

Test Report



INTENTIONAL RADIATOR TESTS ACCORDING TO FCC PART 15 C AND ISED CANADA REQUIREMENTS

Equipment Under Test: Mobile Patient Monitor

Model: Portrait HUB01

Manufacturer: GE Healthcare Finland Oy
Kuortaneenkatu 2
FI-00510, Helsinki
Finland

Customer: GE Healthcare Finland Oy
Kuortaneenkatu 2
FI-00510, Helsinki
Finland

FCC Rule Part: 15.247: 2019
IC Rule Part: RSS-247, Issue 2, 2017
RSS-GEN Issue 5 Amendment 2, 2021
KDB: 558074 D01 15.247 Meas Guidance v05r02
Guidance for Compliance Measurements on Digital
Transmission Systems, Frequency Hopping Spread
Spectrum System, and Hybrid System Devices
Operating Under §15.247 of the FCC rules
(April 2, 2019)

Date: 29 March 2021

Issued by: 

Henri Mäki
Testing Engineer

Date: 29 March 2021

Checked by: 

Mikko Halonen
Development Engineer

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GENERAL REMARKS**Disclaimer**

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

RELEASE HISTORY

Version	Changes	Issued
1.0	Initial release	29 March 2021

PRODUCT DESCRIPTION

Equipment Under Test

Trade mark: GE
 Model: Portrait HUB01
 Type: Mobile Patient Monitor
 Serial no: Sample 1: SRW20440005SP (RF_HUB_RFV_1)
 Sample 2: SRW20440013SP (RF_HUB_RFV_C1)
 FCC ID: 2A08L-HUB01
 IC: 25821-HUB01

General Description

The Portrait HUB01 (later Hub) is a part of GE Healthcare's Portrait Mobile Monitoring Solution system. The Hub enables continuous monitoring of patients by acquiring signals from body-worn sensors through the GE proprietary Medical Body Area Network (MBAN) radio as well as displaying trends and events. The Hub further delivers the patient data to a hospital network through the WLAN (802.11a/b/g/n) radio. Pairing between a Hub and a sensor is made by using an NFC (ISO/IEC 14443) reader in the Hub. In addition to the active MBAN, WLAN and NFC radios, the Hub has a passive RFID tag (EPCglobal Gen-2) that is used for asset management. All Hub antennas are integrated in the mechanics. Besides the wireless interfaces the hub incorporates a 5-pin GE proprietary USB connector in the back of the Hub. The USB connector is used for charging the Hub battery and it enables the SW updates and device configuration.

This test report contains the results for MBAN operating in 2400-2483.5 MHz frequency band.

Classification

Fixed device
 Mobile Device (Human body distance > 20cm)
 Portable Device (Human body distance < 20cm)

Samples and Modifications

No.	Name	Description
1	RF_HUB_RFV_1	Radiated sample
2	RF_HUB_RFV_C1	Conducted sample

In both samples the PWB RF is reworked to be mass production equivalent.

In conducted sample the RF test cables were plugged into existing production test connectors. The production test connectors locate on the PWB next to antenna inputs.

Ratings and declarations

Operating Frequency Range (OFR): 2402.0 – 2478.8 MHz
 Channels: 31
 Channel separation: 2.5 / 2.6 / 2.7 MHz
 Transmission technique: Digital modulation
 Modulation: GFSK
 Antenna type: Integrated custom monopole antennas
 Integral Antenna gain: bottom antenna: 2.9 dBi (highest gain in the frequency range)
 top antenna: 5.6 dBi (highest gain in the frequency range)

Power Supply

Operating voltage range: 3.6 V_{DC} (nominal battery voltage)

Mechanical Size of the EUT

Height: 21 mm

Width: 63 mm

Length: 141 mm

Peripherals

Peripheral	Description / Usage
4 x Sensor Batteries	GE Portrait SBT01, load for the charger unit during conducted emissions test
Charger unit	GE Portrait BCH01, battery charging unit for the EUT and peripheral sensor batteries. Used during conducted emissions test
AC/DC adapter	XP Power ACM36US12-XZ1110A, power supply for the charger unit
Laptop	Dell Precision 3541, companion device for conducted emissions test
AC/DC adapter	Dell HA65NM130, power supply for the laptop

The peripherals were provided by the customer.

SUMMARY OF TESTING

Test Specification	Description of Test	Result
§15.203	Antenna requirement	PASS
§15.207(a) / RSS-GEN 8.8	Conducted Emissions on Power Supply Lines	PASS
§15.247(b)(3) / RSS-247 5.4(d)	Maximum Peak Conducted Output Power	PASS
§15.247(a)(2) / RSS-247 5.2(a)	6 dB Bandwidth	PASS
§15.247(e) / RSS-247 5.2(b)	Power Spectral Density	PASS
RSS-GEN 6.7	99% Occupied Bandwidth	PASS
§15.247(d) / RSS-247 5.5	100 kHz Bandwidth of Frequency Band Edges and Conducted Spurious Emissions	PASS
§15.209(a), §15.247(d) / RSS-247 5.5	Radiated Emissions Within the Restricted Bands	PASS

The decision rule applied for the tests results stated in this test report is according to the requirements of section 1.3 of ANSI C63.10-2013.

EUT Test Conditions during Testing

The EUT was in continuous transmit mode during all the tests. The EUT was configured into the wanted channel using software provided by the manufacturer (MBAN test mode 1.0.0.4.0.13-1116.1.20b2780).

All measurements were performed with the transmit power set to the maximum level the equipment hardware is capable of.

During Conducted Emissions on Power Supply Lines measurement the EUT and peripheral sensor batteries were placed on a charger unit and the batteries were charging. The charger unit was connected via USB to a peripheral laptop, which was reading the battery charge levels during the test. The EUT was set to transmit continuously on middle channel. The AC mains input voltage was 120 V, 60 Hz.

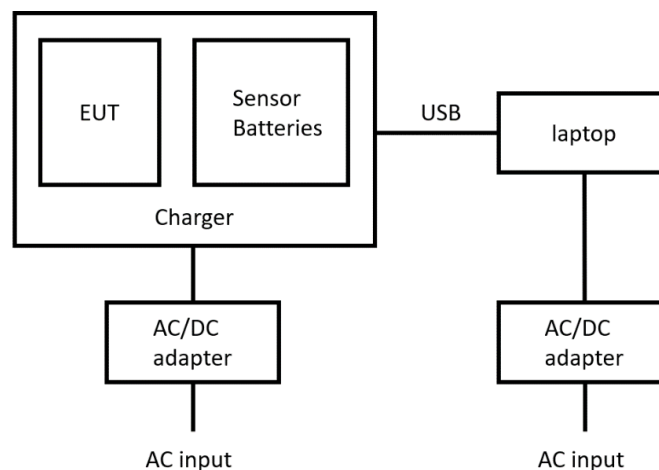


Figure 1: Test setup block diagram for conducted emissions on power supply lines

Table 1: Test frequencies

Channel	Frequency (MHz)
15 Low	2402.0
31 Mid	2443.0
45 High	2478.8

Test Facility

Testing Laboratory / address: FCC designation number: FI0002 ISED CAB identifier: T004	SGS Fimko Ltd Takomotie 8 FI-00380, HELSINKI FINLAND
Test Site:	<input type="checkbox"/> K10LAB, ISED Canada registration number: 8708A-1 <input checked="" type="checkbox"/> K5LAB, ISED Canada registration number: 8708A-2 <input type="checkbox"/> T10LAB

TEST RESULTS

Antenna requirement

Standard: FCC Rule §15.203
Tested by: HEM
Date: 11 January 2021

FCC Rule: 15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Specification	Requirement (at least one of the following shall be applied)	Conclusion
§15.203	1. Permanently attached antenna 2. Unique coupling to the intentional radiator 3. Professionally installed radio. The installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	PASS
Note	Option 1 is used	

Conducted Emissions In The Frequency Range 150 kHz - 30 MHz

Standard: ANSI C63.10-2013
Tested by: HEM
Date: 1 February 2021
Temperature: 23.1 °C
Humidity: 17.1 %RH
Barometric pressure: 990.6 mbar
Measurement uncertainty: ± 2.9 dB, level of confidence 95 % (k = 2)

FCC Rule: 15.207(a)
RSS-GEN 8.8

Conducted disturbance voltage was measured with an artificial main network from 150 kHz to 30 MHz with 4 kHz steps and a resolution bandwidth of 9 kHz. Measurements were carried out with peak and average detectors.

Frequency of emission (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

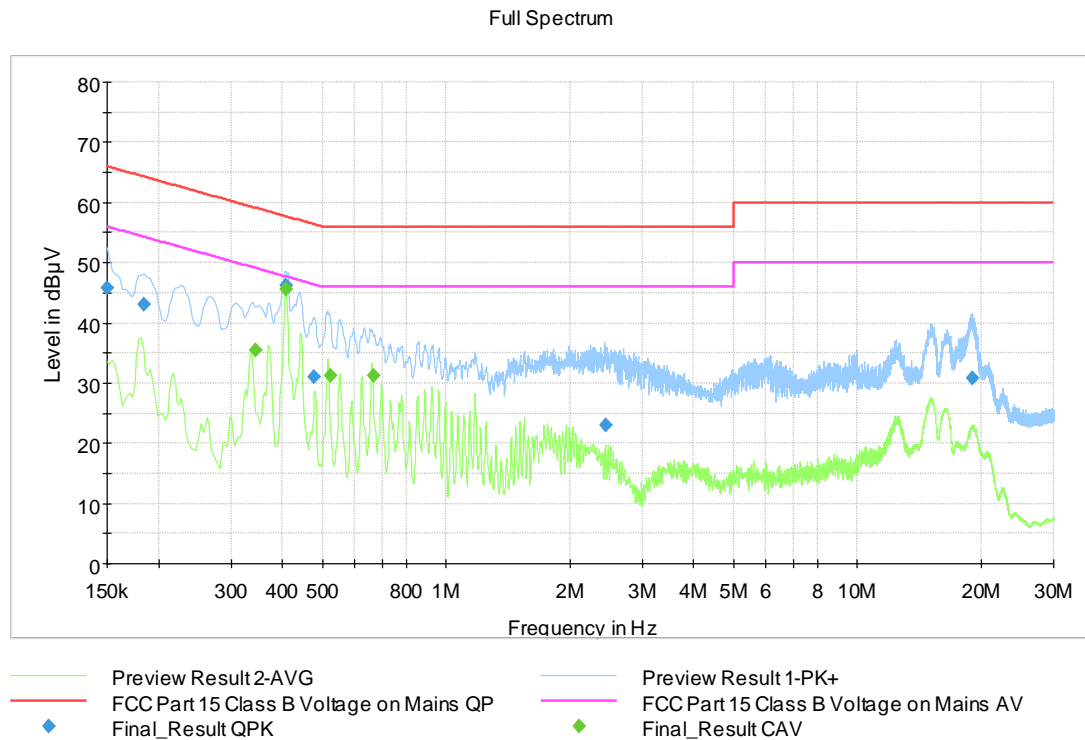


Figure 2: The measured curves with peak- and average detector

CONDUCTED EMISSIONS IN THE FREQUENCY RANGE 150 kHz – 30 MHz
Final measurements from the worst frequencies
Table 2: Final QuasiPeak measurements from the worst frequencies

Frequency (MHz)	QuasiPeak (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	45.77	66.00	20.23	15 x 1000.0	9.000	L1	9.6
0.183750	43.10	64.31	21.21	15 x 1000.0	9.000	L1	9.6
0.407750	46.28	57.69	11.41	15 x 1000.0	9.000	L1	9.7
0.477500	31.06	56.38	25.32	15 x 1000.0	9.000	L1	9.7
2.439750	23.06	56.00	32.94	15 x 1000.0	9.000	N	9.9
19.069500	30.88	60.00	29.12	15 x 1000.0	9.000	N	10.5

Table 3: Final Average measurements from the worst frequencies

Frequency (MHz)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.345500	35.55	49.07	13.52	15 x 1000.0	9.000	L1	9.6
0.409500	45.69	47.66	1.97	15 x 1000.0	9.000	L1	9.7
0.523750	31.33	46.00	14.67	15 x 1000.0	9.000	L1	9.7
0.667750	31.31	46.00	14.69	15 x 1000.0	9.000	L1	9.7

The correction factor in the final result table contains the sum of the transducers (cables).

The result value is the measured value corrected with the correction factor.

Maximum Peak Conducted Output Power

Standard: ANSI C63.10-2013
Tested by: HEM
Date: 11 January 2021
Temperature: 21.9 °C
Humidity: 25.5 %RH
Barometric pressure: 1005.1 mbar
Measurement uncertainty: ± 2.87 dB, level of confidence 95 % (k = 2)

FCC Rule: 15.247(b)(3)
RSS-247 5.4(d)

For systems using digital modulation in the 2400-2483.5 MHz bands the limit is 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.

Measured values are peak values.

