FCC Test Report

Report No.:	RFBFLF-WTW-P21010278-4
FCC ID:	MSQI007D
Test Model:	ASUS_I007D
Received Date:	Jan. 12, 2021
Test Date:	Feb. 24 ~ Mar. 26, 2021
Issued Date:	Mar. 29, 2021
Applicant:	ASUSTeK COMPUTER INC.
Address:	1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location (1):	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
Test Location (2):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number(1):	788550 / TW0003
FCC Registration / Designation Number(2):	723255 / TW2022

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

Table of Contents

Release Control Record **4**

1 Certificate of Conformity **5**

2 Summary of Test Results **6**

2.1 Measurement Uncertainty 6
2.2 Modification Record 6

3 General Information **7**

3.1 General Description of EUT 7
3.2 Description of Test Modes 8
3.2.1 Test Mode Applicability and Tested Channel Detail 9
3.3 Duty Cycle of Test Signal 11
3.4 Description of Support Units 12
3.4.1 Configuration of System under Test 12
3.5 General Description of Applied Standards and References 12

4 Test Types and Results **13**

4.1 Radiated Emission and Bandedge Measurement 13
4.1.1 Limits of Radiated Emission and Bandedge Measurement 13
4.1.2 Test Instruments 14
4.1.3 Test Procedures 15
4.1.4 Deviation from Test Standard 16
4.1.5 Test Setup 16
4.1.6 EUT Operating Conditions 17
4.1.7 Test Results 18
4.2 Conducted Emission Measurement 36
4.2.1 Limits of Conducted Emission Measurement 36
4.2.2 Test Instruments 36
4.2.3 Test Procedures 37
4.2.4 Deviation from Test Standard 37
4.2.5 Test Setup 37
4.2.6 EUT Operating Conditions 37
4.2.7 Test Results 38
4.3 6dB Bandwidth Measurement 40
4.3.1 Limits of 6dB Bandwidth Measurement 40
4.3.2 Test Setup 40
4.3.3 Test Instruments 40
4.3.4 Test Procedure 40
4.3.5 Deviation from Test Standard 40
4.3.6 EUT Operating Conditions 40
4.3.7 Test Result 41
4.4 Conducted Output Power Measurement 45
4.4.1 Limits of Conducted Output Power Measurement 45
4.4.2 Test Setup 45
4.4.3 Test Instruments 45
4.4.4 Test Procedures 45
4.4.5 Deviation from Test Standard 45
4.4.6 EUT Operating Conditions 45
4.4.7 Test Results 46
4.5 Power Spectral Density Measurement 57
4.5.1 Limits of Power Spectral Density Measurement 57
4.5.2 Test Setup 57
4.5.3 Test Instruments 57
4.5.4 Test Procedure 57
4.5.5 Deviation from Test Standard 57
4.5.6 EUT Operating Condition 57

4.5.7 Test Results 58
4.6 Conducted Out of Band Emission Measurement 76
4.6.1 Limits of Conducted Out of Band Emission Measurement 76
4.6.2 Test Setup 76
4.6.3 Test Instruments 76
4.6.4 Test Procedure 76
4.6.5 Deviation from Test Standard 76
4.6.6 EUT Operating Condition 76
4.6.7 Test Results 76

5 Pictures of Test Arrangements 90

Annex A- Band Edge Measurement 91

Appendix – Information of the Testing Laboratories 97

Release Control Record

Issue No.	Description	Date Issued
RFBFLF-WTW-P21010278-4	Original release.	Mar. 29, 2021

1 Certificate of Conformity

Product: EXP21 Smartphone

Brand: ASUS

Test Model: ASUS_I007D

Sample Status: Engineering sample

Applicant: ASUSTeK COMPUTER INC.

Test Date: Feb. 24 ~ Mar. 26, 2021

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

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

Prepared by : Pettie Chen , **Date:** Mar. 29, 2021

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Mar. 29, 2021

Bruce Chen / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -9.29dB at 0.15000MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 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 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	1.9 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	EXP21 Smartphone
Brand	ASUS
Test Model	ASUS_I007D
Sample Status	Engineering sample
Power Supply Rating	7.74 Vdc (Battery) 5 Vdc / 9 Vdc / 12 Vdc / 15Vdc / 20Vdc (Adapter)
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 400Mbps 802.11ax: up to 573.5Mbps
Operating Frequency	2412~2462MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 11 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 7
Output Power	2TX: 182.446mW 1TX: 108.393mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Refer to Note
Cable Supplied	Refer to Note

Note:

1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Battery	SCUD	C21P2002	Rating: 7.74 Vdc, 15.2 Wh
Adapter	AOHAI	A320Q-200325C-US	I/P: 100-240Vac, 50/60Hz,1.5A O/P: 5 Vdc, 3 A; 9 Vdc, 3 A; 12 Vdc, 3A; 15 Vdc, 3 A; 20 Vdc, 3.25 A
Type A to Type C USB Cable	Luxshare	LA9U2026-CS-R	0.5m
Type C to Type C Cable	Luxshare	LA9UC006-CS-R	1.2m
Bluetooth Earphone	Bang & Olufsen	EQ Earbud R	FCC ID: TTUBEOPLAYEQR IC: 3775B-BEOPLAYEQR
		EQ Earbud L	FCC ID: TTUBEOPLAYEQL IC: 3775B-BEOPLAYEQL
Bluetooth Earphone Charging Case	Bang & Olufsen	EQ Charging case	I/P: 5Vdc/500mA O/P: 5Vdc/ R170mA; L170mA

2. The antenna used in this EUT is listed as below table:

Band	Freq. Range	Gain(dBi)			Antenna Type	Connecter Type
		Ant 3 Gain (dBi)	Ant 4 Gain (dBi)	Ant 6 Gain (dBi)		
2.4GHz/BT	2400-2500MHz	-3.332	-0.958	0.5	PIFA	Ipex

3. 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.

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

Modulation Mode	TX Function
802.11b	1TX/2TX
802.11g	1TX/2TX
802.11n (HT20)	1TX/2TX
802.11n (HT40)	1TX/2TX
802.11ac (VHT20)	1TX/2TX
802.11ac (VHT40)	1TX/2TX
802.11ax (HE20)	1TX/2TX
802.11ax (HE40)	1TX/2TX

* The bandwidth and modulation are similar for HT20/HT40/ 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)

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

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

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

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

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	Ant. 4+6

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.
2. Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst radiated emission (above 1GHz) channel for final testing.

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Remark
2TX							
-	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	-
1TX							
-	802.11g	1 to 11	11	OFDM	BPSK	6.0	Note *
	802.11ax (HE20)	1 to 11	11	OFDMA	BPSK	MCS0	Note *
	802.11ax (HE40)	3 to 9	3, 9	OFDMA	BPSK	MCS0	Note *

Note * The power of 1TX partial channels is larger than 2TX channels. So add the Radiated Emission Test for the 1TX partial channels

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Remark
-	802.11g	1 to 11	11	OFDM	BPSK	6.0	-

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)	Remark
-	802.11g	1 to 11	11	OFDM	BPSK	6.0	-

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)
-	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
-	802.11ac (VHT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11ac (VHT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
-	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)
-	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:

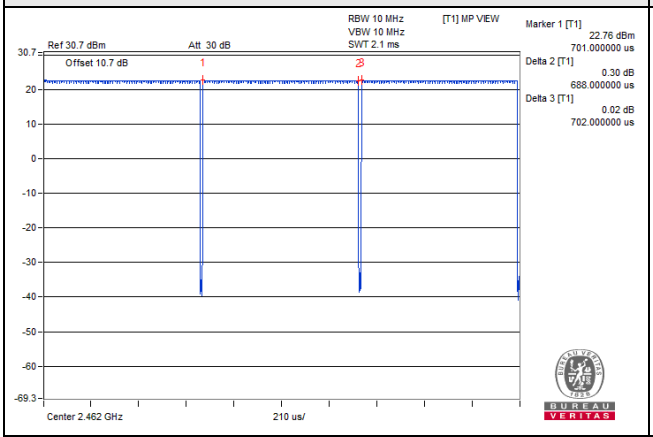
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 68% RH	120Vac, 60Hz	Ryan Du
RE<1G	25 deg. C, 68% RH	120Vac, 60Hz	Ryan Du
PLC	25 deg. C, 62% RH	120Vac, 60Hz	Sampson Chen
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Chris Lin

3.3 Duty Cycle of Test Signal

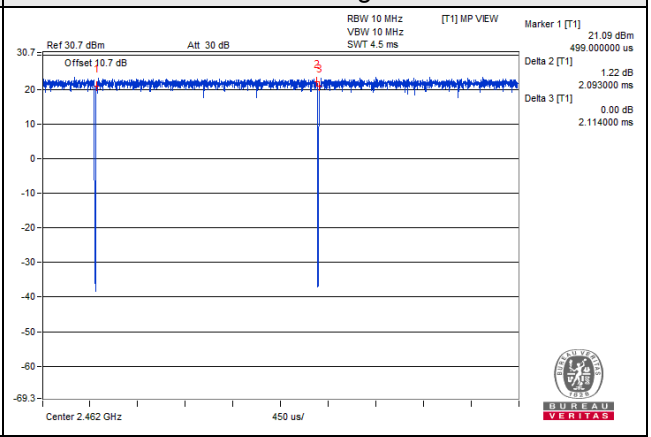
Duty cycle of test signal is ≥ 98%, duty factor is not required.

802.11b: Duty cycle = 0.688/0.702 = 0.98
802.11g: Duty cycle = 2.093/2.114 = 0.99
802.11ax (HE20): Duty cycle = 5.444/5.472 = 0.995
802.11ax (HE40): Duty cycle = 5.421/5.46 = 0.993

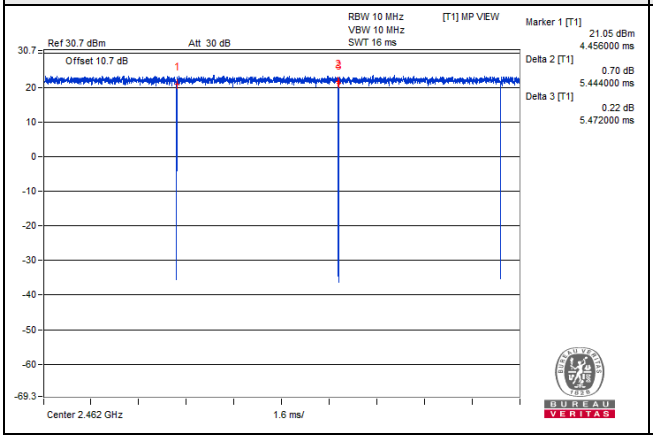
802.11b



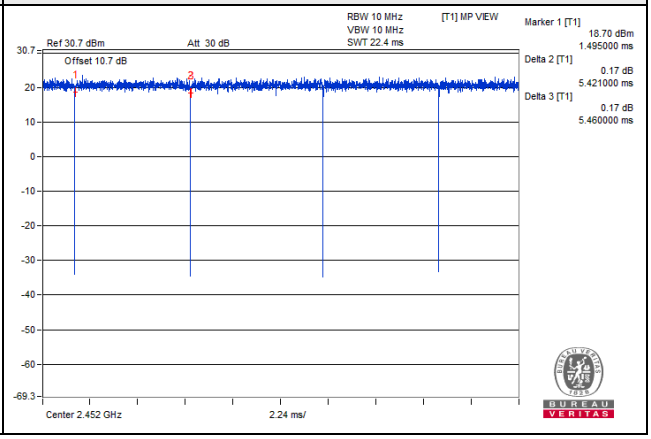
802.11g



802.11ax (HE20)



802.11ax (HE40)

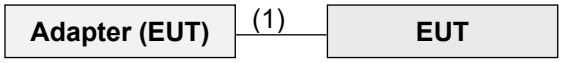


3.4 Description of Support Units

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	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Type C to Type C Cable	1	0.5	Y	0	Accessory

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

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

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver 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	Mar. 05, 2021	Mar. 04, 2022
RF Cable	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	Oct. 20, 2020	Oct. 19, 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
			Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
			Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
			Mar. 16, 2021	Mar. 15, 2022
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. 11, 2021	Jan. 10, 2022
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
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 Hsinchu Chamber 3. (TAF No.: 2022)

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

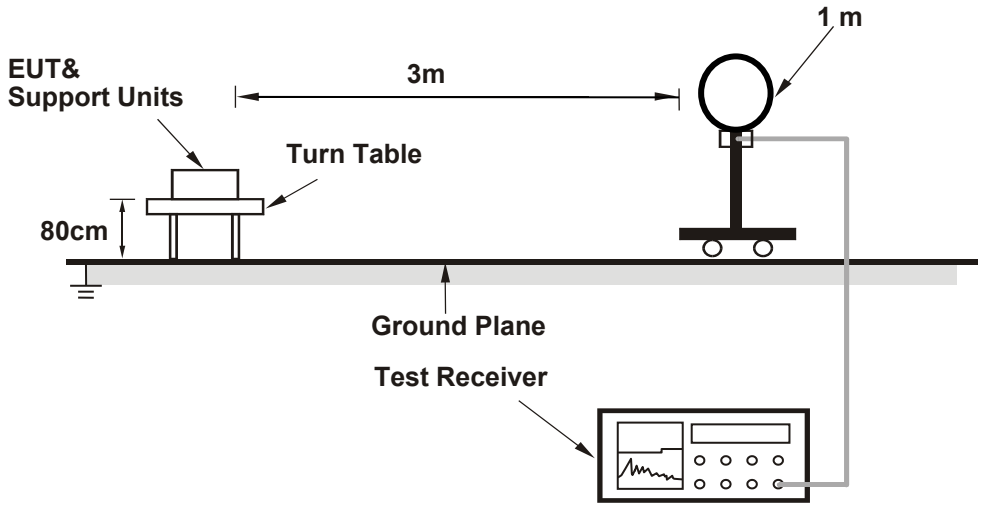
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

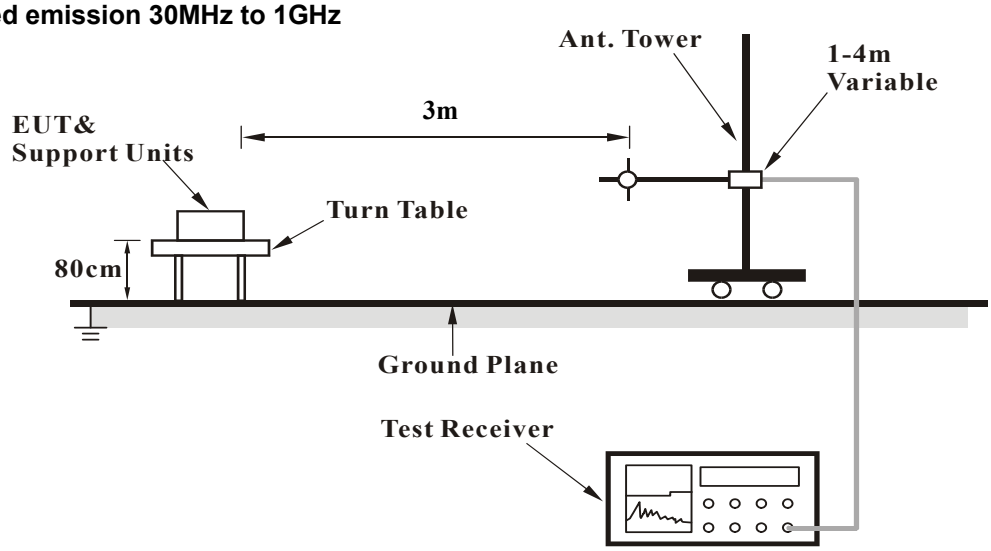
No deviation.

4.1.5 Test Setup

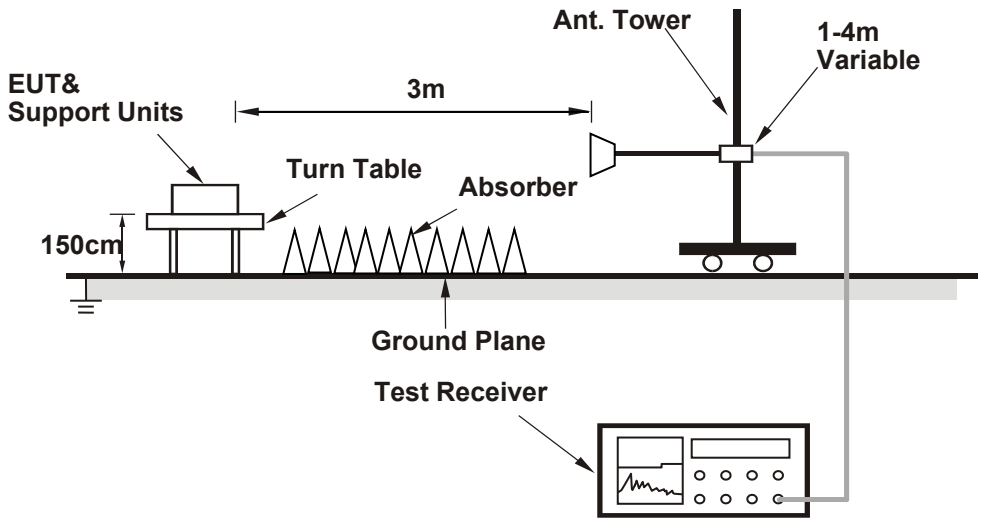
For Radiated emission below 30MHz



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. Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz worst-Case data:

2TX

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	2388.90	56.6 PK	74.0	-17.4	1.40 H	170	57.5	-0.9
2	2388.90	45.4 AV	54.0	-8.6	1.40 H	170	46.3	-0.9
3	*2412.00	108.9 PK			1.40 H	170	109.8	-0.9
4	*2412.00	106.0 AV			1.40 H	170	106.9	-0.9
5	4824.00	37.6 PK	74.0	-36.4	1.83 H	297	33.6	4.0
6	4824.00	26.6 AV	54.0	-27.4	1.83 H	297	22.6	4.0
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	55.3 PK	74.0	-18.7	1.80 V	303	56.2	-0.9
2	2390.00	42.6 AV	54.0	-11.4	1.80 V	303	43.5	-0.9
3	*2412.00	96.8 PK			1.80 V	303	97.7	-0.9
4	*2412.00	93.8 AV			1.80 V	303	94.7	-0.9
5	4824.00	38.6 PK	74.0	-35.4	1.41 V	170	34.6	4.0
6	4824.00	27.0 AV	54.0	-27.0	1.41 V	170	23.0	4.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.1 PK	74.0	-19.9	1.36 H	181	55.0	-0.9
2	2390.00	41.6 AV	54.0	-12.4	1.36 H	181	42.5	-0.9
3	*2437.00	108.7 PK			1.36 H	181	109.6	-0.9
4	*2437.00	105.7 AV			1.36 H	181	106.6	-0.9
5	2483.50	54.9 PK	74.0	-19.1	1.36 H	181	55.7	-0.8
6	2483.50	41.7 AV	54.0	-12.3	1.36 H	181	42.5	-0.8
7	4874.00	37.4 PK	74.0	-36.6	1.85 H	285	33.2	4.2
8	4874.00	26.5 AV	54.0	-27.5	1.85 H	285	22.3	4.2
9	7311.00	42.6 PK	74.0	-31.4	2.19 H	352	32.4	10.2
10	7311.00	31.5 AV	54.0	-22.5	2.19 H	352	21.3	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.2 PK	74.0	-19.8	1.84 V	316	55.1	-0.9
2	2390.00	41.6 AV	54.0	-12.4	1.84 V	316	42.5	-0.9
3	*2437.00	102.8 PK			1.84 V	316	103.7	-0.9
4	*2437.00	99.6 AV			1.84 V	316	100.5	-0.9
5	2483.50	54.2 PK	74.0	-19.8	1.84 V	316	55.0	-0.8
6	2483.50	41.4 AV	54.0	-12.6	1.84 V	316	42.2	-0.8
7	4874.00	39.2 PK	74.0	-34.8	1.47 V	182	35.0	4.2
8	4874.00	27.4 AV	54.0	-26.6	1.47 V	182	23.2	4.2
9	7311.00	43.5 PK	74.0	-30.5	1.29 V	74	33.3	10.2
10	7311.00	32.2 AV	54.0	-21.8	1.29 V	74	22.0	10.2

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.2 PK			1.44 H	161	110.0	-0.8
2	*2462.00	106.0 AV			1.44 H	161	106.8	-0.8
3	2486.80	56.6 PK	74.0	-17.4	1.44 H	161	57.4	-0.8
4	2486.80	46.4 AV	54.0	-7.6	1.44 H	161	47.2	-0.8
5	4924.00	37.6 PK	74.0	-36.4	1.84 H	293	33.4	4.2
6	4924.00	26.8 AV	54.0	-27.2	1.84 H	293	22.6	4.2
7	7386.00	42.7 PK	74.0	-31.3	2.16 H	340	32.4	10.3
8	7386.00	31.6 AV	54.0	-22.4	2.16 H	340	21.3	10.3
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	102.3 PK			2.93 V	311	103.1	-0.8
2	*2462.00	99.2 AV			2.93 V	311	100.0	-0.8
3	2483.50	54.6 PK	74.0	-19.4	2.93 V	311	55.4	-0.8
4	2483.50	44.6 AV	54.0	-9.4	2.93 V	311	45.4	-0.8
5	4924.00	38.6 PK	74.0	-35.4	1.53 V	192	34.4	4.2
6	4924.00	27.0 AV	54.0	-27.0	1.53 V	192	22.8	4.2
7	7386.00	43.1 PK	74.0	-30.9	1.28 V	64	32.8	10.3
8	7386.00	31.8 AV	54.0	-22.2	1.28 V	64	21.5	10.3

Remarks:

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

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.8 PK	74.0	-8.2	1.22 H	225	66.7	-0.9
2	2390.00	49.7 AV	54.0	-4.3	1.22 H	225	50.6	-0.9
3	*2412.00	108.4 PK			1.22 H	225	109.3	-0.9
4	*2412.00	98.3 AV			1.22 H	225	99.2	-0.9
5	4824.00	37.3 PK	74.0	-36.7	1.86 H	298	33.3	4.0
6	4824.00	26.4 AV	54.0	-27.6	1.86 H	298	22.4	4.0
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	61.4 PK	74.0	-12.6	3.73 V	315	62.3	-0.9
2	2390.00	48.1 AV	54.0	-5.9	3.73 V	315	49.0	-0.9
3	*2412.00	106.4 PK			3.73 V	315	107.3	-0.9
4	*2412.00	96.2 AV			3.73 V	315	97.1	-0.9
5	4824.00	38.6 PK	74.0	-35.4	1.42 V	156	34.6	4.0
6	4824.00	27.2 AV	54.0	-26.8	1.42 V	156	23.2	4.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.2 PK	74.0	-19.8	1.18 H	231	55.1	-0.9
2	2390.00	41.4 AV	54.0	-12.6	1.18 H	231	42.3	-0.9
3	*2437.00	108.4 PK			1.18 H	231	109.3	-0.9
4	*2437.00	98.1 AV			1.18 H	231	99.0	-0.9
5	2483.50	54.9 PK	74.0	-19.1	1.18 H	231	55.7	-0.8
6	2483.50	41.7 AV	54.0	-12.3	1.18 H	231	42.5	-0.8
7	4874.00	37.1 PK	74.0	-36.9	1.86 H	306	32.9	4.2
8	4874.00	26.5 AV	54.0	-27.5	1.86 H	306	22.3	4.2
9	7311.00	42.4 PK	74.0	-31.6	2.18 H	349	32.2	10.2
10	7311.00	31.3 AV	54.0	-22.7	2.18 H	349	21.1	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.7 PK	74.0	-20.3	3.69 V	313	54.6	-0.9
2	2390.00	41.3 AV	54.0	-12.7	3.69 V	313	42.2	-0.9
3	*2437.00	105.9 PK			3.69 V	313	106.8	-0.9
4	*2437.00	95.9 AV			3.69 V	313	96.8	-0.9
5	2483.50	55.1 PK	74.0	-18.9	3.69 V	313	55.9	-0.8
6	2483.50	42.1 AV	54.0	-11.9	3.69 V	313	42.9	-0.8
7	4874.00	39.5 PK	74.0	-34.5	1.50 V	184	35.3	4.2
8	4874.00	27.7 AV	54.0	-26.3	1.50 V	184	23.5	4.2
9	7311.00	43.6 PK	74.0	-30.4	1.33 V	63	33.4	10.2
10	7311.00	32.6 AV	54.0	-21.4	1.33 V	63	22.4	10.2

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.9 PK			1.22 H	222	110.7	-0.8
2	*2462.00	100.1 AV			1.22 H	222	100.9	-0.8
3	2483.50	62.9 PK	74.0	-11.1	1.22 H	222	63.7	-0.8
4	2483.50	52.7 AV	54.0	-1.3	1.22 H	222	53.5	-0.8
5	4924.00	37.0 PK	74.0	-37.0	1.89 H	288	32.8	4.2
6	4924.00	26.4 AV	54.0	-27.6	1.89 H	288	22.2	4.2
7	7386.00	43.0 PK	74.0	-31.0	2.24 H	345	32.7	10.3
8	7386.00	32.0 AV	54.0	-22.0	2.24 H	345	21.7	10.3
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	105.6 PK			3.62 V	319	106.4	-0.8
2	*2462.00	95.7 AV			3.62 V	319	96.5	-0.8
3	2483.50	63.6 PK	74.0	-10.4	3.62 V	319	64.4	-0.8
4	2483.50	49.5 AV	54.0	-4.5	3.62 V	319	50.3	-0.8
5	4924.00	39.4 PK	74.0	-34.6	1.46 V	176	35.2	4.2
6	4924.00	27.4 AV	54.0	-26.6	1.46 V	176	23.2	4.2
7	7386.00	43.8 PK	74.0	-30.2	1.33 V	81	33.5	10.3
8	7386.00	32.6 AV	54.0	-21.4	1.33 V	81	22.3	10.3

Remarks:

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

802.11ax (HE20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.7 PK	74.0	-9.3	1.03 H	164	65.6	-0.9
2	2390.00	52.5 AV	54.0	-1.5	1.03 H	164	53.4	-0.9
3	*2412.00	110.7 PK			1.03 H	164	111.6	-0.9
4	*2412.00	98.2 AV			1.03 H	164	99.1	-0.9
5	4824.00	38.1 PK	74.0	-35.9	1.80 H	293	34.1	4.0
6	4824.00	26.8 AV	54.0	-27.2	1.80 H	293	22.8	4.0
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	66.7 PK	74.0	-7.3	3.72 V	319	67.6	-0.9
2	2390.00	51.0 AV	54.0	-3.0	3.72 V	319	51.9	-0.9
3	*2412.00	108.1 PK			3.72 V	319	109.0	-0.9
4	*2412.00	95.5 AV			3.72 V	319	96.4	-0.9
5	4824.00	38.9 PK	74.0	-35.1	1.39 V	183	34.9	4.0
6	4824.00	27.3 AV	54.0	-26.7	1.39 V	183	23.3	4.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.8 PK	74.0	-20.2	1.14 H	136	54.7	-0.9
2	2390.00	41.4 AV	54.0	-12.6	1.14 H	136	42.3	-0.9
3	*2437.00	108.9 PK			1.14 H	136	109.8	-0.9
4	*2437.00	97.1 AV			1.14 H	136	98.0	-0.9
5	2483.50	54.7 PK	74.0	-19.3	1.14 H	136	55.5	-0.8
6	2483.50	41.7 AV	54.0	-12.3	1.14 H	136	42.5	-0.8
7	4874.00	37.4 PK	74.0	-36.6	1.87 H	269	33.2	4.2
8	4874.00	26.5 AV	54.0	-27.5	1.87 H	269	22.3	4.2
9	7311.00	42.4 PK	74.0	-31.6	2.23 H	344	32.2	10.2
10	7311.00	31.4 AV	54.0	-22.6	2.23 H	344	21.2	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.9 PK	74.0	-20.1	3.67 V	305	54.8	-0.9
2	2390.00	41.2 AV	54.0	-12.8	3.67 V	305	42.1	-0.9
3	*2437.00	107.9 PK			3.67 V	305	108.8	-0.9
4	*2437.00	95.3 AV			3.67 V	305	96.2	-0.9
5	2483.50	54.8 PK	74.0	-19.2	3.67 V	305	55.6	-0.8
6	2483.50	41.6 AV	54.0	-12.4	3.67 V	305	42.4	-0.8
7	4874.00	38.9 PK	74.0	-35.1	1.52 V	170	34.7	4.2
8	4874.00	27.3 AV	54.0	-26.7	1.52 V	170	23.1	4.2
9	7311.00	43.1 PK	74.0	-30.9	1.30 V	71	32.9	10.2
10	7311.00	31.8 AV	54.0	-22.2	1.30 V	71	21.6	10.2

