

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

Applicant:	Quanta Computer Inc. No. 188, Wenhua 2nd Road, Guishan District, Taoyuan City 33377, Taiwan
Product Name:	Clover Station Solo
Brand Name:	clover
Model No.:	C501
Model Difference:	N/A
Report Number:	E2/2021/10021
FCC ID	HFS-C501
FCC Rule Part:	§15.407, Cat: U-NII
Issue Date:	February 24, 2021
Date of Test:	January 12, 2021 - February 8, 2021
Date of EUT Received:	January 12, 2021
We hereby certify that	f:

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Approved By:

Jim Chang / Manager



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Revision History							
Report NumberRevisionDescriptionIssue DateRevised By							
E2/2021/10021 Rev.00		Original.	February 24, 2021	Susan Lin			

Note:

1 · Disclaimer

Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.

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GENERAL INFORMATION 1

1.1 **Product Description**

Product Name:	Clover Station Solo
Brand Name:	clover
Model No.:	C501
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
EUT Series No.:	C051UQ04920067
Power Supply:	24Vdc from AC/DC Adapter

1.2 Modulation & Data Rate

Modulation type:64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 802.11ac only	
Transition Rate:	802.11 a: 6/9/12/18/24/36/48/54 Mbps 802.11 n_20MHz: 6.5 – 144.4Mbps 802.11 n_40MHz: 13.5 – 300.0Mbps 802.11 ac_20MHz: 6.5 –173.4Mbps 802.11 ac_40MHz: 13.5 –400.0Mbps 802.11 ac_80MHz: 29.3 – 866.6Mbps

1.3 **Antenna Designation**

Antenna Type	Supplier	Antwnna Part No.	Freq. (MHz)	Peak Antenna Gain (dBi)	Worst Case Scenario
			5150~5250	0.41	
	Quanta	WIFI-1 antenna	5250~5350	0.41	
			5470~5725	0.43	
РСВ			5725~5850	0.54	
FCD			5150~5250	3.96	\boxtimes
	Quanta	WIFI-2 antenna	5250~5350	3.96	\boxtimes
			5470~5725	3.86	\square
			5725~5850	3.95	\boxtimes

Note: Investigation has been done to determine the worst case scenario for the above antennas demonstrated with measurements in this report.

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1.4 FCC

Wi-Fi 802.11	Frequency Range	Channels	Rated Power (Avg.) (dBm) (Worst case)		Modulation Technology	
	5180~5240	4	14	.94		
	5260~5320	4	14.80		OFDM	
а	5500~5700	11	14	.79	OFDIM	
	5745~5825	5	14	.69		
	5180~5240	4	HT:	18.51		
n_HT ac_VHT	5260~5320	4	HT:	18.51	OFDM	
20M	5500~5700	11	HT:	18.49	OFDIVI	
	5745~5825	5	HT:	18.36		
	5190~5230	2	HT:	17.82		
n_HT ac_VHT	5270~5310	2	HT:	17.97	OFDM	
40M	5510~5670	5	HT:	17.64	OFDIM	
	5755~5795	2	HT:	17.55		
	5210	1	VHT:	16.09		
ac_VHT 80M	5290	1	VHT:	14.06	OFDM	
	5530~5610	2	VHT:	17.00		
	5775	1	VHT:	15.62		

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1.5 **Test Methodology of Applied Standards**

FCC Part 15, Subpart E §15.407 FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 FCC KDB 662911 D01 Multiple Transmitter Output v02r01 ANSI C63.10:2013

1.6 **Test Facility**

Laboratory	Test Site Address		FCC Designa- tion number
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)		No.134, Wu Kung Road, New Taipei In- dustrial Park, Wuku District, New Taipei City, Taiwan.	TW0027
	\boxtimes	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	TW0028

1.7 **Special Accessories**

There are no special accessories used while test was conducted.

1.8 **Equipment Modifications**

There was no modification incorporated into the EUT.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on a table which is 0.8 m above ground plane. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz. The CISPR Quasi-Peak and Average detector mode is employed. The two LISNs provide 50uH/50 ohm of coupling impedance for the measuring instrument. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

2.3.2 Conducted Test (RF)

The active antenna port of the unlicensed wireless device is connected to the spectrum analyzer with attenuator to protect the instrumentation. If a second antenna port is available, it is tested at one operating frequency, with other port(s) appropriately terminated, to verify it has similar output characteristics as the fully tested port.

2.3.3 Radiated Emissions

The EUT is a placed on a turn table. For emissions testing at or below 1 GHz, the table height shall be 0.8 m above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

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2.4 Measurement Results Explanation Example

2.4.1 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*9m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

2.4.2 For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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2.5 **Configuration of Tested System** Fig. 2-1 Radiated Emission Configuration



Fig. 2-2 Conducted (Antenna Port) Emission Configuration

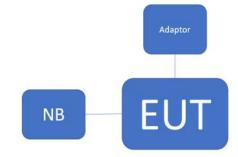


Fig. 2-3 Conducted (AC powerline) Emission Configuration



ltem	Equipment	Mfr/Brand	Model/Type No.	Series No.	Data Cable	Power Cord
1.	WLAN Test Software	N/A	N/A	N/A	N/A	N/A
2.	Notebook	Lenovo	T470	P0001293	N/A	N/A

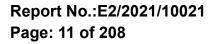
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SUMMARY OF TEST RESULT 3

FCC Rules	Description Of Test	Result
§15.207	AC Power Line Conducted Emission	Compliant
§15.407(e)	Emission Bandwidth	Compliant
§15.407(a)	Maximum Conducted Output Power	Compliant
§15.407(a)	Power Spectral Density	Compliant
§15.205 §15.209 §15.407(b)	Undesirable Radiated Emissions	Compliant
§15.407(c)	Transmission in case of Absence of Information	Compliant
§15.203 §15.407(a)	Antenna Requirement	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 Operating in U-NII Bands

Operated band in 5150 MHz ~5250 MHz

CH

38

46

Operated band in 5470 MHz ~5725 MHz:

CH

102

110

118

126

134

40 M

Freq

(MHz)

5510

5550

5590

5630

5670

20 M				
СН	Freq (MHz)			
36	5180			
40	5200			
44	5220			
48	5240			

20 M

CH

Freq

(MHz)

51	5150 MHz ~5250 MHz:					
40 M			8	0 M		
I	Freq (MHz)		СН	Freq (MHz)		
	5190		42	5210		
	5230					

80 M

CH

106

122

Freq

(MHz)

5530

5610

Operated band in 5250 MHz ~5350 MHz:

Freq

(MHz)

5270

5310

20 M		4	0 M
СН	Freq (MHz)	СН	Fr (M
52	5260	54	52
56	5280	62	53
60	5300		
64	5320		

80 M					
СН	CH Freq (MHz)				
58	5290				

Operated band in 5745 MHz ~5850 MHz:

	• • • • • • • •				
	20 M				
	СН	Freq (MHz)			
	149	5745			
	153	5765			
-	157	5785			
	161	5805			
	165	5825			

		4	40 M					
eq Hz)		СН	Freq (MHz)					
45		151	5755					
65		159	5795					
85								
05								

	0000	/ IVII 12.				
	80 M					
	СН	Freq (MHz)				
	155	5775				
ļ		••••				

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

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The Worst Test Modes and Channel Details 4.2

- 1. The EUT has been tested under operating condition.
- 2. Test program used to control the EUT for staying in continuous transmitting mode is programmed.
- 3. Investigation has been done on all the possible configurations for searching the worst case. The given UE is pre-scanned among below modes.

Modulation	Transmission Chain			٦	Single Transmission Spatial	Multiple Transmission Spatial
🛛 802.11 a	\boxtimes Ch0	🛛 Ch1	🗆 Ch2	🗆 Ch3	🗆 1TX	🛛 2TX
🛛 802.11 n	\boxtimes Ch0	🛛 Ch1	🗆 Ch2	🗆 Ch3		⊠ MIMO
⊠ 802.11 ac	\boxtimes Ch0	🛛 Ch1	🗆 Ch2	🗆 Ch3		⊠ MIMO
□ 802.11 ax	\Box Ch0	🗆 Ch1	🗆 Ch2	🗆 Ch3		

- 4. Therefore, below summary is the modes of test configuration that yield the highest reading and generate the highest emission chosen to carry out the relevantly mandatory test items.
- 5. 802.11 a mode only limit single transmit.

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RADIATED EMISSION TEST: 4.2.1

RADIATED EMISSION TEST (BELOW 1 GHz)							
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11a	5180~5825	36 to 165	44,60,116,157	OFDM	6	2TX	
802.11ac_VHT80	5210~5775	42 to 155	42,58,122,155	OFDM	MCS0	MIMO	
		RADIATED EI	VISSION TEST (A	BOVE 1 GHz)		-	
MODE	FREQUENCY BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)	ANTENNA PORT	
802.11a			36,44,48,52,60,	OFDM	6	2TX	
802.11n_HT20	5180~5825	36 to 165	64,100,116,140, 144,149,157,165	OFDM	MCS8	MIMO	
802.11n_HT40	5190~5795	38 to 159	38,46,54,62,102, 110,134,142, 151,159	OFDM	MCS8	MIMO	
802.11ac_VHT80	5210~5775	42 to 155	42,58,122,155	OFDM	MCS0	MIMO	

Note:

The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for channel Low, Mid and High, the worst case H position was reported.

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ANTENNA PORT CONDUCTED MEASUREMENT: 4.2.2

CONDUCTED TEST						
MODE	FREQUENCY	AVAILABLE	TESTED	MODULATION	DATA RATE	ANTENNA
WIODE	BAND (MHz)	CHANNEL	CHANNEL	MODULATION	(Mbps)	PORT
	5180~5240	36 to 48	36 to 48			
802.11a	5260~5320	52 to 64	52 to 64	OFDM	6	2TX
002.118	5500~5720	100 to 144	100 to 144	OFDIM	0	217
	5745~5825	149 to 165	149 to 165			
	5180~5240	36 to 48	36 to 48	OFDM	MCS8	MIMO
000 11- 11700	5260~5320	52 to 64	52 to 64			
802.11n_HT20	5500~5720	100 to 144	100 to 144			
	5745~5825	149 to 165	149 to 165			
	5190~5230	38 to 46	38 to 46			
002 11p UT40	5270~5310	54 to 62	54 to 62	OFDM	MCS8	MIMO
802.11n_HT40	5510~5670	102 to 142	102 to 142	OFDIM		
	5755~5795	151 to 159	151 to 159			
	5210	42	42		MCS0	
	5290	58	58	OFDM		
802.11ac_VHT80	5530~5610	106 to 138	106 to 138			MIMO
	5775	155	155			

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MEASUREMENT UNCERTAINTY 5

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.34 dB
26dB & 6dB Emission Bandwidth	+/- 1.54 Hz
The Maximum Output Power Meas- urement	+/- 1 dB
Peak Power Spectral Density Meas- urement	+/- 1.54 dB
Frequency Stability	+/- 1.54 Hz
Temperature	+/- 0.4 °C
Humidity	+/- 3.5 %
DC / AC Power Source	DC= +/- 1%, AC=+/- 1%

Radiated S	purio	us Emi	ssion N	leasurement Uncertainty
	+/-	2.64	dB	9kHz~30MHz: +-2.3dB
Polarization: Vertical	+/-	4.93	dB	30MHz - 1000MHz: +/- 3.37dB
Polarization. Vertical	+/-	4.81	dB	1GHz - 18GHz: +/- 4.04dB
	+/-	4.52	dB	18GHz - 40GHz: +/- 4.04dB
	+/-	2.64	dB	9kHz~30MHz: +-2.3dB
Polarization: Horizontal	+/-	4.45	dB	30MHz - 1000MHz: +/- 4.22dB
	+/-	4.81	dB	1GHz - 18GHz: +/- 4.08dB
	+/-	4.52	dB	18GHz - 40GHz: +/- 4.08dB

Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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CONDUCTED EMISSION TEST 6

6.1 Standard Applicable

Frequency range within 150 kHz to 30 MHz shall not exceed the Limit table as below.

		nits
Frequency range	dB(uV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Nota		

Note

1. The lower limit shall apply at the transition frequencies

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

6.2 **Measurement Equipment Used**

	Co	nducted Emission Te	est Site		
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Software	audix	e3	Ver. 6.11- 20180419c	N.C.R	N.C.R
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	974	03/25/2020	03/24/2021
EMI Test Receiver	R&S	ESCI	101342	04/28/2020	04/27/2021
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB- 250-01	03/27/2020	03/26/2021
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2020	03/26/2021

6.3 **EUT Setup**

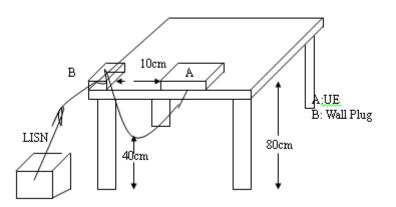
- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10:2013.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
- 3. The LISN was connected with 120Vac/60Hz power source.

