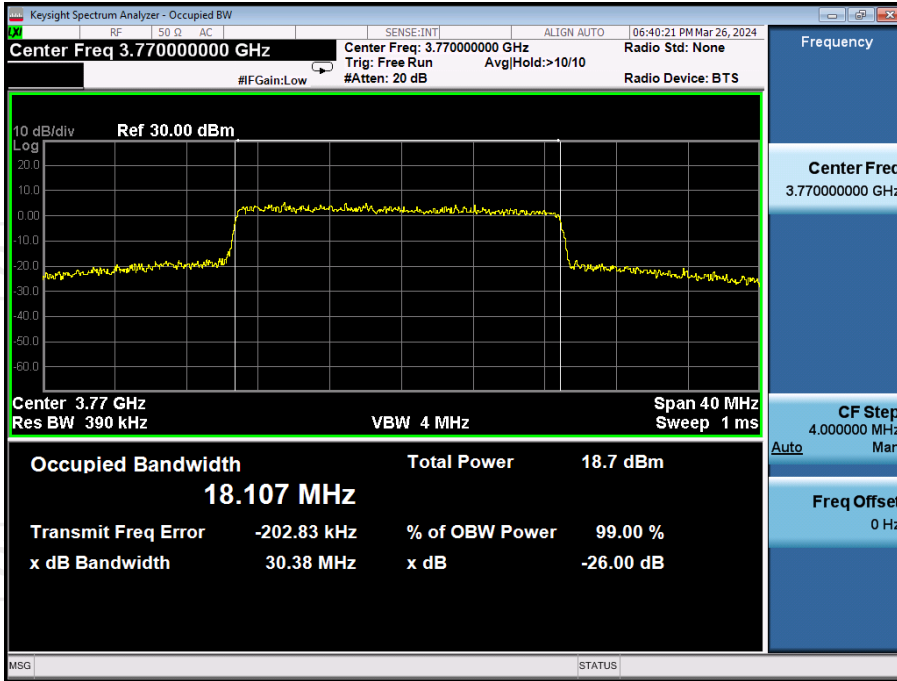
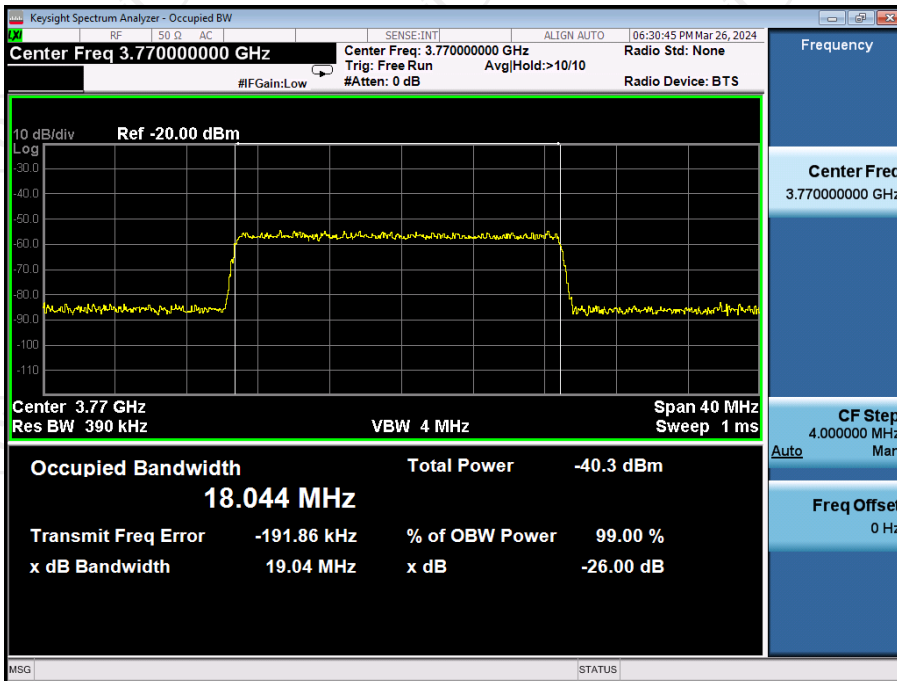


