

## FCC Test Report

**Report No.:** RFBCKS-WTW-P21100666

**FCC ID:** NKR-XIONEWN

**Test Model:** WNXI11AEIBCO

**Series Model:** WNXIxxAEIxC0 (The fifth and sixth character "xx" can be 0 to 9, A to Z, a to z ; the tenth character "x" can be B=Black, G=Gray and W=White for external body color for product)

**Received Date:** 2021/10/21

**Test Date:** 2021/10/22 ~ 2021/11/15

**Issued Date:** 2021/12/14

**Applicant:** Wistron NeWeb Corp.

**Address:** 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**FCC Registration /  
Designation Number:** 723255 / TW2022



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### Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P21100666	Original release.	2021/12/14

## 1 Certificate of Conformity

**Product:** STB (Set Top Box), XiOne-WN

**Brand:** Xfinity

**Test Model:** WNXI11AEIBCO

**Series Model:** WNXIxxAEIxCO (The fifth and sixth character "xx" can be 0 to 9, A to Z, a to z ; the tenth character "x" can be B=Black, G=Gray and W=White for external body color for product)

**Sample Status:** Engineering sample

**Applicant:** Wistron NeWeb Corp.

**Test Date:** 2021/10/22 ~ 2021/11/15

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

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

**Prepared by :** Vivian Huang , **Date:** 2021/12/14  
Vivian Huang / Specialist

**Approved by :** Clark Lin , **Date:** 2021/12/14  
Clark Lin / Technical Manager

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -7.16 dB at 3.53906 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1 dB at 2390.00 MHz.
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	No antenna connector is used.

### Note:

- For 2.4 GHz band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A.
- 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) ( $\pm$ )
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Conducted emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 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	STB (Set Top Box), XiOne-WN
Brand	Xfinity
Test Model	WNXI11AEIBCO
Series Model	WNXIxxAEIxCO (The fifth and sixth character "xx" can be 0 to 9, A to Z, a to z ; the tenth character "x" can be B=Black, G=Gray and W=White for external body color for product)
Status of EUT	Engineering sample
Power Supply Rating	Refer to Note
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT (20/40) mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11g: up to 54 Mbps 802.11n: up to 300 Mbps VHT: up to 400 Mbps 802.11ax: up to 573.5 Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7
Output Power	<b>CDD Mode:</b> 615.324 mW <b>Beamforming Mode:</b> 615.324 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

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

Brand	Model No.	Description
Xfinity	WNXI11AEIBCO	For marketing purposes.
	WNXIxxAEIxCO (The fifth and sixth character "xx" can be 0 to 9, A to Z, a to z ; the tenth character "x" can be B=Black, G=Gray and W=White for external body color for product)	

From the above models, model: **WNXI11AEIBCO** was selected as representative model for the test and its data was recorded in this report.

- There are WLAN, Bluetooth and Zigbee technology used for the EUT
- Simultaneously transmission condition.

Condition	Technology	
1	WLAN 2.4GHz	Bluetooth
2	WLAN 5GHz	Bluetooth
3	WLAN 2.4GHz	Zigbee
4	WLAN 5GHz	Zigbee

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

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

Antenna NO.	RF Chain NO.	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
1	0	2.93	2.4~2.4835GHz	Printed	NA
		3.84	5.15~5.85GHz		
2	1	2.7	2.4~2.4835GHz	Printed	NA
		4.03	5.15~5.85GHz		
3 (For BT/Zigbee)	2	1.17	2.4~2.4835GHz	Printed	NA

5. The EUT must be supplied with a power adapter and the following different models could be chosen:

No	Brand	Model No.	Spec.
1	AcBel	WAK010	Input: 100-120 Vac, 0.25 A, -60 Hz Output: 5 Vdc, 1.5 A DC output cable (Unshielded, 1.5 m)
2	Leader	ML08-7050150-A1	Input: 100-120 Vac, 0.25 A, ~50/60 Hz Output: 5 Vdc, 1.5 A DC output cable (Unshielded, 1.5 m)

Note: From the above adapters, the AC Power Conducted Emissions and Radiated Emissions test worst case was found in **Adapter No.: 1**. Therefore only the test data of the mode was recorded in this report.

6. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX

Note:

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

7. 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.

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



### 3.2 Description of Test Modes

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

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

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

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

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE $<$ 1G	PLC	APCM	
-	√	√	√	√	-

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

#### **Radiated Emission Test (Above 1GHz):**

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

CDD Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

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

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

CDD Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	11	DSSS	DBPSK	1Mb/s

#### **Power Line Conducted Emission Test:**

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

CDD Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	11	DSSS	DBPSK	1Mb/s

### Antenna Port Conducted Measurement:

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

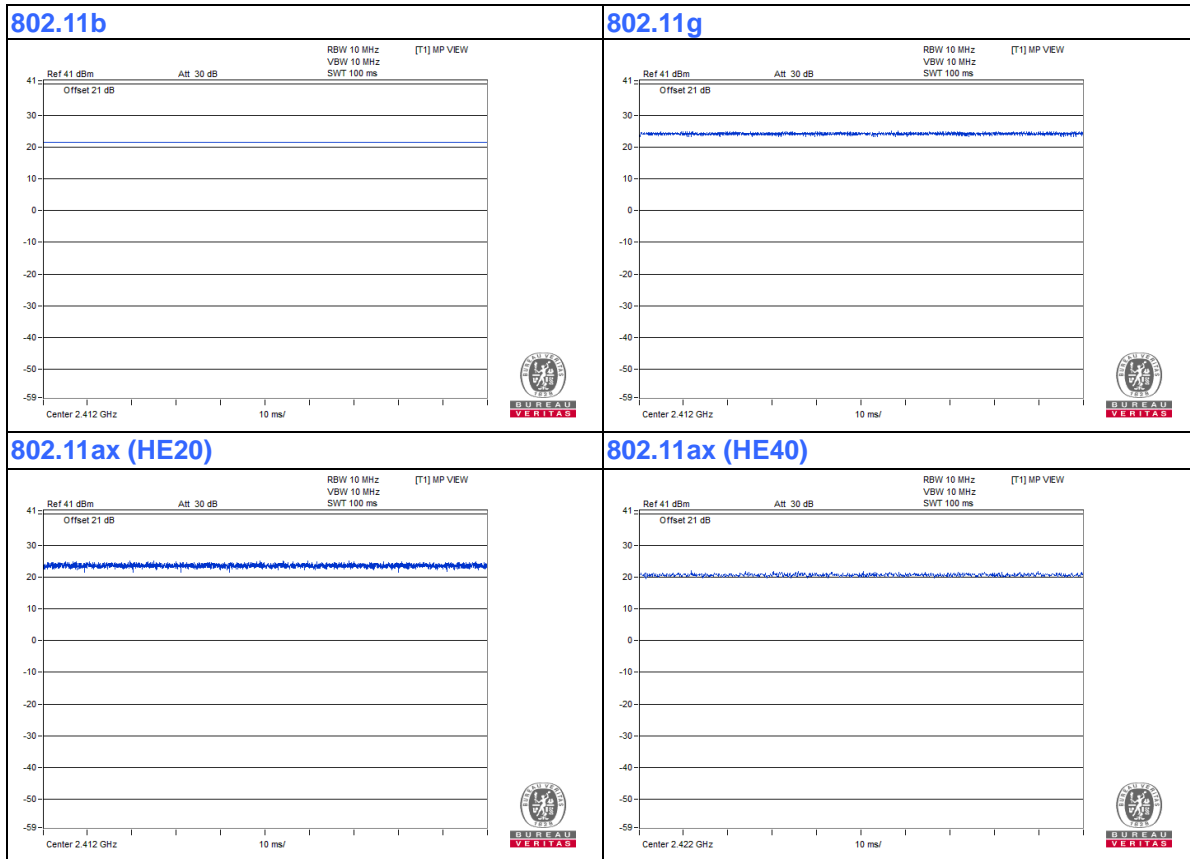
<b>CDD Mode</b>					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
VHT20 (output power only)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40 (output power only)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
<b>Beamforming Mode (output power only)</b>					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

### Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	25deg. C, 66%RH	120Vac, 60Hz	Tom Yang
RE $<$ 1G	25deg. C, 66%RH	120Vac, 60Hz	Tom Yang
PLC	25deg. C, 66%RH	120Vac, 60Hz	Tom Yang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jim Jung

### 3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %, duty factor is not required.



### 3.4 Description of Support Units

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

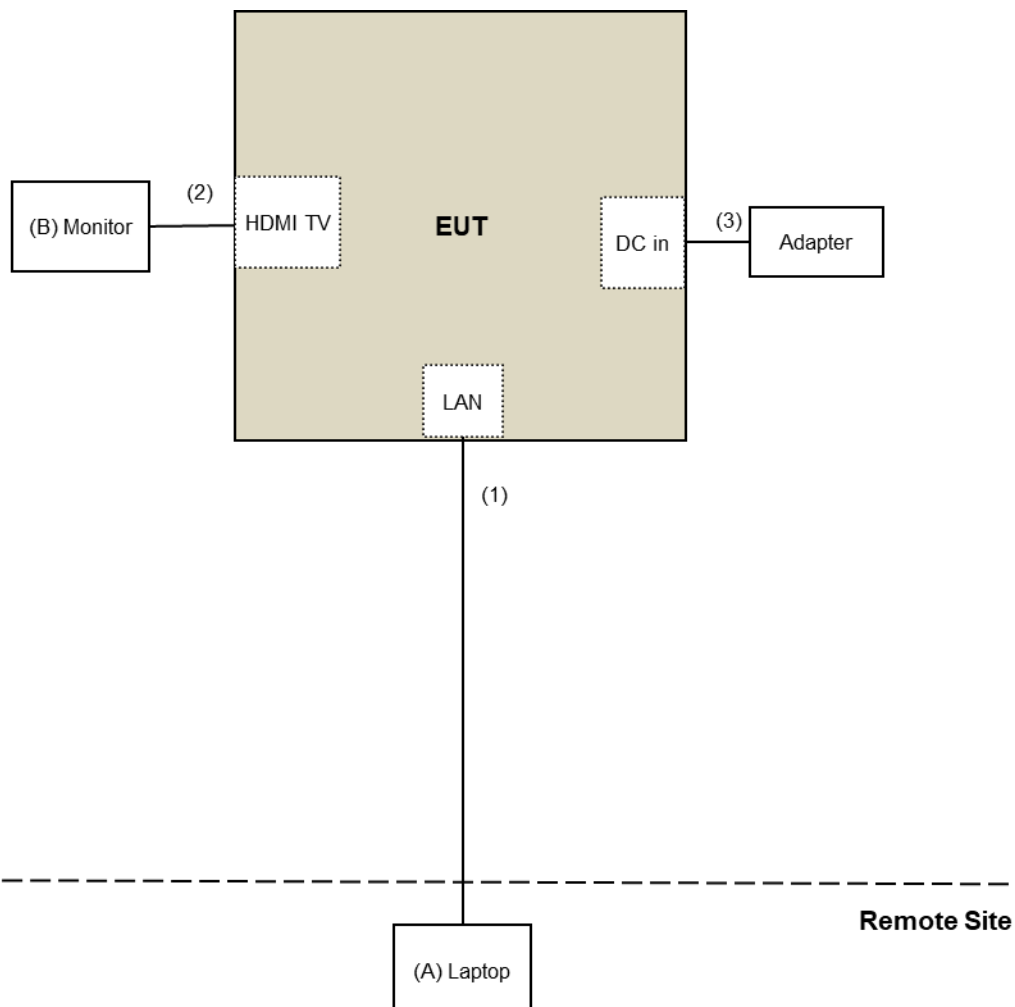
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B.	Monitor	DELL	P2415Q	CN-0J1P7F-QDC0 0-85L-13GB-A09	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	HDMI Cable	1	1.8	Yes	0	Provided by Lab
3.	DC Cable	1	1.5	No	0	Supplied by applicant

#### 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

**For Radiated emission (below 1GHz) & Bandedge test:**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	2020/12/1	2021/11/30
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Pre_Amplifier EMCI	EMC001340	980142	2021/5/24	2022/5/23
LOOP ANTENNA Electro-Metrics	EM-6879	264	2021/3/5	2022/3/4
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2021/1/7	2022/1/6
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-002	2021/1/7	2022/1/6
Pre_Amplifier EMCI	EMC330N	980701	2021/3/10	2022/3/9
Trilog Broadband Antenna Schwarzbeck	VULB 9168	9168-406	2020/11/6	2021/11/5
RF Coaxial Cable COMMATE/PEWC	8D	966-4-1	2021/3/17	2022/3/16
RF Coaxial Cable COMMATE/PEWC	8D	966-4-2	2021/3/17	2022/3/16
RF Coaxial Cable COMMATE/PEWC	8D	966-4-3	2021/3/17	2022/3/16
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-03	2021/1/11	2022/1/10
Horn Antenna SCHWARZBECK	BBHA 9120D	9120D-783	2020/11/22	2021/11/21
Pre_Amplifier EMCI	EMC 12630 SE	980638	2021/4/7	2022/4/6
RF Cable-Frequency Range : 1-26.5GHz EMCI	EMC104-SM-SM-1200	160922	2020/12/25	2021/12/24
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180502	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	180418	2021/4/26	2022/4/25
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170519	2020/11/22	2021/11/21
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: 2021/10/22 ~ 2021/10/28



**For Radiated emission (above 1GHz) test:**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Signal Analyzer Keysight	N9010A	MY56070348	2021/9/15	2022/9/14
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-783	2021/11/14	2022/11/13
Pre_Amplifier EMCI	EMC 12630 SE	980638	2021/4/7	2022/4/6
RF Cable-Frequency Range : 1-26.5GHz EMCI	EMC104-SM-SM-1200	160922	2020/12/25	2021/12/24
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180502	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	180418	2021/4/26	2022/4/25
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170519	2021/11/14	2022/11/13
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: 2021/11/15

**For other test items test:**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	2021/3/8	2022/3/7
Power Meter Anritsu	ML2495A	1529002	2021/6/21	2022/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2021/5/31	2022/5/30
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2021/4/13	2022/4/12
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

**NOTE:**

1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: 2021/11/11

#### 4.1.3 Test Procedures

##### **For Radiated emission below 30MHz**

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

##### **Note:**

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

##### **For Radiated emission above 30MHz**

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

##### **Note:**

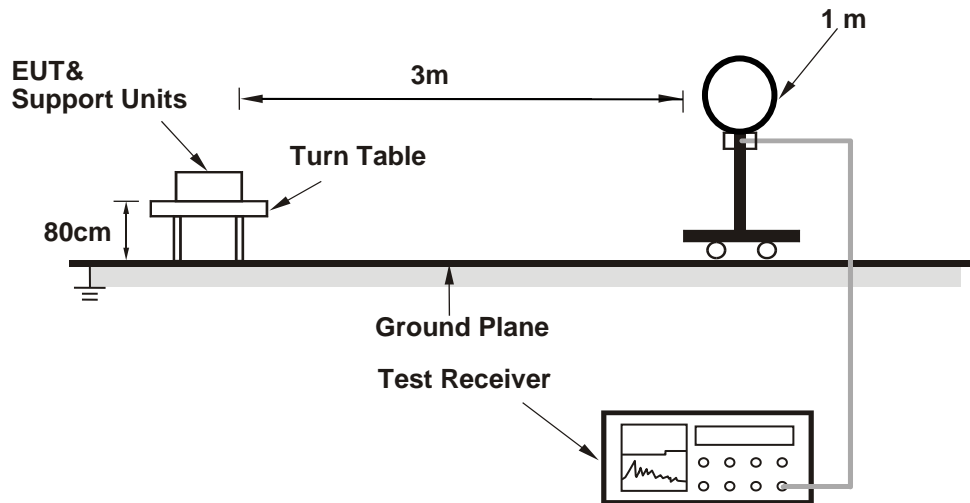
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

#### 4.1.4 Deviation from Test Standard

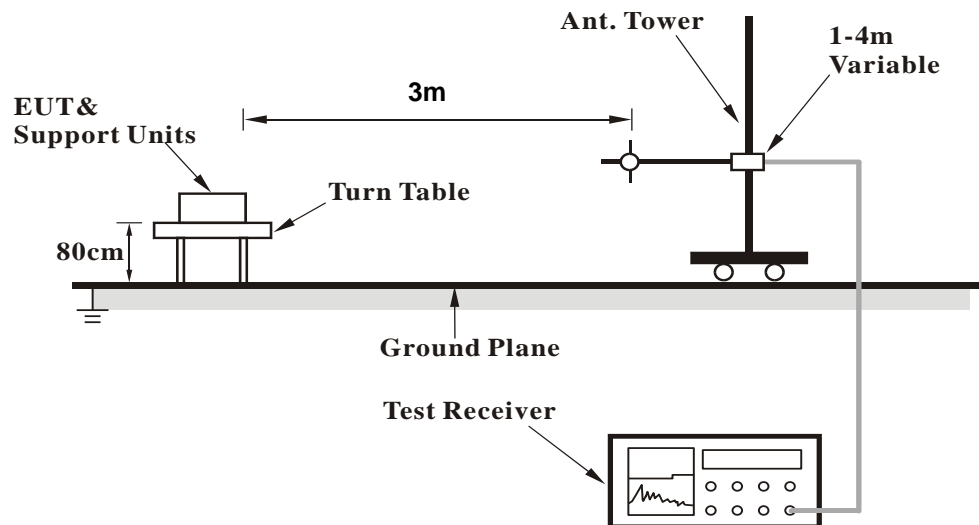
No deviation.

