FCC Test Report (DFS Band)

Report No.: RF160810E03D-1

FCC ID: Q87-WHW03

Test Model: WHW03

Received Date: Jan. 25, 2017

Test Date: Feb. 08 to 15 , 2017

Issued Date: Mar. 13, 2017

Applicant: Linksys LLC

Address: 121 Theory Drive Irvine California 92617 United States

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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Report Issue History Record

Issue No.	Reason for Change	Date Issued
RF160810E03-1	Original	Nov. 03, 2016
RF160810E03D-1	Add DFS band <5.26GHz ~ 5.32GHz, 5.50GHz ~ 5.70GHz>	Mar. 13, 2017

Release Control Record

Issue No.	Description	Date Issued
RF160810E03D-1	Original release.	Mar. 13, 2017

1 Certificate of Conformity

Product: Access Point

Brand: LINKSYS

Test Model: WHW03

Sample Status: ENGINEERING SAMPLE

Applicant: Linksys LLC

Test Date: Feb. 08 to 15 , 2017

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:** Mar. 13, 2017
Wendy Wu / Specialist

Approved by : _____ , **Date:** Mar. 13, 2017
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 -5.15dB at 0.15391MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -3.1dB at 5350.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex (MHF) not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.36 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.47 dB
	6GHz ~ 18GHz	3.75 dB
	18GHz ~ 40GHz	3.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Access Point
Brand	LINKSYS
Test Model	WHW03
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Driver Version	0.0.19
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and 2.4GHz band
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 15 802.11n (HT40), 802.11ac (VHT40): 7 802.11ac (VHT80): 3
Output Power	**5.26GHz ~ 5.32GHz:** 198.398mW **5.50GHz ~ 5.70GHz:** 242.048mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF160810E03-1 as the following:
   - ◆ Add DFS band <5.26GHz ~ 5.32GHz, 5.50GHz ~ 5.70GHz>
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. There are WLAN, Bluetooth, Zigbee technology used for the EUT.
4. Simultaneously transmission condition.

Condition	Technology			
1	WLAN (Radio 1) (2.4GHz / 5GHz-UNII-1, UNII-2A)	WLAN (Radio 2) (5GHz-UNII-2C, UNII-3)	Bluetooth	Zigbee
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.				

5. The EUT power needs to be supplied from one power adapter , the information is as below table:

Brand	Model	Spec.
Linksys	MU24A6120200-A1	Input: 100-240Vac, 50/60Hz, 0.7A Output: 12V, 2A DC output cable (Unshielded, 1.5m)

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

BT Antenna Spec.						
Antenna No	Brand	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type
1	galtronics	60-2703-03	3.13	2.4~2.4835	Dipole	i-pex(MHF)

Zigbee Antenna Spec.						
Antenna No	Brand	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type
2	galtronics	60-2699-03	2.52	2.4~2.4835	Dipole	i-pex(MHF)

WLAN (Radio 2) Antenna Spec.							
Antenna No	Transmitter Circuit	Brand	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type
3	5GHz-Chain (1) (UNII-2C, UNII-3)	galtronics	60-2704-03	3.86	5.5~5.825	Dipole	i-pex(MHF)
4	5GHz-Chain (0) (UNII-2C, UNII-3)	galtronics	60-2708-03	2.36	5.5~5.825	Dipole	i-pex(MHF)

WLAN (Radio 1) Antenna Spec.							
Antenna No	Transmitter Circuit	Brand	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type
5	2.4GHz-Chain (0)	galtronics	60-2698-03	3.43	2.4~2.4835	Dipole	i-pex(MHF)
	5GHz-Chain (1) (UNII-1, UNII-2A)			3.62	5.18~5.320		
6	2.4GHz-Chain (1)	galtronics	60-2697-03	1.49	2.4~2.4835	Dipole	i-pex(MHF)
	5GHz-Chain (0) (UNII-1, UNII-2A)			4.35	5.18~5.320		

7. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
VHT20	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
VHT40	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

Note:
1. All of modulation mode support beamforming function except 802.11b modulation mode.
2. 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)
3. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.

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

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5700MHz

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

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

5 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		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

NOTE:
1. The EUT had been tested under beamforming mode for 5GHz band.

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.

Radio 1						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
Radio 2						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	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.

Radio 1						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320	54 to 62	62	OFDM	BPSK	13.5
Radio 2						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5500-5700	102 to 134	134	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Radio 1						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5260-5320	54 to 62	62	OFDM	BPSK	13.5
Radio 2						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5500-5700	102 to 134	134	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Radio 1						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
Radio 2						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	29.3

Test Condition:

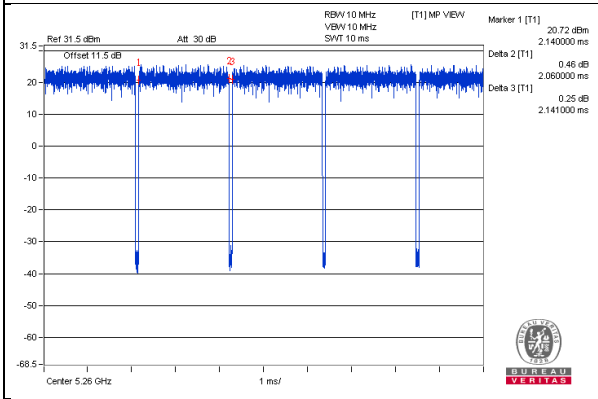
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 66%RH	120Vac, 60Hz	Terry Huang
RE<1G	23deg. C, 61%RH	120Vac, 60Hz	Terry Huang
PLC	25deg. C, 62%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

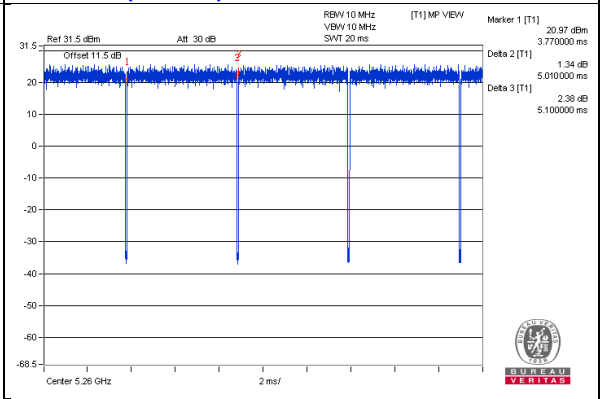
Radio 1

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.06 ms/2.141 ms = 0.962, Duty factor = 10 * log(1/0.962) = 0.17
802.11ac (VHT20): Duty cycle = 5.01 ms/5.1 ms = 0.982
802.11ac (VHT40): Duty cycle = 2.428 ms/2.52 ms = 0.963, Duty factor = 10 * log(1/0.963) = 0.16
802.11ac (VHT80): Duty cycle = 1.147 ms/1.223 ms = 0.938, Duty factor = 10 * log(1/0.938) = 0.28

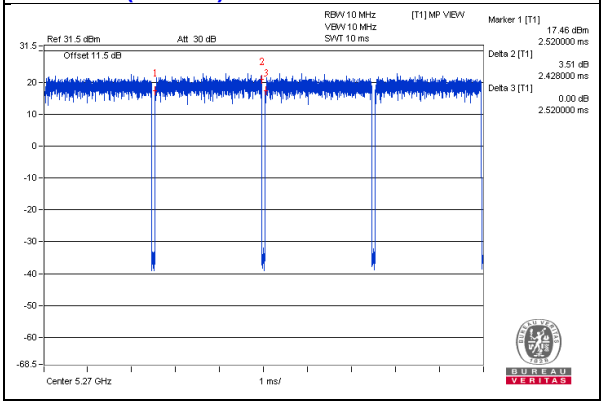
802.11a



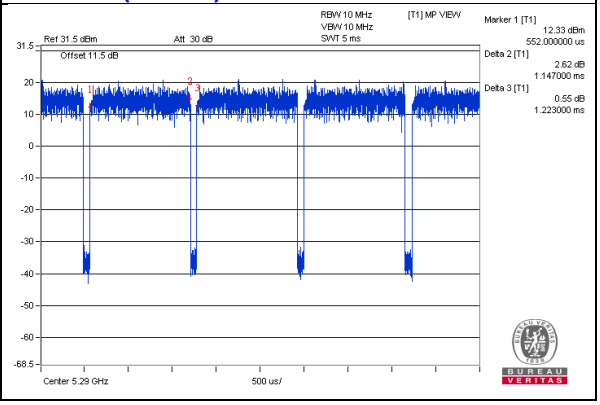
802.11ac (VHT20)



802.11ac (VHT40)



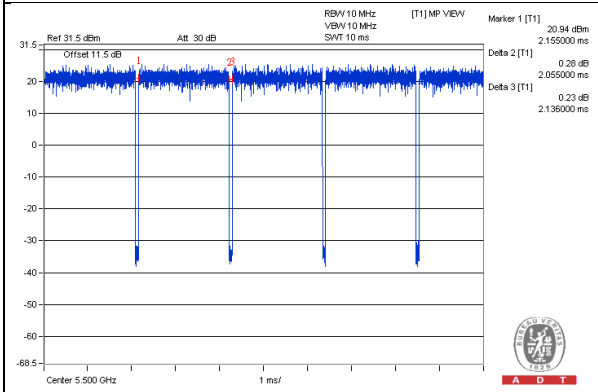
802.11ac (VHT80)



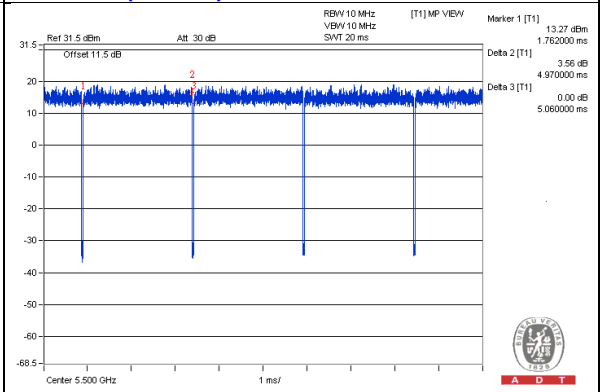
Radio 2

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.055 ms/2.136 ms = 0.962, Duty factor = 10 * log(1/0.962) = 0.17
802.11ac (VHT20): Duty cycle = 4.97 ms/5.06 ms = 0.982
802.11ac (VHT40): Duty cycle = 2.418 ms/2.51 ms = 0.963, Duty factor = 10 * log(1/0.963) = 0.16
802.11ac (VHT80): Duty cycle = 1.144 ms/1.22 ms = 0.938, Duty factor = 10 * log(1/0.938) = 0.28

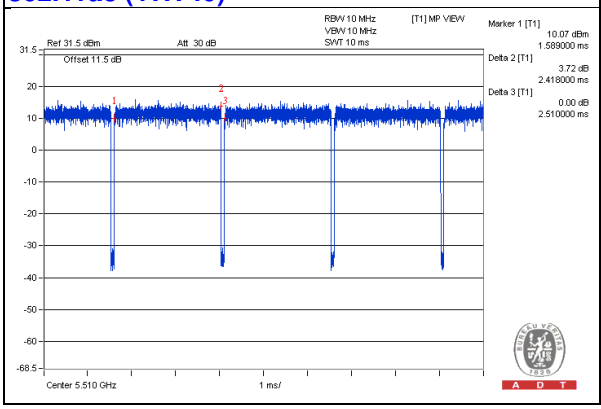
802.11a



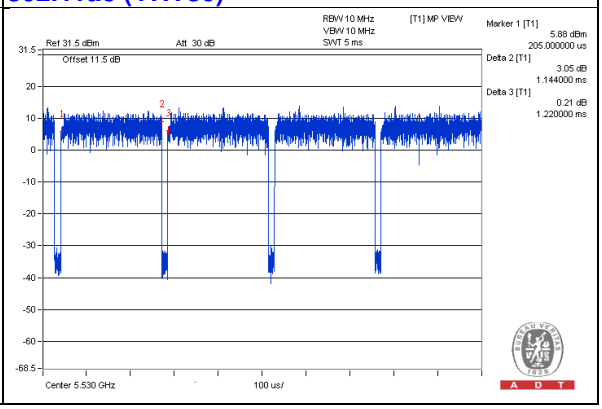
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

