FCC Test Report

Report No.:	RF180601E04-1
FCC ID:	O2U-CH7469
Test Model:	CH7469
Series Model:	CH7469XXXXX (The “X” in the model name could be defined as 0~9,A~Z, “-” or blank.)
Received Date:	June 01, 2018
Test Date:	June 30 to July 10, 2018
Issued Date:	Sep. 06, 2018
Applicant:	Compal Broadband Networks, Inc.
Address:	13F.-1, No.1, Taiyuan 1st. St., Zhubei City, Hsinchu County 302, 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

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Release Control Record

Issue No.	Description	Date Issued
RF180601E04-1	Original release.	Sep. 06, 2018

1 Certificate of Conformity

Product: Cable Modem

Brand: cbn

Test Model: CH7469

Series Model: CH7469XXXXX (The "X" in the model name could be defined as 0~9,A~Z, "-" or blank.)

Sample Status: ENGINEERING SAMPLE

Applicant: Compal Broadband Networks, Inc.

Test Date: June 30 to July 10, 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:** Sep. 06, 2018
Wendy Wu / Specialist

Approved by : _____ , **Date:** Sep. 06, 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 -16.74dB at 6.69531MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 15720.00MHz, 17235.00MHz, 17355MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 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	Cable Modem
Brand	cbn
Test Model	CH7469
Series Model	CH7469XXXXX (The “X” in the model name could be defined as 0~9,A~Z, “-” or blank.)
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
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
Output Power	**2.4GHz**: 891.996mW **5.18GHz ~ 5.24GHz:** 649.936mW **5.745GHz ~ 5.825GHz:** 972.589mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. 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.		

2. The EUT has below model names, which are identical to each other in all aspects except for the followings

Brand	Model	Remark
cbn	CH7469	1. For marketing propose 2. The “X” in the model name could be defined as 0~9,A~Z, "-" or blank.
	CH7469XXXXX	

From the above models, model: CH7469 was selected as representative model for the test and its data was recorded in this report.

3. The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
Frecom	F30L2-120250SPAU	Input: 100-240Vac, 0.8A, 50/60Hz Output: 12V, 2.5A, DC output cable(Unshielded, 2m)

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

Frequency Range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Connecter Type
2.4~2.4835	6.23	Dipole	i-pex(MHF)
5.15~5.35	6.05		
5.47~5.85	5.44		
Note: More detailed information, please refer to operating description.			

5. The EUT incorporates a MIMO function:

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
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)	MCS 0~8, Nss=1	4TX	4RX
	MCS 0~8, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~8, Nss=4	4TX	4RX
802.11ac (VHT40)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	4TX	4RX
	MCS 0~9, Nss=4	4TX	4RX
802.11ac (VHT80)	MCS 0~9, Nss=1	4TX	4RX
	MCS 0~9, Nss=2	4TX	4RX
	MCS 0~9, Nss=3	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 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 refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

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	157	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	157	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

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Eason Tseng
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 68%RH	120Vac, 60Hz	Andy Ho
APCM	21deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.

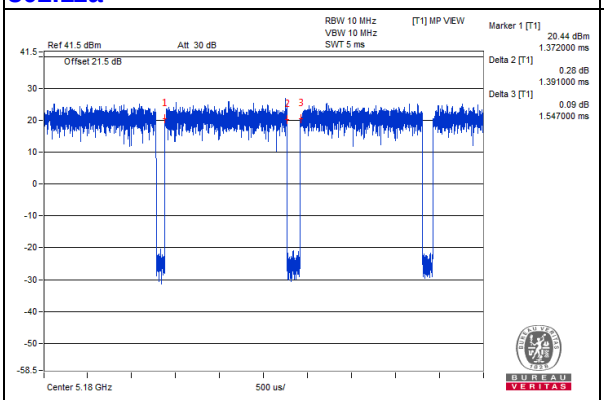
802.11a: Duty cycle = 1.391 ms/1.547 ms = 0.899, Duty factor = 10 * log(1/0.899) = 0.46

802.11ac (VHT20): Duty cycle = 1.314 ms/1.378 ms = 0.954, Duty factor = 10 * log(1/0.954) = 0.21

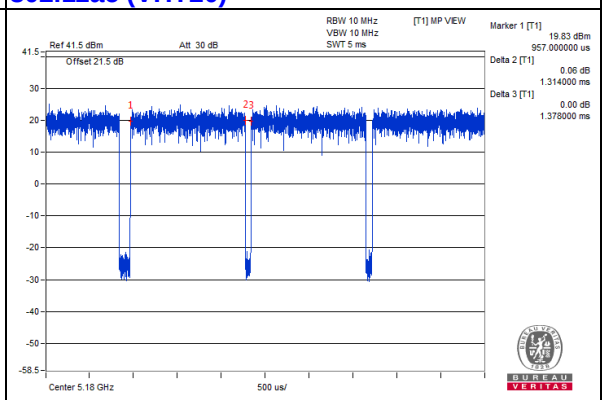
802.11ac (VHT40): Duty cycle = 0.657 ms/0.845 ms = 0.778, Duty factor = 10 * log(1/0.778) = 1.09

802.11ac (VHT80): Duty cycle = 0.323 ms/0.503 ms = 0.642, Duty factor = 10 * log(1/0.642) = 1.92

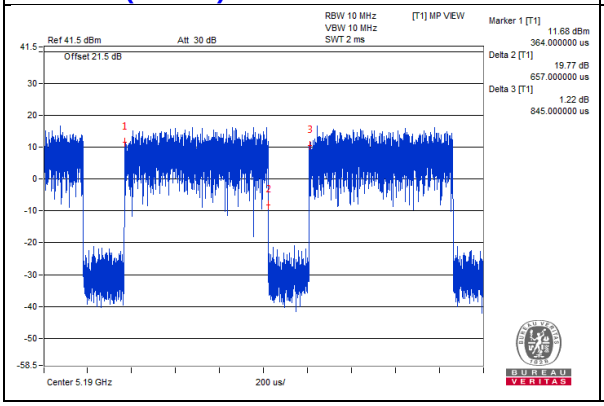
802.11a



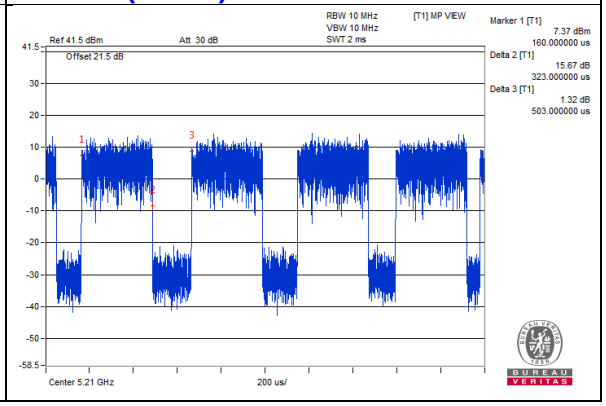
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

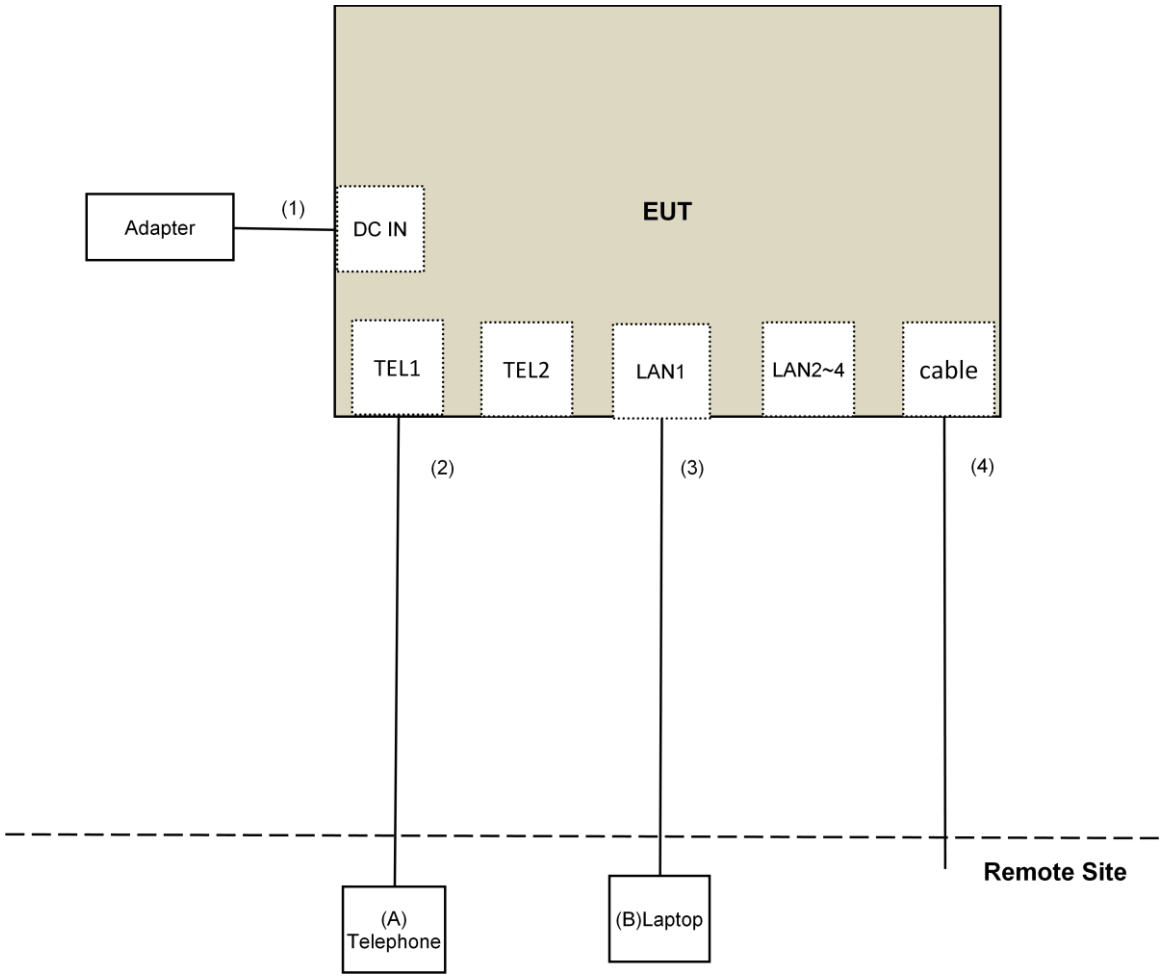
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	WONDER	WD-303	7C17KA 04011	NA	Provided by Lab
B.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

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.	DC Cable	1	2	No	0	Supplied by client
2.	RJ-11 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	Coaxial Cable	1	10	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules 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

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v02r01			Field Strength at 3m	
			PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK:105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK:122.2 (dBμV/m) *4
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-2	Mar. 21, 2018	Mar. 20, 2019
RF Cable	8D	966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 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	160923	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150318	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150321	Jan. 29, 2018	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
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
AC Power Source Extech Electronics	6205	1440452	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 22, 2018	May 21, 2019

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: July 06 to 10, 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. Parallel, perpendicular, and ground-parallel orientations 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:

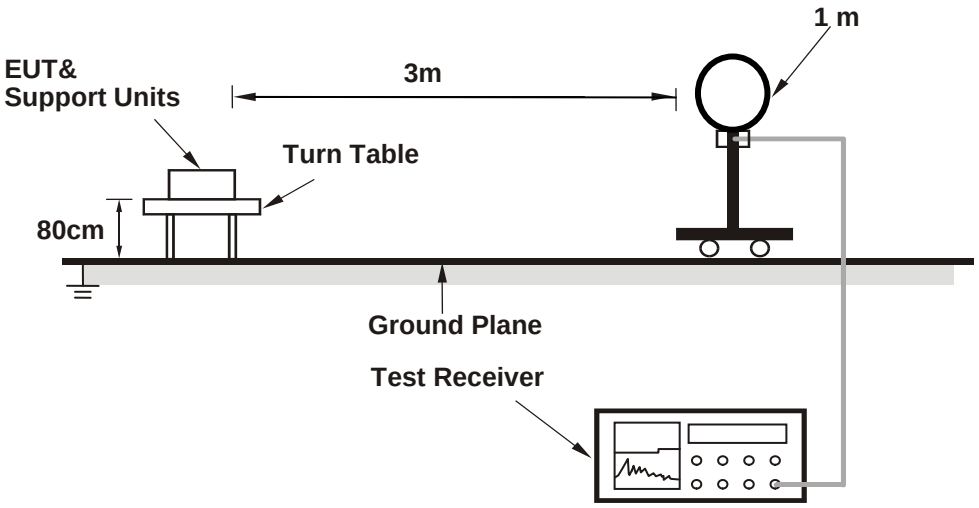
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

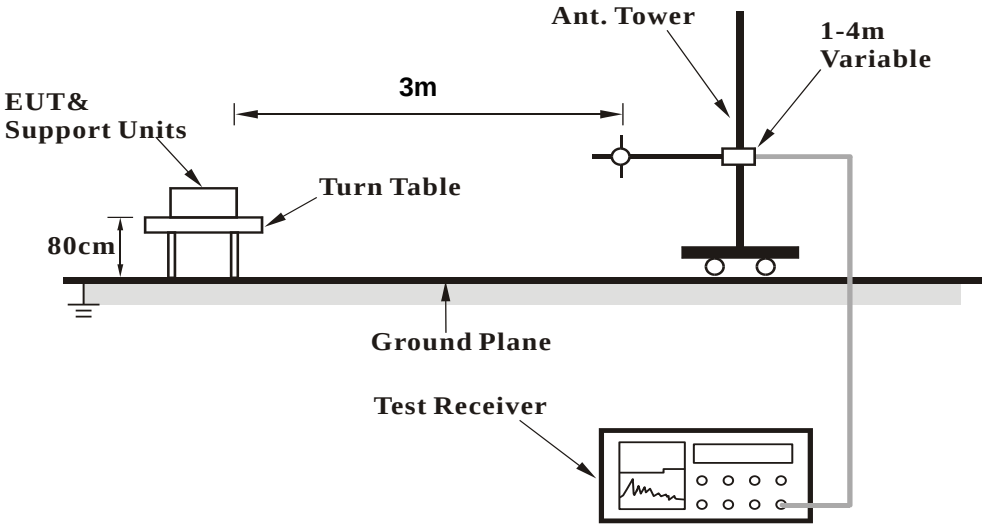
No deviation.

