FCC Test Report

Report No.:	RF180627E05A-1
FCC ID:	Q87-03367
Test Model:	WHW01P
Series Model:	VLP01P, A01P
Received Date:	June 27, 2018
Test Date:	July 04 to 19, 2018
Issued Date:	Sep. 06, 2018
Applicant:	Linksys LLC
Address:	121 Theory Drive, Irvine, CA 92617, 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 (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022 for Test Location (1) 736135 / TW0004 for Test Location (2)

Testing Laboratory
2022

Table of Contents

Report Issue History Record

Issue No.	Reason for Change	Date Issued
RF180627E05-1	Original.	Aug. 23, 2018
RF180627E05A-1	Add DFS band <5.26 ~ 5.32GHz, 5.5 ~ 5.72GHz>	Sep. 06, 2018

Release Control Record

Issue No.	Description	Date Issued
RF180627E05A-1	Original release.	Sep. 06, 2018

1 Certificate of Conformity

Product:	Velop Plug-In
Brand:	Linksys
Test Model:	WHW01P
Series Model:	VLP01P, A01P
Sample Status:	ENGINEERING SAMPLE
Applicant:	Linksys LLC
Test Date:	July 04 to 19, 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 : _____ , **Date:** Sep. 06, 2018

Wendy Wu / Specialist

Approved by : _____ , **Date:** Sep. 06, 2018

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 -3.04dB at 0.61875MHz.
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 5350.00MHz, 5470.00MHz, 5725.00MHz.
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 U.FL 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 (DFS Band)

Product	Velop Plug-In
Brand	Linksys
Test Model	WHW01P
Series Model	VLP01P, A01P
Driver version	1.1.6.189985
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	AC100~240V
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5.26GHz ~ 5.32GHz, 5.50GHz ~ 5.72GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 16 802.11n (HT40), 802.11ac (VHT40): 8 802.11ac (VHT80): 4
Output Power	**CDD Mode:** **5.26 ~ 5.32GHz:** 230.481mW **5.50 ~ 5.72GHz:** 219.085mW **Beamforming Mode:** **5.26 ~ 5.32GHz:** 218.591mW **5.50 ~ 5.72GHz:** 219.045mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF180627E05-1 as the following:
   - ◆ Add DFS band <5.26 ~ 5.32GHz, 5.5 ~ 5.72GHz>.
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. The EUT has below model names, which are identical to each other in all aspects except for the following information:

Brand Name	Model Name	Difference
Linksys	WHW01P	for marketing requirement
	VLP01P	
	A01P	
From the above models, model: **WHW01P** was selected as representative model for the test and its data was recorded in this report.		

4. There are WLAN, Bluetooth technology used for the EUT. The EUT has below radios as following table:

Radio 1	**Radio 2**
WLAN (2.4GHz+5GHz)	Bluetooth

5. Simultaneously transmission condition.

Condition	Technology		
1	WLAN 2.4GHz	WLAN 5GHz	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.			

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

WLAN						
Ant. No.	Chain No.	Ant. Net Gain (dBi)	Freq. range (GHz)	Ant. Type	Connecter Type	Cable Length (mm)
1 (Left)	Chain 0	2.41	2.4~2.4835	Dipole	U.FL	53
		3.15	5.15~5.85			
2 (Right)	Chain 1	3.2	2.4~2.4835	Dipole	U.FL	77
		3.9	5.15~5.85			

Bluetooth					
Ant. No.	Ant. Net Gain (dBi)	Freq. range (GHz)	Ant. Type	Connecter Type	Cable Length (mm)
3	2.13	2.402~2.480	IFA	U.FL	53

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

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

8. This device can support different category application which switched by access point mode and extender mode by software. For "Extender mode" is the device can operate as both a master and client at the applicable.
9. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5700MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 MHz
122	5610 MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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 **Z-plane**.

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5720	54 to 62 102 to 142	54	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5260-5320 5500-5720	54 to 62 102 to 142	54	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	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)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3

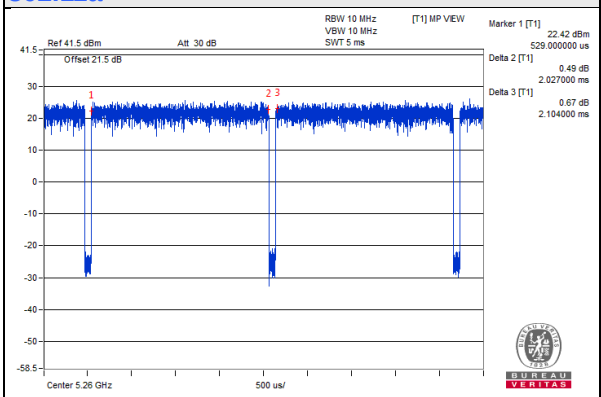
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	20deg. C, 64%RH	120Vac, 60Hz	Eason Tseng
RE<1G	22deg. C, 68%RH	120Vac, 60Hz	Frank chuang
PLC	25deg. C, 69%RH	120Vac, 60Hz	Cody Lee
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

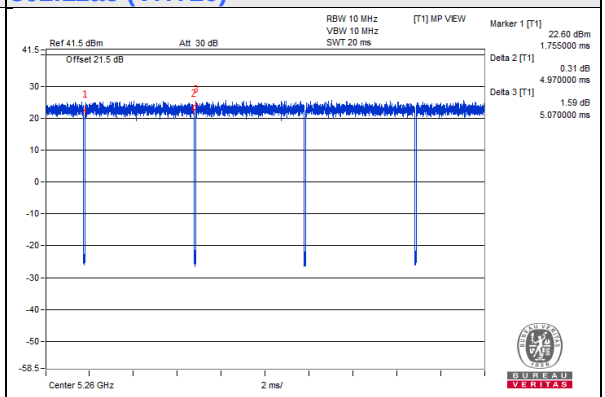
3.3 Duty Cycle of Test Signal

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 = 2.027/2.104 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16
802.11ac (VHT20): Duty cycle = 4.97/5.07 = 0.98
802.11ac (VHT40): Duty cycle = 2.414/2.5 = 0.966, Duty factor = 10 * log(1/0.966) = 0.15
802.11ac (VHT80): Duty cycle = 1.135/1.217 = 0.933, Duty factor = 10 * log(1/0.933) = 0.30

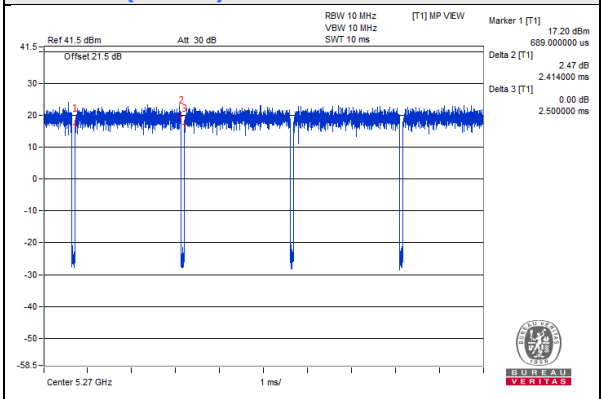
802.11a



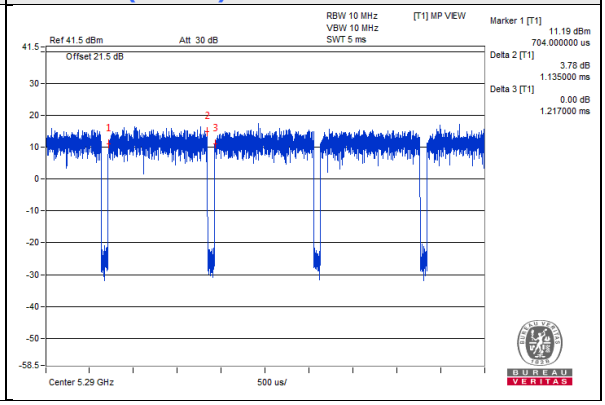
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)

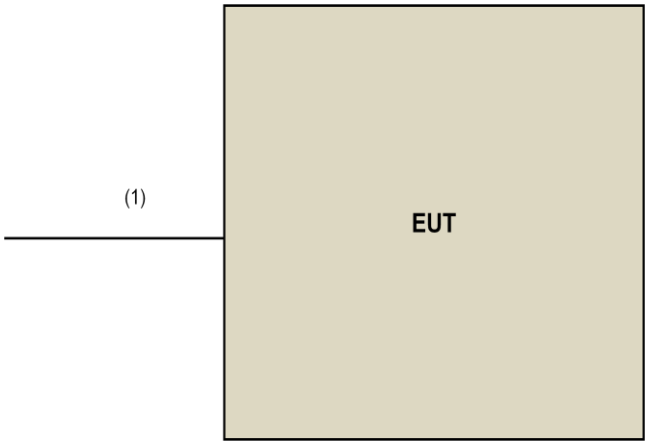


3.4 Description of Support Units

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	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Console Cable	1	0.05	No	0	Supplied by client (for RF Setup)

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules 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="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" 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="4">*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

For Below 1GHz test:

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	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	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	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	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
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: July 04, 2018

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier Mini-Circuits	ZVA-183-S+	AMP-ZVA-03	May 10, 2018	May 09, 2019
RF Cable	EMC104-SM-SM-1200	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	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
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 22, 2018	May 21, 2019

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. The CANADA Site Registration No. is 20331-2
4. Tested Date: July 18 to 19, 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:

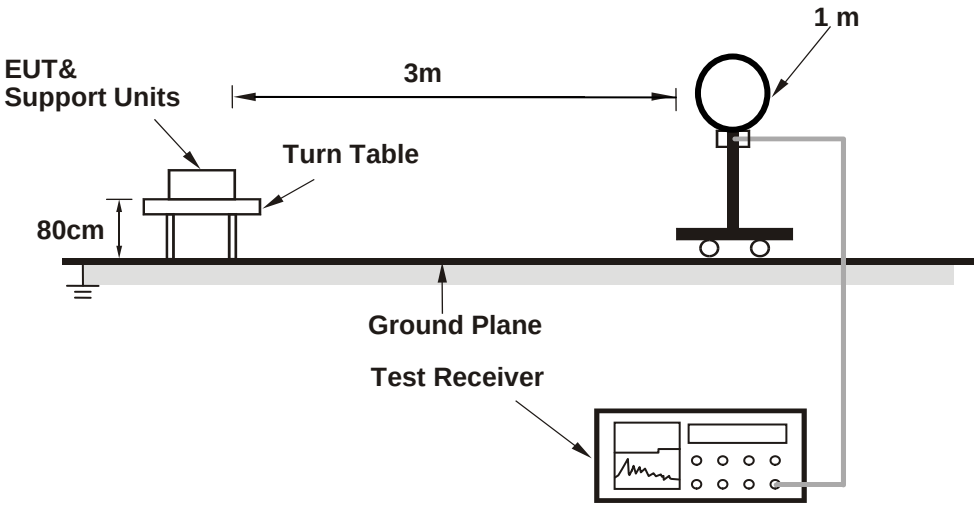
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

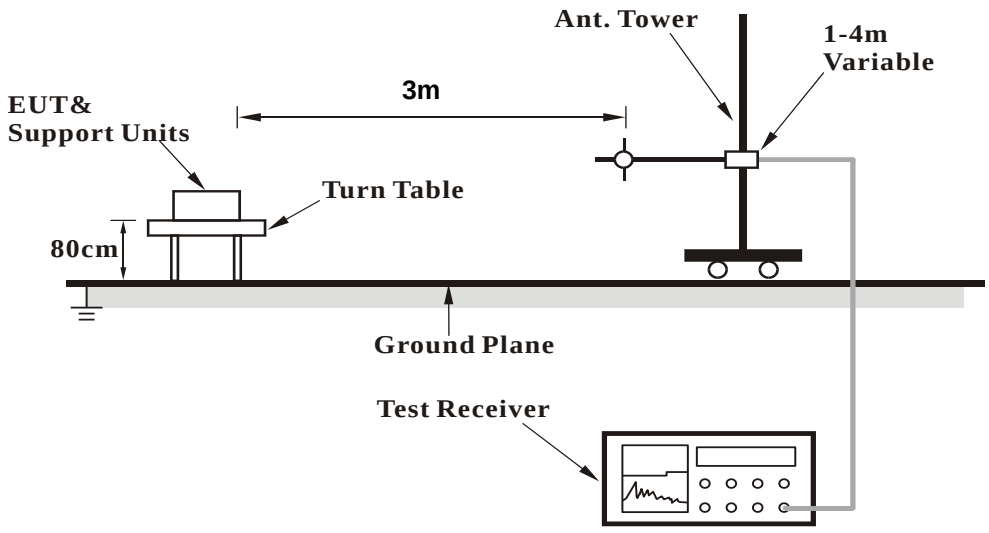
No deviation.