Results:

Table 4: Maximum conducted output power (bottom antenna)

Channel	Conducted Power [dBm]	Limit [dBm]	Margin [dBm]	Result
Low	10.4	30	19.6	PASS
Mid	9.4	30	20.6	PASS
High	9.0	30	21.0	PASS

Table 5: Maximum conducted output power (top antenna)

Channel	Conducted Power [dBm]	Limit [dBm]	Margin [dBm]	Result
Low	10.1	30	19.9	PASS
Mid	9.7	30	20.3	PASS
High	9.4	30	20.6	PASS

Maximum Peak Conducted Output Power

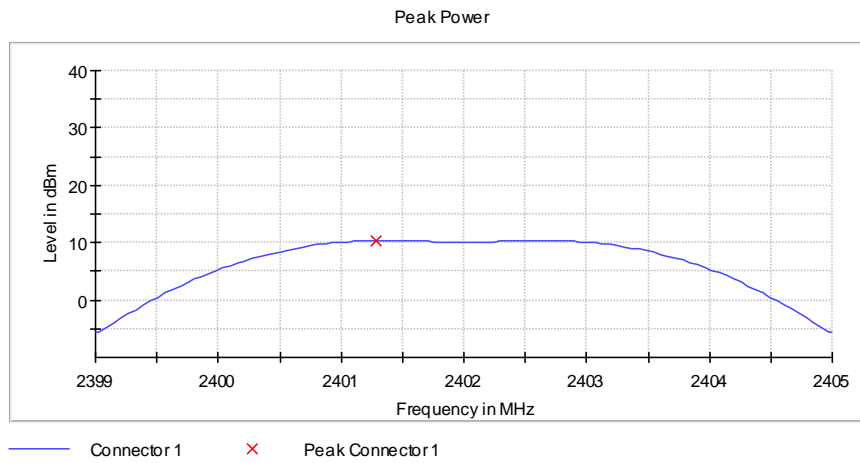


Figure 3: Conducted power, Channel LOW (bottom antenna)

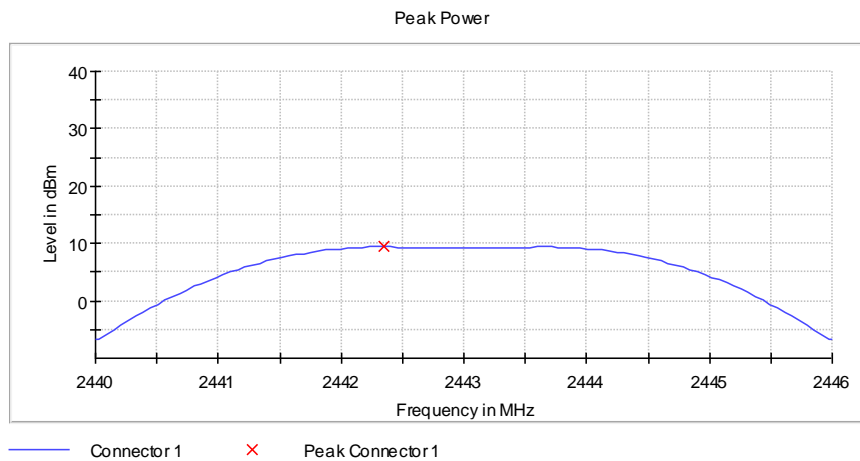


Figure 4: Conducted power, Channel MID (bottom antenna)

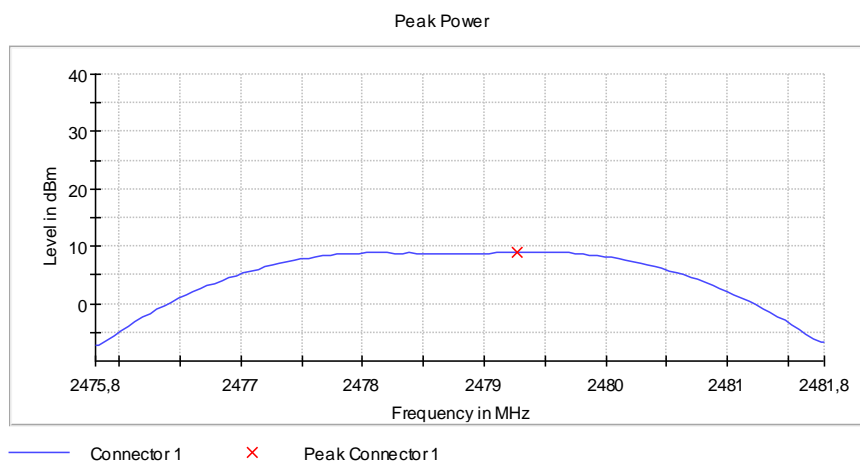


Figure 5: Conducted power, Channel HIGH (bottom antenna)

Maximum Peak Conducted Output Power

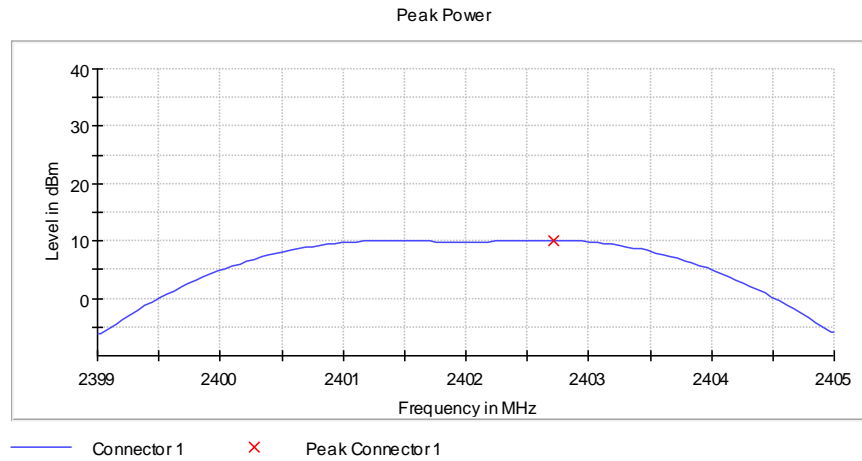


Figure 6: Conducted power, Channel LOW (top antenna)

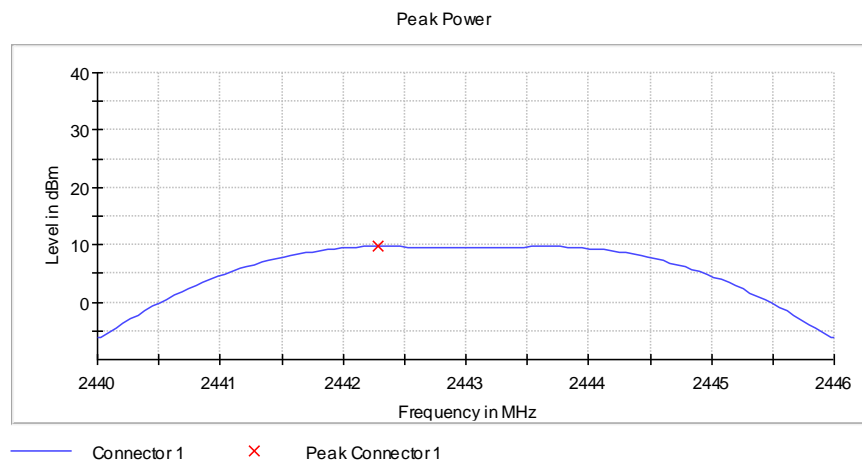


Figure 7: Conducted power, Channel MID (top antenna)

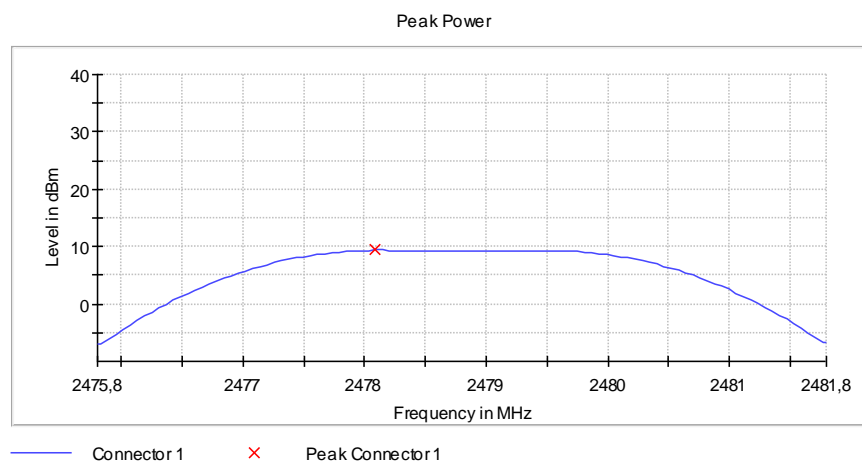


Figure 8: Conducted power, Channel HIGH (top antenna)

Maximum Peak Conducted Output Power
Table 6: Measurement settings, maximum conducted output power

Setting	Instrument Value	Target Value
Start Frequency	2.39900 GHz	2.39900 GHz
Stop Frequency	2.40500 GHz	2.40500 GHz
Span	6.000 MHz	6.000 MHz
RBW	2.000 MHz	>= 1.980 MHz
VBW	10.000 MHz	>= 6.000 MHz
SweepPoints	101	~ 101
SweepTime	953.450 ns	AUTO
Reference Level	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Max Stable Difference	0.03 dB	0.50 dB

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Standard: ANSI C63.10-2013
Tested by: HEM, PKA
Date: 20 – 27 January 2021
Temperature: 21.6 – 22.6 °C
Humidity: 17.7 – 27.9 %RH
Barometric pressure: 992.5 – 1005.3 mbar
Measurement uncertainty: ± 4.51 dB, level of confidence 95 % (k = 2)

FCC Rule: 15.247(d), 15.209(a)

RSS-247 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. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

The correction factor in the final result table contains the sum of the transducers (antenna + amplifier + cables).

Peak values of emissions below 1000 MHz measured for reference as well as transmitter fundamental.

Frequency range [MHz]	Limit [$\mu\text{V/m}$]	Limit [dB $\mu\text{V/m}$]	Detector
30 - 80	100	40.0	Quasi-peak
88 - 216	150	43.5	Quasi-peak
216 - 960	200	46.0	Quasi-peak
960 - 1000	500	53.9	Quasi-peak
Above 1000	500	53.9	Average
Above 1000	5000	73.9	Peak

Investigative measurements were made to determine the worst EUT orientation. The presented final results are the results in the worst orientation.

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Results LOW channel (bottom antenna)

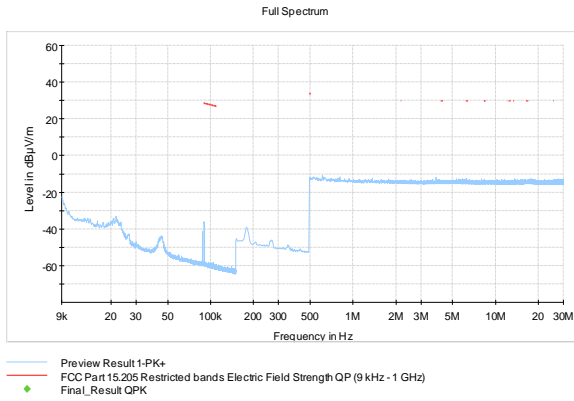


Figure 9: LOW channel (9 kHz – 30 MHz)

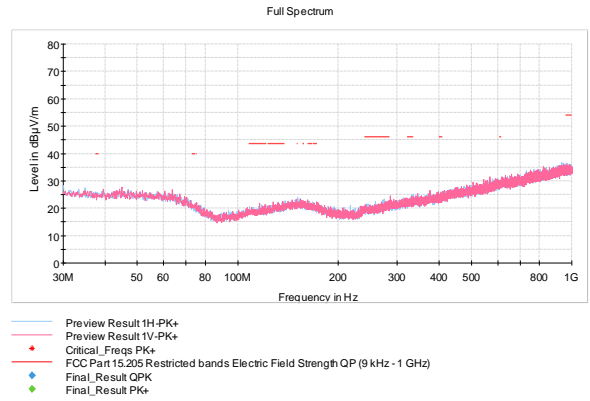


Figure 10: LOW channel (30 MHz – 1000 MHz)

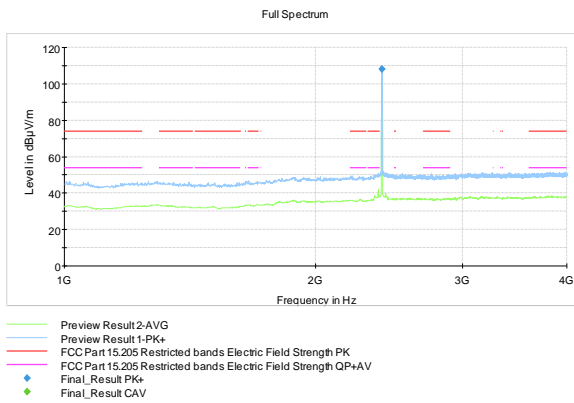


Figure 11: LOW channel (1 GHz – 4 GHz)

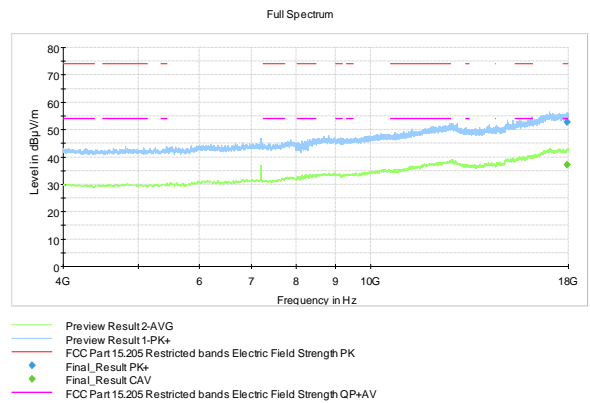


Figure 12: LOW channel (4 GHz – 18 GHz)

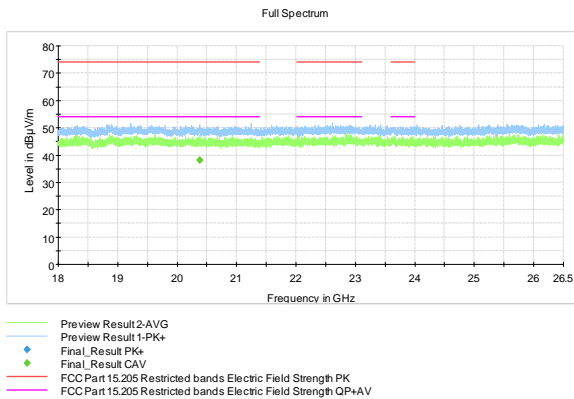


Figure 13: LOW channel (18 GHz – 26.5 GHz)

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Table 7: Peak results LOW channel (bottom antenna)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2401.200000	107.99	---	---	1000.0	1000.000	148.0	V	180.0	14.1
17916.275000	52.80	73.90	21.10	1000.0	1000.000	400.0	V	151.0	24.6

Table 8: Average results LOW channel (bottom antenna)

Frequency (MHz)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
17936.125000	37.17	53.90	16.73	1000.0	1000.000	126.0	V	121.0	24.5
20376.400000	38.10	53.90	15.80	1000.0	1000.000	170.0	H	156.0	7.2

Table 9: Quasi-peak results LOW channel (bottom antenna)

<p>No final measurements were made; no emissions near the limit.</p>									
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Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Results MID channel (bottom antenna)

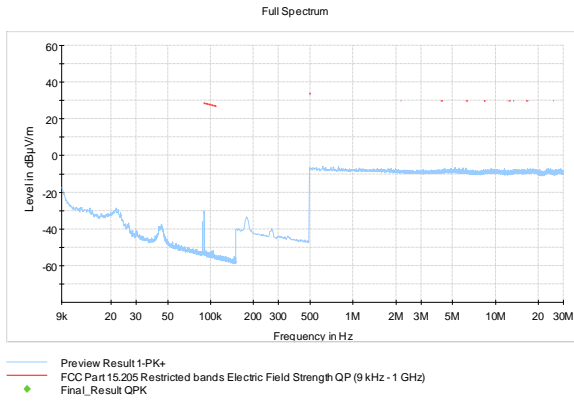


Figure 14: MID channel (9 kHz – 30 MHz)

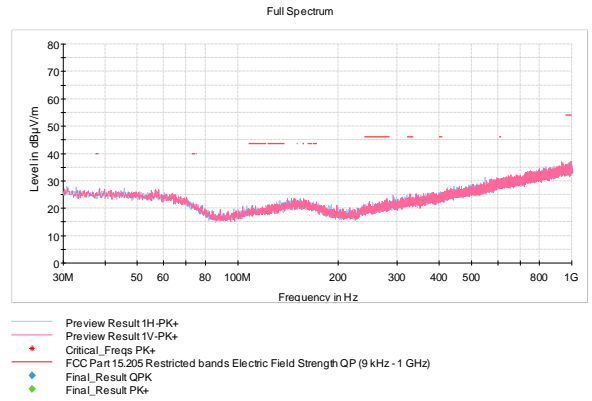


Figure 15: MID channel (30 MHz – 1000 MHz)

