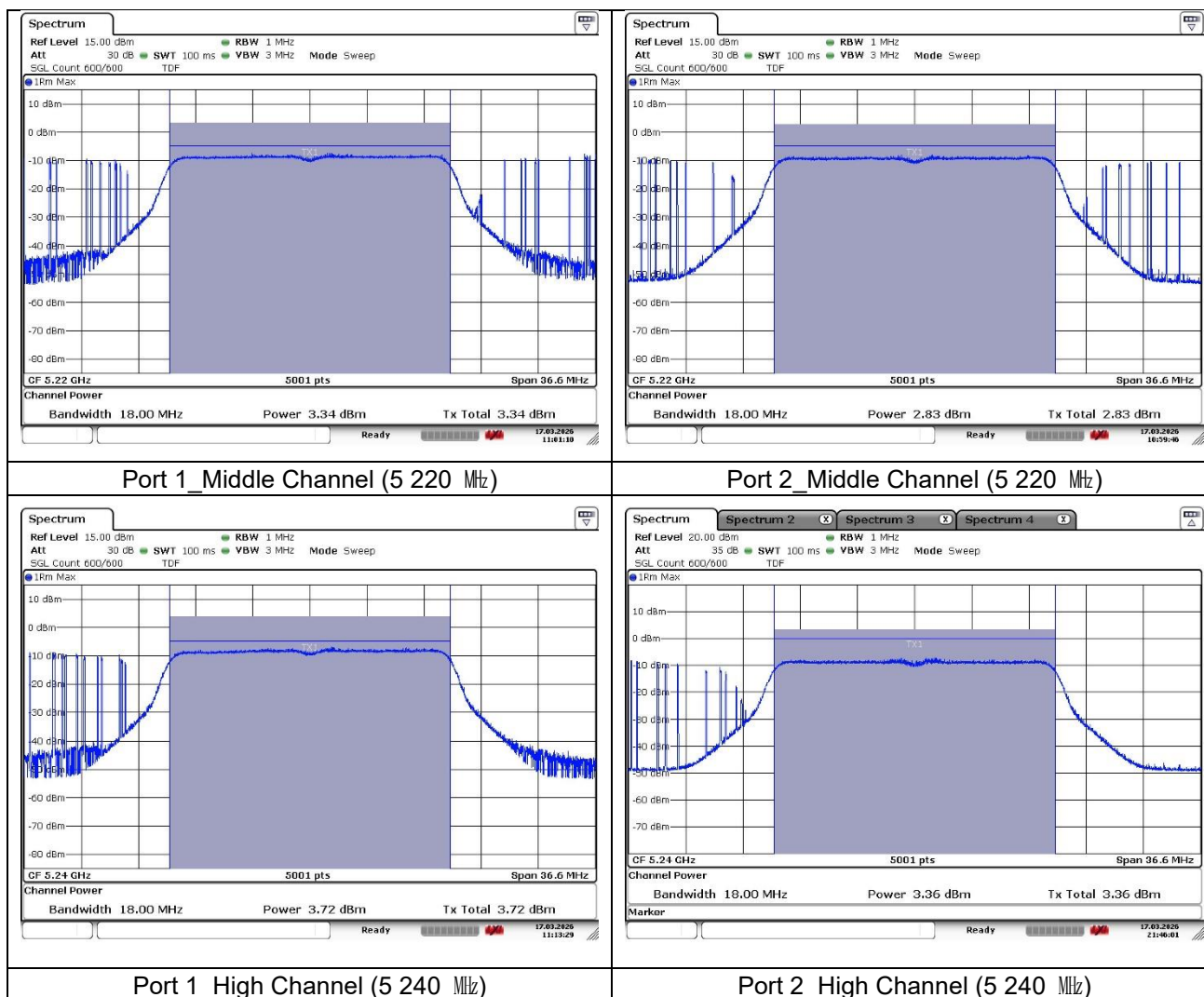
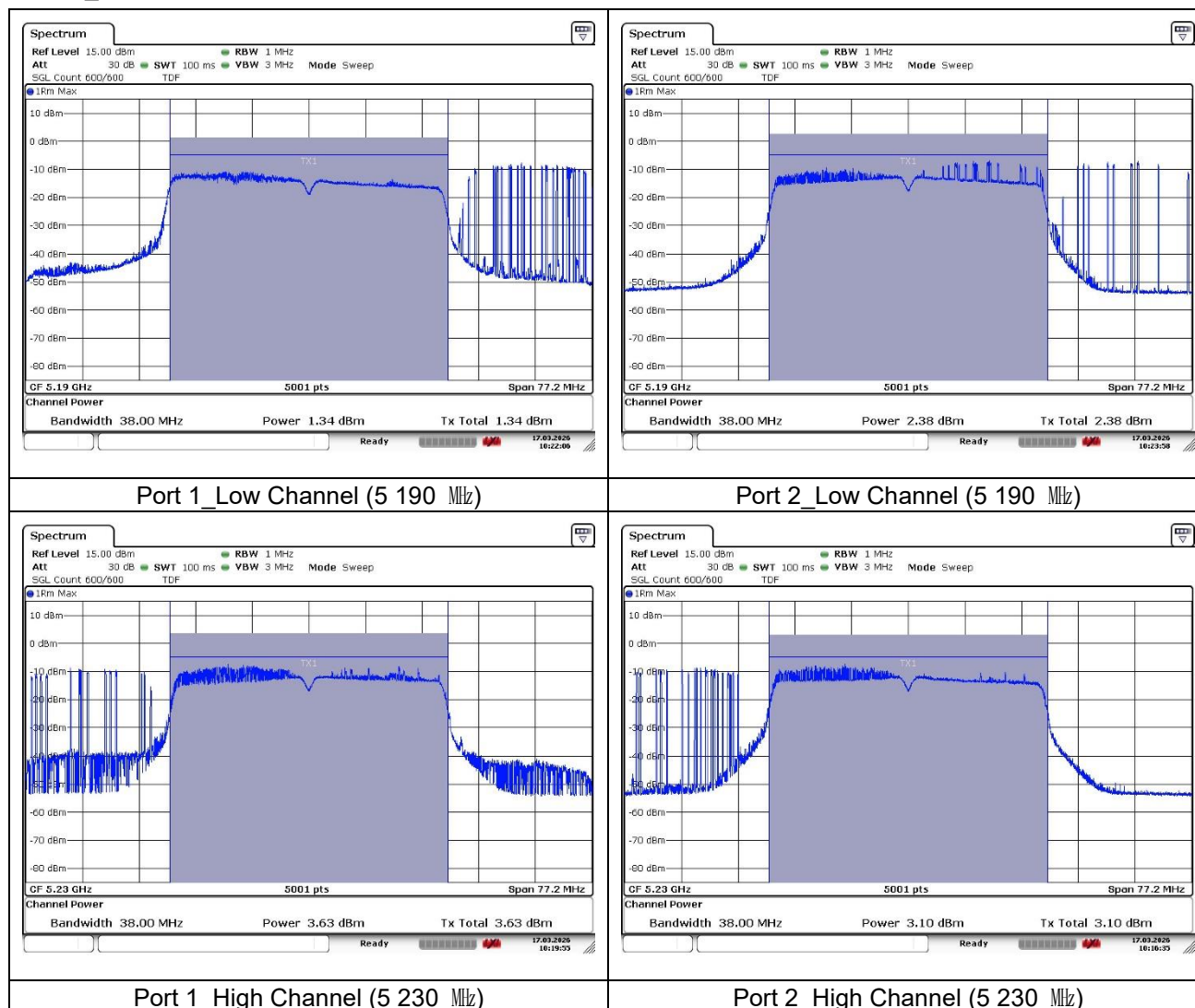
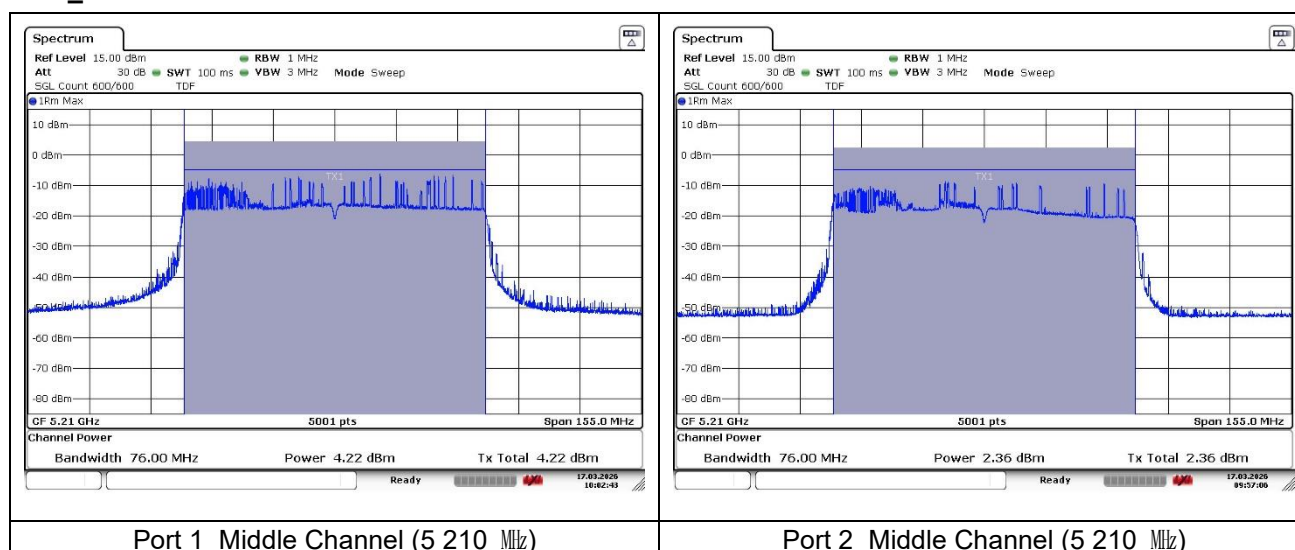