4.1.5 Test Setup

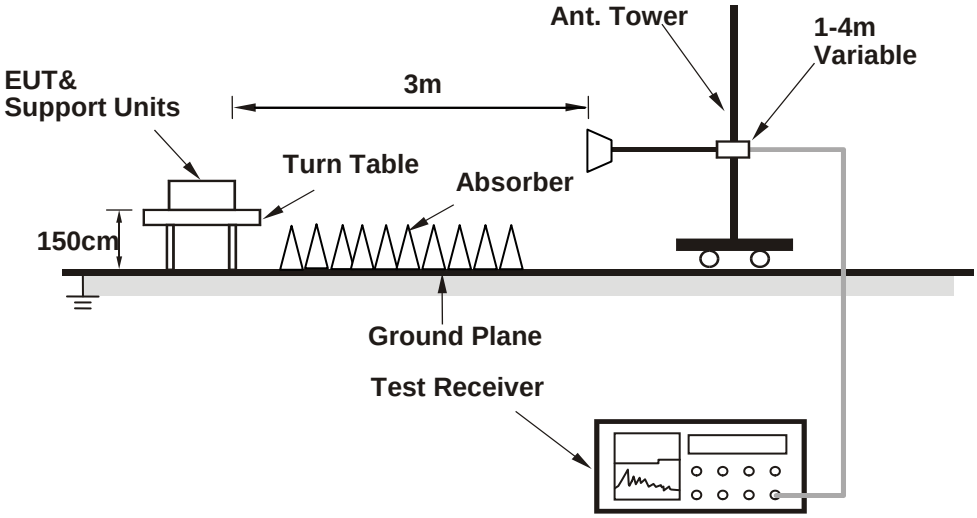
For Radiated emission below 30MHz



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.
a. Controlling software (QDART_1.0.38) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 52	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	58.0 PK	74.0	-16.0	1.05 H	70	55.0	3.0
2	5150.00	41.1 AV	54.0	-12.9	1.05 H	70	38.1	3.0
3	*5260.00	119.7 PK			1.05 H	70	117.3	2.4
4	*5260.00	109.8 AV			1.05 H	70	107.4	2.4
5	#10520.00	42.1 PK	74.0	-31.9	1.57 H	214	29.2	12.9
6	#10520.00	30.3 AV	54.0	-23.7	1.57 H	214	17.4	12.9
7	15780.00	51.1 PK	74.0	-22.9	1.43 H	133	38.6	12.5
8	15780.00	39.1 AV	54.0	-14.9	1.43 H	133	26.6	12.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	48.1 PK	74.0	-25.9	3.93 V	22	45.1	3.0
2	5150.00	38.0 AV	54.0	-16.0	3.93 V	22	35.0	3.0
3	*5260.00	113.2 PK			3.93 V	22	110.8	2.4
4	*5260.00	102.8 AV			3.93 V	22	100.4	2.4
5	#10520.00	44.8 PK	74.0	-29.2	1.52 V	132	31.9	12.9
6	#10520.00	33.2 AV	54.0	-20.8	1.52 V	132	20.3	12.9
7	15780.00	50.2 PK	74.0	-23.8	1.35 V	134	37.7	12.5
8	15780.00	38.0 AV	54.0	-16.0	1.35 V	134	25.5	12.5

REMARKS:

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

CHANNEL	TX Channel 60	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	*5300.00	119.8 PK			1.01 H	79	117.3	2.5
2	*5300.00	110.2 AV			1.01 H	79	107.7	2.5
3	10600.00	42.7 PK	74.0	-31.3	1.57 H	212	30.3	12.4
4	10600.00	30.8 AV	54.0	-23.2	1.57 H	212	18.4	12.4
5	15900.00	51.5 PK	74.0	-22.5	1.42 H	144	39.2	12.3
6	15900.00	39.5 AV	54.0	-14.5	1.42 H	144	27.2	12.3
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	*5300.00	112.5 PK			3.95 V	31	110.0	2.5
2	*5300.00	102.3 AV			3.95 V	31	99.8	2.5
3	10600.00	45.0 PK	74.0	-29.0	1.55 V	132	32.6	12.4
4	10600.00	33.1 AV	54.0	-20.9	1.55 V	132	20.7	12.4
5	15900.00	50.5 PK	74.0	-23.5	1.33 V	141	38.2	12.3
6	15900.00	38.1 AV	54.0	-15.9	1.33 V	141	25.8	12.3

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.

CHANNEL	TX Channel 64	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	*5320.00	119.3 PK			1.01 H	69	116.8	2.5
2	*5320.00	108.4 AV			1.01 H	69	105.9	2.5
3	5350.00	73.5 PK	74.0	-0.5	1.01 H	69	70.9	2.6
4	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**1.01 H**	**69**	**51.3**	**2.6**
5	10640.00	42.5 PK	74.0	-31.5	1.55 H	213	29.9	12.6
6	10640.00	30.5 AV	54.0	-23.5	1.55 H	213	17.9	12.6
7	15960.00	51.4 PK	74.0	-22.6	1.47 H	148	38.9	12.5
8	15960.00	39.5 AV	54.0	-14.5	1.47 H	148	27.0	12.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	110.7 PK			3.91 V	35	108.2	2.5
2	*5320.00	100.6 AV			3.91 V	35	98.1	2.5
3	5350.00	66.9 PK	74.0	-7.1	3.91 V	35	64.3	2.6
4	5350.00	46.7 AV	54.0	-7.3	3.91 V	35	44.1	2.6
5	10640.00	44.6 PK	74.0	-29.4	1.51 V	135	32.0	12.6
6	10640.00	32.7 AV	54.0	-21.3	1.51 V	135	20.1	12.6
7	15960.00	50.4 PK	74.0	-23.6	1.39 V	129	37.9	12.5
8	15960.00	38.0 AV	54.0	-16.0	1.39 V	129	25.5	12.5

REMARKS:

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

CHANNEL	TX Channel 100	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	#5470.00	70.3 PK	74.0	-3.7	1.01 H	71	67.4	2.9
2	#5470.00	53.7 AV	54.0	-0.3	1.01 H	71	50.8	2.9
3	*5500.00	119.1 PK			1.01 H	71	116.2	2.9
4	*5500.00	107.9 AV			1.01 H	71	105.0	2.9
5	11000.00	43.1 PK	74.0	-30.9	1.51 H	207	29.9	13.2
6	11000.00	31.1 AV	54.0	-22.9	1.51 H	207	17.9	13.2
7	#16500.00	51.8 PK	74.0	-22.2	1.43 H	143	36.8	15.0
8	#16500.00	39.7 AV	54.0	-14.3	1.43 H	143	24.7	15.0
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	#5470.00	67.6 PK	74.0	-6.4	3.94 V	17	64.7	2.9
2	#5470.00	47.2 AV	54.0	-6.8	3.94 V	17	44.3	2.9
3	*5500.00	111.1 PK			3.94 V	17	108.2	2.9
4	*5500.00	99.8 AV			3.94 V	17	96.9	2.9
5	11000.00	44.7 PK	74.0	-29.3	1.52 V	119	31.5	13.2
6	11000.00	32.7 AV	54.0	-21.3	1.52 V	119	19.5	13.2
7	#16500.00	50.4 PK	74.0	-23.6	1.38 V	149	35.4	15.0
8	#16500.00	38.0 AV	54.0	-16.0	1.38 V	149	23.0	15.0

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 116	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	*5580.00	120.0 PK			1.01 H	77	116.8	3.2
2	*5580.00	110.6 AV			1.01 H	77	107.4	3.2
3	11160.00	43.2 PK	74.0	-30.8	1.62 H	208	30.1	13.1
4	11160.00	31.1 AV	54.0	-22.9	1.62 H	208	18.0	13.1
5	#16740.00	51.2 PK	74.0	-22.8	1.37 H	131	34.8	16.4
6	#16740.00	39.4 AV	54.0	-14.6	1.37 H	131	23.0	16.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	112.8 PK			3.89 V	16	109.6	3.2
2	*5580.00	102.5 AV			3.89 V	16	99.3	3.2
3	11160.00	45.0 PK	74.0	-29.0	1.55 V	133	31.9	13.1
4	11160.00	32.8 AV	54.0	-21.2	1.55 V	133	19.7	13.1
5	#16740.00	50.1 PK	74.0	-23.9	1.38 V	126	33.7	16.4
6	#16740.00	38.0 AV	54.0	-16.0	1.38 V	126	21.6	16.4

REMARKS:

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

CHANNEL	TX Channel 140	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	*5700.00	116.5 PK			1.09 H	68	113.1	3.4
2	*5700.00	106.2 AV			1.09 H	68	102.8	3.4
3	#5725.00	69.9 PK	74.0	-4.1	1.09 H	68	66.6	3.3
4	#5725.00	53.5 AV	54.0	-0.5	1.09 H	68	50.2	3.3
5	11400.00	43.1 PK	74.0	-30.9	1.59 H	198	29.6	13.5
6	11400.00	31.2 AV	54.0	-22.8	1.59 H	198	17.7	13.5
7	#17100.00	51.0 PK	74.0	-23.0	1.40 H	133	34.9	16.1
8	#17100.00	39.2 AV	54.0	-14.8	1.40 H	133	23.1	16.1
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	*5700.00	108.3 PK			3.89 V	26	104.9	3.4
2	*5700.00	98.1 AV			3.89 V	26	94.7	3.4
3	#5725.00	67.5 PK	74.0	-6.5	3.89 V	26	64.2	3.3
4	#5725.00	47.2 AV	54.0	-6.8	3.89 V	26	43.9	3.3
5	11400.00	43.5 PK	74.0	-30.5	1.49 V	143	30.0	13.5
6	11400.00	30.6 AV	54.0	-23.4	1.49 V	143	17.1	13.5
7	#17100.00	50.0 PK	74.0	-24.0	1.30 V	140	33.9	16.1
8	#17100.00	37.7 AV	54.0	-16.3	1.30 V	140	21.6	16.1

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 144	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	55.1 PK	74.0	-18.9	1.03 H	67	52.2	2.9
2	#5470.00	39.3 AV	54.0	-14.7	1.03 H	67	36.4	2.9
3	*5720.00	120.4 PK			1.03 H	67	117.1	3.3
4	*5720.00	110.7 AV			1.03 H	67	107.4	3.3
5	#5850.00	58.6 PK	74.0	-15.4	1.03 H	67	55.0	3.6
6	#5850.00	40.2 AV	54.0	-13.8	1.03 H	67	36.6	3.6
7	11440.00	43.1 PK	74.0	-30.9	1.63 H	201	29.7	13.4
8	11440.00	31.1 AV	54.0	-22.9	1.63 H	201	17.7	13.4
9	#17160.00	51.3 PK	74.0	-22.7	1.38 H	139	35.0	16.3
10	#17160.00	39.1 AV	54.0	-14.9	1.38 H	139	22.8	16.3
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	#5470.00	53.2 PK	74.0	-20.8	3.90 V	15	50.3	2.9
2	#5470.00	37.1 AV	54.0	-16.9	3.90 V	15	34.2	2.9
3	*5720.00	112.9 PK			3.90 V	15	109.6	3.3
4	*5720.00	102.6 AV			3.90 V	15	99.3	3.3
5	#5850.00	51.2 PK	74.0	-22.8	3.90 V	15	47.6	3.6
6	#5850.00	38.1 AV	54.0	-15.9	3.90 V	15	34.5	3.6
7	11440.00	45.4 PK	74.0	-28.6	1.58 V	138	32.0	13.4
8	11440.00	33.3 AV	54.0	-20.7	1.58 V	138	19.9	13.4
9	#17160.00	50.7 PK	74.0	-23.3	1.33 V	137	34.4	16.3
10	#17160.00	38.2 AV	54.0	-15.8	1.33 V	137	21.9	16.3

REMARKS:

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

802.11ac (VHT20)

