

TEST REPORT

EUT Description	WLAN and BT, 1x1 PCIe M.2 1216 adapter card
Brand Name	Intel® Wi-Fi AX101
Model Name	AX101D2W
FCC/IC ID	FCCID: PD9AX101D2/ IC 1000M-AX101D2
Date of Test Start/End	2020-11-11 / 2020-11-24
Features	802.11ax, Dual Band, 1x1 Wi-Fi + Bluetooth® 5.1, Diversity Antenna (see section 5)

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Reference Standards	FCC CFR Title 47 Part 15 C RSS-247 issue 2, RSS-Gen issue 5 A1 (see section 1)
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Test Report identification	200928-04.TR04
Revision Control	Rev. 00 This test report revision replaces any previous test report revision (see section 8)

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1. Standards, reference documents and applicable test methods

FCC	1. FCC Title 47 CFR part 15 - Subpart C – §15.247 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz. 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 558074 D01 v05r02 - Guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules. 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-247 Issue 2 - Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices. 2. RSS-Gen Issue 5 A1- General Requirements for Compliance of Radio Apparatus. 3. FCC OET KDB 558074 D01 v05r02 - Guidance for compliance measurements on digital transmission system, frequency hopping spread spectrum system, and hybrid system devices operating under section 15.247 of the FCC rules. 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.
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- ✓ 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.
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- ✓ This report is only referred to the item that has undergone the test.
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3. Environmental Conditions

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

Temperature	22.7°C ± 4°C
Humidity	47.9% ± 9%

4. Test samples

Sample	Control #	Description	Model	Serial #	Date of receipt	Note
#1	200928-04.S09	RF Module	AX101D2W	WFM: D8F8834C5810	2020-11-03	RF Conducted
	180000-01.S06	Adapter 1216SD to M.2	HrP Adapter M2	N/A	2017-05-11	
	170000-01.S02	Laptop	Latitude E5450	21HTPF2	2017-03-28	
	180717-03.S14	Extender	PCB00651_01	6510818-132	2018-08-21	
#2	200928-04.S06	RF Module	AX101D2W	WFM:D8F8834C57E8	2020-11-03	Used for 30MHz-18GHz Radiated Spurious Emissions tests
	180717-03.S13	Extender	PCB00651_01	6510818-131	2018-08-21	
	180000-01.S02	Socket	JfP Adapter M2	-	2017-08-09	
	170000-01.S16	Laptop	Latitude E5470	C2HTPF2	2017-06-13	
	200611-03.S28	Main Antenna	Skycross	-	2020-07-01	
	200611-03.S29	Aux Antenna	Skycross	-	2020-07-01	
#3	200928-04.S06	RF Module	AX101D2W	WFM:D8F8834C57E8	2020-11-03	Used for 18GHz-40GHz Radiated Spurious Emissions tests
	200102-01.S03	Extender	ADEXELEC	-	2020-01-02	
	200928-02.S11	Adaptor	HrP M2 Adaptor 1216	6961919-172	2020-10-27	
	200715-03.S06	Absorber	MCS material	-	2020-07-23	
	180000-01.S02	Socket	JfP Adapter M2	-	2017-08-09	
	170801-01.S10	Laptop	Latitude E7470	7KNOXF2	2017-09-08	
	200611-03.S28	Main Antenna	Skycross	-	2020-07-01	
	200611-03.S29	Aux Antenna	Skycross	-	2020-07-01	

5. EUT Features

The herein information is provided by the customer

Brand Name	Intel® Wi-Fi AX101		
Model Name	AX101D2W		
Software Version	DRTU 01594_99_3500_51W		
Driver Version	99.0.58.2		
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 – 5850.0 MHz) Bluetooth 5.1 2.4GHz (2400.0 – 2483.5 MHz)		
Antenna Information	Transmitter	Main (chain A DIV 1)	Aux (chain A Div 2)
	Manufacturer	SkyCross	Skycross
	Antenna type	PIFA antenna	PIFA antenna
	Part number	N/A	N/A
	Declared antenna gain (dBi)	+3.24	+3.24
Document	Filename		Date of receipt
	Intel_Ref_Antenna data_HMC-M2 Ant_Spec_Universe_SkyCross Antenna		2013-01-28

6. Remarks and comments

1. No deviations were made from the test methods listed in section 1 of this report

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 b/g/n/ax 2.4GHz

FCC part	RSS part	Test name	Verdict
15.247 (a) (2)	RSS-247 Clause 5.2 (a)	6dB Bandwidth	P
15.247 (b) (3)	RSS-247 Clause 5.4 (d)	Maximum output power and E.I.R.P	P
15.247 (e)	RSS-247 Clause 5.2 (b)	Power spectral density	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen A1 Clause 8.9	Out-of-band Emissions (conducted)	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen A1 Clause 8.9	Spurious Emissions (radiated)	P

7.2. BLE

FCC part	RSS part	Test name	Verdict
15.247 (a) (2)	RSS-247 Clause 5.2 (a)	6dB Bandwidth	P
15.247 (b) (3)	RSS-247 Clause 5.4 (d)	Maximum output power and E.I.R.P.	P
15.247 (e)	RSS-247 Clause 5.2 (b)	Power spectral density	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen A1 Clause 8.9	Out-of-band Emissions (conducted)	P
15.247 (d) 15.209	RSS-247 Clause 5.5 RSS-Gen A1 Clause 8.9	Spurious Emissions (radiated)	P

P: Pass

F: Fail

NM: Not Measured

NA: Not Applicable

8. Document Revision History

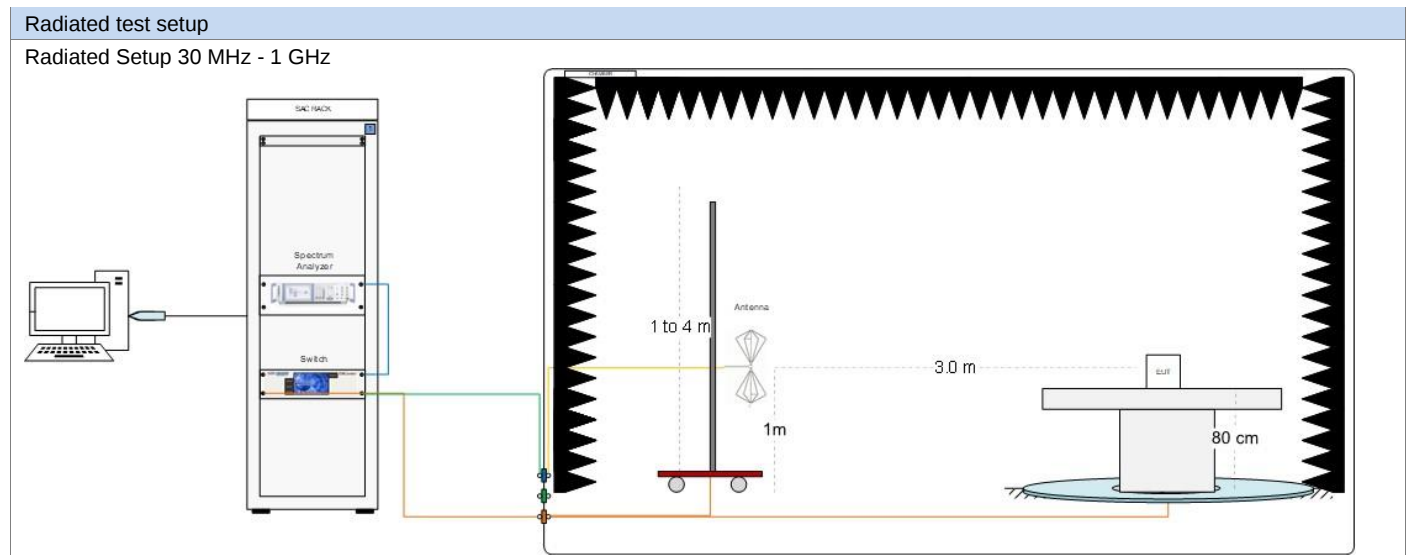
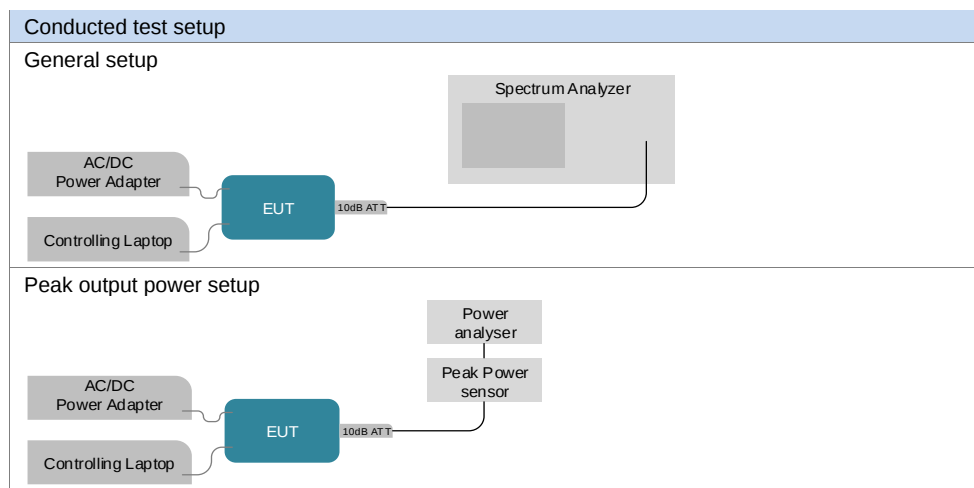
Revision #	Modified by	Revision Details
Rev. 00	C.Requin	First Issue

Annex A. Test & System Description

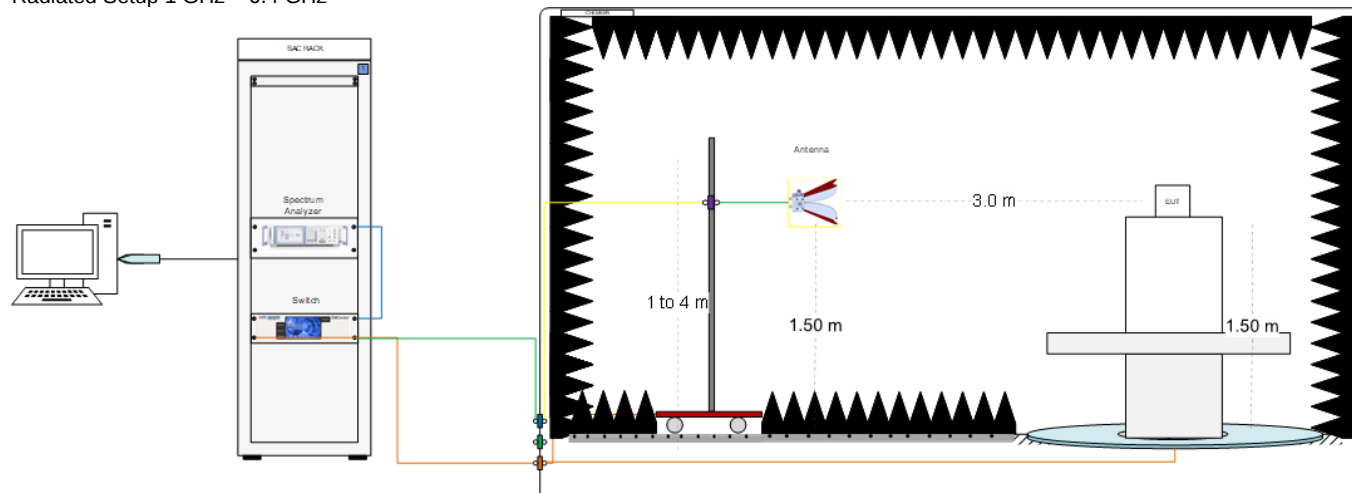
A.1 Measurement System

Measurements were performed using the following setups, made in accordance to the general provisions of FCC OET KDB 558074 D01 DTS Meas Guidance.

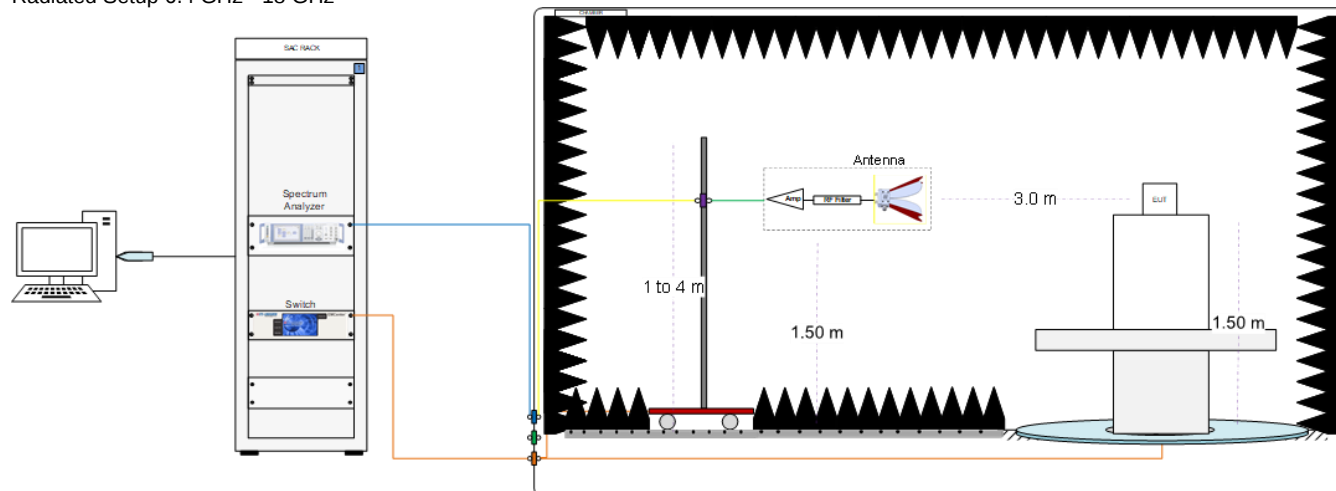
The DUT was installed in a test fixture and this test fixture is connected to a laptop computer and AC/DC power adapter. The laptop computer was used to configure the EUT to continuously transmit at a specified output power using all different modes and modulation schemes, using the Intel proprietary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



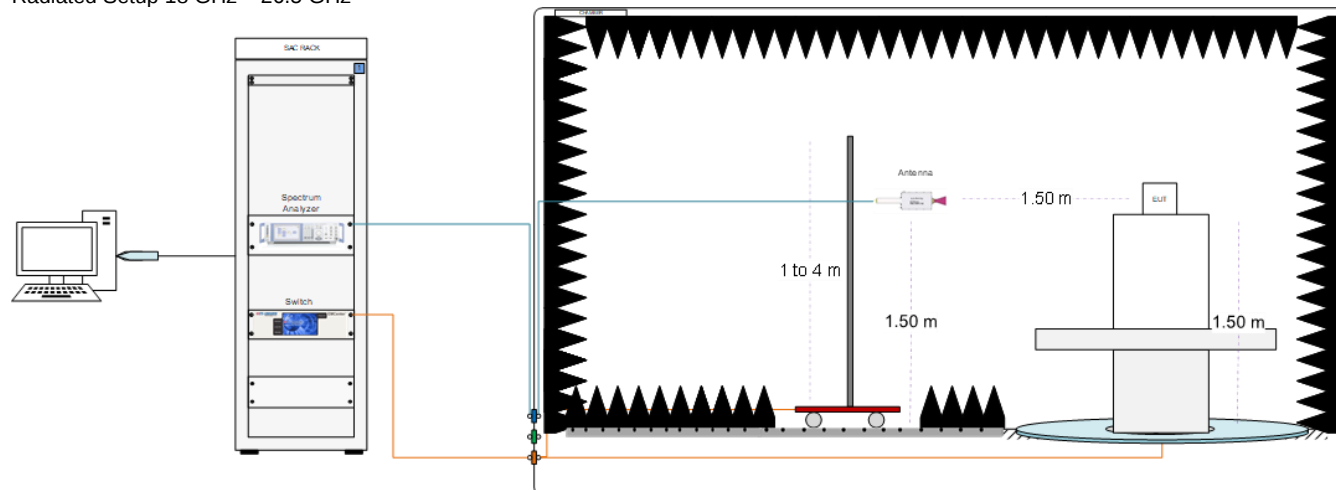
Radiated Setup 1 GHz – 6.4 GHz



Radiated Setup 6.4 GHz - 18 GHz



Radiated Setup 18 GHz – 26.5 GHz



Sample Calculation

The spurious received voltage $V(\text{dB}\mu\text{V})$ in the spectrum Analyzer is converted to Electric field strength using the transducer factor F corresponding to the Rx path Loss:

$$F(\text{dB/m}) = \text{Rx Antenna Factor (dB/m)} + \text{Cable losses (dB)} - \text{Amplifiers Gain (dBi)}$$

$$E(\text{dB}\mu\text{V}) = V(\text{dB}\mu\text{V}) + F(\text{dB/m})$$

For field strength measurements made at other than the distance at which the applicable limit is specified, the field strength of the emission at the distance specified by the limit is deduced as follows:

$$E_{\text{SpecLimit}} = E_{\text{Meas}} + 20 \cdot \log(D_{\text{Meas}}/D_{\text{SpecLimit}})$$

where

$E_{\text{SpecLimit}}$ is the field strength of the emission at the distance specified by the limit, in $\text{dB}\mu\text{V/m}$

E_{Meas} is the field strength of the emission at the measurement distance, in $\text{dB}\mu\text{V/m}$

D_{Meas} is the measurement distance, in m

$D_{\text{SpecLimit}}$ is the distance specified by the limit, in m

A.2 Test Equipment List

Conducted setup

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0316	Spectrum Analyzer	FSV30	103309	Rohde & Schwarz	2019-09-02	2021-09-02
0884	Peak Power Meter	MA24406A	11138	ANRITSU	2019-11-12	2021-11-12
0442	RF cable 50cm	Coax 2.92mm Male To 2.92mm Male	N/A	PASTERNAK	2020-08-26	2021-02-26
1044	10dB Attenuator + MH4	N/A	N/A	N/A	N/A	N/A
0583	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-B9D6E	AVITECH	2019-09-06	2021-09-06
1002	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
0135	Anechoic Chamber	FACT3	5720	ETS-Lindgren	2020-07-06	2022-01-07
0136	Turn Table	ETS	-	ETS-Lindgren	N/A	N/A
0147	Switch & Positioning systems	EMC Center	00159757	ETS-Lindgren	N/A	N/A
0530	Measurement SW	EMC32 , v10.40.10	100623	Rohde & Schwarz	N/A	N/A
1033	Boresight antenna mast	BAM 4.0-P	P/278/2890.01	Maturo	N/A	N/A
0420	Spectrum Analyzer	FSV40	101556	Rohde & Schwarz	2020-05-25	2022-05-25
0993	Biconical antenna 30 MHz – 1 GHz	UBAA9115 + BBVU9135 + DGA9552N	0286 + CH 9044	Schwarzbeck	2019-11-22	2021-11-22
0325	Horn antenna 1GHz-18GHz	3117	00157734	ETS-Lindgren	2019-08-12	2021-08-12
0141	Horn Antenna + Amplifier + HPF6.4	3117	00157736	ETS-Lindgren	2020-04-02	2022-04-02
0334	Double-Ridged Waveguide Horn with Pre-Amplifier 18 GHz to 40 GHz	3116C+PA	00169308bis + 00196308	ETS-Lindgren	2019-07-24	2021-07-24
0202	Cable 1m - 30MHz to 18 GHz	UFB311A-0-3360-50U300	MFR 64639223229-001	Micro-coax	2020-08-25	2021-02-25
0206	Cable 1.2m – 18 to 40 GHz	UFA147A-0-0480-200200	MFR 64639223720-003	Micro-coax	2020-08-25	2021-02-25
0263	Cable 1m - 1GHz to 18GHz	UFA147A	-	Utiliflex	2020-08-25	2021-02-25
0369	Cable 2m - 26.5GHz to 40GHz	794-9191-2000A	E00327	Atem	2020-08-25	2021-02-25
0371	Cable 1m – 30 MHz - 18GHz	UFB311A-0-0590-50U50U	MFR 64639 223230-001	Micro-coax	2020-08-25	2021-02-25
0758	Cable 7.5m - 30MHz to 18GHz	0501051057000GX	18.23.181	Radiall	2020-08-25	2021-02-25
0809	Cable 7m - 18GHz to 40GHz	R286304009	-	Radiall	2020-08-25	2021-02-25
0859	Cable 2.5m - 30MHz to 18GHz	0500990992500KE	19.23.395	Radiall	2020-08-25	2021-02-25
0797	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-D0EB1A	Avtech	2019-07-04	2021-07-04

N/A: Not Applicable

Radiated Setup #2

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0337	Anechoic chamber	RFD-FA-100	5996	ETS Lindgren	2020-07-06	2022-07-06
0238	Switch & Positioner	EMCenter	00151232	ETS Lindgren	N/A	N/A
0382	Antenna Tower	2171B-3.0M	00150123	ETS Lindgren	N/A	N/A
0383	Turntable	-	-	ETS Lindgren	N/A	N/A
0329	Measurement SW	EMC32, v10.50.10	100401	Rohde & Schwarz	N/A	N/A
0133	Spectrum Analyzer	FSV40	101358	Rohde & Schwarz	2020-02-25	2022-02-25
0138	Double Ridge Horn (1- 18GHz)	3117	00152266	ETS Lindgren	2020-03-08	2022-03-08
0141	Horn Antenna + Amplifier + HPF6.4	3117	00157736	ETS-Lindgren	2020-04-02	2022-04-02
0334	Double Horn Ridged antenna	3116C-PA	00169308bis + 00196308	ETS-Lindgren	2019-07-24	2021-07-24
0871	RF Cable 1-18GHz, 1.5 m	0501050991200GX	19.21.710	Radiall	2020-08-20	2021-02-20
0860	RF Cable 1-18GHz, 1.2 m	2301761761200PJ	12.22.1104	Radiall	2020-08-20	2021-02-20
0275	RF Cable 1-18GHz - 6.5m	140-8500-11-51	001	Spectrum	2020-08-20	2021-02-20
0684	RF Cable 1GHz-18GHz 1.5m	-	-	Spirent	2020-08-20	2021-02-20
0679	RF Cable 18-40 GHz 6m	R286304009	1747364	Radiall	2020-08-20	2021-02-20
0028	RF Cable 1.2m 40MHz-40GHz	794-9191-1200A	DA585	Atem	2020-08-20	2021-02-20
0725	RF Cable 1-9.5GHz 1.2m	0500990991200KE	-	Radiall	2020-08-20	2021-02-20
0796	Temp & Humidity Logger	RA12E-TH1-RAS	RA12-D4F316	Avtech	2019-07-05	2021-07-05

N/A: Not Applicable

Shared Radiated Equipment

ID#	Device	Type/Model	Serial #	Manufacturer	Cal. Date	Cal. Due Date
0616	Power Sensor	NRP-Z81	104385	Rohde & Schwarz	2020-04-08	2022-04-08
0617	Power Sensor	NRP-Z81	104386	Rohde & Schwarz	2020-04-08	2022-04-08
0618	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 the 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 <26.5 GHz	± 2.93	dB
Radiated tests <1GHz	± 5.26	dB
Radiated tests 1GHz – 26.5 GHz	± 4.50	dB

Annex B. Test Results DTS

The herein test results were performed by:

Test case measurement	Test Engineer
6dB Bandwidth	C.Requin
Maximum output power and E.I.R.P	C.Requin
Power spectral density	C.Requin
Out-of-band Emissions (conducted)	C.Requin
Spurious Emissions (radiated)	A.Lounes, N.Bui

B.1 Test Conditions

For all modes, the EUT can transmit at both CHAIN A DIV1 and CHAIN A DIV2 RF outputs individually, but not 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
CHAIN A DIV 1/DIV2	802.11b	20	1Mbps
	802.11g	20	6Mbps
	802.11n	20	HT0
		40	HT0
	802.11ax	20	HE0
		40	HE0

B.2 Test Results Tables

B.2.1 6dB & 99% Bandwidth

Test limits

FCC part	RSS part	Limits
15.247 (a) (2)	RSS-247 Clause 5.2 (a)	Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

The conducted setup shown in section *Test & System Description* was used to measure the 6dB & 99% Bandwidth. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

Results tables

Mode	Rate	Antenna	Channel	Freq [MHz]	6dB BW [MHz]	99% BW [MHz]
802.11b	1Mbps	CHAIN A DIV1	1	2412	8.99	13.57
			7	2442	9.55	14.63
			11	2462	9.07	14.20
			12	2467	8.56	13.47
			13	2472	8.08	13.31
		CHAIN A DIV2	1	2412	9.01	13.47
			7	2442	10.03	14.27
			11	2462	9.05	14.09
			12	2467	8.99	13.47
			13	2472	8.56	13.35
802.11g	6Mbps	CHAIN A DIV1	1	2412	13.72	16.56
			7	2442	15.08	17.61
			11	2462	15.10	16.56
			12	2467	15.03	16.55
			13	2472	16.34	16.41
		CHAIN A DIV2	1	2412	15.10	16.55
			7	2442	15.13	17.64
			11	2462	15.10	16.57
			12	2467	14.93	16.56
			13	2472	16.34	16.41
802.11n20	HT0	CHAIN A DIV1	1	2412	15.08	17.67
			7	2442	13.84	19.47
			11	2462	15.05	17.67
			12	2467	15.07	17.67
			13	2472	17.58	17.58
		CHAIN A DIV2	1	2412	15.05	17.67
			7	2442	15.24	19.51
			11	2462	15.07	17.66
			12	2467	15.06	17.67
			13	2472	17.57	17.58
802.11n40	HT0	CHAIN A DIV1	3	2422	32.56	36.03
			7	2442	35.13	36.02
			9	2452	33.85	36.02
			10	2457	32.58	35.97
			11	2462	36.35	36.20
		CHAIN A DIV2	3	2422	33.78	36.04
			7	2442	33.83	36.04
			9	2452	31.35	36.00
			10	2457	35.06	35.96
			11	2462	36.33	36.22

Max Value

Mode	Rate	Antenna	Channel	Freq [MHz]	RU config.	6dB BW [MHz]	99% BW [MHz]
802.11ax20	HE0	CHAIN A DIV1	1	2412	Full	18.18	18.85
					26/0	2.05	18.05
					52/37	16.99	17.81
					106/53	17.13	18.11
			7	2442	Full	15.46	19.10
					Full	15.40	18.85
					Full	15.49	18.86
			12	2462	Full	15.49	18.86
					Full	15.49	18.86
					Full	15.49	18.86
					Full	15.49	18.86
		CHAIN A DIV2	13	2472	Full	18.47	18.74
					26/8	1.99	17.99
					52/40	16.93	17.77
					106/54	16.96	17.80
			1	2412	Full	16.38	18.86
					26/0	2.00	18.25
					52/37	16.98	17.89
					106/53	17.07	18.13
			7	2442	Full	16.14	19.06
					Full	15.81	18.86
					Full	15.78	18.87
802.11ax40	HE0	CHAIN A DIV1	12	2467	Full	18.43	18.73
					Full	18.43	18.73
					Full	18.43	18.73
					Full	18.43	18.73
			13	2472	Full	18.43	18.73
					26/8	1.97	17.82
					52/40	16.91	17.69
					106/54	17.00	17.54
		CHAIN A DIV2	3	2422	Full	35.31	37.48
					242/61	16.17	18.79
					Full	33.84	37.45
					Full	32.86	37.47
			10	2457	Full	35.12	37.44
					Full	37.70	37.58
					242/62	18.32	18.66
					Full	35.02	37.48
		CHAIN A DIV2	3	2422	242/61	15.89	18.82
					Full	35.42	37.44
					Full	34.38	37.44
					Full	35.07	37.40
			10	2457	Full	35.07	37.40
					Full	37.64	37.56
					242/62	18.29	18.64
					Full	37.64	37.56

