

TEST REPORT

EUT Description	WLAN and BT, 2x2 PCIe M.2 2230 SD adapter card
Brand Name	Intel® Wi-Fi 6E AX411
Model Name	AX411NGW
FCC/IC ID	FCC ID: PD9AX411NG/ IC 1000M-AX411NG
Date of Test Start/End	2021-07-06 / 2021-08-12
Features	802.11ax, Tri Band, 2x2 Wi-Fi 6E + Bluetooth® 5.2 + CDB (Concurrent Dual Band simultaneous wi-fi connection) (see section 5)

Applicant	Intel Mobile Communications
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Reference Standards	FCC CFR Title 47 Part 15 C RSS-247 issue 2, RSS-Gen issue 5 (see section 1)
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Test Report identification	210611-02.TR02
Revision Control	Rev. 00 This test report revision replaces any previous test report revision (see section 8)

The test results relate only to the samples tested.
Reference to accreditation shall be used only by full reproduction of test report.

Issued by

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1. Standards, reference documents and applicable test methods

FCC	1. FCC Title 47 CFR part 15 – Subpart E – Unlicensed National Information Infrastructure Devices. 2019-10-01 Edition 2. FCC Title 47 CFR part 15 - Subpart C – §15.209 Radiated emission limits; general requirements. 2019-10-01 Edition 3. FCC OET KDB 789033 D02 v02r01 - General U-NII Test Procedures New Rules – Guidelines for compliance testing of Unlicensed National Information Infrastructure (U-NII) Devices (Part 15, Subpart E) 4. FCC OET KDB 662911 D01 v02r01 - Emissions Testing of Transmitters with Multiple Outputs in the Same Band. 5. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.
ISED	1. RSS-Gen Issue 5 Amendment 1 - General Requirements for Compliance of Radio Apparatus. 2. RSS-247 Issue 2 - Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices. 3. FCC OET KDB 789033 D02 v02r01 - General U-NII Test Procedures New Rules – Guidelines for compliance testing of Unlicensed National Information Infrastructure (U-NII) Devices (Part 15, Subpart E) 4. FCC OET KDB 662911 D01 v02r01 - Emissions Testing of Transmitters with Multiple Outputs in the Same Band. 5. ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

2. General conditions, competences and guarantees

- ✓ Tests performed under FCC standards identified in section 1 are covered by A2LA accreditation.
- ✓ Tests performed under ISED standards identified in section 1 are covered by Cofrac accreditation.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an ISO/IEC 17025:2017 laboratory accredited by the American Association for Laboratory Accreditation (A2LA) with the certificate number 3478.01.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an Accredited Test Firm recognized by the FCC, with Designation Number FR0011.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is an ISO/IEC 17025:2017 testing laboratory accredited by the French Committee for Accreditation (Cofrac) with the certificate number 1-6736.
- ✓ Intel Corporation SAS Wireless RF Lab (Intel WRF Lab) is a Registered Test Site listed by ISED, with ISED #1000Y.
- ✓ Intel WRF Lab declines any responsibility with respect to the identified information provided by the customer and that may affect the validity of results.
- ✓ Intel WRF Lab only provides testing services and is committed to providing reliable, unbiased test results and interpretations.
- ✓ Intel WRF Lab is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.
- ✓ Intel WRF Lab has developed calibration and proficiency programs for its measurement equipment to ensure correlated and reliable results to its customers.
- ✓ This report is only referred to the item that has undergone the test.
- ✓ This report does not imply an approval of the product by the Certification Bodies or competent Authorities.

3. Environmental Conditions

- ✓ At the site where the measurements were performed the following limits were not exceeded during the tests:

Temperature	22°C ±1.7 °C
Humidity	47.1% ±14.1%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of receipt	Note
#01	210611-02.S01	WiFi 6E Module	AX411NGW	WFM:3413E8F0B009	01/07/2021	RF Conducted
	170000-01.S02	Laptop	Latitude E5470	21HTPF2	28/03/2017	
	191003-02.S06	Extender	PCB00651_01	6513519-009	29/10/2019	
#02	210611-02.S19	WiFi 6E Module	AX411NGW	WFM:3413E8F0749A	2021-07-05	Used for 30MHz-1GHz Radiated Spurious Emissions tests
	200102-01.S03	Extender	ADEXELEC	-	2020-01-02	
	210611-02.S15	Adaptor	PowerBy SNJ A4	-	2021-07-02	
	200602-03.S06	Absorber	MCS0	-	2020-07-03	
	170801-01.S10	Laptop	Latitude E7470	7KNOXF2	2017-09-08	
	210611-02.S13	Main Antenna	SkyCross	-	2021-07-02	
	210611-02.S14	Aux Antenna	SkyCross	-	2021-07-02	
#03	210611-02.S18	WiFi 6E Module	AX411NGW	WFM:3413E8F07288	2021-07-05	Used for 1GHz-40GHz Radiated Spurious Emissions tests
	200611-03.S26	Extender	ADEXELEC	-	2020-07-01	
	210611-02.S16	Adaptor	PowerBy SNJ A4	-	2021-07-02	
	200602-03.S06	Absorber	MCS0	-	2020-07-03	
	170000-01.S01	Laptop	Latitude E5470	DBPLMC2	2017-03-28	
	210611-02.S11	Main Antenna	SkyCross	-	2021-07-02	
	210611-02.S12	Aux Antenna	SkyCross	-	2021-07-02	

5. EUT Features

The herein information is provided by the customer

Brand Name	Intel® Wi-Fi 6E AX411		
Model Name	AX411NGW		
Software Version	DRTU Version: 99.2100.64.0-OEM.DRTU.12485		
Driver Version	99.0.63.5		
Prototype / Production	Production		
Supported Radios	802.11b/g/n/ax	2.4GHz (2400.0 – 2483.5 MHz)	
	802.11a/n/ac/ax	5.2GHz (5150.0 – 5350.0 MHz)	
		5.6GHz (5470.0 – 5725.0 MHz)	
		5.8GHz (5725.0 – 5895.0 MHz)	
	802.11ax	6.0GHz (5925.0 - 7125.0MHz)	
Antenna Information	Bluetooth 5.2	2.4GHz (2400.0 – 2483.5 MHz)	
	Transmitter	Main (chain A)	Aux (chain B)
	Manufacturer	SkyCross	Skycross
	Antenna type	PIFA antenna	PIFA antenna
	Part number	N/A	N/A
Additional information	Declared antenna gain (dBi)	+5	+5
	The EUT is a WiFi module supporting concurrent dual band (CDB) transmission modes		
	Mode	TX Chain B	TX Chain A
	CDB Mode + Co-run BT:		
	BT Co-run – CDB SISO	WLAN 2.4GHz + WLAN 5GHz	BT
		WLAN 2.4GHz + WLAN 6GHz	BT
	CDB only SISO	WLAN 2.4GHz + WLAN 5GHz	-
		WLAN 2.4GHz + WLAN 6GHz	-
		-	WLAN 2.4GHz + WLAN 5GHz
		-	WLAN 2.4GHz + WLAN 6GHz
	CDB only MIMO	WLAN 2.4GHz + WLAN 5GHz	WLAN 2.4GHz + WLAN 5GHz
		WLAN 2.4GHz + WLAN 6GHz	WLAN 2.4GHz + WLAN 6GHz
	BT Co-run (CDB SISO)	WLAN 2.4GHz	WLAN 5GHz + BT
		WLAN 2.4GHz	WLAN 6GHz + BT

6. Remarks and comments

1. No deviations were made from the test methods listed in section 1 of this report
2. The CDB mode has been evaluated in a separate report. Refer to report Identification 210611-02.TR51

7. Test Verdicts summary

The statement of conformity to applicable standards in the table below are based on the measured values, without taking into account the measurement uncertainties.

7.1. 802.11 a/n/ac/ax – U-NII-2C

FCC part	RSS clause	Test name	Verdict
15.407 (a) (2)	RSS-247 Clause 6.2.3.1	Maximum output power	P
15.407 (a) (2)	RSS-247 Clause 6.2.3.1	Power spectral density	P
15.407 (b) (3) 15.209 (a)	RSS-247 Clause 6.2.3.2 RSS-GEN A1 Clause 8.9	Undesirable emissions limits: out of band (conducted)	P
15.407 (b) (3) 15.209 (a)	RSS-247 Clause 6.2.3.2 RSS-GEN A1 Clause 8.9	Undesirable emissions limits: Spurious emissions (radiated)	P

P: Pass

F: Fail

NM: Not Measured

NA: Not Applicable

8. Document Revision History

Revision #	Modified by	Revision Details
Rev. 00	Y.Haddad	First Issue

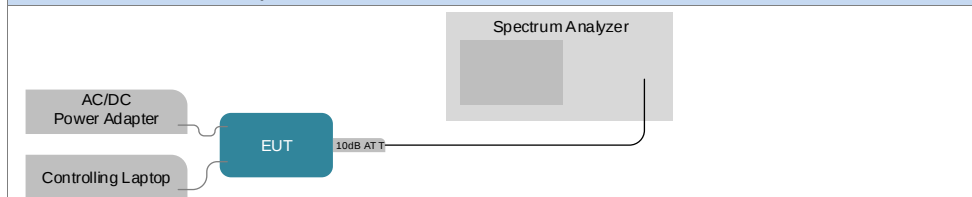
Annex A. Test & System Description

A.1 Measurement System

Measurements were performed using the following setups, made in accordance to the general provisions of FCC OET KDB 789033 D02 General UNII Test Procedures.

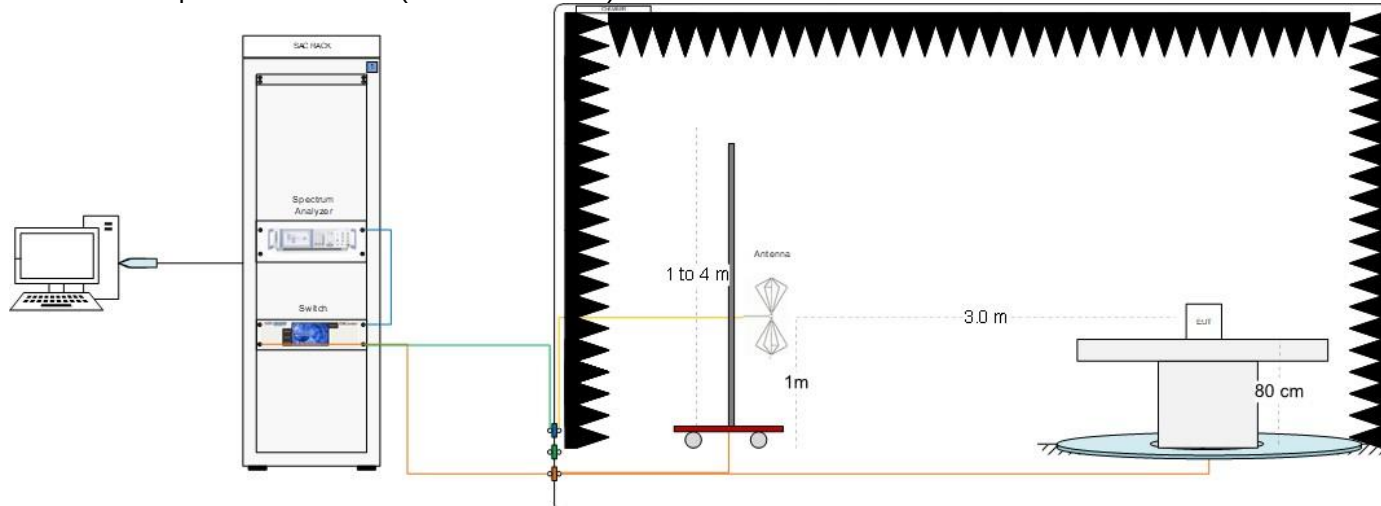
The DUT was installed in a test fixture and this test fixture is connected to a laptop computer and AC/DC power adapter. The laptop computer was used to configure the EUT to continuously transmit at a specified output power using all different modes and modulation schemes, using the Intel proprietary tool DRTU.

Conducted test setup

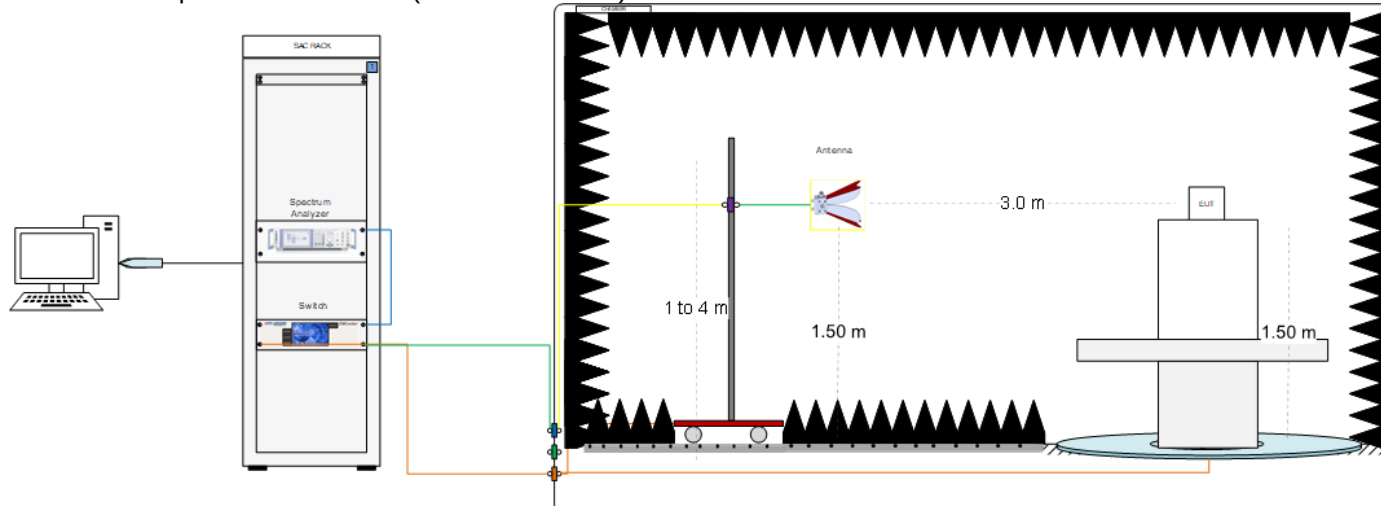


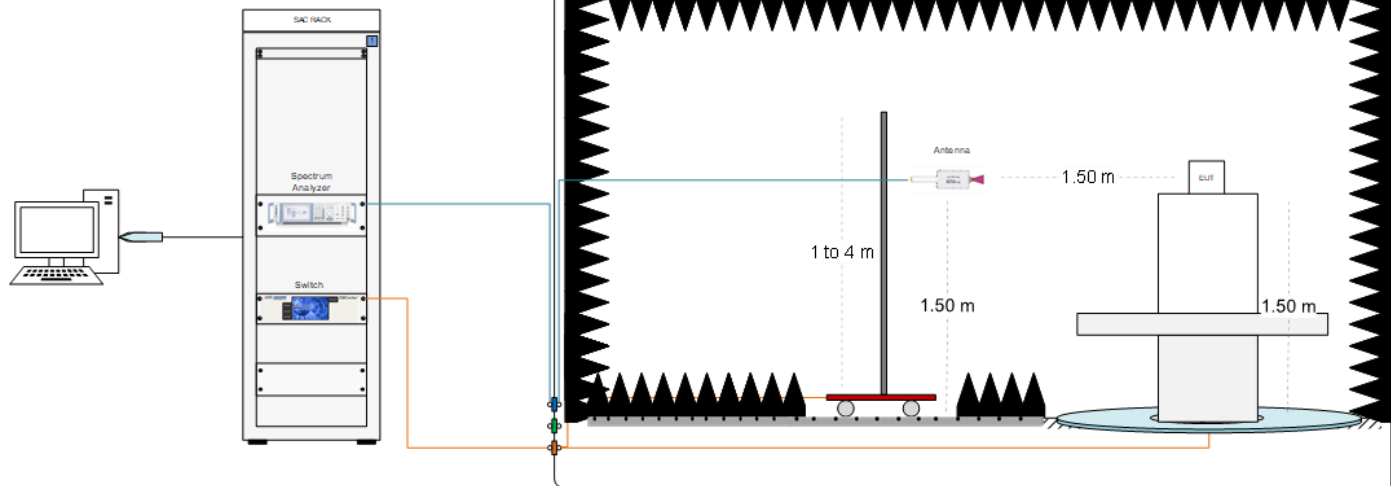
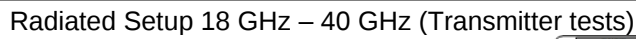
Radiated test setup

Radiated Setup 30 MHz - 1 GHz (Transmitter tests)



Radiated Setup 1 GHz – 6.4 GHz (Transmitter tests)





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A.2 Test Equipment List

Conducted setup

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
273-000	Spectrum Analyzer	FSV30	103309	Rohde & Schwarz	2019-09-02	2021-09-02
018-003	RF cable 50cm	PE360-50CM	N/A	PASTERNAK	2021-02-21	2021-08-21
018-001	10dB Attenuator + MH4	N/A	N/A	N/A	2021-03-09	2021-09-09
145-000	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-B89BE3	AVITECH	20120-01-23	2022-01-23
413-000	Measurement SW v1.5.4.2	Octopi	N/A	Step AT	N/A	N/A

Radiated Setup #1

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
006-000	Anechoic Chamber	FACT3	5720	ETS-Lindgren	2020-07-06	2022-01-07
006-001	Turn Table	ETS	-	ETS-Lindgren	N/A	N/A
006-002	Switch & Positioning systems	EMC Center	00159757	ETS-Lindgren	N/A	N/A
006-008	Measurement SW	EMC32, v10.40.10	100623	Rohde & Schwarz	N/A	N/A
006-011	Boresight antenna mast	BAM 4.0-P	P/278/2890.01	Maturo	N/A	N/A
006-019	Biconical antenna 30 MHz – 1 GHz	UBAA9115 + BBVU9135 + DGA9552N	0286 + CH 9044	Schwarzbeck	2019-11-22	2021-11-22
147-000	Spectrum analyzer	FSW43	101847	Rohde & Schwarz	2020-11-02	2022-11-02
006-020	Horn antenna 3117	3117	00157734	ETS-Lindgren	2019-08-12	2021-08-12
056-000	Horn Antenna 3117 + Amplifier + HPF6.4	3117	00157736	ETS-Lindgren	2020-04-01	2022-04-01
007-008	Double Horn Ridged antenna	3116C-PA	00169308bis + 00196308	ETS-Lindgren	2019-07-24	2021-07-24
006-039	Cable 2.5m - 30MHz to 18GHz	0500990992500KE	19.23.395	Radiall	2021-02-23	2021-08-23
006-030	Cable 1.2m – 18 to 40 GHz	UFA147A-0-0480-200200	MFR 64639223720-003	Micro-coax	2021-02-14	2021-08-14
006-034	Cable 1m - 1GHz to 18GHz	UFA147A	-	Utilflex	2021-02-18	2021-08-18
006-036	Cable 1m – 30 MHz - 18GHz	UFB311A-0-0590-50U50U	MFR 64639 223230-001	Micro-coax	2021-02-23	2021-08-23
006-052	RF Cable 7.5m	0501051057000GX	19.35.850	Radiall	2021-02-23	2021-08-23
006-038	Cable 7m - 18GHz to 40GHz	R286304009	-	Radiall	2021-02-14	2021-08-14
006-051	RF Cable 1.0m	CBL-1.5M-SMSM+	202879	Mini-Circuits	2021-02-23	2021-08-23
365-000	Temperature & Humidity logger	RA12E-TH1-RAS	00-80-A3-E1-6E-55	Avtech	2021-03-08	2023-03-08

N/A: Not Applicable

Radiated Setup #2

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
007-000	Anechoic chamber	RFD-FA-100	5996	ETS Lindgren	2020-07-06	2022-07-06
007-002	Turntable	-	-	ETS Lindgren	N/A	N/A
007-003	Antenna Tower	2171B-3.0M	00150123	ETS Lindgren	N/A	N/A
007-006	Switch & Positioner	EMCenter	00151232	ETS Lindgren	N/A	N/A
007-005	Measurement SW	EMC32, V11.20.00	100401	Rohde & Schwarz	N/A	N/A
127-000	Spectrum Analyzer	FSV40	101358	Rohde & Schwarz	2021-01-15	2023-01-15
007-007	Double Ridge Horn (1- 18GHz)	3117	00152266	ETS Lindgren	2020-03-18	2022-03-18
056-000	Horn Antenna 3117 + Amplifier + HPF6.4	3117	00157736	ETS-Lindgren	2020-04-01	2022-04-01
007-008	Double Horn Ridged antenna	3116C-PA	00169308bis + 00196308	ETS-Lindgren	2019-07-24	2021-07-24
007-022	RF Cable 1-18GHz, 1.5m	0501050991200GX	19.23.493	Radiall	2021-02-14	2021-08-14
007-020	RF Cable 1-18GHz, 1.2 m	2301761761200PJ	12.22.1104	Radiall	2021-02-14	2021-08-14
007-011	RF Cable 1-18GHz - 6.5m	140-8500-11-51	001	Spectrum	2021-02-14	2021-08-14
007-015	RF Cable 1GHz-18GHz 1.5m	-	-	Spirent	2021-02-15	2021-08-15
007-014	RF Cable 18-40 GHz 6m	R286304009	1747364	Radiall	2021-02-14	2021-08-14
007-023	RF Cable 1m DC-40GHz	PE360-100CM	-	Pasternack	2021-02-16	2021-08-16
007-018	RF Cable 1-9.5GHz 1.2m	0500990991200KE	-	Radiall	2021-02-15	2021-08-15
145-000	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-B89BE3	Avtech	2020-01-22	2022-01-22

N/A: Not Applicable

Shared Radiated Equipment

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
022-000	Power Sensor	NRP-Z81	104385	Rohde & Schwarz	2020-04-08	2022-04-08
061-000	Power Sensor	NRP-Z81	104386	Rohde & Schwarz	2020-04-08	2022-04-08
140-000	Power Sensor	NRP-Z81	104382	Rohde & Schwarz	2020-04-08	2022-04-08

A.3 Measurement Uncertainty Evaluation

The system uncertainty evaluation is shown in table below with a coverage factor of $k = 2$ to indicate a 95% level of confidence:

Measurement type	Uncertainty	Unit
Timing	± 0.12	%
Power Spectral density	± 1.47	dB
Occupied bandwidth	± 2.07	%
Conducted Power	± 1.03	dB
Conducted Spurious Emission <40 GHz	± 3.45	dB
Radiated tests <1GHz	± 5.99	dB
Radiated tests 1GHz – 40 GHz	± 5.85	dB

Annex B. Test Results U-NII-2C

The herein test results were performed by:

Test case measurement	Test Peronnel
Power Limits. Maximum output power	C.Requin . Y Haddad
Power spectral density	C.Requin . Y Haddad
Undesirable emissions limits: out of band (conducted)	C.Requin . Y Haddad
Undesirable emissions limits (radiated)	A.Lounes, N.Bui

B.1 Test Conditions

For 802.11a mode the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, but not simultaneously.

