FCC Test Report

Report No.:	RF180328E06C-1
FCC ID:	KA2AP2662A1
Test Model:	DAP-2662
Received Date:	Apr. 20, 2018
Test Date:	Apr. 20 to Sep. 17, 2018
Issued Date:	Mar. 08, 2019
Applicant:	D-Link Corporation
Address:	17595 Mt. Herrmann Street Fountain Valley, CA92708 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF180328E06C-1	Original release.	Mar. 08, 2019

1 Certificate of Conformity

Product:	Wireless AC1200 Wave 2 Dual-Band PoE Access Point
Brand:	D-Link
Test Model:	DAP-2662
Sample Status:	ENGINEERING SAMPLE
Applicant:	D-Link Corporation
Test Date:	Apr. 20 to Sep. 17, 2018
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 : Phoenix Huang , **Date:** Mar. 08, 2019

Phoenix Huang / Specialist

Approved by : , **Date:** Mar. 08, 2019

May Chen / Manager

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 -3.25dB at 0.39609MHz.
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.
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.

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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless AC1200 Wave 2 Dual-Band PoE Access Point
Brand	D-Link
Test Model	DAP-2662
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter or 48Vdc from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
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	**2.4GHz**: 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20: 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz**: 990.758mW **5GHz:** **5.18GHz ~ 5.24GHz:** **CDD Mode:** 690.612mW **Beamforming Mode:** 690.612mW **5.745GHz ~ 5.825GHz:** **CDD Mode:** 660.014mW **Beamforming Mode:** 660.014mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:
1. Simultaneously transmission condition.

Radio 1	Radio 2
WLAN (2.4GHz)	WLAN (5GHz)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.	

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

No	Brand	Model No.	Spec.
1	D-Link	WA-24Q12R	AC Input: 100-240V, 0.7A, 50/60Hz DC Output: 12V, 2A DC Output Cable: 1.2m unshielded
2	Asian Power Devices Inc.	WA-30P12R	Input: 100-240V, 0.9A, 50/60Hz Output: 12V, 2.5A DC Output Cable: 1.2m unshielded

3. For radiated emissions, the EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	**Power from POE**
Mode B	Power from adapter 1
Mode C	Power from adapter 2
Note: From the above modes, the worst cases were found in **Mode A**. Therefore only the test data of the mode was recorded in this report.	

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

Ant No.	Transmitter Circuit	Antenna Gain (dBi)	Frequency rang (GHz)	Antenna type	Connector type
1	Chain (1)	3.7	2.4~2.4835	PIFA	i-pex(MHF)
2	Chain (0)	3.8	2.4~2.4835	PIFA	i-pex(MHF)
3	Chain (1)	3.8	5.15~5.85	PIFA	i-pex(MHF)
4	Chain (0)	3.9	5.15~5.85	PIFA	i-pex(MHF)

5. 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
VHT20	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
VHT40	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	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)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

Note:
1. All of modulation mode support beamforming function except (2.4GHz band & 802.11a) modulation mode.
2. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and VHT 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
3. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.

6. The above EUT information is declared by manufacturer and for more detailed features description, please refers 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	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	Power from POE
2	-	-	√	-	Power from adapter No.: 1
3	-	-	√	-	Power from adapter No.: 2

Where **RE≥1G:** Radiated Emission above 1GHz **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."-"means no effect.

Radiated Emission Test (Above 1GHz):

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

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 (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	40	OFDM	BPSK	6.5

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 (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	40	OFDM	BPSK	6.5

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

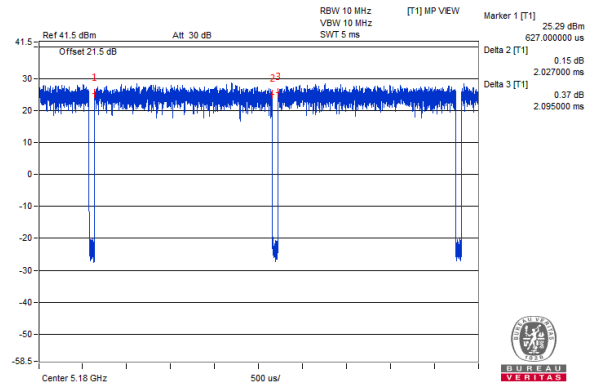
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 66%RH	120Vac, 60Hz	Steven Chiang
RE<1G	24deg. C, 69%RH	120Vac, 60Hz	Steven Chiang
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
	25deg. C, 75%RH	120Vac, 60Hz	Frank Chuang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

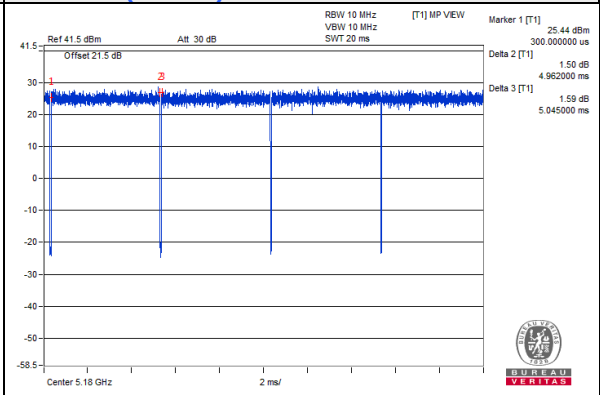
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.027/2.095 = 0.968, Duty factor = 10 * log(1/Duty cycle) = 0.14
802.11ac (VHT20): Duty cycle = 4.962/5.045 = 0.984
802.11ac (VHT40): Duty cycle = 2.406/2.492 = 0.965, Duty factor = 10 * log(1/Duty cycle) = 0.15
802.11ac (VHT80): Duty cycle = 1.135/1.203 = 0.943, Duty factor = 10 * log(1/Duty cycle) = 0.25

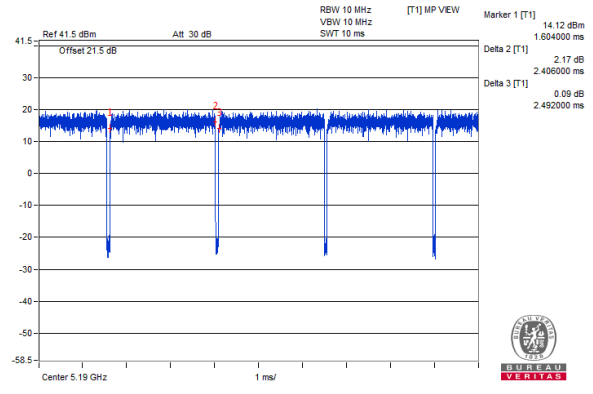
802.11a



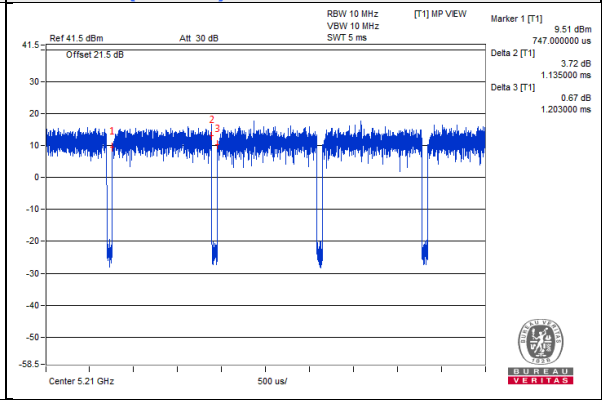
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



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.	PoE Adapter	NA	PCS-G300	NA	NA	Provided by Lab
B.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

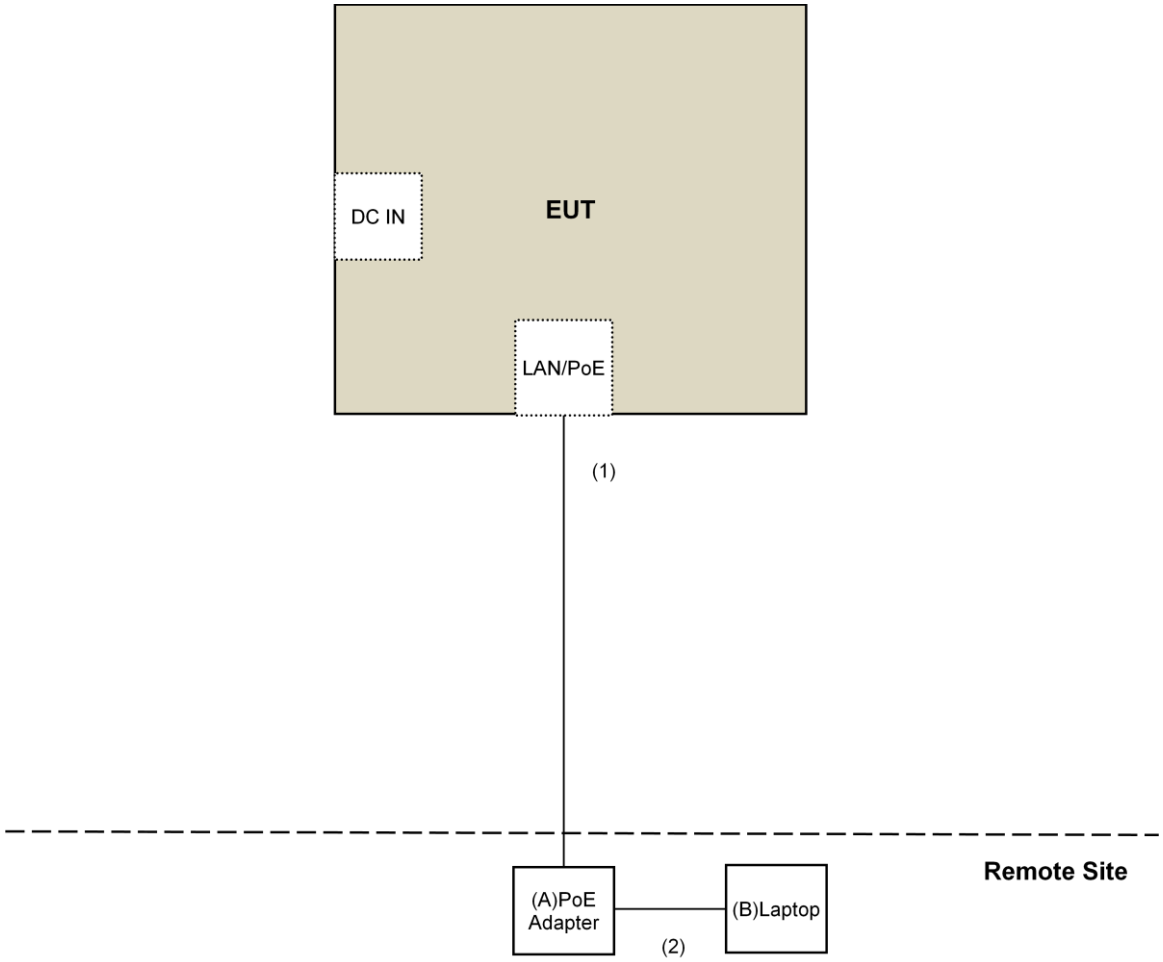
Note:

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

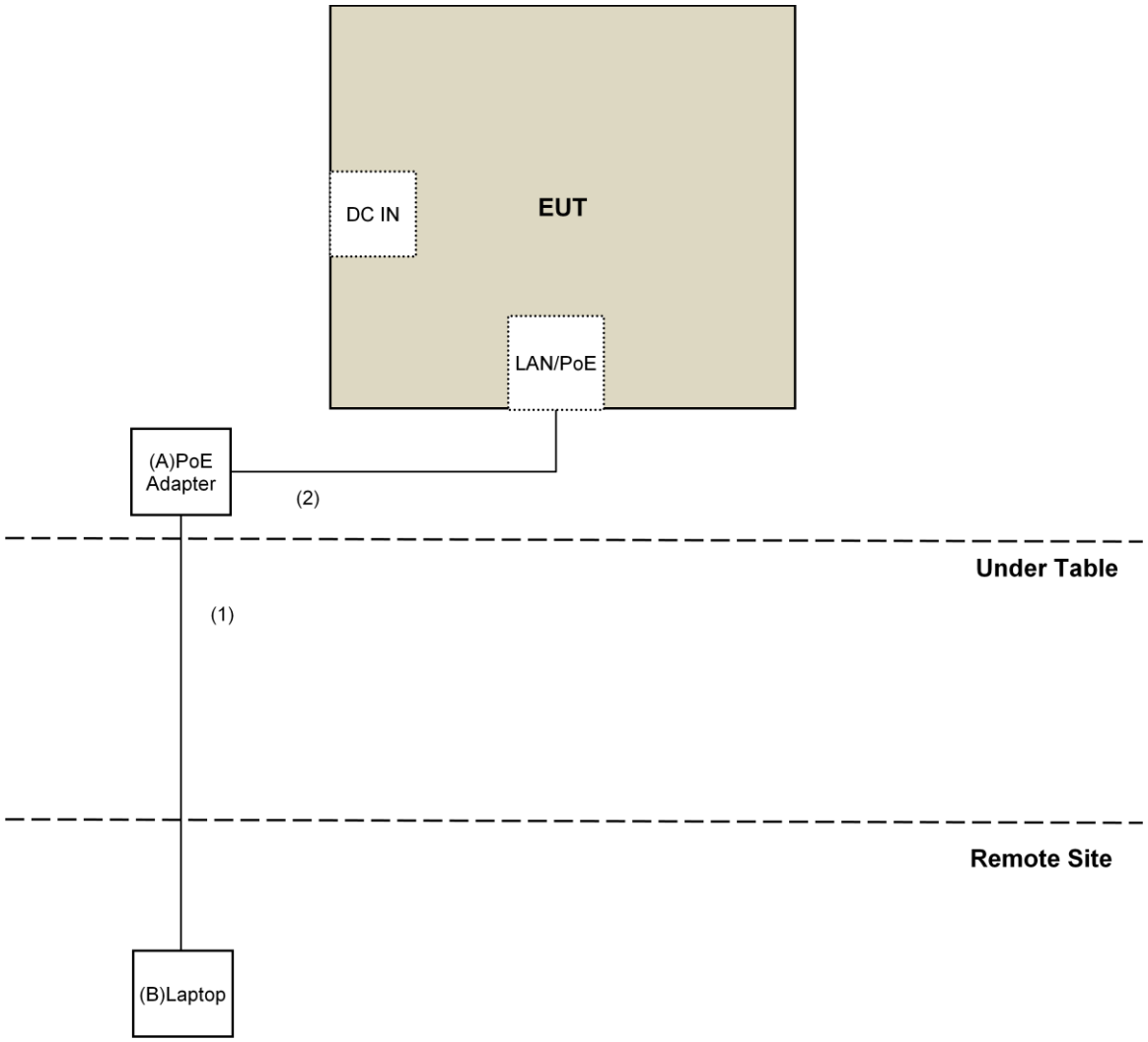
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	3	No	0	Provided by Lab
3.	DC Cable	1	1.2	No	0	Supplied by client

