

Formal Radio Test Report

FCC ID: LDK-ETHIK2360

C9124AXE-B

Cisco Catalyst C9124AX Series 802.11ax Access Point 5 GHz Auxiliary Radio

5725-5850 MHz

Against the following Specifications:

CFR47 Part 15.407



Cisco Systems 170 West Tasman Drive San Jose, CA 95134

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Blackburn	Revision: 1

This report replaces any previously entered test report under EDCS – 22608367. This test report has been electronically authorized and archived using the CISCO Engineering Document Control system. Test Report Template EDCS# 11644120.

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Section 1: Overview

The samples were assessed against the tests detailed in section 3 under the requirements of the following specifications:

Specifications:

CFR47 Part 15.407

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Section 2: Assessment Information

2.1: General

This report contains an assessment of an apparatus against Electromagnetic Compatibility Standards based upon tests carried out on the samples submitted. The testing was performed by and for the use of Cisco systems Inc:

With regard to this assessment, the following points should be noted:

- a) The results contained in this report relate only to the items tested and were obtained in the period between the date of the initial assessment and the date of issue of the report. Manufactured products will not necessarily give identical results due to production and measurement tolerances.
- b) The apparatus was set up and exercised using the configuration and modes of operation defined in this report only.
- c) Where relevant, the apparatus was only assessed using the susceptibility criteria defined in this report and the Test Assessment Plan (TAP).
- d) All testing was performed under the following environmental conditions:

Temperature	15 °C to 35 °C (54 °F to 95 °F)
Atmospheric Pressure	860 mbar to 1060 mbar (25.4" to 31.3")
Humidity	10% to 75*%

e) All AC testing was performed at one or more of the following supply voltages:

110V 60 Hz (+/-20%)

Units of Measurement

The units of measurements defined in the appendices are reported in specific terms, which are test dependent. Where radiated measurements are concerned these are defined at a particular distance. Basic voltage measurements are defined in units of [dBuV]

As an example, the basic calculation for all measurements is as follows:

Emission level [dBuV] = Indicated voltage level [dBuV] + Cable Loss [dB] + Other correction factors [dB]

The combinations of correction factors are dependent upon the exact test configurations [see test equipment lists for further details] and may include:

Antenna Factors, Pre-Amplifier Gain, LISN Loss, Pulse Limiter Loss and Filter Insertion Loss

Note: To convert the results from dBuV/m to uV/m use the following formula:

Level in uV/m = Common Antilogarithm [(X dBuV/m)/20] = Y uV/m

Measurement Uncertainty Values

voltage and power measurements	± 2 dB
conducted EIRP measurements	± 1.4 dB
radiated measurements	± 3.2 dB
frequency measurements	± 2.4 10-7
temperature measurements	± 0.54°
humidity measurements	± 2.3%
DC and low frequency measurements	± 2.5%

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Where relevant measurement uncertainty levels have been estimated for tests performed on the apparatus. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Radiated emissions (expanded uncertainty, confidence interval 95%)

30 MHz – 300 MHz	± 3.8 dB
300 MHz – 1000 MHz	± 4.3 dB
1 GHz – 10 GHz	± 4.0 dB
10 GHz – 18GHz	± 8.2 dB
18GHz – 26.5GHz	± 4.1 dB
26.5GHz – 40GHz	± 3.9 dB

Conducted emissions (expanded uncertainty, confidence interval 95%)

30 MHz - 40 GHz ± 0.38 dB

A product is considered to comply with a requirement if the nominal measured value is below the limit line. The product is considered to not be in compliance in case the nominal measured value is above the limit line.

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2.2: Date of testing

30-JUL-2021 to 31-JUL-2021; 03-AUG-2021

2.3: Report Issue Date

13-OCT-2021

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2.4: Testing facilities

This assessment was performed by:

Testing Laboratory Cisco Systems, Inc. 125 West Tasman Drive (Building P) San Jose, CA 95134 USA

Headquarters Cisco Systems, Inc., 170 West Tasman Drive San Jose, CA 95134, USA

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Cisco System Site	Address	Site Identifier
Building P, 10m Chamber	125 West Tasman Dr San Jose, CA 95134	Company #: 2461N-2
Building P, 5m Chamber	125 West Tasman Dr San Jose, CA 95134	Company #: 2461N-1
Building 7, 5m Chamber	425 E. Tasman Drive San Jose, California 95134 United States	Company #: 2461N-3

Registration Numbers for Industry Canada

Test Engineers:

Johanna Knudsen, Julian Land, Mathew Blackburn

2.5: Equipment Assessed (EUT)

C9124AXE

2.6: EUT Description

The Cisco Catalyst 9124AX Series outdoor access points are next-generation Wi-Fi 6 access points encased in a rugged and robust design that service providers and enterprises can easily deploy.

The radio supports the following modes of operation. The modes are further defined in the radio Theory of Operation. The modes included in this report represent the worst-case data for all modes.

802.11a - Non HT20, One Antenna, 6 to 54 Mbps, 1ss

The following antennas are supported by this product series. Please note, the antenna information has been provided by the customer (the Cisco business unit). The data included in this report represent the worst-case data for all antennas.

Frequency	Antenna Name		Antenna Gain
		Antenna 1	7 dBi (Side Lobe: -1 dBi)
5 GHz TX/RX: Ex		Antenna 2	8 dBi (Side Lobe: 5 dBi)
	TA/RA. External	Antenna 3	13 dBi (Side Lobe: 2 dBi)
		Antenna 4	14 dBi (Side Lobe: 5 dBi)

Section 3: Result Summary

3.1: Results Summary Table

Conducted emissions

Basic Standard	Technical Requirements / Details	Result
FCC 15.407	6dB Bandwidth: (e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.	Pass
FCC 15.407	 99% & 26 dB Bandwidth: The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. There is no limit for 99% OBW. The 26 dB emission is the width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission. 	Pass
FCC 15.407	Output Power: (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.	Pass
FCC 15.407	Power Spectral Density: (3) For the band 5.725-5.85 GHz the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.	Pass
FCC 15.407	 Conducted Spurious Emissions / Band-Edge: (4) For transmitters operating in the 5.725-5.85 GHz band: (i) All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at 5 MHz above or below the band edge. 	Pass
FCC 15.407 FCC 15.205 FCC 15.209	Restricted band: Unwanted emissions must comply with the general field strength limits set forth in §15.209. (7) The provisions of §15.205 apply to intentional radiators operating under this section.	Pass

Basic Standard	Technical Requirements / Details	Result
FCC 15.407 FCC 15.205 FCC 15.209	TX Spurious Emissions: Unwanted emissions must comply with the general field strength limits set forth in §15.209. (7) The provisions of §15.205 apply to intentional radiators operating under this section.	Not covered by the scope of this report
FCC 15.207	AC conducted Emissions: Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries.	Not covered by the scope of this report

Radiated Emissions (General requirements)

* MPE calculation is recorded in a separate report

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Section 4: Sample Details

Note: Each sample was evaluated to ensure that its condition was suitable to be used as a test sample prior to the commencement of testing.

4.1: Sample Details

Sample	Equipment	Manufacturer	Hardware	Serial
No.	Details		Rev.	Number
S01	C9124AXE-B (Used in Rack 9)	Foxconn (For Cisco)	PP	FOC25220CP1

4.2: System Details

System #	Description	Samples
1	EUT (used in Rack 9)	S01

4.3: Mode of Operation Details

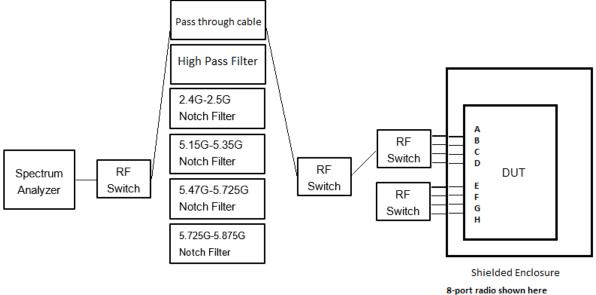
Mode#	Description	Comments
1	Continuously Transmitting Testing using Rack 9	AP Running Image: 8.8.1.10 Cisco AP Software, (ap1g6a), [cheetah- build9:/san1/BUILD/workspace/c176_throttle_mfg/label/mfg-ap1g6a] Compiled Wed Jul 14 22:18:33 GMT 2021

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Appendix A: Emission Test Results

Conducted Test Setup Diagram



8-port radio shown here Some radios will fewer transmit paths

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A.1: Duty Cycle

Duty Cycle Test Requirement

From KDB 789033 D02 General UNII Test Procedures New Rules v02r01:

B. Duty Cycle (x), Transmission Duration (T), and Maximum Power Control Level

1. All measurements are to be performed with the EUT transmitting at 100 percent duty cycle at its maximum power control level; however, if 100 percent duty cycle cannot be achieved, measurements of duty cycle, x, and maximum-power transmission duration, T, are required for each tested mode of operation.

Duty Cycle Test Method

From KDB 789033 D02 General UNII Test Procedures New Rules v02r01:

B. Duty Cycle (x), Transmission Duration (T), and Maximum Power Control Level

The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW \ge EBW if possible; otherwise, set RBW to the largest available value. Set VBW \ge RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in section II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T \le 16.7 microseconds.)

Duty Cycle Test Information

Tested By:	Date of testing:
Johanna Knudsen, Julian Land, Mathew Blackburn	30-JUL-2021 to 31-JUL-2021
Test Result: PASS	

Test Equipment

See Appendix C for list of test equipment

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Duty Cycle Data Table

Duty Cycle table and screen captures are shown below for Power/PSD modes.

Frequency (MHz)	Mode	Data Rate (Mbps)	Duty Cycle (dB)
5720	Non HT20, 6 to 54 Mbps	6.0	0.13094
5745	Non HT20, 6 to 54 Mbps	6.0	0.13094
5785	Non HT20, 6 to 54 Mbps	6.0	0.13094
5825	Non HT20, 6 to 54 Mbps	6.0	0.13094

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA				
KL RF 50 Ω DC CORREC Center Freq 5.745000000 GHz NFE PNO: Fast ←	🛻 Trig: Free Run 🛛 🗛	vg Type: Log-Pwr vg Hold: 1/1	TRACE 1 2 3 4 5 6 TYPE A 	Frequency
10 dB/div Ref 15.00 dBm	#Atten: 28 dB		DET P NNNNN Mkr4 211.0 μs -21.573 dBm	Auto Tune
5.00 -5.00 -15.0		monter and	Martin Martin Contraction	Center Freq 5.745000000 GHz
-25.0 -35.0 -45.0				Start Freq 5.745000000 GHz
-55.0 -65.0 -75.0				Stop Fred 5.745000000 GHz
	W 100 kHz		Span 0 Hz 00 ms (1001 pts)	CF Step 3.000000 MHz <u>Auto</u> Man
MKR MODE TRC SCL X 1 N 1 f 5.752 GHz 2 N 1 f 11.485 GHz 3 N 1 f 5.428 GHz 4 N 1 f 5.584 GHz 5 6	Y FUNCTION -53.297 dBm -64.333 dBm -57.718 dBm -45.373 dBm	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
7 8 9 10 11				Scale Type
MSG	97.03, 0.13	STATUS		

Antenna A

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A.2: 6dB Bandwidth

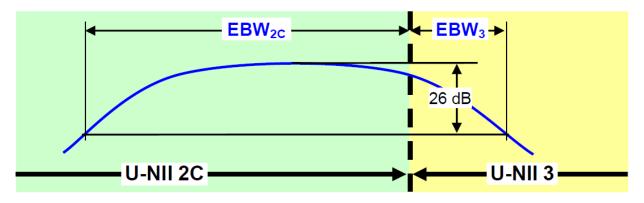
6dB Bandwidth Test Requirement

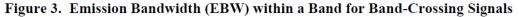
15.407 e:

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

Emission bandwidth (EBW) in U-NII bands:

Band-crossing emissions: For an emission that crosses the boundary between two adjacent U-NII bands, the boundary frequency between the bands serves as one edge for defining the portion of the EBW that falls within a particular U-NII band. However, the -26 dB points are measured relative to the highest point on the contiguous segment—regardless of which band contains that highest point (Figure 3).





6dB Bandwidth Test Procedure

From KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Section C. Bandwidth Measurement

- 6 BW
- Test Procedure
- 1. Set the radio in the continuous transmitting mode.
- 2. Allow the trace to stabilize.
- 3. Setting the x-dB bandwidth mode to -6dB within the measurement set up function.
- 4. Select the automatic OBW measurement function of an instrument to perform bandwidth measurement.
- 5. Capture graphs and record pertinent measurement data.

