Radio Test Report

C9120AXE-x
(x = A, B, N, T)

FCC ID: LDKEDAC92157
IC: 2461N-EDAC92157

5150 MHz – 5250 MHz

5250 MHz – 5350 MHzh

5470 MHz – 5725 MHz

5725 MHz – 5850 MHz

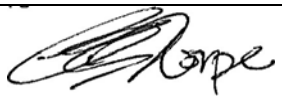
Against the following Specifications:

Radiated TX Spurious Emissions

CFR47 Part 15.407; LP0002 (2018);
RSS-247 Issue 2, Feb 2017; RSS-GEN Issue 5, Feb 2019

ACCREDITED

Cisco Systems
170 West Tasman Drive
San Jose, CA 95134

	
Author: Allan Beecroft **Tested By: Allan Beecroft**	**Approved By:** Gerard Thorpe **Title:** Manager. MGMT-Engineering
Revision: 1.1	**Issue Date: 12-AUG-2020**

This report replaces any previously entered test report under EDCS – 19928593 This test report has been electronically authorized and archived using the CISCO Engineering Document Control system. Test Report Template EDCS# 1526148

Section 1: Overview

1.1 Test Summary

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

Specifications
Radiated TX Spurious Emissions only **CFR47 Part 15.407;** **LP0002 (2018);** **RSS-247 Issue 2, Feb 2017;** **RSS-GEN Issue 5, Feb 2019**

Section 2: Assessment Information

2.1 General

This report contains an assessment of an apparatus against Radio 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	860mbar to 1060mbar (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%)

2.2 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	± 0.54º.
humidity measurements	± 2.3%
DC and low frequency measurements	± 2.5%.

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 – 40GHz	+/- 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.

2.3 Date of testing (initial sample receipt date to last date of testing)

01-JUL-2020 to 09-JUL-2020

2.4 Report Issue Date

See cover page.

2.5 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

Registration Numbers for Industry Canada

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 I, 5m Chamber	285 W. Tasman Drive San Jose, California 95134 United States	Company #: 2461M-1

Test Engineers
Allan Beecroft

2.6 Equipment Assessed (EUT)

C9120AXE-A, V04

2.7 EUT Description

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. Data is recorded at the lowest supported data rate for each mode. This report covers operation on channel 1-11.

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

The following antennas are supported by this product series.
The data included in this report represent the worst case data for all antennas.

Frequency	Part Number	Antenna Type	Antenna Gain (dBi)
-E SKU			
2.4GHz&5GHz	AIR-ANT2524DB-R/=	2.4 GHz 2 dBi/5 GHz 4 dBi Dipole Ant., Black, connectors RP-TNC	2dBi@2.4GHz 4dBi@5GHz
2.4GHz&5GHz	AIR-ANT2524DG-R/=	2.4 GHz 2 dBi/5 GHz 4 dBi Dipole Ant., Gray, connectors RP-TNC	2dBi@2.4GHz 4dBi@5GHz
2.4GHz&5GHz	AIR-ANT2524DW-R/=	2.4 GHz 2 dBi/5 GHz 4 dBi Dipole Ant., White, connectors RP-TNC	2dBi@2.4GHz 4dBi@5GHz
2.4GHz&5GHz	AIR-ANT2535SDW-R	2.4 GHz 3dBi/5 GHz 5 dBi Low Profile Antenna, White, connectors RP-TNC	3dBi@2.4GHz 5dBi@5GHz
2.4GHz&5GHz	AIR-ANT2566P4W-R=	2.4 GHz 6 dBi/5 GHz 6 dBi Directionnel Ant., 4-port, connectors RP-TNC	6dBi@2.4GHz 6dBi@5GHz
2.4GHz&5GHz	AIR-ANT2524V4C-R=	2.4GHz 2 dBi/5GHz 4 dBi Ceiling Mount Omni Ant., 4-port, connectors RP-TNC	2dBi@2.4GHz 4dBi@5GHz
2.4GHz&5GHz	AIR-ANT2544V4M-R=	2.4GHz 4 dBi/5GHz 4 dBi Wall Mount Omni Ant., 4-port, connectors RP-TNC	4dBi@2.4GHz 4dBi@5GHz
2.4GHz&5GHz	AIR-ANT2566D4M-R=	2.4 GHz 6 dBi/5 GHz 6 dBi 60 Deg. Patch Ant., 4-port, RP-TNC	6dBi@2.4GHz 6dBi@5GHz

Section 3: Result Summary

3.1 Results Summary Table

Radiated Emissions (General requirements)

Basic Standard	Technical Requirements / Details	Result
FCC 15.209; FCC 15.205; FCC 15.407(b); RSS-GEN Sec 8.9, 8.10; RSS-247 Sec 6.2; LP0002 (2018) Sec 3.10 & 4.7	**TX Spurious Emissions:** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the field strength limits table in this section.	Pass

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. Please also refer to the "Justification for worst Case test Configuration" section of this report for further details on the selection of EUT samples.

4.1 Sample Details

Sample No.	**Equipment Details**	**Manufacturer**	Hardware Rev.	Firmware Rev.	Software Rev.	**Serial Number**
S01	C9120AXI-x	FOC24172PXD	074-124657-01	S01	C9120AXI-x	FOC24172PXD
S02	AIR-PWRINJ6 V01	C16036663000000279	341-100456-01	S02	AIR-PWRINJ6 V01	C16036663000000279

4.2 System Details

System #	Description	Samples
1	UUT + PoE supply	S01 +S02

4.3 Mode of Operation Details

Mode#	Description	Comments
1	Continuous Transmit	All radios transmitting simultaneously.
2	Continuous Receive	All radios simultaneously in receive mode.

4.4 Software Images

Cisco AP Software, (ap1g7), [rtp-ads-139:/nobackup/eyankevi/Vanc-E_VE_c172_thr_May09/router] Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2020 by Cisco Systems, Inc. Compiled Tue May 19 23:48:59 EDT 2020
Cisco AP Software, (ap1g7), [sjc-ads-5182:/nobackup/maruthib/vanc_detBW] Technical Support: http://www.cisco.com/techsupport Copyright (c) 1986-2020 by Cisco Systems, Inc. Compiled Thu Jun 18 15:00:00 PDT 2020 The following plots were re-measured with ant-A @ 10dBm, ant B, C & D @ 15dBm: A.1.A.16H; A.1.A.16V; A.1.A.17H; A.1.A.17V; A.1.A.18H; A.1.A.18V; A.1.A.19H; A.1.A.19V; A.1.A.20H; A.1.A.20V

Appendix A: Emission Test Results

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

A1 Radiated Spurious Emissions 1GHz – 40GHz

Ref. ANSI C63.10: 2013 section 12.7.6 (peak) & 12.7.7.3 (average)

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	1GHz – 40 GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	1MHz
Video Bandwidth:	3 MHz
Detector:	Peak/Average

Terminate the access Point RF ports with 50 ohm loads.

Define worst case azimuth x, y, z.
Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

1) Average Plot (Vertical and Horizontal), Limit= 54dBuV/m @3m
2) Peak plot (Vertical and Horizontal), Limit = 74dBuV/m @3m

This report represents data for all supported operating modes and antennas.

System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	☑	☐
2	Support	S02	☐	☑

Tested By : Allan Beecroft	**Date of testing: 01-JUL-2020to 23-JUL-2020**
Test Result : Pass	

See Appendix C for list of test equipment

A.1.A Transmitter Radiated Spurious Emissions-Average (1GHz – 10GHz)

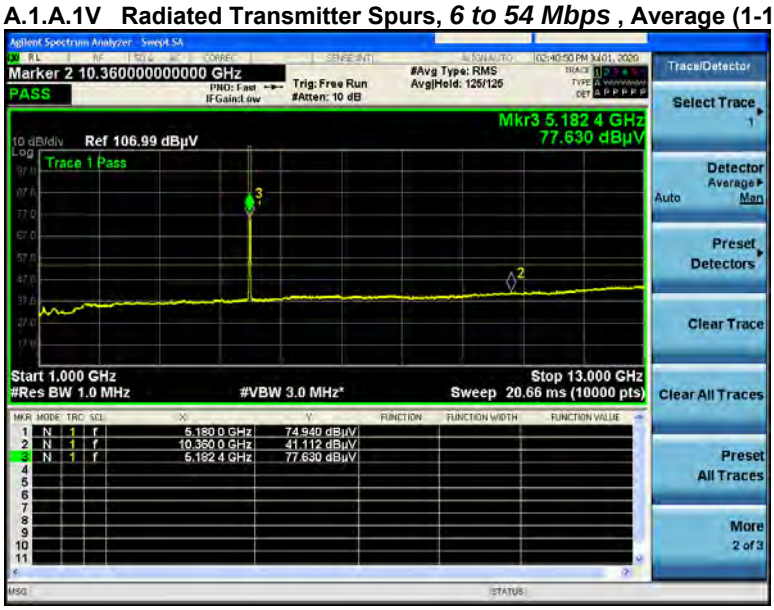
There are no harmonic emissions to measure below 10GHz.

Non-HE20, 5180MHz

A.1.A.1H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (1-10GHz)

Non-HE20, 5180MHz

A.1.A.1V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (1-10GHz)



Non-HE20, 5200MHz

A.1.A.2H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (1-10GHz)

Non-HE20, 5200MHz

A.1.A.2V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (1-10GHz)

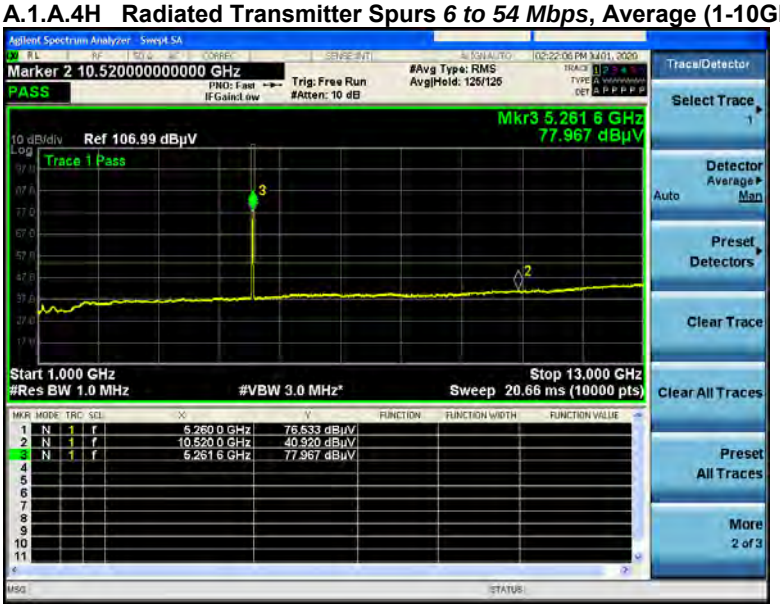
Non-HE20, 5240MHz

A.1.A.3H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (1-10GHz)

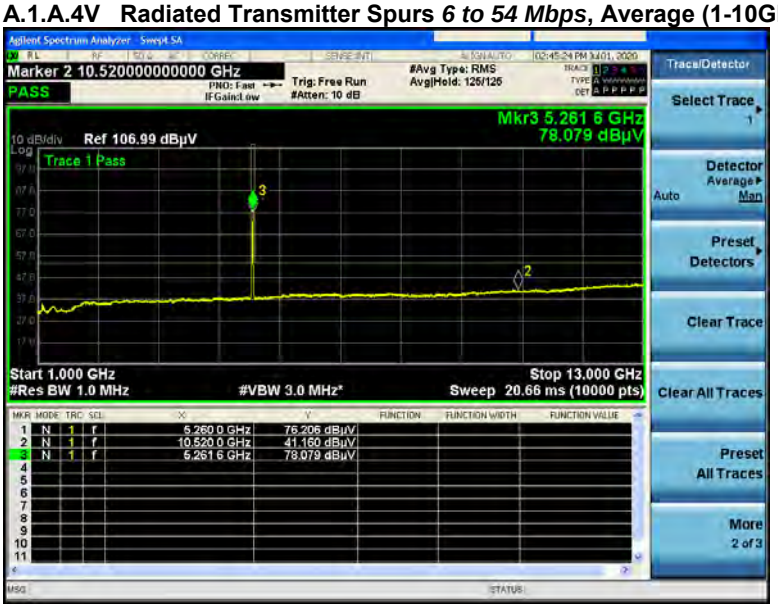
Non-HE20, 5240MHz

A.1.A.3V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (1-10GHz)

Non-HE20, *5260 MHz*
A.1.A.4H Radiated Transmitter Spurs *6 to 54 Mbps*, Average (1-10GHz)