Max Value

B.2.2 Maximum Output Power and antenna gain

Test limits

	Limits
FCC Part 15.247 (b) (3)	(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.
RSS-247 Clause 5.4 (d)	For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e). As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

Test procedure

The Maximum Peak Conducted Output Power was measured using a broadband peak power meter methods for 20MHz and 40MHz channel bandwidth as authorized in chapter 2.0 “*Power limits, definitions and device configuration*” of FCC OET KDB 558074 D01

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. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

Results tables:

Maximum peak power are shown in table below with **min** and **max** values highlighted. Maximum average output power are shown for indicative purpose only

Mode	Rate	# Ch	Freq [MHz]	Ant	Meas Peak Cond.Power [dBm]	EIRP [dBm]	EIRP [mW]	Peak Cond.Power [mW]	Meas. Avg Cond.Power [dBm]	Max. Avg Cond.Power* [dBm]	EIRP [mW]	Avg Cond.Power [mW]
802.11b	1Mbps	1	2412	CHAIN A DIV1	23.42	26.66	463.45	219.79	20.24	20.24	222.84	105.68
				CHAIN A DIV2	23.12	26.36	432.51	205.12	20.04	20.04	212.81	100.93
		7	2442	CHAIN A DIV1	24.81	28.05	638.26	302.69	21.58	21.58	303.39	143.88
				CHAIN A DIV2	24.48	27.72	591.56	280.54	21.27	21.27	282.49	133.97
		11	2462	CHAIN A DIV1	24.24	27.48	559.76	265.46	21.07	21.07	269.77	127.94
				CHAIN A DIV2	23.96	27.20	524.81	248.89	20.74	20.74	250.03	118.58
		12	2467	CHAIN A DIV1	22.31	25.55	358.92	170.22	19.05	19.05	169.43	80.35
				CHAIN A DIV2	22.29	25.53	357.27	169.43	19.03	19.03	168.66	79.98
802.11g	6Mbps	13	2472	CHAIN A DIV1	19.59	22.83	191.87	90.99	16.33	16.33	90.57	42.95
				CHAIN A DIV2	20.58	23.82	240.99	114.29	17.24	17.24	111.69	52.97
		1	2412	CHAIN A DIV1	25.57	28.81	760.33	360.58	17.35	17.58	120.71	57.24
				CHAIN A DIV2	25.63	28.87	770.90	365.59	17.45	17.68	123.52	58.58
		7	2442	CHAIN A DIV1	28.74	31.98	1577.61	748.17	20.42	20.65	244.76	116.07
				CHAIN A DIV2	28.68	31.92	1555.97	737.90	20.32	20.55	239.18	113.43
		11	2462	CHAIN A DIV1	24.31	27.55	568.85	269.77	16.02	16.25	88.87	42.14
				CHAIN A DIV2	23.62	26.86	485.29	230.14	15.36	15.59	76.34	36.20
802.11n20	HTO	12	2467	CHAIN A DIV1	23.84	27.08	510.50	242.10	15.54	15.77	79.57	37.73
				CHAIN A DIV2	23.70	26.94	494.31	234.42	15.46	15.69	78.11	37.05
		13	2472	CHAIN A DIV1	18.28	21.52	141.91	67.30	10.09	10.32	22.68	10.76
				CHAIN A DIV2	18.20	21.44	139.32	66.07	10.06	10.29	22.53	10.68
		1	2412	CHAIN A DIV1	25.48	28.72	744.73	353.18	17.30	17.30	113.24	53.70
				CHAIN A DIV2	25.55	28.79	756.83	358.92	17.38	17.38	115.35	54.70
		7	2442	CHAIN A DIV1	28.92	32.16	1644.37	779.83	20.65	20.65	244.91	116.14
				CHAIN A DIV2	29.00	32.24	1674.94	794.33	20.68	20.68	246.60	116.95
802.11n40	HTO	11	2462	CHAIN A DIV1	24.19	27.43	553.35	262.42	15.94	15.94	82.79	39.26
				CHAIN A DIV2	23.78	27.02	503.50	238.78	15.52	15.52	75.16	35.65
		12	2467	CHAIN A DIV1	23.66	26.90	489.78	232.27	15.43	15.43	73.62	34.91
				CHAIN A DIV2	23.62	26.86	485.29	230.14	15.37	15.37	72.61	34.43
		13	2472	CHAIN A DIV1	18.36	21.60	144.54	68.55	10.22	10.22	22.18	10.52
				CHAIN A DIV2	18.09	21.33	135.83	64.42	9.96	9.96	20.89	9.91
		3	2422	CHAIN A DIV1	25.21	28.45	699.84	331.89	16.84	16.84	101.86	48.31
				CHAIN A DIV2	24.96	28.20	660.69	313.33	16.71	16.71	98.86	46.88
	HTO	7	2442	CHAIN A DIV1	24.49	27.73	592.93	281.19	16.15	16.15	86.90	41.21
				CHAIN A DIV2	24.37	27.61	576.77	273.53	16.01	16.01	84.14	39.90
		9	2452	CHAIN A DIV1	23.02	26.26	422.67	200.45	14.65	14.65	61.52	29.17
				CHAIN A DIV2	23.85	27.09	511.68	242.66	15.46	15.46	74.13	35.16
		10	2457	CHAIN A DIV1	20.32	23.56	226.99	107.65	12.14	12.14	34.51	16.37
				CHAIN A DIV2	20.03	23.27	212.32	100.69	11.87	11.87	32.43	15.38
	HTO	11	2462	CHAIN A DIV1	18.61	21.85	153.11	72.61	10.35	10.35	22.86	10.84
				CHAIN A DIV2	18.48	21.72	148.59	70.47	10.39	10.39	23.07	10.94

* Duty cycle compensated Max Value

Mode	Rate	# Ch	Freq [MHz]	Antenna	RU config	Meas Peak Cond.Po wer [dBm]	EIRP [dBm]	EIRP [mW]	Peak Cond.Power [mW]	Meas. Avg Cond.Power [dBm]	Max. Avg Cond.Power* [dBm]	EIRP [mW]	Avg Cond.Power [mW]
802.11ax20	HEO	1	2412	CHAIN A DIV1	Full	26.14	29.38	866.96	411.15	17.19	17.19	110.41	52.36
					26/0	26.91	30.15	1035.14	490.91	18.80	18.80	159.96	75.86
					52/37	28.18	31.42	1386.76	657.66	19.15	19.15	173.38	82.22
					106/53	28.34	31.58	1438.80	682.34	18.92	18.92	164.44	77.98
				CHAIN A DIV2	Full	26.43	29.67	926.83	439.54	17.43	17.43	116.68	55.34
					26/0	27.20	30.44	1106.62	524.81	18.83	18.83	161.06	76.38
					52/37	28.12	31.36	1367.73	648.63	19.07	19.07	170.22	80.72
					106/53	27.85	31.09	1285.29	609.54	18.42	18.42	146.55	69.50
		7	2442	CHAIN A DIV1	Full	29.38	32.62	1828.10	866.96	20.36	20.36	229.09	108.64
				CHAIN A DIV2	Full	29.18	32.42	1745.82	827.94	20.18	20.18	219.79	104.23
		11	2462	CHAIN A DIV1	Full	25.17	28.41	693.43	328.85	16.07	16.07	85.31	40.46
				CHAIN A DIV2	Full	24.42	27.66	583.45	276.69	15.29	15.29	71.29	33.81
		12	2467	CHAIN A DIV1	Full	24.61	27.85	609.54	289.07	15.50	15.50	74.82	35.48
				CHAIN A DIV2	Full	24.62	27.86	610.94	289.73	15.48	15.48	74.47	35.32
		13	2472	CHAIN A DIV1	Full	19.80	23.04	201.37	95.50	10.29	10.29	22.54	10.69
					26/8	18.44	21.68	147.23	69.82	8.08	8.08	13.55	6.43
					52/40	19.07	22.31	170.22	80.72	8.76	8.76	15.85	7.52
					106/54	19.42	22.66	184.50	87.50	9.34	9.34	18.11	8.59
				CHAIN A DIV2	Full	19.19	22.43	174.98	82.99	9.58	9.58	19.14	9.08
					26/8	18.43	21.67	146.89	69.66	7.99	7.99	13.27	6.30
					52/40	18.95	22.19	165.58	78.52	8.78	8.78	15.92	7.55
					106/54	19.43	22.67	184.93	87.70	9.35	9.35	18.16	8.61

* Duty cycle compensated Max Value

Mode	Rate	# Ch	Freq [MHz]	Antenna	RU config	Meas Peak Cond.Po wer [dBm]	EIRP [dBm]	EIRP [mW]	Peak Cond.Power [mW]	Meas. Avg Cond.Po wer [dBm]	Max. Avg Cond.Po wer* [dBm]	EIRP [mW]	Avg Cond.Power [mW]
802.11ax40	HEO	3	2422	CHAIN A DIV1	Full	25.98	29.22	835.60	396.28	16.69	16.69	98.40	46.67
					242/61	26.26	29.50	891.25	422.67	17.16	17.16	109.65	52.00
				CHAIN A DIV2	Full	25.69	28.93	781.63	370.68	16.44	16.44	92.90	44.06
					242/61	26.54	29.78	950.60	450.82	17.44	17.44	116.95	55.46
		7	2442	CHAIN A DIV1	Full	25.22	28.46	701.46	332.66	15.94	15.94	82.79	39.26
				CHAIN A DIV2	Full	25.07	28.31	677.64	321.37	15.81	15.81	80.35	38.11
		9	2452	CHAIN A DIV1	Full	23.77	27.01	502.34	238.23	14.50	14.50	59.43	28.18
				CHAIN A DIV2	Full	24.28	27.52	564.94	267.92	14.93	14.93	71.29	33.81
		10	2457	CHAIN A DIV1	Full	20.86	24.10	257.04	121.90	11.56	11.56	30.20	14.32
				CHAIN A DIV2	Full	21.43	24.67	293.09	139.00	12.08	12.08	34.04	16.14
		11	2462	CHAIN A DIV1	Full	19.82	23.06	202.30	95.94	10.40	10.40	23.12	10.96
					242/62	18.60	21.84	152.76	72.44	9.10	9.10	17.14	8.13
				CHAIN A DIV2	Full	19.74	22.98	198.61	94.19	10.31	10.31	22.65	10.74
					242/62	18.88	22.12	162.93	77.27	9.43	9.43	18.49	8.77

* Duty cycle compensated Max Value

B.2.3 Power Spectral Density

Test limits

FCC part	RSS part	Limits
15.247 (e)	RSS-247 Clause 5.2 (b)	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test procedure

The peak power spectral density level in the fundamental emission was measured using the *Method PKPSD (peak PSD)* according to section 11.10.2 of ANSI C63.10-2013.

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

Results tables

Mode	Rate	Channel	Freq [MHz]	Antenna	PSD Peak [dBm/3kHz]
802.11b	1Mbps	1	2412	CHAIN A DIV1	-1.97
				CHAIN A DIV2	-2.22
		7	2442	CHAIN A DIV1	-1.00
				CHAIN A DIV2	-1.19
		11	2462	CHAIN A DIV1	-1.35
				CHAIN A DIV2	-1.68
		12	2467	CHAIN A DIV1	-3.20
				CHAIN A DIV2	-3.22
		13	2472	CHAIN A DIV1	-5.91
				CHAIN A DIV2	-4.97
802.11g	6Mbps	1	2412	CHAIN A DIV1	-5.68
				CHAIN A DIV2	-6.02
		7	2442	CHAIN A DIV1	-1.84
				CHAIN A DIV2	-3.17
		11	2462	CHAIN A DIV1	-7.16
				CHAIN A DIV2	-7.86
		12	2467	CHAIN A DIV1	-6.92
				CHAIN A DIV2	-6.77
		13	2472	CHAIN A DIV1	-12.02
				CHAIN A DIV2	-13.12
802.11n20	HT0	1	2412	CHAIN A DIV1	-6.51
				CHAIN A DIV2	-6.23
		7	2442	CHAIN A DIV1	-2.96
				CHAIN A DIV2	-2.40
		11	2462	CHAIN A DIV1	-7.45
				CHAIN A DIV2	-8.09
		12	2467	CHAIN A DIV1	-7.95
				CHAIN A DIV2	-8.35
		13	2472	CHAIN A DIV1	-13.64
				CHAIN A DIV2	-14.19
802.11n40	HT0	3	2422	CHAIN A DIV1	-9.31
				CHAIN A DIV2	-9.34
		7	2442	CHAIN A DIV1	-11.24
				CHAIN A DIV2	-9.92
		9	2452	CHAIN A DIV1	-12.05
				CHAIN A DIV2	-10.82
		10	2457	CHAIN A DIV1	-15.06
				CHAIN A DIV2	-15.44
		11	2462	CHAIN A DIV1	-16.57
				CHAIN A DIV2	-17.50

Mode	Rate	#Ch	Freq[MHz]	Antenna	RU config.	PSD Peak [dBm/3kHz]
802.11ax20	HE0	1	2412	CHAIN A DIV1	Full	-6.63
					26/0	3.39
					52/37	0.14
					106/53	-2.62
				CHAIN A DIV2	Full	-6.88
					26/0	3.26
					52/37	-0.31
					106/53	-3.45
		7	2442	CHAIN A DIV1	Full	-3.79
				CHAIN A DIV2	Full	-3.51
		11	2462	CHAIN A DIV1	Full	-8.50
				CHAIN A DIV2	Full	-8.65
		12	2467	CHAIN A DIV1	Full	-9.35
				CHAIN A DIV2	Full	-8.68
		13	2472	CHAIN A DIV1	Full	-14.16
					26/8	-8.12
					52/40	-10.03
					106/54	-11.74
				CHAIN A DIV2	Full	-14.32
					26/8	-8.30
					52/40	-10.05
					106/54	-11.82

Mode	Rate	#Ch	Freq[MHz]	Antenna	RU config.	PSD Peak [dBm/3kHz]
802.11ax40	HE0	3	2422	CHAIN A DIV1	Full	-10.32
					242/61	-7.41
				CHAIN A DIV2	Full	-11.69
					242/61	-7.29
		7	2442	CHAIN A DIV1	Full	-11.56
				CHAIN A DIV2	Full	-10.90
		9	2452	CHAIN A DIV1	Full	-13.34
				CHAIN A DIV2	Full	-12.02
		10	2457	CHAIN A DIV1	Full	-16.08
				CHAIN A DIV2	Full	-15.04
		11	2462	CHAIN A DIV1	Full	-17.00
					242/62	-13.59
				CHAIN A DIV2	Full	-18.13
					242/62	-15.09

B.2.4 Out-of-band emission (conducted)

Test Limits

FCC part	RSS part	Limits																				
15.247 (d)	RSS-247 Clause 5.5	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.																				
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 lower band edge falling in restricted bands was measured using the primary method according to section 11.12.2.5.2 & 11.12.2.4 of ANSI C63.10-2013.

The upper band edge was measured using the following methods:

- Integration Method according to 11.13.3 of ANSI C63.10-2013
- Primary Method according 11.12.2.5.2 & 11.12.2.4 of ANSI C63.10-2013.

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

For band edge measurements falling in restricted bands, 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	54.0	-41.2

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

See Section B.3.1 for the screenshot results.

B.2.5 Radiated spurious emission

Standard references

FCC part	RSS part	Limits			
15.247 (d) 15.209	RSS-247 Clause 5.5 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):			
		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 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.			

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 to 4 meters, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

The radiated spurious emissions were measured on the worst case configuration selected from the chapter B.2.2 and using the lowest, middle and highest channels.

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

Frequency	Quasi-peak	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dB	---
37.5	30.5	40.0	9.5	V
74.6	30.6	40.0	9.4	V
136.9	37.5	43.5	6.0	H
261.5	41.2	46.0	4.8	H

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

1 GHz – 26.5 GHz, 802.11b, 1Mbps, Chain A-DIV1**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
4823.9	52.9	---	74.0	21.1	H
4823.9	---	43.8	54.0	10.2	H
17494.0	50.6	---	74.0	23.4	V
17494.0	---	41.5	54.0	12.5	V
25910.2	---	39.1	54.0	14.9	H
25910.2	50	---	74.0	24.0	H

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
2627.5	59.2	---	74.0	14.8	V
2627.5	---	44.8	54.0	9.2	V
9767.9	46.1	---	74.0	27.9	V
9767.9	---	37.3	54.0	16.7	V
24535.1	---	37.1	54.0	16.9	H
24535.1	49.6	---	74.0	24.4	H

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3214.0	---	45.9	54.0	8.1	V
3214.0	59.6	---	74.0	14.4	H
17495.9	51.5	---	74.0	22.5	H
17495.9	---	41.5	54.0	12.5	V
24685.2	---	36.2	54.0	17.8	H
24685.2	49.3	---	74.0	24.7	V

1 GHz – 26.5 GHz, 802.11b, 1Mbps, Chain A-DIV2**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
4823.9	52.1	---	74.0	21.9	V
4823.9	---	42.9	54.0	11.1	V
9648.0	45.1	---	74.0	28.9	V
9648.0	---	37.1	54.0	16.9	V
24851.9	---	36.9	54.0	17.1	H
24851.9	50	---	74.0	24.0	H

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3094.0	---	46.1	54.0	7.9	H
3094.0	59.1	---	74.0	14.9	H
9767.9	46	---	74.0	28.0	V
9767.9	---	38.9	54.0	15.1	V
14652.0	48.5	---	74.0	25.5	V
14652.0	---	39.9	54.0	14.1	V
24417.0	---	37.1	54.0	16.9	H
24417.0	49.1	---	74.0	24.9	V

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
2937.5	---	45.6	54.0	8.4	H
2937.5	59.7	---	74.0	14.3	H
17837.6	---	41.2	54.0	12.8	V
17837.6	52.8	---	74.0	21.2	H
24551.6	49.6	---	74.0	24.4	V
24554.0	---	38	54.0	16.0	H

1 GHz – 26.5 GHz, 802.11g, 6Mbps, Chain A-DIV1**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3294.0	---	46.4	54.0	7.6	H
3294.0	59.3	---	74.0	14.7	V
17805.2	---	41	54.0	13.0	V
17805.2	53.3	---	74.0	20.7	V
24533.2	49.5	---	74.0	24.5	H
24543.6	---	37.9	54.0	16.1	V

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3371.5	---	46.2	54.0	7.8	V
3371.5	59.1	---	74.0	14.9	H
17494.4	51.2	---	74.0	22.8	H
17494.4	---	41.4	54.0	12.6	V
25913.5	---	38	54.0	16.0	H
25913.5	49.9	---	74.0	24.1	H

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3371.5	---	46.3	54.0	7.7	H
3371.5	58.8	---	74.0	15.2	V
17831.8	---	41.2	54.0	12.8	V
17831.8	53.7	---	74.0	20.3	V
26215.2	---	37.3	54.0	16.7	V
26215.2	50.5	---	74.0	23.5	V

1 GHz – 26.5 GHz, 802.11g, 6Mbps, Chain A-DIV2**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3314.5	---	46.1	54.0	7.9	V
3314.5	59.1	---	74.0	14.9	V
17839.5	---	41.8	54.0	12.2	V
17839.5	52.9	---	74.0	21.1	V
24225.8	---	37.1	54.0	16.9	H
24225.8	49.2	---	74.0	24.8	H

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3290.0	---	46.1	54.0	7.9	H
3290.0	58.7	---	74.0	15.3	H
17827.9	50.9	---	74.0	23.1	V
17827.9	---	41.9	54.0	12.1	V
24988.4	---	37	54.0	17.0	V
24988.9	49.5	---	74.0	24.5	H

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3230.0	---	46.3	54.0	7.7	H
3230.0	59.1	---	74.0	14.9	V
17838.1	---	41.3	54.0	12.7	H
17838.1	53.2	---	74.0	20.8	H
25244.8	49.2	---	74.0	24.8	V
25247.7	---	38.1	54.0	15.9	V

1 GHz – 26.5 GHz, 802.11n20, HT0, Chain A-DIV1**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3289.5	---	46.2	54.0	7.8	V
3289.5	60	---	74.0	14.0	H
17835.2	---	41.3	54.0	12.7	H
17835.2	53.8	---	74.0	20.2	H
25918.2	50.2	---	74.0	23.8	H
25922.0	---	38.8	54.0	15.2	V

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3292.5	---	46.4	54.0	7.6	H
3292.5	59.3	---	74.0	14.7	V
17865.2	---	41	54.0	13.0	V
17865.2	54	---	74.0	20.0	H
21656.4	---	36.1	54.0	17.9	H
21656.4	49.4	---	74.0	24.6	H

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3294.0	---	46.5	54.0	7.5	H
3294.0	59.6	---	74.0	14.4	H
17905.8	51.7	---	74.0	22.3	V
17905.8	---	41.6	54.0	12.4	V
24529.9	49.8	---	74.0	24.2	H
24530.8	---	37.2	54.0	16.8	H

1 GHz – 26.5 GHz, 802.11n20, HT0, Chain A-DIV2**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3379.0	---	46.2	54.0	7.8	H
3379.0	58.6	---	74.0	15.4	V
17850.7	---	41	54.0	13.0	V
17850.7	53.2	---	74.0	20.8	V
24079.9	---	36.4	54.0	17.6	V
24079.9	49.0	---	74.0	25.0	H

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3367.5	59.1	---	74.0	14.9	V
3368.5	---	46.4	54.0	7.6	V
17828.4	---	41.6	54.0	12.4	V
17828.4	52.9	---	74.0	21.1	V
22254.2	---	35.6	54.0	18.4	V
22254.2	49.1	---	74.0	24.9	H

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3363.5	---	46.5	54.0	7.5	V
3363.5	58.9	---	74.0	15.1	V
17855.5	---	41.7	54.0	12.3	V
17855.5	53.5	---	74.0	20.5	V
24245.6	---	37.4	54.0	16.6	H
24245.6	49.4	---	74.0	24.6	V

1 GHz – 26.5 GHz, 802.11ax20, HE0, Chain A-DIV1**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
4806.9	51.7	---	74.0	22.3	H
4806.9	---	42.1	54.0	11.9	H
17854.5	51.9	---	74.0	22.1	V
17854.5	---	41.8	54.0	12.2	H
22582.4	---	36.4	54.0	17.6	V
22582.4	49.7	---	74.0	24.3	H

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2674.0	---	48	54.0	6.0	V
2674.5	57.6	---	74.0	16.4	V
4867.5	53.1	---	74.0	20.9	H
4867.5	---	42.6	54.0	11.4	H
9734.0	46.5	---	74.0	27.5	H
9734.0	---	37.5	54.0	16.5	V
25257.1	---	37.5	54.0	16.5	H
25257.1	49.6	---	74.0	24.4	H

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
2694.0	57.1	---	74.0	16.9	H
2694.0	---	47.5	54.0	6.5	V
17827.9	52.4	---	74.0	21.6	H
17827.9	---	41.9	54.0	12.1	V
23489.1	---	36.1	54.0	17.9	V
23489.1	48.7	---	74.0	25.3	H

1 GHz – 26.5 GHz, 802.11ax20, HE0, Chain A-DIV2**Radiated Spurious – CH1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
2643.5	57.8	---	74.0	16.2	H
2643.5	---	46.6	54.0	7.4	H
4806.9	51.8	---	74.0	22.2	H
4806.9	---	41.5	54.0	12.5	V
17815.8	---	40.8	54.0	13.2	V
17815.8	53.2	---	74.0	20.8	H
22530.5	49.1	---	74.0	24.9	V
22531.0	---	35.9	54.0	18.1	H

Radiated Spurious – CH7

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
2193.5	---	44.5	54.0	9.5	H
2193.5	56.3	---	74.0	17.7	V
2674.0	58.1	---	74.0	15.9	H
2674.0	---	48.7	54.0	5.3	H
9734.0	47.0	---	74.0	27.0	V
9734.0	---	37.5	54.0	16.5	V
21924.6	---	35.5	54.0	18.5	H
21925.6	48.7	---	74.0	25.3	V

Radiated Spurious – CH11

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2694.0	57.1	---	74.0	16.9	H
2694.0	---	47.6	54.0	6.4	H
17826.0	---	41.1	54.0	12.9	V
17826.0	53.1	---	74.0	20.9	H
21555.8	---	37.1	54.0	16.9	V
21555.8	49.5	---	74.0	24.5	V

1 GHz – 26.5 GHz, 802.11n40, HT0, Chain A-DIV1**Radiated Spurious – CH3F**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3369.5	---	46.3	54.0	7.7	H
3369.5	59.1	---	74.0	14.9	H
17821.2	---	41	54.0	13.0	V
17821.2	54.1	---	74.0	19.9	V
26486.3	50.2	---	74.0	23.8	H
26488.7	---	37.7	54.0	16.3	H

Radiated Spurious – CH6F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3298.5	60.1	---	74.0	13.9	V
3299.5	---	46.4	54.0	7.6	H
17902.4	---	41.4	54.0	12.6	H
17902.4	53.6	---	74.0	20.4	V
21781.1	48.5	---	74.0	25.5	V
21781.6	---	36	54.0	18.0	H

Radiated Spurious – CH9F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3102.5	---	46.1	54.0	7.9	H
3102.5	59.0	---	74.0	15.0	H
17831.8	---	41.4	54.0	12.6	V
17831.8	53.3	---	74.0	20.7	V
26101.0	49.8	---	74.0	24.2	V
26101.4	---	37.4	54.0	16.6	H

1 GHz – 26.5 GHz, 802.11n40, HT0, Chain A-DIV2**Radiated Spurious – CH3F**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3295.0	59.7	---	74.0	14.3	H
3295.5	---	46.3	54.0	7.7	V
17830.8	---	41.5	54.0	12.5	H
17830.8	54	---	74.0	20.0	V
24562.5	49.6	---	74.0	24.4	V
24562.5	---	37	54.0	17.0	H

Radiated Spurious – CH6F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3201.5	---	46.2	54.0	7.8	H
3201.5	59.4	---	74.0	14.6	V
17894.2	---	41.3	54.0	12.7	V
17894.2	53.4	---	74.0	20.6	H
25891.8	49.8	---	74.0	24.2	H
25892.2	---	38.1	54.0	15.9	H

Radiated Spurious – CH9F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3382.0	---	45.9	54.0	8.1	H
3382.0	58.7	---	74.0	15.3	H
17850.7	---	41.5	54.0	12.5	V
17850.7	53.5	---	74.0	20.5	V
25251.0	---	37.6	54.0	16.4	H
25267.0	49.6	---	74.0	24.4	V

1 GHz – 26.5 GHz, 802.11ax40, HE0, Chain A-DIV1**Radiated Spurious – CH3F**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
4807.8	---	42.4	54.0	11.6	H
4808.7	51.6	---	74.0	22.4	H
17825.5	---	41.8	54.0	12.2	V
17825.5	53.2	---	74.0	20.8	V
25914.4	50.0	---	74.0	24.0	H
25916.8	---	38.8	54.0	15.2	H