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From KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section C. Bandwidth Measurement

6 BW
Test parameters
2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) \geq 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

Tested By:	Date of testing:
Johanna Knudsen, Julian Land, Mathew Blackburn	31-JUL-2021; 03-AUG-2021
Test Result: PASS	

Test Equipment

See Appendix C for list of test equipment

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6 dB Bandwidth Table

Frequency (MHz)	Mode	Data Rate (Mbps)	6dB BW (MHz)	Limit (kHz)	Margin (MHz)
5720	Non HT20, 6 to 54 Mbps	6.0	3.2	>500	2.7
5745	Non HT20, 6 to 54 Mbps	6.0	16.3	>500	15.8
5785	Non HT20, 6 to 54 Mbps	6.0	16.3	>500	15.8
5825	Non HT20, 6 to 54 Mbps	6.0	16.3	>500	15.8

Data Screenshots

5720 MHz: Non HT20, 6 to 54 Mbps



Antenna A

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Antenna A

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Antenna A

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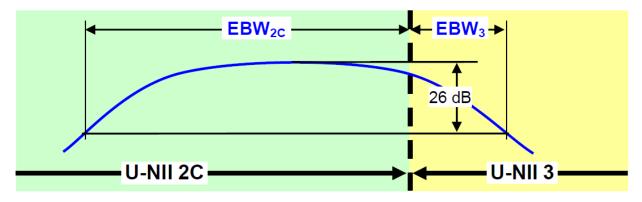
A.3: 99% and 26dB Bandwidth

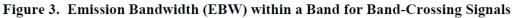
99% and 26dB Bandwidth Test Requirement

There is no requirement for the value of bandwidth. However, the 26dB BW (EBW) is used to calculate the power limits in 15.407 (a) (2).

Power measurements are made using the 99% Bandwidth as the integration bandwidth.

Band-crossing emissions: For an emission that crosses the boundary between two adjacent U-NII bands, the boundary frequency between the bands serves as one edge for defining the portion of the EBW that falls within a particular U-NII band. However, the -26 dB points are measured relative to the highest point on the contiguous segment—regardless of which band contains that highest point (Figure4).





99% and 26dB Bandwidth Test Procedure

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

From KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Section D. 99 Percent Occupied Bandwidth
99% BW
Test Parameters
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 · RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used.
Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
,

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From KDB 789033 D02 General UNII Test Procedures New Rules v02r01 Section C, Measurement Bandwidth, Section 1

um analyzer)			
a) Set RBW = approximately 1% of the emission bandwidth.			
b) Set the VBW > RBW.			
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare			
this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW			
Date of testing:			
30-JUL-2021 to 31-JUL-2021; 03-AUG-2021			

Test Result: PASS

Test Equipment See Appendix C for list of test equipment

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99% and 26dB Bandwidth Table

Frequency (MHz)	Mode	Data Rate (Mbps)	26dB BW (MHz)	99% BW (MHz)
5720	Non HT20, 6 to 54 Mbps	6.0	5.4	4.551
5745	Non HT20, 6 to 54 Mbps	6.0	21.4	16.52
5785	Non HT20, 6 to 54 Mbps	6.0	21.3	16.523
5825	Non HT20, 6 to 54 Mbps	6.0	21.7	16.53

Data Screenshots

5720 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Occupied BV						- F	×
IX RL RF 50 Ω DC Center Freq 5.755000000 NFE NFE	Ginz Tri	SENSE:INT nter Freq: 5.755000000 G g: Free Run tten: 22 dB	Hz	Radio Std:		Frequency	/
	#IFGain:Low #A	tten: 22 dB		Radio Dev	ICE. BIS		
10 dB/div Ref 22.20 dBr	n						
12.2						Center F	Freq
2.20						5.755000000	GHz
-7.80							
-17.8							
-27.8 Y W W	muntermenter						
-37.8	man man	••••••					
-47.8			With the state of the second second	have a law as			
-57.8					e estina dalle an		
-67.8							
Center 5.75500 GHz				Span 6	0.00 MHz		
#Res BW 200 kHz		#VBW 620 kHz			weep 5 s	CF S 6.000000	
	1-	Total Power	47.6	dBm		<u>Auto</u>	Man
Occupied Bandwidt		I otal Powel	17.0	авт			
4.	5514 MHz					Freq Of	ffset
Transmit Freq Error	-27.714 MHz	% of OBW F	ower 99	.00 %			0 Hz
x dB Bandwidth	5.446 MHz	x dB		00 dB			
	J.440 MITZ	Xub	-20.0	JU UB			
MSG			STATUS				
			514105				

Antenna A

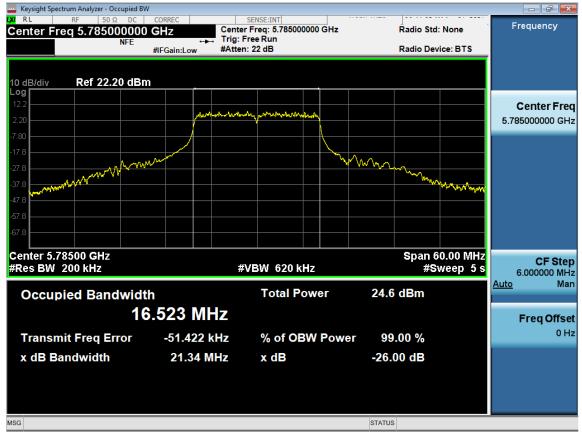
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Antenna A

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Antenna A

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A.4: Maximum Conducted Output Power

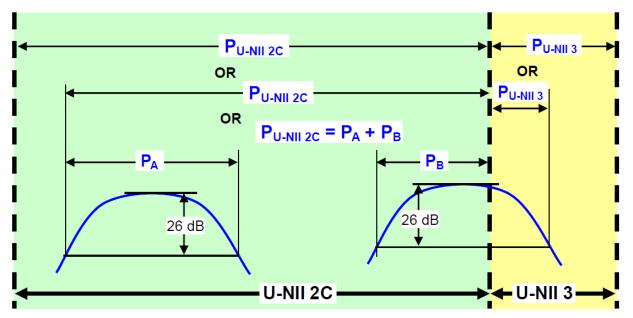
Maximum Conducted Output Power Test Requirement

15.407 a) (3):

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

Band-Crossing Signals:

When measuring the portion of the maximum conducted output power within a single U-NII band, the power shall be integrated across only the portion of the EBW that falls within that band. That is, if an EBW extends across the boundary between two adjacent bands, the boundary frequency between the bands serves as one edge of the frequency range to be integrated. Integration across an entire U-NII band without regard to 26 dB points is also acceptable for determining conducted output power within that band.



Conducted output power within a U-NII band: Integrate over the band or integrate over a span including the 26 dB EBWs of transmission segments within the band or integrate over 26 dB EBW of each transmission segment in the band and sum.

Figure 4. Conducted Output Power Measurement Examples

Maximum Conducted Output Power Test Procedure

Ref. KDB 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10: 2013

Maximum Conducted Output Power
Test Procedure
1. Set the radio in the continuous transmitting mode at full power
2. Compute power by integrating the spectrum across the EBW (or alternatively entire 99% OBW) of the signal using
the instrument's band power measurement function. The integration shall be performed using the spectrum analyzer
band-power measurement function with band limits set equal to the EBW or the OBW band edges.
3. Capture graphs and record pertinent measurement data.

Ref. KDB 789033 D02 General UNII Test Procedures New Rules v02r01

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA), (d) Method SA-2

Maximum Conducted Output Power
Test parameters
Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction). (i) Measure the duty cycle, x, of the transmitter output signal as described in section II.B.
(ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
(iii) Set RBW = 1 MHz.
(iv) Set VBW \geq 3 MHz.
(v) Number of points in sweep \geq 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband
signals are not lost between frequency bins.)
(vi) Sweep time = auto.
(vii) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
(viii) Do not use sweep triggering. Allow the sweep to "free run".
(ix) Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be
averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average

over the on and off periods of the transmitter. (x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied

bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth)

The "measure-and-sum technique" is used for measuring in-band transmit power of a device. In the measure-and-sum approach, the conducted emission level is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units. ANSI C63.10 section 14.3.2.2

Samples, Systems, and Modes

Tested By:	Date of testing:
Johanna Knudsen, Julian Land, Mathew Blackburn	30-JUL-2021 to 31-JUL-2021; 03-AUG-2021
Test Result: PASS	

Test Equipment See Appendix C for list of test equipment

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A.4.1: 7 dBi

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	11.3	0.13	11.4	29	17.58

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	18.5	0.13	18.6	29	10.37

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	18.2	0.13	18.4	29	10.63

Frequency 5825 MHz

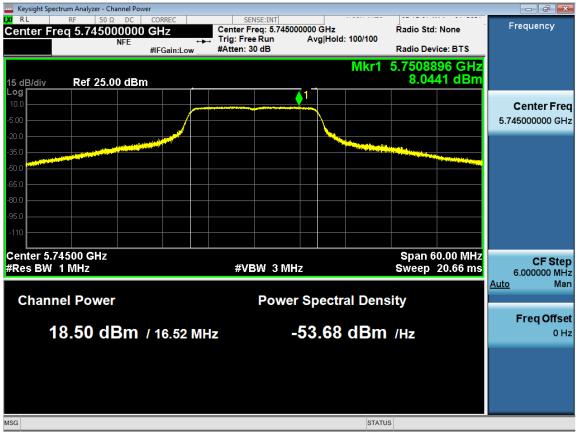
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	17.9	0.13	18.1	29	10.92

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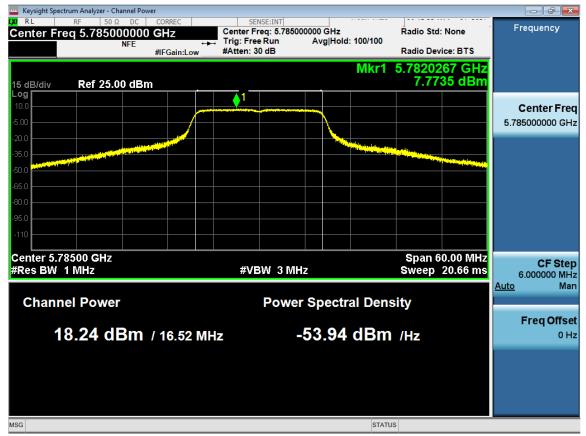
Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps



Antenna A

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Antenna A

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A.4.2: 8 dBi

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	11.3	0.13	11.4	28	16.58

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	18.5	0.13	18.6	28	9.37

Frequency 5785 MHz

				r	1		
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Ч Ц Ц	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	18.2	0.13	18.4	28	9.63

Frequency 5825 MHz

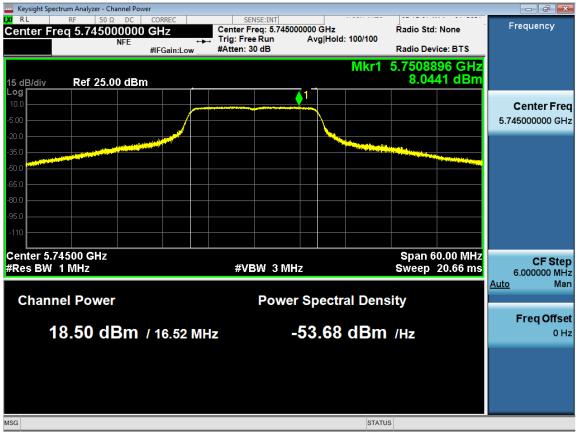
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	17.9	0.13	18.1	28	9.92

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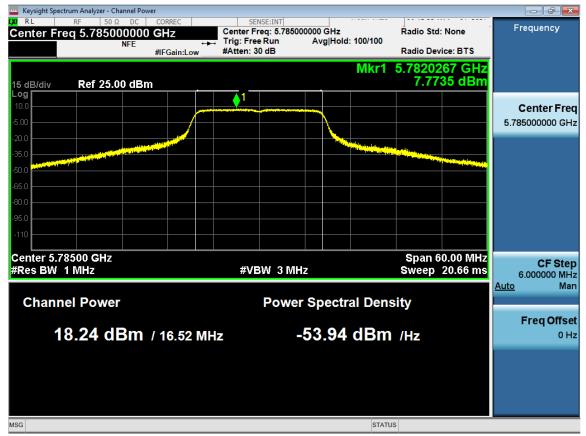
Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps



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Antenna A

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A.4.3: 13 dBi

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	6.2	0.13	6.3	23	16.7

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	15.4	0.13	15.5	23	7.5

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	18.2	0.13	18.4	23	4.63

Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	17.9	0.13	18.1	23	4.92

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Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



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A.4.4: 14 dBi

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	6.2	0.13	6.4	22	15.64

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	13.2	0.13	13.3	22	8.69

Frequency 5785 MHz

	-						
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	18.2	0.13	18.4	22	3.63

Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Max Power (dBm)	Duty Cycle (dB)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	17.9	0.13	18.1	22	3.92

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Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



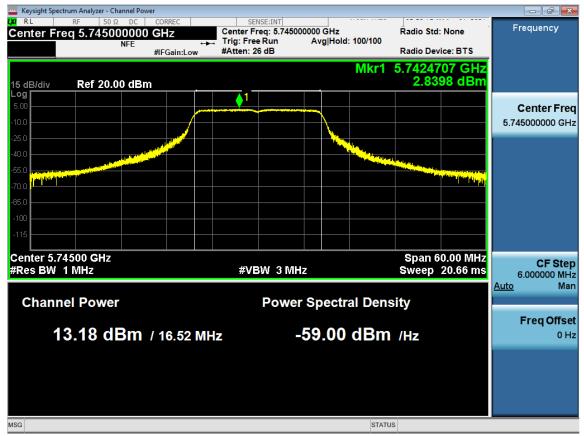
Antenna A

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A.5: Power Spectral Density

Power Spectral Density Test Requirement

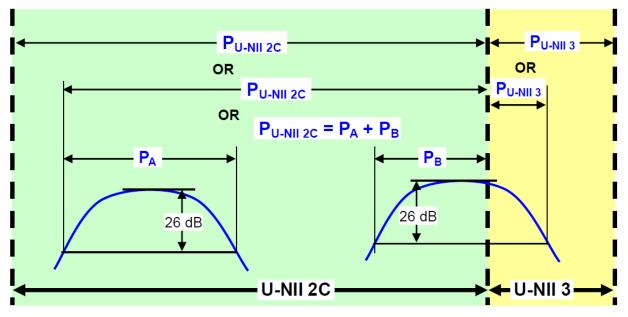
15.407:

(3) For the band 5.725-5.85 GHz...the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(5) The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of son bandwidth of 1 MHz or the 26 dB emission bandwidth of son bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Band-Crossing Signals:

When measuring the portion of the maximum conducted output power within a single U-NII band, the power shall be integrated across only the portion of the EBW that falls within that band. That is, if an EBW extends across the boundary between two adjacent bands, the boundary frequency between the bands serves as one edge of the frequency range to be integrated. Integration across an entire U-NII band without regard to 26 dB points is also acceptable for determining conducted output power within that band.



