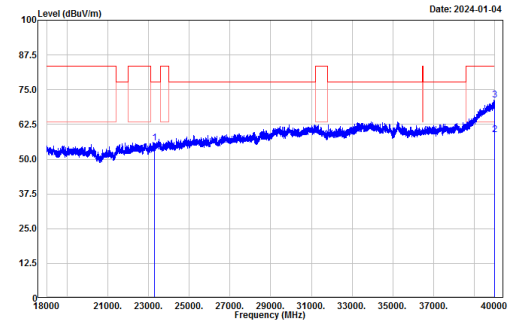
5825 MHz

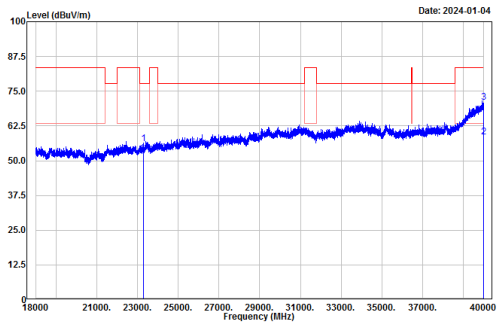
Horizontal



Site : LK-966A
Condition: 1m horizontal
Mode : N20 TX-5825MHz
Note : Temp/RH:18.1°C/62%
Tester: Bruce

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	23300.000	55.81	77.70	-21.89	32.92	22.89	Peak
2	40000.000	58.88	63.50	-4.62	23.84	35.04	Average
3	40000.000	71.24	83.50	-12.26	36.20	35.04	Peak

Vertical



Site : LK-966A
Condition: 1m vertical
Mode : N20 TX-5825MHz
Note : Temp/RH:18.1°C/62%
Tester: Bruce

	Freq	Level	Limit Line	Over Limit	Read Level	Factor	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	
1	23300.000	56.21	77.70	-21.49	33.32	22.89	Peak
2	40000.000	58.67	63.50	-4.83	23.63	35.04	Average
3	40000.000	71.03	83.50	-12.47	35.99	35.04	Peak

Note:

Level = Reading + Factor.

Over Limit = Level – Limit.

Factor = Antenna Factor + Cable Loss – Amplifier Gain.

The other spurious emission which is 20dB to the limit or in noise floor was not recorded.

9 FCC §15.407(a)(e) – Emission Bandwidth

9.1 Applicable Standard

As per FCC §15.407(a): The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

As per FCC §15.407(e): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

9.2 Test Procedure

According to ANSI C63.10-2013 Section 12.4.2&6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
The following procedure shall be used for measuring 99% power bandwidth:
a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
d) Step a) through step c) might require iteration to adjust within the specified range.
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

9.3 Test Results

Test mode: Transmitting

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	Result
UNII-1	802.11a	36	5180	20.04	PASS
		40	5200	19.88	PASS
		48	5240	19.72	PASS
	802.11n 20	36	5180	21.28	PASS
		40	5200	21.24	PASS
		48	5240	21.24	PASS

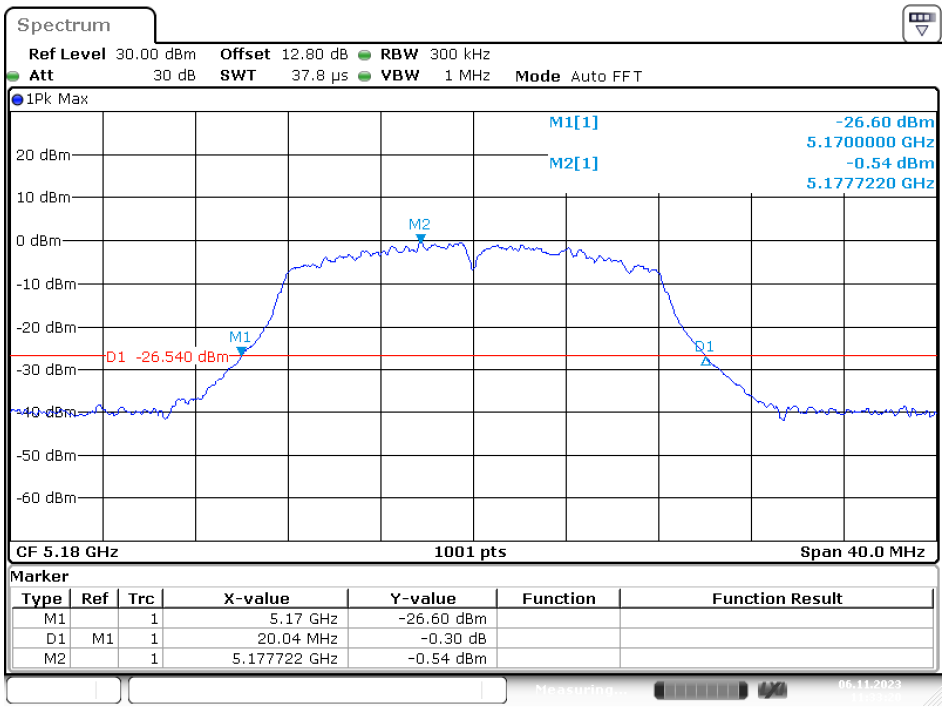
UNII Band	Mode	Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	Limit (kHz)	Result
UNII-3	802.11a	149	5745	15.08	≥500	PASS
		157	5785	15.08	≥500	PASS
		165	5825	15.08	≥500	PASS
	802.11n 20	149	5745	15.08	≥500	PASS
		157	5785	15.08	≥500	PASS
		165	5825	15.08	≥500	PASS

Please refer to the following plots

Transmitting Mode:

UNII-1 Band I / BW 26dBc
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



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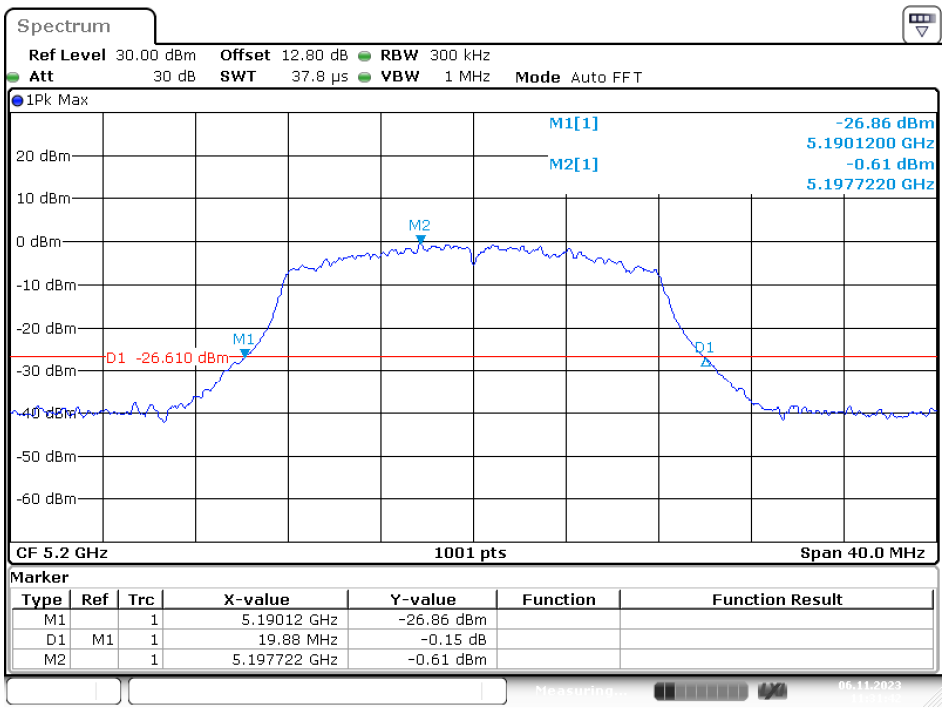
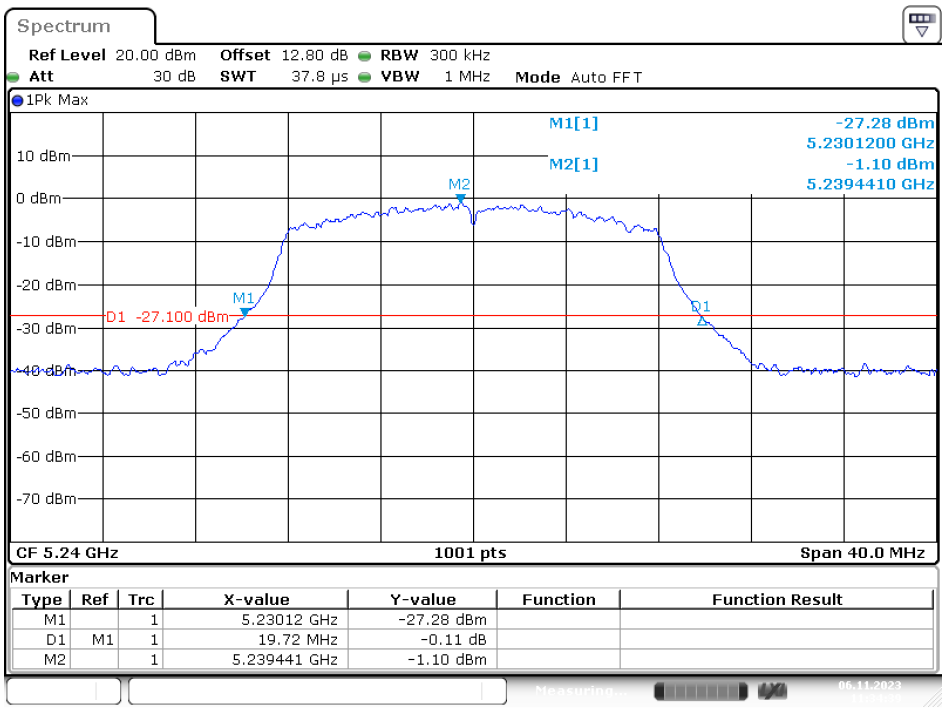
5200MHz



Date: 6.NOV.2023 11:31:42

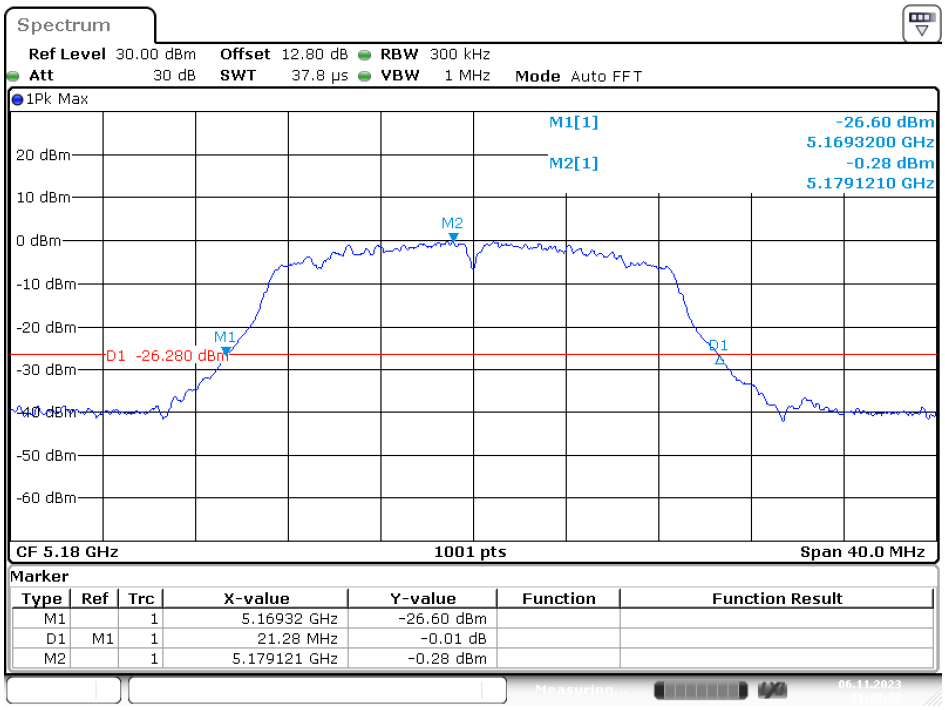
5240MHz



Date: 6.NOV.2023 11:34:40

IEEE 802.11n 20 Mode / 5150 ~ 5250MHz

5180MHz



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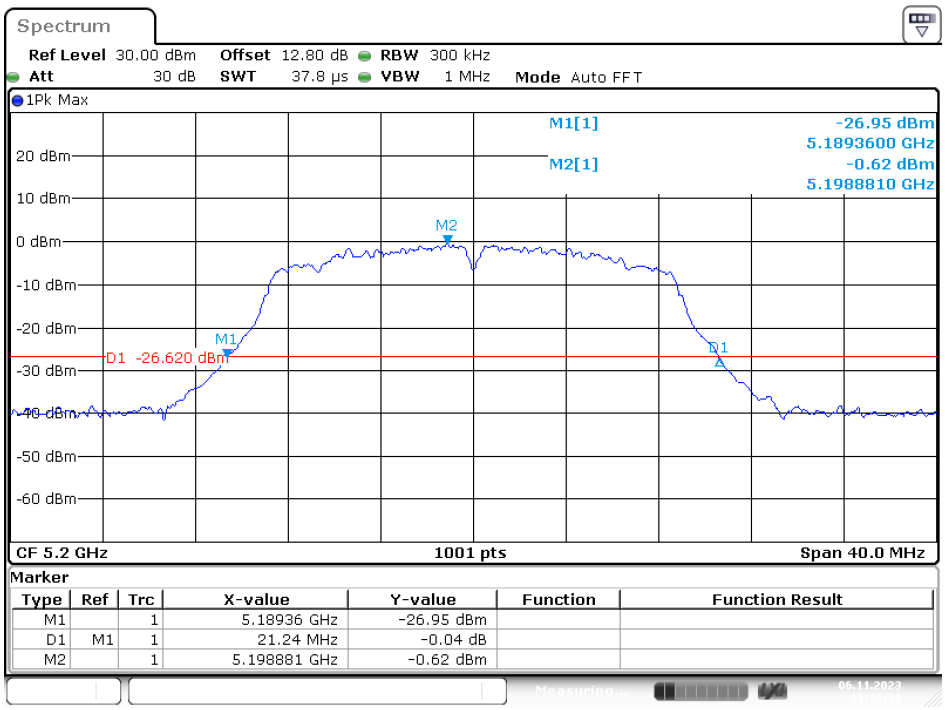
5200MHz



