

FCC Test Report

Report No.: RF160322E08A-1

FCC ID: 2ABTEG2100

Test Model: Fios-G2100

Received Date: Mar. 22, 2016

Test Date: June 21 to July 07, 2016

Issued Date: Nov. 21, 2016

Applicant: Verizon Online LLC

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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT (DFS Band)	7
3.2 Description of Test Modes	11
3.2.1 Test Mode Applicability and Tested Channel Detail	12
3.3 Duty Cycle of Test Signal	15
3.4 Description of Support Units	16
3.4.1 Configuration of System under Test	17
3.5 General Description of Applied Standard	18
4 Test Types and Results	19
4.1 Radiated Emission and Bandedge Measurement	19
4.1.1 Limits of Radiated Emission and Bandedge Measurement	19
4.1.2 Test Instruments	20
4.1.3 Test Procedure	21
4.1.4 Deviation from Test Standard	21
4.1.5 Test Setup	22
4.1.6 EUT Operating Condition	22
4.1.7 Test Results	23
4.2 Conducted Emission Measurement	43
4.2.1 Limits of Conducted Emission Measurement	43
4.2.2 Test Instruments	43
4.2.3 Test Procedure	44
4.2.4 Deviation from Test Standard	44
4.2.5 Test Setup	44
4.2.6 EUT Operating Condition	44
4.2.7 Test Results	45
4.3 Transmit Power Measurement	47
4.3.1 Limits of Transmit Power Measurement	47
4.3.2 Test Setup	48
4.3.3 Test Instruments	48
4.3.4 Test Procedure	49
4.3.5 Deviation from Test Standard	49
4.3.6 EUT Operating Condition	49
4.3.7 Test Result	50
4.4 Peak Power Spectral Density Measurement	71
4.4.1 Limits of Peak Power Spectral Density Measurement	71
4.4.2 Test Setup	71
4.4.3 Test Instruments	71
4.4.4 Test Procedure	71
4.4.5 Deviation from Test Standard	72
4.4.6 EUT Operating Condition	72
4.4.7 Test Results	73
4.5 Frequency Stability Measurement	85
4.5.1 Limits of Frequency Stability Measurement	85
4.5.2 Test Setup	85
4.5.3 Test Instruments	85
4.5.4 Test Procedure	85
4.5.5 Deviation from Test Standard	85
4.5.6 EUT Operating Condition	85

4.5.7 Test Results	86
4.6 6dB Bandwidth Measurment	87
4.6.1 Limits of 6dB Bandwidth Measurement	87
4.6.2 Test Setup	87
4.6.3 Test Instruments	87
4.6.4 Test Procedure	87
4.6.5 Deviation from Test Standard	87
4.6.6 EUT Operating Condition	87
4.6.7 Test Results	88
5 Pictures of Test Arrangements	90
Appendix – Information on the Testing Laboratories	91

Release Control Record

Issue No.	Description	Date Issued
RF160322E08A-1	Original release.	Nov. 21, 2016

1 Certificate of Conformity

Product: Fios-G2100

Brand: Verizon

Test Model: Fios-G2100

Sample Status: R&D SAMPLE

Applicant: Verizon Online LLC

Test Date: June 21 to July 07, 2016

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10: 2013

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

Prepared by :



Date:

Nov. 21, 2016

Claire Kuan / Specialist

Approved by :



Date:

Nov. 21, 2016

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 -12.33dB at 24.00000MHz.
15.407(b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.4dB at 5470.00MHz
15.407(a)(1/2/3)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is I-PEX not a standard connector.

- NOTE:** 1. This report is prepared for FCC class II permissive change. (Add DFS band: 5.26GHz ~ 5.32GHz, 5.5GHz ~ 5.7GHz).
2. The DFS report was recorded in another test report.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS Band)

Product	Fios-G2100
Brand	Verizon
Test Model	Fios-G2100
Status of EUT	R&D SAMPLE
Power Supply Rating	DC 19V from Adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	OFDM
Transfer Rate	802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	5.26GHz ~ 5.32GHz, 5.50GHz ~ 5.72GHz
Number of Channel	16 for 802.11n (HT20), 802.11ac (VHT20) 8 for 802.11n (HT40), 802.11ac (VHT40) 4 for 802.11ac (VHT80)
Output Power	CDD Mode 5.26 ~ 5.32GHz: 246.747mW 5.5 ~ 5.72GHz: 229.5mW SDM Mode: 5.26 ~ 5.32GHz: 246.747mW 5.5 ~ 5.72GHz: 229.5mW Beamforming Mode: 5.26 ~ 5.32GHz: 246.747mW 5.5 ~ 5.72GHz: 229.5mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

- This report is prepared for FCC Class II change. The difference compared with the Report No.: RF160322E08-1 design is as the following:
◆ Add DFS band <5250~5350MHz & 5470~5725MHz>
- According to above conditions, all test items need to be performed. And all data were verified to meet the requirements.
- Simultaneously transmission condition.

Condition	Technology				
1	WLAN (2.4GHz)	WLAN (5GHz)	Zigbee	Z-wave	DECT 6.0

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

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

WLAN					
5GHz					
Antenna No.	Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
1	Chain (0)	4.37	5150~5250	PCB	i-pex(MHF)
		4.92	5250~5350		
		4.23	5470~5725		
		4.23	5725~5850		
2	Chain (1)	4.13	5150~5250	PCB	i-pex(MHF)
		4.06	5250~5350		
		4.03	5470~5725		
		4.03	5725~5850		
3	Chain (2)	3.01	5150~5250	PCB	i-pex(MHF)
		3.72	5250~5350		
		4.79	5470~5725		
		4.71	5725~5850		
4	Chain (3)	3.87	5150~5250	PCB	i-pex(MHF)
		4.26	5250~5350		
		4.61	5470~5725		
		4.3	5725~5850		
2.4GHz					
Antenna No.	Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
5	Chain (0)	3.9	2400~2483.5	PCB	i-pex(MHF)
6	Chain (1)	5.1			
7	Chain (2)	3.95			
8	Chain (3)	3.51			
DECT					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
9	5.46		1920~1930	Embedded	NA
10	5.46		1920~1930	Embedded	NA
Z-wave					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
11	1.02		908~916	On Board Printed	NA
Zigbee					
Antenna No.	Antenna Gain(dBi)		Frequency range (MHz ~ MHz)	Antenna Type	Connector Type
12	4.23		2400~2483.5	On Board Printed	NA
Note 1. For WLAN 2.4GHz will fix transmission on Chain (0), Chain (1) and Chain (2).					

Note 1. For WLAN 2.4GHz will fix transmission on Chain (0), Chain (1) and Chain (2).

The Directional gain table:

Frequency	Max Gain (dBi)
2.4GHz	5.85
5GHz	4.61

Note:

1. Non-TxBF mode & TxBF mode antenna gain refer to KDB 662911 F 2) f) (ii)

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

5. The EUT must be supplied with a adapter as following table:

Brand	Model No.	Spec.	Remark
Verizon	ADP-57AR A	Input: 105-125Vac, 1.5A, 60Hz AC input cable: Unshielded, 3ft Output: 19Vdc, 3.0A DC output cable: Unshielded, 1.8m	DELTA

6. The EUT incorporates a MIMO function.

2.4GHz			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11b	1 ~ 11Mbps	3TX	4RX
802.11g	6 ~ 54Mbps	3TX	4RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	3TX	4RX
	MCS 8~15	3TX	4RX
	MCS 16~23	3TX	4RX
VHT20	MCS0~8 Nss=1	3TX	4RX
	MCS0~8 Nss=2	3TX	4RX
	MCS0~9 Nss=3	3TX	4RX
VHT40	MCS0~9 Nss=1	3TX	4RX
	MCS0~9 Nss=2	3TX	4RX
	MCS0~9 Nss=3	3TX	4RX
5GHz			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS0~8 Nss=1	4TX	4RX
	MCS0~8 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~8 Nss=4	4TX	4RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX

Note: 1. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
2. All of modulation mode support beamforming function except 2.4GHz mode.

7. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

4 channels are provided for 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	5290 MHz

FOR 5500 ~ 5720MHz

12 channels are provided for 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

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)
802.11ac (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
SDM MODE						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	5500-5720	102 to 142	102	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106	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 (VHT80)	5260-5320	58	58	OFDM	BPSK	29.3
802.11ac (VHT80)	5500-5720	106 to 138		OFDM	BPSK	29.3

Power Line Conducted Emission Test:

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

CDD MODE						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	5260-5320 5500-5720	52 to 64 100 to 144	54	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

Max Average Transmit Power						
CDD MODE						
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
SDM MODE						
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

Beamforming MODE						
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
Peak Power Spectral Density						
CDD MODE						
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
SDM MODE						
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, 70%RH	120Vac, 60Hz	Russell Yeh
RE _{<} 1G	25deg. C, 66%RH	120Vac, 60Hz	Weiwei Lo
PLC	24deg. C, 62%RH	120Vac, 60Hz	JyunChun Lin
APCM	18deg. C, 64%RH	120Vac, 60Hz	Anderson Chen

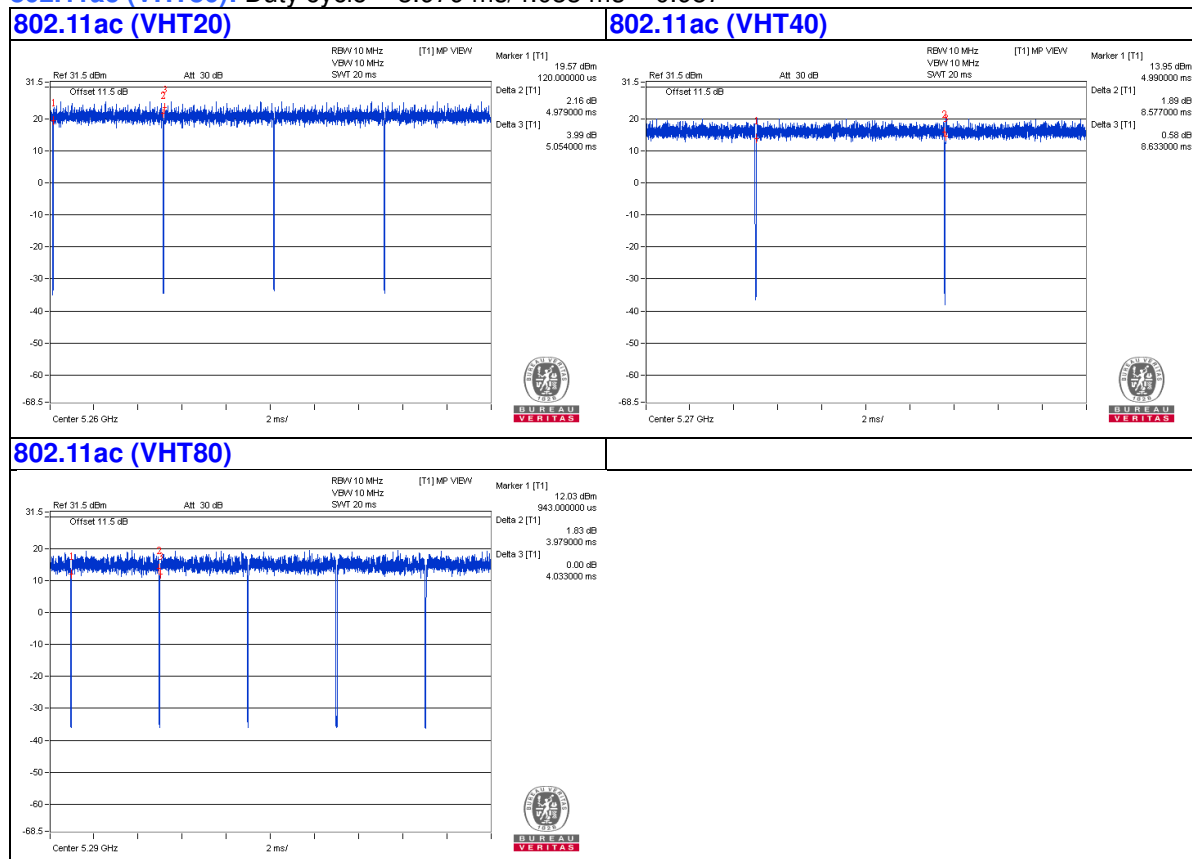
3.3 Duty Cycle of Test Signal

Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11ac (VHT20): Duty cycle = 4.979 ms/5.054 ms = 0.985