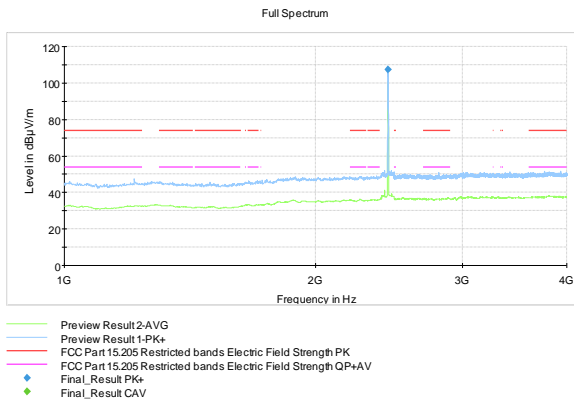


Figure 16: MID channel (1 GHz – 4 GHz)

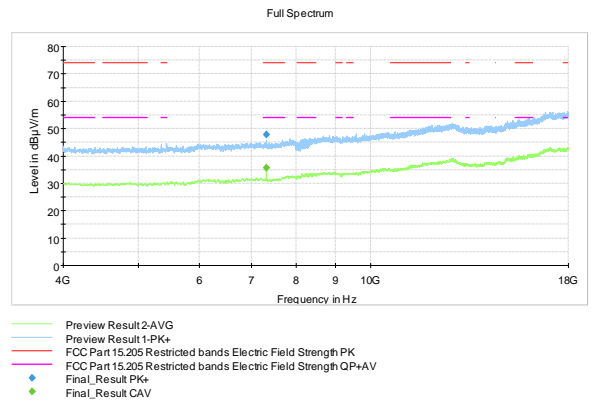


Figure 17: MID channel (4 GHz – 18 GHz)

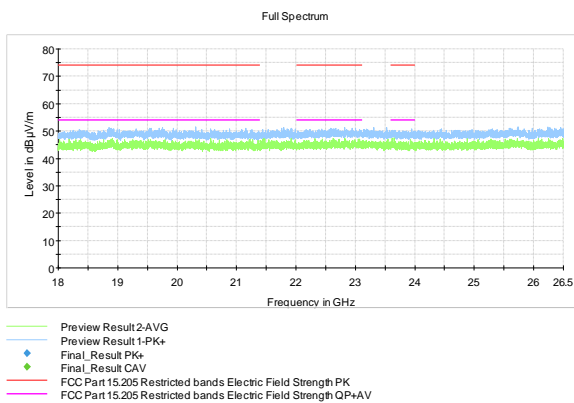


Figure 18: MID channel (18 GHz – 26.5 GHz)

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz
Table 10: Peak results MID channel (bottom antenna)

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2442.250000	107.51	---	---	1000.0	1000.000	184.0	V	172.0	13.8
7326.825000	47.89	73.90	26.01	1000.0	1000.000	105.0	V	57.0	10.7

Table 11: Average results MID channel (bottom antenna)

Frequency (MHz)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7327.025000	35.57	53.90	18.33	1000.0	1000.000	105.0	V	56.0	10.7
22325.600000	38.12	53.90	15.78	1000.0	1000.000	130.0	H	0.0	8.7

Table 12: Quasi-peak results MID channel (bottom antenna)

<p>No final measurements were made; no emissions near the limit.</p>									
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Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Results HIGH channel (bottom antenna)

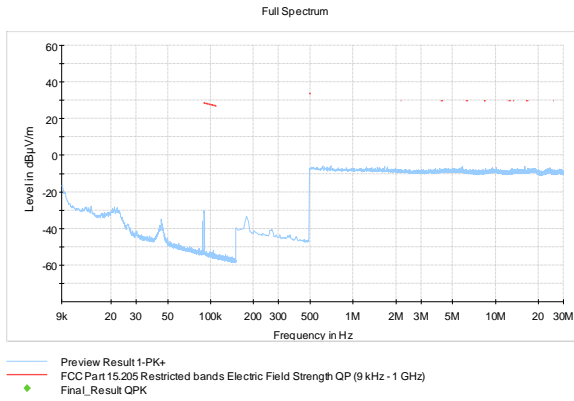


Figure 19: HIGH channel (9 kHz – 30 MHz)

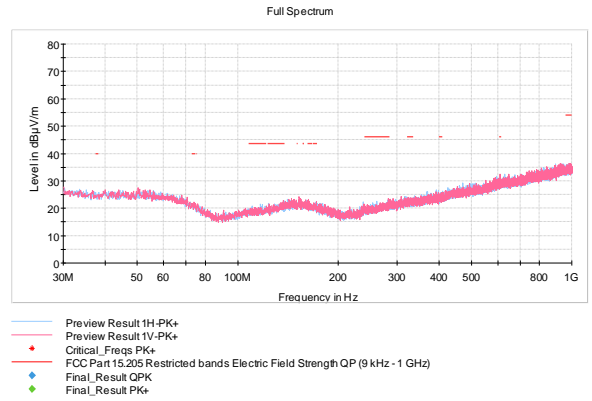


Figure 20: HIGH channel (30 MHz – 1000 MHz)

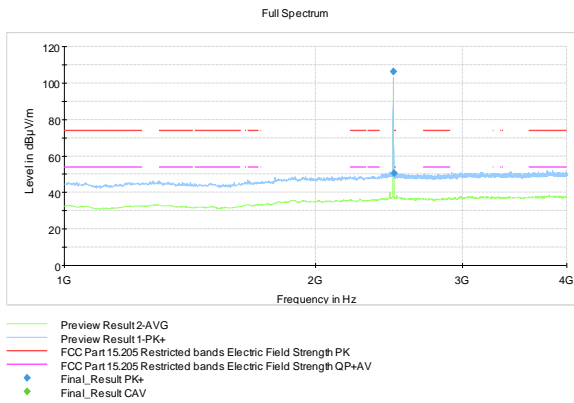


Figure 21: HIGH channel (1 GHz – 4 GHz)

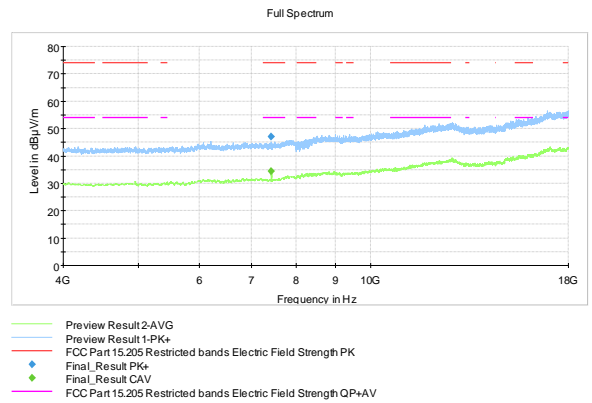


Figure 22: HIGH channel (4 GHz – 18 GHz)

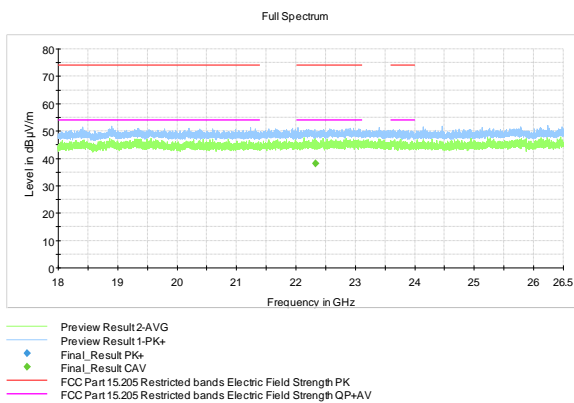


Figure 23: HIGH channel (18 GHz – 26.5 GHz)

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz
Table 13: Peak results HIGH channel (bottom antenna)

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2478.100000	106.07	---	---	1000.0	1000.000	225.0	V	175.0	13.9
2486.100000	50.42	74.00	23.58	1000.0	1000.000	139.0	H	158.0	13.8
7434.325000	47.16	73.90	26.74	1000.0	1000.000	124.0	V	54.0	10.4

Table 14: Average results HIGH channel (bottom antenna)

Frequency (MHz)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7434.325000	34.46	53.90	19.44	1000.0	1000.000	111.0	V	54.0	10.4
22325.600000	38.12	53.90	15.78	1000.0	1000.000	130.0	H	0.0	8.7

Table 15: Quasi-peak results HIGH channel (bottom antenna)

No final measurements were made; no emissions near the limit.									
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Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Radiated lower and upper band edge results (bottom antenna)

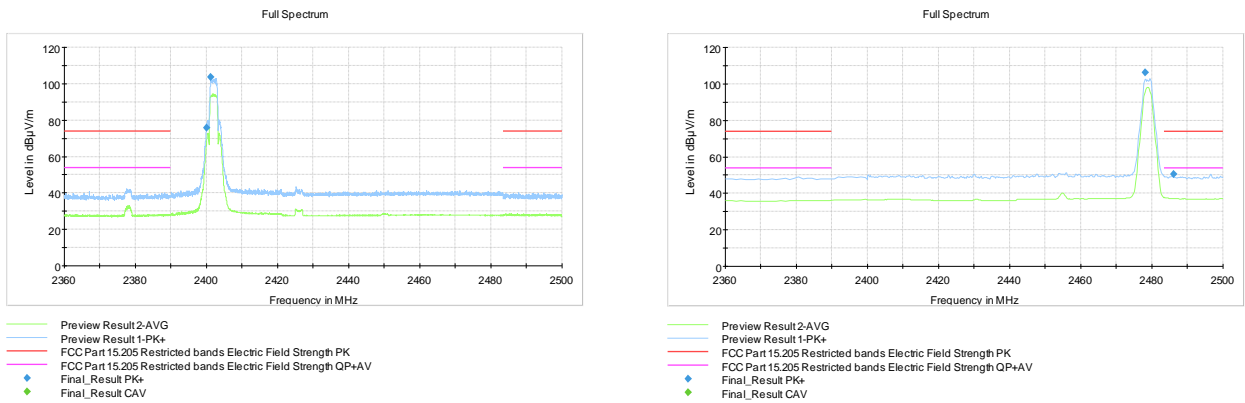


Figure 24: Radiated lower and upper band edge results (bottom antenna)

Table 16: Radiated lower and upper band edge results (bottom antenna)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2400.000000	75.83	83.53 *)	7.70	1000.0	100.000	288.0	V	167.0	14.0
2401.200000	103.53	---	---	1000.0	100.000	288.0	V	177.0	14.1
2478.100000	106.07	---	---	1000.0	1000.000	225.0	V	175.0	13.9
2486.100000	50.42	74.00	23.58	1000.0	1000.000	139.0	H	158.0	13.8

*) -20 dBc

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Results LOW channel (top antenna)

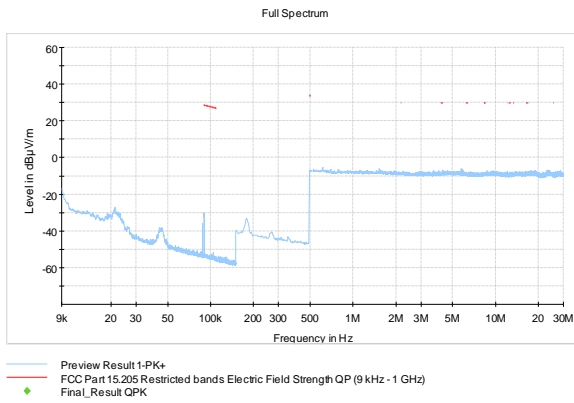


Figure 25: LOW channel (9 kHz – 30 MHz)

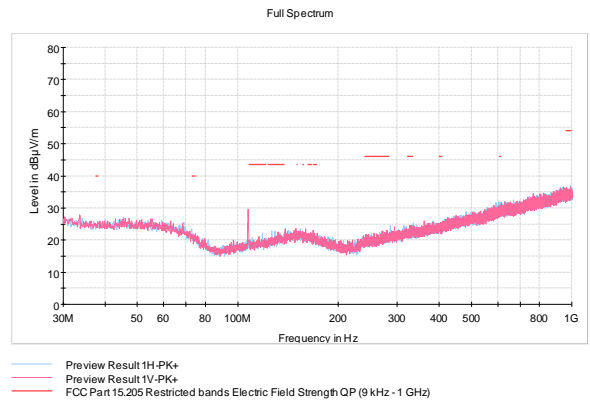


Figure 26: LOW channel (30 MHz – 1000 MHz)

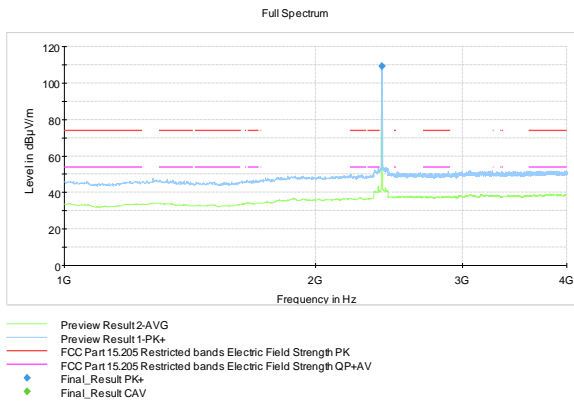


Figure 27: LOW channel (1 GHz – 4 GHz)

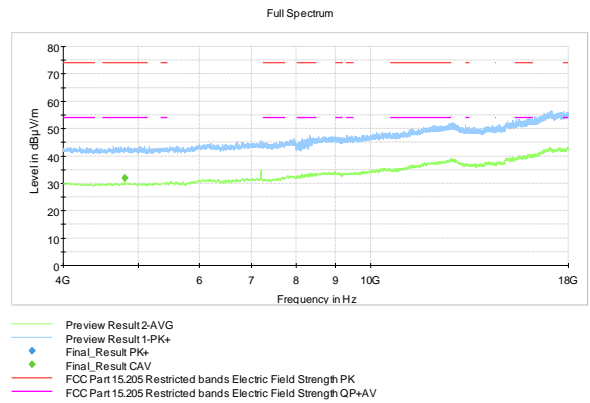


Figure 28: LOW channel (4 GHz – 18 GHz)

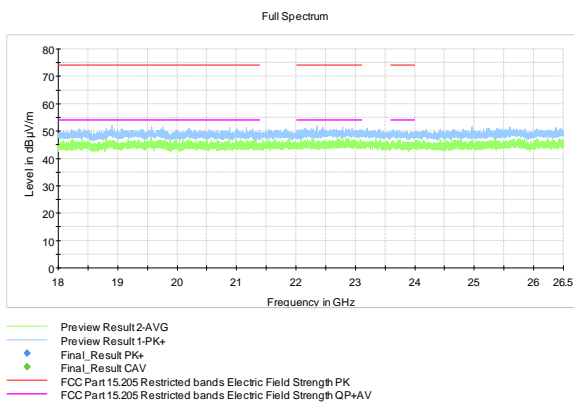


Figure 29: LOW channel (18 GHz – 26.5 GHz)