#### 4.1.5 Test Setup

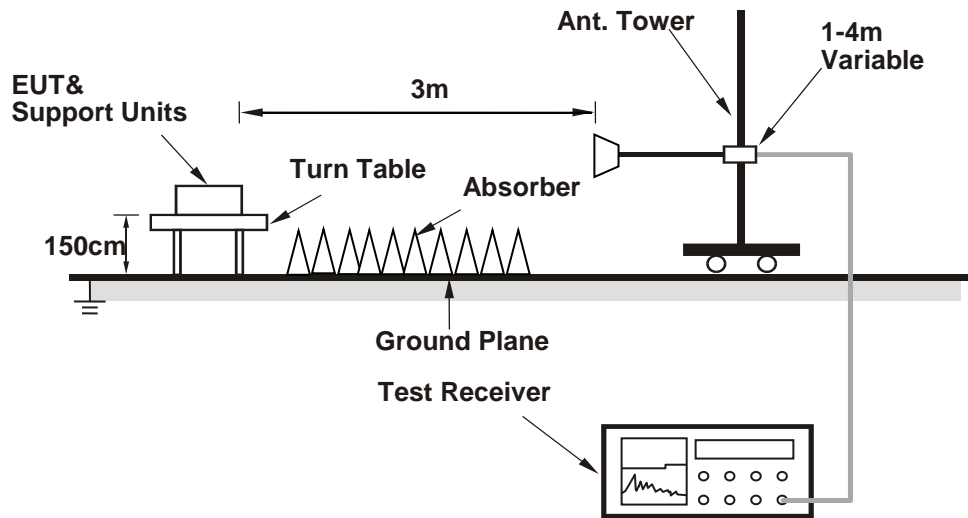
##### For Radiated emission below 30MHz



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



**For Radiated emission above 1GHz**



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

**4.1.6 EUT Operating Conditions**

- a. Connected the EUT with the Laptop Computer which is placed on remote site.
- b. Controlling software (qdart\_conn.win.1.0\_installer\_00089.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

##### Above 1GHz Data:

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.60	58.7 PK	74.0	-15.3	1.28 H	336	62.9	-4.2
2	2387.60	47.2 AV	54.0	-6.8	1.28 H	336	51.4	-4.2
3	*2412.00	113.8 PK			1.28 H	336	118.0	-4.2
4	*2412.00	111.8 AV			1.28 H	336	116.0	-4.2
5	4824.00	39.3 PK	74.0	-34.7	1.14 H	73	38.9	0.4
6	4824.00	33.6 AV	54.0	-20.4	1.14 H	73	33.2	0.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.20	56.2 PK	74.0	-17.8	1.00 V	189	60.4	-4.2
2	2387.20	46.9 AV	54.0	-7.1	1.00 V	189	51.1	-4.2
3	*2412.00	105.0 PK			1.00 V	189	109.2	-4.2
4	*2412.00	103.1 AV			1.00 V	189	107.3	-4.2
5	4824.00	38.8 PK	74.0	-35.2	2.65 V	355	38.4	0.4
6	4824.00	31.0 AV	54.0	-23.0	2.65 V	355	30.6	0.4

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.3 PK	74.0	-17.7	1.29 H	341	60.5	-4.2
2	2390.00	47.2 AV	54.0	-6.8	1.29 H	341	51.4	-4.2
3	*2437.00	114.0 PK			1.29 H	341	118.2	-4.2
4	*2437.00	112.0 AV			1.29 H	341	116.2	-4.2
5	2483.50	56.6 PK	74.0	-17.4	1.29 H	341	60.8	-4.2
6	2483.50	47.1 AV	54.0	-6.9	1.29 H	341	51.3	-4.2
7	4874.00	39.6 PK	74.0	-34.4	1.16 H	68	39.3	0.3
8	4874.00	34.1 AV	54.0	-19.9	1.16 H	68	33.8	0.3
9	7311.00	42.9 PK	74.0	-31.1	2.08 H	143	36.0	6.9
10	7311.00	32.2 AV	54.0	-21.8	2.08 H	143	25.3	6.9

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.4 PK	74.0	-17.6	1.02 V	200	60.6	-4.2
2	2390.00	46.9 AV	54.0	-7.1	1.02 V	200	51.1	-4.2
3	*2437.00	104.5 PK			1.02 V	200	108.7	-4.2
4	*2437.00	102.7 AV			1.02 V	200	106.9	-4.2
5	2483.50	56.6 PK	74.0	-17.4	1.02 V	200	60.8	-4.2
6	2483.50	47.3 AV	54.0	-6.7	1.02 V	200	51.5	-4.2
7	4874.00	38.8 PK	74.0	-35.2	2.63 V	333	38.5	0.3
8	4874.00	30.9 AV	54.0	-23.1	2.63 V	333	30.6	0.3
9	7311.00	43.5 PK	74.0	-30.5	1.73 V	96	36.6	6.9
10	7311.00	32.3 AV	54.0	-21.7	1.73 V	96	25.4	6.9

**Remarks:**

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

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

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	112.8 PK			1.23 H	336	117.0	-4.2
2	*2462.00	110.8 AV			1.23 H	336	115.0	-4.2
3	2483.50	57.9 PK	74.0	-16.1	1.23 H	336	62.1	-4.2
4	2483.50	49.0 AV	54.0	-5.0	1.23 H	336	53.2	-4.2
5	4924.00	39.4 PK	74.0	-34.6	1.12 H	64	38.9	0.5
6	4924.00	33.8 AV	54.0	-20.2	1.12 H	64	33.3	0.5
7	7386.00	42.3 PK	74.0	-31.7	2.10 H	144	35.1	7.2
8	7386.00	31.7 AV	54.0	-22.3	2.10 H	144	24.5	7.2

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.5 PK			1.00 V	3	110.7	-4.2
2	*2462.00	104.3 AV			1.00 V	3	108.5	-4.2
3	2483.50	55.7 PK	74.0	-18.3	1.00 V	0	59.9	-4.2
4	2483.50	46.0 AV	54.0	-8.0	1.00 V	0	50.2	-4.2
5	4924.00	38.9 PK	74.0	-35.1	2.61 V	346	38.4	0.5
6	4924.00	30.8 AV	54.0	-23.2	2.61 V	346	30.3	0.5
7	7386.00	43.6 PK	74.0	-30.4	1.74 V	101	36.4	7.2
8	7386.00	32.1 AV	54.0	-21.9	1.74 V	101	24.9	7.2

**Remarks:**

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

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

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.10	67.3 PK	74.0	-6.7	1.52 H	340	71.5	-4.2
2	<b>2387.10</b>	<b>53.9 AV</b>	<b>54.0</b>	<b>-0.1</b>	<b>1.52 H</b>	<b>340</b>	<b>58.1</b>	<b>-4.2</b>
3	*2412.00	113.9 PK			1.52 H	340	118.1	-4.2
4	*2412.00	105.9 AV			1.52 H	340	110.1	-4.2
5	4824.00	39.9 PK	74.0	-34.1	1.12 H	68	39.5	0.4
6	4824.00	34.5 AV	54.0	-19.5	1.12 H	68	34.1	0.4

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.50	61.1 PK	74.0	-12.9	1.01 V	2	65.3	-4.2
2	2387.50	47.5 AV	54.0	-6.5	1.01 V	2	51.7	-4.2
3	*2412.00	107.1 PK			1.01 V	2	111.3	-4.2
4	*2412.00	97.2 AV			1.01 V	2	101.4	-4.2
5	4824.00	39.0 PK	74.0	-35.0	2.67 V	337	38.6	0.4
6	4824.00	30.9 AV	54.0	-23.1	2.67 V	337	30.5	0.4

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



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

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.8 PK	74.0	-15.2	1.50 H	350	63.0	-4.2
2	2390.00	46.9 AV	54.0	-7.1	1.50 H	350	51.1	-4.2
3	*2437.00	113.5 PK			1.50 H	350	117.7	-4.2
4	*2437.00	105.6 AV			1.50 H	350	109.8	-4.2
5	2483.50	58.1 PK	74.0	-15.9	1.50 H	350	62.3	-4.2
6	2483.50	46.3 AV	54.0	-7.7	1.50 H	350	50.5	-4.2
7	4874.00	39.3 PK	74.0	-34.7	1.19 H	79	39.0	0.3
8	4874.00	33.7 AV	54.0	-20.3	1.19 H	79	33.4	0.3
9	7311.00	43.1 PK	74.0	-30.9	2.09 H	137	36.2	6.9
10	7311.00	32.2 AV	54.0	-21.8	2.09 H	137	25.3	6.9

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.9 PK	74.0	-16.1	1.03 V	6	62.1	-4.2
2	2390.00	46.2 AV	54.0	-7.8	1.03 V	6	50.4	-4.2
3	*2437.00	106.7 PK			1.03 V	6	110.9	-4.2
4	*2437.00	96.9 AV			1.03 V	6	101.1	-4.2
5	2483.50	58.3 PK	74.0	-15.7	1.03 V	6	62.5	-4.2
6	2483.50	46.2 AV	54.0	-7.8	1.03 V	6	50.4	-4.2
7	4874.00	39.2 PK	74.0	-34.8	2.61 V	344	38.9	0.3
8	4874.00	31.3 AV	54.0	-22.7	2.61 V	344	31.0	0.3
9	7311.00	43.3 PK	74.0	-30.7	1.71 V	101	36.4	6.9
10	7311.00	32.1 AV	54.0	-21.9	1.71 V	101	25.2	6.9

**Remarks:**

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	114.1 PK			1.26 H	334	118.3	-4.2
2	*2462.00	106.0 AV			1.26 H	334	110.2	-4.2
3	2483.50	63.9 PK	74.0	-10.1	1.26 H	334	68.1	-4.2
4	2483.50	53.8 AV	54.0	-0.2	1.26 H	334	58.0	-4.2
5	4924.00	39.8 PK	74.0	-34.2	1.12 H	75	39.3	0.5
6	4924.00	34.6 AV	54.0	-19.4	1.12 H	75	34.1	0.5
7	7386.00	43.1 PK	74.0	-30.9	2.03 H	155	35.9	7.2
8	7386.00	32.5 AV	54.0	-21.5	2.03 H	155	25.3	7.2

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.1 PK			1.00 V	3	110.3	-4.2
2	*2462.00	96.1 AV			1.00 V	3	100.3	-4.2
3	2486.40	60.5 PK	74.0	-13.5	1.00 V	3	64.7	-4.2
4	2486.40	46.5 AV	54.0	-7.5	1.00 V	3	50.7	-4.2
5	4924.00	39.1 PK	74.0	-34.9	2.64 V	324	38.6	0.5
6	4924.00	31.2 AV	54.0	-22.8	2.64 V	324	30.7	0.5
7	7386.00	43.9 PK	74.0	-30.1	1.75 V	105	36.7	7.2
8	7386.00	32.6 AV	54.0	-21.4	1.75 V	105	25.4	7.2

**Remarks:**

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

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

**Antenna Polarity & Test Distance : Horizontal at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.4 PK	74.0	-7.6	1.52 H	342	70.6	-4.2
2	2390.00	53.9 AV	54.0	-0.1	1.52 H	342	58.1	-4.2
3	*2412.00	115.2 PK			1.52 H	342	119.4	-4.2
4	*2412.00	105.0 AV			1.52 H	342	109.2	-4.2
5	4824.00	39.5 PK	74.0	-34.5	1.21 H	52	39.1	0.4
6	4824.00	33.9 AV	54.0	-20.1	1.21 H	52	33.5	0.4

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	60.6 PK	74.0	-13.4	1.00 V	1	64.8	-4.2
2	2390.00	49.0 AV	54.0	-5.0	1.00 V	1	53.2	-4.2
3	*2412.00	110.7 PK			1.00 V	1	114.9	-4.2
4	*2412.00	97.3 AV			1.00 V	1	101.5	-4.2
5	4824.00	38.9 PK	74.0	-35.1	2.63 V	336	38.5	0.4
6	4824.00	30.7 AV	54.0	-23.3	2.63 V	336	30.3	0.4

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.1 PK	74.0	-15.9	1.47 H	349	62.3	-4.2
2	2390.00	46.3 AV	54.0	-7.7	1.47 H	349	50.5	-4.2
3	*2437.00	116.3 PK			1.47 H	349	120.5	-4.2
4	*2437.00	105.9 AV			1.47 H	349	110.1	-4.2
5	2483.50	58.3 PK	74.0	-15.7	1.47 H	349	62.5	-4.2
6	2483.50	46.3 AV	54.0	-7.7	1.47 H	349	50.5	-4.2
7	4874.00	39.8 PK	74.0	-34.2	1.20 H	81	39.5	0.3
8	4874.00	34.3 AV	54.0	-19.7	1.20 H	81	34.0	0.3
9	7311.00	43.1 PK	74.0	-30.9	2.12 H	156	36.2	6.9
10	7311.00	32.7 AV	54.0	-21.3	2.12 H	156	25.8	6.9

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.1 PK	74.0	-15.9	1.05 V	5	62.3	-4.2
2	2390.00	46.3 AV	54.0	-7.7	1.05 V	5	50.5	-4.2
3	*2437.00	111.5 PK			1.05 V	5	115.7	-4.2
4	*2437.00	98.0 AV			1.05 V	5	102.2	-4.2
5	2483.50	58.9 PK	74.0	-15.1	1.05 V	5	63.1	-4.2
6	2483.50	46.7 AV	54.0	-7.3	1.05 V	5	50.9	-4.2
7	4874.00	39.2 PK	74.0	-34.8	2.63 V	341	38.9	0.3
8	4874.00	31.2 AV	54.0	-22.8	2.63 V	341	30.9	0.3
9	7311.00	43.1 PK	74.0	-30.9	1.74 V	98	36.2	6.9
10	7311.00	32.1 AV	54.0	-21.9	1.74 V	98	25.2	6.9

**Remarks:**

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	114.9 PK			1.25 H	335	119.1	-4.2
2	*2462.00	103.8 AV			1.25 H	335	108.0	-4.2
3	2483.50	64.3 PK	74.0	-9.7	1.25 H	335	68.5	-4.2
4	2483.50	53.7 AV	54.0	-0.3	1.25 H	335	57.9	-4.2
5	4924.00	39.7 PK	74.0	-34.3	1.15 H	66	39.2	0.5
6	4924.00	34.0 AV	54.0	-20.0	1.15 H	66	33.5	0.5
7	7386.00	42.7 PK	74.0	-31.3	2.08 H	140	35.5	7.2
8	7386.00	32.1 AV	54.0	-21.9	2.08 H	140	24.9	7.2

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	107.6 PK			1.00 V	359	111.8	-4.2
2	*2462.00	94.4 AV			1.00 V	359	98.6	-4.2
3	2483.50	58.4 PK	74.0	-15.6	1.00 V	359	62.6	-4.2
4	2483.50	46.5 AV	54.0	-7.5	1.00 V	359	50.7	-4.2
5	4924.00	38.6 PK	74.0	-35.4	2.59 V	337	38.1	0.5
6	4924.00	30.9 AV	54.0	-23.1	2.59 V	337	30.4	0.5
7	7386.00	43.4 PK	74.0	-30.6	1.75 V	107	36.2	7.2
8	7386.00	32.2 AV	54.0	-21.8	1.75 V	107	25.0	7.2

