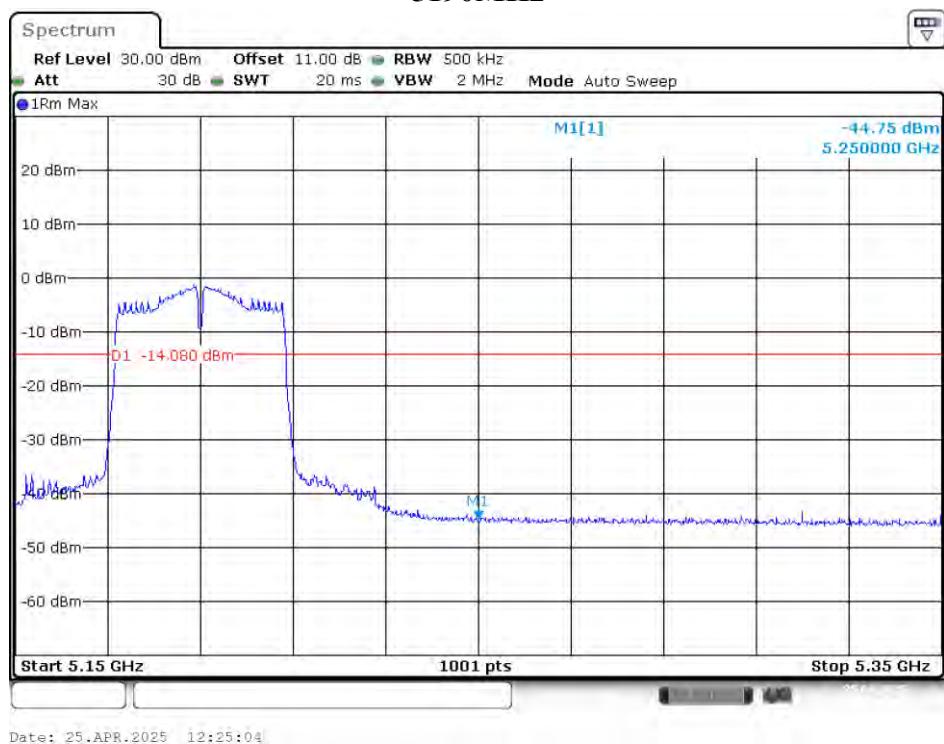


## IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz

## 5190MHz



## 5230MHz



## IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

5210MHz



## 9 FCC §15.407(a)(e) & RSS-247 §6.2, RSS-GEN §6.7 – Emission Bandwidth And Occupied 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.

#### RSS-247 Clause 6.2.1.2

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

#### RSS-247 Clause 6.2.4.2

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### RSS-Gen Clause 6.7

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

### 9.2 Test Procedure

#### 26dB Emission Bandwidth (EBW)

According to ANSI C63.10-2013 Section 12.4.1

- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

**Minimum Emission Bandwidth for the band 5.725-5.85 GHz**

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

**99% Occupied Bandwidth:**

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

5150-5250MHz

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)
UNII-1	802.11a	36	5180	21.24	16.46
		40	5200	21.12	16.42
		48	5240	21.36	16.42
	802.11ac 20	36	5180	21.64	17.62
		40	5200	21.44	17.74
		48	5240	21.68	17.62
	802.11ac 40	38	5190	40.12	36.20
		46	5230	40.06	36.20
	802.11ac 80	42	5210	81.72	75.44

The 99% Occupied Bandwidth have not fallen into the band 5250-5350MHz, please refer to the test plots of 99% Occupied Bandwidth.

5250-5350MHz

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)
UNII-2A	802.11a	52	5260	21.24	16.54
		60	5300	21.24	16.58
		64	5320	21.56	16.46
	802.11ac 20	52	5260	21.44	17.62
		60	5300	21.68	17.74
		64	5320	21.64	17.70
	802.11ac 40	54	5270	39.98	36.20
		62	5310	39.90	36.28
	802.11ac 80	58	5290	81.56	75.44

## 5470-5725MHz

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)
UNII-2C	802.11a	100	5500	21.32	16.62
		116	5580	21.28	16.46
		140	5700	21.44	16.42
	802.11ac 20	100	5500	21.56	17.62
		116	5580	21.52	17.74
		140	5700	21.72	17.62
	802.11ac 40	102	5510	39.82	36.20
		118	5550	39.90	36.20
		134	5670	39.82	36.12
	802.11ac 80	106	5530	81.08	75.44
		122	5610	81.40	75.44

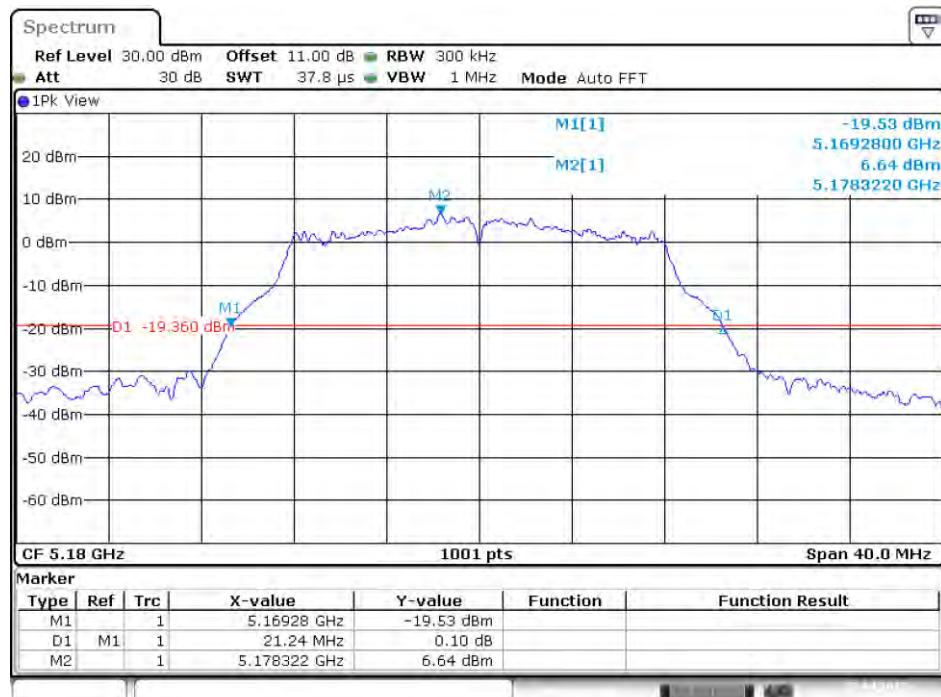
## 5725-5850MHz

UNII Band	Mode	Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)	Limit (kHz)	Result
UNII-3	802.11a	149	5745	16.28	16.54	≥500	PASS
		157	5785	16.28	16.62	≥500	PASS
		165	5825	16.28	16.42	≥500	PASS
	802.11ac 20	149	5745	16.92	17.66	≥500	PASS
		157	5785	17.04	17.74	≥500	PASS
		165	5825	17.28	17.70	≥500	PASS
	802.11ac 40	151	5755	35.84	36.28	≥500	PASS
		159	5795	35.76	36.28	≥500	PASS
	802.11ac 80	155	5775	75.20	75.44	≥500	PASS

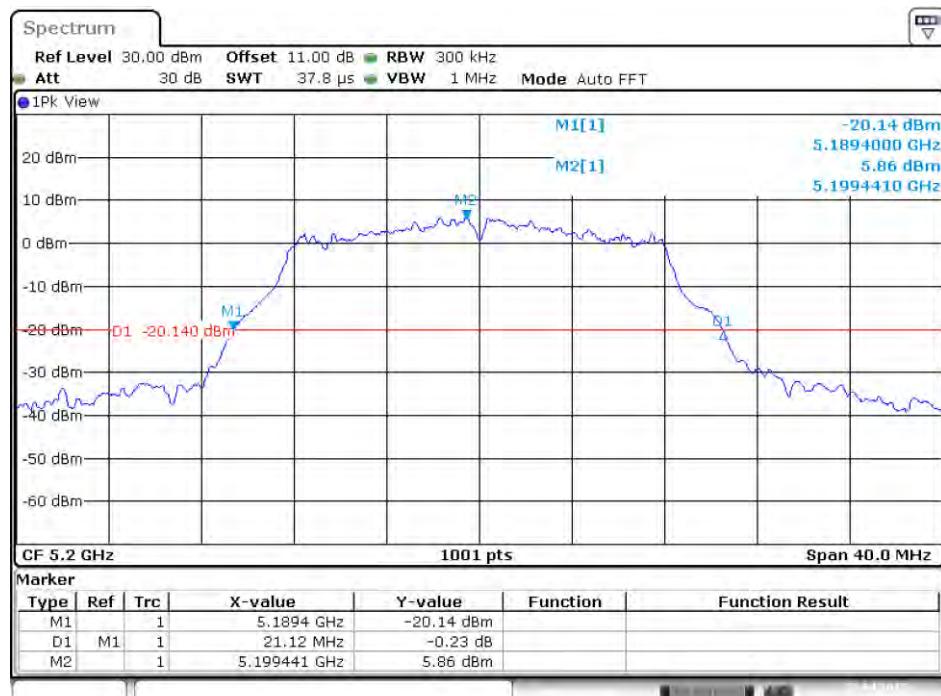
The 99% Occupied Bandwidth have not fallen into the band 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

Please refer to the following plots

Transmitting Mode:

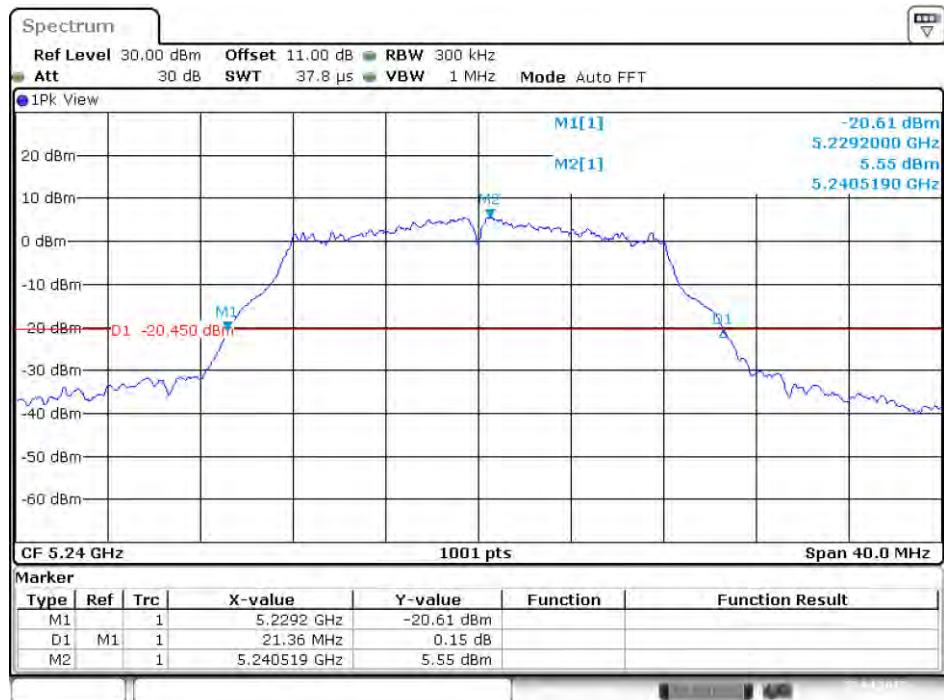
**UNII-1 Band I / BW 26dBc****IEEE 802.11a Mode / 5150 ~ 5250MHz****5180MHz**

Date: 25/APR/2025 12:44:53

**5200MHz**

Date: 25/APR/2025 12:52:45

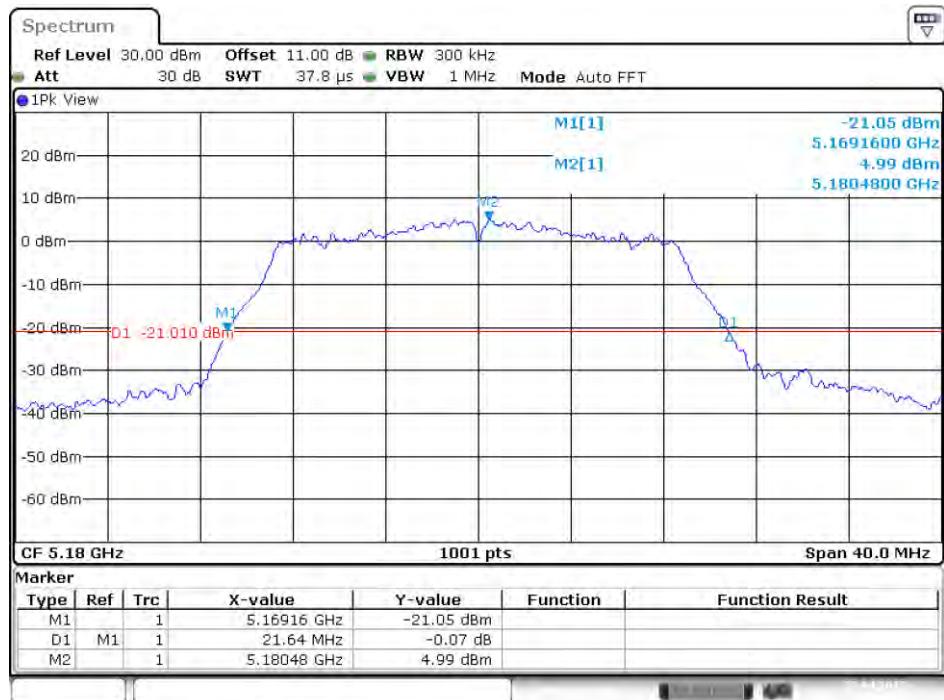
## 5240MHz



Date: 25 APR 2025 12:56:52

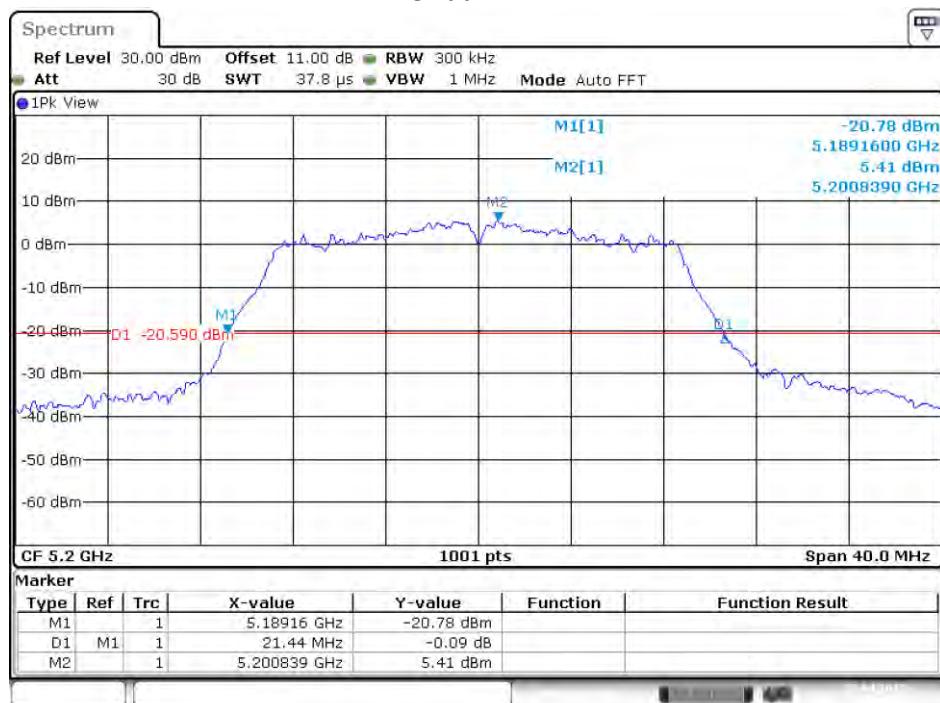
## IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz

## 5180MHz



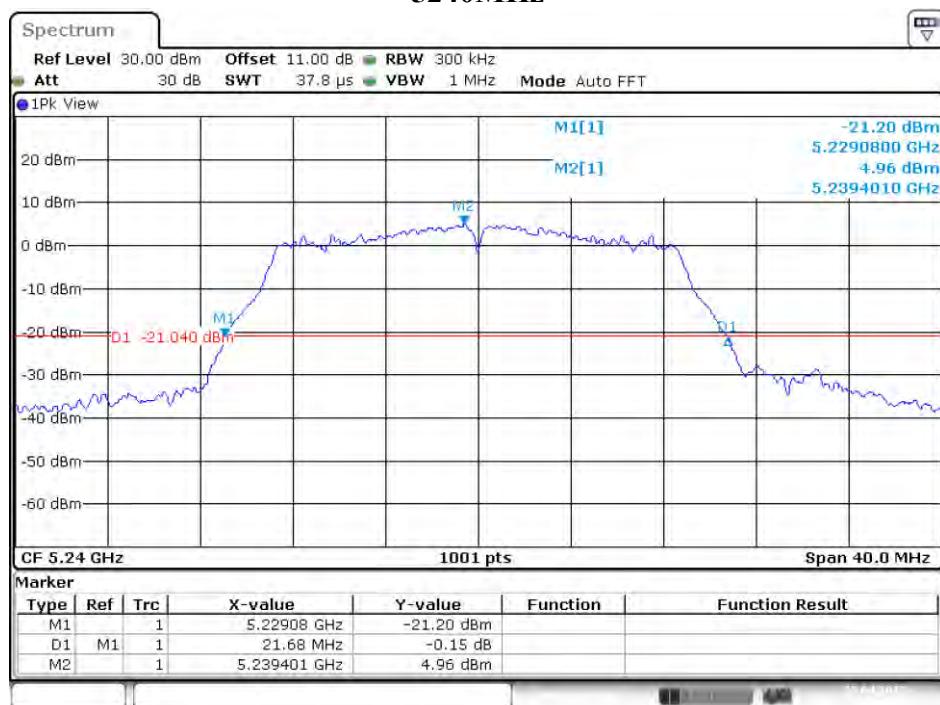
Date: 25 APR 2025 13:34:07

## 5200MHz



Date: 25 APR 2025 13:36:26

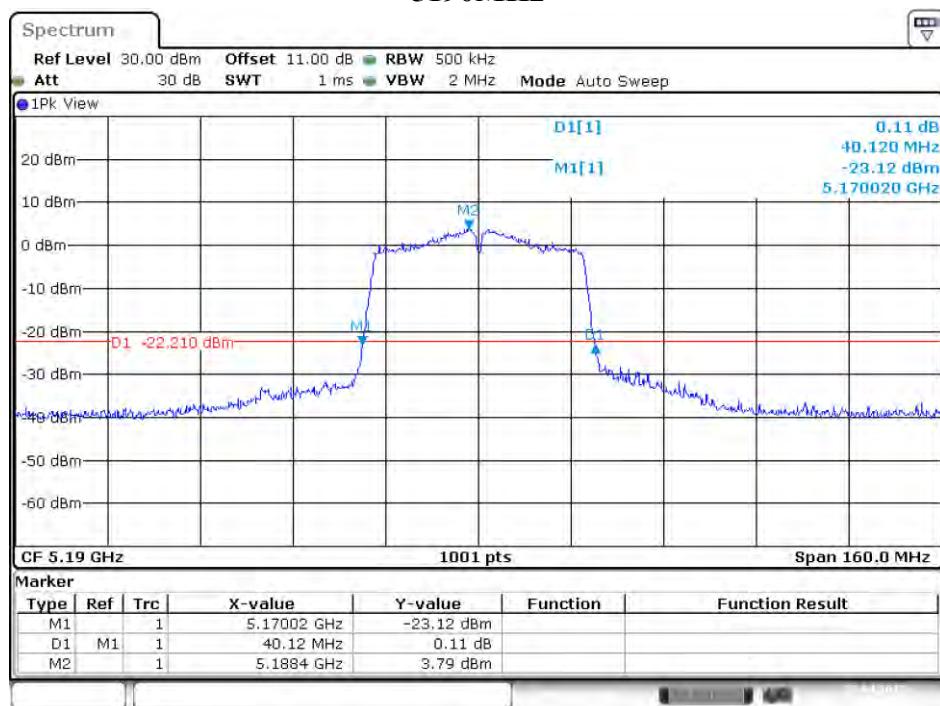
## 5240MHz



Date: 25 APR 2025 13:38:23

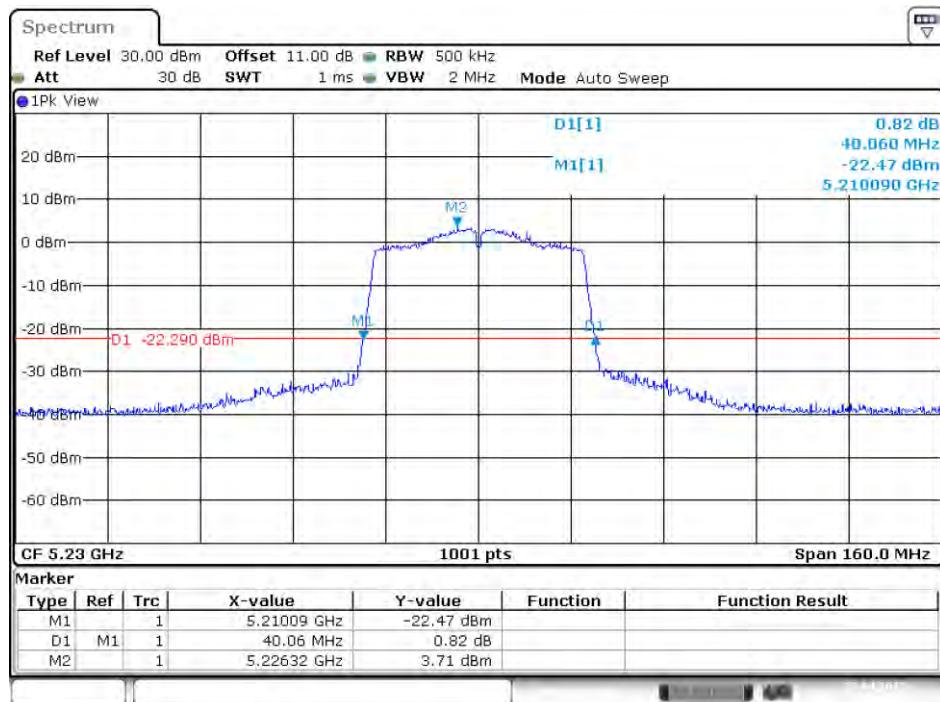
## IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz

