

## FCC Test Report

**Report No.:** RF191030C05-1

**FCC ID:** PY319400468

**Contains FCC ID:** XMR202002EG18NA

**Test Model:** LBR20

**Received Date:** Oct. 30, 2019

**Test Date:** Feb. 12 ~ Feb. 25, 2020

**Issued Date:** Mar. 02, 2020

**Applicant:** NETGEAR, INC.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
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**FCC Registration /  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
RF191030C05-1	Original release	Mar. 02, 2020

## 1 Certificate of Conformity

**Product:** ORBI LTE Router LBR20

**Brand:** NETGEAR

**Test Model:** LBR20

**Sample Status:** Engineering sample

**Applicant:** NETGEAR, INC.

**Test Date:** Feb. 12 ~ Feb. 25, 2020

**Standards:** 47 CFR FCC Part 15, Subpart E (Section 15.407)  
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 :** Celine Chou , **Date:** Mar. 02, 2020  
Celine Chou / Senior Specialist

**Approved by :** Bruce Chen , **Date:** Mar. 02, 2020  
Bruce Chen / Senior Project Engineer

## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -11.79dB at 0.29819MHz.
15.407(b)(1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.2dB at 5137.00MHz and 5648.24MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

### Note:

1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
2. For U-NII-1 band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.
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) ( $\pm$ )
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	ORBI LTE Router LBR20
Brand	NETGEAR
Test Model	LBR20
Sample Status	Engineering sample
Power Supply Rating	12Vdc from Adapter
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps 802.11ac: up to 867Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5745 ~ 5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	CDD Mode: 5180 ~ 5240MHz: 218.820mW 5745 ~ 5825MHz: 592.111mW Beamforming Mode: 5180 ~ 5240MHz: 214.800mW 5745 ~ 5825MHz: 592.111mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Adapter
Cable Supplied	1.95m RJ45 cable non-shielded without core

**Note:**

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

Modulation Mode	Beamforming Mode	TX Function
802.11a	Not Support	2TX
802.11n (HT20)	Support	2TX
802.11n (HT40)	Support	2TX
802.11ac (VHT20)	Support	2TX
802.11ac (VHT40)	Support	2TX
802.11ac (VHT80)	Support	2TX

\* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40 on 802.11ac 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, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

2. The following RF Modules are for the EUT.

RF Module	Band	Antenna No.
Module 1	2.4GHz	3/4
	5GHz Band 4	7/8
Module 2	5GHz Band 1	3/4

3. The EUT uses following adapters.

Adapter 1	
Brand	NETGEAR
Model	AD2067F10
P/N	332-11509-01
Input Power	100-120Vac, 50/60Hz, 1.0A
Output Power	12.0Vdc, 2.5A
Power Line	1.8m power cable without core attached on adapter

Adapter 2	
Brand	NETGEAR
Model	2ABL030F 1
P/N	332-10948-01
Input Power	100-120Vac, 50/60Hz, 1.0A
Output Power	12Vdc, 2.5A
Power Line	1.8m power cable without core attached on adapter

4. The following antennas were provided to the EUT.

Ant. Type	Dipole		
Connector	i-pex(MHF)		
Band	2.4GHz	5GHz Band 1	5GHz Band 4
Direcional Gain (dBi)	4.33	6.38	5.82

5. The WWAN module (Brand: Quectel, Model: EG18-NA) is collocated in this EUT.

6. 2.4GHz & 5GHz & WWAN technology can transmit at same time.



### 3.2 Description of Test Modes

#### For 5180 ~ 5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

#### For 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Powered by adapter 1
B	-	√	√	-	Powered by 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:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

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

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	6.5
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	13.5
	802.11ac (VHT80)		42	42	OFDM	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	6.5
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	13.5
	802.11ac (VHT80)		155	155	OFDM	29.3

#### **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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B	802.11a	5180-5240	38 to 46	40	OFDM	6.0
	802.11ac (VHT40)	5745-5825	151 to 159	159	OFDM	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	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B	802.11a	5180-5240	38 to 46	40	OFDM	6.0
	802.11ac (VHT40)	5745-5825	151 to 159	159	OFDM	6.0

**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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	6.5
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	13.5
	802.11ac (VHT80)		42	42	OFDM	29.3
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	6.5
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	13.5
	802.11ac (VHT80)		155	155	OFDM	29.3

**Test Condition:**

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 70% RH	120Vac, 60Hz	Noah Chang Luis Lee
RE<1G	25 deg. C, 70% RH	120Vac, 60Hz	Luis Lee
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Luis Lee Jones Chang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Jisyong Wang

### 3.3 Duty Cycle of Test Signal

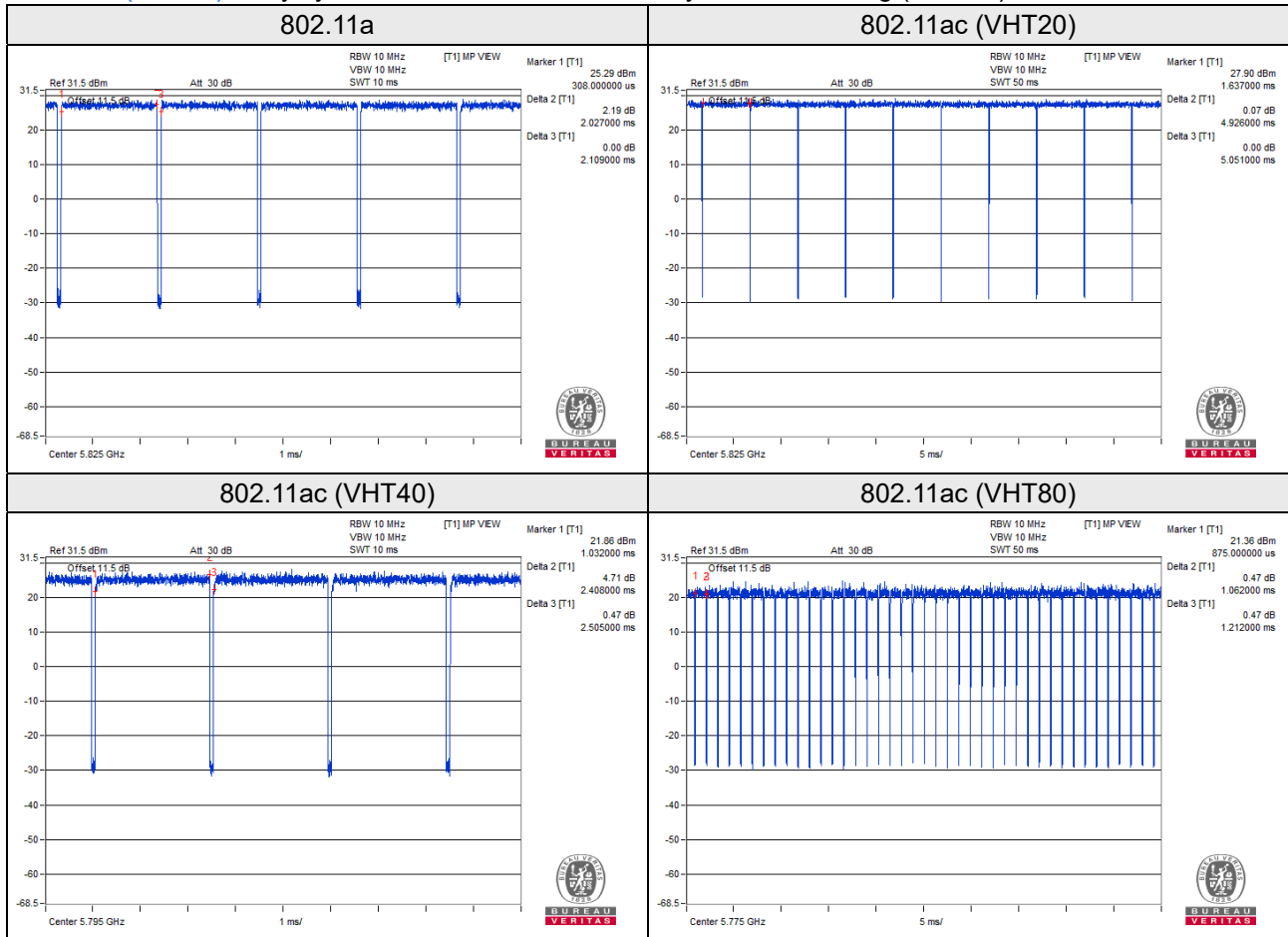
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle =  $2.027/2.109 = 0.961$ , Duty factor =  $10 * \log(1/0.961) = 0.17$

802.11n (HT20): Duty cycle =  $4.926/5.051 = 0.975$ , Duty factor =  $10 * \log(1/0.975) = 0.11$

802.11n (HT40): Duty cycle =  $2.408/2.505 = 0.961$ , Duty factor =  $10 * \log(1/0.961) = 0.17$

802.11ac (VHT80): Duty cycle =  $1.062/1.212 = 0.876$ , Duty factor =  $10 * \log(1/0.876) = 0.57$



### 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.

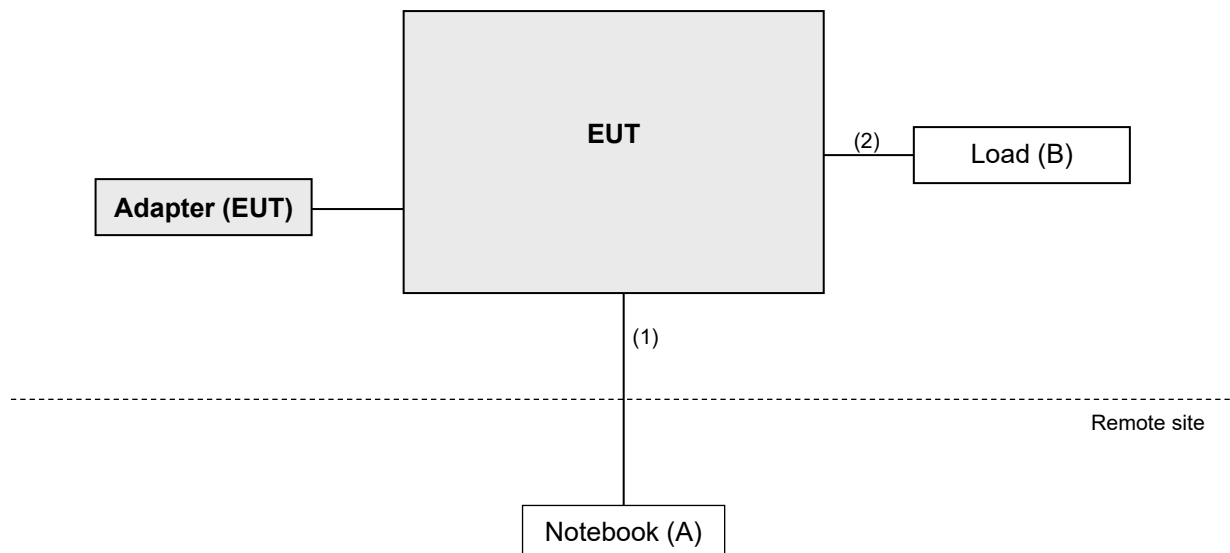
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-

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	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	7	N	0	RJ45, Cat5e
2.	LAN	1	1.5	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:

**Test standard:**

**FCC Part 15, Subpart E (15.407)**

ANSI C63.10:2013

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

**References Test Guidance:**

**KDB 789033 D02 General UNII Test Procedure New Rules v02r01**

**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.

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.

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK: 74 (dBuV/m)	AV: 54 (dBuV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2(dBuV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	<input checked="" type="checkbox"/> 15.407(b)(4)(i)	PK: -27 (dBm/MHz) <sup>*1</sup> PK: 10 (dBm/MHz) <sup>*2</sup> PK: 15.6 (dBm/MHz) <sup>*3</sup> PK: 27 (dBm/MHz) <sup>*4</sup>	PK: 68.2(dBuV/m) <sup>*1</sup> PK: 105.2 (dBuV/m) <sup>*2</sup> PK: 110.8(dBuV/m) <sup>*3</sup> PK: 122.2 (dBuV/m) <sup>*4</sup>
	<input type="checkbox"/> 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
<sup>*1</sup> beyond 75 MHz or more above of the band edge.		<sup>*2</sup> below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
<sup>*3</sup> below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		<sup>*4</sup> from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

#### 4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Dec. 31, 2019	Dec. 30, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 23, 2019	Sep. 22, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jul. 11, 2019	Jul. 10, 2020
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 11, 2019	Jun. 10, 2020
RF Coaxial Cable WORKEN With 5dB PAD	8D-FB	Cable-CH4-01	Aug. 20, 2019	Aug. 19, 2020
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Aug. 20, 2019	Aug. 19, 2020
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Aug. 20, 2019	Aug. 19, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jul. 11, 2019	Jul. 10, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jul. 11, 2019	Jul. 10, 2020
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 05, 2019	Sep. 04, 2020
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY55190004/MY55190007/MY55210005	Jul. 15, 2019	Jul. 14, 2020

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. (802.11a: RBW = 1MHz, VBW = 1kHz; 802.11ac (VHT20): RBW = 1MHz, VBW = 1kHz; 802.11ac (VHT40): RBW = 1MHz, VBW = 1kHz; 802.11ac (VHT80): RBW = 1MHz, VBW = 1kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

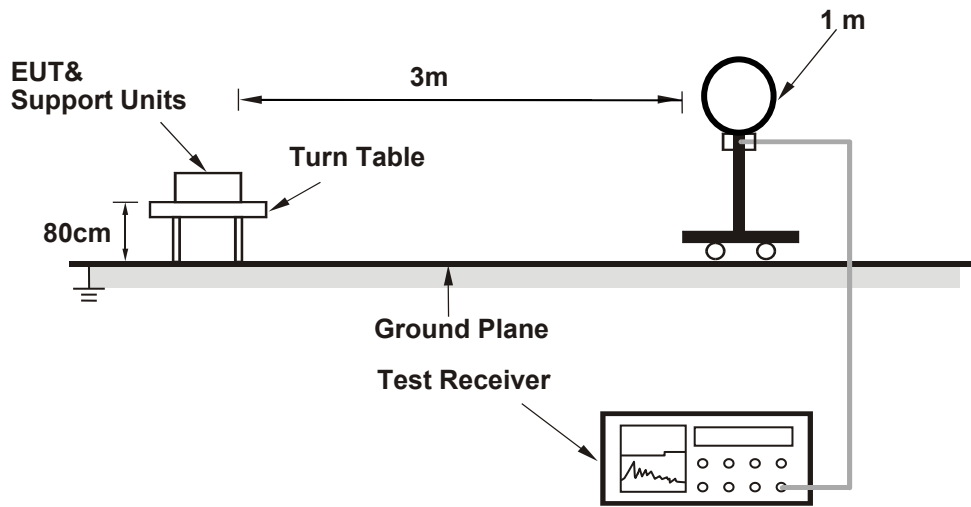
### 4.1.4 Deviation from Test Standard

No deviation.

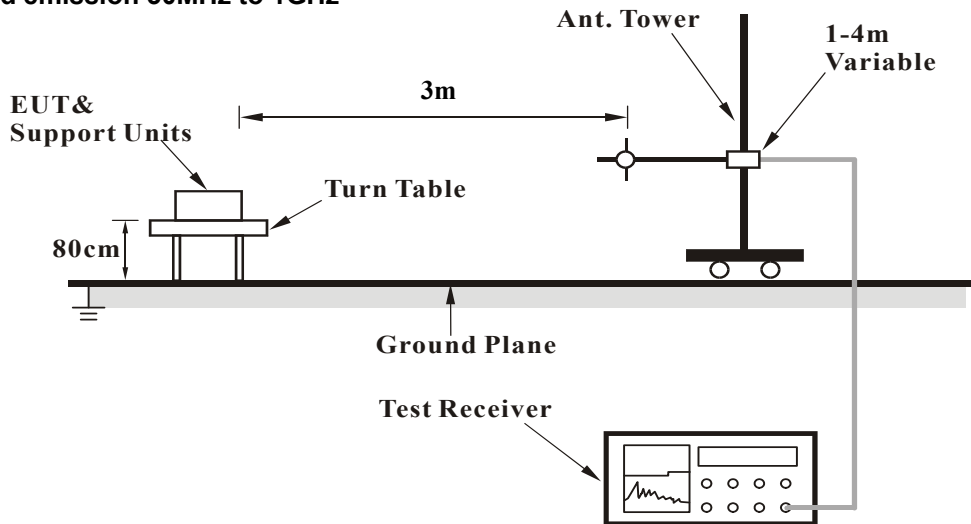


#### 4.1.5 Test Setup

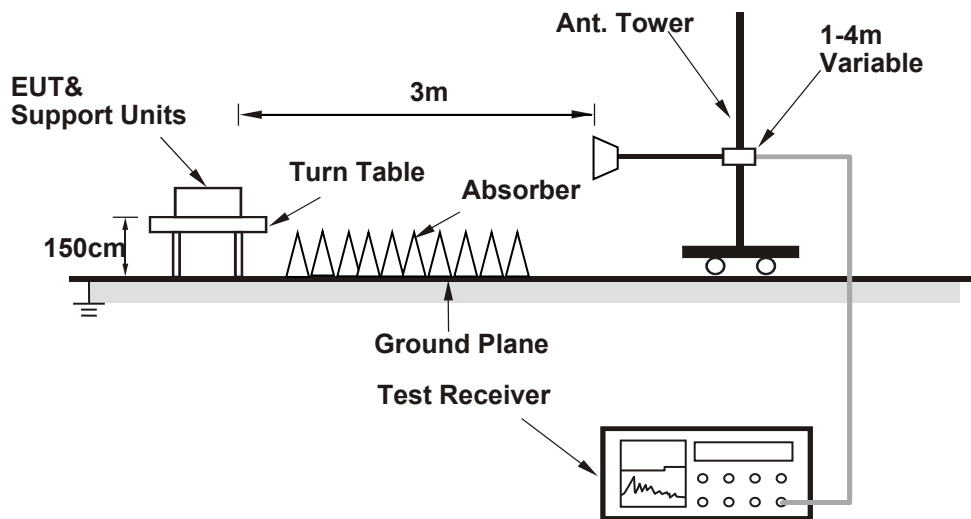
##### For Radiated emission below 30MHz



##### 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

- Placed the EUT on the testing table.
- Prepared a notebook to act as a communication partner and placed it outside of testing area.
- 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.
- The communication partner sent data to EUT by command "PING".

