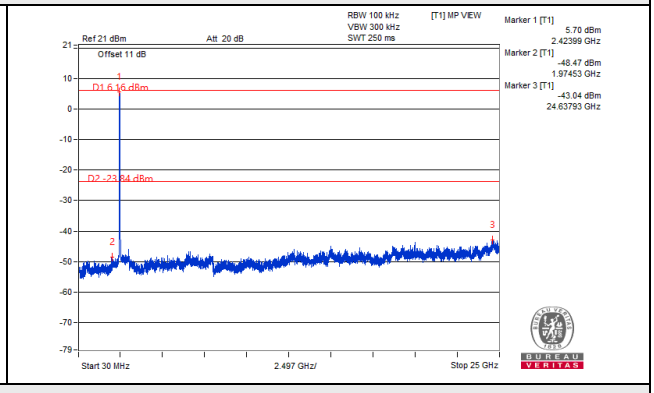
CH 3



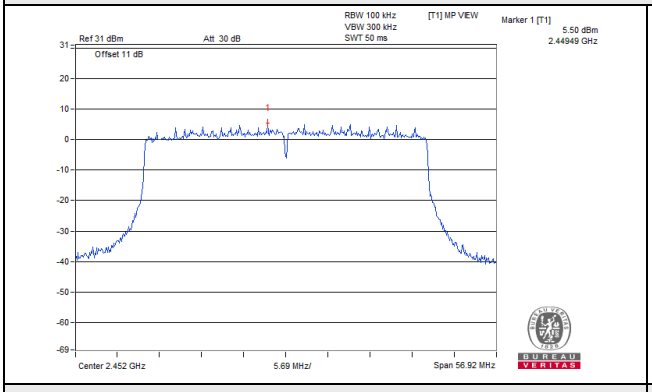


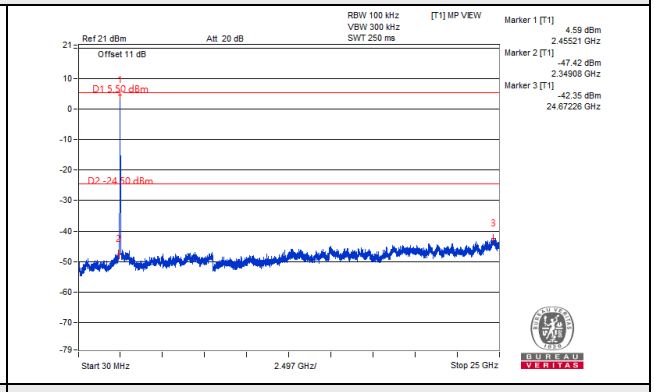
CH 6



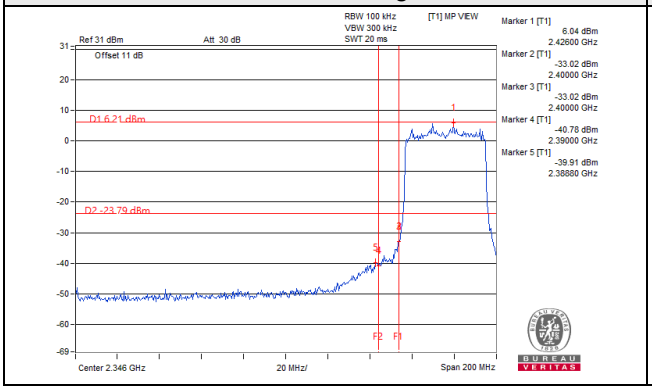


CH 9

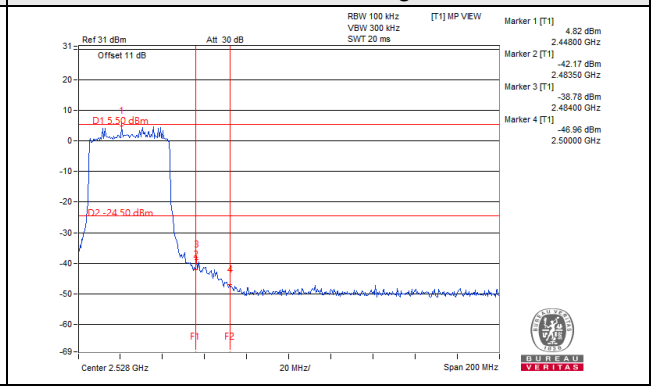




CH 3 Band edge

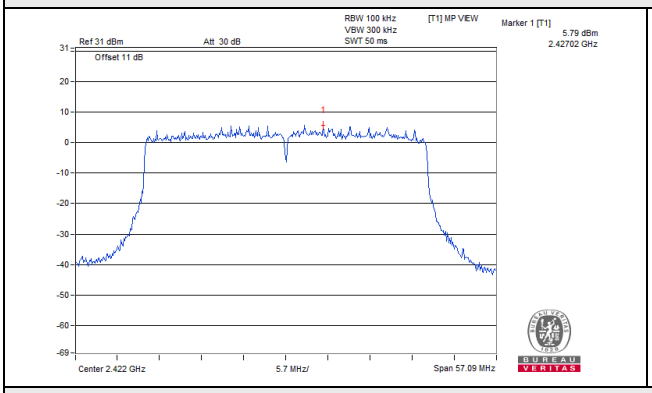


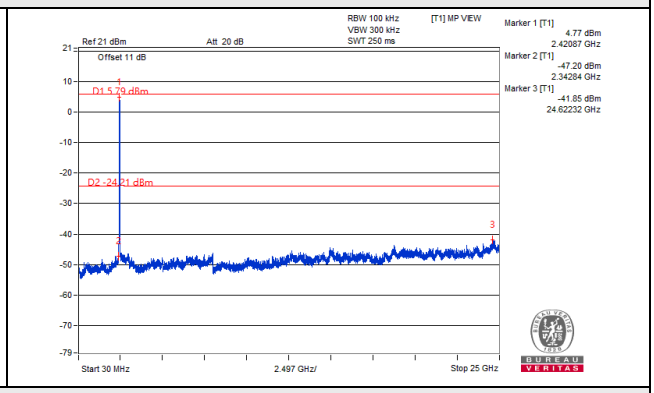
CH 9 Band edge



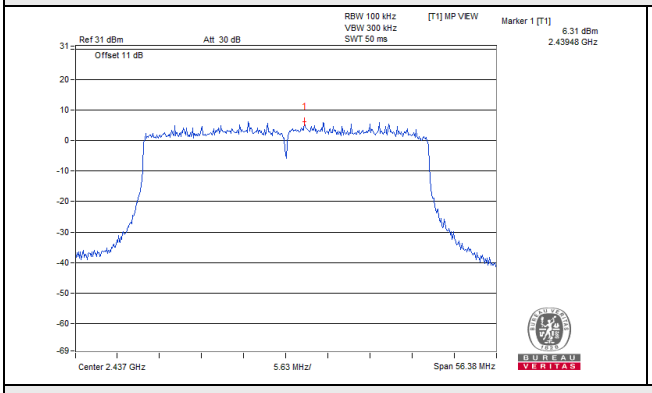