Remarks:

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

CHANNEL	TX Channel 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	108.3 PK			1.10 H	221	109.1	-0.8
2	*2462.00	96.5 AV			1.10 H	221	97.3	-0.8
3	2483.50	67.5 PK	74.0	-6.5	1.10 H	221	68.3	-0.8
4	2483.50	53.8 AV	54.0	-0.2	1.10 H	221	54.6	-0.8
5	4924.00	36.8 PK	74.0	-37.2	1.82 H	286	32.6	4.2
6	4924.00	26.1 AV	54.0	-27.9	1.82 H	286	21.9	4.2
7	7386.00	43.2 PK	74.0	-30.8	2.17 H	339	32.9	10.3
8	7386.00	31.9 AV	54.0	-22.1	2.17 H	339	21.6	10.3
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	107.2 PK			3.99 V	327	108.0	-0.8
2	*2462.00	94.6 AV			3.99 V	327	95.4	-0.8
3	2483.50	64.4 PK	74.0	-9.6	3.99 V	327	65.2	-0.8
4	2483.50	48.2 AV	54.0	-5.8	3.99 V	327	49.0	-0.8
5	4924.00	39.4 PK	74.0	-34.6	1.49 V	196	35.2	4.2
6	4924.00	27.3 AV	54.0	-26.7	1.49 V	196	23.1	4.2
7	7386.00	44.0 PK	74.0	-30.0	1.25 V	75	33.7	10.3
8	7386.00	32.6 AV	54.0	-21.4	1.25 V	75	22.3	10.3

Remarks:

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

802.11ax (HE40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.6 PK	74.0	-4.4	1.18 H	208	70.5	-0.9
2	2390.00	53.0 AV	54.0	-1.0	1.18 H	208	53.9	-0.9
3	*2422.00	106.7 PK			1.18 H	208	107.6	-0.9
4	*2422.00	95.0 AV			1.18 H	208	95.9	-0.9
5	4844.00	37.5 PK	74.0	-36.5	1.88 H	297	33.4	4.1
6	4844.00	26.5 AV	54.0	-27.5	1.88 H	297	22.4	4.1
7	7266.00	42.3 PK	74.0	-31.7	2.19 H	360	32.2	10.1
8	7266.00	31.1 AV	54.0	-22.9	2.19 H	360	21.0	10.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.5 PK	74.0	-11.5	3.75 V	320	63.4	-0.9
2	2390.00	48.7 AV	54.0	-5.3	3.75 V	320	49.6	-0.9
3	*2422.00	104.5 PK			3.75 V	320	105.4	-0.9
4	*2422.00	93.3 AV			3.75 V	320	94.2	-0.9
5	4844.00	39.5 PK	74.0	-34.5	1.49 V	191	35.4	4.1
6	4844.00	27.7 AV	54.0	-26.3	1.49 V	191	23.6	4.1
7	7266.00	43.2 PK	74.0	-30.8	1.34 V	66	33.1	10.1
8	7266.00	31.8 AV	54.0	-22.2	1.34 V	66	21.7	10.1

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.6 PK	74.0	-11.4	1.34 H	168	63.5	-0.9
2	2390.00	49.7 AV	54.0	-4.3	1.34 H	168	50.6	-0.9
3	*2437.00	109.0 PK			1.34 H	168	109.9	-0.9
4	*2437.00	95.7 AV			1.34 H	168	96.6	-0.9
5	2483.50	64.3 PK	74.0	-9.7	1.34 H	168	65.1	-0.8
6	2483.50	51.7 AV	54.0	-2.3	1.34 H	168	52.5	-0.8
7	4874.00	37.4 PK	74.0	-36.6	1.87 H	284	33.2	4.2
8	4874.00	26.4 AV	54.0	-27.6	1.87 H	284	22.2	4.2
9	7311.00	42.4 PK	74.0	-31.6	2.16 H	343	32.2	10.2
10	7311.00	31.2 AV	54.0	-22.8	2.16 H	343	21.0	10.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.9 PK	74.0	-17.1	3.72 V	334	57.8	-0.9
2	2390.00	44.5 AV	54.0	-9.5	3.72 V	334	45.4	-0.9
3	*2437.00	103.6 PK			3.72 V	334	104.5	-0.9
4	*2437.00	92.6 AV			3.72 V	334	93.5	-0.9
5	2483.50	58.2 PK	74.0	-15.8	3.72 V	334	59.0	-0.8
6	2483.50	46.8 AV	54.0	-7.2	3.72 V	334	47.6	-0.8
7	4874.00	39.2 PK	74.0	-34.8	1.42 V	186	35.0	4.2
8	4874.00	27.4 AV	54.0	-26.6	1.42 V	186	23.2	4.2
9	7311.00	43.3 PK	74.0	-30.7	1.28 V	68	33.1	10.2
10	7311.00	32.2 AV	54.0	-21.8	1.28 V	68	22.0	10.2

Remarks:

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

CHANNEL	TX Channel 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	106.9 PK			1.32 H	170	107.7	-0.8
2	*2452.00	94.4 AV			1.32 H	170	95.2	-0.8
3	2485.30	70.9 PK	74.0	-3.1	1.32 H	170	71.7	-0.8
4	2485.30	53.6 AV	54.0	-0.4	1.32 H	170	54.4	-0.8
5	4904.00	37.3 PK	74.0	-36.7	1.82 H	284	33.1	4.2
6	4904.00	26.3 AV	54.0	-27.7	1.82 H	284	22.1	4.2
7	7356.00	42.5 PK	74.0	-31.5	2.24 H	337	32.1	10.4
8	7356.00	31.5 AV	54.0	-22.5	2.24 H	337	21.1	10.4
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	103.2 PK			3.97 V	328	104.0	-0.8
2	*2452.00	91.4 AV			3.97 V	328	92.2	-0.8
3	2485.30	68.6 PK	74.0	-5.4	3.97 V	328	69.4	-0.8
4	2485.30	50.9 AV	54.0	-3.1	3.97 V	328	51.7	-0.8
5	4904.00	38.7 PK	74.0	-35.3	1.51 V	187	34.5	4.2
6	4904.00	26.9 AV	54.0	-27.1	1.51 V	187	22.7	4.2
7	7356.00	43.4 PK	74.0	-30.6	1.34 V	64	33.0	10.4
8	7356.00	31.9 AV	54.0	-22.1	1.34 V	64	21.5	10.4

Remarks:

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

1TX

802.11g

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	112.0 PK			1.43 H	174	77.0	35.0
2	*2462.00	102.2 AV			1.43 H	174	67.2	35.0
3	2483.50	70.5 PK	74.0	-3.5	1.43 H	174	35.5	35.0
4	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.43 H**	**174**	**18.9**	**35.0**
5	4924.00	45.0 PK	74.0	-29.0	1.56 H	211	43.5	1.5
6	4924.00	33.4 AV	54.0	-20.6	1.56 H	211	31.9	1.5
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	107.4 PK			3.60 V	334	72.4	35.0
2	*2462.00	97.6 AV			3.60 V	334	62.6	35.0
3	2483.50	66.0 PK	74.0	-8.0	3.60 V	334	31.0	35.0
4	2483.50	51.3 AV	54.0	-2.7	3.60 V	334	16.3	35.0
5	4924.00	43.5 PK	74.0	-30.5	1.59 V	106	42.0	1.5
6	4924.00	32.0 AV	54.0	-22.0	1.59 V	106	30.5	1.5

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.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11ax (HE20)

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	112.0 PK			1.44 H	165	77.0	35.0
2	*2462.00	99.0 AV			1.44 H	165	64.0	35.0
3	2483.50	63.5 PK	74.0	-10.5	1.44 H	165	28.5	35.0
4	2483.50	49.8 AV	54.0	-4.2	1.44 H	165	14.8	35.0
5	4924.00	44.1 PK	74.0	-29.9	2.15 H	312	42.6	1.5
6	4924.00	32.8 AV	54.0	-21.2	2.15 H	312	31.3	1.5
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	106.5 PK			3.63 V	191	71.5	35.0
2	*2462.00	93.5 AV			3.63 V	191	58.5	35.0
3	2483.50	63.1 PK	74.0	-10.9	3.63 V	191	28.1	35.0
4	2483.50	48.4 AV	54.0	-5.6	3.63 V	191	13.4	35.0
5	4904.00	43.7 PK	74.0	-30.3	1.56 V	122	42.2	1.5
6	4904.00	32.4 AV	54.0	-21.6	1.56 V	122	30.9	1.5

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.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11ax (HE40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	70.5 PK	74.0	-3.5	1.48 H	167	35.3	35.2
2	2390.00	52.7 AV	54.0	-1.3	1.48 H	167	17.5	35.2
3	*2422.00	110.9 PK			1.48 H	167	75.8	35.1
4	*2422.00	97.3 AV			1.48 H	167	62.2	35.1
5	4844.00	44.4 PK	74.0	-29.6	2.15 H	222	42.8	1.6
6	4844.00	33.2 AV	54.0	-20.8	2.15 H	222	31.6	1.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.7 PK	74.0	-6.3	3.79 V	326	32.5	35.2
2	2390.00	50.6 AV	54.0	-3.4	3.79 V	326	15.4	35.2
3	*2422.00	105.5 PK			3.79 V	326	70.4	35.1
4	*2422.00	93.4 AV			3.79 V	326	58.3	35.1
5	4844.00	44.5 PK	74.0	-29.5	2.18 V	15	42.9	1.6
6	4844.00	32.8 AV	54.0	-21.2	2.18 V	15	31.2	1.6

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.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	108.5 PK			1.40 H	168	73.5	35.0
2	*2452.00	96.4 AV			1.40 H	168	61.4	35.0
3	2483.50	66.9 PK	74.0	-7.1	1.40 H	168	31.9	35.0
4	2483.50	51.7 AV	54.0	-2.3	1.40 H	168	16.7	35.0
5	4904.00	43.7 PK	74.0	-30.3	1.58 H	300	42.2	1.5
6	4904.00	32.7 AV	54.0	-21.3	1.58 H	300	31.2	1.5
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	102.3 PK			3.18 V	345	67.3	35.0
2	*2452.00	89.9 AV			3.18 V	345	54.9	35.0
3	2483.50	61.1 PK	74.0	-12.9	3.18 V	345	26.1	35.0
4	2483.50	47.4 AV	54.0	-6.6	3.18 V	345	12.4	35.0
5	4904.00	43.5 PK	74.0	-30.5	1.31 V	200	42.0	1.5
6	4904.00	32.5 AV	54.0	-21.5	1.31 V	200	31.0	1.5

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.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

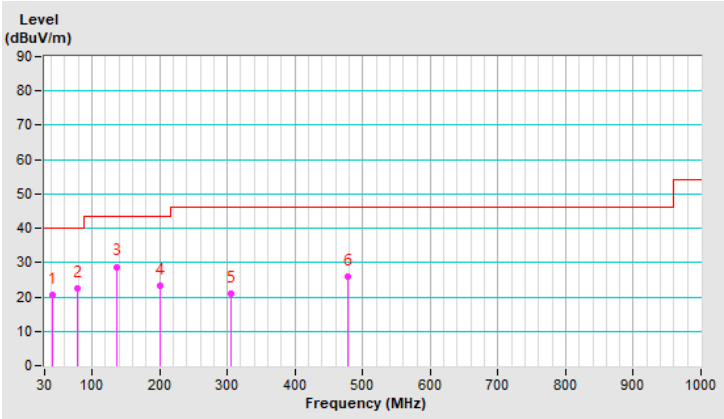
Below 1GHz worst-case data: 802.11g

CHANNEL	TX Channel 11	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	41.35	20.6 QP	40.0	-19.4	1.00 H	141	29.0	-8.4
2	78.52	22.6 QP	40.0	-17.4	3.00 H	0	35.2	-12.6
3	137.28	28.8 QP	43.5	-14.7	2.00 H	247	36.9	-8.1
4	200.02	23.3 QP	43.5	-20.2	2.00 H	196	33.9	-10.6
5	305.48	21.0 QP	46.0	-25.0	2.00 H	360	27.3	-6.3
6	478.07	25.9 QP	46.0	-20.1	3.00 H	312	27.5	-1.6

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.

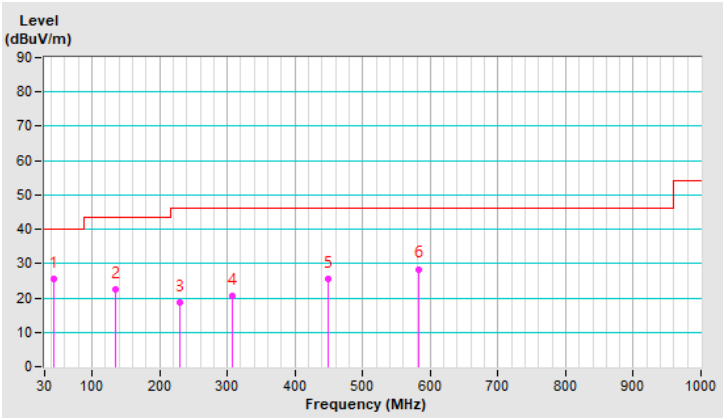


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	43.68	25.4 QP	40.0	-14.6	1.00 V	360	33.7	-8.3
2	135.15	22.6 QP	43.5	-20.9	1.50 V	219	30.9	-8.3
3	229.07	18.7 QP	46.0	-27.3	1.50 V	1	28.7	-10.0
4	307.83	20.6 QP	46.0	-25.4	1.50 V	0	26.8	-6.2
5	449.21	25.4 QP	46.0	-20.6	1.50 V	0	27.5	-2.1
6	582.05	28.4 QP	46.0	-17.6	1.00 V	139	27.6	0.8

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. 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 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 is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Hsinchu Conduction 1. (TAF No.: 2022)

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.

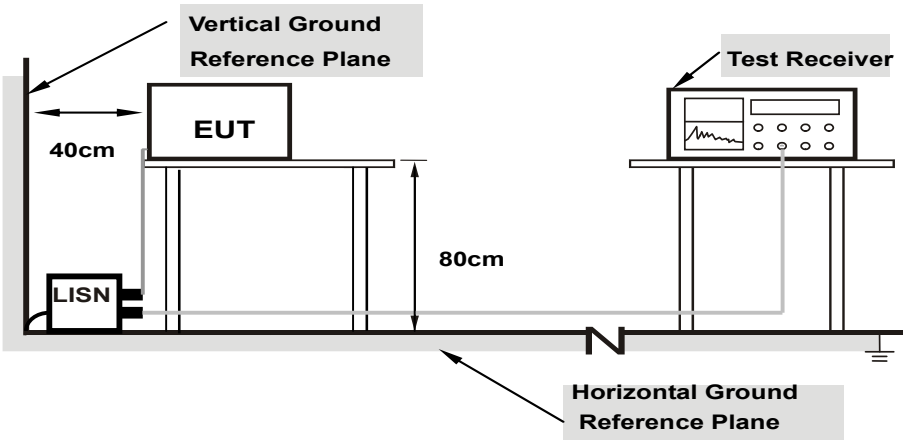
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

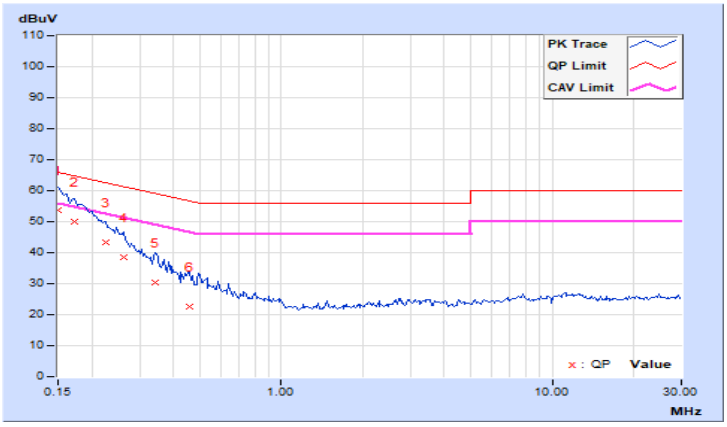
Worst-case data: 802.11g

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.96	43.86	26.95	53.82	36.91	66.00	56.00	-12.18	-19.09
2	0.17344	9.97	40.19	23.44	50.16	33.41	64.79	54.79	-14.63	-21.38
3	0.22422	9.99	33.27	16.74	43.26	26.73	62.66	52.66	-19.40	-25.93
4	0.26328	10.00	28.47	12.69	38.47	22.69	61.33	51.33	-22.86	-28.64
5	0.34141	10.01	20.21	5.88	30.22	15.89	59.17	49.17	-28.95	-33.28
6	0.45859	10.02	12.49	0.75	22.51	10.77	56.72	46.72	-34.21	-35.95

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.

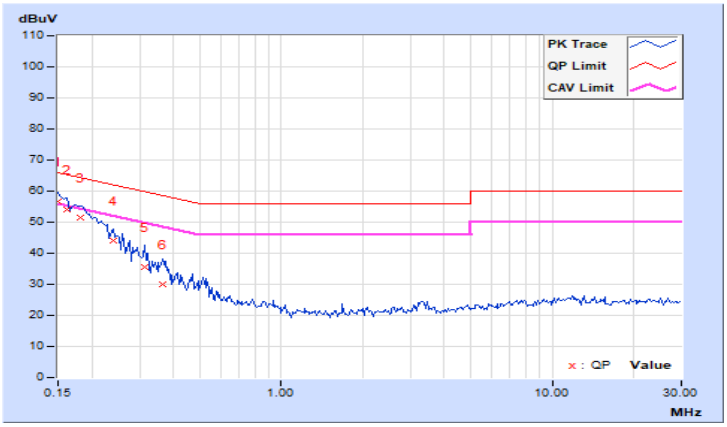


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**9.94**	**46.77**	**29.81**	**56.71**	**39.75**	**66.00**	**56.00**	**-9.29**	**-16.25**
2	0.16172	9.95	44.28	23.88	54.23	33.83	65.38	55.38	-11.15	-21.55
3	0.18125	9.97	41.57	23.50	51.54	33.47	64.43	54.43	-12.89	-20.96
4	0.23984	9.99	34.25	17.36	44.24	27.35	62.10	52.10	-17.86	-24.75
5	0.31406	10.00	25.65	10.48	35.65	20.48	59.86	49.86	-24.21	-29.38
6	0.36484	10.00	20.14	5.99	30.14	15.99	58.62	48.62	-28.48	-32.63

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.

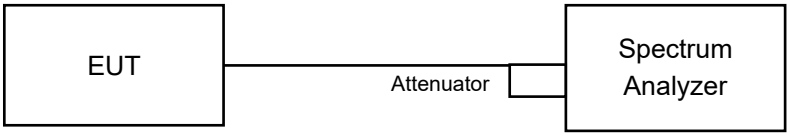


4.3 6dB Bandwidth Measurement

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

2TX

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	8.09	7.61	0.5	Pass
6	2437	8.12	8.13	0.5	Pass
11	2462	8.14	8.14	0.5	Pass

802.11g

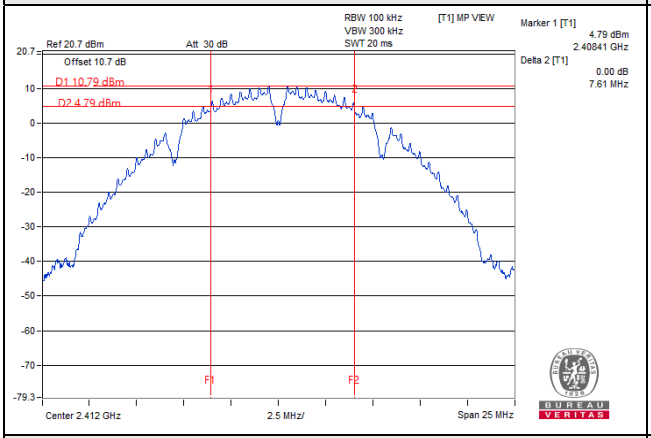
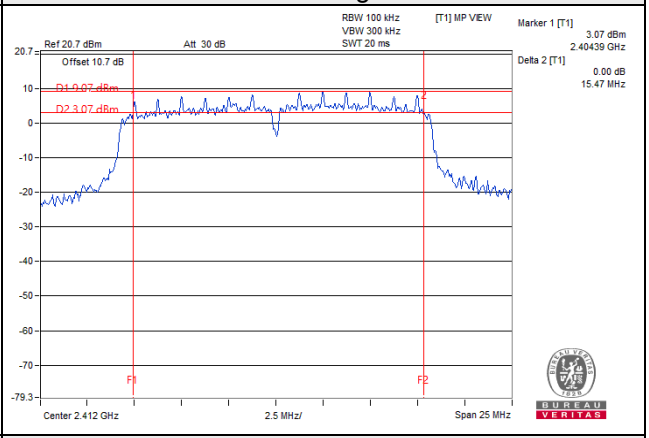
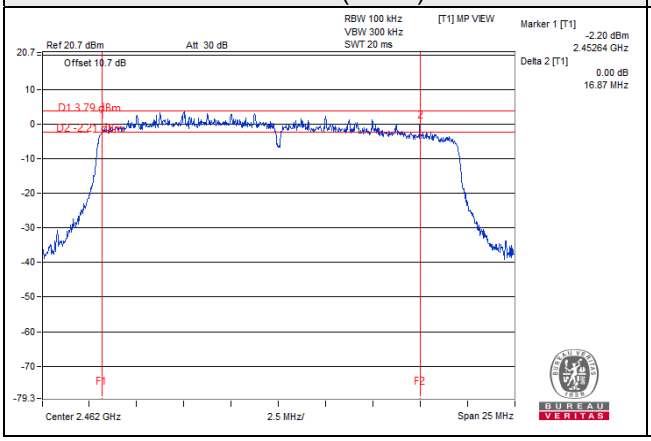
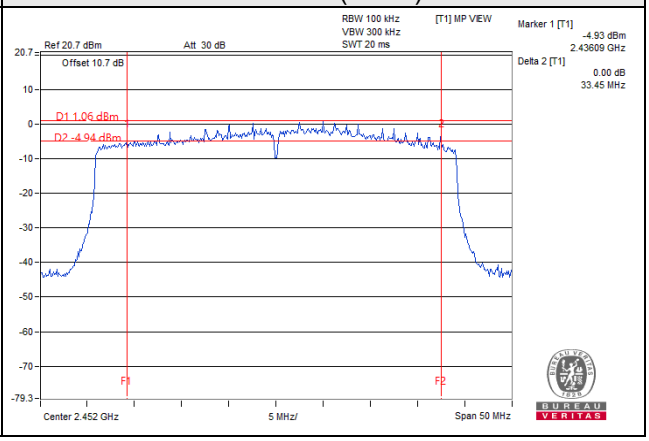
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.47	15.51	0.5	Pass
6	2437	16.36	16.36	0.5	Pass
11	2462	15.74	15.72	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	17.37	17.59	0.5	Pass
6	2437	18.98	18.92	0.5	Pass
11	2462	16.87	16.87	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	35.09	35.09	0.5	Pass
6	2437	38.17	38.08	0.5	Pass
9	2452	33.45	35.25	0.5	Pass

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

1TX

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	8.06	0.5	Pass
6	2437	8.15	0.5	Pass
11	2462	8.59	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.49	0.5	Pass
6	2437	16.36	0.5	Pass
11	2462	15.78	0.5	Pass

802.11ax (HE20)

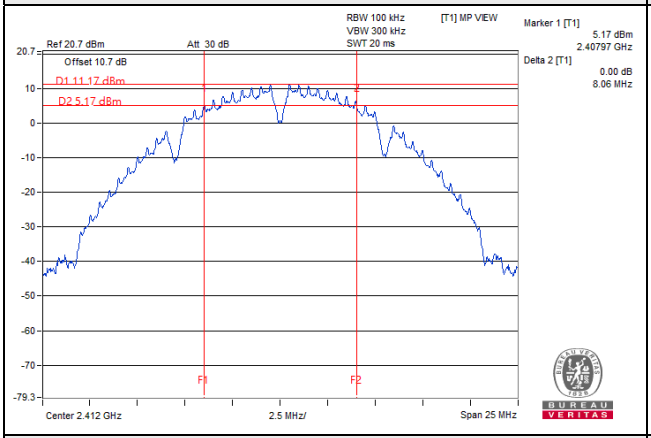
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.58	0.5	Pass
6	2437	18.99	0.5	Pass
11	2462	17.90	0.5	Pass

802.11ax (HE40)

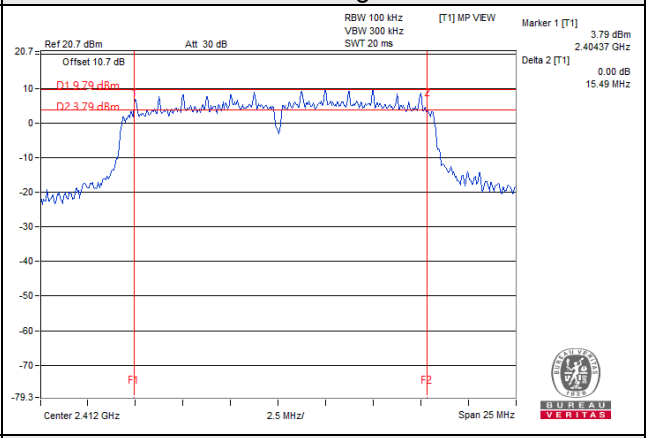
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.08	0.5	Pass
6	2437	38.09	0.5	Pass
9	2452	35.28	0.5	Pass

Spectrum Plot of Worst Value

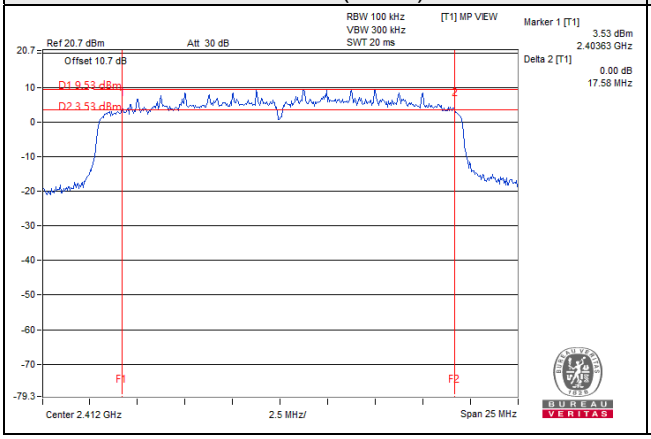
802.11b



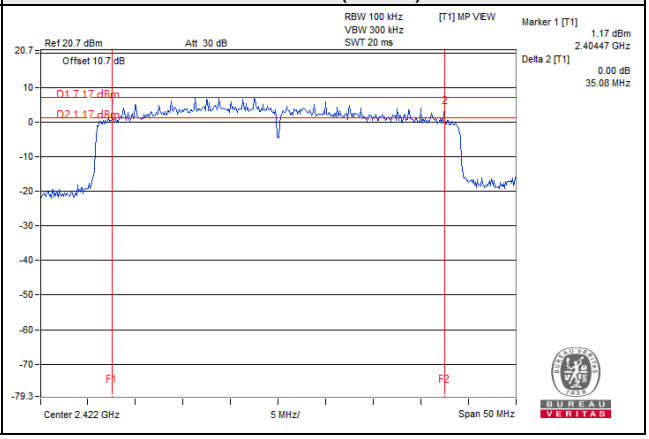
802.11g



802.11ax (HE20)



802.11ax (HE40)