802.11ac (VHT40): Duty cycle = 8.577 ms/8.633 ms = 0.994

802.11ac (VHT80): Duty cycle = 3.979 ms/4.033 ms = 0.987



3.4 Description of Support Units

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

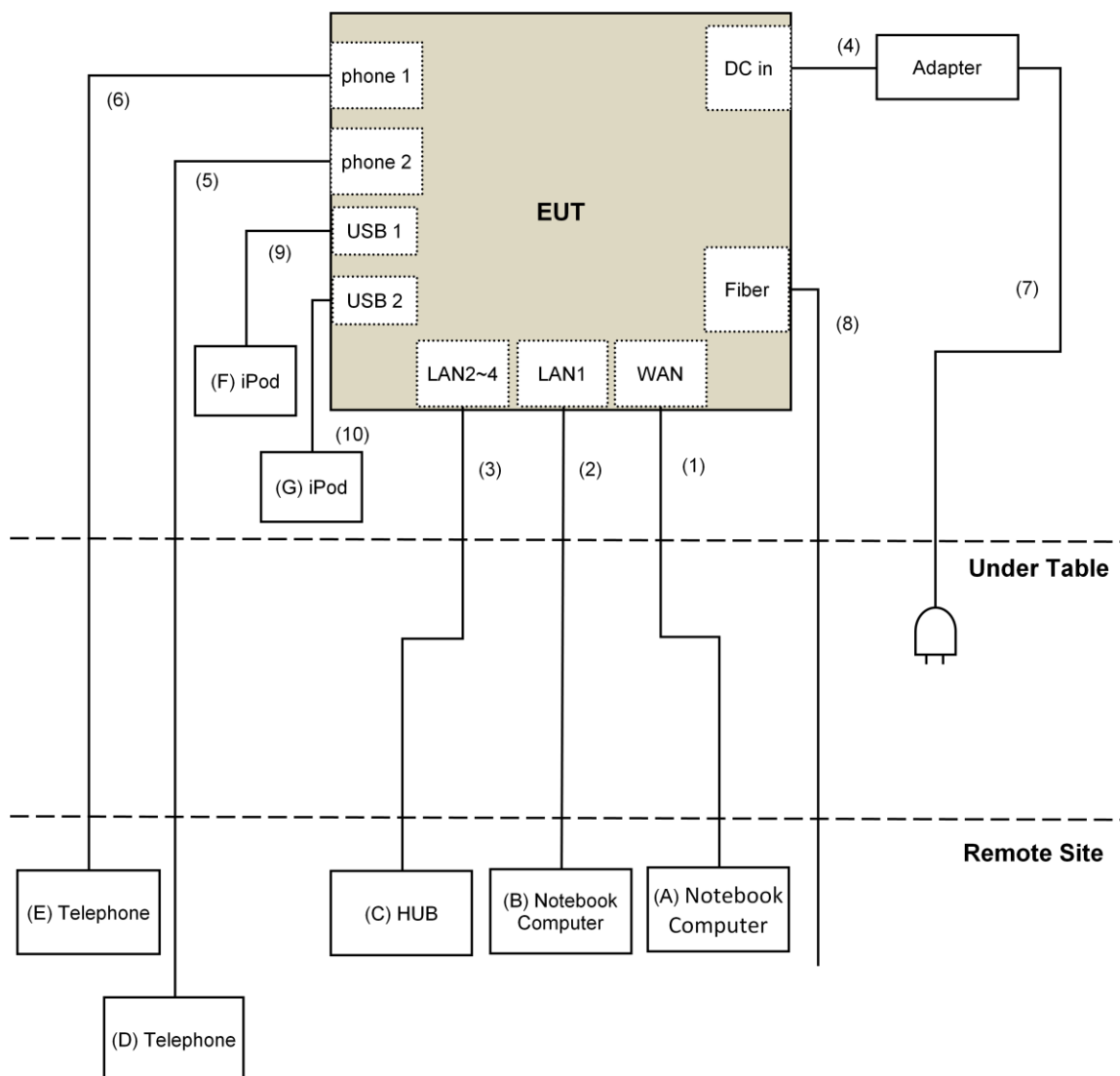
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook Computer	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Notebook Computer	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	Telephone	DAISHO	DS-03	NA	NA	Provided by Lab
E.	Telephone	ROMEO	TE-812	97280903	NA	Provided by Lab
F.	iPod	Apple	MC749TA/A	CC4DMFJUDFDM	NA	Provided by Lab
G.	iPod	Apple	MC749TA/A	CC4DN25WDFDM	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45	1	10	No	0	Provided by Lab
2.	RJ-45	1	10	No	0	Provided by Lab
3.	RJ-45	3	10	No	0	Provided by Lab
4.	DC	1	1.8	No	0	Supplied by client
5.	RJ-11	1	10	No	0	Provided by Lab
6.	RJ-11	1	10	No	0	Provided by Lab
7.	AC	1	3ft	No	0	Provided by Lab
8.	Fiber	1	10	No	0	Provided by Lab
9.	USB	1	0.1	Yes	0	Provided by Lab
10.	USB	1	0.1	Yes	0	Provided by Lab

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 v01r03

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

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v01r03			Field Strength at 3m	
			PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8(dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 05, 2016	May 04, 2017
Power sensor Anritsu	MA2411B	0917122	May 05, 2016	May 04, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2015	Nov. 09, 2016

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. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date: July 05 to 06, 2016

4.1.3 Test Procedure

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

Note:

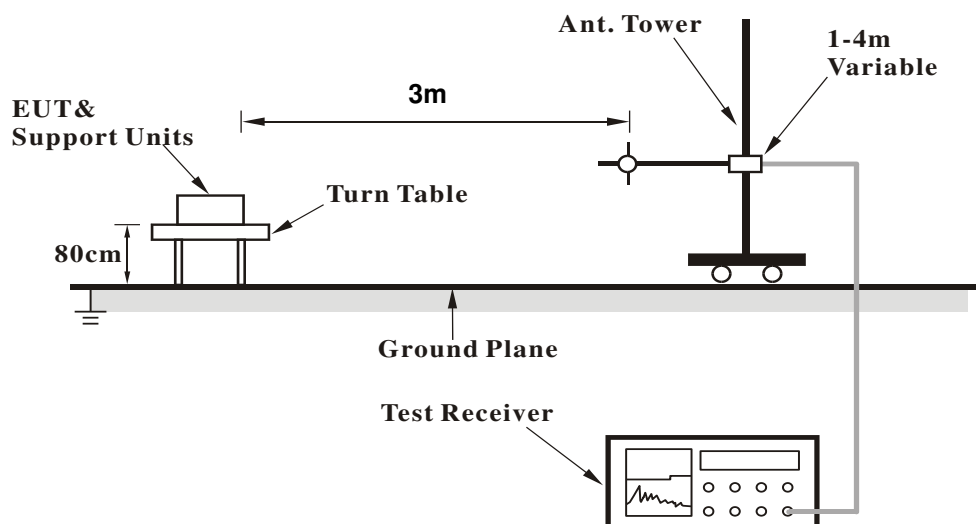
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

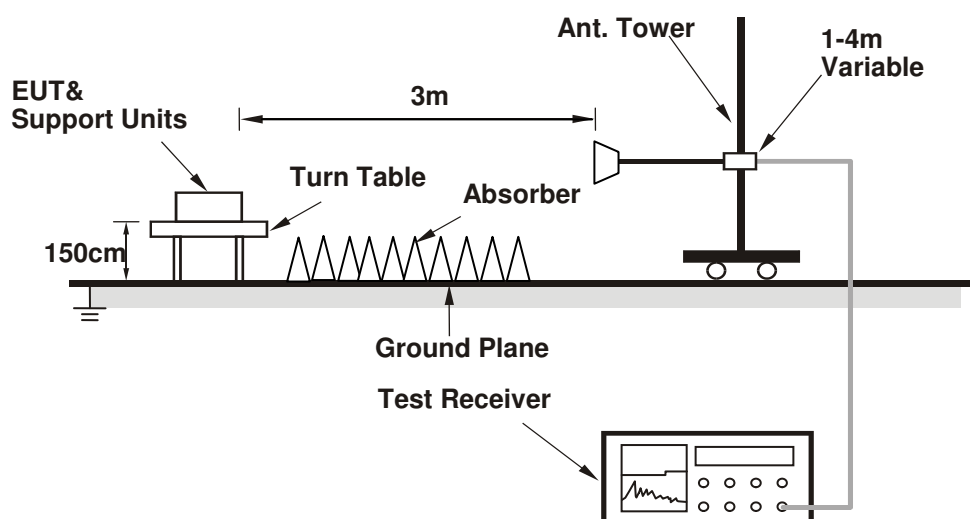
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

1. Connect the EUT with the Notebook Computer which is placed on remote site.
2. Controlling software (Telnet paste 5G.txt command) has been activated to set the EUT on specific status.

4.1.7 Test Results

CDD Mode

Above 1GHz Data:

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	51.4 PK	74.0	-22.6	1.98 H	194	49.8	1.6
2	5150.00	39.2 AV	54.0	-14.8	1.98 H	194	37.6	1.6
3	*5260.00	111.4 PK			1.98 H	194	109.5	1.9
4	*5260.00	96.4 AV			1.98 H	194	94.5	1.9
5	5427.00	53.5 PK	74.0	-20.5	1.98 H	194	51.3	2.2
6	5427.00	43.5 AV	54.0	-10.5	1.98 H	194	41.3	2.2
7	#10520.00	55.4 PK	74.0	-18.6	1.58 H	45	42.9	12.5
8	#10520.00	40.2 AV	54.0	-13.8	1.58 H	45	27.7	12.5
9	15780.00	54.8 PK	74.0	-19.2	1.70 H	222	41.7	13.1
10	15780.00	39.8 AV	54.0	-14.2	1.70 H	222	26.7	13.1

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.3 PK	74.0	-19.7	1.98 V	122	52.7	1.6
2	5150.00	43.2 AV	54.0	-10.8	1.98 V	122	41.6	1.6
3	*5260.00	114.6 PK			1.98 V	122	112.7	1.9
4	*5260.00	105.2 AV			1.98 V	122	103.3	1.9
5	5427.00	59.3 PK	74.0	-14.7	1.98 V	122	57.1	2.2
6	5427.00	47.6 AV	54.0	-6.4	1.98 V	122	45.4	2.2
7	#10520.00	56.3 PK	74.0	-17.7	1.44 V	272	43.8	12.5
8	#10520.00	42.1 AV	54.0	-11.9	1.44 V	272	29.6	12.5
9	15780.00	55.2 PK	74.0	-18.8	1.32 V	203	42.1	13.1
10	15780.00	40.1 AV	54.0	-13.9	1.32 V	203	27.0	13.1

REMARKS:

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

CHANNEL	TX Channel 60	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	*5300.00	111.5 PK			1.74 H	192	109.5	2.0
2	*5300.00	96.2 AV			1.74 H	192	94.2	2.0
3	10600.00	55.5 PK	74.0	-18.5	1.52 H	40	42.8	12.7
4	10600.00	40.4 AV	54.0	-13.6	1.52 H	40	27.7	12.7
5	15900.00	54.9 PK	74.0	-19.1	1.67 H	218	41.6	13.3
6	15900.00	40.0 AV	54.0	-14.0	1.67 H	218	26.7	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	114.3 PK			2.10 V	303	112.3	2.0
2	*5300.00	105.1 AV			2.10 V	303	103.1	2.0
3	10600.00	56.7 PK	74.0	-17.3	1.49 V	268	44.0	12.7
4	10600.00	42.3 AV	54.0	-11.7	1.49 V	268	29.6	12.7
5	15900.00	55.7 PK	74.0	-18.3	1.29 V	198	42.4	13.3
6	15900.00	40.5 AV	54.0	-13.5	1.29 V	198	27.2	13.3

REMARKS:

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

CHANNEL	TX Channel 64	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	*5320.00	111.7 PK			1.79 H	196	109.7	2.0
2	*5320.00	96.3 AV			1.79 H	196	94.3	2.0
3	5350.00	53.9 PK	74.0	-20.1	1.79 H	196	51.8	2.1
4	5350.00	43.7 AV	54.0	-10.3	1.79 H	196	41.6	2.1
5	10640.00	55.6 PK	74.0	-18.4	1.48 H	39	42.9	12.7
6	10640.00	40.6 AV	54.0	-13.4	1.48 H	39	27.9	12.7
7	15960.00	54.7 PK	74.0	-19.3	1.70 H	220	41.6	13.1
8	15960.00	39.7 AV	54.0	-14.3	1.70 H	220	26.6	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	114.5 PK			1.94 V	294	112.5	2.0
2	*5320.00	105.5 AV			1.94 V	294	103.5	2.0
3	5350.00	58.5 PK	74.0	-15.5	1.94 V	294	56.4	2.1
4	5350.00	47.1 AV	54.0	-6.9	1.94 V	294	45.0	2.1
5	10640.00	56.0 PK	74.0	-18.0	1.56 V	270	43.3	12.7
6	10640.00	41.8 AV	54.0	-12.2	1.56 V	270	29.1	12.7
7	15960.00	54.7 PK	74.0	-19.3	1.34 V	200	41.6	13.1
8	15960.00	39.8 AV	54.0	-14.2	1.34 V	200	26.7	13.1

REMARKS:

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

CHANNEL	TX Channel 100	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	53.8 PK	74.0	-20.2	1.68 H	201	51.5	2.3
2	#5470.00	43.5 AV	54.0	-10.5	1.68 H	201	41.2	2.3
3	*5500.00	111.0 PK			1.68 H	201	108.7	2.3
4	*5500.00	95.8 AV			1.68 H	201	93.5	2.3
5	11000.00	55.4 PK	74.0	-18.6	1.60 H	33	42.0	13.4
6	11000.00	40.5 AV	54.0	-13.5	1.60 H	33	27.1	13.4
7	#16500.00	54.4 PK	74.0	-19.6	1.69 H	214	38.8	15.6
8	#16500.00	39.6 AV	54.0	-14.4	1.69 H	214	24.0	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	59.1 PK	74.0	-14.9	1.68 V	277	56.8	2.3
2	#5470.00	47.6 AV	54.0	-6.4	1.68 V	277	45.3	2.3
3	*5500.00	114.6 PK			1.68 V	277	112.3	2.3
4	*5500.00	105.5 AV			1.68 V	277	103.2	2.3
5	11000.00	56.6 PK	74.0	-17.4	1.51 V	278	43.2	13.4
6	11000.00	42.6 AV	54.0	-11.4	1.51 V	278	29.2	13.4
7	#16500.00	55.7 PK	74.0	-18.3	1.39 V	208	40.1	15.6
8	#16500.00	40.6 AV	54.0	-13.4	1.39 V	208	25.0	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 116	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	*5580.00	111.9 PK			1.68 H	199	109.4	2.5
2	*5580.00	96.4 AV			1.68 H	199	93.9	2.5
3	11160.00	55.2 PK	74.0	-18.8	1.50 H	29	41.9	13.3
4	11160.00	40.1 AV	54.0	-13.9	1.50 H	29	26.8	13.3
5	#16740.00	55.1 PK	74.0	-18.9	1.66 H	217	38.7	16.4
6	#16740.00	39.9 AV	54.0	-14.1	1.66 H	217	23.5	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	114.6 PK			1.85 V	353	112.1	2.5
2	*5580.00	105.2 AV			1.85 V	353	102.7	2.5
3	11160.00	56.0 PK	74.0	-18.0	1.54 V	282	42.7	13.3
4	11160.00	41.8 AV	54.0	-12.2	1.54 V	282	28.5	13.3
5	#16740.00	55.3 PK	74.0	-18.7	1.44 V	212	38.9	16.4
6	#16740.00	40.2 AV	54.0	-13.8	1.44 V	212	23.8	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)
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	*5700.00	111.9 PK			1.76 H	191	109.1	2.8
2	*5700.00	96.4 AV			1.76 H	191	93.6	2.8
3	#5725.00	53.5 PK	74.0	-20.5	1.76 H	191	50.7	2.8
4	#5725.00	43.5 AV	54.0	-10.5	1.76 H	191	40.7	2.8
5	11400.00	55.4 PK	74.0	-18.6	1.55 H	27	42.0	13.4
6	11400.00	40.1 AV	54.0	-13.9	1.55 H	27	26.7	13.4
7	#17100.00	54.5 PK	74.0	-19.5	1.61 H	221	36.6	17.9
8	#17100.00	39.7 AV	54.0	-14.3	1.61 H	221	21.8	17.9

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	*5700.00	114.4 PK			1.52 V	275	111.6	2.8
2	*5700.00	104.8 AV			1.52 V	275	102.0	2.8
3	#5725.00	59.7 PK	74.0	-14.3	1.52 V	275	56.9	2.8
4	#5725.00	47.8 AV	54.0	-6.2	1.52 V	275	45.0	2.8
5	11400.00	56.4 PK	74.0	-17.6	1.57 V	276	43.0	13.4
6	11400.00	42.4 AV	54.0	-11.6	1.57 V	276	29.0	13.4
7	#17100.00	55.8 PK	74.0	-18.2	1.38 V	219	37.9	17.9
8	#17100.00	40.5 AV	54.0	-13.5	1.38 V	219	22.6	17.9

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 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	*5720.00	111.6 PK			1.83 H	188	108.9	2.7
2	*5720.00	96.4 AV			1.83 H	188	93.7	2.7
3	#5850.00	56.8 PK	74.0	-17.2	1.83 H	188	54.0	2.8
4	#5850.00	43.5 AV	54.0	-10.5	1.83 H	188	40.7	2.8
5	11440.00	56.1 PK	74.0	-17.9	1.59 H	23	42.8	13.3
6	11440.00	40.7 AV	54.0	-13.3	1.59 H	23	27.4	13.3
7	#17160.00	54.8 PK	74.0	-19.2	1.56 H	218	36.8	18.0
8	#17160.00	40.0 AV	54.0	-14.0	1.56 H	218	22.0	18.0

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	*5720.00	114.0 PK			1.56 V	276	111.3	2.7
2	*5720.00	104.9 AV			1.56 V	276	102.2	2.7
3	#5850.00	59.6 PK	74.0	-14.4	1.56 V	276	56.8	2.8
4	#5850.00	47.6 AV	54.0	-6.4	1.56 V	276	44.8	2.8
5	11440.00	56.4 PK	74.0	-17.6	1.54 V	272	43.1	13.3
6	11440.00	42.0 AV	54.0	-12.0	1.54 V	272	28.7	13.3
7	#17160.00	55.6 PK	74.0	-18.4	1.33 V	216	37.6	18.0
8	#17160.00	40.5 AV	54.0	-13.5	1.33 V	216	22.5	18.0

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.

802.11ac (VHT40)

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	52.1 PK	74.0	-21.9	1.75 H	194	50.5	1.6
2	5150.00	41.1 AV	54.0	-12.9	1.75 H	194	39.5	1.6
3	*5270.00	103.8 PK			1.75 H	194	101.8	2.0
4	*5270.00	94.1 AV			1.75 H	194	92.1	2.0
5	5350.00	54.6 PK	74.0	-19.4	1.75 H	194	52.5	2.1
6	5350.00	43.5 AV	54.0	-10.5	1.75 H	194	41.4	2.1
7	#10540.00	54.8 PK	74.0	-19.2	1.88 H	56	42.3	12.5
8	#10540.00	39.9 AV	54.0	-14.1	1.88 H	56	27.4	12.5
9	15810.00	54.7 PK	74.0	-19.3	1.90 H	209	41.6	13.1
10	15810.00	39.9 AV	54.0	-14.1	1.90 H	209	26.8	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.2 PK	74.0	-16.8	1.74 V	109	55.6	1.6
2	5150.00	45.1 AV	54.0	-8.9	1.74 V	109	43.5	1.6
3	*5270.00	111.9 PK			1.74 V	109	109.9	2.0
4	*5270.00	102.4 AV			1.74 V	109	100.4	2.0
5	5350.00	59.6 PK	74.0	-14.4	1.74 V	109	57.5	2.1
6	5350.00	47.9 AV	54.0	-6.1	1.74 V	109	45.8	2.1
7	#10540.00	54.9 PK	74.0	-19.1	1.98 V	285	42.4	12.5
8	#10540.00	39.9 AV	54.0	-14.1	1.98 V	285	27.4	12.5
9	15810.00	55.2 PK	74.0	-18.8	1.94 V	262	42.1	13.1
10	15810.00	40.1 AV	54.0	-13.9	1.94 V	262	27.0	13.1

REMARKS:

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

CHANNEL	TX Channel 62	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	*5310.00	103.9 PK			1.79 H	196	101.9	2.0
2	*5310.00	94.3 AV			1.79 H	196	92.3	2.0
3	5350.00	54.0 PK	74.0	-20.0	1.79 H	196	51.9	2.1
4	5350.00	44.0 AV	54.0	-10.0	1.79 H	196	41.9	2.1
5	10620.00	55.5 PK	74.0	-18.5	1.90 H	60	42.8	12.7
6	10620.00	40.6 AV	54.0	-13.4	1.90 H	60	27.9	12.7
7	15930.00	54.4 PK	74.0	-19.6	2.04 H	215	41.1	13.3
8	15930.00	39.7 AV	54.0	-14.3	2.04 H	215	26.4	13.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	111.7 PK			2.07 V	299	109.7	2.0
2	*5310.00	102.2 AV			2.07 V	299	100.2	2.0
3	5350.00	59.7 PK	74.0	-14.3	2.07 V	299	57.6	2.1
4	5350.00	47.6 AV	54.0	-6.4	2.07 V	299	45.5	2.1
5	10620.00	55.5 PK	74.0	-18.5	2.07 V	280	42.8	12.7
6	10620.00	40.3 AV	54.0	-13.7	2.07 V	280	27.6	12.7
7	15930.00	55.0 PK	74.0	-19.0	1.97 V	255	41.7	13.3
8	15930.00	39.7 AV	54.0	-14.3	1.97 V	255	26.4	13.3

REMARKS:

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

CHANNEL	TX Channel 102	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	67.3 PK	74.0	-6.7	1.88 H	200	65.0	2.3
2	#5470.00	50.4 AV	54.0	-3.6	1.88 H	200	48.1	2.3
3	*5510.00	108.0 PK			1.88 H	200	105.7	2.3
4	*5510.00	97.4 AV			1.88 H	200	95.1	2.3
5	11020.00	55.5 PK	74.0	-18.5	1.94 H	66	42.1	13.4
6	11020.00	40.5 AV	54.0	-13.5	1.94 H	66	27.1	13.4
7	#16530.00	55.2 PK	74.0	-18.8	2.08 H	211	39.4	15.8
8	#16530.00	40.0 AV	54.0	-14.0	2.08 H	211	24.2	15.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	68.8 PK	74.0	-5.2	2.13 V	298	66.5	2.3
2	#5470.00	53.6 AV	54.0	-0.4	2.13 V	298	51.3	2.3
3	*5510.00	112.0 PK			2.13 V	298	109.7	2.3
4	*5510.00	100.7 AV			2.13 V	298	98.4	2.3
5	11020.00	55.6 PK	74.0	-18.4	2.03 V	277	42.2	13.4
6	11020.00	40.6 AV	54.0	-13.4	2.03 V	277	27.2	13.4
7	#16530.00	54.5 PK	74.0	-19.5	2.08 V	249	38.7	15.8
8	#16530.00	39.5 AV	54.0	-14.5	2.08 V	249	23.7	15.8

REMARKS:

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

CHANNEL	TX Channel 110	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	*5550.00	104.1 PK			1.81 H	203	101.6	2.5
2	*5550.00	94.3 AV			1.81 H	203	91.8	2.5
3	11100.00	55.5 PK	74.0	-18.5	1.93 H	200	42.3	13.2
4	11100.00	40.2 AV	54.0	-13.8	1.93 H	200	27.0	13.2
5	#16650.00	54.2 PK	74.0	-19.8	2.05 H	213	38.0	16.2
6	#16650.00	39.4 AV	54.0	-14.6	2.05 H	213	23.2	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	*5550.00	111.6 PK			1.51 V	118	109.1	2.5
2	*5550.00	102.1 AV			1.51 V	118	99.6	2.5
3	11100.00	55.1 PK	74.0	-18.9	2.02 V	283	41.9	13.2
4	11100.00	39.7 AV	54.0	-14.3	2.02 V	283	26.5	13.2
5	#16650.00	55.3 PK	74.0	-18.7	1.91 V	263	39.1	16.2
6	#16650.00	40.2 AV	54.0	-13.8	1.91 V	263	24.0	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.

CHANNEL	TX Channel 134	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	*5670.00	103.5 PK			1.78 H	194	100.9	2.6
2	*5670.00	94.0 AV			1.78 H	194	91.4	2.6
3	#5725.00	53.8 PK	74.0	-20.2	1.78 H	194	51.0	2.8
4	#5725.00	43.6 AV	54.0	-10.4	1.78 H	194	40.8	2.8
5	11340.00	55.0 PK	74.0	-19.0	1.90 H	209	41.2	13.8
6	11340.00	39.9 AV	54.0	-14.1	1.90 H	209	26.1	13.8
7	#17010.00	54.7 PK	74.0	-19.3	2.01 H	218	36.9	17.8
8	#17010.00	39.9 AV	54.0	-14.1	2.01 H	218	22.1	17.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	111.7 PK			1.88 V	312	109.1	2.6
2	*5670.00	102.2 AV			1.88 V	312	99.6	2.6
3	#5725.00	59.7 PK	74.0	-14.3	1.88 V	312	56.9	2.8
4	#5725.00	47.6 AV	54.0	-6.4	1.88 V	312	44.8	2.8
5	11340.00	55.4 PK	74.0	-18.6	2.04 V	288	41.6	13.8
6	11340.00	40.1 AV	54.0	-13.9	2.04 V	288	26.3	13.8
7	#17010.00	54.8 PK	74.0	-19.2	1.94 V	267	37.0	17.8
8	#17010.00	39.6 AV	54.0	-14.4	1.94 V	267	21.8	17.8

REMARKS:

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

CHANNEL	TX Channel 142	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	*5710.00	103.5 PK			1.80 H	202	100.8	2.7
2	*5710.00	93.7 AV			1.80 H	202	91.0	2.7
3	#5850.00	59.6 PK	74.0	-14.4	1.80 H	202	56.8	2.8
4	#5850.00	46.7 AV	54.0	-7.3	1.80 H	202	43.9	2.8
5	11420.00	55.0 PK	74.0	-19.0	1.96 H	211	41.7	13.3
6	11420.00	40.1 AV	54.0	-13.9	1.96 H	211	26.8	13.3
7	#17130.00	55.2 PK	74.0	-18.8	2.07 H	214	37.3	17.9
8	#17130.00	40.1 AV	54.0	-13.9	2.07 H	214	22.2	17.9

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	*5710.00	111.6 PK			1.93 V	293	108.9	2.7
2	*5710.00	102.1 AV			1.93 V	293	99.4	2.7
3	#5850.00	61.9 PK	74.0	-12.1	1.93 V	293	59.1	2.8
4	#5850.00	48.9 AV	54.0	-5.1	1.93 V	293	46.1	2.8
5	11420.00	55.4 PK	74.0	-18.6	2.03 V	282	42.1	13.3
6	11420.00	40.4 AV	54.0	-13.6	2.03 V	282	27.1	13.3
7	#17130.00	54.2 PK	74.0	-19.8	1.97 V	260	36.3	17.9
8	#17130.00	39.4 AV	54.0	-14.6	1.97 V	260	21.5	17.9

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.