For 802.11n20 & 802.11ax20 (20 MHz channel bandwidth), 802.11n40 & 802.11ax40 (40MHz channel bandwidth), 802.11ac80 & 802.11ax80 (80MHz channel bandwidth) and 802.11ac160 &802.11ax160 (160MHz channel bandwidth) modes the EUT can transmit at both CHAIN A and CHAIN B RF outputs individually, and also simultaneously.

The following data rates were selected based on preliminary testing that identified those rates as the worst cases for output power and spurious levels at the band edges:

Transmission	Mode	Bandwidth (MHz)	Worst Case Data Rate
SISO	802.11a	20	6Mbps
	802.11n	20	HT0
		40	HT0
	802.11ac	80	VHT0
		160	VHT0
	802.11ax	20	HE0
		40	HE0
		80	HE0
		160	HE0
MIMO	802.11n	20/40	HT8
	802.11ac	80/160	VHT0
	802.11ax	20/40/80/160	HE0

B.2 Test Results Tables

B.2.1 26dB & 99% Bandwidth

Test procedure

The conducted setup shown in section *Test & System Description* was used to measure the 26dB & 99% bandwidth. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

For the overlapped channels between U-NII-2C and U-NII-3 bands, and according to FCC OET KDB 789033 D02, the boundary frequency between the bands is used as one edge for defining the portion of the 26dB bandwidth that falls within a particular U-NII band. This rule is only applicable for the 26dB bandwidth and for those channels marked as overlapped.

Results tables

U-NII-2C channels

Mode	Rate	Antenna	Channel	Freq [MHz]	26dB BW [MHz]	99% BW [MHz]
802.11a	6Mbps	SISO A	100	5500	24.45	16.67
			120	5600	24.90	16.67
			140	5700	23.55	16.65
		SISO B	100	5500	24.20	16.55
			120	5600	23.50	16.73
			140	5700	23.90	16.70
802.11n20	HT0	SISO A	100	5500	24.35	17.76
			120	5600	24.30	17.85
			140	5700	24.00	17.75
		SISO B	100	5500	24.55	17.69
			120	5600	25.00	17.80
			140	5700	24.65	17.76
	HT8	MIMO A	100	5500	24.10	17.77
			120	5600	24.35	17.77
			140	5700	24.85	17.63
		MIMO B	100	5500	24.00	17.79
			120	5600	23.60	17.71
			140	5700	23.80	17.67
802.11n40	HT0	SISO A	102	5510	43.74	36.16
			118	5590	46.64	36.40
			134	5670	45.10	36.08
		SISO B	102	5510	43.56	36.16
			118	5590	45.65	36.08
			134	5670	45.76	36.16
	HT8	MIMO A	102	5510	43.65	36.08
			118	5590	52.69	36.24
			134	5670	44.88	36.08
		MIMO B	102	5510	43.65	36.00
			118	5590	44.33	36.16
			134	5670	43.34	36.08
802.11ac80	VHT0	SISO A	106	5530	88.16	75.00
			122	5610	91.01	75.24
		SISO B	106	5530	87.97	75.12
			122	5610	93.29	75.24
		MIMO A	106	5530	87.02	75.12
			122	5610	89.49	75.24
		MIMO B	106	5530	86.45	75.00
			122	5610	87.21	75.00
802.11ac160	VHT0	SISO A	114	5570	164.67	153.25
		SISO B			164.67	153.00
		MIMO A			165.33	153.25
		MIMO B			163.35	153.25

Max Value

Mode	Rate	Antenna	Channel	Freq [MHz]	RU config.	26dB BW [MHz]	99% BW [MHz]
802.11ax20	HE0	SISO A	100	5500	Full	23.70	18.89
					26/0	20.80	18.59
					52/37	22.50	18.44
					106/53	22.80	18.11
			120	5600	Full	24.45	18.94
					Full	24.15	18.90
					26/8	21.05	18.35
					52/40	22.40	18.49
		SISO B	100	5500	106/54	23.45	18.24
					Full	23.90	18.91
					26/0	20.75	17.60
					52/37	22.35	18.05
			120	5600	106/53	22.80	18.27
					Full	24.90	18.91
					Full	24.55	18.89
					26/8	21.05	18.67
		MIMO A	100	5500	52/40	22.30	18.05
					106/54	23.10	18.32
			120	5600	Full	24.00	18.88
					26/0	20.90	18.58
					52/37	22.40	18.47
					106/53	23.20	17.64
		MIMO B	100	5500	Full	24.00	19.00
					Full	24.15	18.93
			120	5600	26/8	21.25	18.52
					52/40	22.35	18.43
		SISO A	102	5510	106/54	23.90	18.09
					Full	23.80	18.86
					26/0	21.30	18.51
					52/37	22.15	18.41
802.11ax40	HE0	SISO A	102	5510	106/53	23.75	18.20
					Full	23.70	18.91
					Full	23.40	18.95
					26/8	20.80	18.23
		SISO B	102	5510	52/40	23.55	18.05
					106/54	23.75	17.89
					Full	44.73	37.52
					242/61	24.93	19.04
		SISO A	118	5590	Full	46.35	37.68
					Full	44.46	37.68
			134	5670	242/62	24.21	18.96
					Full	43.29	37.60
		SISO B	102	5510	242/61	24.21	18.72
					Full	45.00	37.68
					Full	42.57	37.36
					242/62	24.39	18.88
		MIMO A	102	5510	Full	42.57	37.60
					242/61	24.03	18.80
					Full	46.08	37.60
					Full	44.01	37.60
		MIMO B	102	5510	242/62	24.21	18.80
					Full	42.57	37.52
					242/61	23.94	18.88
					Full	43.74	37.60
		SISO A	118	5590	Full	42.66	37.44
					Full	42.66	37.44
			134	5670	242/62	24.84	18.80
					242/62	24.84	18.80

Max Value

Mode	Rate	Antenna	Channel	Freq [MHz]	RU config.	26dB BW [MHz]	99% BW [MHz]
802.11ax80	HE0	SISO A	106	5530	Full	85.31	76.68
					484/65	43.70	37.32
		SISO B	122	5610	Full	85.88	76.80
			106	5530	Full	84.93	76.68
					484/65	42.75	37.44
		MIMO A	122	5610	Full	83.79	76.68
			106	5530	Full	84.17	76.80
					484/65	43.13	37.32
			122	5610	Full	86.45	76.80
		MIMO B	106	5530	Full	83.60	76.80
					484/65	43.70	37.44
			122	5610	Full	83.79	76.56

Mode	Rate	Antenna	Channel	Freq [MHz]	RU config.	26dB BW [MHz]	99% BW [MHz]
802.11ax160	HE0	SISO A	114	5570	Full	163.02	154.75
					996/67	86.79	77.25
					996/S67	85.80	77.25
		SISO B			Full	163.68	155.25
					996/67	86.46	77.25
					996/S67	86.47	77.00
		MIMO A			Full	164.01	154.75
					996/67	86.46	77.00
					996/S67	86.46	77.00
		MIMO B			Full	162.36	154.75
					996/67	84.48	76.75
					996/S67	86.13	77.25

Overlapped channels between U-NII-2C and U-NII-3

Mode	Rate	Channel	Frequency (MHz)	Antenna	Chain	26dB BW [MHz] UNII2C
802.11n20	HT0	144	5720	SISO	A	16.87
					B	17.22
	HT8			MIMO	A	17.42
					B	16.62
802.11n40	HT0	142	5710	SISO	A	39.52
					B	38.35
	HT8			MIMO	A	39.79
					B	36.55
802.11ac80	VHT0	138	5690	SISO	A	79.93
					B	81.64
				MIMO	A	78.79
					B	80.50
802.11ax20	HE0	144	5720	SISO	A	16.78
					B	16.92
				MIMO	A	16.52
					B	17.37
802.11ax40	HE0	142	5710	SISO	A	37.73
					B	37.19
				MIMO	A	36.82
					B	37.36
802.11ax80	HE0	138	5690	SISO	A	77.08
					B	77.46
				MIMO	A	77.65
					B	76.89

See Section B.3.1 and Section B.3.2 for the screenshot results.

B.2.2 Maximum Output power & Maximum power spectral Density

Test limits

Part	Limits
FCC 15.407 (a) (2)	For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band.
RSS-247 Clause 6.2.3 (1)	The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log_{10} B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

Test procedure

The Maximum Conducted Output Power was measured using the channel integration method over the entire 99% occupied bandwidth according to section E) 2) d) (Method SA-2) of KDB 789033

The maximum power spectral density (PSD) was measured using the method according to section F) (Method SA-2) of KDB 789033.

In the measure-and-sum approach for MIMO mode, the conducted emission level (e.g., transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically in linear power units to determine the total emission level from the device.

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power.

The conducted setup shown in section *Test & System Description* was used to measure the maximum conducted output power and power spectral density. The antenna terminal of the EUT is connected to the spectrum analyser through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

For the overlapped channels between U-NII-2C and U-NII-3, and according to FCC OET KDB 789033 D02 the power is computed based on the portion of the emission bandwidth contained within that band. This rule is only applicable for those channels marked as overlapped

Results tables

Duty cycle

Mode	Rate	Antenna	Duty Cycle [%]
802.11a	6Mbps	SISO A	97.83
		SISO B	97.83
802.11n20	HT0	SISO A	98.83
		SISO B	98.83
	HT8	MIMO A	99.4
		MIMO B	99.4
802.11ax20	HE0	SISO A	99.4
		SISO B	98.82
		MIMO A	98.82
		MIMO B	99.39
802.11n40	HT0	SISO A	99.39
		SISO B	99.39
	HT8	MIMO A	98.84
		MIMO B	98.84
802.11ax40	HE0	SISO A	98.79
		SISO B	98.79
		MIMO A	98.79
		MIMO B	98.82
802.11ac80	VHT0	SISO A	98.82
		SISO B	98.78
		MIMO A	98.78
		MIMO B	98.78
802.11ax80	HE0	SISO A	98.81
		SISO B	98.81
		MIMO A	98.6
		MIMO B	98.6
802.11ac160	VTH0	SISO A	98.6
		SISO B	98.79
		MIMO A	98.79
		MIMO B	98.67
802.11ax160	HE0	SISO A	98.67
		SISO B	98.67
		MIMO A	98.8
		MIMO B	98.8

Maximum output power – U-NII-2C Channels

Mode	Rate	#Ch	Freq [MHz]	Antenna	Average Conducted Output Power [dBm]	Avg Max* Conducted Output Power [dBm]	Avg Max*. EIRP [dBm]	Avg Max* Conducted Power [mW]
802.11a	6Mbps	100	5500	SISO A	19.67	19.77	24.77	94.74
				SISO B	19.67	19.77	24.77	94.74
		120	5600	SISO A	20.79	20.89	25.89	122.61
				SISO B	20.82	20.92	25.92	123.46
		140	5700	SISO A	19.60	19.70	24.70	93.22
				SISO B	19.90	20.00	25.00	99.89
802.11n20	HT0	100	5500	SISO A	19.55	19.55	24.55	90.16
				SISO B	19.51	19.51	24.51	89.33
		120	5600	SISO A	20.75	20.75	25.75	118.85
				SISO B	20.76	20.76	25.76	119.12
		140	5700	SISO A	19.34	19.34	24.34	85.90
				SISO B	19.82	19.82	24.82	95.94
	HT8	100	5500	MIMO A	18.15	18.15	23.15	65.31
				MIMO B	18.23	18.23	23.23	66.53
				Combined A+B	21.20	21.20	26.20	131.84
		120	5600	MIMO A	18.32	18.32	23.32	67.92
				MIMO B	18.38	18.38	23.38	68.87
				Combined A+B	21.36	21.36	26.36	136.79
		140	5700	MIMO A	18.56	18.56	23.56	71.78
				MIMO B	18.32	18.32	23.32	67.92
				Combined A+B	21.45	21.45	26.45	139.70
802.11n40	HT0	102	5510	SISO A	17.84	17.84	22.84	60.81
				SISO B	18.21	18.21	23.21	66.22
		118	5590	SISO A	20.79	20.79	25.79	119.95
				SISO B	20.85	20.85	25.85	121.62
		134	5670	SISO A	20.38	20.38	25.38	109.14
				SISO B	20.38	20.38	25.38	109.14
	HT8	102	5510	MIMO A	15.93	15.93	20.93	39.17
				MIMO B	16.64	16.64	21.64	46.13
				Combined A+B	19.31	19.31	24.31	85.31
		118	5590	MIMO A	20.75	20.75	25.75	118.85
				MIMO B	20.72	20.72	25.72	118.03
				Combined A+B	23.75	23.75	28.75	236.88
		134	5670	MIMO A	19.23	19.23	24.23	83.75
				MIMO B	19.56	19.56	24.56	90.36
				Combined A+B	22.41	22.41	27.41	174.12
802.11ac80	VHT0	106	5530	SISO A	17.59	17.59	22.59	57.41
				SISO B	17.43	17.43	22.43	55.34
				MIMO A	15.74	15.74	20.74	37.50
				MIMO B	15.82	15.82	20.82	38.19
		122	5610	Combined A+B	18.79	18.79	23.79	75.69
				SISO A	20.73	20.73	25.73	118.30
				SISO B	20.85	20.85	25.85	121.62
				MIMO A	20.26	20.26	25.26	106.17
802.11ac160	VHT0	114	5570	MIMO B	20.38	20.38	25.38	109.14
				Combined A+B	23.33	23.33	28.33	215.31
				SISO A	15.12	15.12	20.12	32.51
				SISO B	15.15	15.15	20.15	32.73
				MIMO A	13.81	13.81	18.81	24.04
				MIMO B	14.09	14.09	19.09	25.64
				Combined A+B	16.96	16.96	21.96	49.69

* Maximum values are the duty cycle compensated values calculated from the average (measured) values

Mode	Rate	#Ch	Freq [MHz]	Antenna	RU config.	Average Conducted Output Power [dBm]	Avg Max* Conducted Output Power [dBm]	Avg Max*. EIRP [dBm]	Avg Max* Conducted Power [mW]
802.11ax20	HE0	100	5500	SISO A	Full	19.51	19.51	24.51	89.33
					26/0	13.51	13.51	18.51	22.44
					52/37	15.91	15.91	20.91	38.99
					106/53	18.93	18.93	23.93	78.16
				SISO B	Full	19.59	19.59	24.59	90.99
					26/0	13.39	13.39	18.39	21.83
					52/37	16.35	16.35	21.35	43.15
					106/53	19.45	19.45	24.45	88.10
				MIMO A	Full	18.34	18.34	23.34	68.23
					26/0	10.07	10.07	15.07	10.16
					52/37	12.98	12.98	17.98	19.86
					106/53	16.09	16.09	21.09	40.64
				MIMO B	Full	17.86	17.86	22.86	61.09
					26/0	10.43	10.43	15.43	11.04
					52/37	13.05	13.05	18.05	20.18
					106/53	15.86	15.86	20.86	38.55
				Combined A+B	Full	21.12	21.12	26.12	129.33
					26/0	13.26	13.26	18.26	21.20
					52/37	16.03	16.03	21.03	40.04
					106/53	18.99	18.99	23.99	79.19
		120	5600	SISO A	Full	20.84	20.84	25.84	121.34
				SISO B	Full	20.63	20.63	25.63	115.61
				MIMO A	Full	18.43	18.43	23.43	69.66
				MIMO B	Full	18.43	18.43	23.43	69.66
				Combined A+B	Full	21.44	21.44	26.44	139.33
		140	5500	SISO A	Full	19.64	19.64	24.64	92.04
					26/8	13.35	13.35	18.35	21.63
					52/40	16.40	16.40	21.40	43.65
					106/54	19.11	19.11	24.11	81.47
				SISO B	Full	19.84	19.84	24.84	96.38
					26/8	13.26	13.26	18.26	21.18
					52/40	16.28	16.28	21.28	42.46
					106/54	18.95	18.95	23.95	78.52
				MIMO A	Full	18.46	18.46	23.46	70.15
					26/8	10.02	10.02	15.02	10.05
					52/40	12.94	12.94	17.94	19.68
					106/54	16.13	16.13	21.13	41.02
				MIMO B	Full	18.51	18.51	23.51	70.96
					26/8	10.28	10.28	15.28	10.67
					52/40	13.05	13.05	18.05	20.18
					106/54	16.17	16.17	21.17	41.40
				Combined A+B	Full	21.50	21.50	26.50	141.10
					26/8	13.16	13.16	18.16	20.71
					52/40	16.01	16.01	21.01	39.86
					106/54	19.16	19.16	24.16	82.42
802.11ax40	HE0	102	5510	SISO A	Full	18.13	18.13	23.13	65.01
					242/62	19.78	19.78	24.78	95.06
				SISO B	Full	18.18	18.18	23.18	65.77
					242/62	19.64	19.64	24.64	92.04
				MIMO A	Full	16.65	16.65	21.65	46.24
					242/62	18.24	18.24	23.24	66.68
				MIMO B	Full	16.57	16.57	21.57	45.39
					242/62	18.39	18.39	23.39	69.02
				Combined A+B	Full	19.62	19.62	24.62	91.63
					242/62	21.33	21.33	26.33	135.70
		118	5590	SISO A	Full	21.04	21.04	26.04	127.06
				SISO B	Full	20.84	20.84	25.84	121.34
				MIMO A	Full	20.57	20.57	25.57	114.02
				MIMO B	Full	20.59	20.59	25.59	114.55
				Combined A+B	Full	23.59	23.59	28.59	228.58
		134	5670	SISO A	Full	20.55	20.55	25.55	113.50
					242/62	20.59	20.59	25.59	114.55
				SISO B	Full	19.85	19.85	24.85	96.61
					242/62	20.35	20.35	25.35	108.39
				MIMO A	Full	19.34	19.34	24.34	85.90
					242/62	18.14	18.14	23.14	65.16
				MIMO B	Full	19.52	19.52	24.52	89.54
					242/62	18.49	18.49	23.49	70.63
				Combined A+B	Full	22.44	22.44	27.44	175.44
					242/62	21.33	21.33	26.33	135.79

