

FCC Test Report

Report No.: RF160406E07-1

FCC ID: I88NBG6617

Test Model: NBG6617

Received Date: Apr. 06, 2016

Test Date: May 26 to June 06, 2016

Issued Date: July 20, 2016

Applicant: ZyXEL Communications Corporation

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Release Control Record

Issue No.	Description	Date Issued
RF160406E07-1	Original release.	July 20, 2016

1 Certificate of Conformity

Product: AC1300 MU-MIMO Dual-Band Wireless Gigabit Router

Brand: ZyXEL

Test Model: NBG6617

Sample Status: ENGINEERING SAMPLE

Applicant: ZyXEL Communications Corporation

Test Date: May 26 to June 06, 2016

Standard: 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 EMC characteristics under the conditions specified in this report.

Prepared by :



Wendy Wu / Specialist

Date:

July 20, 2016

Approved by :



May Chen / Manager

Date:

July 20, 2016

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 -7.49dB at 0.35313MHz.
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 -0.1dB at 5150.00MHz, 17235.00MHz, 17355.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
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 UFL not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.

NOTE: 1. For WLAN: The EUT was operating in 2.412 ~ 2.462GHz, 5.18~5.24 GHz and 5.745~5.825GHz frequencies. This report was recorded the RF parameters including 5.18~5.24 GHz and 5.745~5.825GHz. For the 2.412 ~ 2.462GHz RF parameters was recorded in another test report.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.31 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC1300 MU-MIMO Dual-Band Wireless Gigabit Router
Brand	ZyXEL
Test Model	NBG6617
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	For 15.247: 2.412 ~ 2.462GHz For 15.407: 5.18GHz ~ 5.24GHz and 5.745GHz ~ 5.825GHz
Number of Channel	For 15.247: 802.11b, 802.11g, 802.11n (HT20), (VHT20): 11 802.11n (HT40), (VHT40): 7 For 15.407: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	For 15.247: 502.41mW For 15.407: 5.18GHz ~ 5.24GHz 453.71mW 5.745GHz ~ 5.825GHz 454.749mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

- 2.4GHz and 5GHz technology can transmit at same time.
- The EUT power needs to be supplied from adapter, the information is as below table:

Brand	Model No.	Spec.
APD	WA-24Q12R	Input: 100-240V, 0.7A, 50-60Hz Output: 12V, 2.0A DC output cable (1.8m, unshielded)

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

Antenna No	PCB Chain No.	Brand	Model	Antenna Type	Antenna Connector	Gain (dBi)	Frequency (GHz to GHz)
1	Chain 0	ARISTOTLE	RFA-52-Z1-155-165	Dipole	UFL	1.44	2.4~2.4835
				Dipole	UFL	0.37	5.15~5.85
2	Chain 1		RFA-52-Z1-75-95	Dipole	UFL	1.78	2.4~2.4835
				Dipole	UFL	3.23	5.15~5.85

4. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS 0~8, NSS=1	2TX	2RX
	MCS 0~8, NSS=2	2TX	2RX
802.11ac (VHT40)	MCS 0~9, NSS=1	2TX	2RX
	MCS 0~9, NSS=2	2TX	2RX
802.11ac (VHT80)	MCS 0~9, NSS=1	2TX	2RX
	MCS 0~9, NSS=2	2TX	2RX

Note: 1. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

2. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.

5. The power setting are list as below:

CDD Mode				
Modulation Mode	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting
802.11a	5180	20	5745	21
	5200	20.5	5785	21
	5240	20.5	5825	21.5
802.11ac (VHT20)	5180	20.5	5745	21
	5200	20.5	5785	21
	5240	20.5	5825	21.5
802.11ac (VHT40)	5190	14.5	5755	21
	5230	21	5795	21.5
802.11ac (VHT80)	5210	15	5775	21
Beamforming Mode				
Modulation Mode	Frequency (MHz)	Power Setting	Frequency (MHz)	Power Setting
802.11ac (VHT20)	5180	20.5	5745	21
	5200	20.5	5785	21
	5240	20.5	5825	21.5
802.11ac (VHT40)	5190	14.5	5755	21
	5230	21	5795	21.5
802.11ac (VHT80)	5210	15	5775	21

6. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

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	
-	√	√	√	√	-

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

NOTE:

- The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5745-5825	151 to 159	159	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5745-5825	151 to 159	159	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3
Beamforming Mode (Output power only)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY	TEST LOCATION
RE _≥ 1G	22deg. C, 65%RH	120Vac, 60Hz	Robert Cheng	1
RE _{<} 1G	25deg. C, 65%RH	120Vac, 60Hz	Tim Ho	1
PLC	23deg. C, 79%RH	120Vac, 60Hz	Arthur Yang	2
APCM	23deg. C, 63%RH	120Vac, 60Hz	Anderson Chen	1

3.3 Duty Cycle of Test Signal

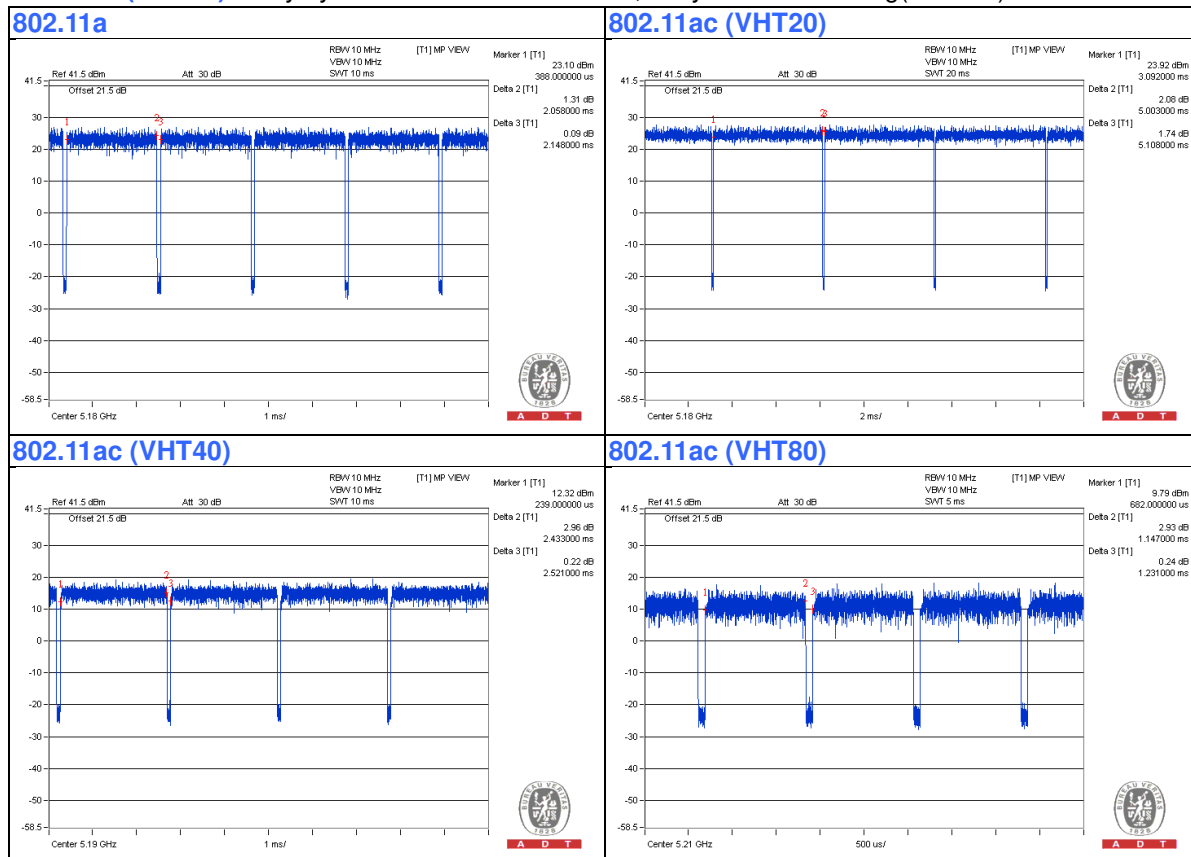
Duty cycle of test signal is < 98 %, duty factor is required

802.11a: Duty cycle = $2.058/2.148 = 0.947$, Duty factor = $10 * \log(1/0.958) = 0.19$

802.11ac (VHT20): Duty cycle = $5.003/5.108 = 0.979$, Duty factor = $10 * \log(1/0.979) = 0.09$

802.11ac (VHT40): Duty cycle = $2.433/2.521 = 0.965$, Duty factor = $10 * \log(1/0.965) = 0.15$

802.11ac (VHT80): Duty cycle = $1.147/1.231 = 0.932$, Duty factor = $10 * \log(1/0.932) = 0.31$



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.

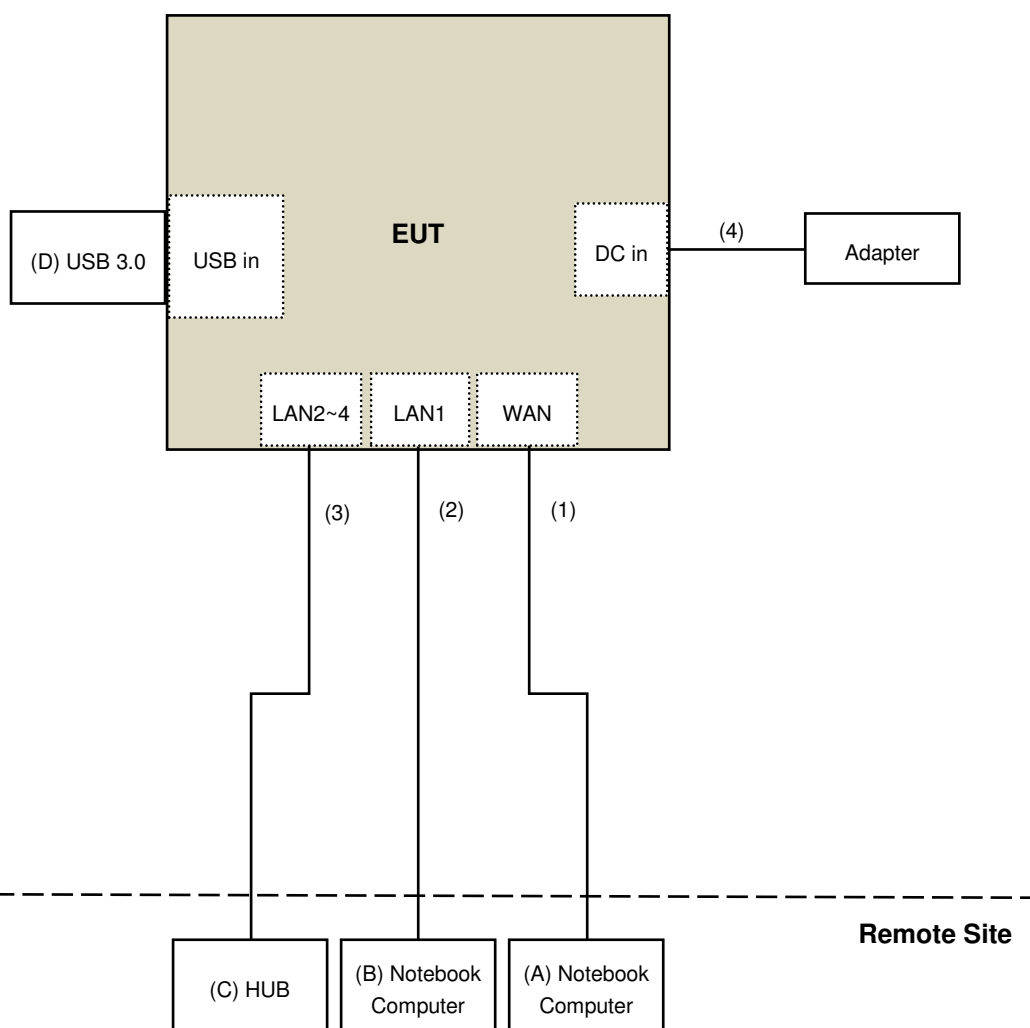
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook Computer	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Notebook Computer	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	USB3.0	NA	NA	NA	NA	Provided by Lab