#### 4.1.7 Test Results

Above 1GHz data:

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.2 PK	74.0	-16.8	2.37 H	267	48.2	9.0
2	5150.00	46.5 AV	54.0	-7.5	2.37 H	267	37.5	9.0
3	*5180.00	106.6 PK			2.37 H	267	66.3	40.3
4	*5180.00	97.1 AV			2.37 H	267	56.8	40.3
5	#10360.00	59.3 PK	68.2	-8.9	1.70 H	133	39.4	19.9
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	5150.00	60.7 PK	74.0	-13.3	1.85 V	73	51.7	9.0
2	5150.00	53.2 AV	54.0	-0.8	1.85 V	73	44.2	9.0
3	*5180.00	114.6 PK			1.85 V	73	74.3	40.3
4	*5180.00	105.1 AV			1.85 V	73	64.8	40.3
5	#10360.00	57.9 PK	68.2	-10.3	2.15 V	233	38.0	19.9

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	*5200.00	105.4 PK			2.39 H	253	65.2	40.2
2	*5200.00	96.4 AV			2.39 H	253	56.2	40.2
3	#10400.00	59.4 PK	68.2	-8.8	3.11 H	122	39.3	20.1

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	114.4 PK			1.75 V	78	74.2	40.2
2	*5200.00	105.4 AV			1.75 V	78	65.2	40.2
3	#10400.00	59.8 PK	68.2	-8.4	2.15 V	269	39.7	20.1

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	*5240.00	105.6 PK			2.30 H	260	65.8	39.8
2	*5240.00	95.9 AV			2.30 H	260	56.1	39.8
3	5350.00	54.6 PK	74.0	-19.4	2.30 H	260	45.8	8.8
4	5350.00	43.3 AV	54.0	-10.7	2.30 H	260	34.5	8.8
5	#10480.00	59.4 PK	68.2	-8.8	1.79 H	30	39.2	20.2

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	113.6 PK			1.80 V	79	73.8	39.8
2	*5240.00	103.9 AV			1.80 V	79	64.1	39.8
3	5350.00	54.8 PK	74.0	-19.2	1.80 V	79	46.0	8.8
4	5350.00	43.5 AV	54.0	-10.5	1.80 V	79	34.7	8.8
5	#10480.00	59.8 PK	68.2	-8.4	2.04 V	233	39.6	20.2

**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.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5619.47	59.2 PK	68.2	-9.0	1.00 H	153	49.8	9.4
2	*5745.00	115.8 PK			1.00 H	153	74.8	41.0
3	*5745.00	105.8 AV			1.00 H	153	64.8	41.0
4	#5935.96	60.9 PK	68.2	-7.3	1.00 H	153	50.7	10.2
5	11490.00	62.2 PK	74.0	-11.8	2.14 H	153	40.1	22.1
6	11490.00	48.9 AV	54.0	-5.1	2.14 H	153	26.8	22.1

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5613.80	60.1 PK	68.2	-8.1	2.09 V	64	50.7	9.4
2	*5745.00	118.6 PK			2.09 V	64	77.6	41.0
3	*5745.00	110.0 AV			2.09 V	64	69.0	41.0
4	#5970.22	60.0 PK	68.2	-8.2	2.09 V	64	49.7	10.3
5	11490.00	62.3 PK	74.0	-11.7	2.11 V	166	40.2	22.1
6	11490.00	49.2 AV	54.0	-4.8	2.11 V	166	27.1	22.1

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.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5613.70	58.6 PK	68.2	-9.6	1.00 H	149	49.2	9.4
2	*5785.00	116.8 PK			1.00 H	149	75.6	41.2
3	*5785.00	106.9 AV			1.00 H	149	65.7	41.2
4	#5952.22	59.4 PK	68.2	-8.8	1.00 H	149	49.1	10.3
5	11570.00	62.0 PK	74.0	-12.0	1.68 H	241	39.8	22.2
6	11570.00	48.9 AV	54.0	-5.1	1.68 H	241	26.7	22.2

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5634.25	59.4 PK	68.2	-8.8	2.06 V	76	50.0	9.4
2	*5785.00	118.2 PK			2.06 V	76	77.0	41.2
3	*5785.00	110.0 AV			2.06 V	76	68.8	41.2
4	#5960.44	60.4 PK	68.2	-7.8	2.06 V	76	50.1	10.3
5	11570.00	62.2 PK	74.0	-11.8	2.19 V	200	40.0	22.2
6	11570.00	49.2 AV	54.0	-4.8	2.19 V	200	27.0	22.2

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.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5640.78	58.6 PK	68.2	-9.6	1.00 H	148	49.1	9.5
2	*5825.00	116.1 PK			1.00 H	148	74.7	41.4
3	*5825.00	106.6 AV			1.00 H	148	65.2	41.4
4	#5946.00	59.8 PK	68.2	-8.4	1.00 H	148	49.6	10.2
5	11650.00	61.3 PK	74.0	-12.7	2.38 H	250	39.4	21.9
6	11650.00	48.6 AV	54.0	-5.4	2.38 H	250	26.7	21.9

**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	#5639.92	56.3 PK	68.2	-11.9	2.00 V	70	46.8	9.5
2	*5825.00	118.7 PK			2.00 V	70	77.3	41.4
3	*5825.00	109.6 AV			2.00 V	70	68.2	41.4
4	#5979.38	58.9 PK	68.2	-9.3	2.00 V	70	48.6	10.3
5	11650.00	61.7 PK	74.0	-12.3	1.69 V	219	39.8	21.9
6	11650.00	48.8 AV	54.0	-5.2	1.69 V	219	26.9	21.9

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.
6. " # " : The radiated frequency is out of the restricted band.



802.11ac (VHT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.3 PK	74.0	-16.7	2.35 H	265	48.3	9.0
2	5150.00	46.6 AV	54.0	-7.4	2.35 H	265	37.6	9.0
3	*5180.00	106.3 PK			2.35 H	265	66.0	40.3
4	*5180.00	96.5 AV			2.35 H	265	56.2	40.3
5	#10360.00	59.1 PK	68.2	-9.1	1.77 H	105	39.2	19.9

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	5150.00	61.1 PK	74.0	-12.9	1.72 V	77	52.1	9.0
2	5150.00	53.1 AV	54.0	-0.9	1.72 V	77	44.1	9.0
3	*5180.00	114.3 PK			1.72 V	77	74.0	40.3
4	*5180.00	104.5 AV			1.72 V	77	64.2	40.3
5	#10360.00	59.4 PK	68.2	-8.8	1.89 V	174	39.5	19.9

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	*5200.00	106.4 PK			2.37 H	251	66.2	40.2
2	*5200.00	96.2 AV			2.37 H	251	56.0	40.2
3	#10400.00	59.5 PK	68.2	-8.7	1.44 H	22	39.4	20.1

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	114.4 PK			1.81 V	81	74.2	40.2
2	*5200.00	104.2 AV			1.81 V	81	64.0	40.2
3	#10400.00	59.8 PK	68.2	-8.4	3.01 V	332	39.7	20.1

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	*5240.00	104.4 PK			2.35 H	270	64.6	39.8
2	*5240.00	94.7 AV			2.35 H	270	54.9	39.8
3	5350.00	54.8 PK	74.0	-19.2	2.35 H	270	46.0	8.8
4	5350.00	43.5 AV	54.0	-10.5	2.35 H	270	34.7	8.8
5	#10480.00	59.7 PK	68.2	-8.5	2.08 H	58	39.5	20.2

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	113.4 PK			1.84 V	66	73.6	39.8
2	*5240.00	103.7 AV			1.84 V	66	63.9	39.8
3	5350.00	54.9 PK	74.0	-19.1	1.84 V	66	46.1	8.8
4	5350.00	43.7 AV	54.0	-10.3	1.84 V	66	34.9	8.8
5	#10480.00	60.0 PK	68.2	-8.2	2.00 V	212	39.8	20.2

**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.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5644.90	58.4 PK	68.2	-9.8	1.00 H	150	48.9	9.5
2	*5745.00	115.8 PK			1.00 H	150	74.8	41.0
3	*5745.00	106.4 AV			1.00 H	150	65.4	41.0
4	#5984.18	60.0 PK	68.2	-8.2	1.00 H	150	49.7	10.3
5	11490.00	62.1 PK	74.0	-11.9	2.12 H	174	40.0	22.1
6	11490.00	48.8 AV	54.0	-5.2	2.12 H	174	26.7	22.1

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5628.26	59.8 PK	68.2	-8.4	2.06 V	59	50.4	9.4
2	*5745.00	118.7 PK			2.06 V	59	77.7	41.0
3	*5745.00	110.0 AV			2.06 V	59	69.0	41.0
4	#5965.11	61.0 PK	68.2	-7.2	2.06 V	59	50.7	10.3
5	11490.00	62.3 PK	74.0	-11.7	2.19 V	326	40.2	22.1
6	11490.00	49.4 AV	54.0	-4.6	2.19 V	326	27.3	22.1

**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.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5646.03	58.0 PK	68.2	-10.2	1.00 H	150	48.5	9.5
2	*5785.00	115.8 PK			1.00 H	150	74.6	41.2
3	*5785.00	106.1 AV			1.00 H	150	64.9	41.2
4	#5930.04	59.8 PK	68.2	-8.4	1.00 H	150	49.6	10.2
5	11570.00	61.7 PK	74.0	-12.3	2.36 H	182	39.5	22.2
6	11570.00	48.6 AV	54.0	-5.4	2.36 H	182	26.4	22.2

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5638.51	59.9 PK	68.2	-8.3	2.02 V	70	50.4	9.5
2	*5785.00	119.0 PK			2.02 V	70	77.8	41.2
3	*5785.00	110.4 AV			2.02 V	70	69.2	41.2
4	#5938.44	60.3 PK	68.2	-7.9	2.02 V	70	50.1	10.2
5	11570.00	62.0 PK	74.0	-12.0	1.99 V	102	39.8	22.2
6	11570.00	49.1 AV	54.0	-4.9	1.99 V	102	26.9	22.2

**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.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5645.15	59.0 PK	68.2	-9.2	1.00 H	148	49.5	9.5
2	*5825.00	116.3 PK			1.00 H	148	74.9	41.4
3	*5825.00	106.8 AV			1.00 H	148	65.4	41.4
4	#5949.64	60.4 PK	68.2	-7.8	1.00 H	148	50.2	10.2
5	11650.00	61.6 PK	74.0	-12.4	2.84 H	136	39.7	21.9
6	11650.00	48.2 AV	54.0	-5.8	2.84 H	136	26.3	21.9

**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	#5608.98	55.6 PK	68.2	-12.6	1.81 V	144	46.2	9.4
2	*5825.00	119.8 PK			1.81 V	144	78.4	41.4
3	*5825.00	109.9 AV			1.81 V	144	68.5	41.4
4	#5941.43	56.9 PK	68.2	-11.3	1.81 V	144	46.7	10.2
5	11650.00	62.3 PK	74.0	-11.7	3.22 V	311	40.4	21.9
6	11650.00	49.2 AV	54.0	-4.8	3.22 V	311	27.3	21.9

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.
6. " # " : The radiated frequency is out of the restricted band.

802.11ac (VHT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5150.00	57.5 PK	74.0	-16.5	2.33 H	265	48.5	9.0
2	5150.00	46.2 AV	54.0	-7.8	2.33 H	265	37.2	9.0
3	*5190.00	97.7 PK			2.33 H	265	57.4	40.3
4	*5190.00	88.5 AV			2.33 H	265	48.2	40.3
5	#10380.00	59.7 PK	68.2	-8.5	2.11 H	177	39.7	20.0

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.2 PK	74.0	-9.8	1.83 V	68	55.2	9.0
2	5150.00	53.6 AV	54.0	-0.4	1.83 V	68	44.6	9.0
3	*5190.00	105.7 PK			1.83 V	68	65.4	40.3
4	*5190.00	96.7 AV			1.83 V	68	56.4	40.3
5	#10380.00	60.1 PK	68.2	-8.1	1.44 V	315	40.1	20.0

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.
5. " \* ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	*5230.00	102.2 PK			2.64 H	262	62.3	39.9
2	*5230.00	92.2 AV			2.64 H	262	52.3	39.9
3	5350.00	55.0 PK	74.0	-19.0	2.64 H	262	46.2	8.8
4	5350.00	43.3 AV	54.0	-10.7	2.64 H	262	34.5	8.8
5	#10460.00	59.7 PK	68.2	-8.5	2.88 H	300	39.5	20.2

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	110.3 PK			1.81 V	68	70.4	39.9
2	*5230.00	101.2 AV			1.81 V	68	61.3	39.9
3	5350.00	55.2 PK	74.0	-18.8	1.81 V	68	46.4	8.8
4	5350.00	43.6 AV	54.0	-10.4	1.81 V	68	34.8	8.8
5	#10460.00	60.1 PK	68.2	-8.1	2.17 V	177	39.9	20.2

**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.
6. " # " : The radiated frequency is out of the restricted band.



CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5633.65	58.9 PK	68.2	-9.3	1.00 H	149	49.5	9.4
2	*5755.00	112.0 PK			1.00 H	149	71.0	41.0
3	*5755.00	103.5 AV			1.00 H	149	62.5	41.0
4	#5928.35	59.3 PK	68.2	-8.9	1.00 H	149	49.1	10.2
5	11510.00	61.6 PK	74.0	-12.4	1.64 H	152	39.6	22.0
6	11510.00	48.7 AV	54.0	-5.3	1.64 H	152	26.7	22.0

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5624.39	56.3 PK	68.2	-11.9	2.00 V	315	46.9	9.4
2	*5755.00	115.3 PK			2.00 V	315	74.3	41.0
3	*5755.00	107.0 AV			2.00 V	315	66.0	41.0
4	#5971.91	57.2 PK	68.2	-11.0	2.00 V	315	46.9	10.3
5	11510.00	62.5 PK	74.0	-11.5	1.05 V	177	40.5	22.0
6	11510.00	49.3 AV	54.0	-4.7	1.05 V	177	27.3	22.0

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.
5. " \* " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5635.08	58.4 PK	68.2	-9.8	1.02 H	153	49.0	9.4
2	*5795.00	112.8 PK			1.02 H	153	71.5	41.3
3	*5795.00	102.6 AV			1.02 H	153	61.3	41.3
4	#5965.55	59.5 PK	68.2	-8.7	1.02 H	153	49.2	10.3
5	11590.00	61.5 PK	74.0	-12.5	1.63 H	205	39.4	22.1
6	11590.00	48.8 AV	54.0	-5.2	1.63 H	205	26.7	22.1

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5617.80	55.4 PK	68.2	-12.8	2.05 V	140	46.0	9.4
2	*5795.00	115.6 PK			2.05 V	140	74.3	41.3
3	*5795.00	106.9 AV			2.05 V	140	65.6	41.3
4	#5947.95	56.9 PK	68.2	-11.3	2.05 V	140	46.7	10.2
5	11590.00	61.9 PK	74.0	-12.1	3.06 V	106	39.8	22.1
6	11590.00	49.0 AV	54.0	-5.0	3.06 V	106	26.9	22.1

**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.
6. " # " : The radiated frequency is out of the restricted band.

802.11ac (VHT80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	5137.00	57.7 PK	74.0	-16.3	2.35 H	265	48.7	9.0
2	5137.00	46.5 AV	54.0	-7.5	2.35 H	265	37.5	9.0
3	*5210.00	90.6 PK			2.35 H	265	50.5	40.1
4	*5210.00	81.8 AV			2.35 H	265	41.7	40.1
5	5350.00	56.3 PK	74.0	-17.7	2.35 H	265	47.5	8.8
6	5350.00	44.0 AV	54.0	-10.0	2.35 H	265	35.2	8.8
7	#10420.00	58.7 PK	68.2	-9.5	1.05 H	114	38.6	20.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5137.00	64.7 PK	74.0	-9.3	2.65 V	92	55.7	9.0
<b>2</b>	<b>5137.00</b>	<b>53.8 AV</b>	<b>54.0</b>	<b>-0.2</b>	<b>2.65 V</b>	<b>92</b>	<b>44.8</b>	<b>9.0</b>
3	*5210.00	100.8 PK			2.65 V	92	60.7	40.1
4	*5210.00	92.1 AV			2.65 V	92	52.0	40.1
5	5350.00	55.5 PK	74.0	-18.5	2.65 V	92	46.7	8.8
6	5350.00	44.4 AV	54.0	-9.6	2.65 V	92	35.6	8.8
7	#10420.00	59.0 PK	68.2	-9.2	1.57 V	55	38.9	20.1

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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

**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	#5642.90	63.0 PK	68.2	-5.2	1.05 H	148	53.5	9.5
2	*5775.00	107.3 PK			1.05 H	148	66.2	41.1
3	*5775.00	99.2 AV			1.05 H	148	58.1	41.1
4	#5960.50	60.3 PK	68.2	-7.9	1.05 H	148	50.0	10.3
5	11550.00	61.7 PK	74.0	-12.3	2.14 H	183	39.5	22.2
6	11550.00	48.6 AV	54.0	-5.4	2.14 H	183	26.4	22.2

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

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
<b>1</b>	<b>#5648.24</b>	<b>68.0 PK</b>	<b>68.2</b>	<b>-0.2</b>	<b>1.88 V</b>	<b>136</b>	<b>58.5</b>	<b>9.5</b>
2	*5775.00	110.7 PK			1.88 V	136	69.6	41.1
3	*5775.00	102.5 AV			1.88 V	136	61.4	41.1
4	#5927.38	61.0 PK	68.2	-7.2	1.88 V	136	50.8	10.2
5	11550.00	62.0 PK	74.0	-12.0	1.99 V	168	39.8	22.2
6	11550.00	49.0 AV	54.0	-5.0	1.99 V	168	26.8	22.2

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.
6. " # " : The radiated frequency is out of the restricted band.

