

FCC Test Report (DFS Band)

Report No.: RFBCKS-WTW-P21070524-3

FCC ID: 2AWHPR211

Test Model: UTR-211

Received Date: 2021/7/15

Test Date: 2021/8/22 ~ 2021/9/23

Issued Date: 2021/11/3

Applicant: Space Exploration Technologies Corp. (SPACEX)

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT (DFS Band)	7
3.2 Description of Test Modes	9
3.2.1 Test Mode Applicability and Tested Channel Detail	10
3.3 Duty Cycle of Test Signal	12
3.4 Description of Support Units	13
3.4.1 Configuration of System under Test	14
3.5 General Description of Applied Standard and References	16
4 Test Types and Results	17
4.1 Radiated Emission and Bandedge Measurement	17
4.1.1 Limits of Radiated Emission and Bandedge Measurement	17
4.1.2 Test Instruments	18
4.1.3 Test Procedure	20
4.1.4 Deviation from Test Standard	21
4.1.5 Test Setup	21
4.1.6 EUT Operating Condition	22
4.1.7 Test Results	23
4.2 Conducted Emission Measurement	49
4.2.1 Limits of Conducted Emission Measurement	49
4.2.2 Test Instruments	49
4.2.3 Test Procedure	50
4.2.4 Deviation from Test Standard	50
4.2.5 Test Setup	50
4.2.6 EUT Operating Condition	50
4.2.7 Test Results	51
4.3 Transmit Power Measurement	53
4.3.1 Limits of Transmit Power Measurement	53
4.3.2 Test Setup	53
4.3.3 Test Instruments	54
4.3.4 Test Procedure	54
4.3.5 Deviation from Test Standard	54
4.3.6 EUT Operating Condition	54
4.3.7 Test Results	55
4.4 Occupied Bandwidth Measurement	71
4.4.1 Test Setup	71
4.4.2 Test Instruments	71
4.4.3 Test Procedure	71
4.4.4 Test Results	72
4.5 Peak Power Spectral Density Measurement	76
4.5.1 Limits of Peak Power Spectral Density Measurement	76
4.5.2 Test Setup	76
4.5.3 Test Instruments	76
4.5.4 Test Procedure	76
4.5.5 Deviation from Test Standard	77
4.5.6 EUT Operating Condition	77
4.5.7 Test Results	78
4.6 Frequency Stability Measurement	83
4.6.1 Limits of Frequency Stability Measurement	83

4.6.2 Test Setup.....	83
4.6.3 Test Instruments	83
4.6.4 Test Procedure	83
4.6.5 Deviation from Test Standard	83
4.6.6 EUT Operating Condition	83
4.6.7 Test Results	84
4.7 6dB Bandwidth Measurement.....	85
4.7.1 Limits of 6dB Bandwidth Measurement.....	85
4.7.2 Test Setup.....	85
4.7.3 Test Instruments	85
4.7.4 Test Procedure	85
4.7.5 Deviation from Test Standard	85
4.7.6 EUT Operating Condition	85
4.7.7 Test Results	86
5 Pictures of Test Arrangements.....	88
Annex A - Band-Edge Measurement (For U-NII-2A, U-NII-2C band)	89
Appendix – Information of the Testing Laboratories	96

Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P21070524-3	Original release.	2021/11/3

1 Certificate of Conformity

Product: Starlink Router

Brand:

SPACEX



Test Model: UTR-211

Sample Status: Engineering sample

Applicant: Space Exploration Technologies Corp. (SPACEX)

Test Date: 2021/8/22 ~ 2021/9/23

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 : Vivian Huang , **Date:** 2021/11/3
Vivian Huang / Specialist

Approved by : Clark Lin , **Date:** 2021/11/3
Clark Lin / Technical 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)(8)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -7.61 dB at 0.22812 MHz.
15.407(b) (1/2/3/4(i/ii)/8)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1 dB at 5725.00 MHz.
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 R-SMA not a standard connector.

Note:

1. For U-NII-2A, U-NII-2C band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS Band)

Product	Starlink Router
Brand	 SPACEX
Test Model	UTR-211
Status of EUT	Engineering sample
Power Supply Rating	100Vac ~240Vac
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to 450 Mbps 802.11ac: up to 1300 Mbps
Operating Frequency	5.26 ~ 5.32 GHz, 5.50 ~ 5.72 GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 16 802.11n (HT40), 802.11ac (VHT40): 8 802.11ac (VHT80): 4
Output Power	CDD Mode: 5.26 ~ 5.32 GHz: 143.059 mW 5.5 ~ 5.72 GHz: 143.301 mW Beamforming Mode: 5.26 ~ 5.32 GHz: 118.352 mW 5.5 ~ 5.72 GHz: 114.694 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

- This is a supplementary report of Report No.: RFBCKS-WTW-P21070524-1 design changed is as the following:
 - ◆ Add DFS band <5250~5350 MHz & 5470~5725 MHz> by software.
- According to above conditions, for DFS band all of test items need to be performed and all data was verified to meet the requirements.
- The EUT has below radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz	WLAN 5GHz

- Simultaneously transmission condition.

Condition	Technology	
1	WLAN 2.4GHz	WLAN 5GHz

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

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

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency Range	Antenna Type	Connector Type
1	0	4.2	2.4~2.4835 GHz	PCB	none
		7.8	5.15~5.85 GHz		
2	1	3.4	2.4~2.4835 GHz	PCB	none
		7.3	5.15~5.85 GHz		
3	2	3.9	2.4~2.4835 GHz	PCB	none
		8.4	5.15~5.85 GHz		

Note: Max. gain was selected for the final test.

6. The directional antenna gain, please refer to the following table:

Frequency Range (GHz)	Directional Antenna Gain (dBi)
2.4~2.4835	7.53
5.15~5.25	9.27
5.25~5.35	9.24
5.47~5.725	9.30
5.725~5.85	9.06

7. The EUT incorporates a MIMO function.

5GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11a	3TX	3RX
802.11n (HT20)	3TX	3RX
802.11n (HT40)	3TX	3RX
802.11ac (VHT20)	3TX	3RX
802.11ac (VHT40)	3TX	3RX
802.11ac (VHT80)	3TX	3RX

Note:

1. All of modulation mode support beamforming function except 802.11a modulation mode.
2. The EUT support Beamforming and non-beamforming mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n mode is the same as the 802.11ac or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

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

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290 MHz

FOR 5500 ~ 5720MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 MHz
122	5610 MHz		

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
PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5720	54 to 62 102 to 142	102	OFDM	BPSK	13.5

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5720	54 to 62 102 to 142	102	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3
Beamforming Mode (output power only)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE $\geq$ 1G	25deg. C, 66%RH	120Vac, 60Hz	Tom Yang
RE<1G	25deg. C, 66%RH	120Vac, 60Hz	Tom Yang
PLC	25deg. C, 66%RH	120Vac, 60Hz	Tom Yang
APCM	25deg. C, 66%RH	120Vac, 60Hz	Leon Dai

3.3 Duty Cycle of Test Signal

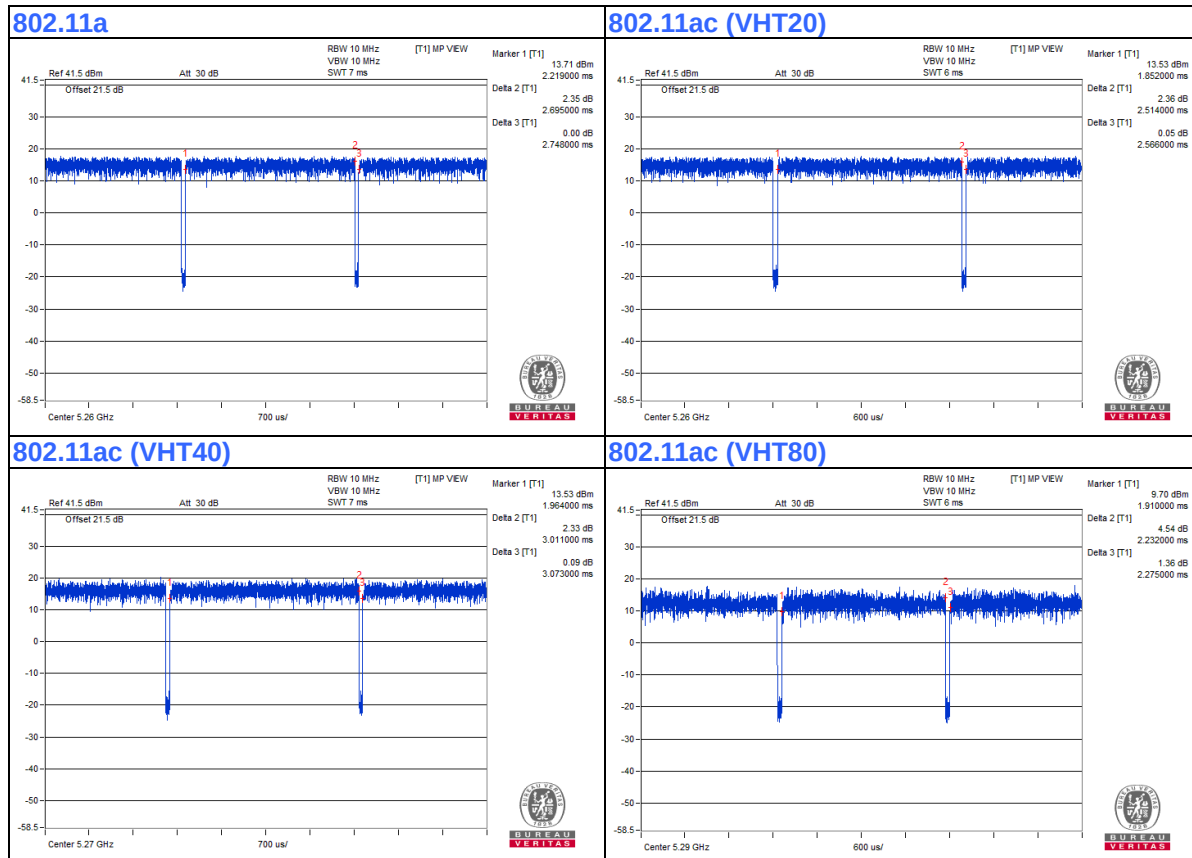
Duty cycle of test signal is $\geq 98\%$, duty factor is not required.

802.11a: Duty cycle = $2.695 \text{ ms} / 2.748 \text{ ms} = 0.981$

802.11ac (VHT20): Duty cycle = $2.514 \text{ ms} / 2.566 \text{ ms} = 0.98$

802.11ac (VHT40): Duty cycle = $3.011 \text{ ms} / 3.073 \text{ ms} = 0.98$

802.11ac (VHT80): Duty cycle = $2.232 \text{ ms} / 2.275 \text{ ms} = 0.981$



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	NA	Provided by Lab
B.	Test Tool	Starlink	NA	NA	NA	Supplied by client
C.	PoE Load	Starlink	NA	NA	NA	Supplied by client
D.	Laptop	DELL	E5430	4YV4VY1	NA	Provided by Lab

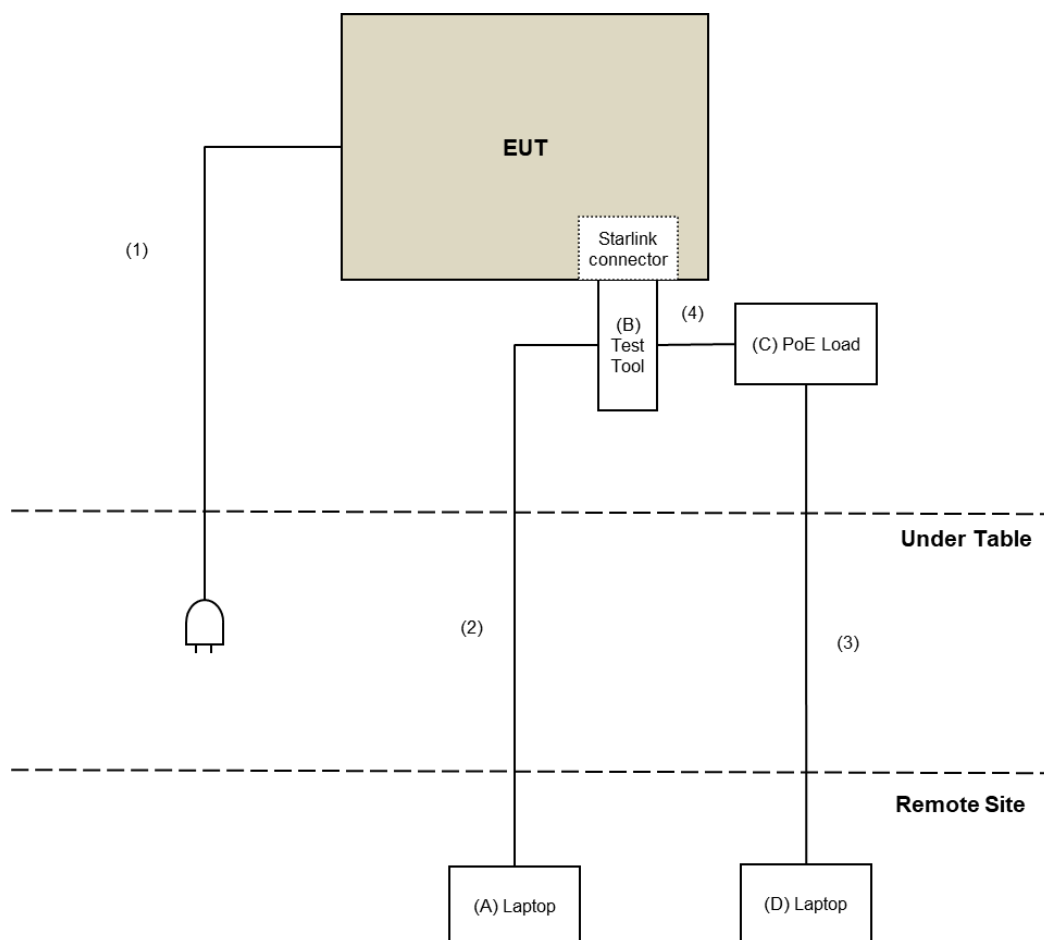
Note:

1. All power cords of the above support units are non-shielded (1.5m).

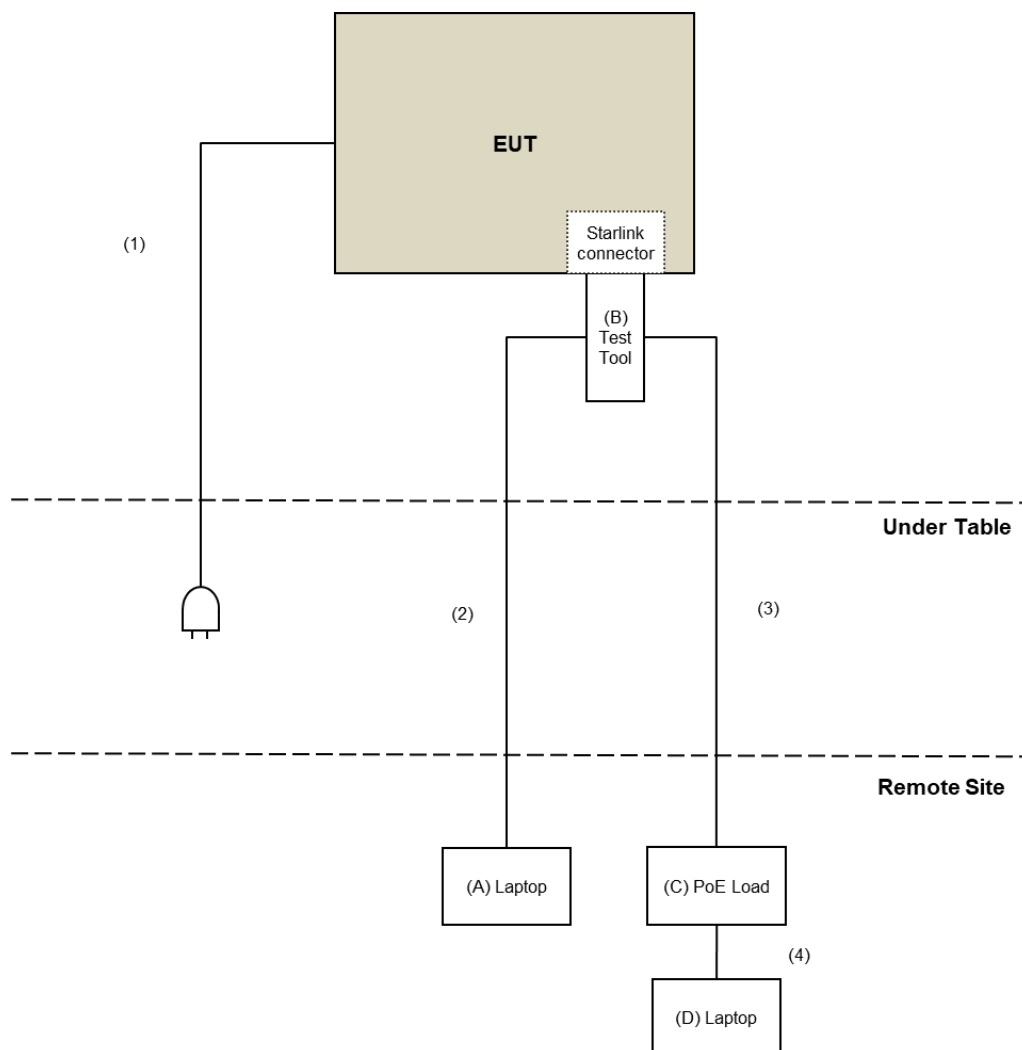
ID	Descriptions (Cables)	Qty	Length (m)	Shielding (Yes/No)	Cores (Number)	Remarks
1	AC Cable	1	2	No	0	Supplied by client
2	RJ-45 Cable	1	10	No	0	Provided by Lab
3	RJ-45 Cable	1	10	No	0	Provided by Lab
4	RJ-45 Cable	1	3	No	0	Provided by Lab

3.4.1 Configuration of System under Test

For AC Power Conducted Emissions test:



For Radiated Emission test:



3.5 General Description of Applied Standard and References

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

Test standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10-2013

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

References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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}
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}
^{*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:

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

4.1.2 Test Instruments

For Radiated Emission, Bandedge test:

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Test Receiver Agilent	N9038A	MY50010156	2021/7/22	2022/7/21
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Pre_Amplifier EMCI	EMC001340	980142	2021/5/24	2022/5/23
LOOP ANTENNA Electro-Metrics	EM-6879	264	2021/3/5	2022/3/4
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-001	2021/1/7	2022/1/6
RF Coaxial Cable JYEBO	5D-FB	LOOPCAB-002	2021/1/7	2022/1/6
Pre_Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	2020/10/20	2021/10/19
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	2020/11/5	2021/11/4
RF Coaxial Cable COMDATE/PEWC	8D	966-3-1	2021/3/16	2022/3/15
RF Coaxial Cable COMDATE/PEWC	8D	966-3-2	2021/3/16	2022/3/15
RF Coaxial Cable COMDATE/PEWC	8D	966-3-3	2021/3/16	2022/3/15
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	2020/9/24	2021/9/23
Horn Antenna Schwarzbeck	BBHA9120-D	9120D-406	2020/11/22	2021/11/21
Pre_Amplifier EMCI	EMC12630SE	980384	2021/1/11	2022/1/10
RF Coaxial Cable EMCI	EMC104-SM-SM-1500	180504	2021/4/26	2022/4/25
RF Coaxial Cable EMCI	EMC104-SM-SM-2000	180601	2021/6/8	2022/6/7
RF Coaxial Cable EMCI	EMC104-SM-SM-6000	210201	2021/5/13	2022/5/12
Fix tool for Boresight antenna tower LIOW GUU	FBA-01	FBA_SIP01	NA	NA
Spectrum Analyzer Keysight	N9030A	MY54490679	2021/7/9	2022/7/8
Pre_Amplifier EMCI	EMC184045SE	980387	2021/1/11	2022/1/10
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170519	2020/11/22	2021/11/21
RF Cable-Frequency range: 1-40GHz EMCI	EMC102-KM-KM-1200	160924	2021/1/11	2022/1/10
RF cable (40GHz) EMCI	EMC-KM-KM-4000	200214	2021/3/10	2022/3/9

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: 2021/8/22 ~ 2021/8/27

For other test:

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Spectrum Analyzer R&S	FSV40	101516	2021/3/8	2022/3/7
Power Meter Anritsu	ML2495A	1529002	2021/6/21	2022/6/20
Pulse Power Sensor Anritsu	MA2411B	1339443	2021/5/31	2022/5/30
Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	2021/4/13	2022/4/12
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA
AC Power Source GOOD WILL	6905S	1991551	NA	NA
DC POWER SUPPLY Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	2021/1/14	2022/1/13
True RMS Clamp Meter Fluke	325	31130711WS	2021/6/2	2022/6/1

- NOTE:**
1. The test was performed in Oven room 2.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. Tested Date: 2021/9/23

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:

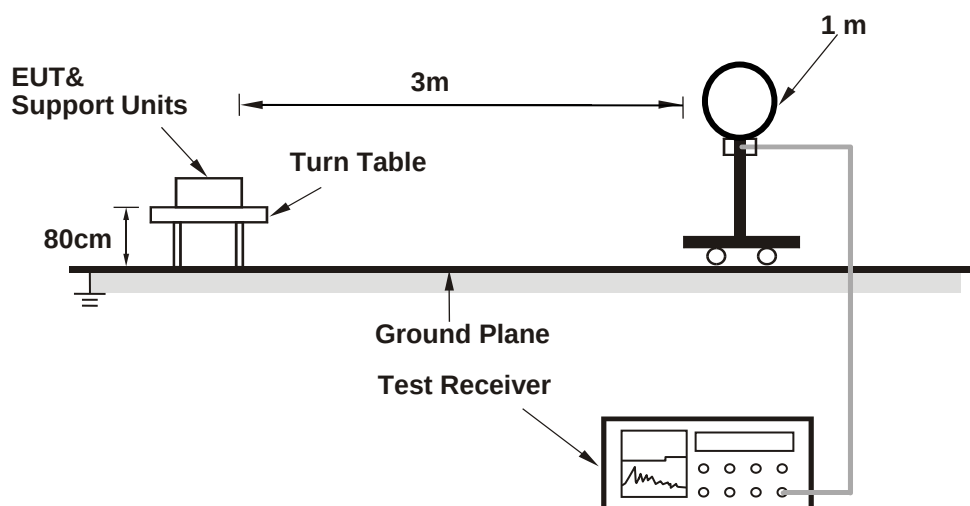
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

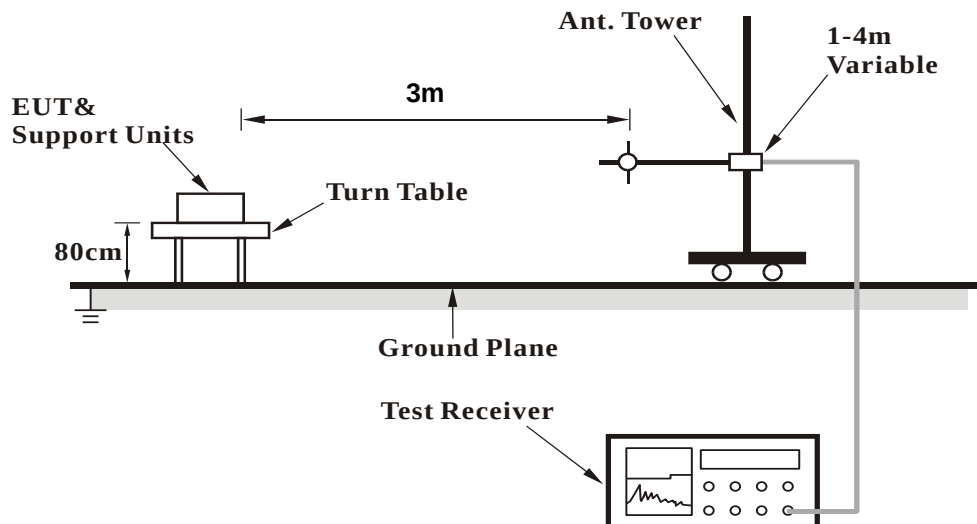
No deviation.

4.1.5 Test Setup

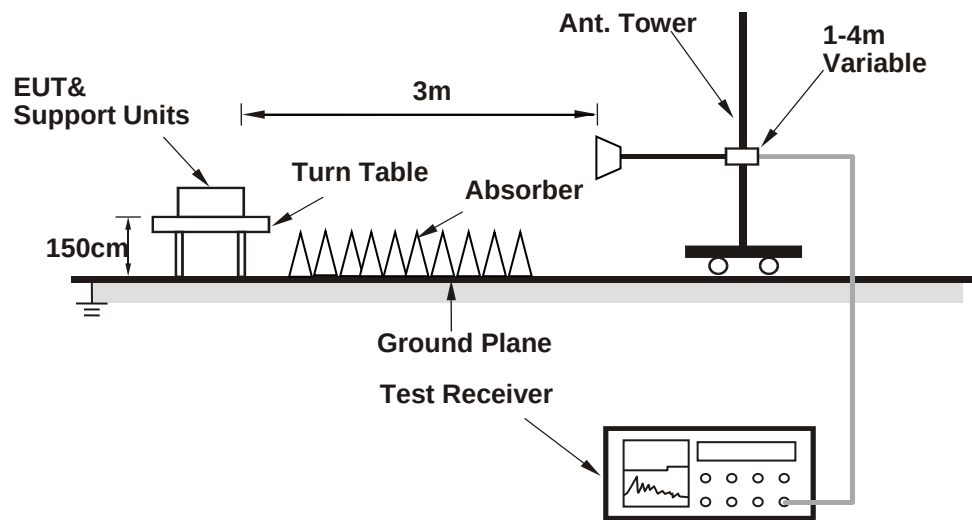
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

- Connected the EUT with the Laptop which is placed on remote site.
- Controlling software (MT7629 QA 0.0.2.5) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 52 : 5260 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5058.00	53.6 PK	74.0	-20.4	3.66 H	176	49.1	4.5
2	5058.00	44.6 AV	54.0	-9.4	3.66 H	176	40.1	4.5
3	*5260.00	119.3 PK			3.66 H	176	115.0	4.3
4	*5260.00	110.5 AV			3.66 H	176	106.2	4.3
5	#10520.00	50.6 PK	68.2	-17.6	1.54 H	151	36.8	13.8
6	15780.00	49.4 PK	74.0	-24.6	1.38 H	256	35.1	14.3
7	15780.00	38.0 AV	54.0	-16.0	1.38 H	256	23.7	14.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5133.30	53.1 PK	74.0	-20.9	2.78 V	138	48.3	4.8
2	5133.30	42.4 AV	54.0	-11.6	2.78 V	138	37.6	4.8
3	*5260.00	116.4 PK			2.78 V	138	112.1	4.3
4	*5260.00	107.2 AV			2.78 V	138	102.9	4.3
5	#10520.00	51.0 PK	68.2	-17.2	1.47 V	18	37.2	13.8
6	15780.00	50.2 PK	74.0	-23.8	1.72 V	43	35.9	14.3
7	15780.00	38.8 AV	54.0	-15.2	1.72 V	43	24.5	14.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11a	Channel	CH 60 : 5300 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	119.3 PK			3.65 H	177	115.0	4.3
2	*5300.00	110.3 AV			3.65 H	177	106.0	4.3
3	10600.00	50.1 PK	74.0	-23.9	1.47 H	141	36.5	13.6
4	10600.00	39.4 AV	54.0	-14.6	1.47 H	141	25.8	13.6
5	15900.00	49.8 PK	74.0	-24.2	1.42 H	227	35.7	14.1
6	15900.00	38.1 AV	54.0	-15.9	1.42 H	227	24.0	14.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	116.3 PK			2.82 V	149	112.0	4.3
2	*5300.00	106.9 AV			2.82 V	149	102.6	4.3
3	10600.00	51.3 PK	74.0	-22.7	1.46 V	6	37.7	13.6
4	10600.00	39.8 AV	54.0	-14.2	1.46 V	6	26.2	13.6
5	15900.00	50.4 PK	74.0	-23.6	1.67 V	16	36.3	14.1
6	15900.00	39.0 AV	54.0	-15.0	1.67 V	16	24.9	14.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11a	Channel	CH 64 : 5320 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	117.7 PK			3.73 H	175	113.4	4.3
2	*5320.00	108.4 AV			3.73 H	175	104.1	4.3
3	5350.00	69.2 PK	74.0	-4.8	3.73 H	175	64.9	4.3
4	5350.00	53.5 AV	54.0	-0.5	3.73 H	175	49.2	4.3
5	10640.00	50.7 PK	74.0	-23.3	1.55 H	145	37.0	13.7
6	10640.00	39.9 AV	54.0	-14.1	1.55 H	145	26.2	13.7
7	15960.00	48.8 PK	74.0	-25.2	1.39 H	237	34.7	14.1
8	15960.00	37.6 AV	54.0	-16.4	1.39 H	237	23.5	14.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	117.6 PK			2.62 V	123	113.3	4.3
2	*5320.00	107.6 AV			2.62 V	123	103.3	4.3
3	5350.00	65.2 PK	74.0	-8.8	2.62 V	123	60.9	4.3
4	5350.00	52.4 AV	54.0	-1.6	2.62 V	123	48.1	4.3
5	10640.00	50.8 PK	74.0	-23.2	1.46 V	19	37.1	13.7
6	10640.00	39.5 AV	54.0	-14.5	1.46 V	19	25.8	13.7
7	15960.00	50.3 PK	74.0	-23.7	1.70 V	16	36.2	14.1
8	15960.00	39.0 AV	54.0	-15.0	1.70 V	16	24.9	14.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11a	Channel	CH 100 : 5500 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	59.3 PK	74.0	-14.7	3.55 H	174	54.9	4.4
2	5460.00	47.2 AV	54.0	-6.8	3.55 H	174	42.8	4.4
3	#5468.50	67.9 PK	68.2	-0.3	3.55 H	174	63.4	4.5
4	*5500.00	115.6 PK			3.55 H	174	110.9	4.7
5	*5500.00	106.5 AV			3.55 H	174	101.8	4.7
6	11000.00	51.6 PK	74.0	-22.4	1.50 H	158	37.3	14.3
7	11000.00	40.3 AV	54.0	-13.7	1.50 H	158	26.0	14.3
8	#16500.00	49.4 PK	68.2	-18.8	1.38 H	231	33.6	15.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5458.50	57.1 PK	74.0	-16.9	2.65 V	127	52.7	4.4
2	5458.50	45.3 AV	54.0	-8.7	2.65 V	127	40.9	4.4
3	#5468.25	66.5 PK	68.2	-1.7	2.65 V	127	62.0	4.5
4	*5500.00	115.2 PK			2.65 V	127	110.5	4.7
5	*5500.00	105.1 AV			2.65 V	127	100.4	4.7
6	11000.00	51.9 PK	74.0	-22.1	1.45 V	17	37.6	14.3
7	11000.00	40.3 AV	54.0	-13.7	1.45 V	17	26.0	14.3
8	#16500.00	50.5 PK	68.2	-17.7	1.64 V	17	34.7	15.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11a	Channel	CH 116 : 5580 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	118.7 PK			3.61 H	163	114.2	4.5
2	*5580.00	110.1 AV			3.61 H	163	105.6	4.5
3	11160.00	50.4 PK	74.0	-23.6	1.44 H	155	36.3	14.1
4	11160.00	39.7 AV	54.0	-14.3	1.44 H	155	25.6	14.1
5	#16740.00	50.0 PK	68.2	-18.2	1.46 H	220	33.2	16.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	116.8 PK			2.80 V	135	112.3	4.5
2	*5580.00	107.5 AV			2.80 V	135	103.0	4.5
3	11160.00	51.4 PK	74.0	-22.6	1.39 V	10	37.3	14.1
4	11160.00	39.8 AV	54.0	-14.2	1.39 V	10	25.7	14.1
5	#16740.00	50.0 PK	68.2	-18.2	1.69 V	44	33.2	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11a	Channel	CH 140 : 5700 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	114.2 PK			3.97 H	188	109.6	4.6
2	*5700.00	105.0 AV			3.97 H	188	100.4	4.6
3	#5725.00	68.0 PK	68.2	-0.2	3.97 H	188	63.3	4.7
4	11400.00	50.1 PK	74.0	-23.9	1.52 H	125	35.6	14.5
5	11400.00	39.5 AV	54.0	-14.5	1.52 H	125	25.0	14.5
6	#17100.00	50.5 PK	68.2	-17.7	1.48 H	243	32.7	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	115.7 PK			2.63 V	142	111.1	4.6
2	*5700.00	105.6 AV			2.63 V	142	101.0	4.6
3	#5725.00	66.5 PK	68.2	-1.7	2.63 V	142	61.8	4.7
4	11400.00	51.0 PK	74.0	-23.0	1.45 V	14	36.5	14.5
5	11400.00	39.8 AV	54.0	-14.2	1.45 V	14	25.3	14.5
6	#17100.00	50.3 PK	68.2	-17.9	1.65 V	41	32.5	17.8

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	54.3 PK	74.0	-19.7	3.85 H	181	49.9	4.4
2	5460.00	44.5 AV	54.0	-9.5	3.85 H	181	40.1	4.4
3	#5470.00	52.3 PK	68.2	-15.9	3.85 H	181	47.8	4.5
4	*5720.00	116.9 PK			3.85 H	181	112.2	4.7
5	*5720.00	108.0 AV			3.85 H	181	103.3	4.7
6	#5850.00	52.4 PK	68.2	-15.8	3.85 H	181	47.4	5.0
7	11440.00	50.2 PK	74.0	-23.8	1.43 H	153	35.6	14.6
8	11440.00	39.3 AV	54.0	-14.7	1.43 H	153	24.7	14.6
9	#17160.00	49.2 PK	68.2	-19.0	1.45 H	236	31.4	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	54.1 PK	74.0	-19.9	2.77 V	122	49.7	4.4
2	5460.00	44.1 AV	54.0	-9.9	2.77 V	122	39.7	4.4
3	#5470.00	53.1 PK	68.2	-15.1	2.77 V	122	48.6	4.5
4	*5720.00	116.6 PK			2.77 V	122	111.9	4.7
5	*5720.00	107.1 AV			2.77 V	122	102.4	4.7
6	#5850.00	51.9 PK	68.2	-16.3	2.77 V	122	46.9	5.0
7	11440.00	51.8 PK	74.0	-22.2	1.39 V	26	37.2	14.6
8	11440.00	40.4 AV	54.0	-13.6	1.39 V	26	25.8	14.6
9	#17160.00	50.7 PK	68.2	-17.5	1.74 V	15	32.9	17.8

Remarks:

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

RF Mode	TX 802.11ac (VHT20)	Channel	CH 52 : 5260 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5142.10	53.4 PK	74.0	-20.6	3.64 H	171	48.6	4.8
2	5142.10	43.7 AV	54.0	-10.3	3.64 H	171	38.9	4.8
3	*5260.00	118.5 PK			3.64 H	171	114.2	4.3
4	*5260.00	109.3 AV			3.64 H	171	105.0	4.3
5	#10520.00	49.6 PK	68.2	-18.6	1.46 H	140	35.8	13.8
6	15780.00	50.0 PK	74.0	-24.0	1.38 H	215	35.7	14.3
7	15780.00	38.4 AV	54.0	-15.6	1.38 H	215	24.1	14.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5066.60	52.3 PK	74.0	-21.7	2.33 V	126	47.7	4.6
2	5066.60	43.6 AV	54.0	-10.4	2.33 V	126	39.0	4.6
3	*5260.00	115.8 PK			2.33 V	126	111.5	4.3
4	*5260.00	107.0 AV			2.33 V	126	102.7	4.3
5	#10520.00	52.0 PK	68.2	-16.2	1.40 V	31	38.2	13.8
6	15780.00	50.8 PK	74.0	-23.2	1.69 V	27	36.5	14.3
7	15780.00	39.2 AV	54.0	-14.8	1.69 V	27	24.9	14.3