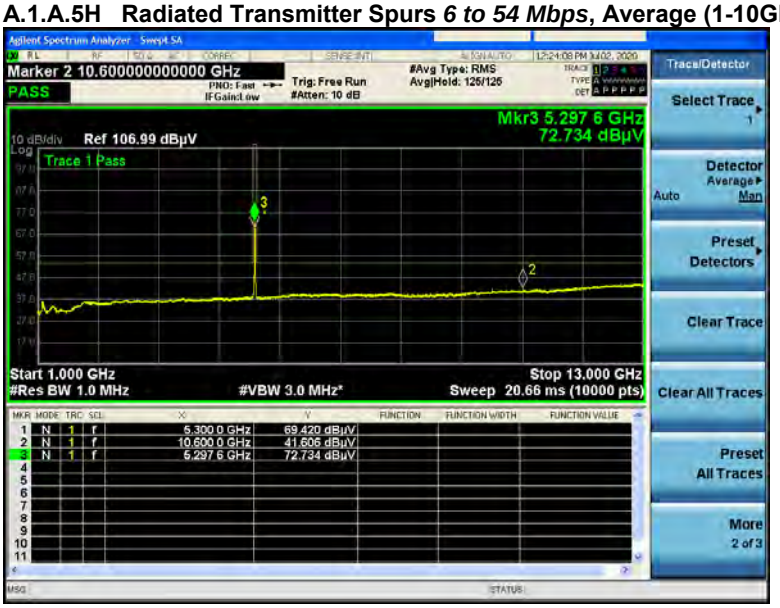


Non-HE20, *5260 MHz*
A.1.A.4V Radiated Transmitter Spurs *6 to 54 Mbps*, Average (1-10GHz)



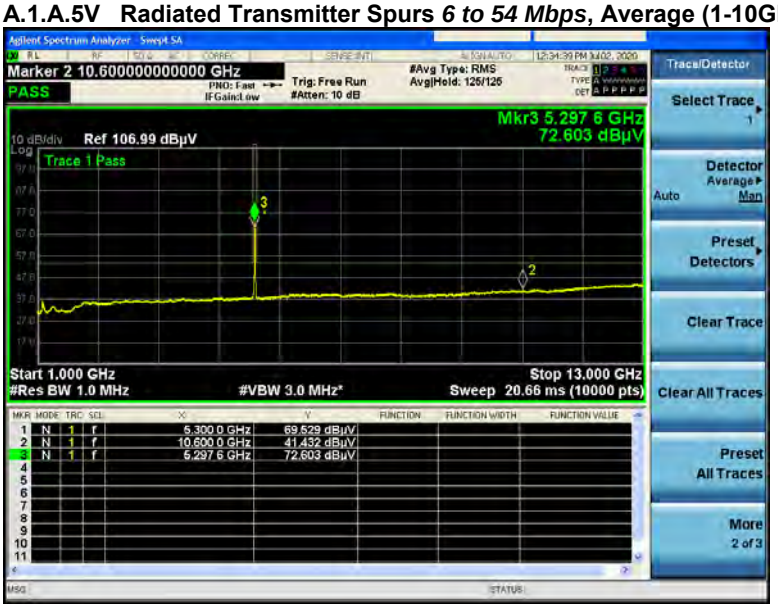
Non-HE20, *5300 MHz*

A.1.A.5H Radiated Transmitter Spurs *6 to 54 Mbps*, Average (1-10GHz)

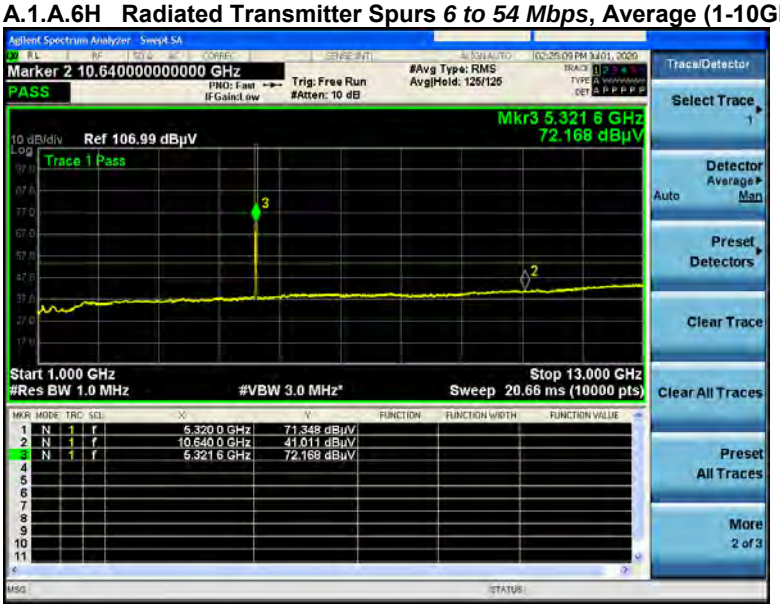


Non-HE20, *5300 MHz*

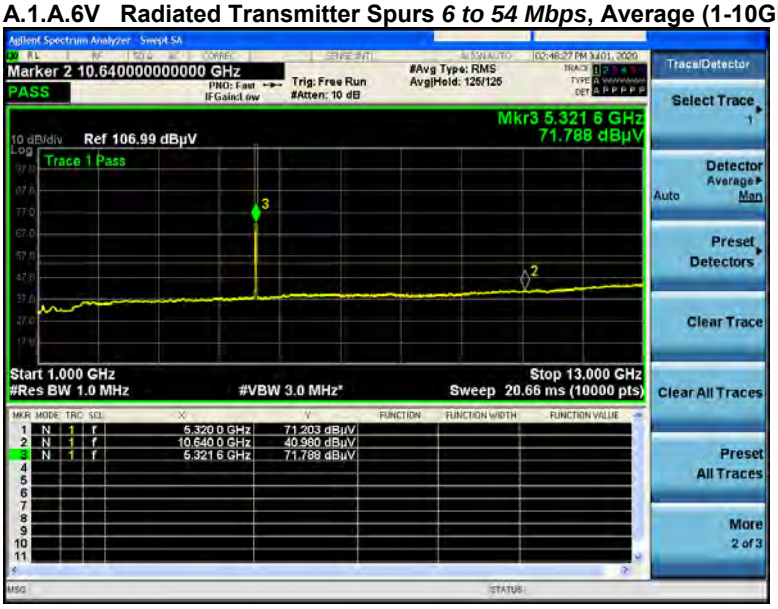
A.1.A.5V Radiated Transmitter Spurs *6 to 54 Mbps*, Average (1-10GHz)



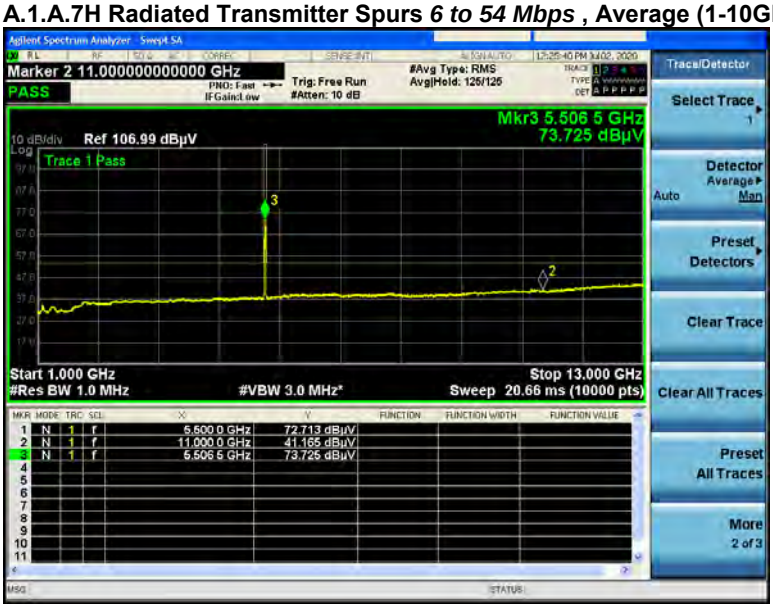
Non-HE20, *5320 MHz*
A.1.A.6H Radiated Transmitter Spurs *6 to 54 Mbps*, Average (1-10GHz)



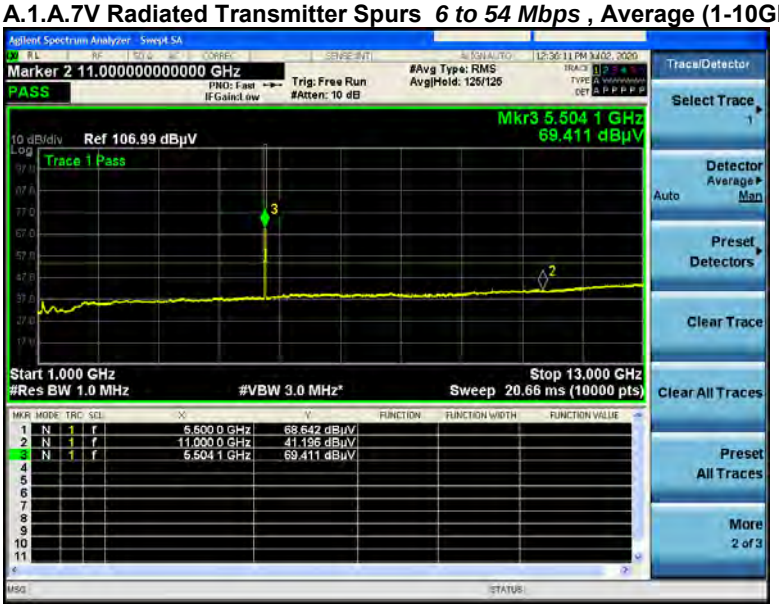
Non-HE20, *5320 MHz*
A.1.A.6V Radiated Transmitter Spurs *6 to 54 Mbps*, Average (1-10GHz)



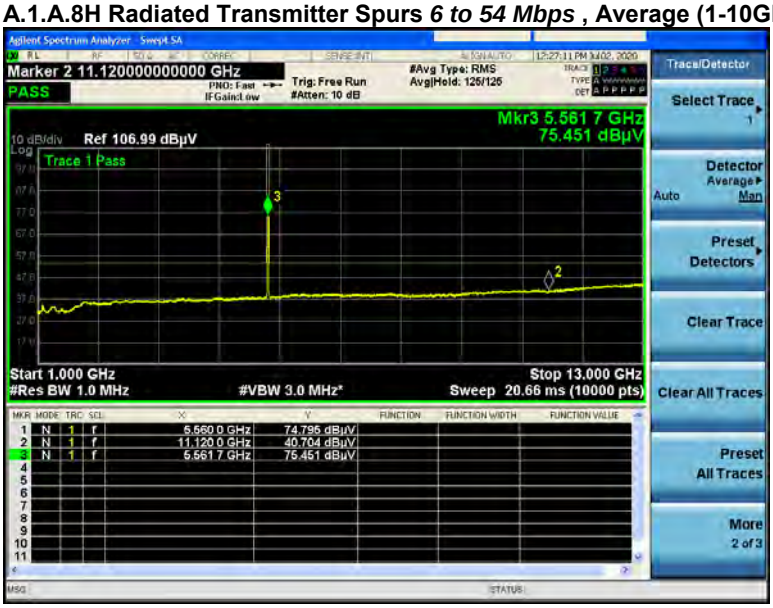
Non-HE20, *5500 MHz*
A.1.A.7H Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



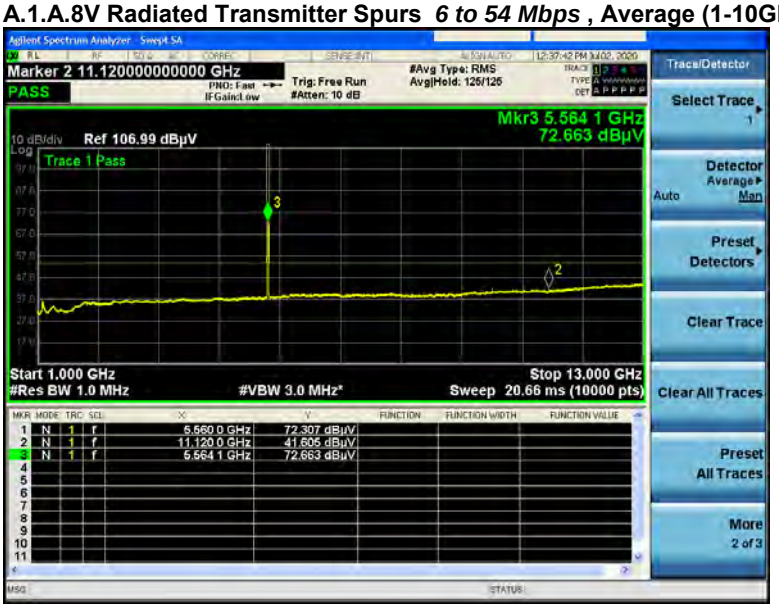
Non-HE20, *5500MHz*
A.1.A.7V Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