## 5190MHz



Date: 25 APR 2025 15:48:14

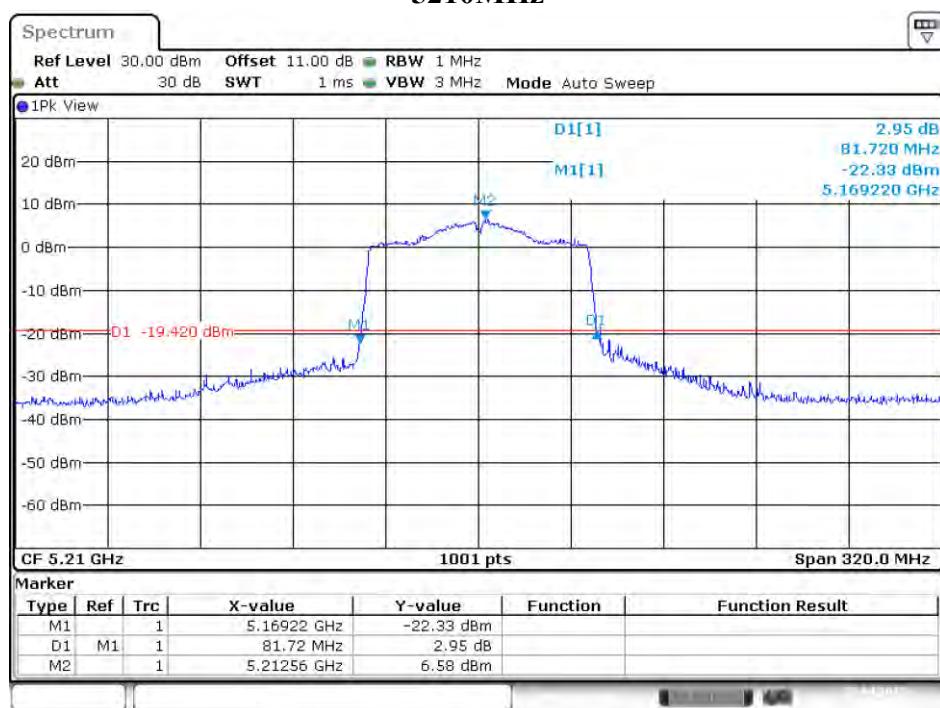
## 5230MHz



Date: 25 APR 2025 16:15:05

## IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

## 5210MHz

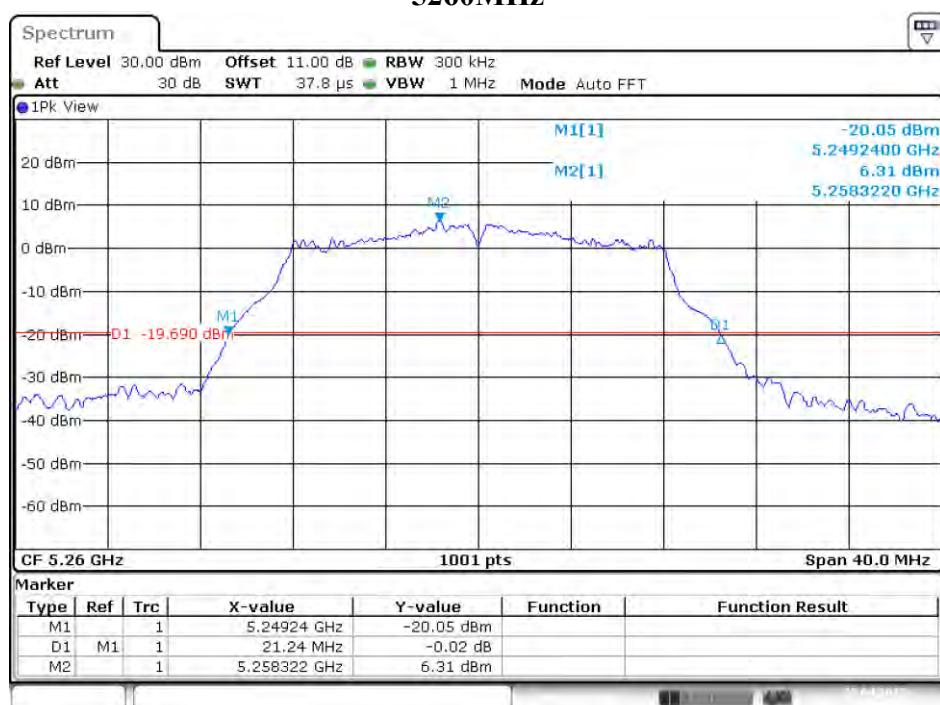


Date: 25 APR 2025 17:39:30

## UNII-2A Band II / BW 26dBc

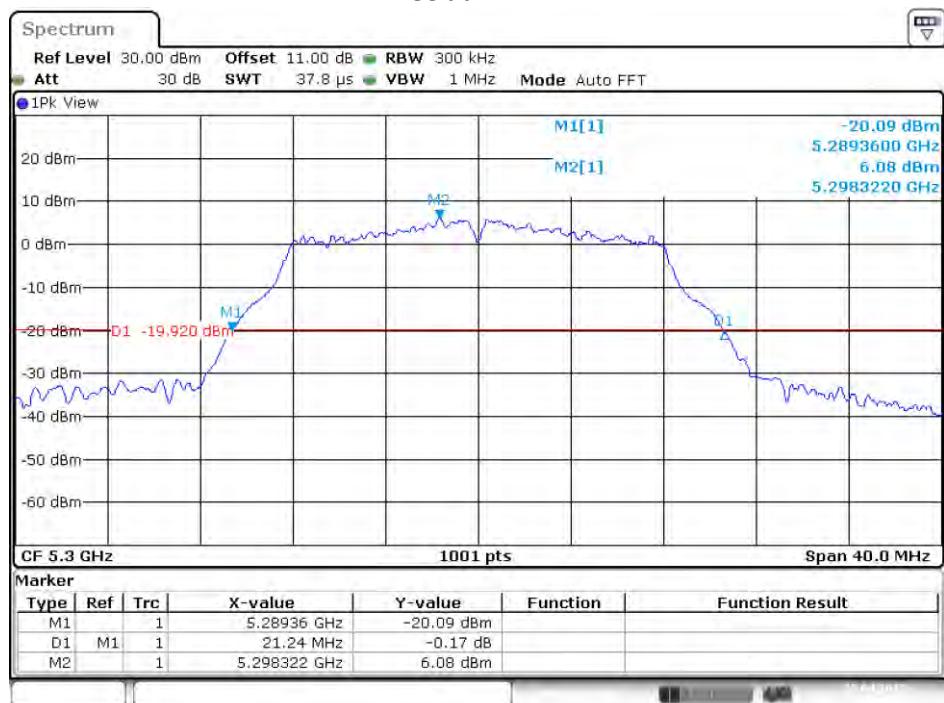
## IEEE 802.11a Mode / 5250 ~ 5350MHz

## 5260MHz



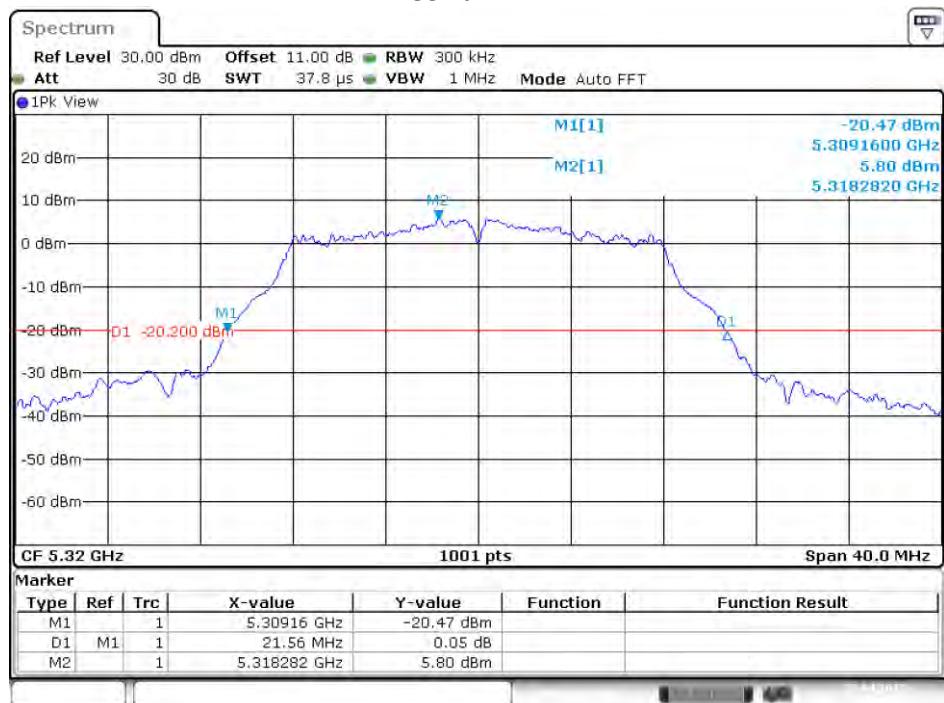
Date: 25 APR 2025 13:00:36

## 5300MHz



Date: 25 APR 2025 13:02:44

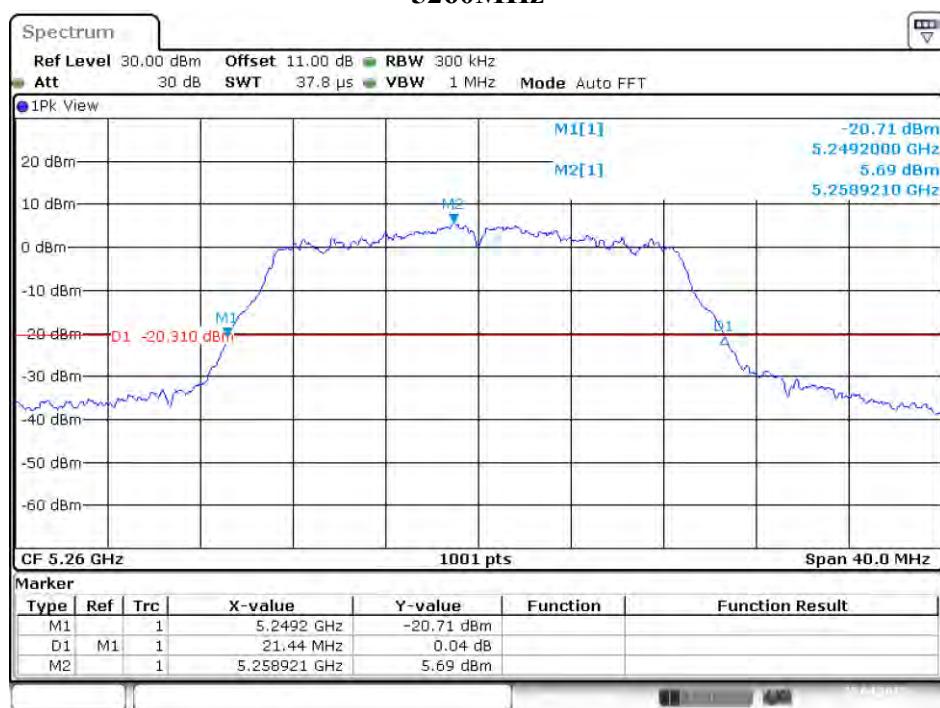
## 5320MHz



Date: 25 APR 2025 13:04:49

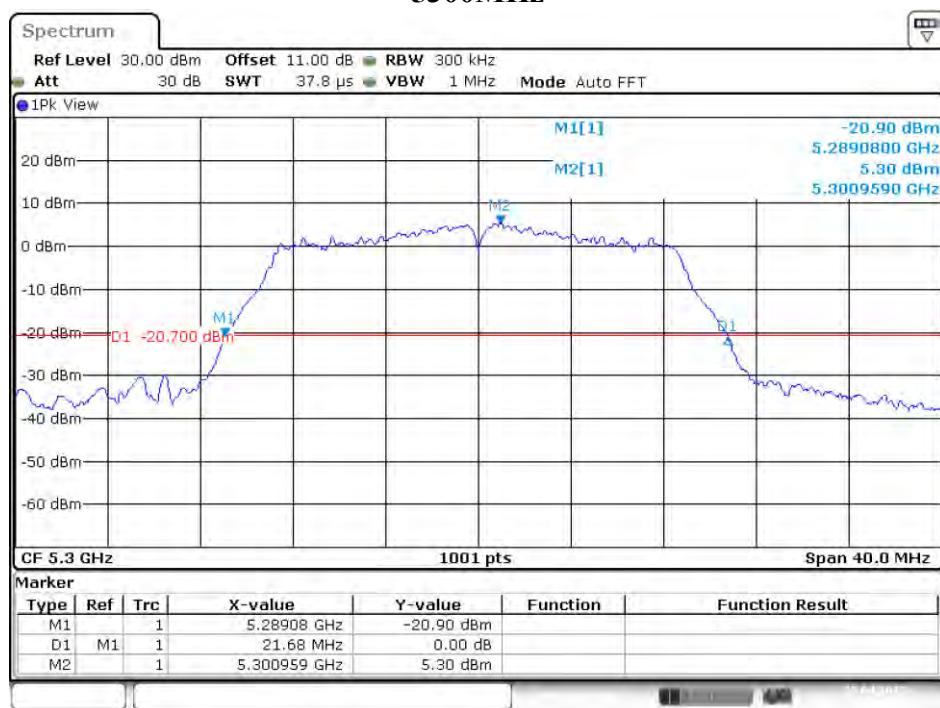
## IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz

## 5260MHz



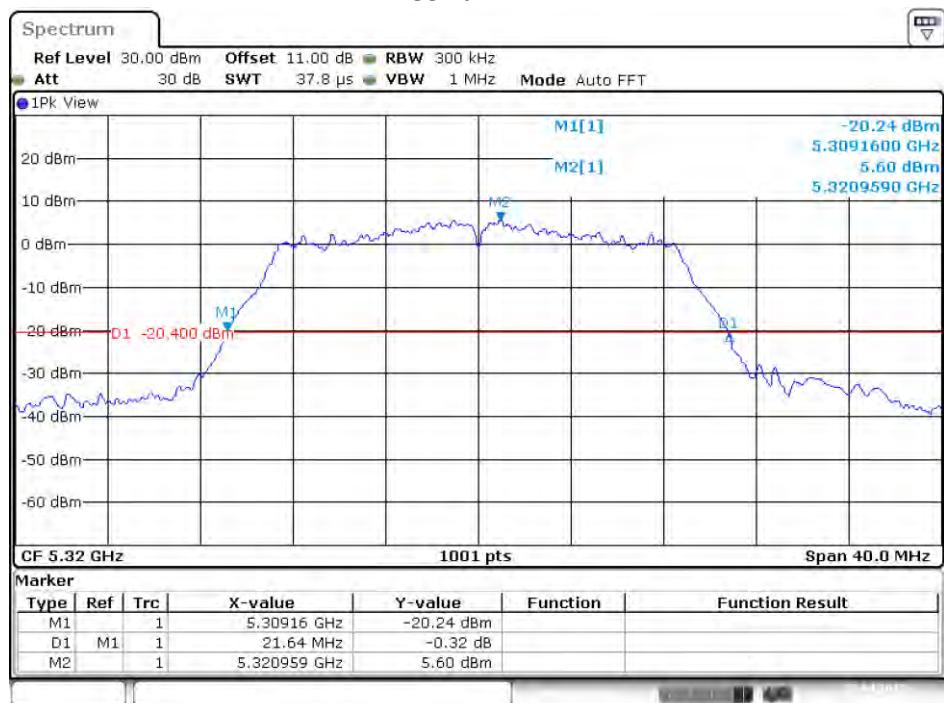
Date: 25 APR 2025 13:40:47

## 5300MHz



Date: 25 APR 2025 13:44:39

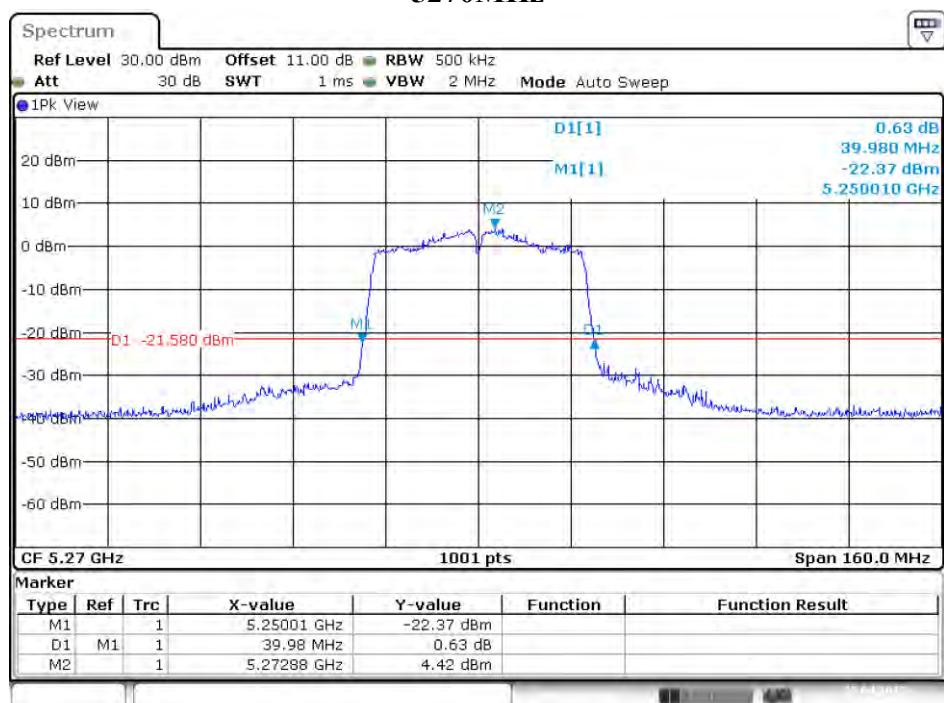
## 5320MHz



Date: 25 APR 2025 13:46:35

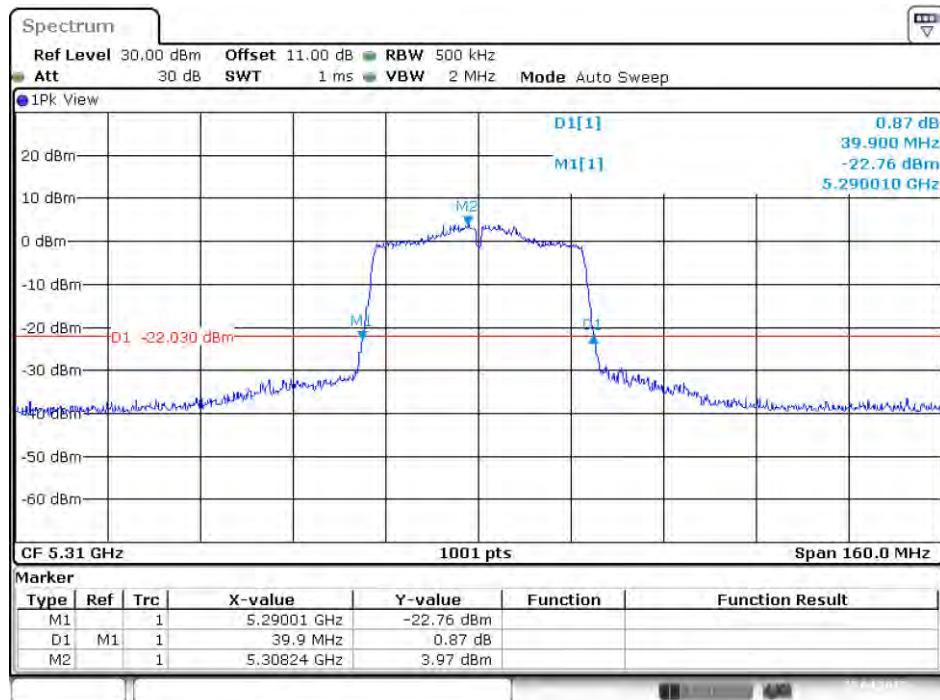
## IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz

## 5270MHz



Date: 25 APR 2025 16:20:08

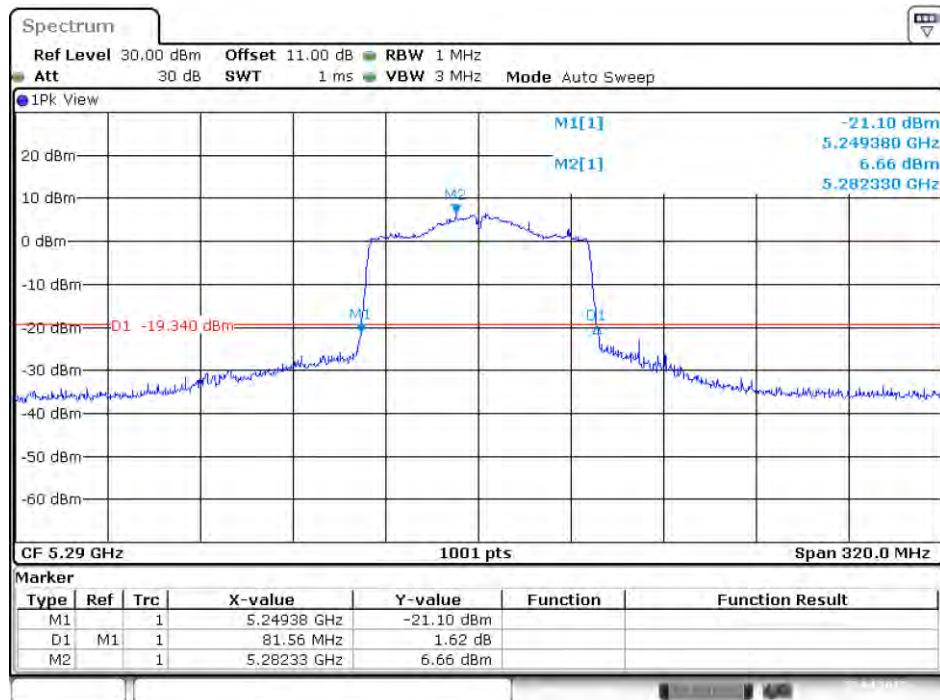
## 5310MHz



Date: 25 APR 2025 16:26:02

## IEEE 802.11ac VHT80 Mode / 5250 ~ 5350MHz

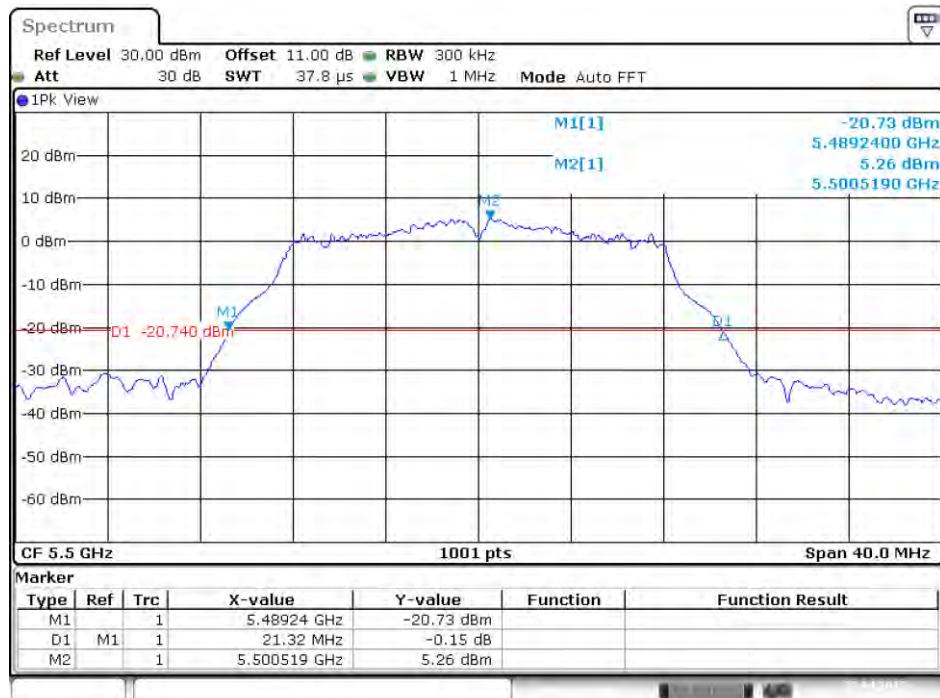
## 5290MHz



Date: 25 APR 2025 17:52:55

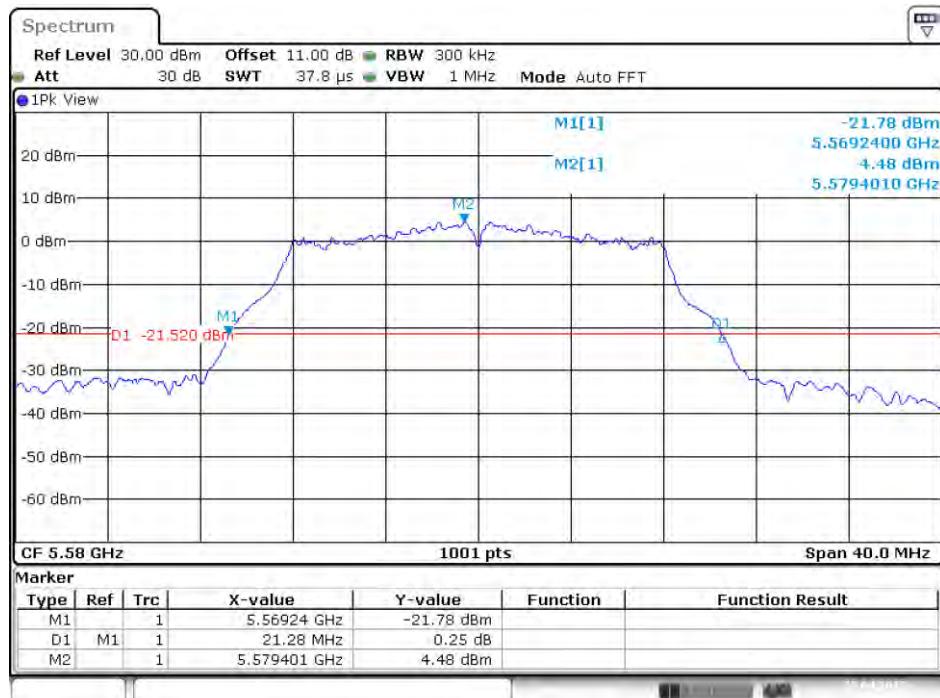
**UNII-2C Band III / BW 26dBc**  
**IEEE 802.11a Mode / 5470 ~ 5725MHz**

5500MHz



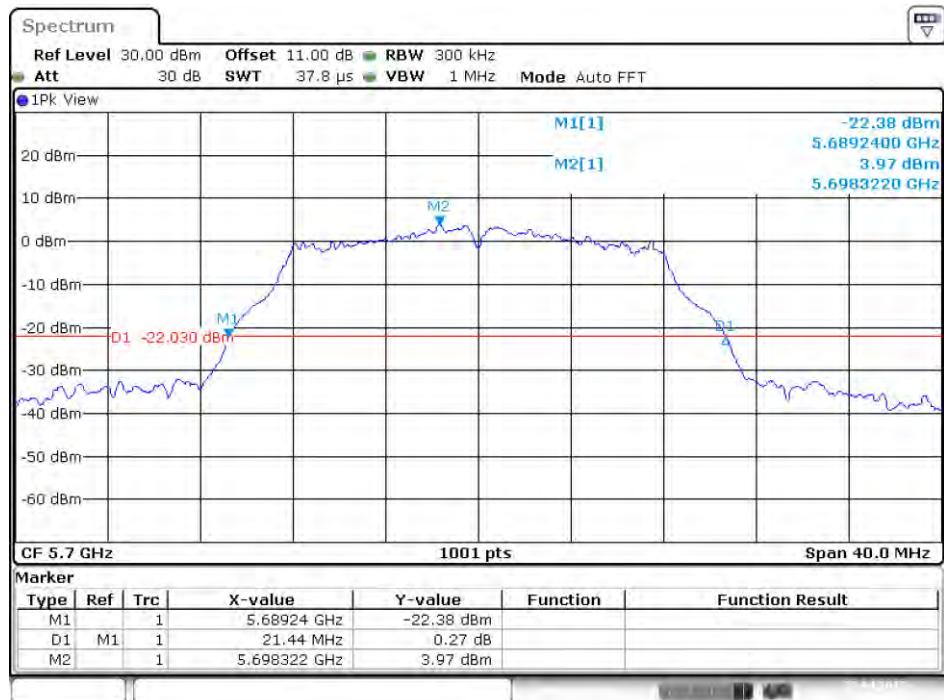
Date: 25 APR 2025, 13:06:47

5580MHz



Date: 25 APR 2025, 13:08:41

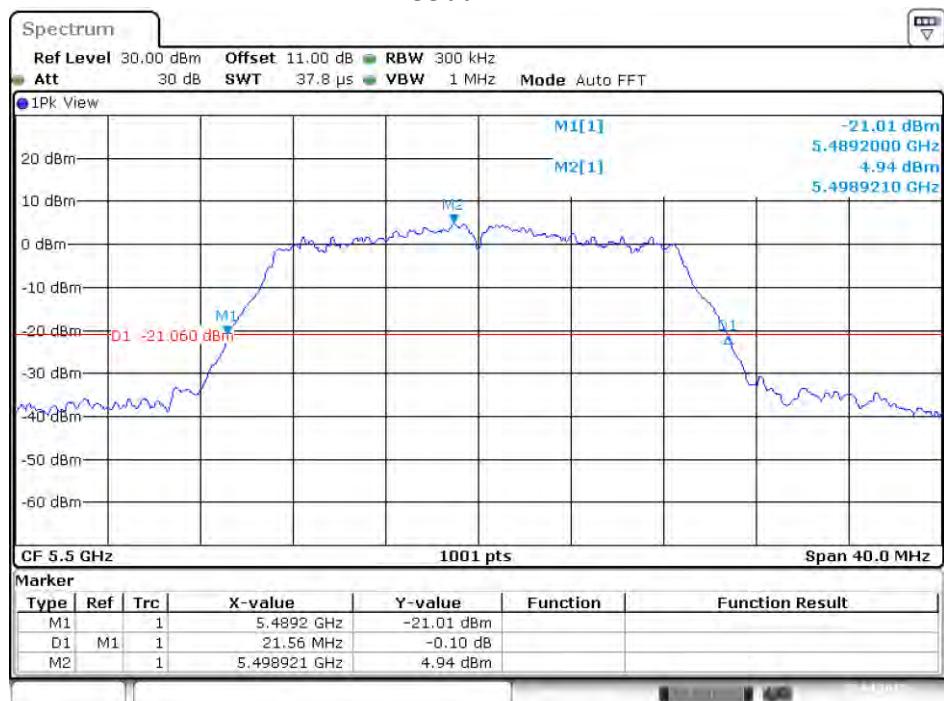
## 5700MHz



Date: 25 APR 2025 13:10:39

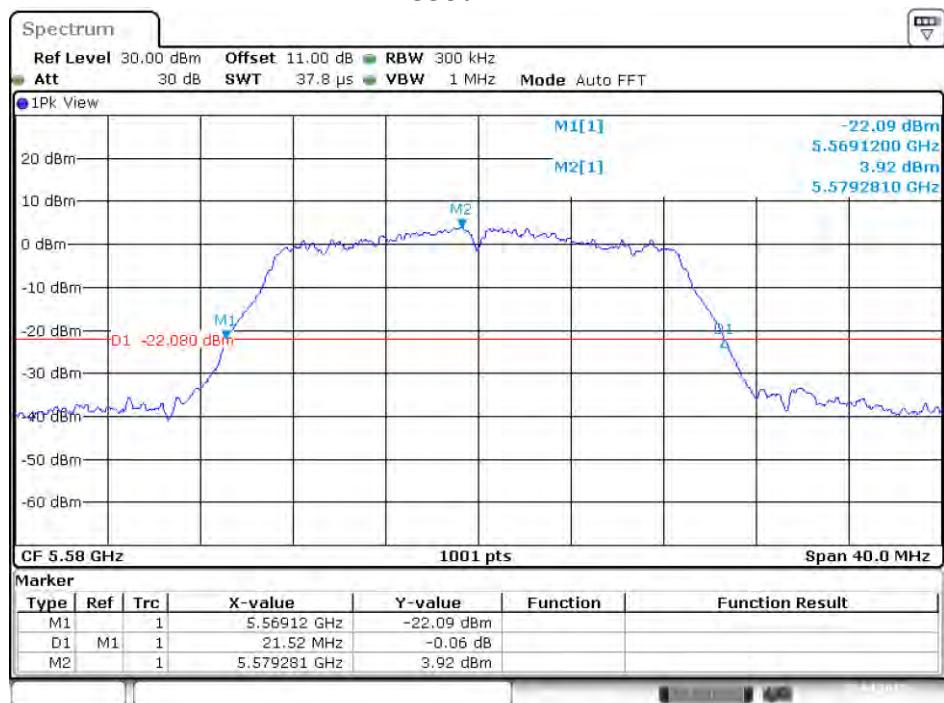
## IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz

## 5500MHz



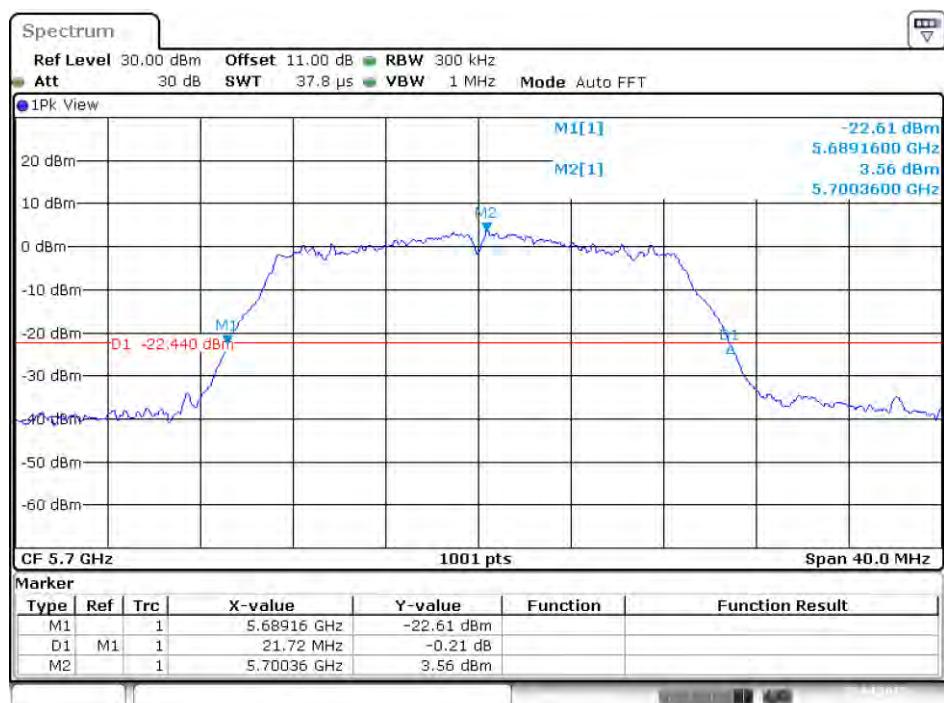
Date: 25 APR 2025 13:58:18

## 5580MHz



Date: 25 APR 2025 14:01:29

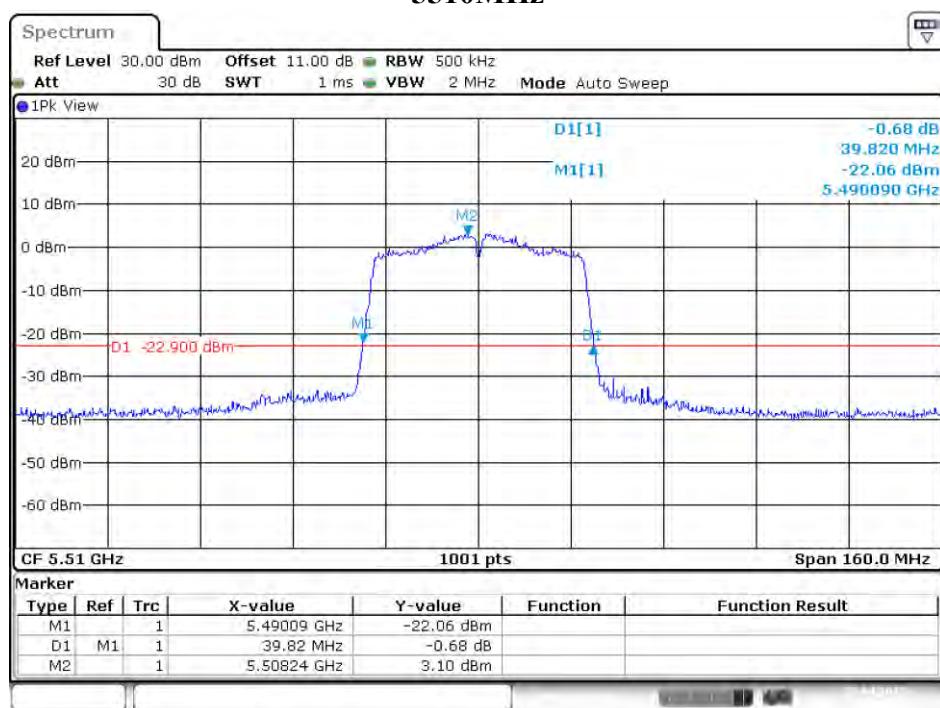
## 5700MHz



Date: 25 APR 2025 14:03:54

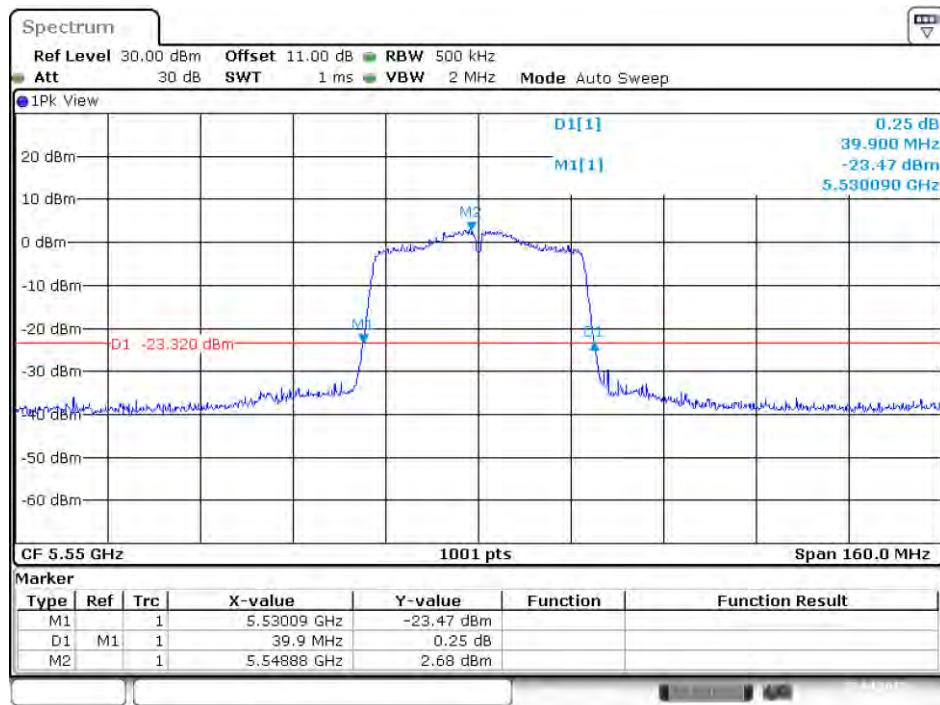
## IEEE 802.11ac VHT40 Mode / 5470 ~ 5725MHz

## 5510MHz



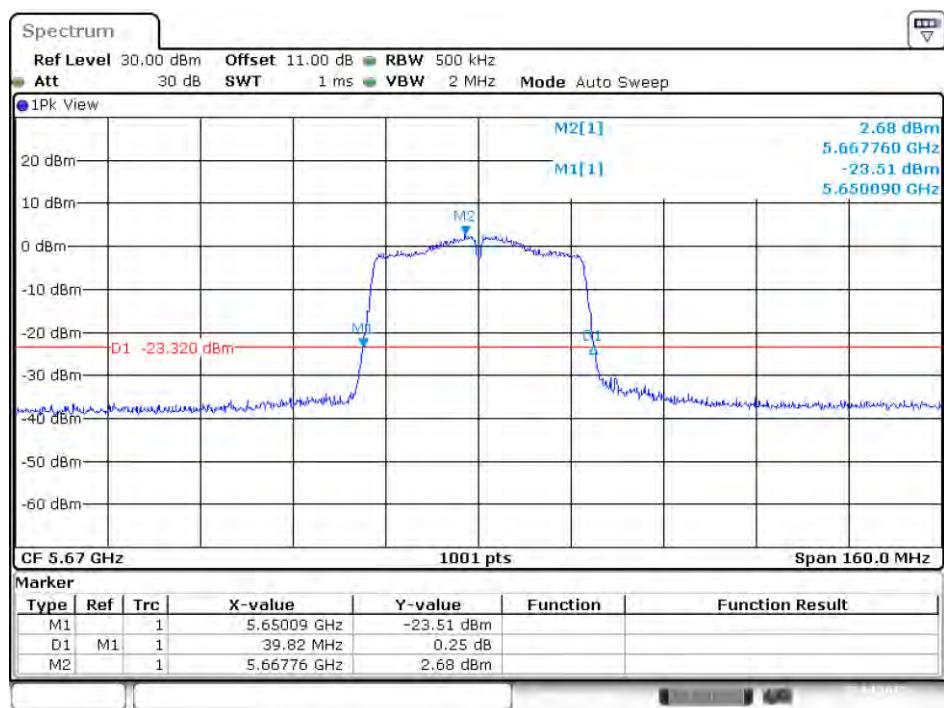
Date: 25 APR 2025 16:34:13

## 5550MHz



Date: 25 APR 2025 16:40:17

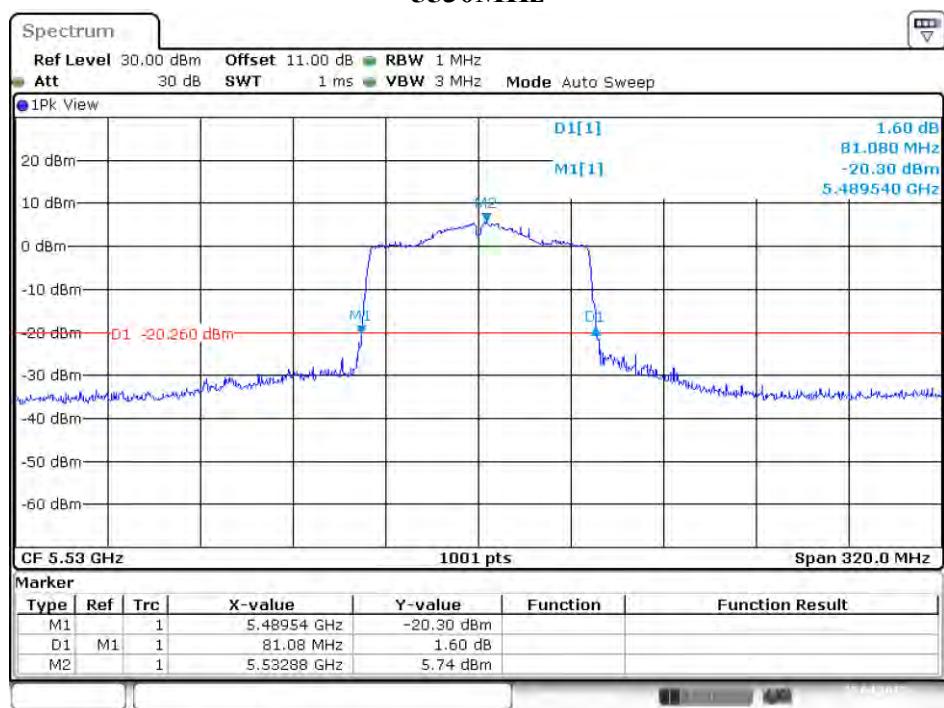
## 5670MHz



Date: 25 APR 2025 16:53:50

## IEEE 802.11ac VHT80 Mode / 5470 ~ 5725MHz

## 5530MHz



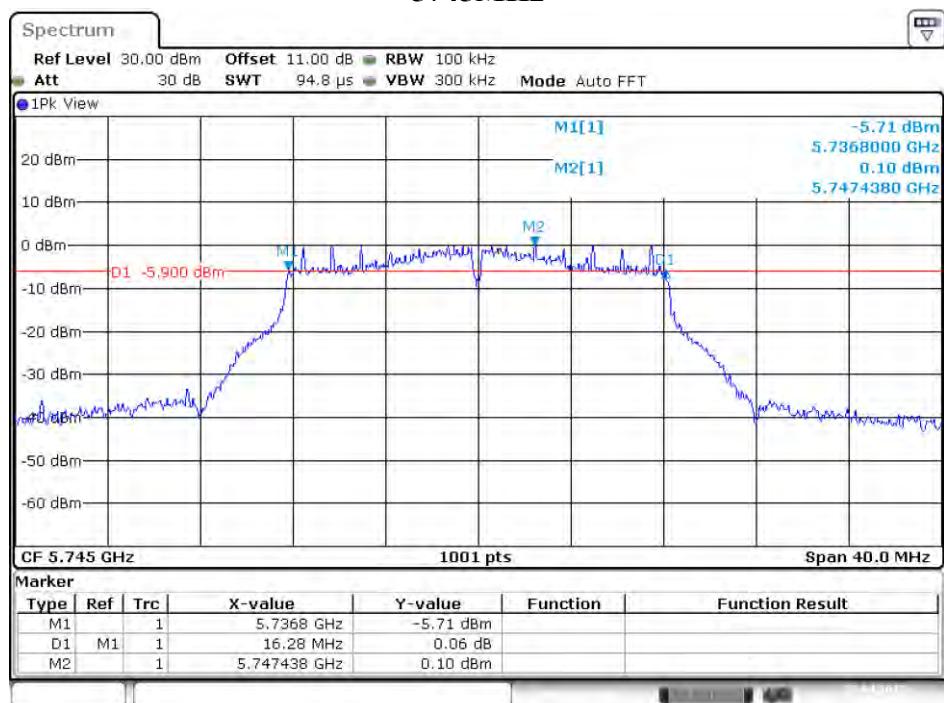
Date: 25 APR 2025 17:58:51

## 5610MHz

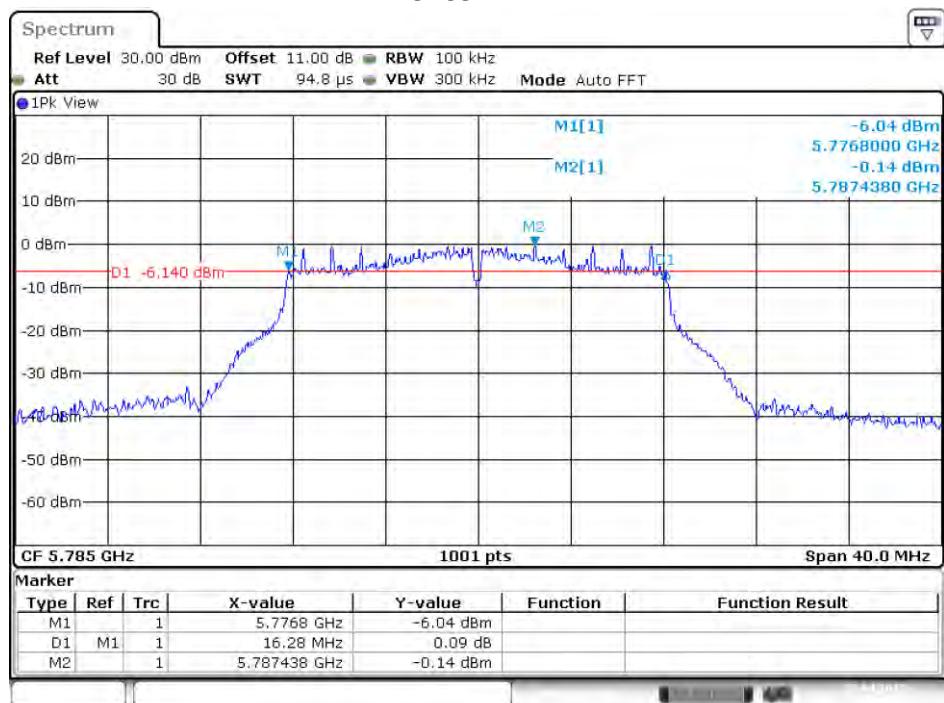


**UNII-3 Band IV / BW 6dBc**  
**IEEE 802.11a Mode / 5725 ~ 5850MHz**

## 5745MHz

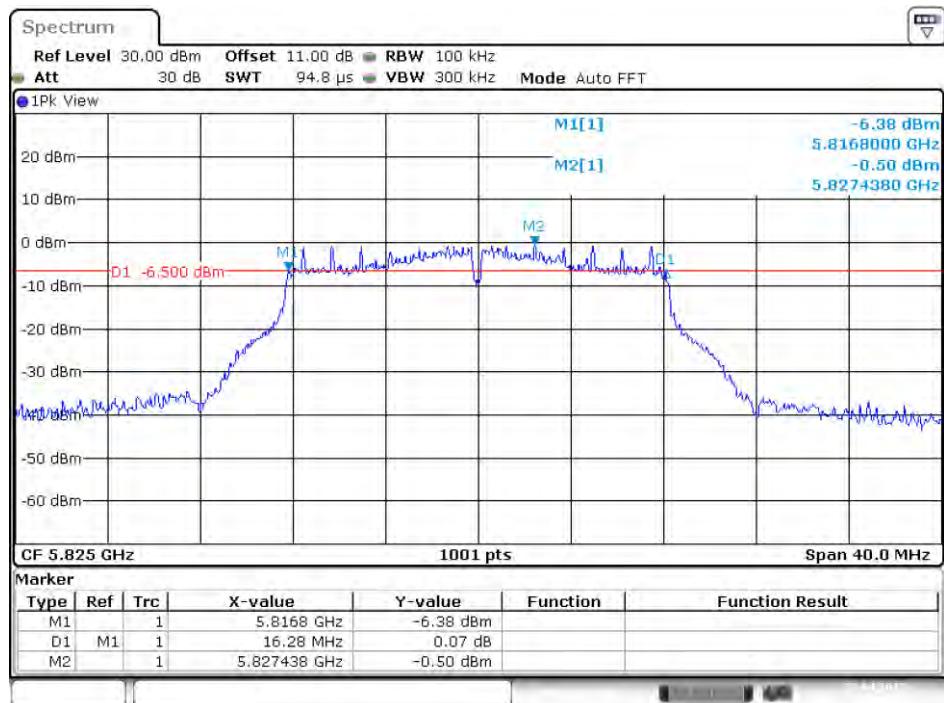


## 5785MHz



Date: 25 APR 2025 13:23:56

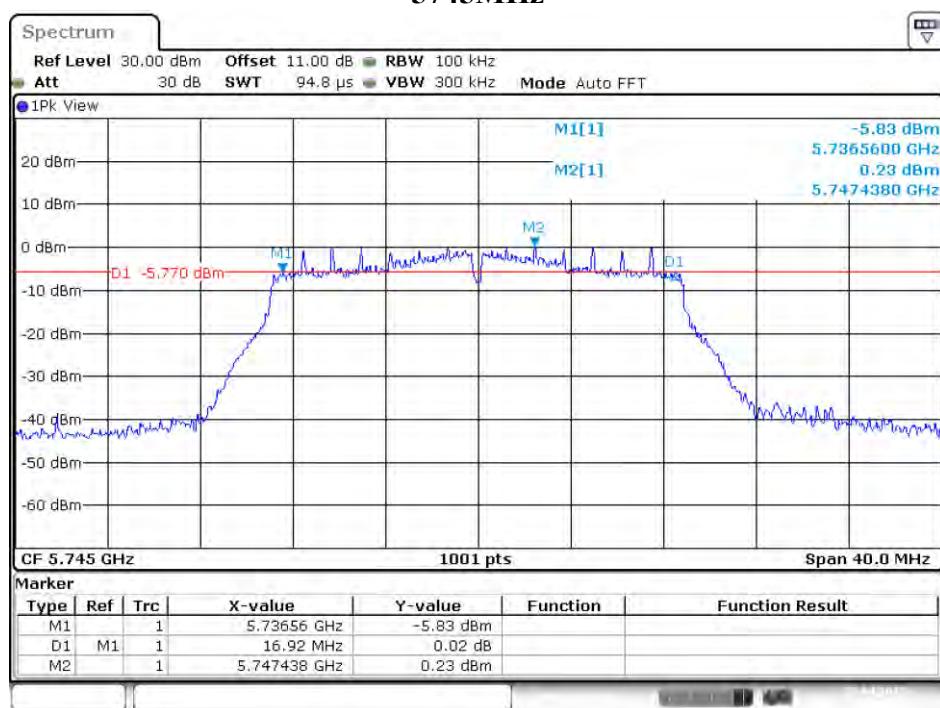
## 5825MHz



Date: 25 APR 2025 13:27:06

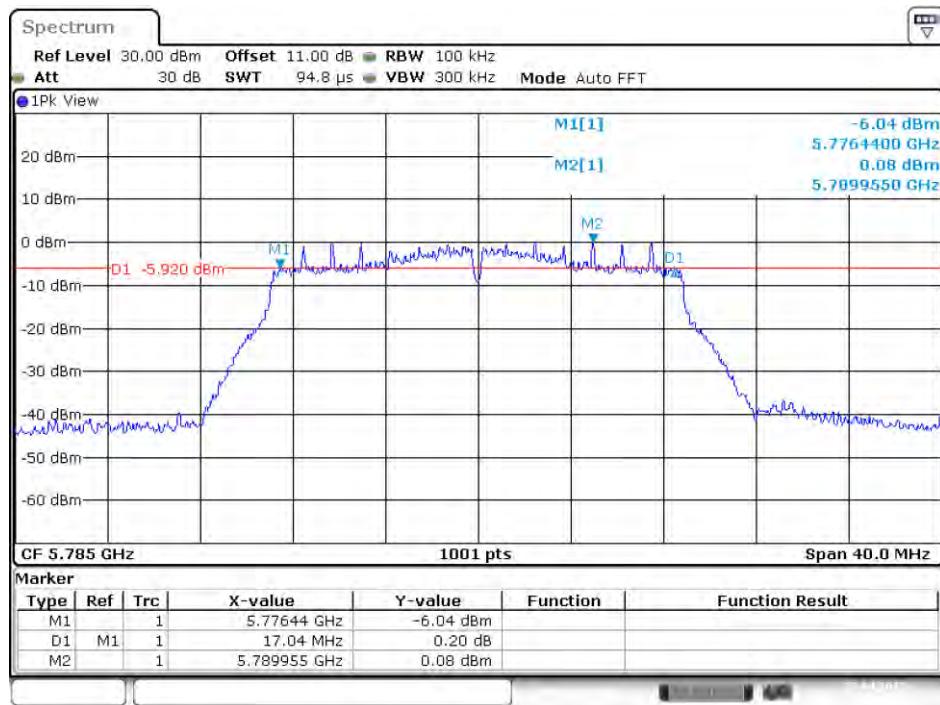
## IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz

## 5745MHz



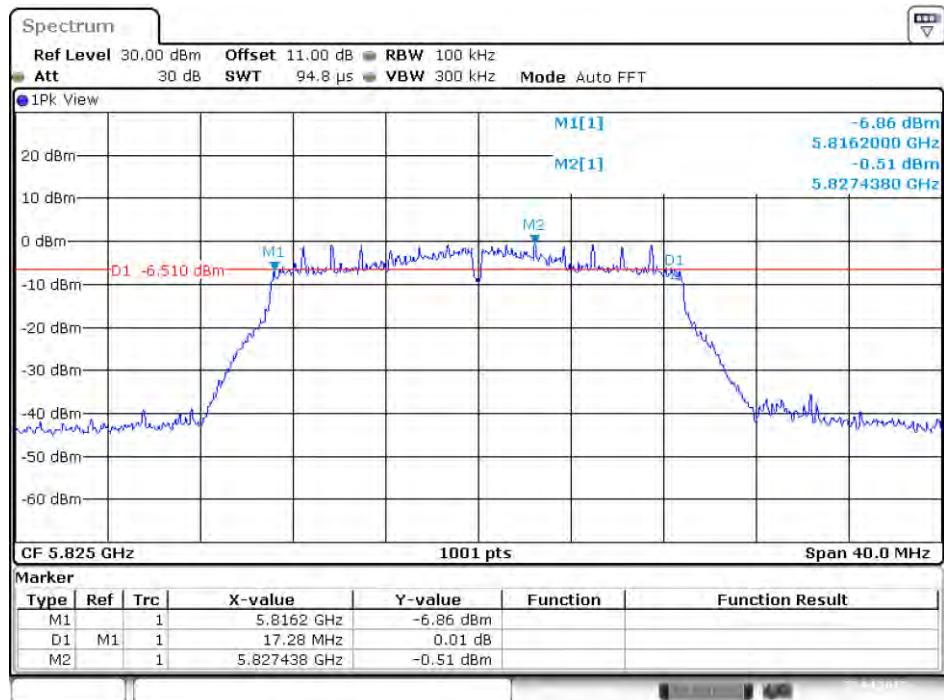
Date: 25 APR 2025 15:06:44

## 5785MHz



Date: 25 APR 2025 15:09:34

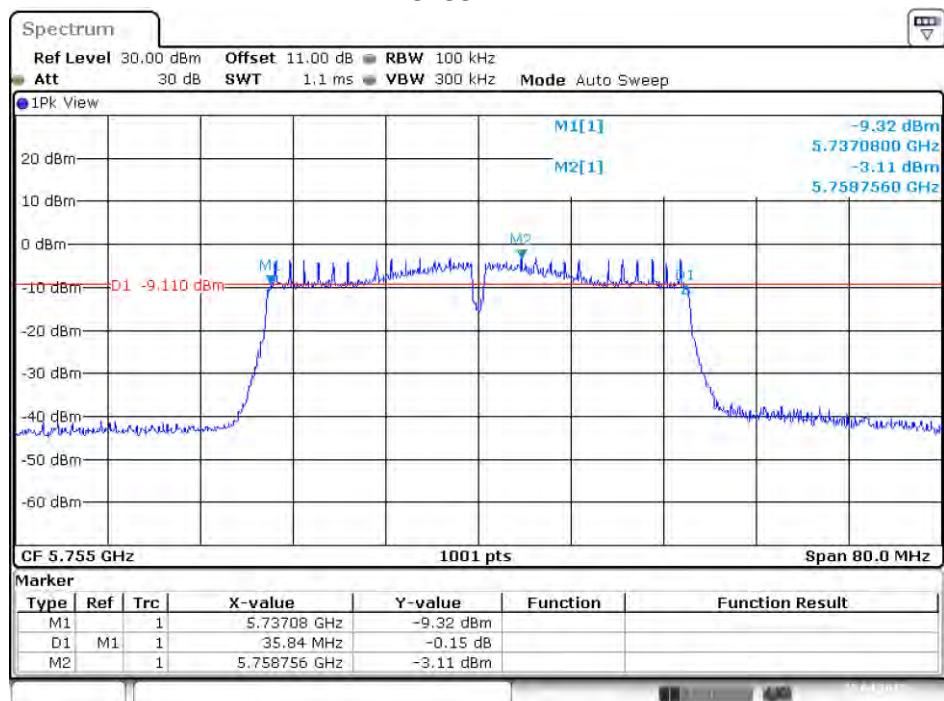
## 5825MHz



Date: 25 APR 2025 15:12:00

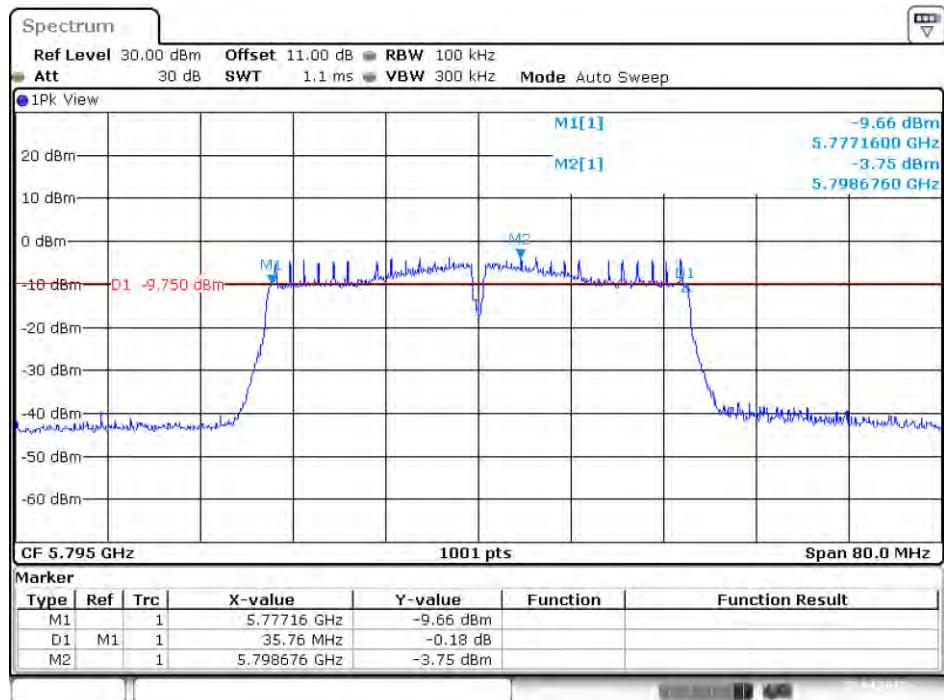
## IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz