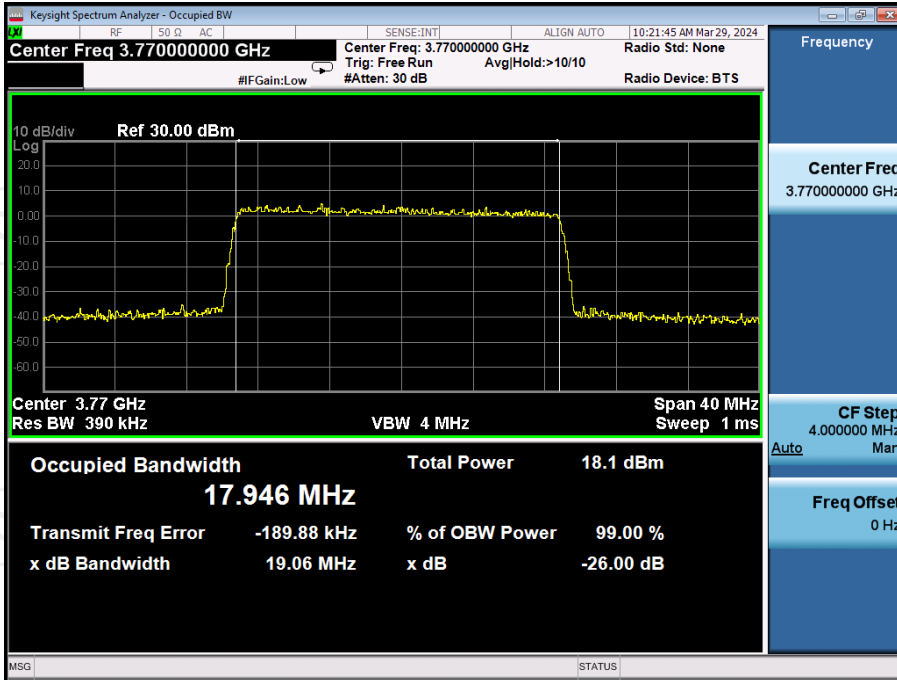
Output 5G NR 20MHz UL @AGC + 3dB



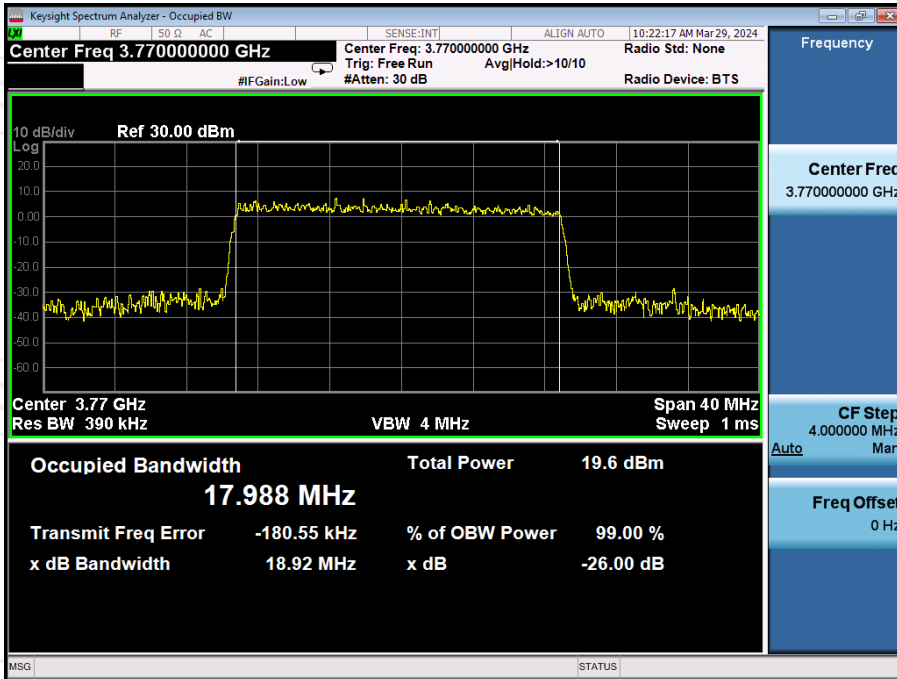
Input 5G NR 20MHz DL



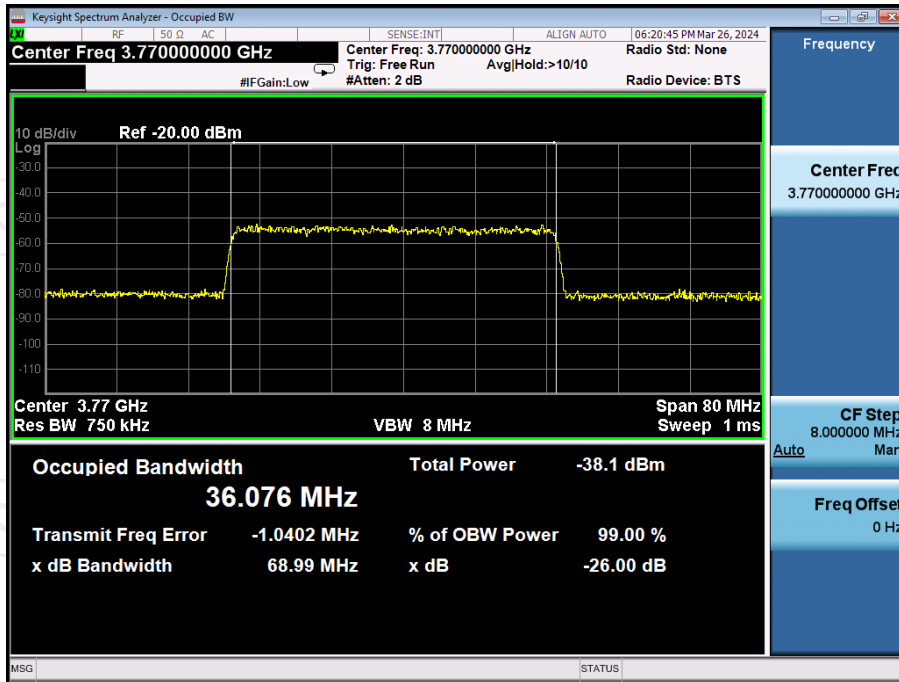
Output 5G NR 20MHz DL @Pre AGC



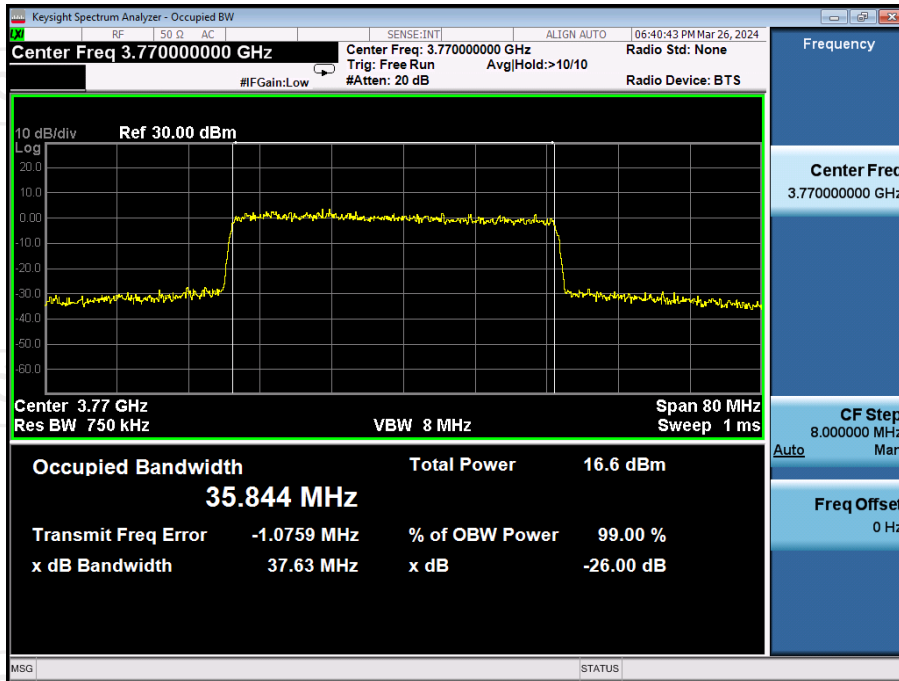
Output 5G NR 20MHz DL @AGC + 3dB



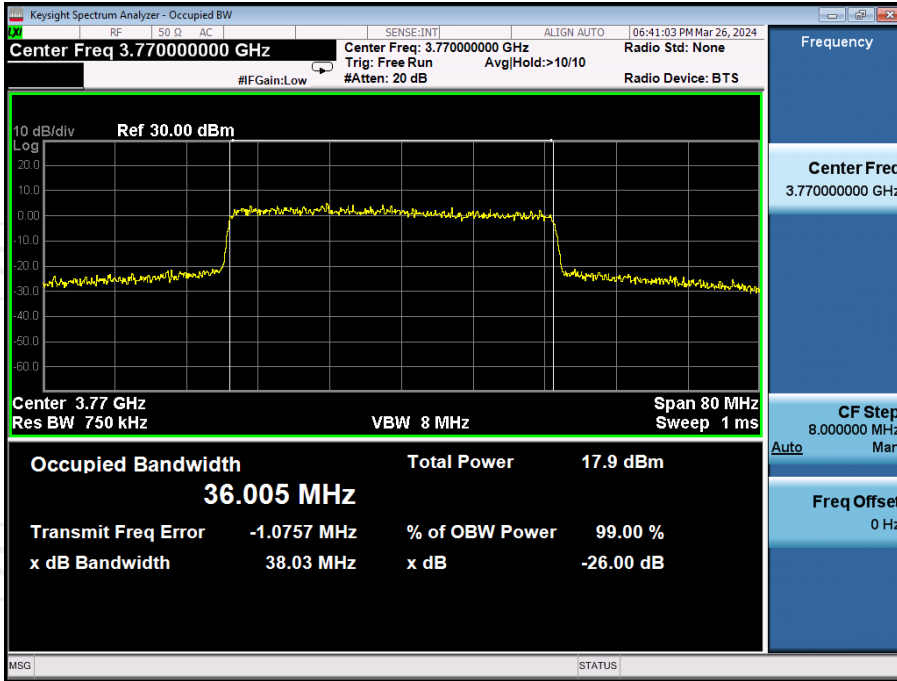
Input 5G NR 40MHz UL



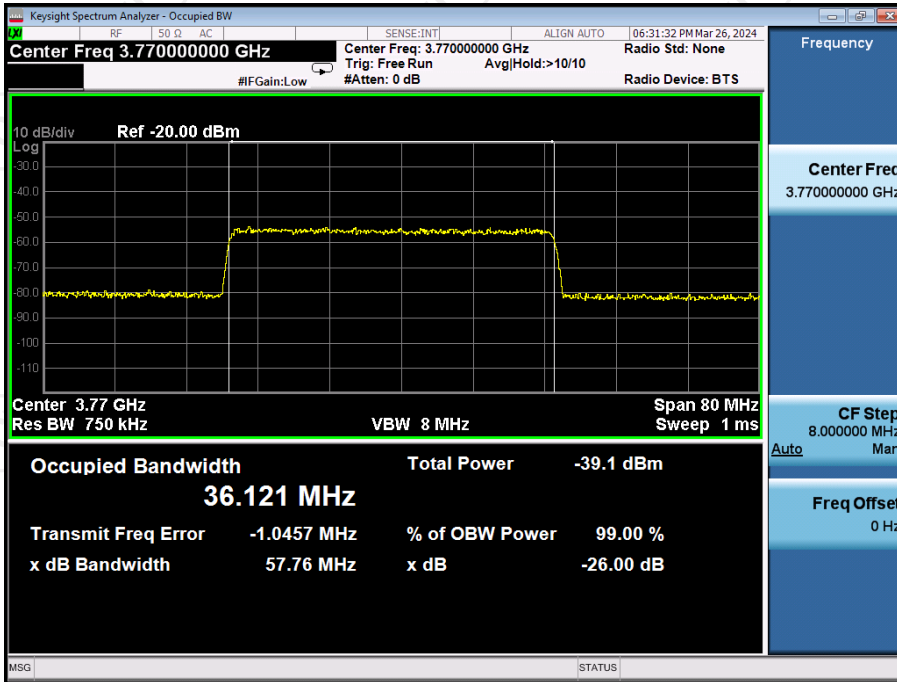
Output 5G NR 40MHz UL @Pre AGC



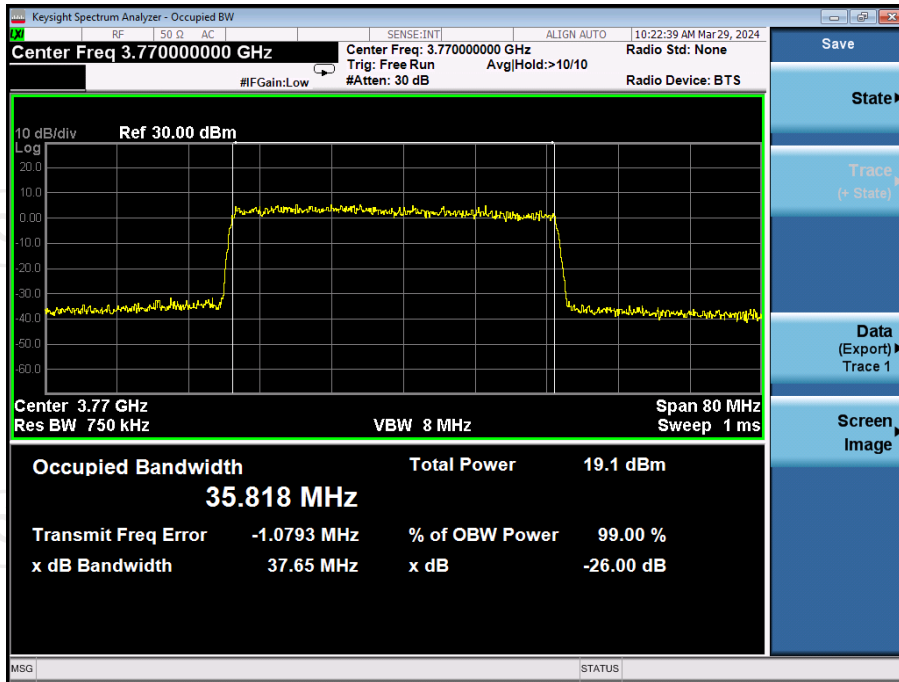
Output 5G NR 40MHz UL @AGC + 3dB



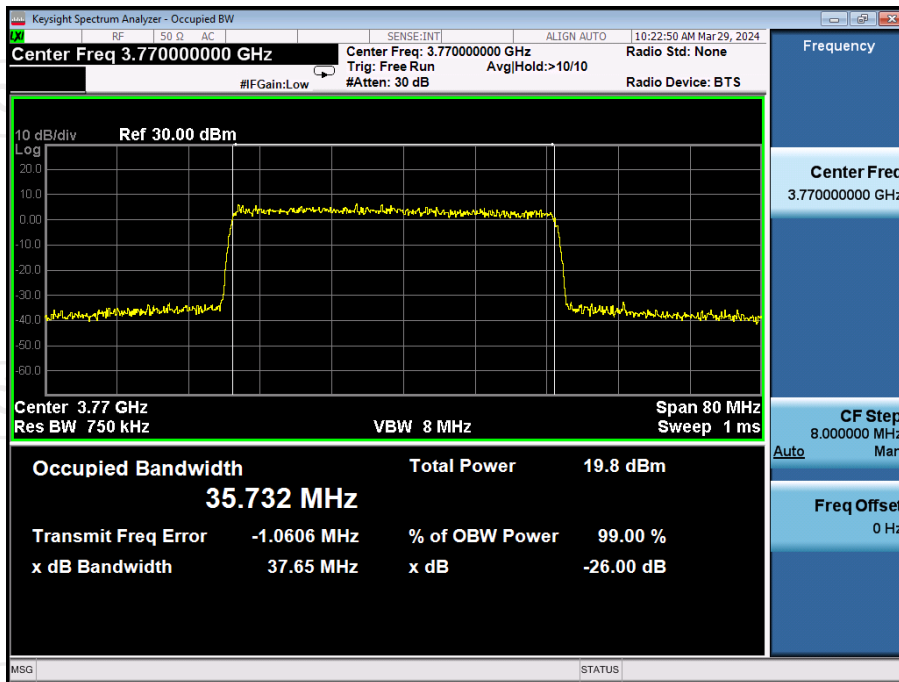
Input 5G NR 40MHz DL



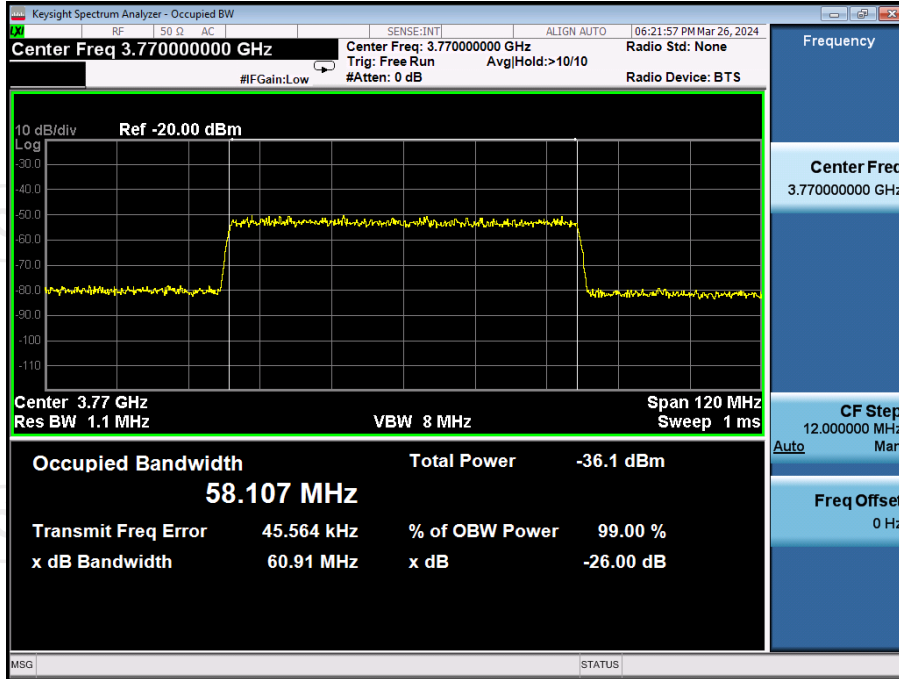
Output 5G NR 40MHz DL @Pre AGC



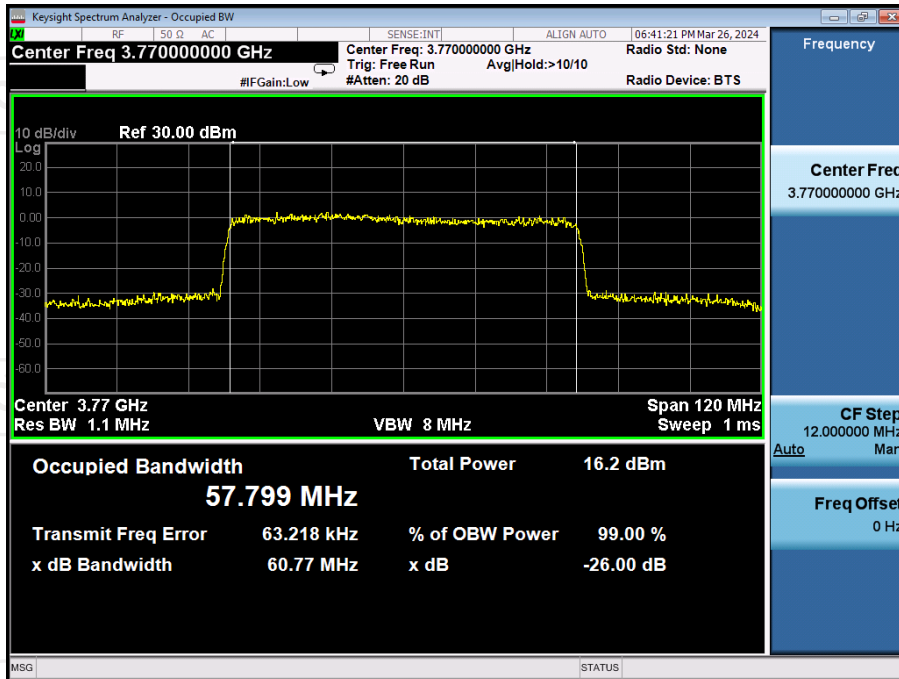
Output 5G NR 40MHz DL @AGC + 3dB



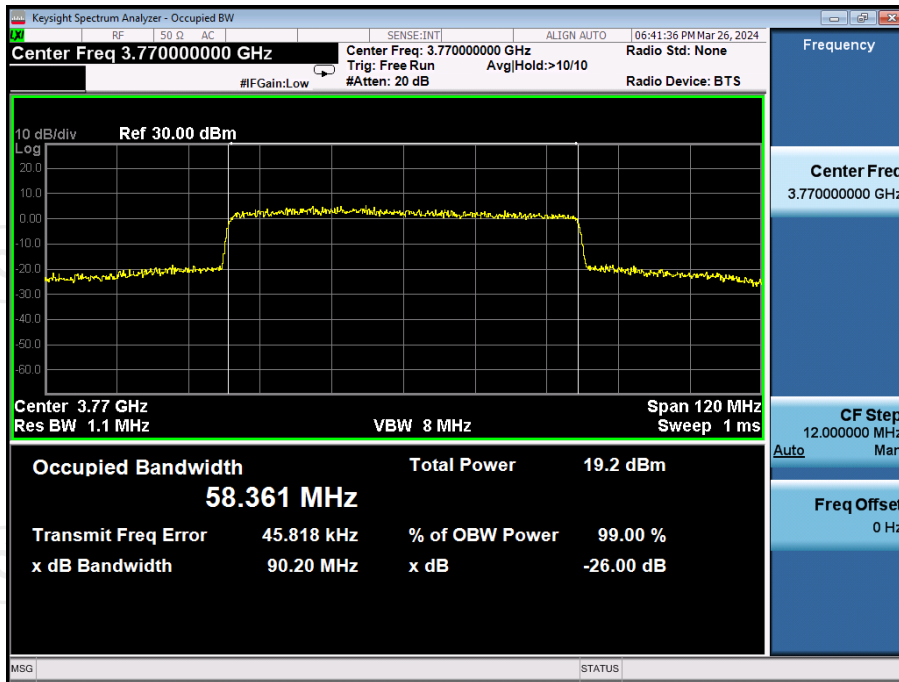
Input 5G NR 60MHz UL



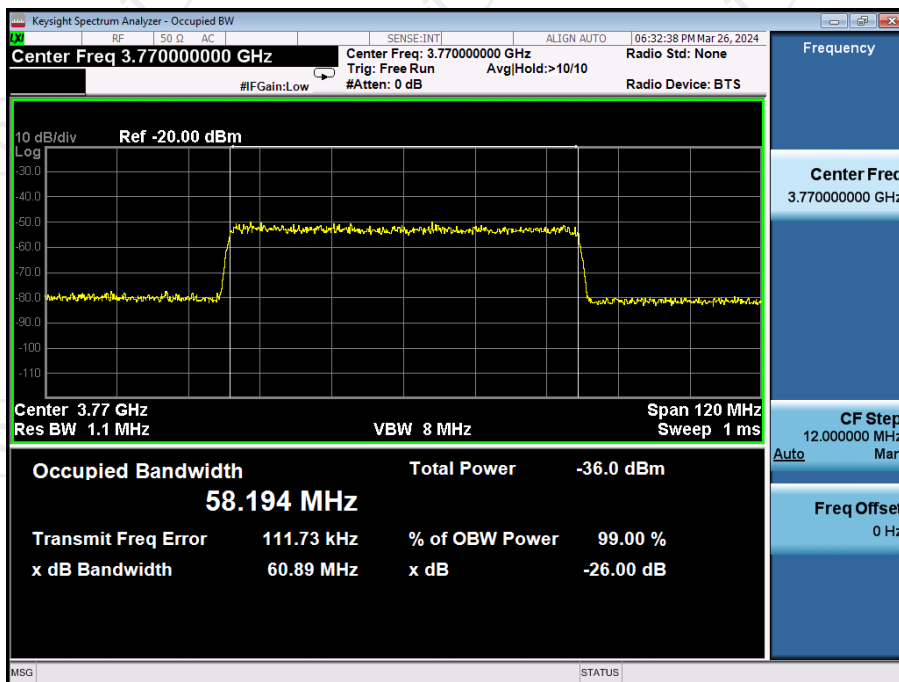
Output 5G NR 60MHz UL @Pre AGC



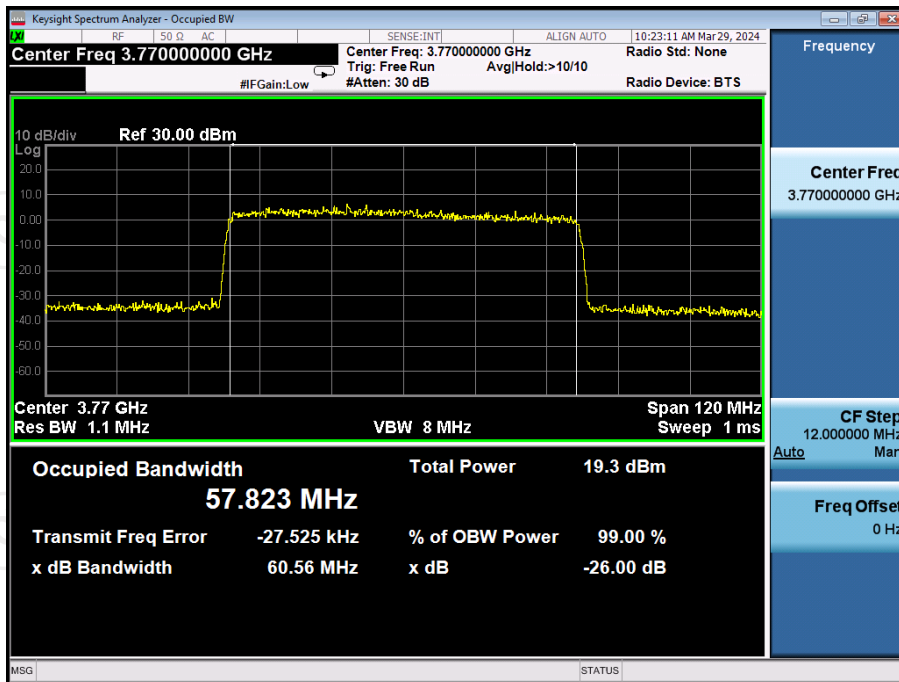
Output 5G NR 60MHz UL @AGC + 3dB



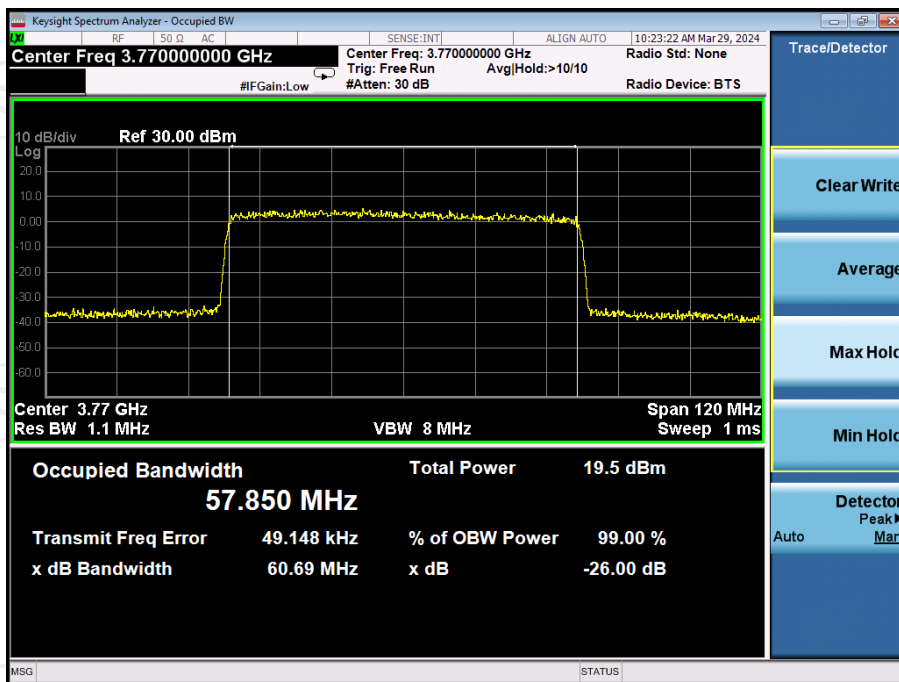
Input 5G NR 60MHz DL



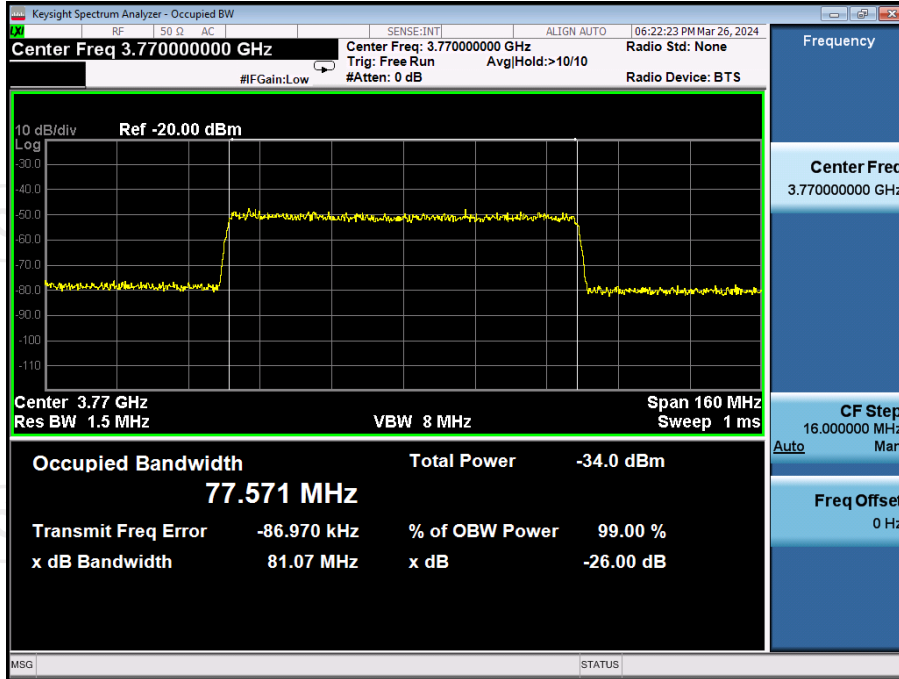
Output 5G NR 60MHz DL @Pre AGC



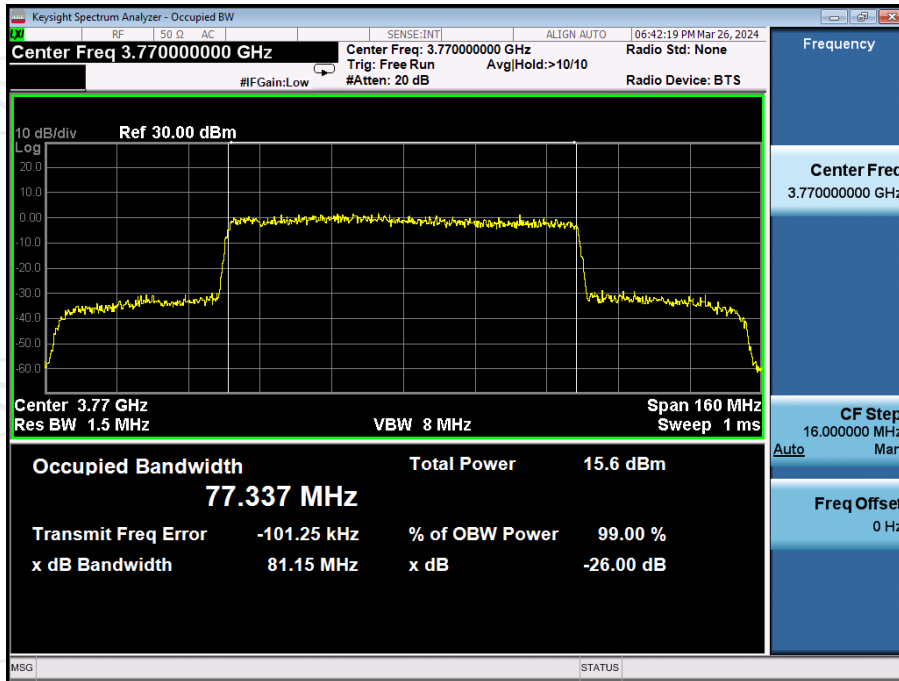
Output 5G NR 60MHz DL @AGC + 3dB