4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

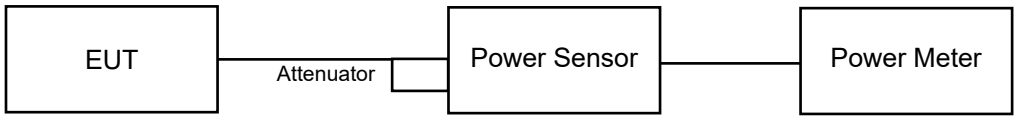
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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

Full RU

2TX

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.87	18.99	176.301	22.46	30	Pass
6	2437	19.85	18.92	174.588	22.42	30	Pass
11	2462	19.91	18.90	175.574	22.44	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.87	18.62	169.829	22.30	30	Pass
6	2437	19.82	18.60	168.384	22.26	30	Pass
11	2462	17.48	17.38	110.677	20.44	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.75	18.62	167.184	22.23	30	Pass
6	2437	19.73	18.65	167.255	22.23	30	Pass
11	2462	14.49	14.38	55.535	17.45	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.56	17.42	112.224	20.50	30	Pass
6	2437	19.75	19.06	174.944	22.43	30	Pass
9	2452	13.95	13.78	48.709	16.88	30	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.90	18.82	173.932	22.40	30	Pass
6	2437	19.92	18.81	174.207	22.41	30	Pass
11	2462	14.65	14.52	57.488	17.60	30	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.75	17.62	117.376	20.70	30	Pass
6	2437	19.86	19.25	180.967	22.58	30	Pass
9	2452	14.18	14.02	51.417	17.11	30	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.93	18.85	175.137	22.43	30	Pass
6	2437	19.94	18.83	175.012	22.43	30	Pass
11	2462	14.84	14.65	59.653	17.76	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.91	17.75	121.368	20.84	30	Pass
6	2437	19.90	19.28	**182.446**	22.61	30	Pass
9	2452	14.39	14.25	54.086	17.33	30	Pass

1TX

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	97.051	19.87	30.00	Pass
6	2437	96.605	19.85	30.00	Pass
11	2462	97.949	19.91	30.00	Pass

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	97.051	19.87	30.00	Pass
6	2437	95.940	19.82	30.00	Pass
11	2462	98.855	19.95	30.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	94.406	19.75	30.00	Pass
6	2437	93.972	19.73	30.00	Pass
11	2462	53.951	17.32	30.00	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	108.393	20.35	30.00	Pass
6	2437	94.406	19.75	30.00	Pass
9	2452	48.084	16.82	30.00	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	97.724	19.90	30.00	Pass
6	2437	98.175	19.92	30.00	Pass
11	2462	54.828	17.39	30.00	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	87.700	19.43	30.00	Pass
6	2437	96.828	19.86	30.00	Pass
9	2452	48.641	16.87	30.00	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	98.401	19.93	30.00	Pass
6	2437	98.628	19.94	30.00	Pass
11	2462	55.335	17.43	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	89.536	19.52	30.00	Pass
6	2437	97.724	19.90	30.00	Pass
9	2452	49.888	16.98	30.00	Pass

Partial RU

2TX

RU26

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	8.14	8.02	12.855	11.09	30	Pass
6	2437	8.34	8.11	13.295	11.24	30	Pass
11	2462	5.26	5.11	6.601	8.20	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	6.48	6.21	8.625	9.36	30	Pass
6	2437	6.53	6.35	8.813	9.45	30	Pass
9	2452	4.62	4.32	5.601	7.48	30	Pass

RU52

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	13.23	13.02	41.083	16.14	30	Pass
6	2437	12.36	12.10	33.437	15.24	30	Pass
11	2462	8.28	8.09	13.171	11.20	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	10.22	10.01	20.543	13.13	30	Pass
6	2437	9.42	9.16	16.991	12.30	30	Pass
9	2452	8.29	8.09	13.187	11.20	30	Pass

RU106

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	15.88	15.62	75.201	18.76	30	Pass
6	2437	14.78	14.58	58.769	17.69	30	Pass
11	2462	10.65	10.45	22.706	13.56	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	12.36	12.11	33.474	15.25	30	Pass
6	2437	12.32	12.12	33.354	15.23	30	Pass
9	2452	10.34	10.11	21.071	13.24	30	Pass

RU242

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.22	19.11	165.031	22.18	30	Pass
6	2437	19.31	19.16	167.724	22.25	30	Pass
11	2462	14.25	14.03	51.900	17.15	30	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	15.95	15.72	76.680	18.85	30	Pass
6	2437	16.81	16.65	94.211	19.74	30	Pass
9	2452	12.35	12.11	33.435	15.24	30	Pass

RU484

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	16.75	16.55	92.501	19.66	30	Pass
6	2437	18.45	18.24	136.665	21.36	30	Pass
9	2452	13.35	13.11	42.092	16.24	30	Pass

1TX

RU26

Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	6.516	8.14	30.00	Pass
6	2437	6.823	8.34	30.00	Pass
11	2462	3.357	5.26	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	4.446	6.48	30.00	Pass
6	2437	4.498	6.53	30.00	Pass
9	2452	2.897	4.62	30.00	Pass

Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	6.339	8.02	30.00	Pass
6	2437	6.471	8.11	30.00	Pass
11	2462	3.243	5.11	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	4.178	6.21	30.00	Pass
6	2437	4.315	6.35	30.00	Pass
9	2452	2.704	4.32	30.00	Pass

RU52

Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	21.038	13.23	30.00	Pass
6	2437	17.219	12.36	30.00	Pass
11	2462	6.730	8.28	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	10.520	10.22	30.00	Pass
6	2437	8.750	9.42	30.00	Pass
9	2452	6.745	8.29	30.00	Pass

Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	20.045	13.02	30.00	Pass
6	2437	16.218	12.10	30.00	Pass
11	2462	6.442	8.09	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	10.023	10.01	30.00	Pass
6	2437	8.241	9.16	30.00	Pass
9	2452	6.442	8.09	30.00	Pass

RU106

Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	38.726	15.88	30.00	Pass
6	2437	30.061	14.78	30.00	Pass
11	2462	11.614	10.65	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	17.219	12.36	30.00	Pass
6	2437	17.061	12.32	30.00	Pass
9	2452	10.814	10.34	30.00	Pass

Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	36.475	15.62	30.00	Pass
6	2437	28.708	14.58	30.00	Pass
11	2462	11.092	10.45	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	16.255	12.11	30.00	Pass
6	2437	16.293	12.12	30.00	Pass
9	2452	10.257	10.11	30.00	Pass

RU242

Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	83.560	19.22	30.00	Pass
6	2437	85.310	19.31	30.00	Pass
11	2462	26.607	14.25	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	39.355	15.95	30.00	Pass
6	2437	47.973	16.81	30.00	Pass
9	2452	17.179	12.35	30.00	Pass

Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	81.470	19.11	30.00	Pass
6	2437	82.414	19.16	30.00	Pass
11	2462	25.293	14.03	30.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	37.325	15.72	30.00	Pass
6	2437	46.238	16.65	30.00	Pass
9	2452	16.255	12.11	30.00	Pass

RU484

Chain 0

802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	47.315	16.75	30.00	Pass
6	2437	69.984	18.45	30.00	Pass
9	2452	21.627	13.35	30.00	Pass

Chain 1

802.11ax (HE40)

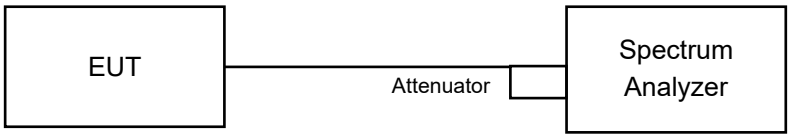
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
3	2422	45.186	16.55	30.00	Pass
6	2437	66.681	18.24	30.00	Pass
9	2452	20.464	13.11	30.00	Pass

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For Average Power (Duty cycle < 98%)
a) 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

FULL RU

2TX

802.11b

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-12.62	3.01	-9.61	8.00	Pass
	6	2437	-13.85	3.01	-10.84	8.00	Pass
	11	2462	-11.83	3.01	-8.82	8.00	Pass
1	1	2412	-12.58	3.01	-9.57	8.00	Pass
	6	2437	-13.77	3.01	-10.76	8.00	Pass
	11	2462	-12.14	3.01	-9.13	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

802.11g

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-16.58	3.01	-13.57	8.00	Pass
	6	2437	-17.66	3.01	-14.65	8.00	Pass
	11	2462	-19.42	3.01	-16.41	8.00	Pass
1	1	2412	-16.82	3.01	-13.81	8.00	Pass
	6	2437	-17.99	3.01	-14.98	8.00	Pass
	11	2462	-19.13	3.01	-16.12	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

802.11ax (HE20)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-18.57	3.01	-15.56	8.00	Pass
	6	2437	-19.87	3.01	-16.86	8.00	Pass
	11	2462	-23.31	3.01	-20.30	8.00	Pass
1	1	2412	-18.39	3.01	-15.38	8.00	Pass
	6	2437	-19.70	3.01	-16.69	8.00	Pass
	11	2462	-23.03	3.01	-20.02	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

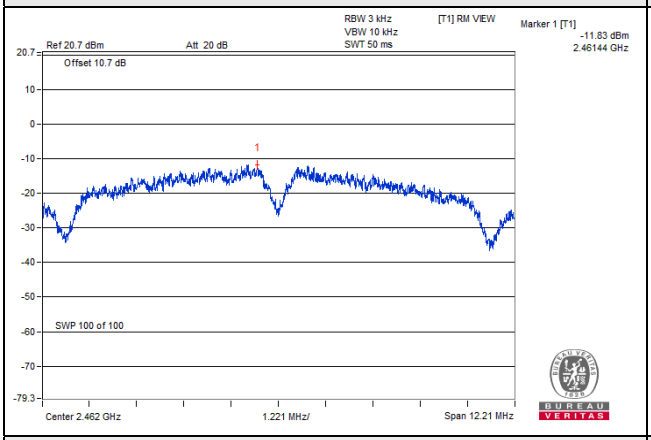
802.11ax (HE40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-22.89	3.01	-19.88	8.00	Pass
	6	2437	-21.88	3.01	-18.87	8.00	Pass
	9	2452	-25.82	3.01	-22.81	8.00	Pass
1	3	2422	-23.00	3.01	-19.99	8.00	Pass
	6	2437	-21.95	3.01	-18.94	8.00	Pass
	9	2452	-26.01	3.01	-23.00	8.00	Pass

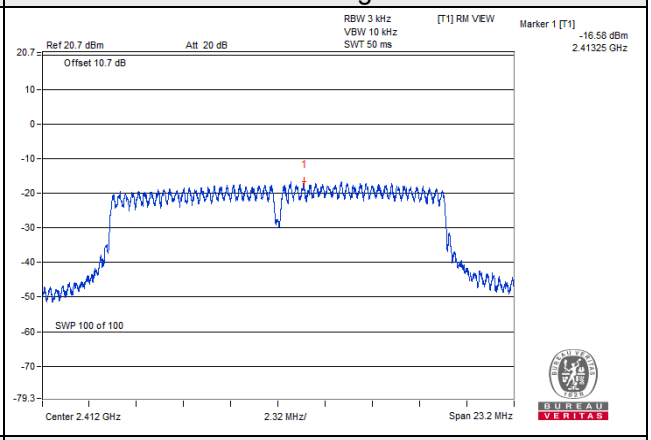
Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

Spectrum Plot of Worst Value

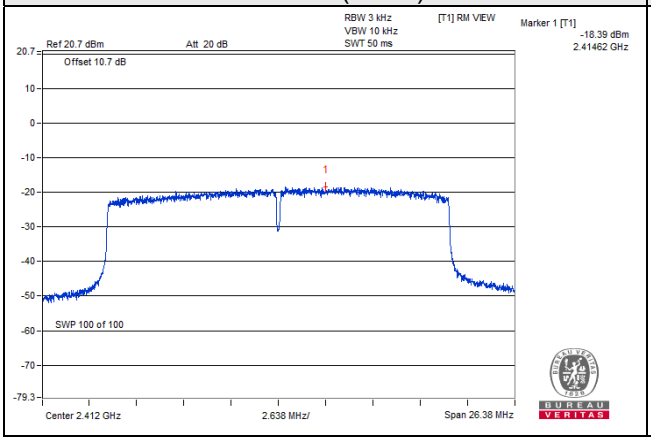
802.11b



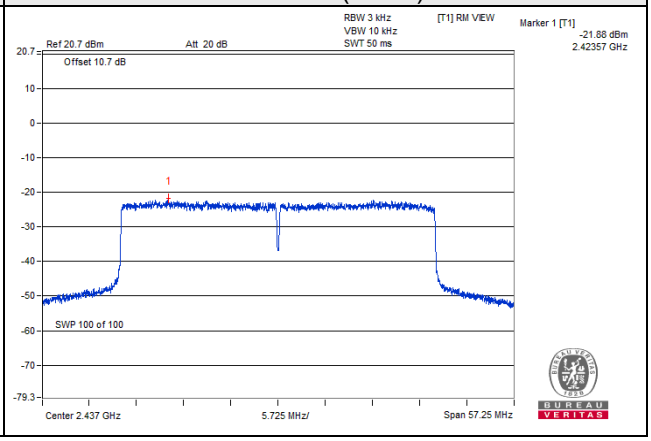
802.11g



802.11ax (HE20)



802.11ax (HE40)



1TX

802.11b

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-11.49	8.00	Pass
6	2437	-12.78	8.00	Pass
11	2462	-11.39	8.00	Pass

802.11g

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-15.71	8.00	Pass
6	2437	-17.20	8.00	Pass
11	2462	-16.63	8.00	Pass

802.11ax (HE20)

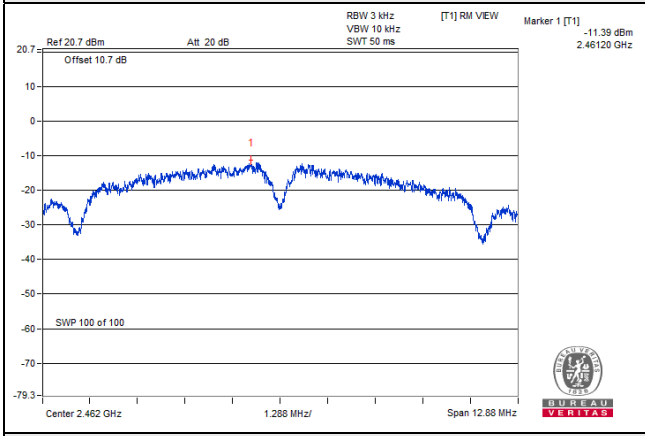
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-17.85	8.00	Pass
6	2437	-19.18	8.00	Pass
11	2462	-20.44	8.00	Pass

802.11ax (HE40)

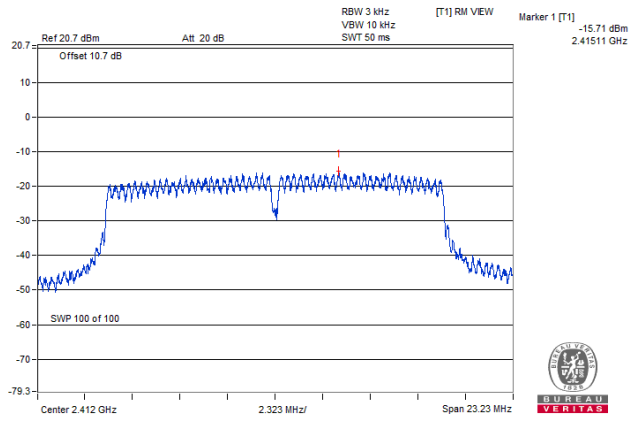
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-19.85	8.00	Pass
6	2437	-21.26	8.00	Pass
9	2452	-23.61	8.00	Pass

Spectrum Plot of Worst Value

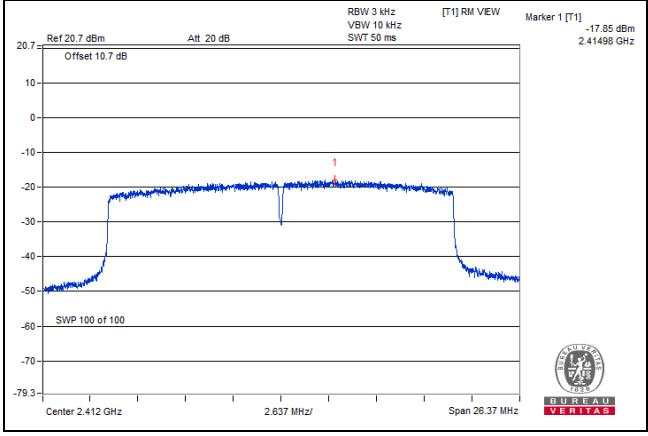
802.11b



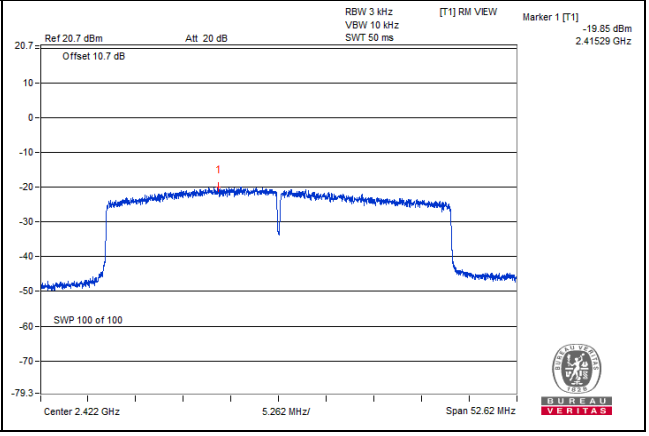
802.11g



802.11ax (HE20)



802.11ax (HE40)



Partial RU
2TX
RU26

802.11ax (HE20)

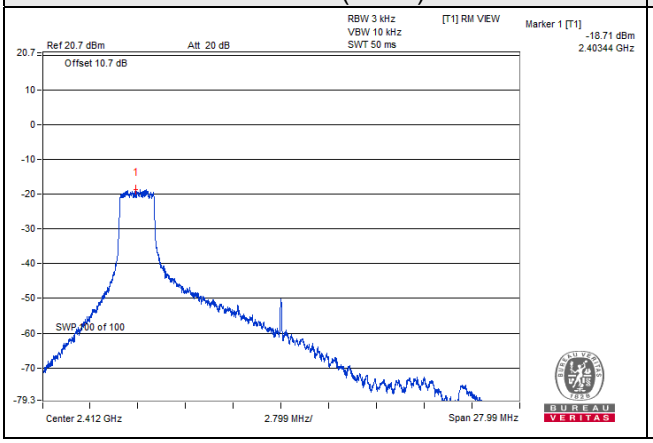
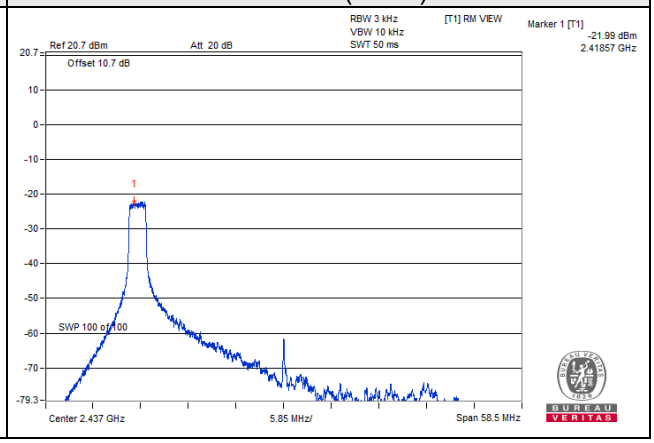
TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-18.71	3.01	-15.70	8.00	Pass
	6	2437	-21.26	3.01	-18.25	8.00	Pass
	11	2462	-24.00	3.01	-20.99	8.00	Pass
1	1	2412	-18.93	3.01	-15.92	8.00	Pass
	6	2437	-21.17	3.01	-18.16	8.00	Pass
	11	2462	-23.73	3.01	-20.72	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

802.11ax (HE40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-23.61	3.01	-20.60	8.00	Pass
	6	2437	-21.99	3.01	-18.98	8.00	Pass
	9	2452	-26.22	3.01	-23.21	8.00	Pass
1	3	2422	-23.43	3.01	-20.42	8.00	Pass
	6	2437	-21.99	3.01	-18.98	8.00	Pass
	9	2452	-26.45	3.01	-23.44	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

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

RU52

802.11ax (HE20)

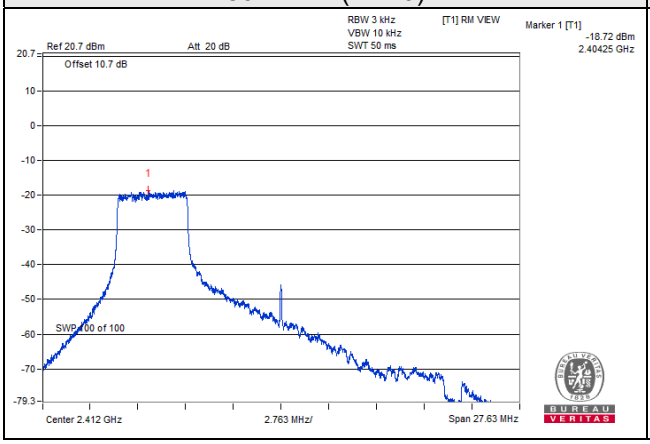
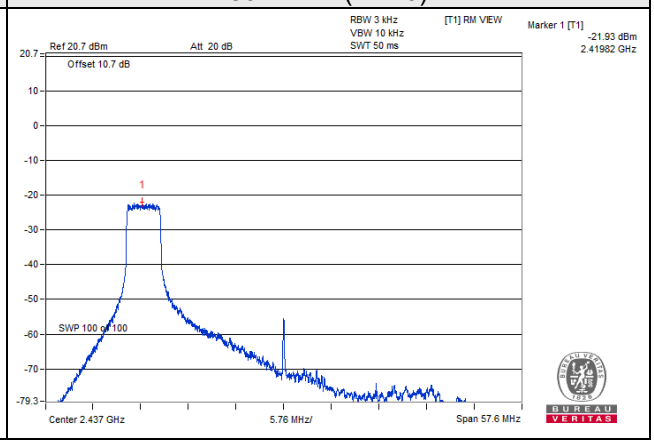
TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-18.84	3.01	-15.83	8.00	Pass
	6	2437	-20.57	3.01	-17.56	8.00	Pass
	11	2462	-23.65	3.01	-20.64	8.00	Pass
1	1	2412	-18.72	3.01	-15.71	8.00	Pass
	6	2437	-20.60	3.01	-17.59	8.00	Pass
	11	2462	-23.29	3.01	-20.28	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

802.11ax (HE40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-23.75	3.01	-20.74	8.00	Pass
	6	2437	-22.41	3.01	-19.40	8.00	Pass
	9	2452	-26.24	3.01	-23.23	8.00	Pass
1	3	2422	-23.57	3.01	-20.56	8.00	Pass
	6	2437	-21.93	3.01	-18.92	8.00	Pass
	9	2452	-26.14	3.01	-23.13	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

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

RU106

802.11ax (HE20)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-18.98	3.01	-15.97	8.00	Pass
	6	2437	-20.20	3.01	-17.19	8.00	Pass
	11	2462	-23.55	3.01	-20.54	8.00	Pass
1	1	2412	-18.66	3.01	-15.65	8.00	Pass
	6	2437	-20.20	3.01	-17.19	8.00	Pass
	11	2462	-23.49	3.01	-20.48	8.00	Pass

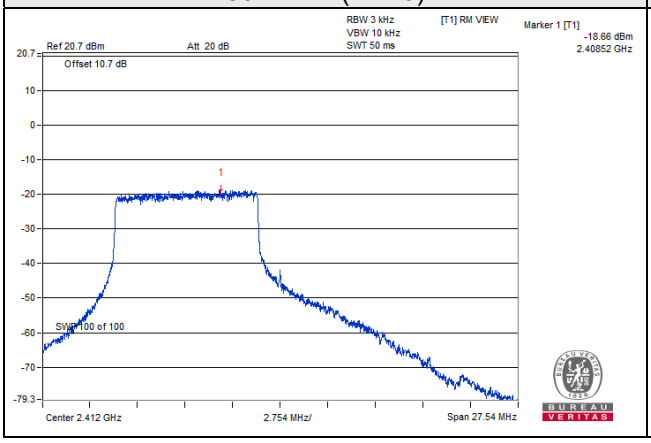
Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

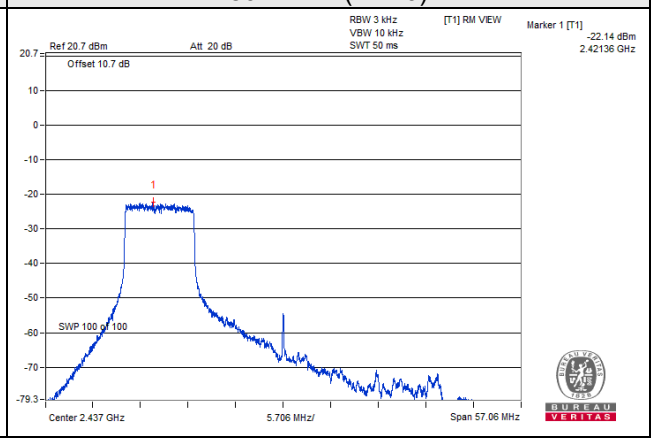
802.11ax (HE40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-23.59	3.01	-20.58	8.00	Pass
	6	2437	-22.14	3.01	-19.13	8.00	Pass
	9	2452	-26.21	3.01	-23.20	8.00	Pass
1	3	2422	-23.25	3.01	-20.24	8.00	Pass
	6	2437	-22.35	3.01	-19.34	8.00	Pass
	9	2452	-26.04	3.01	-23.03	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

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





RU242

802.11ax (HE20)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-18.85	3.01	-15.84	8.00	Pass
	6	2437	-20.15	3.01	-17.14	8.00	Pass
	11	2462	-23.34	3.01	-20.33	8.00	Pass
1	1	2412	-18.49	3.01	-15.48	8.00	Pass
	6	2437	-20.46	3.01	-17.45	8.00	Pass
	11	2462	-26.10	3.01	-23.09	8.00	Pass

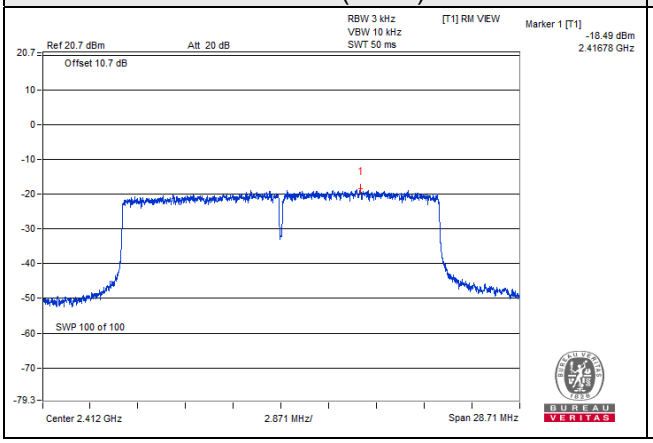
Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

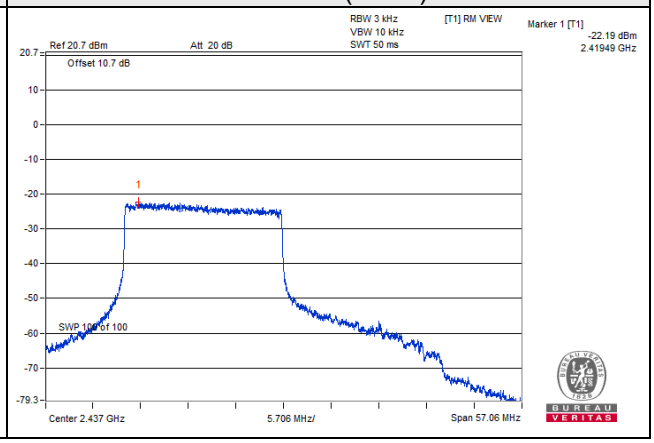
802.11ax (HE40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-23.23	3.01	-20.22	8.00	Pass
	6	2437	-22.19	3.01	-19.18	8.00	Pass
	9	2452	-25.91	3.01	-22.90	8.00	Pass
1	3	2422	-23.37	3.01	-20.36	8.00	Pass
	6	2437	-22.29	3.01	-19.28	8.00	Pass
	9	2452	-26.10	3.01	-23.09	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

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



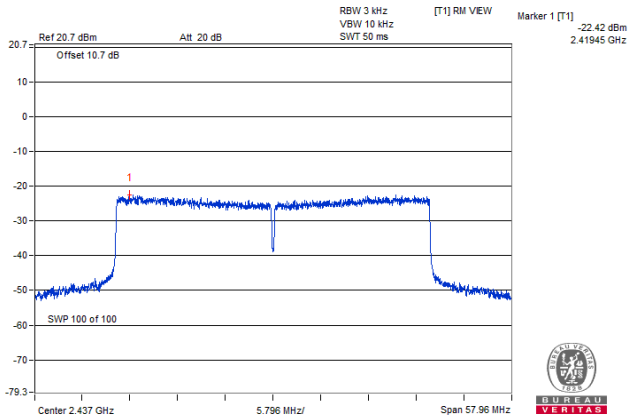


RU484

802.11ax (HE40)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-22.94	3.01	-19.93	8.00	Pass
	6	2437	-22.86	3.01	-19.85	8.00	Pass
	9	2452	-25.86	3.01	-22.85	8.00	Pass
1	3	2422	-23.09	3.01	-20.08	8.00	Pass
	6	2437	-22.42	3.01	-19.41	8.00	Pass
	9	2452	-26.10	3.01	-23.09	8.00	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 0.5 + 10log(2) = 3.51 dBi < 6 dBi, so the power spectral density limit is not reduced.