Note:

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

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)

KDB 789033 D02 General UNII Test Procedure New Rules v01r02

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

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 v01r02	FIELD STRENGTH at 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
Applicable To	EIRP Limit	Equivalent Field Strength at 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBuV/m) ^{*1} PK:105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK:122.2 (dBuV/m) ^{*4}
15.407(b)(4)(ii)	FIELD STRENGTH at 3m / § 15.247(d),	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
^{*1} beyond 75 MHz or more above of the band edge. ^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. ^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. ^{*4} 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:

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

4.1.2 Test Instruments

For Radiated Emission below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-156	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 02, 2016	Apr. 01, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
6. The CANADA Site Registration No. is 20331-1
8. Tested Date: May 31, 2016

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017

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. Loop antenna was used for all emissions below 30 MHz.
3. The test was performed in 966 Chamber No. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
6. Tested Date: May 27 to June 06, 2016

4.1.3 Test Procedure

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

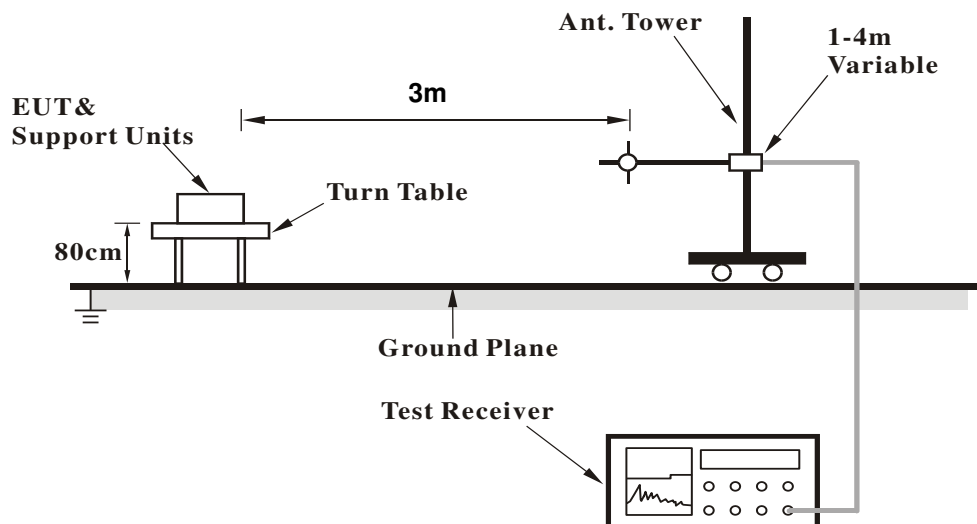
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

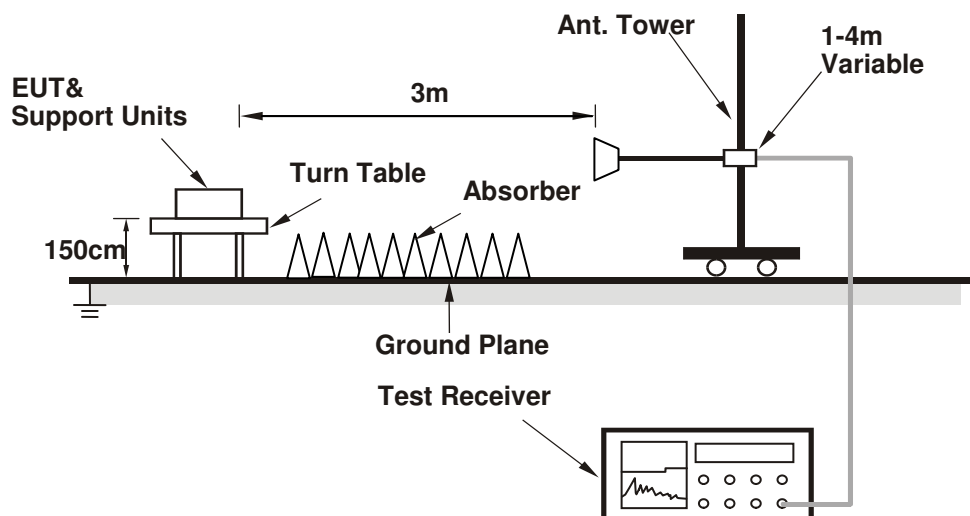
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

For CDD operation :

- Connected the EUT with the Notebook Computer which is placed on remote site.
- Contorlling software (QAC RCT V3.0.187.0) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.2 PK	74.0	-8.8	1.55 H	157	63.6	1.6
2	5150.00	49.7 AV	54.0	-4.3	1.55 H	157	48.1	1.6
3	*5180.00	110.2 PK			1.55 H	157	108.5	1.7
4	*5180.00	99.0 AV			1.55 H	157	97.3	1.7
5	#10360.00	52.9 PK	74.0	-21.1	2.49 H	287	41.2	11.7
6	#10360.00	41.4 AV	54.0	-12.6	2.49 H	287	29.7	11.7
7	15540.00	56.7 PK	74.0	-17.3	2.16 H	246	43.4	13.3
8	15540.00	44.6 AV	54.0	-9.4	2.16 H	246	31.3	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.7 PK	74.0	-4.3	3.63 V	185	68.1	1.6
2	5150.00	53.9 AV	54.0	-0.1	3.63 V	185	52.3	1.6
3	*5180.00	117.3 PK			3.63 V	185	115.6	1.7
4	*5180.00	106.8 AV			3.63 V	185	105.1	1.7
5	#10360.00	54.7 PK	74.0	-19.3	2.81 V	211	43.0	11.7
6	#10360.00	43.8 AV	54.0	-10.2	2.81 V	211	32.1	11.7
7	15540.00	68.1 PK	74.0	-5.9	3.92 V	169	54.8	13.3
8	15540.00	53.1 AV	54.0	-0.9	3.92 V	169	39.8	13.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	110.3 PK			1.51 H	149	108.5	1.8
2	*5200.00	99.2 AV			1.51 H	149	97.4	1.8
3	#10400.00	52.6 PK	74.0	-21.4	2.49 H	279	40.7	11.9
4	#10400.00	40.9 AV	54.0	-13.1	2.49 H	279	29.0	11.9
5	15600.00	56.8 PK	74.0	-17.2	2.11 H	231	43.5	13.3
6	15600.00	44.8 AV	54.0	-9.2	2.11 H	231	31.5	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	117.3 PK			3.64 V	193	115.5	1.8
2	*5200.00	106.8 AV			3.64 V	193	105.0	1.8
3	#10400.00	55.2 PK	74.0	-18.8	2.77 V	213	43.3	11.9
4	#10400.00	44.3 AV	54.0	-9.7	2.77 V	213	32.4	11.9
5	15600.00	68.7 PK	74.0	-5.3	3.88 V	177	55.4	13.3
6	15600.00	53.8 AV	54.0	-0.2	3.88 V	177	40.5	13.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	110.4 PK			1.59 H	152	108.6	1.8
2	*5240.00	99.3 AV			1.59 H	152	97.5	1.8
3	5350.00	52.2 PK	74.0	-21.8	1.59 H	152	50.1	2.1
4	5350.00	40.5 AV	54.0	-13.5	1.59 H	152	38.4	2.1
5	#10480.00	53.3 PK	74.0	-20.7	2.54 H	282	41.1	12.2
6	#10480.00	41.9 AV	54.0	-12.1	2.54 H	282	29.7	12.2
7	15720.00	56.1 PK	74.0	-17.9	2.16 H	242	42.9	13.2
8	15720.00	44.2 AV	54.0	-9.8	2.16 H	242	31.0	13.2

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	118.2 PK			3.74 V	193	116.4	1.8
2	*5240.00	106.6 AV			3.74 V	193	104.8	1.8
3	5350.00	53.1 PK	74.0	-20.9	3.74 V	193	51.0	2.1
4	5350.00	40.8 AV	54.0	-13.2	3.74 V	193	38.7	2.1
5	#10480.00	55.3 PK	74.0	-18.7	2.72 V	221	43.1	12.2
6	#10480.00	44.3 AV	54.0	-9.7	2.72 V	221	32.1	12.2
7	15720.00	66.5 PK	74.0	-7.5	3.79 V	178	53.3	13.2
8	15720.00	53.6 AV	54.0	-0.4	3.79 V	178	40.4	13.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5557.60	56.0 PK	68.2	-12.2	1.54 H	152	53.5	2.5
2	*5745.00	109.7 PK			1.54 H	152	106.9	2.8
3	*5745.00	98.8 AV			1.54 H	152	96.0	2.8
4	#5934.27	53.8 PK	68.2	-14.4	1.54 H	152	50.7	3.1
5	11490.00	52.8 PK	74.0	-21.2	2.50 H	271	39.3	13.5
6	11490.00	41.2 AV	54.0	-12.8	2.50 H	271	27.7	13.5
7	#17235.00	56.5 PK	74.0	-17.5	2.21 H	259	38.1	18.4
8	#17235.00	44.5 AV	54.0	-9.5	2.21 H	259	26.1	18.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5645.95	55.9 PK	68.2	-12.3	3.25 V	179	53.3	2.6
2	*5745.00	118.1 PK			3.25 V	179	115.3	2.8
3	*5745.00	107.0 AV			3.25 V	179	104.2	2.8
4	#5997.93	55.2 PK	68.2	-13.0	3.25 V	179	51.8	3.4
5	11490.00	60.3 PK	74.0	-13.7	2.10 V	232	46.8	13.5
6	11490.00	48.7 AV	54.0	-5.3	2.10 V	232	35.2	13.5
7	#17235.00	69.1 PK	74.0	-4.9	3.25 V	191	50.7	18.4
8	#17235.00	53.9 AV	54.0	-0.1	3.25 V	191	35.5	18.4

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5601.77	54.9 PK	68.2	-13.3	1.48 H	148	52.4	2.5
2	*5785.00	109.7 PK			1.48 H	148	106.8	2.9
3	*5785.00	99.0 AV			1.48 H	148	96.1	2.9
4	#6005.52	54.1 PK	68.2	-14.1	1.48 H	148	50.7	3.4
5	11570.00	52.6 PK	74.0	-21.4	2.45 H	289	39.4	13.2
6	11570.00	41.2 AV	54.0	-12.8	2.45 H	289	28.0	13.2
7	#17355.00	56.5 PK	74.0	-17.5	2.17 H	241	37.4	19.1
8	#17355.00	44.3 AV	54.0	-9.7	2.17 H	241	25.2	19.1

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	#5610.77	56.1 PK	68.2	-12.1	3.20 V	185	53.5	2.6
2	*5785.00	118.3 PK			3.20 V	185	115.4	2.9
3	*5785.00	106.9 AV			3.20 V	185	104.0	2.9
4	#5966.20	54.5 PK	68.2	-13.7	3.20 V	185	51.3	3.2
5	11570.00	60.5 PK	74.0	-13.5	2.12 V	226	47.3	13.2
6	11570.00	49.2 AV	54.0	-4.8	2.12 V	226	36.0	13.2
7	#17355.00	69.1 PK	74.0	-4.9	3.24 V	195	50.0	19.1
8	#17355.00	53.9 AV	54.0	-0.1	3.24 V	195	34.8	19.1