11n/ac_40 MHz

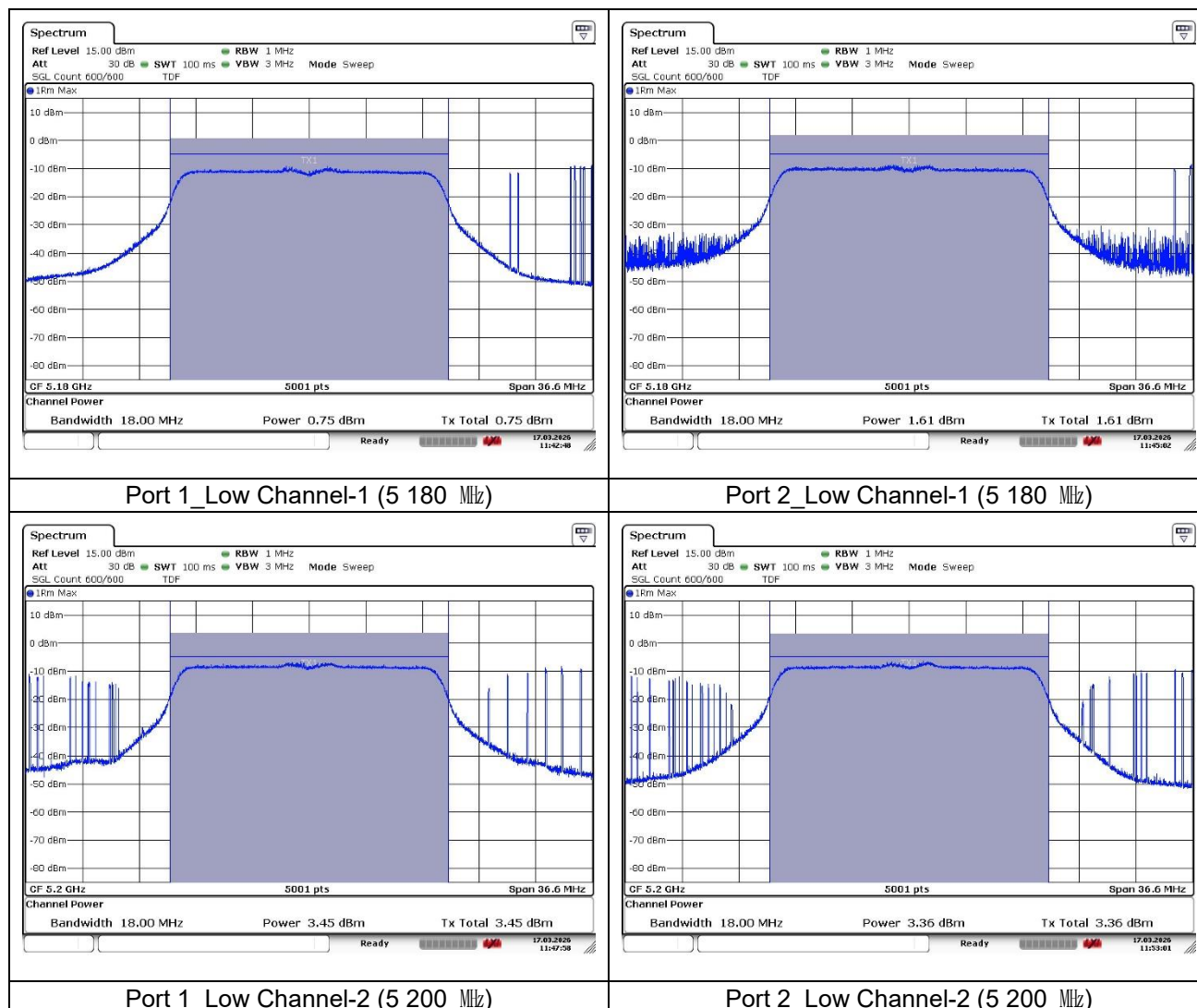


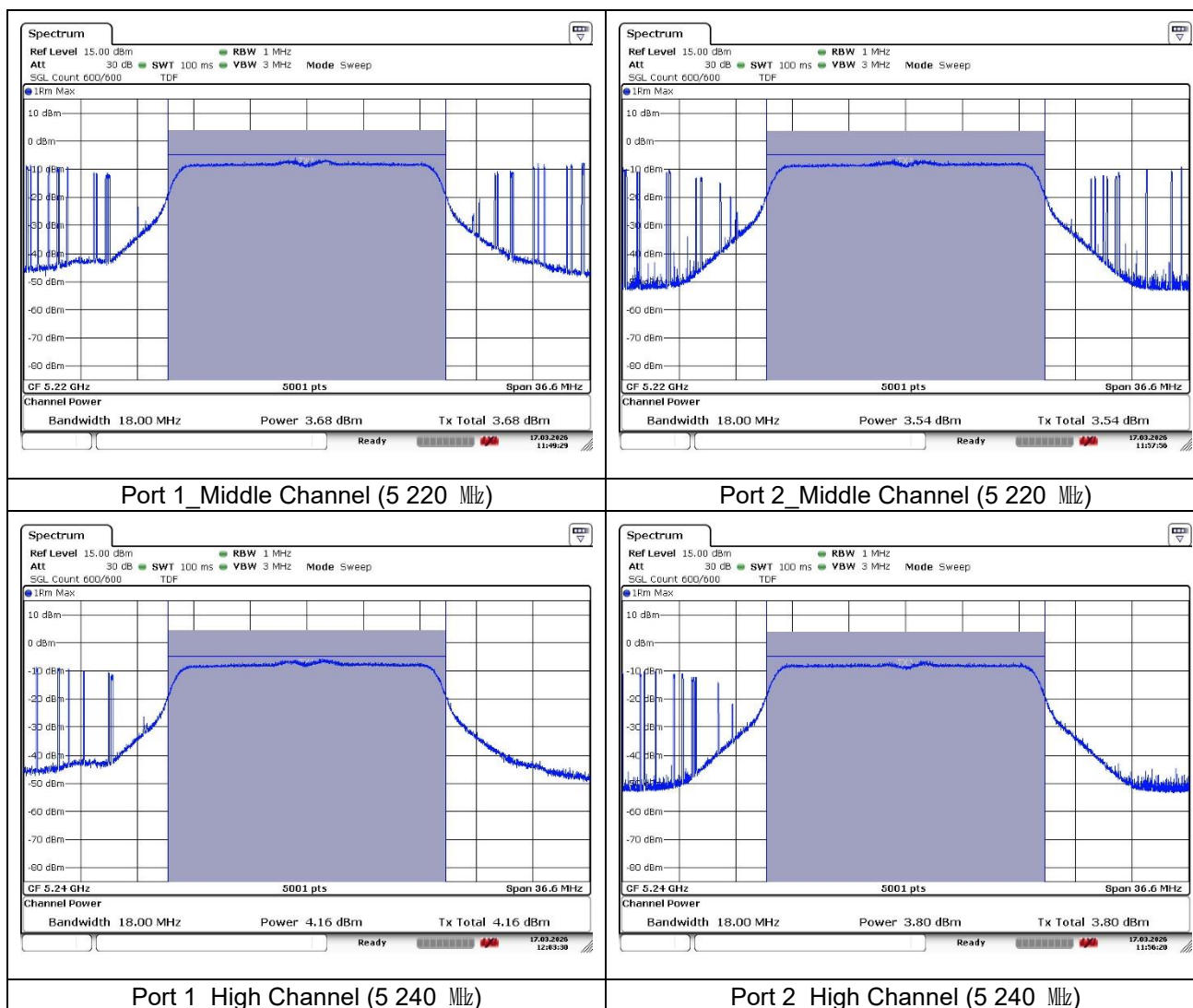
11ac_80 MHz



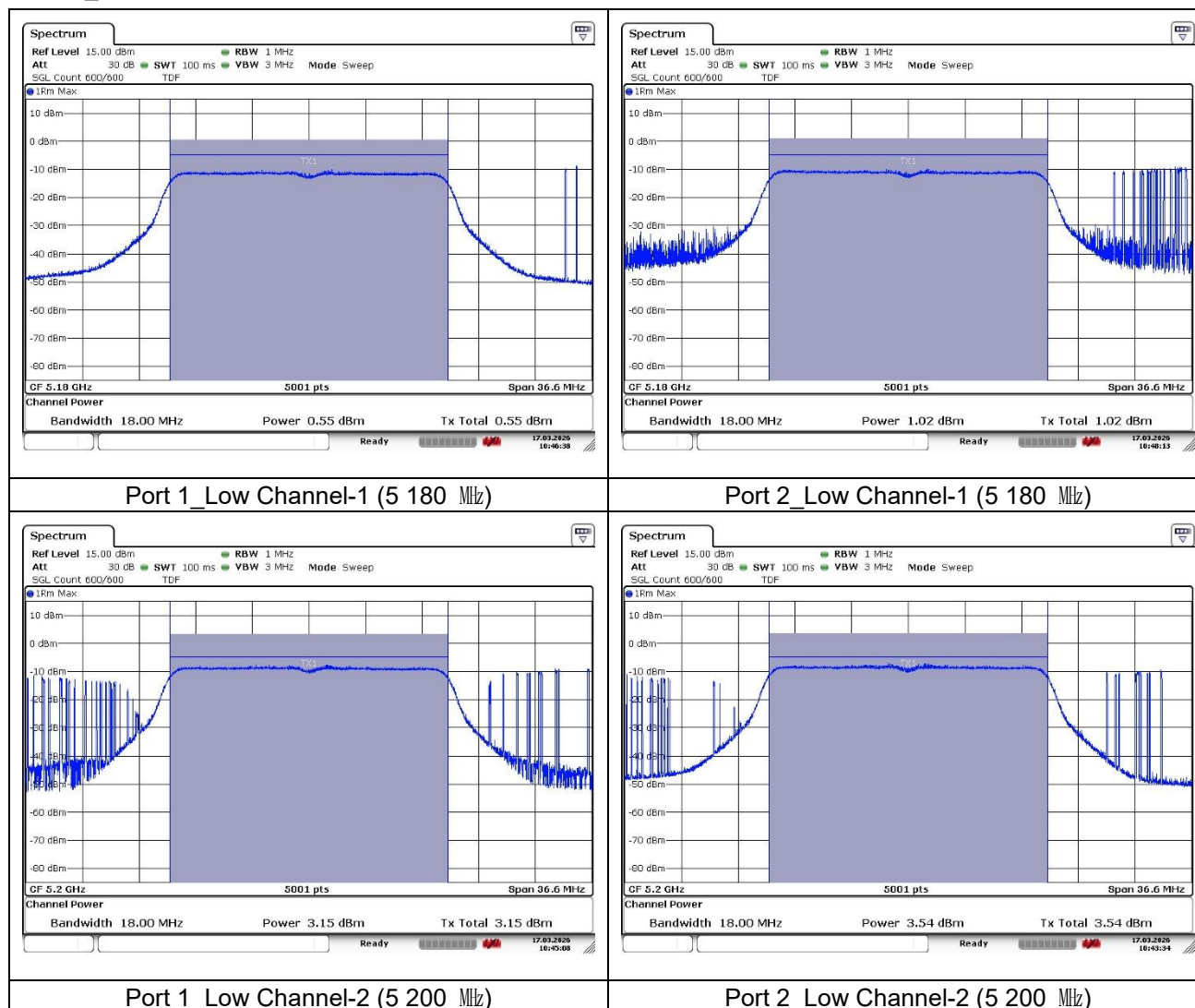
- Ant. 1 + Ant. 3

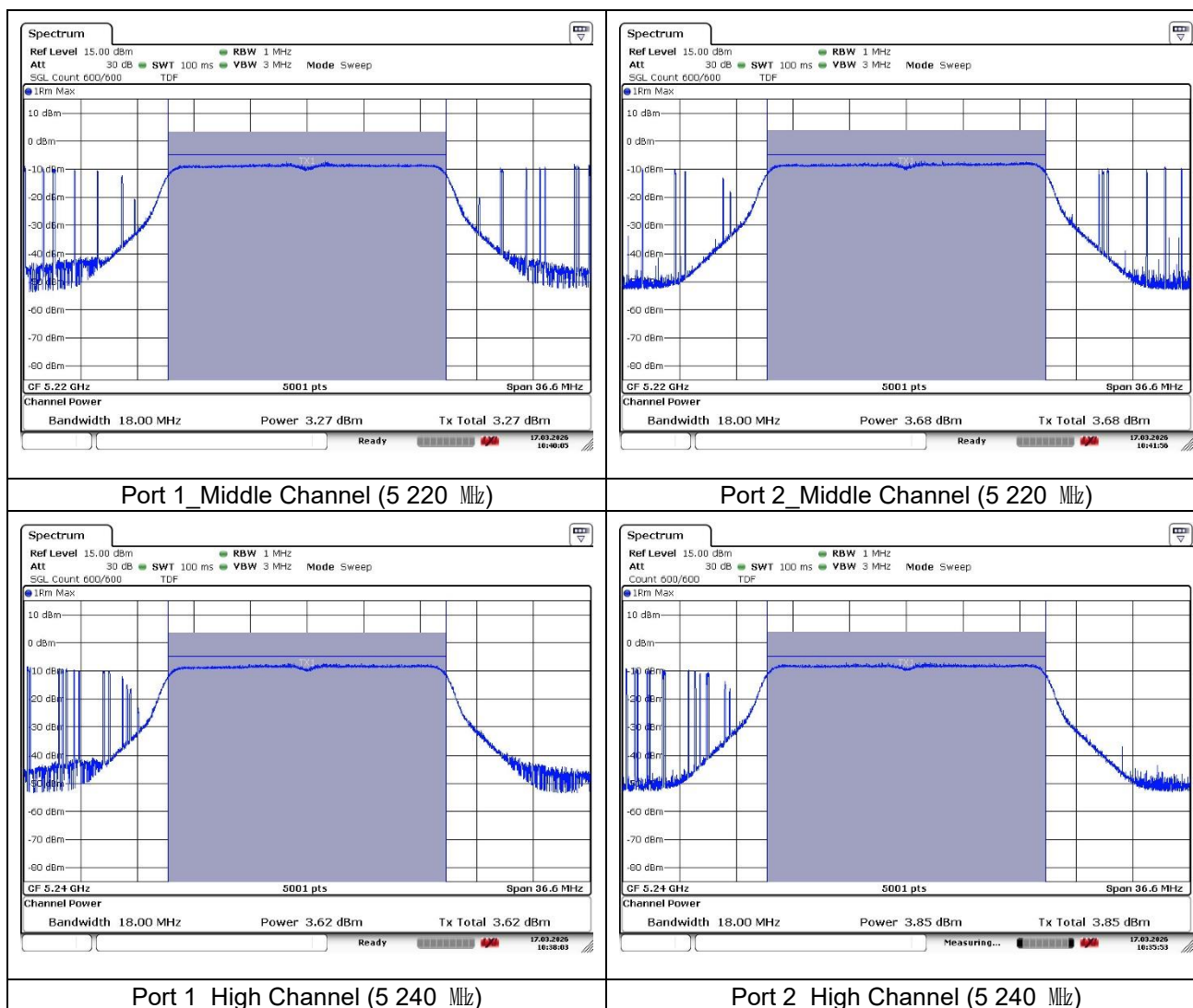
11a



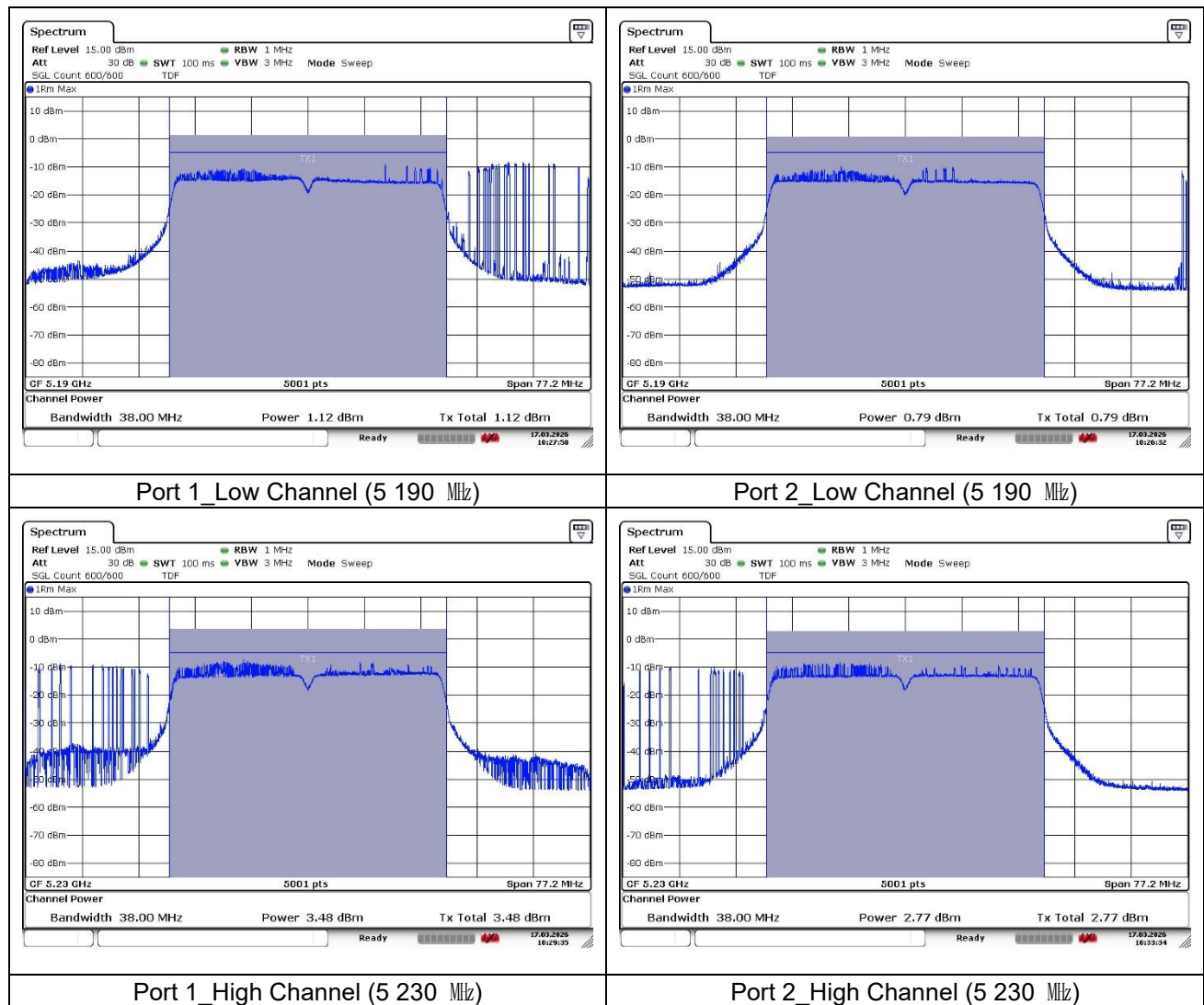


11n/ac_20 MHz

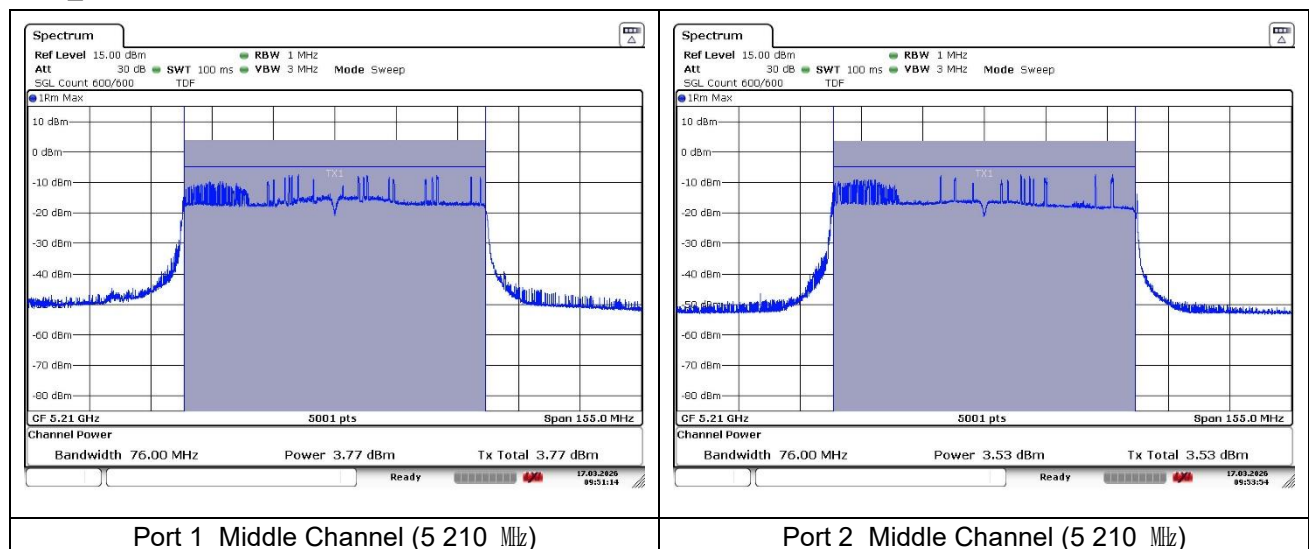




11n/ac_40 MHz

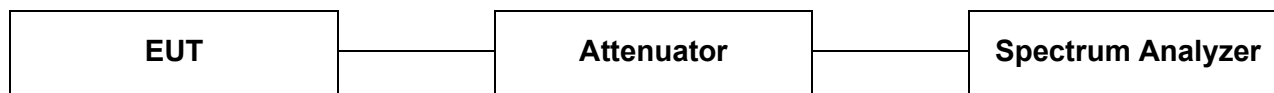


11ac_80 MHz



6. Maximum Power Spectral Density

6.1. Test Setup



6.2. Limit

6.2.1. FCC

According to 15.407(a)(1)(i)

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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

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.

According to 15.407(a)(3)

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 colocated 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 MHz

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

- c. 30 mW; or
- d. $1.76 + 10 \log_{10} B$, dB m.

OEM devices installed in vehicles with a maximum e.i.r.p. greater than 15 mW shall implement 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 all other devices the maximum e.i.r.p. spectral density shall not exceed 10 dB m/MHz. The maximum e.i.r.p. shall not exceed the lesser of:

- c. 200 mW; or
- d. $10 + 10 \log_{10} B$, dB m.

7.3.4.3 Frequency band 5 725-5 850 MHz

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 dB m/500 kHz.

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

However, FFTP devices operating in this band may employ transmitting antennas with directional gain greater than 6 dB i without any corresponding reduction in transmitter maximum conducted output power and the power spectral density. FFTP 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 FFTP 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 dB to the final result to compensate for the difference between linear averaging and power averaging.
5. The result is the Maximum PSD over 1 MHz reference bandwidth.
6. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "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 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth ($< 1 \text{ MHz}$, or $< 500 \text{ kHz}$) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
 - a) Set $\text{RBW} \geq 1/T$, where T is defined in section II.B.1.a).
 - b) Set $\text{VBW} \geq 3 \text{ RBW}$.
 - c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log(500 \text{ kHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
 - d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10 \log(1 \text{ MHz}/\text{RBW})$ to the measured result, whereas $\text{RBW} (< 1 \text{ MHz})$ 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) °C

Relative humidity : 47 %

- Ant. 1 + Ant. 2

Test mode: 11a

Band	Frequency (MHz)	Ch.	Data Rate	Port 1 Measured PSD (dB m)		Port 2 Measured PSD (dB m)		MIMO PSD (dB m)
U-NII 1	5 180	36	18 Mbps	-7.31		-6.44		-3.84
	5 200	40		-4.06		-3.37		-0.69
	5 220	44		-4.06		-3.49		-0.76
	5 240	48		-4.14		-3.47		-0.78
U-NII 3	5 745	149		-2.42		-1.04		1.33
	5 785	157		-2.34		-1.12		1.32
	5 805	161		-2.09		-1.32		1.32
Band	Frequency (MHz)	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 MHz)
U-NII 1	5 180	36	18 Mbps	-3.84	0.27	-3.57	5.00	11
	5 200	40		-0.69		-0.42		
	5 220	44		-0.76		-0.49		
	5 240	48		-0.78		-0.51		
Band	Frequency (MHz)	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 kHz)
U-NII 3	5 745	149	18 Mbps	1.33	0.27	1.60	5.54	30
	5 785	157		1.32		1.59		
	5 805	161		1.32		1.59		

Remark;

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

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

- Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i

(i) If transmit signals are correlated, then

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]

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

Test mode: 11ac_VHT20

Band	Frequency (MHz)	Ch.	Data Rate	Port 1 Measured PSD (dB m)		Port 2 Measured PSD (dB m)		MIMO PSD (dB m)	
U-NII 1	5 180	36	MCS0	-9.49		-8.50		-5.96	
	5 200	40		-6.28		-5.58		-2.91	
	5 220	44		-6.21		-5.60		-2.88	
	5 240	48		-6.26		-5.54		-2.87	
U-NII 3	5 745	149		-4.70		-3.16		-0.85	
	5 785	157		-4.42		-3.27		-0.80	
	5 805	161		-4.19		-3.31		-0.72	
Band	Frequency (MHz)	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 MHz)	
U-NII 1	5 180	36	MCS0	-5.96	1.18	-4.78	5.00	11	
	5 200	40		-2.91		-1.73			
	5 220	44		-2.88		-1.70			
	5 240	48		-2.87		-1.69			
Band	Frequency (MHz)	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 kHz)	
U-NII 3	5 745	149	MCS0	-0.85	1.18	0.33	5.54	30	
	5 785	157		-0.80		0.38			
	5 805	161		-0.72		0.46			

Remark;

- According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.
 - PSD: $10 \log \{10^{(\text{Port 1 PSD} / 10)} + 10^{(\text{Port 2 PSD} / 10)}\}$
 - Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i
 - If transmit signals are correlated, then
 Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]
- Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)

Test mode: 11ac_VHT40

Band	Frequency (MHz)	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	-12.13		-12.09		-9.10	
	5 230	46		-9.12		-9.16		-6.13	
U-NII 3	5 755	151		-6.88		-6.70		-3.78	
	5 795	159		-6.81		-6.82		-3.80	
Band	Frequency (MHz)	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 MHz)	