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz
Table 17: Peak results LOW channel (top antenna)

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2401.200000	109.13	---	---	1000.0	1000.000	189.0	V	346.0	14.1

Table 18: Average results LOW channel (top antenna)

Frequency (MHz)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4805.275000	31.93	53.90	21.97	1000.0	1000.000	105.0	V	267.0	7.6

Table 19: Quasi-peak results LOW channel (top antenna)

<p>No final measurements were made; no emissions near the limit.</p>									
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Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Results MID channel (top antenna)

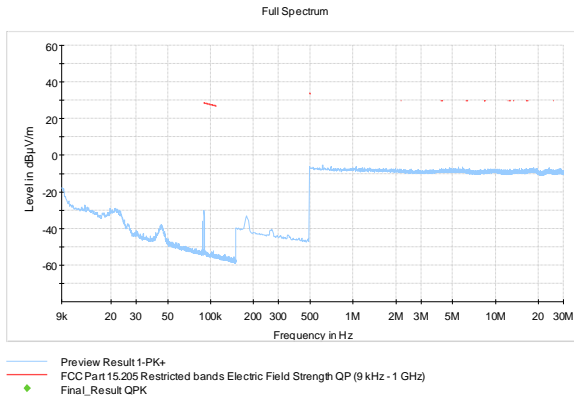


Figure 30: MID channel (9 kHz – 30 MHz)

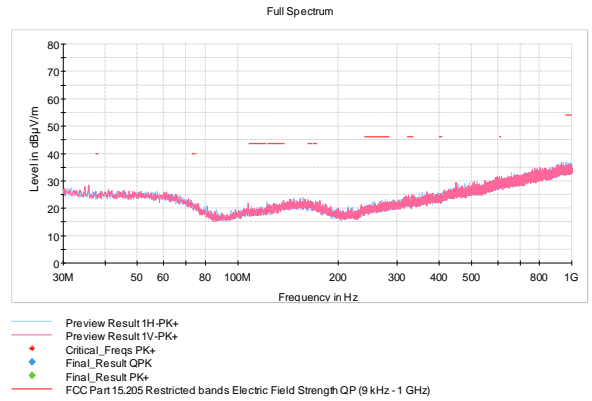


Figure 31: MID channel (30 MHz – 1000 MHz)

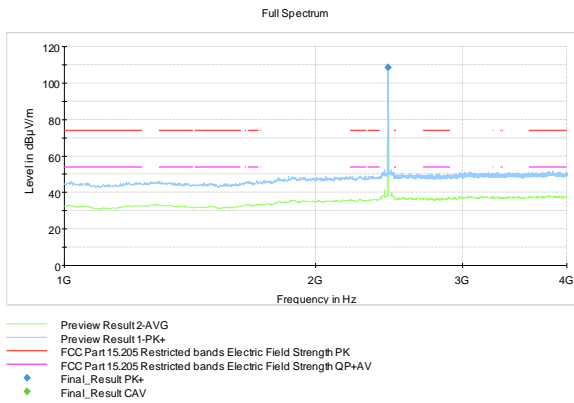


Figure 32: MID channel (1 GHz – 4 GHz)

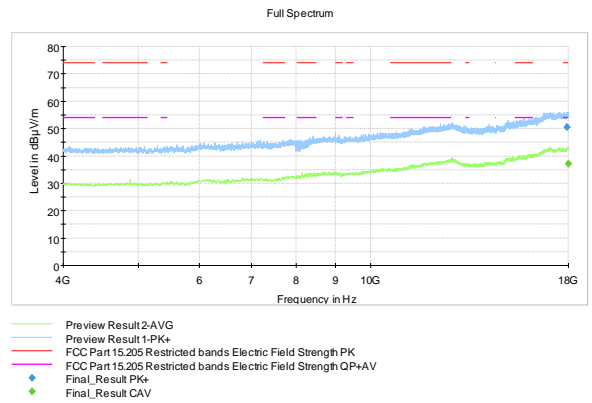


Figure 33: MID channel (4 GHz – 18 GHz)

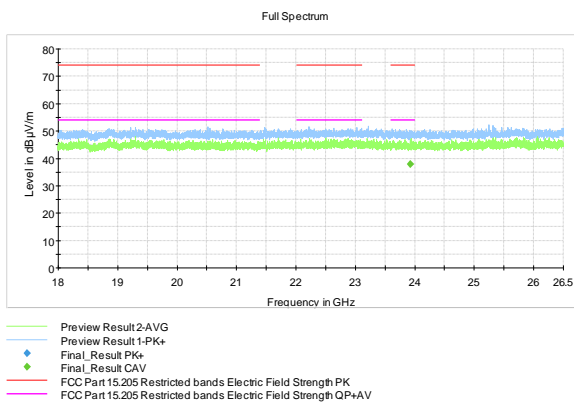


Figure 34: MID channel (18 GHz – 26.5 GHz)

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz
Table 20: Peak results MID channel (top antenna)

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2442.250000	108.52	---	---	1000.0	1000.000	185.0	V	348.0	13.8
17939.725000	50.59	73.90	23.31	1000.0	1000.000	110.0	V	137.0	24.6

Table 21: Average results MID channel (top antenna)

Frequency (MHz)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18000.000000	37.17	53.90	16.73	1000.0	1000.000	126.0	V	17.0	24.8
23930.350000	37.97	53.90	15.93	1000.0	1000.000	170.0	V	331.0	4.9

Table 22: Quasi-peak results MID channel (top antenna)

No final measurements were made; no emissions near the limit.									
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Results HIGH channel (top antenna)

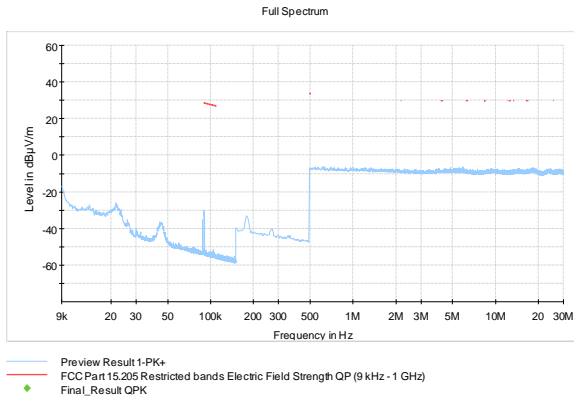


Figure 35: HIGH channel (9 kHz – 30 MHz)

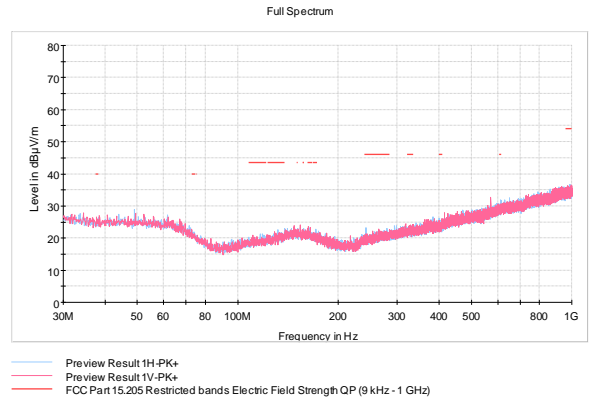


Figure 36: HIGH channel (30 MHz – 1000 MHz)

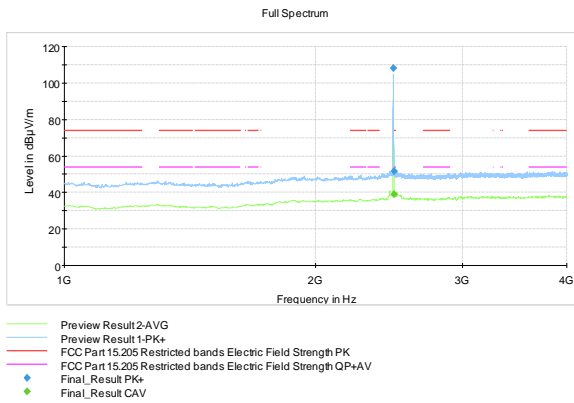


Figure 37: HIGH channel (1 GHz – 4 GHz)

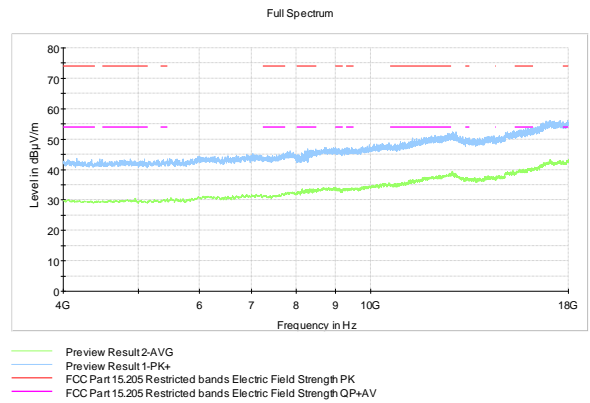


Figure 38: HIGH channel (4 GHz – 18 GHz)

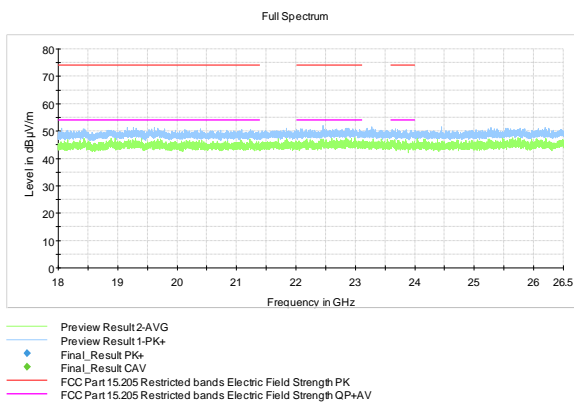


Figure 39: HIGH channel (18 GHz – 26.5 GHz)

Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz
Table 23: Peak results HIGH channel (top antenna)

Frequency (MHz)	MaxPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2478.100000	107.98	---	---	1000.0	1000.000	225.0	V	352.0	13.9
2484.500000	51.60	74.00	22.40	1000.0	1000.000	116.0	V	341.0	13.8

Table 24: Average results HIGH channel (top antenna)

Frequency (MHz)	CAverage (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2483.500000	38.86	54.00	15.14	1000.0	1000.000	202.0	V	349.0	13.8

Table 25: Quasi-peak results HIGH channel (top antenna)

No final measurements were made; no emissions near the limit.									
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Transmitter Radiated Spurious Emissions 9 kHz – 26.5 GHz

Radiated lower and upper band edge results (top antenna)

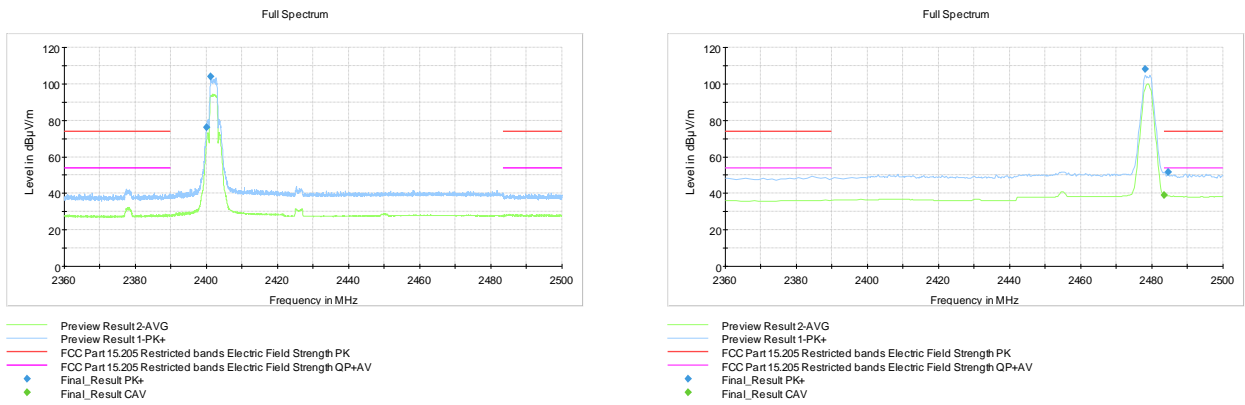


Figure 40: Radiated lower and upper band edge results (top antenna)

Table 26: Radiated lower and upper band edge results (top antenna)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2400.000000	76.06	84.01 *)	7.95	1000.0	100.000	289.0	V	167.0	14.0
2401.200000	104.01	---	---	1000.0	100.000	287.0	V	168.0	14.1
2478.100000	107.98	---	---	1000.0	1000.000	225.0	V	352.0	13.9
2484.500000	51.60	74.00	22.40	1000.0	1000.000	116.0	V	341.0	13.8

*) -20 dBc

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Standard:	ANSI C63.10-2013	
Tested by:	HEM	
Date:	11 January 2021	
Temperature:	21.9 °C	
Humidity:	25.5 %RH	
Barometric pressure:	1005.1 mbar	
Measurement uncertainty:	± 2.87 dB	Level of confidence 95 % (k = 2)

FCC Rule: 15.247(d), 15.209(a)

RSS-247 5.5

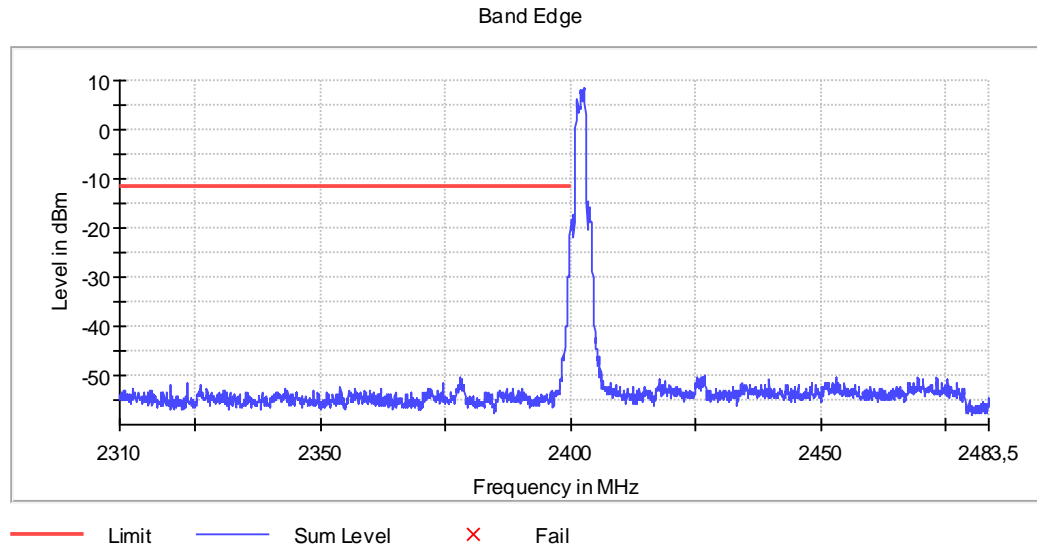
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Table 27: Band edge attenuation (bottom antenna)