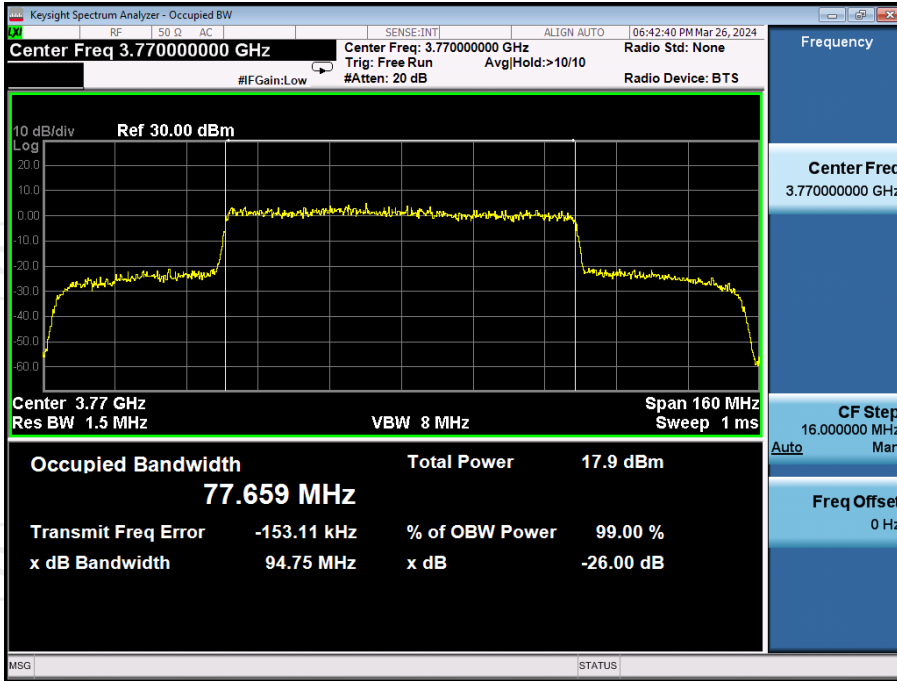
Input 5G NR 80MHz UL



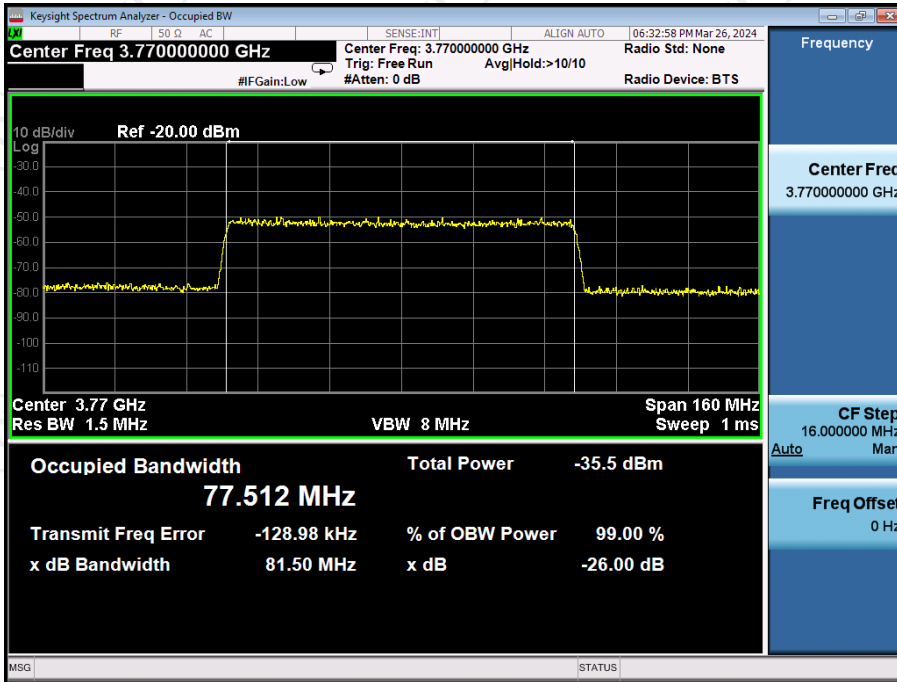
Output 5G NR 80MHz UL @Pre AGC



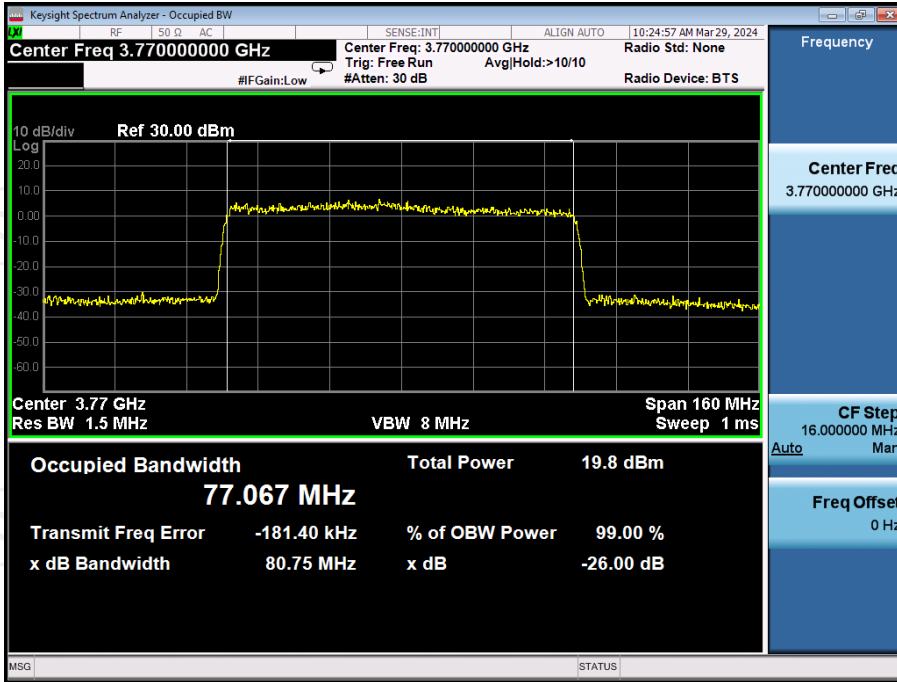
Output 5G NR 80MHz UL @AGC + 3dB



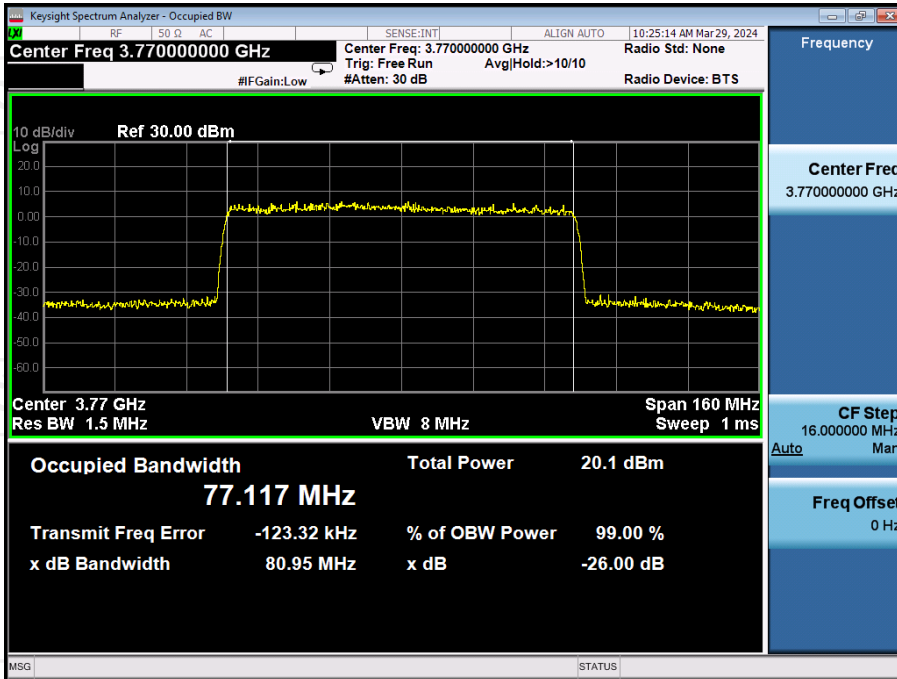
Input 5G NR 80MHz DL



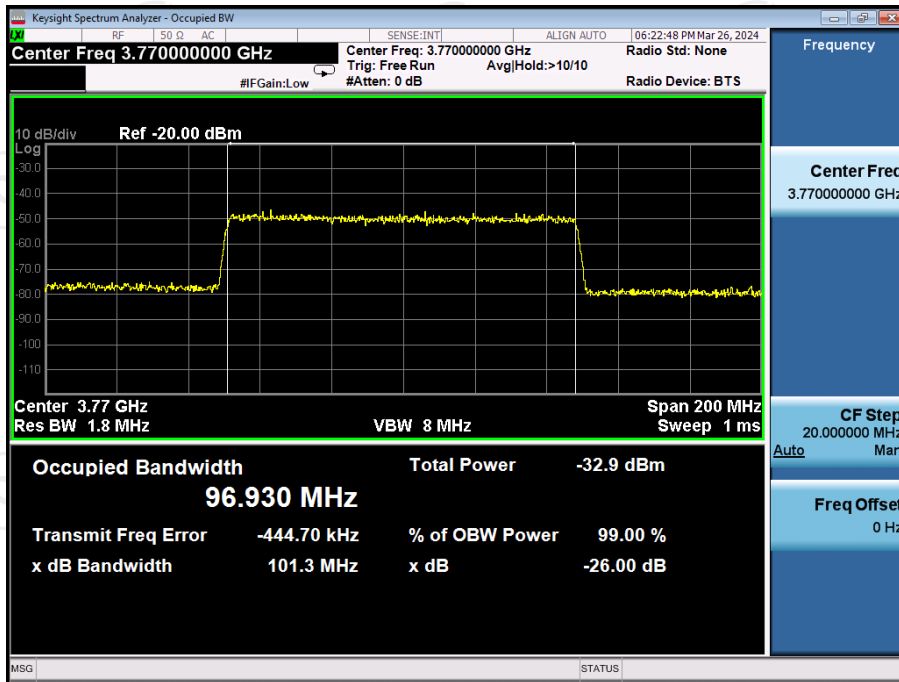
Output 5G NR 80MHz DL @Pre AGC



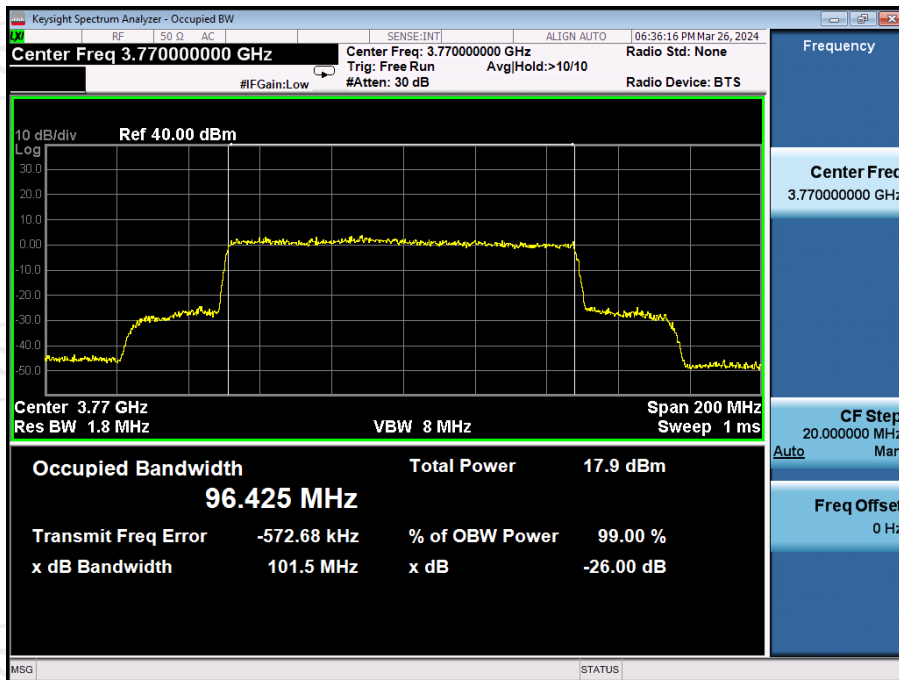
Output 5G NR 80MHz DL @AGC + 3dB



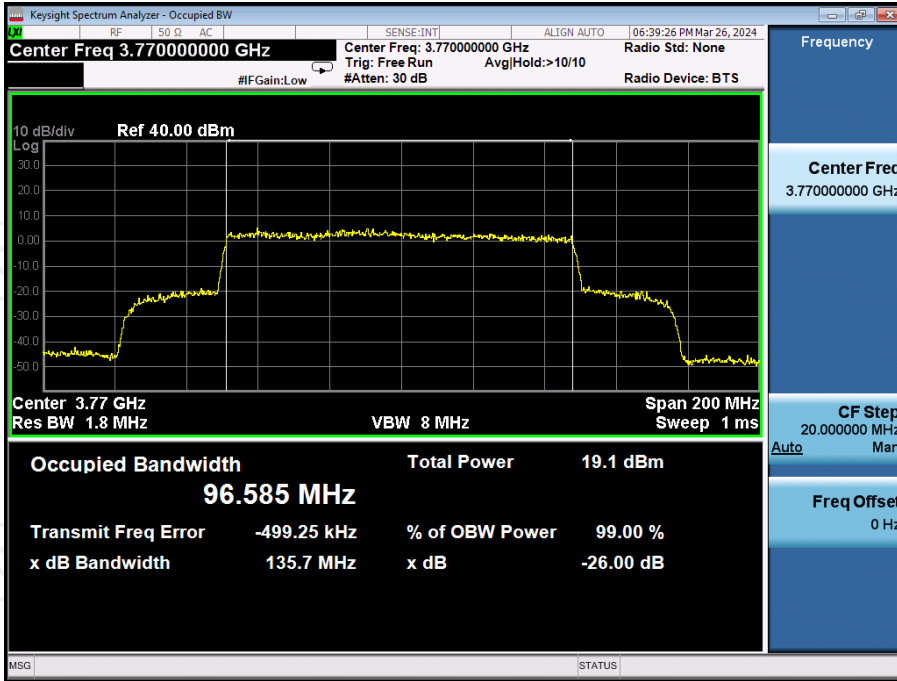
Input 5G NR 100MHz UL



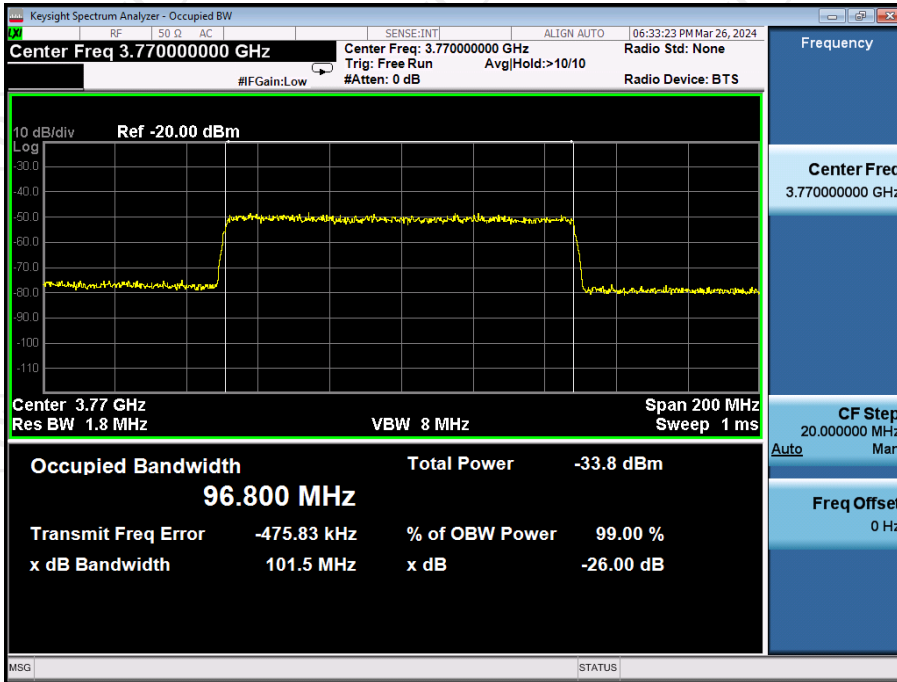
Output 5G NR 100MHz UL @Pre AGC



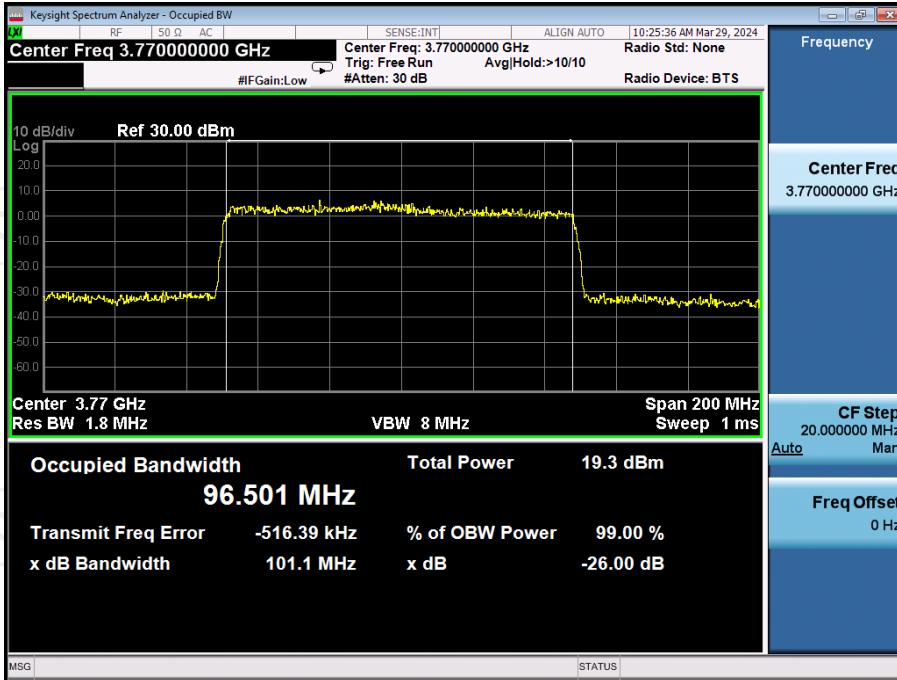
Output 5G NR 100MHz UL @AGC + 3dB



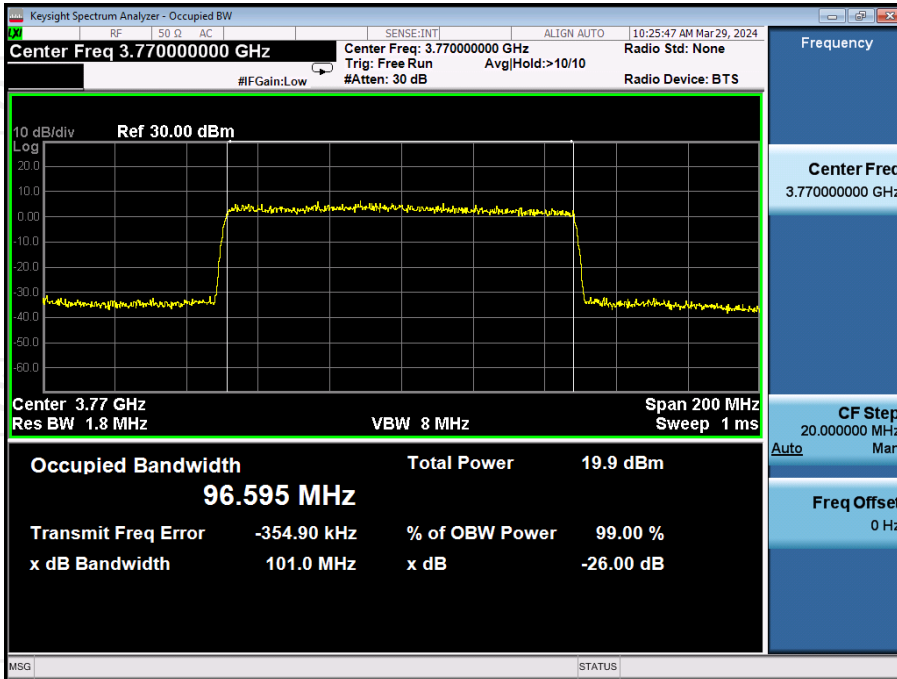
Input 5G NR 100MHz DL



Output 5G NR 100MHz DL @Pre AGC



Output 5G NR 100MHz DL @AGC + 3dB



5.4. Mean output power and amplifier/booster gain

5.4.1. Test Specification

Test Requirement:	FCC Part 2.1046; FCC Part 27.50 (j)(2)
Test Method:	KDB 935210 D05 Indus Booster Basic Meas v01r04
Limit:	E.I.R.P ≤ 1640W/MHz
Test Setup:	<pre> graph LR SG[Signal Generator] --> EUT[EUT] EUT --> RA[RF Attenuator (if required)] RA --> SA[Spectrum Analyzer] </pre>
Test Procedure:	<p>a) Connect a signal generator to the input of the EUT.</p> <p>b) Configure to generate the AWGN (broadband) test signal.</p> <p>c) The frequency of the signal generator shall be set to the frequency f_0 as determined from 3.3.</p> <p>d) Connect a spectrum analyzer or power meter to the output of the EUT using appropriate attenuation as necessary.</p> <p>e) Set the signal generator output power to a level that produces an EUT output level that is just below the AGC threshold (see 3.2), but not more than 0.5 dB below.</p> <p>f) Measure and record the output power of the EUT; use ANSI C63.26-2015 subclause 5.2.4.4.1, for power measurement.</p> <p>g) Remove the EUT from the measurement setup. Using the same signal generator settings, repeat the power measurement at the signal generator port, which was used as the input signal to the EUT, and record as the input power. EUT gain may be calculated as described in 3.5.5.</p> <p>h) Repeat steps f) and g) with input signal amplitude set to 3 dB above the AGC threshold level.</p> <p>i) Repeat steps e) to h) with the narrowband test signal.</p> <p>j) Repeat steps e) to i) for all frequency bands authorized for use by the EUT.</p>
Test Result:	PASS