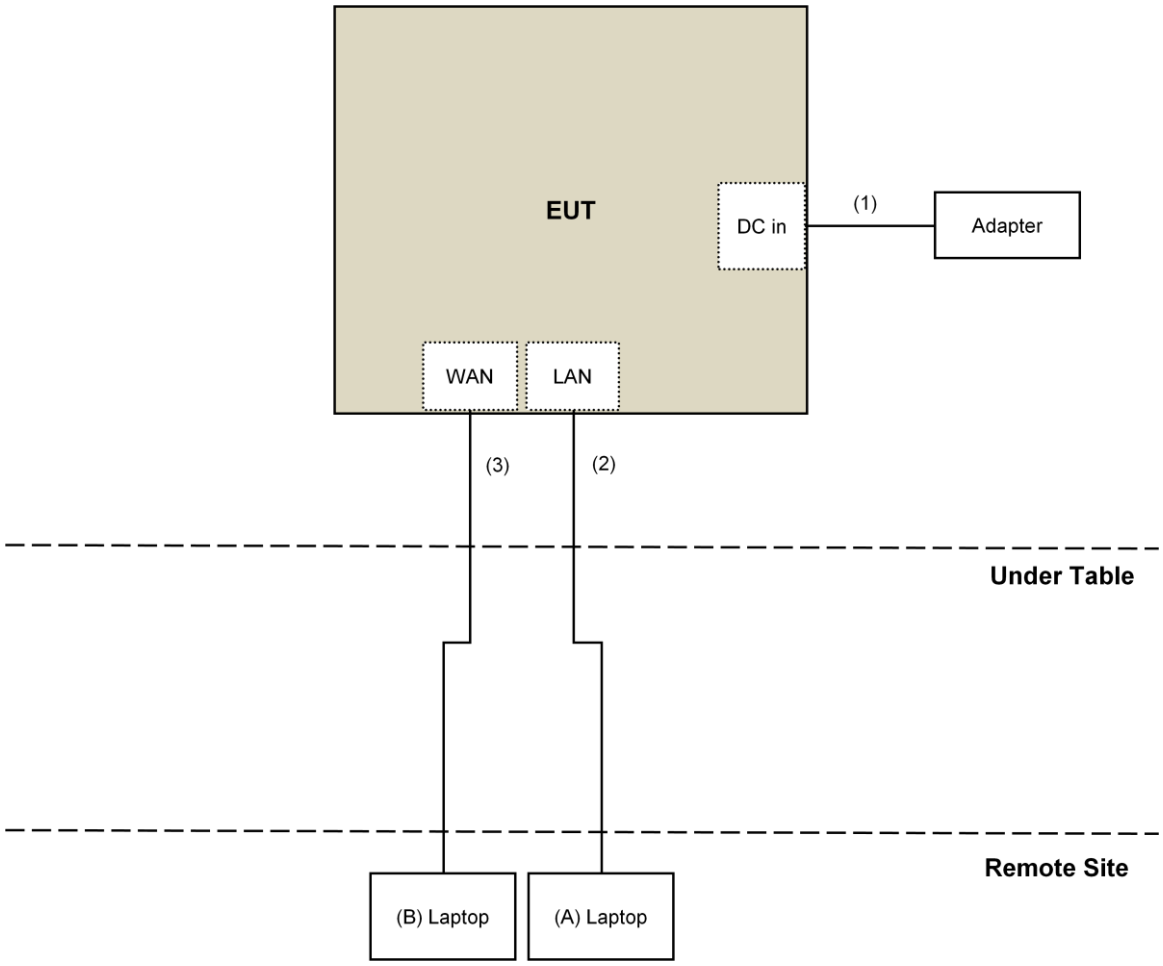
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	HP	Pavilion 14-ab023TU	5CD5340WXZ	NA	Provided by Lab
B.	Laptop	DELL	E6440	F9LYQ32	FCC DoC	Provided by Lab

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.5	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	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 v01r04
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v01r04			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:

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 18, 2016	Aug. 17, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 02, 2016	Apr. 01, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 30, 2016 Mar. 30, 2016	Feb. 01, 2018 Mar. 29, 2017 Mar. 29, 2017
Spectrum Analyzer Keysight	N9030A	MY54490520	July 29, 2016	July 28, 2017
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSv40	100964	June 28, 2016	June 27, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 11, 2017	Jan. 10, 2018
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2016	Nov. 09, 2017

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The FCC Site Registration No. is 147459
5. The CANADA Site Registration No. is 20331-1
6. Loop antenna was used for all emissions below 30 MHz
7. Tested Date: Feb. 08, 2017

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

c. Both X and Y axes of the antenna are set to make the measurement.

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

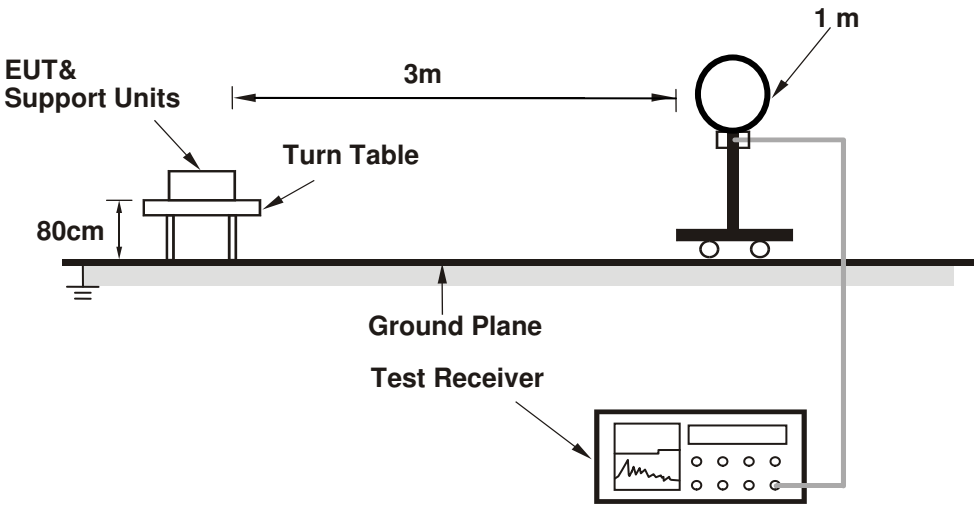
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

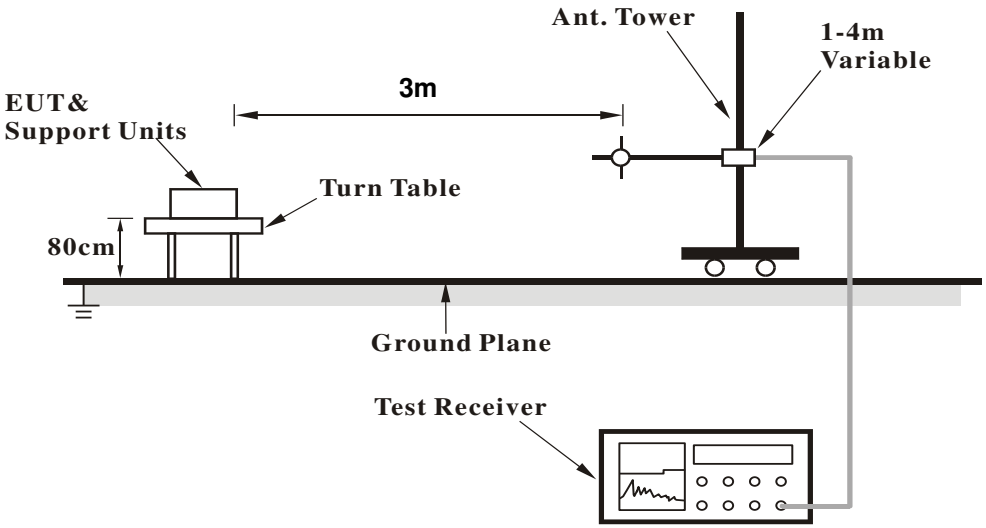
No deviation.

4.1.5 Test Setup

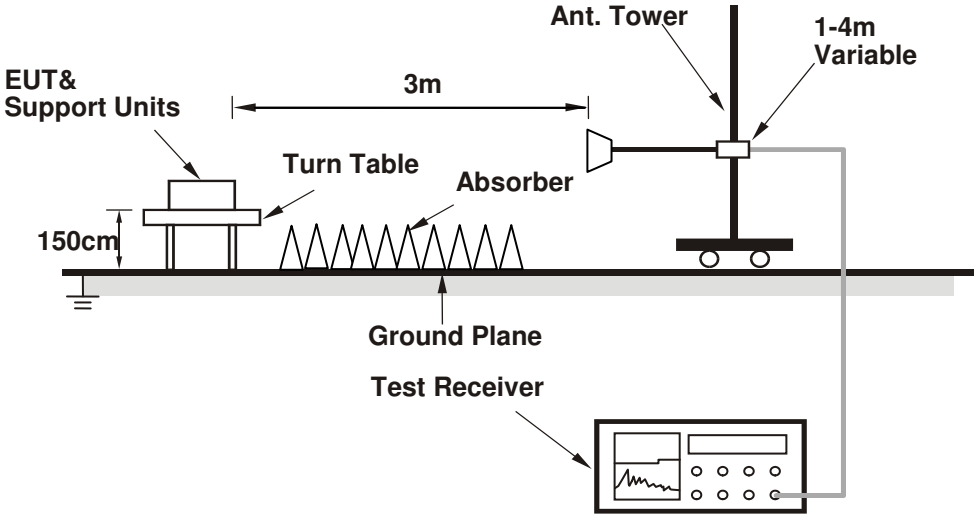
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the laptop which is placed on remote site.
b. Contorlling software (nodes_QCA9886_power command band 3-4.txt) has been activated to set the EUT on specific status.

4.1.7 Test Results

Radio 1

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	49.5 PK	74.0	-24.5	2.72 H	360	46.5	3.0
2	5150.00	38.2 AV	54.0	-15.8	2.72 H	360	35.2	3.0
3	*5260.00	107.0 PK			2.72 H	360	103.8	3.2
4	*5260.00	96.7 AV			2.72 H	360	93.5	3.2
5	#10520.00	52.2 PK	74.0	-21.8	1.50 H	344	40.2	12.0
6	#10520.00	39.4 AV	54.0	-14.6	1.50 H	344	27.4	12.0
7	15780.00	47.0 PK	74.0	-27.0	1.70 H	91	34.9	12.1
8	15780.00	34.3 AV	54.0	-19.7	1.70 H	91	22.2	12.1
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	51.6 PK	74.0	-22.4	1.73 V	140	48.6	3.0
2	5150.00	41.4 AV	54.0	-12.6	1.73 V	140	38.4	3.0
3	*5260.00	116.3 PK			1.73 V	140	113.1	3.2
4	*5260.00	105.3 AV			1.73 V	140	102.1	3.2
5	#10520.00	47.0 PK	74.0	-27.0	1.80 V	29	35.0	12.0
6	#10520.00	34.3 AV	54.0	-19.7	1.80 V	29	22.3	12.0
7	15780.00	46.6 PK	74.0	-27.4	1.16 V	249	34.5	12.1
8	15780.00	34.0 AV	54.0	-20.0	1.16 V	249	21.9	12.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.7 PK	74.0	-23.3	2.75 H	356	47.7	3.0
2	5150.00	38.7 AV	54.0	-15.3	2.75 H	356	35.7	3.0
3	*5300.00	106.7 PK			2.75 H	356	103.5	3.2
4	*5300.00	96.6 AV			2.75 H	356	93.4	3.2
5	5350.00	48.7 PK	74.0	-25.3	2.75 H	356	45.4	3.3
6	5350.00	37.4 AV	54.0	-16.6	2.75 H	356	34.1	3.3
7	10600.00	52.1 PK	74.0	-21.9	1.56 H	321	40.0	12.1
8	10600.00	39.5 AV	54.0	-14.5	1.56 H	321	27.4	12.1
9	15900.00	47.1 PK	74.0	-26.9	1.74 H	82	35.5	11.6
10	15900.00	34.5 AV	54.0	-19.5	1.74 H	82	22.9	11.6
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	5150.00	52.7 PK	74.0	-21.3	1.74 V	137	49.7	3.0
2	5150.00	41.7 AV	54.0	-12.3	1.74 V	137	38.7	3.0
3	*5300.00	116.2 PK			1.74 V	137	113.0	3.2
4	*5300.00	105.4 AV			1.74 V	137	102.2	3.2
5	5350.00	50.8 PK	74.0	-23.2	1.74 V	137	47.5	3.3
6	5350.00	39.2 AV	54.0	-14.8	1.74 V	137	35.9	3.3
7	10600.00	46.8 PK	74.0	-27.2	1.82 V	49	34.7	12.1
8	10600.00	34.1 AV	54.0	-19.9	1.82 V	49	22.0	12.1
9	15900.00	46.6 PK	74.0	-27.4	1.24 V	241	35.0	11.6
10	15900.00	34.1 AV	54.0	-19.9	1.24 V	241	22.5	11.6

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.