4.1.5 Test Setup

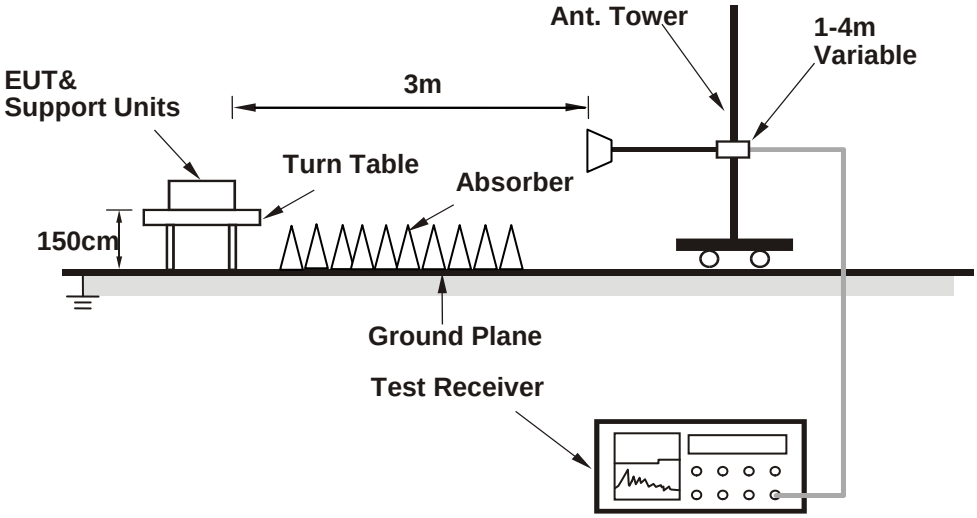
For Radiated emission below 30MHz



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 (Putty paste CH7467CE_5G_Tx cmd.txt command) 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	69.9 PK	74.0	-4.1	1.35 H	176	66.9	3.0
2	5150.00	53.6 AV	54.0	-0.4	1.35 H	176	50.6	3.0
3	*5180.00	116.9 PK			1.35 H	176	114.1	2.8
4	*5180.00	108.7 AV			1.35 H	176	105.9	2.8
5	#10360.00	55.3 PK	74.0	-18.7	1.43 H	320	42.9	12.4
6	#10360.00	45.2 AV	54.0	-8.8	1.43 H	320	32.8	12.4
7	15540.00	55.4 PK	74.0	-18.6	1.45 H	308	42.6	12.8
8	15540.00	43.9 AV	54.0	-10.1	1.45 H	308	31.1	12.8
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	5150.00	69.7 PK	74.0	-4.3	1.51 V	315	66.7	3.0
2	5150.00	53.5 AV	54.0	-0.5	1.51 V	315	50.5	3.0
3	*5180.00	116.1 PK			1.51 V	315	113.3	2.8
4	*5180.00	108.0 AV			1.51 V	315	105.2	2.8
5	#10360.00	54.2 PK	74.0	-19.8	1.10 V	229	41.8	12.4
6	#10360.00	44.1 AV	54.0	-9.9	1.10 V	229	31.7	12.4
7	15540.00	55.1 PK	74.0	-18.9	1.47 V	295	42.3	12.8
8	15540.00	43.5 AV	54.0	-10.5	1.47 V	295	30.7	12.8

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 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	61.6 PK	74.0	-12.4	1.45 H	176	58.6	3.0
2	5150.00	50.7 AV	54.0	-3.3	1.45 H	176	47.7	3.0
3	*5200.00	120.7 PK			1.45 H	176	118.0	2.7
4	*5200.00	112.1 AV			1.45 H	176	109.4	2.7
5	5350.00	56.9 PK	74.0	-17.1	1.45 H	176	54.3	2.6
6	5350.00	45.1 AV	54.0	-8.9	1.45 H	176	42.5	2.6
7	#10400.00	60.5 PK	74.0	-13.5	1.39 H	329	48.0	12.5
8	#10400.00	50.3 AV	54.0	-3.7	1.39 H	329	37.8	12.5
9	15600.00	65.6 PK	74.0	-8.4	1.79 H	311	52.8	12.8
10	15600.00	53.8 AV	54.0	-0.2	1.79 H	311	41.0	12.8
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	5150.00	59.7 PK	74.0	-14.3	1.48 V	318	56.7	3.0
2	5150.00	49.7 AV	54.0	-4.3	1.48 V	318	46.7	3.0
3	*5200.00	119.6 PK			1.48 V	318	116.9	2.7
4	*5200.00	111.5 AV			1.48 V	318	108.8	2.7
5	5350.00	56.9 PK	74.0	-17.1	1.48 V	318	54.3	2.6
6	5350.00	46.1 AV	54.0	-7.9	1.48 V	318	43.5	2.6
7	#10400.00	60.5 PK	74.0	-13.5	1.11 V	243	48.0	12.5
8	#10400.00	49.8 AV	54.0	-4.2	1.11 V	243	37.3	12.5
9	15600.00	65.9 PK	74.0	-8.1	1.46 V	288	53.1	12.8
10	15600.00	52.3 AV	54.0	-1.7	1.46 V	288	39.5	12.8

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 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	119.3 PK			1.25 H	183	116.8	2.5
2	*5240.00	111.8 AV			1.25 H	183	109.3	2.5
3	5350.00	57.9 PK	74.0	-16.1	1.25 H	183	55.3	2.6
4	5350.00	45.6 AV	54.0	-8.4	1.25 H	183	43.0	2.6
5	#10480.00	59.5 PK	74.0	-14.5	1.69 H	324	46.5	13.0
6	#10480.00	48.3 AV	54.0	-5.7	1.69 H	324	35.3	13.0
7	15720.00	65.5 PK	74.0	-8.5	2.32 H	314	53.1	12.4
8	**15720.00**	**53.9 AV**	**54.0**	**-0.1**	**2.32 H**	**314**	**41.5**	**12.4**

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	118.5 PK			1.52 V	322	116.0	2.5
2	*5240.00	111.2 AV			1.52 V	322	108.7	2.5
3	5350.00	57.6 PK	74.0	-16.4	1.52 V	322	55.0	2.6
4	5350.00	45.2 AV	54.0	-8.8	1.52 V	322	42.6	2.6
5	#10480.00	60.3 PK	74.0	-13.7	1.06 V	240	47.3	13.0
6	#10480.00	49.7 AV	54.0	-4.3	1.06 V	240	36.7	13.0
7	15720.00	65.8 PK	74.0	-8.2	1.41 V	295	53.4	12.4
8	15720.00	52.2 AV	54.0	-1.8	1.41 V	295	39.8	12.4

REMARKS:

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

CHANNEL	TX Channel 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	#5626.14	63.2 PK	68.2	-5.0	2.32 H	150	59.9	3.3
2	*5745.00	122.3 PK			2.32 H	150	119.0	3.3
3	*5745.00	112.7 AV			2.32 H	150	109.4	3.3
4	#5945.63	59.7 PK	68.2	-8.5	2.32 H	150	56.2	3.5
5	11490.00	61.7 PK	74.0	-12.3	1.55 H	257	48.3	13.4
6	11490.00	50.9 AV	54.0	-3.1	1.55 H	257	37.5	13.4
7	#17235.00	65.5 PK	74.0	-8.5	1.49 H	329	48.8	16.7
8	**#17235.00**	**53.9 AV**	**54.0**	**-0.1**	**1.49 H**	**329**	**37.2**	**16.7**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5623.62	63.4 PK	68.2	-4.8	2.77 V	296	60.1	3.3
2	*5745.00	119.5 PK			2.77 V	296	116.2	3.3
3	*5745.00	110.9 AV			2.77 V	296	107.6	3.3
4	#5936.41	58.3 PK	68.2	-9.9	2.77 V	296	54.7	3.6
5	11490.00	62.7 PK	74.0	-11.3	1.59 V	324	49.3	13.4
6	11490.00	50.5 AV	54.0	-3.5	1.59 V	324	37.1	13.4
7	#17235.00	61.5 PK	74.0	-12.5	2.48 V	304	44.8	16.7
8	#17235.00	50.3 AV	54.0	-3.7	2.48 V	304	33.6	16.7

REMARKS:

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

CHANNEL	TX Channel 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	#5620.85	63.4 PK	68.2	-4.8	2.17 H	141	60.1	3.3
2	*5785.00	121.8 PK			2.17 H	142	118.5	3.3
3	*5785.00	112.1 AV			2.17 H	142	108.8	3.3
4	#5933.82	59.7 PK	68.2	-8.5	2.17 H	141	56.1	3.6
5	11570.00	64.5 PK	74.0	-9.5	1.40 H	272	51.1	13.4
6	11570.00	51.2 AV	54.0	-2.8	1.40 H	272	37.8	13.4
7	#17355.00	67.8 PK	74.0	-6.2	1.41 H	312	50.5	17.3
8	**#17355.00**	**53.9 AV**	**54.0**	**-0.1**	**1.41 H**	**312**	**36.6**	**17.3**

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	#5588.05	61.4 PK	68.2	-6.8	2.63 V	295	58.2	3.2
2	*5785.00	119.3 PK			2.63 V	295	116.0	3.3
3	*5785.00	110.8 AV			2.63 V	295	107.5	3.3
4	#5923.54	58.5 PK	69.3	-10.8	2.63 V	295	54.9	3.6
5	11570.00	62.8 PK	74.0	-11.2	1.61 V	309	49.4	13.4
6	11570.00	50.5 AV	54.0	-3.5	1.61 V	309	37.1	13.4
7	#17355.00	61.7 PK	74.0	-12.3	2.42 V	315	44.4	17.3
8	#17355.00	50.4 AV	54.0	-3.6	2.42 V	315	33.1	17.3

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 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	#5574.53	64.0 PK	68.2	-4.2	1.90 H	162	60.8	3.2
2	*5825.00	121.9 PK			1.90 H	163	118.4	3.5
3	*5825.00	112.5 AV			1.90 H	163	109.0	3.5
4	#5925.53	59.7 PK	68.2	-8.5	1.90 H	162	56.1	3.6
5	11650.00	65.1 PK	74.0	-8.9	1.51 H	253	51.8	13.3
6	11650.00	52.4 AV	54.0	-1.6	1.51 H	253	39.1	13.3
7	#17475.00	68.2 PK	74.0	-5.8	1.40 H	313	50.0	18.2
8	#17475.00	53.7 AV	54.0	-0.3	1.40 H	313	35.5	18.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5627.57	63.2 PK	68.2	-5.0	2.67 V	287	59.9	3.3
2	*5825.00	119.1 PK			2.87 V	267	115.6	3.5
3	*5825.00	110.7 AV			2.87 V	267	107.2	3.5
4	#5932.19	58.1 PK	68.2	-10.1	2.67 V	287	54.5	3.6
5	11650.00	63.7 PK	74.0	-10.3	2.29 V	258	50.4	13.3
6	11650.00	50.7 AV	54.0	-3.3	2.29 V	258	37.4	13.3
7	#17475.00	61.4 PK	74.0	-12.6	2.45 V	310	43.2	18.2
8	#17475.00	50.0 AV	54.0	-4.0	2.45 V	310	31.8	18.2

REMARKS:

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

802.11ac (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	61.9 PK	74.0	-12.1	1.41 H	174	58.9	3.0
2	5150.00	53.8 AV	54.0	-0.2	1.41 H	174	50.8	3.0
3	*5180.00	116.2 PK			1.41 H	174	113.4	2.8
4	*5180.00	107.8 AV			1.41 H	174	105.0	2.8
5	#10360.00	59.9 PK	74.0	-14.1	1.98 H	309	47.5	12.4
6	#10360.00	50.6 AV	54.0	-3.4	1.98 H	309	38.2	12.4
7	15540.00	60.5 PK	74.0	-13.5	2.44 H	311	47.7	12.8
8	15540.00	53.7 AV	54.0	-0.3	2.44 H	311	40.9	12.8
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	5150.00	60.8 PK	74.0	-13.2	2.84 V	105	57.8	3.0
2	5150.00	53.0 AV	54.0	-1.0	2.84 V	105	50.0	3.0
3	*5180.00	114.6 PK			2.84 V	105	111.8	2.8
4	*5180.00	106.8 AV			2.84 V	105	104.0	2.8
5	#10360.00	62.8 PK	74.0	-11.2	1.64 V	312	50.4	12.4
6	#10360.00	50.7 AV	54.0	-3.3	1.64 V	312	38.3	12.4
7	15540.00	61.9 PK	74.0	-12.1	2.42 V	302	49.1	12.8
8	15540.00	50.6 AV	54.0	-3.4	2.42 V	302	37.8	12.8

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 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	58.6 PK	74.0	-15.4	1.31 H	178	55.6	3.0
2	5150.00	50.4 AV	54.0	-3.6	1.31 H	178	47.4	3.0
3	*5200.00	120.1 PK			1.31 H	178	117.4	2.7
4	*5200.00	111.5 AV			1.31 H	178	108.8	2.7
5	5350.00	56.8 PK	74.0	-17.2	1.31 H	178	54.2	2.6
6	5350.00	44.9 AV	54.0	-9.1	1.31 H	178	42.3	2.6
7	#10400.00	60.2 PK	74.0	-13.8	1.98 H	321	47.7	12.5
8	#10400.00	50.7 AV	54.0	-3.3	1.98 H	321	38.2	12.5
9	15600.00	65.5 PK	74.0	-8.5	1.59 H	309	52.7	12.8
10	15600.00	53.6 AV	54.0	-0.4	1.59 H	309	40.8	12.8
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	5150.00	57.2 PK	74.0	-16.8	2.90 V	100	54.2	3.0
2	5150.00	49.7 AV	54.0	-4.3	2.90 V	100	46.7	3.0
3	*5200.00	119.1 PK			2.90 V	100	116.4	2.7
4	*5200.00	110.5 AV			2.90 V	100	107.8	2.7
5	5350.00	53.9 PK	74.0	-20.1	2.90 V	100	51.3	2.6
6	5350.00	43.5 AV	54.0	-10.5	2.90 V	100	40.9	2.6
7	#10400.00	62.5 PK	74.0	-11.5	1.64 V	304	50.0	12.5
8	#10400.00	50.3 AV	54.0	-3.7	1.64 V	304	37.8	12.5
9	15600.00	64.4 PK	74.0	-9.6	1.44 V	287	51.6	12.8
10	15600.00	52.8 AV	54.0	-1.2	1.44 V	287	40.0	12.8

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 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	119.7 PK			1.37 H	176	117.2	2.5
2	*5240.00	111.4 AV			1.37 H	176	108.9	2.5
3	5350.00	55.2 PK	74.0	-18.8	1.37 H	176	52.6	2.6
4	5350.00	44.5 AV	54.0	-9.5	1.37 H	176	41.9	2.6
5	#10480.00	59.8 PK	74.0	-14.2	1.98 H	325	46.8	13.0
6	#10480.00	50.2 AV	54.0	-3.8	1.98 H	325	37.2	13.0
7	15720.00	67.7 PK	74.0	-6.3	2.34 H	312	55.3	12.4
8	15720.00	53.8 AV	54.0	-0.2	2.34 H	312	41.4	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	118.5 PK			2.95 V	116	116.0	2.5
2	*5240.00	110.2 AV			2.95 V	116	107.7	2.5
3	5350.00	54.5 PK	74.0	-19.5	2.95 V	116	51.9	2.6
4	5350.00	43.8 AV	54.0	-10.2	2.95 V	116	41.2	2.6
5	#10480.00	62.5 PK	74.0	-11.5	1.61 V	303	49.5	13.0
6	#10480.00	50.5 AV	54.0	-3.5	1.61 V	303	37.5	13.0
7	15720.00	61.7 PK	74.0	-12.3	2.41 V	315	49.3	12.4
8	15720.00	50.3 AV	54.0	-3.7	2.41 V	315	37.9	12.4