5.4.2. Test Instruments

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182B	MY53052214	Jun. 29, 2023	Jun. 28, 2024
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jun. 29, 2023	Jun. 28, 2024
Attenuator	50FP-006-H3	JFW	907763	/	/

5.4.3. Test Data

Input/output Power and Gain

Path 1

Operation Frequency Band (MHz)	Signal Type	Input Power @Pre AGC (dBm)	Output Power (dBm)		Gain @Pre AGC	
			Pre AGC	AGC+3dB		
Full-Band (3700MHz -3980MHz)	Uplink	NR 20MHz	-49.05	30.97	31.39	80.02
		NR 40MHz	-49.10	31.33	30.90	80.43
		NR 60MHz	-49.22	30.75	31.29	79.97
		NR 80MHz	-49.35	30.51	31.14	79.86
		NR 100MHz	-49.43	30.62	30.80	80.05
	Downlink	NR 20MHz	-49.50	31.44	31.43	80.94
		NR 40MHz	-49.55	31.88	32.18	81.43
		NR 60MHz	-49.62	31.38	31.71	81.00
		NR 80MHz	-48.63	31.26	31.76	79.89
		NR 100MHz	-48.65	31.69	32.09	80.34
Sub-Band (3700MHz -3840MHz)	Uplink	NR 20MHz	-47.28	30.49	30.79	77.77
		NR 40MHz	-47.40	30.05	30.46	77.45
		NR 60MHz	-47.55	29.79	30.20	77.34
		NR 80MHz	-47.75	29.50	29.49	77.25
		NR 100MHz	-47.81	29.32	29.82	77.13
	Downlink	NR 20MHz	-46.55	30.72	31.19	77.27
		NR 40MHz	-46.66	29.33	31.83	75.99
		NR 60MHz	-46.84	29.92	31.51	76.76
		NR 80MHz	-46.90	29.73	31.81	76.63
		NR 100MHz	-46.98	30.02	31.54	77.00

Path 2

Operation Frequency Band (MHz)	Signal Type	Input Power @Pre AGC (dBm)	Output Power (dBm)		Gain @Pre AGC	
			Pre AGC	AGC+3dB		
Full-Band (3700MHz -3980MHz)	Uplink	NR 20MHz	-47.36	31.90	31.75	79.26
		NR 40MHz	-47.50	31.68	31.99	79.18
		NR 60MHz	-47.68	31.19	31.67	78.87
		NR 80MHz	-47.88	30.92	31.44	78.80
		NR 100MHz	-48.02	30.65	31.06	78.67
	Downlink	NR 20MHz	-49.92	30.54	30.45	80.46
		NR 40MHz	-49.95	31.50	30.55	81.45
		NR 60MHz	-49.75	31.02	30.72	80.77
		NR 80MHz	-49.62	30.69	30.70	80.31
		NR 100MHz	-50.06	30.79	30.57	80.85
Sub-Band (3700MHz -3840MHz)	Uplink	NR 20MHz	-45.90	30.34	30.59	76.24
		NR 40MHz	-46.10	29.69	30.66	75.79
		NR 60MHz	-46.18	29.30	30.35	75.48
		NR 80MHz	-46.25	29.07	30.01	75.32
		NR 100MHz	-45.80	29.12	29.57	74.92
	Downlink	NR 20MHz	-48.38	30.72	31.07	79.10
		NR 40MHz	-48.47	30.76	30.50	79.23
		NR 60MHz	-47.65	31.13	31.49	78.78
		NR 80MHz	-47.67	30.80	31.15	78.47
		NR 100MHz	-47.72	30.54	30.37	78.26

E.I.R.P Spectral Density

Path 1

Operation Frequency Band (MHz)		Signal Type	Max.Output PSD (dBm/MHz)	Antenna Gain (dBi)	Cable loss (dB)	E.I.R.P (dBm/MHz)	Calculated (W/MHz)	Limit (W/MHz)
Full-Band (3700MHz -3980MHz)	Uplink	NR 20MHz	18.38	20	10	28.38	0.689	1640
		NR 40MHz	15.30	20	10	25.30	0.339	
		NR 60MHz	13.51	20	10	23.51	0.224	
		NR 80MHz	12.11	20	10	22.11	0.163	
		NR 100MHz	10.80	20	10	20.80	0.120	
	Downlink	NR 20MHz	18.43	12	10	20.43	0.110	
		NR 40MHz	16.16	12	10	18.16	0.065	
		NR 60MHz	13.93	12	10	15.93	0.039	
		NR 80MHz	12.73	12	10	14.73	0.030	
		NR 100MHz	12.09	12	10	14.09	0.026	
Sub-Band (3700MHz -3840MHz)	Uplink	NR 20MHz	17.77	20	10	27.77	0.598	1640
		NR 40MHz	14.44	20	10	24.44	0.278	
		NR 60MHz	12.42	20	10	22.42	0.175	
		NR 80MHz	10.47	20	10	20.47	0.111	
		NR 100MHz	9.82	20	10	19.82	0.096	
	Downlink	NR 20MHz	18.18	12	10	20.18	0.104	
		NR 40MHz	15.81	12	10	17.81	0.060	
		NR 60MHz	13.73	12	10	15.73	0.037	
		NR 80MHz	12.78	12	10	14.78	0.030	
		NR 100MHz	11.54	12	10	13.54	0.023	

Path 2

Operation Frequency Band (MHz)		Signal Type	Max.Output PSD (dBm/MHz)	Antenna Gain (dBi)	Cable loss (dB)	E.I.R.P (dBm/MHz)	Calculated (W/MHz)	Limit (W/MHz)
Full-Band (3700MHz -3980MHz)	Uplink	NR 20MHz	18.89	20	10	28.89	0.774	1640
		NR 40MHz	15.98	20	10	25.98	0.396	
		NR 60MHz	13.89	20	10	23.89	0.245	
		NR 80MHz	12.41	20	10	22.41	0.174	
		NR 100MHz	11.06	20	10	21.06	0.128	
	Downlink	NR 20MHz	17.53	12	10	19.53	0.090	
		NR 40MHz	15.48	12	10	17.48	0.056	
		NR 60MHz	13.23	12	10	15.23	0.033	
		NR 80MHz	11.67	12	10	13.67	0.023	
		NR 100MHz	10.79	12	10	12.79	0.019	
Sub-Band (3700MHz -3840MHz)	Uplink	NR 20MHz	17.58	20	10	27.58	0.573	1640
		NR 40MHz	14.64	20	10	24.64	0.291	
		NR 60MHz	12.57	20	10	22.57	0.181	
		NR 80MHz	10.98	20	10	20.98	0.125	
		NR 100MHz	9.57	20	10	19.57	0.091	
	Downlink	NR 20MHz	18.06	12	10	20.06	0.101	
		NR 40MHz	14.74	12	10	16.74	0.047	
		NR 60MHz	13.71	12	10	15.71	0.037	
		NR 80MHz	12.12	12	10	14.12	0.026	
		NR 100MHz	10.54	12	10	12.54	0.018	

Note: dBm/MHz = dBm/Hz+10log(MHz/Hz);
E.I.R.P = Output PSD + Antenna gain – Cable loss.

MIMO E.I.R.P Spectral Density

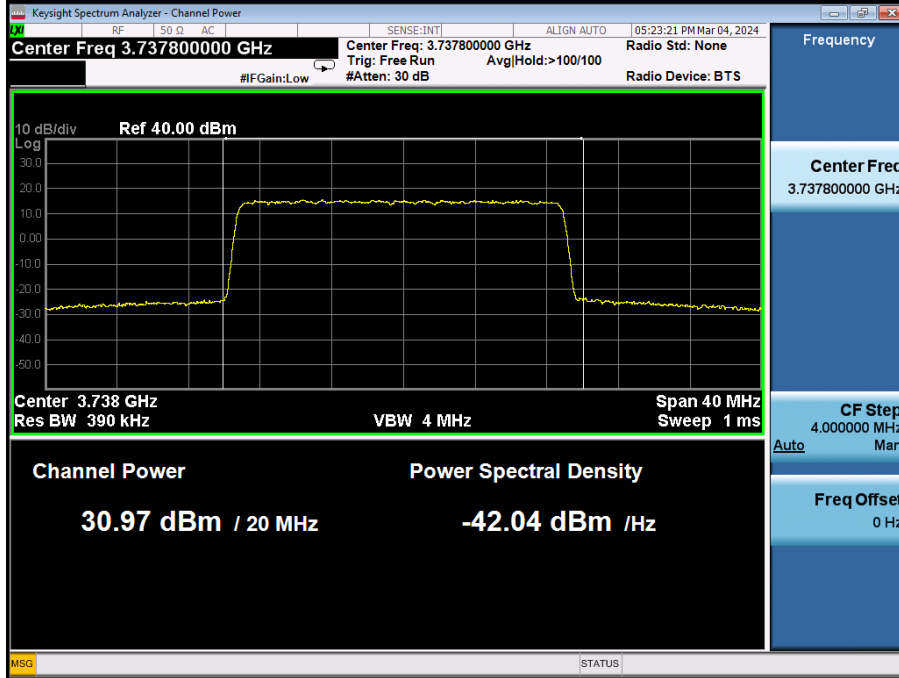
Operation Frequency Band (MHz)		Signal Type	Total PSD (dBm/MHz)	Directional Ant.Gain (dBi)	Cable loss (dB)	E.I.R.P (dBm/MHz)	Calculated (W/MHz)	Limit (W/MHz)
Full-Band (3700MHz -3980MHz)	Uplink	NR 20MHz	21.65	23	10	34.65	2.917	1640
		NR 40MHz	18.66	23	10	31.66	1.466	
		NR 60MHz	16.71	23	10	29.71	0.935	
		NR 80MHz	15.27	23	10	28.27	0.671	
		NR 100MHz	13.94	23	10	26.94	0.494	
	Downlink	NR 20MHz	21.01	15	10	26.01	0.399	
		NR 40MHz	18.84	15	10	23.84	0.242	
		NR 60MHz	16.60	15	10	21.60	0.145	
		NR 80MHz	15.24	15	10	20.24	0.106	
		NR 100MHz	14.50	15	10	19.50	0.089	
Sub-Band (3700MHz -3840MHz)	Uplink	NR 20MHz	20.69	23	10	33.69	2.339	
		NR 40MHz	17.55	23	10	30.55	1.135	
		NR 60MHz	15.51	23	10	28.51	0.710	
		NR 80MHz	13.74	23	10	26.74	0.472	
		NR 100MHz	12.71	23	10	25.71	0.372	
	Downlink	NR 20MHz	21.13	15	10	26.13	0.410	
		NR 40MHz	18.32	15	10	23.32	0.215	
		NR 60MHz	16.73	15	10	21.73	0.149	
		NR 80MHz	15.47	15	10	20.47	0.111	
		NR 100MHz	14.08	15	10	19.08	0.081	