802.11ax (HE40)_Chain 1

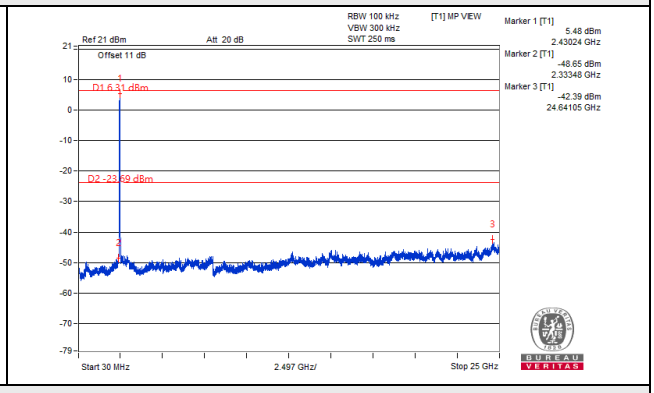
CH 3



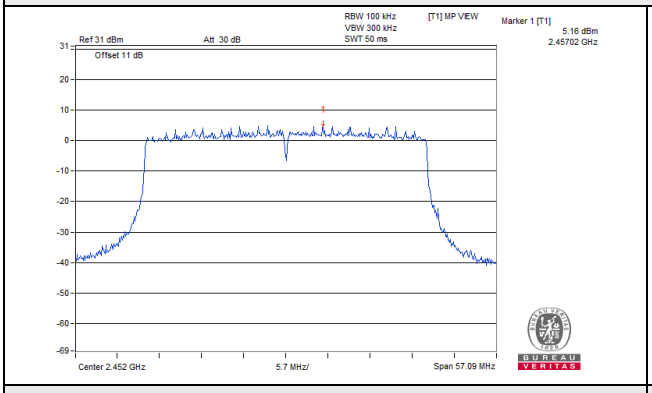


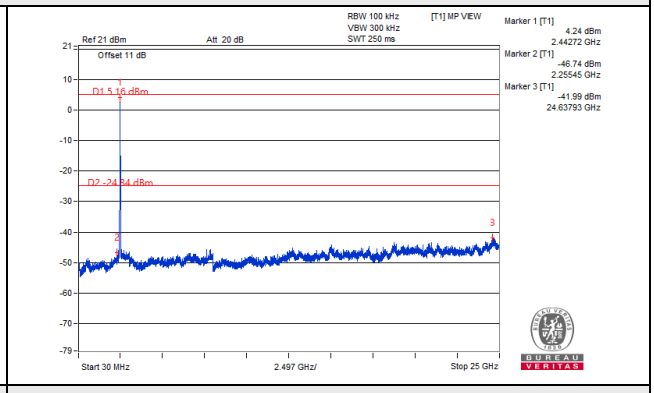
CH 6



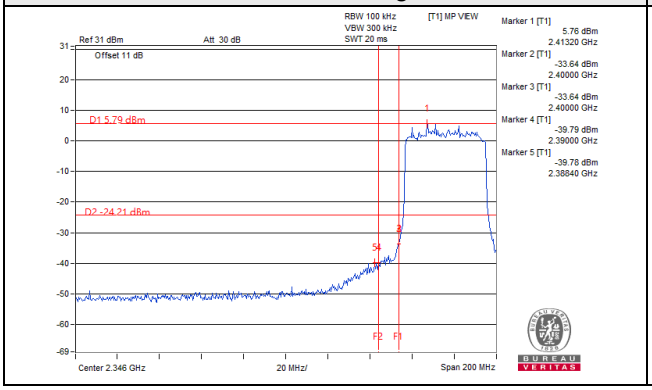


CH 9

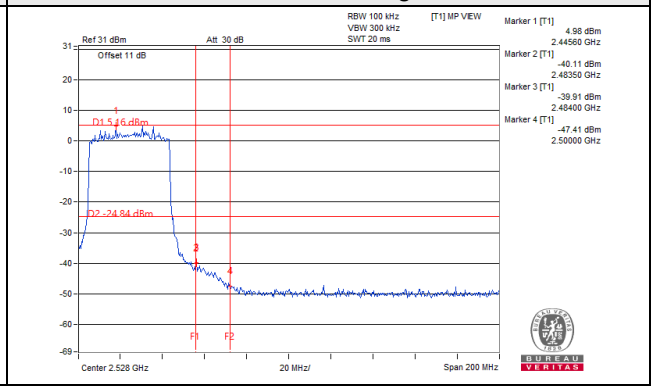




CH 3 Band edge

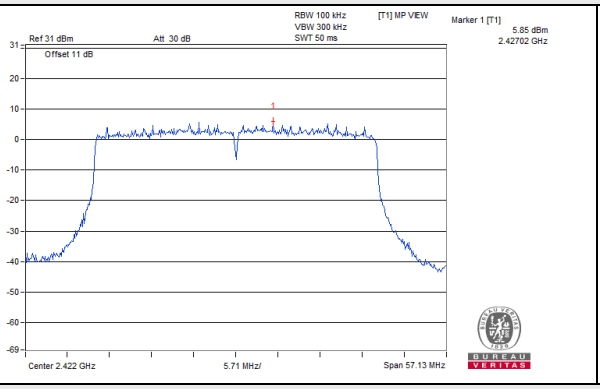


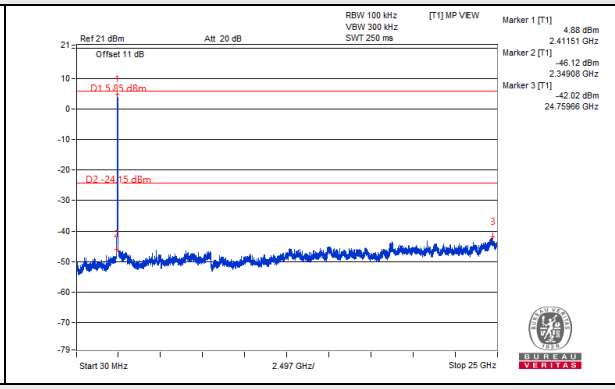
CH 9 Band edge



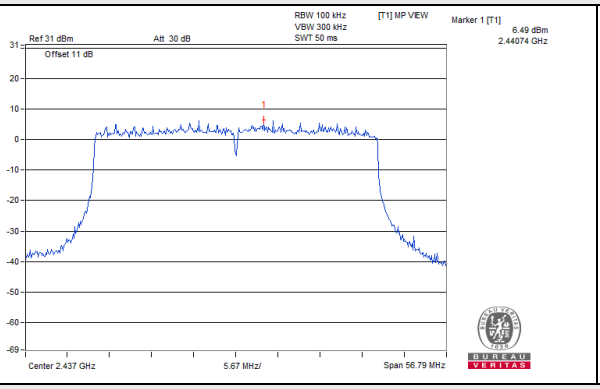
