FCC Test Report

Report No.:	RF180129E01-1
FCC ID:	HEDSSW2AC2600
Test Model:	SS-W2-AC2600
Received Date:	Jan. 29, 2018
Test Date:	Feb. 04 to 14, 2018
Issued Date:	Feb. 26, 2018
Applicant:	Accton Technology Corporation
Address:	No.1, Creation Rd. III, Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.
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:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF180129E01-1	Original release.	Feb. 26, 2018

1 Certificate of Conformity

Product:	SunSpot Wave 2
Brand:	IgniteNet
Test Model:	SS-W2-AC2600
Sample Status:	ENGINEERING SAMPLE
Applicant:	Accton Technology Corporation
Test Date:	Feb. 04 to 14, 2018
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** Feb. 26, 2018
Phoenix Huang / Specialist

Approved by : _____ , **Date:** Feb. 26, 2018
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 -0.5dB at 21.83594MHz.
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 -0.2dB at 5150.00MHz and 5350.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex 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	5.53 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	SunSpot Wave 2
Brand	IgniteNet
Test Model	SS-W2-AC2600
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter or 55Vdc from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
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): 2 802.11ac (VHT80+80): 1 set
Output Power	**2.412 ~ 2.462GHz:** 661.408mW **5.18 ~ 5.24GHz:** 319.264mW **5.745 ~ 5.825GHz:** 649.931mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. This device must needs installed by professional service personnel.
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 EUT must be supplied with a power adapter or POE (only for test not for sale) as following table:

Adapter			
No.	Brand	Model No.	Spec.
1	APD	WA-24Q12FU	Input: 100-240Vac, 50~60Hz, 0.7A Output: 12Vdc, 2.0A DC output cable (Unshielded, 1.8m)
2	MASS POWER	NBS12E120100VU	Input: 100-240Vac, 50/60Hz, 0.3A Output: 12Vdc, 1.0A DC output cable (Unshielded, 1.8m)

POE (Only for test not for sale)		
Brand	Model No.	Spec.
Meraki 802.3at	MA-INJ-5	Input: 100-240Vac, 50-60Hz, 1.5A Output: 55Vdc, 0.63A
Note: From above adapters and POE, the radiated emission worst case was found in **POE**. Therefore only the test data of the modes were recorded in this report individually.		

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

Antenna No.	Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connecter Type
1	NA	NA	5.7	2.4~2.4835	PCB	i-pex
			7.9	5.15~5.25		
			7.7	5.25~5.35		
			6	5.47~5.725		
			5.9	5.725~5.85		
2	NA	NA	6.5	2.4~2.4835	PCB	i-pex
			8	5.15~5.25		
			8	5.25~5.35		
			7.7	5.47~5.725		
			7.8	5.725~5.85		
3	NA	NA	5.8	2.4~2.4835	PCB	i-pex
			7.8	5.15~5.25		
			8	5.25~5.35		
			5.7	5.47~5.725		
			7.1	5.725~5.85		
4	NA	NA	5	2.4~2.4835	PCB	i-pex
			6.7	5.15~5.25		
			6.5	5.25~5.35		
			5.5	5.47~5.725		
			7.4	5.725~5.85		

5. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	4TX	4RX
802.11g	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	4TX	4RX
802.11n (HT20)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11n (HT40)	MCS 0~7	4TX	4RX
	MCS 8~15	4TX	4RX
	MCS 16~23	4TX	4RX
	MCS 24~31	4TX	4RX
802.11ac (VHT20)	MCS0~8 Nss=1	4TX	4RX
	MCS0~8 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~8 Nss=4	4TX	4RX
802.11ac (VHT40)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX
802.11ac (VHT80)	MCS0~9 Nss=1	4TX	4RX
	MCS0~9 Nss=2	4TX	4RX
	MCS0~9 Nss=3	4TX	4RX
	MCS0~9 Nss=4	4TX	4RX
802.11ac (VHT80+VHT80)	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX

Note:
1. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

6. The above EUT information is declared by manufacturer and for more detailed features description, please refers 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	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775 MHz

For simultaneous transmission:

1 set is provided for 802.11ac (VHT80+80):

Channel	Frequency
42+155	5210MHz + 5775MHz

Note: The transmission is for noncontiguous transmission using two nonadjacent 80MHz channels.

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With POE
2	-	-	√	-	With Adapter No.: 1
3	-	-	√	-	With Adapter No.: 2

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 **Y-plane**.
2. "-"means no effect.

Radiated Emission Test (Above 1GHz):

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

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
802.11ac (VHT80+80)	5180-5240, 5745-5825	42 + 155	42 + 155	OFDM	BPSK	58.5

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	149	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

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

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240, 5745-5825	36 to 48, 149 to 165	149	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

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
802.11ac (VHT80+80)	5180-5240, 5745-5825	42 + 155	42 + 155	OFDM	BPSK	58.5

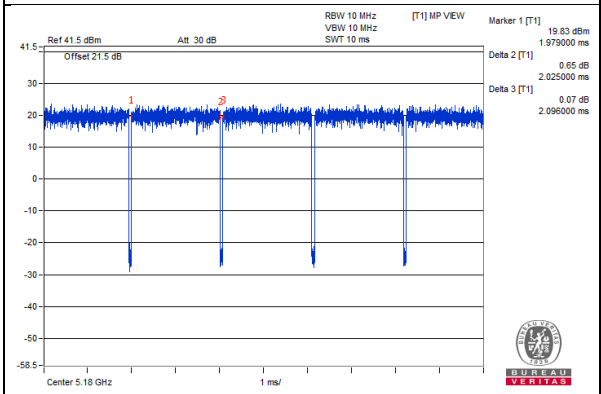
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	20deg. C, 62%RH	120Vac, 60Hz (System)	Eason Tseng
RE<1G	22deg. C, 61%RH	120Vac, 60Hz (System)	Eason Tseng
PLC	25deg. C, 70%RH	120Vac, 60Hz, 120Vac, 60Hz (System)	Andy Ho
APCM	14deg. C, 66%RH	120Vac, 60Hz (System)	Jyunchun Lin

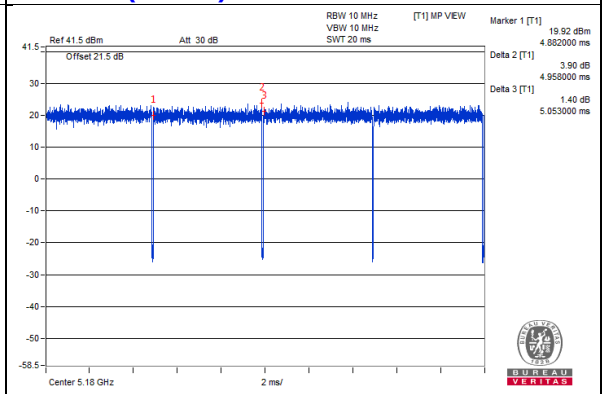
3.3 Duty Cycle of Test Signal

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 = 2.025 ms/2.096 ms = 0.966, Duty factor = 10 * log(1/ Duty cycle) = 0.15
802.11ac (VHT20): Duty cycle = 4.958 ms/5.053 ms = 0.981
802.11ac (VHT40): Duty cycle = 2.412 ms/2.483 ms = 0.971, Duty factor = 10 * log(1/ Duty cycle) = 0.13
802.11ac (VHT80): Duty cycle = 1.134 ms/1.2 ms = 0.945, Duty factor = 10 * log(1/ Duty cycle) = 0.25
802.11ac (VHT80+80): Duty cycle = 2.235 ms/2.308 ms = 0.968, Duty factor = 10 * log(1/ Duty cycle) = 0.14

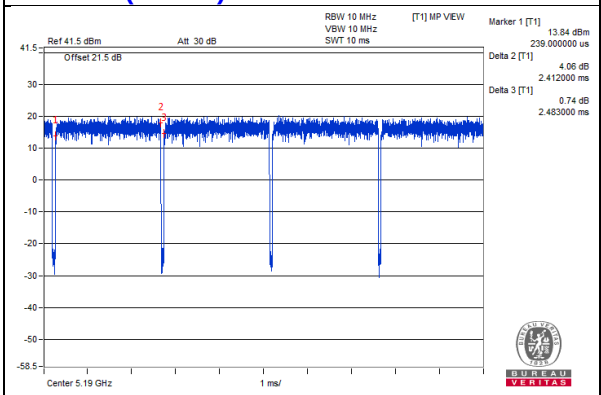
802.11a



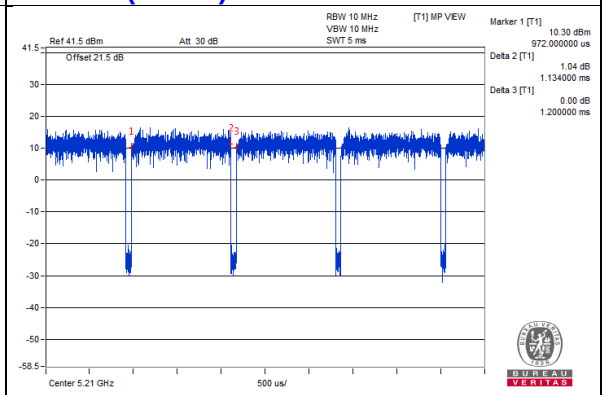
802.11ac (VHT20)



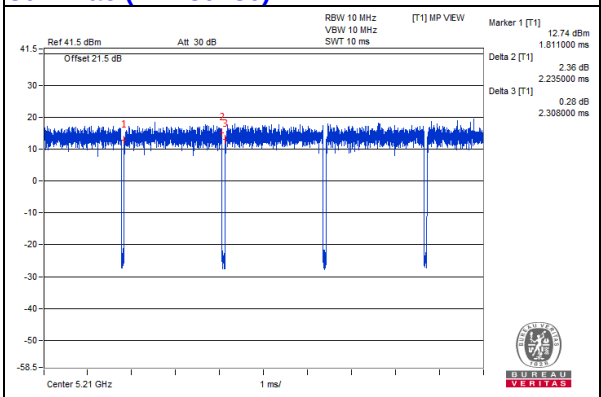
802.11ac (VHT40)



802.11ac (VHT80)



802.11ac (VHT80+80)



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.	POE	Motorola	PD-6555G300	NA	NA	Provided by client
B.	Laptop	DELL	E5430	GM1SKV1	FCC DoC	Provided by Lab
C.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

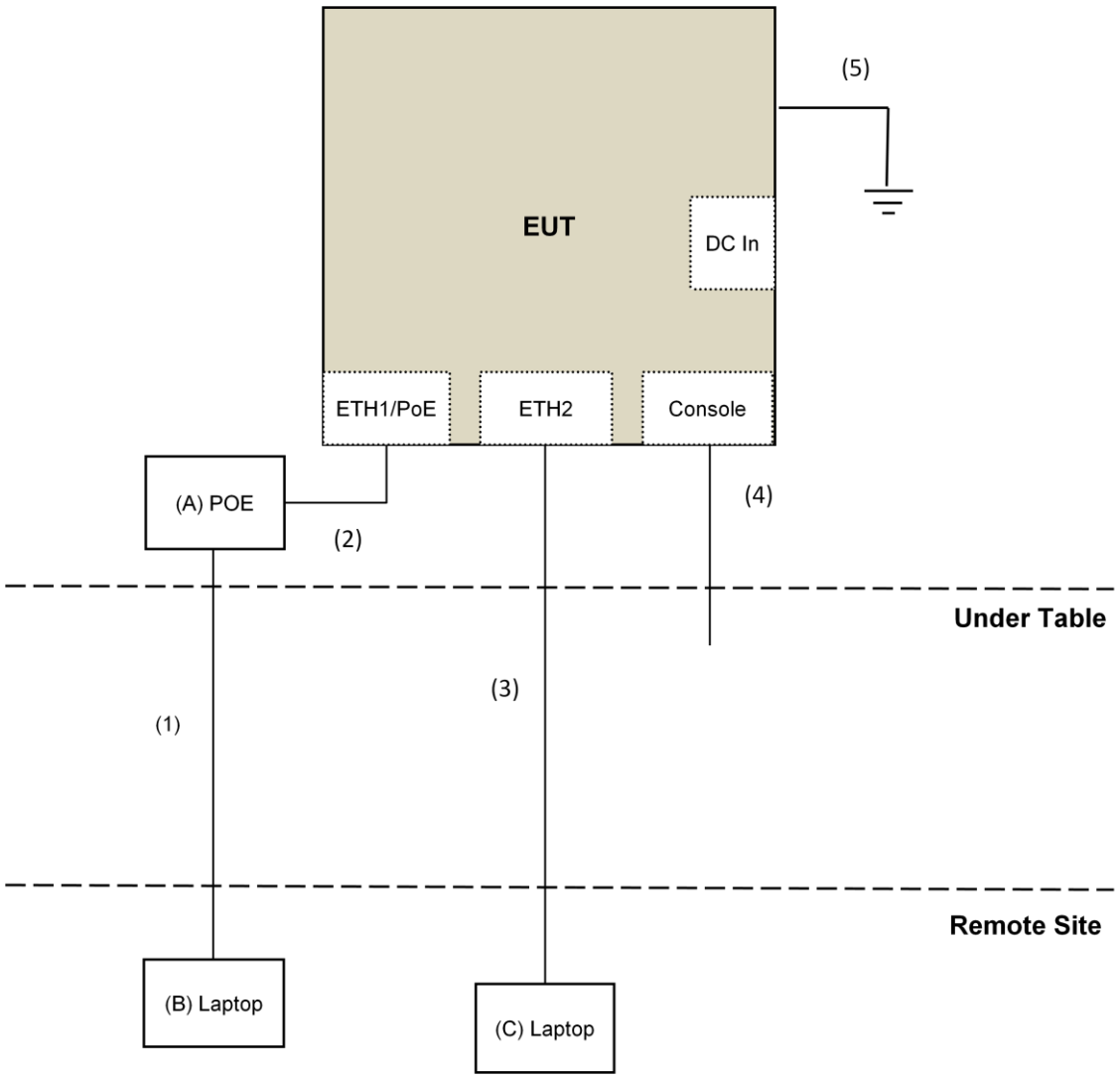
Note:

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

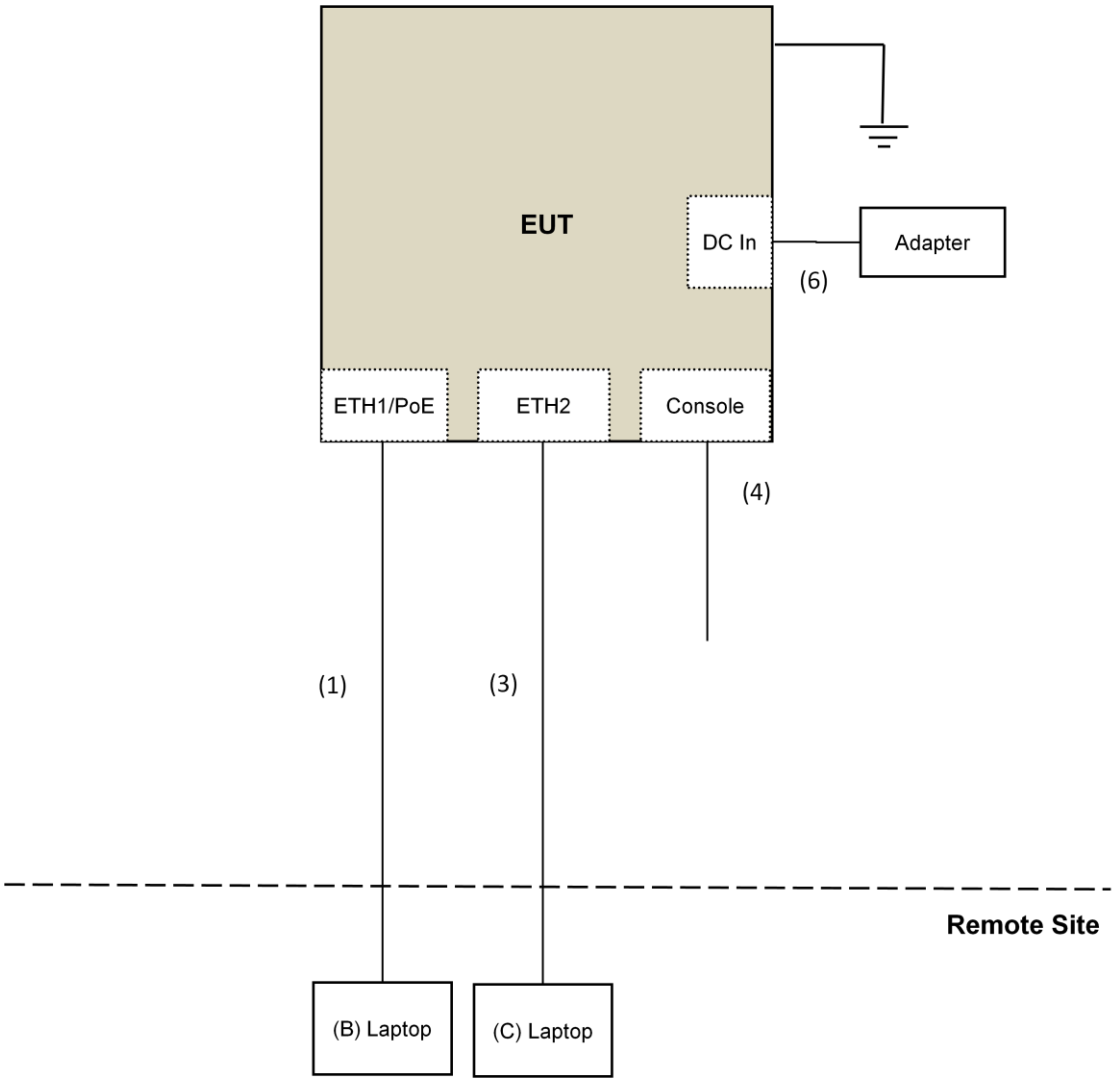
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	3	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	Console Cable	1	1.6	No	0	Provided by Lab
5.	GND	1	3	No	0	Provided by Lab
6.	DC Cable	1	1.8	No	0	Supplied by client