802.11ac (VHT80)

CHANNEL	TX Channel 58	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.9 PK	74.0	-19.1	1.84 H	205	53.3	1.6
2	5150.00	43.6 AV	54.0	-10.4	1.84 H	205	42.0	1.6
3	*5290.00	109.7 PK			1.84 H	205	107.7	2.0
4	*5290.00	96.8 AV			1.84 H	205	94.8	2.0
5	5350.00	69.7 PK	74.0	-4.3	1.84 H	205	67.6	2.1
6	5350.00	52.7 AV	54.0	-1.3	1.84 H	205	50.6	2.1
7	#10580.00	55.2 PK	74.0	-18.8	2.10 H	205	42.5	12.7
8	#10580.00	40.0 AV	54.0	-14.0	2.10 H	205	27.3	12.7
9	15870.00	55.0 PK	74.0	-19.0	2.07 H	222	41.7	13.3
10	15870.00	40.1 AV	54.0	-13.9	2.07 H	222	26.8	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.0 PK	74.0	-18.0	2.21 V	301	54.4	1.6
2	5150.00	44.6 AV	54.0	-9.4	2.21 V	301	43.0	1.6
3	*5290.00	110.6 PK			2.21 V	301	108.6	2.0
4	*5290.00	98.6 AV			2.21 V	301	96.6	2.0
5	5350.00	73.5 PK	74.0	-0.5	2.21 V	301	71.4	2.1
6	5350.00	53.5 AV	54.0	-0.5	2.21 V	301	51.4	2.1
7	#10580.00	54.7 PK	74.0	-19.3	2.09 V	277	42.0	12.7
8	#10580.00	39.7 AV	54.0	-14.3	2.09 V	277	27.0	12.7
9	15870.00	54.2 PK	74.0	-19.8	1.93 V	268	40.9	13.3
10	15870.00	39.4 AV	54.0	-14.6	1.93 V	268	26.1	13.3

REMARKS:

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

CHANNEL	TX Channel 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	#5470.00	66.5 PK	74.0	-7.5	1.87 H	201	64.2	2.3
2	#5470.00	50.8 AV	54.0	-3.2	1.87 H	201	48.5	2.3
3	*5530.00	105.8 PK			1.87 H	201	103.4	2.4
4	*5530.00	95.8 AV			1.87 H	201	93.4	2.4
5	11060.00	55.5 PK	74.0	-18.5	2.00 H	204	42.2	13.3
6	11060.00	40.4 AV	54.0	-13.6	2.00 H	204	27.1	13.3
7	#16590.00	55.1 PK	74.0	-18.9	2.13 H	219	38.8	16.3
8	#16590.00	40.1 AV	54.0	-13.9	2.13 H	219	23.8	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	68.9 PK	74.0	-5.1	2.58 V	250	66.6	2.3
2	#5470.00	53.6 AV	54.0	-0.4	2.58 V	250	51.3	2.3
3	*5530.00	108.2 PK			2.58 V	250	105.8	2.4
4	*5530.00	97.3 AV			2.58 V	250	94.9	2.4
5	11060.00	55.0 PK	74.0	-19.0	2.12 V	274	41.7	13.3
6	11060.00	39.9 AV	54.0	-14.1	2.12 V	274	26.6	13.3
7	#16590.00	54.9 PK	74.0	-19.1	1.97 V	267	38.6	16.3
8	#16590.00	40.1 AV	54.0	-13.9	1.97 V	267	23.8	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.

CHANNEL	TX Channel 122	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	*5610.00	109.7 PK			1.71 H	208	107.1	2.6
2	*5610.00	96.8 AV			1.71 H	208	94.2	2.6
3	#5725.00	54.8 PK	74.0	-19.2	1.71 H	208	52.0	2.8
4	#5725.00	44.5 AV	54.0	-9.5	1.71 H	208	41.7	2.8
5	11220.00	56.1 PK	74.0	-17.9	1.95 H	194	42.6	13.5
6	11220.00	40.6 AV	54.0	-13.4	1.95 H	194	27.1	13.5
7	#16830.00	55.0 PK	74.0	-19.0	2.10 H	214	37.9	17.1
8	#16830.00	39.8 AV	54.0	-14.2	2.10 H	214	22.7	17.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5610.00	111.0 PK			1.68 V	94	108.4	2.6
2	*5610.00	98.9 AV			1.68 V	94	96.3	2.6
3	#5725.00	65.2 PK	74.0	-8.8	1.68 V	94	62.4	2.8
4	#5725.00	50.1 AV	54.0	-3.9	1.68 V	94	47.3	2.8
5	11220.00	55.9 PK	74.0	-18.1	1.97 V	274	42.4	13.5
6	11220.00	40.5 AV	54.0	-13.5	1.97 V	274	27.0	13.5
7	#16830.00	54.7 PK	74.0	-19.3	1.90 V	260	37.6	17.1
8	#16830.00	39.9 AV	54.0	-14.1	1.90 V	260	22.8	17.1

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 138	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	*5690.00	109.2 PK			1.75 H	206	106.5	2.7
2	*5690.00	96.3 AV			1.75 H	206	93.6	2.7
3	#5850.00	56.7 PK	74.0	-17.3	1.75 H	206	53.9	2.8
4	#5850.00	43.2 AV	54.0	-10.8	1.75 H	206	40.4	2.8
5	11380.00	55.1 PK	74.0	-18.9	2.01 H	198	41.7	13.4
6	11380.00	40.0 AV	54.0	-14.0	2.01 H	198	26.6	13.4
7	#17070.00	54.8 PK	74.0	-19.2	2.07 H	209	37.0	17.8
8	#17070.00	39.7 AV	54.0	-14.3	2.07 H	209	21.9	17.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5690.00	111.0 PK			2.57 V	296	108.3	2.7
2	*5690.00	98.9 AV			2.57 V	296	96.2	2.7
3	#5850.00	59.8 PK	74.0	-14.2	2.57 V	296	57.0	2.8
4	#5850.00	47.2 AV	54.0	-6.8	2.57 V	296	44.4	2.8
5	11380.00	55.1 PK	74.0	-18.9	2.04 V	271	41.7	13.4
6	11380.00	39.9 AV	54.0	-14.1	2.04 V	271	26.5	13.4
7	#17070.00	54.8 PK	74.0	-19.2	1.86 V	255	37.0	17.8
8	#17070.00	39.6 AV	54.0	-14.4	1.86 V	255	21.8	17.8

REMARKS:

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

Below 1GHz Worst-Case Data:

CHANNEL	TX Channel 58	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	39.21	34.1 QP	40.0	-5.9	1.24 H	100	43.2	-9.1
2	250.11	41.3 QP	46.0	-4.7	1.74 H	100	51.3	-10.0
3	375.11	37.6 QP	46.0	-8.4	1.24 H	300	43.6	-6.0
4	500.11	34.3 QP	46.0	-11.7	1.42 H	27	37.2	-2.8
5	625.11	42.8 QP	46.0	-3.2	1.64 H	134	42.9	-0.1
6	750.14	39.2 QP	46.0	-6.8	1.87 H	96	37.3	1.9
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	84.61	35.1 QP	40.0	-4.9	1.44 V	87	49.4	-14.3
2	108.61	33.0 QP	43.5	-10.5	1.74 V	37	44.6	-11.6
3	250.11	37.2 QP	46.0	-8.8	1.67 V	55	47.2	-10.0
4	375.11	38.2 QP	46.0	-7.8	1.96 V	68	44.3	-6.0
5	500.12	41.5 QP	46.0	-4.5	1.88 V	78	44.4	-2.8
6	625.06	42.7 QP	46.0	-3.3	1.47 V	84	42.7	-0.1

REMARKS:

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

SDM Mode

Above 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 102	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	64.3 PK	74.0	-9.7	1.75 H	206	62.0	2.3
2	#5470.00	53.2 AV	54.0	-0.8	1.75 H	206	50.9	2.3
3	*5510.00	109.2 PK			1.75 H	206	106.9	2.3
4	*5510.00	99.0 AV			1.75 H	206	96.7	2.3
5	11020.00	55.3 PK	74.0	-18.7	1.98 H	73	41.9	13.4
6	11020.00	41.6 AV	54.0	-12.4	1.98 H	73	28.2	13.4
7	#16530.00	55.8 PK	74.0	-18.2	2.12 H	209	40.0	15.8
8	#16530.00	44.4 AV	54.0	-9.6	2.12 H	209	28.6	15.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	64.5 PK	74.0	-9.5	2.41 V	302	62.2	2.3
2	#5470.00	53.6 AV	54.0	-0.4	2.41 V	302	51.3	2.3
3	*5510.00	111.2 PK			2.41 V	302	108.9	2.3
4	*5510.00	101.1 AV			2.41 V	302	98.8	2.3
5	11020.00	54.2 PK	74.0	-19.8	2.05 V	280	40.8	13.4
6	11020.00	42.4 AV	54.0	-11.6	2.05 V	280	29.0	13.4
7	#16530.00	55.9 PK	74.0	-18.1	2.11 V	253	40.1	15.8
8	#16530.00	45.3 AV	54.0	-8.7	2.11 V	253	29.5	15.8

REMARKS:

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

802.11ac (VHT80)

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	#5470.00	62.8 PK	74.0	-11.2	1.78 H	202	60.5	2.3
2	#5470.00	52.8 AV	54.0	-1.2	1.78 H	202	50.5	2.3
3	*5530.00	106.9 PK			1.78 H	202	104.5	2.4
4	*5530.00	97.2 AV			1.78 H	202	94.8	2.4
5	#5725.00	54.7 PK	74.0	-19.3	1.78 H	202	51.9	2.8
6	#5725.00	44.1 AV	54.0	-9.9	1.78 H	202	41.3	2.8
7	11060.00	54.8 PK	74.0	-19.2	1.97 H	202	41.5	13.3
8	11060.00	42.8 AV	54.0	-11.2	1.97 H	202	29.5	13.3
9	#16590.00	56.7 PK	74.0	-17.3	2.07 H	222	40.4	16.3
10	#16590.00	45.3 AV	54.0	-8.7	2.07 H	222	29.0	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	64.2 PK	74.0	-9.8	2.73 V	302	61.9	2.3
2	#5470.00	53.2 AV	54.0	-0.8	2.73 V	302	50.9	2.3
3	*5530.00	107.9 PK			2.73 V	302	105.5	2.4
4	*5530.00	98.1 AV			2.73 V	302	95.7	2.4
5	#5725.00	55.8 PK	74.0	-18.2	2.73 V	302	53.0	2.8
6	#5725.00	44.5 AV	54.0	-9.5	2.73 V	302	41.7	2.8
7	11060.00	55.4 PK	74.0	-18.6	2.07 V	269	42.1	13.3
8	11060.00	43.3 AV	54.0	-10.7	2.07 V	269	30.0	13.3
9	#16590.00	56.9 PK	74.0	-17.1	1.94 V	263	40.6	16.3
10	#16590.00	46.5 AV	54.0	-7.5	1.94 V	263	30.2	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.

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2015	Oct. 22, 2016
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 28, 2015	Oct. 27, 2016
RF Cable	5D-FB	COACAB-002	Mar. 04, 2016	Mar. 03, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	Jun. 20, 2016	Jun. 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3. Tested Date: June 21, 2016

4.2.3 Test Procedure

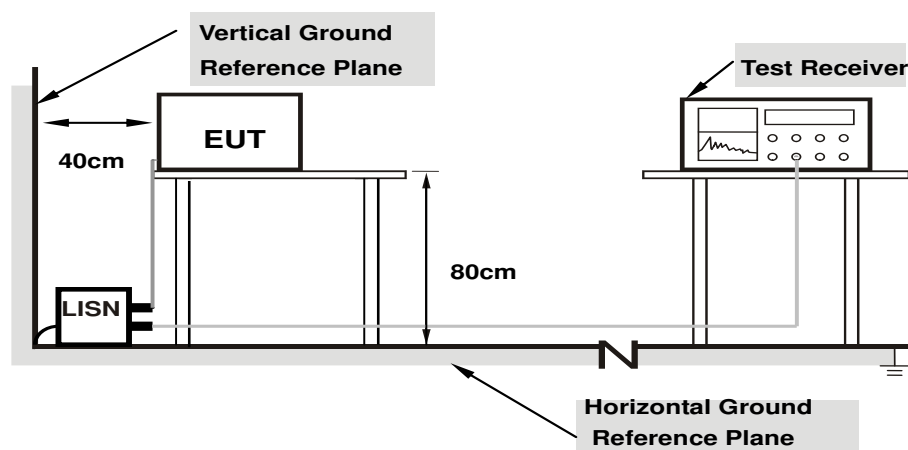
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