* Maximum values are the duty cycle compensated values calculated from the average (measured) value

Mode	Rate	#Ch	Freq [MHz]	Antenna	RU config.	Average Conducted Output Power [dBm]	Avg Max* Conducted Output Power [dBm]	Avg Max*. EIRP [dBm]	Avg Max* Conducted Power [mW]
802.11ax80	HE0	106	5530	SISO A	Full	17.53	17.53	22.53	56.62
					484/65	18.11	18.11	23.11	64.71
				SISO B	Full	17.62	17.62	22.62	57.81
					484/65	18.26	18.26	23.26	66.99
				MIMO A	Full	15.67	15.67	20.67	36.90
					484/65	16.55	16.55	21.55	45.19
		122	5610	MIMO B	Full	16.15	16.15	21.15	41.21
					484/65	16.62	16.62	21.62	45.92
				Combined A+B	Full	18.93	18.93	23.93	78.11
					484/65	19.60	19.60	24.60	91.11
				SISO A	Full	20.78	20.78	25.78	119.67
				SISO B	Full	20.57	20.57	25.57	114.02
802.11ax160	HE0	114	5570	SISO A	FullBW	14.95	14.95	19.95	31.26
					80m/67	17.13	17.13	22.13	51.64
					80m/S67	19.66	19.66	24.66	92.47
				SISO B	FullBW	15.22	15.22	20.22	33.27
					80m/67	17.33	17.33	22.33	54.08
					80m/S67	19.34	19.34	24.34	85.98
				MIMO A	FullBW	13.87	13.97	18.97	24.95
					80m/67	16.08	16.18	21.18	41.50
					80m/S67	18.15	18.25	23.25	66.87
				MIMO B	FullBW	13.93	14.03	19.03	25.30
					80m/67	16.29	16.39	21.39	43.56
					80m/S67	18.44	18.54	23.54	71.39
				Combined A+B	FullBW	16.91	17.01	22.01	50.25
					80m/67	19.20	19.30	24.30	85.06
					80m/S67	21.31	21.41	26.41	138.27

* Maximum values are the duty cycle compensated values calculated from the average (measured) values

Maximum output power – Overlapped channels between U-NII-2C and U-NII-3

Mode	Rate	Antenna	Chain	Channel	Frequency (MHz)	Average Cond. Output Power - UNII-2C [dBm]	Max.* Cond. Output Power - UNII-2C [dBm]	Max.* EIRP UNII2C [dBm]	Max.* Cond. Output Power - UNII-2C [mW]
802.11n20	HT0	SISO	A	144	5720	20.36	20.36	25.36	108.64
			B		5720	19.34	19.34	24.34	85.90
	HT8	MIMO	A		5720	18.34	18.34	23.34	68.23
			B		5720	15.71	15.71	20.71	37.24
		Combined	A+B		5720	20.23	20.23	25.23	105.47
			A+B		5720	20.23	20.23	25.23	105.47
802.11n40	HT0	SISO	A	142	5710	20.83	20.83	25.83	121.06
			B		5710	20.63	20.63	25.63	115.61
	HT8	MIMO	A		5710	20.73	20.73	25.73	118.30
			B		5710	19.48	19.48	24.48	88.72
		Combined	A+B		5710	23.16	23.16	28.16	207.02
			A+B		5710	23.16	23.16	28.16	207.02
802.11ac80	VHT0	SISO	A	138	5690	20.89	20.89	25.89	122.74
			B		5690	20.97	20.97	25.97	125.03
		MIMO	A		5690	20.26	20.26	25.26	106.17
			B		5690	20.69	20.69	25.69	117.22
		Combined	A+B		5690	23.49	23.49	28.49	223.39
			A+B		5690	23.49	23.49	28.49	223.39
802.11ax20	HE0	SISO	A	144	5720	20.21	20.21	25.21	104.95
			B		5720	20.21	20.21	25.21	104.95
		MIMO	A		5720	18.35	18.35	23.35	68.39
			B		5720	18.35	18.35	23.35	68.39
		Combined	A+B		5720	21.36	21.36	26.36	136.78
			A+B		5720	21.36	21.36	26.36	136.78
802.11ax40	HE0	SISO	A	142	5710	20.64	20.64	25.64	115.88
			B		5710	20.64	20.64	25.64	115.88
		MIMO	A		5710	20.47	20.47	25.47	111.43
			B		5710	20.46	20.46	25.46	111.17
		Combined	A+B		5710	23.48	23.48	28.48	222.60
			A+B		5710	23.48	23.48	28.48	222.60
802.11ax80	HE0	SISO	A	138	5690	20.85	20.85	25.85	121.62
			B		5690	20.82	20.82	25.82	120.78
		MIMO	A		5690	20.70	20.70	25.70	117.49
			B		5690	20.56	20.56	25.56	113.76
		Combined	A+B		5690	23.64	23.64	28.64	231.25
			A+B		5690	23.64	23.64	28.64	231.25

* Maximum values are the duty cycle compensated values calculated from the average (measured) values

Max/Min Value

Maximum Power Spectral Density (PSD) – U-NII-2C channels

Mode	Rate	Channel	Freq [MHz]	Antenna	Average conducted PSD [dBm/MHz]	Maximum* conducted PSD [dBm/MHz]
802.11a	6Mbps	100	5500	SISO A	9.44	9.54
				SISO B	9.24	9.34
		120	5600	SISO A	10.37	10.47
				SISO B	10.20	10.30
		140	5700	SISO A	9.13	9.23
				SISO B	9.38	9.48
802.11n20	HT0	100	5500	SISO A	8.89	8.89
				SISO B	8.89	8.89
		120	5600	SISO A	10.19	10.19
				SISO B	10.14	10.14
		140	5700	SISO A	8.59	8.59
				SISO B	9.22	9.22
	HT8	100	5500	MIMO A	7.34	7.34
				MIMO B	7.68	7.68
				Combined A+B	10.52	10.52
				Combined A+B	10.52	10.52
		120	5600	MIMO A	7.77	7.77
				MIMO B	7.71	7.71
				Combined A+B	10.75	10.75
				Combined A+B	10.75	10.75
		140	5700	MIMO A	7.86	7.86
				MIMO B	7.30	7.30
				Combined A+B	10.60	10.60
				Combined A+B	10.60	10.60
802.11n40	HT0	102	5510	SISO A	3.73	3.73
				SISO B	4.10	4.10
		118	5590	SISO A	5.83	5.83
				SISO B	6.73	6.73
		134	5670	SISO A	6.41	6.41
				SISO B	6.27	6.27
	HT8	102	5510	MIMO A	1.80	1.80
				MIMO B	2.46	2.46
				Combined A+B	5.15	5.15
				Combined A+B	5.15	5.15
		118	5590	MIMO A	6.58	6.58
				MIMO B	6.56	6.56
				Combined A+B	9.58	9.58
				Combined A+B	9.58	9.58
		134	5670	MIMO A	5.17	5.17
				MIMO B	5.04	5.04
				Combined A+B	8.12	8.12
				Combined A+B	8.12	8.12
802.11ac80	VHT0	106	5530	SISO A	0.40	0.40
				SISO B	0.31	0.31
				MIMO A	-1.44	-1.44
				MIMO B	-1.27	-1.27
				Combined A+B	1.66	1.66
		122	5610	SISO A	3.53	3.53
				SISO B	3.81	3.81
				MIMO A	3.11	3.11
				MIMO B	3.26	3.26
				Combined A+B	6.20	6.20
802.11ac160	VHT0	114	5570	SISO A	-4.82	-4.82
				SISO B	-4.82	-4.82
				MIMO A	-6.14	-6.14
				MIMO B	-5.81	-5.81
				Combined A+B	-2.96	-2.96

* Maximum values are the duty cycle compensated values calculated from the average (measured) values

Mode	Rate	Channel	Freq [MHz]	Antenna	RU config.	Average conducted PSD [dBm/MHz]	Maximum* conducted PSD [dBm/MHz]
802.11ax20	HE0	100	5500	SISO A	Full	8.55	8.55
					26/0	10.88	10.88
					52/37	10.43	10.43
					106/53	10.43	10.43
				SISO B	Full	8.91	8.91
					26/0	10.64	10.64
					52/37	10.74	10.74
					106/53	10.98	10.98
				MIMO A	Full	7.55	7.55
					26/0	7.49	7.49
					52/37	7.76	7.76
					106/53	7.73	7.73
				MIMO B	Full	7.20	7.20
					26/0	7.86	7.86
					52/37	7.70	7.70
					106/53	7.58	7.58
				Combined A+B	Full	10.39	10.39
					26/0	10.69	10.69
					52/37	10.74	10.74
					106/53	10.67	10.67
		120	5600	SISO A	Full	10.10	10.10
				SISO B	Full	9.88	9.88
				MIMO A	Full	7.60	7.60
				MIMO B	Full	7.66	7.66
				Combined A+B	Full	10.64	10.64
		140	5700	SISO A	Full	9.07	9.07
					26/8	10.67	10.67
					52/40	10.78	10.78
					106/54	10.65	10.65
				SISO B	Full	9.13	9.13
					26/8	10.57	10.57
					52/40	10.91	10.91
					106/54	10.56	10.56
				MIMO A	Full	7.87	7.87
					26/8	7.29	7.29
					52/40	7.51	7.51
					106/54	7.69	7.69
				MIMO B	Full	7.36	7.36
					26/8	7.77	7.77
					52/40	7.62	7.62
					106/54	7.69	7.69
				Combined A+B	Full	10.63	10.63
					26/8	10.55	10.55
					52/40	10.58	10.58
					106/54	10.70	10.70
802.11ax40	HE0	102	5510	SISO A	Full	4.07	4.07
					242/62	8.79	8.79
				SISO B	Full	4.11	4.11
					242/62	8.57	8.57
				MIMO A	Full	2.51	2.51
					242/62	7.37	7.37
				MIMO B	Full	2.48	2.48
					242/62	7.44	7.44
				Combined A+B	Full	5.51	5.51
					242/62	10.42	10.42
		118	5590	SISO A	Full	6.85	6.85
				SISO B	Full	6.69	6.69
				MIMO A	Full	6.72	6.72
				MIMO B	Full	6.46	6.46
				Combined A+B	Full	9.60	9.60
		134	5670	SISO A	FullBW	6.46	6.46
					242/62	9.56	9.56
				SISO B	FullBW	5.62	5.62
					242/62	9.43	9.43
				MIMO A	FullBW	5.19	5.19

					242/62	7.38	7.38
					FullBW	5.43	5.43
				MIMO B	242/62	7.45	7.45
				Combined A+B	FullBW	8.32	8.32
					242/62	10.43	10.43

* Maximum values are the duty cycle compensated values calculated from the average (measured) values

Mode	Rate	Channel	Freq [MHz]	Antenna	RU config.	Average conducted PSD [dBm/MHz]	Maximum* conducted PSD [dBm/MHz]
802.11ax80	HE0	106	5530	SISO A	Full	0.35	0.35
					484/65	3.96	3.96
				SISO B	Full	0.39	0.39
					484/65	3.87	3.87
				MIMO A	Full	-1.45	-1.45
					484/65	2.36	2.36
		122	5610	MIMO B	Full	-0.83	-0.83
					484/65	2.33	2.33
				Combined A+B	Full	1.88	1.88
					484/65	5.36	5.36
				SISO A	Full	3.71	3.71
				SISO B	Full	3.41	3.41
802.11ax160	HE0	114	5570	SISO A	FullBW	-5.08	-5.08
					80m/67	-0.07	-0.07
					80m/S67	2.44	2.44
				SISO B	FullBW	-4.67	-4.67
					80m/67	0.08	0.08
					80m/S67	2.04	2.04
				MIMO A	FullBW	-6.00	-5.90
					80m/67	-0.92	-0.82
					80m/S67	0.99	1.09
				MIMO B	FullBW	-5.97	-5.87
					80m/67	-0.85	-0.75
					80m/S67	1.16	1.26
				Combined A+B	FullBW	-2.97	-2.87
					80m/67	2.13	2.23
					80m/S67	4.09	4.19

* Maximum values are the duty cycle compensated values calculated from the average (measured) values

Maximum Power Spectral Density (PSD) – Overlapped channels between U-NII-2C and U-NII-3

Mode	Rate	Channel	Frequency (MHz)	Antenna	Chain	Average conducted PSD UNII-2C [dBm/MHz]	Maximum* conducted PSD UNII-2C [dBm/MHz]
802.11n20	HT0	144	5720	SISO	A	10.02	10.02
					B	9.89	9.89
	HT8			MIMO	A	7.94	7.94
					B	7.79	7.79
	Combined			A+B	10.88	10.88	
802.11n40	HT0	142	5710	SISO	A	6.60	6.60
					B	6.38	6.38
	HT8			MIMO	A	6.48	6.48
					B	6.19	6.19
	Combined			A+B	9.35	9.35	
802.11ac80	VHT0	138	5690	SISO	A	3.44	3.44
					B	3.51	3.51
				MIMO	A	3.18	3.18
					B	3.25	3.25
				Combined	A+B	6.23	6.23
802.11ax20	HE0	144	5720	SISO	A	9.72	9.72
					B	9.79	9.79
				MIMO	A	7.85	7.85
					B	7.84	7.84
				Combined	A+B	10.86	10.86
802.11ax40	HE0	142	5710	SISO	A	6.36	6.36
					B	6.28	6.28
				MIMO	A	6.09	6.09
					B	6.21	6.21
				Combined	A+B	9.16	9.16
802.11ax80	HE0	138	5690	SISO	A	3.38	3.38
					B	3.35	3.35
				MIMO	A	3.18	3.18
					B	3.08	3.08
				Combined	A+B	6.14	6.14

* Maximum values are the duty cycle compensated values calculated from the average (measured) values

See Section B.3.3 for the screenshot results.

B.2.3 Undesirable emission limits : out of band (Conducted)

Test limits

FCC part	RSS clause	Limits																				
15.407 (b) (3)	RSS-247 Clause 6.2.3 (2)	For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.																				
15.209	RSS-GEN A1, Clause 8.9	Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a):																				
		<table><tr><th>Freq Range (MHz)</th><th>Field Strength (μV/m)</th><th>Field Strength (dBμV/m)</th><th>Meas. Distance (m)</th></tr><tr><td>30-88</td><td>100</td><td>40</td><td>3</td></tr><tr><td>88-216</td><td>150</td><td>43.5</td><td>3</td></tr><tr><td>216-960</td><td>200</td><td>46</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>54</td><td>3</td></tr></table>	Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)	30-88	100	40	3	88-216	150	43.5	3	216-960	200	46	3	Above 960	500	54	3
		Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)																	
		30-88	100	40	3																	
		88-216	150	43.5	3																	
		216-960	200	46	3																	
Above 960	500	54	3																			
The emission limits shown in the table above are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.																						
For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.																						

Test procedure

The conducted setup shown in section *Test & System Description* was used to measure undesirable emissions on the out of band domain. The antenna terminal of the EUT is connected to the spectrum analyzer through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss and the declared antenna gain.

For the lower and upper side of the out of band, the integration method was used as defined in the out of band measurements section II.G.3.d & II.G.2.c of KDB 789033.

For out of band emission measurements in MIMO mode the emission level of individual output is adjusted by $10 \log(N_{ant}) = 3\text{dB}$ for $N_{ant} = 2$ which is equivalent to compare the individual output emission level to the limit minus 3dB. The same approach is applied for peak and RMS detectors.

In case of out of band measurements falling in restricted bands, the declared antenna gain is also compensated in the graph.

The following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dBμV/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated values in the table.

§15.209(a)			Converted values	
Freq Range (MHz)	Distance (m)	Field strength (microvolts/meter)	Field strength (dB microvolts/meter)	Power (dBm)
Above 960	3	500	53.98	-41.2

See Section B.3.4 for the screenshot results.

B.2.4 Radiated spurious emission

Standard references

FCC part	RSS clause	Limits																				
15.407 (b) (3)	RSS-247 Clause 6.2.3 (2)	For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.																				
15.209	RSS-GEN A1, Clause 8.9	Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a): <table><tr><th>Freq Range (MHz)</th><th>Field Strength (μV/m)</th><th>Field Strength (dBμV/m)</th><th>Meas. Distance (m)</th></tr><tr><td>30-88</td><td>100</td><td>40</td><td>3</td></tr><tr><td>88-216</td><td>150</td><td>43.5</td><td>3</td></tr><tr><td>216-960</td><td>200</td><td>46</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>54</td><td>3</td></tr></table> The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit specified when measuring with peak detector function, corresponding to 20 dB above the indicated values in the table.	Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)	30-88	100	40	3	88-216	150	43.5	3	216-960	200	46	3	Above 960	500	54	3
Freq Range (MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Meas. Distance (m)																			
30-88	100	40	3																			
88-216	150	43.5	3																			
216-960	200	46	3																			
Above 960	500	54	3																			

Test procedure

The radiated setups shown in section *Test & System Description* were used to measure the radiated spurious emissions. Depending of the frequency range and bands being tested, different antennas and filters were used. The final measurement is done by varying the antenna height from 1 m to 4 m, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

The radiated spurious emission was measured on the worst case configuration selected from the chapter B.2.2 and using the low, middle and high channels.

Test Results**Radiated spurious - 30 MHz – 1 GHz****Radiated Spurious – All modes**

Frequency	Quasi-Peak	Limit	Margin	Polarization
MHz	dBµV/m	dBµV/m	dB	
536.6	40.2	46.0	5.8	V
545.0	39.5	46.0	6.5	V

Note 1: The spurious signals detected do not depend on either the operating channel or the modulation mode.

