

## FCC Test Report (DFS band)

**Report No.:** RF160906E06H-1

**FCC ID:** PY316200351

**Test Model:** R7000P

**Series Model:** R6900P

**Received Date:** Dec. 29, 2016

**Test Date:** Dec. 29, 2016 to Mar. 16, 2017

**Issued Date:** Mar. 29, 2017

**Applicant:** NETGEAR, Inc.

**Address:** 350 East Plumeria Drive San Jose, CA 95134

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

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### Release Control Record

Issue No.	Description	Date Issued
RF160906E06H-1	Original release.	Mar. 29, 2017

## 1 Certificate of Conformity

**Product:** AC2300 Smart WiFi Router

**Brand:** NETGEAR

**Test Model:** R7000P

**Series Model:** R6900P

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** NETGEAR, Inc.

**Test Date:** Dec. 29, 2016 to Mar. 16, 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 :** Wendy Wu , **Date:** Mar. 29, 2017  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** Mar. 29, 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 -9.16dB at 0.34141MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5460.00MHz.
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(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is Re-SMA 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) ( $\pm$ )
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.30 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.78 dB
	6GHz ~ 18GHz	4.52 dB
	18GHz ~ 40GHz	5.08 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

Product	AC2300 Smart WiFi Router
Brand	NETGEAR
Test Model	R7000P
Series Model	R6900P
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz band
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
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	5.26 ~ 5.32GHz: <b>CDD Mode:</b> 244.451mW <b>Beamforming Mode:</b> 212.539mW 5.50 ~ 5.70GHz: <b>CDD Mode:</b> 246.197mW <b>Beamforming Mode:</b> 218.525mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ45 cable x 1 (unshielded, 1.5m)

Note:

- This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF160906E06A-1 as the following:
  - ◆ Add DFS band <5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz>
- According to above condition, all test items need to be performed. And all data were verified to meet the requirements.
- The EUT has below model names, which are identical to each other in all aspects except for the following:

Brand	Model No.	Different
NETGEAR	R7000P	-
	R6900P	Remove one USB 2.0 port.

From the above models, model: **R7000P** was selected as representative model for the test and its data was recorded in this report.

- Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	WLAN (5GHz)

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

5. The EUT must be supplied with a power adapter and following different models could be chosen as following table:

No	Brand Name	Model No.	P/N	Spec.	Plug
1	NETGEAR	MU42-3120350-A1	332-10762-01	Input: 100-240Vac, 50/60Hz, 1.5A Output: 12Vdc, 3.5A DC output cable: 1.8m, unshielded	FCC/IC
2	NETGEAR	2ABN042F NA	332-10761-01	Input: 100-240Vac, 50/60Hz, 1.5A Output: 12Vdc, 3.5A DC output cable: 1.8m, unshielded	FCC/IC

Note: From the above adapters, the radiated emission worse case was found in Adapter 1. Therefore only the test data of the mode was recorded in this report.

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

Antenna No.	Brand	Model	Ant. Gain(dBi)	Frequency range (GHz to GHz)	Antenna Type	Connector Type
1	NA	NA	0.5	2.4~2.4835	Dipole	Re-SMA
			1.8	5.15~5.85		
2	NA	NA	0.5	2.4~2.4835	Dipole	Re-SMA
			1.8	5.15~5.85		
3	NA	NA	0.5	2.4~2.4835	Dipole	Re-SMA
			1.8	5.15~5.85		



7. The EUT incorporates a MIMO function.

<b>For 2.4GHz Band</b>			
<b>MODULATION MODE</b>	<b>DATA RATE (MCS)</b>	<b>TX &amp; RX CONFIGURATION</b>	
802.11b	1 ~ 11Mbps	3TX	3RX
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
VHT20	MCS0~8 Nss=1	3TX	3RX
	MCS0~8 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
VHT40	MCS0~9 Nss=1	3TX	3RX
	MCS0~9 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
<b>For 5GHz Band</b>			
<b>MODULATION MODE</b>	<b>DATA RATE (MCS)</b>	<b>TX &amp; RX CONFIGURATION</b>	
802.11a	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS 0~8, Nss=1	3TX	3RX
	MCS 0~8, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT40)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT80)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX

Note:

1. All of modulation mode support beamforming function except 802.11a/b/g 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	5290 MHz

#### 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	5530 MHz	122	5610 MHz

### 3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
1	√	√	√	√	With adapter 1
2	-	-	√	-	With adapter 2

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

**NOTE:**

1. The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

#### **Radiated Emission Test (Above 1GHz):**

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5700	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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5700	54 to 62 102 to 134	110	OFDM	BPSK	13.5

### Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5700	54 to 62 102 to 134	110	OFDM	BPSK	13.5

### Antenna Port Conducted Measurement:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5700	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
Beamforming Mode (Output power only)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5700	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 $\geq$ 1G	26deg. C, 73%RH	120Vac, 60Hz	Weiwei Lo
RE<1G	23deg. C, 62%RH	120Vac, 60Hz	Weiwei Lo
PLC	24deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	23deg. C, 63%RH	120Vac, 60Hz	Robert Cheng

### 3.3 Duty Cycle of Test Signal

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

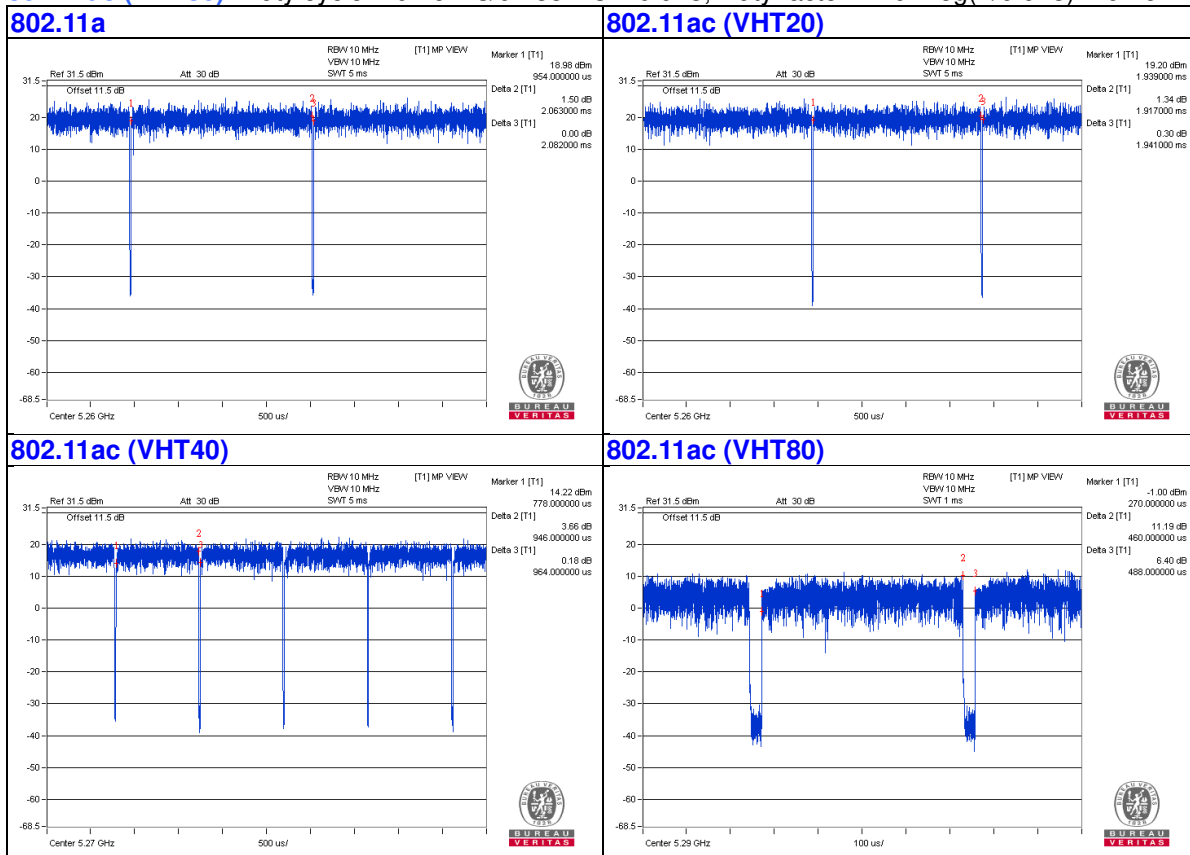
If duty cycle of test signal is  $< 98\%$ , duty factor shall be considered.

**802.11a**: Duty cycle =  $2.063 \text{ ms} / 2.082 \text{ ms} = 0.991$

**802.11ac (VHT20)**: Duty cycle =  $1.917 \text{ ms} / 1.941 \text{ ms} = 0.988$

**802.11ac (VHT40)**: Duty cycle =  $0.946 \text{ ms} / 0.964 \text{ ms} = 0.981$

**802.11ac (VHT80)**: Duty cycle =  $0.46 \text{ ms} / 0.488 \text{ ms} = 0.943$ , Duty factor =  $10 * \log(1/0.943) = 0.26$



### 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.

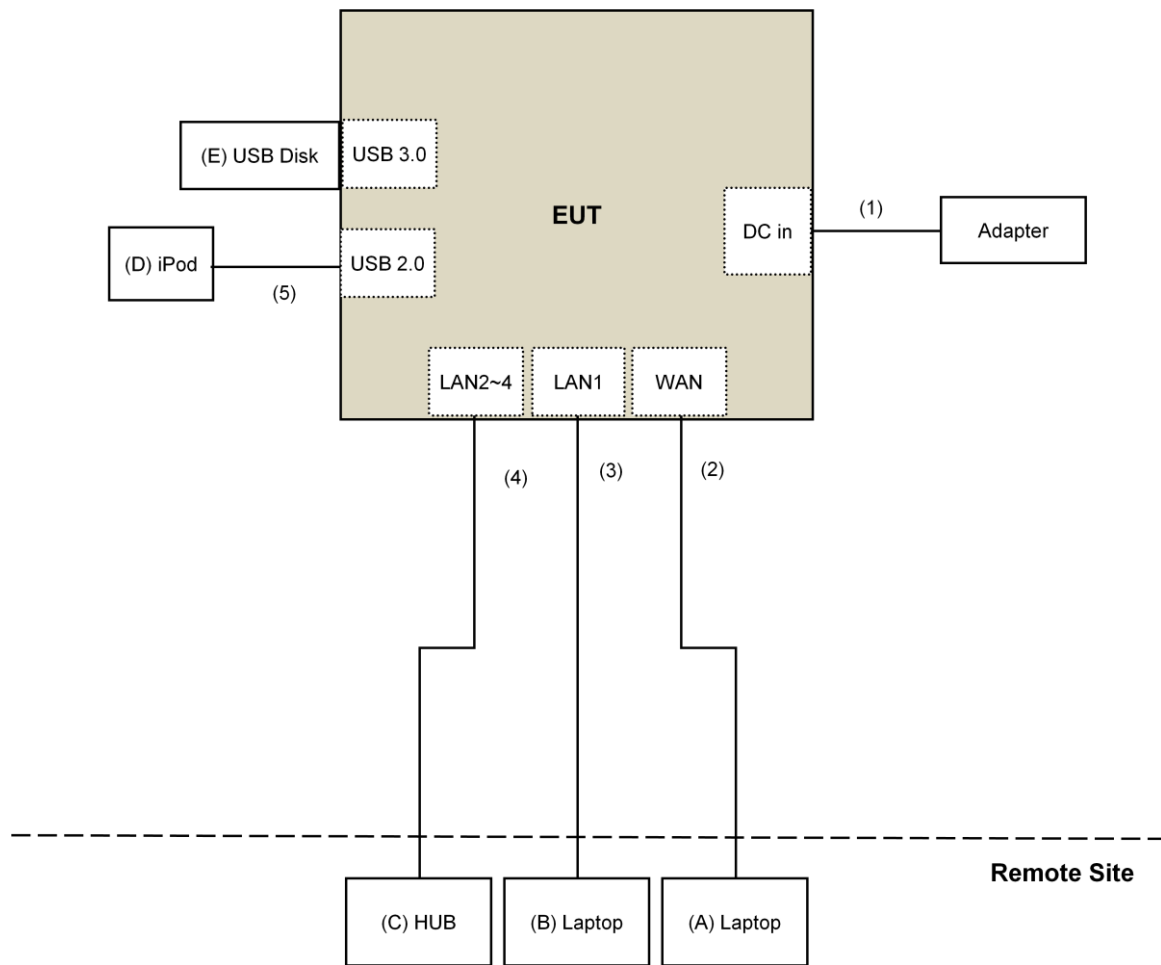
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	iPod	Apple	MC749TA/A	CC4DN25WDFDM	NA	Provided by Lab
E.	USB Disk	Teascend	16GB	NA	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.8	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
4.	RJ-45 Cable	3	10	No	0	Provided by Lab
5.	USB Cable	1	0.1	Yes	0	Provided by Lab