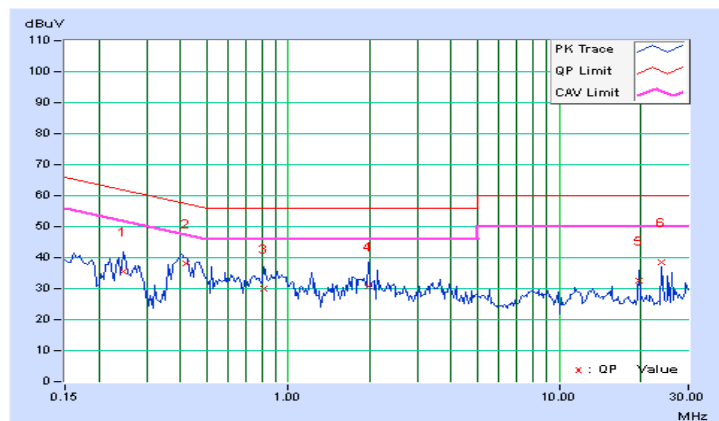
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.24766	10.22	25.33	16.69	35.55	26.91	61.84	51.84	-26.29	-24.93
2	0.41828	10.22	27.86	22.47	38.08	32.69	57.48	47.48	-19.40	-14.79
3	0.81016	10.25	19.60	9.88	29.85	20.13	56.00	46.00	-26.15	-25.87
4	1.98438	10.31	20.33	13.65	30.64	23.96	56.00	46.00	-25.36	-22.04
5	19.68644	11.33	21.29	19.69	32.62	31.02	60.00	50.00	-27.38	-18.98
6	24.00000	11.43	27.18	26.24	38.61	37.67	60.00	50.00	-21.39	-12.33

REMARKS:

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

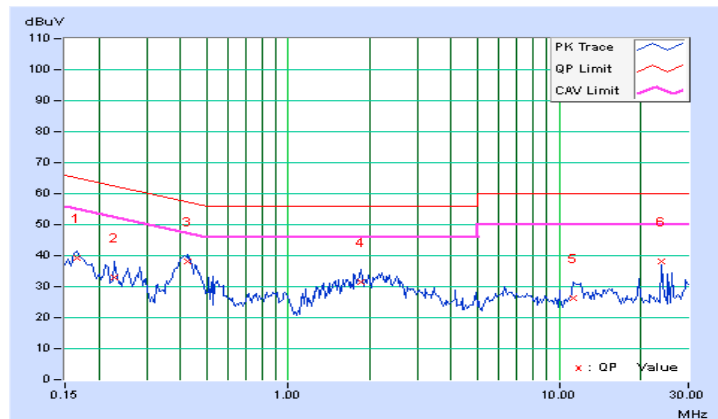


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	10.20	29.08	13.59	39.28	23.79	65.18	55.18	-25.90	-31.39
2	0.22812	10.21	22.71	6.82	32.92	17.03	62.52	52.52	-29.60	-35.49
3	0.42734	10.20	27.82	19.29	38.02	29.49	57.30	47.30	-19.28	-17.81
4	1.85156	10.28	21.19	14.40	31.47	24.68	56.00	46.00	-24.53	-21.32
5	11.33594	10.60	15.88	10.45	26.48	21.05	60.00	50.00	-33.52	-28.95
6	24.00000	11.13	27.02	26.18	38.15	37.31	60.00	50.00	-21.85	-12.69

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

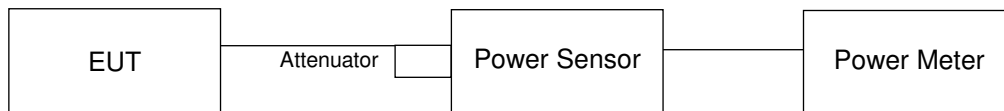
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

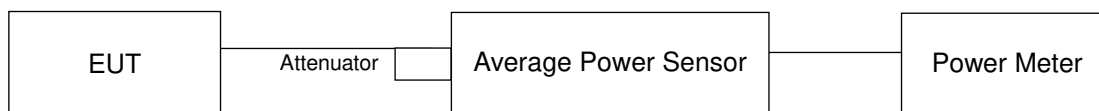
4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

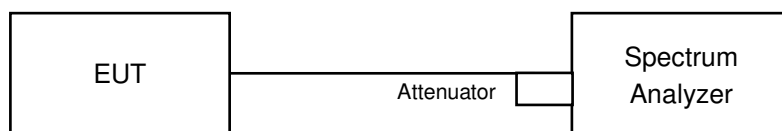
For channel straddling 5725MHz:



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 POWER OUTPUT MEASUREMENT

For channel straddling 5725MHz:

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \times$ 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.

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

802.11ac (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	Chain 2	Chain 3				
52	5260	18.01	17.31	16.46	17.23	214.172	23.31	24.00	Pass
60	5300	17.76	17.24	16.51	17.02	207.791	23.18	24.00	Pass
64	5320	17.78	17.06	16.25	17.32	206.916	23.16	24.00	Pass
100	5500	17.38	17.40	16.38	17.80	213.363	23.29	24.00	Pass
116	5580	17.36	17.46	16.34	17.81	213.617	23.30	24.00	Pass
140	5700	17.29	17.41	16.42	17.98	215.32	23.33	24.00	Pass
144 (UNII-2c Band)	5720	13.87	14.20	12.41	14.17	94.221	19.74	23.33	Pass
144 (UNII-3 Band)	5720	8.39	8.72	7.36	9.20	28.112	14.49	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.

2. The directional gain is 4.61dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*144	5720	122.333	20.88

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	Chain 2	Chain 3
52	5260	23.70	24.23	24.75	24.36
60	5300	23.85	24.18	25.15	24.38
64	5320	23.91	24.22	24.95	25.08
100	5500	23.99	24.10	24.97	25.25
116	5580	23.80	24.23	24.95	24.95
140	5700	24.03	24.02	24.90	25.39
144 (UNII-2c Band)	5720	17.13	17.50	17.55	17.97

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	23.70	24.74 > 24
60	5300	23.85	24.77 > 24
64	5320	23.91	24.78 > 24
100	5500	23.99	24.8 > 24
116	5580	23.80	24.76 > 24
140	5700	24.02	24.8 > 24
144 (UNII-2c Band)	5720	17.13	23.33 < 24

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	17.75	17.60	17.25	17.34	224.398	23.51	24.00	Pass
62	5310	17.66	17.22	16.86	17.42	214.805	23.32	24.00	Pass
102	5510	16.22	16.45	15.76	16.36	166.957	22.23	24.00	Pass
110	5550	17.11	17.58	16.77	17.61	213.895	23.30	24.00	Pass
134	5670	17.21	17.41	16.66	17.41	209.109	23.20	24.00	Pass
142 (UNII-2c Band)	5710	14.07	14.64	13.18	14.09	101.076	20.05	24.00	Pass
142 (UNII-3 Band)	5710	4.11	4.65	2.62	3.93	9.793	9.91	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.
2. The directional gain is 4.61dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*142	5710	110.869	20.45

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	Chain 2	Chain 3
54	5270	43.68	44.17	44.06	44.32
62	5310	43.59	43.90	44.30	44.58
102	5510	43.69	43.89	44.00	44.29
110	5550	43.32	43.90	43.71	44.39
134	5670	43.43	44.19	43.69	44.32
142 (UNII-2c Band)	5710	36.80	36.86	37.18	37.42

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	43.68	27.4 > 24
62	5310	43.59	27.39 > 24
102	5510	43.69	27.4 > 24
110	5550	43.32	27.36 > 24
134	5670	43.43	27.37 > 24
142 (UNII-2c Band)	5710	36.80	26.65 > 24

802.11ac (VHT80)

OUTPUT POWER:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	18.30	18.10	17.51	17.65	246.747	23.92	24.00	Pass
106	5530	16.76	17.22	16.03	17.37	194.81	22.90	24.00	Pass
122	5610	17.38	17.83	16.99	18.07	229.5	23.61	24.00	Pass
138 (UNII-2c Band)	5690	13.73	14.23	14.01	14.28	102.059	20.09	24.00	Pass
138 (UNII-3 Band)	5690	0.25	0.15	-0.41	0.21	4.0538	6.08	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.
2. The directional gain is 4.61dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*138	5690	106.1128	20.26

Note: The total power was calculated through formula and record the value for reference only.

26dB BANDWIDTH:

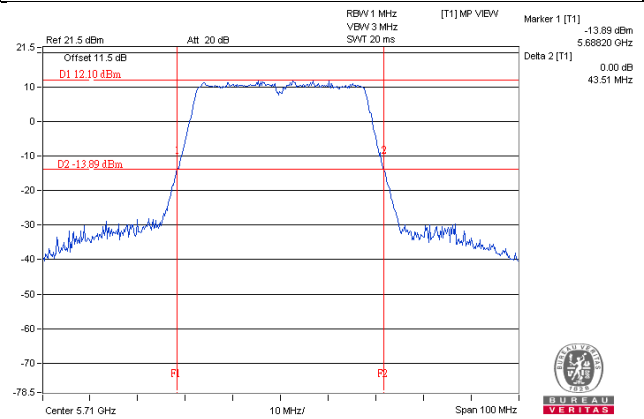
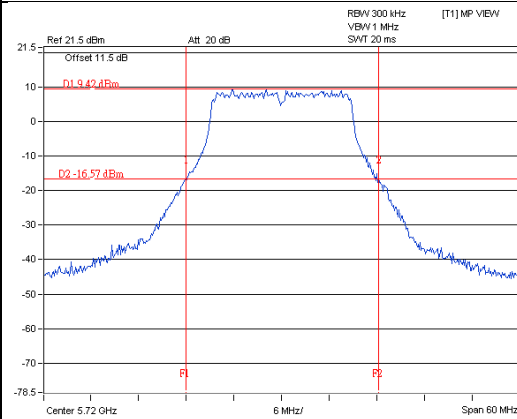
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	81.84	83.27	83.23	82.77
106	5530	82.62	82.47	82.37	83.34
122	5610	82.76	82.47	82.27	83.61
138 (UNII-2c Band)	5690	76.64	76.07	76.07	76.69

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

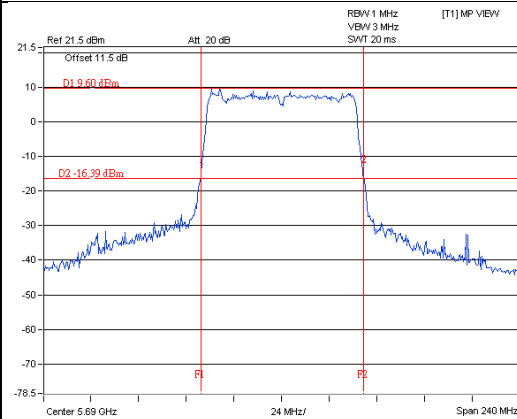
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	81.84	30.12 > 24
106	5530	82.37	30.15 > 24
122	5610	82.27	30.15 > 24
138 (UNII-2c Band)	5690	76.07	29.81 > 24

Spectrum Plot of Worst Value

802.11ac (VHT20)_Chain 0 / CH144 (UNII-2c Band) 802.11ac (VHT40)_Chain 0 / 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

SDM 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	Chain 2	Chain 3				
52	5260	18.01	17.31	16.46	17.23	214.172	23.31	24.00	Pass
60	5300	17.76	17.24	16.51	17.02	207.791	23.18	24.00	Pass
64	5320	17.78	17.06	16.25	17.32	206.916	23.16	24.00	Pass
100	5500	17.38	17.40	16.38	17.80	213.363	23.29	24.00	Pass
116	5580	17.36	17.46	16.34	17.81	213.617	23.30	24.00	Pass
140	5700	17.29	17.41	16.42	17.98	215.32	23.33	24.00	Pass
144 (UNII-2c Band)	5720	13.87	14.20	12.41	14.17	94.221	19.74	23.33	Pass
144 (UNII-3 Band)	5720	8.39	8.72	7.36	9.20	28.112	14.49	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.
2. For 5260-5320MHz: the antenna gain is 4.92dBi < 6dBi, so the power limit shall not be reduced.
3. For 5500-5720MHz: the antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*144	5720	122.333	20.88

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	Chain 2	Chain 3
52	5260	23.70	24.23	24.75	24.36
60	5300	23.85	24.18	25.15	24.38
64	5320	23.91	24.22	24.95	25.08
100	5500	23.99	24.10	24.97	25.25
116	5580	23.80	24.23	24.95	24.95
140	5700	24.03	24.02	24.90	25.39
144 (UNII-2c Band)	5720	17.13	17.50	17.55	17.97

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	23.70	24.74 > 24
60	5300	23.85	24.77 > 24
64	5320	23.91	24.78 > 24
100	5500	23.99	24.8 > 24
116	5580	23.80	24.76 > 24
140	5700	24.02	24.8 > 24
144 (UNII-2c Band)	5720	17.13	23.33 < 24

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	17.75	17.60	17.25	17.34	224.398	23.51	24.00	Pass
62	5310	17.66	17.22	16.86	17.42	214.805	23.32	24.00	Pass
102	5510	17.17	17.46	16.80	17.43	211.036	23.24	24.00	Pass
110	5550	17.11	17.58	16.77	17.61	213.895	23.30	24.00	Pass
134	5670	17.21	17.41	16.66	17.41	209.109	23.20	24.00	Pass
142 (UNII-2c Band)	5710	14.07	14.64	13.18	14.09	101.076	20.05	24.00	Pass
142 (UNII-3 Band)	5710	4.11	4.65	2.62	3.93	9.793	9.91	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.
2. For 5270-5310MHz: the antenna gain is 4.92dBi < 6dBi, so the power limit shall not be reduced.
3. For 5500-5710MHz: the antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*142	5710	110.869	20.45

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	Chain 2	Chain 3
54	5270	43.68	44.17	44.06	44.32
62	5310	43.59	43.90	44.30	44.58
102	5510	43.39	43.83	44.06	44.37
110	5550	43.32	43.90	43.71	44.39
134	5670	43.43	44.19	43.69	44.32
142 (UNII-2c Band)	5710	36.80	36.86	37.18	37.42

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	43.68	27.4 > 24
62	5310	43.59	27.39 > 24
102	5510	43.39	27.37 > 24
110	5550	43.32	27.36 > 24
134	5670	43.43	27.37 > 24
142 (UNII-2c Band)	5710	36.80	26.65 > 24

802.11ac (VHT80)

OUTPUT POWER:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	18.30	18.10	17.51	17.65	246.747	23.92	24.00	Pass
106	5530	17.08	18.34	17.15	18.42	240.666	23.81	24.00	Pass
122	5610	17.38	17.83	16.99	18.07	229.5	23.61	24.00	Pass
138 (UNII-2c Band)	5690	13.73	14.23	14.01	14.28	102.059	20.09	24.00	Pass
138 (UNII-3 Band)	5690	0.25	0.15	-0.41	0.21	4.0538	6.08	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.
2. For 5290MHz: the antenna gain is 4.92dBi < 6dBi, so the power limit shall not be reduced.
3. For 5530-5690MHz: the antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*138	5690	106.1128	20.26

Note: The total power was calculated through formula and record the value for reference only.