3.4.1 Configuration of System under Test

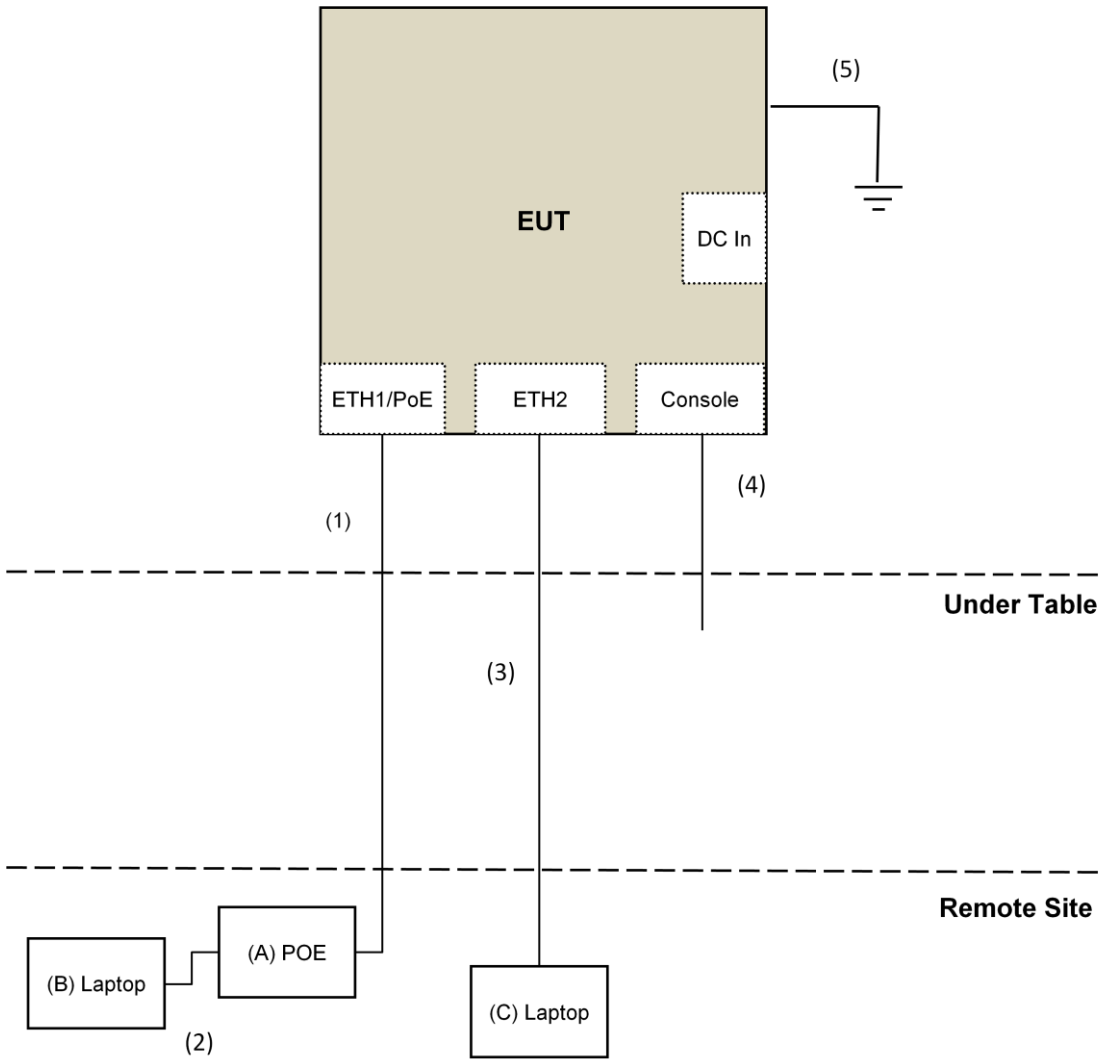
For Conducted Emission (Mode 1):



For Conducted Emission (Mode 2~3):



For Other test items:



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 v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</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 Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Loop Antenna(*) TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Software	ADT_Radiated _V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The CANADA Site Registration No. is 20331-1
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Feb. 14, 2018

For Above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 08, 2017	July 07, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980385	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Jan. 29, 2018 Jan. 29, 2018 Jan. 29, 2018	Jan. 28, 2019 Jan. 28, 2019 Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
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 Agilent	E4446A	MY48250254	Nov. 21, 2017	Nov. 20, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
DC Power Supply Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 29, 2017	May 28, 2018

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 CANADA Site Registration No. is 20331-2
4. Tested Date: Feb. 04 to 06, 2018

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 detects 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:

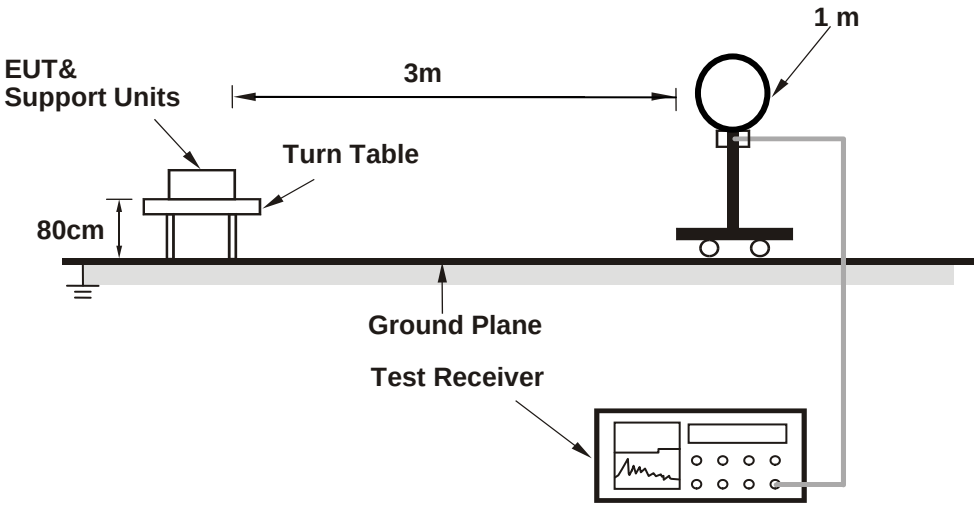
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

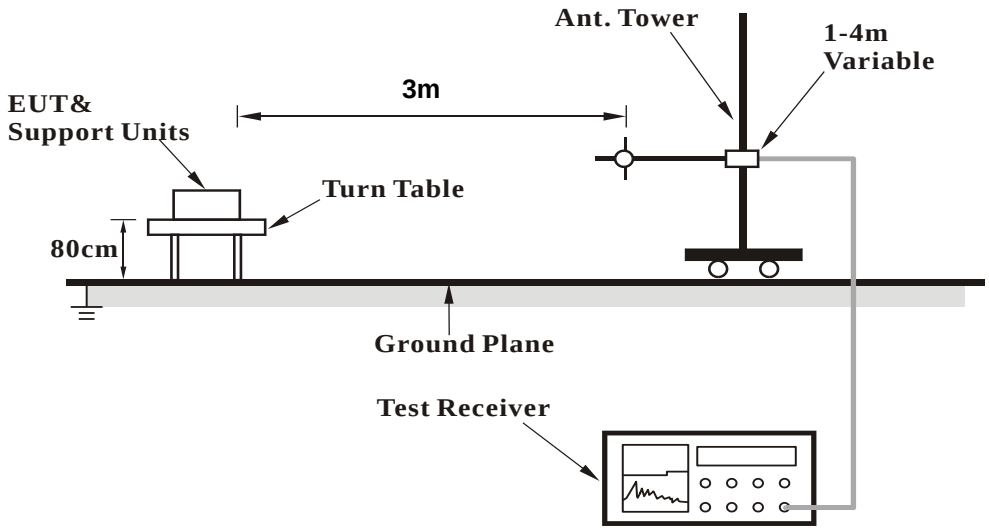
No deviation.

4.1.5 Test Setup

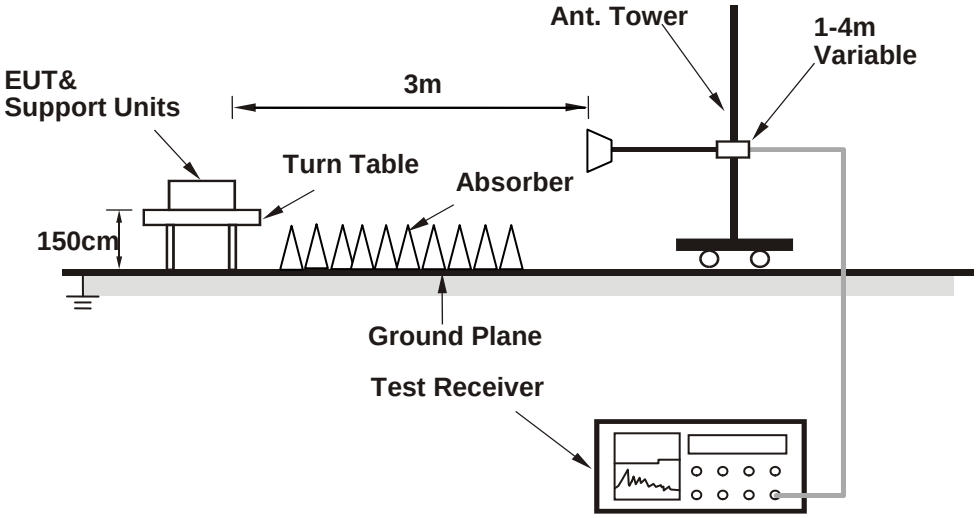
For Radiated emission below 30MHz



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. Controlling software (QDART-Connectivity100038.exe) 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	54.7 PK	74.0	-19.3	2.60 H	360	50.4	4.3
2	5150.00	50.2 AV	54.0	-3.8	2.60 H	360	45.9	4.3
3	*5180.00	116.8 PK			2.59 H	353	112.7	4.1
4	*5180.00	106.6 AV			2.59 H	353	102.5	4.1
5	#10360.00	52.6 PK	74.0	-21.4	3.33 H	308	39.3	13.3
6	#10360.00	41.9 AV	54.0	-12.1	3.33 H	308	28.6	13.3
7	15540.00	56.3 PK	74.0	-17.7	1.48 H	284	43.4	12.9
8	15540.00	46.2 AV	54.0	-7.8	1.48 H	284	33.3	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	5150.00	55.8 PK	74.0	-18.2	1.58 V	169	51.5	4.3
2	5150.00	52.2 AV	54.0	-1.8	1.58 V	169	47.9	4.3
3	*5180.00	117.2 PK			1.58 V	169	113.1	4.1
4	*5180.00	107.2 AV			1.58 V	169	103.1	4.1
5	#10360.00	57.2 PK	74.0	-16.8	3.85 V	360	43.9	13.3
6	#10360.00	44.4 AV	54.0	-9.6	3.85 V	360	31.1	13.3
7	15540.00	58.3 PK	74.0	-15.7	3.96 V	360	45.4	12.9
8	15540.00	45.6 AV	54.0	-8.4	3.96 V	360	32.7	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 40	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.6 PK	74.0	-19.4	2.59 H	359	50.3	4.3
2	5150.00	50.1 AV	54.0	-3.9	2.59 H	359	45.8	4.3
3	*5200.00	116.9 PK			2.59 H	359	112.9	4.0
4	*5200.00	106.6 AV			2.59 H	359	102.6	4.0
5	5350.00	49.1 PK	74.0	-24.9	2.59 H	359	45.1	4.0
6	5350.00	37.5 AV	54.0	-16.5	2.59 H	359	33.5	4.0
7	#10400.00	52.7 PK	74.0	-21.3	3.36 H	313	39.2	13.5
8	#10400.00	42.1 AV	54.0	-11.9	3.36 H	313	28.6	13.5
9	15600.00	56.0 PK	74.0	-18.0	1.54 H	292	42.9	13.1
10	15600.00	45.7 AV	54.0	-8.3	1.54 H	292	32.6	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.8 PK	74.0	-18.2	1.53 V	166	51.5	4.3
2	5150.00	52.6 AV	54.0	-1.4	1.53 V	166	48.3	4.3
3	*5200.00	117.3 PK			1.53 V	166	113.3	4.0
4	*5200.00	107.3 AV			1.53 V	166	103.3	4.0
5	5350.00	51.4 PK	74.0	-22.6	1.53 V	166	47.4	4.0
6	5350.00	39.2 AV	54.0	-14.8	1.53 V	166	35.2	4.0
7	#10400.00	59.2 PK	74.0	-14.8	3.87 V	360	45.7	13.5
8	#10400.00	46.2 AV	54.0	-7.8	3.87 V	360	32.7	13.5
9	15600.00	60.2 PK	74.0	-13.8	3.92 V	360	47.1	13.1
10	15600.00	47.4 AV	54.0	-6.6	3.92 V	360	34.3	13.1

REMARKS:

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

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	#3493.00	42.6 PK	74.0	-31.4	2.77 H	192	41.8	0.8
2	#3493.00	32.4 AV	54.0	-21.6	2.77 H	192	31.6	0.8
3	*5240.00	116.4 PK			2.61 H	360	112.5	3.9
4	*5240.00	106.2 AV			2.61 H	360	102.3	3.9
5	5350.00	56.1 PK	74.0	-17.9	2.61 H	360	52.1	4.0
6	5350.00	44.1 AV	54.0	-9.9	2.61 H	360	40.1	4.0
7	#6986.00	53.6 PK	74.0	-20.4	2.72 H	188	44.9	8.7
8	#6986.00	43.6 AV	54.0	-10.4	2.72 H	188	34.9	8.7
9	#10480.00	53.1 PK	74.0	-20.9	3.35 H	303	39.1	14.0
10	#10480.00	42.5 AV	54.0	-11.5	3.35 H	303	28.5	14.0
11	15720.00	56.0 PK	74.0	-18.0	1.53 H	302	42.5	13.5
12	15720.00	46.0 AV	54.0	-8.0	1.53 H	302	32.5	13.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#3493.00	42.9 PK	74.0	-31.1	1.37 V	156	42.1	0.8
2	#3493.00	33.6 AV	54.0	-20.4	1.37 V	156	32.8	0.8
3	*5240.00	117.3 PK			1.52 V	154	113.4	3.9
4	*5240.00	107.1 AV			1.52 V	154	103.2	3.9
5	5350.00	57.1 PK	74.0	-16.9	1.52 V	154	53.1	4.0
6	5350.00	46.2 AV	54.0	-7.8	1.52 V	154	42.2	4.0
7	#6986.00	53.9 PK	74.0	-20.1	1.49 V	164	45.2	8.7
8	#6986.00	43.8 AV	54.0	-10.2	1.49 V	164	35.1	8.7
9	#10480.00	58.7 PK	74.0	-15.3	3.93 V	349	44.7	14.0
10	#10480.00	45.9 AV	54.0	-8.1	3.93 V	349	31.9	14.0
11	15720.00	60.0 PK	74.0	-14.0	3.86 V	360	46.5	13.5
12	15720.00	47.3 AV	54.0	-6.7	3.86 V	360	33.8	13.5

REMARKS:

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

CHANNEL	TX Channel 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	#5644.39	66.5 PK	68.2	-1.7	3.35 H	357	62.4	4.1
2	*5745.00	119.6 PK			3.39 H	346	115.0	4.6
3	*5745.00	110.7 AV			3.39 H	346	106.1	4.6
4	#5975.87	61.9 PK	68.2	-6.3	3.35 H	357	57.2	4.7
5	11490.00	53.5 PK	74.0	-20.5	1.62 H	234	39.4	14.1
6	11490.00	43.3 AV	54.0	-10.7	1.62 H	234	29.2	14.1
7	#17235.00	48.8 PK	74.0	-25.2	1.51 H	198	31.9	16.9
8	#17235.00	39.3 AV	54.0	-14.7	1.51 H	198	22.4	16.9
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	#5653.11	65.3 PK	70.5	-5.2	1.51 V	186	61.3	4.0
2	*5745.00	121.8 PK			1.66 V	184	117.2	4.6
3	*5745.00	111.6 AV			1.66 V	184	107.0	4.6
4	#6008.80	61.4 PK	68.2	-6.8	1.51 V	186	56.7	4.7
5	11490.00	59.7 PK	74.0	-14.3	2.81 V	344	45.6	14.1
6	11490.00	50.0 AV	54.0	-4.0	2.81 V	344	35.9	14.1
7	#17235.00	51.9 PK	74.0	-22.1	3.93 V	360	35.0	16.9
8	#17235.00	43.3 AV	54.0	-10.7	3.93 V	360	26.4	16.9

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 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	#5626.07	63.3 PK	68.2	-4.9	3.36 H	343	59.1	4.2
2	*5785.00	119.4 PK			3.36 H	343	114.8	4.6
3	*5785.00	110.2 AV			3.36 H	343	105.6	4.6
4	#5942.93	63.2 PK	68.2	-5.0	3.36 H	343	58.5	4.7
5	11570.00	53.4 PK	74.0	-20.6	1.67 H	222	39.3	14.1
6	11570.00	43.4 AV	54.0	-10.6	1.67 H	222	29.3	14.1
7	#17355.00	49.1 PK	74.0	-24.9	1.51 H	214	31.3	17.8
8	#17355.00	39.5 AV	54.0	-14.5	1.51 H	214	21.7	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	#5651.86	61.9 PK	69.6	-7.7	1.69 V	190	57.9	4.0
2	*5785.00	122.3 PK			1.69 V	190	117.7	4.6
3	*5785.00	112.1 AV			1.69 V	190	107.5	4.6
4	#6016.81	62.5 PK	68.2	-5.7	1.69 V	190	57.8	4.7
5	11570.00	59.4 PK	74.0	-14.6	2.75 V	346	45.3	14.1
6	11570.00	49.7 AV	54.0	-4.3	2.75 V	346	35.6	14.1
7	#17355.00	52.1 PK	74.0	-21.9	3.96 V	360	34.3	17.8
8	#17355.00	43.4 AV	54.0	-10.6	3.96 V	360	25.6	17.8

REMARKS:

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

CHANNEL	TX Channel 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	#5603.26	62.9 PK	68.2	-5.3	3.37 H	356	58.7	4.2
2	*5825.00	119.6 PK			3.41 H	351	114.8	4.8
3	*5825.00	110.1 AV			3.41 H	351	105.3	4.8
4	#5936.16	62.0 PK	68.2	-6.2	3.37 H	356	57.3	4.7
5	11650.00	54.0 PK	74.0	-20.0	1.70 H	223	40.0	14.0
6	11650.00	43.8 AV	54.0	-10.2	1.70 H	223	29.8	14.0
7	#17475.00	49.1 PK	74.0	-24.9	1.53 H	205	30.1	19.0
8	#17475.00	39.7 AV	54.0	-14.3	1.53 H	205	20.7	19.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5609.40	62.0 PK	68.2	-6.2	1.52 V	187	57.8	4.2
2	*5825.00	122.6 PK			1.63 V	180	117.8	4.8
3	*5825.00	112.5 AV			1.63 V	180	107.7	4.8
4	#5944.86	62.9 PK	68.2	-5.3	1.52 V	187	58.2	4.7
5	11650.00	59.7 PK	74.0	-14.3	2.74 V	351	45.7	14.0
6	11650.00	50.0 AV	54.0	-4.0	2.74 V	351	36.0	14.0
7	#17475.00	52.1 PK	74.0	-21.9	4.00 V	360	33.1	19.0
8	#17475.00	43.3 AV	54.0	-10.7	4.00 V	360	24.3	19.0

