FCC Test Report

Report No.:	RF140812C13F-1
FCC ID:	PY314100252
Test Model:	C7100V-100NAS
Received Date:	Jan. 16, 2017
Test Date:	Jan. 20 to 21, 2017
Issued Date:	Feb. 02, 2017
Applicant:	NETGEAR INC.
Address:	350 E. Plumeria Drive, San Jose CA 95134, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF140812C13F-1	Original release.	Feb. 02, 2017

1 Certificate of Conformity

Product:	Wireless Cable Data Gateway
Brand:	Netgear
Test Model:	C7100V-100NAS
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR INC.
Test Date:	Jan. 20 to 21, 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:** Feb. 02, 2017

Wendy Wu / Specialist

Approved by : , **Date:** Feb. 02, 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) (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 5133.00MHz., 5150.00MHz, 11570.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

NOTE: 1. This report is prepared for FCC Class II change.

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) (±)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.34 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.41 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	3.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Cable Data Gateway
Brand	Netgear
Test Model	C7100V-100NAS
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	Internal power supply
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**5.18 ~ 5.24GHz** **CDD Mode** 601.659mW **Beamfoming Mode** 603.761mW **5.745 ~ 5.825GHz** **CDD Mode** 603.419mW **Beamfoming Mode** 605.463mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	RJ45 cable (Unshielded, 1.45m)

Note:

1. This report is prepared for FCC Class II change. The difference compared with the Report No.: RF140812C13C-1 is as the following:
   - ◆ Improve the power value to section 15.407 for UNII-1 and UNII-3 band. (The maximum power is lower than the maximum power of original certificate.)
2. According to above conditions, all test items need to be performed, except for AC power conducted emission test item. And all data was verified to meet the requirements.
3. 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.		

4. The EUT must be supplied with an internal power supply:

brand:	PEGATRON
Model:	UPM60N
Input:	100Vac~240Vac
Output:	12V/5A max.
Power Line:	AC cable (Unshielded, 2m)

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

2.4GHz antenna					
No.	**Transmitter Circuit**	**Gain (dBi) (Include cable loss)**	**Frequency range (GHz to GHz)**	**Antenna Type**	**Connecter Type**
1	0	2.07	2.4~2.4835	PIFA	i-pex(MHF)
2	1	2.07	2.4~2.4835	PIFA	i-pex(MHF)
3	2	2.07	2.4~2.4835	PIFA	i-pex(MHF)
5GHz antenna					
No.	**Transmitter Circuit**	**Gain (dBi) (Include cable loss)**	**Frequency range (GHz to GHz)**	**Antenna Type**	**Connecter Type**
4	0	3.33	5.15~5.25	PIFA	i-pex(MHF)
		3.32	5.25~5.35	PIFA	i-pex(MHF)
		3.29	5.47~5.725	PIFA	i-pex(MHF)
		3.28	5.725~5.850	PIFA	i-pex(MHF)
5	1	3.33	5.15~5.25	PIFA	i-pex(MHF)
		3.32	5.25~5.35	PIFA	i-pex(MHF)
		3.29	5.47~5.725	PIFA	i-pex(MHF)
		3.28	5.725~5.850	PIFA	i-pex(MHF)
6	2	3.33	5.15~5.25	PIFA	i-pex(MHF)
		3.32	5.25~5.35	PIFA	i-pex(MHF)
		3.29	5.47~5.725	PIFA	i-pex(MHF)
		3.28	5.725~5.850	PIFA	i-pex(MHF)

6. The EUT incorporates a MIMO function.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	3TX CDD	3RX
802.11g	6 ~ 54Mbps	3TX CDD	3RX
802.11n (HT20) 802.11n (HT40) (For 2.4GHz)	MCS 0~7	3TX CDD / beamforming	3RX
	MCS 8~15	3TX CDD / beamforming	3RX
	MCS 16~23	3TX / beamforming	3RX
802.11n (BW20) (For 2.4GHz)	MCS 0~8, Nss=1 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~8, Nss=2 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3 (256QAM)	3TX / beamforming	3RX
802.11n (BW40) (For 2.4GHz)	MCS 0~9, Nss=1 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=2 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3 (256QAM)	3TX / beamforming	3RX
802.11a	6 ~ 54Mbps	3TX CDD	3RX
802.11n (HT20), 802.11n (HT40) (For 5GHz)	MCS 0~7	3TX CDD / beamforming	3RX
	MCS 8~15	3TX CDD / beamforming	3RX
	MCS 16~23	3TX / beamforming	3RX
802.11ac (VHT20) (For 5GHz)	MCS 0~8, Nss=1	3TX CDD / beamforming	3RX
	MCS 0~8, Nss=2	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3	3TX / beamforming	3RX
802.11ac (VHT40) 802.11ac (VHT80) (For 5GHz)	MCS 0~9, Nss=1	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=2	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3	3TX / beamforming	3RX
Note: 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)			

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240 5745-5825	36 to 48 149 to 165	48	OFDM	BPSK	6

Antenna Port Conducted Measurement:

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

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

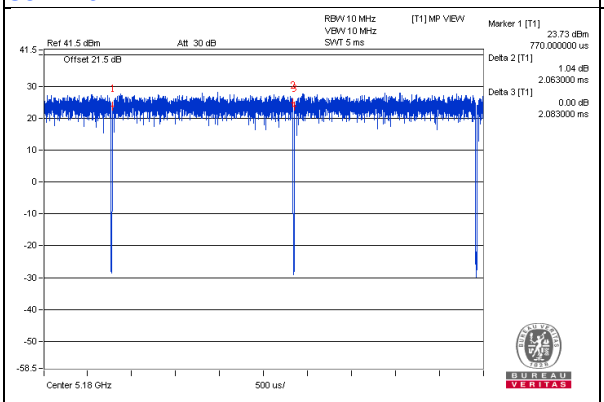
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	24deg. C, 69%RH	120Vac, 60Hz	Terry Huang
RE<1G	23deg. C, 70%RH	120Vac, 60Hz	Andy Ho
APCM	24deg. C, 69%RH	120Vac, 60Hz	Anderson Chen

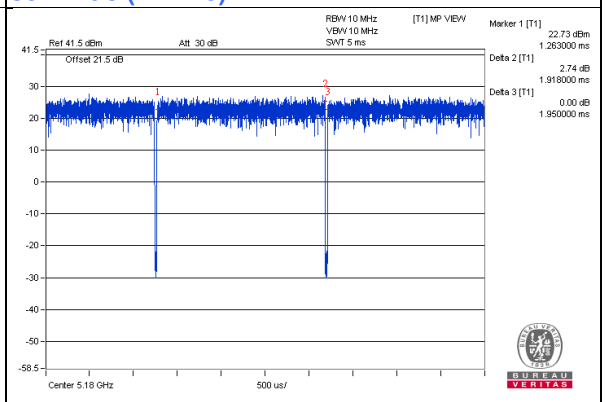
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.063 ms/2.083 ms = 0.99
802.11ac (VHT20): Duty cycle = 1.918 ms/1.95 ms = 0.984
802.11ac (VHT40): Duty cycle = 0.956 ms/0.973 ms = 0.983
802.11ac (VHT80): Duty cycle = 0.46 ms/0.489 ms = 0.941, Duty factor = 10 * log(1/0.941) = 0.27

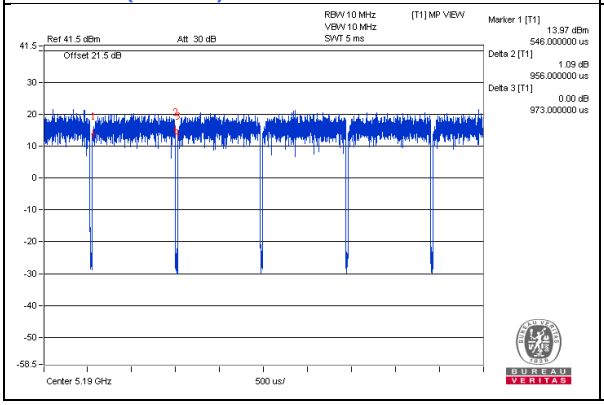
802.11a



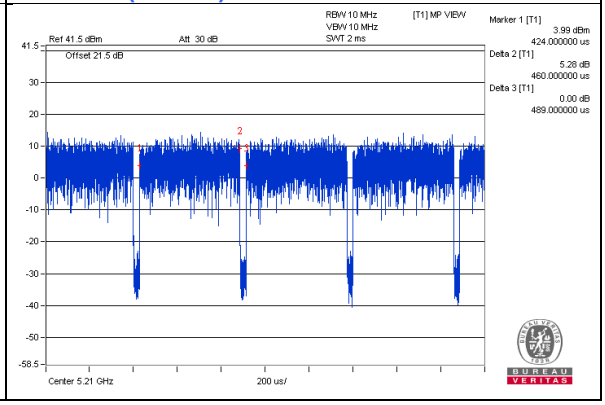
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA 04011	NA	Provided by Lab
		WONDER	WD-303	7C17KA 05211	NA	Provided by Lab
B.	Laptop	LENOVO	E440	PF071LWC	NA	Provided by Lab
C.	HUB	PCI	FX-05EA	NA	NA	Provided by Lab
D.	I-Pod	Apple	MD778TA/A	CC4JMCMXF4T1	NA	Provided by Lab
		Apple	MD778TA/A	CC4JMH7LF4T1	NA	Provided by Lab

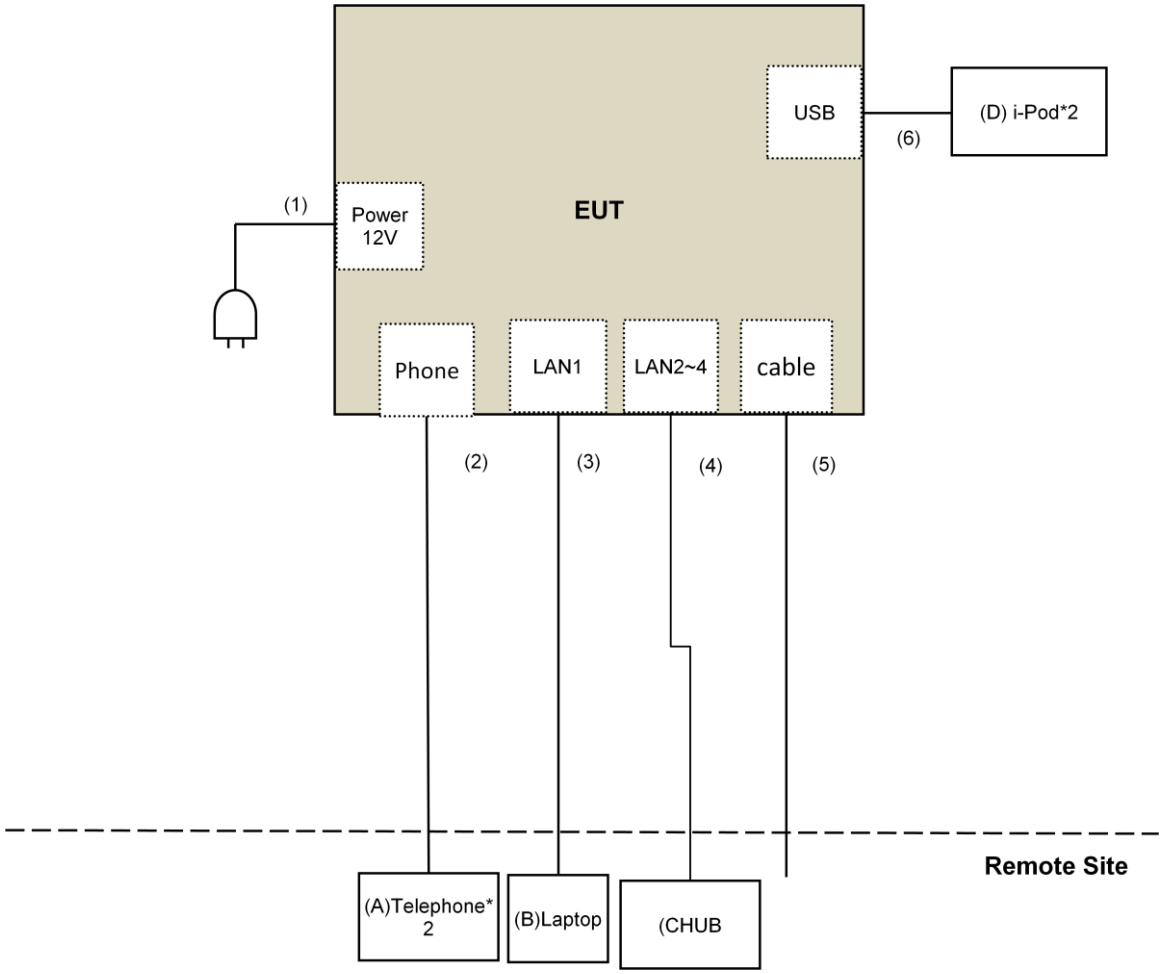
Note:

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-11 Cable	2	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.	Coaxial Cable	1	10	Yes	0	Provided by Lab
6.	USB Cable	2	0.1	Yes	0	Provided by Lab

Note: The core(s) is(are) originally attached to the cable(s).