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.4 PK	74.0	-16.6	1.00 H	72	54.4	3.0
2	5150.00	40.6 AV	54.0	-13.4	1.00 H	72	37.6	3.0
3	*5260.00	119.9 PK			1.00 H	72	117.5	2.4
4	*5260.00	109.6 AV			1.00 H	72	107.2	2.4
5	#10520.00	42.6 PK	74.0	-31.4	1.63 H	205	29.7	12.9
6	#10520.00	30.8 AV	54.0	-23.2	1.63 H	205	17.9	12.9
7	15780.00	51.2 PK	74.0	-22.8	1.48 H	131	38.7	12.5
8	15780.00	39.1 AV	54.0	-14.9	1.48 H	131	26.6	12.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.2 PK	74.0	-18.8	3.87 V	36	52.2	3.0
2	5150.00	37.8 AV	54.0	-16.2	3.87 V	36	34.8	3.0
3	*5260.00	112.1 PK			3.87 V	36	109.7	2.4
4	*5260.00	101.8 AV			3.87 V	36	99.4	2.4
5	#10520.00	44.9 PK	74.0	-29.1	1.51 V	138	32.0	12.9
6	#10520.00	33.2 AV	54.0	-20.8	1.51 V	138	20.3	12.9
7	15780.00	49.9 PK	74.0	-24.1	1.33 V	134	37.4	12.5
8	15780.00	37.7 AV	54.0	-16.3	1.33 V	134	25.2	12.5

REMARKS:

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

CHANNEL	TX Channel 60	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	*5300.00	120.3 PK			1.01 H	71	117.8	2.5
2	*5300.00	109.8 AV			1.01 H	71	107.3	2.5
3	10600.00	42.7 PK	74.0	-31.3	1.57 H	204	30.3	12.4
4	10600.00	31.0 AV	54.0	-23.0	1.57 H	204	18.6	12.4
5	15900.00	51.9 PK	74.0	-22.1	1.40 H	148	39.6	12.3
6	15900.00	40.0 AV	54.0	-14.0	1.40 H	148	27.7	12.3
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	*5300.00	111.6 PK			3.88 V	12	109.1	2.5
2	*5300.00	101.5 AV			3.88 V	12	99.0	2.5
3	10600.00	45.2 PK	74.0	-28.8	1.50 V	141	32.8	12.4
4	10600.00	33.6 AV	54.0	-20.4	1.50 V	141	21.2	12.4
5	15900.00	50.9 PK	74.0	-23.1	1.30 V	127	38.6	12.3
6	15900.00	38.5 AV	54.0	-15.5	1.30 V	127	26.2	12.3

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.

CHANNEL	TX Channel 64	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	*5320.00	120.2 PK			1.14 H	101	117.7	2.5
2	*5320.00	109.2 AV			1.14 H	101	106.7	2.5
3	5350.00	73.1 PK	74.0	-0.9	1.14 H	101	70.5	2.6
4	5350.00	53.8 AV	54.0	-0.2	1.14 H	101	51.2	2.6
5	10640.00	43.3 PK	74.0	-30.7	1.57 H	203	30.7	12.6
6	10640.00	31.2 AV	54.0	-22.8	1.57 H	203	18.6	12.6
7	15960.00	51.3 PK	74.0	-22.7	1.46 H	144	38.8	12.5
8	15960.00	39.4 AV	54.0	-14.6	1.46 H	144	26.9	12.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	111.2 PK			3.92 V	17	108.7	2.5
2	*5320.00	99.8 AV			3.92 V	17	97.3	2.5
3	5350.00	67.2 PK	74.0	-6.8	3.92 V	17	64.6	2.6
4	5350.00	47.0 AV	54.0	-7.0	3.92 V	17	44.4	2.6
5	10640.00	45.1 PK	74.0	-28.9	1.56 V	139	32.5	12.6
6	10640.00	33.7 AV	54.0	-20.3	1.56 V	139	21.1	12.6
7	15960.00	50.2 PK	74.0	-23.8	1.38 V	147	37.7	12.5
8	15960.00	38.0 AV	54.0	-16.0	1.38 V	147	25.5	12.5

REMARKS:

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

CHANNEL	TX Channel 100	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	#5470.00	72.7 PK	74.0	-1.3	1.14 H	103	69.8	2.9
2	**#5470.00**	**53.9 AV**	**54.0**	**-0.1**	**1.14 H**	**103**	**51.0**	**2.9**
3	*5500.00	119.8 PK			1.14 H	103	116.9	2.9
4	*5500.00	108.4 AV			1.14 H	103	105.5	2.9
5	11000.00	43.1 PK	74.0	-30.9	1.55 H	215	29.9	13.2
6	11000.00	31.1 AV	54.0	-22.9	1.55 H	215	17.9	13.2
7	#16500.00	51.2 PK	74.0	-22.8	1.42 H	128	36.2	15.0
8	#16500.00	39.2 AV	54.0	-14.8	1.42 H	128	24.2	15.0
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	#5470.00	67.0 PK	74.0	-7.0	3.92 V	28	64.1	2.9
2	#5470.00	47.0 AV	54.0	-7.0	3.92 V	28	44.1	2.9
3	*5500.00	111.9 PK			3.92 V	28	109.0	2.9
4	*5500.00	100.6 AV			3.92 V	28	97.7	2.9
5	11000.00	44.6 PK	74.0	-29.4	1.48 V	134	31.4	13.2
6	11000.00	32.9 AV	54.0	-21.1	1.48 V	134	19.7	13.2
7	#16500.00	49.6 PK	74.0	-24.4	1.36 V	122	34.6	15.0
8	#16500.00	37.7 AV	54.0	-16.3	1.36 V	122	22.7	15.0

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 116	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	*5580.00	120.8 PK			1.04 H	78	117.6	3.2
2	*5580.00	110.2 AV			1.04 H	78	107.0	3.2
3	11160.00	42.5 PK	74.0	-31.5	1.63 H	224	29.4	13.1
4	11160.00	30.7 AV	54.0	-23.3	1.63 H	224	17.6	13.1
5	#16740.00	51.6 PK	74.0	-22.4	1.46 H	148	35.2	16.4
6	#16740.00	39.4 AV	54.0	-14.6	1.46 H	148	23.0	16.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	111.7 PK			3.98 V	21	108.5	3.2
2	*5580.00	101.8 AV			3.98 V	21	98.6	3.2
3	11160.00	45.1 PK	74.0	-28.9	1.52 V	117	32.0	13.1
4	11160.00	33.3 AV	54.0	-20.7	1.52 V	117	20.2	13.1
5	#16740.00	50.5 PK	74.0	-23.5	1.37 V	127	34.1	16.4
6	#16740.00	38.0 AV	54.0	-16.0	1.37 V	127	21.6	16.4

REMARKS:

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

CHANNEL	TX Channel 140	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	*5700.00	117.0 PK			1.11 H	80	113.6	3.4
2	*5700.00	106.6 AV			1.11 H	80	103.2	3.4
3	#5725.00	71.8 PK	74.0	-2.2	1.11 H	80	68.5	3.3
4	#5725.00	53.8 AV	54.0	-0.2	1.11 H	80	50.5	3.3
5	11400.00	42.6 PK	74.0	-31.4	1.59 H	227	29.1	13.5
6	11400.00	30.7 AV	54.0	-23.3	1.59 H	227	17.2	13.5
7	#17100.00	51.2 PK	74.0	-22.8	1.37 H	155	35.1	16.1
8	#17100.00	39.3 AV	54.0	-14.7	1.37 H	155	23.2	16.1
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	*5700.00	108.5 PK			3.91 V	14	105.1	3.4
2	*5700.00	97.9 AV			3.91 V	14	94.5	3.4
3	#5725.00	66.9 PK	74.0	-7.1	3.91 V	14	63.6	3.3
4	#5725.00	46.7 AV	54.0	-7.3	3.91 V	14	43.4	3.3
5	11400.00	43.3 PK	74.0	-30.7	1.54 V	159	29.8	13.5
6	11400.00	30.7 AV	54.0	-23.3	1.54 V	159	17.2	13.5
7	#17100.00	50.0 PK	74.0	-24.0	1.31 V	144	33.9	16.1
8	#17100.00	37.6 AV	54.0	-16.4	1.31 V	144	21.5	16.1

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 144	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	54.9 PK	74.0	-19.1	1.00 H	60	52.0	2.9
2	#5470.00	39.2 AV	54.0	-14.8	1.00 H	60	36.3	2.9
3	*5720.00	120.3 PK			1.03 H	76	117.0	3.3
4	*5720.00	109.8 AV			1.03 H	76	106.5	3.3
5	#5850.00	58.6 PK	74.0	-15.4	1.00 H	52	55.0	3.6
6	#5850.00	40.1 AV	54.0	-13.9	1.00 H	52	36.5	3.6
7	11440.00	42.4 PK	74.0	-31.6	1.59 H	219	29.0	13.4
8	11440.00	30.5 AV	54.0	-23.5	1.59 H	219	17.1	13.4
9	#17160.00	51.4 PK	74.0	-22.6	1.47 H	133	35.1	16.3
10	#17160.00	39.2 AV	54.0	-14.8	1.47 H	133	22.9	16.3
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	#5470.00	53.2 PK	74.0	-20.8	3.95 V	9	50.3	2.9
2	#5470.00	37.4 AV	54.0	-16.6	3.95 V	9	34.5	2.9
3	*5720.00	112.4 PK			3.95 V	9	109.1	3.3
4	*5720.00	102.3 AV			3.95 V	9	99.0	3.3
5	#5850.00	51.2 PK	74.0	-22.8	3.95 V	9	47.6	3.6
6	#5850.00	37.8 AV	54.0	-16.2	3.95 V	9	34.2	3.6
7	11440.00	45.1 PK	74.0	-28.9	1.49 V	138	31.7	13.4
8	11440.00	33.2 AV	54.0	-20.8	1.49 V	138	19.8	13.4
9	#17160.00	50.2 PK	74.0	-23.8	1.33 V	135	33.9	16.3
10	#17160.00	37.7 AV	54.0	-16.3	1.33 V	135	21.4	16.3

REMARKS:

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

802.11ac (VHT40)

CHANNEL	TX Channel 54	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	59.4 PK	74.0	-14.6	1.12 H	79	56.4	3.0
2	5150.00	43.7 AV	54.0	-10.3	1.12 H	79	40.7	3.0
3	*5270.00	117.0 PK			1.12 H	79	114.6	2.4
4	*5270.00	107.9 AV			1.12 H	79	105.5	2.4
5	#10540.00	43.4 PK	74.0	-30.6	1.58 H	214	30.6	12.8
6	#10540.00	31.3 AV	54.0	-22.7	1.58 H	214	18.5	12.8
7	15810.00	51.7 PK	74.0	-22.3	1.36 H	153	39.3	12.4
8	15810.00	39.8 AV	54.0	-14.2	1.36 H	153	27.4	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	53.1 PK	74.0	-20.9	3.92 V	25	50.1	3.0
2	5150.00	37.5 AV	54.0	-16.5	3.92 V	25	34.5	3.0
3	*5270.00	108.8 PK			3.92 V	25	106.4	2.4
4	*5270.00	99.8 AV			3.92 V	25	97.4	2.4
5	#10540.00	43.9 PK	74.0	-30.1	1.47 V	152	31.1	12.8
6	#10540.00	30.9 AV	54.0	-23.1	1.47 V	152	18.1	12.8
7	15810.00	49.7 PK	74.0	-24.3	1.25 V	149	37.3	12.4
8	15810.00	37.3 AV	54.0	-16.7	1.25 V	149	24.9	12.4

REMARKS:

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

CHANNEL	TX Channel 62	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	*5310.00	113.0 PK			1.21 H	115	110.6	2.4
2	*5310.00	102.6 AV			1.21 H	115	100.2	2.4
3	5350.00	70.8 PK	74.0	-3.2	1.21 H	115	68.2	2.6
4	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**1.21 H**	**115**	**51.3**	**2.6**
5	10620.00	42.5 PK	74.0	-31.5	1.60 H	215	30.0	12.5
6	10620.00	30.6 AV	54.0	-23.4	1.60 H	215	18.1	12.5
7	15930.00	51.4 PK	74.0	-22.6	1.45 H	156	39.0	12.4
8	15930.00	39.1 AV	54.0	-14.9	1.45 H	156	26.7	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	104.9 PK			3.87 V	14	102.5	2.4
2	*5310.00	94.8 AV			3.87 V	14	92.4	2.4
3	5350.00	66.5 PK	74.0	-7.5	3.87 V	14	63.9	2.6
4	5350.00	46.3 AV	54.0	-7.7	3.87 V	14	43.7	2.6
5	10620.00	43.0 PK	74.0	-31.0	1.46 V	138	30.5	12.5
6	10620.00	30.4 AV	54.0	-23.6	1.46 V	138	17.9	12.5
7	15930.00	50.2 PK	74.0	-23.8	1.29 V	140	37.8	12.4
8	15930.00	38.0 AV	54.0	-16.0	1.29 V	140	25.6	12.4