REMARKS:

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

CHANNEL	TX Channel 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	#5558.62	62.2 PK	68.2	-6.0	1.80 H	202	59.1	3.1
2	*5745.00	119.2 PK			1.80 H	202	115.9	3.3
3	*5745.00	110.1 AV			1.80 H	202	106.8	3.3
4	#5962.54	59.4 PK	68.2	-8.8	1.80 H	202	55.9	3.5
5	11490.00	64.5 PK	74.0	-9.5	1.62 H	256	51.1	13.4
6	11490.00	51.1 AV	54.0	-2.9	1.62 H	256	37.7	13.4
7	#17235.00	66.2 PK	74.0	-7.8	1.34 H	313	49.5	16.7
8	#17235.00	53.6 AV	54.0	-0.4	1.34 H	313	36.9	16.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5590.19	61.6 PK	68.2	-6.6	2.76 V	303	58.4	3.2
2	*5745.00	118.9 PK			2.76 V	303	115.6	3.3
3	*5745.00	109.5 AV			2.76 V	303	106.2	3.3
4	#5992.11	58.1 PK	68.2	-10.1	2.76 V	303	54.4	3.7
5	11490.00	62.6 PK	74.0	-11.4	1.69 V	326	49.2	13.4
6	11490.00	50.5 AV	54.0	-3.5	1.69 V	326	37.1	13.4
7	#17235.00	62.2 PK	74.0	-11.8	2.47 V	289	45.5	16.7
8	#17235.00	50.7 AV	54.0	-3.3	2.47 V	289	34.0	16.7

REMARKS:

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

CHANNEL	TX Channel 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	#5551.47	61.6 PK	68.2	-6.6	1.98 H	195	58.6	3.0
2	*5785.00	119.4 PK			1.98 H	195	116.1	3.3
3	*5785.00	110.2 AV			1.98 H	195	106.9	3.3
4	#5923.37	58.1 PK	69.4	-11.3	1.98 H	195	54.5	3.6
5	11570.00	60.4 PK	74.0	-13.6	2.03 H	321	47.0	13.4
6	11570.00	50.9 AV	54.0	-3.1	2.03 H	321	37.5	13.4
7	#17355.00	67.2 PK	74.0	-6.8	1.35 H	311	49.9	17.3
8	#17355.00	53.8 AV	54.0	-0.2	1.35 H	311	36.5	17.3
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	#5559.24	61.6 PK	68.2	-6.6	2.84 V	296	58.5	3.1
2	*5785.00	119.2 PK			2.84 V	296	115.9	3.3
3	*5785.00	109.7 AV			2.84 V	296	106.4	3.3
4	#5944.80	58.1 PK	68.2	-10.1	2.84 V	296	54.6	3.5
5	11570.00	63.2 PK	74.0	-10.8	1.64 V	308	49.8	13.4
6	11570.00	51.0 AV	54.0	-3.0	1.64 V	308	37.6	13.4
7	#17355.00	62.0 PK	74.0	-12.0	2.42 V	318	44.7	17.3
8	#17355.00	50.6 AV	54.0	-3.4	2.42 V	318	33.3	17.3

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 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	#5617.66	63.0 PK	68.2	-5.2	1.96 H	170	59.7	3.3
2	*5825.00	119.2 PK			1.96 H	170	115.7	3.5
3	*5825.00	109.8 AV			1.96 H	170	106.3	3.5
4	#5932.76	59.3 PK	68.2	-8.9	1.96 H	170	55.7	3.6
5	11650.00	63.2 PK	74.0	-10.8	1.53 H	253	49.9	13.3
6	11650.00	50.1 AV	54.0	-3.9	1.53 H	253	36.8	13.3
7	#17475.00	66.4 PK	74.0	-7.6	1.37 H	309	48.2	18.2
8	#17475.00	53.6 AV	54.0	-0.4	1.37 H	309	35.4	18.2

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5561.71	62.3 PK	68.2	-5.9	2.93 V	285	59.2	3.1
2	*5825.00	119.1 PK			2.85 V	293	115.6	3.5
3	*5825.00	109.4 AV			2.85 V	293	105.9	3.5
4	#5937.51	57.6 PK	68.2	-10.6	2.93 V	285	54.0	3.6
5	11650.00	62.0 PK	74.0	-12.0	1.72 V	329	48.7	13.3
6	11650.00	50.1 AV	54.0	-3.9	1.72 V	329	36.8	13.3
7	#17475.00	65.5 PK	74.0	-8.5	1.55 V	290	47.3	18.2
8	#17475.00	52.1 AV	54.0	-1.9	1.55 V	290	33.9	18.2

REMARKS:

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

802.11ac (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	62.6 PK	74.0	-11.4	1.52 H	179	59.6	3.0
2	5150.00	53.8 AV	54.0	-0.2	1.52 H	179	50.8	3.0
3	*5190.00	108.9 PK			1.52 H	179	106.1	2.8
4	*5190.00	100.7 AV			1.52 H	179	97.9	2.8
5	5350.00	53.6 PK	74.0	-20.4	1.52 H	179	51.0	2.6
6	5350.00	43.3 AV	54.0	-10.7	1.52 H	179	40.7	2.6
7	#10380.00	57.6 PK	74.0	-16.4	1.81 H	219	45.2	12.4
8	#10380.00	46.7 AV	54.0	-7.3	1.81 H	219	34.3	12.4
9	15570.00	56.9 PK	74.0	-17.1	1.66 H	262	44.1	12.8
10	15570.00	46.2 AV	54.0	-7.8	1.66 H	262	33.4	12.8
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	5150.00	61.8 PK	74.0	-12.2	2.94 V	110	58.8	3.0
2	5150.00	52.7 AV	54.0	-1.3	2.94 V	110	49.7	3.0
3	*5190.00	108.0 PK			2.94 V	110	105.2	2.8
4	*5190.00	99.9 AV			2.94 V	110	97.1	2.8
5	5350.00	52.6 PK	74.0	-21.4	2.94 V	110	50.0	2.6
6	5350.00	42.8 AV	54.0	-11.2	2.94 V	110	40.2	2.6
7	#10380.00	55.1 PK	74.0	-18.9	1.65 V	324	42.7	12.4
8	#10380.00	45.0 AV	54.0	-9.0	1.65 V	324	32.6	12.4
9	15570.00	55.8 PK	74.0	-18.2	2.37 V	330	43.0	12.8
10	15570.00	45.0 AV	54.0	-9.0	2.37 V	330	32.2	12.8

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 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	115.4 PK			1.35 H	175	112.9	2.5
2	*5230.00	107.1 AV			1.35 H	175	104.6	2.5
3	5350.00	58.2 PK	74.0	-15.8	1.35 H	175	55.6	2.6
4	5350.00	49.1 AV	54.0	-4.9	1.35 H	175	46.5	2.6
5	#10460.00	58.1 PK	74.0	-15.9	1.84 H	223	45.2	12.9
6	#10460.00	46.9 AV	54.0	-7.1	1.84 H	223	34.0	12.9
7	15690.00	63.2 PK	74.0	-10.8	2.79 H	284	50.8	12.4
8	15690.00	52.5 AV	54.0	-1.5	2.79 H	284	40.1	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	114.2 PK			2.92 V	101	111.7	2.5
2	*5230.00	105.8 AV			2.92 V	101	103.3	2.5
3	5350.00	56.2 PK	74.0	-17.8	2.92 V	101	53.6	2.6
4	5350.00	47.4 AV	54.0	-6.6	2.92 V	101	44.8	2.6
5	#10460.00	57.2 PK	74.0	-16.8	1.65 V	298	44.3	12.9
6	#10460.00	46.1 AV	54.0	-7.9	1.65 V	298	33.2	12.9
7	15690.00	61.1 PK	74.0	-12.9	2.41 V	319	48.7	12.4
8	15690.00	49.2 AV	54.0	-4.8	2.41 V	319	36.8	12.4

REMARKS:

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

CHANNEL	TX Channel 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	#5625.12	63.8 PK	68.2	-4.4	1.85 H	211	60.5	3.3
2	*5755.00	114.9 PK			1.85 H	211	111.6	3.3
3	*5755.00	106.1 AV			1.85 H	211	102.8	3.3
4	#5977.98	58.6 PK	68.2	-9.6	1.85 H	211	55.0	3.6
5	11510.00	58.3 PK	74.0	-15.7	1.84 H	224	44.9	13.4
6	11510.00	47.0 AV	54.0	-7.0	1.84 H	224	33.6	13.4
7	#17265.00	64.2 PK	74.0	-9.8	1.49 H	309	47.4	16.8
8	#17265.00	53.7 AV	54.0	-0.3	1.49 H	309	36.9	16.8

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	#5648.21	64.0 PK	68.2	-4.2	2.77 V	301	60.8	3.2
2	*5755.00	113.6 PK			2.77 V	301	110.3	3.3
3	*5755.00	105.4 AV			2.77 V	301	102.1	3.3
4	#5970.40	58.4 PK	68.2	-9.8	2.77 V	301	54.8	3.6
5	11510.00	57.6 PK	74.0	-16.4	1.63 V	290	44.2	13.4
6	11510.00	46.5 AV	54.0	-7.5	1.63 V	290	33.1	13.4
7	#17265.00	61.0 PK	74.0	-13.0	2.43 V	317	44.2	16.8
8	#17265.00	49.2 AV	54.0	-4.8	2.43 V	317	32.4	16.8

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 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	#5606.03	65.0 PK	68.2	-3.2	1.57 H	208	61.7	3.3
2	*5795.00	115.1 PK			1.57 H	208	111.8	3.3
3	*5795.00	106.8 AV			1.57 H	208	103.5	3.3
4	#5924.75	61.8 PK	68.4	-6.6	1.57 H	208	58.2	3.6
5	11590.00	58.4 PK	74.0	-15.6	1.88 H	236	45.0	13.4
6	11590.00	46.9 AV	54.0	-7.1	1.88 H	236	33.5	13.4
7	#17385.00	64.3 PK	74.0	-9.7	1.53 H	323	46.8	17.5
8	#17385.00	53.8 AV	54.0	-0.2	1.53 H	323	36.3	17.5
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	#5647.42	64.6 PK	68.2	-3.6	2.85 V	303	61.4	3.2
2	*5795.00	114.0 PK			2.85 V	303	110.7	3.3
3	*5795.00	105.8 AV			2.85 V	303	102.5	3.3
4	#5923.16	59.2 PK	69.6	-10.4	2.85 V	303	55.6	3.6
5	11590.00	56.8 PK	74.0	-17.2	1.71 V	287	43.4	13.4
6	11590.00	45.6 AV	54.0	-8.4	1.71 V	287	32.2	13.4
7	#17385.00	61.3 PK	74.0	-12.7	2.37 V	306	43.8	17.5
8	#17385.00	49.6 AV	54.0	-4.4	2.37 V	306	32.1	17.5

REMARKS:

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

802.11ac (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	63.9 PK	74.0	-10.1	1.28 H	173	60.9	3.0
2	5150.00	53.7 AV	54.0	-0.3	1.28 H	173	50.7	3.0
3	*5210.00	104.9 PK			1.28 H	173	102.2	2.7
4	*5210.00	96.9 AV			1.28 H	173	94.2	2.7
5	5350.00	55.9 PK	74.0	-18.1	1.28 H	173	53.3	2.6
6	5350.00	44.7 AV	54.0	-9.3	1.28 H	173	42.1	2.6
7	#10420.00	52.8 PK	74.0	-21.2	1.93 H	221	40.2	12.6
8	#10420.00	41.4 AV	54.0	-12.6	1.93 H	221	28.8	12.6
9	15630.00	54.2 PK	74.0	-19.8	1.55 H	319	41.5	12.7
10	15630.00	42.1 AV	54.0	-11.9	1.55 H	319	29.4	12.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.6 PK	74.0	-12.4	2.91 V	111	58.6	3.0
2	5150.00	52.4 AV	54.0	-1.6	2.91 V	111	49.4	3.0
3	*5210.00	103.2 PK			2.91 V	111	100.5	2.7
4	*5210.00	95.1 AV			2.91 V	111	92.4	2.7
5	5350.00	53.8 PK	74.0	-20.2	2.91 V	111	51.2	2.6
6	5350.00	43.1 AV	54.0	-10.9	2.91 V	111	40.5	2.6
7	#10420.00	52.1 PK	74.0	-21.9	1.62 V	314	39.5	12.6
8	#10420.00	39.6 AV	54.0	-14.4	1.62 V	314	27.0	12.6
9	15630.00	53.3 PK	74.0	-20.7	2.32 V	343	40.6	12.7
10	15630.00	41.6 AV	54.0	-12.4	2.32 V	343	28.9	12.7

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5643.88	67.7 PK	68.2	-0.5	1.57 H	209	64.5	3.2
2	*5775.00	111.8 PK			1.57 H	209	108.4	3.4
3	*5775.00	103.9 AV			1.57 H	209	100.5	3.4
4	#5925.20	65.1 PK	68.2	-3.1	1.57 H	209	61.5	3.6
5	11550.00	54.1 PK	74.0	-19.9	1.83 H	234	40.8	13.3
6	11550.00	42.2 AV	54.0	-11.8	1.83 H	234	28.9	13.3
7	#17325.00	65.2 PK	74.0	-8.8	1.52 H	309	48.1	17.1
8	#17325.00	49.3 AV	54.0	-4.7	1.52 H	309	32.2	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	#5648.59	67.2 PK	68.2	-1.0	2.73 V	317	64.0	3.2
2	*5775.00	110.9 PK			2.73 V	317	107.5	3.4
3	*5775.00	101.8 AV			2.73 V	317	98.4	3.4
4	#5927.79	62.3 PK	68.2	-5.9	2.73 V	317	58.7	3.6
5	11550.00	52.1 PK	74.0	-21.9	1.68 V	316	38.8	13.3
6	11550.00	40.2 AV	54.0	-13.8	1.68 V	316	26.9	13.3
7	#17325.00	62.2 PK	74.0	-11.8	2.29 V	341	45.1	17.1
8	#17325.00	46.3 AV	54.0	-7.7	2.29 V	341	29.2	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.