802.11ax (HE40)_Chain 2

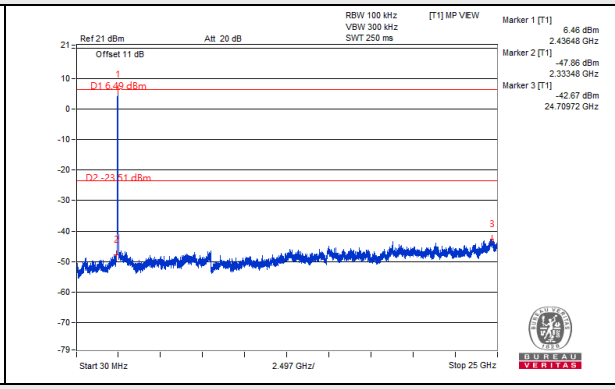
CH 3



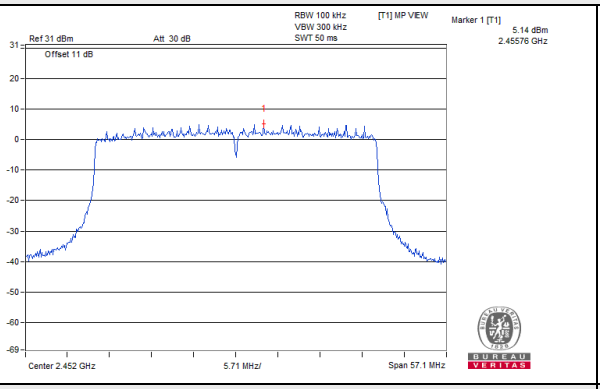


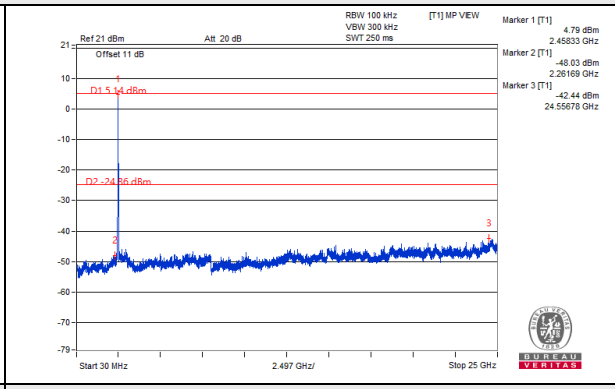
CH 6



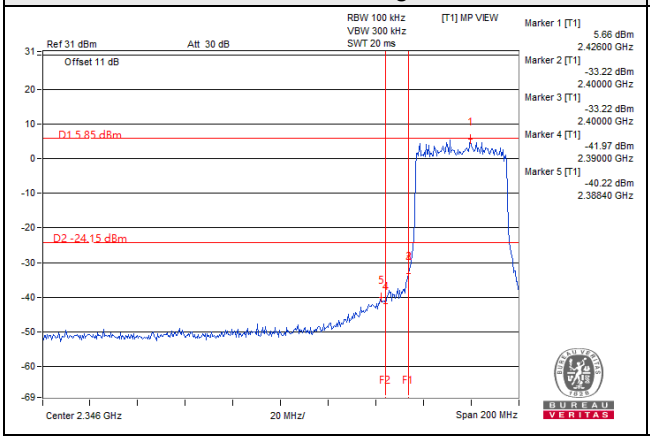


CH 9

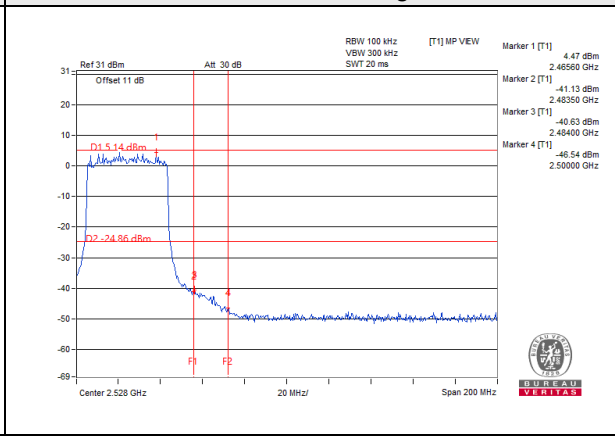




CH 3 Band edge

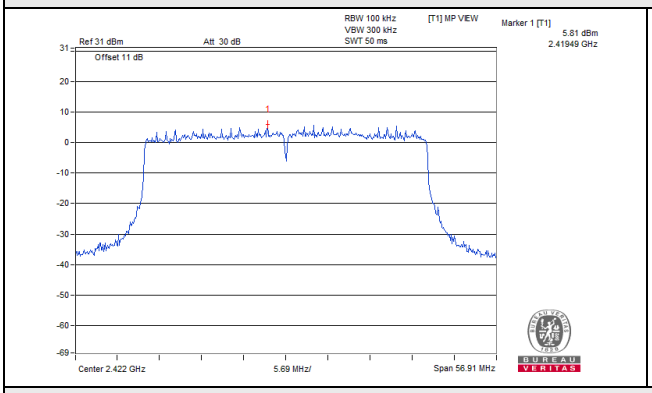


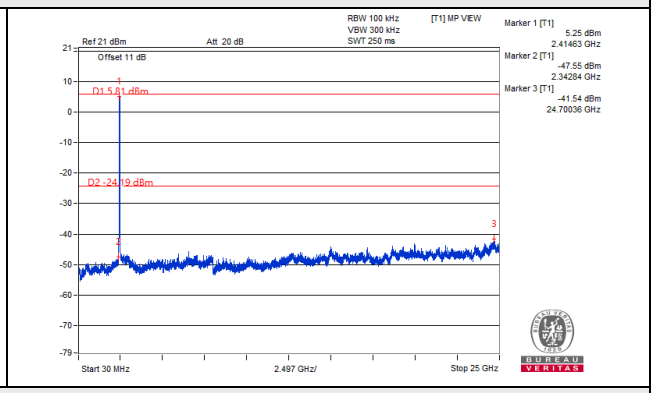
CH 9 Band edge



