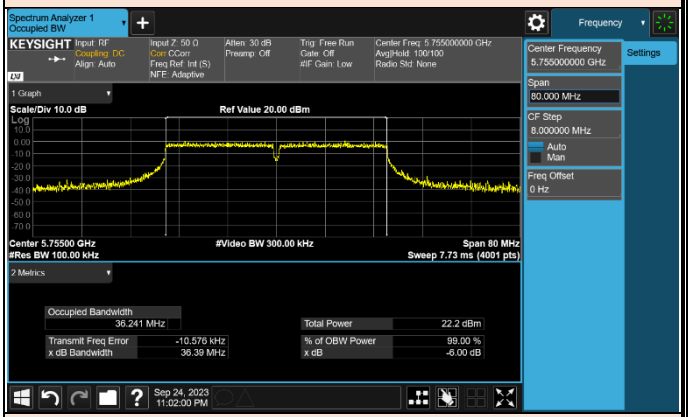
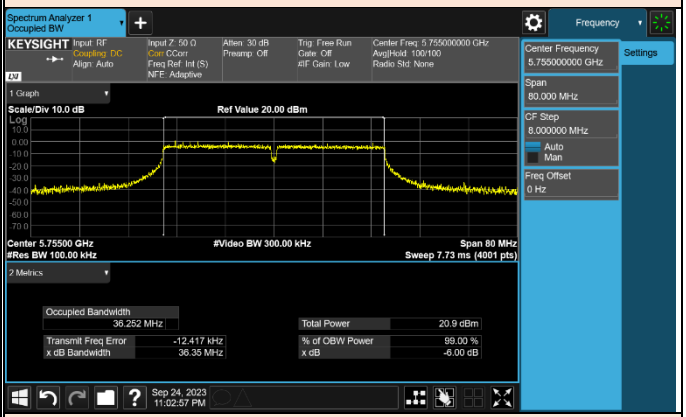
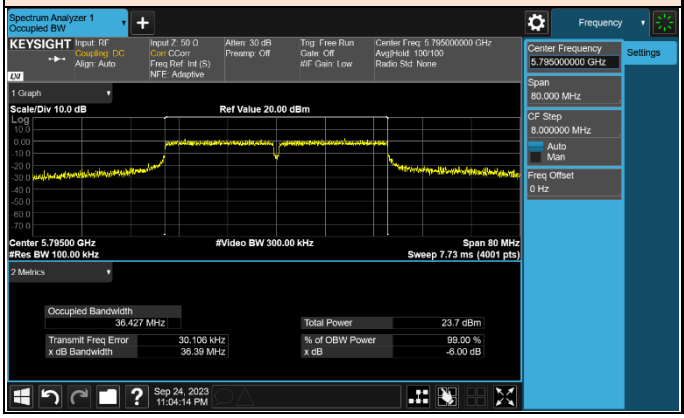
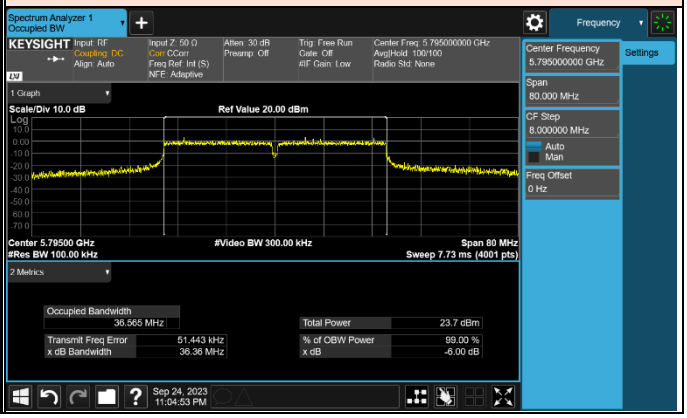
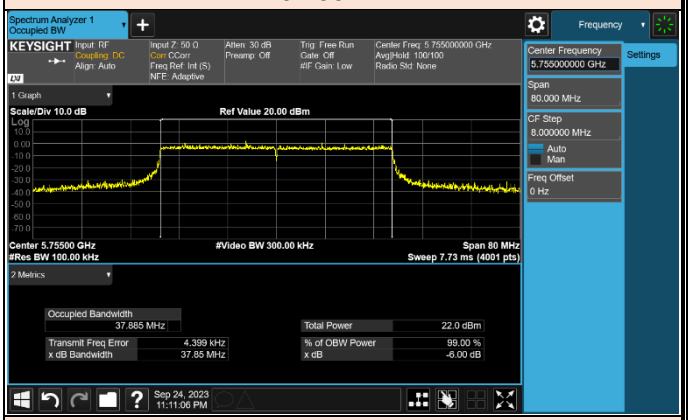
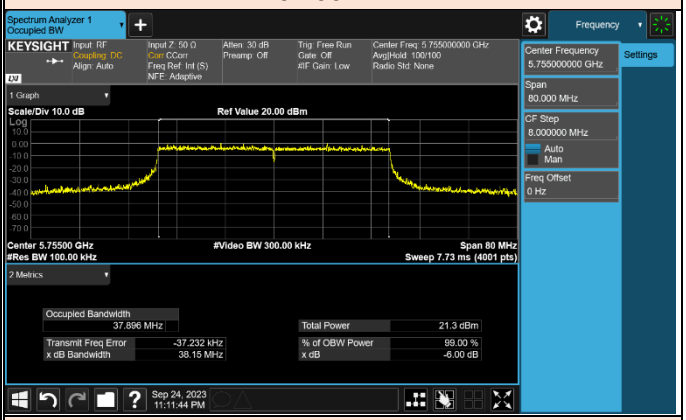
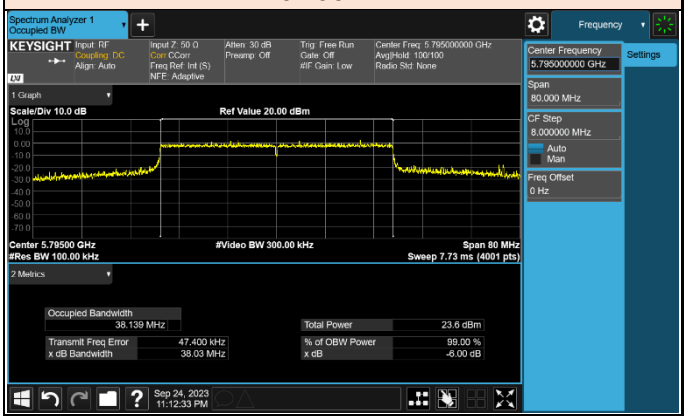
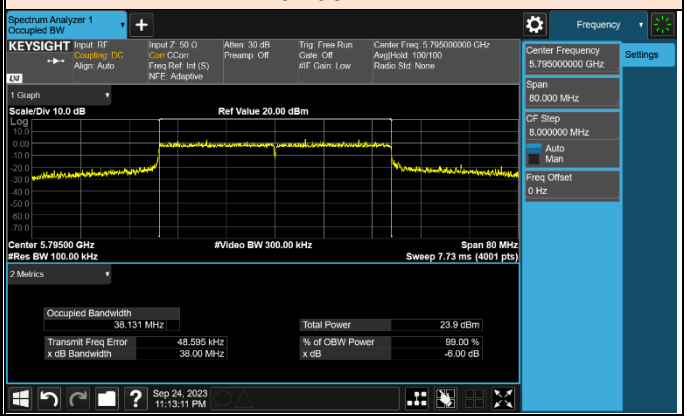
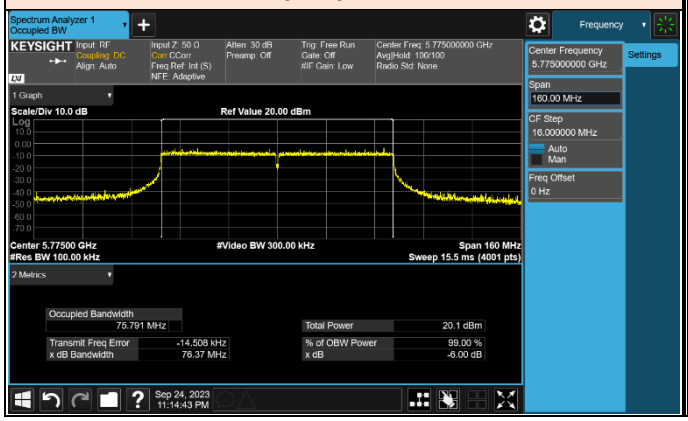
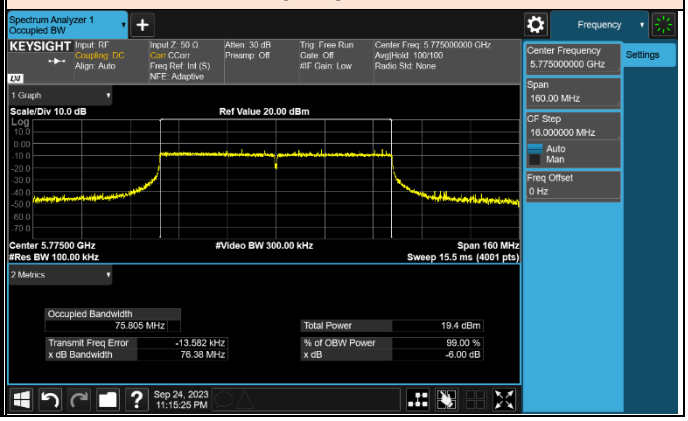
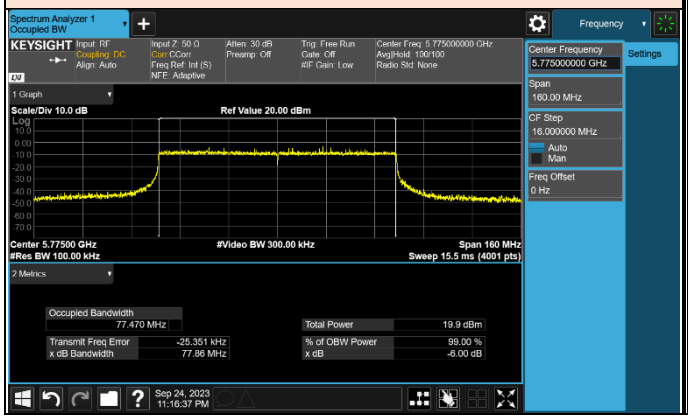
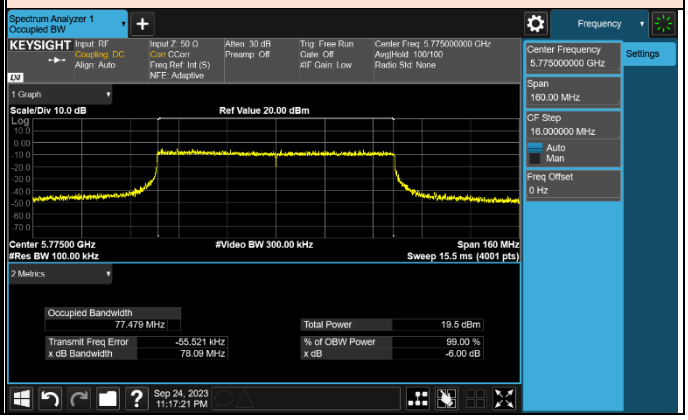
TM 4 _ NII 3	
ANT 1	**ANT 2**
5 755 MHz	**5 755 MHz**
	