802.11a**1 GHz – 40 GHz, 802.11a, 6Mbps, Chain A****Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3375.5	58.7	---	68.2	9.5	H
17820.7	---	40.1	54.0	13.9	H
17829.4	50.8	---	74.0	23.2	H
22000.2	45.9	---	68.2	22.3	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3398.5	57.9	---	68.2	10.3	H
17805.2	51.4	---	74.0	22.6	V
17832.8	---	39.4	54.0	14.6	V
22400.2	45.9	---	74.0	28.1	V
22400.2	---	39.4	54.0	14.6	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3302.0	59.6	---	68.2	8.6	H
17778.2	51.2	---	74.0	22.8	H
17820.2	---	40.4	54.0	13.6	V
22800.1	46.3	---	74.0	27.7	H
22800.1	---	38.6	54.0	15.4	V

1 GHz – 40 GHz, 802.11a, 6Mbps, Chain B**Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3397.5	58.6	---	68.2	9.6	H
17820.2	49.9	---	74.0	24.1	H
17824.5	---	40.4	54.0	13.6	H
22000.2	45.7	---	68.2	22.5	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3400.0	59.0	---	68.2	9.2	V
17777.7	---	40.3	54.0	13.7	H
17780.1	50.3	---	74.0	23.7	H
22400.2	48.3	---	74.0	25.7	V
22400.2	---	40.2	54.0	13.8	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3398.0	58.4	---	68.2	9.8	V
17801.3	---	40.0	54.0	14.0	V
17832.8	50.8	---	74.0	23.2	H
39606.1	54.3	---	74.0	19.7	V
39606.1	---	45.4	54.0	8.6	V

802.11n**1 GHz – 40 GHz, 802.11n20, HT0, Chain A****Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3368.5	59.6	---	68.2	8.6	H
17780.6	---	39.5	54.0	14.5	V
17821.2	50.3	---	74.0	23.7	H
21999.7	45.7	---	68.2	22.5	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3398.0	58.0	---	68.2	10.2	H
11199.0	48.2	---	74.0	25.8	V
11203.9	---	39.4	54.0	14.6	V
22400.2	45.7	---	74.0	28.3	V
22400.2	---	39.8	54.0	14.2	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3382.5	58.4	---	68.2	9.8	V
17807.2	---	41.0	54.0	13.0	H
17812.5	51.3	---	74.0	22.7	V
22800.1	46.6	---	74.0	27.4	V
22800.1	---	38.3	54.0	15.7	V

1 GHz – 40 GHz, 802.11n20, HT0, Chain B**Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3363.5	59.4	---	68.2	8.8	H
17861.3	50.5	---	74.0	23.5	V
17867.1	---	39.6	54.0	14.4	V
21999.7	46.0	---	68.2	22.2	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3382.0	59.1	---	68.2	9.1	V
11199.5	---	39.8	54.0	14.2	V
11200.0	49.1	---	74.0	24.9	V
22400.2	48.9	---	74.0	25.1	V
22400.2	---	40.1	54.0	13.9	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3372.5	58.9	---	68.2	9.3	V
17787.3	51.9	---	74.0	22.1	H
17813.9	---	40.7	54.0	13.3	H
22800.1	45.7	---	74.0	28.3	V
22800.1	---	38.3	54.0	15.7	V

1 GHz – 40 GHz, 802.11n20, HT8, Chain A+B**Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3380.0	58.9	---	68.2	9.3	H
17799.4	---	39.5	54.0	14.5	H
17822.1	51.2	---	74.0	22.8	H
22000.2	45.9	---	68.2	22.3	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3373.5	58.9	---	68.2	9.3	H
11200.5	49.5	---	74.0	24.5	V
11200.5	---	39.6	54.0	14.4	V
22400.2	48.4	---	74.0	25.6	V
22400.2	---	40.0	54.0	14.0	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3399.5	58.2	---	68.2	10.0	H
17781.5	51.7	---	74.0	22.3	V
17822.1	---	39.3	54.0	14.7	H
22800.1	45.3	---	74.0	28.7	V
22800.1	---	38.7	54.0	15.3	V

1 GHz – 40 GHz, 802.11n40, HT0, Chain A**Radiated Spurious – CH102**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3386.5	58.5	---	68.2	9.7	H
17781.0	51.1	---	74.0	22.9	H
17802.3	---	40.5	54.0	13.5	V
22039.9	46.6	---	74.0	27.4	V
22039.9	---	39.2	54.0	14.8	V

Radiated Spurious – CH118

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3376.5	59.4	---	68.2	8.8	H
17772.3	---	40.1	54.0	13.9	H
17783.0	51.1	---	74.0	22.9	V
22360.0	47.2	---	74.0	26.8	V
22360.0	---	40.0	54.0	14.0	V

Radiated Spurious – CH134

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3385.0	58.8	---	68.2	9.4	H
17772.3	50.9	---	74.0	23.1	H
17798.9	---	39.4	54.0	14.6	H
22680.2	47.4	---	74.0	26.6	H
22680.2	---	39.7	54.0	14.3	V

1 GHz – 40 GHz, 802.11n40, HT0, Chain B**Radiated Spurious – CH102**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3397.5	59.2	---	68.2	9.0	V
17768.5	51.1	---	74.0	22.9	H
17800.4	---	40.1	54.0	13.9	H
22039.9	45.5	---	74.0	28.5	V
22039.9	---	37.8	54.0	16.2	V

Radiated Spurious – CH118

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3379.0	58.9	---	68.2	9.3	H
17780.1	---	40.0	54.0	13.9	V
17800.9	50.7	---	74.0	23.3	H
22360.0	46.8	---	74.0	27.2	V
22360.0	---	39.7	54.0	14.3	V

Radiated Spurious – CH134

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3365.0	58.7	---	68.2	9.5	H
17779.1	---	39.8	54.0	14.2	H
17841.0	49.0	---	74.0	25.0	V
22679.7	46.7	---	74.0	27.3	V
22679.7	---	38.6	54.0	15.4	V

1 GHz – 40 GHz, 802.11n40, HT8, Chain A+B**Radiated Spurious – CH102**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3380.5	59.0	---	68.2	9.2	V
17755.0	51.4	---	74.0	22.6	V
17778.2	---	40.1	54.0	13.9	V
22039.9	47.0	---	74.0	27.0	V
22039.9	---	38.9	54.0	15.1	V

Radiated Spurious – CH118

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3383.0	58.8	---	68.2	9.4	V
17801.8	---	40.3	54.0	13.7	H
17809.6	50.7	---	74.0	23.3	V
22360.0	48.1	---	74.0	25.9	V
22360.0	---	41.1	54.0	12.9	V

Radiated Spurious – CH134

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3379.5	59.0	---	68.2	9.2	V
17784.0	51.0	---	74.0	23.0	H
17790.2	---	40.6	54.0	13.4	H
22679.7	46.7	---	74.0	27.3	V
22679.7	---	38.6	54.0	15.4	V

802.11ac**1 GHz – 40 GHz, 802.11ac80, VHT0, Chain A****Radiated Spurious – CH106**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3379.5	59.0	---	68.2	9.2	V
17722.6	50.6	---	74.0	23.4	H
17762.7	---	39.9	54.0	14.1	H
22120.1	45.0	---	74.0	29.0	V
22120.1	---	38.6	54.0	15.4	V

Radiated Spurious – CH122

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3395.0	59.2	---	68.2	9.0	V
17809.6	---	40.5	54.0	13.4	H
17826.0	51.0	---	74.0	23.0	V
22439.8	46.4	---	74.0	27.6	V
22439.8	---	39.0	54.0	15.1	V

Radiated Spurious – CH138

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3375.0	59.2	---	68.2	8.9	V
17802.3	51.3	---	74.0	22.7	V
17804.2	---	40.5	54.0	13.5	H
22760.0	46.0	---	74.0	28.0	V
22760.0	---	39.4	54.0	14.6	V

1 GHz – 40 GHz, 802.11ac80, VHT0, Chain B**Radiated Spurious – CH106**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3373.5	59.8	---	68.2	8.4	V
17806.2	52.2	---	74.0	21.8	H
17820.2	---	40.1	54.0	13.9	V
22120.1	44.4	---	74.0	29.6	H
22120.1	---	37.8	54.0	16.2	V

Radiated Spurious – CH122

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3683.2	---	38.5	54.0	15.5	H
3685.8	51.3	---	74.0	22.7	V
17806.2	51.5	---	74.0	22.6	H
17824.5	---	40.3	54.0	13.7	H
22439.8	46.6	---	74.0	27.4	V
22439.8	---	38.7	54.0	15.3	V

Radiated Spurious – CH138

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3396.5	58.4	---	68.2	9.8	V
17773.3	51.7	---	74.0	22.3	H
17841.0	---	39.9	54.0	14.1	H
22760.0	46.5	---	74.0	27.5	V
22760.0	---	37.8	54.0	16.2	V

1 GHz – 40 GHz, 802.11ac80, VHT0, Chain A+B**Radiated Spurious – CH106**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3397.0	58.4	---	68.2	9.8	V
6912.3	44.2	---	68.2	24.0	V
22120.1	45.4	---	74.0	28.6	V
22120.1	---	38.3	54.0	15.7	V

Radiated Spurious – CH122

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3398.5	58.0	---	68.2	10.2	V
17768.0	---	40.4	54.0	13.6	V
17789.3	51.6	---	74.0	22.4	H
22439.8	46.8	---	74.0	27.2	V
22439.8	---	40.2	54.0	13.8	V

Radiated Spurious – CH138

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3387.5	59.0	---	68.2	9.2	H
17776.2	51.4	---	74.0	22.6	V
17799.4	---	40.0	54.0	14.0	H
22760.0	46.2	---	74.0	27.8	V
22760.0	---	38.5	54.0	15.5	V

1 GHz – 40 GHz, 802.11ac160, VHT0, Chain A**Radiated Spurious – CH114**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3372.0	59.0	---	68.2	9.2	V
17786.8	51.4	---	74.0	22.6	V
17799.9	---	39.9	54.0	14.1	H
22280.2	46.6	---	74.0	27.4	H
22280.2	---	41.5	54.0	12.5	V

1 GHz – 40 GHz, 802.11ac160, VHT0, Chain B**Radiated Spurious – CH114**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3375.0	58.5	---	68.2	9.7	V
17753.5	50.5	---	74.0	23.5	H
17765.6	---	40.0	54.0	14.0	H
22279.8	48.1	---	74.0	25.9	V
22279.8	---	41.0	54.0	13.1	V

1 GHz – 40 GHz, 802.11ac160, VHT0, Chain A+B**Radiated Spurious – CH114**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3384.5	58.6	---	68.2	9.7	H
17786.4	---	40.3	54.0	13.7	H
17801.8	50.6	---	74.0	23.4	V
22279.8	47.0	---	74.0	27.0	V
22279.8	---	40.8	54.0	13.2	V

802.11ax**1 GHz – 40 GHz, 802.11ax20, HE0, Chain A****Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3376.0	58.5	---	68.2	9.7	H
17814.4	51.0	---	74.0	23.0	H
17816.3	---	40.9	54.0	13.1	V
22000.2	45.6	---	68.2	22.6	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3683.7	51.6	---	74.0	22.4	H
3688.0	---	38.5	54.0	15.5	H
17750.1	---	40.4	54.0	13.6	V
17809.1	50.8	---	74.0	23.2	V
22400.2	45.6	---	74.0	28.4	V
22400.2	---	39.8	54.0	14.2	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3379.0	59.0	---	68.2	9.2	H
11383.2	48.2	---	74.0	25.8	H
11383.2	---	39.5	54.0	14.5	V
22800.1	45.1	---	74.0	28.9	V
22800.1	---	37.7	54.0	16.3	V

1 GHz – 40 GHz, 802.11ax20, HE0, Chain B**Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3395.5	58.0	---	68.2	10.2	H
10982.0	48.0	---	74.0	26.0	V
10983.5	---	39.0	54.0	15.0	V
22000.2	45.6	---	68.2	22.6	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3973.4	51.5	---	74.0	22.5	H
3976.5	---	39.8	54.0	14.2	V
17798.9	---	39.6	54.0	14.4	V
17830.8	50.9	---	74.0	23.1	V
22366.6	---	41.0	54.0	13.0	V
22366.6	51.4	---	74.0	22.6	V
22400.2	46.0	---	74.0	28.0	V
22400.2	---	38.6	54.0	15.4	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3367.5	59.1	---	68.2	9.1	V
11372.5	48.5	---	74.0	25.5	H
11383.2	---	39.1	54.0	14.9	V
22800.1	45.1	---	74.0	28.9	V
22800.1	---	38.3	54.0	15.7	V

1 GHz – 40 GHz, 802.11ax20, HE0, Chain A+B**Radiated Spurious – CH100**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3374.5	58.6	---	68.2	9.6	V
10967.5	49.1	---	74.0	24.9	V
10983.5	---	39.0	54.0	15.0	V
21999.7	45.4	---	68.2	22.8	V

Radiated Spurious – CH120

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3773.4	---	39.2	54.0	14.8	V
3777.8	51.8	---	74.0	22.2	V
17781.5	50.2	---	74.0	23.8	V
17813.0	---	40.9	54.0	13.1	V
22400.2	46.4	---	74.0	27.6	V
22400.2	---	40.3	54.0	13.7	V

Radiated Spurious – CH140

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3383.0	58.5	---	68.2	9.7	H
11383.2	48.7	---	74.0	25.3	V
11383.2	---	39.3	54.0	14.7	V
22800.1	46.7	---	74.0	27.3	V
22800.1	---	39.5	54.0	14.4	V

1 GHz – 40 GHz, 802.11ax40, HE0, Chain A**Radiated Spurious – CH102**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3379.0	59.2	---	68.2	9.0	V
17784.4	51.2	---	74.0	22.8	V
17813.4	---	40.6	54.0	13.4	V
22039.9	45.2	---	74.0	28.8	H
22039.9	---	38.4	54.0	15.6	H

Radiated Spurious – CH118

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3397.0	58.2	---	68.2	10.0	H
17798.9	---	39.7	54.0	14.3	H
17842.9	49.9	---	74.0	24.1	H
22360.0	46.0	---	74.0	28.0	V
22360.0	---	40.0	54.0	14.0	V

Radiated Spurious – CH134

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3400.0	58.3	---	68.2	9.9	V
17756.9	---	39.5	54.0	14.5	H
17824.5	51.1	---	74.0	22.9	V
22679.7	47.1	---	74.0	26.9	H
22679.7	---	39.1	54.0	14.9	V

1 GHz – 40 GHz, 802.11ax40, HE0, Chain B**Radiated Spurious – CH102**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3376.0	60.0	---	68.2	8.2	V
11025.5	48.5	---	74.0	25.5	V
11026.0	---	39.8	54.0	14.2	V
22039.9	46.5	---	74.0	27.5	H
22039.9	---	38.5	54.0	15.6	V

Radiated Spurious – CH118

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3374.5	58.6	---	68.2	9.6	V
17820.2	---	40.3	54.0	13.7	V
17820.2	49.9	---	74.0	24.1	V
22360.0	45.8	---	74.0	28.2	V
22360.0	---	39.4	54.0	14.6	V
22373.7	49.9	---	74.0	24.1	V
22373.7	---	40.1	54.0	13.9	V

Radiated Spurious – CH134

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3365.5	59.2	---	68.2	9.0	H
17789.8	---	40.8	54.0	13.2	H
17864.7	50.8	---	74.0	23.2	H
22680.2	46.8	---	74.0	27.2	V
22680.2	---	39.5	54.0	14.6	V

1 GHz – 40 GHz, 802.11ax40, HE0, Chain A+B**Radiated Spurious – CH102**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3394.0	58.7	---	68.2	9.5	V
17735.6	50.1	---	74.0	23.9	V
17820.2	---	40.2	54.0	13.8	H
22039.9	46.0	---	74.0	28.1	V
22039.9	---	39.3	54.0	14.7	V

Radiated Spurious – CH118

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3390.0	59.1	---	68.2	9.1	H
17820.2	---	40.3	54.0	13.7	H
17821.7	50.9	---	74.0	23.1	H
22360.0	46.3	---	74.0	27.7	V
22360.0	---	40.4	54.0	13.6	V

Radiated Spurious – CH134

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3384.5	58.3	---	68.2	9.9	H
17820.7	---	40.1	54.0	13.9	V
17841.0	51.1	---	74.0	22.9	V
22680.2	46.6	---	74.0	27.4	V
22680.2	---	40.0	54.0	14.0	V

1 GHz – 40 GHz, 802.11ax80, HE0, Chain A**Radiated Spurious – CH106**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3390.5	58.5	---	68.2	9.8	V
17747.7	51.0	---	74.0	23.0	H
17757.8	---	39.9	54.0	14.1	V
22119.7	46.0	---	74.0	28.0	V
22119.7	---	38.9	54.0	15.1	V

Radiated Spurious – CH122

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3375.5	60.1	---	68.2	8.1	H
11229.0	48.7	---	74.0	25.3	H
11229.0	---	38.9	54.0	15.1	V
22439.8	46.5	---	74.0	27.5	V
22439.8	---	38.9	54.0	15.1	V

Radiated Spurious – CH138

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3396.5	58.5	---	68.2	9.7	V
11388.5	---	39.3	54.0	14.7	V
11389.0	48.9	---	74.0	25.1	V
22760.0	45.8	---	74.0	28.2	V
22760.0	---	38.6	54.0	15.4	V

1 GHz – 40 GHz, 802.11ax80, HE0, Chain B**Radiated Spurious – CH106**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3373.0	58.9	---	68.2	9.3	V
11069.0	---	40.8	54.0	13.2	V
11070.0	49.8	---	74.0	24.2	V
22120.1	45.0	---	74.0	29.1	V
22120.1	---	36.9	54.0	17.1	H

Radiated Spurious – CH122

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3384.5	58.3	---	68.2	9.9	V
17837.6	50.6	---	74.0	23.4	V
17846.8	---	40.0	54.0	14.0	H
22439.8	46.0	---	74.0	28.0	H
22439.8	---	38.9	54.0	15.1	V
22458.2	---	39.1	54.0	14.9	V
22458.2	48.5	---	74.0	25.5	V

Radiated Spurious – CH138

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3391.0	58.0	---	68.2	10.2	H
17781.5	---	40.8	54.0	13.2	V
17805.7	50.7	---	74.0	23.3	V
22760.0	46.0	---	74.0	28.0	V
22760.0	---	39.5	54.0	14.4	V

1 GHz – 40 GHz, 802.11ax80, HE0, Chain A+B**Radiated Spurious – CH106**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
4147.3	---	40.8	54.0	13.2	V
4150.3	51.5	---	74.0	22.4	H
17780.6	51.7	---	74.0	22.3	V
17820.2	---	40.2	54.0	13.8	V
22120.1	45.4	---	74.0	28.6	V
22120.1	---	38.6	54.0	15.4	V

Radiated Spurious – CH122

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3363.5	59.4	---	68.2	8.8	V
17778.2	---	40.0	54.0	14.0	H
17841.5	50.7	---	74.0	23.3	H
22439.8	47.3	---	74.0	26.7	V
22439.8	---	40.2	54.0	13.8	V

Radiated Spurious – CH138

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3400.0	58.5	---	68.2	9.7	V
11389.0	---	39.7	54.0	14.3	V
11389.5	50.2	---	74.0	23.8	V
22760.0	46.9	---	74.0	27.1	H
22760.0	---	39.6	54.0	14.3	V

1 GHz – 40 GHz, 802.11ax160, HE0, Chain A**Radiated Spurious – CH114**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3390.5	58.5	---	68.2	9.7	H
17801.3	51.0	---	74.0	23.1	V
17820.7	---	40.1	54.0	13.9	H
22279.8	47.6	---	74.0	26.4	V
22279.8	---	41.6	54.0	12.4	V

1 GHz – 40 GHz, 802.11ax160, HE0, Chain B**Radiated Spurious – CH114**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3376.0	58.5	---	68.2	9.7	V
11110.6	50.2	---	74.0	23.8	V
11111.0	---	41.0	54.0	13.0	V
22223.1	47.0	---	74.0	27.1	V
22223.1	---	37.3	54.0	16.7	V
22279.8	---	40.1	54.0	13.9	V
22279.8	46.1	---	74.0	27.9	V

1 GHz – 40 GHz, 802.11ax160, HE0, Chain A+B

Radiated Spurious – CH114

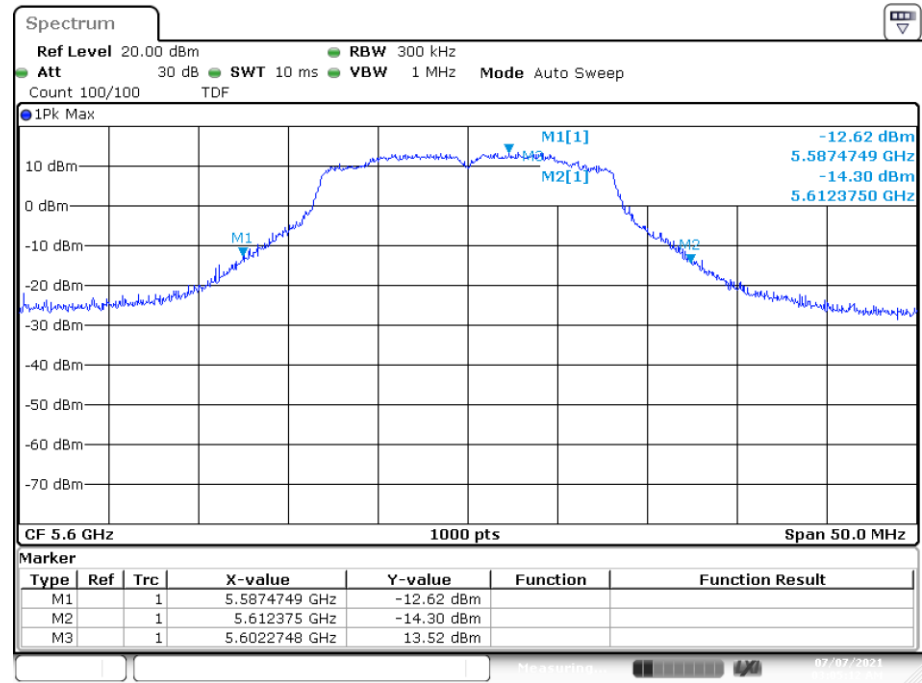
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MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3380.0	58.7	---	68.2	9.5	H
17771.4	51.4	---	74.0	22.6	V
17806.7	---	40.5	54.0	13.6	V
22280.2	46.5	---	74.0	27.5	V
22280.2	---	42.1	54.0	11.9	V