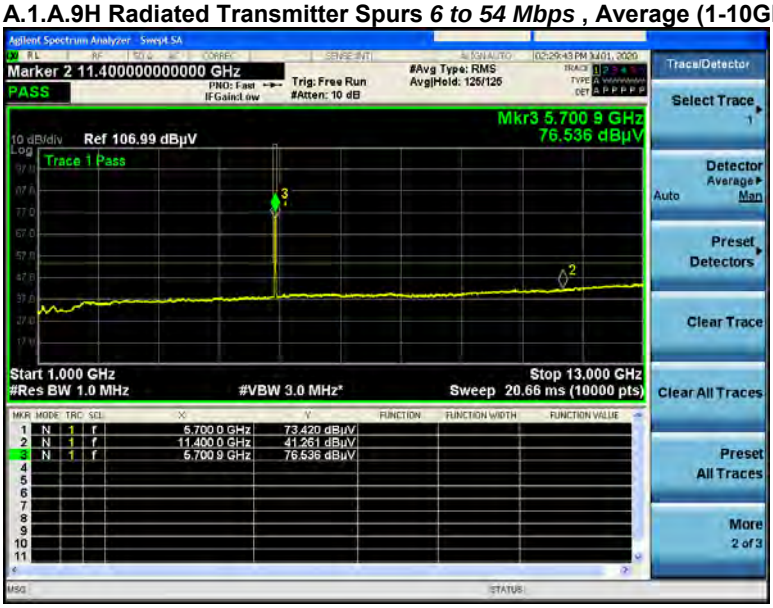
Non-HE20, *5560 MHz*
A.1.A.8H Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



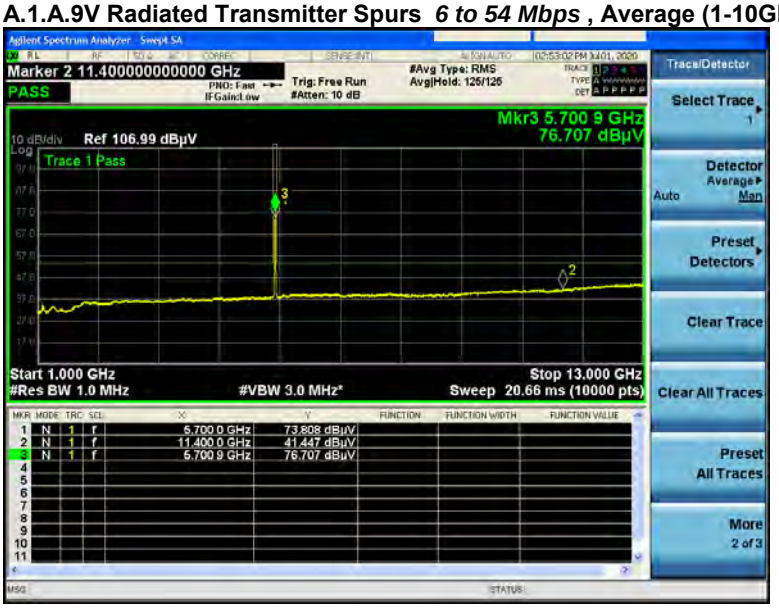
Non-HE20, *5560MHz*
A.1.A.8V Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



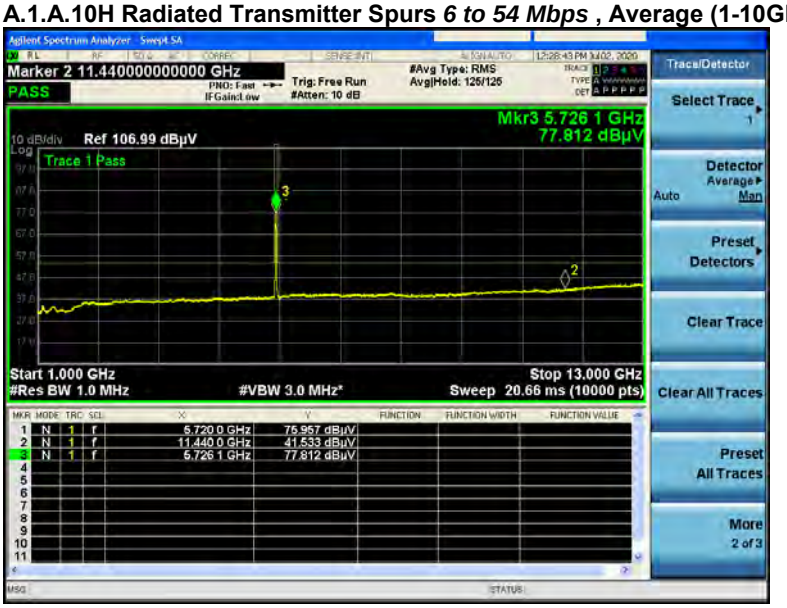
Non-HE20, *5700 MHz*
A.1.A.9H Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



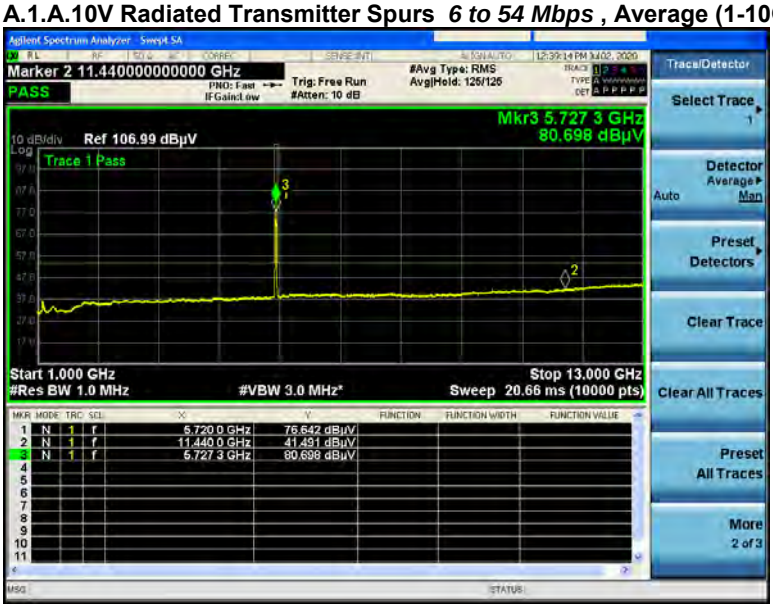
Non-HE20, *5700MHz*
A.1.A.9V Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



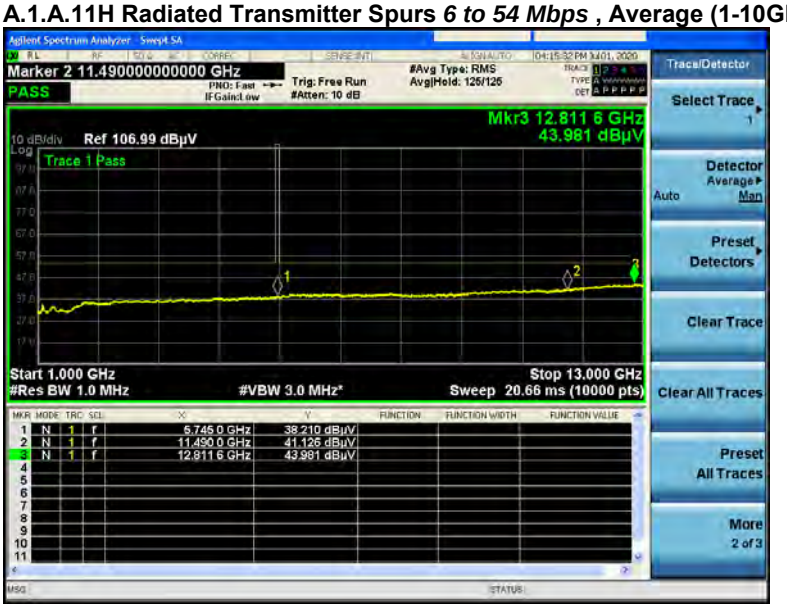
Non-HE20, *5720 MHz*
A.1.A.10H Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



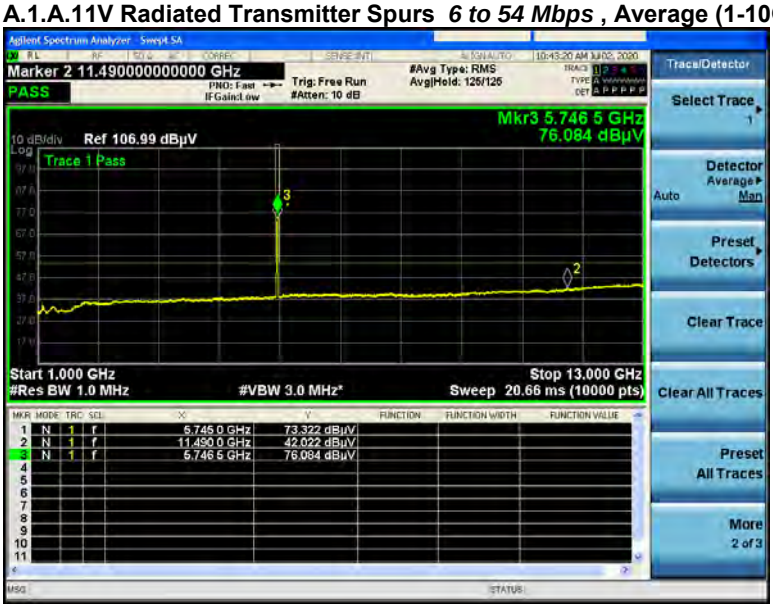
Non-HE20, *5720MHz*
A.1.A.10V Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



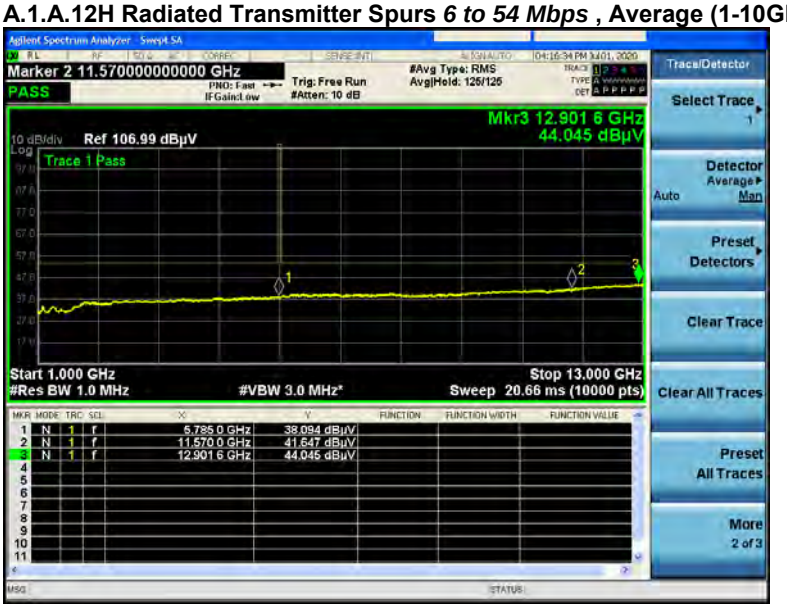
Non-HE20, *5745 MHz*
A.1.A.11H Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



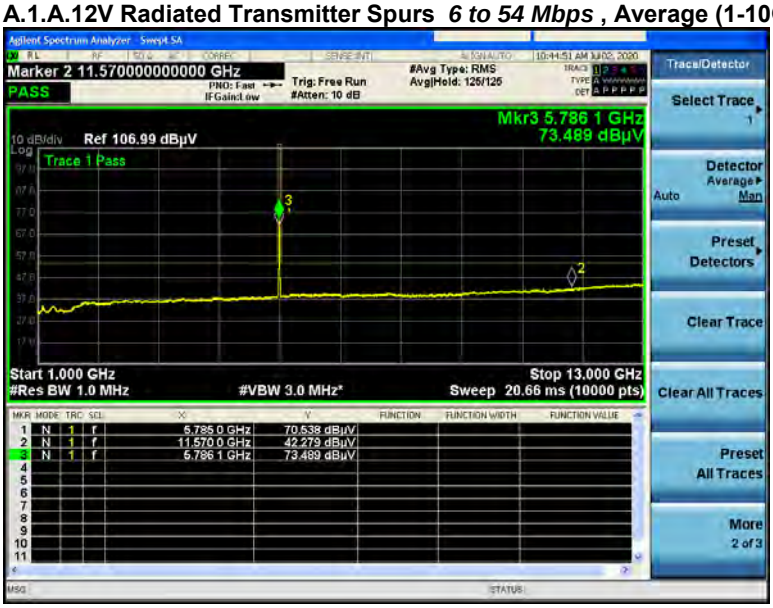
Non-HE20, *5745MHz*
A.1.A.11V Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