REMARKS:

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

CHANNEL	TX Channel 102	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	#5470.00	69.5 PK	74.0	-4.5	1.01 H	104	66.6	2.9
2	#5470.00	53.7 AV	54.0	-0.3	1.01 H	104	50.8	2.9
3	*5510.00	111.7 PK			1.01 H	104	108.8	2.9
4	*5510.00	103.2 AV			1.01 H	104	100.3	2.9
5	11020.00	42.8 PK	74.0	-31.2	1.61 H	220	29.6	13.2
6	11020.00	30.6 AV	54.0	-23.4	1.61 H	220	17.4	13.2
7	#16530.00	50.9 PK	74.0	-23.1	1.42 H	153	36.0	14.9
8	#16530.00	39.1 AV	54.0	-14.9	1.42 H	153	24.2	14.9
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	#5470.00	66.5 PK	74.0	-7.5	3.90 V	20	63.6	2.9
2	#5470.00	46.2 AV	54.0	-7.8	3.90 V	20	43.3	2.9
3	*5510.00	105.0 PK			3.90 V	20	102.1	2.9
4	*5510.00	95.0 AV			3.90 V	20	92.1	2.9
5	11020.00	43.6 PK	74.0	-30.4	1.48 V	135	30.4	13.2
6	11020.00	30.4 AV	54.0	-23.6	1.48 V	135	17.2	13.2
7	#16530.00	50.1 PK	74.0	-23.9	1.32 V	146	35.2	14.9
8	#16530.00	38.1 AV	54.0	-15.9	1.32 V	146	23.2	14.9

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 110	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	#5470.00	65.5 PK	74.0	-8.5	1.12 H	75	62.6	2.9
2	#5470.00	53.8 AV	54.0	-0.2	1.12 H	75	50.9	2.9
3	*5550.00	117.5 PK			1.12 H	75	114.5	3.0
4	*5550.00	107.9 AV			1.12 H	75	104.9	3.0
5	#5725.00	53.7 PK	74.0	-20.3	1.12 H	75	50.4	3.3
6	#5725.00	42.3 AV	54.0	-11.7	1.12 H	75	39.0	3.3
7	11100.00	43.2 PK	74.0	-30.8	1.55 H	224	30.2	13.0
8	11100.00	31.0 AV	54.0	-23.0	1.55 H	224	18.0	13.0
9	#16650.00	52.3 PK	74.0	-21.7	1.47 H	149	36.7	15.6
10	#16650.00	40.0 AV	54.0	-14.0	1.47 H	149	24.4	15.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	66.7 PK	74.0	-7.3	3.94 V	28	63.8	2.9
2	#5470.00	46.4 AV	54.0	-7.6	3.94 V	28	43.5	2.9
3	*5550.00	109.2 PK			3.94 V	28	106.2	3.0
4	*5550.00	100.1 AV			3.94 V	28	97.1	3.0
5	#5725.00	50.2 PK	74.0	-23.8	3.94 V	28	46.9	3.3
6	#5725.00	39.3 AV	54.0	-14.7	3.94 V	28	36.0	3.3
7	11100.00	43.5 PK	74.0	-30.5	1.55 V	147	30.5	13.0
8	11100.00	30.8 AV	54.0	-23.2	1.55 V	147	17.8	13.0
9	#16650.00	50.3 PK	74.0	-23.7	1.31 V	148	34.7	15.6
10	#16650.00	37.8 AV	54.0	-16.2	1.31 V	148	22.2	15.6

REMARKS:

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

CHANNEL	TX Channel 134	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	*5670.00	112.9 PK			1.16 H	129	109.6	3.3
2	*5670.00	103.2 AV			1.16 H	129	99.9	3.3
3	#5725.00	68.0 PK	74.0	-6.0	1.16 H	129	64.7	3.3
4	#5725.00	53.8 AV	54.0	-0.2	1.16 H	129	50.5	3.3
5	11340.00	42.5 PK	74.0	-31.5	1.56 H	216	29.0	13.5
6	11340.00	30.8 AV	54.0	-23.2	1.56 H	216	17.3	13.5
7	#17010.00	51.8 PK	74.0	-22.2	1.46 H	128	35.3	16.5
8	#17010.00	39.6 AV	54.0	-14.4	1.46 H	128	23.1	16.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	104.8 PK			3.87 V	11	101.5	3.3
2	*5670.00	95.1 AV			3.87 V	11	91.8	3.3
3	#5725.00	66.2 PK	74.0	-7.8	3.87 V	11	62.9	3.3
4	#5725.00	46.3 AV	54.0	-7.7	3.87 V	11	43.0	3.3
5	11340.00	43.8 PK	74.0	-30.2	1.50 V	157	30.3	13.5
6	11340.00	30.8 AV	54.0	-23.2	1.50 V	157	17.3	13.5
7	#17010.00	49.9 PK	74.0	-24.1	1.26 V	139	33.4	16.5
8	#17010.00	37.7 AV	54.0	-16.3	1.26 V	139	21.2	16.5

REMARKS:

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

CHANNEL	TX Channel 142	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	#5470.00	53.8 PK	74.0	-20.2	1.15 H	68	50.9	2.9
2	#5470.00	39.0 AV	54.0	-15.0	1.15 H	68	36.1	2.9
3	*5710.00	117.1 PK			1.15 H	68	113.8	3.3
4	*5710.00	107.8 AV			1.15 H	68	104.5	3.3
5	#5850.00	57.1 PK	74.0	-16.9	1.15 H	68	53.5	3.6
6	#5850.00	42.9 AV	54.0	-11.1	1.15 H	68	39.3	3.6
7	11420.00	42.8 PK	74.0	-31.2	1.54 H	200	29.4	13.4
8	11420.00	31.2 AV	54.0	-22.8	1.54 H	200	17.8	13.4
9	#17130.00	51.9 PK	74.0	-22.1	1.40 H	143	35.6	16.3
10	#17130.00	39.6 AV	54.0	-14.4	1.40 H	143	23.3	16.3
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	#5470.00	51.8 PK	74.0	-22.2	3.91 V	11	48.9	2.9
2	#5470.00	37.6 AV	54.0	-16.4	3.91 V	11	34.7	2.9
3	*5710.00	109.1 PK			3.91 V	11	105.8	3.3
4	*5710.00	99.9 AV			3.91 V	11	96.6	3.3
5	#5850.00	53.5 PK	74.0	-20.5	3.91 V	11	49.9	3.6
6	#5850.00	38.7 AV	54.0	-15.3	3.91 V	11	35.1	3.6
7	11420.00	43.3 PK	74.0	-30.7	1.51 V	137	29.9	13.4
8	11420.00	30.4 AV	54.0	-23.6	1.51 V	137	17.0	13.4
9	#17130.00	50.3 PK	74.0	-23.7	1.26 V	142	34.0	16.3
10	#17130.00	38.0 AV	54.0	-16.0	1.26 V	142	21.7	16.3

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 58	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	55.9 PK	74.0	-18.1	1.01 H	73	52.9	3.0
2	5150.00	42.5 AV	54.0	-11.5	1.01 H	73	39.5	3.0
3	*5290.00	108.1 PK			1.01 H	115	105.7	2.4
4	*5290.00	99.0 AV			1.01 H	115	96.6	2.4
5	5350.00	70.5 PK	74.0	-3.5	1.01 H	73	67.9	2.6
6	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**1.01 H**	**73**	**51.3**	**2.6**
7	#10580.00	42.4 PK	74.0	-31.6	1.52 H	221	29.8	12.6
8	#10580.00	30.3 AV	54.0	-23.7	1.52 H	221	17.7	12.6
9	15870.00	51.7 PK	74.0	-22.3	1.45 H	150	39.3	12.4
10	15870.00	39.6 AV	54.0	-14.4	1.45 H	150	27.2	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	49.1 PK	74.0	-24.9	3.69 V	13	46.1	3.0
2	5150.00	37.2 AV	54.0	-16.8	3.69 V	13	34.2	3.0
3	*5290.00	101.2 PK			3.69 V	13	98.8	2.4
4	*5290.00	91.9 AV			3.69 V	13	89.5	2.4
5	5350.00	59.2 PK	74.0	-14.8	3.69 V	13	56.6	2.6
6	5350.00	45.6 AV	54.0	-8.4	3.69 V	13	43.0	2.6
7	#10580.00	42.9 PK	74.0	-31.1	1.48 V	141	30.3	12.6
8	#10580.00	30.1 AV	54.0	-23.9	1.48 V	141	17.5	12.6
9	15870.00	49.6 PK	74.0	-24.4	1.35 V	139	37.2	12.4
10	15870.00	37.3 AV	54.0	-16.7	1.35 V	139	24.9	12.4

REMARKS:

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

CHANNEL	TX Channel 106	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5457.00	65.3 PK	74.0	-8.7	2.23 H	124	62.4	2.9
2	5457.00	53.7 AV	54.0	-0.3	2.23 H	124	50.8	2.9
3	#5470.00	73.6 PK	74.0	-0.4	2.23 H	124	70.7	2.9
4	**#5470.00**	**53.9 AV**	**54.0**	**-0.1**	**2.23 H**	**124**	**51.0**	**2.9**
5	*5530.00	108.9 PK			2.23 H	124	105.9	3.0
6	*5530.00	100.3 AV			2.23 H	124	97.3	3.0
7	#5725.00	52.1 PK	74.0	-21.9	2.23 H	124	48.8	3.3
8	#5725.00	41.5 AV	54.0	-12.5	2.23 H	124	38.2	3.3
9	11060.00	42.8 PK	74.0	-31.2	1.53 H	223	29.6	13.2
10	11060.00	31.1 AV	54.0	-22.9	1.53 H	223	17.9	13.2
11	#16590.00	52.1 PK	74.0	-21.9	1.47 H	132	37.0	15.1
12	#16590.00	39.8 AV	54.0	-14.2	1.47 H	132	24.7	15.1
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	5457.00	66.8 PK	74.0	-7.2	3.98 V	23	63.9	2.9
2	5457.00	46.8 AV	54.0	-7.2	3.98 V	23	43.9	2.9
3	#5470.00	50.1 PK	74.0	-23.9	3.98 V	23	47.2	2.9
4	#5470.00	37.7 AV	54.0	-16.3	3.98 V	23	34.8	2.9
5	*5530.00	102.1 PK			3.98 V	23	99.1	3.0
6	*5530.00	92.8 AV			3.98 V	23	89.8	3.0
7	#5725.00	49.4 PK	74.0	-24.6	3.98 V	23	46.1	3.3
8	#5725.00	37.7 AV	54.0	-16.3	3.98 V	23	34.4	3.3
9	11060.00	44.0 PK	74.0	-30.0	1.54 V	140	30.8	13.2
10	11060.00	30.9 AV	54.0	-23.1	1.54 V	140	17.7	13.2
11	#16590.00	50.1 PK	74.0	-23.9	1.31 V	147	35.0	15.1
12	#16590.00	38.0 AV	54.0	-16.0	1.31 V	147	22.9	15.1