Below 1GHz Data:

802.11ac (VHT20)

CHANNEL	TX Channel 157	**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	94.14	30.7 QP	43.5	-12.8	2.00 H	65	44.0	-13.3
2	173.34	31.9 QP	43.5	-11.6	1.50 H	284	40.5	-8.6
3	375.03	36.0 QP	46.0	-10.0	1.00 H	56	40.8	-4.8
4	625.02	38.1 QP	46.0	-7.9	1.50 H	360	36.9	1.2
5	675.03	34.6 QP	46.0	-11.4	1.00 H	120	32.9	1.7
6	875.02	39.2 QP	46.0	-6.8	1.50 H	81	34.2	5.0
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	81.48	30.9 QP	40.0	-9.1	1.00 V	220	43.7	-12.8
2	125.01	29.6 QP	43.5	-13.9	1.50 V	357	39.0	-9.4
3	375.08	30.9 QP	46.0	-15.1	1.00 V	360	35.7	-4.8
4	506.27	36.1 QP	46.0	-9.9	1.00 V	126	37.6	-1.5
5	558.63	35.7 QP	46.0	-10.3	1.00 V	48	36.4	-0.7
6	748.31	37.3 QP	46.0	-8.7	2.00 V	360	34.2	3.1

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

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 04, 2018	June 03, 2019
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
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
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: June 30, 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.

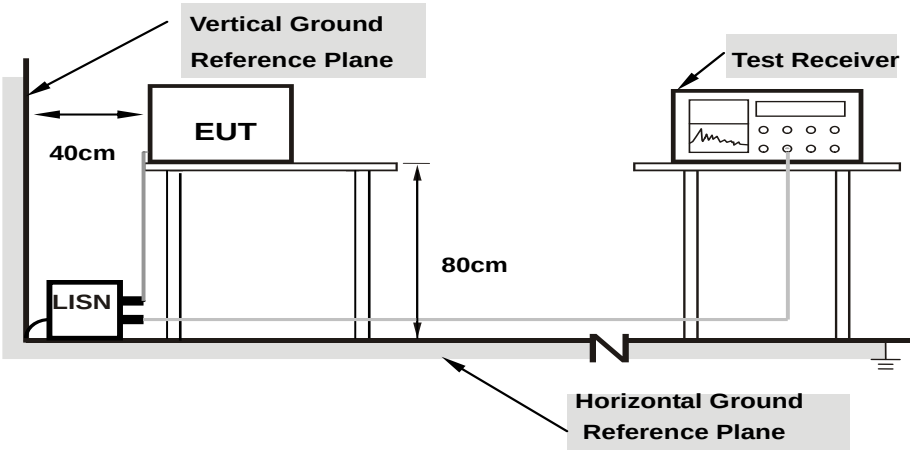
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

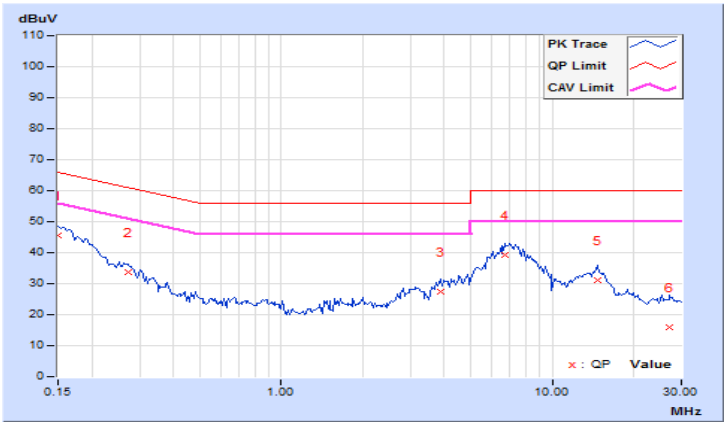
4.2.7 Test Results

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	10.05	35.56	19.20	45.61	29.25	66.00	56.00	-20.39	-26.75
2	0.27109	10.09	23.46	10.58	33.55	20.67	61.08	51.08	-27.53	-30.41
3	3.89063	10.33	17.25	11.65	27.58	21.98	56.00	46.00	-28.42	-24.02
4	**6.69531**	**10.51**	**28.60**	**22.75**	**39.11**	**33.26**	**60.00**	**50.00**	**-20.89**	**-16.74**
5	14.79297	11.05	20.08	14.67	31.13	25.72	60.00	50.00	-28.87	-24.28
6	27.00391	11.53	4.29	-0.38	15.82	11.15	60.00	50.00	-44.18	-38.85

REMARKS:

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

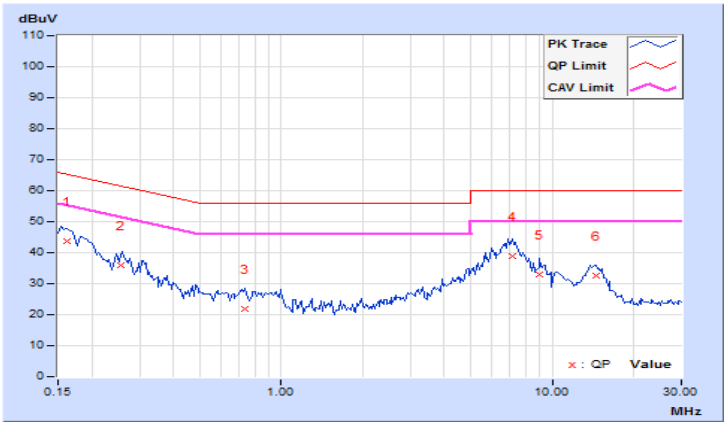


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	9.96	33.61	17.51	43.57	27.47	65.38	55.38	-21.81	-27.91
2	0.25547	9.98	25.88	13.21	35.86	23.19	61.58	51.58	-25.72	-28.39
3	0.73594	10.03	11.87	3.02	21.90	13.05	56.00	46.00	-34.10	-32.95
4	7.14063	10.37	28.65	22.64	39.02	33.01	60.00	50.00	-20.98	-16.99
5	8.98828	10.48	22.60	16.71	33.08	27.19	60.00	50.00	-26.92	-22.81
6	14.55078	10.84	21.84	16.66	32.68	27.50	60.00	50.00	-27.32	-22.50

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.



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 Result

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	19.70	19.42	19.56	18.89	348.634	25.42	30.00	Pass
40	5200	22.25	22.46	22.19	21.47	649.936	28.13	30.00	Pass
48	5240	22.30	22.34	21.97	21.18	629.838	27.99	30.00	Pass
149	5745	23.85	23.65	24.35	23.01	946.656	29.76	30.00	Pass
157	5785	23.94	23.75	24.43	23.23	972.589	29.88	30.00	Pass
165	5825	23.71	23.56	24.28	22.79	919.974	29.64	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	19.27	19.25	19.20	18.31	319.608	25.05	30.00	Pass
40	5200	22.06	22.16	21.87	20.96	603.684	27.81	30.00	Pass
48	5240	22.14	22.22	21.37	20.59	582.046	27.65	30.00	Pass
149	5745	24.05	23.84	23.53	23.41	940.904	29.74	30.00	Pass
157	5785	23.55	23.74	23.17	23.71	905.51	29.57	30.00	Pass
165	5825	23.29	23.23	22.94	23.43	840.764	29.25	30.00	Pass

802.11ac (VHT40)

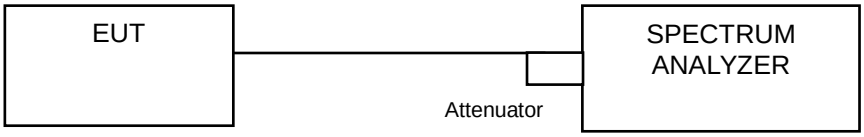
Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	15.59	16.39	17.21	16.46	176.636	22.47	30.00	Pass
46	5230	21.55	21.83	22.24	21.63	608.334	27.84	30.00	Pass
151	5755	23.59	23.54	23.03	23.51	879.801	29.44	30.00	Pass
159	5795	23.78	23.75	23.46	23.90	943.209	29.75	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	14.94	15.54	16.24	15.19	142.109	21.53	30.00	Pass
155	5775	23.77	23.18	24.15	23.56	933.204	29.70	30.00	Pass

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	16.92	16.80	16.68	16.68
40	5200	16.68	16.80	17.04	16.92
48	5240	16.92	16.80	16.92	16.80
149	5745	17.28	17.88	18.36	17.04
157	5785	17.04	18.48	18.24	17.40
165	5825	16.92	19.44	21.24	17.16

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	17.76	17.76	17.76	17.76
40	5200	17.76	17.76	17.76	17.64
48	5240	17.76	17.76	17.88	17.76
149	5745	18.48	19.32	18.00	17.76
157	5785	18.12	18.72	18.12	18.00
165	5825	18.00	18.96	18.00	18.00

802.11ac (VHT40)

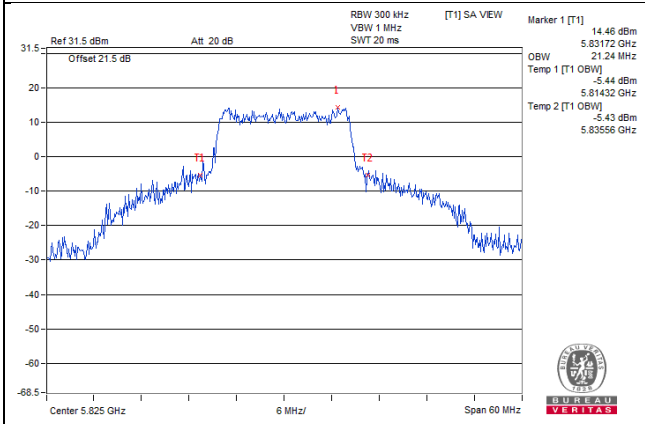
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	36.48	36.72	36.96	36.72
46	5230	36.48	36.96	37.20	36.96
151	5755	37.44	37.68	37.20	37.44
159	5795	37.44	48.96	37.68	38.16

802.11ac (VHT80)

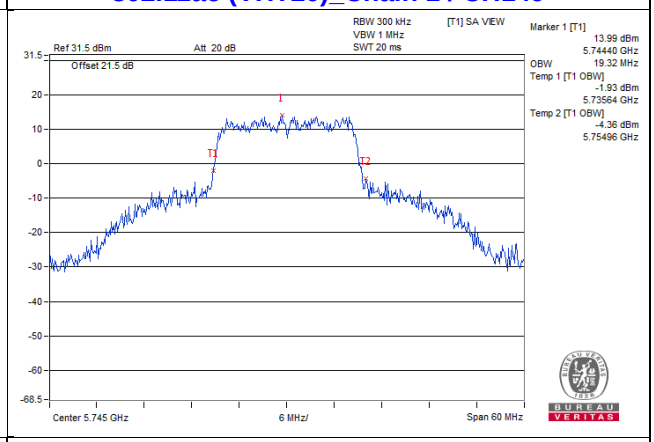
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	75.36	75.84	75.84	75.84
155	5775	78.24	91.68	77.28	77.28

