

## FCC Test Report

**Report No.:** RFBBQZ-WTW-P21091048

**FCC ID:** PY321300545

**Test Model:** RAXE300

**Received Date:** Jul. 01, 2021

**Test Date:** Aug. 03 ~ Nov. 11, 2021

**Issued Date:** Dec. 24, 2021

**Applicant and Manufacturer:** NETGEAR, INC.

**Address:** 350 East Plumeria Drive, San Jose, CA 95134, USA

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

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

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

**FCC Registration /  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
RFBBQZ-WTW-P21091048	Original release.	Dec. 24, 2021

## 1 Certificate of Conformity

**Product:** NIGHTHAWK AXE7800 Tri-Band WiFi 6E Router

**Brand:** NETGEAR

**Test Model:** RAXE300

**Sample Status:** Engineering sample

**Applicant and Manufacturer:** NETGEAR, INC.

**Test Date:** Aug. 03 ~ Nov. 11, 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:** Dec. 24, 2021  
Pettie Chen / Senior Specialist

**Approved by :** Jeremy Lin, **Date:** Dec. 24, 2021  
Jeremy Lin / Project Engineer

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -17.67dB at 0.16173MHz.
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 2390.00, 2483.50, 2484.80, 2485.10MHz.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex not a standard connector.

Note:

- For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.63 dB
	200MHz ~ 1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

Product	NIGHTHAWK AXE7800 Tri-Band WiFi 6E Router
Brand	NETGEAR
Test Model	RAXE300
Sample Status	Engineering sample
Power Supply Rating	12Vdc (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 574Mbps
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	CDD Mode: 854.266mW Beamforming Mode: 826.722mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Cable Supplied	1.95m non-shielded RJ45 cable without core

Note:

1. The EUT has three different sources, after pretest the main source was the worst case for final test.

Option	Source	difference
Option A	Main	USB IC and USB layout
Option B	2nd	
Option C	3rd	

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

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

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

3. The EUT uses following adapters.

Adapter 1	
Brand	Netgear
Model	AD2150F10
P/N	332-11494-02
Input Power	100-120Vac ~50/60Hz; 1A
Output Power	12Vdc, 35A
Power line	1.78m cable without core

Adapter 2	
Brand	Netgear
Model	ADS-45FI-12 12042EPCU-L
P/N	332-11526-02
Input Power	100~120 Vac; ~60 Hz; 1.5 A
Output Power	12Vdc, 3.5A
Power line	1.84m cable without core

4. The EUT with follow antennas gain is listed as table below.

Antenna Type	Dipole
Antenna Connector	i-pex
Antenna Gain	Directional Gain (dBi)
2400~2483.5MHz	4.11
5150~5250MHz	6.26
5250~5350MHz	6.20
5470~5725MHz	6.23
5725~5850MHz	6.27

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

5. WLAN 2.4GHz & 5150-5850 MHz & WLAN 5955~7115 MHz technology can transmit at same time.  
 WLAN 2.4GHz & WLAN 5955~7115 MHz use same antenna.



### 3.2 Description of Test Modes

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

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

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

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

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2

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

Note:

- The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
- "-": Means no effect.

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

#### Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Remark
A, B	802.11g	1 to 11	6	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
A, B	802.11g	1 to 11	6	OFDM	BPSK	6.0	-

Conducted Output Power Measurement:

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

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

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

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

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

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	23 deg. C, 66% RH 25 deg. C, 70% RH	120Vac, 60Hz	Titan Hsu
RE<1G	23 deg. C, 66% RH	120Vac, 60Hz	Titan Hsu
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Greg Lin
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Jisyong Wang

### 3.3 Duty Cycle of Test Signal

Duty cycle of test signal is  $\geq 98\%$ , duty factor is not required.

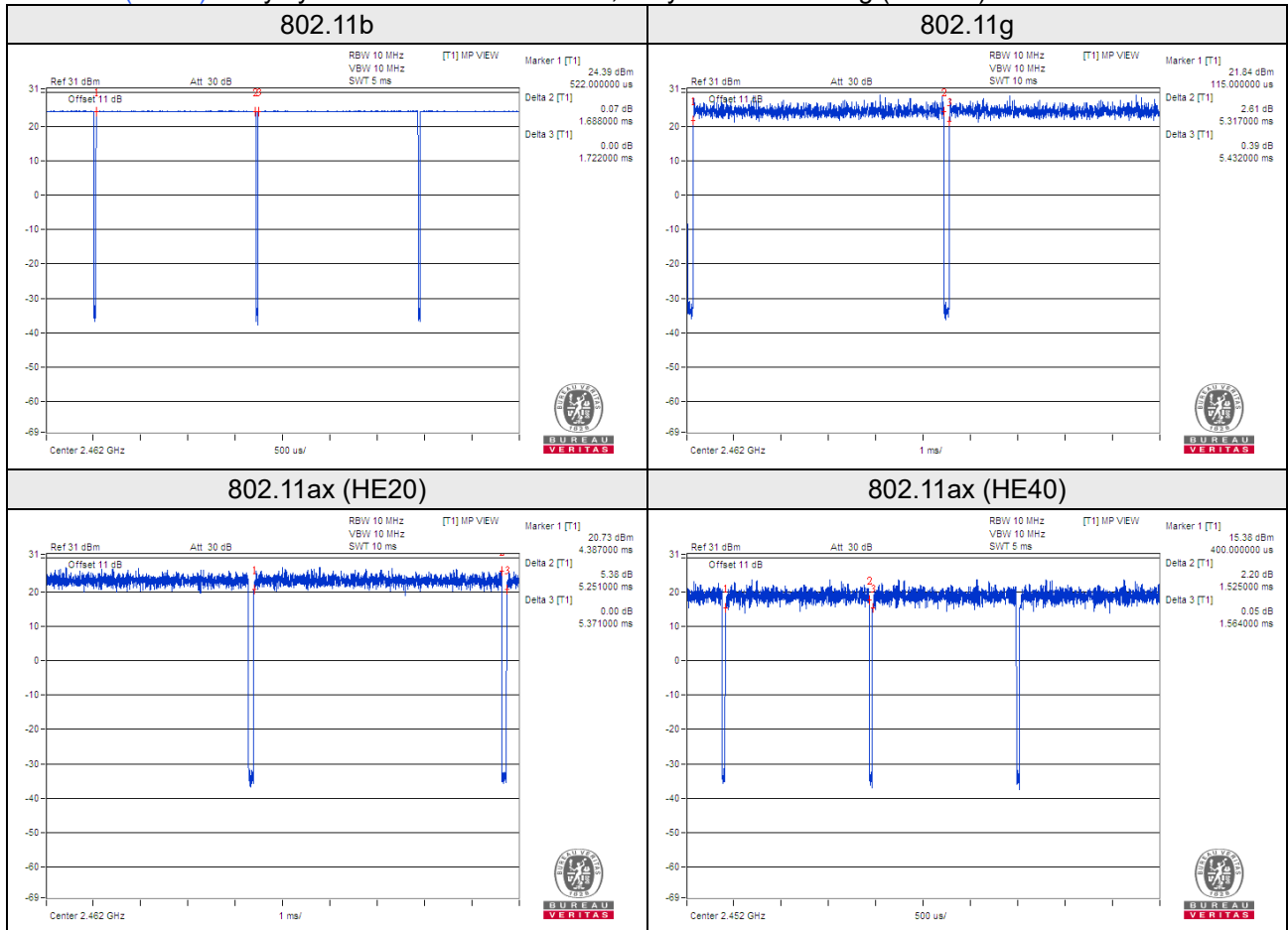
Duty cycle of test signal is  $< 98\%$ , duty factor is required.

802.11b: Duty cycle =  $1.688/1.722 = 0.98$

802.11g: Duty cycle =  $5.317/5.432 = 0.979$ , Duty factor =  $10 * \log(1/0.979) = 0.09$

802.11ax (HE20): Duty cycle =  $5.251/5.371 = 0.978$ , Duty factor =  $10 * \log(1/0.978) = 0.10$

802.11ax (HE40): Duty cycle =  $1.525/1.564 = 0.975$ , Duty factor =  $10 * \log(1/0.975) = 0.11$



### 3.4 Description of Support Units

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

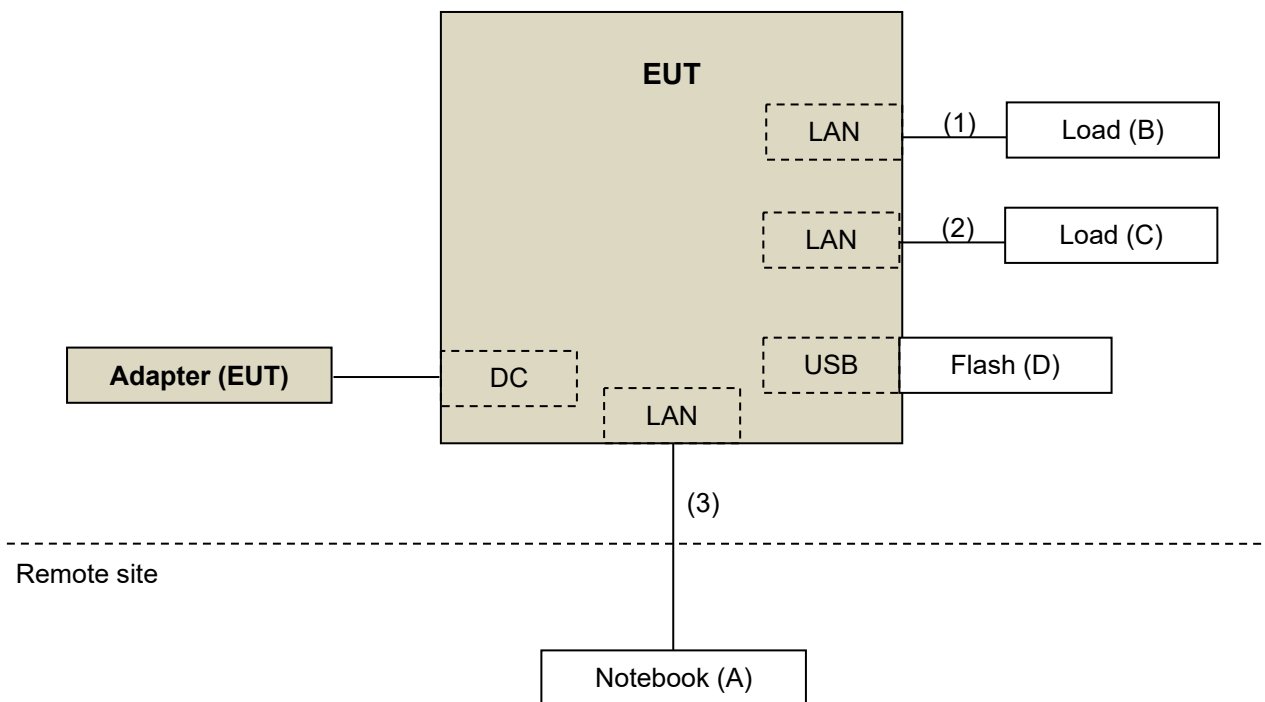
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-
C.	Load	NA	NA	NA	NA	-
D.	Flash	SanDisk	SDDDC3-032G	NA	NA	-

Note:

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

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

#### 3.4.1 Configuration of System under Test



### **3.5 General Description of Applied Standards and References**

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

**Test standard:**

**FCC Part 15, Subpart C (15.247)**

ANSI C63.10-2013

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

**References Test Guidance:**

**KDB 558074 D01 15.247 Meas Guidance v05r02**

**KDB 662911 D01 Multiple Transmitter Output v02r01**

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

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

**Note:**

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

#### 4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Dec. 31, 2020	Dec. 30, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 16, 2020	Sep. 15, 2021
			Sep. 15, 2021	Sep. 14, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 03, 2020	Nov. 02, 2021
			Nov. 01, 2021	Oct. 31, 2022
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
			Jul. 21, 2021	Jul. 20, 2022
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jun. 05, 2021	Jun. 04, 2022
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 05, 2021	Jun. 04, 2022
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH4-01	Jul. 24, 2021	Jul. 23, 2022
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Jul. 24, 2021	Jul. 23, 2022
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Jul. 24, 2021	Jul. 23, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jun. 05, 2021	Jun. 04, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jun. 05, 2021	Jun. 04, 2022
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 19, 2021	Jan. 18, 2022
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 11, 2021	Jan. 10, 2022

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The test was performed in HwaYa Chamber 4.



### 4.1.3 Test Procedures

#### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

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

#### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

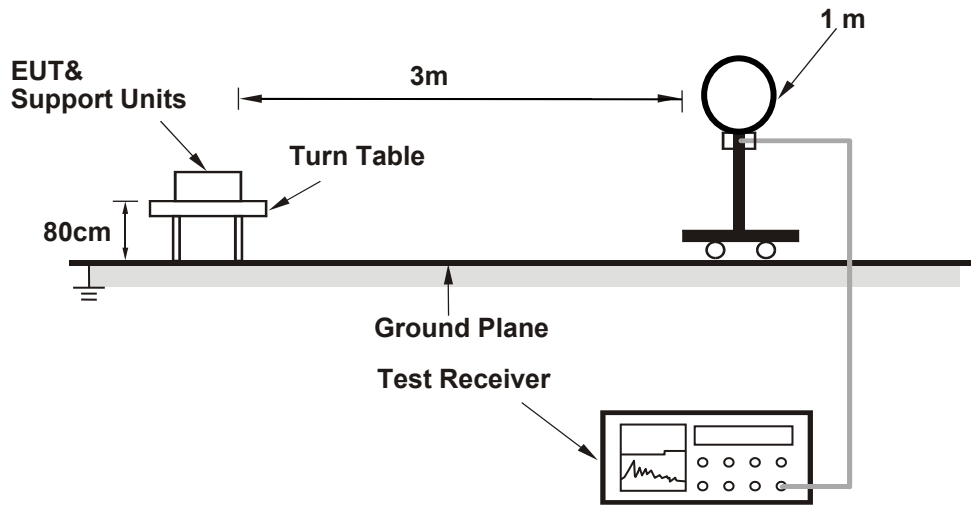
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

### 4.1.4 Deviation from Test Standard

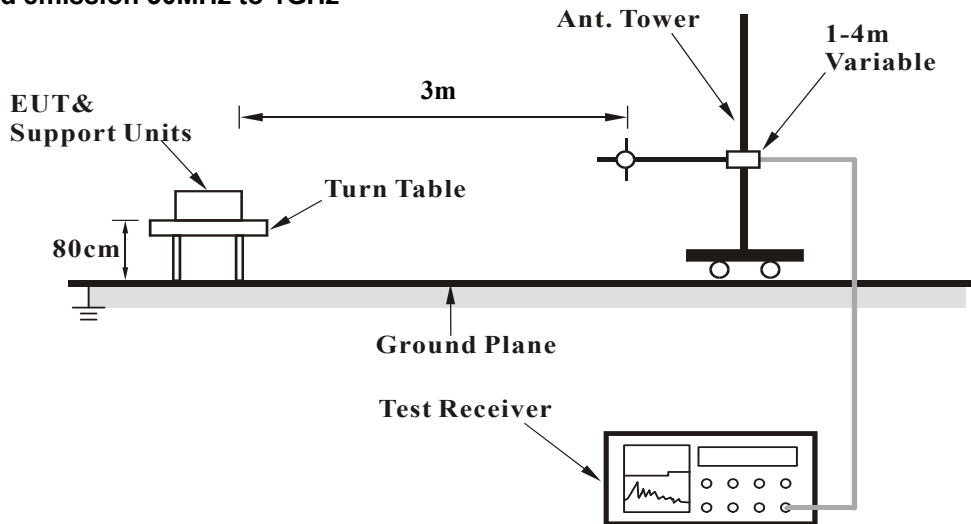
No deviation.