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 60 : 5300 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	118.3 PK			3.71 H	199	114.0	4.3
2	*5300.00	109.6 AV			3.71 H	199	105.3	4.3
3	10600.00	50.4 PK	74.0	-23.6	1.43 H	129	36.8	13.6
4	10600.00	39.6 AV	54.0	-14.4	1.43 H	129	26.0	13.6
5	15900.00	49.9 PK	74.0	-24.1	1.45 H	214	35.8	14.1
6	15900.00	38.3 AV	54.0	-15.7	1.45 H	214	24.2	14.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	115.9 PK			2.28 V	125	111.6	4.3
2	*5300.00	106.9 AV			2.28 V	125	102.6	4.3
3	10600.00	52.1 PK	74.0	-21.9	1.38 V	31	38.5	13.6
4	10600.00	40.5 AV	54.0	-13.5	1.38 V	31	26.9	13.6
5	15900.00	50.5 PK	74.0	-23.5	1.75 V	33	36.4	14.1
6	15900.00	39.0 AV	54.0	-15.0	1.75 V	33	24.9	14.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 64 : 5320 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	117.2 PK			3.58 H	187	112.9	4.3
2	*5320.00	108.1 AV			3.58 H	187	103.8	4.3
3	5350.00	71.7 PK	74.0	-2.3	3.58 H	187	67.4	4.3
4	5350.00	53.6 AV	54.0	-0.4	3.58 H	187	49.3	4.3
5	10640.00	49.7 PK	74.0	-24.3	1.42 H	140	36.0	13.7
6	10640.00	38.9 AV	54.0	-15.1	1.42 H	140	25.2	13.7
7	15960.00	49.6 PK	74.0	-24.4	1.47 H	238	35.5	14.1
8	15960.00	37.8 AV	54.0	-16.2	1.47 H	238	23.7	14.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	114.2 PK			2.64 V	130	109.9	4.3
2	*5320.00	104.5 AV			2.64 V	130	100.2	4.3
3	5350.00	67.6 PK	74.0	-6.4	2.64 V	130	63.3	4.3
4	5350.00	48.5 AV	54.0	-5.5	2.64 V	130	44.2	4.3
5	10640.00	52.5 PK	74.0	-21.5	1.35 V	19	38.8	13.7
6	10640.00	40.7 AV	54.0	-13.3	1.35 V	19	27.0	13.7
7	15960.00	50.3 PK	74.0	-23.7	1.70 V	20	36.2	14.1
8	15960.00	38.9 AV	54.0	-15.1	1.70 V	20	24.8	14.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 100 : 5500 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	60.4 PK	74.0	-13.6	3.90 H	185	56.0	4.4
2	5460.00	46.4 AV	54.0	-7.6	3.90 H	185	42.0	4.4
3	#5467.00	67.7 PK	68.2	-0.5	3.90 H	185	63.2	4.5
4	*5500.00	114.3 PK			3.90 H	185	109.6	4.7
5	*5500.00	105.3 AV			3.90 H	185	100.6	4.7
6	11000.00	49.8 PK	74.0	-24.2	1.51 H	139	35.5	14.3
7	11000.00	39.3 AV	54.0	-14.7	1.51 H	139	25.0	14.3
8	#16500.00	49.9 PK	68.2	-18.3	1.48 H	219	34.1	15.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5458.30	56.8 PK	74.0	-17.2	3.07 V	129	52.4	4.4
2	5458.30	44.1 AV	54.0	-9.9	3.07 V	129	39.7	4.4
3	#5464.70	56.9 PK	68.2	-11.3	3.07 V	129	52.4	4.5
4	*5500.00	114.9 PK			3.07 V	129	110.2	4.7
5	*5500.00	103.8 AV			3.07 V	129	99.1	4.7
6	11000.00	52.3 PK	74.0	-21.7	1.42 V	22	38.0	14.3
7	11000.00	40.8 AV	54.0	-13.2	1.42 V	22	26.5	14.3
8	#16500.00	51.0 PK	68.2	-17.2	1.77 V	44	35.2	15.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 116 : 5580 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	118.1 PK			3.59 H	191	113.6	4.5
2	*5580.00	109.4 AV			3.59 H	191	104.9	4.5
3	11160.00	50.6 PK	74.0	-23.4	1.44 H	125	36.5	14.1
4	11160.00	39.8 AV	54.0	-14.2	1.44 H	125	25.7	14.1
5	#16740.00	49.1 PK	68.2	-19.1	1.42 H	220	32.3	16.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5580.00	115.8 PK			2.73 V	112	111.3	4.5
2	*5580.00	107.2 AV			2.73 V	112	102.7	4.5
3	11160.00	51.6 PK	74.0	-22.4	1.44 V	17	37.5	14.1
4	11160.00	40.2 AV	54.0	-13.8	1.44 V	17	26.1	14.1
5	#16740.00	50.5 PK	68.2	-17.7	1.76 V	19	33.7	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT20)	Channel	CH 140 : 5700 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	111.9 PK			3.84 H	194	107.3	4.6
2	*5700.00	102.8 AV			3.84 H	194	98.2	4.6
3	#5725.00	68.1 PK	68.2	-0.1	3.84 H	194	63.4	4.7
4	11400.00	50.5 PK	74.0	-23.5	1.47 H	134	36.0	14.5
5	11400.00	39.6 AV	54.0	-14.4	1.47 H	134	25.1	14.5
6	#17100.00	50.0 PK	68.2	-18.2	1.38 H	213	32.2	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	115.2 PK			2.63 V	125	110.6	4.6
2	*5700.00	104.3 AV			2.63 V	125	99.7	4.6
3	#5725.00	61.4 PK	68.2	-6.8	2.63 V	125	56.7	4.7
4	11400.00	51.7 PK	74.0	-22.3	1.43 V	31	37.2	14.5
5	11400.00	40.0 AV	54.0	-14.0	1.43 V	31	25.5	14.5
6	#17100.00	51.2 PK	68.2	-17.0	1.75 V	13	33.4	17.8

Remarks:

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

RF Mode	TX 802.11ac (VHT20)	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	54.3 PK	74.0	-19.7	3.87 H	179	49.9	4.4
2	5460.00	44.1 AV	54.0	-9.9	3.87 H	179	39.7	4.4
3	#5470.00	52.3 PK	68.2	-15.9	3.87 H	179	47.8	4.5
4	*5720.00	115.2 PK			3.87 H	179	110.5	4.7
5	*5720.00	105.7 AV			3.87 H	179	101.0	4.7
6	#5850.00	51.7 PK	68.2	-16.5	3.87 H	179	46.7	5.0
7	11440.00	50.5 PK	74.0	-23.5	1.47 H	138	35.9	14.6
8	11440.00	39.8 AV	54.0	-14.2	1.47 H	138	25.2	14.6
9	#17160.00	50.1 PK	68.2	-18.1	1.47 H	220	32.3	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	54.9 PK	74.0	-19.1	2.72 V	121	50.5	4.4
2	5460.00	44.6 AV	54.0	-9.4	2.72 V	121	40.2	4.4
3	#5470.00	52.6 PK	68.2	-15.6	2.72 V	121	48.1	4.5
4	*5720.00	116.1 PK			2.72 V	121	111.4	4.7
5	*5720.00	106.7 AV			2.72 V	121	102.0	4.7
6	#5850.00	51.7 PK	68.2	-16.5	2.72 V	121	46.7	5.0
7	11440.00	52.1 PK	74.0	-21.9	1.36 V	38	37.5	14.6
8	11440.00	40.7 AV	54.0	-13.3	1.36 V	38	26.1	14.6
9	#17160.00	50.6 PK	68.2	-17.6	1.81 V	17	32.8	17.8

Remarks:

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

RF Mode	TX 802.11ac (VHT40)	Channel	CH 54 : 5270 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5270.00	115.8 PK			3.56 H	188	111.5	4.3
2	*5270.00	106.5 AV			3.56 H	188	102.2	4.3
3	5350.00	67.6 PK	74.0	-6.4	3.56 H	188	63.3	4.3
4	5350.00	53.8 AV	54.0	-0.2	3.56 H	188	49.5	4.3
5	#10540.00	49.8 PK	68.2	-18.4	1.43 H	135	36.1	13.7
6	15810.00	50.2 PK	74.0	-23.8	1.40 H	219	36.0	14.2
7	15810.00	38.2 AV	54.0	-15.8	1.40 H	219	24.0	14.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5270.00	114.3 PK			2.71 V	126	110.0	4.3
2	*5270.00	104.2 AV			2.71 V	126	99.9	4.3
3	5350.00	62.0 PK	74.0	-12.0	2.71 V	126	57.7	4.3
4	5350.00	51.0 AV	54.0	-3.0	2.71 V	126	46.7	4.3
5	#10540.00	51.4 PK	68.2	-16.8	1.38 V	27	37.7	13.7
6	15810.00	50.4 PK	74.0	-23.6	1.80 V	30	36.2	14.2
7	15810.00	38.7 AV	54.0	-15.3	1.80 V	30	24.5	14.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 62 : 5310 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5310.00	111.8 PK			3.42 H	172	107.5	4.3
2	*5310.00	104.5 AV			3.42 H	172	100.2	4.3
3	5350.00	65.8 PK	74.0	-8.2	3.42 H	172	61.5	4.3
4	5350.00	53.6 AV	54.0	-0.4	3.42 H	172	49.3	4.3
5	5354.10	66.5 PK	74.0	-7.5	3.42 H	172	62.2	4.3
6	5354.10	52.2 AV	54.0	-1.8	3.42 H	172	47.9	4.3
7	10620.00	49.5 PK	74.0	-24.5	1.53 H	143	35.8	13.7
8	10620.00	39.0 AV	54.0	-15.0	1.53 H	143	25.3	13.7
9	15930.00	49.9 PK	74.0	-24.1	1.39 H	228	35.8	14.1
10	15930.00	38.0 AV	54.0	-16.0	1.39 H	228	23.9	14.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5310.00	110.5 PK			2.66 V	124	106.2	4.3
2	*5310.00	100.8 AV			2.66 V	124	96.5	4.3
3	5350.00	63.6 PK	74.0	-10.4	2.66 V	124	59.3	4.3
4	5350.00	52.5 AV	54.0	-1.5	2.66 V	124	48.2	4.3
5	10620.00	52.3 PK	74.0	-21.7	1.39 V	17	38.6	13.7
6	10620.00	40.6 AV	54.0	-13.4	1.39 V	17	26.9	13.7
7	15930.00	51.1 PK	74.0	-22.9	1.80 V	22	37.0	14.1
8	15930.00	39.4 AV	54.0	-14.6	1.80 V	22	25.3	14.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 102 : 5510 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5429.70	62.4 PK	74.0	-11.6	3.64 H	196	58.0	4.4
2	5429.70	46.0 AV	54.0	-8.0	3.64 H	196	41.6	4.4
3	5458.50	61.1 PK	74.0	-12.9	3.64 H	196	56.7	4.4
4	5458.50	51.7 AV	54.0	-2.3	3.64 H	196	47.3	4.4
5	#5469.60	67.9 PK	68.2	-0.3	3.64 H	196	63.4	4.5
6	*5510.00	109.7 PK			3.64 H	196	105.0	4.7
7	*5510.00	102.7 AV			3.64 H	196	98.0	4.7
8	11020.00	50.3 PK	74.0	-23.7	1.42 H	154	36.1	14.2
9	11020.00	39.8 AV	54.0	-14.2	1.42 H	154	25.6	14.2
10	#16530.00	49.3 PK	68.2	-18.9	1.37 H	227	33.4	15.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	54.3 PK	74.0	-19.7	2.62 V	137	49.9	4.4
2	5460.00	45.1 AV	54.0	-8.9	2.62 V	137	40.7	4.4
3	#5470.00	61.9 PK	68.2	-6.3	2.62 V	137	57.4	4.5
4	*5510.00	110.3 PK			2.62 V	137	105.6	4.7
5	*5510.00	100.1 AV			2.62 V	137	95.4	4.7
6	11020.00	52.6 PK	74.0	-21.4	1.38 V	27	38.4	14.2
7	11020.00	40.6 AV	54.0	-13.4	1.38 V	27	26.4	14.2
8	#16530.00	50.7 PK	68.2	-17.5	1.72 V	32	34.8	15.9

Remarks:

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

RF Mode	TX 802.11ac (VHT40)	Channel	CH 110 : 5550 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5550.00	115.5 PK			3.60 H	187	111.0	4.5
2	*5550.00	106.4 AV			3.60 H	187	101.9	4.5
3	11100.00	49.8 PK	74.0	-24.2	1.48 H	146	35.9	13.9
4	11100.00	39.3 AV	54.0	-14.7	1.48 H	146	25.4	13.9
5	#16650.00	49.4 PK	68.2	-18.8	1.47 H	229	33.0	16.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5550.00	114.3 PK			2.70 V	119	109.8	4.5
2	*5550.00	104.0 AV			2.70 V	119	99.5	4.5
3	11100.00	52.1 PK	74.0	-21.9	1.41 V	24	38.2	13.9
4	11100.00	40.5 AV	54.0	-13.5	1.41 V	24	26.6	13.9
5	#16650.00	50.3 PK	68.2	-17.9	1.69 V	38	33.9	16.4

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT40)	Channel	CH 134 : 5670 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5670.00	110.4 PK			3.65 H	179	105.9	4.5
2	*5670.00	101.5 AV			3.65 H	179	97.0	4.5
3	#5725.00	67.9 PK	68.2	-0.3	3.65 H	179	63.2	4.7
4	11340.00	49.9 PK	74.0	-24.1	1.42 H	129	35.5	14.4
5	11340.00	39.3 AV	54.0	-14.7	1.42 H	129	24.9	14.4
6	#17010.00	49.4 PK	68.2	-18.8	1.41 H	240	31.6	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5670.00	112.8 PK			2.72 V	111	108.3	4.5
2	*5670.00	102.3 AV			2.72 V	111	97.8	4.5
3	#5725.00	62.4 PK	68.2	-5.8	2.72 V	111	57.7	4.7
4	11340.00	52.1 PK	74.0	-21.9	1.42 V	33	37.7	14.4
5	11340.00	40.5 AV	54.0	-13.5	1.42 V	33	26.1	14.4
6	#17010.00	50.7 PK	68.2	-17.5	1.77 V	42	32.9	17.8

Remarks:

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

RF Mode	TX 802.11ac (VHT40)	Channel	CH 142 : 5710 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	52.1 PK	74.0	-21.9	3.91 H	197	47.7	4.4
2	5460.00	41.8 AV	54.0	-12.2	3.91 H	197	37.4	4.4
3	#5470.00	52.5 PK	68.2	-15.7	3.91 H	197	48.0	4.5
4	*5710.00	113.8 PK			3.91 H	197	109.1	4.7
5	*5710.00	105.1 AV			3.91 H	197	100.4	4.7
6	#5850.00	53.9 PK	68.2	-14.3	3.91 H	197	48.9	5.0
7	11420.00	49.9 PK	74.0	-24.1	1.46 H	152	35.4	14.5
8	11420.00	39.0 AV	54.0	-15.0	1.46 H	152	24.5	14.5
9	#17130.00	49.3 PK	68.2	-18.9	1.39 H	233	31.6	17.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	52.3 PK	74.0	-21.7	2.74 V	118	47.9	4.4
2	5460.00	41.9 AV	54.0	-12.1	2.74 V	118	37.5	4.4
3	#5470.00	52.8 PK	68.2	-15.4	2.74 V	118	48.3	4.5
4	*5710.00	114.7 PK			2.74 V	118	110.0	4.7
5	*5710.00	104.3 AV			2.74 V	118	99.6	4.7
6	#5850.00	54.0 PK	68.2	-14.2	2.74 V	118	49.0	5.0
7	11420.00	52.4 PK	74.0	-21.6	1.40 V	42	37.9	14.5
8	11420.00	40.7 AV	54.0	-13.3	1.40 V	42	26.2	14.5
9	#17130.00	50.6 PK	68.2	-17.6	1.75 V	18	32.9	17.7

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 58 : 5290 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5141.70	54.4 PK	74.0	-19.6	3.34 H	176	49.6	4.8
2	5141.70	43.5 AV	54.0	-10.5	3.34 H	176	38.7	4.8
3	*5290.00	106.2 PK			3.34 H	176	101.9	4.3
4	*5290.00	99.7 AV			3.34 H	176	95.4	4.3
5	5350.00	64.1 PK	74.0	-9.9	3.34 H	176	59.8	4.3
6	5350.00	53.5 AV	54.0	-0.5	3.34 H	176	49.2	4.3
7	#10580.00	49.3 PK	68.2	-18.9	1.45 H	129	35.6	13.7
8	15870.00	48.9 PK	74.0	-25.1	1.46 H	220	34.7	14.2
9	15870.00	37.1 AV	54.0	-16.9	1.46 H	220	22.9	14.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5110.50	52.3 PK	74.0	-21.7	2.65 V	124	47.4	4.9
2	5110.50	40.9 AV	54.0	-13.1	2.65 V	124	36.0	4.9
3	*5290.00	105.1 PK			2.65 V	124	100.8	4.3
4	*5290.00	96.2 AV			2.65 V	124	91.9	4.3
5	5350.00	61.9 PK	74.0	-12.1	2.65 V	124	57.6	4.3
6	5350.00	51.4 AV	54.0	-2.6	2.65 V	124	47.1	4.3
7	#10580.00	52.3 PK	68.2	-15.9	1.45 V	12	38.6	13.7
8	15870.00	50.9 PK	74.0	-23.1	1.75 V	17	36.7	14.2
9	15870.00	39.1 AV	54.0	-14.9	1.75 V	17	24.9	14.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 106 : 5530 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5454.80	64.4 PK	74.0	-9.6	3.91 H	187	60.0	4.4
2	5454.80	53.7 AV	54.0	-0.3	3.91 H	187	49.3	4.4
3	5460.00	65.5 PK	74.0	-8.5	3.91 H	187	61.1	4.4
4	5460.00	53.5 AV	54.0	-0.5	3.91 H	187	49.1	4.4
5	#5465.10	67.6 PK	68.2	-0.6	3.91 H	187	63.1	4.5
6	*5530.00	105.9 PK			3.91 H	187	101.3	4.6
7	*5530.00	98.7 AV			3.91 H	187	94.1	4.6
8	#5802.00	51.4 PK	68.2	-16.8	3.91 H	187	46.3	5.1
9	11060.00	49.6 PK	74.0	-24.4	1.50 H	142	35.5	14.1
10	11060.00	39.0 AV	54.0	-15.0	1.50 H	142	24.9	14.1
11	#16590.00	49.4 PK	68.2	-18.8	1.45 H	227	33.3	16.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5458.00	62.7 PK	74.0	-11.3	3.08 V	128	58.3	4.4
2	5458.00	51.5 AV	54.0	-2.5	3.08 V	128	47.1	4.4
3	#5467.90	62.4 PK	68.2	-5.8	3.08 V	128	57.9	4.5
4	*5530.00	104.8 PK			3.08 V	128	100.2	4.6
5	*5530.00	96.1 AV			3.08 V	128	91.5	4.6
6	#5804.80	51.7 PK	68.2	-16.5	3.08 V	128	46.6	5.1
7	11060.00	52.5 PK	74.0	-21.5	1.45 V	40	38.4	14.1
8	11060.00	40.9 AV	54.0	-13.1	1.45 V	40	26.8	14.1
9	#16590.00	51.0 PK	68.2	-17.2	1.75 V	17	34.9	16.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency.
6. " # " : The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 122 : 5610 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5610.00	110.0 PK			3.83 H	181	105.5	4.5
2	*5610.00	101.5 AV			3.83 H	181	97.0	4.5
3	#5725.00	67.8 PK	68.2	-0.4	3.83 H	181	63.1	4.7
4	11220.00	49.6 PK	74.0	-24.4	1.53 H	132	35.2	14.4
5	11220.00	39.1 AV	54.0	-14.9	1.53 H	132	24.7	14.4
6	#16830.00	49.7 PK	68.2	-18.5	1.40 H	222	32.4	17.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5610.00	108.1 PK			3.11 V	135	103.6	4.5
2	*5610.00	99.5 AV			3.11 V	135	95.0	4.5
3	#5725.00	63.4 PK	68.2	-4.8	3.11 V	135	58.7	4.7
4	11220.00	52.5 PK	74.0	-21.5	1.46 V	37	38.1	14.4
5	11220.00	40.6 AV	54.0	-13.4	1.46 V	37	26.2	14.4
6	#16830.00	50.4 PK	68.2	-17.8	1.74 V	14	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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ac (VHT80)	Channel	CH 138 : 5690 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	56.7 PK	74.0	-17.3	3.97 H	186	52.3	4.4
2	5460.00	45.4 AV	54.0	-8.6	3.97 H	186	41.0	4.4
3	#5470.00	60.0 PK	68.2	-8.2	3.97 H	186	55.5	4.5
4	*5690.00	111.4 PK			3.97 H	186	106.9	4.5
5	*5690.00	103.2 AV			3.97 H	186	98.7	4.5
6	#5850.00	61.1 PK	68.2	-7.1	3.97 H	186	56.1	5.0
7	11380.00	49.7 PK	74.0	-24.3	1.56 H	135	35.2	14.5
8	11380.00	38.9 AV	54.0	-15.1	1.56 H	135	24.4	14.5
9	#17070.00	49.5 PK	68.2	-18.7	1.40 H	226	31.6	17.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	56.6 PK	74.0	-17.4	2.61 V	134	52.2	4.4
2	5460.00	45.4 AV	54.0	-8.6	2.61 V	134	41.0	4.4
3	#5470.00	59.9 PK	68.2	-8.3	2.61 V	134	55.4	4.5
4	*5690.00	108.6 PK			2.61 V	134	104.1	4.5
5	*5690.00	100.4 AV			2.61 V	134	95.9	4.5
6	#5850.00	60.9 PK	68.2	-7.3	2.61 V	134	55.9	5.0
7	11380.00	52.7 PK	74.0	-21.3	1.44 V	39	38.2	14.5
8	11380.00	40.8 AV	54.0	-13.2	1.44 V	39	26.3	14.5
9	#17070.00	51.0 PK	68.2	-17.2	1.72 V	26	33.1	17.9