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	107.1 PK			2.78 H	360	103.9	3.2
2	*5320.00	96.6 AV			2.78 H	360	93.4	3.2
3	5350.00	58.5 PK	74.0	-15.5	2.78 H	360	55.2	3.3
4	5350.00	43.9 AV	54.0	-10.1	2.78 H	360	40.6	3.3
5	10640.00	52.4 PK	74.0	-21.6	1.50 H	335	40.2	12.2
6	10640.00	39.7 AV	54.0	-14.3	1.50 H	335	27.5	12.2
7	15960.00	46.5 PK	74.0	-27.5	1.76 H	77	34.9	11.6
8	15960.00	34.1 AV	54.0	-19.9	1.76 H	77	22.5	11.6
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	*5320.00	116.3 PK			1.73 V	139	113.1	3.2
2	*5320.00	105.2 AV			1.73 V	139	102.0	3.2
3	5350.00	60.6 PK	74.0	-13.4	1.73 V	139	57.3	3.3
4	5350.00	45.8 AV	54.0	-8.2	1.73 V	139	42.5	3.3
5	10640.00	46.8 PK	74.0	-27.2	1.82 V	39	34.6	12.2
6	10640.00	34.0 AV	54.0	-20.0	1.82 V	39	21.8	12.2
7	15960.00	46.9 PK	74.0	-27.1	1.20 V	238	35.3	11.6
8	15960.00	34.2 AV	54.0	-19.8	1.20 V	238	22.6	11.6

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.

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.4 PK	74.0	-23.6	1.65 H	294	47.4	3.0
2	5150.00	37.5 AV	54.0	-16.5	1.65 H	294	34.5	3.0
3	*5260.00	108.5 PK			1.65 H	294	105.3	3.2
4	*5260.00	98.1 AV			1.65 H	294	94.9	3.2
5	#10520.00	47.7 PK	74.0	-26.3	1.24 H	360	35.7	12.0
6	#10520.00	34.8 AV	54.0	-19.2	1.24 H	360	22.8	12.0
7	15780.00	49.0 PK	74.0	-25.0	1.55 H	149	36.9	12.1
8	15780.00	38.8 AV	54.0	-15.2	1.55 H	149	26.7	12.1
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	50.7 PK	74.0	-23.3	1.76 V	137	47.7	3.0
2	5150.00	40.7 AV	54.0	-13.3	1.76 V	137	37.7	3.0
3	*5260.00	118.1 PK			1.76 V	137	114.9	3.2
4	*5260.00	106.5 AV			1.76 V	137	103.3	3.2
5	#10520.00	46.5 PK	74.0	-27.5	2.03 V	98	34.5	12.0
6	#10520.00	34.0 AV	54.0	-20.0	2.03 V	98	22.0	12.0
7	15780.00	49.1 PK	74.0	-24.9	3.26 V	94	37.0	12.1
8	15780.00	38.5 AV	54.0	-15.5	3.26 V	94	26.4	12.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	49.5 PK	74.0	-24.5	1.59 H	280	46.5	3.0
2	5150.00	38.2 AV	54.0	-15.8	1.59 H	280	35.2	3.0
3	*5300.00	108.6 PK			1.59 H	280	105.4	3.2
4	*5300.00	98.3 AV			1.59 H	280	95.1	3.2
5	5350.00	48.6 PK	74.0	-25.4	1.59 H	280	45.3	3.3
6	5350.00	35.9 AV	54.0	-18.1	1.59 H	280	32.6	3.3
7	10600.00	47.7 PK	74.0	-26.3	1.24 H	360	35.6	12.1
8	10600.00	34.8 AV	54.0	-19.2	1.24 H	360	22.7	12.1
9	15900.00	49.0 PK	74.0	-25.0	1.55 H	149	37.4	11.6
10	15900.00	38.8 AV	54.0	-15.2	1.55 H	149	27.2	11.6
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	5150.00	51.5 PK	74.0	-22.5	1.80 V	135	48.5	3.0
2	5150.00	41.2 AV	54.0	-12.8	1.80 V	135	38.2	3.0
3	*5300.00	118.2 PK			1.80 V	135	115.0	3.2
4	*5300.00	106.7 AV			1.80 V	135	103.5	3.2
5	5350.00	50.9 PK	74.0	-23.1	1.80 V	135	47.6	3.3
6	5350.00	39.1 AV	54.0	-14.9	1.80 V	135	35.8	3.3
7	10600.00	47.1 PK	74.0	-26.9	2.00 V	103	35.0	12.1
8	10600.00	34.8 AV	54.0	-19.2	2.00 V	103	22.7	12.1
9	15900.00	48.8 PK	74.0	-25.2	3.23 V	96	37.2	11.6
10	15900.00	38.5 AV	54.0	-15.5	3.23 V	96	26.9	11.6

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.

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	108.1 PK			1.61 H	283	104.9	3.2
2	*5320.00	97.8 AV			1.61 H	283	94.6	3.2
3	5350.00	46.5 PK	74.0	-27.5	1.61 H	283	43.2	3.3
4	5350.00	33.0 AV	54.0	-21.0	1.61 H	283	29.7	3.3
5	10640.00	47.7 PK	74.0	-26.3	1.24 H	360	35.5	12.2
6	10640.00	34.8 AV	54.0	-19.2	1.24 H	360	22.6	12.2
7	15960.00	49.0 PK	74.0	-25.0	1.55 H	149	37.4	11.6
8	15960.00	38.8 AV	54.0	-15.2	1.55 H	149	27.2	11.6
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	*5320.00	117.6 PK			1.52 V	135	114.4	3.2
2	*5320.00	106.1 AV			1.52 V	135	102.9	3.2
3	5350.00	48.7 PK	74.0	-25.3	1.52 V	135	45.4	3.3
4	5350.00	35.8 AV	54.0	-18.2	1.52 V	135	32.5	3.3
5	10640.00	46.9 PK	74.0	-27.1	2.04 V	102	34.7	12.2
6	10640.00	34.8 AV	54.0	-19.2	2.04 V	102	22.6	12.2
7	15960.00	48.6 PK	74.0	-25.4	3.28 V	78	37.0	11.6
8	15960.00	38.3 AV	54.0	-15.7	3.28 V	78	26.7	11.6

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.

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	48.4 PK	74.0	-25.6	1.63 H	285	45.4	3.0
2	5150.00	37.1 AV	54.0	-16.9	1.63 H	285	34.1	3.0
3	*5270.00	106.1 PK			1.63 H	285	102.9	3.2
4	*5270.00	96.4 AV			1.63 H	285	93.2	3.2
5	#10540.00	47.9 PK	74.0	-26.1	1.22 H	360	35.9	12.0
6	#10540.00	35.0 AV	54.0	-19.0	1.22 H	360	23.0	12.0
7	15810.00	48.6 PK	74.0	-25.4	1.51 H	133	36.7	11.9
8	15810.00	38.6 AV	54.0	-15.4	1.51 H	133	26.7	11.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.3 PK	74.0	-23.7	1.54 V	136	47.3	3.0
2	5150.00	40.2 AV	54.0	-13.8	1.54 V	136	37.2	3.0
3	*5270.00	115.6 PK			1.54 V	136	112.4	3.2
4	*5270.00	104.9 AV			1.54 V	136	101.7	3.2
5	#10540.00	46.3 PK	74.0	-27.7	1.98 V	113	34.3	12.0
6	#10540.00	33.8 AV	54.0	-20.2	1.98 V	113	21.8	12.0
7	15810.00	48.9 PK	74.0	-25.1	3.27 V	110	37.0	11.9
8	15810.00	38.8 AV	54.0	-15.2	3.27 V	110	26.9	11.9

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	105.1 PK			1.57 H	288	101.9	3.2
2	*5310.00	93.6 AV			1.57 H	288	90.4	3.2
3	5350.00	61.2 PK	74.0	-12.8	1.57 H	288	57.9	3.3
4	5350.00	47.6 AV	54.0	-6.4	1.57 H	288	44.3	3.3
5	10620.00	47.7 PK	74.0	-26.3	1.22 H	360	35.5	12.2
6	10620.00	34.8 AV	54.0	-19.2	1.22 H	360	22.6	12.2
7	15930.00	48.4 PK	74.0	-25.6	1.58 H	143	36.9	11.5
8	15930.00	38.4 AV	54.0	-15.6	1.58 H	143	26.9	11.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	114.0 PK			1.59 V	136	110.8	3.2
2	*5310.00	102.1 AV			1.59 V	136	98.9	3.2
3	5350.00	63.6 PK	74.0	-10.4	1.59 V	136	60.3	3.3
4	**5350.00**	**50.9 AV**	**54.0**	**-3.1**	**1.59 V**	**136**	**47.6**	**3.3**
5	10620.00	46.4 PK	74.0	-27.6	2.02 V	96	34.2	12.2
6	10620.00	33.8 AV	54.0	-20.2	2.02 V	96	21.6	12.2
7	15930.00	48.7 PK	74.0	-25.3	3.24 V	114	37.2	11.5
8	15930.00	38.6 AV	54.0	-15.4	3.24 V	114	27.1	11.5

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	53.7 PK	74.0	-20.3	1.82 H	282	50.7	3.0
2	5150.00	41.6 AV	54.0	-12.4	1.82 H	282	38.6	3.0
3	*5290.00	101.2 PK			1.82 H	282	98.0	3.2
4	*5290.00	88.7 AV			1.82 H	282	85.5	3.2
5	5350.00	60.3 PK	74.0	-13.7	1.82 H	282	57.0	3.3
6	5350.00	47.7 AV	54.0	-6.3	1.82 H	282	44.4	3.3
7	#10580.00	47.4 PK	74.0	-26.6	1.24 H	346	35.3	12.1
8	#10580.00	34.5 AV	54.0	-19.5	1.24 H	346	22.4	12.1
9	15870.00	49.6 PK	74.0	-24.4	1.49 H	160	38.0	11.6
10	15870.00	39.1 AV	54.0	-14.9	1.49 H	160	27.5	11.6
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	5150.00	55.9 PK	74.0	-18.1	1.58 V	134	52.9	3.0
2	5150.00	44.7 AV	54.0	-9.3	1.58 V	134	41.7	3.0
3	*5290.00	110.4 PK			1.58 V	134	107.2	3.2
4	*5290.00	100.0 AV			1.58 V	134	96.8	3.2
5	5350.00	62.7 PK	74.0	-11.3	1.58 V	134	59.4	3.3
6	5350.00	50.8 AV	54.0	-3.2	1.58 V	134	47.5	3.3
7	#10580.00	46.4 PK	74.0	-27.6	2.02 V	102	34.3	12.1
8	#10580.00	33.9 AV	54.0	-20.1	2.02 V	102	21.8	12.1
9	15870.00	49.3 PK	74.0	-24.7	3.24 V	89	37.7	11.6
10	15870.00	39.2 AV	54.0	-14.8	3.24 V	89	27.6	11.6

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.