#### 4.1.5 Test Setup

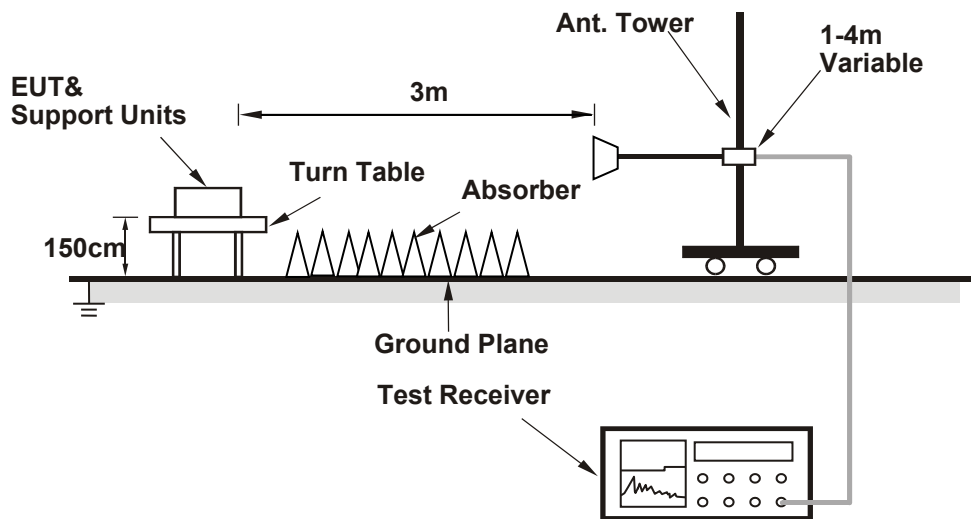
##### For Radiated emission below 30MHz



##### For Radiated emission 30MHz to 1GHz



### For Radiated emission above 1GHz



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

#### 4.1.6 EUT Operating Conditions

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

#### 4.1.7 Test Results

Above 1GHz worst-Case data:

802.11b

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

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	59.4 PK	74.0	-14.6	1.49 H	192	25.3	34.1
2	2390.00	46.5 AV	54.0	-7.5	1.49 H	192	12.4	34.1
3	*2412.00	109.2 PK			1.49 H	192	75.1	34.1
4	*2412.00	106.6 AV			1.49 H	192	72.5	34.1
5	4824.00	52.8 PK	74.0	-21.2	2.42 H	253	39.1	13.7
6	4824.00	39.8 AV	54.0	-14.2	2.42 H	253	26.1	13.7
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	2385.60	65.9 PK	74.0	-8.1	1.09 V	10	31.9	34.0
2	2385.60	52.3 AV	54.0	-1.7	1.09 V	10	18.3	34.0
3	*2412.00	124.1 PK			1.09 V	10	90.0	34.1
4	*2412.00	121.6 AV			1.09 V	10	87.5	34.1
5	4824.00	51.2 PK	74.0	-22.8	1.48 V	63	37.5	13.7
6	4824.00	46.8 AV	54.0	-7.2	1.48 V	63	33.1	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.5 PK			1.88 H	184	74.4	34.1
2	*2437.00	106.0 AV			1.88 H	184	71.9	34.1
3	4874.00	53.0 PK	74.0	-21.0	2.45 H	255	39.3	13.7
4	4874.00	40.0 AV	54.0	-14.0	2.45 H	255	26.3	13.7

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	123.5 PK			1.00 V	357	89.4	34.1
2	*2437.00	121.3 AV			1.00 V	357	87.2	34.1
3	4874.00	51.2 PK	74.0	-22.8	1.60 V	68	37.5	13.7
4	4874.00	47.0 AV	54.0	-7.0	1.60 V	68	33.3	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	108.5 PK			1.66 H	189	74.4	34.1
2	*2462.00	105.9 AV			1.66 H	189	71.8	34.1
3	2483.50	59.1 PK	74.0	-14.9	1.66 H	189	25.0	34.1
4	2483.50	47.1 AV	54.0	-6.9	1.66 H	189	13.0	34.1
5	4924.00	52.9 PK	74.0	-21.1	2.35 H	255	39.3	13.6
6	4924.00	40.0 AV	54.0	-14.0	2.35 H	255	26.4	13.6

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	*2462.00	122.8 PK			1.14 V	358	88.7	34.1
2	*2462.00	120.2 AV			1.14 V	358	86.1	34.1
3	2483.50	66.3 PK	74.0	-7.7	1.14 V	358	32.2	34.1
4	2483.50	53.7 AV	54.0	-0.3	1.14 V	358	19.6	34.1
5	4924.00	51.7 PK	74.0	-22.3	1.62 V	91	38.1	13.6
6	4924.00	47.2 AV	54.0	-6.8	1.62 V	91	33.6	13.6

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.

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.7 PK	74.0	-13.3	2.07 H	186	26.6	34.1
2	2390.00	46.5 AV	54.0	-7.5	2.07 H	186	12.4	34.1
3	*2412.00	106.6 PK			2.07 H	186	72.5	34.1
4	*2412.00	96.4 AV			2.07 H	186	62.3	34.1
5	4824.00	52.3 PK	74.0	-21.7	2.46 H	258	38.6	13.7
6	4824.00	39.7 AV	54.0	-14.3	2.46 H	258	26.0	13.7

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	73.8 PK	74.0	-0.2	1.45 V	319	39.7	34.1
2	2390.00	52.9 AV	54.0	-1.1	1.45 V	319	18.8	34.1
3	*2412.00	118.5 PK			1.45 V	319	84.4	34.1
4	*2412.00	109.4 AV			1.45 V	319	75.3	34.1
5	4824.00	50.9 PK	74.0	-23.1	1.55 V	65	37.2	13.7
6	4824.00	47.0 AV	54.0	-7.0	1.55 V	65	33.3	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.4 PK	74.0	-12.6	1.89 H	150	27.3	34.1
2	2390.00	47.0 AV	54.0	-7.0	1.89 H	150	12.9	34.1
3	*2437.00	110.9 PK			1.89 H	150	76.8	34.1
4	*2437.00	100.6 AV			1.89 H	150	66.5	34.1
5	2483.50	60.3 PK	74.0	-13.7	1.89 H	150	26.2	34.1
6	2483.50	47.6 AV	54.0	-6.4	1.89 H	150	13.5	34.1
7	4874.00	52.7 PK	74.0	-21.3	2.41 H	256	39.0	13.7
8	4874.00	39.8 AV	54.0	-14.2	2.41 H	256	26.1	13.7

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.2 PK	74.0	-1.8	1.53 V	351	38.1	34.1
<b>2</b>	<b>2390.00</b>	<b>53.9 AV</b>	<b>54.0</b>	<b>-0.1</b>	<b>1.53 V</b>	<b>351</b>	<b>19.8</b>	<b>34.1</b>
3	*2437.00	123.3 PK			1.53 V	351	89.2	34.1
4	*2437.00	114.4 AV			1.53 V	351	80.3	34.1
5	2483.50	71.3 PK	74.0	-2.7	1.53 V	351	37.2	34.1
6	2483.50	53.8 AV	54.0	-0.2	1.53 V	351	19.7	34.1
7	4874.00	51.2 PK	74.0	-22.8	2.41 V	169	37.5	13.7
8	4874.00	40.3 AV	54.0	-13.7	2.41 V	169	26.6	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	104.2 PK			2.14 H	156	70.1	34.1
2	*2462.00	93.9 AV			2.14 H	156	59.8	34.1
3	2483.50	58.7 PK	74.0	-15.3	2.14 H	155	24.6	34.1
4	2483.50	47.2 AV	54.0	-6.8	2.14 H	155	13.1	34.1
5	4924.00	52.7 PK	74.0	-21.3	2.35 H	253	39.1	13.6
6	4924.00	39.8 AV	54.0	-14.2	2.35 H	253	26.2	13.6

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	*2462.00	119.2 PK			1.16 V	22	85.1	34.1
2	*2462.00	110.0 AV			1.16 V	22	75.9	34.1
<b>3</b>	<b>2483.50</b>	<b>73.9 PK</b>	<b>74.0</b>	<b>-0.1</b>	<b>1.16 V</b>	<b>22</b>	<b>39.8</b>	<b>34.1</b>
4	2483.50	53.5 AV	54.0	-0.5	1.16 V	22	19.4	34.1
5	4924.00	51.1 PK	74.0	-22.9	2.33 V	165	37.5	13.6
6	4924.00	40.1 AV	54.0	-13.9	2.33 V	165	26.5	13.6

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.

802.11ax (HE20)

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

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	59.6 PK	74.0	-14.4	2.13 H	152	25.5	34.1
2	2390.00	47.6 AV	54.0	-6.4	2.13 H	152	13.5	34.1
3	*2412.00	106.9 PK			2.13 H	152	72.8	34.1
4	*2412.00	93.7 AV			2.13 H	152	59.6	34.1
5	4824.00	52.6 PK	74.0	-21.4	2.35 H	245	38.9	13.7
6	4824.00	39.6 AV	54.0	-14.4	2.35 H	245	25.9	13.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.8 PK	74.0	-4.2	1.09 V	13	35.7	34.1
2	2390.00	53.7 AV	54.0	-0.3	1.09 V	13	19.6	34.1
3	*2412.00	120.6 PK			1.09 V	13	86.5	34.1
4	*2412.00	108.1 AV			1.09 V	13	74.0	34.1
5	4824.00	51.0 PK	74.0	-23.0	1.50 V	66	37.3	13.7
6	4824.00	46.9 AV	54.0	-7.1	1.50 V	66	33.2	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.6 PK			2.13 H	186	77.5	34.1
2	*2437.00	98.9 AV			2.13 H	186	64.8	34.1
3	2484.80	59.2 PK	74.0	-14.8	2.13 H	186	25.1	34.1
4	2484.80	48.0 AV	54.0	-6.0	2.13 H	186	13.9	34.1
5	4874.00	52.9 PK	74.0	-21.1	2.44 H	253	39.2	13.7
6	4874.00	39.9 AV	54.0	-14.1	2.44 H	253	26.2	13.7

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	126.3 PK			1.05 V	11	92.2	34.1
2	*2437.00	114.1 AV			1.05 V	11	80.0	34.1
3	2484.80	69.5 PK	74.0	-4.5	1.05 V	11	35.4	34.1
<b>4</b>	<b>2484.80</b>	<b>53.9 AV</b>	<b>54.0</b>	<b>-0.1</b>	<b>1.05 V</b>	<b>11</b>	<b>19.8</b>	<b>34.1</b>
5	4874.00	51.2 PK	74.0	-22.8	1.55 V	63	37.5	13.7
6	4874.00	47.0 AV	54.0	-7.0	1.55 V	63	33.3	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.0 PK			1.66 H	191	71.9	34.1
2	*2462.00	93.1 AV			1.66 H	191	59.0	34.1
3	2483.50	58.8 PK	74.0	-15.2	1.66 H	191	24.7	34.1
4	2483.50	46.9 AV	54.0	-7.1	1.66 H	191	12.8	34.1
5	4924.00	52.8 PK	74.0	-21.2	2.45 H	254	39.2	13.6
6	4924.00	39.8 AV	54.0	-14.2	2.45 H	254	26.2	13.6

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	*2462.00	119.9 PK			1.26 V	22	85.8	34.1
2	*2462.00	107.5 AV			1.26 V	22	73.4	34.1
3	2483.50	73.3 PK	74.0	-0.7	1.26 V	22	39.2	34.1
4	<b>2483.50</b>	<b>53.9 AV</b>	<b>54.0</b>	<b>-0.1</b>	<b>1.26 V</b>	<b>22</b>	<b>19.8</b>	<b>34.1</b>
5	4924.00	51.2 PK	74.0	-22.8	1.63 V	75	37.6	13.6
6	4924.00	46.8 AV	54.0	-7.2	1.63 V	75	33.2	13.6

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.

802.11ax (HE40)

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

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	59.2 PK	74.0	-14.8	2.08 H	186	25.1	34.1
2	2390.00	46.4 AV	54.0	-7.6	2.08 H	186	12.3	34.1
3	*2422.00	101.3 PK			2.08 H	186	67.3	34.0
4	*2422.00	88.8 AV			2.08 H	186	54.8	34.0
5	4844.00	52.7 PK	74.0	-21.3	2.43 H	259	39.0	13.7
6	4844.00	39.6 AV	54.0	-14.4	2.43 H	259	25.9	13.7
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	66.1 PK	74.0	-7.9	1.30 V	19	32.0	34.1
2	2390.00	53.8 AV	54.0	-0.2	1.30 V	19	19.7	34.1
3	*2422.00	114.5 PK			1.30 V	19	80.5	34.0
4	*2422.00	102.7 AV			1.30 V	19	68.7	34.0
5	4844.00	50.9 PK	74.0	-23.1	1.56 V	68	37.2	13.7
6	4844.00	46.0 AV	54.0	-8.0	1.56 V	68	32.3	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	58.5 PK	74.0	-15.5	1.85 H	149	24.4	34.1
2	2390.00	46.2 AV	54.0	-7.8	1.85 H	149	12.1	34.1
3	*2437.00	104.6 PK			1.85 H	149	70.5	34.1
4	*2437.00	91.8 AV			1.85 H	149	57.7	34.1
5	2485.10	58.9 PK	74.0	-15.1	1.85 H	149	24.7	34.2
6	2485.10	47.1 AV	54.0	-6.9	1.85 H	149	12.9	34.2
7	4874.00	52.7 PK	74.0	-21.3	2.42 H	259	39.0	13.7
8	4874.00	39.8 AV	54.0	-14.2	2.42 H	259	26.1	13.7

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.4 PK	74.0	-5.6	1.06 V	15	34.3	34.1
2	2390.00	53.8 AV	54.0	-0.2	1.06 V	15	19.7	34.1
3	*2437.00	118.6 PK			1.06 V	15	84.5	34.1
4	*2437.00	106.9 AV			1.06 V	15	72.8	34.1
5	2485.10	69.0 PK	74.0	-5.0	1.06 V	15	34.8	34.2
<b>6</b>	<b>2485.10</b>	<b>53.9 AV</b>	<b>54.0</b>	<b>-0.1</b>	<b>1.06 V</b>	<b>15</b>	<b>19.7</b>	<b>34.2</b>
7	4874.00	51.0 PK	74.0	-23.0	1.62 V	72	37.3	13.7
8	4874.00	45.9 AV	54.0	-8.1	1.62 V	72	32.2	13.7

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

**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	102.1 PK			1.91 H	151	68.0	34.1
2	*2452.00	89.8 AV			1.91 H	151	55.7	34.1
3	2483.50	58.9 PK	74.0	-15.1	1.91 H	151	24.8	34.1
4	2483.50	47.0 AV	54.0	-7.0	1.91 H	151	12.9	34.1
5	4904.00	52.5 PK	74.0	-21.5	2.35 H	245	38.8	13.7
6	4904.00	39.6 AV	54.0	-14.4	2.35 H	245	25.9	13.7

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	117.2 PK			1.17 V	16	83.1	34.1
2	*2452.00	104.9 AV			1.17 V	16	70.8	34.1
3	2483.50	71.1 PK	74.0	-2.9	1.17 V	16	37.0	34.1
4	2483.50	53.8 AV	54.0	-0.2	1.17 V	16	19.7	34.1
5	4904.00	51.1 PK	74.0	-22.9	1.65 V	75	37.4	13.7
6	4904.00	45.9 AV	54.0	-8.1	1.65 V	75	32.2	13.7

**Remarks:**

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

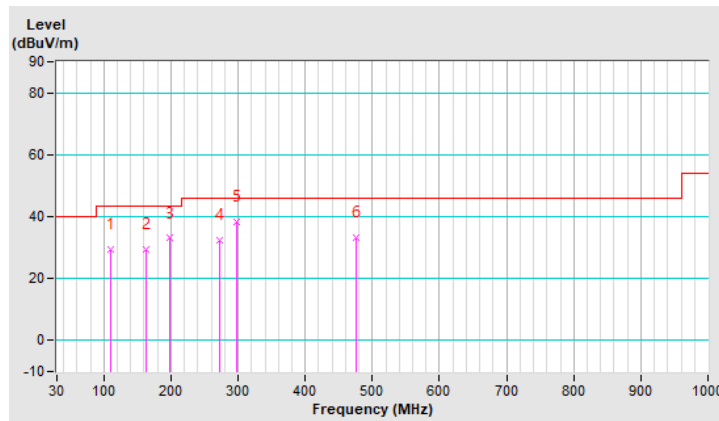
Below 1GHz worst-case data: 802.11g

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

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	109.54	29.3 QP	43.5	-14.2	1.51 H	140	41.6	-12.3
2	162.89	29.2 QP	43.5	-14.3	1.00 H	228	38.2	-9.0
3	198.78	33.0 QP	43.5	-10.5	1.51 H	140	44.8	-11.8
4	273.47	32.5 QP	46.0	-13.5	1.51 H	156	40.9	-8.4
5	298.69	38.1 QP	46.0	-7.9	1.51 H	154	45.8	-7.7
6	476.20	33.2 QP	46.0	-12.8	1.00 H	200	37.7	-4.5

Remarks:

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





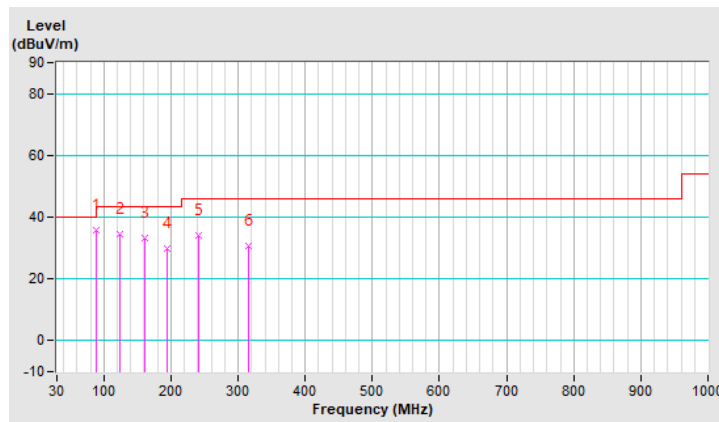
CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

**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	88.20	35.9 QP	43.5	-7.6	1.50 V	292	50.4	-14.5
2	123.12	34.7 QP	43.5	-8.8	1.00 V	165	45.7	-11.0
3	160.95	33.4 QP	43.5	-10.1	1.00 V	232	42.3	-8.9
4	193.93	30.0 QP	43.5	-13.5	1.99 V	162	41.7	-11.7
5	241.46	34.1 QP	46.0	-11.9	1.00 V	166	44.2	-10.1
6	316.15	30.7 QP	46.0	-15.3	1.99 V	158	38.1	-7.4

**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 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.

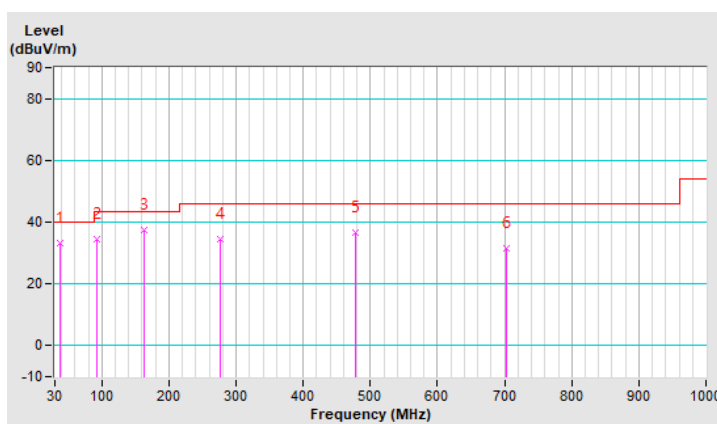


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	37.76	33.12 QP	40.00	-6.88	1.00 H	307	42.68	-9.56
2	92.08	34.54 QP	43.50	-8.96	1.00 H	306	48.77	-14.23
3	163.86	37.30 QP	43.50	-6.20	1.00 H	297	46.18	-8.88
4	276.38	34.60 QP	46.00	-11.40	1.00 H	48	42.74	-8.14
5	478.14	36.67 QP	46.00	-9.33	1.49 H	10	41.09	-4.42
6	703.18	31.44 QP	46.00	-14.56	1.49 H	19	31.62	-0.18

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.