Radiated Spurious – CH6F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2659.0	56.2	---	74.0	17.8	V
2659.0	---	48	54.0	6.0	V
4837.9	---	42.7	54.0	11.3	H
4839.2	53.6	---	74.0	20.4	H
17853.1	---	41.4	54.0	12.6	V
17853.1	53.3	---	74.0	20.7	V
22247.2	---	36.7	54.0	17.3	H
22249.5	47.3	---	74.0	26.7	V

Radiated Spurious – CH9F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2673.5	56.8	---	74.0	17.2	H
2673.5	---	47.6	54.0	6.4	V
4867.9	---	42	54.0	12.0	H
4867.9	53.1	---	74.0	20.9	V
17798.9	---	40.4	54.0	13.6	V
17798.9	52.5	---	74.0	21.5	H
25918.2	50.1	---	74.0	23.9	V
25918.2	---	38.8	54.0	15.2	H

1 GHz – 26.5 GHz, 802.11ax40, HE0, Chain A-DIV2**Radiated Spurious – CH3F**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2644.0	57.4	---	74.0	16.6	V
2644.0	---	46.8	54.0	7.2	H
17830.8	---	41.2	54.0	12.8	V
17830.8	53.2	---	74.0	20.8	V
21159.2	49	---	74.0	25.0	V
21160.1	---	36.3	54.0	17.7	V

Radiated Spurious – CH6F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2179.5	55.7	---	74.0	18.3	H
2179.5	---	44.6	54.0	9.4	H
2659.0	57.8	---	74.0	16.2	H
2659.0	---	49.1	54.0	4.9	H
4837.9	---	41.2	54.0	12.8	V
4840.0	53.1	---	74.0	20.9	V
17859.8	---	41.7	54.0	12.3	V
17859.8	53.7	---	74.0	20.3	V
22894.1	---	36.3	54.0	17.7	H
22894.1	49.5	---	74.0	24.5	V

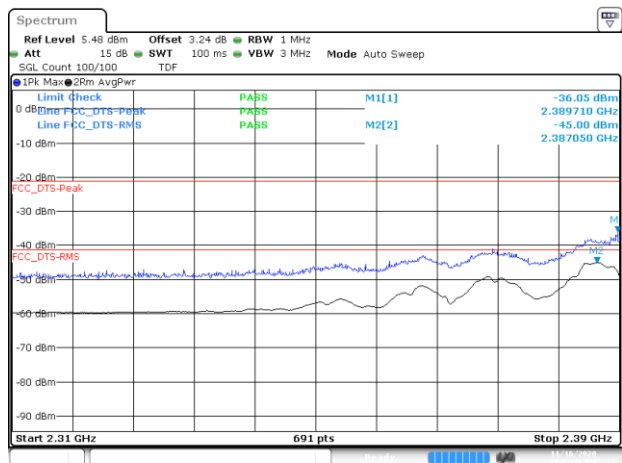
Radiated Spurious – CH9F

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2673.5	58.5	---	74.0	15.5	H
2673.5	---	48.3	54.0	5.7	H
17948.8	---	40.9	54.0	13.1	V
17948.8	53	---	74.0	21.0	H
24211.1	---	37.2	54.0	16.8	H
24211.1	49.1	---	74.0	24.9	H

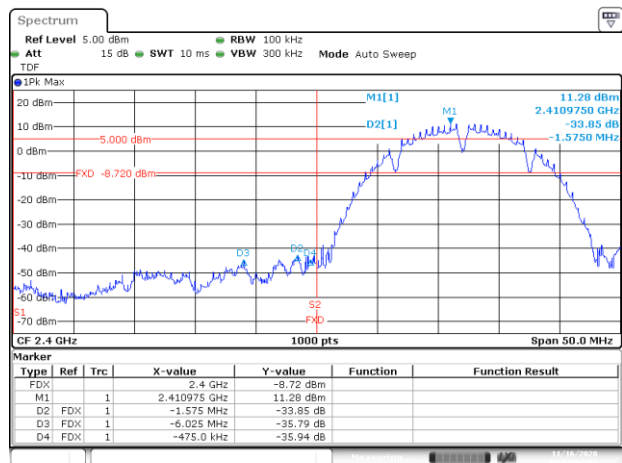
B.3 Test Results Screenshot

B.3.1 Out of band emissions - band-edge low ans High (conducted)

CHAIN A DIV1



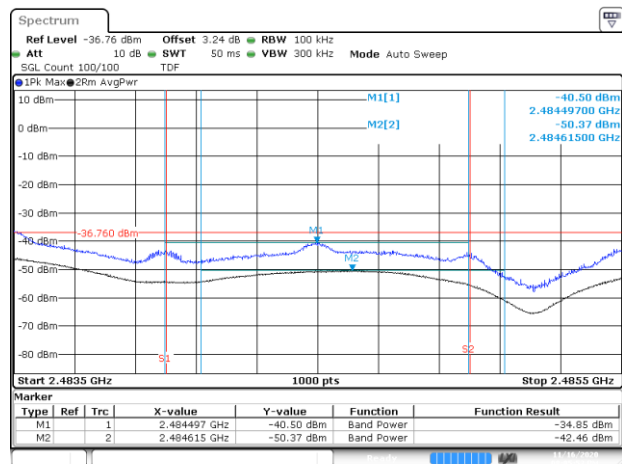
BE-R-LOW, DIV-1, 802.11b-1Mbps, Ch1



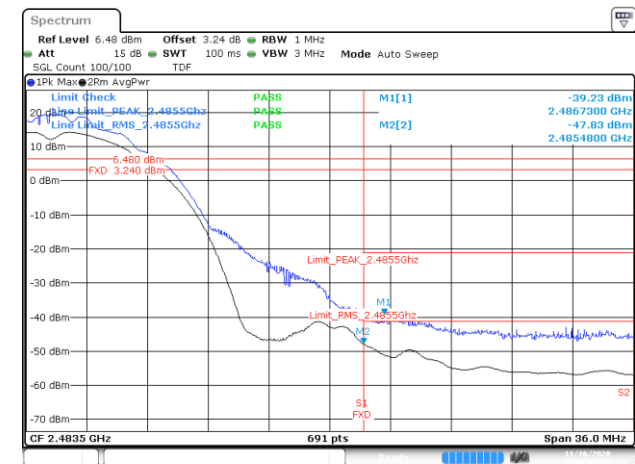
BE-NR, DIV-1, 802.11b-1Mbps, Ch1



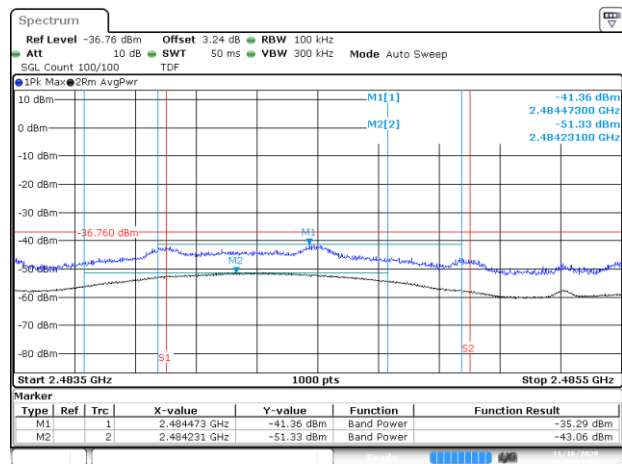
BE-R-HIGH, DIV-1, 802.11b-1Mbps, Ch1



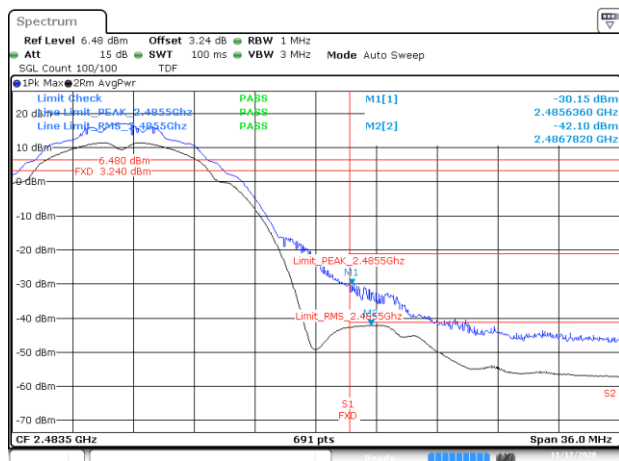
BE-R-HIGH-2MHz, DIV-1, 802.11b-1Mbps, Ch1



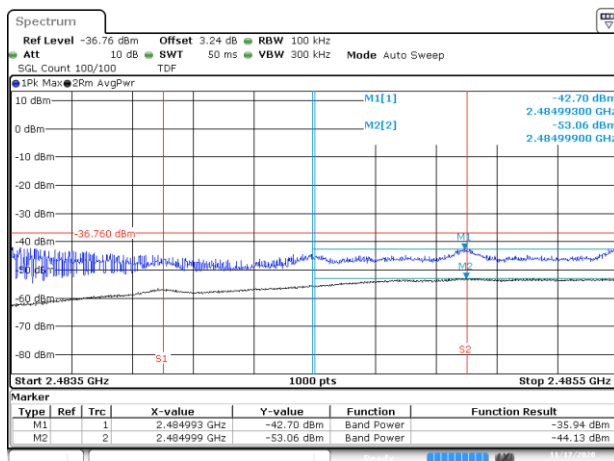
BE-R-HIGH, DIV-1, 802.11b-1Mbps, Ch12



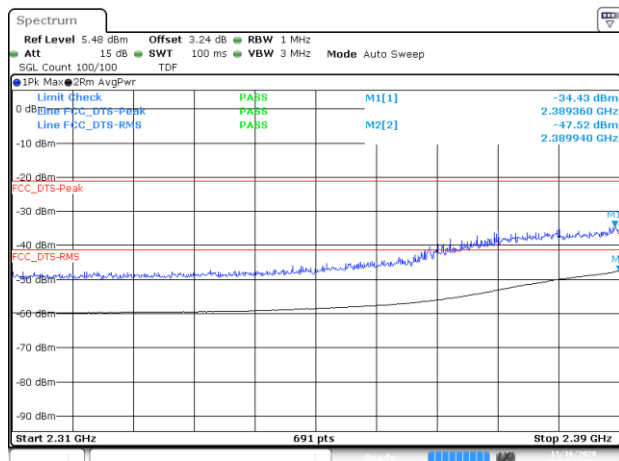
BE-R-HIGH-2MHz, DIV-1, 802.11b-1Mbps, Ch12



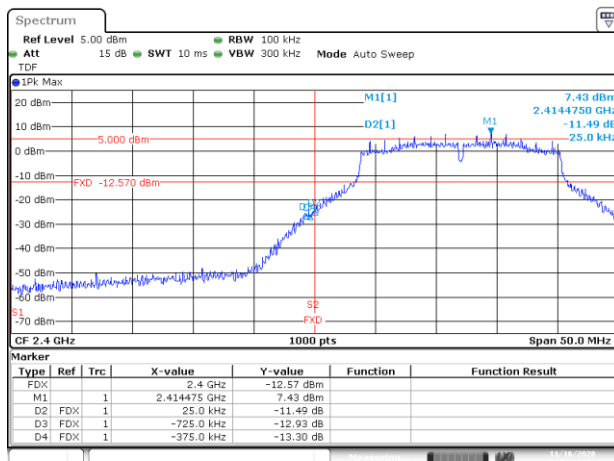
BE-R-HIGH, DIV-1, 802.11b-1Mbps, Ch13



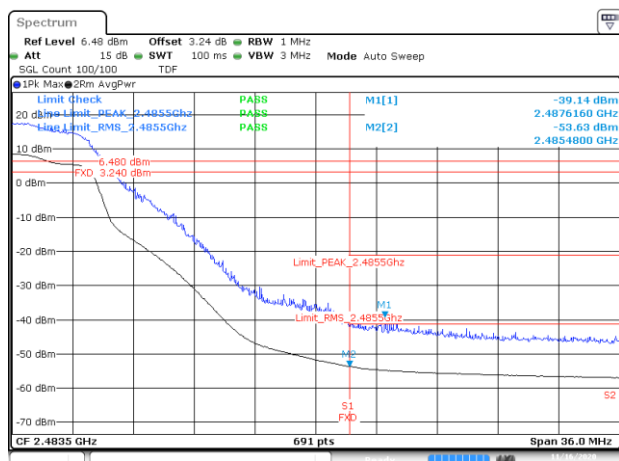
BE-R-HIGH-2MHz, DIV-1, 802.11b-1Mbps, Ch11



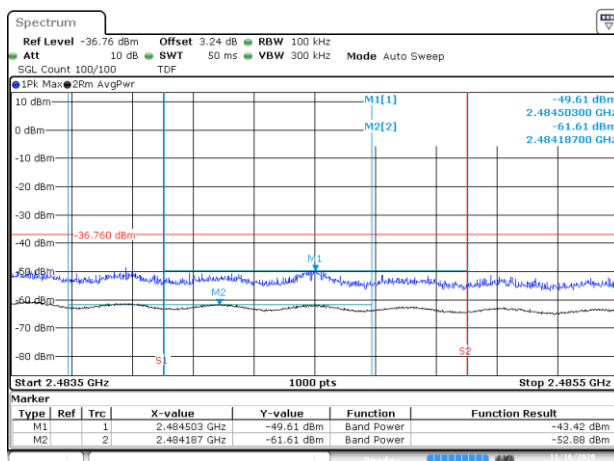
BE-R-LOW, DIV-1, 802.11g-6Mbps, Ch1



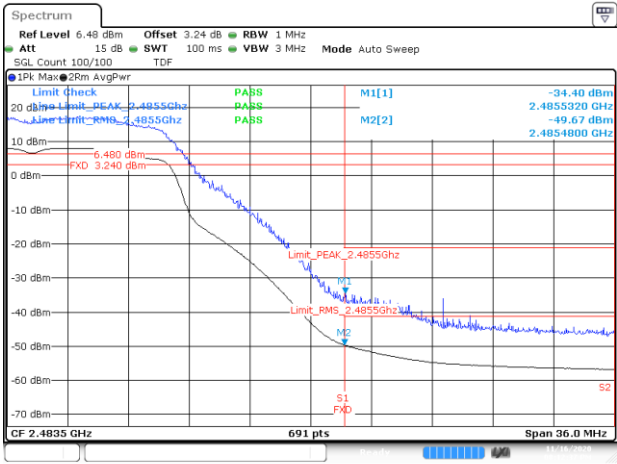
BE-NR, DIV-1, 802.11g-6Mbps, Ch1



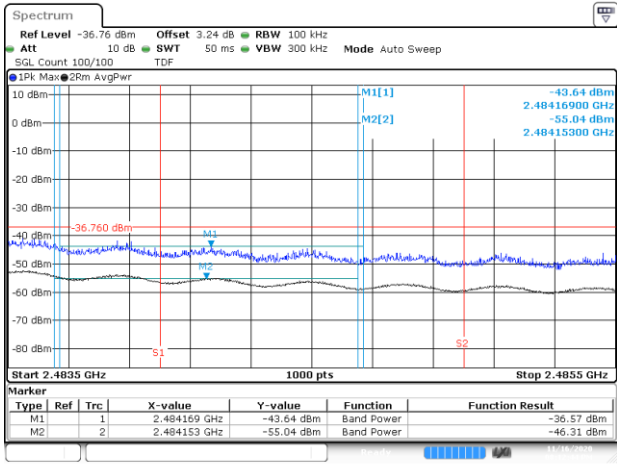
BE-R-HIGH, DIV-1, 802.11g-6Mbps, Ch11



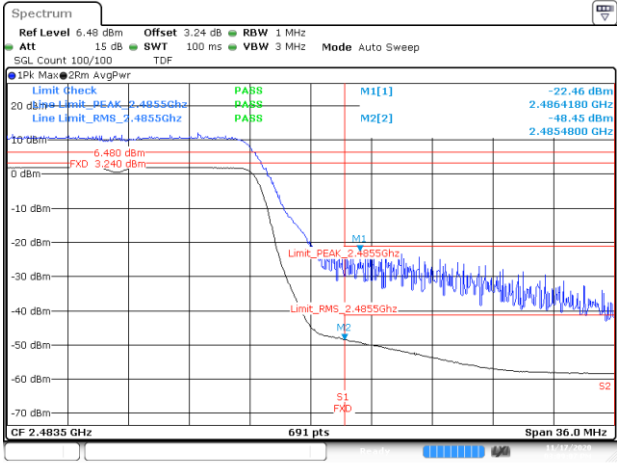
BE-R-HIGH-2MHz, DIV-1, 802.11g-6Mbps, Ch11



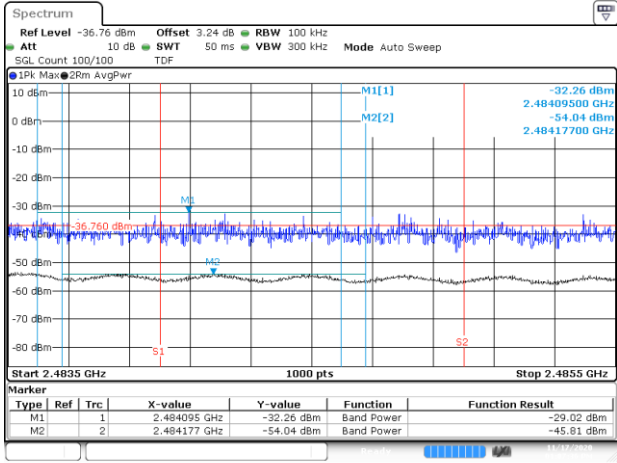
BE-R-HIGH, DIV-1, 802.11g-6Mbps, Ch12



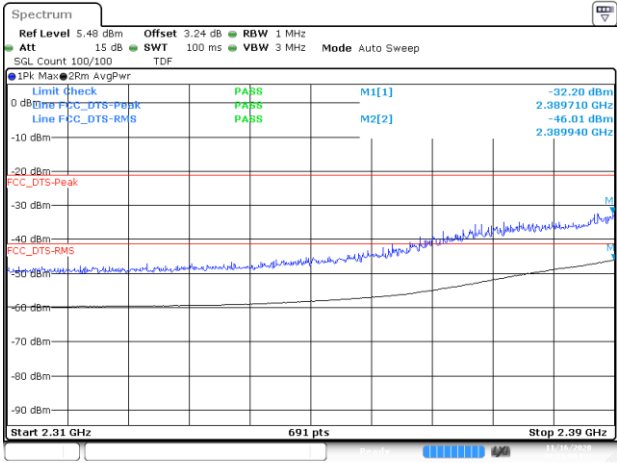
BE-R-HIGH-2MHz, DIV-1, 802.11g-6Mbps, Ch12



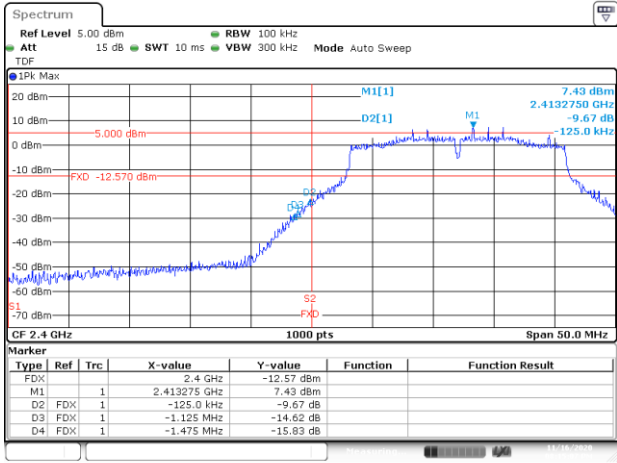
BE-R-HIGH, DIV-1, 802.11g-6Mbps, Ch13



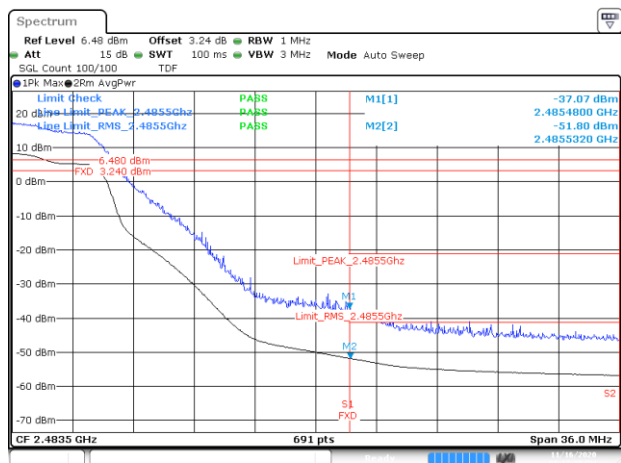
BE-R-HIGH-2MHz, DIV-1, 802.11g-6Mbps, Ch13



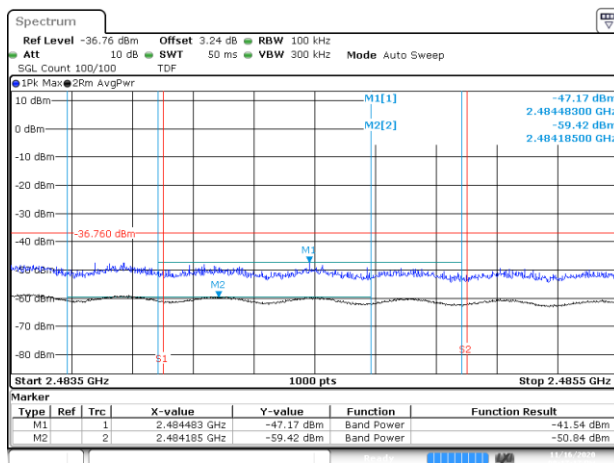
BE-R-LOW, DIV-1, 802.11n20-HT0, Ch1



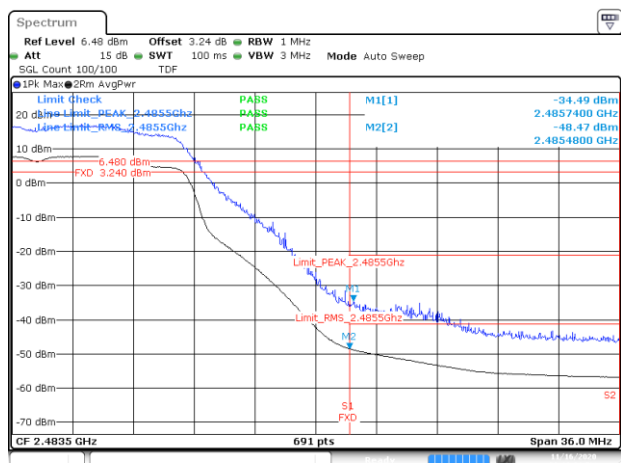
BE-NR, DIV-1, 802.11n20-HT0, Ch1



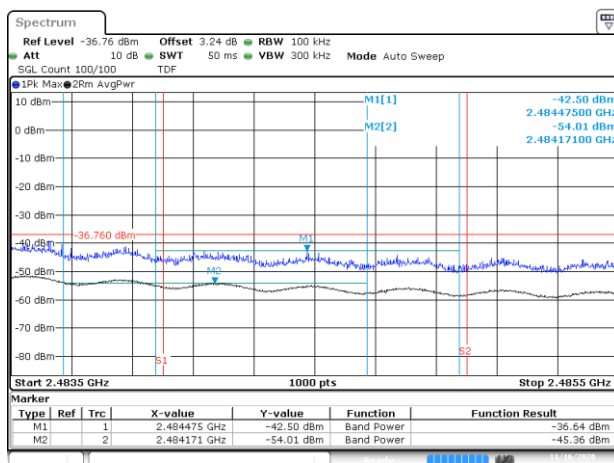
BE-R-HIGH, DIV-1, 802.11n20-HT0, Ch11



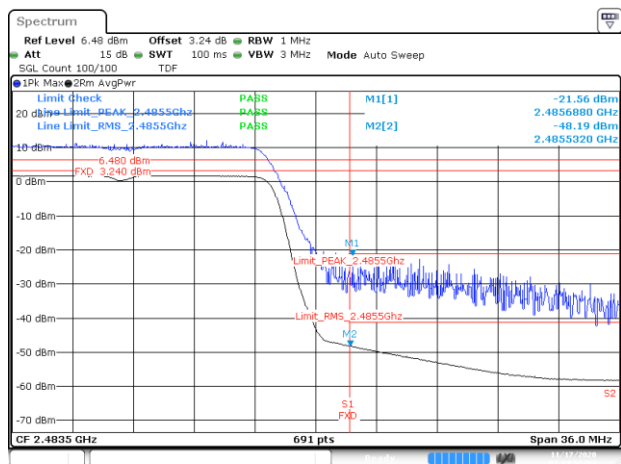
BE-R-HIGH-2MHz, DIV-1, 802.11n20-HT0, Ch11



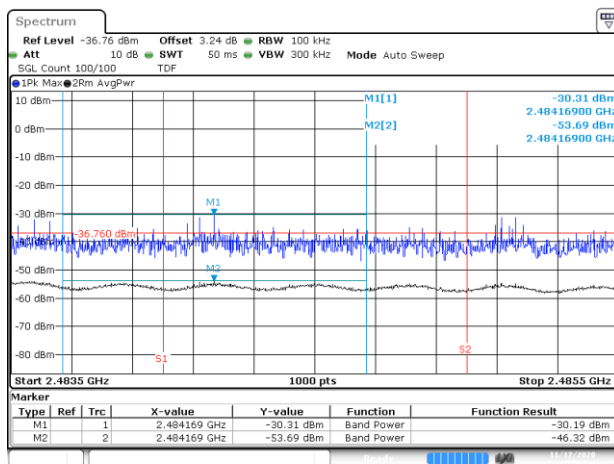
BE-R-HIGH, DIV-1, 802.11n20-HT0, Ch12



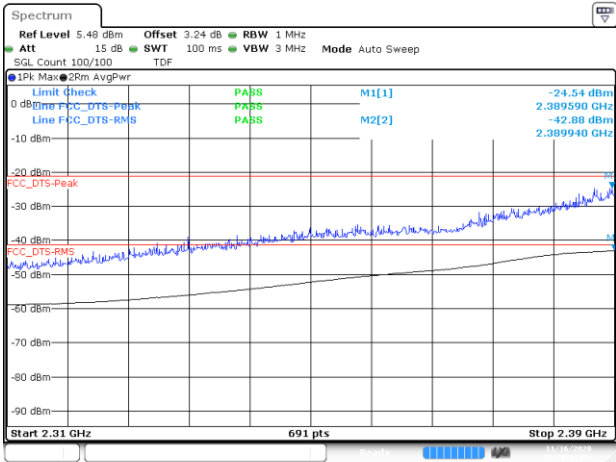
BE-R-HIGH-2MHz, DIV-1, 802.11n20-HT0, Ch12