B.3 Test Results Screenshots

B.3.1 26dB Bandwidth

SISO-A, 802.11a, 6Mbps

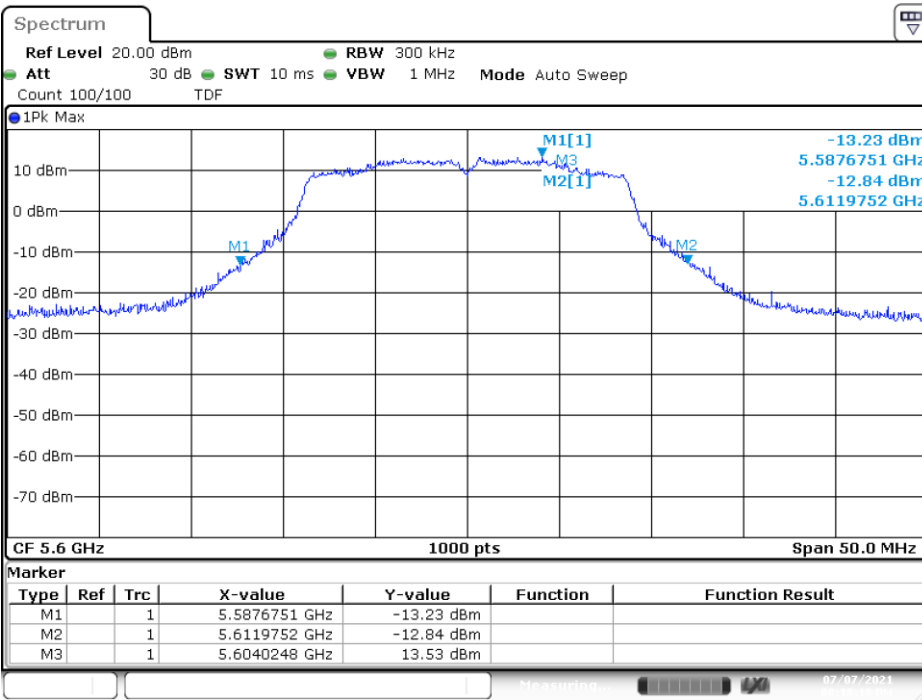
Channel 120



Date: 7.JUL.2021 08:05:12

SISO-B, 802.11n20, HT0

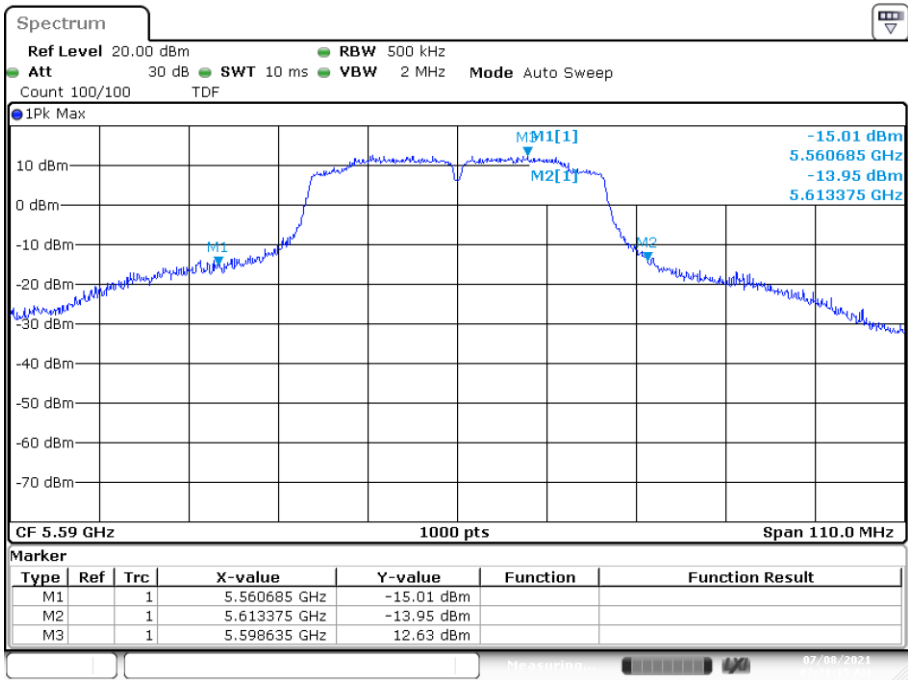
Channel 120



Date: 7.JUL.2021 20:18:19

MIMO-A, 802.11n40, HT8

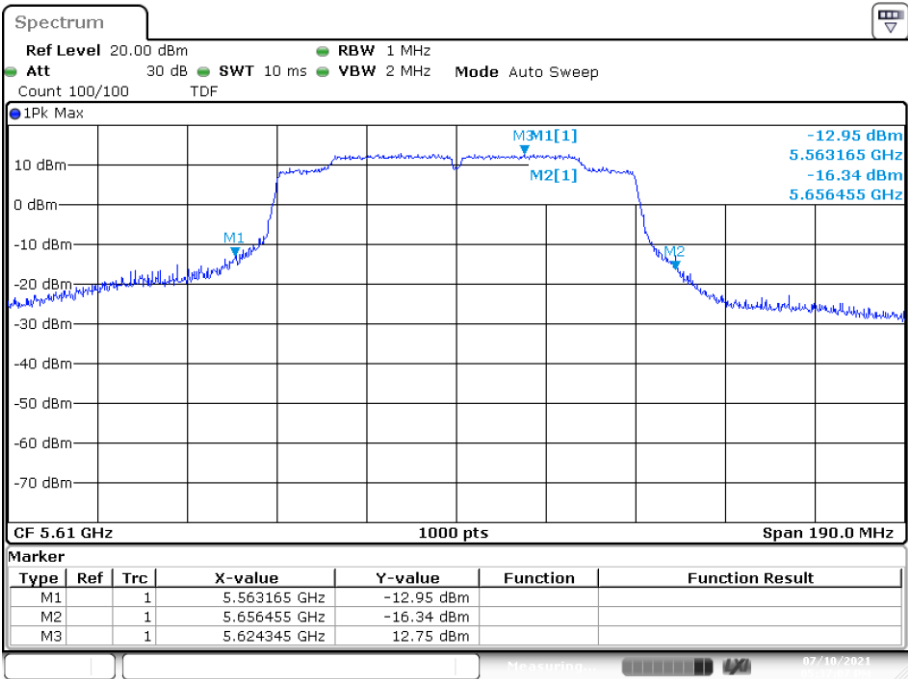
Channel 118



Date: 8.JUL.2021 02:31:15

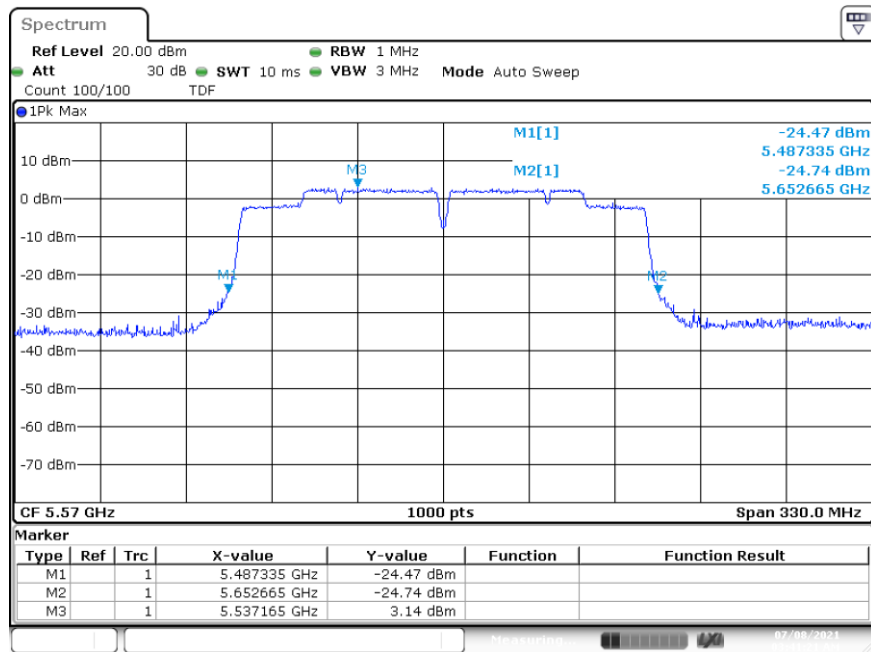
SISO-B, 802.11ac80, VHT0

Channel 122



MIMO-A, 802.11ac160, HT8

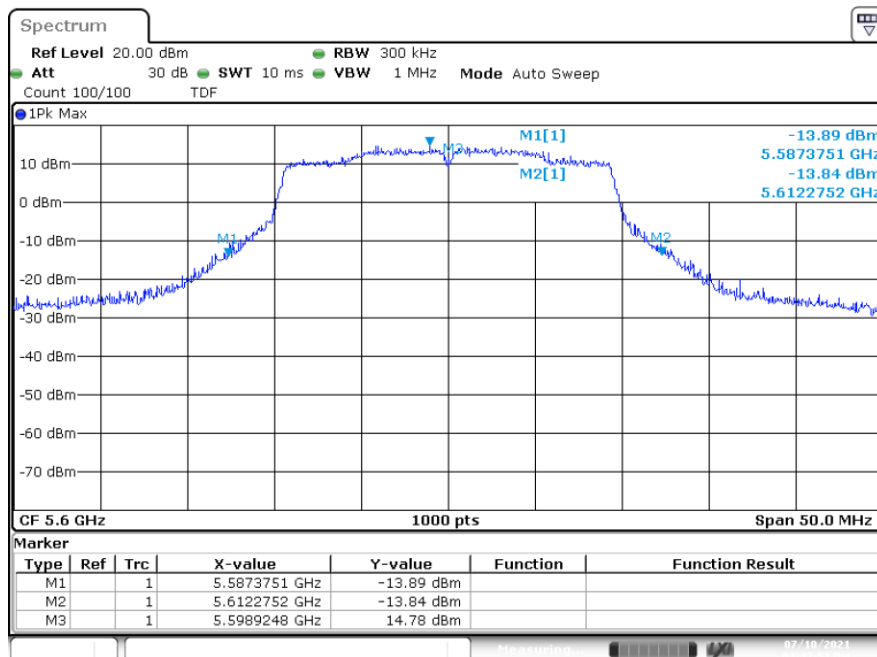
Channel 114



Date: 8.JUL.2021 03:41:21

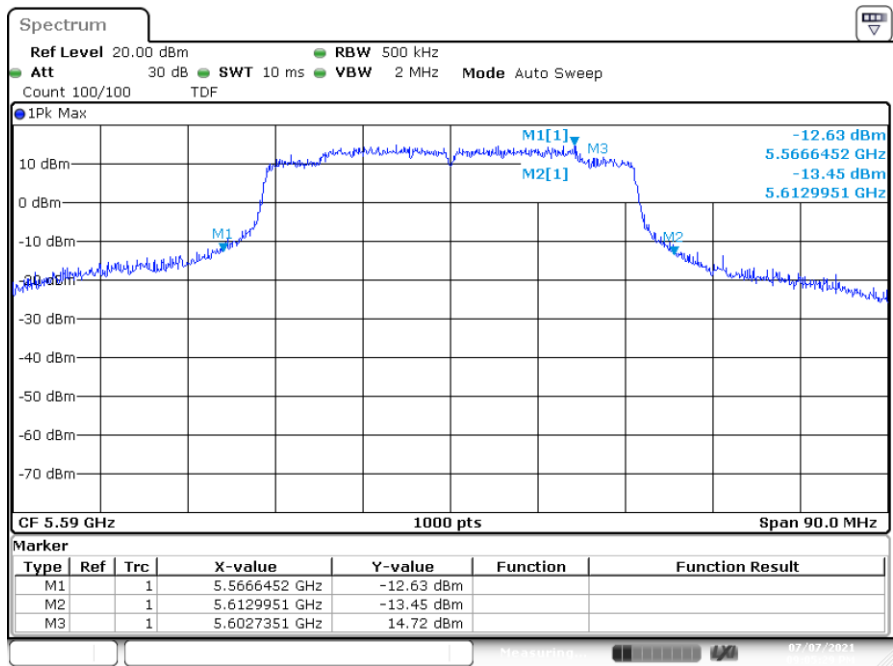
SISO-B, 802.11ax20, HE0

Channel 120



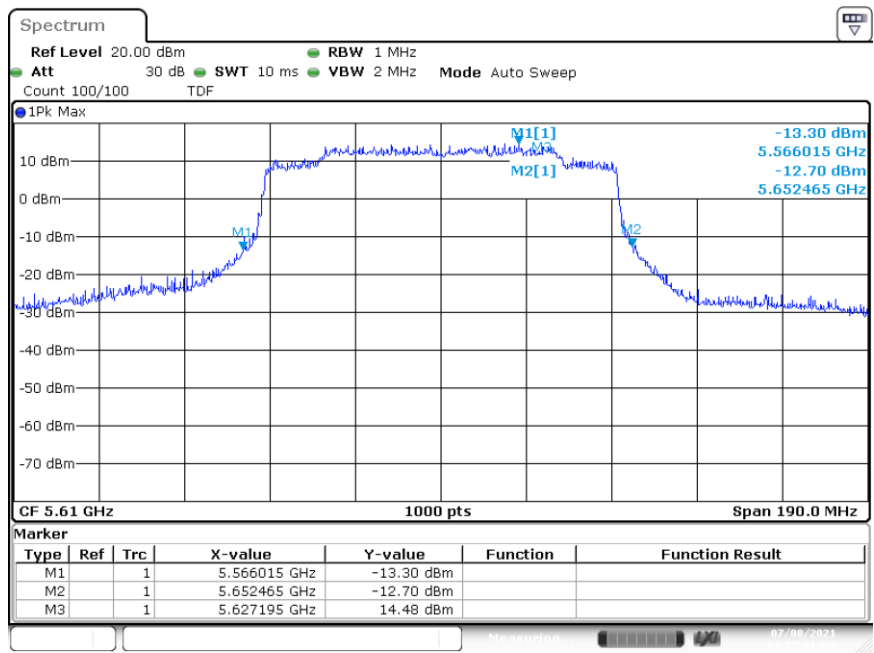
SISO-A, 802.11ax40, HE0

Channel 118



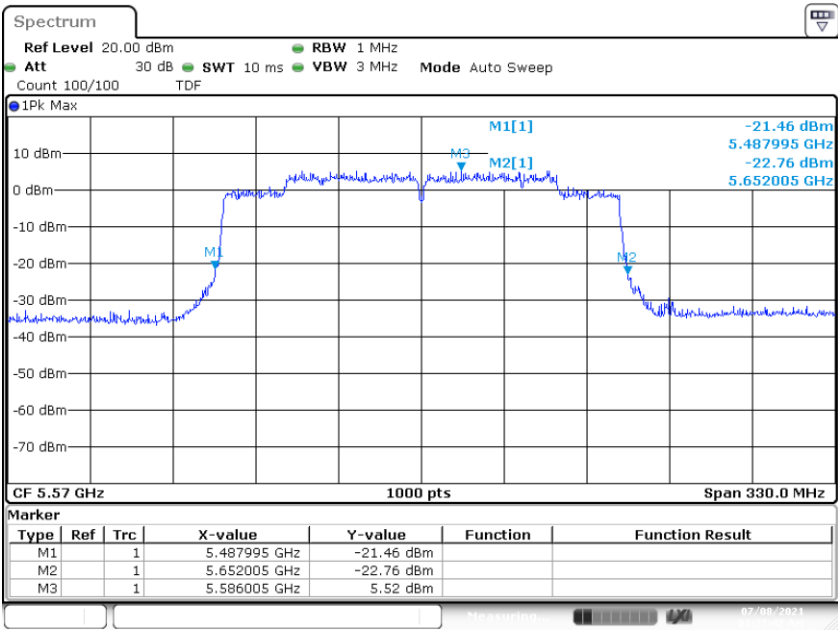
MIMO-A, 802.11ax80, HE0

Channel 122



Channel 114

MIMO-A, 802.11ax160, HE0

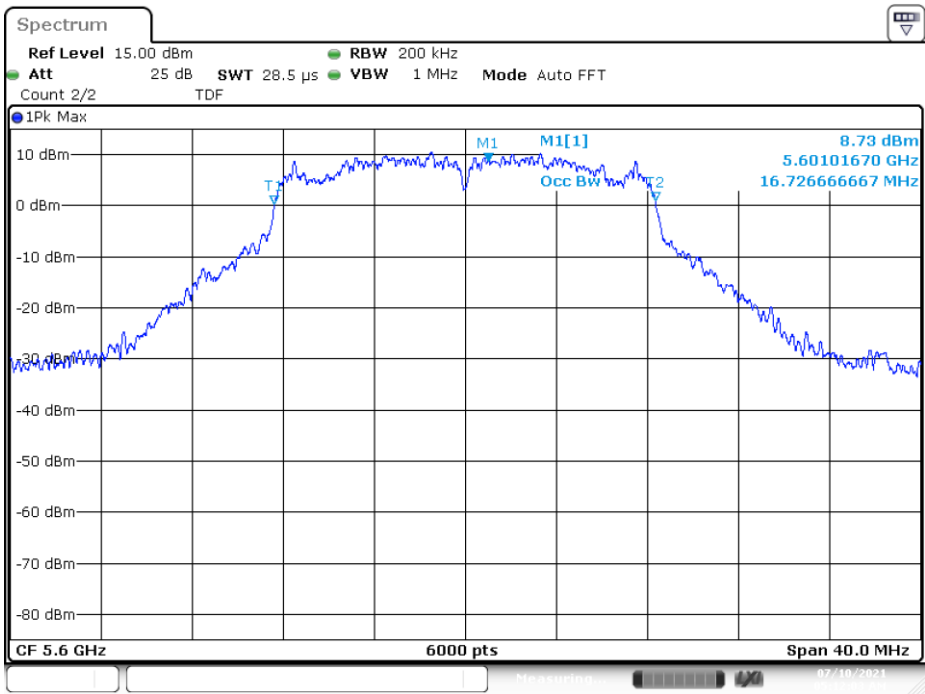


Date: 8.JUL.2021 03:27:43

B.3.2 99% Bandwidth

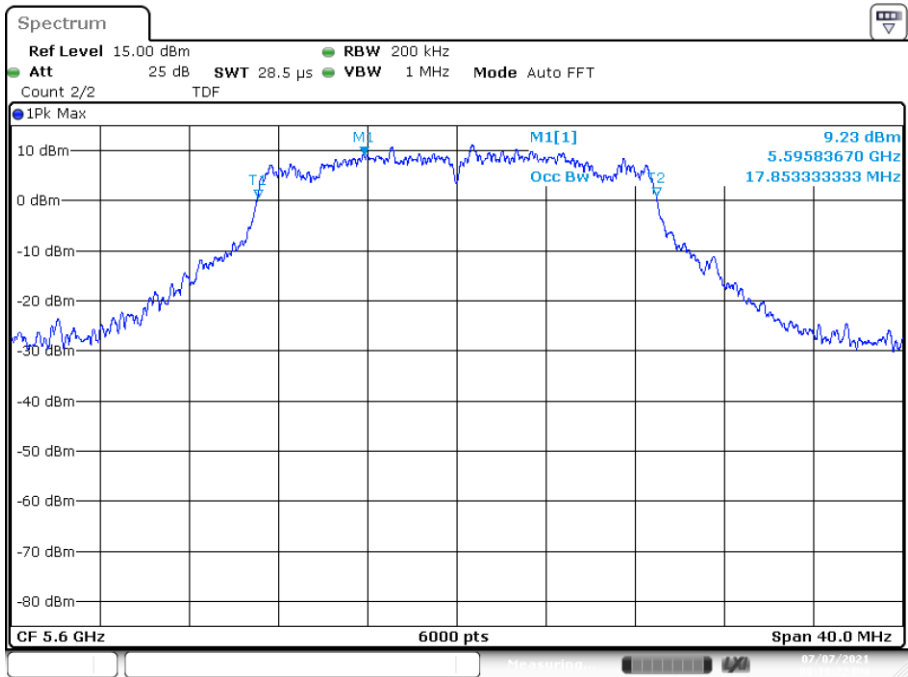