U-NII 1	5 190	38	MCS0	-9.10	2.16	-6.94	5.00	11	
	5 230	46		-6.13		-3.97			
Band	Frequency (MHz)	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 kHz)	
U-NII 3	5 755	151	MCS0	-3.78	2.16	-1.62	5.54	30	
	5 795	159		-3.80		-1.64			

Remark;

- According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.
 - PSD: $10 \log \{10^{(\text{Port 1 PSD} / 10)} + 10^{(\text{Port 2 PSD} / 10)}\}$
 - Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i
 - (i) If transmit signals are correlated, then
 Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]
- Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)

Test mode: 11ac_VHT80

Band	Frequency (MHz)	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	-17.02		-17.29		-14.14	
U-NII 3	5 775	155		-12.13		-12.40		-9.25	
Band	Frequency (MHz)	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 MHz)	
U-NII 1	5 210	42	MCS0	-14.14	3.51	-10.63	5.00	-14.14	
Band	Frequency (MHz)	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 kHz)	
U-NII 3	5 775	155	MCS0	-9.25	3.51	-5.74	5.54	-9.25	

Remark;

- According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.
 - PSD: $10 \log \{10^{(\text{Port 1 PSD} / 10)} + 10^{(\text{Port 2 PSD} / 10)}\}$
 - Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i
 - If transmit signals are correlated, then
 Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]
- Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)

- Ant. 1 + Ant. 3

Test mode: 11a

Band	Frequency (MHz)	Ch.	Data Rate	Port 1 Measured PSD (dB m)		Port 3 Measured PSD (dB m)		MIMO PSD (dB m)
U-NII 1	5 180	36	18 Mbps	-7.03		-7.00		-4.00
	5 200	40		-6.74		-4.08		-2.20
	5 220	44		-3.94		-4.18		-1.05
	5 240	48		-3.70		-4.51		-1.08
U-NII 3	5 745	149		-2.31		-2.24		0.74
	5 785	157		-2.07		-2.13		0.91
	5 805	161		-1.94		-2.45		0.82
Band	Frequency (MHz)	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 MHz)
U-NII 1	5 180	36	18 Mbps	-4.00	0.27	-3.73	3.80	11
	5 200	40		-2.20		-1.93		
	5 220	44		-1.05		-0.78		
	5 240	48		-1.08		-0.81		
Band	Frequency (MHz)	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 kHz)
U-NII 3	5 745	149	18 Mbps	0.74	0.27	1.01	3.38	30
	5 785	157		0.91		1.18		
	5 805	161		0.82		1.09		

Remark;

- According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.
 - PSD: $10 \log \{10^{(\text{Port 1 PSD} / 10)} + 10^{(\text{Port 3 PSD} / 10)}\}$
 - Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i
 - If transmit signals are correlated, then
 Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]
- Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)
- PSD limit is reduced in accordance with Part 15.407 and RSS-247 Issue 4 due to directional gain exceeding 6 dB i.

Test mode: 11ac_VHT20

Band	Frequency (MHz)	Ch.	Data Rate	Port 1 Measured PSD (dB m)	Port 3 Measured PSD (dB m)	MIMO PSD (dB m)		
U-NII 1	5 180	36	MCS0	-9.14	-9.25	-6.18		
	5 200	40		-6.02	-6.24	-3.12		
	5 220	44		-5.97	-6.36	-3.15		
	5 240	48		-6.00	-6.68	-3.32		
U-NII 3	5 745	149		-4.56	-4.26	-1.40		
	5 785	157		-4.24	-4.22	-1.22		
	5 805	161		-3.91	-4.40	-1.14		
Band	Frequency (MHz)	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 MHz)
U-NII 1	5 180	36	MCS0	-6.18	1.18	-5.00	3.80	11
	5 200	40		-3.12		-1.94		
	5 220	44		-3.15		-1.97		
	5 240	48		-3.32		-2.14		
Band	Frequency (MHz)	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 kHz)
U-NII 3	5 745	149	MCS0	-1.40	1.18	-0.22	3.38	30
	5 785	157		-1.22		-0.04		
	5 805	161		-1.14		0.04		

Remark;

- According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.
 - PSD: $10 \log \{10^{(\text{Port 1 PSD} / 10)} + 10^{(\text{Port 3 PSD} / 10)}\}$
 - Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i
 - If transmit signals are correlated, then
 Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]
- Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)

Test mode: 11ac_VHT40

Band	Frequency (MHz)	Ch.	Data Rate	Port 1 Measured PSD (dB m)		Port 3 Measured PSD (dB m)		MIMO PSD (dB m)	
U-NII 1	5 190	38	MCS0	-12.78		-12.91		-9.83	
	5 230	46		-9.85		-10.04		-6.93	
U-NII 3	5 755	151		-8.21		-7.92		-5.05	
	5 795	159		-7.83		-7.82		-4.81	
Band	Frequency (MHz)	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 MHz)	
U-NII 1	5 190	38	MCS0	-9.83	2.16	-7.67	3.80	11	
	5 230	46		-6.93		-4.77			
Band	Frequency (MHz)	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 kHz)	
U-NII 3	5 755	151	MCS0	-5.05	2.16	-2.89	3.38	30	
	5 795	159		-4.81		-2.65			

Remark;

- According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.
 - PSD: $10 \log \{10^{(\text{Port 1 PSD} / 10)} + 10^{(\text{Port 3 PSD} / 10)}\}$
 - Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i
 (i) If transmit signals are correlated, then
 Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]
- Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)

Test mode: 11ac_VHT80

Band	Frequency (MHz)	Ch.	Data Rate	Port 1 Measured PSD (dB m)		Port 3 Measured PSD (dB m)		MIMO PSD (dB m)	
U-NII 1	5 210	42	MCS0	-17.06		-17.66		-14.34	
U-NII 3	5 775	155		-13.71		-13.28		-10.48	
Band	Frequency (MHz)	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 MHz)	
U-NII 1	5 210	42	MCS0	-14.34	3.51	-10.83	3.80	11	
Band	Frequency (MHz)	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 kHz)	
U-NII 3	5 775	155	MCS0	-10.48	3.51	-6.97	3.38	30	