**Remarks:**

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	68.5 PK	74.0	-5.5	1.52 H	341	72.7	-4.2
2	2390.00	53.9 AV	54.0	-0.1	1.52 H	341	58.1	-4.2
3	*2422.00	112.6 PK			1.52 H	341	116.8	-4.2
4	*2422.00	101.7 AV			1.52 H	341	105.9	-4.2
5	4844.00	40.1 PK	74.0	-33.9	1.17 H	74	39.8	0.3
6	4844.00	34.5 AV	54.0	-19.5	1.17 H	74	34.2	0.3
7	7266.00	43.3 PK	74.0	-30.7	2.11 H	133	36.5	6.8
8	7266.00	32.6 AV	54.0	-21.4	2.11 H	133	25.8	6.8

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	66.2 PK	74.0	-7.8	1.00 V	3	70.4	-4.2
2	2390.00	48.6 AV	54.0	-5.4	1.00 V	3	52.8	-4.2
3	*2422.00	104.9 PK			1.00 V	3	109.1	-4.2
4	*2422.00	92.9 AV			1.00 V	3	97.1	-4.2
5	4844.00	38.7 PK	74.0	-35.3	2.66 V	340	38.4	0.3
6	4844.00	30.7 AV	54.0	-23.3	2.66 V	340	30.4	0.3
7	7266.00	42.8 PK	74.0	-31.2	1.78 V	110	36.0	6.8
8	7266.00	31.9 AV	54.0	-22.1	1.78 V	110	25.1	6.8

**Remarks:**

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	65.3 PK	74.0	-8.7	1.49 H	340	69.5	-4.2
2	2390.00	53.7 AV	54.0	-0.3	1.49 H	340	57.9	-4.2
3	*2437.00	112.8 PK			1.49 H	340	117.0	-4.2
4	*2437.00	101.4 AV			1.49 H	340	105.6	-4.2
5	2483.50	62.2 PK	74.0	-11.8	1.49 H	340	66.4	-4.2
6	2483.50	50.3 AV	54.0	-3.7	1.49 H	340	54.5	-4.2
7	4874.00	39.5 PK	74.0	-34.5	1.20 H	83	39.2	0.3
8	4874.00	33.8 AV	54.0	-20.2	1.20 H	83	33.5	0.3
9	7311.00	42.5 PK	74.0	-31.5	2.05 H	153	35.6	6.9
10	7311.00	31.8 AV	54.0	-22.2	2.05 H	153	24.9	6.9

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	58.5 PK	74.0	-15.5	1.08 V	14	62.7	-4.2
2	2390.00	46.9 AV	54.0	-7.1	1.08 V	14	51.1	-4.2
3	*2437.00	105.8 PK			1.08 V	14	110.0	-4.2
4	*2437.00	93.7 AV			1.08 V	14	97.9	-4.2
5	2483.50	58.2 PK	74.0	-15.8	1.08 V	14	62.4	-4.2
6	2483.50	46.5 AV	54.0	-7.5	1.08 V	14	50.7	-4.2
7	4874.00	38.5 PK	74.0	-35.5	2.61 V	324	38.2	0.3
8	4874.00	30.8 AV	54.0	-23.2	2.61 V	324	30.5	0.3
9	7311.00	43.6 PK	74.0	-30.4	1.77 V	100	36.7	6.9
10	7311.00	32.2 AV	54.0	-21.8	1.77 V	100	25.3	6.9

**Remarks:**

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	109.7 PK			1.48 H	339	113.9	-4.2
2	*2452.00	100.0 AV			1.48 H	339	104.2	-4.2
3	2483.50	62.1 PK	74.0	-11.9	1.48 H	339	66.3	-4.2
4	2483.50	53.7 AV	54.0	-0.3	1.48 H	339	57.9	-4.2
5	4904.00	39.8 PK	74.0	-34.2	1.22 H	55	39.4	0.4
6	4904.00	34.2 AV	54.0	-19.8	1.22 H	55	33.8	0.4
7	7356.00	43.1 PK	74.0	-30.9	2.09 H	152	36.0	7.1
8	7356.00	32.2 AV	54.0	-21.8	2.09 H	152	25.1	7.1

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2452.00	103.4 PK			1.00 V	360	107.6	-4.2
2	*2452.00	91.6 AV			1.00 V	360	95.8	-4.2
3	2483.50	64.9 PK	74.0	-9.1	1.00 V	360	69.1	-4.2
4	2483.50	47.4 AV	54.0	-6.6	1.00 V	360	51.6	-4.2
5	4904.00	38.4 PK	74.0	-35.6	2.64 V	317	38.0	0.4
6	4904.00	30.5 AV	54.0	-23.5	2.64 V	317	30.1	0.4
7	7356.00	43.4 PK	74.0	-30.6	1.68 V	101	36.3	7.1
8	7356.00	32.1 AV	54.0	-21.9	1.68 V	101	25.0	7.1

**Remarks:**

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



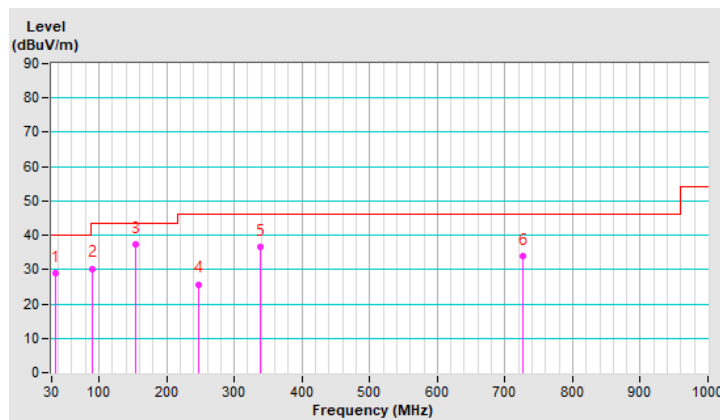
### Below 1GHz Data:

<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 11 : 2462 MHz
<b>Frequency Range</b>	9kHz ~ 1GHz	<b>Detector Function</b>	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.53	29.0 QP	40.0	-11.0	3.00 H	340	42.5	-13.5
2	90.55	30.3 QP	43.5	-13.2	2.00 H	323	48.5	-18.2
3	153.26	37.5 QP	43.5	-6.0	2.00 H	323	49.5	-12.0
4	247.18	25.7 QP	46.0	-20.3	2.00 H	0	38.5	-12.8
5	338.68	36.6 QP	46.0	-9.4	1.00 H	146	46.3	-9.7
6	726.73	34.0 QP	46.0	-12.0	1.00 H	174	34.0	0.0

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



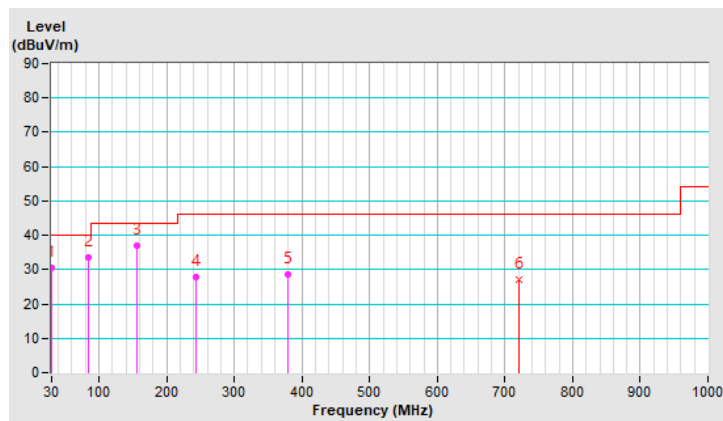
RF Mode	TX 802.11b	Channel	CH 11 : 2462 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

**Antenna Polarity & Test Distance : Vertical at 3 m**

No	Frequency (MHz)	Emission Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBUV)	Correction Factor (dB/m)
1	30.48	30.6 QP	40.0	-9.4	1.00 V	153	44.2	-13.6
2	83.96	33.7 QP	40.0	-6.3	1.50 V	161	51.8	-18.1
3	155.13	37.0 QP	43.5	-6.5	1.00 V	0	48.8	-11.8
4	243.69	27.8 QP	46.0	-18.2	1.00 V	274	40.8	-13.0
5	379.54	28.5 QP	46.0	-17.5	1.00 V	196	36.9	-8.4
6	721.29	27.0 QP	46.0	-19.0	1.00 V	148	27.2	-0.2

**Remarks:**

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



## 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### 4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	2021/10/13	2022/10/12
LISN R&S	ESH3-Z5	848773/004	2021/10/29	2022/10/28
LISN R & S	ESH3-Z5	835239/001	2021/3/26	2022/3/25
50 ohms Terminator	50	3	2021/10/27	2022/10/26
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2021/9/25	2022/9/24
Fixed attenuator STI	STI02-2200-10	005	2021/8/27	2022/8/26
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

**Note:**

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: 2021/10/29

#### 4.2.3 Test Procedures

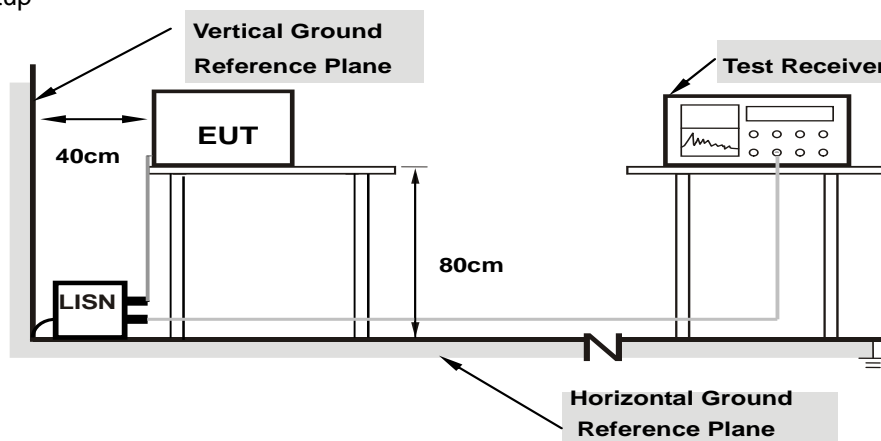
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

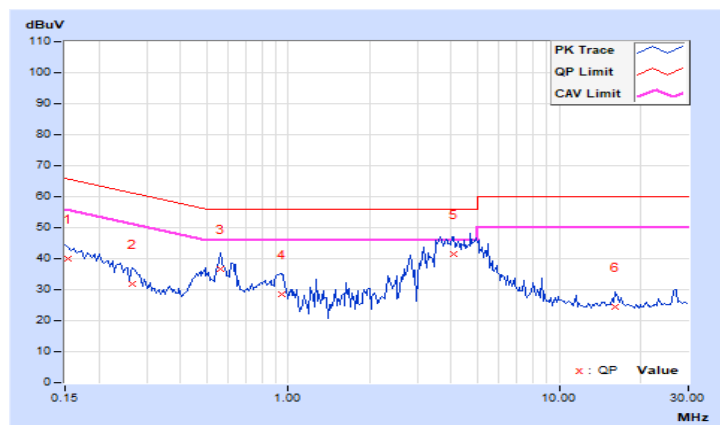
## 4.2.7 Test Results

<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 11 : 2462 MHz
<b>Frequency Range</b>	150kHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.07	29.96	19.94	40.03	30.01	65.79	55.79	-25.76	-25.78
2	0.26719	10.09	21.73	10.40	31.82	20.49	61.20	51.20	-29.38	-30.71
3	0.56406	10.12	26.69	20.69	36.81	30.81	56.00	46.00	-19.19	-15.19
4	0.94297	10.15	18.29	9.88	28.44	20.03	56.00	46.00	-27.56	-25.97
5	4.07813	10.36	31.28	15.81	41.64	26.17	56.00	46.00	-14.36	-19.83
6	16.16797	11.27	13.00	3.99	24.27	15.26	60.00	50.00	-35.73	-34.74

## 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

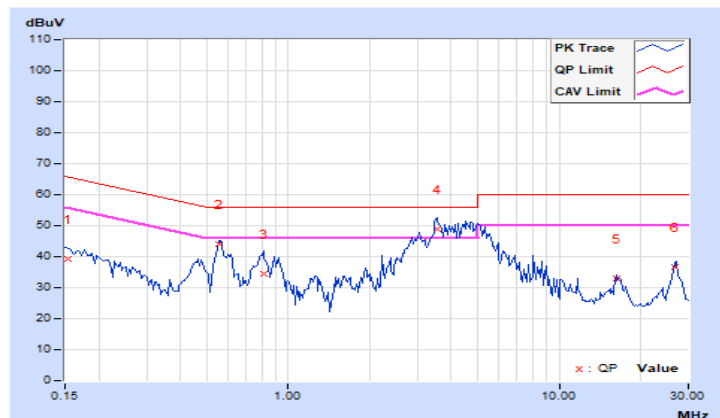


<b>RF Mode</b>	TX 802.11b	<b>Channel</b>	CH 11 : 2462 MHz
<b>Frequency Range</b>	150kHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.05	29.31	20.94	39.36	30.99	65.79	55.79	-26.43	-24.80
2	0.55625	10.11	33.91	26.48	44.02	36.59	56.00	46.00	-11.98	-9.41
3	0.81406	10.13	24.19	16.84	34.32	26.97	56.00	46.00	-21.68	-19.03
<b>4</b>	<b>3.53906</b>	<b>10.30</b>	<b>38.54</b>	<b>22.65</b>	<b>48.84</b>	<b>32.95</b>	<b>56.00</b>	<b>46.00</b>	<b>-7.16</b>	<b>-13.05</b>
5	16.23047	11.06	21.76	17.13	32.82	28.19	60.00	50.00	-27.18	-21.81
6	26.64844	11.36	25.47	22.69	36.83	34.05	60.00	50.00	-23.17	-15.95

**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

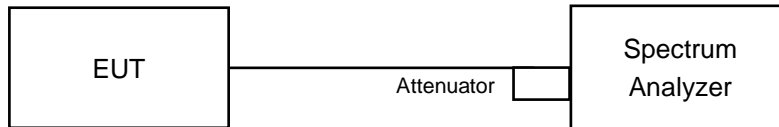


### 4.3 6dB Bandwidth Measurement

#### 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)  $\geq 3 \times$  RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

#### 4.3.5 Deviation from Test Standard

No deviation.