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5614.12	54.3 PK	68.2	-13.9	1.57 H	165	51.7	2.6
2	*5825.00	110.1 PK			1.57 H	165	107.2	2.9
3	*5825.00	99.1 AV			1.57 H	165	96.2	2.9
4	#5979.87	53.6 PK	68.2	-14.6	1.57 H	165	50.3	3.3
5	11650.00	52.6 PK	74.0	-21.4	2.47 H	292	39.4	13.2
6	11650.00	41.4 AV	54.0	-12.6	2.47 H	292	28.2	13.2
7	#17475.00	56.7 PK	74.0	-17.3	2.14 H	262	37.3	19.4
8	#17475.00	44.7 AV	54.0	-9.3	2.14 H	262	25.3	19.4

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5571.40	55.1 PK	68.2	-13.1	3.27 V	175	52.6	2.5
2	*5825.00	117.8 PK			3.27 V	175	114.9	2.9
3	*5825.00	106.6 AV			3.27 V	175	103.7	2.9
4	#5927.35	54.3 PK	68.2	-13.9	3.27 V	175	51.2	3.1
5	11650.00	59.8 PK	74.0	-14.2	2.11 V	241	46.6	13.2
6	11650.00	48.8 AV	54.0	-5.2	2.11 V	241	35.6	13.2
7	#17475.00	68.5 PK	74.0	-5.5	3.19 V	199	49.1	19.4
8	#17475.00	53.5 AV	54.0	-0.5	3.19 V	199	34.1	19.4

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.0 PK	74.0	-9.0	1.47 H	143	63.4	1.6
2	5150.00	49.7 AV	54.0	-4.3	1.47 H	143	48.1	1.6
3	*5180.00	111.2 PK			1.47 H	143	109.5	1.7
4	*5180.00	101.0 AV			1.47 H	143	99.3	1.7
5	#10360.00	52.9 PK	74.0	-21.1	2.46 H	279	41.2	11.7
6	#10360.00	41.5 AV	54.0	-12.5	2.46 H	279	29.8	11.7
7	15540.00	57.0 PK	74.0	-17.0	2.20 H	260	43.7	13.3
8	15540.00	44.9 AV	54.0	-9.1	2.20 H	260	31.6	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.5 PK	74.0	-2.5	3.62 V	196	69.9	1.6
2	5150.00	53.8 AV	54.0	-0.2	3.62 V	196	52.2	1.6
3	*5180.00	118.2 PK			3.62 V	196	116.5	1.7
4	*5180.00	108.0 AV			3.62 V	196	106.3	1.7
5	#10360.00	54.6 PK	74.0	-19.4	2.75 V	226	42.9	11.7
6	#10360.00	44.0 AV	54.0	-10.0	2.75 V	226	32.3	11.7
7	15540.00	68.7 PK	74.0	-5.3	3.85 V	157	55.4	13.3
8	15540.00	53.4 AV	54.0	-0.6	3.85 V	157	40.1	13.3

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	111.0 PK			1.48 H	163	109.2	1.8
2	*5200.00	100.6 AV			1.48 H	163	98.8	1.8
3	#10400.00	53.5 PK	74.0	-20.5	2.41 H	285	41.6	11.9
4	#10400.00	41.9 AV	54.0	-12.1	2.41 H	285	30.0	11.9
5	15600.00	56.7 PK	74.0	-17.3	2.20 H	250	43.4	13.3
6	15600.00	44.7 AV	54.0	-9.3	2.20 H	250	31.4	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	118.8 PK			3.57 V	198	117.0	1.8
2	*5200.00	108.3 AV			3.57 V	198	106.5	1.8
3	#10400.00	54.8 PK	74.0	-19.2	2.77 V	218	42.9	11.9
4	#10400.00	44.1 AV	54.0	-9.9	2.77 V	218	32.2	11.9
5	15600.00	68.7 PK	74.0	-5.3	3.90 V	164	55.4	13.3
6	15600.00	53.5 AV	54.0	-0.5	3.90 V	164	40.2	13.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	111.8 PK			1.49 H	153	110.0	1.8
2	*5240.00	101.5 AV			1.49 H	153	99.7	1.8
3	5350.00	52.1 PK	74.0	-21.9	1.49 H	153	50.0	2.1
4	5350.00	40.3 AV	54.0	-13.7	1.49 H	153	38.2	2.1
5	#10480.00	53.2 PK	74.0	-20.8	2.47 H	290	41.0	12.2
6	#10480.00	41.9 AV	54.0	-12.1	2.47 H	290	29.7	12.2
7	15720.00	57.7 PK	74.0	-16.3	2.22 H	255	44.5	13.2
8	15720.00	45.3 AV	54.0	-8.7	2.22 H	255	32.1	13.2
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	118.4 PK			3.68 V	185	116.6	1.8
2	*5240.00	107.9 AV			3.68 V	185	106.1	1.8
3	5350.00	53.2 PK	74.0	-20.8	3.72 V	181	51.1	2.1
4	5350.00	41.2 AV	54.0	-12.8	3.72 V	181	39.1	2.1
5	#10480.00	55.1 PK	74.0	-18.9	2.76 V	225	42.9	12.2
6	#10480.00	44.1 AV	54.0	-9.9	2.76 V	225	31.9	12.2
7	15720.00	68.5 PK	74.0	-5.5	3.94 V	159	55.3	13.2
8	15720.00	53.3 AV	54.0	-0.7	3.94 V	159	40.1	13.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5630.27	54.3 PK	68.2	-13.9	1.51 H	156	51.7	2.6
2	*5745.00	111.3 PK			1.51 H	156	108.5	2.8
3	*5745.00	100.4 AV			1.51 H	156	97.6	2.8
4	#5970.85	54.3 PK	68.2	-13.9	1.51 H	156	51.1	3.2
5	11490.00	52.6 PK	74.0	-21.4	2.48 H	280	39.1	13.5
6	11490.00	41.2 AV	54.0	-12.8	2.48 H	280	27.7	13.5
7	#17235.00	57.1 PK	74.0	-16.9	2.20 H	269	38.7	18.4
8	#17235.00	45.3 AV	54.0	-8.7	2.20 H	269	26.9	18.4

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5639.30	56.4 PK	68.2	-11.8	3.68 V	201	53.8	2.6
2	*5745.00	116.4 PK			3.68 V	201	113.6	2.8
3	*5745.00	107.9 AV			3.68 V	201	105.1	2.8
4	#6004.10	54.8 PK	68.2	-13.4	3.68 V	201	51.4	3.4
5	11490.00	60.0 PK	74.0	-14.0	2.81 V	207	46.5	13.5
6	11490.00	48.3 AV	54.0	-5.7	2.81 V	207	34.8	13.5
7	#17235.00	67.1 PK	74.0	-6.9	3.51 V	181	48.7	18.4
8	#17235.00	53.5 AV	54.0	-0.5	3.51 V	181	35.1	18.4

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5581.35	53.8 PK	68.2	-14.4	1.55 H	168	51.3	2.5
2	*5785.00	110.3 PK			1.55 H	168	107.4	2.9
3	*5785.00	101.5 AV			1.55 H	168	98.6	2.9
4	#5939.50	53.4 PK	68.2	-14.8	1.55 H	168	50.3	3.1
5	11570.00	53.4 PK	74.0	-20.6	2.44 H	285	40.2	13.2
6	11570.00	41.9 AV	54.0	-12.1	2.44 H	285	28.7	13.2
7	#17355.00	56.9 PK	74.0	-17.1	2.22 H	252	37.8	19.1
8	#17355.00	45.0 AV	54.0	-9.0	2.22 H	252	25.9	19.1

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	#5599.40	55.1 PK	68.2	-13.1	3.64 V	174	52.6	2.5
2	*5785.00	117.0 PK			3.64 V	174	114.1	2.9
3	*5785.00	108.4 AV			3.64 V	174	105.5	2.9
4	#5962.77	54.0 PK	68.2	-14.2	3.64 V	174	50.8	3.2
5	11570.00	60.7 PK	74.0	-13.3	2.80 V	210	47.5	13.2
6	11570.00	48.9 AV	54.0	-5.1	2.80 V	210	35.7	13.2
7	#17355.00	67.4 PK	74.0	-6.6	3.44 V	208	48.3	19.1
8	#17355.00	53.5 AV	54.0	-0.5	3.44 V	208	34.4	19.1

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5556.65	54.0 PK	68.2	-14.2	1.45 H	145	51.5	2.5
2	*5825.00	108.8 PK			1.45 H	145	105.9	2.9
3	*5825.00	101.2 AV			1.45 H	145	98.3	2.9
4	#5995.55	54.5 PK	68.2	-13.7	1.45 H	145	51.1	3.4
5	11650.00	52.4 PK	74.0	-21.6	2.45 H	290	39.2	13.2
6	11650.00	41.1 AV	54.0	-12.9	2.45 H	290	27.9	13.2
7	#17475.00	56.6 PK	74.0	-17.4	2.23 H	258	37.2	19.4
8	#17475.00	44.8 AV	54.0	-9.2	2.23 H	258	25.4	19.4

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5617.93	55.8 PK	68.2	-12.4	3.31 V	159	53.2	2.6
2	*5825.00	116.5 PK			3.31 V	159	113.6	2.9
3	*5825.00	108.3 AV			3.31 V	159	105.4	2.9
4	#5986.05	54.7 PK	68.2	-13.5	3.31 V	159	51.4	3.3
5	11650.00	60.0 PK	74.0	-14.0	2.71 V	221	46.8	13.2
6	11650.00	48.6 AV	54.0	-5.4	2.71 V	221	35.4	13.2
7	#17475.00	67.6 PK	74.0	-6.4	3.46 V	197	48.2	19.4
8	#17475.00	53.7 AV	54.0	-0.3	3.46 V	197	34.3	19.4

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.3 PK	74.0	-8.7	1.58 H	179	63.7	1.6
2	5150.00	49.7 AV	54.0	-4.3	1.58 H	179	48.1	1.6
3	*5190.00	102.1 PK			1.58 H	179	100.3	1.8
4	*5190.00	91.4 AV			1.58 H	179	89.6	1.8
5	#10380.00	51.4 PK	74.0	-22.6	2.42 H	286	39.6	11.8
6	#10380.00	39.5 AV	54.0	-14.5	2.42 H	286	27.7	11.8
7	15570.00	56.3 PK	74.0	-17.7	2.19 H	253	43.0	13.3
8	15570.00	44.7 AV	54.0	-9.3	2.19 H	253	31.4	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.1 PK	74.0	-6.9	3.81 V	198	65.5	1.6
2	5150.00	53.8 AV	54.0	-0.2	3.81 V	198	52.2	1.6
3	*5190.00	109.4 PK			3.81 V	198	107.6	1.8
4	*5190.00	98.6 AV			3.81 V	198	96.8	1.8
5	#10380.00	51.4 PK	74.0	-22.6	2.77 V	185	39.6	11.8
6	#10380.00	39.5 AV	54.0	-14.5	2.77 V	185	27.7	11.8
7	15570.00	56.6 PK	74.0	-17.4	3.76 V	131	43.3	13.3
8	15570.00	44.5 AV	54.0	-9.5	3.76 V	131	31.2	13.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.2 PK	74.0	-10.8	1.53 H	165	61.6	1.6
2	5150.00	48.1 AV	54.0	-5.9	1.53 H	165	46.5	1.6
3	*5230.00	109.6 PK			1.53 H	165	107.8	1.8
4	*5230.00	98.3 AV			1.53 H	165	96.5	1.8
5	5350.00	53.8 PK	74.0	-20.2	1.53 H	165	51.7	2.1
6	5350.00	41.4 AV	54.0	-12.6	1.53 H	165	39.3	2.1
7	#10460.00	51.4 PK	74.0	-22.6	2.40 H	300	39.3	12.1
8	#10460.00	39.5 AV	54.0	-14.5	2.40 H	300	27.4	12.1
9	15690.00	56.3 PK	74.0	-17.7	2.20 H	246	43.1	13.2
10	15690.00	44.7 AV	54.0	-9.3	2.20 H	246	31.5	13.2