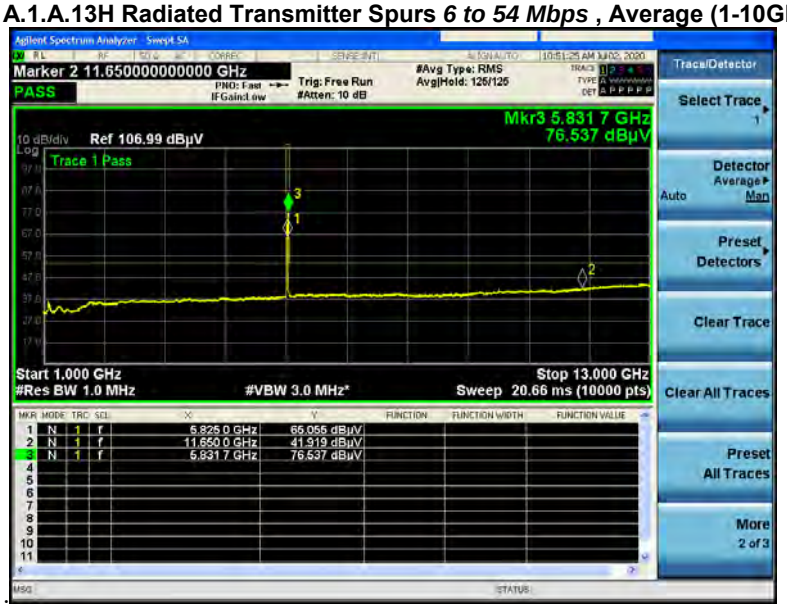
Non-HE20, *5785 MHz*
A.1.A.12H Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



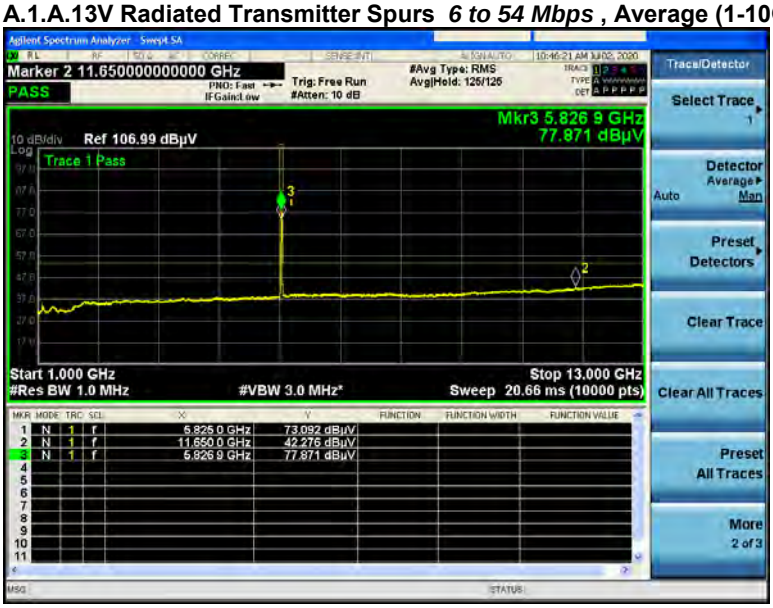
Non-HE20, *5785MHz*
A.1.A.12V Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



Non-HE20, *5825 MHz*
A.1.A.13H Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



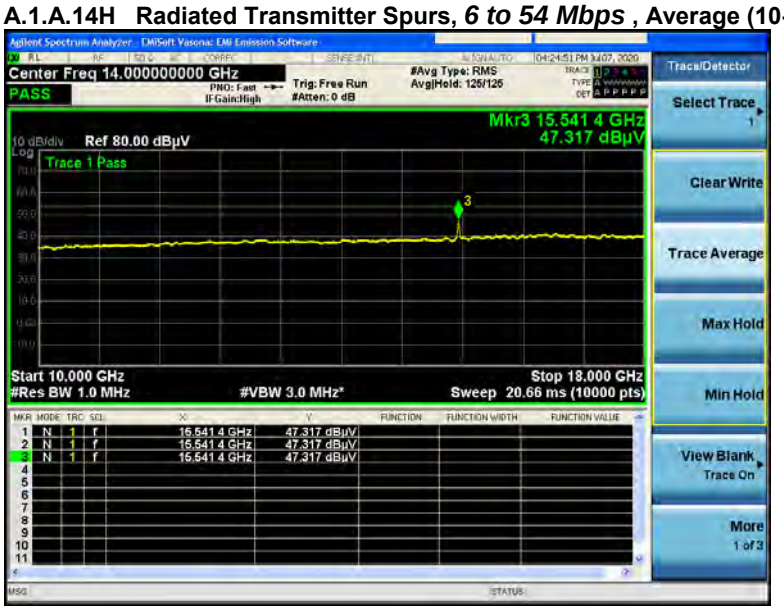
Non-HE20, *5825MHz*
A.1.A.13V Radiated Transmitter Spurs *6 to 54 Mbps* , Average (1-10GHz)



Transmitter Radiated Spurious Emissions-Average (10GHz – 18GHz)

Non-HE20, 5180MHz

A.1.A.14H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)



Non-HE20, 5180MHz

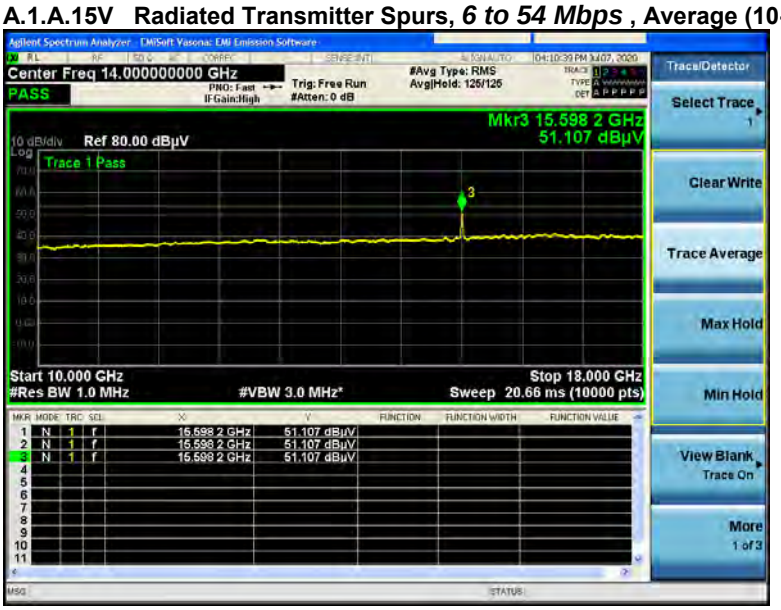
A.1.A.14V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5200MHz

A.1.A.15H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5200MHz

A.1.A.15V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

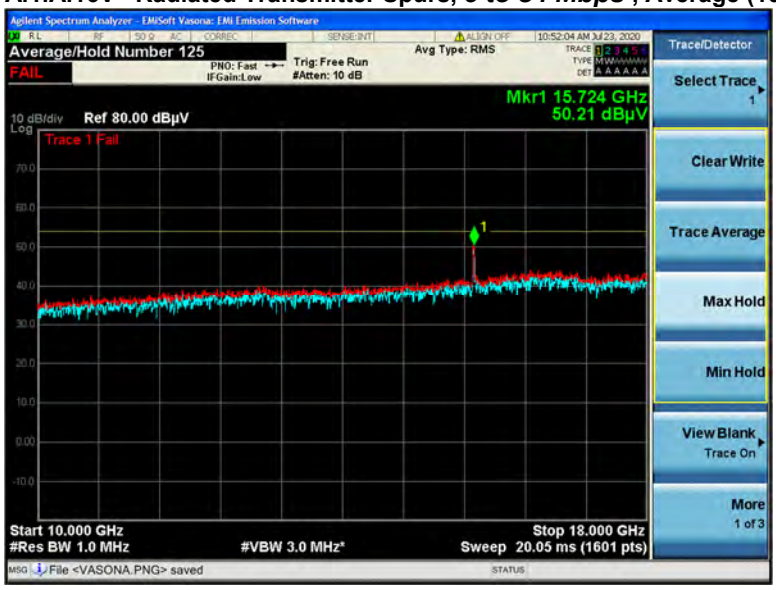


Non-HE20, 5240MHz

A.1.A.16H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5240MHz

A.1.A.16V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)



Formal Data

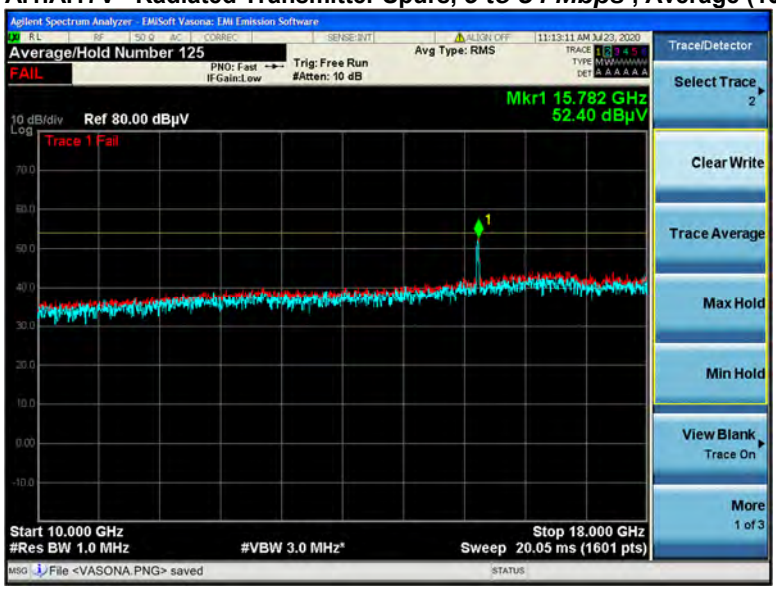
No	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1	15723.594	41.1	15.4	-10.7	45.7	Average	V	182	281	54.0	-8.3	Pass	

Non-HE20, 5260MHz

A.1.A.17H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5260MHz

A.1.A.17V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)



Formal Data

No	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1	15781.719	42.5	15.4	-10.5	47.4	Average	V	182	281	54.0	-6.6	Pass	

Non-HE20, 5300MHz

A.1.A.18H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5300MHz

A.1.A.18V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Formal Data

No	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1	15781.719	42.5	15.4	-10.5	47.4	Average	V	182	281	54.0	-6.6	Pass	

Non-HE20, 5320MHz

A.1.A.19H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5320MHz

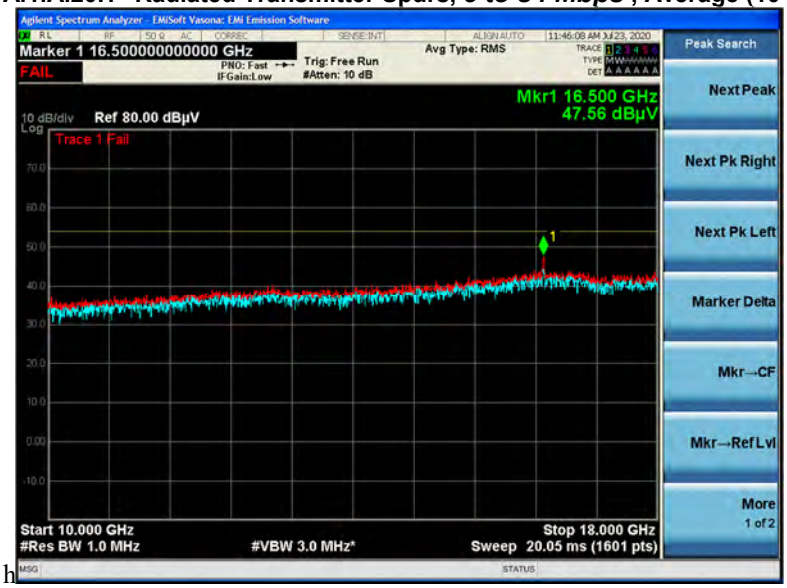
A.1.A.19V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Formal Data

No	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1	15960.000	38.6	15.6	-10.5	43.7	Average	V	182	281	54.0	-10.3	Pass	

Non-HE20, 5500MHz

A.1.A.20H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)



h

Non-HE20, 5500MHz

A.1.A.20V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Formal Data

No	Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1	16500.000	35.5	15.8	-9.7	41.6	Average	V	182	281	54.0	-12.4	Pass	