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

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

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-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 Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 14, 2017	Jan. 13, 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: Jan. 20 to 21, 2017

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

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

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

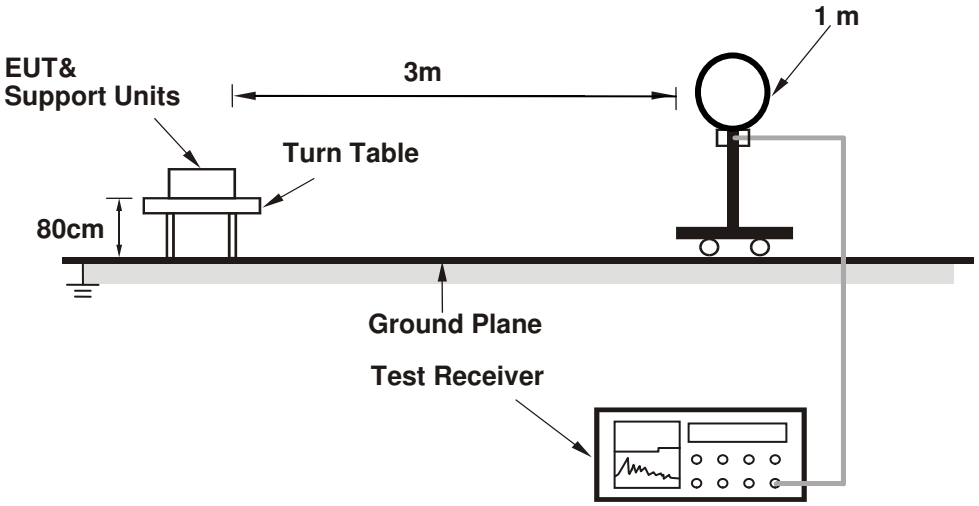
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

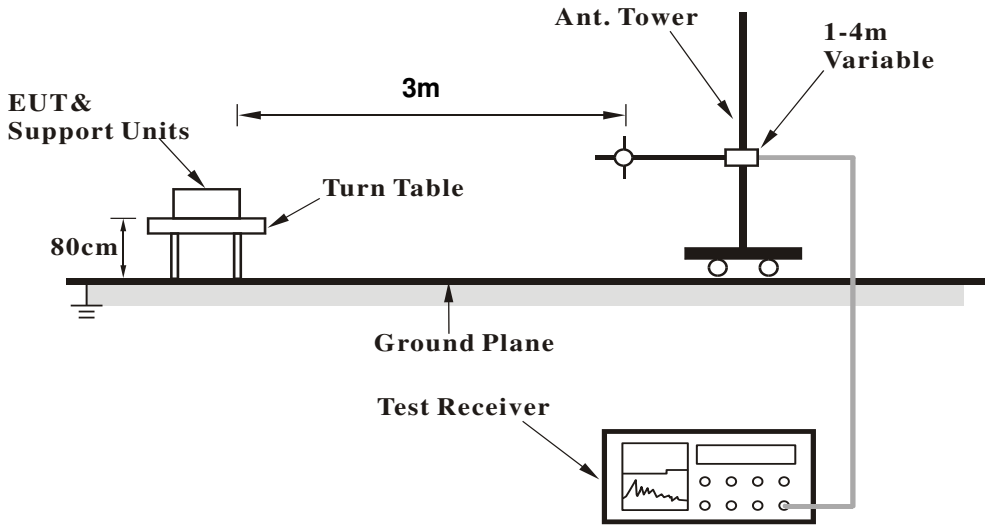
No deviation.

4.1.5 Test Setup

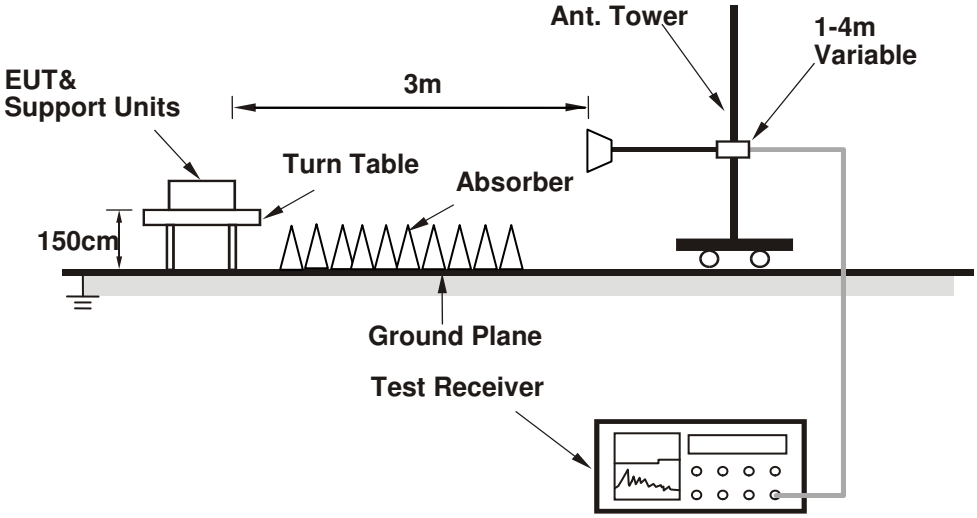
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.

b. Contorlling software (Mtool.exe[2.0.1.1]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.7 PK	74.0	-6.3	1.06 H	261	64.7	3.0
2	5150.00	53.5 AV	54.0	-0.5	1.06 H	261	50.5	3.0
3	*5180.00	118.0 PK			1.06 H	261	114.9	3.1
4	*5180.00	107.7 AV			1.06 H	261	104.6	3.1
5	5393.60	55.4 PK	74.0	-18.6	1.06 H	244	52.0	3.4
6	5393.60	46.6 AV	54.0	-7.4	1.06 H	244	43.2	3.4
7	#10360.00	55.2 PK	74.0	-18.8	1.47 H	164	42.3	12.9
8	#10360.00	44.1 AV	54.0	-9.9	1.47 H	164	31.2	12.9
9	15540.00	52.5 PK	74.0	-21.5	1.50 H	0	38.0	14.5
10	15540.00	40.6 AV	54.0	-13.4	1.50 H	0	26.1	14.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.2 PK	74.0	-5.8	1.50 V	176	65.2	3.0
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.50 V**	**176**	**50.9**	**3.0**
3	*5180.00	120.2 PK			1.50 V	176	117.1	3.1
4	*5180.00	110.2 AV			1.50 V	176	107.1	3.1
5	5393.60	62.7 PK	74.0	-11.3	2.12 V	296	59.3	3.4
6	5393.60	52.2 AV	54.0	-1.8	2.12 V	296	48.8	3.4
7	#10360.00	58.3 PK	74.0	-15.7	1.50 V	60	45.4	12.9
8	#10360.00	46.3 AV	54.0	-7.7	1.50 V	60	33.4	12.9
9	15540.00	52.3 PK	74.0	-21.7	1.66 V	312	37.8	14.5
10	15540.00	41.0 AV	54.0	-13.0	1.66 V	312	26.5	14.5

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	117.2 PK			1.08 H	275	114.1	3.1
2	*5200.00	106.9 AV			1.08 H	275	103.8	3.1
3	5422.00	63.1 PK	74.0	-10.9	1.08 H	275	59.6	3.5
4	5422.00	52.7 AV	54.0	-1.3	1.08 H	275	49.2	3.5
5	#10400.00	54.8 PK	74.0	-19.2	1.47 H	153	41.7	13.1
6	#10400.00	43.9 AV	54.0	-10.1	1.47 H	153	30.8	13.1
7	15600.00	52.9 PK	74.0	-21.1	1.52 H	0	38.3	14.6
8	15600.00	40.8 AV	54.0	-13.2	1.52 H	0	26.2	14.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	119.4 PK			1.50 V	170	116.3	3.1
2	*5200.00	109.4 AV			1.50 V	170	106.3	3.1
3	5422.00	64.3 PK	74.0	-9.7	1.50 V	303	60.8	3.5
4	5422.00	53.8 AV	54.0	-0.2	1.50 V	303	50.3	3.5
5	#10400.00	57.6 PK	74.0	-16.4	1.48 V	45	44.5	13.1
6	#10400.00	45.8 AV	54.0	-8.2	1.48 V	45	32.7	13.1
7	15600.00	52.4 PK	74.0	-21.6	1.61 V	312	37.8	14.6
8	15600.00	41.0 AV	54.0	-13.0	1.61 V	312	26.4	14.6

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5081.30	59.1 PK	74.0	-14.9	1.12 H	245	56.3	2.8
2	5081.30	49.5 AV	54.0	-4.5	1.12 H	245	46.7	2.8
3	*5240.00	117.2 PK			1.11 H	285	114.1	3.1
4	*5240.00	106.8 AV			1.11 H	285	103.7	3.1
5	5454.70	62.4 PK	74.0	-11.6	1.12 H	269	59.0	3.4
6	5454.70	52.7 AV	54.0	-1.3	1.12 H	269	49.3	3.4
7	#10480.00	55.3 PK	74.0	-18.7	1.46 H	165	42.8	12.5
8	#10480.00	44.2 AV	54.0	-9.8	1.46 H	165	31.7	12.5
9	15720.00	52.5 PK	74.0	-21.5	1.48 H	12	37.7	14.8
10	15720.00	40.7 AV	54.0	-13.3	1.48 H	12	25.9	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	5081.30	60.1 PK	74.0	-13.9	1.62 V	175	57.3	2.8
2	5081.30	50.1 AV	54.0	-3.9	1.62 V	175	47.3	2.8
3	*5240.00	119.4 PK			1.50 V	169	116.3	3.1
4	*5240.00	109.3 AV			1.50 V	169	106.2	3.1
5	5454.70	63.6 PK	74.0	-10.4	1.62 V	296	60.2	3.4
6	5454.70	53.8 AV	54.0	-0.2	1.62 V	296	50.4	3.4
7	#10480.00	58.3 PK	74.0	-15.7	1.47 V	52	45.8	12.5
8	#10480.00	46.1 AV	54.0	-7.9	1.47 V	52	33.6	12.5
9	15720.00	53.0 PK	74.0	-21.0	1.67 V	303	38.2	14.8
10	15720.00	41.5 AV	54.0	-12.5	1.67 V	303	26.7	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.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5617.63	63.2 PK	68.2	-5.0	1.69 H	114	59.4	3.8
2	*5745.00	118.2 PK			1.69 H	114	114.1	4.1
3	*5745.00	107.6 AV			1.69 H	114	103.5	4.1
4	#5980.04	63.4 PK	68.2	-4.8	1.69 H	114	58.6	4.8
5	11490.00	61.6 PK	74.0	-12.4	1.51 H	67	48.0	13.6
6	11490.00	51.1 AV	54.0	-2.9	1.51 H	67	37.5	13.6
7	#17235.00	56.2 PK	74.0	-17.8	1.61 H	225	36.1	20.1
8	#17235.00	45.4 AV	54.0	-8.6	1.61 H	225	25.3	20.1
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	#5583.96	64.6 PK	68.2	-3.6	1.51 V	58	60.9	3.7
2	*5745.00	120.3 PK			1.51 V	58	116.2	4.1
3	*5745.00	110.1 AV			1.51 V	58	106.0	4.1
4	#5983.94	64.9 PK	68.2	-3.3	1.51 V	58	59.8	5.1
5	11490.00	66.4 PK	74.0	-7.6	1.50 V	120	52.8	13.6
6	11490.00	53.7 AV	54.0	-0.3	1.50 V	120	40.1	13.6
7	#17235.00	57.3 PK	74.0	-16.7	1.43 V	223	37.2	20.1
8	#17235.00	45.5 AV	54.0	-8.5	1.43 V	223	25.4	20.1

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5629.32	62.7 PK	68.2	-5.5	1.65 H	125	58.9	3.8
2	*5785.00	118.5 PK			1.65 H	125	114.4	4.1
3	*5785.00	107.8 AV			1.65 H	125	103.7	4.1
4	#5950.29	65.2 PK	68.2	-3.0	1.65 H	125	60.8	4.4
5	11570.00	61.5 PK	74.0	-12.5	1.57 H	81	48.1	13.4
6	11570.00	50.9 AV	54.0	-3.1	1.57 H	81	37.5	13.4
7	#17355.00	56.5 PK	74.0	-17.5	1.62 H	237	35.8	20.7
8	#17355.00	45.7 AV	54.0	-8.3	1.62 H	237	25.0	20.7
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	#5622.95	64.8 PK	68.2	-3.4	1.46 V	59	61.0	3.8
2	*5785.00	121.4 PK			1.46 V	59	117.3	4.1
3	*5785.00	110.9 AV			1.46 V	59	106.8	4.1
4	#5943.86	66.4 PK	68.2	-1.8	1.46 V	59	61.8	4.6
5	11570.00	65.1 PK	74.0	-8.9	1.47 V	37	51.7	13.4
6	**11570.00**	**53.9 AV**	**54.0**	**-0.1**	**1.47 V**	**37**	**40.5**	**13.4**
7	#17355.00	56.7 PK	74.0	-17.3	1.45 V	218	36.0	20.7
8	#17355.00	45.0 AV	54.0	-9.0	1.45 V	218	24.3	20.7