5 795 MHz	**5 795 MHz**
	

TM 5 _ NII 3	
ANT 1	**ANT 2**
5 755 MHz	**5 755 MHz**
	
5 795 MHz	**5 795 MHz**
	

TM 6 _ NII 3	
ANT 1	**ANT 2**
5 775 MHz	**5 775 MHz**
	

TM 7 _ NII 3	
ANT 1	**ANT 2**
5 775 MHz	**5 775 MHz**
	

3.4 Maximum Conducted Output Power

3.4.1 Regulation

Part. 15.407(a)

(1) For the band 5.15 - 5.25 GHz.

(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. 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).

(ii) **For an indoor 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. 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.**

(iii) For fixed point-to-point access points 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. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(iv) For mobile and portable 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. 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.

(2) **For the 5.25 - 5.35 GHz and 5.47 - 5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. 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**.

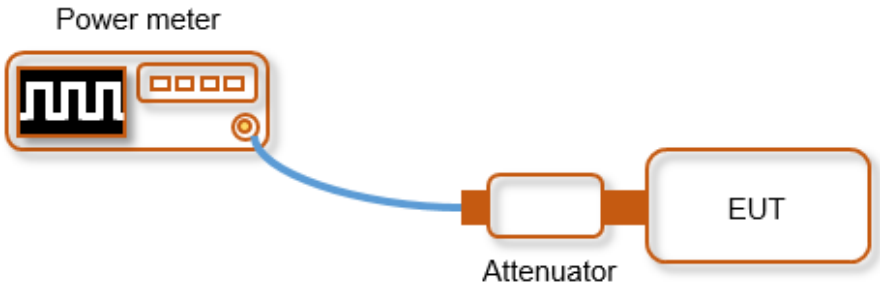
(3) **For the band 5.725 - 5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced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

3.4.2 Test Procedure

Method PM-G of KDB789033

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.

3.4.3 Test Setup



3.4.4 Test Result

[Test Result of Maximum Conducted Output Power]

Limit:

5 GHz Band	Power Limit [mW]	Calculated Limit [dBm]	Direction gain [dBi]	Conducted Limit [dBm]
NII 1	1000	30.00	6.11	**29.89**
NII 2A	11dBm+10logB	23.89	6.41	**23.48**
NII 2C	11dBm+10logB	23.95	6.61	**23.34**
NII 3	1000	30.00	6.57	**29.43**

Note1: B is the 26 dB emission bandwidth in megahertz.

Test Mode	Band	Tested Frequency [MHz]	Measured Power [dBm]		
			ANT1	ANT2	MIMO
802.11a	NII 1	5 180	11. 43	10. 94	-
		5 200	11. 28	10. 45	
		5 240	11. 16	12. 01	
	NII 2A	5 260	12. 38	12. 71	
		5 280	11. 60	12. 19	
		5 320	14. 98	14. 57	
	NII 2C	5 500	8. 94	9. 51	
		5 580	11. 82	11. 12	
		5 720	11. 72	12. 33	
	NII 3	5 745	19. 57	18. 49	
		5 785	19. 07	19. 47	
		5 825	19. 26	19. 58	
802.11n(HT20)	NII 1	5 180	10. 31	8. 51	12. 51
		5 200	11. 21	10. 87	14. 05
		5 240	11. 17	11. 98	14. 60
	NII 2A	5 260	12. 27	12. 58	15. 44
		5 280	12. 07	12. 65	15. 38
		5 320	10. 85	10. 38	13. 63
	NII 2C	5 500	5. 34	5. 91	8. 64
		5 580	11. 82	11. 25	14. 55
		5 720	11. 54	12. 66	15. 15
	NII 3	5 745	15. 69	16. 92	19. 36
		5 785	16. 78	17. 01	19. 91
		5 825	16. 35	16. 17	19. 27

Test Mode	Band	Tested Frequency [MHz]	Measured Power [dBm]		
			ANT1	ANT2	MIMO
802.11ac(VHT20)	NII 1	5 180	10. 27	8. 50	12. 48
		5 200	11. 25	10. 98	14. 13
		5 240	11. 31	12. 01	14. 68
	NII 2A	5 260	12. 12	12. 37	15. 26
		5 280	11. 66	12. 51	15. 12
		5 320	10. 98	10. 48	13. 75
	NII 2C	5 500	5. 32	5. 88	8. 62
		5 580	11. 97	11. 19	14. 61
		5 720	11. 81	12. 51	15. 18
	NII 3	5 745	15. 74	16. 67	19. 24
		5 785	16. 70	17. 03	19. 88
		5 825	16. 44	16. 06	19. 26
802.11ax(HE20)	NII 1	5 180	12. 32	10. 61	14. 56
		5 200	11. 43	11. 04	14. 25
		5 240	10. 47	11. 15	13. 83
	NII 2A	5 260	11. 61	11. 98	14. 81
		5 280	12. 16	12. 33	15. 26
		5 320	10. 55	10. 03	13. 31
	NII 2C	5 500	6. 28	6. 14	9. 22
		5 580	12. 24	11. 71	14. 99
		5 720	12. 31	13. 14	15. 76
	NII 3	5 745	15. 71	16. 68	19. 23
		5 785	17. 30	17. 34	20. 33
		5 825	16. 53	16. 07	19. 32

Test Mode	Band	Tested Frequency [MHz]	Measured Power [dBm]		
			ANT1	ANT2	MIMO
802.11n(HT40)	NII 1	5 190	10. 13	8. 51	12. 41
		5 230	11. 26	12. 41	14. 88
	NII 2A	5 270	14. 91	15. 47	18. 21
		5 310	7. 81	7. 68	10. 76
	NII 2C	5 510	4. 69	5. 19	7. 96
		5 550	14. 96	15. 29	18. 14
		5 710	14. 78	15. 01	17. 91
	NII 3	5 755	16. 30	16. 89	19. 62
		5 795	16. 98	17. 21	20. 11
802.11ac(VHT40)	NII 1	5 190	10. 19	8. 52	12. 45
		5 230	11. 27	12. 63	15. 01
	NII 2A	5 270	14. 55	14. 91	17. 74
		5 310	7. 82	7. 68	10. 76
	NII 2C	5 510	5. 37	5. 01	8. 20
		5 550	15. 37	15. 48	18. 44
		5 710	13. 96	14. 98	17. 51
	NII 3	5 755	16. 26	16. 66	19. 47
		5 795	16. 93	17. 09	20. 02
802.11ax(HE40)	NII 1	5 190	10. 98	9. 58	13. 35
		5 230	11. 27	12. 57	14. 98
	NII 2A	5 270	14. 41	14. 50	17. 47
		5 310	7. 86	7. 70	10. 79
	NII 2C	5 510	4. 98	5. 00	8. 00
		5 550	15. 11	15. 32	18. 23
		5 710	13. 99	15. 01	17. 54
	NII 3	5 755	14. 16	13. 84	17. 01
		5 795	16. 95	17. 12	20. 05

Test Mode	Band	Tested Frequency [MHz]	Measured Power [dBm]		
			ANT1	ANT2	MIMO
802.11ac(VHT80)	NII 1	5 210	9. 33	7. 89	11. 68
	NII 2A	5 290	7. 45	7. 52	10. 50
	NII 2C	5 530	5. 88	5. 93	8. 92
		5 610	17. 54	17. 01	20. 29
		5 690	16. 82	17. 51	20. 19
	NII 3	5 775	13. 68	13. 22	16. 47
802.11ax(HE80)	NII 1	5 210	10. 60	9. 34	13. 03
	NII 2A	5 290	7. 23	7. 44	10. 35
	NII 2C	5 530	3. 99	4. 25	7. 13
		5 610	16. 85	17. 06	19. 97
		5 690	16. 98	17. 55	20. 28
	NII 3	5 775	13. 82	13. 38	16. 62
802.11ac(VHT160)	NII 1	5 250	7. 38	7. 55	10. 48
	NII 2C	5 570	2. 82	2. 89	5. 87
802.11ax(HE160)	NII 1	5 250	7. 37	7. 53	10. 46
	NII 2C	5 570	-0. 14	-0. 86	2. 53

3.5 Maximum Power Spectral Density

3.5.1 Regulation

Part. 15.407(a)

(1) For the band 5.15 - 5.25 GHz.
(i) For an outdoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band. note1

(ii) **For an indoor access point operating in the band 5.15 - 5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 MHz band. note1**

(iii) For fixed point-to-point access points operating in the band 5.15 - 5.25 GHz, transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.