Spectrum Plot of Worst Value	
802.11ax (HE40)	
	

Partial RU
1TX
RU26

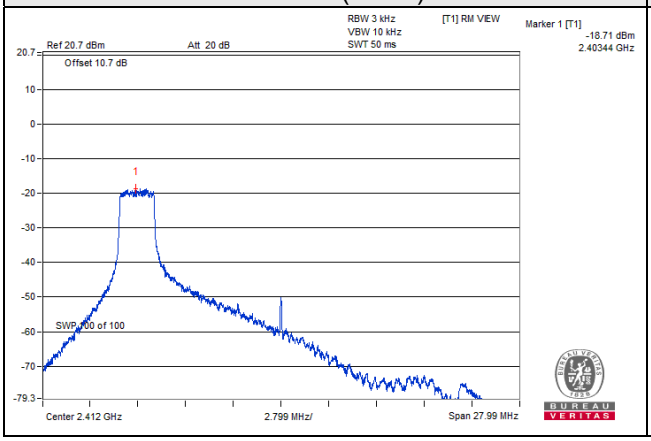
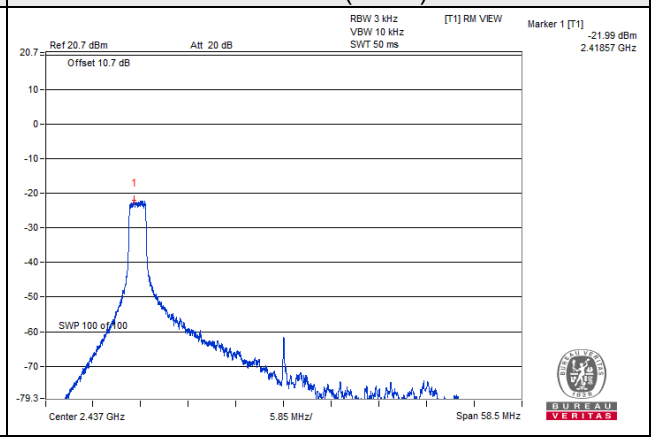
Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.71	8.00	Pass
6	2437	-21.26	8.00	Pass
11	2462	-24.00	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.61	8.00	Pass
6	2437	-21.99	8.00	Pass
9	2452	-26.22	8.00	Pass

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

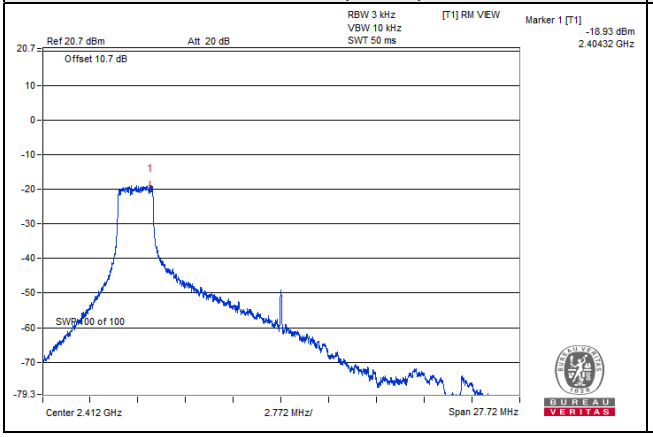
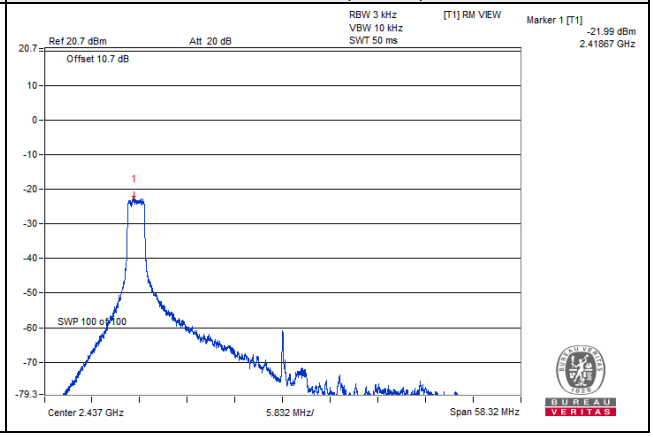
Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.93	8.00	Pass
6	2437	-21.17	8.00	Pass
11	2462	-23.73	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.43	8.00	Pass
6	2437	-21.99	8.00	Pass
9	2452	-26.45	8.00	Pass

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

RU52

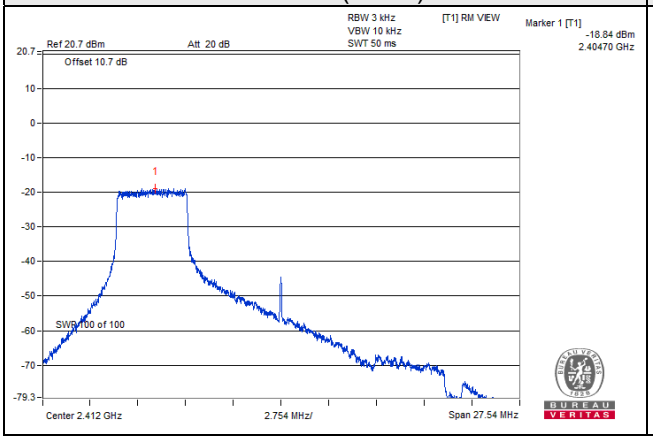
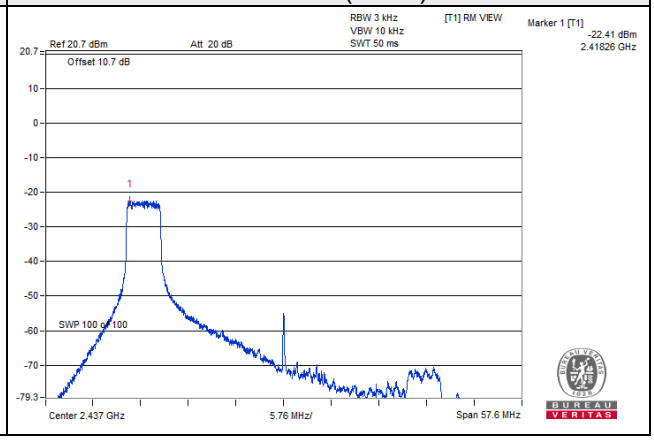
Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.84	8.00	Pass
6	2437	-20.57	8.00	Pass
11	2462	-23.65	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.75	8.00	Pass
6	2437	-22.41	8.00	Pass
9	2452	-26.24	8.00	Pass

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

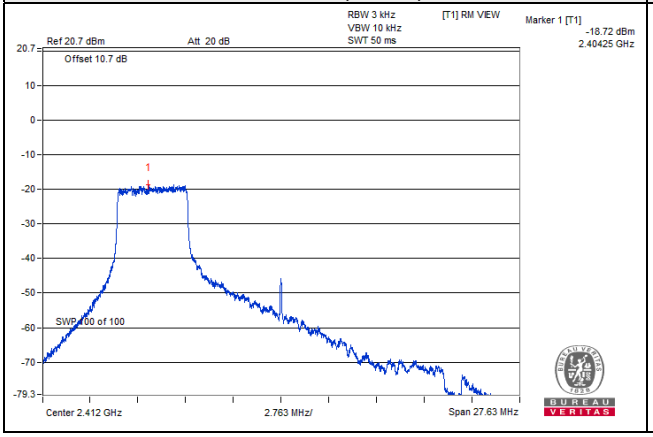
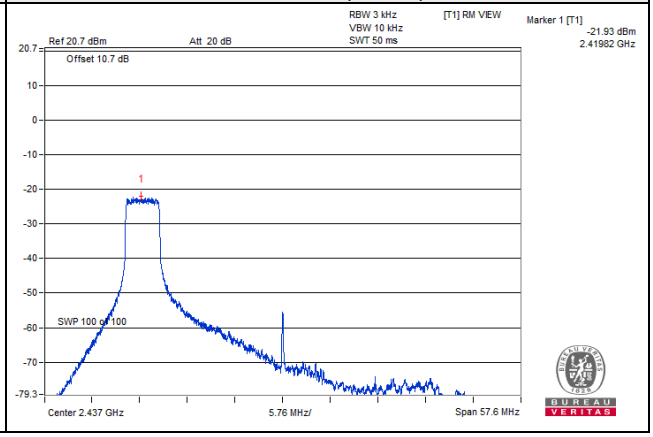
Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.72	8.00	Pass
6	2437	-20.60	8.00	Pass
11	2462	-23.29	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.57	8.00	Pass
6	2437	-21.93	8.00	Pass
9	2452	-26.14	8.00	Pass

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

RU106

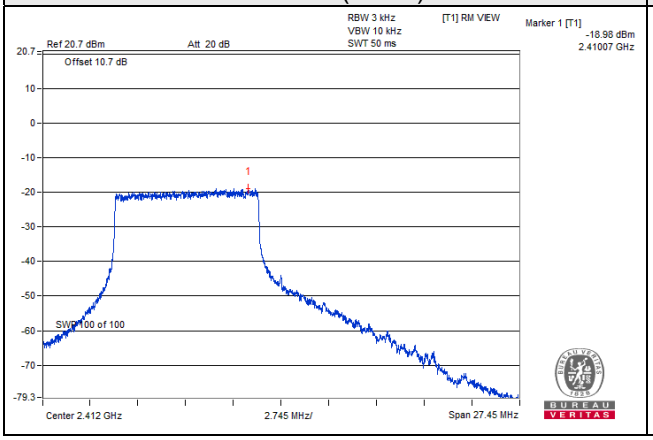
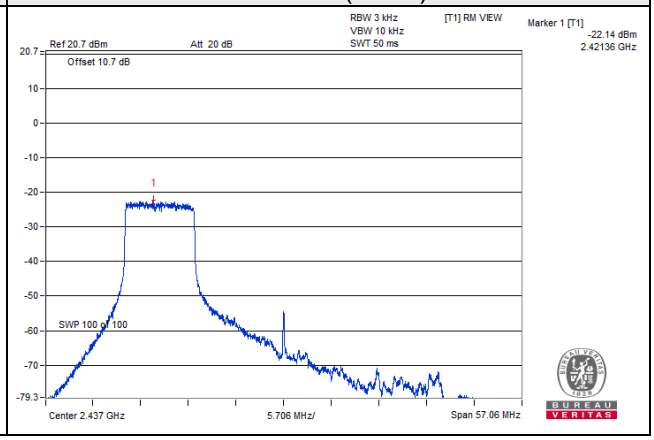
Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.98	8.00	Pass
6	2437	-20.20	8.00	Pass
11	2462	-23.55	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.59	8.00	Pass
6	2437	-22.14	8.00	Pass
9	2452	-26.21	8.00	Pass

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

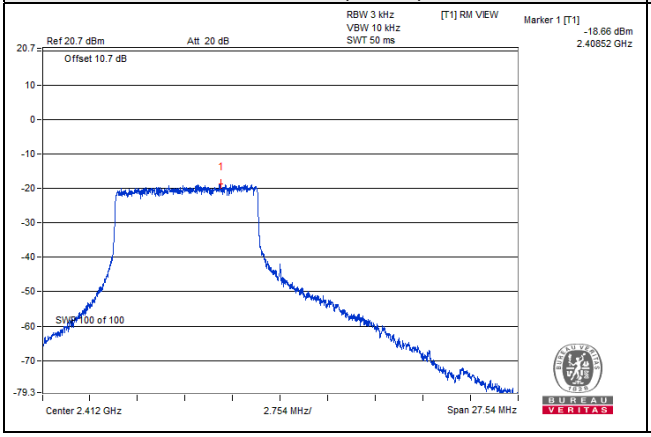
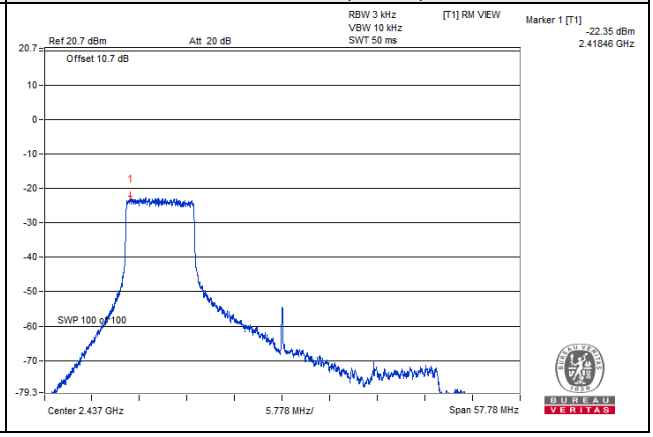
Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.66	8.00	Pass
6	2437	-20.20	8.00	Pass
11	2462	-23.49	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.25	8.00	Pass
6	2437	-22.35	8.00	Pass
9	2452	-26.04	8.00	Pass

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

RU242

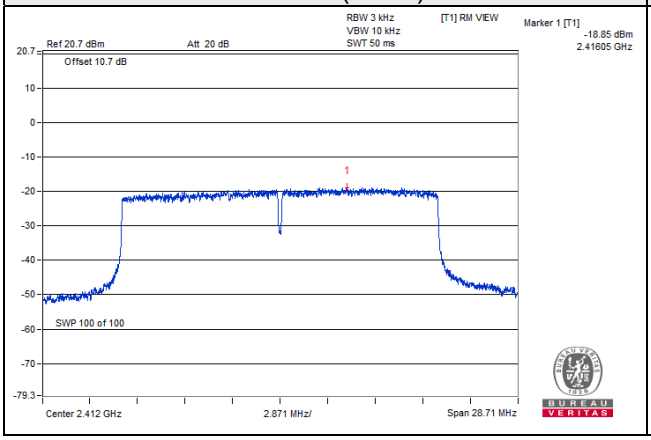
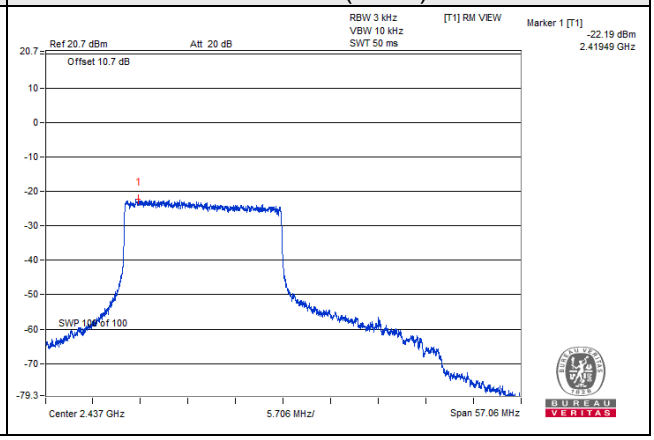
Chain 0

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.85	8.00	Pass
6	2437	-20.15	8.00	Pass
11	2462	-23.34	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.23	8.00	Pass
6	2437	-22.19	8.00	Pass
9	2452	-25.91	8.00	Pass

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

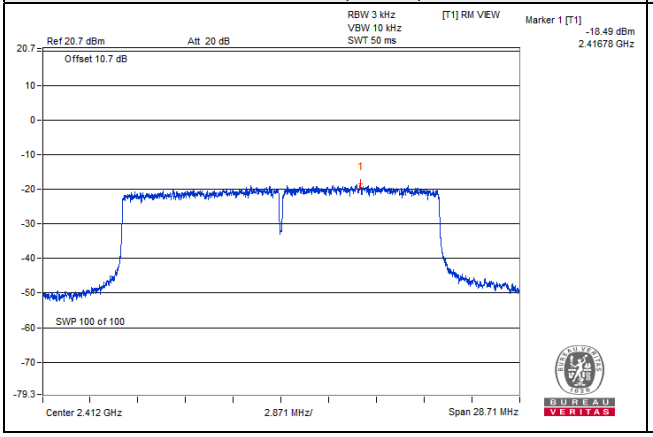
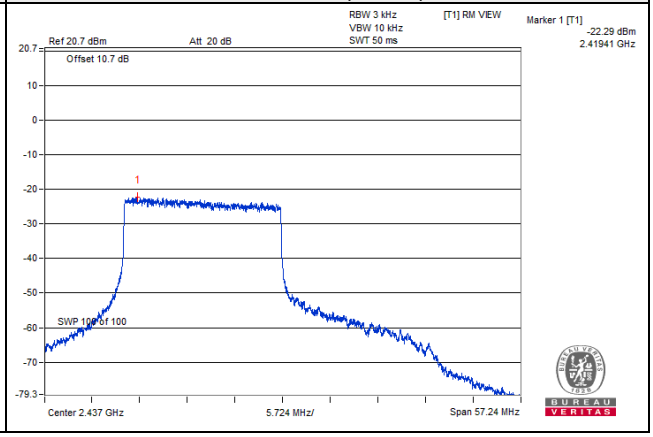
Chain 1

802.11ax (HE20)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
1	2412	-18.49	8.00	Pass
6	2437	-20.46	8.00	Pass
11	2462	-26.10	8.00	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.37	8.00	Pass
6	2437	-22.29	8.00	Pass
9	2452	-26.10	8.00	Pass

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

RU484

Chain 0

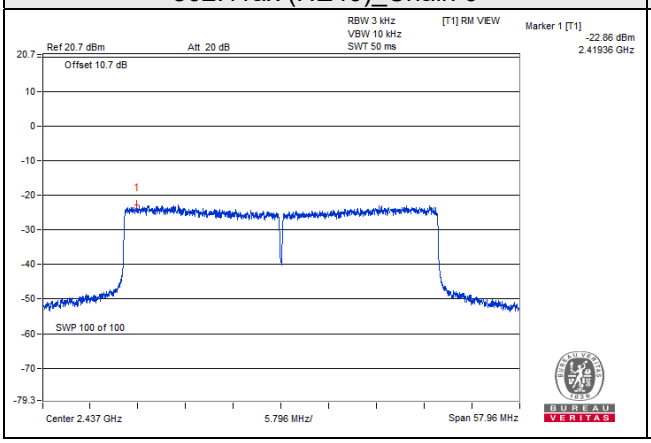
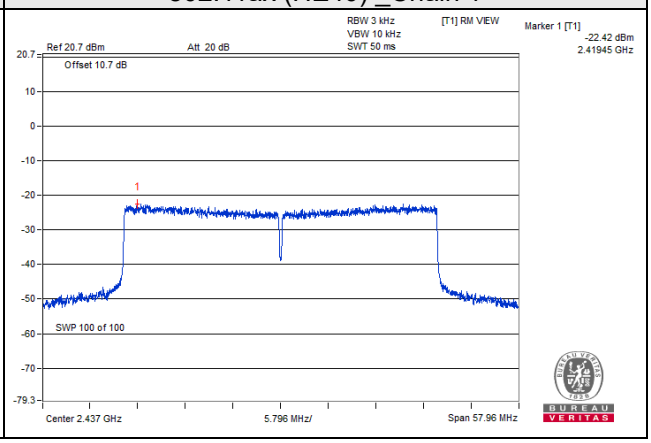
802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-22.94	8.00	Pass
6	2437	-22.86	8.00	Pass
9	2452	-25.86	8.00	Pass

Chain 1

802.11ax (HE40)

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	2422	-23.09	8.00	Pass
6	2437	-22.42	8.00	Pass
9	2452	-26.10	8.00	Pass

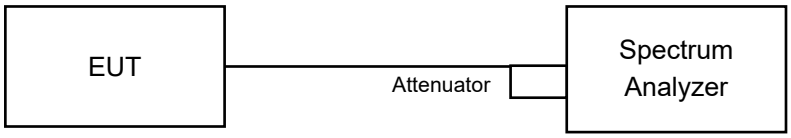
Spectrum Plot of Worst Value	
802.11ax (HE40)_Chain 0	802.11ax (HE40) _Chain 1
	

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as item 4.3.6.

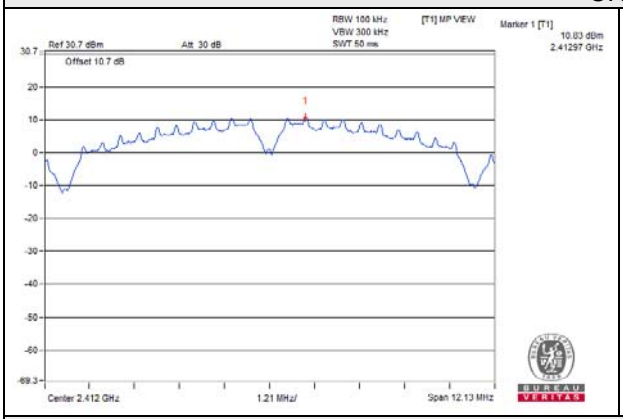
4.6.7 Test Results

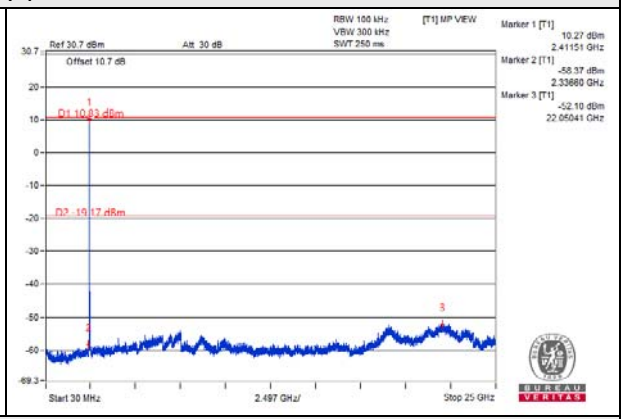
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit.
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows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