26dB BANDWIDTH:

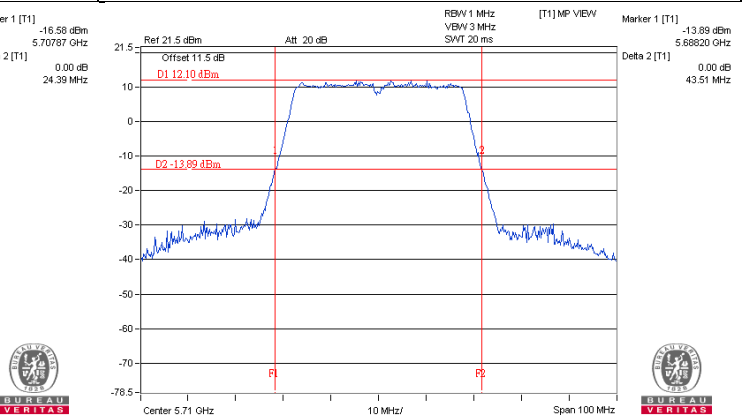
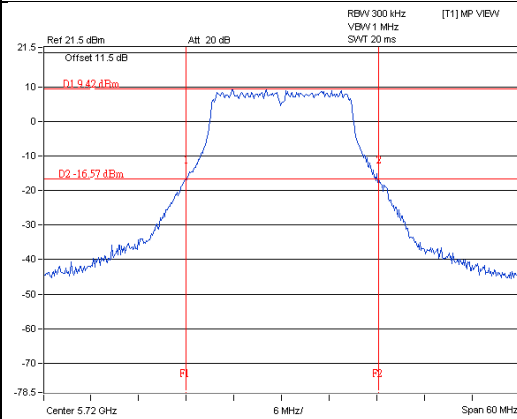
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	81.84	83.27	83.23	82.77
106	5530	82.10	82.43	82.05	83.03
122	5610	82.76	82.47	82.27	83.61
138 (UNII-2c Band)	5690	76.64	76.07	76.07	76.69

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

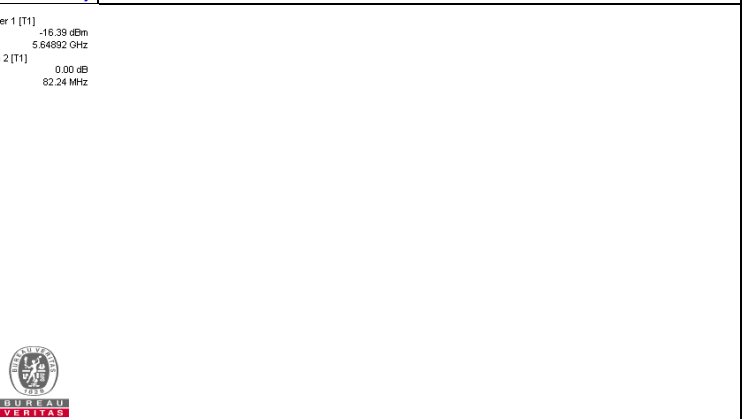
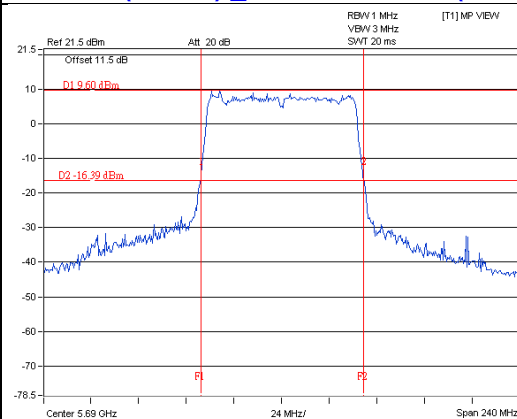
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	81.84	30.12 > 24
106	5530	82.05	30.14 > 24
122	5610	82.27	30.15 > 24
138 (UNII-2c Band)	5690	76.07	29.81 > 24

Spectrum Plot of Worst Value

802.11ac (VHT20)_Chain 0 / CH144 (UNII-2c Band) 802.11ac (VHT40)_Chain 0 / 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

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	Chain 2	Chain 3				
52	5260	18.01	17.31	16.46	17.23	214.172	23.31	24.00	Pass
60	5300	17.76	17.24	16.51	17.02	207.791	23.18	24.00	Pass
64	5320	17.78	17.06	16.25	17.32	206.916	23.16	24.00	Pass
100	5500	17.38	17.40	16.38	17.80	213.363	23.29	24.00	Pass
116	5580	17.36	17.46	16.34	17.81	213.617	23.30	24.00	Pass
140	5700	17.29	17.41	16.42	17.98	215.32	23.33	24.00	Pass
144 (UNII-2c Band)	5720	13.87	14.20	12.41	14.17	94.221	19.74	23.33	Pass
144 (UNII-3 Band)	5720	8.39	8.72	7.36	9.20	28.112	14.49	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.

2. The directional gain is 4.61dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*144	5720	122.333	20.88

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	Chain 2	Chain 3
52	5260	23.70	24.23	24.75	24.36
60	5300	23.85	24.18	25.15	24.38
64	5320	23.91	24.22	24.95	25.08
100	5500	23.99	24.10	24.97	25.25
116	5580	23.80	24.23	24.95	24.95
140	5700	24.03	24.02	24.90	25.39
144 (UNII-2c Band)	5720	17.13	17.50	17.55	17.97

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	23.70	24.74 > 24
60	5300	23.85	24.77 > 24
64	5320	23.91	24.78 > 24
100	5500	23.99	24.8 > 24
116	5580	23.80	24.76 > 24
140	5700	24.02	24.8 > 24
144 (UNII-2c Band)	5720	17.13	23.33 < 24

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	17.75	17.60	17.25	17.34	224.398	23.51	24.00	Pass
62	5310	17.66	17.22	16.86	17.42	214.805	23.32	24.00	Pass
102	5510	16.22	16.45	15.76	16.36	166.957	22.23	24.00	Pass
110	5550	17.11	17.58	16.77	17.61	213.895	23.30	24.00	Pass
134	5670	17.21	17.41	16.66	17.41	209.109	23.20	24.00	Pass
142 (UNII-2c Band)	5710	14.07	14.64	13.18	14.09	101.076	20.05	24.00	Pass
142 (UNII-3 Band)	5710	4.11	4.65	2.62	3.93	9.793	9.91	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.
2. The directional gain is 4.61dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*142	5710	110.869	20.45

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	Chain 2	Chain 3
54	5270	43.68	44.17	44.06	44.32
62	5310	43.59	43.90	44.30	44.58
102	5510	43.69	43.89	44.00	44.29
110	5550	43.32	43.90	43.71	44.39
134	5670	43.43	44.19	43.69	44.32
142 (UNII-2c Band)	5710	36.80	36.86	37.18	37.42

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	43.68	27.4 > 24
62	5310	43.59	27.39 > 24
102	5510	43.69	27.4 > 24
110	5550	43.32	27.36 > 24
134	5670	43.43	27.37 > 24
142 (UNII-2c Band)	5710	36.80	26.65 > 24

802.11ac (VHT80)

OUTPUT POWER:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	18.30	18.10	17.51	17.65	246.747	23.92	24.00	Pass
106	5530	16.76	17.22	16.03	17.37	194.81	22.90	24.00	Pass
122	5610	17.38	17.83	16.99	18.07	229.5	23.61	24.00	Pass
138 (UNII-2c Band)	5690	13.73	14.23	14.01	14.28	102.059	20.09	24.00	Pass
138 (UNII-3 Band)	5690	0.25	0.15	-0.41	0.21	4.0538	6.08	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.
2. The directional gain is 4.61dBi < 6dBi, so the power limit shall not be reduced.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*138	5690	106.1128	20.26

Note: The total power was calculated through formula and record the value for reference only.

26dB BANDWIDTH:

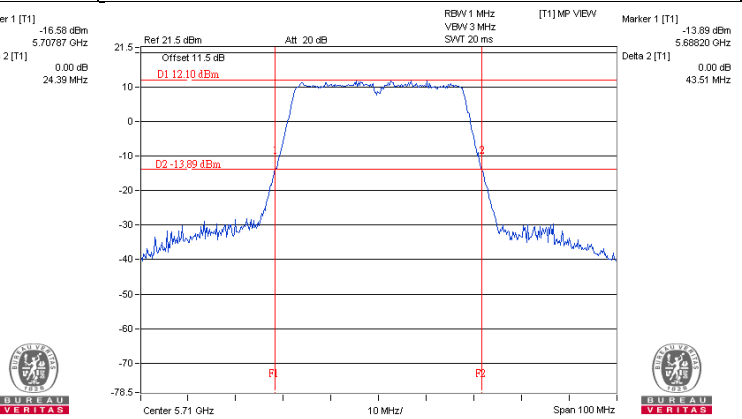
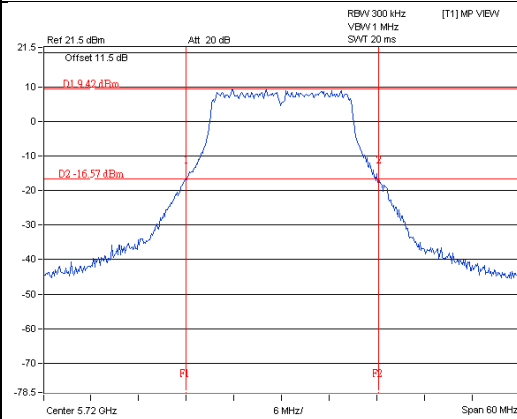
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	81.84	83.27	83.23	82.77
106	5530	82.62	82.47	82.37	83.34
122	5610	82.76	82.47	82.27	83.61
138 (UNII-2c Band)	5690	76.64	76.07	76.07	76.69

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

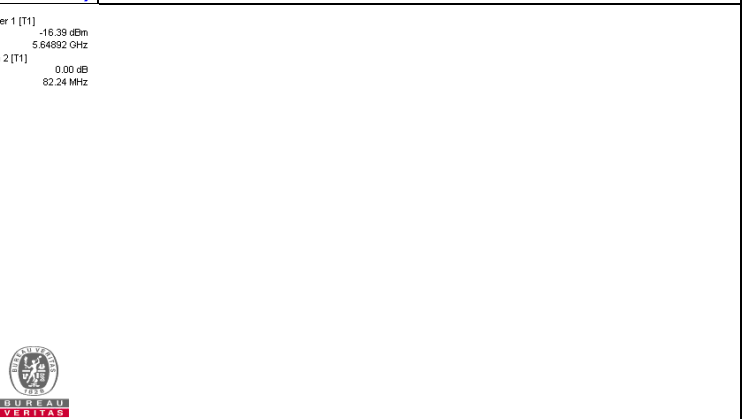
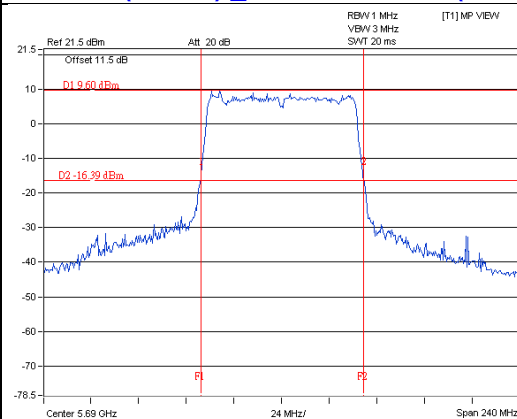
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	81.84	30.12 > 24
106	5530	82.37	30.15 > 24
122	5610	82.27	30.15 > 24
138 (UNII-2c Band)	5690	76.07	29.81 > 24

Spectrum Plot of Worst Value

802.11ac (VHT20)_Chain 0 / CH144 (UNII-2c Band) 802.11ac (VHT40)_Chain 0 / CH142 (UNII-2c Band)



802.11ac (VHT80)_Chain 1 / CH138 (UNII-2c Band)



NOTE:

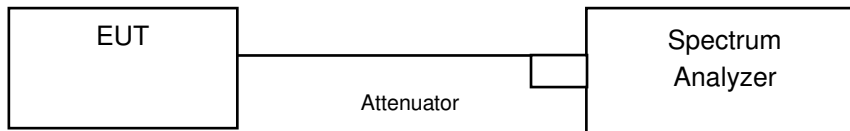
- For CH144 (UNII-2c Band) = 5725MHz - Marker 1
- For CH142 (UNII-2c Band) = 5725MHz - Marker 1
- For CH138 (UNII-2c Band) = 5725MHz - Marker 1

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For U-NII-2A, U-NII-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 $BWCF = 10\log(500\text{ kHz}/300\text{ kHz})$
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

CDD MODE

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

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	Chain 2	Chain 3			
52	5260	5.18	3.28	2.00	2.97	9.54	11.00	Pass
60	5300	4.20	3.14	2.46	2.82	9.23	11.00	Pass
64	5320	4.03	3.55	2.06	3.33	9.32	11.00	Pass
100	5500	3.74	3.61	3.04	3.70	9.55	11.00	Pass
116	5580	4.04	2.58	2.41	3.17	9.12	11.00	Pass
140	5700	2.68	3.61	2.54	4.21	9.34	11.00	Pass
144 (UNII-2c Band)	5720	3.37	3.74	2.21	3.96	9.39	11.00	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. The directional gain = 4.61dBi < 6dBi , so the power density limit shall not be reduced.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
54	5270	0.21	-0.12	0.12	0.25	6.14	11.00	Pass
62	5310	-0.25	0.45	-0.27	0.90	6.26	11.00	Pass
102	5510	-0.99	-1.10	-1.36	-0.56	5.03	11.00	Pass
110	5550	-0.12	-0.26	0.32	-1.04	5.77	11.00	Pass
134	5670	-0.14	0.45	-0.64	0.11	5.98	11.00	Pass
142 (UNII-2c Band)	5710	-0.15	0.41	-0.64	0.16	5.98	11.00	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. The directional gain = 4.61dBi < 6dBi , so the power density limit shall not be reduced.

802.11ac (VHT80)

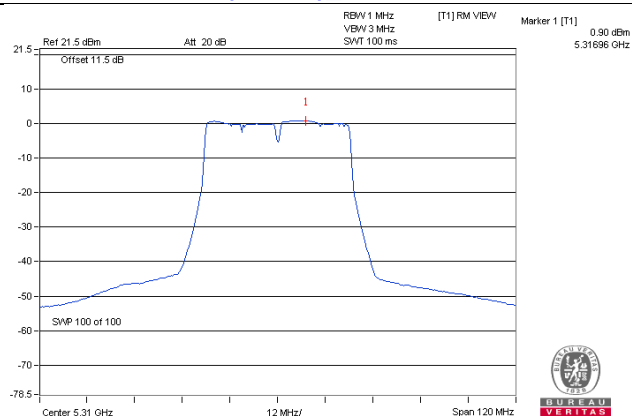
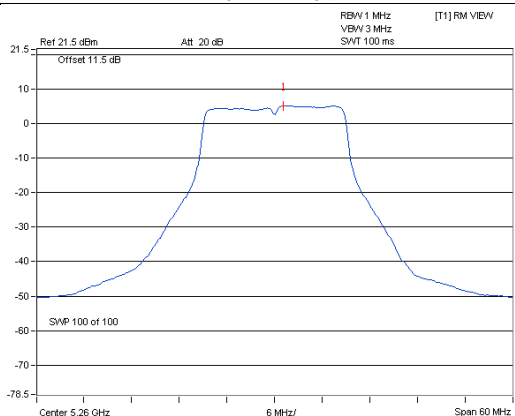
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
58	5290	-1.25	-1.37	-1.68	-2.32	4.38	11.00	Pass
106	5530	-2.56	-2.50	-3.26	-2.14	3.42	11.00	Pass
122	5610	-2.22	-1.89	-1.09	-1.46	4.38	11.00	Pass
138 (UNII-2c Band)	5690	-3.46	-2.13	-2.51	-2.25	3.46	11.00	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 4.61dBi < 6dBi , so the power density limit shall not be reduced.

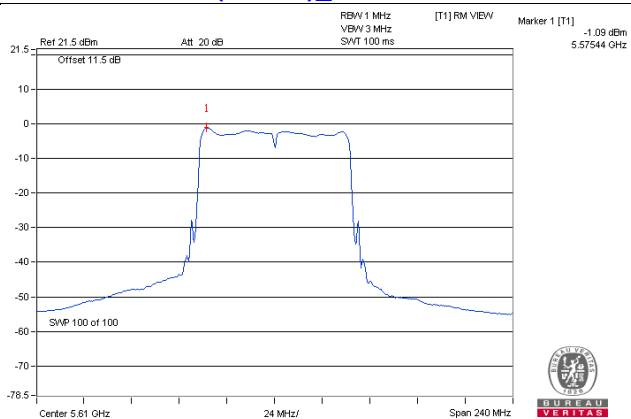
Spectrum Plot of Worst Value

802.11ac (VHT20)_Chain 0 / CH52

802.11ac (VHT40)_Chain 3 / CH62



802.11ac (VHT80)_Chain 2 / CH122



**For U-NII-3:
802.11ac (VHT20)**

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	144 (UNII-3 Band)	5720	-3.82	-1.60	6.02	4.42	30.00	Pass
1	144 (UNII-3 Band)	5720	-3.51	-1.29	6.02	4.73	30.00	Pass
2	144 (UNII-3 Band)	5720	-4.85	-2.63	6.02	3.39	30.00	Pass
3	144 (UNII-3 Band)	5720	-3.15	-0.93	6.02	5.09	30.00	Pass

Note: 1. The directional gain = 4.61dBi < 6dBi , so the power density limit shall not be reduced.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	142 (UNII-3 Band)	5710	-8.12	-5.90	6.02	0.12	30.00	Pass
1	142 (UNII-3 Band)	5710	-7.45	-5.23	6.02	0.79	30.00	Pass
2	142 (UNII-3 Band)	5710	-9.23	-7.01	6.02	-0.99	30.00	Pass
3	142 (UNII-3 Band)	5710	-8.26	-6.04	6.02	-0.02	30.00	Pass

Note: 1. The directional gain = 4.61dBi < 6dBi , so the power density limit shall not be reduced.

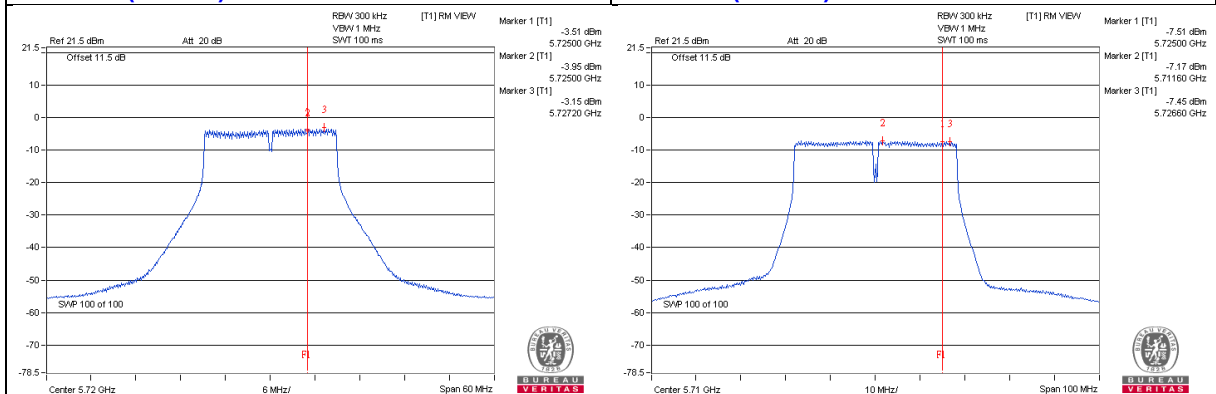
802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	138 (UNII-3 Band)	5690	-11.16	-8.94	6.02	-2.92	30.00	Pass
1	138 (UNII-3 Band)	5690	-10.89	-8.67	6.02	-2.65	30.00	Pass
2	138 (UNII-3 Band)	5690	-11.45	-9.23	6.02	-3.21	30.00	Pass
3	138 (UNII-3 Band)	5690	-11.40	-9.18	6.02	-3.16	30.00	Pass

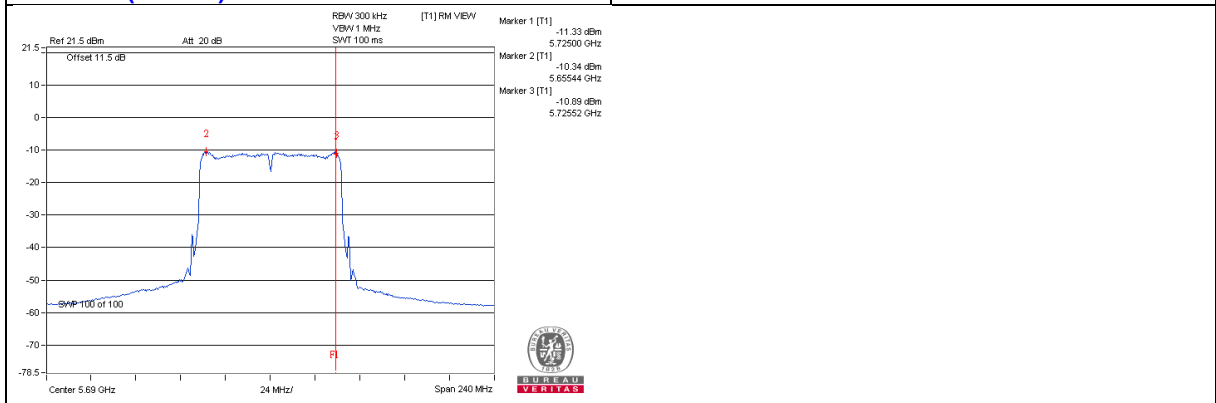
Note: 1. The directional gain = 4.61dBi < 6dBi , so the power density limit shall not be reduced.

Spectrum Plot of Worst Value

802.11ac (VHT20) – Chain 3: CH144 UNII-3 Band | 802.11ac (VHT40) – Chain 1: CH142 UNII-3 Band



802.11ac (VHT80) – Chain 1: CH138 UNII-3 Band



SDM MODE

For U-NII-2A, U-NII-2C:
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	Chain 2	Chain 3			
52	5260	5.18	3.28	2.00	2.97	9.54	11.00	Pass
60	5300	4.20	3.14	2.46	2.82	9.23	11.00	Pass
64	5320	4.03	3.55	2.06	3.33	9.32	11.00	Pass
100	5500	3.74	3.61	3.04	3.70	9.55	11.00	Pass
116	5580	4.04	2.58	2.41	3.17	9.12	11.00	Pass
140	5700	2.68	3.61	2.54	4.21	9.34	11.00	Pass
144 (UNII-2c Band)	5720	3.37	3.74	2.21	3.96	9.39	11.00	Pass

- Note: A. 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.
- B. For 5260-5320MHz: the antenna gain is 4.92dBi < 6dBi, so the power limit shall not be reduced.
- C. For 5500-5720MHz: the antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
54	5270	0.21	-0.12	0.12	0.25	6.14	11.00	Pass
62	5310	-0.25	0.45	-0.27	0.90	6.26	11.00	Pass
102	5510	0.46	0.44	1.18	0.54	6.69	11.00	Pass
110	5550	-0.12	-0.26	0.32	-1.04	5.77	11.00	Pass
134	5670	-0.14	0.45	-0.64	0.11	5.98	11.00	Pass
142 (UNII-2c Band)	5710	-0.15	0.41	-0.64	0.16	5.98	11.00	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For 5270-5310MHz: the antenna gain is 4.92dBi < 6dBi, so the power limit shall not be reduced.
3. For 5510-5710MHz: the antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

802.11ac (VHT80)

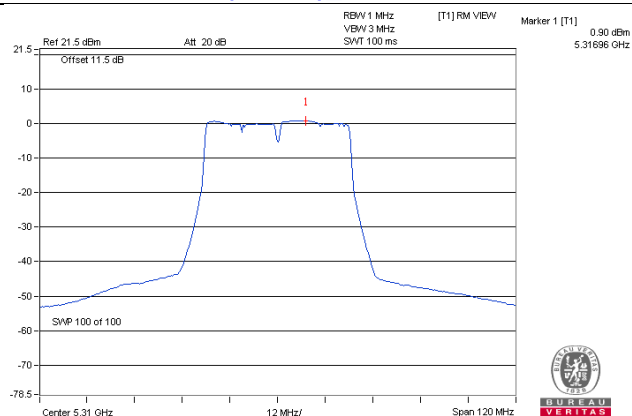
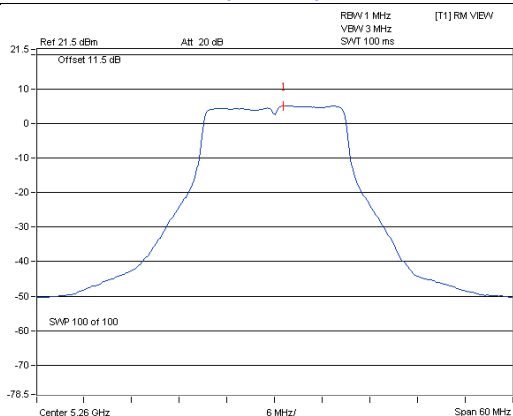
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
58	5290	-1.25	-1.37	-1.68	-2.32	4.38	11.00	Pass
106	5530	-2.22	-1.72	-1.14	-0.79	4.59	11.00	Pass
122	5610	-2.22	-1.89	-1.09	-1.46	4.38	11.00	Pass
138 (UNII-2c Band)	5690	-3.46	-2.13	-2.51	-2.25	3.46	11.00	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For 5290MHz: the antenna gain is 4.92dBi < 6dBi, so the power limit shall not be reduced.
3. For 5530-5690MHz: the antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