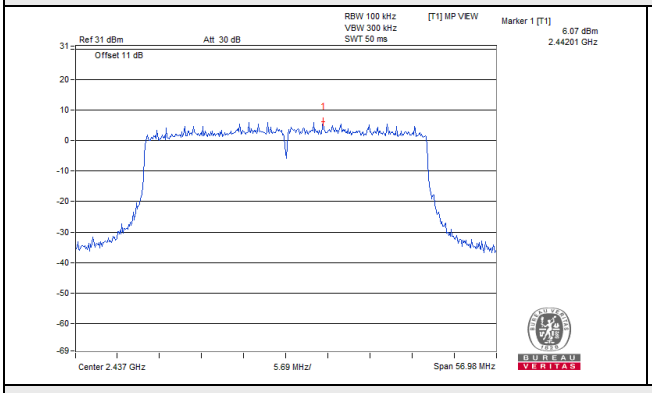
802.11ax (HE40)_Chain 3

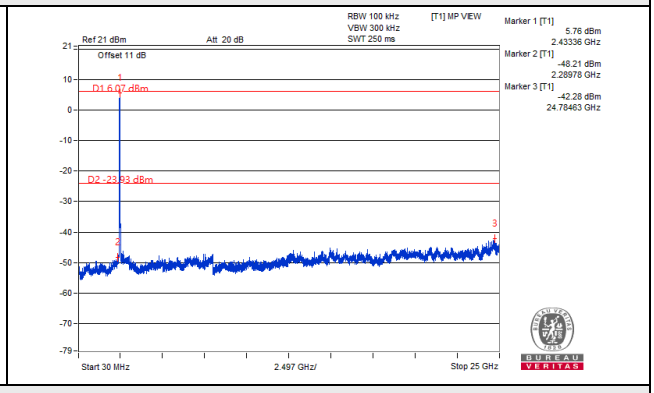
CH 3



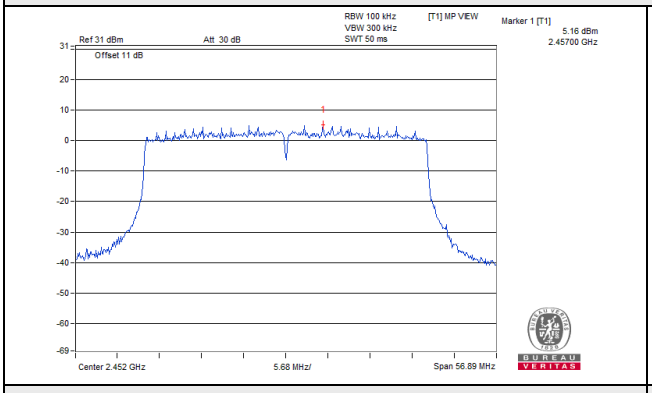


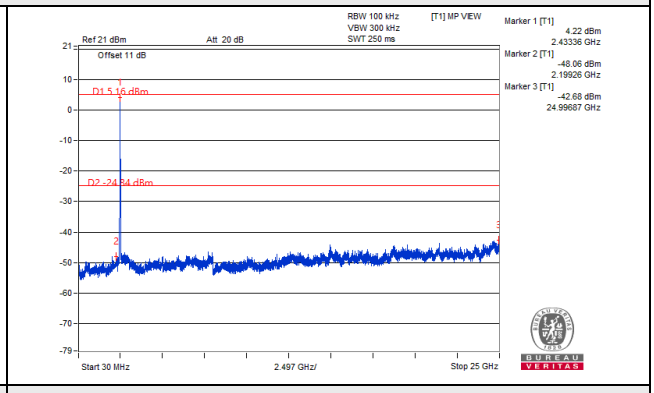
CH 6



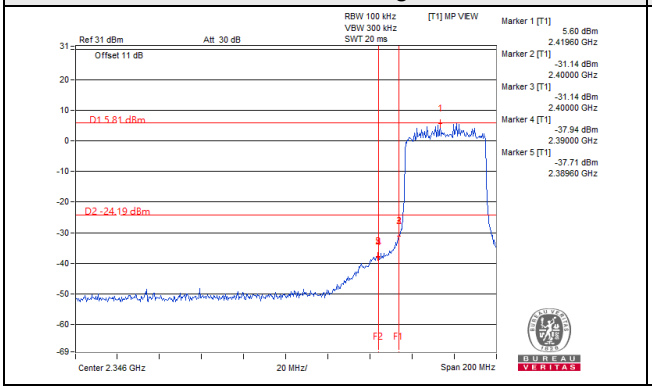


CH 9

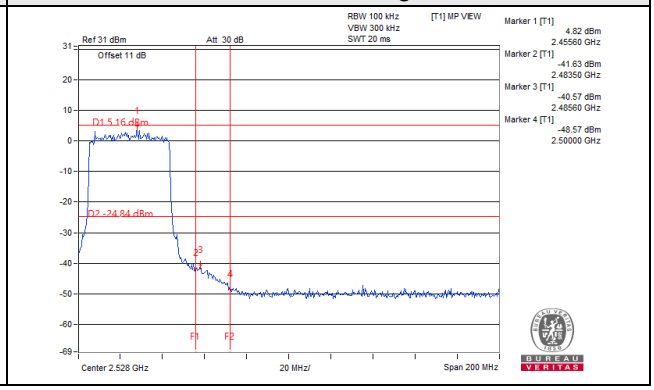




CH 3 Band edge



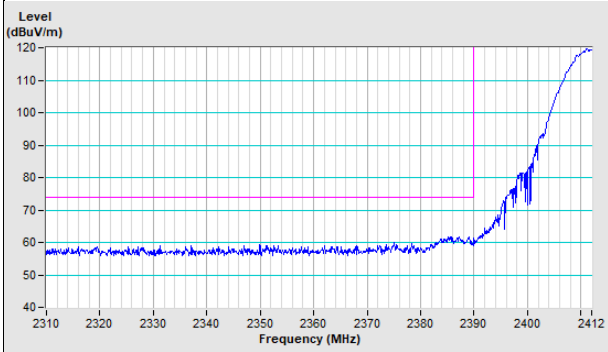
CH 9 Band edge



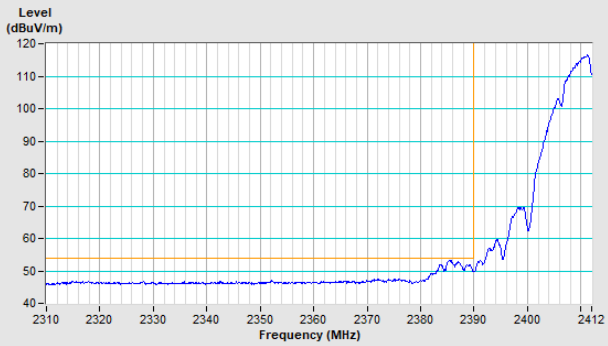
