FCC Test Report

Report No.:	RF170410E06-1
FCC ID:	PY317200376
Test Model:	WAC505
Received Date:	Apr. 10, 2017
Test Date:	Apr. 14 to May 17, 2017
Issued Date:	May 28, 2017
Applicant:	NETGEAR, INC.
Address:	350 East Plumeria Drive San Jose, CA 95134
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
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
RF170410E06-1	Original release.	May 28, 2017

1 Certificate of Conformity

Product:	AC WiFi Business Access Point
Brand:	NETGEAR
Test Model:	WAC505
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, INC.
Test Date:	Apr. 14 to May 17, 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:** May 28, 2017

Wendy Wu / Specialist

Approved by : , **Date:** May 28, 2017

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -3.13dB at 0.30034MHz.
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 5150.00MHz, 11570.00MHz, 11650.00MHz.
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.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.30 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.16 dB
	6GHz ~ 18GHz	4.91 dB
	18GHz ~ 40GHz	5.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AC WiFi Business Access Point
Brand	NETGEAR
Test Model	WAC505
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter or DC 48V from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** **CDD Mode:** 621.974mW **Beamforming Mode:** 616.913mW **5.18 ~ 5.24GHz** **CDD Mode:** 426.701mW **Beamforming Mode:** 405.274mW **5.745 ~ 5.825GHz** **CDD Mode:** 557.248mW **Beamforming Mode:** 527.379mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. The EUT must be supplied with a POE (only for test not for sale) or power adapter and following different models could be chosen as following table:

Adapter				
No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	2ABL030F 1	332-10758-01	AC Input: 100-120Vac, 1A, 50/60Hz DC Output: 12V, 2.5A DC Output cable: Unshielded, 1.8m
2	NETGEAR	ADS-40FPA-12	332-10759-01	AC Input: 100-120Vac, 1A, 60Hz DC Output: 12V, 2.5A DC Output cable: Unshielded, 1.8m
POE (only for test not for sale)				
No.	Brand	Model No.	Spec.	
1	Microsemi Corp.	PD-3501G/AC	AC Input: 100-240Vac, 0.43A, 50/60Hz DC Output: 48V, 0.35A	
Note: 1. From the above adapters and POE, the worse case was found in Adapter 2. Therefore only the test data of the mode was recorded in this report.				

2. 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.		

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

Antenna No.	Brand	Model	Ant. Gain(dBi)	Frequency range (GHz)	Antenna Type	Connecter Type	Cable Length
1	Master Wave Technology	98P2JMIPF018	3.07	2.4~2.4835	PCB	i-pex(MHF)	79mm
2	Master Wave Technology	98P2JMIPF018	3.07	2.4~2.4835	PCB	i-pex(MHF)	79mm
3	Master Wave Technology	98P2KUIPF020	4.01	5.15~5.85	PCB	i-pex(MHF)	89mm
4	Master Wave Technology	98P2KUIPF019	3.84	5.15~5.85	PCB	i-pex(MHF)	41mm

4. The EUT incorporates a MIMO function.

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

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

5. 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	PLC	APCM	
1	-	-	√	-	Power from adapter 1
2	√	√	√	√	Power from adapter 2
3	-	-	√	-	Power from POE

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

NOTE:
1. The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	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	149	OFDM	BPSK	6

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240 5745-5825	36 to 48 149 to 165	149	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
802.11ac (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
Beamforming Mode (Output power only)						
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:

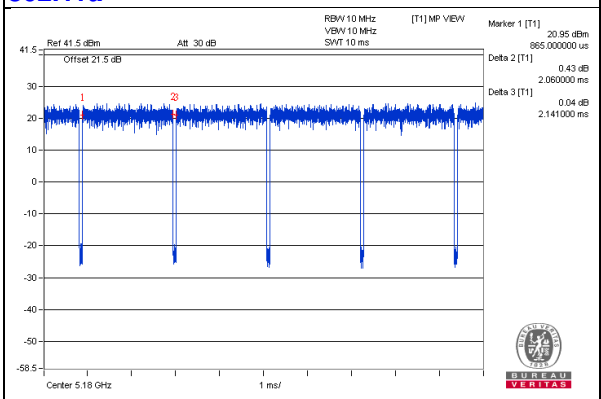
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	22deg. C, 63%RH	120Vac, 60Hz	Rey Chen
RE<1G	23deg. C, 66%RH	120Vac, 60Hz	Terry Huang
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

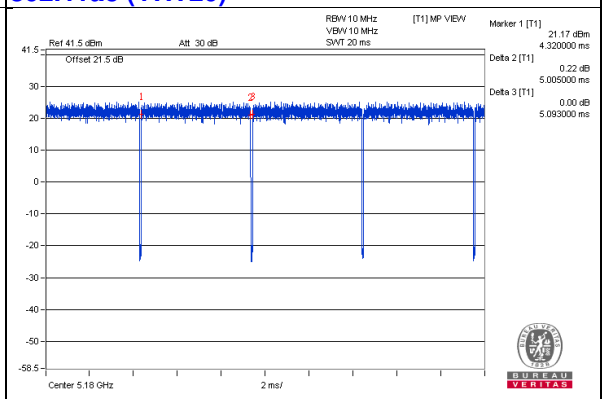
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 2.06/2.141 = 0.962, Duty factor = 10 * log(1/0.962) = 0.17
802.11ac (VHT20): Duty cycle = 5.005/5.093 = 0.983
802.11ac (VHT40): Duty cycle = 2.431/2.509 = 0.969, Duty factor = 10 * log(1/0.969) = 0.14
802.11ac (VHT80): Duty cycle = 1.145/1.224 = 0.935, Duty factor = 10 * log(1/0.935) = 0.29

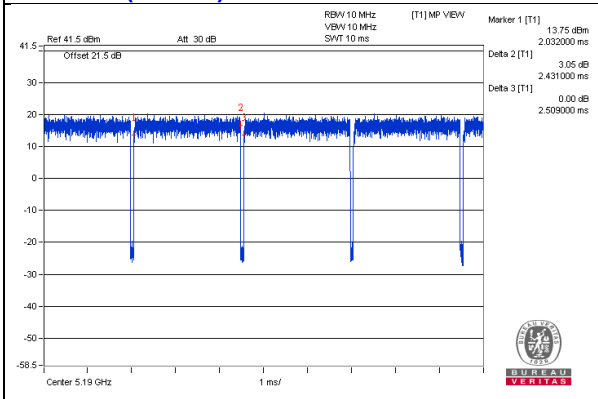
802.11a



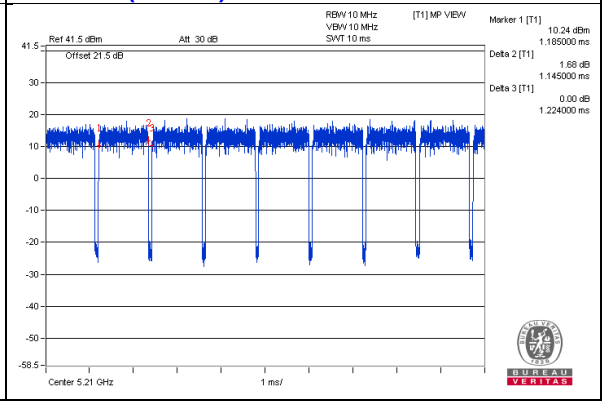
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5440	6FC7F12	FCC DoC	Provided by Lab
B.	POE	Power Dsine	PD-3501	NA	NA	Supplied by client

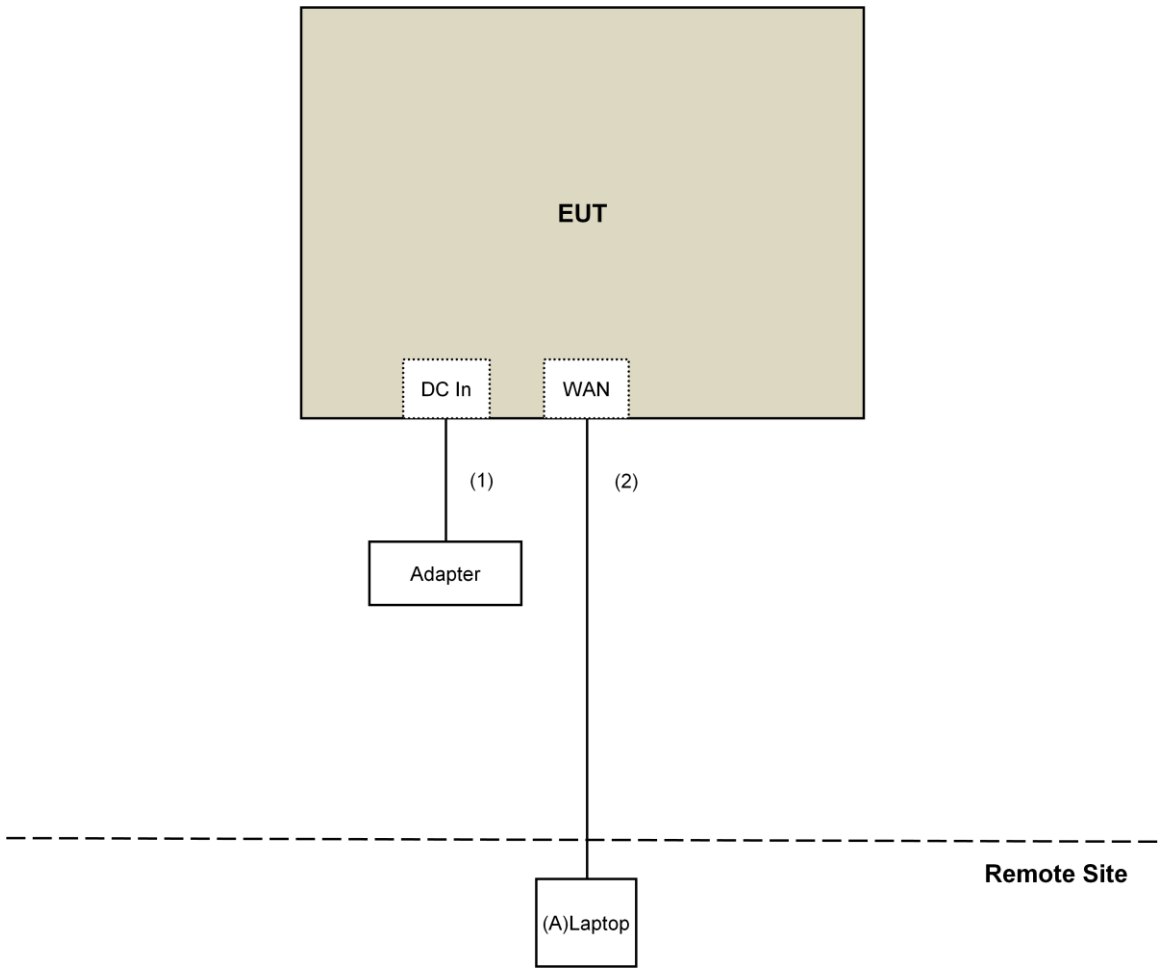
Note:

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

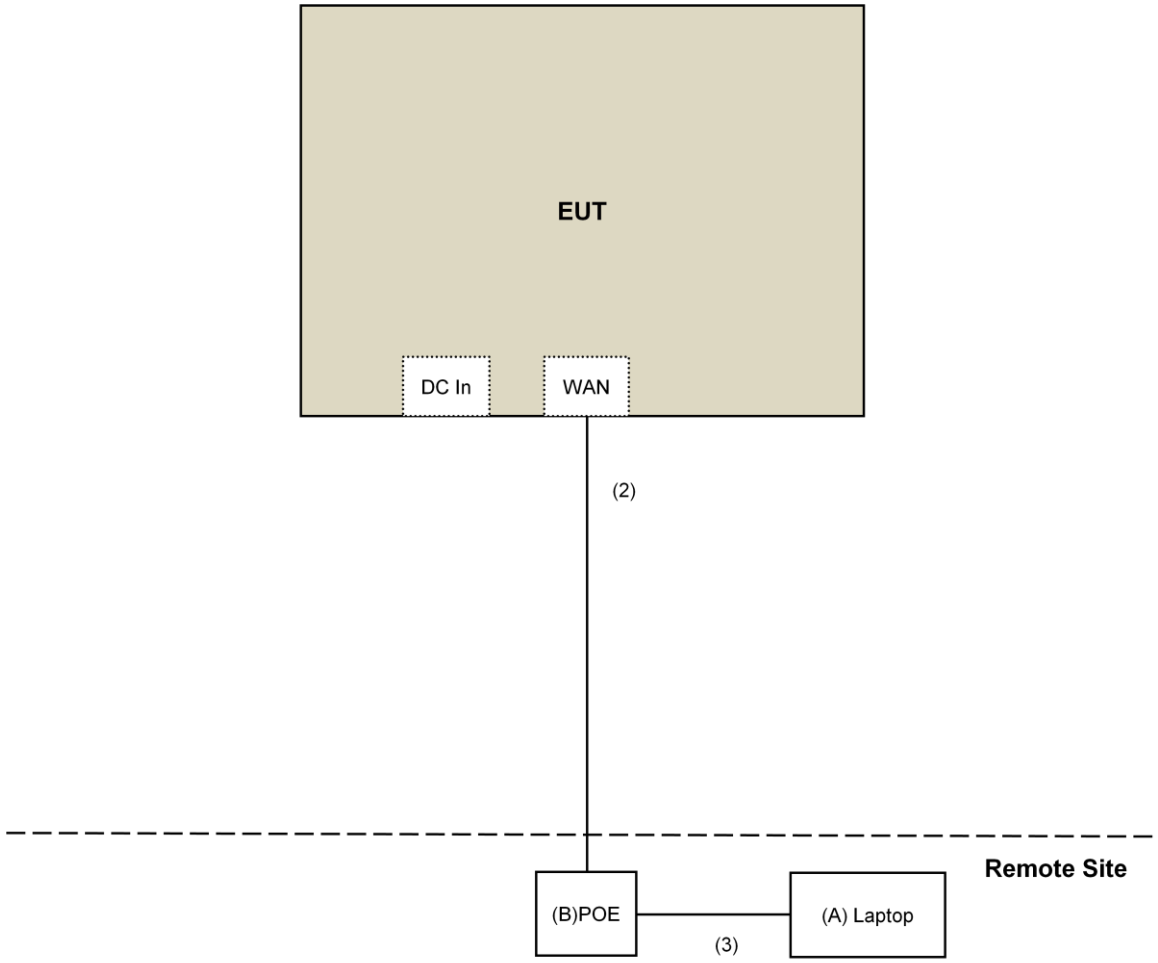
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.8	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	3	No	0	Provided by Lab