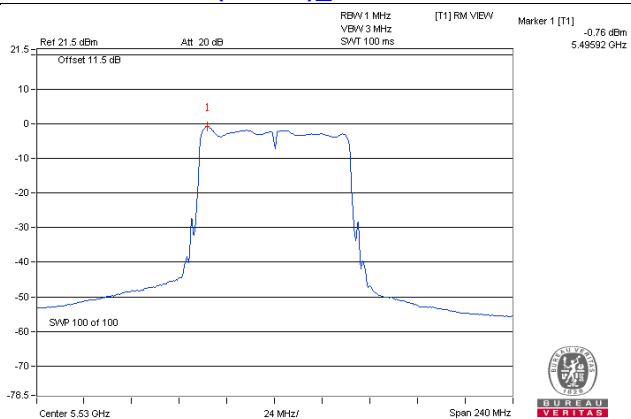
Spectrum Plot of Worst Value

802.11ac (VHT20)_Chain 0 / CH52

802.11ac (VHT40)_Chain 3 / CH62



802.11ac (VHT80)_Chain 3 / CH106



For U-NII-3:
802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	144 (UNII-3 Band)	5720	-3.82	-1.60	6.02	4.42	30.00	Pass
1	144 (UNII-3 Band)	5720	-3.51	-1.29	6.02	4.73	30.00	Pass
2	144 (UNII-3 Band)	5720	-4.85	-2.63	6.02	3.39	30.00	Pass
3	144 (UNII-3 Band)	5720	-3.15	-0.93	6.02	5.09	30.00	Pass

Note: The antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	142 (UNII-3 Band)	5710	-8.12	-5.90	6.02	0.12	30.00	Pass
1	142 (UNII-3 Band)	5710	-7.45	-5.23	6.02	0.79	30.00	Pass
2	142 (UNII-3 Band)	5710	-9.23	-7.01	6.02	-0.99	30.00	Pass
3	142 (UNII-3 Band)	5710	-8.26	-6.04	6.02	-0.02	30.00	Pass

Note: The antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

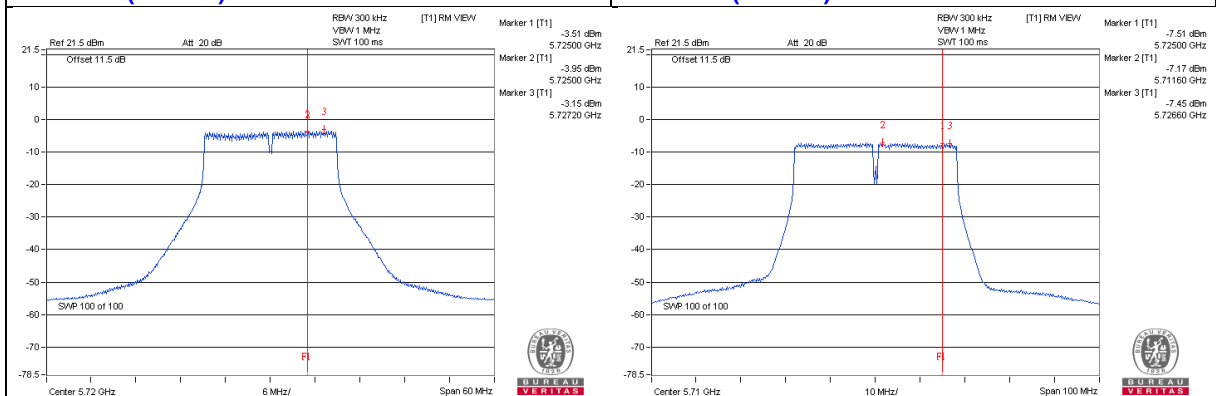
802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	138 (UNII-3 Band)	5690	-11.16	-8.94	6.02	-2.92	30.00	Pass
1	138 (UNII-3 Band)	5690	-10.89	-8.67	6.02	-2.65	30.00	Pass
2	138 (UNII-3 Band)	5690	-11.45	-9.23	6.02	-3.21	30.00	Pass
3	138 (UNII-3 Band)	5690	-11.40	-9.18	6.02	-3.16	30.00	Pass

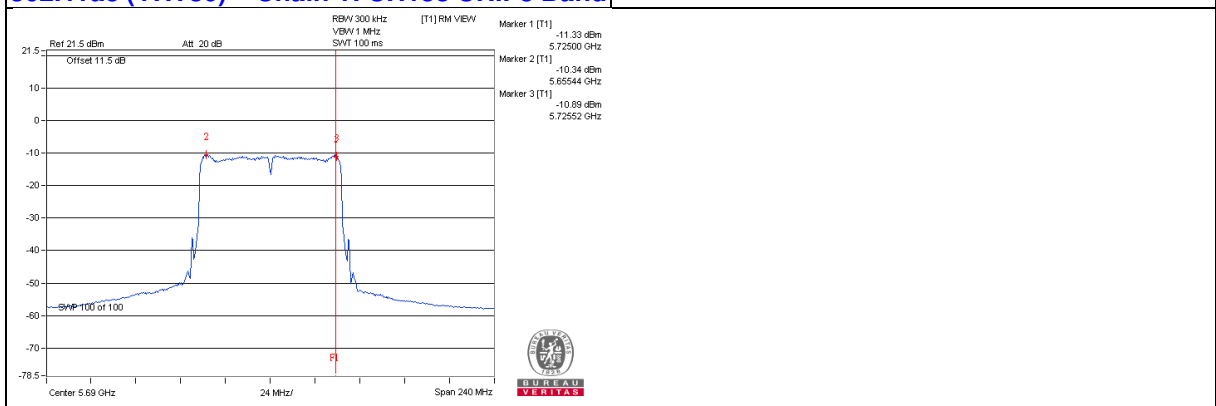
Note: The antenna gain is 4.71dBi < 6dBi, so the power limit shall not be reduced.

Spectrum Plot of Worst Value

802.11ac (VHT20) – Chain 3: CH144 UNII-3 Band | 802.11ac (VHT40) – Chain 1: CH142 UNII-3 Band



802.11ac (VHT80) – Chain 1: CH138 UNII-3 Band

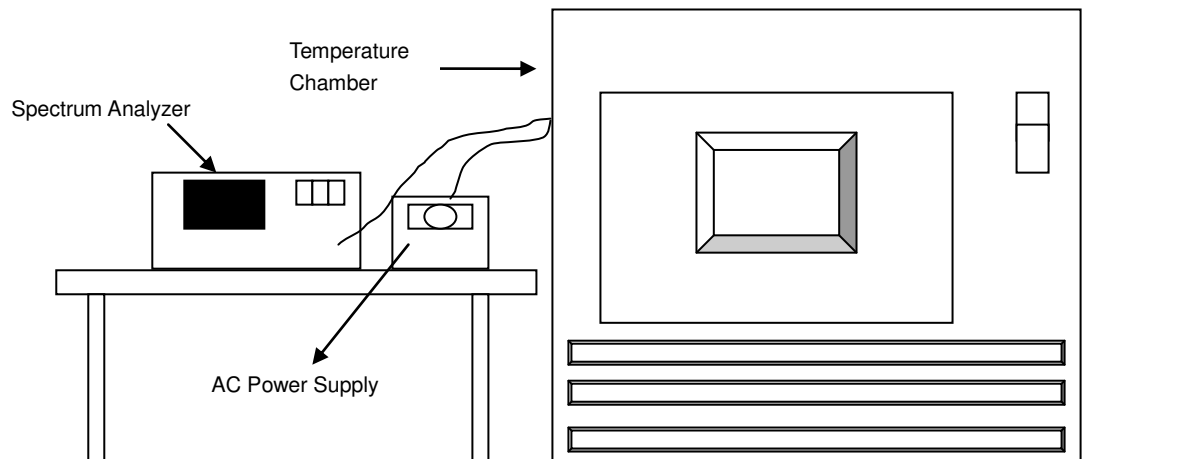


4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5260MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Reading (MHz)	Result	Reading (MHz)	Result	Reading (MHz)	Result	Reading (MHz)	Result
50	120	5260.027	Pass	5260.0254	Pass	5260.0285	Pass	5260.028	Pass
40	120	5260.023	Pass	5260.0252	Pass	5260.0231	Pass	5260.0261	Pass
30	120	5259.9834	Pass	5259.9827	Pass	5259.9827	Pass	5259.9849	Pass
20	120	5259.995	Pass	5259.9966	Pass	5259.9946	Pass	5259.9947	Pass
10	120	5260.0223	Pass	5260.0235	Pass	5260.0261	Pass	5260.024	Pass
0	120	5260.0002	Pass	5259.998	Pass	5260.0008	Pass	5259.9985	Pass
-10	120	5259.9856	Pass	5259.982	Pass	5259.9823	Pass	5259.9823	Pass
-20	120	5259.9793	Pass	5259.979	Pass	5259.981	Pass	5259.9797	Pass
-30	120	5259.991	Pass	5259.9879	Pass	5259.9877	Pass	5259.9889	Pass

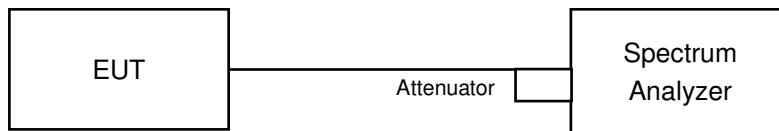
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5260MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Reading (MHz)	Result	Reading (MHz)	Result	Reading (MHz)	Result	Reading (MHz)	Result
20	138	5259.9948	Pass	5259.9967	Pass	5259.9954	Pass	5259.9951	Pass
	120	5259.995	Pass	5259.9966	Pass	5259.9946	Pass	5259.9947	Pass
	102	5259.9951	Pass	5259.9969	Pass	5259.9953	Pass	5259.9955	Pass

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
*144 (UNII-3 Band)	5720	3.83	3.81	3.83	3.82	0.5	PASS

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

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
*142 (UNII-3 Band)	5710	3.25	3.25	3.21	3.24	0.5	PASS

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

802.11ac (VHT80)

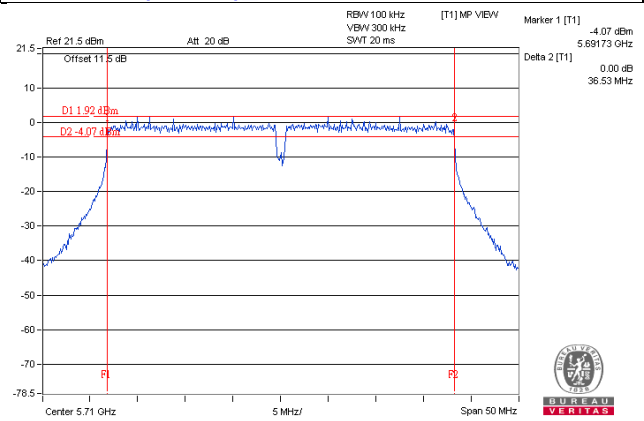
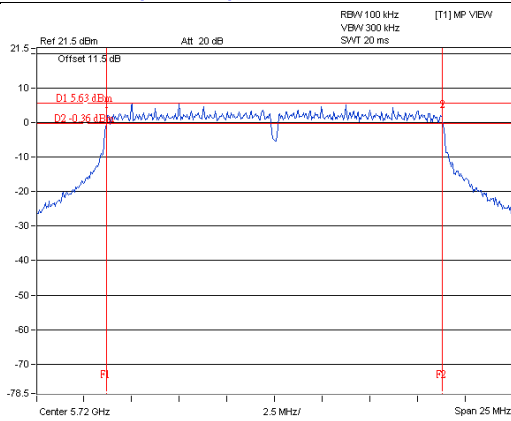
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
*138 (UNII-3 Band)	5690	2.73	2.80	2.74	2.70	0.5	PASS

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

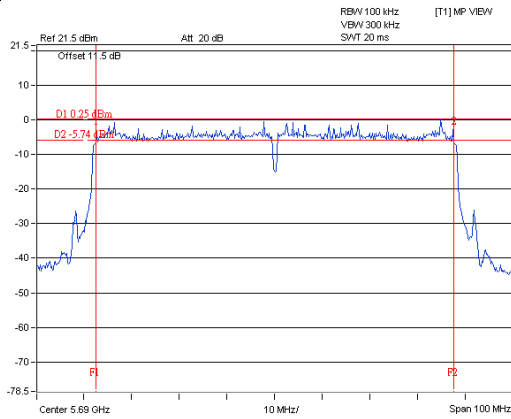
Spectrum Plot of Worst Value

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



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 accredited and approved according to ISO/IEC 17025.

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

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

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