Test Plots

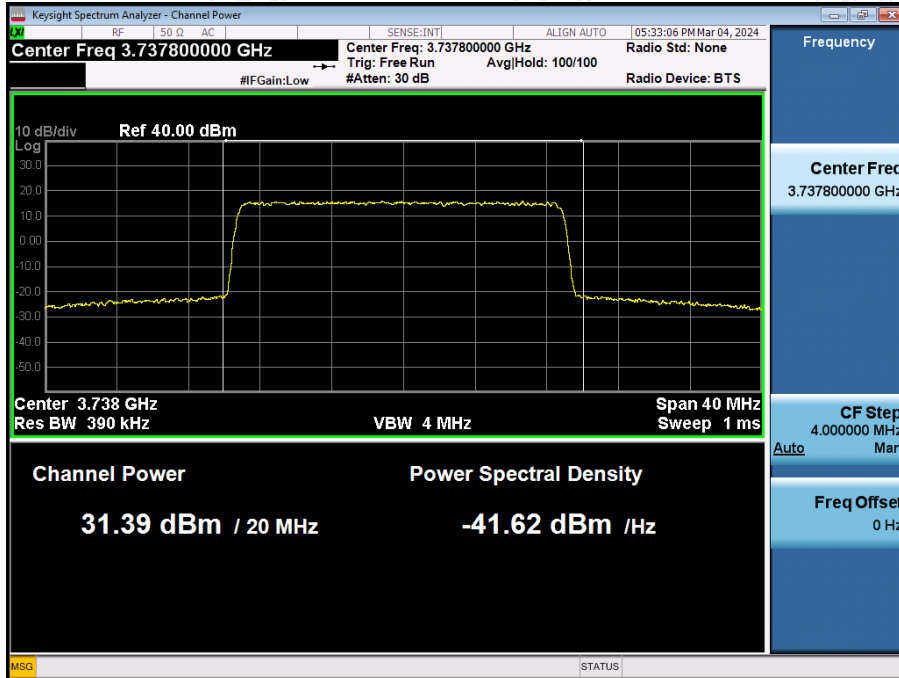
Path 1

Full-Band Mode

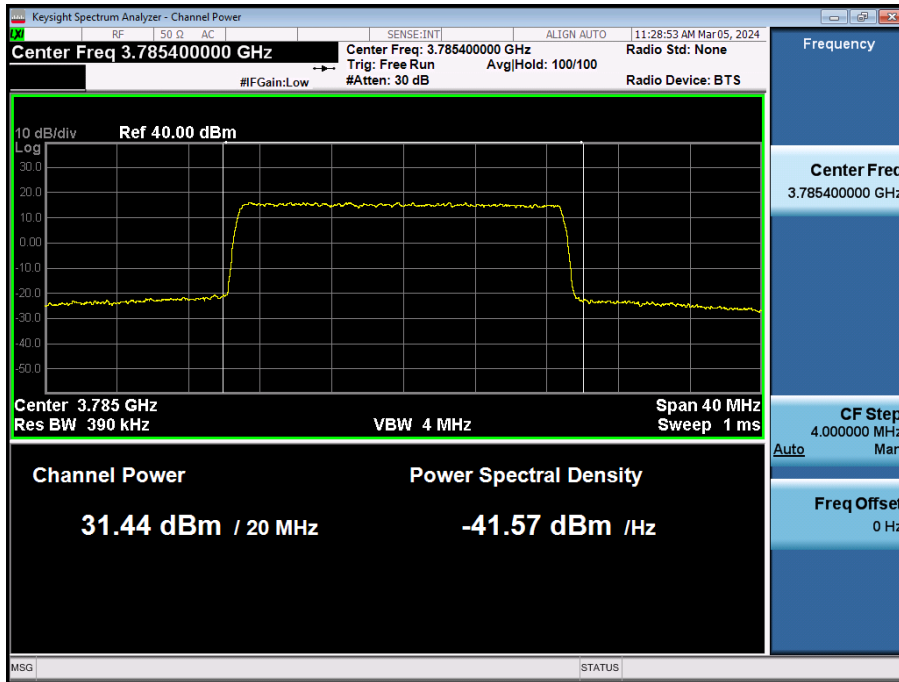
5G NR 20MHz UL Pre AGC



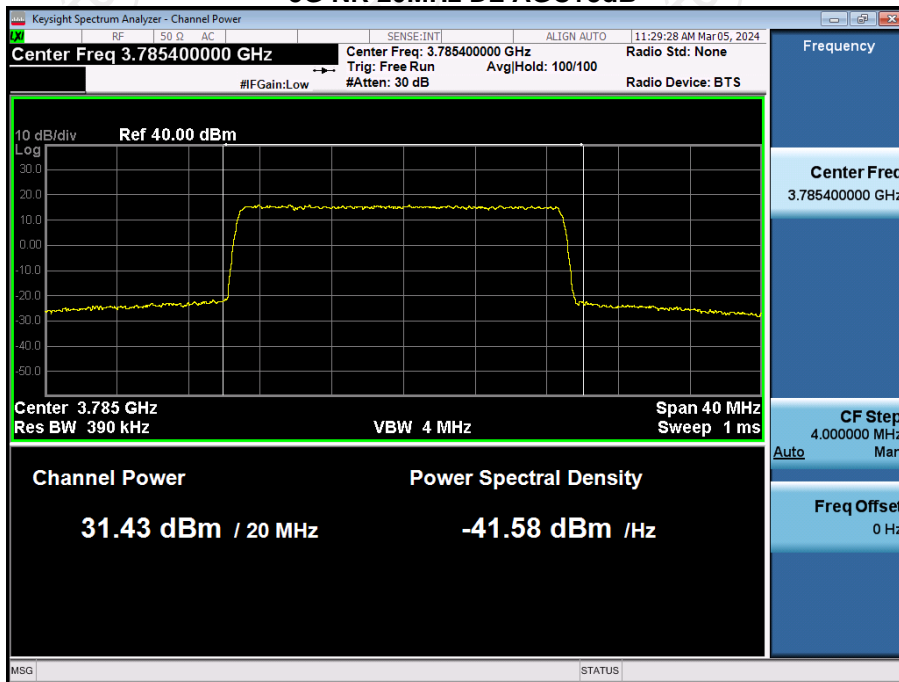
5G NR 20MHz UL AGC+3dB



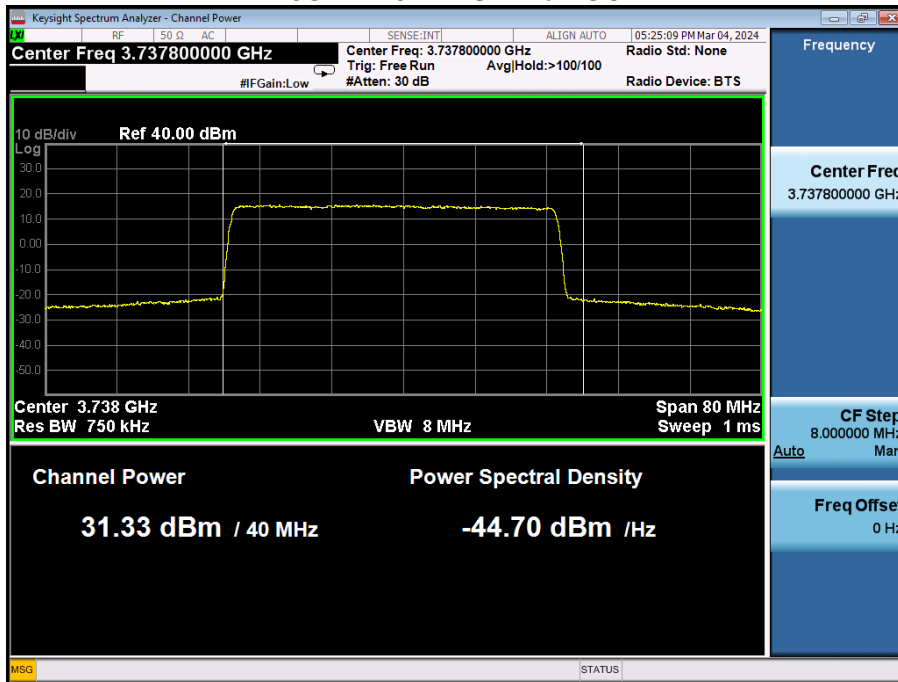
5G NR 20MHz DL Pre AGC



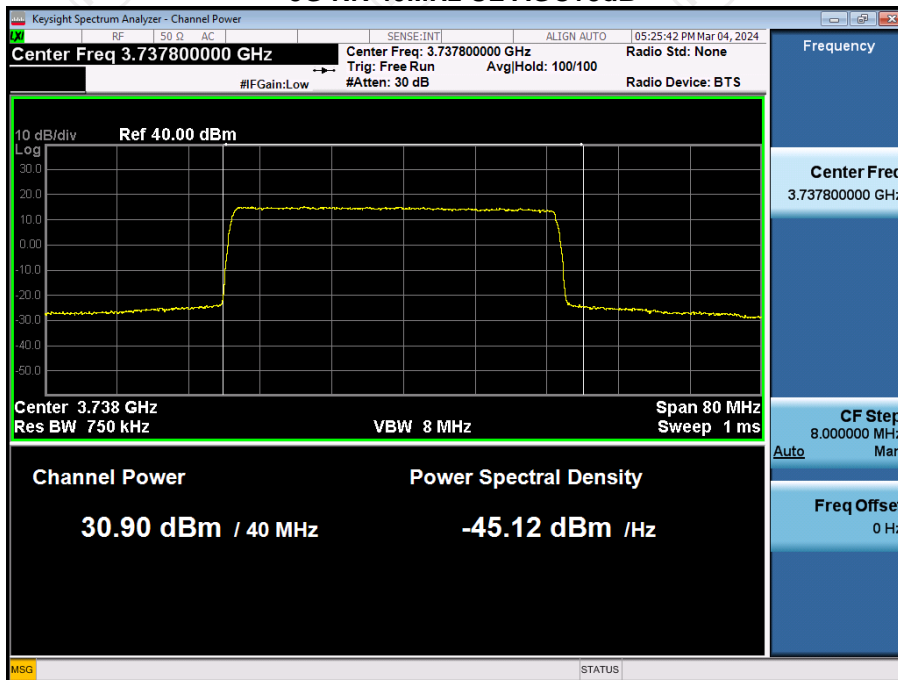
5G NR 20MHz DL AGC+3dB



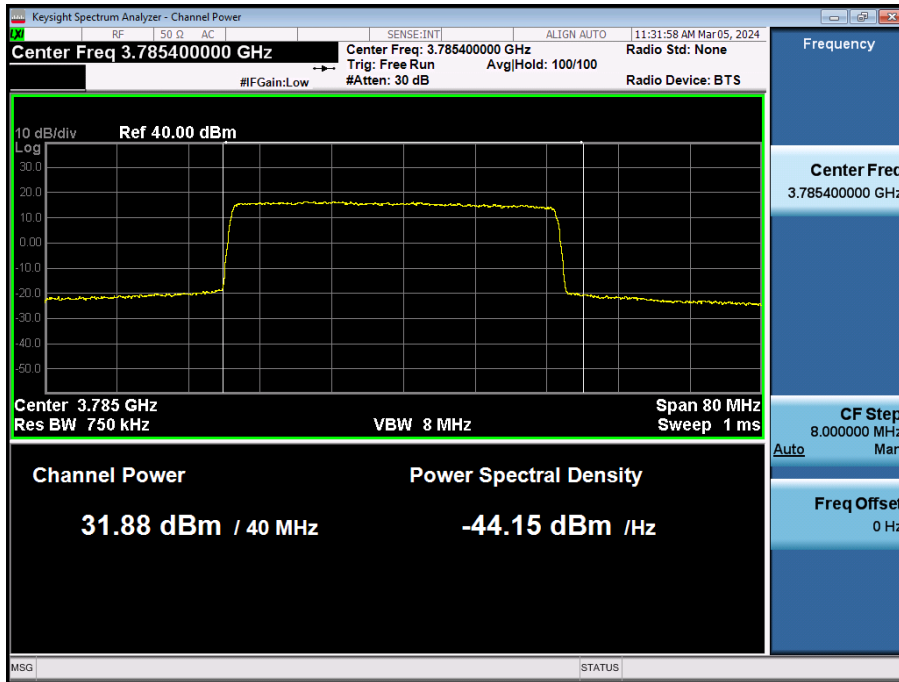
5G NR 40MHz UL Pre AGC



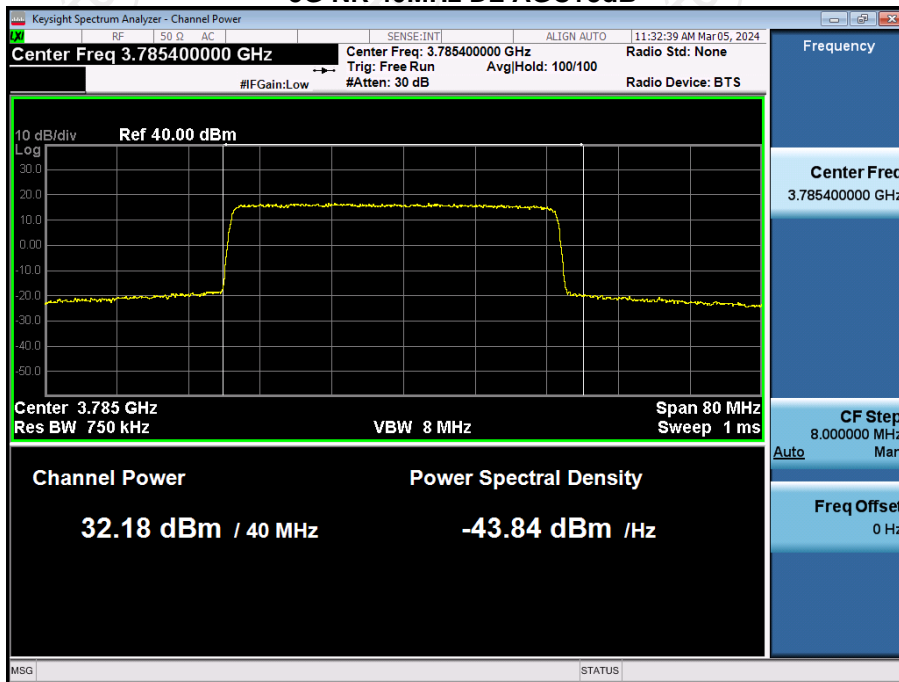
5G NR 40MHz UL AGC+3dB



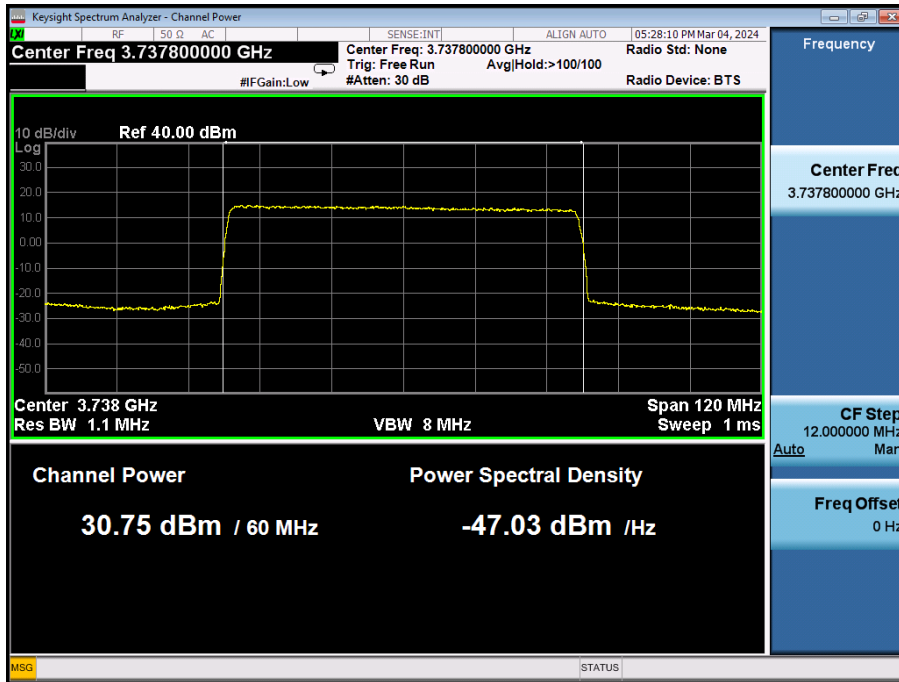
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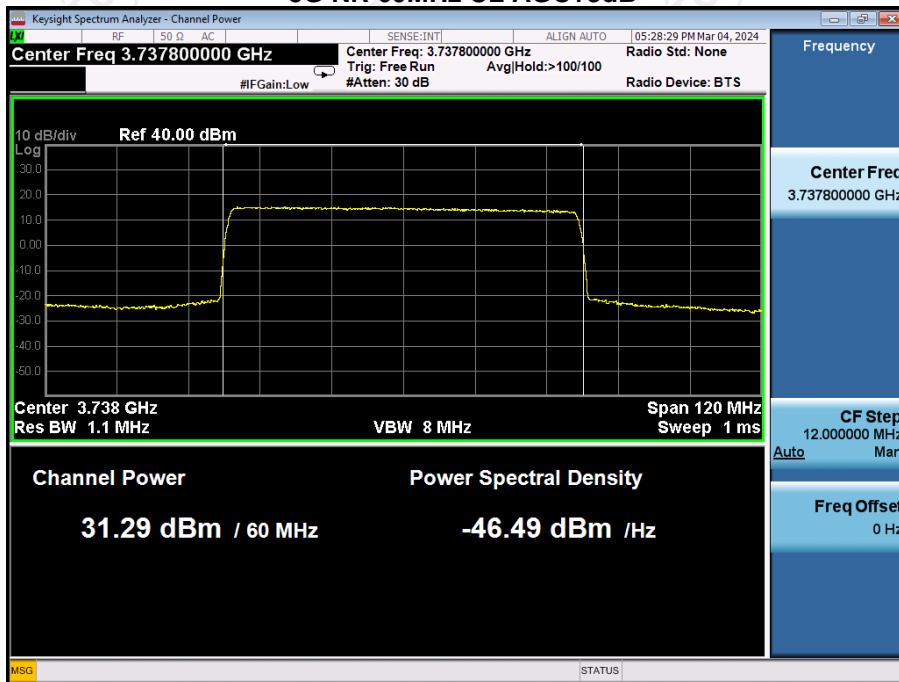
5G NR 40MHz DL AGC+3dB