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	5150.00	64.2 PK	74.0	-9.8	3.56 V	191	62.6	1.6
2	5150.00	51.9 AV	54.0	-2.1	3.56 V	191	50.3	1.6
3	*5230.00	116.7 PK			3.56 V	191	114.9	1.8
4	*5230.00	105.6 AV			3.56 V	191	103.8	1.8
5	5350.00	56.1 PK	74.0	-17.9	3.56 V	191	54.0	2.1
6	5350.00	44.3 AV	54.0	-9.7	3.56 V	191	42.2	2.1
7	#10460.00	55.3 PK	74.0	-18.7	2.78 V	198	43.2	12.1
8	#10460.00	44.3 AV	54.0	-9.7	2.78 V	198	32.2	12.1
9	15690.00	65.1 PK	74.0	-8.9	3.81 V	138	51.9	13.2
10	15690.00	53.4 AV	54.0	-0.6	3.81 V	138	40.2	13.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5645.00	55.3 PK	68.2	-12.9	1.60 H	149	52.7	2.6
2	*5755.00	107.5 PK			1.60 H	149	104.6	2.9
3	*5755.00	97.3 AV			1.60 H	149	94.4	2.9
4	#5952.80	55.5 PK	68.2	-12.7	1.60 H	149	52.3	3.2
5	11510.00	50.9 PK	74.0	-23.1	2.41 H	272	37.4	13.5
6	11510.00	39.2 AV	54.0	-14.8	2.41 H	272	25.7	13.5
7	#17265.00	55.7 PK	74.0	-18.3	2.21 H	237	37.2	18.5
8	#17265.00	44.2 AV	54.0	-9.8	2.21 H	237	25.7	18.5

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.27	57.6 PK	68.2	-10.6	3.48 V	181	55.0	2.6
2	*5755.00	114.9 PK			3.48 V	181	112.0	2.9
3	*5755.00	104.6 AV			3.48 V	181	101.7	2.9
4	#5975.60	54.8 PK	68.2	-13.4	3.48 V	181	51.6	3.2
5	11510.00	60.9 PK	74.0	-13.1	2.72 V	200	47.4	13.5
6	11510.00	49.0 AV	54.0	-5.0	2.72 V	200	35.5	13.5
7	#17265.00	64.1 PK	74.0	-9.9	3.46 V	197	45.6	18.5
8	#17265.00	53.5 AV	54.0	-0.5	3.46 V	197	35.0	18.5

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5605.57	55.4 PK	68.2	-12.8	1.52 H	153	52.8	2.6
2	*5795.00	107.1 PK			1.52 H	153	104.2	2.9
3	*5795.00	97.4 AV			1.52 H	153	94.5	2.9
4	#6002.20	54.1 PK	68.2	-14.1	1.52 H	153	50.7	3.4
5	11590.00	50.6 PK	74.0	-23.4	2.39 H	258	37.5	13.1
6	11590.00	39.0 AV	54.0	-15.0	2.39 H	258	25.9	13.1
7	#17385.00	55.7 PK	74.0	-18.3	2.21 H	244	36.4	19.3
8	#17385.00	44.4 AV	54.0	-9.6	2.21 H	244	25.1	19.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5564.73	54.8 PK	68.2	-13.4	3.33 V	159	50.9	3.9
2	*5795.00	114.5 PK			3.33 V	159	111.6	2.9
3	*5795.00	104.6 AV			3.33 V	159	101.7	2.9
4	#6010.75	55.6 PK	68.2	-12.6	3.33 V	159	51.1	4.5
5	11590.00	60.5 PK	74.0	-13.5	2.74 V	215	47.4	13.1
6	11590.00	49.1 AV	54.0	-4.9	2.74 V	215	36.0	13.1
7	#17385.00	64.2 PK	74.0	-9.8	3.44 V	205	44.9	19.3
8	#17385.00	53.5 AV	54.0	-0.5	3.44 V	205	34.2	19.3

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.3 PK	74.0	-8.7	1.53 H	155	63.7	1.6
2	5150.00	49.9 AV	54.0	-4.1	1.53 H	155	48.3	1.6
3	*5210.00	99.4 PK			1.53 H	155	97.6	1.8
4	*5210.00	87.6 AV			1.53 H	155	85.8	1.8
5	5350.00	51.5 PK	74.0	-22.5	1.53 H	155	49.4	2.1
6	5350.00	40.7 AV	54.0	-13.3	1.53 H	155	38.6	2.1
7	#10420.00	51.2 PK	74.0	-22.8	2.38 H	268	39.2	12.0
8	#10420.00	39.3 AV	54.0	-14.7	2.38 H	268	27.3	12.0
9	15630.00	55.5 PK	74.0	-18.5	2.24 H	244	42.2	13.3
10	15630.00	44.0 AV	54.0	-10.0	2.24 H	244	30.7	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.9 PK	74.0	-6.1	3.75 V	193	66.3	1.6
2	5150.00	53.6 AV	54.0	-0.4	3.75 V	193	52.0	1.6
3	*5210.00	106.8 PK			3.75 V	193	105.0	1.8
4	*5210.00	94.9 AV			3.75 V	193	93.1	1.8
5	5350.00	53.7 PK	74.0	-20.3	3.75 V	193	51.6	2.1
6	5350.00	42.6 AV	54.0	-11.4	3.75 V	193	40.5	2.1
7	#10420.00	51.2 PK	74.0	-22.8	2.76 V	183	39.2	12.0
8	#10420.00	39.2 AV	54.0	-14.8	2.76 V	183	27.2	12.0
9	15630.00	56.3 PK	74.0	-17.7	3.80 V	126	43.0	13.3
10	15630.00	44.4 AV	54.0	-9.6	3.80 V	126	31.1	13.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5650.23	63.1 PK	68.4	-5.3	1.54 H	152	60.5	2.6
2	*5775.00	104.6 PK			1.54 H	152	101.7	2.9
3	*5775.00	92.2 AV			1.54 H	152	89.3	2.9
4	#5953.75	54.5 PK	68.2	-13.7	1.54 H	152	51.3	3.2
5	11550.00	51.2 PK	74.0	-22.8	2.36 H	275	37.9	13.3
6	11550.00	39.3 AV	54.0	-14.7	2.36 H	275	26.0	13.3
7	#17325.00	55.6 PK	74.0	-18.4	2.23 H	250	36.7	18.9
8	#17325.00	43.9 AV	54.0	-10.1	2.23 H	250	25.0	18.9

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	#5643.10	65.6 PK	68.2	-2.6	3.43 V	183	63.0	2.6
2	*5775.00	111.3 PK			3.43 V	183	108.4	2.9
3	*5775.00	99.8 AV			3.43 V	183	96.9	2.9
4	#5934.27	59.1 PK	68.2	-9.1	3.43 V	183	56.0	3.1
5	11550.00	51.7 PK	74.0	-22.3	2.79 V	193	38.4	13.3
6	11550.00	39.8 AV	54.0	-14.2	2.79 V	193	26.5	13.3
7	#17325.00	56.6 PK	74.0	-17.4	3.81 V	115	37.7	18.9
8	#17325.00	44.6 AV	54.0	-9.4	3.81 V	115	25.7	18.9

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.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Data:

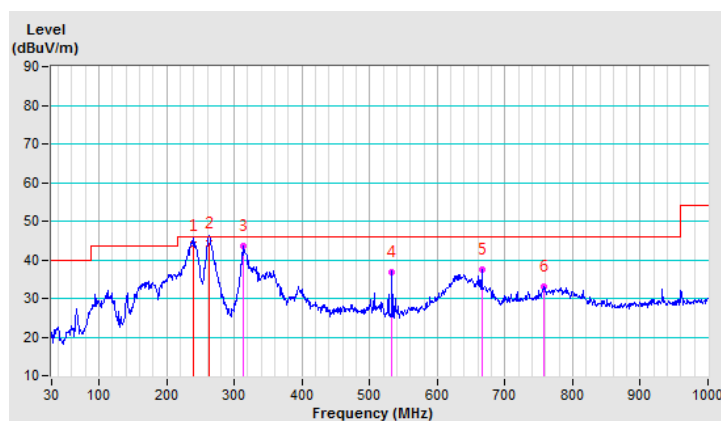
802.11ac (VHT40)

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	239.01	43.8 QP	46.0	-2.2	1.10 H	33	53.7	-9.9
2	262.68	44.2 QP	46.0	-1.8	1.06 H	56	53.1	-8.9
3	313.78	43.5 QP	46.0	-2.5	1.00 H	324	50.5	-7.0
4	532.74	36.9 QP	46.0	-9.1	1.50 H	39	38.8	-1.9
5	665.43	37.5 QP	46.0	-8.5	1.00 H	186	36.7	0.8
6	757.51	33.0 QP	46.0	-13.0	1.00 H	174	30.3	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.
4. Margin value = Emission Level – Limit value

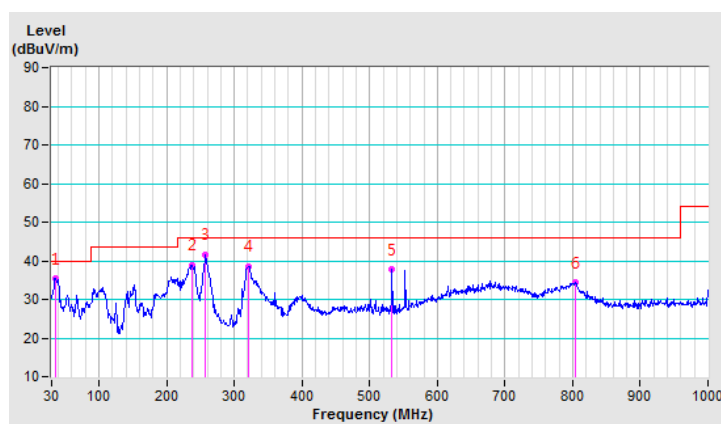


CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	36.45	35.3 QP	40.0	-4.7	1.00 V	120	44.9	-9.6
2	237.74	38.8 QP	46.0	-7.2	1.00 V	282	48.9	-10.1
3	257.51	41.6 QP	46.0	-4.4	2.00 V	25	50.8	-9.2
4	320.11	38.5 QP	46.0	-7.5	1.50 V	351	45.3	-6.8
5	532.74	37.6 QP	46.0	-8.4	1.00 V	184	39.5	-1.9
6	803.64	34.2 QP	46.0	-11.8	1.50 V	105	31.1	3.1

REMARKS:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 09, 2016	May 08, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 08, 2016	Mar. 07, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-002	Sep. 14, 2015	Sep. 13, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
50 ohms Terminator	E1-011315	13	Dec. 11 2015	Dec. 10 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
- 3 The VCCI Con C Registration No. is C-3611.
- 4 Tested Date: May 26, 2016

4.2.3 Test Procedure

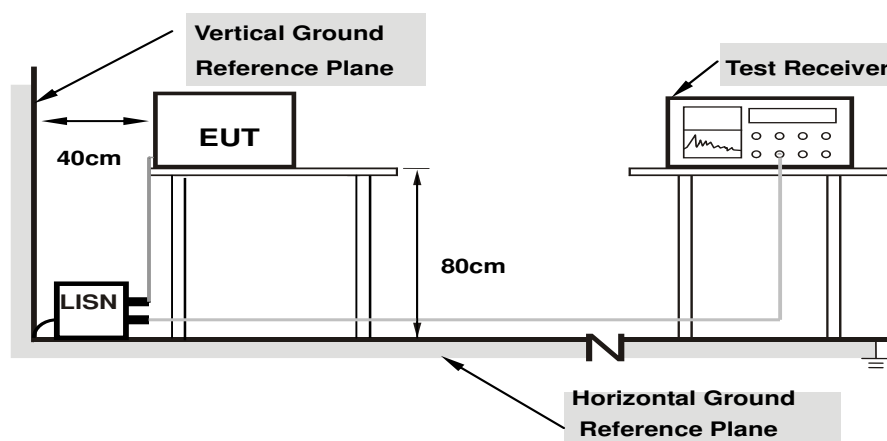
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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 Condition

Same as 4.1.6.