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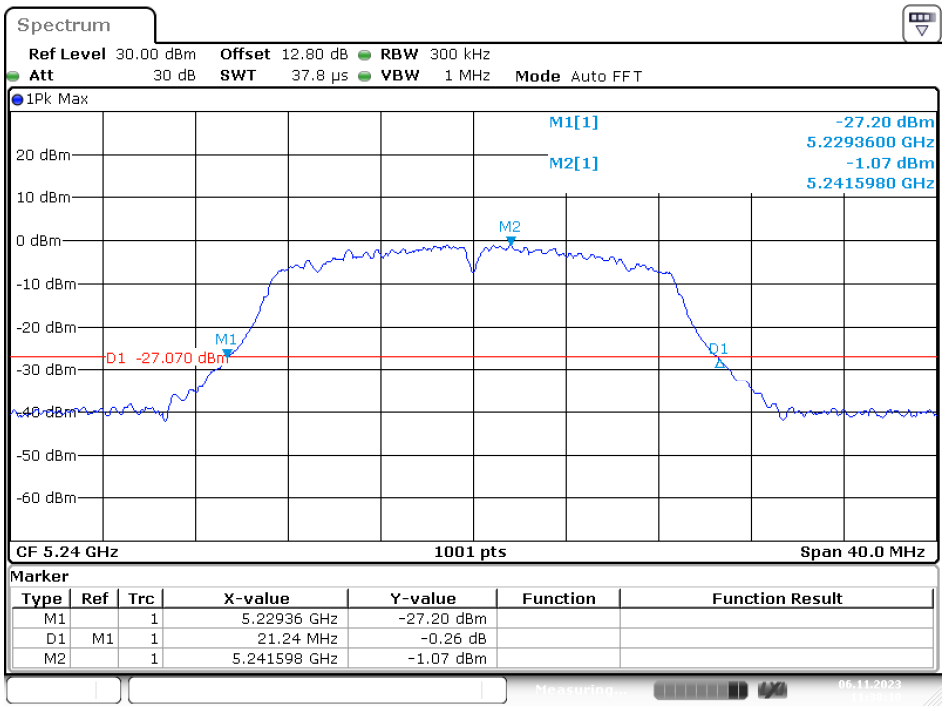
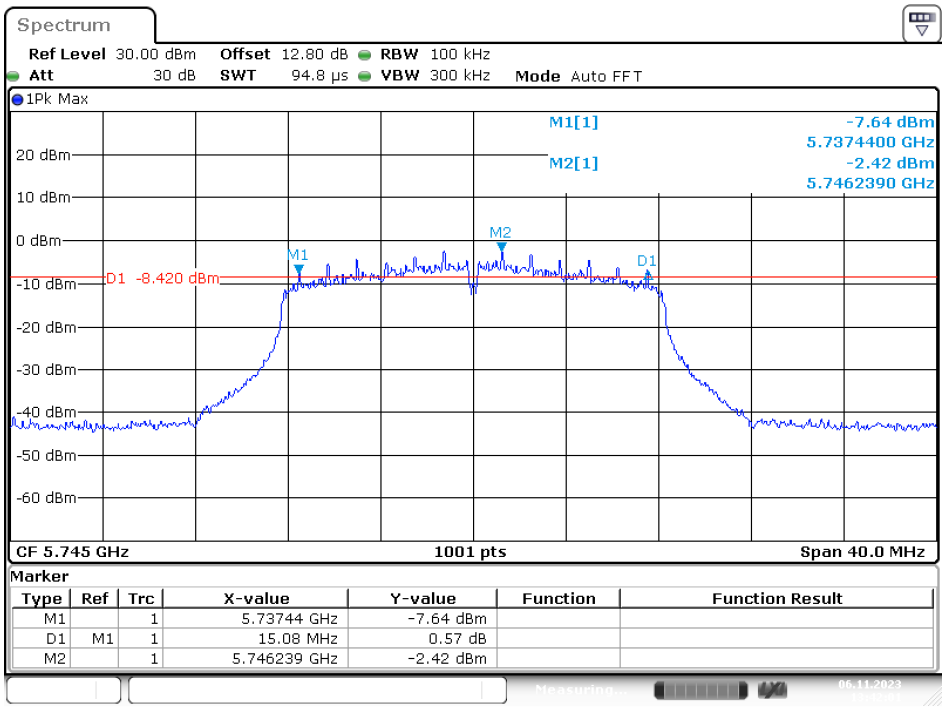
5240MHz



Date: 6.NOV.2023 11:38:10

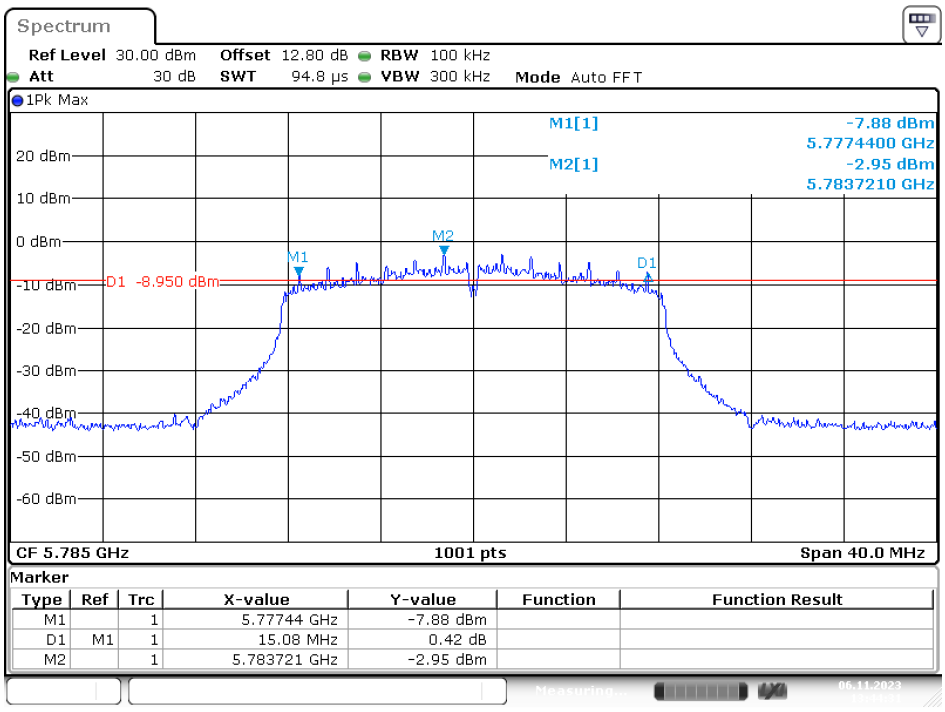
UNII-3 Band IV / BW 6dBc
IEEE 802.11a Mode / 5725 ~ 5850MHz