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.5 PK	74.0	-13.5	2.64 H	337	56.2	4.3
2	5150.00	49.9 AV	54.0	-4.1	2.64 H	337	45.6	4.3
3	*5180.00	114.5 PK			2.64 H	337	110.4	4.1
4	*5180.00	104.9 AV			2.64 H	337	100.8	4.1
5	#10360.00	52.4 PK	74.0	-21.6	3.43 H	315	39.1	13.3
6	#10360.00	41.6 AV	54.0	-12.4	3.43 H	315	28.3	13.3
7	15540.00	55.9 PK	74.0	-18.1	1.46 H	279	43.0	12.9
8	15540.00	45.3 AV	54.0	-8.7	1.46 H	279	32.4	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	5150.00	61.7 PK	74.0	-12.3	1.65 V	175	57.4	4.3
2	5150.00	52.4 AV	54.0	-1.6	1.65 V	175	48.1	4.3
3	*5180.00	116.8 PK			1.65 V	175	112.7	4.1
4	*5180.00	106.2 AV			1.65 V	175	102.1	4.1
5	#10360.00	55.2 PK	74.0	-18.8	3.90 V	360	41.9	13.3
6	#10360.00	45.6 AV	54.0	-8.4	3.90 V	360	32.3	13.3
7	15540.00	56.9 PK	74.0	-17.1	4.00 V	360	44.0	12.9
8	15540.00	47.9 AV	54.0	-6.1	4.00 V	360	35.0	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 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	53.7 PK	74.0	-20.3	2.60 H	347	49.4	4.3
2	5150.00	49.3 AV	54.0	-4.7	2.60 H	347	45.0	4.3
3	*5200.00	114.2 PK			2.60 H	347	110.2	4.0
4	*5200.00	104.9 AV			2.60 H	347	100.9	4.0
5	5350.00	47.8 PK	74.0	-26.2	2.60 H	347	43.8	4.0
6	5350.00	36.2 AV	54.0	-17.8	2.60 H	347	32.2	4.0
7	#10400.00	52.5 PK	74.0	-21.5	3.38 H	322	39.0	13.5
8	#10400.00	41.9 AV	54.0	-12.1	3.38 H	322	28.4	13.5
9	15600.00	56.0 PK	74.0	-18.0	1.51 H	292	42.9	13.1
10	15600.00	45.5 AV	54.0	-8.5	1.51 H	292	32.4	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.8 PK	74.0	-11.2	1.63 V	169	58.5	4.3
2	5150.00	51.2 AV	54.0	-2.8	1.63 V	169	46.9	4.3
3	*5200.00	116.8 PK			1.63 V	169	112.8	4.0
4	*5200.00	106.5 AV			1.63 V	169	102.5	4.0
5	5350.00	49.3 PK	74.0	-24.7	1.63 V	169	45.3	4.0
6	5350.00	39.4 AV	54.0	-14.6	1.63 V	169	35.4	4.0
7	#10400.00	55.1 PK	74.0	-18.9	3.95 V	360	41.6	13.5
8	#10400.00	45.4 AV	54.0	-8.6	3.95 V	360	31.9	13.5
9	15600.00	56.3 PK	74.0	-17.7	3.98 V	360	43.2	13.1
10	15600.00	47.5 AV	54.0	-6.5	3.98 V	360	34.4	13.1

REMARKS:

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

CHANNEL	TX Channel 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	114.0 PK			2.59 H	360	110.1	3.9
2	*5240.00	104.6 AV			2.59 H	360	100.7	3.9
3	5350.00	48.4 PK	74.0	-25.6	2.59 H	360	44.4	4.0
4	5350.00	36.7 AV	54.0	-17.3	2.59 H	360	32.7	4.0
5	#10480.00	52.1 PK	74.0	-21.9	3.42 H	334	38.1	14.0
6	#10480.00	41.6 AV	54.0	-12.4	3.42 H	334	27.6	14.0
7	15720.00	56.1 PK	74.0	-17.9	1.47 H	282	42.6	13.5
8	15720.00	45.8 AV	54.0	-8.2	1.47 H	282	32.3	13.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	117.0 PK			1.66 V	171	113.1	3.9
2	*5240.00	106.5 AV			1.66 V	171	102.6	3.9
3	5350.00	53.7 PK	74.0	-20.3	1.66 V	171	49.7	4.0
4	5350.00	43.2 AV	54.0	-10.8	1.66 V	171	39.2	4.0
5	#10480.00	54.8 PK	74.0	-19.2	4.00 V	352	40.8	14.0
6	#10480.00	44.9 AV	54.0	-9.1	4.00 V	352	30.9	14.0
7	15720.00	56.1 PK	74.0	-17.9	3.95 V	360	42.6	13.5
8	15720.00	47.4 AV	54.0	-6.6	3.95 V	360	33.9	13.5

REMARKS:

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

CHANNEL	TX Channel 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	#5653.34	67.2 PK	70.7	-3.5	3.17 H	356	63.2	4.0
2	*5745.00	118.3 PK			3.25 H	344	113.7	4.6
3	*5745.00	109.3 AV			3.25 H	344	104.7	4.6
4	#5998.92	62.0 PK	68.2	-6.2	3.17 H	356	57.3	4.7
5	11490.00	53.9 PK	74.0	-20.1	1.73 H	218	39.8	14.1
6	11490.00	44.0 AV	54.0	-10.0	1.73 H	218	29.9	14.1
7	#17235.00	48.7 PK	74.0	-25.3	1.43 H	208	31.8	16.9
8	#17235.00	39.3 AV	54.0	-14.7	1.43 H	208	22.4	16.9
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	#5651.36	63.4 PK	69.2	-5.8	1.52 V	184	59.4	4.0
2	*5745.00	120.6 PK			1.50 V	179	116.0	4.6
3	*5745.00	111.3 AV			1.50 V	179	106.7	4.6
4	#5961.81	59.3 PK	68.2	-8.9	1.52 V	184	54.6	4.7
5	11490.00	62.1 PK	74.0	-11.9	3.16 V	356	48.0	14.1
6	11490.00	49.8 AV	54.0	-4.2	3.16 V	356	35.7	14.1
7	#17235.00	51.5 PK	74.0	-22.5	3.98 V	360	34.6	16.9
8	#17235.00	41.2 AV	54.0	-12.8	3.98 V	360	24.3	16.9

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 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	#5552.10	62.4 PK	68.2	-5.8	3.21 H	357	58.4	4.0
2	*5785.00	118.3 PK			3.21 H	357	113.7	4.6
3	*5785.00	109.5 AV			3.21 H	357	104.9	4.6
4	#5931.79	61.0 PK	68.2	-7.2	3.21 H	357	56.3	4.7
5	11570.00	53.5 PK	74.0	-20.5	1.70 H	217	39.4	14.1
6	11570.00	43.6 AV	54.0	-10.4	1.70 H	217	29.5	14.1
7	#17355.00	49.3 PK	74.0	-24.7	1.47 H	212	31.5	17.8
8	#17355.00	39.7 AV	54.0	-14.3	1.47 H	212	21.9	17.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5643.01	61.8 PK	68.2	-6.4	1.46 V	180	57.7	4.1
2	*5785.00	120.8 PK			1.46 V	180	116.2	4.6
3	*5785.00	111.5 AV			1.46 V	180	106.9	4.6
4	#6012.64	63.2 PK	68.2	-5.0	1.46 V	180	58.5	4.7
5	11570.00	62.1 PK	74.0	-11.9	3.21 V	342	48.0	14.1
6	11570.00	50.1 AV	54.0	-3.9	3.21 V	342	36.0	14.1
7	#17355.00	52.2 PK	74.0	-21.8	3.96 V	352	34.4	17.8
8	#17355.00	41.6 AV	54.0	-12.4	3.96 V	352	23.8	17.8

REMARKS:

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

CHANNEL	TX Channel 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	#5609.47	62.7 PK	68.2	-5.5	3.11 H	342	58.5	4.2
2	*5825.00	118.5 PK			3.19 H	346	113.7	4.8
3	*5825.00	109.4 AV			3.19 H	346	104.6	4.8
4	#5925.71	62.2 PK	68.2	-6.0	3.11 H	342	57.5	4.7
5	11650.00	53.8 PK	74.0	-20.2	1.70 H	225	39.8	14.0
6	11650.00	43.8 AV	54.0	-10.2	1.70 H	225	29.8	14.0
7	#17475.00	49.1 PK	74.0	-24.9	1.52 H	215	30.1	19.0
8	#17475.00	39.8 AV	54.0	-14.2	1.52 H	215	20.8	19.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5571.07	62.4 PK	68.2	-5.8	1.61 V	188	58.3	4.1
2	*5825.00	120.9 PK			1.46 V	167	116.1	4.8
3	*5825.00	111.5 AV			1.46 V	167	106.7	4.8
4	#5941.83	62.0 PK	68.2	-6.2	1.61 V	188	57.3	4.7
5	11650.00	62.2 PK	74.0	-11.8	3.23 V	336	48.2	14.0
6	11650.00	50.0 AV	54.0	-4.0	3.23 V	336	36.0	14.0
7	#17475.00	52.1 PK	74.0	-21.9	3.98 V	347	33.1	19.0
8	#17475.00	41.4 AV	54.0	-12.6	3.98 V	347	22.4	19.0

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.5 PK	74.0	-12.5	2.60 H	337	57.2	4.3
2	5150.00	49.2 AV	54.0	-4.8	2.60 H	337	44.9	4.3
3	*5190.00	110.8 PK			2.55 H	355	106.7	4.1
4	*5190.00	101.5 AV			2.55 H	355	97.4	4.1
5	5350.00	47.8 PK	74.0	-26.2	2.60 H	337	43.8	4.0
6	5350.00	36.7 AV	54.0	-17.3	2.60 H	337	32.7	4.0
7	#10380.00	51.5 PK	74.0	-22.5	3.40 H	327	38.1	13.4
8	#10380.00	40.3 AV	54.0	-13.7	3.40 H	327	26.9	13.4
9	15570.00	52.5 PK	74.0	-21.5	1.51 H	277	39.5	13.0
10	15570.00	41.6 AV	54.0	-12.4	1.51 H	277	28.6	13.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.7 PK	74.0	-8.3	1.78 V	167	61.4	4.3
2	5150.00	53.7 AV	54.0	-0.3	1.78 V	167	49.4	4.3
3	*5190.00	112.4 PK			1.78 V	167	108.3	4.1
4	*5190.00	103.2 AV			1.78 V	167	99.1	4.1
5	5350.00	51.9 PK	74.0	-22.1	1.78 V	167	47.9	4.0
6	5350.00	40.3 AV	54.0	-13.7	1.78 V	167	36.3	4.0
7	#10380.00	55.3 PK	74.0	-18.7	3.36 V	350	41.9	13.4
8	#10380.00	44.7 AV	54.0	-9.3	3.36 V	350	31.3	13.4
9	15570.00	56.2 PK	74.0	-17.8	3.94 V	360	43.2	13.0
10	15570.00	45.6 AV	54.0	-8.4	3.94 V	360	32.6	13.0

REMARKS:

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

CHANNEL	TX Channel 46	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	*5230.00	113.2 PK			2.60 H	337	109.3	3.9
2	*5230.00	104.5 AV			2.60 H	337	100.6	3.9
3	5350.00	59.4 PK	74.0	-14.6	2.60 H	337	55.4	4.0
4	5350.00	49.2 AV	54.0	-4.8	2.60 H	337	45.2	4.0
5	#10460.00	52.3 PK	74.0	-21.7	3.41 H	325	38.4	13.9
6	#10460.00	41.1 AV	54.0	-12.9	3.41 H	325	27.2	13.9
7	15690.00	53.8 PK	74.0	-20.2	1.45 H	281	40.2	13.6
8	15690.00	42.3 AV	54.0	-11.7	1.45 H	281	28.7	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	115.4 PK			1.69 V	168	111.5	3.9
2	*5230.00	106.8 AV			1.69 V	168	102.9	3.9
3	5350.00	63.6 PK	74.0	-10.4	1.69 V	168	59.6	4.0
4	**5350.00**	**53.8 AV**	**54.0**	**-0.2**	**1.69 V**	**168**	**49.8**	**4.0**
5	#10460.00	56.1 PK	74.0	-17.9	3.79 V	354	42.2	13.9
6	#10460.00	45.2 AV	54.0	-8.8	3.79 V	354	31.3	13.9
7	15690.00	57.6 PK	74.0	-16.4	3.93 V	360	44.0	13.6
8	15690.00	46.4 AV	54.0	-7.6	3.93 V	360	32.8	13.6

REMARKS:

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

CHANNEL	TX Channel 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	*5755.00	116.1 PK			3.31 H	357	111.5	4.6
2	*5755.00	107.5 AV			3.31 H	357	102.9	4.6
3	#5935.02	61.2 PK	68.2	-7.0	3.31 H	357	56.5	4.7
4	#6000.31	61.2 PK	68.2	-7.0	3.31 H	357	56.5	4.7
5	11510.00	53.9 PK	74.0	-20.1	1.75 H	201	39.8	14.1
6	11510.00	43.8 AV	54.0	-10.2	1.75 H	201	29.7	14.1
7	#17265.00	49.5 PK	74.0	-24.5	1.46 H	215	32.4	17.1
8	#17265.00	40.1 AV	54.0	-13.9	1.46 H	215	23.0	17.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5648.92	66.3 PK	68.2	-1.9	1.72 V	177	62.2	4.1
2	*5755.00	118.2 PK			1.72 V	177	113.6	4.6
3	*5755.00	109.4 AV			1.72 V	177	104.8	4.6
4	#5987.02	62.6 PK	68.2	-5.6	1.72 V	177	57.9	4.7
5	11510.00	62.4 PK	74.0	-11.6	3.19 V	343	48.3	14.1
6	11510.00	50.1 AV	54.0	-3.9	3.19 V	343	36.0	14.1
7	#17265.00	52.1 PK	74.0	-21.9	3.90 V	355	35.0	17.1
8	#17265.00	41.6 AV	54.0	-12.4	3.90 V	355	24.5	17.1

REMARKS:

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

CHANNEL	TX Channel 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	#5614.42	63.1 PK	68.2	-5.1	3.30 H	360	58.9	4.2
2	*5795.00	116.1 PK			3.30 H	360	111.4	4.7
3	*5795.00	107.6 AV			3.30 H	360	102.9	4.7
4	#5974.23	62.3 PK	68.2	-5.9	3.30 H	360	57.6	4.7
5	11590.00	54.0 PK	74.0	-20.0	1.72 H	231	39.9	14.1
6	11590.00	44.1 AV	54.0	-9.9	1.72 H	231	30.0	14.1
7	#17385.00	49.1 PK	74.0	-24.9	1.46 H	220	31.1	18.0
8	#17385.00	39.4 AV	54.0	-14.6	1.46 H	220	21.4	18.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5647.40	64.6 PK	68.2	-3.6	1.64 V	179	60.5	4.1
2	*5795.00	117.9 PK			1.64 V	179	113.2	4.7
3	*5795.00	109.3 AV			1.64 V	179	104.6	4.7
4	#5928.80	64.8 PK	68.2	-3.4	1.64 V	179	60.1	4.7
5	11590.00	61.7 PK	74.0	-12.3	3.18 V	333	47.6	14.1
6	11590.00	49.6 AV	54.0	-4.4	3.18 V	333	35.5	14.1
7	#17385.00	52.6 PK	74.0	-21.4	3.92 V	344	34.6	18.0
8	#17385.00	42.0 AV	54.0	-12.0	3.92 V	344	24.0	18.0

REMARKS:

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

802.11ac (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	58.7 PK	74.0	-15.3	2.52 H	360	54.4	4.3
2	5150.00	48.6 AV	54.0	-5.4	2.52 H	360	44.3	4.3
3	*5210.00	106.1 PK			2.52 H	360	102.0	4.1
4	*5210.00	98.2 AV			2.52 H	360	94.1	4.1
5	5350.00	51.7 PK	74.0	-22.3	2.52 H	360	47.7	4.0
6	5350.00	40.4 AV	54.0	-13.6	2.52 H	360	36.4	4.0
7	#10420.00	51.6 PK	74.0	-22.4	3.46 H	338	38.0	13.6
8	#10420.00	40.5 AV	54.0	-13.5	3.46 H	338	26.9	13.6
9	15630.00	52.6 PK	74.0	-21.4	1.45 H	289	39.3	13.3
10	15630.00	41.8 AV	54.0	-12.2	1.45 H	289	28.5	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.9 PK	74.0	-9.1	1.61 V	167	60.6	4.3
2	**5150.00**	**53.8 AV**	**54.0**	**-0.2**	**1.61 V**	**167**	**49.5**	**4.3**
3	*5210.00	109.5 PK			1.61 V	167	105.4	4.1
4	*5210.00	101.3 AV			1.61 V	167	97.2	4.1
5	5350.00	56.5 PK	74.0	-17.5	1.61 V	167	52.5	4.0
6	5350.00	45.3 AV	54.0	-8.7	1.61 V	167	41.3	4.0
7	#10420.00	55.4 PK	74.0	-18.6	3.39 V	359	41.8	13.6
8	#10420.00	44.7 AV	54.0	-9.3	3.39 V	359	31.1	13.6
9	15630.00	55.9 PK	74.0	-18.1	3.93 V	360	42.6	13.3
10	15630.00	45.3 AV	54.0	-8.7	3.93 V	360	32.0	13.3

REMARKS:

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

CHANNEL	TX Channel 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	#5651.96	66.2 PK	69.7	-3.5	3.48 H	352	62.2	4.0
2	*5775.00	109.2 PK			3.48 H	352	104.6	4.6
3	*5775.00	100.9 AV			3.48 H	352	96.3	4.6
4	#5935.03	63.0 PK	68.2	-5.2	3.48 H	352	58.3	4.7
5	11550.00	53.7 PK	74.0	-20.3	1.71 H	208	39.6	14.1
6	11550.00	42.3 AV	54.0	-11.7	1.71 H	208	28.2	14.1
7	#17325.00	54.8 PK	74.0	-19.2	1.42 H	230	37.4	17.4
8	#17325.00	43.9 AV	54.0	-10.1	1.42 H	230	26.5	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	#5643.41	67.8 PK	68.2	-0.4	1.58 V	172	63.7	4.1
2	*5775.00	110.7 PK			1.58 V	172	106.1	4.6
3	*5775.00	101.4 AV			1.58 V	172	96.8	4.6
4	#5924.41	65.0 PK	68.6	-3.6	1.58 V	172	60.3	4.7
5	11550.00	56.1 PK	74.0	-17.9	3.24 V	334	42.0	14.1
6	11550.00	46.5 AV	54.0	-7.5	3.24 V	334	32.4	14.1
7	#17325.00	56.3 PK	74.0	-17.7	3.93 V	347	38.9	17.4
8	#17325.00	47.7 AV	54.0	-6.3	3.93 V	347	30.3	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.