Annex A- Band Edge Measurement

802.11b Channel 1

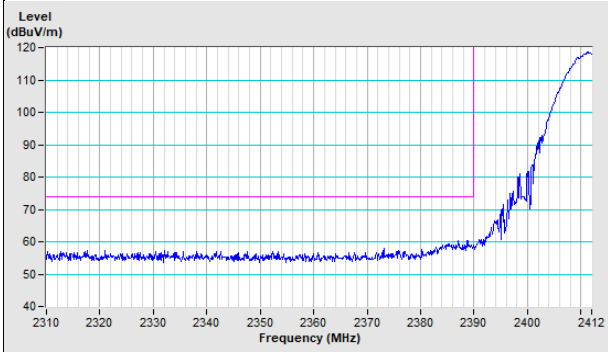
Horizontal (Peak)



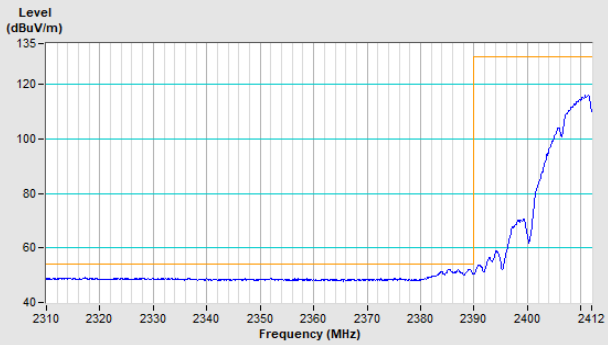
Horizontal (Average)



Vertical (Peak)

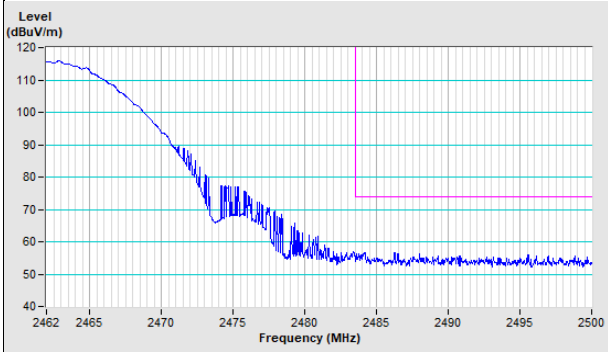


Vertical (Average)

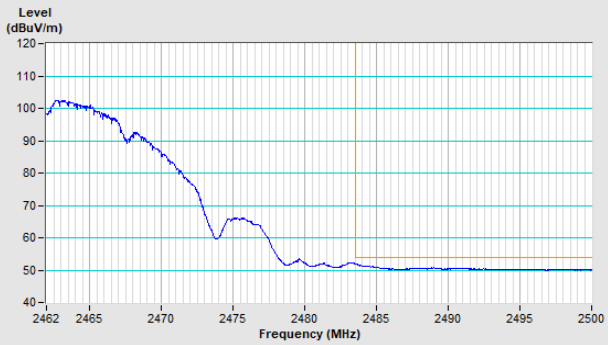


802.11b Channel 11

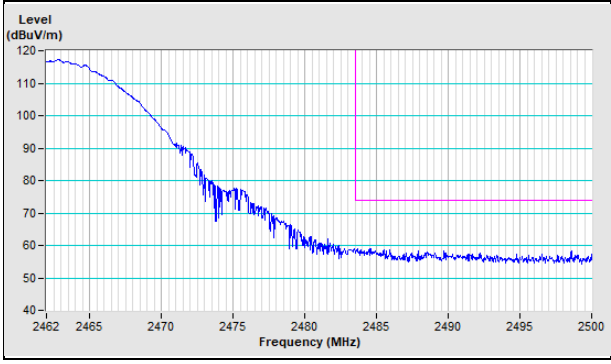
Horizontal (Peak)