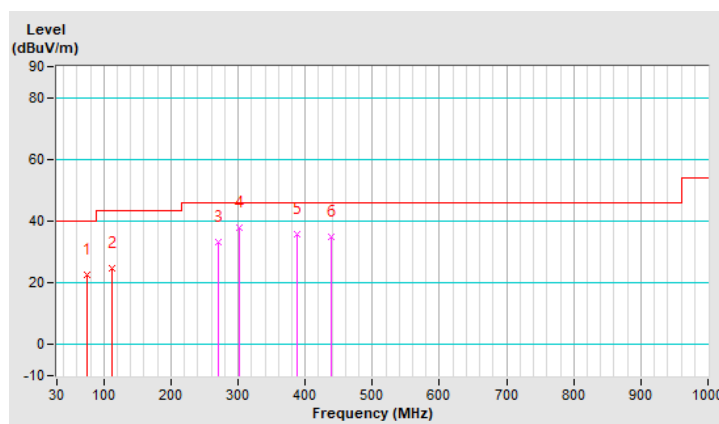


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	75.15	22.50 QP	40.00	-17.50	1.00 V	255	34.07	-11.57
2	111.64	24.80 QP	43.50	-18.70	1.00 V	260	36.72	-11.92
3	270.56	33.17 QP	46.00	-12.83	1.00 V	259	41.52	-8.35
4	301.60	37.94 QP	46.00	-8.06	1.00 V	306	45.41	-7.47
5	386.96	35.57 QP	46.00	-10.43	1.00 V	306	41.66	-6.09
6	439.34	35.09 QP	46.00	-10.91	1.00 V	252	40.09	-5.00

Remarks:

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



## 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

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

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

### 4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 04, 2020	Dec. 03, 2021
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 16, 2021	Jan. 15, 2022
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 25, 2021	Feb. 24, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100220	Dec. 01, 2020	Nov. 30, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

- Note:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. The test was performed in HwaYa Shielded Room 1(Conduction 1).  
 3. The VCCI Site Registration No. is C-12040.

#### 4.2.3 Test Procedures

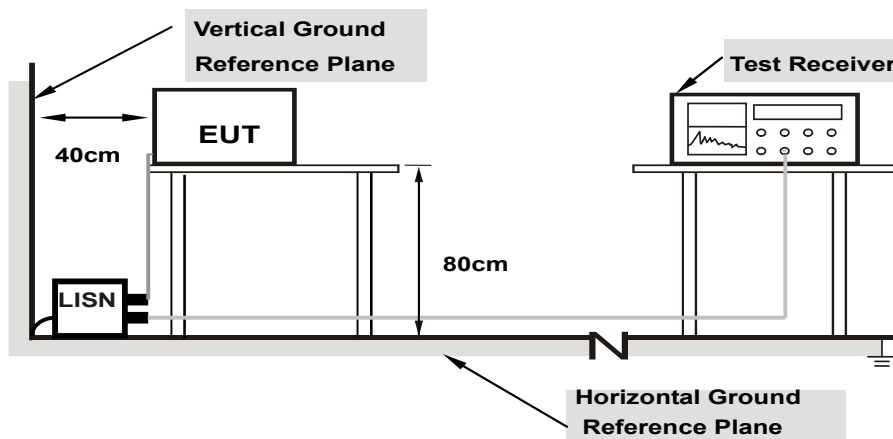
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

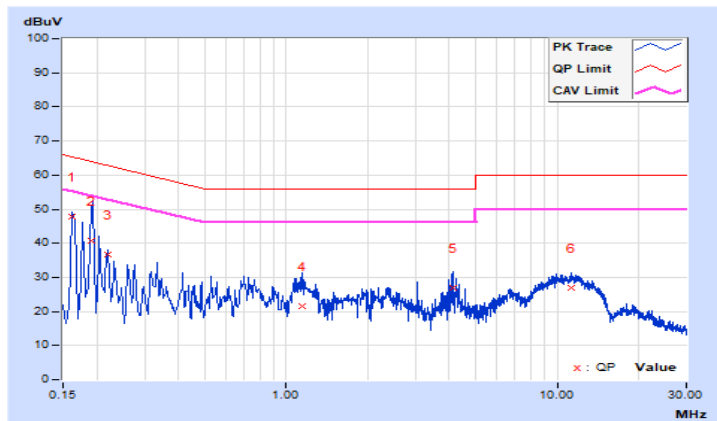
Worst-case data: 802.11g

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	9.76	37.94	18.82	47.70	28.58	65.37	55.37	-17.67	-26.79
2	0.19204	9.77	30.99	14.46	40.76	24.23	63.95	53.95	-23.19	-29.72
3	0.22038	9.78	26.94	11.30	36.72	21.08	62.80	52.80	-26.08	-31.72
4	1.15096	9.91	11.49	6.07	21.40	15.98	56.00	46.00	-34.60	-30.02
5	4.13429	9.98	17.11	5.22	27.09	15.20	56.00	46.00	-28.91	-30.80
6	11.27004	10.06	16.78	11.15	26.84	21.21	60.00	50.00	-33.16	-28.79

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.

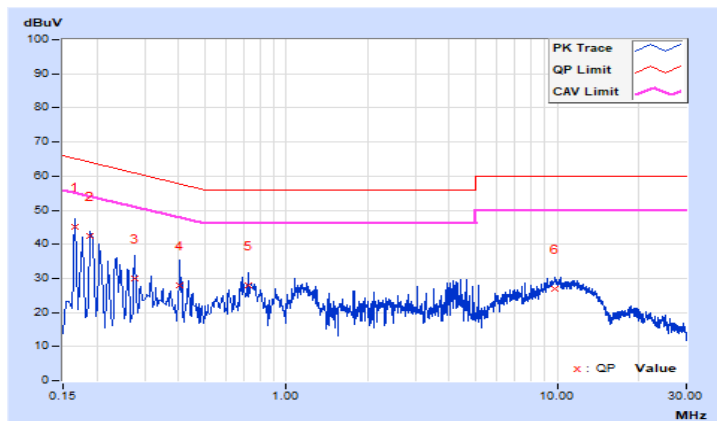


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16564	9.81	35.28	16.57	45.09	26.38	65.18
2	0.18910	9.82	32.61	14.07	42.43	23.89	64.08	54.08	-21.65	-30.19
3	0.27512	9.86	20.22	6.54	30.08	16.40	60.96	50.96	-30.88	-34.56
4	0.40415	9.90	18.08	11.62	27.98	21.52	57.77	47.77	-29.79	-26.25
5	0.72465	9.93	17.96	3.44	27.89	13.37	56.00	46.00	-28.11	-32.63
6	9.82725	10.14	16.64	9.72	26.78	19.86	60.00	50.00	-33.22	-30.14

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.

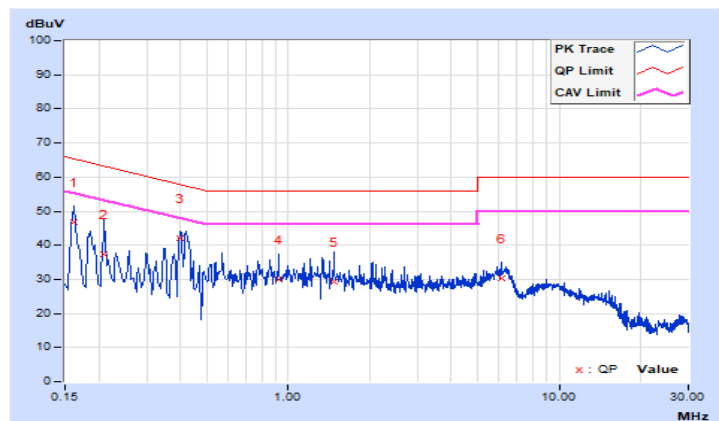


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16200	9.76	37.12	20.34	46.88	30.10	65.36
2	0.21000	9.77	27.59	16.04	37.36	25.81	63.21	53.21	-25.85	-27.40
3	0.39800	9.83	32.25	26.18	42.08	36.01	57.90	47.90	-15.82	-11.89
4	0.92200	9.90	20.08	12.87	29.98	22.77	56.00	46.00	-26.02	-23.23
5	1.47800	9.92	19.35	13.40	29.27	23.32	56.00	46.00	-26.73	-22.68
6	6.09400	10.01	20.26	13.18	30.27	23.19	60.00	50.00	-29.73	-26.81

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.



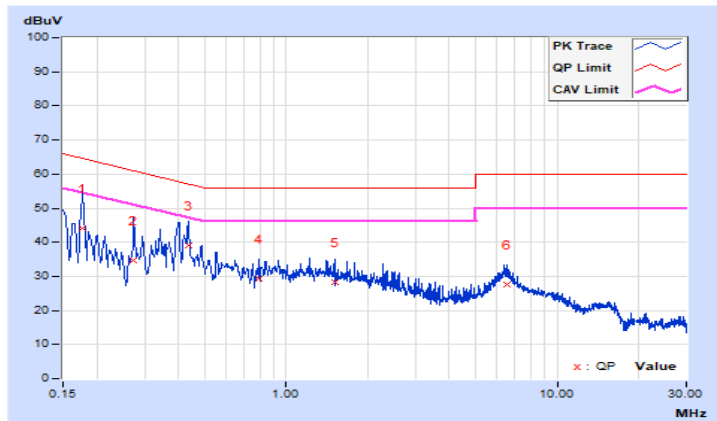


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.17800	9.82	34.41	19.89	44.23	29.71	64.58
2	0.27400	9.86	24.80	16.01	34.66	25.87	61.00	51.00	-26.34	-25.13
3	0.43400	9.90	29.05	18.89	38.95	28.79	57.18	47.18	-18.23	-18.39
4	0.79000	9.94	19.48	12.26	29.42	22.20	56.00	46.00	-26.58	-23.80
5	1.50600	9.98	18.15	12.29	28.13	22.27	56.00	46.00	-27.87	-23.73
6	6.56200	10.08	17.56	11.41	27.64	21.49	60.00	50.00	-32.36	-28.51

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.

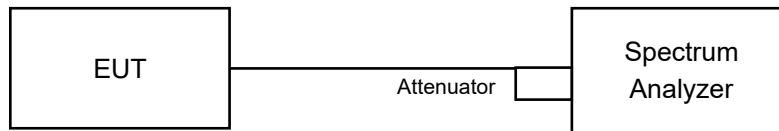


### 4.3 6dB Bandwidth Measurement

#### 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

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

#### 4.3.5 Deviation from Test Standard

No deviation.

#### 4.3.6 EUT Operating Conditions

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

#### 4.3.7 Test Result

##### 802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.10	7.11	0.5	Pass
6	2437	7.07	7.11	0.5	Pass
11	2462	7.10	7.10	0.5	Pass

##### 802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.45	16.43	0.5	Pass
6	2437	16.42	16.44	0.5	Pass
11	2462	16.46	16.45	0.5	Pass

##### 802.11ax (HE20)

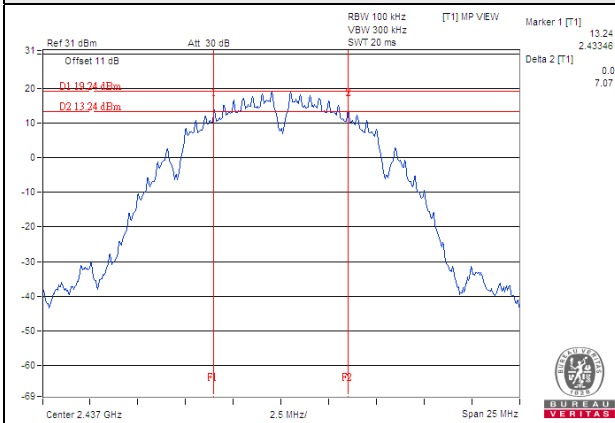
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	19.09	19.04	0.5	Pass
6	2437	19.06	19.02	0.5	Pass
11	2462	19.12	18.98	0.5	Pass

##### 802.11ax (HE40)

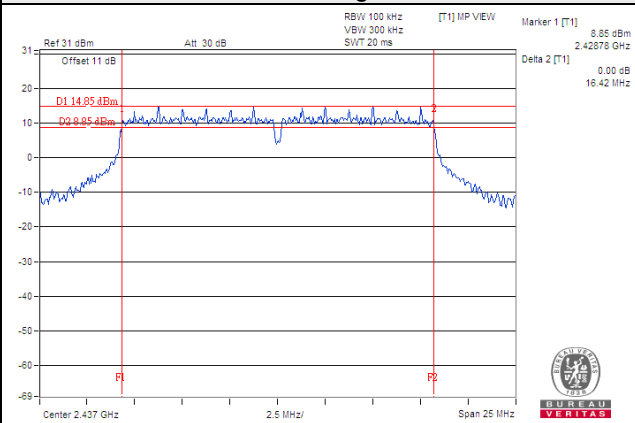
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	37.84	37.33	0.5	Pass
6	2437	37.71	37.38	0.5	Pass
9	2452	37.74	37.40	0.5	Pass

### Spectrum Plot of Worst Value

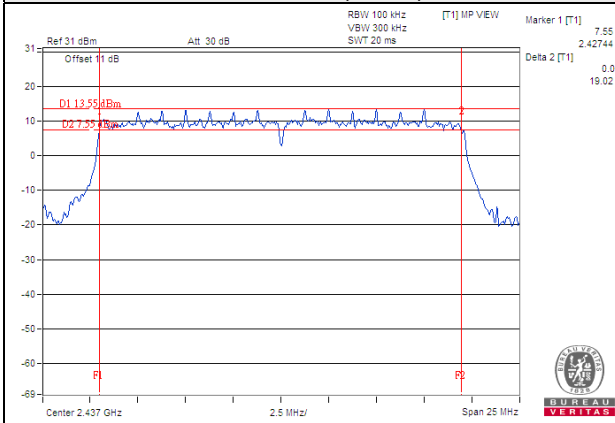
802.11b



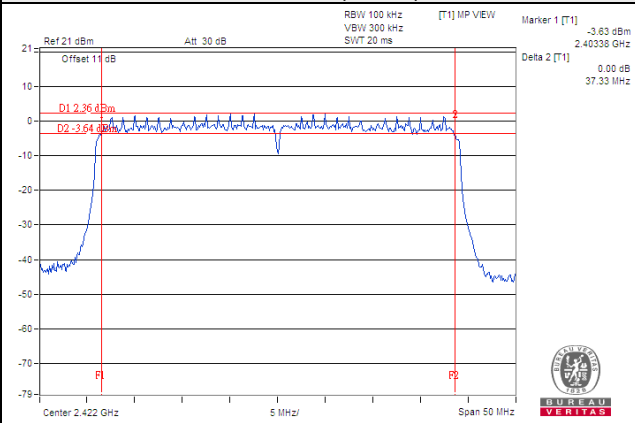
802.11g



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,

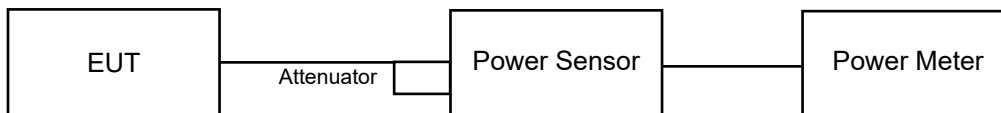
Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any  $N_{ANT}$ ;

Array Gain =  $5 \log(N_{ANT}/N_{SS})$  dB or 3 dB, whichever is less for 20-MHz channel widths with  $N_{ANT} \geq 5$ .

For power measurements on all other devices: Array Gain =  $10 \log(N_{ANT}/N_{SS})$  dB.

### 4.4.2 Test Setup



### 4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.4.4 Test Procedures

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

### 4.4.5 Deviation from Test Standard

No deviation.

### 4.4.6 EUT Operating Conditions

Same as item 4.3.6.

