FCC Test Report

Report No.:	RFBEMT-WTW-P20100622
FCC ID:	K7S-08270
Test Model:	RE7350
Series Model:	RE7310
Received Date:	Oct. 26, 2020
Test Date:	Nov. 16 to 30, 2020
Issued Date:	Dec. 15, 2020
Applicant:	Belkin International, Inc.
Address:	12045 East Waterfront Drive Playa Vista, CA 90094 United States Of America
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RFBEMT-WTW-P20100622	Original release.	Dec. 15, 2020

1 Certificate of Conformity

Product:	LINKSYS RE7350 WIFI 6 RANGE EXTENDER, AX1800 LINKSYS RE7310 WIFI RANGE EXTENDER, AX1800
Brand:	Linksys
Test Model:	RE7350
Series Model:	RE7310
Sample Status:	Engineering sample
Applicant:	Belkin International, Inc.
Test Date:	Nov. 16 to 30, 2020
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10: 2013

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

Prepared by : Joyce Kuo , **Date:** Dec. 15, 2020

Joyce Kuo / Specialist

Approved by : , **Date:** Dec. 15, 2020

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -3.92dB at 0.50938MHz.
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 4874.00MHz, 4924.00MHz, 2485.50MHz, 2389.49 MHz and 2483.50MHz.
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 i-pex(MHF) not a standard connector.

Note:
1. For 2.4GHz 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	1.9 dB
Conducted emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	LINKSYS RE7350 WIFI 6 RANGE EXTENDER, AX1800 LINKSYS RE7310 WIFI RANGE EXTENDER, AX1800
Brand	Linksys
Test Model	RE7350
Series Model	RE7310
Status of EUT	Engineering sample
Driver Version (FVIN)	1.0.3.16
Power Supply Rating	100 ~ 240 Vac, 1.5 A, 50-60 Hz
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462 GHz **5GHz:** 5.18 ~ 5.24 GHz, 5.745 ~ 5.825 GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), 802.11ax (HE20): 11 802.11n (HT40), 802.11ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 4 802.11ac (VHT80), 802.11ax (HE80): 2
Output Power	**CDD Mode:** **2.4GHz:** 847.77 mW **5.18 ~ 5.24GHz:** 538.719 mW **5.745 ~ 5.825GHz:** 563.029 mW **Beamforming Mode:** **2.4GHz:** 629.061 mW **5.18 ~ 5.24GHz:** 538.719 mW **5.745 ~ 5.825GHz:** 540.43 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

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

Product Name	Model Name	Brand	PCBA
LINKSYS RE7350 WIFI 6 RANGE EXTENDER, AX1800	RE7350	Linksys	with RJ45
LINKSYS RE7310 WIFI RANGE EXTENDER, AX1800	RE7310		no RJ45
Note: Above two model names of EUT were pre-tested in chamber, the worse case was found in model No.: **RE7350**. Therefore only the test data of the type was recorded in this report.			

2. Simultaneously transmission condition.

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

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

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	DB1	4.9	2.4~2.4835	PCB	i-pex(MHF)	80
		5.3	5.15~5.25			
		4.8	5.725~5.85			
2	DB2	4.9	2.4~2.4835	PCB	i-pex(MHF)	80
		5.5	5.15~5.25			
		5.1	5.725~5.85			

4. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX

Note:

1. All of modulation mode support beamforming function except 802.11a/b/g & 2.4GHz 802.11n modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11n mode for 20MHz (40MHz) and 802.11ax mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n/VH mode is the same as the 802.11ax mode or more lower than it and investigated worst case to representative mode in test report.

5. The above EUT information is declared by manufacturer and for more detailed features description,

please refers to the manufacturer's specifications or user's manual.

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

3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20) and 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) and 802.11ax (HE40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

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

Note: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Radiated Emission Test (Below 1GHz):

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11g	1 to 11	6	OFDM	BPSK	6Mb/s

Power Line Conducted Emission Test:

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

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11g	1 to 11	6	OFDM	BPSK	6Mb/s

Antenna Port Conducted Measurement:

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

CDD Mode					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
802.11n (HT20) (Output power only)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
802.11n (HT40) (Output power only)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
Beamforming Mode (output power only)					
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	Data Rate Parameter
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Test Condition:

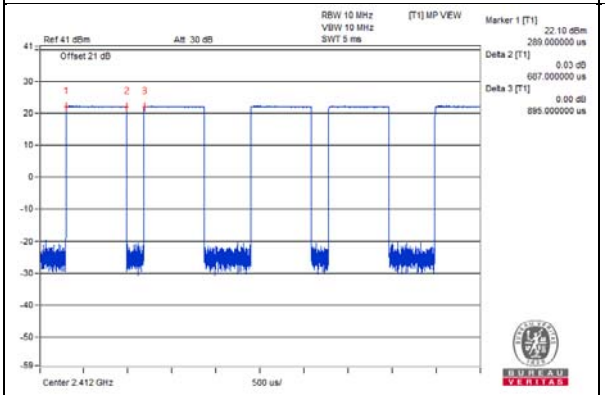
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 75%RH	120Vac, 60Hz	Benson Chao
RE<1G	25deg. C, 75%RH	120Vac, 60Hz	Benson Chao
PLC	25deg. C, 65%RH	120Vac, 60Hz	Carter Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Eric Peng

3.3 Duty Cycle of Test Signal

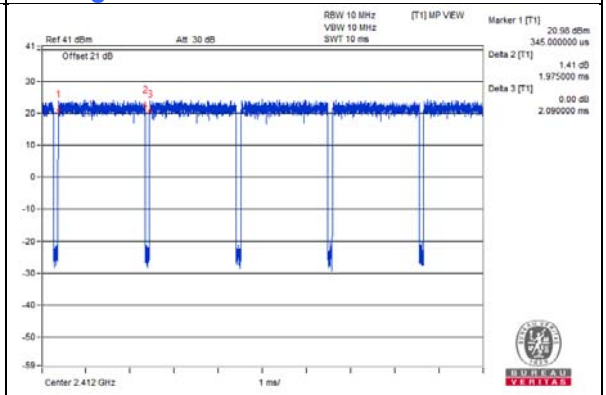
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 0.687 ms /0.895 ms=0.768, Duty factor = 10 * log (1/Duty cycle) = 1.15 dB
802.11g: Duty cycle = 1.975 ms /2.09 ms=0.945, Duty factor = 10 * log (1/Duty cycle) = 0.25 dB
802.11ax (HE20): Duty cycle = 5.443 ms /5.664 ms=0.961, Duty factor = 10 * log (1/Duty cycle) = 0.17 dB
802.11ax (HE40): Duty cycle = 5.443 ms /5.726 ms=0.951, Duty factor = 10 * log (1/Duty cycle) = 0.22 dB

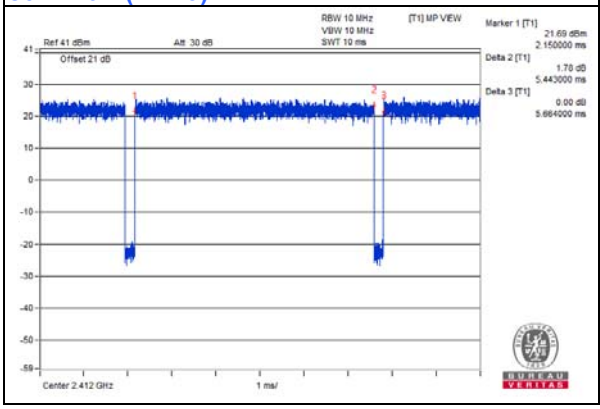
802.11b



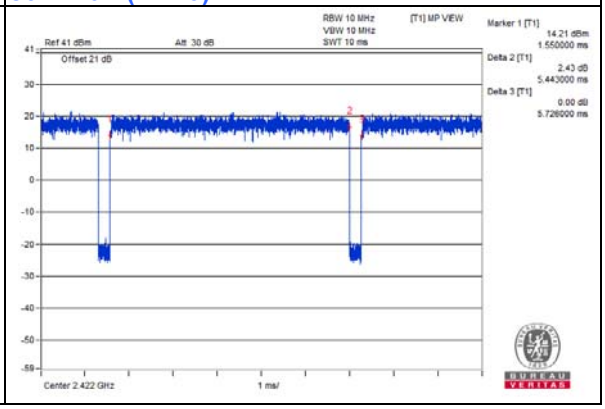
802.11g



802.11ax (HE20)



802.11ax (HE40)



3.4 Description of Support Units

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

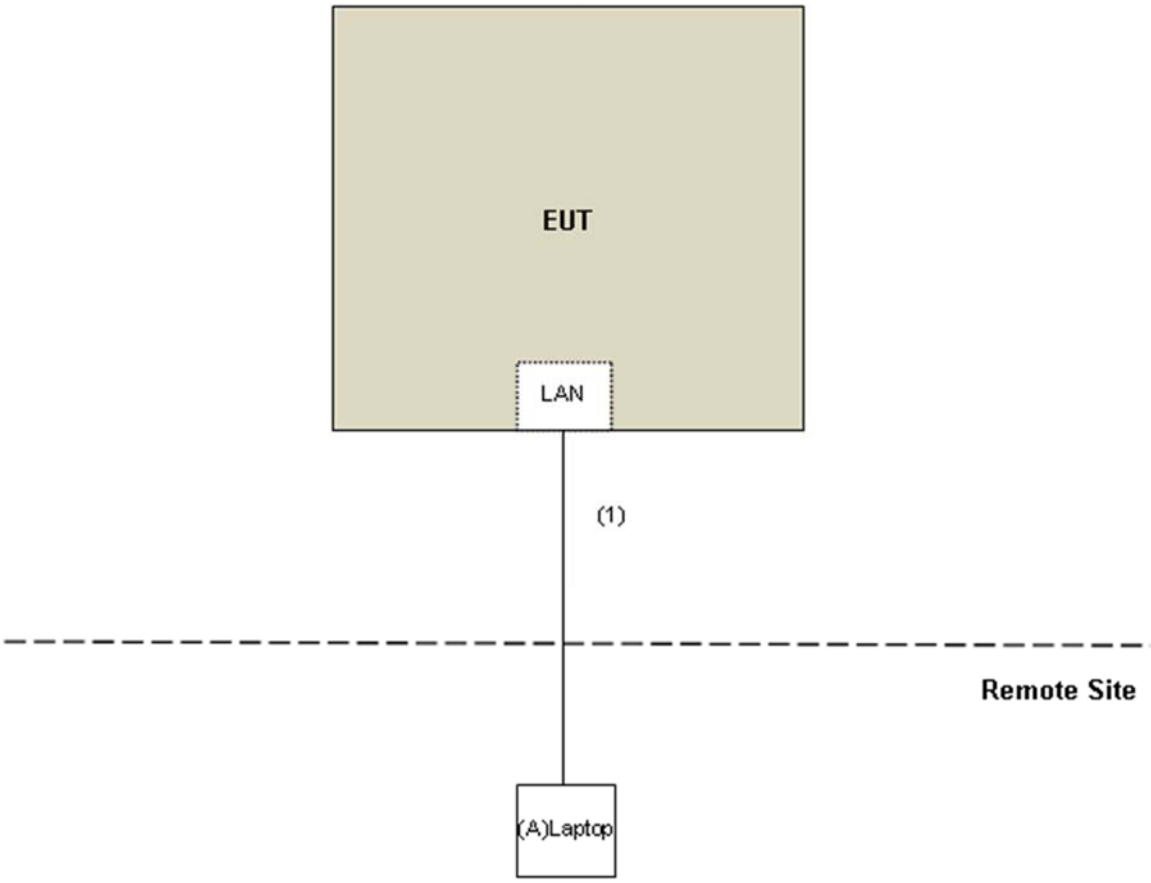
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Dell	N1-010437	NA	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test Standard:

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

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

References Test Guidance:

KDB 558074 D01 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 20dB below the highest level of the desired power:

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

4.1.2 Test Instruments

For Radiated emission & Bandedge test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1500	180504	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 966 Chamber No. 3.
3. Tested Date: Nov. 29 to 30, 2020

For other test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Nov. 16, 2020

4.1.3 Test Procedures

For Radiated emission below 30MHz

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

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

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

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

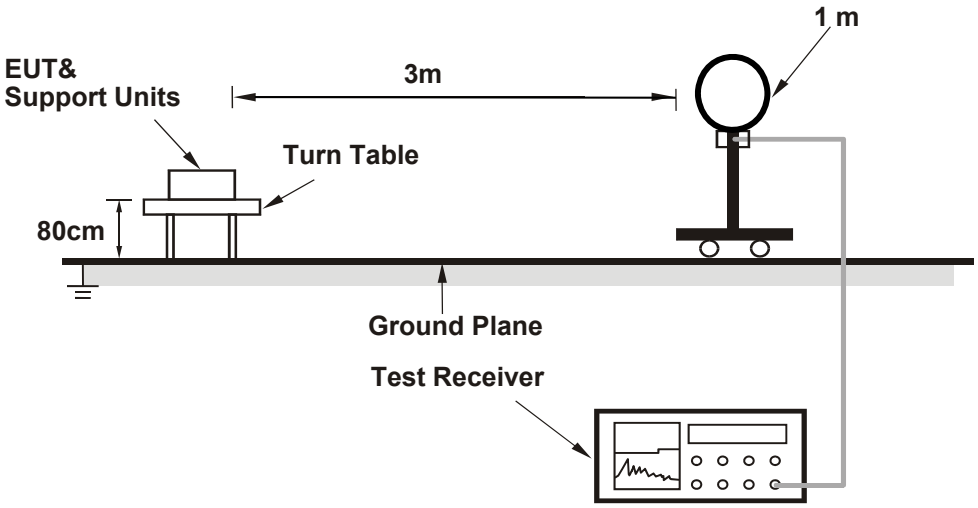
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

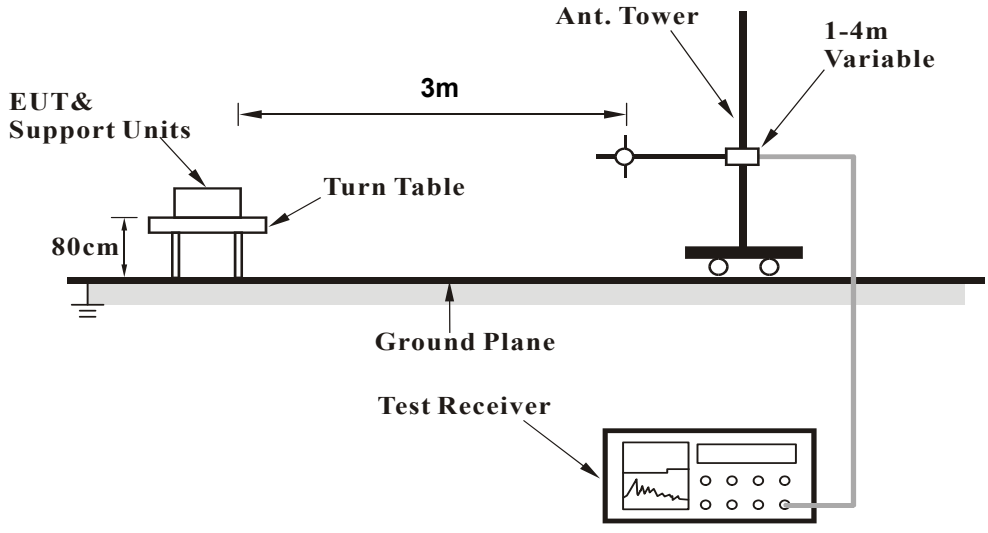
No deviation.

4.1.5 Test Setup

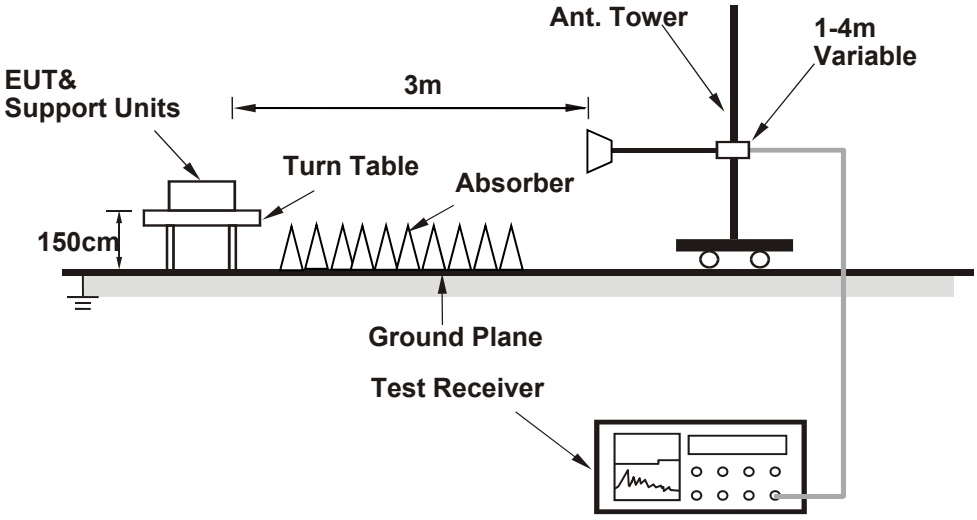
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QDART-Connectivity 1.0-00072) has been activated to set the EUT under transmission condition continuously at specific channel frenquency.