(iv) For mobile and portable client devices in the 5.15 - 5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band. note1

(2) **For the 5.25 - 5.35 GHz and 5.47 - 5.725 GHz bands, the peak power spectral density shall not exceed 11 dBm in any 1 MHz band. note1**

(3) **For the band 5.725 - 5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band.**[note1,note2]

Note1: If transmitting antennas of directional gain greater than 6 dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note2: Fixed point - to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

3.5.2 Test Procedure

Maximum Power Spectral Density is measured using Measurement Procedure of KDB789033 D02v02r01

1) 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.)

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

3) 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.

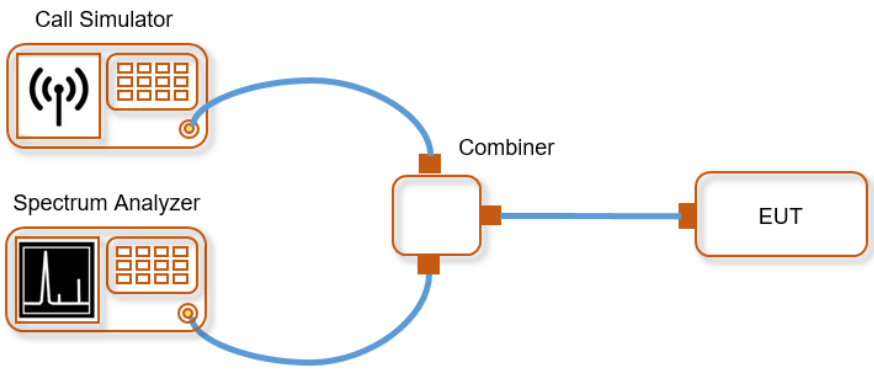
4) The result is the Maximum PSD over 1 MHz reference bandwidth.

5) 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 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
a) Set RBW ≥ 1 / T, where T is defined in section II.B.1.a). (Refer to Appendix II)
b) Set VBW ≥ 3 RBW.
c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log(500 kHz / RBW) to the measured result, whereas RBW (< 500 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 MHz / RBW) to the measured result, whereas RBW (< 1 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.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW = 100 kHz is available on nearly all spectrum analyzers.

3.5.3 Test Setup



3.5.4 Test Result

[Test Result of Maximum Power Spectral Density]

Limit

Band	Limit [dBm]	Antenna Gain (Worst case) [dBi]	Determined Limit [dBm]
NII 1	17.00	6.11	**16.89**
NII 2A	11.00	6.41	**10.59**
NII 2C	11.00	6.61	**10.39**
NII 3	30.00	6.57	**29.43**

Test Mode	Band	Tested Frequency [MHz]	Measured Power [dBm]			T.F	Result Power [dBm]		
			ANT1	ANT2	MIMO		ANT1	ANT2	MIMO
TM 1	NII 1	5 180	-0.26	0.58	-	0.00	-0.26	0.58	-
		5 200	-0.76	0.56			-0.76	0.56	
		5 240	0.18	-0.26			0.18	-0.26	
	NII 2A	5 260	1.30	1.14			1.30	1.14	
		5 280	0.42	0.65			0.42	0.65	
		5 320	0.56	1.01			0.56	1.01	
	NII 2C	5 500	-0.84	-1.09			-0.84	-1.09	
		5 580	0.10	1.12			0.10	1.12	
		5 720	0.82	0.77			0.82	0.77	
	NII 3	5 745	-0.77	-2.26		6.99	6.22	4.73	
		5 785	1.61	-0.26			8.60	6.73	
		5 825	1.50	-0.48			8.49	6.51	
TM 2	NII 1	5 180	-1.88	-0.56	1.84	0.00	-1.88	-0.56	1.84
		5 200	-0.28	0.77	3.29		-0.28	0.77	3.29
		5 240	0.04	-0.43	2.82		0.04	-0.43	2.82
	NII 2A	5 260	0.92	0.75	3.85		0.92	0.75	3.85
		5 280	0.62	0.90	3.77		0.62	0.90	3.77
		5 320	-0.46	-0.17	2.70		-0.46	-0.17	2.70
	NII 2C	5 500	-4.67	-4.73	-1.69		-4.67	-4.73	-1.69
		5 580	0.04	1.11	3.62		0.04	1.11	3.62
		5 720	0.82	0.24	3.55		0.82	0.24	3.55
	NII 3	5 745	-2.25	-3.16	0.33	6.99	4.74	3.83	7.32
		5 785	-1.30	-0.99	1.87		5.69	6.00	8.86
		5 825	-1.95	-2.19	0.94		5.04	4.80	7.93

Test Mode	Band	Tested Frequency [MHz]	Measured Power [dBm]			T.F	Result Power [dBm]		
			ANT1	ANT2	MIMO		ANT1	ANT2	MIMO
TM 3	NII 1	5 180	-0.66	0.55	3.00	0.00	-0.66	0.55	3.00
		5 200	-0.85	0.63	2.96		-0.85	0.63	2.96
		5 240	0.33	0.10	3.23		0.33	0.10	3.23
	NII 2A	5 260	0.88	0.26	3.59		0.88	0.26	3.59
		5 280	0.58	0.77	3.69		0.58	0.77	3.69
		5 320	-1.12	-0.76	2.07		-1.12	-0.76	2.07
	NII 2C	5 500	-6.91	-6.99	-3.94		-6.91	-6.99	-3.94
		5 580	-0.03	1.61	3.88		-0.03	1.61	3.88
		5 720	0.49	0.37	3.44		0.49	0.37	3.44
	NII 3	5 745	-3.47	-4.21	-0.82	6.99	3.52	2.78	6.17
		5 785	-2.33	-2.39	0.65		4.66	4.60	7.64
		5 825	-3.07	-3.43	-0.23		3.92	3.56	6.76
TM 4	NII 1	5 190	-4.75	-3.25	-0.92	0.00	-4.75	-3.25	-0.92
		5 230	-1.84	-2.07	1.06		-1.84	-2.07	1.06
	NII 2A	5 270	0.98	0.94	3.97		0.98	0.94	3.97
		5 310	-5.65	-5.35	-2.49		-5.65	-5.35	-2.49
	NII 2C	5 510	-7.96	-8.14	-5.04		-7.96	-8.14	-5.04
		5 550	0.17	1.03	3.63		0.17	1.03	3.63
		5 710	0.86	0.32	3.61		0.86	0.32	3.61
	NII 3	5 755	-4.97	-5.52	-2.23	6.99	2.02	1.47	4.76
		5 795	-4.40	-4.05	-1.21		2.59	2.94	5.78
TM 5	NII 1	5 190	-3.64	-2.45	0.01	0.00	-3.64	-2.45	0.01
		5 230	-2.54	-2.56	0.46		-2.54	-2.56	0.46
	NII 2A	5 270	0.50	0.60	3.56		0.50	0.60	3.56
		5 310	-5.67	-5.35	-2.49		-5.67	-5.35	-2.49
	NII 2C	5 510	-10.71	-10.43	-7.56		-10.71	-10.43	-7.56
		5 550	0.16	1.08	3.66		0.16	1.08	3.66
		5 710	0.68	0.13	3.42		0.68	0.13	3.42
	NII 3	5 755	-10.26	-10.82	-7.52	6.99	-3.27	-3.83	-0.53
		5 795	-6.02	-5.19	-2.57		0.97	1.80	4.42

Test Mode	Band	Tested Frequency [MHz]	Measured Power [dBm]			T.F	Result Power [dBm]		
			ANT1	ANT2	MIMO		ANT1	ANT2	MIMO
TM 6	NII 1	5 210	-8.51	-7.30	-4.85	0.00	-8.51	-7.30	-4.85
	NII 2A	5 290	-8.14	-8.12	-5.12		-8.14	-8.12	-5.12
	NII 2C	5 530	-11.99	-11.63	-8.79		-11.99	-11.63	-8.79
		5 610	0.11	1.40	3.81		0.11	1.40	3.81
		5 690	0.68	0.11	3.41		0.68	0.11	3.41
	NII 3	5 775	-12.64	-13.07	-9.84	6.99	-5.65	-6.08	-2.85
TM 7	NII 1	5 210	-6.95	-5.94	-3.40	0.00	-6.95	-5.94	-3.40
	NII 2A	5 290	-8.65	-8.69	-5.66		-8.65	-8.69	-5.66
	NII 2C	5 530	-13.31	-13.29	-10.29		-13.31	-13.29	-10.29
		5 610	0.27	1.11	3.72		0.27	1.11	3.72
		5 690	0.47	0.19	3.35		0.47	0.19	3.35
	NII 3	5 775	-13.76	-13.99	-10.86	6.99	-6.77	-7.00	-3.87
TM 8	NII 1	5 250	-12.07	-11.95	-9.00	0.00	-12.07	-11.95	-9.00
	NII 2C	5 570	-15.79	-14.96	-12.35		-15.79	-14.96	-12.35
TM 9	NII 1	5 250	-11.43	-11.84	-8.62	0.00	-11.43	-11.84	-8.62
	NII 2C	5 570	-18.88	-19.45	-16.15		-18.88	-19.45	-16.15