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.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5579.13	62.0 PK	68.2	-6.2	1.66 H	122	58.3	3.7
2	*5825.00	118.4 PK			1.66 H	112	114.2	4.2
3	*5825.00	107.7 AV			1.66 H	112	103.5	4.2
4	#5990.59	64.0 PK	68.2	-4.2	1.66 H	122	59.1	4.9
5	11650.00	61.9 PK	74.0	-12.1	1.50 H	61	48.5	13.4
6	11650.00	51.6 AV	54.0	-2.4	1.50 H	61	38.2	13.4
7	#17475.00	55.5 PK	74.0	-18.5	1.62 H	229	34.5	21.0
8	#17475.00	44.9 AV	54.0	-9.1	1.62 H	229	23.9	21.0
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	#5584.94	63.1 PK	68.2	-5.1	1.49 V	45	59.4	3.7
2	*5825.00	120.4 PK			1.49 V	45	116.2	4.2
3	*5825.00	110.4 AV			1.49 V	45	106.2	4.2
4	#5982.82	66.0 PK	68.2	-2.2	1.49 V	45	60.9	5.1
5	11650.00	64.4 PK	74.0	-9.6	1.85 V	34	51.0	13.4
6	11650.00	53.4 AV	54.0	-0.6	1.85 V	34	40.0	13.4
7	#17475.00	57.1 PK	74.0	-16.9	1.45 V	227	36.1	21.0
8	#17475.00	45.5 AV	54.0	-8.5	1.45 V	227	24.5	21.0

REMARKS:

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

802.11ac (VHT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4965.00	58.6 PK	74.0	-15.4	1.63 H	115	56.1	2.5
2	4965.00	47.8 AV	54.0	-6.2	1.63 H	115	45.3	2.5
3	5150.00	68.1 PK	74.0	-5.9	1.63 H	104	65.1	3.0
4	5150.00	52.9 AV	54.0	-1.1	1.63 H	104	49.9	3.0
5	*5180.00	116.3 PK			1.63 H	104	113.2	3.1
6	*5180.00	105.8 AV			1.63 H	104	102.7	3.1
7	5397.20	63.4 PK	74.0	-10.6	1.63 H	42	60.0	3.4
8	5397.20	52.8 AV	54.0	-1.2	1.63 H	42	49.4	3.4
9	#10360.00	55.7 PK	74.0	-18.3	1.51 H	148	42.8	12.9
10	#10360.00	44.5 AV	54.0	-9.5	1.51 H	148	31.6	12.9
11	15540.00	52.3 PK	74.0	-21.7	1.50 H	5	37.8	14.5
12	15540.00	40.7 AV	54.0	-13.3	1.50 H	5	26.2	14.5
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	4965.00	59.7 PK	74.0	-14.3	1.08 V	228	57.2	2.5
2	4965.00	48.9 AV	54.0	-5.1	1.08 V	228	46.4	2.5
3	5150.00	69.3 PK	74.0	-4.7	1.08 V	232	66.3	3.0
4	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.08 V**	**232**	**50.9**	**3.0**
5	*5180.00	118.5 PK			1.08 V	232	115.4	3.1
6	*5180.00	108.3 AV			1.08 V	232	105.2	3.1
7	5397.20	63.6 PK	74.0	-10.4	1.08 V	47	60.2	3.4
8	5397.20	53.4 AV	54.0	-0.6	1.08 V	47	50.0	3.4
9	#10360.00	58.6 PK	74.0	-15.4	1.47 V	60	45.7	12.9
10	#10360.00	46.4 AV	54.0	-7.6	1.47 V	60	33.5	12.9
11	15540.00	52.0 PK	74.0	-22.0	1.65 V	300	37.5	14.5
12	15540.00	40.8 AV	54.0	-13.2	1.65 V	300	26.3	14.5

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	116.7 PK			1.58 H	95	113.6	3.1
2	*5200.00	105.9 AV			1.58 H	95	102.8	3.1
3	5417.60	63.1 PK	74.0	-10.9	1.58 H	95	59.6	3.5
4	5417.60	52.7 AV	54.0	-1.3	1.58 H	95	49.2	3.5
5	#10400.00	55.7 PK	74.0	-18.3	1.45 H	161	42.6	13.1
6	#10400.00	44.5 AV	54.0	-9.5	1.45 H	161	31.4	13.1
7	15600.00	52.2 PK	74.0	-21.8	1.54 H	11	37.6	14.6
8	15600.00	40.4 AV	54.0	-13.6	1.54 H	11	25.8	14.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	118.9 PK			1.50 V	308	115.8	3.1
2	*5200.00	108.4 AV			1.50 V	308	105.3	3.1
3	5417.60	64.0 PK	74.0	-10.0	1.50 V	50	60.5	3.5
4	5417.60	53.8 AV	54.0	-0.2	1.50 V	50	50.3	3.5
5	#10400.00	57.7 PK	74.0	-16.3	1.47 V	46	44.6	13.1
6	#10400.00	45.9 AV	54.0	-8.1	1.47 V	46	32.8	13.1
7	15600.00	52.5 PK	74.0	-21.5	1.63 V	302	37.9	14.6
8	15600.00	41.4 AV	54.0	-12.6	1.63 V	302	26.8	14.6

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	118.1 PK			1.61 H	101	115.0	3.1
2	*5240.00	106.1 AV			1.61 H	101	103.0	3.1
3	5456.10	61.8 PK	74.0	-12.2	1.61 H	101	58.4	3.4
4	5456.10	52.4 AV	54.0	-1.6	1.61 H	101	49.0	3.4
5	#10480.00	54.9 PK	74.0	-19.1	1.43 H	164	42.4	12.5
6	#10480.00	43.6 AV	54.0	-10.4	1.43 H	164	31.1	12.5
7	15720.00	53.0 PK	74.0	-21.0	1.47 H	0	38.2	14.8
8	15720.00	40.9 AV	54.0	-13.1	1.47 H	0	26.1	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	*5240.00	120.3 PK			1.42 V	174	117.2	3.1
2	*5240.00	108.6 AV			1.42 V	174	105.5	3.1
3	5456.10	63.2 PK	74.0	-10.8	1.42 V	172	59.8	3.4
4	5456.10	53.6 AV	54.0	-0.4	1.42 V	172	50.2	3.4
5	#10480.00	58.7 PK	74.0	-15.3	1.54 V	52	46.2	12.5
6	#10480.00	46.8 AV	54.0	-7.2	1.54 V	52	34.3	12.5
7	15720.00	52.1 PK	74.0	-21.9	1.66 V	312	37.3	14.8
8	15720.00	40.8 AV	54.0	-13.2	1.66 V	312	26.0	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.

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5583.38	62.9 PK	68.2	-5.3	1.71 H	100	59.2	3.7
2	*5745.00	118.3 PK			1.71 H	100	114.2	4.1
3	*5745.00	107.9 AV			1.71 H	100	103.8	4.1
4	#5990.41	65.1 PK	68.2	-3.1	1.71 H	100	60.2	4.9
5	11490.00	61.7 PK	74.0	-12.3	1.45 H	67	48.1	13.6
6	11490.00	51.2 AV	54.0	-2.8	1.45 H	67	37.6	13.6
7	#17235.00	56.4 PK	74.0	-17.6	1.58 H	216	36.3	20.1
8	#17235.00	45.5 AV	54.0	-8.5	1.58 H	216	25.4	20.1
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	#5591.14	64.8 PK	68.2	-3.4	1.55 V	57	61.1	3.7
2	*5745.00	120.3 PK			1.55 V	57	116.2	4.1
3	*5745.00	108.7 AV			1.55 V	57	104.6	4.1
4	#5976.78	63.8 PK	68.2	-4.4	1.55 V	57	58.8	5.0
5	11490.00	63.6 PK	74.0	-10.4	1.69 V	109	50.0	13.6
6	11490.00	53.0 AV	54.0	-1.0	1.69 V	109	39.4	13.6
7	#17235.00	57.5 PK	74.0	-16.5	1.75 V	214	37.4	20.1
8	#17235.00	45.2 AV	54.0	-8.8	1.75 V	214	25.1	20.1

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5623.51	63.5 PK	68.2	-4.7	1.75 H	102	59.7	3.8
2	*5785.00	118.2 PK			1.75 H	102	114.1	4.1
3	*5785.00	107.8 AV			1.75 H	102	103.7	4.1
4	#5938.63	64.9 PK	68.2	-3.3	1.75 H	102	60.6	4.3
5	11570.00	62.2 PK	74.0	-11.8	1.54 H	72	48.8	13.4
6	11570.00	51.6 AV	54.0	-2.4	1.54 H	72	38.2	13.4
7	#17355.00	55.6 PK	74.0	-18.4	1.56 H	214	34.9	20.7
8	#17355.00	44.9 AV	54.0	-9.1	1.56 H	214	24.2	20.7
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	#5625.85	64.7 PK	68.2	-3.5	1.51 V	49	60.9	3.8
2	*5785.00	120.1 PK			1.51 V	49	116.0	4.1
3	*5785.00	108.6 AV			1.51 V	49	104.5	4.1
4	#5939.77	65.9 PK	68.2	-2.3	1.51 V	49	61.4	4.5
5	11570.00	63.5 PK	74.0	-10.5	1.72 V	106	50.1	13.4
6	11570.00	53.0 AV	54.0	-1.0	1.72 V	106	39.6	13.4
7	#17355.00	57.6 PK	74.0	-16.4	1.74 V	206	36.9	20.7
8	#17355.00	45.4 AV	54.0	-8.6	1.74 V	206	24.7	20.7

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.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5589.83	62.1 PK	68.2	-6.1	1.73 H	99	58.4	3.7
2	*5825.00	118.1 PK			1.73 H	99	113.9	4.2
3	*5825.00	107.7 AV			1.73 H	99	103.5	4.2
4	#5986.37	64.4 PK	68.2	-3.8	1.73 H	99	59.5	4.9
5	11650.00	61.8 PK	74.0	-12.2	1.49 H	74	48.4	13.4
6	11650.00	51.3 AV	54.0	-2.7	1.49 H	74	37.9	13.4
7	#17475.00	56.7 PK	74.0	-17.3	1.62 H	209	35.7	21.0
8	#17475.00	45.7 AV	54.0	-8.3	1.62 H	209	24.7	21.0
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	#5590.27	63.3 PK	68.2	-4.9	1.51 V	50	59.6	3.7
2	*5825.00	119.4 PK			1.51 V	50	115.2	4.2
3	*5825.00	108.1 AV			1.51 V	50	103.9	4.2
4	#5950.10	64.8 PK	68.2	-3.4	1.51 V	50	60.2	4.6
5	11650.00	63.8 PK	74.0	-10.2	1.68 V	101	50.4	13.4
6	11650.00	53.2 AV	54.0	-0.8	1.68 V	101	39.8	13.4
7	#17475.00	57.5 PK	74.0	-16.5	1.80 V	227	36.5	21.0
8	#17475.00	45.4 AV	54.0	-8.6	1.80 V	227	24.4	21.0

REMARKS:

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

802.11ac (VHT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.9 PK	74.0	-6.1	1.75 H	109	64.9	3.0
2	5150.00	52.4 AV	54.0	-1.6	1.75 H	109	49.4	3.0
3	*5190.00	108.1 PK			1.75 H	109	105.0	3.1
4	*5190.00	98.1 AV			1.75 H	109	95.0	3.1
5	5358.00	55.4 PK	74.0	-18.6	1.75 H	109	52.2	3.2
6	5358.00	44.8 AV	54.0	-9.2	1.75 H	109	41.6	3.2
7	#10380.00	50.8 PK	74.0	-23.2	1.45 H	169	37.8	13.0
8	#10380.00	38.3 AV	54.0	-15.7	1.45 H	169	25.3	13.0
9	15570.00	52.6 PK	74.0	-21.4	1.50 H	9	38.1	14.5
10	15570.00	40.4 AV	54.0	-13.6	1.50 H	9	25.9	14.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.3 PK	74.0	-5.7	1.50 V	254	65.3	3.0
2	5150.00	53.7 AV	54.0	-0.3	1.50 V	254	50.7	3.0
3	*5190.00	110.3 PK			1.50 V	254	107.2	3.1
4	*5190.00	100.4 AV			1.50 V	254	97.3	3.1
5	5358.00	56.8 PK	74.0	-17.2	1.50 V	254	53.6	3.2
6	5358.00	45.4 AV	54.0	-8.6	1.50 V	254	42.2	3.2
7	#10380.00	51.0 PK	74.0	-23.0	1.49 V	60	38.0	13.0
8	#10380.00	38.4 AV	54.0	-15.6	1.49 V	60	25.4	13.0
9	15570.00	51.9 PK	74.0	-22.1	1.66 V	310	37.4	14.5
10	15570.00	40.9 AV	54.0	-13.1	1.66 V	310	26.4	14.5

REMARKS:

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

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.4 PK	74.0	-12.6	1.78 H	116	58.4	3.0
2	5150.00	52.5 AV	54.0	-1.5	1.78 H	116	49.5	3.0
3	*5230.00	103.4 PK			1.78 H	116	100.3	3.1
4	*5230.00	94.8 AV			1.78 H	116	91.7	3.1
5	5350.00	53.8 PK	74.0	-20.2	1.78 H	116	50.6	3.2
6	5350.00	43.1 AV	54.0	-10.9	1.78 H	116	39.9	3.2
7	#10460.00	50.6 PK	74.0	-23.4	1.46 H	181	37.9	12.7
8	#10460.00	38.2 AV	54.0	-15.8	1.46 H	181	25.5	12.7
9	15690.00	52.2 PK	74.0	-21.8	1.54 H	9	37.3	14.9
10	15690.00	40.0 AV	54.0	-14.0	1.54 H	9	25.1	14.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.5 PK	74.0	-11.5	1.50 V	256	59.5	3.0
2	5150.00	53.8 AV	54.0	-0.2	1.50 V	256	50.8	3.0
3	*5230.00	105.6 PK			1.50 V	256	102.5	3.1
4	*5230.00	97.3 AV			1.50 V	256	94.2	3.1
5	5350.00	54.9 PK	74.0	-19.1	1.50 V	256	51.7	3.2
6	5350.00	44.6 AV	54.0	-9.4	1.50 V	256	41.4	3.2
7	#10460.00	54.5 PK	74.0	-19.5	1.44 V	75	41.8	12.7
8	#10460.00	41.6 AV	54.0	-12.4	1.44 V	75	28.9	12.7
9	15690.00	51.4 PK	74.0	-22.6	1.70 V	295	36.5	14.9
10	15690.00	40.5 AV	54.0	-13.5	1.70 V	295	25.6	14.9