#### 4.4.7 Test Results

##### CDD Mode

##### 802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	26.41	25.96	831.979	29.20	30	Pass
6	2437	26.30	25.86	812.058	29.10	30	Pass
11	2462	26.27	25.74	798.616	29.02	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	21.86	20.78	273.136	24.36	30	Pass
6	2437	26.86	25.67	<b>854.266</b>	29.32	30	Pass
11	2462	21.12	20.15	232.934	23.67	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	19.98	18.83	175.924	22.45	30	Pass
6	2437	26.49	25.81	826.722	29.17	30	Pass
11	2462	20.49	19.39	198.840	22.99	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	17.81	16.99	110.398	20.43	30	Pass
6	2437	21.39	20.63	253.332	24.04	30	Pass
9	2452	19.95	18.77	174.191	22.41	30	Pass

### Beamforming Mode

#### 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	19.98	18.83	175.924	22.45	30.00	Pass
6	2437	26.49	25.81	826.722	29.17	30.00	Pass
11	2462	20.49	19.39	198.840	22.99	30.00	Pass

Note: Beamforming Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 4.11\text{dBi} < 6\text{dBi}$ , so the limit is not reduced.

#### 802.11ax (HE40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.81	16.99	110.398	20.43	30.00	Pass
6	2437	21.39	20.63	253.332	24.04	30.00	Pass
9	2452	19.95	18.77	174.191	22.41	30.00	Pass

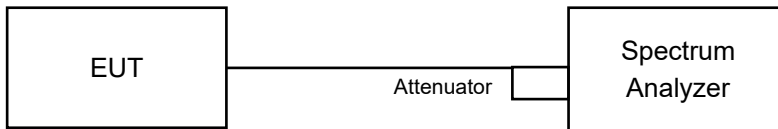
Note: Beamforming Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 4.11\text{dBi} < 6\text{dBi}$ , so the limit is not reduced.

## 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:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- e) Set VBW  $\geq 3 \times \text{RBW}$ .
- f) Detector = power averaging (RMS) or sample detector (when RMS not available).
- g) Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span}/\text{RBW}$ .
- h) Sweep time = auto couple.
- i) Do not use sweep triggering. Allow sweep to "free run".
- j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
- k) Use the peak marker function to determine the maximum amplitude level.
- l) Add  $10 \log (1/x)$ , where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.

### 4.5.5 Deviation from Test Standard

No deviation.

### 4.5.6 EUT Operating Condition

Same as item 4.3.6.



#### 4.5.7 Test Results

##### 802.11b

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-4.32	3.01	-1.31	8.00	Pass
	6	2437	-4.98	3.01	-1.97	8.00	Pass
	11	2462	-4.81	3.01	-1.80	8.00	Pass
1	1	2412	-6.93	3.01	-3.92	8.00	Pass
	6	2437	-6.21	3.01	-3.20	8.00	Pass
	11	2462	-6.40	3.01	-3.39	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 =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 4.11 \text{dBi} < 6 \text{dBi}$ , so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

##### 802.11g

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-11.39	3.01	0.09	-8.29	8.00	Pass
	6	2437	-6.68	3.01	0.09	-3.58	8.00	Pass
	11	2462	-12.07	3.01	0.09	-8.97	8.00	Pass
1	1	2412	-13.54	3.01	0.09	-10.44	8.00	Pass
	6	2437	-7.86	3.01	0.09	-4.76	8.00	Pass
	11	2462	-14.13	3.01	0.09	-11.03	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 =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 4.11 \text{dBi} < 6 \text{dBi}$ , so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE20)

TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	1	2412	-13.54	3.01	0.1	-10.43	8.00	Pass
	6	2437	-8.70	3.01	0.1	-5.59	8.00	Pass
	11	2462	-12.47	3.01	0.1	-9.36	8.00	Pass
1	1	2412	-16.52	3.01	0.1	-13.41	8.00	Pass
	6	2437	-10.52	3.01	0.1	-7.41	8.00	Pass
	11	2462	-16.06	3.01	0.1	-12.95	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 =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 4.11 \text{dBi} < 6 \text{dBi}$ , so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ax (HE40)

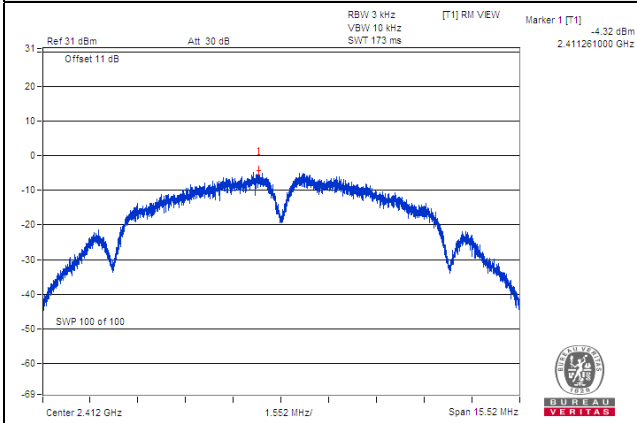
TX chain	Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
0	3	2422	-19.78	3.01	0.11	-16.66	8.00	Pass
	6	2437	-16.08	3.01	0.11	-12.96	8.00	Pass
	9	2452	-17.66	3.01	0.11	-14.54	8.00	Pass
1	3	2422	-21.37	3.01	0.11	-18.25	8.00	Pass
	6	2437	-16.28	3.01	0.11	-13.16	8.00	Pass
	9	2452	-18.82	3.01	0.11	-15.70	8.00	Pass

**Note:**

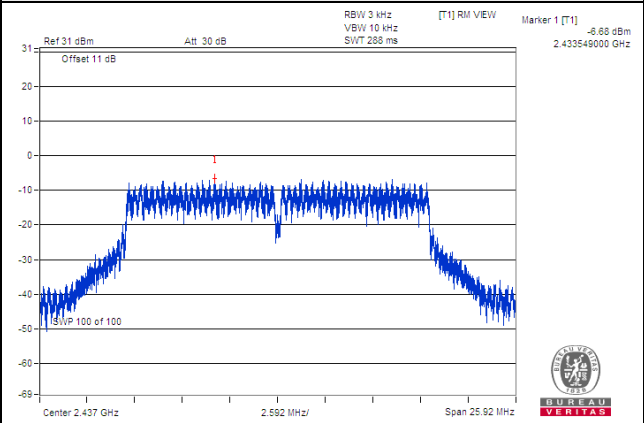
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 4.11 \text{dBi} < 6 \text{dBi}$ , so the limit is not reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

### Spectrum Plot of Worst Value

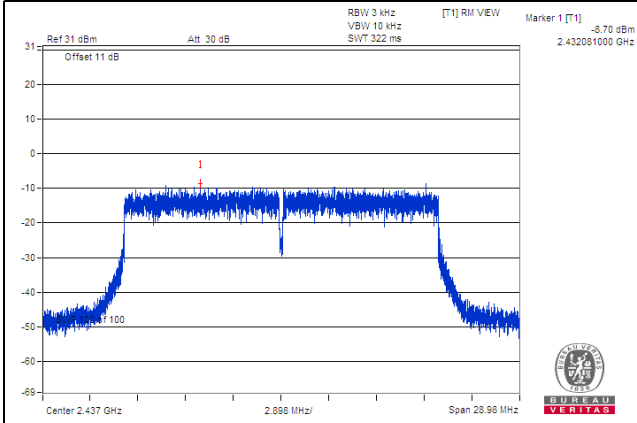
#### 802.11b



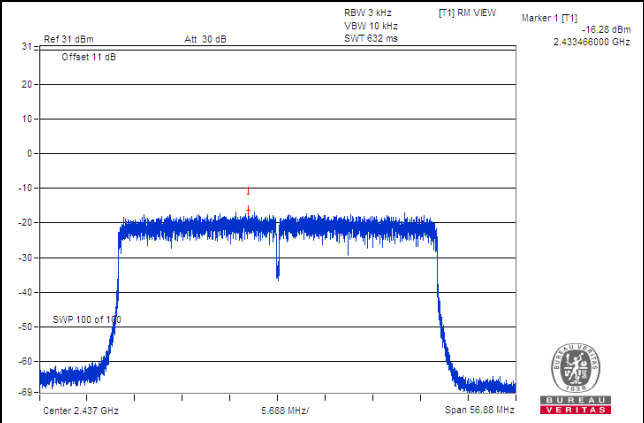
#### 802.11g



#### 802.11ax (HE20)



#### 802.11ax (HE40)

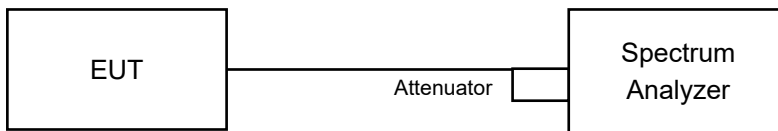


## 4.6 Conducted Out of Band Emission Measurement

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

#### MEASUREMENT PROCEDURE OOB

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

#### 4.6.5 Deviation from Test Standard

No deviation.

#### 4.6.6 EUT Operating Condition

Same as item 4.3.6.

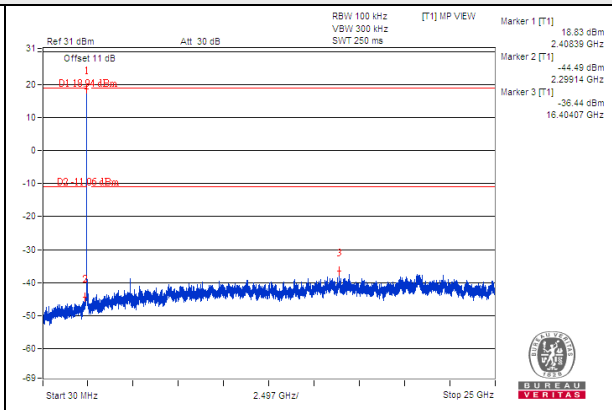
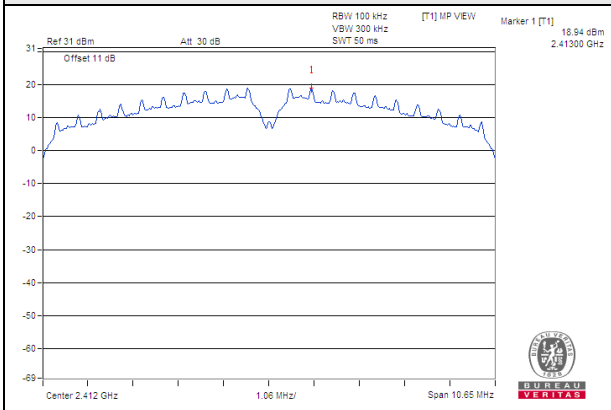
#### 4.6.7 Test Results

The conducted emission test is performed on each TX port of operating mode without summing or adding  $10\log(N)$  since the limit is relative emission limit.

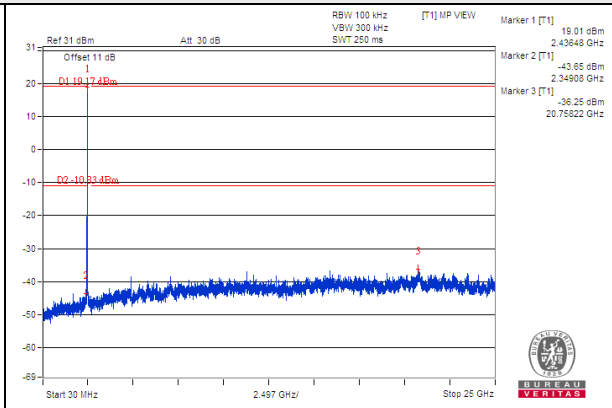
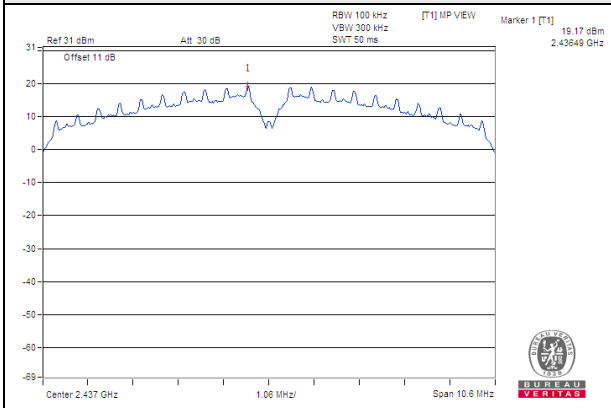
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

802.11b\_Chain 0

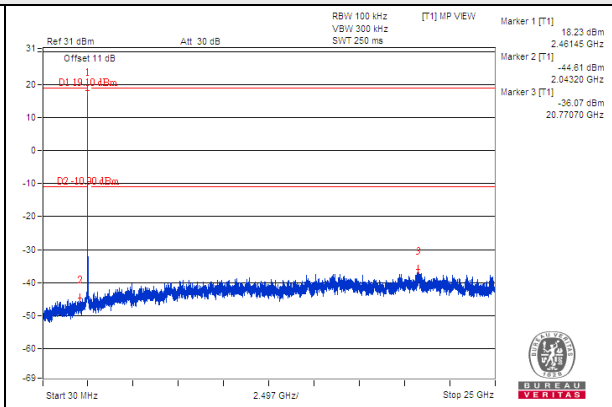
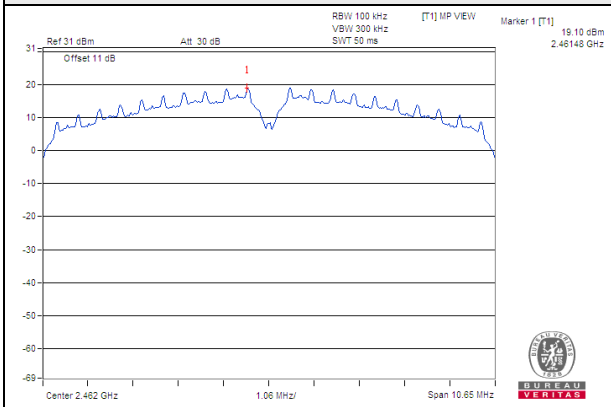
CH 1



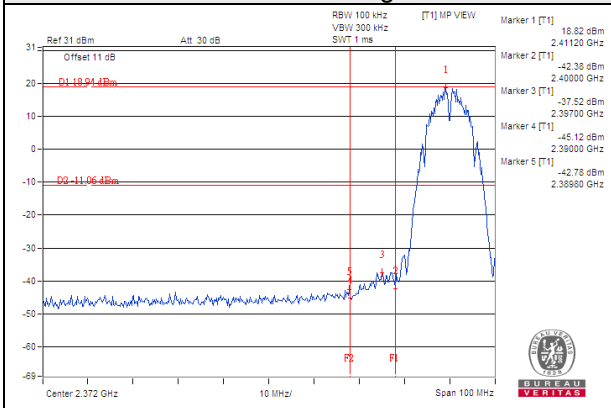
CH 6



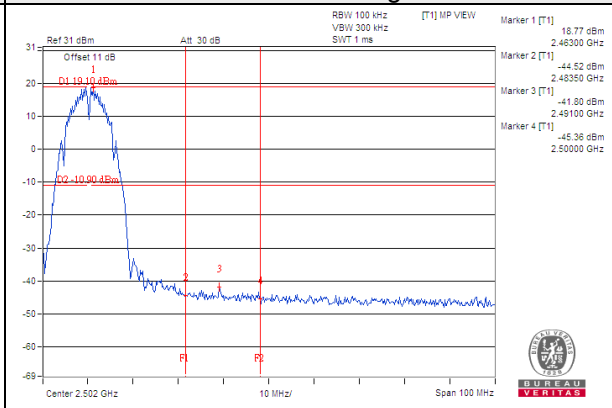
CH 11



CH 11 Band edge

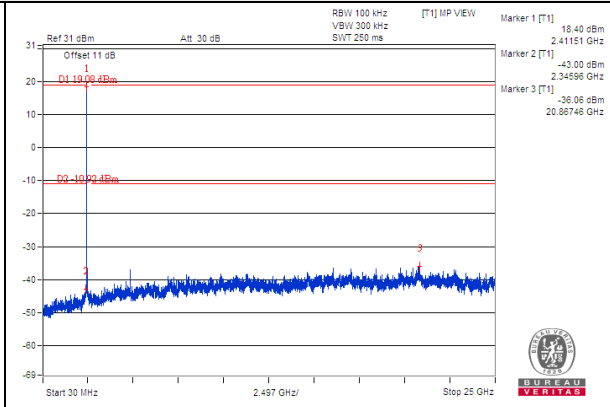
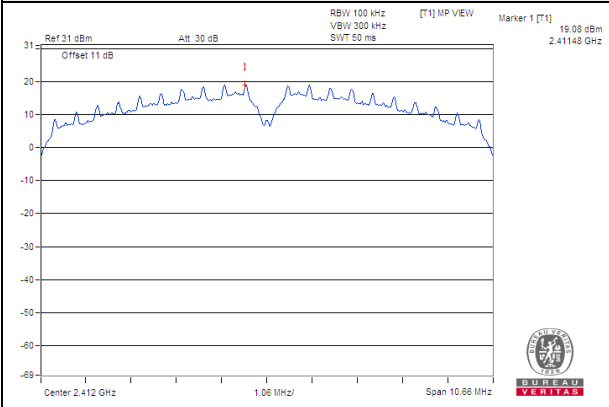