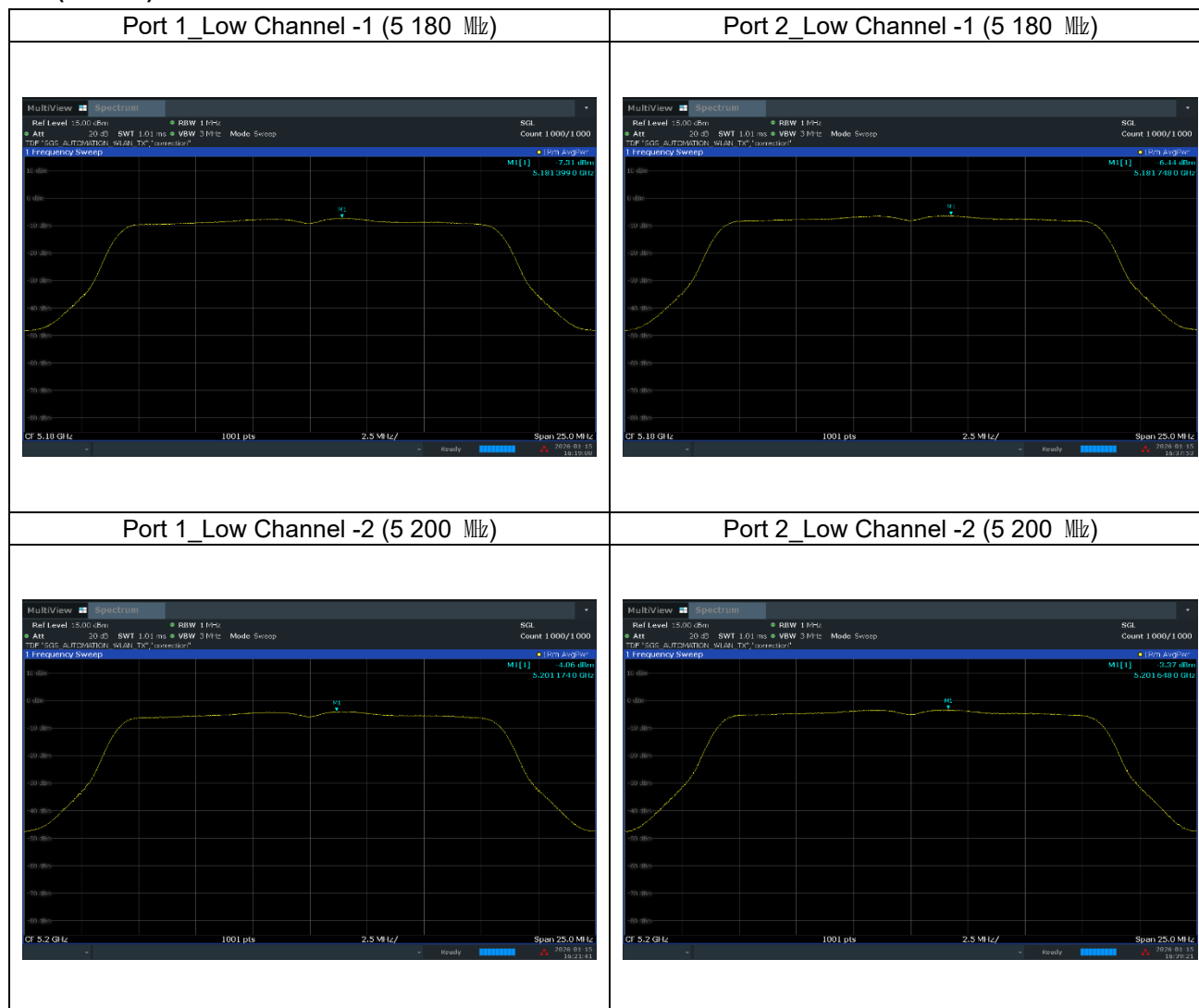
Remark;

- According to KDB 662911, power spectral density of each port and antenna gain was combined by using below calculation.
 - PSD: $10 \log \{10^{(\text{Port 1 PSD} / 10)} + 10^{(\text{Port 3 PSD} / 10)}\}$
 - Unequal antenna gains, with equal transmit powers. For antenna gains given by $G_1, G_2, \dots, G_N$ dB i
 - If transmit signals are correlated, then
 Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{\text{ANT}}]$ 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.]
- Final PSD (dB m) = PSD (dB m) + Duty Cycle Correction Factor (dB)

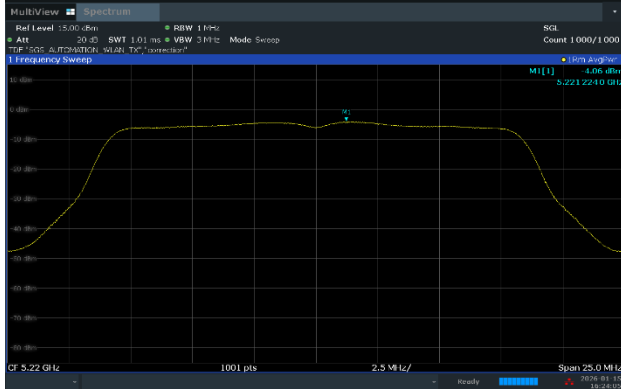
Test plots

- Ant. 1 + Ant. 2

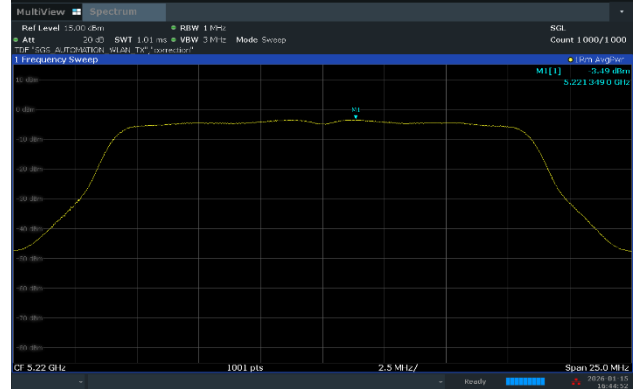
11a (Band 1)



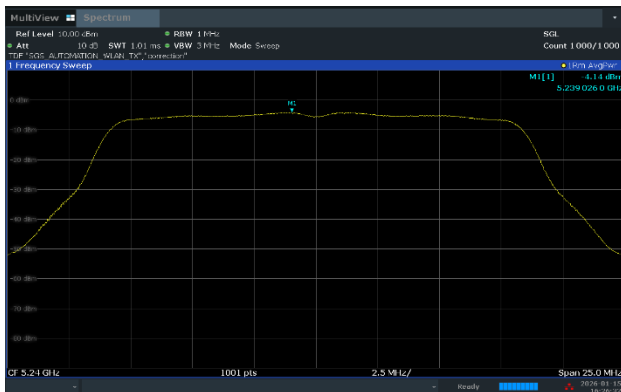
Port 1_Middle Channel (5 220 MHz)



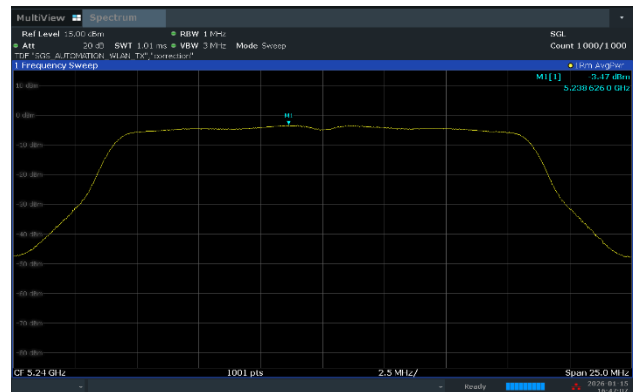
Port 2_Middle Channel (5 220 MHz)



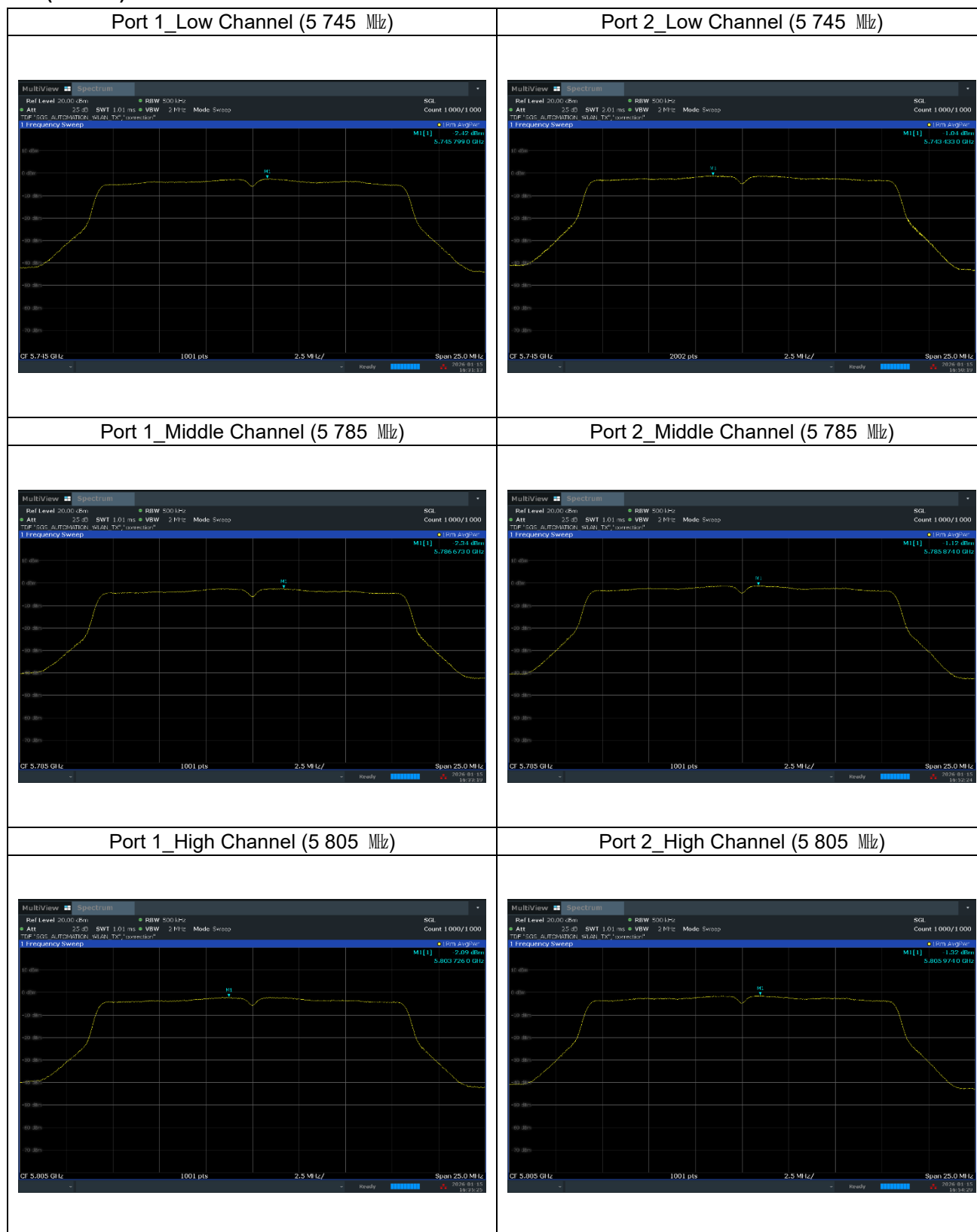
Port 1_High Channel (5 240 MHz)



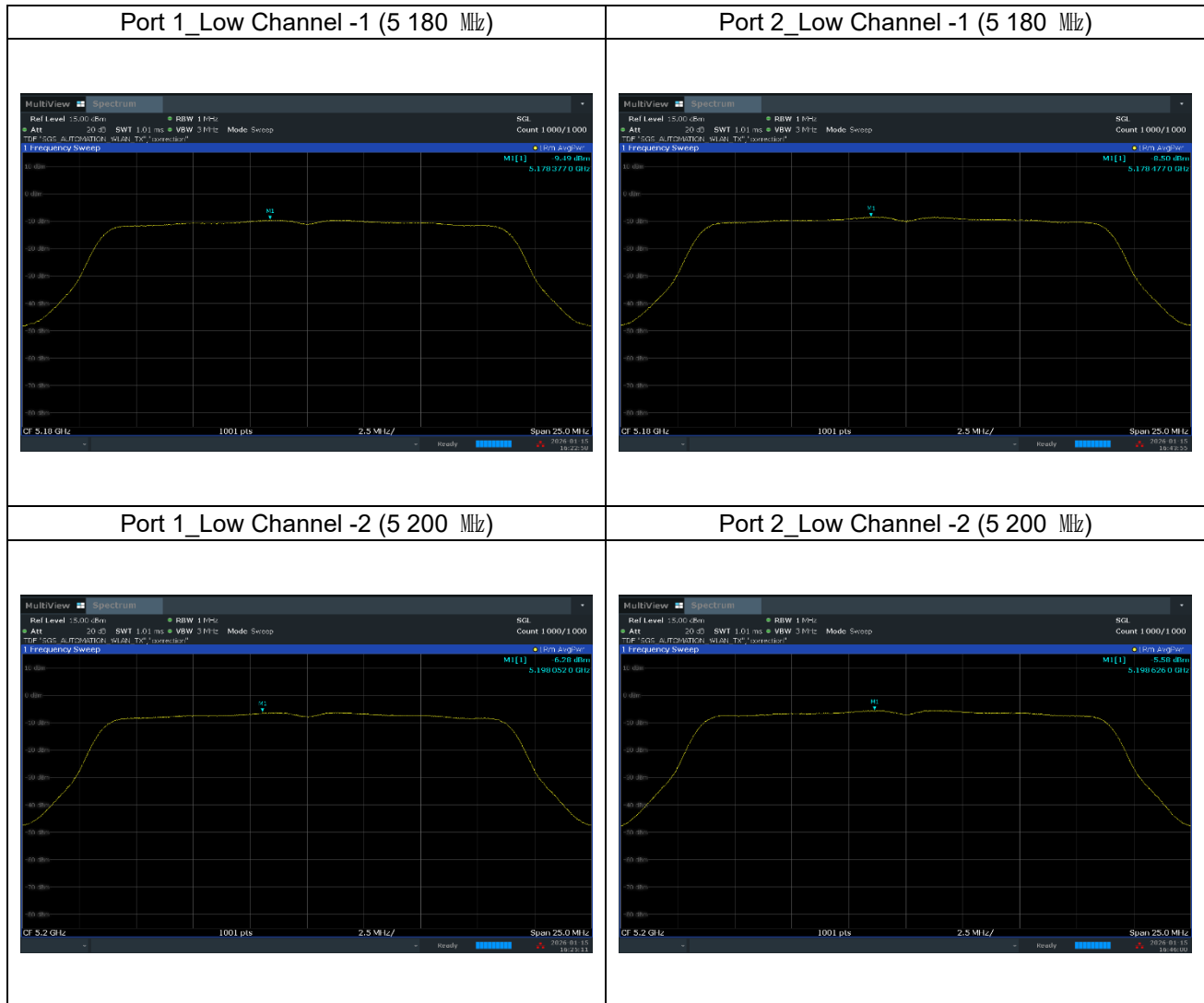
Port 2_High Channel (5 240 MHz)