3.4.1 Configuration of System under Test

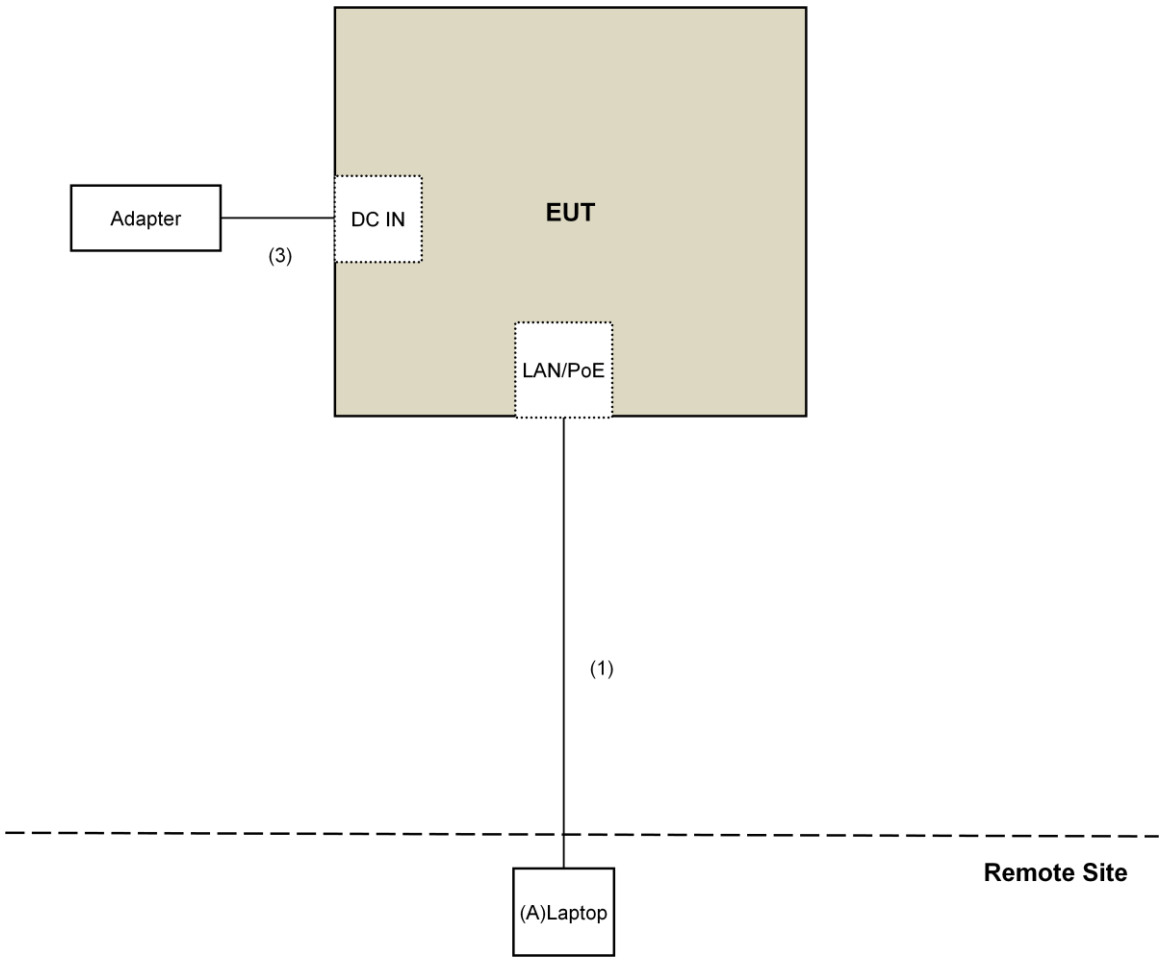
POE mode for radiated emission:



POE mode for conducted emission:



Adapter mode for conducted emission:



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 v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*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.</td></tr>
</table>

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 08, 2017	July 07, 2018
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1 966-4-2 966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980385	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	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	FSv40	100964	July 01, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
DC Power Supply Topward	6603D	795558	NA	NA
True RMS Clamp Meter FLUKE	325	31130711WS	May 29, 2017	May 28, 2018

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. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Apr. 24 to May 03, 2018

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

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

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

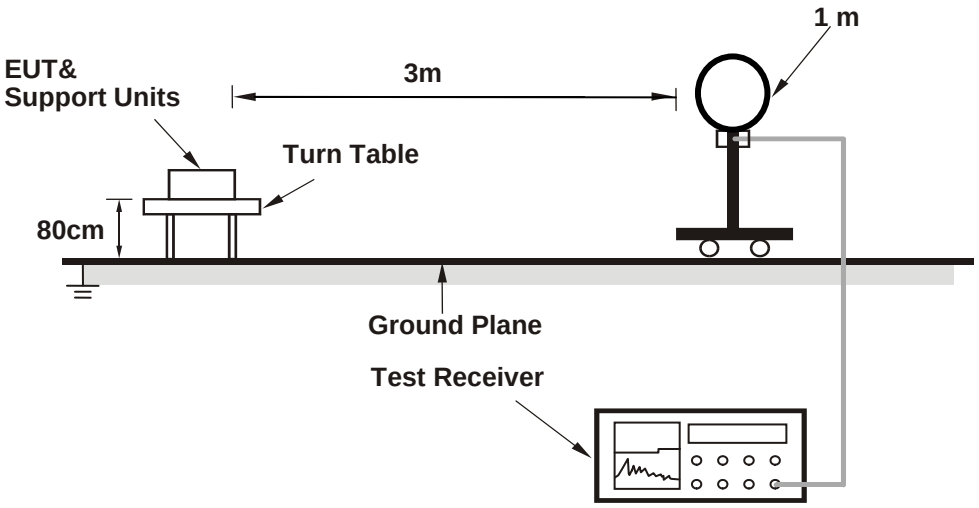
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

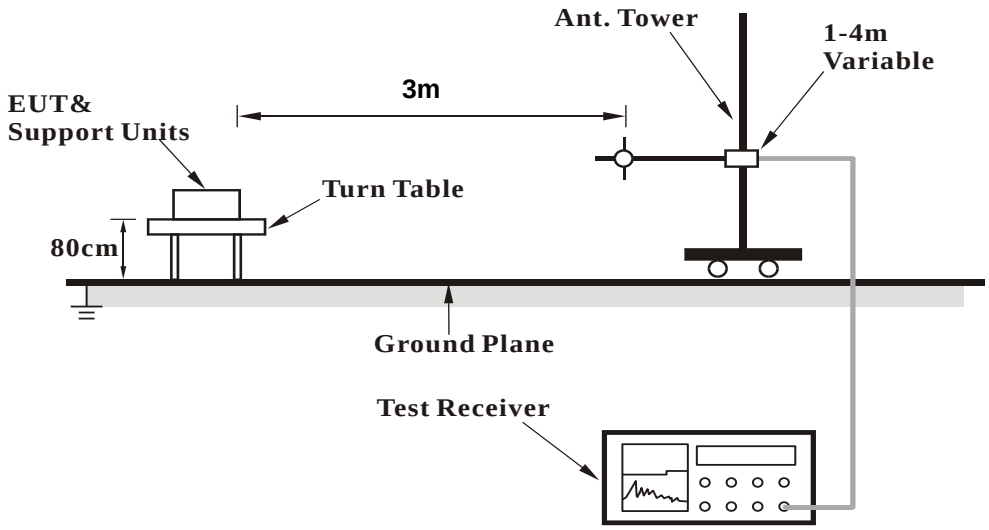
No deviation.

4.1.5 Test Setup

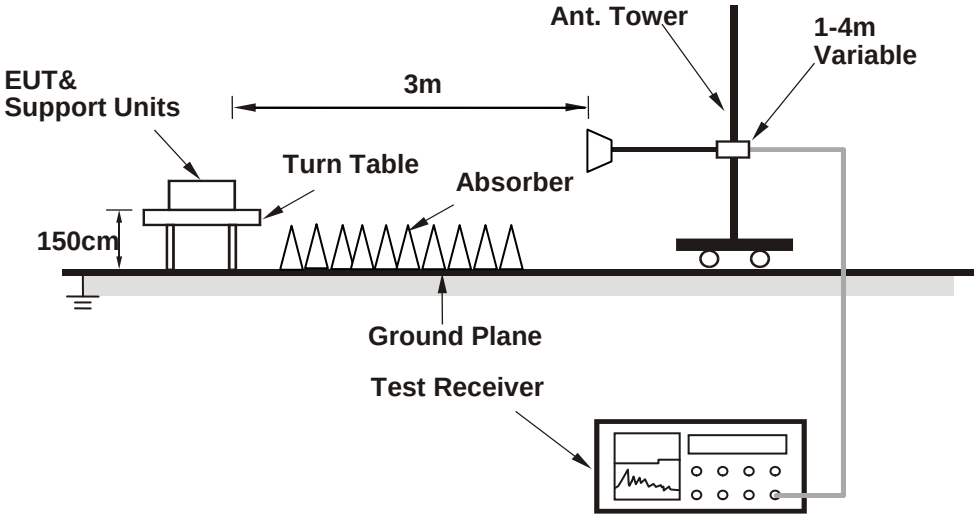
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Placed the EUT on the testing table.
b. Contorlling software (QRCT Ver:3.0.297.0) 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) 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	63.3 PK	74.0	-10.7	1.03 H	234	59.2	4.1
2	5150.00	50.4 AV	54.0	-3.6	1.03 H	234	46.3	4.1
3	*5180.00	114.3 PK			1.03 H	234	110.5	3.8
4	*5180.00	103.7 AV			1.03 H	234	99.9	3.8
5	#10360.00	56.9 PK	74.0	-17.1	3.67 H	40	43.8	13.1
6	#10360.00	45.1 AV	54.0	-8.9	3.67 H	40	32.0	13.1
7	15540.00	55.8 PK	74.0	-18.2	2.50 H	217	42.7	13.1
8	15540.00	43.6 AV	54.0	-10.4	2.50 H	217	30.5	13.1
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	5150.00	66.8 PK	74.0	-7.2	1.01 V	29	62.7	4.1
2	5150.00	53.7 AV	54.0	-0.3	1.01 V	29	49.6	4.1
3	*5180.00	119.1 PK			1.01 V	29	115.3	3.8
4	*5180.00	108.4 AV			1.01 V	29	104.6	3.8
5	#10360.00	62.2 PK	74.0	-11.8	1.33 V	167	49.1	13.1
6	#10360.00	49.0 AV	54.0	-5.0	1.33 V	167	35.9	13.1
7	15540.00	65.2 PK	74.0	-8.8	1.08 V	213	52.1	13.1
8	15540.00	51.9 AV	54.0	-2.1	1.08 V	213	38.8	13.1

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 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	5150.00	56.1 PK	74.0	-17.9	1.09 H	218	52.0	4.1
2	5150.00	43.8 AV	54.0	-10.2	1.09 H	218	39.7	4.1
3	*5200.00	116.5 PK			1.09 H	218	112.8	3.7
4	*5200.00	105.4 AV			1.09 H	218	101.7	3.7
5	#10400.00	57.1 PK	74.0	-16.9	3.61 H	30	44.0	13.1
6	#10400.00	45.2 AV	54.0	-8.8	3.61 H	30	32.1	13.1
7	15600.00	55.8 PK	74.0	-18.2	2.49 H	212	42.8	13.0
8	15600.00	43.4 AV	54.0	-10.6	2.49 H	212	30.4	13.0
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	60.7 PK	74.0	-13.3	1.27 V	285	56.6	4.1
2	5150.00	46.9 AV	54.0	-7.1	1.27 V	285	42.8	4.1
3	*5200.00	120.1 PK			1.27 V	285	116.4	3.7
4	*5200.00	110.1 AV			1.27 V	285	106.4	3.7
5	#10400.00	63.0 PK	74.0	-11.0	1.29 V	351	49.9	13.1
6	#10400.00	49.5 AV	54.0	-4.5	1.29 V	351	36.4	13.1
7	15600.00	67.2 PK	74.0	-6.8	1.14 V	212	54.2	13.0
8	15600.00	53.5 AV	54.0	-0.5	1.14 V	212	40.5	13.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	116.2 PK			1.12 H	234	112.7	3.5
2	*5240.00	105.3 AV			1.12 H	234	101.8	3.5
3	5350.00	52.4 PK	74.0	-21.6	1.12 H	234	48.8	3.6
4	5350.00	40.2 AV	54.0	-13.8	1.12 H	234	36.6	3.6
5	5402.00	54.8 PK	74.0	-19.2	1.12 H	234	51.0	3.8
6	5402.00	41.3 AV	54.0	-12.7	1.12 H	234	37.5	3.8
7	#10480.00	56.6 PK	74.0	-17.4	3.70 H	30	43.1	13.5
8	#10480.00	44.8 AV	54.0	-9.2	3.70 H	30	31.3	13.5
9	15720.00	55.9 PK	74.0	-18.1	2.50 H	222	43.1	12.8
10	15720.00	43.8 AV	54.0	-10.2	2.50 H	222	31.0	12.8
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	119.8 PK			1.25 V	278	116.3	3.5
2	*5240.00	109.9 AV			1.25 V	278	106.4	3.5
3	5350.00	54.5 PK	74.0	-19.5	1.25 V	278	50.9	3.6
4	5350.00	42.3 AV	54.0	-11.7	1.25 V	278	38.7	3.6
5	5402.00	56.7 PK	74.0	-17.3	1.25 V	278	52.9	3.8
6	5402.00	45.4 AV	54.0	-8.6	1.25 V	278	41.6	3.8
7	#10480.00	62.1 PK	74.0	-11.9	1.22 V	349	48.6	13.5
8	#10480.00	48.9 AV	54.0	-5.1	1.22 V	349	35.4	13.5
9	15720.00	67.1 PK	74.0	-6.9	1.11 V	210	54.3	12.8
10	15720.00	53.5 AV	54.0	-0.5	1.11 V	210	40.7	12.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
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) 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	*5745.00	112.3 PK			2.20 H	45	108.0	4.3
2	*5745.00	102.9 AV			2.20 H	45	98.6	4.3
3	11490.00	59.5 PK	74.0	-14.5	1.50 H	188	45.5	14.0
4	11490.00	46.5 AV	54.0	-7.5	1.50 H	188	32.5	14.0
5	#17235.00	48.6 PK	74.0	-25.4	1.66 H	253	31.7	16.9
6	#17235.00	37.3 AV	54.0	-16.7	1.66 H	253	20.4	16.9
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	*5745.00	122.0 PK			2.37 V	86	117.7	4.3
2	*5745.00	112.4 AV			2.37 V	86	108.1	4.3
3	11490.00	64.5 PK	74.0	-9.5	3.76 V	99	50.5	14.0
4	11490.00	52.2 AV	54.0	-1.8	3.76 V	99	38.2	14.0
5	#17235.00	54.2 PK	74.0	-19.8	1.26 V	259	37.3	16.9
6	#17235.00	41.8 AV	54.0	-12.2	1.26 V	259	24.9	16.9

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.