Remarks:

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

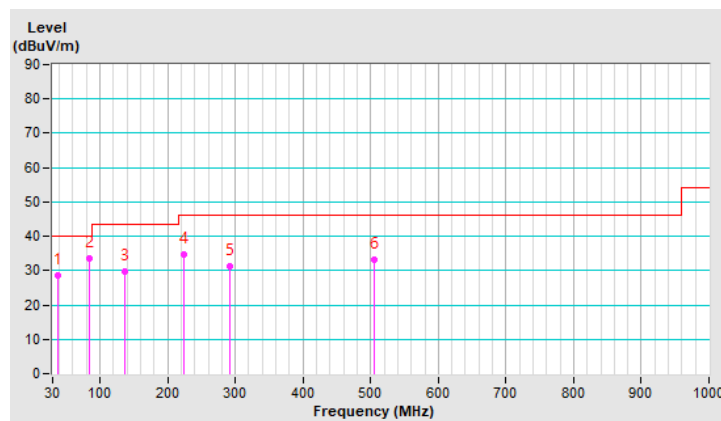
Below 1GHz Data:

RF Mode	TX 802.11ac (VHT40)	Channel	CH 102 : 5510 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	38.56	28.6 QP	40.0	-11.4	1.00 H	360	37.2	-8.6
2	84.22	33.7 QP	40.0	-6.3	3.00 H	232	47.3	-13.6
3	137.52	29.8 QP	43.5	-13.7	1.50 H	282	38.0	-8.2
4	224.36	34.5 QP	46.0	-11.5	1.50 H	236	45.1	-10.6
5	291.25	31.3 QP	46.0	-14.7	1.00 H	126	38.2	-6.9
6	505.08	33.1 QP	46.0	-12.9	1.50 H	221	34.0	-0.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

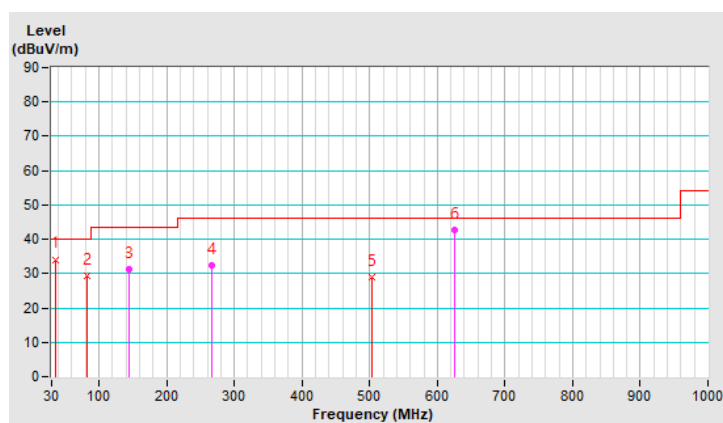


RF Mode	TX 802.11ac (VHT40)	Channel	CH 102 : 5510 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.63	34.1 QP	40.0	-5.9	1.00 V	4	43.2	-9.1
2	83.05	29.4 QP	40.0	-10.6	1.00 V	0	42.9	-13.5
3	144.05	31.4 QP	43.5	-12.1	1.00 V	2	39.2	-7.8
4	266.73	32.3 QP	46.0	-13.7	1.00 V	318	40.2	-7.9
5	502.47	28.9 QP	46.0	-17.1	1.00 V	3	29.8	-0.9
6	625.00	42.6 QP	46.0	-3.4	1.00 V	0	40.7	1.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



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	2020/10/20	2021/10/19
LISN R&S	ESH3-Z5	848773/004	2020/10/27	2021/10/26
LISN R & S	ESH3-Z5	835239/001	2021/3/26	2022/3/25
50 ohms Terminator	50	3	2020/10/26	2021/10/25
RF Coaxial Cable JYEBO	5D-FB	COCCAB-001	2020/9/26	2021/9/25
Fixed attenuator STI	STI02-2200-10	005	2021/8/27	2022/8/26
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: 2021/8/27

4.2.3 Test Procedure

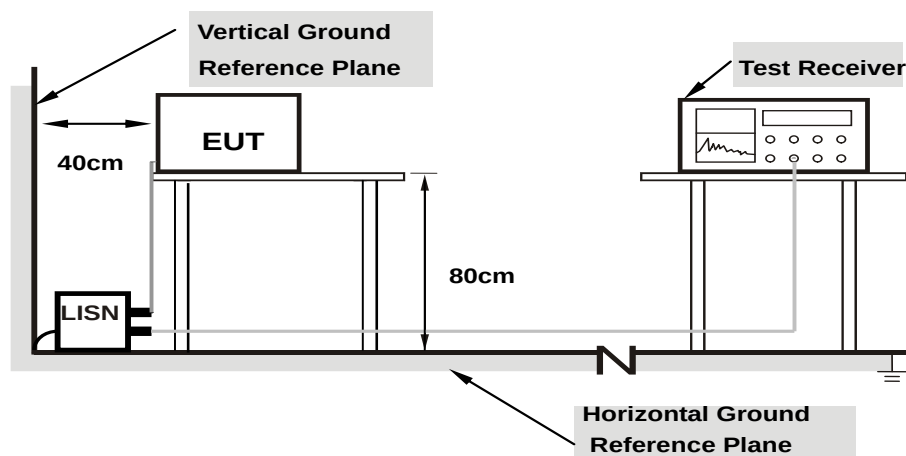
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

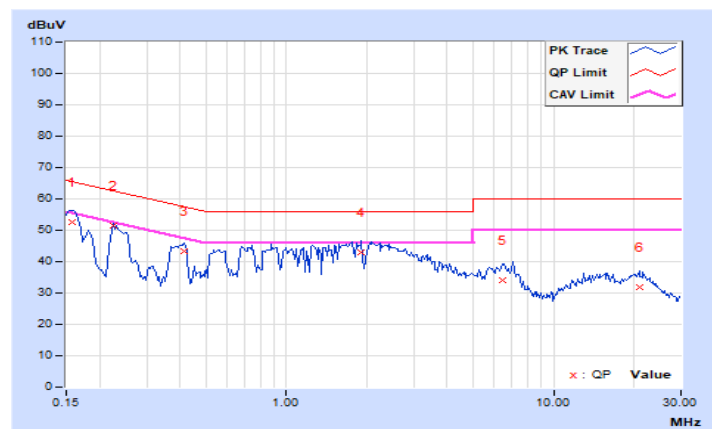
4.2.7 Test Results

RF Mode	TX 802.11ac (VHT40)	Channel	CH 102 : 5510 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.95	42.76	35.24	52.71	45.19	65.58	55.58	-12.87	-10.39
2	0.22422	9.97	41.42	31.55	51.39	41.52	62.66	52.66	-11.27	-11.14
3	0.41563	9.99	33.25	22.86	43.24	32.85	57.54	47.54	-14.30	-14.69
4	1.89453	10.07	33.06	19.83	43.13	29.90	56.00	46.00	-12.87	-16.10
5	6.44531	10.32	23.58	15.57	33.90	25.89	60.00	50.00	-26.10	-24.11
6	20.91797	11.14	20.72	14.11	31.86	25.25	60.00	50.00	-28.14	-24.75

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

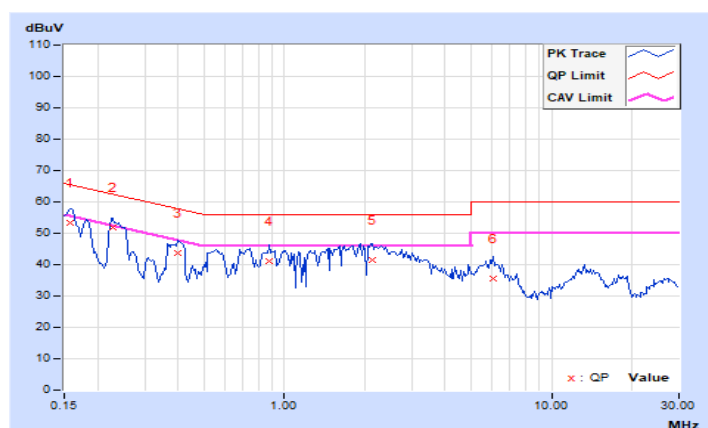


RF Mode	TX 802.11ac (VHT40)	Channel	CH 102 : 5510 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.92	43.23	36.17	53.15	46.09	65.58	55.58	-12.43	-9.49
2	0.22812	9.95	41.89	34.96	51.84	44.91	62.52	52.52	-10.68	-7.61
3	0.40000	9.96	33.88	20.86	43.84	30.82	57.85	47.85	-14.01	-17.03
4	0.87266	9.99	31.23	18.83	41.22	28.82	56.00	46.00	-14.78	-17.18
5	2.14453	10.05	31.50	18.61	41.55	28.66	56.00	46.00	-14.45	-17.34
6	6.08203	10.22	25.29	16.55	35.51	26.77	60.00	50.00	-24.49	-23.23

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
		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

Note: This device can support different category application which switched by access point mode and client mode by software.

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} ;

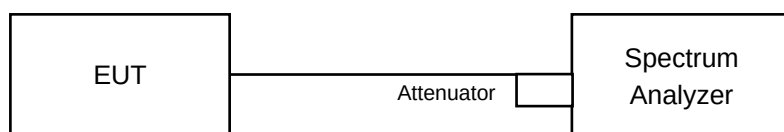
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

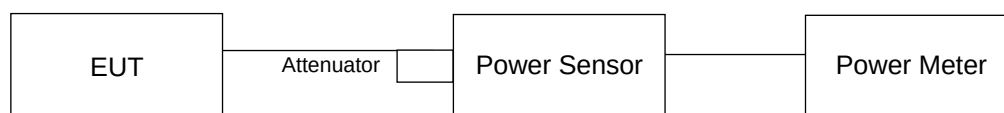
4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

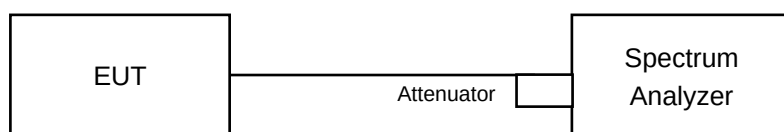
For channel straddling 5725MHz:



For other channels:



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

For channel straddling 5725MHz:

Follow FCC KDB 789033 UNII test procedure:

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \text{ Span} / \text{RBW}$.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

For other channels:

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

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW $>$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	16.02	15.77	16.14	118.867	20.75	21.6	Pass
60	5300	16.21	16.03	15.62	118.345	20.73	21.6	Pass
64	5320	16.12	15.94	15.64	116.834	20.68	21.6	Pass
100	5500	16.17	15.51	15.03	108.805	20.37	21.6	Pass
116	5580	16.06	15.77	15.04	110.037	20.42	21.6	Pass
140	5700	15.99	15.87	15.08	110.567	20.44	21.6	Pass
*144 (U-NII-2C Band)	5720	15.38	14.82	13.92	89.514	19.52	20.36	Pass
*144 (U-NII-3 Band)	5720	7.92	7.32	6.75	16.321	12.13	27.6	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

1. For U-NII-2A&2C: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to 24-(8.4-6) = 21.6dBm.
2. For U-NII-3: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to 30-(8.4-6) = 27.6dBm.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
52	5260	20.31	24.07 > 24
60	5300	20.22	24.05 > 24
64	5320	20.22	24.05 > 24
100	5500	20.27	24.06 > 24
116	5580	20.31	24.07 > 24
140	5700	20.27	24.06 > 24
144 (U-NII-2C Band)	5720	15.02	22.76 < 24

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

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	15.88	15.95	16.05	118.352	20.73	21.6	Pass
60	5300	15.45	15.51	15.66	107.451	20.31	21.6	Pass
64	5320	15.31	16.34	16.08	117.566	20.70	21.6	Pass
100	5500	16.02	15.48	15.20	108.426	20.35	21.6	Pass
116	5580	15.78	15.86	15.22	109.658	20.40	21.6	Pass
140	5700	15.88	15.81	15.12	109.341	20.39	21.6	Pass
*144 (U-NII-2C Band)	5720	14.76	14.70	14.21	85.798	19.33	20.38	Pass
*144 (U-NII-3 Band)	5720	7.77	7.79	6.88	16.871	12.27	27.6	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

1. For U-NII-2A&2C: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to 24-(8.4-6) = 21.6dBm.
2. For U-NII-3: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to 30-(8.4-6) = 27.6dBm.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
52	5260	20.29	24.07 > 24
60	5300	20.38	24.09 > 24
64	5320	20.38	24.09 > 24
100	5500	20.27	24.06 > 24
116	5580	20.46	24.1 > 24
140	5700	20.27	24.06 > 24
144 (U-NII-2C Band)	5720	15.09	22.78 < 24

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

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
54	5270	16.84	16.68	16.83	143.059	21.56	21.6	Pass
62	5310	16.87	16.76	16.30	138.723	21.42	21.6	Pass
102	5510	16.89	17.23	16.19	143.301	21.56	21.6	Pass
110	5550	16.92	16.78	15.79	134.779	21.30	21.6	Pass
134	5670	17.20	16.93	16.18	143.294	21.56	21.6	Pass
*142 (U-NII-2C Band)	5710	16.15	16.18	15.37	117.14	20.69	21.6	Pass
*142 (U-NII-3 Band)	5710	3.98	4.03	3.53	7.284	8.62	27.6	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

1. For U-NII-2A&2C: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to 24-(8.4-6) = 21.6dBm.
2. For U-NII-3: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to 30-(8.4-6) = 27.6dBm.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
54	5270	41.75	27.2 > 24
62	5310	41.66	27.19 > 24
102	5510	41.68	27.19 > 24
110	5550	41.67	27.19 > 24
134	5670	41.8	27.21 > 24
142 (U-NII-2C Band)	5710	35.67	26.52 > 24

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

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
58	5290	15.36	14.20	14.26	87.327	19.41	21.6	Pass
106	5530	15.00	14.19	13.68	81.2	19.10	21.6	Pass
122	5610	17.24	16.81	16.26	143.207	21.56	21.6	Pass
*138 (U-NII-2C Band)	5690	16.07	16.34	15.52	119.155	20.76	21.6	Pass
*138 (U-NII-3 Band)	5690	0.43	0.27	-0.26	3.1101	4.93	27.6	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

1. For U-NII-2A&2C: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to $24 - (8.4 - 6) = 21.6\text{dBm}$.
2. For U-NII-3: Maximum gain = 8.4dBi > 6dBi, so the power limit shall be reduced to $30 - (8.4 - 6) = 27.6\text{dBm}$.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
58	5290	81.27	30.09 > 24
106	5530	81.19	30.09 > 24
122	5610	81.34	30.1 > 24
138 (U-NII-2C Band)	5690	75.35	29.77 > 24

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

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	15.88	15.95	16.05	118.352	20.73	20.76	Pass
60	5300	15.45	15.51	15.66	107.451	20.31	20.76	Pass
64	5320	15.31	16.34	16.08	117.566	20.70	20.76	Pass
100	5500	16.02	15.48	15.20	108.426	20.35	20.7	Pass
116	5580	15.78	15.86	15.22	109.658	20.40	20.7	Pass
140	5700	15.88	15.81	15.12	109.341	20.39	20.7	Pass
*144 (U-NII-2C Band)	5720	14.76	14.70	14.21	85.798	19.33	19.48	Pass
*144 (U-NII-3 Band)	5720	7.77	7.79	6.88	16.871	12.27	26.94	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

1. For U-NII-2A: The directional gain = 9.24 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(9.24-6)".
2. For U-NII-2C: The directional gain = 9.3 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(9.3-6)".
3. For U-NII-3: The directional gain = 9.06 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.6-6) = 26.94 dBm.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
52	5260	20.29	24.07 > 24
60	5300	20.38	24.09 > 24
64	5320	20.38	24.09 > 24
100	5500	20.27	24.06 > 24
116	5580	20.46	24.1 > 24
140	5700	20.27	24.06 > 24
144 (U-NII-2C Band)	5720	15.09	22.78 < 24

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

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
54	5270	15.87	15.70	15.87	114.427	20.59	20.76	Pass
62	5310	15.88	15.80	15.33	110.864	20.45	20.76	Pass
102	5510	15.94	16.25	15.21	114.624	20.59	20.7	Pass
110	5550	15.94	15.82	14.80	107.658	20.32	20.7	Pass
134	5670	16.24	15.95	15.22	114.694	20.60	20.7	Pass
*142 (U-NII-2C Band)	5710	15.40	15.55	14.52	98.88	19.95	20.7	Pass
*142 (U-NII-3 Band)	5710	3.39	3.48	2.42	6.157	7.89	26.94	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

1. For U-NII-2A: The directional gain = 9.24 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(9.24-6)".
2. For U-NII-2C: The directional gain = 9.3 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(9.3-6)".
3. For U-NII-3: The directional gain = 9.06 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.6-6) = 26.94 dBm.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
54	5270	41.75	27.2 > 24
62	5310	41.66	27.19 > 24
102	5510	41.68	27.19 > 24
110	5550	41.67	27.19 > 24
134	5670	41.8	27.21 > 24
142 (U-NII-2C Band)	5710	35.67	26.52 > 24

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

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
58	5290	15.36	14.20	14.26	87.327	19.41	20.76	Pass
106	5530	15.00	14.19	13.68	81.2	19.10	20.7	Pass
122	5610	16.24	15.83	15.30	114.24	20.58	20.7	Pass
*138 (U-NII-2C Band)	5690	15.52	15.65	14.50	100.557	20.02	20.7	Pass
*138 (U-NII-3 Band)	5690	-0.43	-0.12	-1.21	2.6353	4.21	26.94	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