2TX

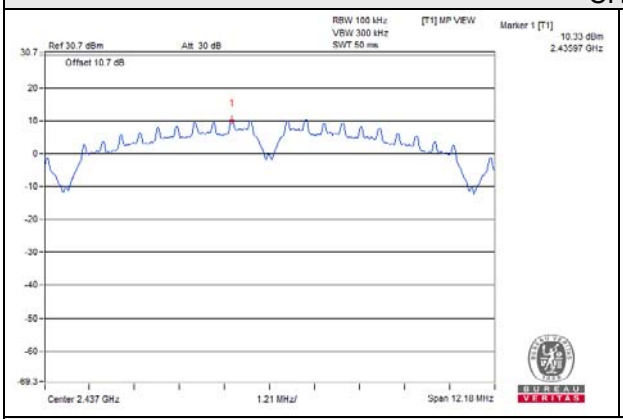
802.11b_Chain 0

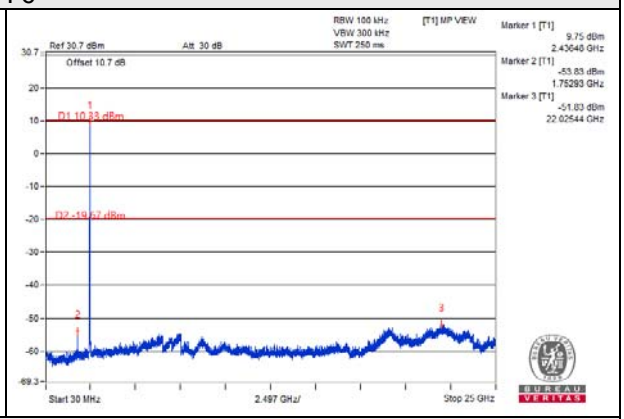
CH 1



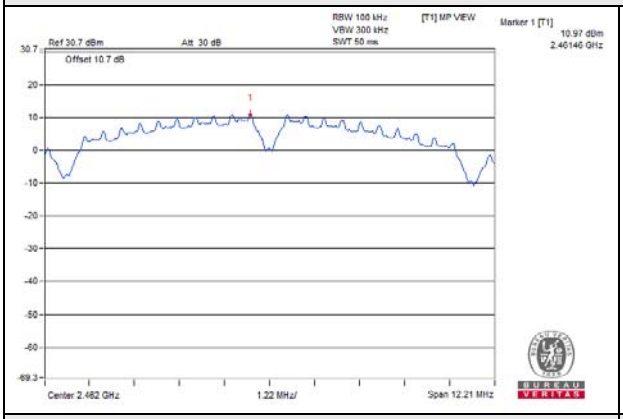


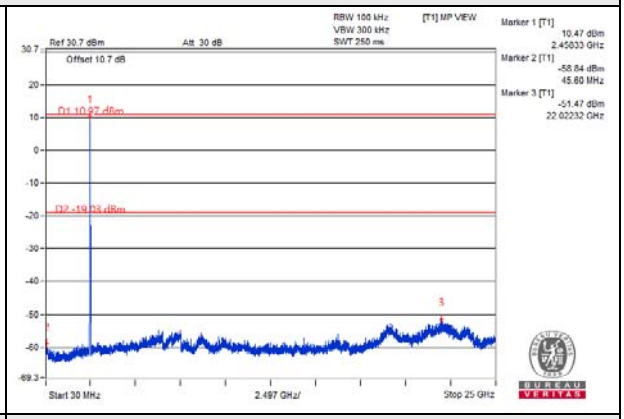
CH 6



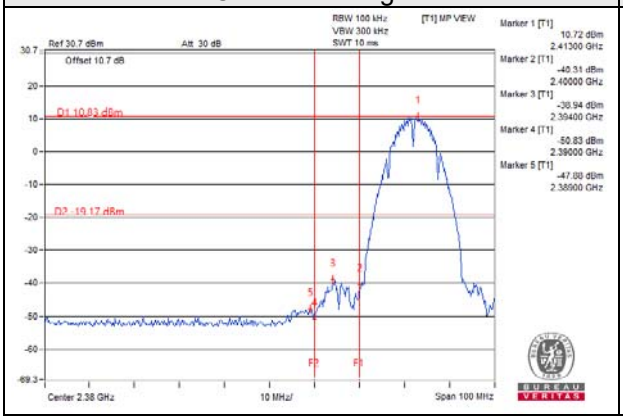


CH 11

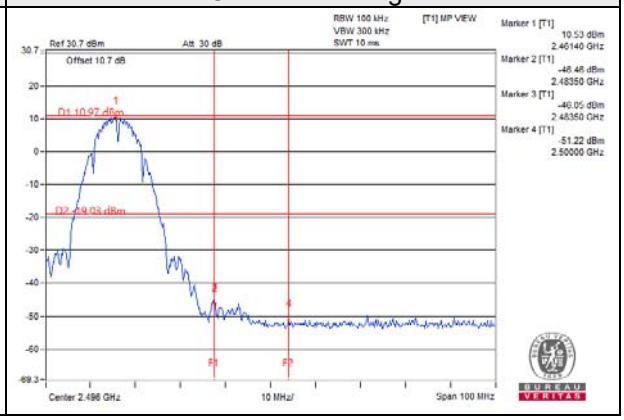




CH 1 Band edge

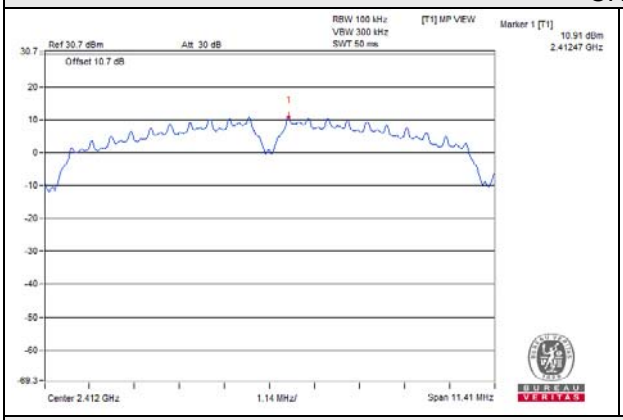


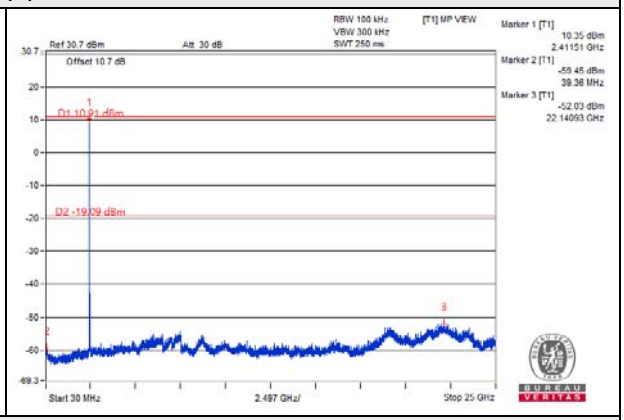
CH 11 Band edge



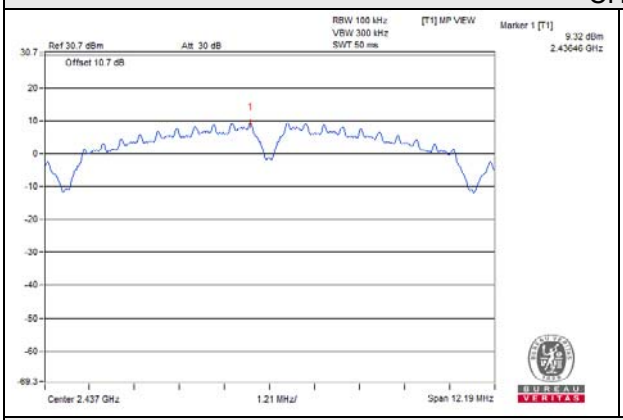
802.11b_Chain 1

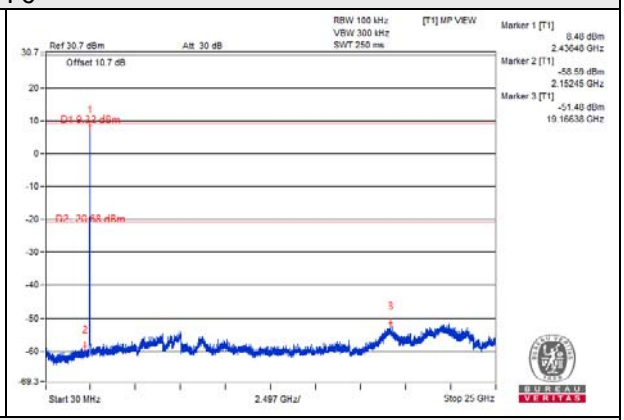
CH 1



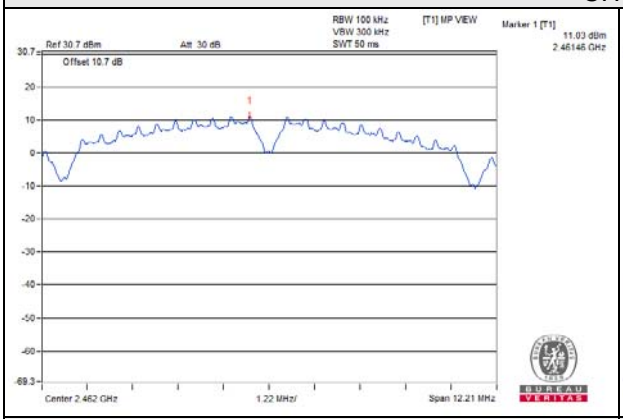


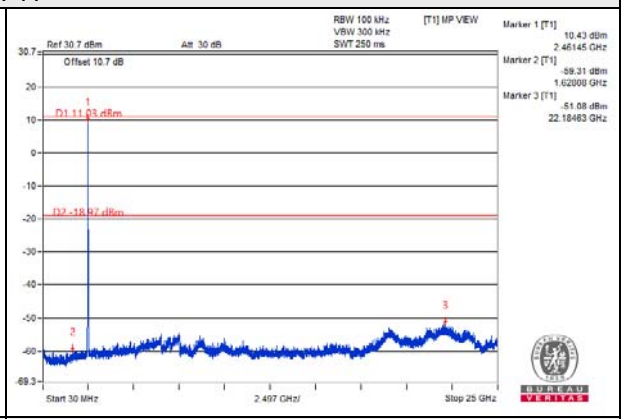
CH 6



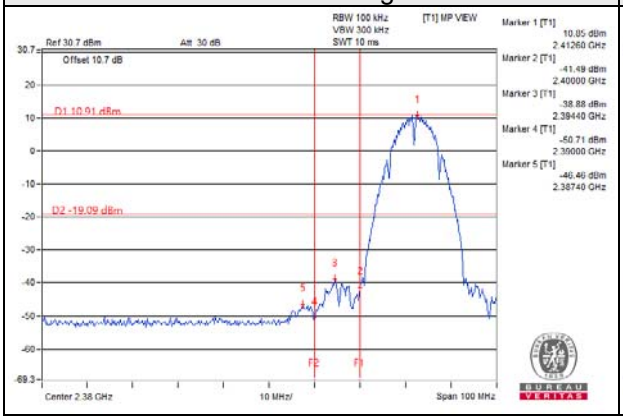


CH 11

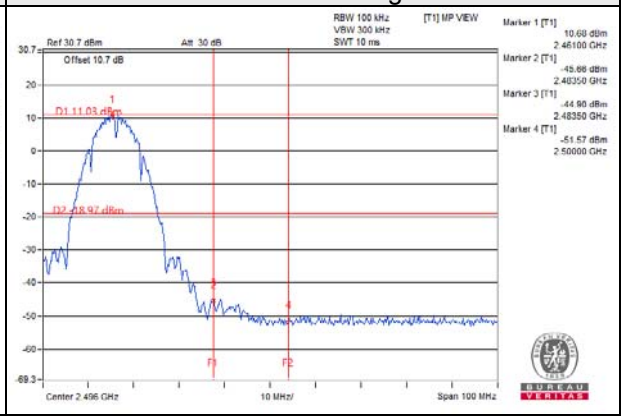




CH 1 Band edge

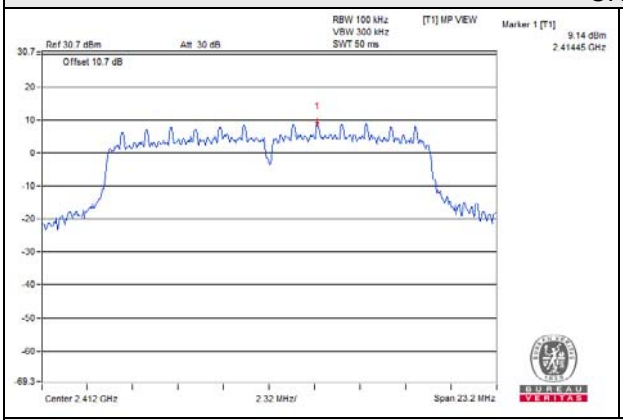


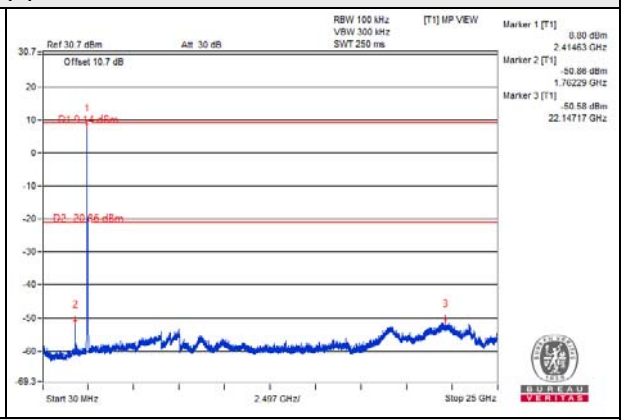
CH 11 Band edge



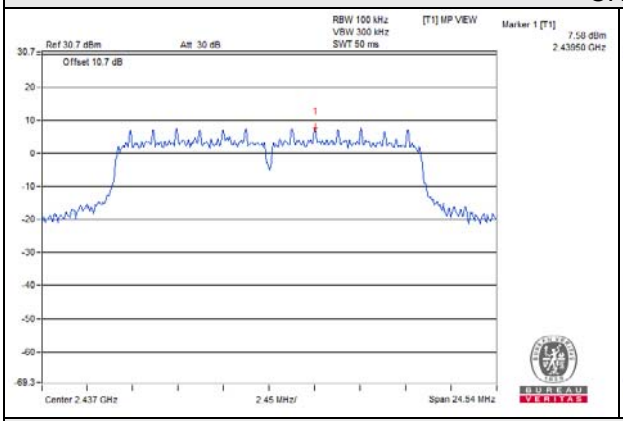
802.11g_Chain 0

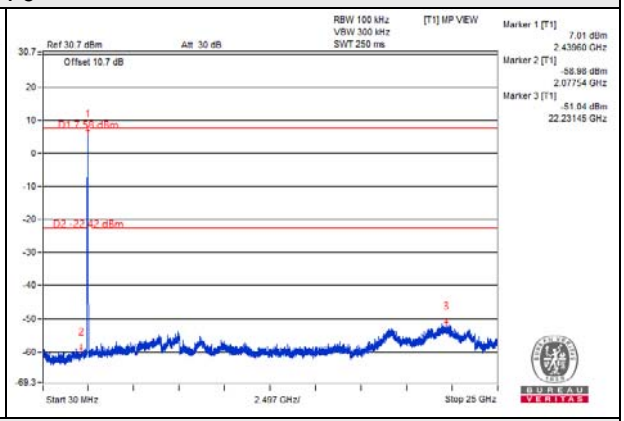
CH 1



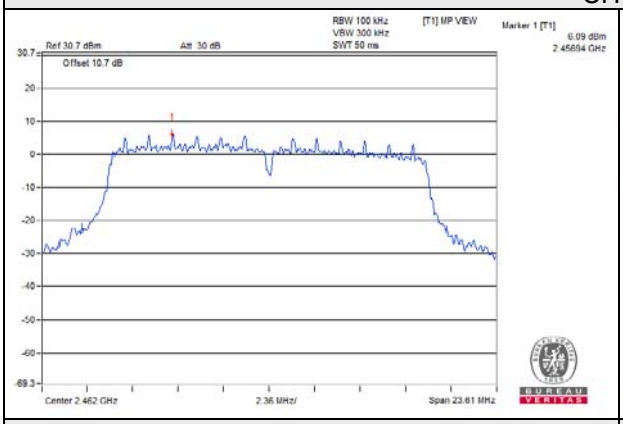


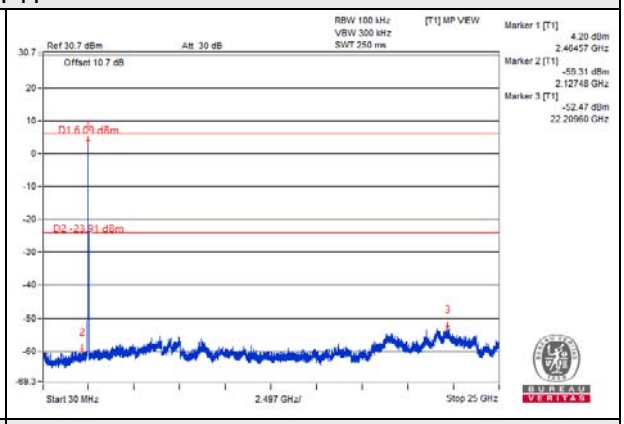
CH 6



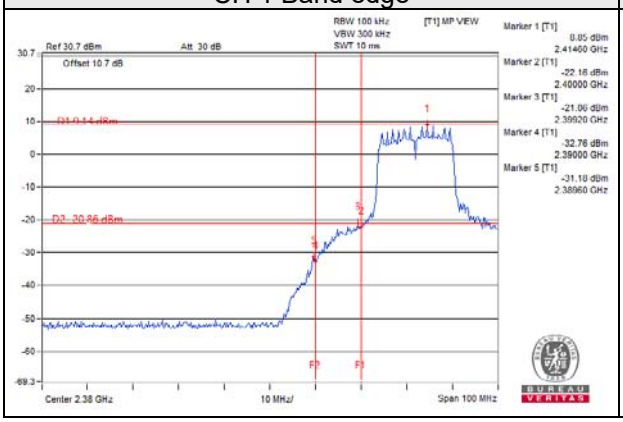


CH 11

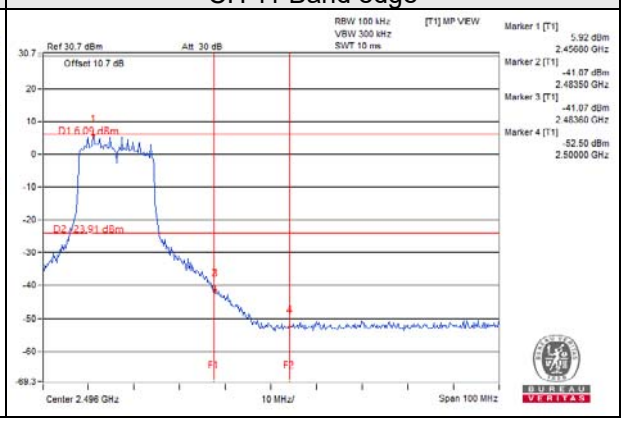




CH 1 Band edge

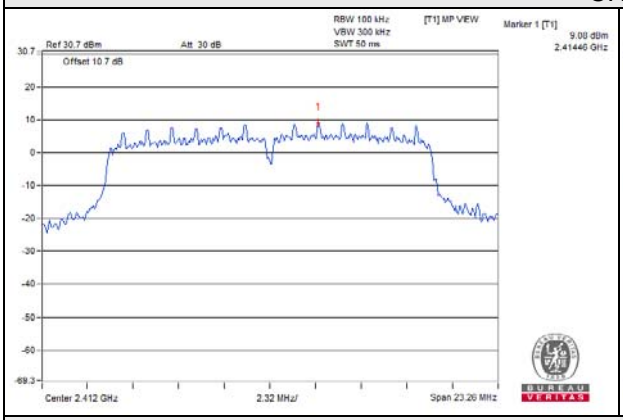


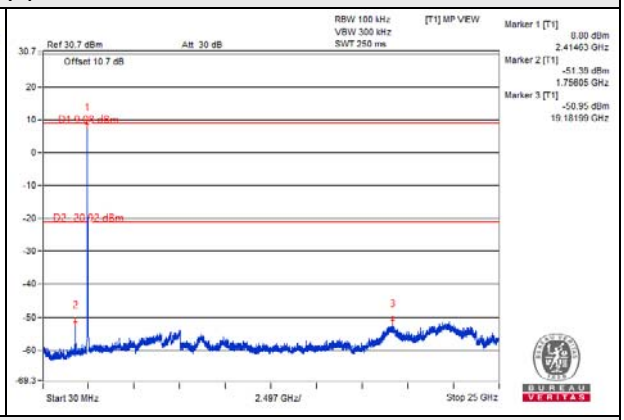
CH 11 Band edge



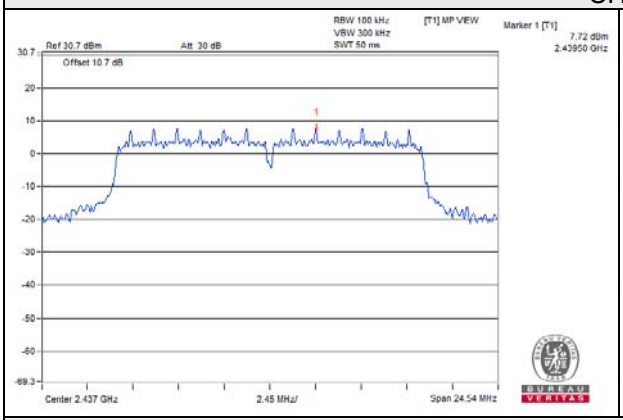
802.11g_Chain 1

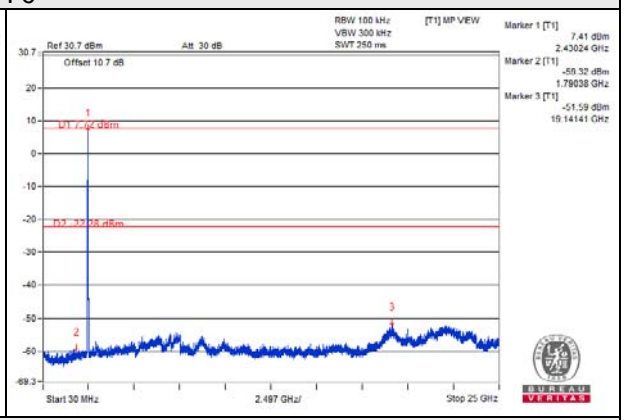
CH 1



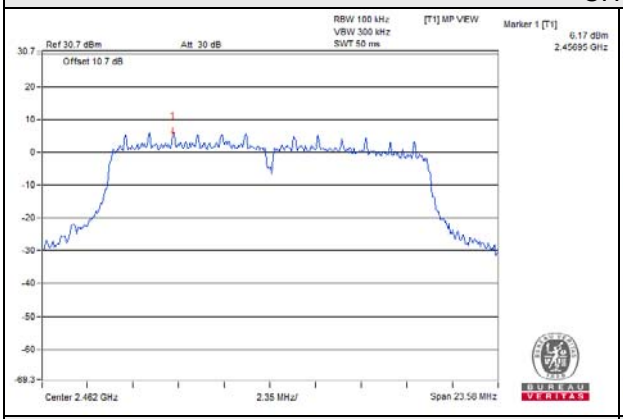


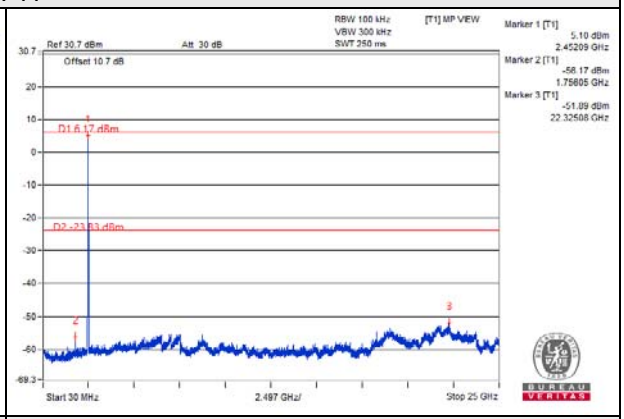
CH 6



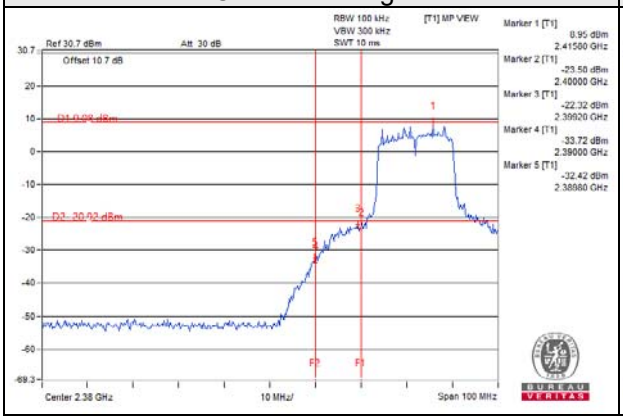


CH 11

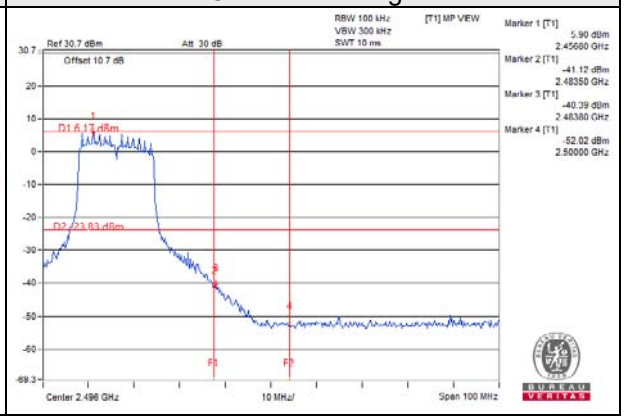




CH 1 Band edge

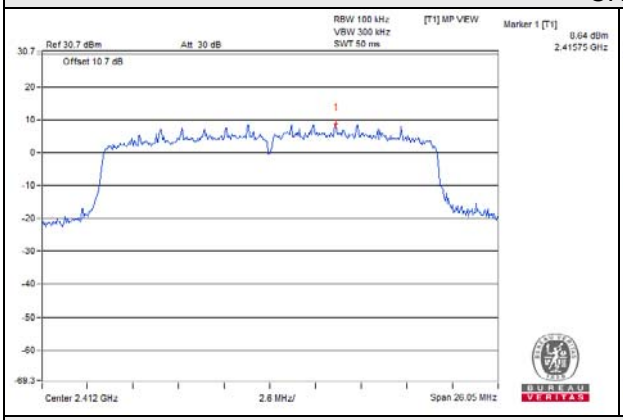


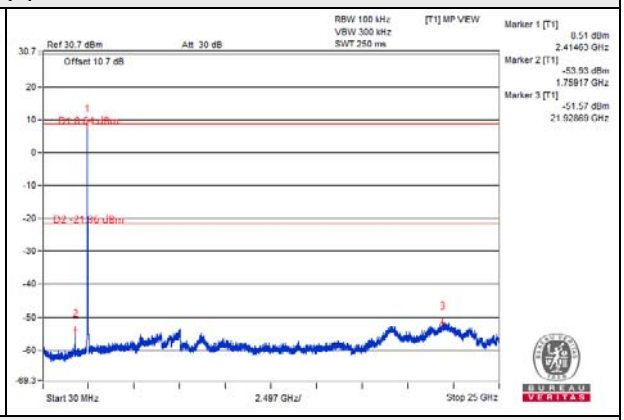
CH 11 Band edge



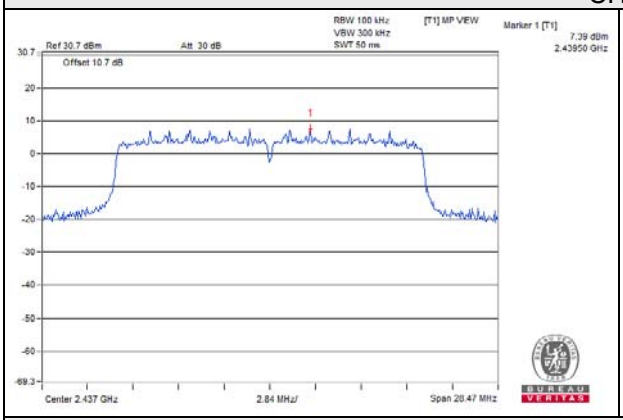
802.11ax (HE20)_Chain 0

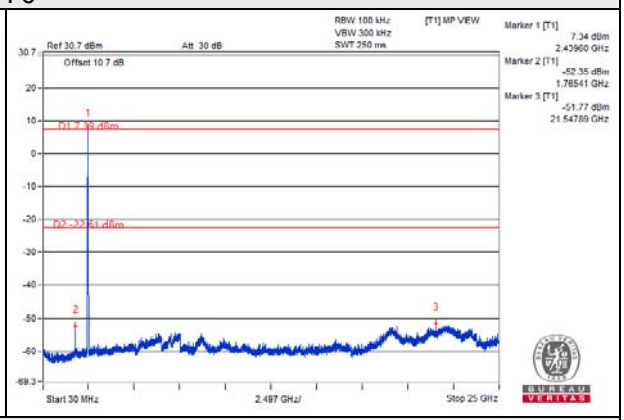
CH 1



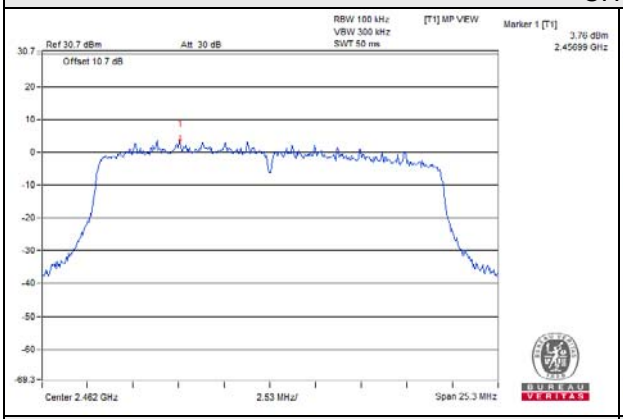


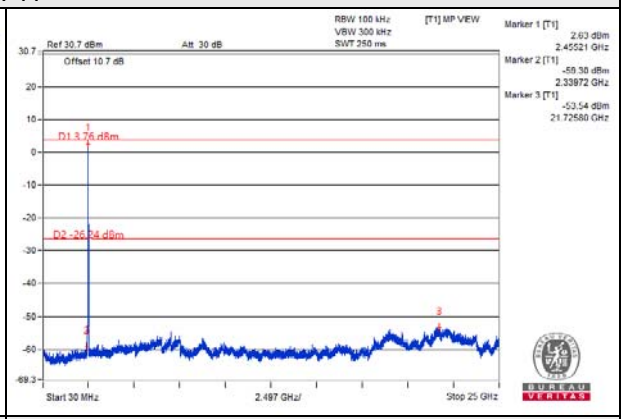
CH 6