Band Edge Attenuation	
Lower Band Edge	Upper Band Edge
-27.1 dBc	-57.3
Limit: -20 dBc	

Table 28: Band edge attenuation (top antenna)

Band Edge Attenuation	
Lower Band Edge	Upper Band Edge
-27.1	-57.8 dBc
Limit: -20 dBc	

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Figure 41: Lower Band Edge (bottom antenna)
Table 29: Lower band edge results (bottom antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.975000	-18.5	7.1	-11.4	PASS
2399.925000	-20.5	9.1	-11.4	PASS
2399.875000	-21.2	9.8	-11.4	PASS
2399.825000	-22.7	11.3	-11.4	PASS
2399.775000	-24.3	12.9	-11.4	PASS
2399.725000	-25.0	13.6	-11.4	PASS
2399.675000	-26.7	15.3	-11.4	PASS
2399.575000	-28.7	17.3	-11.4	PASS
2399.625000	-28.9	17.5	-11.4	PASS
2399.525000	-29.3	17.9	-11.4	PASS
2399.475000	-31.8	20.4	-11.4	PASS
2399.425000	-33.0	21.6	-11.4	PASS
2399.375000	-35.7	24.3	-11.4	PASS
2399.325000	-37.4	26.0	-11.4	PASS
2399.275000	-38.3	26.9	-11.4	PASS

Transmitter Band Edge Measurement and Conducted Spurious Emissions

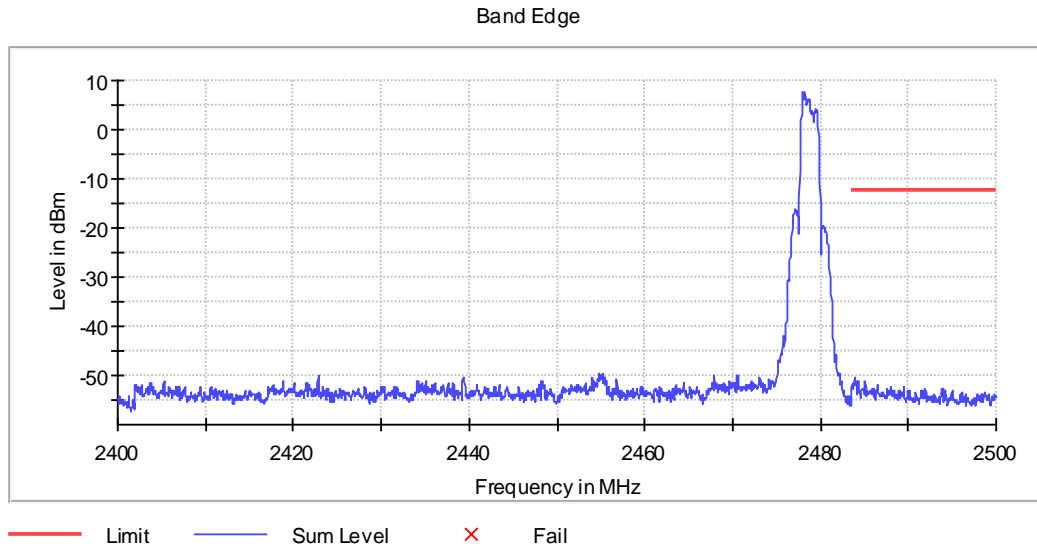


Figure 42: Upper Band Edge (bottom antenna)

Table 30: Upper band edge results (bottom antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.925000	-49.5	37.3	-12.2	PASS
2483.875000	-49.6	37.4	-12.2	PASS
2485.075000	-50.1	37.9	-12.2	PASS
2484.275000	-50.3	38.1	-12.2	PASS
2483.975000	-50.4	38.2	-12.2	PASS
2484.225000	-50.4	38.2	-12.2	PASS
2483.625000	-50.6	38.4	-12.2	PASS
2483.675000	-50.7	38.5	-12.2	PASS
2485.025000	-50.7	38.5	-12.2	PASS
2484.075000	-50.9	38.7	-12.2	PASS
2484.025000	-50.9	38.7	-12.2	PASS
2486.475000	-51.2	39.0	-12.2	PASS
2487.975000	-51.2	39.0	-12.2	PASS
2489.475000	-51.2	39.0	-12.2	PASS
2489.525000	-51.3	39.1	-12.2	PASS

Transmitter Band Edge Measurement and Conducted Spurious Emissions

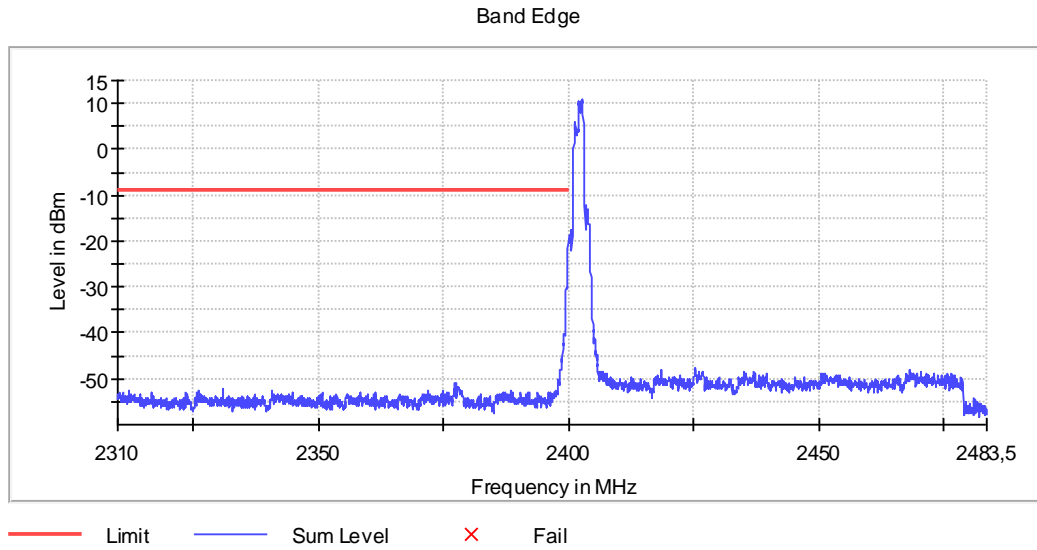


Figure 43: Lower Band Edge (top antenna)

Table 31: Lower band edge results (top antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.975000	-16.1	7.1	-9.0	PASS
2399.925000	-18.0	9.0	-9.0	PASS
2399.875000	-18.8	9.8	-9.0	PASS
2399.825000	-20.2	11.2	-9.0	PASS
2399.775000	-21.6	12.6	-9.0	PASS
2399.725000	-23.0	14.0	-9.0	PASS
2399.675000	-24.3	15.3	-9.0	PASS
2399.575000	-26.3	17.3	-9.0	PASS
2399.625000	-26.6	17.6	-9.0	PASS
2399.525000	-27.0	18.0	-9.0	PASS
2399.475000	-29.8	20.8	-9.0	PASS
2399.425000	-30.9	21.9	-9.0	PASS
2399.375000	-33.2	24.2	-9.0	PASS
2399.325000	-34.4	25.4	-9.0	PASS
2399.275000	-35.6	26.6	-9.0	PASS

Transmitter Band Edge Measurement and Conducted Spurious Emissions

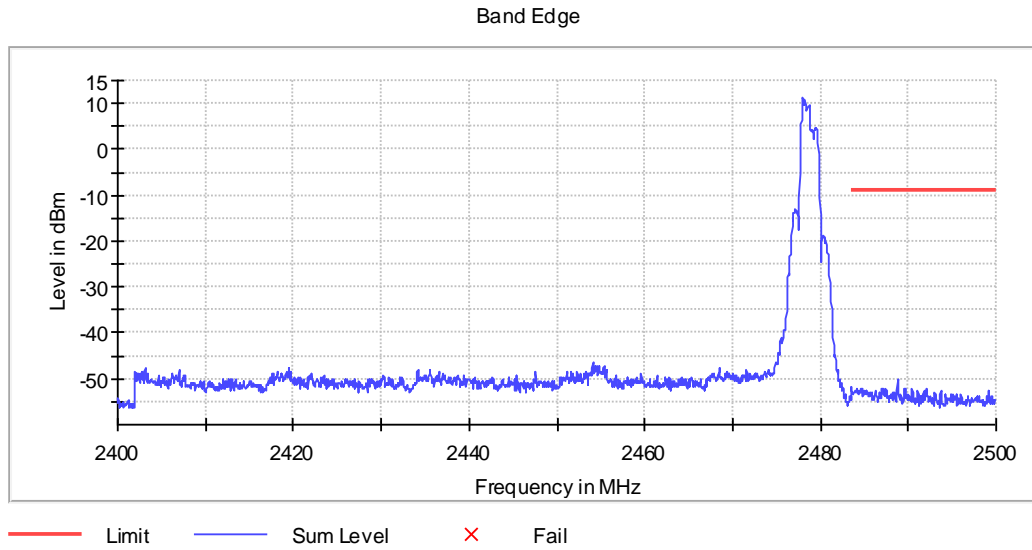


Figure 44: Upper Band Edge (top antenna)

Table 32: Upper band edge results (top antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2488.825000	-46.6	37.8	-8.9	PASS
2488.775000	-46.7	37.8	-8.9	PASS
2483.525000	-48.3	39.4	-8.9	PASS
2487.425000	-48.4	39.5	-8.9	PASS
2488.875000	-48.4	39.6	-8.9	PASS
2487.075000	-48.4	39.6	-8.9	PASS
2489.625000	-48.4	39.6	-8.9	PASS
2484.175000	-48.5	39.6	-8.9	PASS
2484.675000	-48.5	39.6	-8.9	PASS
2489.575000	-48.5	39.6	-8.9	PASS
2492.075000	-48.5	39.7	-8.9	PASS
2487.025000	-48.6	39.7	-8.9	PASS
2484.125000	-48.6	39.7	-8.9	PASS
2490.425000	-48.6	39.7	-8.9	PASS
2484.725000	-48.7	39.8	-8.9	PASS

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Conducted spurious emissions results LOW channel (bottom antenna)

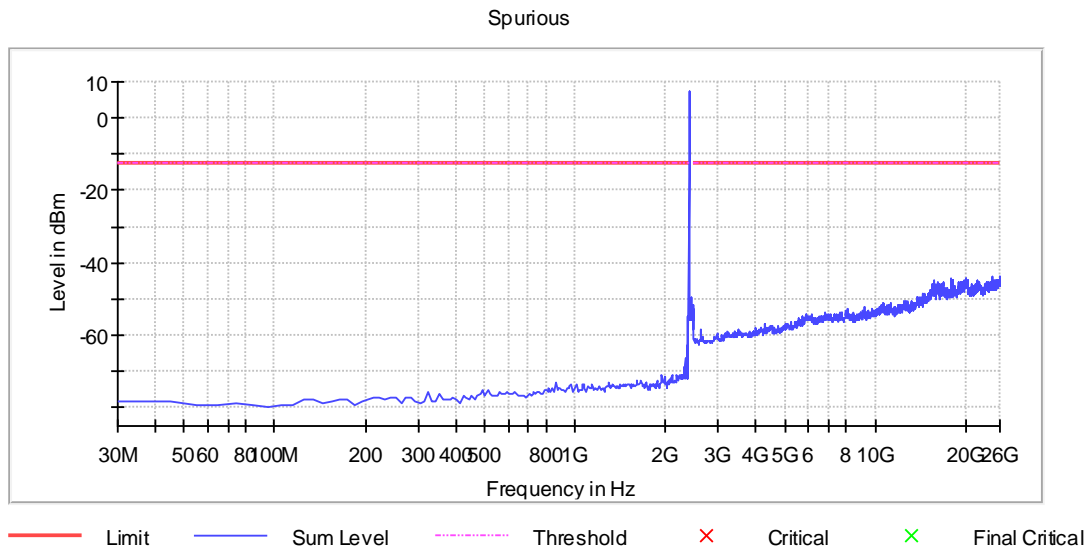


Figure 45: Conducted spurious emissions 30 MHz – 26 GHz LOW channel (bottom antenna)

Table 33: Pre measurements, conducted spurious emissions LOW channel (bottom antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-15.3	2.7	-12.6
25945.031555	-43.6	31.0	-12.6
24655.771674	-43.9	31.2	-12.6
25835.094666	-44.0	31.4	-12.6
25925.043030	-44.1	31.5	-12.6
25855.083192	-44.2	31.6	-12.6
20188.336273	-44.3	31.6	-12.6
25895.060242	-44.3	31.6	-12.6
25915.048768	-44.4	31.8	-12.6
20158.353485	-44.4	31.8	-12.6
25905.054505	-44.4	31.8	-12.6
17849.678814	-44.5	31.9	-12.6
25955.025818	-44.5	31.9	-12.6
25935.037293	-44.5	31.9	-12.6
24775.702826	-44.6	32.0	-12.6

Table 34: Final measurements, conducted spurious emissions LOW channel (bottom antenna)

No final measurements were made; no emissions near the limit.

Conducted spurious emissions results MID channel (bottom antenna)

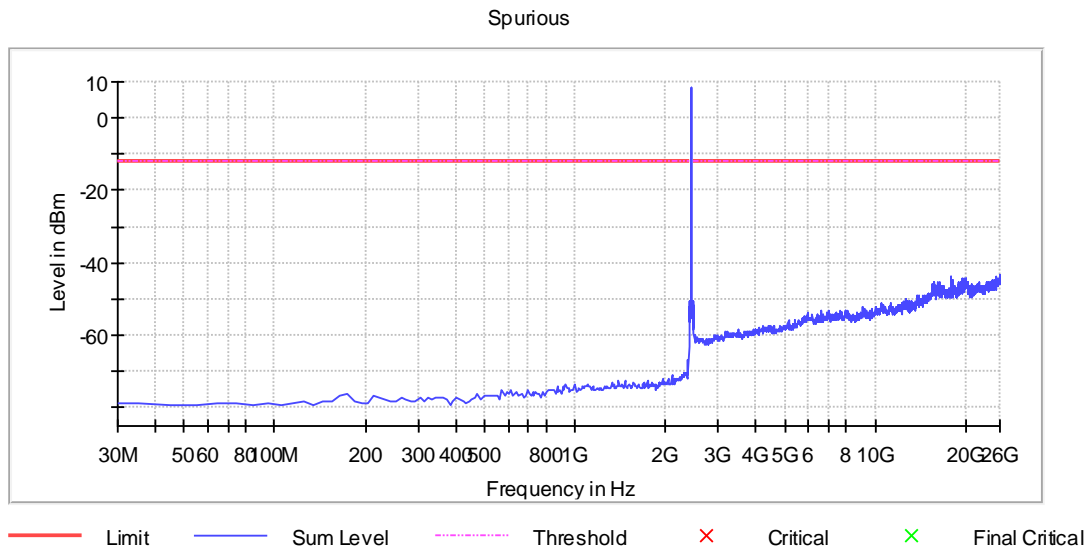


Figure 46: Conducted spurious emissions 30 MHz – 26 GHz MID channel (bottom antenna)

Table 35: Pre measurements, conducted spurious emissions MID channel (bottom antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25945.031555	-43.3	31.5	-11.8
25935.037293	-43.3	31.5	-11.8
25885.065980	-43.4	31.6	-11.8
25895.060242	-43.6	31.8	-11.8
25875.071717	-43.7	31.8	-11.8
17849.678814	-43.8	32.0	-11.8
17869.667340	-44.0	32.2	-11.8
25205.456120	-44.0	32.2	-11.8
19838.537080	-44.1	32.3	-11.8
25735.152040	-44.1	32.3	-11.8
20138.364960	-44.1	32.3	-11.8
25905.054505	-44.1	32.3	-11.8
25855.083192	-44.2	32.4	-11.8
25925.043030	-44.2	32.4	-11.8
25835.094666	-44.2	32.4	-11.8

Table 36: Final measurements, conducted spurious emissions MID channel (bottom antenna)

No final measurements were made; no emissions near the limit.