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 62	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	33.01	26.7 QP	40.0	-13.3	1.00 H	218	36.4	-9.7
2	140.05	26.2 QP	43.5	-17.3	1.00 H	78	35.2	-9.0
3	205.36	29.6 QP	43.5	-13.9	2.00 H	109	41.1	-11.5
4	309.61	29.6 QP	46.0	-16.4	2.50 H	88	36.7	-7.1
5	598.56	38.6 QP	46.0	-7.4	1.50 H	109	38.8	-0.2
6	701.33	35.8 QP	46.0	-10.2	1.50 H	301	34.6	1.2
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	78.35	27.6 QP	40.0	-12.4	1.00 V	175	40.1	-12.5
2	251.28	31.2 QP	46.0	-14.8	2.50 V	92	40.6	-9.4
3	346.66	31.8 QP	46.0	-14.2	1.50 V	134	38.2	-6.4
4	403.25	30.6 QP	46.0	-15.4	2.00 V	149	35.5	-4.9
5	701.33	35.8 QP	46.0	-10.2	1.50 V	301	34.6	1.2
6	719.86	30.6 QP	46.0	-15.4	2.50 V	304	29.0	1.6

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

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Above 1GHz Data:

802.11a

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	54.2 PK	74.0	-19.8	1.67 H	213	50.8	3.4
2	#5470.00	41.3 AV	54.0	-12.7	1.67 H	213	37.9	3.4
3	*5500.00	110.2 PK			1.67 H	213	106.7	3.5
4	*5500.00	99.5 AV			1.67 H	213	96.0	3.5
5	11000.00	47.3 PK	74.0	-26.7	1.52 H	160	34.3	13.0
6	11000.00	34.9 AV	54.0	-19.1	1.52 H	160	21.9	13.0
7	#16500.00	49.1 PK	74.0	-24.9	1.21 H	315	35.7	13.4
8	#16500.00	37.2 AV	54.0	-16.8	1.21 H	315	23.8	13.4
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	#5470.00	56.8 PK	74.0	-17.2	1.00 V	360	53.4	3.4
2	#5470.00	44.4 AV	54.0	-9.6	1.00 V	360	41.0	3.4
3	*5500.00	114.0 PK			1.00 V	360	110.5	3.5
4	*5500.00	104.2 AV			1.00 V	360	100.7	3.5
5	11000.00	47.3 PK	74.0	-26.7	1.50 V	36	34.3	13.0
6	11000.00	35.0 AV	54.0	-19.0	1.50 V	36	22.0	13.0
7	#16500.00	48.6 PK	74.0	-25.4	1.86 V	99	35.2	13.4
8	#16500.00	37.1 AV	54.0	-16.9	1.86 V	99	23.7	13.4

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	50.4 PK	74.0	-23.6	1.67 H	206	47.0	3.4
2	#5470.00	38.6 AV	54.0	-15.4	1.67 H	206	35.2	3.4
3	*5580.00	110.0 PK			1.67 H	206	106.5	3.5
4	*5580.00	99.1 AV			1.67 H	206	95.6	3.5
5	11160.00	47.2 PK	74.0	-26.8	1.47 H	150	34.7	12.5
6	11160.00	35.0 AV	54.0	-19.0	1.47 H	150	22.5	12.5
7	#16740.00	49.2 PK	74.0	-24.8	1.24 H	318	34.8	14.4
8	#16740.00	37.6 AV	54.0	-16.4	1.24 H	318	23.2	14.4
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	#5470.00	52.9 PK	74.0	-21.1	1.00 V	360	49.5	3.4
2	#5470.00	41.6 AV	54.0	-12.4	1.00 V	360	38.2	3.4
3	*5580.00	114.0 PK			1.00 V	360	110.5	3.5
4	*5580.00	104.2 AV			1.00 V	360	100.7	3.5
5	11160.00	47.4 PK	74.0	-26.6	1.45 V	32	34.9	12.5
6	11160.00	35.4 AV	54.0	-18.6	1.45 V	32	22.9	12.5
7	#16740.00	49.2 PK	74.0	-24.8	1.82 V	103	34.8	14.4
8	#16740.00	37.5 AV	54.0	-16.5	1.82 V	103	23.1	14.4

REMARKS:

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

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	110.1 PK			1.72 H	213	106.4	3.7
2	*5700.00	99.3 AV			1.72 H	213	95.6	3.7
3	#5725.00	59.6 PK	74.0	-14.4	1.72 H	213	55.9	3.7
4	#5725.00	42.7 AV	54.0	-11.3	1.72 H	213	39.0	3.7
5	11400.00	47.3 PK	74.0	-26.7	1.49 H	167	34.7	12.6
6	11400.00	34.6 AV	54.0	-19.4	1.49 H	167	22.0	12.6
7	#17100.00	48.9 PK	74.0	-25.1	1.16 H	325	32.4	16.5
8	#17100.00	37.2 AV	54.0	-16.8	1.16 H	325	20.7	16.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	114.1 PK			1.00 V	360	110.4	3.7
2	*5700.00	104.4 AV			1.00 V	360	100.7	3.7
3	#5725.00	61.8 PK	74.0	-12.2	1.00 V	360	58.1	3.7
4	#5725.00	44.8 AV	54.0	-9.2	1.00 V	360	41.1	3.7
5	11400.00	47.6 PK	74.0	-26.4	1.49 V	50	35.0	12.6
6	11400.00	35.4 AV	54.0	-18.6	1.49 V	50	22.8	12.6
7	#17100.00	48.2 PK	74.0	-25.8	1.82 V	100	31.7	16.5
8	#17100.00	36.7 AV	54.0	-17.3	1.82 V	100	20.2	16.5

REMARKS:

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

802.11ac (VHT20)

CHANNEL	TX Channel 100	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	48.7 PK	74.0	-25.3	1.80 H	200	45.3	3.4
2	#5470.00	41.3 AV	54.0	-12.7	1.80 H	200	37.9	3.4
3	*5500.00	110.3 PK			1.80 H	200	106.8	3.5
4	*5500.00	100.1 AV			1.80 H	200	96.6	3.5
5	11000.00	47.7 PK	74.0	-26.3	1.24 H	360	34.7	13.0
6	11000.00	34.8 AV	54.0	-19.2	1.24 H	360	21.8	13.0
7	#16500.00	49.0 PK	74.0	-25.0	1.55 H	149	35.6	13.4
8	#16500.00	38.8 AV	54.0	-15.2	1.55 H	149	25.4	13.4
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	#5470.00	55.8 PK	74.0	-18.2	1.00 V	360	52.4	3.4
2	#5470.00	45.1 AV	54.0	-8.9	1.00 V	360	41.7	3.4
3	*5500.00	115.9 PK			1.00 V	360	112.4	3.5
4	*5500.00	104.2 AV			1.00 V	360	100.7	3.5
5	11000.00	47.1 PK	74.0	-26.9	2.05 V	111	34.1	13.0
6	11000.00	34.9 AV	54.0	-19.1	2.05 V	111	21.9	13.0
7	#16500.00	49.2 PK	74.0	-24.8	3.20 V	81	35.8	13.4
8	#16500.00	38.8 AV	54.0	-15.2	3.20 V	81	25.4	13.4

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	46.8 PK	74.0	-27.2	1.82 H	211	43.4	3.4
2	#5470.00	38.3 AV	54.0	-15.7	1.82 H	211	34.9	3.4
3	*5580.00	109.8 PK			1.82 H	211	106.3	3.5
4	*5580.00	100.0 AV			1.82 H	211	96.5	3.5
5	11160.00	47.7 PK	74.0	-26.3	1.24 H	360	35.2	12.5
6	11160.00	34.8 AV	54.0	-19.2	1.24 H	360	22.3	12.5
7	#16740.00	49.0 PK	74.0	-25.0	1.55 H	149	34.6	14.4
8	#16740.00	38.8 AV	54.0	-15.2	1.55 H	149	24.4	14.4
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	#5470.00	54.2 PK	74.0	-19.8	1.07 V	360	50.8	3.4
2	#5470.00	42.3 AV	54.0	-11.7	1.07 V	360	38.9	3.4
3	*5580.00	114.0 PK			1.07 V	360	110.5	3.5
4	*5580.00	104.2 AV			1.07 V	360	100.7	3.5
5	11160.00	46.5 PK	74.0	-27.5	1.97 V	111	34.0	12.5
6	11160.00	34.0 AV	54.0	-20.0	1.97 V	111	21.5	12.5
7	#16740.00	49.1 PK	74.0	-24.9	3.21 V	103	34.7	14.4
8	#16740.00	38.7 AV	54.0	-15.3	3.21 V	103	24.3	14.4

REMARKS:

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

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	110.5 PK			1.72 H	214	106.8	3.7
2	*5700.00	100.2 AV			1.72 H	214	96.5	3.7
3	#5725.00	58.7 PK	74.0	-15.3	1.72 H	214	55.0	3.7
4	#5725.00	40.7 AV	54.0	-13.3	1.72 H	214	37.0	3.7
5	11400.00	47.7 PK	74.0	-26.3	1.24 H	360	35.1	12.6
6	11400.00	34.8 AV	54.0	-19.2	1.24 H	360	22.2	12.6
7	#17100.00	49.0 PK	74.0	-25.0	1.55 H	149	32.5	16.5
8	#17100.00	38.8 AV	54.0	-15.2	1.55 H	149	22.3	16.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	115.3 PK			1.36 V	170	111.6	3.7
2	*5700.00	104.4 AV			1.36 V	170	100.7	3.7
3	#5725.00	66.1 PK	74.0	-7.9	1.36 V	170	62.4	3.7
4	#5725.00	44.4 AV	54.0	-9.6	1.36 V	170	40.7	3.7
5	11400.00	46.8 PK	74.0	-27.2	2.01 V	100	34.2	12.6
6	11400.00	34.4 AV	54.0	-19.6	2.01 V	100	21.8	12.6
7	#17100.00	49.2 PK	74.0	-24.8	3.23 V	89	32.7	16.5
8	#17100.00	38.7 AV	54.0	-15.3	3.23 V	89	22.2	16.5

REMARKS:

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

802.11ac (VHT40)

CHANNEL	TX Channel 102	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	55.4 PK	74.0	-18.6	1.75 H	220	52.0	3.4
2	#5470.00	46.1 AV	54.0	-7.9	1.75 H	220	42.7	3.4
3	*5510.00	108.9 PK			1.75 H	220	105.4	3.5
4	*5510.00	97.3 AV			1.75 H	220	93.8	3.5
5	11020.00	47.7 PK	74.0	-26.3	1.25 H	349	34.8	12.9
6	11020.00	34.7 AV	54.0	-19.3	1.25 H	349	21.8	12.9
7	#16530.00	49.1 PK	74.0	-24.9	1.51 H	142	35.5	13.6
8	#16530.00	38.7 AV	54.0	-15.3	1.51 H	142	25.1	13.6
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	62.6 PK	74.0	-11.4	1.29 V	357	59.2	3.4
2	#5470.00	49.7 AV	54.0	-4.3	1.29 V	357	46.3	3.4
3	*5510.00	113.6 PK			1.29 V	357	110.1	3.5
4	*5510.00	101.6 AV			1.29 V	357	98.1	3.5
5	11020.00	46.3 PK	74.0	-27.7	1.97 V	95	33.4	12.9
6	11020.00	33.7 AV	54.0	-20.3	1.97 V	95	20.8	12.9
7	#16530.00	49.3 PK	74.0	-24.7	3.16 V	108	35.7	13.6
8	#16530.00	39.1 AV	54.0	-14.9	3.16 V	108	25.5	13.6

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	53.1 PK	74.0	-20.9	1.77 H	218	49.7	3.4
2	#5470.00	42.2 AV	54.0	-11.8	1.77 H	218	38.8	3.4
3	*5550.00	108.2 PK			1.77 H	218	104.7	3.5
4	*5550.00	98.0 AV			1.77 H	218	94.5	3.5
5	11100.00	47.7 PK	74.0	-26.3	1.30 H	360	35.0	12.7
6	11100.00	34.7 AV	54.0	-19.3	1.30 H	360	22.0	12.7
7	#16650.00	49.0 PK	74.0	-25.0	1.56 H	162	34.8	14.2
8	#16650.00	38.7 AV	54.0	-15.3	1.56 H	162	24.5	14.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	54.2 PK	74.0	-19.8	1.10 V	353	50.8	3.4
2	#5470.00	45.7 AV	54.0	-8.3	1.10 V	353	42.3	3.4
3	*5550.00	112.9 PK			1.10 V	353	109.4	3.5
4	*5550.00	102.1 AV			1.10 V	353	98.6	3.5
5	11100.00	46.8 PK	74.0	-27.2	1.98 V	110	34.1	12.7
6	11100.00	34.4 AV	54.0	-19.6	1.98 V	110	21.7	12.7
7	#16650.00	48.7 PK	74.0	-25.3	3.26 V	113	34.5	14.2
8	#16650.00	38.3 AV	54.0	-15.7	3.26 V	113	24.1	14.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	109.1 PK			1.81 H	221	105.5	3.6
2	*5670.00	99.7 AV			1.81 H	221	96.1	3.6
3	#5725.00	52.2 PK	74.0	-21.8	1.81 H	221	48.5	3.7
4	#5725.00	39.4 AV	54.0	-14.6	1.81 H	221	35.7	3.7
5	11340.00	47.9 PK	74.0	-26.1	1.20 H	357	35.5	12.4
6	11340.00	35.0 AV	54.0	-19.0	1.20 H	357	22.6	12.4
7	#17010.00	48.8 PK	74.0	-25.2	1.57 H	141	32.6	16.2
8	#17010.00	38.8 AV	54.0	-15.2	1.57 H	141	22.6	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	*5670.00	114.1 PK			1.35 V	13	110.5	3.6
2	*5670.00	103.8 AV			1.35 V	13	100.2	3.6
3	#5725.00	59.4 PK	74.0	-14.6	1.35 V	13	55.7	3.7
4	#5725.00	43.2 AV	54.0	-10.8	1.35 V	13	39.5	3.7
5	11340.00	46.9 PK	74.0	-27.1	1.96 V	100	34.5	12.4
6	11340.00	34.4 AV	54.0	-19.6	1.96 V	100	22.0	12.4
7	#17010.00	49.6 PK	74.0	-24.4	3.20 V	89	33.4	16.2
8	#17010.00	38.9 AV	54.0	-15.1	3.20 V	89	22.7	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.