Below 1GHz Worst-Case Data:

802.11a

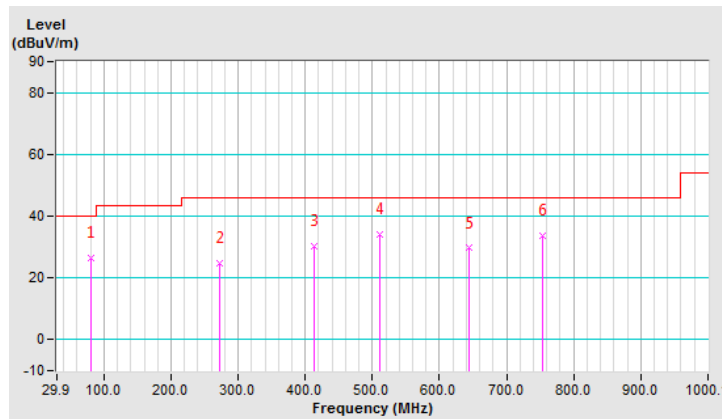
CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

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	80.35	26.5 QP	40.0	-13.5	1.99 H	310	39.4	-12.9
2	273.42	24.9 QP	46.0	-21.1	1.99 H	343	33.0	-8.1
3	414.10	30.2 QP	46.0	-15.8	1.99 H	309	34.8	-4.6
4	511.12	33.9 QP	46.0	-12.1	1.99 H	310	36.2	-2.3
5	645.01	29.6 QP	46.0	-16.4	1.99 H	6	28.5	1.1
6	753.67	33.7 QP	46.0	-12.3	1.99 H	310	29.7	4.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit 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.

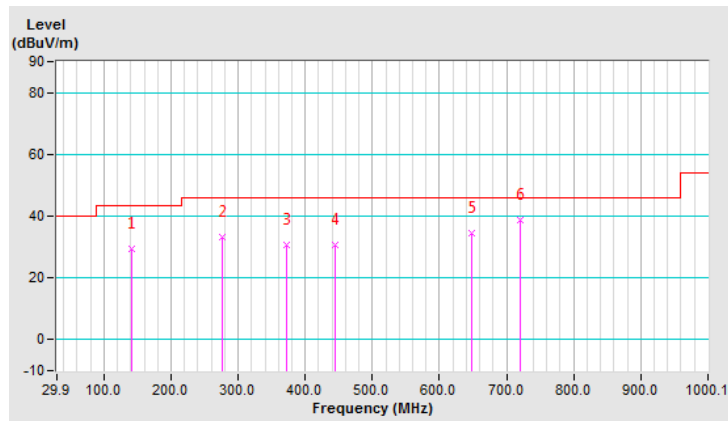


CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

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	140.50	29.3 QP	43.5	-14.2	1.01 V	273	38.5	-9.2
2	276.33	33.4 QP	46.0	-12.6	1.01 V	302	41.4	-8.0
3	371.41	30.8 QP	46.0	-15.2	1.01 V	335	36.3	-5.5
4	444.18	30.8 QP	46.0	-15.2	1.51 V	320	34.4	-3.6
5	648.89	34.5 QP	46.0	-11.5	1.01 V	302	33.4	1.1
6	720.68	38.6 QP	46.0	-7.4	1.01 V	167	35.9	2.7

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 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.



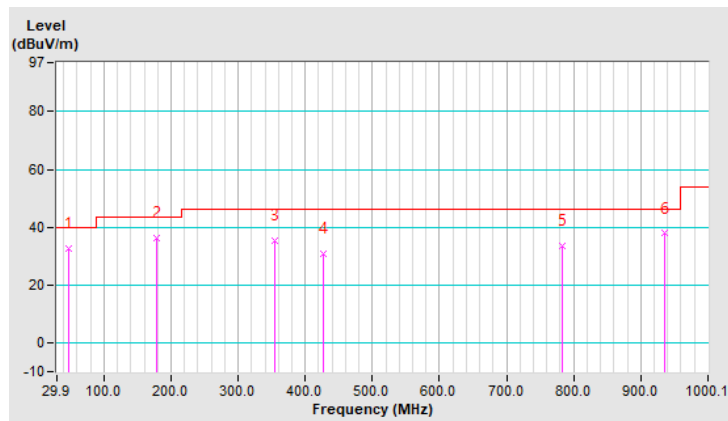
802.11ac (VHT40)

CHANNEL	TX Channel 151	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	47.39	32.4 QP	40.0	-7.6	1.00 H	345	41.0	-8.6
2	179.37	36.2 QP	43.5	-7.3	2.00 H	306	46.2	-10.0
3	354.98	35.2 QP	46.0	-10.8	1.99 H	345	41.2	-6.0
4	426.71	30.8 QP	46.0	-15.2	1.00 H	304	34.9	-4.1
5	783.75	33.4 QP	46.0	-12.6	1.50 H	13	28.8	4.6
6	936.07	37.8 QP	46.0	-8.2	1.00 H	123	29.9	7.9

Remarks:

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

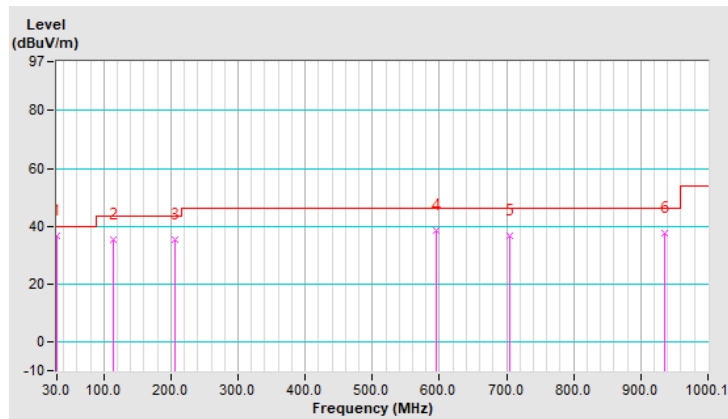


CHANNEL	TX Channel 151	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

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	30.00	36.7 QP	40.0	-3.3	1.01 V	337	46.5	-9.8
2	114.31	35.4 QP	43.5	-8.1	1.01 V	335	46.8	-11.4
3	205.51	35.2 QP	43.5	-8.3	1.01 V	337	46.7	-11.5
4	594.56	38.3 QP	46.0	-7.7	1.01 V	273	38.4	-0.1
5	705.16	36.8 QP	46.0	-9.2	1.01 V	273	34.5	2.3
6	936.07	37.7 QP	46.0	-8.3	1.51 V	6	29.8	7.9

Remarks:

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





802.11a

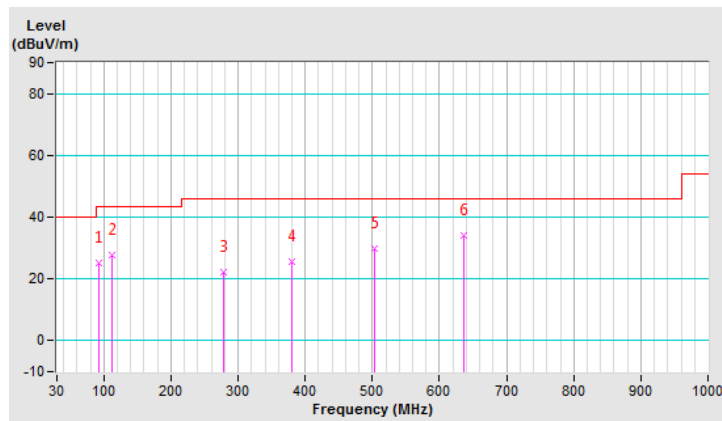
CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

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	92.18	25.0 QP	43.5	-18.5	1.51 H	62	39.2	-14.2
2	112.39	27.6 QP	43.5	-15.9	1.51 H	62	39.2	-11.6
3	278.72	22.3 QP	46.0	-23.7	2.00 H	24	30.3	-8.0
4	379.76	25.7 QP	46.0	-20.3	2.00 H	159	30.8	-5.1
5	504.12	29.8 QP	46.0	-16.2	1.51 H	342	31.1	-1.3
6	636.25	34.2 QP	46.0	-11.8	1.01 H	4	32.7	1.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit 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.

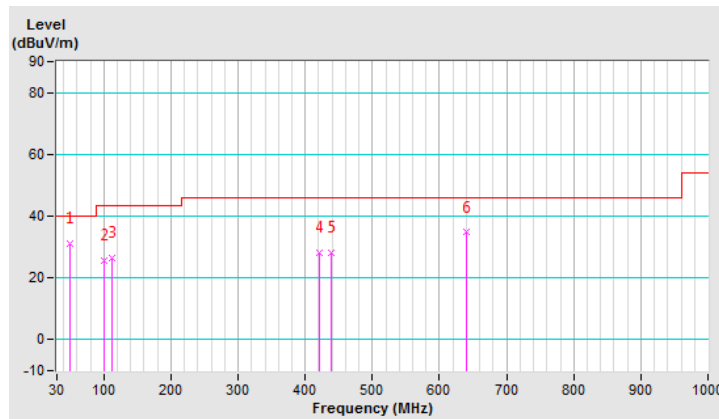


CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

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	50.21	31.1 QP	40.0	-8.9	1.00 V	6	39.9	-8.8
2	99.95	25.4 QP	43.5	-18.1	1.99 V	163	38.5	-13.1
3	112.39	26.3 QP	43.5	-17.2	1.99 V	163	37.9	-11.6
4	420.18	28.3 QP	46.0	-17.7	1.00 V	339	31.9	-3.6
5	438.83	28.3 QP	46.0	-17.7	1.49 V	134	31.1	-2.8
6	640.91	34.7 QP	46.0	-11.3	1.00 V	190	33.2	1.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit 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.



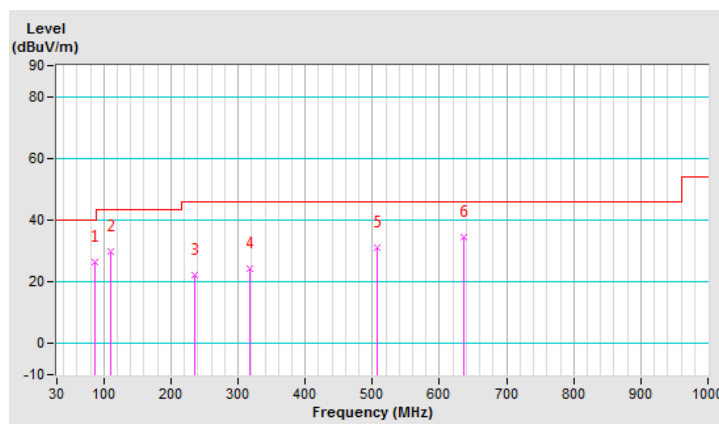
802.11ac (VHT40)

CHANNEL	TX Channel 151	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	87.52	26.3 QP	40.0	-13.7	1.99 H	104	40.5	-14.2
2	110.83	29.7 QP	43.5	-13.8	1.49 H	306	41.6	-11.9
3	235.19	22.3 QP	46.0	-23.7	1.49 H	108	32.8	-10.5
4	317.58	24.5 QP	46.0	-21.5	1.00 H	202	31.4	-6.9
5	507.23	31.0 QP	46.0	-15.0	1.49 H	14	32.2	-1.2
6	636.25	34.5 QP	46.0	-11.5	1.49 H	3	33.0	1.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit 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.

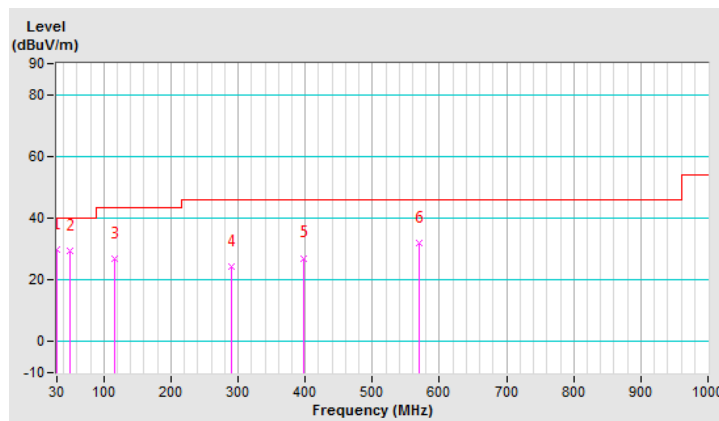


CHANNEL	TX Channel 151	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

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	30.00	29.7 QP	40.0	-10.3	2.00 V	3	40.1	-10.4
2	50.21	29.5 QP	40.0	-10.5	1.51 V	142	38.3	-8.8
3	115.50	26.9 QP	43.5	-16.6	1.01 V	37	38.3	-11.4
4	289.60	24.2 QP	46.0	-21.8	2.00 V	22	31.9	-7.7
5	398.41	27.1 QP	46.0	-18.9	1.51 V	5	31.6	-4.5
6	569.41	32.1 QP	46.0	-13.9	1.01 V	257	32.0	0.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit 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. 11, 2019	Dec. 10, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
			Feb. 20, 2020	Feb. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
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.

3. The VCCI Site Registration No. is C-12040.

### 4.2.3 Test Procedures

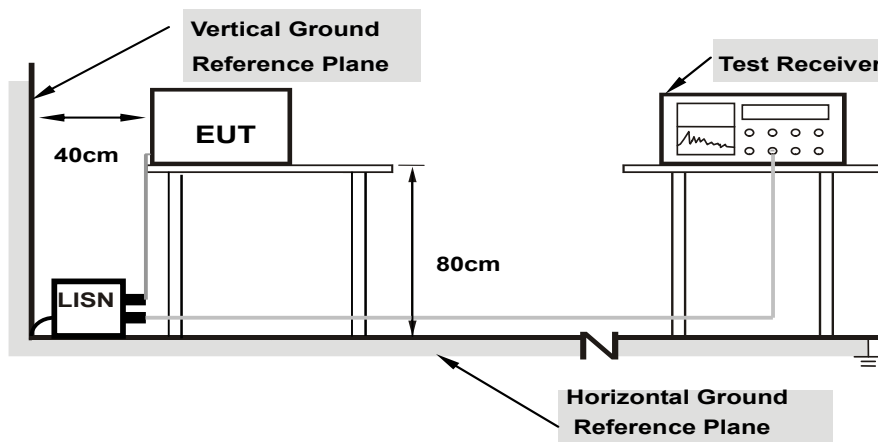
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

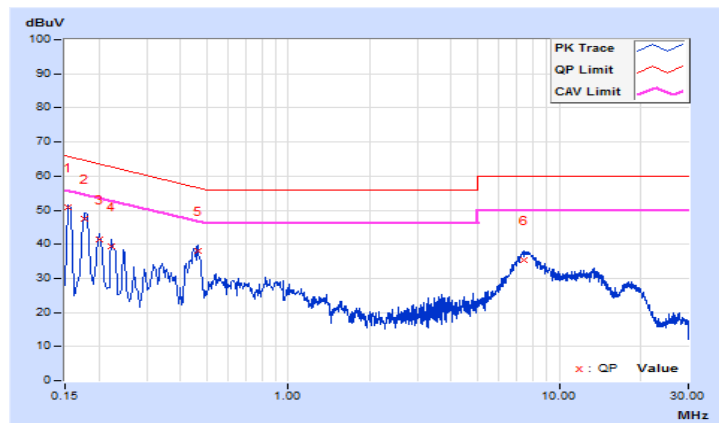
802.11a

Phase	Line (L)	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	0.15400	10.15	40.57	27.39	50.72	37.54	65.78
2	0.17800	10.16	37.20	23.91	47.36	34.07	64.58	54.58	-17.22	-20.51
3	0.20200	10.16	31.09	20.45	41.25	30.61	63.53	53.53	-22.28	-22.92
4	0.22200	10.16	29.37	17.80	39.53	27.96	62.74	52.74	-23.21	-24.78
5	0.46200	10.18	27.95	20.00	38.13	30.18	56.66	46.66	-18.53	-16.48
6	7.43800	10.52	24.69	19.17	35.21	29.69	60.00	50.00	-24.79	-20.31

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.

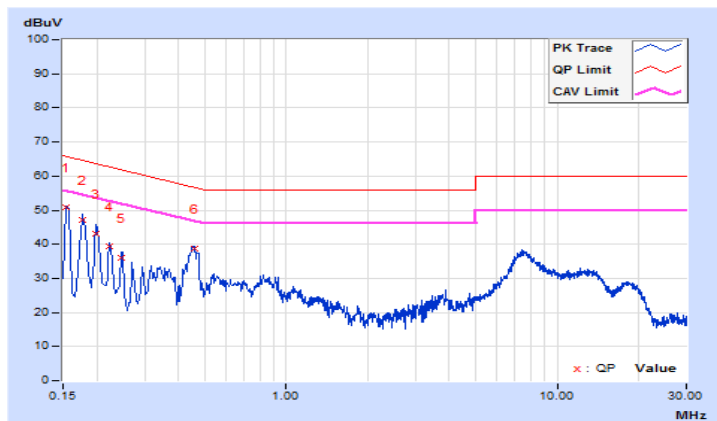


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

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	0.15400	10.13	40.60	27.11	50.73	37.24	65.78
2	0.17800	10.13	37.16	23.84	47.29	33.97	64.58	54.58	-17.29	-20.61
3	0.19800	10.13	32.86	20.86	42.99	30.99	63.69	53.69	-20.70	-22.70
4	0.22200	10.13	29.35	17.70	39.48	27.83	62.74	52.74	-23.26	-24.91
5	0.24600	10.14	25.95	14.20	36.09	24.34	61.89	51.89	-25.80	-27.55
6	0.45716	10.18	28.67	19.51	38.85	29.69	56.74	46.74	-17.89	-17.05

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.