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6.5 Measurement Procedure

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all phases of power being supplied by given UE are completed.

6.6 Measurement Result

Note: Refer to next page for measurement data and plots. Note2: The * reveals the worst-case results that closet to the limit.

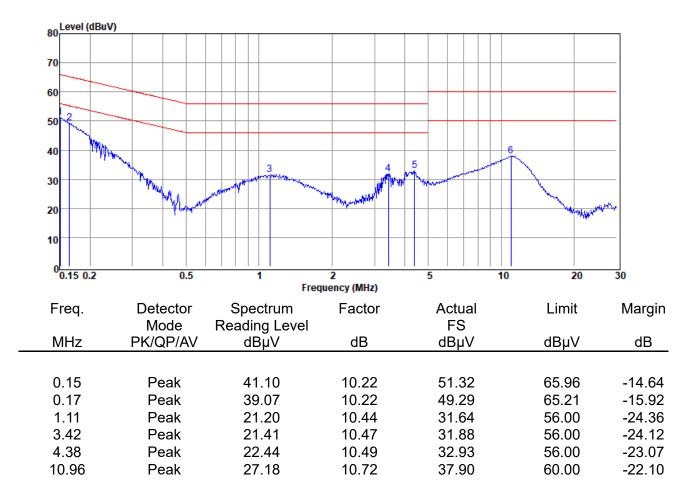
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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AC POWER LINE CONDUCTED EMISSION TEST DATA

Report Number	:E2/2020/10021	Test Site	:Conduction Room C
Test Mode	:WLAN 5G	Test Date	:2021-01-28
Power	:120V/60Hz	Temp./Humi.	:21.2/62
Probe	:L1	Engineer	:Ashton Chiu
Note:	: Adapter:FSP120-AABN3		

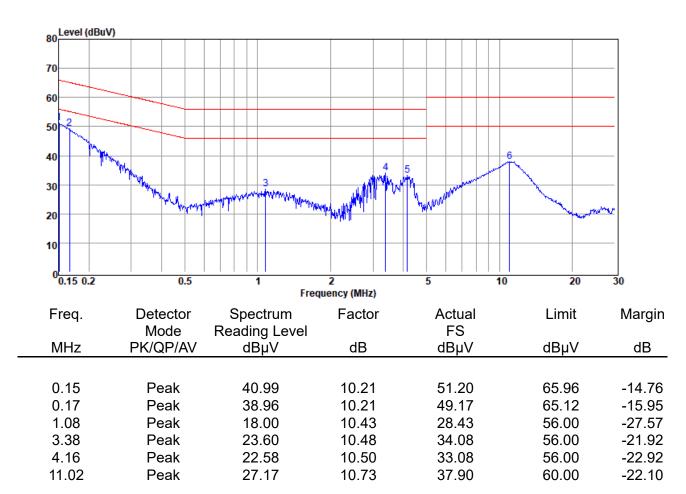


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Report Number	:E2/2020/10021	Test Site	:Conduction Room C
Test Mode	:WLAN 5G	Test Date	:2021-01-28
Power	:120V/60Hz	Temp./Humi.	:21.2/62
Probe	:N	Engineer	:Ashton Chiu
Note:	: Adapter:FSP120-AABN3		



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7 DUTY CYCLE TEST SIGNAL

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

7.1 Measurement Procedure:

- 1. Set span = Zero
- 2. RBW = 8MHz
- 3. VBW = 8MHz,
- 4. Detector = Peak

Duty Cycle:

Mode	Duty Cycle (%) =Ton / (Ton+Toff)	Duty Factor (dB) =10*log(1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
802.11a	95.37	0.21	0.48	1.00
802.11n_20	94.58	0.24	0.52	1.00
802.11ac_20	95.07	0.22	0.52	1.00
802.11n_40	87.44	0.58	2.02	3.00
802.11ac_40	91.35	0.39	1.05	2.00
802.11ac_80	83.15	0.80	2.16	3.00

Duty Cycle Factor: 10 * log(1/0.9537037) = 0.21 Duty Cycle Factor: 10 * log(1/0.94581281) = 0.24 Duty Cycle Factor: 10 * log(1/0.95073892) = 0.22 Duty Cycle Factor: 10 * log(1/0.87439614) = 0.58 Duty Cycle Factor: 10 * log(1/0.91346154) = 0.39 Duty Cycle Factor: 10 * log(1/0.83154122) = 0.8

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DUTY CYCLE TEST SIGNAL MEASUREMENT RESULT 7.2

802.11a

Swept SA KEYSIGHT	Iyzer 1	Input Z	Ζ: 50 Ω	#Atten: 30 dB	PNO: Fas	t Ava Tv	pe: Voltage	123456		Frequer
	Coupling: DC Align: Auto	Correc	ctions: Off Ref: Int (S)		Gate: Off IF Gain: L Sig Track	Trig: Fr	ee Run	P N N N N N	5.1800	Frequency 000000 GHz
1 Spectrum				Ref Lvl Offset	11.70 dB		ΔMkr	3 2.156 ms	Span 0.0000	00000 Hz
Scale/Div 10 c	зв			Ref Level 30.00				0.58 dB	Sv	vept Span
20.0				3Δ4						ro Span
10.0	***	-		Aleilain a shalanna		ntip gitte north gitte an optig		personal and personal data personal data		Full Span
-10.0 -20.0			_						Start Fi 5.1800	eq 000000 GHz
-30.0 -40.0 -50.0				4	*		*		Stop Fr 5.1800	eq 000000 GHz
-60.0 Center 5.1800	00000 GHz			#Video BW 8	0 MH7			Span 0 Hz	AL	JTO TUNE
Res BW 8 MH				#VIGEO DIV O			Sweep 10.	0 ms (5001 pts)	CF Ste	p 100 MHz
Mode	Trace Scale		x	Y	Function	Function V	Vidth Fu	nction Value	Au Ma	
1 Δ2 2 F 3 Δ4	1 t 1 t 1 t	(Δ) (Δ)	2.062 ms 1.750 ms 2.156 ms	11.76 dBr	m				Freq O 0 Hz	ffset
4 F 5 6	1 t		1.750 ms	11.76 dBr	m					g
Spectrum Analyz		3:20	08, 2021 0:20 PM	$\Box \Delta$					Signal ' (Span Z	oom)
n HT20 pectrum Analyz wept SA KEYSIGHT	ter 1	3:20	50 Ω 50 Ω	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low	Avg Type Trig: Free	Voltage	123456	Center Fr	Frequency
n HT20 pectrum Analyz wept SA KEYSIGHT	rer 1	 3:20 Input Z: 5 	50 Ω 50 Ω	#Atten: 30 dB		Trig: Free	Voltage Run	123456 WWWWWW PNNNN	Center Fr	Frequency
In HT20 spectrum Analyz wept SA KEYSIGHT RL ++ A xy Spectrum	eer 1	3:20	50 Ω ons: Off : Int (S)	f Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: O .70 dB	Trig: Free	Voltage Run	123456 WWWWWW PNNNN 2.020 ms	Center Fr 5.180000	Frequency 0000 GHz
In HT20 spectrum Analyz Swept SA (EYSIGHT I RL ++ A Sale Scale/Div 10 dB Log	nput: RF Coupling: DC Align: Auto	3:20	50 Ω ons: Off : Int (S)		Gate: Off IF Gain: Low Sig Track: O .70 dB	Trig: Free	Voltage Run	123456 WWWWWW PNNNN	Center Fr 5.180000 Span 0.000000	Frequency 0000 GHz
In HT20 spectrum Analyz wept SA KEYSIGHT II RL ++- Sr Scale/Div 10 dB -09 00 10.0	eer 1	3:20	50 Ω ons: Off : Int (S)	f Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: O .70 dB	Trig: Free	Voltage Run	123456 WWWWWW PNNNN 2.020 ms -0.94 dB	Center Fr 5.180000 Span 0.0000000 Sven Zero Fu	Frequency equency 0000 GHz 000 Hz ot Span Span
In HT20 spectrum Analyz wept SA KEYSIGHT RL + A xa I spectrum Scale/Div 10 dB 000 000 000 000 000 000 000 0	nput: RF Coupling: DC Align: Auto	3:20	50 Ω ons: Off : Int (S)	f Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: O .70 dB	Trig: Free	Voltage Run	123456 WWWWWW PNNNN 2.020ms -0.94dB	Center Fr 5.180000 Span 0.000000 Svej Zero Fu Start Frec	Frequency equency 0000 GHz 000 Hz ot Span Span
In HT20 Spectrum Analyz Spectrum Analyz Spectrum Scale/Div 10 dB Og 00 10.0 00 00 00 00 00 00 00 00 00	nput: RF Coupling: DC Align: Auto	3:20	50 Ω ons: Off : Int (S)	f Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: O .70 dB	Trig: Free	Voltage Run	123456 WWWWWW PNNNN 2.020 ms -0.94 dB	Center Fr 5.180000 Span 0.000000 Start Free 5.180000 Ful Start Free 5.180000 Stop Free	Frequency equency 0000 GHz 000 Hz ot Span Span I Span
In HT20 Spectrum Analyz Wept SA (EYSIGHT II RL → A Spectrum Scale/Div 10 dB 00 00 10.0 00 00 00 00 00 00 00 00 00	ter 1 nput: RF Coupling: DC Nign: Auto	3:20	50 Ω 50 Ω	f Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: O .70 dB IBm	Trig: Free	Voltage Run	123456 WWWWWW PNNNN 2.020 ms -0.94 dB	Center Fr 5.180000 Span 0.000000 Start Free 5.180000 Stop Free 5.180000	Frequency equency 0000 GHz 000 Hz 000 Hz 1 Span 1 Span 1 0000 GHz
In HT20 spectrum Analyz wept SA KEYSIGHT II Scale/Div 10 dB 20 20 20 20 20 20 20 20 20 20	ter 1	3:20	50 Ω 50 Ω	f Lvi Offset 11. f Level 30.00 d	Gate: Off IF Gain: Low Sig Track: O .70 dB IBm	, Trig: Free	Voltage Run	12 3 4 5 6 WWWWWW P N N N N N 2.020 ms -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB	Center Fr 5.180000 Span 0.000000 Start Free 5.180000 Ful Start Free 5.180000 AUT CF Step	Frequency equency 0000 GHz 000 Hz ot Span Span I Span I Span I Span 0000 GHz 0000 GHz 00000 GHz
In HT20 spectrum Analyz wept SA KEYSIGHT I Spectrum Scale/Div 10 dB -9 200 200 200 200 200 200 200 20	ter 1 nput: RF Coupling DC Nign: Auto	3:20	50 Ω 50 Ω	f Lvi Offset 11. f Level 30.00 d	Gate: Off IF Gain: Low Sig Track: O .70 dB IBm	, Trig: Free	Voltage Run AMkr3 weep 20.0 m	12 3 4 5 6 WWWWWW P N N N N N 2.020 ms -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB -0.94 dB	Center Fr 5.180000 Span 0.000000 Start Free 5.180000 Ful Start Free 5.180000 AUT	Frequency equency 0000 GHz 000 Hz ot Span Span I Span I Span I Span 0000 GHz 0000 GHz 00000 GHz
In HT20 Spectrum Analyz Swept SA KEYSIGHT RL → 1 Spectrum Scale/Div 10 dB Log 20.0 10.0 20.0 30.0 40.0 50.0 660.0 Center 5.180000 Res BW 8 MHz 5 Marker Table Mode T 1 Δ2	rer 1	Size	50 Ω 50 Π 50 Π	f LvI Offset 11. f Level 30.00 d Video BW 8.0 Υ Δ) -1.978 dB 12.41 dBm	Gate: Off IF Gain: Low Sig Track: O .70 dB IBm 	rig: Free	Voltage Run AMkr3 weep 20.0 m	1 2 3 4 5 6 WWWWWW PNNNN 2.020 ms -0.94 dB 	Center Fr 5.180000 Span 0.000000 Span 0.000000 Start Free 5.180000 Stop Free 5.180000 AUT CF Step 8.000000 AUT CF Step 8.000000 Auto Free Offs	Frequency equency 0000 GHz 000 Hz ot Span 1 Span 1 Span 1 Span 1 O000 GHz 0 0000 GHz 0 0 TUNE 0 MHz
In HT20 Spectrum Analyz Swept SA KEYSIGHT RL J Scale/Div 10 dB Log 20.0 10.0 20.0 30.0 40.0 50.0 60.0 Center 5.180000 Res BW 8 MHz 5 Marker Table Mode T 1 Δ2	rer 1	 3:20 Input Z: 5 Correctio Freq Ref X (Δ) 1 (Δ) 2 	50 Ω 50 Π 50 Π	f Lvi Offset 11. f Level 30.00 d v v v v v v v v v v v v v v v v v v v	Gate: Off IF Gain: Low Sig Track: O .70 dB IBm 	rig: Free	Voltage Run AMkr3 weep 20.0 m	12 3 4 5 6 WWWWWW PNNNN 2.020 ms -0.94 dB -0.94 dB Span 0 Hz s (10001 pts) tion Value	Center Fr 5.180000 Span 0.000000 Span 0.000000 Stop Free 5.180000 AUT CF Step 8.000000 Auto Man	Frequency equency 0000 GHz 000 Hz ot Span Span I Span I Span I Span 0000 GHz 0 TUNE 0 MHz et