#### 4.3.6 EUT Operating Conditions

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

#### 4.3.7 Test Result

##### 802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.6	8.14	0.5	Pass
6	2437	8.12	8.14	0.5	Pass
11	2462	8.02	8.14	0.5	Pass

##### 802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.87	16.05	0.5	Pass
6	2437	16.05	16.05	0.5	Pass
11	2462	15.81	16.04	0.5	Pass

##### 802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	18.24	18.3	0.5	Pass
6	2437	18.62	17.71	0.5	Pass
11	2462	18.46	17.81	0.5	Pass

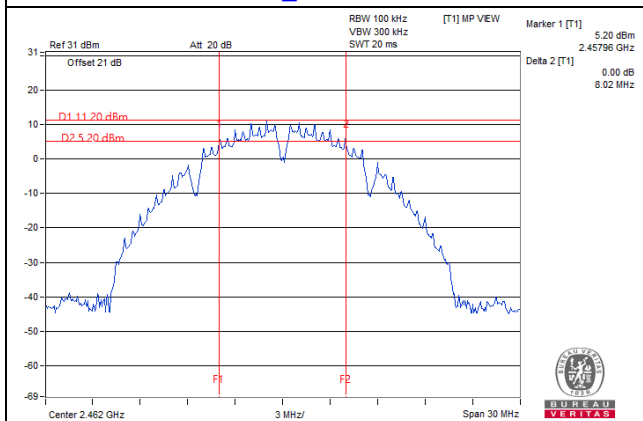
##### 802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	37.48	37.41	0.5	Pass
6	2437	37.75	37.07	0.5	Pass
9	2452	37.68	36.22	0.5	Pass

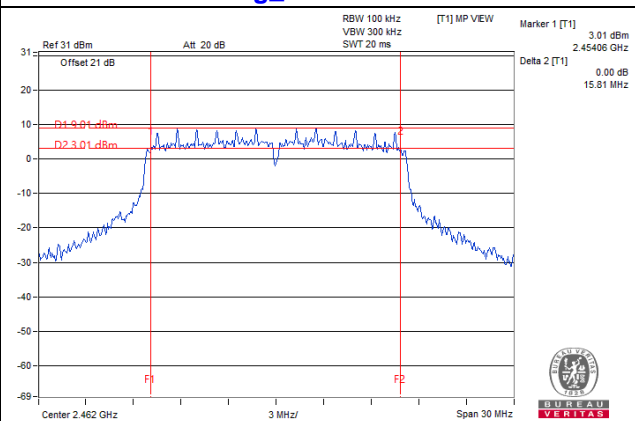


Spectrum Plot of Worst Value

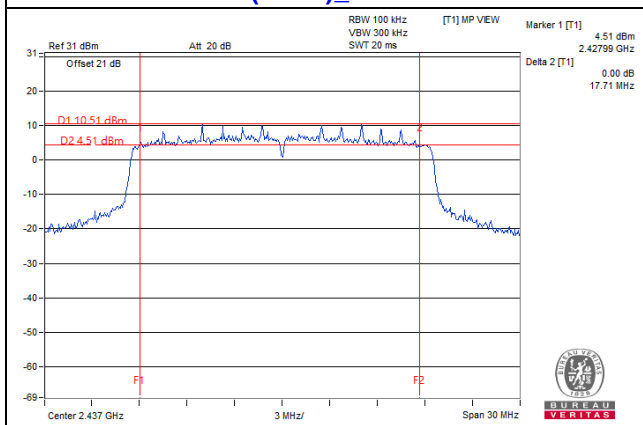
802.11b\_Chain 0 / CH1



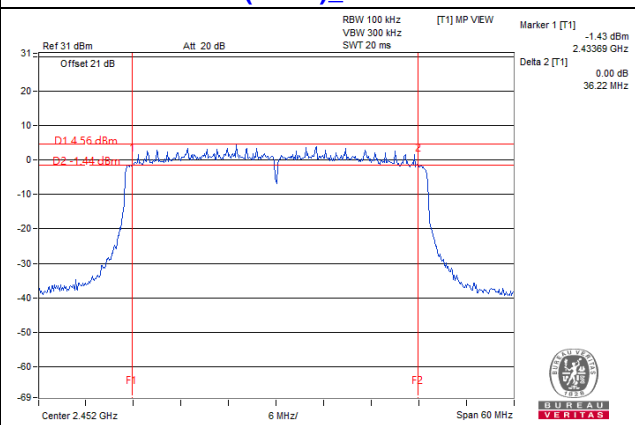
802.11g\_Chain 0 / CH1



802.11ax (HE20)\_Chain 1 / CH6



802.11ax (HE40)\_Chain 1 / CH9



## 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,

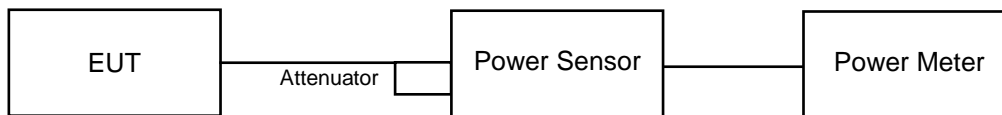
Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

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

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

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

### 4.4.5 Deviation from Test Standard

No deviation.

### 4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

#### 4.4.7 Test Results

#### FOR PEAK POWER

#### CDD Mode

#### 802.11b

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.33	23.86	514.24	27.11	30	Pass
6	2437	24.08	23.69	489.742	26.90	30	Pass
11	2462	24.15	23.63	490.691	26.91	30	Pass

#### 802.11g

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.88	24.82	610.999	27.86	30	Pass
6	2437	24.62	24.52	572.874	27.58	30	Pass
11	2462	24.04	24.12	511.739	27.09	30	Pass

#### VHT20

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.78	24.75	599.146	27.78	30	Pass
6	2437	24.63	24.63	580.805	27.64	30	Pass
11	2462	23.77	23.78	477.013	26.79	30	Pass

#### VHT40

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	24.13	24.06	513.504	27.11	30	Pass
6	2437	24.38	24.28	542.074	27.34	30	Pass
9	2452	23.54	23.49	449.301	26.53	30	Pass

**802.11ax (HE20)**

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.96	24.80	615.324	27.89	30	Pass
6	2437	24.73	24.64	588.238	27.70	30	Pass
11	2462	24.08	23.96	504.744	27.03	30	Pass

**802.11ax (HE40)**

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	24.28	24.14	527.335	27.22	30	Pass
6	2437	24.47	24.39	554.688	27.44	30	Pass
9	2452	23.69	23.52	458.789	26.62	30	Pass

## Beamforming Mode

### VHT20

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.78	24.75	599.146	27.78	30	Pass
6	2437	24.63	24.63	580.805	27.64	30	Pass
11	2462	23.77	23.78	477.013	26.79	30	Pass

**Note:** The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.83 \text{ dBi} < 6\text{dBi}$ , so the output power limit shall not be reduced.

### VHT40

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	24.13	24.06	513.504	27.11	30	Pass
6	2437	24.38	24.28	542.074	27.34	30	Pass
9	2452	23.54	23.49	449.301	26.53	30	Pass

**Note:** The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.83 \text{ dBi} < 6\text{dBi}$ , so the output power limit shall not be reduced.

### 802.11ax (HE20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	24.96	24.80	615.324	27.89	30	Pass
6	2437	24.73	24.64	588.238	27.70	30	Pass
11	2462	24.08	23.96	504.744	27.03	30	Pass

**Note:** The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.83 \text{ dBi} < 6\text{dBi}$ , so the output power limit shall not be reduced.

**802.11ax (HE40)**

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	24.28	24.14	527.335	27.22	30	Pass
6	2437	24.47	24.39	554.688	27.44	30	Pass
9	2452	23.69	23.52	458.789	26.62	30	Pass

**Note:** The directional gain =  $10 \log[(10^{G_0/20} + 10^{G_1/20})^2 / 2] = 5.83 \text{ dBi} < 6 \text{ dBi}$ , so the output power limit shall not be reduced.

## FOR AVERAGE POWER

### CDD Mode

#### 802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	22.17	21.61	309.693	24.91
6	2437	22.00	21.52	300.395	24.78
11	2462	22.29	21.51	311.013	24.93

#### 802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	20.46	20.53	224.153	23.51
6	2437	20.56	20.81	234.266	23.70
11	2462	19.52	19.85	186.142	22.70

#### VHT20

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	19.74	19.72	187.945	22.74
6	2437	20.33	20.49	219.838	23.42
11	2462	18.31	18.52	138.886	21.43

#### VHT40

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	18.67	18.49	144.252	21.59
6	2437	19.40	19.51	176.427	22.47
9	2452	17.77	17.70	118.726	20.75

**802.11ax (HE20)**

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	19.84	19.77	191.225	22.82
6	2437	20.40	20.56	223.411	23.49
11	2462	18.39	18.58	141.135	21.50

**802.11ax (HE40)**

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	18.73	18.58	146.756	21.67
6	2437	19.45	19.59	179.096	22.53
9	2452	17.86	17.76	120.798	20.82



**Beamforming Mode:**
**VHT20**

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	19.74	19.72	187.945	22.74
6	2437	20.33	20.49	219.838	23.42
11	2462	18.31	18.52	138.886	21.43

**VHT40**

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	18.67	18.49	144.252	21.59
6	2437	19.40	19.51	176.427	22.47
9	2452	17.77	17.70	118.726	20.75

**802.11ax (HE20)**

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	19.84	19.77	191.225	22.82
6	2437	20.40	20.56	223.411	23.49
11	2462	18.39	18.58	141.135	21.50

**802.11ax (HE40)**

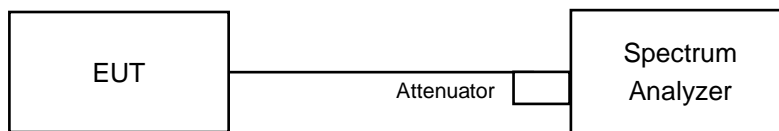
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	18.73	18.58	146.756	21.67
6	2437	19.45	19.59	179.096	22.53
9	2452	17.86	17.76	120.798	20.82

## 4.5 Power Spectral Density Measurement

### 4.5.1 Limits of Power Spectral Density Measurement

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

### 4.5.2 Test Setup



### 4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.5.4 Test Procedure

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

### 4.5.5 Deviation from Test Standard

No deviation.

### 4.5.6 EUT Operating Condition

Same as Item 4.3.6

#### 4.5.7 Test Results

##### 802.11b

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-3.98	-7.16	-2.27	8.00	Pass
6	2437	-4.76	-4.50	-1.62	8.00	Pass
11	2462	-5.70	-5.37	-2.52	8.00	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.  
 2. The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.83 \text{ dBi} < 6\text{dBi}$ , so the power density limit shall not be reduced.

##### 802.11g

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-5.78	-5.51	-2.63	8.00	Pass
6	2437	-4.77	-4.40	-1.57	8.00	Pass
11	2462	-6.20	-5.41	-2.78	8.00	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.  
 2. The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.83 \text{ dBi} < 6\text{dBi}$ , so the power density limit shall not be reduced.

##### 802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
1	2412	-6.53	-5.52	-2.99	8.00	Pass
6	2437	-4.97	-5.64	-2.28	8.00	Pass
11	2462	-6.73	-7.67	-4.16	8.00	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.  
 2. The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.83 \text{ dBi} < 6\text{dBi}$ , so the power density limit shall not be reduced.

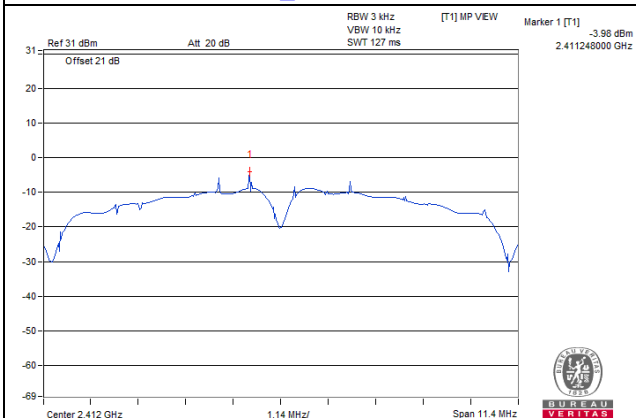
##### 802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
		Chain 0	Chain 1			
3	2422	-10.06	-9.63	-6.83	8.00	Pass
6	2437	-9.77	-9.42	-6.58	8.00	Pass
9	2452	-10.99	-10.76	-7.86	8.00	Pass

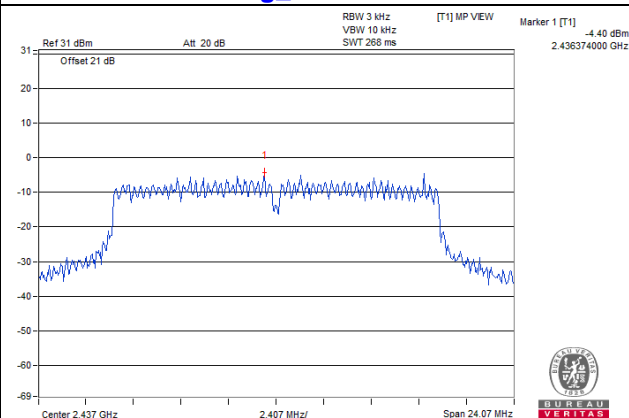
- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.  
 2. The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 5.83 \text{ dBi} < 6\text{dBi}$ , so the power density limit shall not be reduced.

### Spectrum Plot of Worst Value

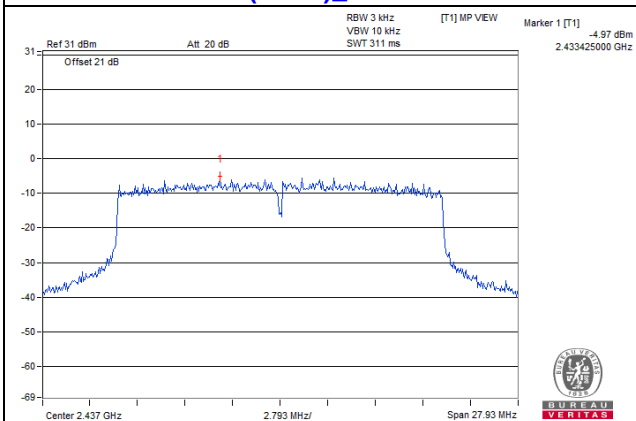
#### 802.11b\_Chain 0 / CH1



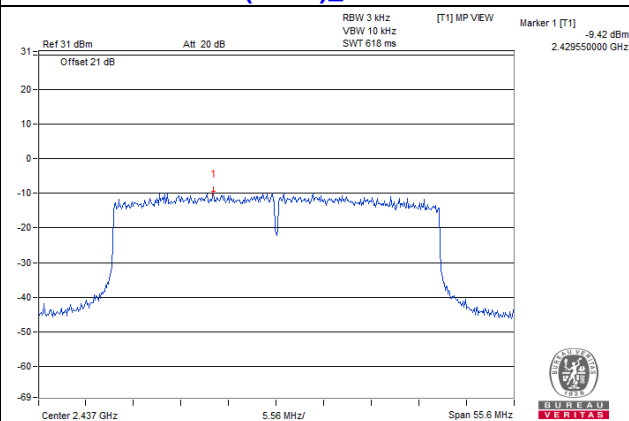
#### 802.11g\_Chain 1 / CH6



#### 802.11ax (HE20)\_Chain 0 / CH6



#### 802.11ax (HE40)\_Chain 1 / CH6

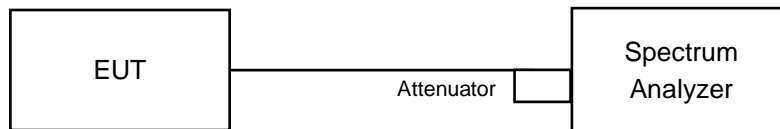


## 4.6 Conducted Out of Band Emission Measurement

### 4.6.1 Limits of Conducted Out of Band Emission Measurement

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

### 4.6.2 Test Setup



### 4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 Test Procedure

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  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 OOBE

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

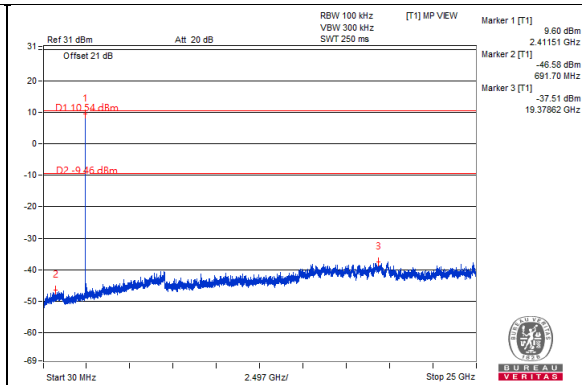
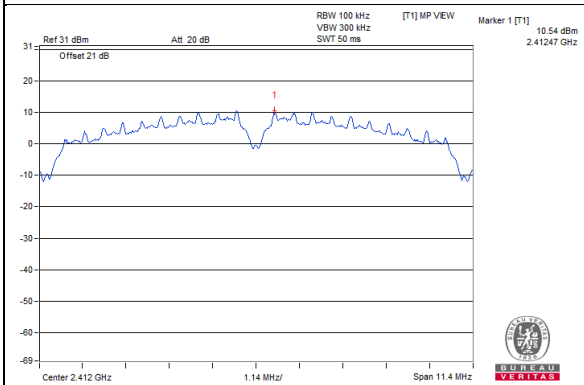
Same as Item 4.3.6