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 122	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	*5610.00	111.2 PK			2.10 H	119	107.9	3.3
2	*5610.00	101.5 AV			2.10 H	119	98.2	3.3
3	#5725.00	68.3 PK	74.0	-5.7	2.10 H	119	65.0	3.3
4	**#5725.00**	**53.9 AV**	**54.0**	**-0.1**	**2.10 H**	**119**	**50.6**	**3.3**
5	11220.00	42.6 PK	74.0	-31.4	1.52 H	207	29.4	13.2
6	11220.00	30.7 AV	54.0	-23.3	1.52 H	207	17.5	13.2
7	#16830.00	51.3 PK	74.0	-22.7	1.38 H	141	34.7	16.6
8	#16830.00	39.5 AV	54.0	-14.5	1.38 H	141	22.9	16.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5610.00	103.4 PK			3.88 V	21	100.1	3.3
2	*5610.00	93.7 AV			3.88 V	21	90.4	3.3
3	#5725.00	66.9 PK	74.0	-7.1	3.88 V	21	63.6	3.3
4	#5725.00	46.7 AV	54.0	-7.3	3.88 V	21	43.4	3.3
5	11220.00	43.3 PK	74.0	-30.7	1.50 V	127	30.1	13.2
6	11220.00	30.5 AV	54.0	-23.5	1.50 V	127	17.3	13.2
7	#16830.00	49.8 PK	74.0	-24.2	1.31 V	151	33.2	16.6
8	#16830.00	37.5 AV	54.0	-16.5	1.31 V	151	20.9	16.6

REMARKS:

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

CHANNEL	TX Channel 138	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	#5470.00	55.3 PK	74.0	-18.7	1.09 H	85	52.4	2.9
2	#5470.00	39.8 AV	54.0	-14.2	1.09 H	85	36.9	2.9
3	*5690.00	112.8 PK			1.09 H	85	109.5	3.3
4	*5690.00	104.2 AV			1.09 H	85	100.9	3.3
5	#5850.00	66.6 PK	74.0	-7.4	1.09 H	85	63.0	3.6
6	#5850.00	53.2 AV	54.0	-0.8	1.09 H	85	49.6	3.6
7	11380.00	42.0 PK	74.0	-32.0	1.57 H	227	28.5	13.5
8	11380.00	30.3 AV	54.0	-23.7	1.57 H	227	16.8	13.5
9	#17070.00	52.0 PK	74.0	-22.0	1.47 H	148	35.8	16.2
10	#17070.00	39.9 AV	54.0	-14.1	1.47 H	148	23.7	16.2
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	#5470.00	49.7 PK	74.0	-24.3	3.91 V	16	46.8	2.9
2	#5470.00	37.6 AV	54.0	-16.4	3.91 V	16	34.7	2.9
3	*5690.00	104.5 PK			3.91 V	16	101.2	3.3
4	*5690.00	96.1 AV			3.91 V	16	92.8	3.3
5	#5850.00	65.9 PK	74.0	-8.1	3.91 V	16	62.3	3.6
6	#5850.00	45.8 AV	54.0	-8.2	3.91 V	16	42.2	3.6
7	11380.00	43.4 PK	74.0	-30.6	1.53 V	136	29.9	13.5
8	11380.00	30.7 AV	54.0	-23.3	1.53 V	136	17.2	13.5
9	#17070.00	50.2 PK	74.0	-23.8	1.35 V	142	34.0	16.2
10	#17070.00	38.0 AV	54.0	-16.0	1.35 V	142	21.8	16.2

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 (VHT40)

CHANNEL	TX Channel 54	**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	118.00	26.4 QP	43.5	-17.1	1.50 H	73	36.4	-10.0
2	244.73	27.6 QP	46.0	-18.4	1.00 H	0	36.7	-9.1
3	311.64	31.6 QP	46.0	-14.4	1.00 H	45	38.1	-6.5
4	379.27	32.7 QP	46.0	-13.3	1.00 H	51	37.4	-4.7
5	421.25	34.0 QP	46.0	-12.0	1.00 H	45	37.6	-3.6
6	637.44	30.9 QP	46.0	-15.1	1.00 H	69	29.5	1.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	45.88	33.2 QP	40.0	-6.8	1.00 V	87	41.1	-7.9
2	109.52	25.5 QP	43.5	-18.0	1.00 V	275	36.3	-10.8
3	309.80	28.4 QP	46.0	-17.6	1.00 V	322	35.2	-6.8
4	389.70	30.0 QP	46.0	-16.0	1.00 V	348	34.5	-4.5
5	405.90	31.3 QP	46.0	-14.7	1.00 V	348	35.4	-4.1
6	639.43	30.6 QP	46.0	-15.4	1.00 V	160	29.2	1.4

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 15, 2018	May 14, 2019
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Aug. 31, 2017	Aug. 30, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV 216	10072	June 04, 2018	June 03, 2019
RF Cable	5D-FB	COACAB-002	Feb. 23, 2018	Feb. 22, 2019
10 dB PAD EMEC	STI02-2200-10	001	Mar. 16, 2018	Mar. 15, 2019
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2017	Sep. 21, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
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 Conducted Room C
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: July 04, 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.

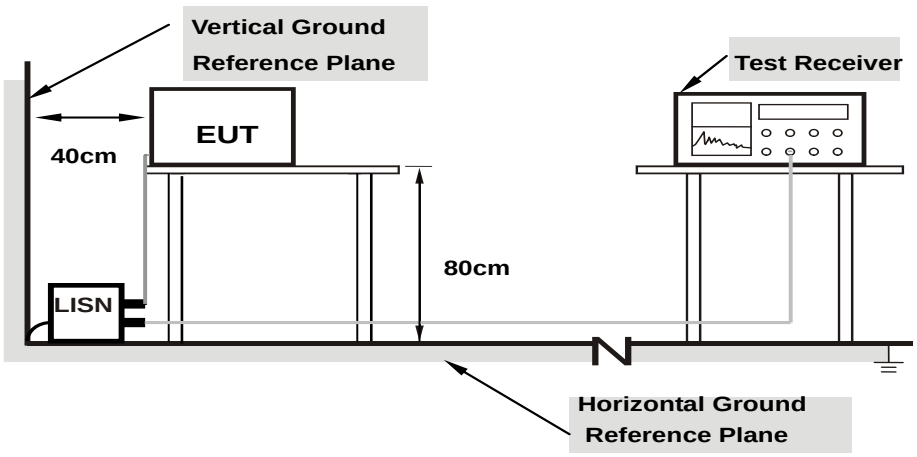
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

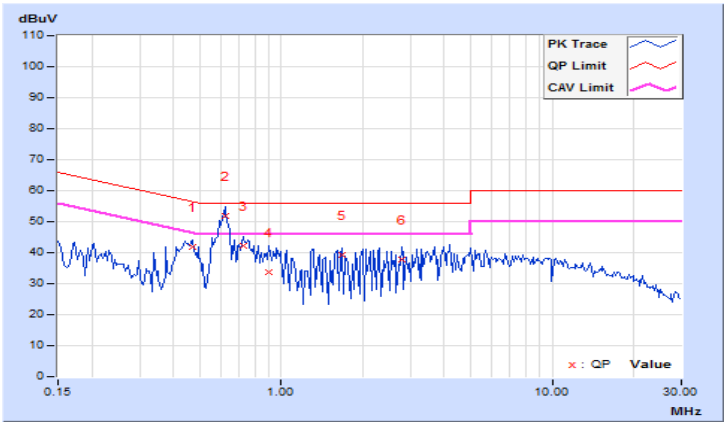
4.2.7 Test Results

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	0.47031	10.00	31.75	24.83	41.75	34.83	56.51	46.51	-14.76	-11.68
2	**0.61875**	**10.01**	**41.72**	**32.95**	**51.73**	**42.96**	**56.00**	**46.00**	**-4.27**	**-3.04**
3	0.72422	10.02	32.22	25.33	42.24	35.35	56.00	46.00	-13.76	-10.65
4	0.90391	10.04	23.57	15.46	33.61	25.50	56.00	46.00	-22.39	-20.50
5	1.67969	10.06	29.06	18.96	39.12	29.02	56.00	46.00	-16.88	-16.98
6	2.80078	10.12	27.67	17.51	37.79	27.63	56.00	46.00	-18.21	-18.37

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.

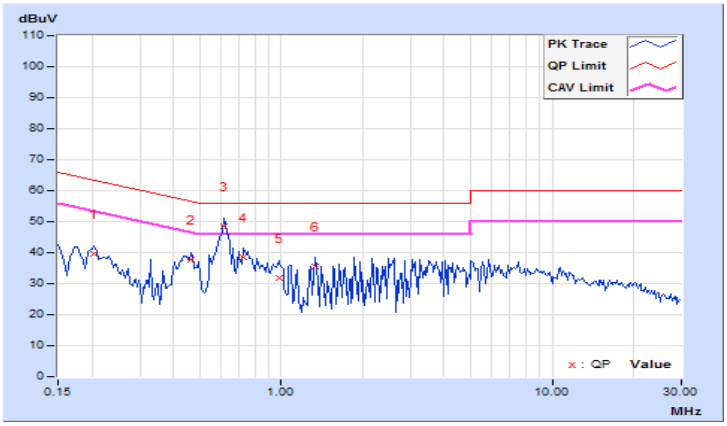


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.20469	9.99	29.71	22.38	39.70	32.37	63.42	53.42	-23.72	-21.05
2	0.46641	10.02	27.69	19.28	37.71	29.30	56.58	46.58	-18.87	-17.28
3	0.61484	10.03	38.33	30.63	48.36	40.66	56.00	46.00	-7.64	-5.34
4	0.72422	10.04	28.60	21.25	38.64	31.29	56.00	46.00	-17.36	-14.71
5	0.98203	10.06	21.64	10.20	31.70	20.26	56.00	46.00	-24.30	-25.74
6	1.33203	10.07	25.33	14.16	35.40	24.23	56.00	46.00	-20.60	-21.77

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,

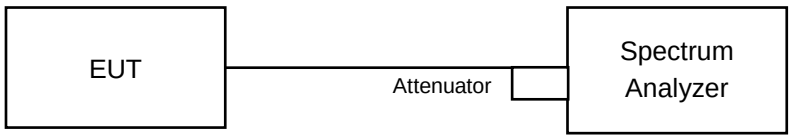
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

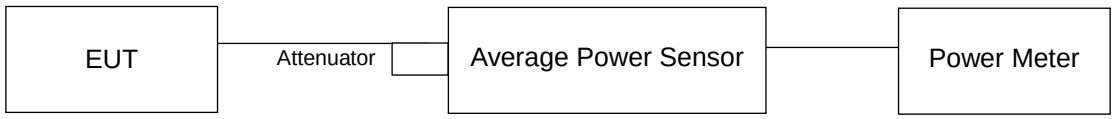
4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

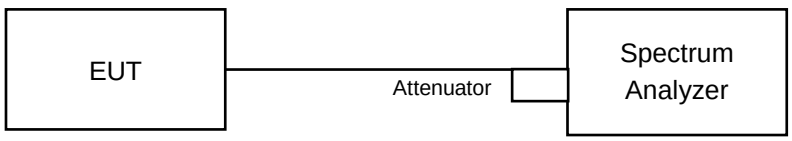
For channel straddling 5725MHz:



For other channels:



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

For channel straddling 5725MHz:

802.11ac (VHT20)

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW =1MHz.
3. Set the VBW ≥ 3 x RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

Other Modulation mode

Method SA-2

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW =1MHz.
3. Set the VBW ≥ 3 x RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

For other channels:

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.