3.4.1 Configuration of System under Test

Mode 1 & Mode 2:



Mode 3:



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v01r04
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<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 v01r04</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

For OOBE test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150323	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Pre-Amplifier EMCI	EMC184045SE	980387	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. The FCC Site Registration No. is 292998
4. The CANADA Site Registration No. is 20331-2
5. Tested Date: Apr. 14, 2017

For other test:

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. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 27, 2016	Dec. 26, 2017
Pre-Amplifier EMCI	EMC12630SE	980385	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150323	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Pre-Amplifier EMCI	EMC184045SE	980387	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSv40	100964	June 28, 2016	June 27, 2017
Power meter Anritsu	ML2495A	0824006	May 26, 2016	May 25, 2017
Power sensor Anritsu	MA2411B	0738172	May 26, 2016	May 25, 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: May 13 to 17, 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:

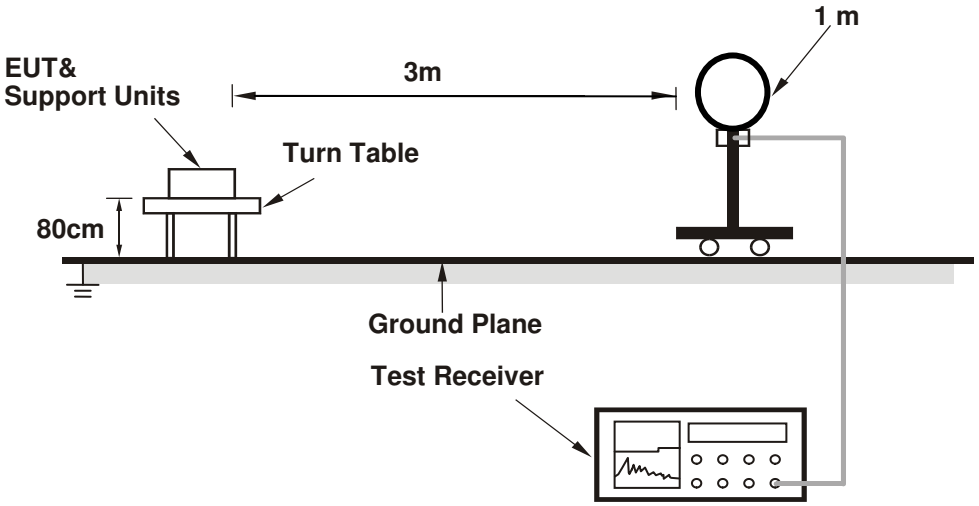
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

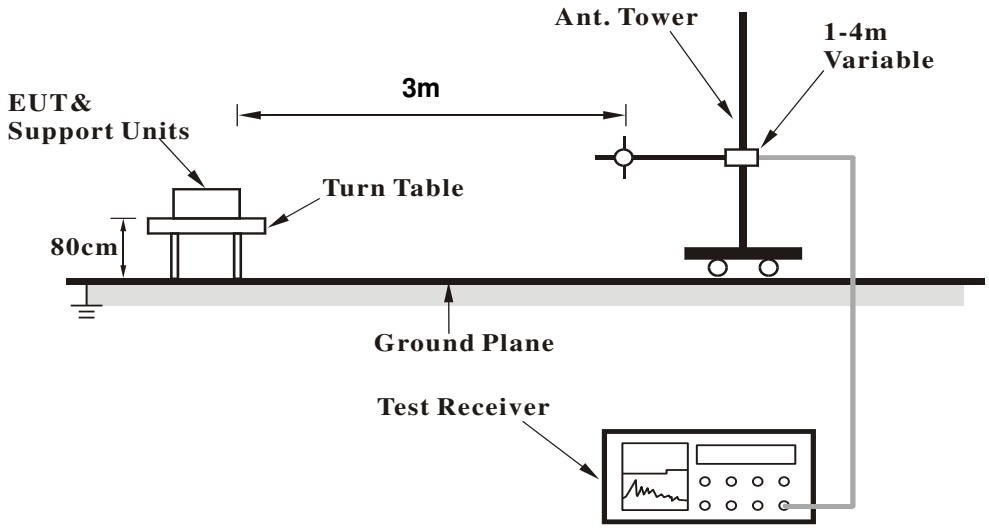
No deviation.

4.1.5 Test Setup

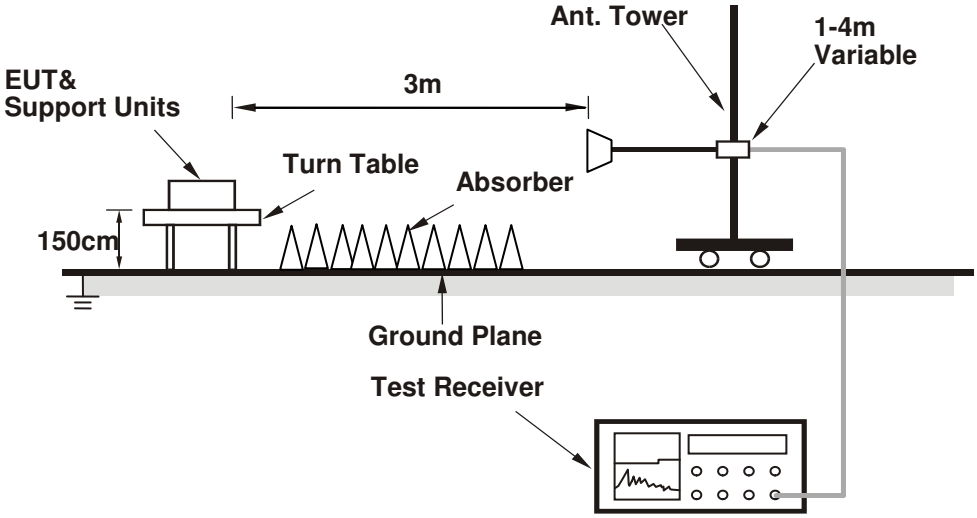
For Radiated emission below 30MHz



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 (QCA Radio Control Toolkit Version3.0187.0) 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	72.3 PK	74.0	-1.7	1.26 H	161	69.4	2.9
2	5150.00	53.6 AV	54.0	-0.4	1.26 H	161	50.7	2.9
3	*5180.00	114.8 PK			1.26 H	161	111.8	3.0
4	*5180.00	104.8 AV			1.26 H	161	101.8	3.0
5	#10360.00	60.1 PK	74.0	-13.9	1.00 H	168	48.0	12.1
6	#10360.00	48.6 AV	54.0	-5.4	1.00 H	168	36.5	12.1
7	15540.00	63.4 PK	74.0	-10.6	1.26 H	80	51.5	11.9
8	15540.00	51.3 AV	54.0	-2.7	1.26 H	80	39.4	11.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.1 PK	74.0	-3.9	3.45 V	18	67.2	2.9
2	5150.00	51.3 AV	54.0	-2.7	3.45 V	18	48.4	2.9
3	*5180.00	109.7 PK			3.45 V	18	106.7	3.0
4	*5180.00	100.6 AV			3.45 V	18	97.6	3.0
5	#10360.00	57.6 PK	74.0	-16.4	1.12 V	94	45.5	12.1
6	#10360.00	47.8 AV	54.0	-6.2	1.12 V	94	35.7	12.1
7	15540.00	59.2 PK	74.0	-14.8	2.29 V	166	47.3	11.9
8	15540.00	47.7 AV	54.0	-6.3	2.29 V	166	35.8	11.9

REMARKS:

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

CHANNEL	TX Channel 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	5150.00	69.5 PK	74.0	-4.5	1.23 H	158	66.6	2.9
2	5150.00	53.6 AV	54.0	-0.4	1.23 H	158	50.7	2.9
3	*5200.00	118.5 PK			1.23 H	158	115.5	3.0
4	*5200.00	108.3 AV			1.23 H	158	105.3	3.0
5	5350.00	50.4 PK	74.0	-23.6	1.28 H	158	47.0	3.4
6	5350.00	38.5 AV	54.0	-15.5	1.28 H	158	35.1	3.4
7	#10400.00	60.6 PK	74.0	-13.4	1.00 H	171	48.6	12.0
8	#10400.00	49.0 AV	54.0	-5.0	1.00 H	171	37.0	12.0
9	15600.00	63.5 PK	74.0	-10.5	1.23 H	90	51.4	12.1
10	15600.00	52.1 AV	54.0	-1.9	1.23 H	90	40.0	12.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.6 PK	74.0	-6.4	3.42 V	15	64.7	2.9
2	5150.00	51.7 AV	54.0	-2.3	3.42 V	15	48.8	2.9
3	*5200.00	113.6 PK			3.42 V	15	110.6	3.0
4	*5200.00	104.5 AV			3.42 V	15	101.5	3.0
5	5350.00	48.3 PK	74.0	-25.7	3.42 V	15	44.9	3.4
6	5350.00	36.6 AV	54.0	-17.4	3.42 V	15	33.2	3.4
7	#10400.00	57.6 PK	74.0	-16.4	1.09 V	93	45.6	12.0
8	#10400.00	47.8 AV	54.0	-6.2	1.09 V	93	35.8	12.0
9	15600.00	59.5 PK	74.0	-14.5	2.29 V	174	47.4	12.1
10	15600.00	47.6 AV	54.0	-6.4	2.29 V	174	35.5	12.1

REMARKS:

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

CHANNEL	TX Channel 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	116.4 PK			1.00 H	153	113.2	3.2
2	*5240.00	106.7 AV			1.00 H	153	103.5	3.2
3	5350.00	50.2 PK	74.0	-23.8	1.00 H	153	46.8	3.4
4	5350.00	39.1 AV	54.0	-14.9	1.00 H	153	35.7	3.4
5	#10480.00	60.3 PK	74.0	-13.7	1.00 H	182	48.1	12.2
6	#10480.00	49.0 AV	54.0	-5.0	1.00 H	182	36.8	12.2
7	15720.00	64.5 PK	74.0	-9.5	1.22 H	104	51.6	12.9
8	15720.00	52.9 AV	54.0	-1.1	1.22 H	104	40.0	12.9
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	*5240.00	111.3 PK			3.40 V	2	108.1	3.2
2	*5240.00	102.1 AV			3.40 V	2	98.9	3.2
3	5350.00	48.2 PK	74.0	-25.8	3.40 V	2	44.8	3.4
4	5350.00	37.1 AV	54.0	-16.9	3.40 V	2	33.7	3.4
5	#10480.00	57.3 PK	74.0	-16.7	1.09 V	89	45.1	12.2
6	#10480.00	47.7 AV	54.0	-6.3	1.09 V	89	35.5	12.2
7	15720.00	59.3 PK	74.0	-14.7	2.30 V	179	46.4	12.9
8	15720.00	47.5 AV	54.0	-6.5	2.30 V	179	34.6	12.9

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 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	#5629.31	59.4 PK	68.2	-8.8	1.05 H	170	54.6	4.8
2	*5745.00	119.5 PK			1.05 H	170	115.5	4.0
3	*5745.00	110.7 AV			1.05 H	170	106.7	4.0
4	#5968.18	57.4 PK	68.2	-10.8	1.05 H	170	51.9	5.5
5	11490.00	65.4 PK	74.0	-8.6	3.84 H	142	52.6	12.8
6	11490.00	53.4 AV	54.0	-0.6	3.84 H	142	40.6	12.8
7	#17235.00	56.6 PK	74.0	-17.4	2.13 H	72	39.2	17.4
8	#17235.00	45.6 AV	54.0	-8.4	2.13 H	72	28.2	17.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.87	54.5 PK	68.2	-13.7	2.94 V	351	49.7	4.8
2	*5745.00	112.9 PK			2.94 V	351	108.9	4.0
3	*5745.00	103.9 AV			2.94 V	351	99.9	4.0
4	#5947.68	54.7 PK	68.2	-13.5	2.94 V	351	49.3	5.4
5	11490.00	62.9 PK	74.0	-11.1	1.26 V	9	50.1	12.8
6	11490.00	50.4 AV	54.0	-3.6	1.26 V	9	37.6	12.8
7	#17235.00	53.7 PK	74.0	-20.3	1.10 V	96	36.3	17.4
8	#17235.00	42.7 AV	54.0	-11.3	1.10 V	96	25.3	17.4

REMARKS:

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

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	#5584.09	55.5 PK	68.2	-12.7	1.05 H	161	51.3	4.2
2	*5785.00	120.8 PK			1.05 H	161	116.8	4.0
3	*5785.00	109.9 AV			1.05 H	161	105.9	4.0
4	#5955.36	56.4 PK	68.2	-11.8	1.05 H	161	51.7	4.7
5	11570.00	65.6 PK	74.0	-8.4	3.88 H	360	53.0	12.6
6	**11570.00**	**53.9 AV**	**54.0**	**-0.1**	**3.88 H**	**360**	**41.3**	**12.6**
7	#17355.00	57.2 PK	74.0	-16.8	2.11 H	68	39.1	18.1
8	#17355.00	45.9 AV	54.0	-8.1	2.11 H	68	27.8	18.1
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	#5554.45	53.4 PK	68.2	-14.8	3.82 V	314	49.2	4.2
2	*5785.00	114.9 PK			3.72 V	314	110.9	4.0
3	*5785.00	104.6 AV			3.72 V	314	100.6	4.0
4	#5930.96	54.0 PK	68.2	-14.2	3.72 V	314	49.3	4.7
5	11570.00	62.9 PK	74.0	-11.1	1.30 V	0	50.3	12.6
6	11570.00	51.3 AV	54.0	-2.7	1.30 V	0	38.7	12.6
7	#17355.00	54.1 PK	74.0	-19.9	1.12 V	110	36.0	18.1
8	#17355.00	42.3 AV	54.0	-11.7	1.12 V	110	24.2	18.1

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 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	#5593.47	53.9 PK	68.2	-14.3	1.01 H	181	49.6	4.3
2	*5825.00	117.9 PK			1.01 H	160	113.8	4.1
3	*5825.00	108.6 AV			1.01 H	160	104.5	4.1
4	#6022.28	54.8 PK	68.2	-13.4	1.01 H	181	50.0	4.8
5	11650.00	65.9 PK	74.0	-8.1	3.95 H	16	53.1	12.8
6	**11650.00**	**53.9 AV**	**54.0**	**-0.1**	**3.95 H**	**16**	**41.1**	**12.8**
7	#17475.00	56.9 PK	74.0	-17.1	2.09 H	72	38.1	18.8
8	#17475.00	45.8 AV	54.0	-8.2	2.09 H	72	27.0	18.8
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	#5633.18	54.3 PK	68.2	-13.9	3.70 V	311	49.9	4.4
2	*5825.00	111.8 PK			3.70 V	311	107.7	4.1
3	*5825.00	101.9 AV			3.70 V	311	97.8	4.1
4	#5930.40	54.7 PK	68.2	-13.5	3.70 V	311	50.0	4.7
5	11650.00	62.4 PK	74.0	-11.6	1.28 V	14	49.6	12.8
6	11650.00	51.1 AV	54.0	-2.9	1.28 V	14	38.3	12.8
7	#17475.00	53.6 PK	74.0	-20.4	1.12 V	101	34.8	18.8
8	#17475.00	42.7 AV	54.0	-11.3	1.12 V	101	23.9	18.8

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 (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	5150.00	70.6 PK	74.0	-3.4	1.01 H	158	67.7	2.9
2	5150.00	53.8 AV	54.0	-0.2	1.01 H	158	50.9	2.9
3	*5180.00	115.3 PK			1.01 H	158	112.3	3.0
4	*5180.00	104.2 AV			1.01 H	158	101.2	3.0
5	#10360.00	59.4 PK	74.0	-14.6	2.52 H	123	47.3	12.1
6	#10360.00	46.8 AV	54.0	-7.2	2.52 H	123	34.7	12.1
7	15540.00	59.1 PK	74.0	-14.9	1.23 H	87	47.2	11.9
8	15540.00	48.5 AV	54.0	-5.5	1.23 H	87	36.6	11.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.3 PK	74.0	-5.7	3.86 V	12	65.4	2.9
2	5150.00	52.6 AV	54.0	-1.4	3.86 V	12	49.7	2.9
3	*5180.00	111.5 PK			3.86 V	12	108.5	3.0
4	*5180.00	100.3 AV			3.86 V	12	97.3	3.0
5	#10360.00	57.0 PK	74.0	-17.0	1.07 V	92	44.9	12.1
6	#10360.00	44.9 AV	54.0	-9.1	1.07 V	92	32.8	12.1
7	15540.00	56.5 PK	74.0	-17.5	2.33 V	184	44.6	11.9
8	15540.00	46.1 AV	54.0	-7.9	2.33 V	184	34.2	11.9

REMARKS:

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

CHANNEL	TX Channel 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	5150.00	71.2 PK	74.0	-2.8	1.22 H	157	68.3	2.9
2	5150.00	53.4 AV	54.0	-0.6	1.22 H	157	50.5	2.9
3	*5200.00	118.5 PK			1.22 H	157	115.5	3.0
4	*5200.00	107.5 AV			1.22 H	157	104.5	3.0
5	#10400.00	59.7 PK	74.0	-14.3	2.49 H	127	47.7	12.0
6	#10400.00	47.1 AV	54.0	-6.9	2.49 H	127	35.1	12.0
7	15600.00	58.7 PK	74.0	-15.3	1.27 H	89	46.6	12.1
8	15600.00	48.2 AV	54.0	-5.8	1.27 H	89	36.1	12.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.4 PK	74.0	-14.6	3.84 V	9	56.5	2.9
2	5150.00	42.7 AV	54.0	-11.3	3.84 V	9	39.8	2.9
3	*5200.00	114.1 PK			3.84 V	9	111.1	3.0
4	*5200.00	103.5 AV			3.84 V	9	100.5	3.0
5	#10400.00	57.3 PK	74.0	-16.7	1.12 V	98	45.3	12.0
6	#10400.00	45.3 AV	54.0	-8.7	1.12 V	98	33.3	12.0
7	15600.00	56.8 PK	74.0	-17.2	2.29 V	172	44.7	12.1
8	15600.00	46.4 AV	54.0	-7.6	2.29 V	172	34.3	12.1

REMARKS:

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

CHANNEL	TX Channel 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	116.0 PK			1.26 H	142	112.8	3.2
2	*5240.00	105.6 AV			1.26 H	142	102.4	3.2
3	5350.00	52.4 PK	74.0	-21.6	1.26 H	142	49.0	3.4
4	5350.00	39.3 AV	54.0	-14.7	1.26 H	142	35.9	3.4
5	#10480.00	59.3 PK	74.0	-14.7	2.53 H	123	47.1	12.2
6	#10480.00	46.7 AV	54.0	-7.3	2.53 H	123	34.5	12.2
7	15720.00	58.1 PK	74.0	-15.9	1.26 H	76	45.2	12.9
8	15720.00	47.9 AV	54.0	-6.1	1.26 H	76	35.0	12.9
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	*5240.00	112.3 PK			3.81 V	28	109.1	3.2
2	*5240.00	101.7 AV			3.81 V	28	98.5	3.2
3	5350.00	50.1 PK	74.0	-23.9	3.81 V	28	46.7	3.4
4	5350.00	37.2 AV	54.0	-16.8	3.81 V	28	33.8	3.4
5	#10480.00	57.2 PK	74.0	-16.8	1.07 V	84	45.0	12.2
6	#10480.00	45.1 AV	54.0	-8.9	1.07 V	84	32.9	12.2
7	15720.00	56.3 PK	74.0	-17.7	2.30 V	161	43.4	12.9
8	15720.00	46.0 AV	54.0	-8.0	2.30 V	161	33.1	12.9

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 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	#5641.89	60.6 PK	68.2	-7.6	1.16 H	162	55.8	4.8
2	*5745.00	120.6 PK			1.16 H	162	116.6	4.0
3	*5745.00	109.8 AV			1.16 H	162	105.8	4.0
4	#5932.43	58.6 PK	68.2	-9.6	1.16 H	162	53.2	5.4
5	11490.00	66.4 PK	74.0	-7.6	2.28 H	164	53.6	12.8
6	11490.00	53.5 AV	54.0	-0.5	2.28 H	164	40.7	12.8
7	#17235.00	57.5 PK	74.0	-16.5	1.22 H	144	40.1	17.4
8	#17235.00	44.7 AV	54.0	-9.3	1.22 H	144	27.3	17.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5626.36	54.6 PK	68.2	-13.6	2.92 V	352	49.9	4.7
2	*5745.00	111.2 PK			2.92 V	352	107.2	4.0
3	*5745.00	102.8 AV			2.92 V	352	98.8	4.0
4	#6006.95	54.5 PK	68.2	-13.7	2.92 V	352	48.8	5.7
5	11490.00	64.5 PK	74.0	-9.5	1.34 V	22	51.7	12.8
6	11490.00	51.3 AV	54.0	-2.7	1.34 V	22	38.5	12.8
7	#17235.00	55.7 PK	74.0	-18.3	1.17 V	110	38.3	17.4
8	#17235.00	42.8 AV	54.0	-11.2	1.17 V	110	25.4	17.4

REMARKS:

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

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	#5643.55	56.9 PK	68.2	-11.3	1.16 H	164	52.5	4.4
2	*5785.00	120.9 PK			1.16 H	164	116.9	4.0
3	*5785.00	111.6 AV			1.16 H	164	107.6	4.0
4	#6024.49	56.1 PK	68.2	-12.1	1.16 H	164	51.3	4.8
5	11570.00	66.5 PK	74.0	-7.5	3.77 H	360	53.9	12.6
6	11570.00	53.1 AV	54.0	-0.9	3.77 H	360	40.5	12.6
7	#17355.00	57.2 PK	74.0	-16.8	1.23 H	146	39.1	18.1
8	#17355.00	44.4 AV	54.0	-9.6	1.23 H	146	26.3	18.1
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	#5642.54	54.5 PK	68.2	-13.7	3.95 V	89	50.1	4.4
2	*5785.00	116.0 PK			3.95 V	89	112.0	4.0
3	*5785.00	104.0 AV			3.95 V	89	100.0	4.0
4	#5977.58	54.6 PK	68.2	-13.6	3.95 V	89	49.9	4.7
5	11570.00	64.2 PK	74.0	-9.8	1.33 V	27	51.6	12.6
6	11570.00	51.2 AV	54.0	-2.8	1.33 V	27	38.6	12.6
7	#17355.00	55.3 PK	74.0	-18.7	1.06 V	117	37.2	18.1
8	#17355.00	42.3 AV	54.0	-11.7	1.06 V	117	24.2	18.1

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 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	#5610.17	55.8 PK	68.2	-12.4	1.20 H	165	51.4	4.4
2	*5825.00	118.5 PK			1.20 H	165	114.4	4.1
3	*5825.00	107.5 AV			1.20 H	165	103.4	4.1
4	#5930.14	56.1 PK	68.2	-12.1	1.20 H	165	51.4	4.7
5	11650.00	65.4 PK	74.0	-8.6	1.30 H	286	52.6	12.8
6	11650.00	53.8 AV	54.0	-0.2	1.30 H	286	41.0	12.8
7	#17475.00	57.0 PK	74.0	-17.0	1.27 H	157	38.2	18.8
8	#17475.00	44.2 AV	54.0	-9.8	1.27 H	157	25.4	18.8
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	#5633.11	53.6 PK	68.2	-14.6	3.93 V	87	49.2	4.4
2	*5825.00	112.5 PK			3.93 V	87	108.4	4.1
3	*5825.00	101.9 AV			3.93 V	87	97.8	4.1
4	#5960.82	54.2 PK	68.2	-14.0	3.93 V	87	49.5	4.7
5	11650.00	63.3 PK	74.0	-10.7	1.29 V	15	50.5	12.8
6	11650.00	51.7 AV	54.0	-2.3	1.29 V	15	38.9	12.8
7	#17475.00	55.2 PK	74.0	-18.8	1.07 V	104	36.4	18.8
8	#17475.00	52.3 AV	54.0	-1.7	1.07 V	104	33.5	18.8

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 (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	67.2 PK	74.0	-6.8	1.22 H	156	64.3	2.9
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.22 H**	**156**	**51.0**	**2.9**
3	*5190.00	110.3 PK			1.22 H	156	107.3	3.0
4	*5190.00	101.5 AV			1.22 H	156	98.5	3.0
5	5350.00	51.3 PK	74.0	-22.7	1.22 H	156	47.9	3.4
6	5350.00	39.5 AV	54.0	-14.5	1.22 H	156	36.1	3.4
7	#10380.00	59.2 PK	74.0	-14.8	2.54 H	124	47.1	12.1
8	#10380.00	46.9 AV	54.0	-7.1	2.54 H	124	34.8	12.1
9	15570.00	58.7 PK	74.0	-15.3	1.20 H	101	46.6	12.1
10	15570.00	48.2 AV	54.0	-5.8	1.20 H	101	36.1	12.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.3 PK	74.0	-8.7	2.98 V	324	62.4	2.9
2	5150.00	51.3 AV	54.0	-2.7	2.98 V	324	48.4	2.9
3	*5190.00	103.5 PK			2.98 V	324	100.5	3.0
4	*5190.00	94.6 AV			2.98 V	324	91.6	3.0
5	5350.00	49.5 PK	74.0	-24.5	2.98 V	324	46.1	3.4
6	5350.00	37.3 AV	54.0	-16.7	2.98 V	324	33.9	3.4
7	#10380.00	57.2 PK	74.0	-16.8	1.10 V	82	45.1	12.1
8	#10380.00	45.1 AV	54.0	-8.9	1.10 V	82	33.0	12.1
9	15570.00	56.3 PK	74.0	-17.7	2.31 V	183	44.2	12.1
10	15570.00	46.1 AV	54.0	-7.9	2.31 V	183	34.0	12.1

REMARKS:

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

CHANNEL	TX Channel 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	#5154.00	66.0 PK	74.0	-8.0	1.27 H	151	63.1	2.9
2	#5154.00	53.6 AV	54.0	-0.4	1.27 H	151	50.7	2.9
3	*5230.00	114.1 PK			1.27 H	151	111.0	3.1
4	*5230.00	105.3 AV			1.27 H	151	102.2	3.1
5	5350.00	55.2 PK	74.0	-18.8	1.27 H	151	51.8	3.4
6	5350.00	41.6 AV	54.0	-12.4	1.27 H	151	38.2	3.4
7	#10460.00	61.9 PK	74.0	-12.1	3.91 H	156	49.7	12.2
8	#10460.00	50.7 AV	54.0	-3.3	3.91 H	156	38.5	12.2
9	15690.00	53.3 PK	74.0	-20.7	3.93 H	360	40.4	12.9
10	15690.00	42.6 AV	54.0	-11.4	3.93 H	360	29.7	12.9
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	#5154.00	63.8 PK	74.0	-10.2	3.01 V	334	60.9	2.9
2	#5154.00	51.3 AV	54.0	-2.7	3.01 V	334	48.4	2.9
3	*5230.00	107.3 PK			3.01 V	334	104.2	3.1
4	*5230.00	98.2 AV			3.01 V	334	95.1	3.1
5	5350.00	53.1 PK	74.0	-20.9	3.01 V	334	49.7	3.4
6	5350.00	39.7 AV	54.0	-14.3	3.01 V	334	36.3	3.4
7	#10460.00	59.3 PK	74.0	-14.7	1.14 V	81	47.1	12.2
8	#10460.00	48.6 AV	54.0	-5.4	1.14 V	81	36.4	12.2
9	15690.00	51.4 PK	74.0	-22.6	2.30 V	198	38.5	12.9
10	15690.00	40.5 AV	54.0	-13.5	2.30 V	198	27.6	12.9

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	#5650.81	68.5 PK	68.8	-0.3	1.02 H	163	63.8	4.7
2	*5755.00	117.0 PK			1.02 H	163	113.0	4.0
3	*5755.00	107.5 AV			1.02 H	163	103.5	4.0
4	#5946.81	56.4 PK	68.2	-11.8	1.02 H	163	51.0	5.4
5	11510.00	61.3 PK	74.0	-12.7	3.93 H	152	48.5	12.8
6	11510.00	50.3 AV	54.0	-3.7	3.93 H	152	37.5	12.8
7	#17265.00	53.2 PK	74.0	-20.8	3.88 H	360	35.6	17.6
8	#17265.00	42.5 AV	54.0	-11.5	3.88 H	360	24.9	17.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5634.89	58.9 PK	68.2	-9.3	2.99 V	331	54.1	4.8
2	*5755.00	108.1 PK			2.99 V	331	104.1	4.0
3	*5755.00	100.0 AV			2.99 V	331	96.0	4.0
4	#5970.60	57.7 PK	68.2	-10.5	2.99 V	331	52.2	5.5
5	11510.00	59.1 PK	74.0	-14.9	1.25 V	17	46.3	12.8
6	11510.00	48.4 AV	54.0	-5.6	1.25 V	17	35.6	12.8
7	#17265.00	51.3 PK	74.0	-22.7	1.09 V	112	33.7	17.6
8	#17265.00	40.7 AV	54.0	-13.3	1.09 V	112	23.1	17.6

REMARKS:

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

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	#5634.11	63.0 PK	68.2	-5.2	1.01 H	166	58.2	4.8
2	*5795.00	116.0 PK			1.01 H	165	111.9	4.1
3	*5795.00	106.8 AV			1.01 H	165	102.7	4.1
4	#5930.82	66.2 PK	68.2	-2.0	1.01 H	166	60.8	5.4
5	11590.00	61.8 PK	74.0	-12.2	3.90 H	160	49.2	12.6
6	11590.00	41.3 AV	54.0	-12.7	3.90 H	160	28.7	12.6
7	#17385.00	53.8 PK	74.0	-20.2	3.89 H	360	35.4	18.4
8	#17385.00	43.0 AV	54.0	-11.0	3.89 H	360	24.6	18.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5573.45	57.4 PK	68.2	-10.8	3.00 V	328	52.8	4.6
2	*5795.00	109.3 PK			2.94 V	336	105.2	4.1
3	*5795.00	99.7 AV			2.94 V	336	95.6	4.1
4	#5950.81	57.7 PK	68.2	-10.5	3.00 V	328	52.3	5.4
5	11590.00	59.6 PK	74.0	-14.4	1.32 V	7	47.0	12.6
6	11590.00	39.1 AV	54.0	-14.9	1.32 V	7	26.5	12.6
7	#17385.00	51.7 PK	74.0	-22.3	1.08 V	109	33.3	18.4
8	#17385.00	41.1 AV	54.0	-12.9	1.08 V	109	22.7	18.4

REMARKS:

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

802.11ac (VHT80)

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	65.8 PK	74.0	-8.2	1.10 H	153	62.9	2.9
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.10 H**	**153**	**51.0**	**2.9**
3	*5210.00	106.9 PK			1.10 H	153	103.9	3.0
4	*5210.00	97.3 AV			1.10 H	153	94.3	3.0
5	5350.00	60.4 PK	74.0	-13.6	1.10 H	153	57.0	3.4
6	5350.00	45.4 AV	54.0	-8.6	1.10 H	153	42.0	3.4
7	#10420.00	59.2 PK	74.0	-14.8	2.47 H	114	47.2	12.0
8	#10420.00	46.8 AV	54.0	-7.2	2.47 H	114	34.8	12.0
9	15630.00	59.2 PK	74.0	-14.8	1.25 H	75	46.8	12.4
10	15630.00	48.4 AV	54.0	-5.6	1.25 H	75	36.0	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.3 PK	74.0	-10.7	3.46 V	309	60.4	2.9
2	5150.00	51.7 AV	54.0	-2.3	3.46 V	309	48.8	2.9
3	*5210.00	99.8 PK			3.46 V	309	96.8	3.0
4	*5210.00	91.2 AV			3.46 V	309	88.2	3.0
5	5350.00	58.5 PK	74.0	-15.5	3.46 V	309	55.1	3.4
6	5350.00	43.2 AV	54.0	-10.8	3.46 V	309	39.8	3.4
7	#10420.00	57.5 PK	74.0	-16.5	1.13 V	82	45.5	12.0
8	#10420.00	45.4 AV	54.0	-8.6	1.13 V	82	33.4	12.0
9	15630.00	56.5 PK	74.0	-17.5	2.29 V	169	44.1	12.4
10	15630.00	46.4 AV	54.0	-7.6	2.29 V	169	34.0	12.4

REMARKS:

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

CHANNEL	TX Channel 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	#5633.02	67.8 PK	68.2	-0.4	1.01 H	160	63.0	4.8
2	*5775.00	109.7 PK			1.01 H	160	105.7	4.0
3	*5775.00	100.3 AV			1.01 H	160	96.3	4.0
4	#5933.54	65.9 PK	68.2	-2.3	1.01 H	160	60.5	5.4
5	11550.00	59.7 PK	74.0	-14.3	2.49 H	110	47.0	12.7
6	11550.00	47.1 AV	54.0	-6.9	2.49 H	110	34.4	12.7
7	#17325.00	59.6 PK	74.0	-14.4	1.21 H	88	41.8	17.8
8	#17325.00	48.7 AV	54.0	-5.3	1.21 H	88	30.9	17.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5634.56	62.0 PK	68.2	-6.2	3.51 V	315	57.2	4.8
2	*5775.00	101.8 PK			3.51 V	315	97.8	4.0
3	*5775.00	94.8 AV			3.51 V	315	90.8	4.0
4	#5936.25	54.8 PK	68.2	-13.4	3.51 V	315	49.4	5.4
5	11550.00	57.7 PK	74.0	-16.3	1.12 V	86	45.0	12.7
6	11550.00	45.4 AV	54.0	-8.6	1.12 V	86	32.7	12.7
7	#17325.00	56.4 PK	74.0	-17.6	2.28 V	169	38.6	17.8
8	#17325.00	46.0 AV	54.0	-8.0	2.28 V	169	28.2	17.8

REMARKS:

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

Below 1GHz Data:

802.11a

CHANNEL	TX Channel 149	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	32.04	36.3 QP	40.0	-3.7	1.00 H	82	45.7	-9.4
2	43.82	27.4 QP	40.0	-12.6	1.00 H	246	35.1	-7.7
3	118.05	30.3 QP	43.5	-13.2	1.50 H	278	40.1	-9.8
4	280.77	30.2 QP	46.0	-15.8	1.00 H	154	38.2	-8.0
5	331.91	27.8 QP	46.0	-18.2	1.00 H	321	34.5	-6.7
6	451.76	29.8 QP	46.0	-16.2	2.00 H	335	33.4	-3.6
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	31.92	35.7 QP	40.0	-4.3	1.00 V	50	45.1	-9.4
2	44.02	34.7 QP	40.0	-5.3	1.00 V	212	42.4	-7.7
3	57.60	28.2 QP	40.0	-11.8	1.00 V	292	36.5	-8.3
4	115.34	29.8 QP	43.5	-13.7	1.00 V	131	40.1	-10.3
5	279.65	26.4 QP	46.0	-19.6	1.00 V	44	34.5	-8.1
6	434.78	28.3 QP	46.0	-17.7	1.00 V	29	32.2	-3.9

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 20, 2016	June 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3 Tested Date: May 16, 2017

4.2.3 Test Procedure

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

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

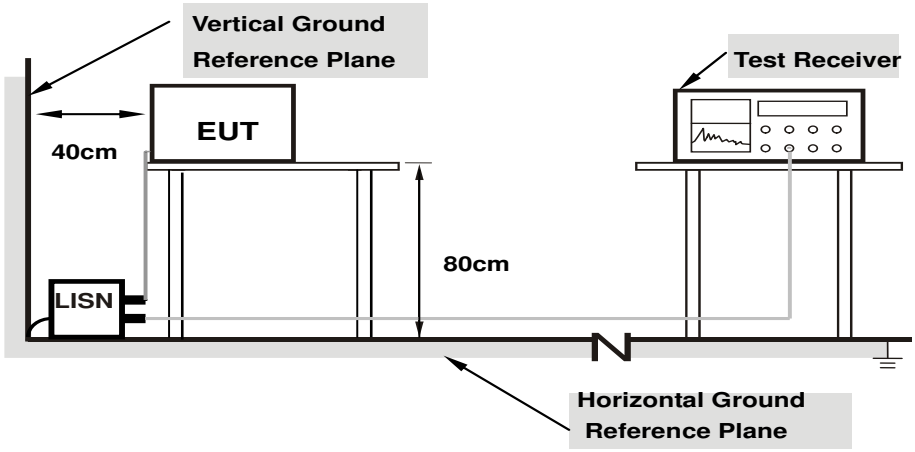
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

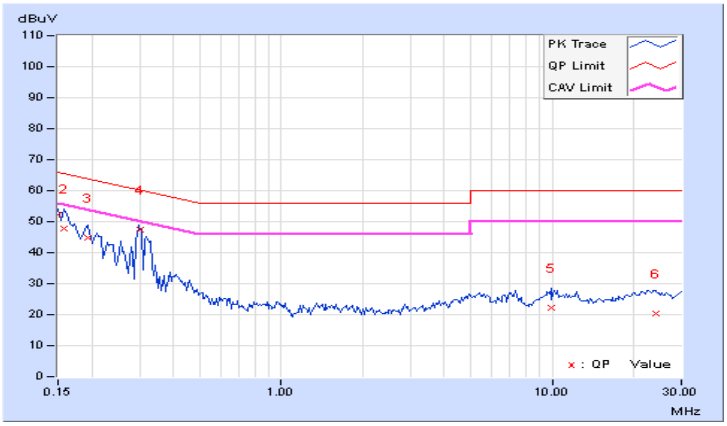
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.20	42.05	29.16	52.25	39.36	66.00	56.00	-13.75	-16.64
2	0.15781	10.20	37.73	26.79	47.93	36.99	65.58	55.58	-17.65	-18.59
3	0.19297	10.20	34.71	24.09	44.91	34.29	63.91	53.91	-19.00	-19.62
4	0.30081	10.22	37.30	35.32	47.52	45.54	60.22	50.22	-12.70	-4.68
5	9.87500	10.72	11.43	7.49	22.15	18.21	60.00	50.00	-37.85	-31.79
6	24.20703	11.76	8.57	2.77	20.33	14.53	60.00	50.00	-39.67	-35.47

REMARKS:

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

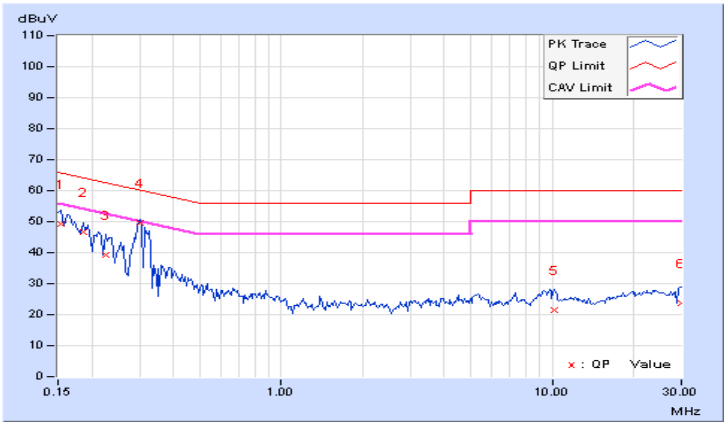


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.19	39.15	28.87	49.34	39.06	65.79	55.79	-16.45	-16.73
2	0.18516	10.18	36.33	25.46	46.51	35.64	64.25	54.25	-17.74	-18.61
3	0.22422	10.18	29.00	18.69	39.18	28.87	62.66	52.66	-23.48	-23.79
4	**0.30034**	**10.21**	**39.39**	**36.89**	**49.60**	**47.10**	**60.23**	**50.23**	**-10.63**	**-3.13**
5	10.14844	10.64	10.95	5.45	21.59	16.09	60.00	50.00	-38.41	-33.91
6	29.84662	11.40	12.31	9.58	23.71	20.98	60.00	50.00	-36.29	-29.02

REMARKS:

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



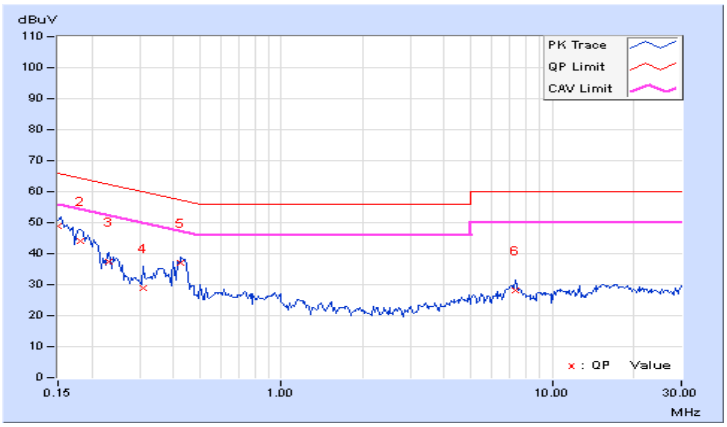
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.20	38.85	25.00	49.05	35.20	66.00	56.00	-16.95	-20.80
2	0.18125	10.20	33.81	20.72	44.01	30.92	64.43	54.43	-20.42	-23.51
3	0.23203	10.21	27.21	15.88	37.42	26.09	62.38	52.38	-24.96	-26.29
4	0.31016	10.22	18.55	5.59	28.77	15.81	59.97	49.97	-31.20	-34.16
5	0.42734	10.24	26.77	19.22	37.01	29.46	57.30	47.30	-20.29	-17.84
6	7.36328	10.55	17.53	12.46	28.08	23.01	60.00	50.00	-31.92	-26.99

REMARKS:

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

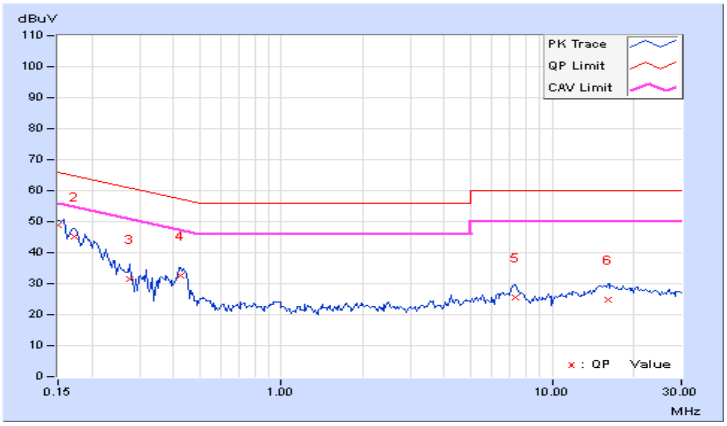


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	38.81	24.17	49.00	34.36	66.00	56.00	-17.00	-21.64
2	0.17344	10.18	35.07	21.07	45.25	31.25	64.79	54.79	-19.54	-23.54
3	0.27500	10.20	21.21	8.53	31.41	18.73	60.97	50.97	-29.56	-32.24
4	0.42344	10.24	22.51	14.44	32.75	24.68	57.38	47.38	-24.63	-22.70
5	7.32031	10.45	15.07	10.76	25.52	21.21	60.00	50.00	-34.48	-28.79
6	16.02344	11.15	13.67	8.17	24.82	19.32	60.00	50.00	-35.18	-30.68

REMARKS:

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



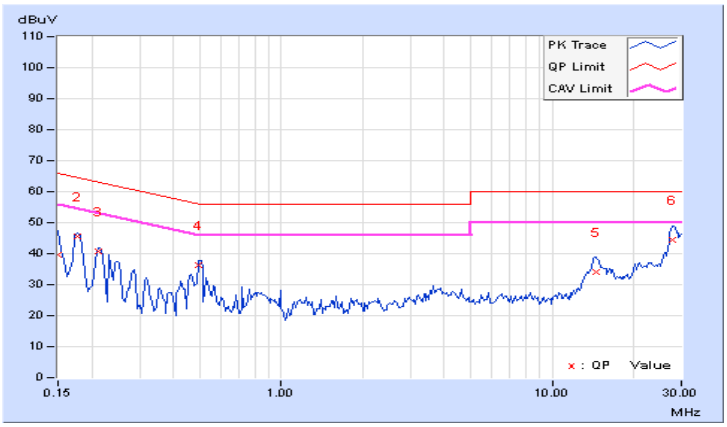
4.2.9 Test Results (Mode 3)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.19	29.60	13.15	39.79	23.34	66.00	56.00	-26.21	-32.66
2	0.17734	10.19	35.46	25.46	45.65	35.65	64.61	54.61	-18.96	-18.96
3	0.21250	10.19	30.44	20.27	40.63	30.46	63.11	53.11	-22.48	-22.65
4	0.49766	10.23	26.02	22.67	36.25	32.90	56.04	46.04	-19.79	-13.14
5	14.49609	11.00	23.19	17.71	34.19	28.71	60.00	50.00	-25.81	-21.29
6	27.82813	11.45	33.05	27.47	44.50	38.92	60.00	50.00	-15.50	-11.08

REMARKS:

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

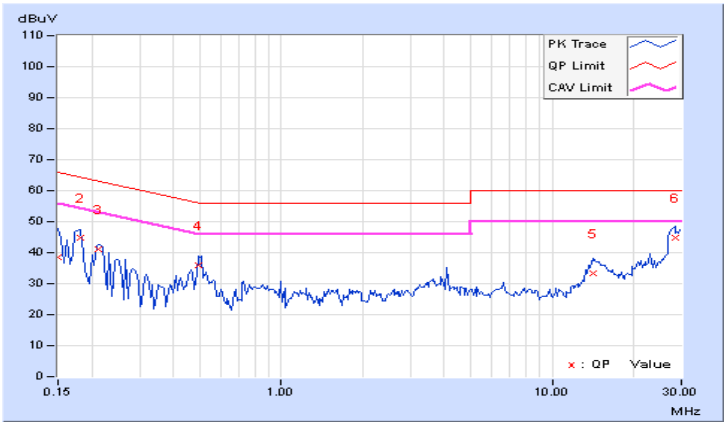


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.18	28.21	12.75	38.39	22.93	66.00	56.00	-27.61	-33.07
2	0.18125	10.17	34.62	22.82	44.79	32.99	64.43	54.43	-19.64	-21.44
3	0.21250	10.16	30.91	21.18	41.07	31.34	63.11	53.11	-22.04	-21.77
4	0.49375	10.21	25.65	22.51	35.86	32.72	56.10	46.10	-20.24	-13.38
5	14.08984	10.81	22.55	17.12	33.36	27.93	60.00	50.00	-26.64	-22.07
6	28.36328	11.06	33.85	28.75	44.91	39.81	60.00	50.00	-15.09	-10.19

REMARKS:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 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.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.34	18.75	160.89	22.07	30.00	Pass
40	5200	23.38	23.20	426.701	26.30	30.00	Pass
48	5240	21.47	21.35	276.739	24.42	30.00	Pass
149	5745	24.41	24.49	557.248	27.46	30.00	Pass
157	5785	24.14	23.82	500.409	26.99	30.00	Pass
165	5825	21.52	21.36	278.679	24.45	30.00	Pass

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				
36	5180	18.62	18.41	142.121	21.53	30.00	Pass
40	5200	23.31	22.81	405.274	26.08	30.00	Pass
48	5240	20.56	20.18	217.995	23.38	30.00	Pass
149	5745	24.30	24.12	527.379	27.22	30.00	Pass
157	5785	24.20	23.92	509.631	27.07	30.00	Pass
165	5825	21.52	21.35	278.364	24.45	30.00	Pass

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				
38	5190	17.65	17.75	117.776	20.71	30.00	Pass
46	5230	21.45	21.51	281.216	24.49	30.00	Pass
151	5755	21.48	21.62	285.816	24.56	30.00	Pass
159	5795	23.89	24.09	501.354	27.00	30.00	Pass

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				
42	5210	16.47	16.52	89.236	19.51	30.00	Pass
155	5775	19.14	19.05	162.388	22.11	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				
36	5180	18.62	18.41	142.121	21.53	29.06	Pass
40	5200	23.31	22.81	405.274	26.08	29.06	Pass
48	5240	20.56	20.18	217.995	23.38	29.06	Pass
149	5745	24.30	24.12	527.379	27.22	29.06	Pass
157	5785	24.20	23.92	509.631	27.07	29.06	Pass
165	5825	21.52	21.35	278.364	24.45	29.06	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power limit shall be reduced to 30-(6.94-6) = 29.06dBm.

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				
38	5190	17.65	17.75	117.776	20.71	29.06	Pass
46	5230	21.45	21.51	281.216	24.49	29.06	Pass
151	5755	21.48	21.62	285.816	24.56	29.06	Pass
159	5795	23.89	24.09	501.354	27.00	29.06	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power limit shall be reduced to 30-(6.94-6) = 29.06dBm.

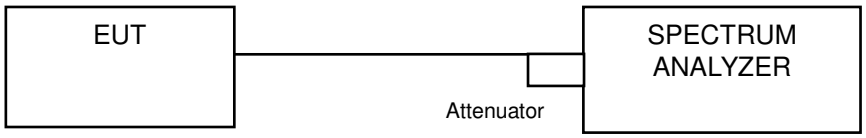
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.47	16.52	89.236	19.51	29.06	Pass
155	5775	19.14	19.05	162.388	22.11	29.06	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power limit shall be reduced to 30-(6.94-6) = 29.06dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	16.56	16.44
40	5200	25.68	23.52
48	5240	16.68	16.80
149	5745	33.84	31.80
157	5785	32.88	31.20
165	5825	18.72	18.24

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	17.64	17.64
40	5200	25.08	18.96
48	5240	17.88	17.64
149	5745	35.64	34.44
157	5785	34.44	33.00
165	5825	19.68	18.72

802.11ac (VHT40)

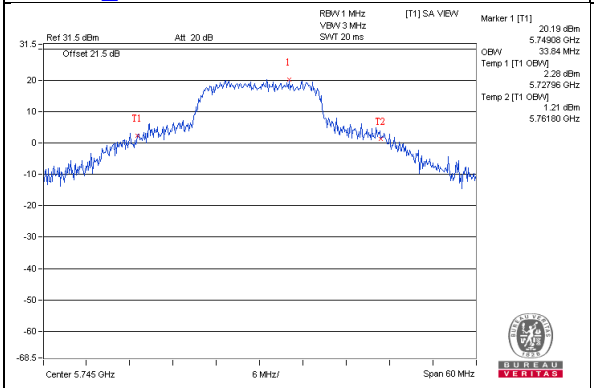
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
38	5190	36.24	36.24
46	5230	36.72	36.72
151	5755	37.44	37.44
159	5795	62.88	64.32

802.11ac (VHT80)

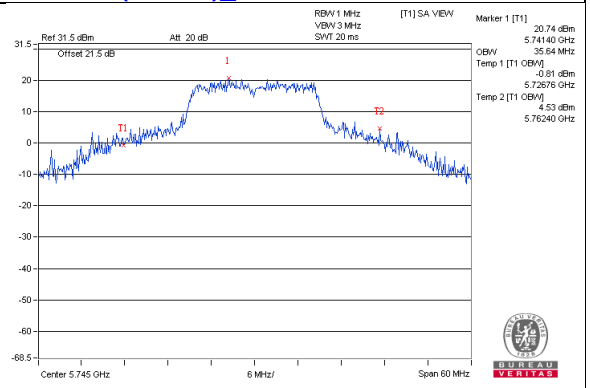
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
42	5210	75.84	76.32
155	5775	75.84	76.32