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802.11ac VHT20

Spectrum Analy Swept SA	zer 1 v	+					¢	Frequer	ncy
	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corrections: 0 Freq Ref: Int	Off	PNO: Fast Gate: Off IF Gain: Low	Avg Type: Volt Trig: Free Run		₩ 5.180	er Frequency 0000000 GHz	s
1 Spectrum				Sig Track: Off	Δ	Mkr3 2.030 m	Span	000000 Hz	
Scale/Div 10 dl	в		Ref LvI Offset 1 Ref Level 30.00			0.60 d	0.000	Swept Span	
20.0	014	2				h a char a sun char		Zero Span	_
10.0	/ 3/	14 11 11 11 11						Full Span	
-10.0	N2						Start	Freq 0000000 GHz	
-30.0							Stop I		=
-40.0								0000000 GHz	
-60.0								AUTO TUNE	٦
Center 5.18000 Res BW 8 MHz			#Video BW 8.0	0 MHz	Sween	Span 0 20.0 ms (10001 pt	-Iz		4
5 Marker Table	•					,,	8.000	0000 MHz	
Mode	Trace Scale	х	Y	Function	Function Width	Function Value		Auto Man	
1 Δ2 2 F	1 t 1 t		2 ms (Δ) 13.89 dE 4 ms -1.283 dBm				Freq	Offset	=
3 <u>∆</u> 4 4 F	1 t 1 t		0 ms (Δ) 0.5953 dE 4 ms -1.283 dBm				0 Hz		=
5								s Scale	
6									
1 5 C		Feb 08, 202 3:23:36 Pt		· · ·			Signa (Span		
n HT 40 Spectrum Analyz Swept SA KEYSIGHT	zer 1	+ Input Ζ: 50 Ω	M Atten: 30 dB	PNO: Fast Gate: Off	Avg Type: Volt	age 12345	6 Cente	I Track	_
In HT 40 Spectrum Analy Swept SA KEYSIGHT RL	zer 1	+	M Atten: 30 dB.	Gate: Off IF Gain: Low		age 12345	G Cente ₩ 5.190	Lin I Track Zoom) Frequer	_
n HT 40 Spectrum Analy Swept SA KEYSIGHT	zer 1	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB	Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Volt Trig: Free Run	age 12345	6 Cente W Span	I Track Zoom) Frequer Frequency 0000000 GHz	_
In HT 40 Spectrum Analy Swept SA KEYSIGHT RL ↓ VV 1 Spectrum Scale/Div 10 dl	zer 1	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB.	Gate: Off IF Gain: Low Sig Track: Off 1.70 dB	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNNN	G Cente Signa Conte Span Span 0.000 B Span	In Track Zoom) Frequer Prequency D000000 GHz D000000 Hz Swept Span	_
■ 5 (n HT 40 Spectrum Analy, Swept SA KEYSIGHT RL → LN 1 Spectrum Scale/Div 10 dl Log 20.0	zer 1	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB Off (S) Ref Lvl Offset 1	Gate: Off IF Gain: Low Sig Track: Off 1.70 dB	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNNN Mkr3 582.0 µ	G Cente Signa Conte Span Span 0.000 B Span	I Track Zoom Frequer Pr Frequency D000000 GHz D000000 Hz Swept Span Zero Span	_
In HT 40 Spectrum Analy Swept SA KEYSIGHT RL ↓vv 1 Spectrum Scale/Div 10 dl Log 20.0 0.00 0.00	zer 1	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB Off (S) Ref Lvl Offset 1	Gate: Off IF Gain: Low Sig Track: Off 1.70 dB	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNNN Mkr3 582.0 µ	6 Cente ₩ 5.190 Span 0.000 B 2 2	In Track Zoom) Frequer er Frequency D000000 GHz D000000 Hz Swept Span Zero Span Full Span	_
■ 5 0 n HT 40 Spectrum Analy: Swept SA KEYSIGHT RL → tor 1 Spectrum Scale/Div 10 dl Log 20.0 10.0 3Δ	zer 1	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB Off (S) Ref Lvl Offset 1	Gate: Off IF Gain: Low Sig Track: Off 1.70 dB	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNNN Mkr3 582.0 µ	G Center Signa Conter Span Span Span Span Start	In Track Zoom) Frequer er Frequency D000000 GHz D000000 Hz Swept Span Zero Span Full Span	_
■ 5 n HT 40 Spectrum Analy Swept SA KEYSIGHT RL V 1 Spectrum Scale/Div 10 dl Log 20.0 10.0 3Δ 0.00 -10.0	zer 1	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB Off (S) Ref Lvl Offset 1	Gate: Off IF Gain: Low Sig Track: Off 1.70 dB	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNNN Mkr3 582.0 µ	6 Cente 5 190 5 2 6 Cente 5 190 5 2 5 190 5 2 5 190 5 19	In Track Zoom) Frequer er Frequency D000000 GHz D000000 Hz Swept Span Zero Span Full Span Freq D000000 GHz	_
■ 5 0 n HT 40 Spectrum Analy: Swept SA KEYSIGHT RL 207 1 Spectrum Scale/Div 10 dl Log 20.0 0.00 -0.00 -0.00 -50.0 -60.0	Input: RF Coupling: DC Align: Auto	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB. Off (S) Ref Lvi Offset 1 Ref Level 30.00	Gate: Off IF Gain: Low Sig Track: Off 1.70 dB dBm	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNN Mkr3 582.0 µ 0.15 d	6 Cente 5.190 Span Span Span Span Span Start 5.190 Start 5.190	I Track Zoom) Frequency D000000 GHz D000000 Hz Swept Span Full Span Freq D000000 GHz Freq	_
Image: Constraint of the section of the sec	zer 1	H Input Z: 50 Ω Corrections: 0	M Atten: 30 dB Off (S) Ref Lvl Offset 1	Gate: Off IF Gain: Low Sig Track: Off 1.70 dB dBm	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNNN Mkr3 582.0 µ	6 Cente 5 Signa 6 Cente 5 Span 0.000 8 2 2 5 Start I 5.190 5 Start I 5.190 5 Start I 5	I Track Zoom Frequer er Frequency 2000000 GHz 2000000 Hz Swept Span Full Span Full Span Freq 2000000 GHz Freq 20000000 GHz Freq 20000000 GHz	_
Image: Constraint of the sector of	zer 1	H Input Z: 50 Ω Corrections: (Freq Ref: Int	M Atten: 30 dB Off (S) Ref Lvi Offset 1 Ref Level 30.00 #Video BW 8.0	Gate: Off IF Gain: Low Sig Track: Off dBm 0 MHz	Avg Type: Volt Trig: Free Run	age 12.3.4.5 WWWWW PNNN Mkr3 582.0 µ 0.15 d 0.15 d 5 20.0 ms (10001 pr	6 Cente	In Track Zoom Frequer Pr Frequency 2000000 GHz 2000000 Hz Swept Span Zero Span Full Span Full Span Freq 20000000 GHz Freq 20000000 GHz Erep 2000 MHz Auto	_
Image: Constraint of the sector of	zer 1 , [Input: RF Coupling: DC Align: Auto B 1 00000 GHz 00000 GHz Trace Scale 1 t	H Input Z: 50 Ω Corrections: (Freq Ref. Int)	M Atten: 30 dB. Off (S) #Atten: 30 dB. Ref LvI Offset 1 Ref Level 30.00 #Video BW 8.0 .0 μs (Δ) 1.515 dE	Gate: Off IF Gain: Low Sig Track: Off dBm 0 MHz Function	Avg Type: Volt Trig: Free Run	age 12345 WWWWW PNNNN Mkr3 582.0 µ 0.15 d	6 Cente 5 Signa 6 Cente 5 Span 5 Span 0.000 8 2 2 5 Start I 5.190 5 Start I 5.190 5 Start I 5 Sta	In Track Zoom Frequer rr Frequency 2000000 GHz 2000000 Hz 2000000 GHz Freq 20000000 GHz Freq 20000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 200000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz Ereq 20000000 GHz Ereq 2000000 GHz Ereq 20000000 GHz Ereq 2000000 GHz Ereq 20000000 GHz Ereq 2000000 GHz Ereq 20000000 GHz Ereq 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 200000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 200000000 GHz 20000000 GHz 200000000 GHz 200000000 GHz 2000000000 GHz 2000000000000000000000000000000000000	-
■ 5 0 n HT 40 Spectrum Analy Swept SA KEYSIGHT RL 207 1 Spectrum Scale/Div 10 dl Log 20.0 0.00 -20.0 -0.0	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corrections: (Freq Ref. Int	M A Atten: 30 dB Off (S) Ref Lvl Offset 1 Ref Level 30.00 #Video BW 8.0 #Video BW 8.0 (Δ) 1.515 dB 4.192 dBm 0.0 μs (Δ) 0.1455 dBm	Gate: Off IF Gain: Low Sig Track: Off dBm 0 MHz Function	Avg Type: Volt Trig: Free Run	age 12.3.4.5 WWWWW PNNN Mkr3 582.0 µ 0.15 d 0.15 d 5 20.0 ms (10001 pr	6 Cente 5.190 Span 0.000 B ■ 2 Start I 5.190 Stop I 5.190	In Track Zoom Frequer r Frequency 2000000 GHz 2000000 Hz Swept Span Zero Span Full Span Full Span Freq 2000000 GHz Ereq 2000000 GHz Ereq 2000000 GHz AUTO TUNE Iep 2000 MHz Auto Alan Offset	-
A mode 1 Δ2 2 F	zer 1	Input Z: 50 Ω Corrections: (Freq Ref. Int	M 44tten: 30 dB off (S) Ref Lvl Offset 1 Ref Level 30.00 #Video BW 8.1 (Δ) 1.515 dE 0 μs (Δ) 1.515 dB	Gate: Off IF Gain: Low Sig Track: Off dBm 0 MHz Function	Avg Type: Volt Trig: Free Run	age 12.3.4.5 WWWWW PNNN Mkr3 582.0 µ 0.15 d 0.15 d 5 20.0 ms (10001 pr	6 Cente 5 Signa 5 Span 0 000 8 Span 0 000 8 Start I 5 190 5 190	In Track Zoom Frequency 2000000 GHz 2000000 Hz 2000000 Hz 2000000 GHz 2000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 2000000 GHz 20000000 GHz 20000000 GHz 20000000 GHz 2000000 GHz 20000000 GHz 2000000 GHz 2000000000 GHz 20000000 GHZ 2000000000 GHZ 2000000000 GHZ 200000000 GHZ 200000000 GHZ 200000000 GHZ 200000000 GHZ 20000000000 GHZ 2000000000000000000000000000000000000	