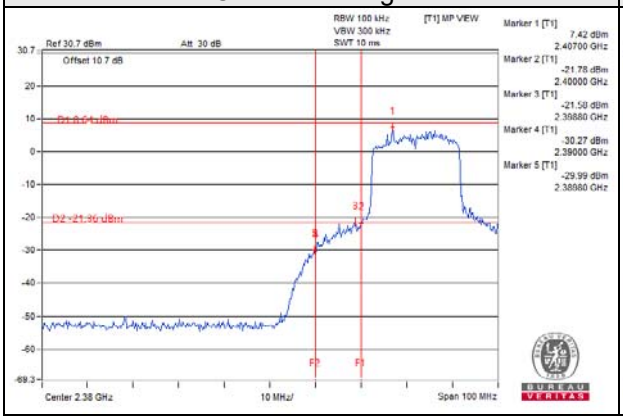


CH 11

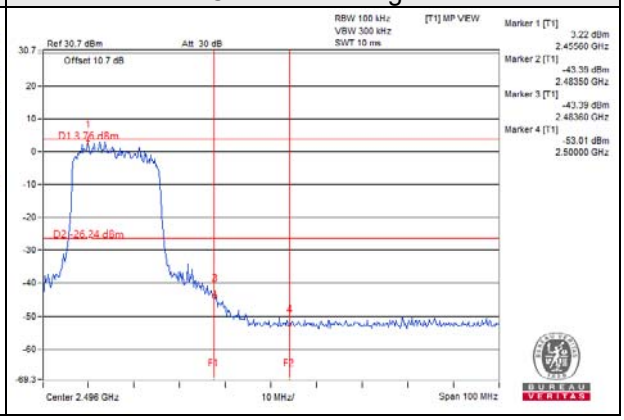




CH 1 Band edge

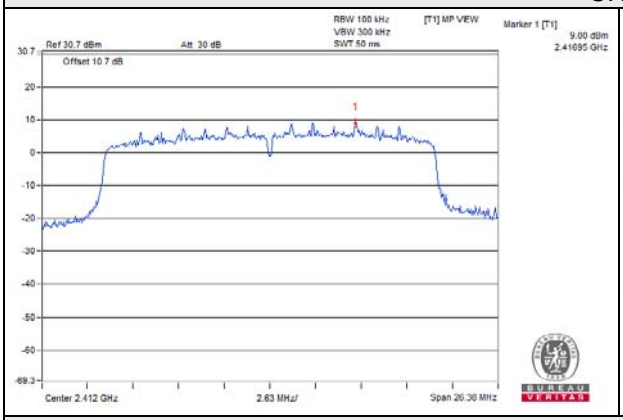


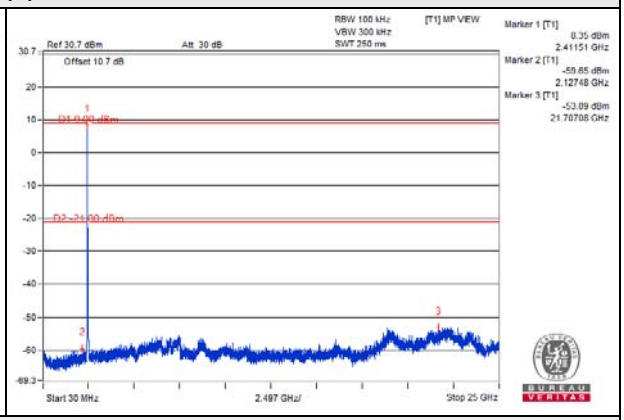
CH 11 Band edge



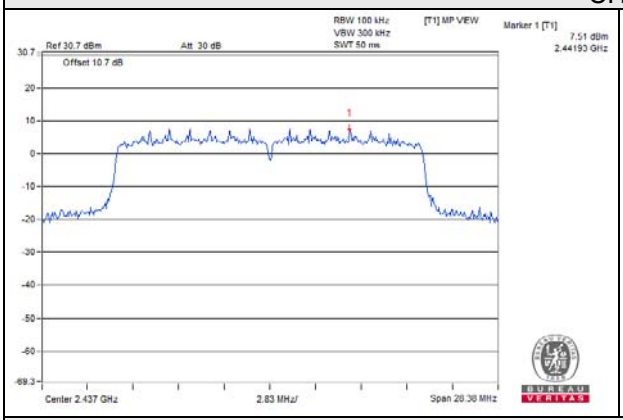
802.11ax (HE20)_Chain 1

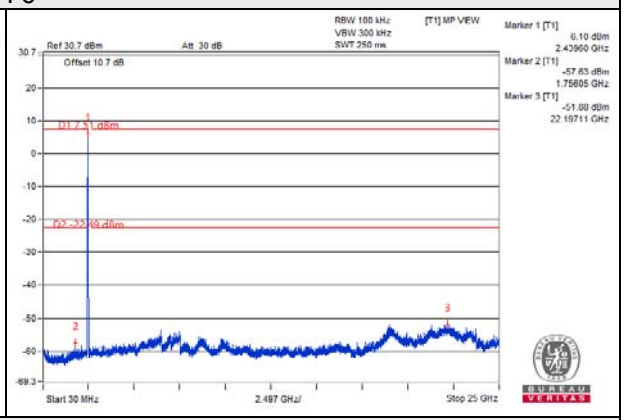
CH 1



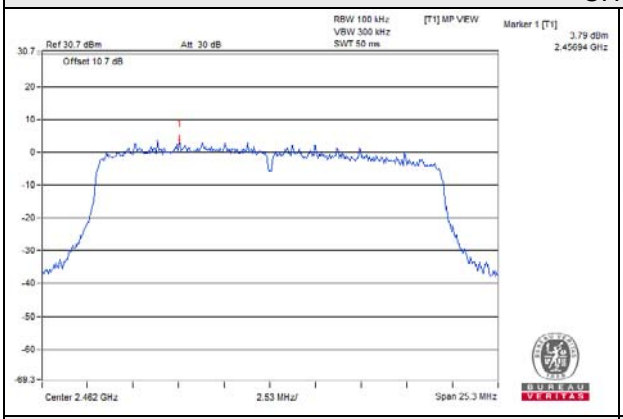


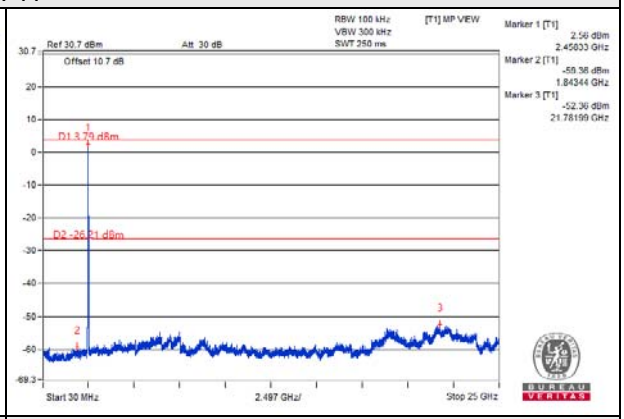
CH 6



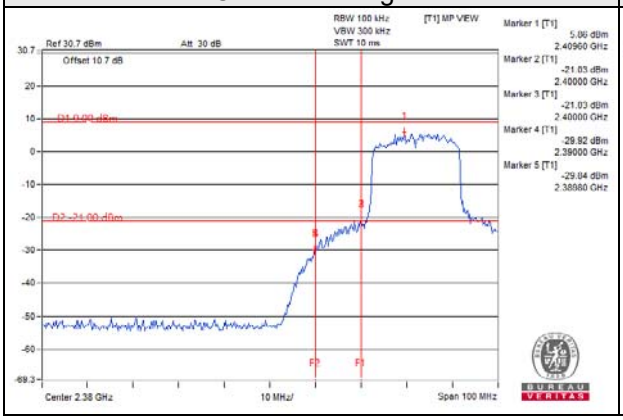


CH 11

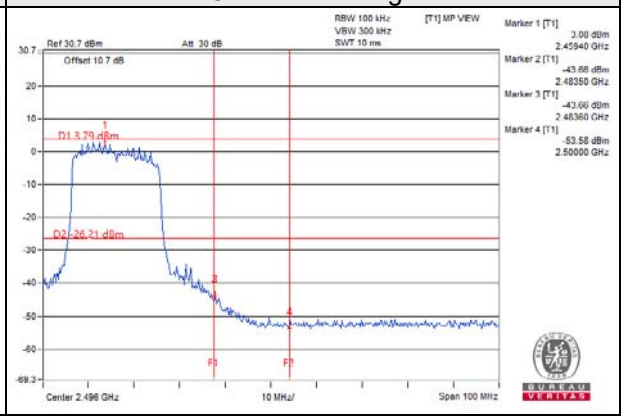




CH 1 Band edge

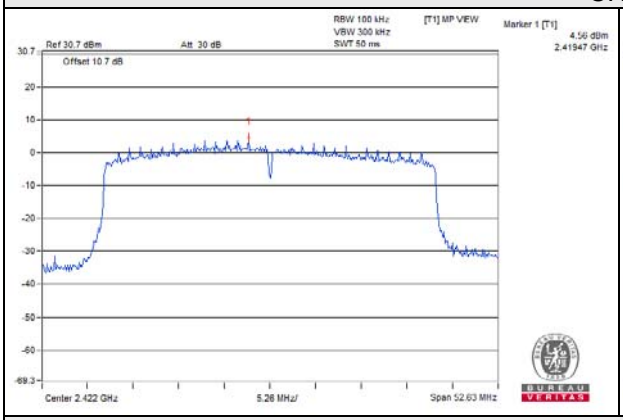


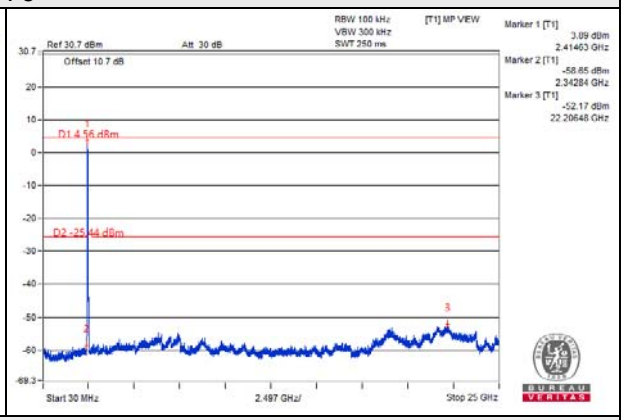
CH 11 Band edge



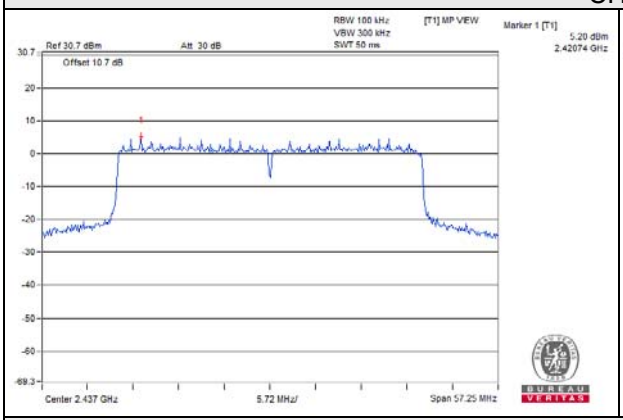
802.11ax (HE40)_Chain 0

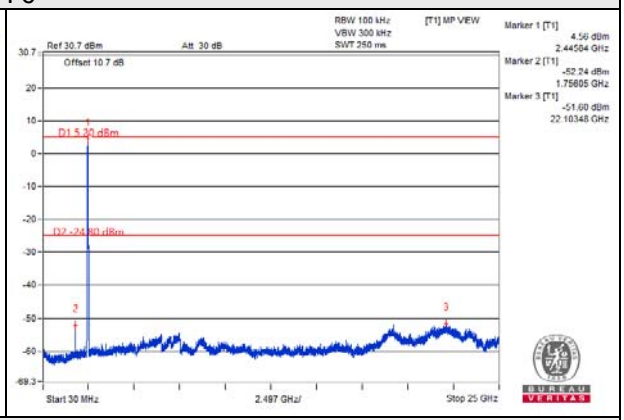
CH 3



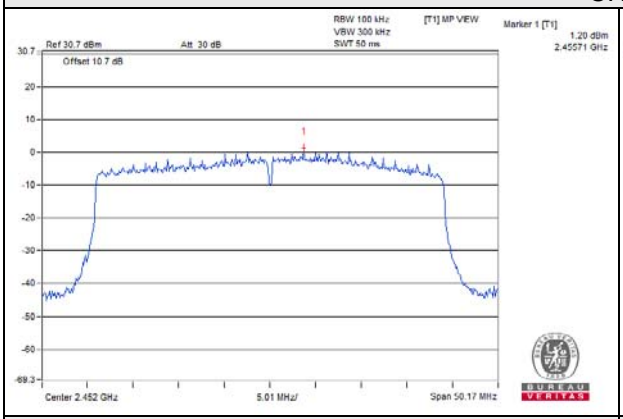


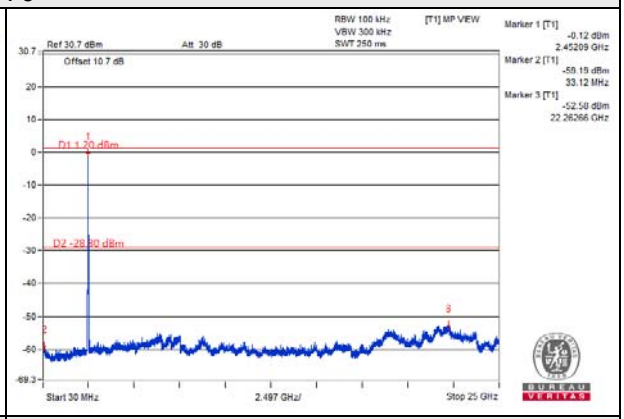
CH 6



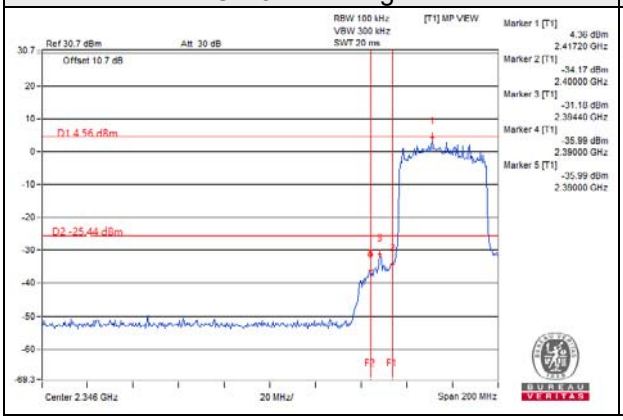


CH 9

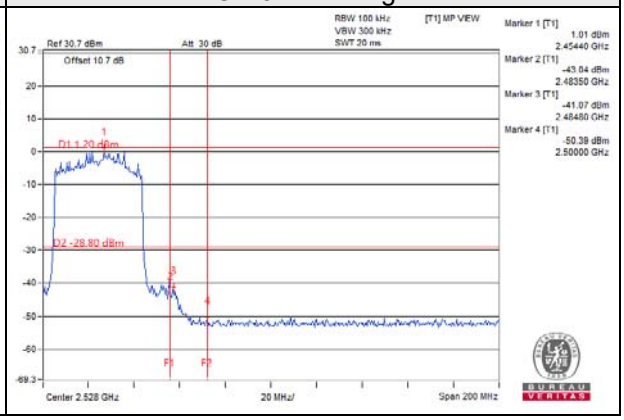




CH 3 Band edge

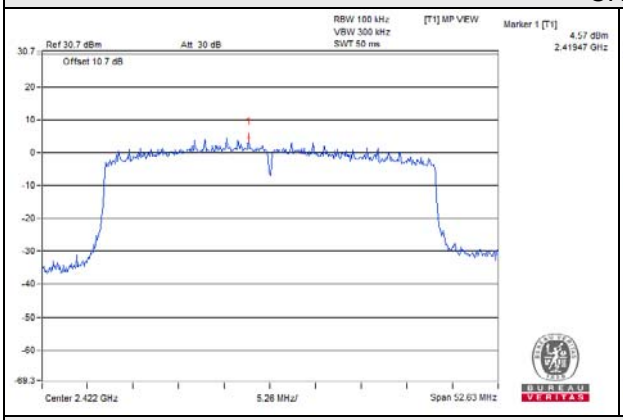


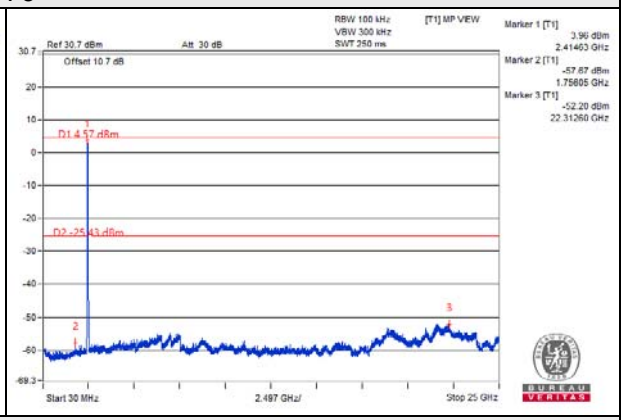
CH 9 Band edge



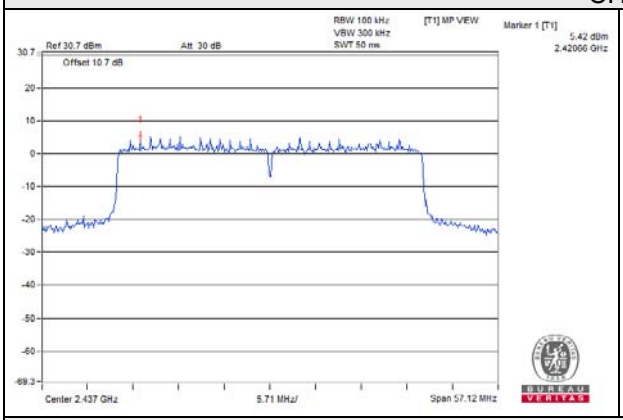
802.11ax (HE40)_Chain 1

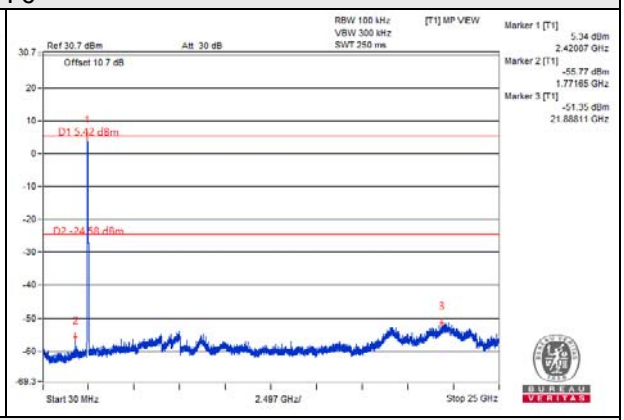
CH 3



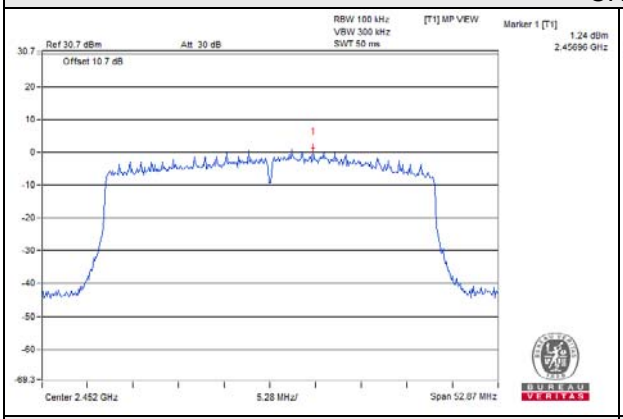


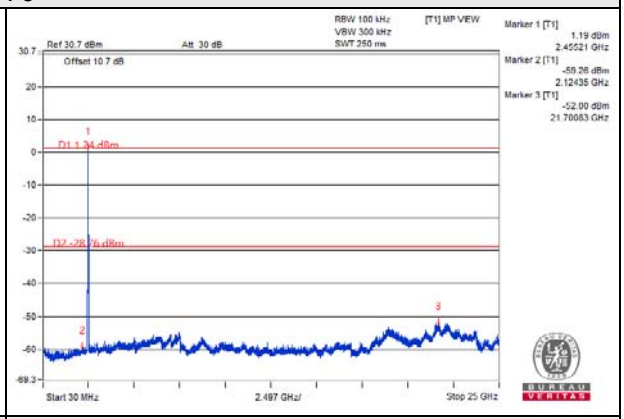
CH 6



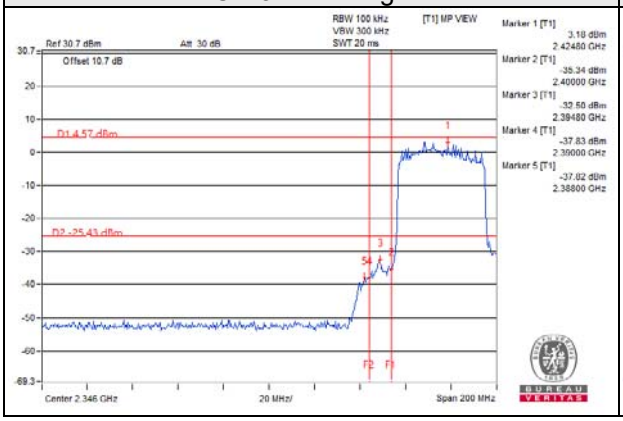


CH 9

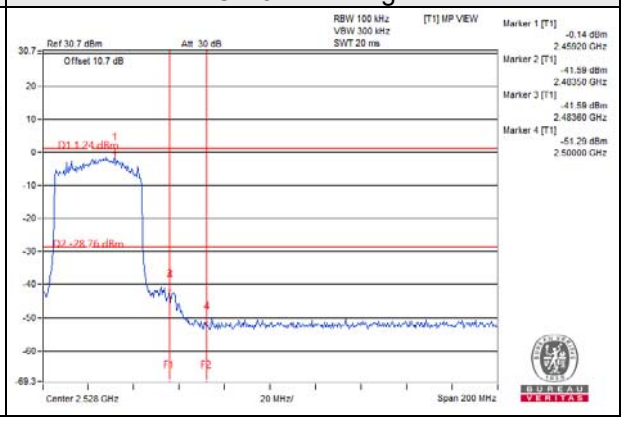




CH 3 Band edge

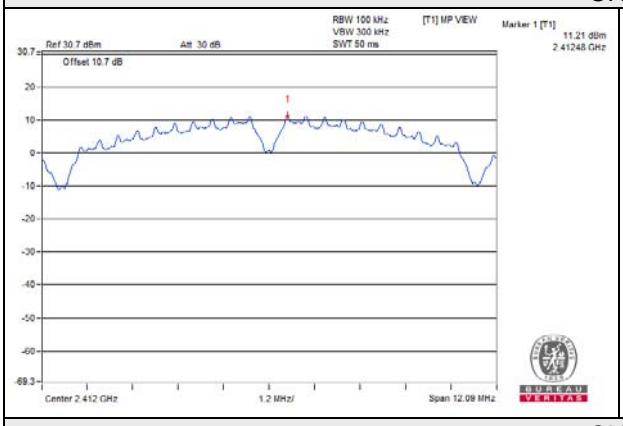


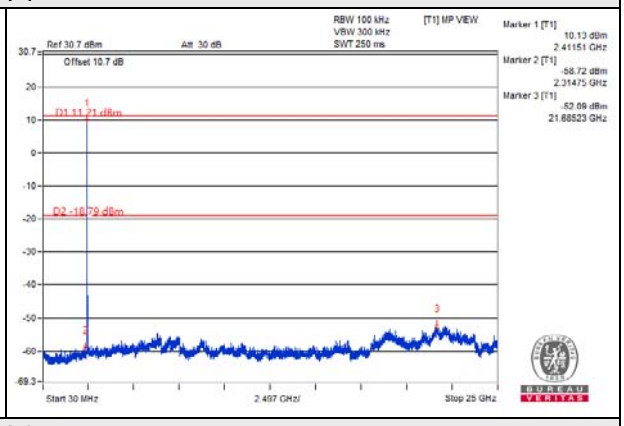
CH 9 Band edge



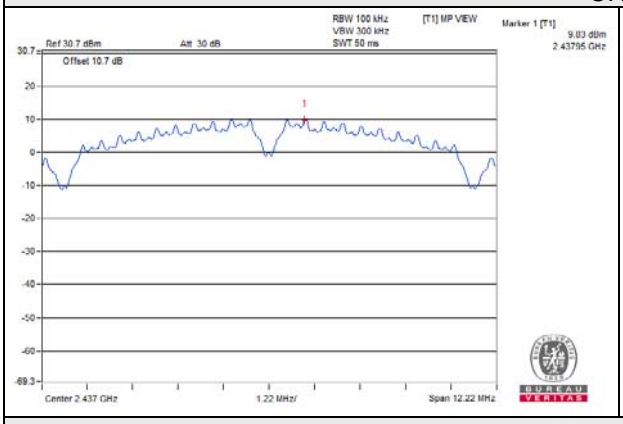
1TX
802.11b

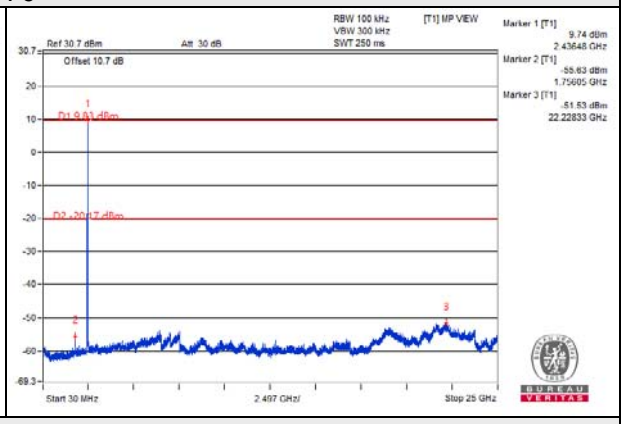
CH 1



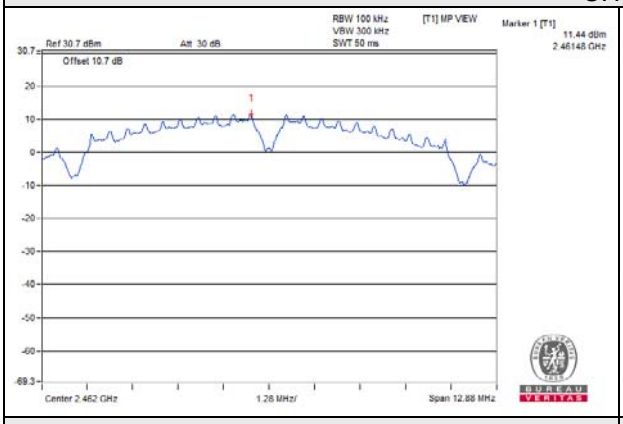


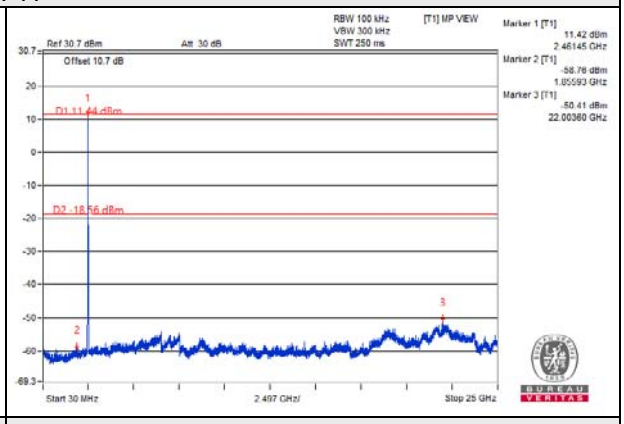
CH 6



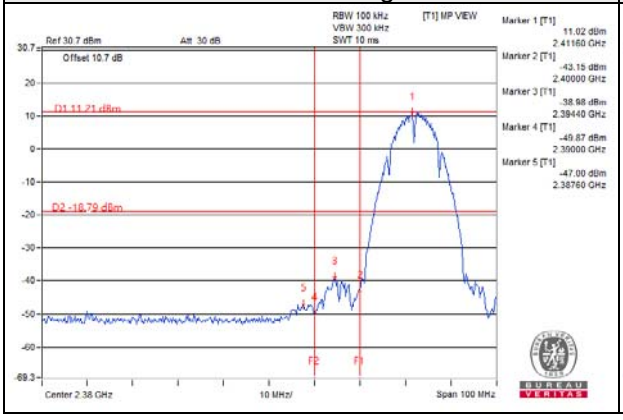


CH 11

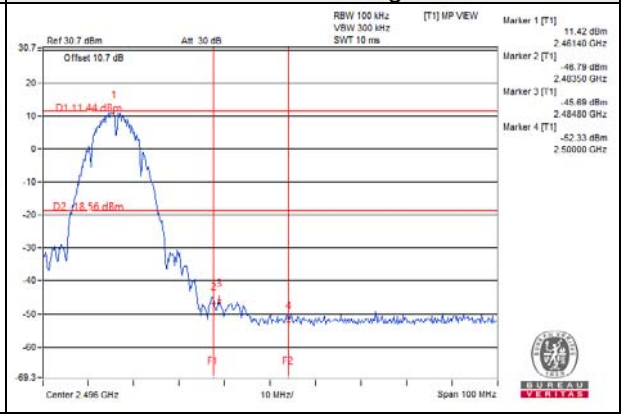




CH 1 Band edge

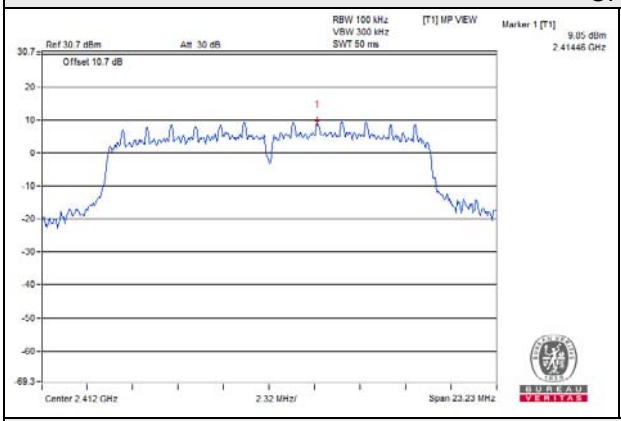


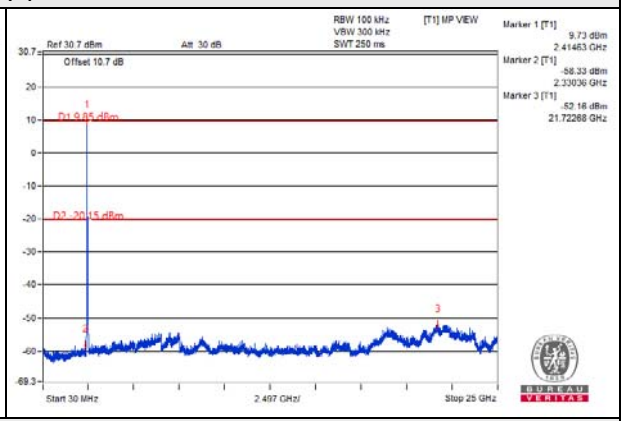