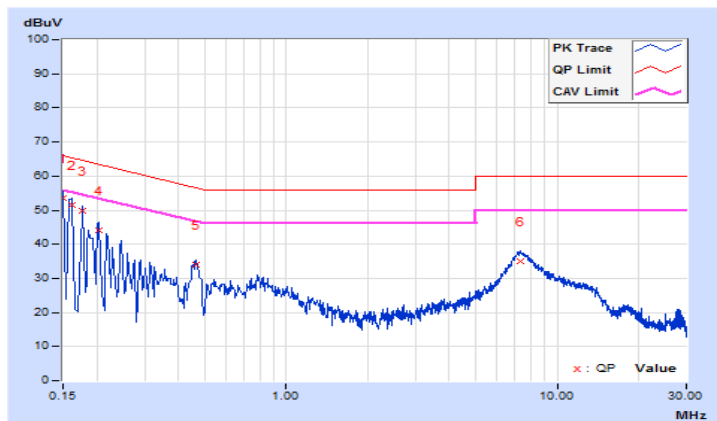
802.11ac (VHT40)

Phase	Line (L)	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	0.15000	10.15	43.54	26.80	53.69	36.95	66.00
2	0.16096	10.15	41.31	23.26	51.46	33.41	65.41	55.41	-13.95	-22.00
3	0.17737	10.16	39.62	24.14	49.78	34.30	64.61	54.61	-14.83	-20.31
4	0.20404	10.16	33.85	18.40	44.01	28.56	63.44	53.44	-19.43	-24.88
5	0.46669	10.18	23.97	19.76	34.15	29.94	56.57	46.57	-22.42	-16.63
6	7.30530	10.51	24.41	19.32	34.92	29.83	60.00	50.00	-25.08	-20.17

Remarks:

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

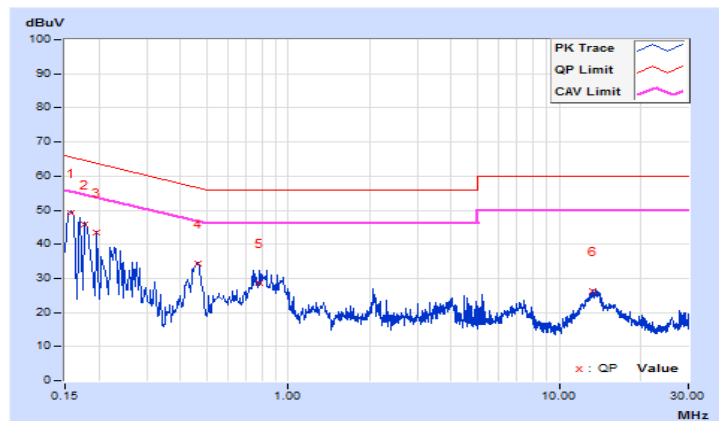


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

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	0.15760	10.13	38.96	22.08	49.09	32.21	65.59
2	0.17737	10.13	35.70	19.07	45.83	29.20	64.61	54.61	-18.78	-25.41
3	0.19692	10.13	33.28	18.28	43.41	28.41	63.74	53.74	-20.33	-25.33
4	0.46669	10.18	24.29	19.22	34.47	29.40	56.57	46.57	-22.10	-17.17
5	0.78733	10.22	18.39	11.76	28.61	21.98	56.00	46.00	-27.39	-24.02
6	13.28369	10.63	15.53	10.95	26.16	21.58	60.00	50.00	-33.84	-28.42

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.



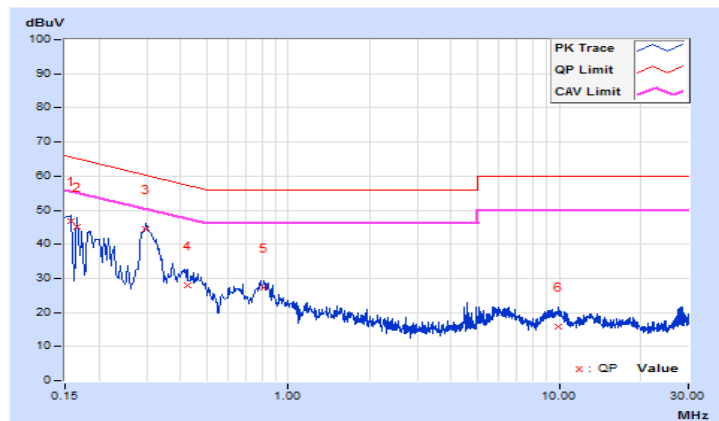
802.11a

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	0.15782	10.15	36.76	21.23	46.91	31.38	65.58
2	0.16564	10.15	35.13	19.13	45.28	29.28	65.18	55.18	-19.90	-25.90
3	0.29858	10.16	34.31	26.64	44.47	36.80	60.28	50.28	-15.81	-13.48
4	0.42334	10.17	17.78	10.57	27.95	20.74	57.38	47.38	-29.43	-26.64
5	0.81079	10.24	17.12	10.90	27.36	21.14	56.00	46.00	-28.64	-24.86
6	9.92500	10.55	5.21	0.45	15.76	11.00	60.00	50.00	-44.24	-39.00

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.

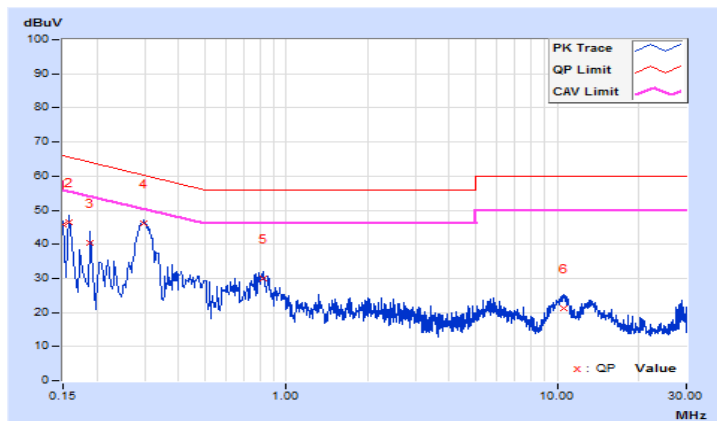


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.15000	10.13	35.57	17.27	45.70	27.40	66.00
2	0.15782	10.13	36.29	22.04	46.42	32.17	65.58	55.58	-19.16	-23.41
3	0.18910	10.13	30.38	17.39	40.51	27.52	64.08	54.08	-23.57	-26.56
4	0.29819	10.15	36.06	28.28	46.21	38.43	60.29	50.29	-14.08	-11.86
5	0.82234	10.23	19.68	12.49	29.91	22.72	56.00	46.00	-26.09	-23.28
6	10.63662	10.55	10.58	5.88	21.13	16.43	60.00	50.00	-38.87	-33.57

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.



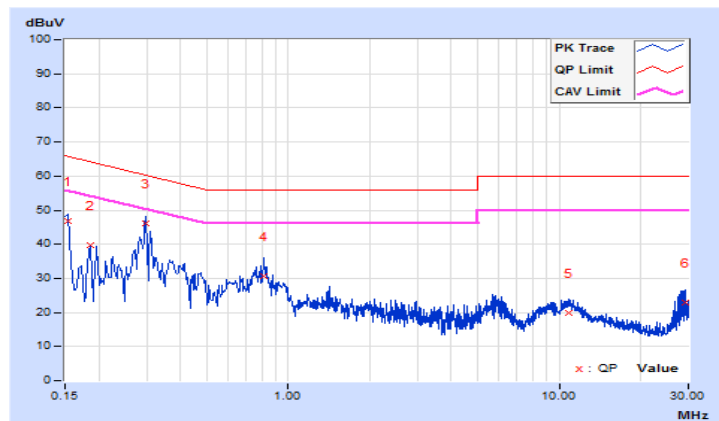
802.11ac (VHT40)

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

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	0.15391	10.15	36.53	19.96	46.68	30.11	65.79	55.79	-19.11	-25.68
2	0.18519	10.16	29.71	16.00	39.87	26.16	64.25	54.25	-24.38	-28.09
3	0.29858	10.16	35.81	28.08	45.97	38.24	60.28	50.28	-14.31	-12.04
4	0.81079	10.24	20.46	14.39	30.70	24.63	56.00	46.00	-25.30	-21.37
5	10.83603	10.56	9.30	4.48	19.86	15.04	60.00	50.00	-40.14	-34.96
6	29.41635	10.87	11.99	8.72	22.86	19.59	60.00	50.00	-37.14	-30.41

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.

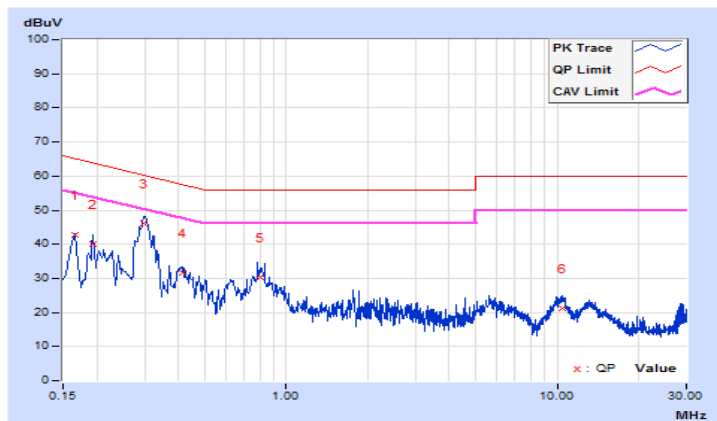


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.16564	10.13	32.70	19.62	42.83	29.75	65.18
2	0.19301	10.13	29.87	16.86	40.00	26.99	63.91	53.91	-23.91	-26.92
<b>3</b>	<b>0.29819</b>	<b>10.15</b>	<b>36.14</b>	<b>28.35</b>	<b>46.29</b>	<b>38.50</b>	<b>60.29</b>	<b>50.29</b>	<b>-14.00</b>	<b>-11.79</b>
4	0.41197	10.17	21.35	13.25	31.52	23.42	57.61	47.61	-26.09	-24.19
5	0.80297	10.22	20.00	12.61	30.22	22.83	56.00	46.00	-25.78	-23.17
6	10.50759	10.55	10.80	6.09	21.35	16.64	60.00	50.00	-38.65	-33.36

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 Transmit Power Measurement

#### 4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

\*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

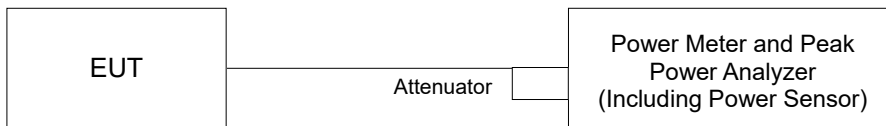
Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

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.

#### 4.3.2 Test Setup



#### 4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

#### 4.3.4 Test Procedure

Method PM is 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 and set the detector to average. Duty factor is not added to measured value.

#### 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

Power Output:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.32	20.40	217.295	23.37	30.00	Pass
40	5200	20.46	20.32	<b>218.820</b>	23.40	30.00	Pass
48	5240	20.10	20.51	214.789	23.32	30.00	Pass
149	5745	24.73	24.55	582.269	27.65	30.00	Pass
157	5785	24.41	24.22	540.299	27.33	30.00	Pass
165	5825	24.49	24.53	564.982	27.52	30.00	Pass

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.16	20.27	210.167	23.23	30.00	Pass
40	5200	20.29	20.33	214.800	23.32	30.00	Pass
48	5240	20.01	20.54	213.471	23.29	30.00	Pass
149	5745	24.75	24.63	588.940	27.70	30.00	Pass
157	5785	24.71	24.67	588.890	27.70	30.00	Pass
165	5825	24.68	24.37	567.292	27.54	30.00	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	14.71	14.55	58.090	17.64	30.00	Pass
46	5230	20.02	20.56	214.225	23.31	30.00	Pass
151	5755	24.57	24.09	542.866	27.35	30.00	Pass
159	5795	24.89	24.53	<b>592.111</b>	27.72	30.00	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	13.48	13.49	44.620	16.50	30.00	Pass
155	5775	22.40	22.11	336.335	25.27	30.00	Pass



Beamforming Mode

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.16	20.27	210.167	23.23	29.62	Pass
40	5200	20.29	20.33	<b>214.800</b>	23.32	29.62	Pass
48	5240	20.01	20.54	213.471	23.29	29.62	Pass
149	5745	24.75	24.63	588.940	27.70	30.00	Pass
157	5785	24.71	24.67	588.890	27.70	30.00	Pass
165	5825	24.68	24.37	567.292	27.54	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain = 6.38dBi > 6dBi, so the power limit shall be reduced to 30 - (6.38 - 6) = 29.62dBi.
2. 5745-5825MHz: Directional gain = 5.82dBi < 6dBi, so the power limit not need to reduce.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	14.71	14.55	58.090	17.64	29.62	Pass
46	5230	20.02	20.56	214.225	23.31	29.62	Pass
151	5755	24.57	24.09	542.866	27.35	30.00	Pass
159	5795	24.89	24.53	<b>592.111</b>	27.72	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain = 6.38dBi > 6dBi, so the power limit shall be reduced to 30 - (6.38 - 6) = 29.62dBi.
2. 5745-5825MHz: Directional gain = 5.82dBi < 6dBi, so the power limit not need to reduce.

802.11ac (VHT80)

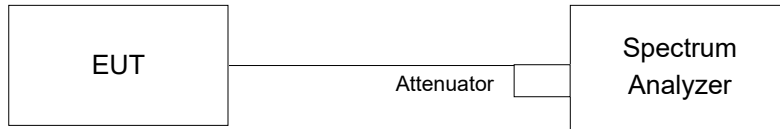
Chan.	Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	13.48	13.49	44.620	16.50	29.62	Pass
155	5775	22.40	22.11	336.335	25.27	30.00	Pass

Note:

1. 5180-5240MHz: Directional gain = 6.38dBi > 6dBi, so the power limit shall be reduced to 30 - (6.38 - 6) = 29.62dBi.
2. 5745-5825MHz: Directional gain = 5.82dBi < 6dBi, so the power limit not need to reduce.

## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Test Setup



### 4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

#### 4.4.4 Test Result

##### 802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.40	17.04
40	5200	17.64	17.76
48	5240	17.28	17.40
149	5745	16.78	16.61
157	5785	16.92	16.92
165	5825	17.04	16.68

##### 802.11ac (VHT20)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.12	18.12
40	5200	18.36	18.48
48	5240	18.12	18.24
149	5745	17.88	17.76
157	5785	18.00	17.88
165	5825	18.00	17.88

##### 802.11ac (VHT40)

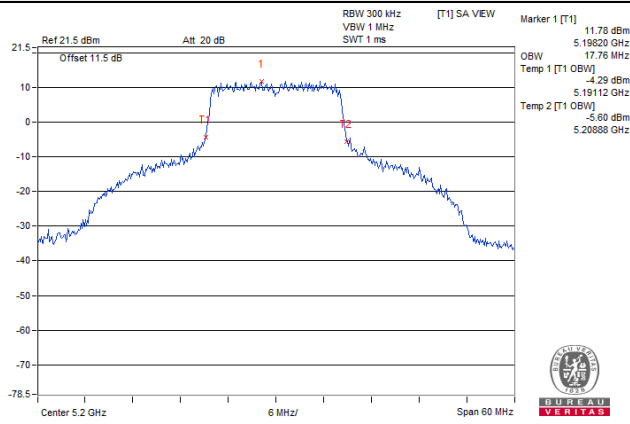
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.24	36.12
46	5230	36.60	36.72
151	5755	36.48	36.60
159	5795	36.36	36.60

##### 802.11ac (VHT80)

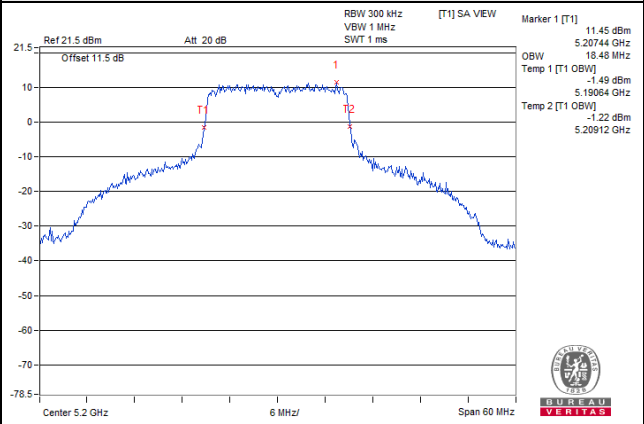
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	76.08
155	5775	75.84	76.08

### Spectrum Plot of Worst Value

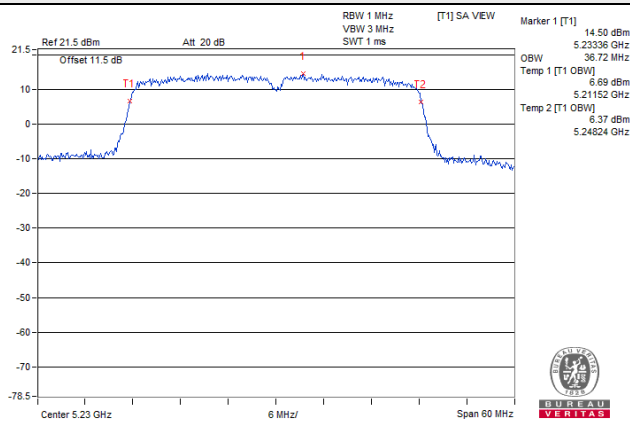
#### 802.11a



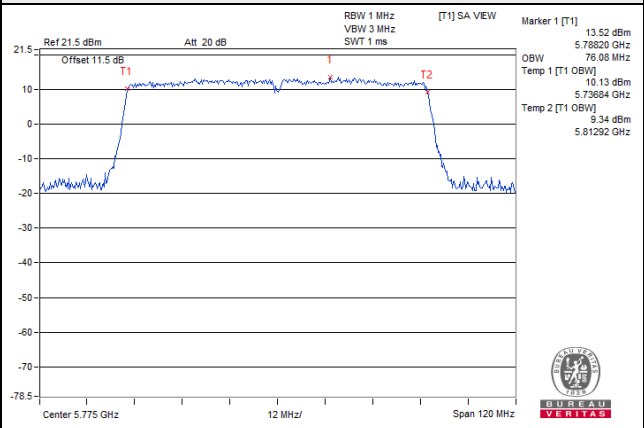
#### 802.11ac (VHT20)