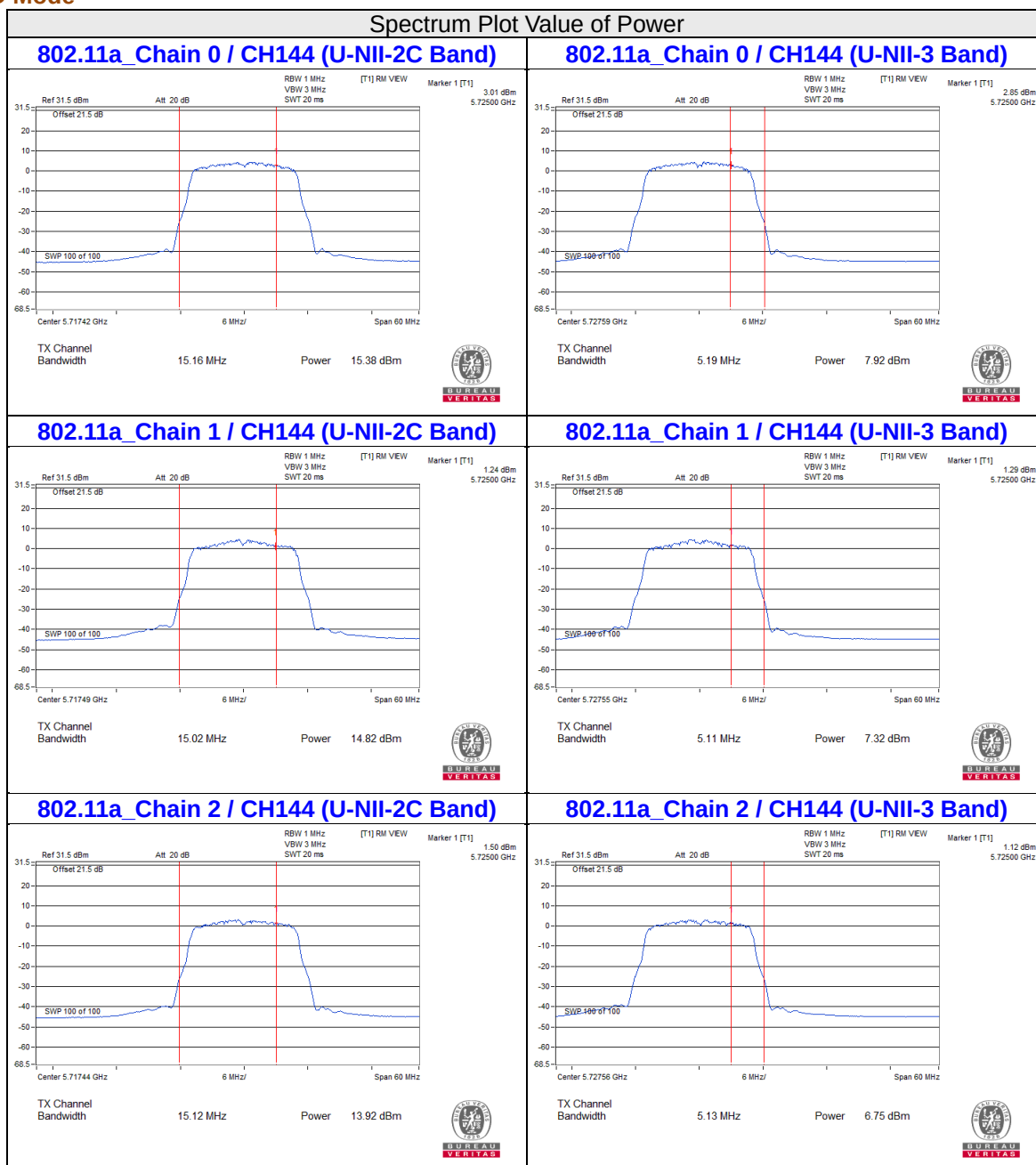
1. For U-NII-2A: The directional gain = 9.24 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(9.24-6)".
2. For U-NII-2C: The directional gain = 9.3 dBi > 6 dBi, therefore the limit needs to reduce, so the power limit shall be reduced to "Determined Conducted Limit-(9.3-6)".
3. For U-NII-3: The directional gain = 9.06 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.6-6) = 26.94 dBm.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
58	5290	81.27	30.09 > 24
106	5530	81.19	30.09 > 24
122	5610	81.34	30.1 > 24
138 (U-NII-2C Band)	5690	75.35	29.77 > 24

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

For channel straddling 5725MHz of Power

CDD Mode









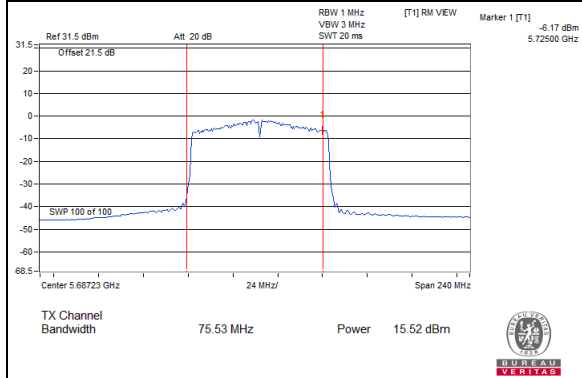
Beamforming Mode



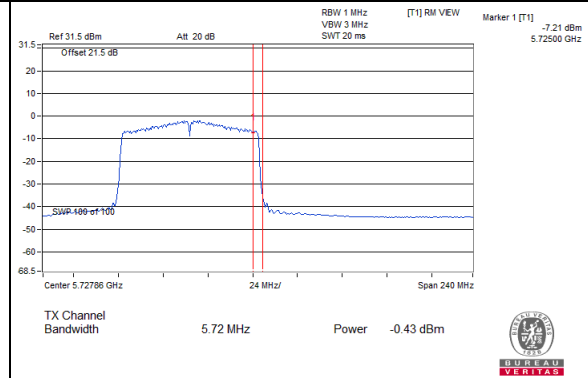


Spectrum Plot Value of Power

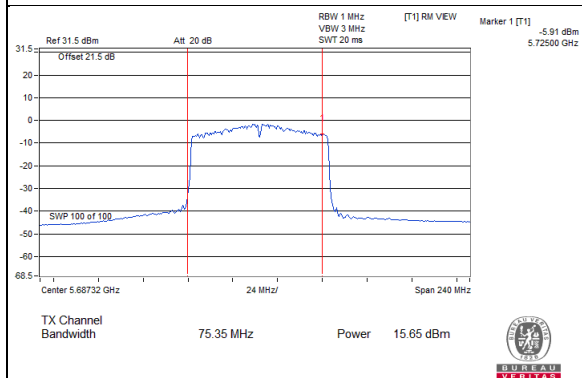
802.11ac (VHT80)_Chain 0 / CH138 (U-NII-2C Band)



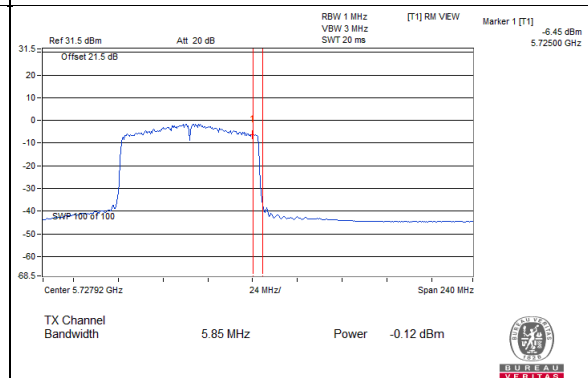
802.11ac (VHT80)_Chain 0 / CH138 (U-NII-3 Band)



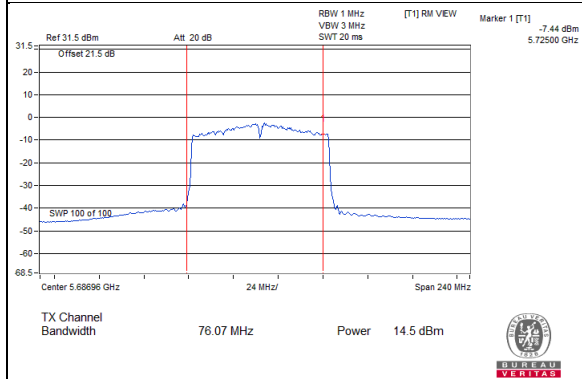
802.11ac (VHT80)_Chain 1 / CH138 (U-NII-2C Band)



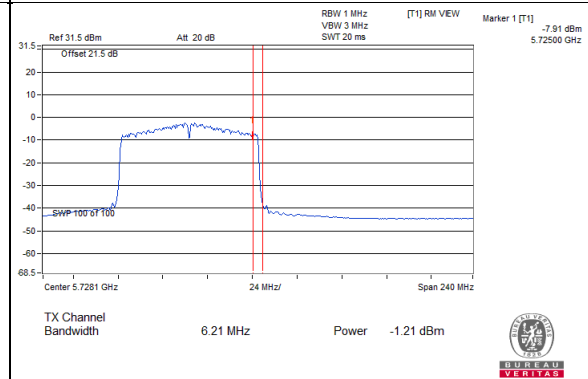
802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)



802.11ac (VHT80)_Chain 2 / CH138 (U-NII-2C Band)



802.11ac (VHT80)_Chain 2 / CH138 (U-NII-3 Band)



26dB OCCUPIED BANDWIDTH

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	20.43	20.31	20.32
60	5300	20.25	20.22	20.26
64	5320	20.27	20.3	20.22
100	5500	20.38	20.27	20.34
116	5580	20.33	20.32	20.31
140	5700	20.52	20.33	20.27
144 (U-NII-2C Band)	5720	15.16	15.02	15.12

802.11ac (VHT20)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	20.68	20.29	20.47
60	5300	20.79	20.38	20.48
64	5320	20.68	20.38	20.52
100	5500	20.65	20.27	20.43
116	5580	20.76	20.46	20.49
140	5700	20.71	20.27	20.45
144 (U-NII-2C Band)	5720	15.31	15.09	15.17

802.11ac (VHT40)

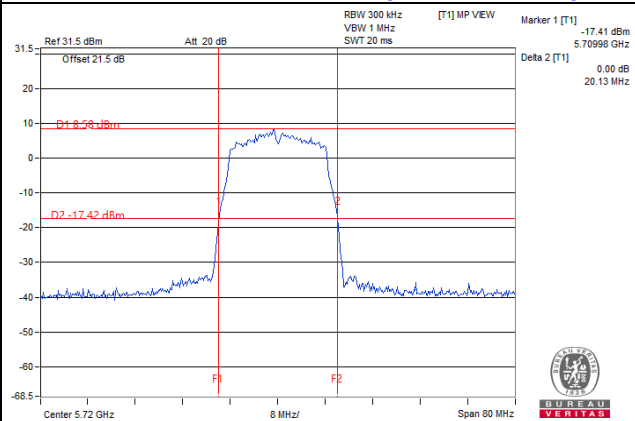
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	42.19	41.81	41.75
62	5310	42.3	41.79	41.66
102	5510	42.21	41.7	41.68
110	5550	42.17	41.67	41.85
134	5670	42.04	41.92	41.8
142 (U-NII-2C Band)	5710	36.14	35.94	35.67

802.11ac (VHT80)

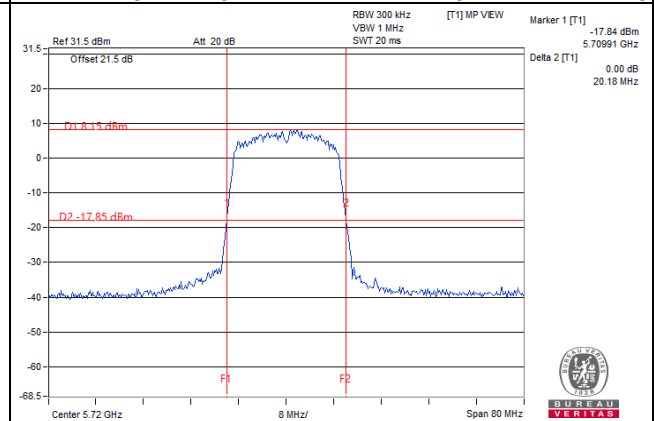
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
58	5290	81.27	81.32	82.17
106	5530	81.32	81.19	82.11
122	5610	81.34	81.39	82.3
138 (U-NII-2C Band)	5690	75.53	75.35	76.07

Spectrum Plot of Worst Value

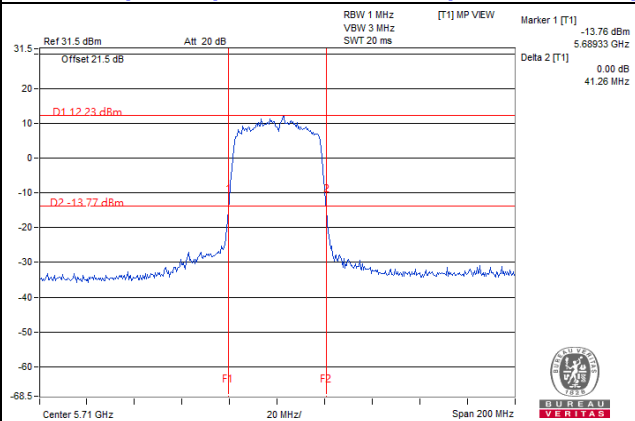
802.11a_Chain 1 / CH144 (U-NII-2C Band)



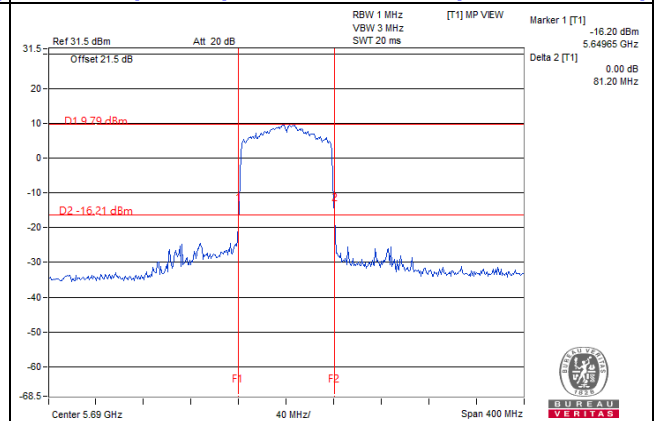
802.11ac (VHT20)_Chain 1 / CH144 (U-NII-2C Band)



802.11ac (VHT40)_Chain 2 / CH142 (U-NII-2C Band)



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-2C Band)

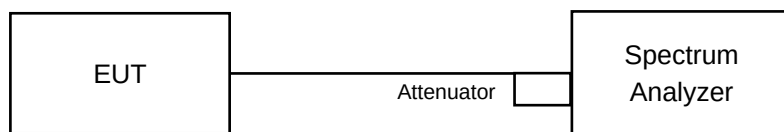


Note:

- For CH144 (U-NII-2C) = 5725MHz - Marker 1
- For CH142 (U-NII-2C) = 5725MHz - Marker 1
- For CH138 (U-NII-2C) = 5725MHz - Marker 1

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

CDD Mode

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	16.8	16.56	16.56
60	5300	16.68	16.56	16.44
64	5320	16.68	16.56	16.56
100	5500	16.68	16.56	16.44
116	5580	16.68	16.56	16.44
140	5700	16.68	16.56	16.44
144 (U-NII-2C Band)	5720	13.4	13.4	13.28
144 (U-NII-3 Band)	5720	3.28	3.28	3.28

802.11ac (VHT20)

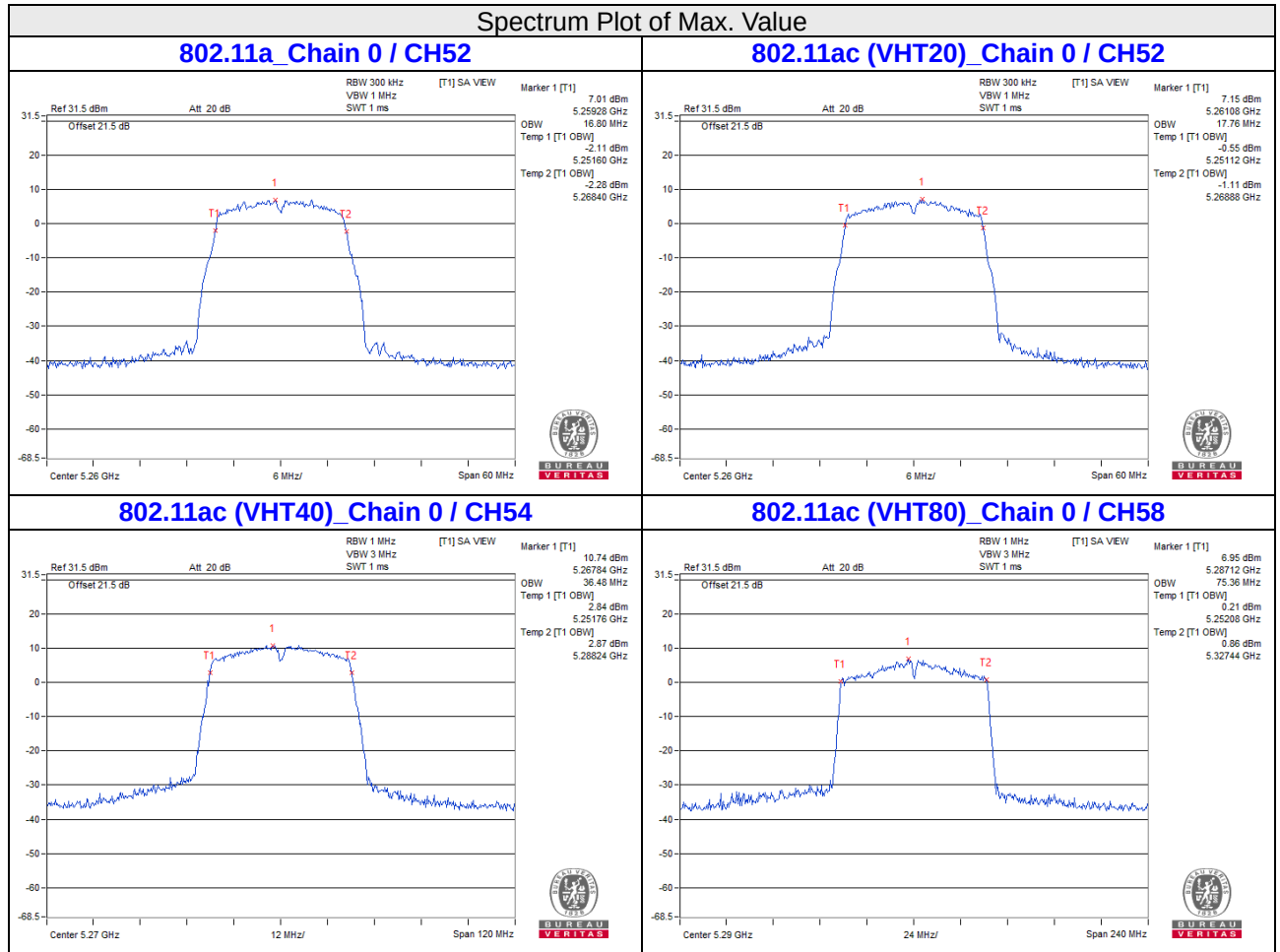
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	17.76	17.52	17.64
60	5300	17.76	17.52	17.64
64	5320	17.76	17.64	17.52
100	5500	17.76	17.64	17.52
116	5580	17.76	17.52	17.64
140	5700	17.76	17.64	17.64
144 (U-NII-2C Band)	5720	13.88	13.88	13.76
144 (U-NII-3 Band)	5720	3.88	3.76	3.76

802.11ac (VHT40)