### 4.6.7 Test Results

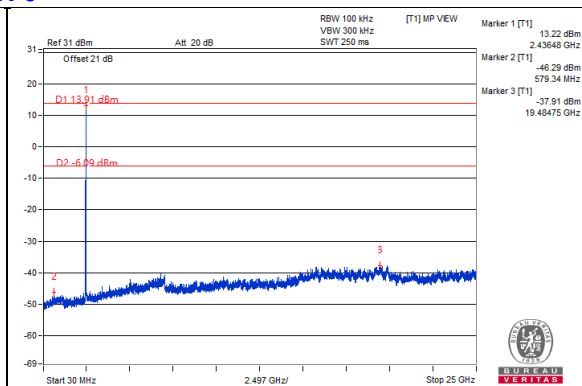
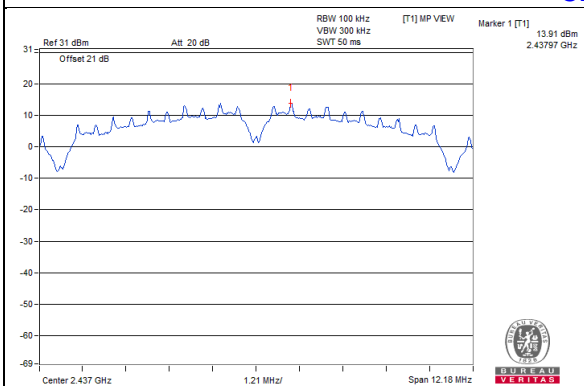
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b  
Chain 0

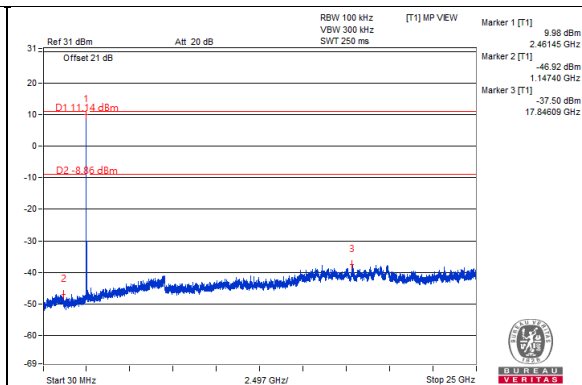
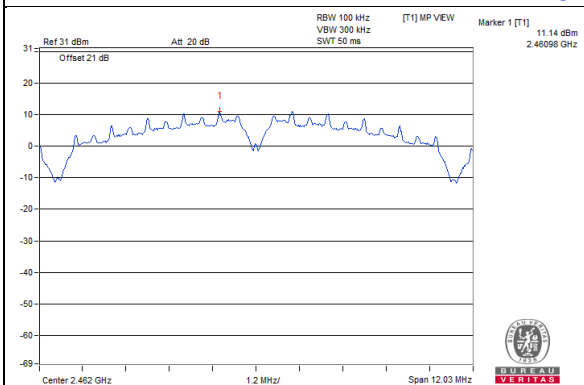
CH 1



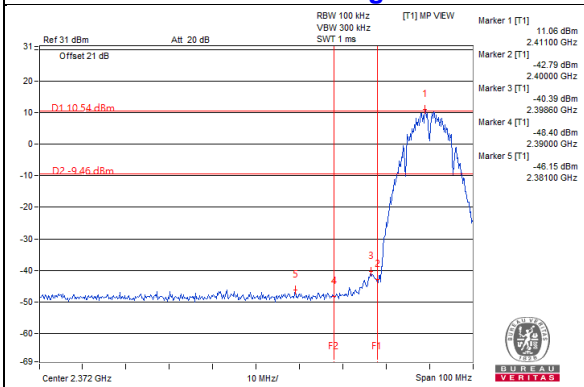
CH 6



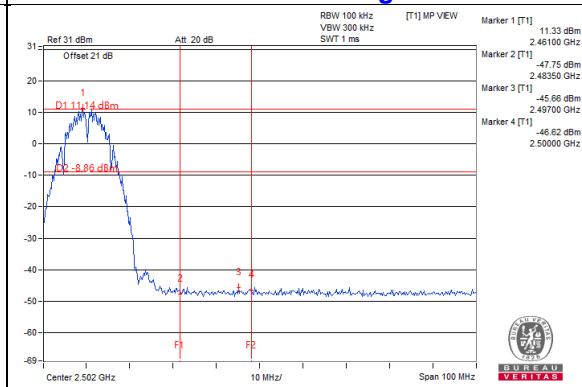
CH 11



CH 1 Band edge

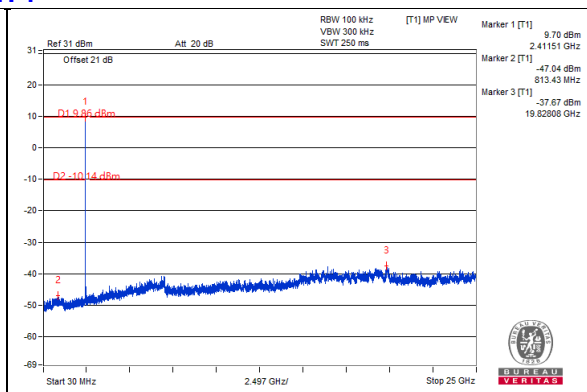
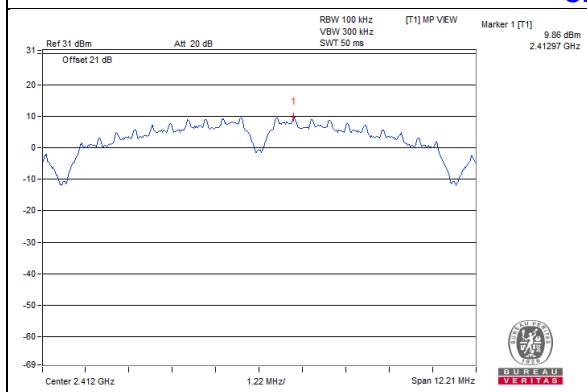


CH 11 Band edge

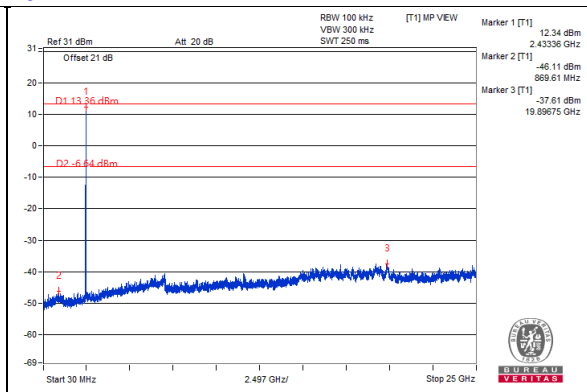
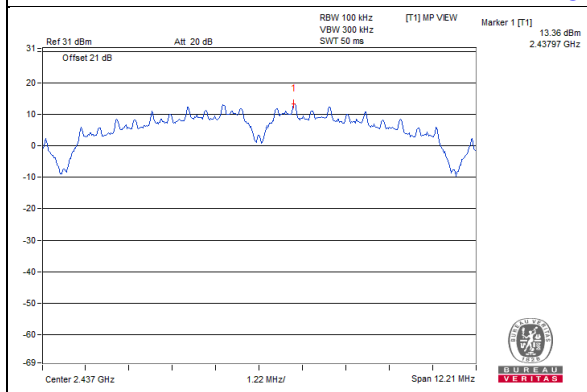


Chain 1

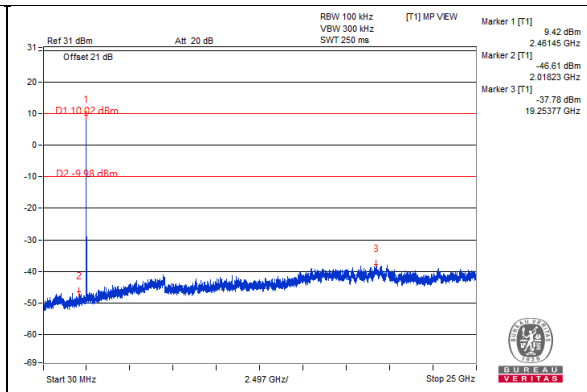
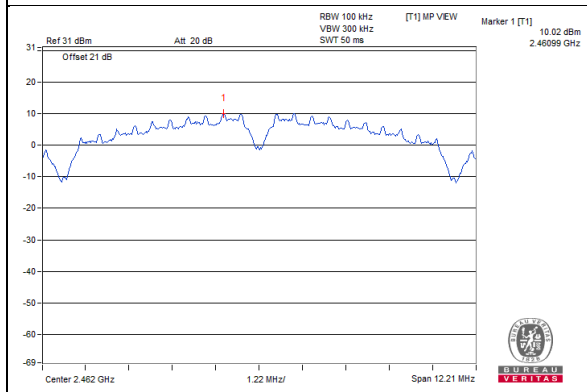
CH 1



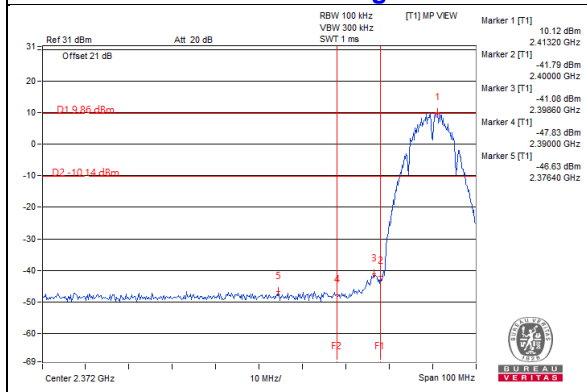
CH 6



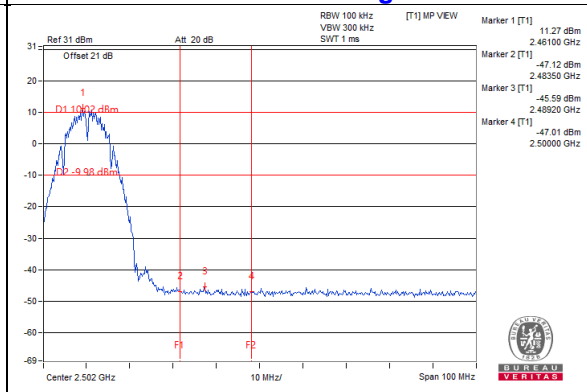
CH 11



CH 1 Band edge

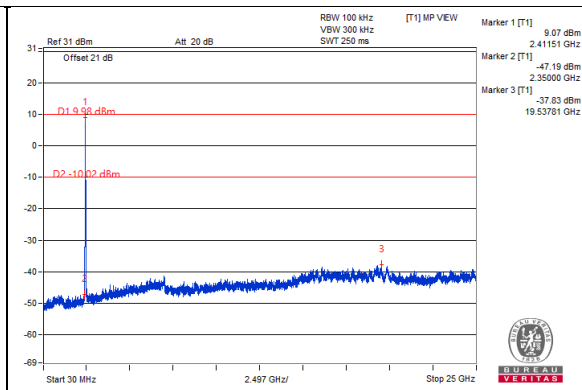
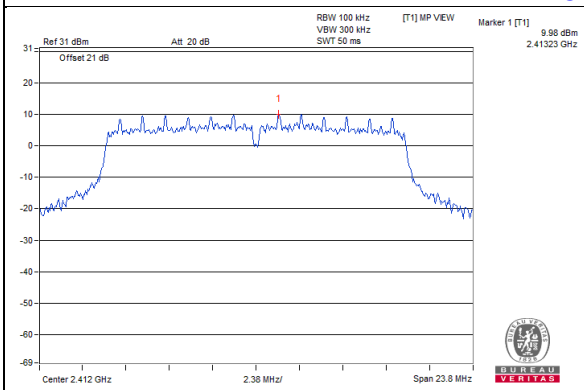


CH 11 Band edge

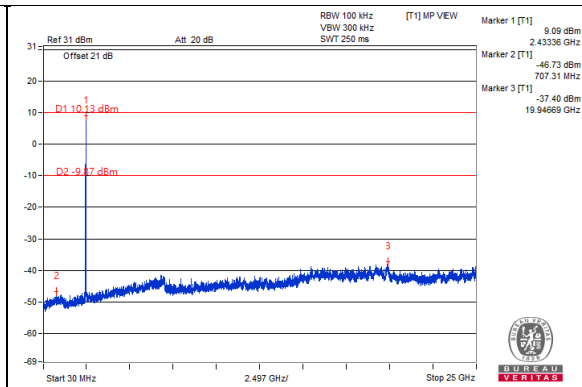
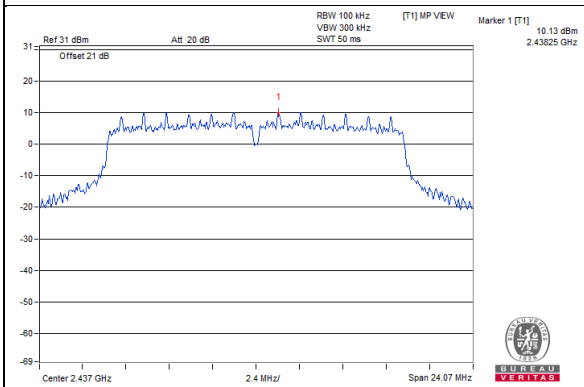


**802.11g  
Chain 0**

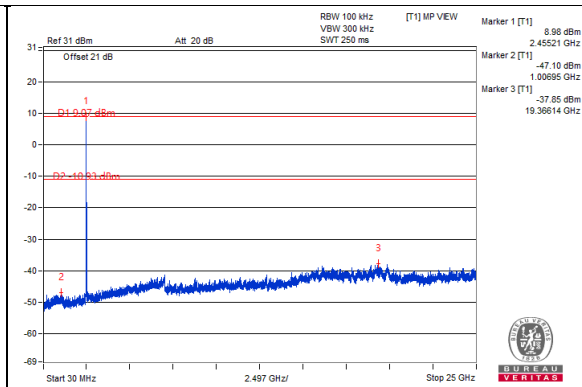
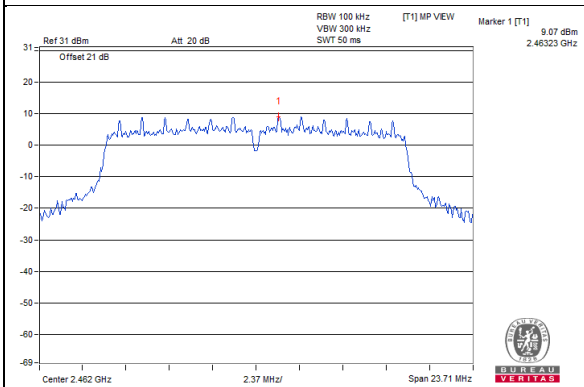
**CH 1**