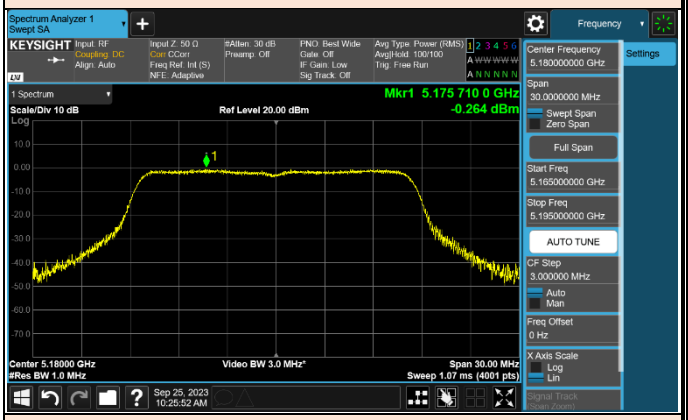
Note1: NII 3 [T.F] = 10*LOG(500kHz/100kHz) + DCCF"
Note2: Test Result = Measurement Data + T.F

[Test Plot of Maximum Power Spectral Density]

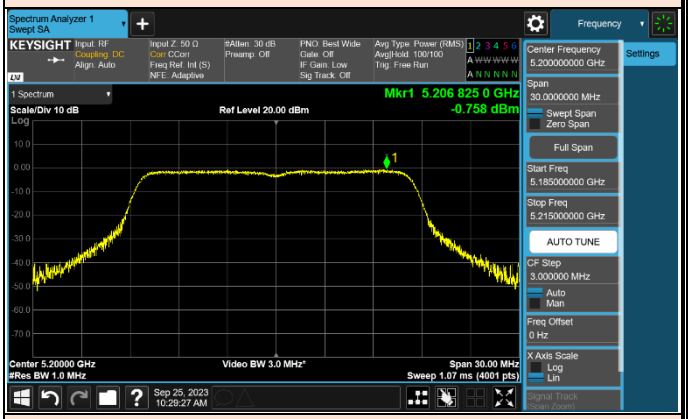
TM 1 _ NII 1

ANT 1

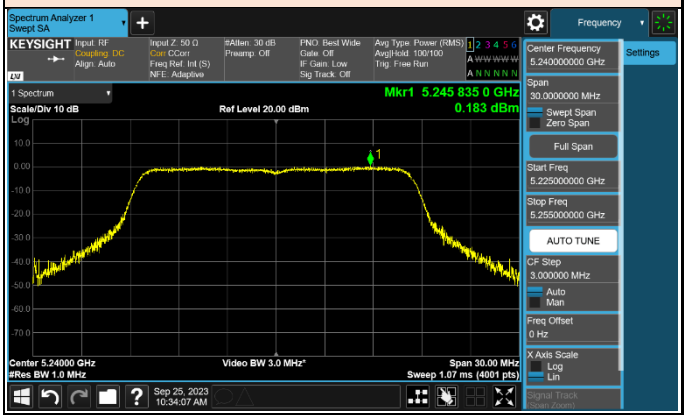
5 180 MHz



5 200 MHz

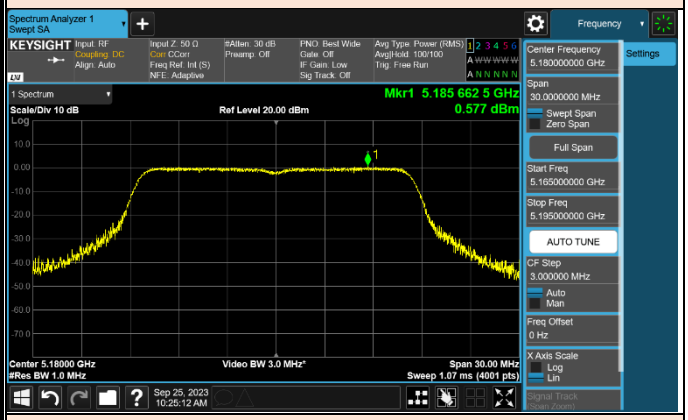


5 240 MHz



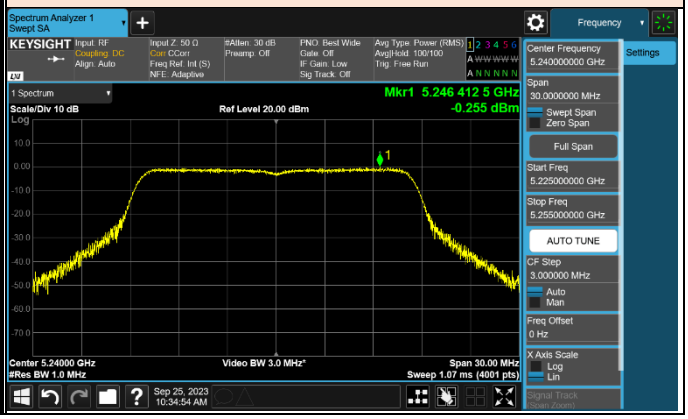
ANT 2

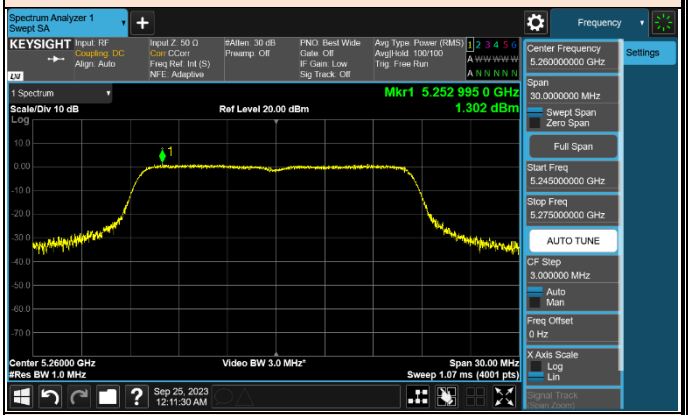
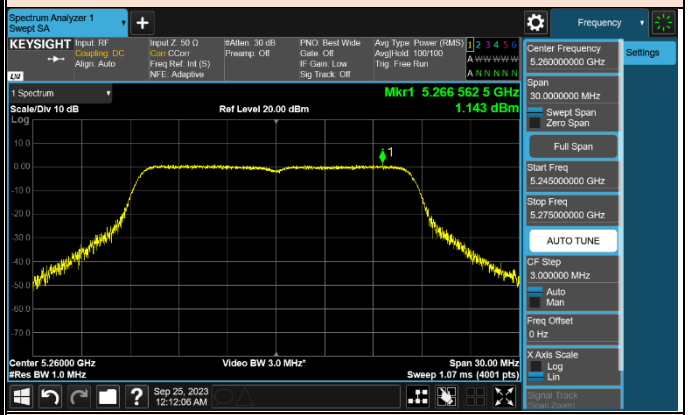
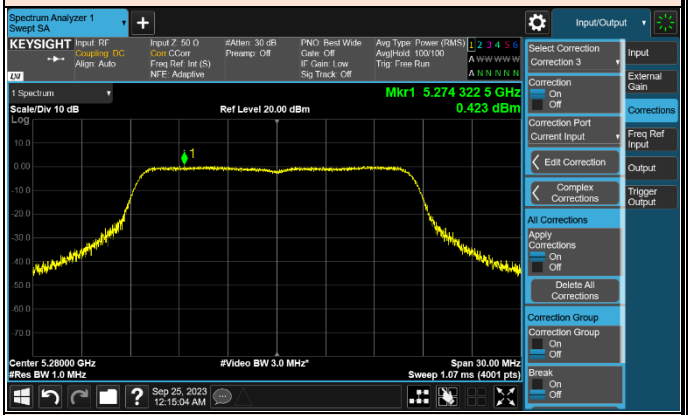
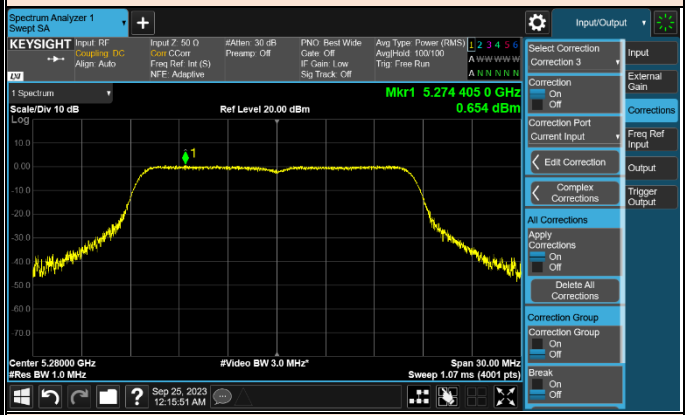
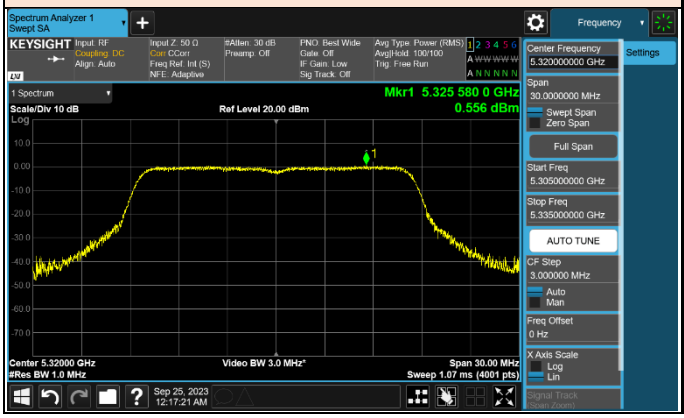
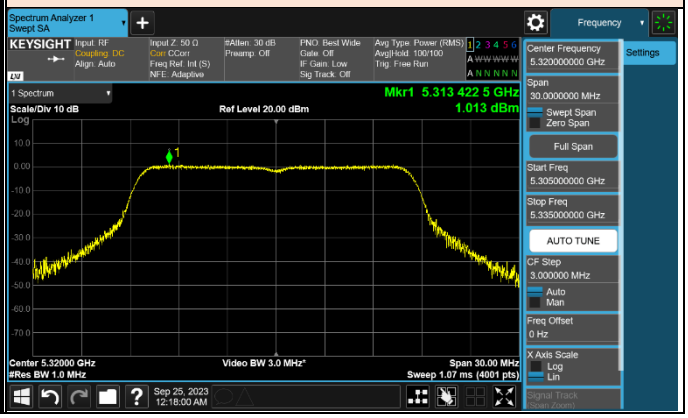
5 180 MHz