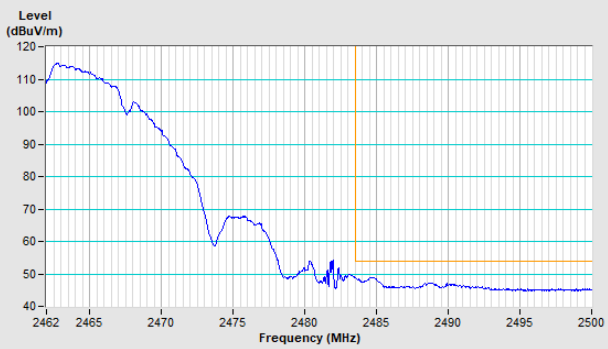
Horizontal (Average)



Vertical (Peak)

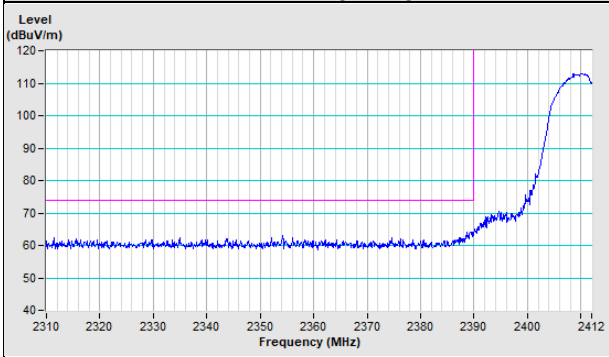


Vertical (Average)

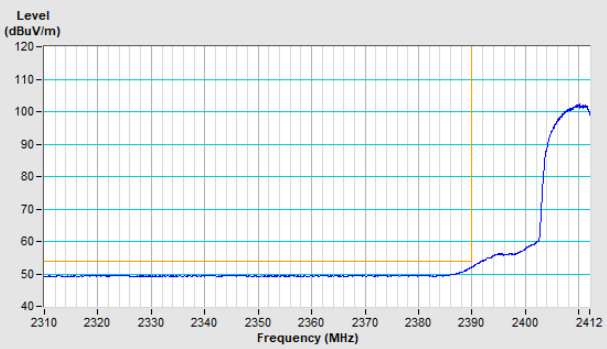


802.11g Channel 1

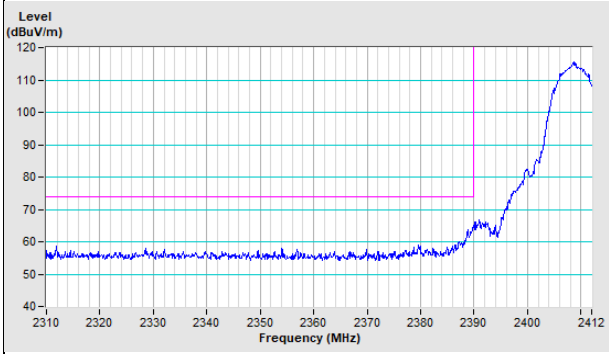
Horizontal (Peak)



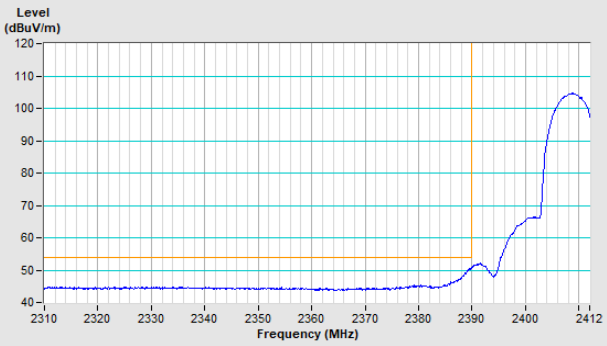
Horizontal (Average)



Vertical (Peak)

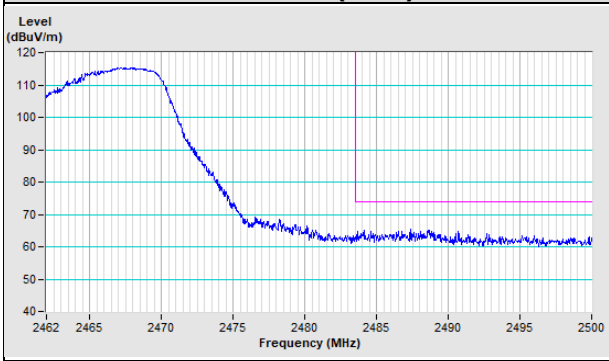


Vertical (Average)

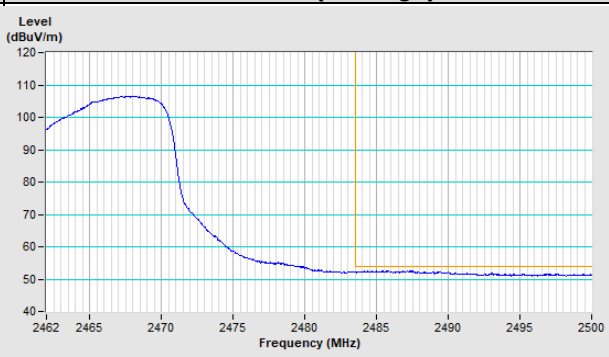


802.11g Channel 11

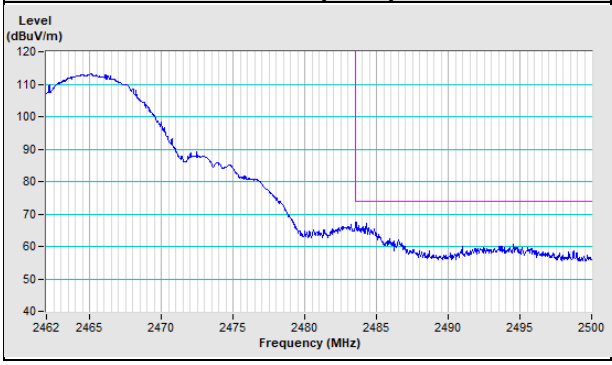
Horizontal (Peak)



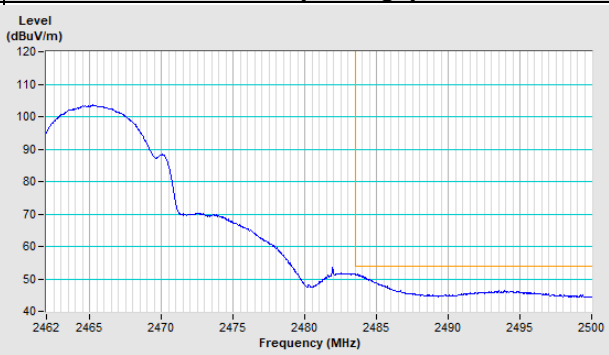
Horizontal (Average)