802.11ac (VHT80+80)

CHANNEL	TX Channel 42+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	5150.00	55.4 PK	74.0	-18.6	2.49 H	360	51.4	4.0
2	5150.00	46.5 AV	54.0	-7.5	2.49 H	360	42.5	4.0
3	*5210.00	105.5 PK			2.49 H	360	101.7	3.8
4	*5210.00	96.9 AV			2.49 H	360	93.1	3.8
5	5350.00	51.1 PK	74.0	-22.9	2.49 H	360	47.3	3.8
6	5350.00	39.9 AV	54.0	-14.1	2.49 H	360	36.1	3.8
7	#5626.51	62.2 PK	68.2	-6.0	3.47 H	354	58.0	4.2
8	*5775.00	106.2 PK			3.47 H	354	102.0	4.2
9	*5775.00	97.4 AV			3.47 H	354	93.2	4.2
10	#6006.64	61.4 PK	68.2	-6.8	3.47 H	354	56.7	4.7
11	#10420.00	47.1 PK	74.0	-26.9	3.44 H	349	34.2	12.9
12	#10420.00	32.8 AV	54.0	-21.2	3.44 H	349	19.9	12.9
13	11550.00	46.1 PK	74.0	-27.9	1.68 H	208	32.2	13.9
14	11550.00	33.5 AV	54.0	-20.5	1.68 H	208	19.6	13.9
15	15630.00	50.2 PK	74.0	-23.8	1.43 H	298	36.9	13.3
16	15630.00	35.7 AV	54.0	-18.3	1.43 H	298	22.4	13.3
17	#17325.00	48.3 PK	74.0	-25.7	1.46 H	238	31.3	17.0
18	#17325.00	36.7 AV	54.0	-17.3	1.46 H	238	19.7	17.0

REMARKS:

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

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	64.1 PK	74.0	-9.9	1.94 V	207	60.1	4.0
2	5150.00	53.7 AV	54.0	-0.3	1.94 V	207	49.7	4.0
3	*5210.00	108.8 PK			1.94 V	207	105.0	3.8
4	*5210.00	98.7 AV			1.94 V	207	94.9	3.8
5	5350.00	59.2 PK	74.0	-14.8	1.94 V	207	55.4	3.8
6	5350.00	46.9 AV	54.0	-7.1	1.94 V	207	43.1	3.8
7	#5653.27	65.2 PK	70.6	-5.4	1.64 V	162	61.2	4.0
8	*5775.00	109.3 PK			1.64 V	162	105.1	4.2
9	*5775.00	99.6 AV			1.64 V	162	95.4	4.2
10	#5916.08	64.0 PK	74.8	-10.8	1.64 V	162	59.3	4.7
11	#10420.00	48.7 PK	74.0	-25.3	3.41 V	360	35.8	12.9
12	#10420.00	35.4 AV	54.0	-18.6	3.41 V	360	22.5	12.9
13	11550.00	48.2 PK	74.0	-25.8	3.28 V	338	34.3	13.9
14	11550.00	35.5 AV	54.0	-18.5	3.28 V	338	21.6	13.9
15	15630.00	50.8 PK	74.0	-23.2	3.95 V	360	37.5	13.3
16	15630.00	38.7 AV	54.0	-15.3	3.95 V	360	25.4	13.3
17	#17325.00	49.3 PK	74.0	-24.7	3.89 V	338	32.3	17.0
18	#17325.00	38.9 AV	54.0	-15.1	3.89 V	338	21.9	17.0

REMARKS:

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

Below 1GHz Data:

802.11ac (VHT20)

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	31.12	33.9 QP	40.0	-6.1	1.86 H	224	42.8	-8.9
2	98.05	36.2 QP	43.5	-7.3	2.00 H	207	49.2	-13.0
3	170.53	39.2 QP	43.5	-4.3	1.95 H	206	48.0	-8.8
4	231.76	40.4 QP	46.0	-5.6	2.24 H	205	50.8	-10.4
5	250.04	41.9 QP	46.0	-4.1	1.46 H	221	51.2	-9.3
6	750.01	40.8 QP	46.0	-5.2	1.00 H	264	38.8	2.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	38.15	37.9 QP	40.0	-2.1	1.00 V	163	46.4	-8.5
2	227.23	37.2 QP	46.0	-8.8	1.00 V	115	48.1	-10.9
3	310.89	37.1 QP	46.0	-8.9	1.10 V	238	44.0	-6.9
4	500.01	38.2 QP	46.0	-7.8	1.49 V	226	40.9	-2.7
5	625.02	38.1 QP	46.0	-7.9	1.52 V	207	38.2	-0.1
6	750.01	40.1 QP	46.0	-5.9	1.86 V	119	38.1	2.0

REMARKS:

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

4.2 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	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
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 Conduction 1.
3 Tested Date: Feb. 08 to 14, 2018

4.2.3 Test Procedure

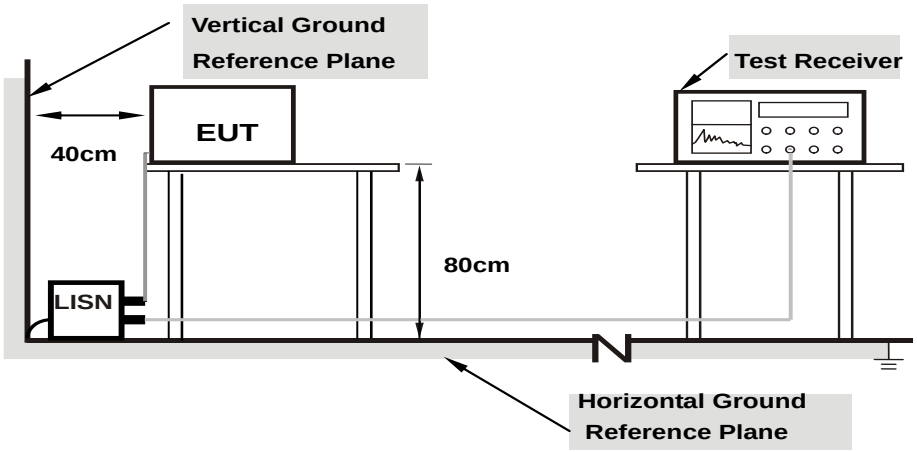
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

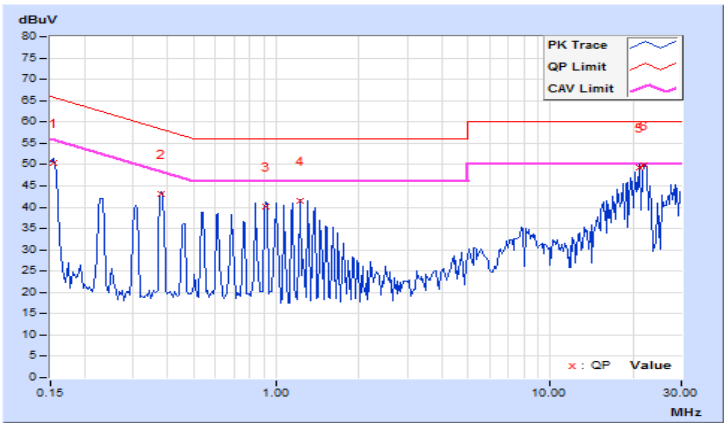
4.2.7 Test Results (Mode 1)

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	0.15391	10.13	40.28	37.87	50.41	48.00	65.79	55.79	-15.38	-7.79
2	0.38047	10.19	32.84	32.77	43.03	42.96	58.27	48.27	-15.24	-5.31
3	0.91953	10.22	29.91	25.07	40.13	35.29	56.00	46.00	-15.87	-10.71
4	1.22266	10.24	31.15	28.35	41.39	38.59	56.00	46.00	-14.61	-7.41
5	21.08619	11.23	37.96	37.31	49.19	48.54	60.00	50.00	-10.81	-1.46
6	**21.83594**	**11.24**	**38.48**	**38.26**	**49.72**	**49.50**	**60.00**	**50.00**	**-10.28**	**-0.50**

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

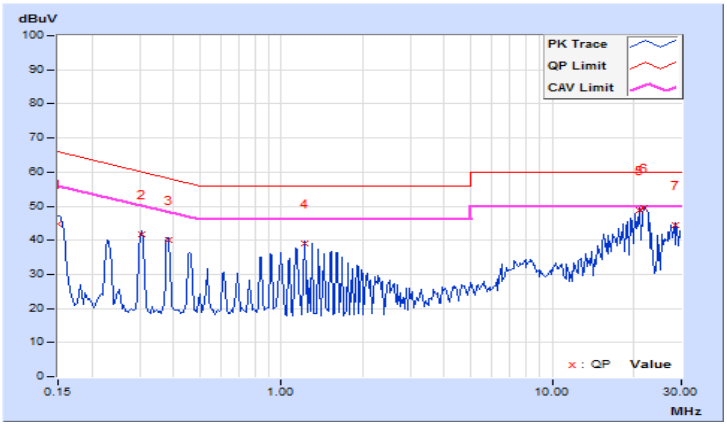


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	10.04	34.75	32.77	44.79	42.81	66.00	56.00	-21.21	-13.19
2	0.30625	10.06	31.83	31.04	41.89	41.10	60.07	50.07	-18.18	-8.97
3	0.38438	10.08	29.86	28.16	39.94	38.24	58.18	48.18	-18.24	-9.94
4	1.21522	10.12	29.00	25.90	39.12	36.02	56.00	46.00	-16.88	-9.98
5	21.08594	11.02	37.75	37.61	48.77	48.63	60.00	50.00	-11.23	-1.37
6	21.83681	11.03	38.52	38.34	49.55	49.37	60.00	50.00	-10.45	-0.63
7	28.36719	11.08	33.24	29.11	44.32	40.19	60.00	50.00	-15.68	-9.81

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



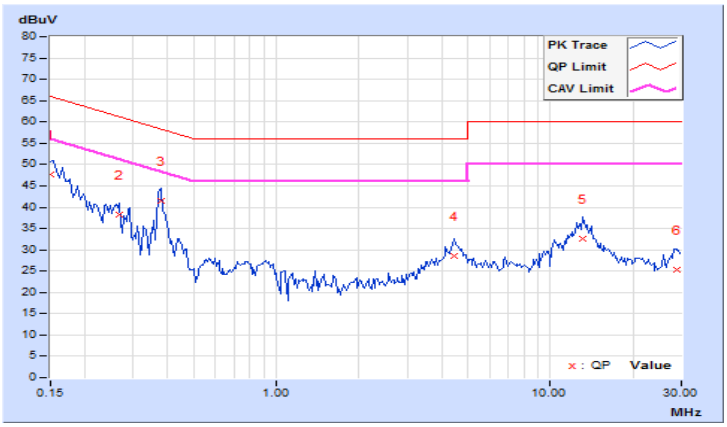
4.2.8 Test Results (Mode 2)

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	10.14	37.45	26.01	47.59	36.15	66.00	56.00	-18.41	-19.85
2	0.26719	10.17	27.95	20.06	38.12	30.23	61.20	51.20	-23.08	-20.97
3	0.38047	10.20	31.39	23.04	41.59	33.24	58.27	48.27	-16.68	-15.03
4	4.44531	10.47	17.97	9.85	28.44	20.32	56.00	46.00	-27.56	-25.68
5	13.17969	11.04	21.65	14.61	32.69	25.65	60.00	50.00	-27.31	-24.35
6	28.74219	11.69	13.71	6.74	25.40	18.43	60.00	50.00	-34.60	-31.57

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

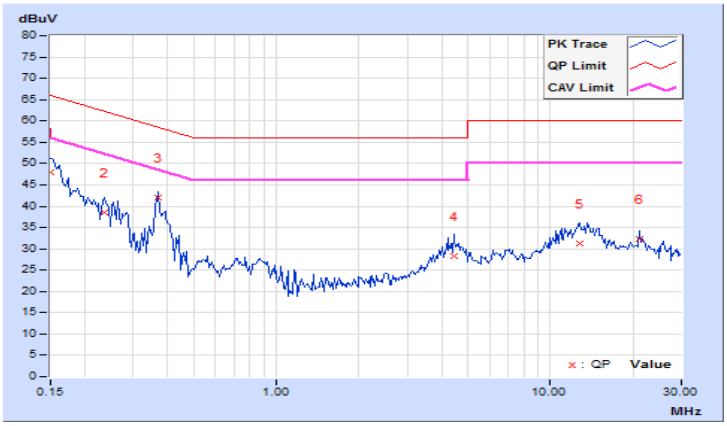


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	10.05	37.95	25.22	48.00	35.27	66.00	56.00	-18.00	-20.73
2	0.23594	10.06	28.42	19.91	38.48	29.97	62.24	52.24	-23.76	-22.27
3	0.36875	10.09	31.82	29.94	41.91	40.03	58.53	48.53	-16.62	-8.50
4	4.42969	10.32	17.90	9.93	28.22	20.25	56.00	46.00	-27.78	-25.75
5	12.71484	10.82	20.34	12.46	31.16	23.28	60.00	50.00	-28.84	-26.72
6	21.16797	11.30	20.96	16.87	32.26	28.17	60.00	50.00	-27.74	-21.83

Remarks:

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



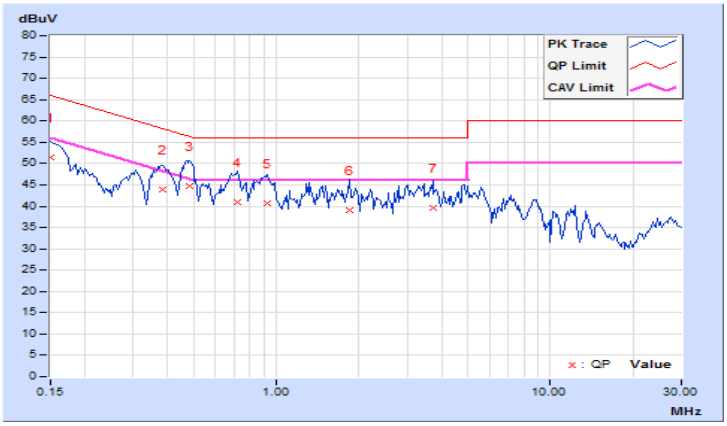
4.2.9 Test Results (Mode 3)

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	10.14	41.40	29.15	51.54	39.29	66.00	56.00	-14.46	-16.71
2	0.38438	10.20	33.66	24.57	43.86	34.77	58.18	48.18	-14.32	-13.41
3	0.48203	10.21	34.40	24.79	44.61	35.00	56.30	46.30	-11.69	-11.30
4	0.71641	10.23	30.77	21.81	41.00	32.04	56.00	46.00	-15.00	-13.96
5	0.92734	10.24	30.51	21.80	40.75	32.04	56.00	46.00	-15.25	-13.96
6	1.85547	10.29	28.90	20.95	39.19	31.24	56.00	46.00	-16.81	-14.76
7	3.73047	10.42	29.10	21.43	39.52	31.85	56.00	46.00	-16.48	-14.15

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

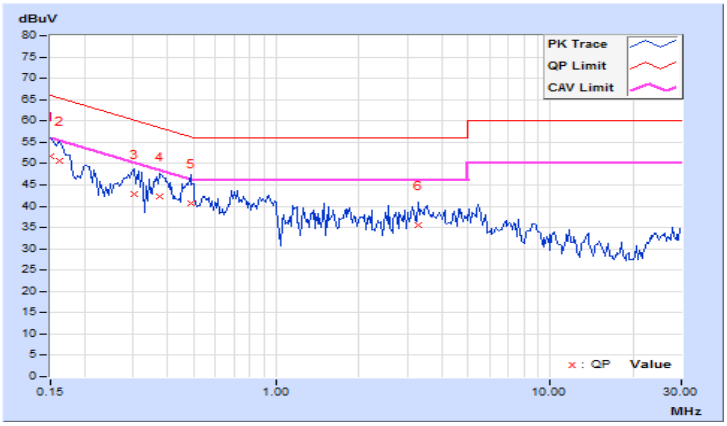


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	10.05	41.78	29.27	51.83	39.32	66.00	56.00	-14.17	-16.68
2	0.16172	10.05	40.70	28.53	50.75	38.58	65.38	55.38	-14.63	-16.80
3	0.30234	10.08	32.84	22.66	42.92	32.74	60.18	50.18	-17.26	-17.44
4	0.37656	10.09	32.19	23.02	42.28	33.11	58.35	48.35	-16.07	-15.24
5	0.48594	10.10	30.63	21.41	40.73	31.51	56.24	46.24	-15.51	-14.73
6	3.30078	10.25	25.24	17.99	35.49	28.24	56.00	46.00	-20.51	-17.76

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 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)
		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 Results

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	15.85	16.11	16.30	15.95	161.304	22.08	28	Pass
40	5200	15.95	15.97	16.21	16.32	163.53	22.14	28	Pass
48	5240	15.82	16.26	16.18	16.28	164.418	22.16	28	Pass
149	5745	21.94	21.97	21.91	22.14	632.634	28.01	28.2	Pass
157	5785	22.05	22.14	21.86	22.05	637.794	28.05	28.2	Pass
165	5825	21.96	22.04	22.06	21.93	633.641	28.02	28.2	Pass

Note: 1. For U-NII-1 band: the max gain is 8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(8-6) = 28dBm.
2. For U-NII-3 band: the max gain is 7.8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(7.8-6) = 28.2dBm.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	15.78	16.02	16.28	15.96	159.746	22.03	28	Pass
40	5200	15.81	16.05	16.16	15.99	159.403	22.02	28	Pass
48	5240	15.90	16.00	16.02	16.11	159.542	22.03	28	Pass
149	5745	22.03	22.20	22.05	22.15	649.931	28.13	28.2	Pass
157	5785	22.07	22.18	21.90	22.22	647.868	28.11	28.2	Pass
165	5825	21.98	22.24	21.89	22.09	641.588	28.07	28.2	Pass

Note: 1. For U-NII-1 band: the max gain is 8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(8-6) = 28dBm.
2. For U-NII-3 band: the max gain is 7.8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(7.8-6) = 28.2dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.09	18.23	18.05	18.11	259.484	24.14	28	Pass
46	5230	18.95	19.16	18.94	19.03	319.264	25.04	28	Pass
151	5755	21.72	21.98	21.61	21.65	597.45	27.76	28.2	Pass
159	5795	21.63	21.84	21.73	21.81	598.944	27.77	28.2	Pass

Note: 1. For U-NII-1 band: the max gain is 8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(8-6) = 28dBm.
2. For U-NII-3 band: the max gain is 7.8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(7.8-6) = 28.2dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.81	16.73	16.64	16.72	188.192	22.75	28	Pass
155	5775	18.21	18.09	18.13	18.25	262.486	24.19	28.2	Pass

Note: 1. For U-NII-1 band: the max gain is 8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(8-6) = 28dBm.
2. For U-NII-3 band: the max gain is 7.8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(7.8-6) = 28.2dBm.