5 200 MHz

5 240 MHz

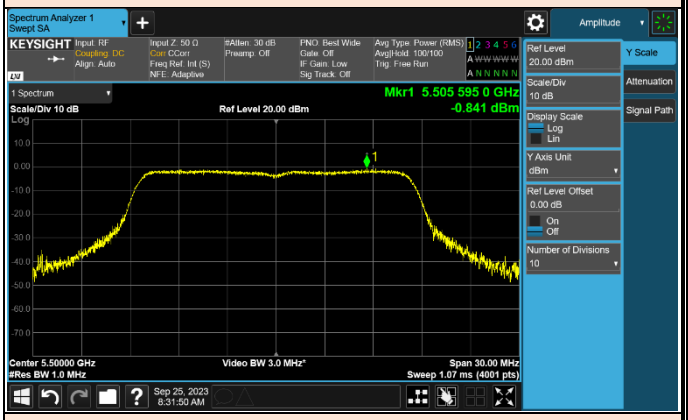


TM 1 _ NII 2A	
ANT 1	**ANT 2**
5 260 MHz	**5 260 MHz**
	
5 280 MHz	**5 280 MHz**
	
5 320 MHz	**5 320 MHz**
	

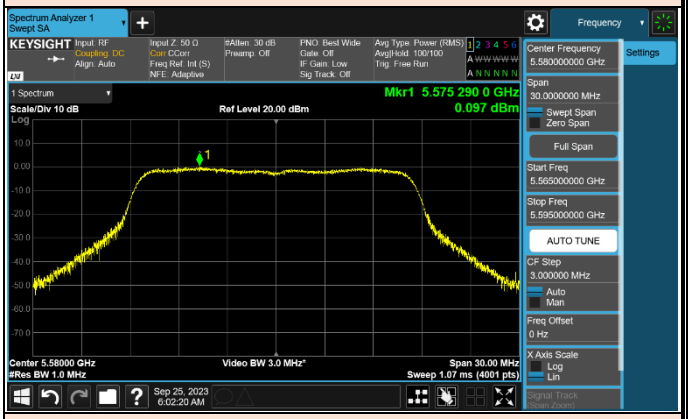
TM 1 _ NII 2C

ANT 1

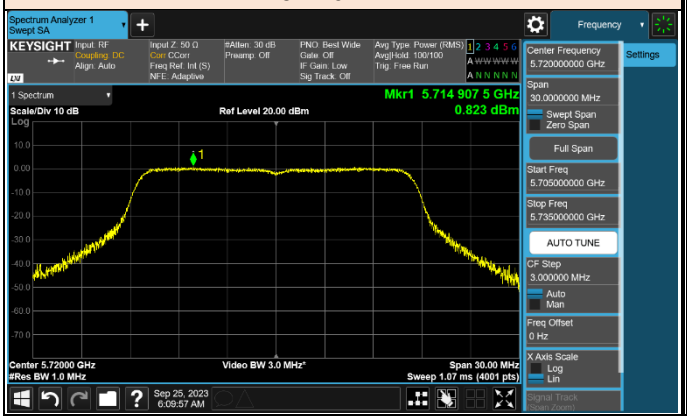
5 500 MHz



5 580 MHz

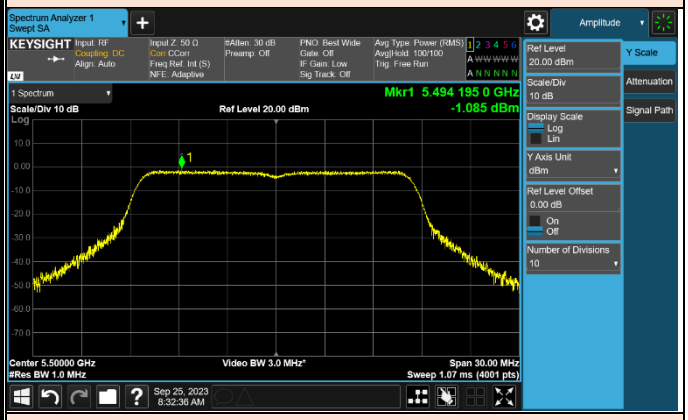


5 720 MHz

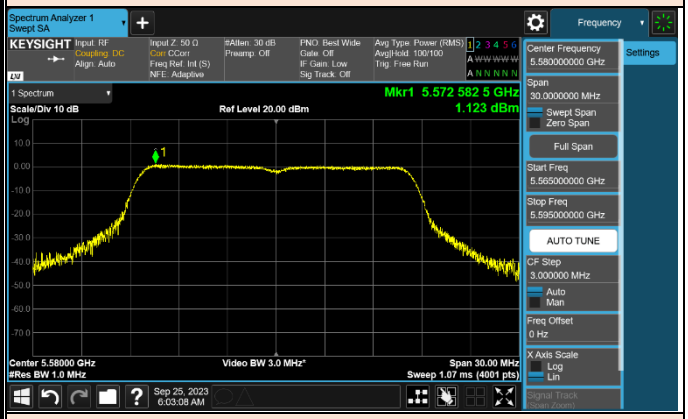


ANT 2

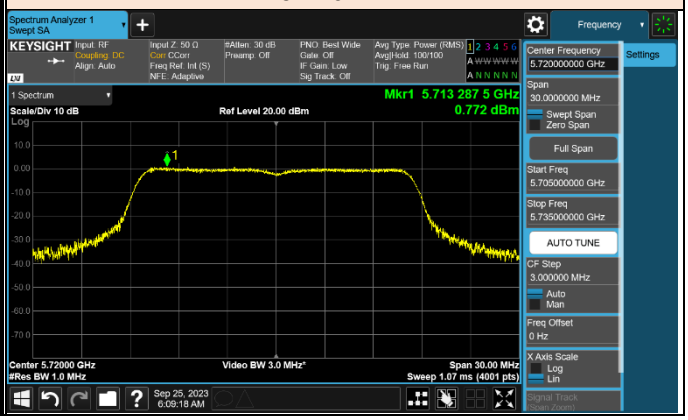
5 500 MHz

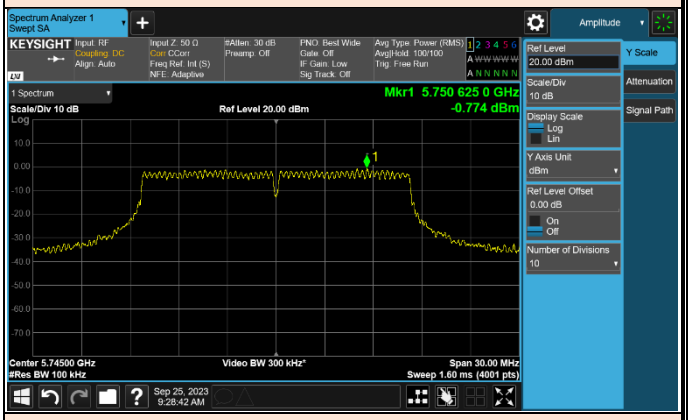
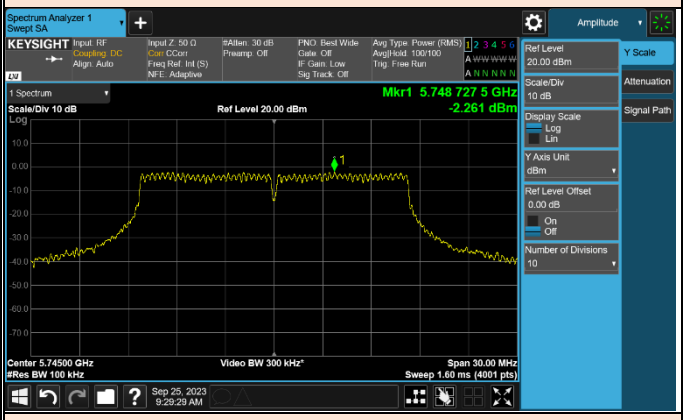
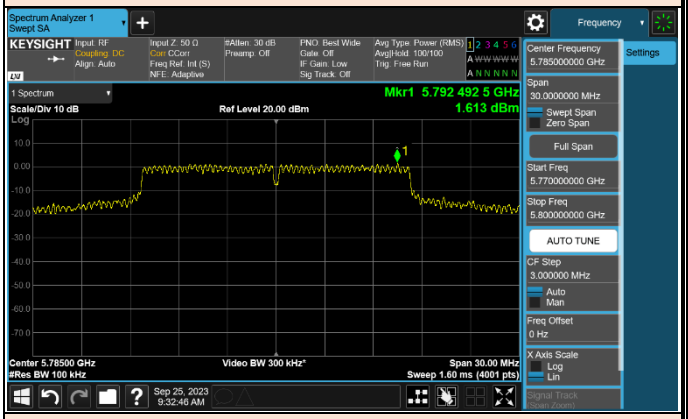
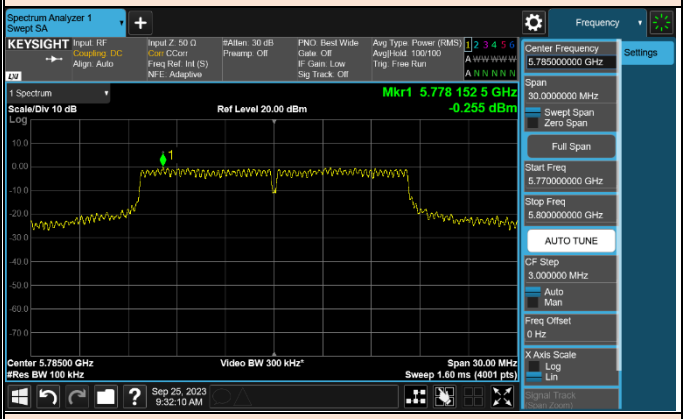
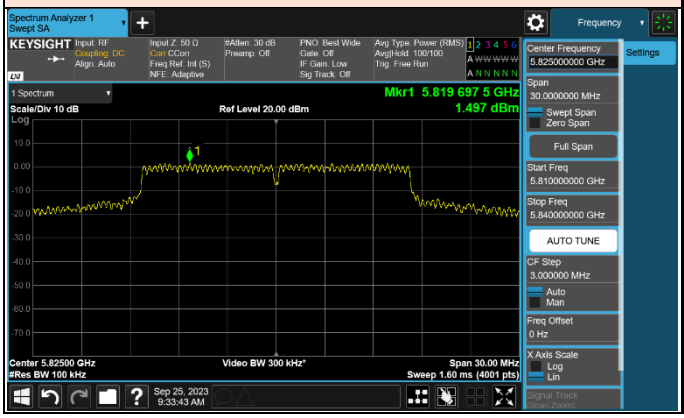
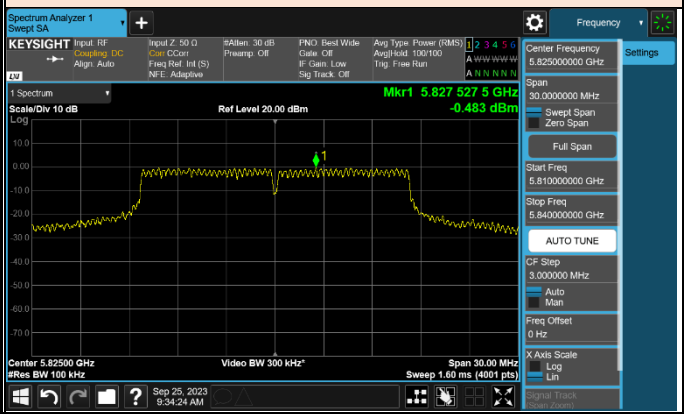