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	*5785.00	109.4 PK			1.10 H	171	105.1	4.3
2	*5785.00	98.9 AV			1.10 H	171	94.6	4.3
3	11570.00	60.2 PK	74.0	-13.8	1.49 H	176	46.2	14.0
4	11570.00	47.0 AV	54.0	-7.0	1.49 H	176	33.0	14.0
5	#17355.00	48.2 PK	74.0	-25.8	1.72 H	253	30.9	17.3
6	#17355.00	37.1 AV	54.0	-16.9	1.72 H	253	19.8	17.3
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	*5785.00	121.6 PK			2.36 V	84	117.3	4.3
2	*5785.00	111.8 AV			2.36 V	84	107.5	4.3
3	11570.00	64.2 PK	74.0	-9.8	3.73 V	101	50.2	14.0
4	11570.00	51.9 AV	54.0	-2.1	3.73 V	101	37.9	14.0
5	#17355.00	54.5 PK	74.0	-19.5	1.26 V	249	37.2	17.3
6	#17355.00	41.8 AV	54.0	-12.2	1.26 V	249	24.5	17.3

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 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	*5825.00	109.8 PK			2.22 H	42	105.4	4.4
2	*5825.00	100.2 AV			2.22 H	42	95.8	4.4
3	11650.00	59.4 PK	74.0	-14.6	1.44 H	185	45.5	13.9
4	11650.00	46.5 AV	54.0	-7.5	1.44 H	185	32.6	13.9
5	#17475.00	48.2 PK	74.0	-25.8	1.62 H	263	30.0	18.2
6	#17475.00	37.1 AV	54.0	-16.9	1.62 H	263	18.9	18.2
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	*5825.00	121.0 PK			2.33 V	83	116.6	4.4
2	*5825.00	111.2 AV			2.33 V	83	106.8	4.4
3	11650.00	66.8 PK	74.0	-7.2	3.74 V	103	52.9	13.9
4	11650.00	53.6 AV	54.0	-0.4	3.74 V	103	39.7	13.9
5	#17475.00	54.6 PK	74.0	-19.4	1.20 V	256	36.4	18.2
6	#17475.00	42.0 AV	54.0	-12.0	1.20 V	256	23.8	18.2

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.

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	63.8 PK	74.0	-10.2	1.02 H	237	59.7	4.1
2	5150.00	50.8 AV	54.0	-3.2	1.02 H	237	46.7	4.1
3	*5180.00	113.5 PK			1.02 H	237	109.7	3.8
4	*5180.00	102.0 AV			1.02 H	237	98.2	3.8
5	#10360.00	56.8 PK	74.0	-17.2	3.63 H	32	43.7	13.1
6	#10360.00	45.1 AV	54.0	-8.9	3.63 H	32	32.0	13.1
7	15540.00	55.7 PK	74.0	-18.3	2.50 H	231	42.6	13.1
8	15540.00	43.5 AV	54.0	-10.5	2.50 H	231	30.4	13.1
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	5150.00	67.2 PK	74.0	-6.8	1.06 V	29	63.1	4.1
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.06 V**	**29**	**49.8**	**4.1**
3	*5180.00	118.2 PK			1.06 V	29	114.4	3.8
4	*5180.00	106.7 AV			1.06 V	29	102.9	3.8
5	#10360.00	51.8 PK	74.0	-22.2	1.19 V	168	38.7	13.1
6	#10360.00	39.4 AV	54.0	-14.6	1.19 V	168	26.3	13.1
7	15540.00	55.5 PK	74.0	-18.5	1.09 V	214	42.4	13.1
8	15540.00	40.2 AV	54.0	-13.8	1.09 V	214	27.1	13.1

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 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	5150.00	59.3 PK	74.0	-14.7	1.04 H	225	55.2	4.1
2	5150.00	45.8 AV	54.0	-8.2	1.04 H	225	41.7	4.1
3	*5200.00	116.3 PK			1.04 H	225	112.6	3.7
4	*5200.00	104.8 AV			1.04 H	225	101.1	3.7
5	#10400.00	57.0 PK	74.0	-17.0	3.63 H	50	43.9	13.1
6	#10400.00	45.2 AV	54.0	-8.8	3.63 H	50	32.1	13.1
7	15600.00	55.7 PK	74.0	-18.3	2.44 H	232	42.7	13.0
8	15600.00	43.6 AV	54.0	-10.4	2.44 H	232	30.6	13.0
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	62.3 PK	74.0	-11.7	1.06 V	31	58.2	4.1
2	5150.00	48.2 AV	54.0	-5.8	1.06 V	31	44.1	4.1
3	*5200.00	121.0 PK			1.06 V	31	117.3	3.7
4	*5200.00	109.2 AV			1.06 V	31	105.5	3.7
5	#10400.00	56.3 PK	74.0	-17.7	1.21 V	168	43.2	13.1
6	#10400.00	44.5 AV	54.0	-9.5	1.21 V	168	31.4	13.1
7	15600.00	68.7 PK	74.0	-5.3	1.12 V	214	55.7	13.0
8	15600.00	53.7 AV	54.0	-0.3	1.12 V	214	40.7	13.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	116.8 PK			1.09 H	220	113.3	3.5
2	*5240.00	105.1 AV			1.09 H	220	101.6	3.5
3	5350.00	52.6 PK	74.0	-21.4	1.09 H	220	49.0	3.6
4	5350.00	40.2 AV	54.0	-13.8	1.09 H	220	36.6	3.6
5	5396.00	53.4 PK	74.0	-20.6	1.09 H	220	49.6	3.8
6	5396.00	41.6 AV	54.0	-12.4	1.09 H	220	37.8	3.8
7	#10480.00	57.1 PK	74.0	-16.9	3.63 H	49	43.6	13.5
8	#10480.00	45.2 AV	54.0	-8.8	3.63 H	49	31.7	13.5
9	15720.00	55.9 PK	74.0	-18.1	2.56 H	206	43.1	12.8
10	15720.00	43.7 AV	54.0	-10.3	2.56 H	206	30.9	12.8
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	121.2 PK			1.07 V	30	117.7	3.5
2	*5240.00	109.4 AV			1.07 V	30	105.9	3.5
3	5350.00	54.5 PK	74.0	-19.5	1.07 V	30	50.9	3.6
4	5350.00	42.0 AV	54.0	-12.0	1.07 V	30	38.4	3.6
5	5396.00	55.9 PK	74.0	-18.1	1.07 V	30	52.1	3.8
6	5396.00	43.7 AV	54.0	-10.3	1.07 V	30	39.9	3.8
7	#10480.00	56.2 PK	74.0	-17.8	1.22 V	159	42.7	13.5
8	#10480.00	44.7 AV	54.0	-9.3	1.22 V	159	31.2	13.5
9	15720.00	66.7 PK	74.0	-7.3	1.20 V	213	53.9	12.8
10	15720.00	53.5 AV	54.0	-0.5	1.20 V	213	40.7	12.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
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) 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	*5745.00	112.1 PK			2.20 H	49	107.8	4.3
2	*5745.00	102.0 AV			2.20 H	49	97.7	4.3
3	11490.00	59.7 PK	74.0	-14.3	1.49 H	193	45.7	14.0
4	11490.00	46.6 AV	54.0	-7.4	1.49 H	193	32.6	14.0
5	#17235.00	48.9 PK	74.0	-25.1	1.71 H	264	32.0	16.9
6	#17235.00	37.4 AV	54.0	-16.6	1.71 H	264	20.5	16.9
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	*5745.00	121.4 PK			2.36 V	83	117.1	4.3
2	*5745.00	111.1 AV			2.36 V	83	106.8	4.3
3	11490.00	65.1 PK	74.0	-8.9	3.78 V	97	51.1	14.0
4	11490.00	52.6 AV	54.0	-1.4	3.78 V	97	38.6	14.0
5	#17235.00	53.6 PK	74.0	-20.4	1.26 V	267	36.7	16.9
6	#17235.00	41.3 AV	54.0	-12.7	1.26 V	267	24.4	16.9

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.

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	*5785.00	112.4 PK			2.15 H	45	108.1	4.3
2	*5785.00	102.1 AV			2.15 H	45	97.8	4.3
3	11570.00	59.7 PK	74.0	-14.3	1.46 H	173	45.7	14.0
4	11570.00	46.8 AV	54.0	-7.2	1.46 H	173	32.8	14.0
5	#17355.00	48.7 PK	74.0	-25.3	1.64 H	244	31.4	17.3
6	#17355.00	37.5 AV	54.0	-16.5	1.64 H	244	20.2	17.3
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	*5785.00	122.0 PK			2.36 V	83	117.7	4.3
2	*5785.00	111.7 AV			2.36 V	83	107.4	4.3
3	11570.00	63.9 PK	74.0	-10.1	3.76 V	103	49.9	14.0
4	11570.00	51.7 AV	54.0	-2.3	3.76 V	103	37.7	14.0
5	#17355.00	54.3 PK	74.0	-19.7	1.28 V	272	37.0	17.3
6	#17355.00	41.7 AV	54.0	-12.3	1.28 V	272	24.4	17.3

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 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	*5825.00	110.1 PK			2.13 H	43	105.7	4.4
2	*5825.00	100.1 AV			2.13 H	43	95.7	4.4
3	11650.00	59.3 PK	74.0	-14.7	1.44 H	182	45.4	13.9
4	11650.00	46.1 AV	54.0	-7.9	1.44 H	182	32.2	13.9
5	#17475.00	48.4 PK	74.0	-25.6	1.61 H	258	30.2	18.2
6	#17475.00	37.0 AV	54.0	-17.0	1.61 H	258	18.8	18.2
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	*5825.00	120.6 PK			2.22 V	85	116.2	4.4
2	*5825.00	110.1 AV			2.22 V	85	105.7	4.4
3	11650.00	66.3 PK	74.0	-7.7	3.70 V	108	52.4	13.9
4	11650.00	53.7 AV	54.0	-0.3	3.70 V	108	39.8	13.9
5	#17475.00	54.6 PK	74.0	-19.4	1.21 V	261	36.4	18.2
6	#17475.00	41.9 AV	54.0	-12.1	1.21 V	261	23.7	18.2

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.

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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	63.2 PK	74.0	-10.8	1.04 H	224	59.1	4.1
2	5150.00	50.1 AV	54.0	-3.9	1.04 H	224	46.0	4.1
3	*5190.00	105.6 PK			1.04 H	224	101.8	3.8
4	*5190.00	95.7 AV			1.04 H	224	91.9	3.8
5	5350.00	52.8 PK	74.0	-21.2	1.04 H	224	49.2	3.6
6	5350.00	42.4 AV	54.0	-11.6	1.04 H	224	38.8	3.6
7	#10380.00	57.3 PK	74.0	-16.7	3.73 H	25	44.2	13.1
8	#10380.00	45.4 AV	54.0	-8.6	3.73 H	25	32.3	13.1
9	15570.00	56.3 PK	74.0	-17.7	2.55 H	211	43.2	13.1
10	15570.00	44.0 AV	54.0	-10.0	2.55 H	211	30.9	13.1
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	5150.00	65.6 PK	74.0	-8.4	1.11 V	30	61.5	4.1
2	5150.00	53.6 AV	54.0	-0.4	1.11 V	30	49.5	4.1
3	*5190.00	110.6 PK			1.11 V	30	106.8	3.8
4	*5190.00	100.9 AV			1.11 V	30	97.1	3.8
5	5350.00	54.8 PK	74.0	-19.2	1.11 V	30	51.2	3.6
6	5350.00	42.7 AV	54.0	-11.3	1.11 V	30	39.1	3.6
7	#10380.00	42.1 PK	74.0	-31.9	1.68 V	223	29.0	13.1
8	#10380.00	33.3 AV	54.0	-20.7	1.68 V	223	20.2	13.1
9	15570.00	41.2 PK	74.0	-32.8	2.39 V	129	28.1	13.1
10	15570.00	30.6 AV	54.0	-23.4	2.39 V	129	17.5	13.1

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 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	111.1 PK			1.05 H	235	107.6	3.5
2	*5230.00	102.4 AV			1.05 H	235	98.9	3.5
3	5350.00	54.3 PK	74.0	-19.7	1.05 H	235	50.7	3.6
4	5350.00	42.1 AV	54.0	-11.9	1.05 H	235	38.5	3.6
5	#10460.00	57.3 PK	74.0	-16.7	3.64 H	33	43.9	13.4
6	#10460.00	45.5 AV	54.0	-8.5	3.64 H	33	32.1	13.4
7	15690.00	55.2 PK	74.0	-18.8	2.51 H	217	42.3	12.9
8	15690.00	43.2 AV	54.0	-10.8	2.51 H	217	30.3	12.9
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	*5230.00	116.1 PK			1.13 V	24	112.6	3.5
2	*5230.00	107.2 AV			1.13 V	24	103.7	3.5
3	5350.00	56.5 PK	74.0	-17.5	1.13 V	24	52.9	3.6
4	5350.00	44.5 AV	54.0	-9.5	1.13 V	24	40.9	3.6
5	#10460.00	57.6 PK	74.0	-16.4	2.30 V	3	44.2	13.4
6	#10460.00	45.7 AV	54.0	-8.3	2.30 V	3	32.3	13.4
7	15690.00	65.5 PK	74.0	-8.5	1.20 V	209	52.6	12.9
8	15690.00	53.5 AV	54.0	-0.5	1.20 V	209	40.6	12.9

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.

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	*5755.00	110.6 PK			2.12 H	44	106.3	4.3
2	*5755.00	101.0 AV			2.12 H	44	96.7	4.3
3	11510.00	59.5 PK	74.0	-14.5	1.44 H	199	45.5	14.0
4	11510.00	46.2 AV	54.0	-7.8	1.44 H	199	32.2	14.0
5	#17265.00	48.7 PK	74.0	-25.3	1.67 H	266	31.7	17.0
6	#17265.00	37.6 AV	54.0	-16.4	1.67 H	266	20.6	17.0
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	*5755.00	119.2 PK			1.25 V	86	114.9	4.3
2	*5755.00	110.1 AV			1.25 V	86	105.8	4.3
3	11510.00	60.8 PK	74.0	-13.2	1.34 V	253	46.8	14.0
4	11510.00	49.6 AV	54.0	-4.4	1.34 V	253	35.6	14.0
5	#17265.00	54.9 PK	74.0	-19.1	1.22 V	263	37.9	17.0
6	#17265.00	42.5 AV	54.0	-11.5	1.22 V	263	25.5	17.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	*5795.00	109.9 PK			2.20 H	46	105.6	4.3
2	*5795.00	100.8 AV			2.20 H	46	96.5	4.3
3	11590.00	59.3 PK	74.0	-14.7	1.44 H	200	45.3	14.0
4	11590.00	46.1 AV	54.0	-7.9	1.44 H	200	32.1	14.0
5	#17385.00	48.4 PK	74.0	-25.6	1.65 H	245	31.1	17.3
6	#17385.00	37.2 AV	54.0	-16.8	1.65 H	245	19.9	17.3
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	*5795.00	119.6 PK			2.32 V	84	115.3	4.3
2	*5795.00	110.2 AV			2.32 V	84	105.9	4.3
3	11590.00	62.5 PK	74.0	-11.5	1.29 V	252	48.5	14.0
4	11590.00	50.9 AV	54.0	-3.1	1.29 V	252	36.9	14.0
5	#17385.00	54.8 PK	74.0	-19.2	1.14 V	271	37.5	17.3
6	#17385.00	42.3 AV	54.0	-11.7	1.14 V	271	25.0	17.3

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.