#### 802.11ac (VHT40)

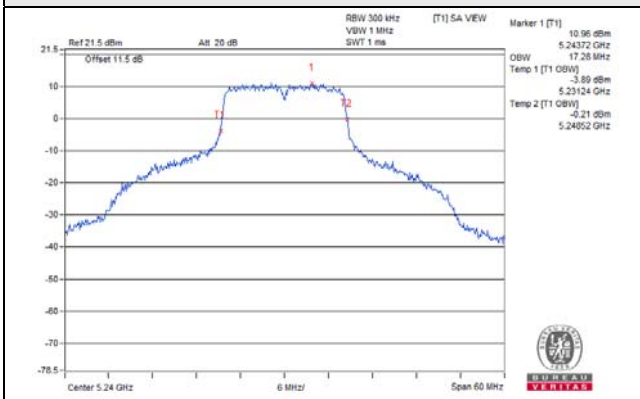


#### 802.11ac (VHT80)

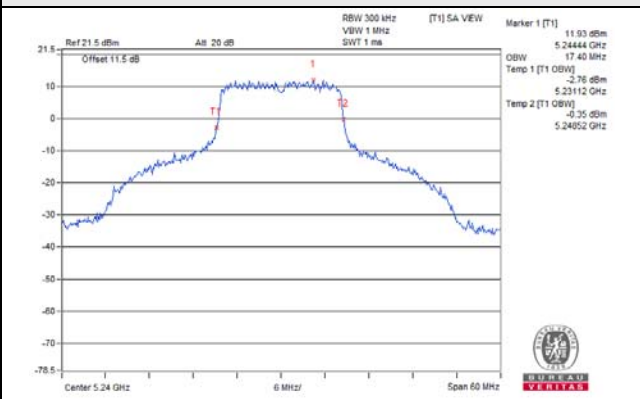


Spectrum Plot for near By DFS Band

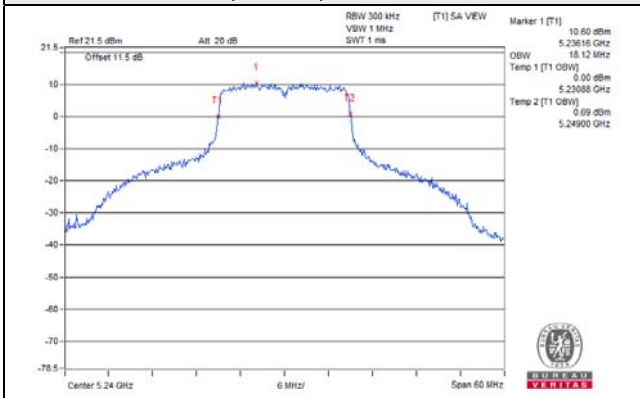
802.11a / Chain 0 / CH 48



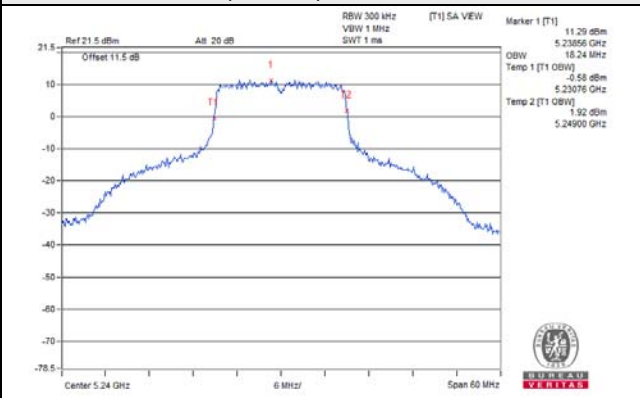
802.11a / Chain 1 / CH 48



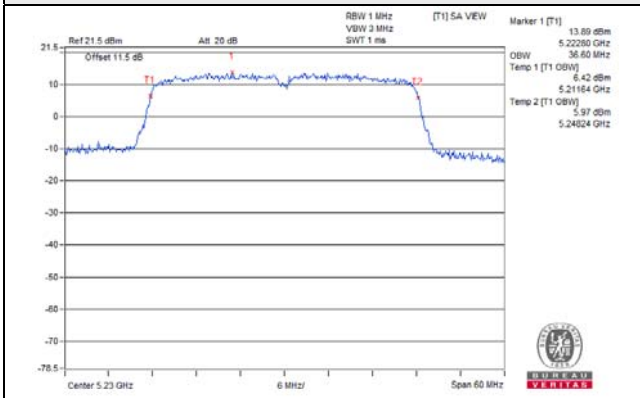
802.11ac (VHT20) / Chain 0 / CH 48



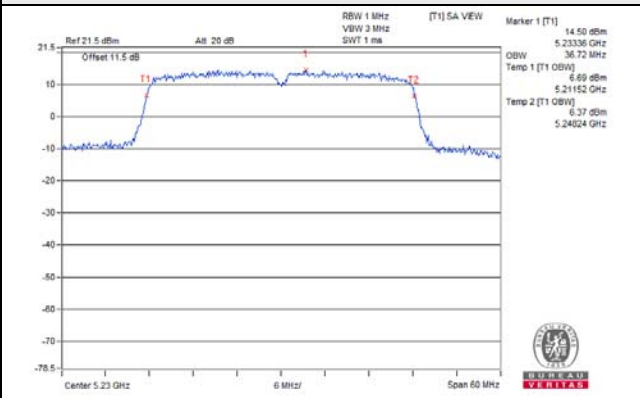
802.11ac (VHT20) / Chain 1 / CH 48



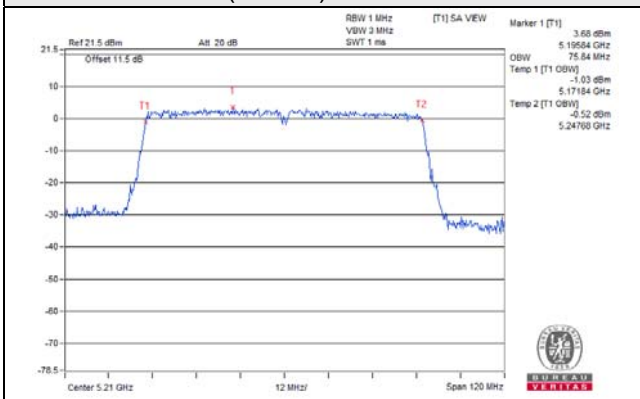
802.11ac (VHT40) / Chain 0 / CH 46



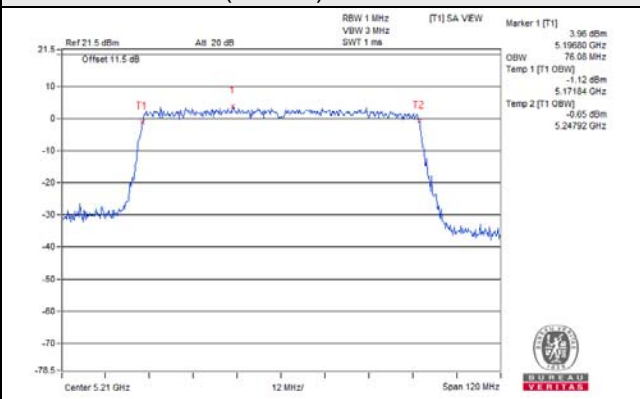
802.11ac (VHT40) / Chain 1 / CH 46



802.11ac (VHT80) / Chain 0 / CH 42

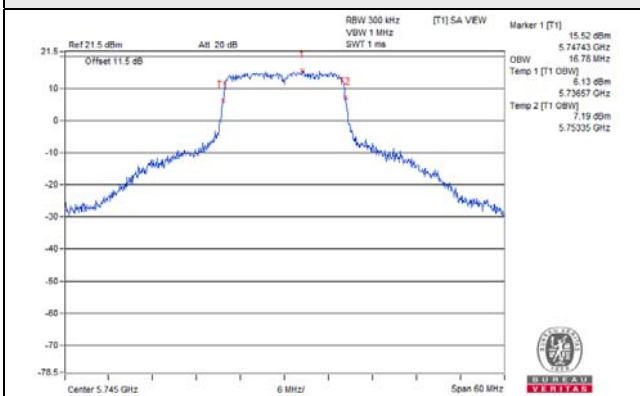


802.11ac (VHT80) / Chain 1 / CH 42

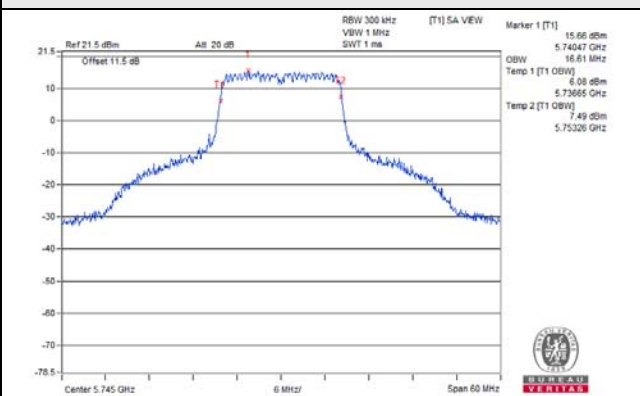


### Spectrum Plot for near By DFS Band

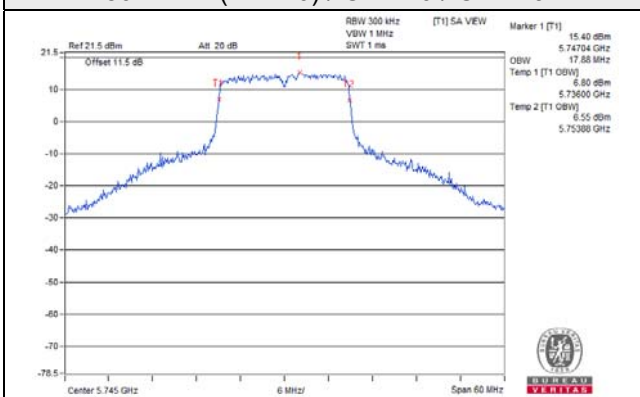
**802.11a / Chain 0 / CH 149**



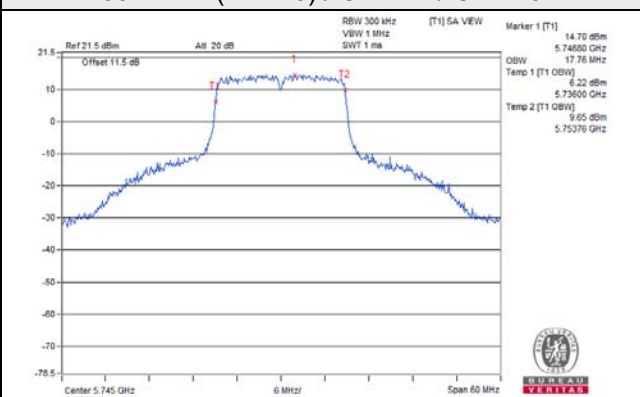
**802.11a / Chain 1 / CH 149**



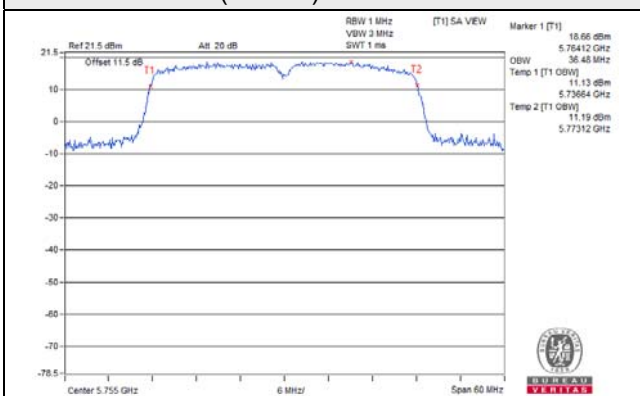
**802.11ac (VHT20) / Chain 0 / CH 149**



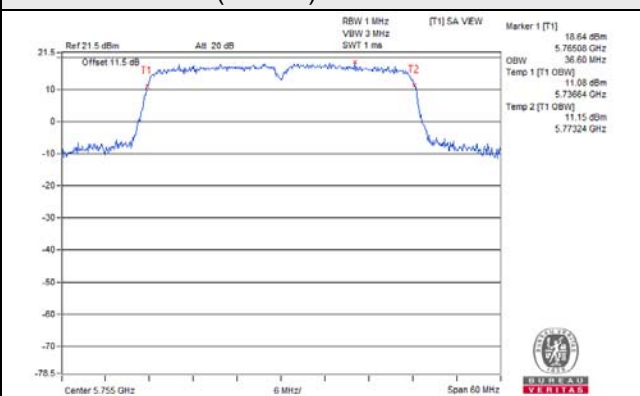
**802.11ac (VHT20) / Chain 1 / CH 149**



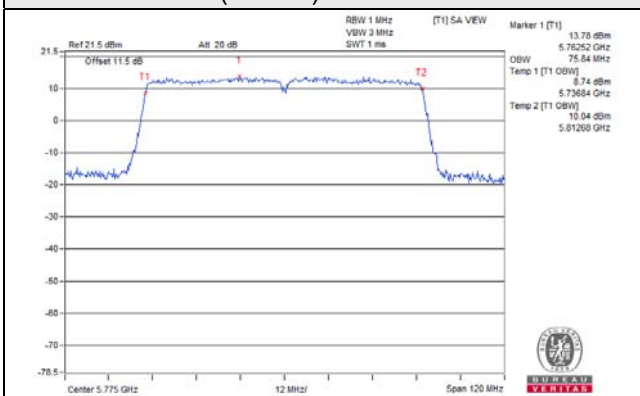
**802.11ac (VHT40) / Chain 0 / CH 151**



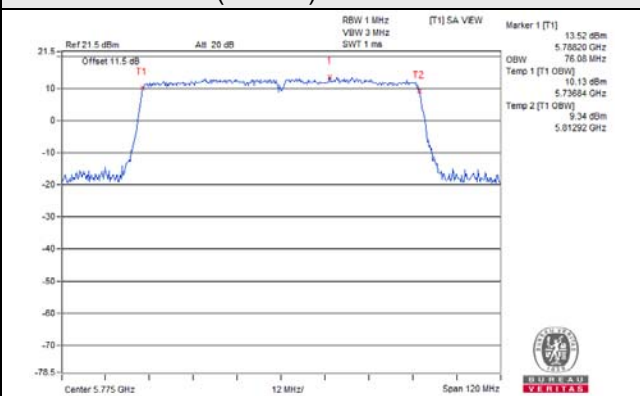
**802.11ac (VHT40) / Chain 1 / CH 151**



**802.11ac (VHT80) / Chain 0 / CH 155**



**802.11ac (VHT80) / Chain 1 / CH 155**

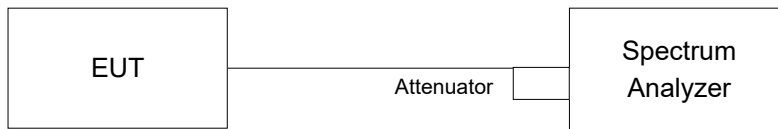


## 4.5 Peak Power Spectral Density Measurement

### 4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C			11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

### 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 Procedures

For U-NII-1 band:

Using method SA-2

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1MHz, Set VBW  $\geq$  3 MHz, Detector = RMS
- Set Channel power measure = 1MHz
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add  $10 \log (1/\text{duty cycle})$

For U-NII-3 band:

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW  $\geq$  1 MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $\text{BWCF} = 10\log(500 \text{ kHz} / 300 \text{ kHz})$
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add  $10 \log (1/\text{duty cycle})$

#### **4.5.5 Deviation from Test Standard**

No deviation.

#### **4.5.6 EUT Operating Conditions**

Same as 4.3.6.



#### 4.5.7 Test Results

For U-NII-1 band:

##### 802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	6.39	6.77	0.17	9.76	16.62	Pass
40	5200	6.45	7.08	0.17	9.96	16.62	Pass
48	5240	6.16	7.01	0.17	9.79	16.62	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 6.38dBi > 6dBi, so the power density limit shall be reduced to  $17 - (6.38 - 6) = 16.62$ dBi.
- Refer to section 3.3 for duty cycle spectrum plot.

##### 802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	5.99	6.25	0.11	9.24	16.62	Pass
40	5200	6.05	6.67	0.11	9.49	16.62	Pass
48	5240	5.83	6.49	0.11	9.29	16.62	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 6.38dBi > 6dBi, so the power density limit shall be reduced to  $17 - (6.38 - 6) = 16.62$ dBi.
- Refer to section 3.3 for duty cycle spectrum plot.