4.1.7 Test Results

Above 1GHz Data：

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.0 PK	74.0	-18.0	2.14 H	269	57.4	-1.4
2	2390.00	45.2 AV	54.0	-8.8	2.14 H	269	46.6	-1.4
3	*2412.00	106.0 PK			2.14 H	269	107.4	-1.4
4	*2412.00	104.6 AV			2.14 H	269	106.0	-1.4
5	4824.00	55.0 PK	74.0	-19.0	1.00 H	345	51.5	3.5
6	4824.00	53.7 AV	54.0	-0.3	1.00 H	345	50.2	3.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2368.63	55.0 PK	74.0	-19.0	3.85 V	335	56.3	-1.3
2	2368.63	44.7 AV	54.0	-9.3	3.85 V	335	46.0	-1.3
3	*2412.00	107.3 PK			3.85 V	335	108.7	-1.4
4	*2412.00	105.4 AV			3.85 V	335	106.8	-1.4
5	4824.00	51.0 PK	74.0	-23.0	1.00 V	341	47.5	3.5
6	4824.00	49.4 AV	54.0	-4.6	1.00 V	341	45.9	3.5

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	55.6 PK	74.0	-18.4	2.13 H	271	57.0	-1.4
2	2390.00	45.4 AV	54.0	-8.6	2.13 H	271	46.8	-1.4
3	*2437.00	106.6 PK			2.13 H	271	108.1	-1.5
4	*2437.00	104.9 AV			2.13 H	271	106.4	-1.5
5	2483.50	55.6 PK	74.0	-18.4	2.13 H	271	57.0	-1.4
6	2483.50	45.4 AV	54.0	-8.6	2.13 H	271	46.8	-1.4
7	4874.00	54.9 PK	74.0	-19.1	2.61 H	346	51.2	3.7
8	**4874.00**	**53.8 AV**	**54.0**	**-0.2**	**2.61 H**	**346**	**50.1**	**3.7**
9	7311.00	50.6 PK	74.0	-23.4	1.12 H	48	40.8	9.8
10	7311.00	46.5 AV	54.0	-7.5	1.12 H	48	36.7	9.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	54.8 PK	74.0	-19.2	3.72 V	341	56.2	-1.4
2	2390.00	46.7 AV	54.0	-7.3	3.72 V	341	48.1	-1.4
3	*2437.00	107.9 PK			3.72 V	341	109.4	-1.5
4	*2437.00	105.7 AV			3.72 V	341	107.2	-1.5
5	2483.50	55.8 PK	74.0	-18.2	3.72 V	341	57.2	-1.4
6	2483.50	45.5 AV	54.0	-8.5	3.72 V	341	46.9	-1.4
7	4874.00	50.6 PK	74.0	-23.4	1.00 V	355	46.9	3.7
8	4874.00	49.3 AV	54.0	-4.7	1.00 V	355	45.6	3.7
9	7311.00	47.5 PK	74.0	-26.5	2.63 V	112	37.7	9.8
10	7311.00	42.8 AV	54.0	-11.2	2.63 V	112	33.0	9.8

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.8 PK			2.18 H	279	108.2	-1.4
2	*2462.00	105.0 AV			2.18 H	279	106.4	-1.4
3	2497.01	54.6 PK	74.0	-19.4	2.18 H	279	56.0	-1.4
4	2497.01	42.8 AV	54.0	-11.2	2.18 H	279	44.2	-1.4
5	4924.00	54.8 PK	74.0	-19.2	2.61 H	351	51.1	3.7
6	**4924.00**	**53.8 AV**	**54.0**	**-0.2**	**2.61 H**	**351**	**50.1**	**3.7**
7	7386.00	48.5 PK	74.0	-25.5	2.02 H	62	38.7	9.8
8	7386.00	47.2 AV	54.0	-6.8	2.02 H	62	37.4	9.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.2 PK			3.87 V	345	108.6	-1.4
2	*2462.00	105.3 AV			3.87 V	345	106.7	-1.4
3	2496.14	53.5 PK	74.0	-20.5	3.87 V	345	54.9	-1.4
4	2496.14	44.7 AV	54.0	-9.3	3.87 V	345	46.1	-1.4
5	4924.00	50.2 PK	74.0	-23.8	1.05 V	352	46.5	3.7
6	4924.00	49.0 AV	54.0	-5.0	1.05 V	352	45.3	3.7
7	7386.00	47.3 PK	74.0	-26.7	2.58 V	116	37.5	9.8
8	7386.00	42.5 AV	54.0	-11.5	2.58 V	116	32.7	9.8

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.46	60.1 PK	74.0	-13.9	2.19 H	282	61.5	-1.4
2	2389.46	47.5 AV	54.0	-6.5	2.19 H	282	48.9	-1.4
3	*2412.00	107.8 PK			2.19 H	282	109.2	-1.4
4	*2412.00	99.3 AV			2.19 H	282	100.7	-1.4
5	4824.00	51.7 PK	74.0	-22.3	1.01 H	329	48.2	3.5
6	4824.00	50.3 AV	54.0	-3.7	1.01 H	329	46.8	3.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.70	67.2 PK	74.0	-6.8	3.82 V	357	68.6	-1.4
2	2389.70	53.5 AV	54.0	-0.5	3.82 V	357	54.9	-1.4
3	*2412.00	108.1 PK			3.82 V	357	109.5	-1.4
4	*2412.00	100.9 AV			3.82 V	357	102.3	-1.4
5	4824.00	47.9 PK	74.0	-26.1	1.00 V	353	44.4	3.5
6	4824.00	46.9 AV	54.0	-7.1	1.00 V	353	43.4	3.5

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	2.15 H	272	58.9	-1.4
2	2390.00	44.6 AV	54.0	-9.4	2.15 H	272	46.0	-1.4
3	*2437.00	115.3 PK			2.15 H	272	116.8	-1.5
4	*2437.00	107.4 AV			2.15 H	272	108.9	-1.5
5	2483.50	54.7 PK	74.0	-19.3	2.15 H	272	56.1	-1.4
6	2483.50	43.9 AV	54.0	-10.1	2.15 H	272	45.3	-1.4
7	4874.00	51.4 PK	74.0	-22.6	2.56 H	332	47.7	3.7
8	4874.00	50.5 AV	54.0	-3.5	2.56 H	332	46.8	3.7
9	7311.00	47.7 PK	74.0	-26.3	1.08 H	36	37.9	9.8
10	7311.00	43.6 AV	54.0	-10.4	1.08 H	36	33.8	9.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	62.8 PK	74.0	-11.2	3.65 V	351	64.2	-1.4
2	2390.00	50.6 AV	54.0	-3.4	3.65 V	351	52.0	-1.4
3	*2437.00	116.5 PK			3.65 V	351	118.0	-1.5
4	*2437.00	108.5 AV			3.65 V	351	110.0	-1.5
5	2483.50	65.5 PK	74.0	-8.5	3.65 V	351	66.9	-1.4
6	2483.50	52.2 AV	54.0	-1.8	3.65 V	351	53.6	-1.4
7	4874.00	47.8 PK	74.0	-26.2	1.00 V	358	44.1	3.7
8	4874.00	46.5 AV	54.0	-7.5	1.00 V	358	42.8	3.7
9	7311.00	44.0 PK	74.0	-30.0	2.65 V	109	34.2	9.8
10	7311.00	39.3 AV	54.0	-14.7	2.65 V	109	29.5	9.8

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.9 PK			2.24 H	279	109.3	-1.4
2	*2462.00	99.0 AV			2.24 H	279	100.4	-1.4
3	2483.50	64.1 PK	74.0	-9.9	2.24 H	279	65.5	-1.4
4	2483.50	52.1 AV	54.0	-1.9	2.24 H	279	53.5	-1.4
5	4924.00	51.8 PK	74.0	-22.2	2.59 H	321	48.1	3.7
6	4924.00	50.6 AV	54.0	-3.4	2.59 H	321	46.9	3.7
7	7386.00	47.7 PK	74.0	-26.3	1.09 H	30	37.9	9.8
8	7386.00	43.6 AV	54.0	-10.4	1.09 H	30	33.8	9.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	108.6 PK			3.87 V	354	110.0	-1.4
2	*2462.00	99.3 AV			3.87 V	354	100.7	-1.4
3	2485.50	64.4 PK	74.0	-9.6	3.87 V	354	65.8	-1.4
4	**2485.50**	**53.8 AV**	**54.0**	**-0.2**	**3.87 V**	**354**	**55.2**	**-1.4**
5	4924.00	48.0 PK	74.0	-26.0	1.02 V	344	44.3	3.7
6	4924.00	46.4 AV	54.0	-7.6	1.02 V	344	42.7	3.7
7	7386.00	48.6 PK	74.0	-25.4	2.58 V	97	38.8	9.8
8	7386.00	40.2 AV	54.0	-13.8	2.58 V	97	30.4	9.8

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 1：2412 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.4 PK	74.0	-8.6	2.23 H	270	66.8	-1.4
2	2390.00	53.3 AV	54.0	-0.7	2.23 H	270	54.7	-1.4
3	*2412.00	104.8 PK			2.23 H	270	106.2	-1.4
4	*2412.00	97.3 AV			2.23 H	270	98.7	-1.4
5	4824.00	48.4 PK	74.0	-25.6	2.67 H	331	44.9	3.5
6	4824.00	47.7 AV	54.0	-6.3	2.67 H	331	44.2	3.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.49	64.1 PK	74.0	-9.9	3.97 V	2	65.5	-1.4
2	**2389.49**	**53.8 AV**	**54.0**	**-0.2**	**3.97 V**	**2**	**55.2**	**-1.4**
3	*2412.00	105.3 PK			3.97 V	2	106.7	-1.4
4	*2412.00	99.1 AV			3.97 V	2	100.5	-1.4
5	4824.00	45.1 PK	74.0	-28.9	1.00 V	354	41.6	3.5
6	4824.00	44.2 AV	54.0	-9.8	1.00 V	354	40.7	3.5

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	54.2 PK	74.0	-19.8	2.24 H	255	55.6	-1.4
2	2390.00	42.5 AV	54.0	-11.5	2.24 H	255	43.9	-1.4
3	*2437.00	114.9 PK			2.24 H	255	116.4	-1.5
4	*2437.00	107.2 AV			2.24 H	255	108.7	-1.5
5	2483.50	54.4 PK	74.0	-19.6	2.24 H	255	55.8	-1.4
6	2483.50	42.4 AV	54.0	-11.6	2.24 H	255	43.8	-1.4
7	4874.00	48.7 PK	74.0	-25.3	2.61 H	328	45.0	3.7
8	4874.00	47.8 AV	54.0	-6.2	2.61 H	328	44.1	3.7
9	7311.00	44.2 PK	74.0	-29.8	1.09 H	25	34.4	9.8
10	7311.00	40.2 AV	54.0	-13.8	1.09 H	25	30.4	9.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	63.4 PK	74.0	-10.6	3.75 V	354	64.8	-1.4
2	2390.00	53.0 AV	54.0	-1.0	3.75 V	354	54.4	-1.4
3	*2437.00	116.8 PK			3.75 V	354	118.3	-1.5
4	*2437.00	108.1 AV			3.75 V	354	109.6	-1.5
5	2483.50	65.6 PK	74.0	-8.4	3.75 V	354	67.0	-1.4
6	2483.50	53.3 AV	54.0	-0.7	3.75 V	354	54.7	-1.4
7	4874.00	44.6 PK	74.0	-29.4	1.00 V	350	40.9	3.7
8	4874.00	43.6 AV	54.0	-10.4	1.00 V	350	39.9	3.7
9	7311.00	41.4 PK	74.0	-32.6	2.70 V	104	31.6	9.8
10	7311.00	36.6 AV	54.0	-17.4	2.70 V	104	26.8	9.8

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	105.6 PK			2.20 H	267	107.0	-1.4
2	*2462.00	96.8 AV			2.20 H	267	98.2	-1.4
3	2483.50	61.5 PK	74.0	-12.5	2.20 H	267	62.9	-1.4
4	2483.50	48.8 AV	54.0	-5.2	2.20 H	267	50.2	-1.4
5	4924.00	48.1 PK	74.0	-25.9	2.65 H	318	44.4	3.7
6	4924.00	47.4 AV	54.0	-6.6	2.65 H	318	43.7	3.7
7	7386.00	43.9 PK	74.0	-30.1	1.13 H	26	34.1	9.8
8	7386.00	39.9 AV	54.0	-14.1	1.13 H	26	30.1	9.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.7 PK			3.81 V	348	108.1	-1.4
2	*2462.00	98.7 AV			3.81 V	348	100.1	-1.4
3	2484.80	65.1 PK	74.0	-8.9	3.81 V	348	66.5	-1.4
4	2484.80	53.4 AV	54.0	-0.6	3.81 V	348	54.8	-1.4
5	4924.00	44.9 PK	74.0	-29.1	1.00 V	343	41.2	3.7
6	4924.00	43.9 AV	54.0	-10.1	1.00 V	343	40.2	3.7
7	7386.00	41.5 PK	74.0	-32.5	2.72 V	107	31.7	9.8
8	7386.00	36.7 AV	54.0	-17.3	2.72 V	107	26.9	9.8

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 3：2422 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.19	65.1 PK	74.0	-8.9	2.21 H	262	66.5	-1.4
2	2389.19	53.4 AV	54.0	-0.6	2.21 H	262	54.8	-1.4
3	*2422.00	105.0 PK			2.21 H	262	106.4	-1.4
4	*2422.00	94.1 AV			2.21 H	262	95.5	-1.4
5	4844.00	45.7 PK	74.0	-28.3	2.66 H	310	42.1	3.6
6	4844.00	44.0 AV	54.0	-10.0	2.66 H	310	40.4	3.6
7	7266.00	41.0 PK	74.0	-33.0	1.16 H	35	31.3	9.7
8	7266.00	37.3 AV	54.0	-16.7	1.16 H	35	27.6	9.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2389.96	63.2 PK	74.0	-10.8	3.84 V	356	64.6	-1.4
2	2389.96	53.6 AV	54.0	-0.4	3.84 V	356	55.0	-1.4
3	*2422.00	107.8 PK			3.84 V	356	109.2	-1.4
4	*2422.00	96.0 AV			3.84 V	356	97.4	-1.4
5	4844.00	43.3 PK	74.0	-30.7	1.00 V	332	39.7	3.6
6	4844.00	42.3 AV	54.0	-11.7	1.00 V	332	38.7	3.6
7	7266.00	39.6 PK	74.0	-34.4	2.74 V	123	29.9	9.7
8	7266.00	34.8 AV	54.0	-19.2	2.74 V	123	25.1	9.7

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	53.9 PK	74.0	-20.1	2.22 H	247	55.3	-1.4
2	2390.00	42.3 AV	54.0	-11.7	2.22 H	247	43.7	-1.4
3	*2437.00	106.3 PK			2.22 H	247	107.8	-1.5
4	*2437.00	95.8 AV			2.22 H	247	97.3	-1.5
5	2483.50	53.5 PK	74.0	-20.5	2.22 H	247	54.9	-1.4
6	2483.50	42.1 AV	54.0	-11.9	2.22 H	247	43.5	-1.4
7	4874.00	45.8 PK	74.0	-28.2	2.68 H	322	42.1	3.7
8	4874.00	43.9 AV	54.0	-10.1	2.68 H	322	40.2	3.7
9	7311.00	40.9 PK	74.0	-33.1	1.11 H	27	31.1	9.8
10	7311.00	37.0 AV	54.0	-17.0	1.11 H	27	27.2	9.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.5 PK	74.0	-8.5	3.69 V	354	66.9	-1.4
2	2390.00	52.3 AV	54.0	-1.7	3.69 V	354	53.7	-1.4
3	*2437.00	107.4 PK			3.69 V	354	108.9	-1.5
4	*2437.00	97.9 AV			3.69 V	354	99.4	-1.5
5	2483.50	65.5 PK	74.0	-8.5	3.69 V	354	66.9	-1.4
6	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**3.69 V**	**354**	**55.2**	**-1.4**
7	4874.00	43.4 PK	74.0	-30.6	1.00 V	332	39.7	3.7
8	4874.00	42.2 AV	54.0	-11.8	1.00 V	332	38.5	3.7
9	7311.00	39.0 PK	74.0	-35.0	2.77 V	128	29.2	9.8
10	7311.00	34.4 AV	54.0	-19.6	2.77 V	128	24.6	9.8

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 9：2452 MHz
Frequency Range	1GHz ~ 25GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	105.3 PK			2.26 H	262	106.7	-1.4
2	*2452.00	94.4 AV			2.26 H	262	95.8	-1.4
3	2487.86	64.6 PK	74.0	-9.4	2.26 H	262	66.0	-1.4
4	2487.86	50.6 AV	54.0	-3.4	2.26 H	262	52.0	-1.4
5	4904.00	45.9 PK	74.0	-28.1	2.61 H	297	42.2	3.7
6	4904.00	44.0 AV	54.0	-10.0	2.61 H	297	40.3	3.7
7	7356.00	41.3 PK	74.0	-32.7	1.13 H	31	31.4	9.9
8	7356.00	37.5 AV	54.0	-16.5	1.13 H	31	27.6	9.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	107.7 PK			3.85 V	351	109.1	-1.4
2	*2452.00	96.2 AV			3.85 V	351	97.6	-1.4
3	2486.85	67.8 PK	74.0	-6.2	3.85 V	351	69.2	-1.4
4	2486.85	47.0 AV	54.0	-7.0	3.85 V	351	48.4	-1.4
5	2490.50	63.8 PK	74.0	-10.2	3.85 V	351	65.2	-1.4
6	2490.50	53.5 AV	54.0	-0.5	3.85 V	351	54.9	-1.4
7	4904.00	43.7 PK	74.0	-30.3	1.00 V	333	40.0	3.7
8	4904.00	42.6 AV	54.0	-11.4	1.00 V	333	38.9	3.7
9	7356.00	39.7 PK	74.0	-34.3	2.77 V	133	29.8	9.9
10	7356.00	34.7 AV	54.0	-19.3	2.77 V	133	24.8	9.9

Remarks:

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

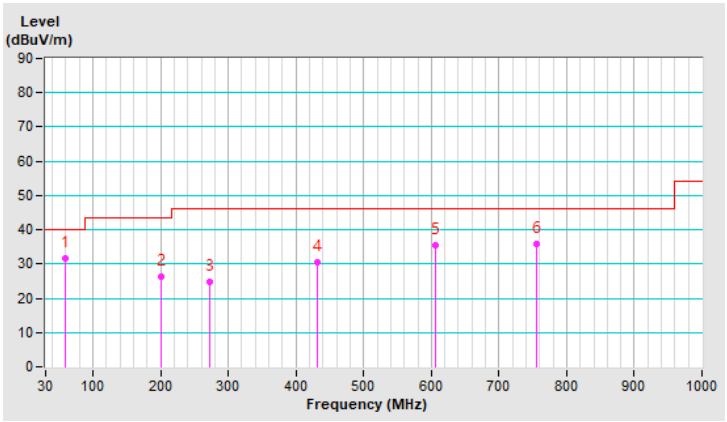
Below 1GHz Data:

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	59.32	31.6 QP	40.0	-8.4	1.50 H	217	39.7	-8.1
2	200.48	26.2 QP	43.5	-17.3	2.00 H	84	36.2	-10.0
3	272.89	24.6 QP	46.0	-21.4	1.00 H	82	31.6	-7.0
4	431.22	30.5 QP	46.0	-15.5	1.50 H	251	32.3	-1.8
5	606.37	35.5 QP	46.0	-10.5	1.00 H	320	33.2	2.3
6	756.19	35.8 QP	46.0	-10.2	1.50 H	360	30.2	5.6

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

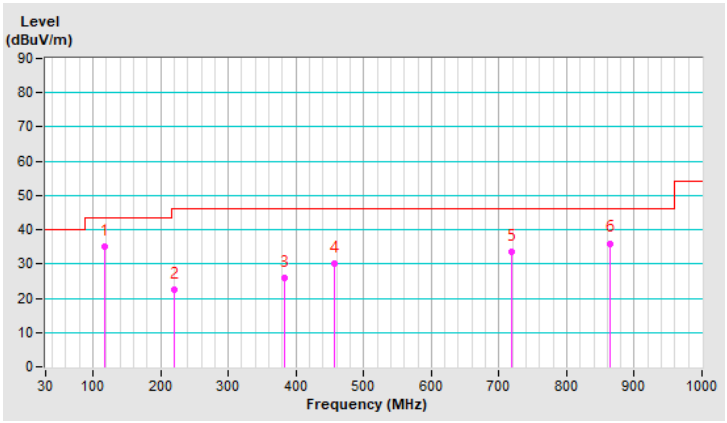


RF Mode	TX 802.11g	Channel	CH 6：2437 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	117.45	35.2 QP	43.5	-8.3	1.50 V	298	44.5	-9.3
2	220.85	22.6 QP	46.0	-23.4	1.00 V	239	32.4	-9.8
3	382.62	25.9 QP	46.0	-20.1	1.50 V	360	29.5	-3.6
4	456.31	30.1 QP	46.0	-15.9	1.00 V	16	31.4	-1.3
5	718.80	33.7 QP	46.0	-12.3	1.00 V	360	29.5	4.2
6	864.95	36.0 QP	46.0	-10.0	2.00 V	11	29.2	6.8

Remarks:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: Nov. 30, 2020

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.

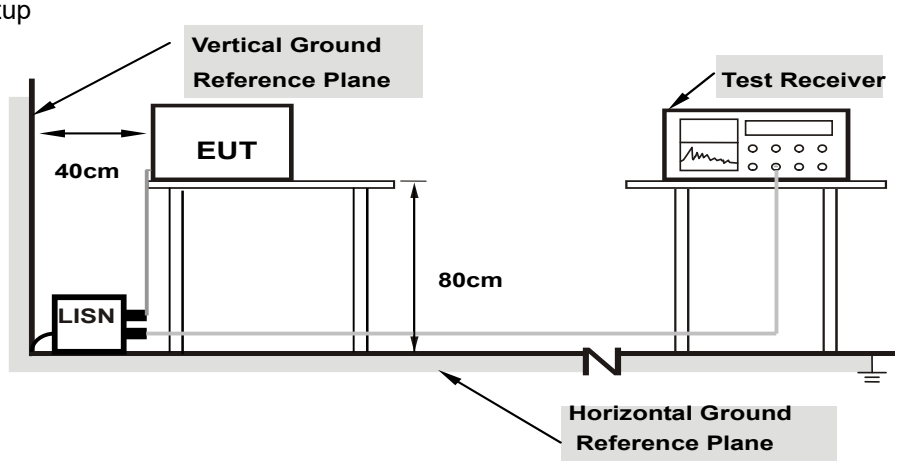
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

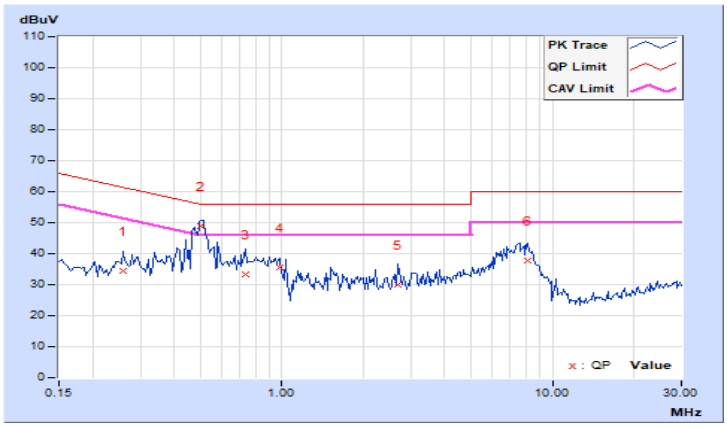
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.25938	10.00	24.32	17.48	34.32	27.48	61.45	51.45	-27.13	-23.97
2	0.50156	10.03	38.83	30.57	48.86	40.60	56.00	46.00	-7.14	-5.40
3	0.73203	10.04	23.17	16.47	33.21	26.51	56.00	46.00	-22.79	-19.49
4	0.98594	10.06	25.40	14.07	35.46	24.13	56.00	46.00	-20.54	-21.87
5	2.68750	10.19	19.76	12.86	29.95	23.05	56.00	46.00	-26.05	-22.95
6	8.11719	10.58	27.29	19.84	37.87	30.42	60.00	50.00	-22.13	-19.58

Remarks:

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

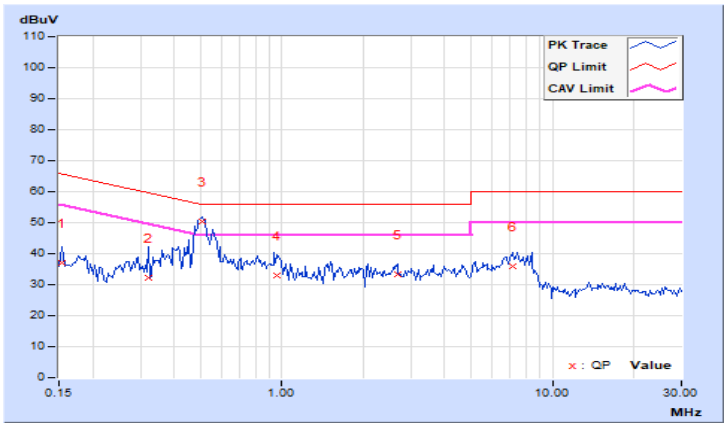


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.94	27.24	14.10	37.18	24.04	65.79	55.79	-28.61	-31.75
2	0.32188	10.00	22.39	16.46	32.39	26.46	59.66	49.66	-27.27	-23.20
3	**0.50938**	**10.02**	**40.19**	**32.06**	**50.21**	**42.08**	**56.00**	**46.00**	**-5.79**	**-3.92**
4	0.96250	10.07	23.02	16.88	33.09	26.95	56.00	46.00	-22.91	-19.05
5	2.66797	10.18	23.16	15.97	33.34	26.15	56.00	46.00	-22.66	-19.85
6	7.13281	10.44	25.37	18.39	35.81	28.83	60.00	50.00	-24.19	-21.17

Remarks:

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

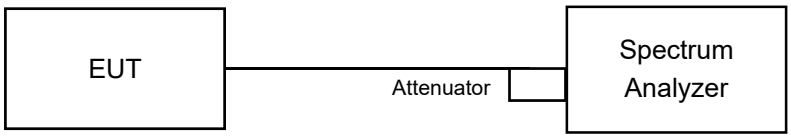


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	8.1	8.02	0.5	PASS
6	2437	7.6	8.03	0.5	PASS
11	2462	7.61	7.61	0.5	PASS

802.11g

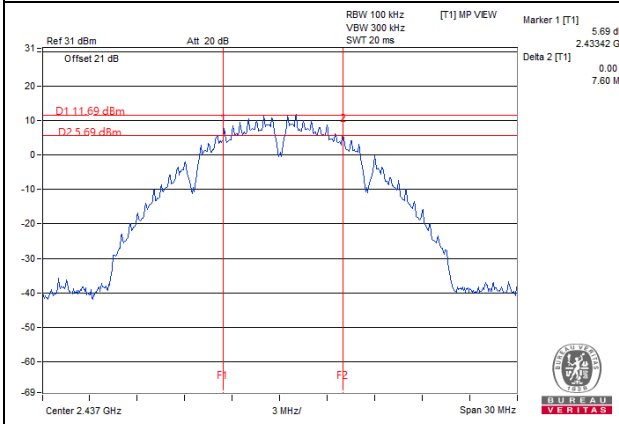
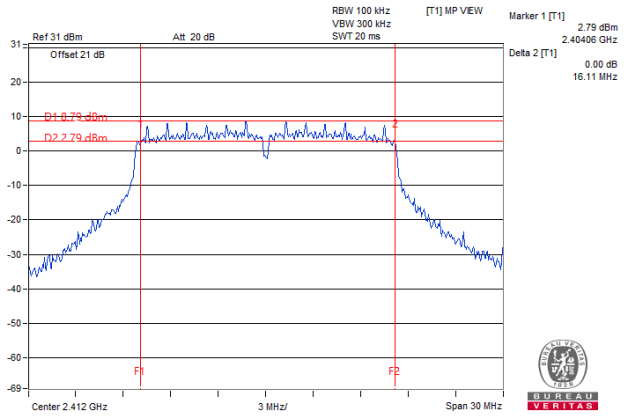
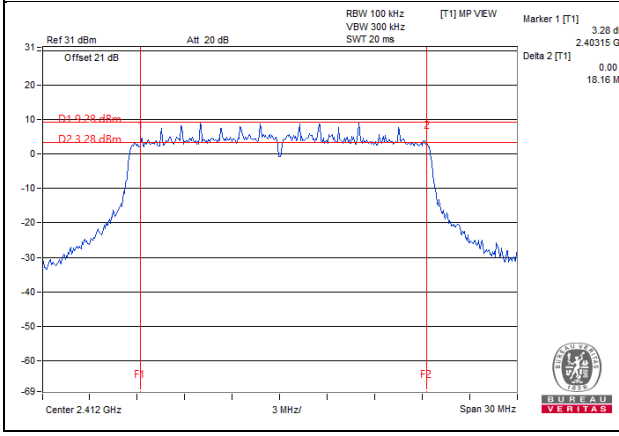
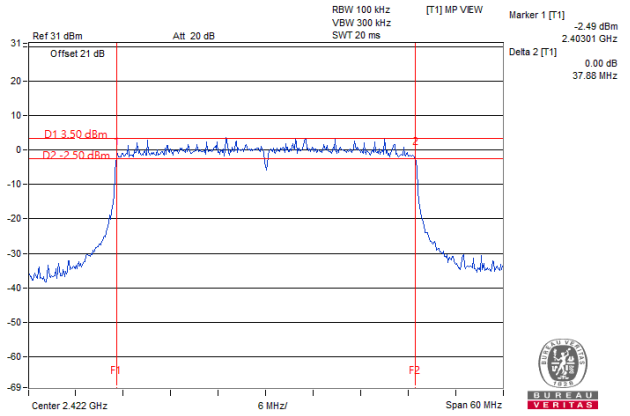
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.11	16.34	0.5	PASS
6	2437	16.37	16.37	0.5	PASS
11	2462	16.34	16.34	0.5	PASS

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	18.64	18.16	0.5	PASS
6	2437	18.93	18.65	0.5	PASS
11	2462	18.28	18.33	0.5	PASS

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	37.97	37.88	0.5	PASS
6	2437	37.97	37.92	0.5	PASS
9	2452	38.16	37.99	0.5	PASS

Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH6	**802.11g / Chain 0 : CH1**
	
802.11ax (HE20) / Chain 1 : CH1	**802.11ax (HE40) / Chain 1 : CH3**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

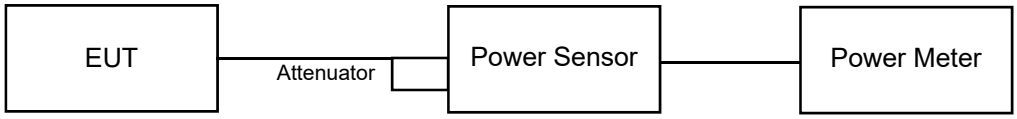
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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

FOR PEAK POWER

CDD Mode

802.11b

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.90	23.13	400.574	26.03	30	Pass
6	2437	22.89	23.07	397.304	25.99	30	Pass
11	2462	23.09	23.50	427.576	26.31	30	Pass

802.11g

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.79	25.67	670.278	28.26	30	Pass
6	2437	26.01	26.52	847.77	29.28	30	Pass
11	2462	24.94	25.79	691.204	28.40	30	Pass

802.11n (HT20)

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.32	24.23	535.246	27.29	30	Pass
6	2437	25.74	26.23	794.732	29.00	30	Pass
11	2462	24.73	25.21	629.061	27.99	30	Pass

802.11n (HT40)

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	21.85	23.36	369.879	25.68	30	Pass
6	2437	21.81	22.24	319.199	25.04	30	Pass
9	2452	22.69	21.54	328.341	25.16	30	Pass

802.11ax (HE20)

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.64	24.45	569.684	27.56	30	Pass
6	2437	26.03	26.44	841.422	29.25	30	Pass
11	2462	24.73	25.21	629.061	27.99	30	Pass

802.11ax (HE40)

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	22.19	23.68	398.923	26.01	30	Pass
6	2437	22.84	22.78	381.98	25.82	30	Pass
9	2452	22.91	22.83	387.301	25.88	30	Pass

Beamforming Mode

802.11ax (HE20)

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.64	24.45	569.684	27.56	28.09	Pass
6	2437	24.52	24.95	595.747	27.75	28.09	Pass
11	2462	24.73	25.21	629.061	27.99	28.09	Pass

Note: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 7.91dBi > 6dBi , so the power limit shall be reduced to 30-(7.91-6) =28.09dBm.

802.11ax (HE40)

Chan.	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	22.19	23.68	398.923	26.01	28.09	Pass
6	2437	22.84	22.78	381.98	25.82	28.09	Pass
9	2452	22.91	22.83	387.301	25.88	28.09	Pass

Note: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 7.91dBi > 6dBi , so the power limit shall be reduced to 30-(7.91-6) =28.09dBm.

FOR AVERAGE POWER

CDD Mode

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	20.25	20.59	220.477	23.43
6	2437	20.35	20.54	221.633	23.46
11	2462	20.48	20.97	236.712	23.74

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	19.72	20.44	204.419	23.11
6	2437	24.05	24.19	516.519	27.13
11	2462	19.95	20.52	211.575	23.25

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	18.04	18.70	137.811	21.39
6	2437	23.65	23.81	472.176	26.74
11	2462	18.35	18.92	146.374	21.65

802.11n (HT40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	16.01	16.85	88.32	19.46
6	2437	18.19	18.51	136.875	21.36
9	2452	16.47	16.79	92.114	19.64

802.11ax (HE20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	18.34	18.91	146.038	21.64
6	2437	23.94	24.02	500.09	26.99
11	2462	18.65	19.14	155.318	21.91

802.11ax (HE40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	16.31	17.07	93.689	19.72
6	2437	18.46	18.80	146.003	21.64
9	2452	16.73	17.01	97.332	19.88

Beamforming Mode

802.11ax (HE20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	18.34	18.91	146.038	21.64
6	2437	22.45	22.54	355.266	25.51
11	2462	18.65	19.14	155.318	21.91

802.11ax (HE40)

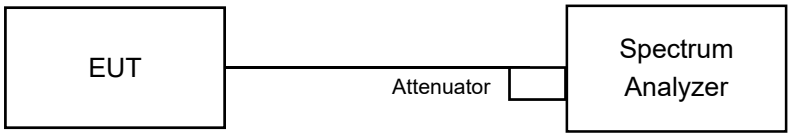
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	16.31	17.07	93.689	19.72
6	2437	18.46	18.80	146.003	21.64
9	2452	16.73	17.01	97.332	19.88

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1				
1	2412	-2.89	-2.31	1.1015	0.42	6.09	PASS
6	2437	-1.84	-1.59	1.3481	1.30	6.09	PASS
11	2462	-2.55	-1.78	1.2196	0.86	6.09	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.

2. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.91dBi > 6dBi, so the power density limit shall be reduced to 8- (7.91-6) = 6.09 dBm.

802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1				
1	2412	-6.00	-4.25	0.627	-2.03	6.09	PASS
6	2437	-0.92	-1.08	1.5889	2.01	6.09	PASS
11	2462	-5.97	-3.21	0.7305	-1.36	6.09	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.

2. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.91dBi > 6dBi, so the power density limit shall be reduced to 8- (7.91-6) = 6.09 dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1				
1	2412	-7.92	-7.63	0.334	-4.76	6.09	PASS
6	2437	-2.99	-3.59	0.9399	-0.27	6.09	PASS
11	2462	-7.82	-7.13	0.3588	-4.45	6.09	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.

2. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.91dBi > 6dBi, so the power density limit shall be reduced to 8- (7.91-6) = 6.09 dBm.