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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	5150.00	63.5 PK	74.0	-10.5	1.07 H	243	59.4	4.1
2	5150.00	50.1 AV	54.0	-3.9	1.07 H	243	46.0	4.1
3	*5210.00	100.3 PK			1.07 H	243	96.6	3.7
4	*5210.00	91.5 AV			1.07 H	243	87.8	3.7
5	5350.00	54.3 PK	74.0	-19.7	1.07 H	243	50.7	3.6
6	5350.00	42.1 AV	54.0	-11.9	1.07 H	243	38.5	3.6
7	#10420.00	56.9 PK	74.0	-17.1	3.62 H	28	43.7	13.2
8	#10420.00	45.4 AV	54.0	-8.6	3.62 H	28	32.2	13.2
9	15630.00	55.9 PK	74.0	-18.1	2.45 H	225	42.9	13.0
10	15630.00	43.7 AV	54.0	-10.3	2.45 H	225	30.7	13.0
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	67.8 PK	74.0	-6.2	1.25 V	25	63.7	4.1
2	5150.00	53.5 AV	54.0	-0.5	1.25 V	25	49.4	4.1
3	*5210.00	105.6 PK			1.25 V	25	101.9	3.7
4	*5210.00	96.1 AV			1.25 V	25	92.4	3.7
5	5350.00	55.4 PK	74.0	-18.6	1.25 V	25	51.8	3.6
6	5350.00	43.9 AV	54.0	-10.1	1.25 V	25	40.3	3.6
7	#10420.00	56.2 PK	74.0	-17.8	1.19 V	161	43.0	13.2
8	#10420.00	44.6 AV	54.0	-9.4	1.19 V	161	31.4	13.2
9	15630.00	67.0 PK	74.0	-7.0	1.15 V	216	54.0	13.0
10	15630.00	53.6 AV	54.0	-0.4	1.15 V	216	40.6	13.0

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
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	*5775.00	103.4 PK			2.21 H	46	99.0	4.4
2	*5775.00	93.9 AV			2.21 H	46	89.5	4.4
3	11550.00	59.8 PK	74.0	-14.2	1.46 H	189	45.9	13.9
4	11550.00	46.8 AV	54.0	-7.2	1.46 H	189	32.9	13.9
5	#17325.00	48.7 PK	74.0	-25.3	1.64 H	266	31.5	17.2
6	#17325.00	37.6 AV	54.0	-16.4	1.64 H	266	20.4	17.2
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	*5775.00	113.1 PK			2.27 V	82	108.7	4.4
2	*5775.00	103.6 AV			2.27 V	82	99.2	4.4
3	11550.00	55.6 PK	74.0	-18.4	1.30 V	254	41.7	13.9
4	11550.00	45.2 AV	54.0	-8.8	1.30 V	254	31.3	13.9
5	#17325.00	50.1 PK	74.0	-23.9	1.27 V	259	32.9	17.2
6	#17325.00	37.3 AV	54.0	-16.7	1.27 V	259	20.1	17.2

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.

Below 1GHz Data:

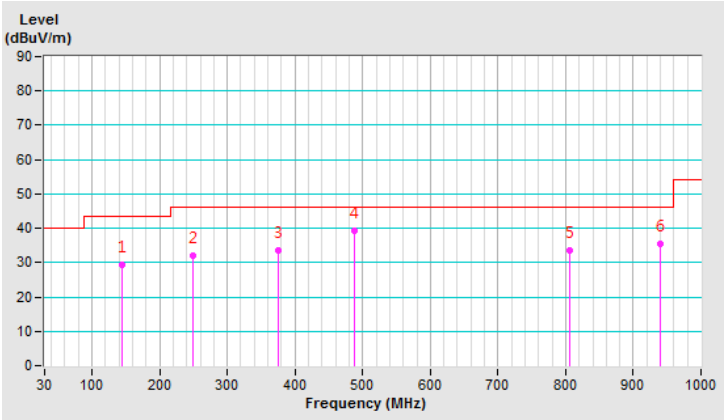
802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	145.26	29.5 QP	43.5	-14.0	2.00 H	101	37.4	-7.9
2	250.02	32.0 QP	46.0	-14.0	1.00 H	59	40.9	-8.9
3	375.00	33.6 QP	46.0	-12.4	1.00 H	41	38.4	-4.8
4	488.64	39.2 QP	46.0	-6.8	2.00 H	360	41.3	-2.1
5	806.51	33.7 QP	46.0	-12.3	2.00 H	306	29.8	3.9
6	939.11	35.3 QP	46.0	-10.7	1.00 H	360	29.1	6.2

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 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.

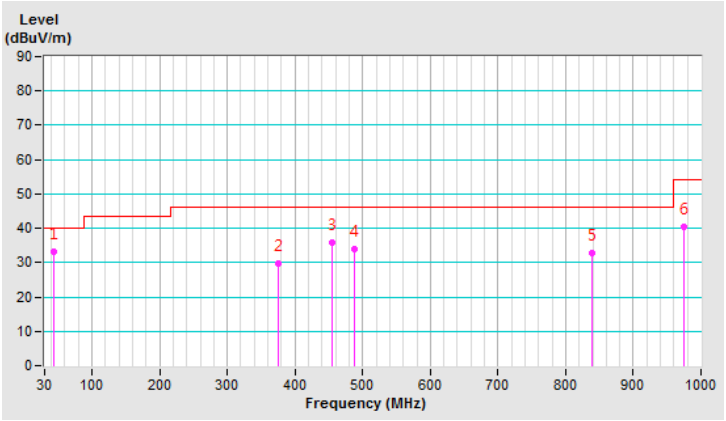


CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	43.75	33.3 QP	40.0	-6.7	1.00 V	174	41.3	-8.0
2	374.98	29.8 QP	46.0	-16.2	1.50 V	187	34.6	-4.8
3	454.91	35.8 QP	46.0	-10.2	1.00 V	303	38.4	-2.6
4	488.57	34.0 QP	46.0	-12.0	1.00 V	89	36.1	-2.1
5	838.20	32.8 QP	46.0	-13.2	1.50 V	238	28.3	4.5
6	975.00	40.3 QP	54.0	-13.7	1.50 V	165	33.8	6.5

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. Margin value = Emission Level – Limit value
4. 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

For Mode 1~2:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
Fixed attenuator EMEC	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3. Tested Date: Apr. 20 to 24, 2018

For Mode 3:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: Sep. 17, 2018

4.2.3 Test Procedure

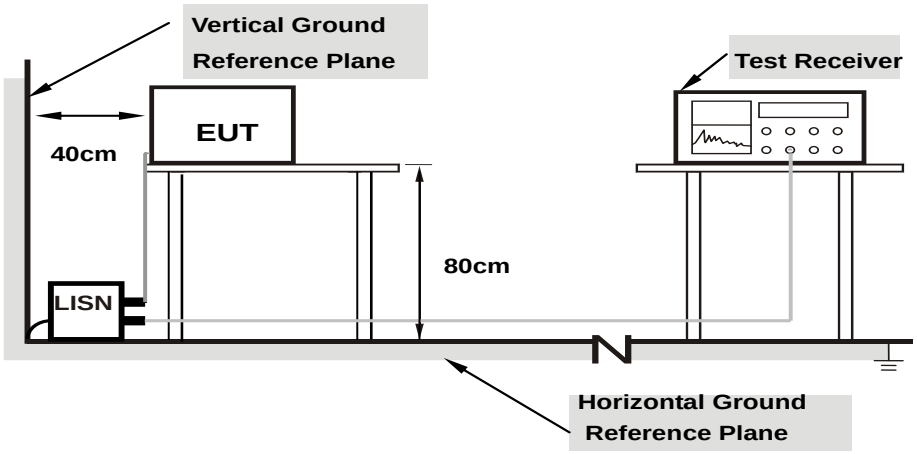
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: 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.

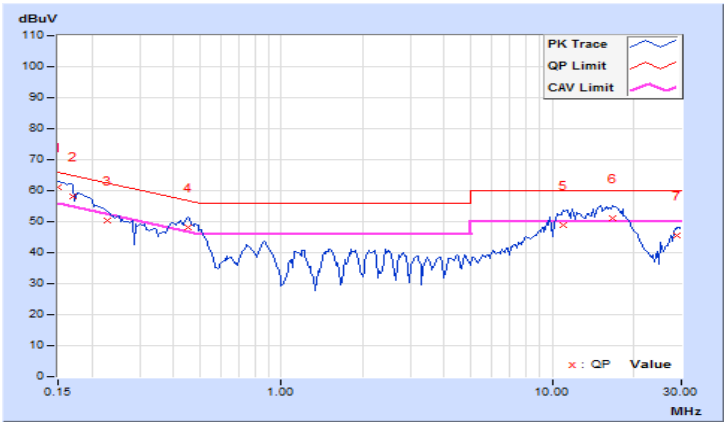
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.03	50.98	34.07	61.01	44.10	66.00	56.00	-4.99	-11.90
2	0.16953	10.04	48.14	32.76	58.18	42.80	64.98	54.98	-6.80	-12.18
3	0.22812	10.07	40.23	26.25	50.30	36.32	62.52	52.52	-12.22	-16.20
4	0.45078	10.11	38.22	32.40	48.33	42.51	56.86	46.86	-8.53	-4.35
5	11.00781	10.60	38.26	29.09	48.86	39.69	60.00	50.00	-11.14	-10.31
6	16.81641	10.93	40.25	34.04	51.18	44.97	60.00	50.00	-8.82	-5.03
7	28.97266	11.22	34.34	31.42	45.56	42.64	60.00	50.00	-14.44	-7.36

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

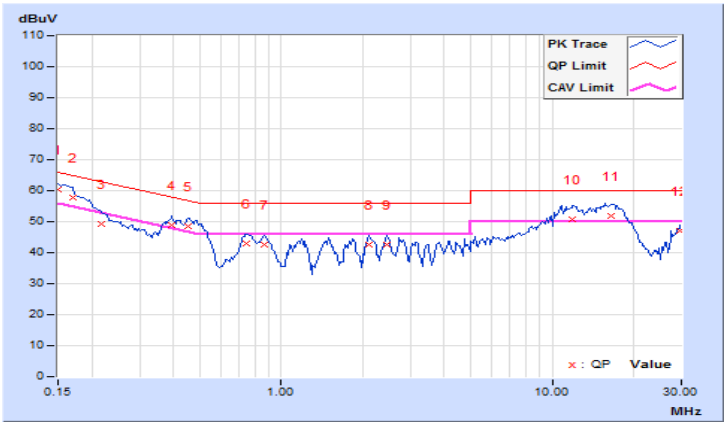


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	50.48	34.26	60.42	44.20	66.00	56.00	-5.58	-11.80
2	0.16953	9.95	47.69	32.92	57.64	42.87	64.98	54.98	-7.34	-12.11
3	0.21641	9.96	39.29	22.50	49.25	32.46	62.96	52.96	-13.71	-20.50
4	**0.39609**	**10.00**	**39.02**	**34.68**	**49.02**	**44.68**	**57.93**	**47.93**	**-8.91**	**-3.25**
5	0.45078	10.00	38.56	32.72	48.56	42.72	56.86	46.86	-8.30	-4.14
6	0.74766	10.02	33.07	28.12	43.09	38.14	56.00	46.00	-12.91	-7.86
7	0.86094	10.02	32.66	25.48	42.68	35.50	56.00	46.00	-13.32	-10.50
8	2.11328	10.07	32.53	26.77	42.60	36.84	56.00	46.00	-13.40	-9.16
9	2.46094	10.09	32.44	25.93	42.53	36.02	56.00	46.00	-13.47	-9.98
10	11.90234	10.49	40.31	31.85	50.80	42.34	60.00	50.00	-9.20	-7.66
11	16.49609	10.73	41.16	34.34	51.89	45.07	60.00	50.00	-8.11	-4.93
12	29.79688	10.99	36.02	33.79	47.01	44.78	60.00	50.00	-12.99	-5.22

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



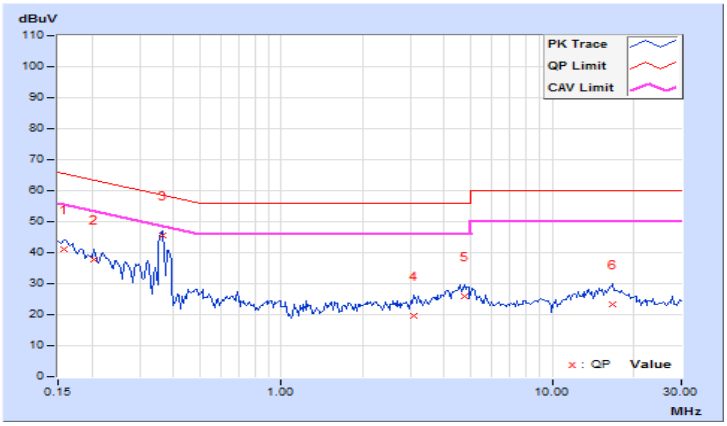
4.2.8 Test Results (Mode 2)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.05	30.99	22.78	41.04	32.83	65.58	55.58	-24.54	-22.75
2	0.20469	10.07	27.88	21.61	37.95	31.68	63.42	53.42	-25.47	-21.74
3	0.36319	10.11	35.58	34.68	45.69	44.79	58.66	48.66	-12.97	-3.87
4	3.08203	10.28	9.49	2.61	19.77	12.89	56.00	46.00	-36.23	-33.11
5	4.73438	10.39	15.59	5.99	25.98	16.38	56.00	46.00	-30.02	-29.62
6	16.76953	11.18	12.05	6.80	23.23	17.98	60.00	50.00	-36.77	-32.02

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

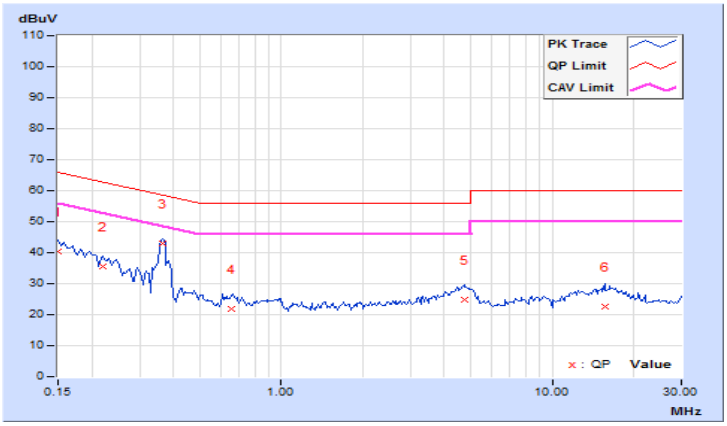


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	30.34	21.75	40.29	31.70	66.00	56.00	-25.71	-24.30
2	0.22031	9.98	25.70	19.98	35.68	29.96	62.81	52.81	-27.13	-22.85
3	0.36484	10.01	33.00	31.51	43.01	41.52	58.62	48.62	-15.61	-7.10
4	0.65781	10.03	11.78	8.82	21.81	18.85	56.00	46.00	-34.19	-27.15
5	4.75000	10.23	14.75	5.17	24.98	15.40	56.00	46.00	-31.02	-30.60
6	15.61719	10.90	11.56	5.78	22.46	16.68	60.00	50.00	-37.54	-33.32

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



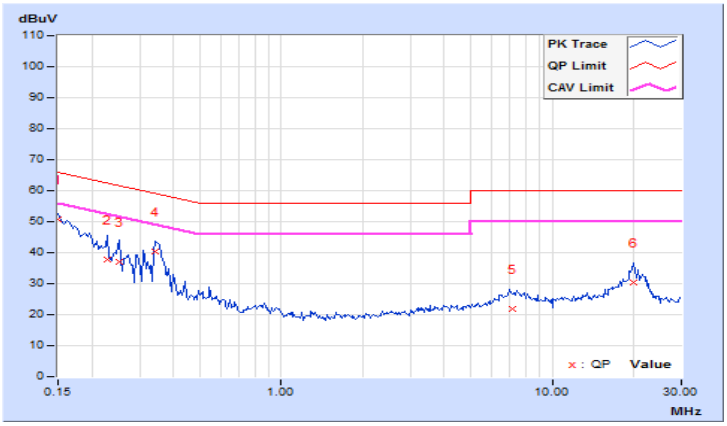
4.2.9 Test Results (Mode 3)