Non-HE20, 5560MHz

A.1.A.21H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5560MHz

A.1.A.21V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5700MHz

A.1.A.22H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5700MHz

A.1.A.22V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5720MHz

A.1.A.23H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5720MHz

A.1.A.23V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5745MHz

A.1.A.24H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5745MHz

A.1.A.24V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5785MHz

A.1.A.25H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5785MHz

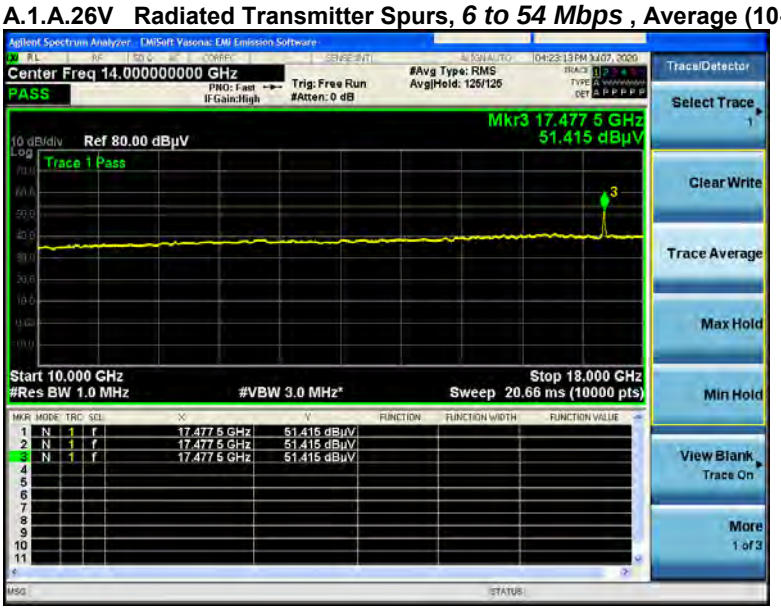
A.1.A.25V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5825MHz

A.1.A.26H Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)

Non-HE20, 5825MHz

A.1.A.26V Radiated Transmitter Spurs, *6 to 54 Mbps* , Average (10-18GHz)



A.1.P Transmitter Radiated Spurious Emissions-Peak (1GHz – 10GHz)

There are no harmonic emissions to measure below 10GHz.

Non-HE20, 5180MHz

P.1.P.1H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5180MHz

P.1.P.1V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5200MHz

P.1.P.2H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5200MHz

P.1.P.2V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5240MHz

P.1.P.3H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5240MHz

P.1.P.3V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5260MHz

P.1.P.4H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5260MHz

P.1.P.4V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5300MHz

P.1.P.5H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5300MHz

P.1.P.5V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5320MHz

P.1.P.6H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5320MHz

P.1.P.6V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5500MHz

P.1.P.7H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5500MHz

P.1.P.7V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5560MHz

P.1.P.8H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5560MHz

P.1.P.8V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5700MHz

P.1.P.9H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5700MHz

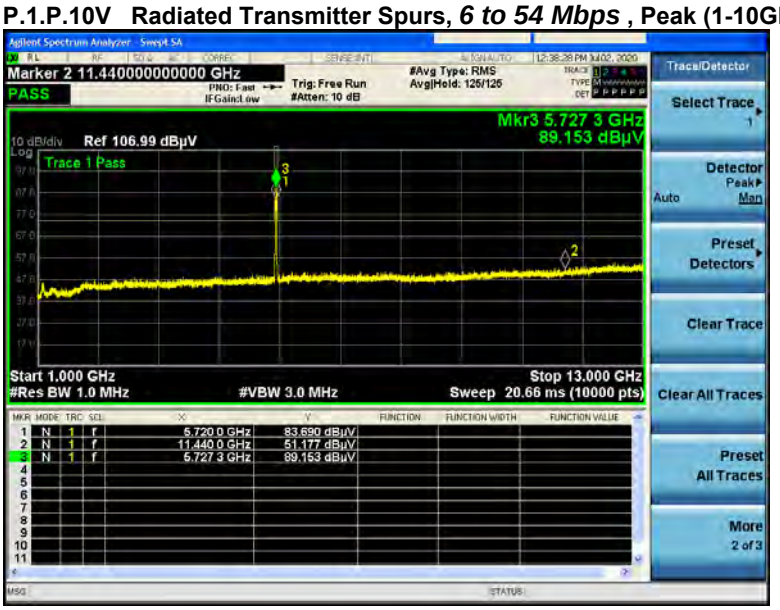
P.1.P.9V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5720MHz

P.1.P.10H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5720MHz

P.1.P.10V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)



Non-HE20, 5745MHz

P.1.P.11H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5745MHz

P.1.P.11V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5785MHz

P.1.P.12H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5785MHz

P.1.P.12V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Non-HE20, 5825MHz

P.1.P.13H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

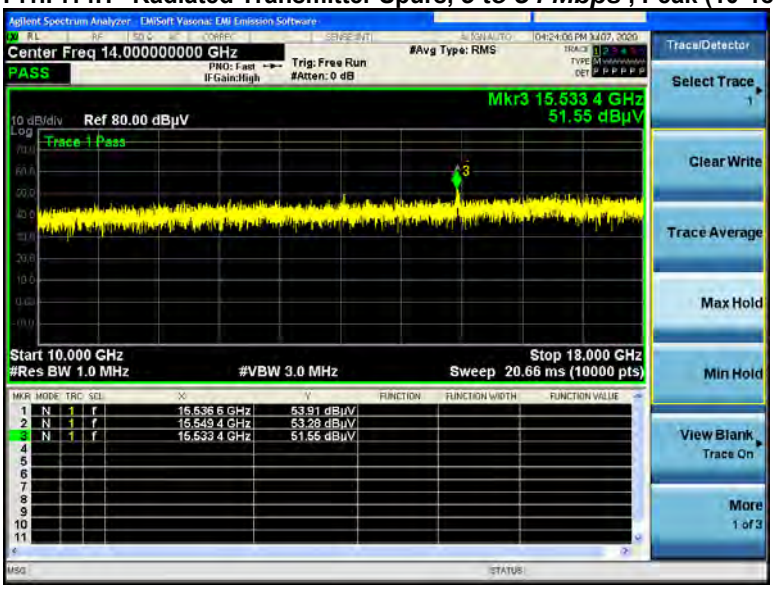
Non-HE20, 5825MHz

P.1.P.13V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (1-10GHz)

Transmitter Radiated Spurious Emissions-Peak (10GHz – 18GHz)

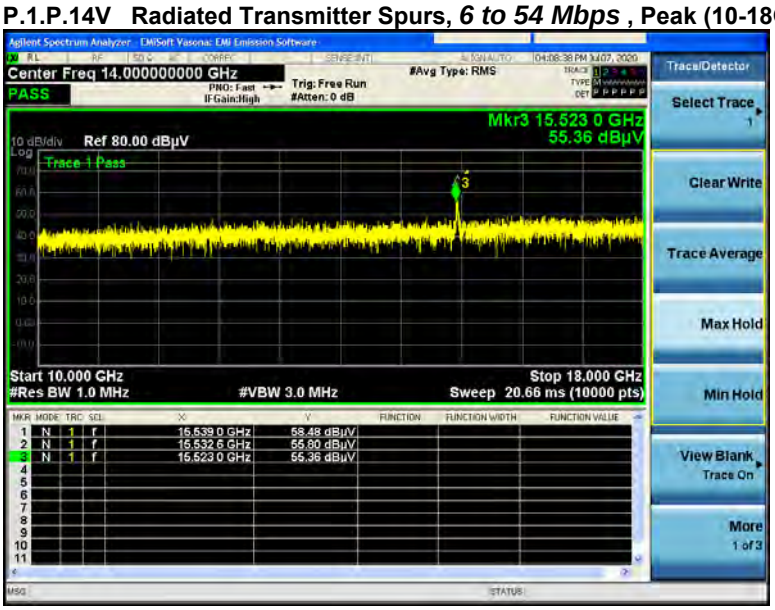
Non-HE20, 5180MHz

P.1.P.14H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



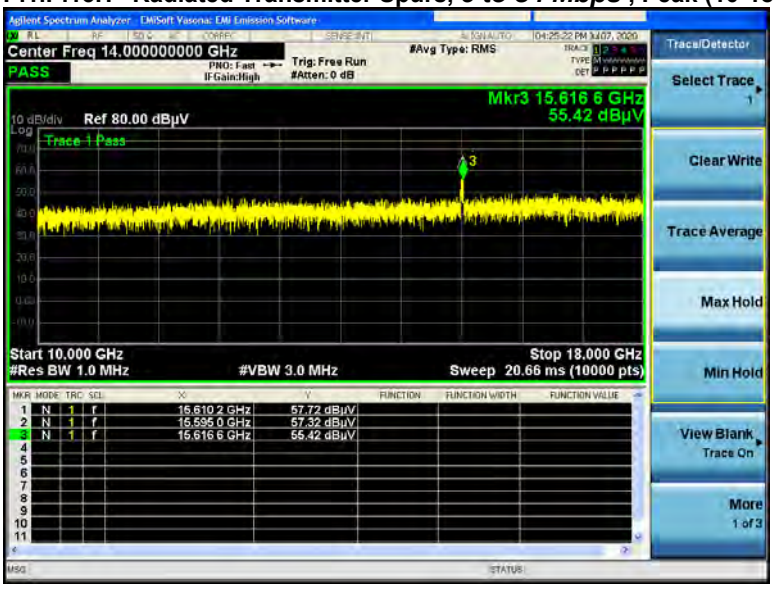
Non-HE20, 5180MHz

P.1.P.14V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



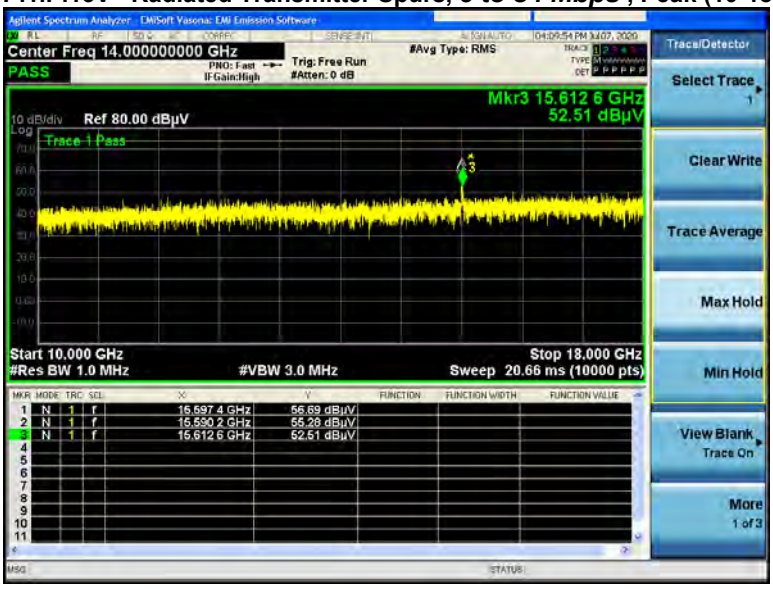
Non-HE20, 5200MHz

P.1.P.15H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



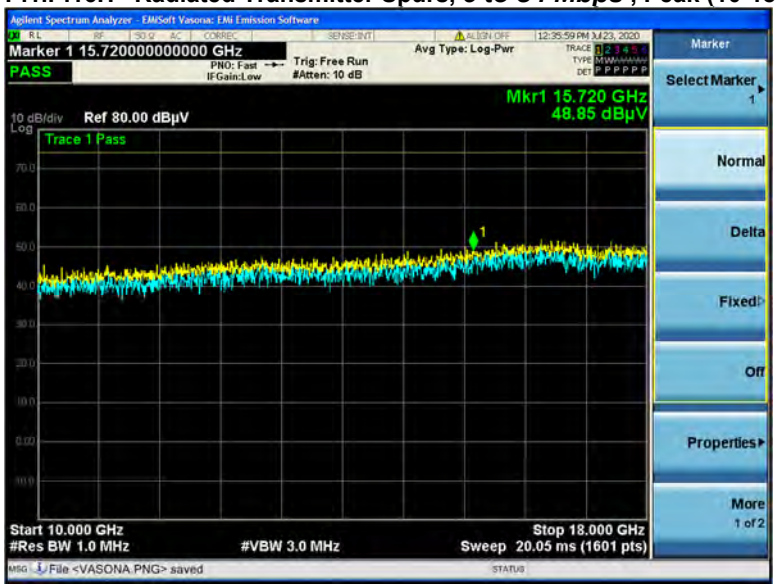
Non-HE20, 5200MHz

P.1.P.15V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



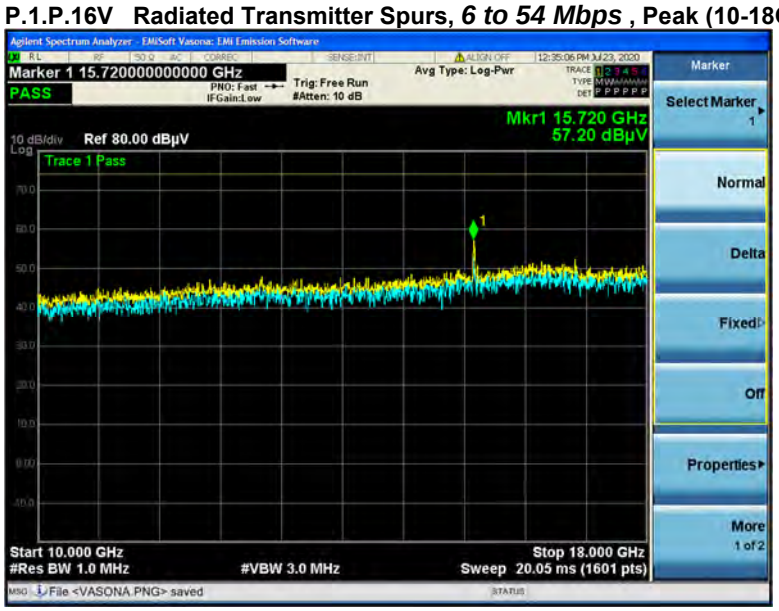
Non-HE20, 5240MHz

P.1.P.16H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



Non-HE20, 5240MHz

P.1.P.16V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)