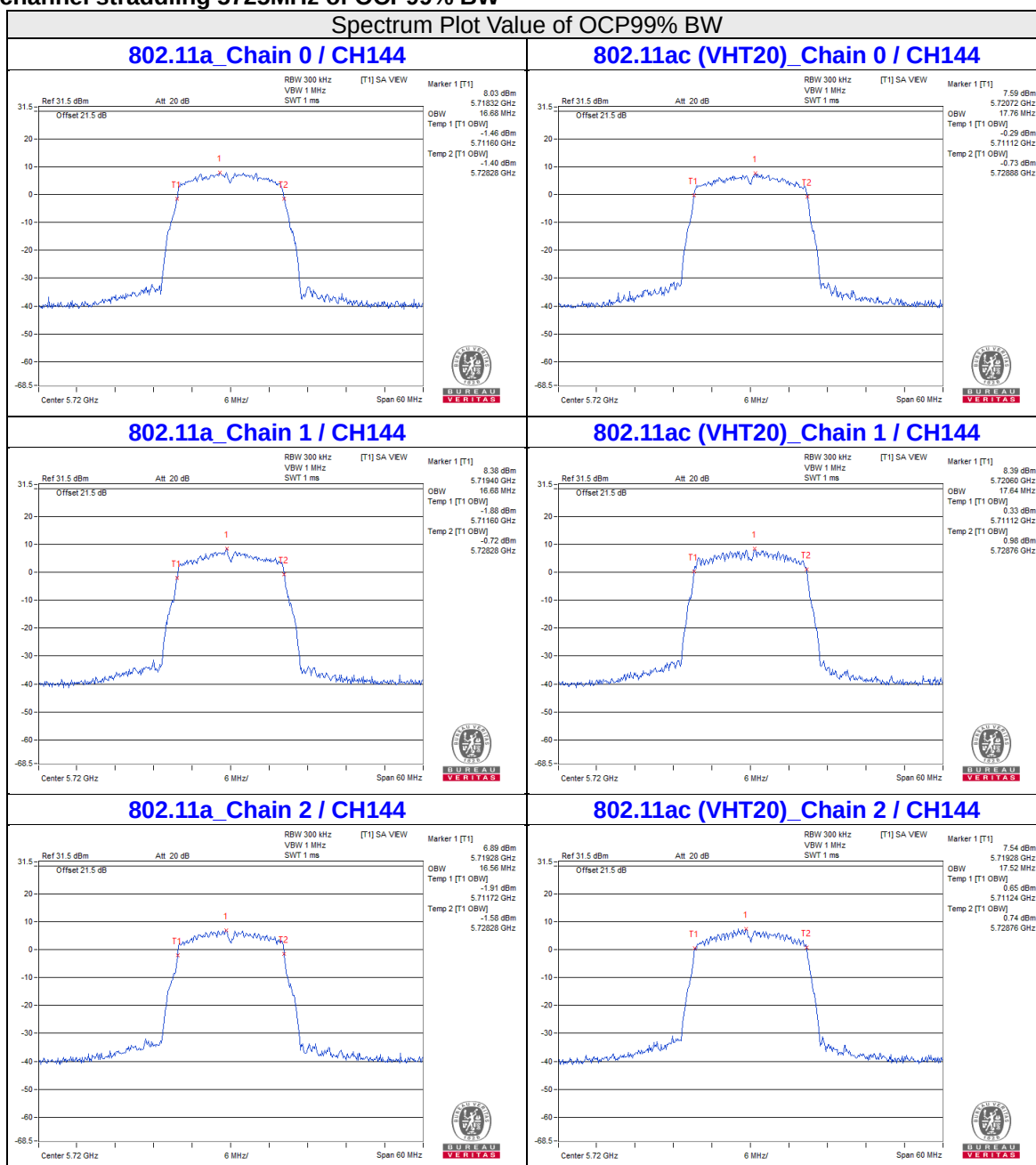
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	36.48	36.24	36.48
62	5310	36.48	36.48	36.24
102	5510	36.48	36.48	36.24
110	5550	36.48	36.48	36.24
134	5670	36.48	36.48	36.24
142 (U-NII-2C Band)	5710	33.24	33.24	33.24
142 (U-NII-3 Band)	5710	3.24	3	3.24

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
58	5290	75.36	74.88	75.36
106	5530	74.88	74.88	74.88
122	5610	74.88	74.88	75.36
138 (U-NII-2C Band)	5690	72.92	72.44	72.92
138 (U-NII-3 Band)	5690	2.44	2.44	2.44



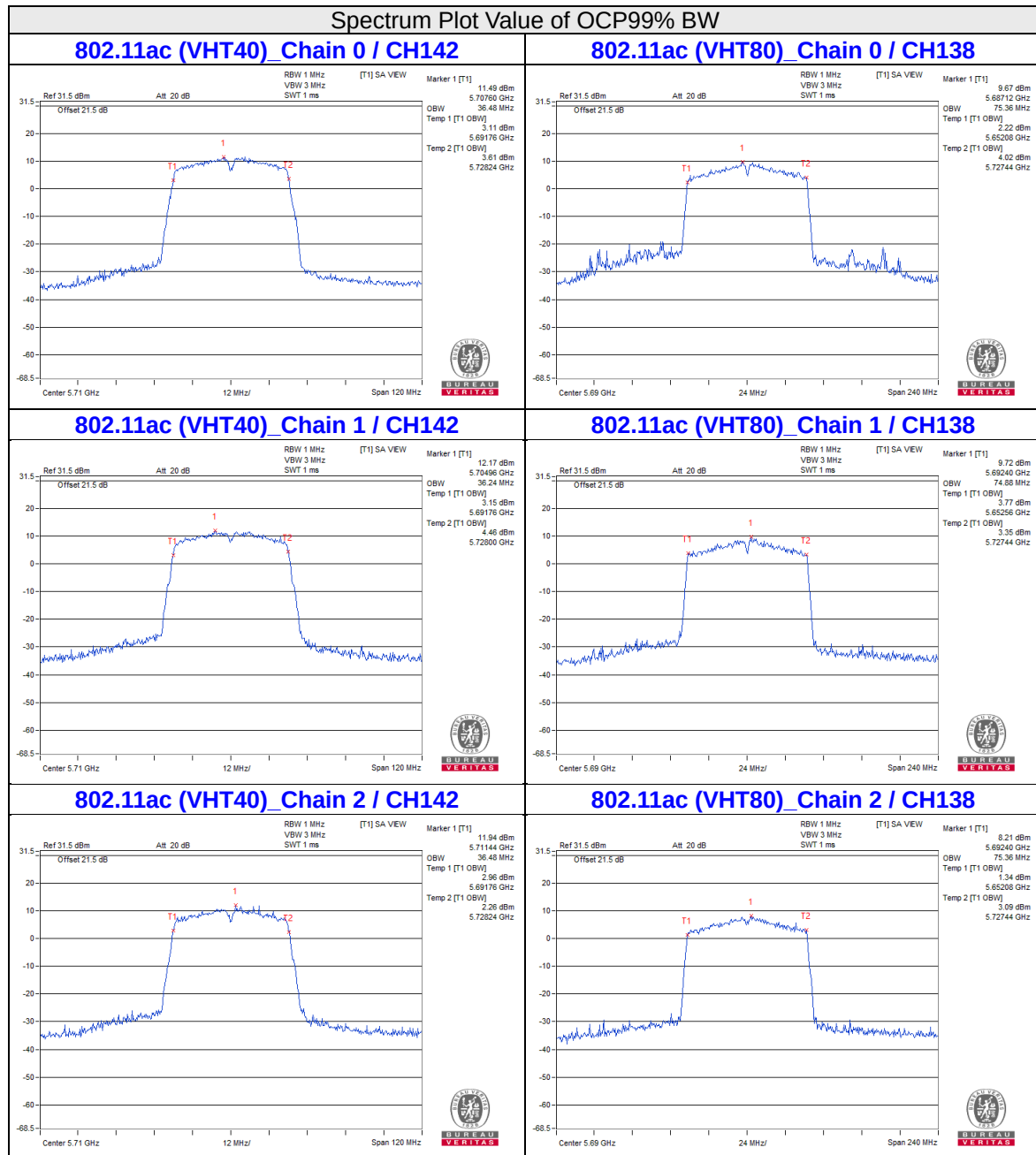
For channel straddling 5725MHz of OCP99% BW



Note:

For CH144 (U-NII-2C) = 5725MHz - Temp 1

For CH144 (U-NII-3) = Temp 2 - 5725MHz



Note:

For CH142 (U-NII-2C) = 5725MHz - Temp 1
 For CH138 (U-NII-2C) = 5725MHz - Temp 1
 For CH142 (U-NII-3) = Temp 2 - 5725MHz
 For CH138 (U-NII-3) = Temp 2 - 5725MHz

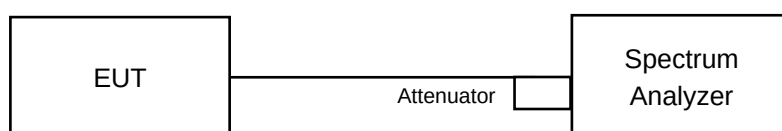
4.5 Peak Power Spectral Density Measurement

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

Note: This device can support different category application which switched by access point mode and client mode by software.

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-2A, U-NII-2C band:

Using method SA-1

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

For U-NII-3 band:

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 (increasing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{ kHz}/300\text{ kHz})$
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

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-2A, U-NII-2C band:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
52	5260	2.49	2.36	2.51	7.22	7.76	Pass
60	5300	2.74	1.93	1.88	6.97	7.76	Pass
64	5320	2.43	2.30	2.88	7.32	7.76	Pass
100	5500	2.85	2.46	2.70	7.44	7.70	Pass
116	5580	2.77	2.52	2.75	7.45	7.70	Pass
140	5700	2.87	2.96	2.52	7.56	7.70	Pass
144 (U-NII-2C Band)	5720	2.72	2.48	1.96	7.17	7.70	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. For U-NII-2A: The directional gain = 9.24 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.24-6) = 7.76$ dBm.
3. For U-NII-2C: The directional gain = 9.3 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.3-6) = 7.70$ dBm.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
52	5260	2.60	2.80	2.79	7.50	7.76	Pass
60	5300	2.83	2.93	2.08	7.40	7.76	Pass
64	5320	2.35	2.98	2.45	7.37	7.76	Pass
100	5500	2.57	3.19	2.10	7.41	7.70	Pass
116	5580	2.41	2.98	2.20	7.31	7.70	Pass
140	5700	2.65	3.30	2.08	7.48	7.70	Pass
144 (U-NII-2C Band)	5720	2.88	2.98	2.30	7.50	7.70	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. For U-NII-2A: The directional gain = 9.24 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.24-6) = 7.76$ dBm.
3. For U-NII-2C: The directional gain = 9.3 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.3-6) = 7.70$ dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
54	5270	1.28	1.05	0.96	5.87	7.76	Pass
62	5310	1.25	1.11	0.15	5.63	7.76	Pass
102	5510	2.18	1.40	0.96	6.31	7.70	Pass
110	5550	1.03	1.07	-0.06	5.48	7.70	Pass
134	5670	1.14	1.39	-0.27	5.58	7.70	Pass
142 (U-NII-2C Band)	5710	1.39	0.87	0.04	5.57	7.70	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. For U-NII-2A: The directional gain = 9.24 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.24-6) = 7.76$ dBm.
3. For U-NII-2C: The directional gain = 9.3 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.3-6) = 7.70$ dBm.

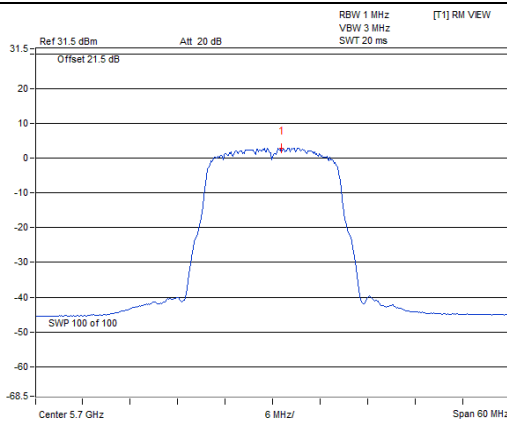
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
58	5290	-3.22	-3.85	-3.71	1.19	7.76	Pass
106	5530	-3.16	-3.68	-3.67	1.27	7.70	Pass
122	5610	-0.80	-0.69	-1.69	3.73	7.70	Pass
138 (U-NII-2C Band)	5690	-1.21	-0.59	-1.67	3.64	7.70	Pass

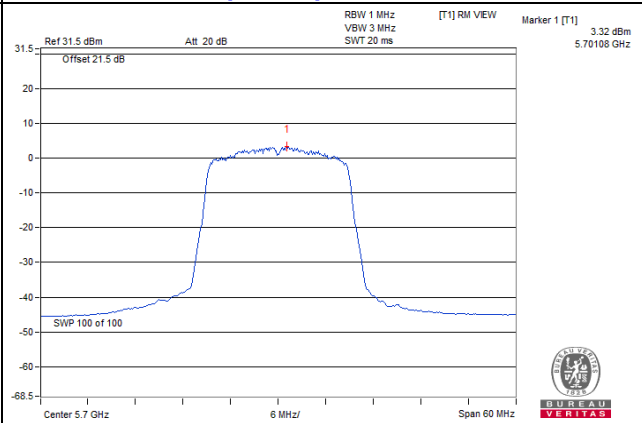
- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. For U-NII-2A: The directional gain = 9.24 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.24-6) = 7.76$ dBm.
3. For U-NII-2C: The directional gain = 9.3 dBi > 6dBi, so the power density limit shall be reduced to $11-(9.3-6) = 7.70$ dBm.

Spectrum Plot of Worst Value

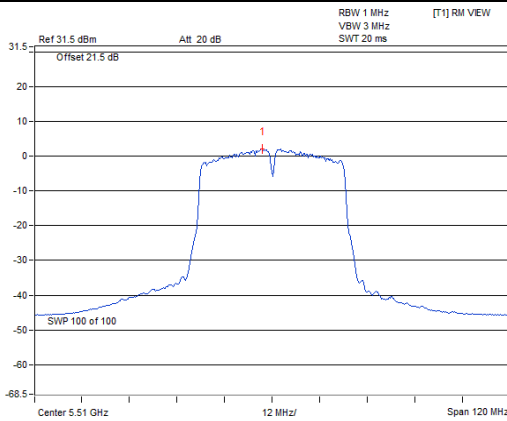
802.11a_Chain 1 / CH140



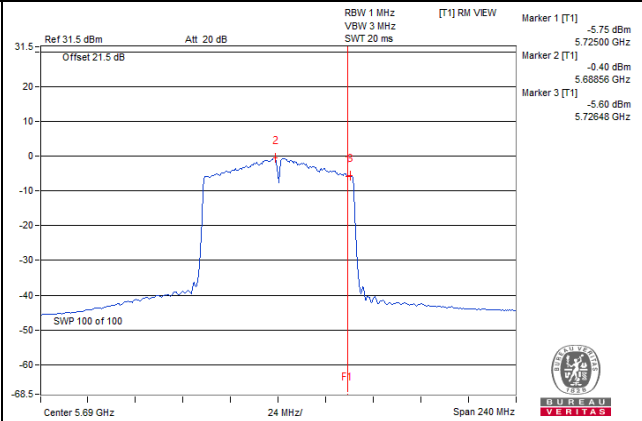
802.11ac (VHT20)_Chain 1 / CH140



802.11ac (VHT40)_Chain 0 / CH102



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-2C Band)



For U-NII-3 band:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)			Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
144 (U-NII-3 Band)	5720	-7.60	-7.86	-7.75	-2.96	-0.74	26.94	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = 9.06 dBi > 6dBi, so the power density limit shall be reduced to $30-(9.06-6) = 26.94$ dBm.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)			Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
144 (U-NII-3 Band)	5720	-7.24	-6.83	-7.88	-2.52	-0.30	26.94	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = 9.06 dBi > 6dBi, so the power density limit shall be reduced to $30-(9.06-6) = 26.94$ dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)			Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
142 (U-NII-3 Band)	5710	-11.49	-11.70	-12.29	-7.04	-4.82	26.94	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = 9.06 dBi > 6dBi, so the power density limit shall be reduced to $30-(9.06-6) = 26.94$ dBm.

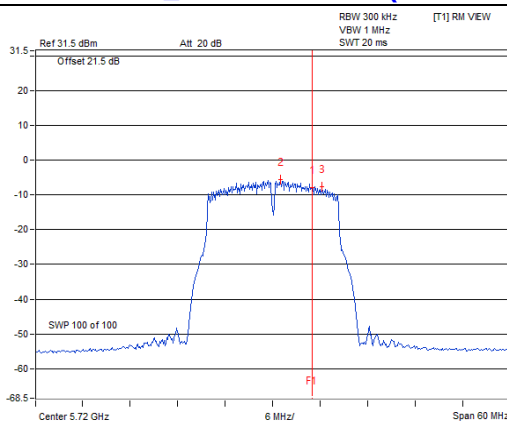
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)			Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
138 (U-NII-3 Band)	5690	-14.42	-14.91	-15.30	-10.09	-7.87	26.94	Pass

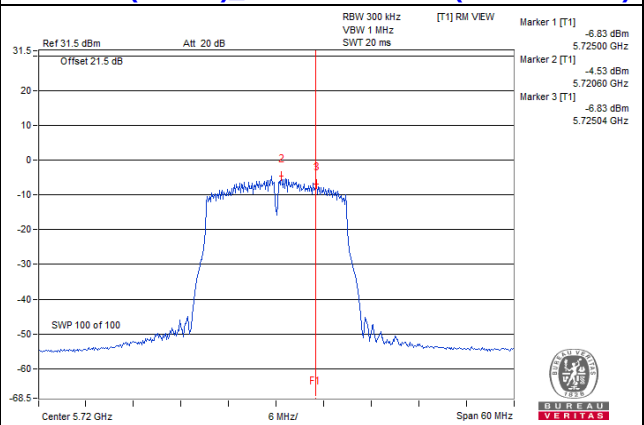
- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = 9.06 dBi > 6dBi, so the power density limit shall be reduced to $30-(9.06-6) = 26.94$ dBm.