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.05	40.69	24.26	50.74	34.31	66.00	56.00	-15.26	-21.69
2	0.22812	10.08	27.72	15.68	37.80	25.76	62.52	52.52	-24.72	-26.76
3	0.25156	10.08	26.78	16.92	36.86	27.00	61.71	51.71	-24.85	-24.71
4	0.34141	10.11	30.20	24.72	40.31	34.83	59.17	49.17	-18.86	-14.34
5	7.12500	10.53	11.50	3.90	22.03	14.43	60.00	50.00	-37.97	-35.57
6	20.00781	11.39	18.88	12.71	30.27	24.10	60.00	50.00	-29.73	-25.90

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

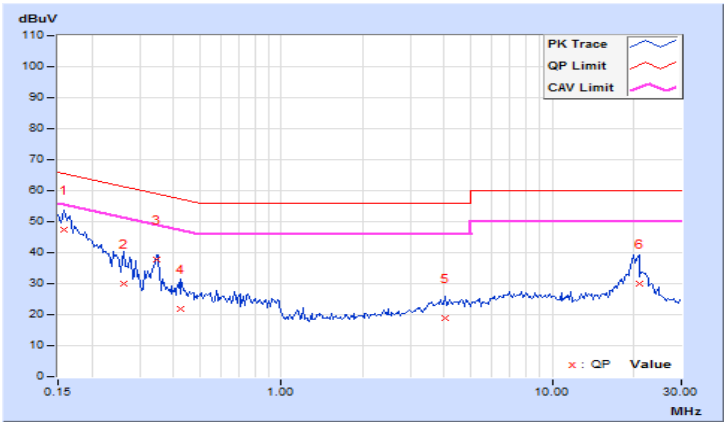


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.96	37.33	21.28	47.29	31.24	65.58	55.58	-18.29	-24.34
2	0.26328	9.99	20.18	3.71	30.17	13.70	61.33	51.33	-31.16	-37.63
3	0.34531	10.01	27.63	24.54	37.64	34.55	59.07	49.07	-21.43	-14.52
4	0.42734	10.02	11.82	1.09	21.84	11.11	57.30	47.30	-35.46	-36.19
5	4.05078	10.19	8.57	1.13	18.76	11.32	56.00	46.00	-37.24	-34.68
6	20.88672	11.18	18.76	13.31	29.94	24.49	60.00	50.00	-30.06	-25.51

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 ≦ 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)
		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)

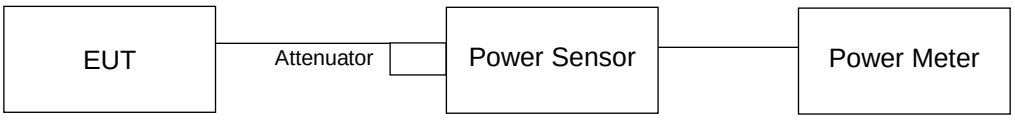
*B is the 26 dB emission bandwidth in megahertz

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

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 Results

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	23.41	23.96	468.166	26.70	30.00	Pass
40	5200	24.70	25.44	645.066	28.10	30.00	Pass
48	5240	24.59	25.18	617.35	27.91	30.00	Pass
149	5745	24.21	24.45	542.245	27.34	30.00	Pass
157	5785	23.95	24.21	511.946	27.09	30.00	Pass
165	5825	23.01	23.26	411.822	26.15	30.00	Pass

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	22.63	23.38	401.002	26.03	30.00	Pass
40	5200	24.98	25.75	690.612	28.39	30.00	Pass
48	5240	24.60	25.40	635.14	28.03	30.00	Pass
149	5745	23.84	24.25	508.176	27.06	30.00	Pass
157	5785	23.79	24.05	493.429	26.93	30.00	Pass
165	5825	22.75	23.01	388.351	25.89	30.00	Pass

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	17.66	18.13	123.358	20.91	30.00	Pass
46	5230	24.64	25.36	634.63	28.03	30.00	Pass
151	5755	24.96	25.07	634.695	28.03	30.00	Pass
159	5795	25.14	25.23	660.014	28.20	30.00	Pass

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	16.53	17.14	96.739	19.86	30.00	Pass
155	5775	20.43	20.76	229.532	23.61	30.00	Pass

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	22.63	23.38	401.002	26.03	29.14	Pass
40	5200	24.98	25.75	690.612	28.39	29.14	Pass
48	5240	24.60	25.40	635.14	28.03	29.14	Pass
149	5745	23.84	24.25	508.176	27.06	29.14	Pass
157	5785	23.79	24.05	493.429	26.93	29.14	Pass
165	5825	22.75	23.01	388.351	25.89	29.14	Pass

NOTE: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 3] = 6.86dBi > 6dBi, so the power limit shall be reduced to 30-(6.86-6) = 29.14dBm.

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	17.66	18.13	123.358	20.91	29.14	Pass
46	5230	24.64	25.36	634.63	28.03	29.14	Pass
151	5755	24.96	25.07	634.695	28.03	29.14	Pass
159	5795	25.14	25.23	660.014	28.20	29.14	Pass

NOTE: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 3] = 6.86dBi > 6dBi, so the power limit shall be reduced to 30-(6.86-6) = 29.14dBm.

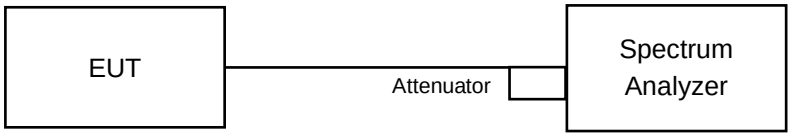
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.53	17.14	96.739	19.86	29.14	Pass
155	5775	20.43	20.76	229.532	23.61	29.14	Pass

NOTE: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 3] = 6.86dBi > 6dBi, so the power limit shall be reduced to 30-(6.86-6) = 29.14dBm.

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 SAMPLE. 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 Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.44	16.68
40	5200	16.68	16.80
48	5240	16.56	16.68
149	5745	16.44	16.44
157	5785	16.56	16.56
165	5825	16.56	16.44

802.11ac (VHT20)

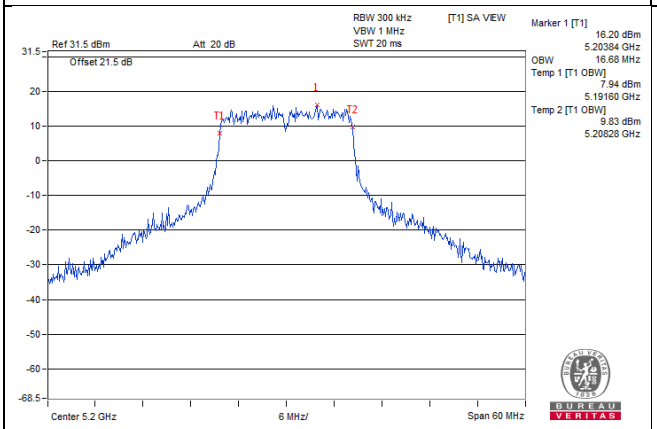
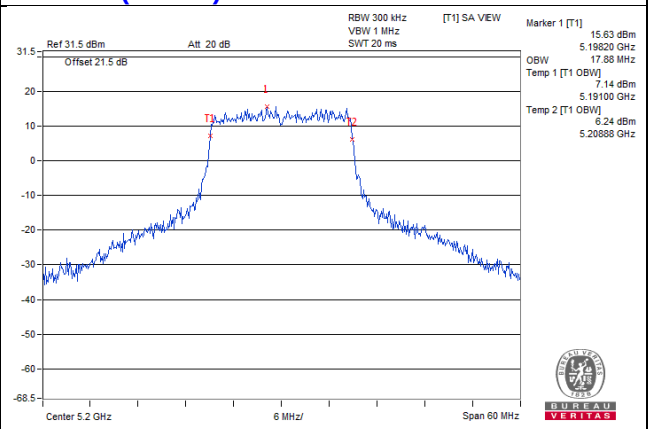
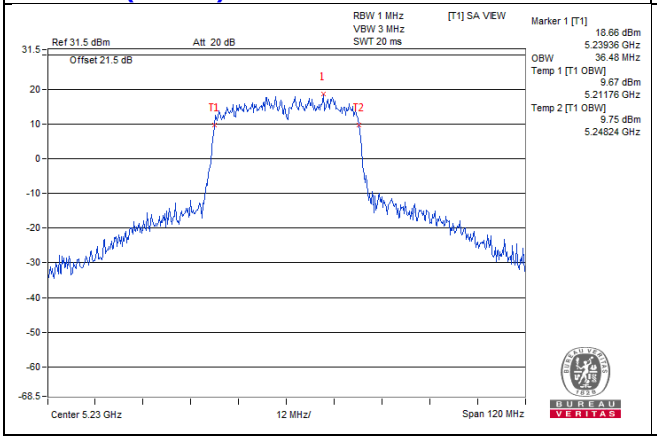
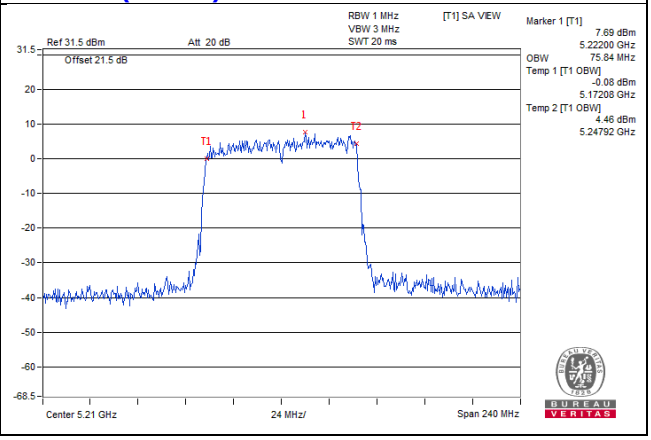
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.76	17.76
40	5200	17.88	17.88
48	5240	17.64	17.88
149	5745	17.76	17.76
157	5785	17.76	17.76
165	5825	17.64	17.76

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.24	36.48
46	5230	36.48	36.48
151	5755	36.24	36.00
159	5795	36.48	36.48

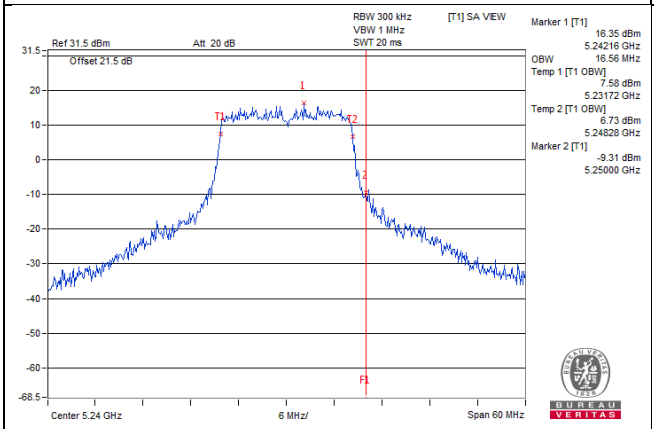
802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	75.84
155	5775	75.84	75.84

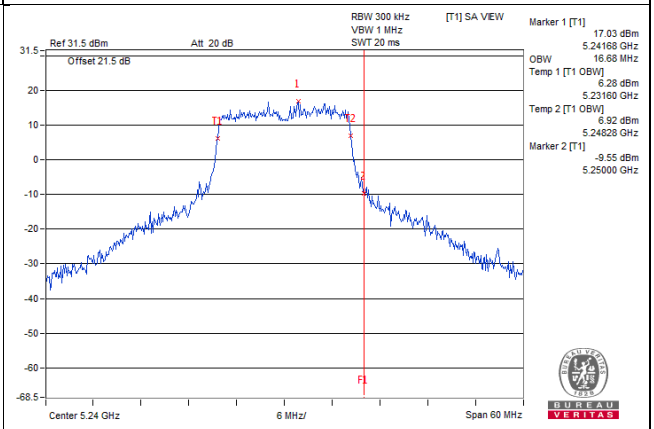
Spectrum Plot of Worst Value	
802.11a / Chain 1 : CH40	**802.11ac (VHT20) / Chain 0 : CH40**
	
