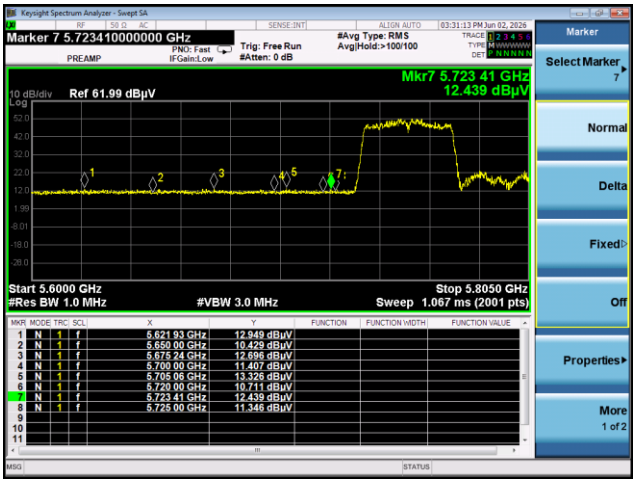
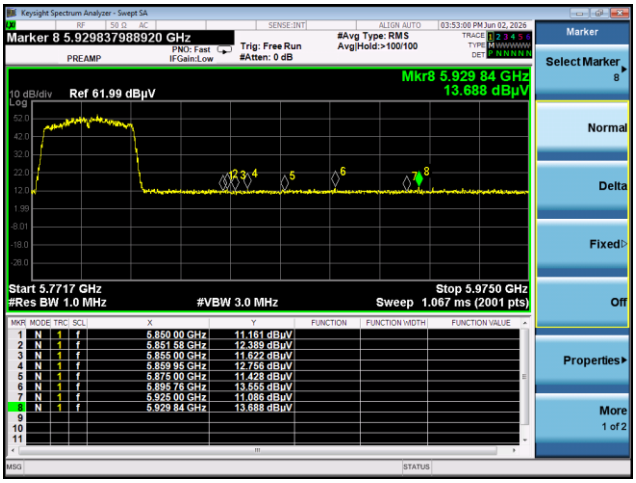
11ac_VHT40

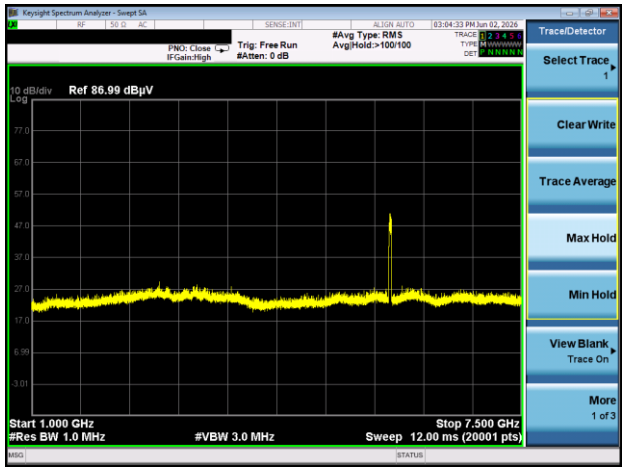
Low channel Band edge (Peak) - U-NII 3



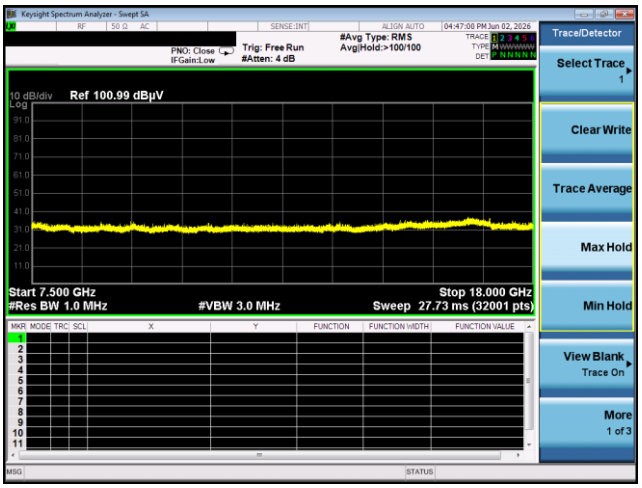
High channel Band edge (Peak) - U-NII 3



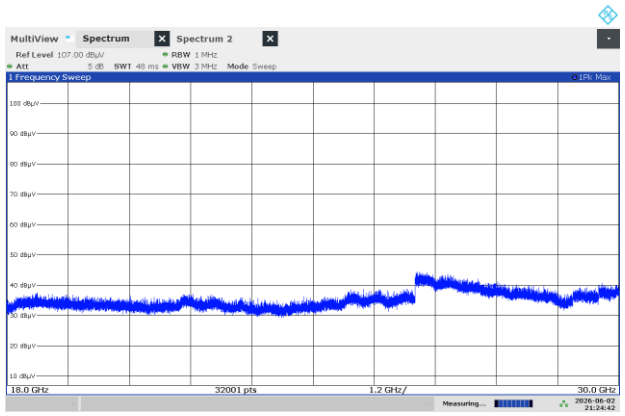
Radiated Spurious Emissions



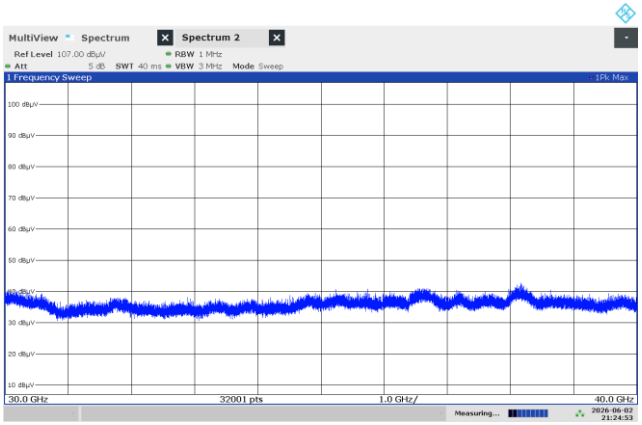
1 ㎓ ~ 7.5 ㎓



7.5 ㎓ ~ 18 ㎓



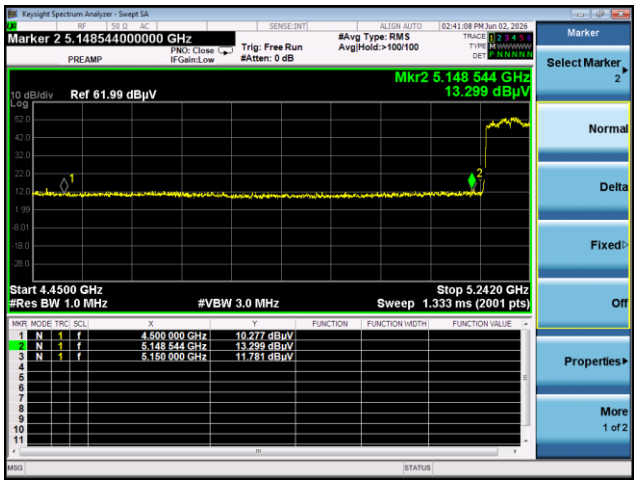
18 ㎓ ~ 30 ㎓



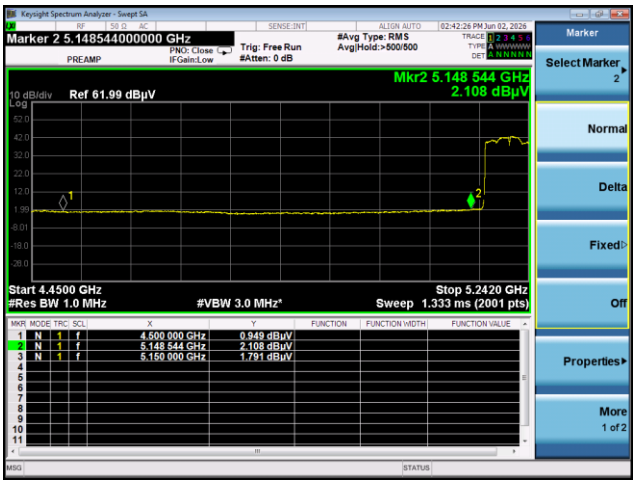
30 ㎓ ~ 40 ㎓

11ac_VHT80

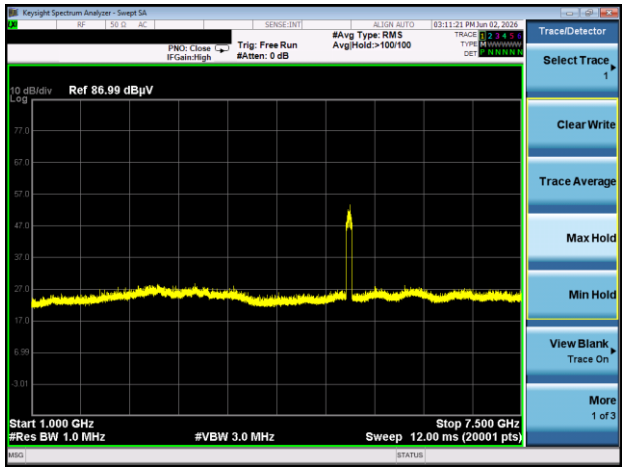
Middle channel Band edge (Peak) - U-NII 1



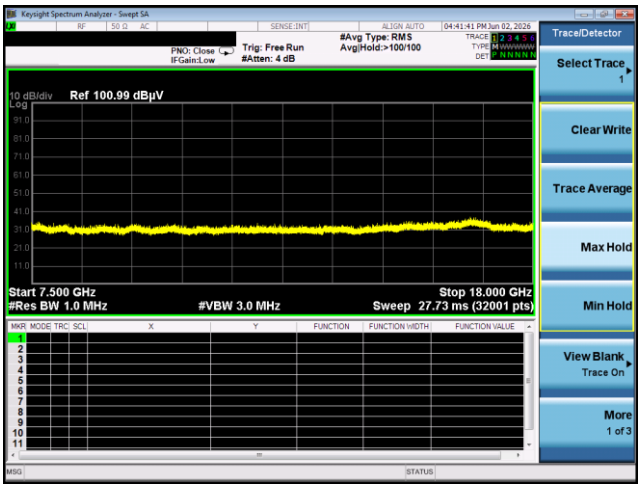
Middle channel Band edge (Average) - U-NII 1



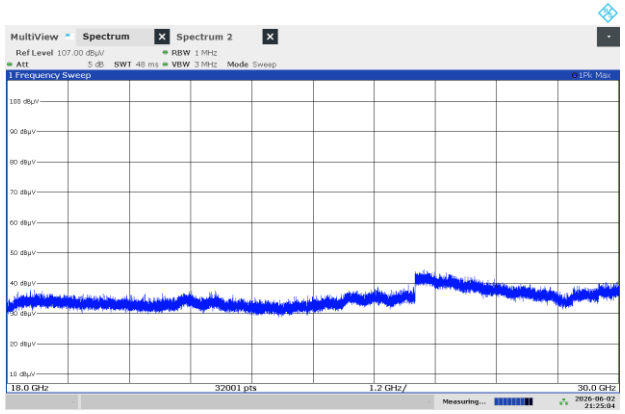
Radiated Spurious Emissions



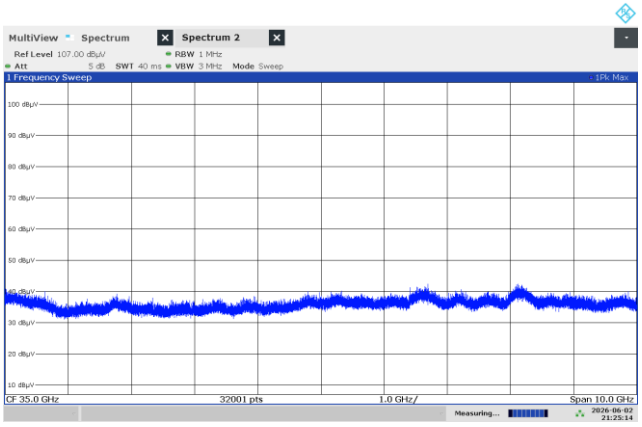
1 ㎓ ~ 7.5 ㎓



7.5 ㎓ ~ 18 ㎓

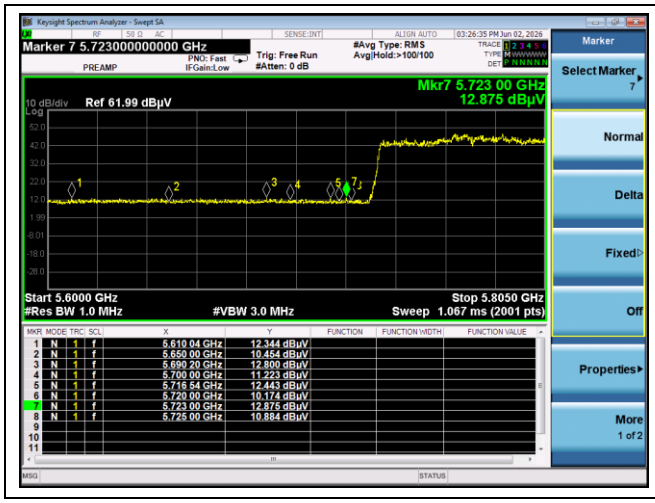


18 ㎓ ~ 30 ㎓

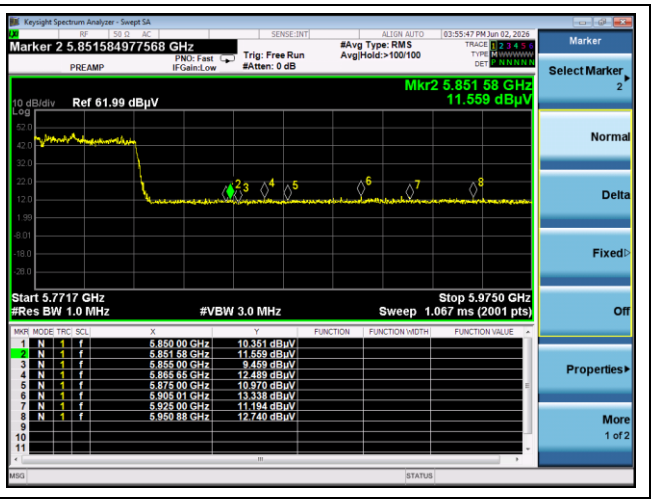


30 ㎓ ~ 40 ㎓

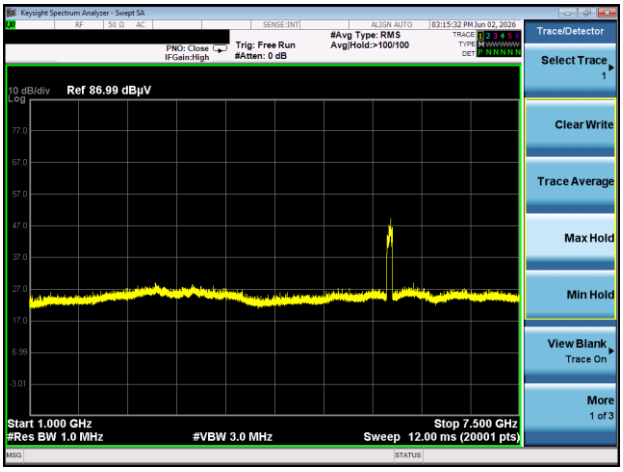
Middle channel Band edge (Peak) - U-NII 3



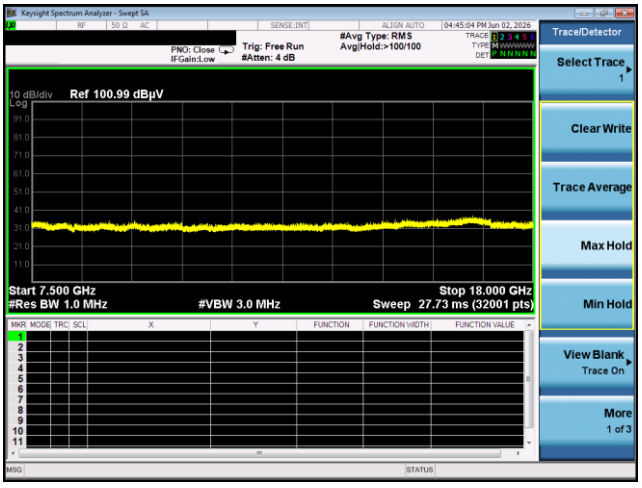
Middle channel Band edge (Peak) - U-NII 3



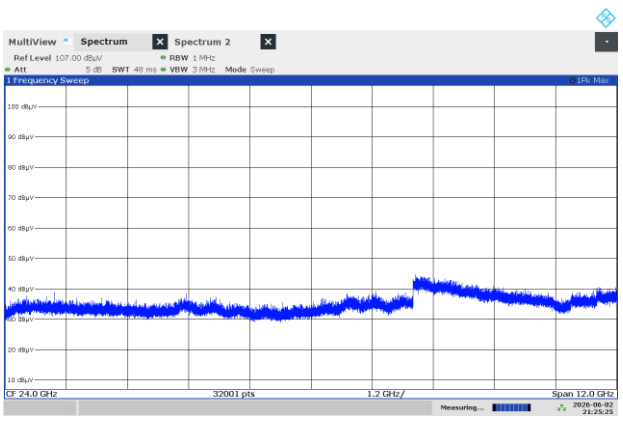
Radiated Spurious Emissions



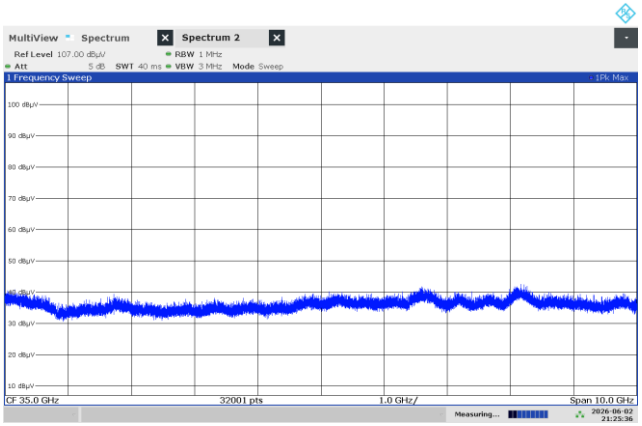
1 ㎓ ~ 7.5 ㎓



7.5 ㎓ ~ 18 ㎓



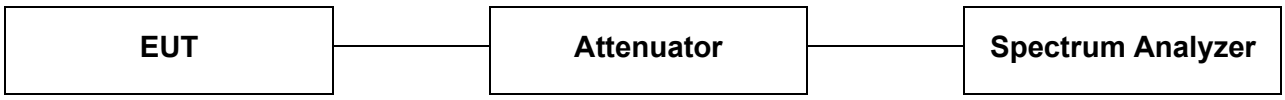
18 ㎓ ~ 30 ㎓



30 ㎓ ~ 40 ㎓

3. 26 ㏈ Bandwidth & 99 % Bandwidth

3.1. Test Setup



3.2. Limit

None; for reporting purpose only.

3.3. Test Procedure

3.3.1. 26 ㏈ Bandwidth

1. This measurement settings are specified in section Ⅱ.C.1 of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = approximately 1 % of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 ㏈ down from the peak 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 %.

3.3.2. 99 % Bandwidth

3.3.2.1 FCC

1. This measurement settings are specified in section Ⅱ.D of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set center frequency to the nominal EUT channel center frequency.
3. Set span = 1.5 times to 5.0 times the OBW.
4. Set RBW = 1 % to 5 % of the OBW.
5. Set VBW ≥ 3 x RBW.
6. 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.
7. Use the 99 % power bandwidth function of the instrument (if available).
8. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. 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 % occupied bandwidth is the difference between these two frequencies.

In the result,
- DFS requirements are not applicable in the 5 150 ㎒ ~ 5 250 ㎒.

3.3.2.2 IC

The test follows section 6.9.3 of ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Errata to C63.10a-2024.

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 at least three times the RBW, unless otherwise specified by the applicable requirement.