REMARKS:

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

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5650.64	65.2 PK	68.7	-3.5	1.64 H	124	61.3	3.9
2	*5755.00	116.1 PK			1.64 H	124	112.1	4.0
3	*5755.00	104.8 AV			1.64 H	124	100.8	4.0
4	#5929.36	63.8 PK	68.2	-4.4	1.64 H	124	59.5	4.3
5	11510.00	58.2 PK	74.0	-15.8	1.54 H	59	44.7	13.5
6	11510.00	47.8 AV	54.0	-6.2	1.54 H	59	34.3	13.5
7	#17265.00	56.8 PK	74.0	-17.2	1.63 H	222	36.5	20.3
8	#17265.00	45.8 AV	54.0	-8.2	1.63 H	222	25.5	20.3
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	#5636.16	65.4 PK	68.2	-2.8	1.47 V	48	61.6	3.8
2	*5755.00	116.7 PK			1.47 V	48	112.7	4.0
3	*5755.00	105.2 AV			1.47 V	48	101.2	4.0
4	#5928.91	64.5 PK	68.2	-3.7	1.47 V	48	60.0	4.5
5	11510.00	60.1 PK	74.0	-13.9	1.69 V	104	46.6	13.5
6	11510.00	49.1 AV	54.0	-4.9	1.69 V	104	35.6	13.5
7	#17265.00	57.8 PK	74.0	-16.2	1.77 V	202	37.5	20.3
8	#17265.00	45.2 AV	54.0	-8.8	1.77 V	202	24.9	20.3

REMARKS:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5633.39	62.5 PK	68.2	-5.7	1.72 H	104	58.7	3.8
2	*5795.00	115.9 PK			1.72 H	104	111.8	4.1
3	*5795.00	104.6 AV			1.72 H	104	100.5	4.1
4	#5950.31	64.4 PK	68.2	-3.8	1.72 H	104	60.0	4.4
5	11590.00	57.9 PK	74.0	-16.1	1.50 H	45	44.6	13.3
6	11590.00	47.7 AV	54.0	-6.3	1.50 H	45	34.4	13.3
7	#17385.00	56.6 PK	74.0	-17.4	1.59 H	218	35.8	20.8
8	#17385.00	45.4 AV	54.0	-8.6	1.59 H	218	24.6	20.8
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	#5636.58	64.3 PK	68.2	-3.9	1.51 V	62	60.5	3.8
2	*5795.00	117.1 PK			1.51 V	62	113.0	4.1
3	*5795.00	105.4 AV			1.51 V	62	101.3	4.1
4	#5939.16	65.4 PK	68.2	-2.8	1.51 V	62	60.9	4.5
5	11590.00	60.7 PK	74.0	-13.3	1.66 V	88	47.4	13.3
6	11590.00	49.5 AV	54.0	-4.5	1.66 V	88	36.2	13.3
7	#17385.00	57.5 PK	74.0	-16.5	1.75 V	188	36.7	20.8
8	#17385.00	45.1 AV	54.0	-8.9	1.75 V	188	24.3	20.8

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.5 PK	74.0	-4.5	1.74 H	113	66.5	3.0
2	5150.00	52.5 AV	54.0	-1.5	1.74 H	113	49.5	3.0
3	*5210.00	103.8 PK			1.74 H	113	100.7	3.1
4	*5210.00	92.7 AV			1.74 H	113	89.6	3.1
5	5350.00	52.1 PK	74.0	-21.9	1.74 H	113	48.9	3.2
6	5350.00	41.4 AV	54.0	-12.6	1.74 H	113	38.2	3.2
7	#10420.00	50.7 PK	74.0	-23.3	1.44 H	157	37.8	12.9
8	#10420.00	37.9 AV	54.0	-16.1	1.44 H	157	25.0	12.9
9	15630.00	52.8 PK	74.0	-21.2	1.48 H	0	38.1	14.7
10	15630.00	40.7 AV	54.0	-13.3	1.48 H	0	26.0	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	5150.00	70.4 PK	74.0	-3.6	1.52 V	269	67.4	3.0
2	5150.00	53.8 AV	54.0	-0.2	1.52 V	269	50.8	3.0
3	*5210.00	106.0 PK			1.52 V	269	102.9	3.1
4	*5210.00	95.1 AV			1.52 V	269	92.0	3.1
5	5350.00	53.5 PK	74.0	-20.5	1.52 V	269	50.3	3.2
6	5350.00	42.3 AV	54.0	-11.7	1.52 V	269	39.1	3.2
7	#10420.00	51.5 PK	74.0	-22.5	1.46 V	66	38.6	12.9
8	#10420.00	38.7 AV	54.0	-15.3	1.46 V	66	25.8	12.9
9	15630.00	51.9 PK	74.0	-22.1	1.61 V	322	37.2	14.7
10	15630.00	40.9 AV	54.0	-13.1	1.61 V	322	26.2	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.

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5133.00	55.8 PK	74.0	-18.2	1.71 H	106	52.8	3.0
2	5133.00	50.0 AV	54.0	-4.0	1.71 H	106	47.0	3.0
3	#5648.32	66.7 PK	68.2	-1.5	1.71 H	106	62.8	3.9
4	*5775.00	111.2 PK			1.71 H	106	107.1	4.1
5	*5775.00	100.0 AV			1.71 H	106	95.9	4.1
6	#5929.34	66.4 PK	68.2	-1.8	1.71 H	106	62.1	4.3
7	11550.00	55.2 PK	74.0	-18.8	1.54 H	64	41.7	13.5
8	11550.00	45.1 AV	54.0	-8.9	1.54 H	64	31.6	13.5
9	#17325.00	56.7 PK	74.0	-17.3	1.68 H	234	36.2	20.5
10	#17325.00	45.9 AV	54.0	-8.1	1.68 H	234	25.4	20.5
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	5133.00	59.1 PK	74.0	-14.9	1.58 V	249	56.1	3.0
2	**5133.00**	**53.9 AV**	**54.0**	**-0.1**	**1.58 V**	**249**	**50.9**	**3.0**
3	#5649.27	66.4 PK	68.2	-1.8	1.58 V	249	62.5	3.9
4	*5775.00	113.7 PK			1.58 V	249	109.6	4.1
5	*5775.00	104.7 AV			1.58 V	249	100.6	4.1
6	#5939.50	66.3 PK	68.2	-1.9	1.58 V	249	62.0	4.3
7	11550.00	57.2 PK	74.0	-16.8	1.70 V	101	43.7	13.5
8	11550.00	46.1 AV	54.0	-7.9	1.70 V	101	32.6	13.5
9	#17325.00	57.7 PK	74.0	-16.3	1.82 V	200	37.2	20.5
10	#17325.00	45.3 AV	54.0	-8.7	1.82 V	200	24.8	20.5

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.

Below 1GHz Data:

802.11a

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	105.05	29.7 QP	43.5	-13.8	2.00 H	249	41.6	-11.9
2	201.04	35.3 QP	43.5	-8.2	2.00 H	107	47.0	-11.7
3	375.00	38.5 QP	46.0	-7.5	1.00 H	309	44.5	-6.0
4	597.77	36.4 QP	46.0	-9.6	1.00 H	122	36.9	-0.5
5	625.00	37.5 QP	46.0	-8.5	1.00 H	247	37.6	-0.1
6	880.04	36.3 QP	46.0	-9.7	1.50 H	290	32.8	3.5
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	37.95	34.1 QP	40.0	-5.9	1.00 V	210	42.5	-8.4
2	66.21	32.9 QP	40.0	-7.1	1.00 V	360	42.4	-9.5
3	207.95	35.3 QP	43.5	-8.2	1.00 V	40	47.0	-11.7
4	374.98	32.5 QP	46.0	-13.5	1.00 V	228	38.5	-6.0
5	602.42	37.1 QP	46.0	-8.9	1.00 V	360	37.4	-0.3
6	720.01	37.9 QP	46.0	-8.1	1.50 V	247	36.9	1.0

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

4.2 Transmit Power Measurement

4.2.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.2.2 Test Setup

4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Condition

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

4.2.7 Test Result

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	23.24	22.57	23.11	596.224	27.75	30.00	Pass
40	5200	23.03	22.67	23.25	597.185	27.76	30.00	Pass
48	5240	23.11	22.82	23.13	601.659	27.79	30.00	Pass
149	5745	22.80	22.58	23.65	603.419	27.81	30.00	Pass
157	5785	22.66	23.03	23.08	588.647	27.70	30.00	Pass
165	5825	23.02	22.62	23.35	599.529	27.78	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	22.38	21.58	23.00	516.388	27.13	27.90	Pass
40	5200	22.97	22.09	23.28	572.775	27.58	27.90	Pass
48	5240	22.93	22.14	23.13	565.607	27.53	27.90	Pass
149	5745	22.86	22.42	23.76	605.463	27.82	27.95	Pass
157	5785	22.77	22.09	23.65	582.781	27.66	27.95	Pass
165	5825	22.88	22.51	23.61	601.942	27.80	27.95	Pass

Note: 1. For UNII-1: Directional gain = 3.3dBi + 10log(3) = 8.1dBi > 6dBi , so the power limit shall be reduced to 30-(8.1-6) = 27.90dBm.

2. For UNII-3: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power limit shall be reduced to 30-(8.05-6) = 27.95dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	17.74	17.09	17.45	166.187	22.21	27.90	Pass
46	5230	23.30	22.19	23.51	603.761	27.81	27.90	Pass
151	5755	23.16	22.75	23.20	604.309	27.81	27.95	Pass
159	5795	22.81	22.42	23.75	602.704	27.80	27.95	Pass

Note: 1. For UNII-1: Directional gain = 3.3dBi + 10log(3) = 8.1dBi > 6dBi , so the power limit shall be reduced to 30-(8.1-6) = 27.90dBm.

2. For UNII-3: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power limit shall be reduced to 30-(8.05-6) = 27.95dBm.

802.11ac (VHT80)

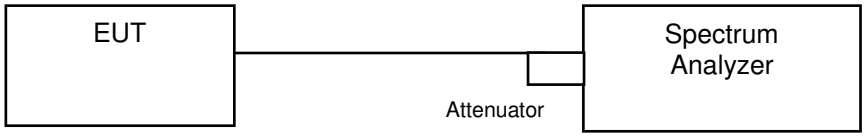
Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	15.34	14.14	15.95	99.495	19.98	27.90	Pass
155	5775	22.34	21.98	22.61	511.547	27.09	27.95	Pass

Note: 1. For UNII-1: Directional gain = 3.3dBi + 10log(3) = 8.1dBi > 6dBi , so the power limit shall be reduced to 30-(8.1-6) = 27.90dBm.

2. For UNII-3: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power limit shall be reduced to 30-(8.05-6) = 27.95dBm.

4.3 Occupied Bandwidth Measurement

4.3.1 Test Setup



4.3.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.3 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.

4.3.4 Test Results

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
36	5180	17.16	17.04	17.76
40	5200	17.28	17.16	17.40
48	5240	17.04	17.16	17.40
149	5745	16.92	16.92	17.76
157	5785	17.40	17.40	18.24
165	5825	17.52	17.52	19.44

Beamforming Mode

802.11ac (VHT20)

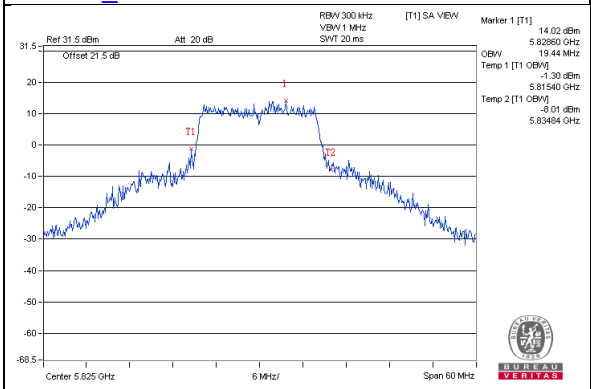
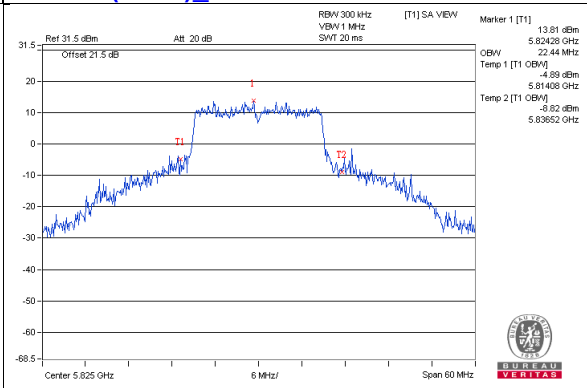
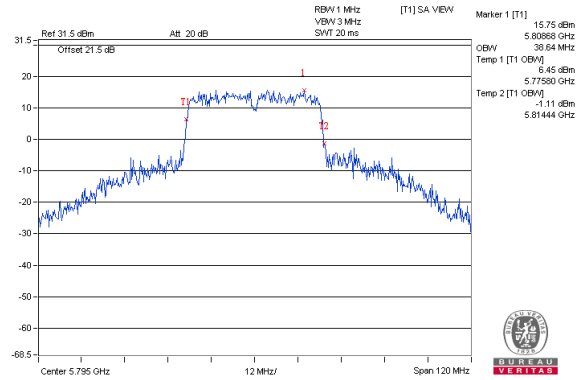
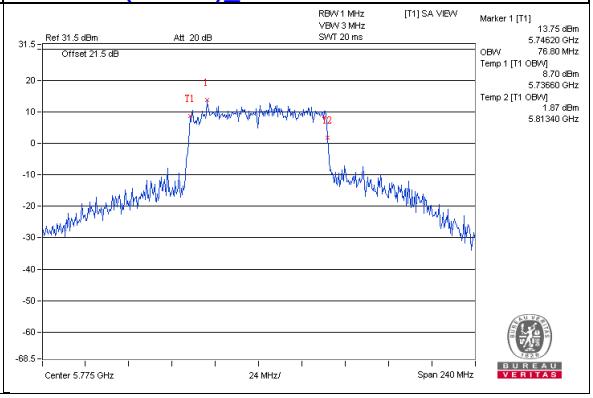
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
36	5180	18.00	18.00	18.12
40	5200	18.00	18.00	18.24
48	5240	18.00	18.12	18.36
149	5745	18.24	18.12	18.60
157	5785	18.36	18.24	20.28
165	5825	18.48	18.60	22.44