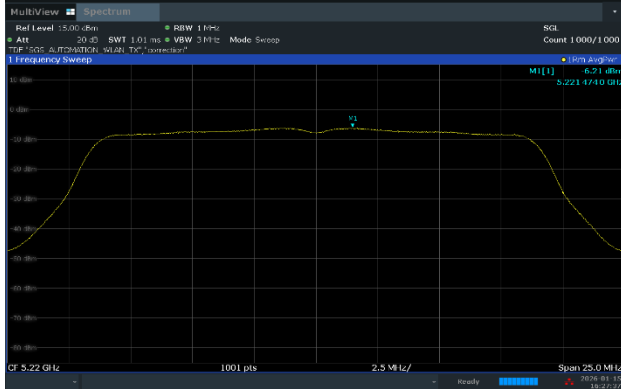
11a (Band 3)



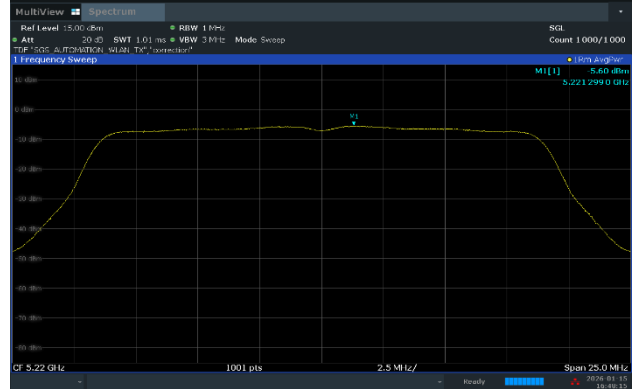
11ac_VHT20 (Band 1)



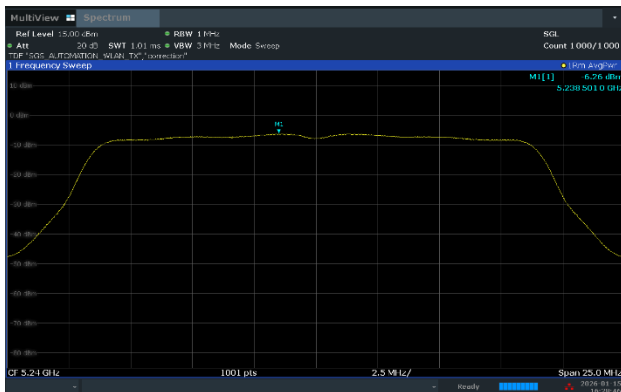
Port 1_Middle Channel (5 220 MHz)



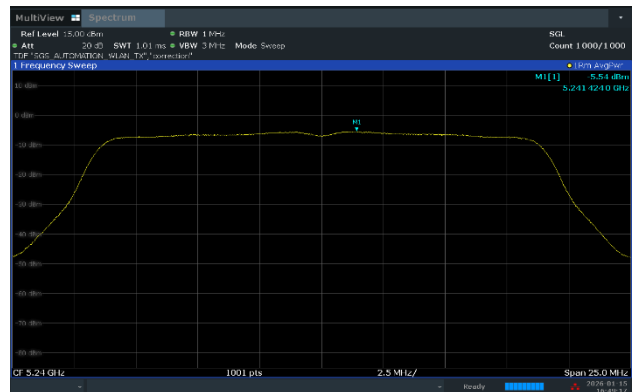
Port 2_Middle Channel (5 220 MHz)



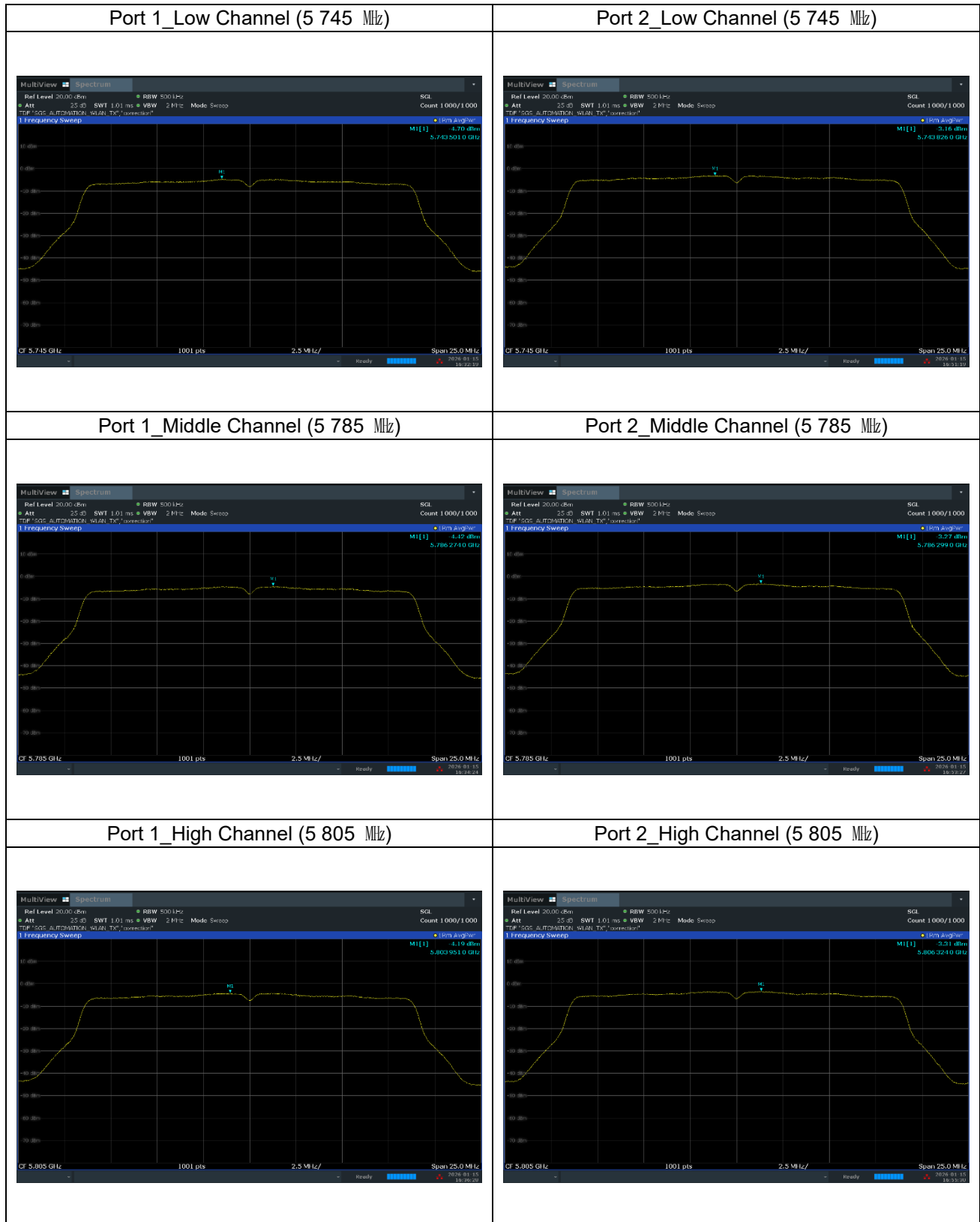
Port 1_High Channel (5 240 MHz)



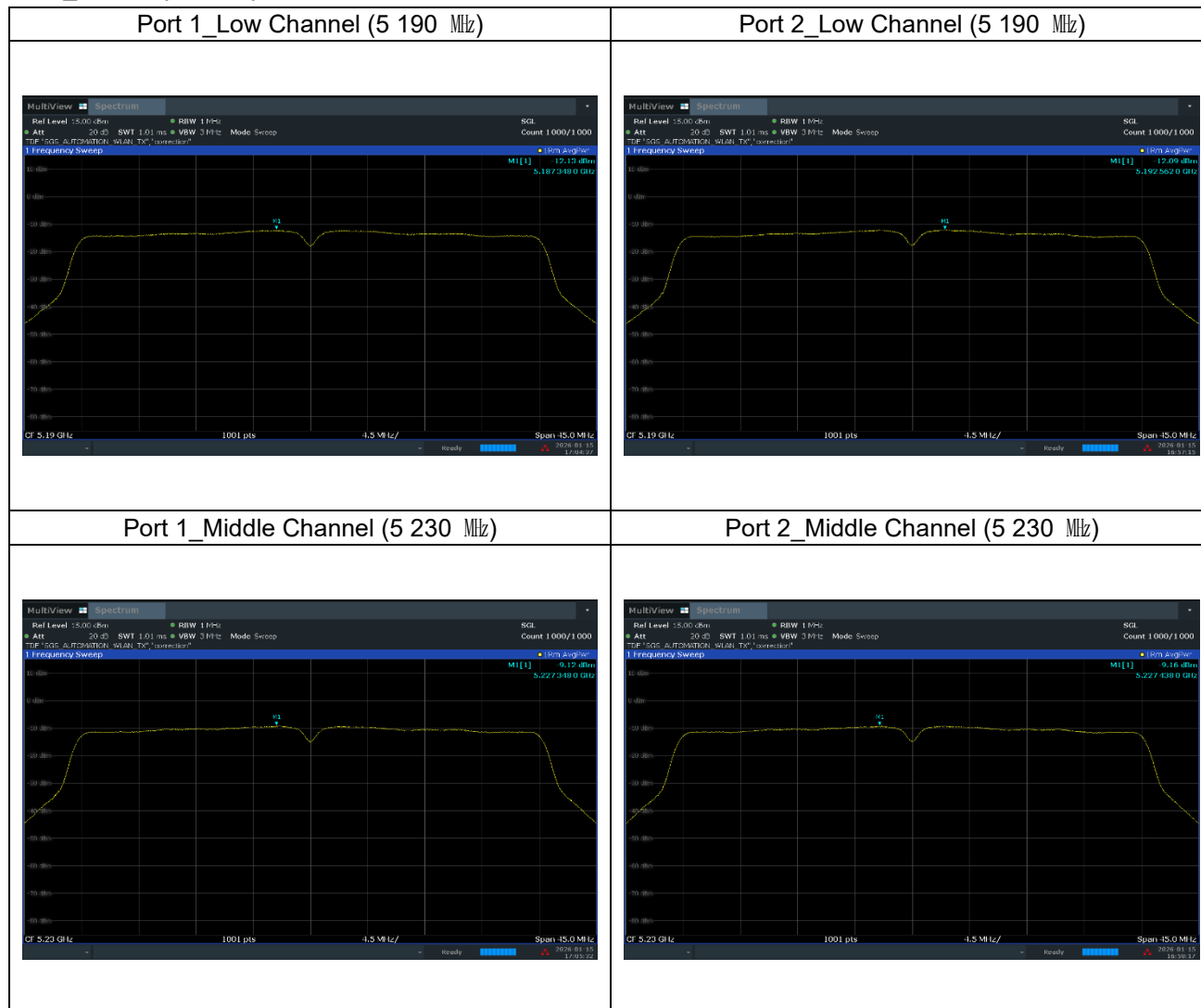
Port 2_High Channel (5 240 MHz)