Spectrum Plot of Worst Value

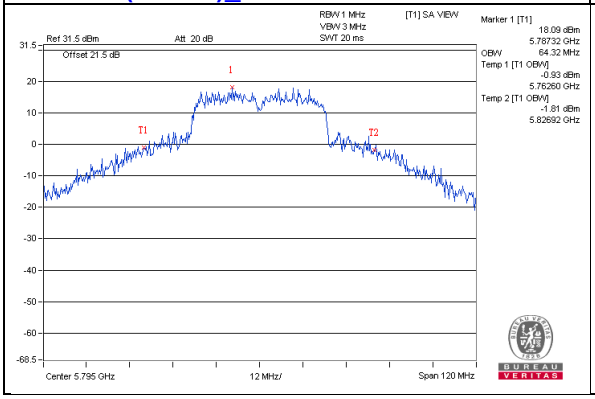
802.11a_Chain0 / CH149



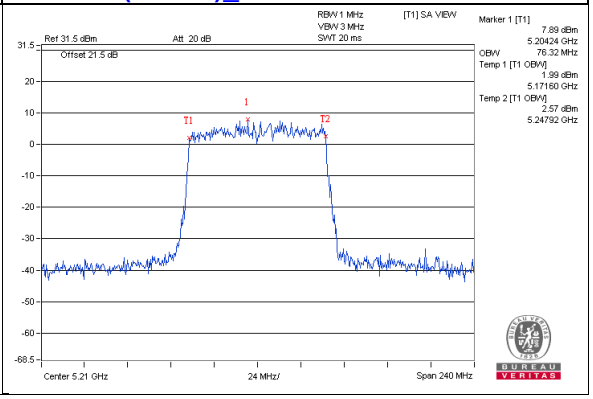
802.11ac (VHT20)_Chain0 / CH149



802.11ac (VHT40)_Chain1 / CH159

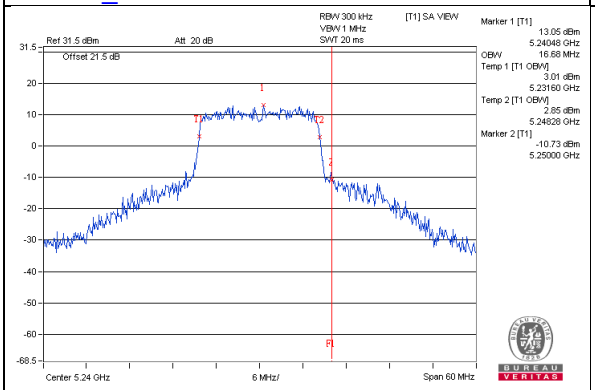


802.11ac (VHT80)_Chain1 / CH42

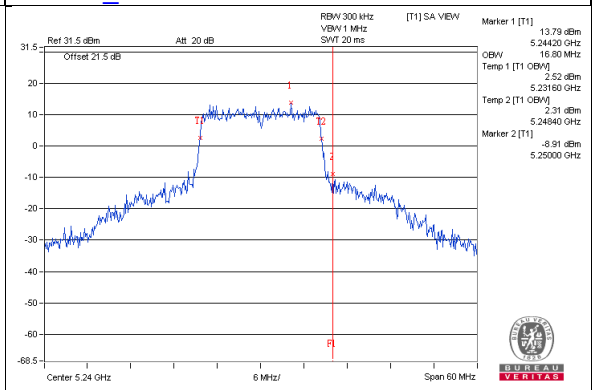


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

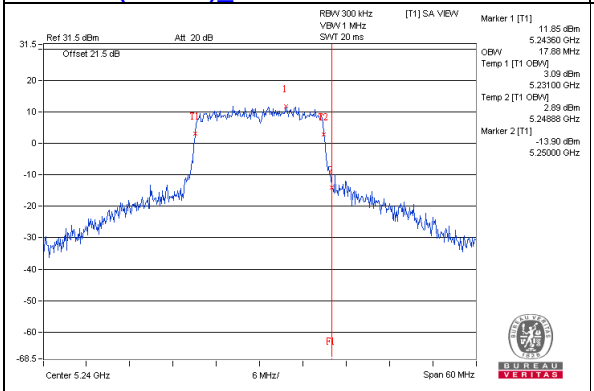
802.11a_Chain0 / CH48



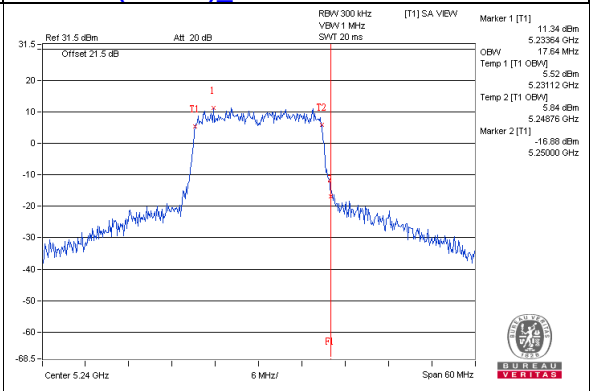
802.11a_Chain1 / CH48



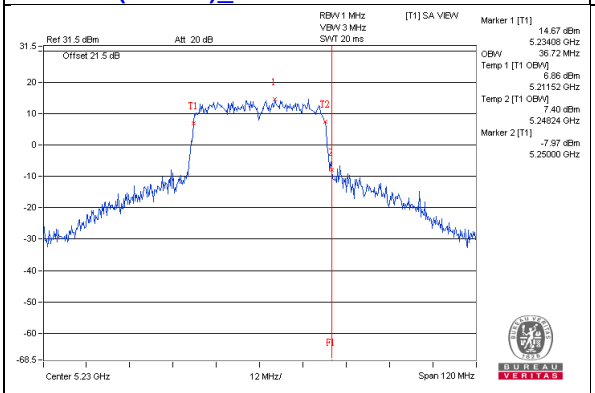
802.11ac(VHT20)_Chain0 / CH48



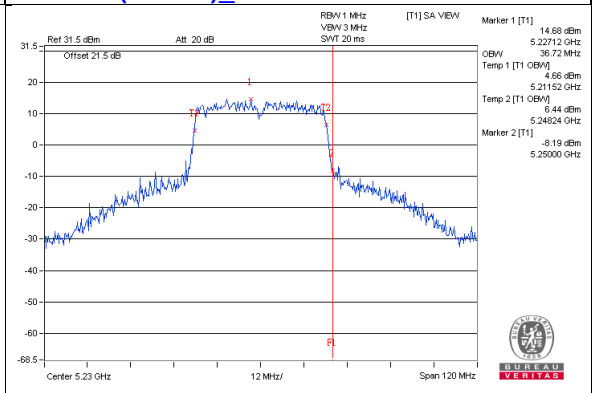
802.11ac(VHT20)_Chain1 / CH48



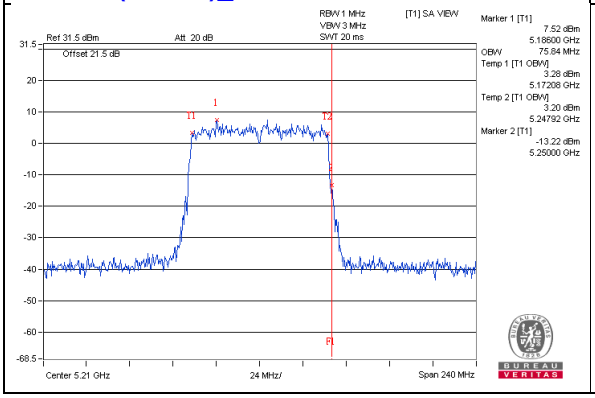
802.11ac(VHT40)_Chain0 / CH46



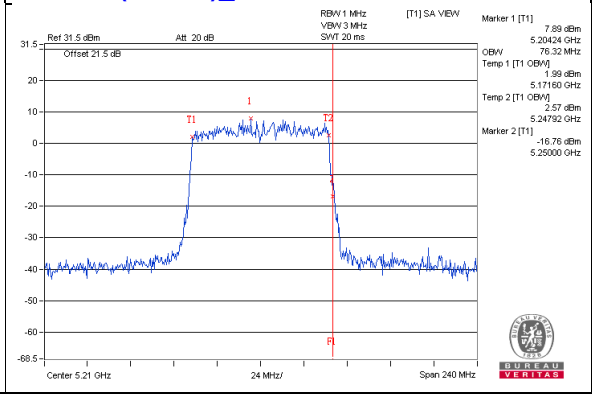
802.11ac(VHT40)_Chain1 / CH46



802.11ac(VHT80)_Chain0 / CH42

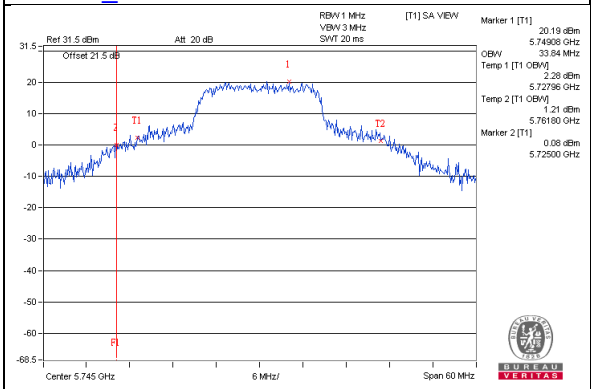


802.11ac(VHT80)_Chain1 / CH42

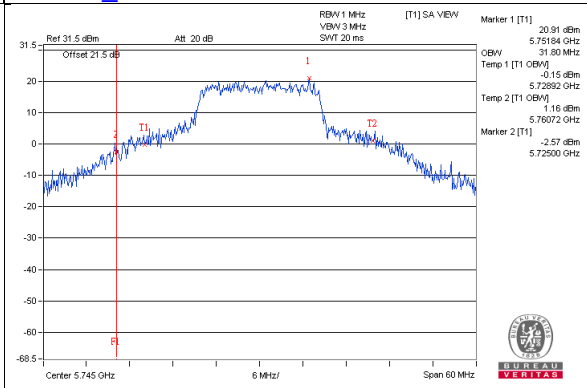


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

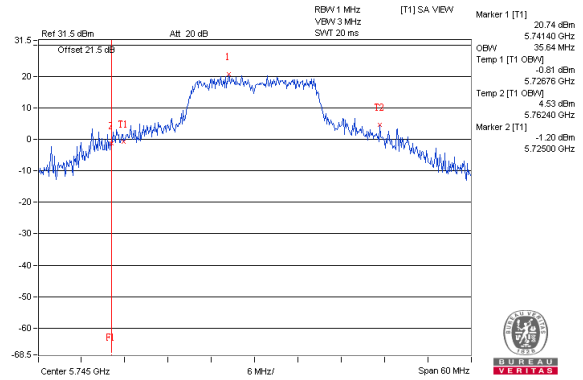
802.11a_Chain0 / CH149



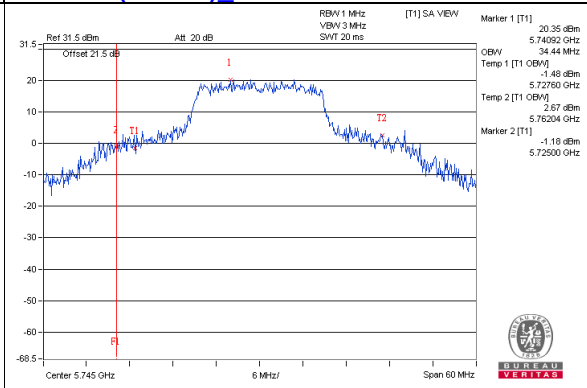
802.11a_Chain1 / CH149



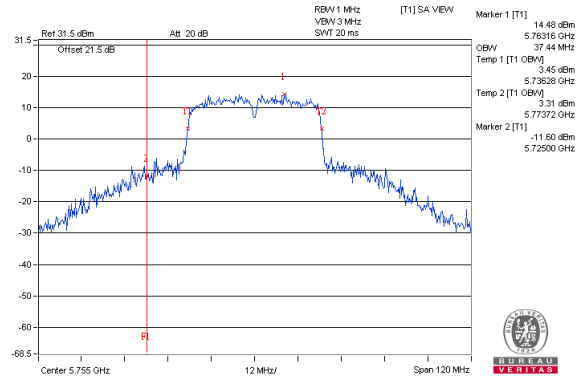
802.11ac(VHT20)_Chain0 / CH149



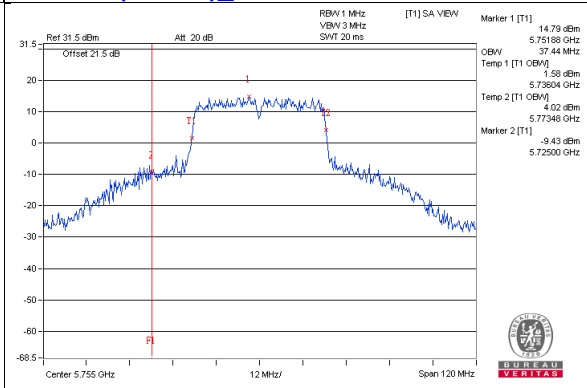
802.11ac(VHT20)_Chain1 / CH149



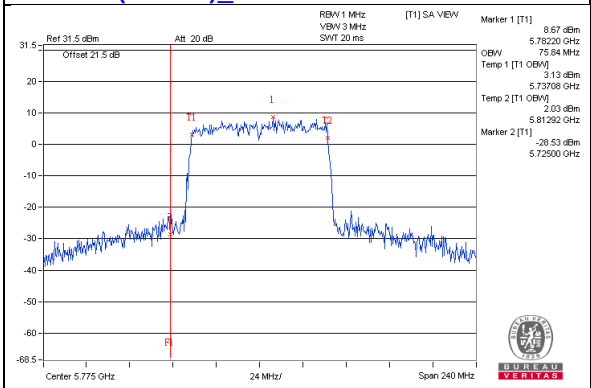
802.11ac(VHT40)_Chain0 / CH151



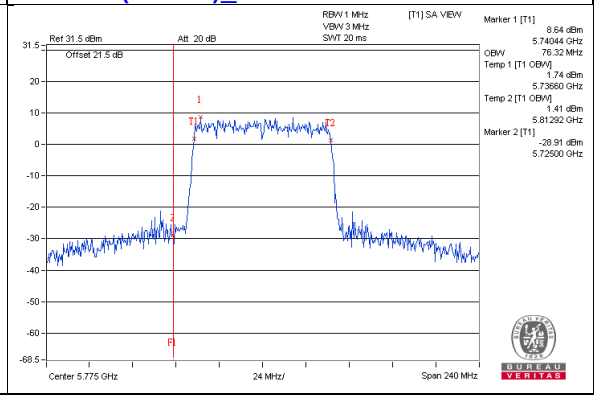
802.11ac(VHT40)_Chain1 / CH151



802.11ac(VHT80)_Chain0 / CH155



802.11ac(VHT80)_Chain1 / CH155

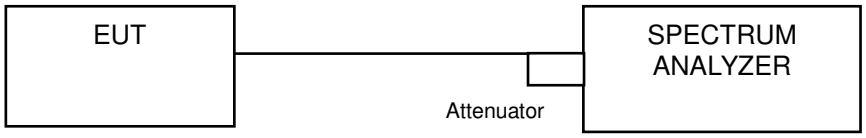


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

802.11ac (VHT20)

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

802.11a, 802.11ac (VHT40), 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)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	5.62	5.00	0.17	8.50	16.06	Pass
40	5200	9.91	9.44	0.17	12.86	16.06	Pass
48	5240	8.01	8.16	0.17	11.26	16.06	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 17-(6.94-6) = 16.06dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.02	4.94	8.52	16.06	Pass
40	5200	9.63	8.57	12.14	16.06	Pass
48	5240	7.96	6.69	10.38	16.06	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 17-(6.94-6) = 16.06dBm.