## 5755MHz



Date: 25 APR 2025 17:02:55

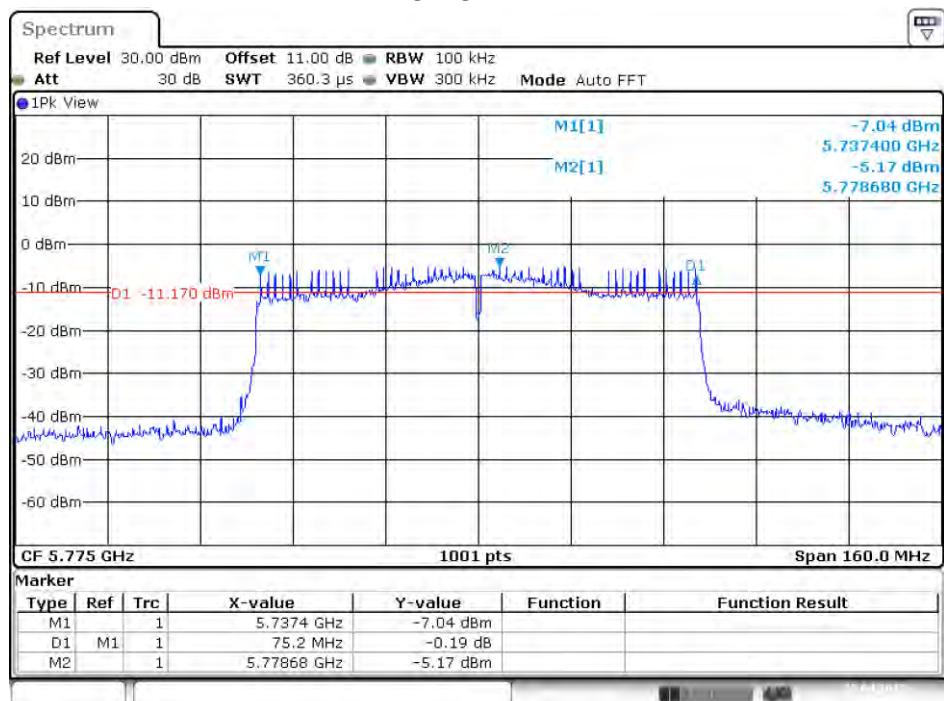
## 5795MHz



Date: 25 APR 2025 17:22:31

## IEEE 802.11ac VHT80 Mode / 5725 ~ 5850MHz

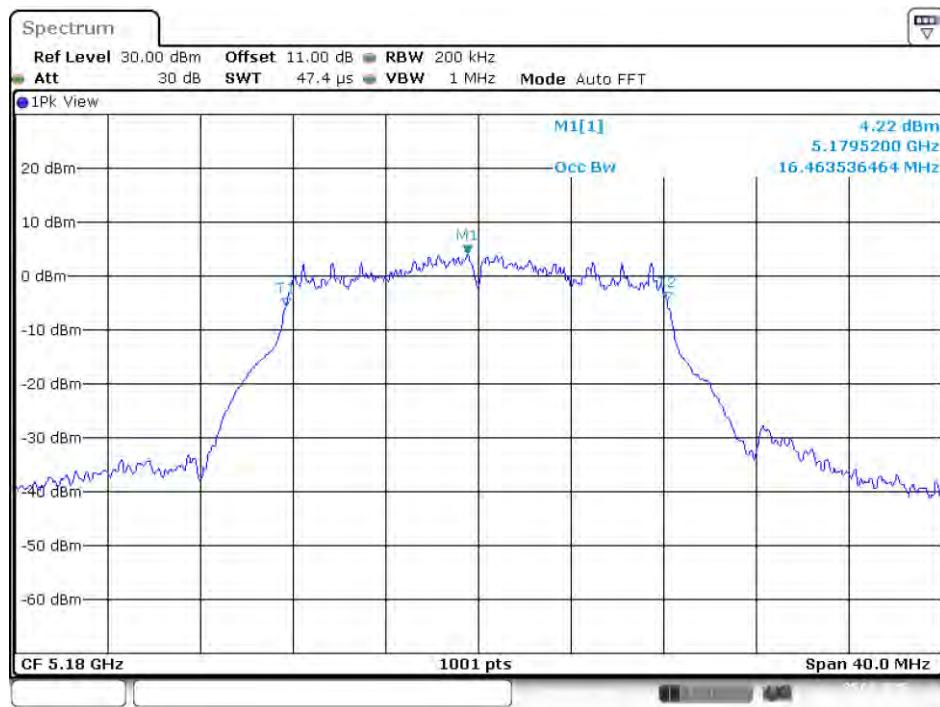
## 5775MHz



Date: 25 APR 2025 18:07:44

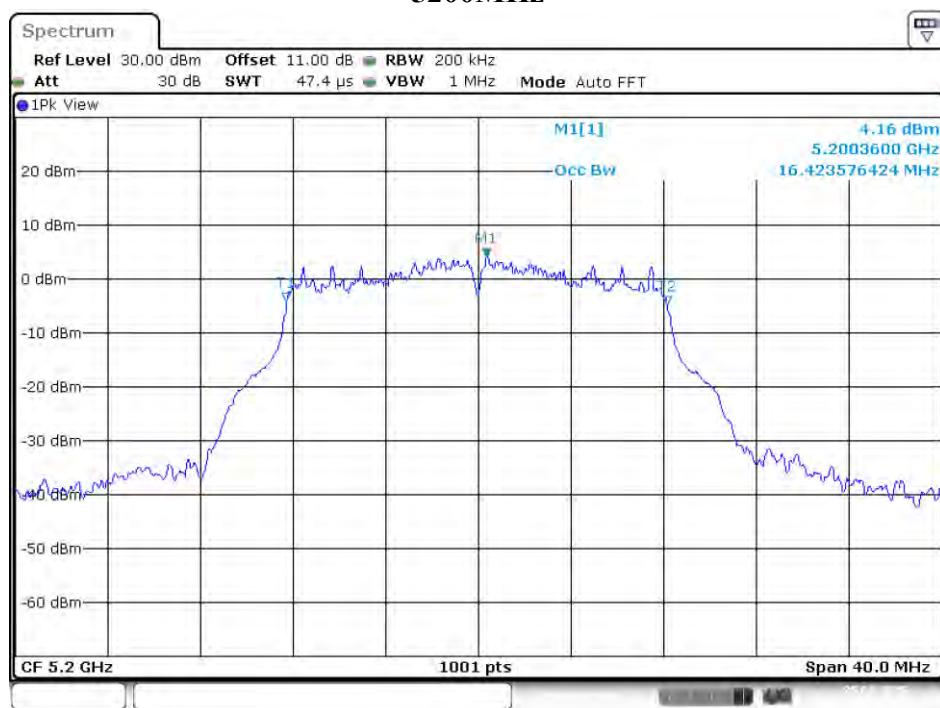
**UNII-1 Band I / OBW 99%**  
**IEEE 802.11a Mode / 5150 ~ 5250MHz**

**5180MHz**



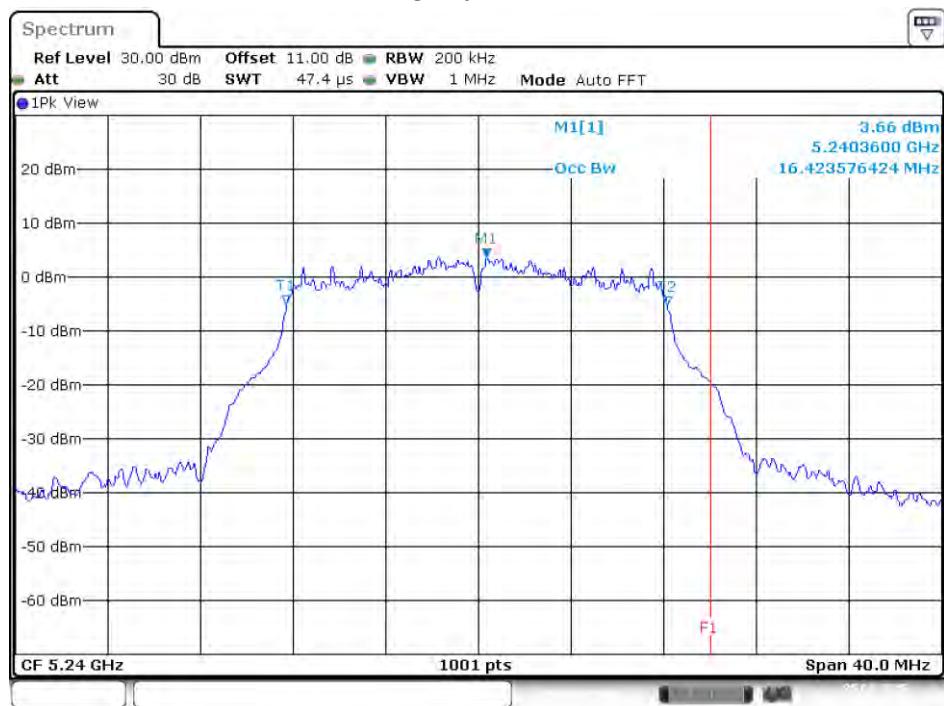
Date: 25 APR 2025 12:45:29

**5200MHz**



Date: 25 APR 2025 12:53:21

## 5240MHz

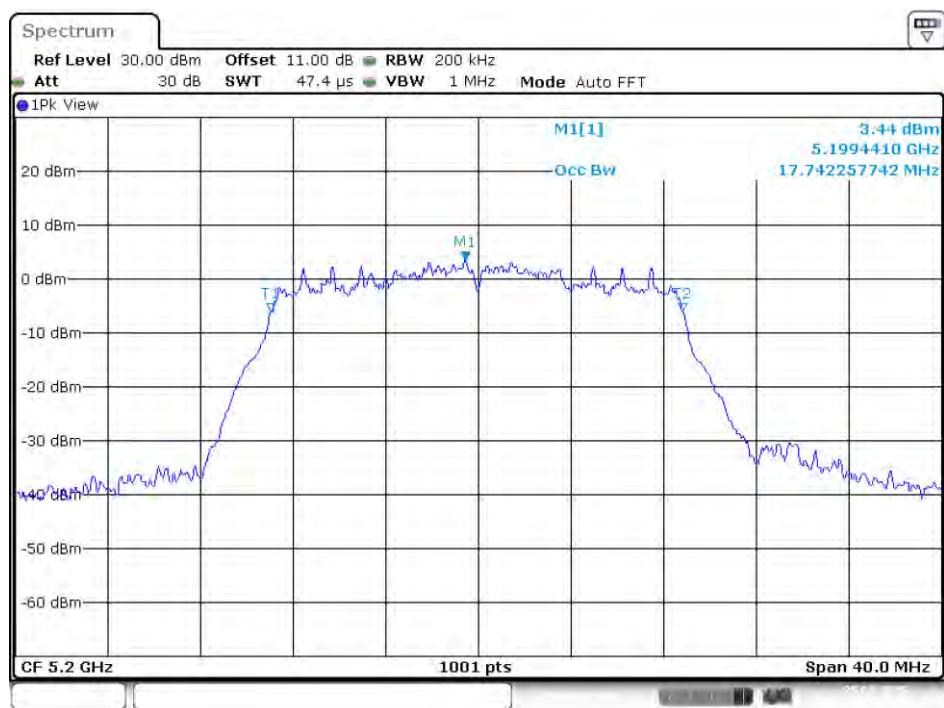


## IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz

## 5180MHz



## 5200MHz

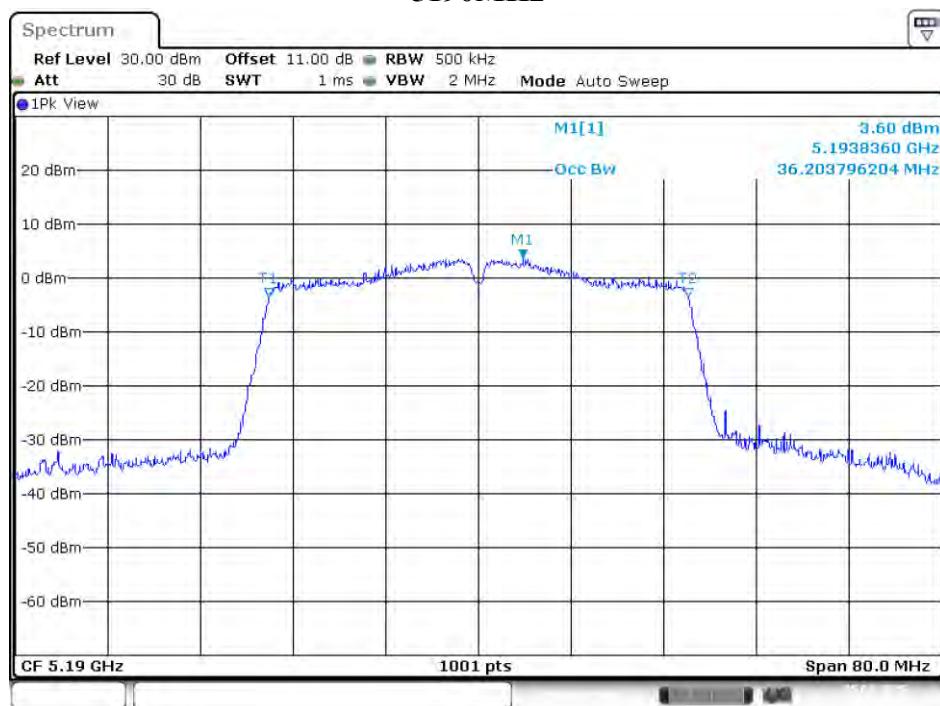


## 5240MHz



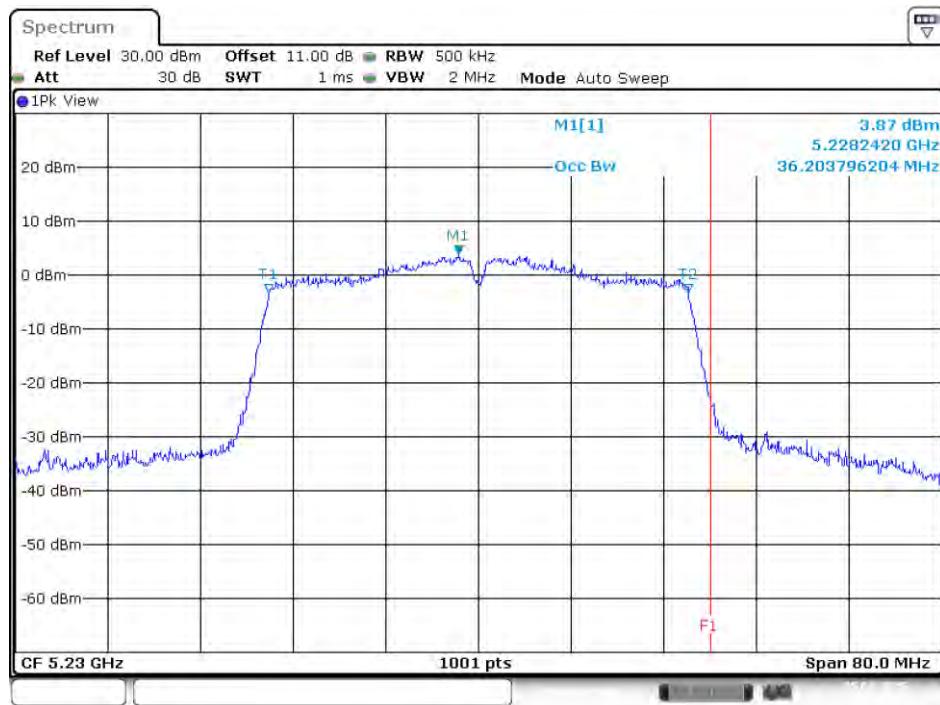
## IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz

## 5190MHz



Date: 25 APR 2025 15:20:28

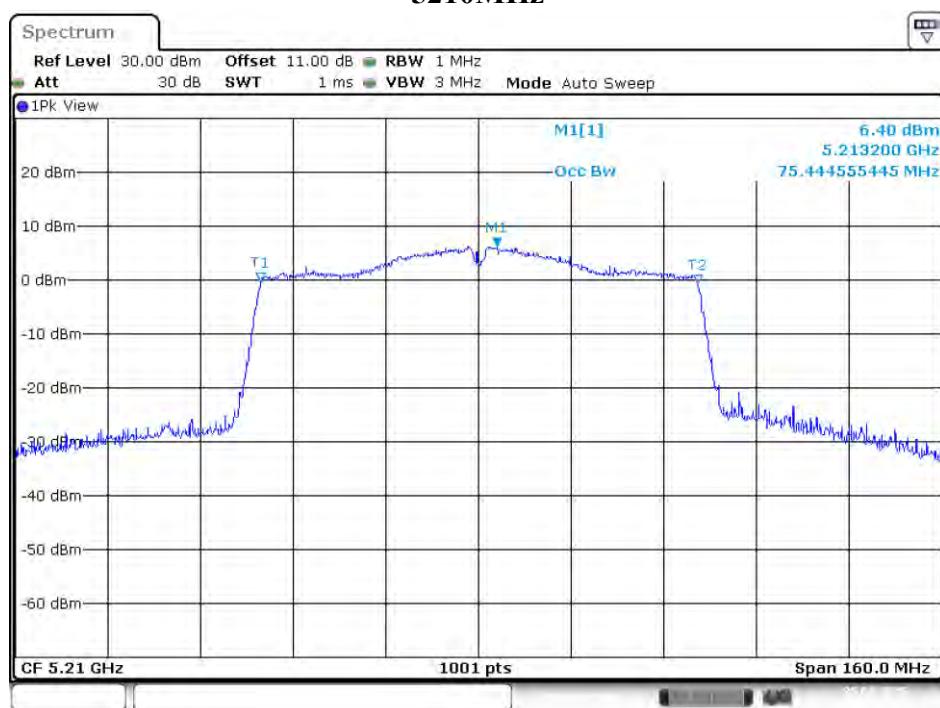
## 5230MHz



Date: 25 APR 2025 15:53:37

## IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

5210MHz



Date: 25 APR 2025 17:28:59

## UNII-2A Band II / OBW 99%

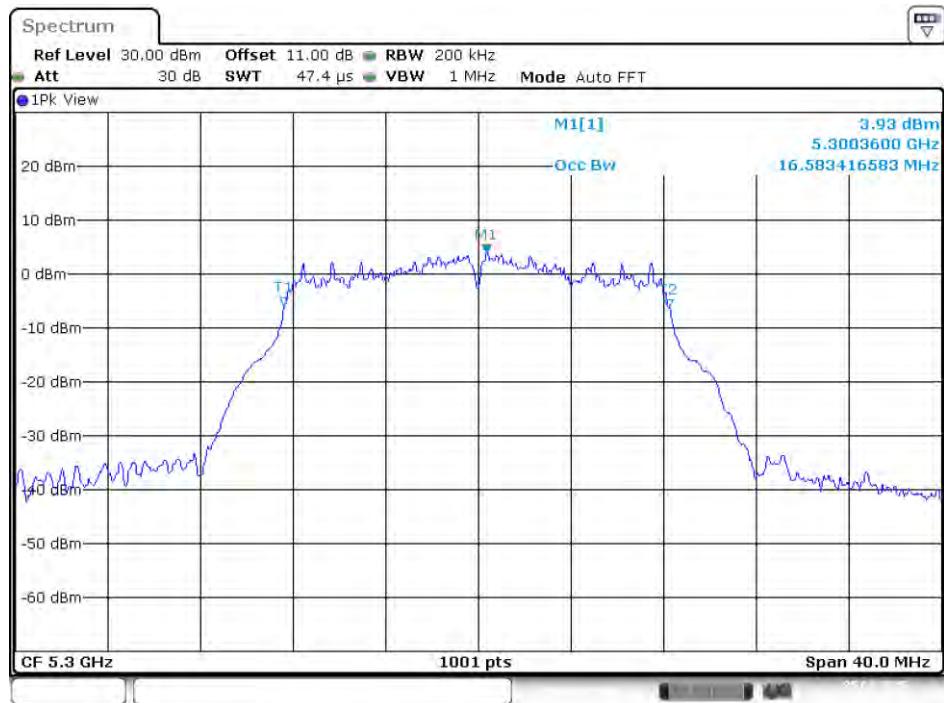
## IEEE 802.11a Mode / 5250 ~ 5350MHz

5260MHz



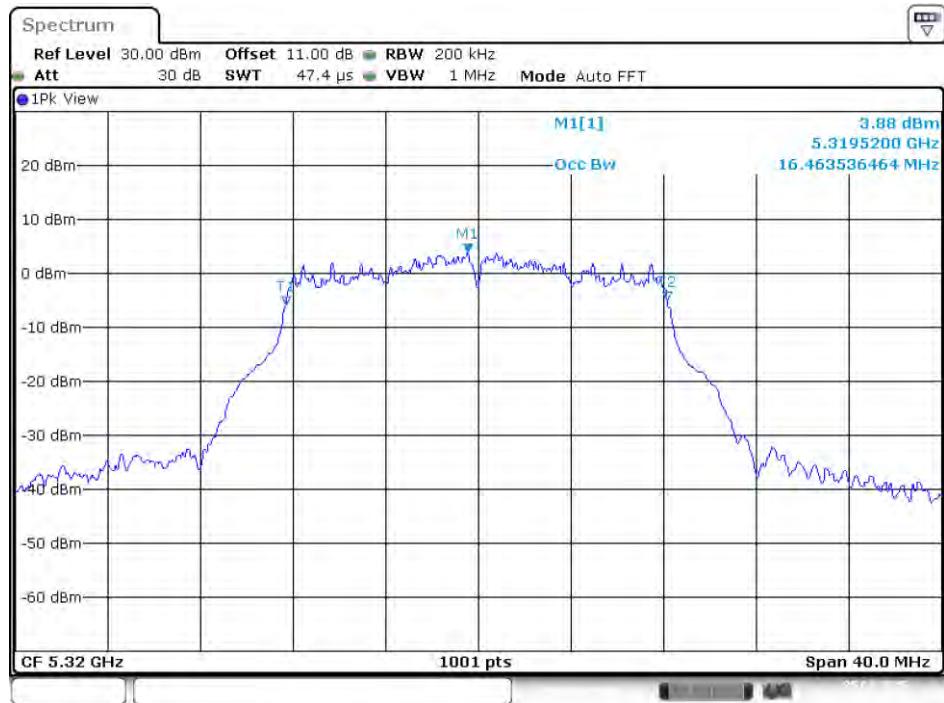
Date: 25 APR 2025 13:01:12

## 5300MHz



Date: 25 APR 2025 13:03:20

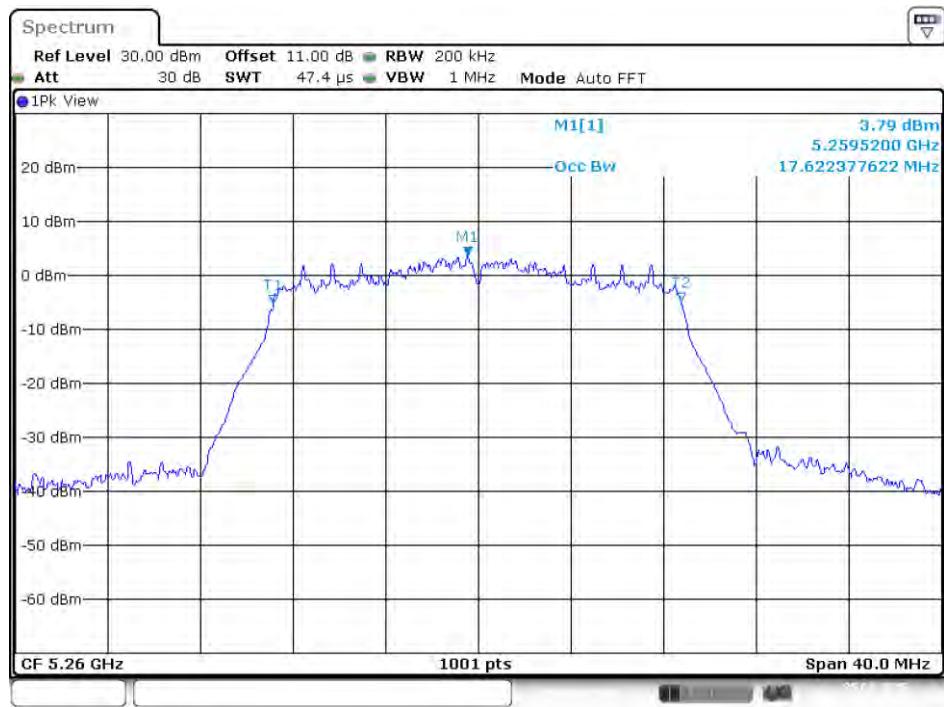
## 5320MHz



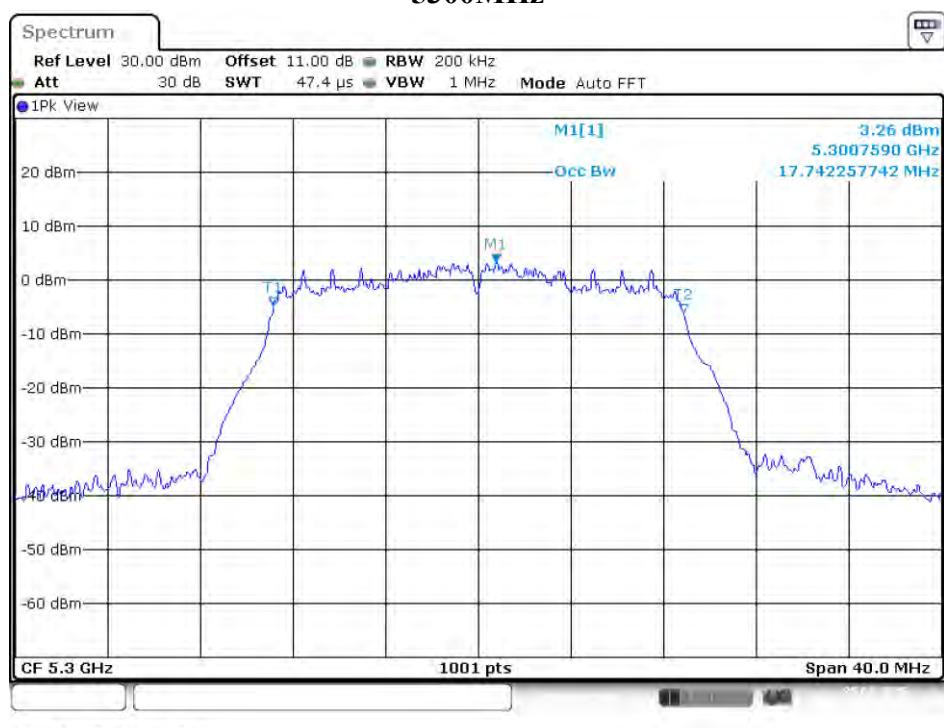
Date: 25 APR 2025 13:05:25

## IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz

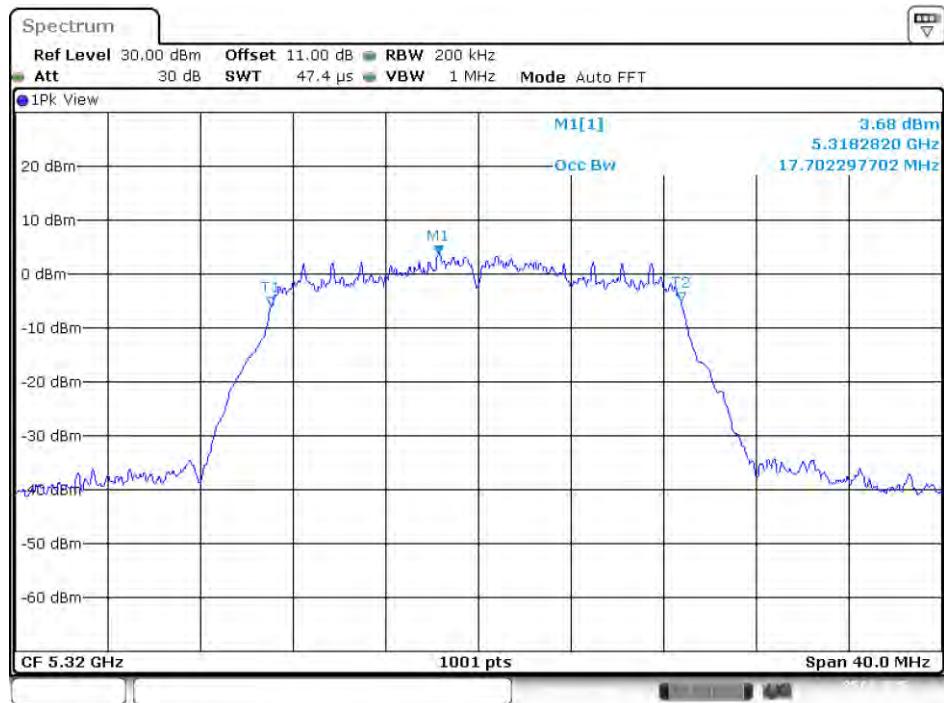
## 5260MHz



## 5300MHz



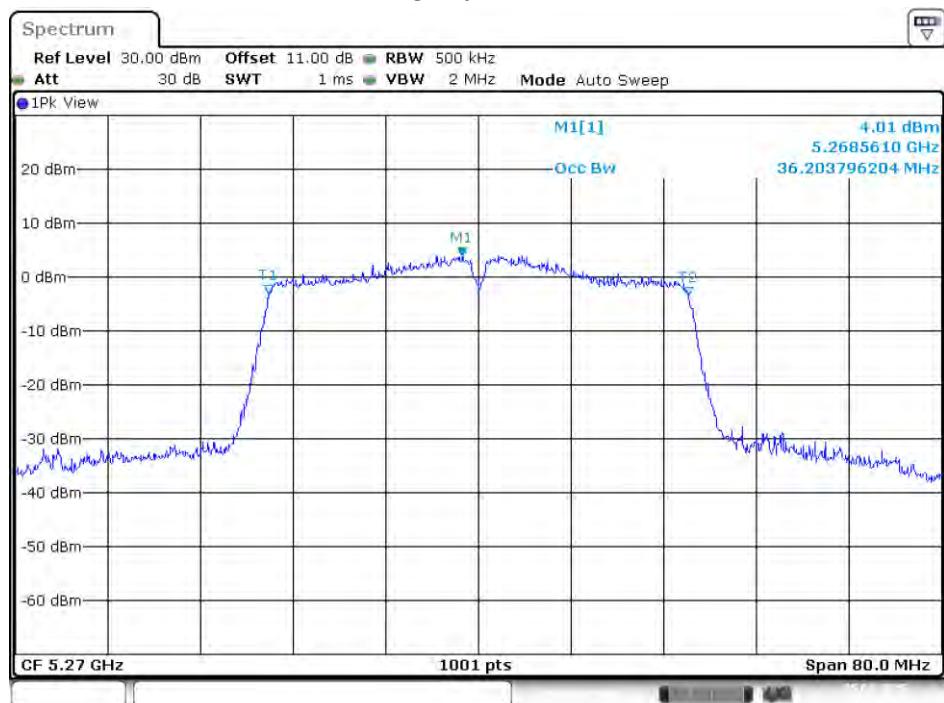
## 5320MHz



Date: 25 APR 2025 13:47:12

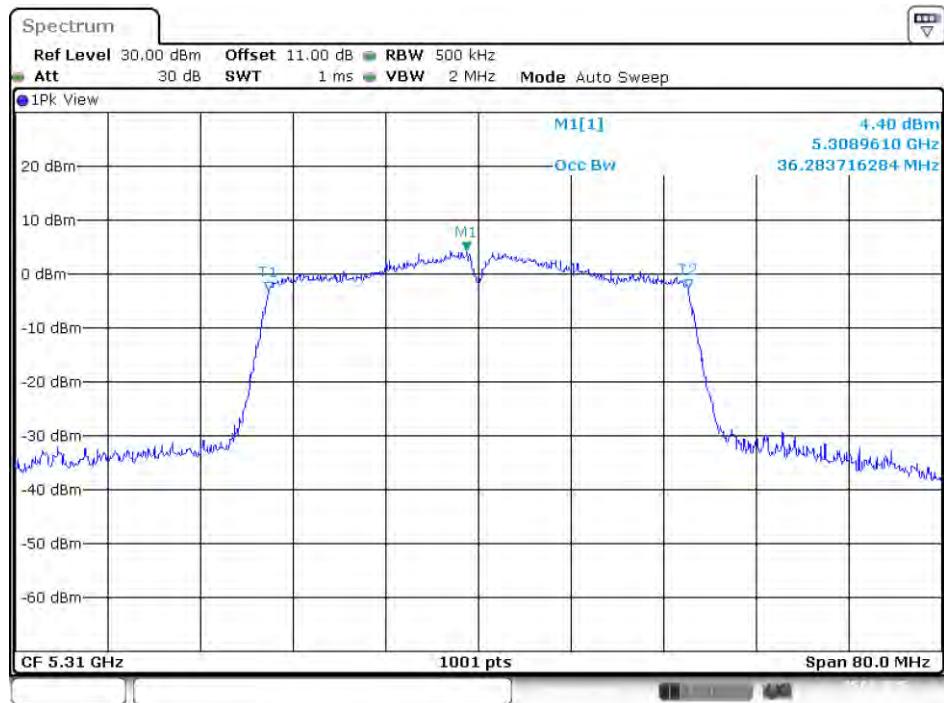
## IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz