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	59.4 PK	74.0	-14.6	1.81 H	268	56.0	3.4
2	#5470.00	47.7 AV	54.0	-6.3	1.81 H	268	44.3	3.4
3	*5530.00	102.8 PK			1.81 H	268	99.3	3.5
4	*5530.00	93.3 AV			1.81 H	268	89.8	3.5
5	#5725.00	46.6 PK	74.0	-27.4	1.81 H	268	42.9	3.7
6	#5725.00	34.5 AV	54.0	-19.5	1.81 H	268	30.8	3.7
7	11060.00	47.0 PK	74.0	-27.0	1.21 H	360	34.2	12.8
8	11060.00	34.3 AV	54.0	-19.7	1.21 H	360	21.5	12.8
9	#16590.00	49.5 PK	74.0	-24.5	1.52 H	163	35.5	14.0
10	#16590.00	39.1 AV	54.0	-14.9	1.52 H	163	25.1	14.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	61.5 PK	74.0	-12.5	1.63 V	175	58.1	3.4
2	#5470.00	50.8 AV	54.0	-3.2	1.63 V	175	47.4	3.4
3	*5530.00	107.9 PK			1.63 V	175	104.4	3.5
4	*5530.00	97.3 AV			1.63 V	175	93.8	3.5
5	#5725.00	48.7 PK	74.0	-25.3	1.63 V	175	45.0	3.7
6	#5725.00	37.9 AV	54.0	-16.1	1.63 V	175	34.2	3.7
7	11060.00	46.4 PK	74.0	-27.6	1.91 V	99	33.6	12.8
8	11060.00	33.9 AV	54.0	-20.1	1.91 V	99	21.1	12.8
9	#16590.00	49.2 PK	74.0	-24.8	3.17 V	98	35.2	14.0
10	#16590.00	38.6 AV	54.0	-15.4	3.17 V	98	24.6	14.0

REMARKS:

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

CHANNEL	TX Channel 122	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5610.00	104.3 PK			1.82 H	287	100.7	3.6
2	*5610.00	93.6 AV			1.82 H	287	90.0	3.6
3	#5725.00	53.2 PK	74.0	-20.8	1.82 H	287	49.5	3.7
4	#5725.00	38.6 AV	54.0	-15.4	1.82 H	287	34.9	3.7
5	11220.00	47.6 PK	74.0	-26.4	1.22 H	356	35.1	12.5
6	11220.00	34.7 AV	54.0	-19.3	1.22 H	356	22.2	12.5
7	#16830.00	48.6 PK	74.0	-25.4	1.61 H	142	34.0	14.6
8	#16830.00	38.5 AV	54.0	-15.5	1.61 H	142	23.9	14.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5610.00	109.1 PK			1.77 V	164	105.5	3.6
2	*5610.00	97.5 AV			1.77 V	164	93.9	3.6
3	#5725.00	55.6 PK	74.0	-18.4	1.77 V	164	51.9	3.7
4	#5725.00	41.9 AV	54.0	-12.1	1.77 V	164	38.2	3.7
5	11220.00	46.3 PK	74.0	-27.7	1.98 V	113	33.8	12.5
6	11220.00	34.0 AV	54.0	-20.0	1.98 V	113	21.5	12.5
7	#16830.00	48.7 PK	74.0	-25.3	3.18 V	89	34.1	14.6
8	#16830.00	38.4 AV	54.0	-15.6	3.18 V	89	23.8	14.6

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.

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 134	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.36	26.4 QP	40.0	-13.6	1.50 H	253	35.5	-9.1
2	162.89	32.9 QP	43.5	-10.6	1.50 H	174	41.3	-8.4
3	383.36	35.0 QP	46.0	-11.0	1.00 H	338	40.3	-5.3
4	518.58	31.4 QP	46.0	-14.6	1.00 H	261	33.3	-1.9
5	589.43	38.2 QP	46.0	-7.8	2.00 H	117	38.6	-0.4
6	705.62	32.5 QP	46.0	-13.5	1.50 H	61	31.1	1.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	35.39	23.6 QP	40.0	-16.4	1.00 V	210	33.3	-9.7
2	39.80	25.0 QP	40.0	-15.0	2.50 V	269	34.0	-9.0
3	109.34	32.1 QP	43.5	-11.4	2.00 V	319	43.6	-11.5
4	306.39	32.1 QP	46.0	-13.9	1.00 V	310	39.3	-7.2
5	429.42	31.6 QP	46.0	-14.4	2.50 V	219	35.4	-3.8
6	702.89	30.9 QP	46.0	-15.1	2.50 V	193	29.6	1.3

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

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. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 20, 2016	June 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3 Tested Date: Feb. 15, 2017

4.2.3 Test Procedure

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

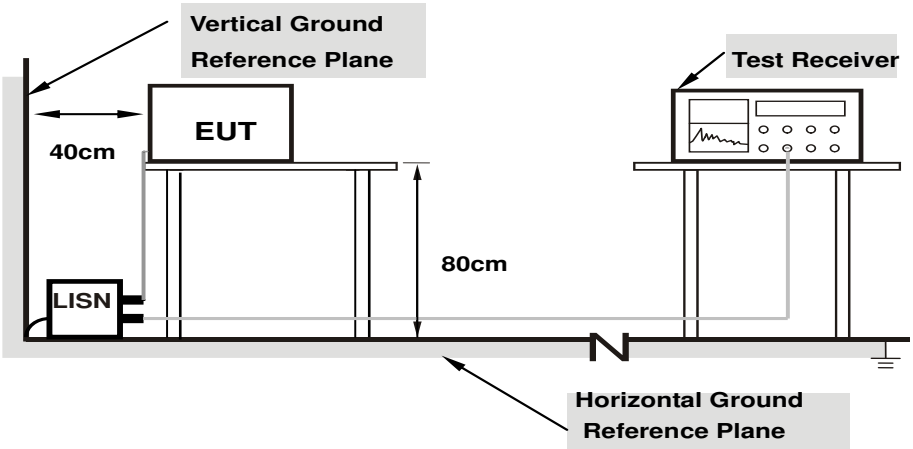
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

4.2.7 Test Results

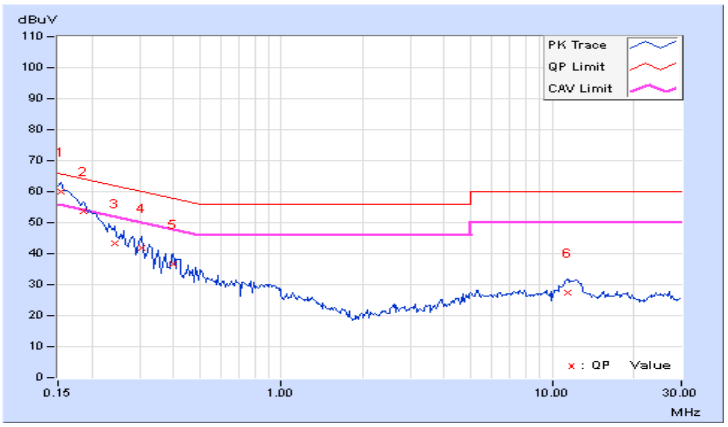
Radio 1

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.20	49.94	34.97	60.14	45.17	65.79	55.79	-5.65	-10.62
2	0.18516	10.20	43.45	28.79	53.65	38.99	64.25	54.25	-10.60	-15.26
3	0.24375	10.21	33.19	18.88	43.40	29.09	61.97	51.97	-18.57	-22.88
4	0.30625	10.22	31.51	21.36	41.73	31.58	60.07	50.07	-18.34	-18.49
5	0.40000	10.24	26.27	14.38	36.51	24.62	57.85	47.85	-21.34	-23.23
6	11.36328	10.89	16.42	12.45	27.31	23.34	60.00	50.00	-32.69	-26.66

REMARKS:

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

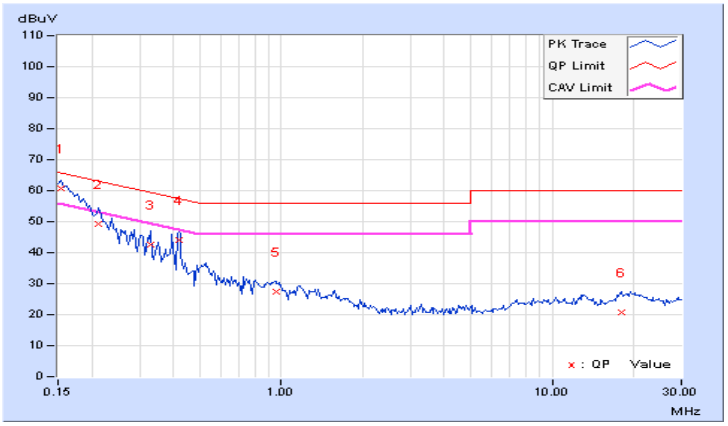


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15391**	**10.19**	**50.45**	**35.43**	**60.64**	**45.62**	**65.79**	**55.79**	**-5.15**	**-10.17**
2	0.21250	10.17	39.07	26.29	49.24	36.46	63.11	53.11	-13.87	-16.65
3	0.32969	10.22	32.47	26.03	42.69	36.25	59.46	49.46	-16.77	-13.21
4	0.41953	10.24	33.91	31.25	44.15	41.49	57.46	47.46	-13.31	-5.97
5	0.95469	10.26	17.21	12.70	27.47	22.96	56.00	46.00	-28.53	-23.04
6	18.13281	11.27	9.47	6.48	20.74	17.75	60.00	50.00	-39.26	-32.25

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.