5 580 MHz



5 720 MHz

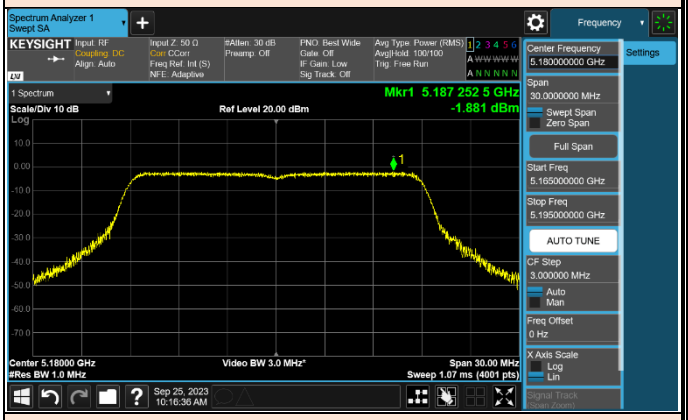


TM 1 _ NII 3	
ANT 1	**ANT 2**
5 745 MHz	**5 745 MHz**
	
5 785 MHz	**5 785 MHz**
	
5 825 MHz	**5 825 MHz**
	

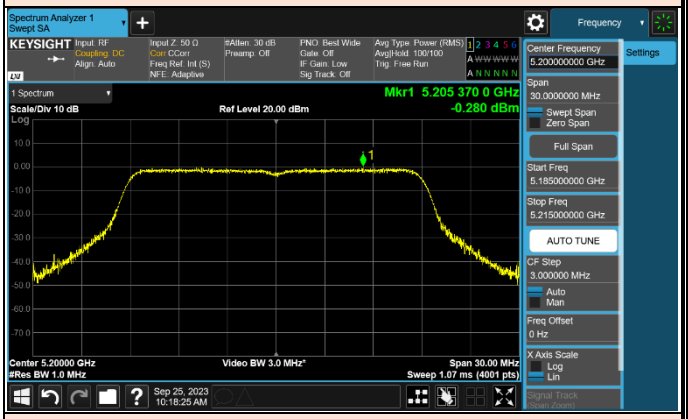
TM 2 _ NII 1

ANT 1

5 180 MHz



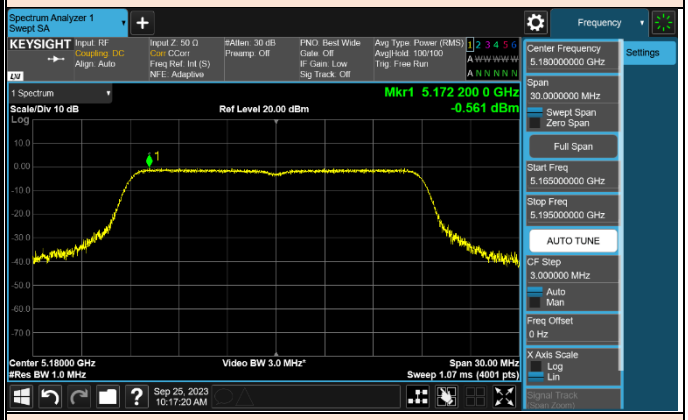
5 200 MHz



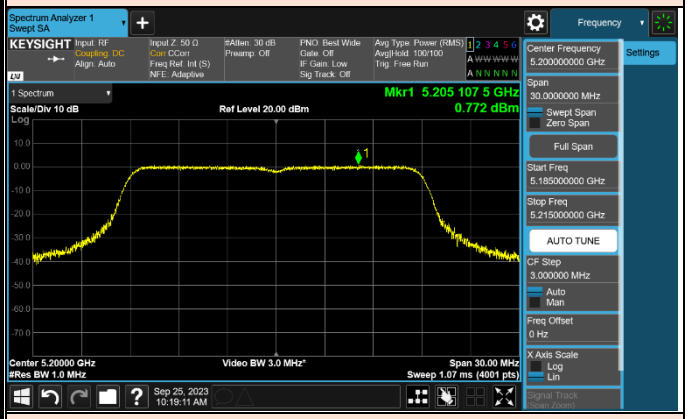
5 240 MHz

ANT 2

5 180 MHz



5 200 MHz



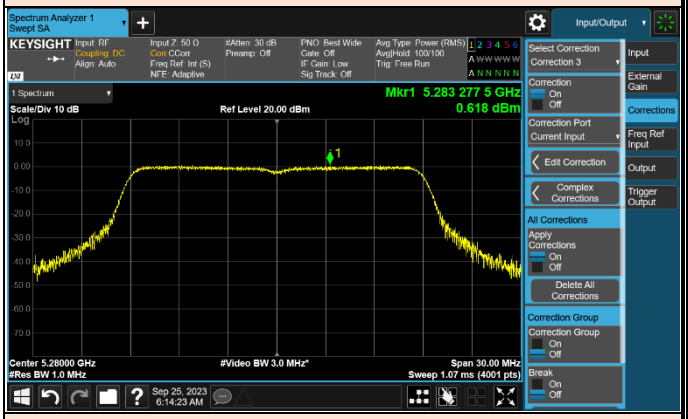
5 240 MHz