Spectrum Plot of Worst Value

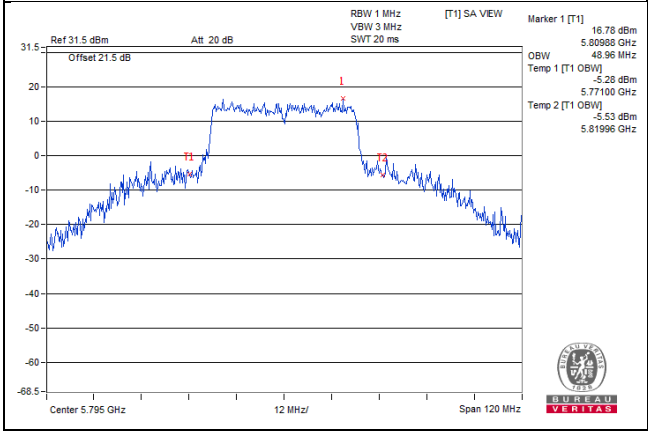
802.11a_Chain 2 / CH165



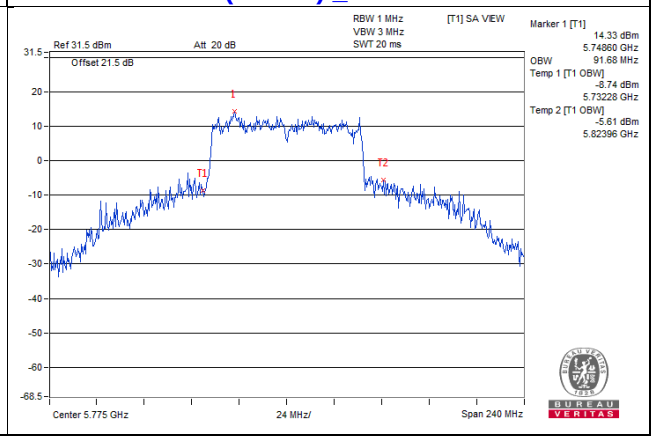
802.11ac (VHT20)_Chain 1 / CH149



802.11ac (VHT40) _Chain 1 / CH159

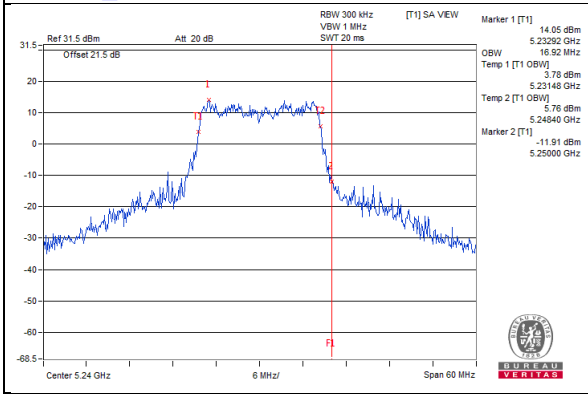


802.11ac (VHT80) _Chain 1 / CH155

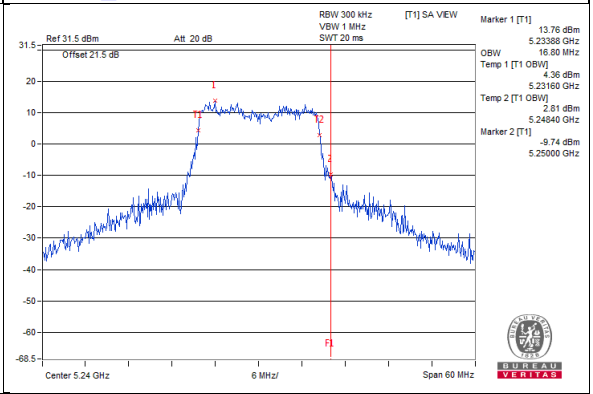


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

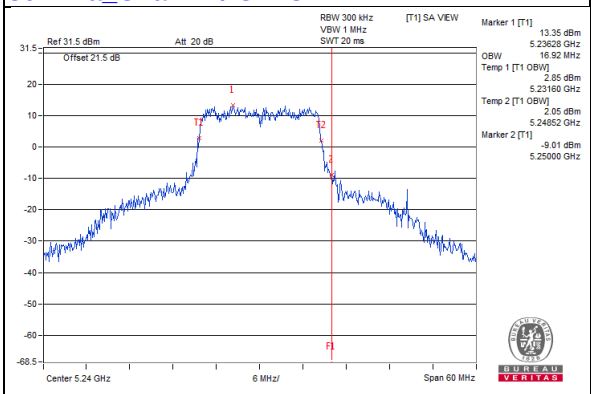
802.11a_Chain 0 / CH48



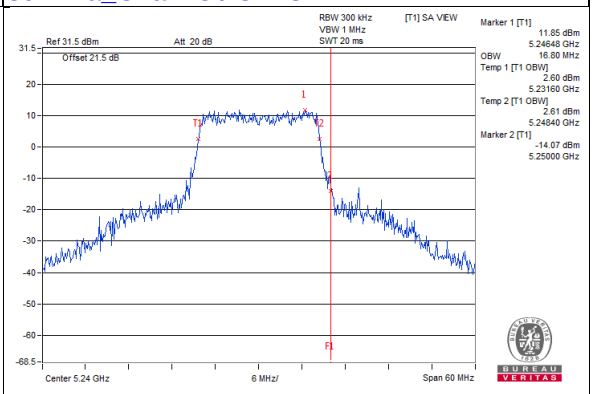
802.11a_Chain 1 / CH48



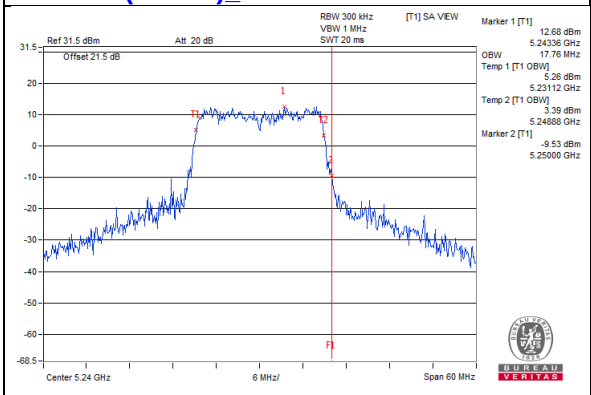
802.11a_Chain 2 / CH48



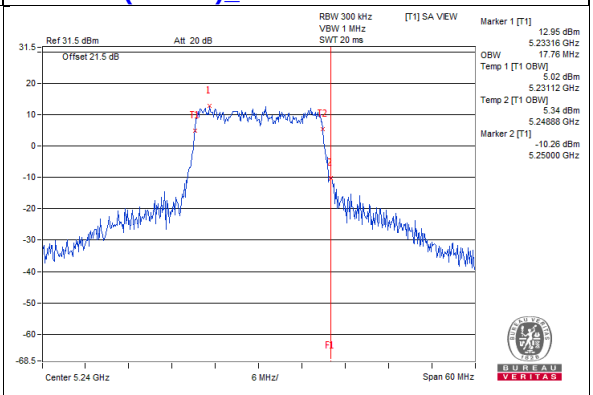
802.11a_Chain 3 / CH48



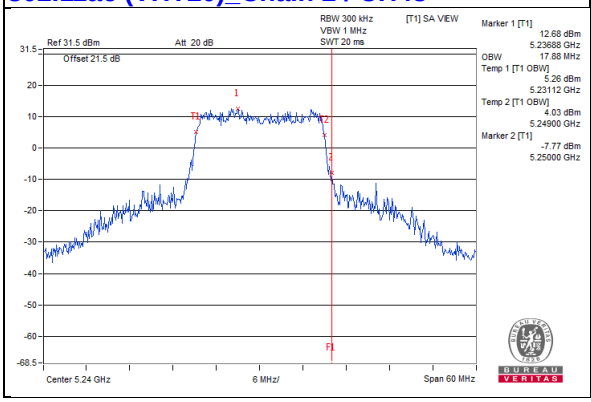
802.11ac (VHT20)_Chain 0 / CH48



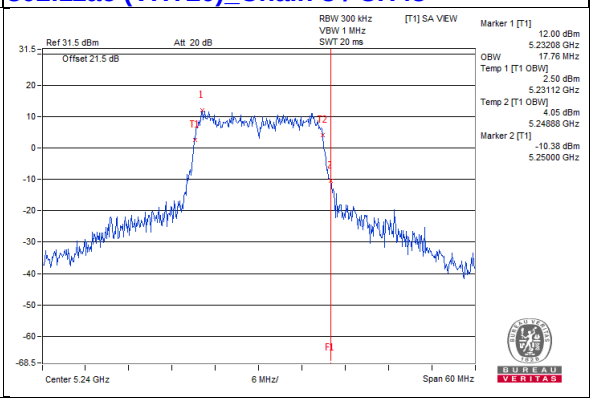
802.11ac (VHT20)_Chain 1 / CH48



802.11ac (VHT20)_Chain 2 / CH48

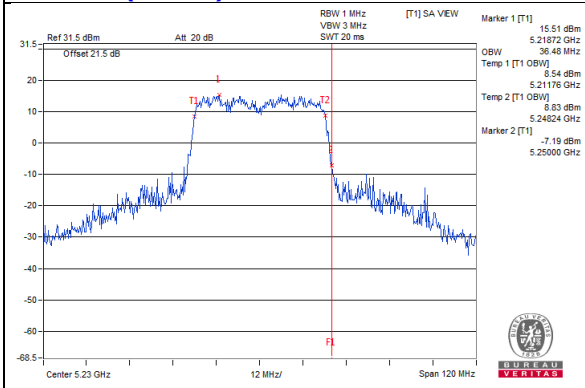


802.11ac (VHT20)_Chain 3 / CH48

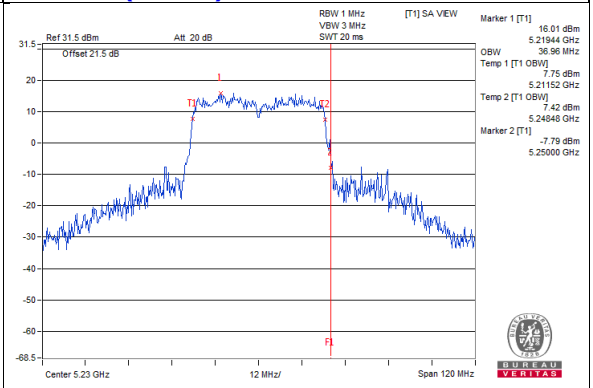


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

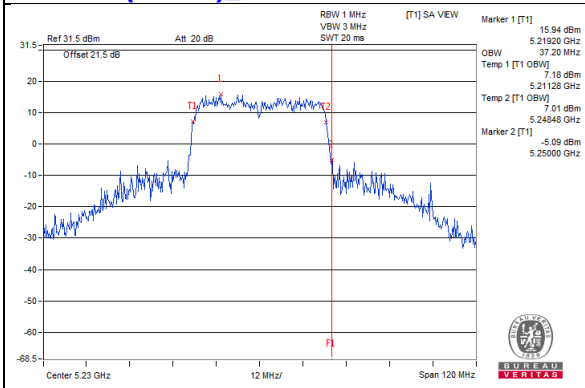
802.11ac (VHT40)_Chain 0 / CH46



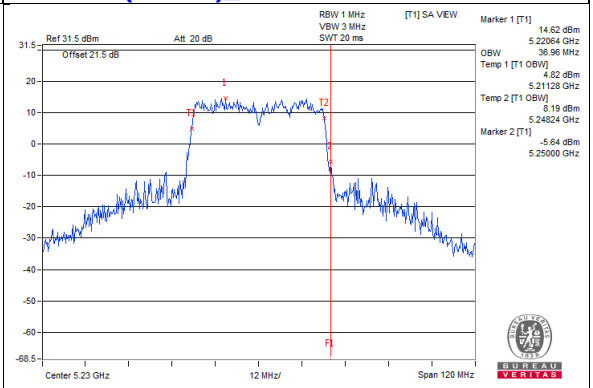
802.11ac (VHT40)_Chain 1 / CH46



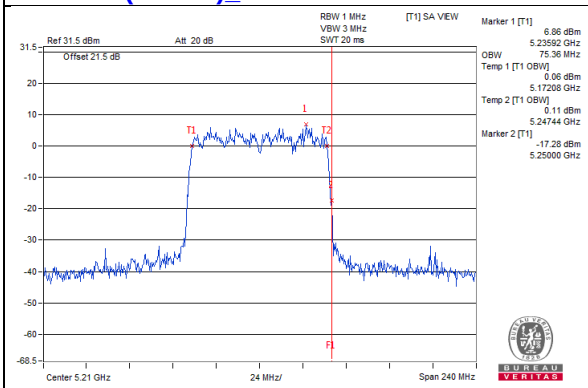
802.11ac (VHT40)_Chain 2 / CH46



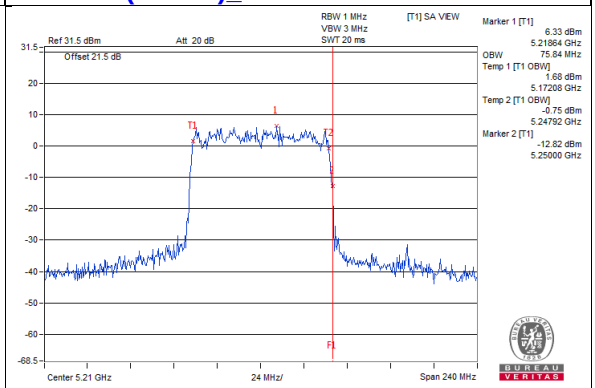
802.11ac (VHT40)_Chain 3 / CH46



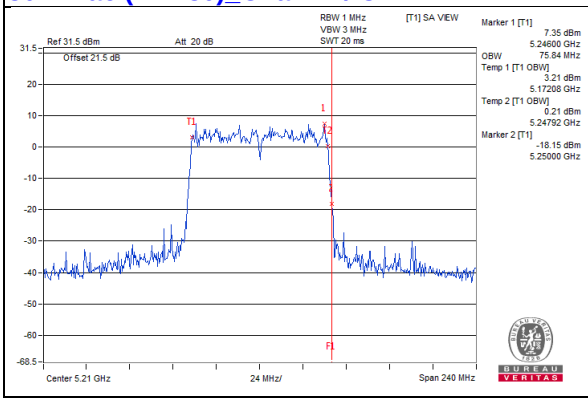
802.11ac (VHT80)_Chain 0 / CH42



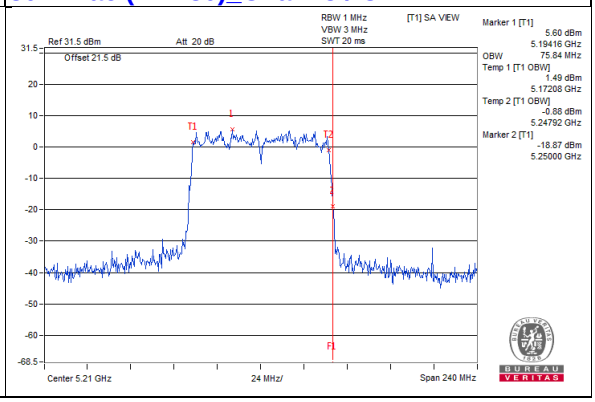
802.11ac (VHT80)_Chain 1 / CH42



802.11ac (VHT80)_Chain 2 / CH42

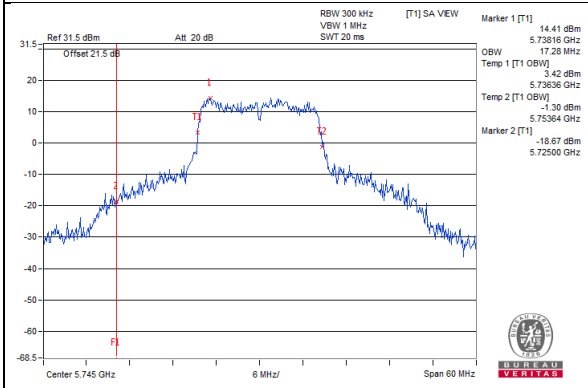


802.11ac (VHT80)_Chain 3 / CH42

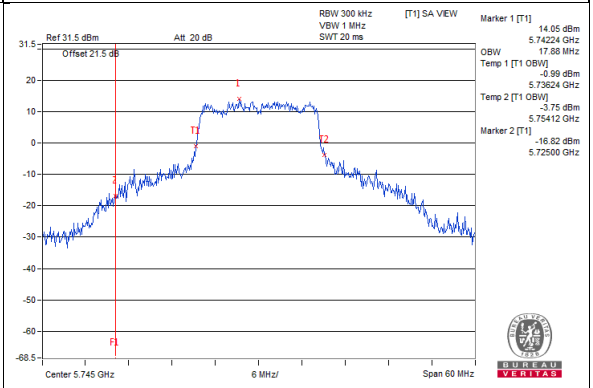


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

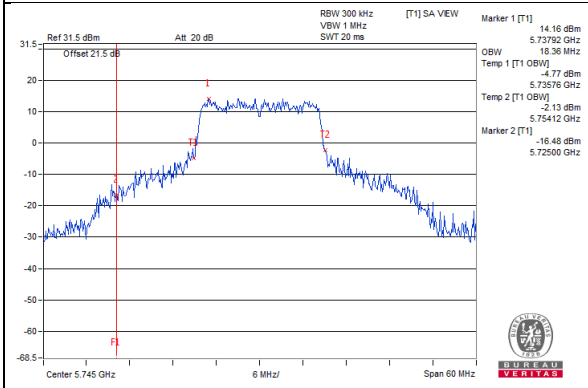
802.11a_Chain 0 / CH149



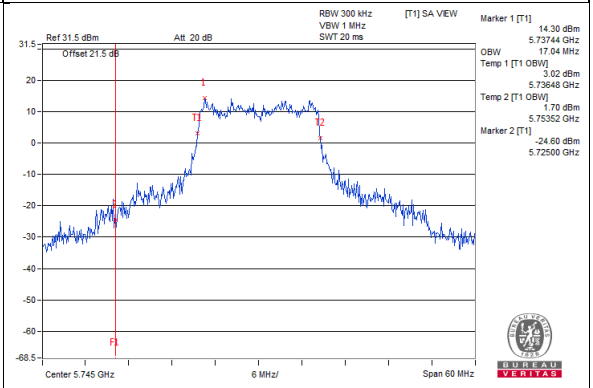
802.11a_Chain 1 / CH149



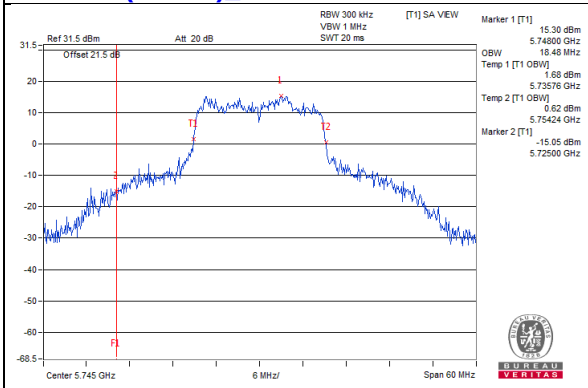
802.11a_Chain 2 / CH149



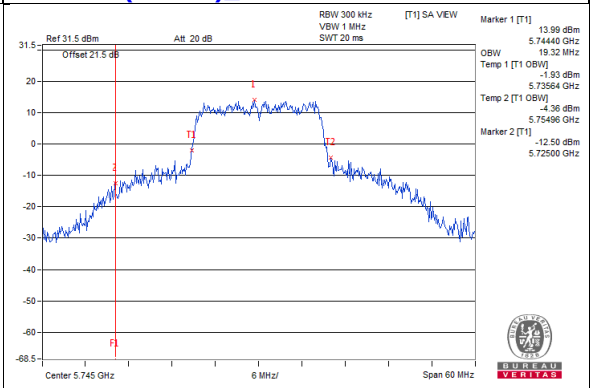
802.11a_Chain 3 / CH149



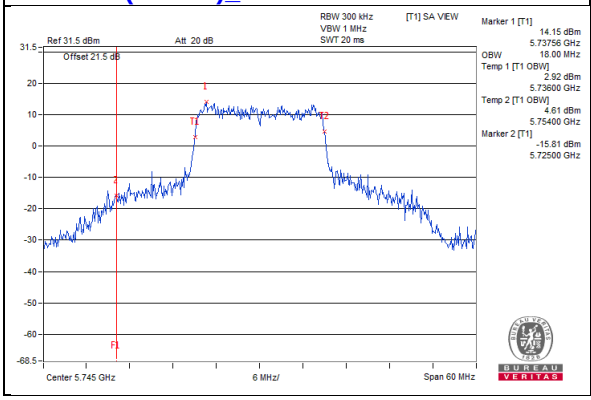
802.11ac (VHT20)_Chain 0 / CH149



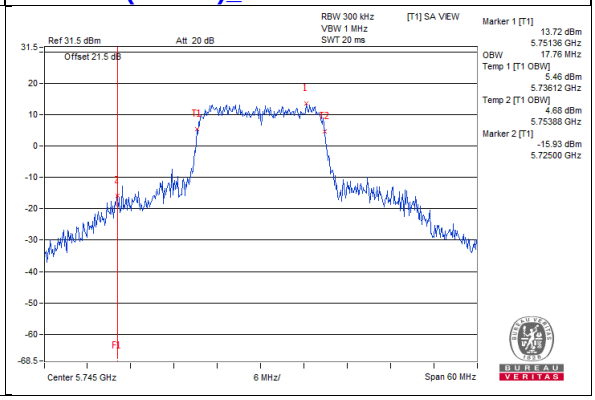
802.11ac (VHT20)_Chain 1 / CH149



802.11ac (VHT20)_Chain 2 / CH149

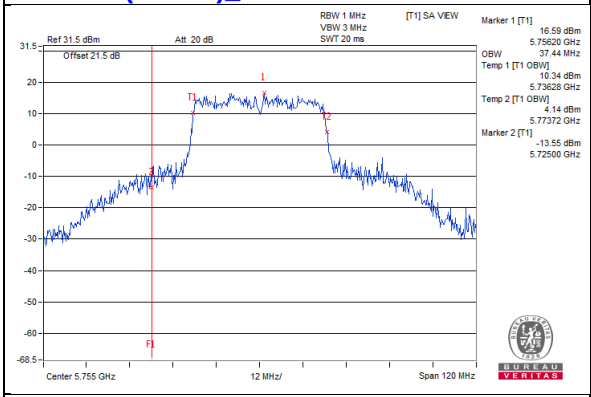


802.11ac (VHT20)_Chain 3 / CH149

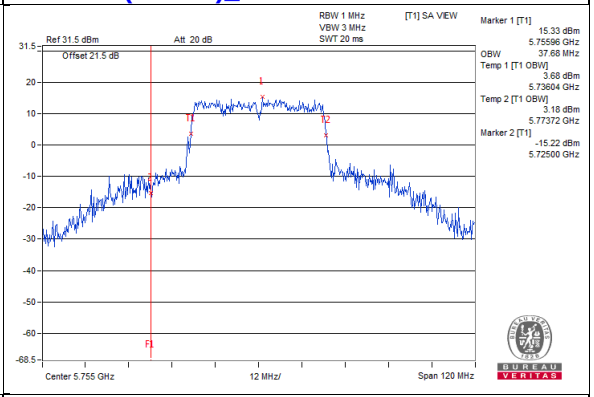


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