Vertical (Peak)

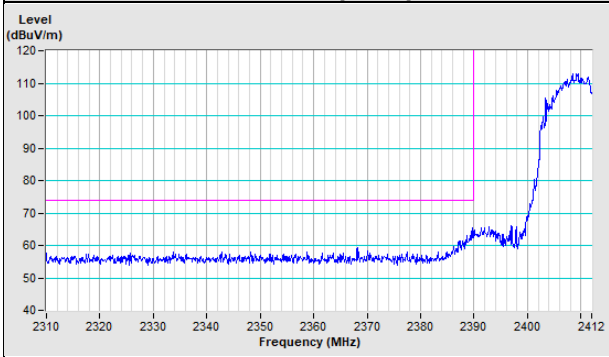


Vertical (Average)

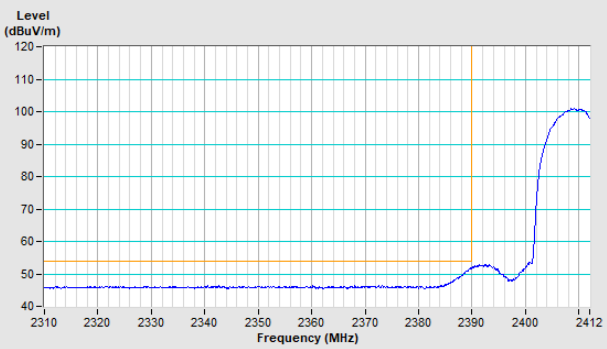


802.11ax (HE20) Channel 1

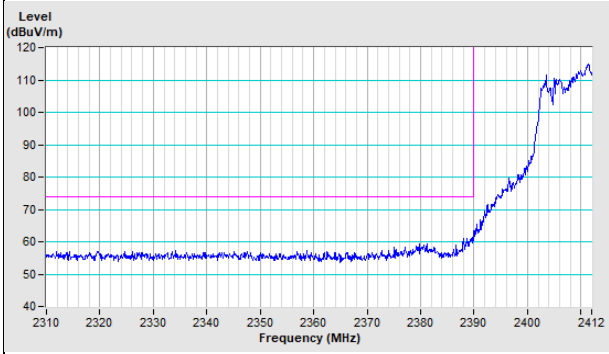
Horizontal (Peak)



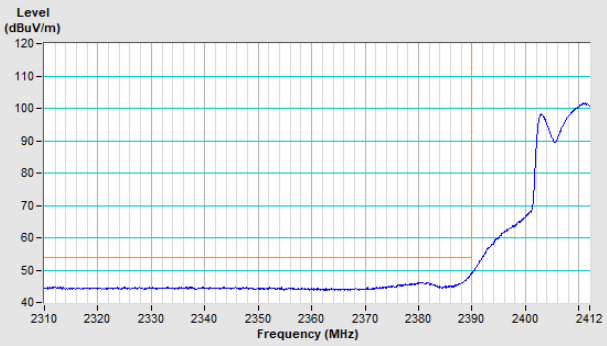
Horizontal (Average)



Vertical (Peak)

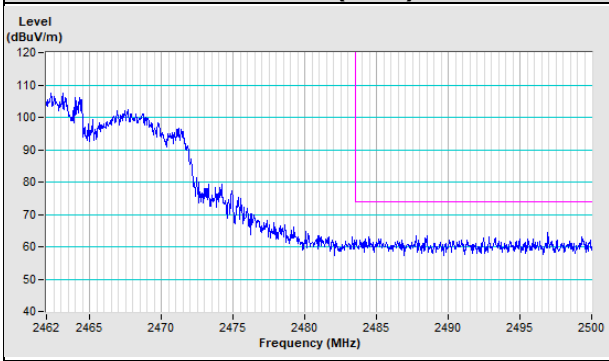


Vertical (Average)

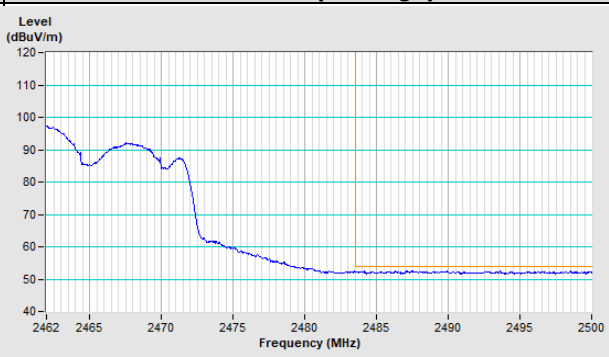


802.11ax (HE20) Channel 11

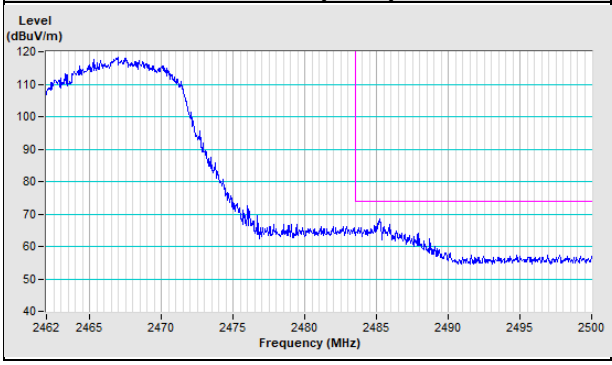
Horizontal (Peak)



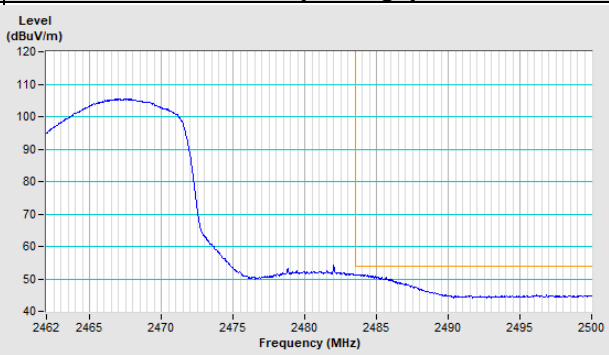
Horizontal (Average)