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802.11ac VHT 40

	· · · · · · · · · · · · · · · · · · ·	+					¢	Frequen	су
RL +	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corrections: Off Freq Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low	Avg Type: Voltag Trig: Free Run	w ww ww w		r Frequency 000000 GHz	Set
LNI 1 Spectrum	T		Ref Lvi Offset 11	Sig Track: Off	ΔΝ	P NN NN N Ikr3 1.040 ms	Span 0.000	00000 Hz	
Scale/Div 10 d	B		Ref Level 30.00 d			0.15 dB		wept Span ero Span	
20.0	364							Full Span	Ĵ
-10.0							Start F 5.190	Freq 0000000 GHz	
-30.0		* * *			1 1 1	1 1 1	Stop F 5.190	req 000000 GHz	
-60.0 Center 5.19000			#Video BW 8.0	MHz		Span 0 Hz		UTO TUNE)
Res BW 8 MHz 5 Marker Table	<u>د</u> ۲				Sweep 2	20.0 ms (10001 pts)	CF Ste 8.000	000 MHz	
Mode 1 Δ2	Trace Scale	X (Δ) 952.0 μ	Y Is (Δ) 0.3910 dB	Function F	unction Width	Function Value			_
2 F 3 Δ4 4 F	1 t	620.0 µ	is 3.596 dBm is (Δ) 0.1529 dB				Freq C 0 Hz	Offset	_
5 6		020.0 µ	3.390 UDIII				X Axis	og	
4 5		Feb 08, 2021 3:24:35 PM	$\bigcirc \land$				Signal	Track	
							(Span)	Zoom)	
1ac VHT	80						ll(Span)	Zoom)	
Spectrum Analy Swept SA	/zer 1	+						Zoom) Frequen	су
Spectrum Analy	/zer 1	HINDUT Z: 50 Ω Corrections: Off Freq Ref: Int (S)	#Atten: 30 dB	PNO: Fast Gate: Off IF Gain: Low	Avg Type: Voltag Trig: Free Run	le <u>123456</u> W WWWW	Center		<u> </u>
Spectrum Analy Swept SA KEYSIGHT	Input: RF	Input Z: 50 Ω Corrections: Off		Gate: Off IF Gain: Low Sig Track: Off	Avg Type: Voltag Trig: Free Run	le 123456	Center 5.210 Span	Frequency 0000000 GHz	
Spectrum Analy Swept SA KEYSIGHT RL LV 1 Spectrum Scale/Div 10 d	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corrections: Off	#Atten: 30 dB Ref Lvi Offset 11. Ref Level 30.00 d	Gate: Off IF Gain: Low Sig Track: Off .70 dB	Avg Type: Voltag Trig: Free Run	e 123456 WWWWWW PNNNN	Center 5.210 Span 0.000	Frequency 000000 GHz 000000 Hz wept Span	<u> </u>
Spectrum Analy Swept SA KEYSIGHT RL +- UN 1 Spectrum Scale/Div 10 d Log 20.0 10.0	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corrections: Off	Ref Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: Off .70 dB	Avg Type: Voltag Trig: Free Run	le <u>123456</u> WWWWWW PNNNN Mkr3 550.0 µs	Center 5.210 Span 0.000	Frequency 0000000 GHz 0000000 Hz	- -
Spectrum Analy Swept SA KEYSIGHT RL +- UN 1 Spectrum Scale/Div 10 d Log 20.0 10.0 .000 -10.0 -20.0	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corrections: Off	Ref Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: Off .70 dB	Avg Type: Voltag Trig: Free Run	le <u>123456</u> WWWWWW PNNNN Mkr3 550.0 µs	Center 5.210 Span 0.000 Start F	Frequency r Frequency 000000 GHz 000000 Hz wept Span ero Span Full Span	- -
Spectrum Analy Swept SA KEYSIGHT RL I Spectrum Scale/Div 10 d Log 20.0 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00	Input: RF Coupling: DC Align: Auto	Input Z: 50 Ω Corrections: Off	Ref Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: Off .70 dB	Avg Type: Voltag Trig: Free Run	le <u>123456</u> WWWWWW PNNNN Mkr3 550.0 µs	Center 5.210 Span 0.000 S Z Start F 5.210 Stop F	Frequency o000000 GHz o00000 Hz wept Span ero Span Full Span Fireq o000000 GHz	- -
Spectrum Analy Swept SA KEYSIGHT RL I Spectrum Scale/Div 10 d Log 20.0 -0.0	Zer 1	Input Z: 50 Ω Corrections: Off	Ref Lvi Offset 11	Gate: Off IF Gain: Low Sig Track: Off IBm	Avg Type: Voltag Trig: Free Run	e 12 3 4 5 6 WWWWWW P NN NN N Mkr3 550.0 µs -1.00 dB Fill a fill a	Center 5.210 Span 0.000 Start F 5.210 Stop F 5.210 Stop F 5.210	Frequency r Frequency 000000 GHz 000000 Hz wept Span Fro Span Full Span Freq 0000000 GHz Freq 0000000 GHz UTO TUNE	- -
Spectrum Analy Swept SA KEYSIGHT RL I Spectrum Scale/Div 10 d Log 20.0 -10.0 -20.0 -30.0 -50.0 -60.0	Zer 1	Input Z: 50 Ω Corrections: Off	Ref LvI Offset 11. Ref Level 30.00 d	Gate: Off IF Gain: Low Sig Track: Off IBm	Avg Type: Voltag Trig: Free Run	e <u>123456</u> www.www P N N N N Mkr3 550.0 µs -1.00 dB	Center 5.210 Span 0.000 Start F 5.210 Stop F 5.210 Stop F 5.210 A CF Sttc 8.000	Frequency r Frequency 000000 GHz 000000 Hz wept Span ero Span Full Span Freq 000000 GHz Freq 000000 GHz UTO TUNE Pp 000 MHz	<u> </u>
Spectrum Analy Swept SA KEYSIGHT RL	Zer 1	Input Z: 50 Ω Corrections: Off Freq Ref: Int (S)	Ref LvI Offset 11. Ref Level 30.00 d #Video BW 8.0	Gate: Off IF Gain: Low Sig Track: Off IBM MHz	Avg Type: Voltag Trig: Free Run	e 12 3 4 5 6 WWWWWW P NN NN N Mkr3 550.0 µs -1.00 dB Fill a fill a	Center 5.210 Span 0.000 Start F 5.210 Stop F 5.210 Stop F 5.210 A CF Stt 8.000 A N M	Frequency 000000 GHz 000000 Hz wept Span ero Span Full Span Full Span Freq 0000000 GHz UTO TUNE ep 0000 MHz uto Ian	- -
Spectrum Analy Swept SA KEYSIGHT RL 1 Scale/Div 10 d Log 20.0 20.0 -0.0	Zer 1	Input Z: 50 Ω Corrections: Off Freq Ref: Int (S) X (Δ) 464.0 μ 66.00 μ (Δ) 550.0 μ	Ref LvI Offset 11. Ref Level 30.00 d #Video BW 8.0 #Video BW 8.0	Gate: Off IF Gain: Low Sig Track: Off IBM MHz	Avg Type: Voltag Trig: Free Run	P N N N N Mkr3 550.0 µs -1.00 dB Span 0 Hz 20.0 ms (10001 pts)	Center 5.210 Span 0.000 Start F 5.210 Stop F 5.210 CF Stt 8.000 A A CF Stt	Frequency 000000 GHz 000000 Hz wept Span ero Span Full Span Full Span Freq 0000000 GHz UTO TUNE ep 0000 MHz uto Ian	
Spectrum Analy Swept SA KEYSIGHT RL I Spectrum Scale/Div 10 d Log 20.0 10.0 30.0 40.0 -0.0	Zer 1	Input Z: 50 Ω Corrections: Off Freq Ref: Int (S)	Ref LvI Offset 11. Ref Level 30.00 d #Video BW 8.0 #Video BW 8.0	Gate: Off IF Gain: Low Sig Track: Off IBM MHz	Avg Type: Voltag Trig: Free Run	P N N N N Mkr3 550.0 µs -1.00 dB Span 0 Hz 20.0 ms (10001 pts)	Centei 5.210 Span 0.000 Start F 5.210 Stop F 5.210 Stop F 5.210 A CF Stt 8.000 A Freq C	Frequency r Frequency 000000 GHz wept Span ero Span Full Span Freq 000000 GHz Treq 000000 GHz UTO TUNE ep 000 MHz uto tan Dffset Scale og	- -

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8 EMISSION BANDWIDTH MEASUREMENT

8.1 Standard Applicable

There is no limit bandwidth for U-NII-1, U-NII-2-A and U-NII-2-C. The minimum of 6dB Bandwidth measurement is 0.5 MHz for U-NII-3

8.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules.
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the Antenna port to the spectrum analyzer.
 - 3.a. 26dB Band width Measurement: Set the spectrum analyzer as 1% of emission BW Sweep=auto,
 Detector = Peak,
 Trace Mode = Max Hold,
 Manually readjust RBW until the RBW/EBW ratio is 1% based on EBW as observed on the result of pre-sequence measurement.
 - 3.b. Mark the peak frequency and -26dB (upper and lower) frequency.
- 4. Repeat the procedures as list above until all test default channels (low, middle, and high) are completed.
- Minimum Emission Bandwidth for the band 5.725-5.850GHz.

 a. Set the spectrum analyzer as
 RBW = 100 kHz,
 VBW = 3*RBW,
 Span = 30M/50MHz,
 Detector=Peak,
 Sweep=auto
 b. Mark the peak frequency and –6dB (upper and lower) frequency.
- 6. Repeat above procedures until all frequency of interest measured was complete.