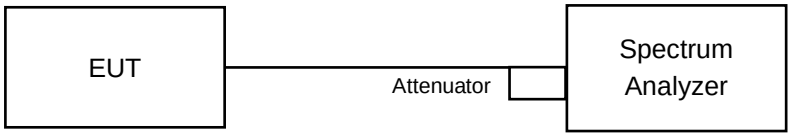
802.11ac (VHT80+80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42+155	5210	18.72	18.61	-	-	147.084	21.68	28	Pass
	5775	-	-	18.73	18.69	148.606	21.72	28.2	Pass

Note: 1. For U-NII-1 band: the max gain is 8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(8-6) = 28dBm.
2. For U-NII-3 band: the max gain is 7.8dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(7.8-6) = 28.2dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	17.16	17.16	17.28	17.16
40	5200	17.16	17.16	17.04	17.16
48	5240	16.44	16.56	16.56	16.44
149	5745	17.16	17.16	17.16	17.40
157	5785	17.16	17.40	17.16	17.28
165	5825	17.40	17.28	17.28	17.28

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	18.36	18.36	18.24	18.36
40	5200	18.24	18.36	18.24	18.24
48	5240	17.64	17.64	17.64	17.64
149	5745	18.24	18.48	18.36	18.36
157	5785	18.36	18.36	18.24	18.36
165	5825	18.36	18.48	18.36	18.36

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	36.24	36.24	36.24	36.24
46	5230	36.24	36.24	36.24	36.24
151	5755	36.24	36.24	36.24	36.24
159	5795	36.48	36.24	36.48	36.48

802.11ac (VHT80)

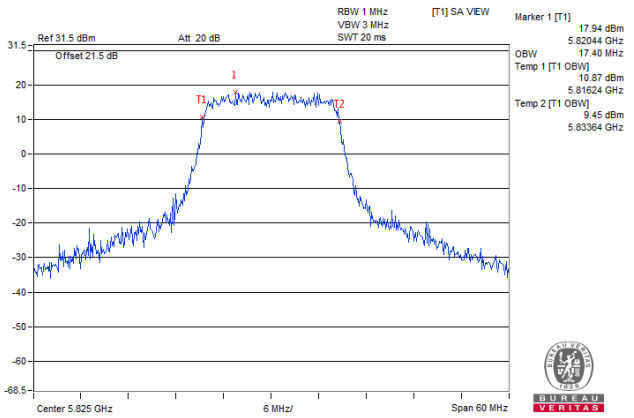
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	76.32	75.84	76.32	75.84
155	5775	75.84	75.84	76.32	76.32

802.11ac (VHT80+80)

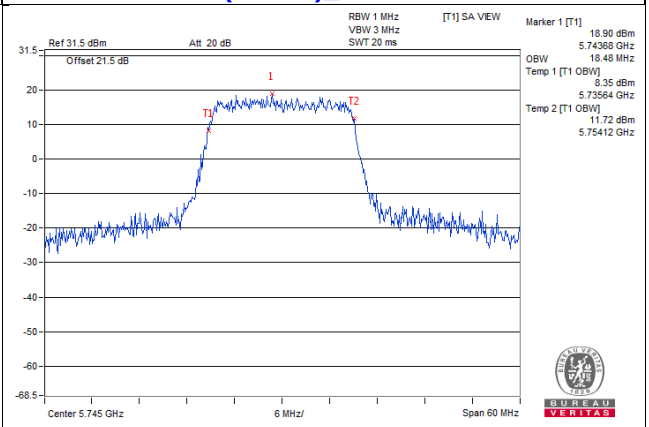
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42+155	5210	75.84	75.84	-	-
	5775	-	-	76.32	75.84

Spectrum Plot of Worst Value

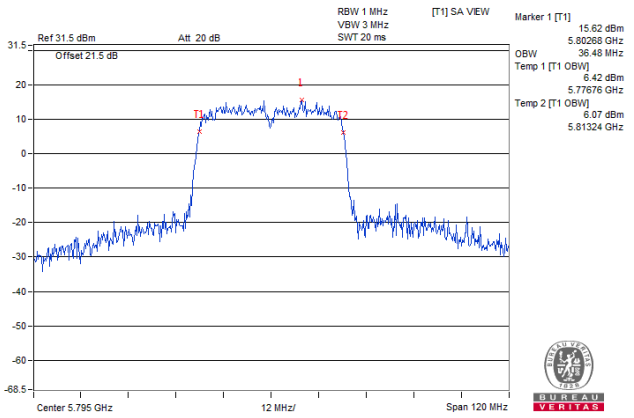
802.11a_Chain 0 / CH165



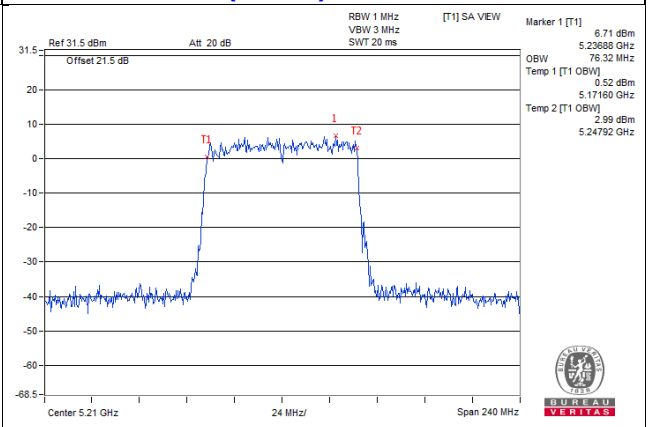
802.11ac (VHT20)_Chain 1 / CH149



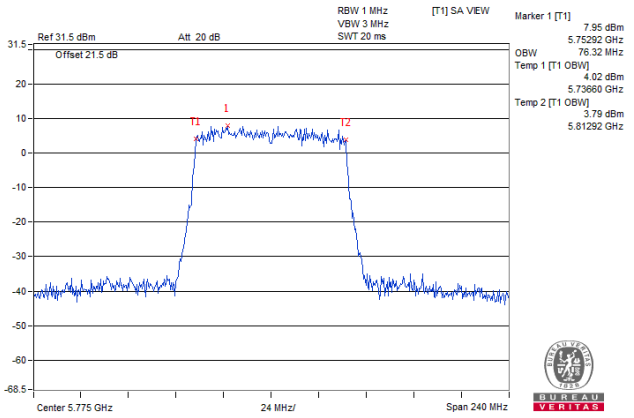
802.11ac (VHT40) _Chain 0 / CH159



802.11ac (VHT80) _Chain 0 / CH42

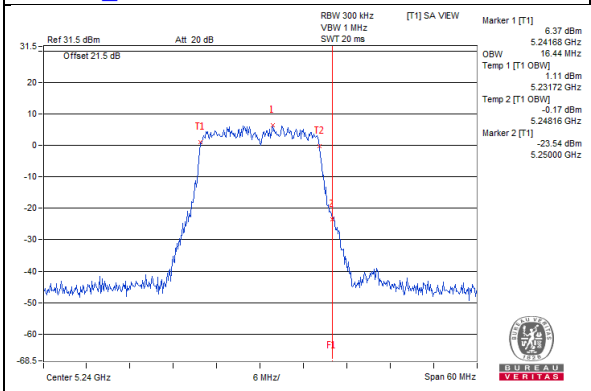


802.11ac (VHT80+80) / Chain 2: CH155

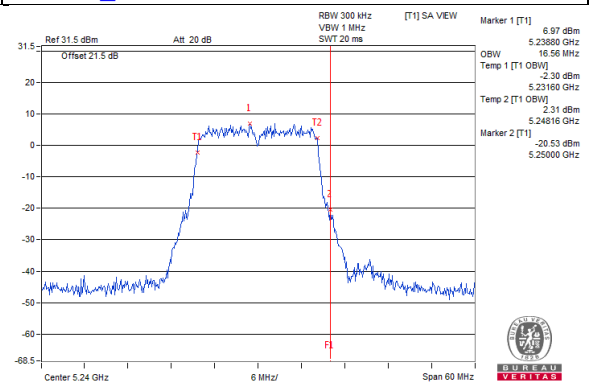


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

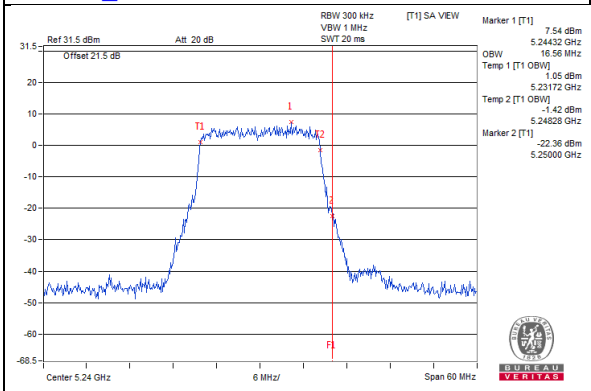
802.11a_Chain 0 / CH48



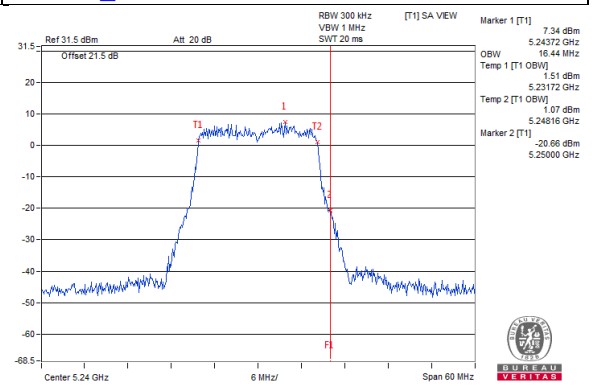
802.11a_Chain 1 / CH48



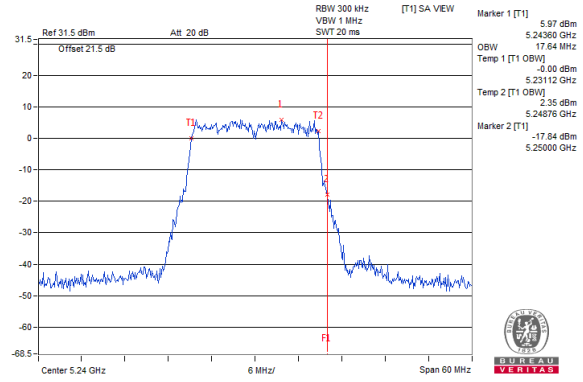
802.11a_Chain 2 / CH48



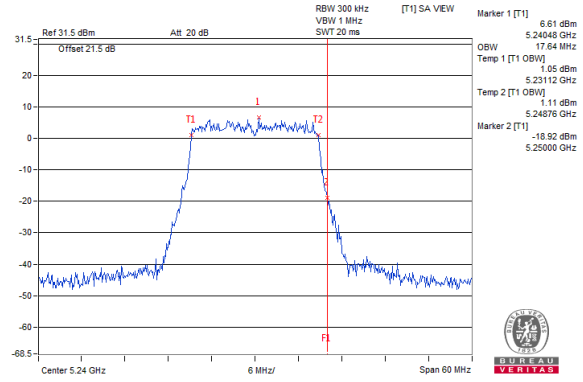
802.11a_Chain 3 / CH48



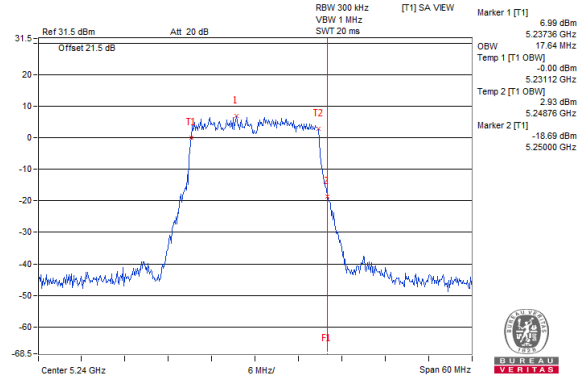
802.11ac (VHT20)_Chain 0 / CH48



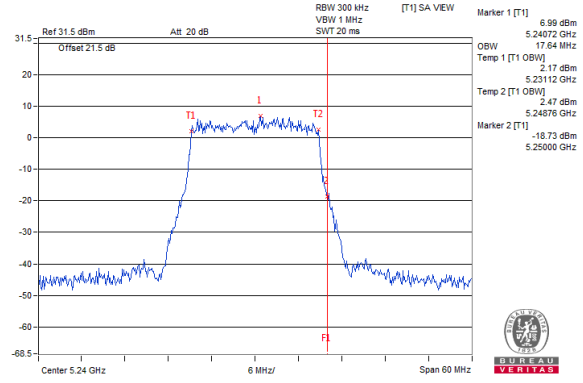
802.11ac (VHT20)_Chain 1 / CH48



802.11ac (VHT20)_Chain 2 / CH48

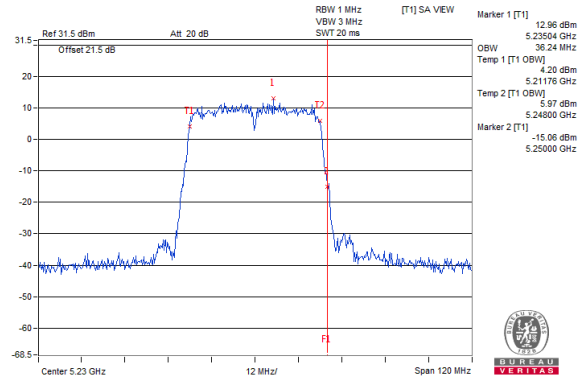


802.11ac (VHT20)_Chain 3 / CH48

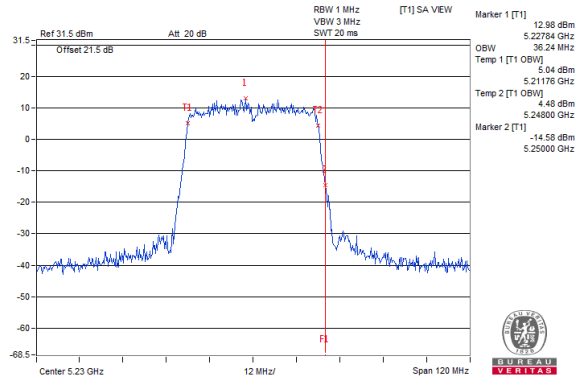


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

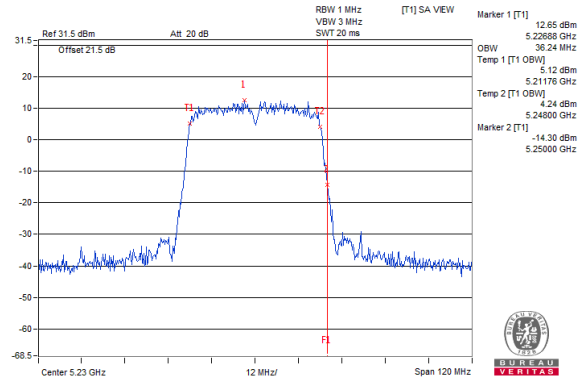
802.11ac (VHT40)_Chain 0 / CH46



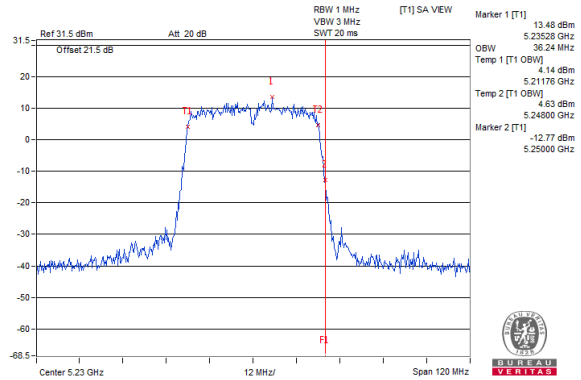
802.11ac (VHT40)_Chain 1 / CH46



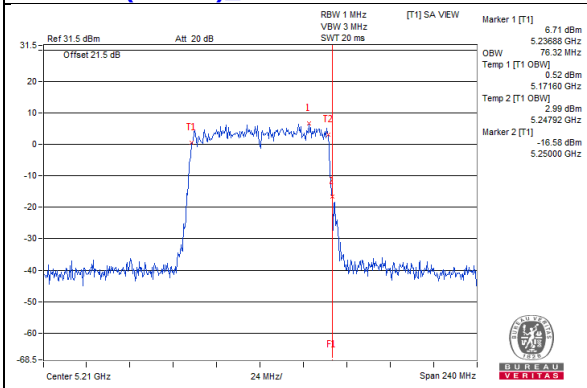
802.11ac (VHT40)_Chain 2 / CH46



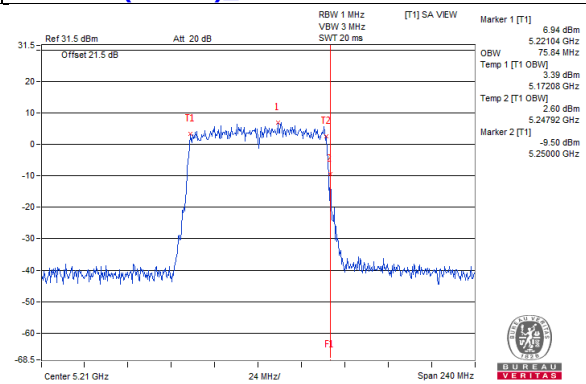
802.11ac (VHT40)_Chain 3 / CH46



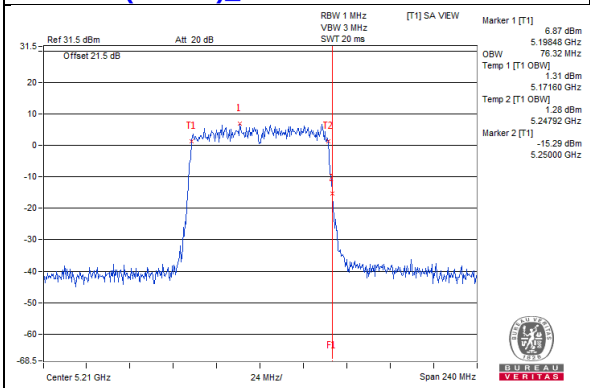
802.11ac (VHT80)_Chain 0 / CH42



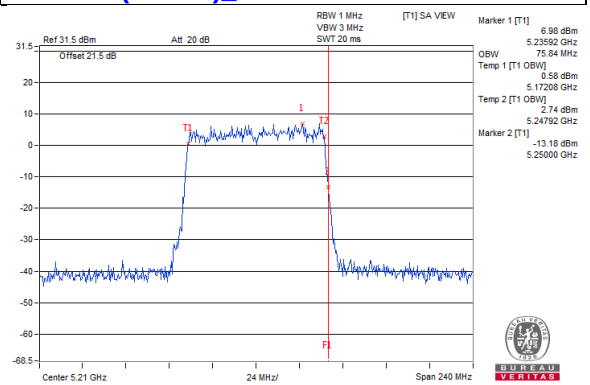
802.11ac (VHT80)_Chain 1 / CH42

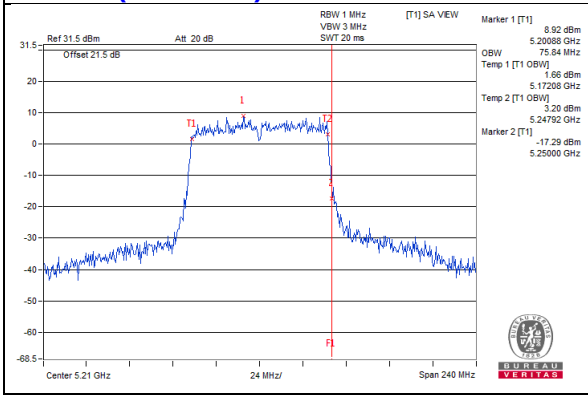
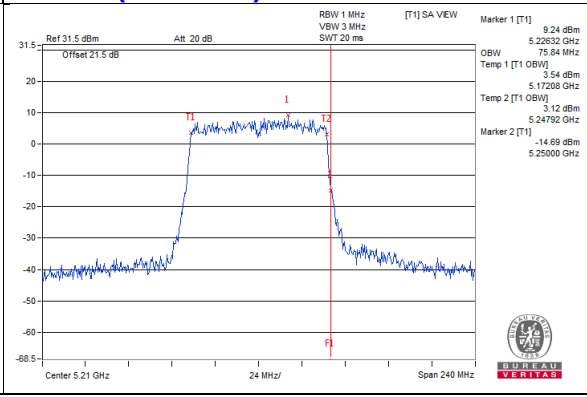