5745MHz



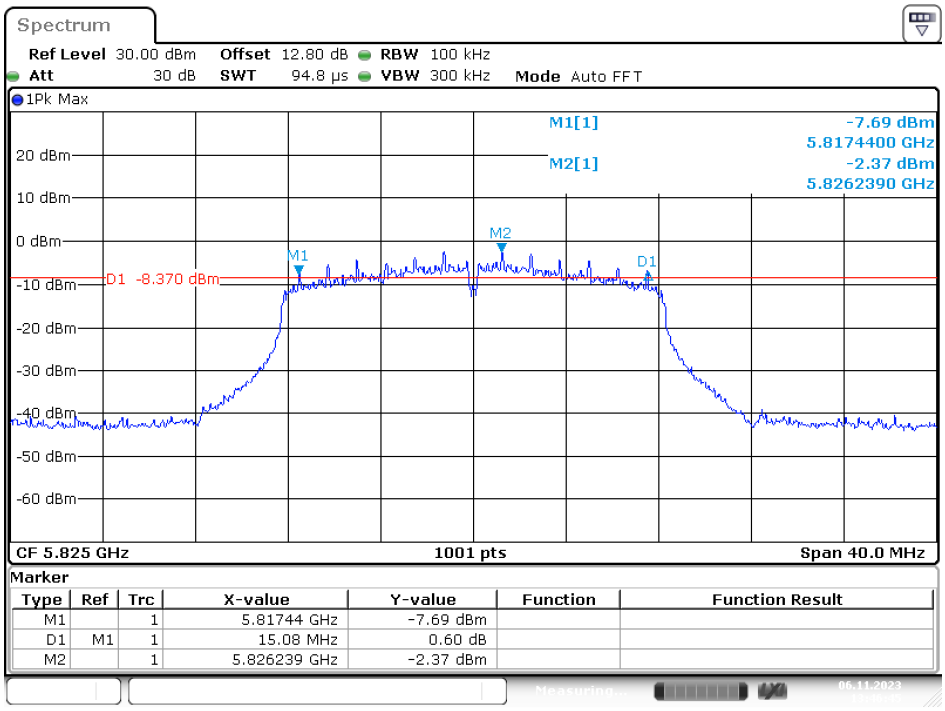
Date: 6.NOV.2023 13:42:01

5785MHz



Date: 6.NOV.2023 13:44:32

5825MHz



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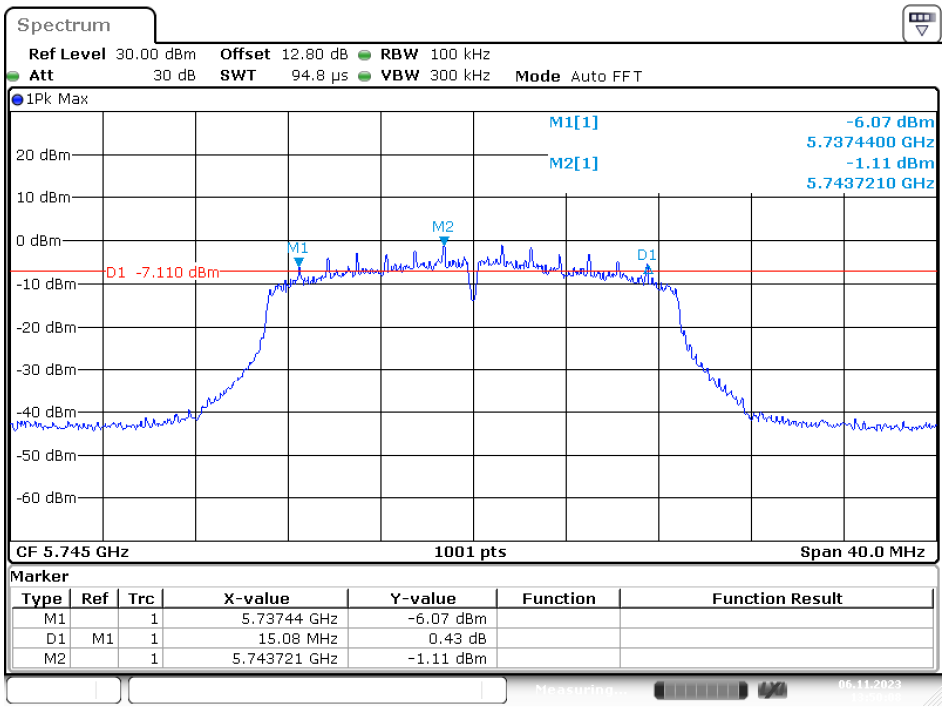
IEEE 802.11n HT20 Mode / 5725 ~ 5850MHz

5745MHz



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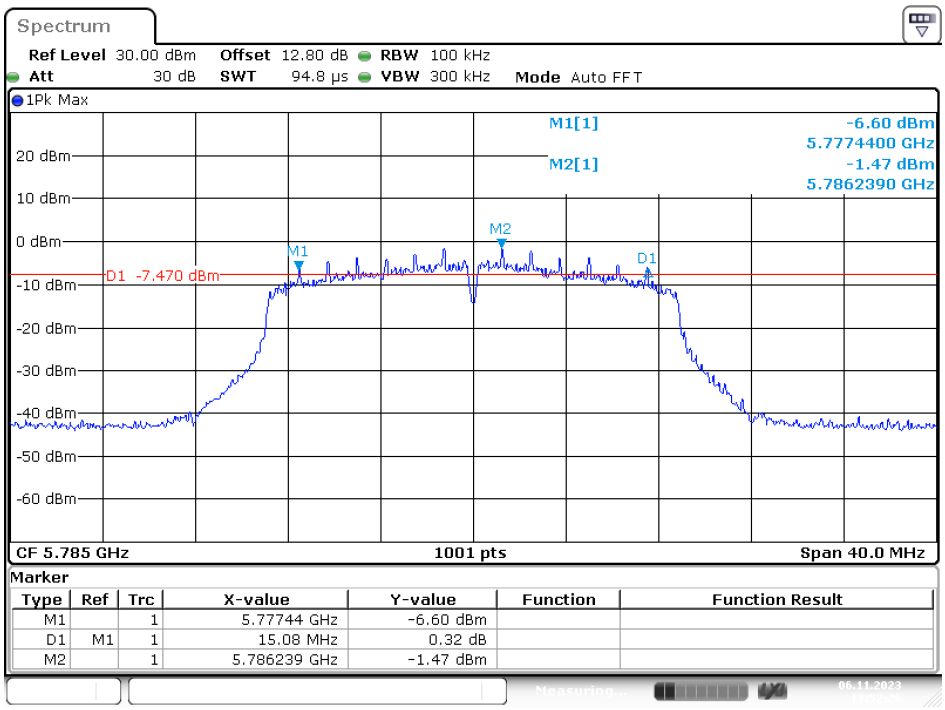
5785MHz



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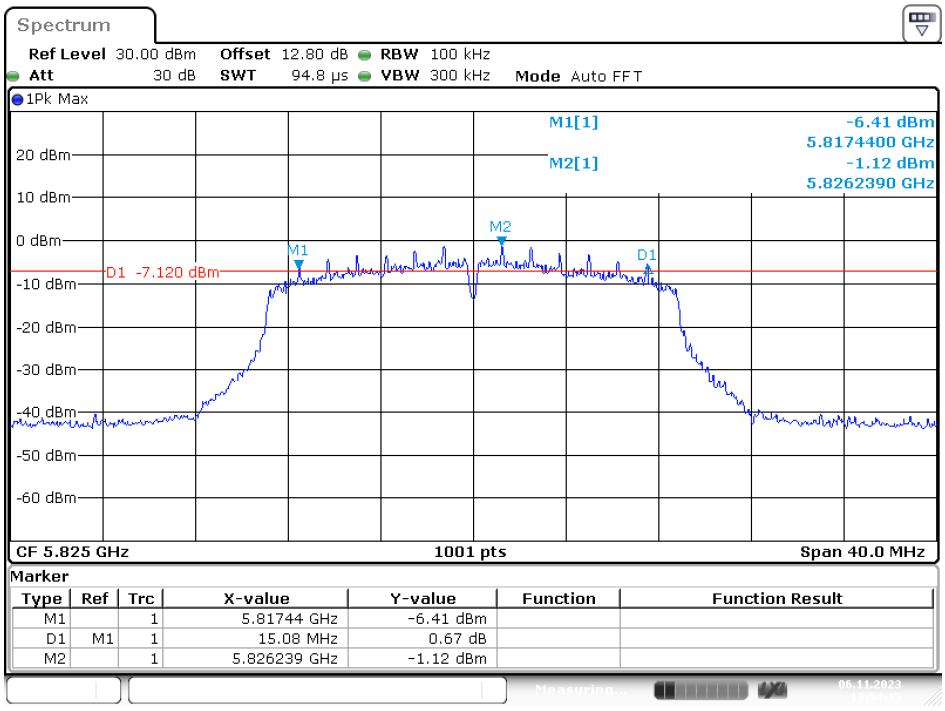
5825MHz



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10 FCC §15.407(a) – Maximum Output Power

10.1 Applicable Standard

According to FCC §15.407(a):

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over thefrequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral densityshall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gaingreater than 6 dBi are used, both the maximum conducted output power and the maximum powerspectral density shall bereduced by the amount in dB that the directional gain of the antennaexceeds 6 dBi

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

10.2 Test Procedure

The use Power Meter

1. Place the EUT on a bench and set it in transmitting mode.

2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power sensor.