CH 11 Band edge

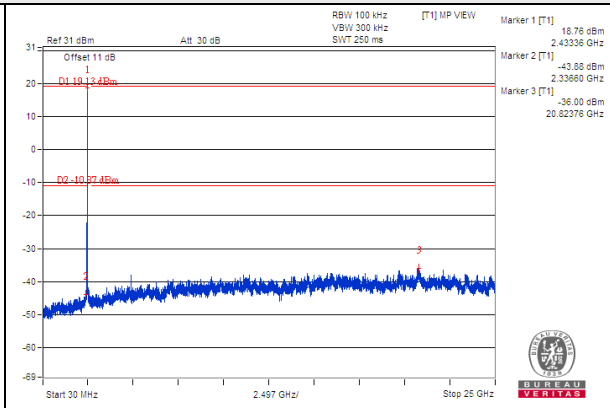
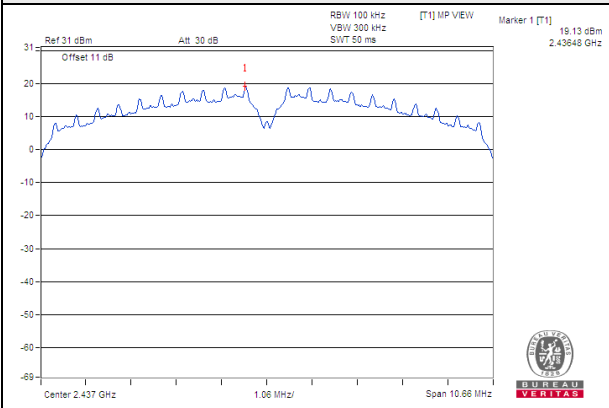


# 802.11b\_Chain 1

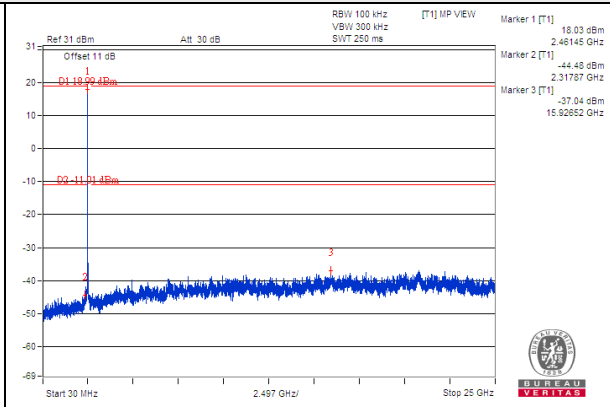
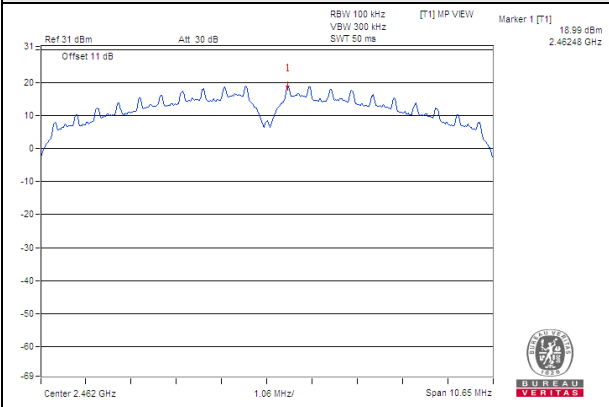
## CH 1



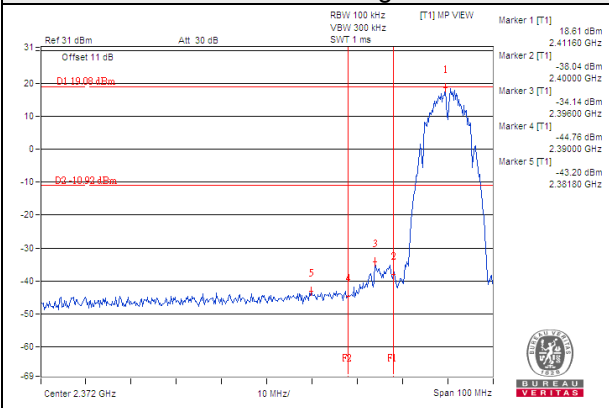
## CH 6



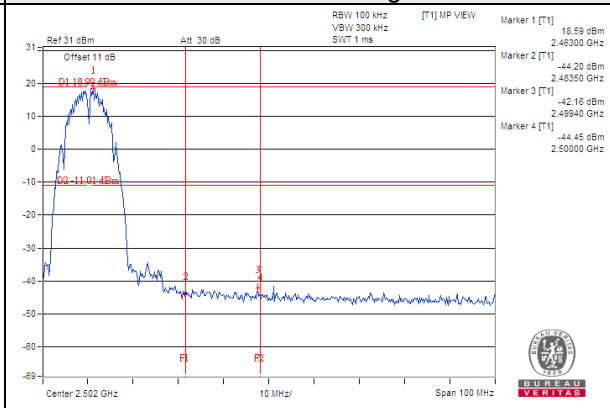
## CH 11



## CH 11 Band edge

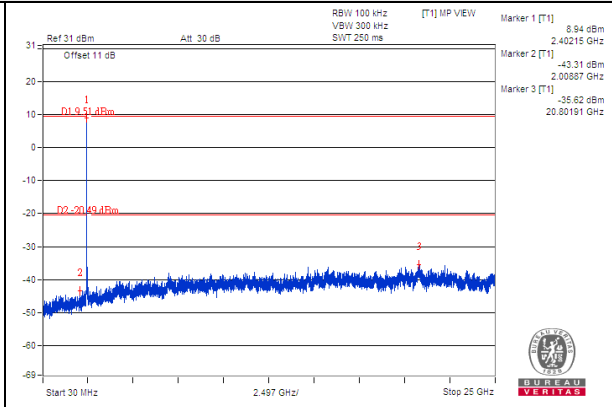
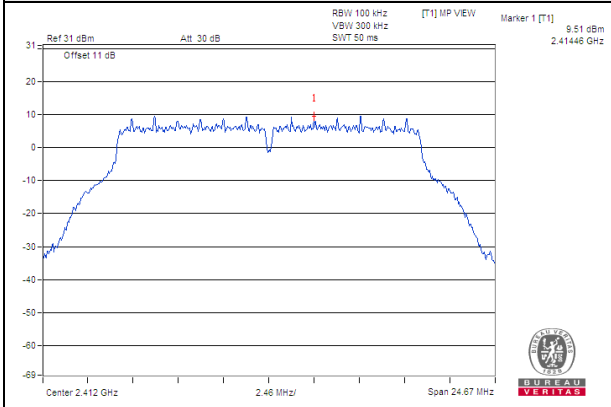


## CH 11 Band edge

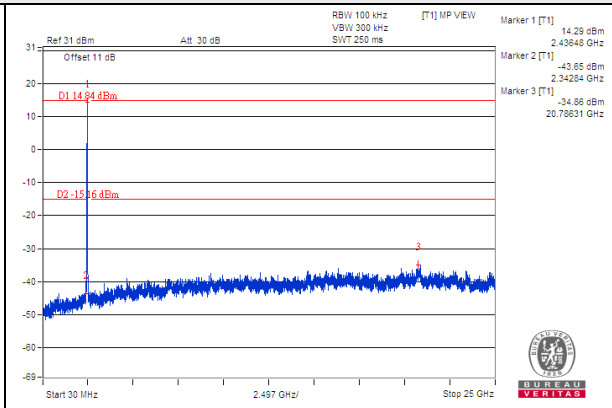
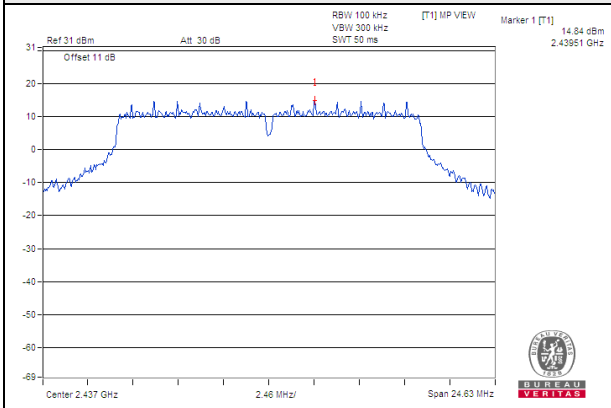


# 802.11g\_Chain 0

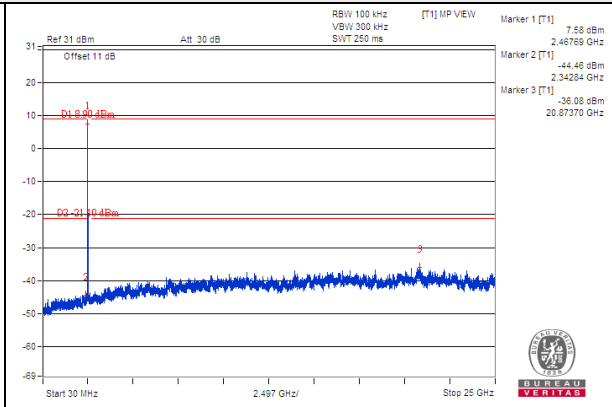
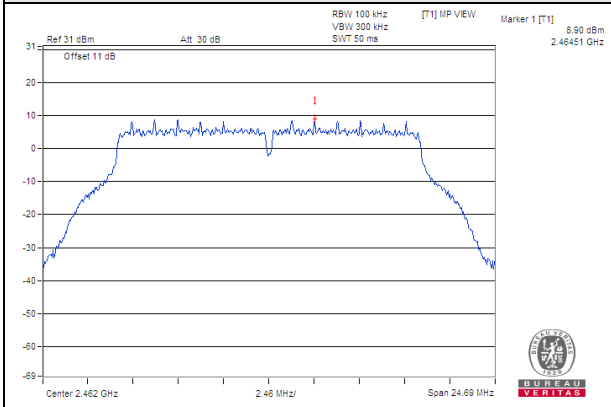
## CH 1



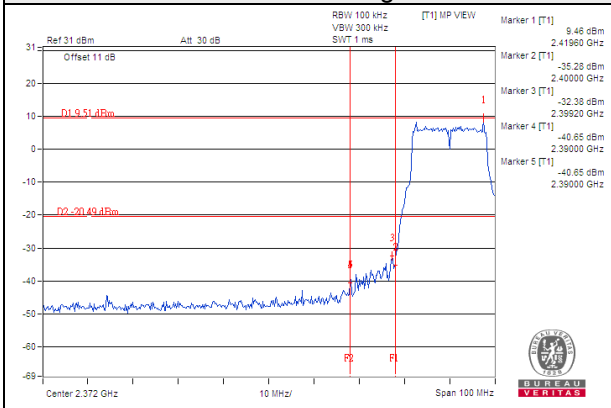
## CH 6



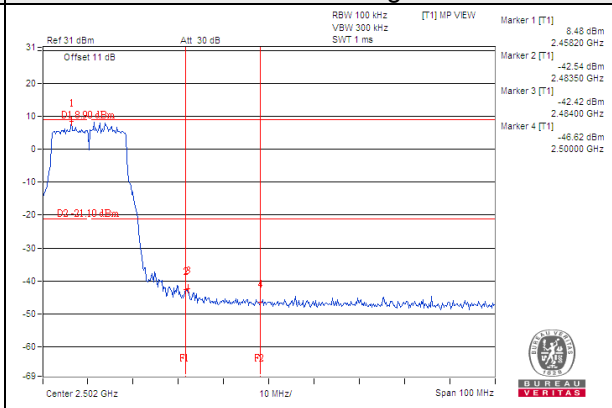
## CH 11



## CH 11 Band edge



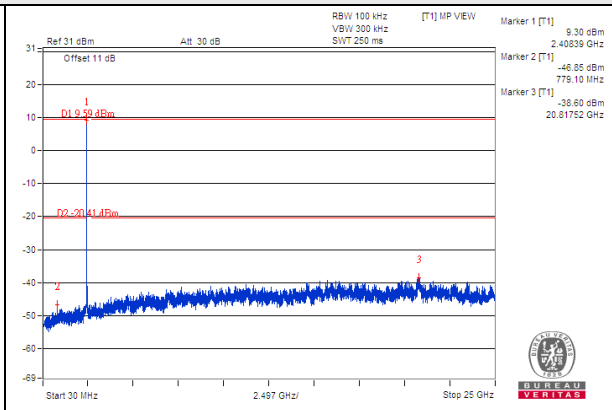
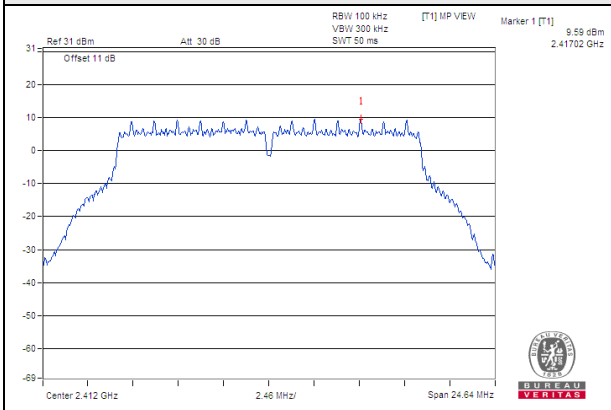
## CH 11 Band edge



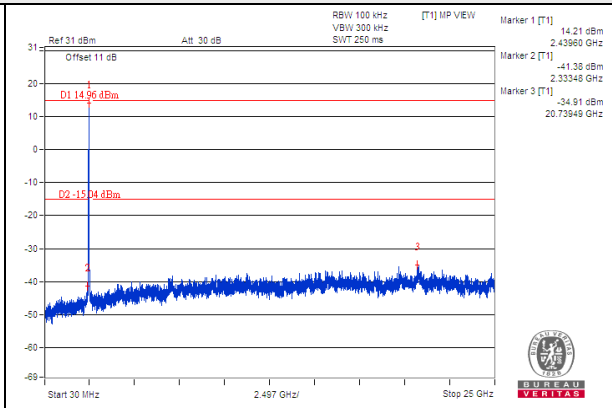
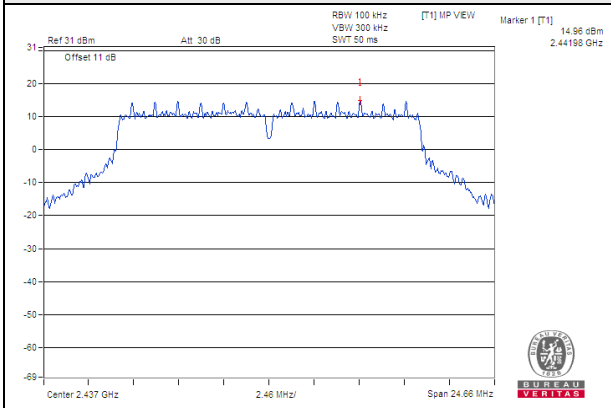


### 802.11g\_Chain 1

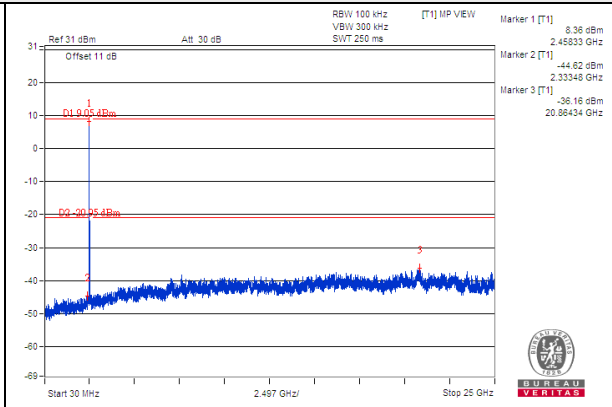
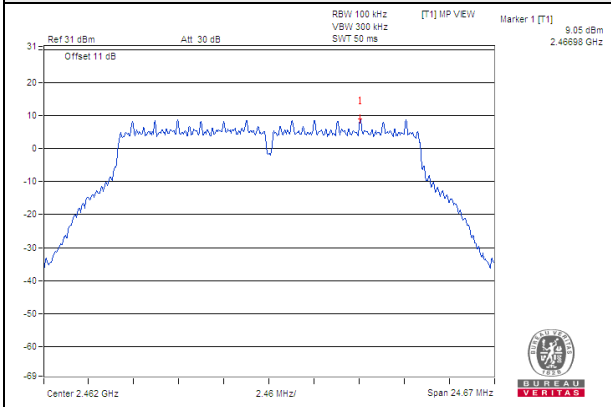
#### CH 1