TM 2 _ NII 2A

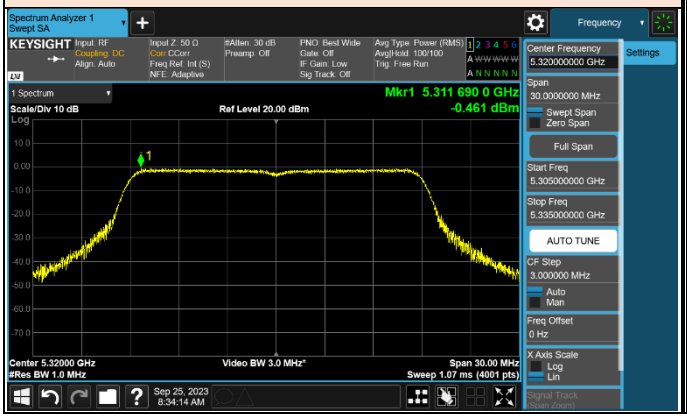
ANT 1

5 260 MHz

5 280 MHz



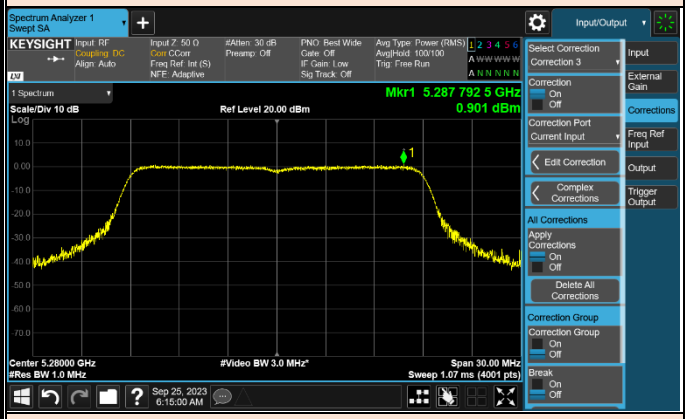
5 320 MHz



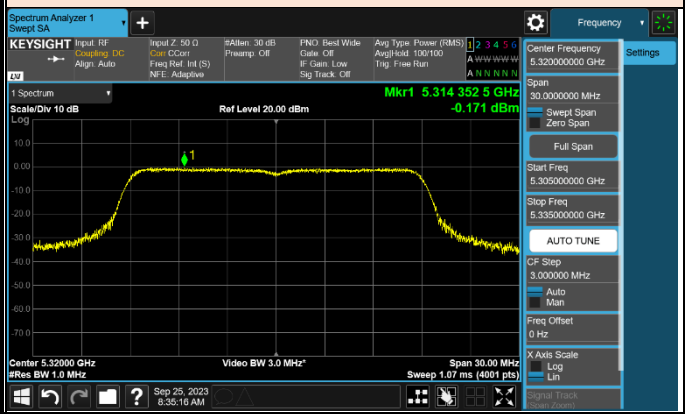
ANT 2

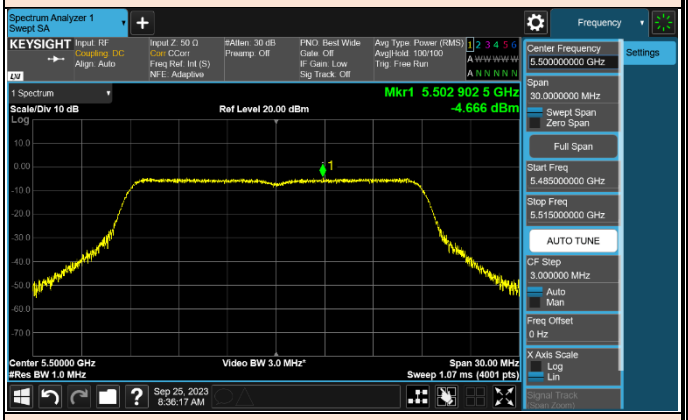
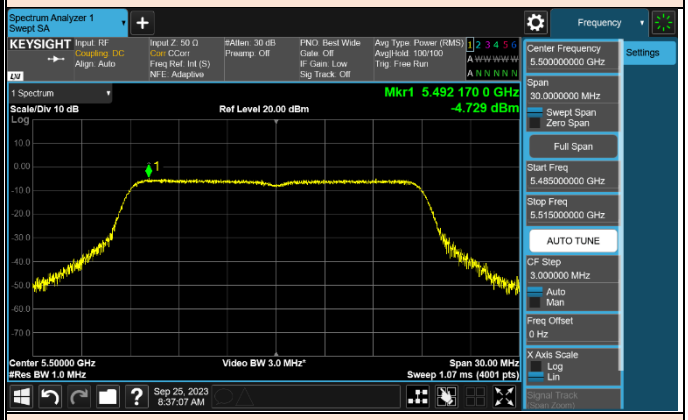
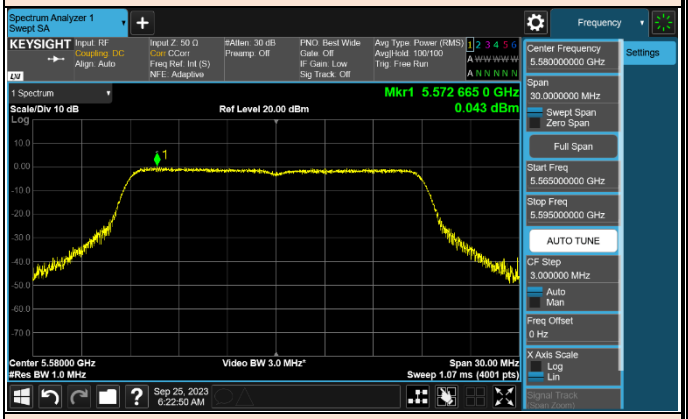
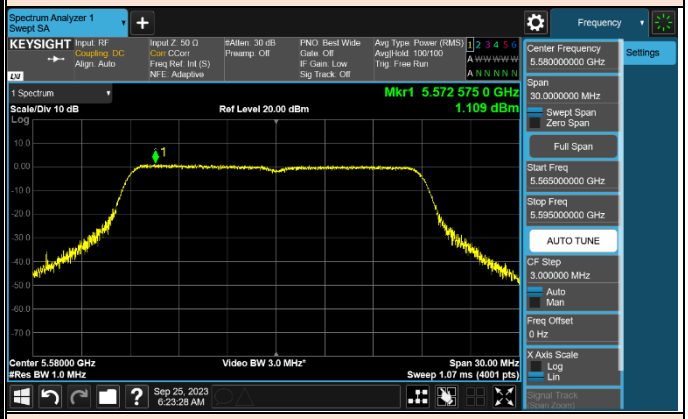
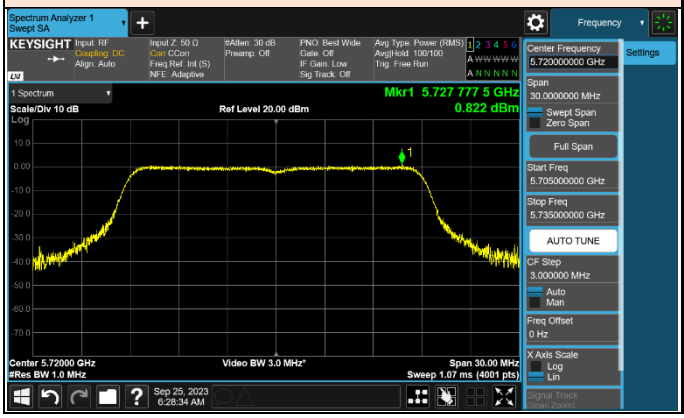
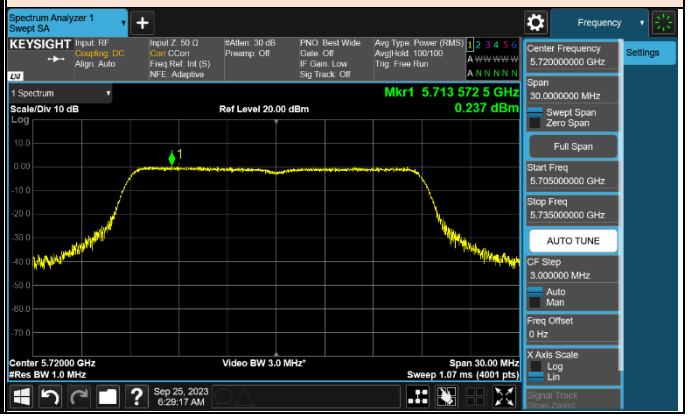
5 260 MHz