### 3.4.1 Configuration of System under Test



### 3.5 General Description of Applied Standard

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

**FCC Part 15, Subpart E (15.407)**  
**KDB 789033 D02 General UNII Test Procedure New Rules v01r03**  
**KDB 662911 D01 Multiple Transmitter Output v02r01**  
**ANSI C63.10-2013**

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

**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 v01r03		Field Strength at 3m	
		PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	<input type="checkbox"/> 15.407(b)(4)(i)	PK:-27 (dBm/MHz) <sup>*1</sup> PK:10 (dBm/MHz) <sup>*2</sup> PK:15.6 (dBm/MHz) <sup>*3</sup> PK:27 (dBm/MHz) <sup>*4</sup>	PK: 68.2(dBμV/m) <sup>*1</sup> PK:105.2 (dBμV/m) <sup>*2</sup> PK: 110.8(dBμV/m) <sup>*3</sup> PK:122.2 (dBμV/m) <sup>*4</sup>
	<input type="checkbox"/> 15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
<sup>*1</sup> beyond 75 MHz or more above of the band edge.		<sup>*2</sup> below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
<sup>*3</sup> below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		<sup>*4</sup> from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

#### Note:

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

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

## 4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Pre-Amplifier <sup>(*)</sup> EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna <sup>(*)</sup> 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-01	Nov. 10, 2016	Nov. 09, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Dec. 13, 2016	Dec. 12, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	160923 150318 150323	Feb. 02, 2017 Mar. 30, 2016 Mar. 30, 2016	Feb. 01, 2018 Mar. 29, 2017 Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045SE	980387	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	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	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. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
- 6 Loop antenna was used for all emissions below 30 MHz.
7. Tested Date: Mar. 03 to 15, 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:**

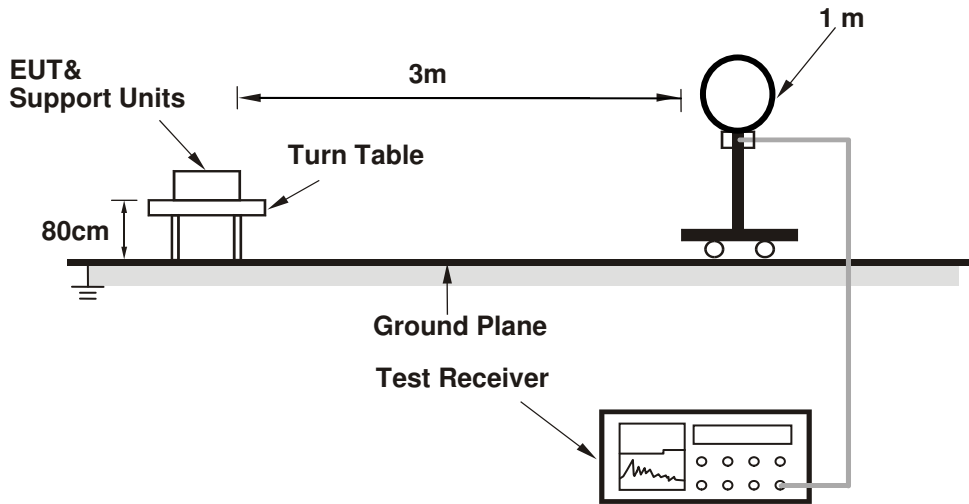
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 10Hz (Duty cycle  $\geq 98\%$ ) 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

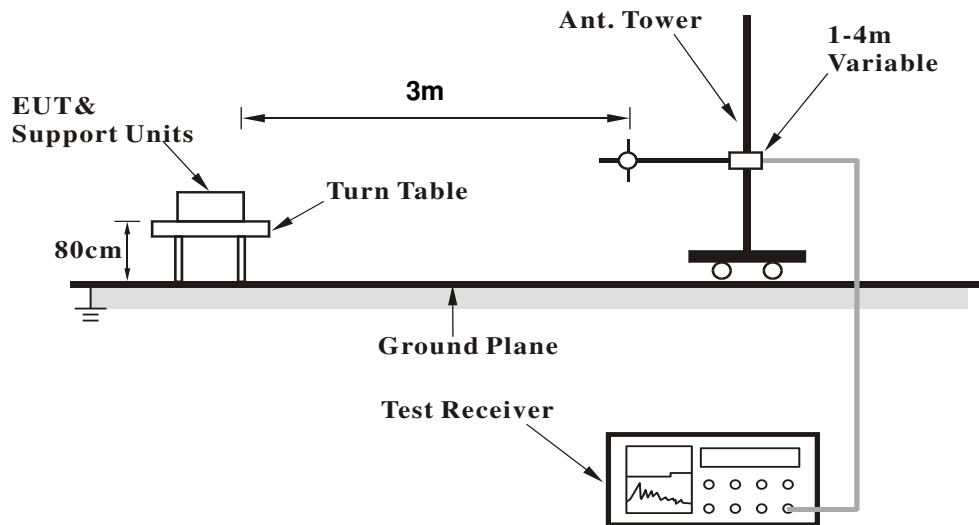
No deviation.

#### 4.1.5 Test Setup

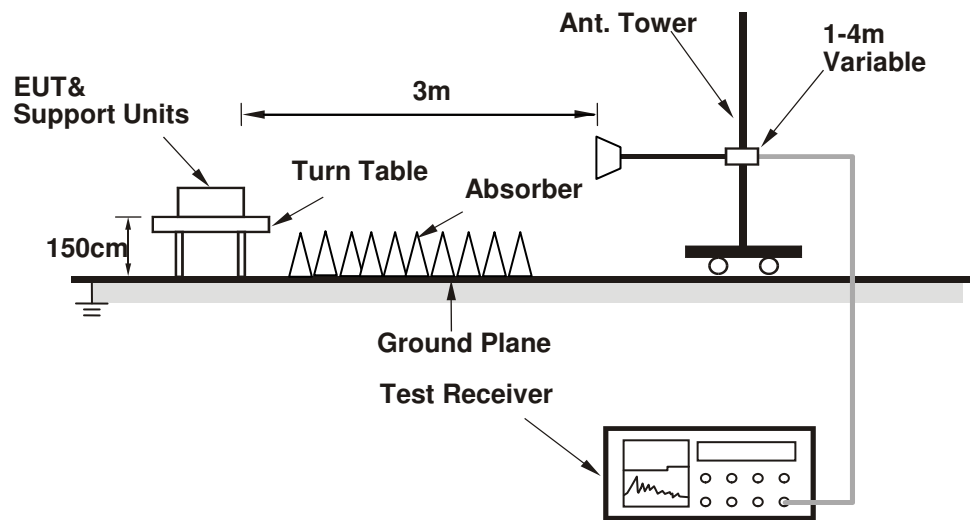
##### For Radiated emission below 30MHz



##### 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 (Mtool.exe V2.0.1.1) has been activated to set the EUT on specific status.

## 4.1.7 Test Results

## Above 1GHz Data:

## 802.11a

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5103.00	43.6 PK	74.0	-30.4	1.01 H	109	40.8	2.8
2	5103.00	36.3 AV	54.0	-17.7	1.01 H	109	33.5	2.8
3	*5260.00	106.7 PK			1.01 H	109	103.5	3.2
4	*5260.00	96.5 AV			1.01 H	109	93.3	3.2
5	5414.00	48.0 PK	74.0	-26.0	1.01 H	109	44.6	3.4
6	5414.00	38.0 AV	54.0	-16.0	1.01 H	109	34.6	3.4
7	#10520.00	45.0 PK	74.0	-29.0	1.96 H	151	33.0	12.0
8	#10520.00	33.6 AV	54.0	-20.4	1.96 H	151	21.6	12.0
9	15780.00	43.8 PK	74.0	-30.2	1.45 H	24	30.7	13.1
10	15780.00	32.8 AV	54.0	-21.2	1.45 H	24	19.7	13.1

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5103.00	48.8 PK	74.0	-25.2	3.41 V	18	46.0	2.8
2	5103.00	39.0 AV	54.0	-15.0	3.41 V	18	36.2	2.8
3	*5260.00	114.4 PK			3.41 V	18	111.2	3.2
4	*5260.00	104.8 AV			3.41 V	18	101.6	3.2
5	5414.00	52.1 PK	74.0	-21.9	3.41 V	18	48.7	3.4
6	5414.00	41.9 AV	54.0	-12.1	3.41 V	18	38.5	3.4
7	#10520.00	45.7 PK	74.0	-28.3	3.39 V	26	33.7	12.0
8	#10520.00	33.7 AV	54.0	-20.3	3.39 V	26	21.7	12.0
9	15780.00	44.4 PK	74.0	-29.6	2.50 V	109	31.3	13.1
10	15780.00	33.4 AV	54.0	-20.6	2.50 V	109	20.3	13.1

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 60	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5144.00	46.8 PK	74.0	-27.2	1.01 H	120	43.9	2.9
2	5144.00	37.4 AV	54.0	-16.6	1.01 H	120	34.5	2.9
3	*5300.00	106.9 PK			1.01 H	91	103.7	3.2
4	*5300.00	96.8 AV			1.01 H	91	93.6	3.2
5	5350.00	51.8 PK	74.0	-22.2	1.01 H	100	48.4	3.4
6	5350.00	41.2 AV	54.0	-12.8	1.01 H	100	37.8	3.4
7	10600.00	45.1 PK	74.0	-28.9	1.93 H	163	32.9	12.2
8	10600.00	33.5 AV	54.0	-20.5	1.93 H	163	21.3	12.2
9	15900.00	43.4 PK	74.0	-30.6	1.50 H	49	30.9	12.5
10	15900.00	32.5 AV	54.0	-21.5	1.50 H	49	20.0	12.5

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5144.00	49.4 PK	74.0	-24.6	3.37 V	21	46.5	2.9
2	5144.00	41.0 AV	54.0	-13.0	3.37 V	21	38.1	2.9
3	*5300.00	115.0 PK			3.43 V	11	111.8	3.2
4	*5300.00	105.5 AV			3.43 V	11	102.3	3.2
5	5350.00	57.5 PK	74.0	-16.5	3.40 V	34	54.1	3.4
6	5350.00	46.5 AV	54.0	-7.5	3.40 V	34	43.1	3.4
7	10600.00	44.4 PK	74.0	-29.6	2.28 V	203	32.2	12.2
8	10600.00	35.6 AV	54.0	-18.4	2.28 V	203	23.4	12.2
9	15900.00	45.1 PK	74.0	-28.9	1.89 V	126	32.6	12.5
10	15900.00	33.7 AV	54.0	-20.3	1.89 V	126	21.2	12.5

**REMARKS:**

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



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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	106.4 PK			1.04 H	104	103.1	3.3
2	*5320.00	96.6 AV			1.04 H	104	93.3	3.3
3	5355.00	46.4 PK	74.0	-27.6	1.04 H	104	43.0	3.4
4	5355.00	37.1 AV	54.0	-16.9	1.04 H	104	33.7	3.4
5	10640.00	44.7 PK	74.0	-29.3	1.94 H	163	32.2	12.5
6	10640.00	33.3 AV	54.0	-20.7	1.94 H	163	20.8	12.5
7	15960.00	43.7 PK	74.0	-30.3	1.49 H	24	31.1	12.6
8	15960.00	32.3 AV	54.0	-21.7	1.49 H	24	19.7	12.6

**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	114.3 PK			3.38 V	22	111.0	3.3
2	*5320.00	105.1 AV			3.38 V	22	101.8	3.3
3	5355.00	57.0 PK	74.0	-17.0	3.37 V	42	53.6	3.4
4	5355.00	46.1 AV	54.0	-7.9	3.37 V	42	42.7	3.4
5	10640.00	43.8 PK	74.0	-30.2	2.30 V	207	31.3	12.5
6	10640.00	35.1 AV	54.0	-18.9	2.30 V	207	22.6	12.5
7	15960.00	45.1 PK	74.0	-28.9	1.90 V	108	32.5	12.6
8	15960.00	33.7 AV	54.0	-20.3	1.90 V	108	21.1	12.6