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
38	5190	36.72	36.72	36.72
46	5230	36.96	36.48	37.68
151	5755	37.68	37.20	37.92
159	5795	37.92	37.44	38.64

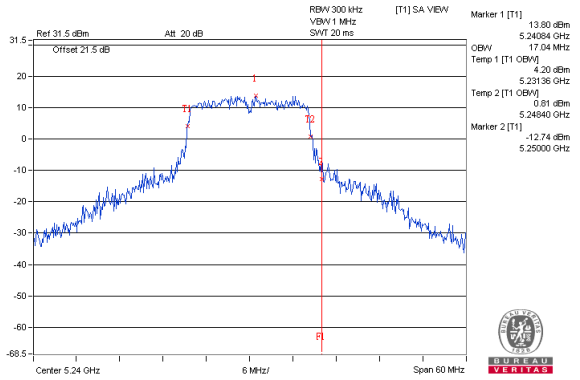
802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
42	5210	76.32	75.84	75.84
155	5775	76.32	76.32	76.80

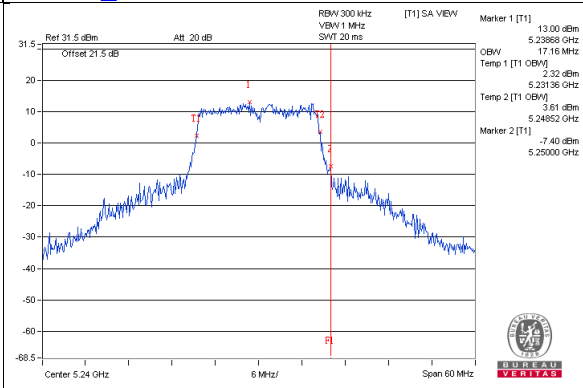
Spectrum Plot of Worst Value	
802.11a_Chain2 / CH165	**802.11n (HT20)_Chain2 / CH165**
	