CH 11 Band edge



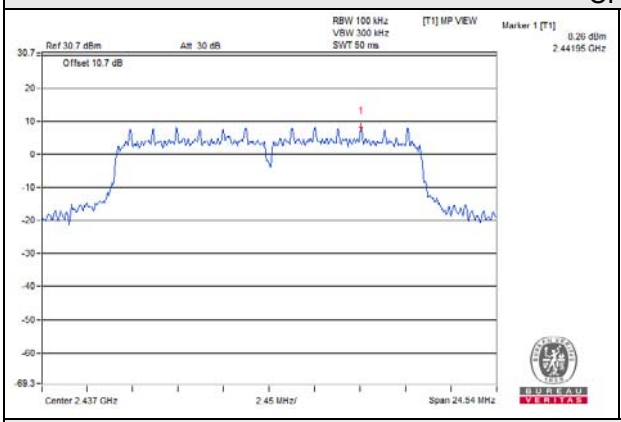
802.11g

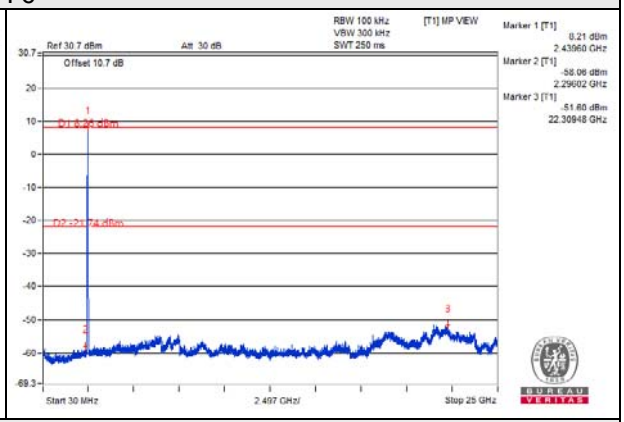
CH 1



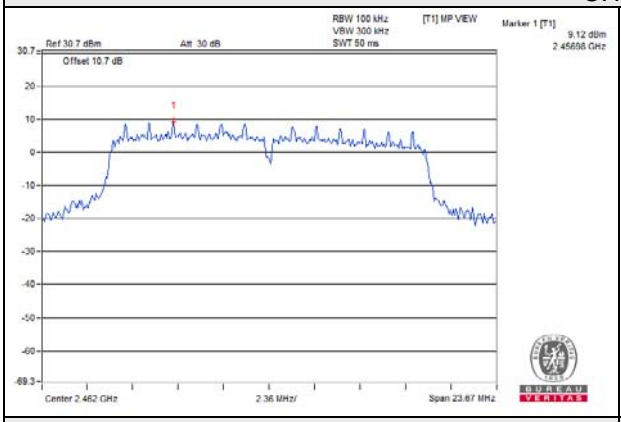


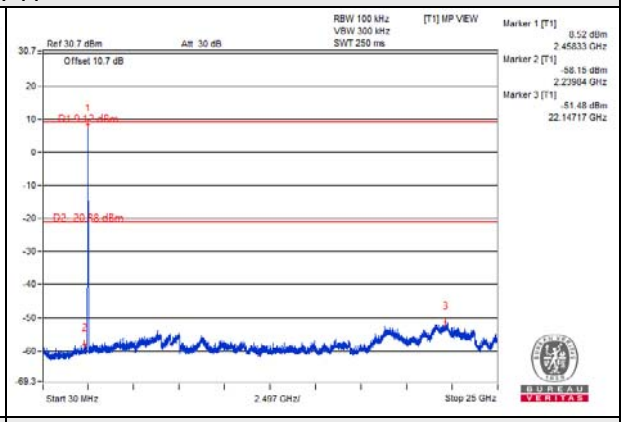
CH 6



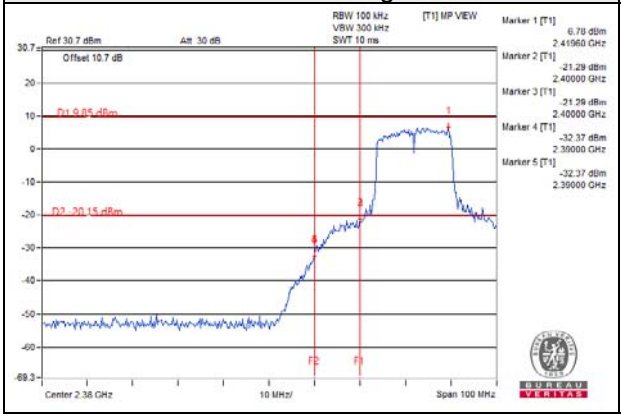


CH 11

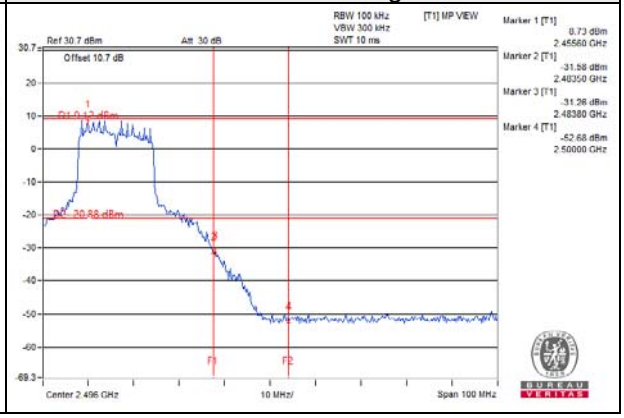




CH 1 Band edge

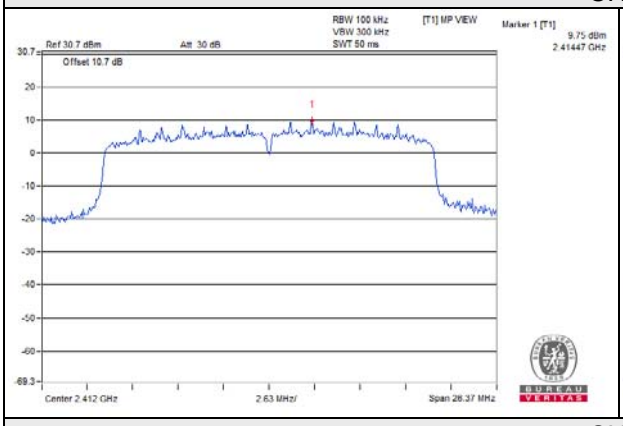


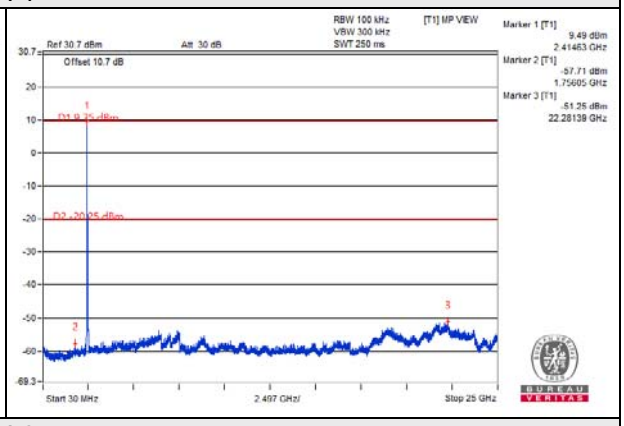
CH 11 Band edge



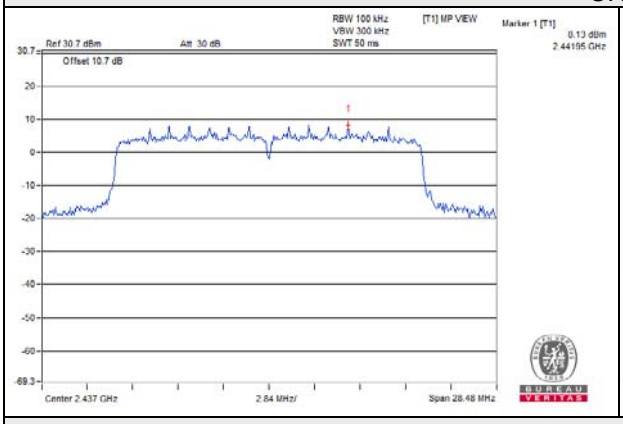
802.11ax (HE20)

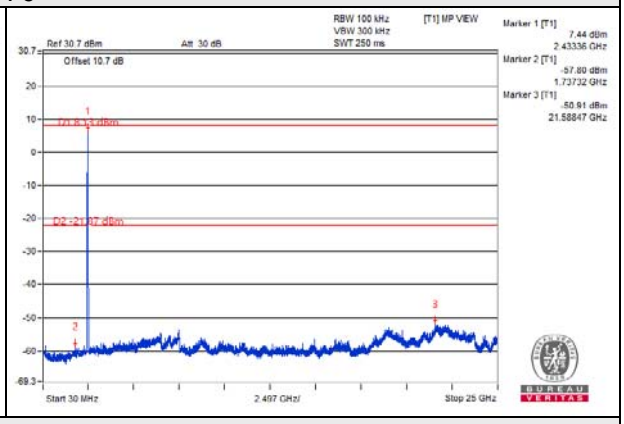
CH 1



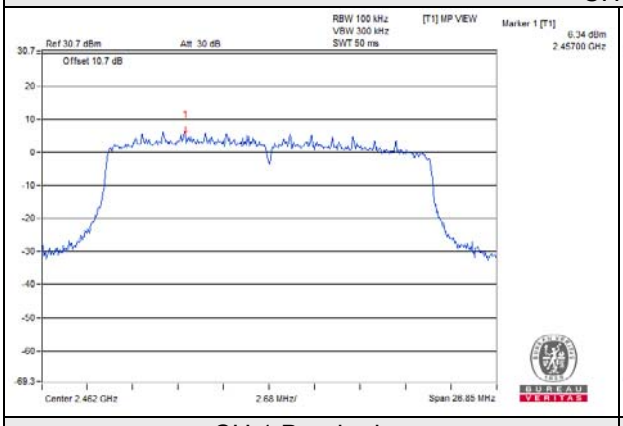


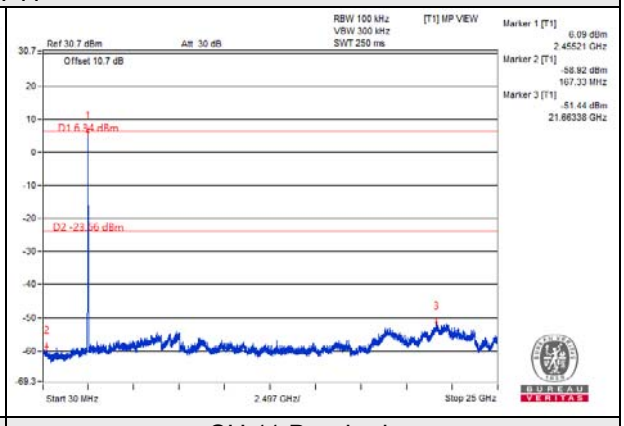
CH 6



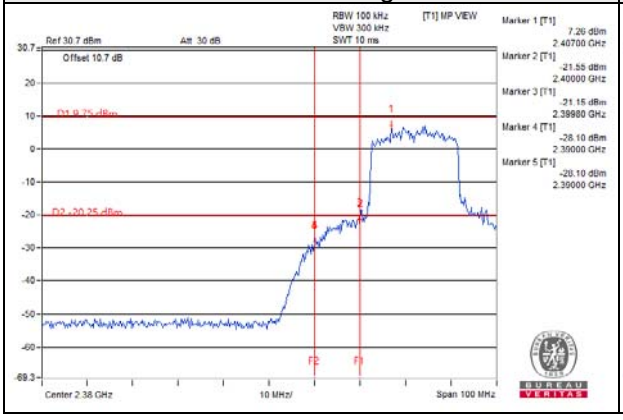


CH 11

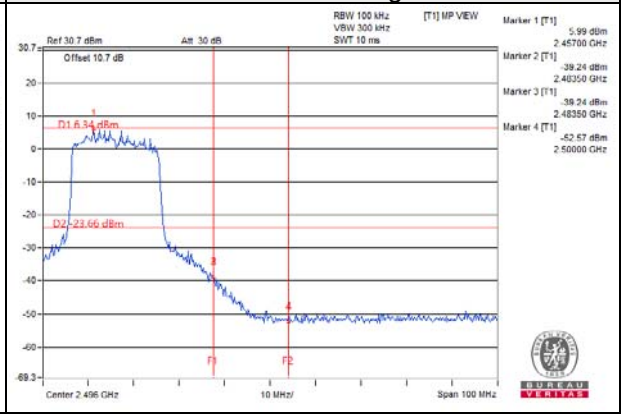




CH 1 Band edge

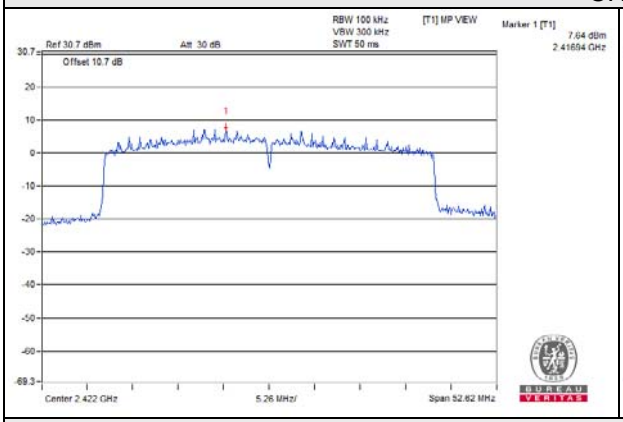


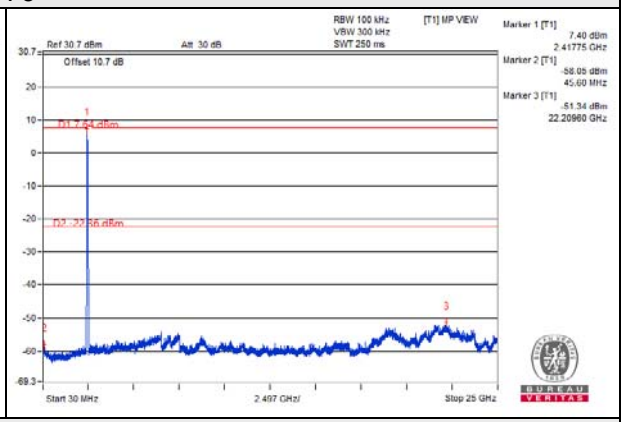
CH 11 Band edge



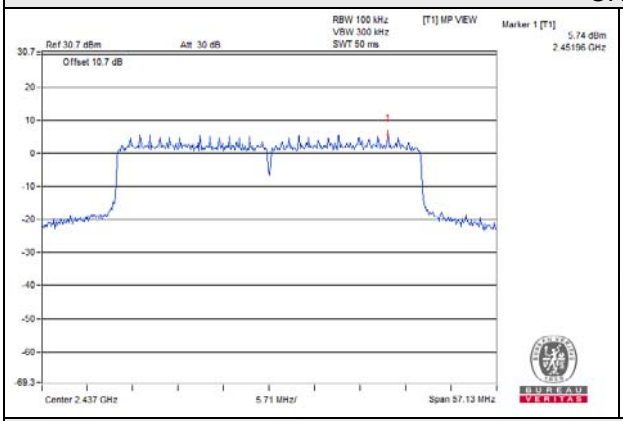
802.11ax (HE40)

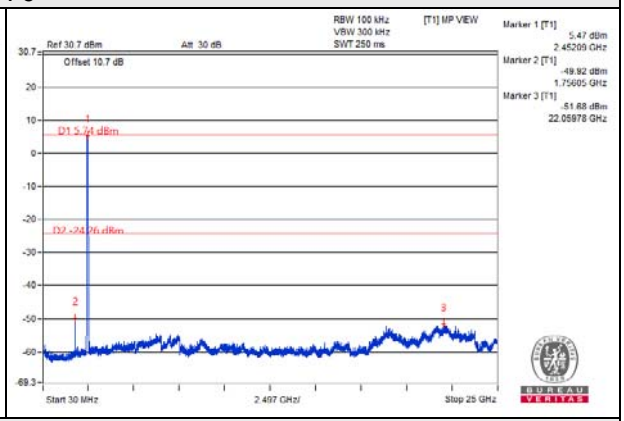
CH 3



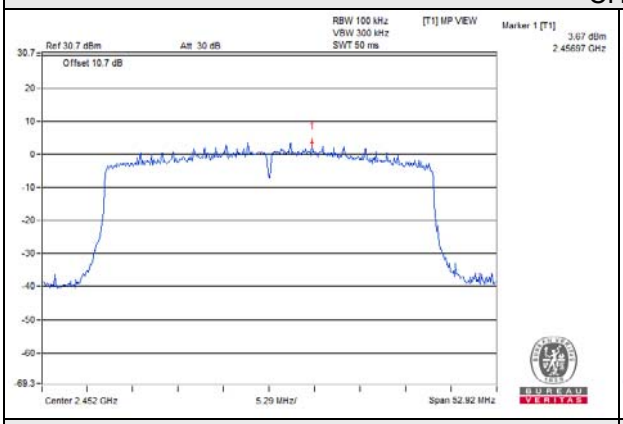


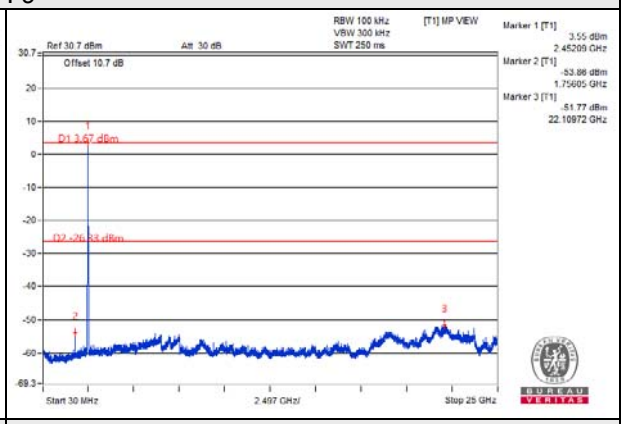
CH 6



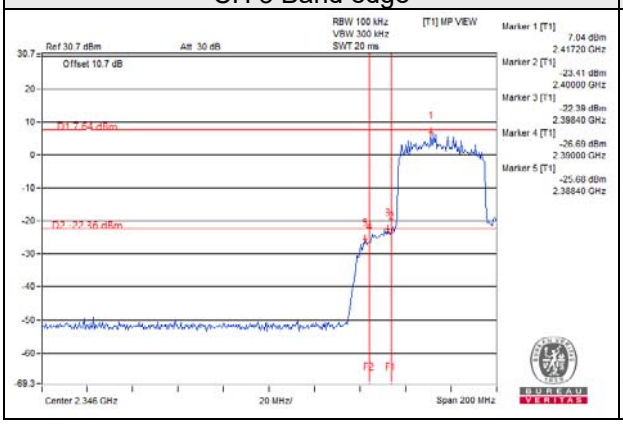


CH 9

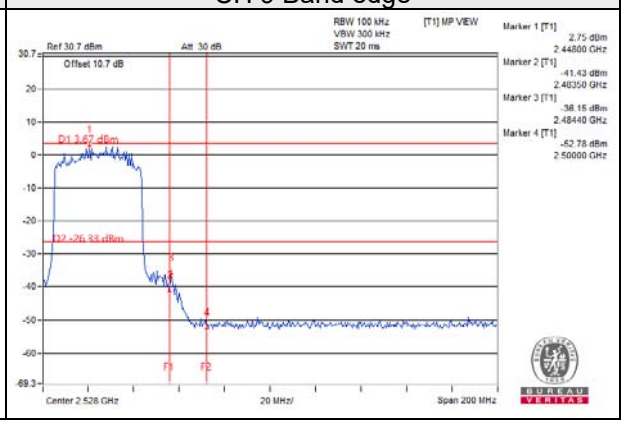




CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

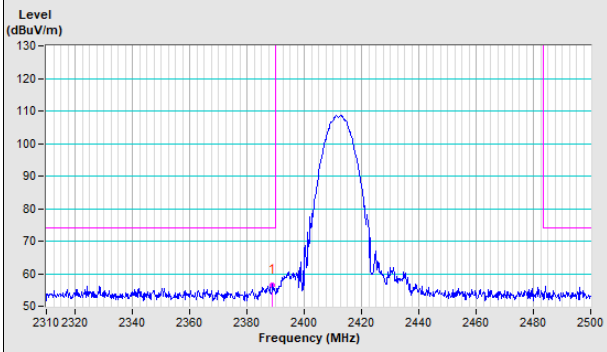
Please refer to the attached file (Test Setup Photo).

Annex A- Band Edge Measurement

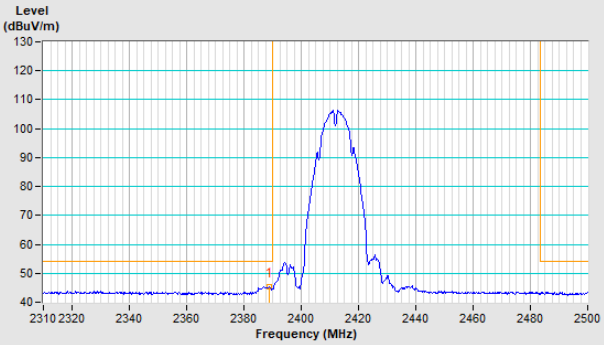
2TX

802.11b Channel 1

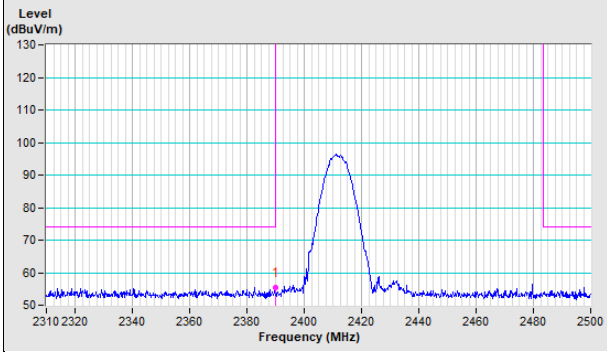
Horizontal (Peak)



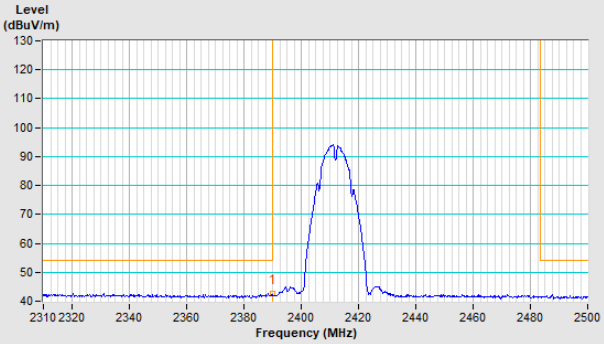
Horizontal (Average)



Vertical (Peak)

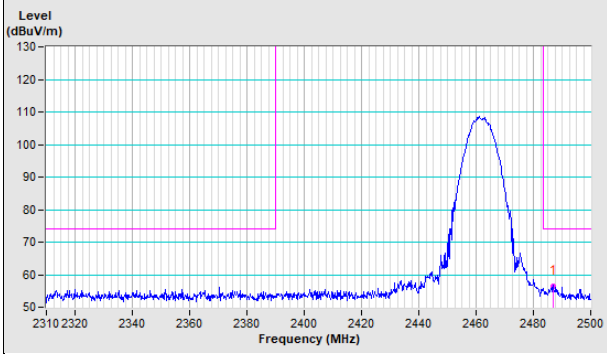


Vertical (Average)

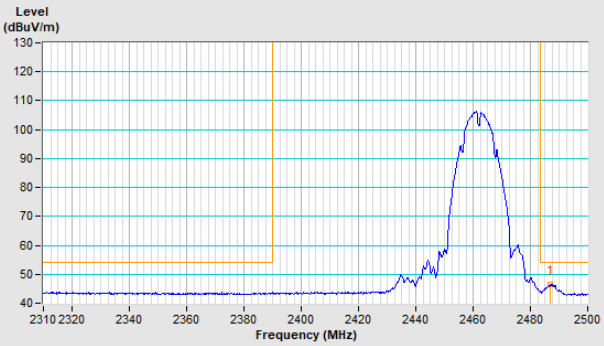


802.11b Channel 11

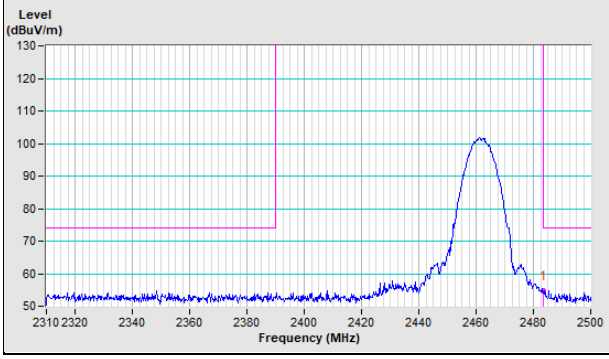
Horizontal (Peak)



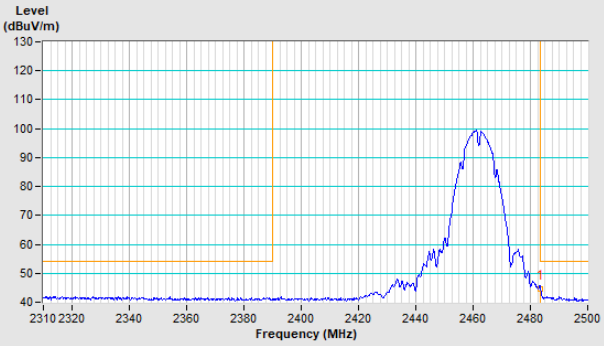
Horizontal (Average)



Vertical (Peak)

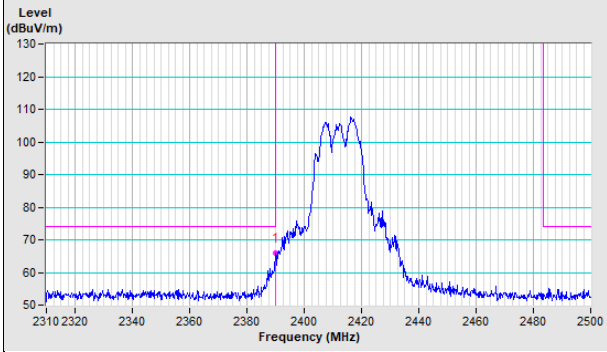


Vertical (Average)