802.11ac (VHT40)

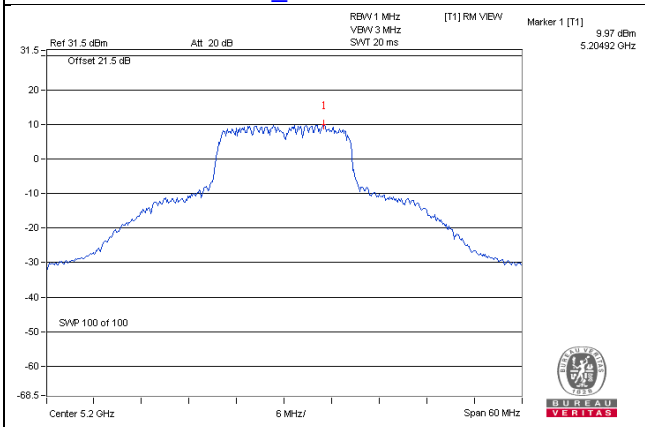
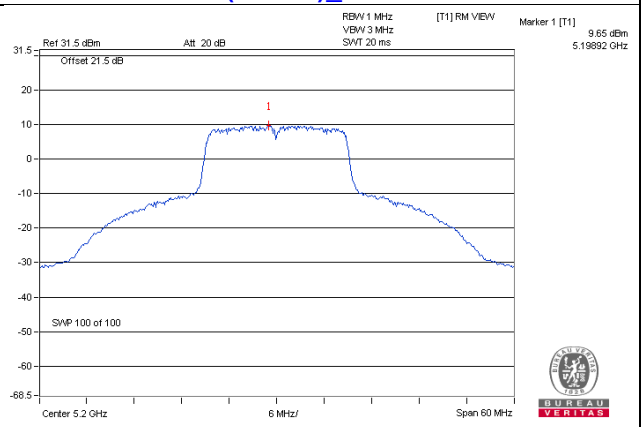
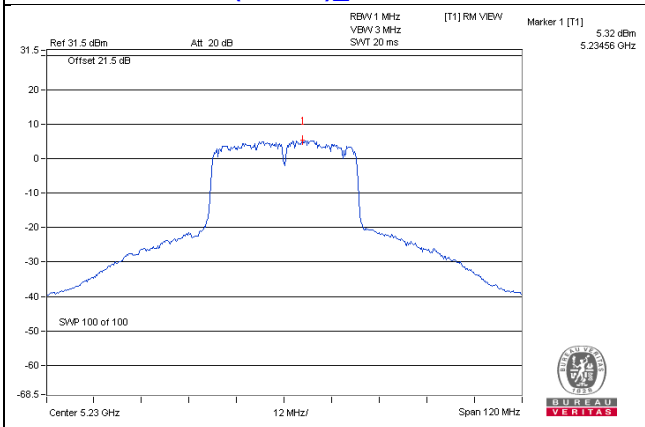
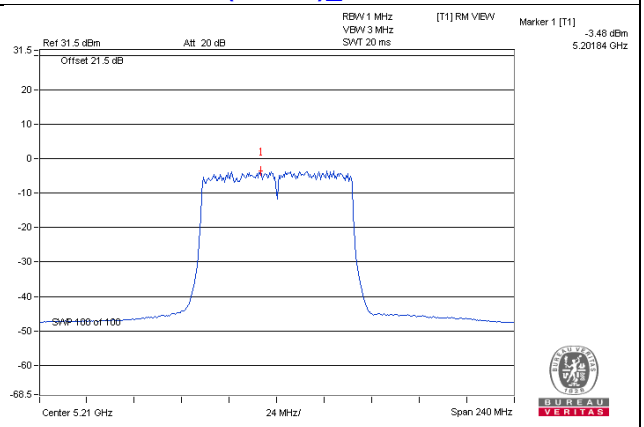
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	1.08	1.48	0.14	4.43	16.06	Pass
46	5230	5.18	5.04	0.14	8.26	16.06	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 17-(6.94-6) = 16.06dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)		Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-3.56	-3.64	0.29	-0.30	16.06	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 17-(6.94-6) = 16.06dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH40	**802.11ac (VHT20)_Chain 0 / CH40**
	
802.11ac (VHT40)_Chain 0 / CH46	**802.11ac (VHT80)_Chain 1 / CH42**
	

For U-NII-3:

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	2.68	4.90	3.01	0.17	8.08	29.06	Pass
	157	5785	2.01	4.23	3.01	0.17	7.41	29.06	Pass
	165	5825	-0.49	1.73	3.01	0.17	4.91	29.06	Pass
1	149	5745	2.65	4.87	3.01	0.17	8.05	29.06	Pass
	157	5785	2.49	4.71	3.01	0.17	7.89	29.06	Pass
	165	5825	-0.37	1.85	3.01	0.17	5.03	29.06	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 30-(6.94-6) = 29.06dBm.

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

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	2.68	4.90	3.01	7.91	29.06	Pass
	157	5785	1.96	4.18	3.01	7.19	29.06	Pass
	165	5825	-0.49	1.73	3.01	4.74	29.06	Pass
1	149	5745	2.47	4.69	3.01	7.70	29.06	Pass
	157	5785	2.13	4.35	3.01	7.36	29.06	Pass
	165	5825	0.18	2.40	3.01	5.41	29.06	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 30-(6.94-6) = 29.06dBm.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-3.49	-1.27	3.01	0.14	1.88	29.06	Pass
	159	5795	-1.60	0.62	3.01	0.14	3.77	29.06	Pass
1	151	5755	-3.03	-0.81	3.01	0.14	2.34	29.06	Pass
	159	5795	-1.43	0.79	3.01	0.14	3.94	29.06	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 30-(6.94-6) = 29.06dBm.

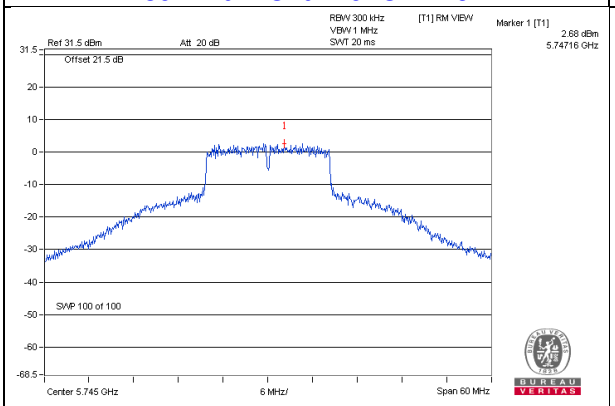
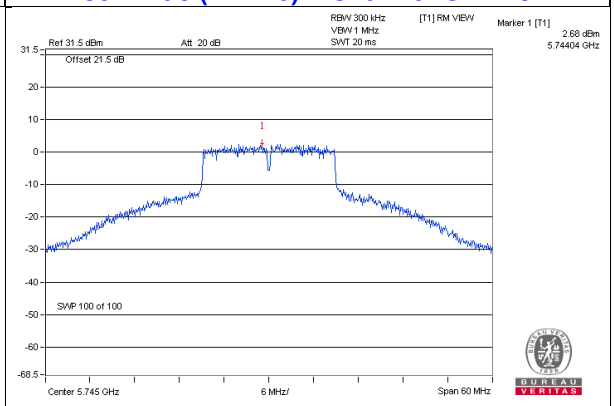
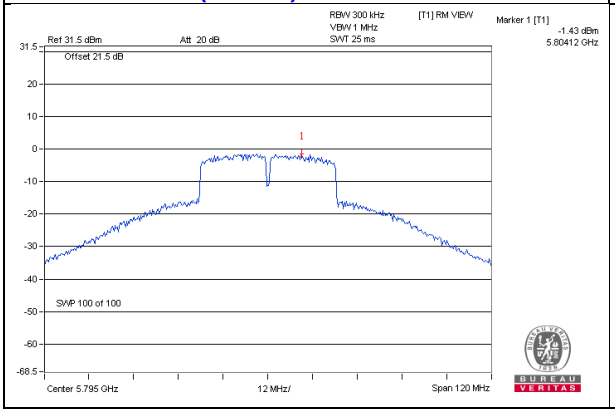
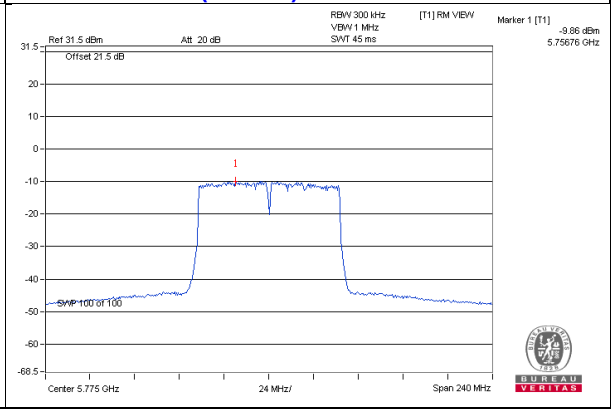
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-10.01	-7.79	3.01	0.29	-4.49	29.06	Pass
1	155	5775	-9.86	-7.64	3.01	0.29	-4.34	29.06	Pass

Note: 1. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.94dBi > 6dBi , so the power density limit shall be reduced to 30-(6.94-6) = 29.06dBm.

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

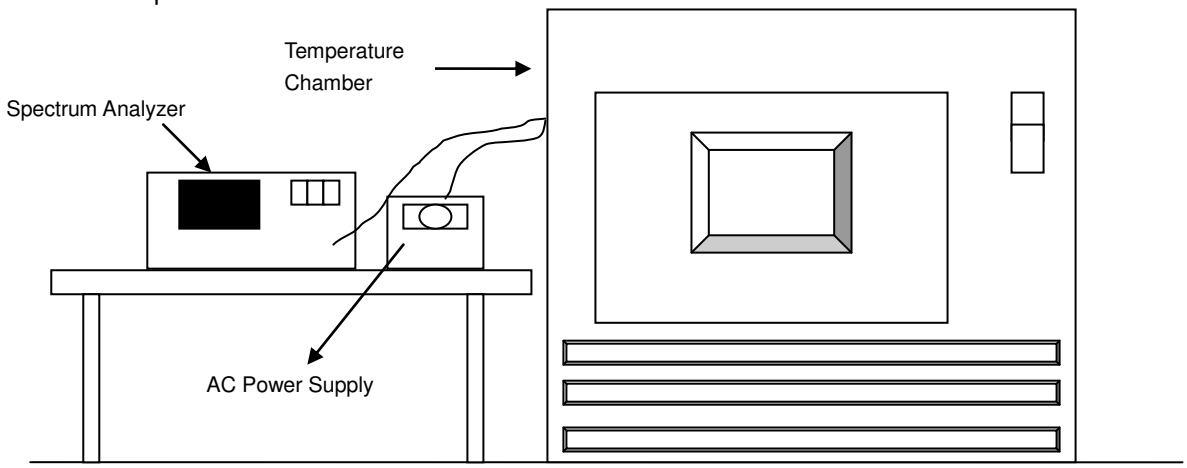
Spectrum Plot of Worst Value	
802.11a – Chain 0: CH 149	**802.11ac (VHT20) – Chain 0: CH 149**
	
802.11ac (VHT40) – Chain 1: CH 159	**802.11ac (VHT80) – Chain 1: CH 155**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 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	5179.9794	PASS	5179.9772	PASS	5179.9781	PASS	5179.9805	PASS
40	120	5179.9946	PASS	5179.9934	PASS	5179.9976	PASS	5179.9934	PASS
30	120	5180.0225	PASS	5180.0188	PASS	5180.0187	PASS	5180.0225	PASS
20	120	5179.9834	PASS	5179.9833	PASS	5179.9825	PASS	5179.9804	PASS
10	120	5180.0184	PASS	5180.0156	PASS	5180.016	PASS	5180.0162	PASS
0	120	5179.9898	PASS	5179.99	PASS	5179.9869	PASS	5179.9879	PASS
-10	120	5180.0035	PASS	5180.0046	PASS	5180.0026	PASS	5180.0055	PASS
-20	120	5179.9835	PASS	5179.9874	PASS	5179.9883	PASS	5179.9864	PASS
-30	120	5180.0226	PASS	5180.0252	PASS	5180.0249	PASS	5180.0226	PASS

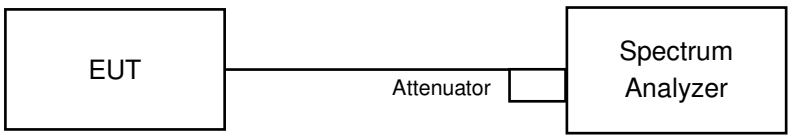
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9826	PASS	5179.9836	PASS	5179.9815	PASS	5179.98	PASS
	120	5179.9834	PASS	5179.9833	PASS	5179.9825	PASS	5179.9804	PASS
	102	5179.9839	PASS	5179.983	PASS	5179.9832	PASS	5179.9813	PASS

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.31	16.31	0.5	PASS
157	5785	16.00	16.34	0.5	PASS
165	5825	16.06	16.34	0.5	PASS

802.11ac (VHT20)