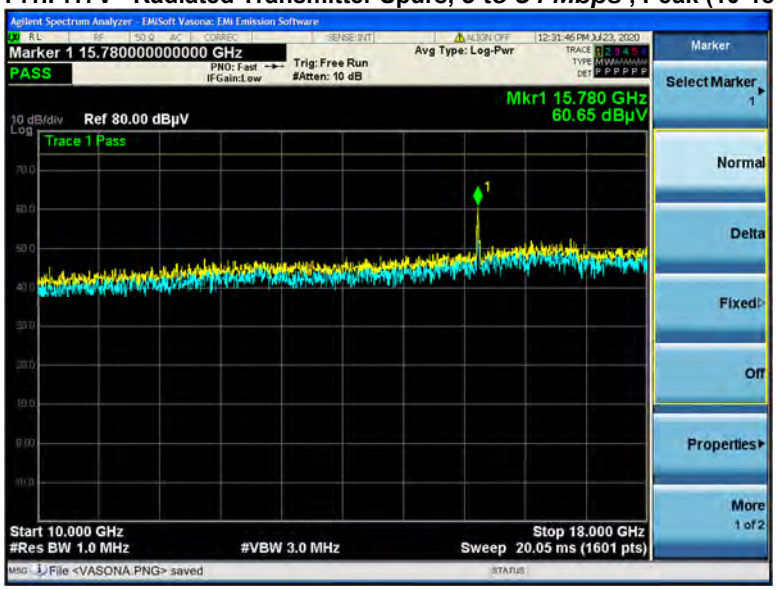


Non-HE20, 5260MHz

P.1.P.17H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)

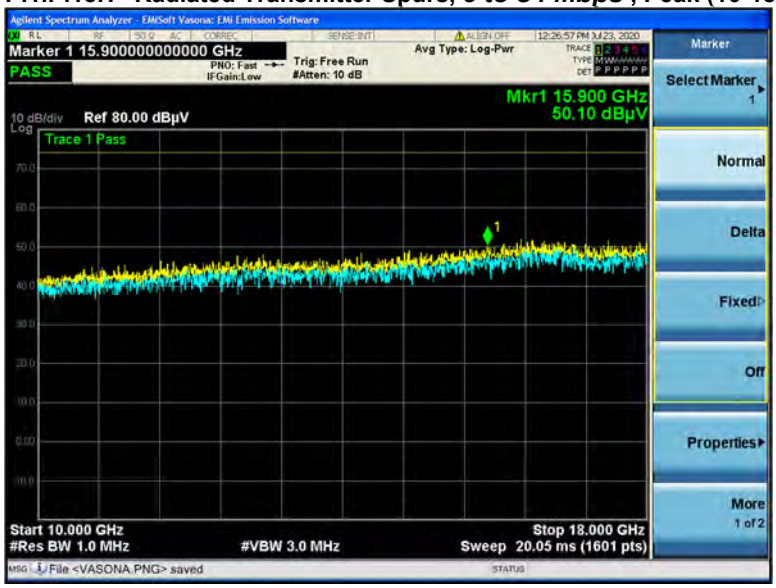
Non-HE20, 5260MHz

P.1.P.17V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



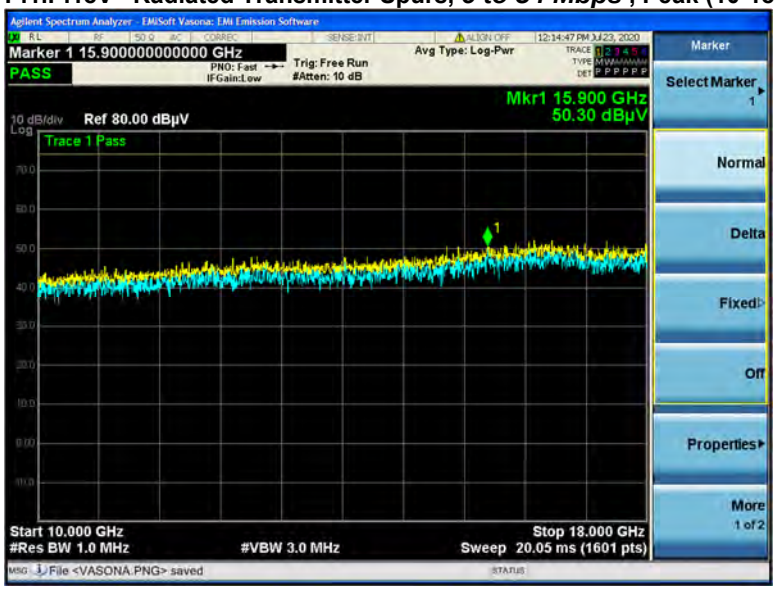
Non-HE20, 5300MHz

P.1.P.18H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



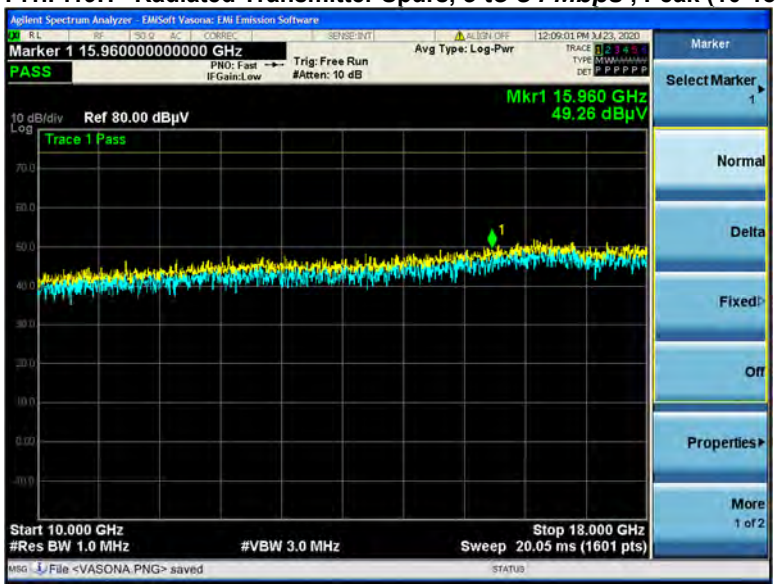
Non-HE20, 5300MHz

P.1.P.18V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



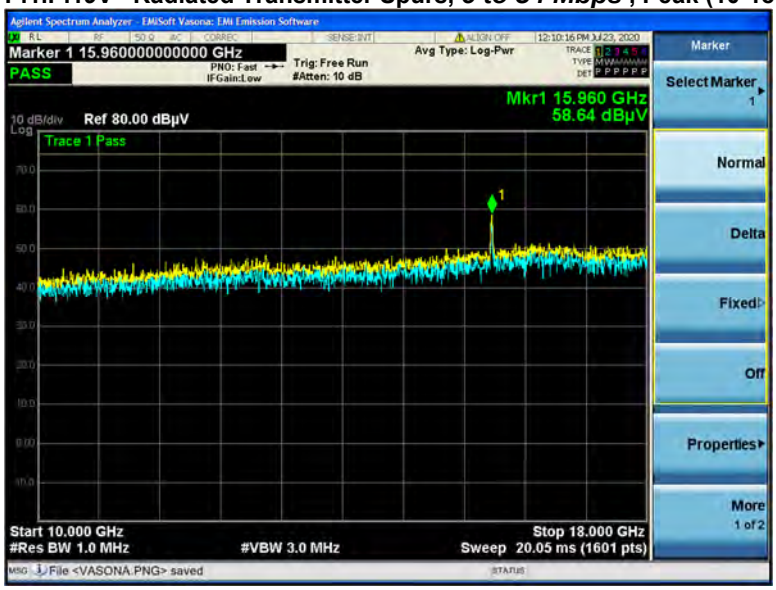
Non-HE20, 5320MHz

P.1.P.19H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



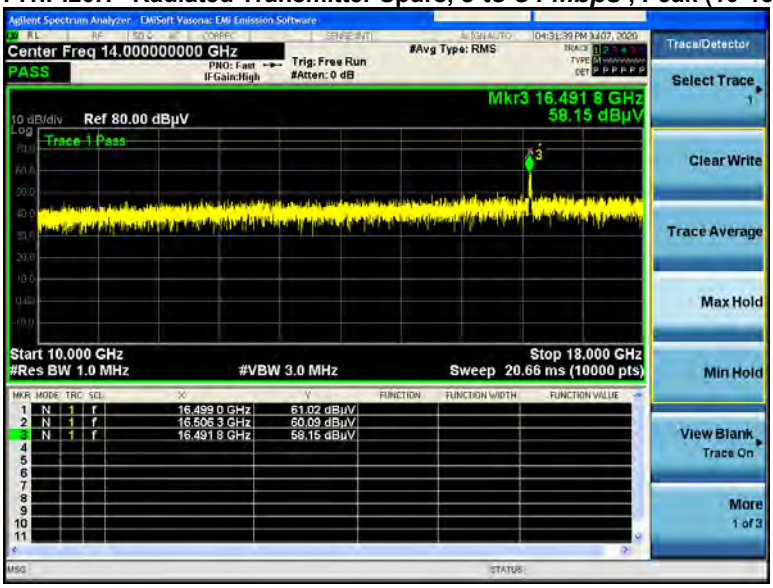
Non-HE20, 5320MHz

P.1.P.19V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



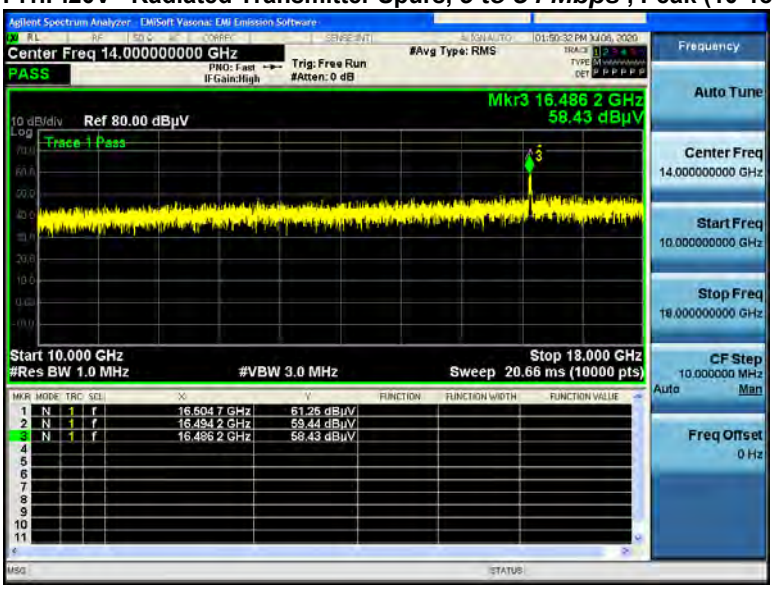
Non-HE20, 5500MHz

P.1.P.20H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



Non-HE20, 5500MHz

P.1.P.20V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



Non-HE20, 5560MHz

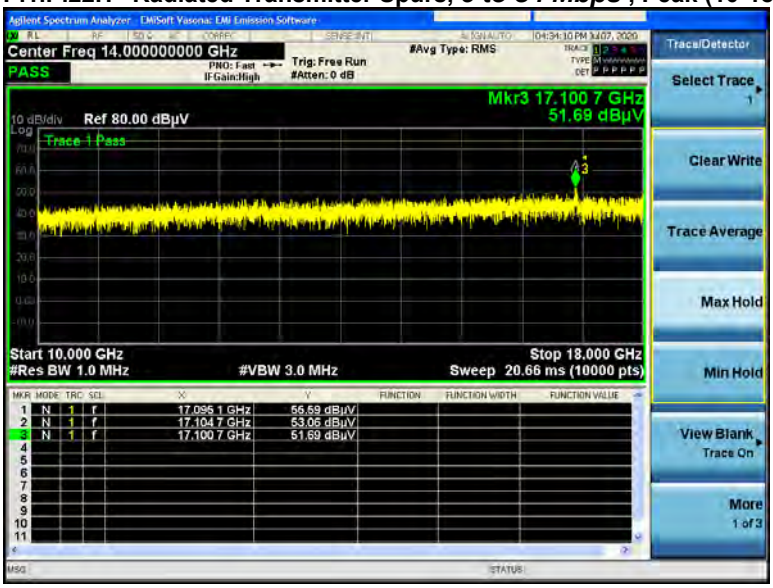
P.1.P.21H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)