802.11ac (VHT40) / Chain 0: CH46	**802.11ac (VHT80) / Chain 0 : CH42**
	

Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

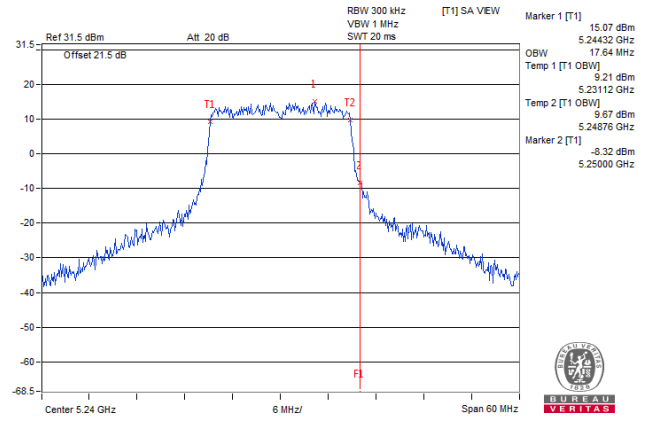
802.11a / Chain 0 : CH48



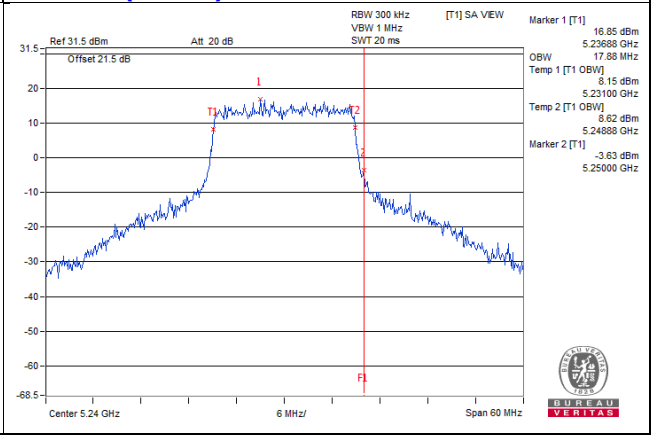
802.11a / Chain 1 : CH48



802.11ac (VHT20) / Chain 0 : CH48

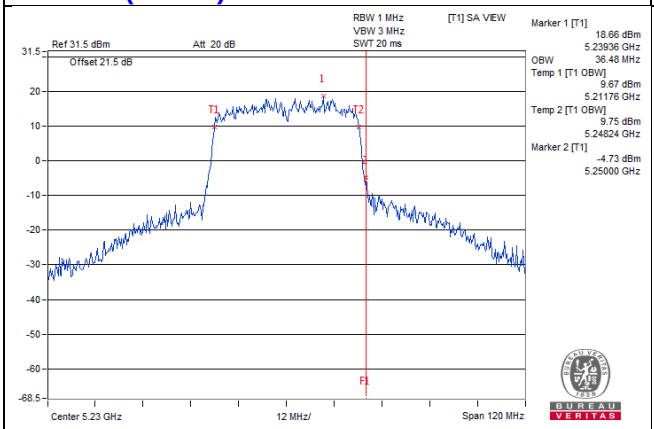


802.11ac (VHT20) / Chain 1 : CH48

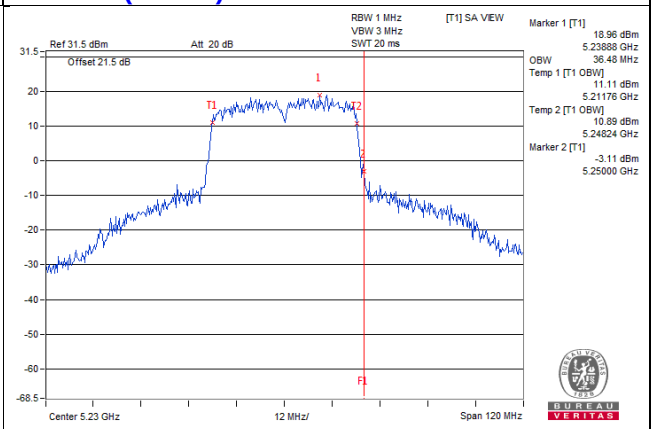


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

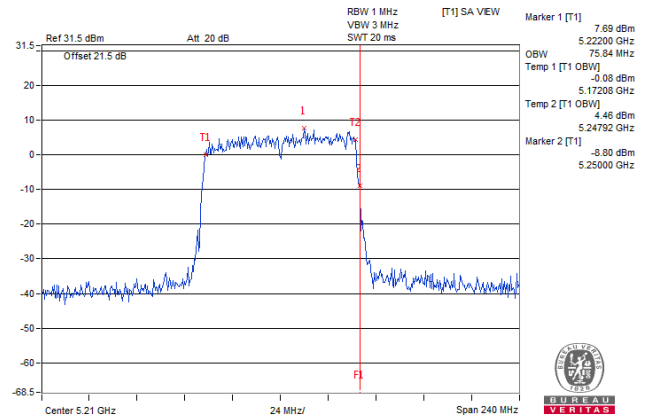
802.11ac (VHT40) / Chain 0 : CH46



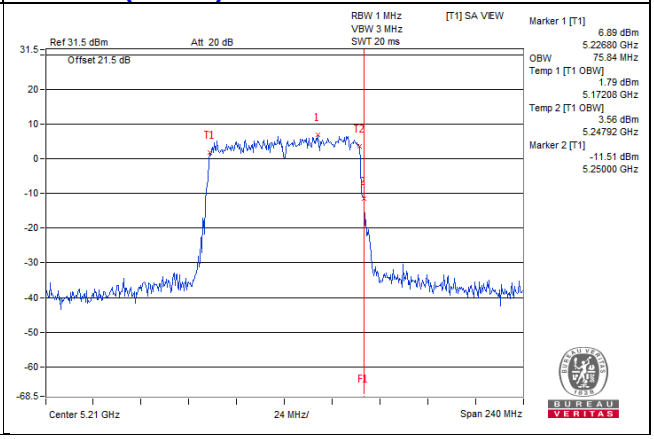
802.11ac (VHT40) / Chain 1 : CH46



802.11ac (VHT80) / Chain 0 : CH42

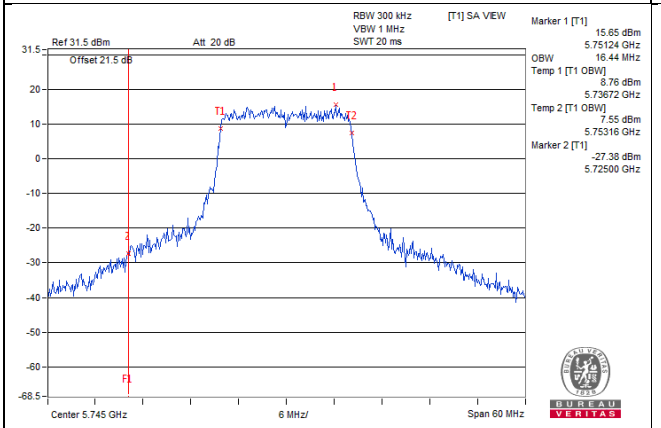


802.11ac (VHT80) / Chain 1 : CH42

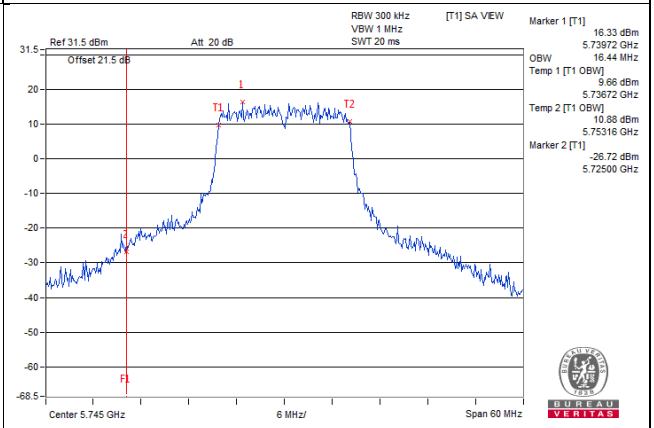


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

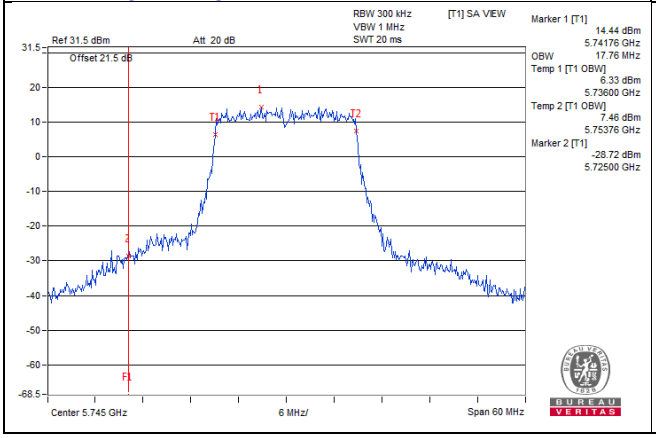
802.11a / Chain 0 : CH149



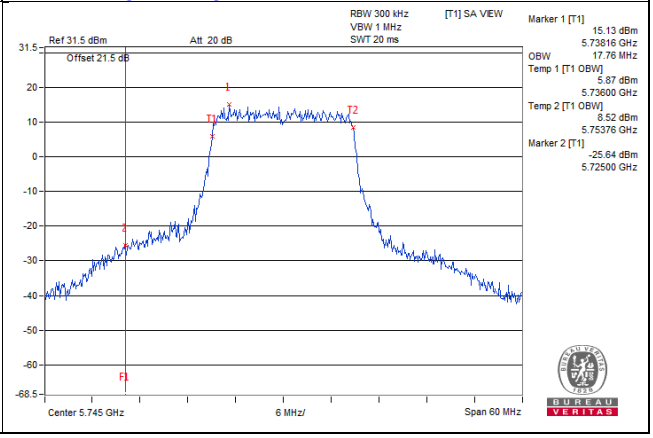
802.11a / Chain 1 : CH149



802.11ac (VHT20) / Chain 0 : CH149

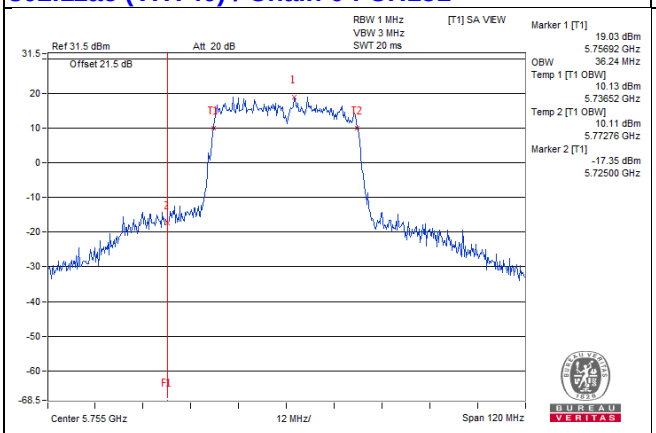


802.11ac (VHT20) / Chain 1 : CH149

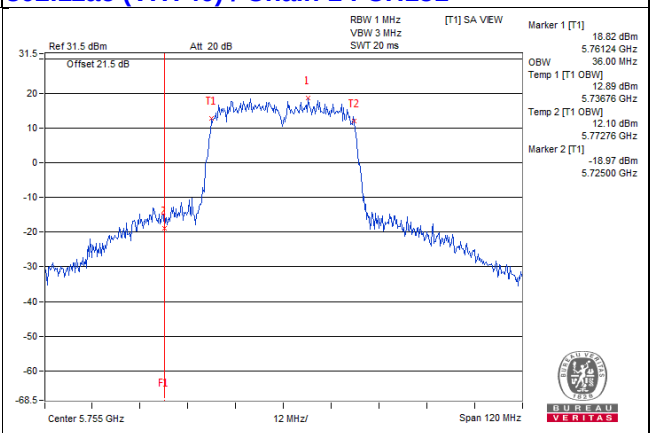


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

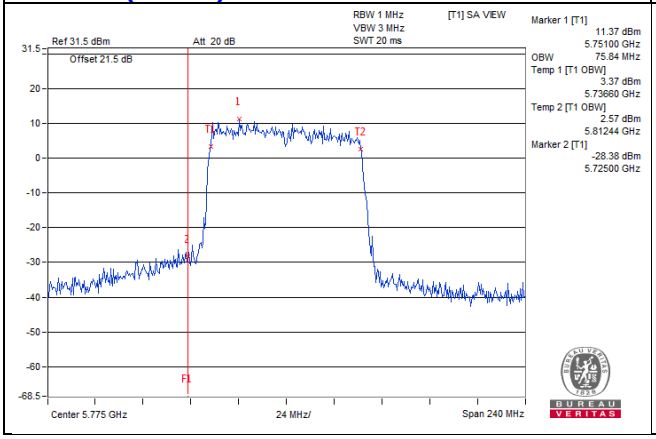
802.11ac (VHT40) / Chain 0 : CH151



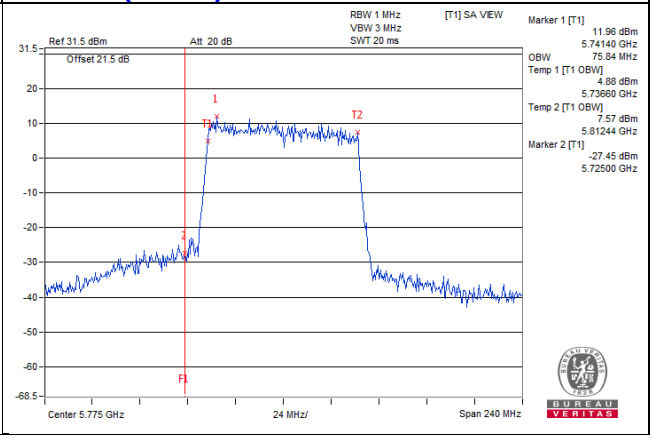
802.11ac (VHT40) / Chain 1 : CH151



802.11ac (VHT80) / Chain 0 : CH155



802.11ac (VHT80) / Chain 1 : CH155

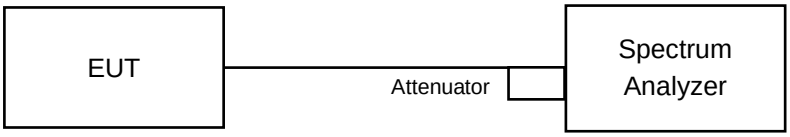


4.5 Peak Power Spectral Density Measurement

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	
		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 Procedure

For U-NII-1

802.11ac (VHT20)

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 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

802.11a, 802.11ac (VHT40) & 802.11ac (VHT80)

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 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/duty cycle)

For U-NII-3:

802.11ac (VHT20)

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 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 BWCF = 10log(500kHz/300kHz)
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

802.11a, 802.11ac (VHT40) & 802.11ac (VHT80)

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 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 BWCF = 10log(500kHz/300kHz)
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/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

CDD Mode

For U-NII-1:

802.11a

Chan.	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	9.57	10.34	0.14	13.13	16.14	Pass
40	5200	10.92	11.98	0.14	14.64	16.14	Pass
48	5240	10.55	11.47	0.14	14.19	16.14	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[($10^{G0/20}$ + $10^{G1/20}$ / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 17-(6.86-6) = 16.14dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	9.00	9.37	12.20	16.14	Pass
40	5200	10.82	11.48	14.17	16.14	Pass
48	5240	10.62	11.78	14.25	16.14	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[($10^{G0/20}$ + $10^{G1/20}$ / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 17-(6.86-6) = 16.14dBm.

802.11ac (VHT40)

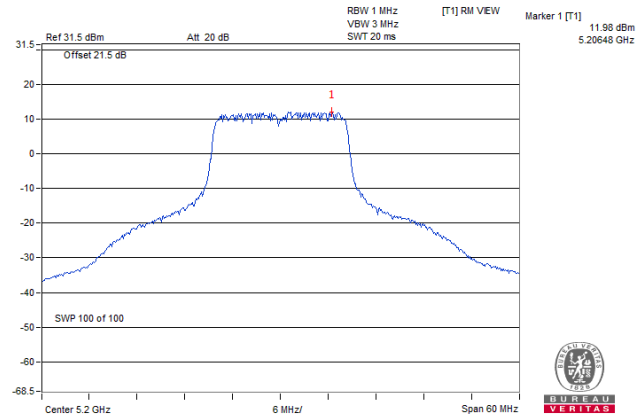
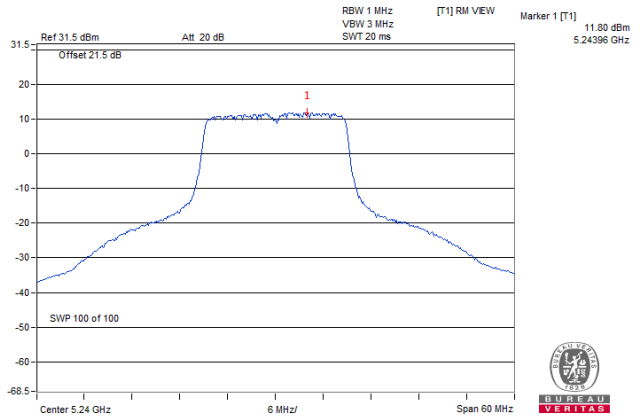
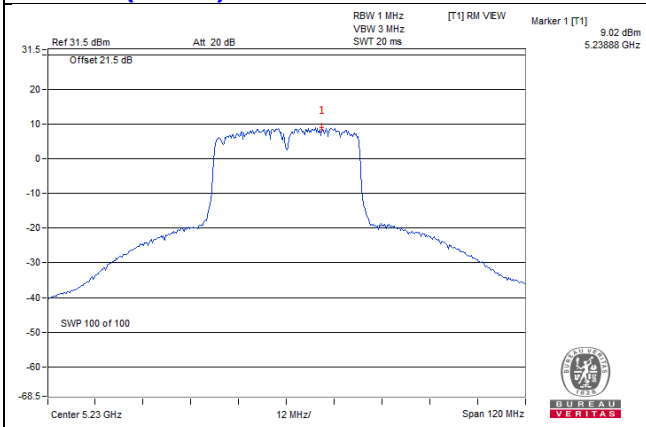
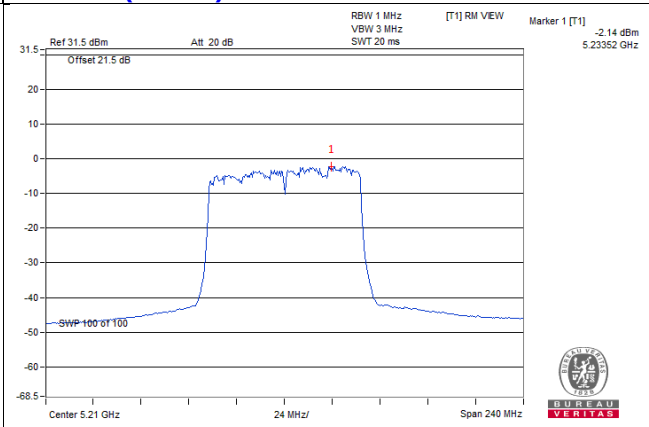
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	1.14	1.84	0.15	4.67	16.14	Pass
46	5230	7.98	8.87	0.15	11.61	16.14	Pass

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[($10^{G0/20}$ + $10^{G1/20}$ / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 17-(6.86-6) = 16.14dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	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	-2.61	-2.14	0.25	0.89	16.14	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[($10^{G0/20}$ + $10^{G1/20}$ / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 17-(6.86-6) = 16.14dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 1 : CH40	**802.11ac (VHT20) / Chain 1 : CH48**
	
802.11ac (VHT40) / Chain 1 : CH46	**802.11ac (VHT80) / Chain 1 : CH42**
	

For U-NII-3:

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	2.59	4.81	3.01	0.14	7.96	29.14	Pass
	157	5785	2.39	4.61	3.01	0.14	7.76	29.14	Pass
	165	5825	1.70	3.92	3.01	0.14	7.07	29.14	Pass
1	149	5745	2.57	4.79	3.01	0.14	7.94	29.14	Pass
	157	5785	2.34	4.56	3.01	0.14	7.71	29.14	Pass
	165	5825	1.17	3.39	3.01	0.14	6.54	29.14	Pass

Note: 1. Directional gain = 10 log[(10$^{G0/20}$ + 10$^{G1/20}$ / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 30-(6.86-6) = 29.14dBm.