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Conducted spurious emissions results HIGH channel (bottom antenna)

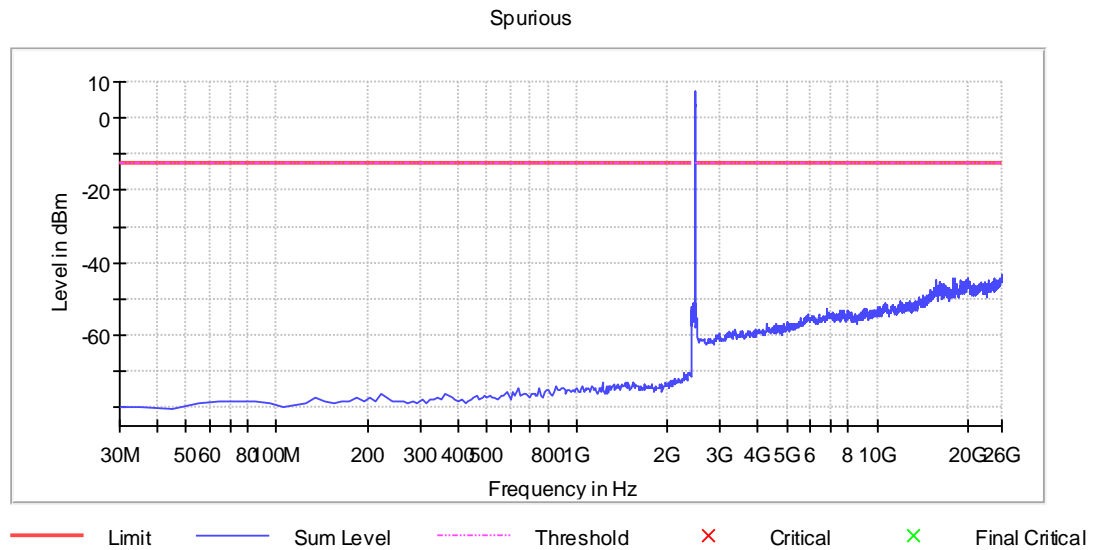


Figure 47: Conducted spurious emissions 30 MHz – 26 GHz HIGH channel (bottom antenna)

Table 37: Pre measurements, conducted spurious emissions HIGH channel (bottom antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25845.088929	-43.4	30.9	-12.5
25875.071717	-43.4	30.9	-12.5
25865.077454	-43.5	31.0	-12.5
25855.083192	-43.7	31.2	-12.5
25895.060242	-43.9	31.4	-12.5
25935.037293	-44.0	31.5	-12.5
25765.134828	-44.1	31.5	-12.5
17839.684552	-44.2	31.7	-12.5
25915.048768	-44.3	31.7	-12.5
25885.065980	-44.3	31.7	-12.5
20098.387909	-44.3	31.8	-12.5
20148.359222	-44.5	32.0	-12.5
24635.783149	-44.5	32.0	-12.5
18179.489482	-44.5	32.0	-12.5
25975.014343	-44.6	32.0	-12.5

Table 38: Final measurements, conducted spurious emissions HIGH channel (bottom antenna)

No final measurements were made; no emissions near the limit.

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Conducted spurious emissions results LOW channel (top antenna)

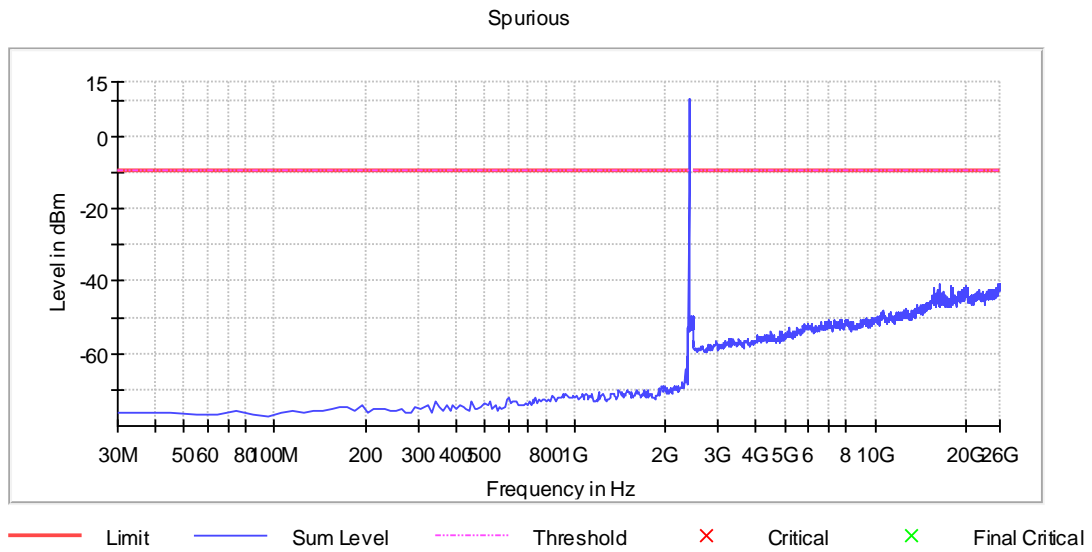


Figure 48: Conducted spurious emissions 30 MHz – 26 GHz LOW channel (top antenna)

Table 39: Pre measurements, conducted spurious emissions LOW channel (top antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
2395.021008	-11.6	1.8	-9.8
25955.025818	-40.7	30.9	-9.8
25845.088929	-40.8	31.0	-9.8
25885.065980	-41.0	31.2	-9.8
25925.043030	-41.0	31.2	-9.8
16400.510731	-41.0	31.2	-9.8
25915.048768	-41.0	31.2	-9.8
25905.054505	-41.1	31.3	-9.8
25505.283999	-41.1	31.3	-9.8
17849.678814	-41.3	31.5	-9.8
20128.370697	-41.3	31.5	-9.8
25825.100404	-41.4	31.6	-9.8
25855.083192	-41.4	31.7	-9.8
17839.684552	-41.5	31.7	-9.8
25715.163515	-41.6	31.8	-9.8

Table 40: Final measurements, conducted spurious emissions LOW channel (top antenna)

No final measurements were made; no emissions near the limit.

Conducted spurious emissions results MID channel (top antenna)

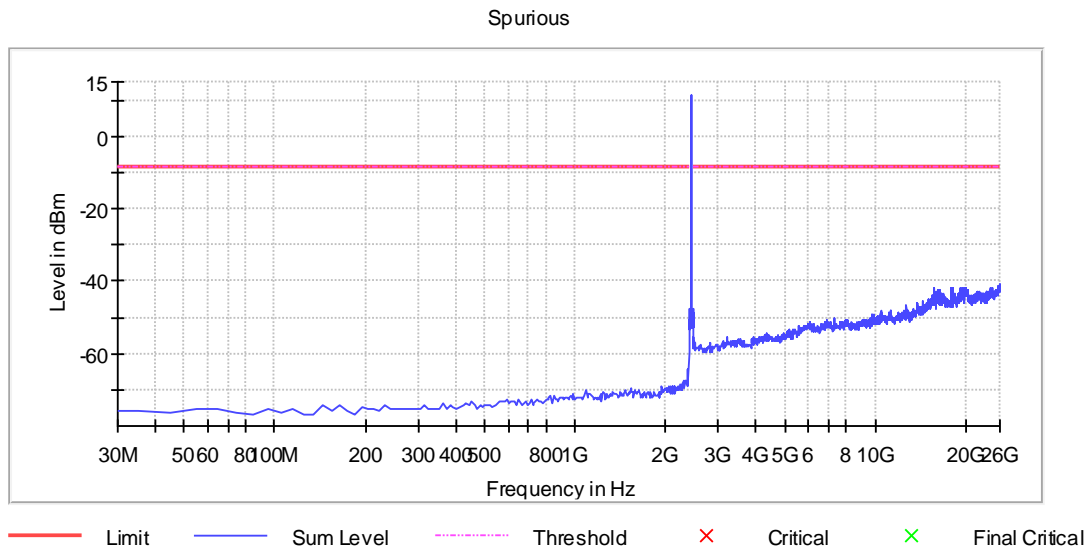


Figure 49: Conducted spurious emissions 30 MHz – 26 GHz MID channel (top antenna)

Table 41: Pre measurements, conducted spurious emissions MID channel (top antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25885.065980	-40.6	32.1	-8.5
25905.054505	-41.2	32.6	-8.5
25775.129091	-41.2	32.6	-8.5
25865.077454	-41.4	32.9	-8.5
25895.060242	-41.5	33.0	-8.5
25825.100404	-41.6	33.1	-8.5
25845.088929	-41.7	33.1	-8.5
25955.025818	-41.7	33.2	-8.5
17839.684552	-41.7	33.2	-8.5
25805.111878	-41.7	33.2	-8.5
25815.106141	-41.8	33.3	-8.5
15730.895134	-41.8	33.3	-8.5
25505.283999	-41.8	33.3	-8.5
19818.548555	-41.8	33.3	-8.5
25985.008606	-41.9	33.4	-8.5

Table 42: Final measurements, conducted spurious emissions MID channel (top antenna)

No final measurements were made; no emissions near the limit.

Conducted spurious emissions results HIGH channel (top antenna)

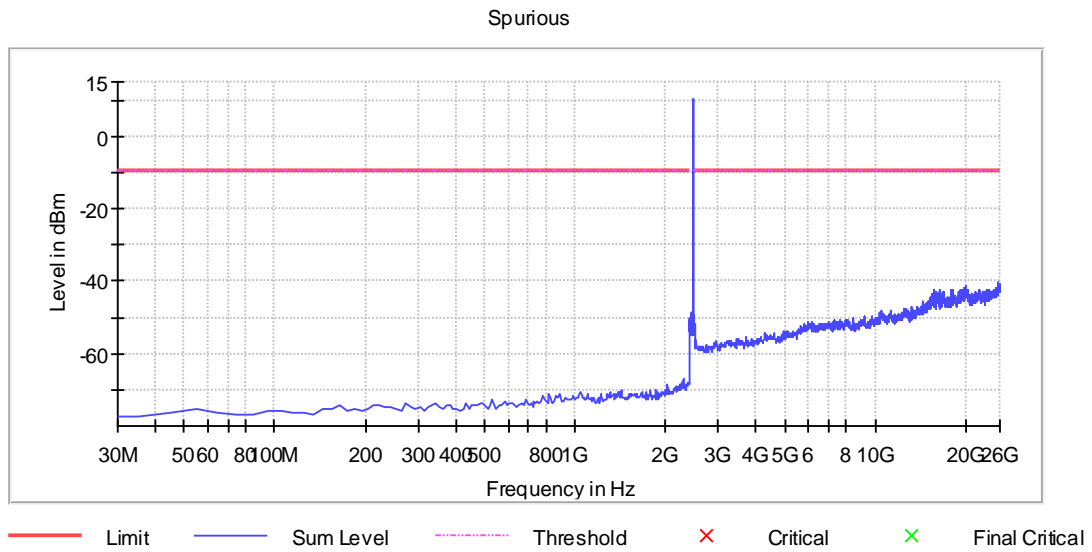


Figure 50: Conducted spurious emissions 30 MHz – 26 GHz HIGH channel (top antenna)

Table 43: Pre measurements, conducted spurious emissions HIGH channel (top antenna)

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)
25785.123353	-40.2	30.7	-9.5
25915.048768	-41.1	31.6	-9.5
25875.071717	-41.2	31.8	-9.5
25895.060242	-41.5	32.1	-9.5
20148.359222	-41.6	32.1	-9.5
25505.283999	-41.6	32.2	-9.5
25805.111878	-41.7	32.3	-9.5
25775.129091	-41.8	32.3	-9.5
25835.094666	-41.8	32.3	-9.5
19818.548555	-41.8	32.3	-9.5
25185.467595	-41.8	32.3	-9.5
20178.342010	-41.8	32.4	-9.5
19848.531343	-41.8	32.4	-9.5
25855.083192	-41.9	32.4	-9.5
19788.565767	-41.9	32.5	-9.5

Table 44: Final measurements, conducted spurious emissions HIGH channel (top antenna)

No final measurements were made; no emissions near the limit.