##### 802.11ac (VHT40)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-1.97	-1.88	0.17	1.26	16.62	Pass
46	5230	2.98	3.87	0.17	6.63	16.62	Pass

Note:

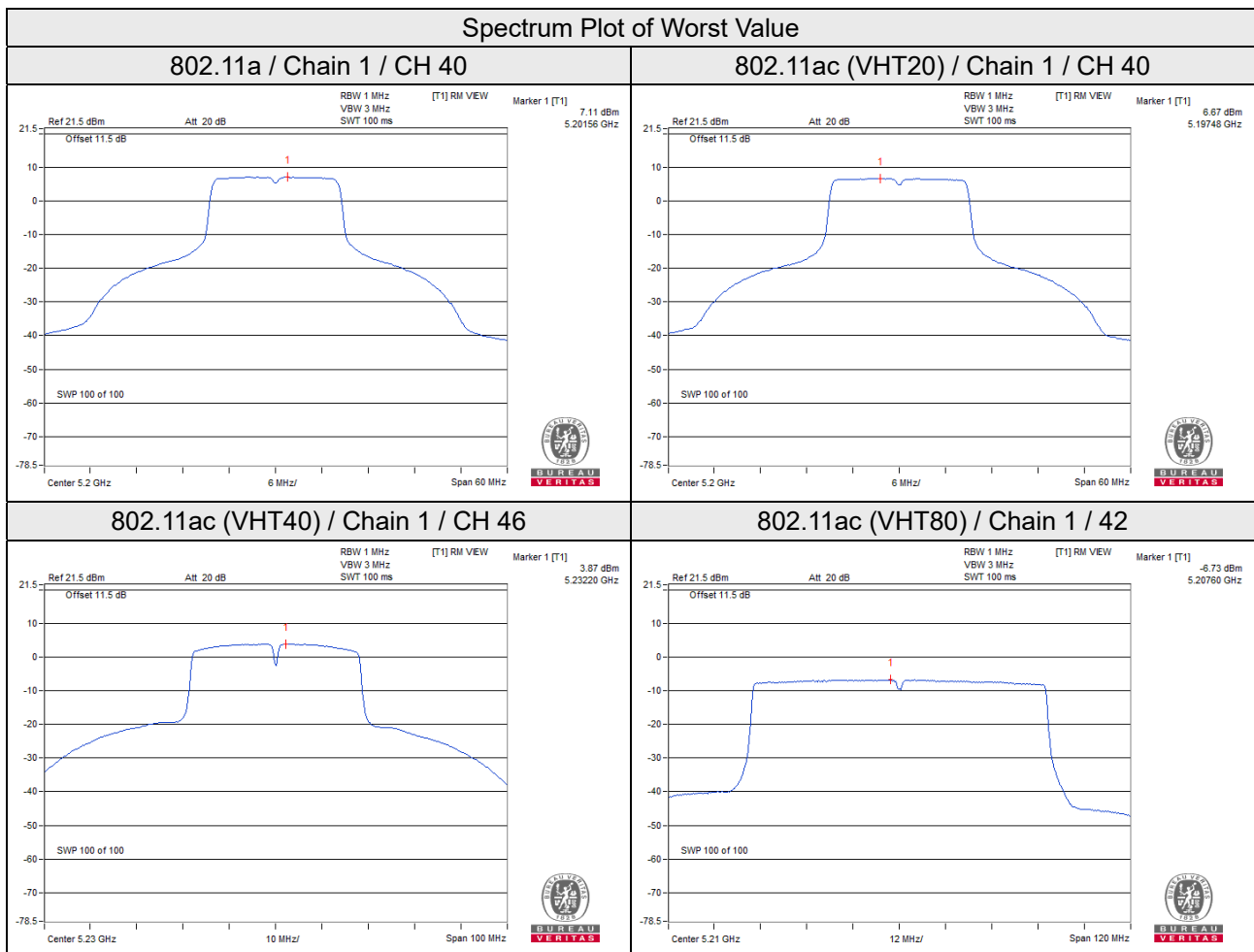
- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 6.38dBi > 6dBi, so the power density limit shall be reduced to  $17 - (6.38 - 6) = 16.62$ dBi.
- Refer to section 3.3 for duty cycle spectrum plot.

### 802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-6.96	-6.79	0.57	-3.29	16.62	Pass

**Note:**

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 6.38dBi > 6dBi, so the power density limit shall be reduced to 17 - (6.38 - 6) = 16.62dBi.
- Refer to section 3.3 for duty cycle spectrum plot.



For U-NII-3 band:

802.11a

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	3.03	5.25	3.01	0.17	8.43	30.00	Pass
	157	5785	3.38	5.60	3.01	0.17	8.78	30.00	Pass
	165	5825	3.04	5.26	3.01	0.17	8.44	30.00	Pass
1	149	5745	2.28	4.50	3.01	0.17	7.68	30.00	Pass
	157	5785	2.90	5.12	3.01	0.17	8.30	30.00	Pass
	165	5825	2.67	4.89	3.01	0.17	8.07	30.00	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N<sub>ANT</sub>) dB.
2. Directional gain = 5.82dBi < 6dBi, so the power density limit not need to reduce.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	2.74	4.96	3.01	0.11	8.08	30.00	Pass
	157	5785	2.97	5.19	3.01	0.11	8.31	30.00	Pass
	165	5825	2.46	4.68	3.01	0.11	7.80	30.00	Pass
1	149	5745	2.03	4.25	3.01	0.11	7.37	30.00	Pass
	157	5785	2.83	5.05	3.01	0.11	8.17	30.00	Pass
	165	5825	2.58	4.80	3.01	0.11	7.92	30.00	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N<sub>ANT</sub>) dB.
2. Directional gain = 5.82dBi < 6dBi, so the power density limit not need to reduce.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-0.08	2.14	3.01	0.17	5.32	30.00	Pass
	159	5795	0.00	2.22	3.01	0.17	5.40	30.00	Pass
1	151	5755	-0.99	1.23	3.01	0.17	4.41	30.00	Pass
	159	5795	-0.29	1.93	3.01	0.17	5.11	30.00	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N<sub>ANT</sub>) dB.
2. Directional gain = 5.82dBi < 6dBi, so the power density limit not need to reduce.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

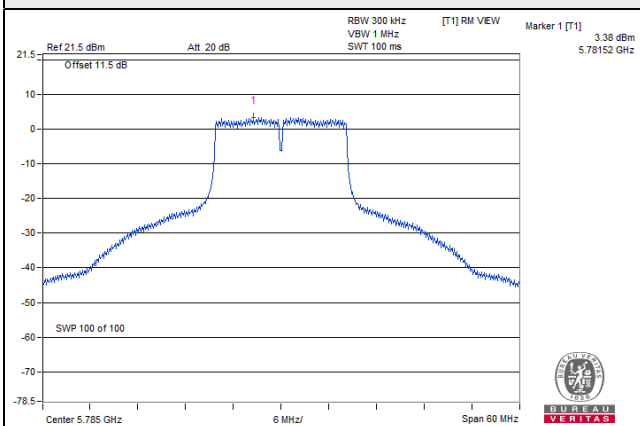
TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-5.21	-2.99	3.01	0.57	0.59	30.00	Pass
1	155	5775	-5.98	-3.76	3.01	0.57	-0.18	30.00	Pass

Note:

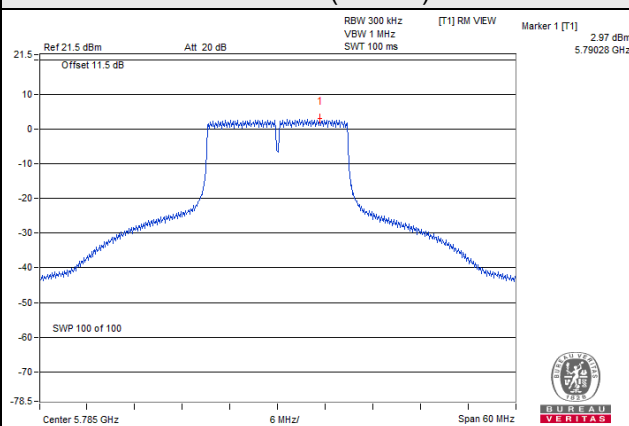
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N<sub>ANT</sub>) dB.
2. Directional gain = 5.82dBi < 6dBi, so the power density limit not need to reduce.
3. Refer to section 3.3 for duty cycle spectrum plot.

### Spectrum Plot of Worst Value

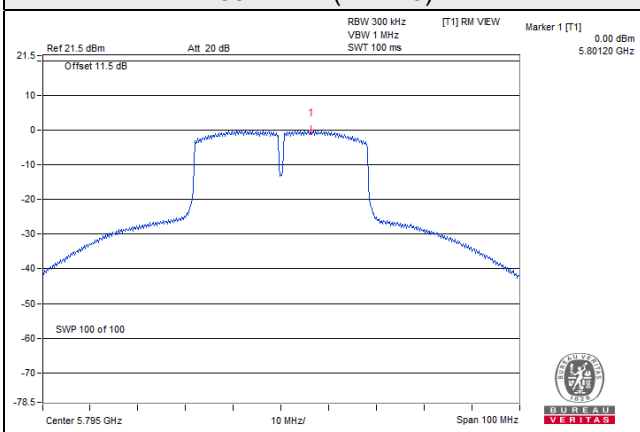
#### 802.11a



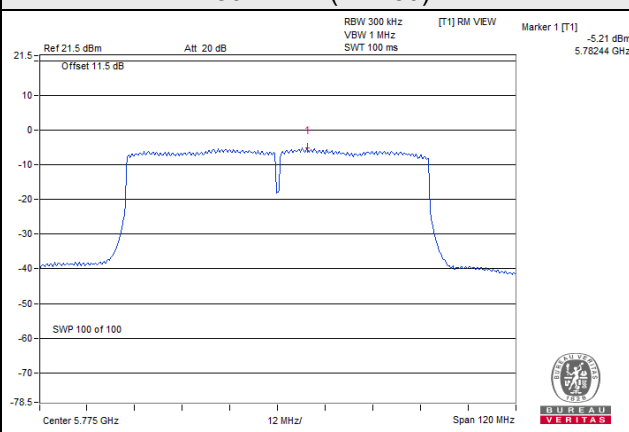
#### 802.11ac (VHT20)



#### 802.11ac (VHT40)



#### 802.11ac (VHT80)

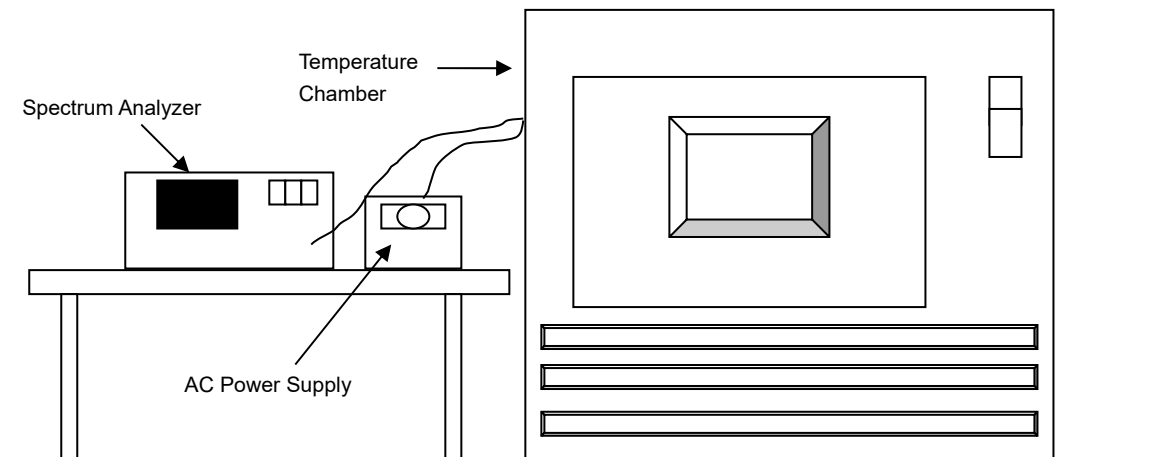


## 4.6 Frequency Stability

### 4.6.1 Limits of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation

### 4.6.2 Test Setup



### 4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 23, 2019	Sep. 22, 2020
Standard Temperature And Humidity Chamber TERCHY	MHU-225AU	920842	May 31, 2019	May 30, 2020
Digital Multimeter Fluke	87-III	70360742	Jun. 28, 2019	Jun. 27, 2020
AC Power Supply Extech	CFW-105	E000603	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.

### 4.6.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step d with every 10 degrees reduction until the lowest temperature achieved.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

#### 4.6.5 Deviation from Test Standard

No deviation.

#### 4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

#### 4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
40	120	5180.0246	PASS	5180.0234	PASS	5180.0228	PASS	5180.0247	PASS
30	120	5179.9912	PASS	5179.9929	PASS	5179.9888	PASS	5179.9928	PASS
20	120	5179.9936	PASS	5179.995	PASS	5179.9942	PASS	5179.9926	PASS
10	120	5180.019	PASS	5180.0196	PASS	5180.0196	PASS	5180.0169	PASS
0	120	5180.0264	PASS	5180.0262	PASS	5180.0256	PASS	5180.0242	PASS

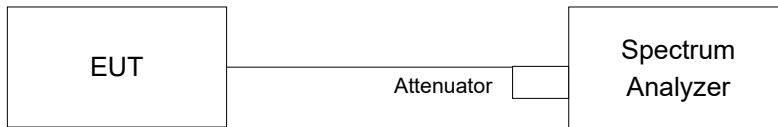
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5179.9944	PASS	5179.9958	PASS	5179.9935	PASS	5179.9934	PASS
	120	5179.9936	PASS	5179.995	PASS	5179.9942	PASS	5179.9926	PASS
	102	5179.9937	PASS	5179.9948	PASS	5179.9938	PASS	5179.9934	PASS

## 4.7 6dB Bandwidth Measurement

### 4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

### 4.7.2 Test Setup



### 4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.7.4 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

### 4.7.5 Deviation from Test Standard

No deviation.

### 4.7.6 EUT Operating Condition

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



#### 4.7.7 Test Results

##### 802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.36	16.36	0.5	Pass
157	5785	16.41	16.39	0.5	Pass
165	5825	16.41	16.38	0.5	Pass

##### 802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.63	17.61	0.5	Pass
157	5785	17.64	17.60	0.5	Pass
165	5825	17.64	17.62	0.5	Pass

##### 802.11ac (VHT40)

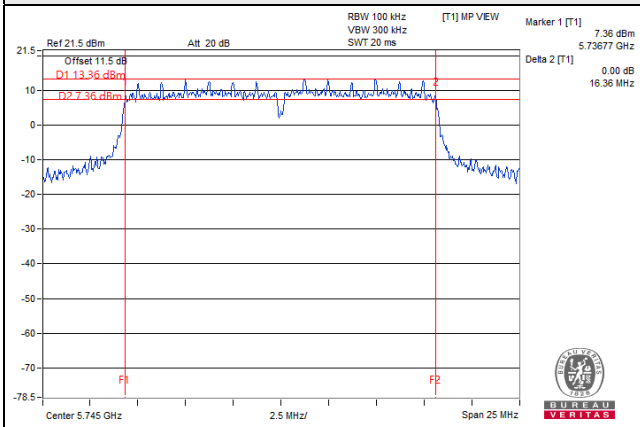
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.23	35.25	0.5	Pass
159	5795	35.23	35.48	0.5	Pass

##### 802.11ac (VHT80)

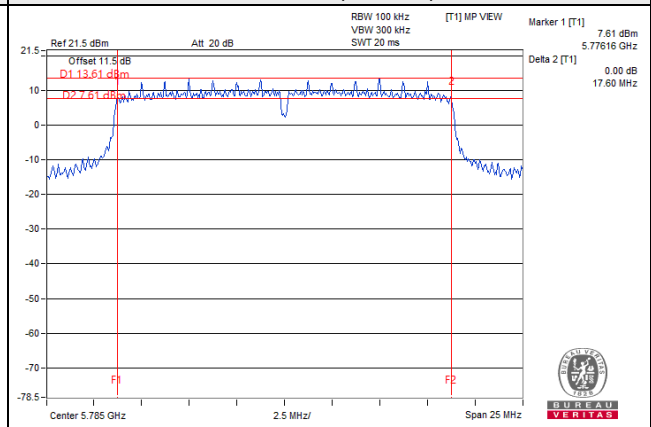
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.00	75.59	0.5	Pass

### Spectrum Plot of Worst Value

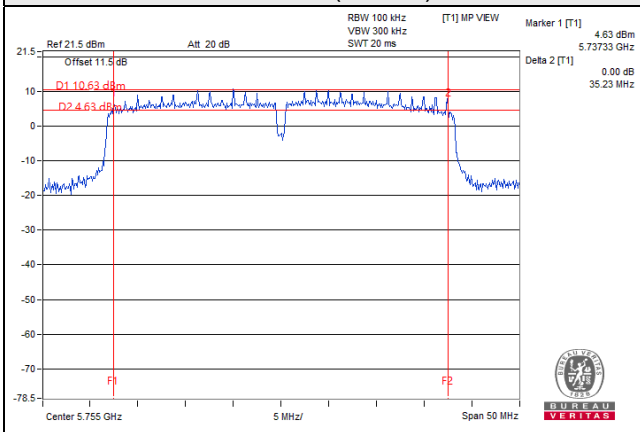
802.11a



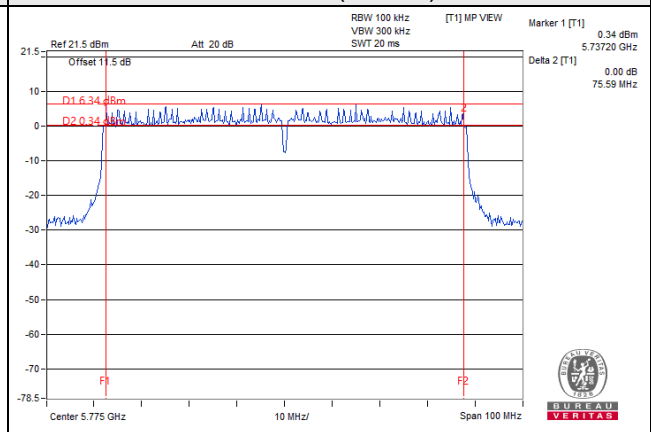
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