**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.

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5038.00	47.0 PK	74.0	-27.0	1.12 H	101	44.2	2.8
2	5038.00	37.4 AV	54.0	-16.6	1.12 H	101	34.6	2.8
3	5458.00	52.3 PK	74.0	-21.7	1.00 H	101	48.9	3.4
4	5458.00	41.5 AV	54.0	-12.5	1.00 H	101	38.1	3.4
5	#5470.00	51.7 PK	74.0	-22.3	1.04 H	120	48.3	3.4
6	#5470.00	41.2 AV	54.0	-12.8	1.04 H	120	37.8	3.4
7	*5500.00	106.3 PK			1.12 H	120	102.9	3.4
8	*5500.00	96.0 AV			1.12 H	120	92.6	3.4
9	#5733.00	47.5 PK	74.0	-26.5	1.00 H	101	43.6	3.9
10	#5733.00	37.7 AV	54.0	-16.3	1.00 H	101	33.8	3.9
11	11000.00	44.6 PK	74.0	-29.4	2.00 H	165	31.2	13.4
12	11000.00	33.2 AV	54.0	-20.8	2.00 H	165	19.8	13.4
13	#16500.00	44.4 PK	74.0	-29.6	1.49 H	42	29.7	14.7
14	#16500.00	33.1 AV	54.0	-20.9	1.49 H	42	18.4	14.7

**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	5038.00	47.0 PK	74.0	-27.0	3.21 V	15	44.2	2.8
2	5038.00	39.0 AV	54.0	-15.0	3.21 V	15	36.2	2.8
3	5458.00	55.8 PK	74.0	-18.2	3.18 V	14	52.4	3.4
4	5458.00	45.4 AV	54.0	-8.6	3.18 V	14	42.0	3.4
5	#5470.00	65.7 PK	74.0	-8.3	3.18 V	16	62.3	3.4
6	#5470.00	49.2 AV	54.0	-4.8	3.18 V	16	45.8	3.4
7	*5500.00	114.7 PK			3.18 V	16	111.3	3.4
8	*5500.00	104.5 AV			3.18 V	16	101.1	3.4
9	#5733.00	57.9 PK	74.0	-16.1	3.14 V	22	54.0	3.9
10	#5733.00	47.8 AV	54.0	-6.2	3.14 V	22	43.9	3.9
11	11000.00	43.9 PK	74.0	-30.1	2.26 V	212	30.5	13.4
12	11000.00	35.1 AV	54.0	-18.9	2.26 V	212	21.7	13.4
13	#16500.00	45.4 PK	74.0	-28.6	1.88 V	135	30.7	14.7
14	#16500.00	33.9 AV	54.0	-20.1	1.88 V	135	19.2	14.7

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 116	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5117.00	43.5 PK	74.0	-30.5	1.04 H	104	40.7	2.8
2	5117.00	35.5 AV	54.0	-18.5	1.04 H	104	32.7	2.8
3	5354.00	46.7 PK	74.0	-27.3	1.00 H	98	43.3	3.4
4	5354.00	37.2 AV	54.0	-16.8	1.00 H	98	33.8	3.4
5	*5580.00	107.4 PK			1.04 H	105	103.9	3.5
6	*5580.00	97.7 AV			1.04 H	105	94.2	3.5
7	#5819.00	52.6 PK	74.0	-21.4	1.03 H	96	48.5	4.1
8	#5819.00	41.8 AV	54.0	-12.2	1.03 H	96	37.7	4.1
9	11160.00	44.2 PK	74.0	-29.8	1.96 H	152	31.3	12.9
10	11160.00	33.0 AV	54.0	-21.0	1.96 H	152	20.1	12.9
11	#16740.00	44.2 PK	74.0	-29.8	1.48 H	38	28.5	15.7
12	#16740.00	33.0 AV	54.0	-21.0	1.48 H	38	17.3	15.7

**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	5117.00	51.2 PK	74.0	-22.8	2.92 V	93	48.4	2.8
2	5117.00	41.8 AV	54.0	-12.2	2.92 V	93	39.0	2.8
3	5354.00	57.6 PK	74.0	-16.4	2.67 V	96	54.2	3.4
4	5354.00	47.5 AV	54.0	-6.5	2.67 V	96	44.1	3.4
5	*5580.00	115.4 PK			2.99 V	25	111.9	3.5
6	*5580.00	106.0 AV			2.99 V	25	102.5	3.5
7	#5819.00	63.0 PK	74.0	-11.0	2.97 V	60	58.9	4.1
8	#5819.00	48.7 AV	54.0	-5.3	2.97 V	60	44.6	4.1
9	11160.00	43.5 PK	74.0	-30.5	2.35 V	187	30.6	12.9
10	11160.00	35.1 AV	54.0	-18.9	2.35 V	187	22.2	12.9
11	#16740.00	45.2 PK	74.0	-28.8	1.85 V	134	29.5	15.7
12	#16740.00	34.1 AV	54.0	-19.9	1.85 V	134	18.4	15.7

**REMARKS:**

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

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5456.00	43.4 PK	74.0	-30.6	1.02 H	115	40.0	3.4
2	5456.00	35.3 AV	54.0	-18.7	1.02 H	115	31.9	3.4
3	#5470.00	46.2 PK	74.0	-27.8	1.07 H	92	42.8	3.4
4	#5470.00	36.9 AV	54.0	-17.1	1.07 H	92	33.5	3.4
5	*5700.00	110.8 PK			1.07 H	92	107.0	3.8
6	*5700.00	101.3 AV			1.07 H	92	97.5	3.8
7	#5730.00	52.8 PK	74.0	-21.2	1.02 H	121	48.9	3.9
8	#5730.00	41.8 AV	54.0	-12.2	1.02 H	121	37.9	3.9
9	11400.00	44.7 PK	74.0	-29.3	1.95 H	151	31.8	12.9
10	11400.00	33.4 AV	54.0	-20.6	1.95 H	151	20.5	12.9
11	#17100.00	44.2 PK	74.0	-29.8	1.55 H	51	26.6	17.6
12	#17100.00	33.0 AV	54.0	-21.0	1.55 H	51	15.4	17.6

**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	5456.00	51.3 PK	74.0	-22.7	2.66 V	50	47.9	3.4
2	5456.00	41.6 AV	54.0	-12.4	2.66 V	50	38.2	3.4
3	#5470.00	57.6 PK	74.0	-16.4	2.61 V	42	54.2	3.4
4	#5470.00	47.6 AV	54.0	-6.4	2.61 V	42	44.2	3.4
5	*5700.00	119.1 PK			2.61 V	42	115.3	3.8
6	*5700.00	110.0 AV			2.61 V	42	106.2	3.8
7	#5730.00	62.9 PK	74.0	-11.1	2.61 V	42	59.0	3.9
8	#5730.00	48.5 AV	54.0	-5.5	2.61 V	42	44.6	3.9
9	11400.00	44.1 PK	74.0	-29.9	2.24 V	198	31.2	12.9
10	11400.00	35.5 AV	54.0	-18.5	2.24 V	198	22.6	12.9
11	#17100.00	44.5 PK	74.0	-29.5	1.93 V	116	26.9	17.6
12	#17100.00	33.3 AV	54.0	-20.7	1.93 V	116	15.7	17.6

**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.

**802.11ac (VHT20)**

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5095.00	43.6 PK	74.0	-30.4	1.09 H	102	40.8	2.8
2	5095.00	35.4 AV	54.0	-18.6	1.09 H	102	32.6	2.8
3	*5260.00	107.5 PK			1.03 H	114	104.3	3.2
4	*5260.00	97.2 AV			1.03 H	114	94.0	3.2
5	5350.00	47.4 PK	74.0	-26.6	1.03 H	114	44.0	3.4
6	5350.00	37.9 AV	54.0	-16.1	1.03 H	114	34.5	3.4
7	#10520.00	44.6 PK	74.0	-29.4	2.01 H	174	32.6	12.0
8	#10520.00	33.3 AV	54.0	-20.7	2.01 H	174	21.3	12.0
9	15780.00	43.5 PK	74.0	-30.5	1.52 H	45	30.4	13.1
10	15780.00	32.2 AV	54.0	-21.8	1.52 H	45	19.1	13.1

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5095.00	49.1 PK	74.0	-24.9	3.31 V	1	46.3	2.8
2	5095.00	39.0 AV	54.0	-15.0	3.31 V	1	36.2	2.8
3	*5260.00	114.5 PK			3.31 V	1	111.3	3.2
4	*5260.00	104.8 AV			3.31 V	1	101.6	3.2
5	5350.00	52.3 PK	74.0	-21.7	3.31 V	1	48.9	3.4
6	5350.00	41.9 AV	54.0	-12.1	3.31 V	1	38.5	3.4
7	#10520.00	43.7 PK	74.0	-30.3	2.30 V	189	31.7	12.0
8	#10520.00	35.0 AV	54.0	-19.0	2.30 V	189	23.0	12.0
9	15780.00	45.2 PK	74.0	-28.8	1.88 V	118	32.1	13.1
10	15780.00	34.1 AV	54.0	-19.9	1.88 V	118	21.0	13.1

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 60	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5143.00	42.7 PK	74.0	-31.3	1.07 H	108	39.8	2.9
2	5143.00	34.9 AV	54.0	-19.1	1.07 H	108	32.0	2.9
3	*5300.00	107.9 PK			1.02 H	124	104.7	3.2
4	*5300.00	97.6 AV			1.02 H	124	94.4	3.2
5	5351.00	47.9 PK	74.0	-26.1	1.09 H	106	44.5	3.4
6	5351.00	37.9 AV	54.0	-16.1	1.09 H	106	34.5	3.4
7	10600.00	45.3 PK	74.0	-28.7	1.94 H	161	33.1	12.2
8	10600.00	33.6 AV	54.0	-20.4	1.94 H	161	21.4	12.2
9	15900.00	44.3 PK	74.0	-29.7	1.51 H	33	31.8	12.5
10	15900.00	33.0 AV	54.0	-21.0	1.51 H	33	20.5	12.5

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5143.00	49.1 PK	74.0	-24.9	3.00 V	15	46.2	2.9
2	5143.00	39.1 AV	54.0	-14.9	3.00 V	15	36.2	2.9
3	*5300.00	114.9 PK			3.31 V	14	111.7	3.2
4	*5300.00	105.2 AV			3.31 V	14	102.0	3.2
5	5351.00	52.7 PK	74.0	-21.3	3.31 V	14	49.3	3.4
6	5351.00	42.2 AV	54.0	-11.8	3.31 V	14	38.8	3.4
7	10600.00	43.3 PK	74.0	-30.7	2.32 V	218	31.1	12.2
8	10600.00	34.9 AV	54.0	-19.1	2.32 V	218	22.7	12.2
9	15900.00	44.9 PK	74.0	-29.1	1.89 V	122	32.4	12.5
10	15900.00	33.5 AV	54.0	-20.5	1.89 V	122	21.0	12.5

**REMARKS:**

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

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5029.00	46.9 PK	74.0	-27.1	1.08 H	97	44.2	2.7
2	5029.00	37.3 AV	54.0	-16.7	1.08 H	97	34.6	2.7
3	*5320.00	107.8 PK			1.09 H	128	104.5	3.3
4	*5320.00	97.9 AV			1.09 H	128	94.6	3.3
5	5351.00	42.9 PK	74.0	-31.1	1.06 H	122	39.5	3.4
6	5351.00	34.8 AV	54.0	-19.2	1.06 H	122	31.4	3.4
7	10640.00	44.0 PK	74.0	-30.0	2.02 H	175	31.5	12.5
8	10640.00	32.8 AV	54.0	-21.2	2.02 H	175	20.3	12.5
9	15960.00	43.6 PK	74.0	-30.4	1.51 H	33	31.0	12.6
10	15960.00	32.5 AV	54.0	-21.5	1.51 H	33	19.9	12.6