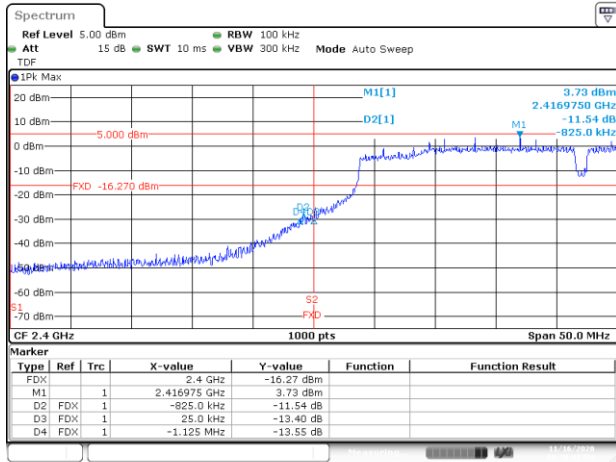
BE-R-HIGH, DIV-1, 802.11n20-HT0, Ch13



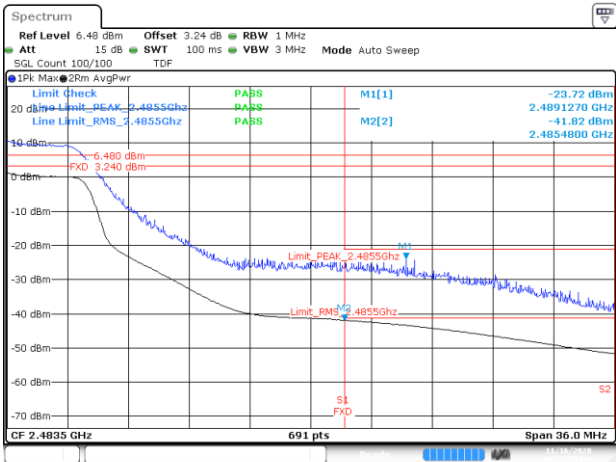
BE-R-HIGH-2MHz, DIV-1, 802.11n20-HT0, Ch13



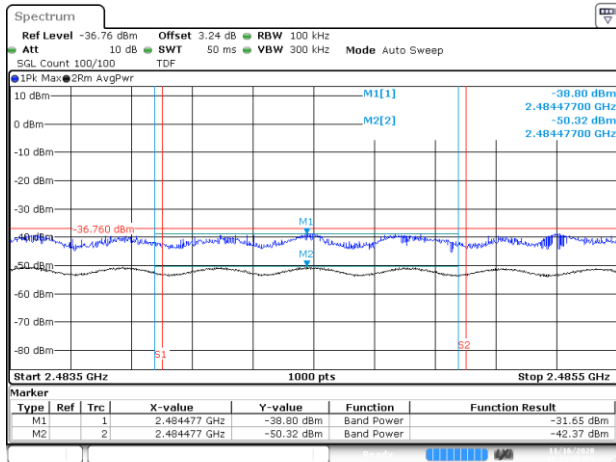
BE-R-LOW, DIV-1, 802.11n40-HT0, Ch3



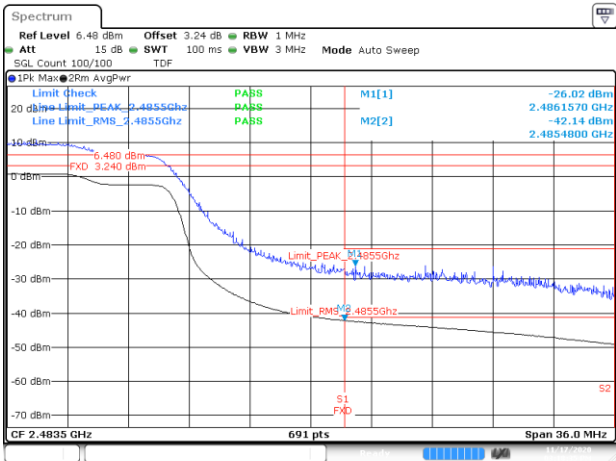
BE-NR, DIV-1, 802.11n40-HT0, Ch3



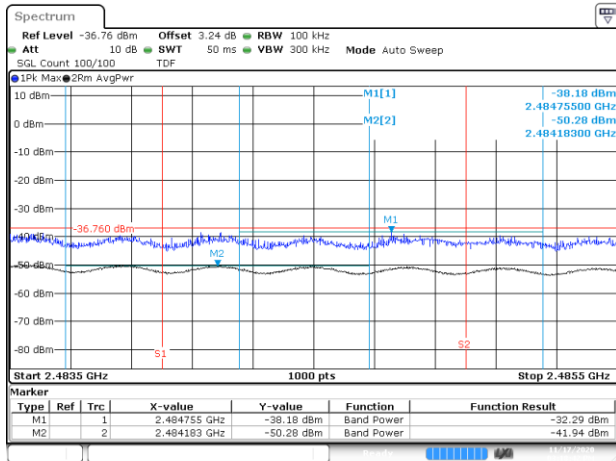
BE-R-HIGH, DIV-1, 802.11n40-HT0, Ch9



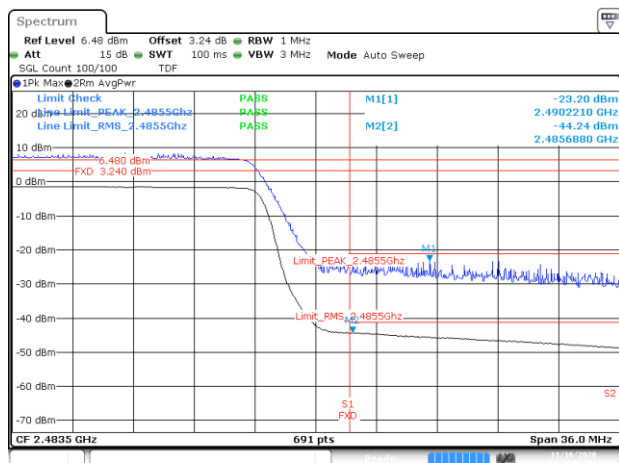
BE-R-HIGH-2MHz, DIV-1, 802.11n40-HT0, Ch9



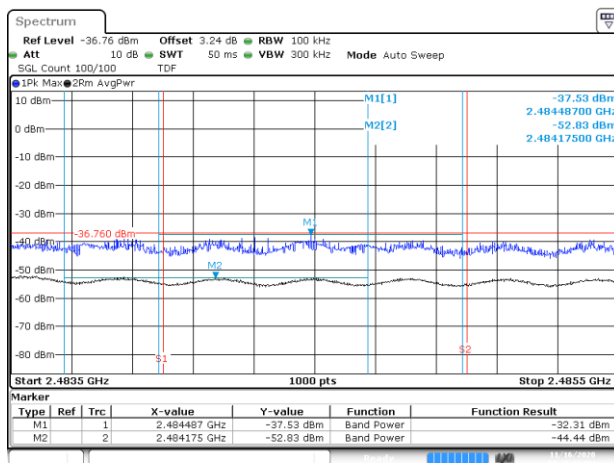
BE-R-HIGH, DIV-1, 802.11n40-HT0, Ch10



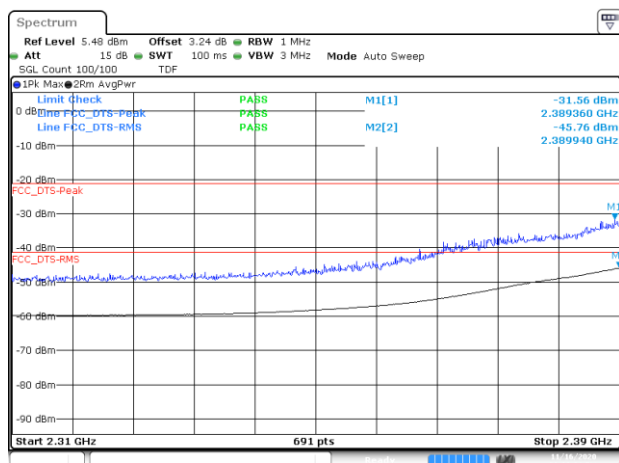
BE-R-HIGH-2MHz, DIV-1, 802.11n40-HT0, Ch10



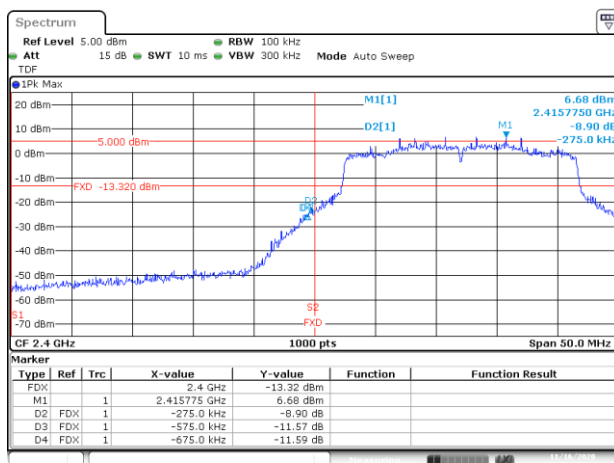
BE-R-HIGH, DIV-1, 802.11n40-HT0, Ch11



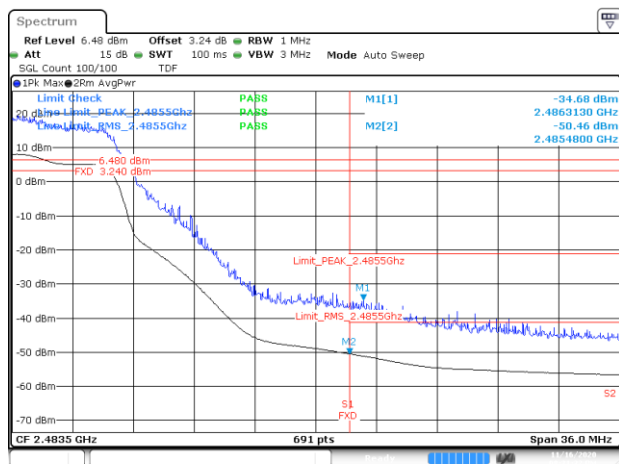
BE-R-HIGH-2MHz, DIV-1, 802.11n40-HT0, Ch11



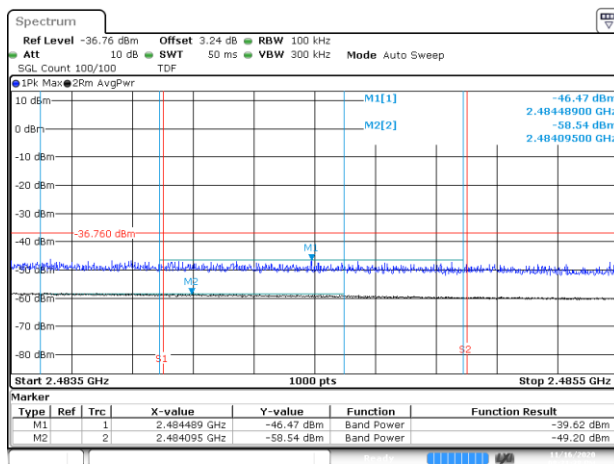
BE-R-LOW, DIV-1, 802.11ax20-HE0, Ch1



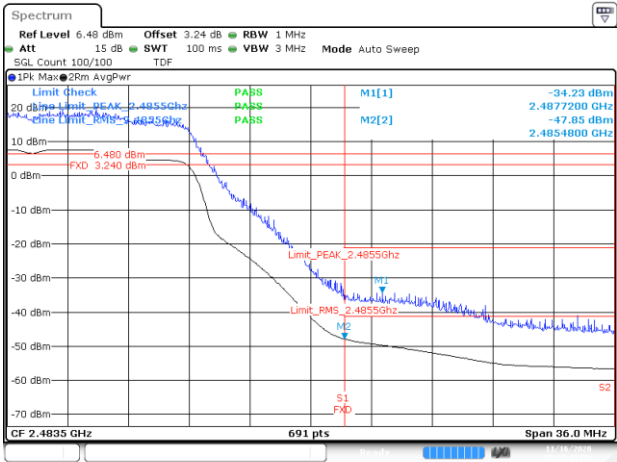
BE-NR, DIV-1, 802.11ax20-HE0, Ch1



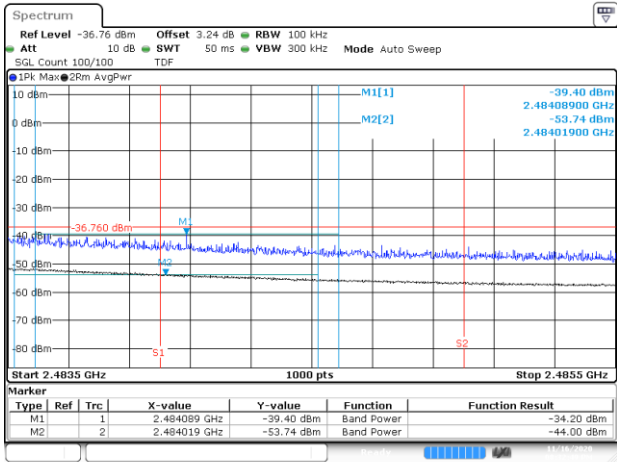
BE-R-HIGH, DIV-1, 802.11ax20-HE0, Ch11



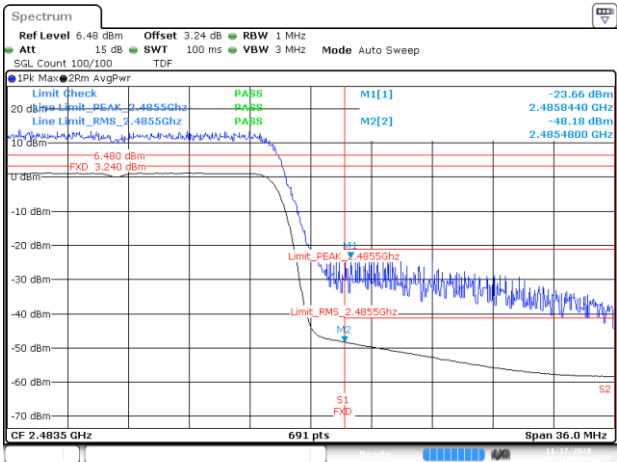
BE-R-HIGH-2MHz, DIV-1, 802.11ax20-HE0, Ch11



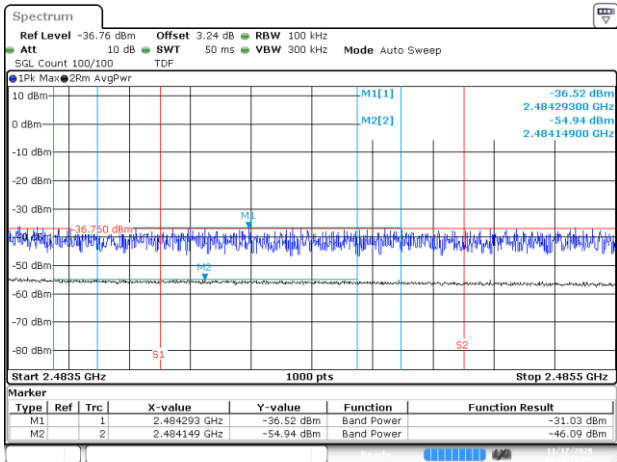
BE-R-HIGH, DIV-1, 802.11ax20-HE0, Ch12



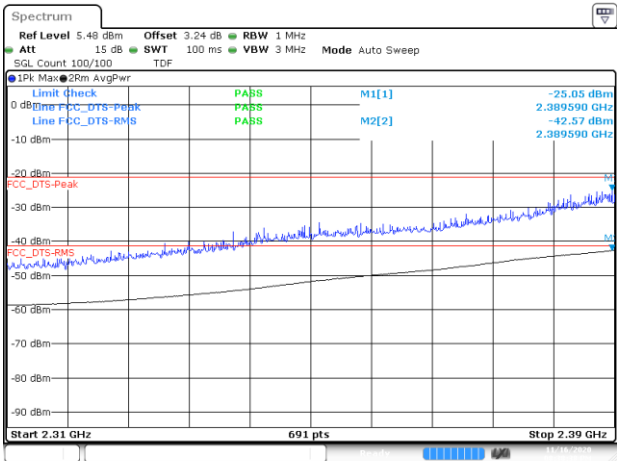
BE-R-HIGH-2MHz, DIV-1, 802.11ax20-HE0, Ch12



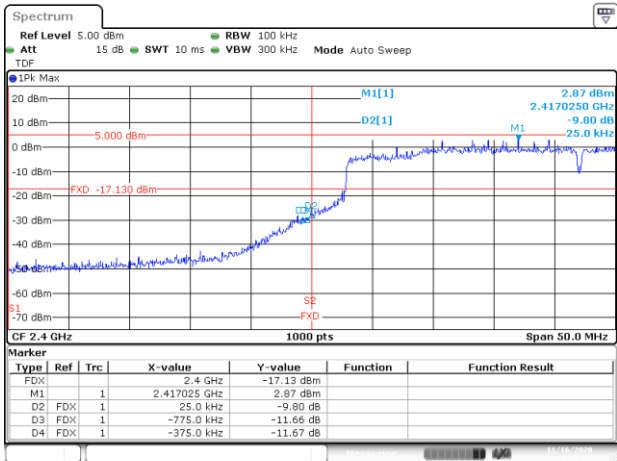
BE-R-HIGH, DIV-1, 802.11ax20-HE0, Ch13



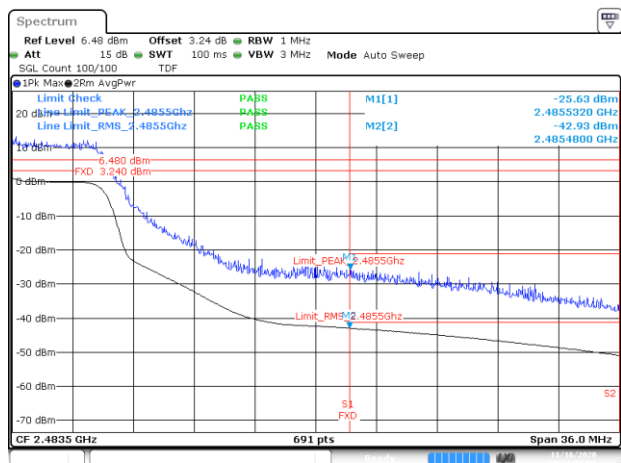
BE-R-HIGH-2MHz, DIV-1, 802.11ax20-HE0, Ch13



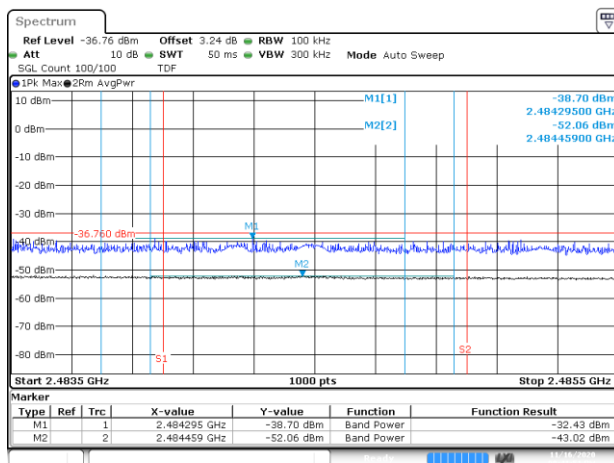
BE-R-LOW, DIV-1, 802.11ax40-HE0, Ch3



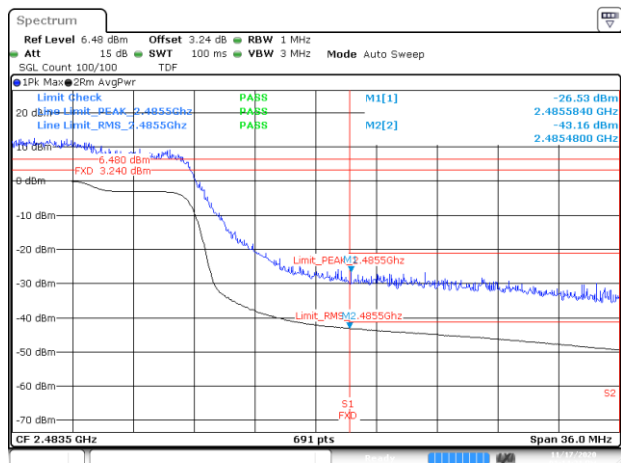
BE-NR, DIV-1, 802.11ax40-HE0, Ch3



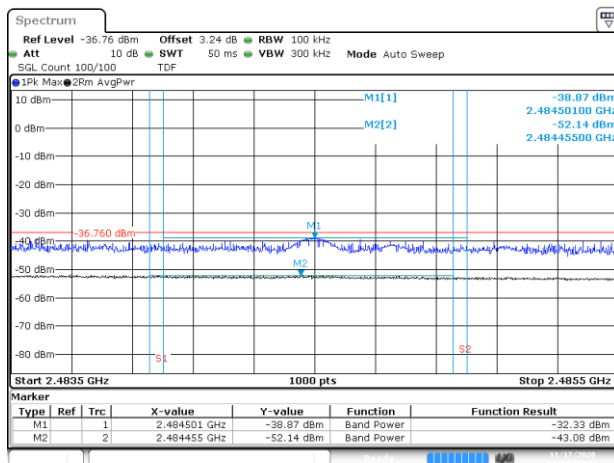
BE-R-HIGH, DIV-1, 802.11ax40-HE0, Ch9



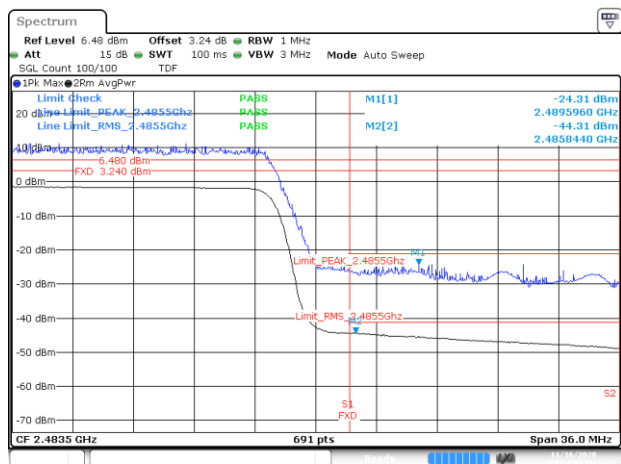
BE-R-HIGH-2MHz, DIV-1, 802.11ax40-HE0, Ch9



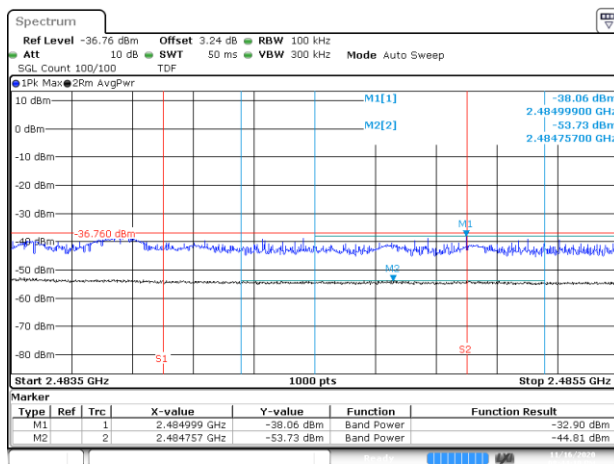
BE-R-HIGH, DIV-1, 802.11ax40-HE0, Ch10



BE-R-HIGH-2MHz, DIV-1, 802.11ax40-HE0, Ch10

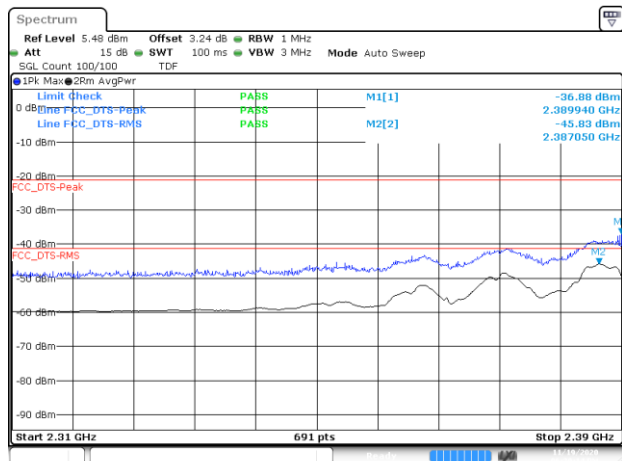


BE-R-HIGH, DIV-1, 802.11ax40-HE0, Ch11



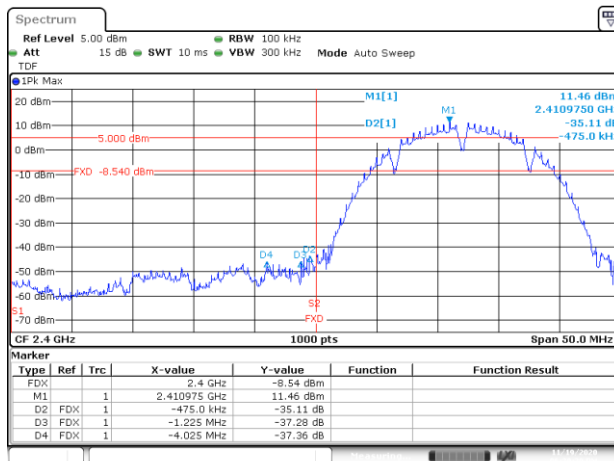
BE-R-HIGH-2MHz, DIV-1, 802.11ax40-HE0, Ch11