1) When measuring OBW for UWB, the VBW shall be set to three times the RBW or the maximum available VBW of the measuring instrument.

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 4.1.6.2.

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 spectral 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).

3.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 %

SISO

- Ant. 1

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	12 Mbps	21.399	16.883
	5 220	44		21.419	16.863
	5 240	48		21.379	16.883
U-NII 3	5 745	149		21.459	16.883
	5 785	157		21.479	16.903
	5 825	165		21.459	16.903

- Ant. 2

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate	26 ㏈ Bandwidth (㎒)	99 % Bandwidth (㎒)
U-NII 1	5 180	36	12 Mbps	21.339	16.863
	5 220	44		21.419	16.883
	5 240	48		21.339	16.883
U-NII 3	5 745	149		21.519	16.903
	5 785	157		21.479	16.903
	5 825	165		21.419	16.903

MIMO

- Ant. 1 + Ant. 2

Test mode: 11ac_VHT20

Band	Frequency (㎒)	Ch.	Data Rate	26 ㏈ Bandwidth (㎒)		99 % Bandwidth (㎒)	
				Port 1	Port 2	Port 1	Port 2
U-NII 1	5 180	36	MCS0	21.678	21.459	18.082	17.822
	5 220	44		21.858	21.578	18.062	17.842
	5 240	48		21.778	21.519	18.062	17.842
U-NII 3	5 745	149		22.078	21.479	18.082	17.842
	5 785	157		21.818	21.558	18.122	17.862
	5 825	165		21.918	21.439	18.102	17.862

Test mode: 11ac_VHT40

Band	Frequency (㎒)	Ch.	Data Rate	26 ㏈ Bandwidth (㎒)		99 % Bandwidth (㎒)	
				Port 1	Port 2	Port 1	Port 2
U-NII 1	5 190	38	MCS0	40.000	39.481	36.284	36.164
	5 230	46		40.000	39.161	36.284	36.164
U-NII 3	5 755	151		40.000	39.481	36.324	36.124
	5 795	159		40.040	39.401	36.324	36.124

Test mode: 11ac_VHT80

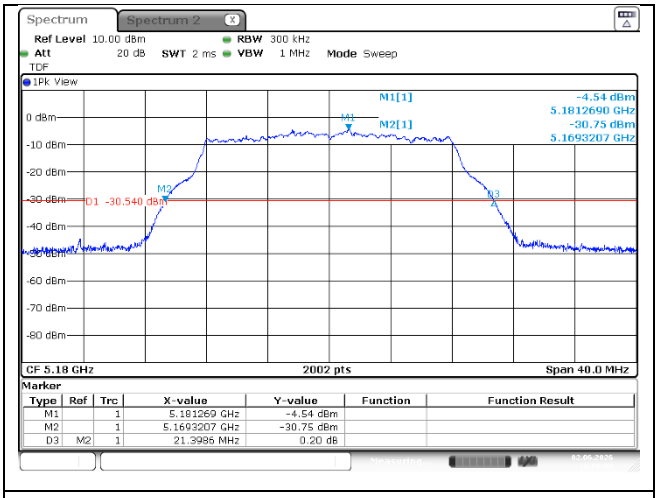
Band	Frequency (㎒)	Ch.	Data Rate	26 ㏈ Bandwidth (㎒)		99 % Bandwidth (㎒)	
				Port 1	Port 2	Port 1	Port 2
U-NII 1	5 210	42	MCS0	81.918	81.439	75.524	75.684
U-NII 3	5 775	155		82.158	81.199	75.684	75.604

Test plots

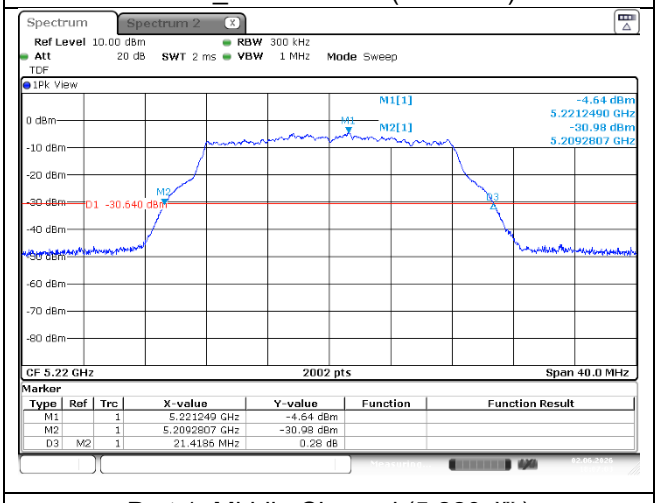
- SISO (Ant. 1)

26 dB Bandwidth

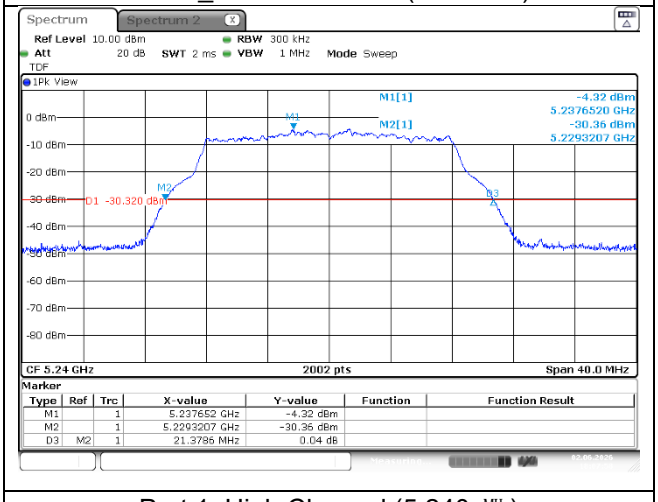
11a (U-NII 1)



Port 1_Low Channel (5 180 ㎒)

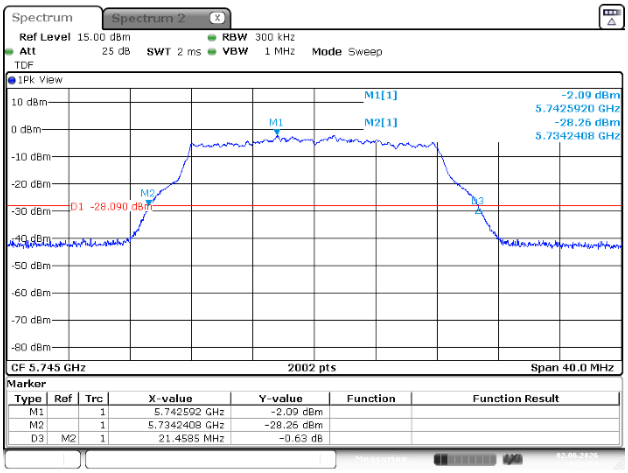


Port 1_Middle Channel (5 220 ㎒)

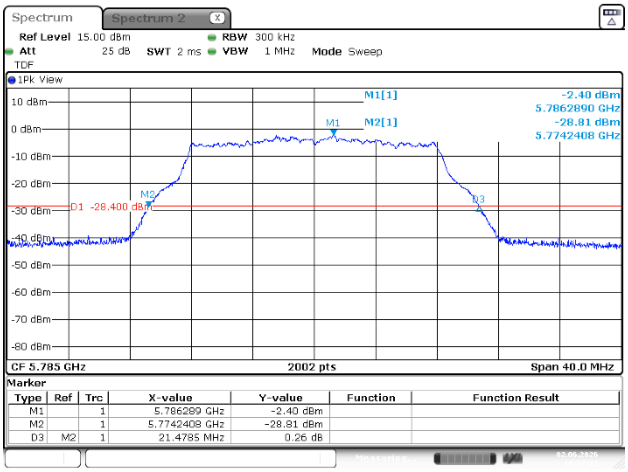


Port 1_High Channel (5 240 ㎒)

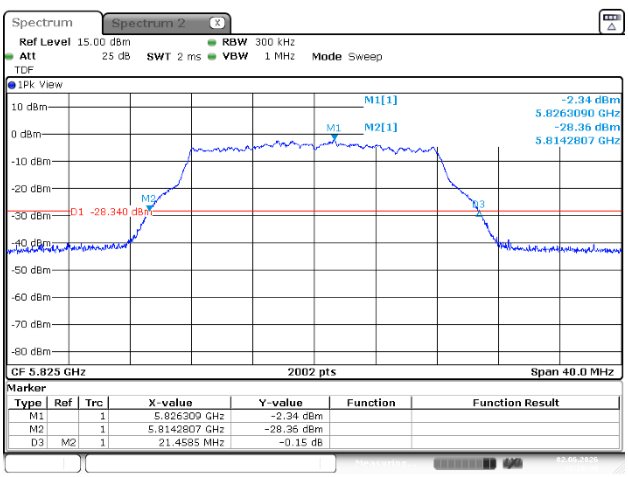
11a (U-NII 3)



Port 1_Low Channel (5 745 ㎒)



Port 1_Middle Channel (5 785 ㎒)

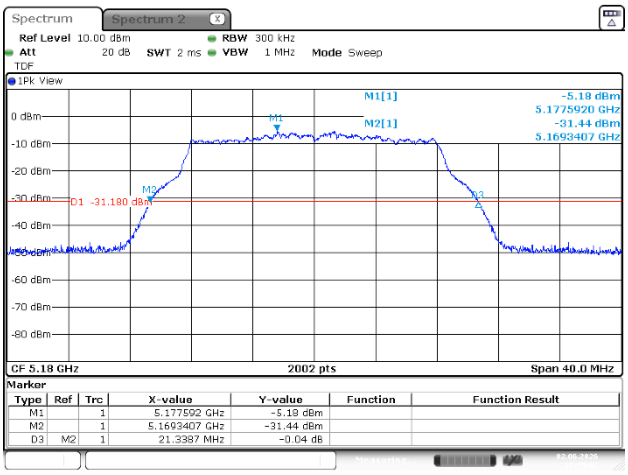


Port 1_High Channel (5 825 ㎒)

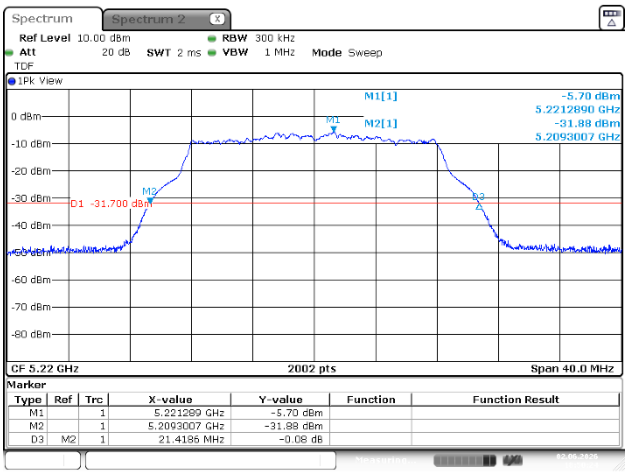
- SISO (Ant. 2)

26 dB Bandwidth

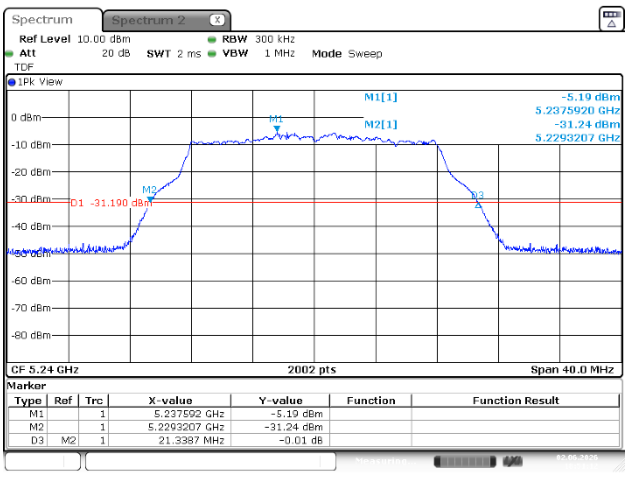
11a (U-NII 1)



Port 2_Low Channel (5 180 ㎒)

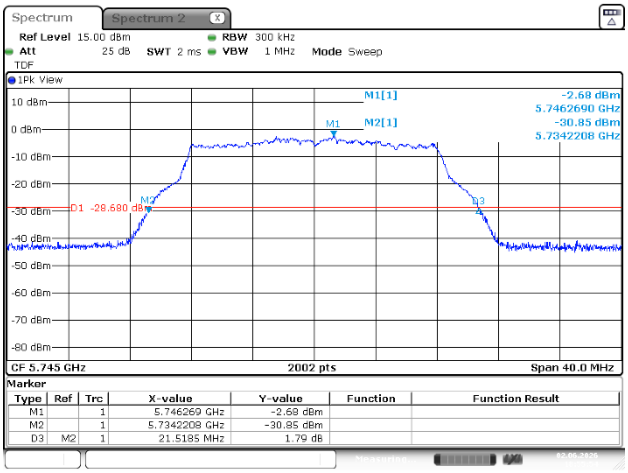


Port 2_Middle Channel (5 220 ㎒)

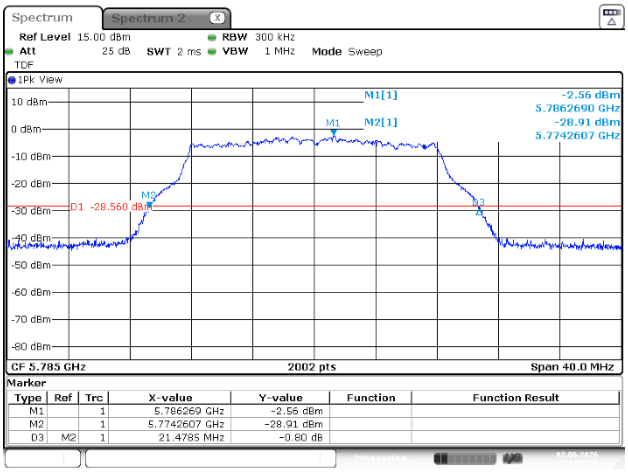


Port 2_High Channel (5 240 ㎒)

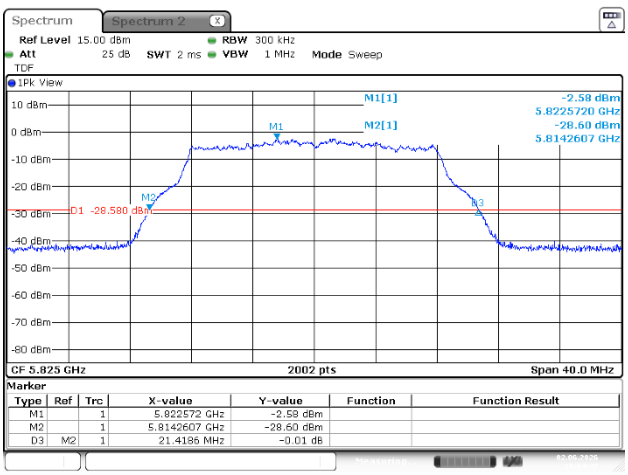
11a (U-NII 3)



Port 2_Low Channel (5 745 ㎒)



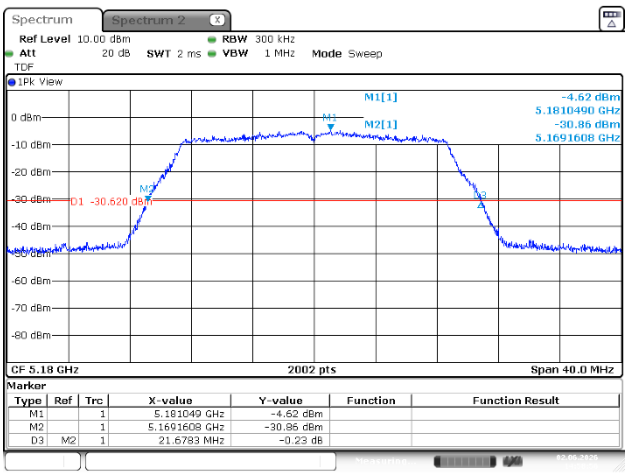
Port 2_Middle Channel (5 785 ㎒)



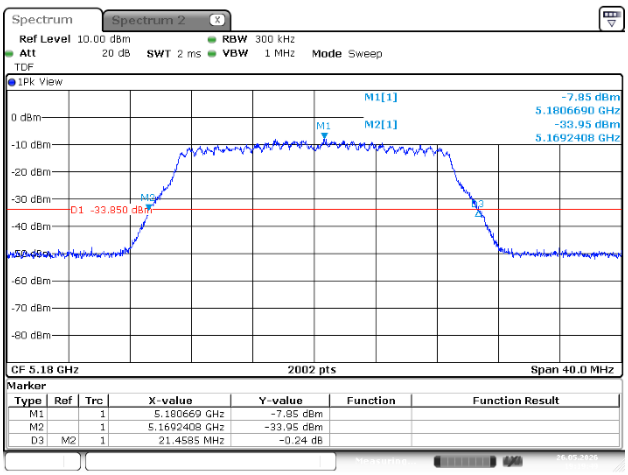
Port 2_High Channel (5 825 ㎒)

- MIMO (Ant. 1 + Ant. 2)

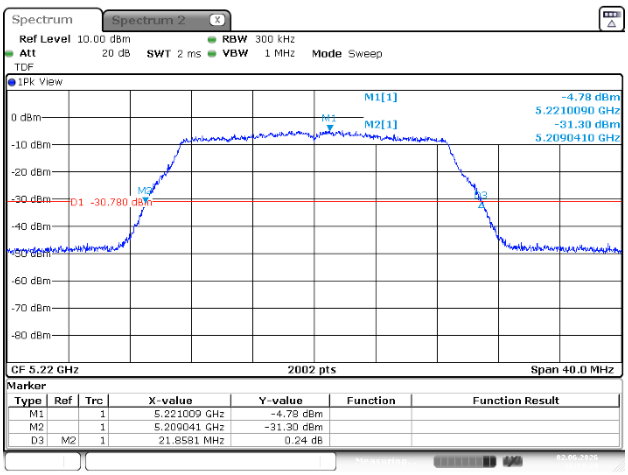
11ac_VHT20 (U-NII 1)



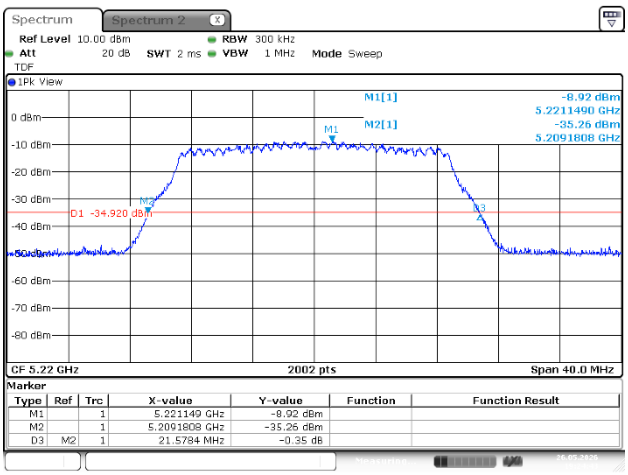
Port 1_Low Channel (5 180 ㎒)



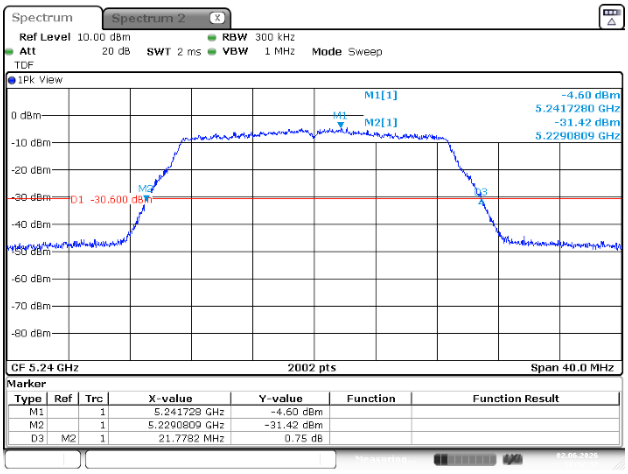
Port 2_Low Channel (5 180 ㎒)