**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	5029.00	52.2 PK	74.0	-21.8	3.22 V	12	49.5	2.7
2	5029.00	41.9 AV	54.0	-12.1	3.22 V	12	39.2	2.7
3	*5320.00	114.5 PK			3.49 V	30	111.2	3.3
4	*5320.00	105.0 AV			3.49 V	30	101.7	3.3
5	5351.00	49.4 PK	74.0	-24.6	3.49 V	30	46.0	3.4
6	5351.00	39.6 AV	54.0	-14.4	3.49 V	30	36.2	3.4
7	10640.00	44.2 PK	74.0	-29.8	2.32 V	204	31.7	12.5
8	10640.00	35.3 AV	54.0	-18.7	2.32 V	204	22.8	12.5
9	15960.00	44.4 PK	74.0	-29.6	1.90 V	136	31.8	12.6
10	15960.00	33.2 AV	54.0	-20.8	1.90 V	136	20.6	12.6

**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.

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5037.00	45.1 PK	74.0	-28.9	1.07 H	105	42.4	2.7
2	5037.00	36.4 AV	54.0	-17.6	1.07 H	105	33.7	2.7
3	5456.00	51.9 PK	74.0	-22.1	1.09 H	100	48.5	3.4
4	5456.00	40.5 AV	54.0	-13.5	1.09 H	100	37.1	3.4
5	#5470.00	52.2 PK	74.0	-21.8	1.07 H	112	48.8	3.4
6	#5470.00	41.4 AV	54.0	-12.6	1.07 H	112	38.0	3.4
7	*5500.00	107.6 PK			1.07 H	113	104.2	3.4
8	*5500.00	96.9 AV			1.07 H	113	93.5	3.4
9	#5735.00	42.5 PK	74.0	-31.5	1.10 H	111	38.6	3.9
10	#5735.00	35.9 AV	54.0	-18.1	1.10 H	111	32.0	3.9
11	11000.00	44.5 PK	74.0	-29.5	1.98 H	166	31.1	13.4
12	11000.00	32.9 AV	54.0	-21.1	1.98 H	166	19.5	13.4
13	#16500.00	43.9 PK	74.0	-30.1	1.56 H	25	29.2	14.7
14	#16500.00	32.7 AV	54.0	-21.3	1.56 H	25	18.0	14.7

**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	5037.00	47.0 PK	74.0	-27.0	3.22 V	21	44.3	2.7
2	5037.00	38.9 AV	54.0	-15.1	3.22 V	21	36.2	2.7
3	5456.00	55.8 PK	74.0	-18.2	3.40 V	100	52.4	3.4
4	5456.00	45.4 AV	54.0	-8.6	3.40 V	100	42.0	3.4
5	#5470.00	65.7 PK	74.0	-8.3	3.48 V	32	62.3	3.4
6	#5470.00	48.9 AV	54.0	-5.1	3.48 V	32	45.5	3.4
7	*5500.00	114.9 PK			3.48 V	32	111.5	3.4
8	*5500.00	104.5 AV			3.48 V	32	101.1	3.4
9	#5735.00	57.5 PK	74.0	-16.5	3.50 V	50	53.6	3.9
10	#5735.00	47.7 AV	54.0	-6.3	3.50 V	50	43.8	3.9
11	11000.00	44.1 PK	74.0	-29.9	2.36 V	213	30.7	13.4
12	11000.00	35.6 AV	54.0	-18.4	2.36 V	213	22.2	13.4
13	#16500.00	44.2 PK	74.0	-29.8	1.86 V	111	29.5	14.7
14	#16500.00	33.2 AV	54.0	-20.8	1.86 V	111	18.5	14.7

**REMARKS:**

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



<b>CHANNEL</b>	TX Channel 116	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5119.00	47.8 PK	74.0	-26.2	1.04 H	99	45.0	2.8
2	5119.00	38.0 AV	54.0	-16.0	1.04 H	99	35.2	2.8
3	5355.00	42.6 PK	74.0	-31.4	1.14 H	118	39.2	3.4
4	5355.00	36.2 AV	54.0	-17.8	1.14 H	118	32.8	3.4
5	*5580.00	107.6 PK			1.01 H	97	104.1	3.5
6	*5580.00	97.3 AV			1.01 H	97	93.8	3.5
7	#5819.00	42.1 PK	74.0	-31.9	1.09 H	126	38.0	4.1
8	#5819.00	35.6 AV	54.0	-18.4	1.09 H	126	31.5	4.1
9	11160.00	44.7 PK	74.0	-29.3	1.96 H	158	31.8	12.9
10	11160.00	33.5 AV	54.0	-20.5	1.96 H	158	20.6	12.9
11	#16740.00	43.9 PK	74.0	-30.1	1.47 H	24	28.2	15.7
12	#16740.00	32.9 AV	54.0	-21.1	1.47 H	24	17.2	15.7

**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	5119.00	56.1 PK	74.0	-17.9	2.87 V	97	53.3	2.8
2	5119.00	45.9 AV	54.0	-8.1	2.87 V	97	43.1	2.8
3	5355.00	58.0 PK	74.0	-16.0	2.71 V	87	54.6	3.4
4	5355.00	48.0 AV	54.0	-6.0	2.71 V	87	44.6	3.4
5	*5580.00	114.7 PK			3.50 V	50	111.2	3.5
6	*5580.00	104.5 AV			3.50 V	50	101.0	3.5
7	#5819.00	47.2 PK	74.0	-26.8	3.38 V	61	43.1	4.1
8	#5819.00	38.8 AV	54.0	-15.2	3.38 V	61	34.7	4.1
9	11160.00	43.9 PK	74.0	-30.1	2.25 V	187	31.0	12.9
10	11160.00	35.0 AV	54.0	-19.0	2.25 V	187	22.1	12.9
11	#16740.00	44.5 PK	74.0	-29.5	1.87 V	132	28.8	15.7
12	#16740.00	33.2 AV	54.0	-20.8	1.87 V	132	17.5	15.7

**REMARKS:**

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

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5467.00	42.1 PK	74.0	-31.9	1.13 H	103	38.7	3.4
2	#5467.00	35.4 AV	54.0	-18.6	1.13 H	103	32.0	3.4
3	#5468.00	47.3 PK	74.0	-26.7	1.04 H	117	43.9	3.4
4	#5468.00	37.4 AV	54.0	-16.6	1.04 H	117	34.0	3.4
5	*5700.00	110.9 PK			1.03 H	104	107.1	3.8
6	*5700.00	101.6 AV			1.03 H	104	97.8	3.8
7	#5725.00	52.0 PK	74.0	-22.0	1.00 H	116	48.1	3.9
8	#5725.00	41.5 AV	54.0	-12.5	1.00 H	116	37.6	3.9
9	11400.00	44.4 PK	74.0	-29.6	1.99 H	164	31.5	12.9
10	11400.00	32.7 AV	54.0	-21.3	1.99 H	164	19.8	12.9
11	#17100.00	43.6 PK	74.0	-30.4	1.45 H	30	26.0	17.6
12	#17100.00	32.4 AV	54.0	-21.6	1.45 H	30	14.8	17.6

**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	#5467.00	57.7 PK	74.0	-16.3	2.65 V	54	54.3	3.4
2	#5467.00	47.5 AV	54.0	-6.5	2.65 V	54	44.1	3.4
3	#5468.00	51.3 PK	74.0	-22.7	2.71 V	64	47.9	3.4
4	#5468.00	41.9 AV	54.0	-12.1	2.71 V	64	38.5	3.4
5	*5700.00	118.5 PK			3.49 V	58	114.7	3.8
6	*5700.00	109.6 AV			3.49 V	58	105.8	3.8
7	#5725.00	63.1 PK	74.0	-10.9	3.49 V	58	59.2	3.9
8	#5725.00	48.4 AV	54.0	-5.6	3.49 V	58	44.5	3.9
9	11400.00	44.4 PK	74.0	-29.6	2.33 V	190	31.5	12.9
10	11400.00	35.7 AV	54.0	-18.3	2.33 V	190	22.8	12.9
11	#17100.00	45.5 PK	74.0	-28.5	1.88 V	122	27.9	17.6
12	#17100.00	34.1 AV	54.0	-19.9	1.88 V	122	16.5	17.6

**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.

**802.11ac (VHT40)**

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5027.00	47.2 PK	74.0	-26.8	1.00 H	108	44.5	2.7
2	5027.00	37.5 AV	54.0	-16.5	1.00 H	108	34.8	2.7
3	5124.00	52.3 PK	74.0	-21.7	1.00 H	108	49.5	2.8
4	5124.00	41.6 AV	54.0	-12.4	1.00 H	108	38.8	2.8
5	*5270.00	106.1 PK			1.00 H	108	102.9	3.2
6	*5270.00	95.1 AV			1.00 H	108	91.9	3.2
7	#10540.00	44.6 PK	74.0	-29.4	1.97 H	159	32.6	12.0
8	#10540.00	33.2 AV	54.0	-20.8	1.97 H	159	21.2	12.0
9	15810.00	43.9 PK	74.0	-30.1	1.50 H	38	30.9	13.0
10	15810.00	32.7 AV	54.0	-21.3	1.50 H	38	19.7	13.0

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5027.00	53.2 PK	74.0	-20.8	1.95 V	139	50.5	2.7
2	5027.00	42.8 AV	54.0	-11.2	1.95 V	139	40.1	2.7
3	5124.00	59.1 PK	74.0	-14.9	1.95 V	139	56.3	2.8
4	5124.00	45.2 AV	54.0	-8.8	1.95 V	139	42.4	2.8
5	*5270.00	113.2 PK			1.95 V	139	110.0	3.2
6	*5270.00	102.6 AV			1.95 V	139	99.4	3.2
7	#10540.00	43.9 PK	74.0	-30.1	2.30 V	202	31.9	12.0
8	#10540.00	35.3 AV	54.0	-18.7	2.30 V	202	23.3	12.0
9	15810.00	45.0 PK	74.0	-29.0	1.90 V	124	32.0	13.0
10	15810.00	33.7 AV	54.0	-20.3	1.90 V	124	20.7	13.0

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 62	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	108.8 PK			1.00 H	91	105.5	3.3
2	*5310.00	96.8 AV			1.00 H	91	93.5	3.3
3	5350.00	52.1 PK	74.0	-21.9	1.00 H	121	48.7	3.4
4	5350.00	41.4 AV	54.0	-12.6	1.00 H	121	38.0	3.4
5	5459.00	46.5 PK	74.0	-27.5	1.00 H	100	43.1	3.4
6	5459.00	37.1 AV	54.0	-16.9	1.00 H	100	33.7	3.4
7	10620.00	44.4 PK	74.0	-29.6	2.02 H	171	32.0	12.4
8	10620.00	32.8 AV	54.0	-21.2	2.02 H	171	20.4	12.4
9	15930.00	43.9 PK	74.0	-30.1	1.53 H	24	31.4	12.5
10	15930.00	32.8 AV	54.0	-21.2	1.53 H	24	20.3	12.5

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	115.9 PK			2.17 V	188	112.6	3.3
2	*5310.00	104.4 AV			2.17 V	188	101.1	3.3
3	5350.00	64.9 PK	74.0	-9.1	2.17 V	188	61.5	3.4
4	5350.00	53.6 AV	54.0	-0.4	2.17 V	188	50.2	3.4
5	5459.00	62.6 PK	74.0	-11.4	2.17 V	188	59.2	3.4
6	5459.00	51.6 AV	54.0	-2.4	2.17 V	188	48.2	3.4
7	10620.00	44.2 PK	74.0	-29.8	2.24 V	200	31.8	12.4
8	10620.00	35.8 AV	54.0	-18.2	2.24 V	200	23.4	12.4
9	15930.00	44.9 PK	74.0	-29.1	1.86 V	111	32.4	12.5
10	15930.00	33.8 AV	54.0	-20.2	1.86 V	111	21.3	12.5

**REMARKS:**

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

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	51.9 PK	74.0	-22.1	1.00 H	125	48.5	3.4
2	#5470.00	41.2 AV	54.0	-12.8	1.00 H	125	37.8	3.4
3	*5510.00	107.9 PK			1.00 H	125	104.4	3.5
4	*5510.00	98.0 AV			1.00 H	125	94.5	3.5
5	11020.00	44.6 PK	74.0	-29.4	1.98 H	173	31.3	13.3
6	11020.00	33.4 AV	54.0	-20.6	1.98 H	173	20.1	13.3
7	#16530.00	44.3 PK	74.0	-29.7	1.52 H	47	29.5	14.8
8	#16530.00	32.9 AV	54.0	-21.1	1.52 H	47	18.1	14.8