802.11ax (HE40)

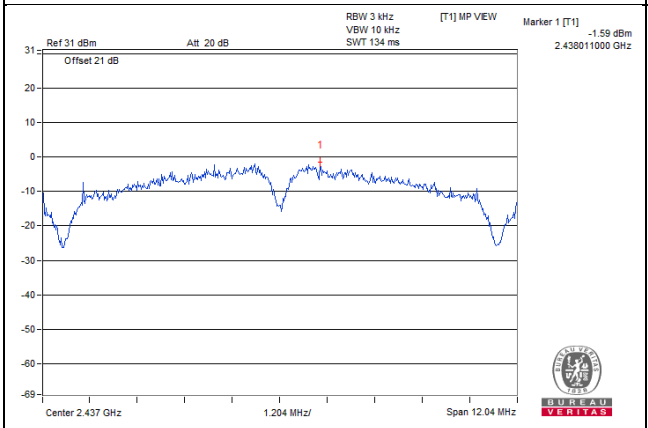
Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (mW/3kHz)	Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1				
3	2422	-12.27	-11.39	0.1319	-8.80	6.09	PASS
6	2437	-10.44	-9.41	0.20492	-6.88	6.09	PASS
9	2452	-12.30	-10.78	0.14244	-8.46	6.09	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.

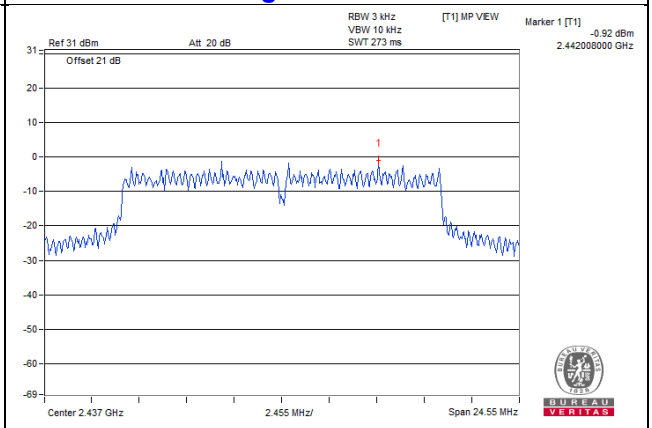
2. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.91dBi > 6dBi, so the power density limit shall be reduced to 8- (7.91-6) = 6.09 dBm.

Spectrum Plot of Worst Value

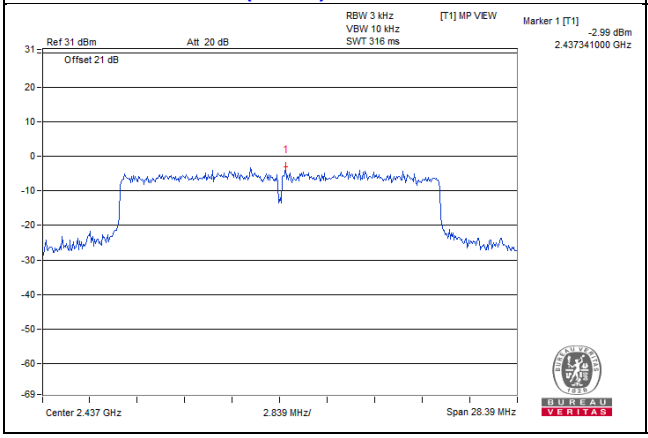
802.11b / Chain 1 : CH6



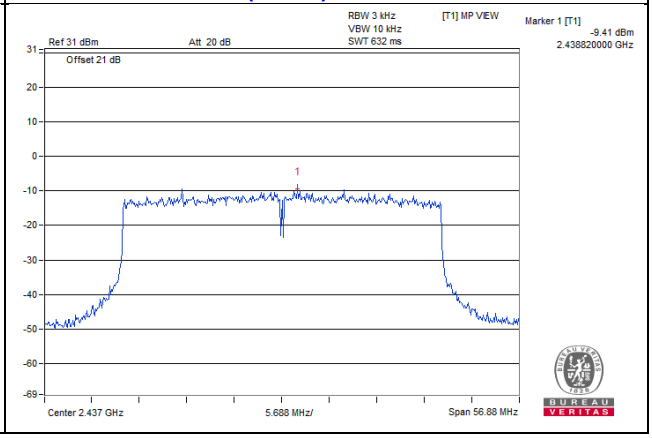
802.11g / Chain 0 : CH6



802.11ax (HE20) / Chain 0 : CH6



802.11ax (HE40) / Chain 1 : CH6

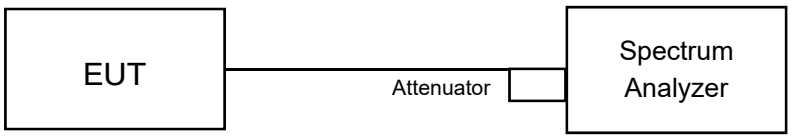


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

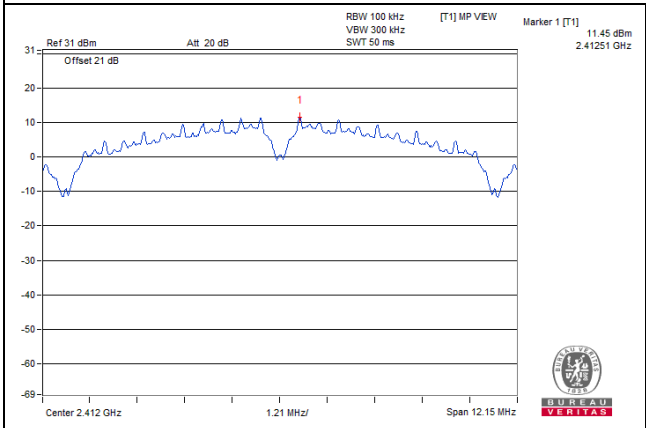
Same as Item 4.3.6

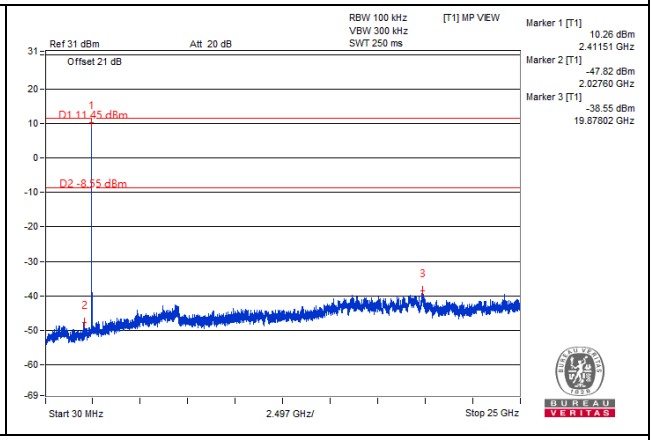
4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