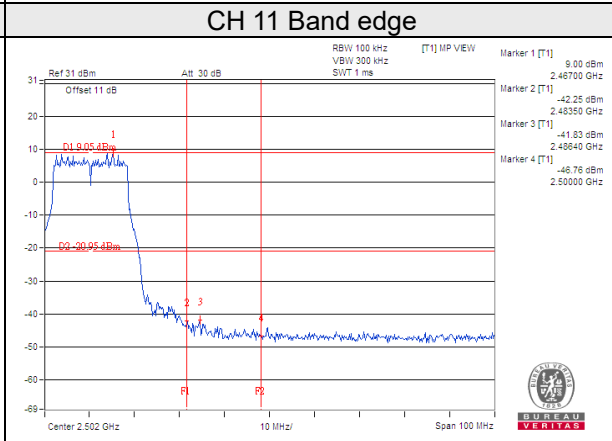
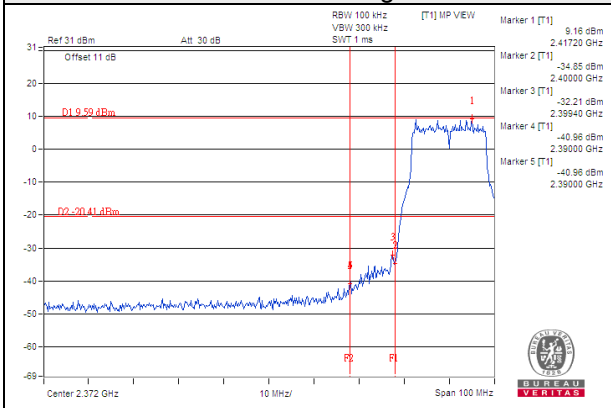
#### CH 6



#### CH 11

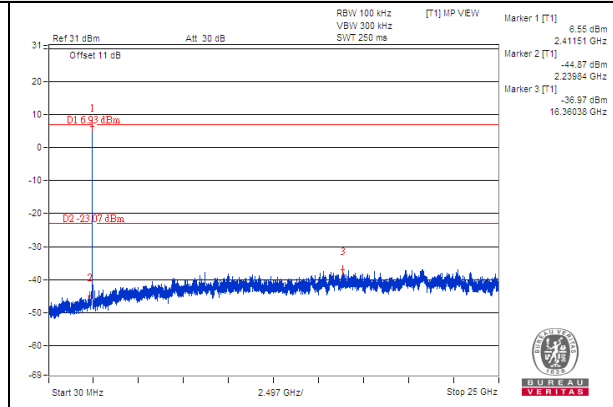
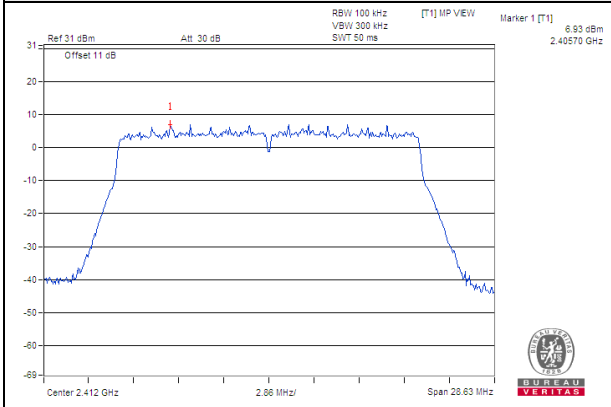


#### CH 11 Band edge

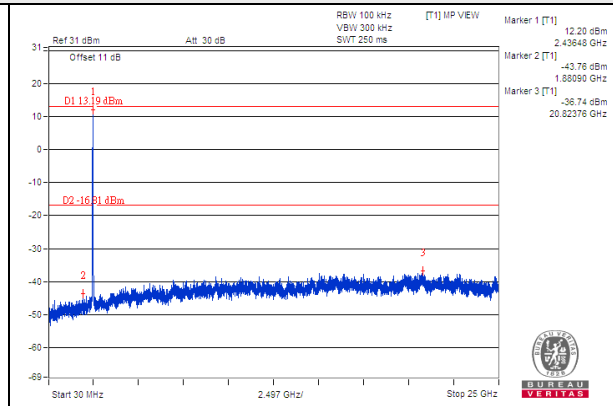
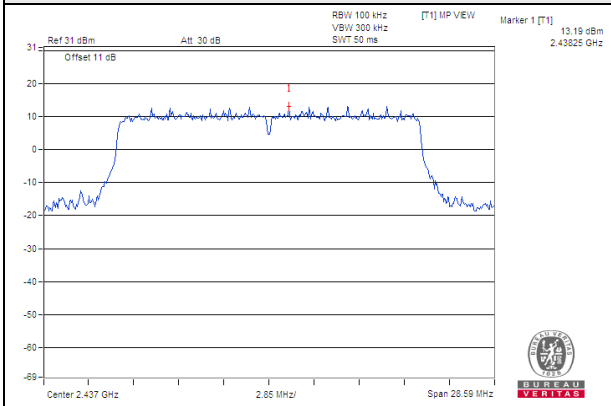


802.11ax (HE20)\_Chain 0

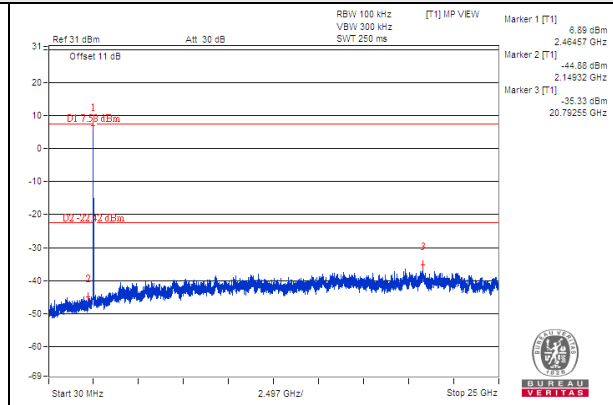
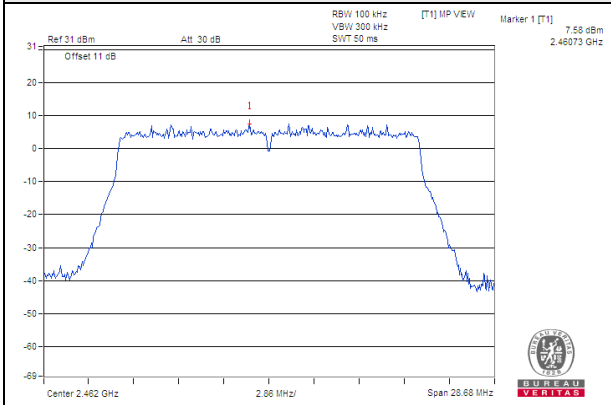
CH 1



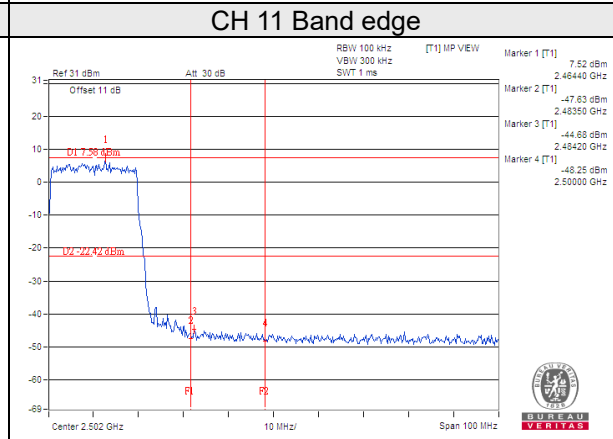
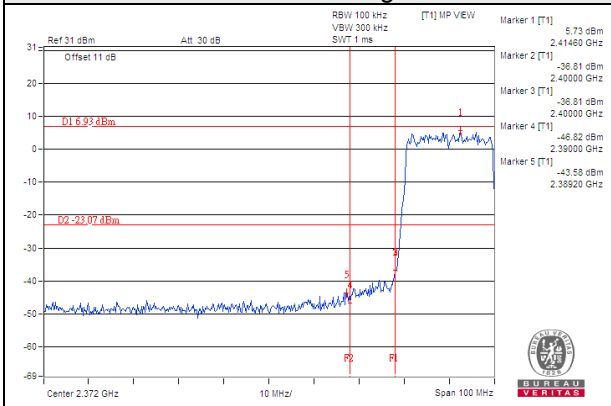
CH 6



CH 11

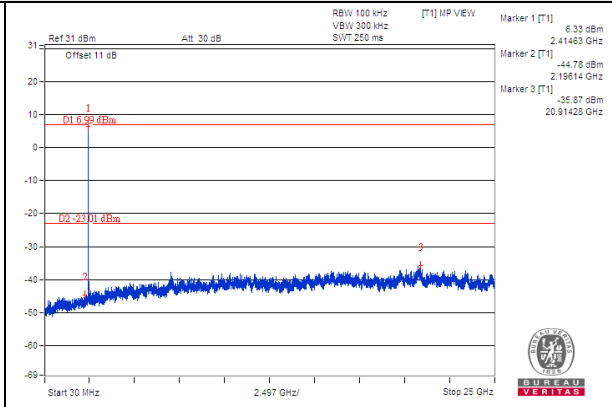
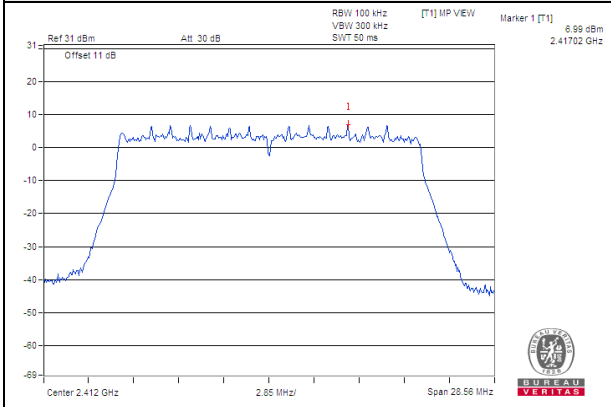


CH 11 Band edge

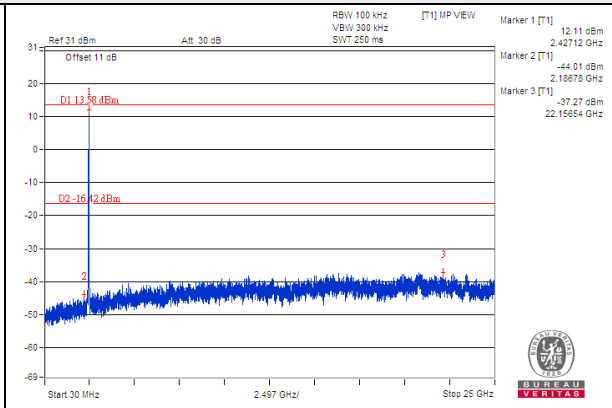
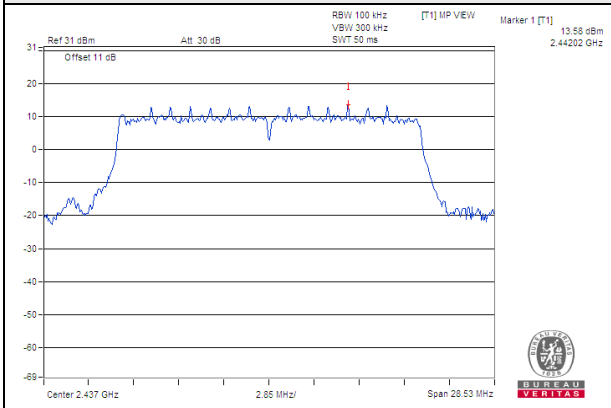


802.11ax (HE20)\_Chain 1

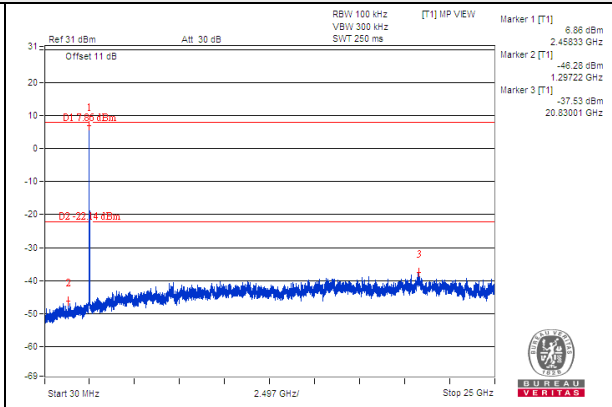
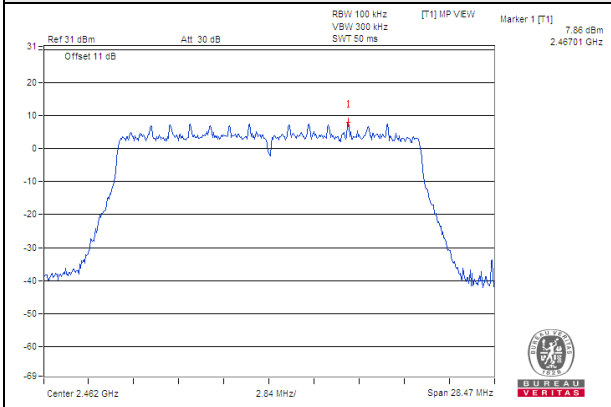
CH 1



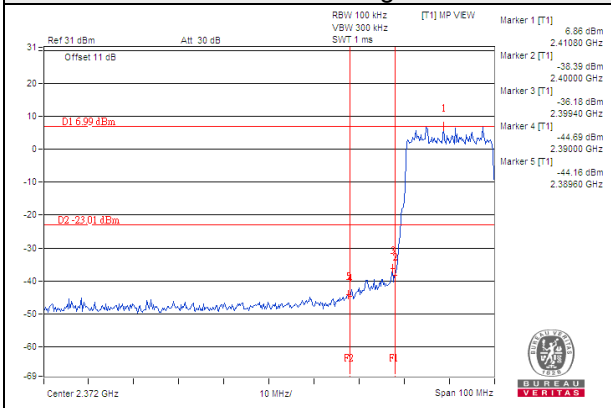
CH 6



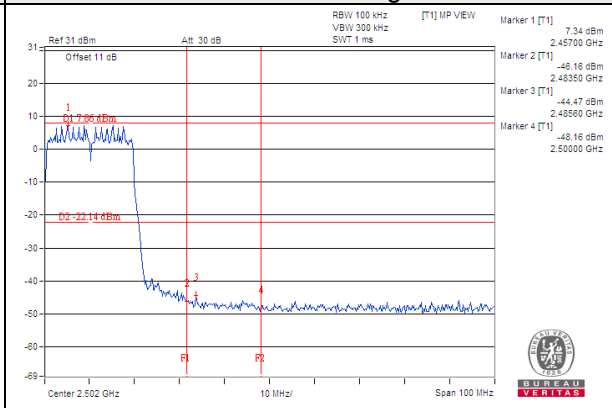
CH 11



CH 11 Band edge

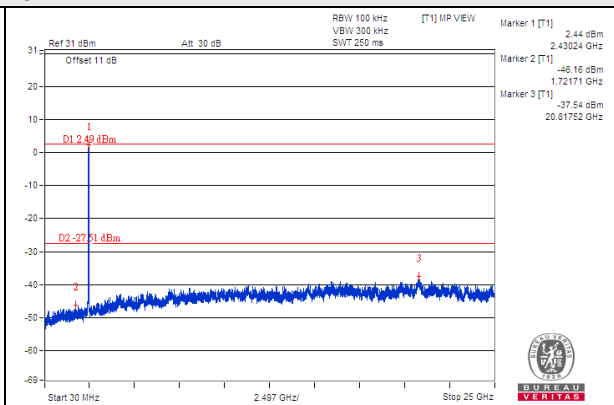
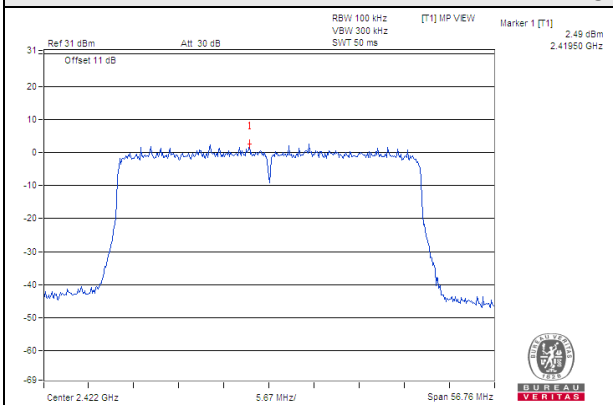


CH 11 Band edge

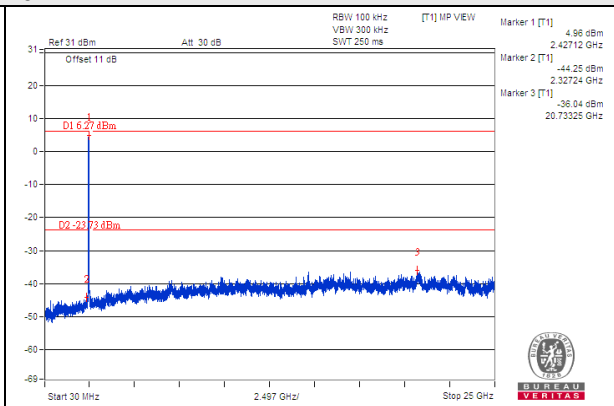
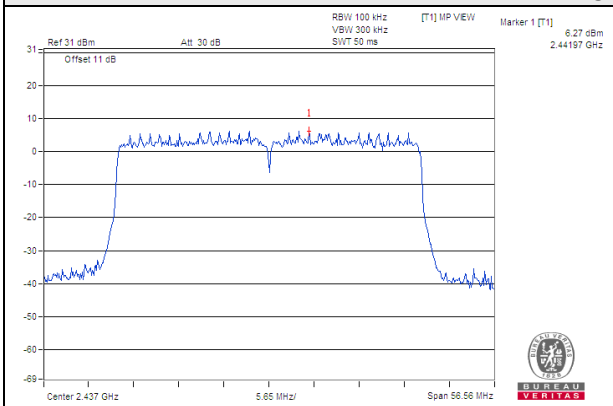