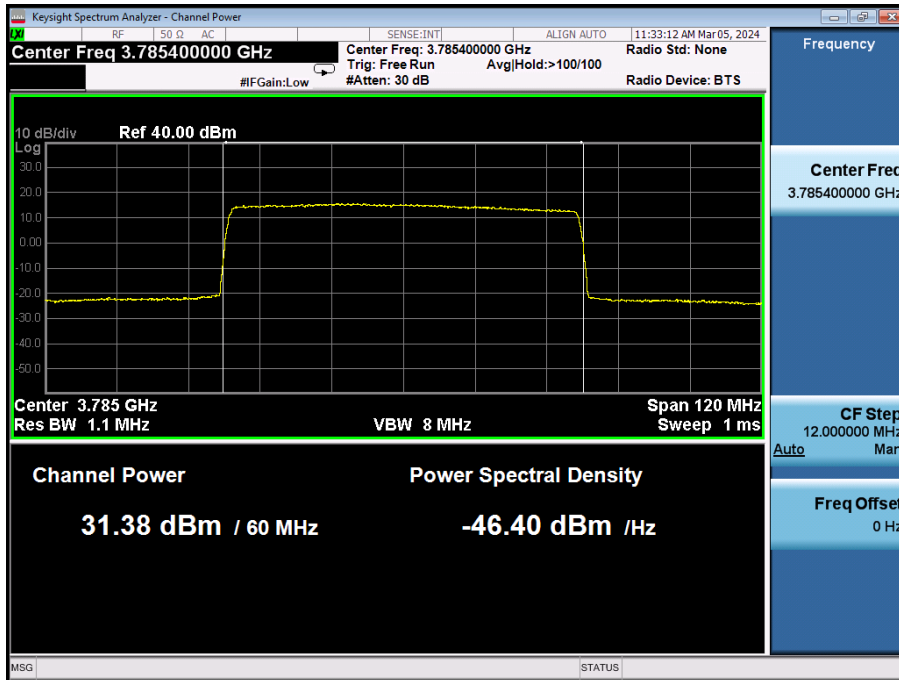
5G NR 60MHz UL Pre AGC



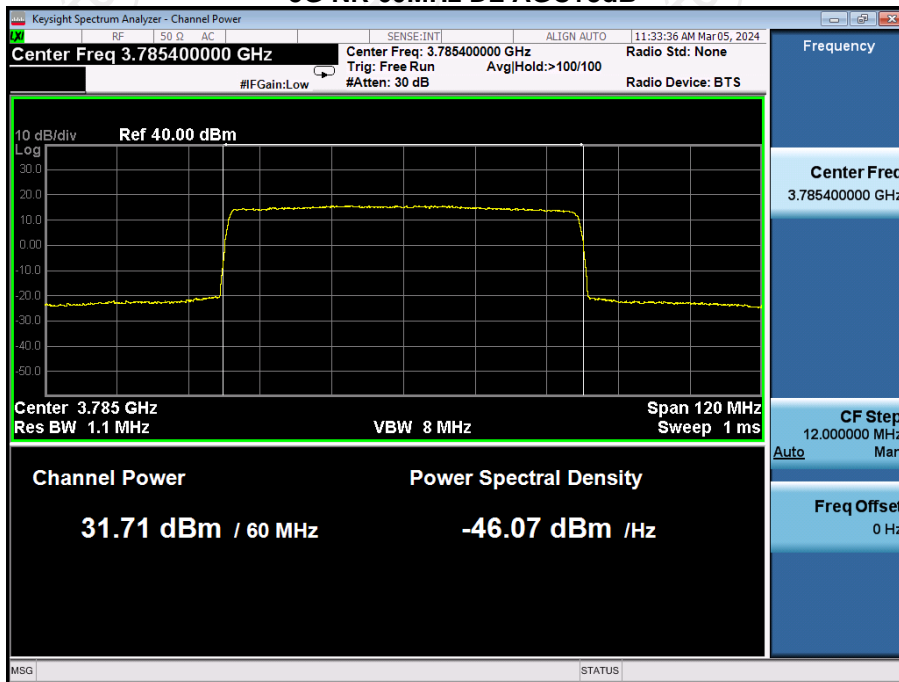
5G NR 60MHz UL AGC+3dB



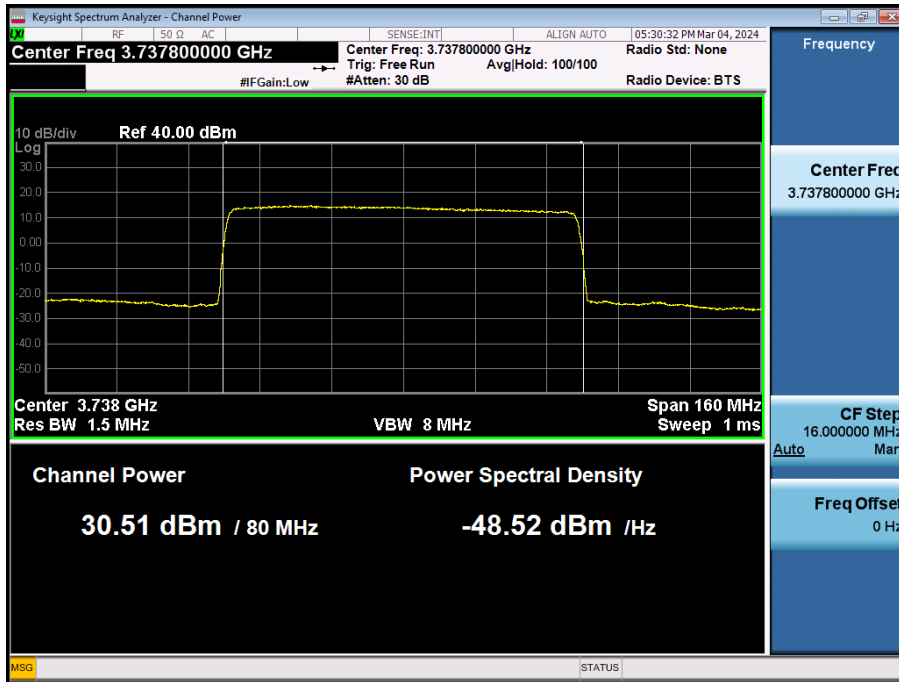
5G NR 60MHz DL Pre AGC



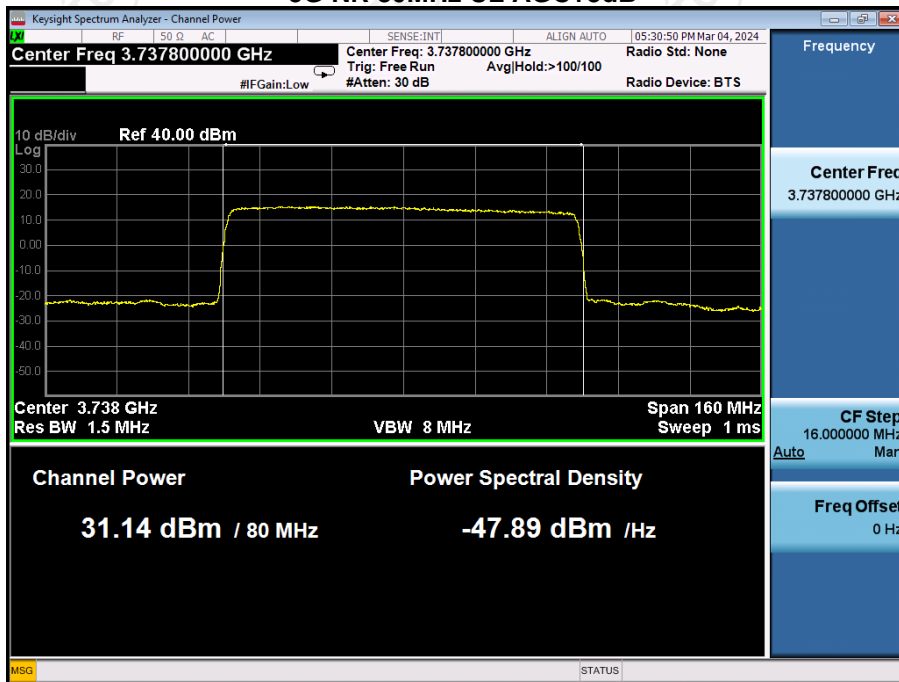
5G NR 60MHz DL AGC+3dB



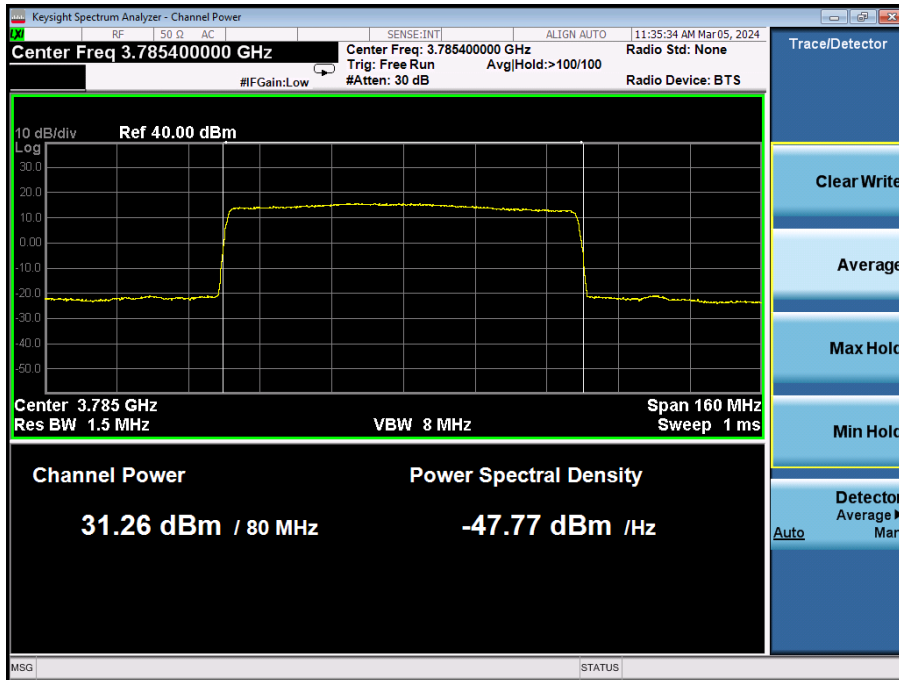
5G NR 80MHz UL Pre AGC



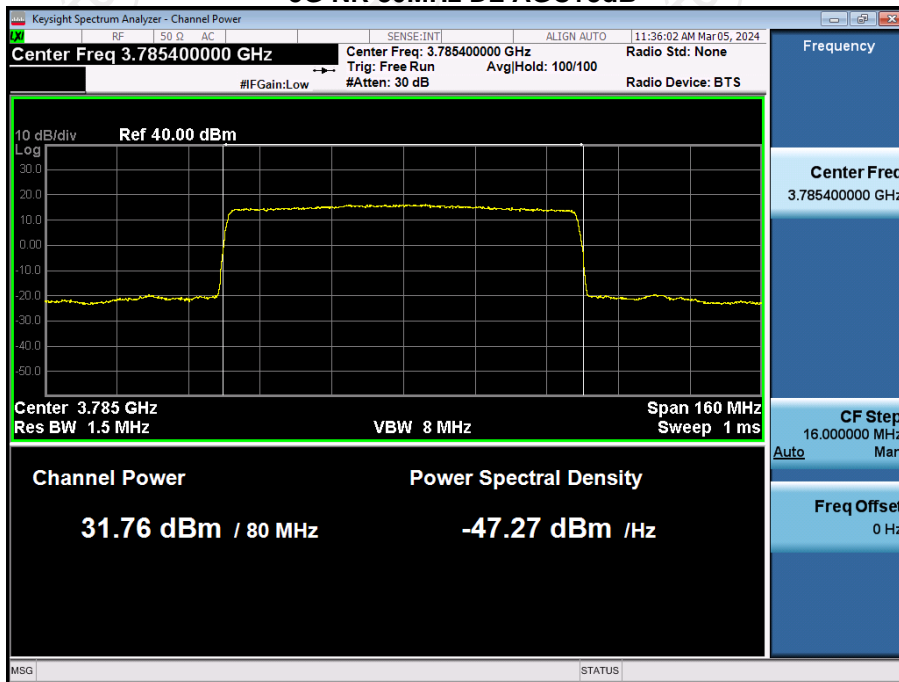
5G NR 80MHz UL AGC+3dB



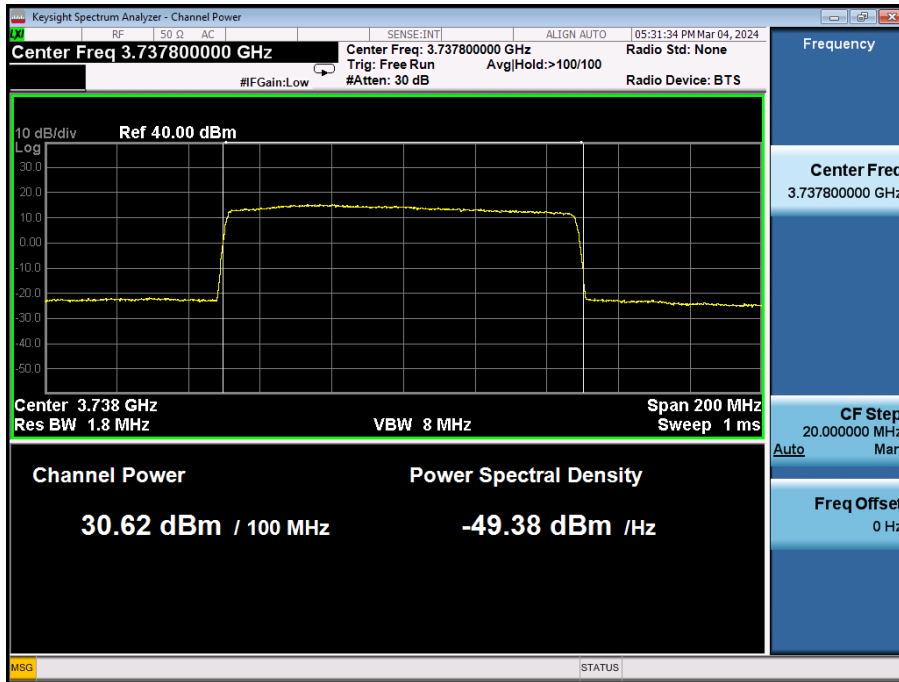
5G NR 80MHz DL Pre AGC