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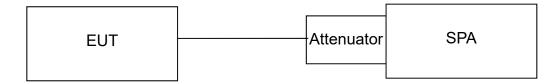
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



8.3 **Measurement Equipment Used**

SGS Conducted Room							
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.		
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071573	06/26/2020	06/25/2021		
Attenuator	Marvelous	MVE2213-10	RF06	11/19/2020	11/18/2021		
Attenuator	Marvelous	WATT-218FS- 10	RF18	11/19/2020	11/18/2021		
DC Block	PASTERNACK	PE8210	RF153	11/19/2020	11/18/2021		

8.4 **Test Set-up**



8.5 **Measurement Result**

8.5.1 FCC 26dB Bandwidth

802.11a_Ch0						
Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)				
5180	22.51	13.520				
5220	21.80	13.380				
5240	22.43	13.510				
5260	22.11	13.450				
5300	21.08	13.240				
5320	22.11	13.450				
5500	22.78	13.580				
5580	23.05	13.630				
5700	21.91	13.410				

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B 13 1 A WAT I LLAC IN 17 I K A I	1 (000-2) 2200-0210	1 (000-2) 2230-0400	www.595.6611.tw
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802.11n_HT20_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5180	23.59	13.730	5180	21.88	13.400
5220	21.59	13.340	5220	23.47	13.710
5240	22.27	13.480	5240	22.55	13.530
5260	22.58	13.540	5260	22.78	13.580
5300	22.72	13.560	5300	21.63	13.350
5320	22.28	13.480	5320	23.59	13.730
5500	21.89	13.400	5500	23.46	13.700
5580	22.92	13.600	5580	22.05	13.430
5700	23.21	13.660	5700	22.20	13.460

802.11n _HT40_Ch0

802.11n_HT20_Ch0

802.11n _HT40_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5190	40.80	16.110	5190	40.56	16.080
5230	41.08	16.140	5230	40.64	16.090
5270	40.59	16.080	5270	40.80	16.110
5310	40.46	16.070	5310	40.77	16.100
5510	40.98	16.130	5510	40.95	16.120
5550	40.83	16.110	5550	40.59	16.080
5670	40.85	16.110	5670	40.68	16.090

802.11ac _VHT80_Ch0

802.11ac _VHT80_Ch1

Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	26dB BW (MHz)	10 Log (B) (dB)
5210	81.89	19.130	5210	83.48	19.220
5290	82.65	19.170	5290	83.26	19.200
5530	82.43	19.160	5530	82.80	19.180
5610	82.26	19.150	5610	82.85	19.180

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8.5.2 6dB Bandwidth (5725 MHz~ 5850 MHz) measure with Peak detector for FCC

802 11a Ch0

Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)				
5745	14.21	11.530				
5785	16.37	12.140				
5825	16.38	12.140				

802.11n_HT20_Ch0			802.11n_HT20_Ch1		
Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5745	17.57	12.450	5745	16.66	12.220
5785	15.68	11.950	5785	15.60	11.930
5825	17.33	12.390	5825	17.35	12.390

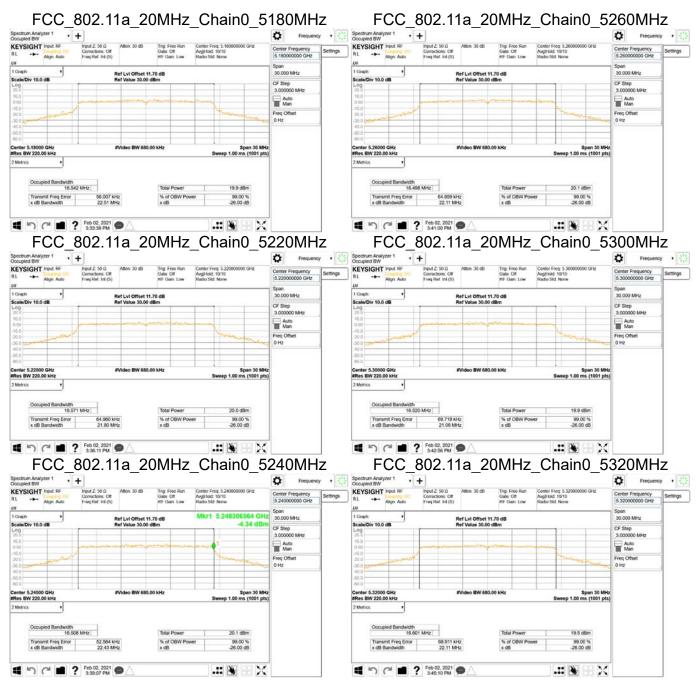
8	802.11n_HT40_Ch0			802.11n_HT40_Ch1		
	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
ſ	5755	35.71	15.530	5755	36.07	15.570
	5795	33.90	15.300	5795	35.75	15.530

802.11ac _VHT80_Ch0			802.11ac _VHT80_C	h1	
Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)	Freq. (MHz)	6dB BW (MHz)	10 Log (B) (dB)
5775	75.18	18.760	5775	74.56	18.730

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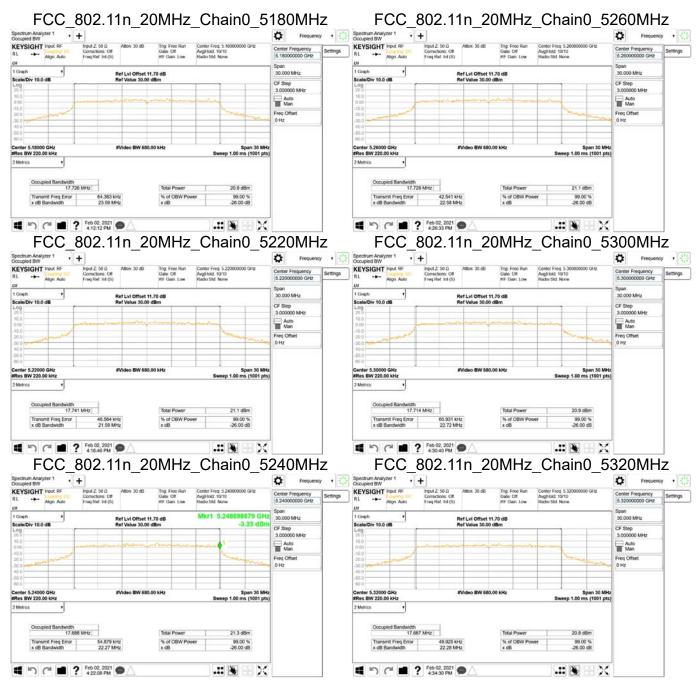




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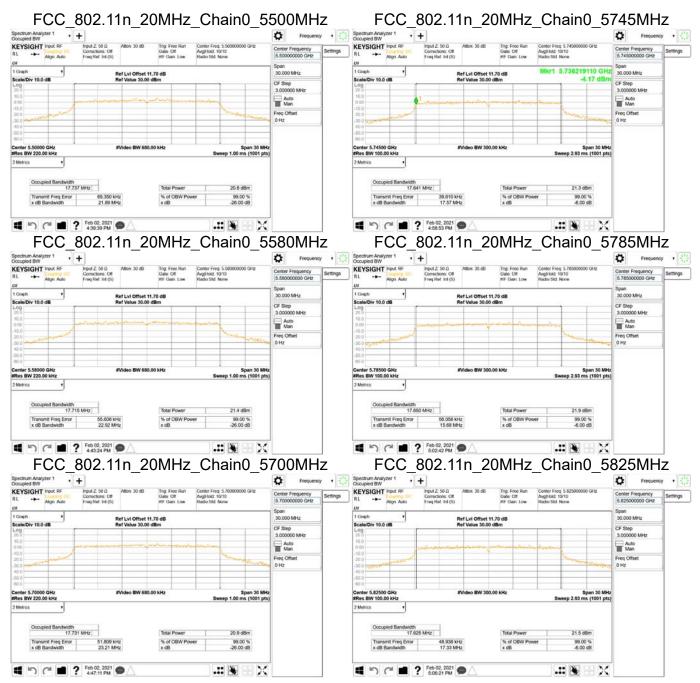




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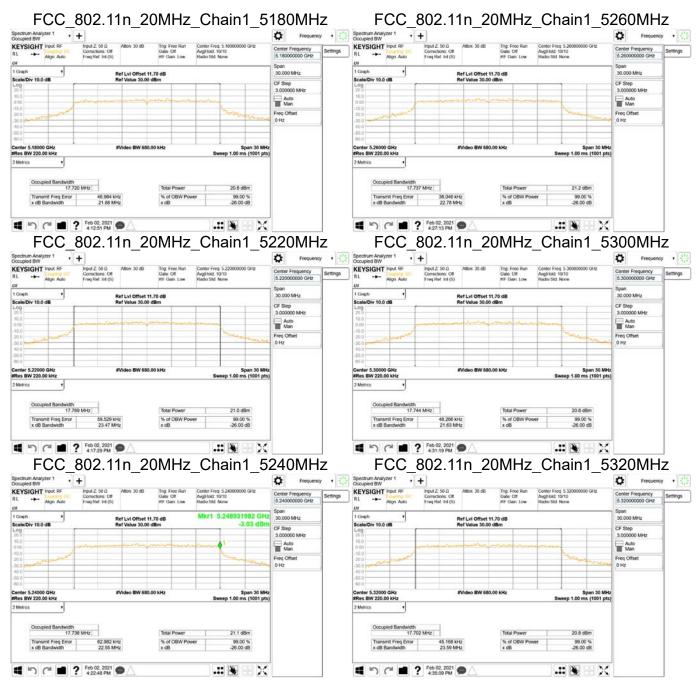




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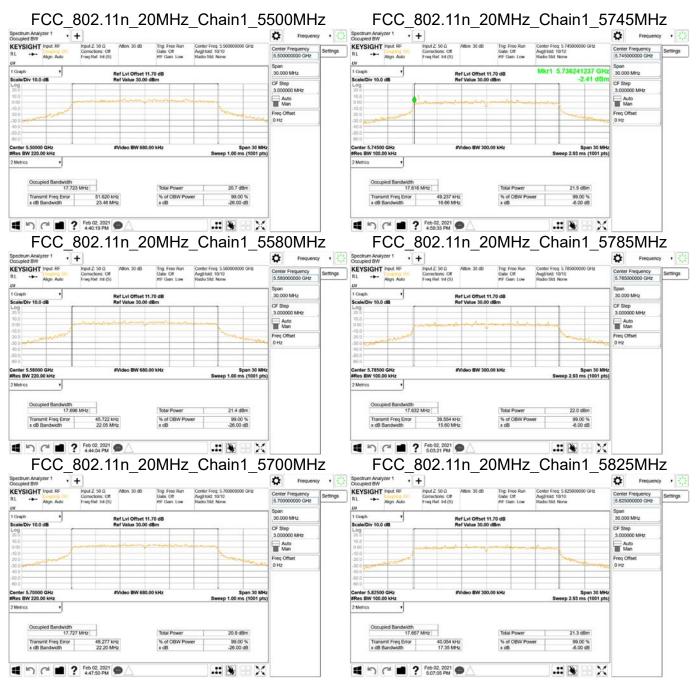




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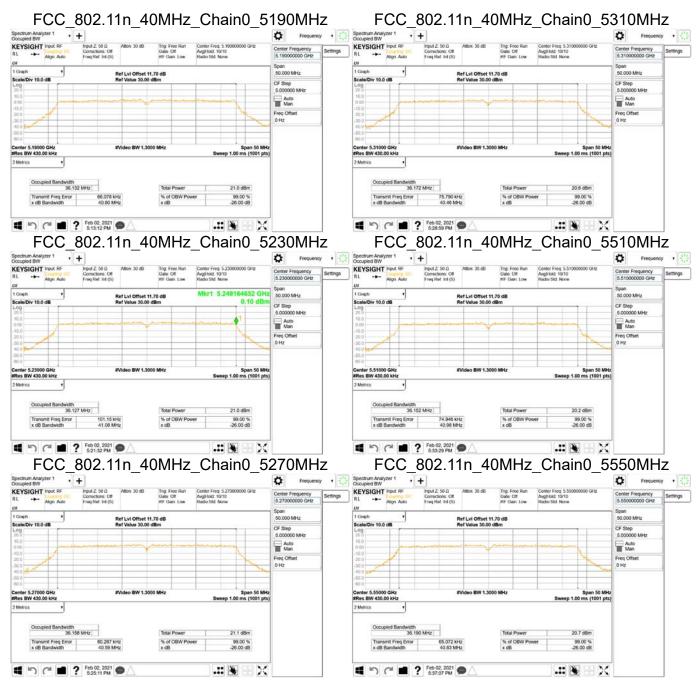