10.3 Test Results

Test Mode: Transmitting

5150-5250MHz

Test Modes	Channel	Frequency (MHz)	Maximum Conducted Average Output Power (dBm)	Limit (dBm)
802.11a	36	5180	9.25	24
	40	5200	9.31	24
	48	5240	8.69	24
802.11n 20	36	5180	9.48	24
	40	5200	9.44	24
	48	5240	8.72	24

5725-5850MHz

Test Modes	Channel	Frequency (MHz)	Maximum Conducted Average Output Power (dBm)	Limit (dBm)
802.11a	149	5745	8.43	30
	157	5785	8.00	30
	165	5825	8.37	30
802.11n 20	149	5745	9.82	30
	157	5785	9.44	30
	165	5825	9.85	30

11 FCC §15.407(a) – Power Spectral Density

11.1 Applicable Standard

According to FCC §15.407(a):

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

11.2 Test Procedure

The measurements are base on FCC KDB 789033 D02 General UNII Test Procedyres New Rules v02r01: Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices section F: Maximum power spectral density.

Duty cycle <98%, duty cycle variations are less than ±2%

Method SA-2 was used.

11.3 Test Results

Test Mode: Transmitting

5150-5250MHz

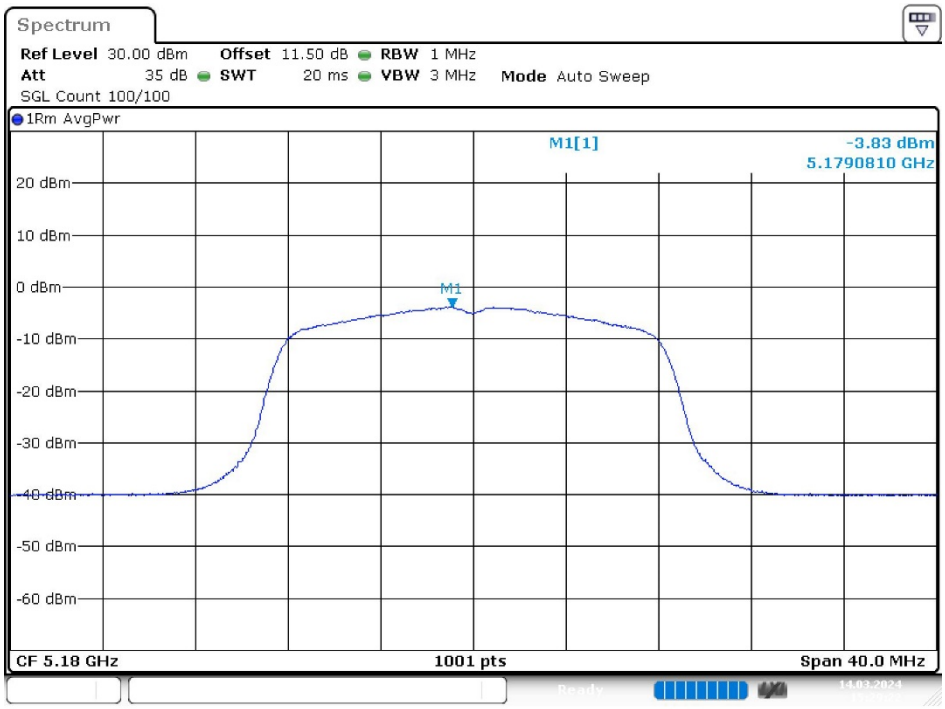
UNII Band	Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Duty Factor (dB)	Power Spectral Density with duty factor (dBm/MHz)	Limit (dBm/MHz)
UNII-1	802.11a	36	5180	-3.83	1.02	-2.81	11
		40	5200	-3.45	1.02	-2.43	11
		48	5240	-4.18	1.02	-3.16	11
	802.11n 20	36	5180	-3.37	1.08	-2.29	11
		40	5200	-3.27	1.08	-2.19	11
		48	5240	-4.04	1.08	-2.96	11

5725-5850MHz

UNII Band	Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/500kHz)	Duty Factor (dB)	Power Spectral Density with duty factor (dBm/500kHz)	Limit (dBm/500kHz)
UNII-3	802.11a	149	5745	-6.36	1.02	-5.34	30
		157	5785	-7.19	1.02	-6.17	30
		165	5825	-6.20	1.02	-5.18	30
	802.11n 20	149	5745	-5.05	1.08	-3.97	30
		157	5785	-5.91	1.08	-4.83	30
		165	5825	-5.44	1.08	-4.36	30

UNII-1 Band I / PSD
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



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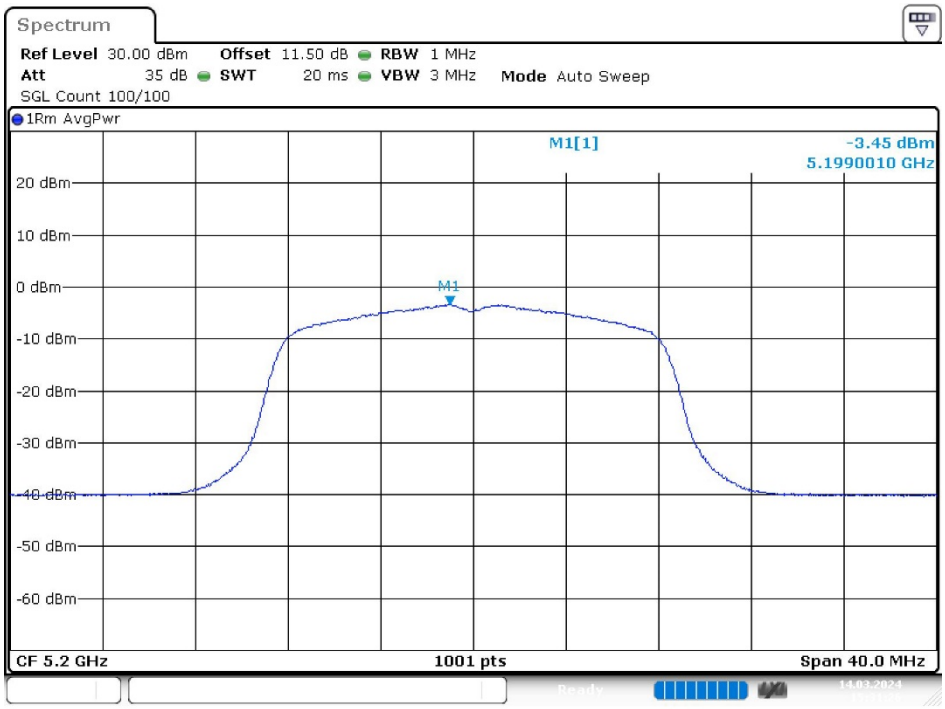
5200MHz