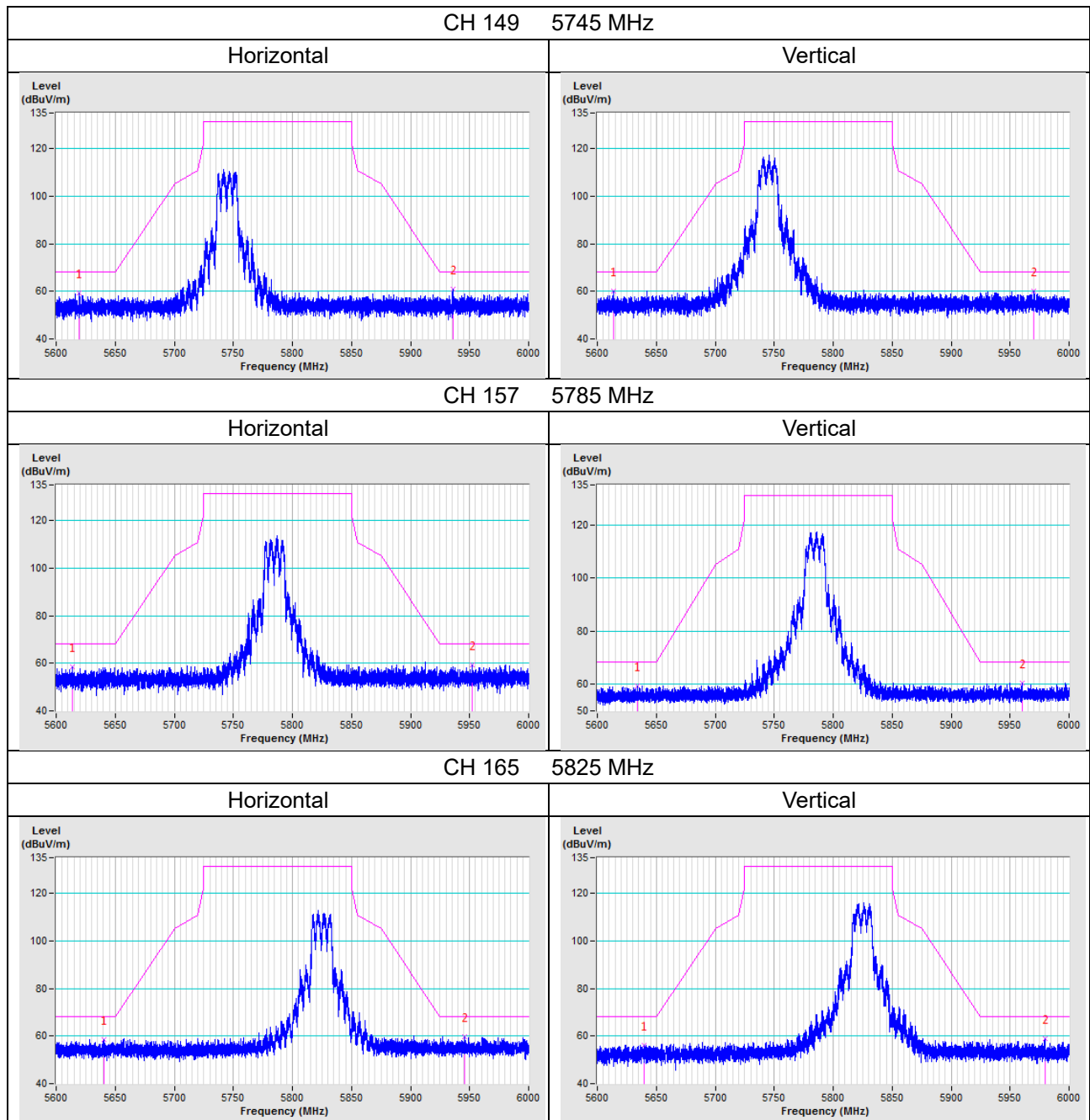


## 5 Pictures of Test Arrangements

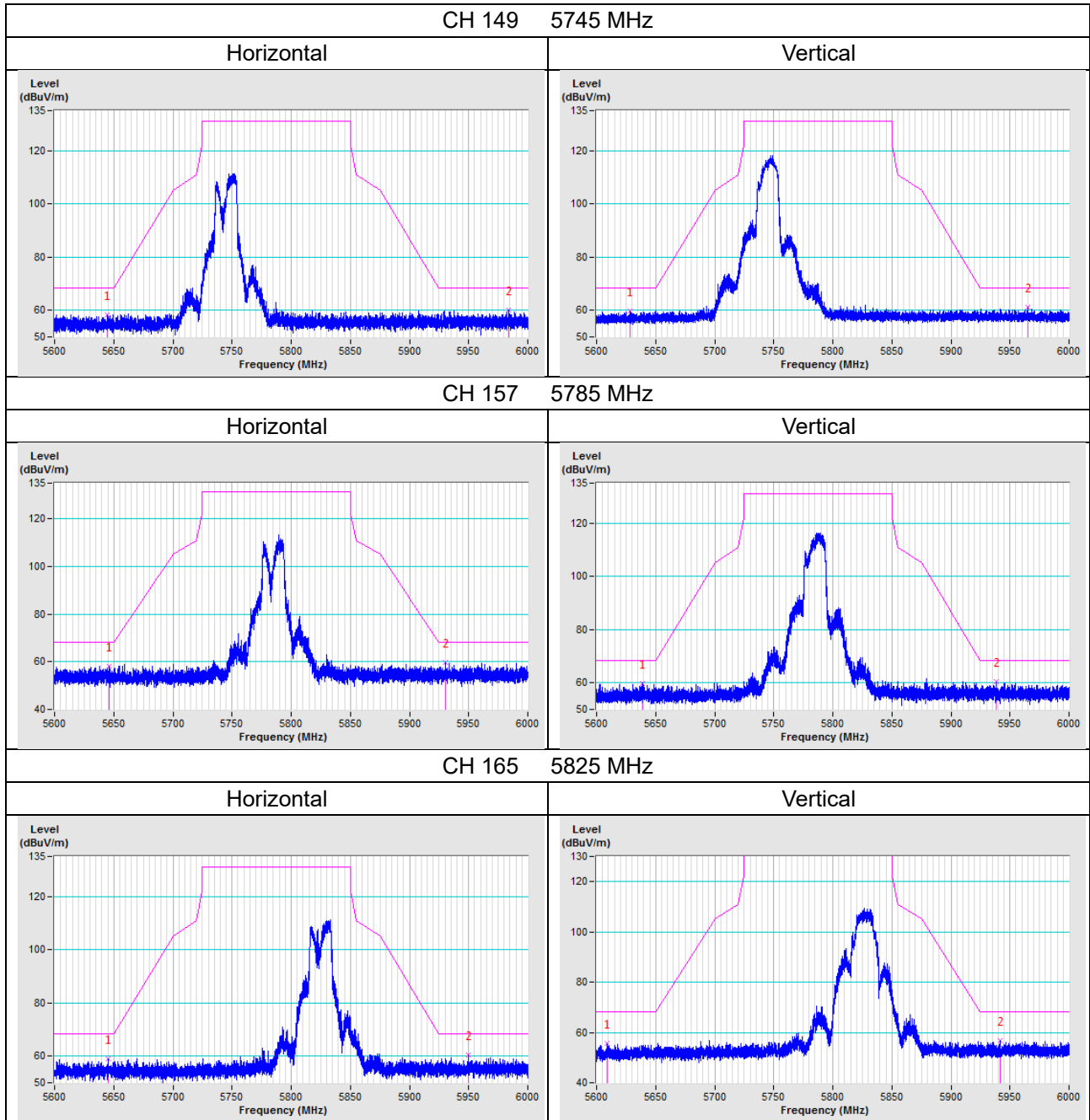
Please refer to the attached file (Test Setup Photo).

### Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

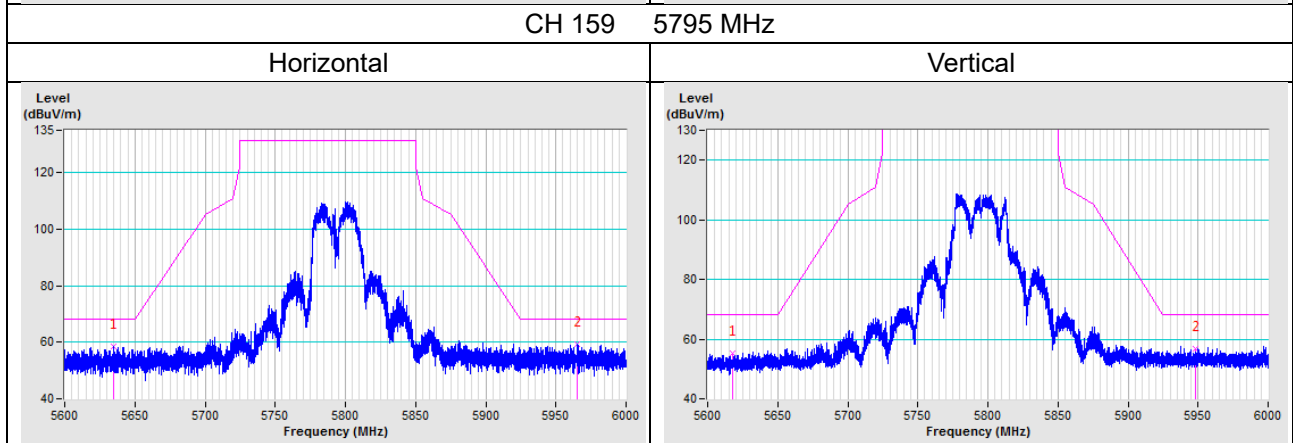
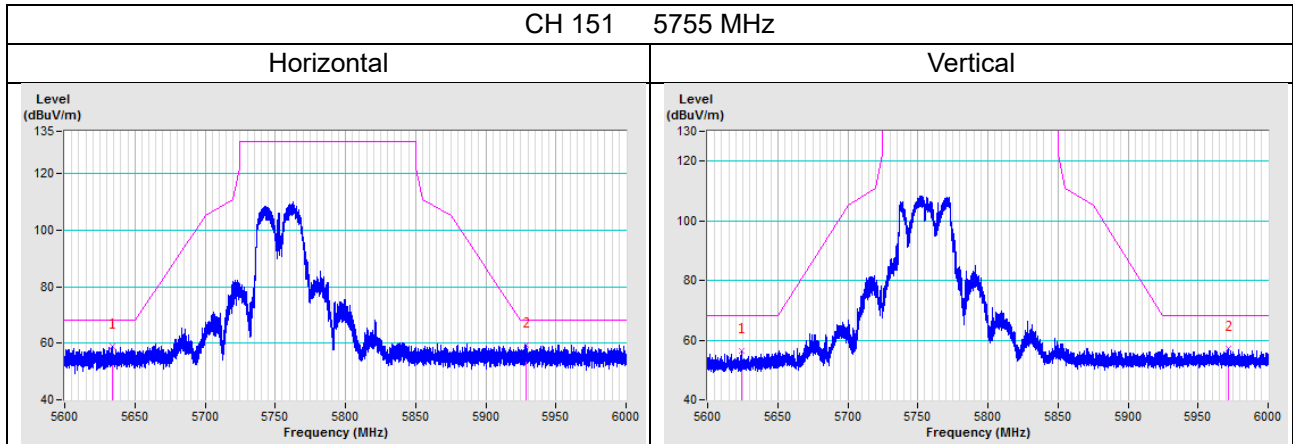
802.11a



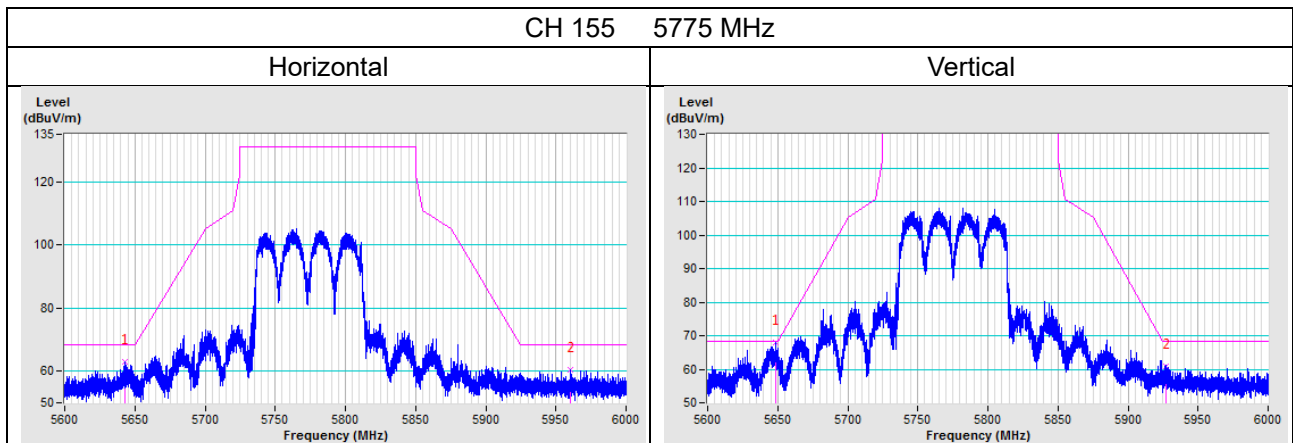
802.11ac (VHT20)



802.11ac (VHT40)

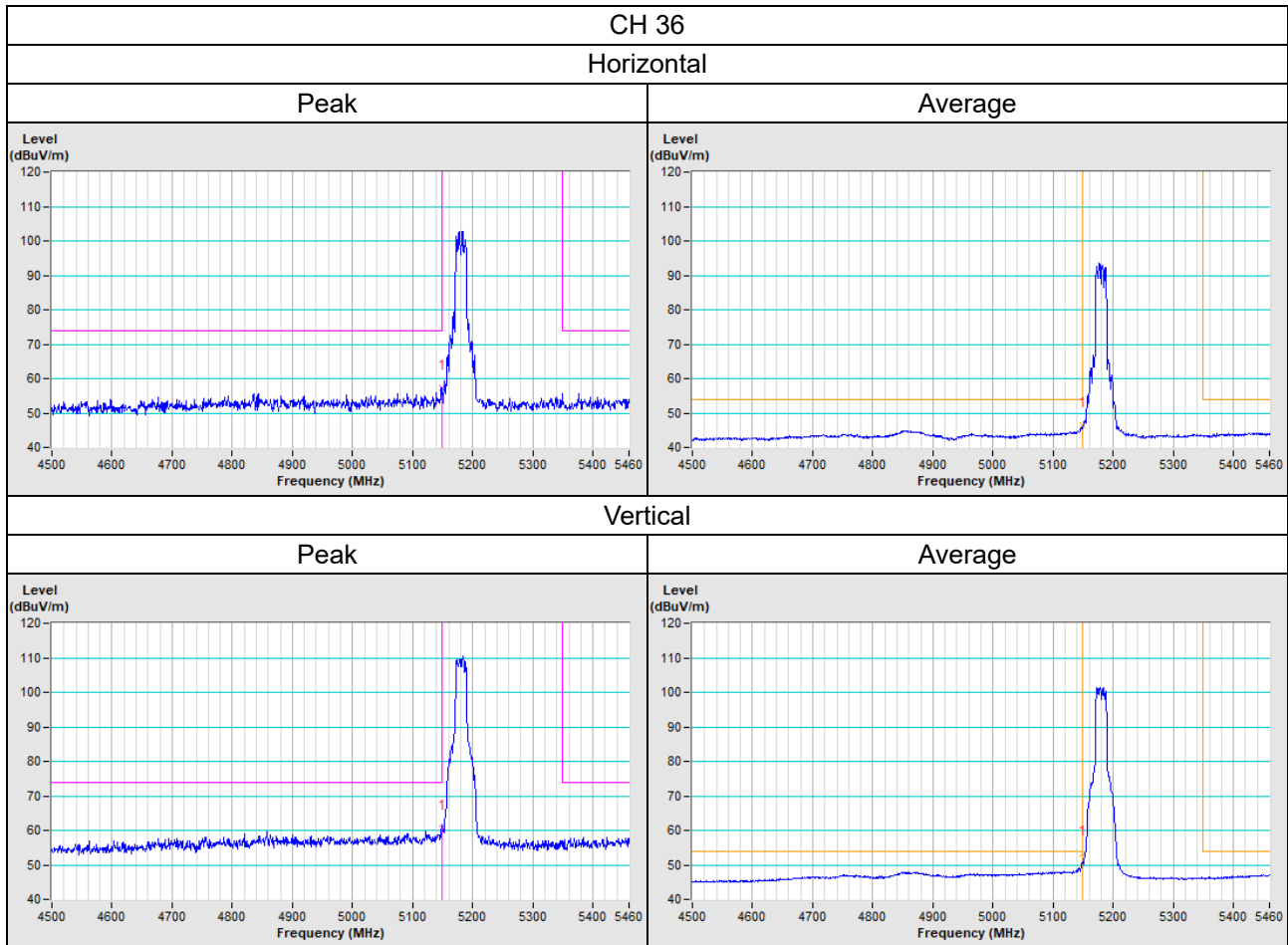


802.11ac (VHT80)