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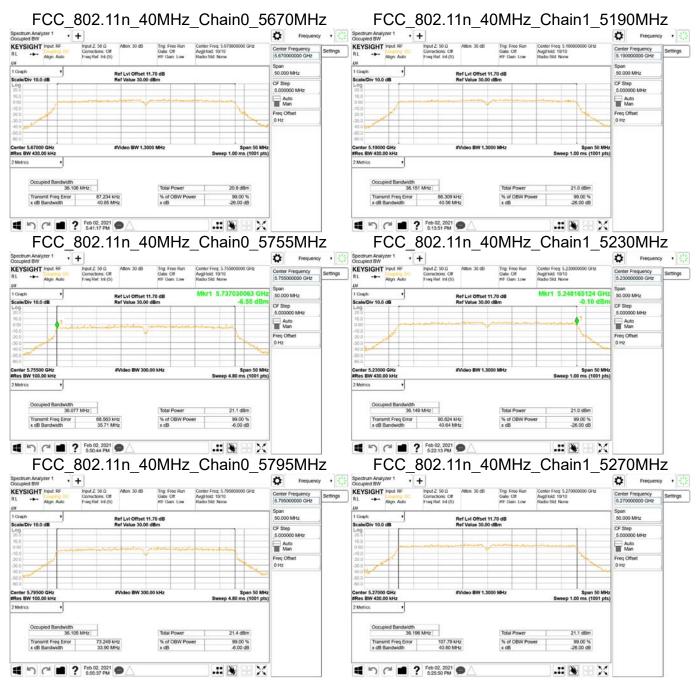




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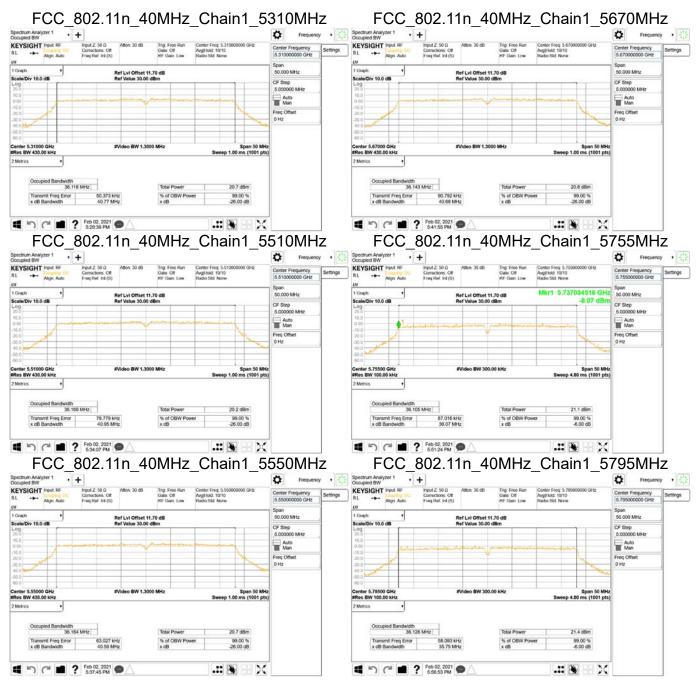




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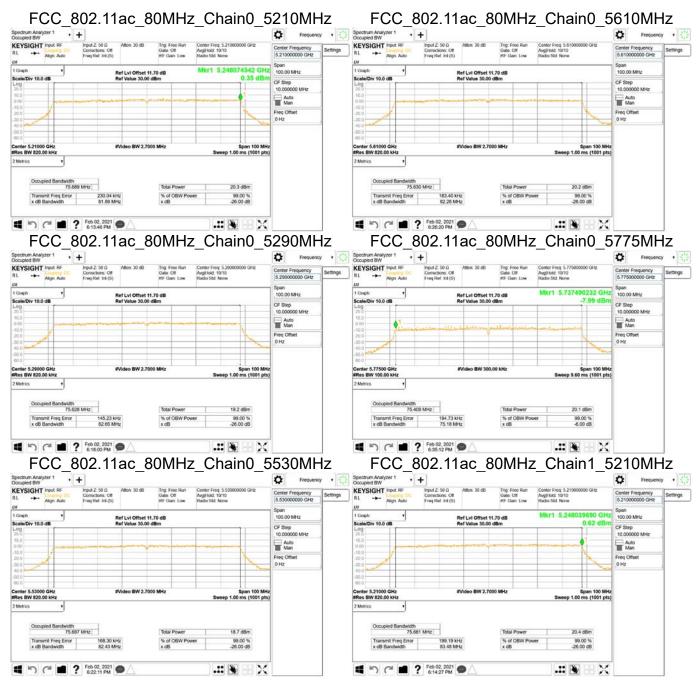




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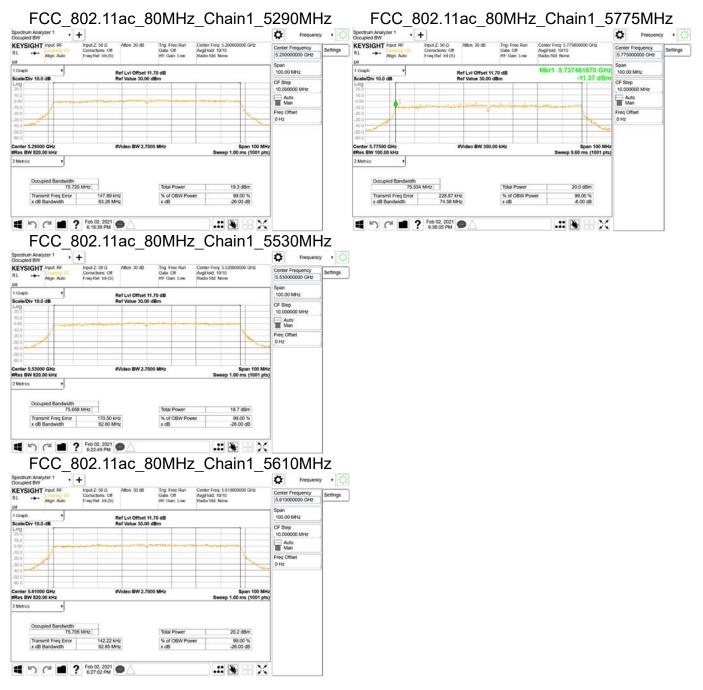




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8.5.3 **BW Verification for DFS Function**

802.11a_Ch0

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.31	< 5250
5745	5736.83	> 5725

802.11n_HT20_Ch0

802.11n_HT20_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)	Freq. (MHz)	Measured Freq. (MHz)	Limit (MHz)
5240	5248.90	< 5250	5240	5248.93	< 5250
5745	5736.22	> 5725	5745	5736.24	> 5725

802.11n HT40 Ch0

802.11n HT40 Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit Freq. (MHz) (MHz)		Measured Freq. (MHz)	Limit (MHz)
5230	5248.16	< 5250	5230	5248.17	< 5250
5755	5737.03	> 5725	5755	5737.03	> 5725

802.11ac _VHT80_Ch0

802.11ac _VHT80_Ch1

Freq. (MHz)	Measured Freq. (MHz)	Limit Freq. (MHz) (MHz)		Measured Freq. (MHz)	Limit (MHz)
5210	5248.07	< 5250	5210	5248.04	< 5250
5775	5737.49	> 5725	5775	5737.46	> 5725

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MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT 9

9.1 Standard Applicable

FCC

OPERZTION Band	EUT CATEGORY		LIMIT			
		Access Point (Master device)	1 Watt(30dBm)			
U-NII-1		Fixed point-to-point Access Ponit	1 Watt(30dBm)			
	\boxtimes	Mobile and portable client device	250mW(23.98dBm)			
U-NII-2A	\boxtimes		250mW(23.98dBm) or 11dBm+10 log B			
U-NII-2C	\boxtimes		250mW(23.98dBm) or 11dBm+10 log B			
U-NII-3	\boxtimes		1 Watt(30dBm)			
If transmitting antennas of directional gain greater than 6 dBi are used, the Maximum transmit power shall be reduced by the amount in dB that the direction-al gain of the antenna exceeds 6 dBi.						

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Note:

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

NSS = the number of independent spatial streams of data;

NANT = the total number of antennas

 $g_{j,k} = 10^{Gk/20}$ if the kth antenna is being fed by spatial stream j, or zero if it is not;

 G_k is the gain in dBi of the kth antenna.

The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

9.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
- 4. Power Meter is used as the auxiliary test equipment to conduct the output power measurement.
- 5. Record the max. reading and add 10 log(1/duty cycle).
- 6. Repeat above procedures until all frequency (low, middle, and high channel) measured were complete.

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9.3 **Measurement Equipment Used**

SGS Conducted Room							
EQUIPMENT TYPE	E MFR MODE NUMBE		SERIAL NUMBER	LAST CAL.	CAL DUE.		
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071573	06/26/2020	06/25/2021		
Power Meter	Anritsu	ML2496A	1512003	07/23/2020	07/22/2021		
Power Sensor	Anritsu	MA2411B	1339378	07/23/2020	07/22/2021		
Power Sensor	Anritsu	MA2411B	1339379	07/23/2020	07/22/2021		
Attenuator	Marvelous	MVE2213-10	RF06	11/19/2020	11/18/2021		
Attenuator	Marvelous	WATT-218FS- 10	RF18	11/19/2020	11/18/2021		
DC Block	PASTERNACK	PE8210	RF153	11/19/2020	11/18/2021		

Test Set-up 9.4

FUT	Attenuator	Power Meter
EUT	Allendalor	Fower Meter

9.5 **Measurement Result**

Conducted output power (FCC) 9.5.1

802.11a Ch0

02.11a_0			TOTAL	TOTAL		REQUIRED		T
СН	Frequency	Data	POWER	POWER		LIMIT		RESULT
	(MHz)	Rate	(dBm)	(mW)		(dBm)		
36	5180	6	14.46	27.899		23.98		PASS
44	5220	6	14.94	31.159		23.98		PASS
48	5240	6	14.68	29.349		23.98		PASS
52	5260	6	14.79	30.101	23.98	or 11+10log(B) =	24.45	PASS
60	5300	6	14.80	30.171	23.98	or 11+10log(B) =	24.24	PASS
64	5320	6	14.64	29.079	23.98	or 11+10log(B) =	24.45	PASS
100	5500	6	14.16	26.037	23.98	or 11+10log(B) =	24.58	PASS
116	5580	6	14.79	30.101	23.98	or 11+10log(B) =	24.63	PASS
140	5700	6	14.40	27.516	23.98	or 11+10log(B) =	24.41	PASS
149	5745	6	14.49	28.092		30		PASS
157	5785	6	14.69	29.416		30		PASS
165	5825	6	14.35	27.201		30		PASS

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	Member of SGS Grou							



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802.11a Ch1

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		REQUIRED LIMIT (dBm)		RESULT
36	5180	6	14.34	27.139		23.98		PASS
44	5220	6	14.02	25.211		23.98		PASS
48	5240	6	14.03	25.269		23.98		PASS
52	5260	6	14.04	25.327	23.98	or 11+10log(B) =	24.45	PASS
60	5300	6	14.03	25.269	23.98	or 11+10log(B) =	24.24	PASS
64	5320	6	14.09	25.620	23.98	or 11+10log(B) =	24.45	PASS
100	5500	6	14.12	25.798	23.98	or 11+10log(B) =	24.58	PASS
116	5580	6	14.23	26.460	23.98	or 11+10log(B) =	24.63	PASS
140	5700	6	14.45	27.835	23.98	or 11+10log(B) =	24.41	PASS
149	5745	6	14.12	25.798		30		PASS
157	5785	6	14.10	25.679		30		PASS
165	5825	6	14.11	25.739		30		PASS