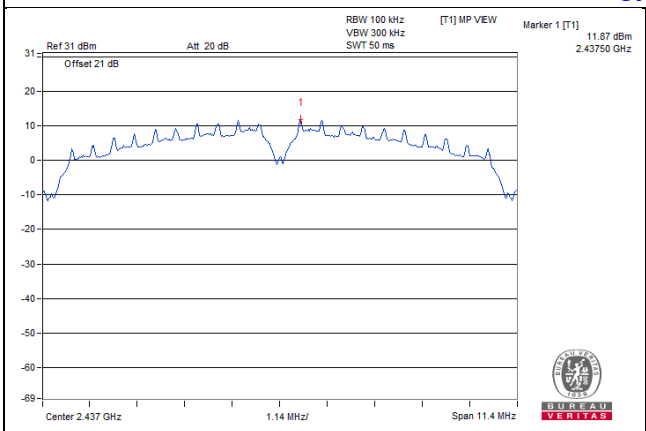
802.11b
CHAIN 0

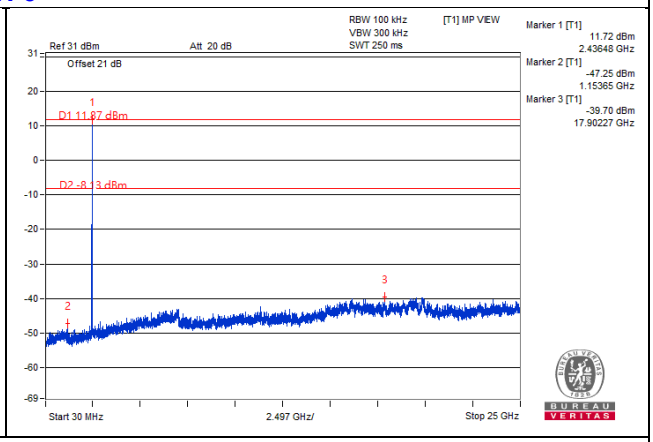
CH 1



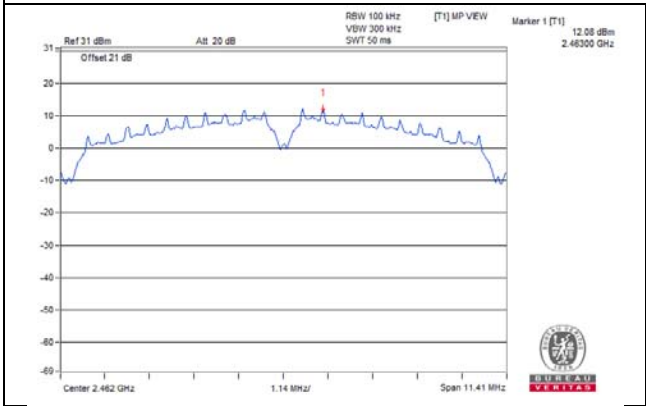


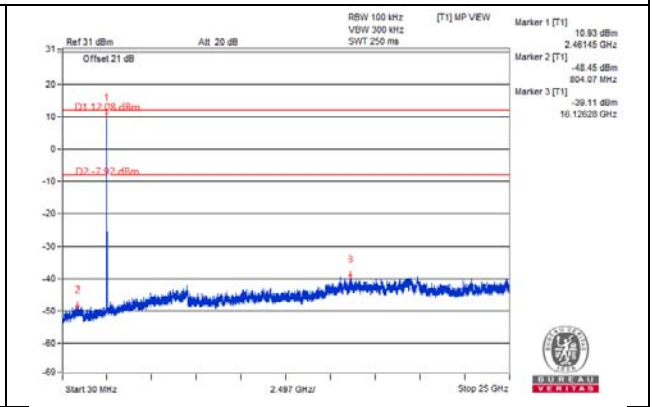
CH 6



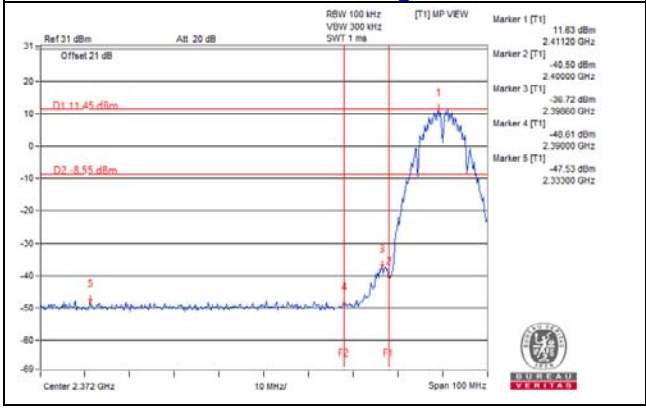


CH 11

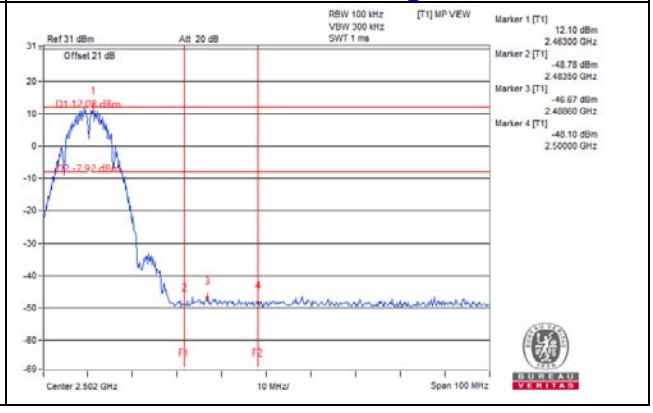




CH 1 Band edge

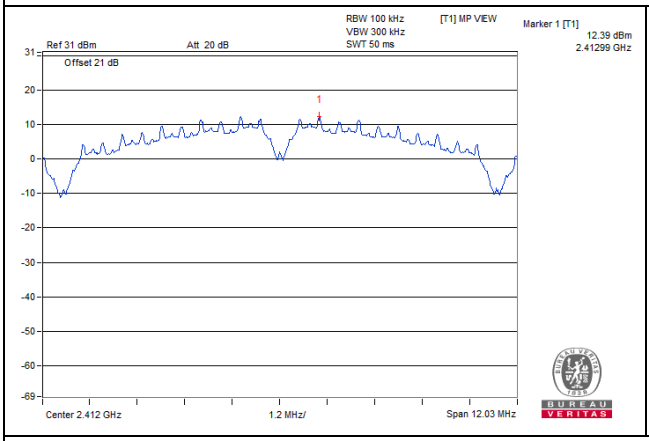


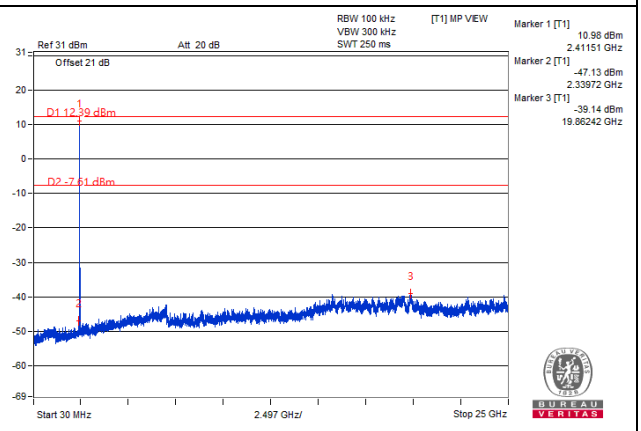
CH 11 Band edge



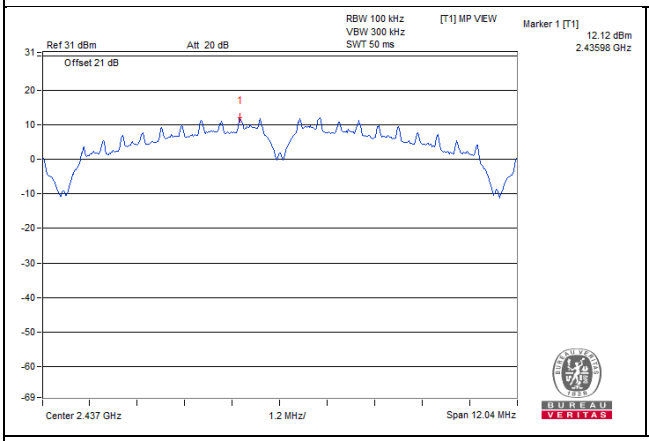
CHAIN 1

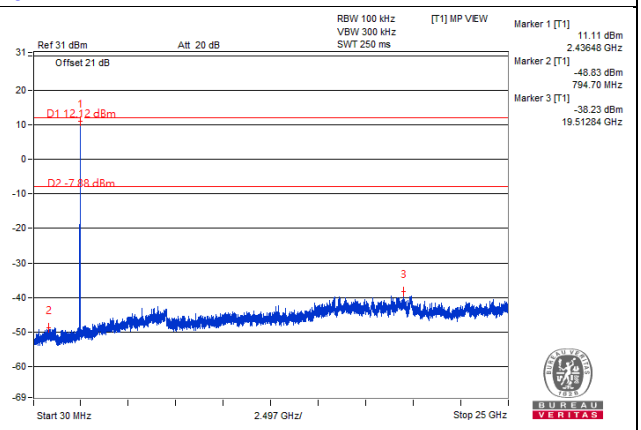
CH 1



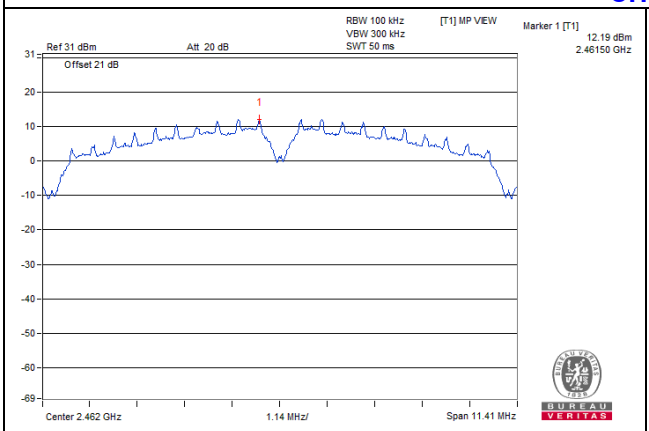


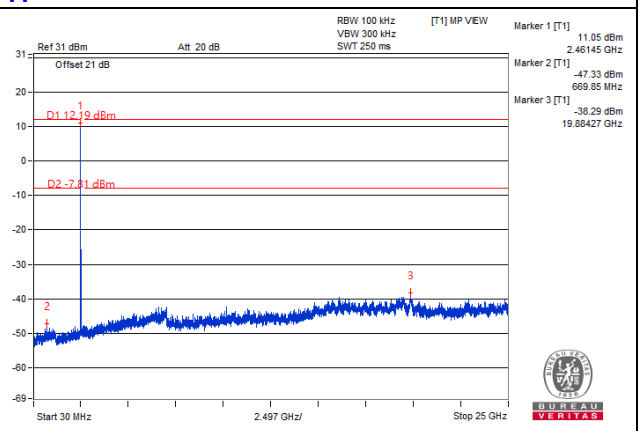
CH 6



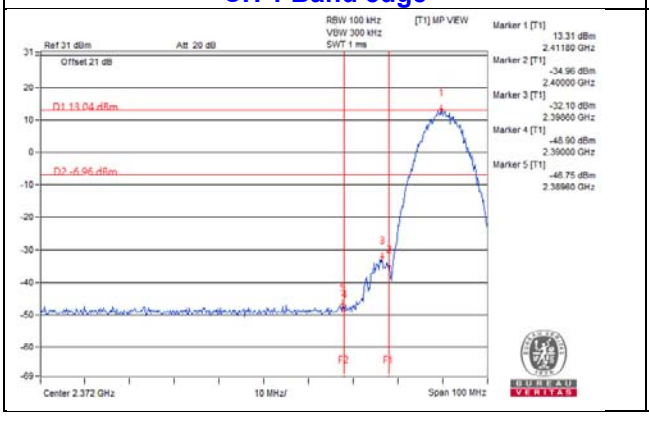


CH 11

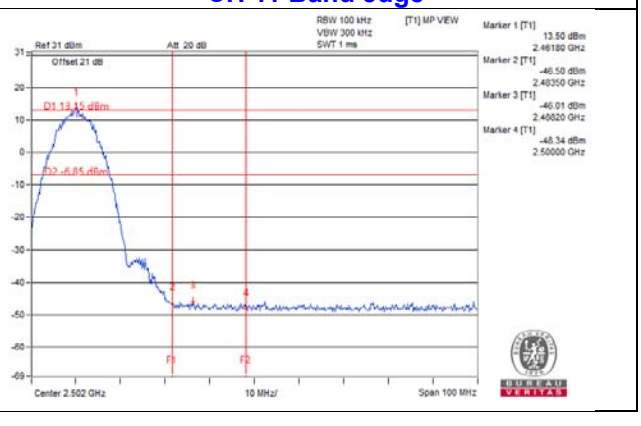




CH 1 Band edge

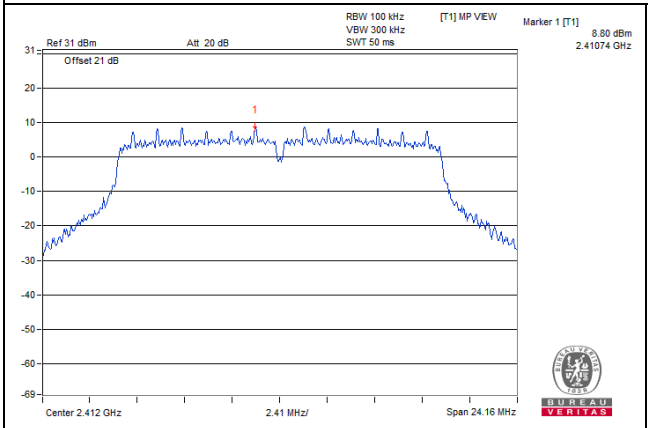


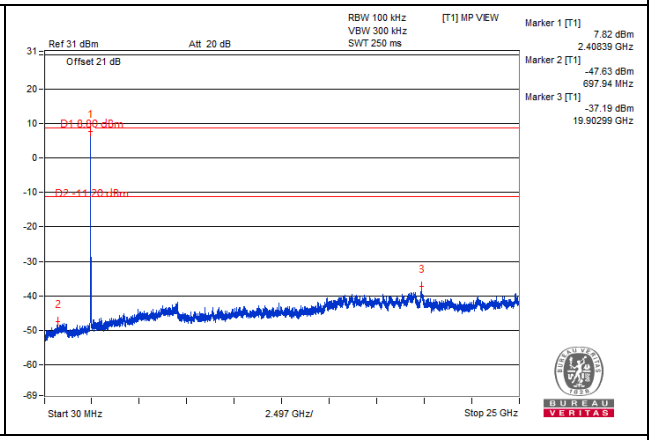
CH 11 Band edge



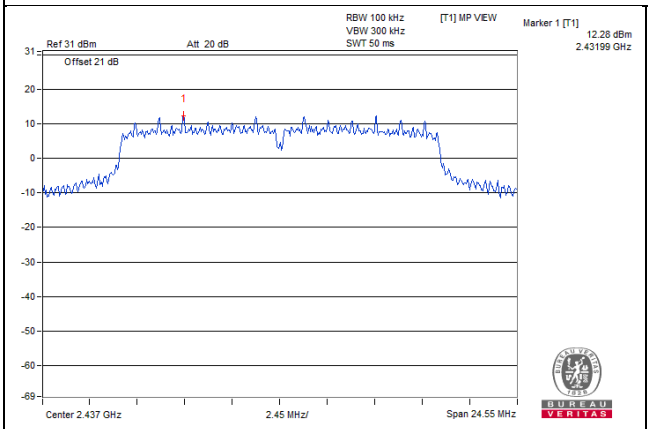
802.11g
CHAIN 0

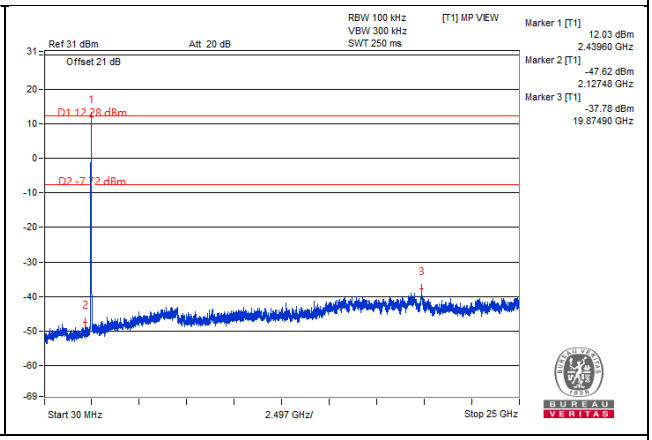
CH 1



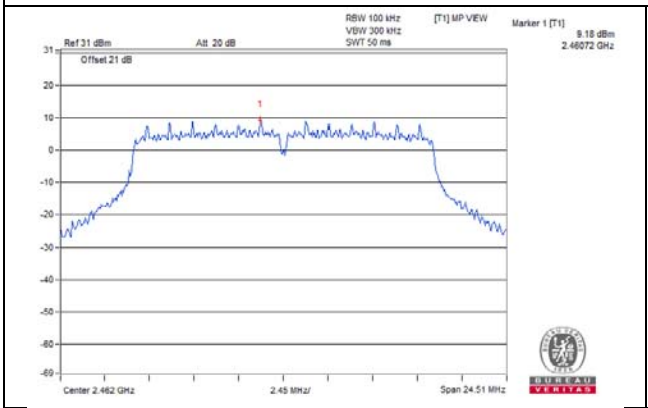


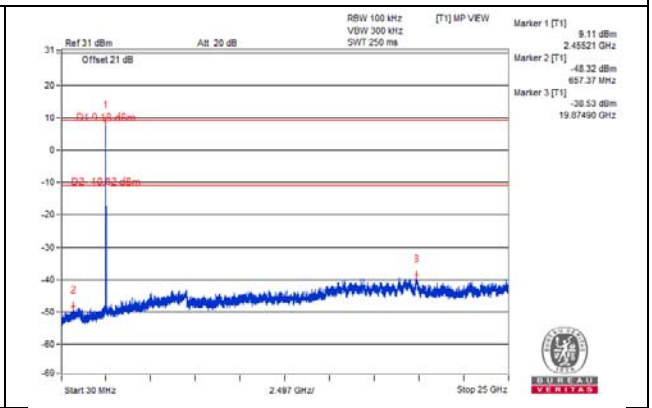
CH 6



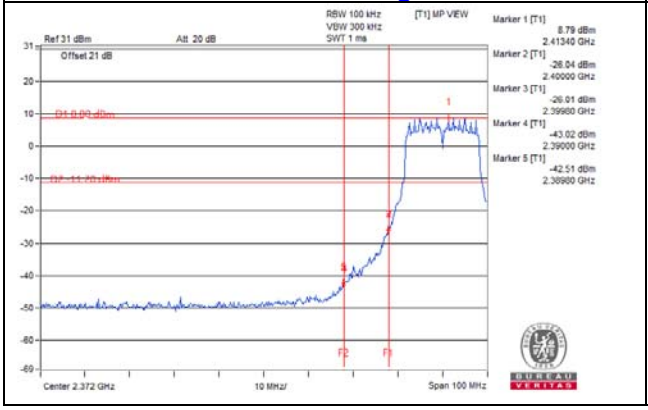


CH 11

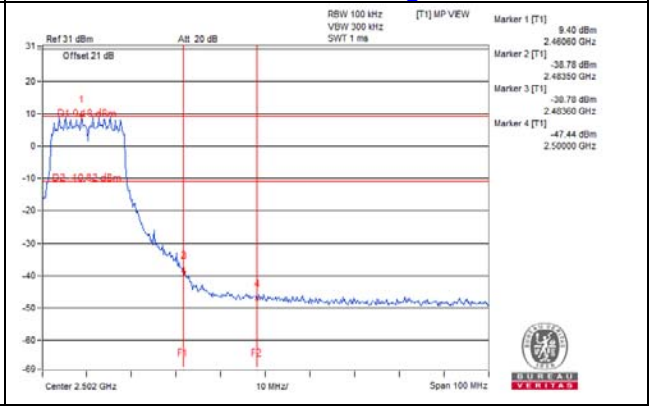




CH 1 Band edge

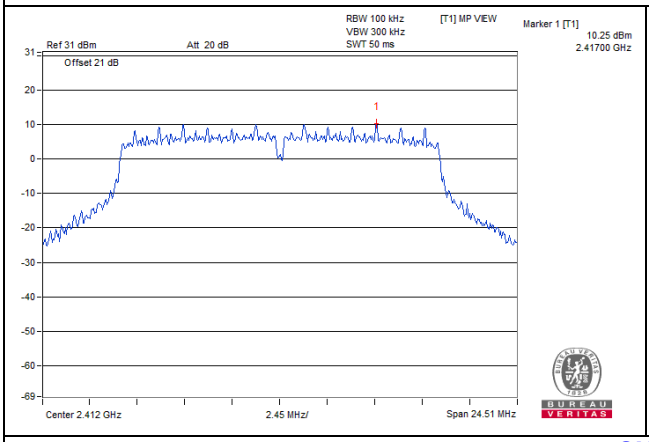


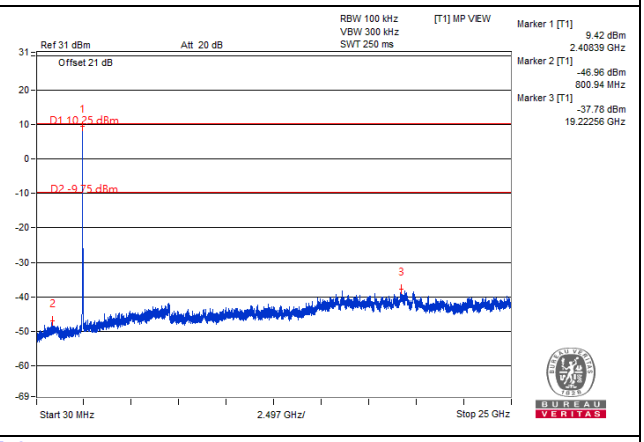
CH 11 Band edge



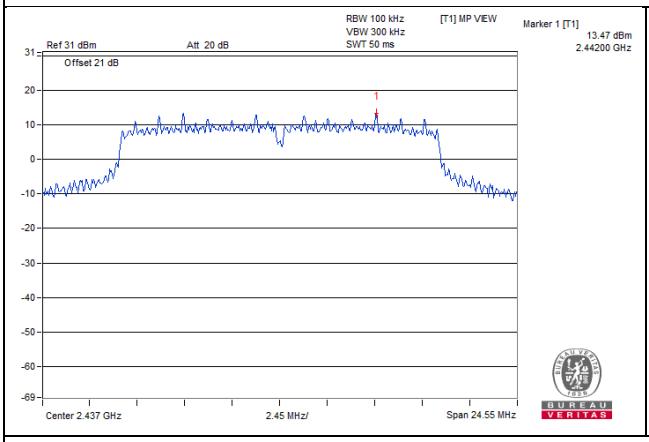
CHAIN 1

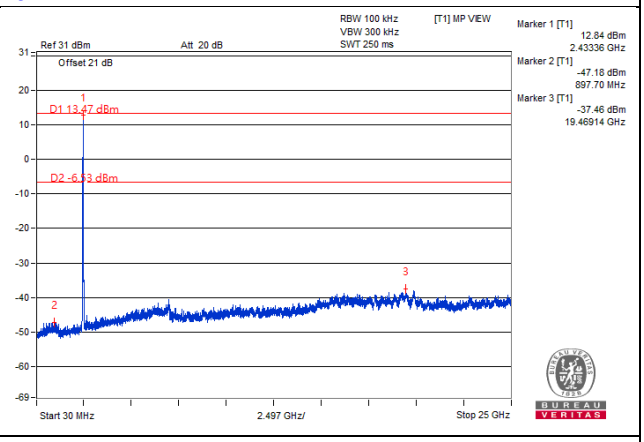
CH 1



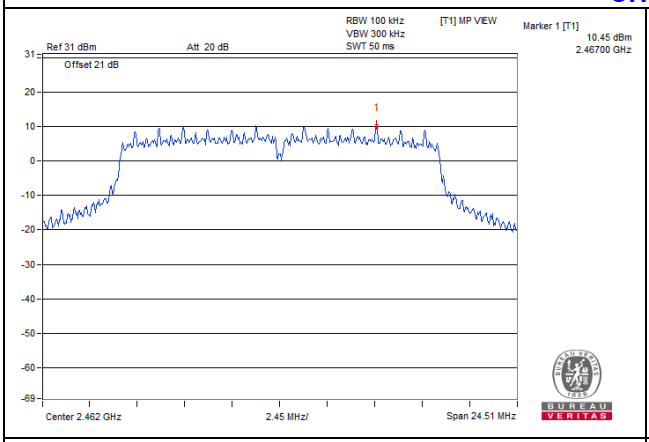


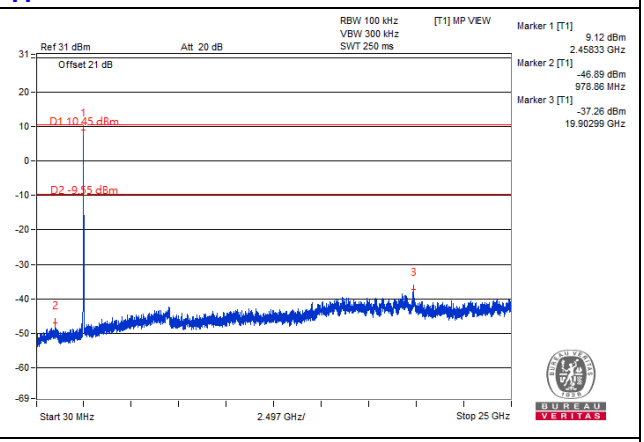
CH 6



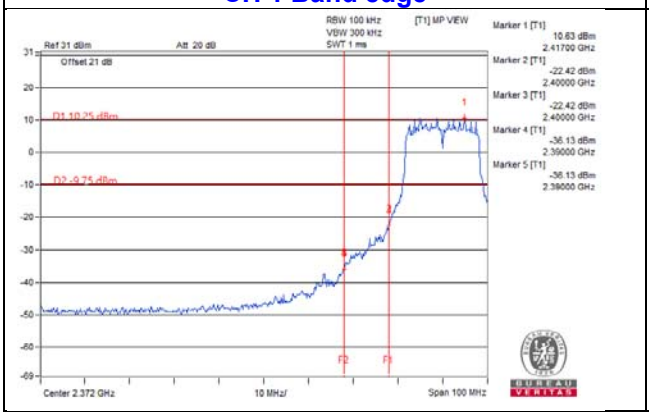


CH 11

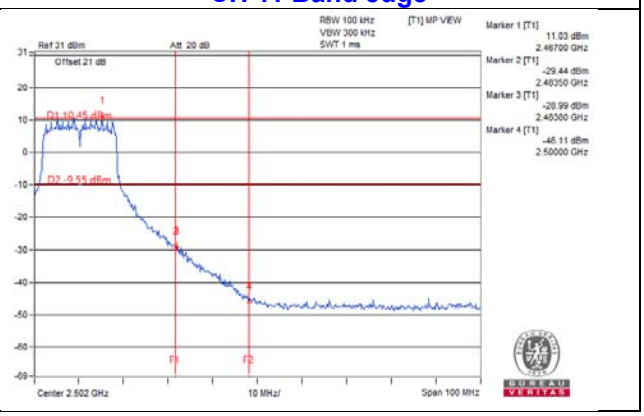




CH 1 Band edge



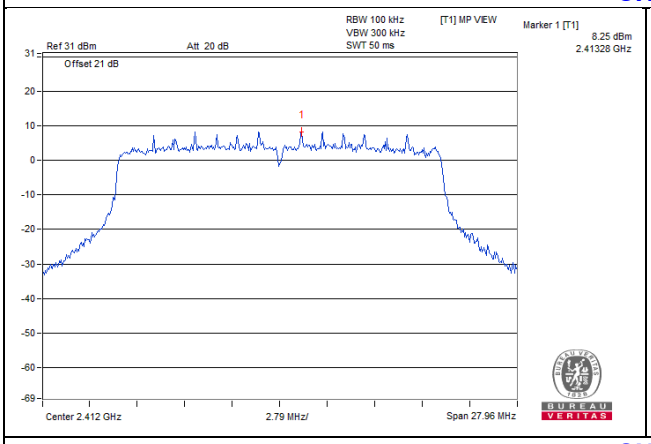
CH 11 Band edge

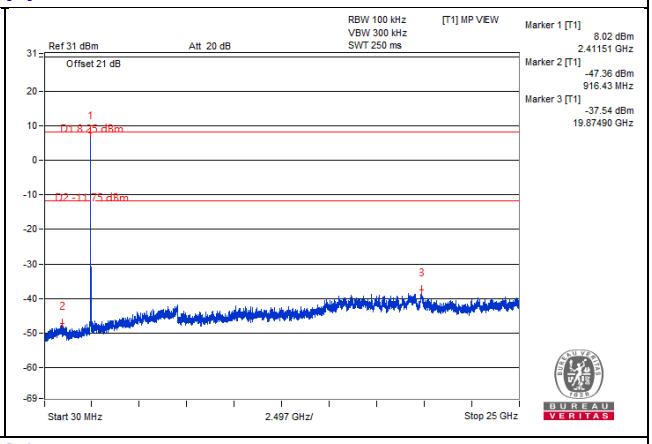


802.11ax (HE20)