Non-HE20, 5560MHz

P.1.P.21V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)

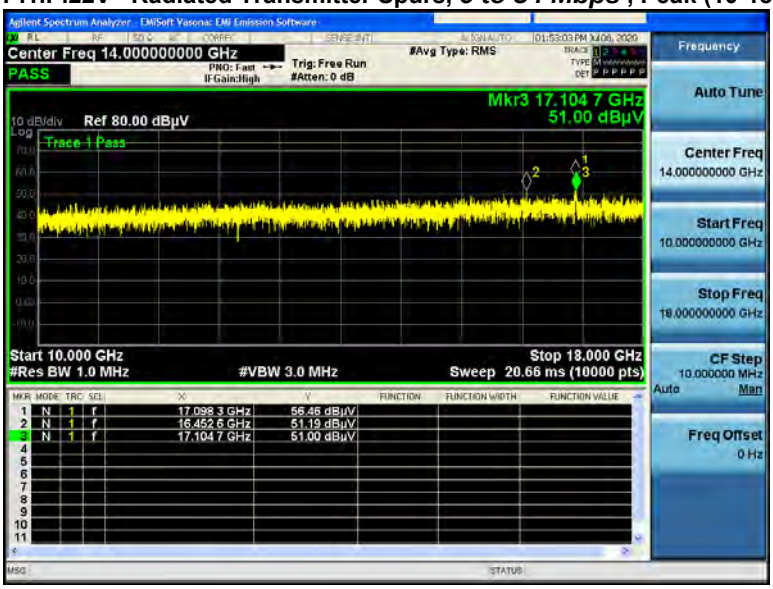
Non-HE20, 5700MHz

P.1.P.22H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



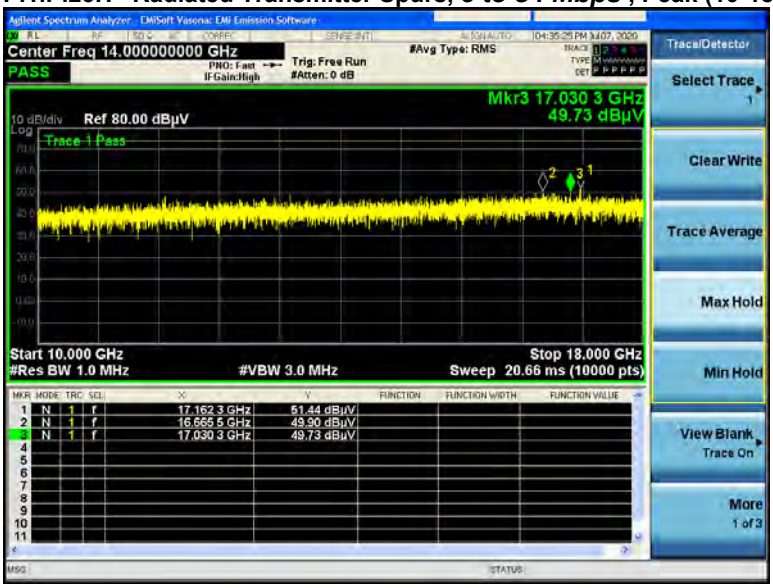
Non-HE20, 5700MHz

P.1.P.22V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



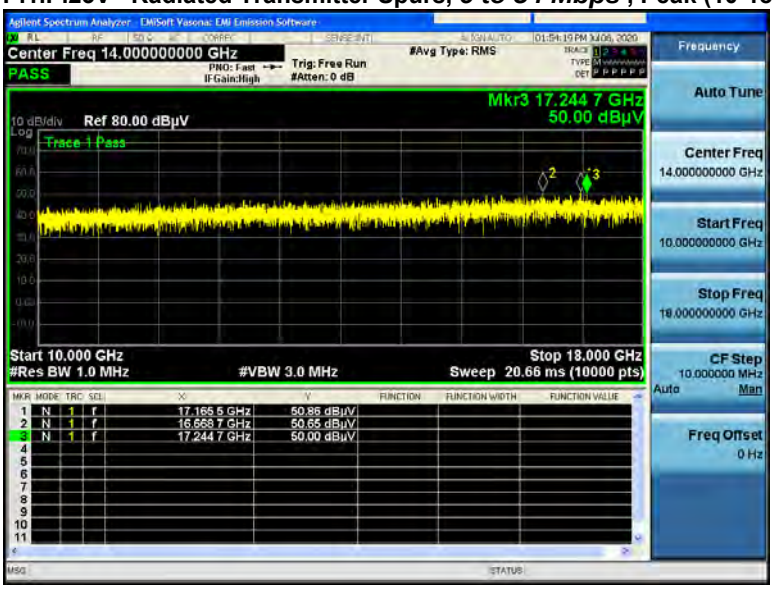
Non-HE20, 5720MHz

P.1.P.23H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



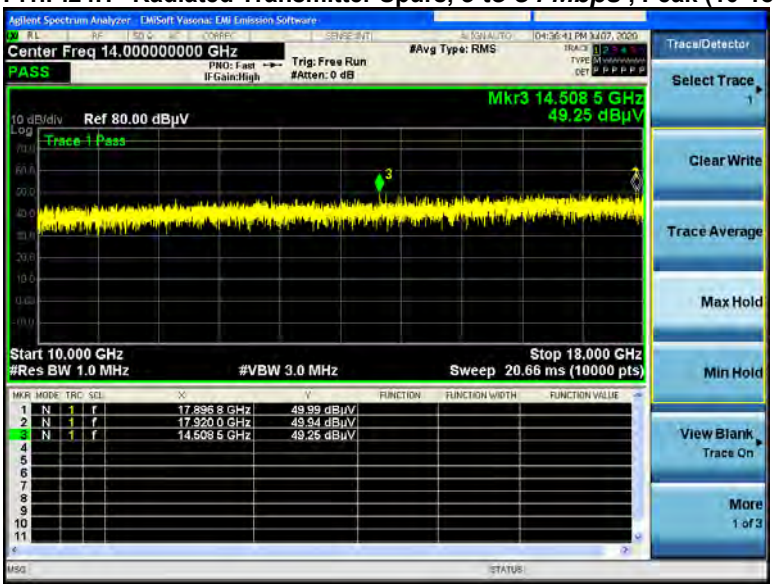
Non-HE20, 5720MHz

P.1.P.23V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



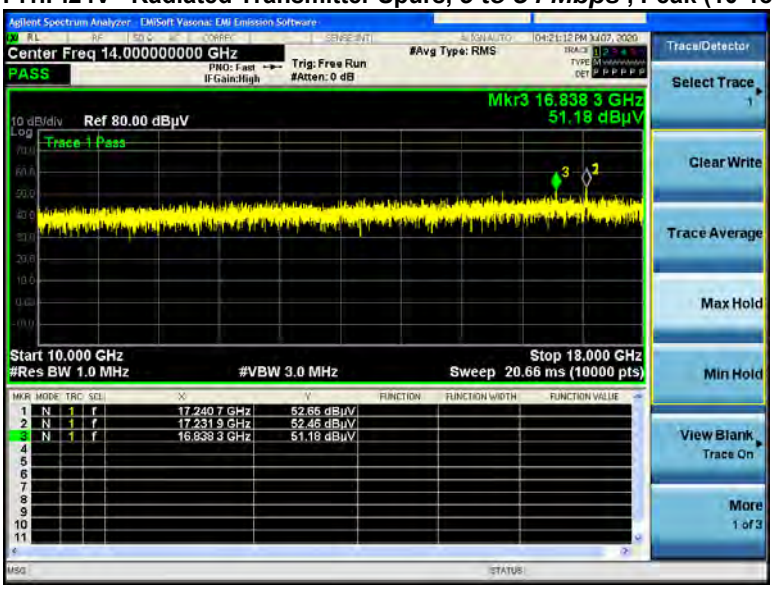
Non-HE20, 5745MHz

P.1.P.24H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



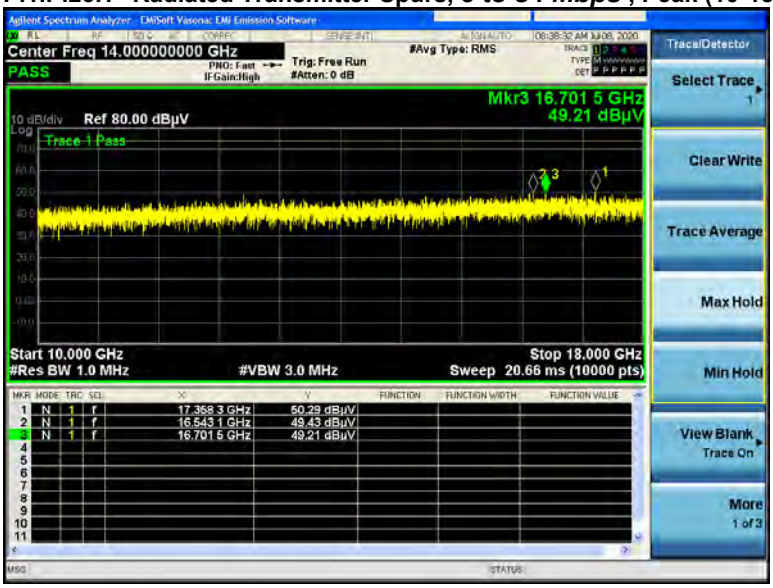
Non-HE20, 5745MHz

P.1.P.24V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



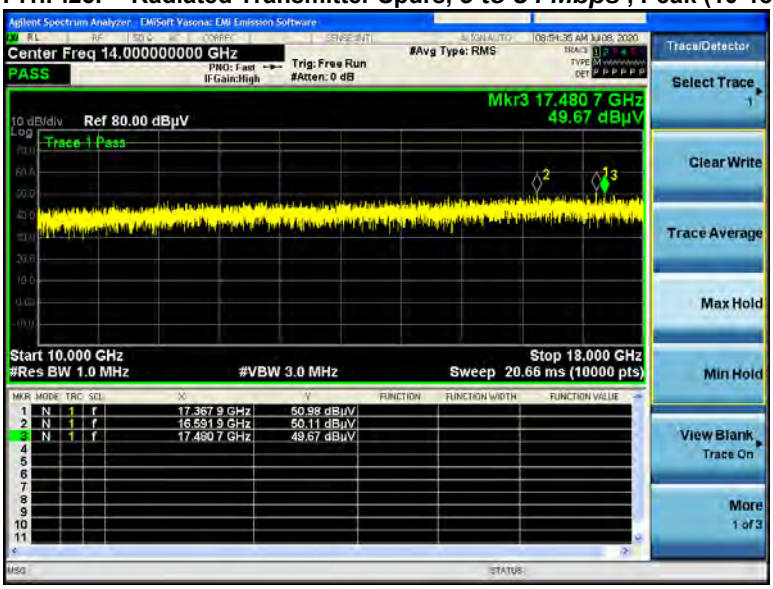
Non-HE20, 5785MHz

P.1.P.25H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



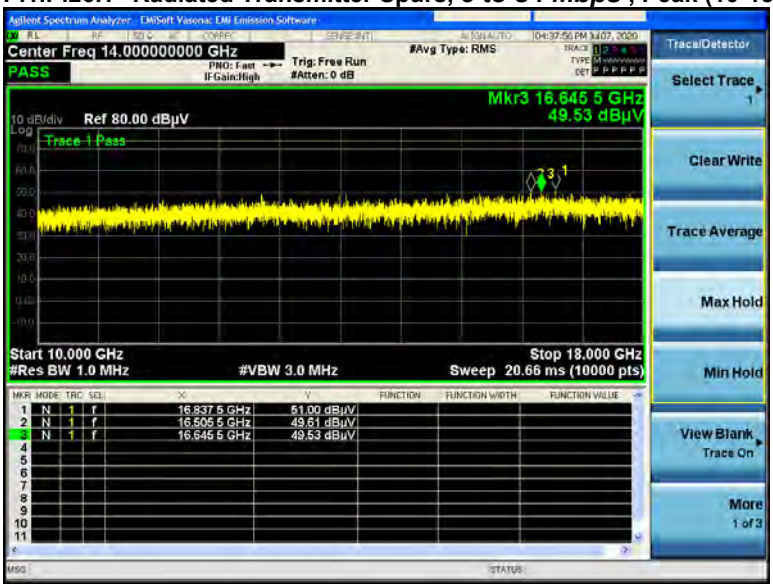
Non-HE20, 5785MHz

P.1.P.25P Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



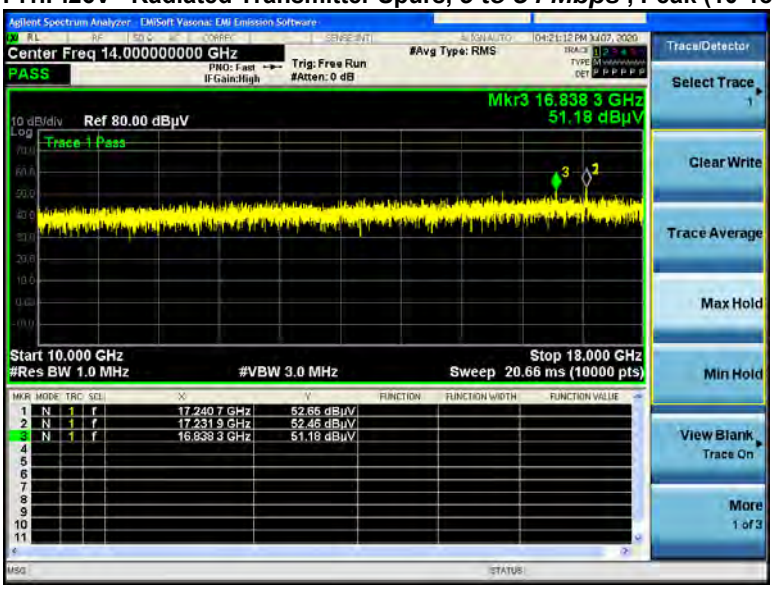
Non-HE20, 5825MHz

P.1.P.26H Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)

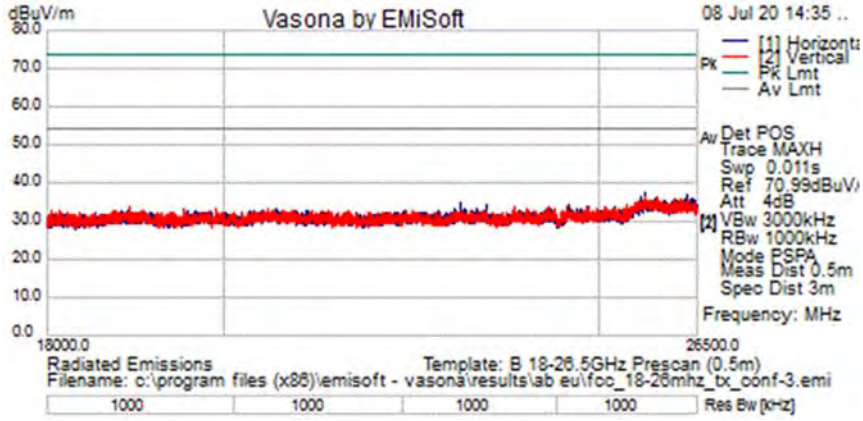


Non-HE20, 5825MHz

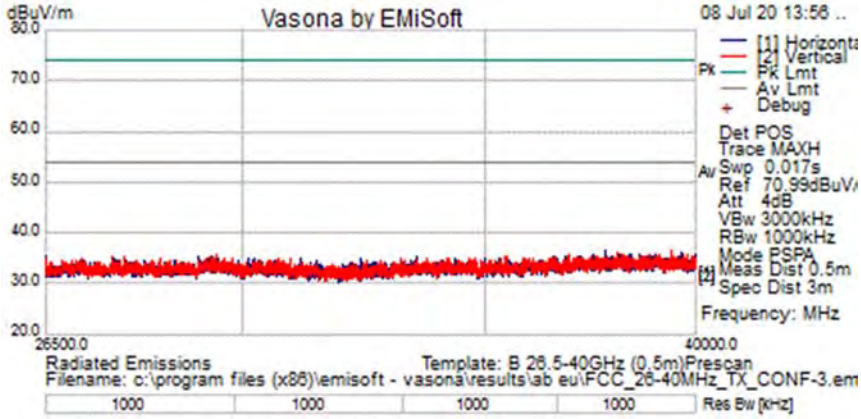
P.1.P.26V Radiated Transmitter Spurs, *6 to 54 Mbps* , Peak (10-18GHz)



Radiated Transmitter Spurs, All radios, All rate, All modes, Peak & Average (18GHz-26.5GHz) Horizontal & Vertical
P.1.A.P.1H/V



Radiated Transmitter Spurs, All radios, All rate, All modes, Peak & Average (26.5-40GHz) Horizontal & Vertical
P.1.A.P.2H/V



A.2 Radiated Emissions 30MHz to 1GHz

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

Using Vasona, configure the spectrum analyzer as shown below (be sure to enter all losses between the transmitter output and the spectrum analyzer). Place the radio in continuous transmit mode.

Span:	30MHz – 1GHz
Reference Level:	80 dBuV
Attenuation:	10 dB
Sweep Time:	Coupled
Resolution Bandwidth:	100kHz
Video Bandwidth:	300kHz
Detector:	Peak for Pre-scan, Quasi-Peak
.	Compliance shall be determined using CISPR quasi-peak detection; however, peak detection is permitted as an alternative to quasi-peak detection.

Terminate the access Point RF ports with 50 ohm loads.

Maximize Turntable (find worst case table angle), Maximize Antenna (find worst case height)

This report represents data for all supported operating modes and antennas.

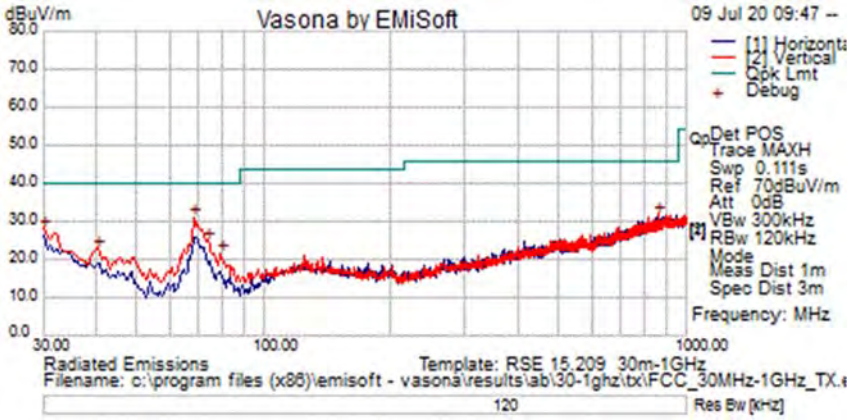
System #	Description	Samples
1	EUT	S01
2	Support Power Supply	S02

Tested By : Allan Beecroft	**Date of testing: 09-JUL-2020**
Test Result : PASS	

See Appendix C for list of test equipment

Transmitter Radiated Emissions (30MHz – 1GHz) Horizontal & Vertical

All rates, all modes.



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

30MHz to 1GHz					
Equip#	**Manufacturer/ Model**	**Description**	**Last Cal**	**Next Due**	**Test Item**
CIS38404	SUNOL SCIENCES / JB1	Combination Antenna, 30MHz-2GHz	27-FEB-2020	27-FEB-2021	A2
CIS18313uc	Keysight (Agilent/HP) / 8447D	AMPLIFIER	30-APR-2019	30-OCT-2020	A2
CIS8342	TIMES MICROWAVE SYSTEMS / RG-214	RG-214 Cable	30-APR-2020	30-OCT-2020	A2
CIS21117	MICRO-COAX / UFB311A-0-2484-5 20520	Coaxial Cable-18Ghz	12 Aug 2019	12 Aug 2020	A2