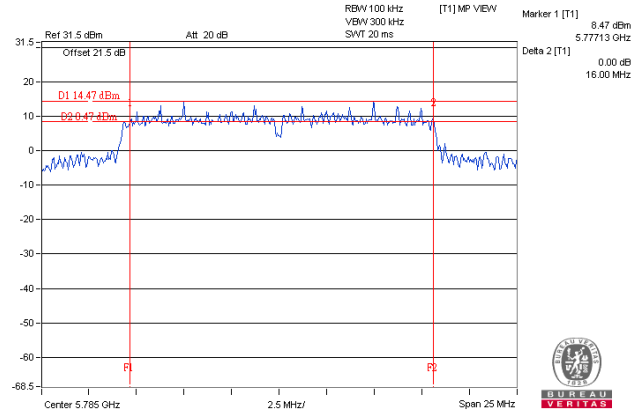
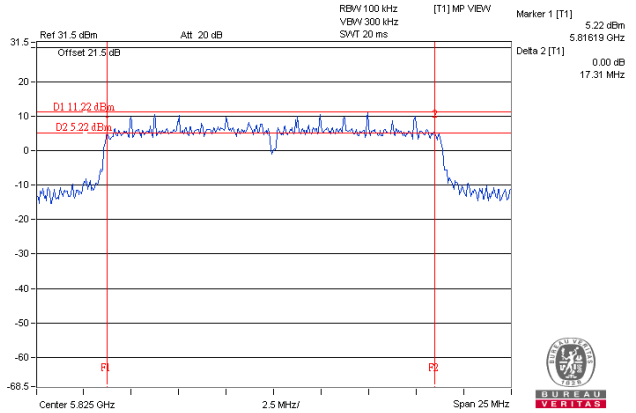
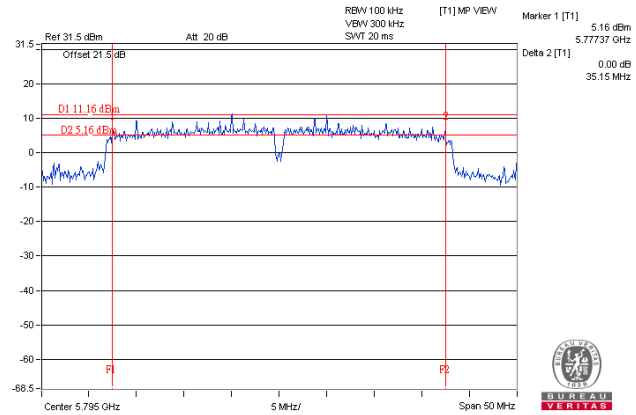
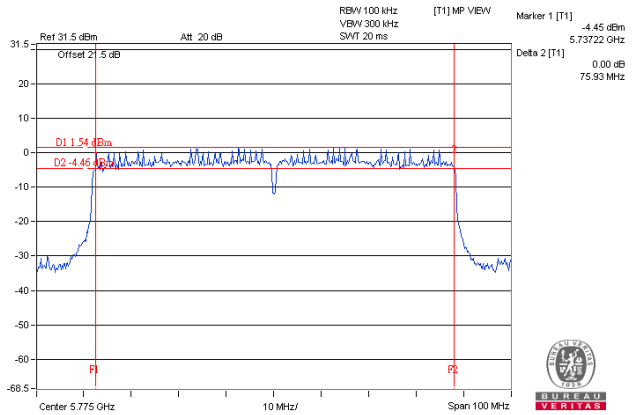
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.62	17.62	0.5	PASS
157	5785	17.62	17.61	0.5	PASS
165	5825	17.31	16.96	0.5	PASS

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.31	35.20	0.5	PASS
159	5795	35.76	35.15	0.5	PASS

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.93	76.00	0.5	PASS

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH157	**802.11ac (VHT20)_Chain 0 / CH165**
	
802.11ac (VHT40)_Chain 1 / CH159	**802.11ac (VHT80)_Chain 0 / CH155**
	

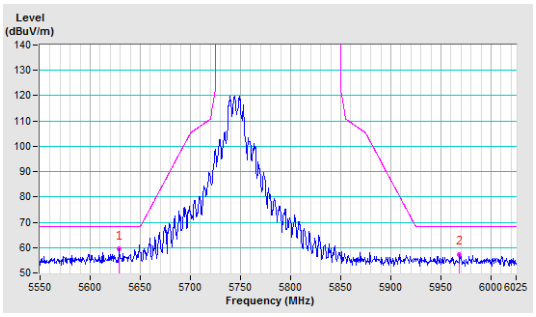
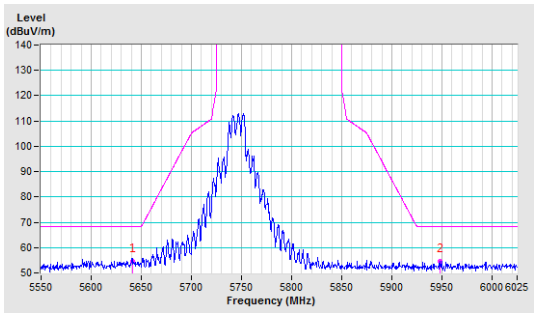
5 Pictures of Test Arrangements

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

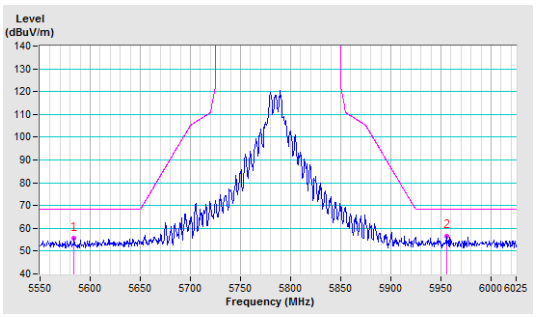
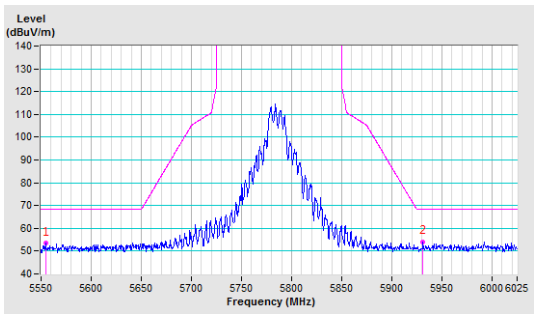
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

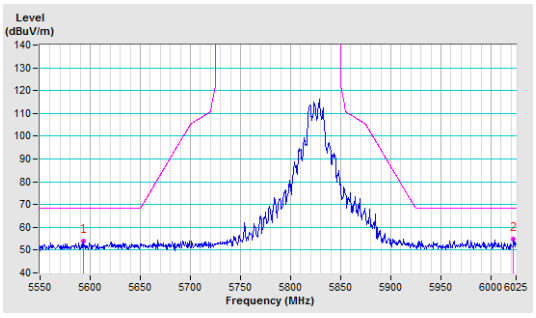
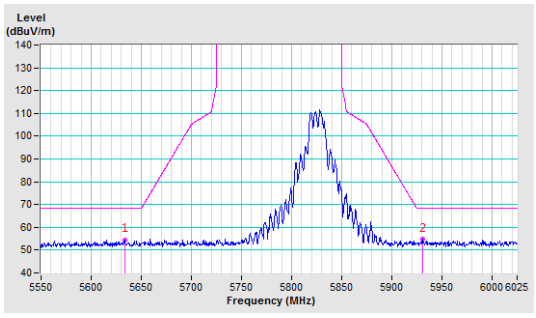
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

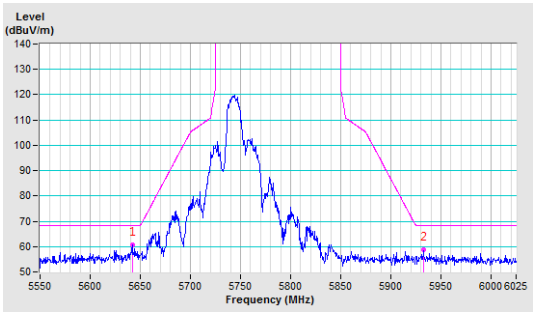
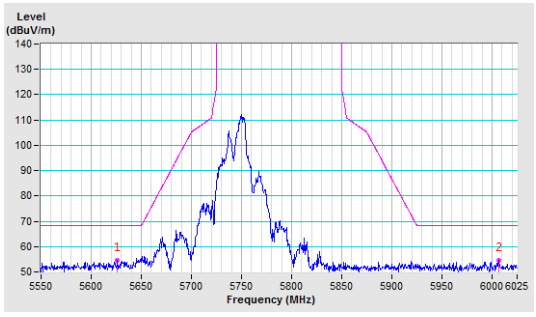
Horizontal	Vertical
	

CH 165 5825 MHz

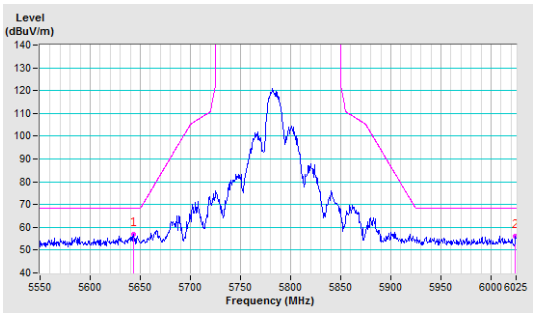
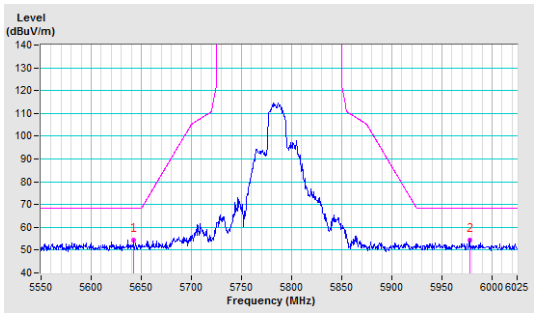
Horizontal	Vertical
	

802.11ac (VHT20)

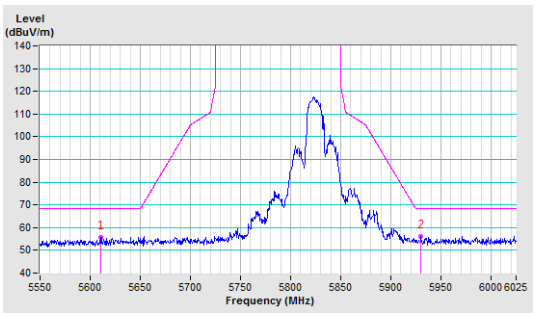
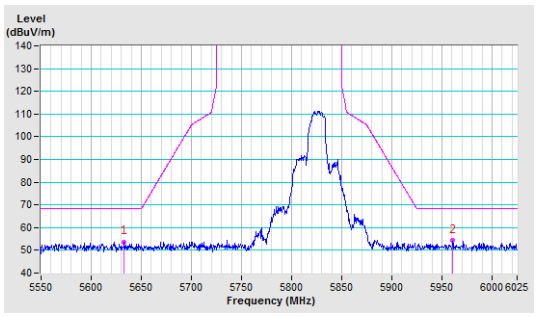
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

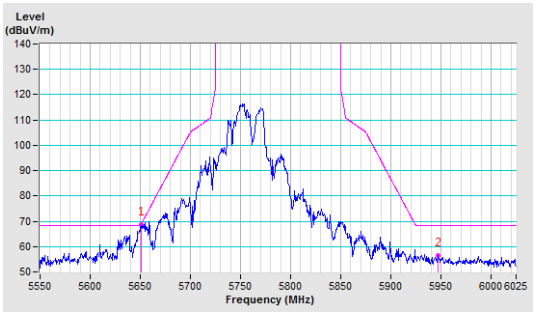
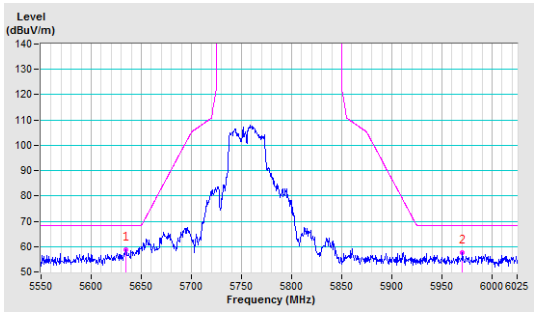
Horizontal	Vertical
	

CH 165 5825 MHz

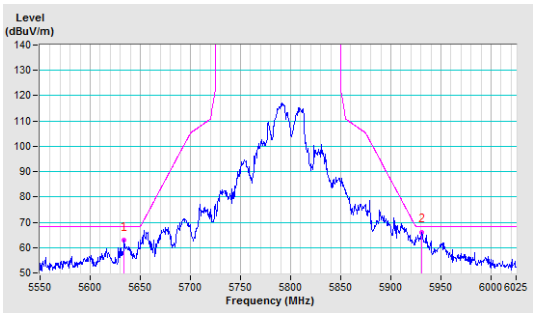
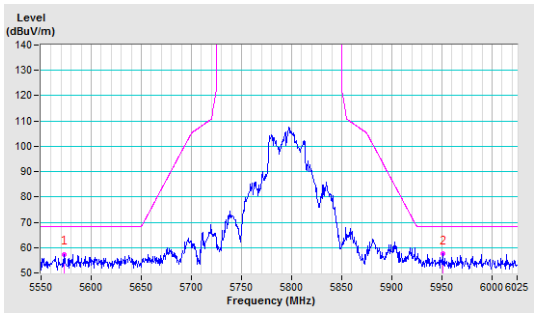
Horizontal	Vertical
	

802.11ac (VHT40)

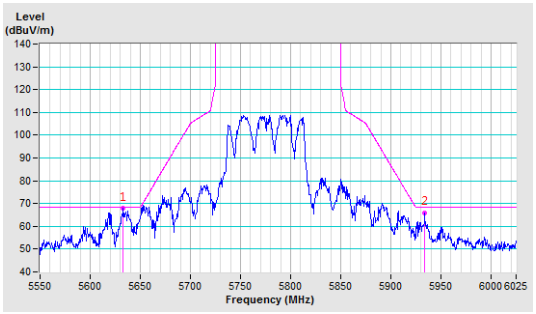
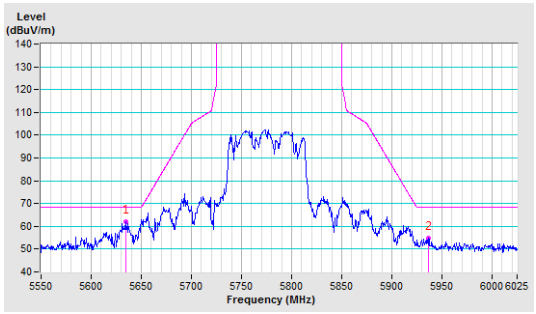
CH 151 5755 MHz

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:

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

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

--- END ---