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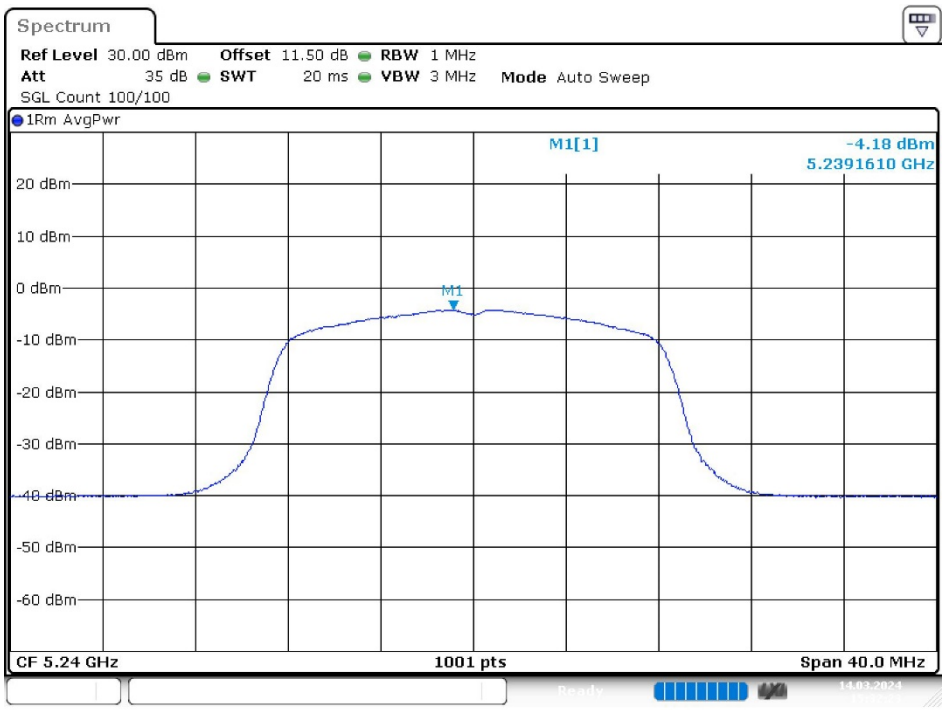
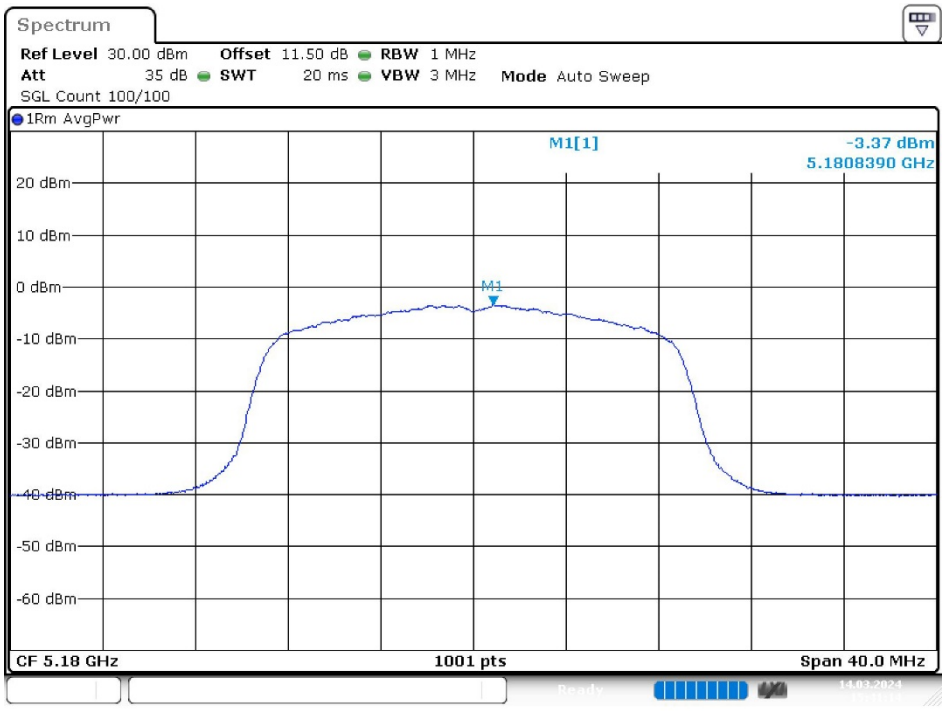
5240MHz