CHAIN A – DIV2



Date: 19 NOV 2020 18:39:15

BE-R-LOW, DIV-2, 802.11b-1Mbps, Ch1



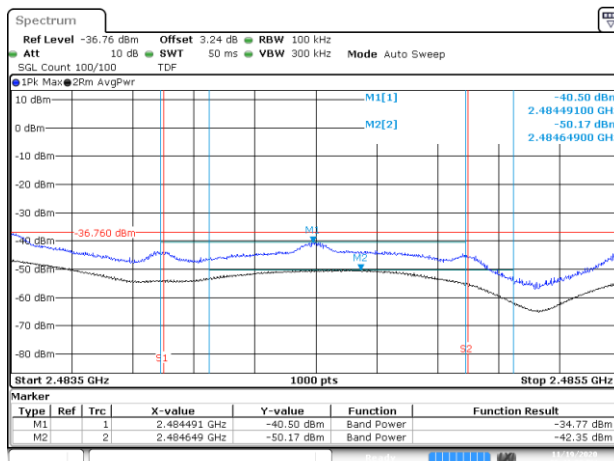
Date: 19 NOV 2020 18:39:21

BE-NR, DIV-2, 802.11b-1Mbps, Ch1



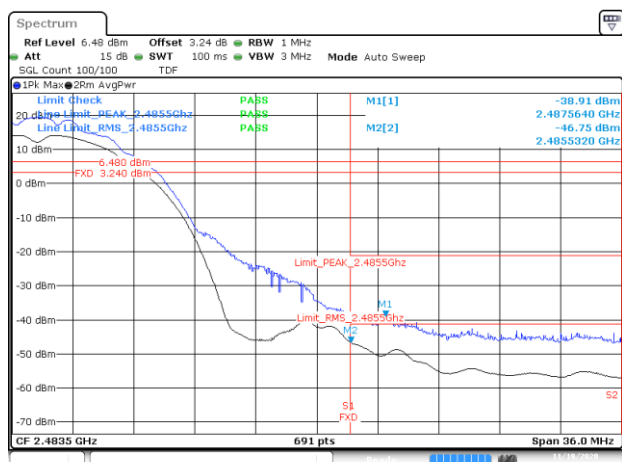
Date: 19 NOV 2020 18:41:25

BE-R-HIGH, DIV-2, 802.11b-1Mbps, Ch11



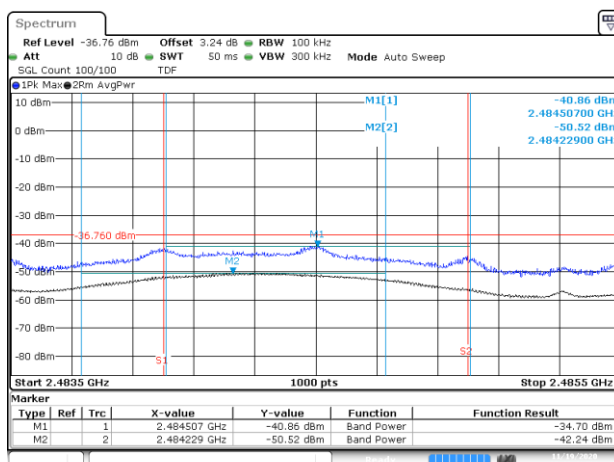
Date: 19 NOV 2020 18:41:31

BE-R-HIGH-2MHz, DIV-2, 802.11b-1Mbps, Ch11



Date: 19 NOV 2020 18:42:35

BE-R-HIGH, DIV-2, 802.11b-1Mbps, Ch12



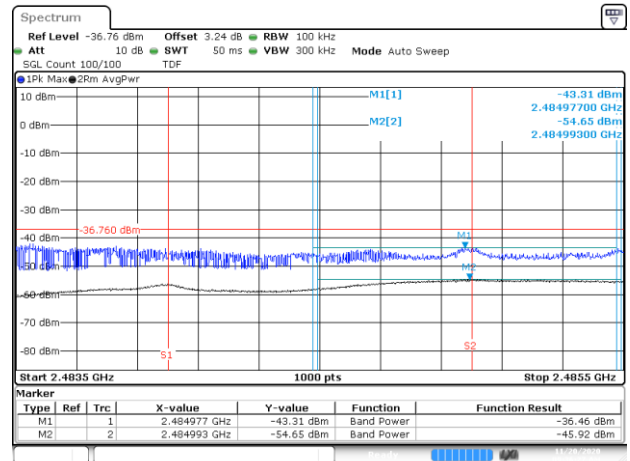
Date: 19 NOV 2020 18:42:42

BE-R-HIGH-2MHz, DIV-2, 802.11b-1Mbps, Ch12



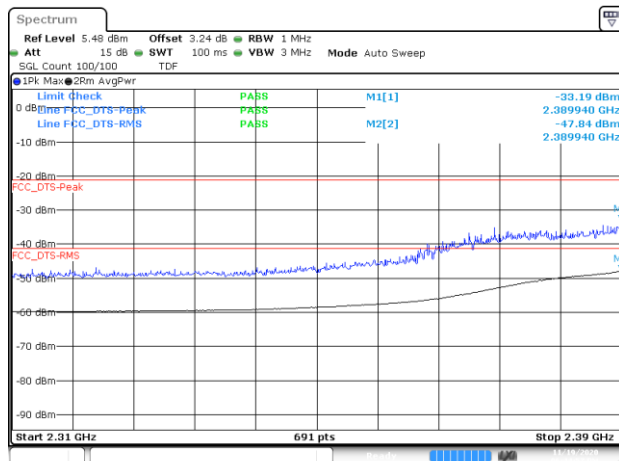
Date: 20 NOV 2020 09:36:21

BE-R-HIGH, DIV-2, 802.11b-1Mbps, Ch13



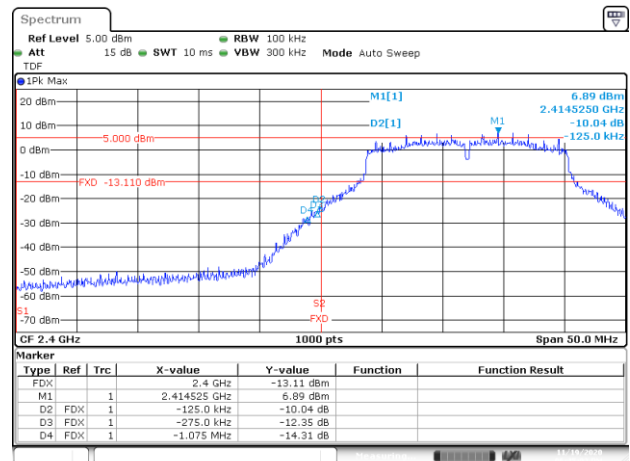
Date: 20 NOV 2020 09:36:27

BE-R-HIGH-2MHz, DIV-2, 802.11b-1Mbps, Ch11



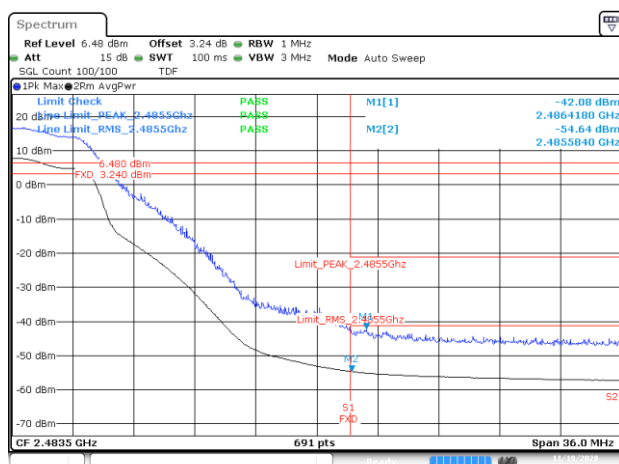
Date: 19.NOV.2020 18:44:57

BE-R-LOW, DIV-2, 802.11g-6Mbps, Ch1



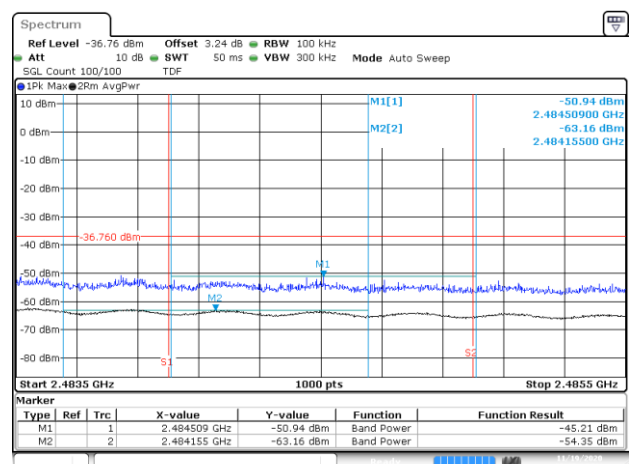
Date: 19 NOV 2020 18:45:03

BE-NR, DIV-2, 802.11g-6Mbps, Ch1



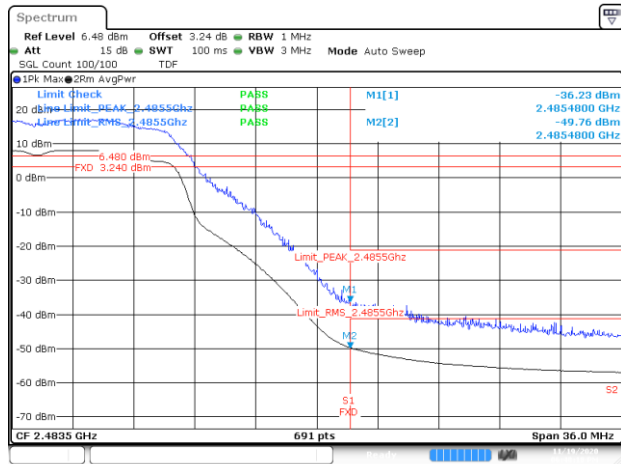
Date: 19.NOV.2020 18:47:07

BE-R-HIGH, DIV-2, 802.11g-6Mbps, Ch11



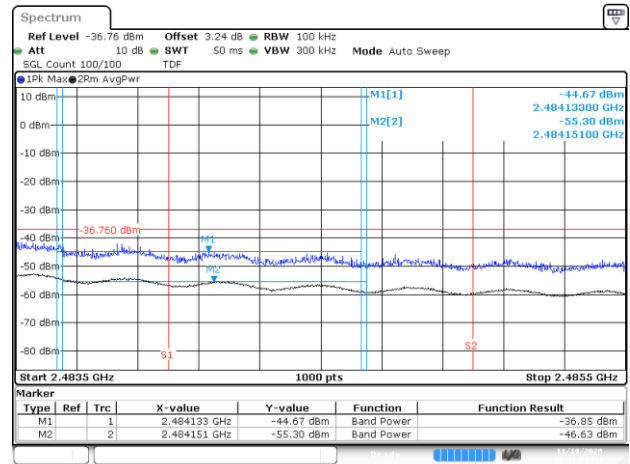
Date: 19 NOV 2020 18:47:14

BE-R-HIGH-2MHz, DIV-2, 802.11g-6Mbps, Ch11



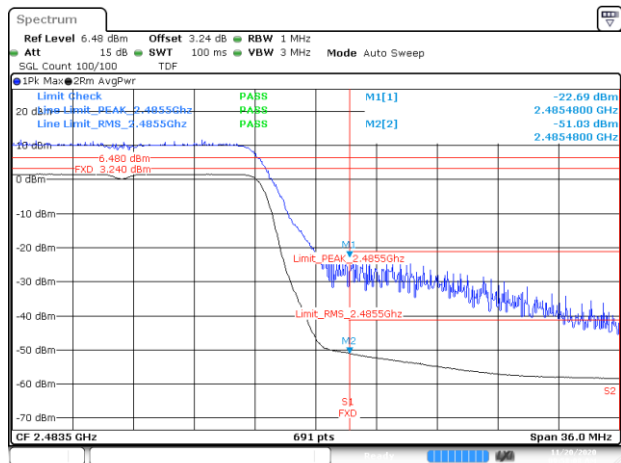
Date: 19 NOV 2020 18:43:18

BE-R-HIGH, DIV-2, 802.11g-6Mbps, Ch12



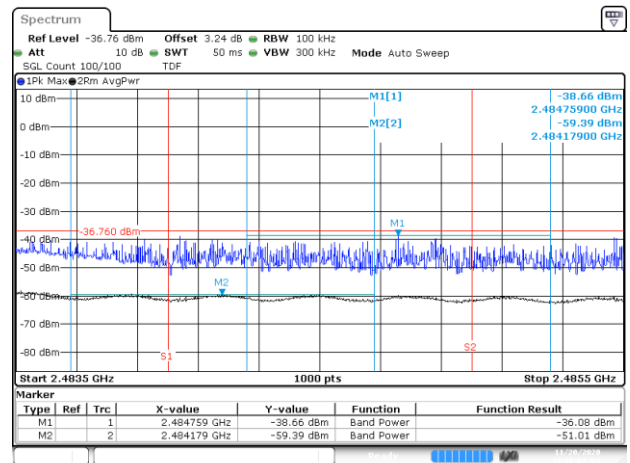
Date: 19 NOV 2020 18:48:25

BE-R-HIGH-2MHz, DIV-2, 802.11g-6Mbps, Ch12



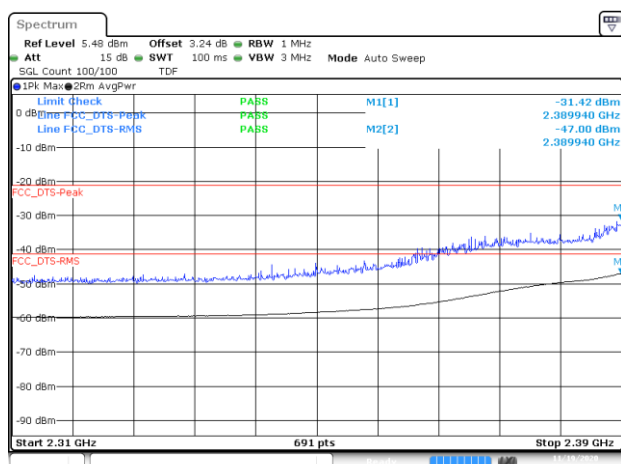
Date: 20 NOV 2020 09:58:08

BE-R-HIGH, DIV-2, 802.11g-6Mbps, Ch13



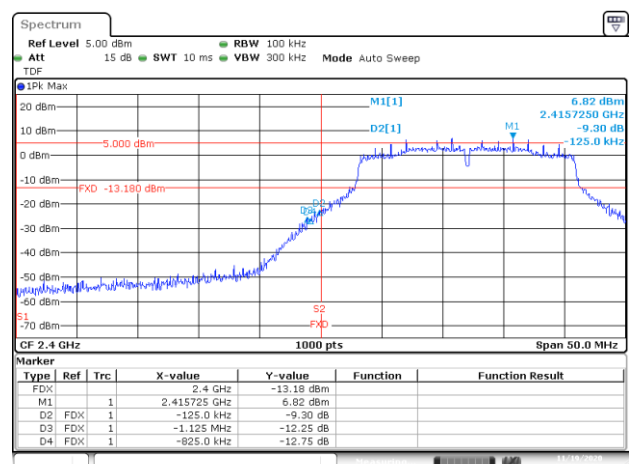
Date: 20 NOV 2020 10:00:04

BE-R-HIGH-2MHz, DIV-2, 802.11g-6Mbps, Ch13



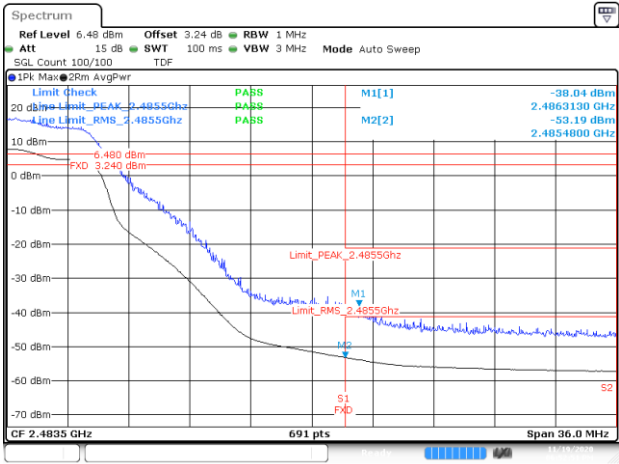
Date: 19 NOV 2020 18:50:41

BE-R-LOW, DIV-2, 802.11n20-HT0, Ch1



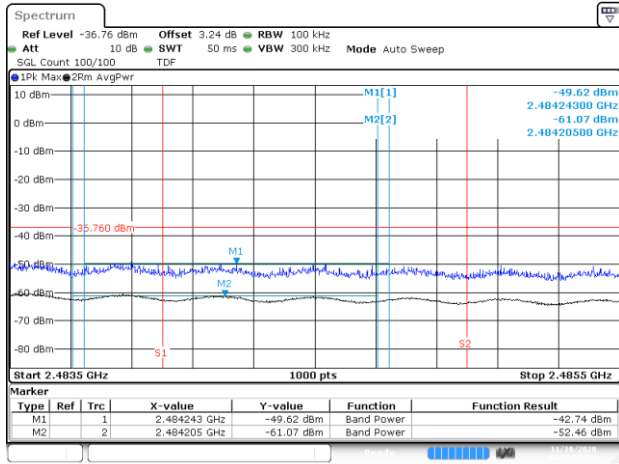
Date: 19 NOV 2020 18:50:47

BE-NR, DIV-2, 802.11n20-HT0, Ch1



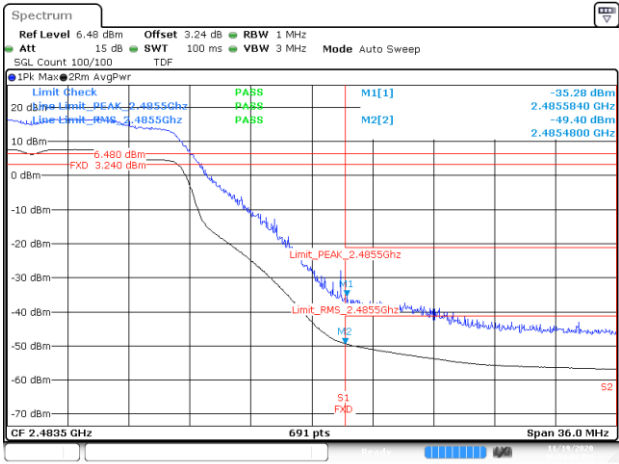
Date: 19 NOV 2020 18:52:51

BE-R-HIGH, DIV-2, 802.11n20-HT0, Ch11



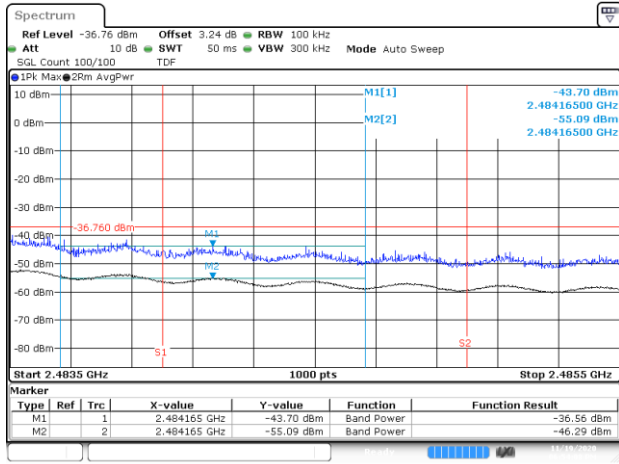
Date: 19 NOV 2020 18:52:57

BE-R-HIGH-2MHz, DIV-2, 802.11n20-HT0, Ch11



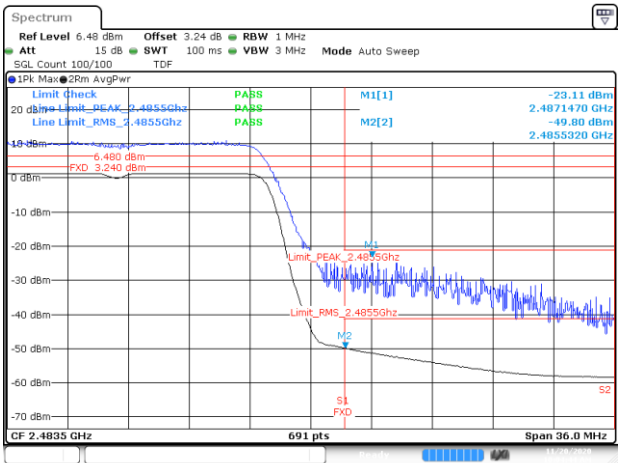
Date: 19 NOV 2020 18:54:02

BE-R-HIGH, DIV-2, 802.11n20-HT0, Ch12



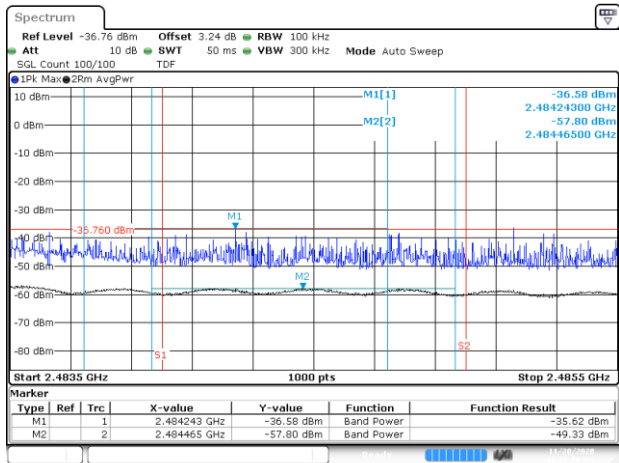
Date: 19 NOV 2020 18:54:08

BE-R-HIGH-2MHz, DIV-2, 802.11n20-HT0, Ch12



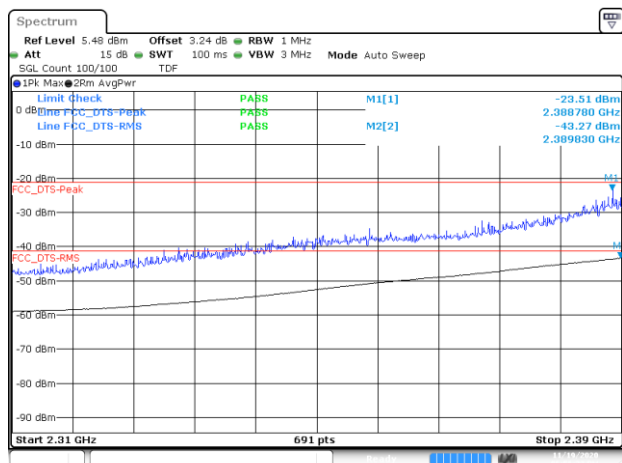
Date: 20 NOV 2020 10:04:44

BE-R-HIGH, DIV-2, 802.11n20-HT0, Ch13



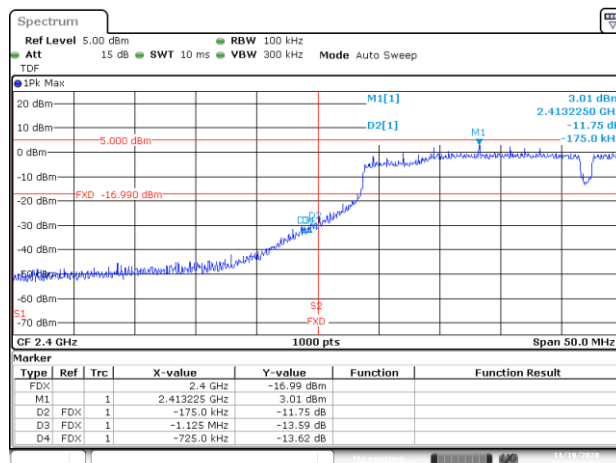
Date: 20 NOV 2020 10:05:38

BE-R-HIGH-2MHz, DIV-2, 802.11n20-HT0, Ch13



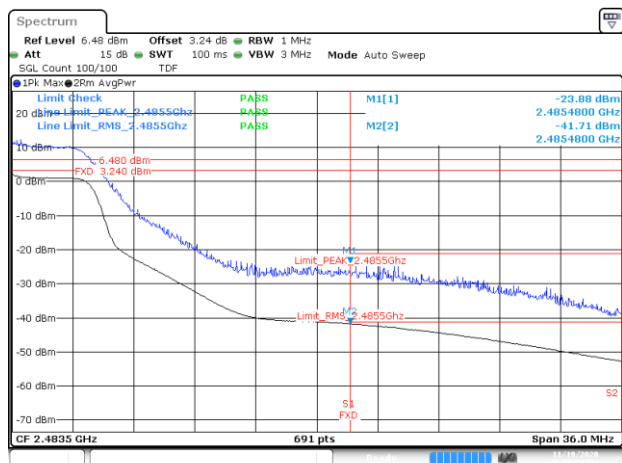
Date: 19 NOV 2020 18:58:23

BE-R-LOW, DIV-2, 802.11n40-HT0, Ch3



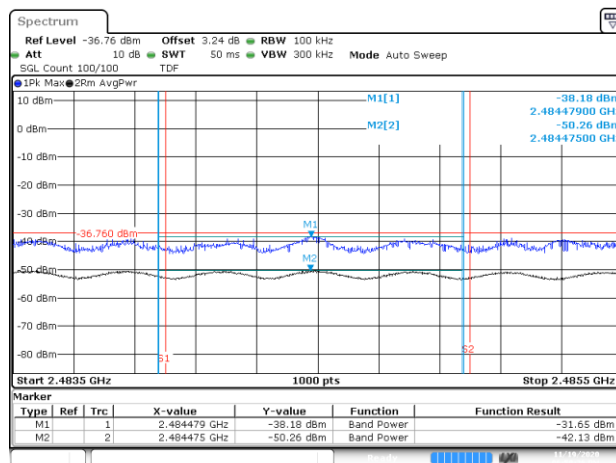
Date: 19 NOV 2020 18:58:29

BE-NR, DIV-2, 802.11n40-HT0, Ch3



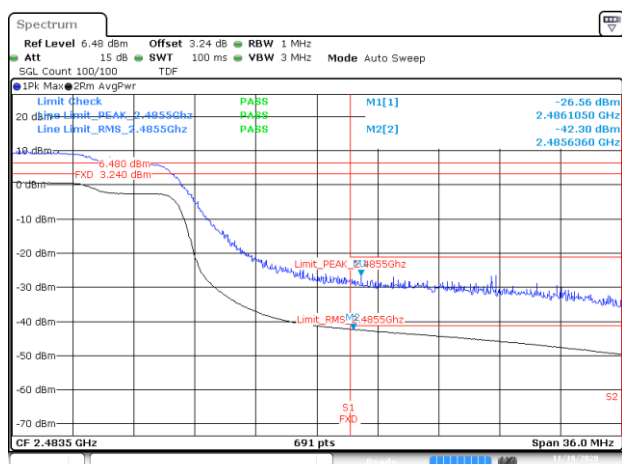