802.11ac (VHT40)_Chain2 / CH159	**802.11ac (VHT80)_Chain2 / CH155**
	

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

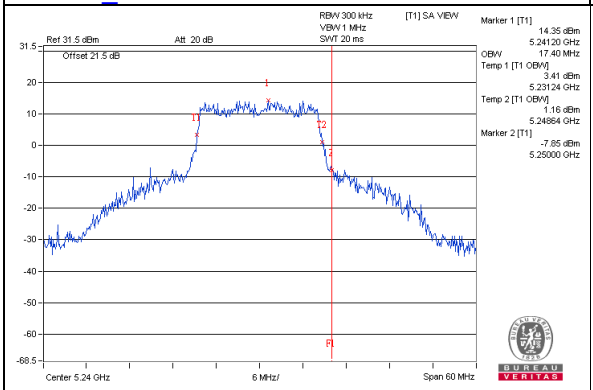
802.11a_Chain0 / CH48



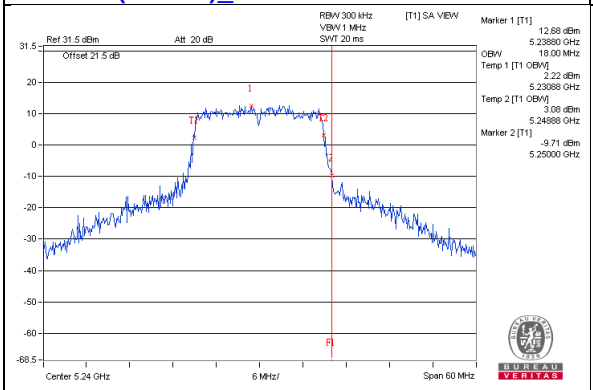
802.11a_Chain1 / CH48



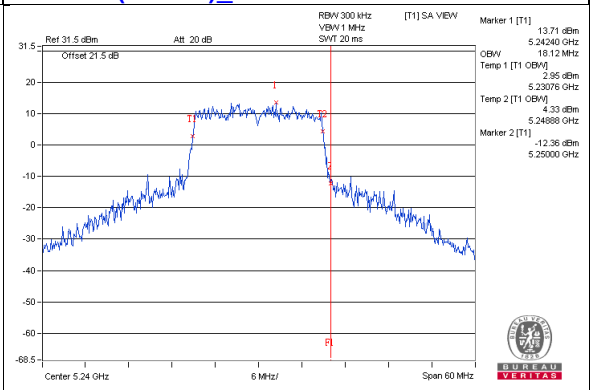
802.11a_Chain2 / CH48



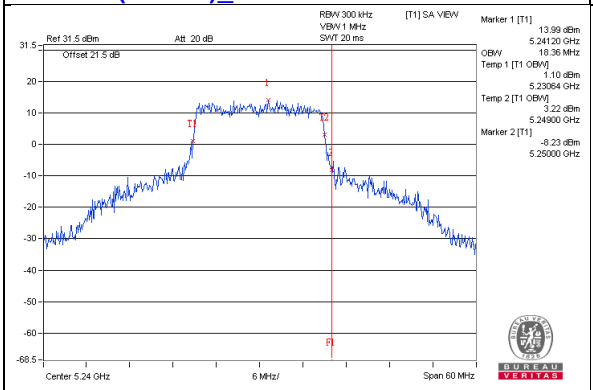
802.11ac(VHT20)_Chain0 / CH48



802.11ac(VHT20)_Chain1 / CH48

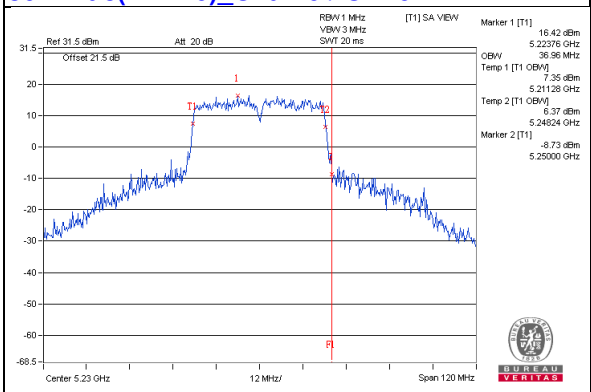


802.11ac(VHT20)_Chain2 / CH48

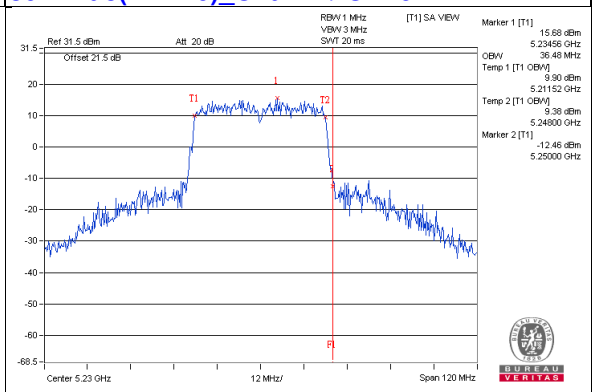


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

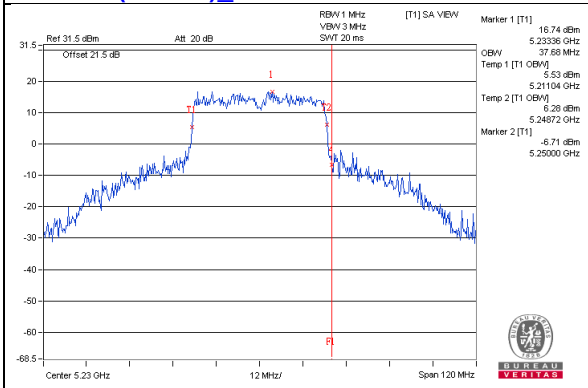
802.11ac(VHT40)_Chain0 / CH46



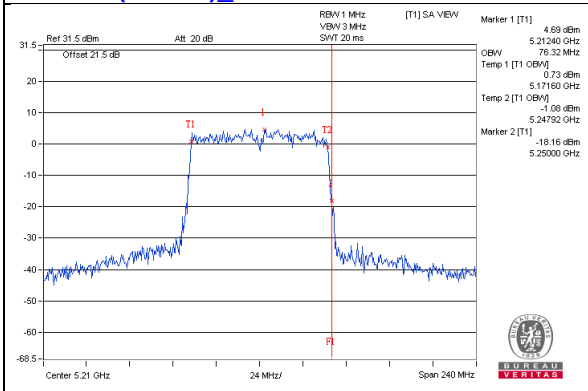
802.11ac(VHT40)_Chain1 / CH46



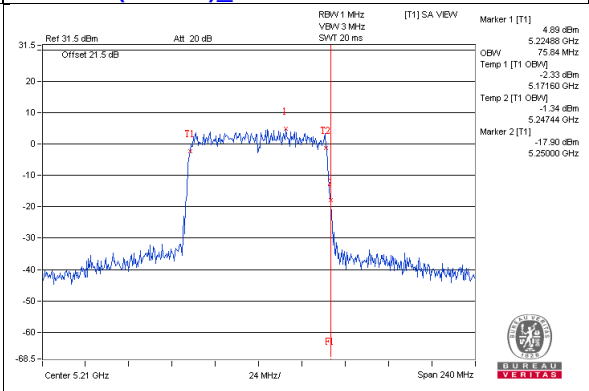
802.11ac(VHT40)_Chain2 / CH46



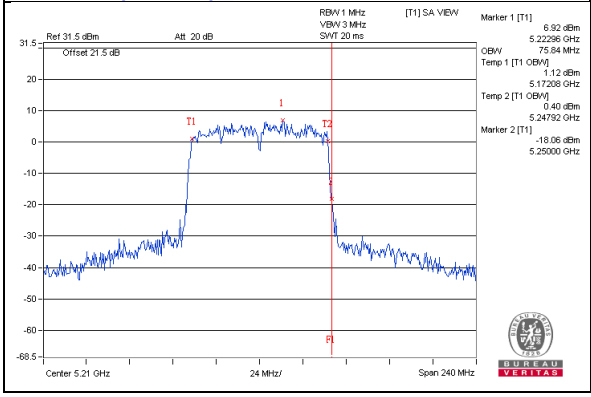
802.11ac(VHT80)_Chain0 / CH42



802.11ac(VHT80)_Chain1 / CH42

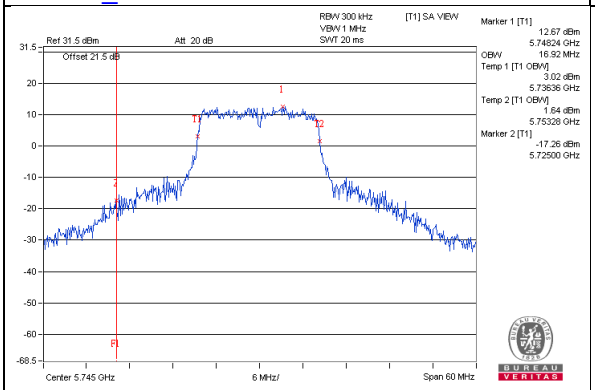


802.11ac(VHT80)_Chain2 / CH42

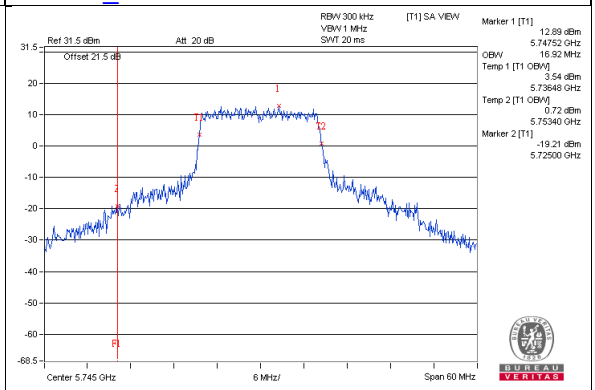


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

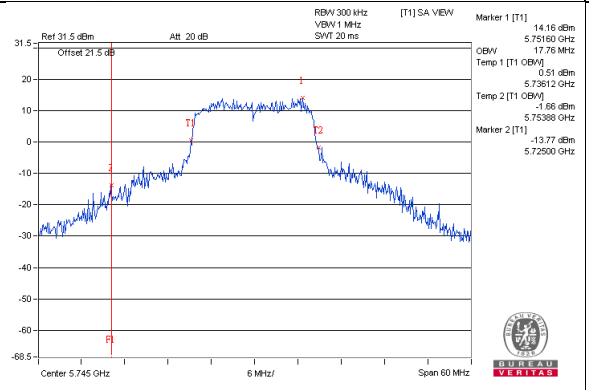
802.11a_Chain0 / CH149



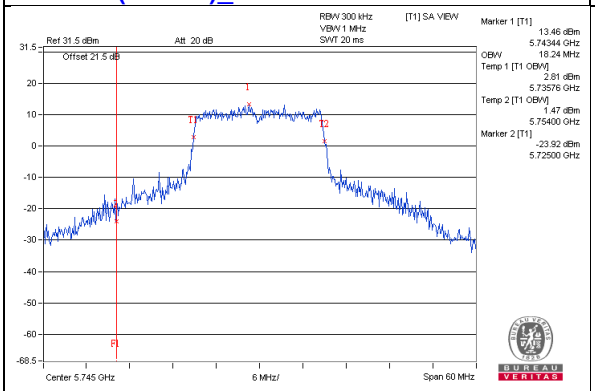
802.11a_Chain1 / CH149



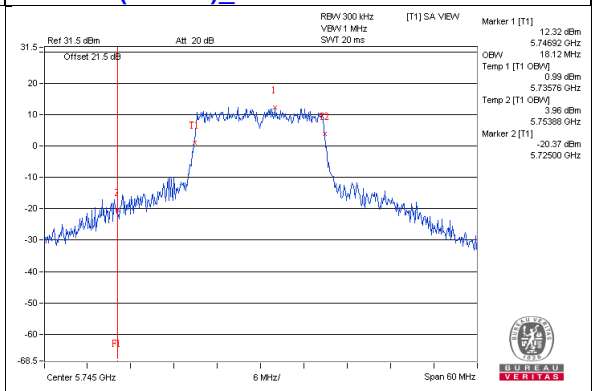
802.11a_Chain2 / CH149



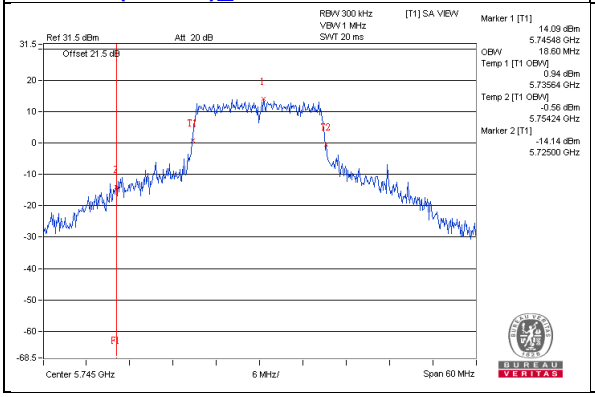
802.11ac(VHT20)_Chain0 / CH149



802.11ac(VHT20)_Chain1 / CH149

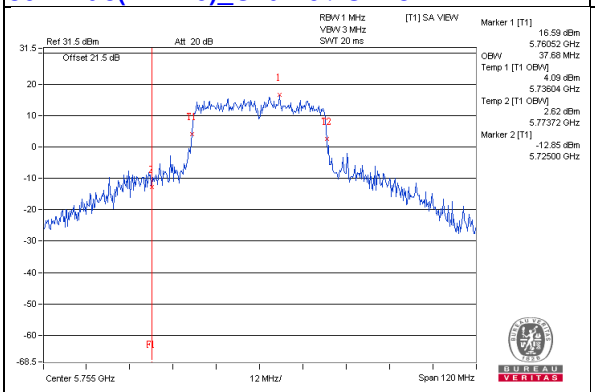


802.11ac(VHT20)_Chain2 / CH149

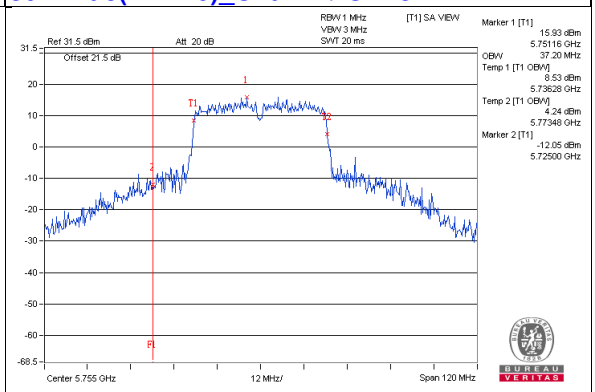


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

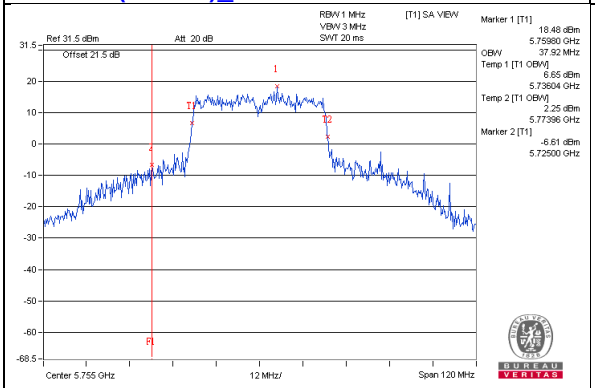
802.11ac(VHT40)_Chain0 / CH151



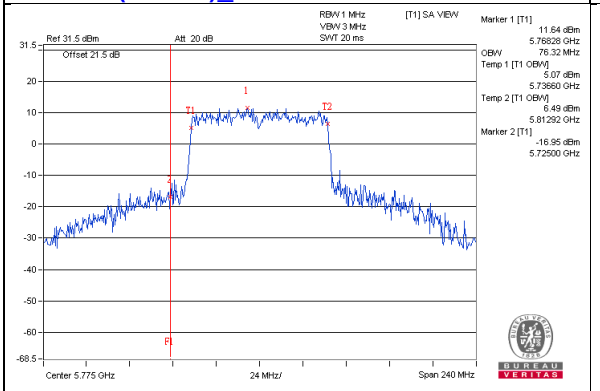
802.11ac(VHT40)_Chain1 / CH151



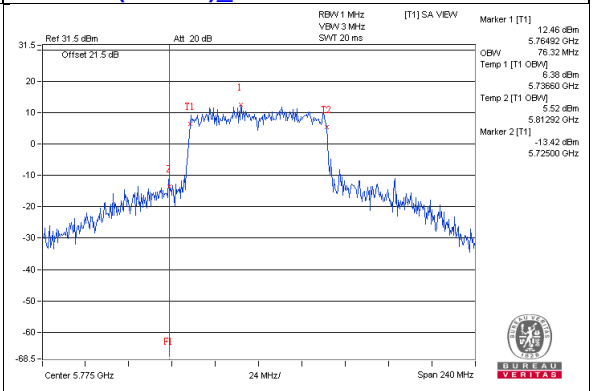
802.11ac(VHT40)_Chain2 / CH151



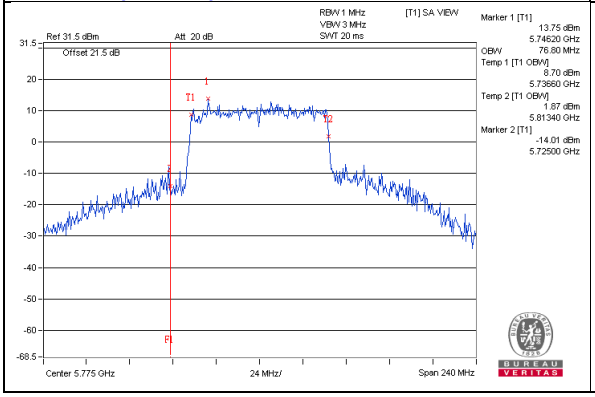
802.11ac(VHT80)_Chain0 / CH155



802.11ac(VHT80)_Chain1 / CH155



802.11ac(VHT80)_Chain2 / CH155

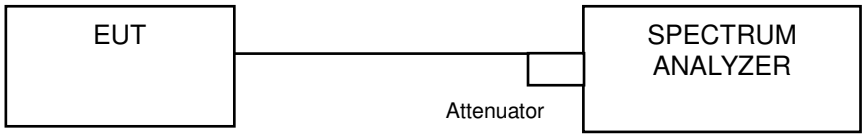


4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

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

For U-NII-1:

Using method SA-1

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

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

802.11ac (VHT80)

For U-NII-1:

Using method SA-2

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

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

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

4.4.7 Test Results

For U-NII-1:

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			
36	5180	9.78	9.01	9.99	14.38	14.90	Pass
40	5200	9.95	9.28	10.13	14.57	14.90	Pass
48	5240	10.05	9.37	10.29	14.69	14.90	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 = 3.3dBi + 10log(3) = 8.1dBi > 6dB , so the power density limit shall be reduced to 17-(8.1-6) = 14.90dBm.

Beamforming Mode

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			
36	5180	8.69	7.95	9.04	13.35	14.90	Pass
40	5200	8.89	8.95	10.02	14.09	14.90	Pass
48	5240	9.10	9.20	9.90	14.19	14.90	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 = 3.3dBi + 10log(3) = 8.1dBi > 6dB , so the power density limit shall be reduced to 17-(8.1-6) = 14.90dBm.

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			
38	5190	1.58	0.85	1.83	6.21	14.90	Pass
46	5230	6.79	5.13	7.06	11.18	14.90	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 = 3.3dBi + 10log(3) = 8.1dBi > 6dB , so the power density limit shall be reduced to 17-(8.1-6) = 14.90dBm.

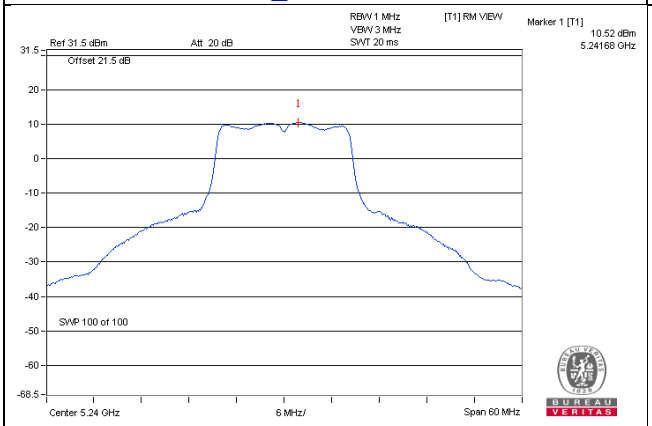
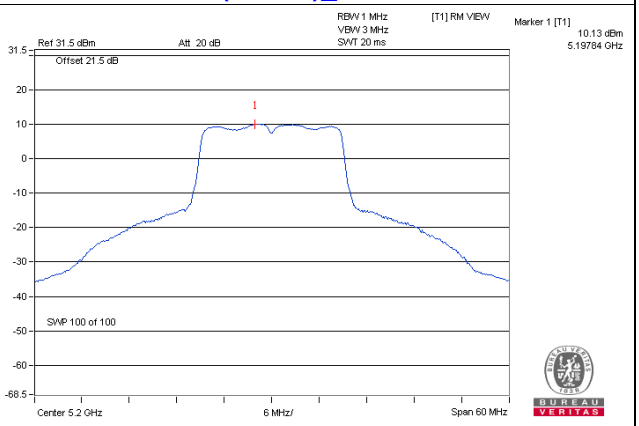
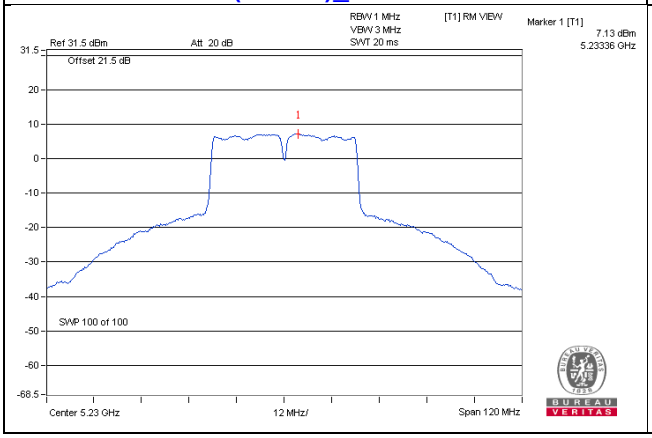
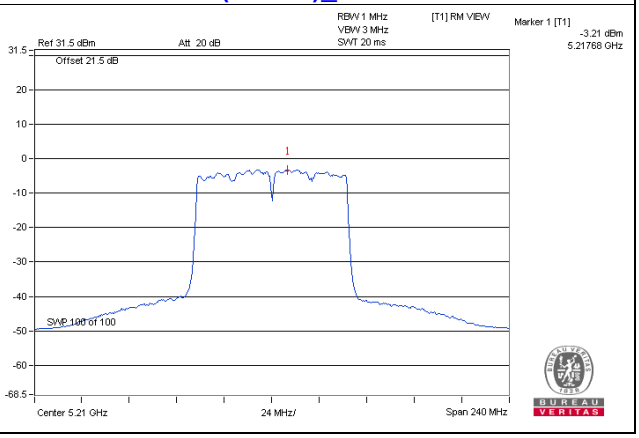
802.11ac (VHT80)

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				
42	5210	-4.14	-4.88	-3.30	0.27	0.98	14.90	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 = 3.3dBi + 10log(3) = 8.1dBi > 6dB , so the power density limit shall be reduced to 17-(8.1-6) = 14.90dBm.