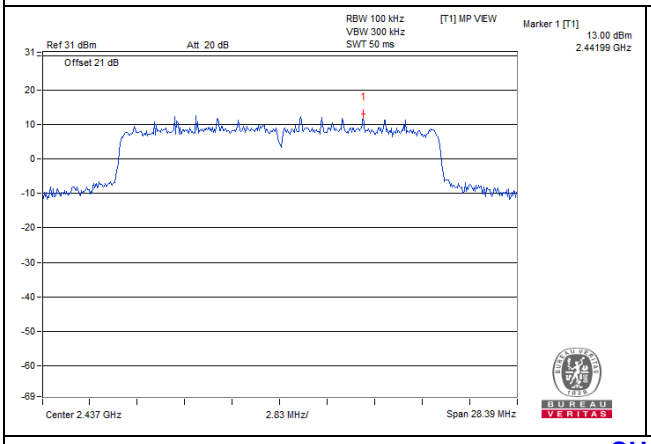
CHAIN 0

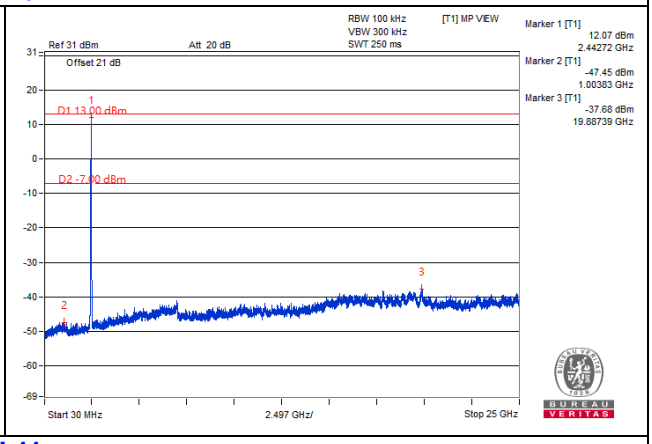
CH 1



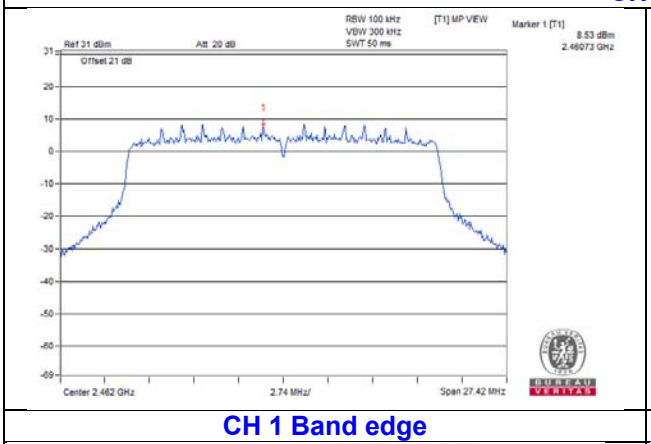


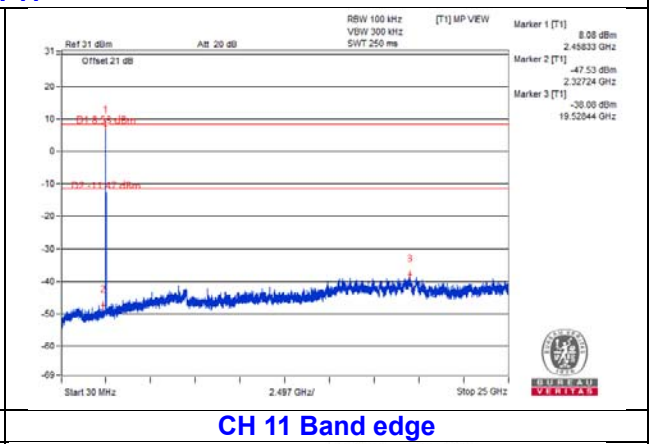
CH 6



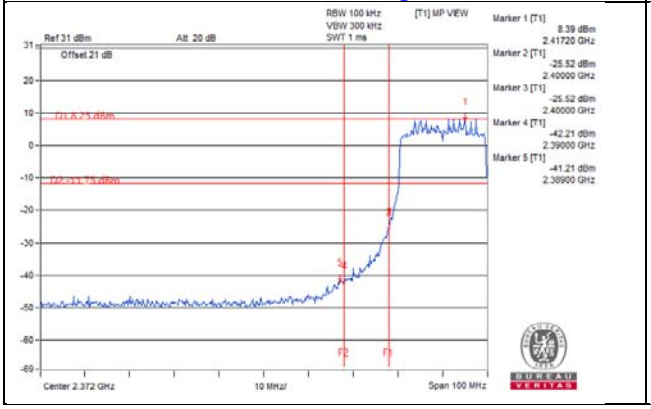


CH 11

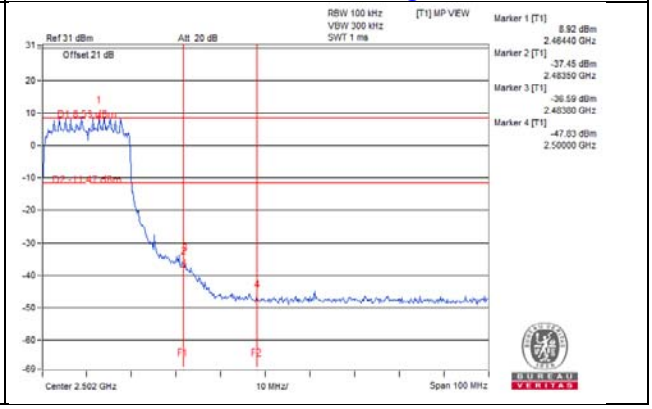




CH 1 Band edge

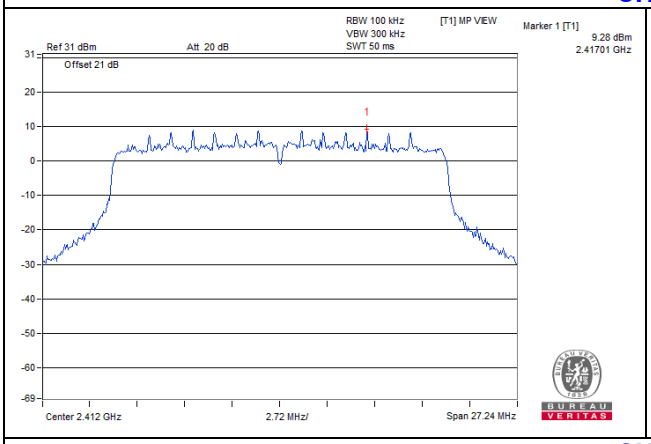


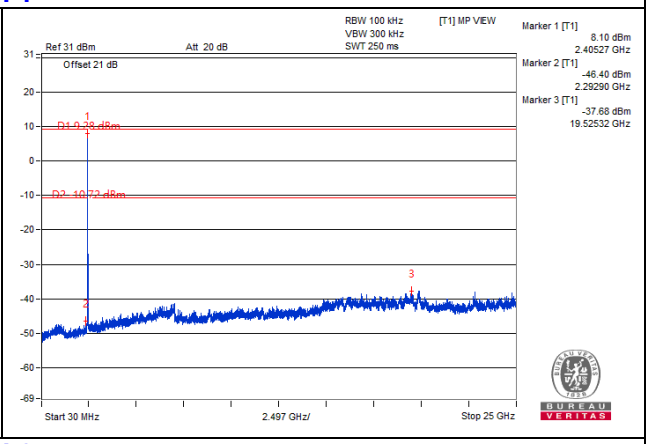
CH 11 Band edge



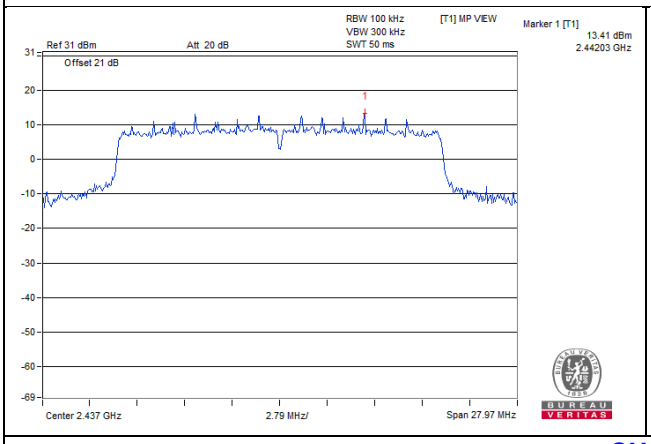
CHAIN 1

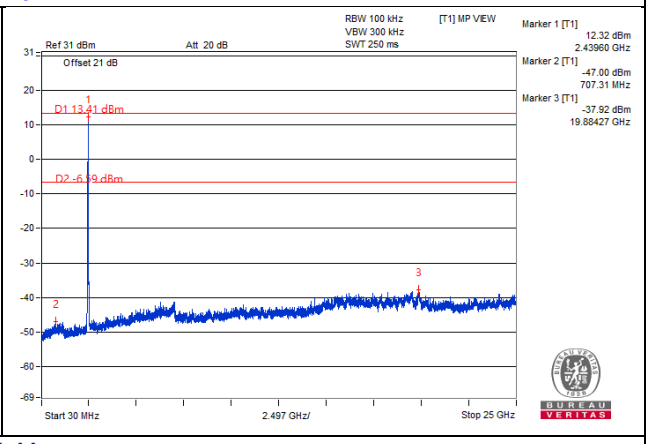
CH 1



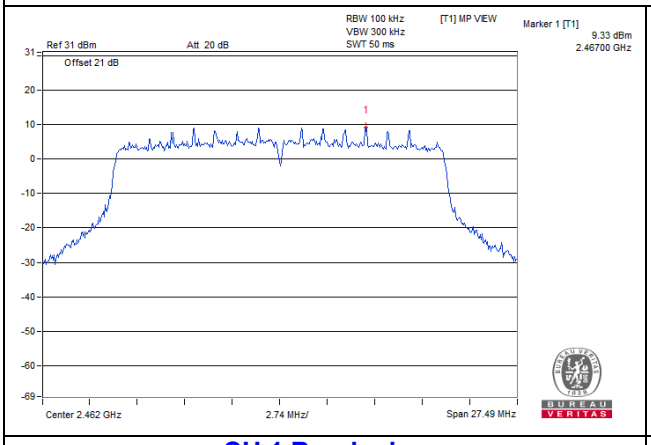


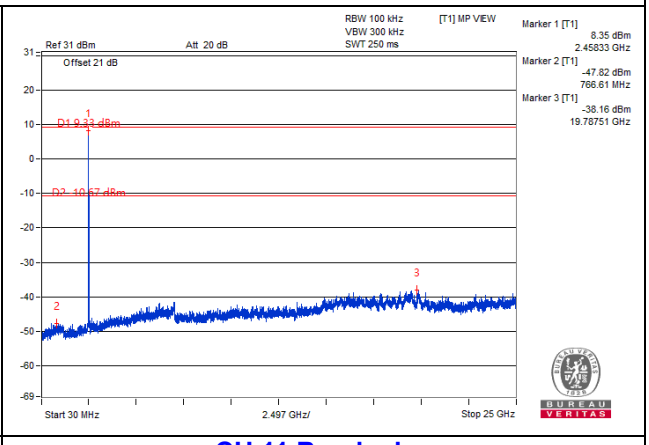
CH 6



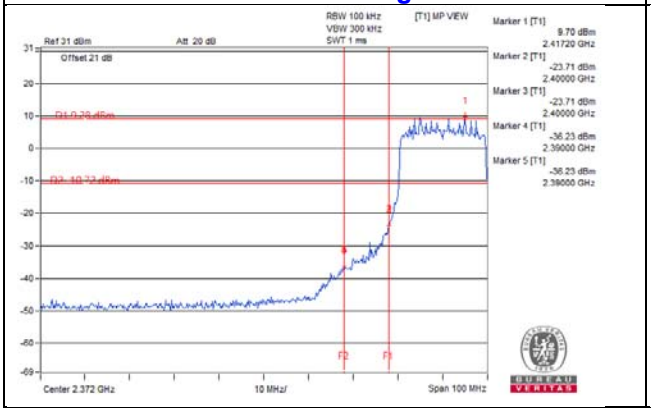


CH 11

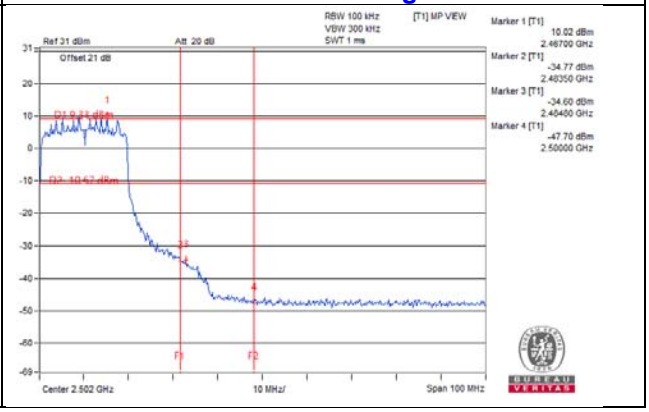




CH 1 Band edge

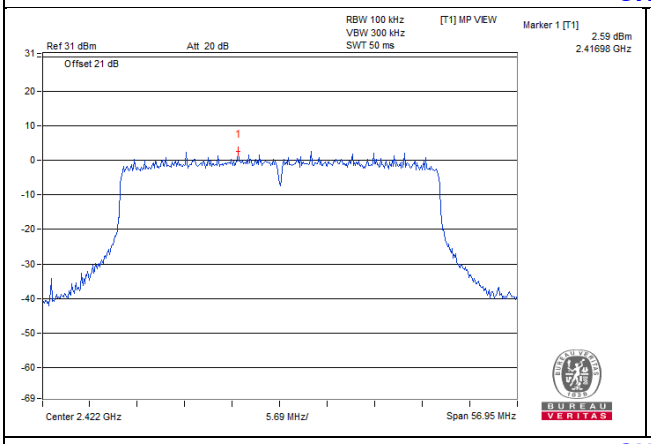


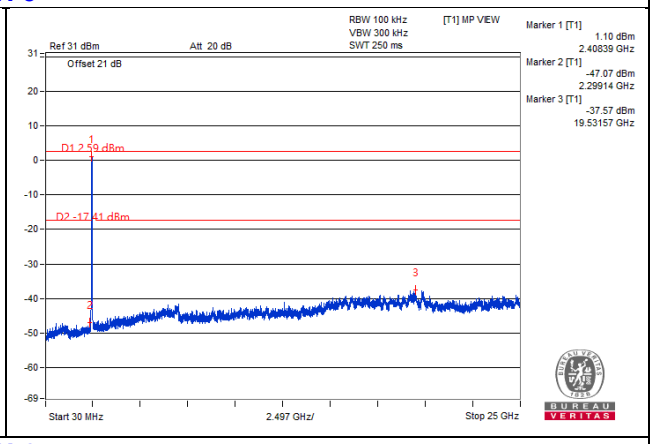
CH 11 Band edge



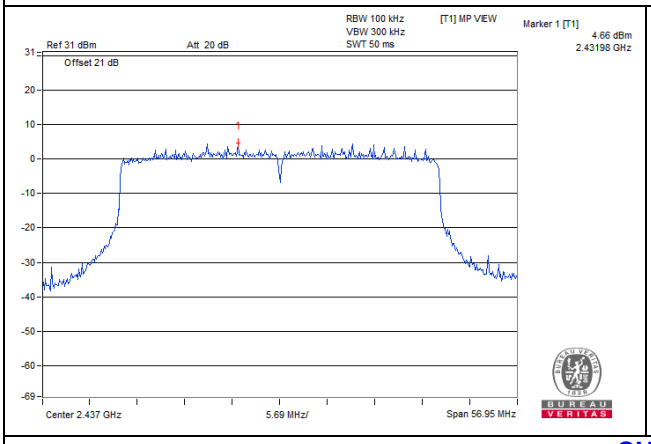
802.11ax (HE40)
Chain 0

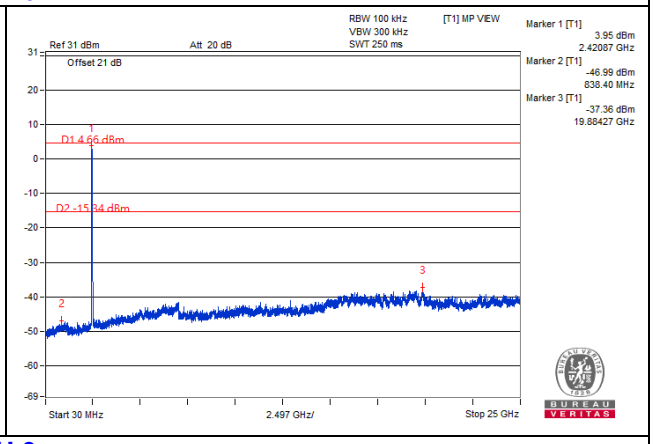
CH 3



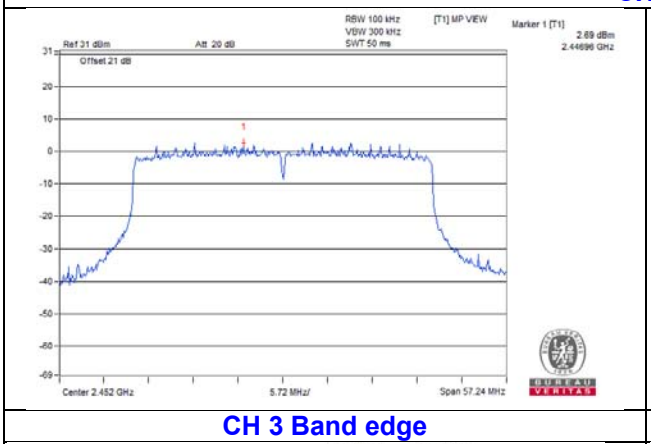


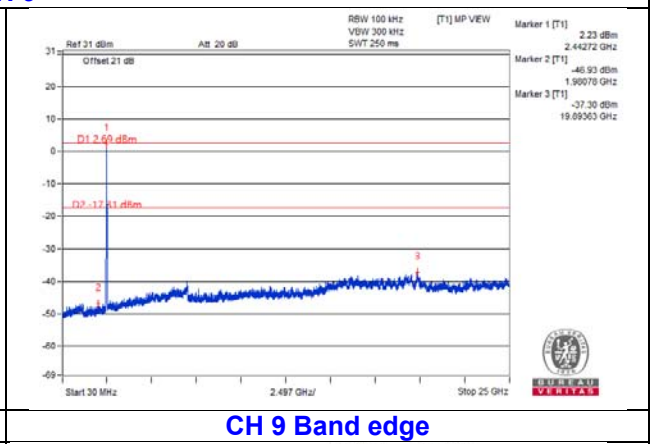
CH 6



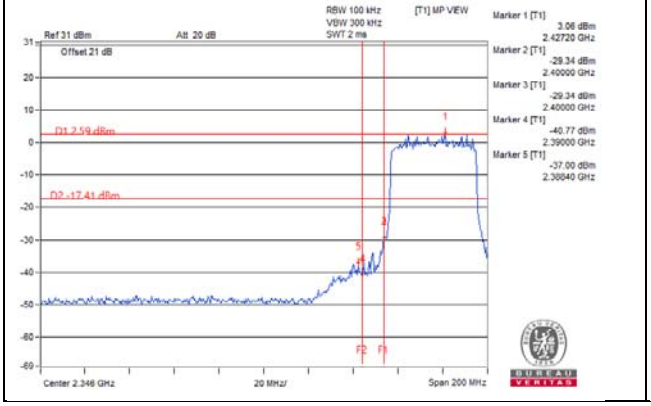


CH 9

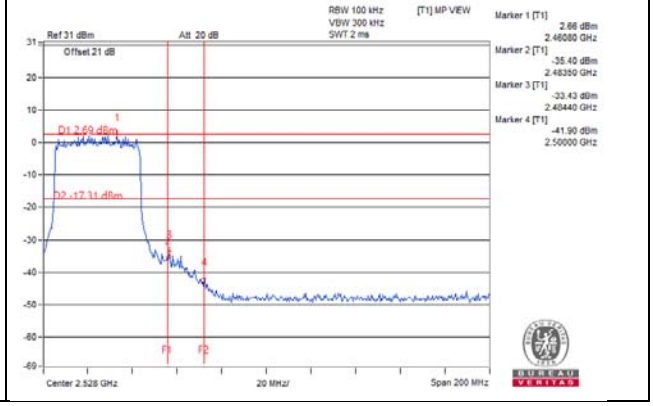




CH 3 Band edge