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

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	1.59	3.81	3.01	6.82	29.14	Pass
	157	5785	1.45	3.67	3.01	6.68	29.14	Pass
	165	5825	0.72	2.94	3.01	5.95	29.14	Pass
1	149	5745	2.14	4.36	3.01	7.37	29.14	Pass
	157	5785	1.77	3.99	3.01	7.00	29.14	Pass
	165	5825	0.36	2.58	3.01	5.59	29.14	Pass

Note: 1. Directional gain = 10 log[(10$^{G0/20}$ + 10$^{G1/20}$)^2 / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 30-(6.86-6) = 29.14dBm.

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	-0.60	1.62	3.01	0.15	4.78	29.14	Pass
	159	5795	-0.88	1.34	3.01	0.15	4.50	29.14	Pass
1	151	5755	-0.51	1.71	3.01	0.15	4.87	29.14	Pass
	159	5795	-0.23	1.99	3.01	0.15	5.15	29.14	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 30-(6.86-6) = 29.14dBm.

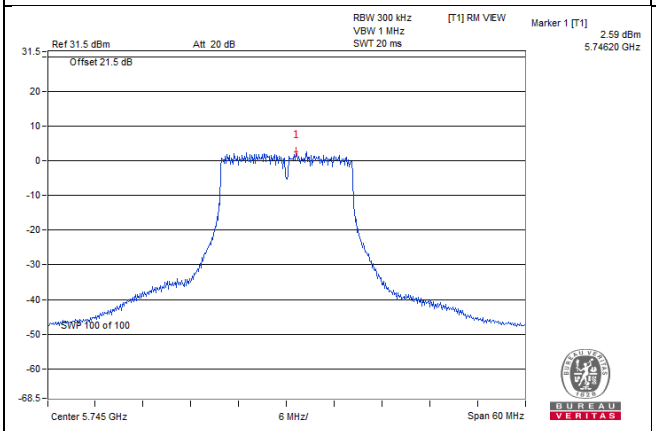
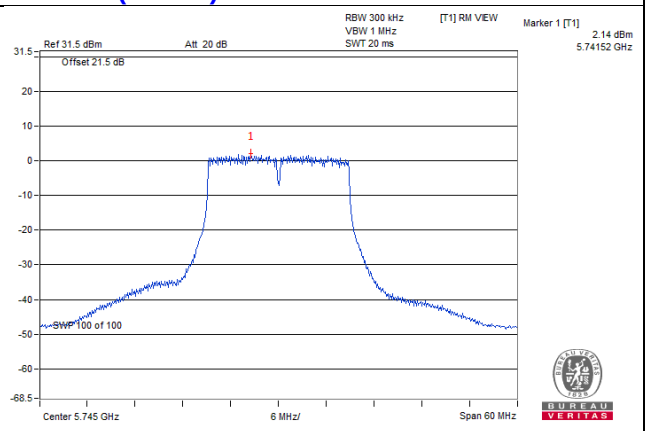
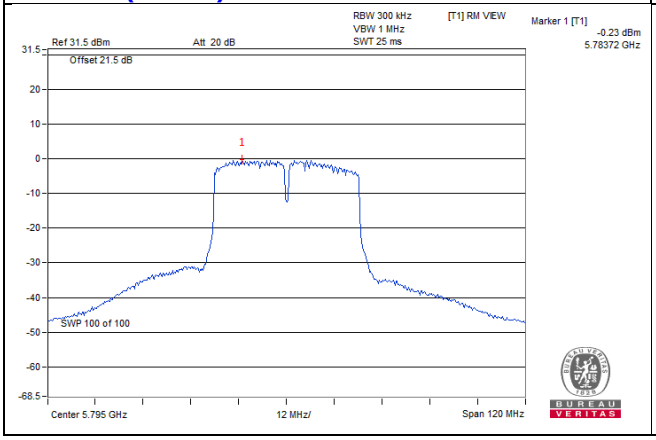
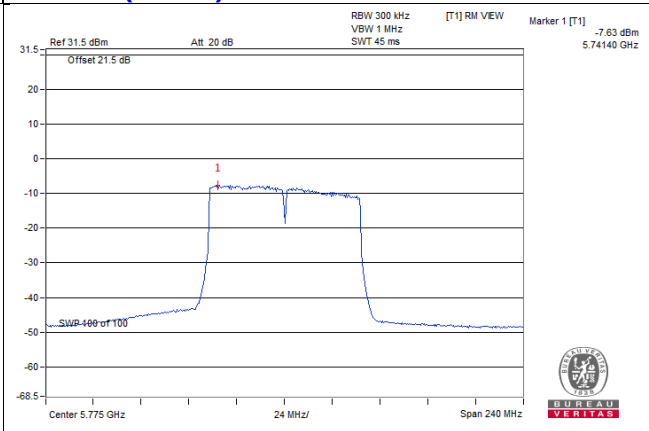
2. Refer to section 3.3 for duty cycle spectrum plot.

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	-8.09	-5.87	3.01	0.25	-2.61	29.14	Pass
1	155	5775	-7.63	-5.41	3.01	0.25	-2.15	29.14	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$ / 2] = 6.86dBi > 6dBi, so the power density limit shall be reduced to 30-(6.86-6) = 29.14dBm.

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

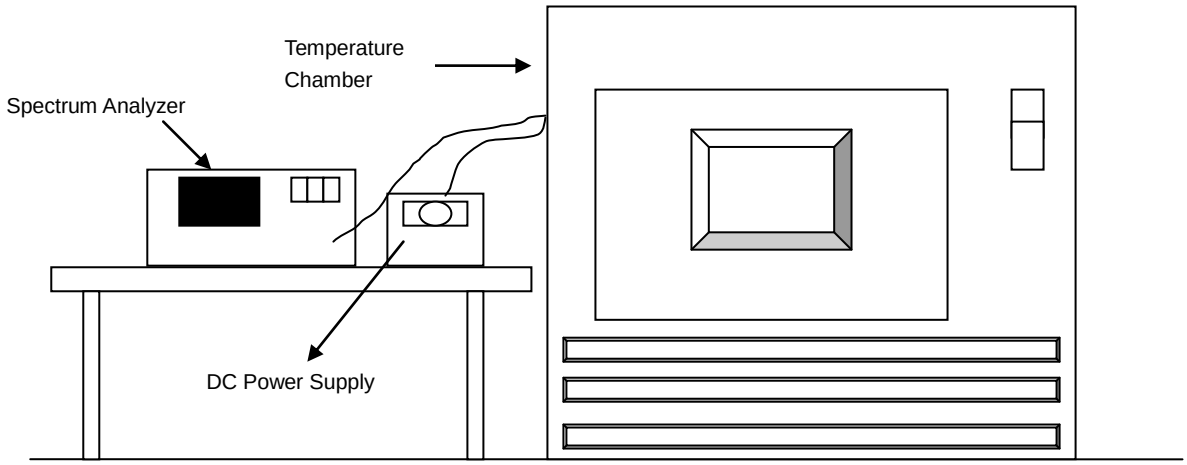
Spectrum Plot of Worst Value	
802.11a / Chain 0 : CH149	**802.11ac (VHT20) / Chain 1 : CH149**
	
802.11ac (VHT40) / Chain 1 : CH159	**802.11ac (VHT80) / Chain 1 : CH155**
	

4.6 Frequency Stability Measurement

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

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. 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.

e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.

f. 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: 5180 MHz									
TEMP. (℃)	Power Supply (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	48	5179.9956	Pass	5179.9947	Pass	5179.9946	Pass	5179.9963	Pass
40	48	5180.0224	Pass	5180.0221	Pass	5180.0253	Pass	5180.0243	Pass
30	48	5179.9954	Pass	5179.9976	Pass	5179.9956	Pass	5179.9991	Pass
20	48	5180.0197	Pass	5180.018	Pass	5180.0157	Pass	5180.0159	Pass
10	48	5180.0002	Pass	5179.9999	Pass	5180.001	Pass	5180.0011	Pass
0	48	5180.0134	Pass	5180.0135	Pass	5180.0124	Pass	5180.0129	Pass
-10	48	5180.0194	Pass	5180.0227	Pass	5180.0197	Pass	5180.0196	Pass
-20	48	5180.0141	Pass	5180.0181	Pass	5180.0177	Pass	5180.0174	Pass
-30	48	5179.9945	Pass	5179.9938	Pass	5179.996	Pass	5179.993	Pass

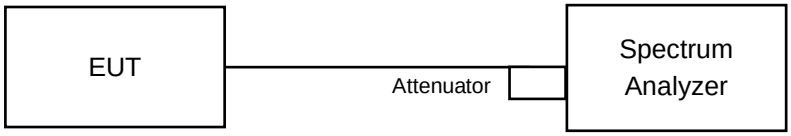
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vdc)	0 Minutes		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	55.2	5180.0198	Pass	5180.0183	Pass	5180.015	Pass	5180.0154	Pass
	48	5180.0197	Pass	5180.018	Pass	5180.0157	Pass	5180.0159	Pass
	40.8	5180.02	Pass	5180.0176	Pass	5180.0154	Pass	5180.0166	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

MEASUREMENT PROCEDURE REF

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 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	16.37	16.39	0.5	Pass
157	5785	16.38	16.38	0.5	Pass
165	5825	16.38	16.38	0.5	Pass

802.11ac (VHT20)

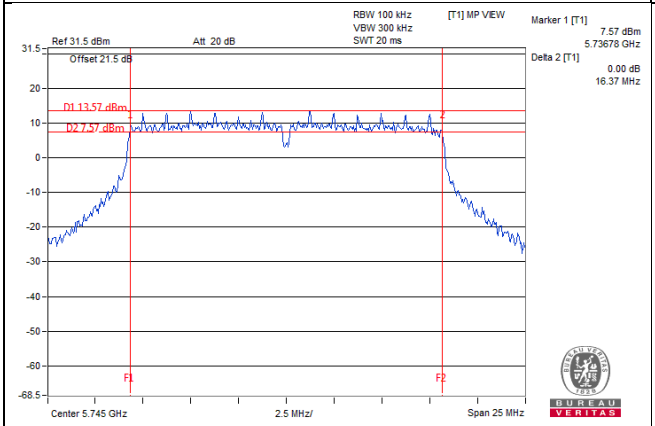
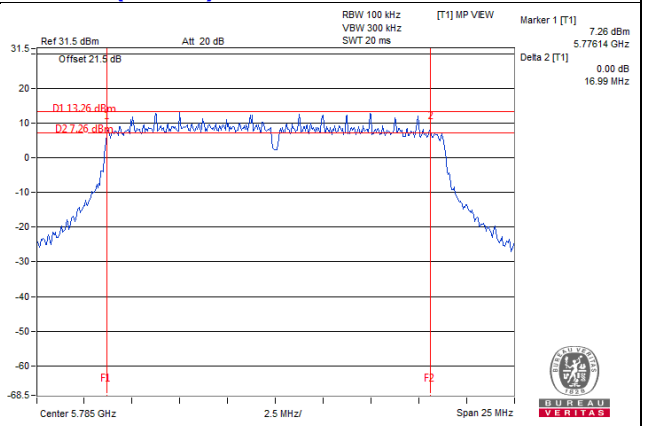
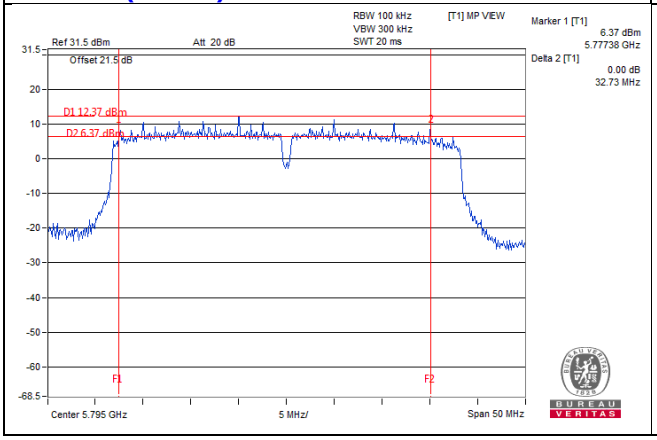
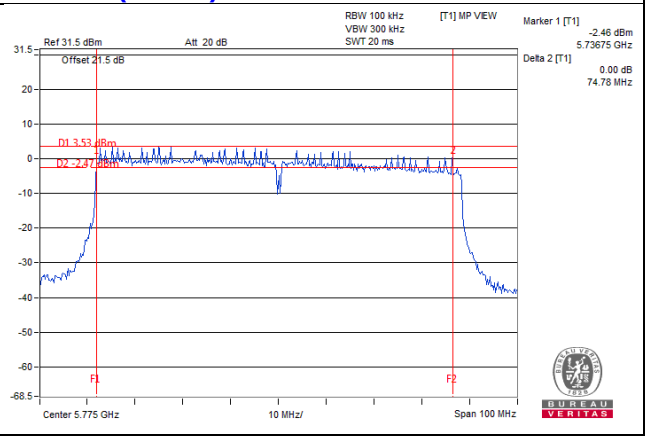
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.60	17.59	0.5	Pass
157	5785	17.02	16.99	0.5	Pass
165	5825	17.22	17.56	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.14	35.15	0.5	Pass
159	5795	35.44	32.73	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	74.78	75.94	0.5	Pass

Spectrum Plot of Worst Value	
802.11a / Chain 0 : CH149	**802.11ac (VHT20) / Chain 1 : CH157**
	