Date: 19 NOV 2020 18:58:31

BE-R-HIGH, DIV-2, 802.11n40-HT0, Ch9



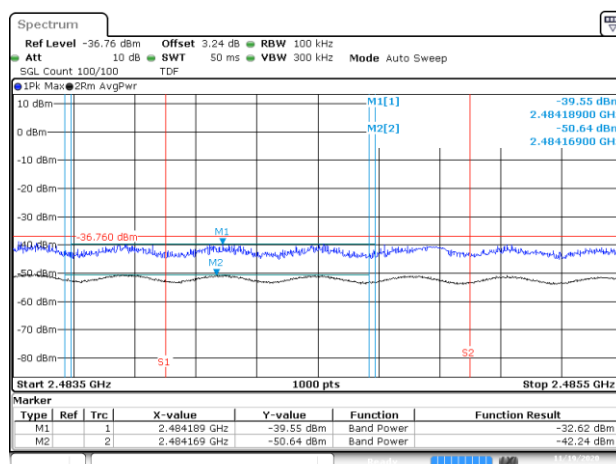
Date: 19 NOV 2020 18:58:37

BE-R-HIGH-2MHz, DIV-2, 802.11n40-HT0, Ch9



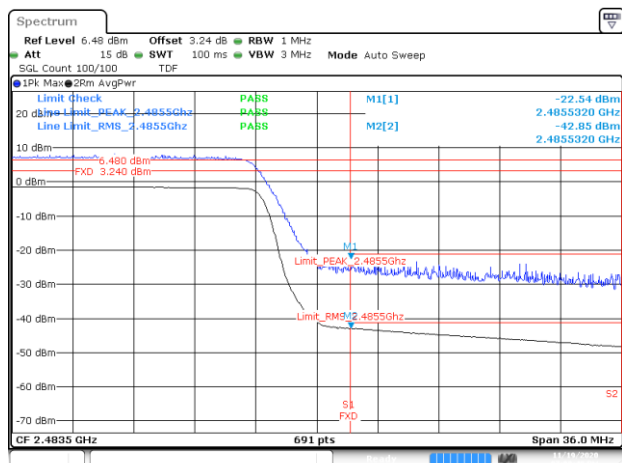
Date: 19 NOV 2020 18:58:40

BE-R-HIGH, DIV-2, 802.11n40-HT0, Ch10



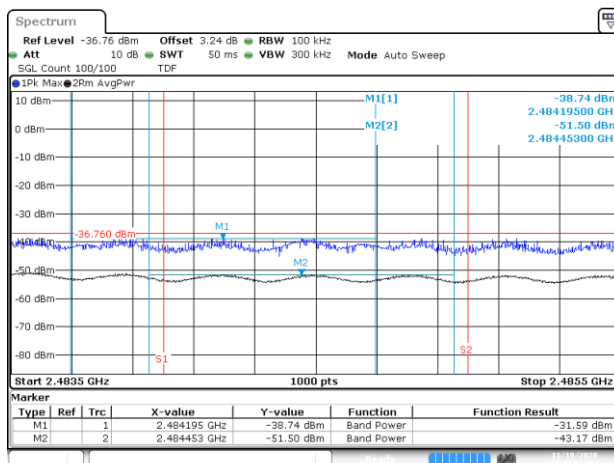
Date: 19 NOV 2020 18:58:47

BE-R-HIGH-2MHz, DIV-2, 802.11n40-HT0, Ch10



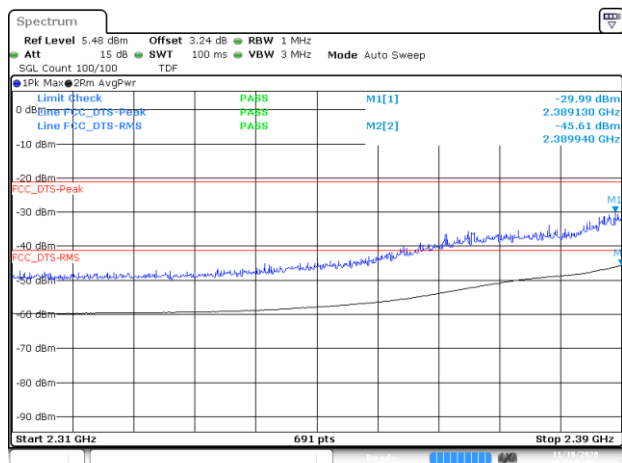
Date: 19 NOV 2020 19:03:50

BE-R-HIGH, DIV-2, 802.11n40-HT0, Ch11



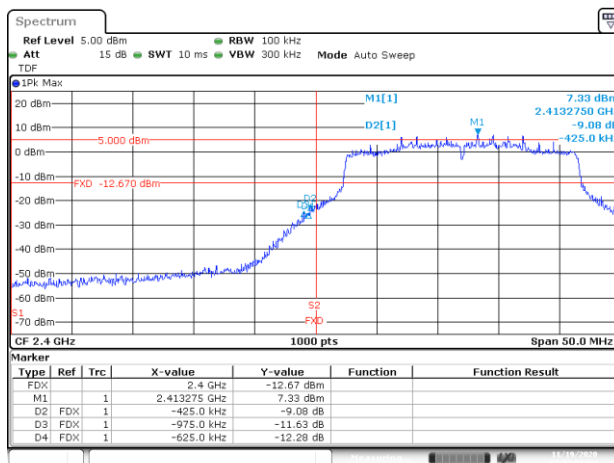
Date: 19 NOV 2020 19:03:55

BE-R-HIGH-2MHz, DIV-2, 802.11n40-HT0, Ch11



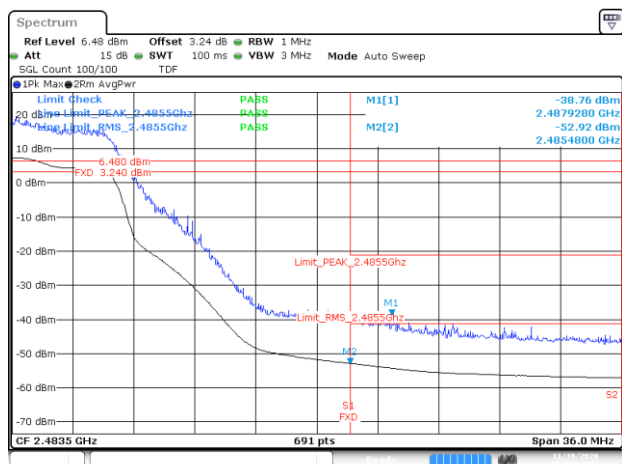
Date: 19 NOV 2020 19:02:02

BE-R-LOW, DIV-2, 802.11ax20-HE0, Ch1



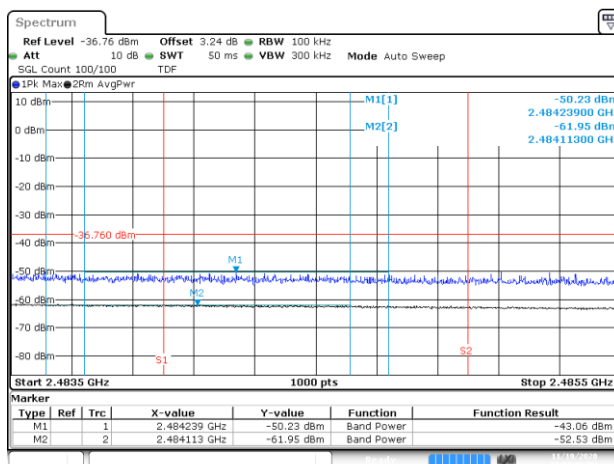
Date: 19 NOV 2020 19:02:05

BE-NR, DIV-2, 802.11ax20-HE0, Ch1



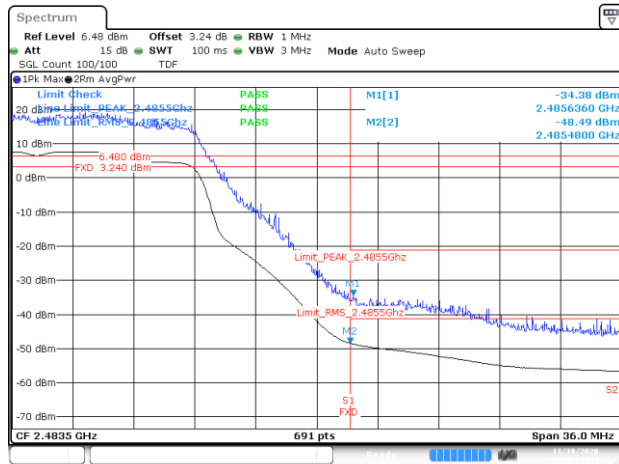
Date: 19 NOV 2020 19:07:13

BE-R-HIGH, DIV-2, 802.11ax20-HE0, Ch11



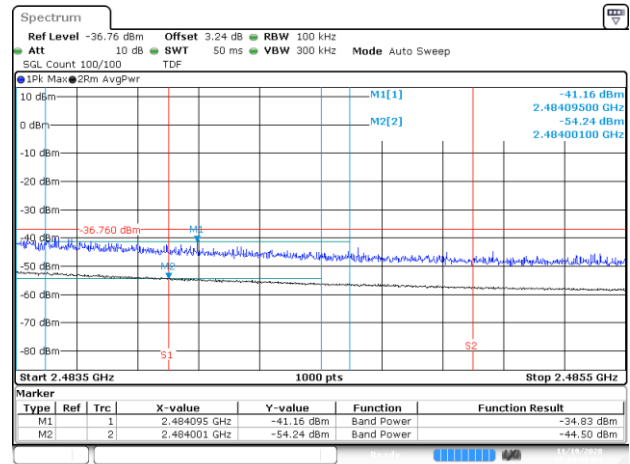
Date: 19 NOV 2020 19:07:19

BE-R-HIGH-2MHz, DIV-2, 802.11ax20-HE0, Ch11



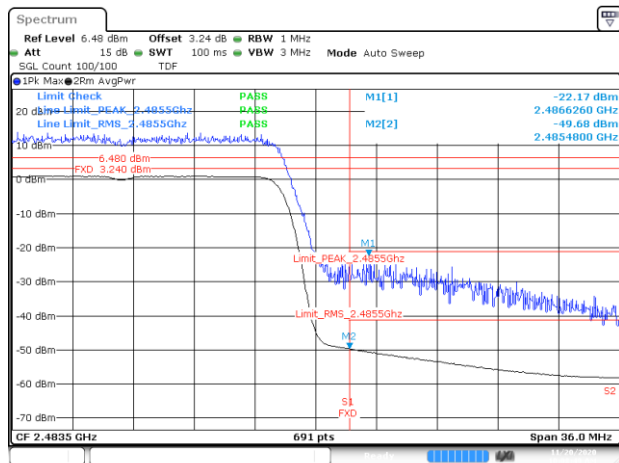
Date: 19 NOV 2020 19:03:24

BE-R-HIGH, DIV-2, 802.11ax20-HE0, Ch12



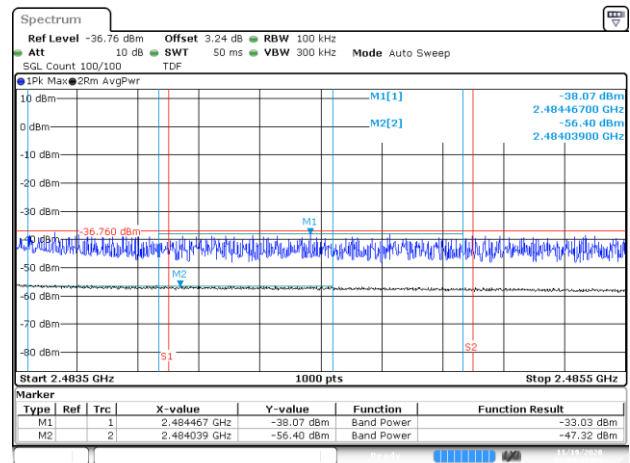
Date: 19 NOV 2020 19:03:30

BE-R-HIGH-2MHz, DIV-2, 802.11ax20-HE0, Ch12



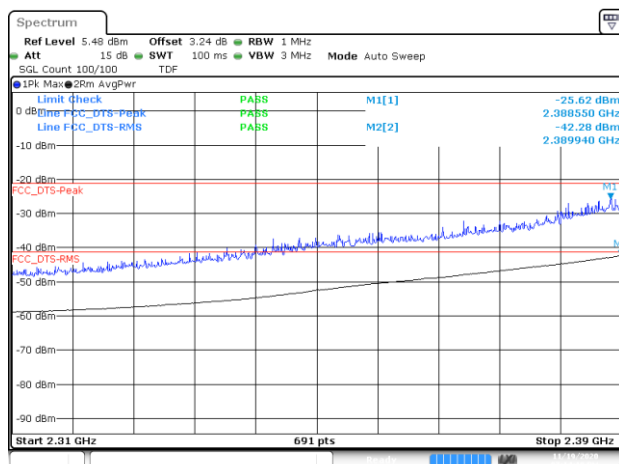
Date: 20 NOV 2020 10:08:50

BE-R-HIGH, DIV-2, 802.11ax20-HE0, Ch13



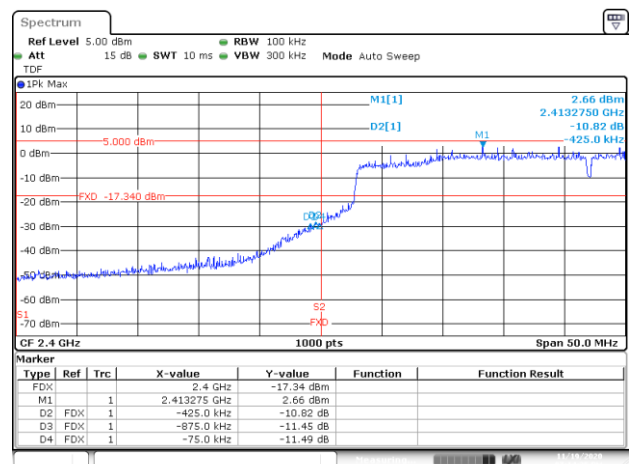
Date: 19 NOV 2020 19:03:41

BE-R-HIGH-2MHz, DIV-2, 802.11ax20-HE0, Ch13



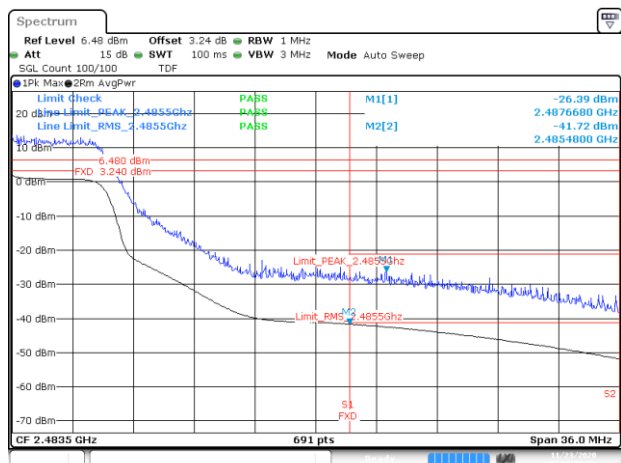
Date: 19 NOV 2020 19:14:19

BE-R-LOW, DIV-2, 802.11ax40-HE0, Ch3



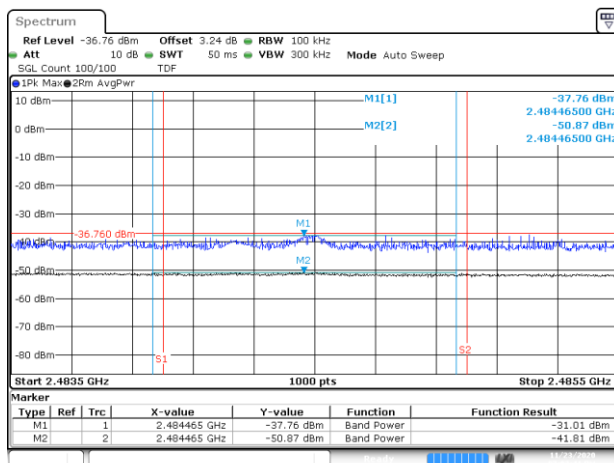
Date: 19 NOV 2020 19:14:25

BE-NR, DIV-2, 802.11ax40-HE0, Ch3



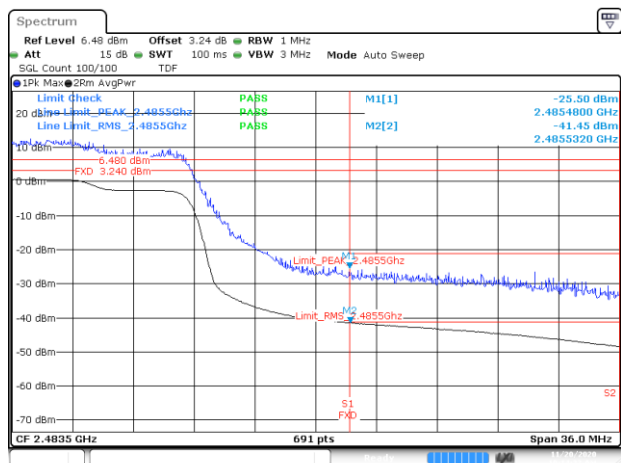
Date: 23/NOV/2020 19:18:33

BE-R-HIGH, DIV-2, 802.11ax40-HE0, Ch9



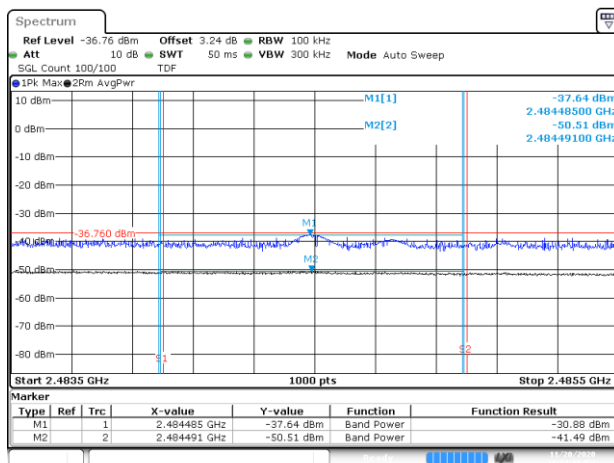
Date: 23/NOV/2020 19:03:42

BE-R-HIGH-2MHz, DIV-2, 802.11ax40-HE0, Ch9



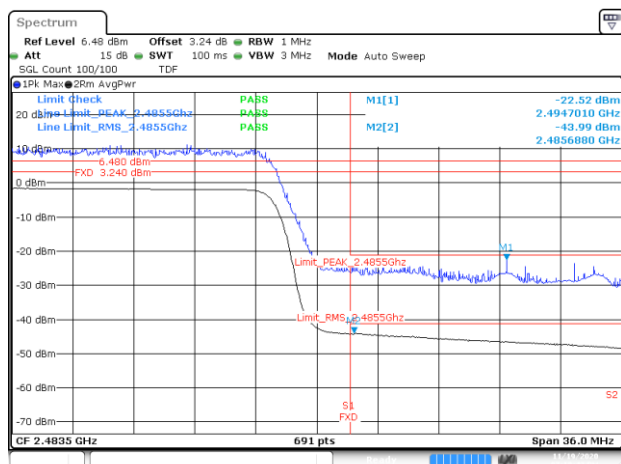
Date: 20/NOV/2020 10:14:33

BE-R-HIGH, DIV-2, 802.11ax40-HE0, Ch10



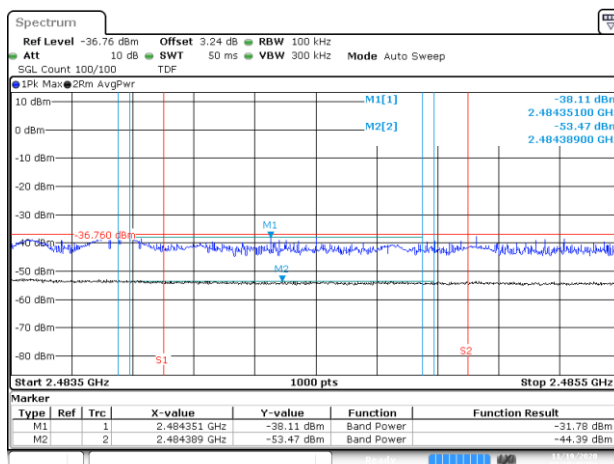
Date: 20/NOV/2020 10:14:40

BE-R-HIGH-2MHz, DIV-2, 802.11ax40-HE0, Ch10



Date: 19/NOV/2020 19:19:43

BE-R-HIGH, DIV-2, 802.11ax40-HE0, Ch11



Date: 19/NOV/2020 19:19:50

BE-R-HIGH-2MHz, DIV-2, 802.11ax40-HE0, Ch11

B.4 Test Results BLE

B.4.1 6dB & 99% Bandwidth

Test limits

FCC part	RSS part	Limits
15.247 (a) (2)	RSS-247 Clause 5.2 (a)	Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

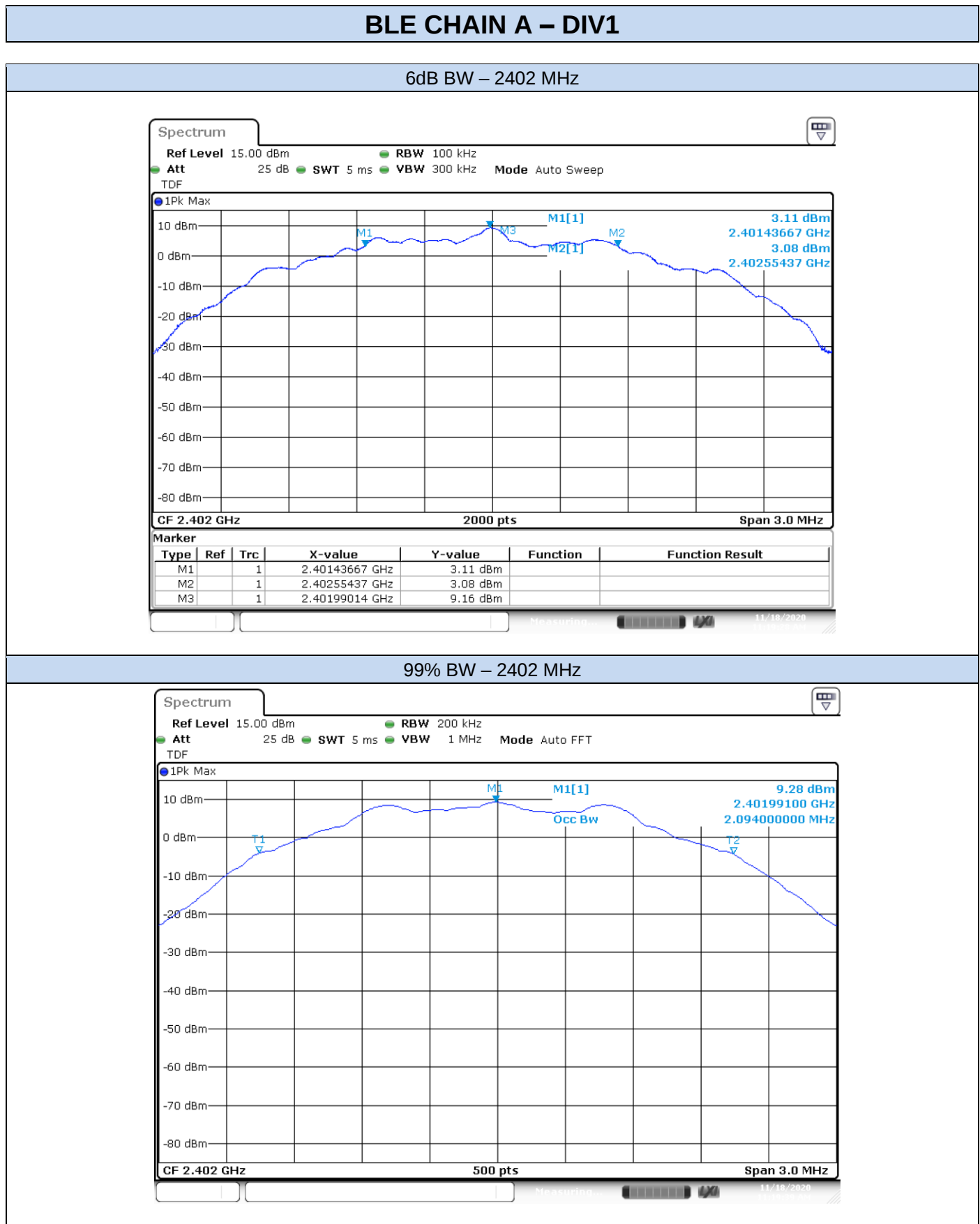
Test procedure

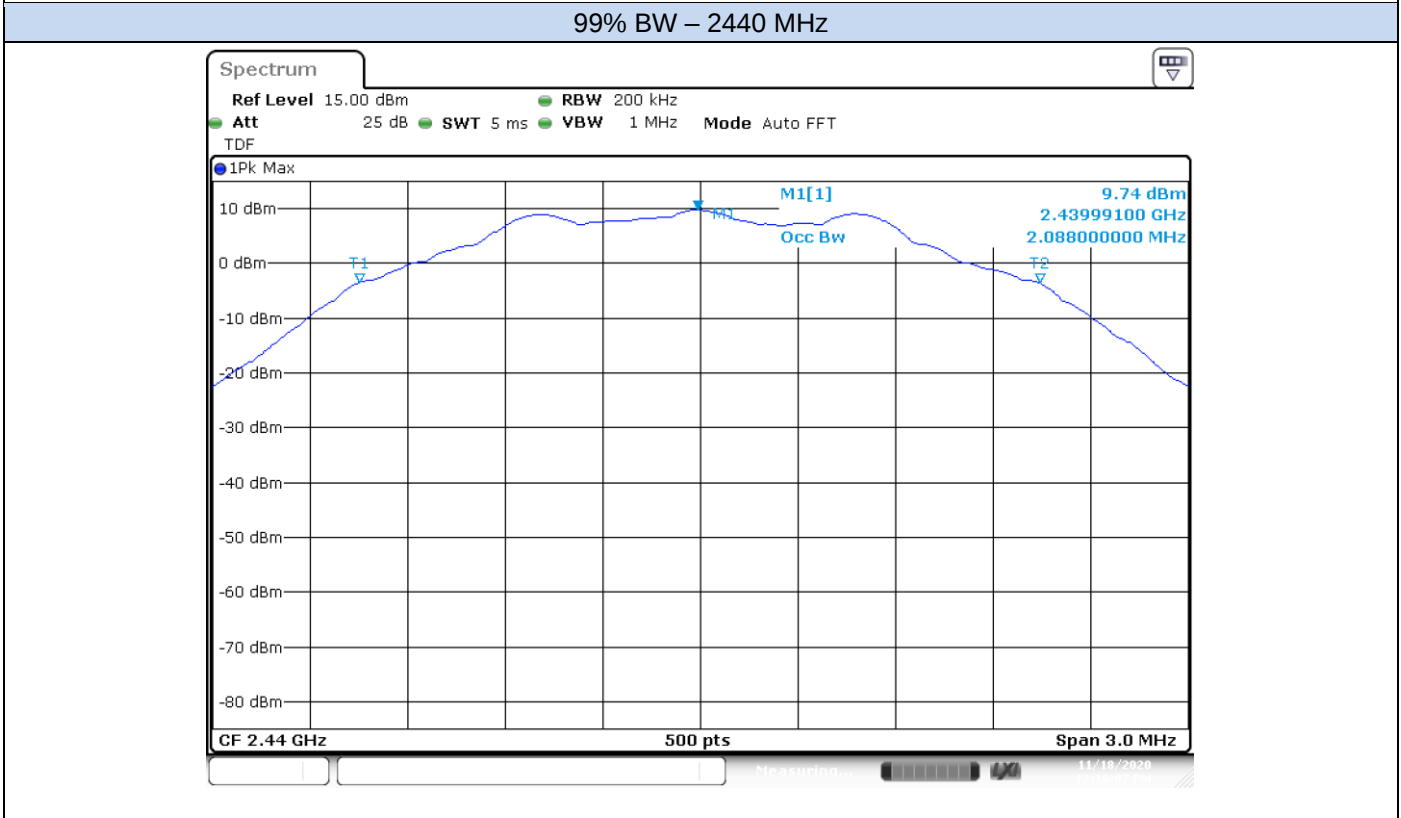
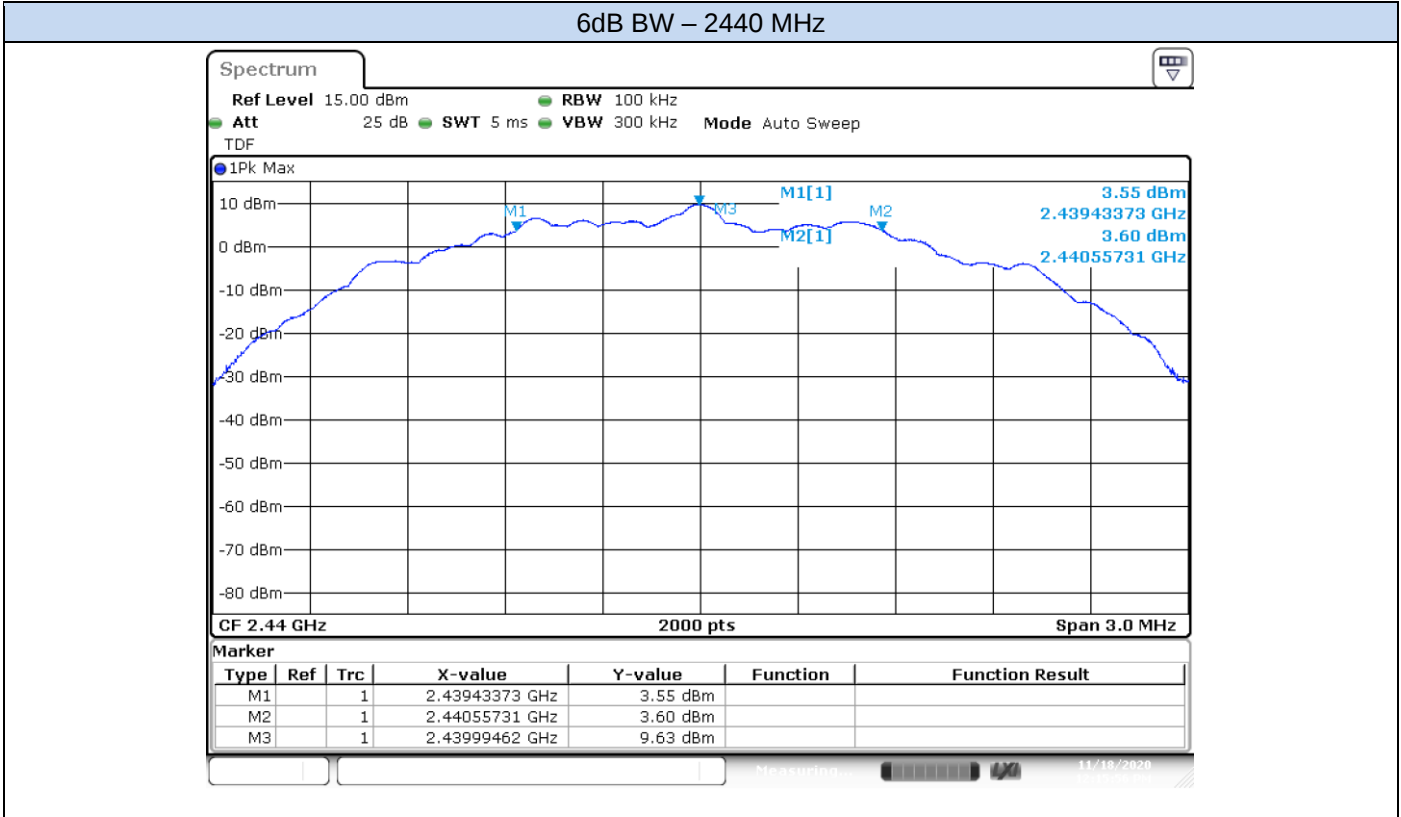
The conducted setup shown in section *Test & System Description* was used to measure the 6dB & 99% Bandwidth. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