## 5270MHz



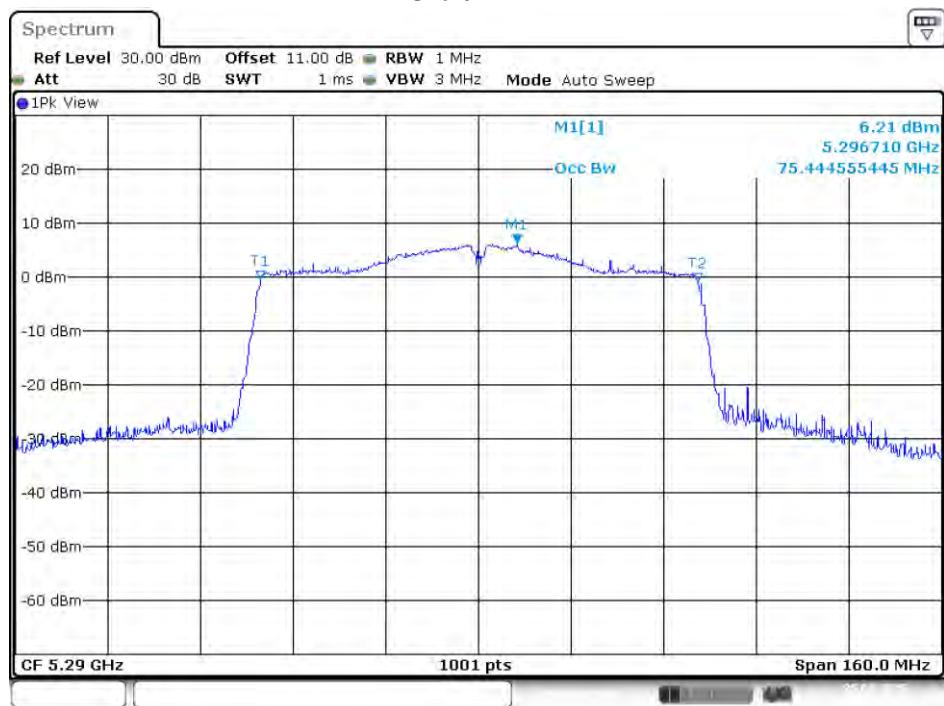
Date: 25 APR 2025 16:17:47

## 5310MHz



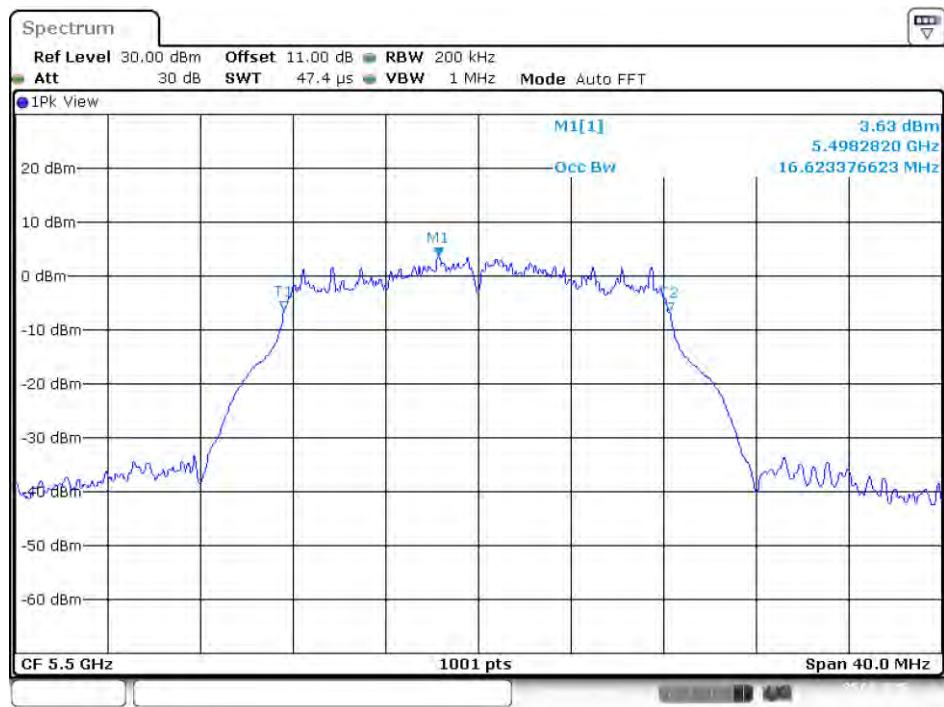
## IEEE 802.11ac VHT80 Mode / 5250 ~ 5350MHz

## 5290MHz

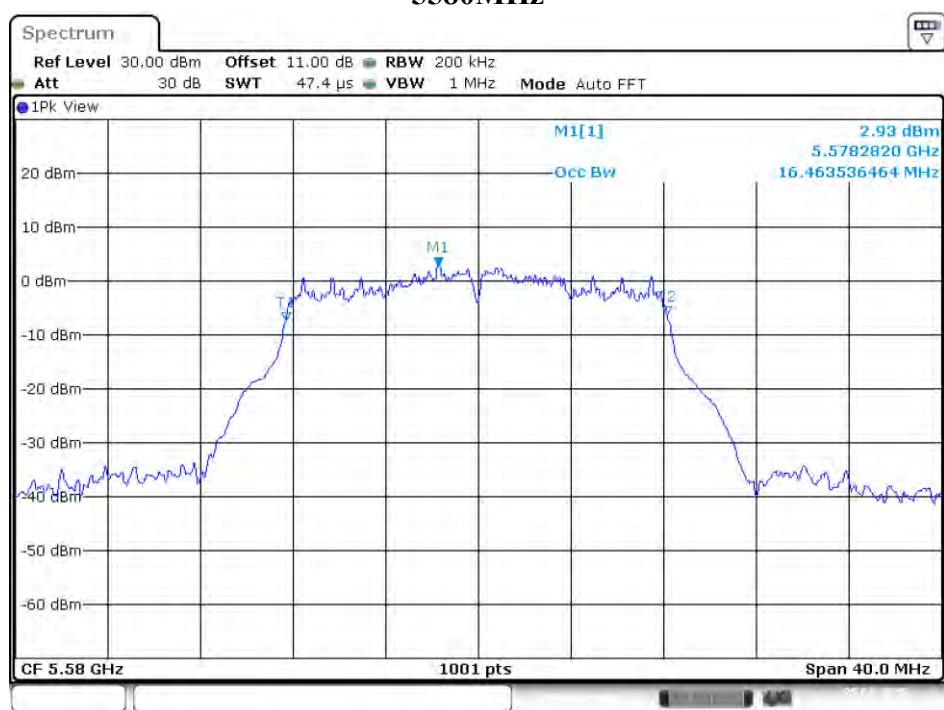


**UNII-2C Band III / OBW 99%**  
**IEEE 802.11a Mode / 5470 ~ 5725MHz**

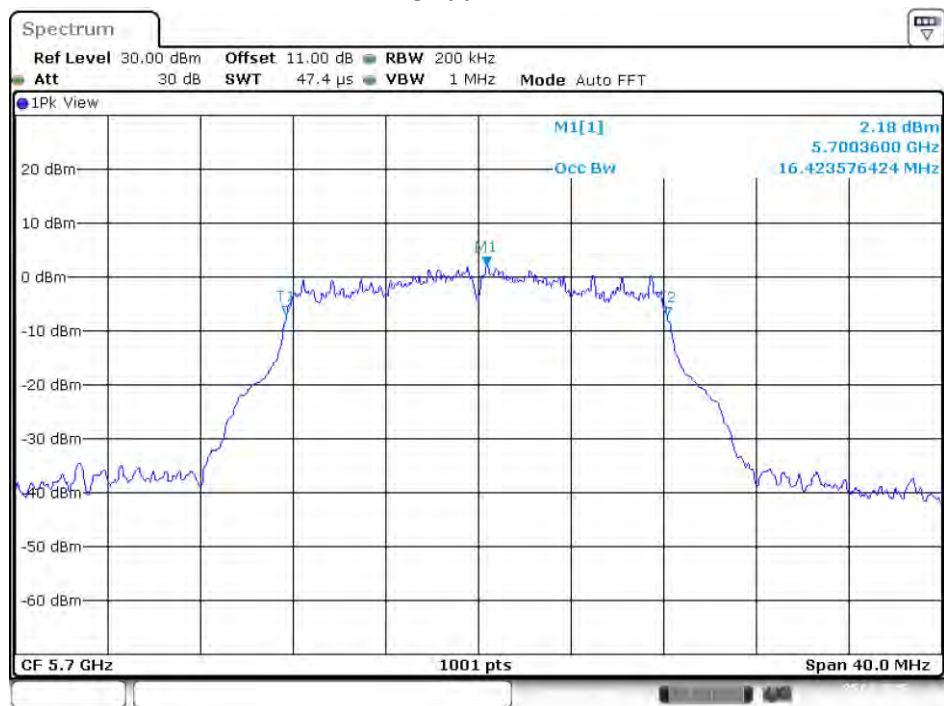
**5500MHz**



**5580MHz**



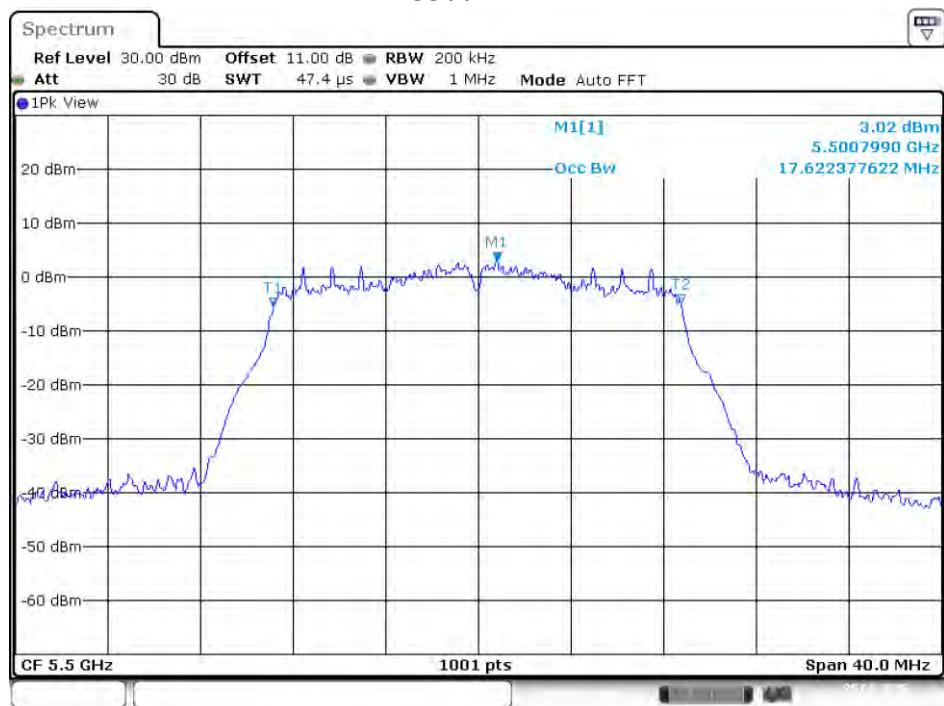
## 5700MHz



Date: 25 APR 2025 13:11:15

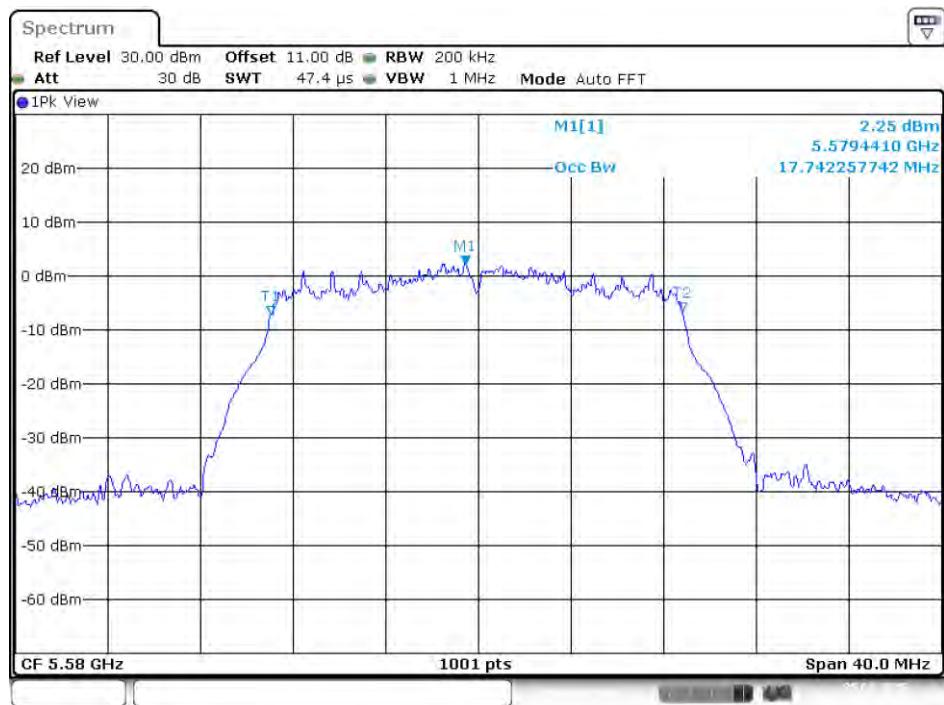
## IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz

## 5500MHz

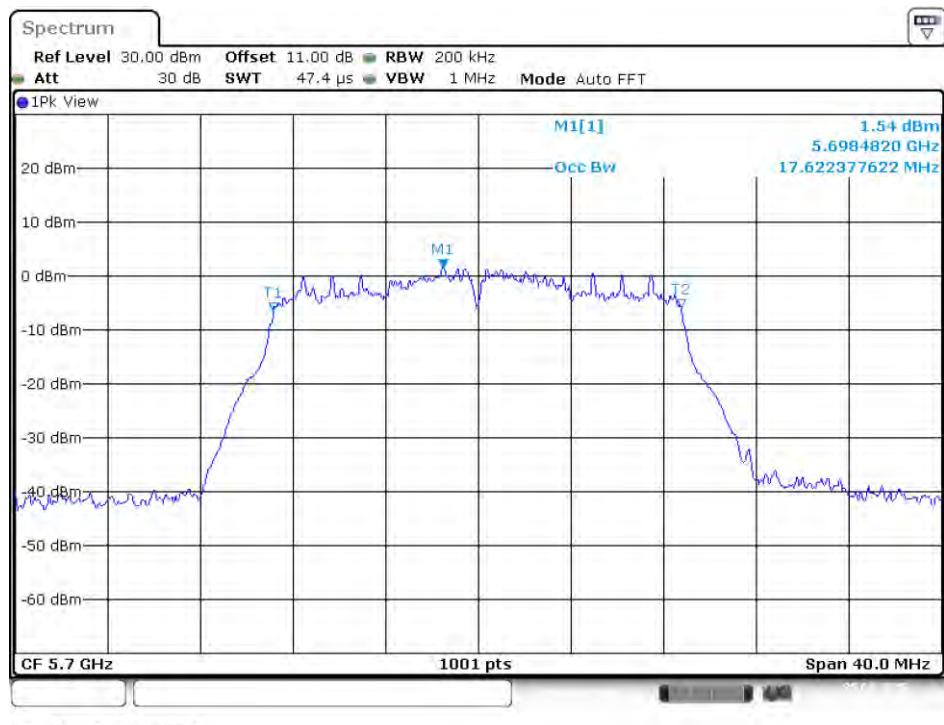


Date: 25 APR 2025 13:58:54

## 5580MHz

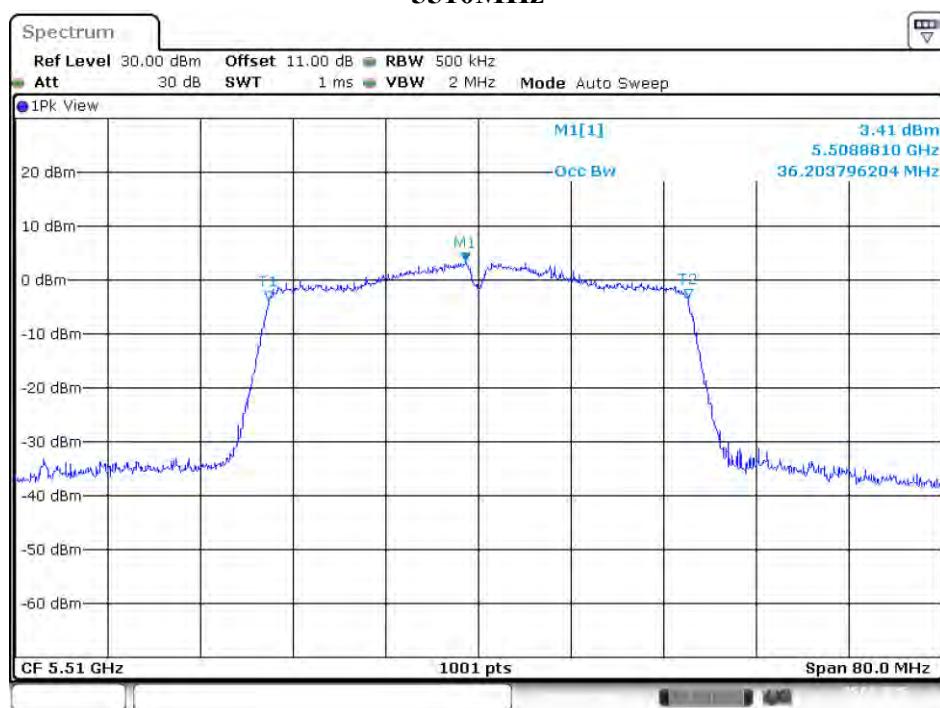


## 5700MHz



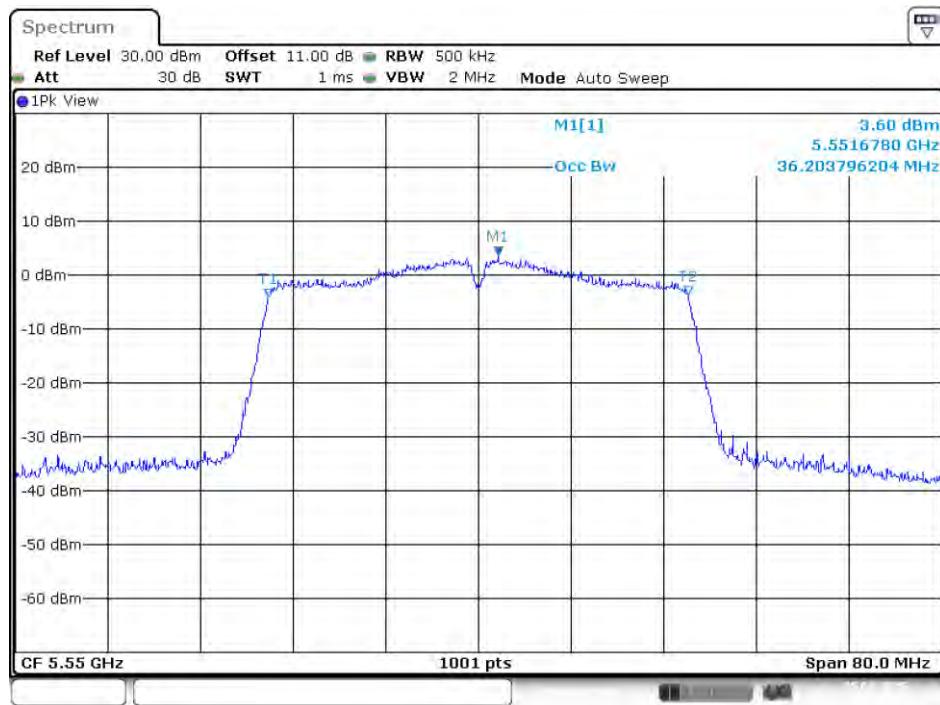
## IEEE 802.11ac VHT40 Mode / 5470 ~ 5725MHz

## 5510MHz



Date: 25 APR 2025 16:30:20

## 5550MHz



Date: 25 APR 2025 16:37:04

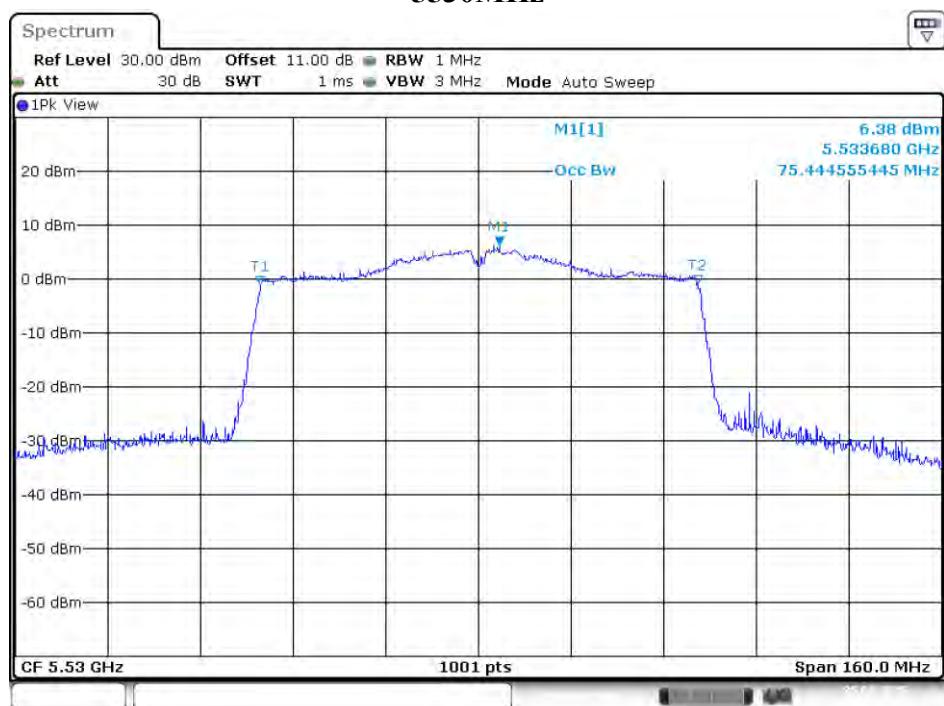
## 5670MHz



Date: 25 APR. 2025 16:43:06

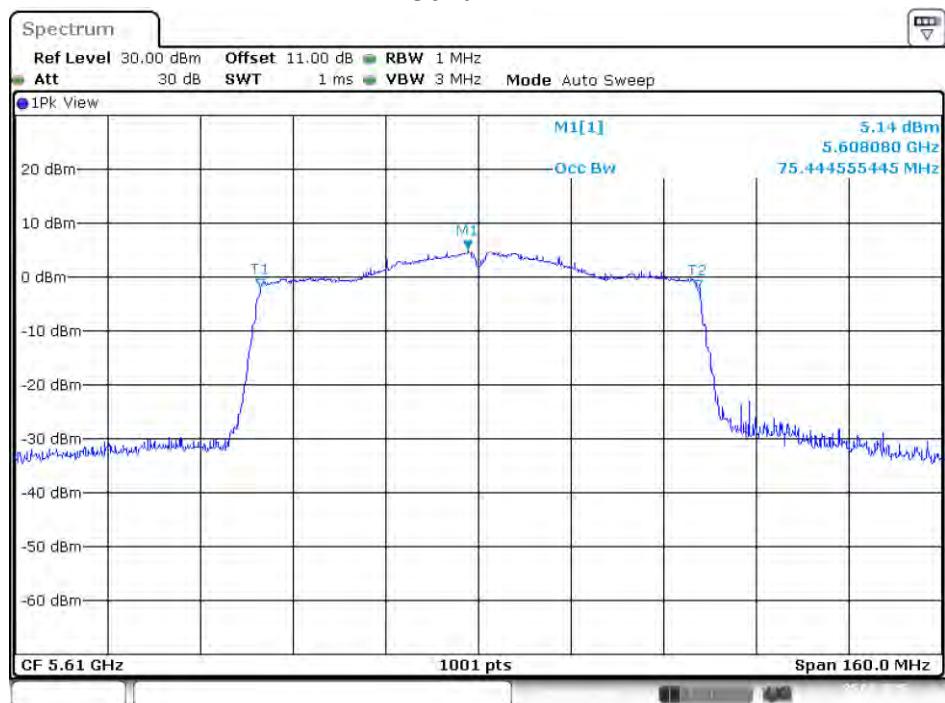
## IEEE 802.11ac VHT80 Mode / 5470 ~ 5725MHz