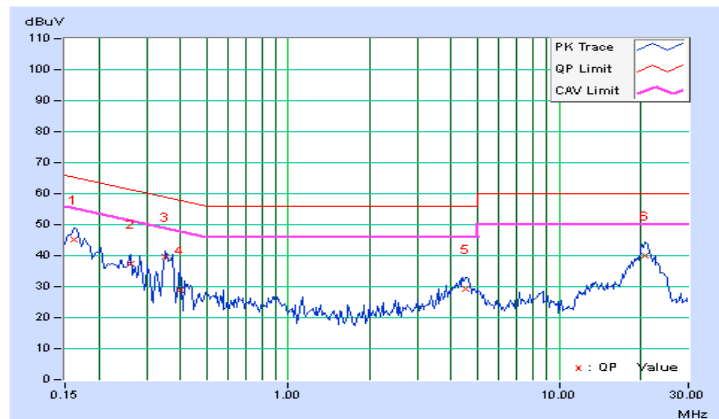
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	10.43	34.87	24.70	45.30	35.13	65.38	55.38	-20.08	-20.25
2	0.26328	10.41	26.99	21.44	37.40	31.85	61.33	51.33	-23.93	-19.48
3	0.35313	10.42	29.15	26.72	39.57	37.14	58.89	48.89	-19.32	-11.75
4	0.40000	10.43	18.58	12.83	29.01	23.26	57.85	47.85	-28.84	-24.59
5	4.53516	10.66	18.42	10.55	29.08	21.21	56.00	46.00	-26.92	-24.79
6	20.82031	11.51	28.48	19.88	39.99	31.39	60.00	50.00	-20.01	-18.61

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.

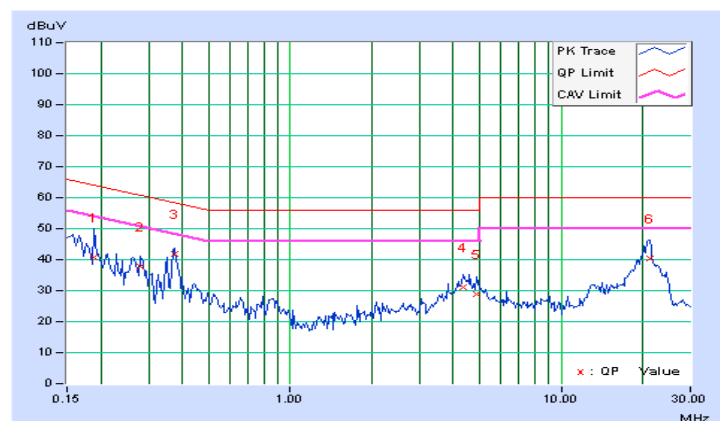


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18906	10.45	30.25	19.91	40.70	30.36	64.08	54.08	-23.38	-23.72
2	0.27891	10.46	27.49	23.09	37.95	33.55	60.85	50.85	-22.90	-17.30
3	0.37266	10.48	31.40	30.47	41.88	40.95	58.44	48.44	-16.56	-7.49
4	4.35938	10.74	20.33	13.40	31.07	24.14	56.00	46.00	-24.93	-21.86
5	4.89063	10.76	18.30	10.67	29.06	21.43	56.00	46.00	-26.94	-24.57
6	21.16016	11.51	28.90	20.98	40.41	32.49	60.00	50.00	-19.59	-17.51

REMARKS:

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



4.3 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,

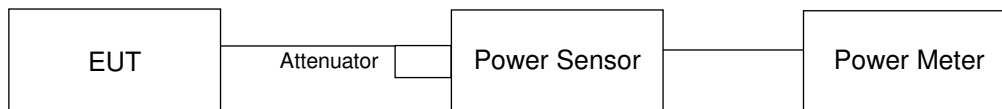
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 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. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

For CDD operation :

- c. Connected the EUT with the Notebook Computer which is placed on remote site.
- d. Contorlling software (QAC RCT V3.0.187.0) has been activated to set the EUT on specific status.

For Tx-BF operation :

- a. Connected the EUT with the WLAN client card which is placed after the antenna tower
- b. .Tx-BF command (iwpriv) and iperf.exe has been activated to set the EUT on specific status.

4.3.7 Test Result

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	21.99	22.51	336.363	25.27	30.00	Pass
40	5200	22.35	22.89	366.327	25.64	30.00	Pass
48	5240	22.43	22.99	374.052	25.73	30.00	Pass
149	5745	22.78	23.27	401.995	26.04	30.00	Pass
157	5785	22.42	23.01	374.568	25.74	30.00	Pass
165	5825	22.36	23.07	374.955	25.74	30.00	Pass

CDD Mode / Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	22.21	22.96	364.038	25.61	30.00	Pass
40	5200	22.24	22.91	362.928	25.60	30.00	Pass
48	5240	22.29	23.04	370.806	25.69	30.00	Pass
149	5745	22.72	23.51	411.456	26.14	30.00	Pass
157	5785	22.74	23.56	414.918	26.18	30.00	Pass
165	5825	22.38	23.41	392.262	25.94	30.00	Pass

Note: 1. For Beamforming mode : Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power limit shall not to be reduced.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	16.97	17.63	107.717	20.32	30.00	Pass
46	5230	23.15	23.93	453.71	26.57	30.00	Pass
151	5755	23.24	23.41	430.143	26.34	30.00	Pass
159	5795	23.42	23.71	454.749	26.58	30.00	Pass

Note: 1. For Beamforming mode : Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power limit shall not to be reduced.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	17.23	17.78	112.824	20.52	30.00	Pass
155	5775	22.61	23.01	382.376	25.82	30.00	Pass

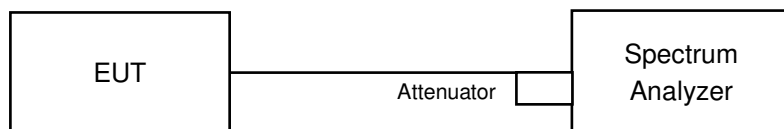
Note: 1. For Beamforming mode : Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power limit shall not to be reduced.

4.4 Peak Power Spectral Density Measurement

4.4.1 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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For U-NII-1

Using method SA-2

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

For U-NII-3

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. 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 $\text{BWCF} = 10 \log (500 \text{ kHz}/300 \text{ kHz})$
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add $10 \log (1/\text{duty cycle})$

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.1.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	7.38	8.46	0.19	11.15	17.00	Pass
40	5200	8.28	8.84	0.19	11.77	17.00	Pass
48	5240	8.66	9.11	0.19	12.09	17.00	Pass

- Note:** 1. Method 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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	7.98	8.65	0.09	11.43	17.00	Pass
40	5200	8.39	8.56	0.09	11.58	17.00	Pass
48	5240	7.95	9.26	0.09	11.75	17.00	Pass

- Note:** 1. Method 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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-0.11	-0.37	0.15	2.93	17.00	Pass
46	5230	6.39	7.46	0.15	10.12	17.00	Pass

- Note:** 1. Method 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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

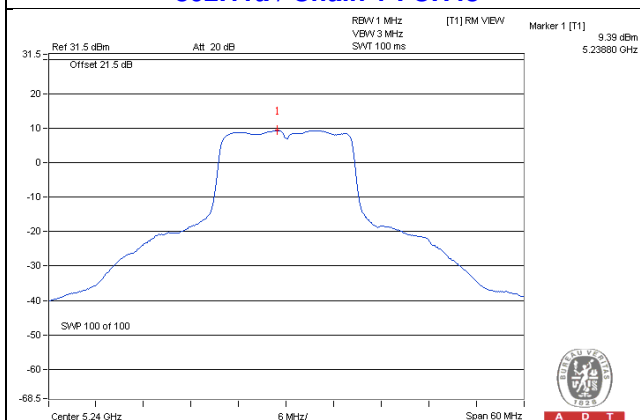
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-3.58	-2.07	0.31	0.56	17.00	Pass

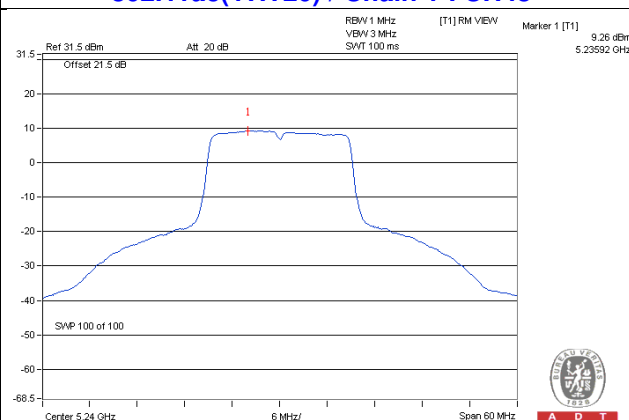
- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

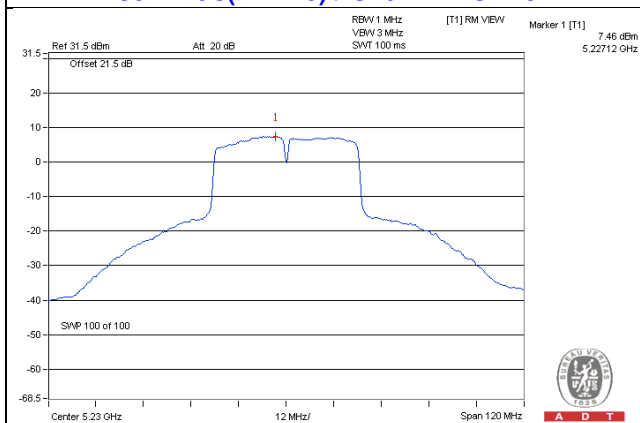
802.11a / Chain 1 : CH48



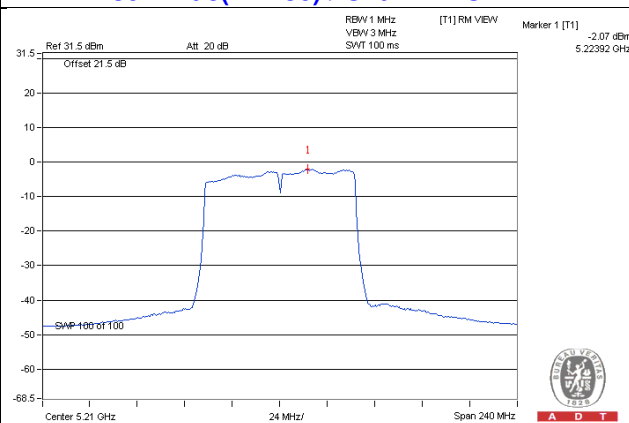
802.11ac(VHT20) / Chain 1 : CH48



802.11ac(VHT40) / Chain 1 : CH46



802.11ac(VHT80) / Chain 1 : CH42



For U-NII-3 Band

802.11a

TX chain	Chan.	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	1.23	3.45	3.01	0.19	6.65	30.00	Pass
	157	5785	0.97	3.19	3.01	0.19	6.39	30.00	Pass
	165	5825	1.02	3.24	3.01	0.19	6.44	30.00	Pass
1	149	5745	2.44	4.66	3.01	0.19	7.86	30.00	Pass
	157	5785	2.14	4.36	3.01	0.19	7.56	30.00	Pass
	165	5825	1.84	4.06	3.01	0.19	7.26	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

TX chain	Chan.	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	1.03	3.25	3.01	0.09	6.35	30.00	Pass
	157	5785	0.92	3.14	3.01	0.09	6.24	30.00	Pass
	165	5825	0.86	3.08	3.01	0.09	6.18	30.00	Pass
1	149	5745	2.65	4.87	3.01	0.09	7.97	30.00	Pass
	157	5785	2.13	4.35	3.01	0.09	7.45	30.00	Pass
	165	5825	1.91	4.13	3.01	0.09	7.23	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

TX chain	Chan.	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	-1.72	0.50	3.01	0.15	3.66	30.00	Pass
	159	5795	-1.74	0.48	3.01	0.15	3.64	30.00	Pass
1	151	5755	-0.58	1.64	3.01	0.15	4.80	30.00	Pass
	159	5795	-0.78	1.44	3.01	0.15	4.60	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.