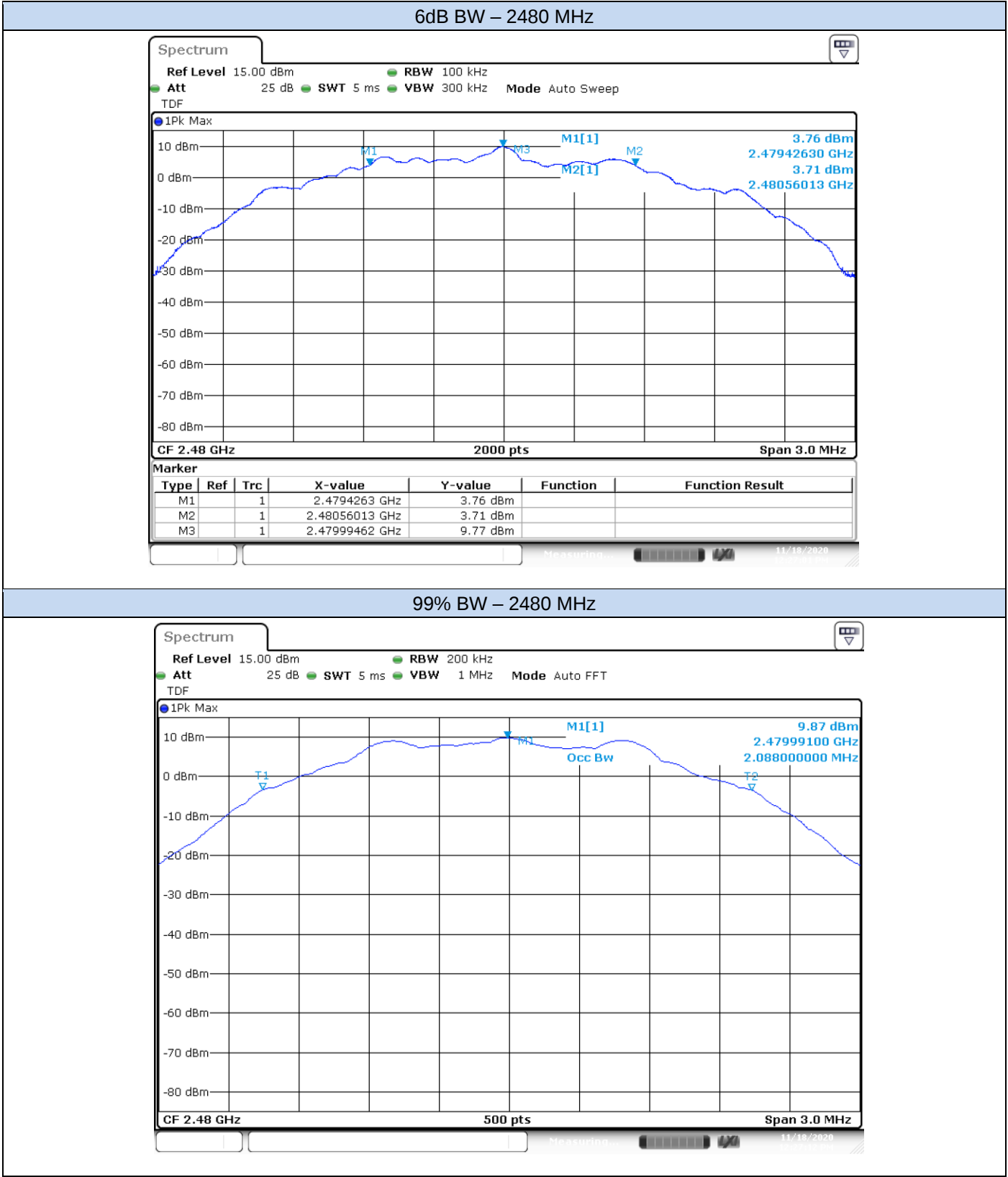
Results tables

Mode	Antenna	Channel	Frequency [MHz]	6dB BW [MHz]	99% BW [MHz]
BLE	Div 1	0	2402	1.12	2.09
		19	2440	1.12	2.09
		39	2480	1.13	2.09
BLE	Div 2	0	2402	1.11	2.09
		19	2440	1.12	2.09
		39	2480	1.13	2.09

Results screenshot







99% BW – 2480 MHz

Spectrum

Ref Level 15.00 dBm
Att 25 dB
TDF

RBW 200 kHz
SWT 5 ms
VBW 1 MHz
Mode Auto FFT

1Pk Max

9.87 dBm
2.47999100 GHz
Occ Bw
2.088000000 MHz

CF 2.48 GHz

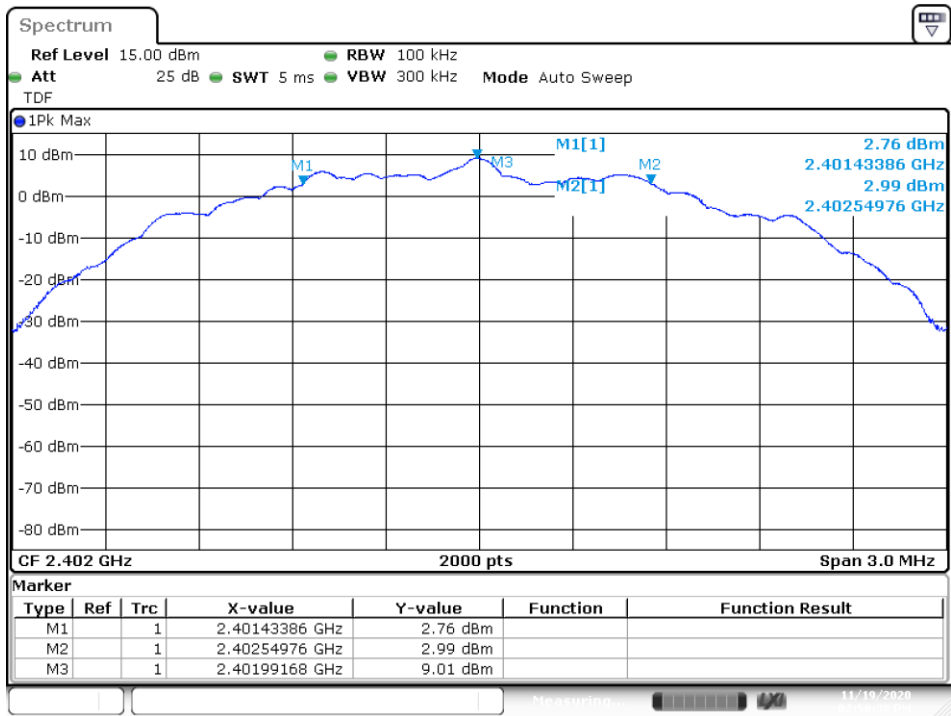
500 pts

Span 3.0 MHz

Measuring... 11/18/2020

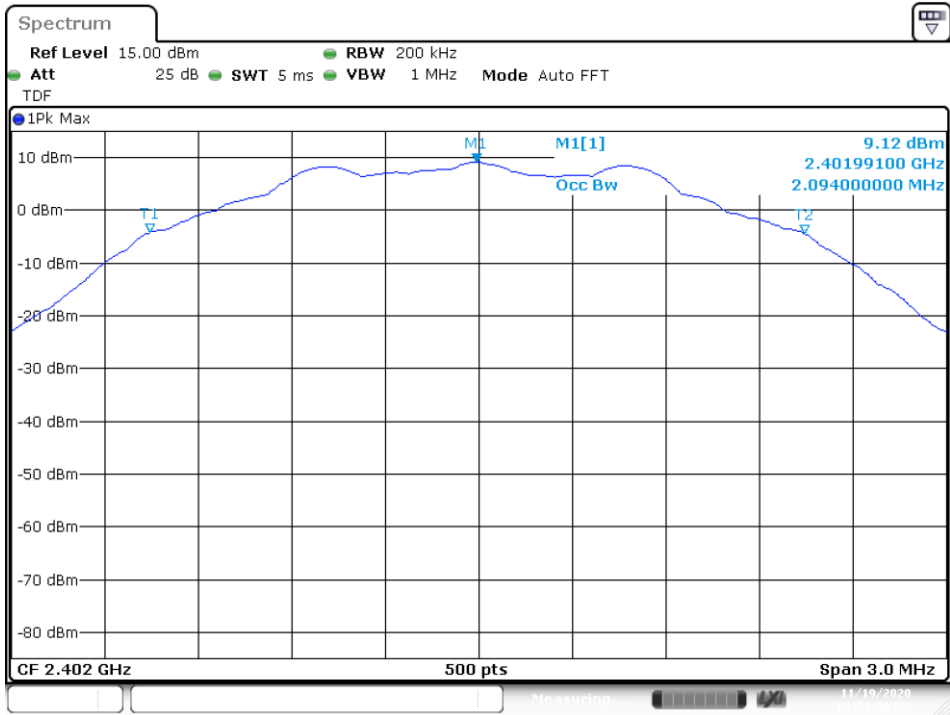
BLE CHAIN A – DIV2

6dB BW – 2402 MHz

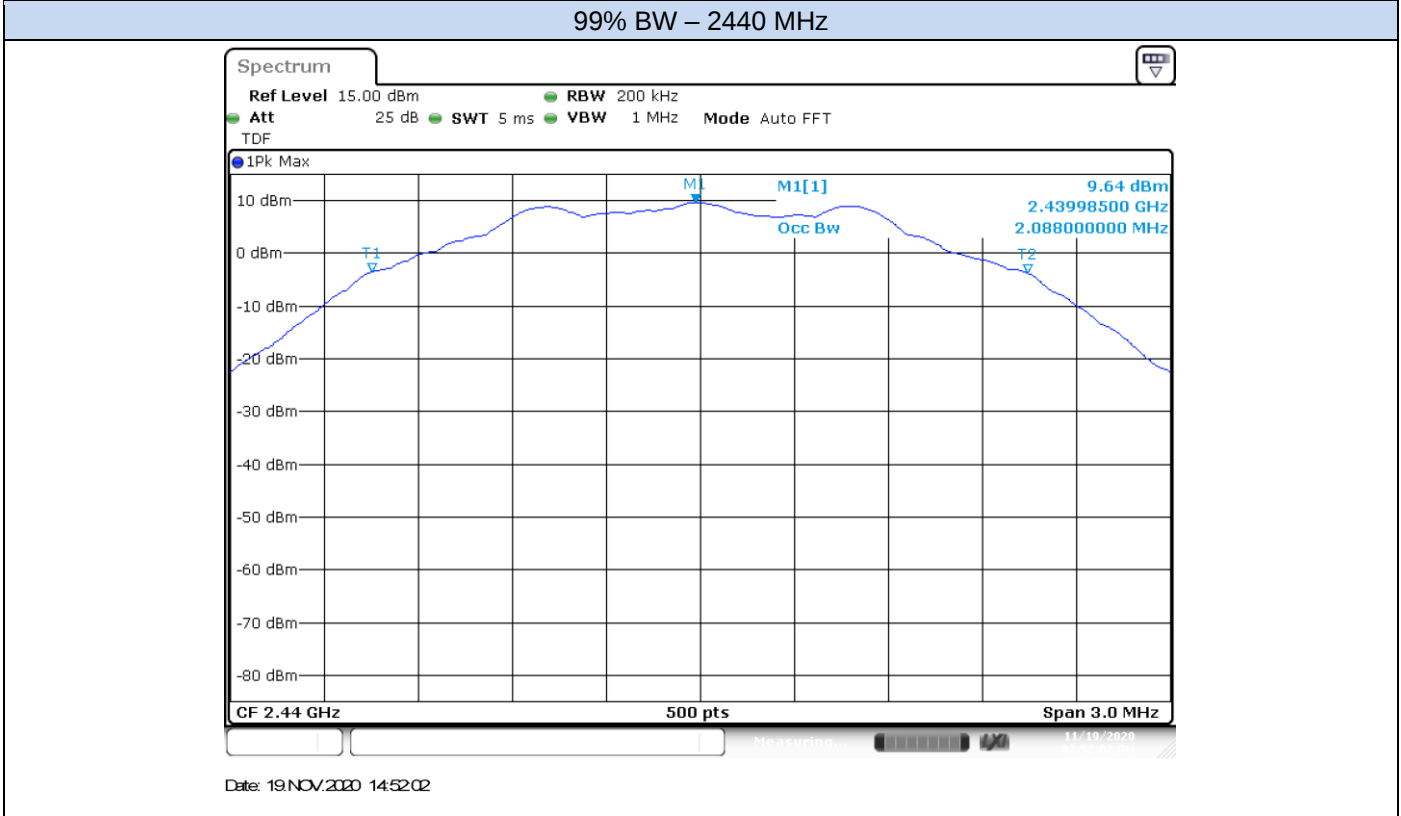
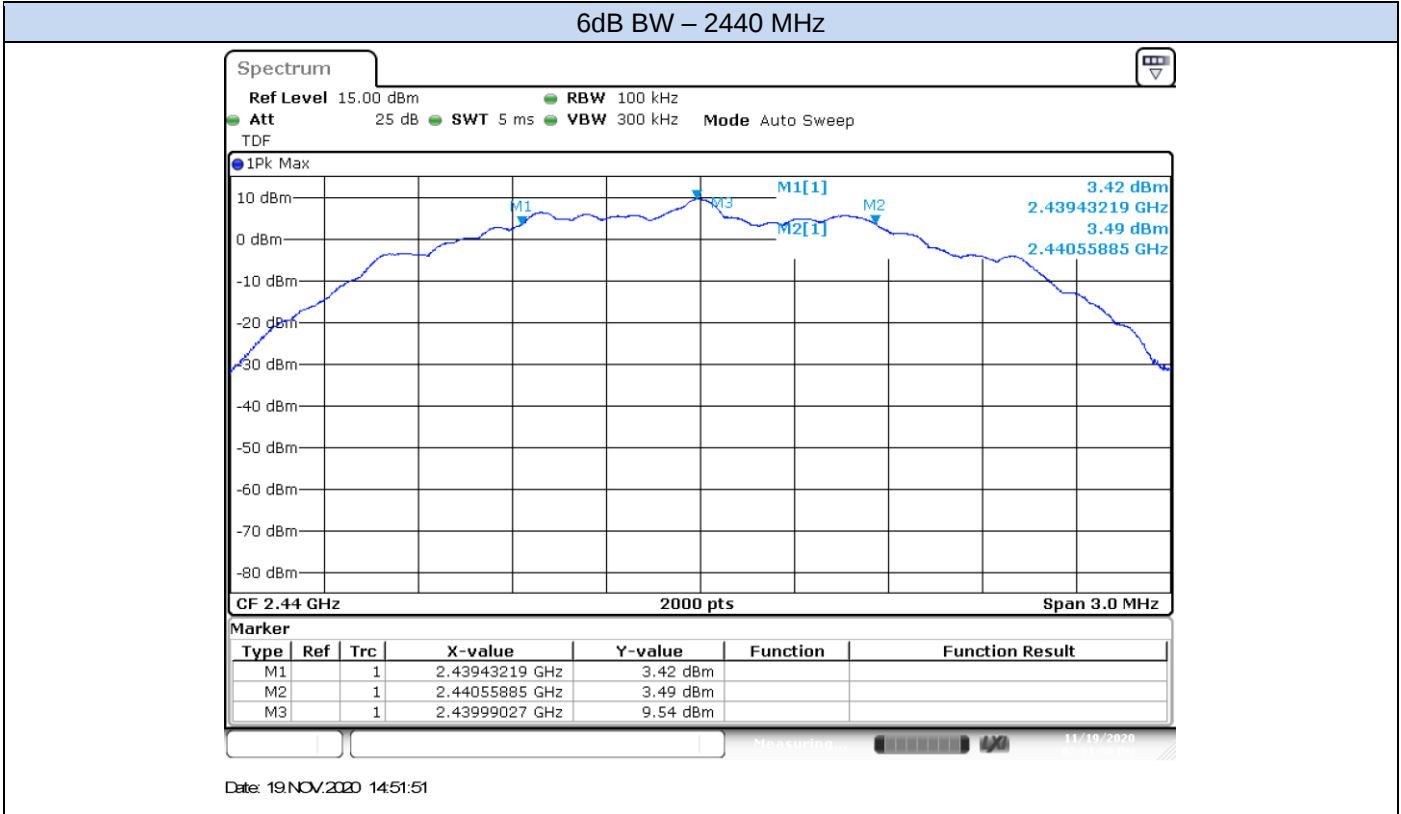


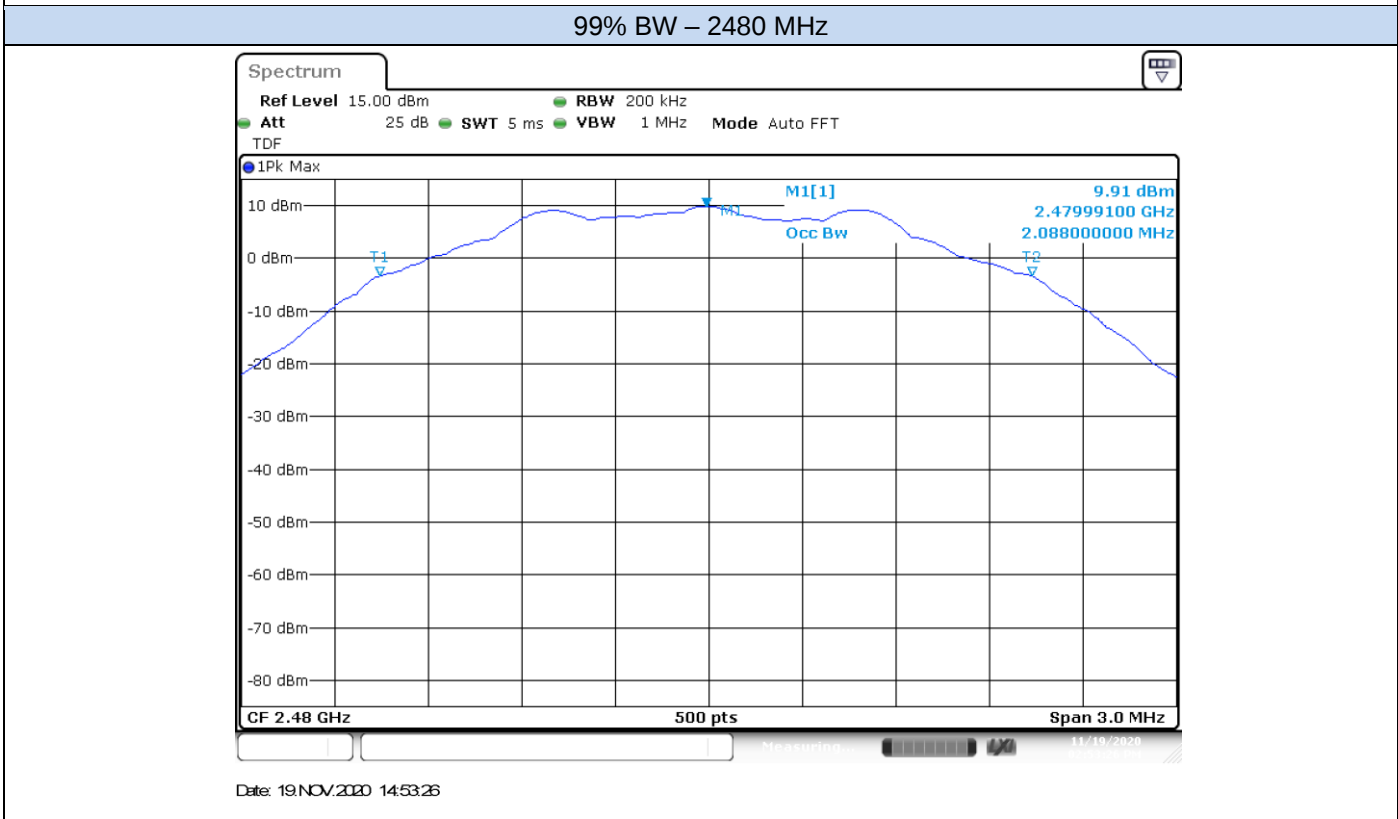
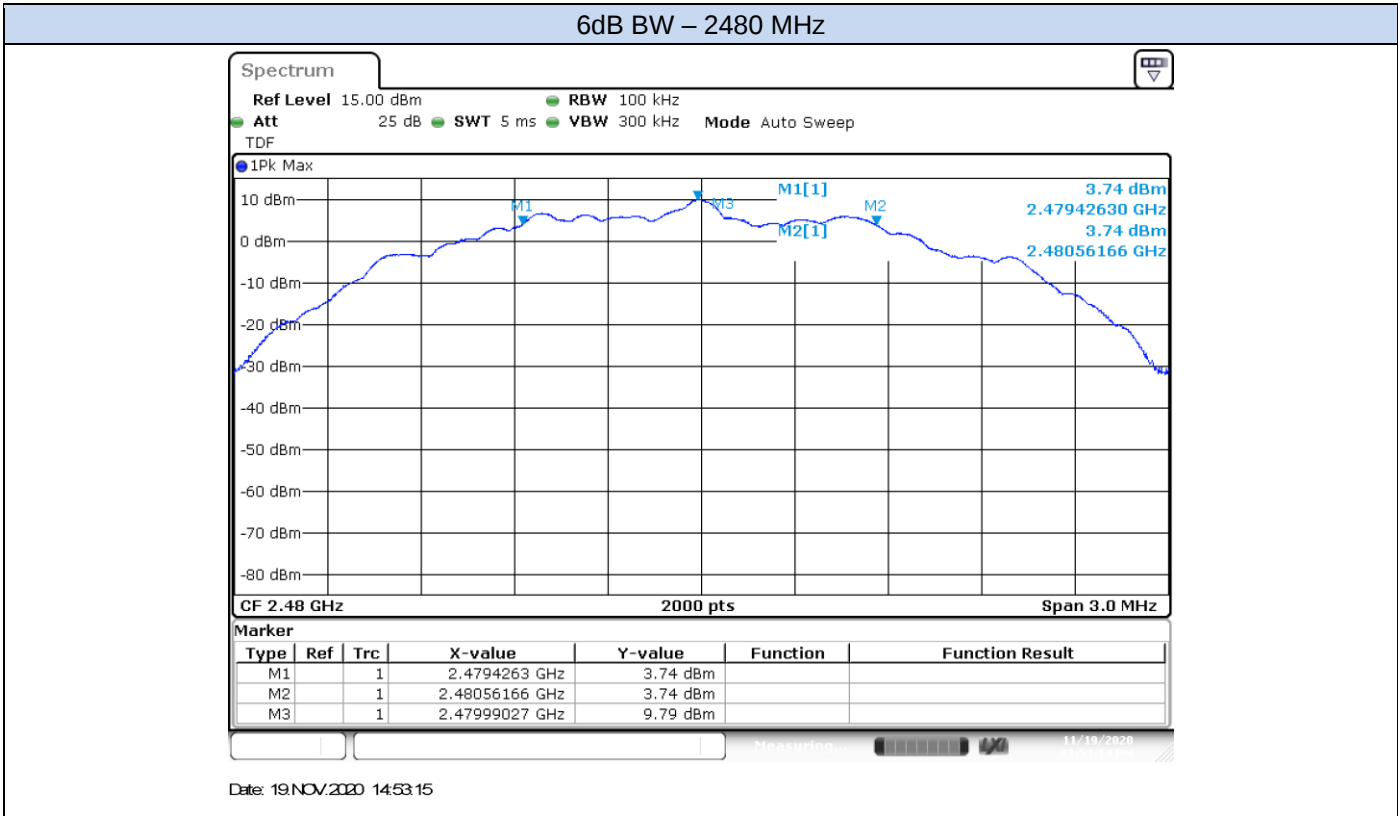
Date: 19.NOV.2020 14:50:39

99% BW – 2402 MHz



Date: 19.NOV.2020 14:50:50





B.4.2 Maximum Output Power and antenna gain

Test limits

	Limits
FCC Part 15.247 (b) (3)	(b) The maximum peak conducted output power of the intentional radiator shall not exceed the following: (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi.
RSS-247 Clause 5.4 (d)	For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e). As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode

Test procedure:

The Maximum peak conducted output power was measured using the $RBW \geq DTS \text{ bandwidth}$ method defined in paragraph 11.9.1.1 of ANSI C63.10-2013.

The Maximum conducted average output power was measured using the channel integration method according to Method AVGSA-2, defined in paragraph 11.9.2.2.4 of ANSI C63.10-2013.