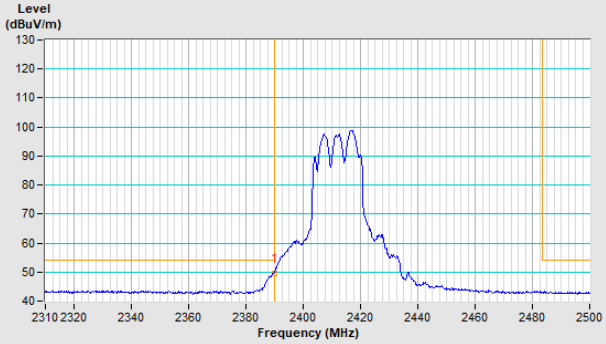


802.11g Channel 1

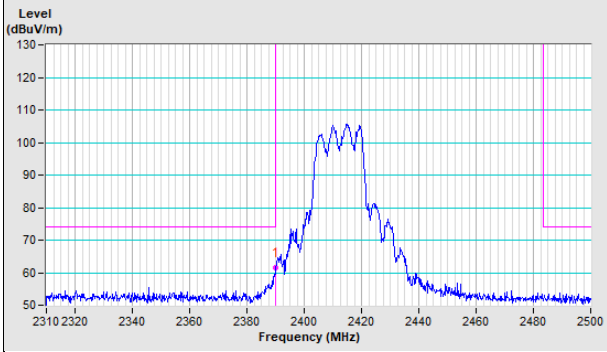
Horizontal (Peak)



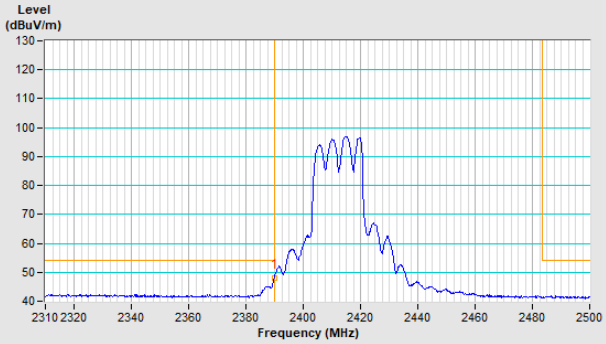
Horizontal (Average)



Vertical (Peak)

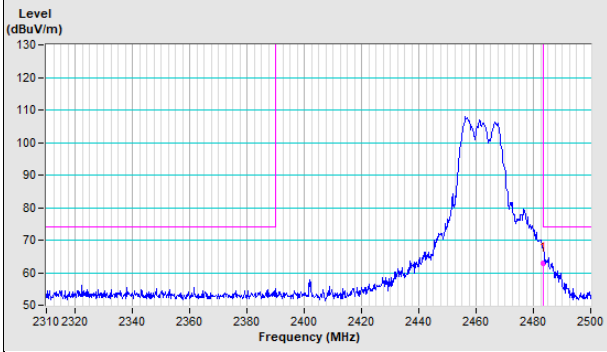


Vertical (Average)

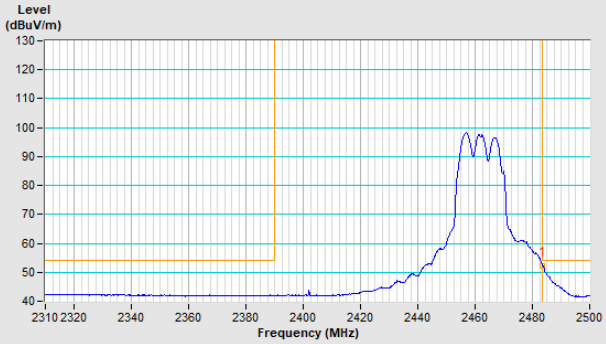


802.11g Channel 11

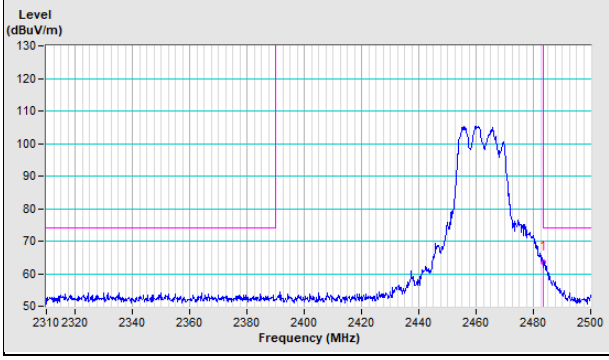
Horizontal (Peak)



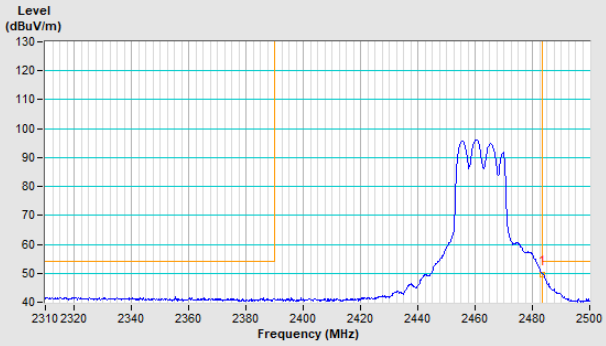
Horizontal (Average)

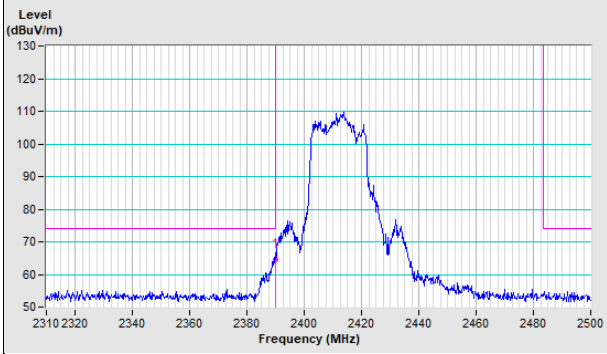
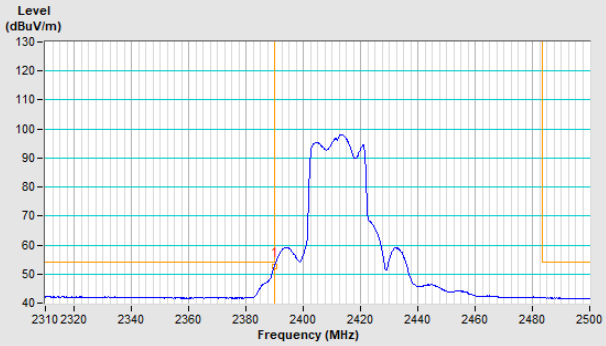
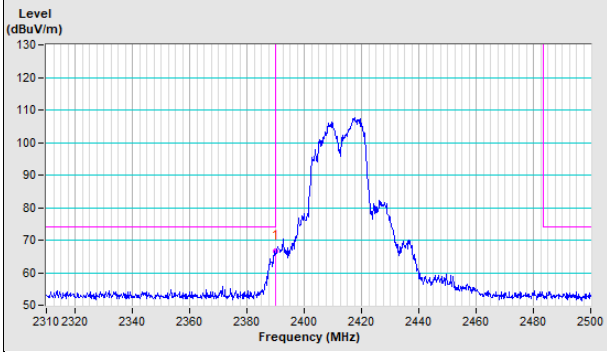
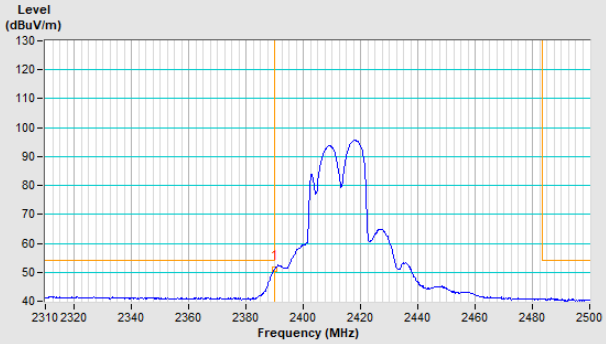


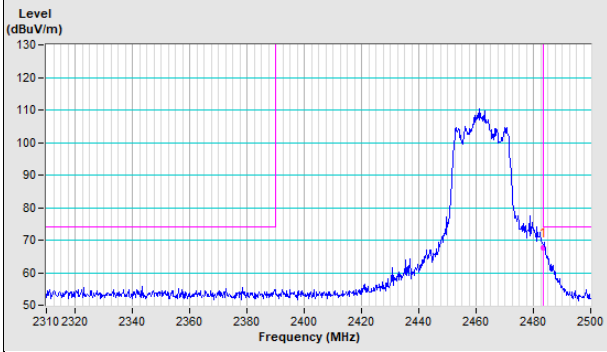
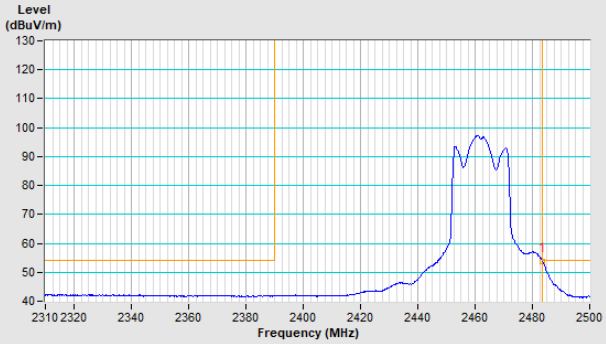
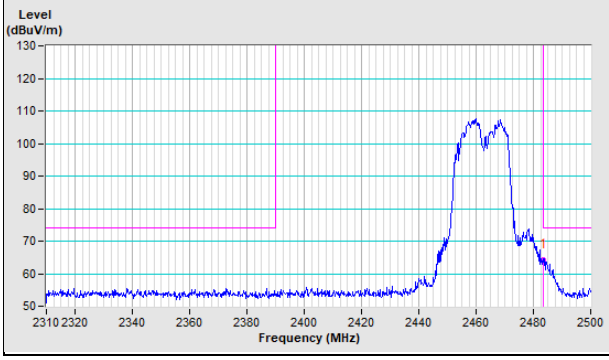
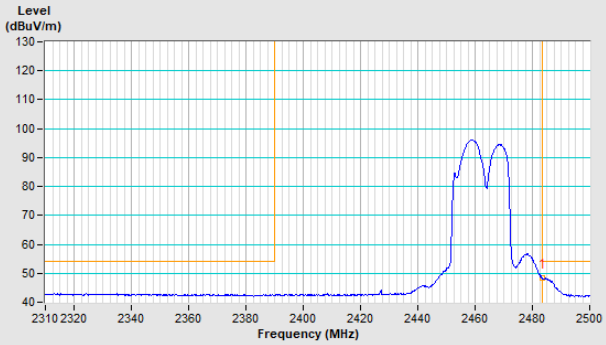
Vertical (Peak)



Vertical (Average)

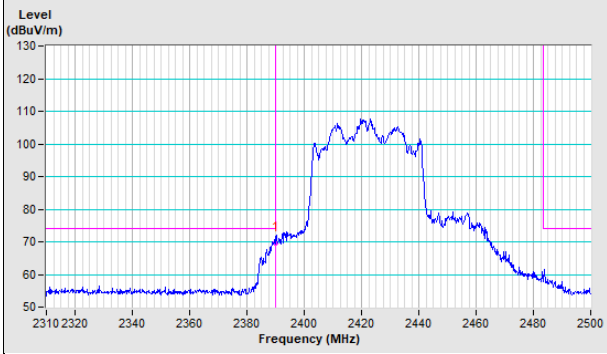


802.11ax (HE20) Channel 1	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

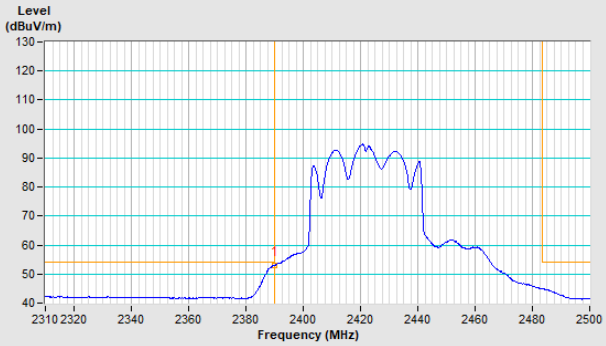
802.11ax (HE20) Channel 11	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ax (HE40) Channel 3

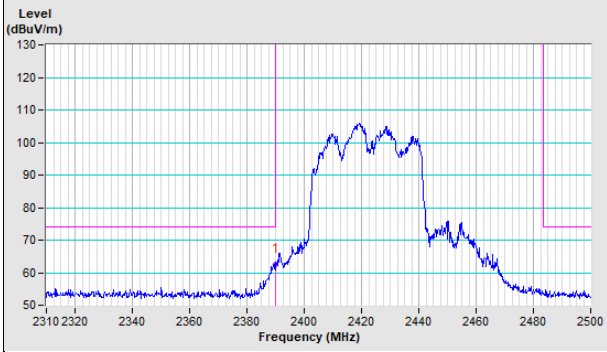
Horizontal (Peak)



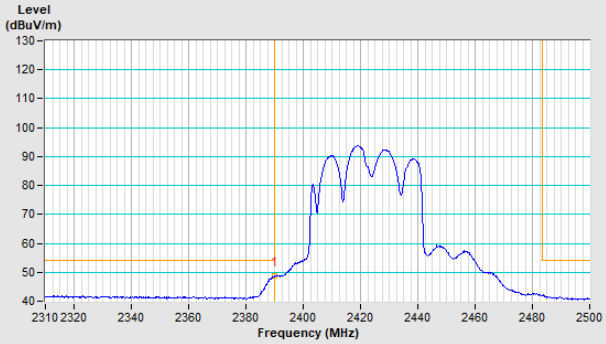
Horizontal (Average)



Vertical (Peak)

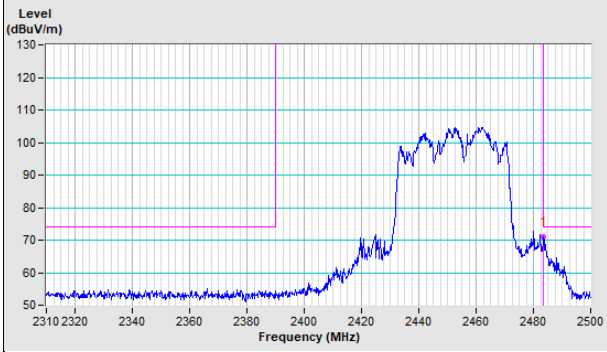


Vertical (Average)

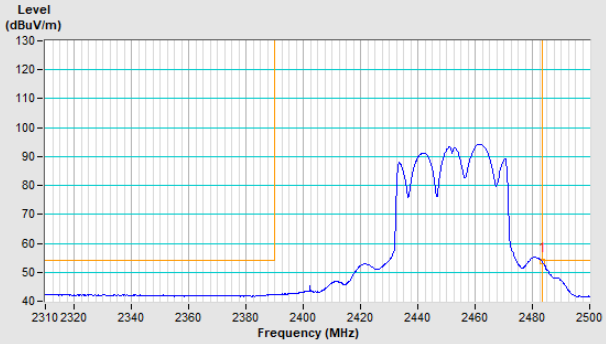


802.11ax (HE40) Channel 9

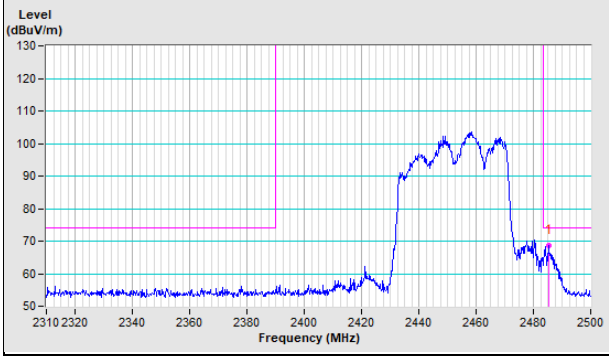
Horizontal (Peak)



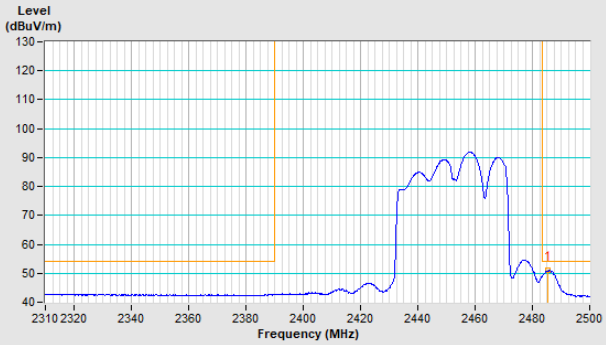
Horizontal (Average)



Vertical (Peak)



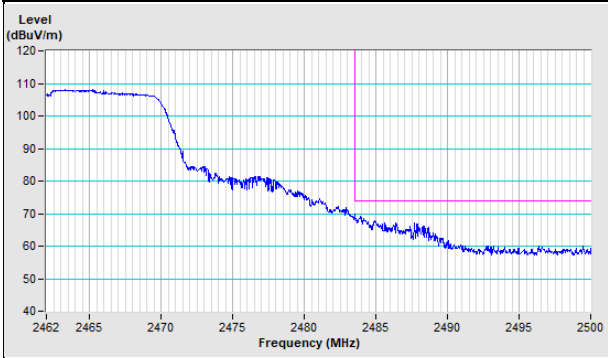
Vertical (Average)



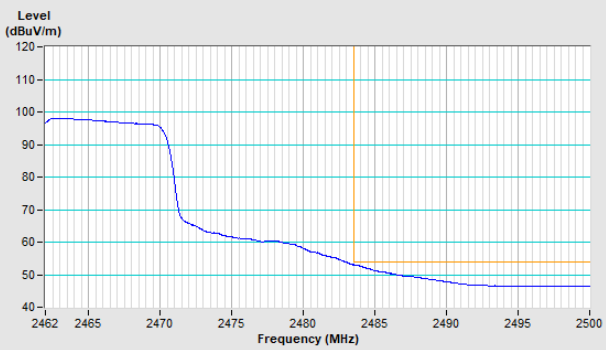
1TX

802.11g Channel 11

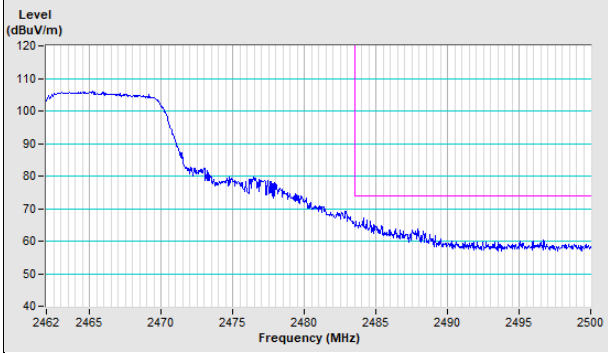
Horizontal (Peak)



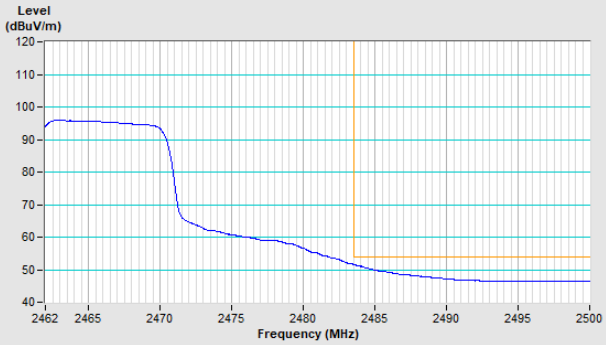
Horizontal (Average)



Vertical (Peak)

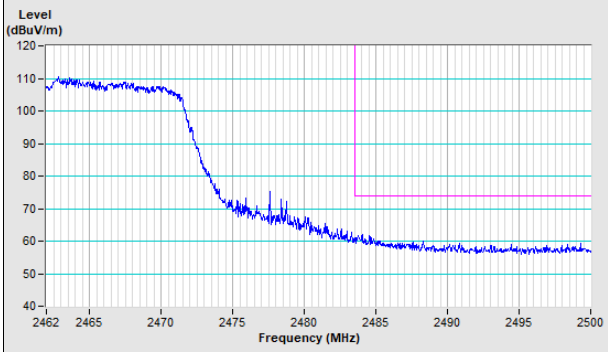


Vertical (Average)

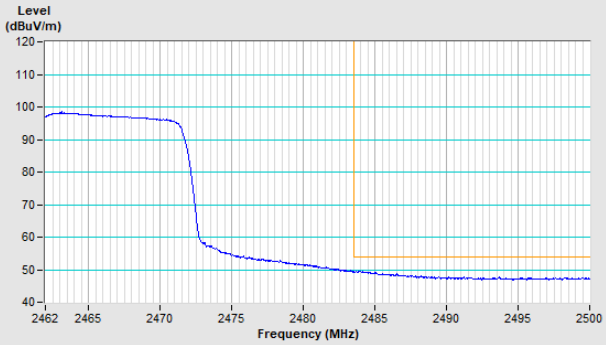


802.11ax (HE20) Channel 11

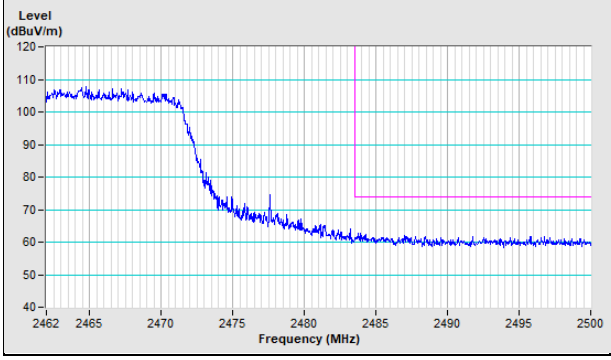
Horizontal (Peak)



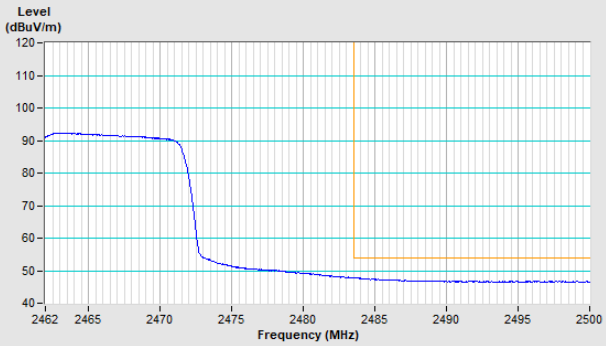
Horizontal (Average)



Vertical (Peak)

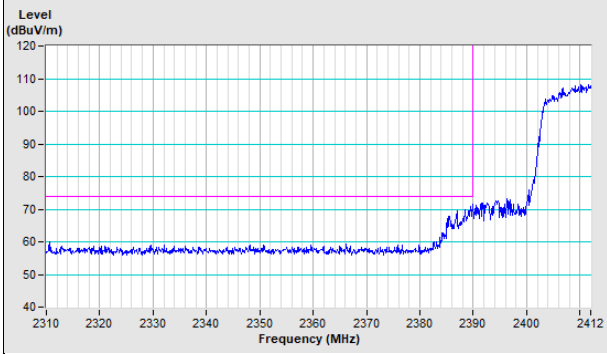


Vertical (Average)

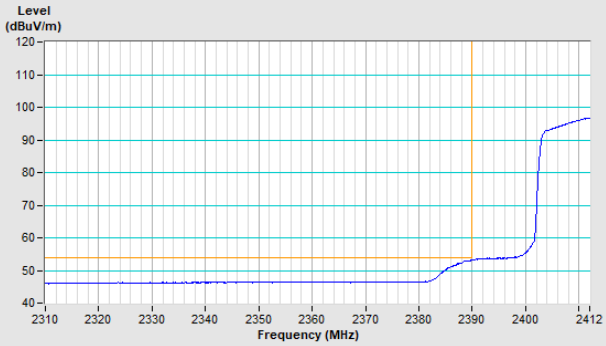


802.11ax (HE40) Channel 3

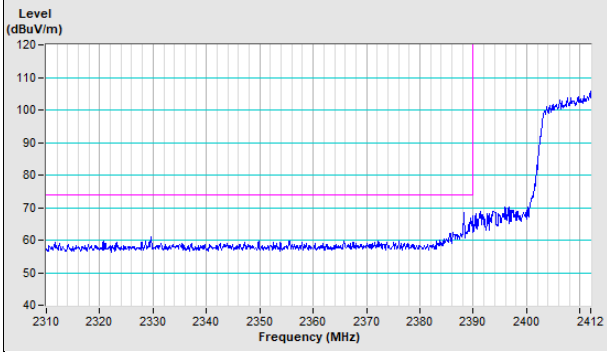
Horizontal (Peak)



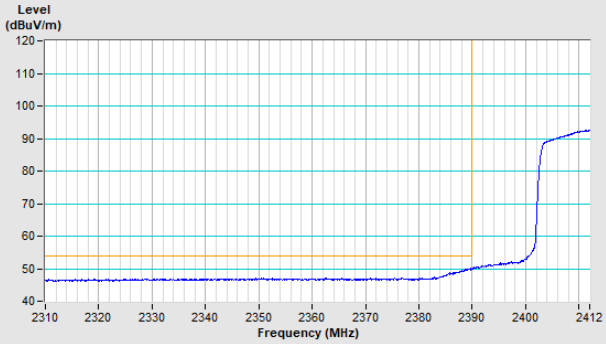
Horizontal (Average)



Vertical (Peak)

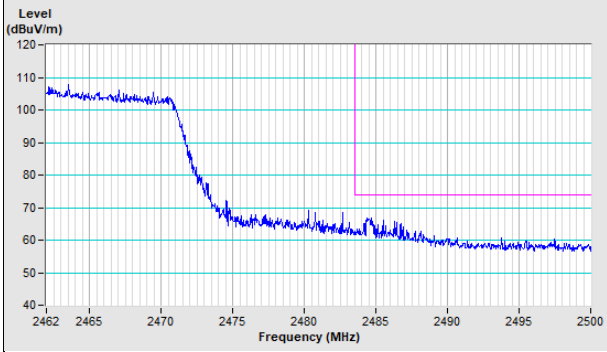


Vertical (Average)

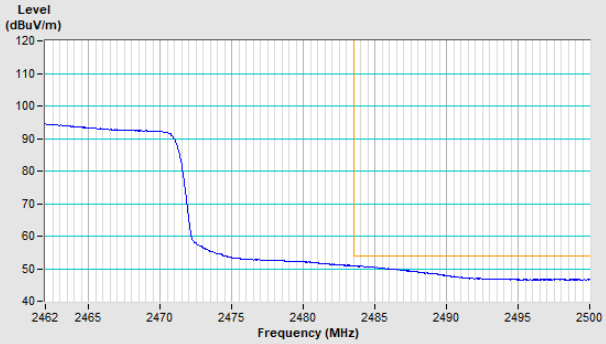


802.11ax (HE40) Channel 9

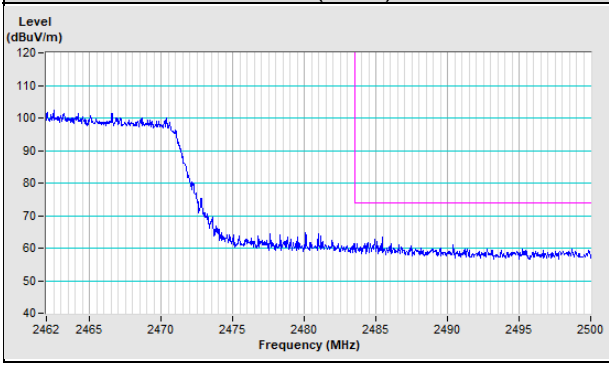
Horizontal (Peak)



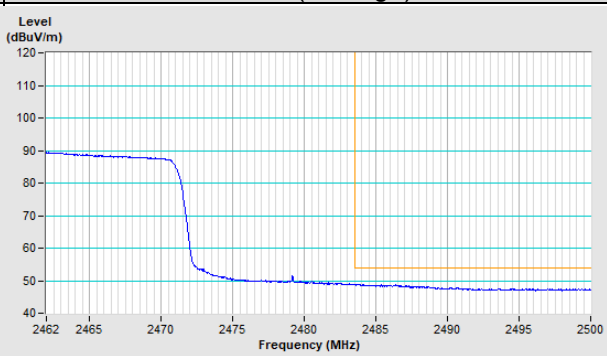
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of the Testing Laboratories

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

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

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

--- END ---