# Annex B- Band Edge Measurement

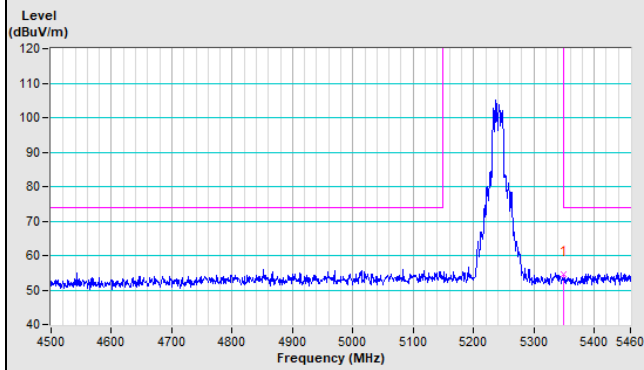
802.11a



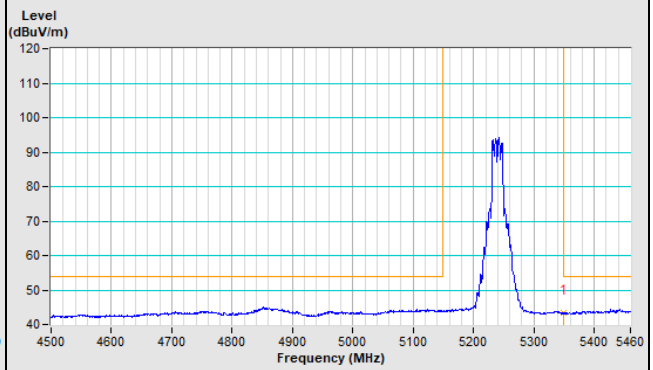
CH 48

Horizontal

Peak

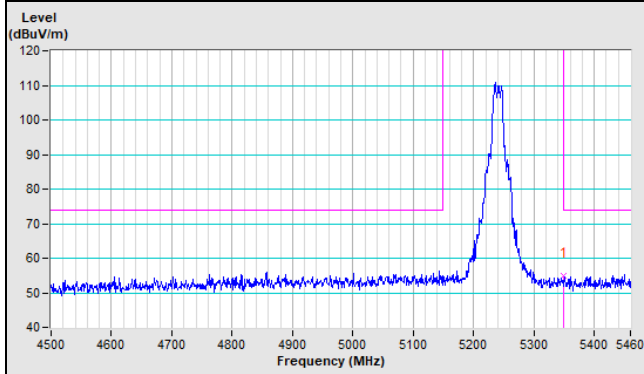


Average

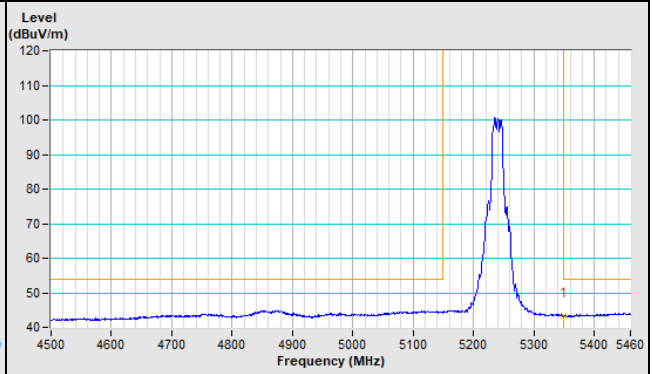


Vertical

Peak



Average



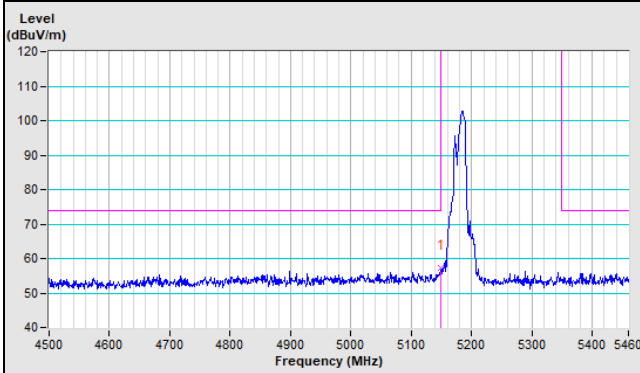


802.11ac (VHT20)

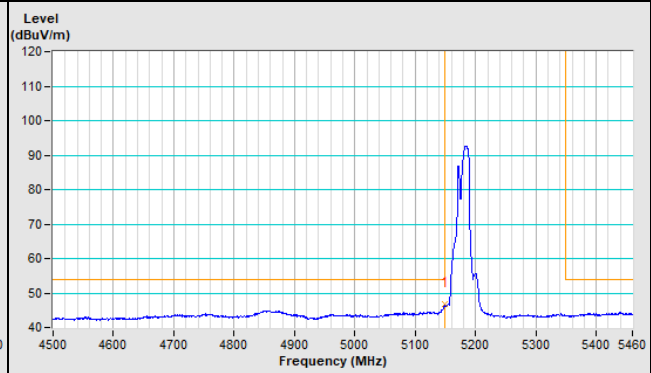
CH 36

Horizontal

Peak

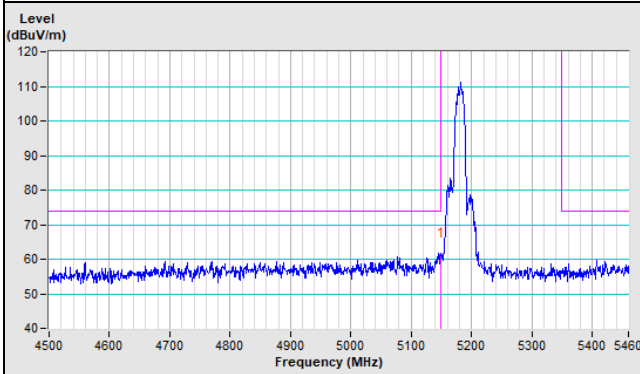


Average

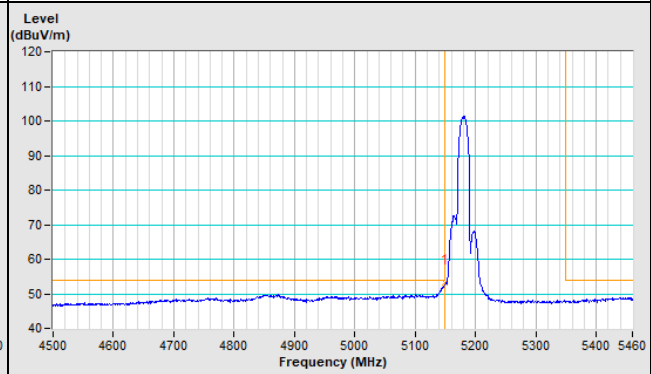


Vertical

Peak



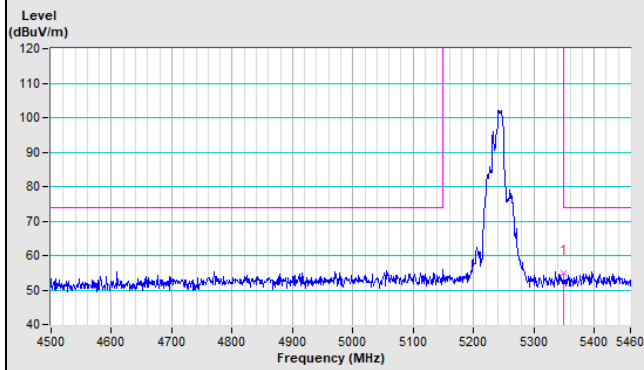
Average



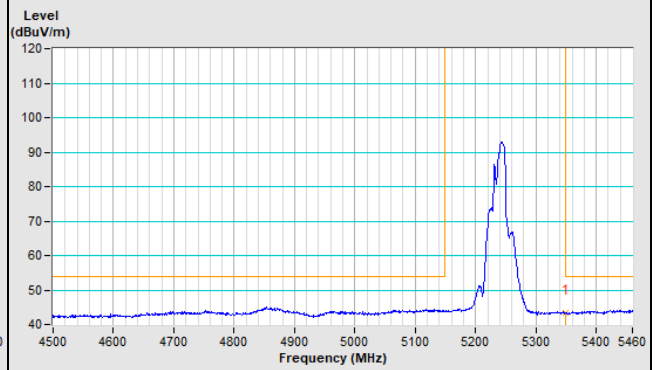
CH 48

Horizontal

Peak

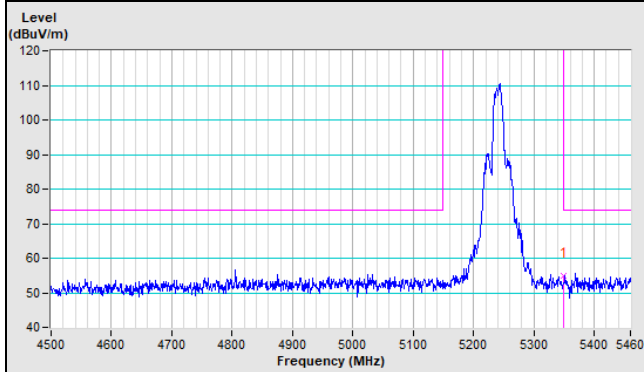


Average

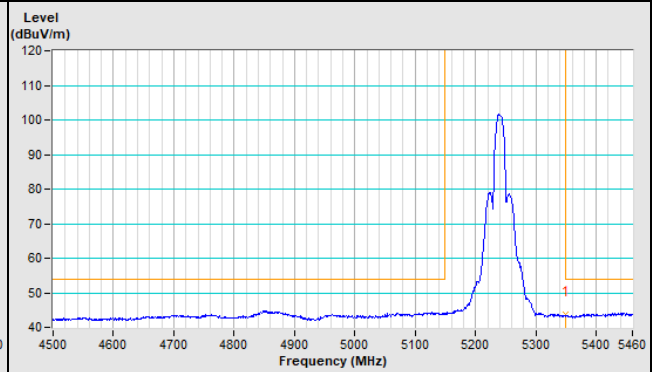


Vertical

Peak



Average

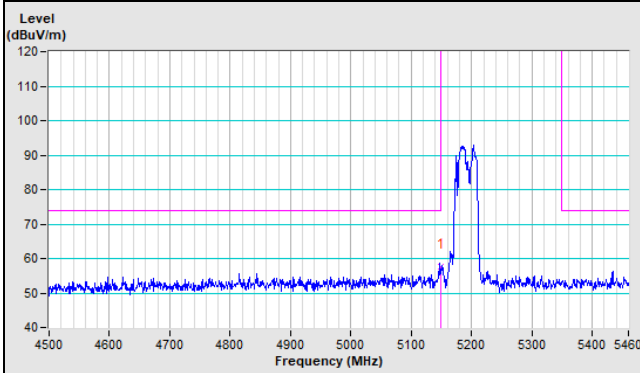


802.11ac (VHT40)

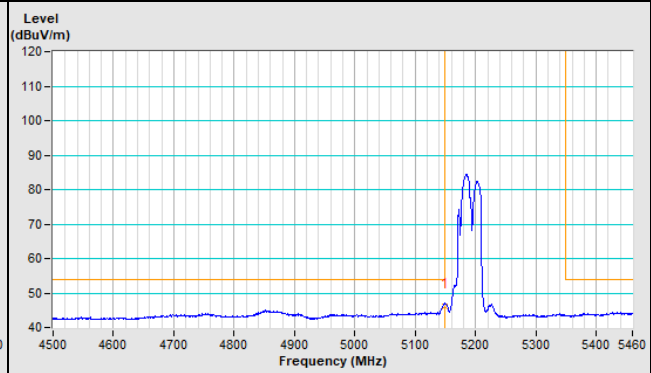
CH 38

Horizontal

Peak

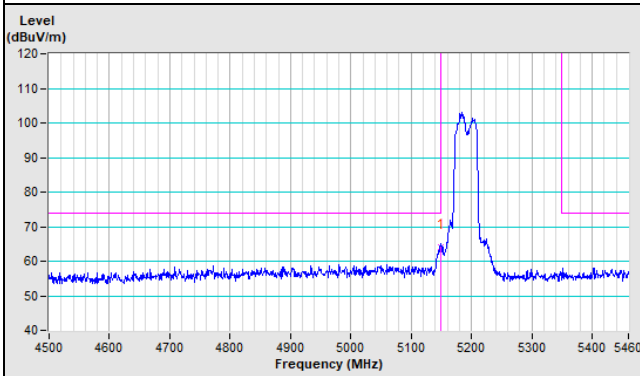


Average

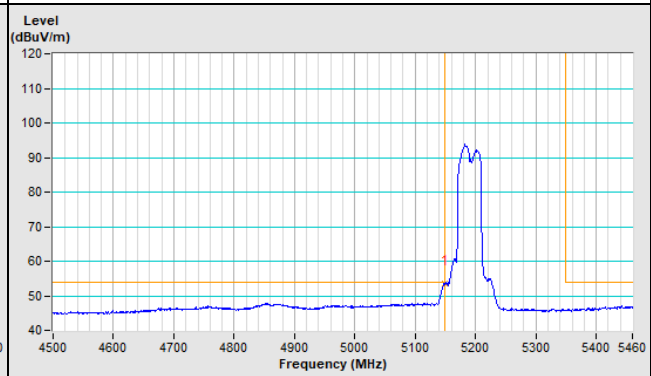


Vertical

Peak



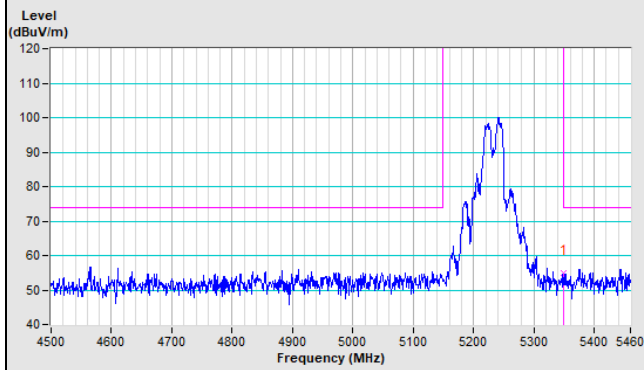
Average



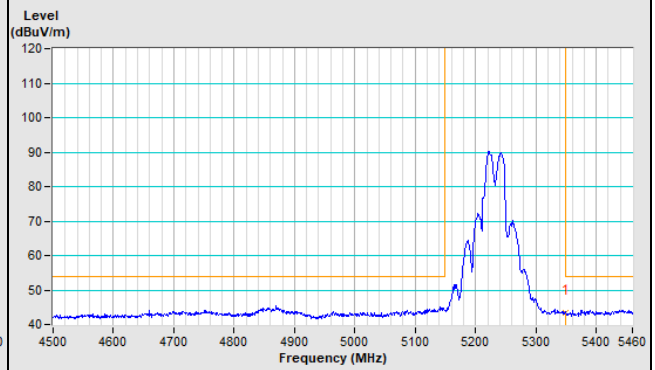
CH 46

Horizontal

Peak

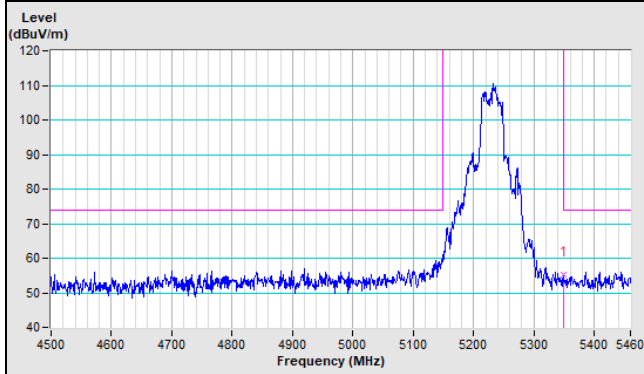


Average

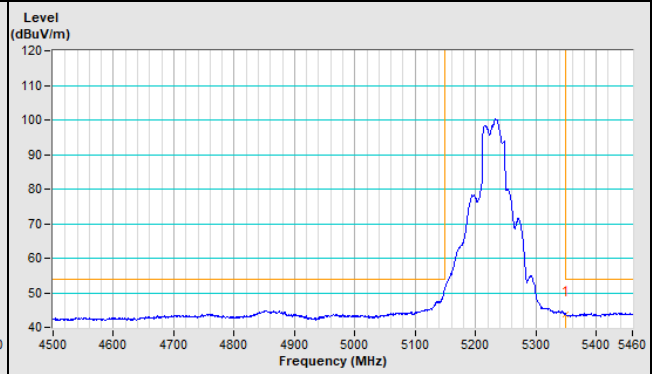


Vertical

Peak



Average

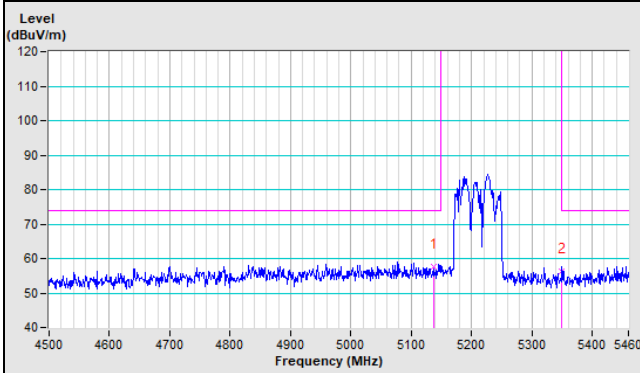


802.11ac (VHT80)

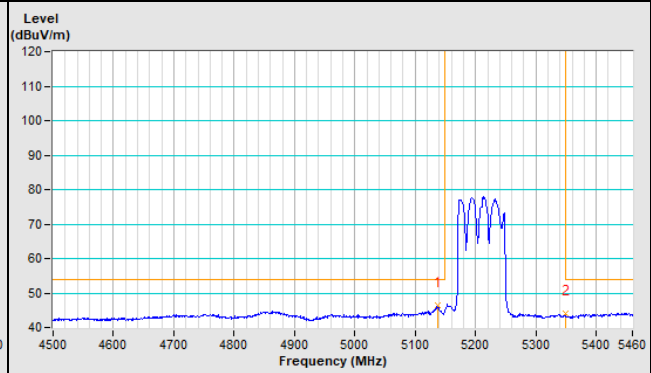
CH 42

Horizontal

Peak

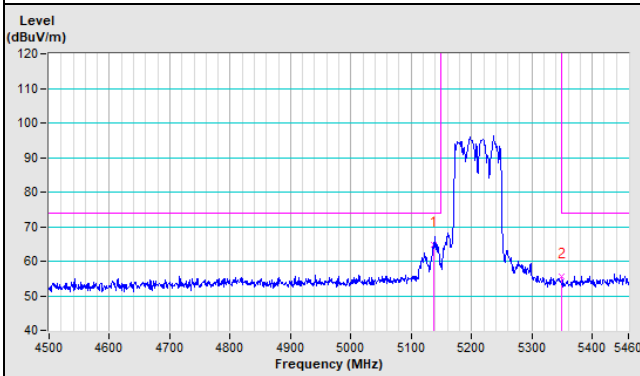


Average

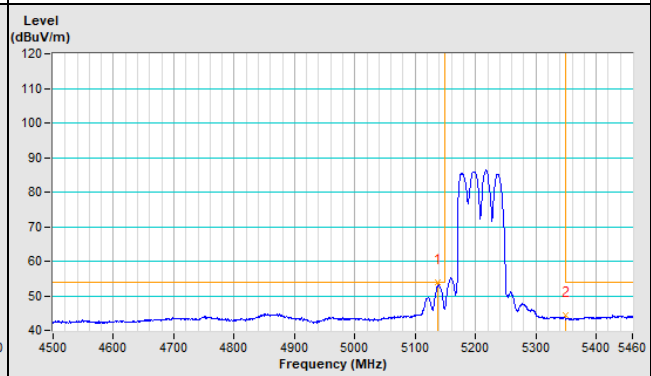


Vertical

Peak



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.

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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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