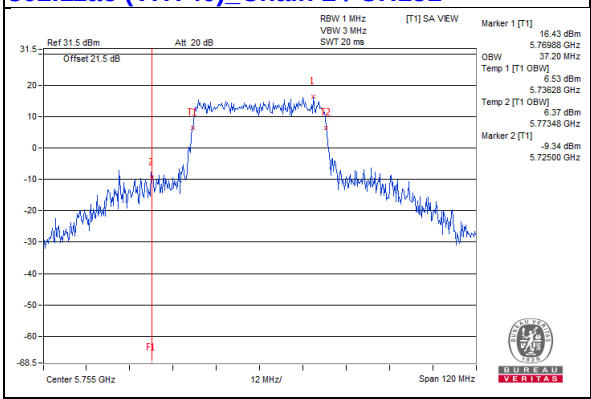
802.11ac (VHT40)_Chain 0 / CH151



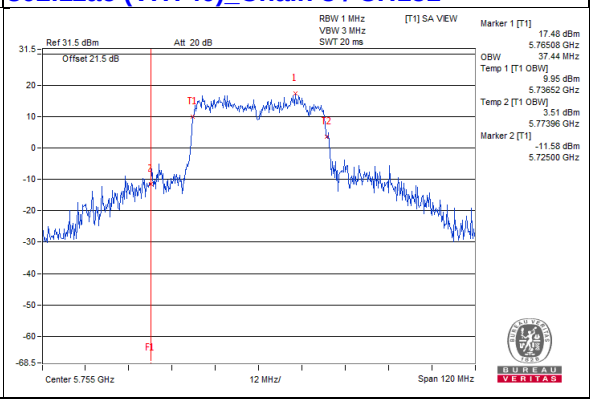
802.11ac (VHT40)_Chain 1 / CH151



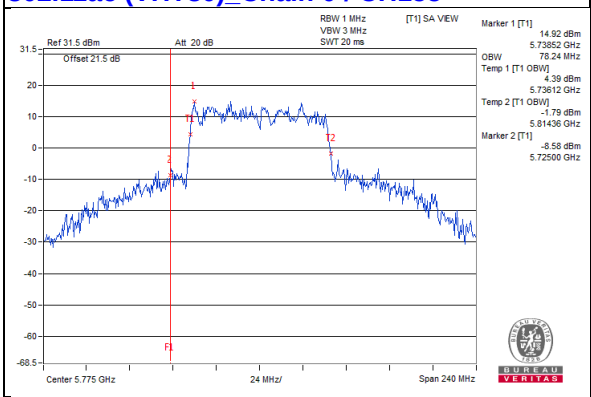
802.11ac (VHT40)_Chain 2 / CH151



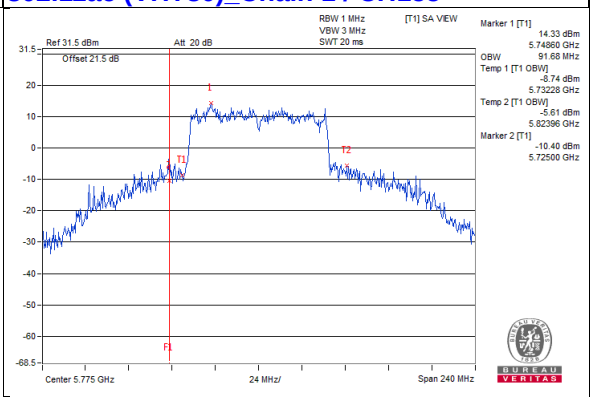
802.11ac (VHT40)_Chain 3 / CH151



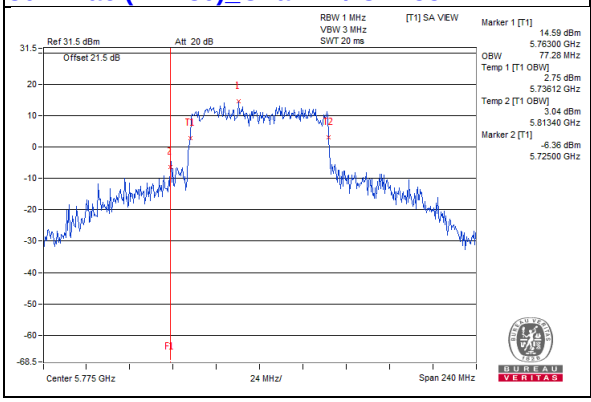
802.11ac (VHT80)_Chain 0 / CH155



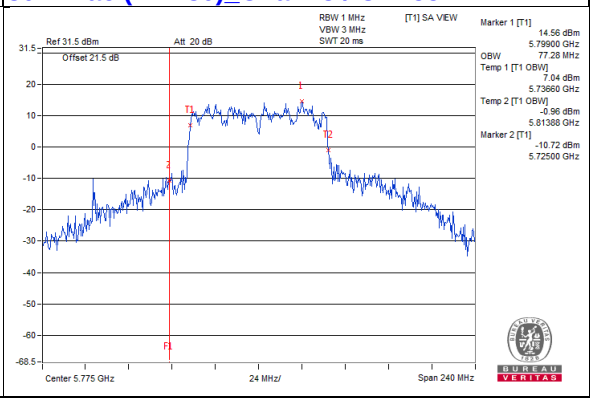
802.11ac (VHT80)_Chain 1 / CH155



802.11ac (VHT80)_Chain 2 / CH155



802.11ac (VHT80)_Chain 3 / CH155

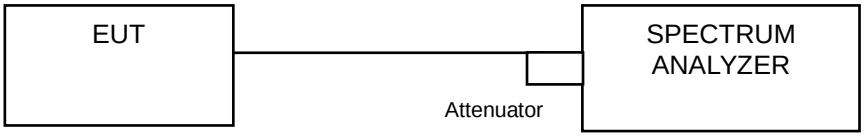


4.5 Peak Power Spectral Density Measurement

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:

Using method SA-2

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

For U-NII-3:

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/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	5.69	5.91	5.44	4.08	0.46	11.82	16.95	Pass
40	5200	7.72	8.34	6.78	2.90	0.46	13.35	16.95	Pass
48	5240	7.21	8.29	6.55	6.67	0.46	13.72	16.95	Pass

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

2. Directional gain = 6.05dBi > 6dBi , so the power density limit shall be reduced to 17-(6.05-6) = 16.95dBm.

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

802.11ac (VHT20)

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	4.65	5.34	4.96	5.39	0.21	11.32	16.95	Pass
40	5200	7.53	5.46	4.31	6.04	0.21	12.22	16.95	Pass
48	5240	6.85	6.63	6.59	4.23	0.21	12.42	16.95	Pass

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

2. Directional gain = 6.05dBi > 6dBi , so the power density limit shall be reduced to 17-(6.05-6) = 16.95dBm.

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

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	-6.99	-5.17	-1.02	-5.97	1.09	2.99	16.95	Pass
46	5230	4.19	2.84	4.95	2.43	1.09	10.83	16.95	Pass

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

2. Directional gain = 6.05dBi > 6dBi , so the power density limit shall be reduced to 17-(6.05-6) = 16.95dBm.

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	-8.88	-7.39	-6.37	-7.55	1.92	0.49	16.95	Pass

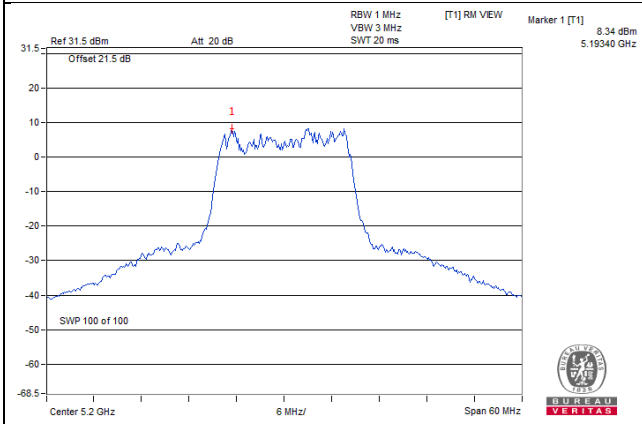
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 6.05dBi > 6dBi , so the power density limit shall be reduced to 17-(6.05-6) = 16.95dBm.