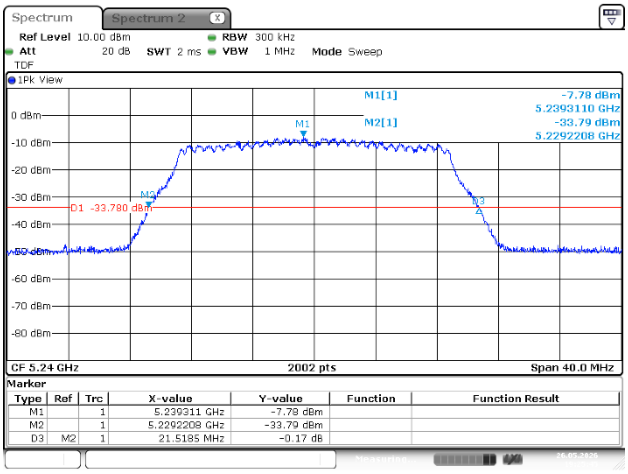
Port 1_Middle Channel (5 220 ㎒)



Port 2_Middle Channel (5 220 ㎒)

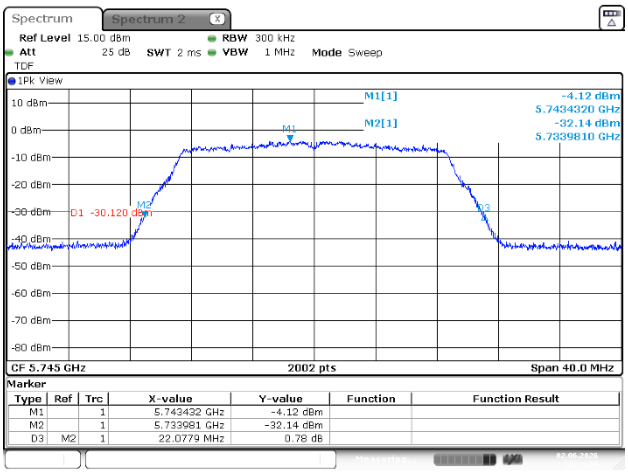


Port 1_High Channel (5 240 ㎒)

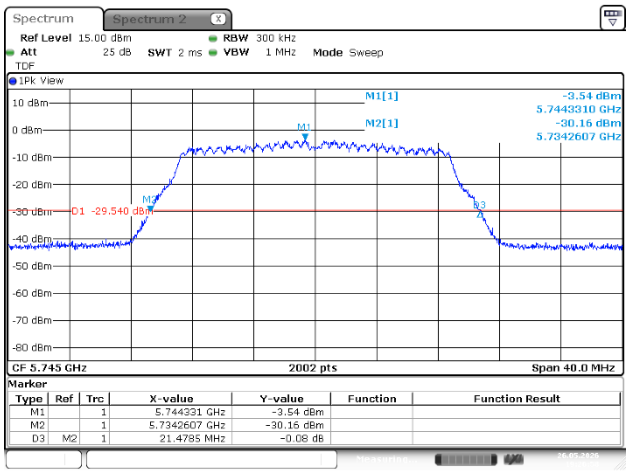


Port 2_High Channel (5 240 ㎒)

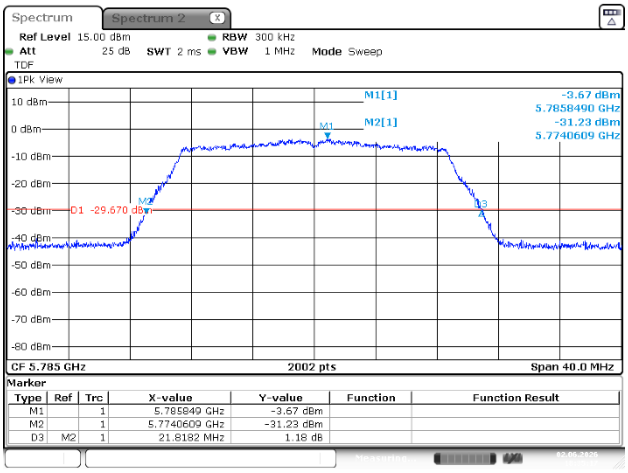
11ac_VHT20 (U-NII 3)



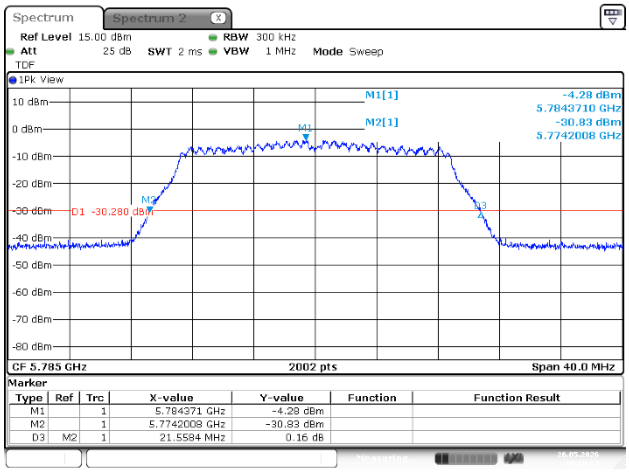
Port 1_Low Channel (5 745 ㎒)



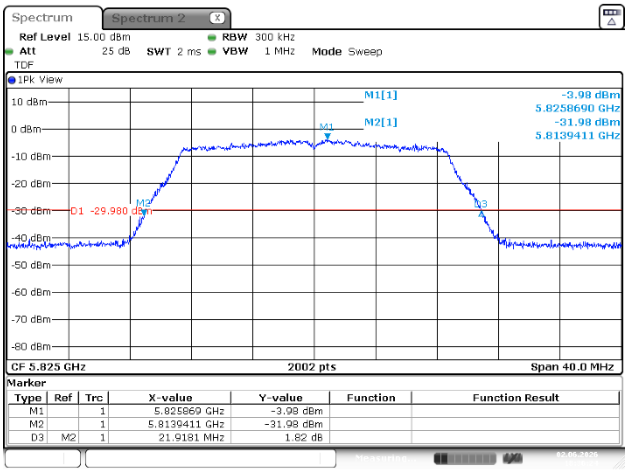
Port 2_Low Channel (5 745 ㎒)



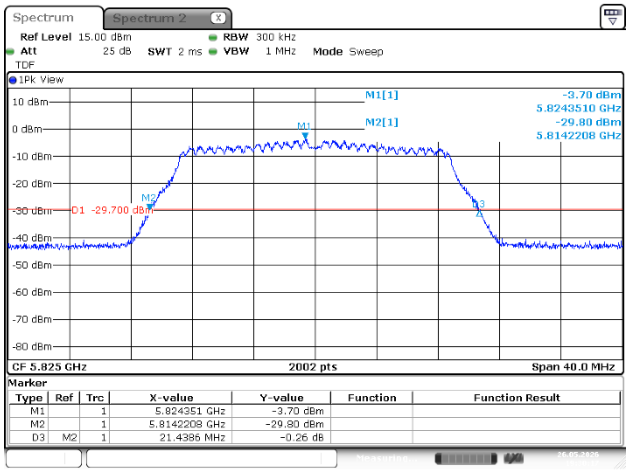
Port 1_Middle Channel (5 785 ㎒)



Port 2_Middle Channel (5 785 ㎒)

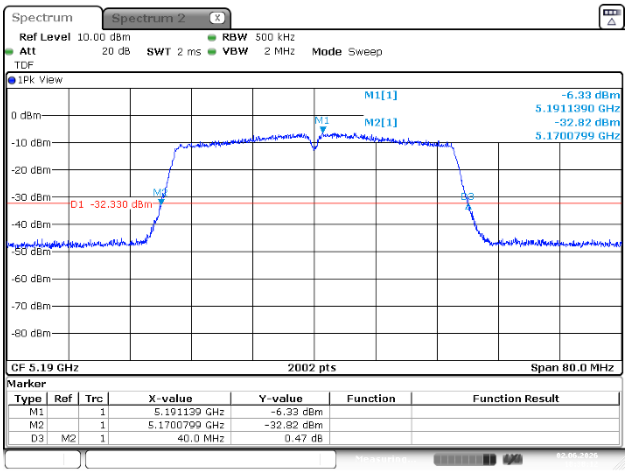


Port 1_High Channel (5 825 ㎒)

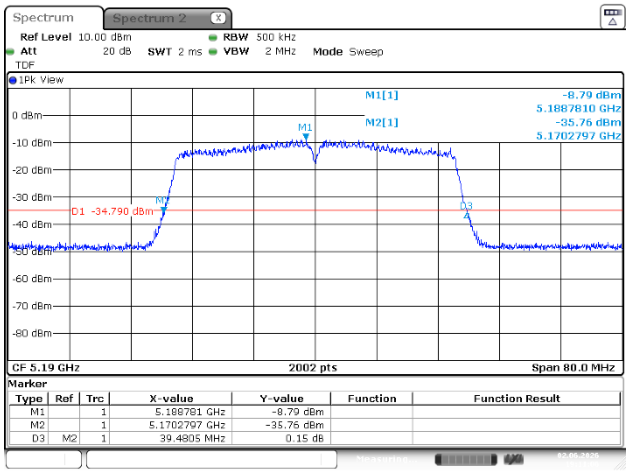


Port 2_High Channel (5 825 ㎒)

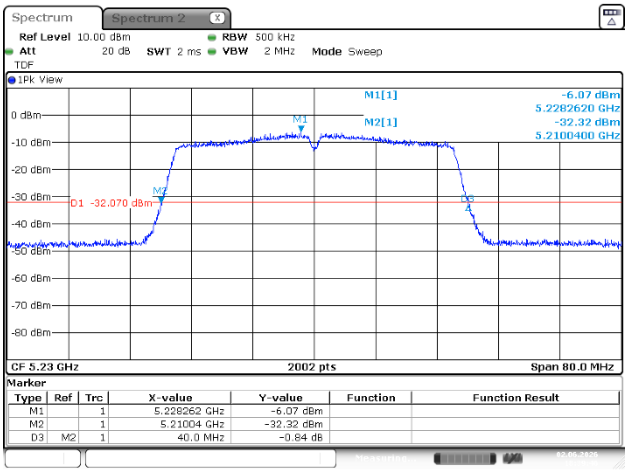
11ac_VHT40 (U-NII 1)



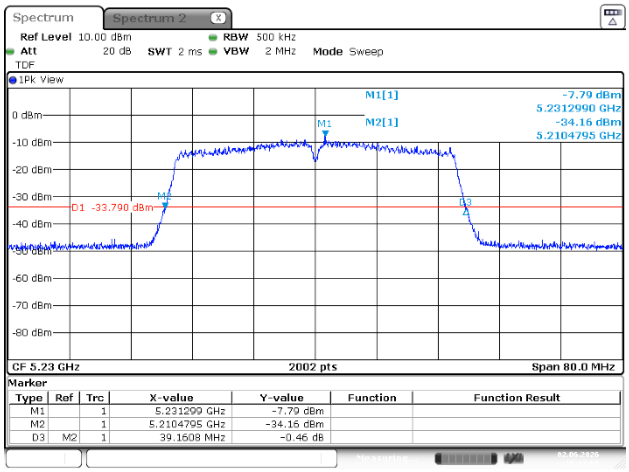
Port 1_Low Channel (5 190 ㎒)



Port 2_Low Channel (5 190 ㎒)

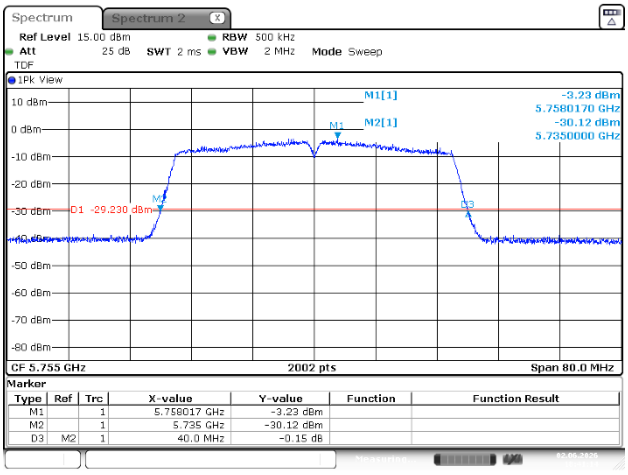


Port 1_High Channel (5 230 ㎒)

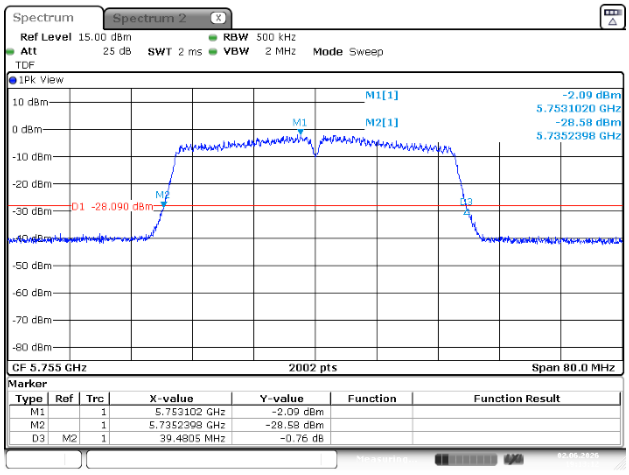


Port 2_High Channel (5 230 ㎒)

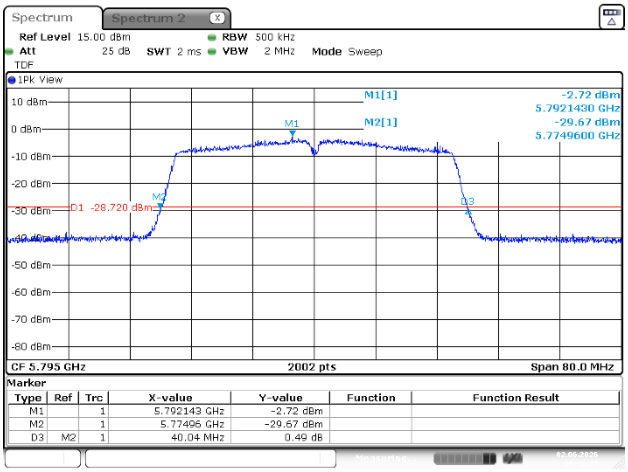
11ac_VHT40 (U-NII 3)



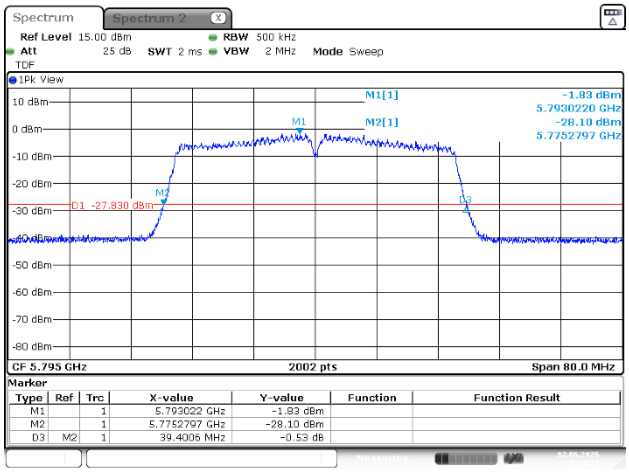
Port 1_Low Channel (5 755 ㎒)



Port 2_Low Channel (5 755 ㎒)

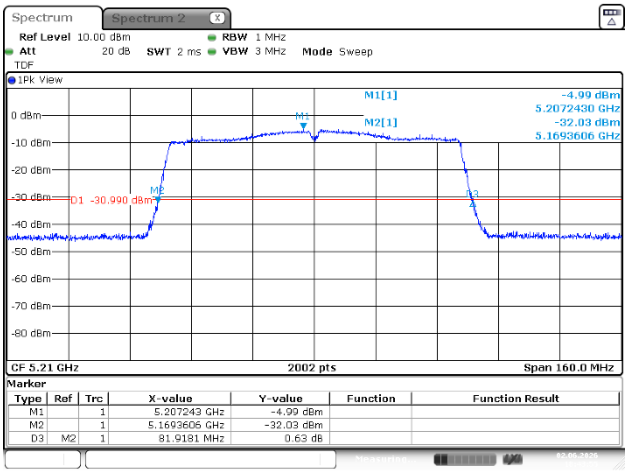


Port 1_High Channel (5 795 ㎒)

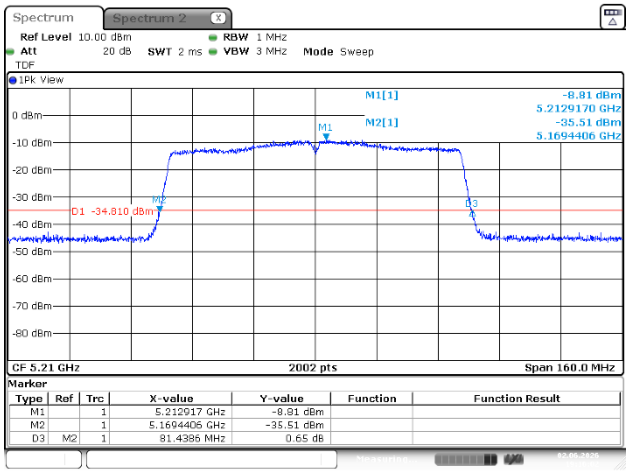


Port 2_High Channel (5 795 ㎒)

11ac_VHT80 (U-NII 1)

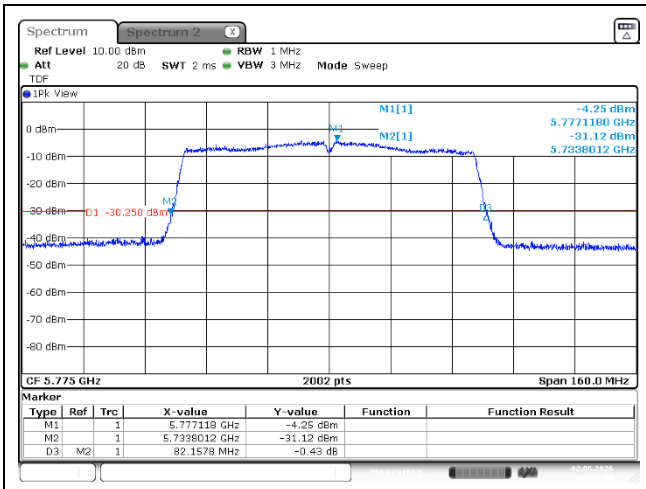


Port 1_Middle Channel (5 210 ㎒)

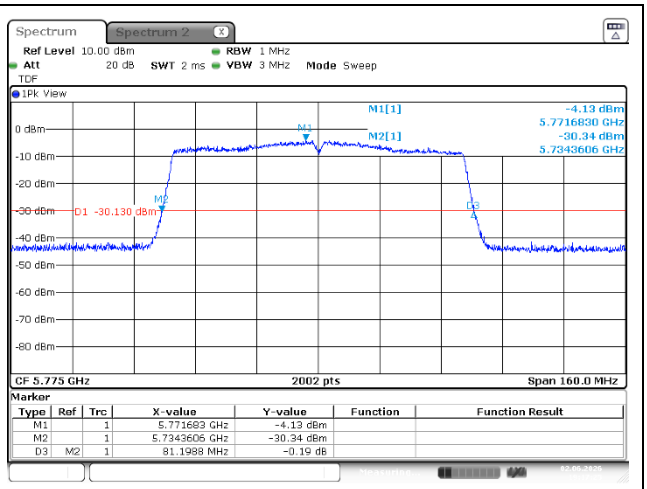


Port 2_Middle Channel (5 210 ㎒)

11ac_VHT80 (U-NII 3)



Port 1_Middle Channel (5 775 ㎒)