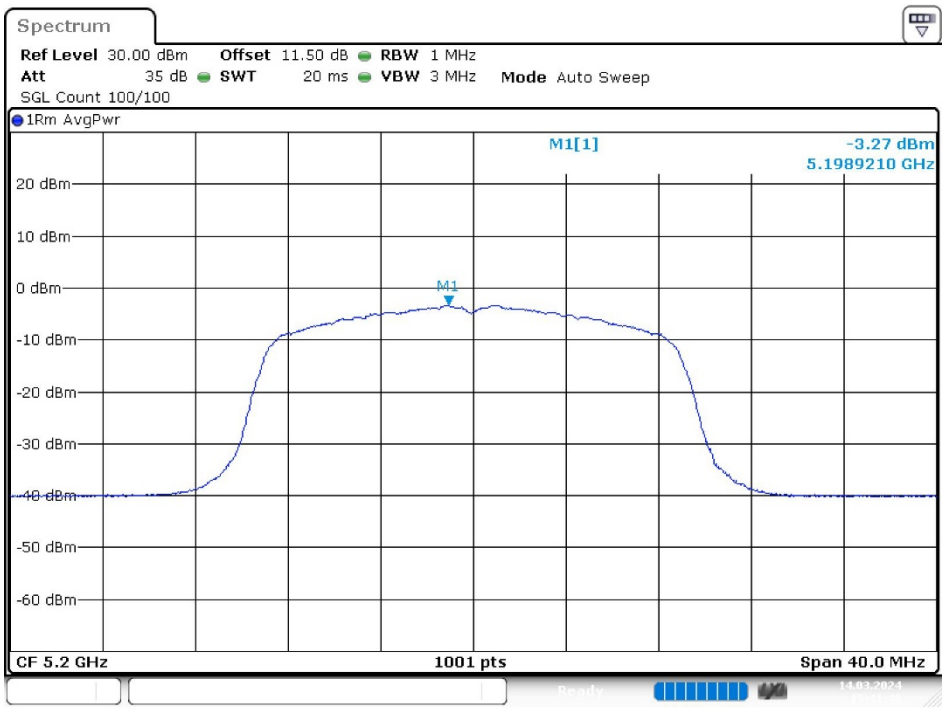


IEEE 802.11n 20 Mode / 5150 ~ 5250MHz

5180MHz



5200MHz



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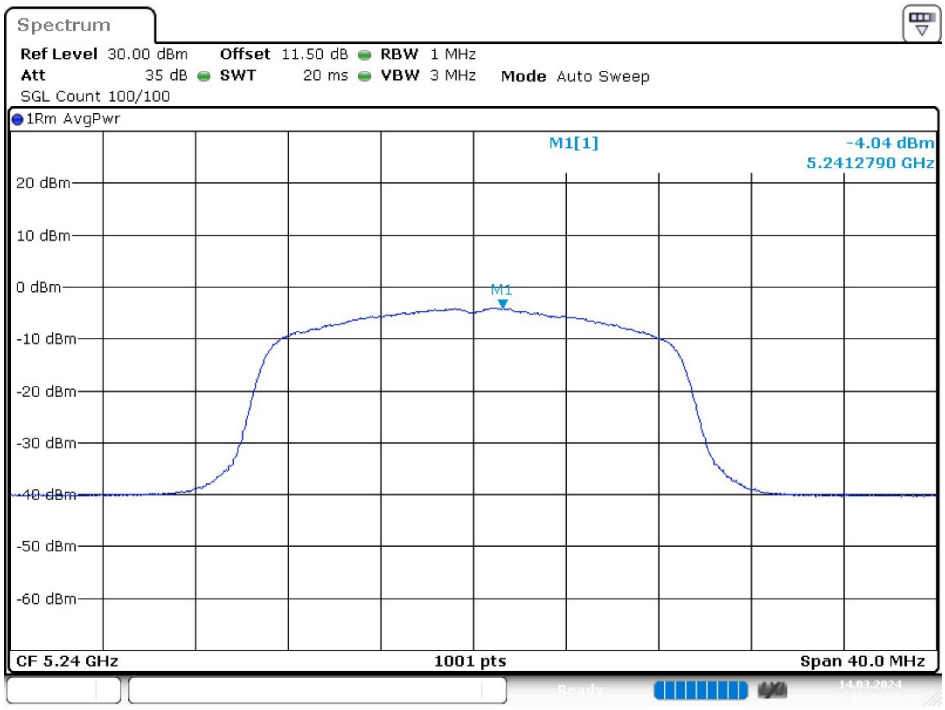
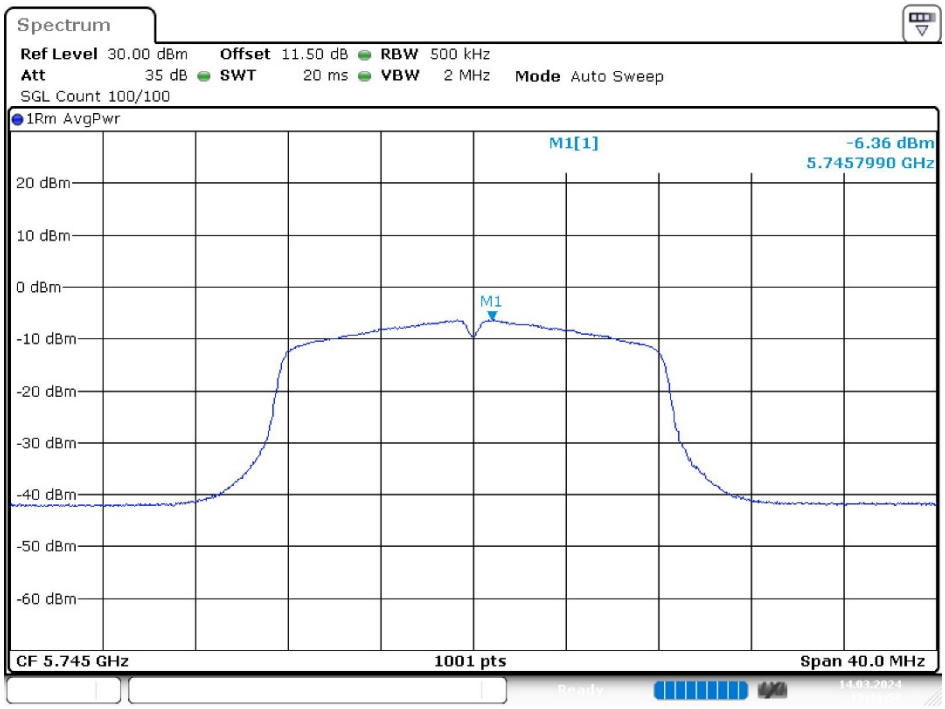
5240MHz



Date: 14.MAR.2024 15:42:25

UNII-3 Band IV / PSD
IEEE 802.11a Mode / 5725 ~ 5850MHz

5745MHz



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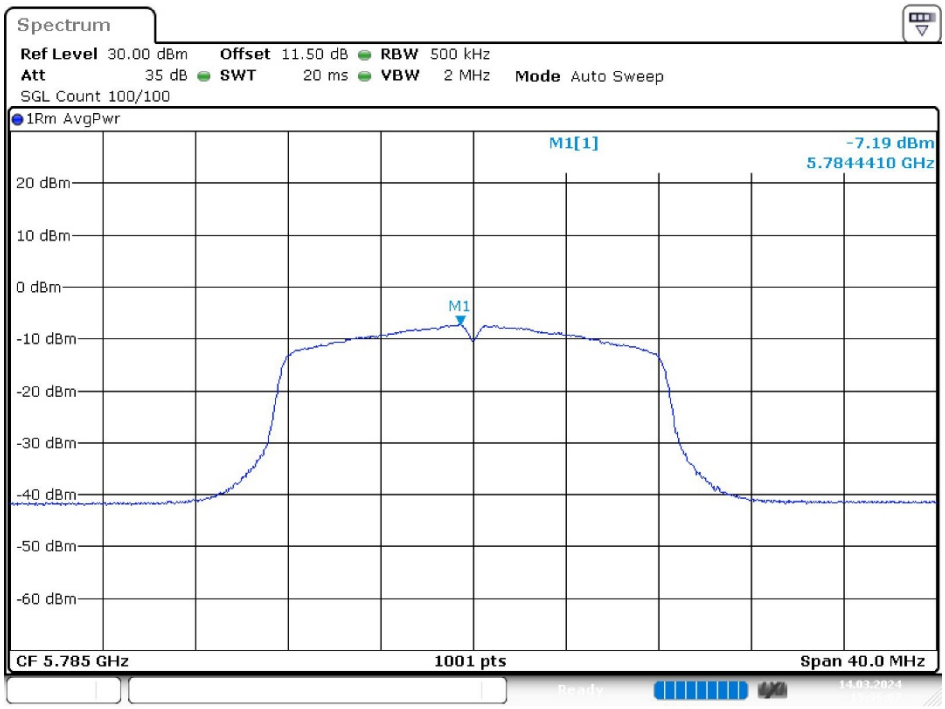
5785MHz