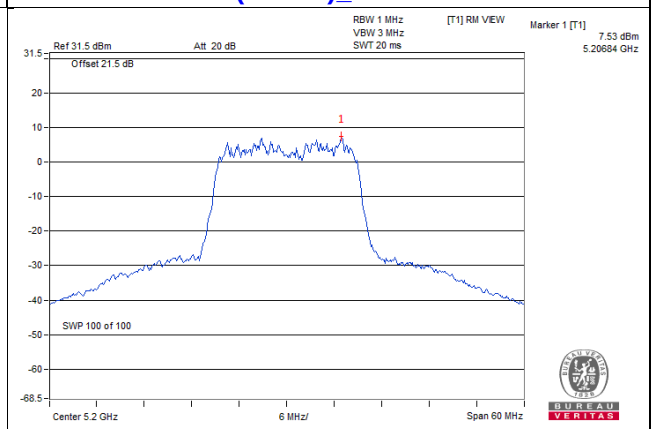
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

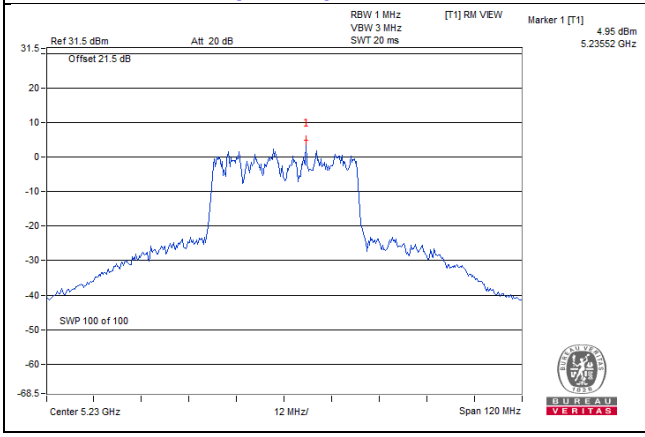
802.11a_Chain 1 / CH40



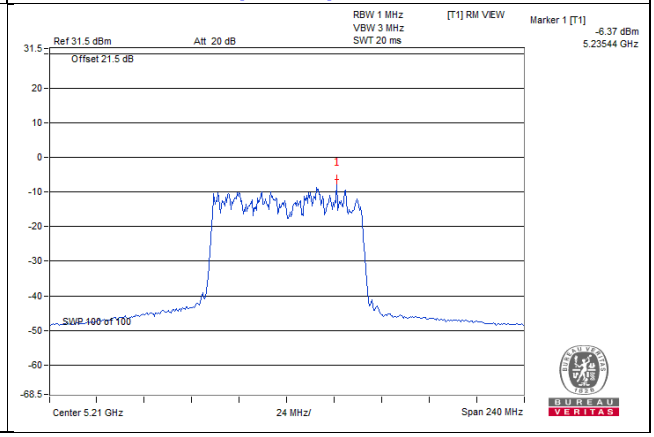
802.11ac (VHT20)_Chain 0 / CH40



802.11ac (VHT40)_Chain 2 / CH46



802.11ac (VHT80)_Chain 2 / 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	0.51	2.73	6.02	0.46	9.21	30.00	Pass
	157	5785	-1.05	1.17	6.02	0.46	7.65	30.00	Pass
	165	5825	-0.09	2.13	6.02	0.46	8.61	30.00	Pass
1	149	5745	1.09	3.31	6.02	0.46	9.79	30.00	Pass
	157	5785	0.95	3.17	6.02	0.46	9.65	30.00	Pass
	165	5825	-0.06	2.16	6.02	0.46	8.64	30.00	Pass
2	149	5745	1.22	3.44	6.02	0.46	9.92	30.00	Pass
	157	5785	1.61	3.83	6.02	0.46	10.31	30.00	Pass
	165	5825	0.88	3.10	6.02	0.46	9.58	30.00	Pass
3	149	5745	0.84	3.06	6.02	0.46	9.54	30.00	Pass
	157	5785	1.83	4.05	6.02	0.46	10.53	30.00	Pass
	165	5825	0.05	2.27	6.02	0.46	8.75	30.00	Pass

Note: 1. The Directional gain = 5.44dBi < 6dBi, so the power density limit shall not be reduced.

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

802.11ac (VHT20)

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	1.38	3.60	6.02	0.21	9.83	30.00	Pass
	157	5785	1.26	3.48	6.02	0.21	9.71	30.00	Pass
	165	5825	0.71	2.93	6.02	0.21	9.16	30.00	Pass
1	149	5745	1.39	3.61	6.02	0.21	9.84	30.00	Pass
	157	5785	-0.33	1.89	6.02	0.21	8.12	30.00	Pass
	165	5825	0.26	2.48	6.02	0.21	8.71	30.00	Pass
2	149	5745	0.35	2.57	6.02	0.21	8.80	30.00	Pass
	157	5785	0.46	2.68	6.02	0.21	8.91	30.00	Pass
	165	5825	0.19	2.41	6.02	0.21	8.64	30.00	Pass
3	149	5745	0.52	2.74	6.02	0.21	8.97	30.00	Pass
	157	5785	1.77	3.99	6.02	0.21	10.22	30.00	Pass
	165	5825	1.20	3.42	6.02	0.21	9.65	30.00	Pass

Note: 1. The Directional gain = 5.44dBi < 6dBi, so the power density limit shall not be reduced.

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

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	-3.60	-1.38	6.02	1.09	5.73	30.00	Pass
	159	5785	-3.37	-1.15	6.02	1.09	5.96	30.00	Pass
1	151	5745	-5.23	-3.01	6.02	1.09	4.10	30.00	Pass
	159	5785	-4.04	-1.82	6.02	1.09	5.29	30.00	Pass
2	151	5745	-4.39	-2.17	6.02	1.09	4.94	30.00	Pass
	159	5785	-4.95	-2.73	6.02	1.09	4.38	30.00	Pass
3	151	5745	-3.79	-1.57	6.02	1.09	5.54	30.00	Pass
	159	5785	-3.68	-1.46	6.02	1.09	5.65	30.00	Pass

Note: 1. The Directional gain = 5.44dBi < 6dBi, so the power density limit shall not be reduced.

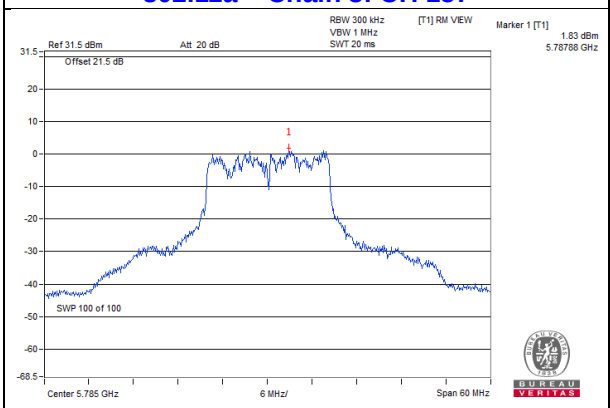
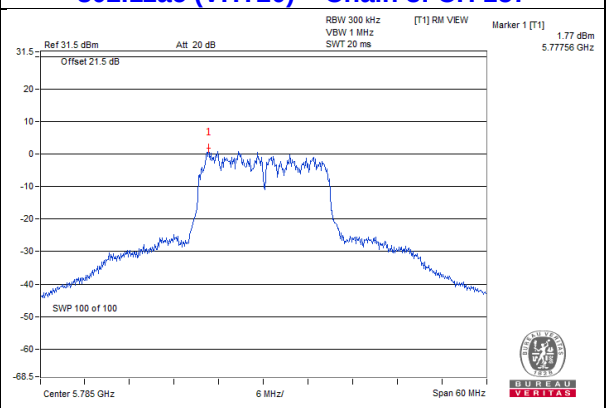
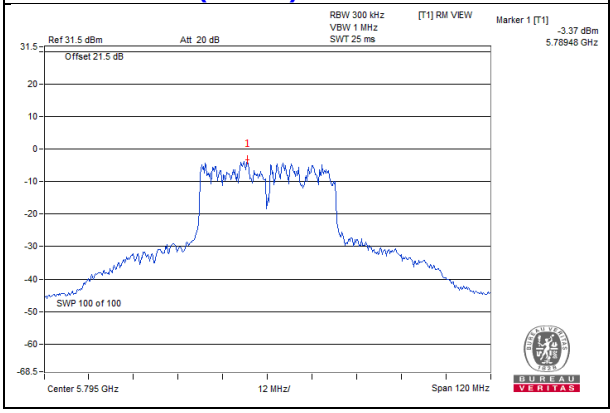
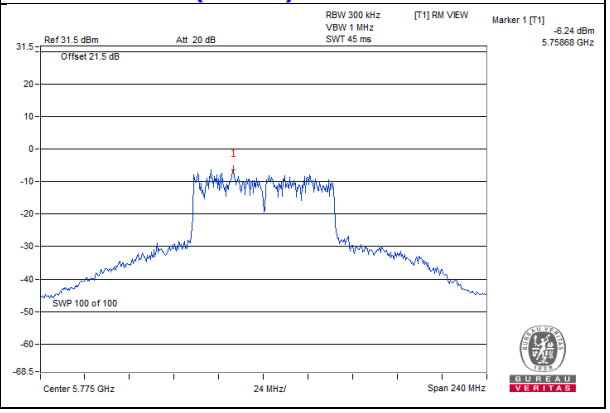
2. Refer to section 3.3 for duty cycle spectrum plot.

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	-6.24	-4.02	6.02	1.92	3.92	30.00	Pass
1	155	5745	-7.12	-4.90	6.02	1.92	3.04	30.00	Pass
2	155	5745	-6.54	-4.32	6.02	1.92	3.62	30.00	Pass
3	155	5745	-7.05	-4.83	6.02	1.92	3.11	30.00	Pass

Note: 1. The Directional gain = 5.44dBi < 6dBi, so the power density limit shall not be reduced.

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

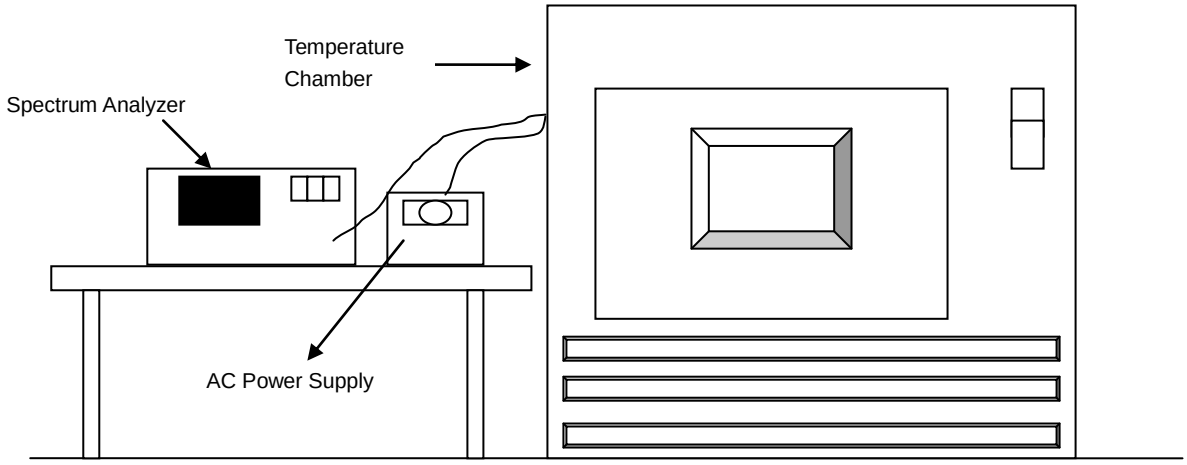
Spectrum Plot of Worst Value	
802.11a – Chain 3: CH 157	**802.11ac (VHT20) – Chain 3: CH 157**
	
802.11ac (VHT40) – Chain 0: CH 159	**802.11ac (VHT80) – Chain 0: CH 155**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 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	120	5180.0101	PASS	5180.0093	PASS	5180.0111	PASS	5180.0117	PASS
40	120	5179.9749	PASS	5179.975	PASS	5179.9764	PASS	5179.9775	PASS
30	120	5179.9771	PASS	5179.9761	PASS	5179.9806	PASS	5179.9793	PASS
20	120	5180.0164	PASS	5180.0203	PASS	5180.0161	PASS	5180.0189	PASS
10	120	5180.0009	PASS	5179.9994	PASS	5180.0009	PASS	5179.9989	PASS
0	120	5179.9801	PASS	5179.9823	PASS	5179.9847	PASS	5179.9819	PASS
-10	120	5180.0044	PASS	5180.0031	PASS	5180.0055	PASS	5180.004	PASS
-20	120	5179.995	PASS	5179.9949	PASS	5179.9958	PASS	5179.9987	PASS
-30	120	5180.0026	PASS	5180.0012	PASS	5180.0023	PASS	5180.0019	PASS

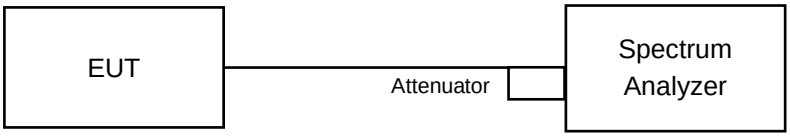
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0155	PASS	5180.0202	PASS	5180.0166	PASS	5180.0189	PASS
	120	5180.0164	PASS	5180.0203	PASS	5180.0161	PASS	5180.0189	PASS
	102	5180.0158	PASS	5180.0201	PASS	5180.0156	PASS	5180.0179	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	16.10	16.35	16.40	16.41	0.5	Pass
157	5785	15.94	16.36	16.38	16.38	0.5	Pass
165	5825	16.06	16.34	16.37	15.80	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	16.04	16.56	16.74	16.38	0.5	Pass
157	5785	15.92	16.35	16.73	16.34	0.5	Pass
165	5825	16.17	16.55	16.92	16.22	0.5	Pass

802.11ac (VHT40)

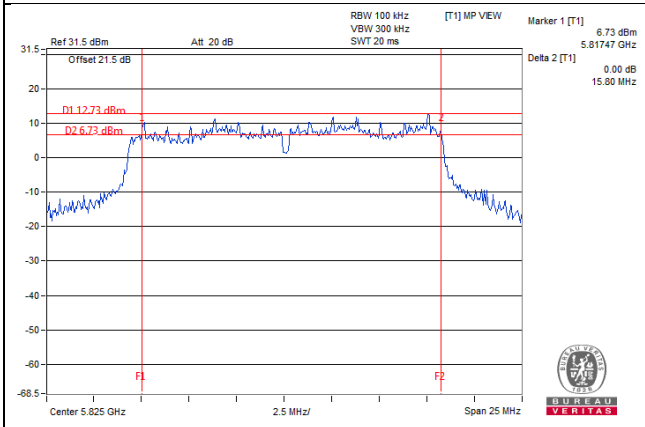
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.63	36.06	36.45	35.32	0.5	Pass
159	5795	35.80	35.86	36.46	35.30	0.5	Pass

802.11ac (VHT80)

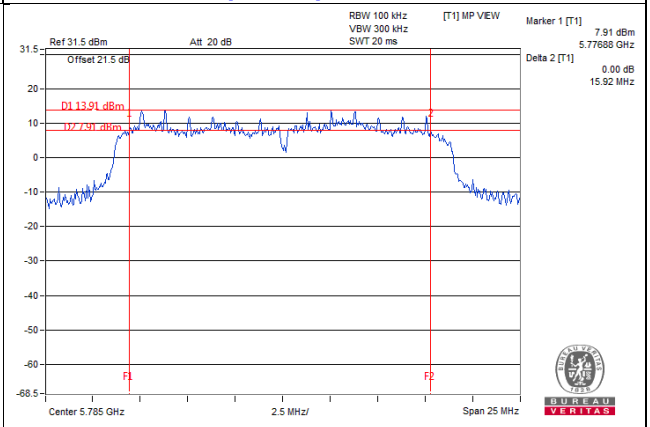
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	75.66	75.49	75.67	75.70	0.5	Pass