802.11ac (VHT40) / Chain 1 : CH159	**802.11ac (VHT80) / Chain 0 : CH155**
	

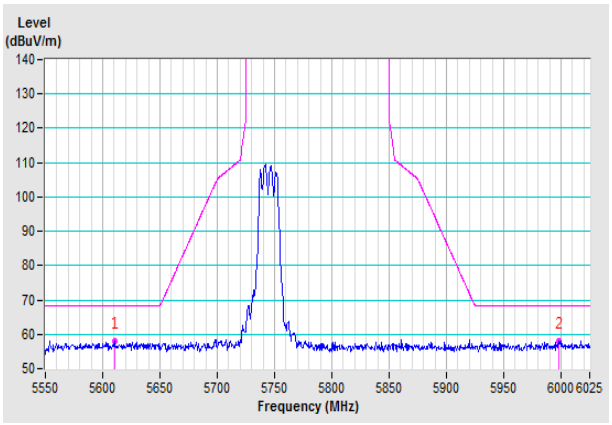
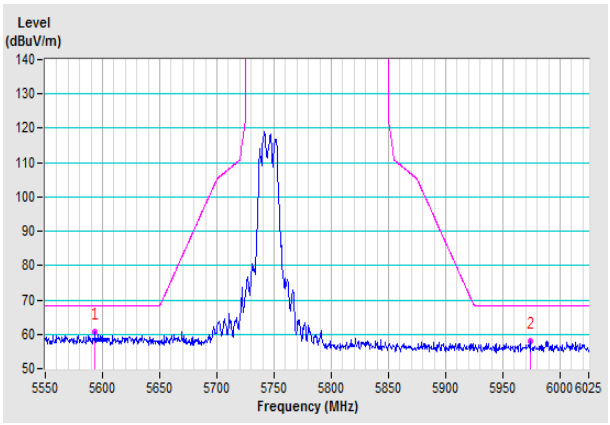
5 Pictures of Test Arrangements

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

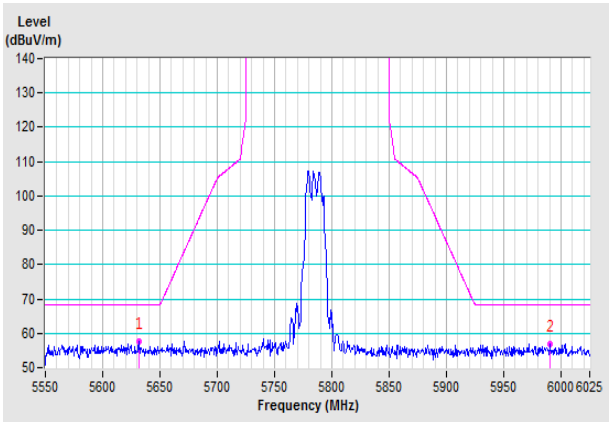
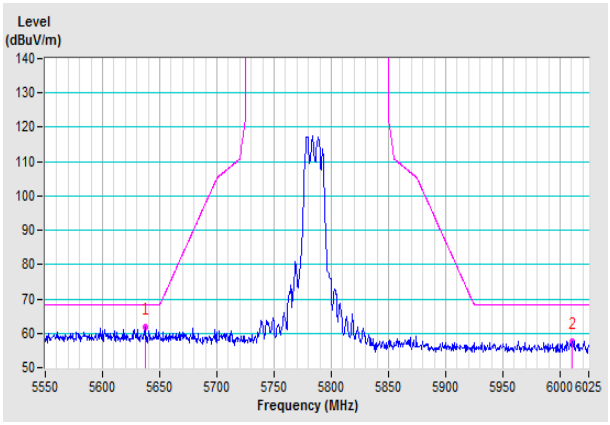
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

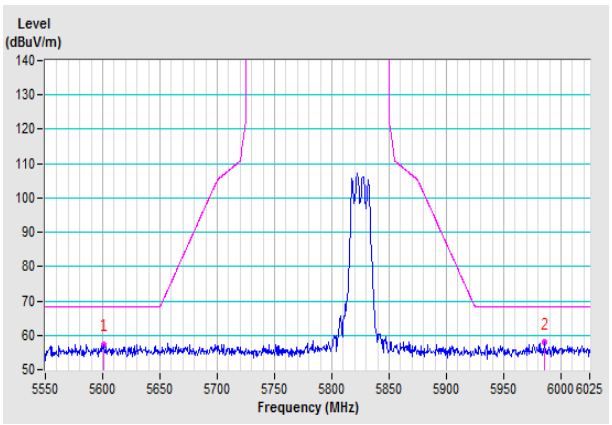
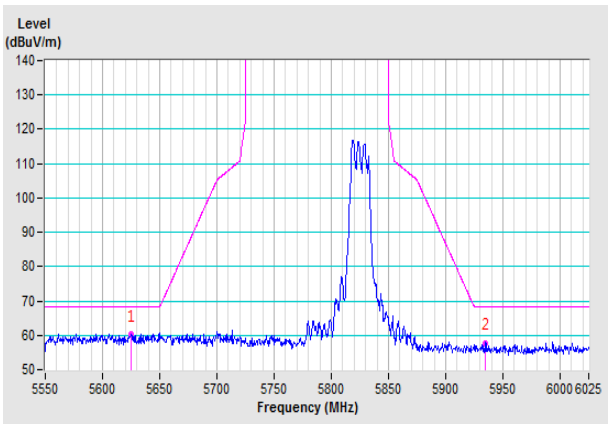
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

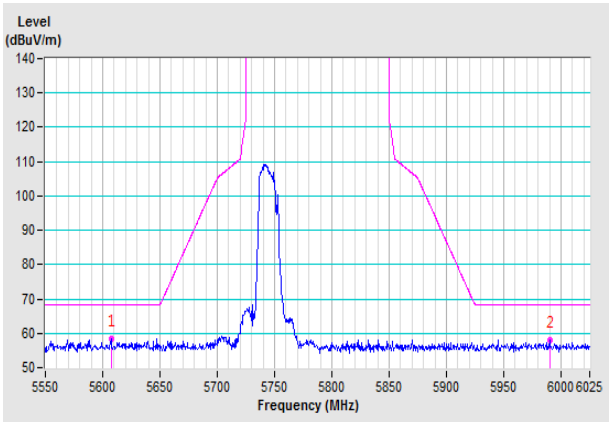
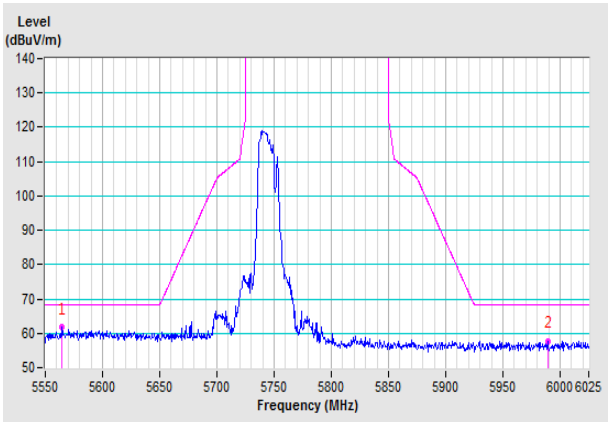
Horizontal	Vertical
	

CH 165 5825 MHz

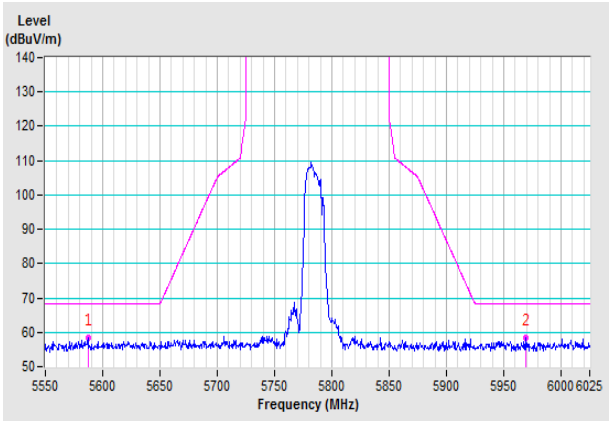
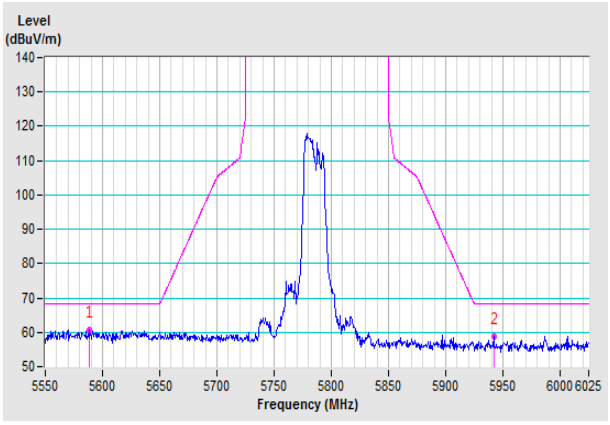
Horizontal	Vertical
	

802.11ac (VHT20)

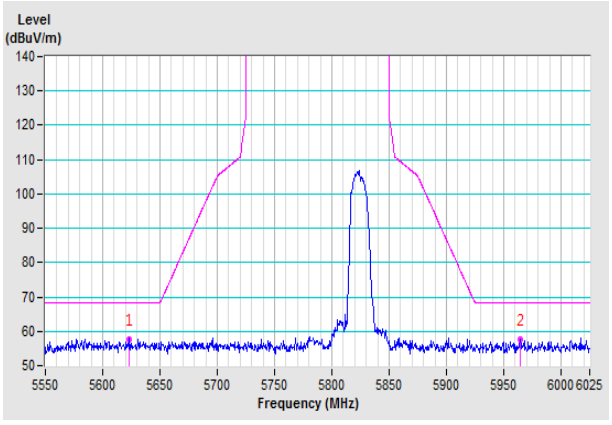
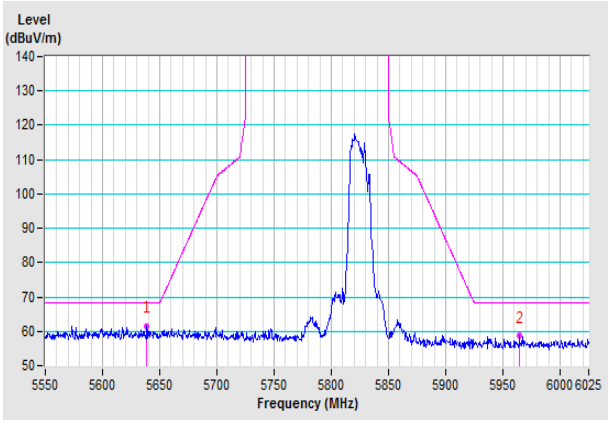
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

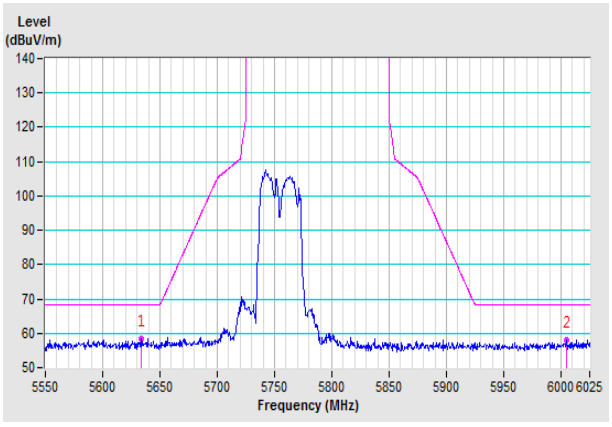
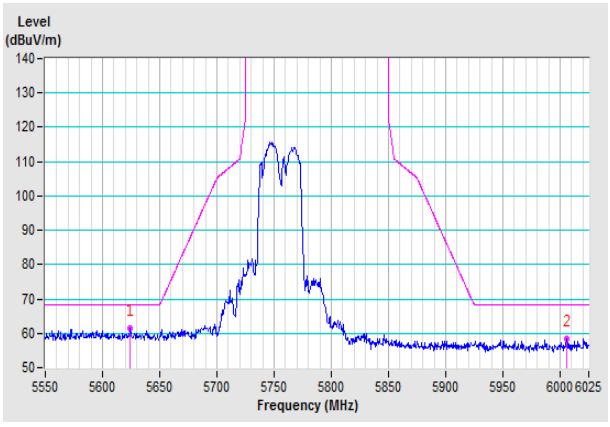
Horizontal	Vertical
	

CH 165 5825 MHz

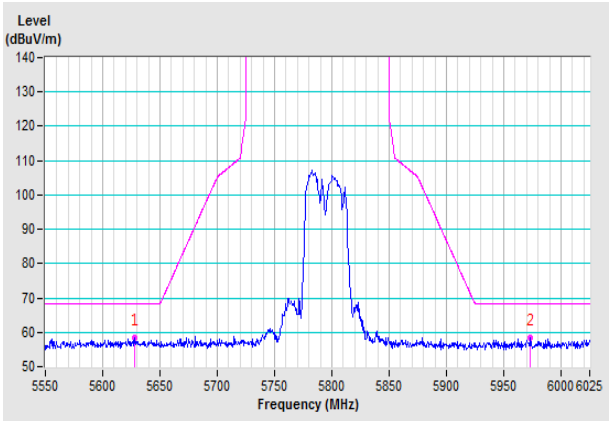
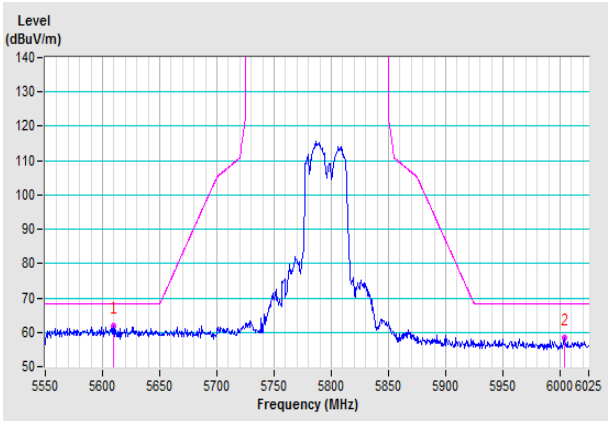
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

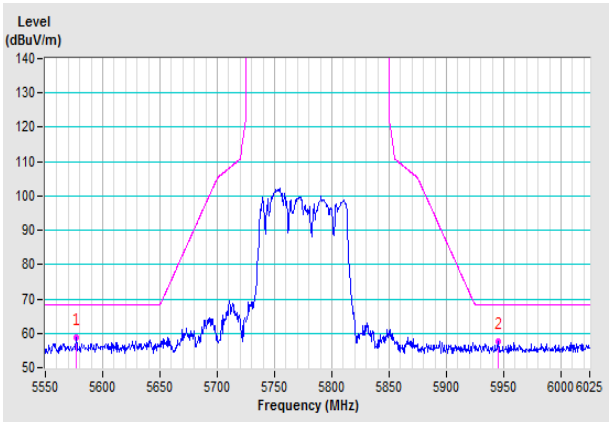
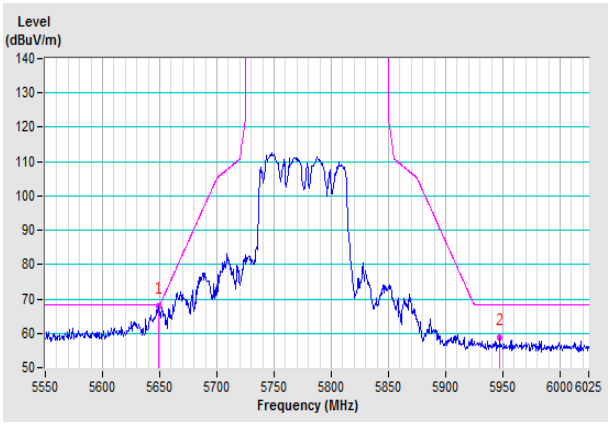
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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

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

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