Vertical (Peak)

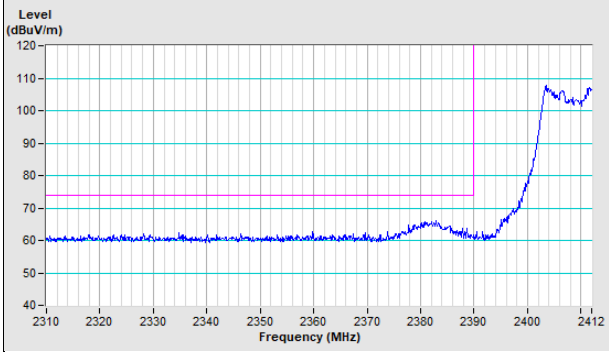


Vertical (Average)

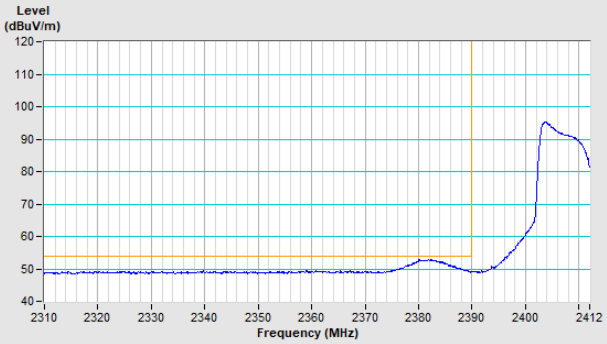


802.11ax (HE40) Channel 3

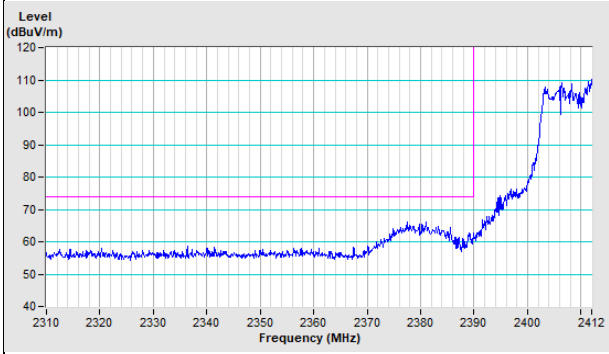
Horizontal (Peak)



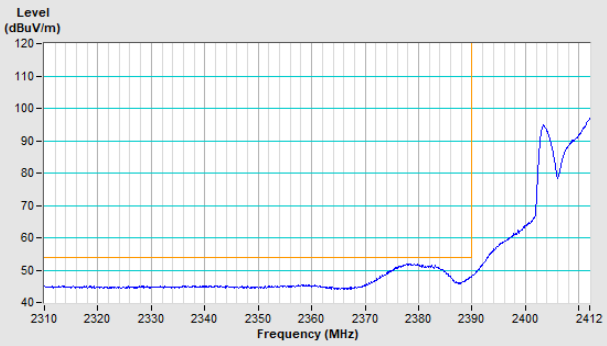
Horizontal (Average)



Vertical (Peak)

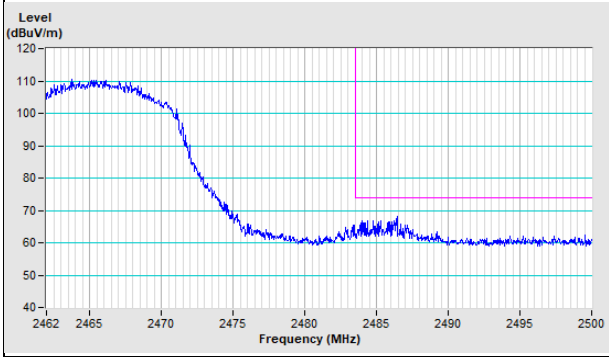


Vertical (Average)

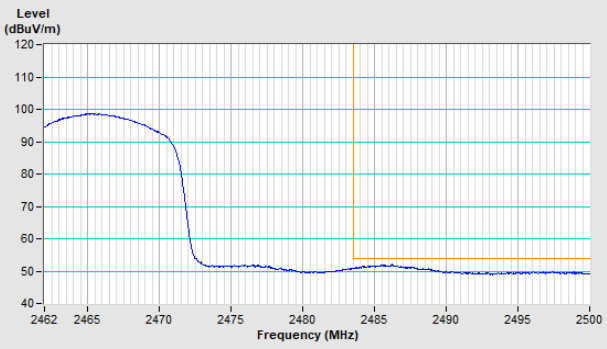


802.11ax (HE40) Channel 9

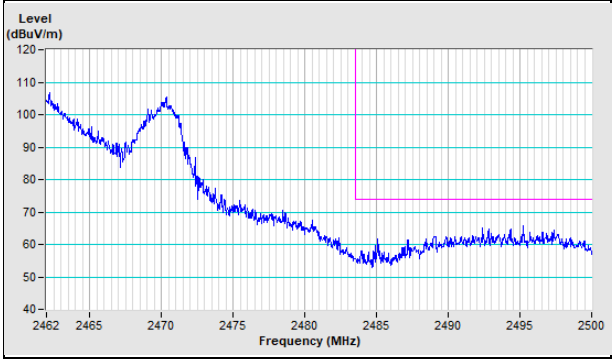
Horizontal (Peak)



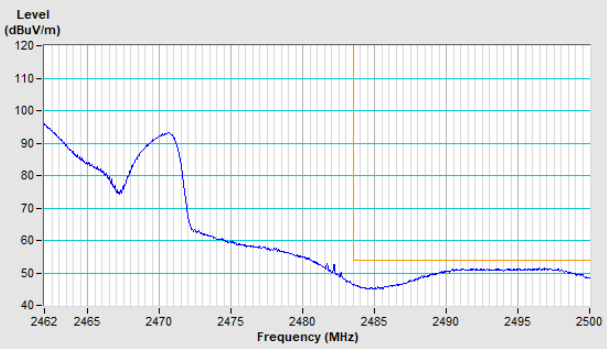
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



5 Pictures of Test Arrangements

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

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.

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

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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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