802.11n_HT20_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)			RESULT
36	5180	MCS0	15.50	35.497		23.98		PASS
44	5220	MCS0	15.68	36.999		23.98		PASS
48	5240	MCS0	15.72	37.342		23.98		PASS
52	5260	MCS0	15.88	38.743	23.98	or 11+10log(B) =	24.54	PASS
60	5300	MCS0	15.62	36.492	23.98	or 11+10log(B) =	24.56	PASS
64	5320	MCS0	15.33	34.135	23.98	or 11+10log(B) =	24.48	PASS
100	5500	MCS0	15.05	32.003	23.98	or 11+10log(B) =	24.40	PASS
116	5580	MCS0	15.53	35.743	23.98	or 11+10log(B) =	24.60	PASS
140	5700	MCS0	15.09	32.299	23.98	or 11+10log(B) =	24.66	PASS
149	5745	MCS0	15.31	33.978		30		PASS
157	5785	MCS0	15.45	35.091		30		PASS
165	5825	MCS0	15.13	32.598		30		PASS

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802.11n_HT20_Ch1

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)			RESULT
36	5180	MCS0	15.08	32.225		23.98		PASS
44	5220	MCS0	15.88	38.743		23.98		PASS
48	5240	MCS0	15.87	38.654		23.98		PASS
52	5260	MCS0	15.92	39.102	23.98	or 11+10log(B) =	24.58	PASS
60	5300	MCS0	15.94	39.282	23.98	or 11+10log(B) =	24.35	PASS
64	5320	MCS0	15.01	31.710	23.98	or 11+10log(B) =	24.73	PASS
100	5500	MCS0	15.12	32.523	23.98	or 11+10log(B) =	24.70	PASS
116	5580	MCS0	15.28	33.744	23.98	or 11+10log(B) =	24.43	PASS
140	5700	MCS0	15.82	38.212	23.98	or 11+10log(B) =	24.46	PASS
149	5745	MCS0	14.60	28.853		30		PASS
157	5785	MCS0	15.07	32.151		30		PASS
165	5825	MCS0	15.08	32.225		30		PASS

802.11n HT20 MIMO

011	Frequency	Data	Avg. POW	/ER (dBm)	TOTAL	TOTAL		REQUIRED		DEQUE T
СН	(MHz)	Rate	CH 0	CH 1	POWER (dBm)	POWER (mW)		LIMIT (dBm)		RESULT
36	5180	MCS8	15.31	15.04	18.43	69.652		23.98		PASS
44	5220	MCS8	15.32	14.83	18.33	68.142		23.98		PASS
48	5240	MCS8	15.68	14.79	18.51	70.958		23.98		PASS
52	5260	MCS8	15.71	14.75	18.51	70.937	23.98	or 11+10log(B) =	24.54	PASS
60	5300	MCS8	15.45	14.69	18.34	68.216	23.98	or 11+10log(B) =	24.35	PASS
64	5320	MCS8	15.14	14.77	18.21	66.240	23.98	or 11+10log(B) =	24.48	PASS
100	5500	MCS8	14.96	14.83	18.15	65.279	23.98	or 11+10log(B) =	24.40	PASS
116	5580	MCS8	15.43	15.04	18.49	70.658	23.98	or 11+10log(B) =	24.43	PASS
140	5700	MCS8	15.01	14.69	18.11	64.643	23.98	or 11+10log(B) =	24.46	PASS
149	5745	MCS8	14.83	14.53	17.93	62.156		30		PASS
157	5785	MCS8	15.41	14.79	18.36	68.601		30		PASS
165	5825	MCS8	15.01	14.68	18.10	64.571		30		PASS

802.11n_HT40_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		RESULT		
38	5190	MCS0	14.72	29.668		23.98		PASS
46	5230	MCS0	14.94	31.210		23.98		PASS
54	5270	MCS0	14.96	31.354	23.98	or 11+10log(B) =	27.08	PASS
62	5310	MCS0	14.75	29.874	23.98	or 11+10log(B) =	27.07	PASS
102	5510	MCS0	14.75	29.874	23.98	or 11+10log(B) =	27.13	PASS
110	5550	MCS0	13.65	23.190	23.98	or 11+10log(B) =	27.11	PASS
134	5670	MCS0	14.85	30.570	23.98	or 11+10log(B) =	27.11	PASS
151	5755	MCS0	14.83	30.429		30		PASS
159	5795	MCS0	14.96	31.354		30		PASS

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802.11n HT40 Ch1

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)	REQUIRED LIMIT (dBm)			RESULT
38	5190	MCS0	14.62	28.993		23.98		PASS
46	5230	MCS0	14.44	27.816		23.98		PASS
54	5270	MCS0	14.45	27.880	23.98	or 11+10log(B) =	27.11	PASS
62	5310	MCS0	14.51	28.268	23.98	or 11+10log(B) =	27.10	PASS
102	5510	MCS0	14.66	29.261	23.98	or 11+10log(B) =	27.12	PASS
110	5550	MCS0	13.48	22.299	23.98	or 11+10log(B) =	27.08	PASS
134	5670	MCS0	14.68	29.396	23.98	or 11+10log(B) =	27.09	PASS
151	5755	MCS0	14.11	25.781		30		PASS
159	5795	MCS0	14.51	28.268		30		PASS

802.11n HT40 MIMO

СН	Frequency	Data	Avg. POW	/ER (dBm)	TOTAL POWER	TOTAL POWER		REQUIRED LIMIT		RESULT
GI	(MHz)	Rate	CH 0	CH 1	(dBm)	(mW)		(dBm)		RESOLI
38	5190	MCS8	14.38	13.83	17.71	58.978		23.98		PASS
46	5230	MCS8	14.6	13.82	17.82	60.544		23.98		PASS
54	5270	MCS8	14.93	13.75	17.97	62.707	23.98	or 11+10log(B) =	27.08	PASS
62	5310	MCS8	14.51	13.76	17.74	59.489	23.98	or 11+10log(B) =	27.07	PASS
102	5510	MCS8	14.05	14.01	17.62	57.853	23.98	or 11+10log(B) =	27.12	PASS
110	5550	MCS8	12.58	12.15	15.96	39.478	23.98	or 11+10log(B) =	27.08	PASS
134	5670	MCS8	14.21	13.88	17.64	58.095	23.98	or 11+10log(B) =	27.09	PASS
151	5755	MCS8	14.16	13.44	17.41	55.057		30		PASS
159	5795	MCS8	14.31	13.58	17.55	56.932		30		PASS

802.11ac_VHT80_Ch0

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		RESULT		
42	5210	MCS0	13.75	23.720		23.98		PASS
58	5290	MCS0	11.18	13.126	23.98	or 11+10log(B) =	30.17	PASS
106	5530	MCS0	13.44	22.086	23.98	or 11+10log(B) =	30.16	PASS
122	5610	MCS0	13.58	22.810	23.98	or 11+10log(B) =	30.15	PASS
155	5775	MCS0	13.61	22.968		30		PASS

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802.11ac_VHT80_Ch1

СН	Frequency (MHz)	Data Rate	TOTAL POWER (dBm)	TOTAL POWER (mW)		RESULT		
42	5210	MCS0	13.57	22.757		23.98		PASS
58	5290	MCS0	11.01	12.622	23.98	or 11+10log(B) =	30.20	PASS
106	5530	MCS0	13.98	25.010	23.98	or 11+10log(B) =	30.18	PASS
122	5610	MCS0	13.31	21.435	23.98	or 11+10log(B) =	30.18	PASS
155	5775	MCS0	13.51	22.445		30		PASS

802.11ac_VHT80_MIMO

	Frequency	Data	Avg. POW	'ER (dBm)	TOTAL	TOTAL		REQUIRED		
СН	(MHz)	Rate	CH 0	CH 1	POWER (dBm)	POWER (mW)		LIMIT (dBm)		RESULT
42	5210	MCS0	12.46	12.09	16.09	40.648		23.98		PASS
58	5290	MCS0	10.46	10.02	14.06	25.451	23.98	or 11+10log(B) =	30.17	PASS
106	5530	MCS0	13.36	13	17.00	50.063	23.98	or 11+10log(B) =	30.16	PASS
122	5610	MCS0	12.06	11.75	15.72	37.318	23.98	or 11+10log(B) =	30.15	PASS
155	5775	MCS0	11.98	11.64	15.62	36.516		30		PASS

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. 除非另有說明,此報告結果僅對測試之樣品負責,同時此樣品僅保留90天。本報告未經本公司書面許可,不可部份複製。

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10 MAXIMUM POWER SPECTRAL DENSITY

10.1 Standard Applicable

FCC

OPERZTION Band	EUT CATEGORY		LIMIT		
		Access Point (Master device)	17dBm/ MHz		
U-NII-1		Fixed point-to-point Access Ponit			
	\boxtimes	Mobile and portable client device	11dBm/ MHz		
U-NII-2A	\boxtimes		11dBm/ MHz		
U-NII-2C	\boxtimes		11dBm/ MHz		
U-NII-3	\boxtimes		30dBm/ 500kHz		
If transmitting antennas of directional gain greater than 6 dBi are used, the Maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.					

Note:

As per section F. 2). e). (ii) of FCC KDB 662911 D01

If antenna gains are not equal and each transmit antenna is driven by only one spatial stream, directional gain may be calculated by either of the following formulas.

• DirectionalGain =
$$10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream; NSS = the number of independent spatial streams of data; NANT = the total number of antennas $g_{j,k} = / 20 \ 10$ Gk if the kth antenna is being fed by spatial stream j, or zero if it is not; G_k is the gain in dBi of the kth antenna.

The antenna gain is not greater than 6 dBi. Therefore, reduction of power is not required.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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10.2 Measurement Procedure

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules .
- 3. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to Spectrum.
- 4. For U-NII1, U-NII-2A, U-NII-2C Band:

Set RBW=1MHz, VBW=3MHz, where span is enough to capture the entire bandwidth, Sweep time = Auto (601 pts), detector = sample, traces 100 sweeps of video averaging. (SA-2 with the omission of procedure x, the integration with 26dB EBW bandwidth) **For U-NII-3 Band**:

Set RBW= approximately 1% of EBW, VBW≥ 3RBW, where span is enough to capture the entire bandwidth, Sweep time = Auto, detector = RMS or sample, traces 100 sweeps of video averaging.

- 5. User the cursor on spectrum to peak search the highest level of trace
- 6. Record the max. reading and add 10 log(1/duty cycle).
- 7. Repeat above procedures until all default test channel (low, middle, and high) was complete.
- MIMO mode: offset is set following "measure and add 10 Log (N)" on spectrum to measure the PSD for MIMO mode. Offset = cable loss + 10 log (N), where N is number of transmitting antenna.