2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

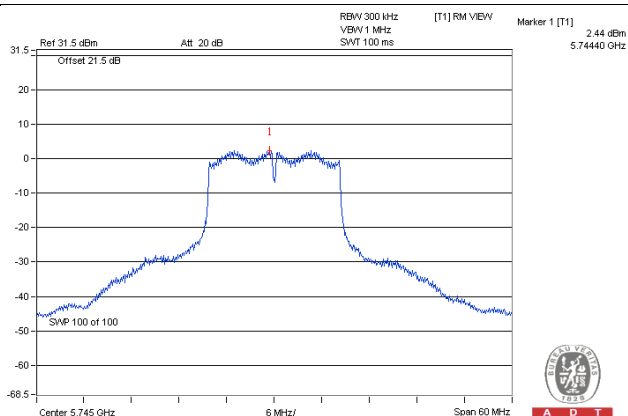
TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-5.96	-3.74	3.01	0.31	-0.42	30.00	Pass
1	155	5775	-4.01	-1.79	3.01	0.31	1.53	30.00	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 4.93\text{dBi} < 6\text{dBi}$, so the power density limit shall not to be reduced.

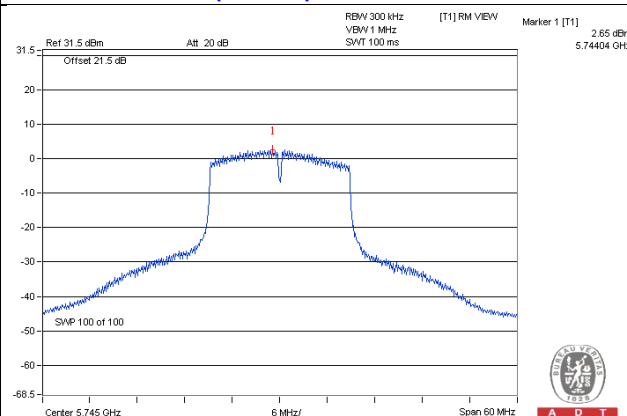
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

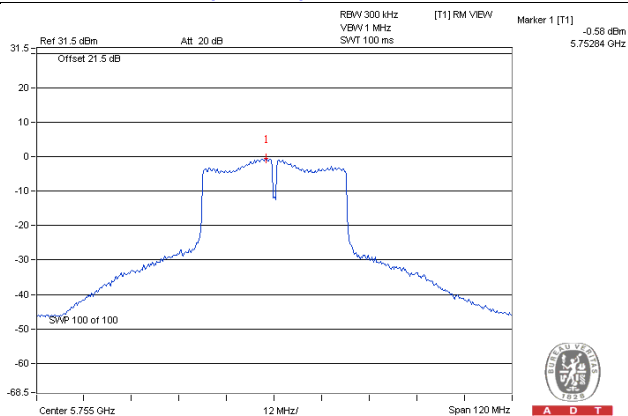
802.11a / Chain 1 : CH149



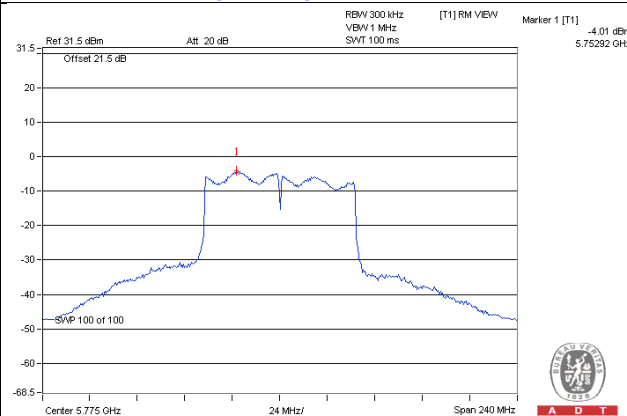
802.11ac(VHT20) / Chain 1 : CH149



802.11ac(VHT40) / Chain 1 : CH151



802.11ac(VHT80) / Chain 1 : CH155

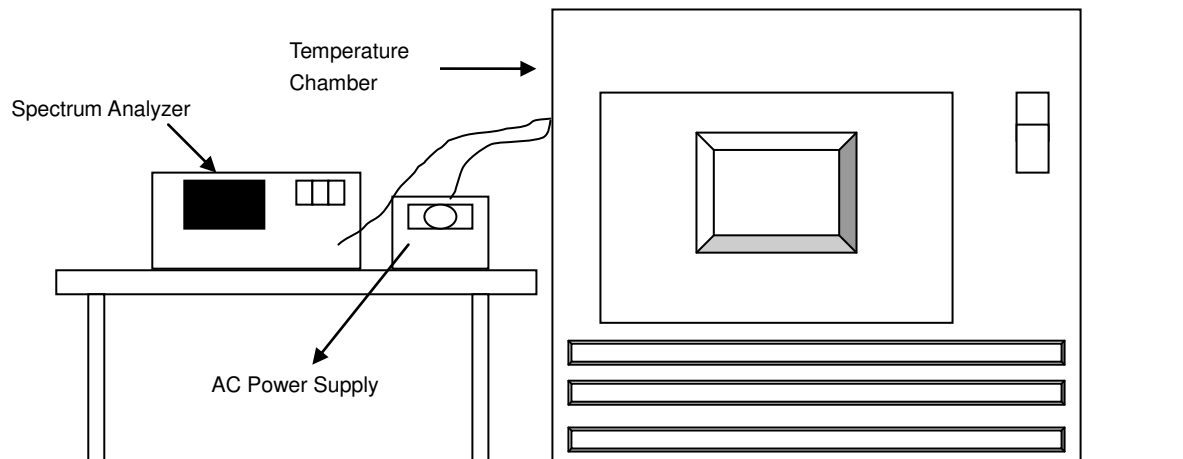


4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- 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 2 and 3 with the temperature chamber set to the lowest temperature.
- 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5180.0151	Pass	5180.0127	Pass	5180.0171	Pass	5180.0157	Pass
40	120	5180.0028	Pass	5180.0037	Pass	5180.0032	Pass	5180.0031	Pass
30	120	5180.0131	Pass	5180.0161	Pass	5180.0169	Pass	5180.017	Pass
20	120	5180.0195	Pass	5180.0174	Pass	5180.0162	Pass	5180.0183	Pass
10	120	5180.0208	Pass	5180.021	Pass	5180.0207	Pass	5180.0196	Pass
0	120	5180.0138	Pass	5180.0144	Pass	5180.0115	Pass	5180.0124	Pass
-10	120	5180.0008	Pass	5180.0016	Pass	5180.0008	Pass	5180.0044	Pass
-20	120	5179.9963	Pass	5179.9993	Pass	5179.9967	Pass	5179.9976	Pass
-30	120	5179.9929	Pass	5179.9946	Pass	5179.9948	Pass	5179.9926	Pass

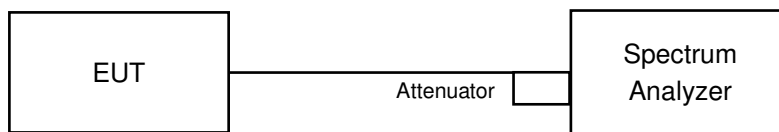
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0194	Pass	5180.0182	Pass	5180.0159	Pass	5180.0173	Pass
	120	5180.0195	Pass	5180.0174	Pass	5180.0162	Pass	5180.0183	Pass
	102	5180.0203	Pass	5180.0176	Pass	5180.0167	Pass	5180.0183	Pass

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

- 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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.39	15.11	0.5	Pass
157	5785	16.40	15.15	0.5	Pass
165	5825	16.40	15.09	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.62	15.06	0.5	Pass
157	5785	17.62	15.15	0.5	Pass
165	5825	17.63	15.71	0.5	Pass

802.11ac (VHT40)

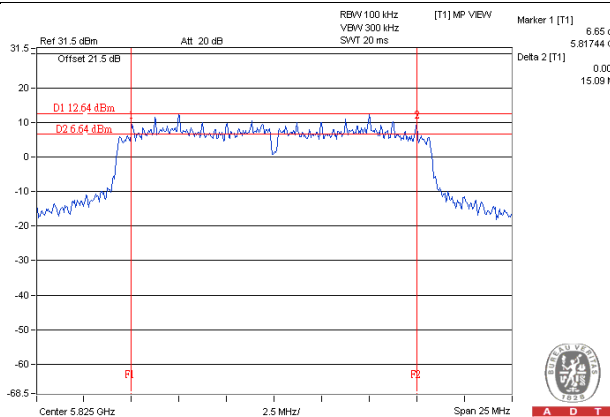
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.27	33.87	0.5	Pass
159	5795	35.36	35.10	0.5	Pass

802.11ac (VHT80)

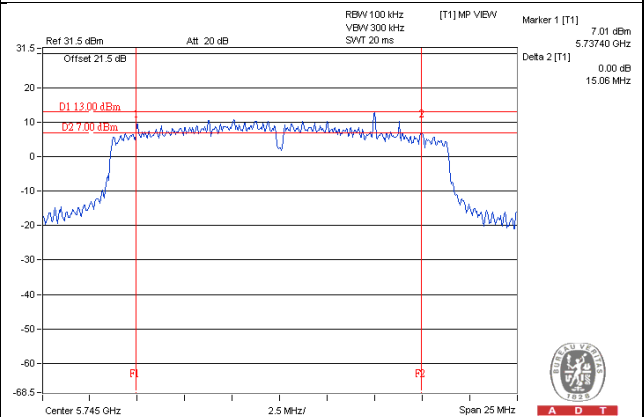
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.74	75.46	0.5	Pass