## 5530MHz



Date: 25 APR. 2025 17:56:53

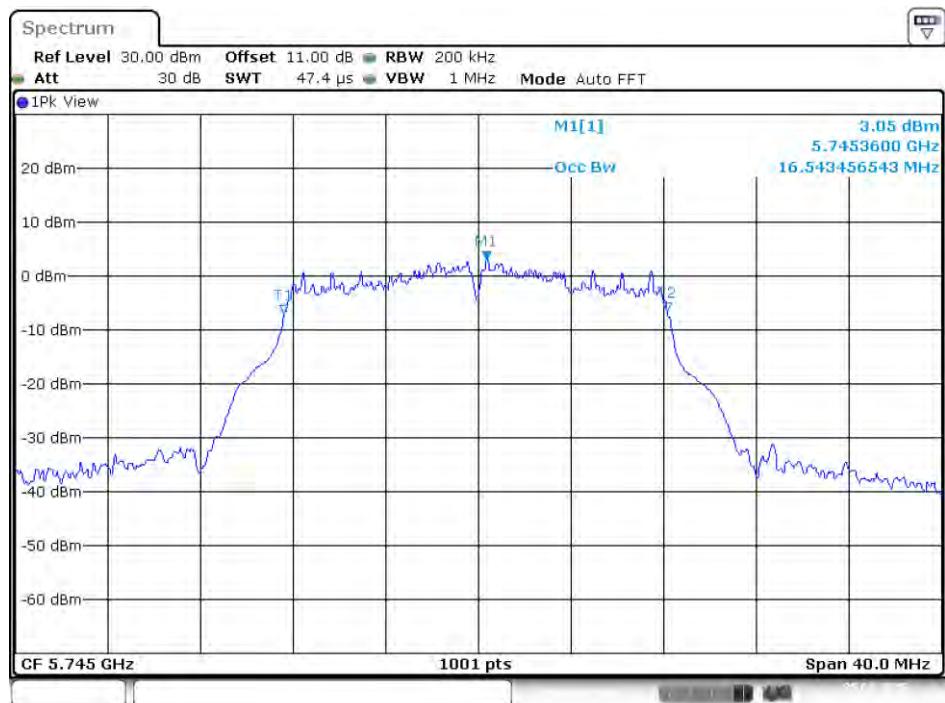
## 5610MHz



Date: 25 APR 2025 18:02:24

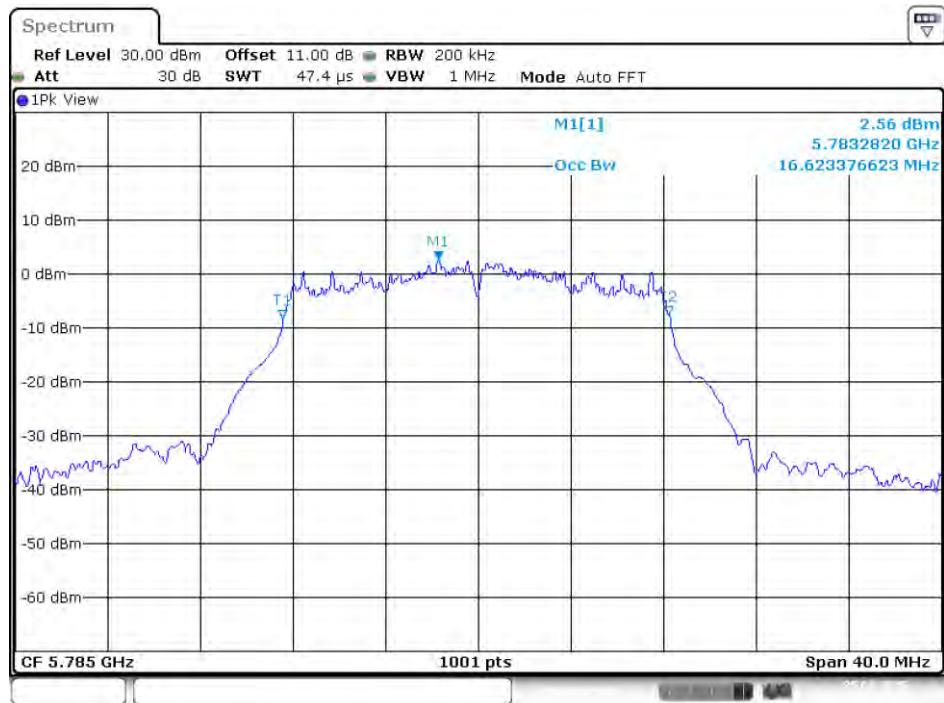
**UNII-3 Band IV / OBW 99%**  
**IEEE 802.11a Mode / 5725 ~ 5850MHz**

## 5745MHz



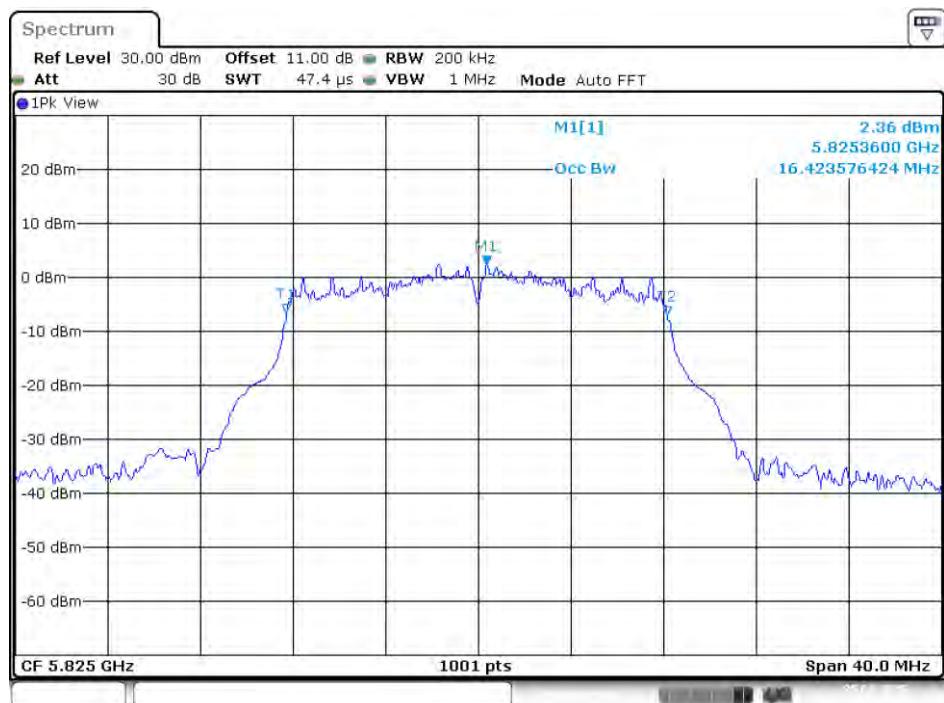
Date: 25 APR 2025 13:22:06

## 5785MHz



Date: 25 APR 2025 13:25:00

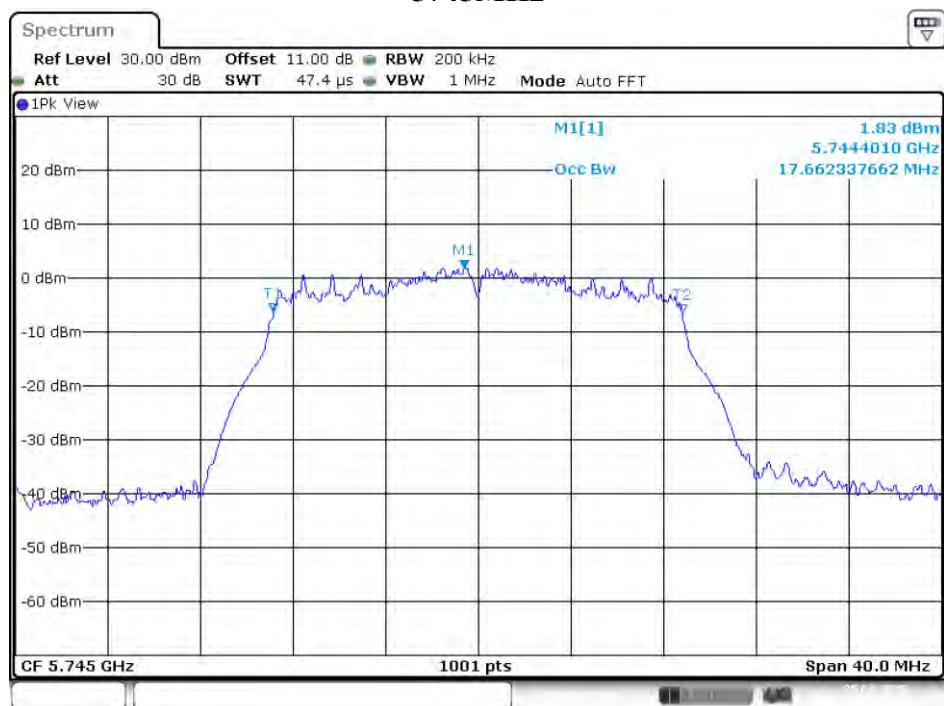
## 5825MHz



Date: 25 APR 2025 13:28:10

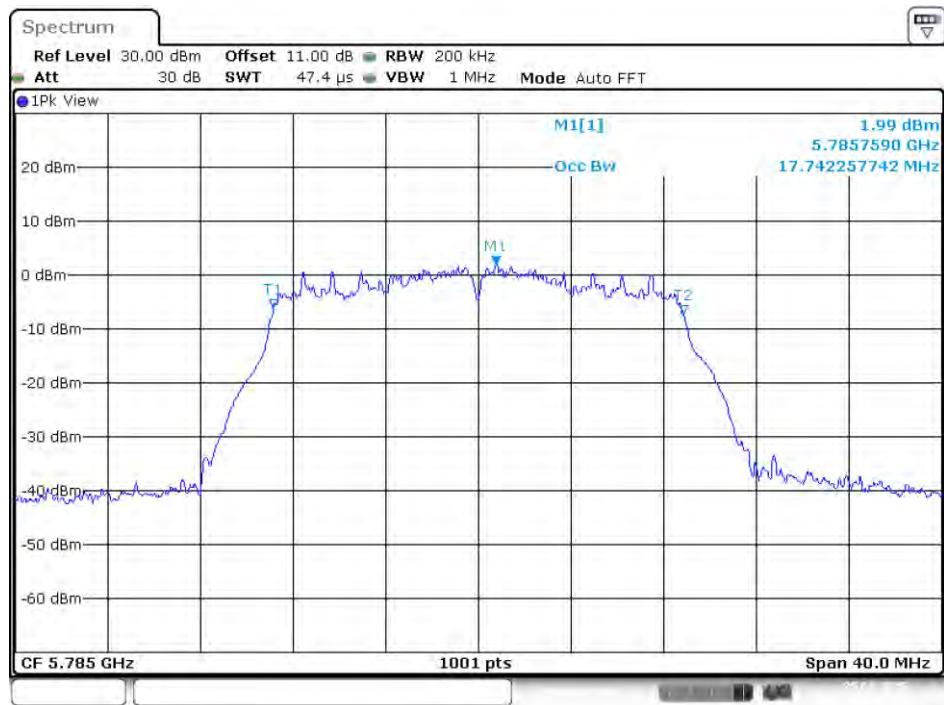
## IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz

## 5745MHz



Date: 25 APR 2025 15:07:48

## 5785MHz



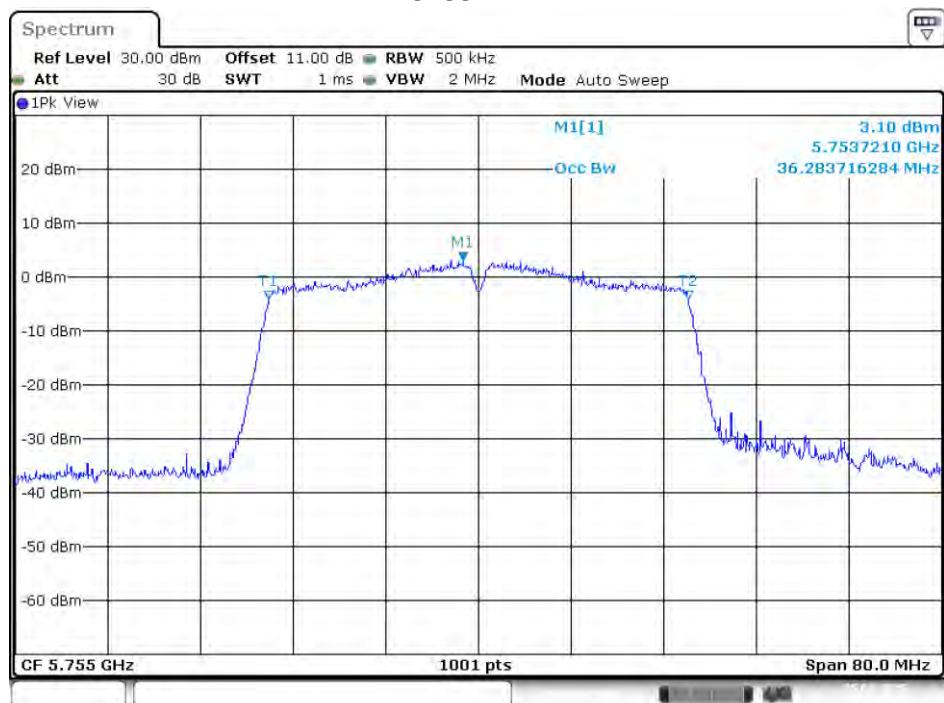
Date: 25 APR 2025 15:10:37

## 5825MHz

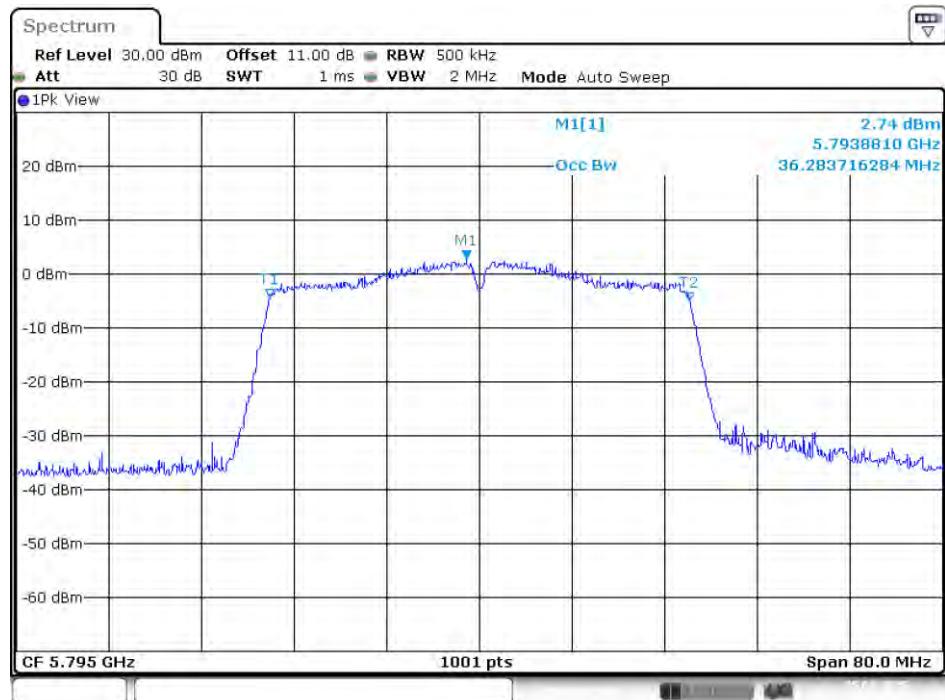


## IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz

## 5755MHz



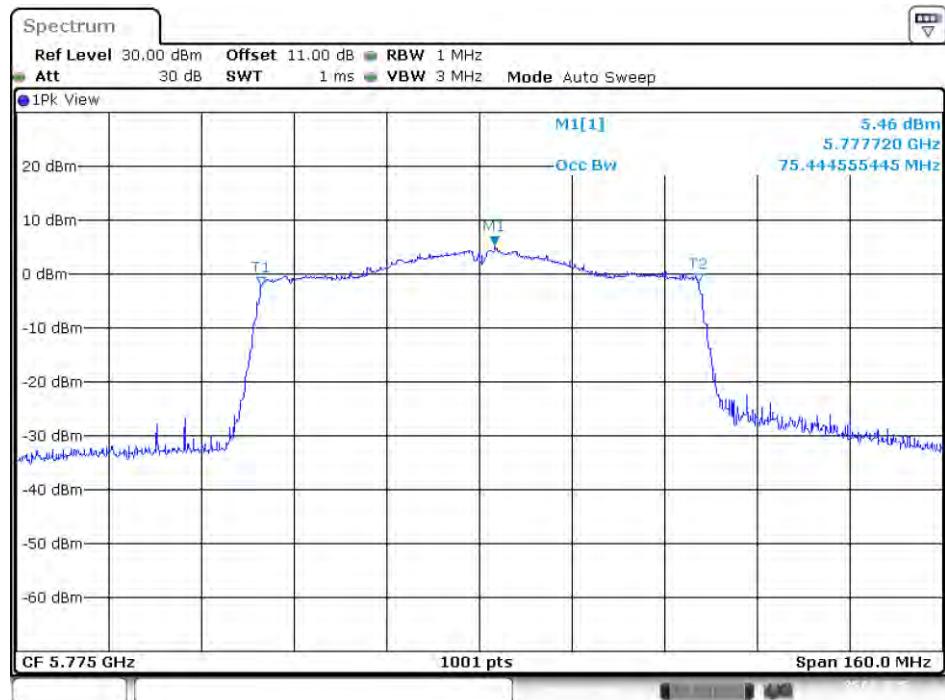
## 5795MHz



Date: 25 APR 2025 17:23:34

## IEEE 802.11ac VHT80 Mode / 5725 ~ 5850MHz

## 5775MHz



Date: 25 APR 2025 18:08:48

## 10 FCC §15.407(a) & RSS-247 §6.2 – 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 the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. In addition, the 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 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.

According to RSS-247 §6.2:

For the 5.15-5.25 GHz band

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10} B$ , dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10} B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the 5.25-5.35 GHz band

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

For the 5.47-5.725 GHz bands

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10} B$ , dBm, whichever is less.

The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10} B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

For the 5.725-5.85 GHz bands

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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 Footnote3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

## 10.2 Test Procedure

According to ANSI C63.10-2013 Section 12.3.3.1

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)	Conducted Average Output Power (dBm)	Duty Factor (dB)	Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC Limit (dBm)	EIRP Power (dBm)	RSS-247 EIRP Limit (dBm)
802.11a	36	5180	13.29	0.22	13.51	24	18.71	22.16
	40	5200	13.47	0.22	13.69	24	18.89	22.15
	48	5240	13.39	0.22	13.61	24	18.81	22.15
802.11ac VHT20	36	5180	12.75	0.22	12.97	24	18.17	22.46
	40	5200	12.89	0.22	13.11	24	18.31	22.49
	48	5240	12.94	0.22	13.16	24	18.36	22.46
802.11ac VHT40	38	5190	11.79	0.13	11.92	24	17.12	23
	46	5230	11.85	0.13	11.98	24	17.18	23
802.11ac VHT80	42	5210	13.13	0.66	13.79	24	18.99	23

Note: The device is a client device.

The maximum antenna gain is 5.2 dBi.

#### 5250-5350MHz

Test Modes	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)	Duty Factor (dB)	Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC Limit (dBm)	RSS-247 Limit (dBm)	EIRP Power (dBm)	RSS-247 EIRP Limit (dBm)
802.11a	52	5260	13.44	0.22	13.66	24	23.19	18.16	29.19
	60	5300	13.36	0.22	13.58	24	23.20	18.08	29.20
	64	5320	13.46	0.22	13.68	24	23.16	18.18	29.16
802.11ac VHT20	52	5260	12.97	0.22	13.19	24	23.46	17.69	29.46
	60	5300	13.04	0.22	13.26	24	23.49	17.76	29.49
	64	5320	13.14	0.22	13.36	24	23.48	17.86	29.48
802.11ac VHT40	54	5270	11.91	0.13	12.04	24	24	16.54	30
	62	5310	11.98	0.13	12.11	24	24	16.61	30
802.11ac VHT80	58	5290	13.22	0.66	13.88	24	24	18.38	30

Note: The maximum antenna gain is 4.5 dBi.

**5470-5725MHz**

Test Modes	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)	Duty Factor (dB)	Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC Limit (dBm)	RSS-247 Limit (dBm)	EIRP Power (dBm)	RSS-247 EIRP Limit (dBm)
802.11a	100	5500	12.69	0.22	12.91	24	23.21	16.91	29.21
	116	5580	12.28	0.22	12.50	24	23.16	16.50	29.16
	140	5700	11.36	0.22	11.58	24	23.15	15.58	29.15
802.11ac VHT20	100	5500	12.28	0.22	12.50	24	23.46	16.50	29.46
	116	5580	11.88	0.22	12.10	24	23.49	16.10	29.49
	140	5700	10.94	0.22	11.16	24	23.49	15.16	29.46
802.11ac VHT40	102	5510	10.89	0.13	11.02	24	24	15.02	30
	110	5550	10.91	0.13	11.04	24	24	15.04	30
	134	5670	10.13	0.13	10.26	24	24	14.26	30
802.11ac VHT80	106	5530	12.41	0.66	13.07	24	24	17.07	30
	122	5610	11.86	0.66	12.52	24	24	16.52	30

Note: The maximum antenna gain is 4 dBi.

**5725-5850MHz**

Test Modes	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)	Duty Factor (dB)	Maximum Conducted Average Output Power With Duty Factor (dBm)	FCC / RSS-247 Limit (dBm)
802.11a	149	5745	12.14	0.22	12.36	30
	157	5785	11.79	0.22	12.01	30
	165	5825	11.57	0.22	11.79	30
802.11ac VHT20	149	5745	11.49	0.22	11.71	30
	157	5785	11.45	0.22	11.67	30
	165	5825	10.99	0.22	11.21	30
802.11ac VHT40	151	5755	10.69	0.13	10.82	30
	159	5795	10.28	0.13	10.41	30
802.11ac VHT80	155	5775	11.58	0.66	12.24	30

## 11 FCC §15.407(a) & RSS-247 §6.2 – 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  $11 \text{ dBm} + 10 \log B$ , 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.

According to RSS-247 §6.2:

For the 5.15-5.25 GHz band

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or  $1.76 + 10 \log_{10}B$ , dBm, whichever is less. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or  $10 + 10 \log_{10}B$ , dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the 5.25-5.35 GHz band

Devices, other than devices installed in vehicles, shall comply with the following:

- a) The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;
- b) The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

For the 5.47-5.725 GHz bands

The maximum conducted output power shall not exceed 250 mW or  $11 + 10 \log_{10}B$ , dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or  $17 + 10 \log_{10}B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

For the 5.725-5.85 GHz bands

The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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 Footnote3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

## 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  $\pm 2\%$

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)	EIRP Power Spectral Density (dBm/MHz)	
								Result	Limit
UNII-1	802.11a	36	5180	3.58	0.22	3.80	11	9.00	10
		40	5200	3.66	0.22	3.88	11	9.08	10
		48	5240	3.48	0.22	3.70	11	8.90	10
	802.11ac 20	36	5180	2.61	0.22	2.83	11	8.03	10
		40	5200	2.67	0.22	2.89	11	8.09	10
		48	5240	2.63	0.22	2.85	11	8.05	10
	802.11ac 40	38	5190	-1.41	0.13	-1.28	11	3.92	10
		46	5230	-1.36	0.13	-1.23	11	3.97	10
	802.11ac 80	42	5210	-2.43	0.66	-1.77	11	3.43	10

Note: The device is a client device.

The maximum antenna gain is 5.2 dBi.

#### 5250-5350MHz

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-2A	802.11a	52	5260	3.56	0.22	3.78	11
		60	5300	3.52	0.22	3.74	11
		64	5320	3.76	0.22	3.98	11
	802.11ac 20	52	5260	2.91	0.22	3.13	11
		60	5300	2.89	0.22	3.11	11
		64	5320	2.85	0.22	3.07	11
	802.11ac 40	54	5270	-0.96	0.13	-0.83	11
		62	5310	-1.11	0.13	-0.98	11
	802.11ac 80	58	5290	-2.57	0.66	-1.91	11

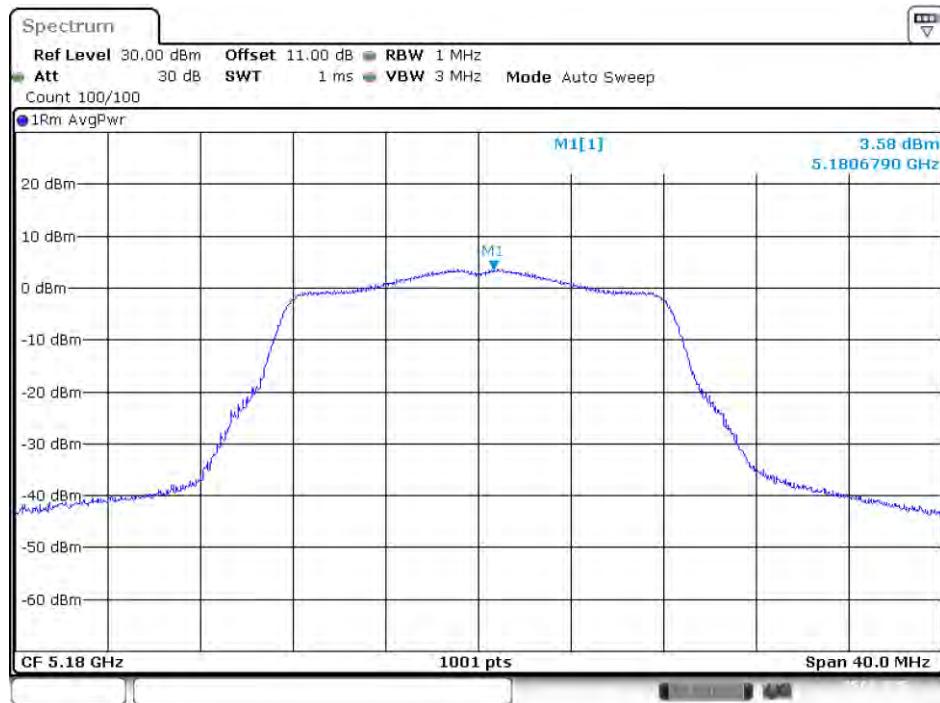
**5470-5725MHz**

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-2C	802.11a	100	5500	2.87	0.22	3.09	11
		116	5580	2.52	0.22	2.74	11
		140	5700	1.60	0.22	1.82	11
	802.11ac 20	100	5500	2.06	0.22	2.28	11
		116	5580	1.54	0.22	1.76	11
		140	5700	0.72	0.22	0.94	11
	802.11ac 40	102	5510	-1.84	0.13	-1.71	11
		110	5550	-2.21	0.13	-2.08	11
		134	5670	-2.72	0.13	-2.59	11
	802.11ac 80	106	5530	-3.09	0.66	-2.43	11
		122	5610	-3.77	0.66	-3.11	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	-0.31	0.22	-0.09	30
		157	5785	-0.75	0.22	-0.53	30
		165	5825	-1.05	0.22	-0.83	30
	802.11ac 20	149	5745	-0.92	0.22	-0.70	30
		157	5785	-1.18	0.22	-0.96	30
		165	5825	-1.55	0.22	-1.33	30
	802.11ac 40	151	5755	-5.26	0.13	-5.13	30
		159	5795	-5.15	0.13	-5.02	30
	802.11ac 80	155	5775	-6.98	0.66	-6.32	30