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	67.4 PK	74.0	-6.6	2.15 V	178	64.0	3.4
2	#5470.00	53.8 AV	54.0	-0.2	2.15 V	178	50.4	3.4
3	*5510.00	114.5 PK			2.15 V	178	111.0	3.5
4	*5510.00	105.1 AV			2.15 V	178	101.6	3.5
5	11020.00	44.5 PK	74.0	-29.5	2.31 V	194	31.2	13.3
6	11020.00	35.7 AV	54.0	-18.3	2.31 V	194	22.4	13.3
7	#16530.00	45.2 PK	74.0	-28.8	1.86 V	125	30.4	14.8
8	#16530.00	34.0 AV	54.0	-20.0	1.86 V	125	19.2	14.8

**REMARKS:**

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

<b>CHANNEL</b>	TX Channel 110	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5380.00	51.3 PK	74.0	-22.7	1.07 H	116	47.9	3.4
2	5380.00	41.4 AV	54.0	-12.6	1.07 H	116	38.0	3.4
3	5400.00	52.1 PK	74.0	-21.9	1.02 H	111	48.7	3.4
4	5400.00	41.4 AV	54.0	-12.6	1.02 H	111	38.0	3.4
5	*5550.00	112.1 PK			1.02 H	104	108.7	3.4
6	*5550.00	99.9 AV			1.02 H	104	96.5	3.4
7	11100.00	44.9 PK	74.0	-29.1	1.94 H	166	31.9	13.0
8	11100.00	33.3 AV	54.0	-20.7	1.94 H	166	20.3	13.0
9	#16650.00	44.0 PK	74.0	-30.0	1.47 H	38	28.5	15.5
10	#16650.00	32.9 AV	54.0	-21.1	1.47 H	38	17.4	15.5

**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	5380.00	60.7 PK	74.0	-13.3	2.11 V	178	57.3	3.4
2	5380.00	52.5 AV	54.0	-1.5	2.11 V	178	49.1	3.4
3	5400.00	61.7 PK	74.0	-12.3	2.11 V	178	58.3	3.4
4	5400.00	52.5 AV	54.0	-1.5	2.11 V	178	49.1	3.4
5	*5550.00	119.5 PK			2.11 V	178	116.1	3.4
6	*5550.00	107.7 AV			2.11 V	178	104.3	3.4
7	11100.00	43.5 PK	74.0	-30.5	2.36 V	212	30.5	13.0
8	11100.00	35.1 AV	54.0	-18.9	2.36 V	212	22.1	13.0
9	#16650.00	45.5 PK	74.0	-28.5	1.94 V	137	30.0	15.5
10	#16650.00	34.1 AV	54.0	-19.9	1.94 V	137	18.6	15.5

**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.

<b>CHANNEL</b>	TX Channel 134	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 40GHz		Average (AV)

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	109.4 PK			1.00 H	129	105.7	3.7
2	*5670.00	97.5 AV			1.00 H	129	93.8	3.7
3	#5725.00	50.5 PK	74.0	-23.5	1.11 H	118	46.6	3.9
4	#5725.00	40.9 AV	54.0	-13.1	1.11 H	118	37.0	3.9
5	11340.00	44.5 PK	74.0	-29.5	2.02 H	152	31.5	13.0
6	11340.00	33.3 AV	54.0	-20.7	2.02 H	152	20.3	13.0
7	#17010.00	44.1 PK	74.0	-29.9	1.52 H	51	26.7	17.4
8	#17010.00	32.7 AV	54.0	-21.3	1.52 H	51	15.3	17.4

**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	*5670.00	116.3 PK			1.69 V	180	112.6	3.7
2	*5670.00	104.6 AV			1.69 V	180	100.9	3.7
3	#5725.00	65.9 PK	74.0	-8.1	1.69 V	180	62.0	3.9
4	#5725.00	52.3 AV	54.0	-1.7	1.69 V	180	48.4	3.9
5	11340.00	43.8 PK	74.0	-30.2	2.30 V	188	30.8	13.0
6	11340.00	35.1 AV	54.0	-18.9	2.30 V	188	22.1	13.0
7	#17010.00	44.6 PK	74.0	-29.4	1.93 V	139	27.2	17.4
8	#17010.00	33.3 AV	54.0	-20.7	1.93 V	139	15.9	17.4

**REMARKS:**

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

802.11ac (VHT80)

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	46.7 PK	74.0	-27.3	1.05 H	95	43.8	2.9
2	5150.00	37.3 AV	54.0	-16.7	1.05 H	95	34.4	2.9
3	*5290.00	101.6 PK			1.08 H	111	98.4	3.2
4	*5290.00	92.6 AV			1.08 H	111	89.4	3.2
5	5356.00	52.1 PK	74.0	-21.9	1.02 H	125	48.7	3.4
6	5356.00	41.4 AV	54.0	-12.6	1.02 H	125	38.0	3.4
7	#10580.00	44.9 PK	74.0	-29.1	1.92 H	148	32.7	12.2
8	#10580.00	33.4 AV	54.0	-20.6	1.92 H	148	21.2	12.2
9	15870.00	43.7 PK	74.0	-30.3	1.48 H	34	31.1	12.6
10	15870.00	32.4 AV	54.0	-21.6	1.48 H	34	19.8	12.6

**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	55.0 PK	74.0	-19.0	2.23 V	179	52.1	2.9
2	5150.00	45.3 AV	54.0	-8.7	2.23 V	179	42.4	2.9
3	*5290.00	108.7 PK			2.23 V	179	105.5	3.2
4	*5290.00	99.9 AV			2.23 V	179	96.7	3.2
5	5356.00	63.2 PK	74.0	-10.8	2.23 V	179	59.8	3.4
6	5356.00	53.7 AV	54.0	-0.3	2.23 V	179	50.3	3.4
7	#10580.00	43.9 PK	74.0	-30.1	2.33 V	186	31.7	12.2
8	#10580.00	35.2 AV	54.0	-18.8	2.33 V	186	23.0	12.2
9	15870.00	45.1 PK	74.0	-28.9	1.88 V	115	32.5	12.6
10	15870.00	33.9 AV	54.0	-20.1	1.88 V	115	21.3	12.6

**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.



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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	52.2 PK	74.0	-21.8	1.07 H	109	48.8	3.4
2	5460.00	41.6 AV	54.0	-12.4	1.07 H	109	38.2	3.4
3	#5470.00	52.1 PK	74.0	-21.9	1.06 H	122	48.7	3.4
4	#5470.00	40.3 AV	54.0	-13.7	1.06 H	122	36.9	3.4
5	*5530.00	104.5 PK			1.07 H	109	101.1	3.4
6	*5530.00	95.0 AV			1.07 H	109	91.6	3.4
7	#5725.00	48.5 PK	74.0	-25.5	1.07 H	109	44.6	3.9
8	#5725.00	37.6 AV	54.0	-16.4	1.07 H	109	33.7	3.9
9	11060.00	44.7 PK	74.0	-29.3	2.01 H	149	31.5	13.2
10	11060.00	33.2 AV	54.0	-20.8	2.01 H	149	20.0	13.2
11	#16590.00	44.2 PK	74.0	-29.8	1.44 H	41	28.8	15.4
12	#16590.00	33.1 AV	54.0	-20.9	1.44 H	41	17.7	15.4

**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	5460.00	68.3 PK	74.0	-5.7	1.93 V	172	64.9	3.4
2	5460.00	53.9 AV	54.0	-0.1	1.93 V	172	50.5	3.4
3	#5470.00	68.1 PK	74.0	-5.9	1.93 V	172	64.7	3.4
4	#5470.00	50.1 AV	54.0	-3.9	1.93 V	172	46.7	3.4
5	*5530.00	111.3 PK			1.93 V	172	107.9	3.4
6	*5530.00	102.4 AV			1.93 V	172	99.0	3.4
7	#5725.00	56.8 PK	74.0	-17.2	1.93 V	172	52.9	3.9
8	#5725.00	46.4 AV	54.0	-7.6	1.93 V	172	42.5	3.9
9	11060.00	44.2 PK	74.0	-29.8	2.28 V	212	31.0	13.2
10	11060.00	35.5 AV	54.0	-18.5	2.28 V	212	22.3	13.2
11	#16590.00	45.4 PK	74.0	-28.6	1.87 V	110	30.0	15.4
12	#16590.00	33.9 AV	54.0	-20.1	1.87 V	110	18.5	15.4

**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.

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	52.2 PK	74.0	-21.8	1.05 H	115	48.8	3.4
2	#5470.00	41.9 AV	54.0	-12.1	1.05 H	115	38.5	3.4
3	*5610.00	109.6 PK			1.05 H	115	105.9	3.7
4	*5610.00	100.1 AV			1.05 H	115	96.4	3.7
5	#5725.00	52.1 PK	74.0	-21.9	1.05 H	115	48.2	3.9
6	#5725.00	41.3 AV	54.0	-12.7	1.05 H	115	37.4	3.9
7	11220.00	44.0 PK	74.0	-30.0	1.93 H	167	31.0	13.0
8	11220.00	32.7 AV	54.0	-21.3	1.93 H	167	19.7	13.0
9	#16830.00	43.6 PK	74.0	-30.4	1.52 H	40	27.6	16.0
10	#16830.00	32.5 AV	54.0	-21.5	1.52 H	40	16.5	16.0

**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	63.9 PK	74.0	-10.1	1.98 V	170	60.5	3.4
2	#5470.00	53.4 AV	54.0	-0.6	1.98 V	170	50.0	3.4
3	*5610.00	116.9 PK			1.98 V	170	113.2	3.7
4	*5610.00	107.4 AV			1.98 V	170	103.7	3.7
5	#5725.00	68.0 PK	74.0	-6.0	1.98 V	170	64.1	3.9
6	#5725.00	50.3 AV	54.0	-3.7	1.98 V	170	46.4	3.9
7	11220.00	44.1 PK	74.0	-29.9	2.31 V	211	31.1	13.0
8	11220.00	35.4 AV	54.0	-18.6	2.31 V	211	22.4	13.0
9	#16830.00	44.4 PK	74.0	-29.6	1.93 V	140	28.4	16.0
10	#16830.00	33.2 AV	54.0	-20.8	1.93 V	140	17.2	16.0

**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.

**Below 1GHz Data:**

**802.11ac (VHT40)**

<b>CHANNEL</b>	TX Channel 110	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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	42.38	30.0 QP	40.0	-10.0	2.50 H	190	38.9	-8.9
2	62.16	30.4 QP	40.0	-9.6	2.50 H	277	39.9	-9.5
3	89.95	29.1 QP	43.5	-14.4	2.50 H	285	43.6	-14.5
4	170.32	32.8 QP	43.5	-10.7	2.50 H	69	41.9	-9.1
5	362.11	35.6 QP	46.0	-10.4	1.00 H	214	42.0	-6.4
6	429.45	33.7 QP	46.0	-12.3	1.00 H	177	38.0	-4.3

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	54.36	36.4 QP	40.0	-3.6	1.00 V	286	45.2	-8.8
2	101.74	34.7 QP	43.5	-8.8	1.50 V	0	47.3	-12.6
3	173.13	32.9 QP	43.5	-10.6	1.50 V	0	42.3	-9.4
4	394.41	33.0 QP	46.0	-13.0	1.00 V	104	38.6	-5.6
5	498.01	27.9 QP	46.0	-18.1	2.00 V	360	30.7	-2.8
6	836.29	29.2 QP	46.0	-16.8	1.50 V	79	26.3	2.9

**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

## 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: Dec. 29, 2016

#### 4.2.3 Test Procedure

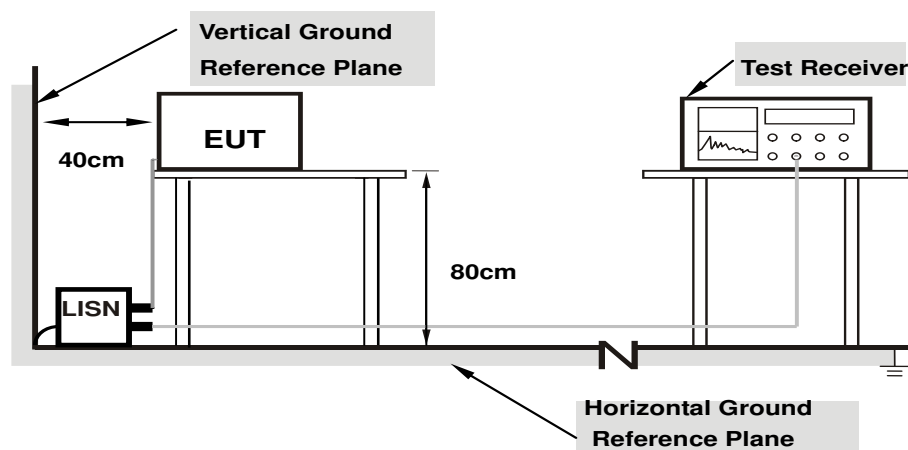
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

#### 4.2.4 Deviation from Test Standard

No deviation.