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. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

Results tables

Mode	Antenna	Meas. Duty Cycle [%]	CH	Frequency [MHz]	Peak Power [dBm]		Peak Output Power [mW]
					Measured Conducted Output Power	EIRP	
BLE	Div 1	32.6%	0	2402	9.33	12.57	8.56
			19	2440	9.78	13.02	9.52
			39	2480	9.91	13.15	9.79
	Div 2	32.6%	0	2402	9.15	12.39	8.23
			19	2440	9.69	12.93	9.31
			39	2480	9.95	13.19	9.88

Max Value

Min Value

Mode	Antenna	Meas. Duty Cycle [%]	CH	Frequency [MHz]	Average Output Power* [dBm]			Average Output Power [mW]
					Maximum Conducted Output Power	Maximum Conducted Output Power Duty cycle Compensated	EIRP	
BLE	Div 1	32.6%	0	2402	4.41	9.28	12.52	8.47
			19	2440	4.87	9.74	12.98	9.42
			39	2480	4.99	9.86	13.10	9.68
	Div 2	32.6%	0	2402	4.23	9.10	12.34	8.13
			19	2440	4.77	9.64	12.88	9.20
			39	2480	5.03	9.90	13.14	9.77

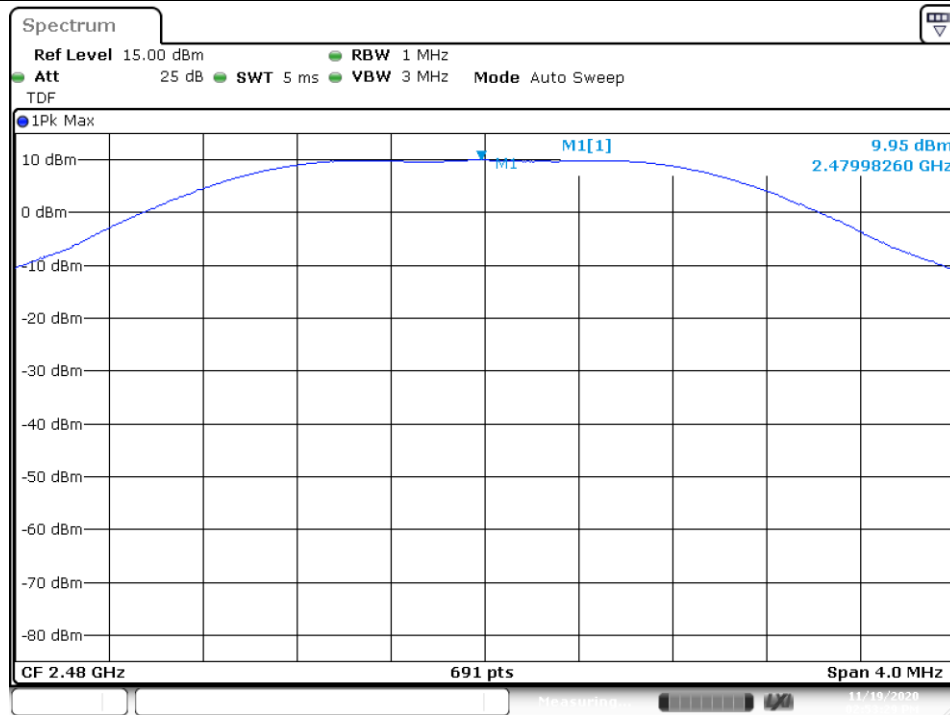
* Output Power RMS values are shown for indicative purpose only

Results screenshot



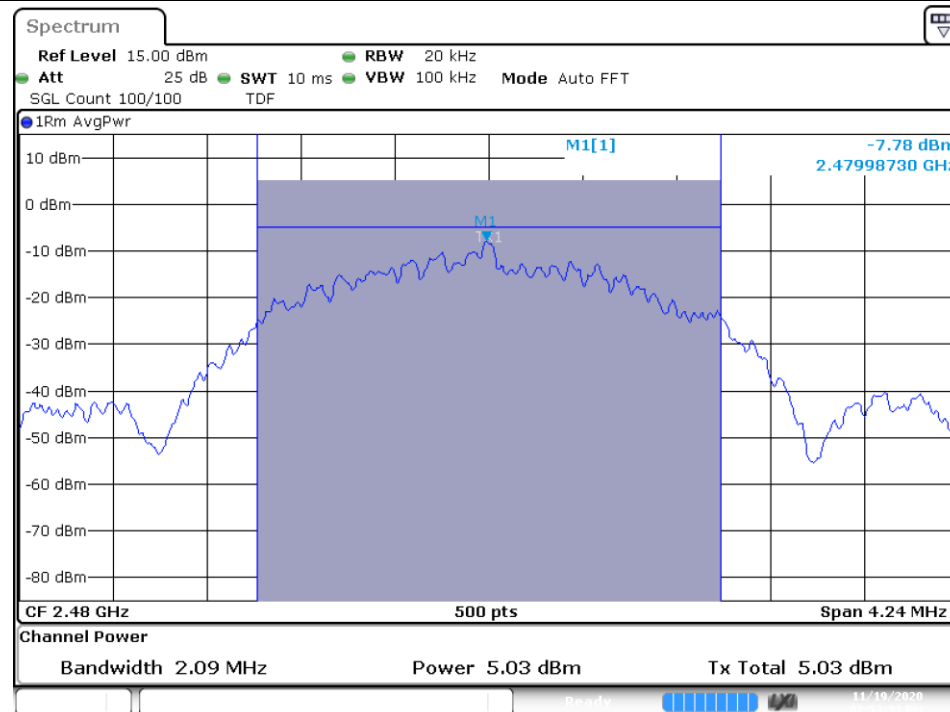
BLE CHAIN A – DIV2

Max Power Peak – 2480 MHz



Date: 19.NOV.2020 14:53:29

Max Power RMS – 2480 MHz



Date: 19.NOV.2020 14:53:33

B.4.3 Power Spectral Density

Test limits

FCC part	RSS part	Limits
15.247 (e)	RSS-247 Clause 5.2 (b)	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test procedure

The maximum peak power spectral density level of the fundamental emission was measured using the method PKPSD, defined in paragraph 11.10.2 of ANSI C63.10-2013.

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

Results tables

Mode	Antenna	CH	Frequency [MHz]	PSD Peak [dBm]
BLE	Div 1	0	2402	-8.31
		19	2440	-7.88
		39	2480	-7.5
	Div 2	0	2402	-8.51
		19	2440	-8.05
		39	2480	-7.49

B.4.4 Out-of-band emission (Conducted)

Test Limits

FCC part	RSS part	Limits																				
15.247 (d)	RSS-247 Clause 5.5	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.																				
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 Streghth (μV/m)</th><th>Field Streghth (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 Streghth (μV/m)	Field Streghth (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 Streghth (μV/m)	Field Streghth (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

In case of band edge measurements falling in restricted bands, the declared Antenna Gain is also compensated in the graph.

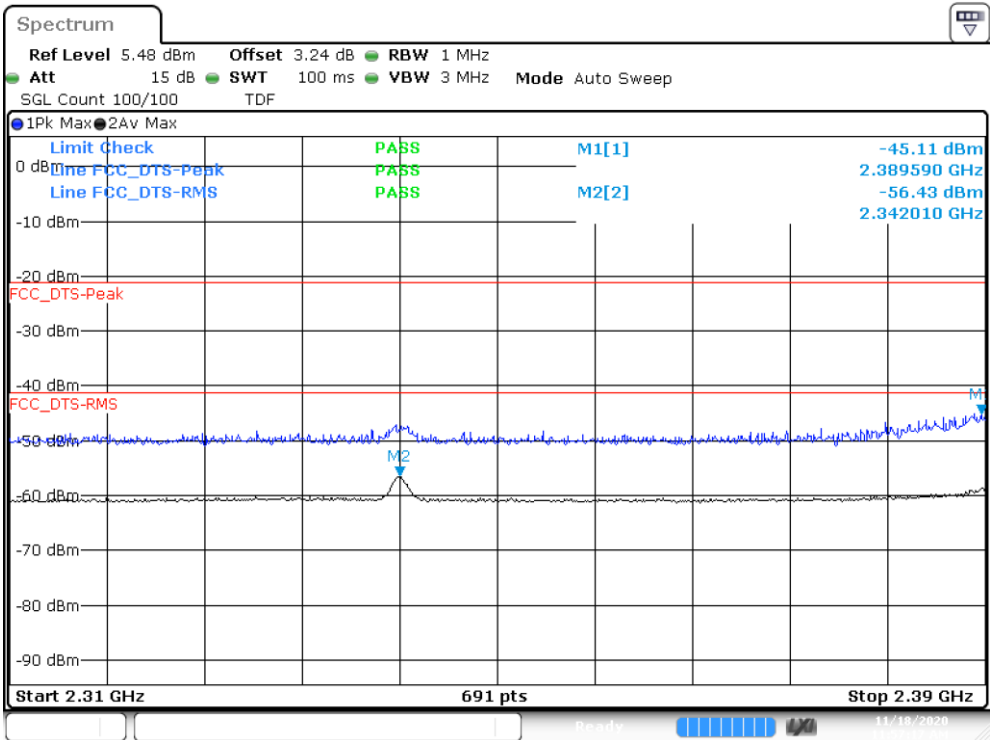
For band edge measurements falling in restricted bands, the following limits in dBm were applied for the average detector after the conversion from the limits detailed above in dBμV/m, according to FCC 47 CFR part 15 - Subpart C – §15.209(a). The limits in dBm for peak detector are 20dB above the indicated 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	54.0	-41.2

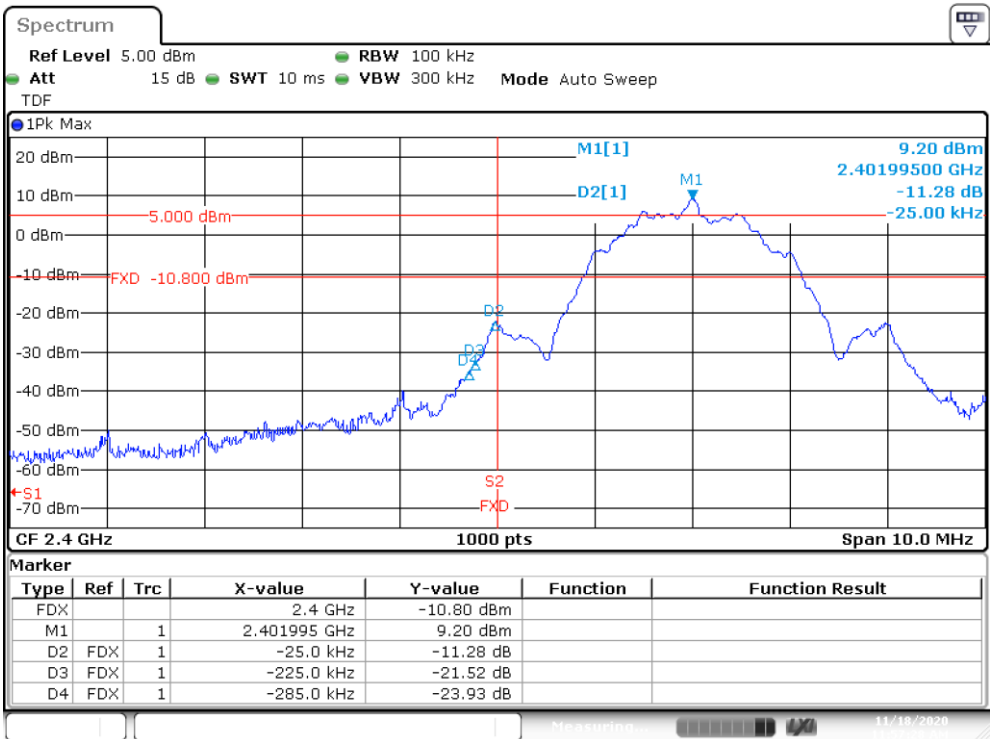
The conducted setup shown in section *Test & System Description* was used to measure the out-of-band emissions. The antenna terminal of the EUT is connected to the spectrum through an attenuator, and the spectrum analyzer reading is compensated to include the RF path loss.

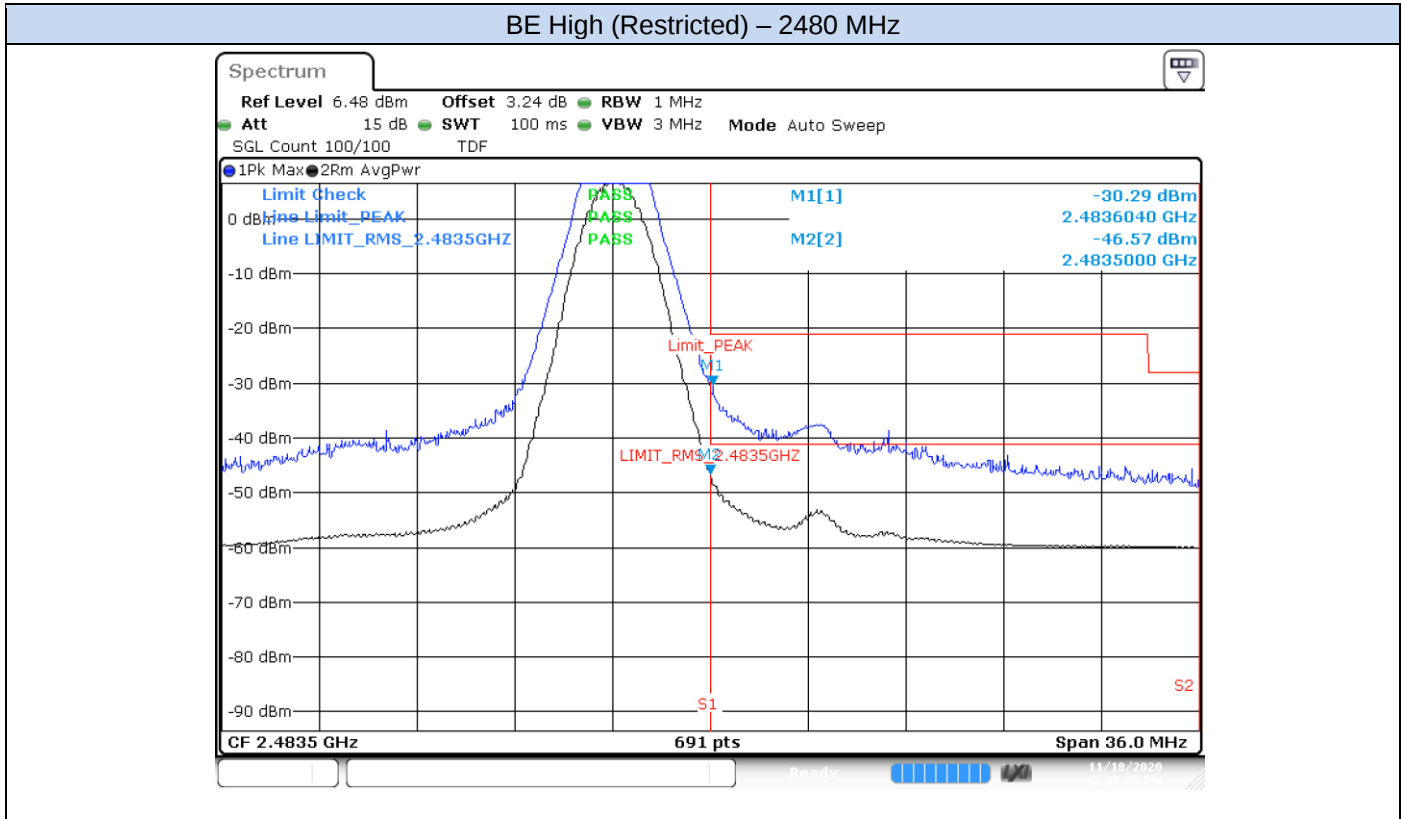
BLE – CHAIN A – DIV1

BE Low (Restricted) – 2402 MHz



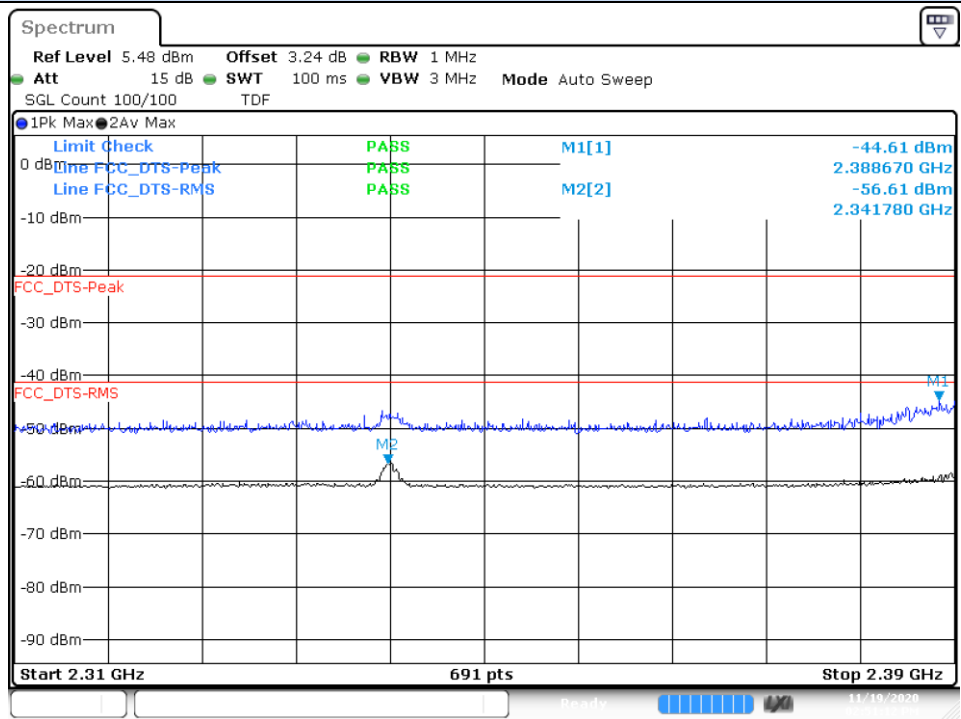
BE Low (Non Restricted) – 2402 MHz





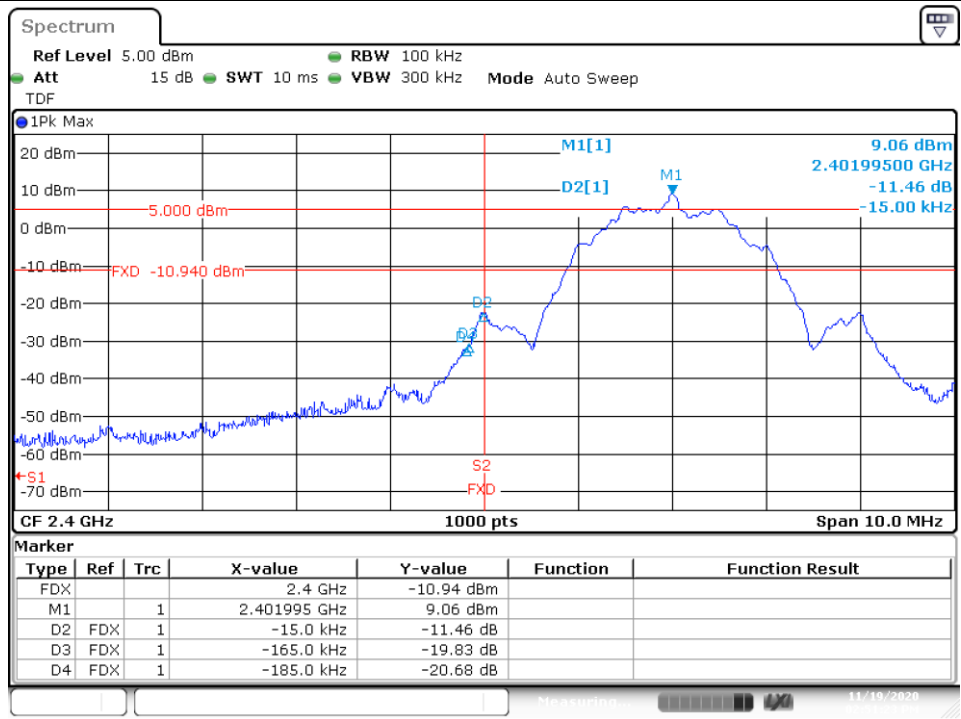
BLE – CHAIN A – DIV2

BE Low (Restricted) – 2402 MHz

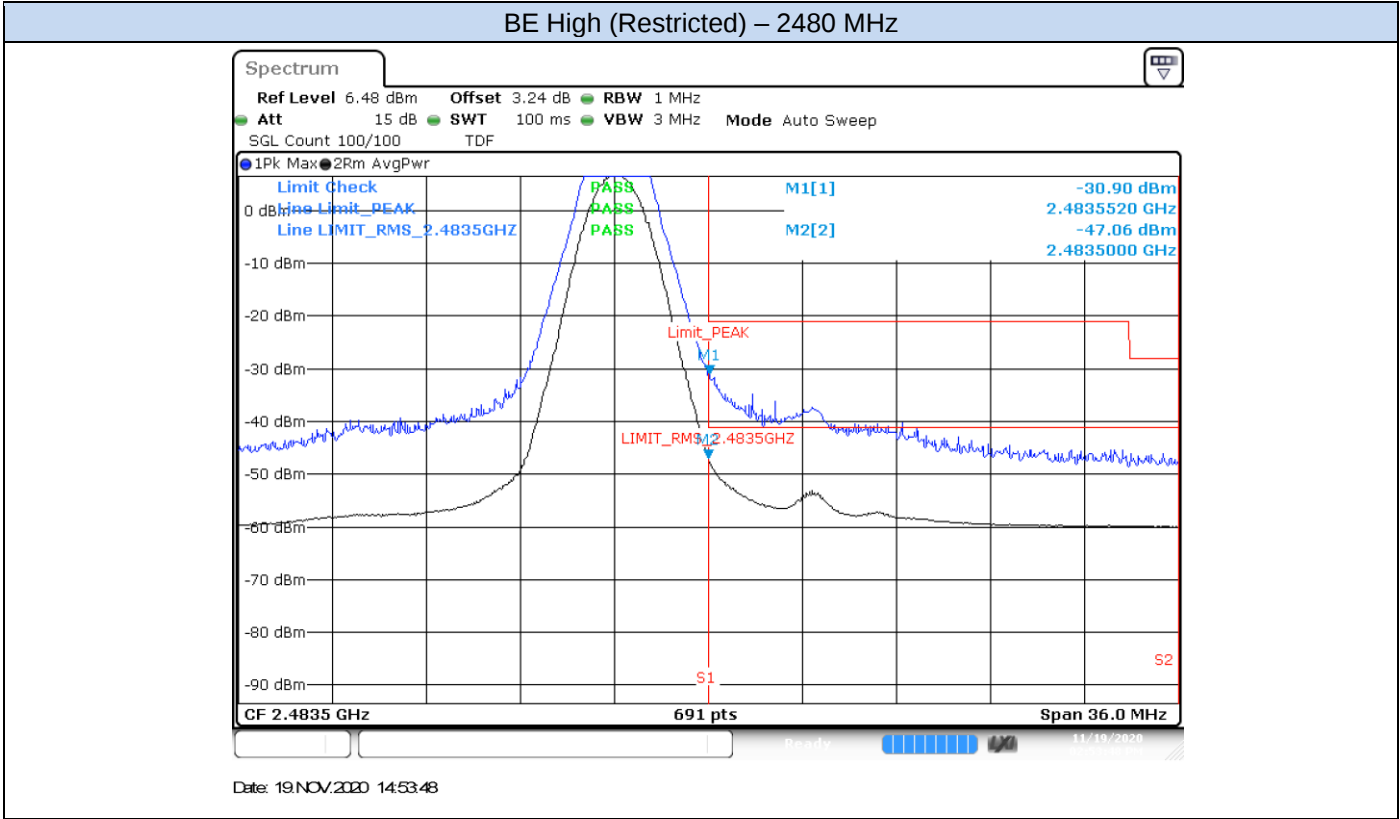


Date: 19.NOV.2020 14:51:12

BE Low (Non Restricted) – 2402 MHz



Date: 19.NOV.2020 14:51:23



B.4.5 Radiated spurious emission

Standards references

FCC part	RSS part	Limits																				
15.247 (d) 15.209	RSS-247 Clause 5.5 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 Streghth (μV/m)</th><th>Field Streghth (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 Streghth (μV/m)	Field Streghth (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 Streghth (μV/m)	Field Streghth (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 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.																						

Test procedure

The radiated setups shown in section *Test & System Description* were used to measure the radiated spurious emissions. 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 to 4 meters, the EUT azimuth over 360° and for both Vertical and Horizontal polarizations.

The radiated spurious emissions were measured on the lowest, middle and highest channels.

Test Results**Radiated Spurious - 30 MHz – 1 GHz**

Frequency	Quasi-Peak	Limit	Margin	Polarization
MHz	dBμV/m	dBμV/m	dB	---
37.5	28.8	40.0	11.2	V
261.5	39.1	46.0	6.9	H
274.0	37.9	46.0	8.1	H

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

1 GHz – 26.5 GHz, BLE**Radiated Spurious – 2402 MHz – DIV1**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3003.0	---	47.9	54.0	6.1	H
3003.0	60.9	---	74.0	13.1	H
9607.5	47.2	---	74.0	26.8	H
9607.5	---	36.7	54.0	17.3	V
25923.5	50.3	---	74.0	23.7	H
25931.0	---	37.6	54.0	16.4	H

Radiated Spurious – 2440 MHz – DIV1

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
3223.5	62.5	---	74.0	11.5	H
3223.5	---	48.4	54.0	5.6	V
9759.5	---	35.1	54.0	18.9	V
9760.0	46.5	---	74.0	27.5	V
24996.0	---	36.4	54.0	17.6	H
24997.5	50.2	---	74.0	23.8	H

Radiated Spurious – 2480 MHz – DIV1

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
2998.5	---	47.8	54.0	6.2	V
2998.5	60.2	---	74.0	13.8	H
9919.5	47.5	---	74.0	26.5	H
9919.5	---	36.4	54.0	17.6	V
25917.5	---	37.6	54.0	16.4	H
25952.0	50.7	---	74.0	23.3	H

1 GHz – 26.5 GHz, BLE**Radiated Spurious – 2402 MHz – DIV2**

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3151.0	62.2	---	74.0	11.8	V
3151.5	---	48.3	54.0	5.7	H
9607.0	48.5	---	74.0	25.5	V
9607.0	---	36.7	54.0	17.3	V
25911.5	50.4	---	74.0	23.6	V
25929.5	---	37.6	54.0	16.4	H

Radiated Spurious – 2440 MHz– DIV2

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBµV/m	dBµV/m	dBµV/m	dB	---
3046.5	---	47.8	54.0	6.2	V
3048.0	60.9	---	74.0	13.1	V
9761.0	---	35.0	54.0	19.0	V
9761.5	46.8	---	74.0	27.2	H
25733.0	51.0	---	74.0	23.0	H
25738.5	---	36.6	54.0	17.4	H

Radiated Spurious – 2480 MHz– DIV2

Frequency	MaxPeak	Average	Limit	Margin	Polar
MHz	dBμV/m	dBμV/m	dBμV/m	dB	---
2978.0	---	47.6	54.0	6.4	H
2978.0	61.5	---	74.0	12.5	H
9919.5	---	36.4	54.0	17.6	V
9921.0	48.2	---	74.0	25.8	V
25804.5	---	37.2	54.0	16.8	H
25805.5	50.7	---	74.0	23.3	V