Conducted output power within a U-NII band: Integrate over the band or integrate over a span including the 26 dB EBWs of transmission segments within the band or integrate over 26 dB EBW of each transmission segment in the band and sum.

Figure 4. Conducted Output Power Measurement Examples

Power Spectral Density Test Procedure

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Ref. KDB 789033 D02 General UNII Test Procedures New Rules v02r01

F. Maximum Power Spectral Density (PSD)

Power Spectral Density Test Procedure

The rules requires "maximum power spectral density" measurements where the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission.

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

3. Make the following adjustments to the peak value of the spectrum, if applicable: a) If Method SA-2 or SA-2 Alternative was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.

b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

4. The result is the Maximum PSD over 1 MHz reference bandwidth.

5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz.

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Ref. KDB 789033 D02 General UNII Test Procedures New Rules v02r01

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA), (d) Method SA-2
--

Power Spectral Density	
Test parameters	
Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correct	tion).
(i) Measure the duty cycle, x, of the transmitter output signal as described in section II.B.	
(ii) Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.	
(iii) Set RBW = 1 MHz. (this should be 500kHz per KDB789033, Section F, (5))	
(iv) Set VBW \geq 3 MHz.	
(v) Number of points in sweep \geq 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowl	band
signals are not lost between frequency bins.)	
(vi) Sweep time = auto.	
(vii) Detector – RMS (i.e. power averaging) if available. Otherwise, use sample detector mode	

(vii) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(viii) Do not use sweep triggering. Allow the sweep to "free run".

(ix) Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.

(x) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth)

F. Maximum Power Spectral Density (PSD)

2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

3. Make the following adjustments to the peak value of the spectrum, if applicable: a) If Method SA-2 or SA-2 Alternative was used, add 10 $\log(1/x)$, where x is the duty cycle, to the peak of the spectrum.

5. ... For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz.

The "measure-and-sum technique" is used for measuring in-band transmit power of a device. In the measure-and-sum approach, the conducted emission level is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units. ANSI C63.10 section 14.3.2.2

Tested By:	Date of testing:
Johanna Knudsen, Julian Land, Mathew Blackburn	31-JUL-2021; 03-AUG-2021
Test Result: PASS	

Test Equipment See Appendix C for list of test equipment

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A.5.1: 7 dBi

Frequency 5720 MHz

Mode		Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20), 6 to 54 Mbps	1	7	5.7	0.13	5.8	29	23.16

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	5.4	0.13	5.5	29	23.51

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	5.3	0.13	5.4	29	23.56

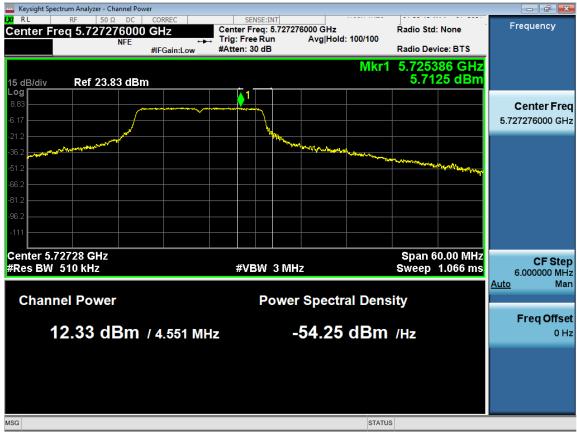
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	5.2	0.13	5.3	29	23.67

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Data Screenshots

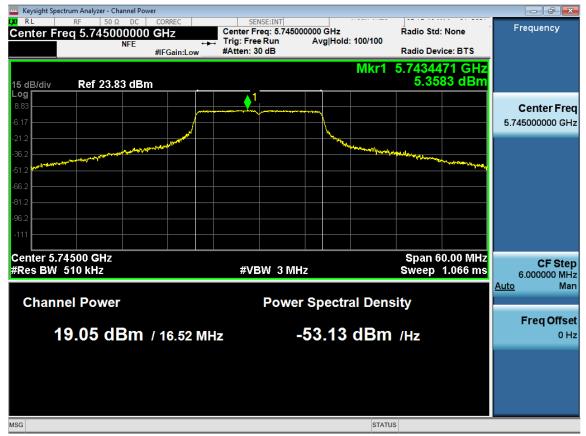
5720 MHz: Non HT20, 6 to 54 Mbps



Antenna A

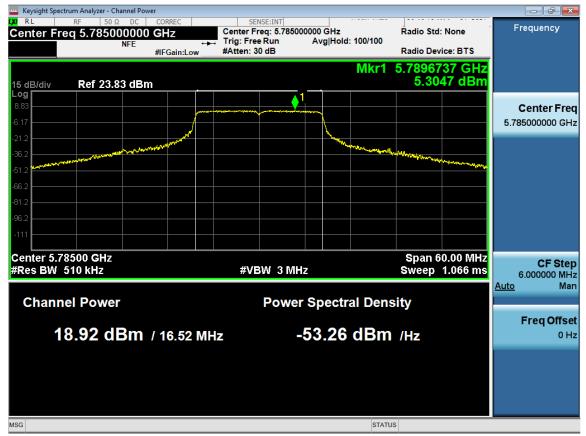
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Antenna A

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Antenna A

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A.5.2: 8 dBi

Frequency 5720 MHz

Mode		Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20), 6 to 54 Mbps	1	8	5.7	0.13	5.8	28	22.16

Frequency 5745 MHz

Mode	Paths	rrelated Antenna Gain ti)	1 PSD tm/500 kHz)	ty Cycle ()	al PSD tm/500 kHz)	nit 8m/500 kHz)	rgin ()
	Tx Patl	Correla (dBi)	<u></u> д д	Duty C (dB)	Total P (dBm/5		Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	5.4	0.13	5.5	28	22.51

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	5.3	0.13	5.4	28	22.56

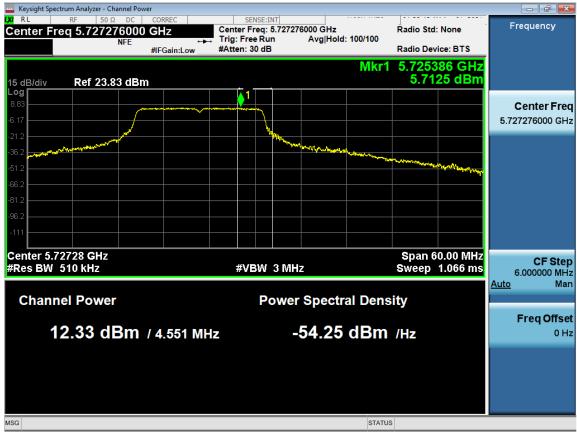
Frequency 5825 MHz

Mode		Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20), 6 to 54 Mbps	1	8	5.2	0.13	5.3	28	22.67

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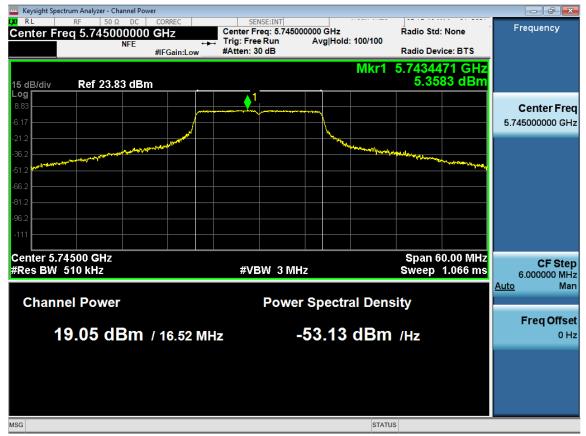
Data Screenshots

5720 MHz: Non HT20, 6 to 54 Mbps



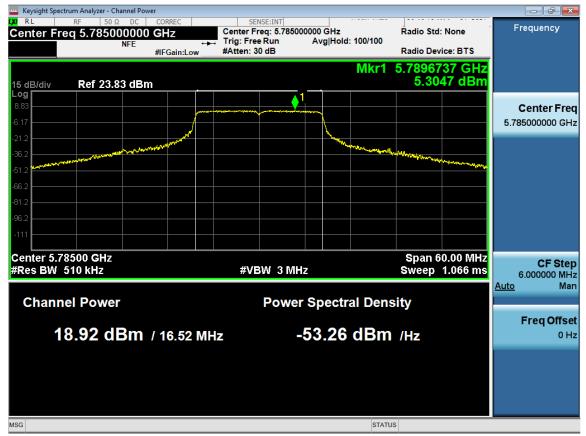
Antenna A

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Antenna A

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Antenna A

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A.5.3: 13 dBi

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13		0.13	0.2	23	22.84

Frequency 5745 MHz

Mode	Paths	related Antenna Gain i)	1 PSD m/500 kHz)	y Cycle)	al PSD m/500 kHz)	it m/500 kHz)	gin)
	Tx Path	Correla (dBi)	Tx 1 PS (dBm/5	Duty C	Total P (dBm/5		Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	2.6	0.13	2.7	23	20.26

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	5.3	0.13	5.4	23	17.56

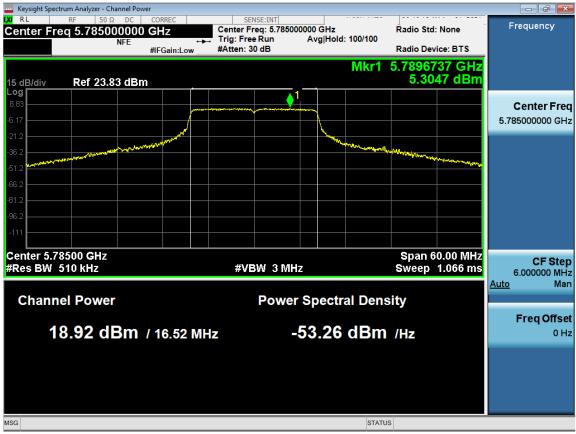
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	5.2	0.13	5.3	23	17.67

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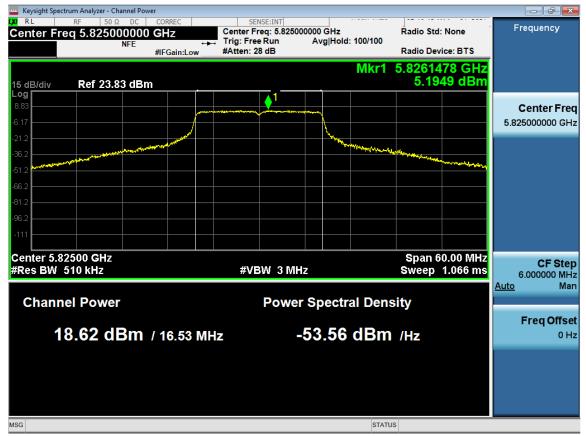
Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



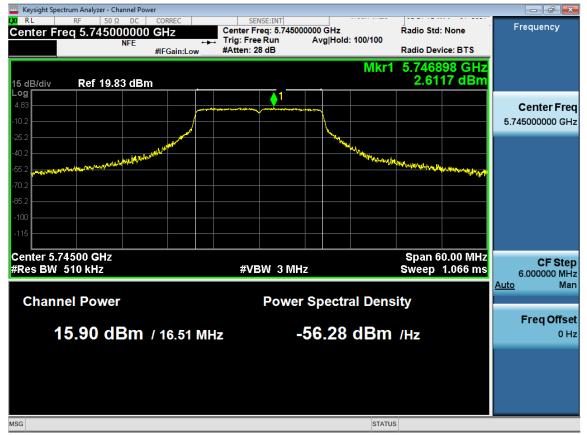
Antenna A

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Antenna A

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Antenna A

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A.5.4: 14 dBi

Frequency 5720 MHz

Mode		Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20,	6 to 54 Mbps	1	14	0.5	0.13	0.6	22	21.36

Frequency 5745 MHz

Mode	x Paths	orrelated Antenna Gain (Bi)	x 1 PSD IBm/500 kHz)	uty Cycle IB)	otal PSD JBm/500 kHz)	imit IBm/500 kHz)	argin IB)
	TXI	Cor (dB	, X (dB	Dut (dB	Tot: (dB	Lim (dB	Març (dB)
Non HT20, 6 to 54 Mbps	1	14	0.4	0.13	0.5	22	21.48