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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 Result

CDD Mode

802.11a

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.42	20.29	217.059	23.37	24.00	Pass
60	5300	20.51	20.36	221.103	23.45	24.00	Pass
64	5320	19.23	19.17	166.357	22.21	23.82	Pass
100	5500	19.07	19.01	160.34	22.05	23.91	Pass
116	5580	20.48	20.31	219.085	23.41	24.00	Pass
140	5700	16.58	16.32	88.354	19.46	23.82	Pass
*144 (UNII-2C Band)	5720	16.34	16.13	87.267	19.41	22.78	Pass
*144 (UNII-3 Band)	5720	10.30	10.03	21.574	13.34	30.00	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	108.841	20.37
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	28.28	26.00
60	5300	22.55	20.83
64	5320	19.59	19.15
100	5500	20.01	19.55
116	5580	20.97	21.13
140	5700	19.38	19.17
144 (UNII-2C Band)	5720	19.30	15.08

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidt

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	26.00	25.14 > 24
60	5300	20.83	24.18 > 24
64	5320	19.15	23.82 < 24
100	5500	19.55	23.91 < 24
116	5580	20.97	24.21 > 24
140	5700	19.17	23.82 < 24
144 (UNII-2C Band)	5720	15.08	22.78 < 24

802.11ac (VHT20)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.38	20.31	216.543	23.36	24.00	Pass
60	5300	20.48	20.29	218.591	23.40	24.00	Pass
64	5320	19.51	19.21	172.699	22.37	24.00	Pass
100	5500	19.60	19.41	178.498	22.52	24.00	Pass
116	5580	20.41	20.38	219.045	23.41	24.00	Pass
140	5700	17.90	17.80	121.916	20.86	24.00	Pass
*144 (UNII-2C Band)	5720	16.54	16.65	91.32	19.61	22.93	Pass
*144 (UNII-3 Band)	5720	11.06	11.27	26.161	14.18	30.00	Pass

Note: 1. * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	117.481	20.7
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	28.17	25.45
60	5300	22.00	21.03
64	5320	20.67	20.46
100	5500	20.66	20.62
116	5580	21.33	20.75
140	5700	20.53	20.26
144 (UNII-2C Band)	5720	15.95	15.62

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidt

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	25.45	25.05 > 24
60	5300	21.03	24.22 > 24
64	5320	20.46	24.1 > 24
100	5500	20.62	24.14 > 24
116	5580	20.75	24.17 > 24
140	5700	20.26	24.06 > 24
144 (UNII-2C Band)	5720	15.62	22.93 < 24

802.11ac (VHT40)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.71	20.52	230.481	23.63	24.00	Pass
62	5310	17.51	17.42	111.572	20.48	24.00	Pass
102	5510	17.54	17.38	111.456	20.47	24.00	Pass
110	5550	20.08	20.07	203.484	23.09	24.00	Pass
134	5670	18.33	18.21	134.299	21.28	24.00	Pass
*142 (UNII-2C Band)	5710	17.74	17.33	117.548	20.70	24.00	Pass
*142 (UNII-3 Band)	5710	5.82	6.25	8.322	9.20	30.00	Pass

Note: 1. * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
142	5710	125.87	21
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	56.11	59.35
62	5310	40.89	40.84
102	5510	40.91	40.81
110	5550	40.72	40.49
134	5670	41.01	40.63
142 (UNII-2C Band)	5710	45.02	35.84

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidtl

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	56.11	28.49 > 24
62	5310	40.84	27.11 > 24
102	5510	40.81	27.1 > 24
110	5550	40.49	27.07 > 24
134	5670	40.63	27.08 > 24
142 (UNII-2C Band)	5710	35.84	26.54 > 24

802.11ac (VHT80)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	16.81	16.53	92.951	19.68	24.00	Pass
106	5530	17.73	17.46	115.012	20.61	24.00	Pass
122	5610	19.81	19.62	187.341	22.73	24.00	Pass
*138 (UNII-2C Band)	5690	16.71	16.85	102.183	20.09	24.00	Pass
*138 (UNII-3 Band)	5690	2.43	3.11	4.07	6.10	30.00	Pass

Note: 1. * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
138	5690	106.253	20.26
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.85	83.78
106	5530	86.04	83.78
122	5610	84.84	84.26
138 (UNII-2C Band)	5690	92.14	76.72

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidtl

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.78	30.23 > 24
106	5530	83.78	30.23 > 24
122	5610	84.26	30.25 > 24
138 (UNII-2C Band)	5690	76.72	29.84 > 24

Beamforming Mode

802.11ac (VHT20)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.38	20.31	216.543	23.36	23.46	Pass
60	5300	20.48	20.29	218.591	23.40	23.46	Pass
64	5320	19.51	19.21	172.699	22.37	23.46	Pass
100	5500	19.60	19.41	178.498	22.52	23.46	Pass
116	5580	20.41	20.38	219.045	23.41	23.46	Pass
140	5700	17.90	17.80	121.916	20.86	23.46	Pass
*144 (UNII-2C Band)	5720	16.54	16.65	91.32	19.61	22.39	Pass
*144 (UNII-3 Band)	5720	11.06	11.27	26.161	14.18	29.46	Pass

Note: 1. * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

2. For UNII-2A, UNII-2C: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.54dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit” -(6.54-6).

3. For UNII-3: Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.54dBi > 6dBi , so the power limit shall be reduced to 30-(6.54-6) = 29.46dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
144	5720	117.481	20.7
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	28.17	25.45
60	5300	22.00	21.03
64	5320	20.67	20.46
100	5500	20.66	20.62
116	5580	21.33	20.75
140	5700	20.53	20.26
144 (UNII-2C Band)	5720	15.95	15.62

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidt

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	25.45	25.05 > 24
60	5300	21.03	24.22 > 24
64	5320	20.46	24.1 > 24
100	5500	20.62	24.14 > 24
116	5580	20.75	24.17 > 24
140	5700	20.26	24.06 > 24
144 (UNII-2C Band)	5720	15.62	22.93 < 24

802.11ac (VHT40)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.23	20.06	206.83	23.16	23.46	Pass
62	5310	17.51	17.42	111.572	20.48	23.46	Pass
102	5510	17.54	17.38	111.456	20.47	23.46	Pass
110	5550	20.08	20.07	203.484	23.09	23.46	Pass
134	5670	18.33	18.21	134.299	21.28	23.46	Pass
*142 (UNII-2C Band)	5710	17.10	16.70	101.553	20.07	23.46	Pass
*142 (UNII-3 Band)	5710	5.66	5.04	7.118	8.52	29.46	Pass

Note: 1. * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

2. For UNII-2A, UNII-2C: Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.54dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit” -(6.54-6).

3. For UNII-3: Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.54dBi > 6dBi , so the power limit shall be reduced to 30-(6.54-6) = 29.46dBm.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
142	5710	108.671	20.36
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	56.11	59.35
62	5310	40.89	40.84
102	5510	40.91	40.81
110	5550	40.72	40.49
134	5670	41.01	40.63
142 (UNII-2C Band)	5710	45.02	35.84

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidtl

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	56.11	28.49 > 24
62	5310	40.84	27.11 > 24
102	5510	40.81	27.1 > 24
110	5550	40.49	27.07 > 24
134	5670	40.63	27.08 > 24
142 (UNII-2C Band)	5710	35.84	26.54 > 24

802.11ac (VHT80)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	16.81	16.53	92.951	19.68	23.46	Pass
106	5530	17.73	17.46	115.012	20.61	23.46	Pass
122	5610	19.81	19.62	187.341	22.73	23.46	Pass
*138 (UNII-2C Band)	5690	16.18	16.19	89.089	19.50	23.46	Pass
*138 (UNII-3 Band)	5690	1.88	1.74	3.254	5.12	29.46	Pass

Note: 1. * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

2. For UNII-2A, UNII-2C: Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.54dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit” -(6.54-6).

3. For UNII-3: Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.54dBi > 6dBi , so the power limit shall be reduced to 30-(6.54-6) = 29.46dBm.

The Total Power for the straddle channel:

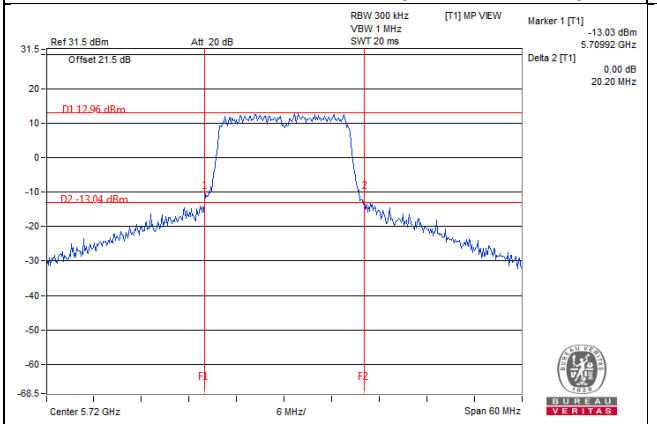
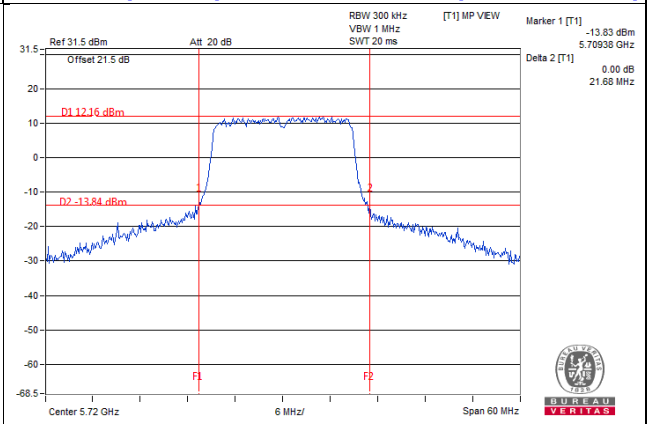
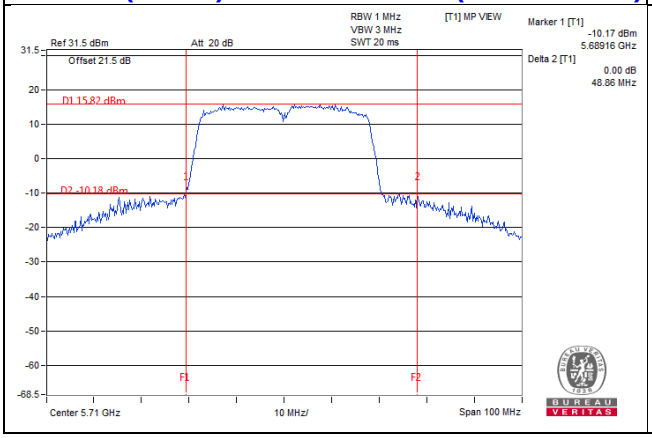
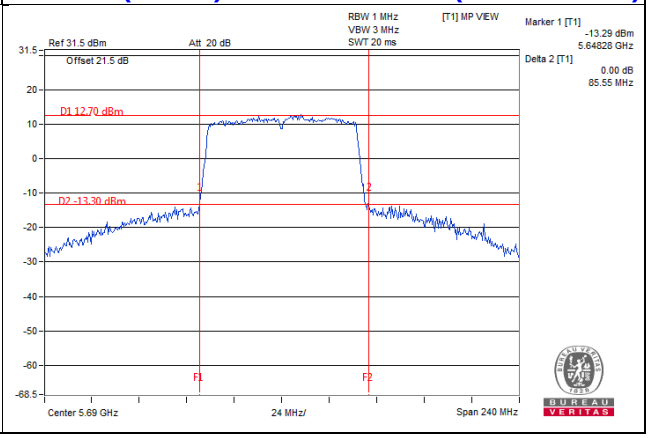
Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
138	5690	92.343	19.65
Note: The total power was calculated through formula and record the value for reference only.			

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.85	83.78
106	5530	86.04	83.78
122	5610	84.84	84.26
138 (UNII-2C Band)	5690	92.14	76.72

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidt

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.78	30.23 > 24
106	5530	83.78	30.23 > 24
122	5610	84.26	30.25 > 24
138 (UNII-2C Band)	5690	76.72	29.84 > 24

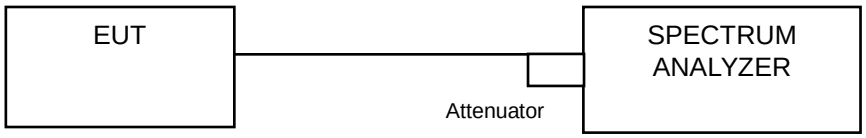
Spectrum Plot of Worst Value	
802.11a / Chain 1 – CH144 (UNII-2C Band)	**802.11ac (VHT20) / Chain 1 - CH144 (UNII-2C Band)**
	
802.11ac (VHT40) / Chain 1 - CH142 (UNII-2C Band)	**802.11ac (VHT80) / Chain 1 - CH138 (UNII-2C Band)**
	

NOTE:

For CH144 (UNII-2C Band) = 5725MHz - Marker 1
For CH142 (UNII-2C Band) = 5725MHz - Marker 1
For CH138 (UNII-2C Band) = 5725MHz - Marker 1

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
52	5260	16.80	16.68
60	5300	16.68	16.56
64	5320	16.56	16.44
100	5500	16.44	16.56
116	5580	16.44	16.68
140	5700	16.56	16.44
144 (UNII-2C Band)	5720	13.40	13.40
144 (UNII-3 Band)	5720	3.28	3.16

802.11ac (VHT20)