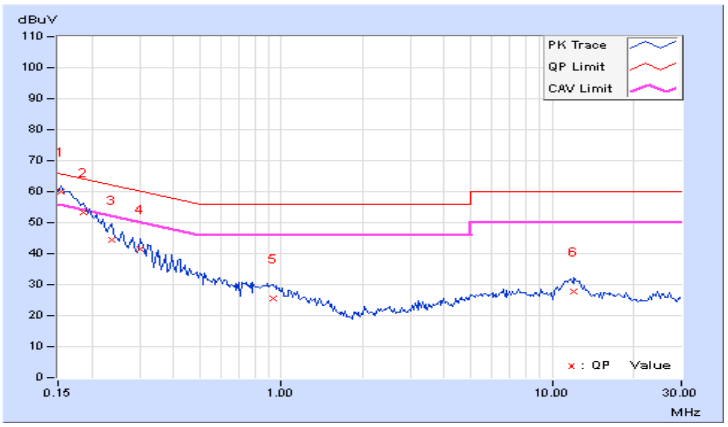
Radio 2

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.20	49.68	34.67	59.88	44.87	65.79	55.79	-5.91	-10.92
2	0.18516	10.20	43.29	28.44	53.49	38.64	64.25	54.25	-10.76	-15.61
3	0.23594	10.21	34.09	21.85	44.30	32.06	62.24	52.24	-17.94	-20.18
4	0.30234	10.22	31.18	21.00	41.40	31.22	60.18	50.18	-18.78	-18.96
5	0.93125	10.29	15.45	11.04	25.74	21.33	56.00	46.00	-30.26	-24.67
6	12.03516	10.96	16.65	12.62	27.61	23.58	60.00	50.00	-32.39	-26.42

REMARKS:

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

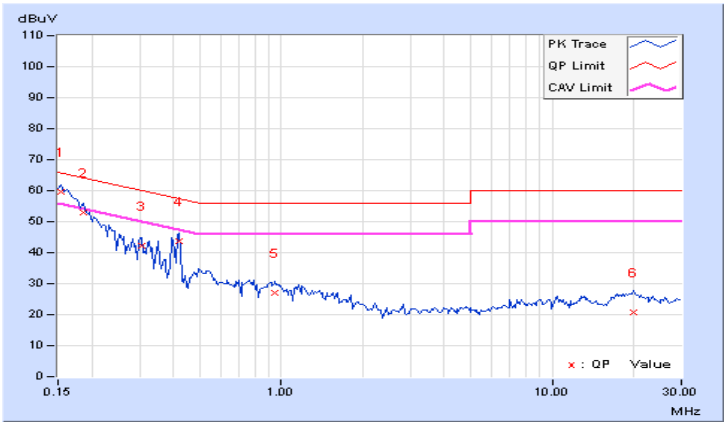


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.19	49.27	34.34	59.46	44.53	65.79	55.79	-6.33	-11.26
2	0.18516	10.18	42.95	28.14	53.13	38.32	64.25	54.25	-11.12	-15.93
3	0.30625	10.21	31.93	24.30	42.14	34.51	60.07	50.07	-17.93	-15.56
4	0.41953	10.24	33.34	30.37	43.58	40.61	57.46	47.46	-13.88	-6.85
5	0.95078	10.26	16.81	11.88	27.07	22.14	56.00	46.00	-28.93	-23.86
6	20.06250	11.38	9.36	6.79	20.74	18.17	60.00	50.00	-39.26	-31.83

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 Measurment

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

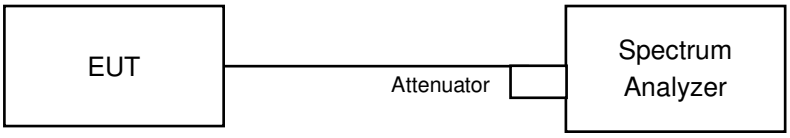
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

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

Radio 1

802.11a

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.21	19.13	186.8	22.71	22.80	Pass
60	5300	20.28	19.44	194.562	22.89	22.90	Pass
64	5320	20.22	19.67	197.879	22.96	23.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(7-6)".

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.43	19.08
60	5300	19.51	19.50
64	5320	20.04	20.01

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	19.08	23.8 < 24
60	5300	19.50	23.9 < 24
64	5320	20.01	24.01 > 24

802.11ac (VHT20)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.19	19.14	186.507	22.71	23.00	Pass
60	5300	20.35	19.42	195.891	22.92	23.00	Pass
64	5320	20.17	19.75	198.398	22.98	23.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(7-6)".

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.18	20.22
60	5300	20.31	20.54
64	5320	20.43	20.16

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	20.18	24.04 > 24
60	5300	20.31	24.07 > 24
64	5320	20.16	24.04 > 24

802.11ac (VHT40)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.49	19.21	195.312	22.91	23.00	Pass
62	5310	20.20	19.60	195.914	22.92	23.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(7-6)".

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	40.84	40.97
62	5310	41.05	40.65

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	40.84	27.11 > 24
62	5310	40.65	27.09 > 24

802.11ac (VHT80)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	20.19	19.17	187.076	22.72	23.00	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(7-6)".

26dB OCCUPIED BANDWIDTH

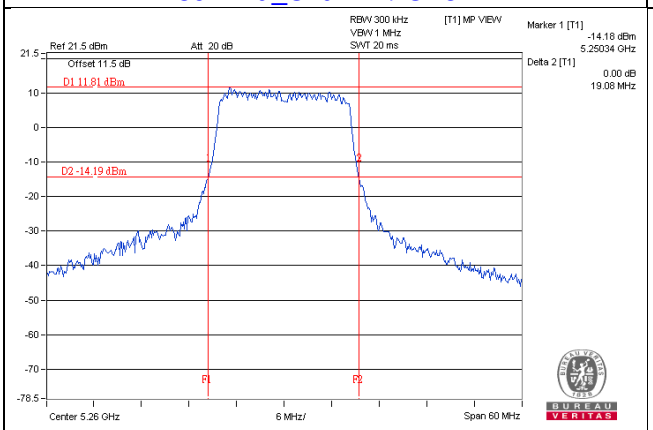
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.45	83.38

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

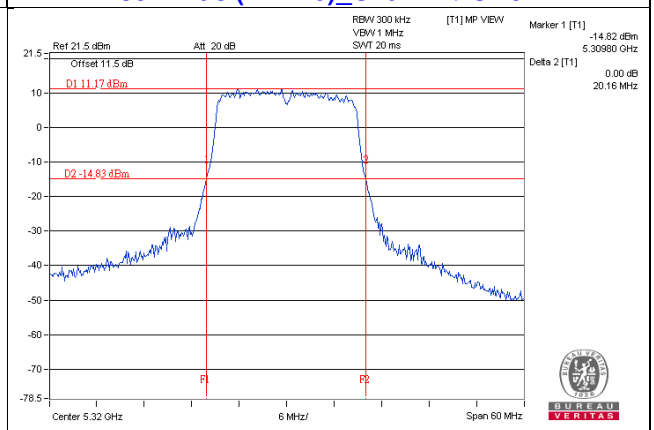
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.38	30.21 > 24

Spectrum Plot of Worst Value

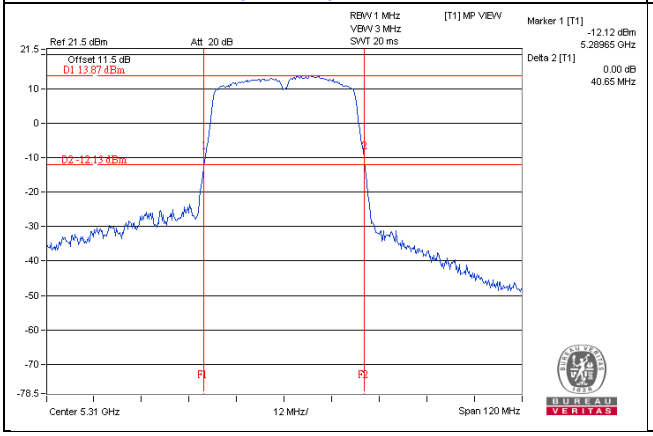
802.11a_Chain 1 / CH52



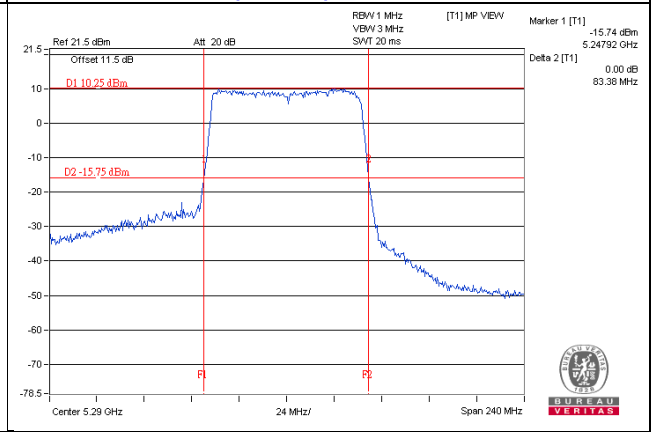
802.11ac (VHT20)_Chain 1 / CH64



8802.11ac (VHT40) _Chain 1 / CH62



802.11ac (VHT80) _Chain 1 / CH58



Radio 2

802.11a

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
100	5500	20.79	20.62	235.295	23.72	23.83	Pass
116	5580	20.93	20.16	227.633	23.57	23.85	Pass
140	5700	20.95	20.55	237.952	23.76	23.78	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(6.15-6)".

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
100	5500	20.10	19.89
120	5600	19.97	20.00
140	5700	20.05	19.67

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
100	5500	19.89	23.98 < 24
120	5600	19.97	24 > 24
140	5700	19.67	23.93 < 24

802.11ac (VHT20)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
100	5500	20.63	20.57	229.636	23.61	23.85	Pass
116	5580	21.02	20.43	236.882	23.75	23.85	Pass
140	5700	20.77	20.33	227.294	23.57	23.85	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(6.15-6)".

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
100	5500	20.80	20.77
116	5580	20.68	20.84
140	5700	20.65	20.83

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)
100	5500	20.77	24.17 > 24
116	5580	20.68	24.15 > 24
140	5700	20.65	24.14 > 24

802.11ac (VHT40)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
102	5510	20.70	20.71	235.251	23.72	23.85	Pass
110	5550	20.82	20.60	235.596	23.72	23.85	Pass
134	5670	21.20	20.39	241.222	23.82	23.85	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(6.15-6)".

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
102	5510	40.92	41.00
110	5550	41.08	40.98
134	5670	40.83	41.11

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
102	5510	40.92	27.11 > 24
110	5550	40.98	27.12 > 24
134	5670	40.83	27.1 > 24

802.11ac (VHT80)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
106	5530	20.82	20.44	231.443	23.64	23.85	Pass
122	5610	21.30	20.30	242.048	23.84	23.85	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi, so the power limit shall be reduced to "Determined Conducted Limit-(6.15-6)".

26dB OCCUPIED BANDWIDTH

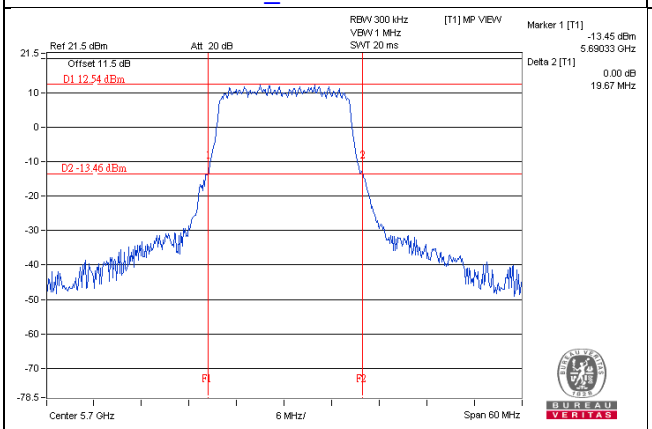
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
106	5530	84.22	84.17
122	5610	84.15	84.02

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

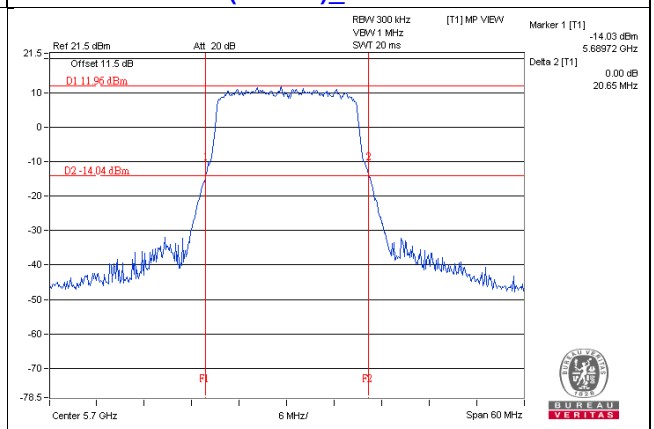
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
106	5530	84.17	30.25 > 24
122	5610	84.02	30.24 > 24