### 802.11ax (HE40)\_Chain 0

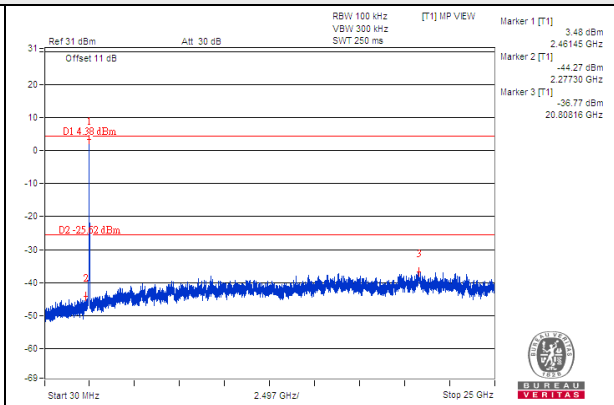
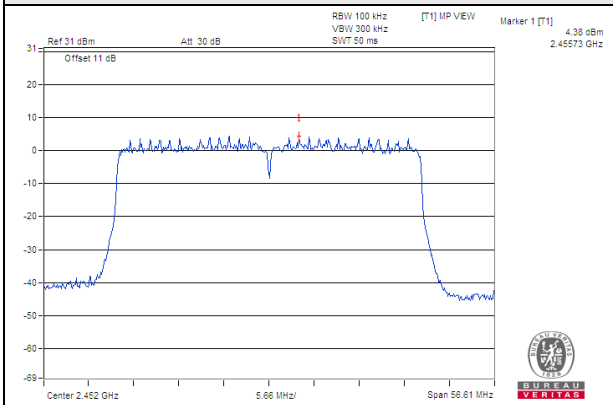
#### CH 3



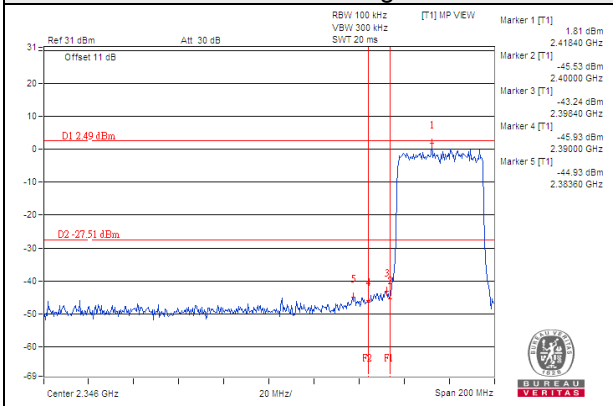
#### CH 6



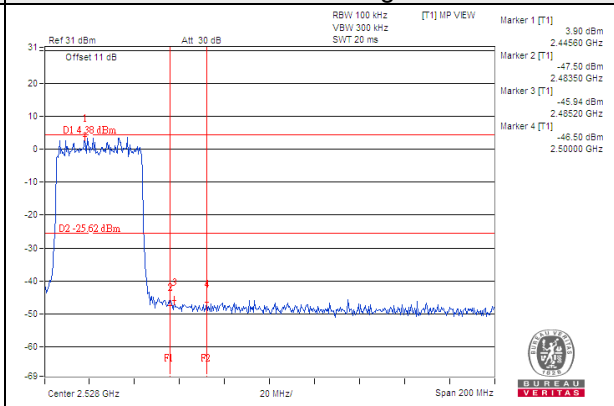
#### CH 9



#### CH 3 Band edge

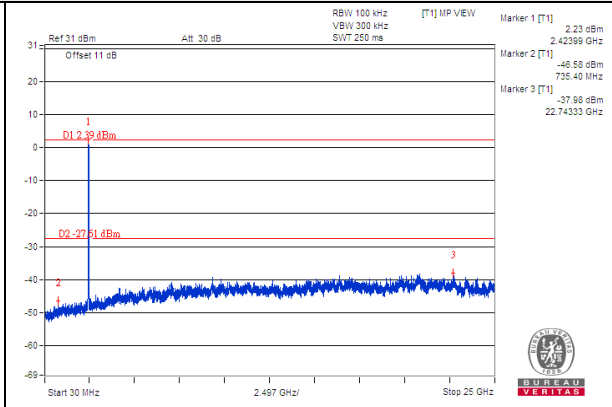
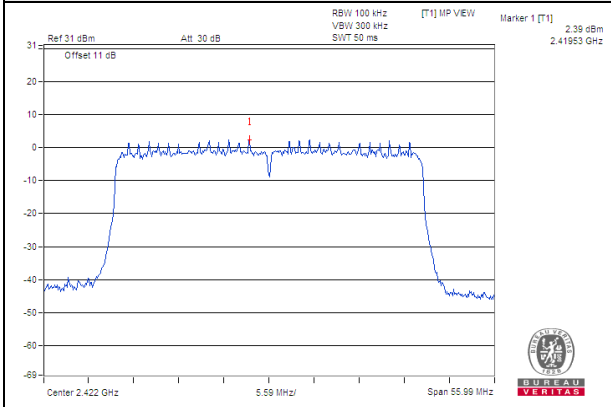


#### CH 9 Band edge

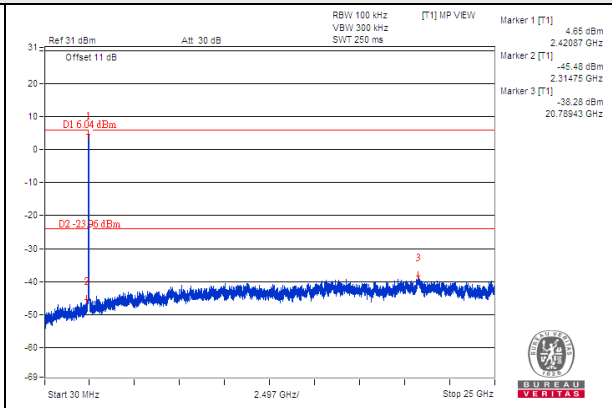
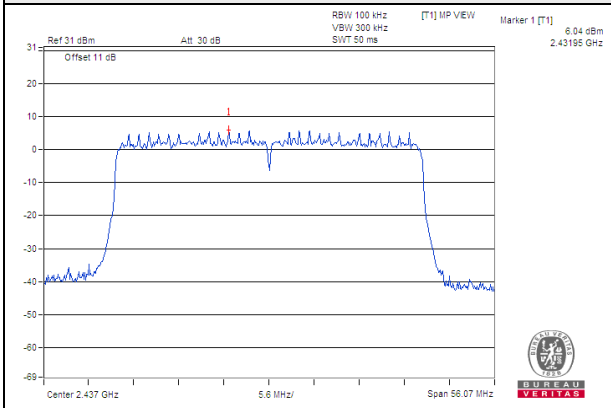


802.11ax (HE40)\_Chain 1

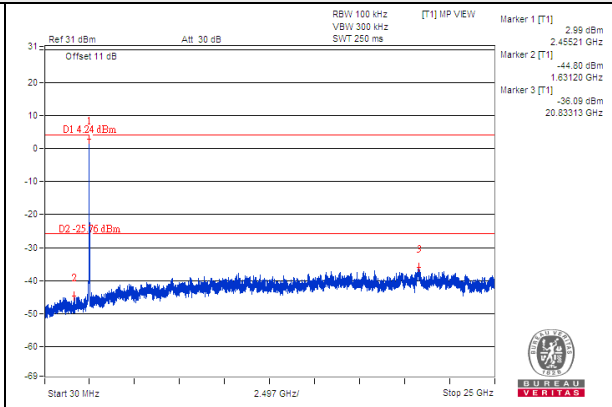
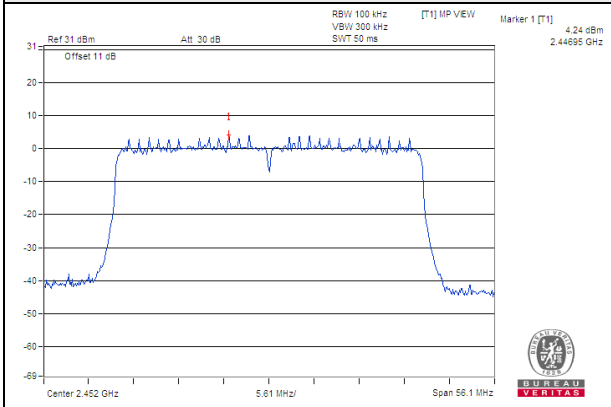
CH 3



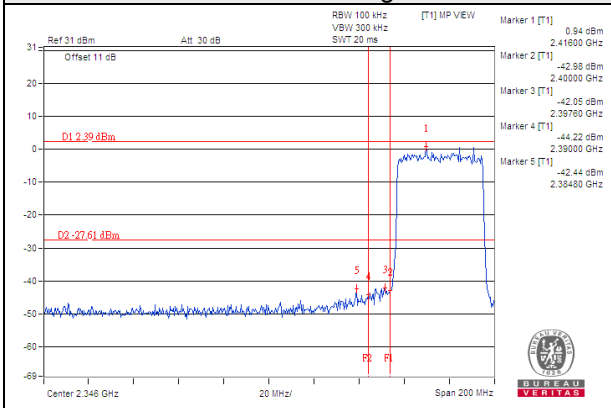
CH 6



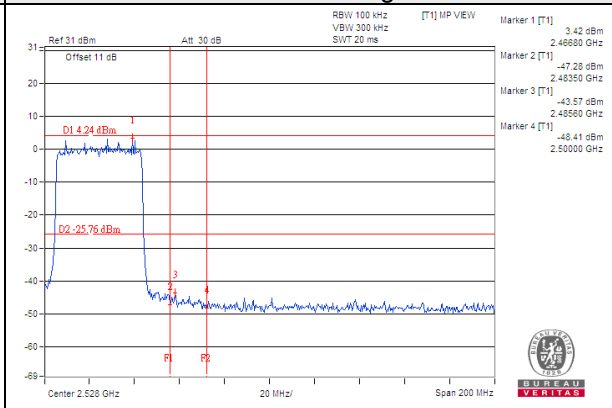
CH 9



CH 3 Band edge



CH 9 Band edge

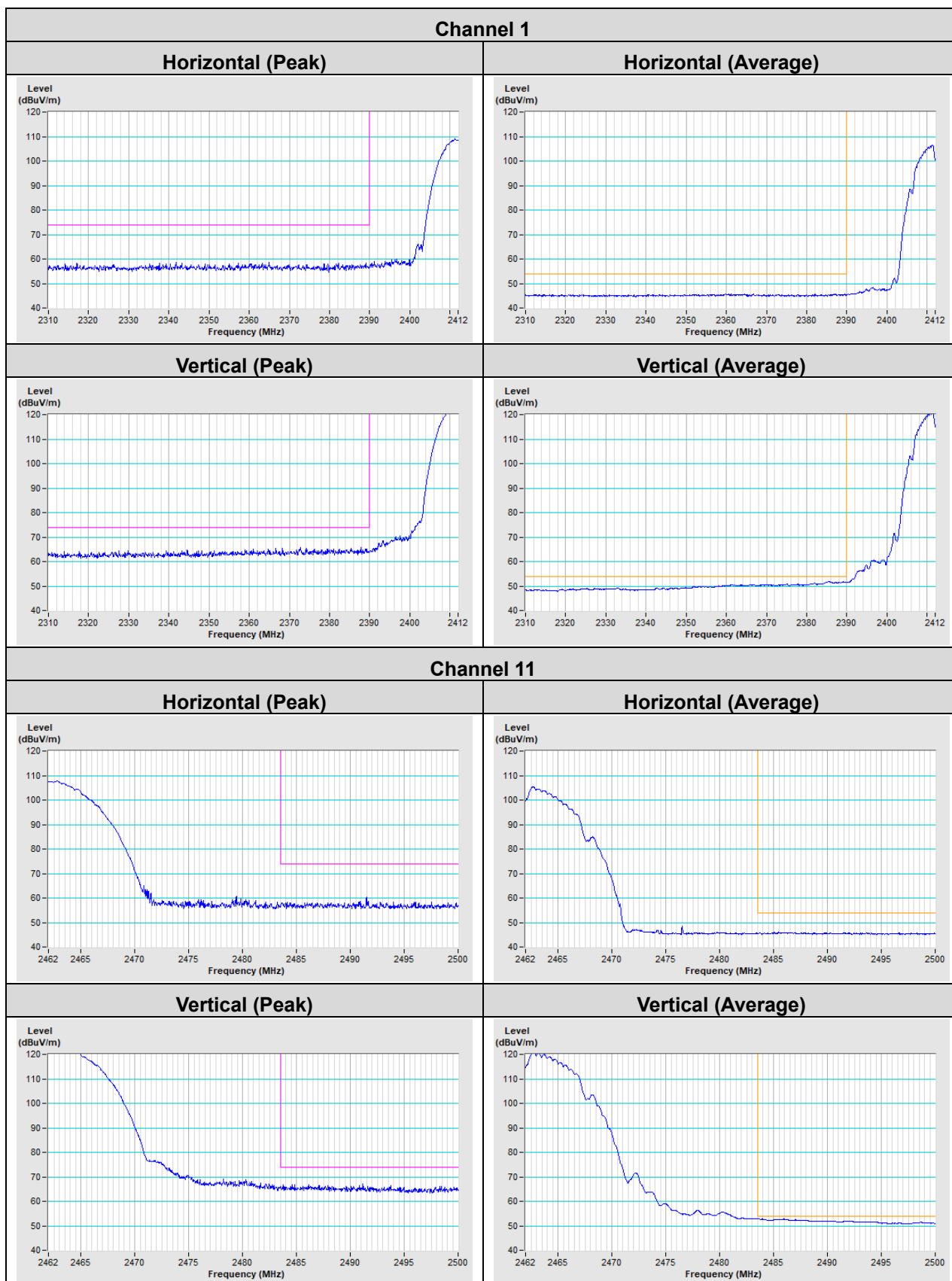


## 5 Pictures of Test Arrangements

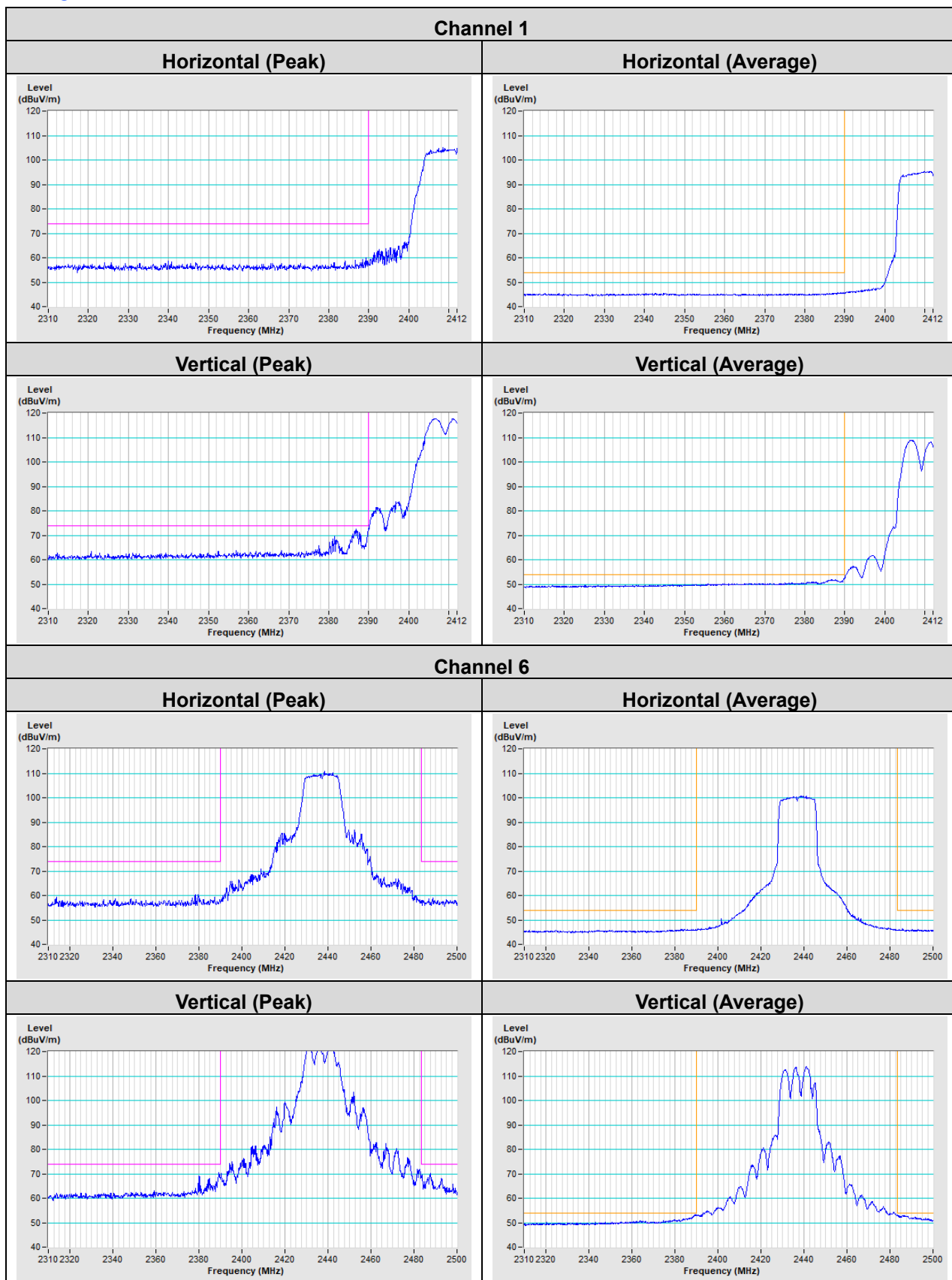
Please refer to the attached file (Test Setup Photo).