Spectrum Plot of Worst Value

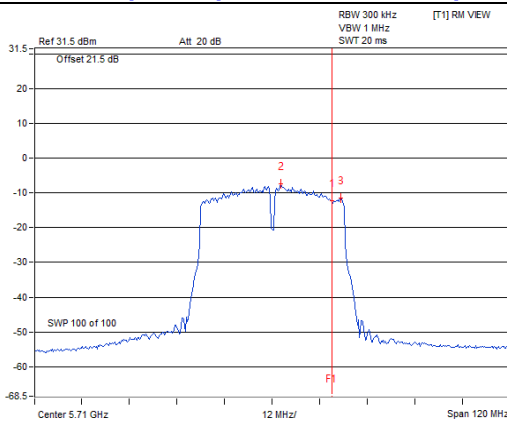
802.11a_Chain 0 / CH144 (U-NII-3 Band)



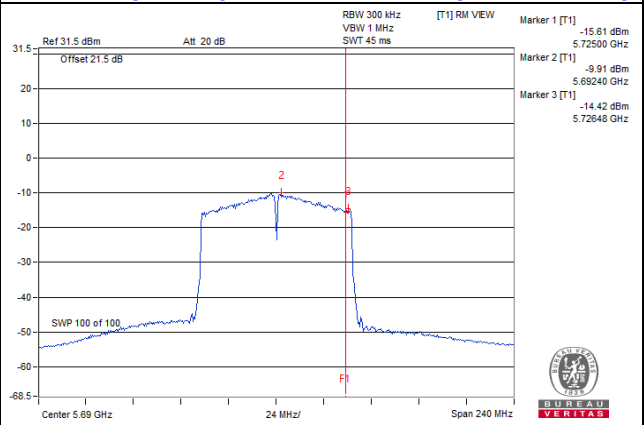
802.11ac (VHT20)_Chain 1 / CH144 (U-NII-3 Band)



802.11ac (VHT40)_Chain 0 / CH142 (U-NII-3 Band)



802.11ac (VHT80)_Chain 0 / CH138 (U-NII-3 Band)

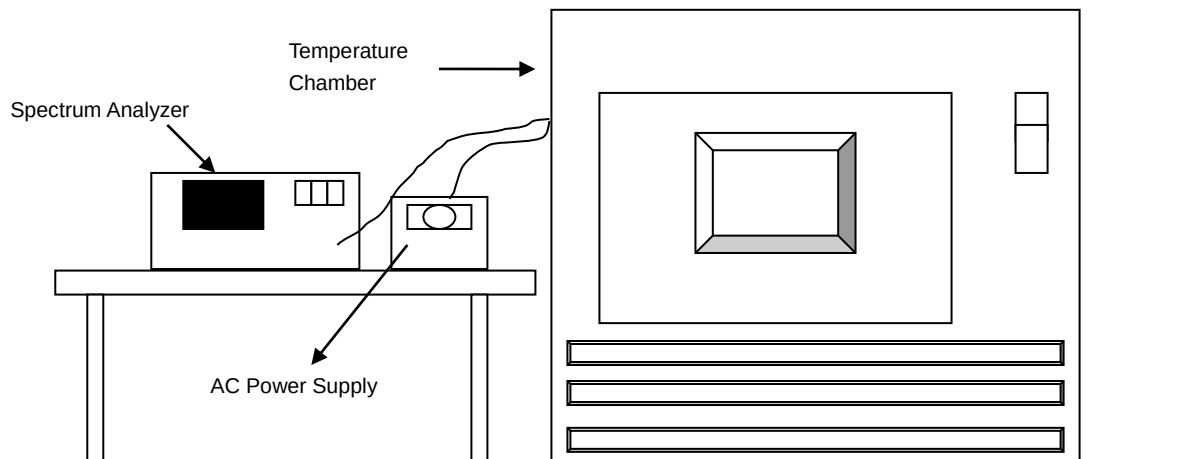


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5260 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 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	5260.0098	Pass	5260.0091	Pass	5260.0083	Pass	5260.0099	Pass
40	120	5260.0153	Pass	5260.0151	Pass	5260.0188	Pass	5260.0164	Pass
30	120	5259.9975	Pass	5259.9998	Pass	5259.9989	Pass	5259.998	Pass
20	120	5259.9828	Pass	5259.9804	Pass	5259.9831	Pass	5259.9832	Pass
10	120	5260.0009	Pass	5260.0005	Pass	5259.9991	Pass	5260.0019	Pass
0	120	5259.989	Pass	5259.9883	Pass	5259.9871	Pass	5259.9869	Pass
-10	120	5259.9724	Pass	5259.9736	Pass	5259.9739	Pass	5259.9757	Pass
-20	120	5259.9773	Pass	5259.9737	Pass	5259.9747	Pass	5259.9745	Pass
-30	120	5259.9841	Pass	5259.9843	Pass	5259.9828	Pass	5259.9858	Pass

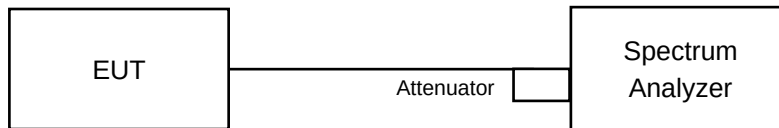
Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (°C)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5259.9821	Pass	5259.9801	Pass	5259.9822	Pass	5259.983	Pass
	120	5259.9828	Pass	5259.9804	Pass	5259.9831	Pass	5259.9832	Pass
	102	5259.983	Pass	5259.9797	Pass	5259.984	Pass	5259.9827	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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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		
144 (U-NII-3 Band)	5720	2.59	2.6	3.16	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
144 (U-NII-3 Band)	5720	2.58	2.57	2.58	0.5	Pass

802.11ac (VHT40)

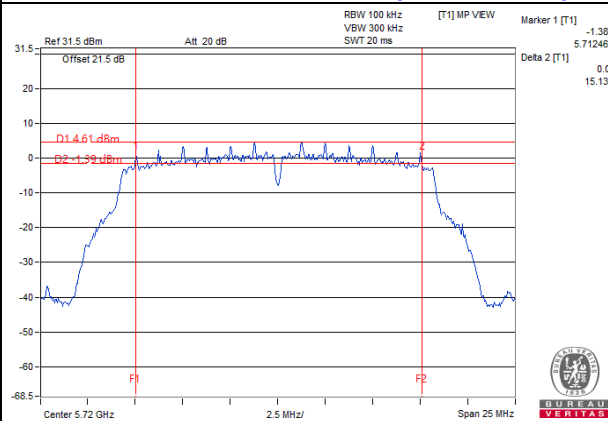
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
142 (U-NII-3 Band)	5710	2.58	2.55	2.63	0.5	Pass

802.11ac (VHT80)

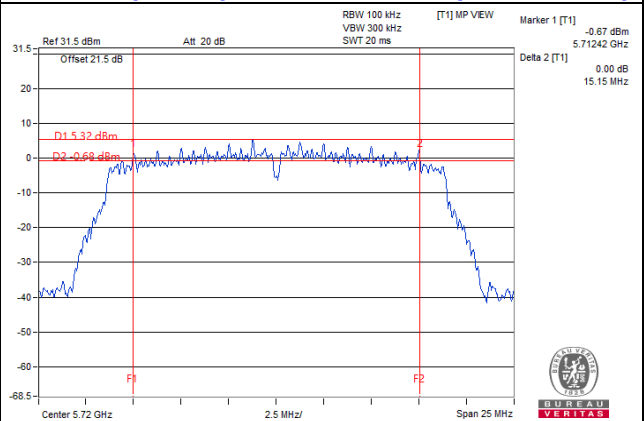
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
138 (U-NII-3 Band)	5690	2.65	2.63	2.68	0.5	Pass

Spectrum Plot of Worst Value

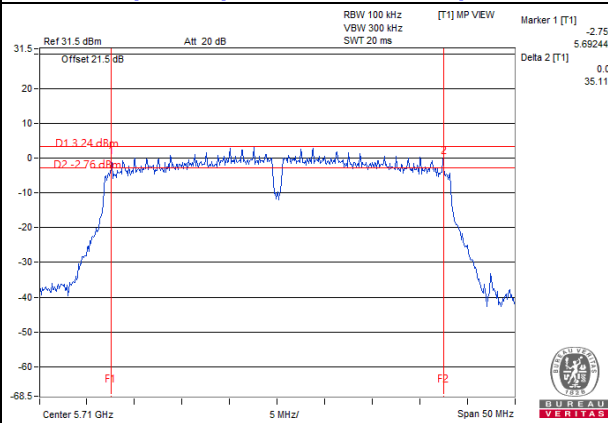
802.11a_Chain 0 / CH144 (U-NII-3 Band)



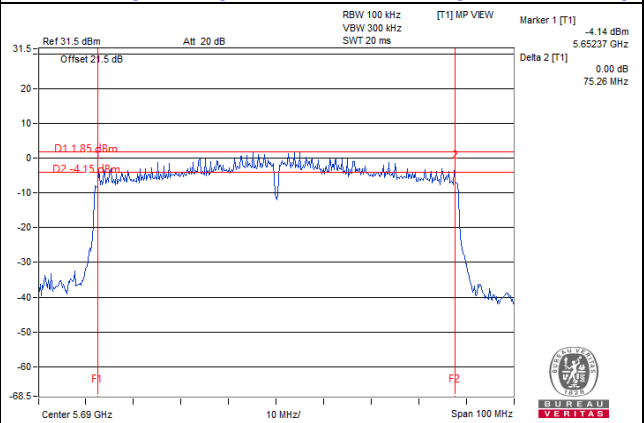
802.11ac (VHT20)_Chain 1 / CH144 (U-NII-3 Band)



802.11ac (VHT40)_Chain 1 / CH142 (U-NII-3 Band)



802.11ac (VHT80)_Chain 1 / CH138 (U-NII-3 Band)

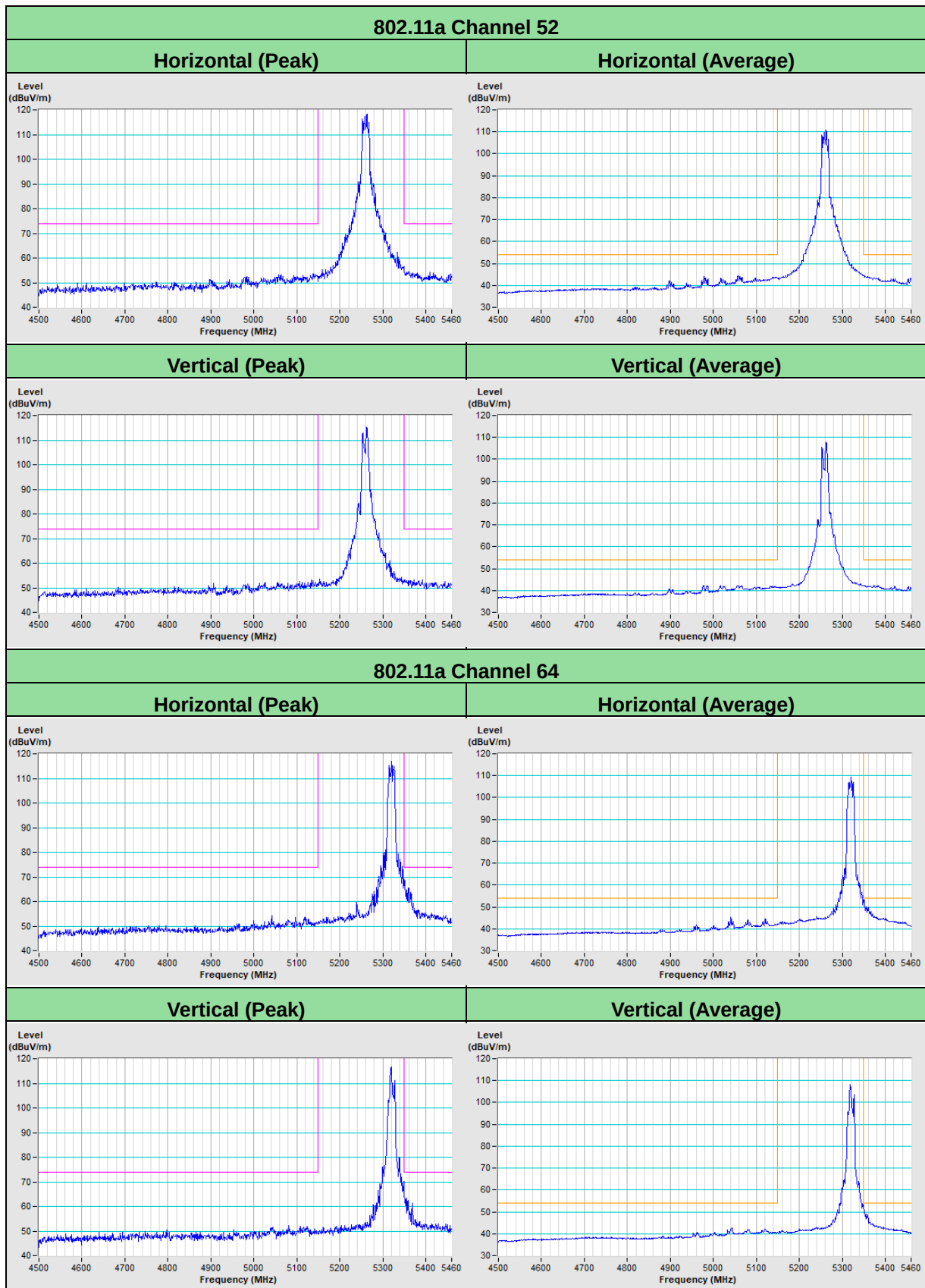


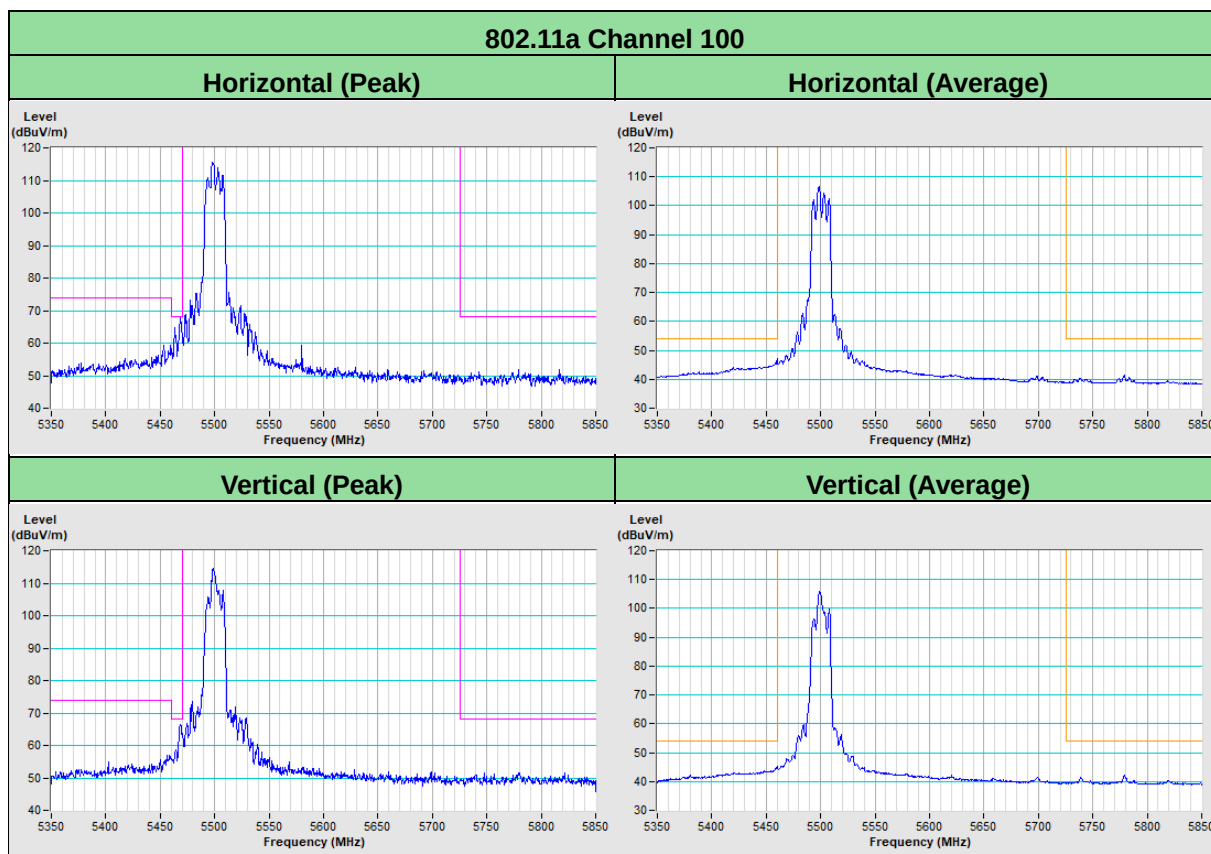
Note: The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

5 Pictures of Test Arrangements

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

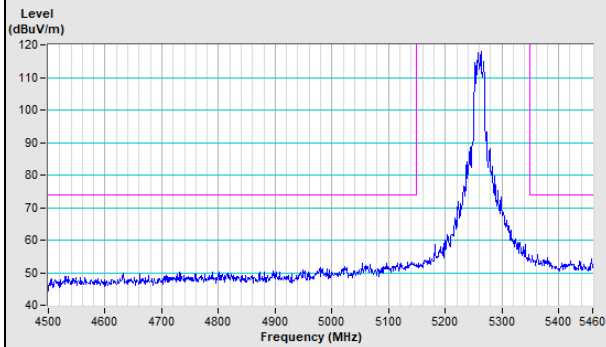
Annex A - Band-Edge Measurement (For U-NII-2A, U-NII-2C band)



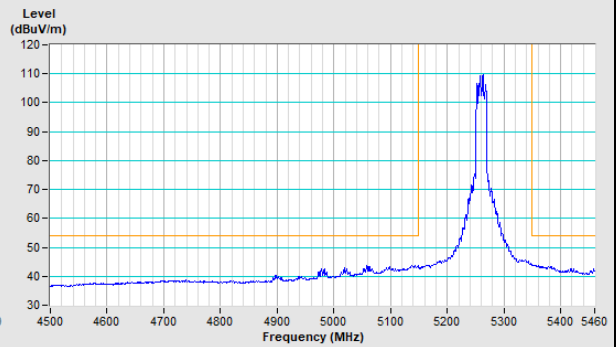


802.11ac (VHT20) Channel 52

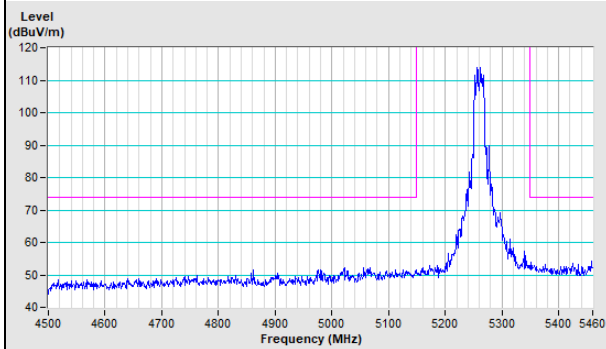
Horizontal (Peak)



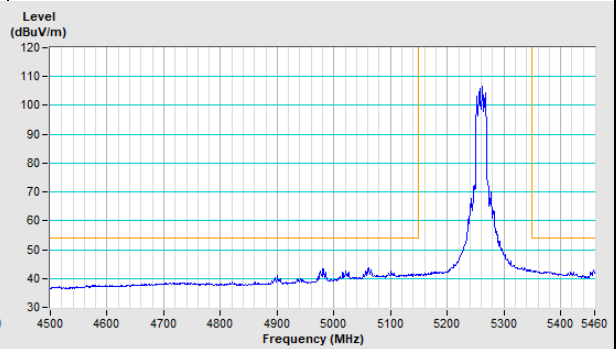
Horizontal (Average)



Vertical (Peak)