802.11ac (VHT80)_Chain 2 / CH42



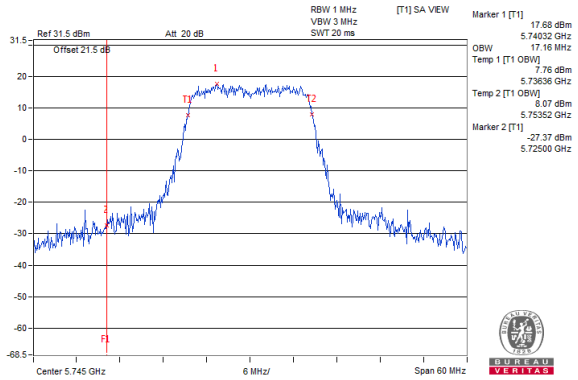
802.11ac (VHT80)_Chain 3 / CH42



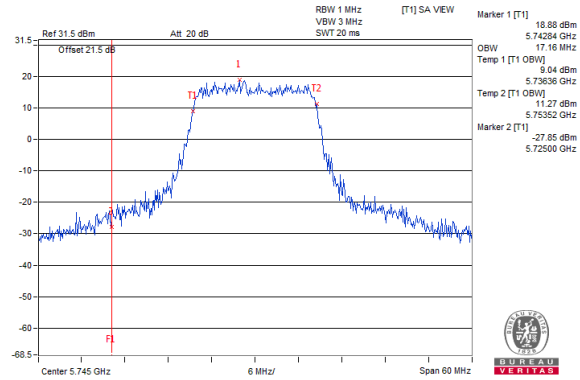
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11ac(VHT80+80) / Chain 0 : CH42	**802.11ac(VHT80+80) / Chain 1 : CH42**
	

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

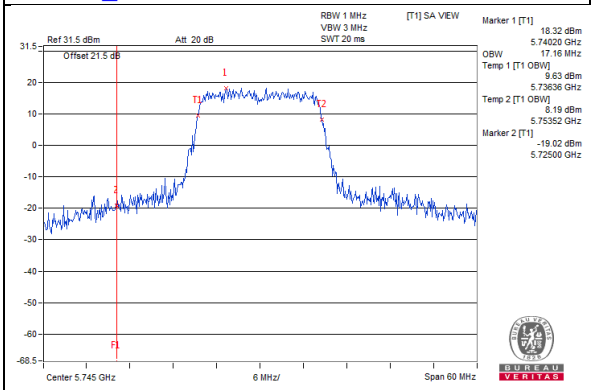
802.11a_Chain 0 / CH149



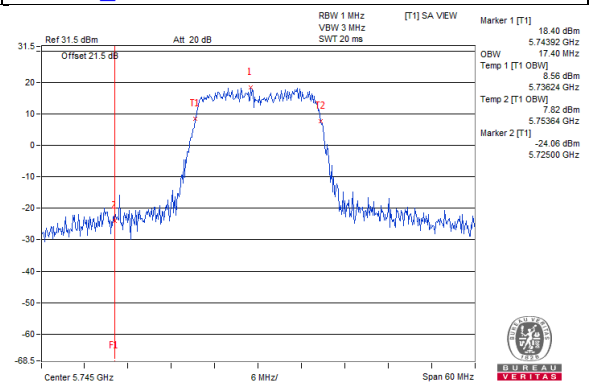
802.11a_Chain 1 / CH149



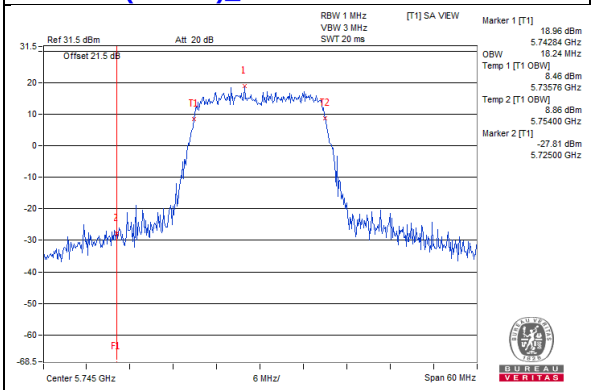
802.11a_Chain 2 / CH149



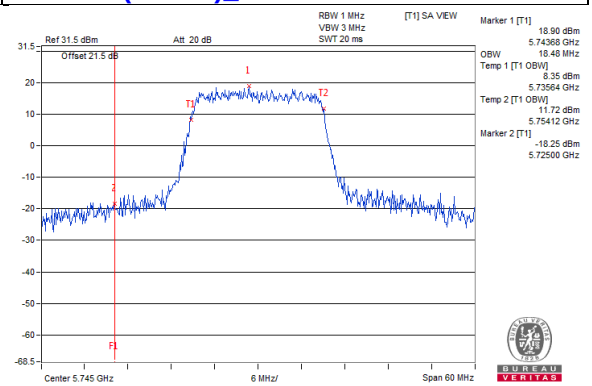
802.11a_Chain 3 / CH149



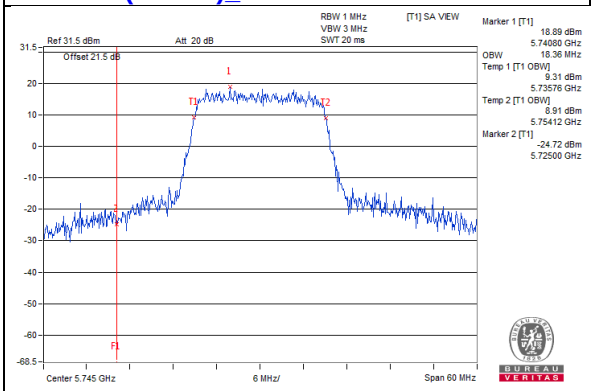
802.11ac (VHT20)_Chain 0 / CH149



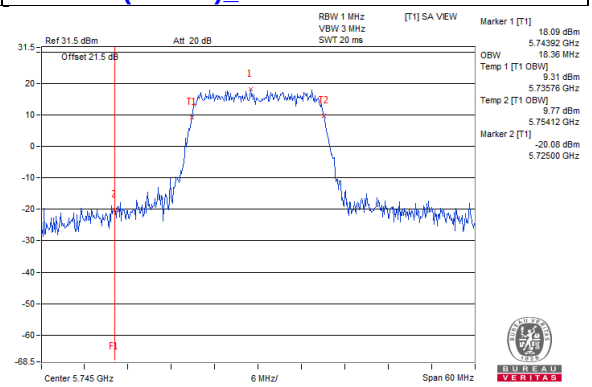
802.11ac (VHT20)_Chain 1 / CH149



802.11ac (VHT20)_Chain 2 / CH149

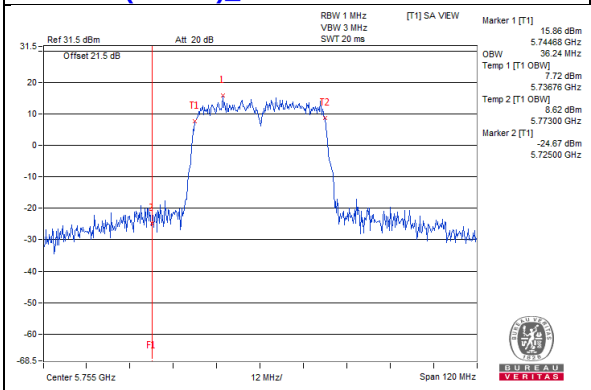


802.11ac (VHT20)_Chain 3 / CH149

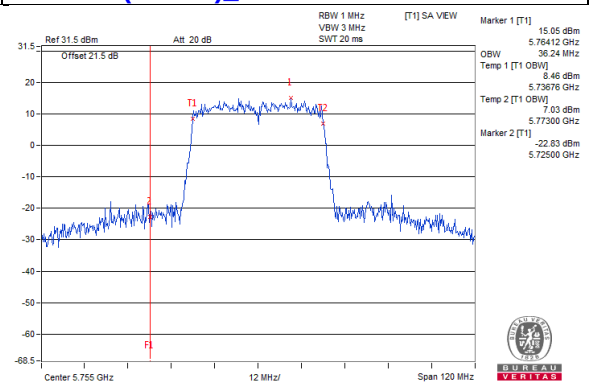


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

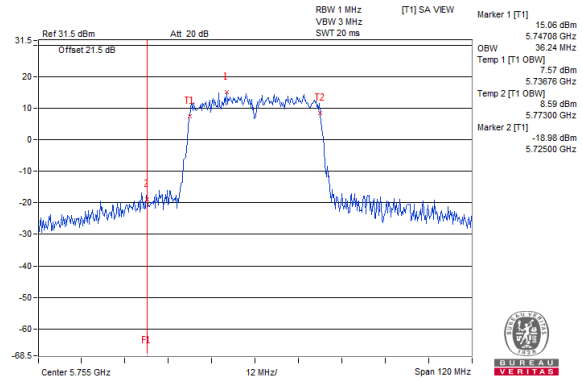
802.11ac (VHT40)_Chain 0 / CH151



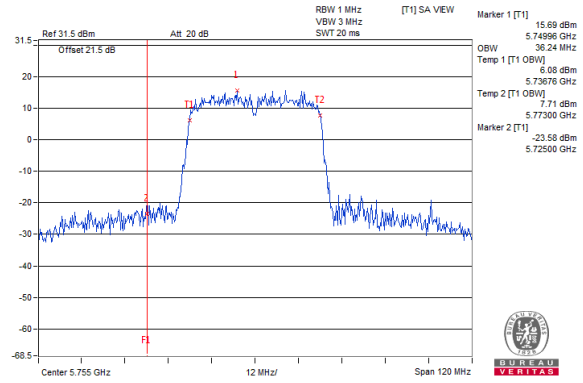
802.11ac (VHT40)_Chain 1 / CH151



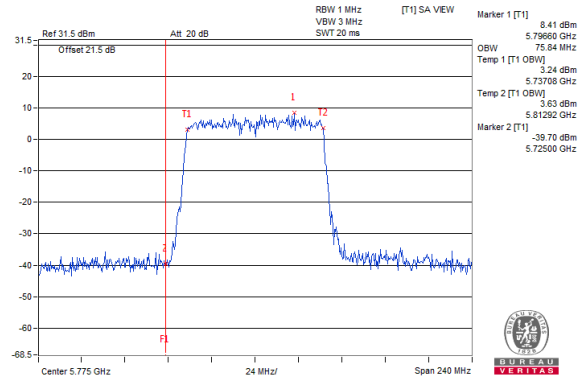
802.11ac (VHT40)_Chain 2 / CH151



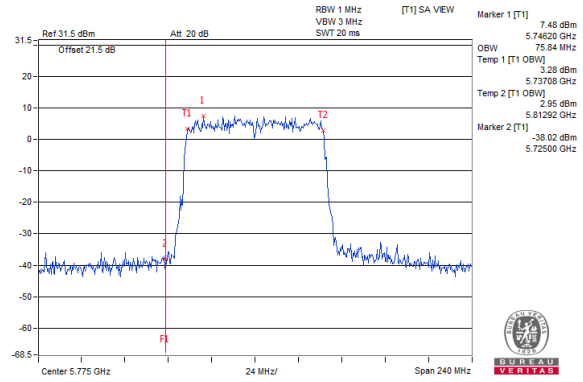
802.11ac (VHT40)_Chain 3 / CH151



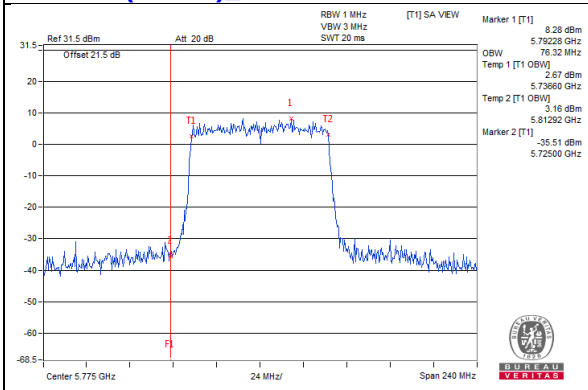
802.11ac (VHT80)_Chain 0 / CH155



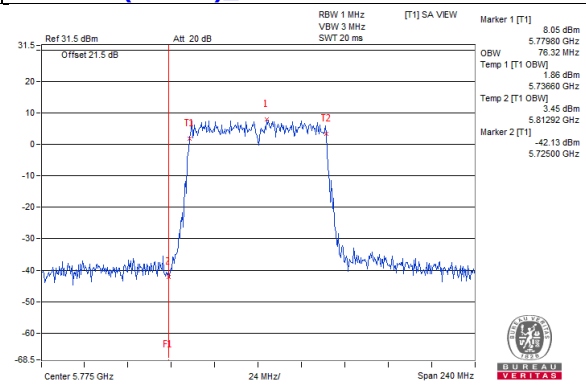
802.11ac (VHT80)_Chain 1 / CH155

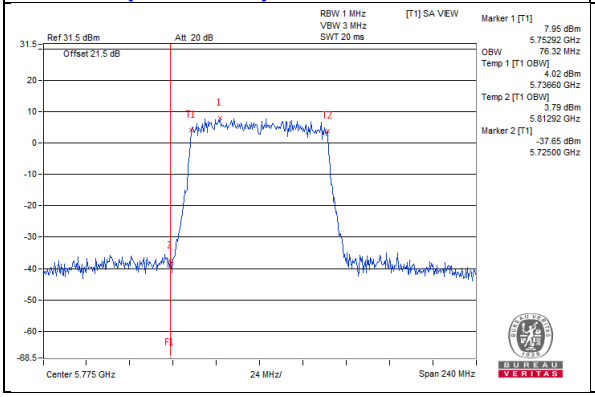
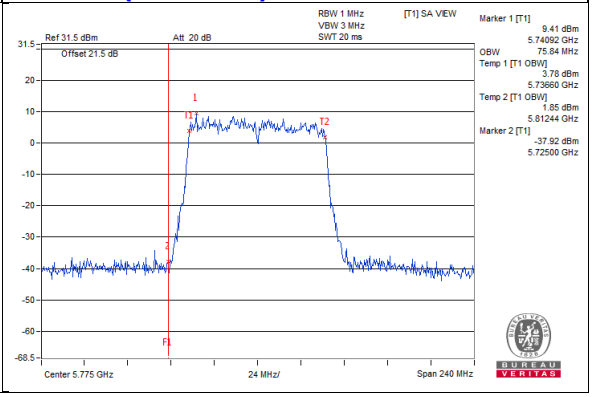


802.11ac (VHT80)_Chain 2 / CH155



802.11ac (VHT80)_Chain 3 / CH155



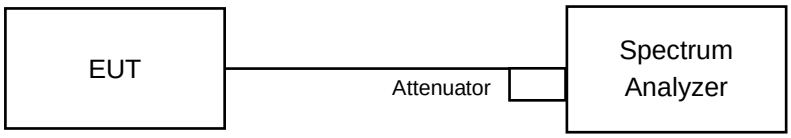
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11ac (VHT80+80) / Chain 2 : CH155	**802.11ac (VHT80+80) / Chain 3 : CH155**
	

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	
		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

For U-NII-1 band:
For 802.11ac (VHT20)

Using method SA-1

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

For 802.11a, 802.11ac (VHT40), 802.11ac (VHT80), 802.11ac (VHT80+80)

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 band:
For 802.11ac (VHT20)

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

For 802.11a, 802.11ac (VHT40), 802.11ac (VHT80), 802.11ac (VHT80+80)

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/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	1.40	2.14	2.43	1.83	0.15	8.14	9.36	Pass
40	5200	1.99	2.04	2.18	2.01	0.15	8.23	9.36	Pass
48	5240	1.63	2.06	2.31	2.74	0.15	8.37	9.36	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$ + 10^{Chain2}/20 + $10^{Chain3/20}$)^2 / 4] = 13.64dBi > 6dBi , so the power density limit shall be reduced to 17-(13.64-6) = 9.36dBm.
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	Chain 2	Chain 3			
36	5180	1.59	1.77	1.97	1.84	7.82	9.36	Pass
40	5200	2.02	1.62	2.37	1.52	7.92	9.36	Pass
48	5240	1.66	1.57	2.41	2.36	8.04	9.36	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$ + 10^{Chain2}/20 + $10^{Chain3/20}$)^2 / 4] = 13.64dBi > 6dBi , so the power density limit shall be reduced to 17-(13.64-6) = 9.36dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	1.00	1.32	1.32	1.62	0.13	7.47	9.36	Pass
46	5230	1.90	2.23	1.56	2.24	0.13	8.14	9.36	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$ + 10^{Chain2}/20 + $10^{Chain3/20}$)^2 / 4] = 13.64dBi > 6dBi , so the power density limit shall be reduced to 17-(13.64-6) = 9.36dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