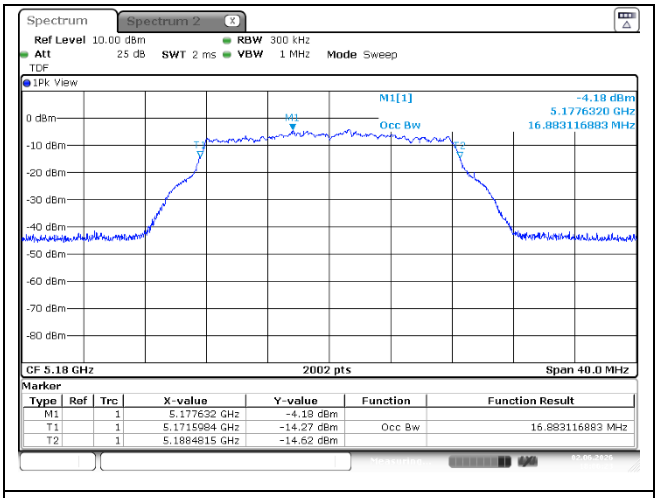


Port 2_Middle Channel (5 775 ㎒)

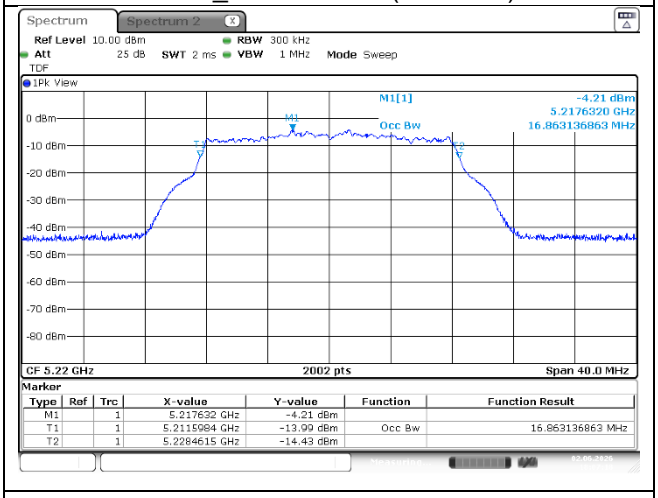
99 % Bandwidth

- SISO (Ant. 1)

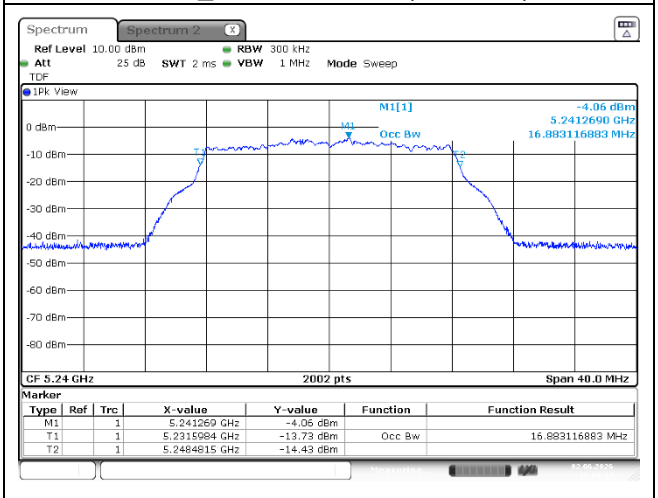
11a (U-NII 1)



Port 1_Low Channel (5 180 ㎒)

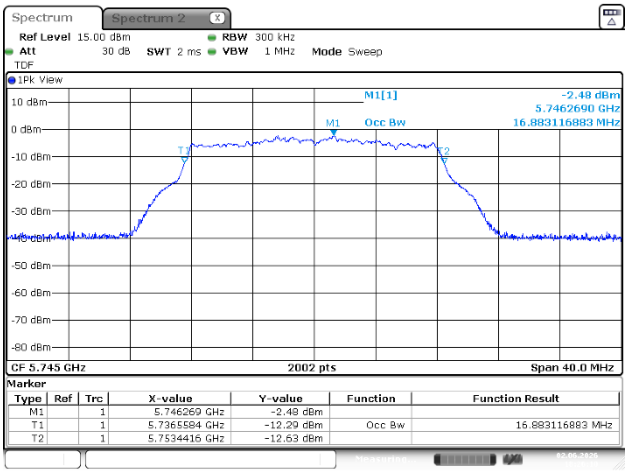


Port 1_Middle Channel (5 220 ㎒)

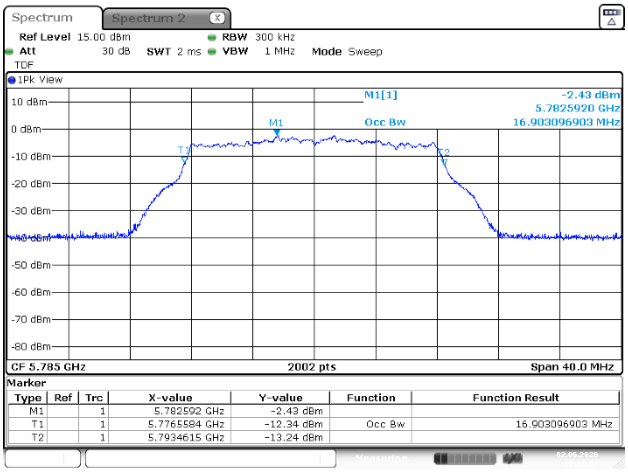


Port 1_High Channel (5 240 ㎒)

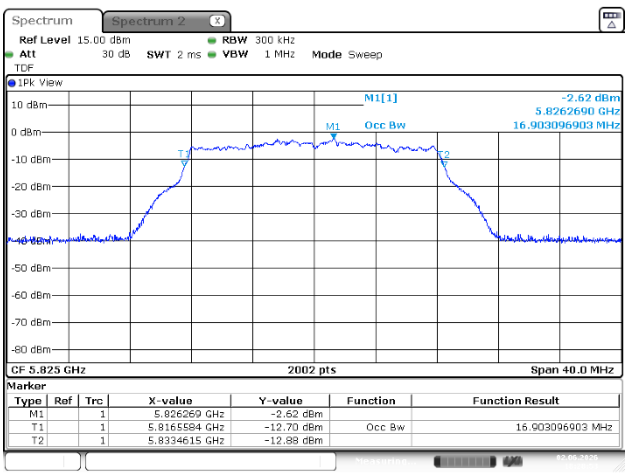
11a (U-NII 3)



Port 1_Low Channel (5 745 ㎒)



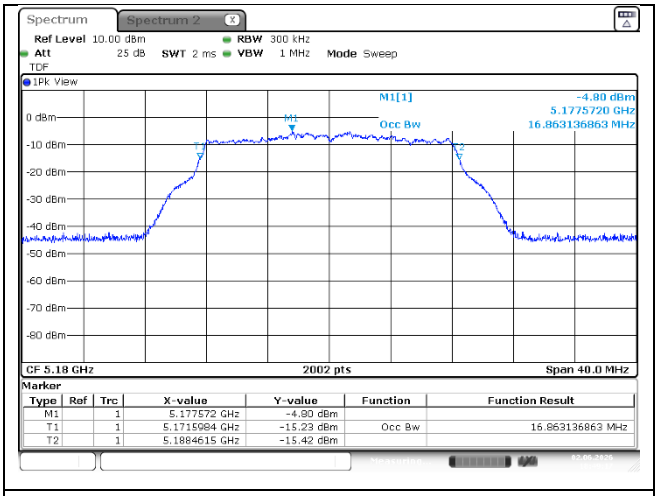
Port 1_Middle Channel (5 785 ㎒)



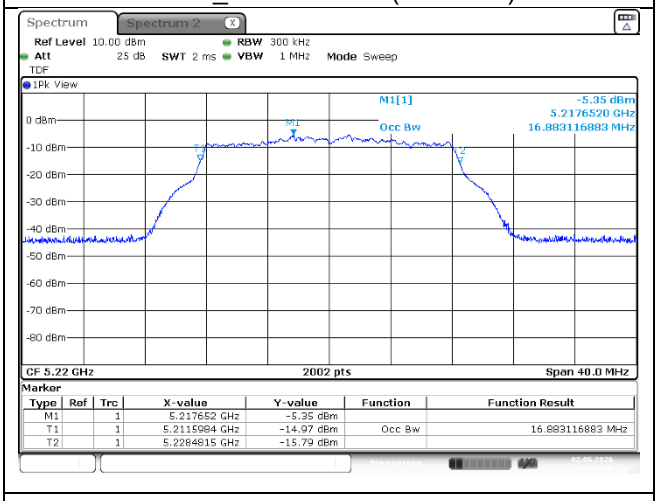
Port 1_High Channel (5 825 ㎒)

- SISO (Ant. 2)

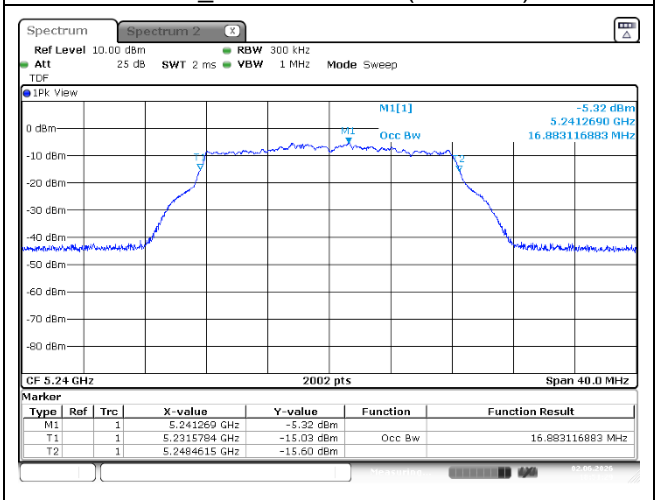
11a (U-NII 1)



Port 2_Low Channel (5 180 ㎒)

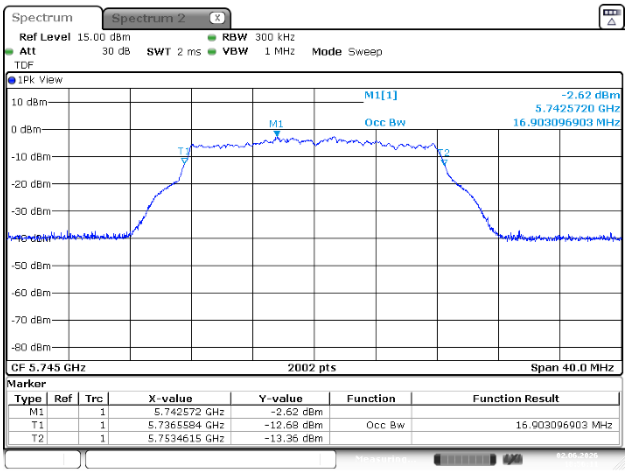


Port 2_Middle Channel (5 220 ㎒)

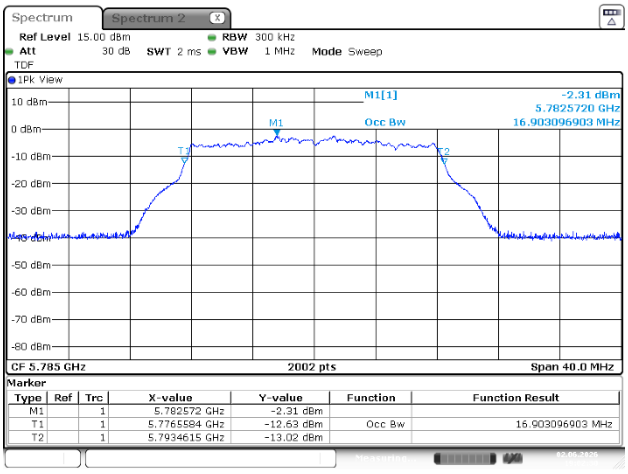


Port 2_High Channel (5 240 ㎒)

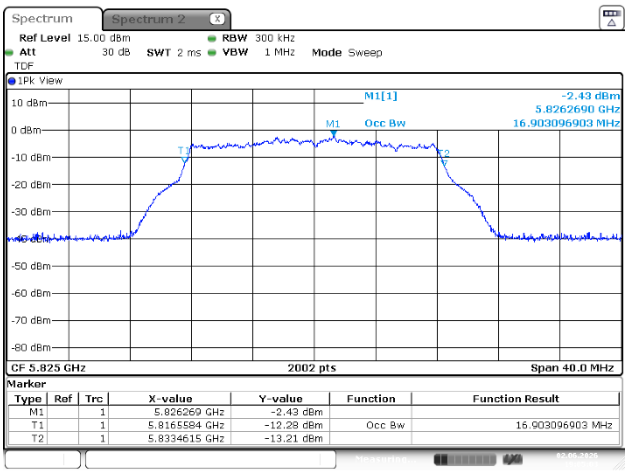
11a (U-NII 3)



Port 2_Low Channel (5 745 ㎒)



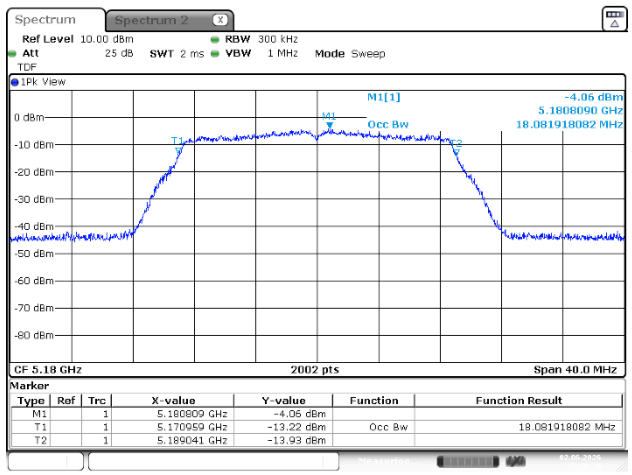
Port 2_Middle Channel (5 785 ㎒)



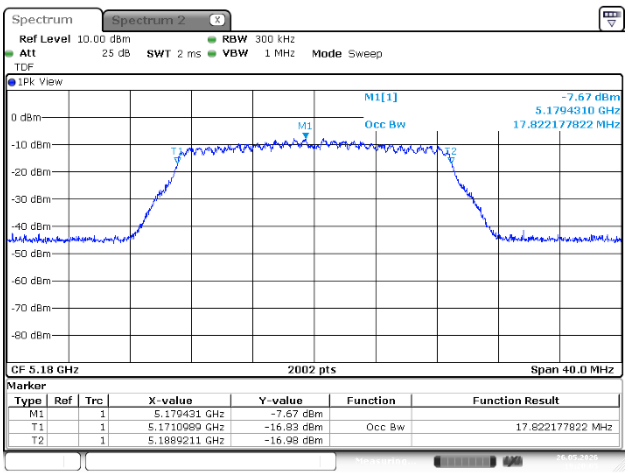
Port 2_High Channel (5 825 ㎒)

- MIMO (Ant. 1 + Ant. 2)

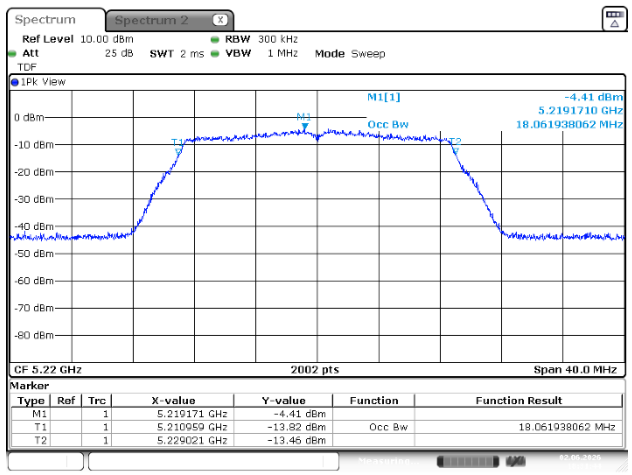
11ac_VHT20 (U-NII 1)



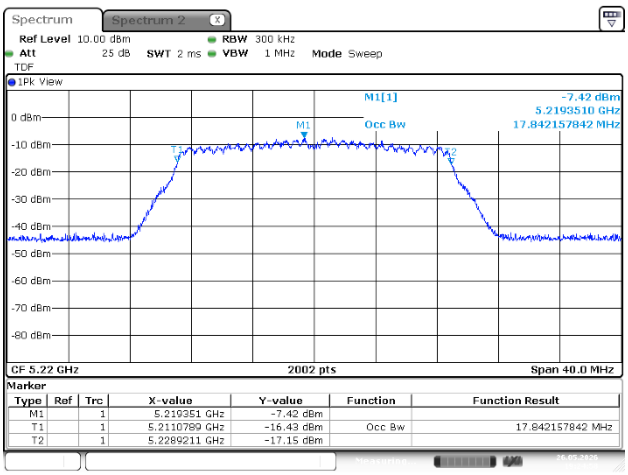
Port 1_Low Channel (5 180 ㎒)



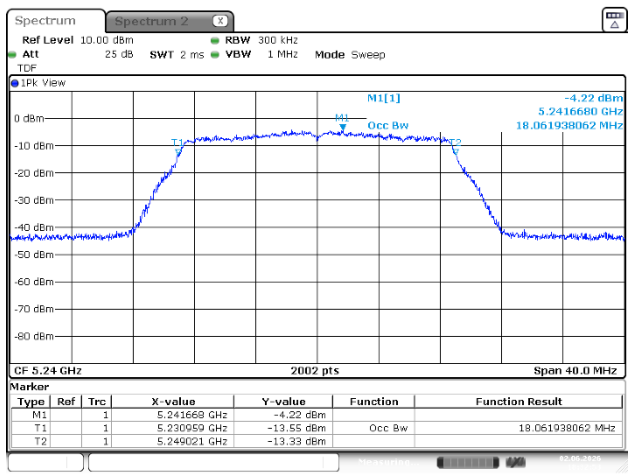
Port 2_Low Channel (5 180 ㎒)



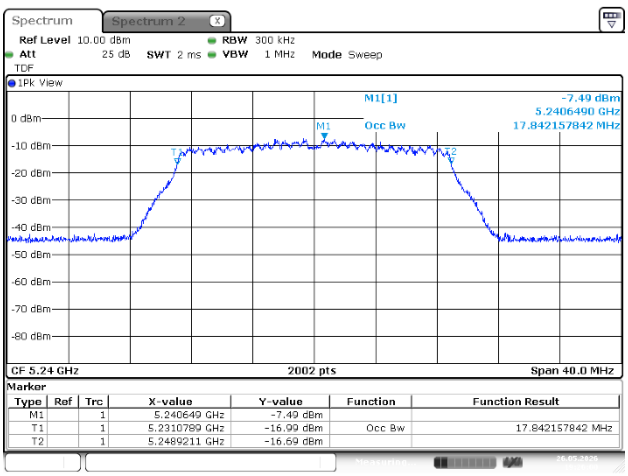
Port 1_Middle Channel (5 220 ㎒)



Port 2_Middle Channel (5 220 ㎒)

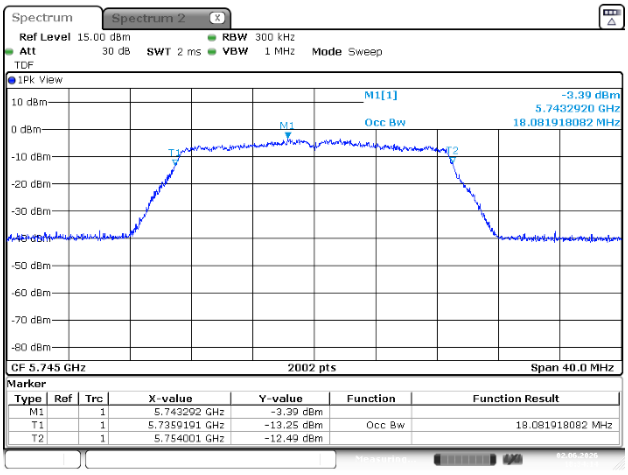


Port 1_High Channel (5 240 ㎒)