#### 4.2.5 Test Setup



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

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

#### 4.2.6 EUT Operating Condition

Same as 4.1.6.

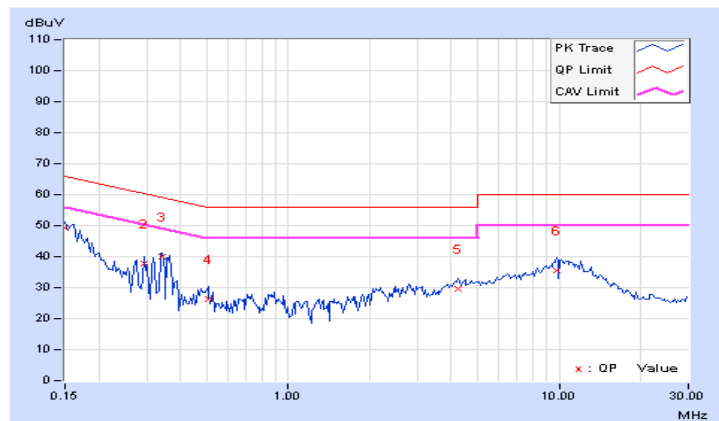
#### 4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.15000	10.20	38.92	23.51	49.12	33.71	66.00	56.00	-16.88
2	0.29453	10.22	27.55	23.44	37.77	33.66	60.40	50.40	-22.63	-16.74
<b>3</b>	<b>0.34141</b>	<b>10.23</b>	<b>29.84</b>	<b>29.78</b>	<b>40.07</b>	<b>40.01</b>	<b>59.17</b>	<b>49.17</b>	<b>-19.10</b>	<b>-9.16</b>
4	0.50547	10.25	16.15	12.76	26.40	23.01	56.00	46.00	-29.60	-22.99
5	4.25391	10.33	19.30	13.50	29.63	23.83	56.00	46.00	-26.37	-22.17
6	9.76953	10.71	24.99	20.33	35.70	31.04	60.00	50.00	-24.30	-18.96

#### REMARKS:

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

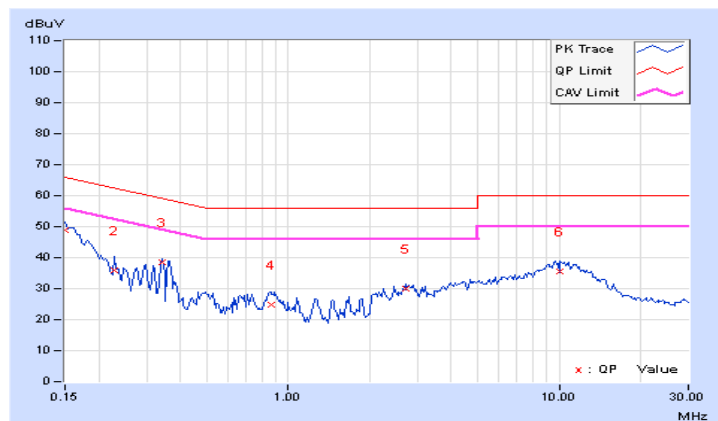


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.15000	10.19	38.76	22.52	48.95	32.71	66.00	56.00	-17.05
2	0.22812	10.18	25.89	15.01	36.07	25.19	62.52	52.52	-26.45	-27.33
3	0.34141	10.22	28.15	27.58	38.37	37.80	59.17	49.17	-20.80	-11.37
4	0.86094	10.26	14.41	9.29	24.67	19.55	56.00	46.00	-31.33	-26.45
5	2.71875	10.28	19.68	12.24	29.96	22.52	56.00	46.00	-26.04	-23.48
6	10.08203	10.64	24.85	20.31	35.49	30.95	60.00	50.00	-24.51	-19.05

**REMARKS:**

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



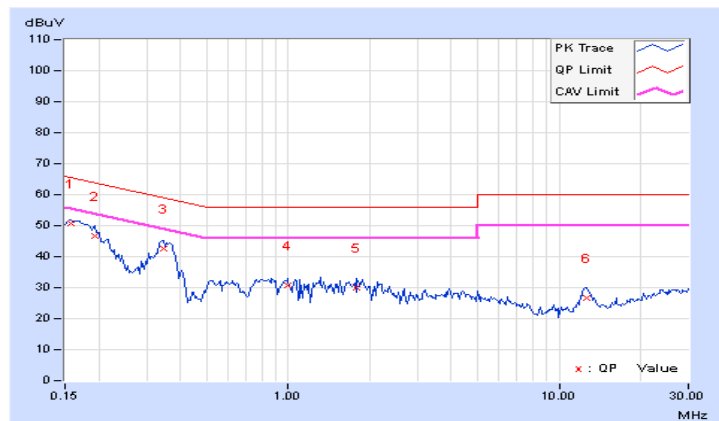
#### 4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.15781	10.20	40.47	31.58	50.67	41.78	65.58	55.58	-14.91
2	0.19297	10.20	36.49	28.27	46.69	38.47	63.91	53.91	-17.22	-15.44
3	0.34531	10.23	32.48	24.47	42.71	34.70	59.07	49.07	-16.36	-14.37
4	0.99766	10.30	20.46	12.44	30.76	22.74	56.00	46.00	-25.24	-23.26
5	1.78906	10.29	19.56	10.16	29.85	20.45	56.00	46.00	-26.15	-25.55
6	12.62500	11.03	15.62	10.74	26.65	21.77	60.00	50.00	-33.35	-28.23

#### REMARKS:

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



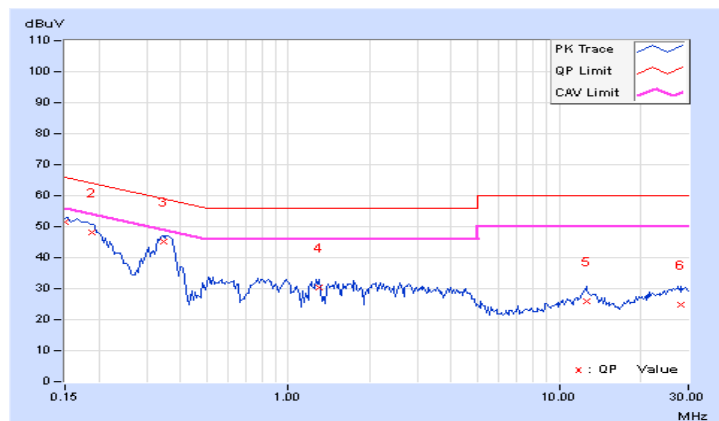


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	41.27	32.39	51.46	42.58	66.00	56.00	-14.54	-13.42
2	0.18906	10.17	38.12	30.47	48.29	40.64	64.08	54.08	-15.79	-13.44
3	0.34531	10.22	35.00	27.24	45.22	37.46	59.07	49.07	-13.85	-11.61
4	1.30859	10.28	20.23	10.40	30.51	20.68	56.00	46.00	-25.49	-25.32
5	12.57422	10.87	14.91	10.45	25.78	21.32	60.00	50.00	-34.22	-28.68
6	28.29297	11.40	13.29	9.09	24.69	20.49	60.00	50.00	-35.31	-29.51

#### REMARKS:

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



### 4.3 Transmit Power Measurement

#### 4.3.1 Limits of Transmit Power Measurement

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

\*B is the 26 dB emission bandwidth in megahertz

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

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

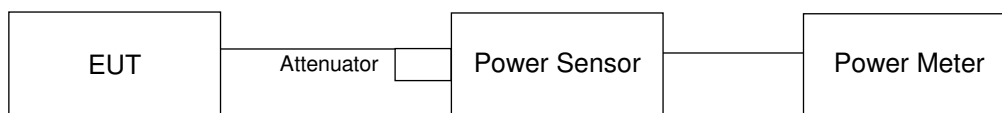
Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any  $N_{ANT}$ ;

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

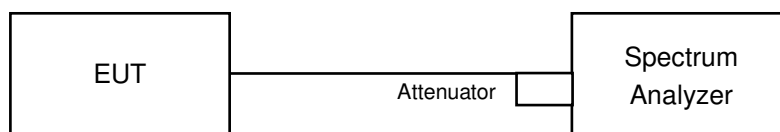
For power measurements on all other devices: Array Gain =  $10 \log(N_{ANT}/N_{SS})$  dB.

#### 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

#### CDD Mode

#### 802.11a

#### Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	18.25	18.18	18.63	205.546	23.13	24	Pass
60	5300	18.39	18.11	18.80	209.596	23.21	24	Pass
64	5320	18.26	18.13	18.58	204.112	23.10	24	Pass
100	5500	18.55	18.32	18.02	202.921	23.07	24	Pass
116	5580	18.75	18.43	18.03	208.185	23.18	24	Pass
140	5700	18.68	18.41	18.24	209.814	23.22	24	Pass

#### 26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	21.67	21.62	21.50
60	5300	21.75	21.51	21.61
64	5320	21.77	21.61	21.54
100	5500	21.72	21.48	21.44
116	5580	21.74	21.47	21.53
140	5700	21.66	21.49	21.15

**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	21.50	24.32 > 24
60	5300	21.51	24.32 > 24
64	5320	21.54	24.33 > 24
100	5500	21.44	24.31 > 24
116	5580	21.47	24.31 > 24
140	5700	21.15	24.25 > 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	Chain 2				
52	5260	18.70	18.44	18.67	217.575	23.38	24	Pass
60	5300	18.44	18.38	18.63	211.634	23.26	24	Pass
64	5320	18.40	18.22	18.91	213.361	23.29	24	Pass
100	5500	18.74	18.29	18.12	207.133	23.16	24	Pass
116	5580	19.02	18.35	18.02	211.577	23.25	24	Pass
140	5700	18.57	18.44	18.59	214.045	23.31	24	Pass

### 26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	22.00	21.77	21.65
60	5300	22.36	21.95	21.86
64	5320	22.04	21.54	21.90
100	5500	22.03	21.57	21.63
116	5580	21.96	21.63	21.75
140	5700	22.00	21.56	21.55

**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	21.65	24.35 > 24
60	5300	21.86	24.39 > 24
64	5320	21.54	24.33 > 24
100	5500	21.57	24.33 > 24
116	5580	21.63	24.35 > 24
140	5700	21.55	24.33 > 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	Chain 2				
54	5270	19.13	18.78	19.40	244.451	23.88	24	Pass
62	5310	16.43	16.04	16.42	127.986	21.07	24	Pass
102	5510	17.41	16.86	16.36	146.861	21.67	24	Pass
110	5550	19.56	18.81	19.02	246.197	23.91	24	Pass
134	5670	19.19	18.72	18.80	233.316	23.68	24	Pass

#### 26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	41.26	41.20	41.20
62	5310	41.39	41.35	41.31
102	5510	41.14	41.27	41.25
110	5550	41.72	41.20	41.21
134	5670	41.41	41.37	41.38

**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)
54	5270	41.20	27.14 > 24
62	5310	41.31	27.16 > 24
102	5510	41.14	27.14 > 24
110	5550	41.20	27.14 > 24
134	5670	41.37	27.16 > 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	Chain 2				
58	5290	13.83	13.66	14.03	72.675	18.61	24	Pass
106	5530	14.20	15.10	15.05	90.651	19.57	24	Pass
122	5610	19.10	18.68	19.45	243.178	23.86	24	Pass