Spectrum Plot of Worst Value

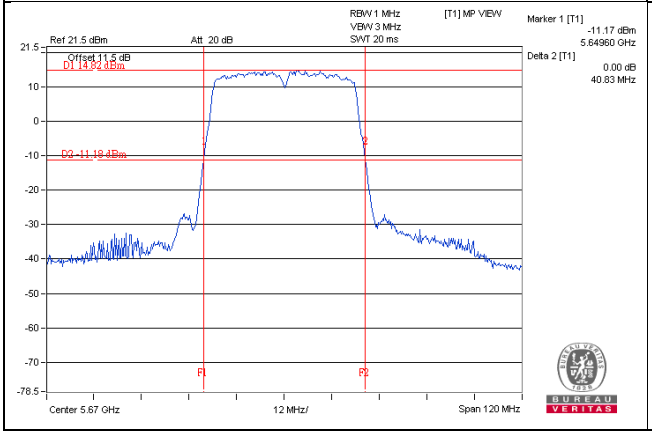
802.11a_Chain 1 / CH140



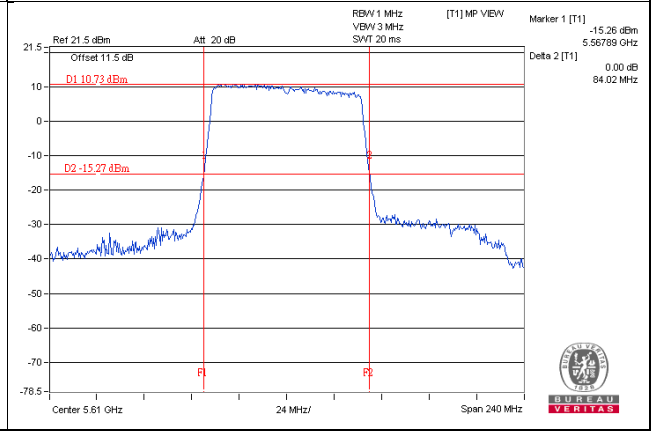
802.11ac (VHT20)_Chain 0 / CH140



8802.11ac (VHT40) _Chain 0 / CH134

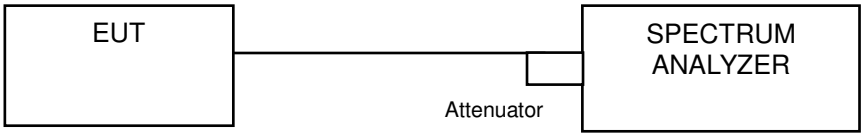


802.11ac (VHT80) _Chain 1 / CH122



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

Radio 1

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
52	5260	16.44	16.68
60	5300	16.44	16.44
64	5320	16.44	16.56

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
52	5260	17.64	17.64
60	5300	17.64	17.64
64	5320	17.64	17.52

802.11ac (VHT40)

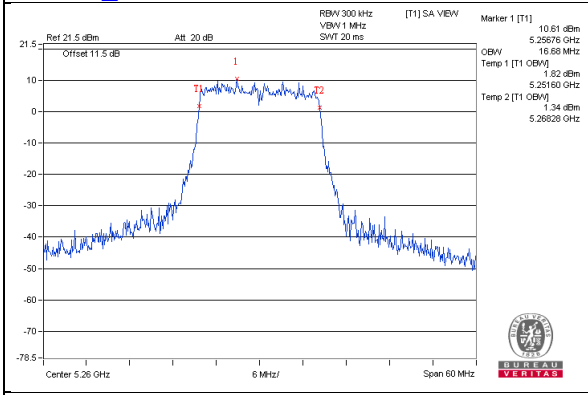
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
54	5270	36.00	36.24
62	5310	36.48	36.00

802.11ac (VHT80)

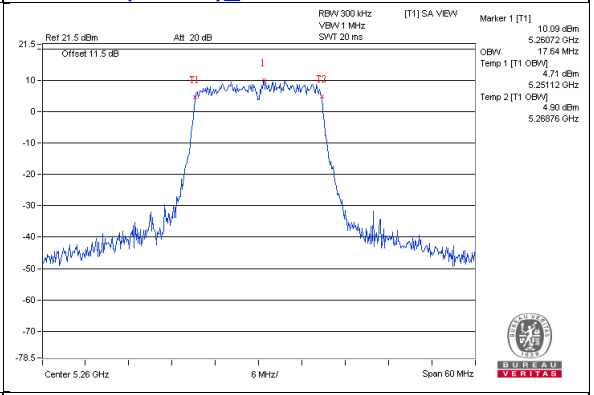
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
58	5290	75.84	75.84

Spectrum Plot of Worst Value

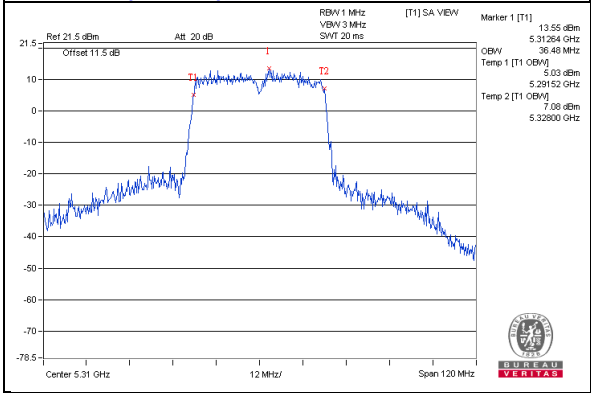
802.11a_Chain1 / CH52



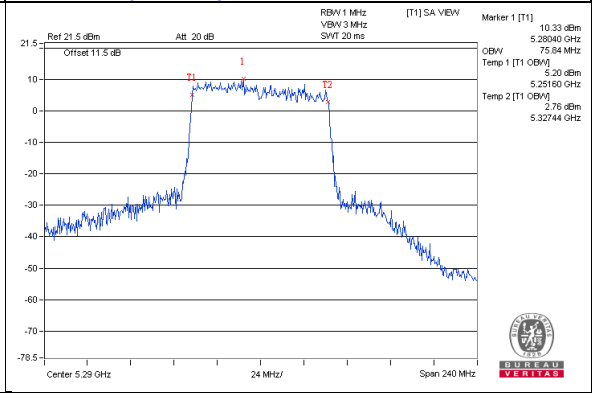
802.11ac (VHT20)_Chain0 / CH52



802.11ac (VHT40)_Chain0 / CH62



802.11ac (VHT80)_Chain0 / CH58



Radio 2

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
100	5500	16.56	16.56
116	5580	16.44	16.56
140	5700	16.44	16.44

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
100	5500	17.76	17.76
116	5580	17.64	17.64
140	5700	17.64	17.64

802.11ac (VHT40)

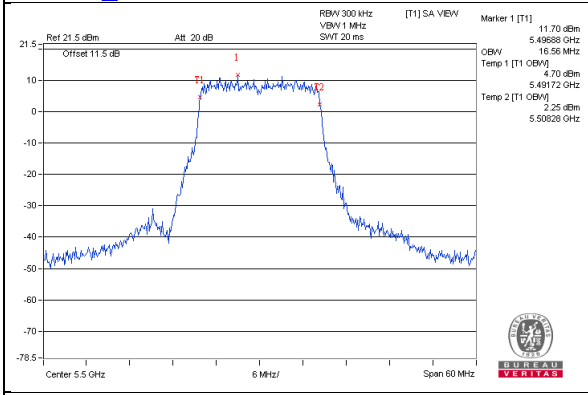
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
102	5510	36.24	36.48
110	5550	36.24	36.24
134	5670	36.24	36.24

802.11ac (VHT80)

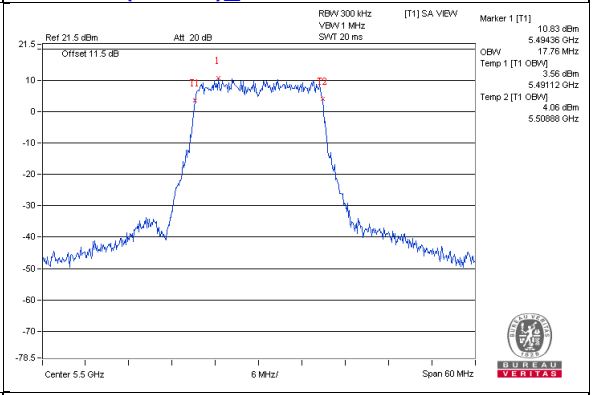
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
106	5530	75.84	76.32
122	5610	75.84	76.32

Spectrum Plot of Worst Value

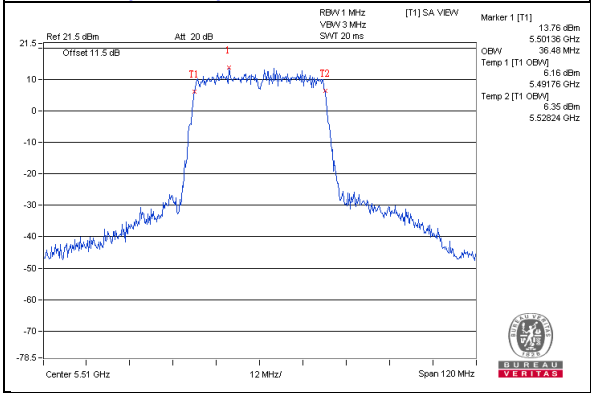
802.11a_Chain0 / CH100



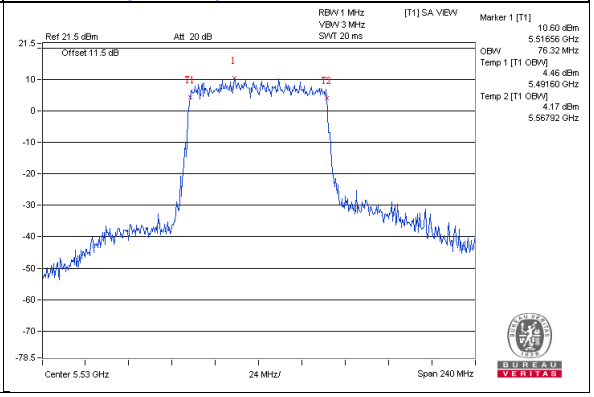
802.11ac (VHT20)_Chain0 / CH100



802.11ac (VHT40)_Chain1 / CH102



802.11ac (VHT80)_Chain1 / CH106

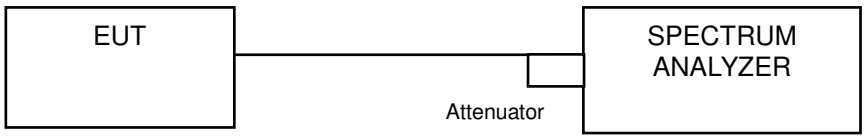


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

802.11ac (VHT20)

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

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

Using method SA-2

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

Radio 1

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	5.40	5.21	0.17	8.48	10.00	Pass
60	5300	5.86	4.86	0.17	8.57	10.00	Pass
64	5320	5.84	5.69	0.17	8.94	10.00	Pass

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

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi , so the power density limit shall be reduced to 11-(7-6) = 10dBm.

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

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
52	5260	5.56	5.23	8.41	10.00	Pass
60	5300	5.41	4.91	8.18	10.00	Pass
64	5320	5.68	5.39	8.55	10.00	Pass

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

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi , so the power density limit shall be reduced to 11-(7-6) = 10dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	3.44	2.39	0.16	6.12	10.00	Pass
62	5310	2.73	3.03	0.16	6.05	10.00	Pass

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

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi , so the power density limit shall be reduced to 11-(7-6) = 10dBm.

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

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	-0.02	-1.52	0.28	2.58	10.00	Pass

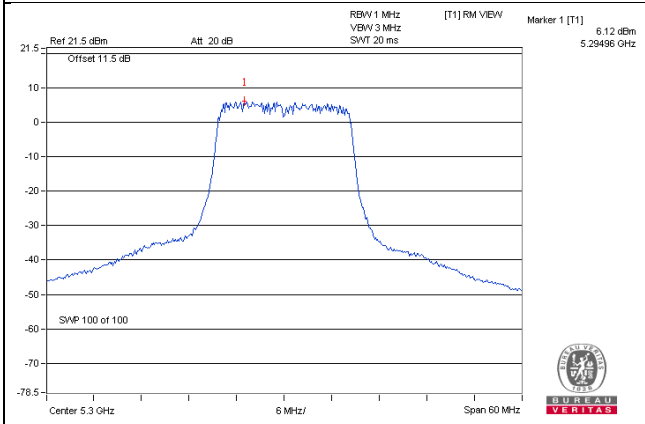
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 7dBi > 6dBi , so the power density limit shall be reduced to 11-(7-6) = 10dBm.