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	5.3	0.13	5.4	22	16.56

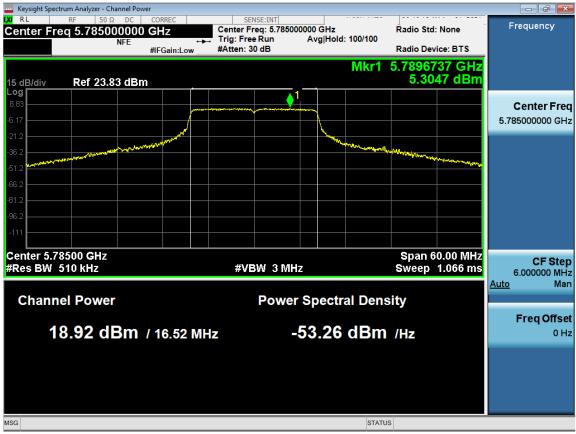
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 PSD (dBm/500 kHz)	Duty Cycle (dB)	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	5.2	0.13	5.3	22	16.67

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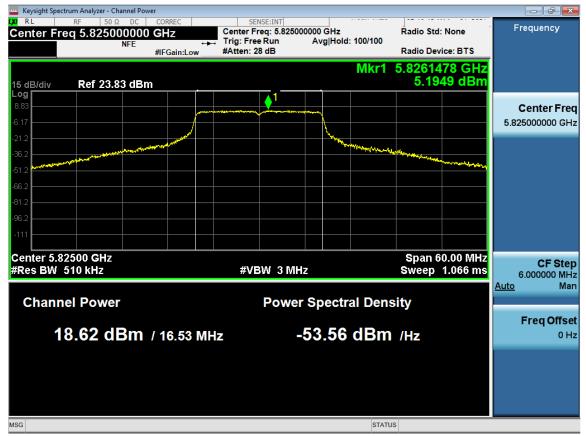
Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



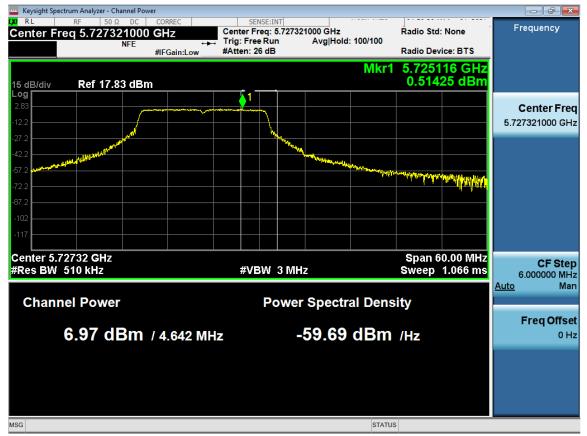
Antenna A

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Antenna A

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Antenna A

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A.6: Conducted Spurious Emissions

Conducted Spurious Emissions Test Requirement

15.407:

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.

15.205 | 15.209:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Use formula below to substitute conducted measurements in place of radiated measurements

 $E[dB\mu V/m] = EIRP[dBm] - 20 \log(d[meters]) + 104.77$, where E = field strength and d = 3 meter

1) Average Plot, Limit= -41.25 dBm eirp 2) Peak plot, Limit = -21.25 dBm eirp

Conducted Spurious Emissions Test Procedure

From KDB 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10: 2013

Conducted Spurious Emissions Test Procedure

1. Connect the antenna port(s) to the spectrum analyzer input.

2. Place the radio in continuous transmit mode

3. Configure Spectrum analyzer as per test parameters below (be sure to enter all losses between the transmitter output and the spectrum analyzer).

4. Use the peak marker function to determine the maximum spurs amplitude level.

5. Out-of-band and spurious emissions tests are performed on each output individually without summing or adding 10 log(N) since the measurements are made relative to the in-band emissions on the individual outputs. The worst-case output is recorded.

6. Capture graphs and record pertinent measurement data.

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Ref. 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10: 2013 Section 12.7.6 (Peak), Section 12.7.7.2 (Method AD)

Conducted Spurious Emissions	
Test parameters	
Peak	Average
Span = 30MHz to 26.5GHz / 26.5GHz to 40GHz	Span = 30MHz to 26.5GHz / 26.5GHz to 40GHz
RBW = 1 MHz	RBW = 1 MHz
VBW ≥ 3 MHz	VBW ≥ 3 MHz
Sweep = Auto couple	Sweep = Auto couple
Detector = Peak	Detector = RMS
Trace = Max Hold.	Power Averaging

Add the max antenna gain + ground reflection factor (4.7 dB for frequencies between 30 MHz and 1000 MHz, and 0 dB for frequencies > 1000 MHz).

Tested By:	Date of testing:
Johanna Knudsen, Julian Land, Mathew Blackburn	30-JUL-2021 to 31-JUL-2021; 03-AUG-2021
Test Result: PASS	

Test Equipment See Appendix C for list of test equipment

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A.6.1: 7 dBi

Conducted Spurs Average Upper

Frequency 5745 MHz

Mode	iths	lated Antenna Gain	Spur Power)	Cycle	Conducted Spur)		<u> </u>
	Tx Paths	Correlate (dBi)	Tx 1 Spur (dBm)		Total Con (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-72.1	0.13	-65.0	-41	23.71

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA					
RL RF 50 Ω DC Center Freq 26.00000000			vg Type: RMS g Hold: 125/125		
NFE	PNO:Fast ↔ Trig:F IFGain:High #Atten			DETANNNN	
10 dB/div Ref -10.00 dBm			Μ	kr4 34.512 GHz -72.088 dBm	Auto Tune
Log					
-20.0					Center Freq 26.000000000 GHz
-30.0					26.00000000 GHz
-50.0					
-60.0					Start Freq 12.00000000 GHz
-70.0				¢ ⁴	12.00000000 GH2
-80.0 2			and the second s	non who who me	
-90.0	ward a service and a service of a	han har			Stop Freq 40.00000000 GHz
-100					40.000000000 GHZ
Start 12.00 GHz				Stop 40.00 GHz	CF Step
#Res BW 1.0 MHz	#VBW 3.0 MI	lz*	Sweep 4	6.87 ms (1001 pts)	2.80000000 GHz
MKR MODE TRC SCL X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 N 1 f 11		dBm dBm			Freq Offset
	.512 GHz -72.088	dBm			0 Hz
5 6				=	
8					Scale Type
9					Log <u>Lin</u>
MSG			STATUS	S	

Antenna A

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Conducted Spurs Peak Upper

Fred	uency	5745	MH7
1164	ucity	51 45	1411 12

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-49.9	0.13	-42.8	-21	21.53

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω DC	CORREC	CENCEJINT			
Center Freq 26.00000000) GHz	SENSE:INT	#Avg Type: RMS Avg Hold: 125/125	TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
NFE		#Atten: 0 dB		DET P NNNNN	Auto Tune
10 dB/div Ref -10.00 dBm			MI	(r4 39.132 GHz -49.914 dBm	Auto Tune
-20.0		Ĭ			Center Freq
-30.0					26.00000000 GHz
-40.0				4	
-50.0			A. I. A. I. MARCHARD	Hermon and the second second	Start Freq 12.000000000 GHz
-70.0 2 Juli row a real way and a standard	han many and the	where the state of the second s	ntogether handlight page and a second		12.000000000 GHZ
-80.0					Stop Freq
-90.0					40.000000000 GHz
-100					
Start 12.00 GHz #Res BW 1.0 MHz	#VBW 3	0 MUz	Swoon A	Stop 40.00 GHz 6.87 ms (1001 pts)	CF Step 2.80000000 GHz
	#¥D¥¥ 3			FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 12		74.529 dBm 74.529 dBm			
3		49.914 dBm			Freq Offset 0 Hz
				E	0 H2
7					Scale Type
9					Log Lin
				*	
MSG			STATUS		

Antenna A

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Conducted Spurs Average

Frequency 5720 MHz

Mode		Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 M	ops	1	7	-57.3	0.13	-50.2	-41	8.92

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-52.6	0.13	-45.5	-41	4.22

Frequency 5785 MHz

Mode	Tx Paths	⁴ Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	1	-55.9	0.13	-48.8	-41	7.52

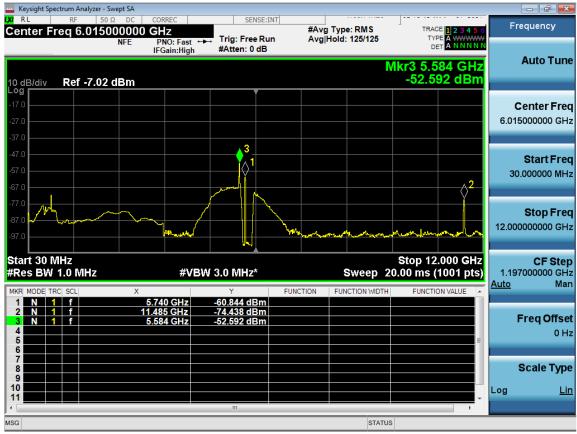
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-56.7	0.13	-49.6	-41	8.32

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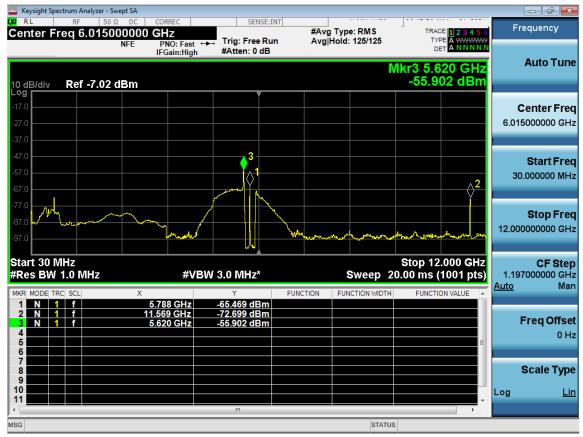
Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps



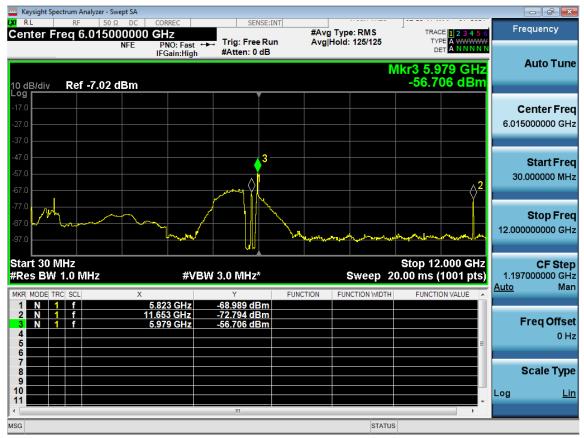
Antenna A

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Antenna A

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Antenna A

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Conducted Spurs Peak

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-58.1	0.13	-51.0	-21	29.72

Frequency 5745 MHz

Mode	k Paths	orrelated Antenna Gain Bi)	k 1 Spur Power Bm)	uty Cycle B)	otal Conducted Spur Bm)	mit B)	argin B)
	Т× F	Cori (dBi	Tx 1 (dBr	Dut) (dB)	Tota (dBr	Limi (dB)	Març (dB)
Non HT20, 6 to 54 Mbps	1	7	-56.6	0.13	-49.5	-21	28.22

Frequency 5785 MHz

		T					
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-56.5	0.13	-49.4	-21	28.12

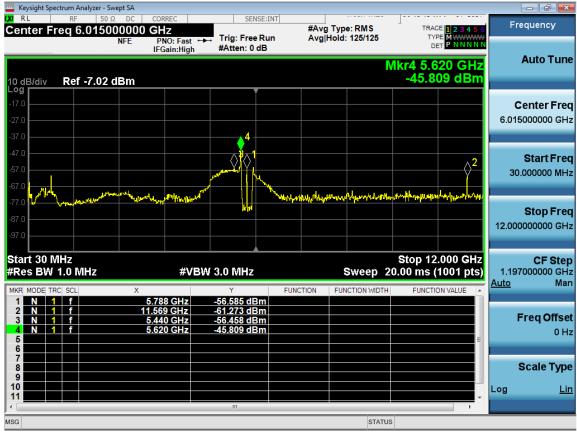
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-57.2	0.13	-50.1	-21	28.82

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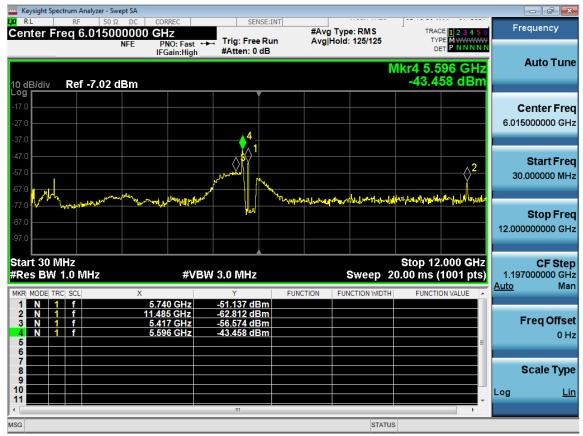
Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