#### 26dB OCCUPIED BANDWIDTH

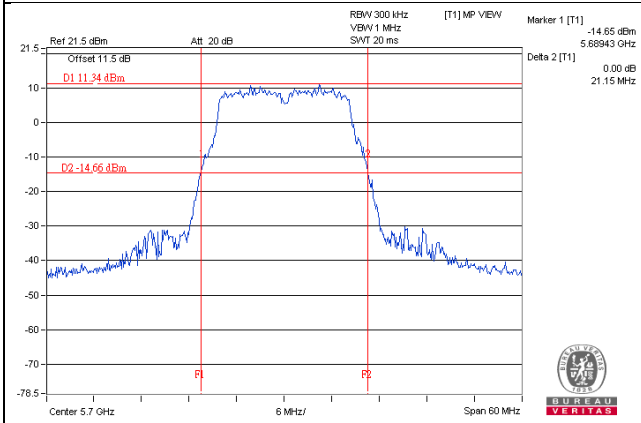
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
58	5290	82.34	82.18	82.05
106	5530	82.58	82.33	82.03
122	5610	82.69	82.87	82.67

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

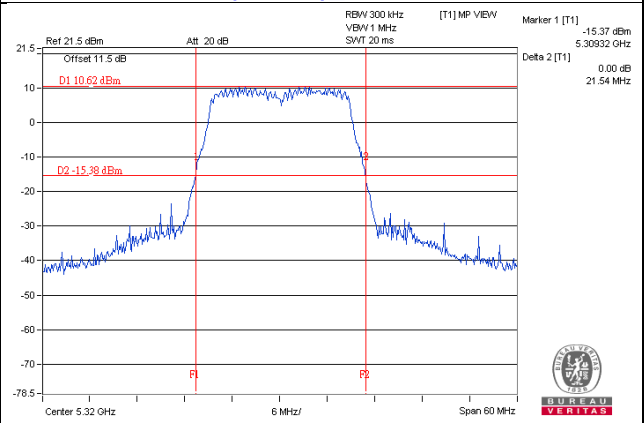
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.05	30.14 > 24
106	5530	82.03	30.13 > 24
122	5610	82.67	30.17 > 24

Spectrum Plot of Worst Value

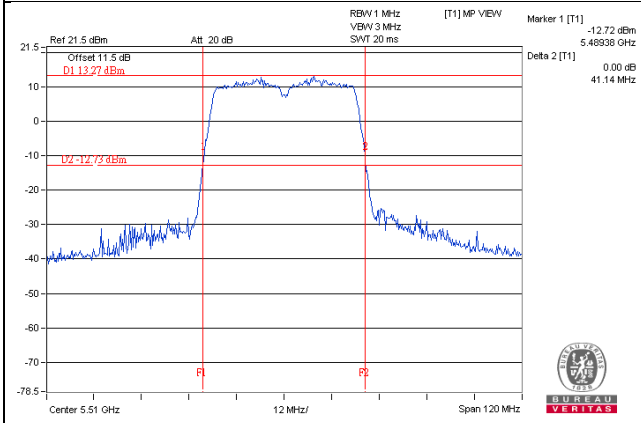
802.11a\_Chain 2 / CH140



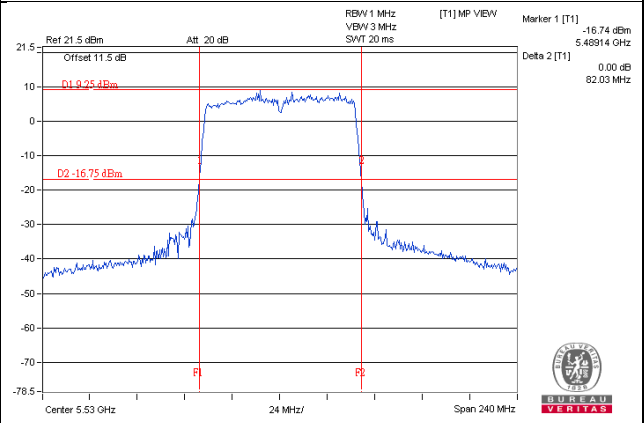
802.11ac (VHT20)\_Chain 1 / CH64



802.11ac (VHT40)\_Chain 0 / CH102



802.11ac (VHT80)\_Chain 2 / CH106





## Beamforming Mode

### 802.11ac (VHT20)

#### Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	18.24	18.03	18.12	195.077	22.90	23.43	Pass
60	5300	18.16	18.11	18.21	196.4	22.93	23.43	Pass
64	5320	18.02	17.89	18.38	193.77	22.87	23.43	Pass
100	5500	18.48	18.02	17.89	195.374	22.91	23.43	Pass
116	5580	18.64	17.96	17.79	195.748	22.92	23.43	Pass
140	5700	18.22	18.09	18.10	195.356	22.91	23.43	Pass

**Note:** 1. Directional gain =  $1.8\text{dBi} + 10\log(3) = 6.57\text{dBi} > 6\text{dBi}$ , so the power limit shall be reduced to "Determined Conducted Limit-(6.57-6)".

#### 26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	22.00	21.77	21.65
60	5300	22.36	21.95	21.86
64	5320	22.04	21.54	21.90
100	5500	22.03	21.57	21.63
116	5580	21.96	21.63	21.75
140	5700	22.00	21.56	21.55

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

Power Limit = $11\text{dBm} + 10\log B < \text{U-NII-2A, U-NII-2C} >$			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.65	24.35 > 24
60	5300	21.86	24.39 > 24
64	5320	21.54	24.33 > 24
100	5500	21.57	24.33 > 24
116	5580	21.63	24.35 > 24
140	5700	21.55	24.33 > 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	Chain 2				
54	5270	18.57	18.27	18.66	212.539	23.27	23.43	Pass
62	5310	16.43	16.04	16.42	127.986	21.07	23.43	Pass
102	5510	17.41	16.86	16.36	146.861	21.67	23.43	Pass
110	5550	18.69	18.64	18.54	218.525	23.40	23.43	Pass
134	5670	18.44	18.28	18.38	205.986	23.14	23.43	Pass

**Note:** 1. Directional gain =  $1.8\text{dBi} + 10\log(3) = 6.57\text{dBi} > 6\text{dBi}$ , so the power limit shall be reduced to "Determined Conducted Limit-(6.57-6)".

### 26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	41.26	41.20	41.20
62	5310	41.39	41.35	41.31
102	5510	41.14	41.27	41.25
110	5550	41.72	41.20	41.21
134	5670	41.41	41.37	41.38

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

Power Limit = $11\text{dBm} + 10\log B < \text{U-NII-2A, U-NII-2C} >$			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.20	27.14 > 24
62	5310	41.31	27.16 > 24
102	5510	41.14	27.14 > 24
110	5550	41.20	27.14 > 24
134	5670	41.37	27.16 > 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	Chain 2				
58	5290	13.83	13.66	14.03	72.675	18.61	23.43	Pass
106	5530	14.20	15.10	15.05	90.651	19.57	23.43	Pass
122	5610	18.65	18.17	18.55	210.511	23.23	23.43	Pass

**Note:** 1. Directional gain =  $1.8\text{dBi} + 10\log(3) = 6.57\text{dBi} > 6\text{dBi}$ , so the power limit shall be reduced to "Determined Conducted Limit-(6.57-6)".

#### 26dB OCCUPIED BANDWIDTH

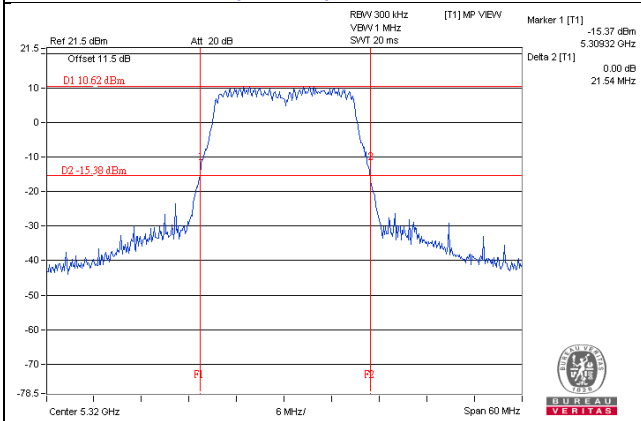
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
58	5290	82.34	82.18	82.05
106	5530	82.58	82.33	82.03
122	5610	82.69	82.87	82.67

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

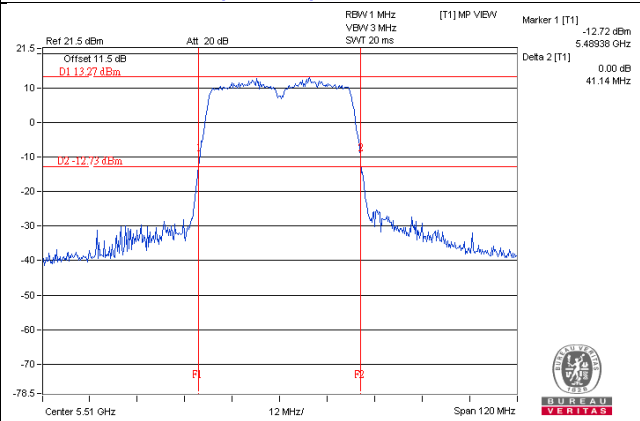
Power Limit = $11\text{dBm} + 10\log B < \text{U-NII-2A, U-NII-2C} >$			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.05	30.14 > 24
106	5530	82.03	30.13 > 24
122	5610	82.67	30.17 > 24

### Spectrum Plot of Worst Value

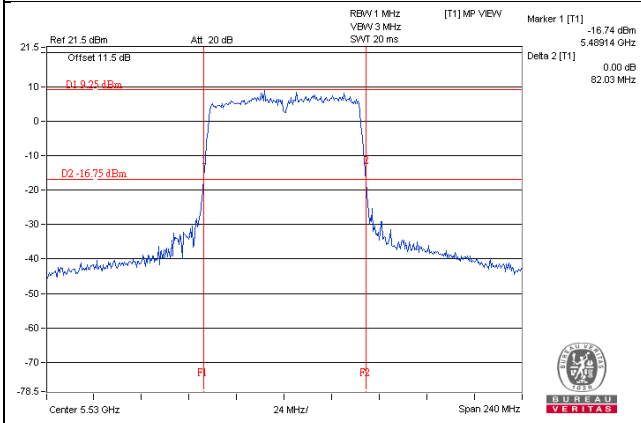
**802.11ac (VHT20) \_Chain 1 / CH64**



**802.11ac (VHT40) \_Chain 0 / CH102**

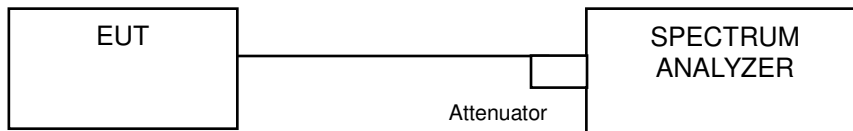


**802.11ac (VHT80) \_Chain 0 / CH106**



## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Test Setup



### 4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.4.3 Test Procedure

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

#### 4.4.4 Test Results

##### 802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
52	5260	17.04	16.80	16.92
60	5300	17.04	16.92	16.80
64	5320	16.92	16.92	16.80
100	5500	16.92	17.04	16.92
116	5580	16.92	17.04	16.80
140	5700	17.04	16.80	16.80

##### 802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
52	5260	18.12	18.00	18.00
60	5300	18.12	18.00	18.00
64	5320	18.00	18.00	17.88
100	5500	18.12	17.88	18.00
116	5580	18.00	17.88	18.00
140	5700	17.88	18.00	18.00

##### 802.11ac (VHT40)

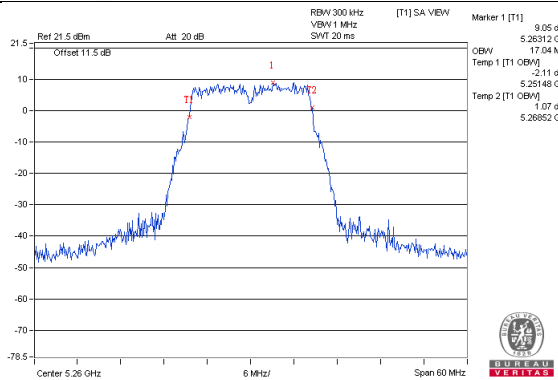
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
54	5270	36.72	36.48	36.72
62	5310	36.72	36.48	36.72
102	5510	36.48	36.48	36.72
110	5550	36.72	36.48	36.48
134	5670	36.72	36.72	36.96