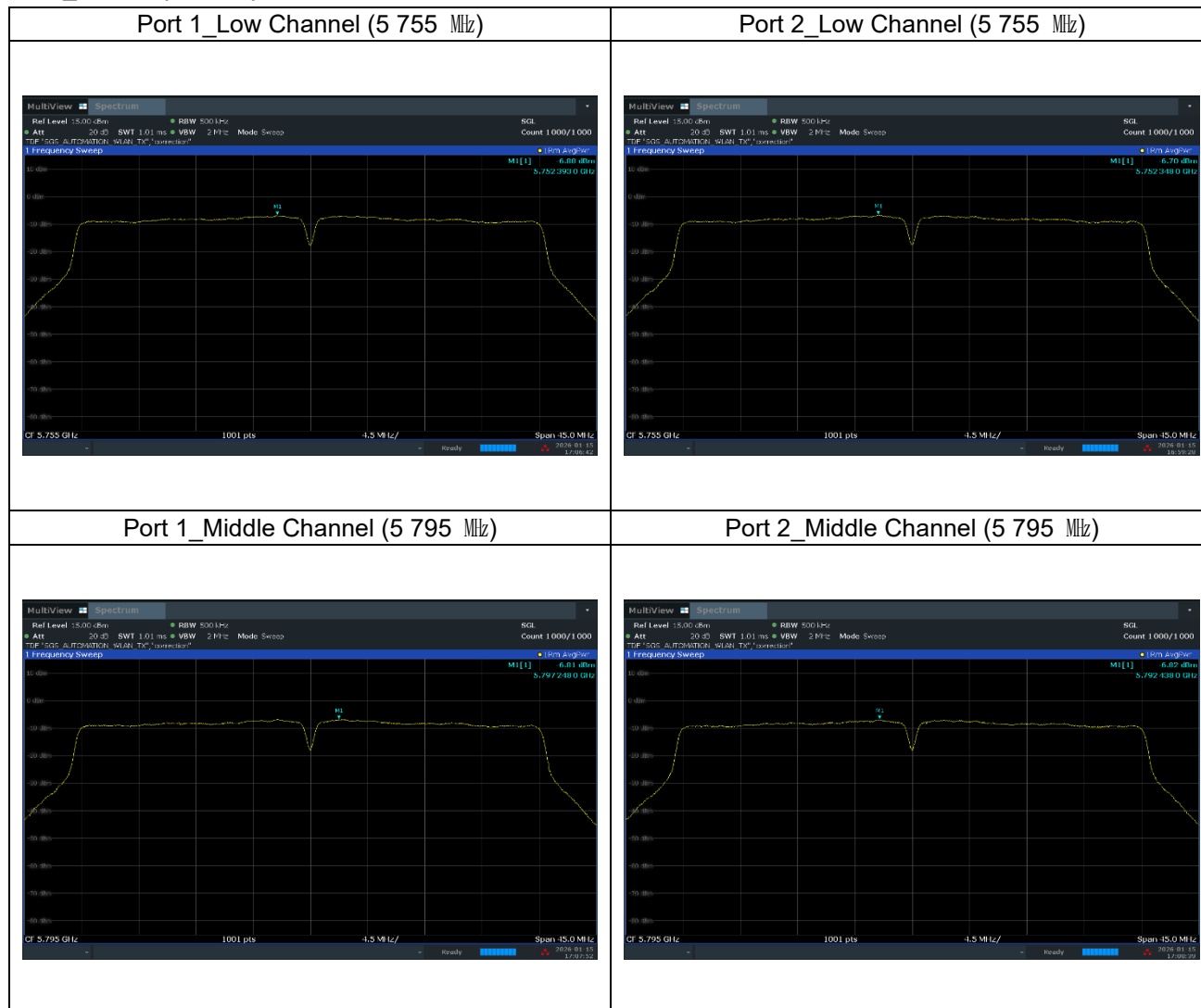
11ac_VHT20 (Band 3)



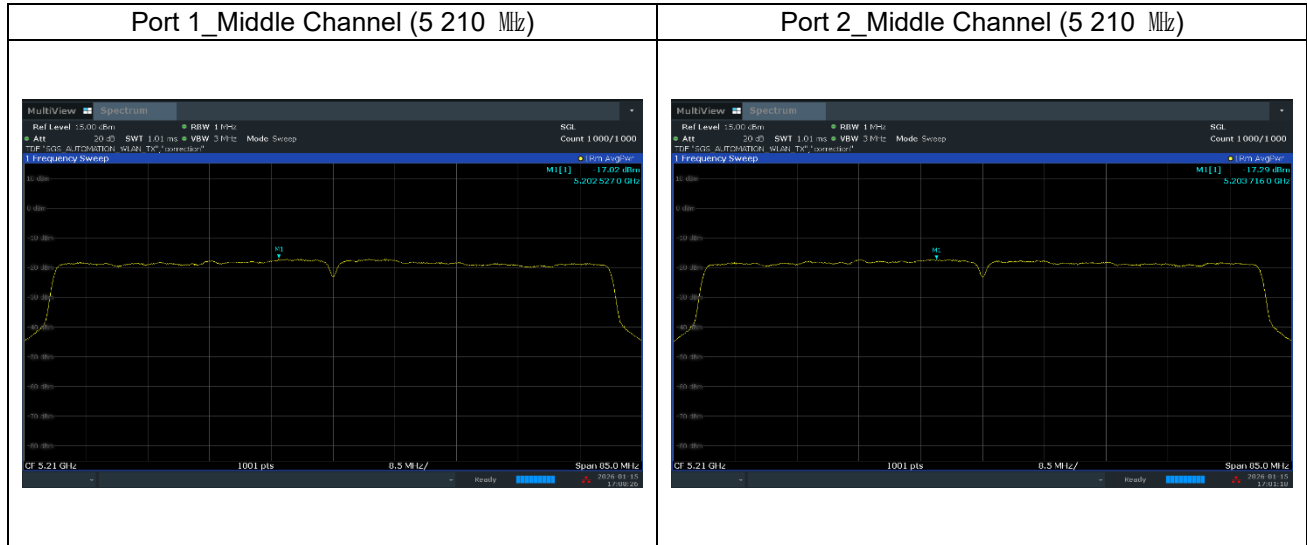
11av_VHT40 (Band 1)



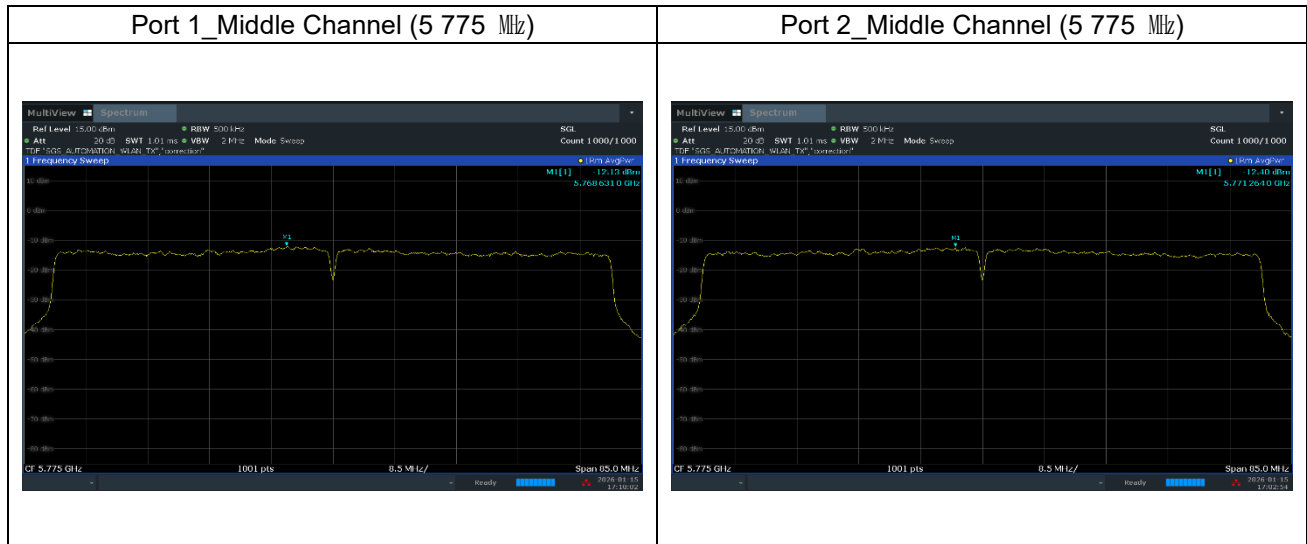
11ac_VHT40 (Band 3)



11ac_VHT80 (Band 1)

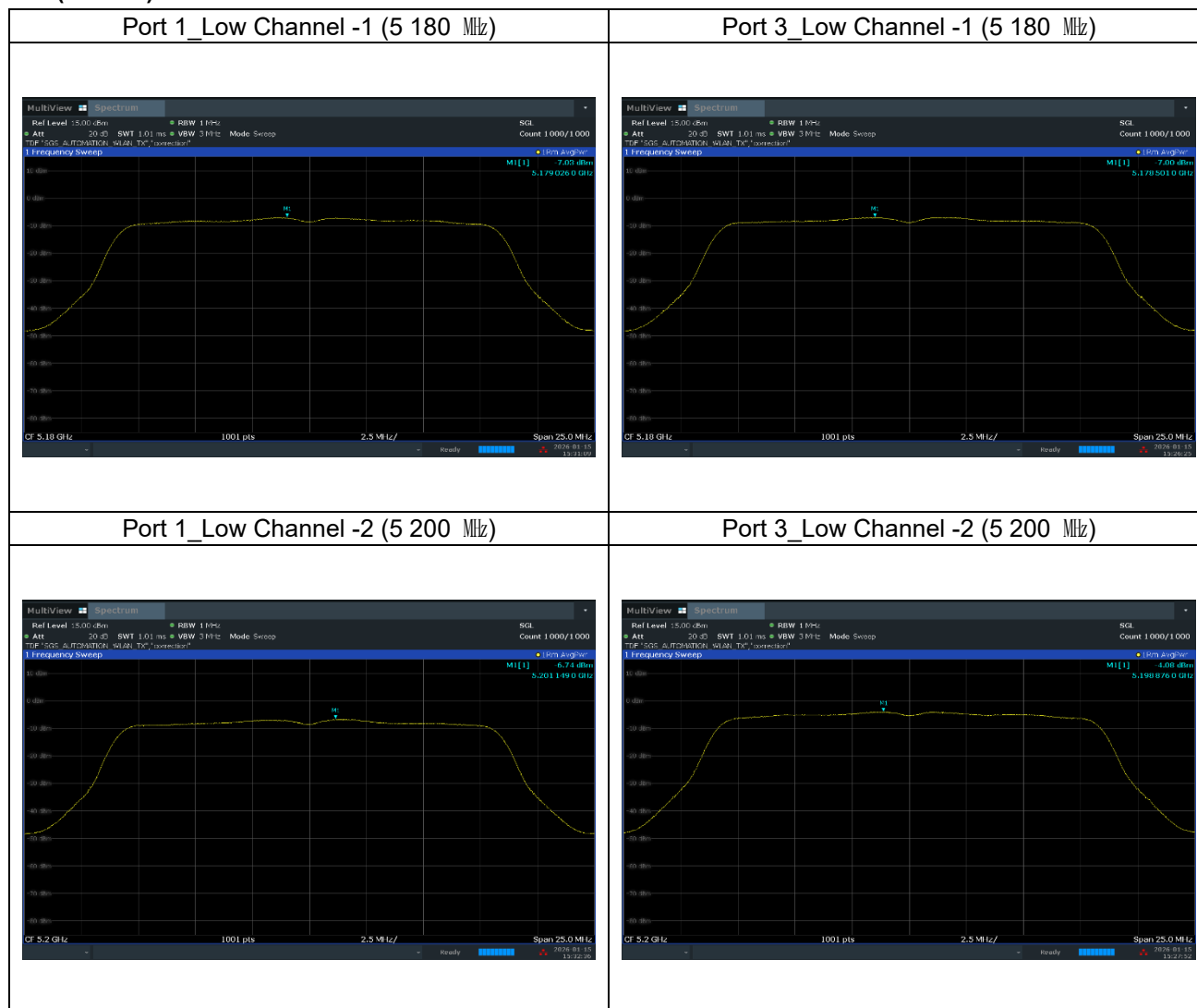


11ac_VHT80 (Band 3)

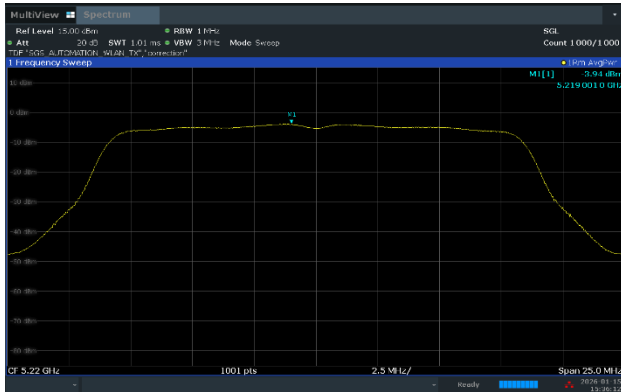


- Ant. 1 + Ant. 3

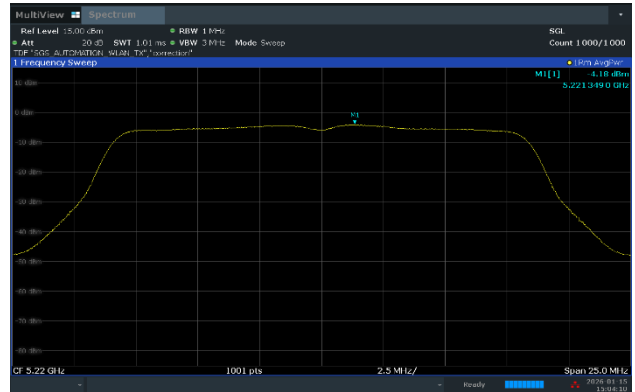
11a (Band 1)



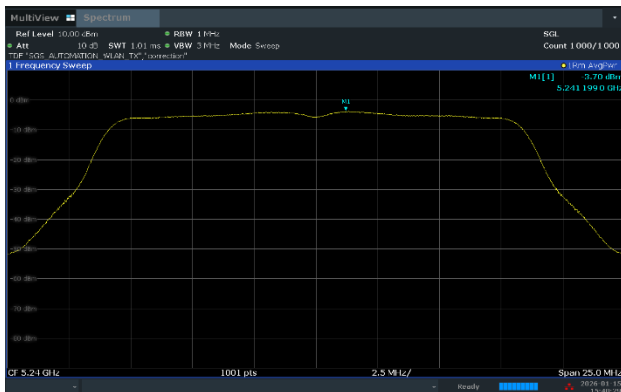
Port 1_Middle Channel (5 220 MHz)



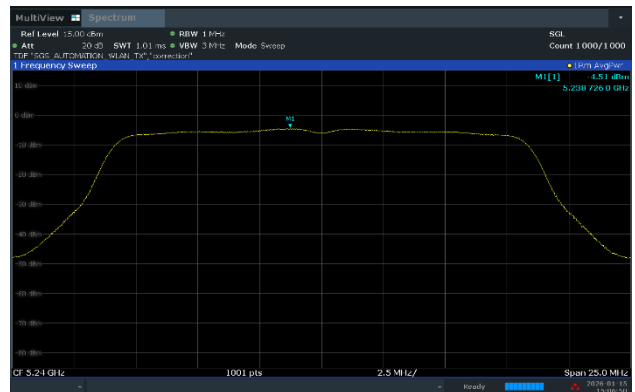
Port 3_Middle Channel (5 220 MHz)