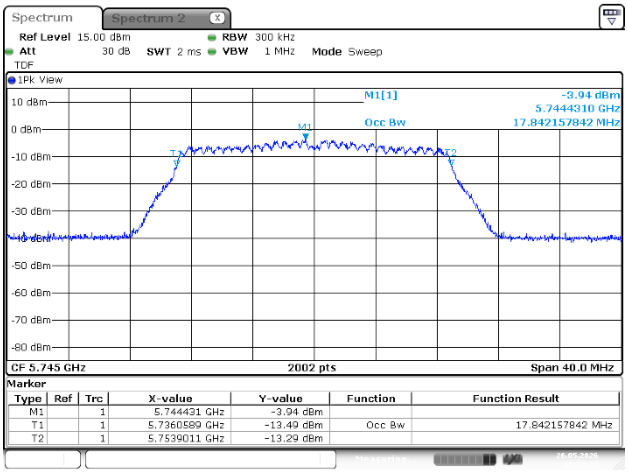


Port 2_High Channel (5 240 ㎒)

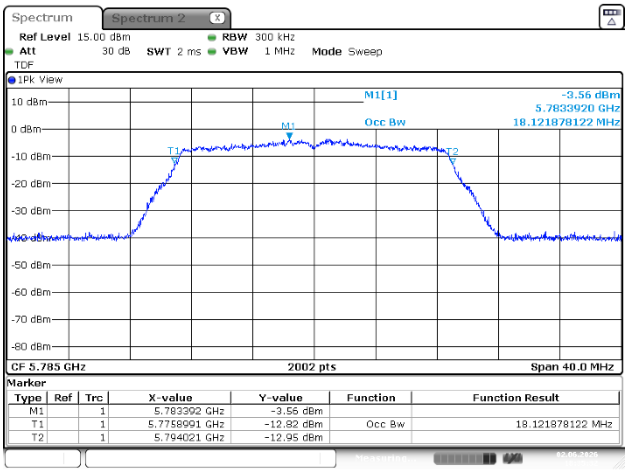
11ac_VHT20 (U-NII 3)



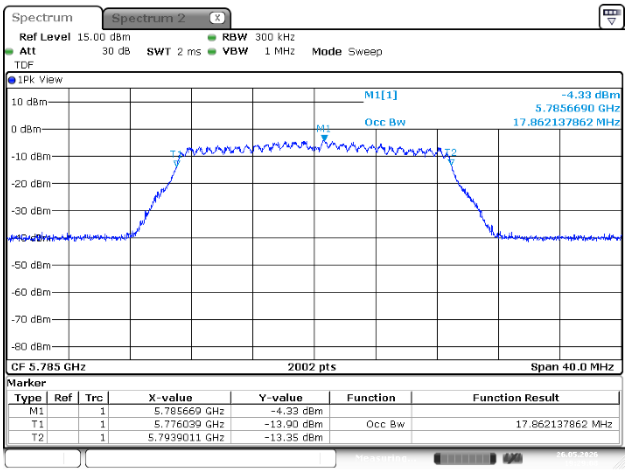
Port 1_Low Channel (5 745 ㎒)



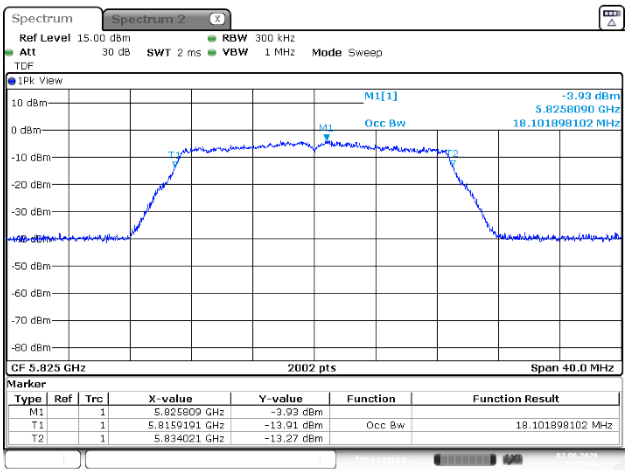
Port 2_Low Channel (5 745 ㎒)



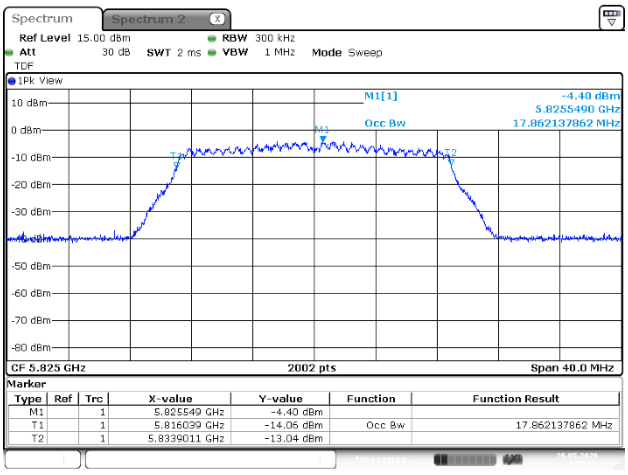
Port 1_Middle Channel (5 785 ㎒)



Port 2_Middle Channel (5 785 ㎒)

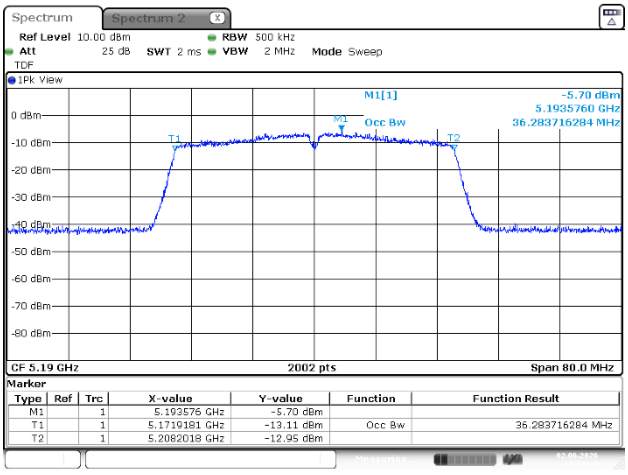


Port 1_High Channel (5 825 ㎒)

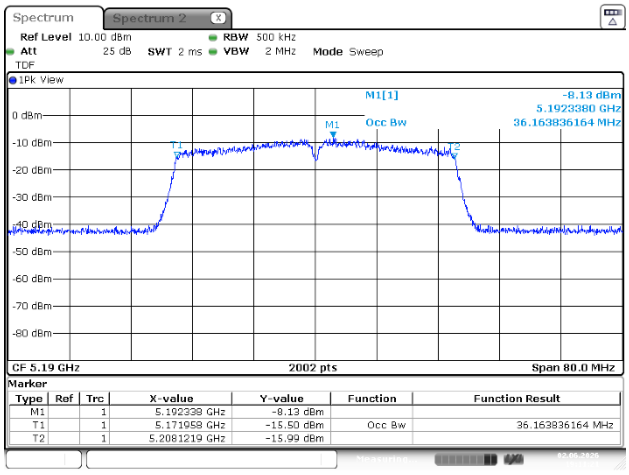


Port 2_High Channel (5 825 ㎒)

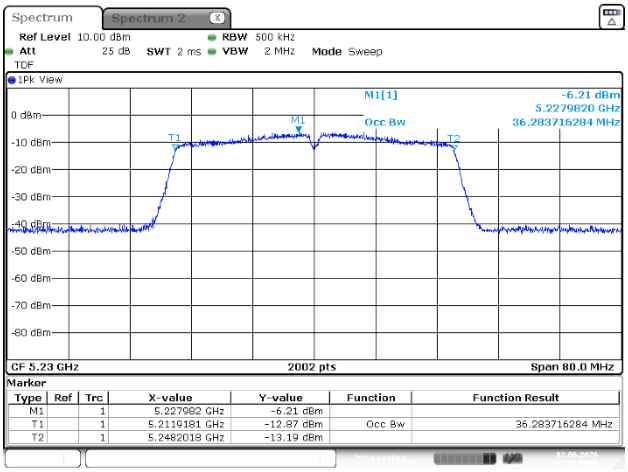
11ac_VHT40 (U-NII 1)



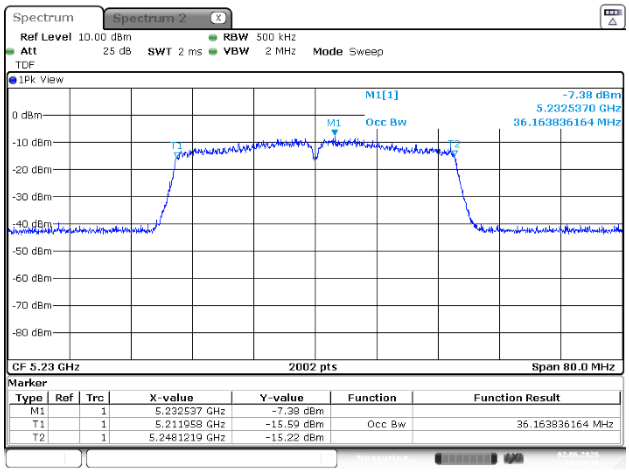
Port 1_Low Channel (5 190 ㎒)



Port 2_Low Channel (5 190 ㎒)

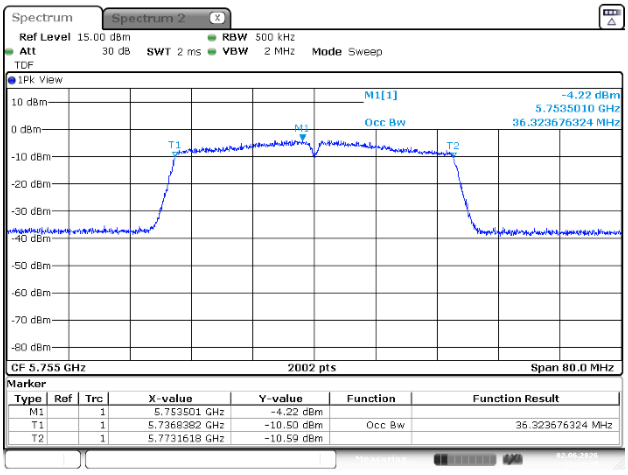


Port 1_High Channel (5 230 ㎒)

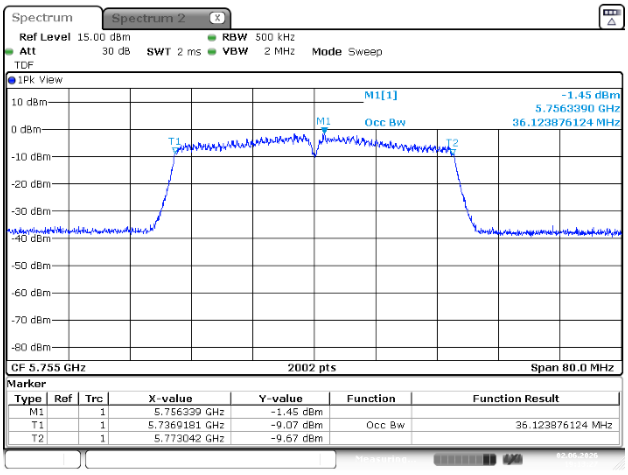


Port 2_High Channel (5 230 ㎒)

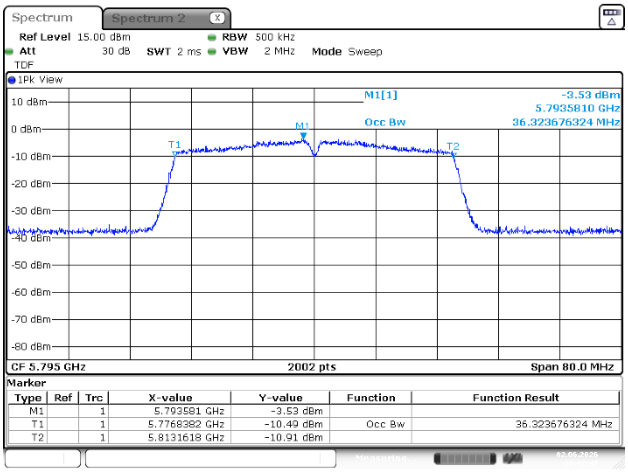
11ac_VHT40 (U-NII 3)



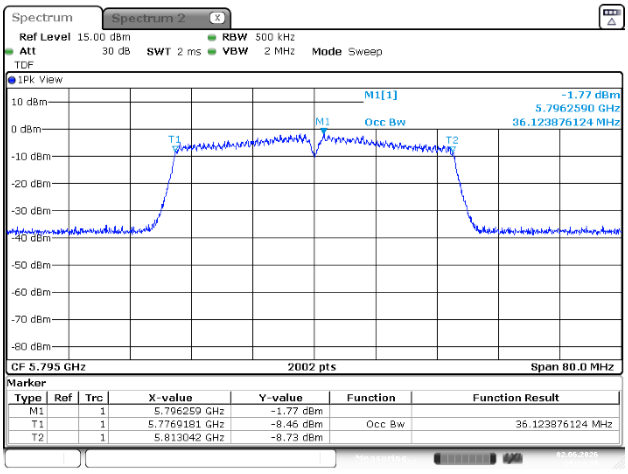
Port 1_Low Channel (5 755 ㎒)



Port 2_Low Channel (5 755 ㎒)

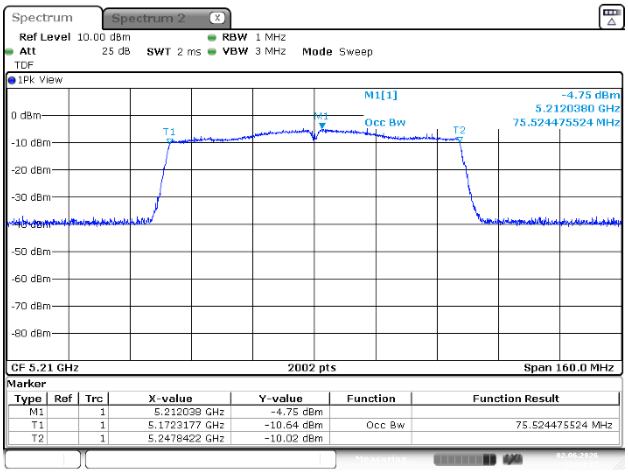


Port 1_High Channel (5 795 ㎒)

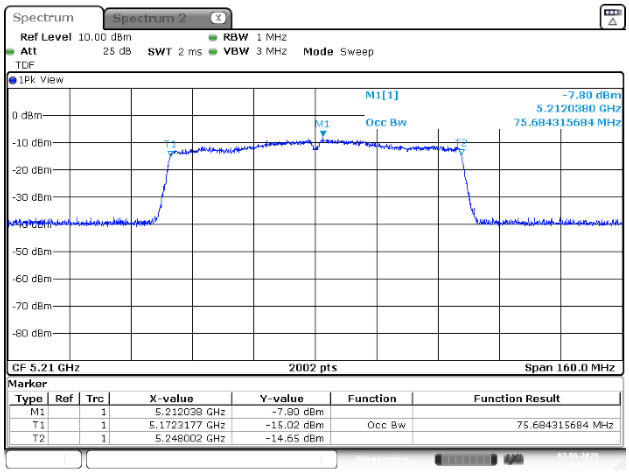


Port 2_High Channel (5 795 ㎒)

11ac_VHT80 (U-NII 1)

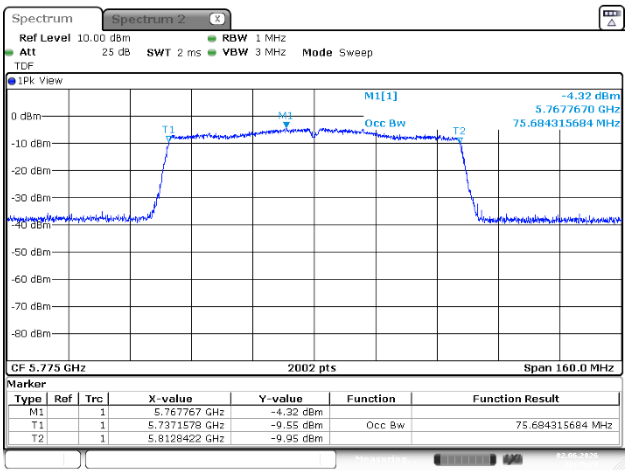


Port 1_Middle Channel (5 210 ㎒)

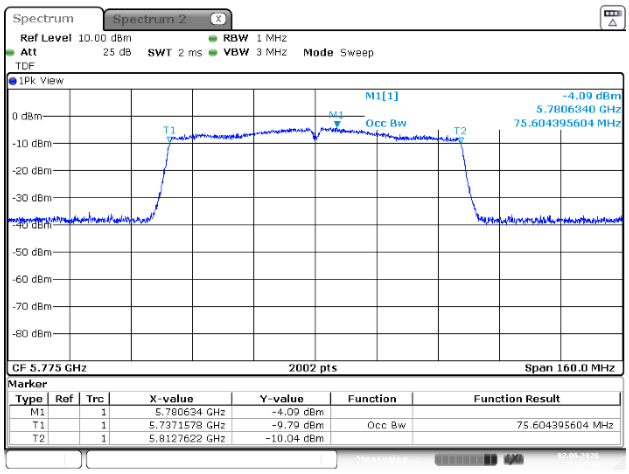


Port 2_Middle Channel (5 210 ㎒)

11ac_VHT80 (U-NII 3)



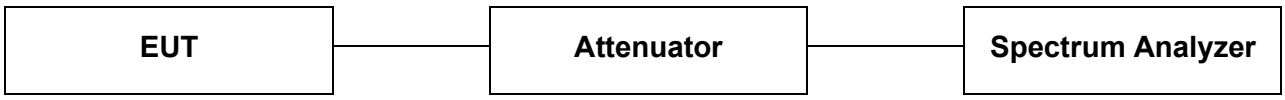
Port 1_Middle Channel (5 775 ㎒)



Port 2_Middle Channel (5 775 ㎒)

4. 6 dB Bandwidth

4.1. Test Setup



4.2. Limit

4.2.1. FCC

According to §15.407(e), within the 5.725-5.85 ㎓ band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 ㎑.

4.2.2. IC

According to RSS-247 Issue 4, 7.3.4.2, for equipment operating in the band 5 725-5 850 ㎒, the 6 dB bandwidth shall be at least 500 ㎑.

4.3. Test Procedure

1. This measurement settings are specified in section Ⅱ.C.2 of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = 100 ㎑.
3. Set the video bandwidth (VBW) ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Sweep = auto couple.
7. Allow the trace to stabilize.
8. 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.