CIS49563	HUBER + SUHNER / Sucoflex 106A	N-type cable 18GHz	12-AUG-2019	12-AUG-2020	A2
CIS56155	HUBER + SUHNER / Sucoflex 104PA	RF N-Type Cable 2meter 18GHz	13-JAN-2020	13-JAN-2021	A2
CIS47410	Agilent / N9038A	/ MXE EMI Receiver 20Hz to 26.5GHz	06-MAR-2020	06-MAR-2021	A2
CIS8448	CISCO / NSA CAL	NSA Chamber	26 Sep 2019	26 Sep 2020	A2
CIS45166	STANLEY / 33-428	26' TAPE MEASURE	Cal not required	Cal not required	A2
CIS27233	York CNE V	Comparison Noise Emitter	Cal Not Required	Cal Not Required	A2
CIS58225	COMET / T7611-4	Temperature Probe & Monitoring Unit	20-AUG-2019	20-AUG-2020	A2

1GHz to 18GHz					
Equip#	**Manufacturer/ Model**	**Description**	**Last Cal**	**Next Due**	**Test Item**
CIS040597	CISCO Above 1GHz Site Cal	1GHz Cispr Site Verification	27 Sep 2019	27 Sep 2020	A.1.A.1H to A.1.A.26H. A.1.A.1V to A.1.A.26V. P.1.P.1H to P.1.P.26H. P.1P.1V to P.1.P26V
CIS47410	Agilent / N9038A	/ MXE EMI Receiver 20Hz to 26.5GHz	06-MAR-2020	06-MAR-2021	
CIS41201	ETS Lindgren 3117	Double Ridged Horn Antenna	27-AUG- 2019	27 -AUG-2020	
CIS45096	CISCO TH0118	Mast Mount Preamplifier Array, 1-18GHz	29-OCT-2019	29-OCT-2020	
CIS49563	HUBER + SUHNER / Sucoflex 106A	N-type cable 18GHz	12-AUG-2019	12-AUG-2020	
CIS56060	Miteq	SMA Preamplifier 18GHz	08-APR-2020	08-OCT-2020	
CIS34740	ETS Lindgren 3117	Double Ridged Horn Antenna	10-FEB- 2020	10-FEB- 2021	
CIS34304	Micro-Tronics HPM50112-02	High Pass Filter 6.4GHz – 18GHz	27 JUN 2019	27-DEC-2020	
CIS21117	MICRO-COAX / UFB311A-0-2484-520520	Coaxial Cable-18Ghz	12 AUG- 2019	12 AUG- 2020	
CIS56155	HUBER + SUHNER / Sucoflex 104PA	RF N-Type Cable 2meter 18GHz	13-JAN-2020	13-JAN-2021	
CIS45166	STANLEY 33-428	8 meter Tape Measure	Cal Not Required	Cal Not Required	
CIS58225	COMET / T7611-4	Temperature Probe & Monitoring Unit	20-AUG-2019	20-AUG-2020	
CIS54235	PASTERNACK PE5011-1	PRESET TORQUE WRENCH, 8 IN/LBS	02-MAR-2020	02-MAR-2021	
CIS34075	SCHAFFNER RSG 2000	Reference Spectrum Generator, 1-18GHz	Cal Not Required	Cal Not Required	
CIS35040	Micro-Tronics HPM50112-02	High Pass Filter 6.4GHz – 18GHz	27 JUN- 2019	27-DEC-2020	
18GHz to 40GHz					
CIS26860	Cisco 1840	18-40GHz EMI Test Head/Verification Fixture	12-AUG-2019	12-AUG-2020	P.1.A.P1H/V P.1.A.P2H/V
CIS38393	Agilent / E4446A	PSA Spectrum Analyzer	08-JAN-2020	08-JAN-2021	P.1.A.P.1H/V P.1.A.P.2H/V
CIS7052	HP / 83731B	Synthesized Signal Generator	04-AUG-2019	04-AUG-2020	P.1.A.P.1H/V P.1.A.P.2H/V

Appendix C: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

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	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt ($1x10^3$)
L1	Line 1	µV	Microvolt ($1x10^{-6}$)
L2	Line2	A	Amp
L3	Line 3	µA	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	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current

Appendix D: Photographs of Test Setups

Please refer to the attachment

Appendix E: Software Used to Perform Testing

EMIsoft Vasona, version 6.024

Appendix F: Test Procedures

Measurements were made in accordance with

- KDB 789033 - D02 General UNII Test Procedures New Rules v01r02
- KDB 662911 - MIMO
- ANSI C63.10 2013 Intentional Radiators

Test procedures are summarized below:

FCC 5GHz RSE Test Procedures	EDCS # 1511600

Appendix G: 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 H: Test Assessment Plan

Target Power Tables EDCS# 18087112

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