Spectrum Plot of Worst Value

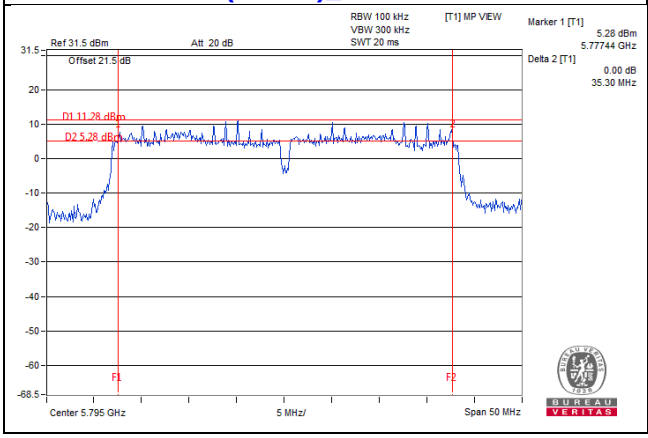
802.11a_Chain 3 / CH165



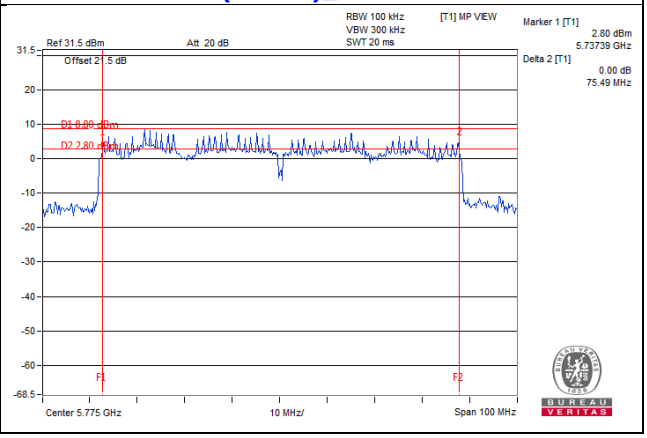
802.11ac (VHT20)_Chain 0 / CH157



802.11ac (VHT40)_Chain 3 / CH159



802.11ac (VHT80)_Chain 1 / CH155



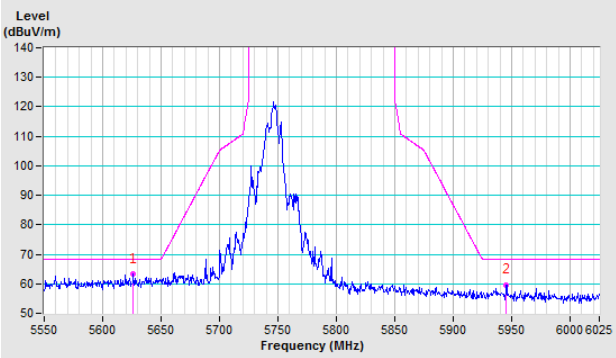
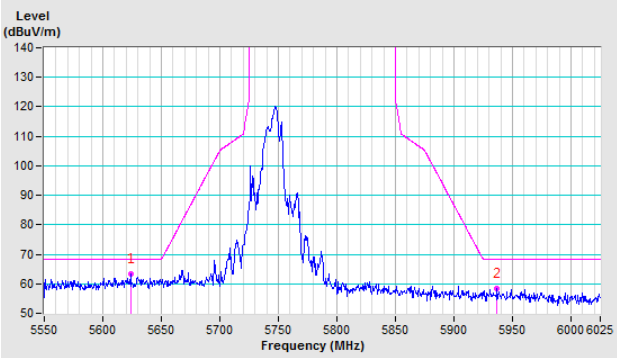
5 Pictures of Test Arrangements

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

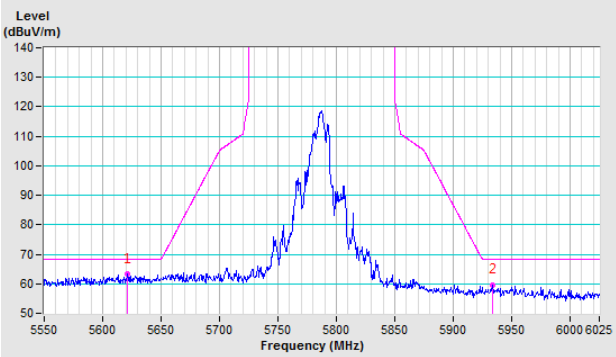
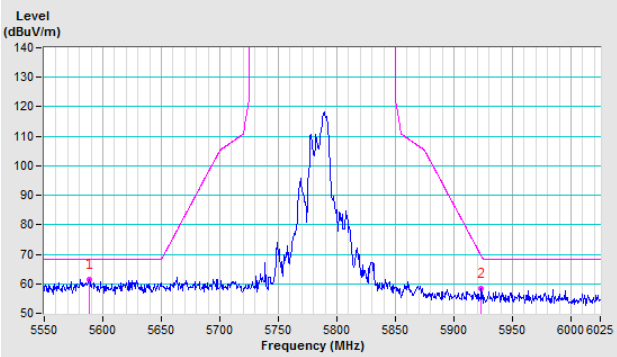
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

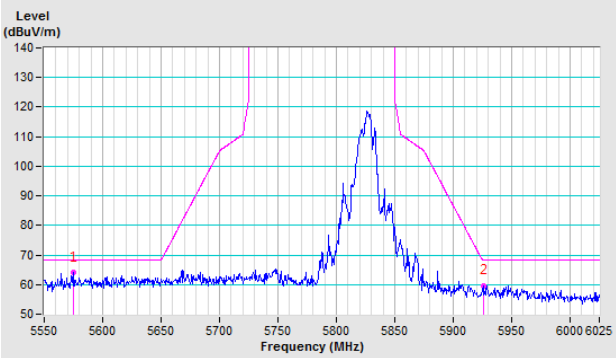
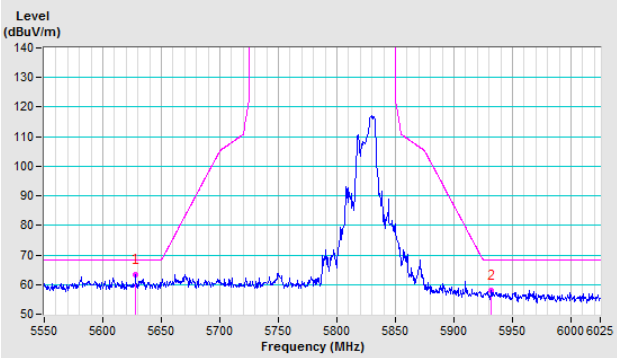
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

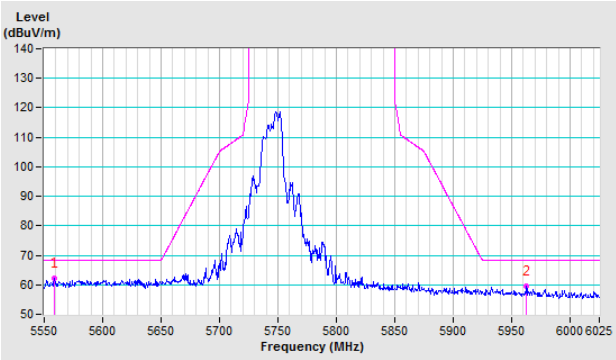
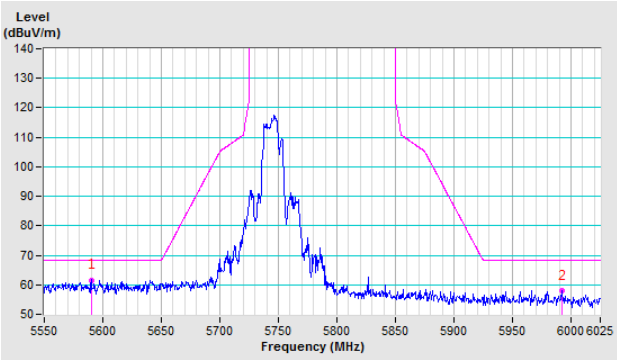
Horizontal	Vertical
	

CH 165 5825 MHz

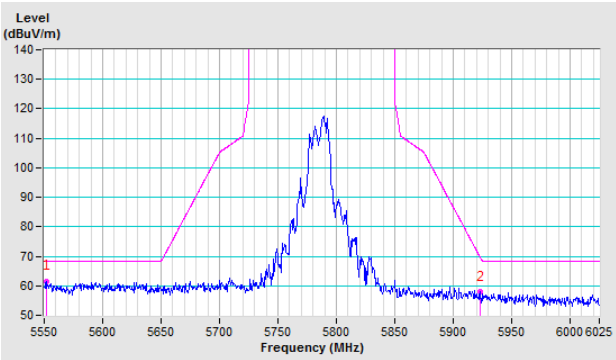
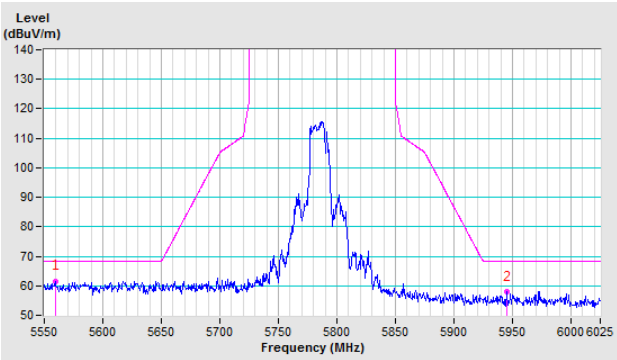
Horizontal	Vertical
	

802.11ac (VHT20)

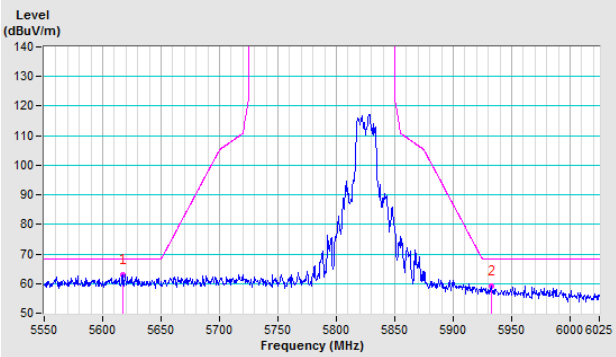
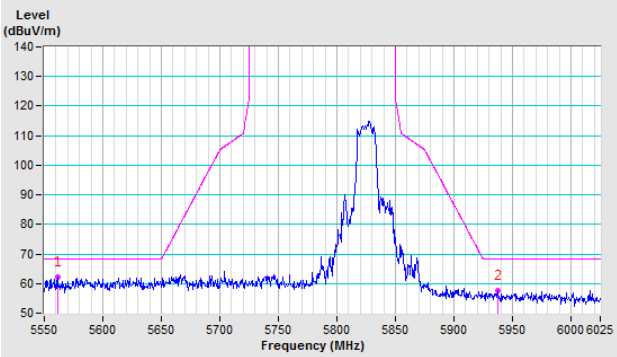
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

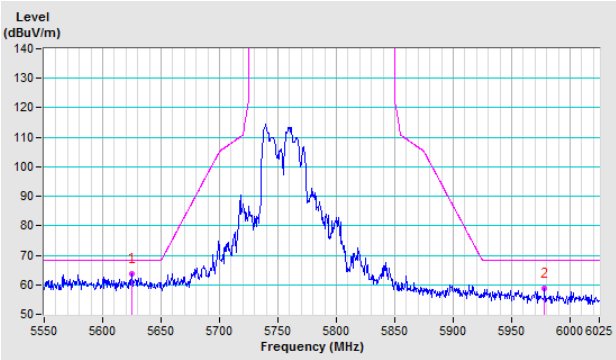
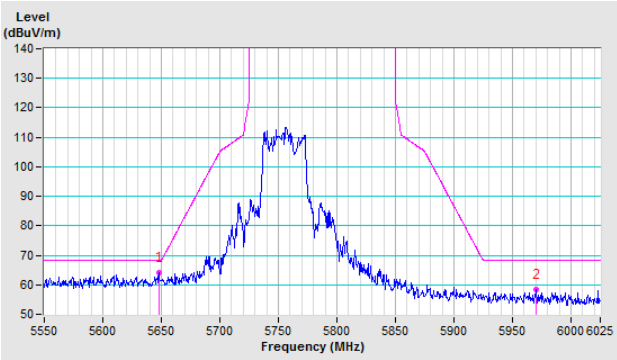
Horizontal	Vertical
	

CH 165 5825 MHz

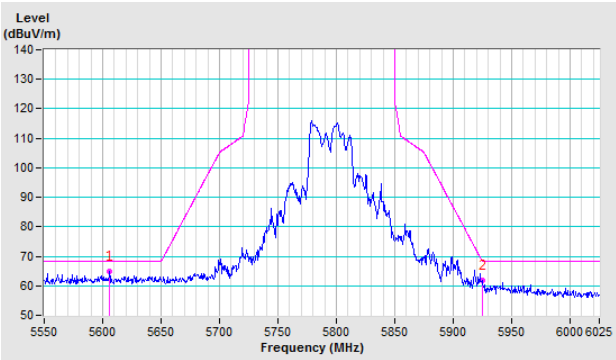
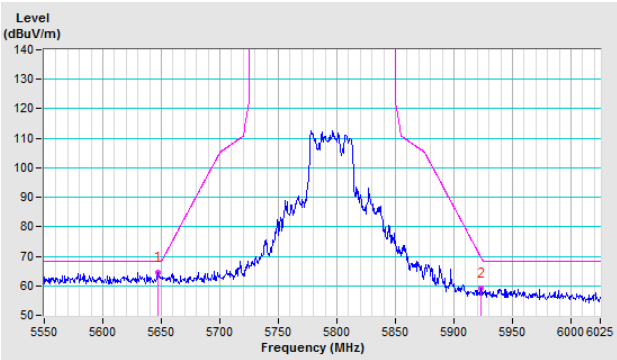
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

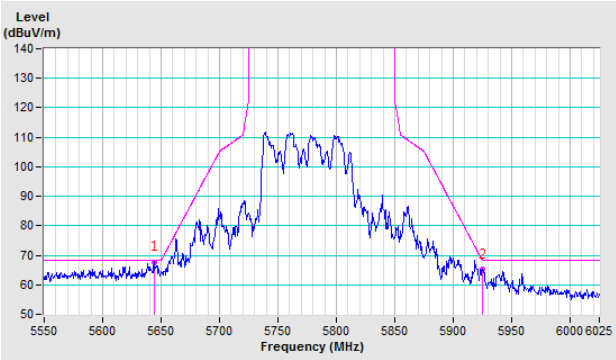
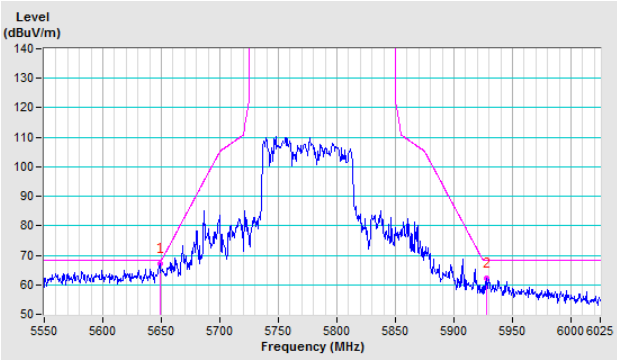
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are 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
Tel: 886-2-26052180
Fax: 886-2-26051924

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

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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 ---