4.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 %

- SISO (Ant. 1)

Band	Mode	Frequency (㎒)	Ch.	Data Rate	6 ㏈ Bandwidth (㎒)	Minimum Bandwidth (㎑)
U-NII 3	11a	5 745	149	12 Mbps	16.324	500
		5 785	157		16.304	
		5 825	165		16.324	

- SISO (Ant. 2)

Band	Mode	Frequency (㎒)	Ch.	Data Rate	6 ㏈ Bandwidth (㎒)	Minimum Bandwidth (㎑)
U-NII 3	11a	5 745	149	12 Mbps	16.324	500
		5 785	157		16.344	
		5 825	165		16.344	

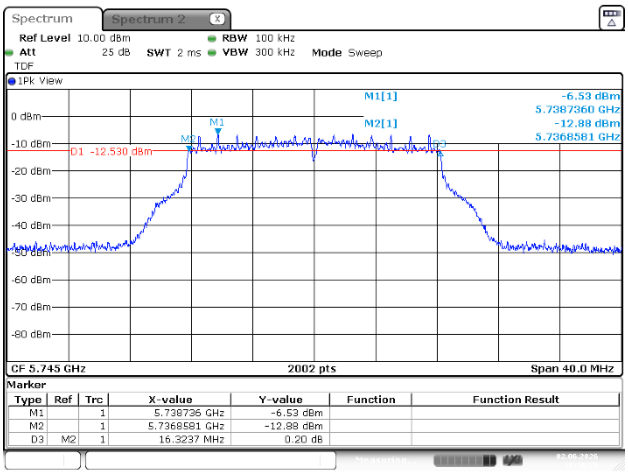
- MIMO (Ant. 1 + Ant. 2)

Band	Mode	Frequency (㎒)	Ch.	Data Rate	6 ㏈ Bandwidth (㎒)		Minimum Bandwidth (㎑)
					Port 1	Port 2	
U-NII 3	11ac_VHT20	5 745	149	MCS0	17.582	17.622	500
		5 785	157		17.582	17.602	
		5 825	165		17.582	17.602	
	11ac_VHT40	5 755	151	MCS0	35.245	35.764	
		5 795	159		35.285	35.764	
	11ac_VHT80	5 775	155	MCS0	75.285	75.604	

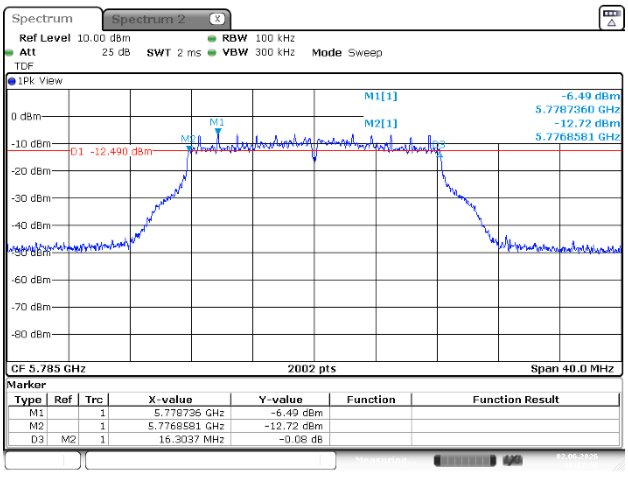
Test plots

- SISO (Ant. 1)

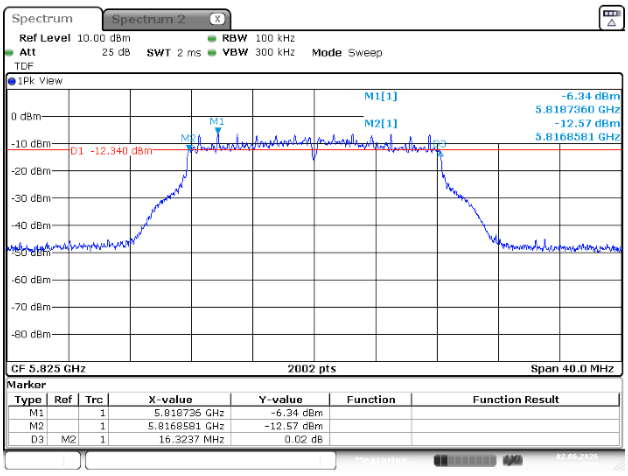
11a (U-NII 3)



Port 1_Low Channel (5 745 ㎒)



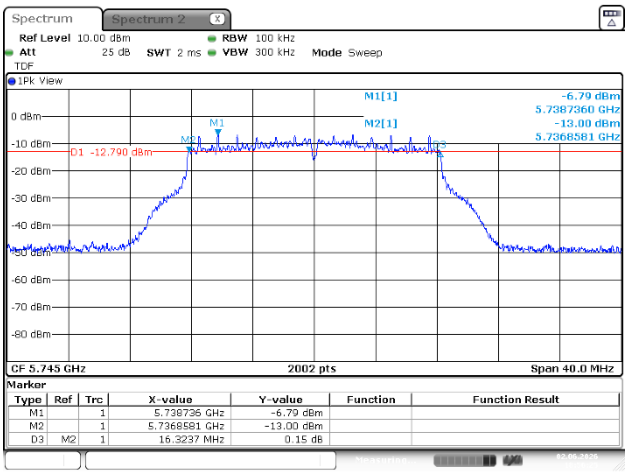
Port 1_Middle Channel (5 785 ㎒)



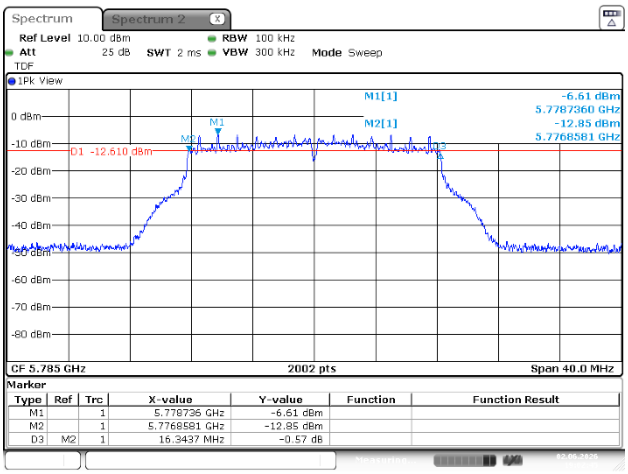
Port 1_High Channel (5 825 ㎒)

- SISO (Ant. 1)

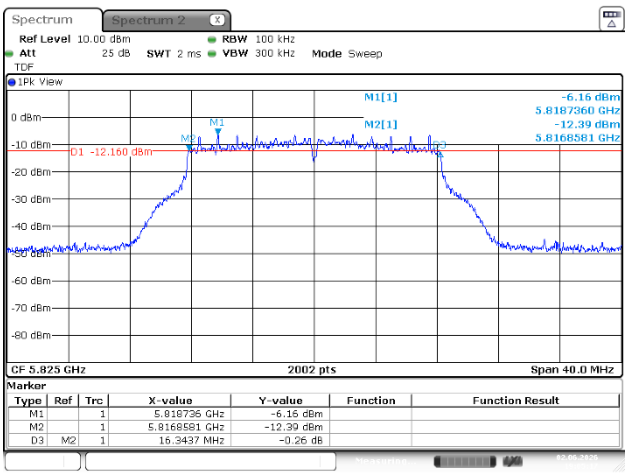
11a (U-NII 3)



Port 2_Low Channel (5 745 ㎒)



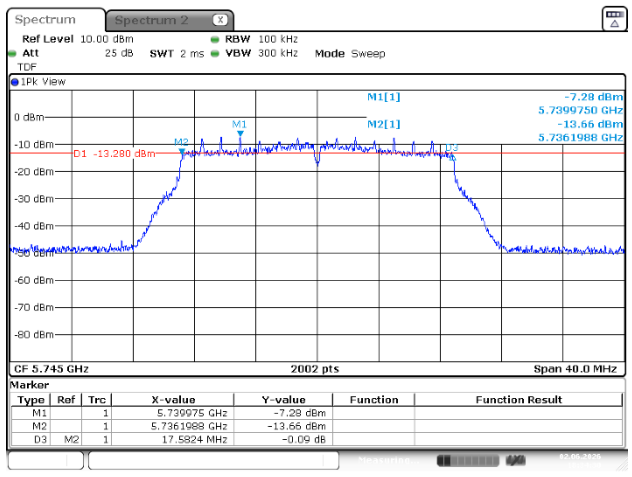
Port 2_Middle Channel (5 785 ㎒)



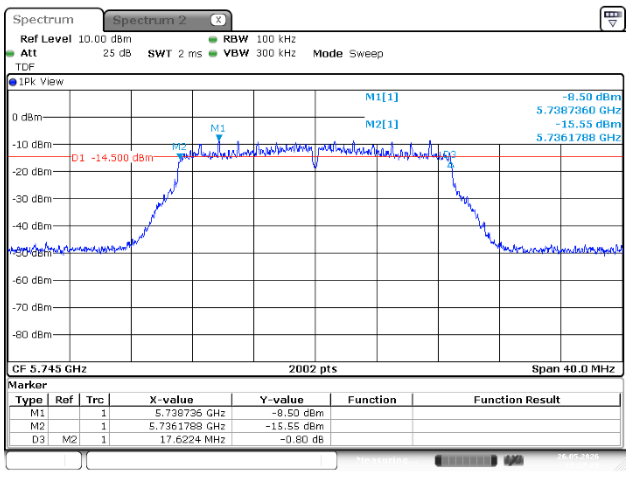
Port 2_High Channel (5 825 ㎒)

- MIMO (Ant. 1 + Ant. 2)

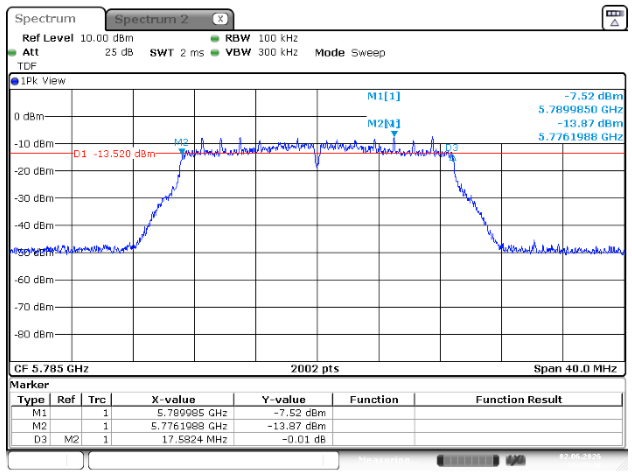
11ac_VHT20 (U-NII 3)



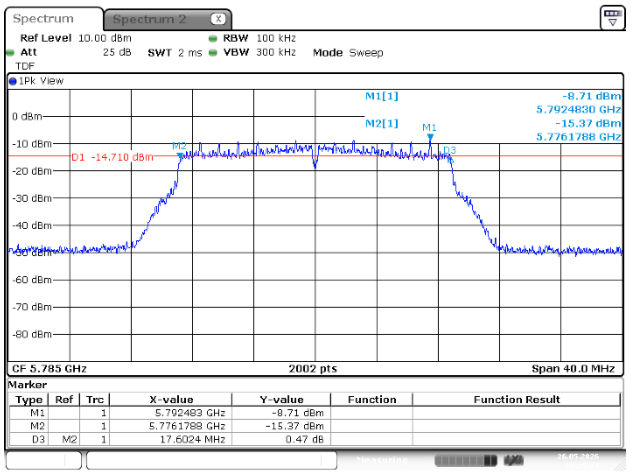
Port 1_Low Channel (5 745 ㎒)



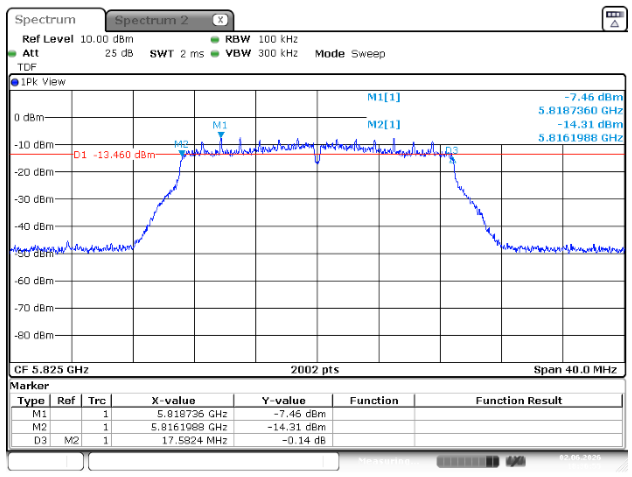
Port 2_Low Channel (5 745 ㎒)



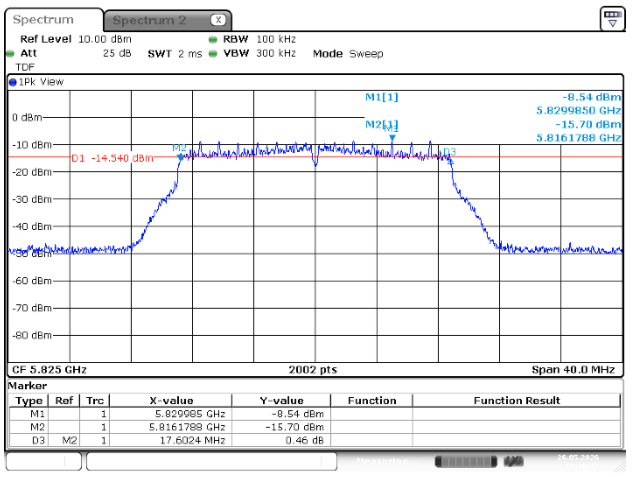
Port 1_Middle Channel (5 785 ㎒)



Port 2_Middle Channel (5 785 ㎒)

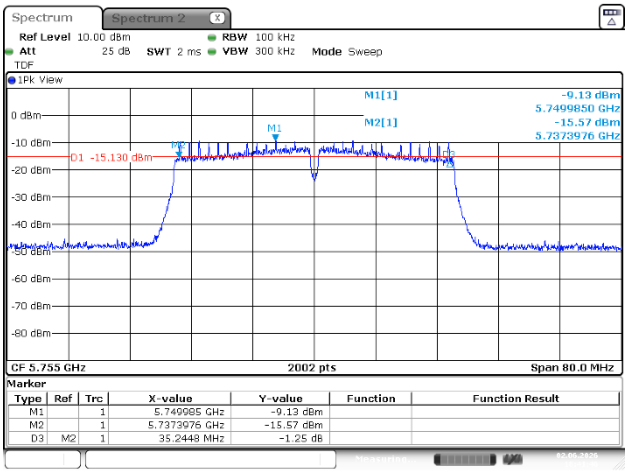


Port 1_High Channel (5 825 ㎒)

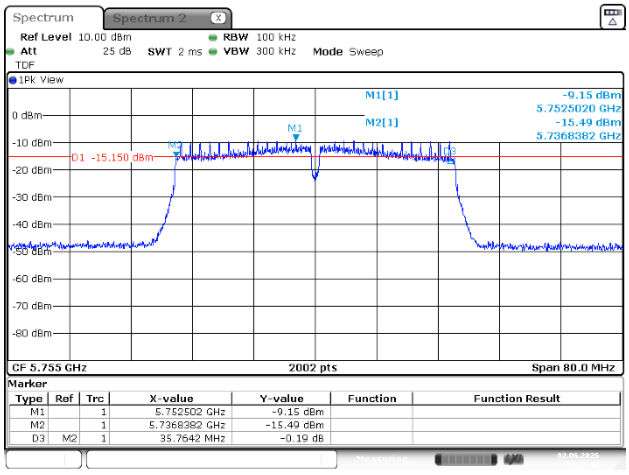


Port 2_High Channel (5 825 ㎒)

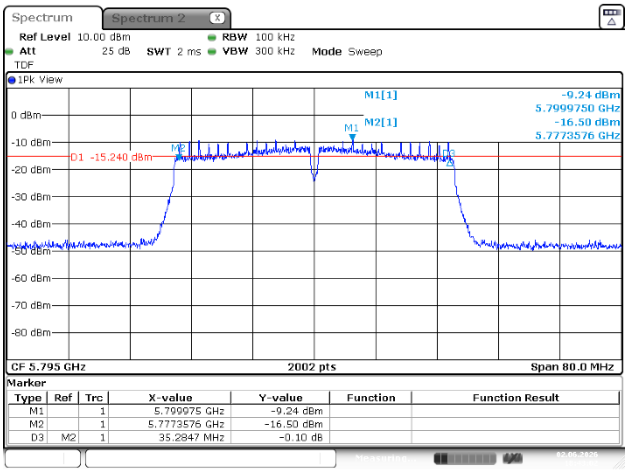
11ac_VHT40 (U-NII 3)



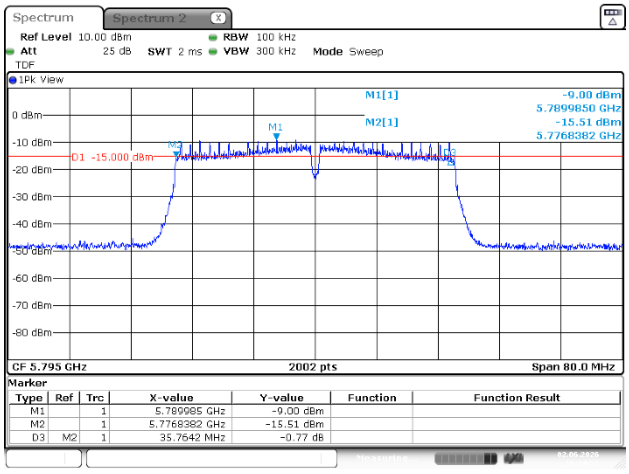
Port 1_Low Channel (5 755 ㎒)



Port 2_Low Channel (5 755 ㎒)

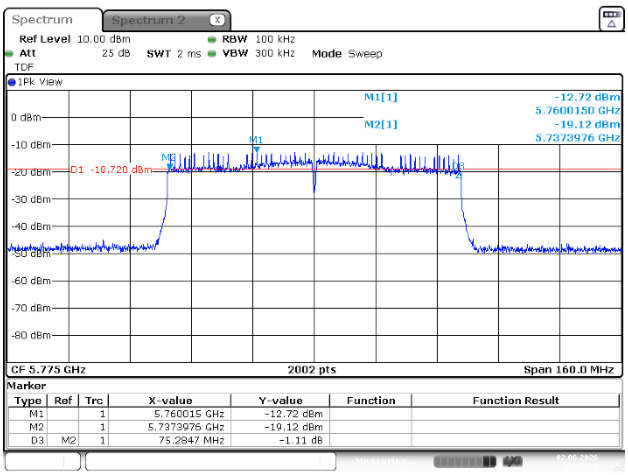


Port 1_High Channel (5 795 ㎒)

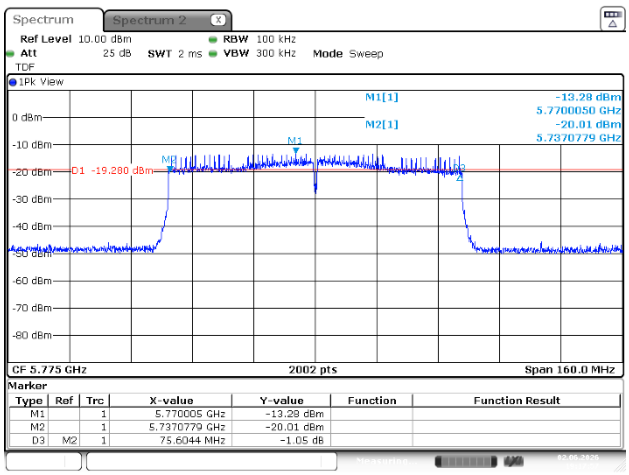


Port 2_High Channel (5 795 ㎒)

11ac_VHT80 (U-NII 3)



Port 1_Middle Channel (5 775 ㎒)

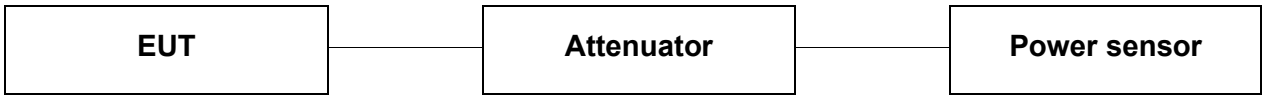


Port 2_Middle Channel (5 775 ㎒)

5. Maximum Conducted Output Power

5.1. Test Setup

5.1.1 RF Output Power



5.2. Limit

5.2.1. FCC

According to 15.407(a)(1)(iv)

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

According to 15.407(a)(3)

For the band 5.725-5.85 ㎓, 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 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i 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.

5.2.2. IC

According to RSS-247 Issue 4,

7.3.1.2 Frequency band 5 150-5 250 ㎒

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed the lesser of:

a. 30 ㎽; or
b. 1.76 + 10 $\log_{10}$B, ㏈m.

OEM devices installed in vehicles with a maximum e.i.r.p. greater than 15 ㎽ shall implement TPC in order to have the capability to operate at least 3 ㏈ below the maximum permitted e.i.r.p. of 30 ㎽.

For all other devices the maximum e.i.r.p. spectral density shall not exceed 10 ㏈m/㎒. The maximum e.i.r.p. shall not exceed the lesser of:

a. 200 ㎽; or
b. 10 + 10 $\log_{10}$B, ㏈m.

7.3.4.3 Frequency band 5 725-5 850 ㎒

Equipment operating in the band 5 725-5 850 shall comply with the following power limits:

a. the maximum conducted output power shall not exceed 1 W; and
b. the maximum output power spectral density shall not exceed 30 ㏈m/500 ㎑.