Spectrum Plot of Worst Value

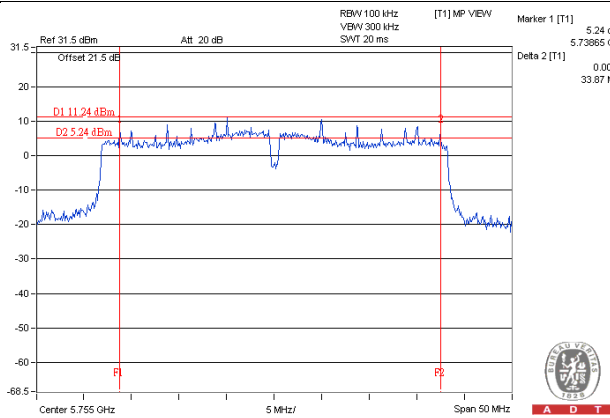
802.11a / Chain 1 : CH165



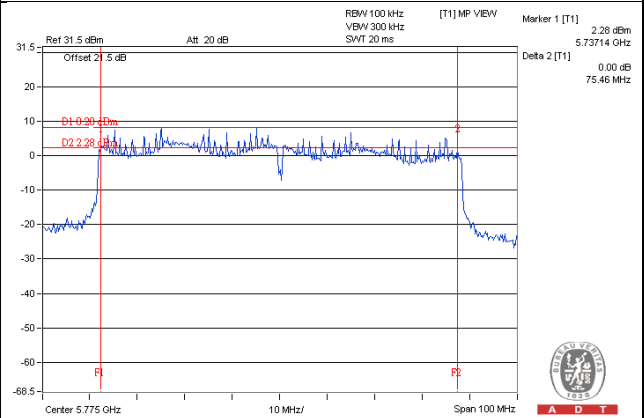
802.11ac(VHT20) / Chain 1 : CH149



802.11ac(VHT40) / Chain 1 : CH151



802.11ac(VHT80) / Chain 1 : CH155



5 Pictures of Test Arrangements

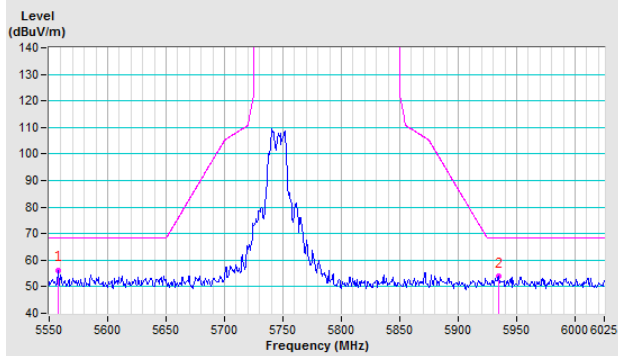
Please refer to the attached file (Test Setup Photo).

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

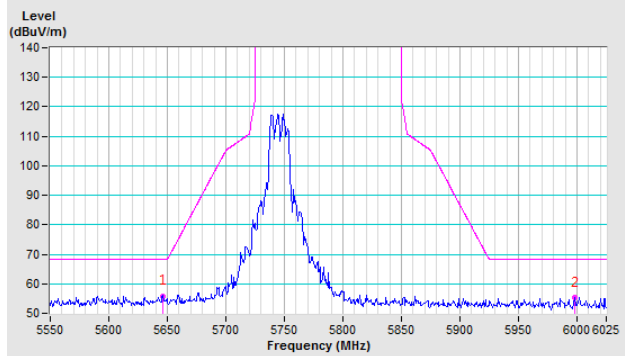
802.11a

CH 149 5745 MHz

Horizontal

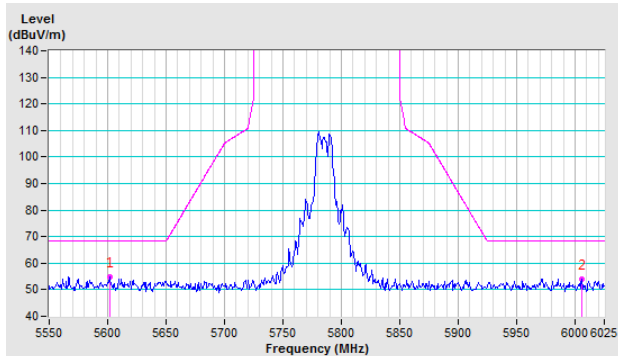


Vertical

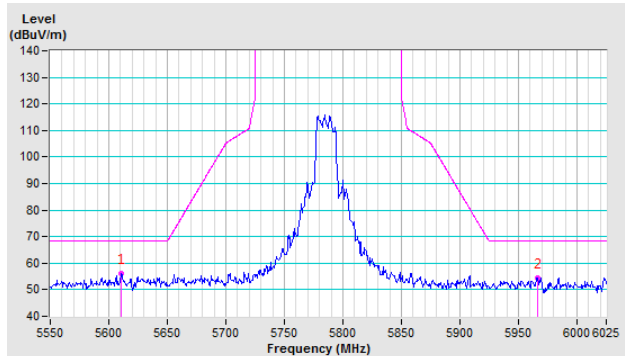


CH 157 5785 MHz

Horizontal

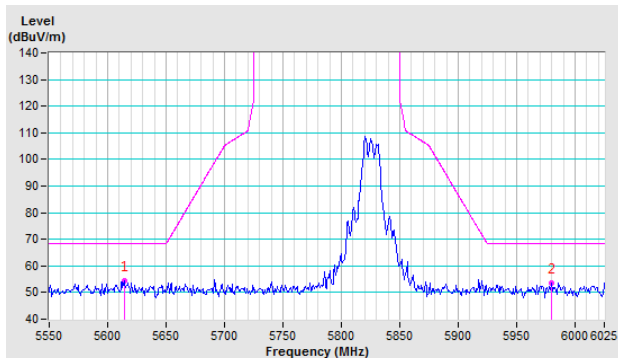


Vertical

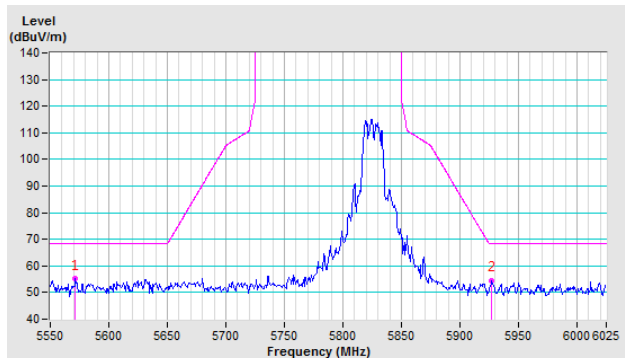


CH 165 5825 MHz

Horizontal



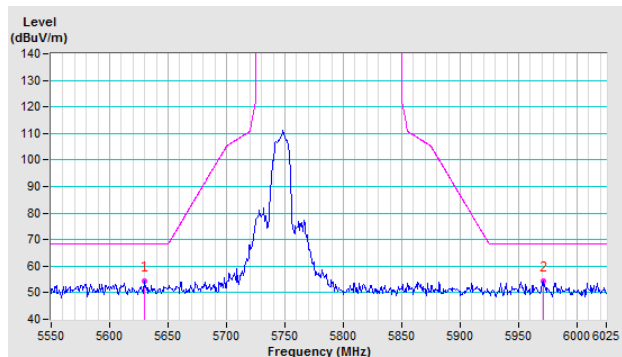
Vertical



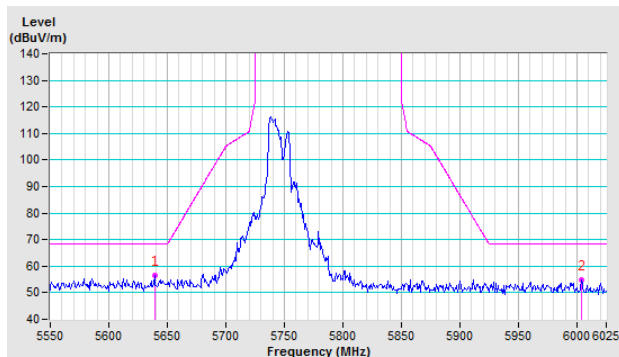
802.11ac (VHT20)

CH 149 5745 MHz

Horizontal

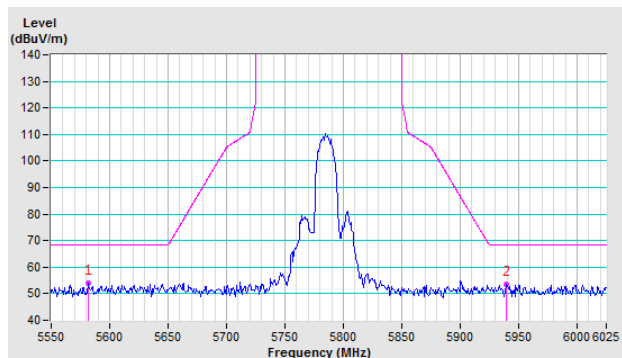


Vertical

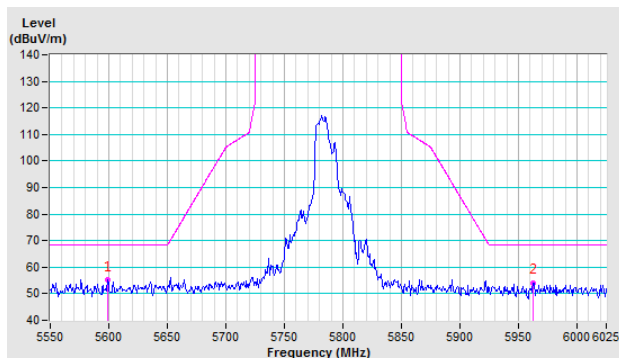


CH 157 5785 MHz

Horizontal

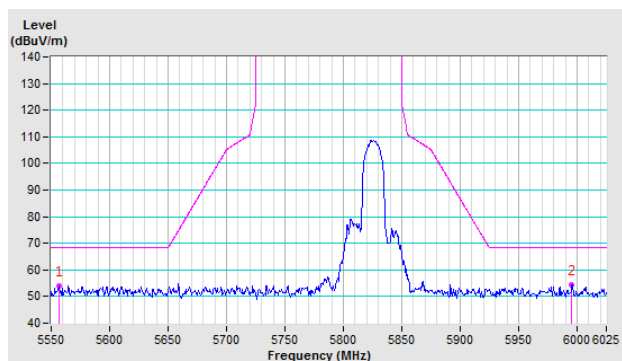


Vertical

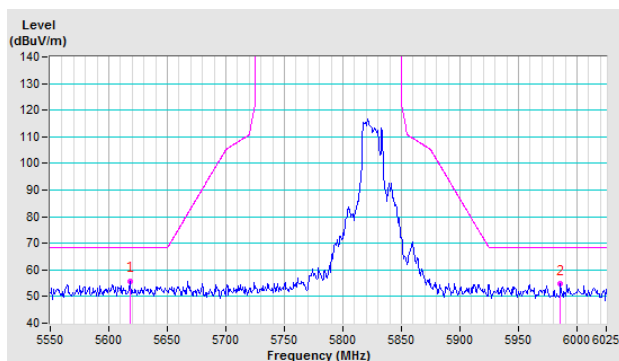


CH 165 5825 MHz

Horizontal



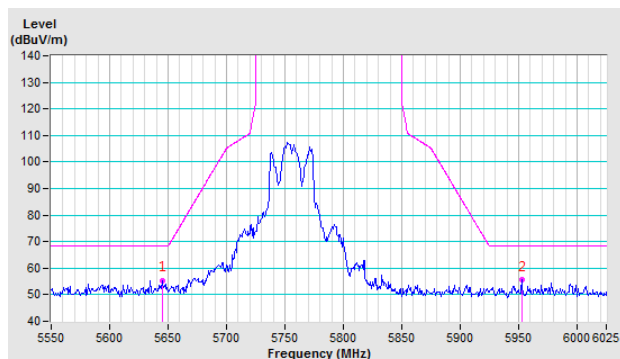
Vertical



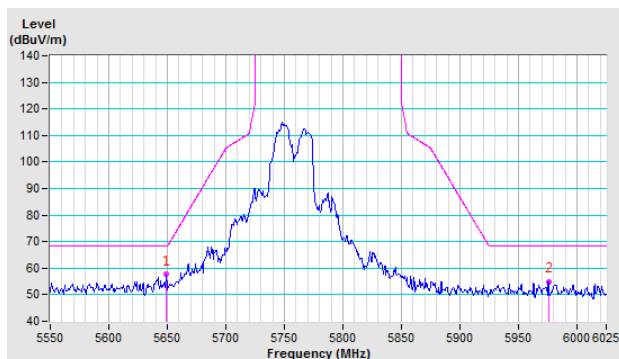
802.11ac (VHT40)