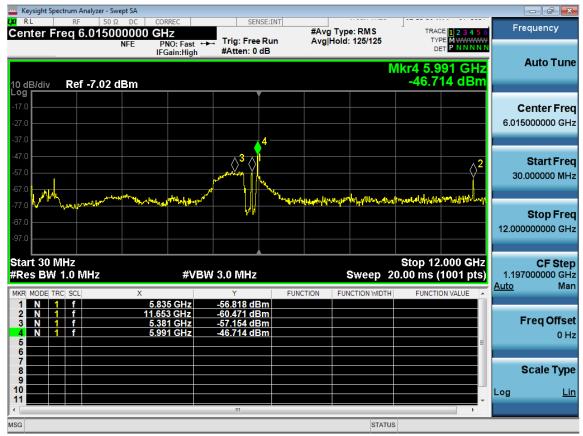
Antenna A

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Antenna A

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Antenna A

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A.6.2: 8 dBi

Conducted Spurs Average Upper

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-72.1	0.13	-64.0	-41	22.71

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

weysight Spectrum Analyzer - Swept SA								
M RL RF 50 Ω DC Center Freq 26.00000000	ORREC	SENSE:INT	#Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency			
10 dB/div Ref -10.00 dBm		Frig: Free Run #Atten: 0 dB	Avg Hold: 125/125	kr4 34.512 GHz -72.088 dBm	Auto Tune			
-20.0 -30.0 -40.0					Center Freq 26.00000000 GHz			
-60.0 -60.0 -70.0				4 61 + 0.41 ^m /by	Start Freq 12.000000000 GHz			
-80.0 2 -90.0 (-100	nghagalong ang higg strategy and ang high strategy and ang high strategy and ang high strategy and	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and the second second	hand a labor of the art the	Stop Freq 40.00000000 GHz			
Start 12.00 GHz #Res BW 1.0 MHz	#Res BW 1.0 MHz #VBW 3.0 MHz* Sweep 46.87 ms (1001 pts)							
2 N 1 f 1	5.745 GHz 1.490 GHz 4.512 GHz -7	dBm dBm 2.088 dBm		E	Freq Offset 0 Hz			
7 8 9 10 11					Scale Type Log <u>Lin</u>			
MSG		III	STATU	5				

Antenna A

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Conducted Spurs Peak Upper

Fred	uency	5745	MHz
1104	lacitoy	01 40	1411 12

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA	CORREC	SENSE:INT			
Center Freq 26.0000000 NFE			#Avg Type: RMS Avg Hold: 125/125	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P N N N N N	Frequency
10 dB/div Ref -10.00 dBm			MI	(r4 39.132 GHz -49.914 dBm	Auto Tune
-20.0 -30.0 -40.0				4	Center Freq 26.00000000 GHz
-50.0 -60.0 -70.0 2	antile and a grap of a company	g where the state of the state	production to a glist property and	Marin phyllosoft Marin and Marin	Start Freq 12.000000000 GHz
-80.0 -90.0 -100					Stop Freq 40.00000000 GHz
Start 12.00 GHz #Res BW 1.0 MHz		3.0 MHz		Stop 40.00 GHz 6.87 ms (1001 pts)	CF Step 2.80000000 GHz <u>Auto</u> Man
MKR MODE TRC SCL X 1 N 1 f 1	12.028 GHz 12.028 GHz	-74.529 dBm -74.529 dBm -49.914 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
7 8 9 9 10 11					Scale Type
MSG			STATUS		

Antenna A

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Conducted Spurs Average

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-57.3	0.13	-49.2	-41	7.92

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-52.6	0.13	-44.5	-41	3.22

Frequency 5785 MHz

Mode	Tx Paths	b Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-55.9	0.13	-47.8	-41	6.52

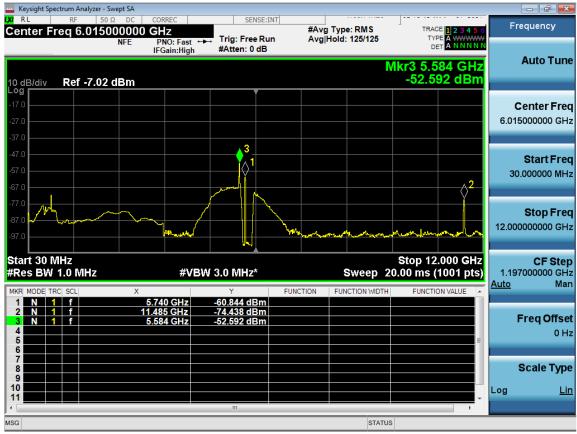
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-56.7	0.13	-48.6	-41	7.32

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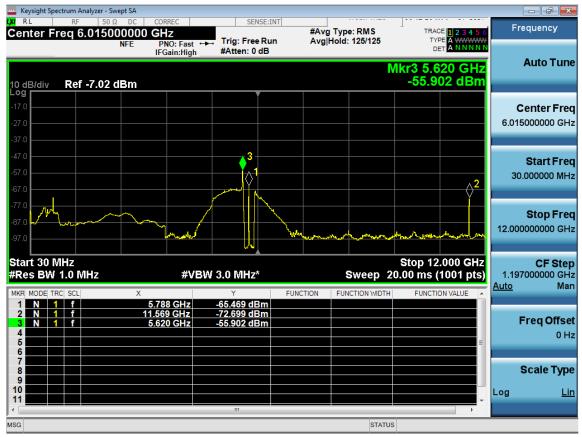
Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps



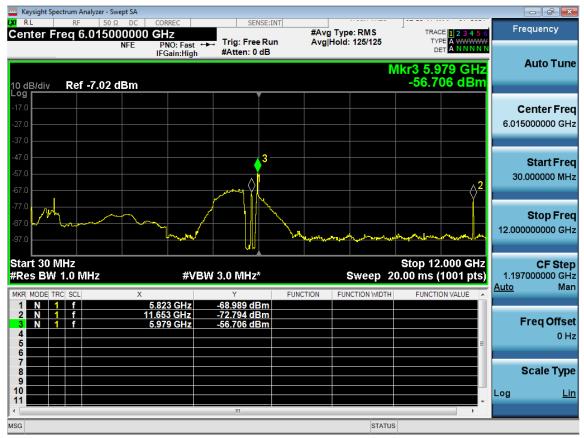
Antenna A

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Antenna A

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Antenna A

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Conducted Spurs Peak

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-58.1	0.13	-50.0	-21	28.72

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-56.6	0.13	-48.5	-21	27.22

Frequency 5785 MHz

	-						
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-56.5	0.13	-48.4	-21	27.12

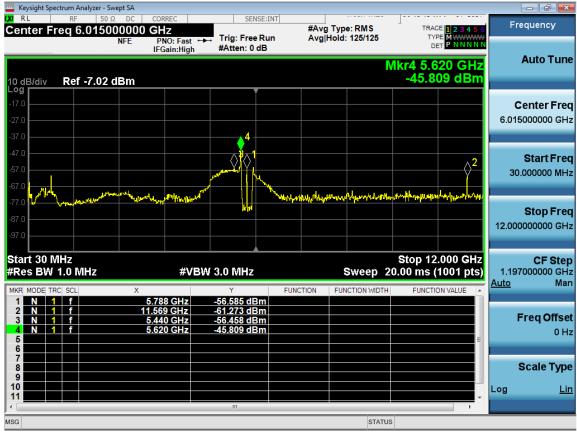
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-57.2	0.13	-49.1	-21	27.82

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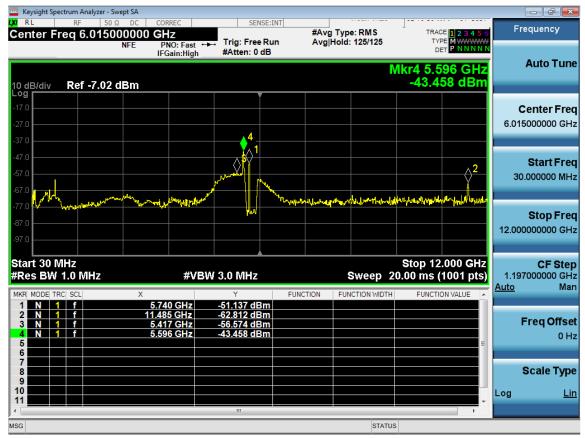
Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



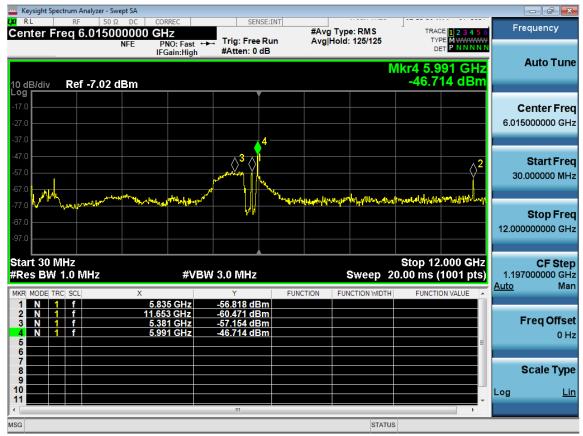
Antenna A

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Antenna A

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Antenna A

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A.6.3: 13 dBi

Conducted Spurs Average Upper

Frequency 5745 MHz

		a Gain			Spur		
Mode	Tx Paths	Correlated Antenna (dBi)	rx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted S (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-72.1	0.13	-59.0	-41	17.71

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

weysight Spectrum Analyzer - Swept SA					
M RL RF 50 Ω DC Center Freq 26.00000000 C <thc< th=""> C <thc< td=""><td>O GHz</td><td>SENSE:INT</td><td>#Avg Type: RMS</td><td>TRACE 1 2 3 4 5 6</td><td>Frequency</td></thc<></thc<>	O GHz	SENSE:INT	#Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref -10.00 dBm		Frig: Free Run #Atten: 0 dB	Avg Hold: 125/125	kr4 34.512 GHz -72.088 dBm	Auto Tune
-20.0 -30.0 -40.0					Center Freq 26.00000000 GHz
-60.0 -60.0 -70.0				4 61 + 0.41 ^m /by	Start Freq 12.000000000 GHz
-80.0 2 -90.0 (-100	Marching and the second states of the second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and the second second	hand a labor of the art the	Stop Freq 40.00000000 GHz
Start 12.00 GHz #Res BW 1.0 MHz	#VBW 3.		Sweep 4	Stop 40.00 GHz 6.87 ms (1001 pts)	CF Step 2.800000000 GHz <u>Auto</u> Man
2 N 1 f 1	5.745 GHz 1.490 GHz 4.512 GHz -7	dBm dBm 2.088 dBm		E	Freq Offset 0 Hz
7 8 9 10 11					Scale Type Log <u>Lin</u>
MSG		III	STATU	5	

Antenna A

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Conducted Spurs Peak Upper

Fred	uency	5745	MHz
1109	lacitoy	51 45	1411 12

		Gain			n		
Mode	x Paths	Correlated Antenna dBi)	x 1 Spur Power dBm)	Juty Cycle dB)	otal Conducted Spur dBm)	.imit dB)	Margin (dB)
	F		ЪС		ЪС	Ĵ	23
Non HT20, 6 to 54 Mbps	1	13	-49.9	0.13	-36.8	-21	15.53

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω DC	CORREC	CENCEJINT			
Center Freq 26.00000000) GHz	SENSE:INT	#Avg Type: RMS Avg Hold: 125/125	TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
NFE		#Atten: 0 dB		DET P NNNNN	Auto Tune
10 dB/div Ref -10.00 dBm			MI	(r4 39.132 GHz -49.914 dBm	Auto Tune
-20.0		Ĭ			Center Freq
-30.0					26.00000000 GHz
-40.0				4	
-50.0			A. I. A. I. MARCHARD	Hermologian when anythere	Start Freq 12.000000000 GHz
-70.0 2 Juli row a real way and a standard	han many and the	where the state of the second s	ntogether hard a the part of the second		12.000000000 GHZ
-80.0					Stop Freq
-90.0					40.000000000 GHz
-100					
Start 12.00 GHz #Res BW 1.0 MHz	#VBW 3	0 MUz	Swoon A	Stop 40.00 GHz 6.87 ms (1001 pts)	CF Step 2.80000000 GHz
	#¥D¥¥ 3			FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 12		74.529 dBm 74.529 dBm			
3		49.914 dBm			Freq Offset 0 Hz
				E	0 H2
7					Scale Type
9					Log Lin
				*	
MSG			STATUS		

Antenna A

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Conducted Spurs Average

Frequency 5720 MHz

Mode		Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6	6 to 54 Mbps	1	13	-62.3	0.13	-49.2	-41	7.92