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

Spectrum Plot of Worst Value	
802.11a_Chain 2 / CH48	**802.11ac (VHT20)_Chain 2 / CH40**
	
802.11ac (VHT40)_Chain 2 / CH46	**802.11ac (VHT80)_Chain 2 / CH42**
	

For U-NII-3:

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	1.15	3.37	4.77	8.14	27.95	Pass
	157	5785	0.98	3.20	4.77	7.97	27.95	Pass
	165	5825	1.02	3.24	4.77	8.01	27.95	Pass
1	149	5745	0.63	2.85	4.77	7.62	27.95	Pass
	157	5785	0.69	2.91	4.77	7.68	27.95	Pass
	165	5825	0.27	2.49	4.77	7.26	27.95	Pass
2	149	5745	2.16	4.38	4.77	9.15	27.95	Pass
	157	5785	1.73	3.95	4.77	8.72	27.95	Pass
	165	5825	2.13	4.35	4.77	9.12	27.95	Pass

Note: 1. Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) = 27.95dBm.

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	0.90	3.12	4.77	7.89	27.95	Pass
	157	5785	0.70	2.92	4.77	7.69	27.95	Pass
	165	5825	1.23	3.45	4.77	8.22	27.95	Pass
1	149	5745	0.38	2.60	4.77	7.37	27.95	Pass
	157	5785	0.71	2.93	4.77	7.70	27.95	Pass
	165	5825	0.28	2.50	4.77	7.27	27.95	Pass
2	149	5745	2.26	4.48	4.77	9.25	27.95	Pass
	157	5785	1.60	3.82	4.77	8.59	27.95	Pass
	165	5825	1.54	3.76	4.77	8.53	27.95	Pass

Note: 1. Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) = 27.95dBm.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-1.98	0.24	4.77	5.01	27.95	Pass
	159	5795	-1.82	0.40	4.77	5.17	27.95	Pass
1	151	5755	-2.47	-0.25	4.77	4.52	27.95	Pass
	159	5795	-2.94	-0.72	4.77	4.05	27.95	Pass
2	151	5755	-1.88	0.34	4.77	5.11	27.95	Pass
	159	5795	-1.99	0.23	4.77	5.00	27.95	Pass

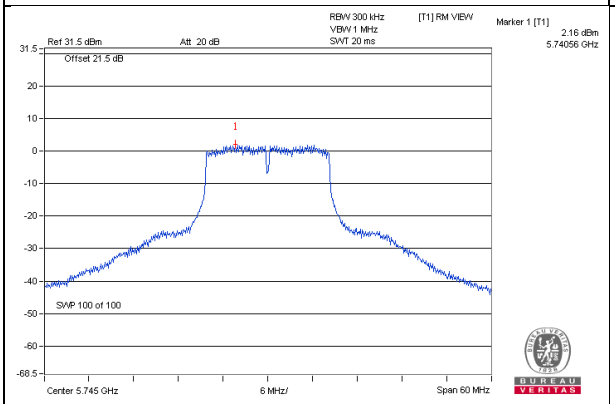
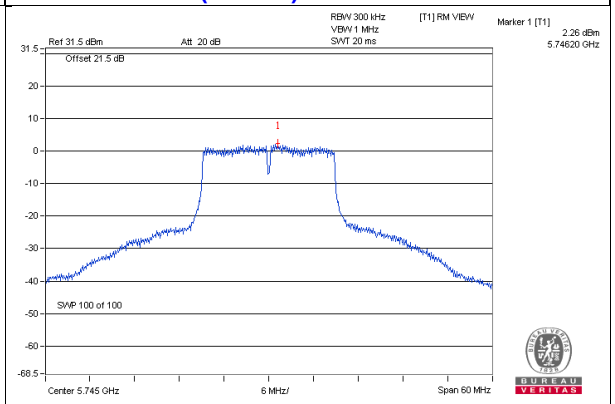
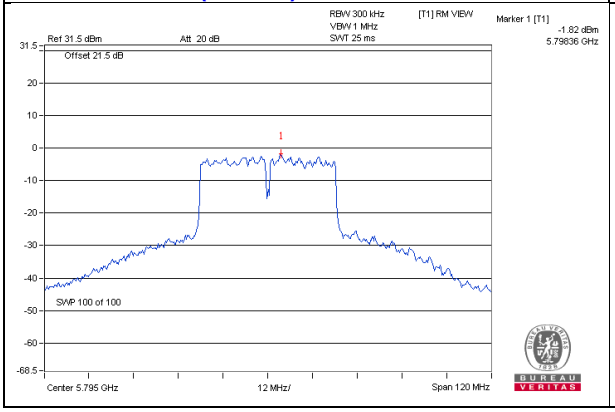
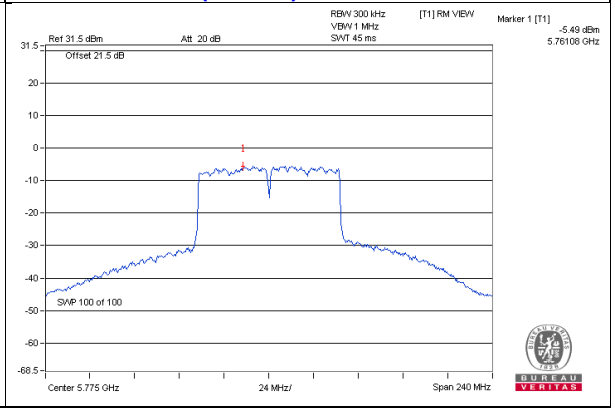
Note: 1. Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) = 27.95dBm.

802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-5.98	-3.76	4.77	0.27	1.28	27.95	Pass
1	155	5775	-6.08	-3.86	4.77	0.27	1.18	27.95	Pass

Note: 1. Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) = 27.95dBm.

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

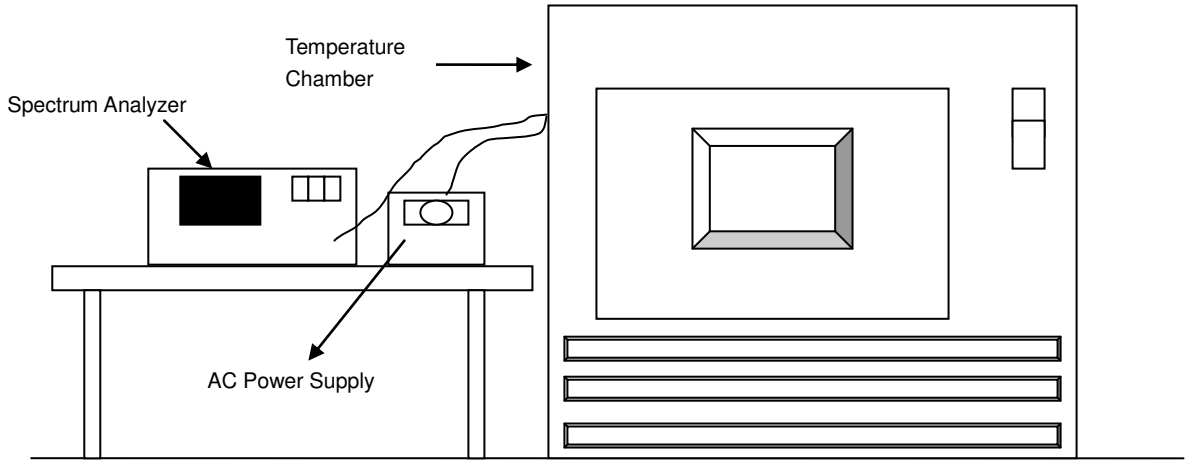
Spectrum Plot of Worst Value	
802.11a – Chain 2: CH 149	**802.11ac (VHT20) – Chain 2: CH 149**
	
802.11ac (VHT40) – Chain 0: CH 159	**802.11ac (VHT80) – Chain 2: CH 155**
	

4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5179.9918	PASS	5179.9944	PASS	5179.992	PASS	5179.9918	PASS
40	120	5180.0082	PASS	5180.0083	PASS	5180.012	PASS	5180.0099	PASS
30	120	5180.0131	PASS	5180.0125	PASS	5180.0141	PASS	5180.0108	PASS
20	120	5180.0126	PASS	5180.0119	PASS	5180.0109	PASS	5180.0102	PASS
10	120	5179.9948	PASS	5179.9961	PASS	5179.9952	PASS	5179.9974	PASS
0	120	5179.996	PASS	5179.9969	PASS	5179.9948	PASS	5179.9986	PASS
-10	120	5179.9876	PASS	5179.9877	PASS	5179.9894	PASS	5179.9897	PASS
-20	120	5180.0001	PASS	5180.0043	PASS	5180.0023	PASS	5180.0043	PASS
-30	120	5180.0073	PASS	5180.007	PASS	5180.0056	PASS	5180.0049	PASS

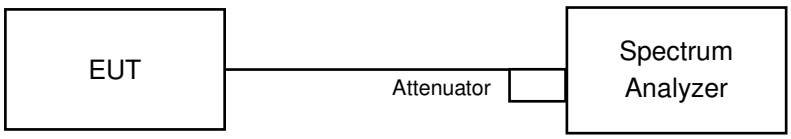
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0127	PASS	5180.0114	PASS	5180.0113	PASS	5180.0092	PASS
	120	5180.0126	PASS	5180.0119	PASS	5180.0109	PASS	5180.0102	PASS
	102	5180.0119	PASS	5180.0129	PASS	5180.01	PASS	5180.0106	PASS

4.6 6dB Bandwidth Measurment

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	16.40	16.43	16.38	0.5	Pass
157	5785	16.38	16.42	16.36	0.5	Pass
165	5825	16.14	16.42	16.39	0.5	Pass

802.11n (HT20)

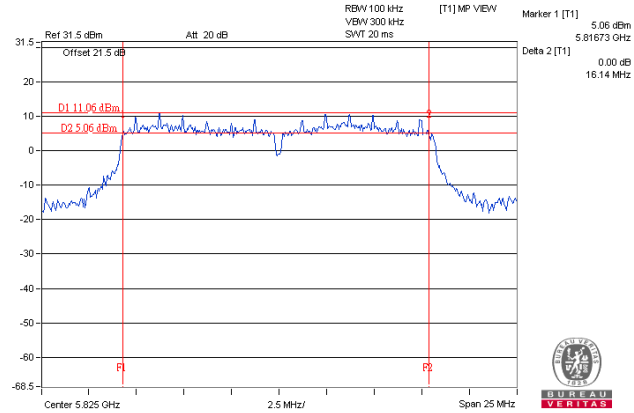
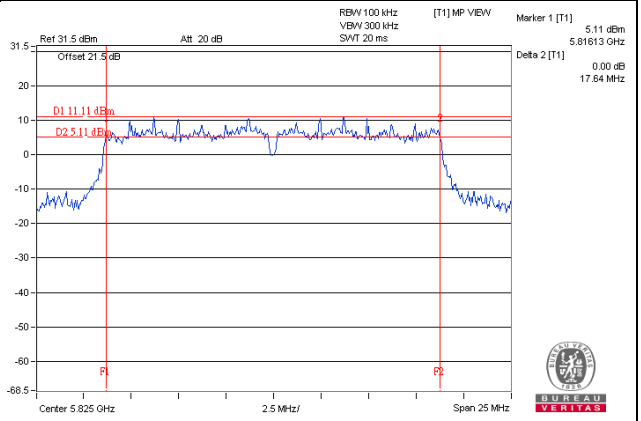
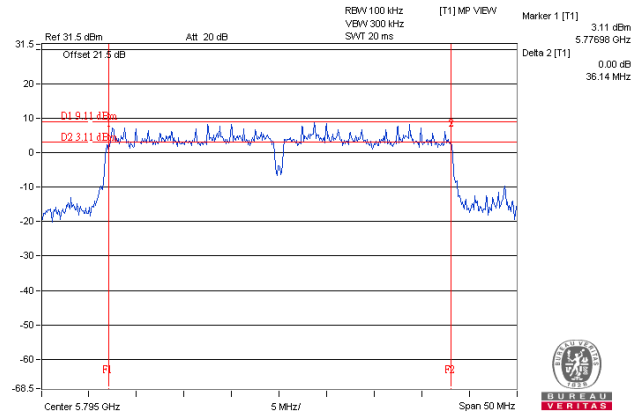
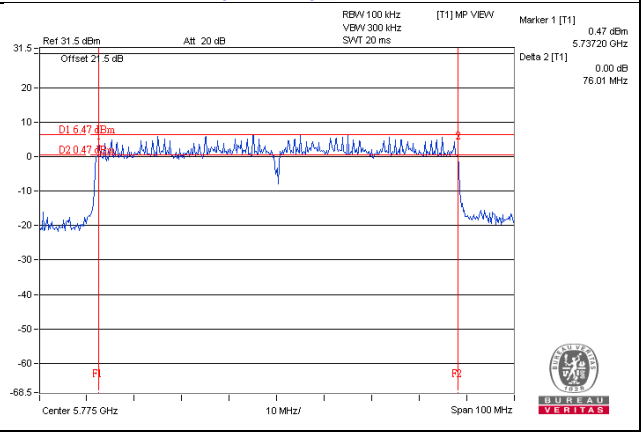
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.65	17.72	17.67	0.5	Pass
157	5785	17.65	17.69	17.67	0.5	Pass
165	5825	17.64	17.68	17.64	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.21	36.43	36.36	0.5	Pass
159	5795	36.14	36.44	36.36	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	76.09	76.29	76.01	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH165	**802.11ac (VHT20)_Chain 0 / CH165**
	