When using transmitting antennas with a directional gain exceeding 6 ㏈i, 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 ㏈i.

However, FPTP devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter maximum conducted output power and the power spectral density. FPTP operations exclude the use of PTMP systems, omnidirectional applications and multiple collocated transmitters transmitting the same information. However, remote stations of PTMP systems shall be permitted to operate at e.i.r.p. greater than 4 W under the same conditions as for FPTP systems.

5.3. Test Procedure

5.3.1 RF Output Power

1. This measurement settings are specified in section Ⅱ.E.3.b of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

5.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 %

- SISO (Ant. 1)

Test mode: 11a

Band	Frequency (㎒)	Data Rate	Average Power (㏈m)	Antenna Gain (㏈i)	E.I.R.P. (㏈m)
U-NII 1	5 180	12 Mbps	4.54	3.10	7.64
	5 220		4.61		7.71
	5 240		4.61		7.71
U-NII 3	5 745		6.56	3.10	9.66
	5 785		6.72		9.82
	5 825		6.56		9.66

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 26 ㏈ BW (㎒)	11+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 180	23.98			3.10	23.98
	5 220					
	5 240					
U-NII 3	5 745	30			3.10	30
	5 785					
	5 825					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 99 % BW (㎒)	1.76+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 180	14.77	16.863	14.03	3.10	14.03
	5 220					
	5 240					
U-NII 3	5 745	30			3.10	30
	5 785					
	5 825					

Remark;

1. E.I.R.P. (㏈m) = Average Power Result (㏈m) + Directional Antenna Gain (㏈i)

- SISO (Ant. 2)

Test mode: 11a

Band	Frequency (㎒)	Data Rate	Average Power (㏈m)	Antenna Gain (㏈i)	E.I.R.P. (㏈m)
U-NII 1	5 180	12 Mbps	3.95	3.10	7.05
	5 220		4.18		7.28
	5 240		4.20		7.30
U-NII 3	5 745		6.45	3.10	9.55
	5 785		6.35		9.45
	5 825		6.37		9.47

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 26 ㏈ BW (㎒)	11+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 180	23.98			3.10	23.98
	5 220					
	5 240					
U-NII 3	5 745	30			3.10	30
	5 785					
	5 825					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 99 % BW (㎒)	1.76+10LogB (㏈m)	Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 180	14.77	16.863	14.03	3.10	14.03
	5 220					
	5 240					
U-NII 3	5 745	30			3.10	30
	5 785					
	5 825					

Remark;

1. E.I.R.P. (㏈m) = Average Power Result (㏈m) + Directional Antenna Gain (㏈i)

- MIMO (Ant. 1 + Ant. 2)

Test mode: 11ac_VHT20

Band	Frequency (㎒)	Data Rate	Port 1 Average Power (dB m)	Port 2 Average Power (dB m)	MIMO Average Power (dB m)
U-NII 1	5 180	MCS 0	4.06	-0.11	5.47
	5 220		4.15	-0.53	5.42
	5 240		4.20	-0.38	5.50
U-NII 3	5 745		4.84	3.26	7.13
	5 785		4.48	3.10	6.85
	5 825		4.63	3.25	7.00

Band	Frequency (㎒)	Data Rate	MIMO Average Power (dB m)	Directional Antenna Gain (dB i)	MIMO E.I.R.P. (dB m)
U-NII 1	5 180	MCS 0	5.47	6.11	11.58
	5 220		5.42		11.53
	5 240		5.50		11.61
U-NII 3	5 745		7.13	6.11	13.24
	5 785		6.85		12.96
	5 825		7.00		13.11

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	23.98			6.11	23.87
	5 220					
	5 240					
U-NII 3	5 745	30			6.11	29.89
	5 785					
	5 805					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 180	14.77	17.822	14.27	6.11	14.27
	5 220					
	5 240					
U-NII 3	5 745	30			6.11	29.89
	5 785					
	5 825					

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dB i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N_{ANT}$] dB i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]
2. E.I.R.P. (dB m) = Average Power Result (dB m) + Directional Antenna Gain (dB i)
3. The maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB i.

Test mode: 11ac_VHT40

Band	Frequency (㎒)	Data Rate	Port 1 Average Power (㏈m)	Port 2 Average Power (㏈m)	MIMO Average Power (㏈m)
U-NII 1	5 190	MCS0	3.49	-1.83	4.61
	5 230		3.13	-1.38	4.45
U-NII 3	5 755		5.18	4.53	7.88
	5 795		4.78	4.05	7.44

Band	Frequency (㎒)	Data Rate	MIMO Average Power (㏈m)	Directional Antenna Gain (㏈i)	MIMO E.I.R.P. (㏈m)
U-NII 1	5 190	MCS0	4.61	6.11	10.72
	5 230		4.45		10.56
U-NII 3	5 755		7.88	6.11	13.99
	5 795		7.44		13.55

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 26 ㏈ BW (㎒)	11+10LogB (㏈m)	Directional Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 190	23.98			6.11	23.87
	5 230					
U-NII 3	5 755	30			6.11	29.89
	5 795					

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (㏈m)	Min. 99 % BW (㎒)	1.76+10LogB (㏈m)	Directional Antenna Gain (㏈i)	Limit (㏈m)
U-NII 1	5 190	14.77	36.164	17.34	6.11	14.77
	5 230					
U-NII 3	5 755	30			6.11	29.89
	5 795					

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N ㏈i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N_{ANT}$] ㏈i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. E.I.R.P. (㏈m) = Average Power Result (㏈m) + Directional Antenna Gain (㏈i)
3. The maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 ㏈i.

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Data Rate	Port 1 Average Power (dB m)	Port 2 Average Power (dB m)	MIMO Average Power (dB m)
U-NII 1	5 210	MCS0	3.78	-1.41	4.93
U-NII 3	5 775		3.94	3.12	6.56
Band	**Frequency (㎒)**	**Data Rate**	**MIMO Average Power (dB m)**	**Directional Antenna Gain (dB i)**	**MIMO E.I.R.P. (dB m)**
U-NII 1	5 210	MCS0	4.93	6.11	11.04
U-NII 3	5 775		6.56	6.11	12.67

Band	FCC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 26 dB BW (㎒)	11+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 210	23.98			6.11	23.87
U-NII 3	5 775	30			6.11	29.89

Band	IC Limit					
	Frequency (㎒)	Fixed Limit (dB m)	Min. 99 % BW (㎒)	1.76+10LogB (dB m)	Directional Antenna Gain (dB i)	Limit (dB m)
U-NII 1	5 210	14.77	75.524	20.54	6.11	14.77
U-NII 3	5 775	30			6.11	29.89

Remark;

1. According to KDB 662911, Average power of each port and antenna gain was combined by using below calculation.

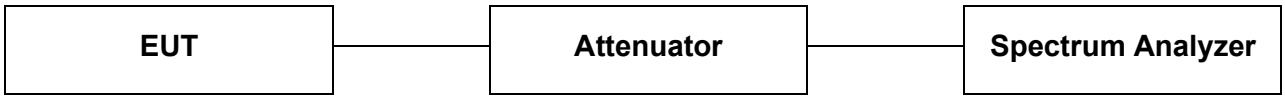
   - Average power: 10 log {10^(Port 1 power / 10)+10^(Port 2 power / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dB i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N_{ANT}$] dB i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. E.I.R.P. (dB m) = Average Power Result (dB m) + Directional Antenna Gain (dB i)
3. The maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB i.

6. Maximum Power Spectral Density

6.1. Test Setup



6.2. Limit

6.2.1. FCC

According to 15.407(a)(1)(iv)

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

According to 15.407(a)(3)

For the band 5.725-5.85 ㎓, 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 ㏈m in any 500-㎑ band. If transmitting antennas of directional gain greater than 6 ㏈i are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in ㏈ that the directional gain of the antenna exceeds 6 ㏈i. However, fixed point-to point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i 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.

6.2.2. IC

According to RSS-247 Issue 4,

7.3.1.2 Frequency band 5 150-5 250 ㎒

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed the lesser of:

c. 30 ㎽; or

d. 1.76 + 10 $\log_{10}$B, ㏈m.

OEM devices installed in vehicles with a maximum e.i.r.p. greater than 15 ㎽ shall implement TPC in order to have the capability to operate at least 3 ㏈ below the maximum permitted e.i.r.p. of 30 ㎽.

For all other devices the maximum e.i.r.p. spectral density shall not exceed 10 ㏈m/㎒. The maximum e.i.r.p. shall not exceed the lesser of:

c. 200 ㎽; or

d. 10 + 10 $\log_{10}$B, ㏈m.

7.3.4.3 Frequency band 5 725-5 850 ㎒

Equipment operating in the band 5 725-5 850 shall comply with the following power limits:

c. the maximum conducted output power shall not exceed 1 W; and

d. the maximum output power spectral density shall not exceed 30 ㏈m/500 ㎑.

When using transmitting antennas with a directional gain exceeding 6 ㏈i, 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 ㏈i.

However, FPTP devices operating in this band may employ transmitting antennas with directional gain greater than 6 ㏈i without any corresponding reduction in transmitter maximum conducted output power and the power spectral density. FPTP operations exclude the use of PTMP systems, omnidirectional applications and multiple collocated transmitters transmitting the same information. However, remote stations of PTMP systems shall be permitted to operate at e.i.r.p. greater than 4 W under the same conditions as for FPTP systems.

6.3. Test Procedure

1. This measurement settings are specified in section Ⅱ.F of KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

2. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, “Compute power…”. (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)

3. Use the peak search function on the instrument to find the peak of the spectrum and record its value.

4. Make the following adjustments to the peak value of the spectrum, if applicable:

   a) **If Method SA-2 or SA-2 Alternative was used, add 10 log(1/x), where x is the duty cycle, to the peak of the spectrum.**
   b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 ㏈ to the final result to compensate for the difference between linear averaging and power averaging.

5. The result is the Maximum PSD over 1 ㎒ reference bandwidth.

6. For devices operating in the bands 5.15-5.25 ㎓, 5.25-5.35 ㎓, and 5.47-5.725 ㎓, the above procedures make use of 1 ㎒ RBW to satisfy directly the 1 ㎒ reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 ㎓, the rules specify a measurement bandwidth of 500 ㎑. Many spectrum analyzers do not have 500 ㎑ RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 ㎒, or 500 ㎑, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (*i.e.,* 1 ㎒, or 500 ㎑). If measurements are performed using a reduced resolution bandwidth (< 1 ㎒, or < 500 ㎑) and integrated over 1 ㎒, or 500 ㎑ bandwidth, the following adjustments to the procedures apply:

   a) Set RBW ≥ 1/*T*, where *T* is defined in section II.B.1.a).
   b) Set VBW ≥ 3 RBW.
   c) If measurement bandwidth of Maximum PSD is specified in 500 ㎑, add 10 log(500 ㎑/RBW) to the measured result, whereas RBW (< 500 ㎑) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
   d) If measurement bandwidth of Maximum PSD is specified in 1 ㎒, add 10 log(1 ㎒/RBW) to the measured result, whereas RBW (< 1 ㎒) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
   e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

6.4. Test Result

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 %

- SISO (Ant. 1)

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate	Measured PSD (㏈ m)	Duty Cycle Correction Factor (㏈)	Final PSD (㏈ m)	Antenna Gain (㏈ i)	Limit (㏈ m/1 ㎒)
U-NII 1	5 180	36	12 Mbps	-7.70	0.60	-7.10	3.10	11
	5 220	44		-7.76		-7.16		
	5 240	48		-7.61		-7.01		
Band	**Frequency (㎒)**	**Ch.**	**Data Rate**	**Measured PSD (㏈ m)**	**Duty Cycle Correction Factor (㏈)**	**Final PSD (㏈ m)**	**Antenna Gain (㏈ i)**	**Limit (㏈ m/500 ㎑)**
U-NII 3	5 745	149	12 Mbps	-8.45	0.60	-7.85	3.10	30
	5 785	157		-8.64		-8.04		
	5 825	165		-8.64		-8.04		

- SISO (Ant. 2)

Test mode: 11a

Band	Frequency (㎒)	Ch.	Data Rate	Measured PSD (㏈ m)	Duty Cycle Correction Factor (㏈)	Final PSD (㏈ m)	Antenna Gain (㏈ i)	Limit (㏈ m/1 ㎒)
U-NII 1	5 180	36	12 Mbps	-8.75	0.60	-8.15	3.10	11
	5 220	44		-8.88		-8.28		
	5 240	48		-8.78		-8.18		
Band	**Frequency (㎒)**	**Ch.**	**Data Rate**	**Measured PSD (㏈ m)**	**Duty Cycle Correction Factor (㏈)**	**Final PSD (㏈ m)**	**Antenna Gain (㏈ i)**	**Limit (㏈ m/500 ㎑)**
U-NII 3	5 745	149	12 Mbps	-8.77	0.60	-8.17	3.10	30
	5 785	157		-8.62		-8.02		
	5 825	165		-8.53		-7.93		

Remark;

1. Final PSD (㏈ m) = PSD (㏈ m) + Duty Cycle Correction Factor (㏈)

- MIMO (Ant. 1 + Ant. 2)

Test mode: 11ac_VHT20

Band	Frequency (㎒)	Ch.	Data Rate	Port 1 Measured PSD (㏈ m)	Port 2 Measured PSD (㏈ m)	MIMO PSD (㏈ m)
U-NII 1	5 180	36	MCS0	-7.93	-12.28	-6.57
	5 220	44		-8.07	-12.19	-6.65
	5 240	48		-7.83	-12.24	-6.49
U-NII 3	5 745	149		-9.99	-11.09	-7.49
	5 785	157		-10.26	-11.16	-7.68
	5 825	165		-10.22	-11.51	-7.81

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (㏈ m)	Duty Cycle Correction Factor (㏈)	MIMO Final PSD (㏈ m)	Directional Antenna Gain (㏈ i)	Limit (㏈ m/1 ㎒)
U-NII 1	5 180	36	MCS0	-6.57	0.62	-5.96	6.11	10.89
	5 220	44		-6.65		-6.03		
	5 240	48		-6.49		-5.87		

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (㏈ m)	Duty Cycle Correction Factor (㏈)	MIMO Final PSD (㏈ m)	Directional Antenna Gain (㏈ i)	Limit (㏈ m/500 ㎑)
U-NII 3	5 745	149	MCS0	-7.49	0.62	-6.88	6.11	29.89
	5 785	157		-7.68		-7.06		
	5 825	165		-7.81		-7.19		

Remark;

1. According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.

   - PSD: 10 log {10^(Port 1 PSD / 10)+10^(Port 2 PSD / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N ㏈ i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2/N_{ANT}$] ㏈ i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Final PSD (㏈ m) = PSD (㏈ m) + Duty Cycle Correction Factor (㏈)
3. The maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 ㏈ i.

Test mode: 11ac_VHT40

Band	Frequency (㎒)	Ch.	Data Rate	Port 1 Measured PSD (dB m)	Port 2 Measured PSD (dB m)	MIMO PSD (dB m)
U-NII 1	5 190	38	MCS0	-12.32	-16.62	-10.95
	5 230	46		-12.61	-16.41	-11.10
U-NII 3	5 755	151		-13.14	-13.02	-10.07
	5 795	159		-13.13	-13.00	-10.05

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 190	38	MCS0	-10.95	1.13	-9.82	6.11	10.89
	5 230	46		-11.10		-9.97		

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/500 ㎑)
U-NII 3	5 755	151	MCS0	-10.07	1.13	-8.94	6.11	29.89
	5 795	159		-10.05		-8.93		

Remark;

1. According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.

   - PSD: 10 log {10^(Port 1 PSD / 10)+10^(Port 2 PSD / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dB i
   (i) If transmit signals are correlated, then
   Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/N_{ANT}$] dB i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

2. Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)
3. The maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB i.

Test mode: 11ac_VHT80

Band	Frequency (㎒)	Ch.	Data Rate	Port 1 Measured PSD (dB m)	Port 2 Measured PSD (dB m)	MIMO PSD (dB m)
U-NII 1	5 210	42	MCS0	-15.33	-20.15	-14.09
U-NII 3	5 775	155		-17.82	-17.80	-14.80

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/1 ㎒)
U-NII 1	5 210	42	MCS0	-14.09	1.94	-12.15	6.11	10.89

Band	Frequency (㎒)	Ch.	Data Rate	MIMO PSD (dB m)	Duty Cycle Correction Factor (dB)	MIMO Final PSD (dB m)	Directional Antenna Gain (dB i)	Limit (dB m/500 ㎑)
U-NII 3	5 775	155	MCS0	-14.80	1.94	-12.86	6.11	29.89

Remark;

1. According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.

   - PSD: 10 log {10^(Port 1 PSD / 10)+10^(Port 2 PSD / 10)}

   - Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, …, G_N dBi
   (i) If transmit signals are correlated, then
   Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/N_{ANT}]$ dBi [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

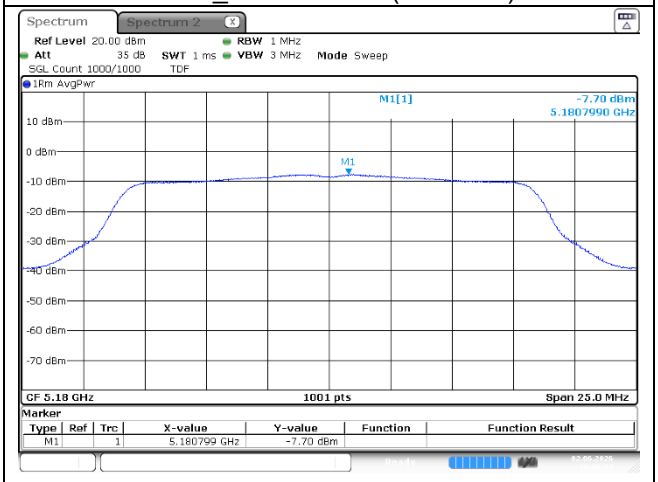
2. Final PSD (dBm) = PSD (dBm) + Duty Cycle Correction Factor (dB)
3. The maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test plots

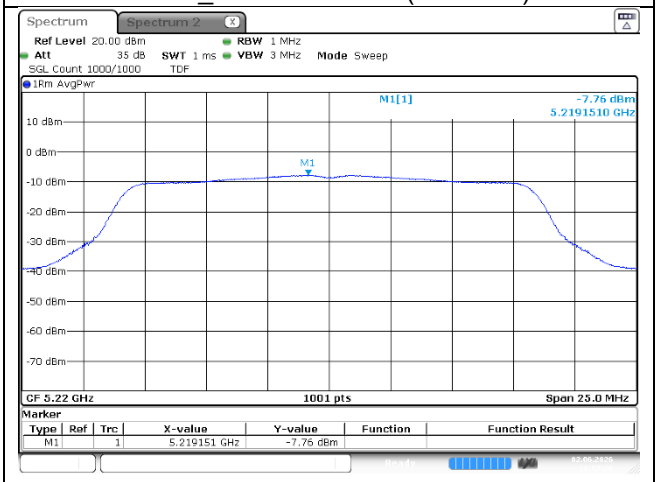
- SISO (Ant. 1)

11a (U-NII 1)

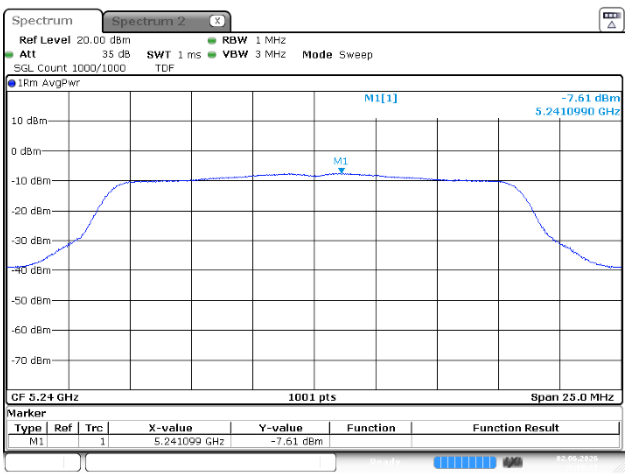
Port 1_Low Channel (5 180 ㎒)