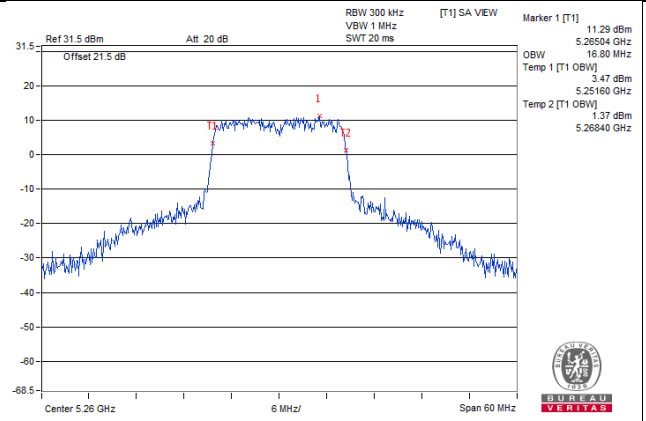
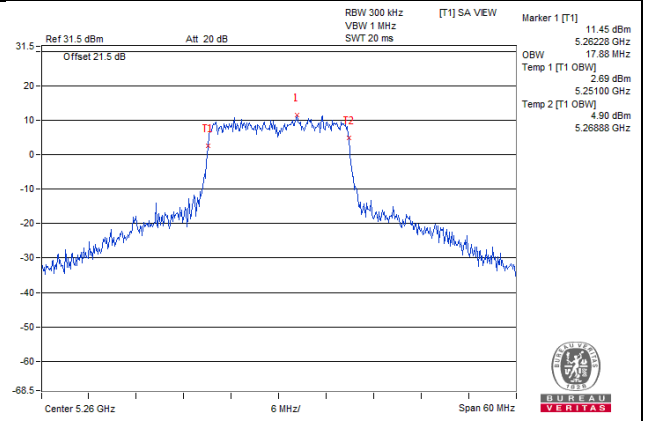
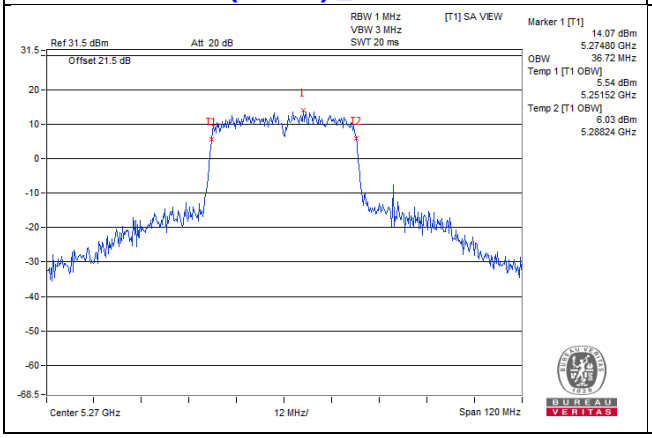
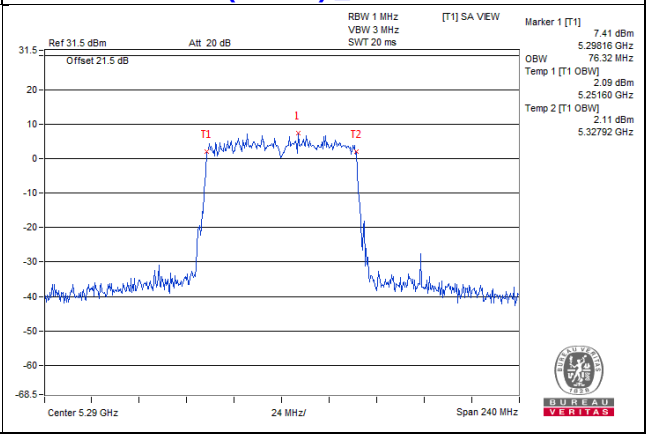
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.88	17.76
60	5300	17.76	17.76
64	5320	17.76	17.64
100	5500	17.76	17.76
116	5580	17.76	17.64
140	5700	17.76	17.76
144 (UNII-2C Band)	5720	13.88	13.88
144 (UNII-3 Band)	5720	3.88	3.88

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.48	36.72
62	5310	36.24	36.24
102	5510	36.48	36.00
110	5550	36.24	36.24
134	5670	36.24	36.24
142 (UNII-2C Band)	5710	33.40	33.20
142 (UNII-3 Band)	5710	3.20	3.00

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	76.32	76.32
106	5530	75.84	75.36
122	5610	76.32	75.84
138 (UNII-2C Band)	5690	72.92	72.92
138 (UNII-3 Band)	5690	2.92	2.92

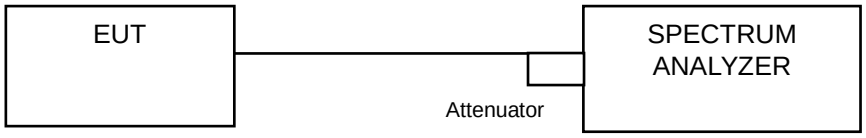
Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH52	**802.11ac (VHT20)_ Chain 0 / CH52**
	
802.11ac (VHT40) _Chain 1 / CH54	**802.11ac (VHT80) _Chain 0 / CH58**
	

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

802.11ac (VHT20)

For U-NII-2A, UNII-2C:

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

For U-NII-3:

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(500 kHz/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)

For U-NII-2A, UNII-2C:

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:

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(500 kHz/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

For UNII-2A & UNII-2C:

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				
52	5260	6.93	6.67	0.16	9.97	10.46	Pass
60	5300	7.00	6.23	0.16	9.80	10.46	Pass
64	5320	5.89	5.60	0.16	8.92	10.46	Pass
100	5500	5.93	5.19	0.16	8.75	10.46	Pass
116	5580	6.85	6.38	0.16	9.79	10.46	Pass
140	5700	2.70	3.01	0.16	6.03	10.46	Pass
144 (UNII-2C Band)	5720	7.29	6.88	0.16	10.26	10.46	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[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 11-(6.54-6) = 10.46dBm.
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			
52	5260	6.90	6.72	9.82	10.46	Pass
60	5300	6.52	6.40	9.47	10.46	Pass
64	5320	5.90	5.57	8.75	10.46	Pass
100	5500	5.71	5.83	8.78	10.46	Pass
116	5580	7.10	6.61	9.87	10.46	Pass
140	5700	4.14	3.96	7.06	10.46	Pass
144 (UNII-2C Band)	5720	6.84	6.91	9.89	10.46	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[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 11-(6.54-6) = 10.46dBm.

802.11ac (VHT40)

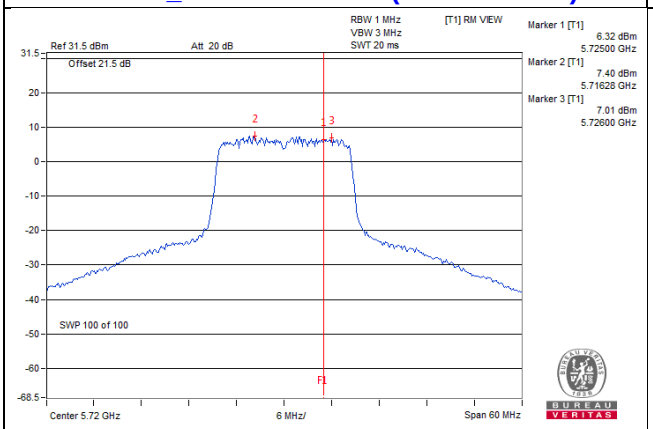
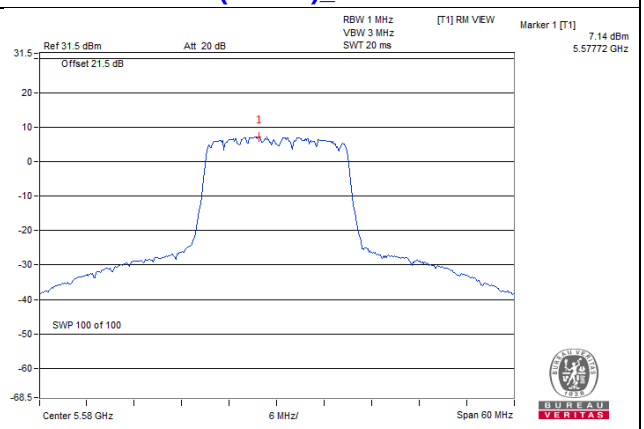
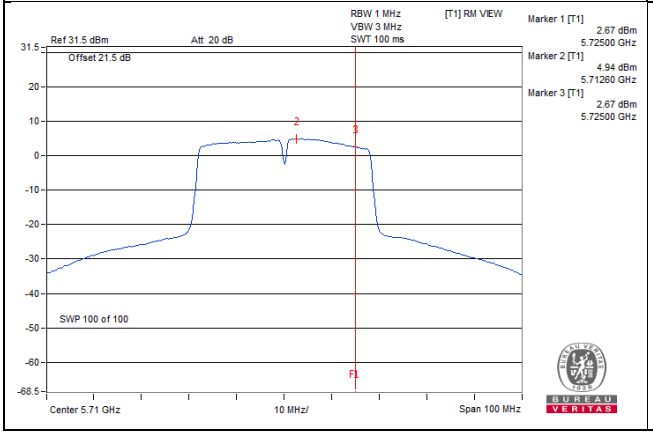
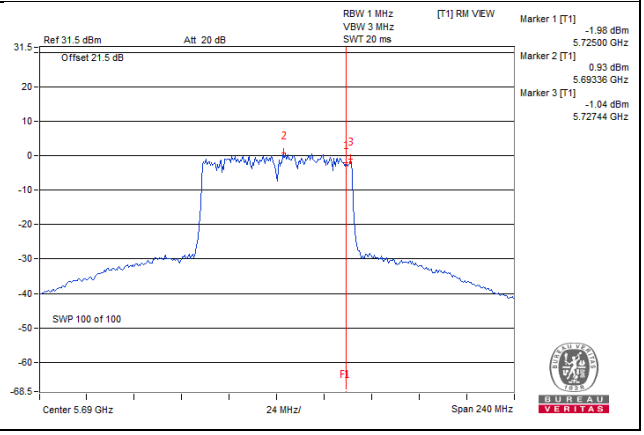
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	4.04	3.59	0.15	6.98	10.46	Pass
62	5310	0.42	0.84	0.15	3.80	10.46	Pass
102	5510	0.99	0.83	0.15	4.07	10.46	Pass
110	5550	3.40	3.47	0.15	6.60	10.46	Pass
134	5670	1.84	1.26	0.15	4.72	10.46	Pass
142 (UNII-2C Band)	5710	4.94	4.33	0.15	7.81	10.46	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[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 11-(6.54-6) = 10.46dBm.
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				
58	5290	-3.45	-4.84	0.30	-0.78	10.46	Pass
106	5530	-2.52	-3.45	0.30	0.35	10.46	Pass
122	5610	-1.56	-0.55	0.30	2.29	10.46	Pass
138 (UNII-2C Band)	5690	0.93	0.39	0.30	3.98	10.46	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[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 11-(6.54-6) = 10.46dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH144 (UNII-2C Band)	**802.11ac (VHT20)_Chain 0 / CH116**
	
802.11ac (VHT40)_Chain 0 / CH142 (UNII-2C Band)	**802.11ac (VHT80)_Chain 0 / CH138 (UNII-2C Band)**
	

For UNII-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	144 (UNII-3 Band)	5720	-1.26	0.96	3.01	0.16	4.13	29.46	Pass
1	144 (UNII-3 Band)	5720	-1.70	0.52	3.01	0.16	3.69	29.46	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 30-(6.54-6) = 29.46dBm.

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

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	144 (UNII-3 Band)	5720	-1.48	0.74	3.01	3.75	29.46	Pass
1	144 (UNII-3 Band)	5720	-1.48	0.74	3.01	3.75	29.46	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 30-(6.54-6) = 29.46dBm.

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	142 (UNII-3 Band)	5710	-5.59	-3.37	3.01	0.15	-0.21	29.46	Pass
1	142 (UNII-3 Band)	5710	-5.84	-3.62	3.01	0.15	-0.46	29.46	Pass

Note: 1. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 30-(6.54-6) = 29.46dBm.