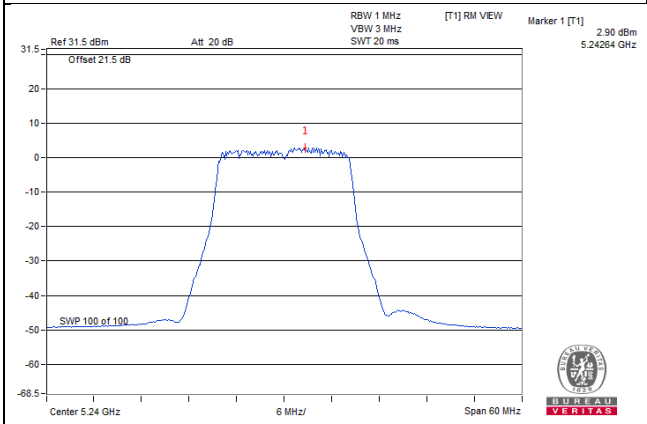
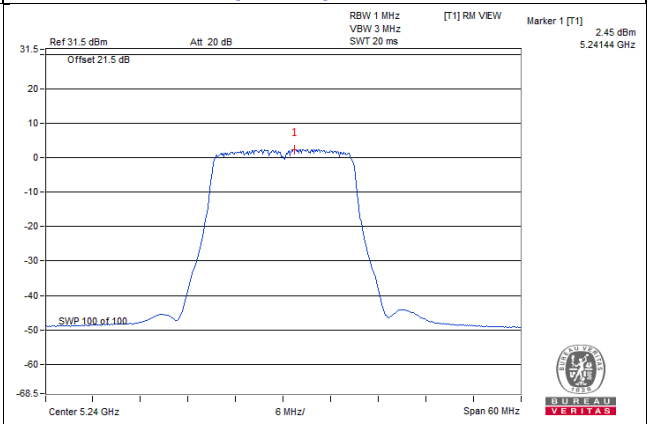
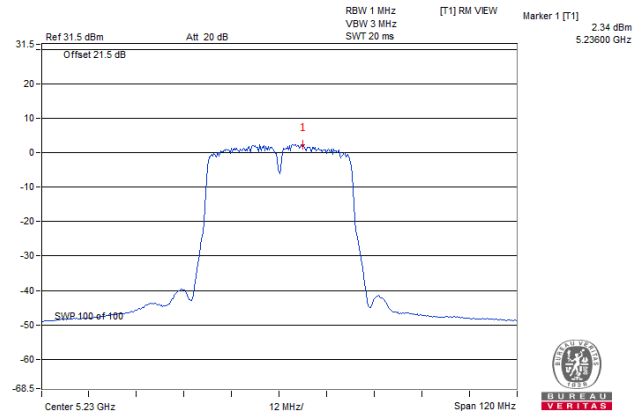
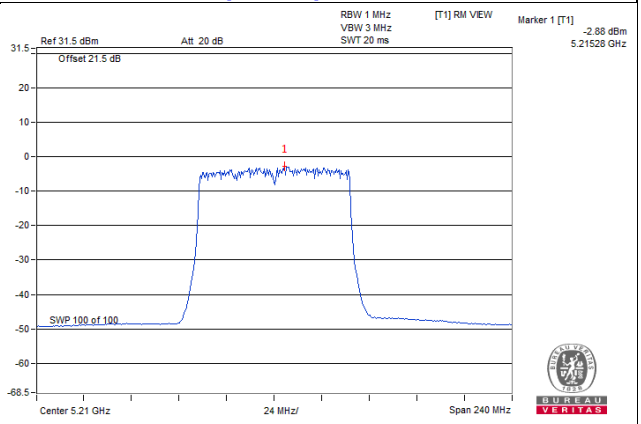
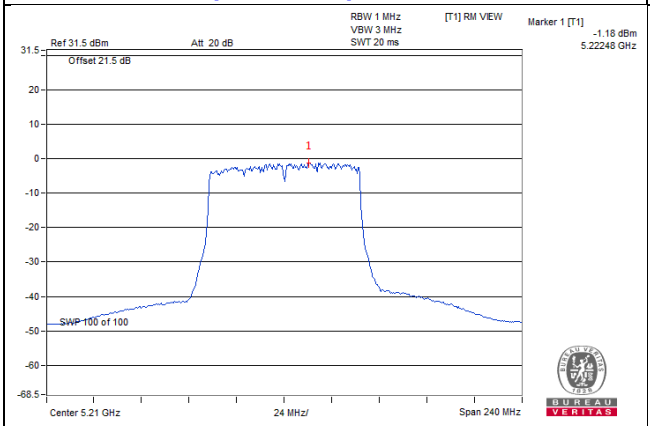
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	-3.93	-4.18	-2.88	-2.96	0.25	2.82	9.36	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$ + 10^{Chain2}/20 + $10^{Chain3/20}$)^2 / 4] = 13.64dBi > 6dBi , so the power density limit shall be reduced to 17-(13.64-6) = 9.36dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80+80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42+155	5210	-1.26	-1.28	-	-	0.14	1.88	9.36	Pass
	5775	Test results refer to U_NII-3 data							

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$ + 10^{Chain2}/20 + $10^{Chain3/20}$)^2 / 4] = 13.64dBi > 6dBi , so the power density limit shall be reduced to 17-(13.64-6) = 9.36dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 3 / CH48	**802.11ac (VHT20)_Chain 2 / CH48**
	
802.11ac (VHT40)_Chain 3 / CH46	**802.11ac (VHT80)_Chain 2 / CH42**
	
802.11ac (VHT80+80)_Chain 0 / CH42	
	

For U-NII-3:

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	0.02	2.24	6.02	0.15	8.41	22.90	Pass
	157	5785	0.26	2.48	6.02	0.15	8.65	22.90	Pass
	165	5825	0.57	2.79	6.02	0.15	8.96	22.90	Pass
1	149	5745	0.28	2.50	6.02	0.15	8.67	22.90	Pass
	157	5785	0.40	2.62	6.02	0.15	8.79	22.90	Pass
	165	5825	0.47	2.69	6.02	0.15	8.86	22.90	Pass
2	149	5745	0.21	2.43	6.02	0.15	8.60	22.90	Pass
	157	5785	0.38	2.60	6.02	0.15	8.77	22.90	Pass
	165	5825	0.52	2.74	6.02	0.15	8.91	22.90	Pass
3	149	5745	-0.06	2.16	6.02	0.15	8.33	22.90	Pass
	157	5785	0.51	2.73	6.02	0.15	8.90	22.90	Pass
	165	5825	0.32	2.54	6.02	0.15	8.71	22.90	Pass

Note: 1. The Directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$ + 10^{Chain2}/20 + $10^{Chain3/20}$)^2 / 4] = 13.1dBi > 6dBi , so the power density limit shall be reduced to 30-(13.1-6) = 22.9dBm.

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

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=4) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-0.58	1.64	6.02	7.66	22.90	Pass
	157	5785	-0.16	2.06	6.02	8.08	22.90	Pass
	165	5825	0.06	2.28	6.02	8.30	22.90	Pass
1	149	5745	0.43	2.65	6.02	8.67	22.90	Pass
	157	5785	0.05	2.27	6.02	8.29	22.90	Pass
	165	5825	0.56	2.78	6.02	8.80	22.90	Pass
2	149	5745	0.20	2.42	6.02	8.44	22.90	Pass
	157	5785	-0.16	2.06	6.02	8.08	22.90	Pass
	165	5825	0.10	2.32	6.02	8.34	22.90	Pass
3	149	5745	0.29	2.51	6.02	8.53	22.90	Pass
	157	5785	0.52	2.74	6.02	8.76	22.90	Pass
	165	5825	0.59	2.81	6.02	8.83	22.90	Pass

Note: 1. The Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$ + 10^{Chain2}/20 + 10$^{Chain3/20}$)^2 / 4] = 13.1dBi > 6dBi , so the power density limit shall be reduced to 30-(13.1-6) = 22.9dBm.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5745	-3.14	-0.92	6.02	0.13	5.23	22.90	Pass
	159	5785	-2.99	-0.77	6.02	0.13	5.38	22.90	Pass
1	151	5745	-3.59	-1.37	6.02	0.13	4.78	22.90	Pass
	159	5785	-2.97	-0.75	6.02	0.13	5.40	22.90	Pass
2	151	5745	-3.15	-0.93	6.02	0.13	5.22	22.90	Pass
	159	5785	-3.33	-1.11	6.02	0.13	5.04	22.90	Pass
3	151	5745	-3.55	-1.33	6.02	0.13	4.82	22.90	Pass
	159	5785	-3.19	-0.97	6.02	0.13	5.18	22.90	Pass

Note: 1. The Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$ + 10^{Chain2}/20 + 10$^{Chain3/20}$)^2 / 4] = 13.1dBi > 6dBi , so the power density limit shall be reduced to 30-(13.1-6) = 22.9dBm.

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=4) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5745	-9.94	-7.72	6.02	0.25	-1.45	22.90	Pass
1	155	5745	-10.22	-8.00	6.02	0.25	-1.73	22.90	Pass
2	155	5745	-10.06	-7.84	6.02	0.25	-1.57	22.90	Pass
3	155	5745	-10.19	-7.97	6.02	0.25	-1.70	22.90	Pass

Note: 1. The Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$ + 10^{Chain2}/20 + 10$^{Chain3/20}$)^2 / 4] = 13.1dBi > 6dBi , so the power density limit shall be reduced to 30-(13.1-6) = 22.9dBm.

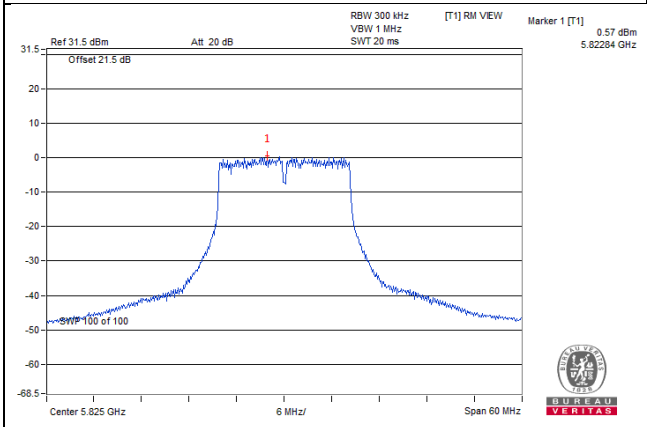
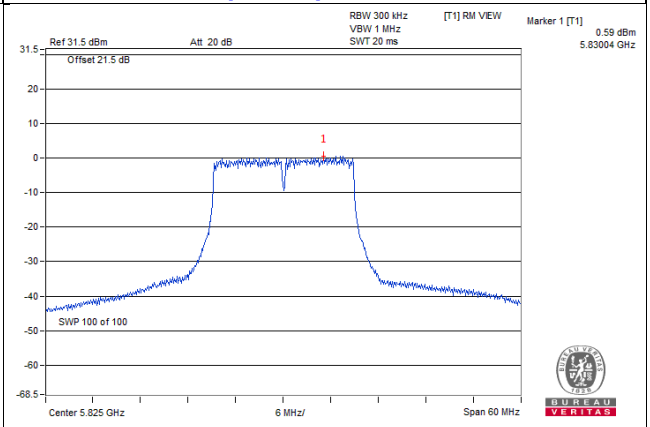
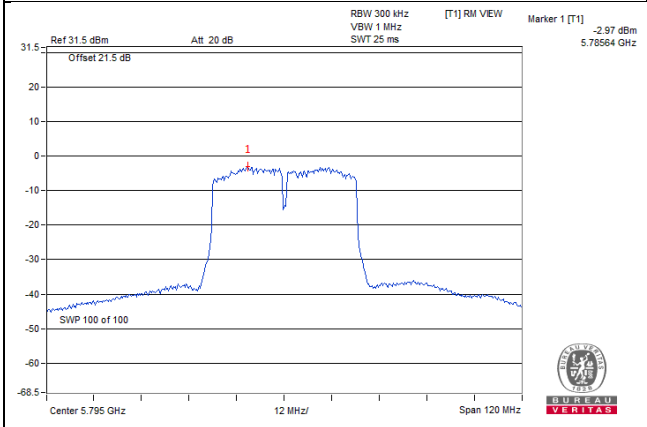
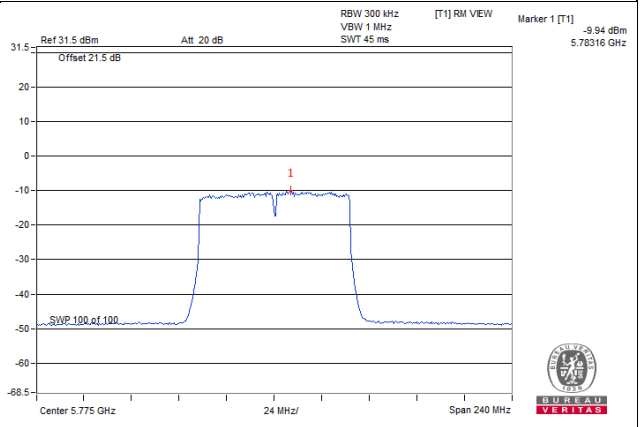
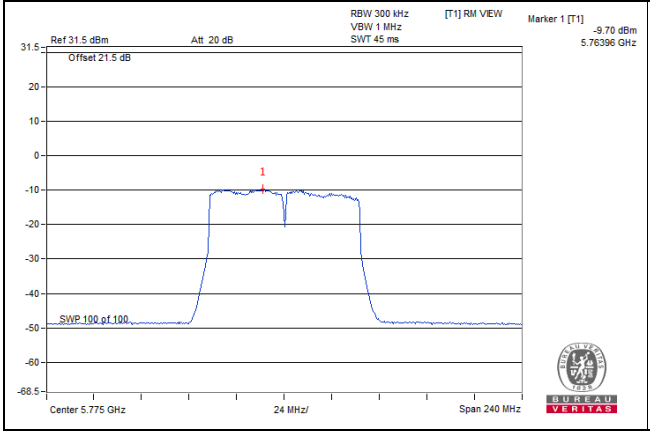
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80+80)

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	42	5210	Test results refer to U_NII-1 data						
1	42	5210	Test results refer to U_NII-1 data						
2	155	5745	-10.21	-7.99	3.01	0.14	-4.84	22.90	Pass
3	155	5745	-9.70	-7.48	3.01	0.14	-4.33	22.90	Pass

Note: 1. The Directional gain = 10 log[(10$^{Chain0/20}$ + 10$^{Chain1/20}$ + 10^{Chain2}/20 + 10$^{Chain3/20}$)^2 / 4] = 13.1dBi > 6dBi , so the power density limit shall be reduced to 30-(13.1-6) = 22.9dBm.

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

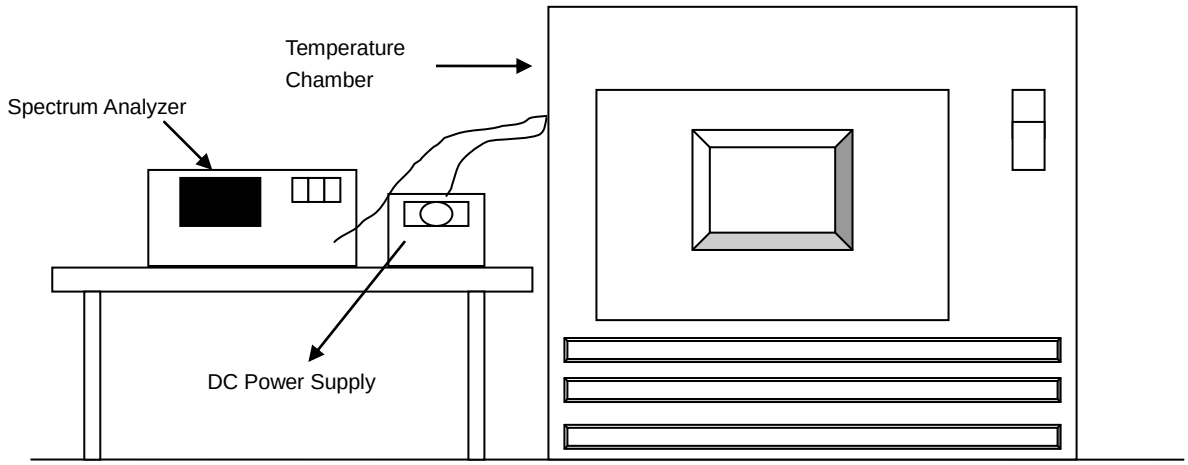
Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH165	**802.11ac (VHT20)_Chain 3 / CH165**
	
8802.11ac (VHT40)_Chain 1 / CH159	**802.11ac (VHT80)_Chain 0 / CH155**
	
802.11ac (VHT80+80)_Chain 3 / CH155	
	

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 DC 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 (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	55	5180.0065	Pass	5180.0029	Pass	5180.0029	Pass	5180.0028	Pass
40	55	5179.9855	Pass	5179.9851	Pass	5179.9869	Pass	5179.9848	Pass
30	55	5179.9838	Pass	5179.9842	Pass	5179.9822	Pass	5179.9815	Pass
20	55	5179.9861	Pass	5179.9863	Pass	5179.9845	Pass	5179.9857	Pass
10	55	5180.0169	Pass	5180.0176	Pass	5180.0179	Pass	5180.0185	Pass
0	55	5180.0021	Pass	5180	Pass	5179.9988	Pass	5179.9994	Pass
-10	55	5180.0108	Pass	5180.0113	Pass	5180.0113	Pass	5180.0082	Pass
-20	55	5179.9884	Pass	5179.9875	Pass	5179.9871	Pass	5179.9892	Pass
-30	55	5180.0188	Pass	5180.0207	Pass	5180.0223	Pass	5180.0196	Pass

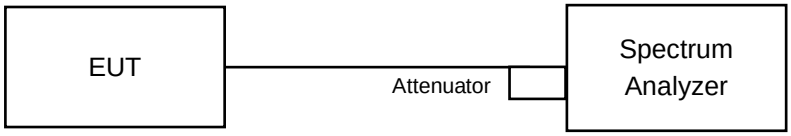
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	63.25	5179.9861	Pass	5179.9863	Pass	5179.9855	Pass	5179.9856	Pass
	55	5179.9861	Pass	5179.9863	Pass	5179.9845	Pass	5179.9857	Pass
	46.75	5179.9859	Pass	5179.9865	Pass	5179.9849	Pass	5179.9852	Pass

4.7 6dB Bandwidth Measurement

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	Chain 2	Chain 3		
149	5745	16.38	16.40	16.38	16.39	0.5	Pass
157	5785	16.41	16.42	16.40	16.38	0.5	Pass
165	5825	16.39	16.41	16.40	16.38	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.33	17.63	17.62	17.65	0.5	Pass
157	5785	17.62	17.64	17.61	17.23	0.5	Pass
165	5825	17.62	17.63	17.63	17.59	0.5	Pass

802.11ac (VHT40)