Transmitter Band Edge Measurement and Conducted Spurious Emissions

Table 45: Measurement settings, band edge

Setting	Instrument Value	Target Value
Start Frequency	2.40000 GHz	2.40000 GHz
Stop Frequency	2.48350 GHz	2.48350 GHz
Span	83.500 MHz	83.500 MHz
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	1670	~ 1670
Sweeptime	94.727 μ s	AUTO
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Max Stable Difference	0.44 dB	0.50 dB

Table 46: Measurement settings, spurious emissions

Setting	Instrument Value	Target Value
RBW	100.000 kHz	<= 100.000 kHz
VBW	300.000 kHz	>= 300.000 kHz
SweepPoints	238	~ 238
Sweeptime	23.700 ms	AUTO
Reference Level	-20.000 dBm	-30.000 dBm
Attenuation	10.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	3	3
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Max Stable Difference	0.00 dB	0.50 dB

6 dB Bandwidth of the Channel

Standard: ANSI C63.10-2013
Tested by: HEM
Date: 11 January 2021
Temperature: 21.9 °C
Humidity: 25.5 %RH
Barometric pressure: 1005.1 mbar

FCC Rule: 15.247(a)(2)
RSS-247 5.2(a)

Results:

Table 47: 6 dB bandwidth test results (bottom antenna)

Channel	6 dB BW [kHz]	Minimum limit [kHz]
Low	1980.198	500
Mid	1980.198	
High	1980.198	

Table 48: 6 dB bandwidth test results (top antenna)

Channel	6 dB BW [kHz]	Minimum limit [kHz]
Low	1980.198	500
Mid	1980.198	
High	1980.198	

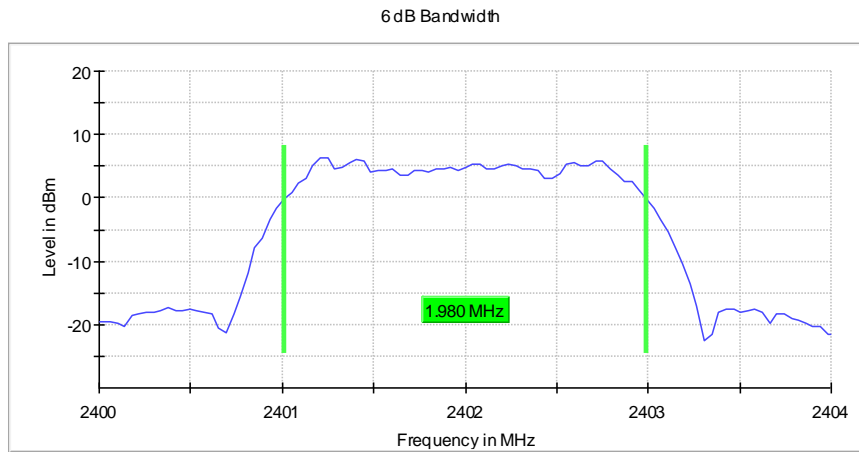


Figure 51: 6 dB bandwidth, channel LOW (bottom antenna)

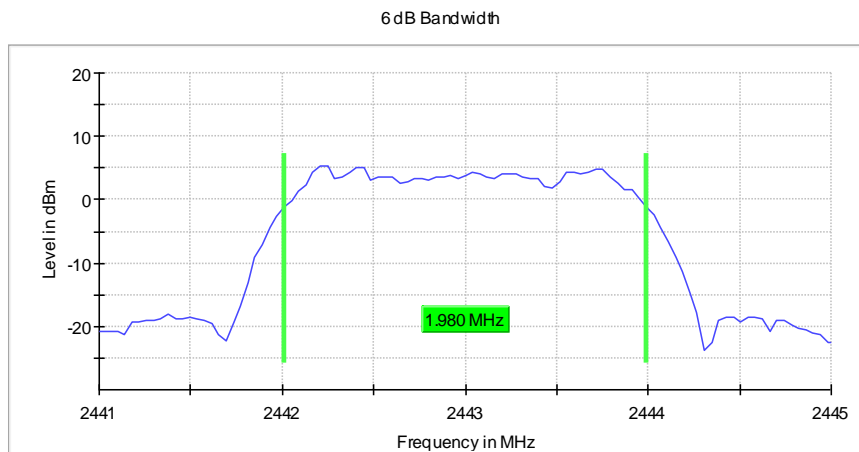


Figure 52: 6 dB bandwidth, channel MID (bottom antenna)

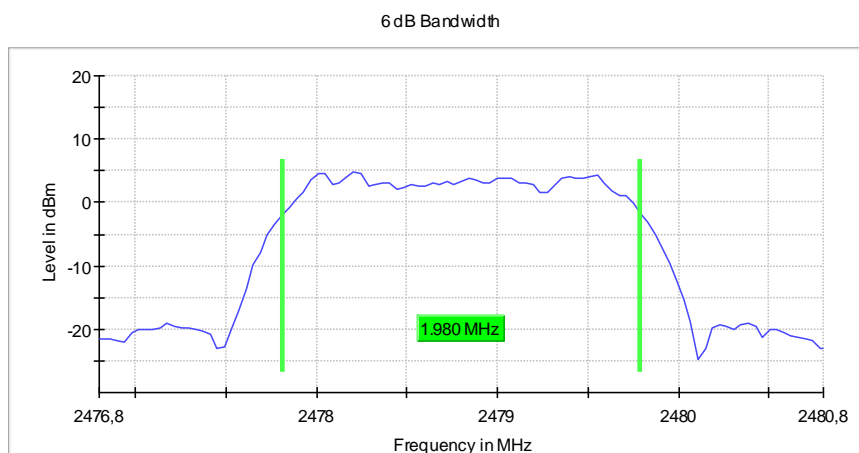


Figure 53: 6 dB bandwidth, channel HIGH (bottom antenna)

6 dB Bandwidth of the Channel

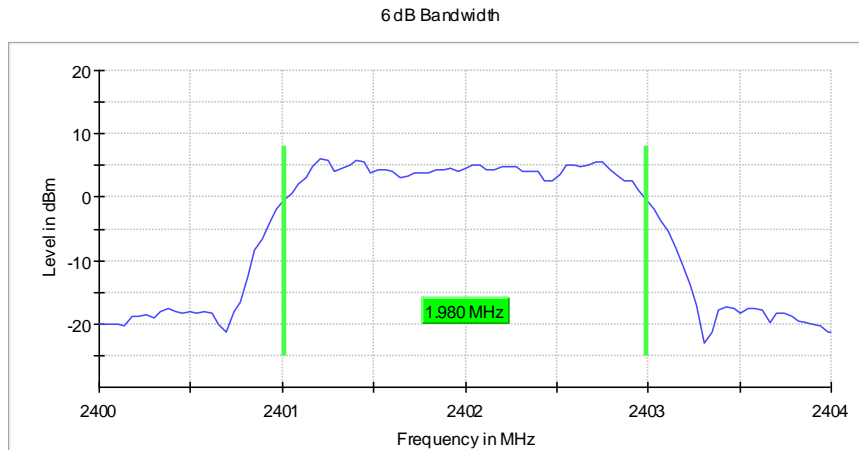


Figure 54: 6 dB bandwidth, channel LOW (top antenna)

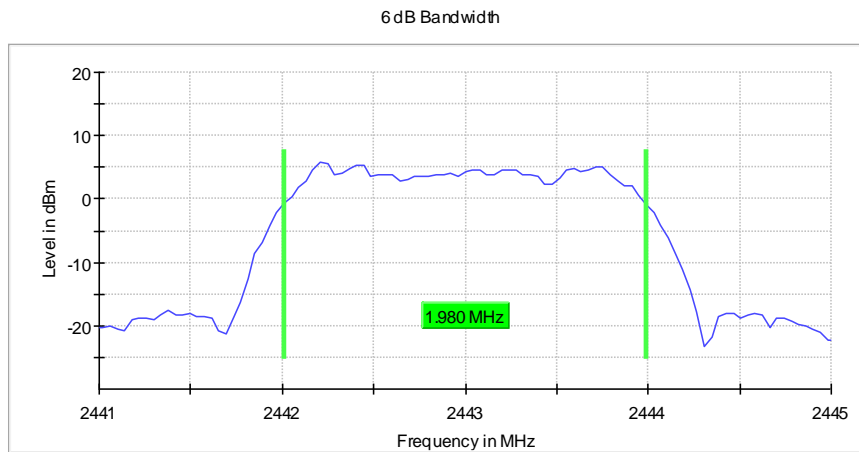


Figure 55: 6 dB bandwidth, channel MID (top antenna)

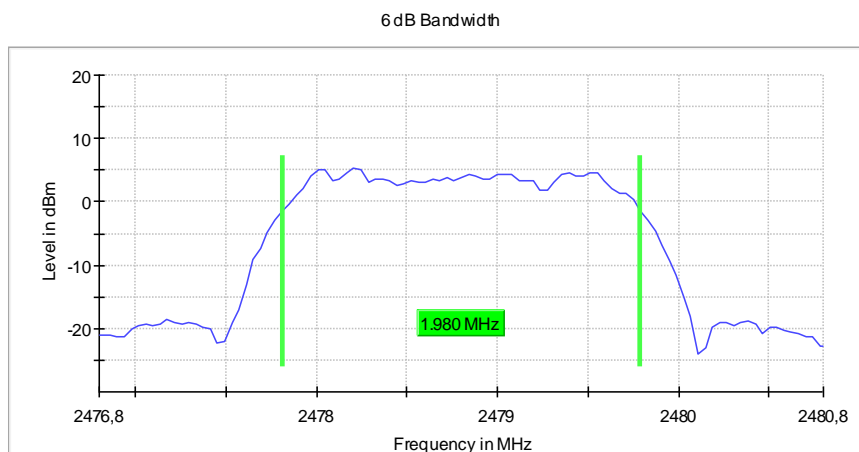


Figure 56: 6 dB bandwidth, channel HIGH (top antenna)

Table 49: Measurement settings, 6 dB bandwidth

Setting	Instrument Value	Target Value
Span	4.000 MHz	4.000 MHz
RBW	100.000 kHz	~ 100.000 kHz
VBW	300.000 kHz	~ 300.000 kHz
SweepPoints	101	~ 80
SweepTime	18.938 μ s	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	9 / max. 150	max. 150
Stable	5 / 5	5
Max Stable Difference	0.11 dB	0.50 dB

Power Spectral Density

Standard: ANSI C63.10-2013
Tested by: HEM
Date: 11 January 2021
Temperature: 21.9 °C
Humidity: 25.5 %RH
Barometric pressure: 1005.1 mbar

FCC Rule: 15.247(e)
RSS-247 5.2(b)

Results:

Table 50: Power spectral density test results (bottom antenna)

Channel	PSD dBm/10 kHz	Maximum limit [dBm/3 kHz]
Low	-1.510	+8.00
Mid	-2.434	
High	-2.809	

Table 51: Power spectral density test results (top antenna)

Channel	PSD dBm/10 kHz	Maximum limit [dBm/3 kHz]
Low	-1.774	+8.00
Mid	-2.078	
High	-2.372	

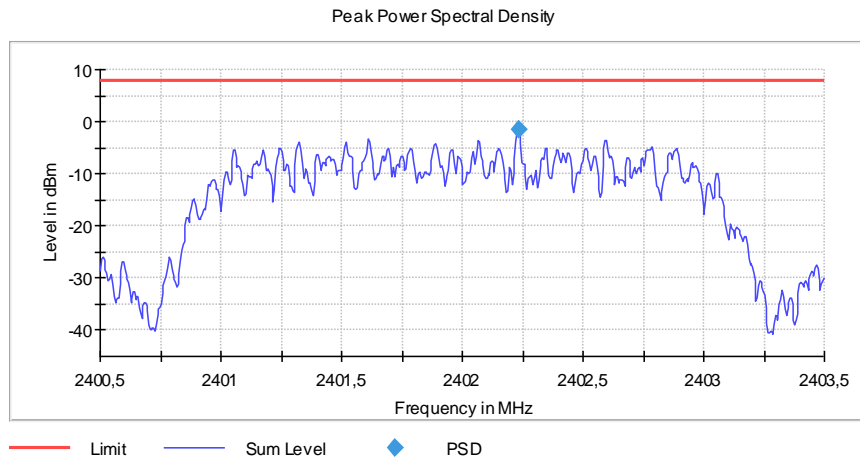


Figure 57: Power spectral density, channel LOW (bottom antenna)

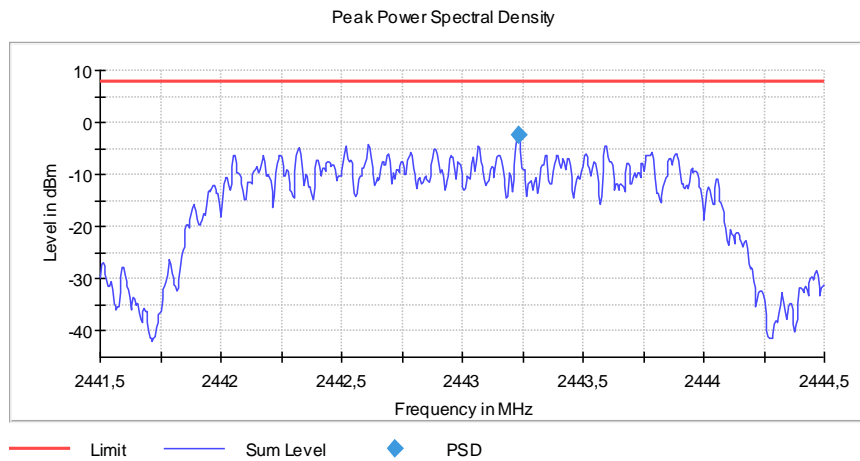


Figure 58: Power spectral density, channel MID (bottom antenna)

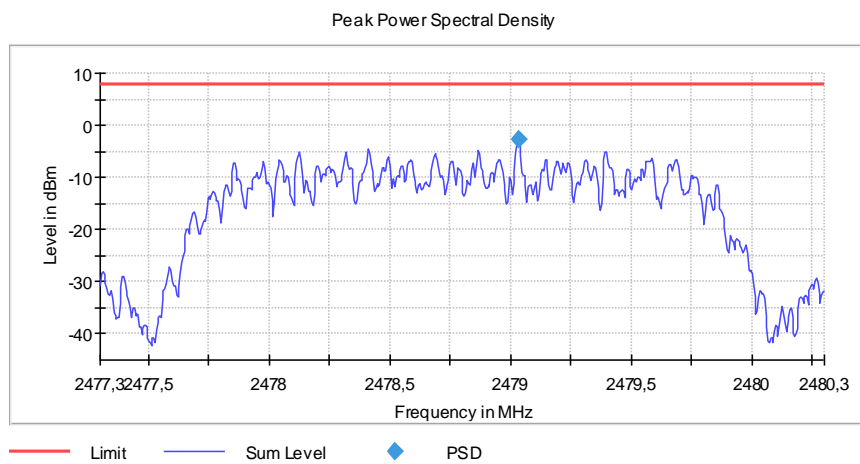


Figure 59: Power spectral density, channel HIGH (bottom antenna)

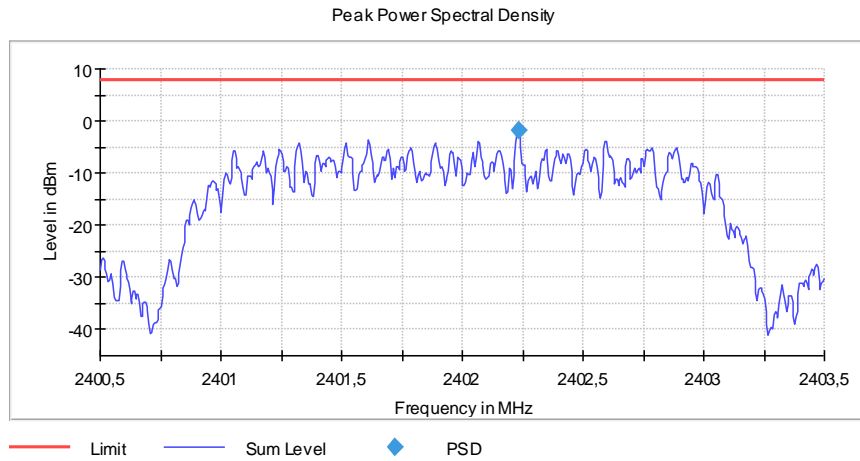


Figure 60: Power spectral density, channel LOW (top antenna)