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-55.3	0.13	-42.2	-41	0.92

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-55.9	0.13	-42.8	-41	1.52

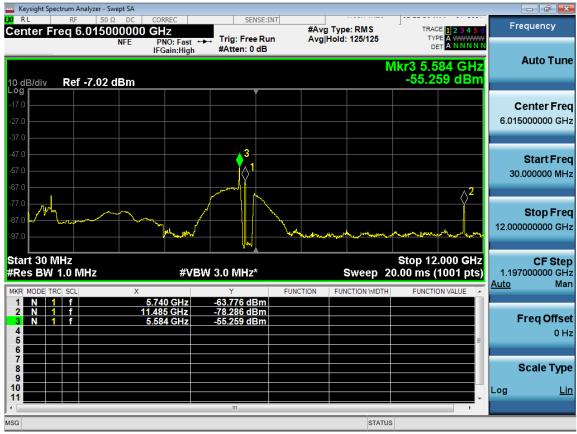
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-56.7	0.13	-43.6	-41	2.32

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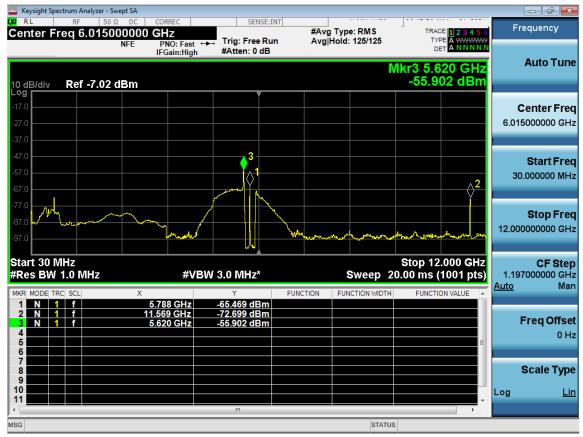
Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps



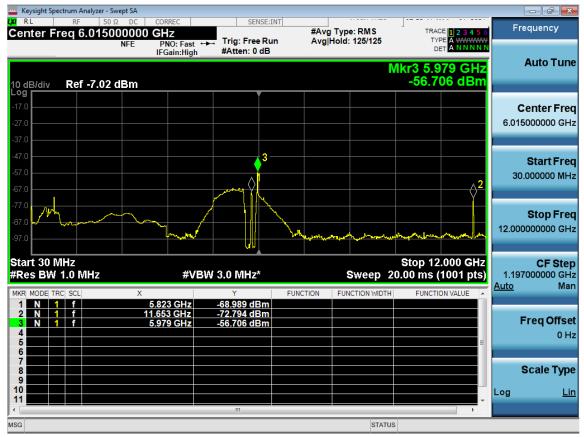
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Antenna A

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Antenna A

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Conducted Spurs Peak

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-62.3	0.13	-49.2	-21	27.92

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-56.1	0.13	-43.0	-21	21.72

Frequency 5785 MHz

		1					
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-56.5	0.13	-43.4	-21	22.12

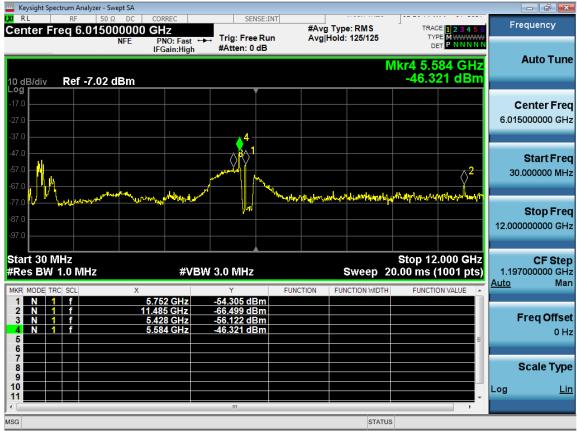
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-57.2	0.13	-44.1	-21	22.82

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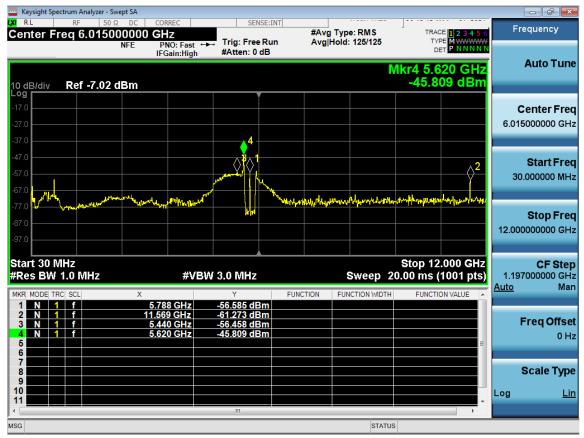
Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps



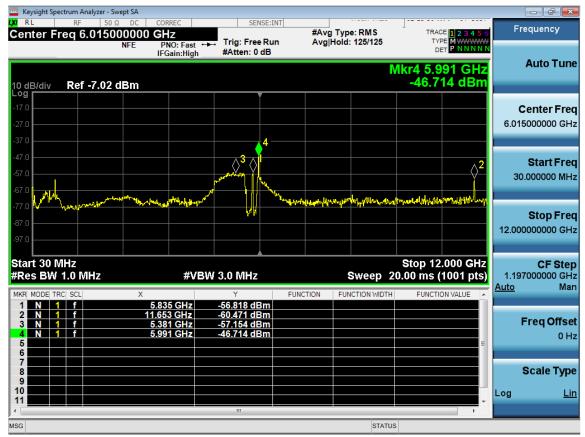
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Antenna A

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Antenna A

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A.6.4: 14 dBi

Conducted Spurs Average Upper

Frequency 5745 MHz

		u					
Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-72.1	0.13	-58.0	-41	16.71

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

weysight Spectrum Analyzer - Swept SA					
M RL RF 50 Ω DC Center Freq 26.00000000 C <thc< th=""> C <thc< td=""><td>O GHz</td><td>SENSE:INT</td><td>#Avg Type: RMS</td><td>TRACE 1 2 3 4 5 6</td><td>Frequency</td></thc<></thc<>	O GHz	SENSE:INT	#Avg Type: RMS	TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref -10.00 dBm		Frig: Free Run #Atten: 0 dB	Avg Hold: 125/125	kr4 34.512 GHz -72.088 dBm	Auto Tune
-20.0 -30.0 -40.0					Center Freq 26.00000000 GHz
-60.0 -60.0 -70.0				4 61 + 0.41 ^m /by	Start Freq 12.000000000 GHz
-80.0 2 -90.0 (-100	Marching and the second states of the second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	and the second second	hand a labor of the art the	Stop Freq 40.00000000 GHz
Start 12.00 GHz #Res BW 1.0 MHz	#VBW 3.		Sweep 4	Stop 40.00 GHz 6.87 ms (1001 pts)	CF Step 2.80000000 GHz <u>Auto</u> Man
2 N 1 f 1	5.745 GHz 1.490 GHz 4.512 GHz -7	dBm dBm 2.088 dBm		E	Freq Offset 0 Hz
7 8 9 10 11					Scale Type Log <u>Lin</u>
MSG		III	STATU	5	

Antenna A

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Conducted Spurs Peak Upper

Fred	uency	5745	MHz
1104	lacitoy	01 40	1411 12

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA RL RF 50 Ω DC	CORREC	CENCEJINT			
Center Freq 26.00000000) GHz	SENSE:INT	#Avg Type: RMS Avg Hold: 125/125	TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
NFE		#Atten: 0 dB		DET P NNNNN	Auto Tune
10 dB/div Ref -10.00 dBm			MI	(r4 39.132 GHz -49.914 dBm	Auto Tune
-20.0		Ĭ			Center Freq
-30.0					26.00000000 GHz
-40.0				4	
-50.0			A. I. A. I. MARCHARD	Hermon and the second second	Start Freq 12.000000000 GHz
-70.0 2 Juli row a real way and a standard	han many and the	where the state of the second s	ntogether hard a the part of the second		12.000000000 GHZ
-80.0					Stop Freq
-90.0					40.000000000 GHz
-100					
Start 12.00 GHz #Res BW 1.0 MHz	#VBW 3	0 MUz	Swoon A	Stop 40.00 GHz 6.87 ms (1001 pts)	CF Step 2.80000000 GHz
	#¥D¥¥ 3			FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 12		74.529 dBm 74.529 dBm			
3		49.914 dBm			Freq Offset 0 Hz
				E	0 H2
7					Scale Type
9					Log Lin
				*	
MSG			STATUS		

Antenna A

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Conducted Spurs Average

Frequency 5720 MHz

Mode		Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to	54 Mbps	1	14	-62.4	0.13	-48.3	-41	7.02

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-57.5	0.13	-43.4	-41	2.12

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	n Tx 1 Spur Power o (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin dB)
Non HT20, 6 to 54 Mbps	1	14	-55.9	0.13	-41.8	-41	0.52

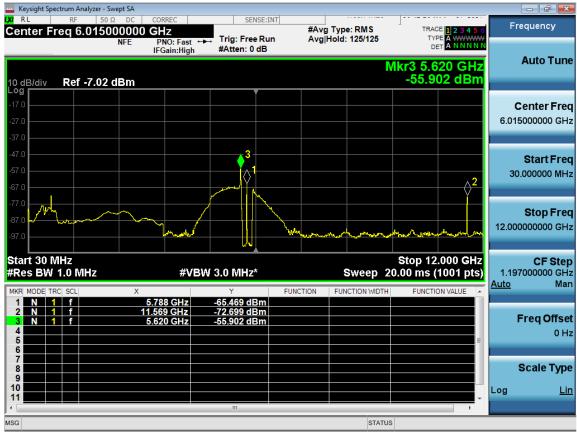
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-56.7	0.13	-42.6	-41	1.32

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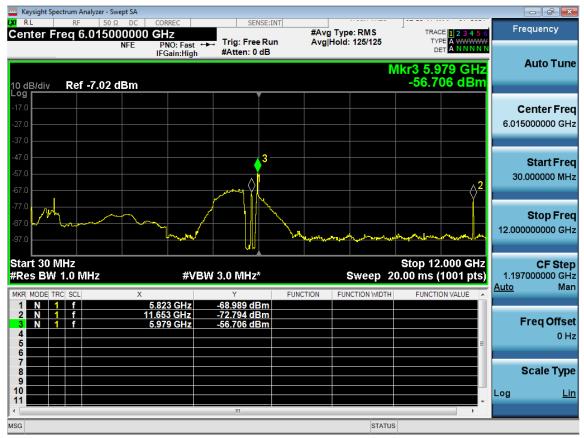
Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



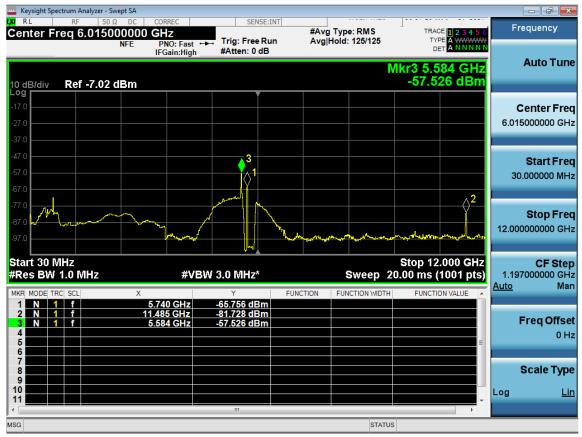
Antenna A

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Antenna A

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Antenna A

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Conducted Spurs Peak

Frequency 5720 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-62.5	0.13	-48.4	-21	27.12

Frequency 5745 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-61.1	0.13	-47.0	-21	25.72

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-56.5	0.13	-42.4	-21	21.12

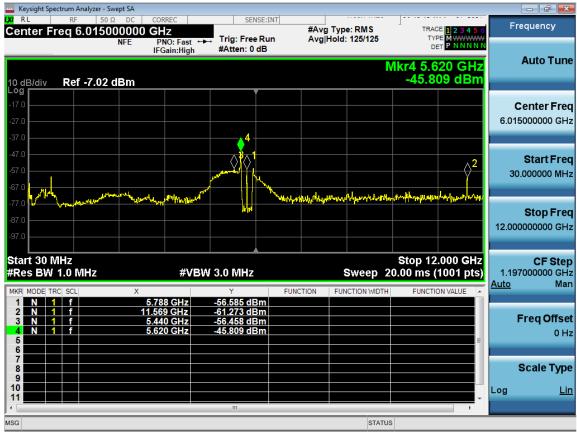
Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Spur Power (dBm)	Duty Cycle (dB)	Total Conducted Spur (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-57.2	0.13	-43.1	-21	21.82

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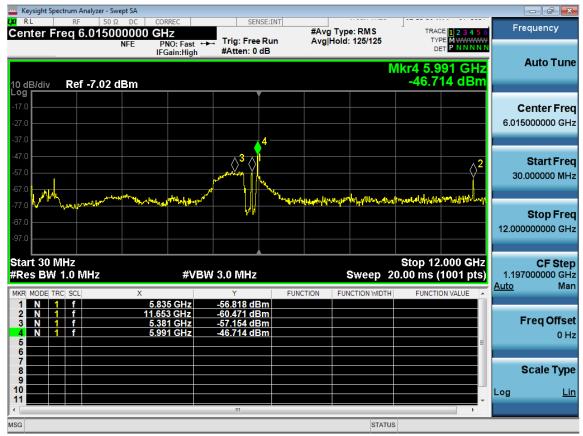
Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps



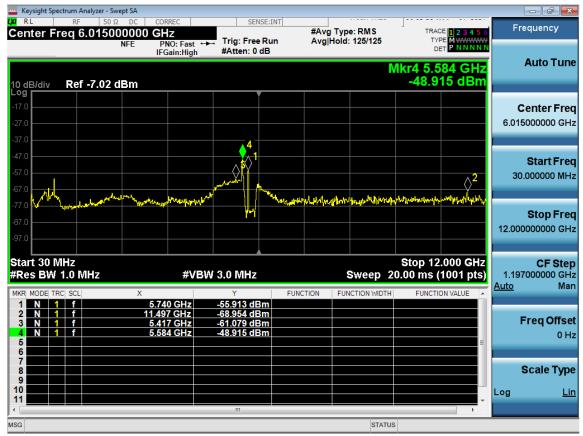
Antenna A

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Antenna A

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Antenna A

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A.7: Conducted Bandedge

Conducted Band Edge Test Requirement

15.407:

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

- (6) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.
- (7) The provisions of §15.205 apply to intentional radiators operating under this section.