SISO-B, 802.11a, 6Mbps

Channel 120



SISO-A, 802.11n20, HT0

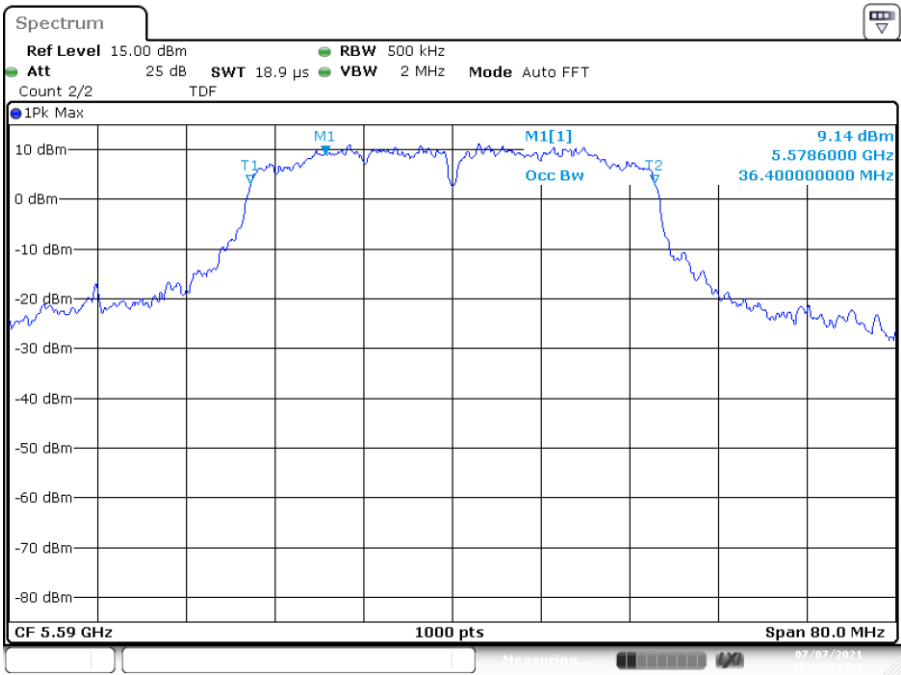
Channel 120



Date: 7.JUL.2021 20:18:22

SISO-A, 802.11n40, HT0

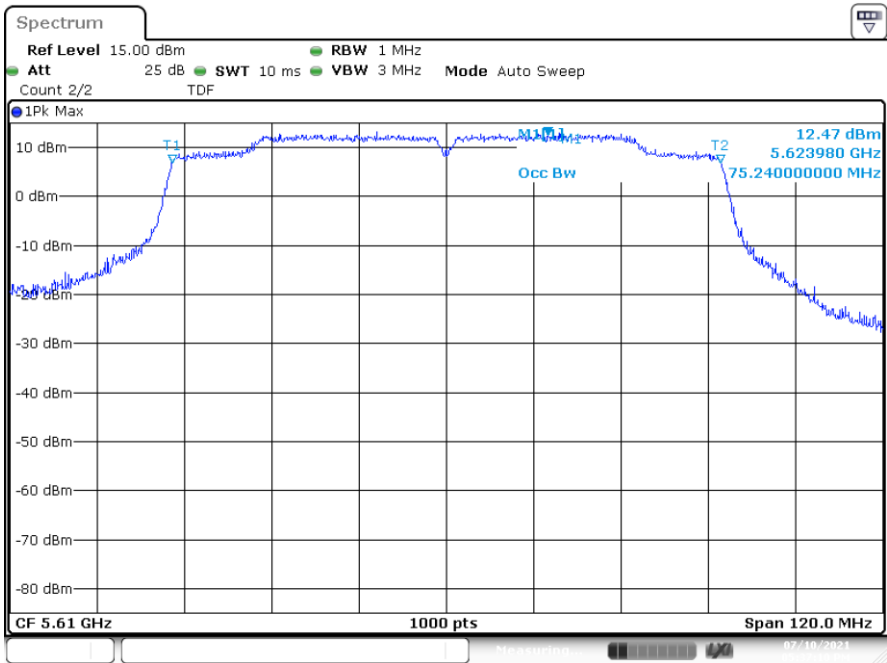
Channel 118



Date: 7.JUL.2021 20:29:14

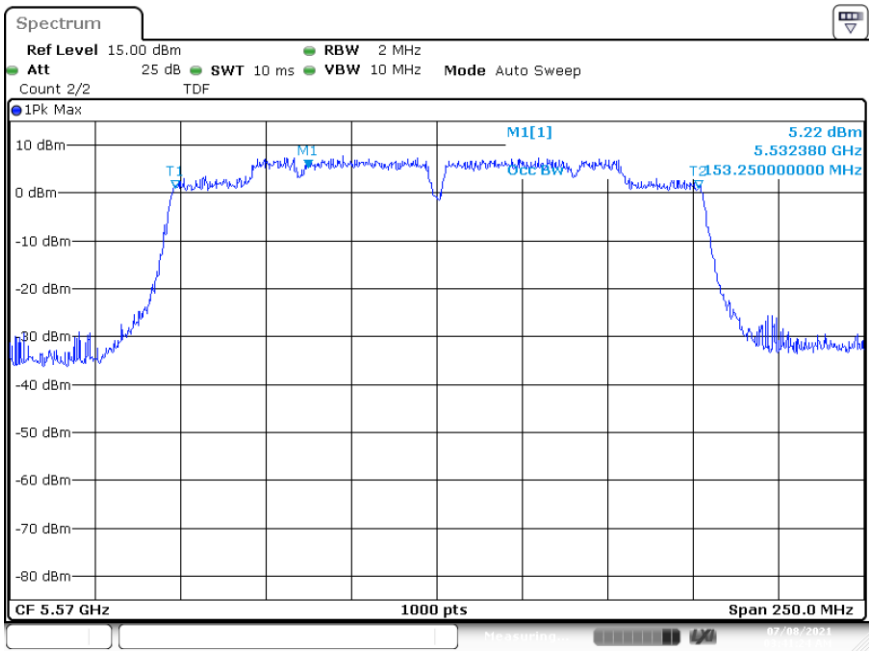
SISO-B, 802.11ac80, VHT0

Channel 122



Channel 114

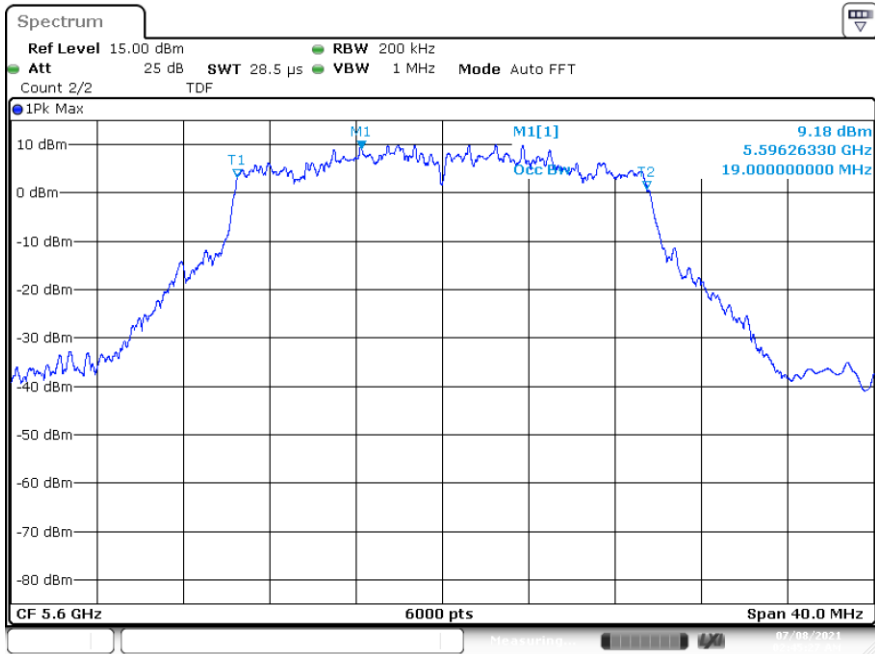
MIMO-A, 802.11ac160, VHT0



Date: 8 JUL 2021 03:41:24

Channel 120

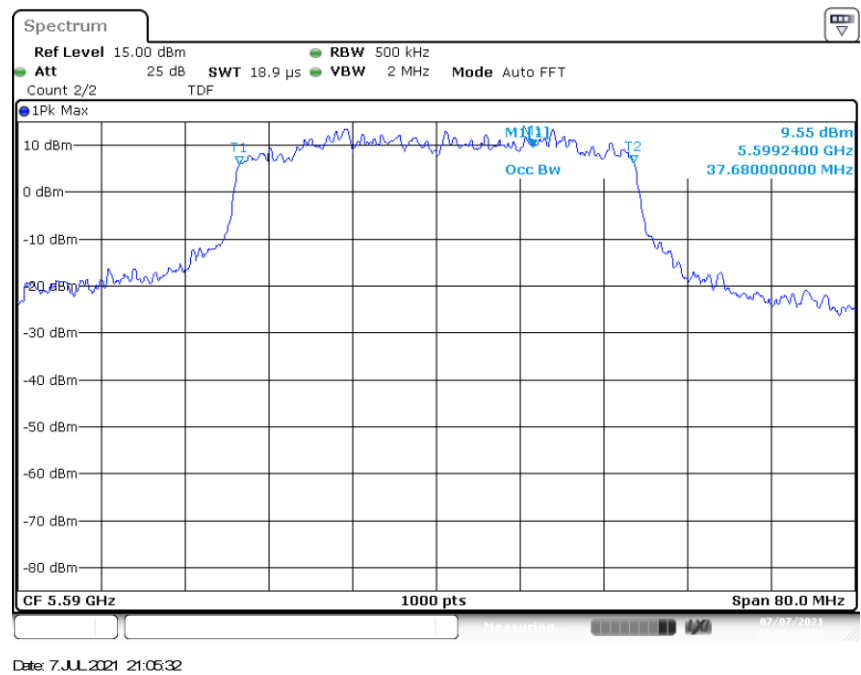
MIMO-A, 802.11ax20, HE0



Date: 8 JUL 2021 02:45:28

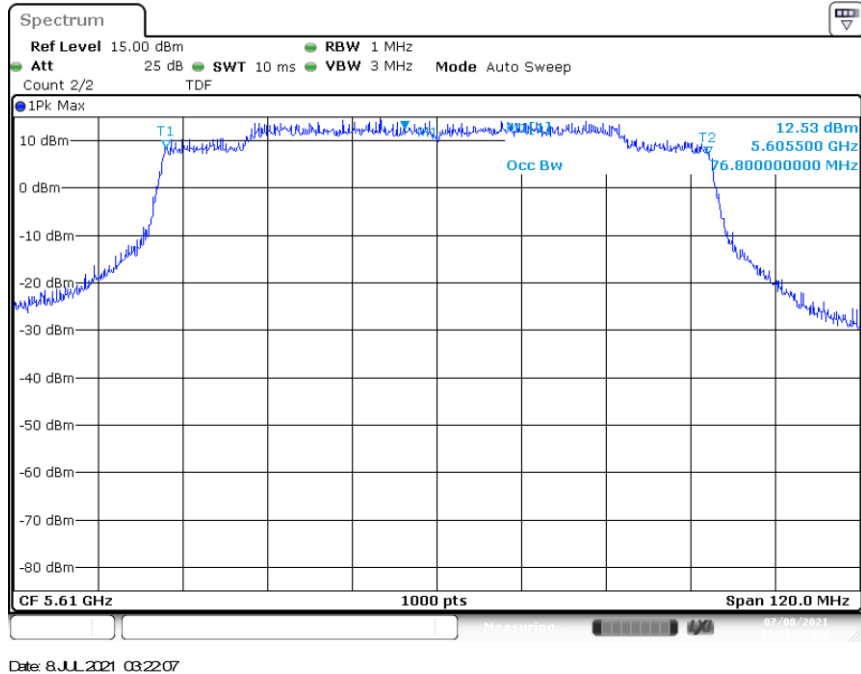
SISO-A, 802.11ax40, HE0

Channel 118



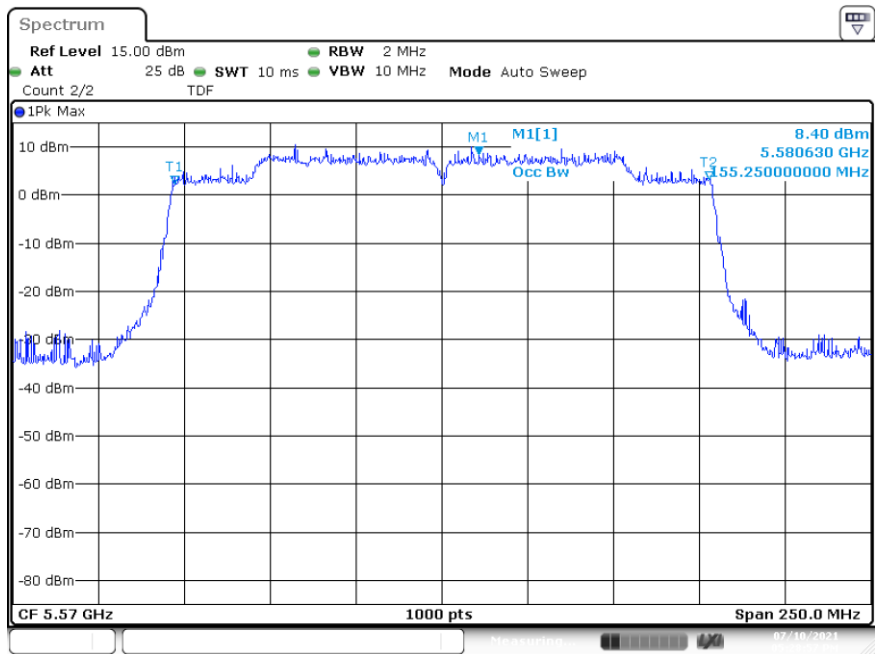
MIMO-A, 802.11ax80, HE0

Channel 122



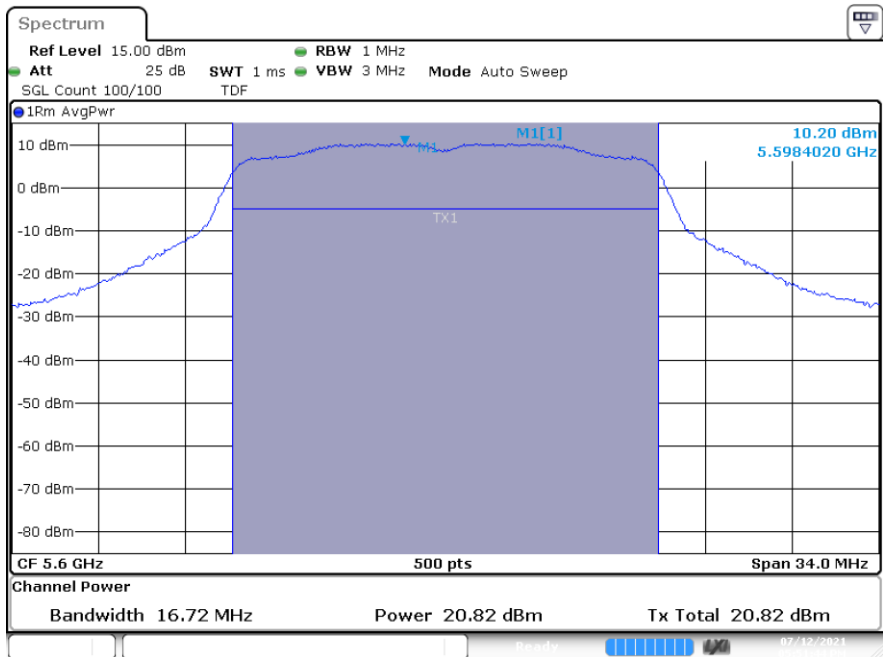
Channel 114

SISO-B, 802.11ax160, HE0



B.3.3 Maximum Output Power & Maximum power spectral Density

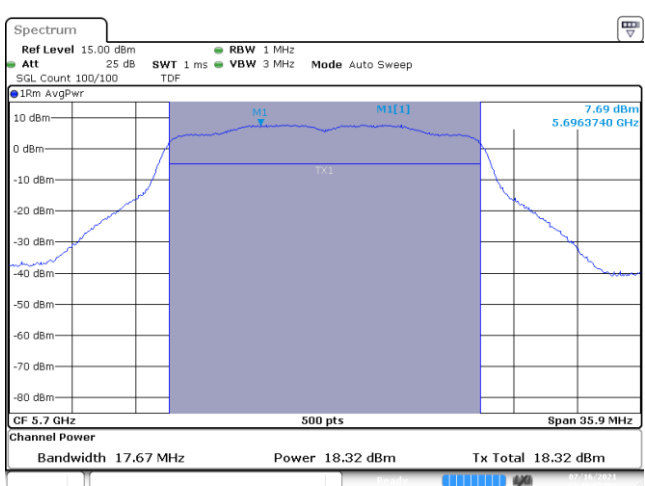
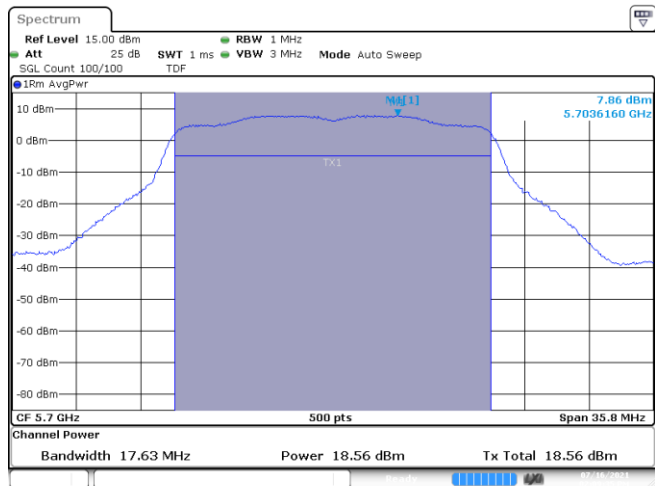
SISO-B, 802.11a, 6Mbps Channel 120