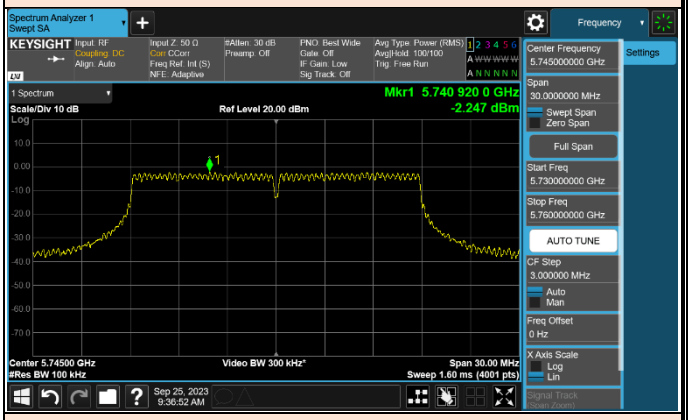
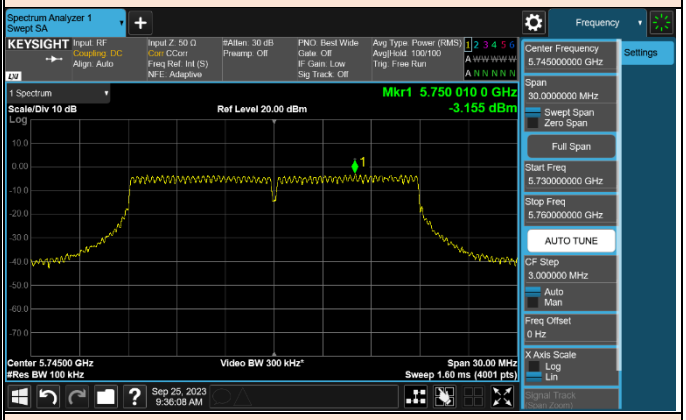
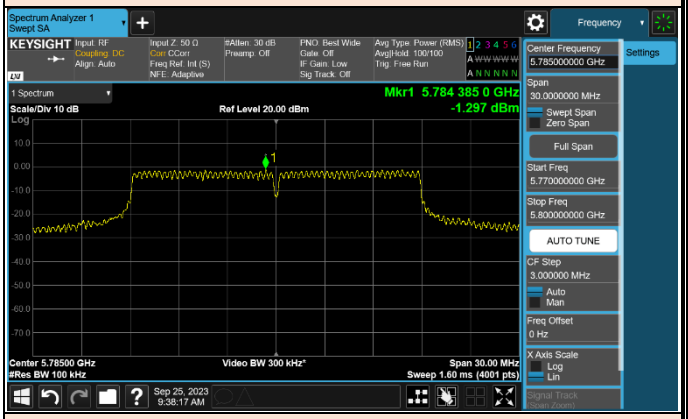
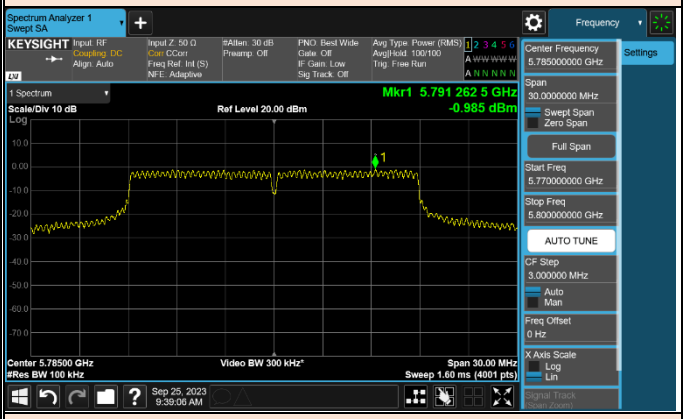
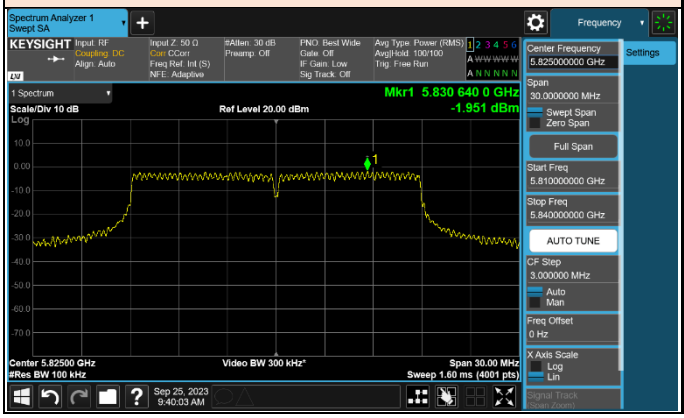
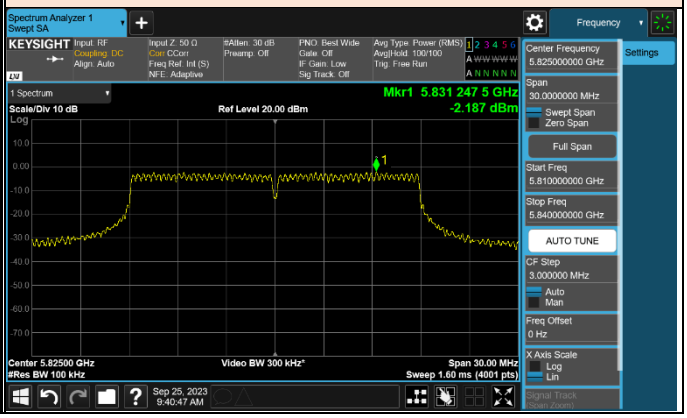
5 280 MHz



5 320 MHz



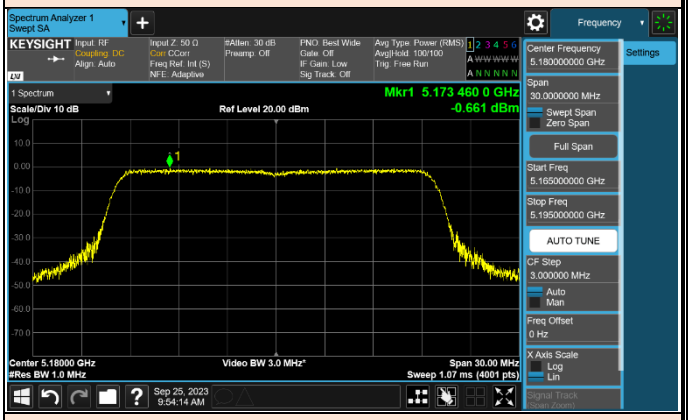
TM 2 _ NII 2C	
ANT 1	**ANT 2**
5 500 MHz	**5 500 MHz**
	
5 580 MHz	**5 580 MHz**
	
5 720 MHz	**5 720 MHz**
	

TM 2 _ NII 3	
ANT 1	**ANT 2**
5 745 MHz	**5 745 MHz**
	
5 785 MHz	**5 785 MHz**
	
5 825 MHz	**5 825 MHz**
	

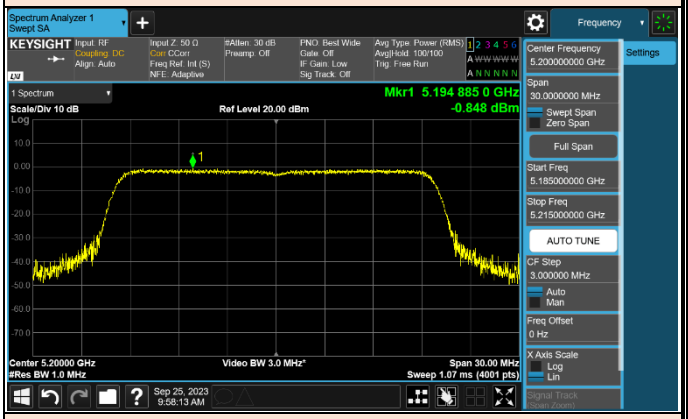
TM 3 _ NII 1

ANT 1

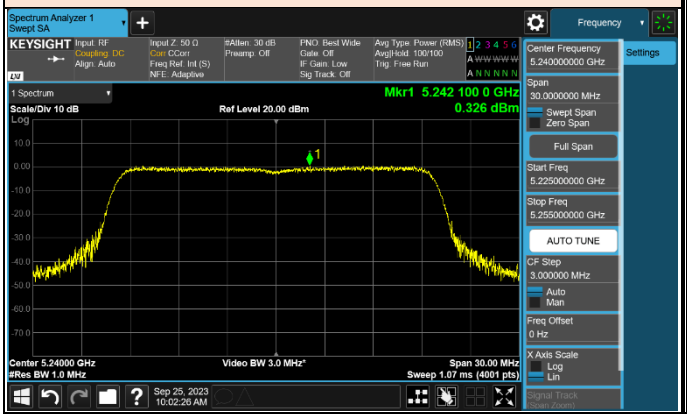
5 180 MHz



5 200 MHz

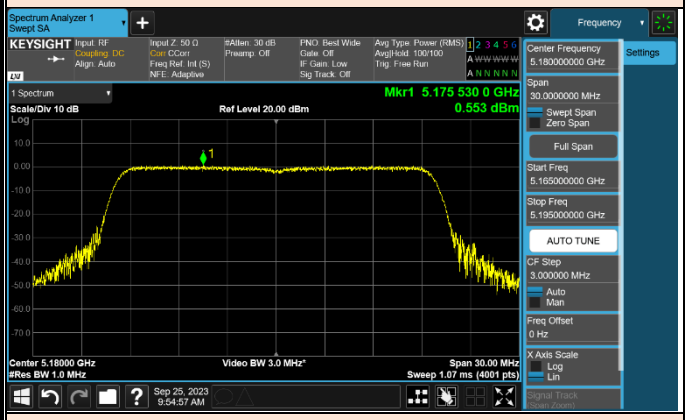


5 240 MHz

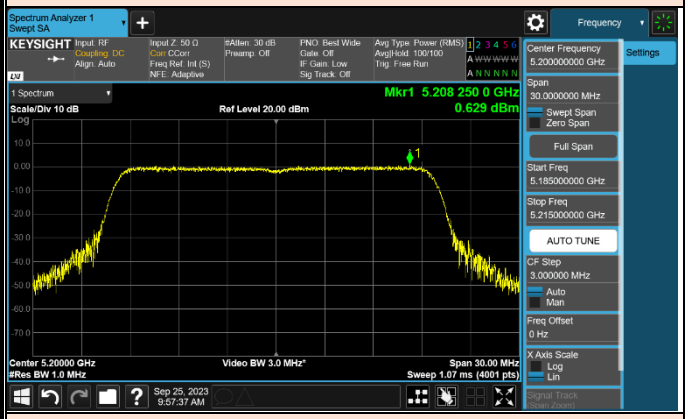
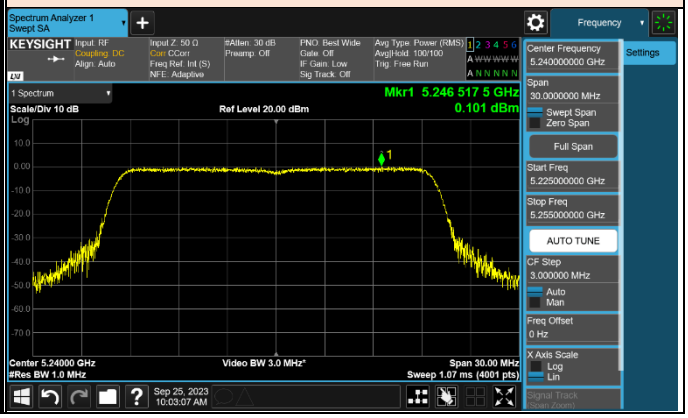


ANT 2

5 180 MHz



5 200 MHz



5 240 MHz