802.11ac (VHT40)_Chain 0 / CH159	**802.11ac (VHT80)_Chain 2 / CH155**
	

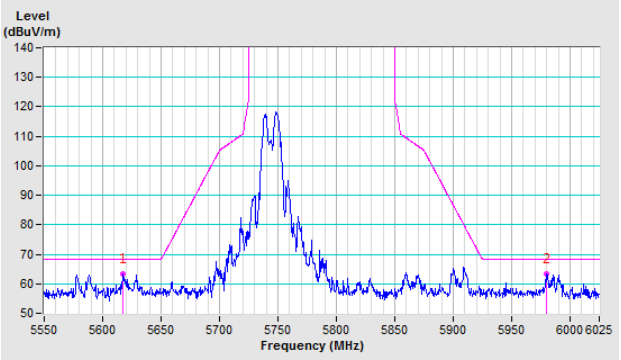
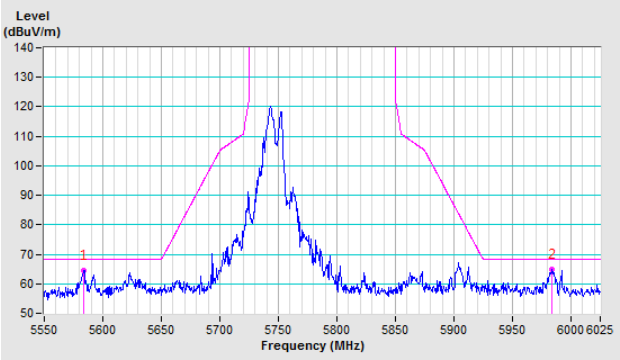
5 Pictures of Test Arrangements

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

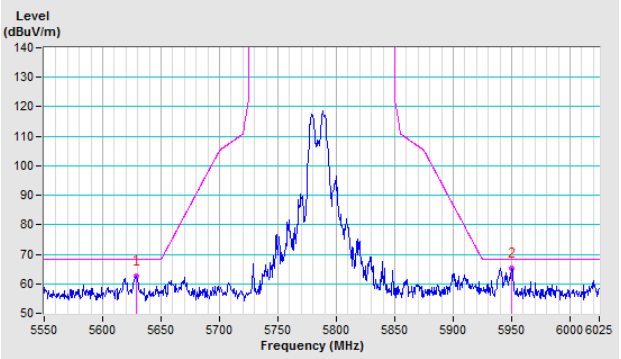
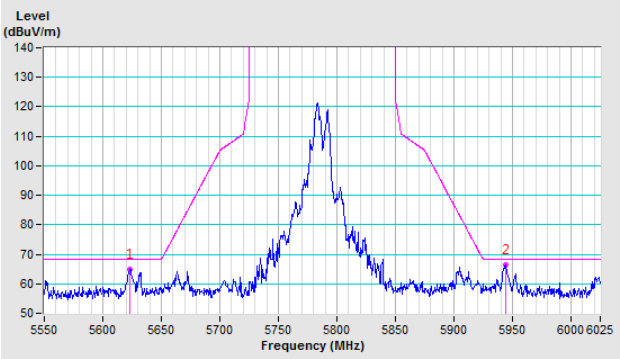
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

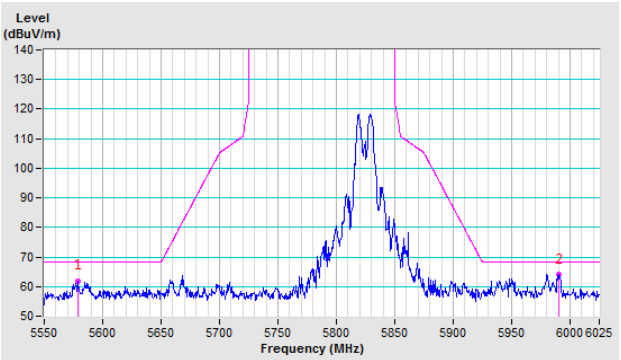
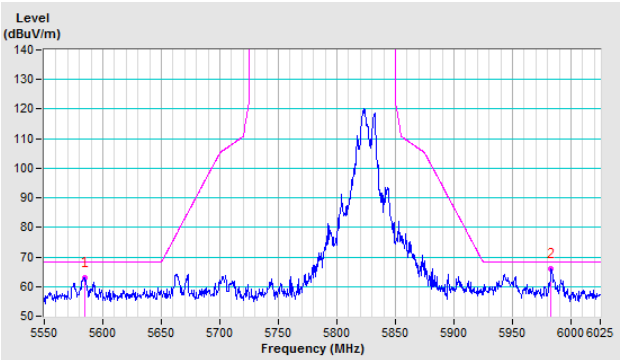
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

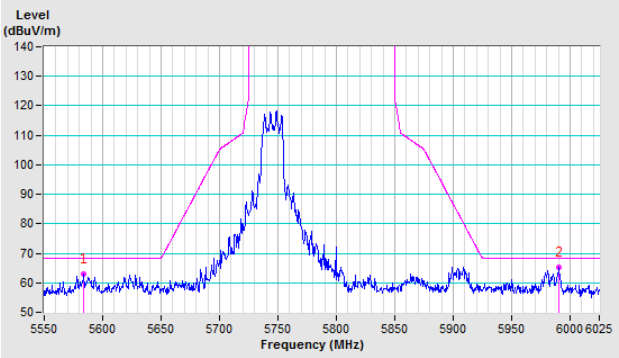
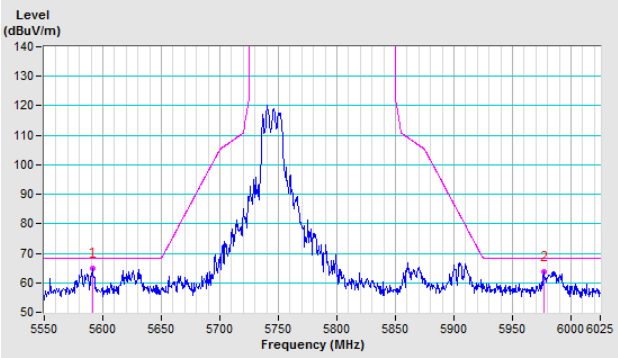
Horizontal	Vertical
	

CH 165 5825 MHz

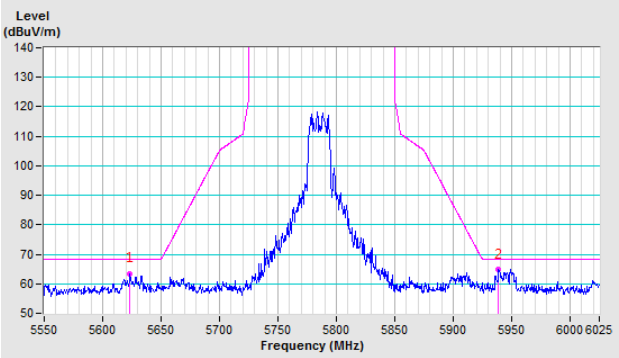
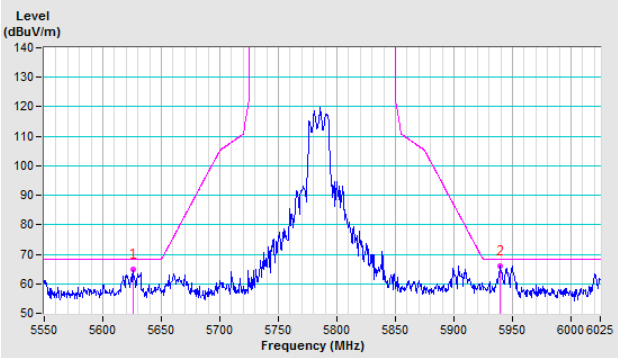
Horizontal	Vertical
	

802.11ac (VHT20)

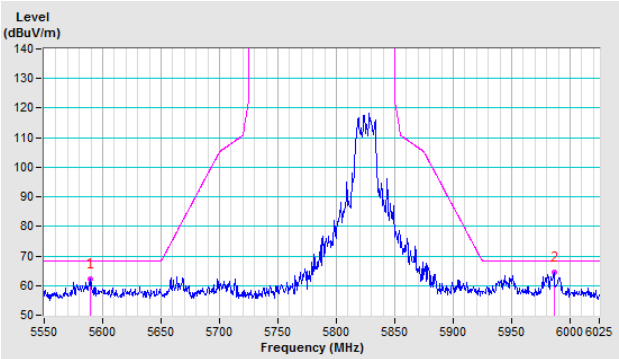
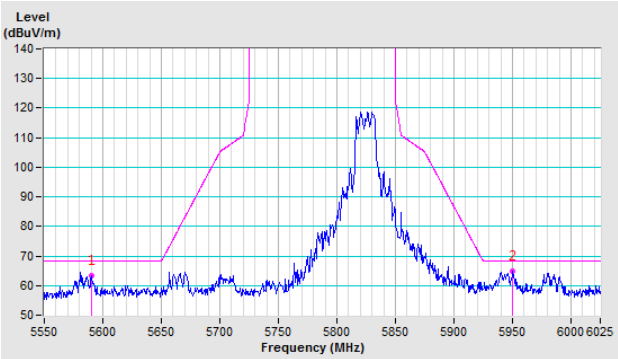
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

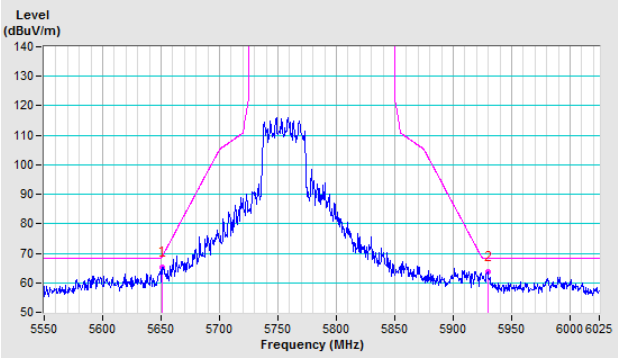
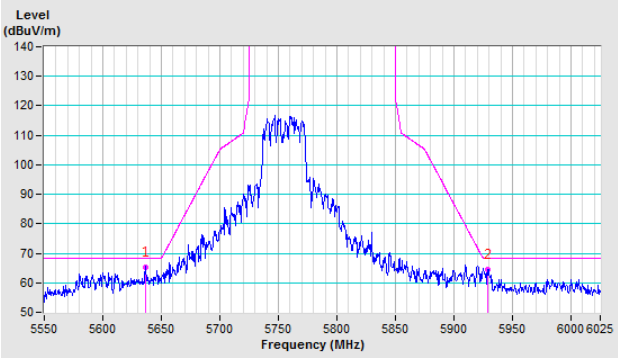
Horizontal	Vertical
	

CH 165 5825 MHz

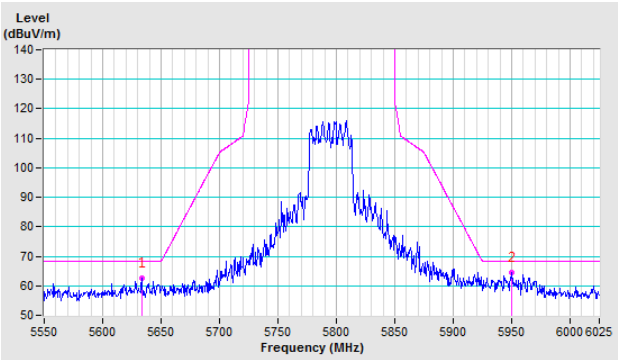
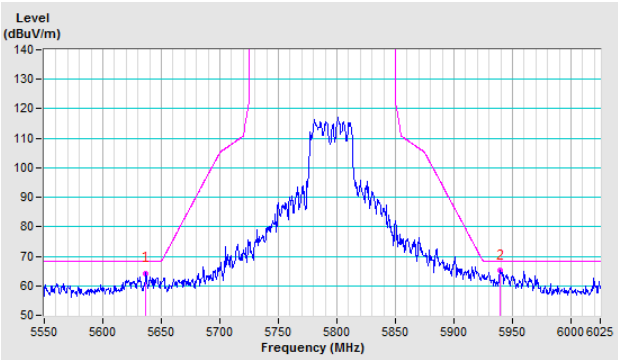
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

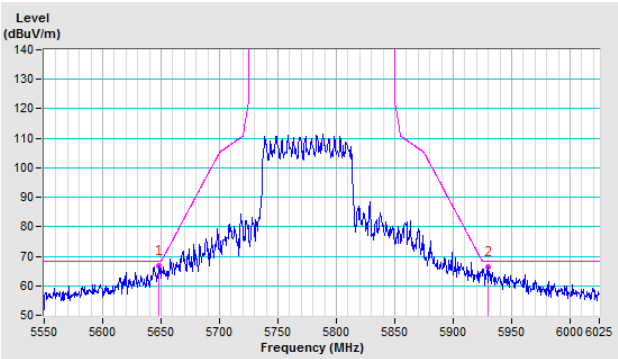
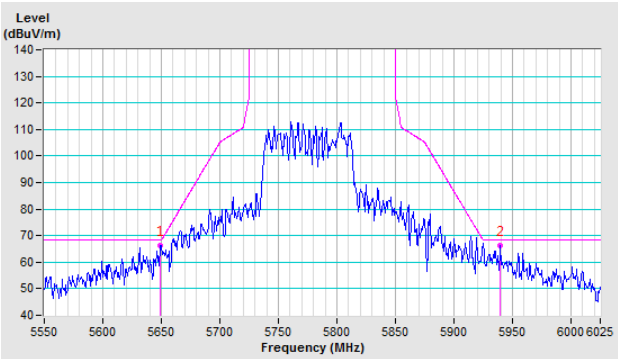
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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

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Fax: 886-2-26051924

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

Hwa Ya EMC/RF/Safety Lab
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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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