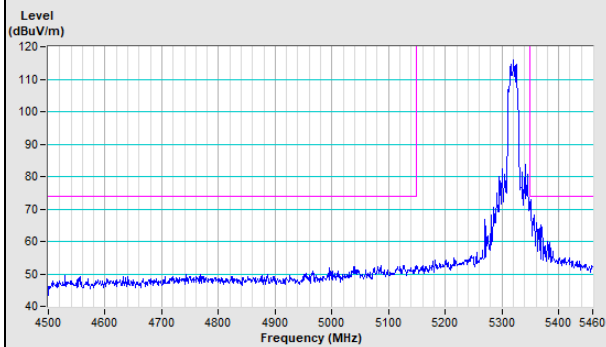


Vertical (Average)

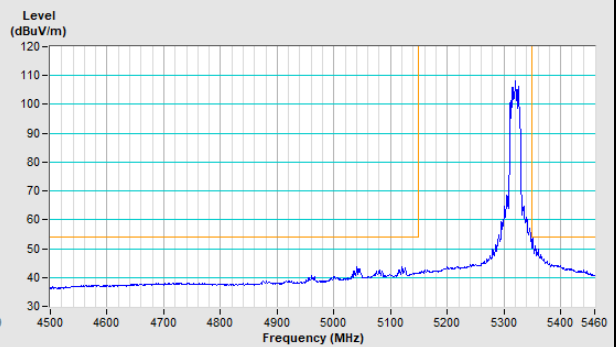


802.11ac (VHT20) Channel 64

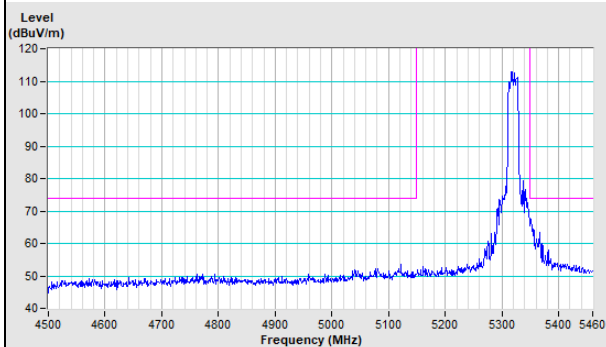
Horizontal (Peak)



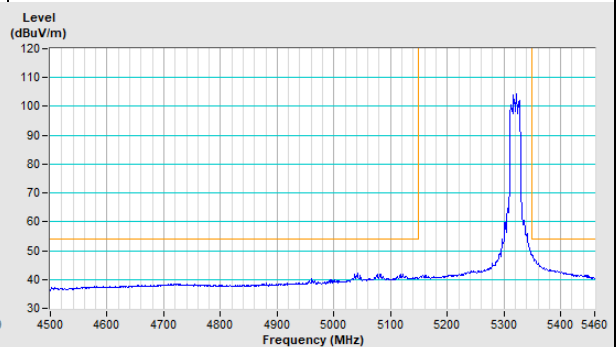
Horizontal (Average)

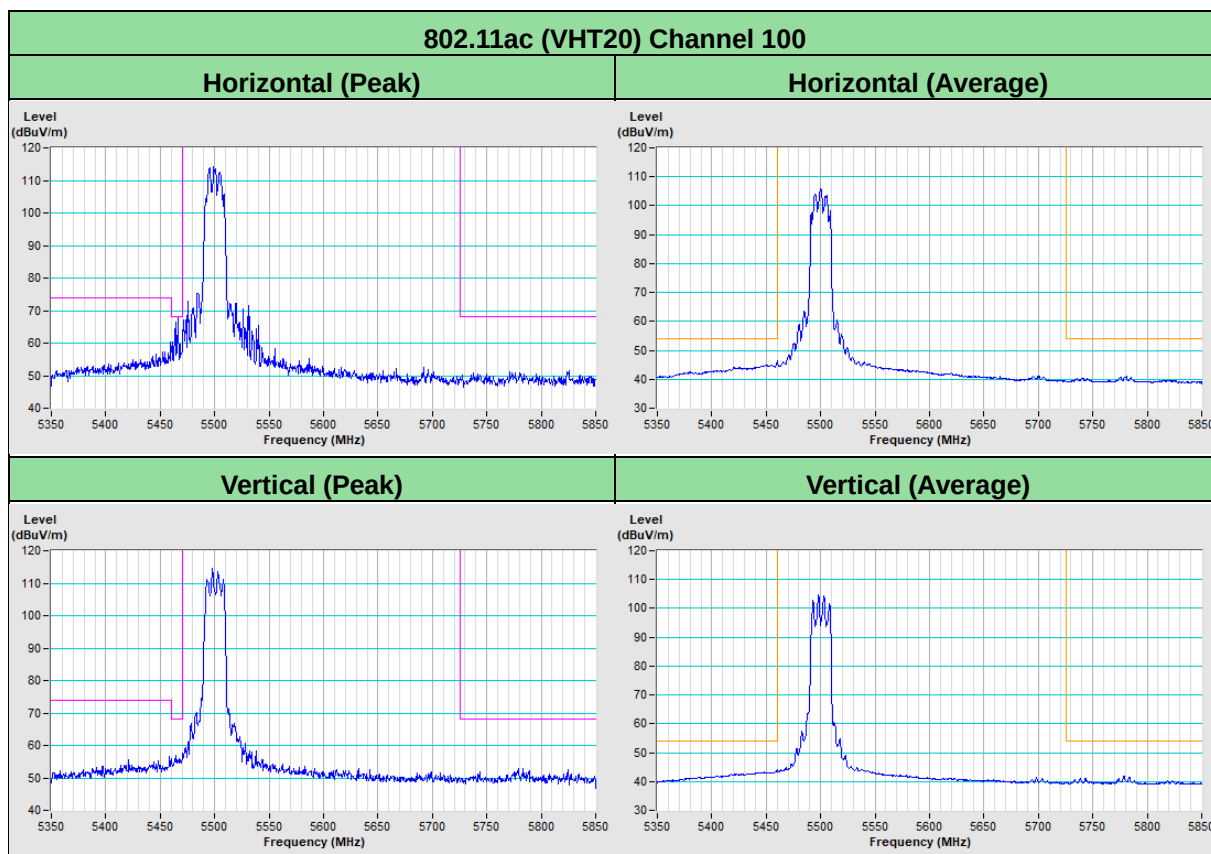


Vertical (Peak)



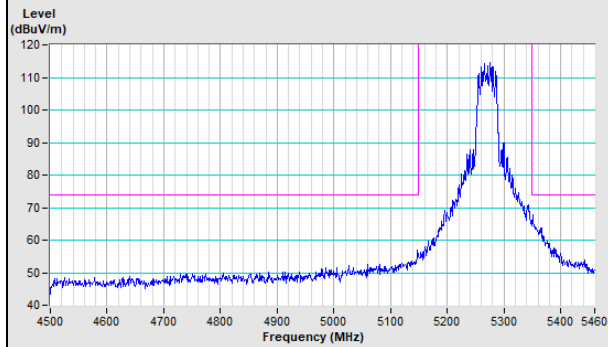
Vertical (Average)



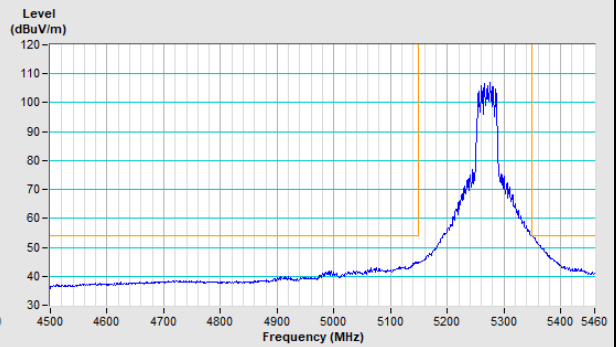


802.11ac (VHT40) Channel 54

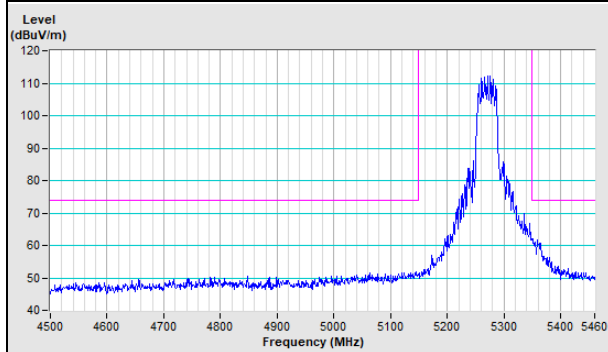
Horizontal (Peak)



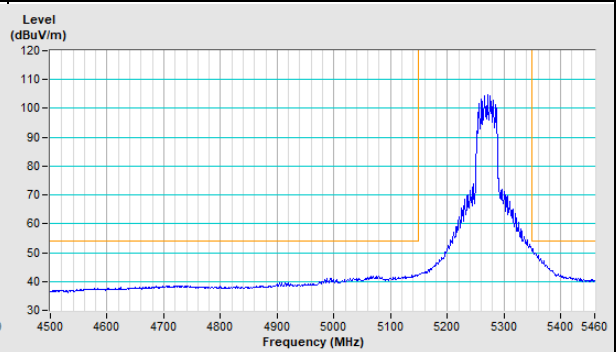
Horizontal (Average)



Vertical (Peak)

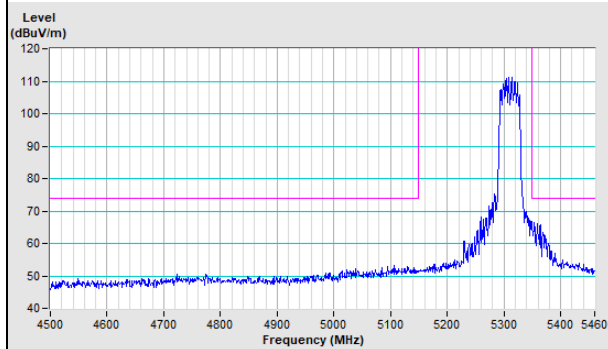


Vertical (Average)

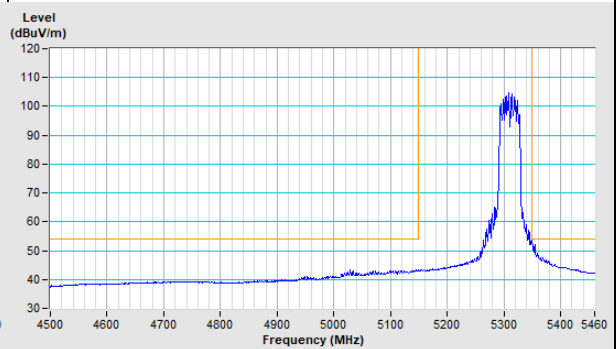


802.11ac (VHT40) Channel 62

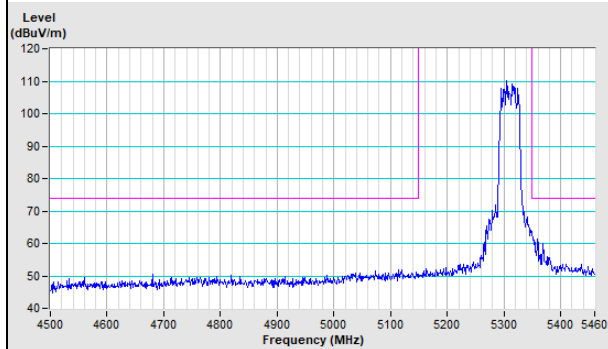
Horizontal (Peak)



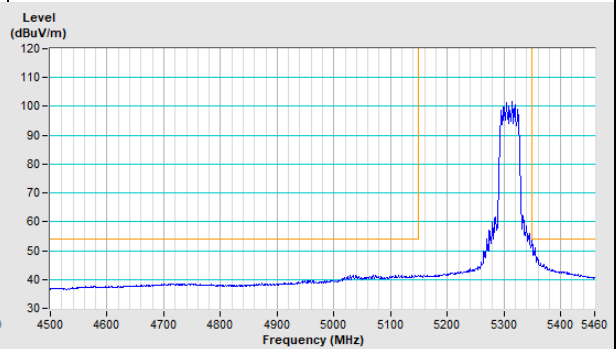
Horizontal (Average)

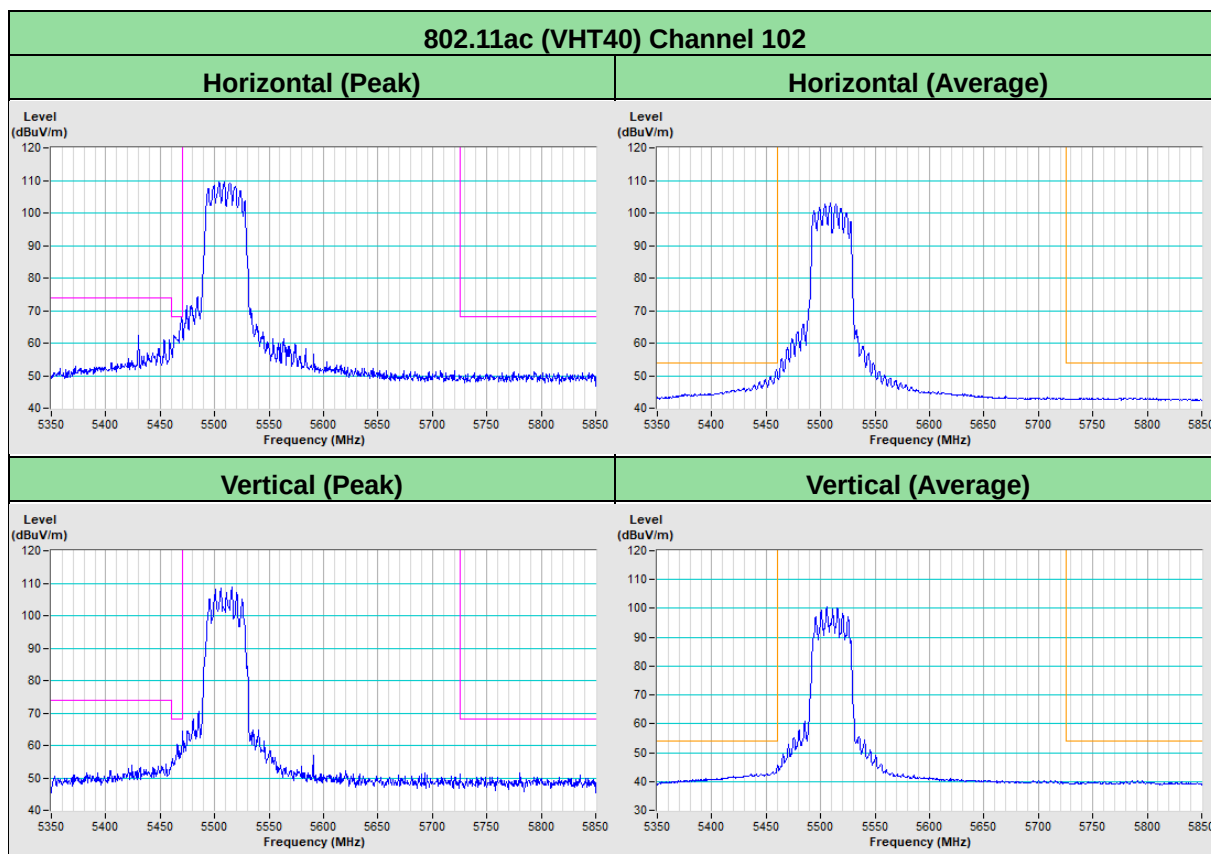


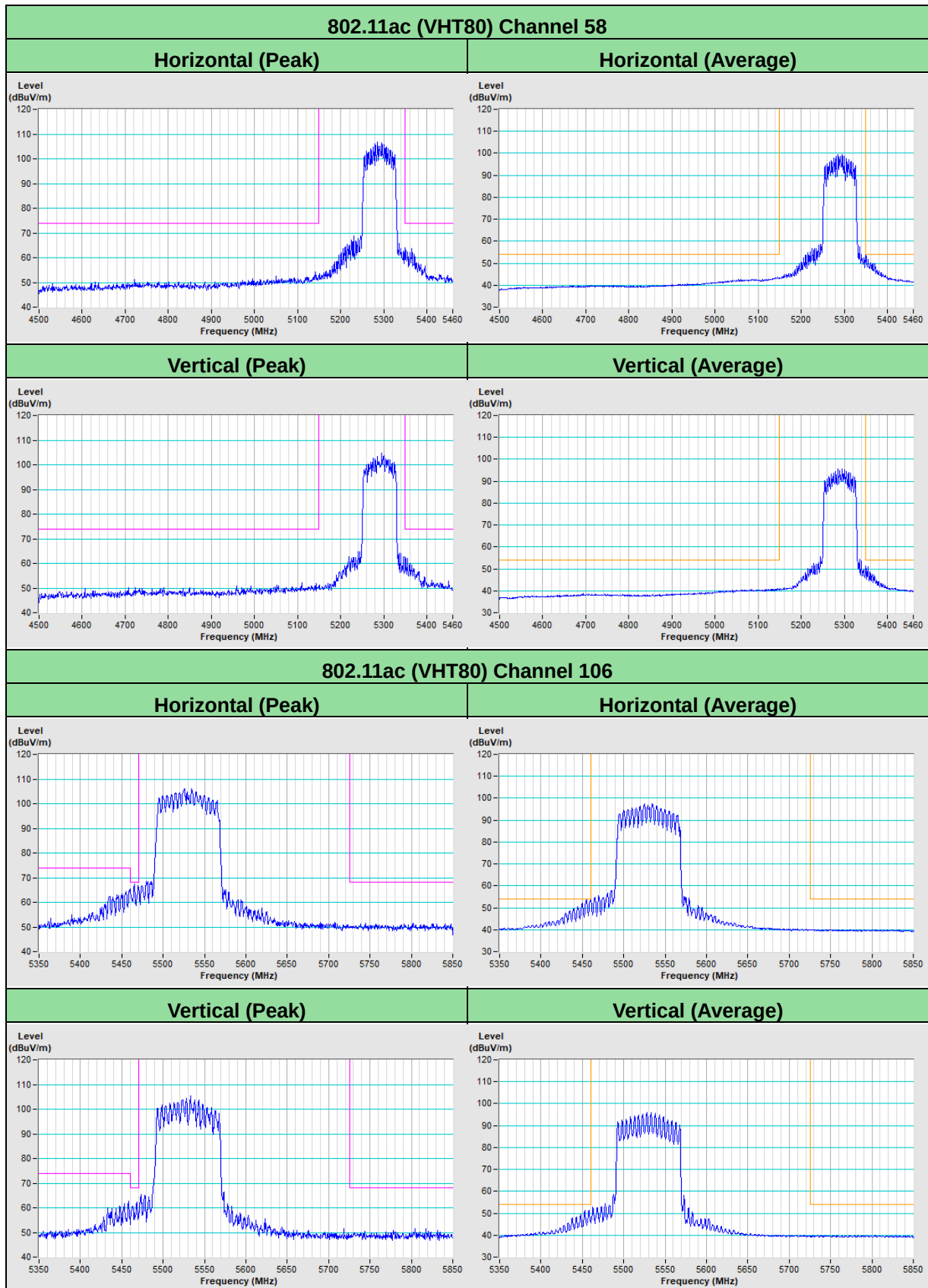
Vertical (Peak)



Vertical (Average)







Appendix – Information of 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.

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Web Site: www.bureauveritas-adt.com

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

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