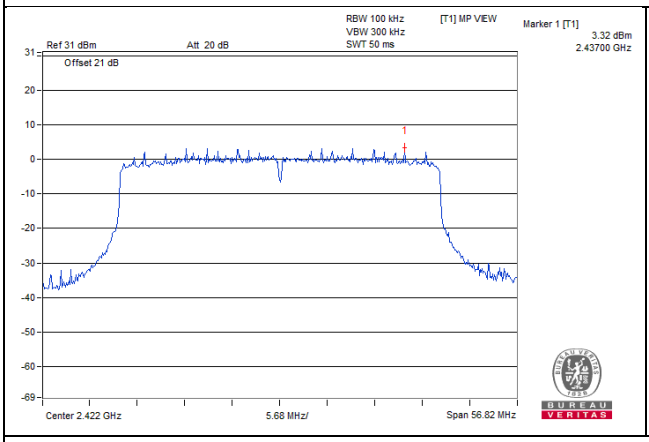


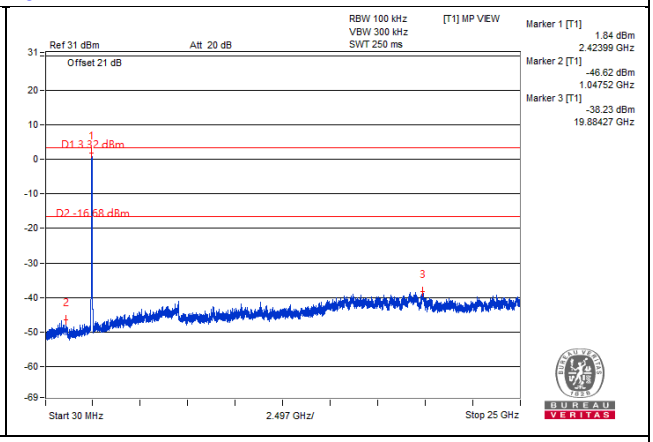
CH 9 Band edge



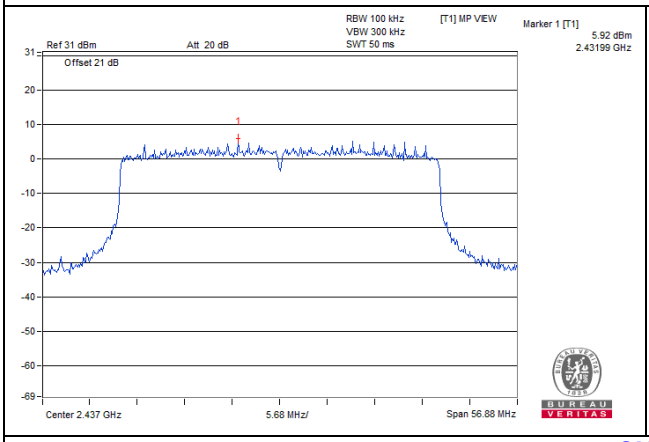
Chain 1

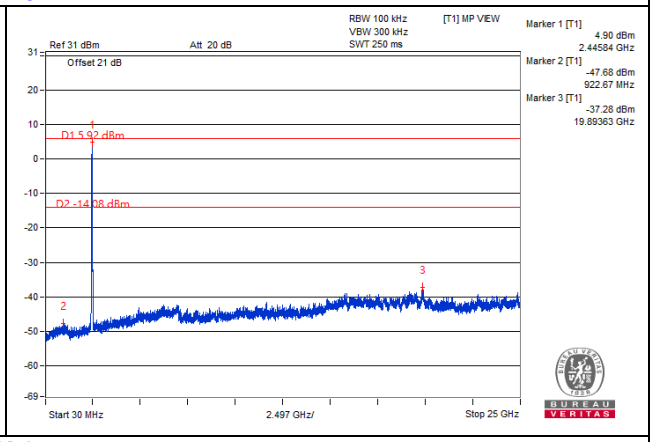
CH 3



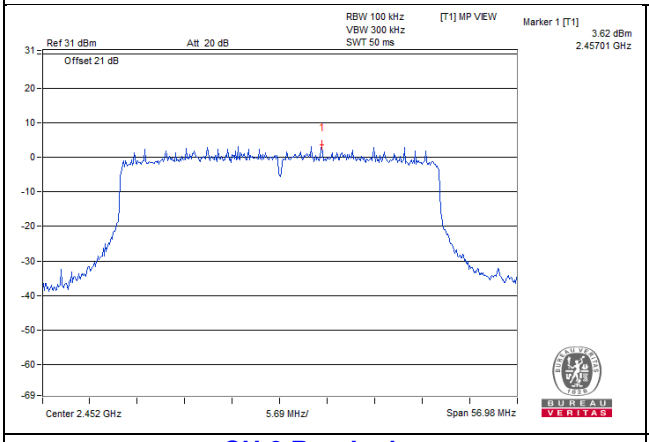


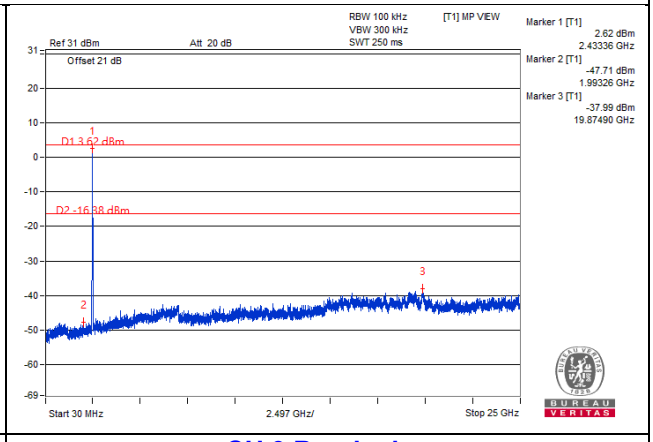
CH 6



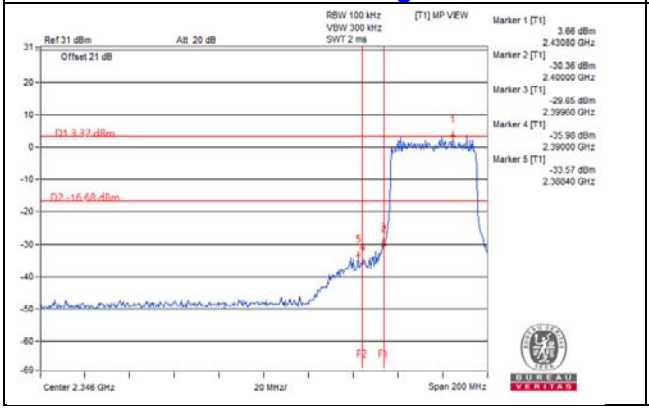


CH 9

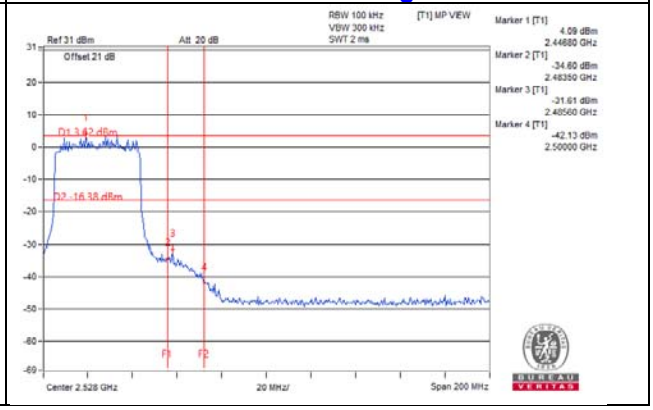




CH 3 Band edge



CH 9 Band edge



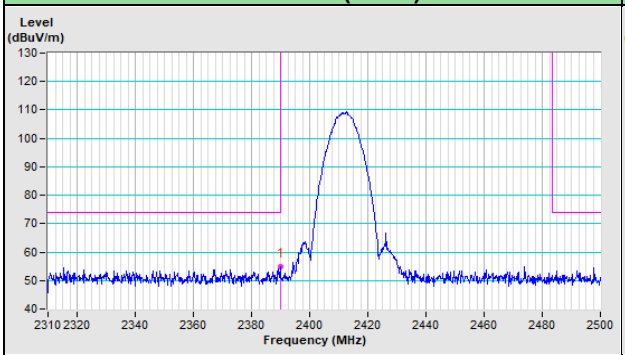
5 Pictures of Test Arrangements

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

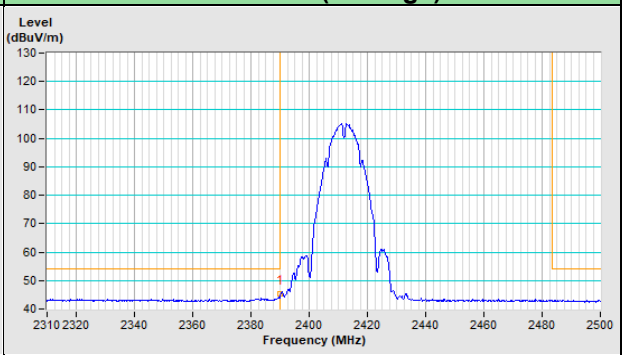
Annex A - Band-Edge Measurement

802.11b Channel 1

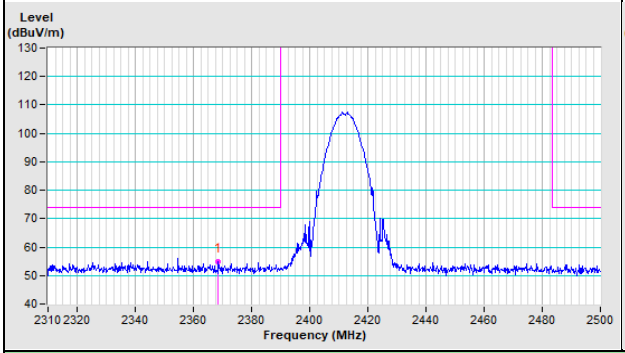
Horizontal (Peak)



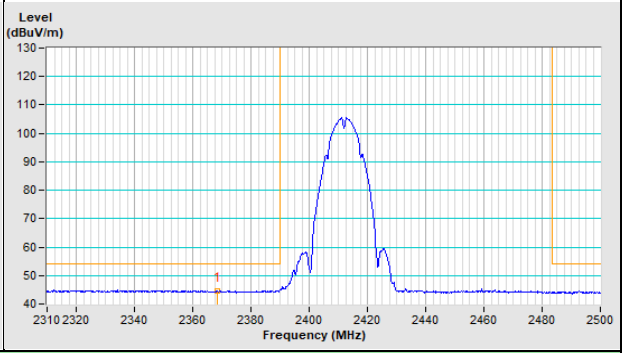
Horizontal (Average)



Vertical (Peak)

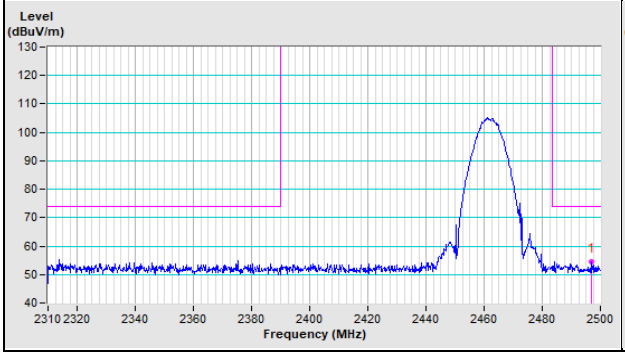


Vertical (Average)

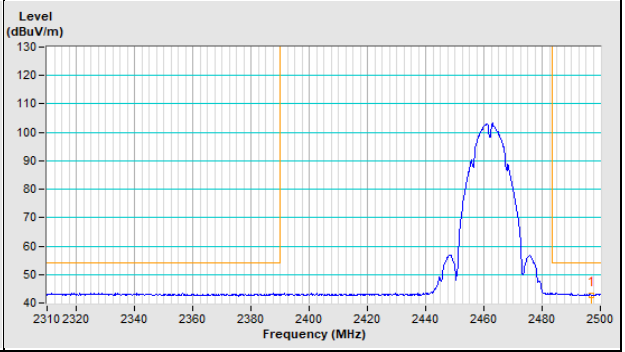


802.11b Channel 11

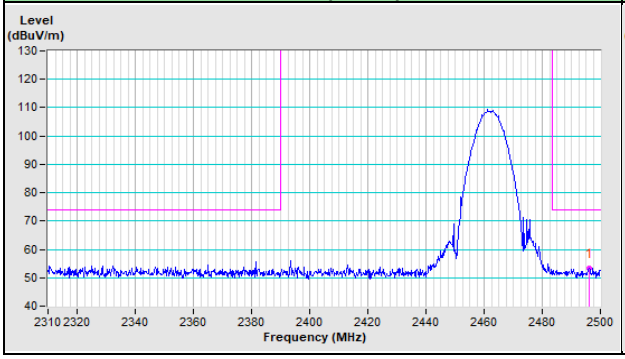
Horizontal (Peak)



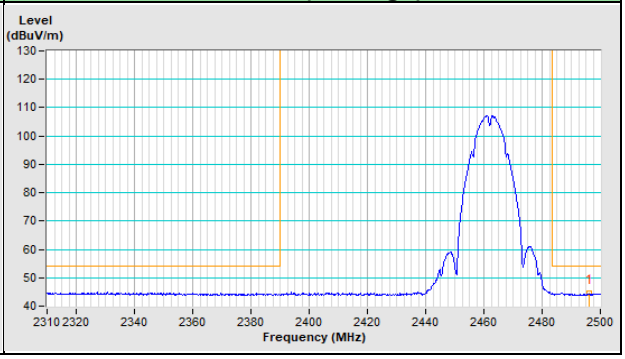
Horizontal (Average)



Vertical (Peak)

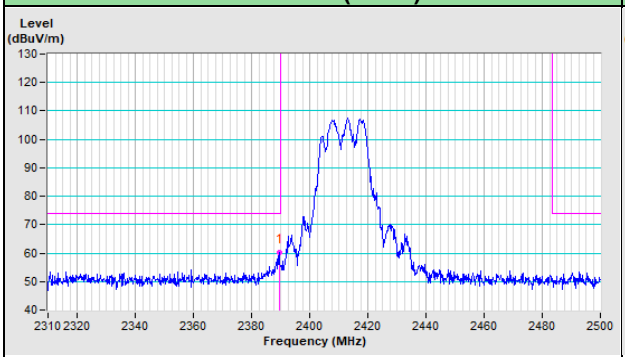


Vertical (Average)