(8) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits

KDB 789033 D02 General UNII Test Procedures New Rules v02r01:

2. Unwanted Emissions that fall Outside of the Restricted Bands

a) For all measurements, follow the requirements in II.G.3. "General Requirements for Unwanted Emissions Measurements."

b) At frequencies below 1000 MHz, use the procedure described in II.G.4. "Procedure for Unwanted Emissions Measurements Below 1000 MHz."

c) At frequencies above 1000 MHz, use the procedure for maximum emissions described in II.G.5., "Procedure for Unwanted Emissions Measurements Above 1000 MHz."

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.3

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.

Conducted Band Edge Test Procedure

Ref. 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10: 2013
Conducted Band Edge
Test Procedure
1. Connect the antenna port(s) to the spectrum analyzer input.

2. Place the radio in continuous transmit mode. Use the procedures in KDB 789033 D02 General UNII Test Procedures New Rules v02r01 to substitute conducted measurements in place of radiated measurements.

3. Configure Spectrum analyzer as per test parameters below (be sure to enter all losses between the transmitter output and the spectrum analyzer).

4. Record the marker. Also measure any emissions in the restricted bands.

5. The "measure-and-sum technique" is used for measuring in-band transmit power of a device. In the measureand-sum approach, the conducted emission level is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units. The worst-case output is recorded.

6. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance.

Also measure any emissions in the restricted bands

7. Capture graphs and record pertinent measurement data.

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Ref. 789033 D02 General UNII Test Procedures New Rules v02r01

ANSI C63.10: 2013 Section 12.7.6	(Peak), Section 12.7.7.2 (Method AD)

Conducted Spurious Emissions	
Test parameters	
Peak	Average
Span = 30MHz to 26.5GHz / 26.5GHz to 40GHz	Span = 30MHz to 26.5GHz / 26.5GHz to 40GHz
RBW = 1 MHz	RBW = 1 MHz
VBW ≥ 3 MHz	VBW ≥ 3 MHz
Sweep = Auto couple	Sweep = Auto couple
Detector = Peak	Detector = RMS
Trace = Max Hold.	Power Averaging
Tested By:	Date of testing:

30-JUL-2021 to 31-JUL-2021; 03-AUG-2021

Test Equipment

Test Result: PASS

See Appendix C for list of test equipment

Johanna Knudsen, Julian Land, Mathew Blackburn

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A.7.1: 7 dBi

Conducted Bandedge Peak 15407L

Frequency 5745 MHz

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA					- 6 💌
RL RF 50 Ω DC Center Freq 5.602500000 Contect Conte	GHz	#Avg Typ #Avg Typ e Run Avg Hold		E 1 2 3 4 5 6	Frequency
10 dB/div Ref 23.00 dBm	PNO: Fast Trig: Fre IFGain:Low #Atten: 2		Mkr2 5.583	22 GHz 81 dBm	Auto Tune
13.0 3.00 -7.00					Center Freq 5.602500000 GHz
-17.0 -27.0 -37.0	2				Start Freq 5.460000000 GHz
-47.0 -57.0 -67.0 dat the the back of the state of the st	Herailalitelitelitelitelitelitelitelitelitelite	ค _{ามส} ายส.การ์ไปประเทศ	mandation and a way of the second		Stop Freq 5.745000000 GHz
Start 5.4600 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	<u>z</u>	Stop 5.7 Sweep 1.066 ms (7450 GHz 4000 pts) Au	CF Step 28.500000 MHz ito Man
2 N 1 f 5.50 3 4 5 5 6	25 00 GHz 32.328 d 83 22 GHz 49.681 d	Bm	NCTION WIDTH FUNCTIN		Freq Offset 0 Hz
7 8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10					Scale Type
MSG			STATUS		

Antenna A

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Conducted Bandedge Peak 15407R

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-51.7	-44.6	-27	17.57

Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	7	-52.0	-44.9	-27	17.87

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Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA								
RL RF 50 Ω DC Center Freq 6.762500000	GHz	SENS		#Avg Typ		TRAC		Frequency
NFE	PNO: Fast ++ IFGain:Low	 Trig: Free F #Atten: 28 d 		Avg Hold:	125/125	DE		
					Mk	r2 5.93	0 GHz	Auto Tune
10 dB/div Ref 23.00 dBm						-51.6	76 dBm	
13.0								Center Freq
3.00								6.762500000 GHz
-7.00								
-17.0								Start Freq
-27.0								5.775000000 GHz
-37.0								
-47.0								Stop Freq
								7.750000000 GHz
-67.0	and the second states and a		unplying window	an in the second states	hind the states of the states	erpelanten pleter	ad at the second	
Start 5.7750 GHz					1	Stop 7.7	'500 GHz	CF Step
#Res BW 1.0 MHz	#VBW	/ 3.0 MHz		<u> </u>	Sweep 3	.466 ms (4000 pts)	197.500000 MHz Auto Man
MKR MODE TRC SCL X	850 0 GHz	∨ -67.624 dBr	FUNCT	ION FUN	ICTION WIDTH	FUNCTION	ON VALUE	Auto Mari
2 N 1 f 5.9	939 0 GHz	-51.676 dBn						Freq Offset
3 4								0 Hz
5							E	
7								Scale Type
9								
10								Log <u>Lin</u>
					ĺ	1	•	
MSG					STATUS			

Antenna A

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Keysight Spectrum Analyzer - Swept SA						- 6 -
KE RF 50 Ω DC Center Freq 6.76250000	CORREC	SENSE:I	#Avg	Type: RMS	TRACE 1 2 3 4 5	Frequency
NFE	PNO: Fast ← IFGain:Low	 Trig: Free Ru #Atten: 24 dB 		lold: 125/125		
10 dB/diy Ref 23.00 dBm				Mk	r2 5.982 4 GHz -51.952 dBm	Auto Tune
Log 13.0 3.00						Center Freq 6.762500000 GHz
-17.0 -27.0 -37.0						Start Freq 5.775000000 GHz
-47.0 2 -67.0	hinter the state of the state o	A with the set of the	n an in the state of the state	lanaidh laiteachaig ais leag	ng data pila pila di katalang	Stop Freq 7.75000000 GHz
Start 5.7750 GHz #Res BW 1.0 MHz		W 3.0 MHz			Stop 7.7500 GHz 466 ms (4000 pts)	197.500000 MHz
MKR MODE TRC SCL	5.850 0 GHz	۲ -38.522 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
	5.982 4 GHz	-51.952 dBm				Freq Offset 0 Hz
7 8 8 9 10 11						Scale Type
MSG		III		STATUS	•	
Wod				STATUS		

Antenna A

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A.7.2: 8 dBi

Conducted Bandedge Peak 15407L

Frequency 5745 MHz

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA					- 6 💌
RL RF 50 Ω DC Center Freq 5.602500000 Contect Conte	GHz	#Avg Typ #Avg Typ e Run Avg Hold			Frequency
10 dB/div Ref 23.00 dBm	PNO: Fast Trig: Fre IFGain:Low #Atten: 2		Mkr2 5.583	22 GHz 81 dBm	Auto Tune
13.0 3.00 -7.00					Center Freq 5.602500000 GHz
-17.0 -27.0 -37.0	2				Start Freq 5.460000000 GHz
-47.0 -57.0 -67.0 dat the the back of the state of the st	Herailalitelitelitelitelitelitelitelitelitelite	คุณสูงประหนุ่ม) (ระเปล่าไหร่างไรเป	mandation and a way of the second		Stop Freq 5.745000000 GHz
Start 5.4600 GHz #Res BW 1.0 MHz	#VBW 3.0 MHz	<u>z</u>	Stop 5.7 Sweep 1.066 ms (7450 GHz 4000 pts) Au	CF Step 28.500000 MHz ito Man
2 N 1 f 5.50 3 4 5 5 6	25 00 GHz 32.328 d 83 22 GHz 49.681 d	Bm	NCTION WIDTH FUNCTIN		Freq Offset 0 Hz
7 8 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10					Scale Type
MSG			STATUS		

Antenna A

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Conducted Bandedge Peak 15407R

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-51.7	-43.6	-27	16.57

Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	8	-52.0	-43.9	-27	16.87

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Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA	CORREC	CENCE	-7817				
Center Freq 6.762500000		Trig: Free R	#Avg	Type: RMS Hold: 125/125	TRAC	E 1 2 3 4 5 6 E A WWWW	Frequency
NFE	IFGain:Low	#Atten: 28 d			DE		Auto Tune
10 dB/diy Ref 23.00 dBm				Mł	(r2 5.939 -51.67	0 GHz 76 dBm	Autorune
13.0 3.00							Center Freq 6.762500000 GHz
-7.00 -17.0 -27.0 -37.0							Start Freq 5.775000000 GHz
-47.0 -67.0 -67.0	al the state of the		npaquaania aykayydd	hadijidar kunstitidan daraya	an palakita palakita	al a finite of the program	Stop Freq 7.750000000 GHz
Start 5.7750 GHz #Res BW 1.0 MHz	#VBW	/ 3.0 MHz		Sweep 3	Stop 7.7 .466 ms (4	500 GHz 1000 pts)	CF Step 197.500000 MHz Auto Man
2 N 1 f 5.3 3 4 5 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	850 0 GHz 939 0 GHz	Y -67.624 dBm -51.676 dBm		FUNCTION WIDTH	FUNCTIO	E	Freq Offset 0 Hz
7 8 9 9 9 9 9 10 11 1 9 10 10 10 10 10 10 10 10 10 10 10 10 10							Scale Type
MSG				STATU	5	4	

Antenna A

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5825 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA						- 6 -
KE RF 50 Ω DC Center Freq 6.76250000	CORREC	SENSE:I	#Avg	Type: RMS	TRACE 1 2 3 4 5	Frequency
NFE	PNO: Fast ← IFGain:Low	 Trig: Free Ru #Atten: 24 dB 		lold: 125/125		
10 dB/diy Ref 23.00 dBm				Mk	r2 5.982 4 GHz -51.952 dBm	Auto Tune
Log 13.0 3.00						Center Freq 6.762500000 GHz
-17.0 -27.0 -37.0						Start Freq 5.775000000 GHz
-47.0 2 -67.0	hinter the state of the state o	A with the call is a first section of the call	n an in the state of the state	lanaidh laiteachaig ais leag	ng data pila pila di katalang	Stop Freq 7.75000000 GHz
Start 5.7750 GHz #Res BW 1.0 MHz		W 3.0 MHz			Stop 7.7500 GHz 466 ms (4000 pts)	197.500000 MHz
MKR MODE TRC SCL	5.850 0 GHz	۲ -38.522 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
	5.982 4 GHz	-51.952 dBm				Freq Offset 0 Hz
7 8 8 9 10 11						Scale Type
MSG		III		STATUS	•	
Wod				STATUS		

Antenna A

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A.7.3: 13 dBi

Conducted Bandedge Peak 15407L

Frequency 5745 MHz

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA					
X RL RF 50 Ω DC Center Freq 5.602500000 DC DC DC DC		SENSE:INT	#Avg Type: RMS Avg Hold: 125/125	TRACE 1 2 3 4 5 6 TYPE A WWWW	Frequency
NFE		ten: 22 dB		DET P NNNN	Auto Tune
10 dB/div Ref 19.00 dBm			Mkı	r2 5.582 51 GHz -52.48 <u>1 dBm</u>	Auto Tune
9,00 -1.00 -11.0					Center Freq 5.602500000 GHz
-21.0 -31.0 -41.0					Start Freq 5.460000000 GHz
-51.0 -61.0 -71.0	lating political plants	Whitehout	higinaha, hijosallu dahar kolu		Stop Freq 5.745000000 GHz
Start 5.4600 GHz #Res BW 1.0 MHz	#VBW 3.0	MHz	Sweep 1	Stop 5.7450 GHz I.066 ms (4000 pts)	CF Step 28.500000 MHz Auto Man
MKR MODE TRC SCL X			CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 N 1 f 5.52 3 4 5 5 6	25 00 GHz -47.2 32 51 GHz -52.4	225 dBm 181 dBm			Freq Offset 0 Hz
7 8 8 9 9 10 11					Scale Type
∢ [MSG		III	STATU	s	

Antenna A

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Conducted Bandedge Peak 15407R

Frequency 5785 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Fotal Tx Bandedge Level (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-51.7	-38.6	-27	11.57

Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	13	-52.0	-38.9	-27	11.87

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Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA	CORREC	CENCE	-7817				
Center Freq 6.762500000		Trig: Free R	#Avg	Type: RMS Hold: 125/125	TRAC	E 1 2 3 4 5 6 E A WWWW	Frequency
NFE	IFGain:Low	#Atten: 28 d			DE		Auto Tune
10 dB/diy Ref 23.00 dBm				Mł	(r2 5.939 -51.67	0 GHz 76 dBm	Autorune
13.0 3.00							Center Freq 6.762500000 GHz
-7.00 -17.0 -27.0 -37.0							Start Freq 5.775000000 GHz
-47.0 -67.0 -67.0	al the state of the		npaquaanda oo baada	hadijidar kunstitidan daraya	an palakita palakita	al a finite of the program	Stop Freq 7.750000000 GHz
Start 5.7750 GHz #Res BW 1.0 MHz	#VBW	/ 3.0 MHz		Sweep 3	Stop 7.7 .466 ms (4	500 GHz 1000 pts)	CF Step 197.500000 MHz Auto Man
2 N 1 f 5.3 3 4 5 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	850 0 GHz 939 0 GHz	Y -67.624 dBm -51.676 dBm		FUNCTION WIDTH	FUNCTIO	E	Freq Offset 0 Hz
7 8 9 9 9 9 9 10 11 1 9 10 10 10 10 10 10 10 10 10 10 10 10 10							Scale Type
MSG				STATU	S	4	

Antenna A

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5825 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA	CORREC	SENSE:I	NT			
Center Freq 6.76250000			#Avg	Type: RMS Hold: 125/125	TRACE 1 2 3 4 5 TYPE A WWWW	Frequency
	IFGain:Low	#Atten: 24 dE			DET PNNN	Auto Tune
10 dB/diy Ref 23.00 dBm				Mk	r2 5.982 4 GHz -51.952 dBm	
13.0		ļĬ_				Center Freq
3.00						6.762500000 GHz
-7.00						
-27.0						Start Freq 5.77500000 GHz
-37.0						
-47.0						Stop Freq
ez o						7.75000000 GHz
	ta da la serie de la serie	n in the second seco	neria ajuka para dala parinte	kapan di kalendari di kanga	ng dalah da katan kat	
Start 5.7750 GHz #Res BW 1.0 MHz	#VBW	V 3.0 MHz		Sweep 3	Stop 7.7500 GHz 466 ms (4000 pts)	197.500000 MHz
MKR MODE TRC SCL X		Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 N 1 f 5	.850 0 GHz .982 4 GHz	-38.522 dBm -51.952 dBm				Freq Offset
3 4						0 Hz
6					E	
8						Scale Type
9 10 11						Log <u>Lin</u>
		III			4	
MSG				STATUS		

Antenna A

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A.7.4: 14 dBi

Conducted Bandedge Peak 15407L

Frequency 5745 MHz

Data Screenshots

5745 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA						- ¢ 🔀
ໝ RL RF 50Ω DC Center Freq 5.602500000		SENSE:II	#Avg	Type: RMS Iold: 125/125	TRACE 1 2 3 4 5 6 TYPE A WWWWW	Frequency
NFE	PNO: Fast ++ IFGain:Low	 Trig: Free Run #Atten: 18 dB 	n Avgin	1010: 120/120	DET	
10 dB/div Ref 17.50 dBm				Mkr	2 5.582 58 GHz -54.675 dBm	Auto Tune
Log		T				
7.50						Center Freq
-2.50						5.602500000 GHz
-12.5						
-32.5						Start Freq
-42.5						5.460000000 GHz
-52.5		<mark>_ ♦</mark> ²			<u>y</u> r	
-62.5						Stop Freq
	. It		Lahladh ha Li			5.745000000 GHz
⁻⁷²⁵		n inninn			Stop 5.7450 GHz	OF Otom
#Res BW 1.0 MHz	#VBW	3.0 MHz		Sweep 1.	.066 ms (4000 pts)	CF Step 28.500000 MHz
MKR MODE TRC SCL X		Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f 5.7 2 N 1 f 5.5	25 00 GHz 82 58 GHz	-50.236 dBm -54.675 dBm				
		-04.070 0.0111				Freq Offset
5					E	0 Hz
6 7						
8						Scale Type
10					_	Log <u>Lin</u>
		III			4	
MSG				STATUS	3	

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Conducted Bandedge Peak 15407R

Frequency 5785 MHz

Frequency 5825 MHz

Mode	Tx Paths	Correlated Antenna Gain (dBi)	Tx 1 Bandedge Level (dBm)	Total Tx Bandedge Level (dBm)	Limit (dB)	Margin (dB)
Non HT20, 6 to 54 Mbps	1	14	-52.0	-37.9	-27	10.87

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Data Screenshots

5785 MHz: Non HT20, 6 to 54 Mbps

Keysight Spectrum Analyzer - Swept SA	CORREC	CENCE	-7817				e e <mark>x</mark>
Center Freq 6.762500000		Trig: Free R	#Av	g Type: RMS Hold: 125/125	⊥ TRAC TYP	E 1 2 3 4 5 6 E A WWWW	Frequency
NFE	IFGain:Low	#Atten: 28 d			DE		Auto Tune
10 dB/diy Ref 23.00 dBm				MI	(r2 5.939 -51.67	9 0 GHz 76 dBm	Auto Func
13.0 3.00							Center Freq 6.762500000 GHz
-7.00 -17.0 -27.0 -37.0							Start Freq 5.775000000 GHz
-47.0 -67.0 -67.0			en e Navasse la presidente	n e fijdere in hereitig bester en ser			Stop Freq 7.750000000 GHz
Start 5.7750 GHz #Res BW 1.0 MHz	#VBW	/ 3.0 MHz		Sweep 3	Stop 7.7 .466 ms (4	′500 GHz 4000 pts)	CF Step 197.500000 MHz Auto Man
2 N 1 f 5.3 3 4 5 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	850 0 GHz 939 0 GHz	Y -67.624 dBm -51.676 dBm		FUNCTION WIDTH	FUNCTIO	DN VALUE	Freq Offset 0 Hz
7 8 9 9 9 9 9 10 11 1 9 10 10 10 10 10 10 10 10 10 10 10 10 10							Scale Type
MSG							

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5825 MHz: Non HT20, 6 to 54 Mbps

🔤 Keysight Spectrum Analyzer - Swept SA						- 6 -
Center Freq 6.7625000		SENSE:I	#Avg	Type: RMS	TRACE 1 2 3 4 5	Frequency
NFE	PNO: Fast ← IFGain:Low	 Trig: Free Ru #Atten: 24 dB 		lold: 125/125		
10 dB/diy Ref 23.00 dBm	n			Mk	r2 5.982 4 GHz -51.952 dBm	Auto Tune
Log 13.0 -7.00						Center Freq 6.762500000 GHz
-17.0 -27.0 -37.0						Start Freq 5.775000000 GHz
-47.0 2 -67.0	a hi san hi	مر بالدين المراجع المر من مراجع المراجع	and in the second s	lanaidh laiteachaig ais leag	ng data pila pila di katalang data kang data katalang di katalang di katalang di katalang di katalang di katala	Stop Freq 7.75000000 GHz
Start 5.7750 GHz #Res BW 1.0 MHz		W 3.0 MHz			Stop 7.7500 GHz 466 ms (4000 pts)	197.500000 MHz
MKR MODE TRC SCL	× 5.850 0 GHz	۲ -38.522 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 N 1 f 3 4 5 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	5.982 4 GHz	-51.952 dBm				Freq Offset 0 Hz
7 8 9 9 10 11						Scale Type Log <u>Lin</u>
MSG		III		STATUS	Þ	
Mod				STATUS		

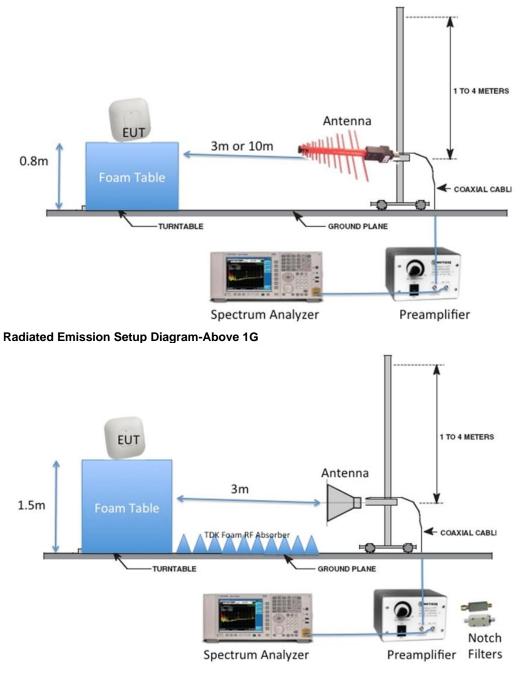
Antenna A

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Appendix B: Emission Test Results

Testing Laboratory: Cisco Systems, Inc., 125 West Tasman Drive, San Jose, CA 95134, USA

Radiated Emission Setup Diagram-Below 1G



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B.1: Radiated Spurious Emissions

FCC 15.205 | 15.407

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Not covered by the scope of this test report.

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B.2: Radiated Emissions 30MHz to 1GHz

FCC 15.209 | 15.205 | 15.407

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Ref. ANSI C63.10: 2013 section 6.5

Not covered by the scope of this test report.

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B.3: AC Conducted Emissions

FCC 15.207

Except when the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply, either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table in these sections. The more stringent limit applies at the frequency range boundaries.

Measurement Procedure Accordance with ANSI C63.10:2013 section 6.2

Not covered by the scope of this test report.

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Equipment #	Manufacturer/ Model	Description	Last Cal	Next Due			
	Test Equipment used for conducted tests – Rack 9						
58719	Cisco/Automation Test Insertion Loss	Rack 9	Verify Before Use	Verify Before Use			
53614	Keysight (Agilent/HP)/ N9030B-550 OPT LNP EP0	PXA Signal Analyzer, 2Hz- 50GHz with Options LNP and EP0	1-Jul-21	1-Jul-22			
58231	NATIONAL INSTRUMENTS / PXIe- 1062Q	CHASSIS	Cal Not Required	Cal Not Required			
58232	NATIONAL INSTRUMENTS / PXIe- 8840	Up to 2.6 GHz Quad-Core PXI Express Controller	Cal Not Required	Cal Not Required			
58234	NATIONAL INSTRUMENTS / PXI-2796	40 GHz Dual 6x1 Multiplexer (SP6T)	Verify Before Use	Verify Before Use			
58236	NATIONAL INSTRUMENTS / PXI-2796	40 GHz Dual 6x1 Multiplexer (SP6T)	Verify Before Use	Verify Before Use			
58237	NATIONAL INSTRUMENTS / PXI-2799	Switch 1x1	Verify Before Use	Verify Before Use			
54235	PASTERNACK/ PE5019-1	Torque Wrench	9-Mar-21	9-Mar-22			
58256	COMET/ T7611-4	WEB SENSOR FOR REMOTE THERMOMETER HYGROMETER	3-Feb-21	3-Feb-22			

Appendix C: List of Test Equipment Used to perform the test

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Appendix D: Abbreviation Key and Definitions

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz (1x10 ³)
EN	European Norm	MHz	MegaHertz (1x10 ⁶)
IEC	International Electro technical Commission	GHz	Gigahertz (1x10 ⁹)
CISPR	International Special Committee on Radio Interference	н	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV Kilovolt (1)	
L1	Line 1	μV Microvolt (1x1	
L2	Line2	А	Amp
L3	Line 3	μΑ	Micro Amp (1x10 ⁻⁶)
DC	Direct Current	mS	Milli Second (1x10 ⁻³)
RAW	Uncorrected measurement value, as indicated by the measuring device	μS	Micro Second (1x10 ⁻⁶)
RF	Radio Frequency	μS	Micro Second (1x10 ⁻⁶)
SLCE	Signal Line Conducted Emissions		
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
Р	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current

The following table defines abbreviations used within this test report.

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Appendix E: Photographs of Test Setups

EUT Photos have been omitted from this test report. Photos can be found in the supplementary exhibit included in the submission and EDCS# 22609793.

Appendix F: Software Used to Perform Testing

Cisco Internal LabView Radio Test Automation Software:

RF Automation Main versions: 230 RF Domain Report Generation - version 3

Appendix G: Test Procedures

Measurements were made in accordance with:

- KDB Publication No. 789033 D02 General UNII Test Procedures New Rules v02r01
- KDB Publication No. 662911 MIMO
- ANSI C63.4 2014 Unintentional Radiators
- ANSI C63.10 2013 Intentional Radiators

Test procedures are summarized below:

FCC 5GHz Test Procedures	EDCS # 1445048
FCC 5GHz RSE Test Procedures	EDCS # 1511600

Appendix H: Scope of Accreditation (A2LA certificate number 1178-01)

The scope of accreditation of Cisco Systems, Inc. can be found on the A2LA web page at:

http://www.a2la.org/scopepdf/1178-01.pdf

Appendix I: Test Assessment Plan

Compliance Test Plan EDCS# 21468207 Target Power Tables (Excel) EDCS# EDCS-21389500

Appendix J: Worst Case Justification

N/A

End

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