Port 1_Middle Channel (5 220 ㎒)

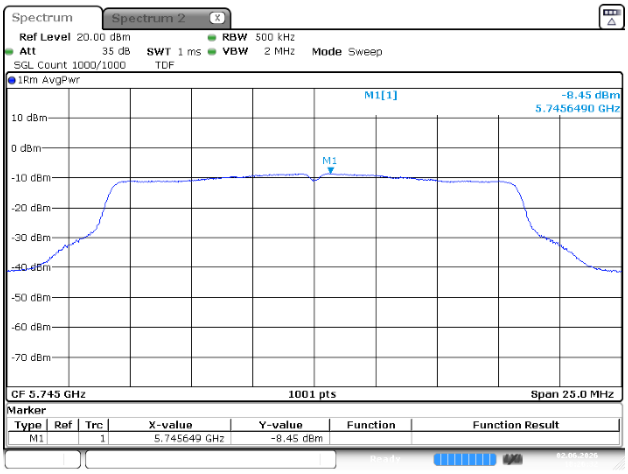


Port 1_High Channel (5 240 ㎒)

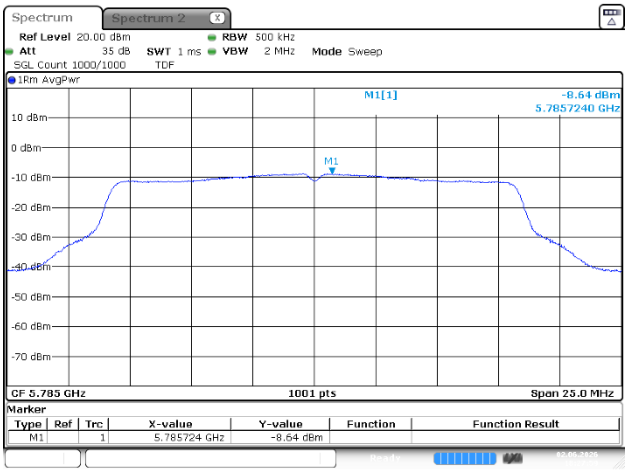


11a (U-NII 3)

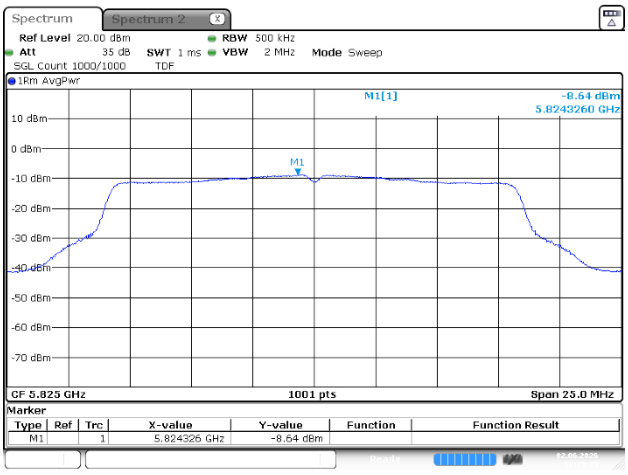
Port 1_Low Channel (5 745 ㎒)



Port 1_Middle Channel (5 785 ㎒)



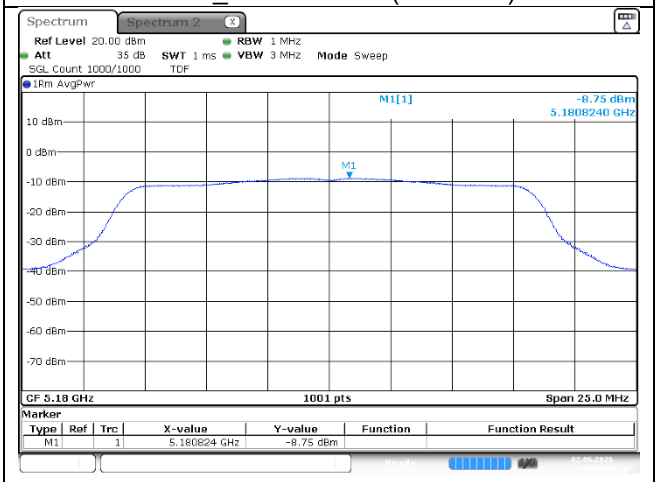
Port 1_High Channel (5 825 ㎒)



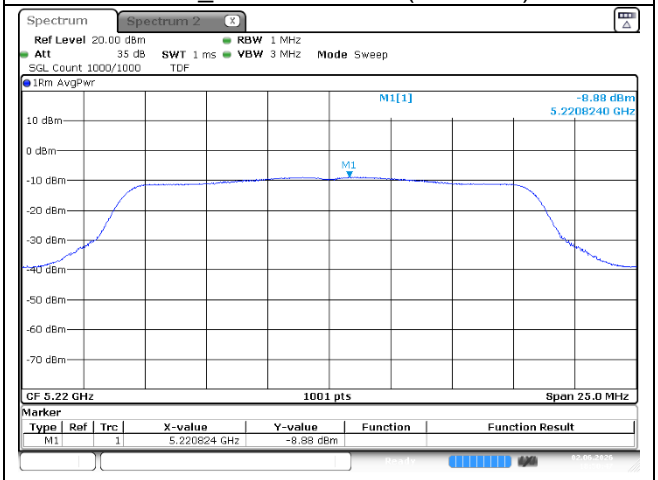
- SISO (Ant. 2)

11a (U-NII 1)

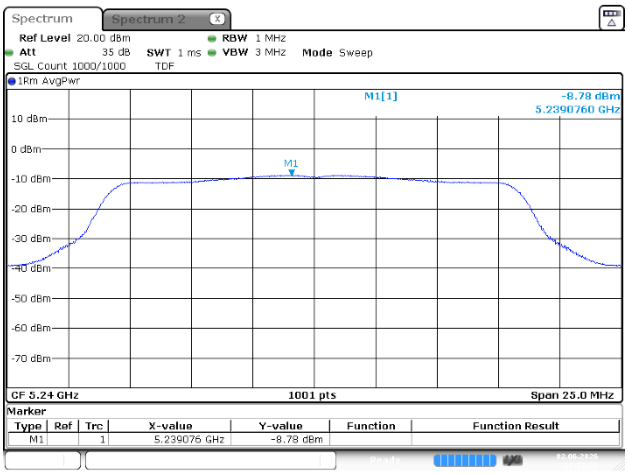
Port 2_Low Channel (5 180 ㎒)



Port 2_Middle Channel (5 220 ㎒)

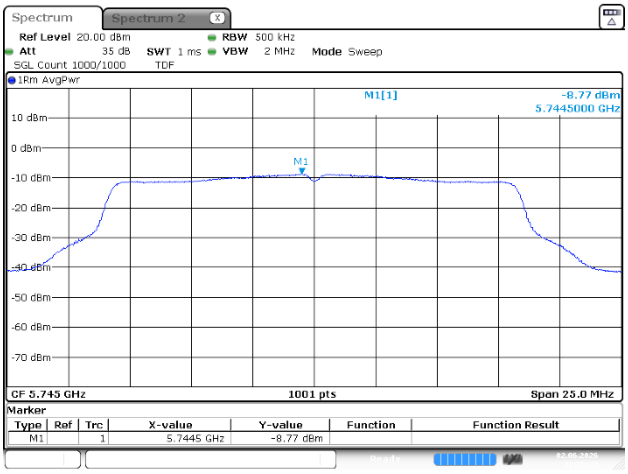


Port 2_High Channel (5 240 ㎒)

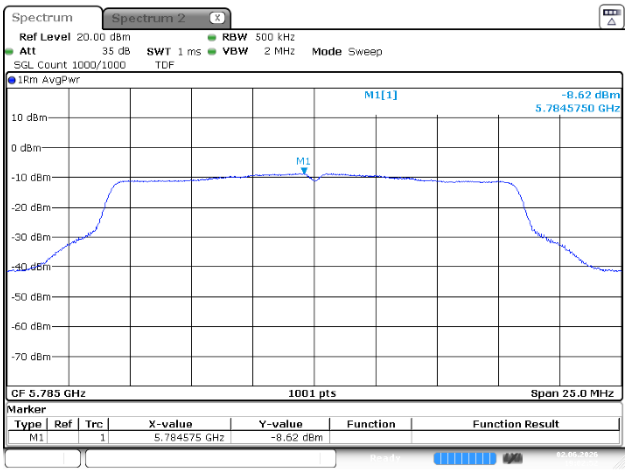


11a (U-NII 3)

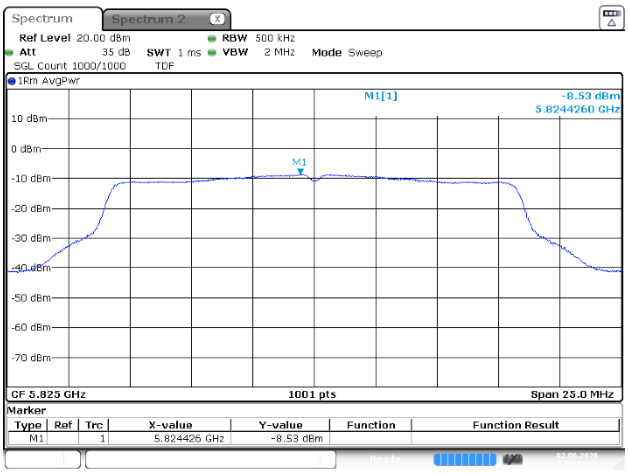
Port 2_Low Channel (5 745 ㎒)



Port 2_Middle Channel (5 785 ㎒)



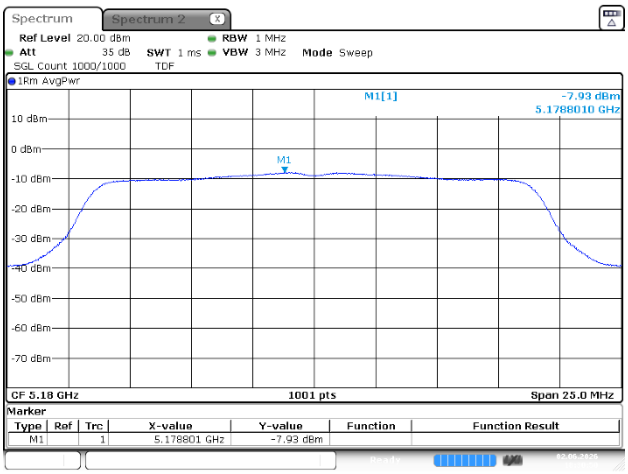
Port 2_High Channel (5 825 ㎒)



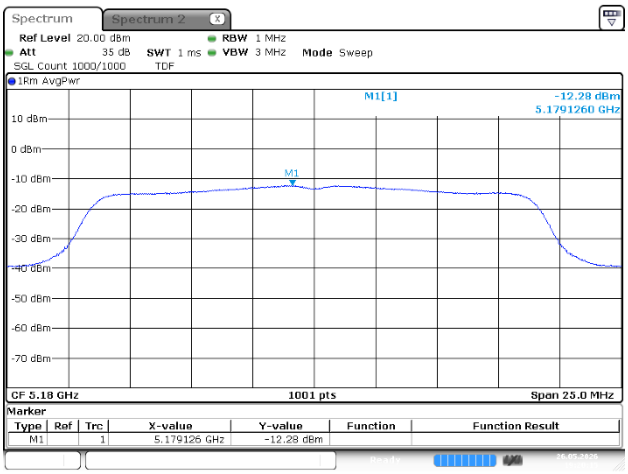
- MIMO (Ant.1 + Ant. 2)

11ac_VHT20 (U-NII 1)

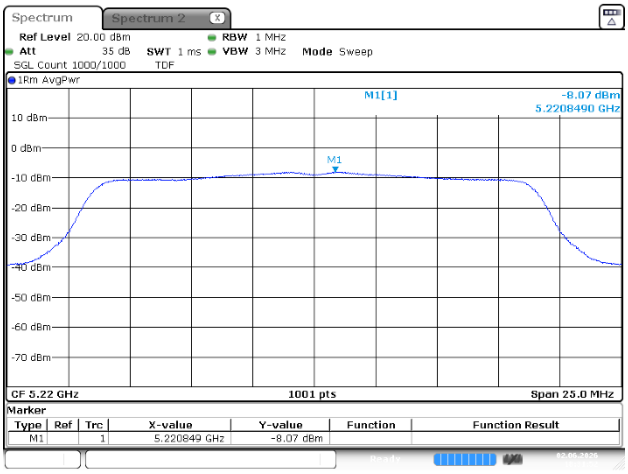
Port 1_Low Channel (5 180 ㎒)



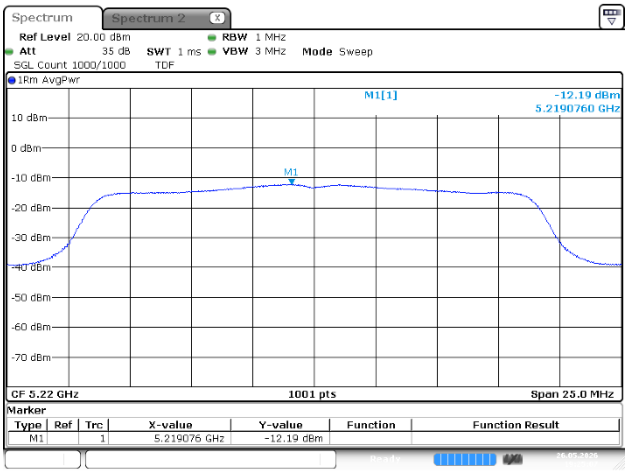
Port 2_Low Channel (5 180 ㎒)



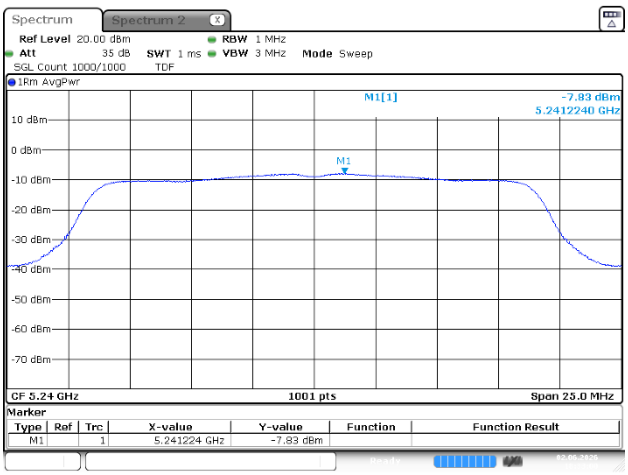
Port 1_Middle Channel (5 220 ㎒)



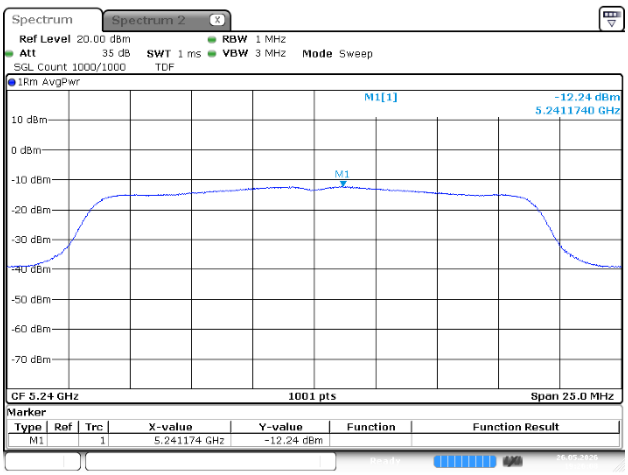
Port 2_Middle Channel (5 220 ㎒)



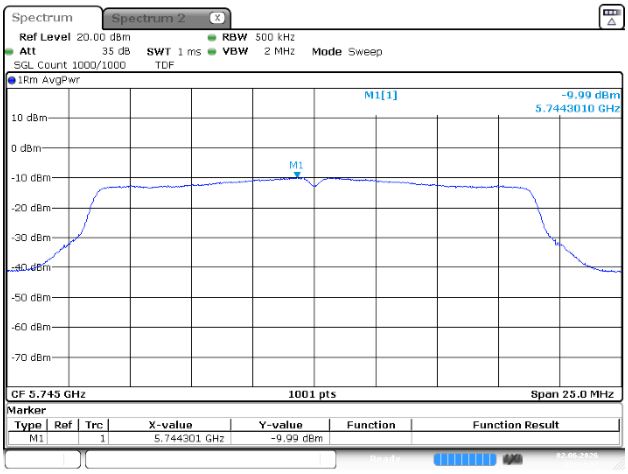
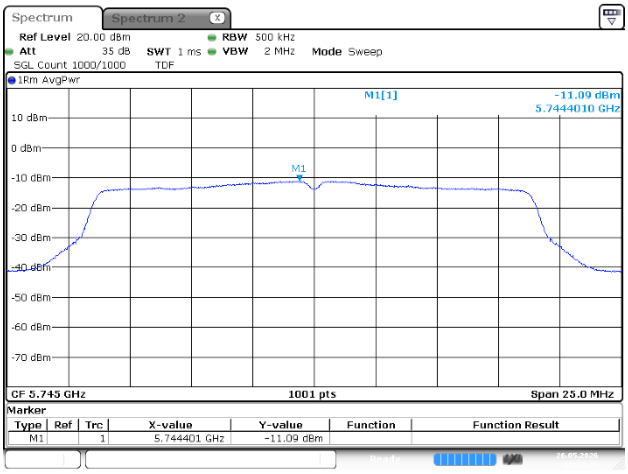
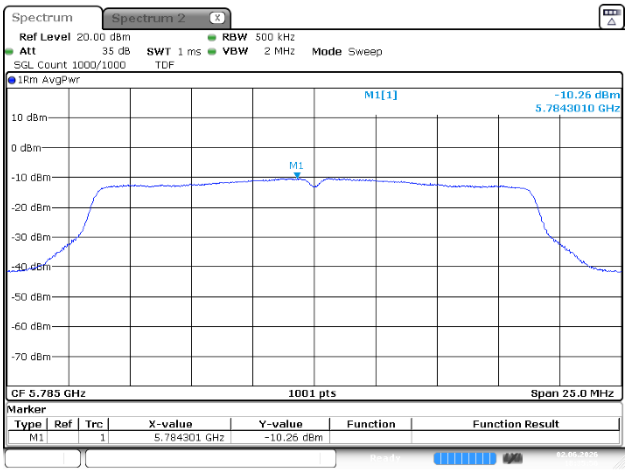
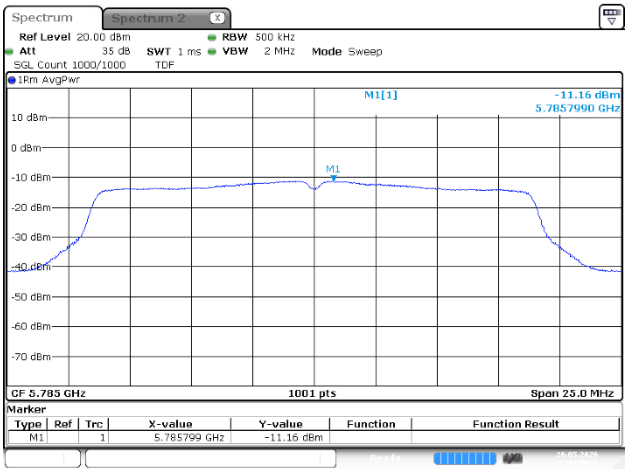
Port 1_High Channel (5 240 ㎒)



Port 2_High Channel (5 240 ㎒)



11ac_VHT20 (U-NII 3)

Port 1_Low Channel (5 745 ㎒)	Port 2_Low Channel (5 745 ㎒)
	
Port 1_Middle Channel (5 785 ㎒)	**Port 2_Middle Channel (5 785 ㎒)**
	
Port 1_High Channel (5 825 ㎒)	**Port 2_High Channel (5 825 ㎒)**