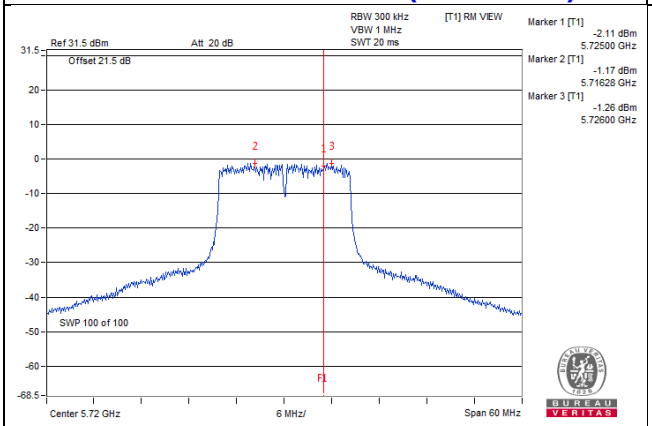
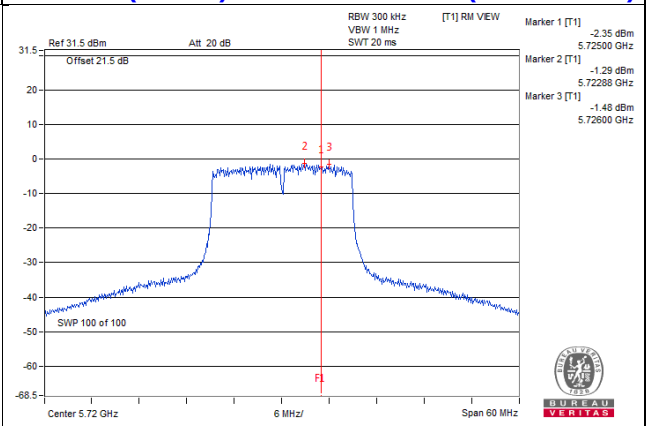
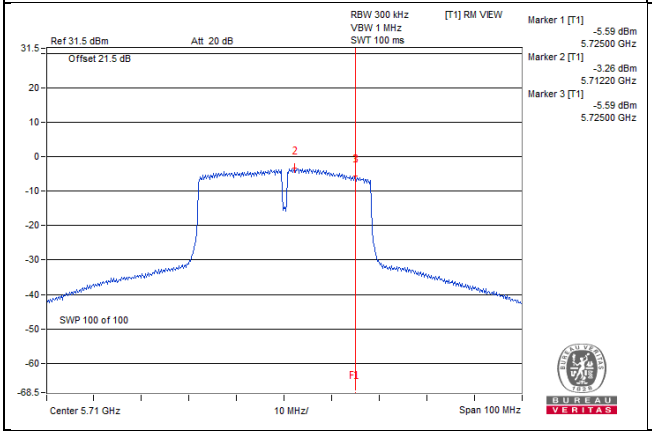
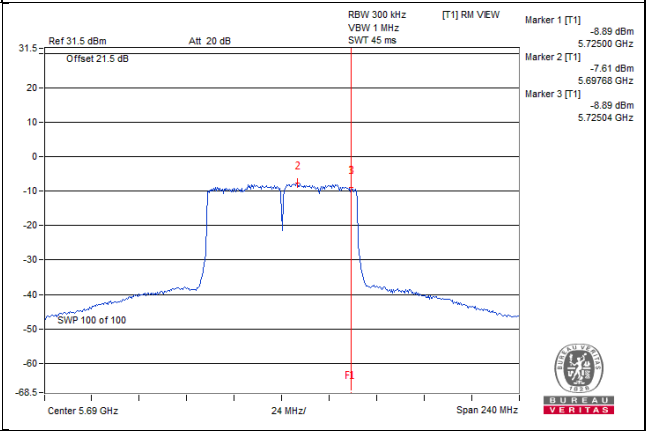
2. Refer to section 3.3 for duty cycle spectrum plot.

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	138 (UNII-3 Band)	5690	-9.69	-7.47	3.01	0.30	-4.16	29.46	Pass
1	138 (UNII-3 Band)	5690	-8.89	-6.67	3.01	0.30	-3.36	29.46	Pass

Note: 1. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 6.54dBi > 6dBi , so the power density limit shall be reduced to 30-(6.54-6) = 29.46dBm.

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

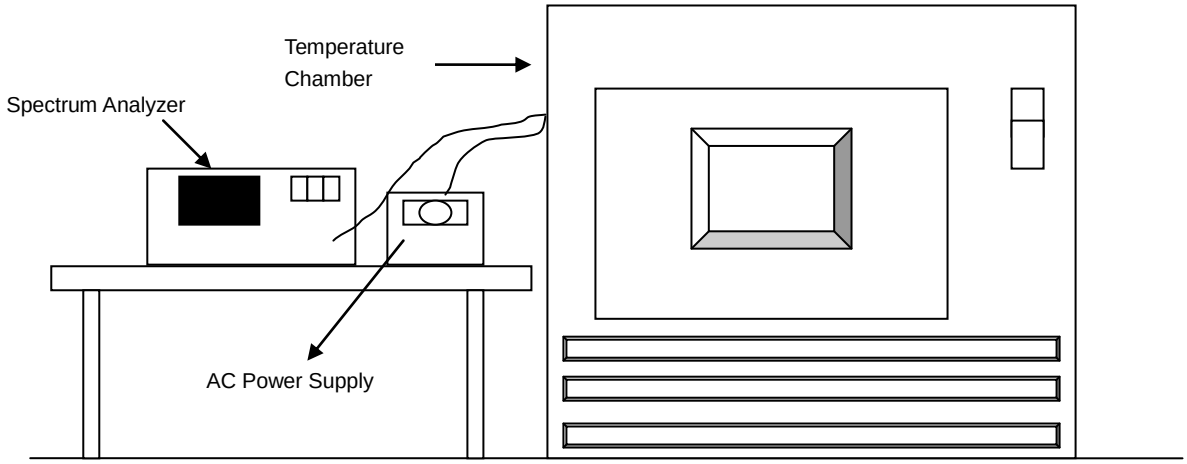
Spectrum Plot of Worst Value	
802.11a / Chain 0 – CH144 (UNII-3 Band)	**802.11ac (VHT20) / Chain 0 – CH144 (UNII-3 Band)**
	
802.11ac (VHT40) / Chain 0 – CH142 (UNII-3 Band)	**802.11ac (VHT80) / Chain 1 – CH138 (UNII-3 Band)**
	

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 AC 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: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	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	120	5259.9923	PASS	5259.9923	PASS	5259.9912	PASS	5259.991	PASS
40	120	5260.0049	PASS	5260.0065	PASS	5260.0041	PASS	5260.0035	PASS
30	120	5259.9956	PASS	5259.9981	PASS	5259.9945	PASS	5259.9951	PASS
20	120	5259.9895	PASS	5259.9882	PASS	5259.9875	PASS	5259.9899	PASS
10	120	5260.0137	PASS	5260.0139	PASS	5260.0152	PASS	5260.0147	PASS
0	120	5260.0118	PASS	5260.0123	PASS	5260.0103	PASS	5260.0127	PASS
-10	120	5260.0127	PASS	5260.0099	PASS	5260.0137	PASS	5260.0119	PASS
-20	120	5260.0005	PASS	5260.0007	PASS	5259.9991	PASS	5259.9986	PASS
-30	120	5259.9951	PASS	5259.9948	PASS	5259.9921	PASS	5259.9936	PASS

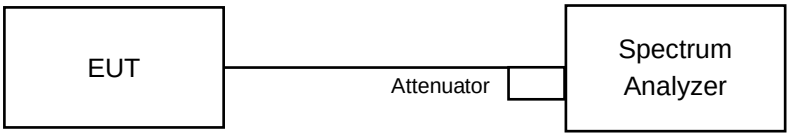
Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5259.989	PASS	5259.9892	PASS	5259.9884	PASS	5259.9904	PASS
	120	5259.9895	PASS	5259.9882	PASS	5259.9875	PASS	5259.9899	PASS
	102	5259.9888	PASS	5259.9879	PASS	5259.9873	PASS	5259.9892	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		
144 (UNII-3 Band)	5720	3.17	3.21	0.5	Pass

802.11ac (VHT20)

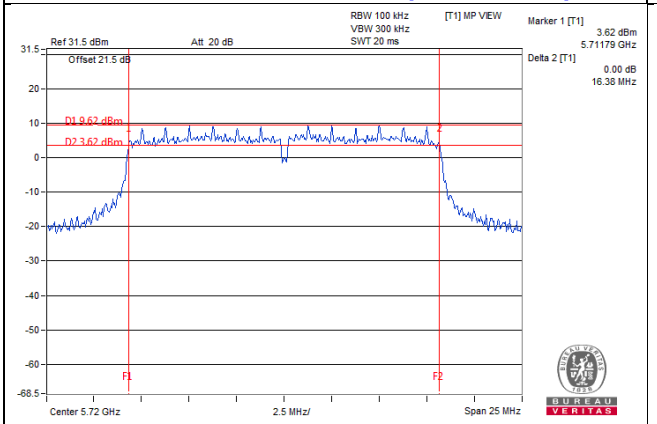
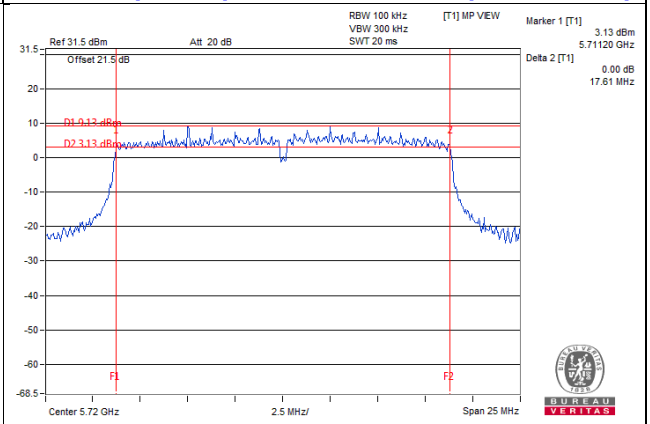
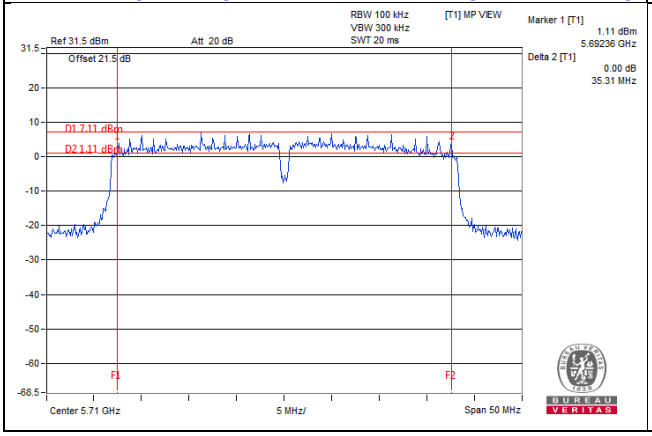
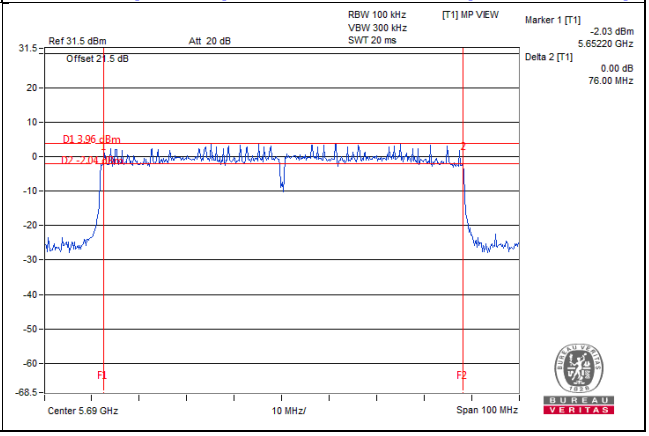
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144 (UNII-3 Band)	5720	3.81	3.81	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142 (UNII-3 Band)	5710	2.67	2.80	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138 (UNII-3 Band)	5690	3.20	3.22	0.5	Pass

Spectrum Plot of Worst Value	
802.11a / Chain 0 - CH144 (UNII-3 Band)	**802.11ac (VHT20) / Chain 0 - CH144 (UNII-3 Band)**
	
802.11ac (VHT40) / Chain 0 - CH142 (UNII-3 Band)	**802.11ac (VHT80) / Chain 0 - CH138 (UNII-3 Band)**
	

Note: The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

5 Pictures of Test Arrangements

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

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:

Linkou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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.

--- END ---