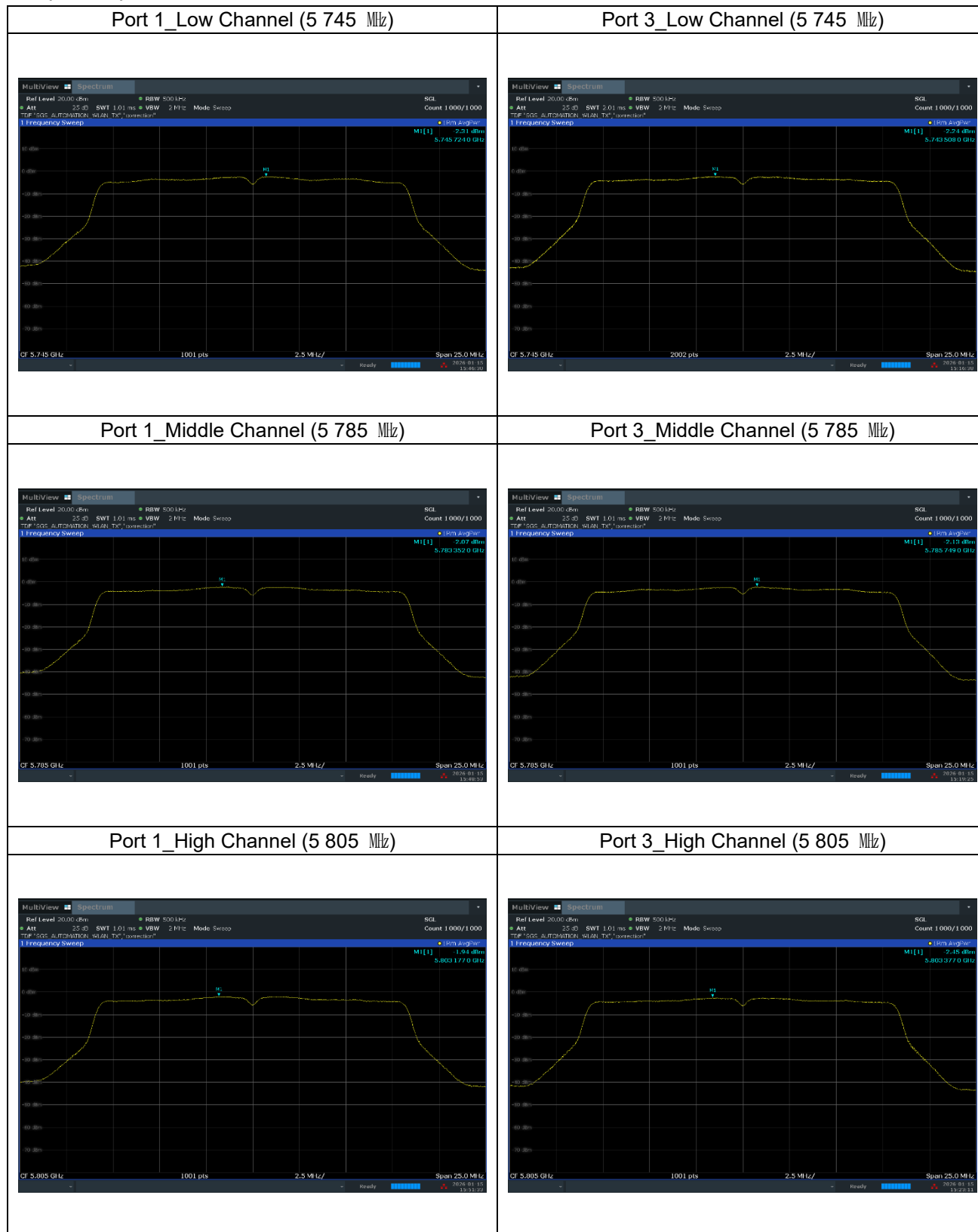
Port 1_High Channel (5 240 MHz)



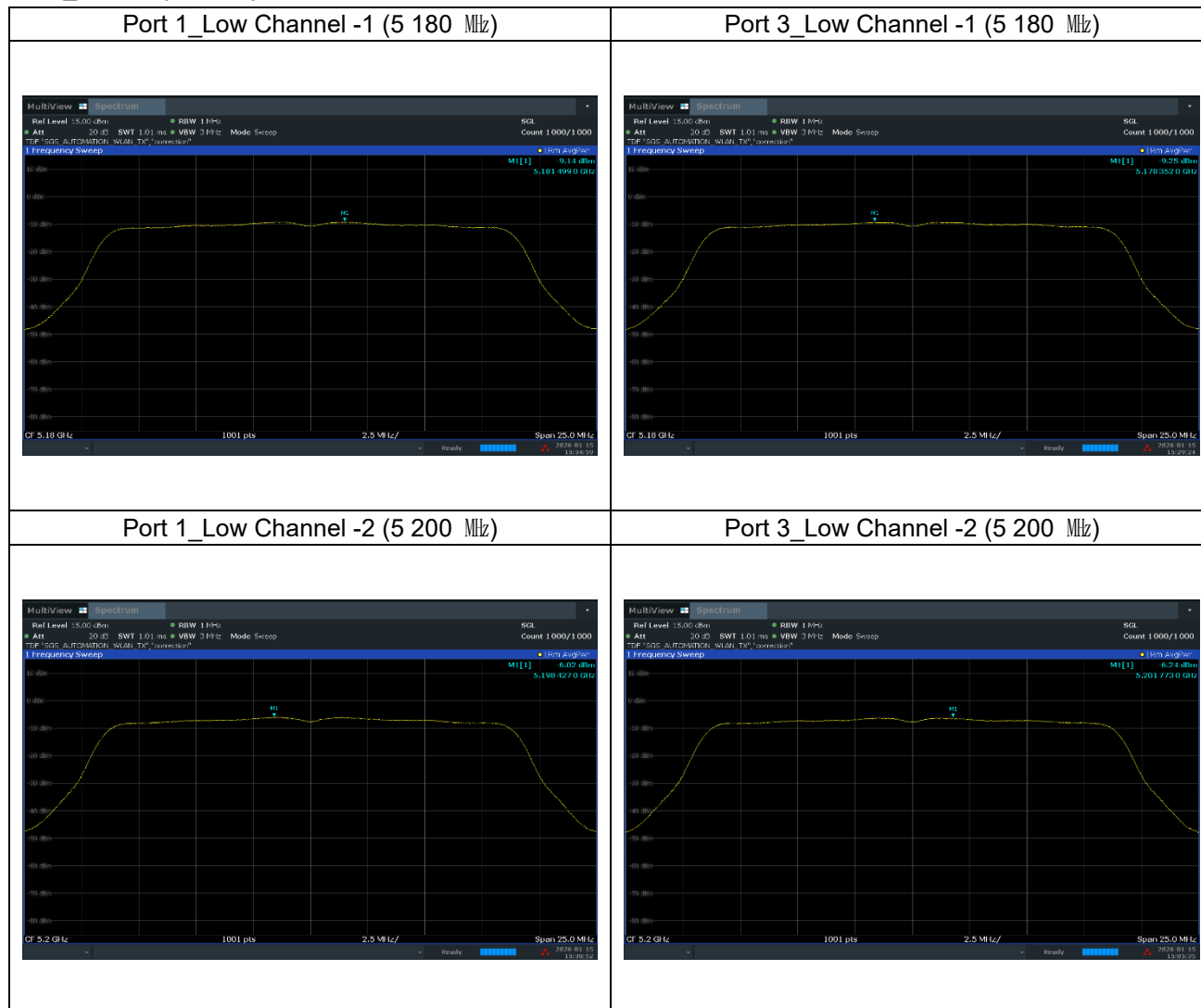
Port 3_High Channel (5 240 MHz)



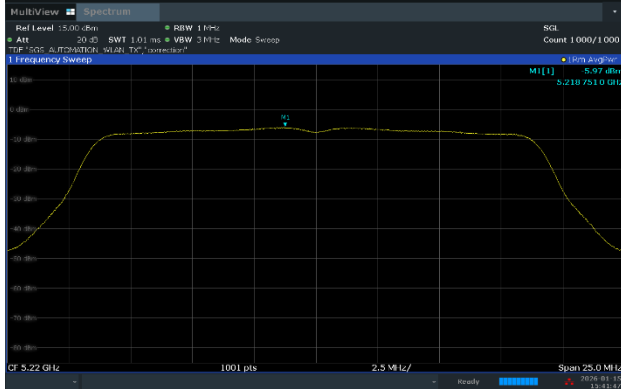
11a (Band 3)



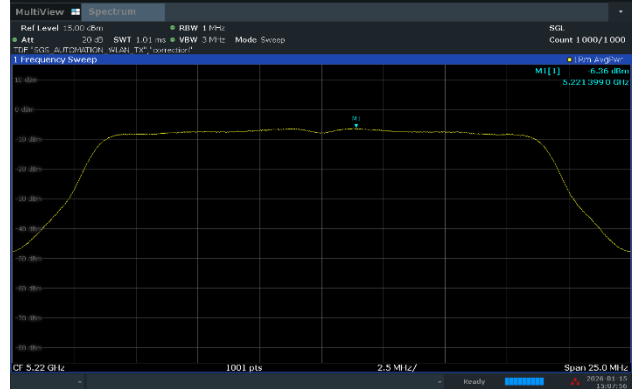
11ac_VHT20 (Band 1)



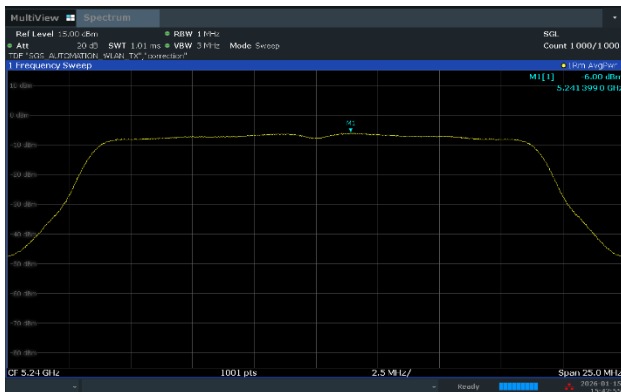
Port 1_Middle Channel (5 220 MHz)



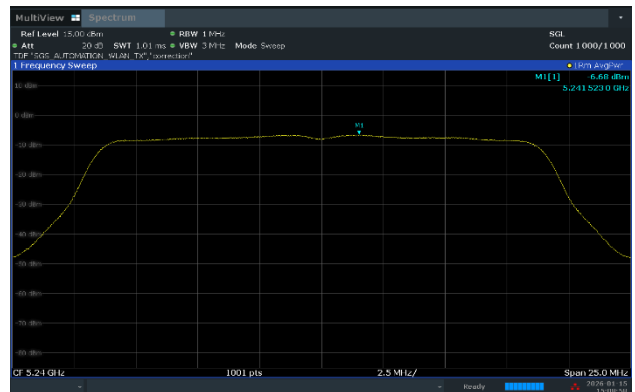
Port 3_Middle Channel (5 220 MHz)



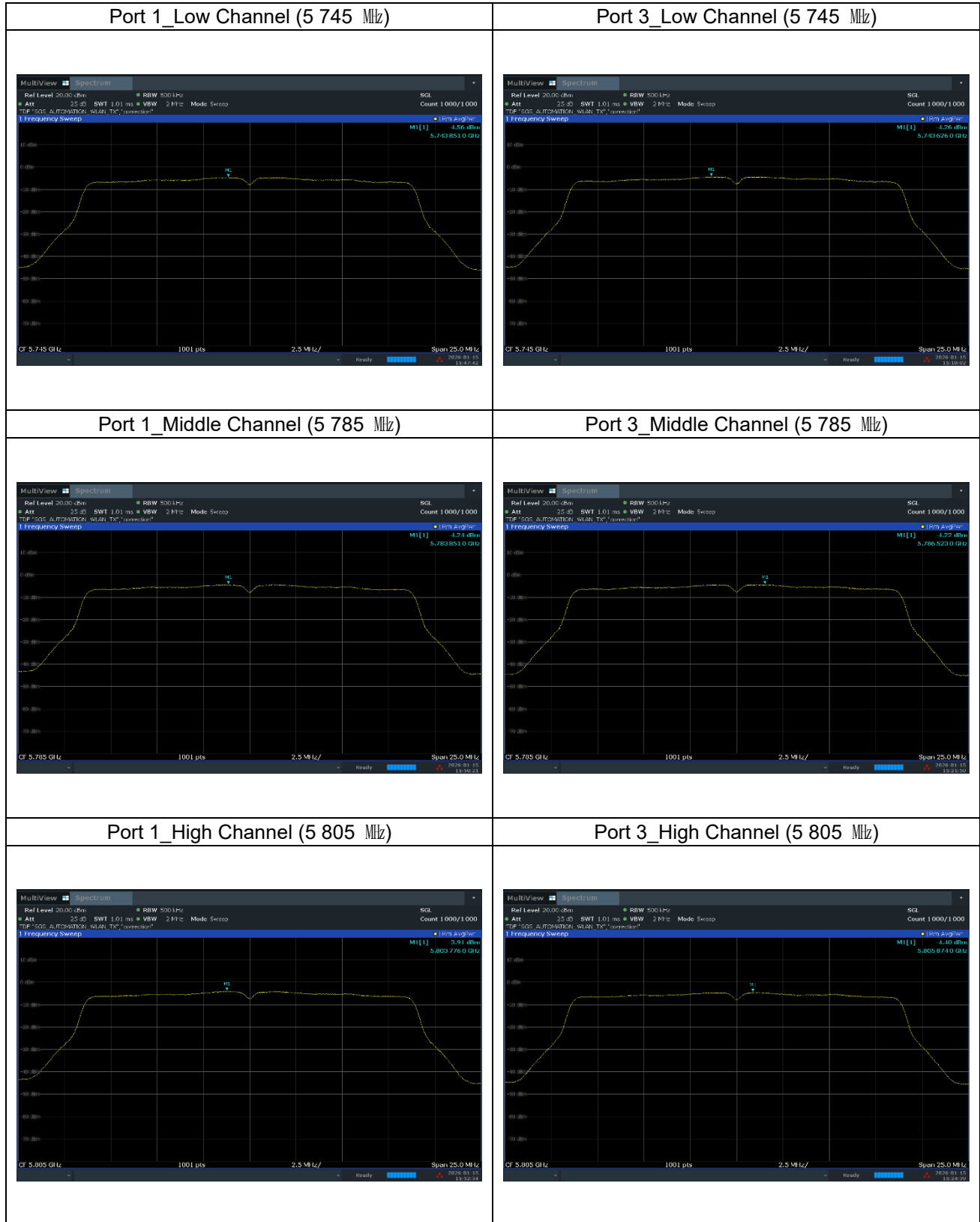
Port 1_High Channel (5 240 MHz)