##### 802.11ac (VHT80)

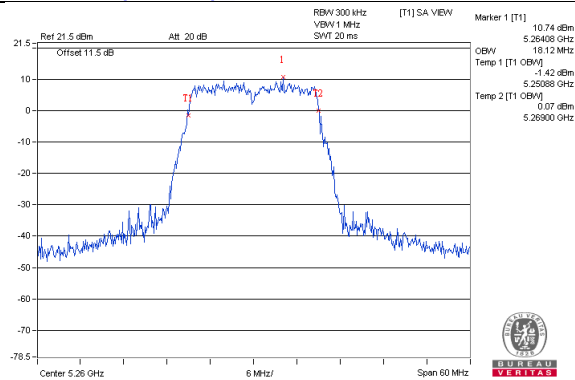
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
58	5290	76.32	76.32	76.32
106	5530	75.84	75.84	75.84
122	5610	75.84	75.84	76.32

### Spectrum Plot of Worst Value

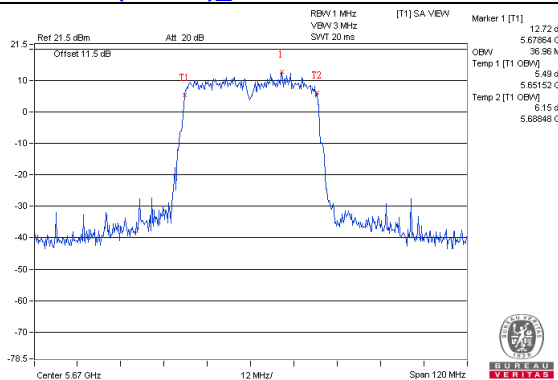
**802.11a\_Chain0 / CH52**



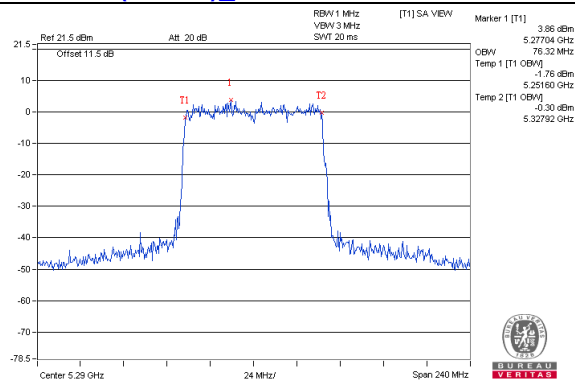
**802.11ac (VHT20)\_Chain0 / CH52**



**802.11ac (VHT40)\_Chain2 / CH134**



**802.11ac (VHT80)\_Chain0 / CH58**

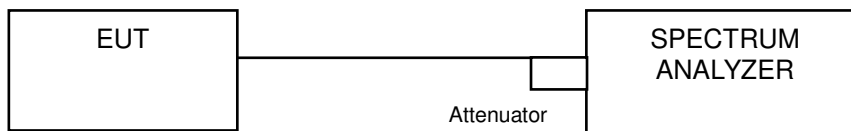


## 4.5 Peak Power Spectral Density Measurement

### 4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
		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

#### 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)

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

#### 802.11ac (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

#### CDD Mode

#### 802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
52	5260	5.05	5.09	5.72	10.07	10.43	Pass
60	5300	5.65	5.20	5.57	10.25	10.43	Pass
64	5320	5.54	5.07	5.30	10.08	10.43	Pass
100	5500	5.83	5.19	5.12	10.16	10.43	Pass
116	5580	6.07	5.72	4.63	10.29	10.43	Pass
140	5700	6.05	5.38	5.19	10.33	10.43	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 =  $1.8\text{dBi} + 10\log(3) = 6.57\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $11 - (6.57 - 6) = 10.43\text{dBm}$ .

#### 802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
52	5260	5.43	4.65	5.71	10.06	10.43	Pass
60	5300	5.35	5.08	5.54	10.10	10.43	Pass
64	5320	5.50	4.18	6.26	10.17	10.43	Pass
100	5500	5.82	4.97	5.07	10.07	10.43	Pass
116	5580	4.96	5.69	5.13	10.04	10.43	Pass
140	5700	5.48	5.07	5.19	10.02	10.43	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 =  $1.8\text{dBi} + 10\log(3) = 6.57\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $11 - (6.57 - 6) = 10.43\text{dBm}$ .

### 802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
54	5270	2.86	1.72	2.38	7.12	10.43	Pass
62	5310	0.34	-1.26	-0.51	4.34	10.43	Pass
102	5510	0.20	0.39	0.07	4.99	10.43	Pass
110	5550	2.83	3.15	2.84	7.71	10.43	Pass
134	5670	2.13	1.57	1.74	6.59	10.43	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 =  $1.8\text{dBi} + 10\log(3) = 6.57\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $11 - (6.57 - 6) = 10.43\text{dBm}$ .

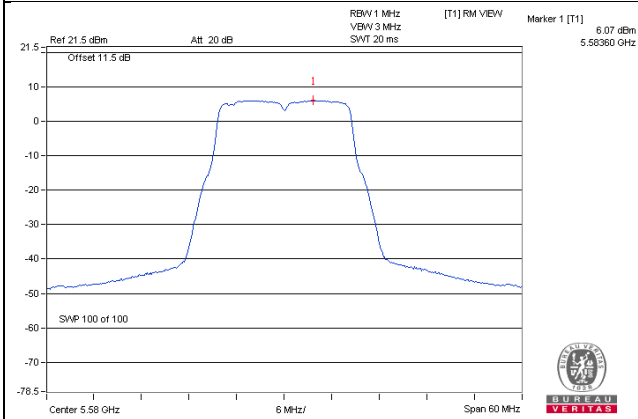
### 802.11ac (VHT80)

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	Chain 2				
58	5290	-6.54	-6.67	-6.09	0.26	-1.40	10.43	Pass
106	5530	-4.24	-3.61	-4.35	0.26	0.97	10.43	Pass
122	5610	0.25	0.41	0.41	0.26	5.39	10.43	Pass

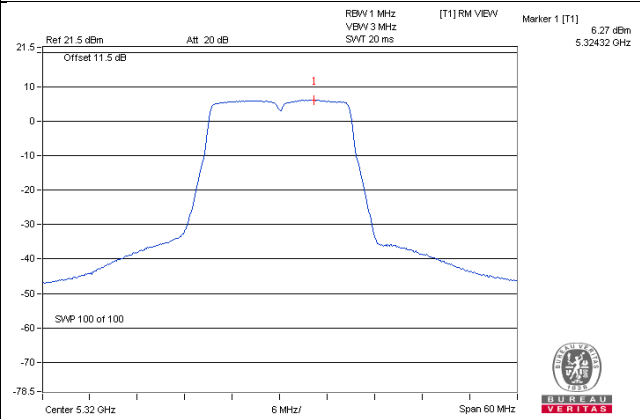
- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain =  $1.8\text{dBi} + 10\log(3) = 6.57\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $11 - (6.57 - 6) = 10.43\text{dBm}$ .
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

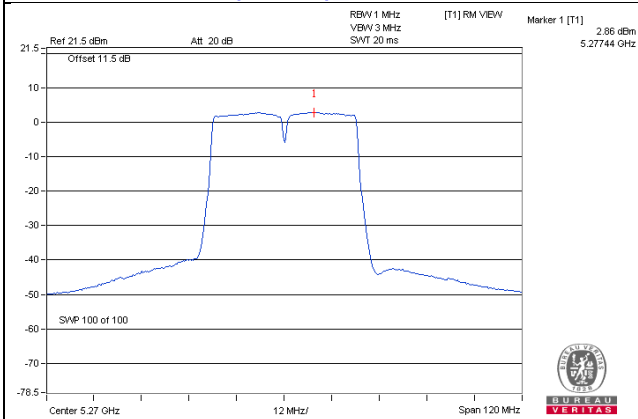
802.11a\_Chain 0 / CH116



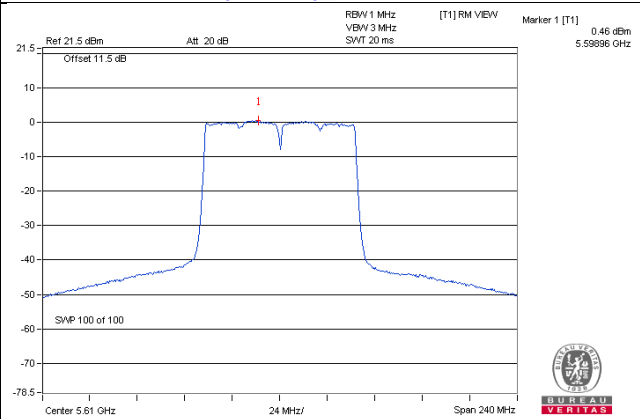
802.11ac (VHT20)\_Chain 2 / CH64



802.11ac (VHT40)\_Chain 0 / CH54



802.11ac (VHT80)\_Chain 1 / CH122

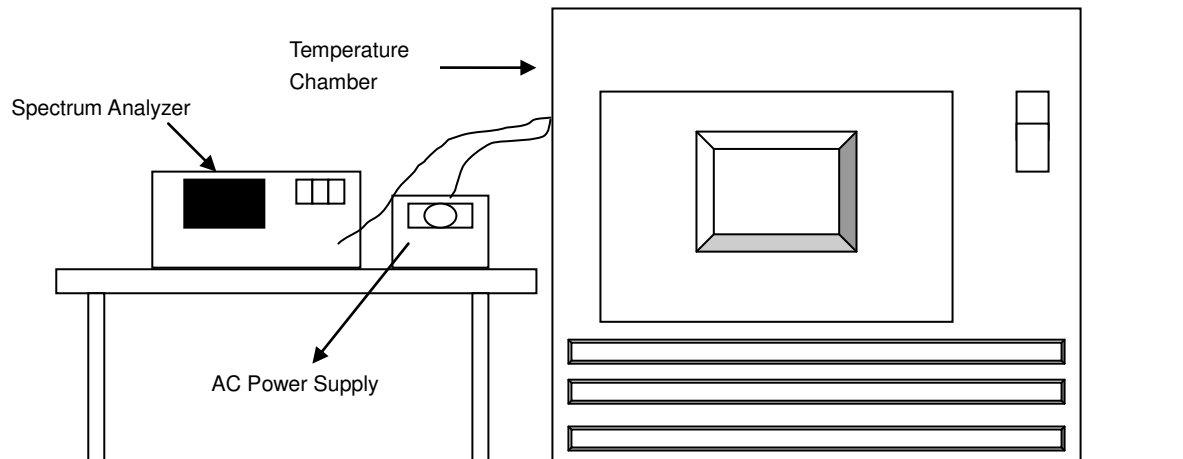


## 4.6 Frequency Stability Measurement

### 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

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

### 4.6.5 Deviation from Test Standard

No deviation.

### 4.6.6 EUT Operating Condition

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

## 4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5260 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5260.0127	PASS	5260.014	PASS	5260.0134	PASS	5260.0145	PASS
40	120	5259.9789	PASS	5259.9764	PASS	5259.9789	PASS	5259.9807	PASS
30	120	5260.0132	PASS	5260.0108	PASS	5260.0128	PASS	5260.0128	PASS
20	120	5260.0108	PASS	5260.0072	PASS	5260.0086	PASS	5260.009	PASS
10	120	5259.9902	PASS	5259.993	PASS	5259.9906	PASS	5259.9938	PASS
0	120	5259.9831	PASS	5259.9807	PASS	5259.9848	PASS	5259.9812	PASS
-10	120	5260.0068	PASS	5260.0056	PASS	5260.0063	PASS	5260.0034	PASS
-20	120	5260.0085	PASS	5260.0093	PASS	5260.0063	PASS	5260.0091	PASS
-30	120	5259.9823	PASS	5259.9792	PASS	5259.9837	PASS	5259.9824	PASS

Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5260.0106	PASS	5260.0069	PASS	5260.0091	PASS	5260.0089	PASS
	120	5260.0108	PASS	5260.0072	PASS	5260.0086	PASS	5260.009	PASS
	102	5260.0112	PASS	5260.0075	PASS	5260.0091	PASS	5260.0084	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.

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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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