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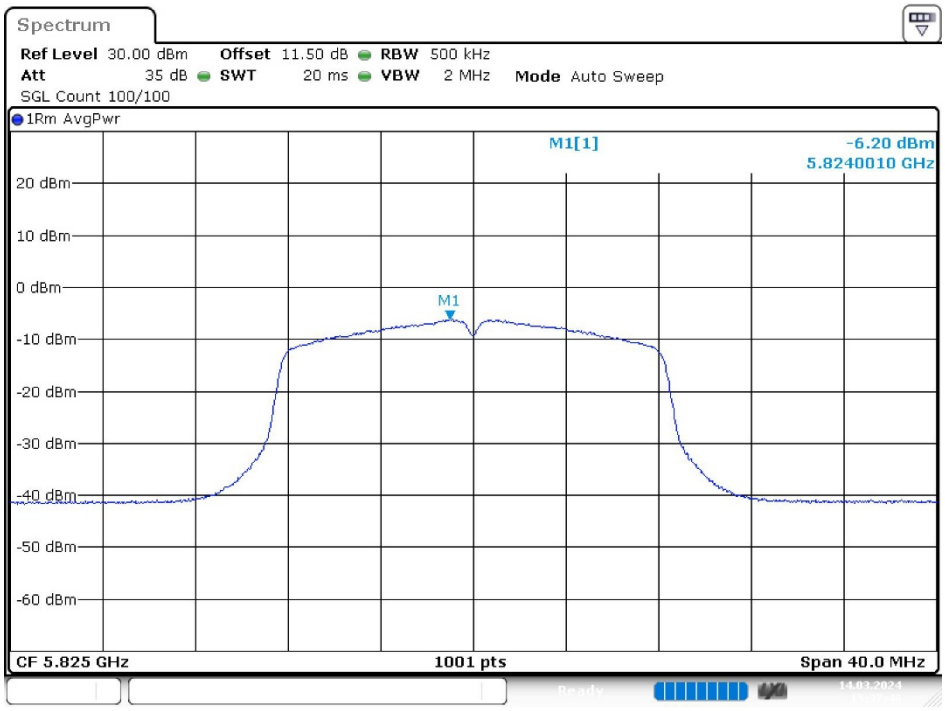
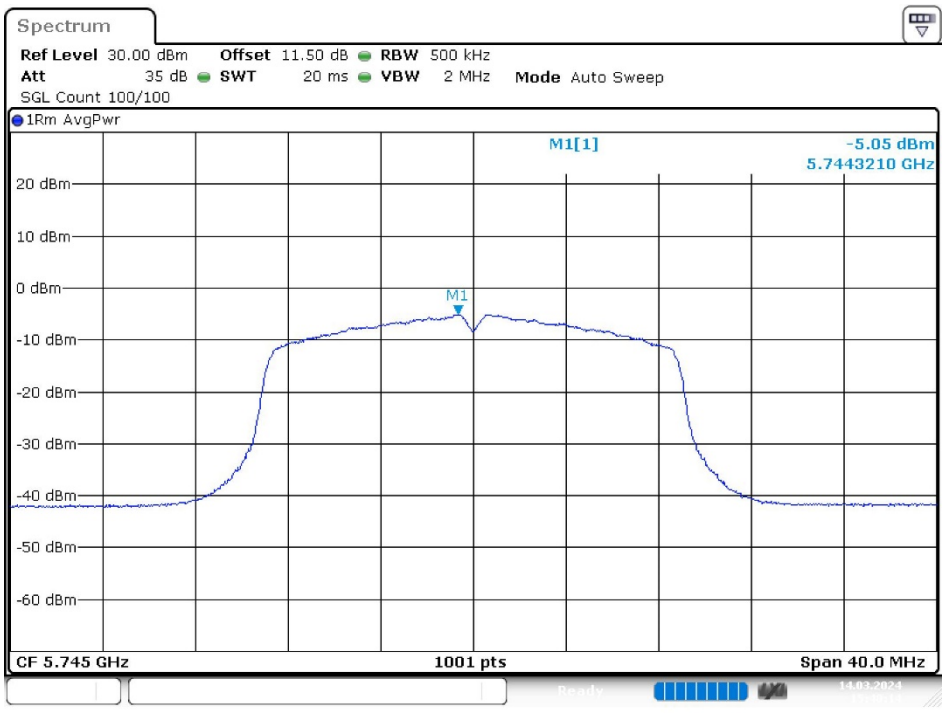
5825MHz

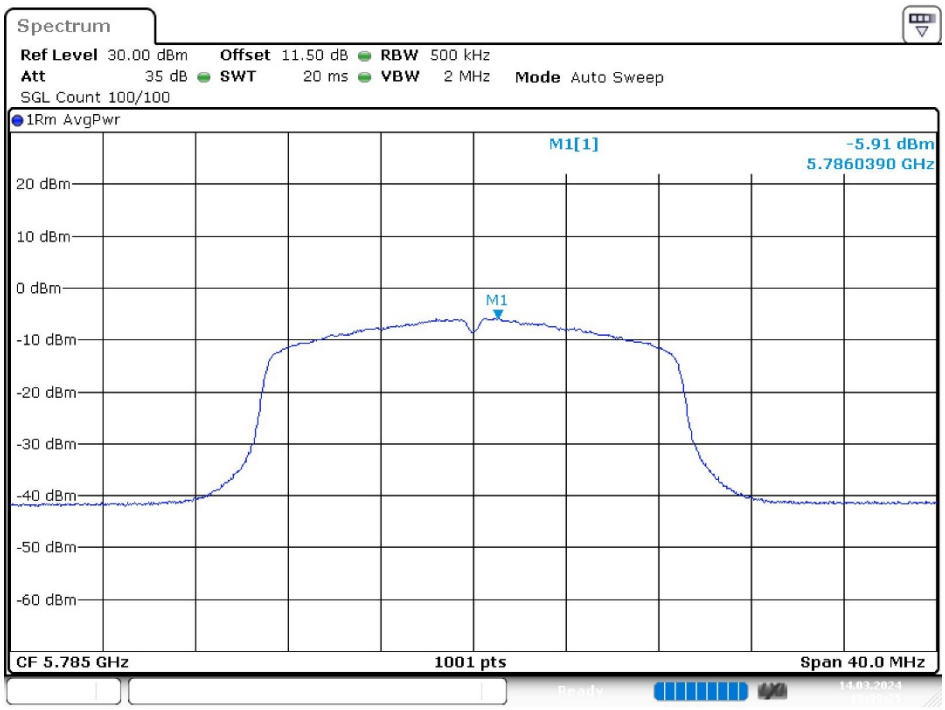


IEEE 802.11n 20 Mode / 5725 ~ 5850MHz

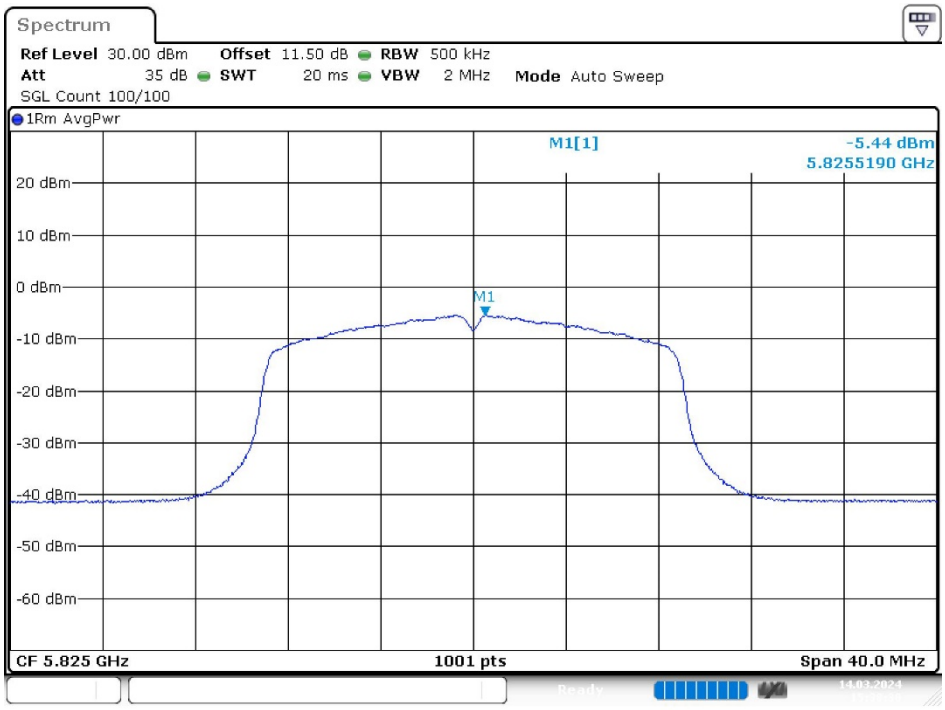
5745MHz



5785MHz



5825MHz



******* END OF REPORT *******