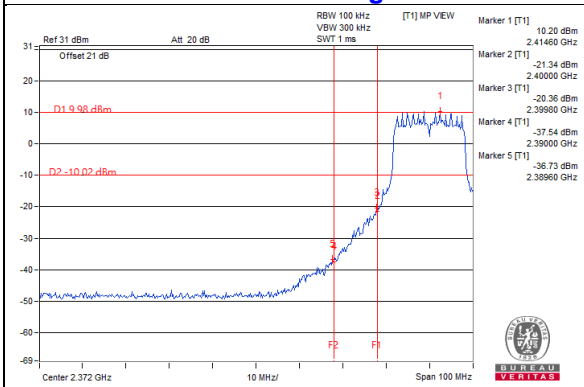
**CH 6**



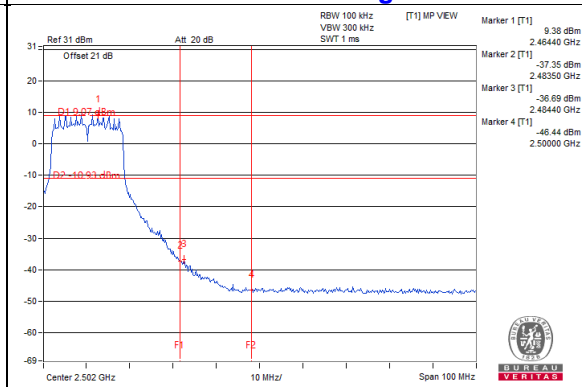
**CH 11**



**CH 1 Band edge**



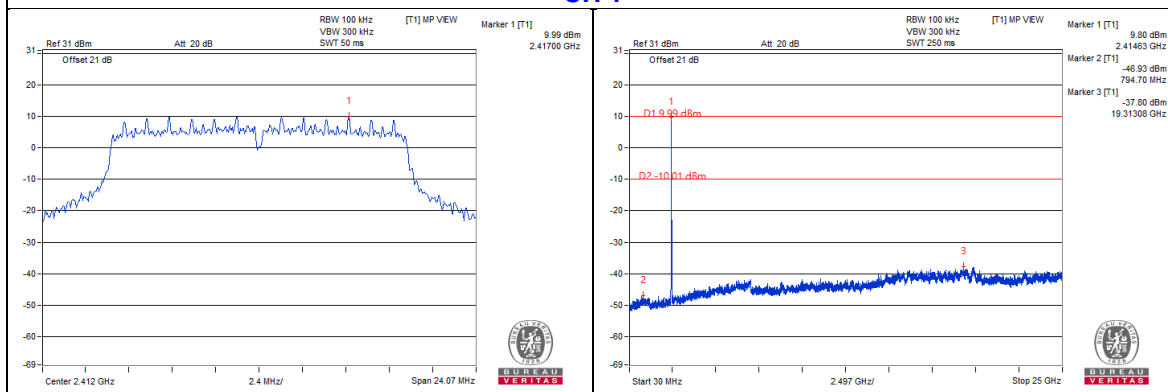
**CH 11 Band edge**



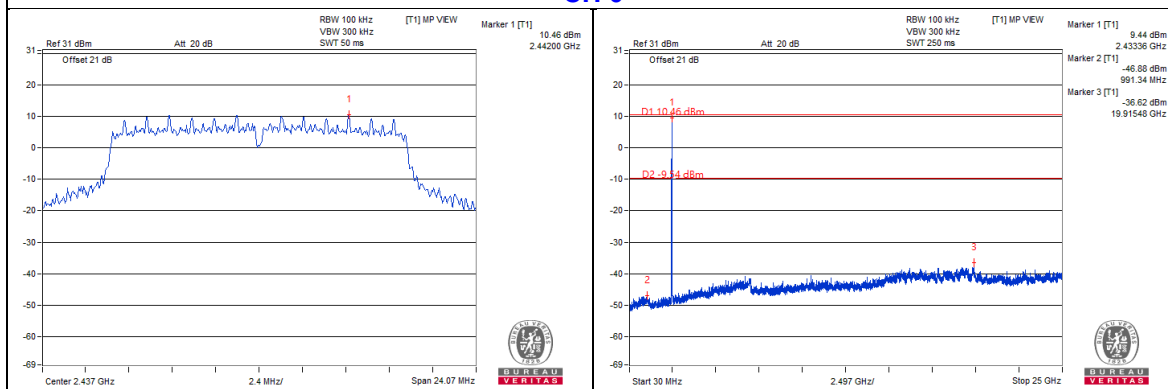


### Chain 1

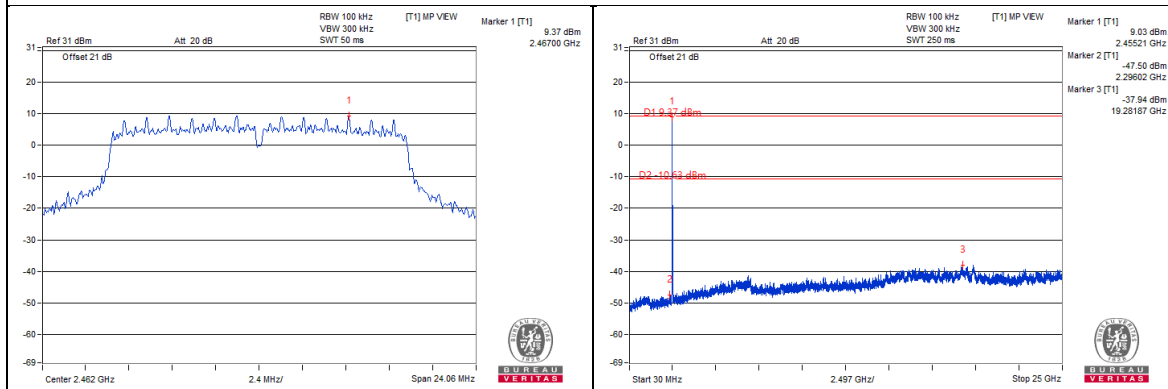
#### CH 1



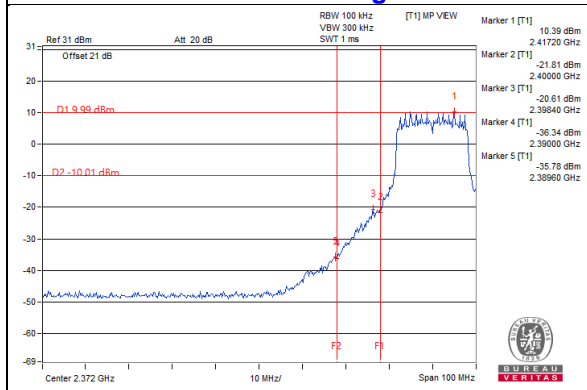
#### CH 6



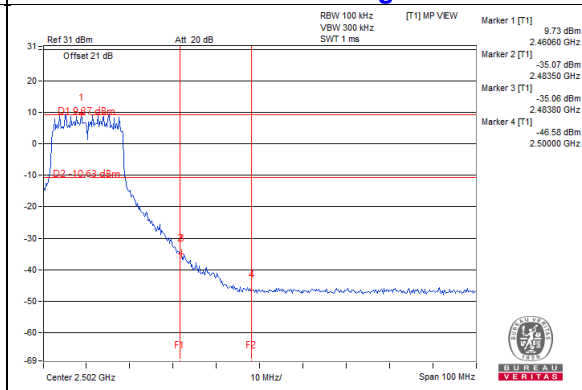
#### CH 11



#### CH 1 Band edge

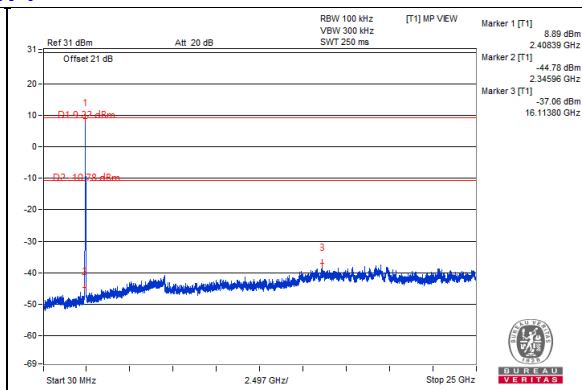
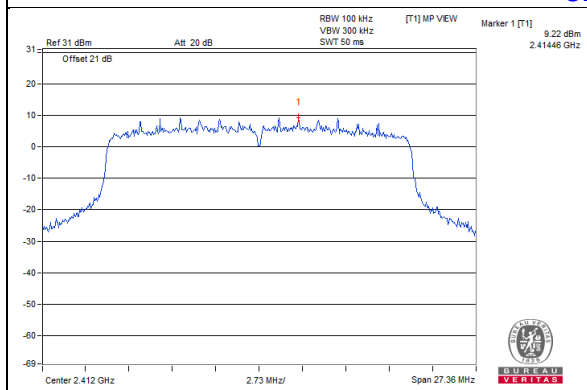


#### CH 11 Band edge

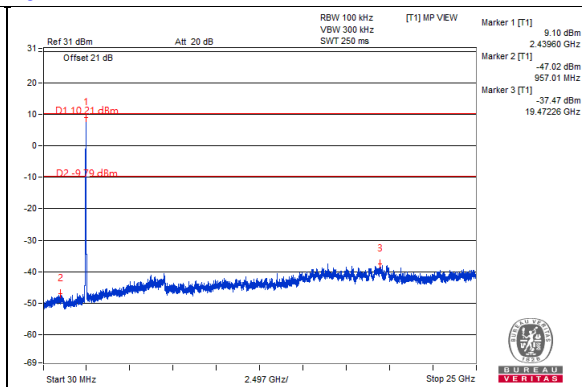
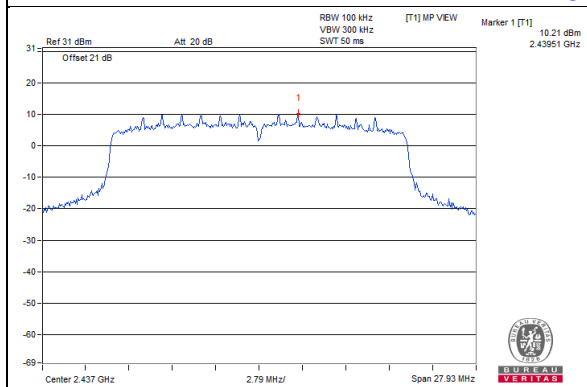


# 802.11ax (HE20) Chain 0

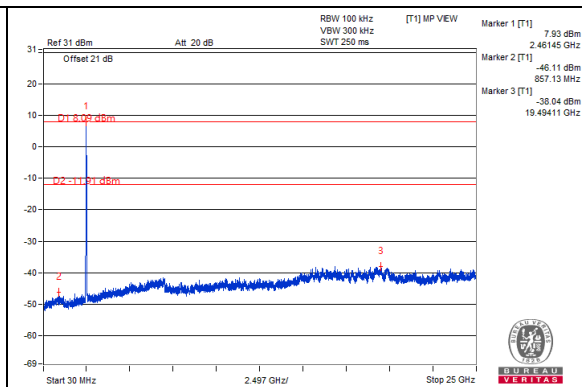
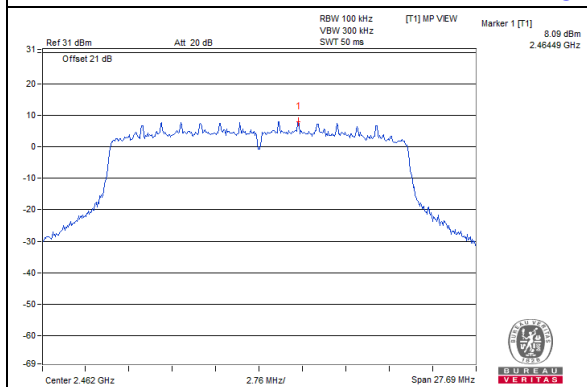
## CH 1



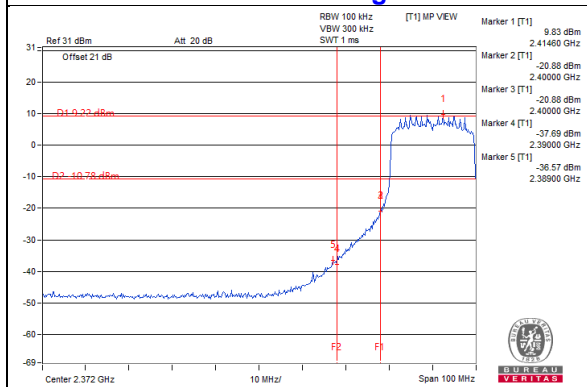
## CH 6



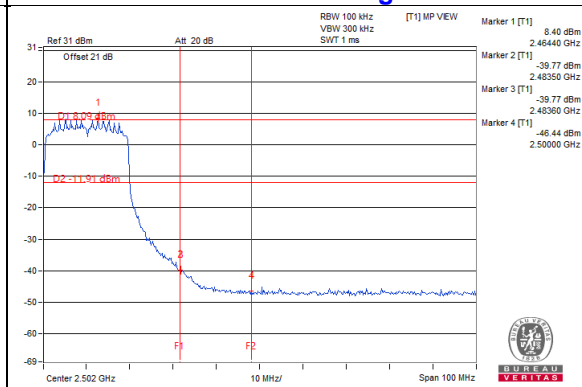
## CH 11



## CH 1 Band edge

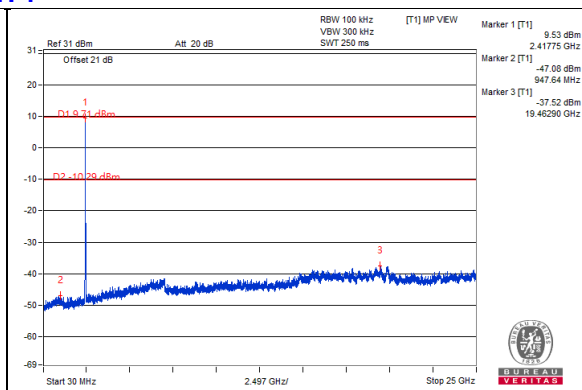
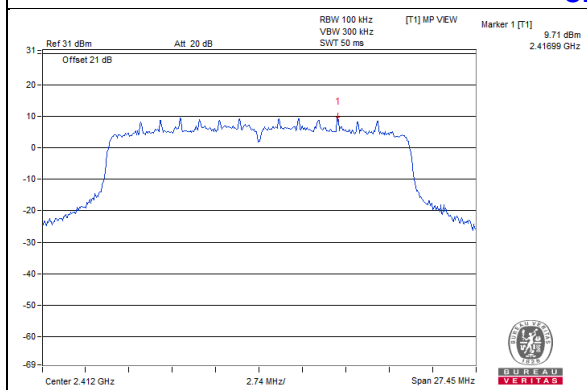


## CH 11 Band edge

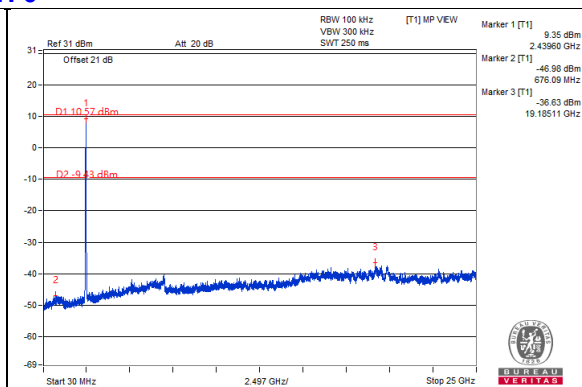
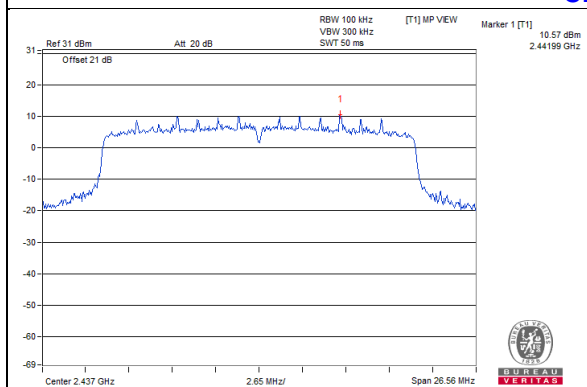


### Chain 1

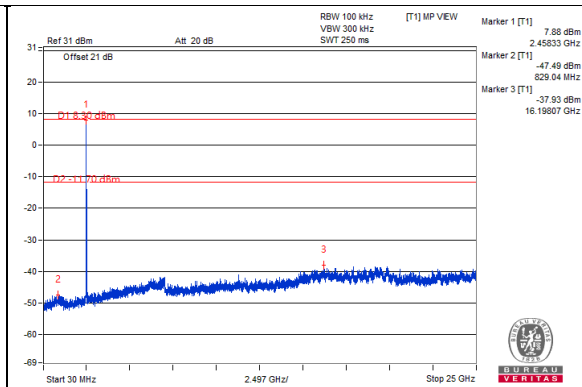
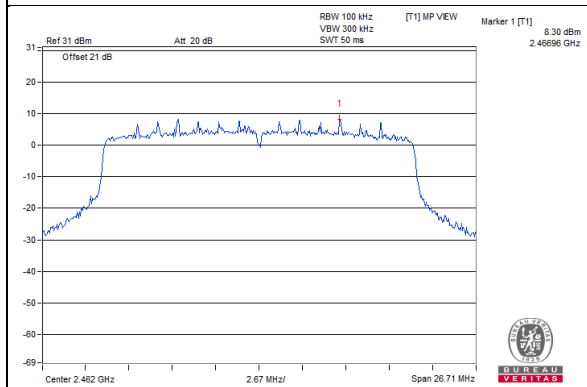
#### CH 1