# Annex A- Band Edge Measurement

802.11b



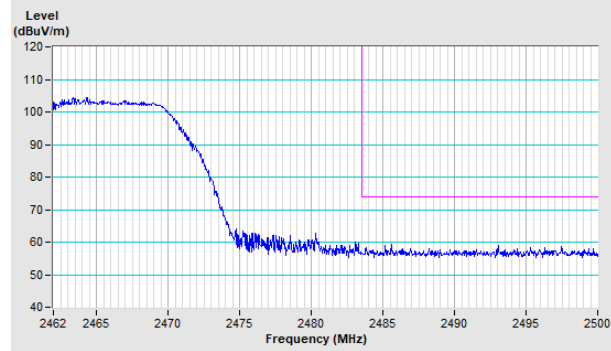
802.11g



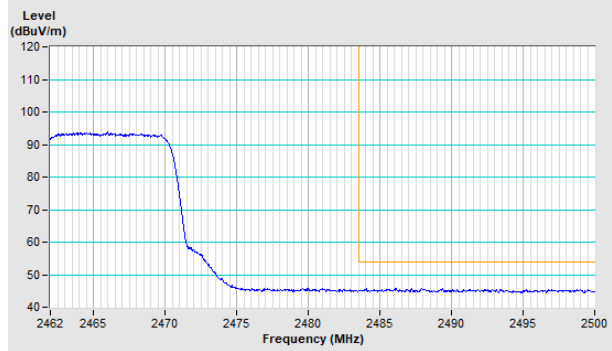


**Channel 11**

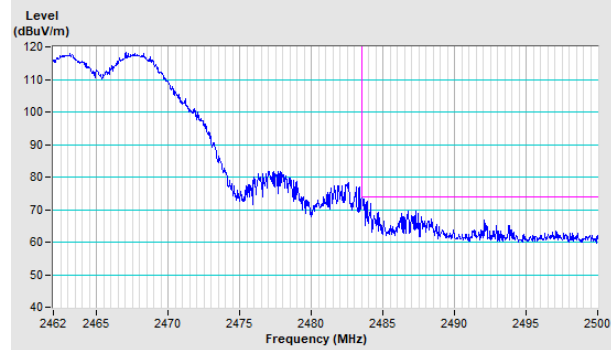
**Horizontal (Peak)**



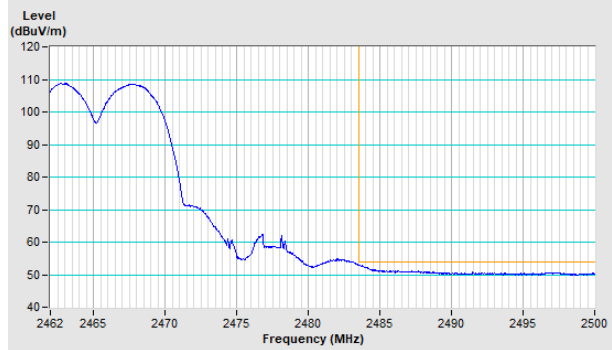
**Horizontal (Average)**



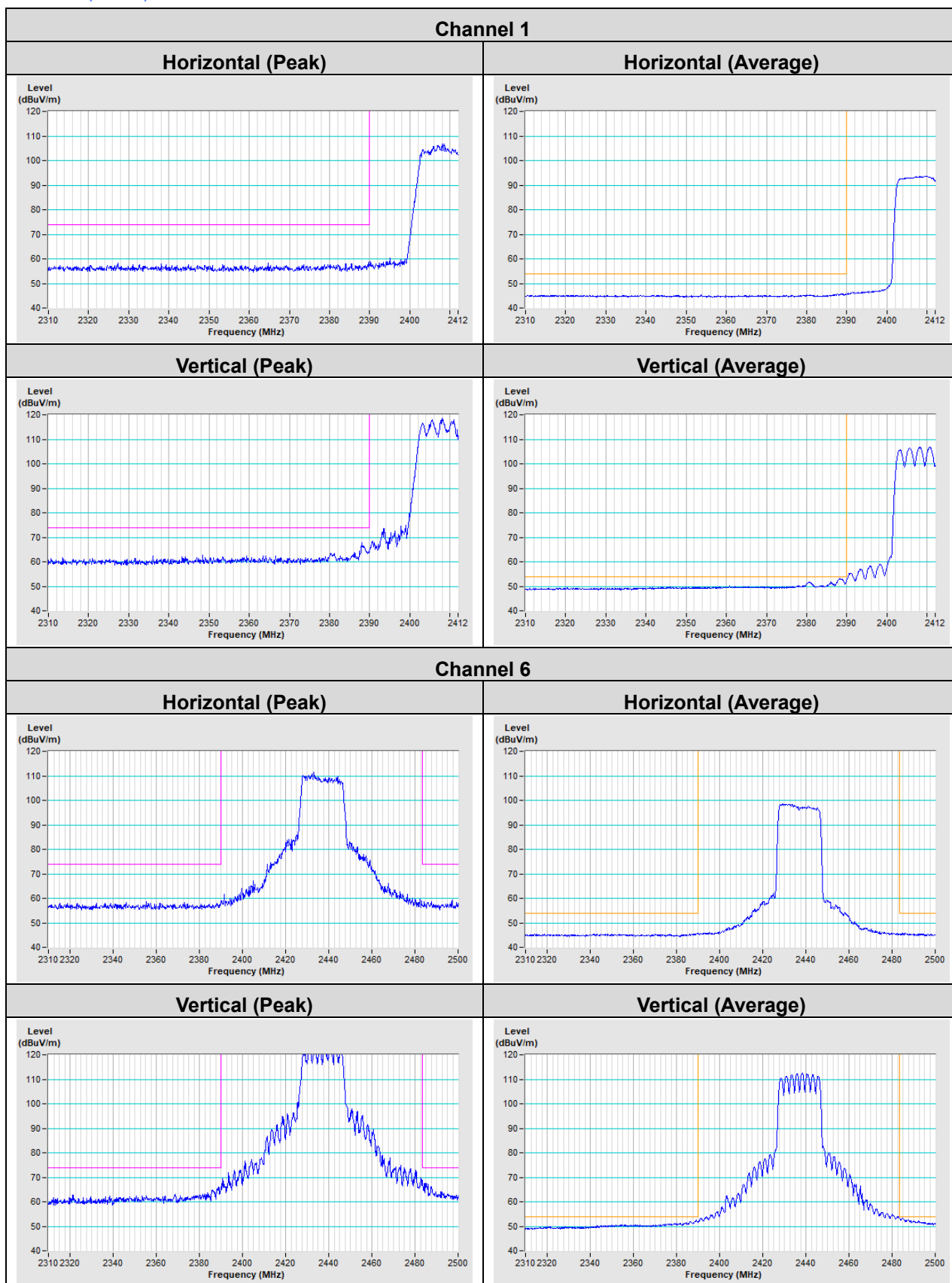
**Vertical (Peak)**



**Vertical (Average)**

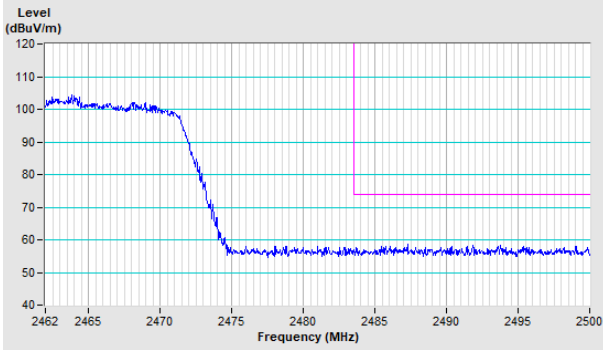


802.11ax (HE20)

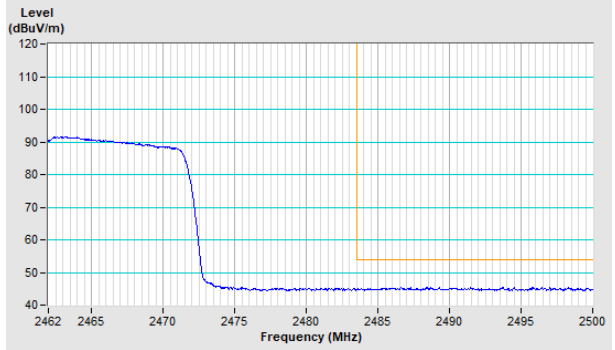


### Channel 11

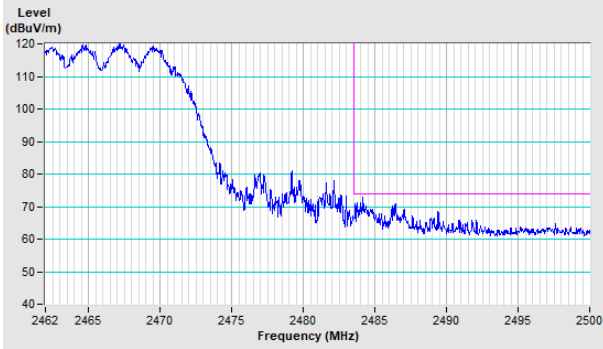
#### Horizontal (Peak)



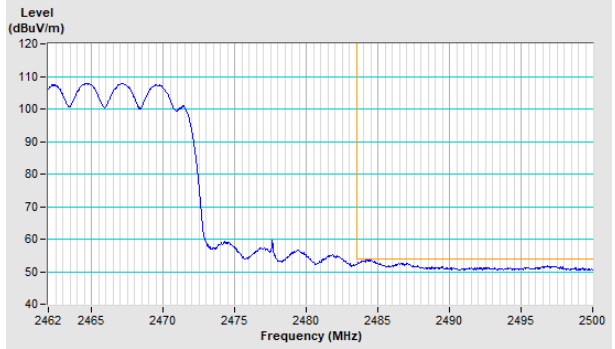
#### Horizontal (Average)



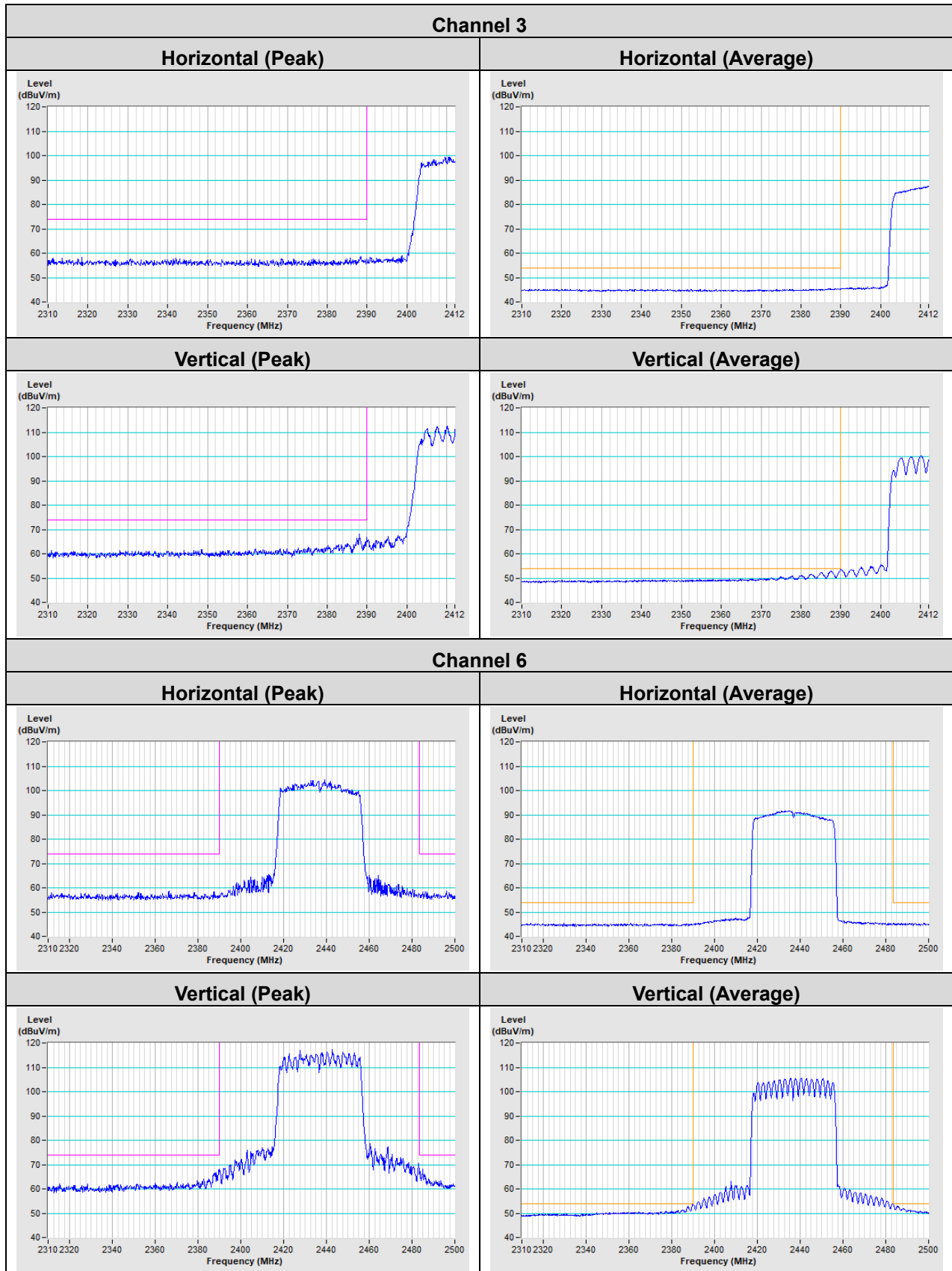
#### Vertical (Peak)



#### Vertical (Average)

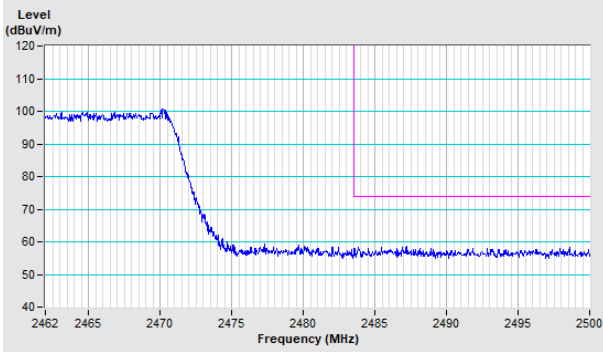


802.11ax (HE40)

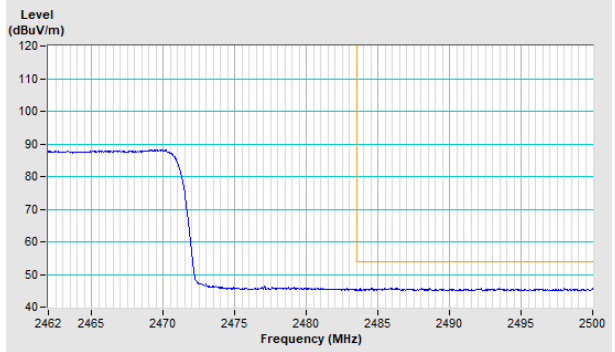


**Channel 9**

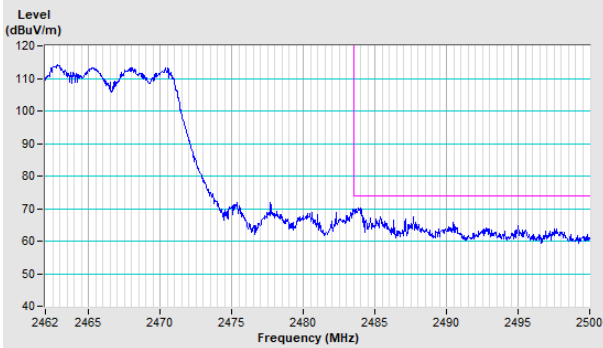
**Horizontal (Peak)**



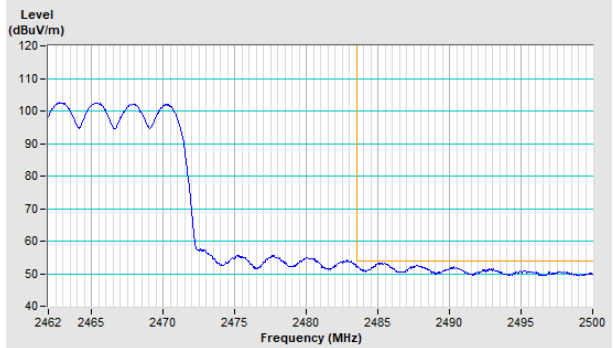
**Horizontal (Average)**



**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:

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

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