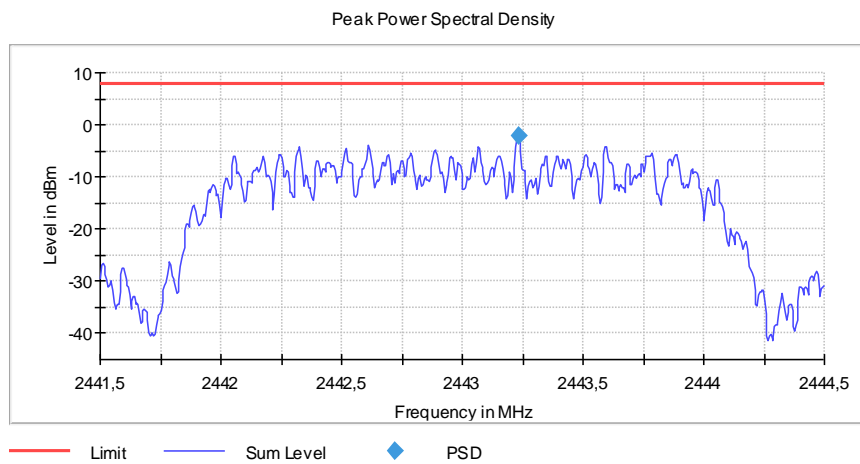


Figure 61: Power spectral density, channel MID (top antenna)

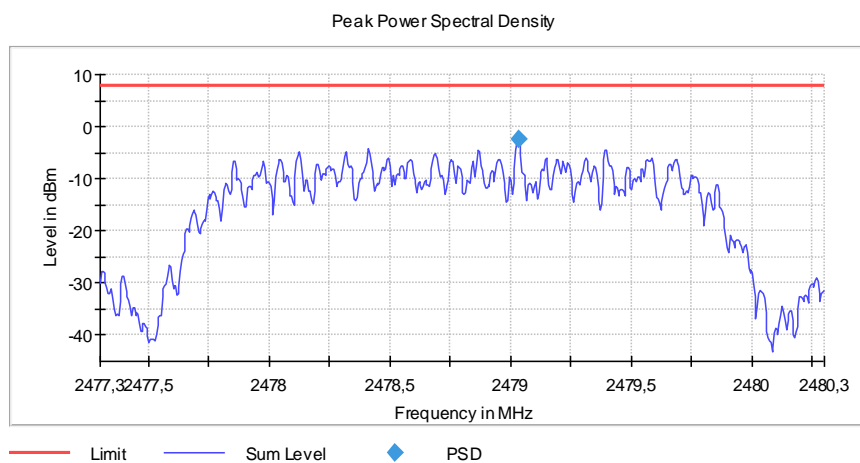


Figure 62: Power spectral density, channel HIGH (top antenna)

Table 52: Measurement settings, Power spectral density

Setting	Instrument Value	Target Value
Span	3.000 MHz	3.000 MHz
RBW	10.000 kHz	<= 10.000 kHz
VBW	30.000 kHz	>= 30.000 kHz
SweepPoints	600	~ 600
Sweptime	3.000 ms	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Max Stable Difference	0.36 dB	0.50 dB

99% Occupied Bandwidth

Standard: RSS-GEN
Tested by: HEM
Date: 11 January 2021
Temperature: 21.9 °C
Humidity: 25.5 %RH
Barometric pressure: 1005.1 mbar

RSS-GEN 6.7

Results

Table 53: 99% occupied bandwidth test results (bottom antenna)

Channel	99 % BW [MHz]	Limit
Low	2.190000	-
Mid	2.190000	-
High	2.190000	-

Table 54: 99% occupied bandwidth test results (top antenna)

Channel	99 % BW [MHz]	Limit
Low	2.190000	-
Mid	2.190000	-
High	2.180000	-

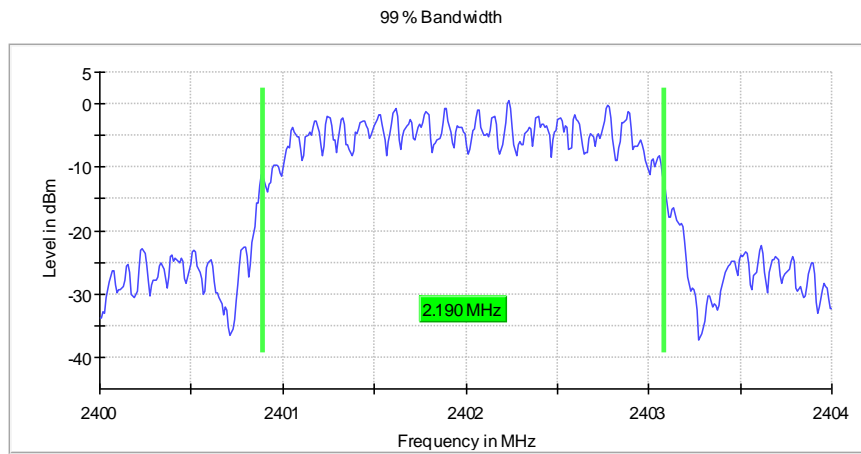


Figure 63: 99% OBW, channel LOW (bottom antenna)

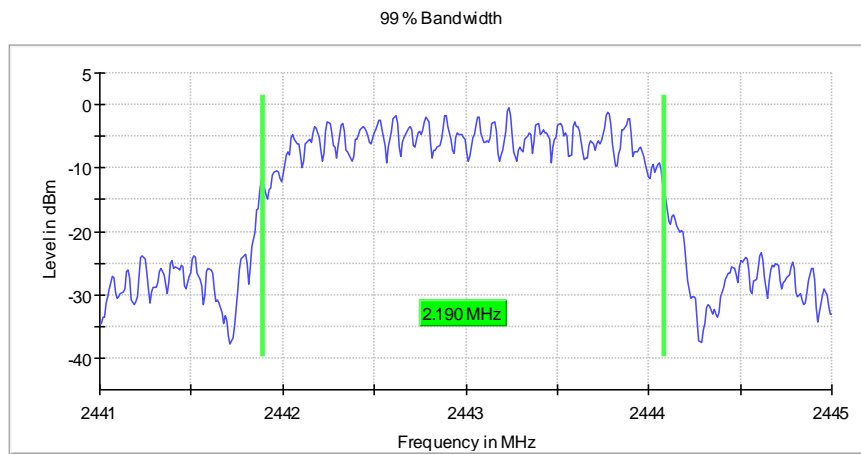


Figure 64: 99% OBW, channel MID (bottom antenna)

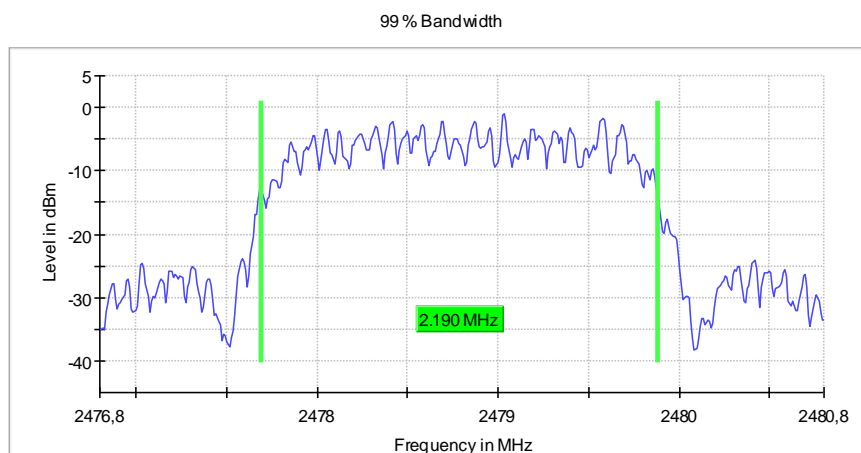


Figure 65: 99% OBW, channel HIGH (bottom antenna)

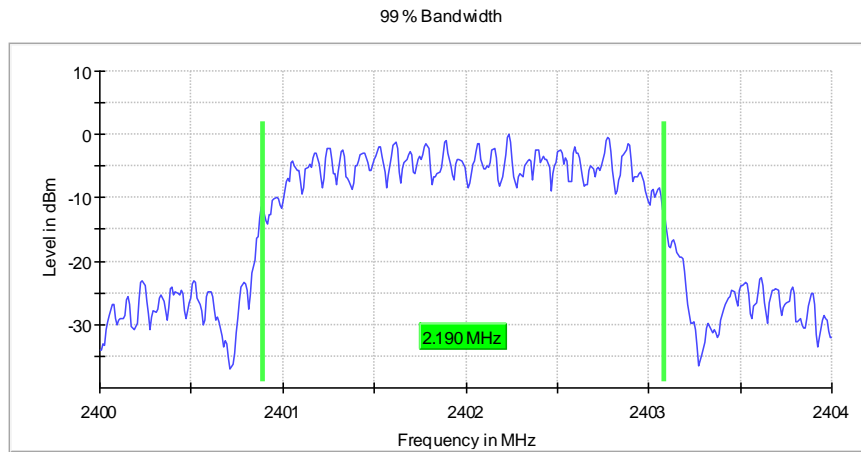


Figure 66: 99% OBW, channel LOW (top antenna)

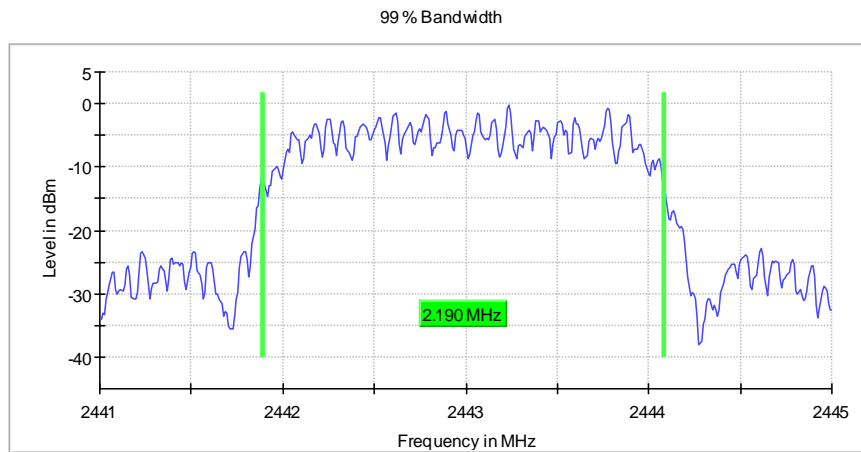


Figure 67: 99% OBW, channel MID (top antenna)

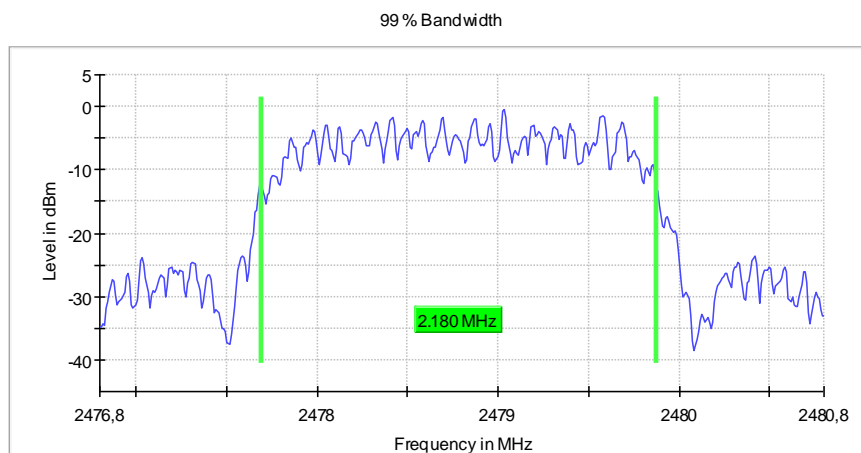


Figure 68: 99% OBW, channel HIGH (top antenna)

Table 55: Measurements settings, 99% occupied bandwidth

Setting	Instrument Value	Target Value
Span	4.000 MHz	4.000 MHz
RBW	20.000 kHz	>= 20.000 kHz
VBW	100.000 kHz	>= 60.000 kHz
SweepPoints	400	~ 400
Sweeptime	94.824 µs	AUTO
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	AUTO
Detector	MaxPeak	MaxPeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	AUTO
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Max Stable Difference	0.21 dB	0.30 dB

TEST EQUIPMENT

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
ANTENNA	EMCO	3160-09, emi 18-26.5GHz	inv. 7294	2020-02-20	2021-02-20
ANTENNA	EMCO	3117, emi 1-18GHz	inv. 7293	2020-03-11	2022-03-11
ANTENNA	ROHDE & SCHWARZ	HFH2-Z2 , 335.4711.52	inv. 8013	2020-10-28	2022-10-28
ANTENNA	SCHWARZBECK	VULB 9168	inv. 8911	2020-11-04	2022-11-04
ANTENNA MAST	MATURO	TAM 4.0E	inv. 10181	NCR	NCR
ATTENUATOR	PASTERNAK	10 dB, DC-40 GHz	sn:A1	2019-04-01	2021-04-01
ATTENUATOR	PASTERNAK	PE 7004-4 (4dB)	inv. 10126	2019-04-01	2021-04-01
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW26	inv. 10679	2020-07-20	2021-07-20
FILTER	WAINWRIGHT	HP, WHKX4.0/18G-10SS	inv:10403	2019-04-01	2021-04-01
LISN	ROHDE & SCHWARZ	ENV216	inv. 9611	2020-03-03	2021-03-03
LISN	ROHDE & SCHWARZ	ESH3-Z5	inv. 8019	2020-05-19	2021-05-19
MAST & TURNTABLE CONTROLLER	MATURO	NCD	inv. 10183	NCR	NCR
OSP BASE UNIT	ROHDE & SCHWARZ	OSP120	inv:10882	2019-02-28	2021-02-28
OSP-B157W 8 PORT	ROHDE & SCHWARZ	OSP-B157W8	inv:10883	2019-02-06	2021-02-06
OSP-B157WX	ROHDE & SCHWARZ	OSP-B157WX	inv:10884	2019-02-13	2021-02-13
POWER SUPPLY	CALIFORNIA INSTR.	5001 iX Series II	inv. 7826	NCR	NCR
RF PREAMPLIFIER	CIAO	CA118-3123	inv. 10278	2020-10-09	2021-10-09
RF PREAMPLIFIER	CIAO	CA1840-5019	inv. 10593	2020-10-09	2021-10-09
SPECTRUM ANALYZER	ROHDE & SCHWARZ	FSV40	inv:10881	2020-06-10	2021-09-06
TEST SOFTWARE	ROHDE & SCHWARZ	EMC-32	-	-	-
TURNTABLE	MATURO	DS430 UPGRADED	inv. 10182	NCR	NCR

NCR = No calibration required

END OF REPORT