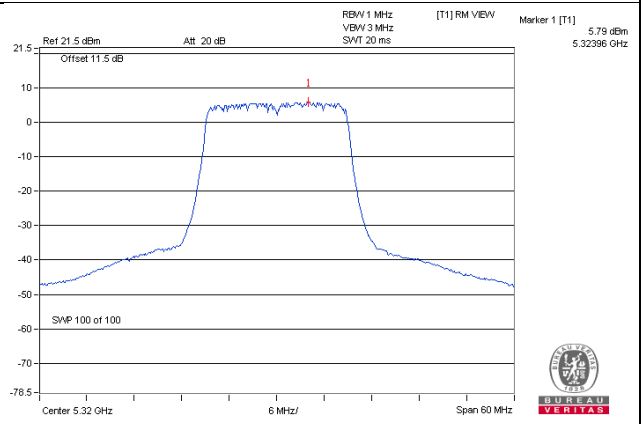
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

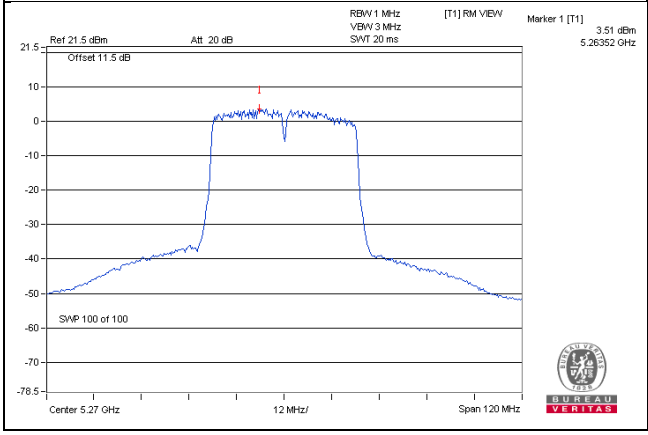
802.11a_Chain 0 / CH60



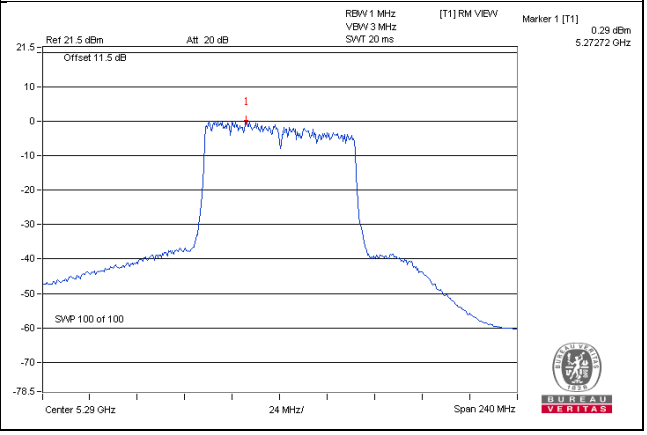
802.11ac (VHT20)_Chain 0 / CH64



802.11ac (VHT40)_Chain 0 / CH54



802.11ac (VHT80)_Chain 0 / CH58



Radio 2

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
100	5500	6.13	6.41	0.17	9.45	10.85	Pass
116	5580	6.37	5.69	0.17	9.22	10.85	Pass
140	5700	6.27	5.91	0.17	9.27	10.85	Pass

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

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi , so the power density limit shall be reduced to 11-(6.15-6) = 10.85dBm.

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

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
100	5500	5.91	6.00	8.97	10.85	Pass
116	5580	6.09	5.83	8.97	10.85	Pass
140	5700	5.88	5.29	8.61	10.85	Pass

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

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi , so the power density limit shall be reduced to 11-(6.15-6) = 10.85dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
102	5510	3.38	3.33	0.16	6.53	10.85	Pass
110	5550	3.72	3.45	0.16	6.76	10.85	Pass
134	5670	3.48	2.50	0.16	6.19	10.85	Pass

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

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi , so the power density limit shall be reduced to 11-(6.15-6) = 10.85dBm.

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

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
106	5530	-0.16	0.23	0.28	3.33	10.85	Pass
122	5610	0.33	-0.35	0.28	3.29	10.85	Pass

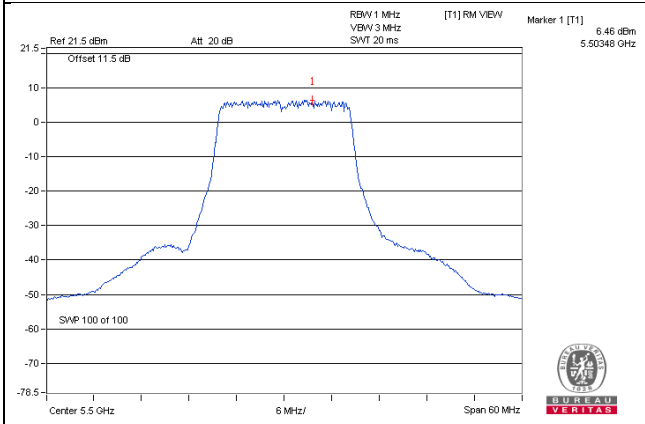
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.15dBi > 6dBi , so the power density limit shall be reduced to 11-(6.15-6) = 10.85dBm.

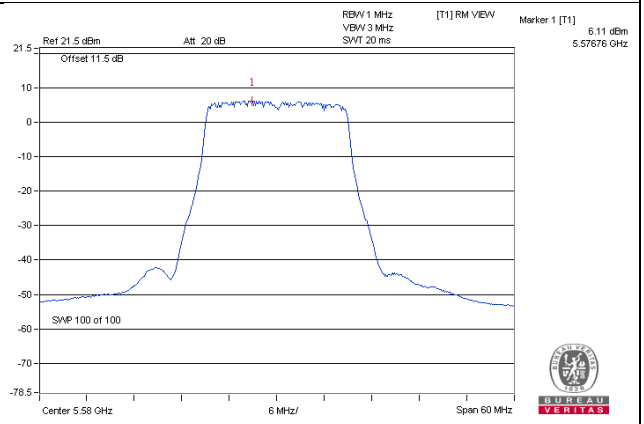
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

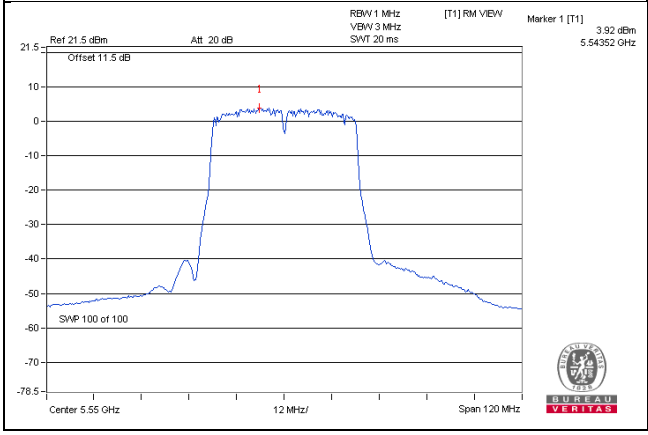
802.11a_Chain 1 / CH100



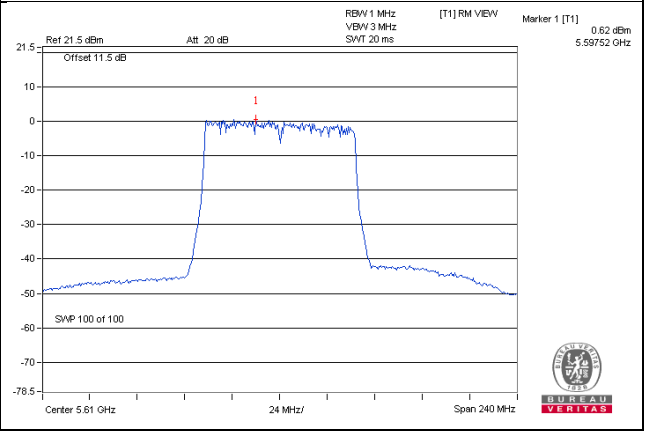
802.11ac (VHT20)_Chain 0 / CH116



802.11ac (VHT40)_Chain 0 / CH110



802.11ac (VHT80)_Chain 0 / CH122

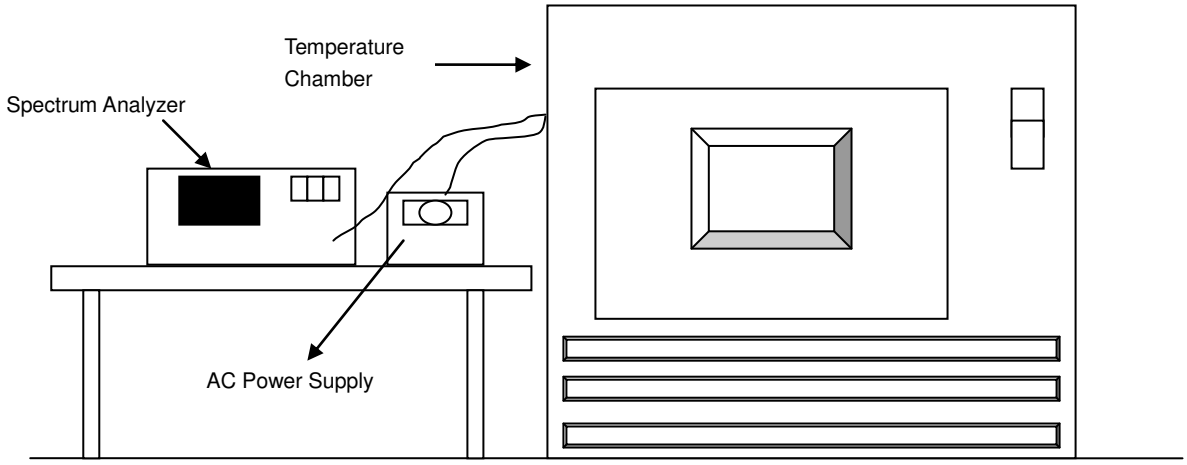


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Radio 1

Frequency Stability Versus Temp.									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5260.0021	PASS	5260.0011	PASS	5260.0047	PASS	5260.0036	PASS
40	120	5259.9794	PASS	5259.9805	PASS	5259.9801	PASS	5259.9805	PASS
30	120	5259.9771	PASS	5259.9799	PASS	5259.9785	PASS	5259.9759	PASS
20	120	5259.9925	PASS	5259.9929	PASS	5259.9946	PASS	5259.9958	PASS
10	120	5260.0054	PASS	5260.0051	PASS	5260.0067	PASS	5260.0055	PASS
0	120	5260.0133	PASS	5260.0155	PASS	5260.0159	PASS	5260.0172	PASS
-10	120	5259.9882	PASS	5259.9909	PASS	5259.9877	PASS	5259.9918	PASS
-20	120	5260.0044	PASS	5260.0027	PASS	5260.0055	PASS	5260.0034	PASS
-30	120	5259.9776	PASS	5259.978	PASS	5259.9795	PASS	5259.9787	PASS

Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5259.9923	PASS	5259.9934	PASS	5259.9952	PASS	5259.995	PASS
	120	5259.9925	PASS	5259.9929	PASS	5259.9946	PASS	5259.9958	PASS
	102	5259.9918	PASS	5259.9939	PASS	5259.9944	PASS	5259.9953	PASS

Radio 2

Frequency Stability Versus Temp.									
Operating Frequency: 5500 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5499.9808	PASS	5499.9782	PASS	5499.9806	PASS	5499.9781	PASS
40	120	5499.99	PASS	5499.9885	PASS	5499.9912	PASS	5499.9896	PASS
30	120	5499.9817	PASS	5499.9796	PASS	5499.9781	PASS	5499.9809	PASS
20	120	5500.0168	PASS	5500.0161	PASS	5500.0129	PASS	5500.0141	PASS
10	120	5499.9911	PASS	5499.9916	PASS	5499.9926	PASS	5499.9926	PASS
0	120	5499.9823	PASS	5499.9811	PASS	5499.9787	PASS	5499.983	PASS
-10	120	5499.9957	PASS	5499.999	PASS	5499.9989	PASS	5499.9936	PASS
-20	120	5500.0059	PASS	5500.0033	PASS	5500.002	PASS	5500.0039	PASS
-30	120	5500.0018	PASS	5500.001	PASS	5500.0058	PASS	5500.0062	PASS

Frequency Stability Versus Voltage									
Operating Frequency: 5500 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5500.0178	PASS	5500.0162	PASS	5500.0129	PASS	5500.0141	PASS
	120	5500.0168	PASS	5500.0161	PASS	5500.0129	PASS	5500.0141	PASS
	102	5500.0158	PASS	5500.0161	PASS	5500.0124	PASS	5500.0151	PASS

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:

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

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

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