CH 151 5755 MHz

Horizontal

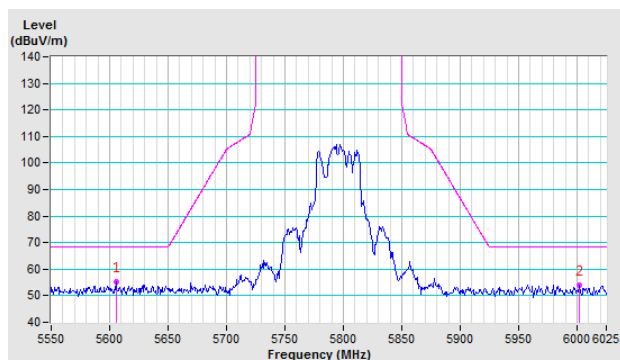


Vertical

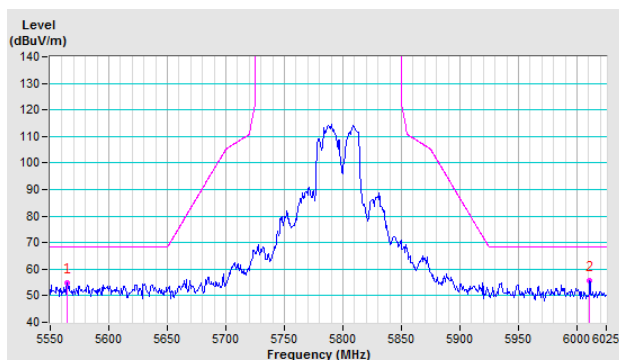


CH 159 5795 MHz

Horizontal



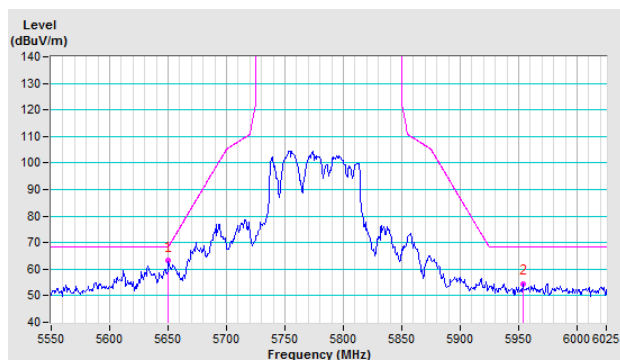
Vertical



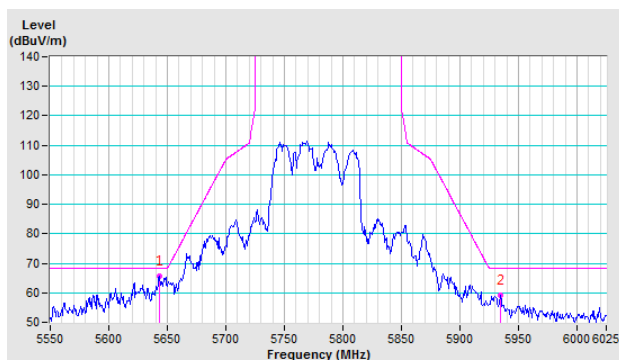
802.11ac (VHT80)

CH 155 5775 MHz

Horizontal



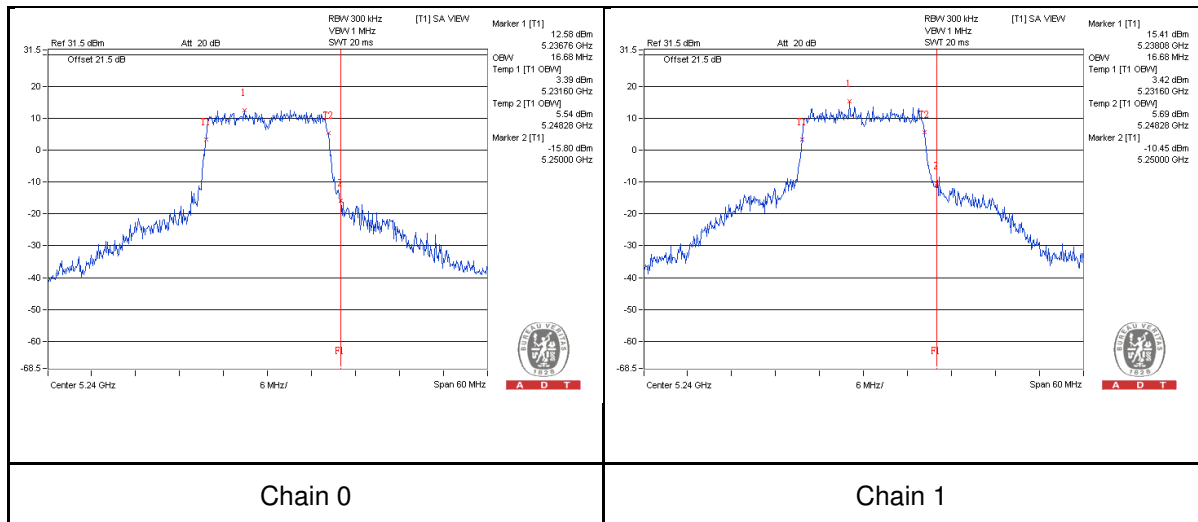
Vertical



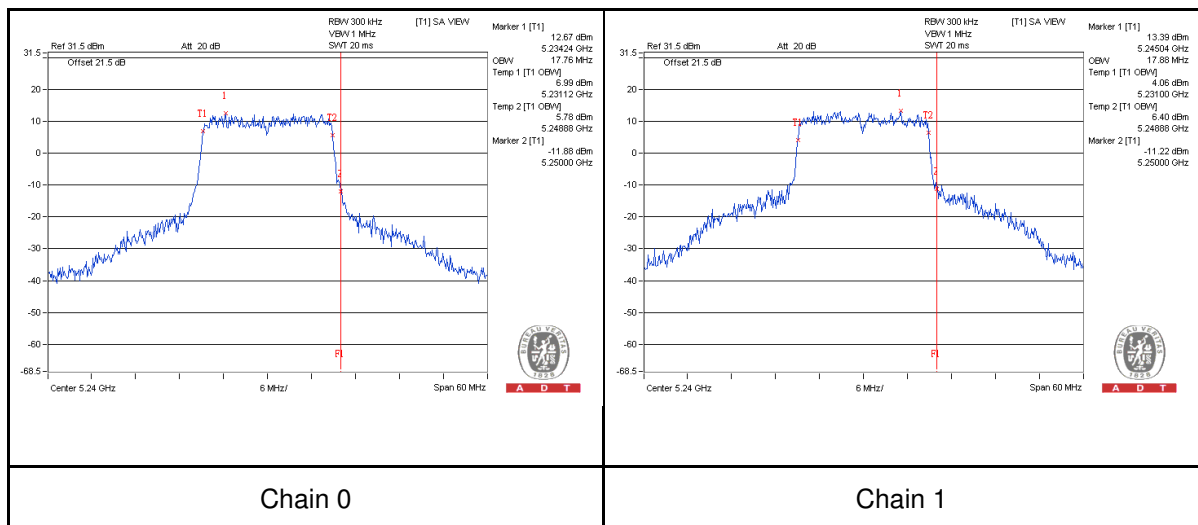
Annex B – Band Edge at nearby DFS Band

1) Test results demonstrating last channel (99% OBW) shall not exceed the band edge on 5150~5250MHz.

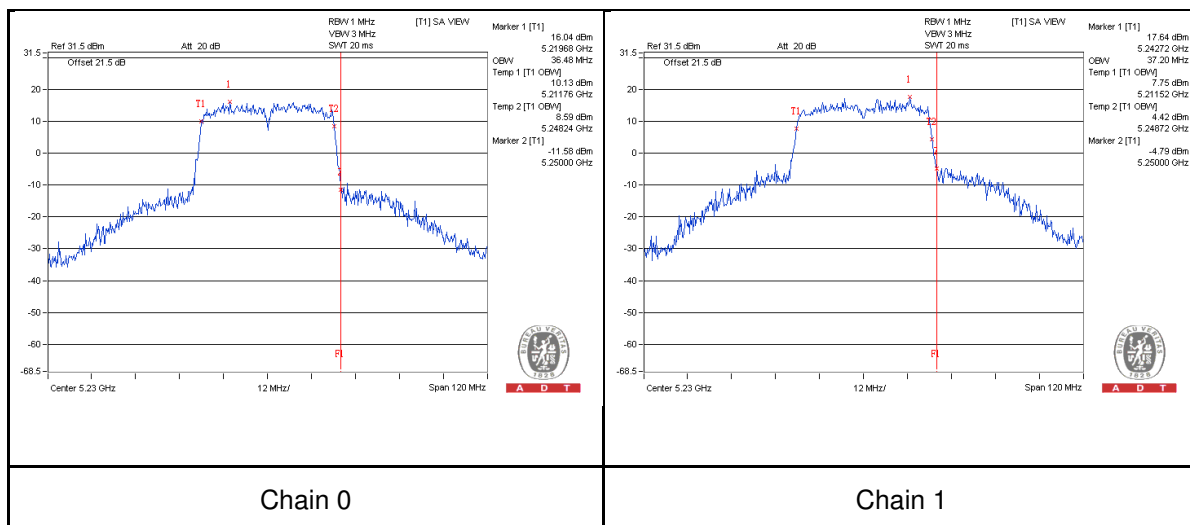
802.11a



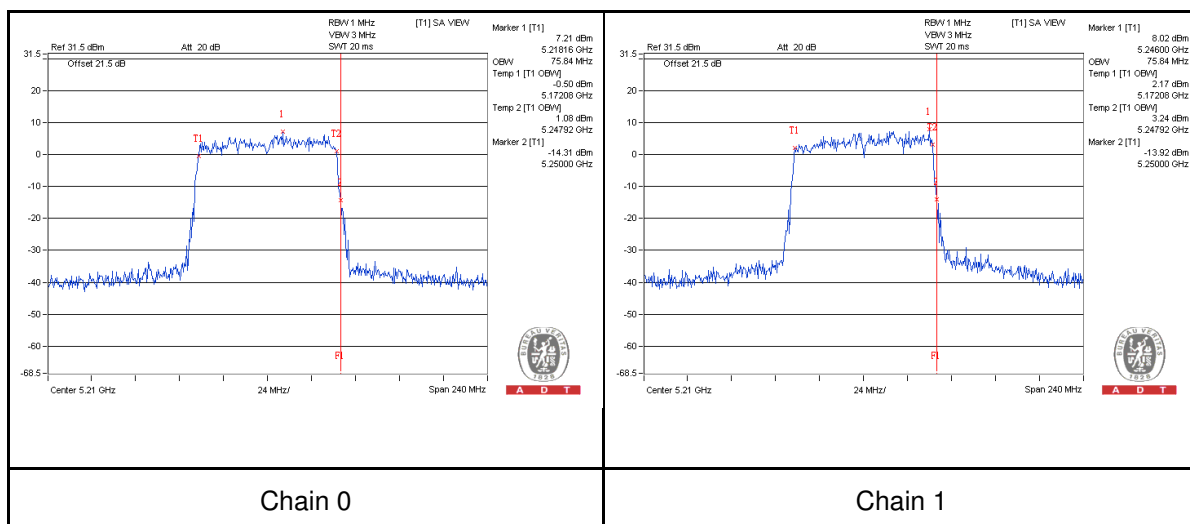
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



Appendix – Information on the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

--- END ---