Note: For the test of PSD at MIMO mode, the highest emission of worst case employing Measure and add 10 log (N) technical is reported after the comparison between Main Antenna at single transmitting mode and Aux that yields the higher value. The MIMO transmitting mode produces higher value of outcome.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

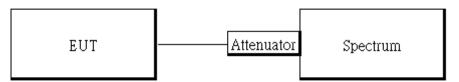
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10.3 **Measurement Equipment Used**

SGS Conducted Room							
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.		
Spectrum Analyzer	KEYSIGHT	N9010B	MY59071573	06/26/2020	06/25/2021		
Attenuator	Marvelous	MVE2213-10	RF06	11/19/2020	11/18/2021		
Attenuator	Marvelous	WATT-218FS- 10	RF18	11/19/2020	11/18/2021		
DC Block	PASTERNACK	PE8210	RF153	11/19/2020	11/18/2021		

10.4 Test Set-up



10.5 **Measurement Result**

10.5.1 Power spectral density

	POWER DENSITY 802.11a MODE						
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	ch1 meas PSD (dBm/MHz)	Duty Factor (dB)	Maxmum Corr'd	l PSD(dBm/MHz)	Limit	Margin (dB)
5180.00	2.39	0.00	0.21	2.	60	11.00 dBm/MHz	-8.40
5220.00	2.46	0.00	0.21	2.0	67	11.00 dBm/MHz	-8.33
5240.00	2.95	0.00	0.21	3.	16	11.00 dBm/MHz	-7.84
5260.00	-0.46	0.00	0.21	-0.	25	11.00 dBm/MHz	-11.25
5300.00	0.87	0.00	0.21	1.0	08	11.00 dBm/MHz	-9.92
5320.00	-0.10	0.00	0.21	0.	11	11.00 dBm/MHz	-10.89
5500.00	1.93	0.00	0.21	2.	14	11.00 dBm/MHz	-8.86
5580.00	2.12	0.00	0.21	2.3	33	11.00 dBm/MHz	-8.67
5700.00	3.12	0.00	0.21	3.3	33	11.00 dBm/MHz	-7.67
Frequency (MHz)	ch0 meas PSD (dBm/300kHz)	ch1 meas PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Maxmum Corr'd PSD (dBm/500kHz)	Limit	Margin (dB)
5745.00	-2.06	0.00	0.21	2.22	0.37	30.00 dBm/500kHz	-29.63
5785.00	-3.29	0.00	0.21	2.22	-0.86	30.00 dBm/500kHz	-30.86
5825.00	-2.85	0.00	0.21	2.22	-0.42	30.00 dBm/500kHz	-30.42

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	POWER DENSITY 802.11n HT20 MODE						
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	ch1 meas PSD (dBm/MHz)	Duty Factor (dB)	Maxmum Corr'o	l PSD(dBm/MHz)	Limit	Margin (dB)
5180.00	0.12	1.58	0.24	4.	16	11.00 dBm/MHz	-6.84
5220.00	-0.23	1.05	0.24	3.	71	11.00 dBm/MHz	-7.29
5240.00	0.40	1.99	0.24	4.	52	11.00 dBm/MHz	-6.48
5260.00	1.21	1.28	0.24	4.	50	11.00 dBm/MHz	-6.50
5300.00	-1.02	0.40	0.24	3.	00	11.00 dBm/MHz	-8.00
5320.00	0.45	1.14	0.24	4.	06	11.00 dBm/MHz	-6.94
5500.00	-0.03	0.39	0.24	3.	44	11.00 dBm/MHz	-7.56
5580.00	2.54	1.32	0.24	5.	22	11.00 dBm/MHz	-5.78
5700.00	0.98	2.54	0.24	5.	08	11.00 dBm/MHz	-5.92
Frequency (MHz)	ch0 meas PSD (dBm/300kHz)	ch1 meas PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Maxmum Corr'd PSD(dBm/500kHz)	Limit	Margin (dB)
5745.00	-4.12	-3.92	0.24	2.22	1.45	30.00 dBm/500kHz	-28.55
5785.00	-3.50	-2.98	0.24	2.22	2.24	30.00 dBm/500kHz	-27.76
5825.00	-2.60	-2.04	0.24	2.22	3.16	30.00 dBm/500kHz	-26.84

	POWER DENSITY 802.11n HT40 MODE						
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	ch1 meas PSD (dBm/MHz)	Duty Factor (dB)	Maxmum Corr'd PSD(dBm/MHz)		Limit	Margin (dB)
5190.00	-4.25	-2.78	0.58	0.	14	11.00 dBm/MHz	-10.86
5230.00	-4.51	-5.36	0.58	-1.	.32	11.00 dBm/MHz	-12.32
5270.00	-5.62	-5.26	0.58	-1.	.85	11.00 dBm/MHz	-12.85
5310.00	-3.41	-2.97	0.58	0.	41	11.00 dBm/MHz	-10.59
5510.00	-4.44	-3.01	0.58	-0.08		11.00 dBm/MHz	-11.08
5550.00	-5.12	-5.55	0.58	-1.	.74	11.00 dBm/MHz	-12.74
5670.00	-5.28	-6.10	0.58	-2	.08	11.00 dBm/MHz	-13.08
Frequency (MHz)	ch0 meas PSD (dBm/300kHz)	ch1 meas PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Maxmum Corr'd PSD(dBm/500kHz)	Limit	Margin (dB)
5755.00	-9.95	-8.49	0.58	2.22	-3.35	30.00 dBm/500kHz	-33.35
5795.00	-7.93	-8.91	0.58	2.22	-2.58	30.00 dBm/500kHz	-32.58

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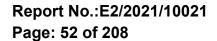


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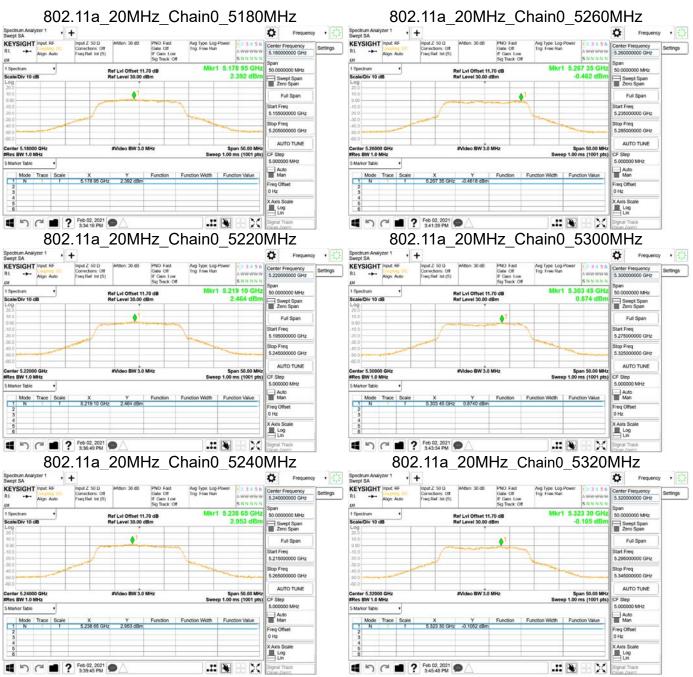
	POWER DENSITY 802.11ac VHT80 MODE						
Frequency (MHz)	ch0 meas PSD (dBm/MHz)	ch1 meas PSD (dBm/MHz)	Duty Factor (dB)	Maxmum Corr'd	I PSD(dBm/MHz)	Limit	Margin (dB)
5210.00	-7.68	-8.92	0.80	-4.	45	11.00 dBm/MHz	-15.45
5290.00	-10.94	-7.75	0.80	-5.	25	11.00 dBm/MHz	-16.25
5530.00	-9.49	-10.92	0.80	-6.34		11.00 dBm/MHz	-17.34
5610.00	-9.27	-5.04	0.80	-2.	85	11.00 dBm/MHz	-13.85
Frequency (MHz)	ch0 meas PSD (dBm/300kHz)	ch1 meas PSD (dBm/300kHz)	Duty Factor (dB)	10log (500kHz/RBW) Factor(dB)	Maxmum Corr'd PSD(dBm/500kHz)	Limit	Margin (dB)
5775.00	-13.34	-12.57	0.80	2.22	-6.91	30.00 dBm/500kHz	-36.91

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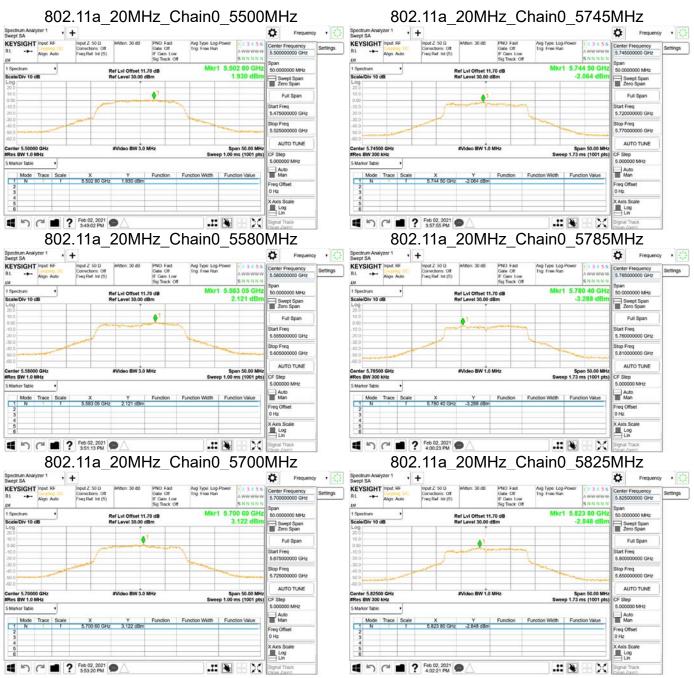




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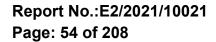
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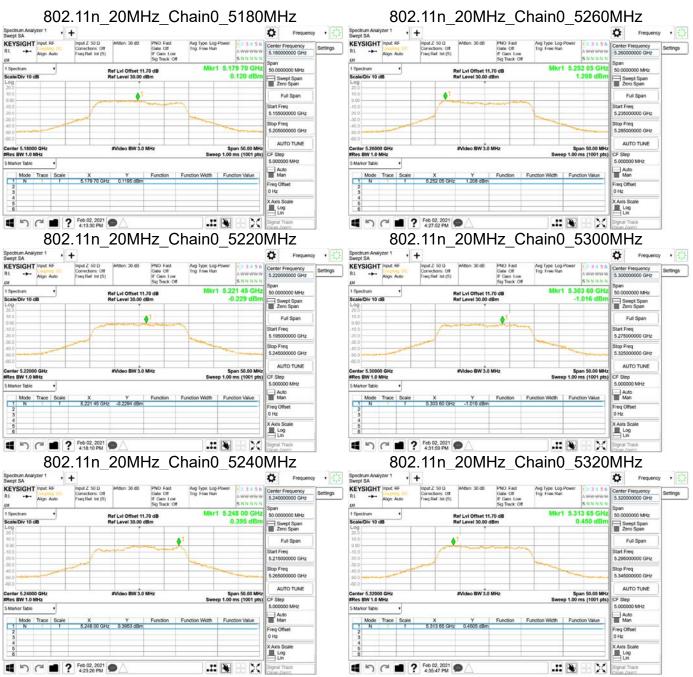


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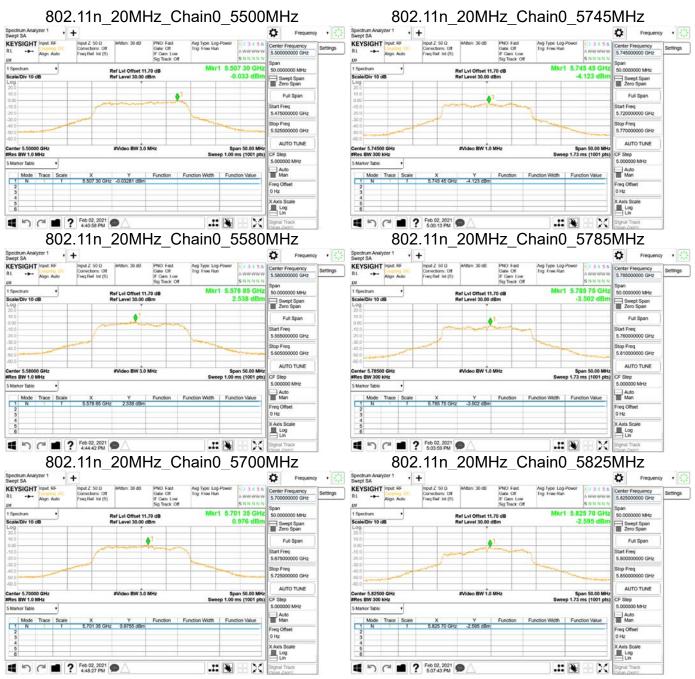




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