MIMO-A, 802.11n20, HT8

MIMO-B, 802.11n20, HT8

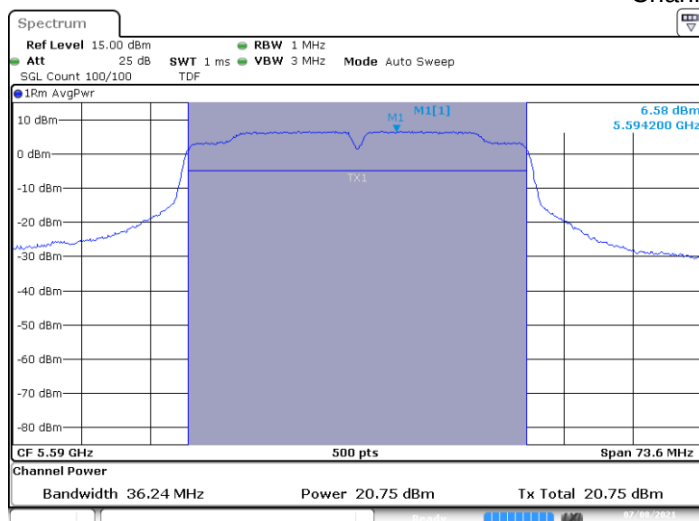
Channel 140



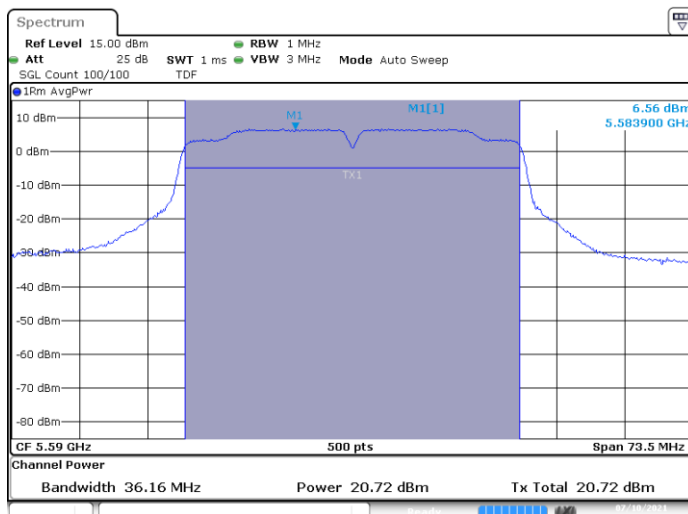
MIMO-A, 802.11n40, HT8

MIMO-B, 802.11n40, HT8

Channel 118



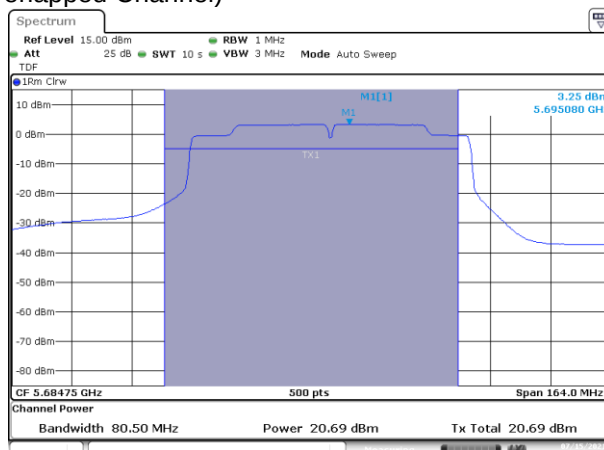
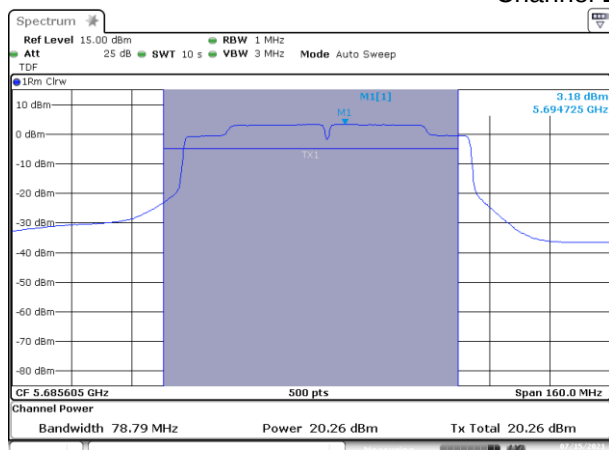
Date: 8 JUL 2021 02:31:20



MIMO-A, 802.11ac80, HT8

MIMO-B, 802.11ac80, HT8

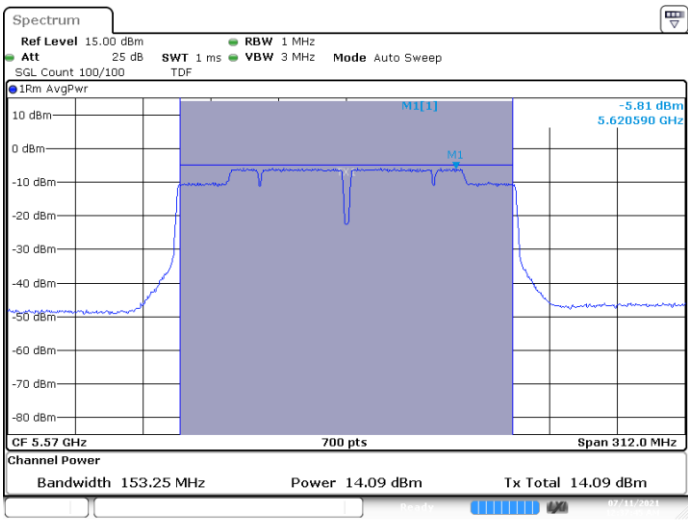
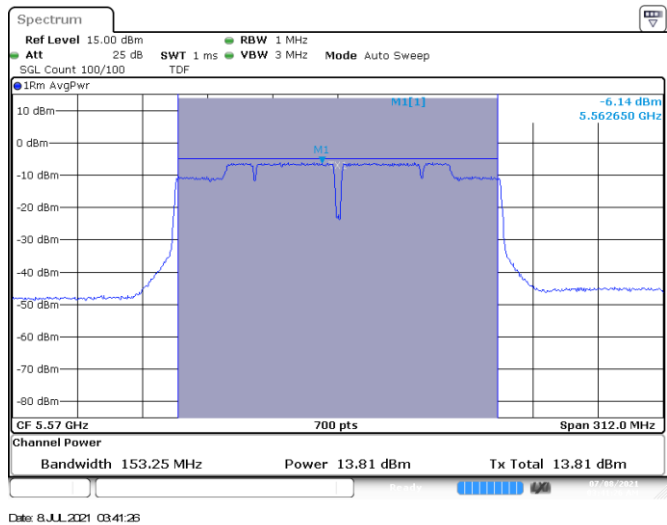
Channel 138 (Overlapped Channel)



MIMO-A, 802.11ac160, HT8

MIMO-B, 802.11ac160, HT8

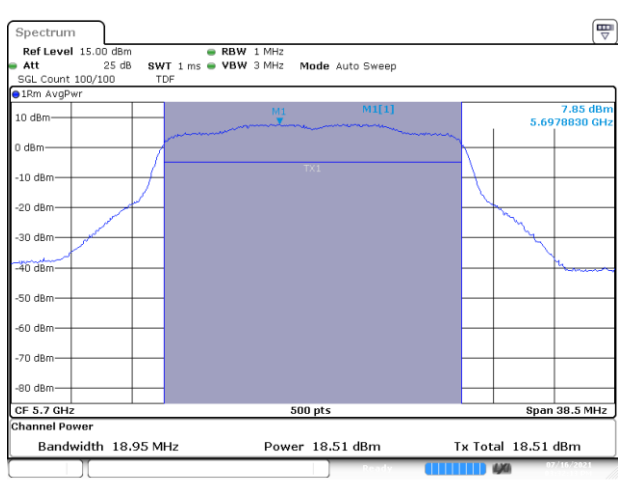
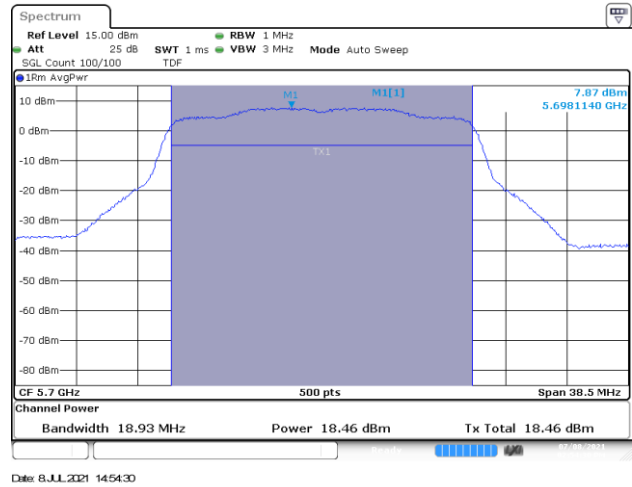
Channel 114



MIMO-A, 802.11ax20, HE0

MIMO-B, 802.11ax20, HE0

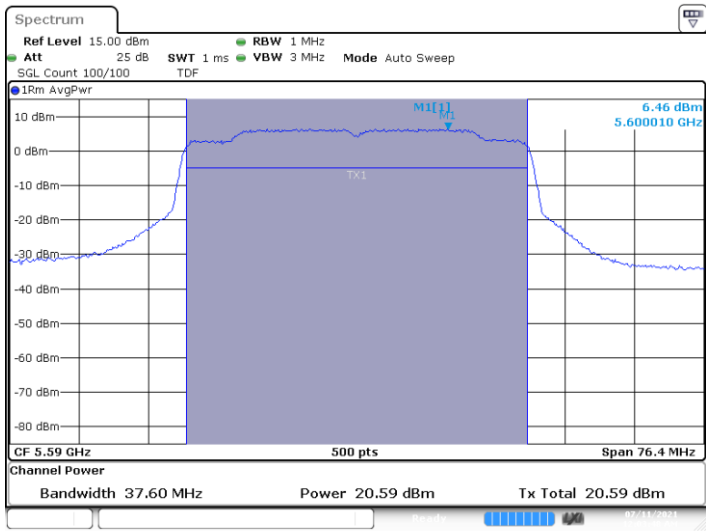
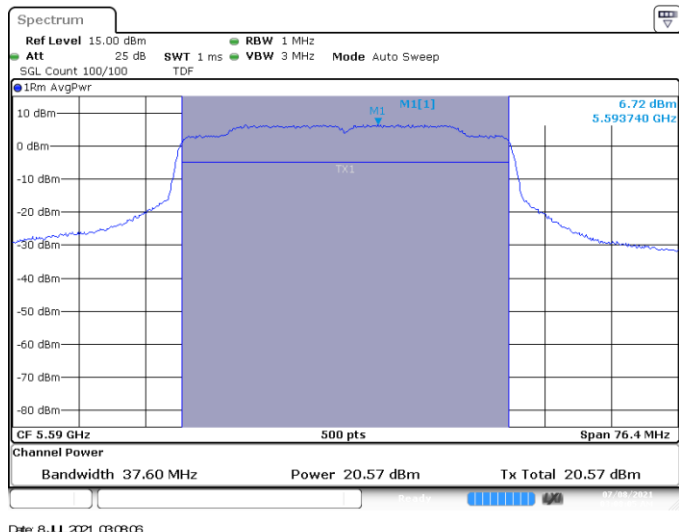
Channel 144



MIMO-A, 802.11ax40, HE0

MIMO-B, 802.11ax40, HE0

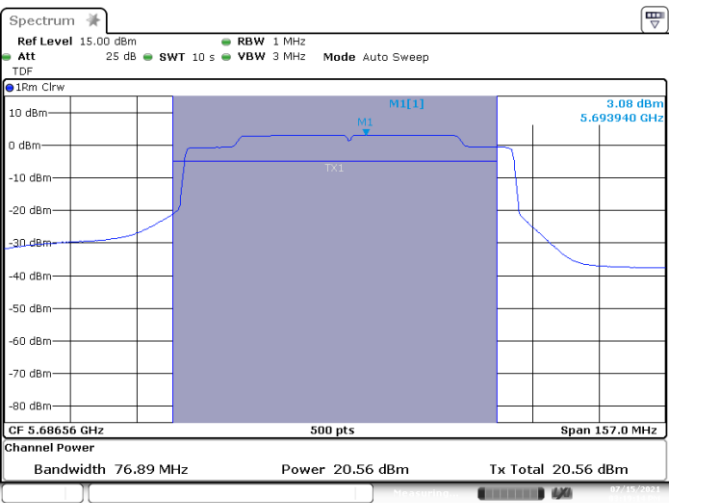
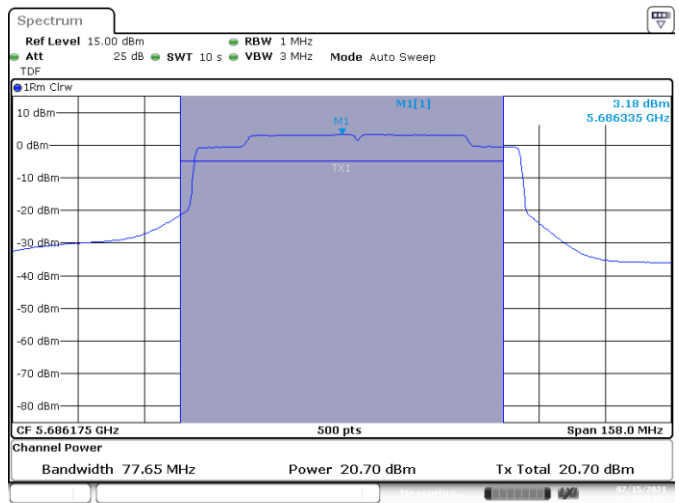
Channel 118



MIMO-A, 802.11ax80, HE0

MIMO-B, 802.11ax80, HE0

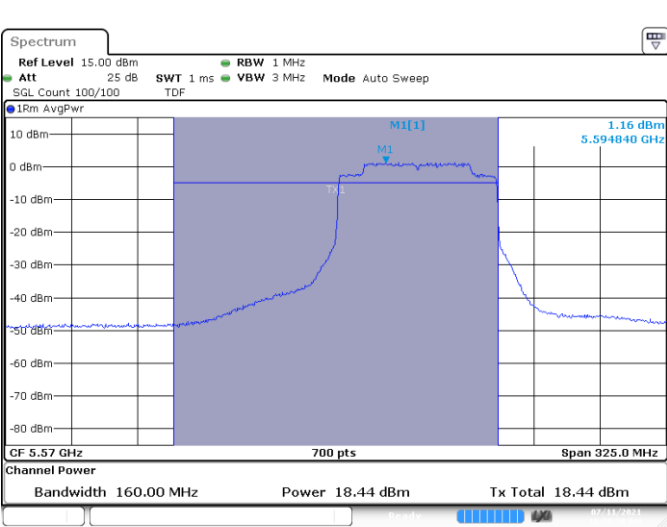
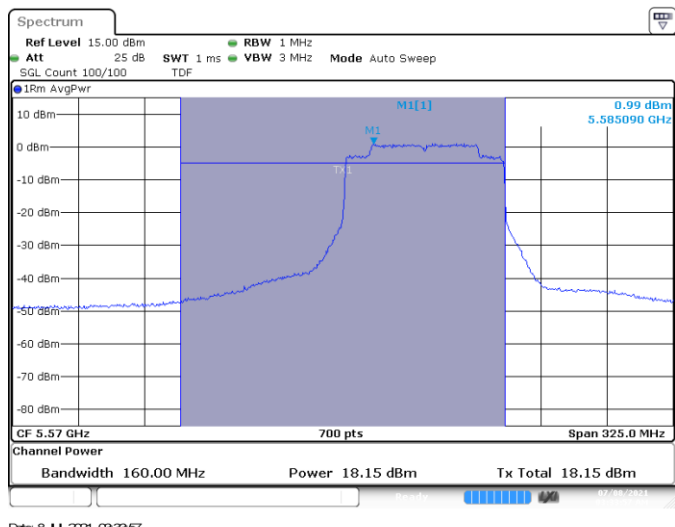
Channel 138 (Overlapped Channel)



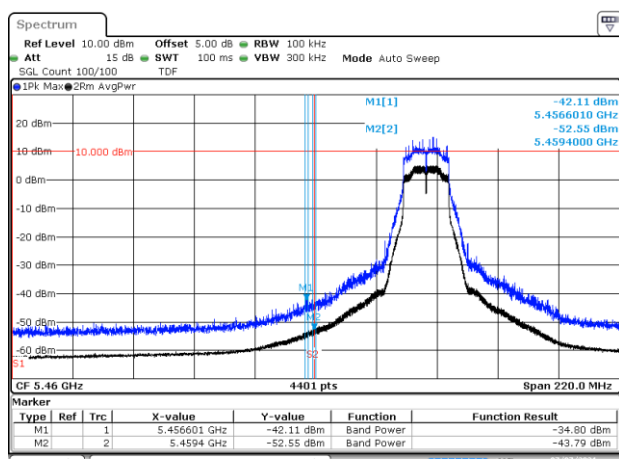
MIMO-A, 802.11ax160, HE0

MIMO-A, 802.11ax160, HE0

Channel 114

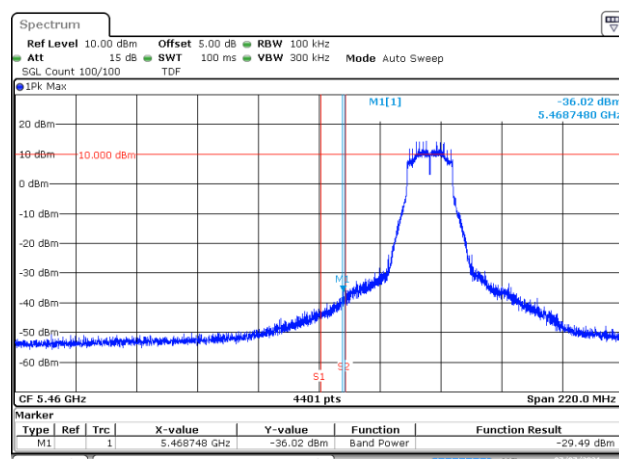


B.3.4 Undesirable emission limits : out of band (Conducted)