Please refer to the following plots

**UNII-1 Band I / PSD****UNII-1 Band I / PSD  
IEEE 802.11a Mode / 5150 ~ 5250MHz****5180MHz**

Date: 25 APR 2025 12:45:01

**5200MHz**

Date: 25 APR 2025 12:52:54

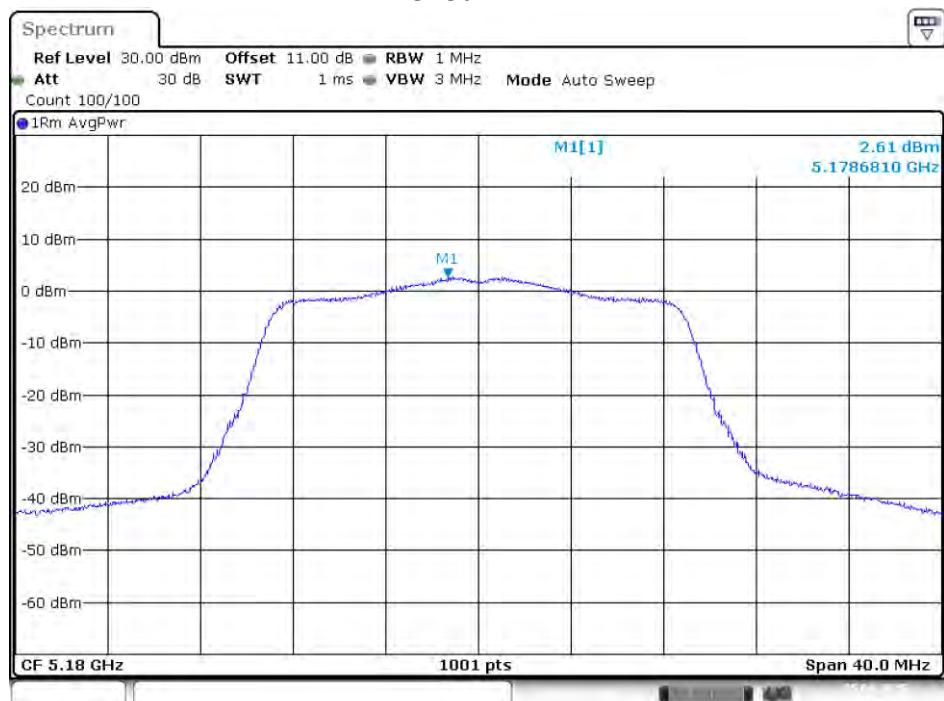
## 5240MHz



Date: 25 APR 2025 12:57:00

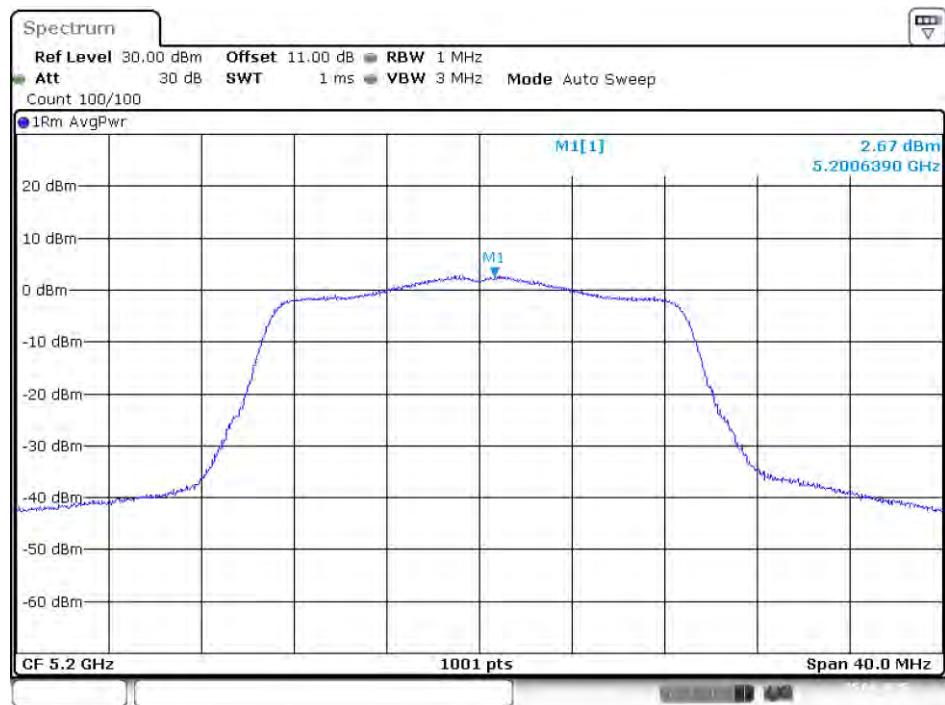
## IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz

## 5180MHz

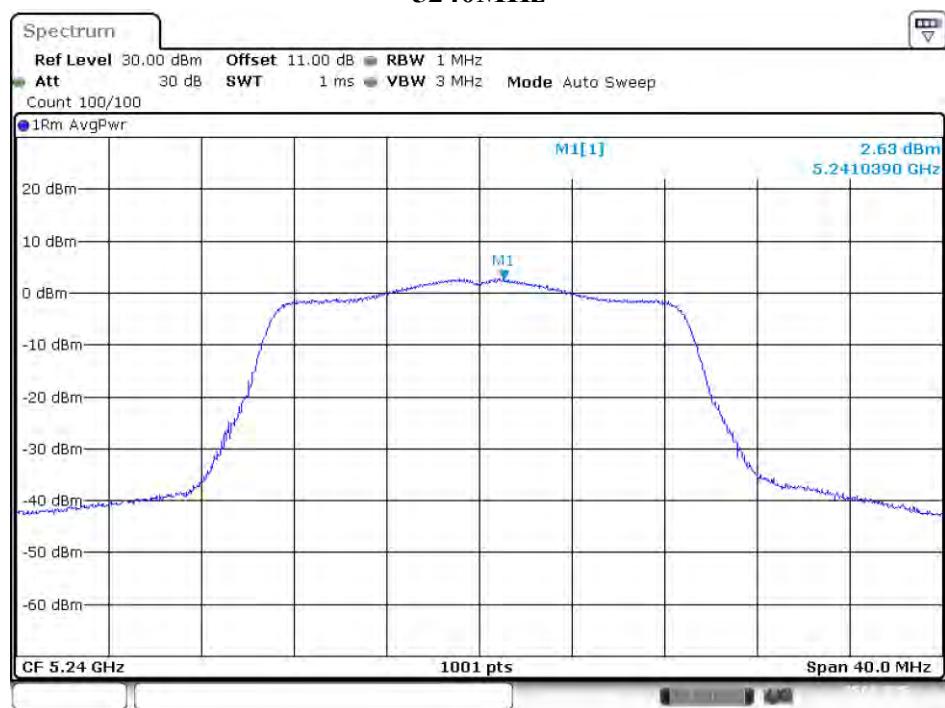


Date: 25 APR 2025 13:34:16

## 5200MHz

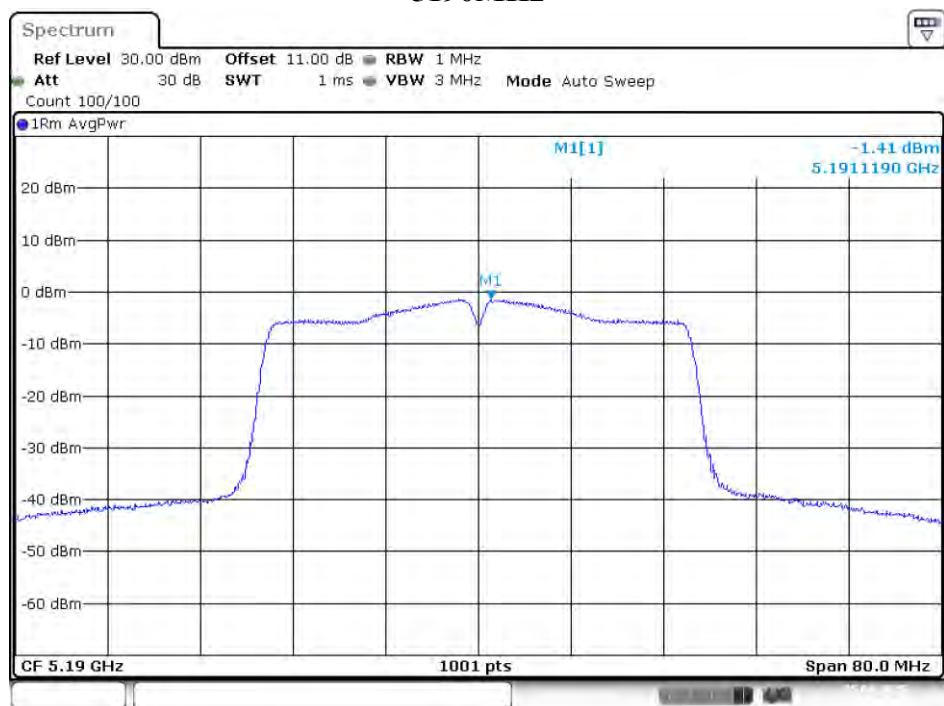


## 5240MHz

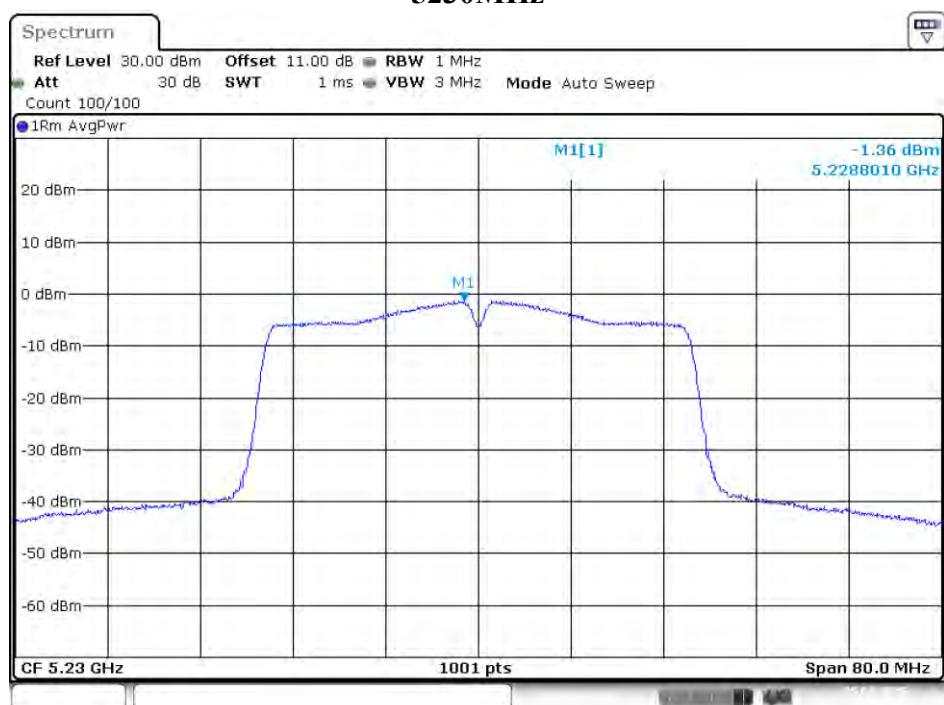


## IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz

## 5190MHz



## 5230MHz



## IEEE 802.11ac VHT80 Mode / 5150 ~ 5250MHz

5210MHz

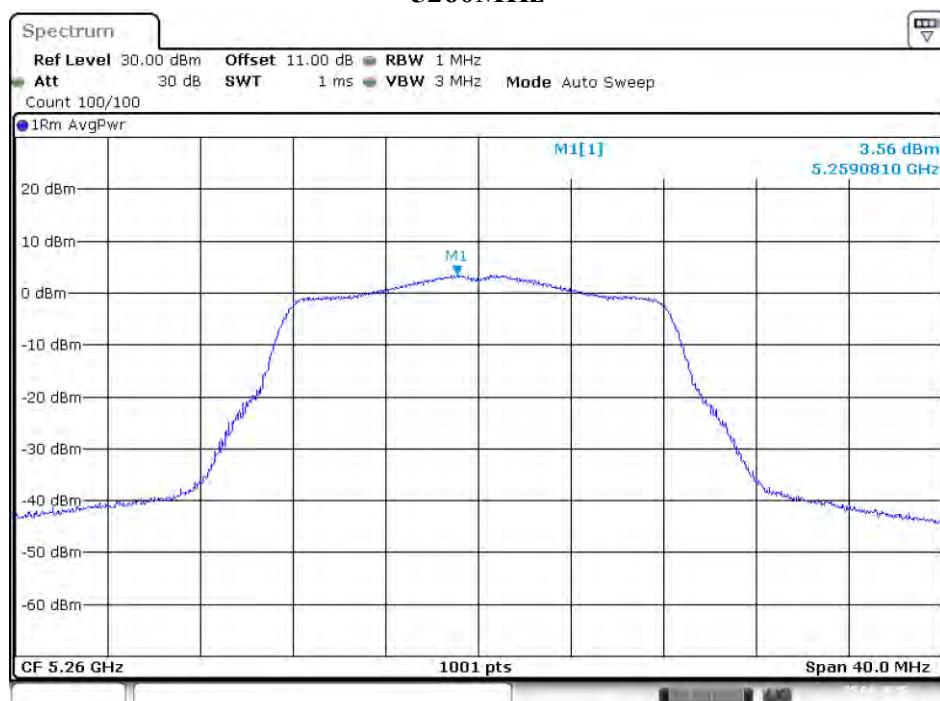


Date: 25 APR 2025 17:28:32

## UNII-2A Band II / PSD

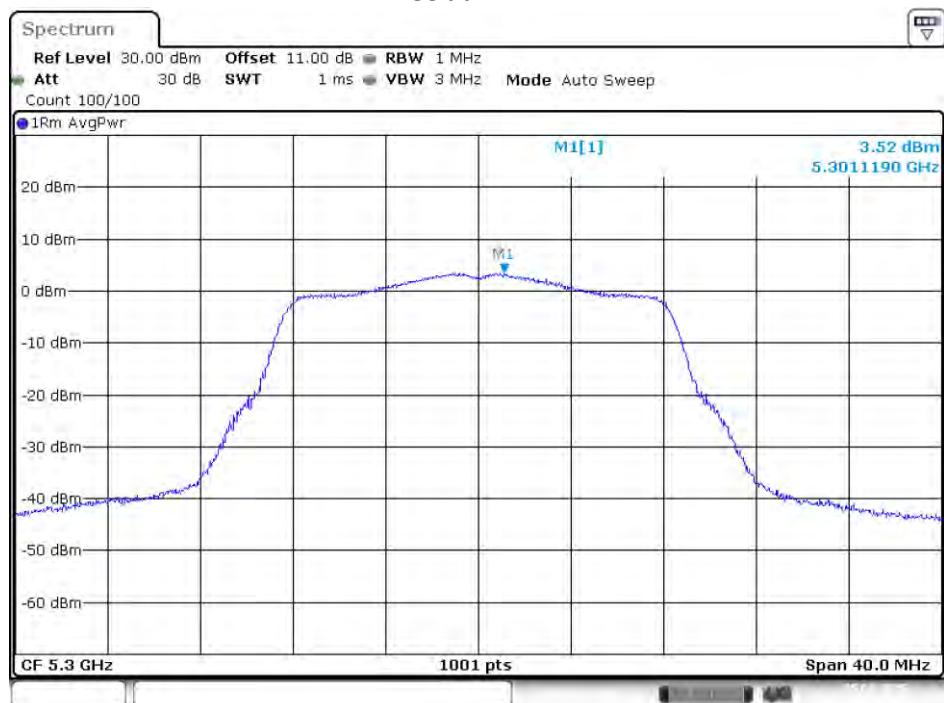
## IEEE 802.11a Mode / 5250 ~ 5350MHz

5260MHz

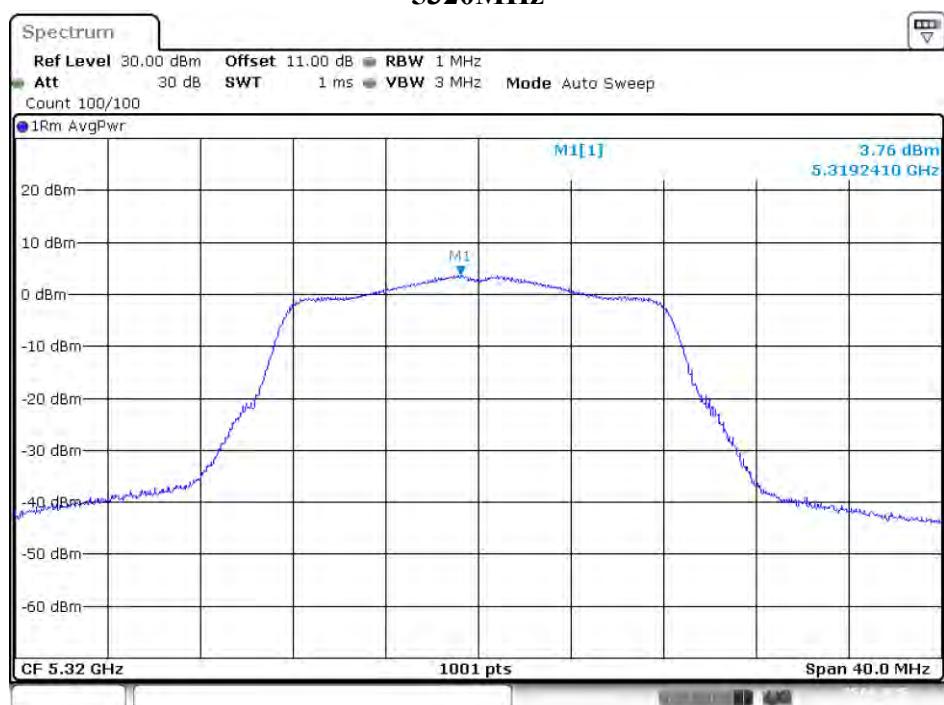


Date: 25 APR 2025 13:00:45

## 5300MHz

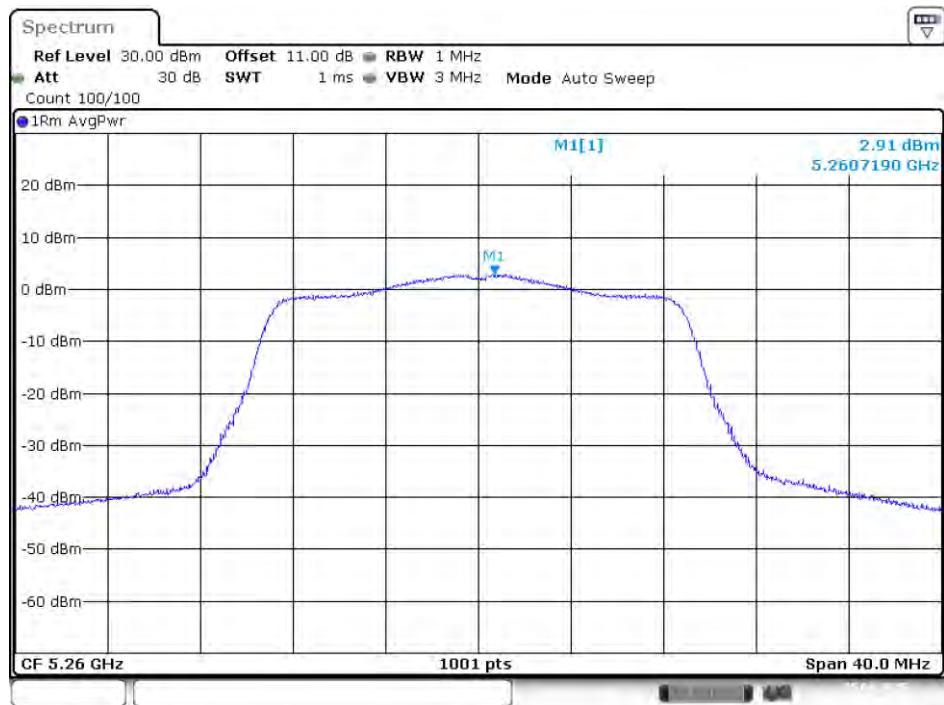


## 5320MHz

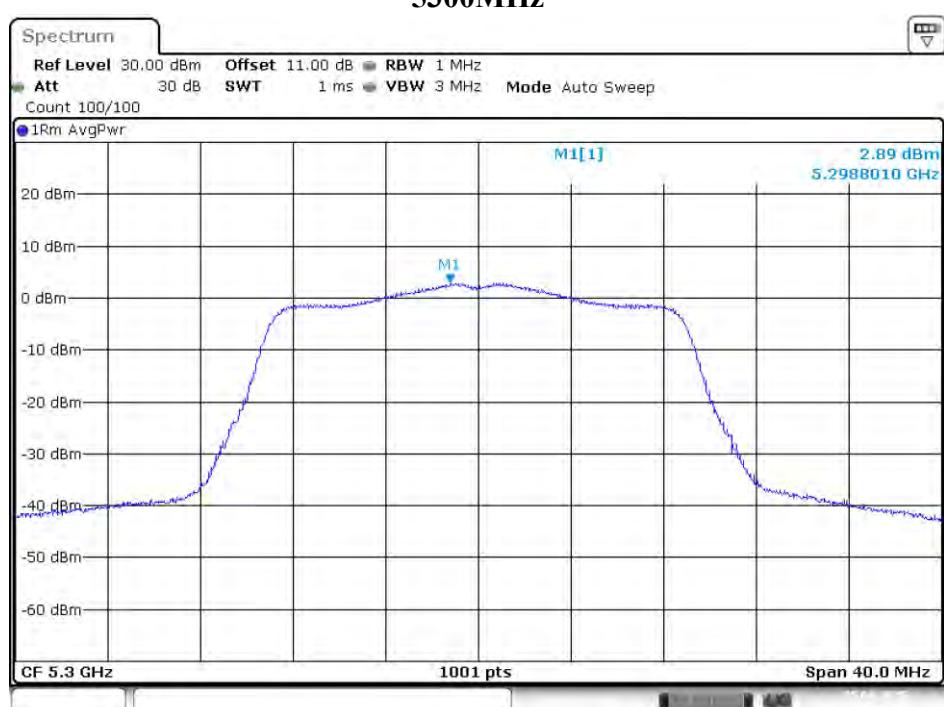


## IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz

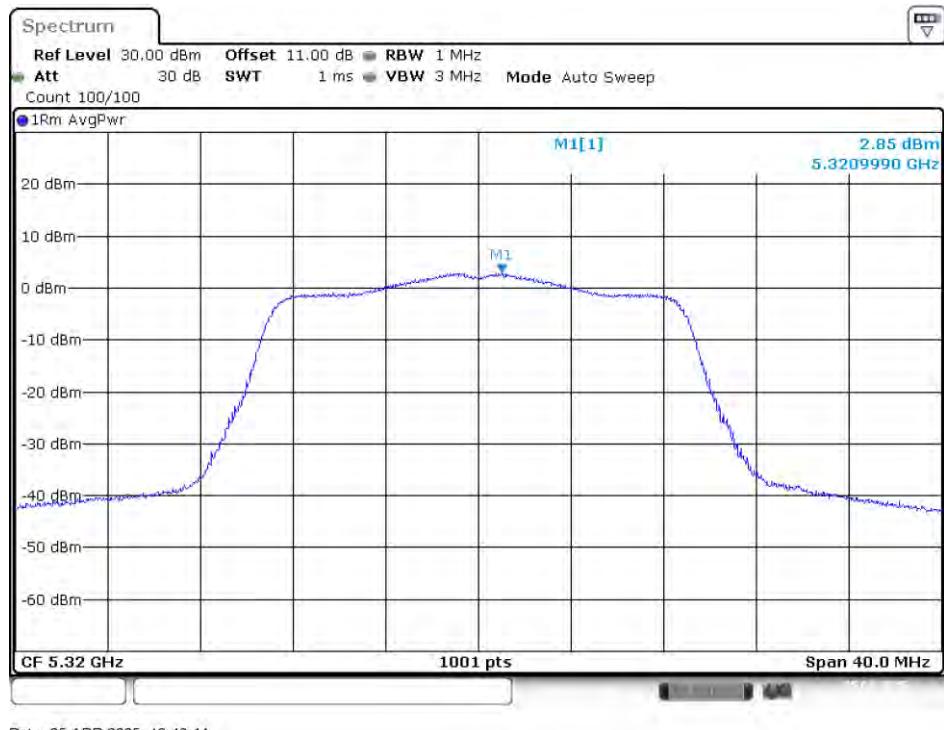
## 5260MHz



## 5300MHz

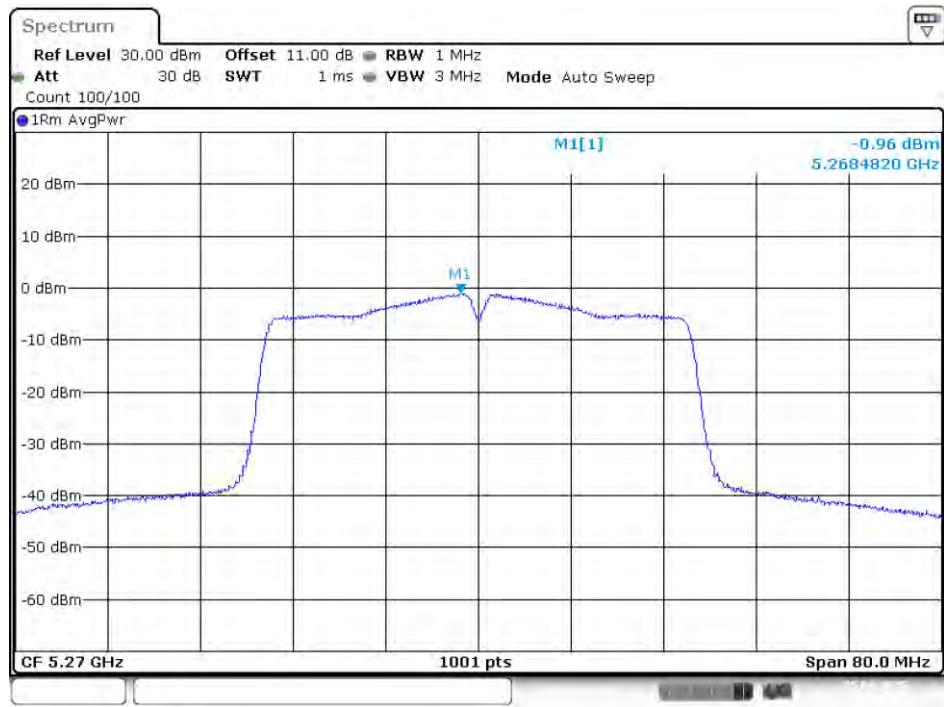


## 5320MHz

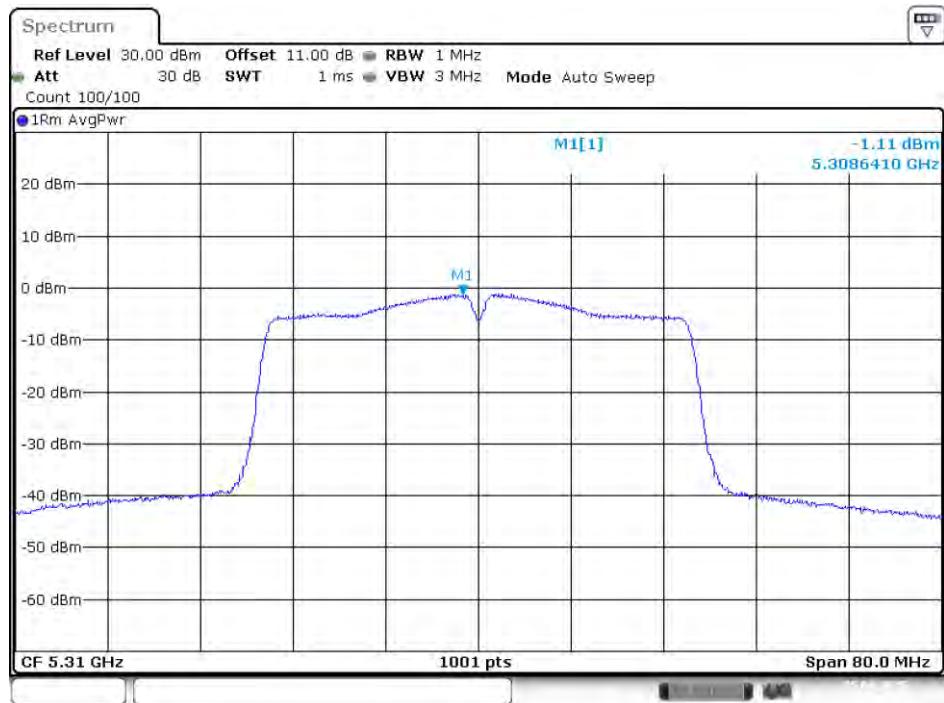


## IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz

## 5270MHz



## 5310MHz



Date: 25 APR 2025 16:22:07

## IEEE 802.11ac VHT80 Mode / 5250 ~ 5350MHz

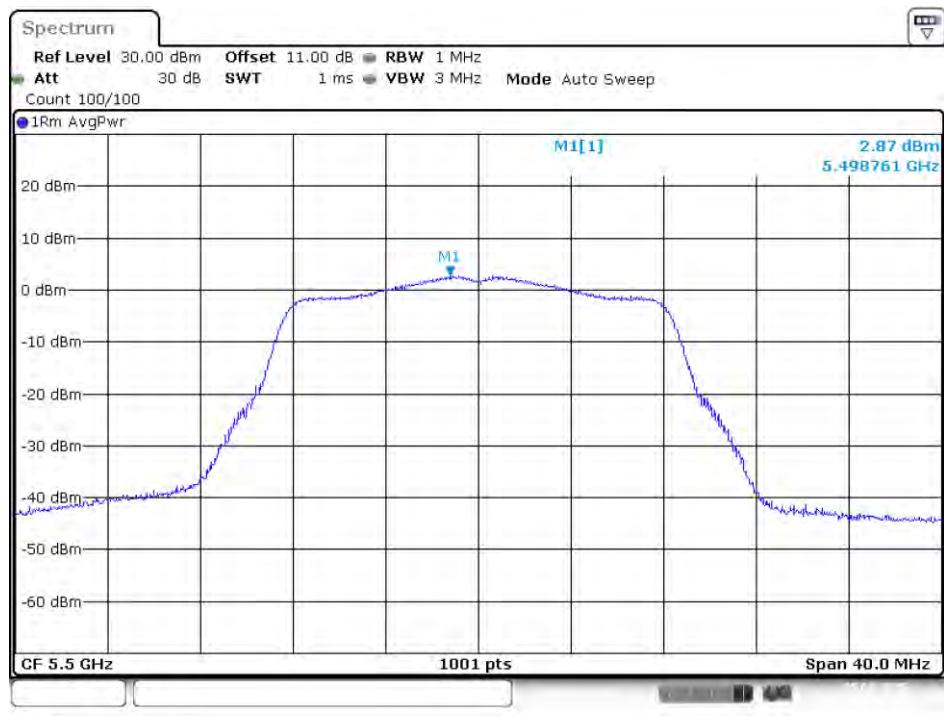
## 5290MHz



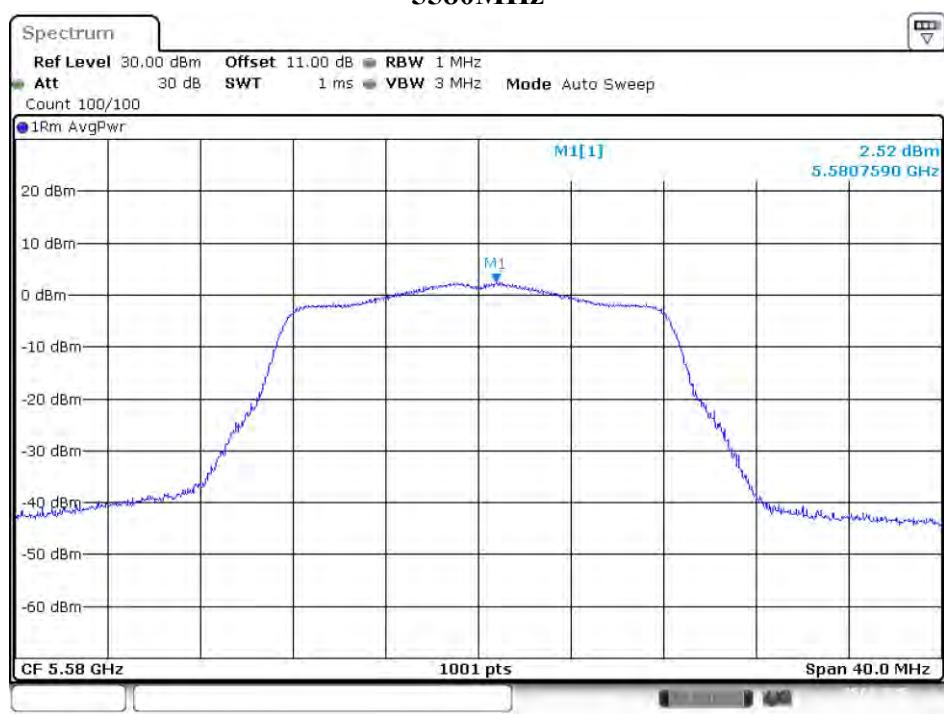
Date: 25 APR 2025 17:48:05

**UNII-2C Band III / PSD**  
**IEEE 802.11a Mode / 5470 ~ 5725MHz**

5500MHz



5580MHz



## 5700MHz

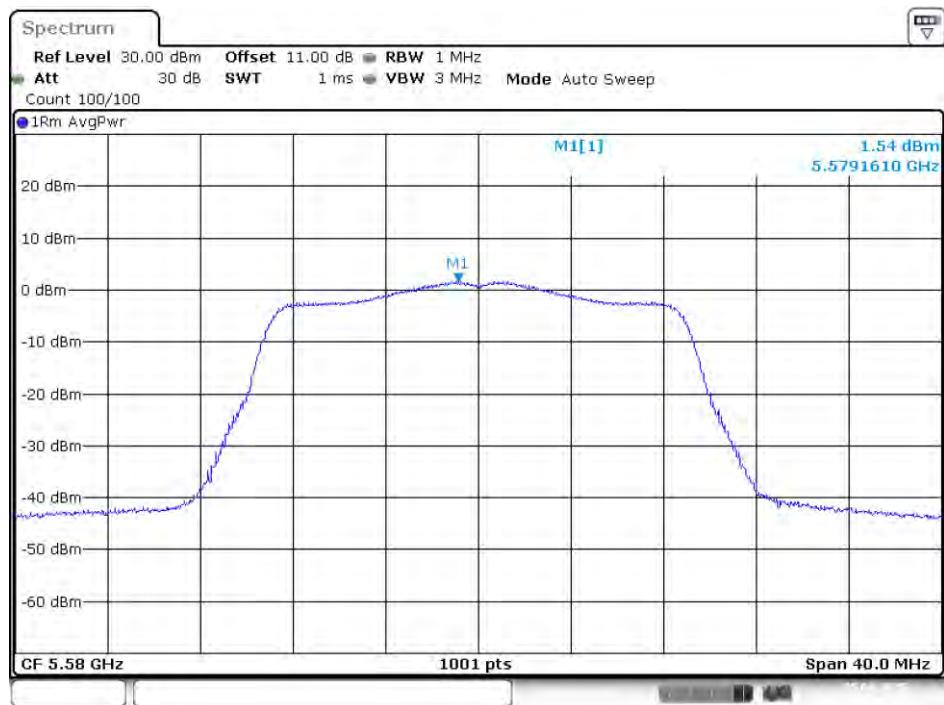


## IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz

## 5500MHz



## 5580MHz

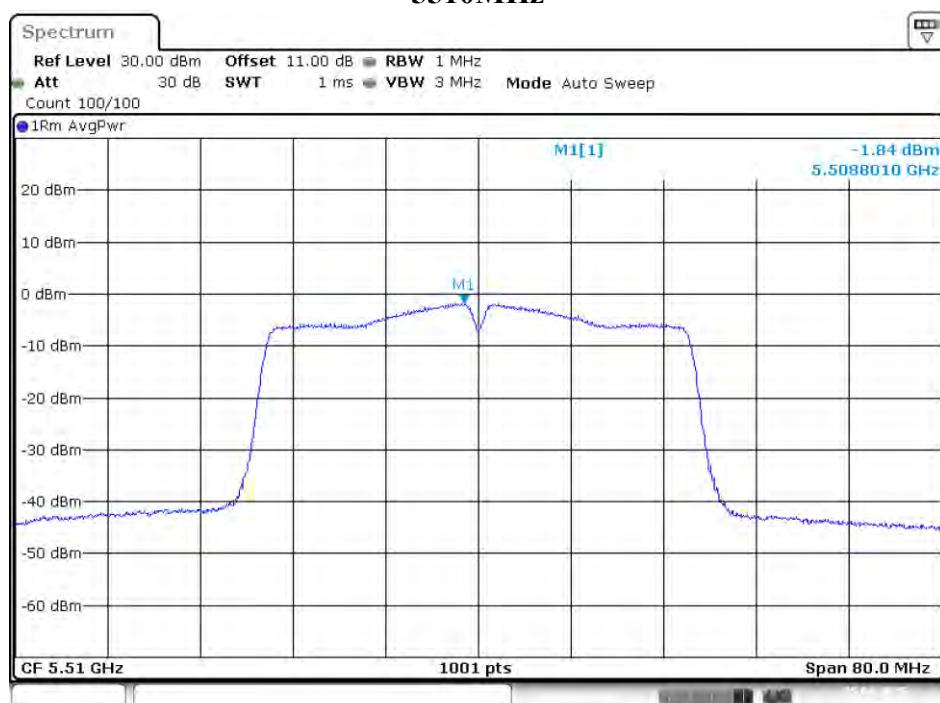


## 5700MHz



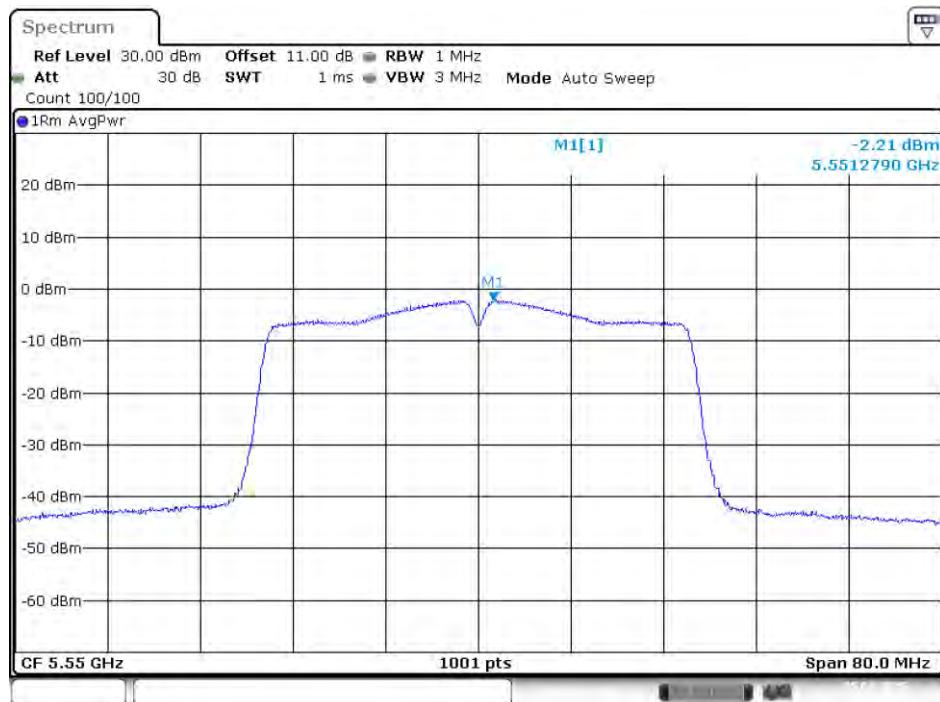
## IEEE 802.11ac VHT40 Mode / 5470 ~ 5725MHz

## 5510MHz



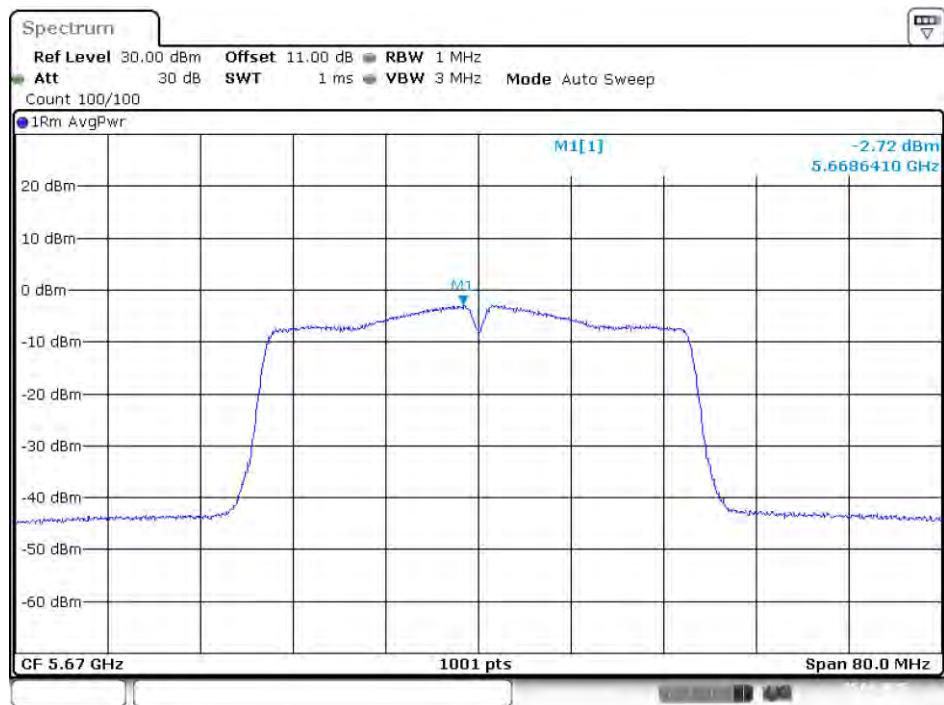
Date: 25 APR 2025 16:29:53

## 5550MHz



Date: 25 APR 2025 16:36:37

## 5670MHz



Date: 25 APR 2025 16:42:38

## IEEE 802.11ac VHT80 Mode / 5470 ~ 5725MHz

## 5530MHz



Date: 25 APR 2025 17:56:26

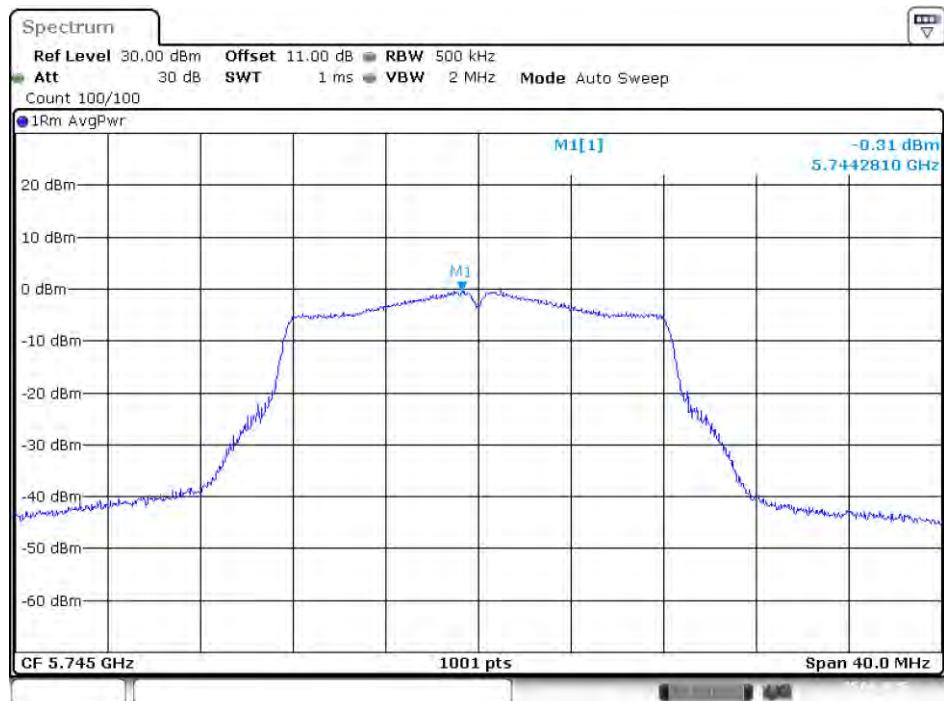
## 5610MHz



Date: 25 APR 2025 18:01:57

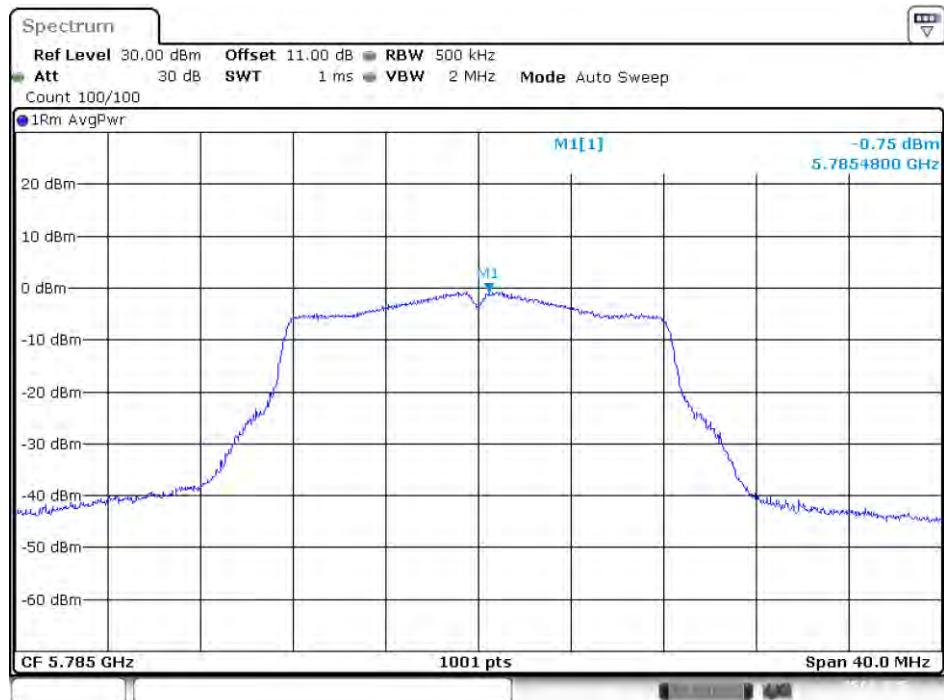
**UNII-3 Band IV / PSD**  
**IEEE 802.11a Mode / 5725 ~ 5850MHz**

## 5745MHz

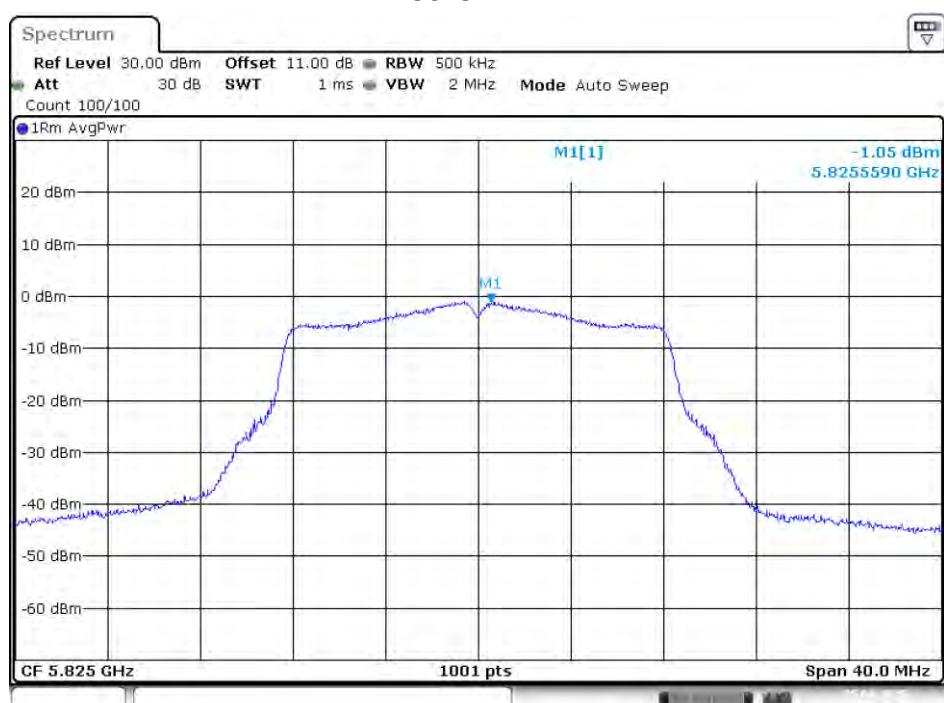


Date: 25 APR 2025 13:21:38

## 5785MHz



## 5825MHz



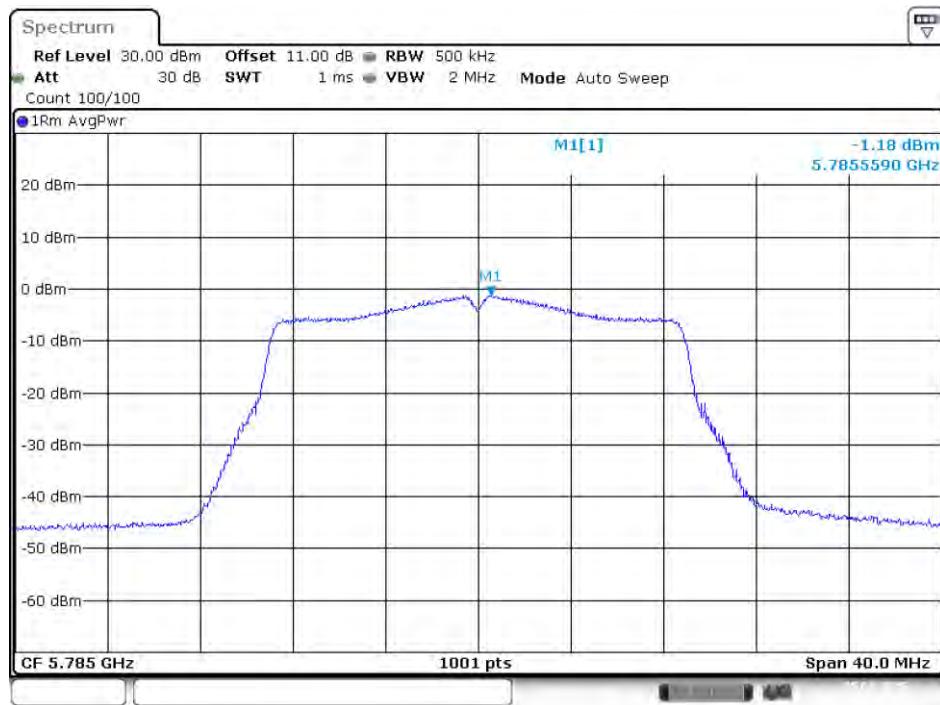
## IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz

## 5745MHz



Date: 25 APR 2025 15:07:21

## 5785MHz



Date: 25 APR 2025 15:10:10

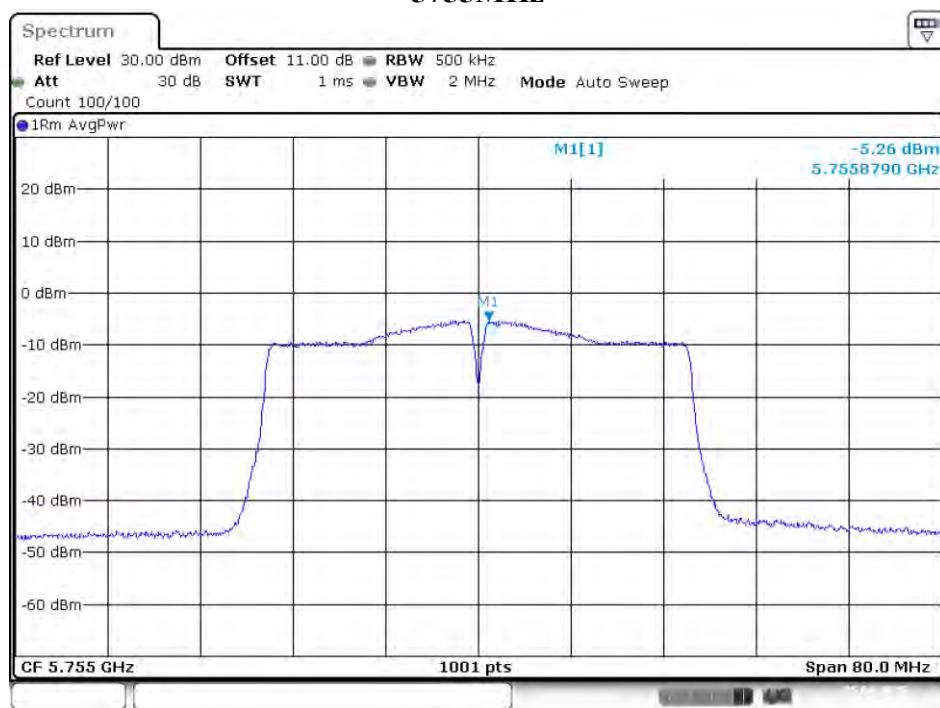
## 5825MHz



Date: 25 APR 2025 15:12:36

## IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz

## 5755MHz



Date: 25 APR 2025 17:03:31

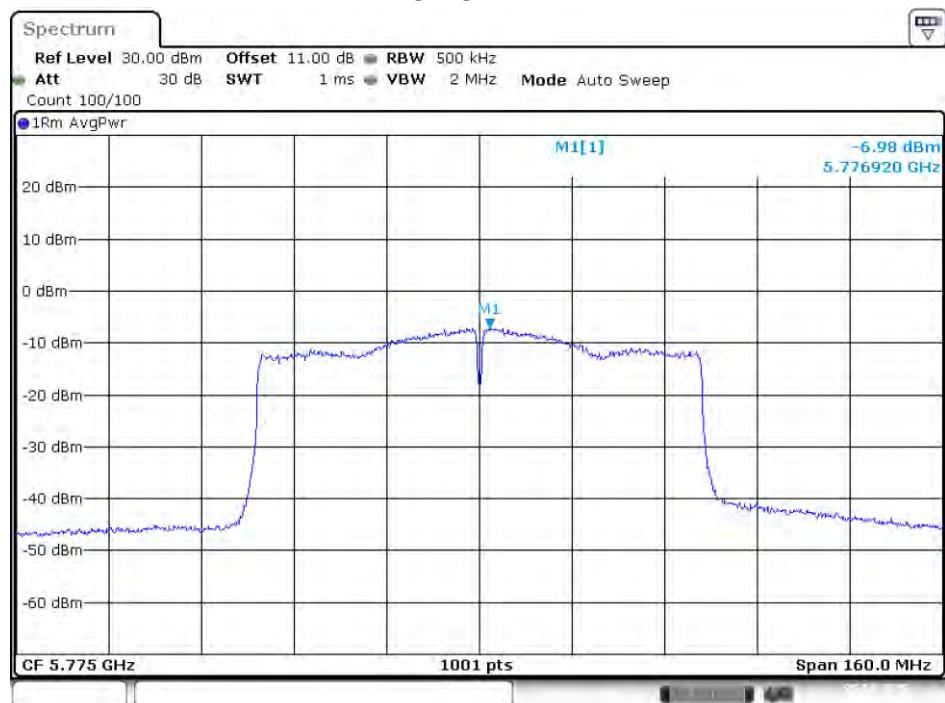
## 5795MHz



Date: 25 APR 2025 17:23:07

## IEEE 802.11ac VHT80 Mode / 5725 ~ 5850MHz

## 5775MHz



Date: 25 APR 2025 18:08:20

## 12 RSS-247 §6.4 – Additional requirements

### 12.1 Applicable Standard

According to RSS-247 Clause 6.4 Additional requirement

The following requirements shall apply:

- a. The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.
- b. All LE-LAN devices must contain security features to protect against modification of software by unauthorized parties.

Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the frequency ranges within the 5 GHz band, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use various means, including the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment certification.

Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the LE-LAN device.

- c. The user manual for LE-LAN devices shall contain instructions related to the restrictions mentioned in the above sections, namely that:
  - i. the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;Footnote4
  - ii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
  - iii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate; and
  - iv. where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

## **12.2 Judgment**

RSS-247 Clause 6.4 a):

The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. Please refer to the declaration

RSS-247 Clause 6.4 b):

The devices must contain security features to protect against modification of software by unauthorized parties. Please refer to the declaration

RSS-247 Clause 6.4 c):

i). The device operates on 5150-5250MHz is only for indoor use.

ii). The device operates on 5250-5350MHz/5470-5725MHz complies with the e.i.r.p. limit.

iii). The antenna is not detachable, and all the EIPR compliance with RSS-247 requirement. Please refer to the conducted output power test result.

iv). Not Applicable.

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