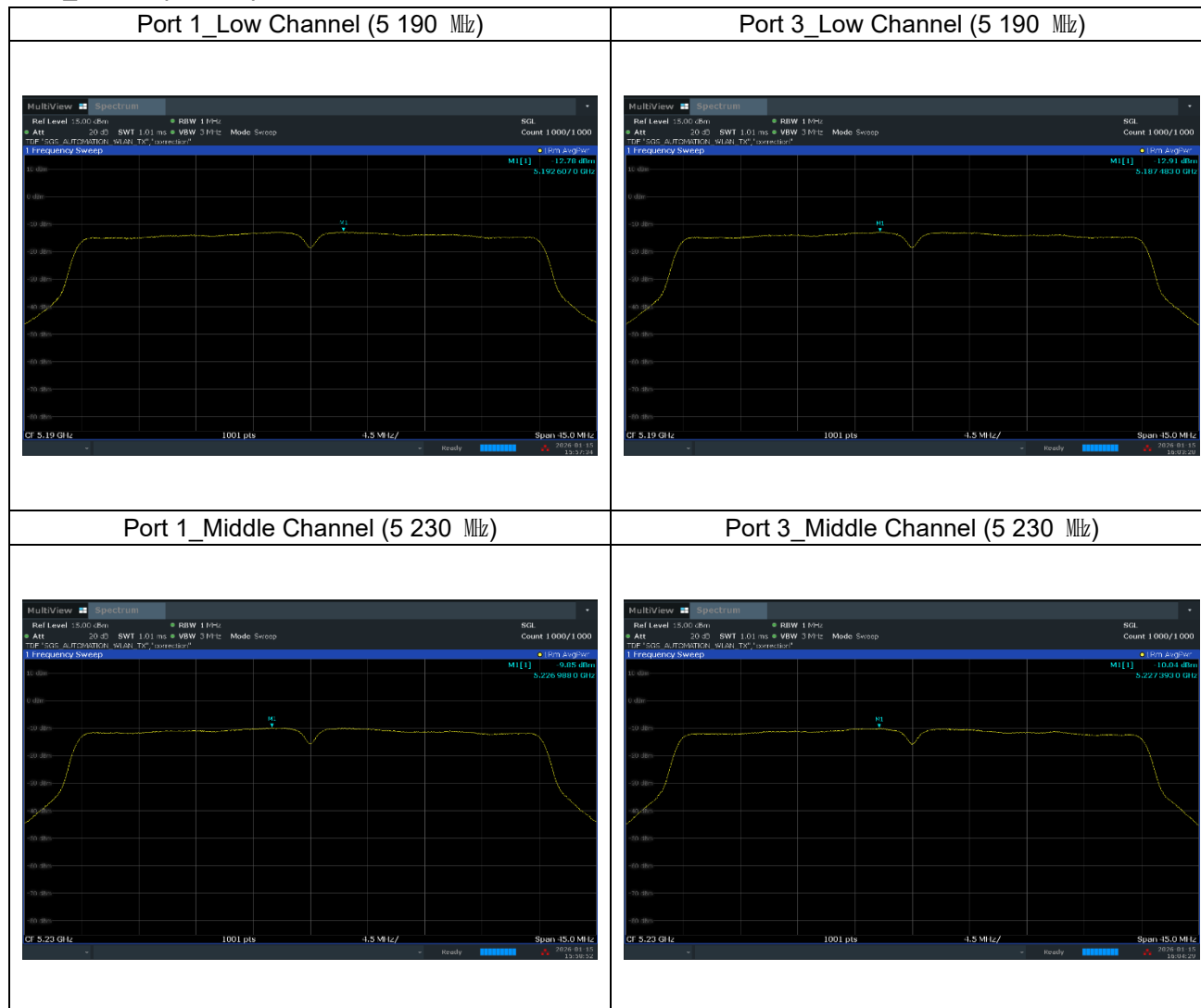
Port 3_High Channel (5 240 MHz)



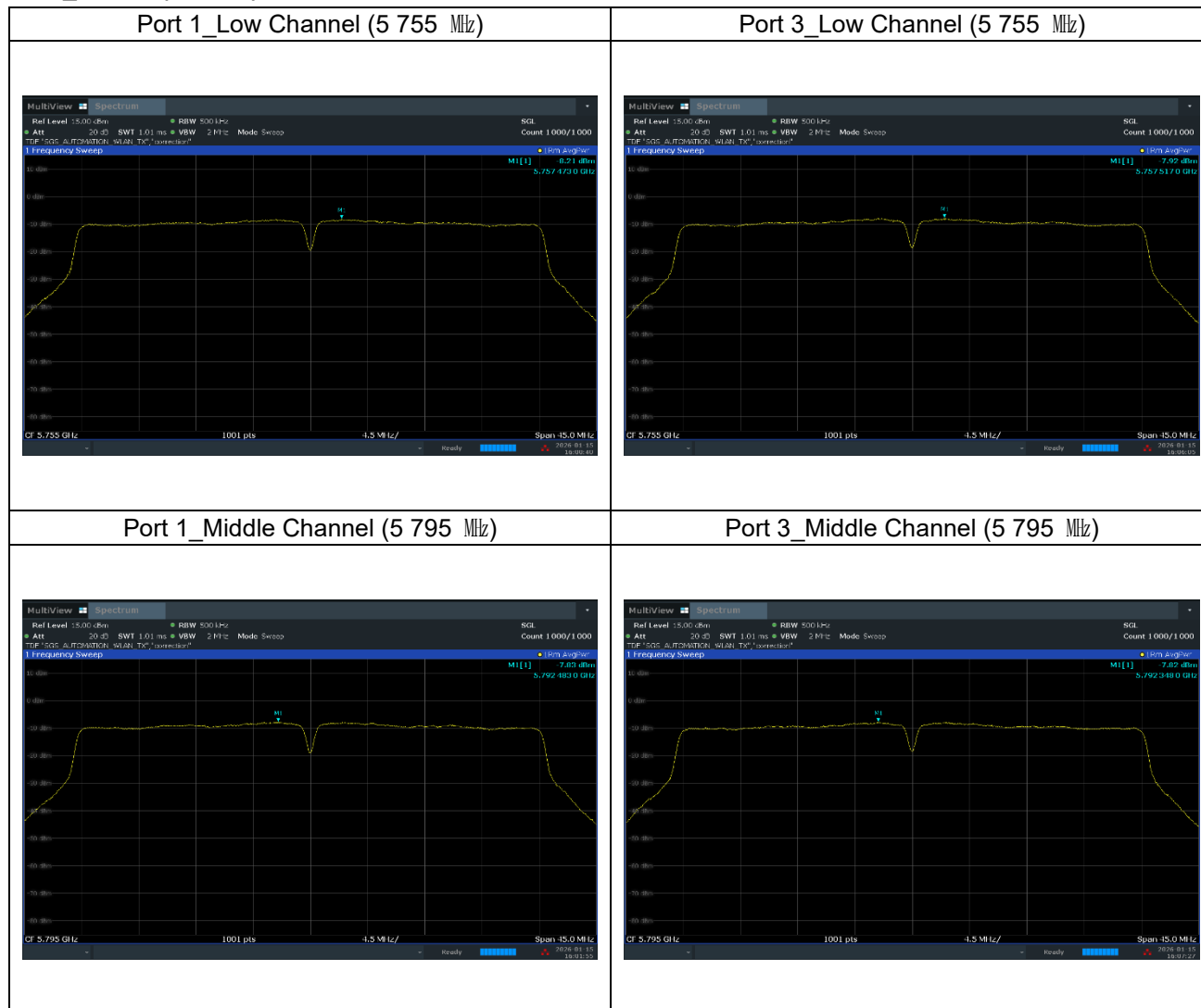
11ac_VHT20 (Band 3)



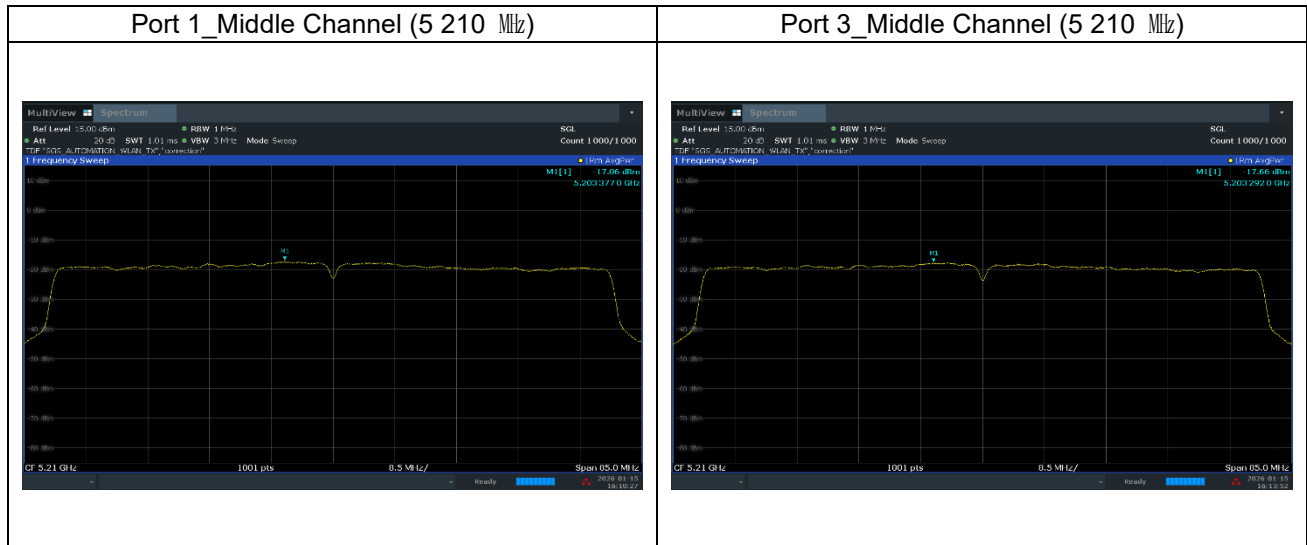
11av_VHT40 (Band 1)



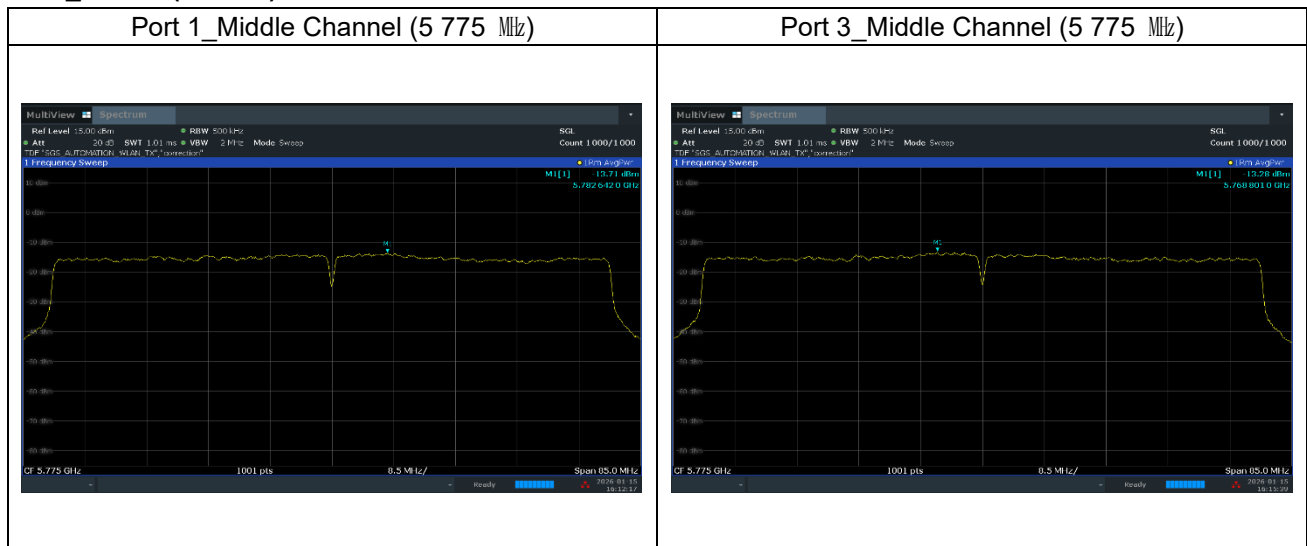
11ac_VHT40 (Band 3)



11ac_VHT80 (Band 1)



11ac_VHT80 (Band 3)



7. Antenna Requirement

7.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. And according to FCC 47 CFR Section §15.407(a) 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.

7.2. Antenna Connected Construction

Antenna used in this product is Pattern antenna and peak max gain of antenna as below.

Band		5 150 MHz ~ 5 250 MHz	5 725 MHz ~ 5 850 MHz
Mode		11a/n_HT20, HT40, 11ac_VHT20, VHT40, VHT80	
Ant. 1 Gain (dB i)		0.90	0.71
Ant. 2 Gain (dB i)		2.95	4.04
Ant. 3 Gain (dB i)		0.68	0.02
Directional Gain (dB i)	Ant. 1 + Ant. 2	5.00	5.54
	Ant. 1 + Ant. 3	3.80	3.38

According to ANSI C63.10-2020 (for FCC) and ANSI C63.10-2020 + Cor.1-2023 + C63.10a-2024 + Errata to C63.10a-2024 (for ISED), unequal antenna gains with equal transmit powers.

a) If transmit signals are correlated, then

$$\text{Directional gain} = 10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2 / N_{\text{ANT}}] \text{ dB i}$$

Note that the purpose of the factor 20 in the denominator of each exponent and the square of the sum of terms is to combine the signal levels coherently.

- End of the Test Report -