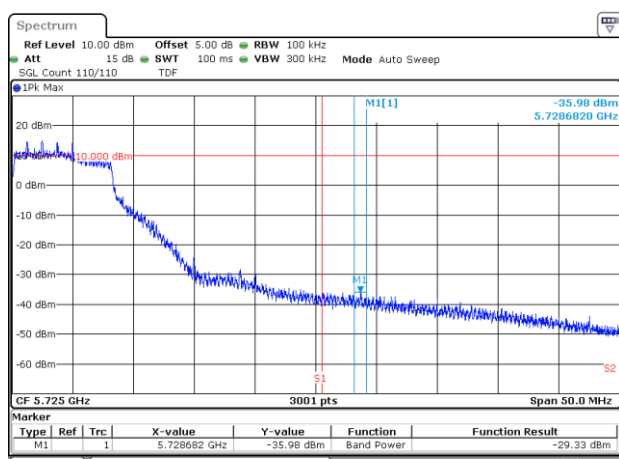
Date: 7.JUL.2021 03:03:50

BE-R-LOW, SISO-A, 802.11a20-6Mbps, Ch100



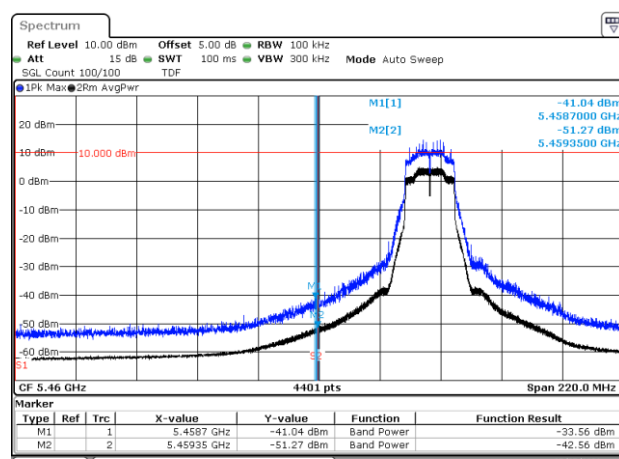
Date: 7.JUL.2021 03:04:02

BE-NR-LOW, SISO-A, 802.11a20-6Mbps, Ch100



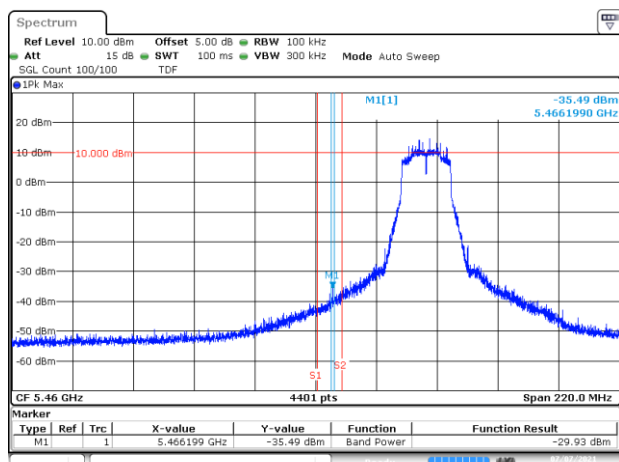
Date: 8.JUL.2021 10:07:24

BE-NR-HIGH, SISO-A, 802.11a20-6Mbps, Ch140



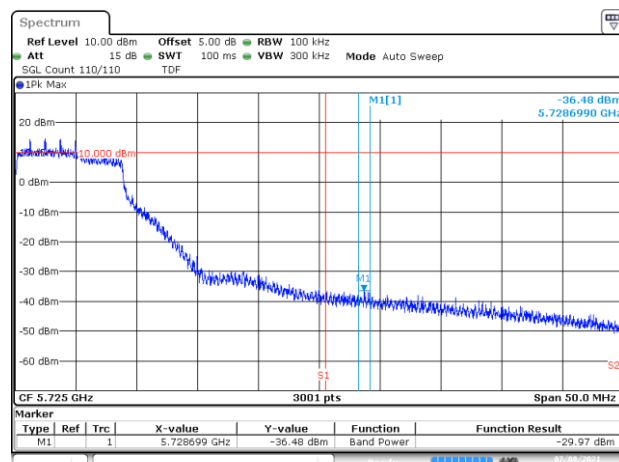
Date: 7.JUL.2021 20:16:51

BE-R-LOW, SISO-A, 802.11n20-HT0, Ch100



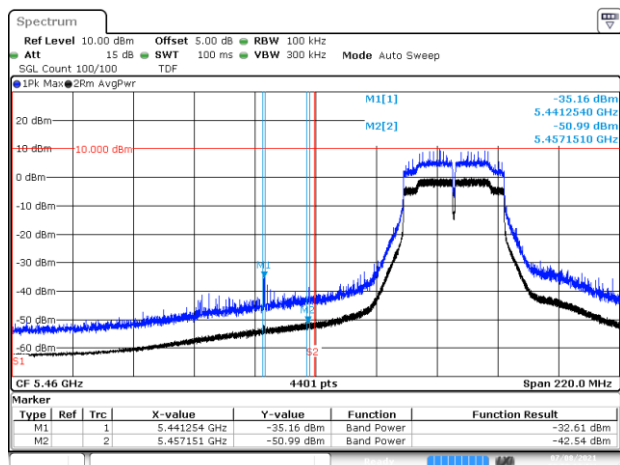
Date: 7.JUL.2021 20:17:03

BE-NR-LOW, SISO-A, 802.11n20-HT0, Ch100

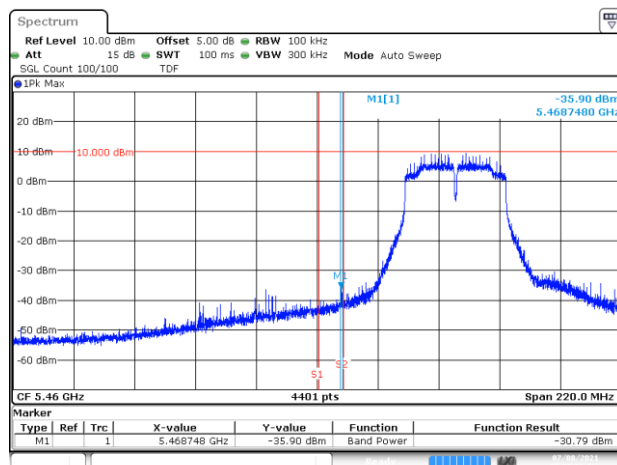


Date: 8.JUL.2021 10:13:35

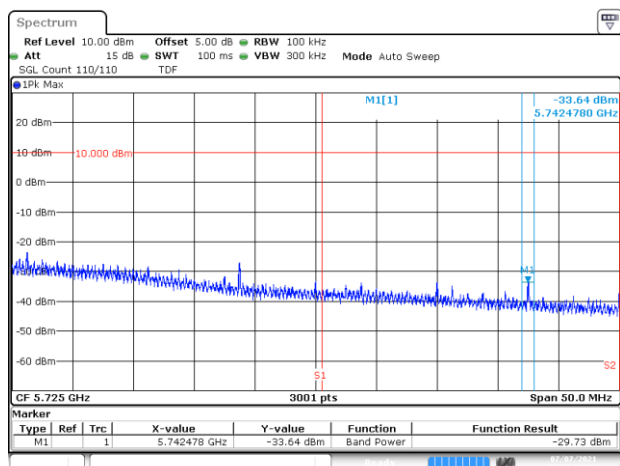
BE-NR-HIGH, SISO-A, 802.11n20-HT0, Ch140



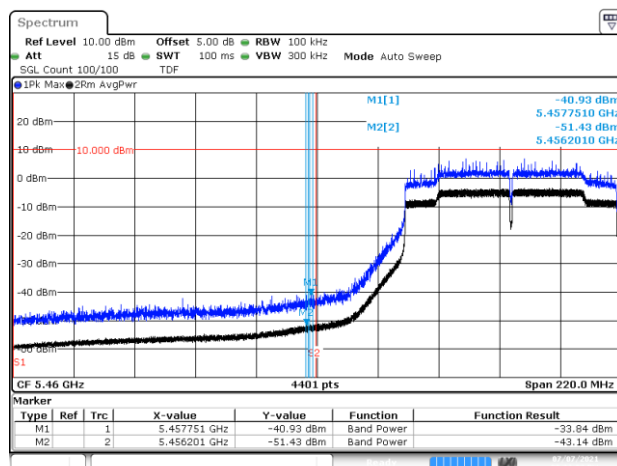
BE-R-LOW, SISO-A, 802.11n40-HT0, Ch102



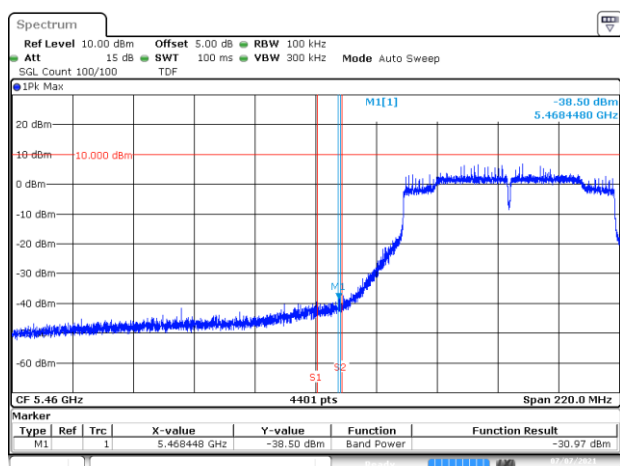
BE-NR-LOW, SISO-A, 802.11n40-HT0, Ch102



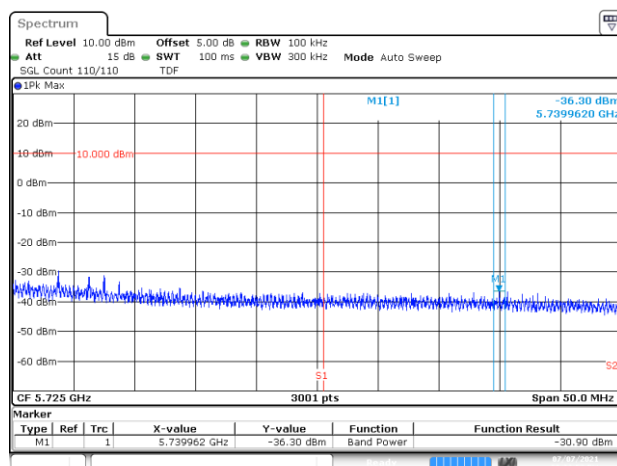
BE-NR-HIGH, SISO-A, 802.11n40-HT0, Ch134



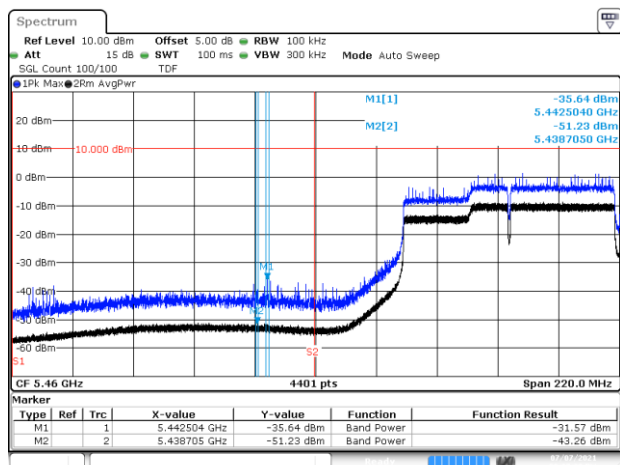
BE-R-LOW, SISO-A, 802.11ac80-VHT0, Ch106



BE-NR-LOW, SISO-A, 802.11ac80-VHT0, Ch106

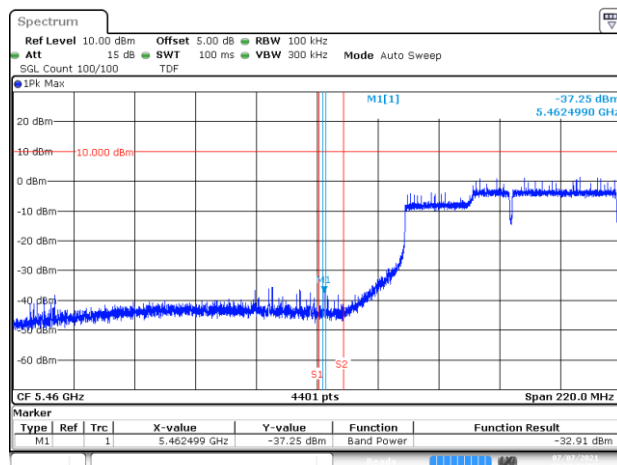


BE-NR-HIGH, SISO-A, 802.11ac80-VHT0, Ch122



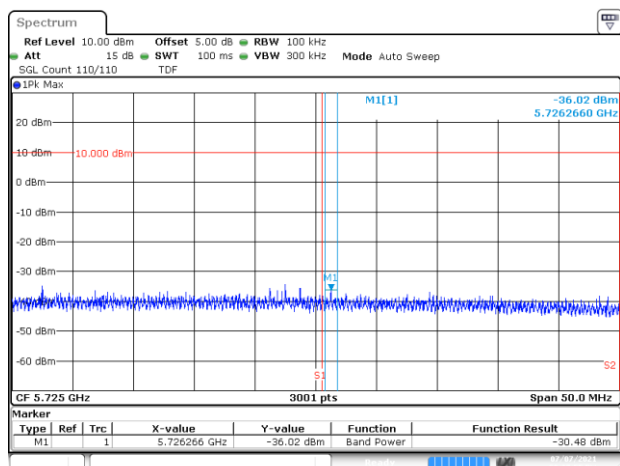
Date: 7.JUL.2021 21:37:29

BE-R-LOW, SISO-A, 802.11ac160-VHT0, Ch114



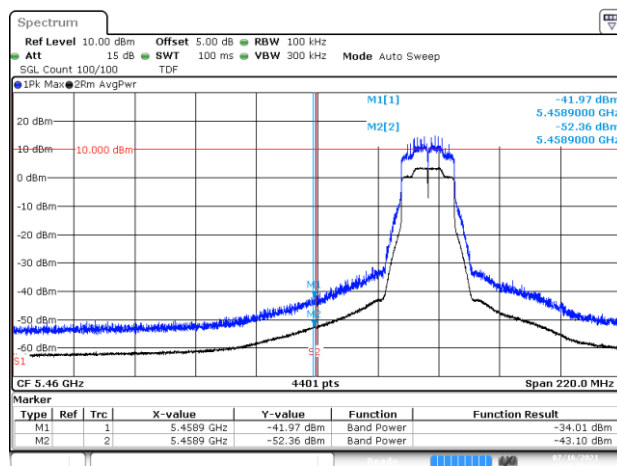
Date: 7.JUL.2021 21:37:41

BE-NR-LOW, SISO-A, 802.11ac160-VHT0, Ch114

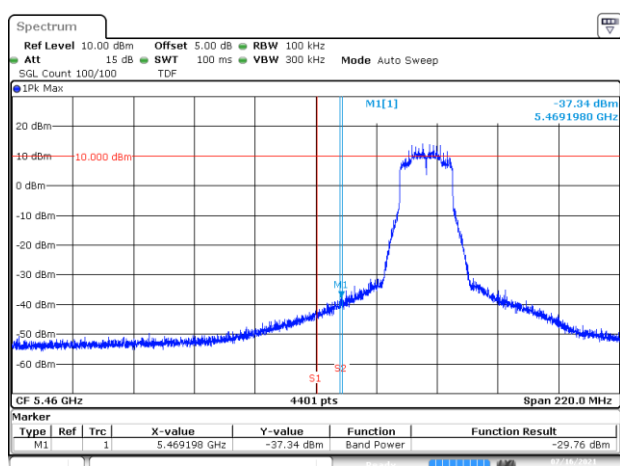


Date: 7.JUL.2021 21:37:56

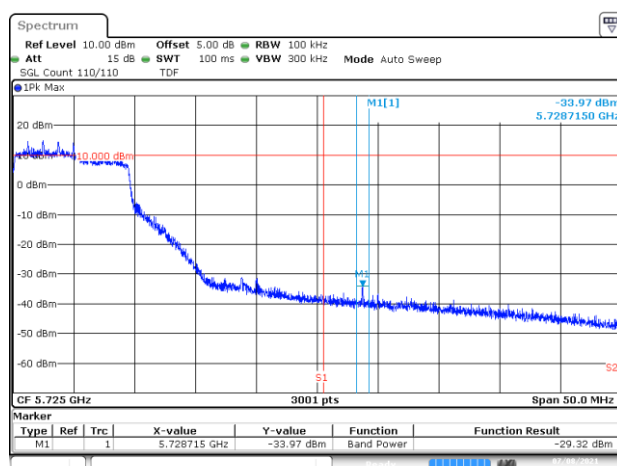
BE-NR-HIGH, SISO-A, 802.11ac160-VHT0, Ch114



BE-R-LOW, SISO-A, 802.11ax20-HE0, Ch100

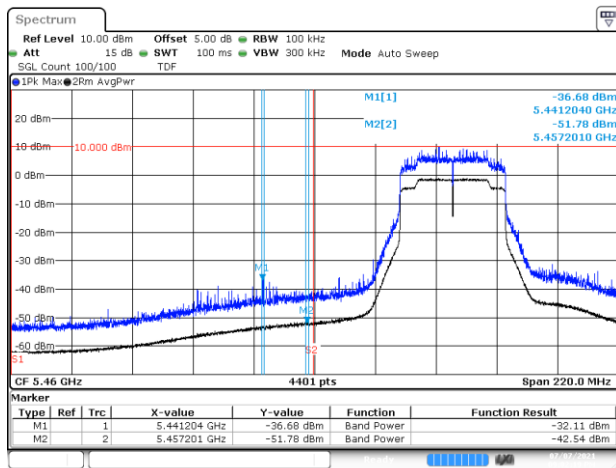


BE-NR-LOW, SISO-A, 802.11ax20-HE0, Ch100

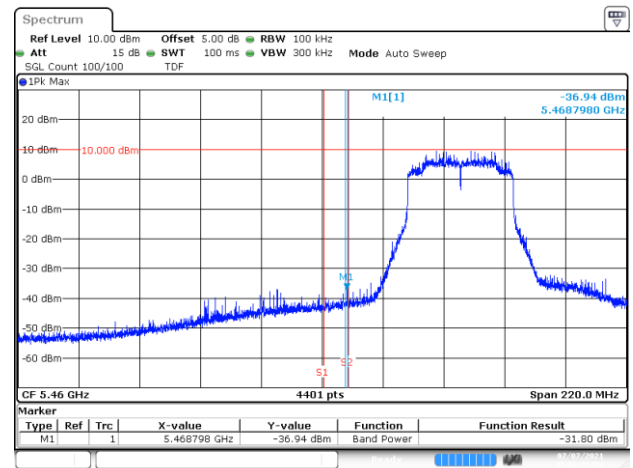


Date: 8.JUL.2021 10:34:43

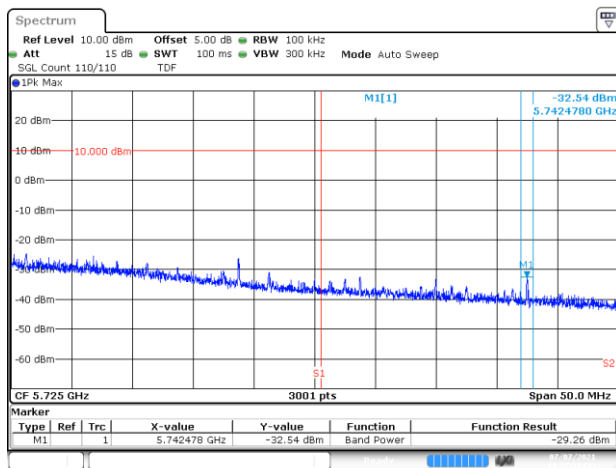
BE-NR-HIGH, SISO-A, 802.11ax20-HE0, Ch140



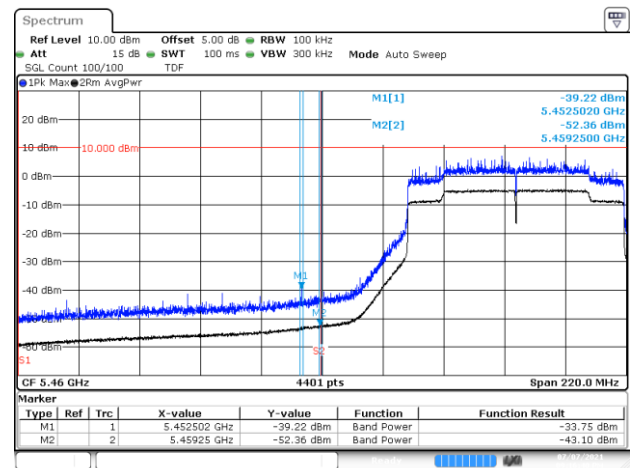
BE-R-LOW, SISO-A, 802.11ax40-HE0, Ch102



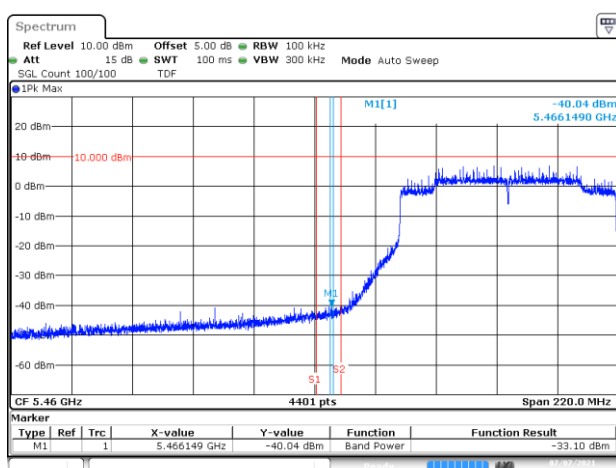
BE-NR-LOW, SISO-A, 802.11ax40-HE0, Ch102



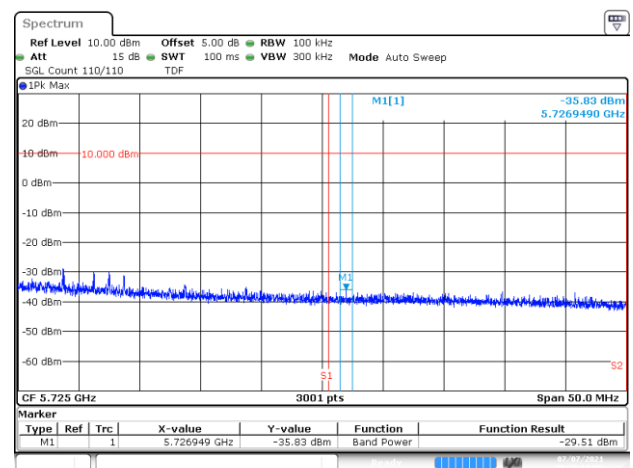
BE-NR-HIGH, SISO-A, 802.11ax40-HE0, Ch134



BE-R-LOW, SISO-A, 802.11ax80-HE0, Ch106



BE-NR-LOW, SISO-A, 802.11ax80-HE0, Ch106



BE-NR-HIGH, SISO-A, 802.11ax80-HE0, Ch122