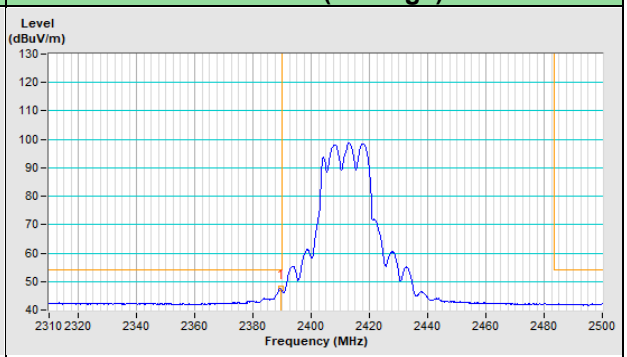


802.11g Channel 1

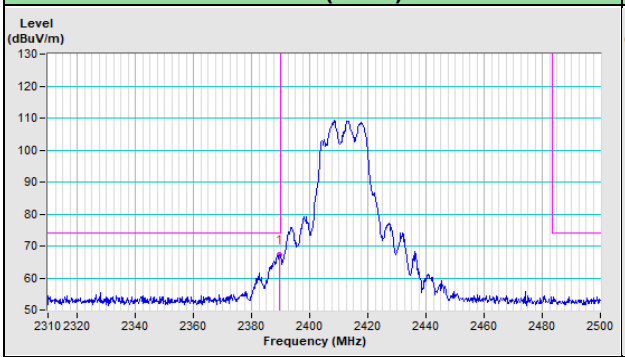
Horizontal (Peak)



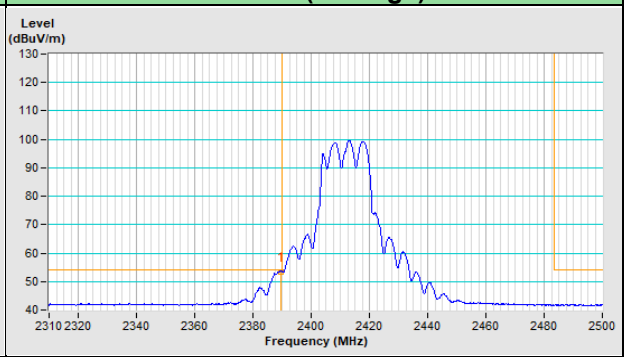
Horizontal (Average)



Vertical (Peak)

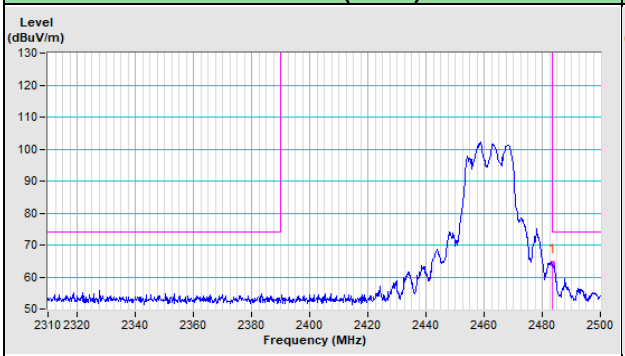


Vertical (Average)

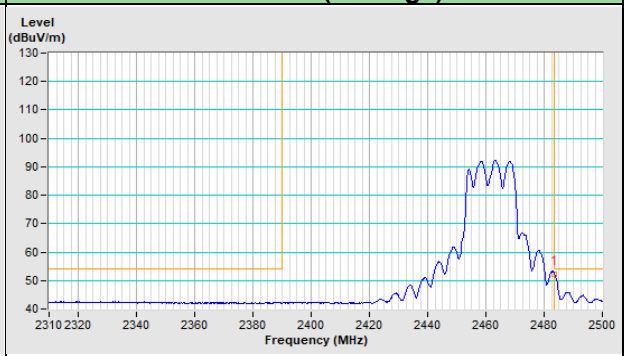


802.11g Channel 11

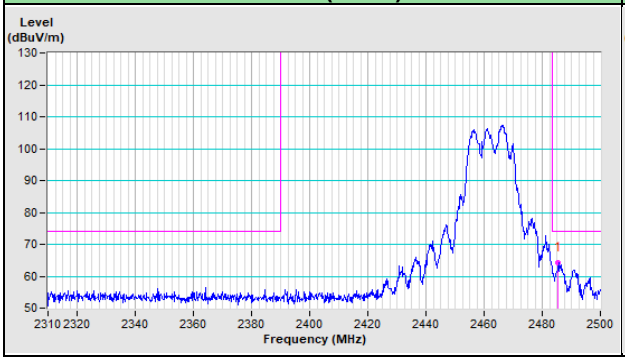
Horizontal (Peak)



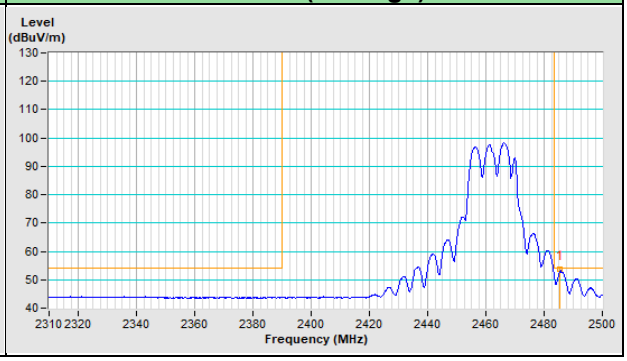
Horizontal (Average)



Vertical (Peak)

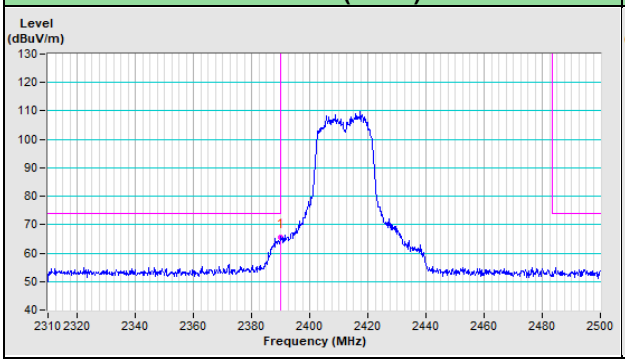


Vertical (Average)

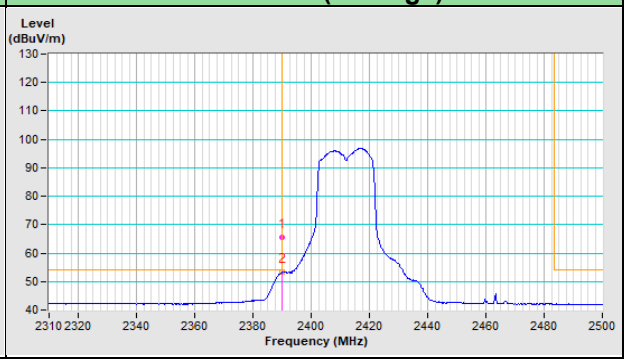


802.11ax (HE20) Channel 1

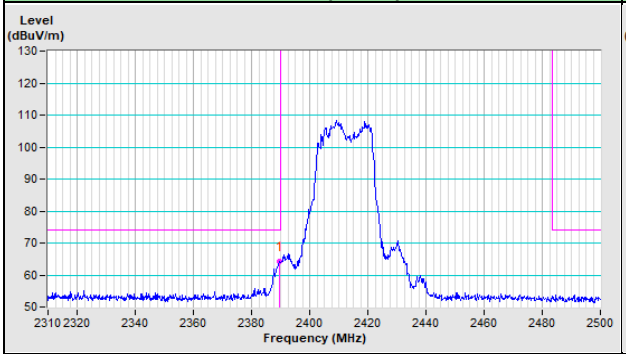
Horizontal (Peak)



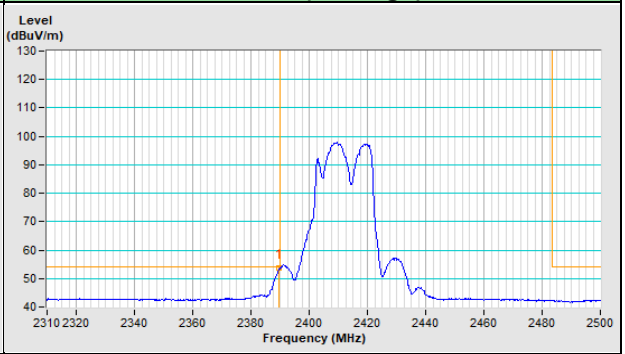
Horizontal (Average)



Vertical (Peak)

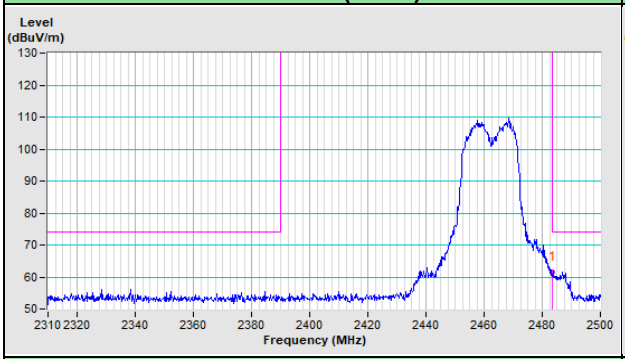


Vertical (Average)

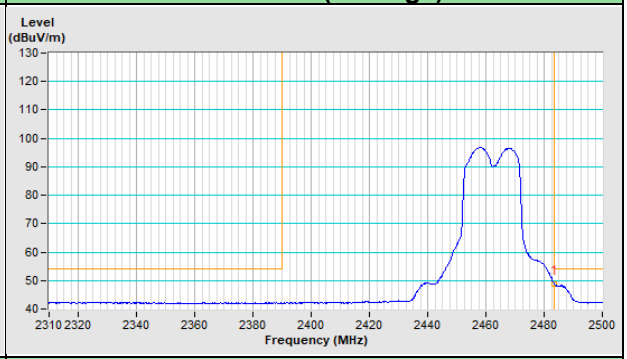


802.11ax (HE20) Channel 11

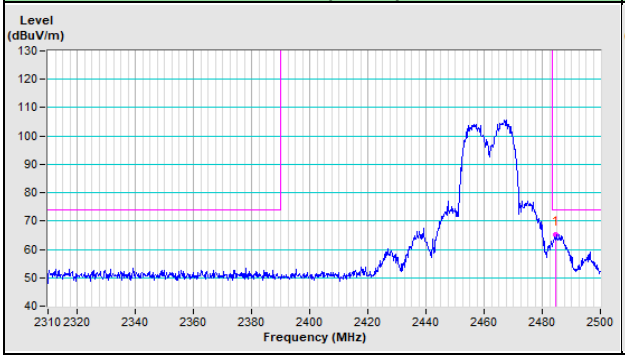
Horizontal (Peak)



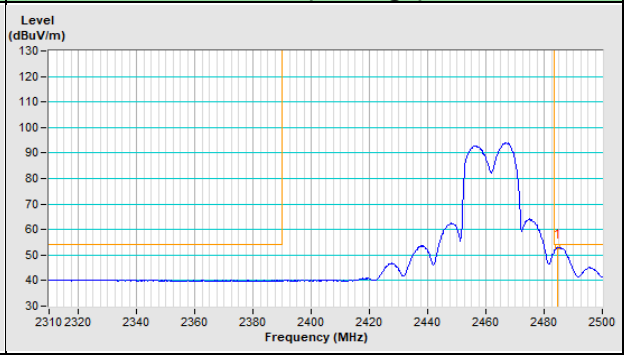
Horizontal (Average)



Vertical (Peak)

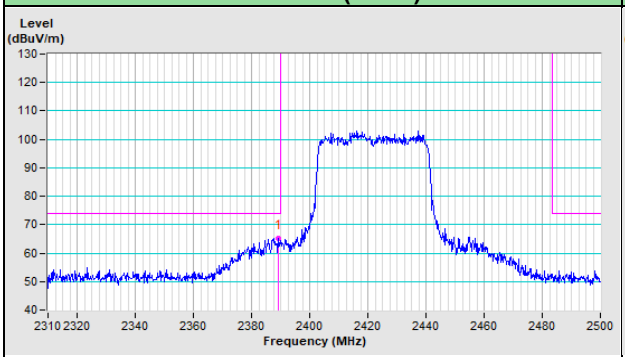


Vertical (Average)

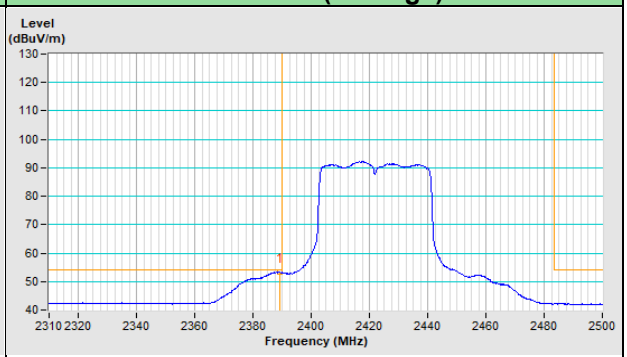


802.11ax (HE40) Channel 3

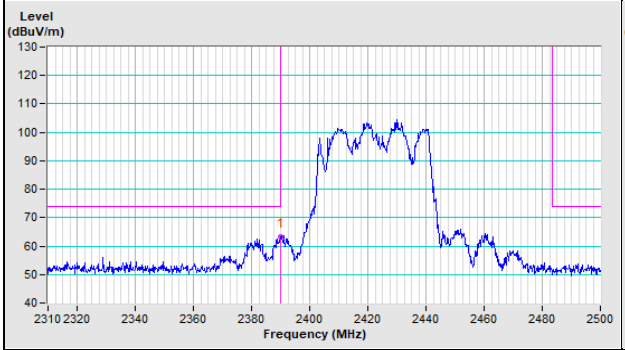
Horizontal (Peak)



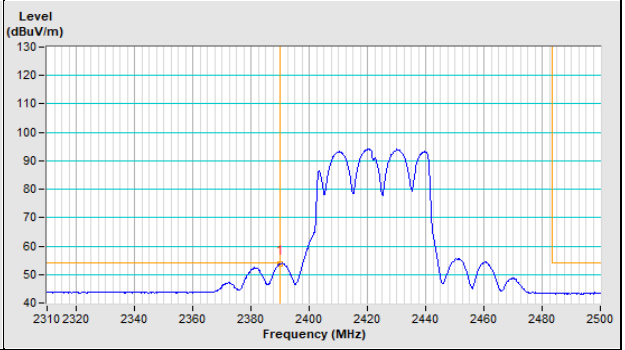
Horizontal (Average)



Vertical (Peak)

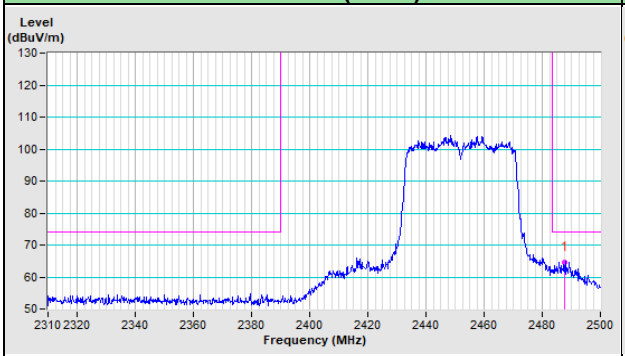


Vertical (Average)

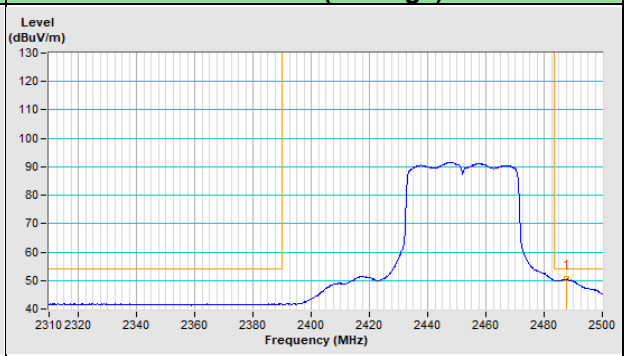


802.11ax (HE40) Channel 9

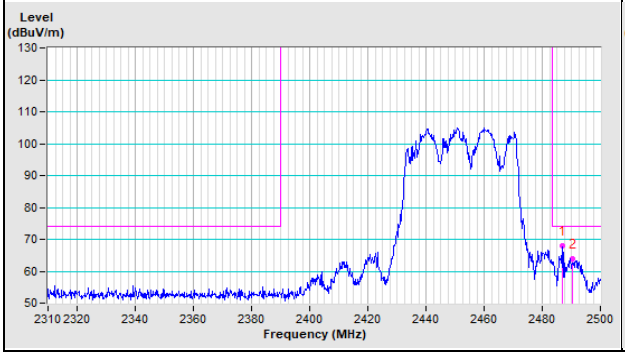
Horizontal (Peak)



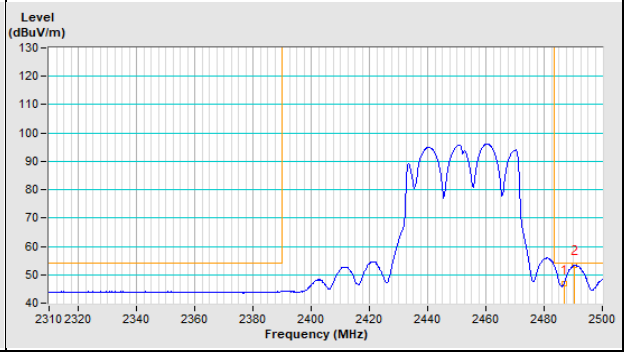
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are 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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The address and road map of all our labs can be found in our web site also.

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