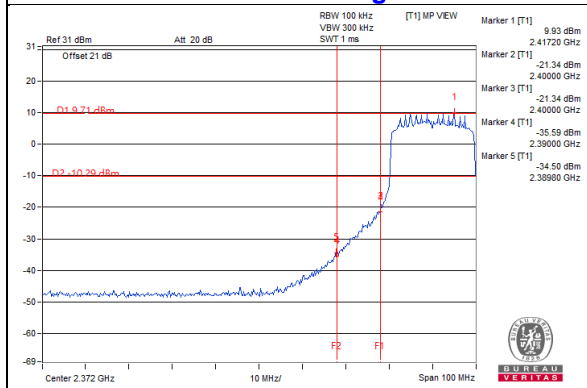
#### CH 6



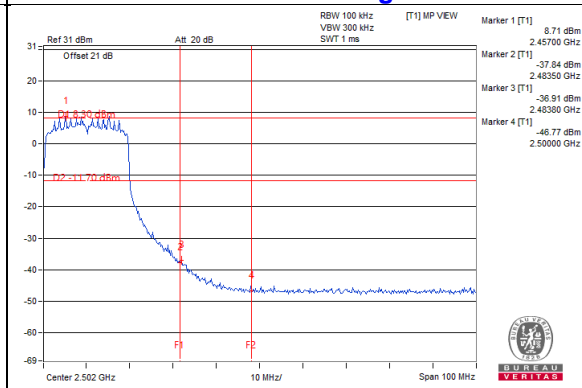
#### CH 11



#### CH 1 Band edge

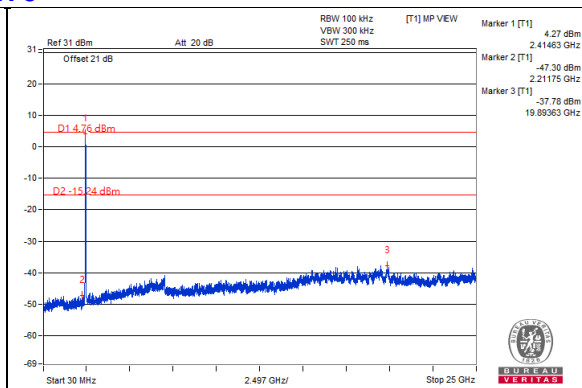
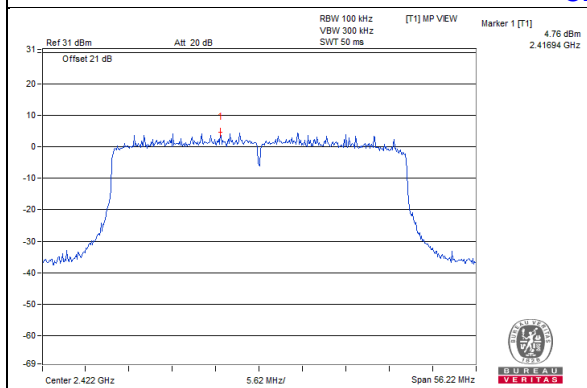


#### CH 11 Band edge

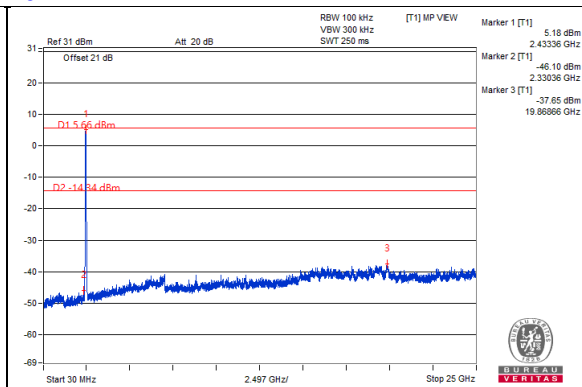
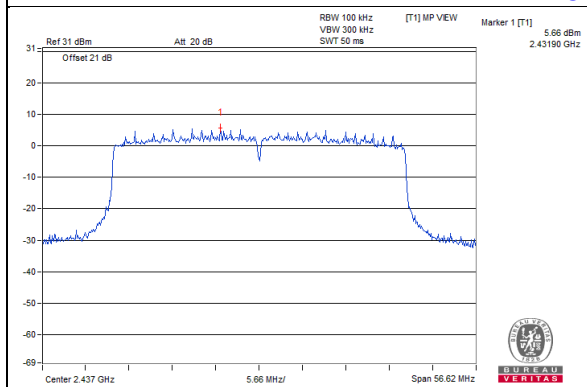


# 802.11ax (HE40) Chain 0

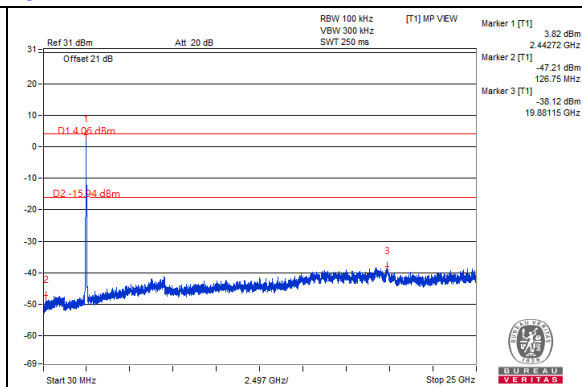
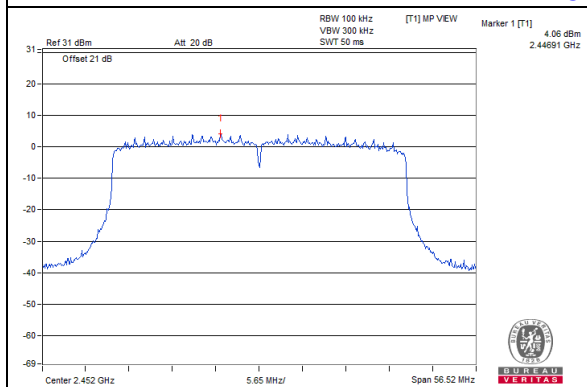
## CH 3