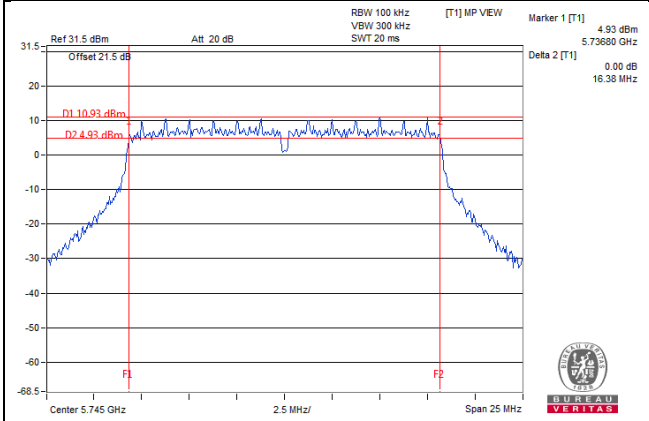
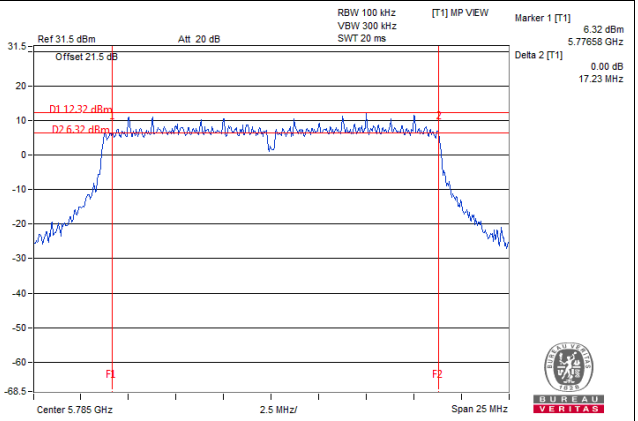
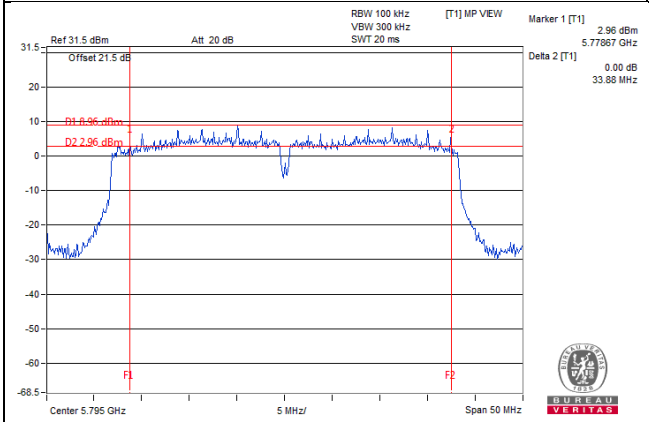
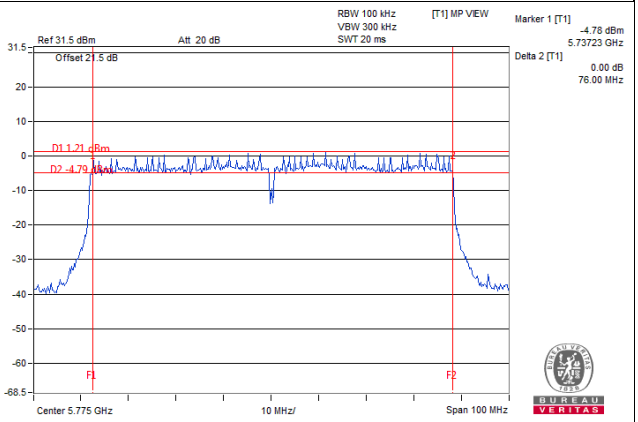
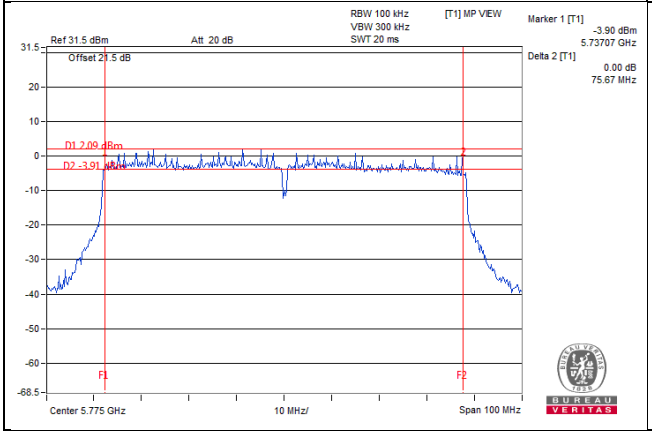
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.27	35.19	33.89	35.09	0.5	Pass
159	5795	35.19	33.88	35.88	35.21	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.03	76.00	76.44	76.01	0.5	Pass

802.11ac (VHT80+80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
42+155	5210	-					
	5775	-	-	76.00	75.67	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH149	**802.11ac (VHT20)_Chain 3 / CH157**
	
802.11ac (VHT40)_Chain 1 / CH159	**802.11ac (VHT80)_Chain 1 / CH155**
	
802.11ac (VHT80+80)_Chain 3 / CH155	
	

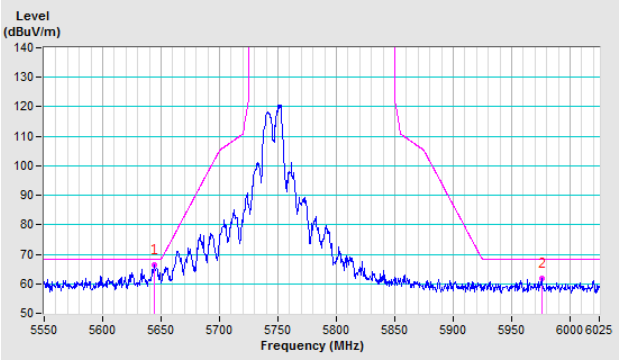
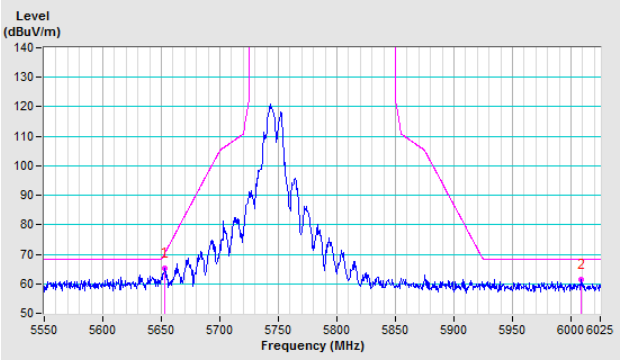
5 Pictures of Test Arrangements

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

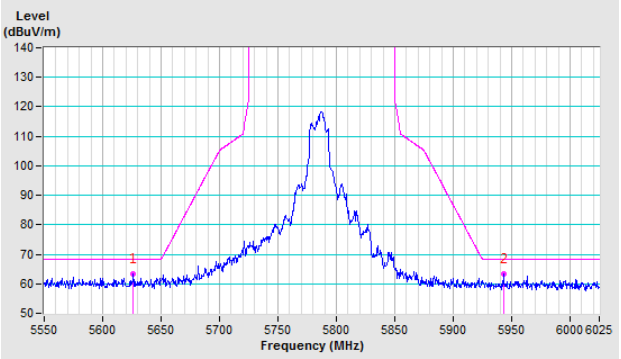
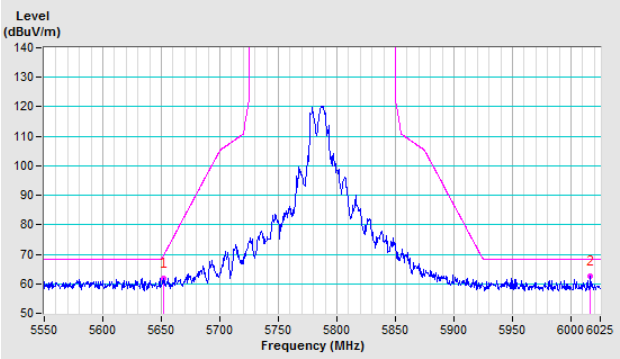
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

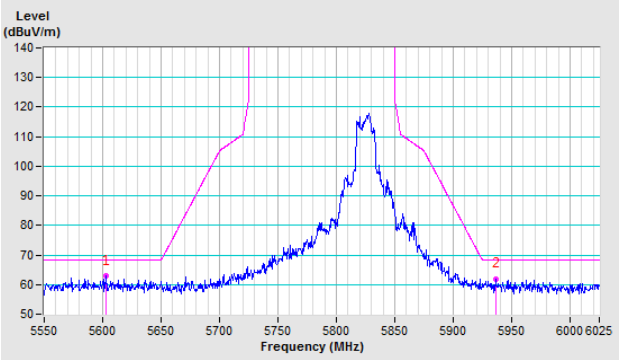
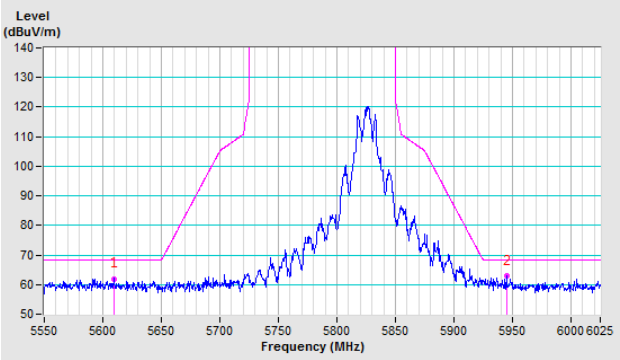
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

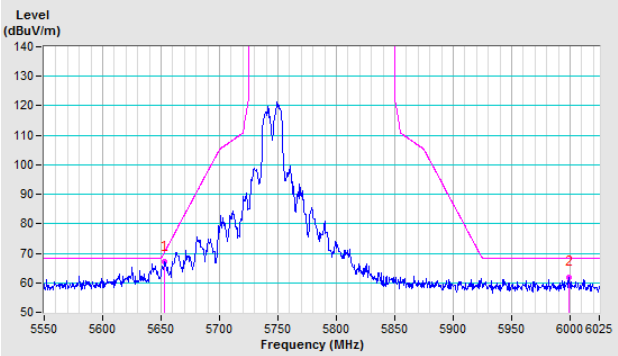
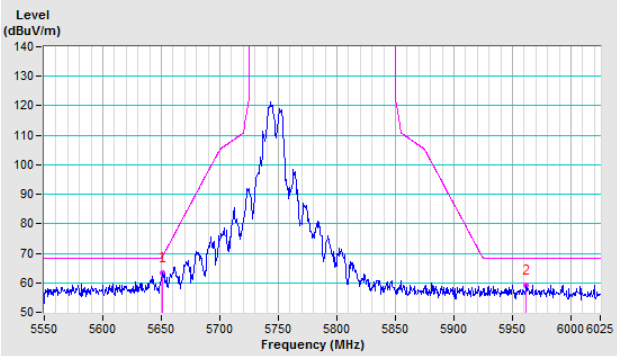
Horizontal	Vertical
	

CH 165 5825 MHz

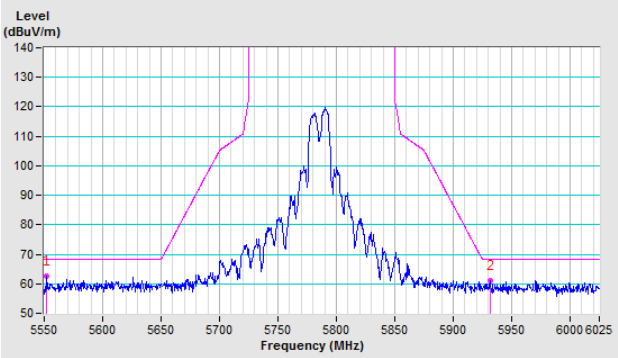
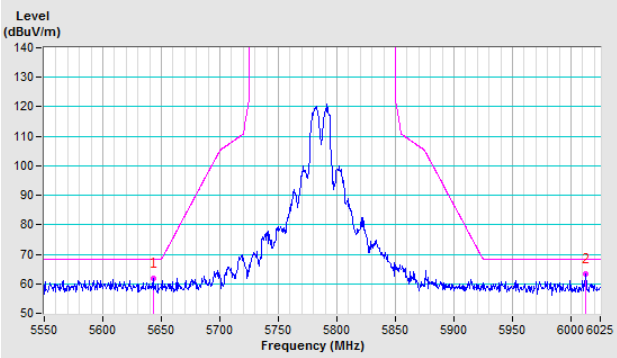
Horizontal	Vertical
	

802.11ac (VHT20)

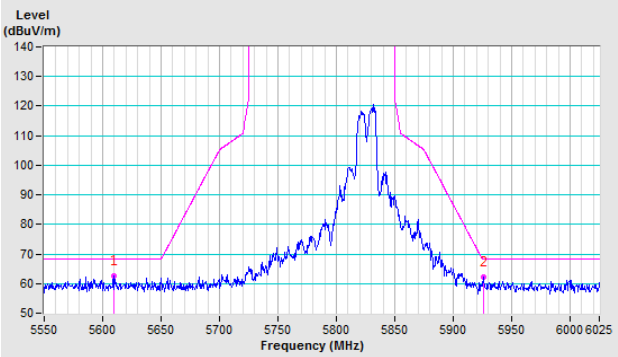
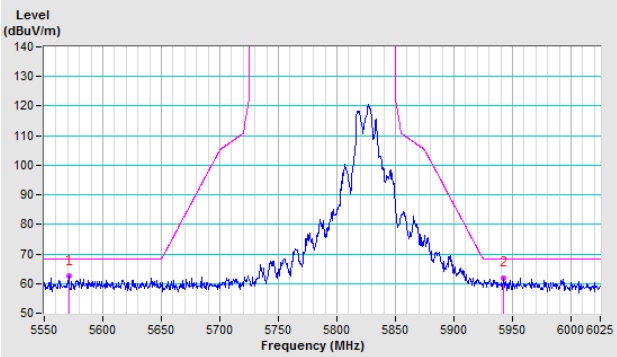
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

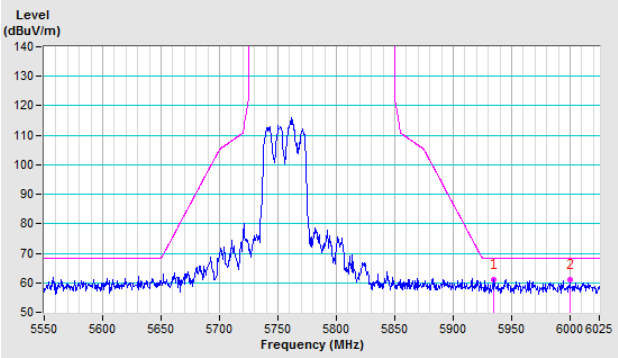
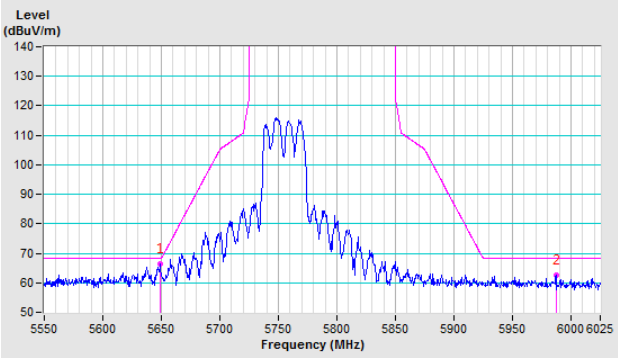
Horizontal	Vertical
	

CH 165 5825 MHz

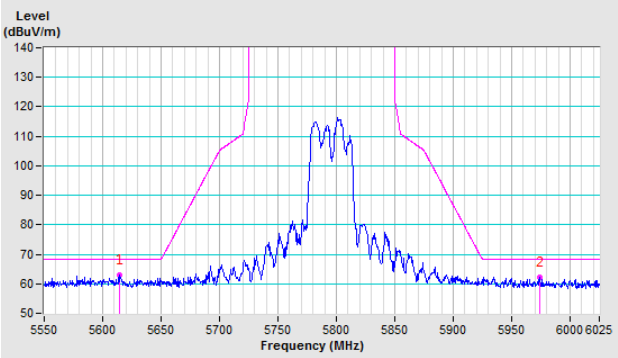
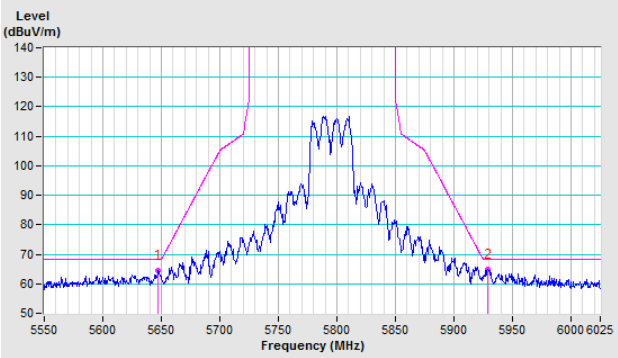
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

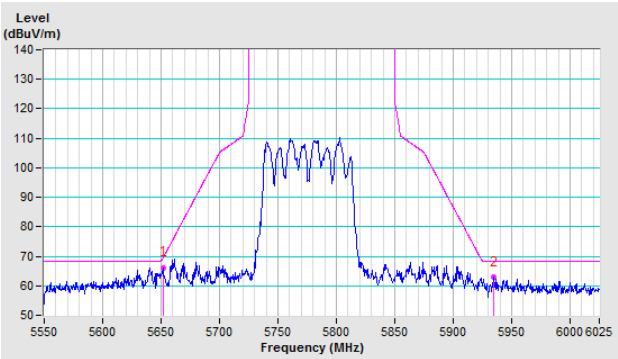
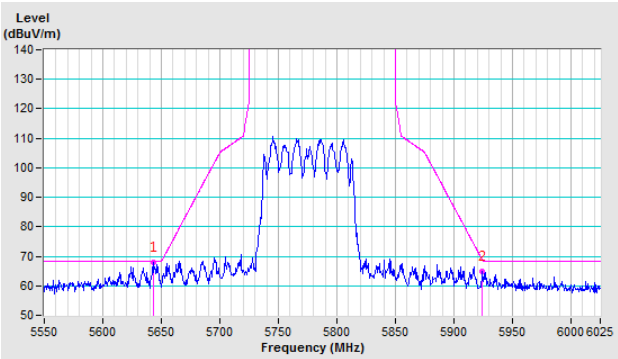
Horizontal	Vertical
	

CH 159 5795 MHz

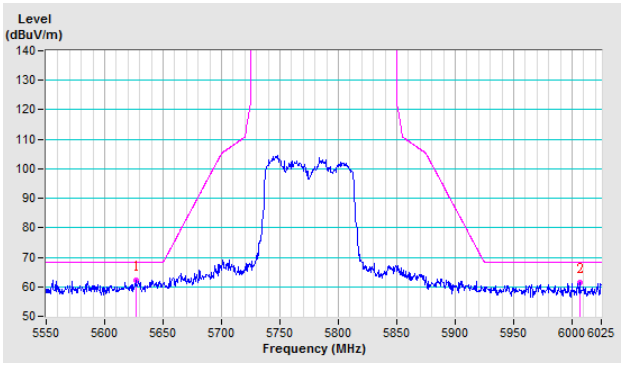
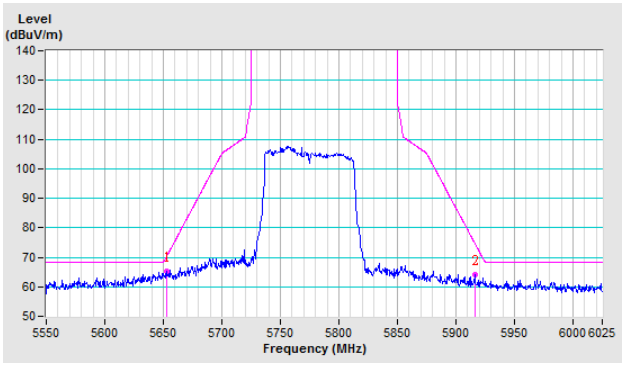
Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

802.11ac (VHT80+80)

CH 42+155 5210+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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

Linkou EMC/RF Lab
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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
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Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
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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 ---