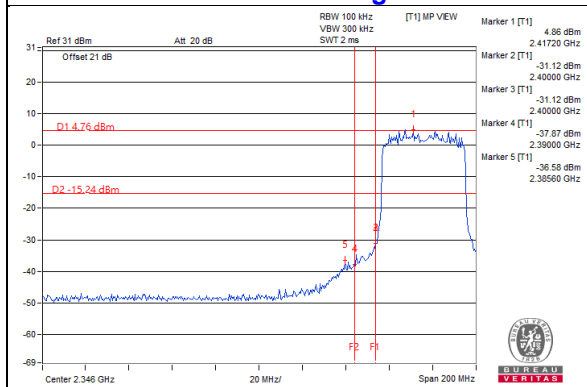
## CH 6



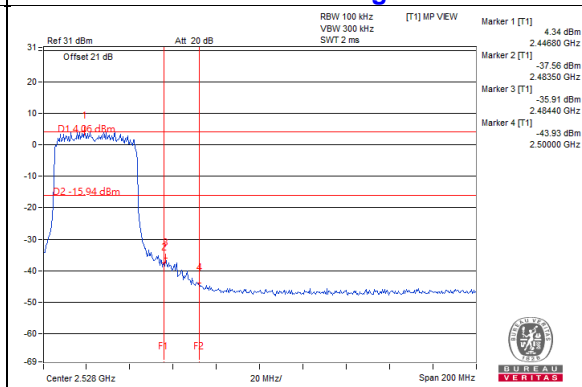
## CH 9



## CH 3 Band edge

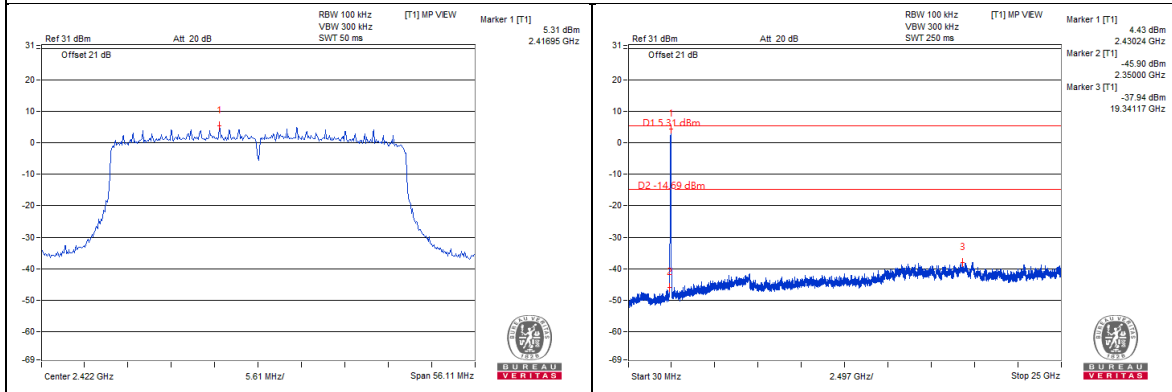


## CH 9 Band edge

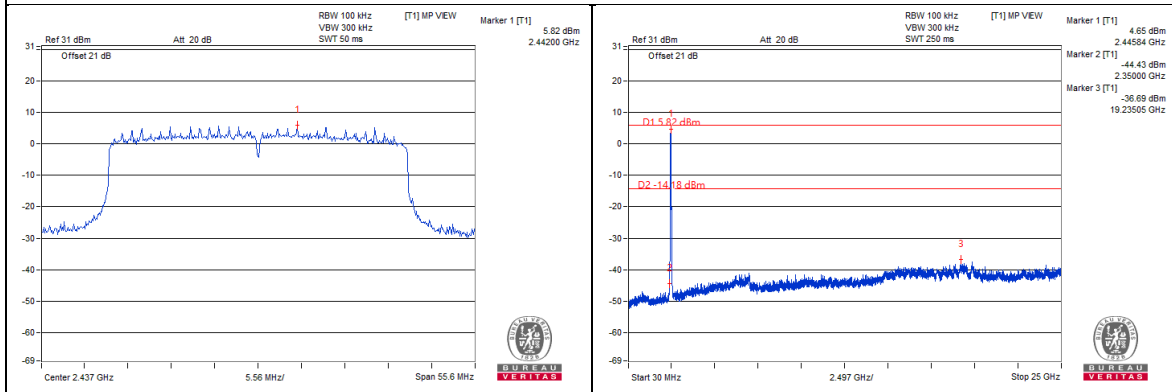


### Chain 1

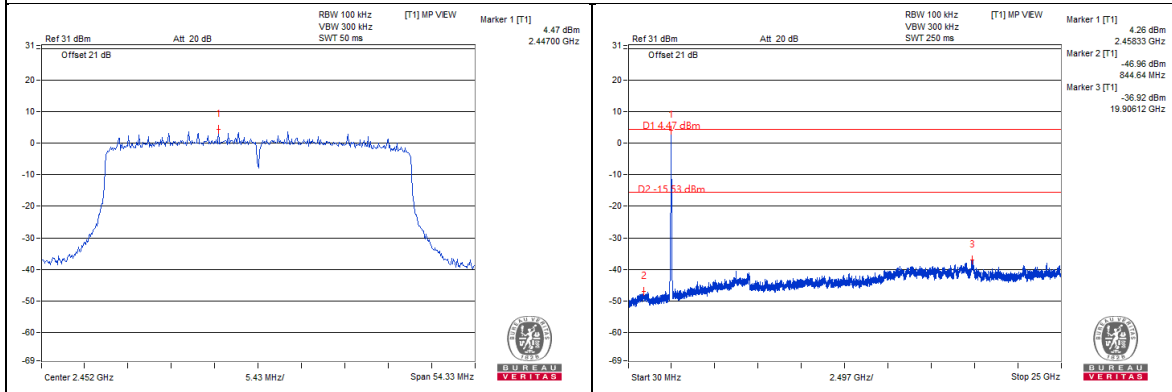
#### CH 3



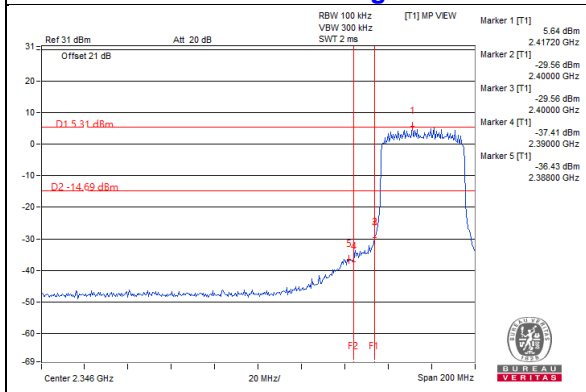
#### CH 6



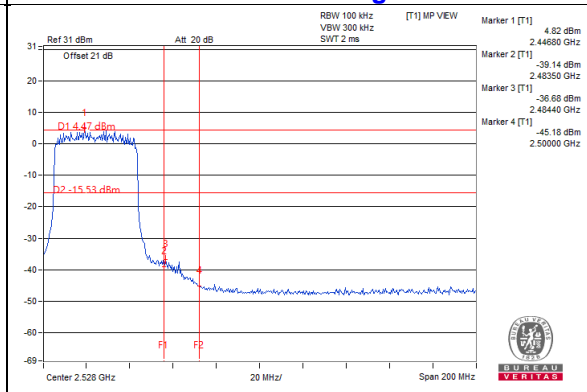
#### CH 9



#### CH 3 Band edge



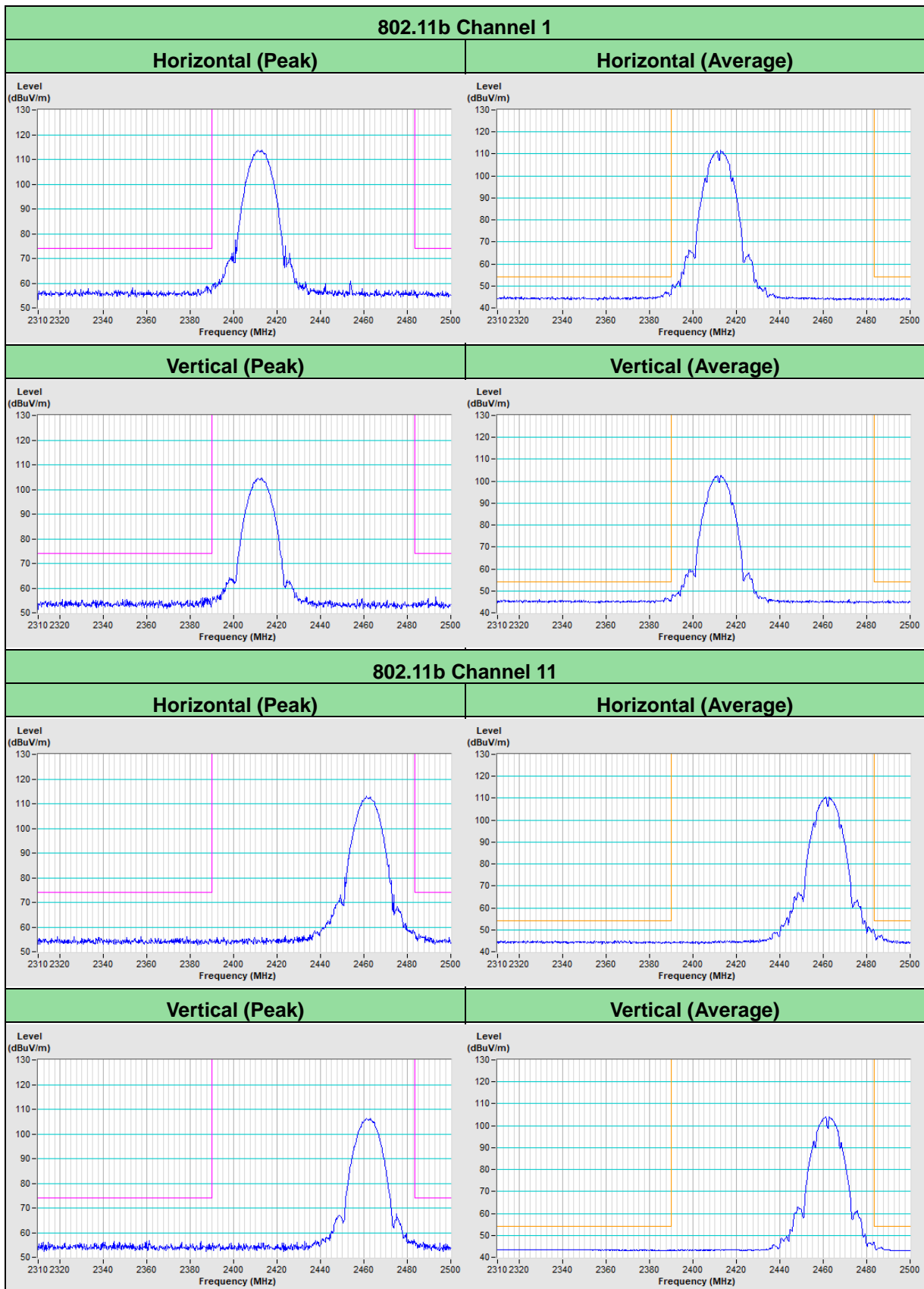
#### CH 9 Band edge

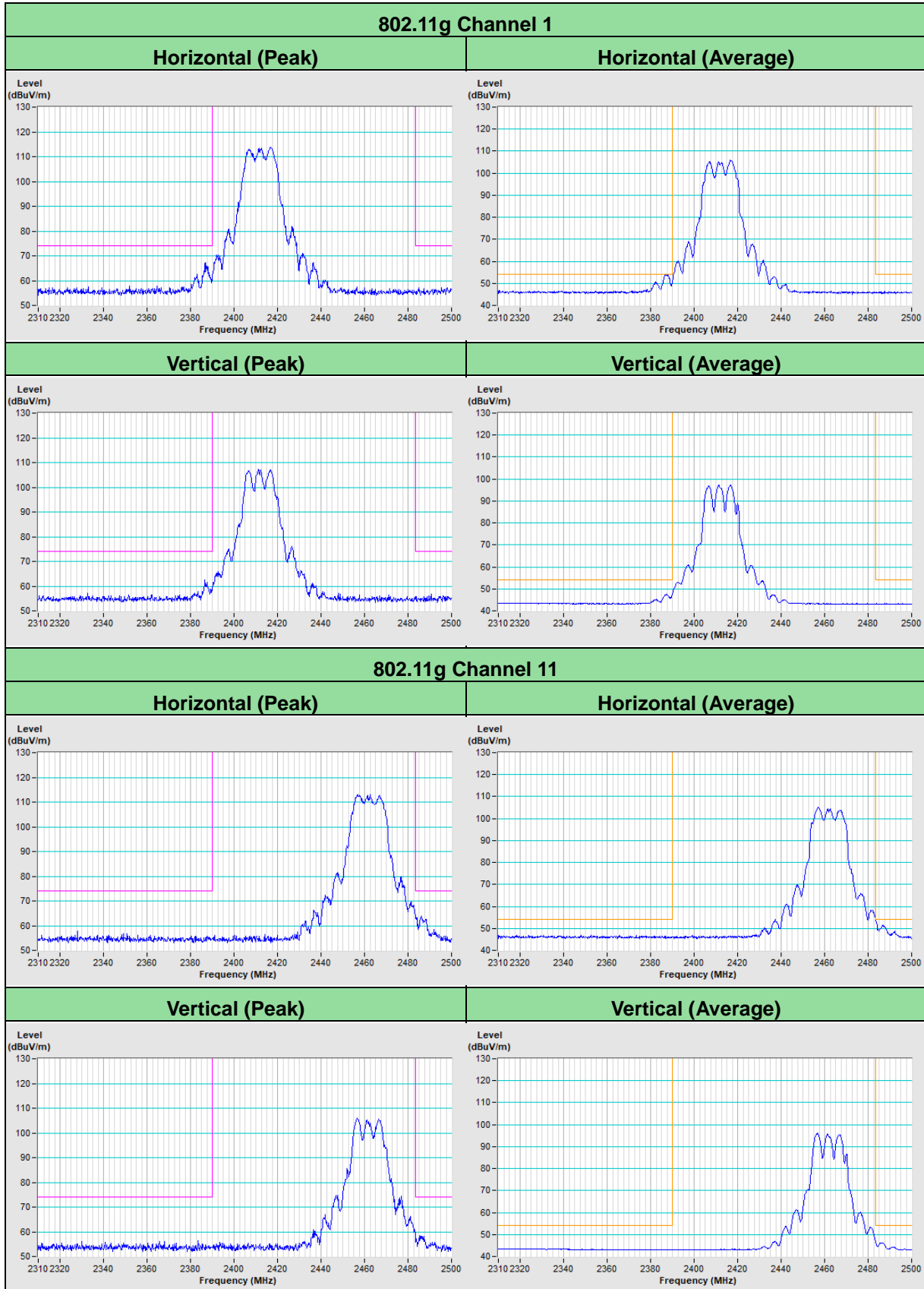


## 5 Pictures of Test Arrangements

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

## Annex A - Band-Edge Measurement

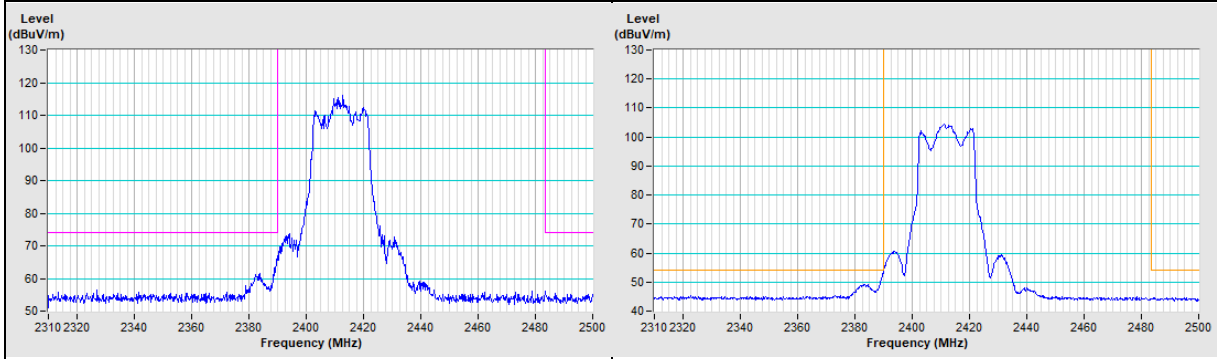




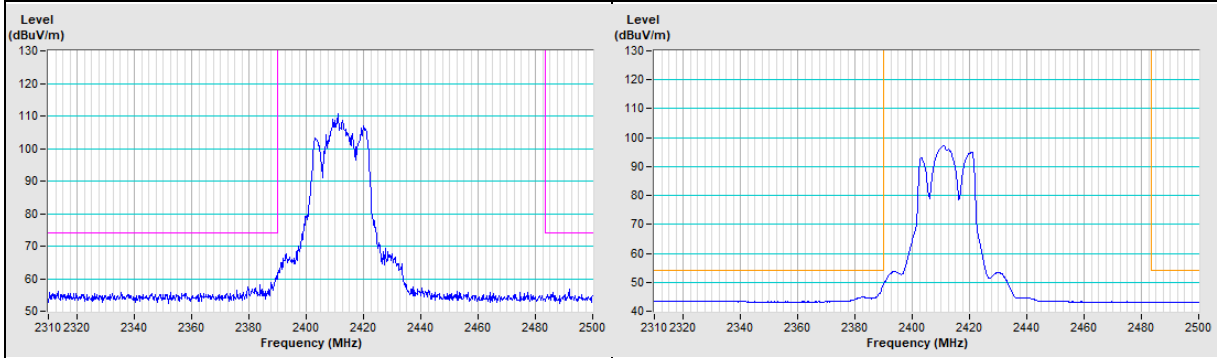


### 802.11ax (HE20) Channel 1

Horizontal (Peak)	Horizontal (Average)
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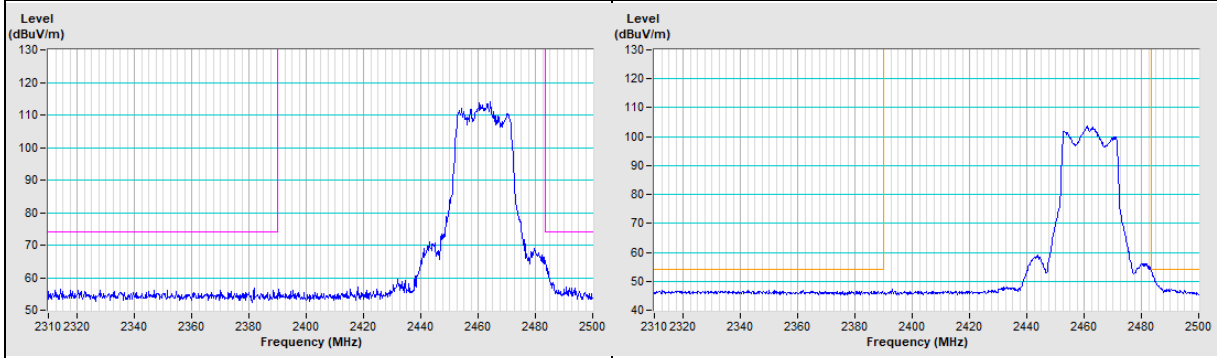


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

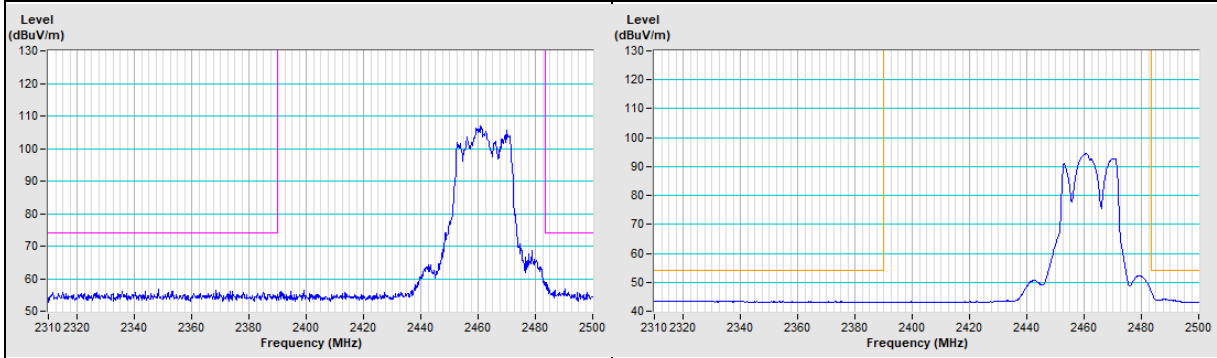


### 802.11ax (HE20) Channel 11

Horizontal (Peak)	Horizontal (Average)
-------------------	----------------------

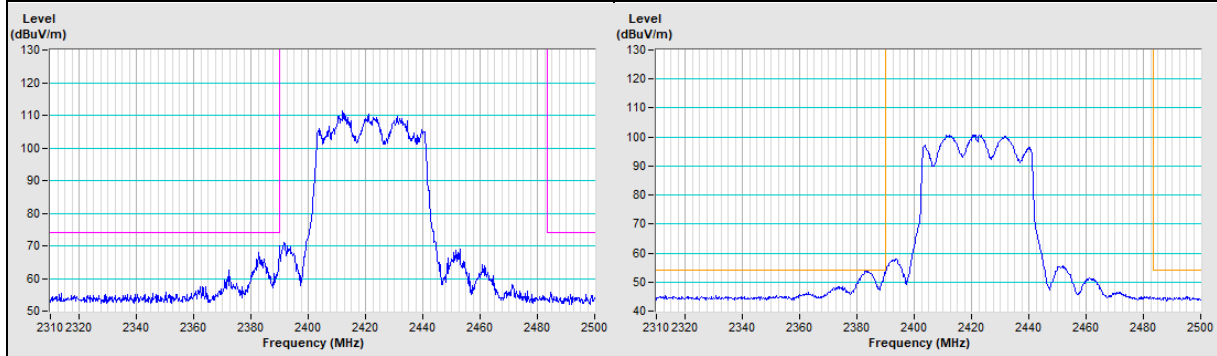


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

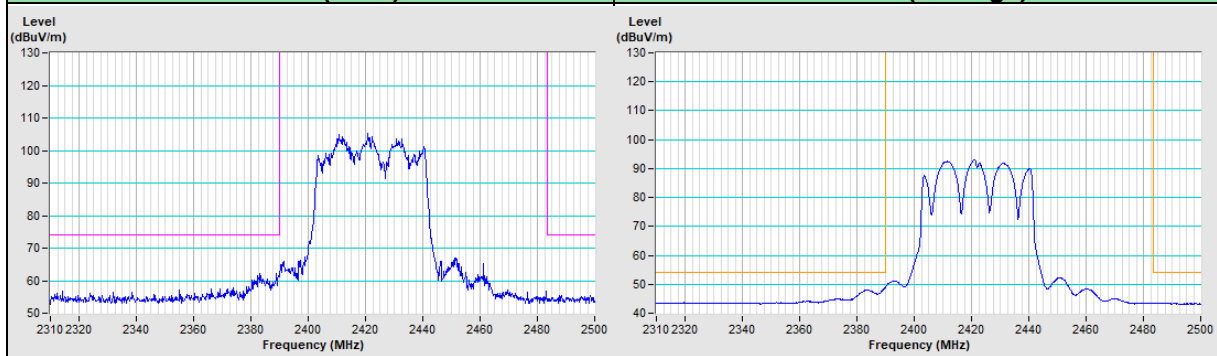


### 802.11ax (HE40) Channel 3

Horizontal (Peak)	Horizontal (Average)
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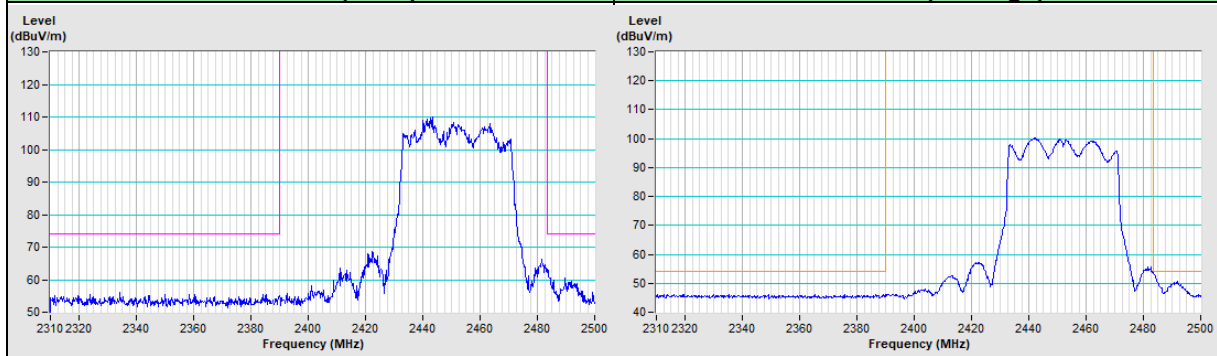


Vertical (Peak)	Vertical (Average)
-----------------	--------------------

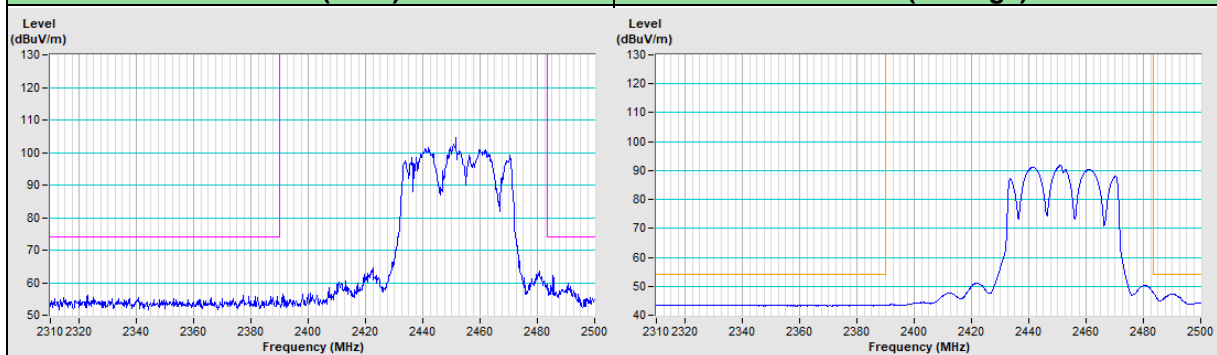


### 802.11ax (HE40) Channel 9

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 according to ISO/IEC 17025.

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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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