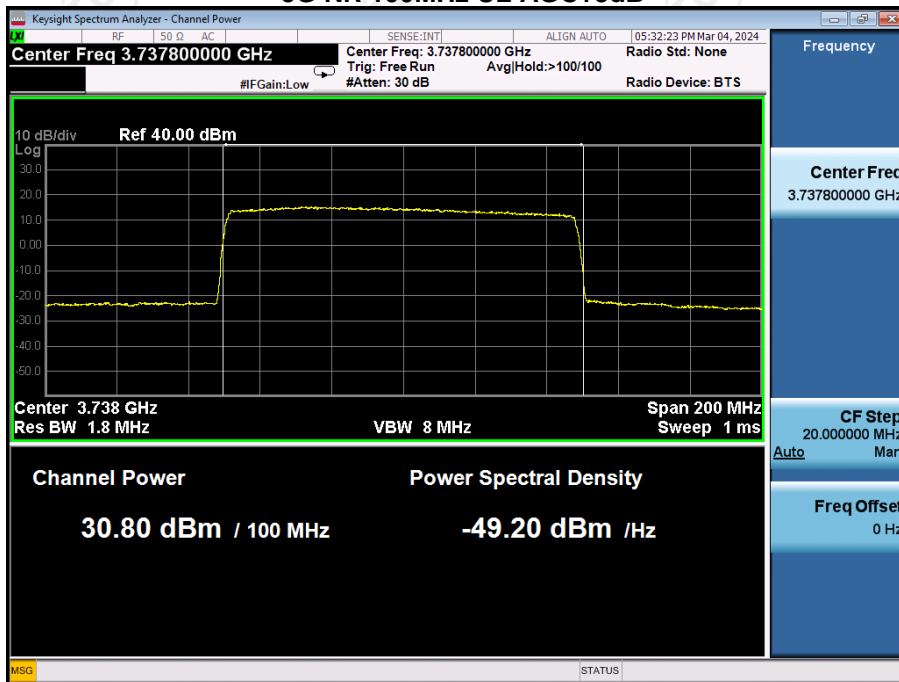
5G NR 80MHz DL AGC+3dB



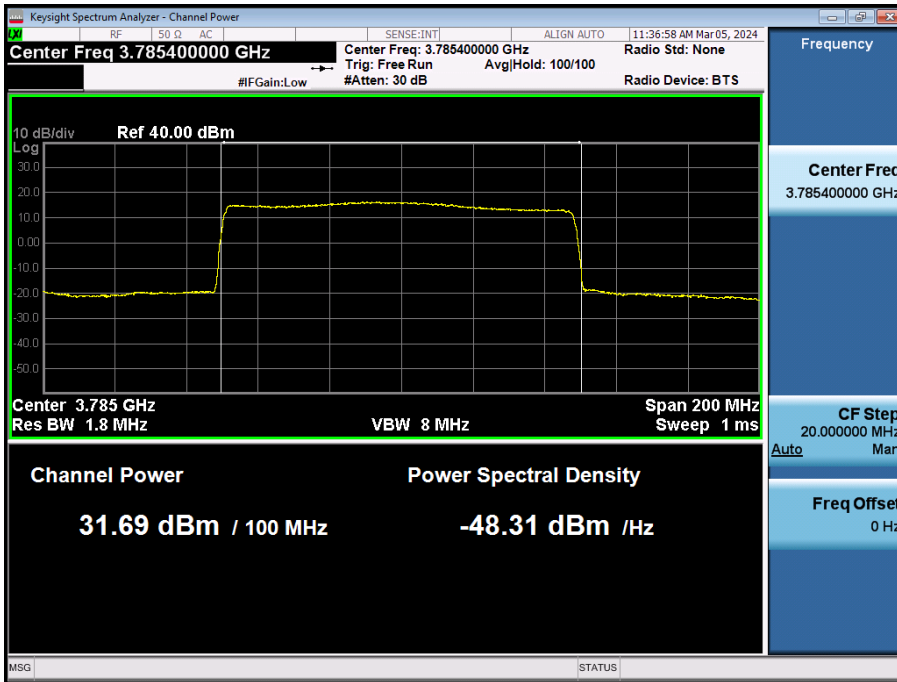
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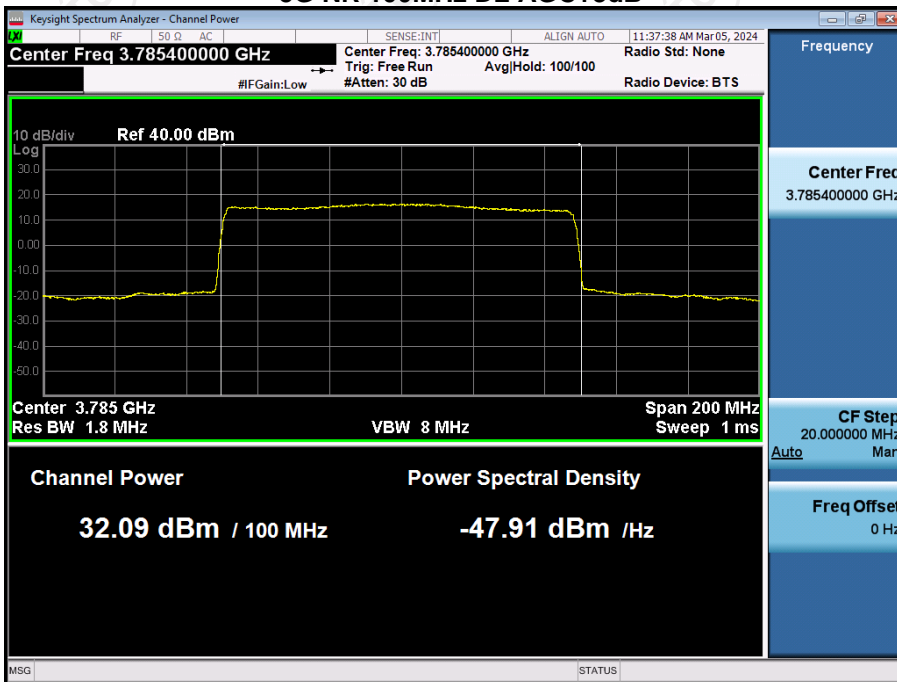
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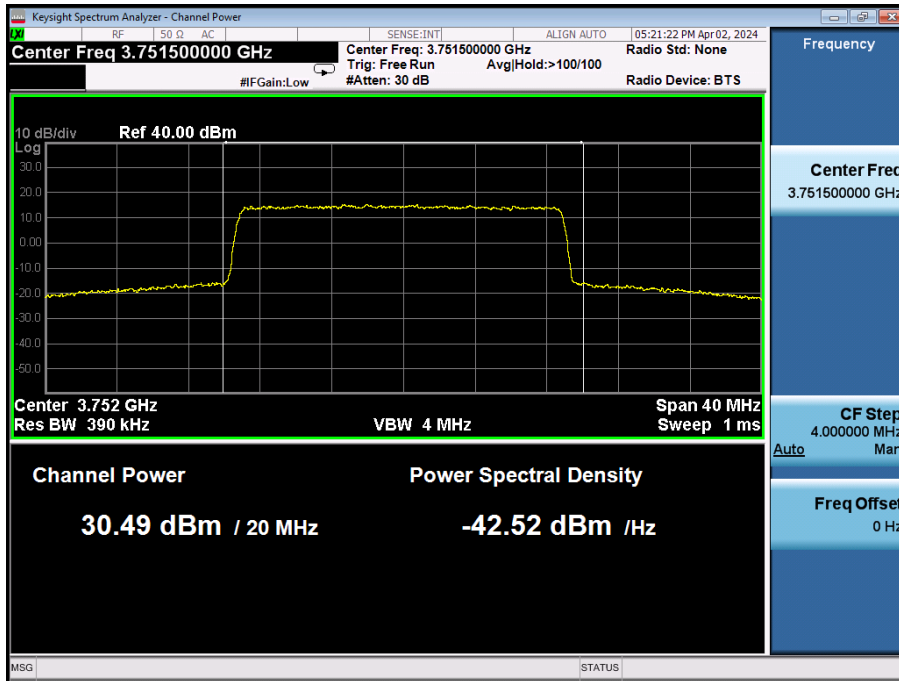


5G NR 100MHz DL AGC+3dB

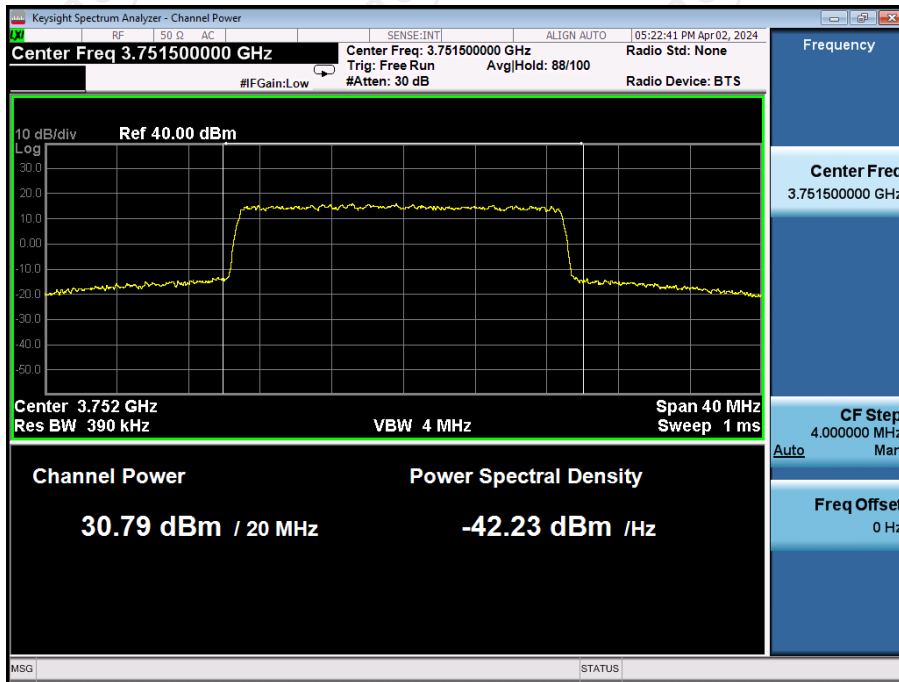


Sub-Band Mode

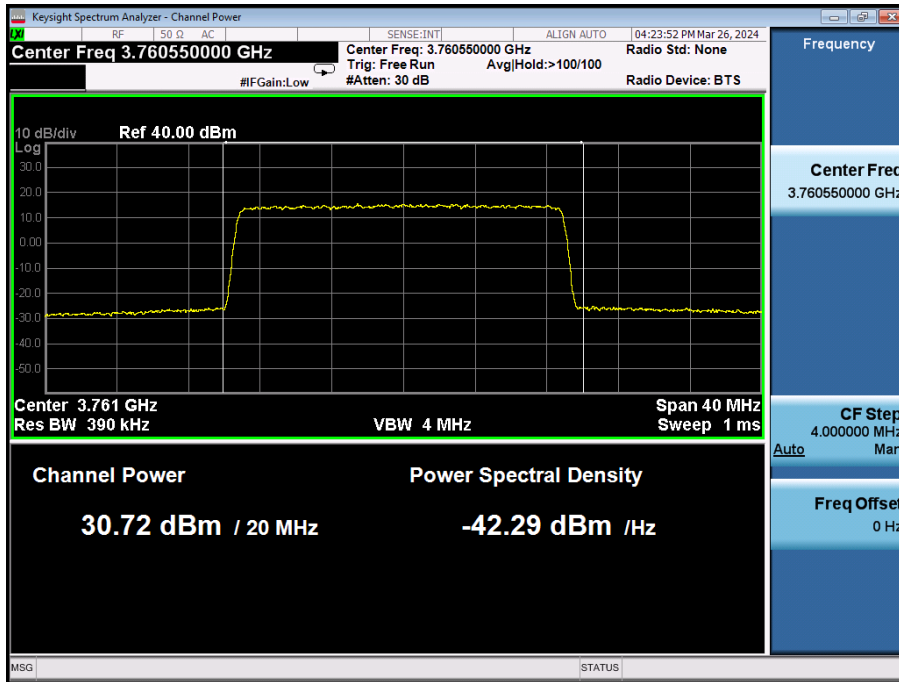
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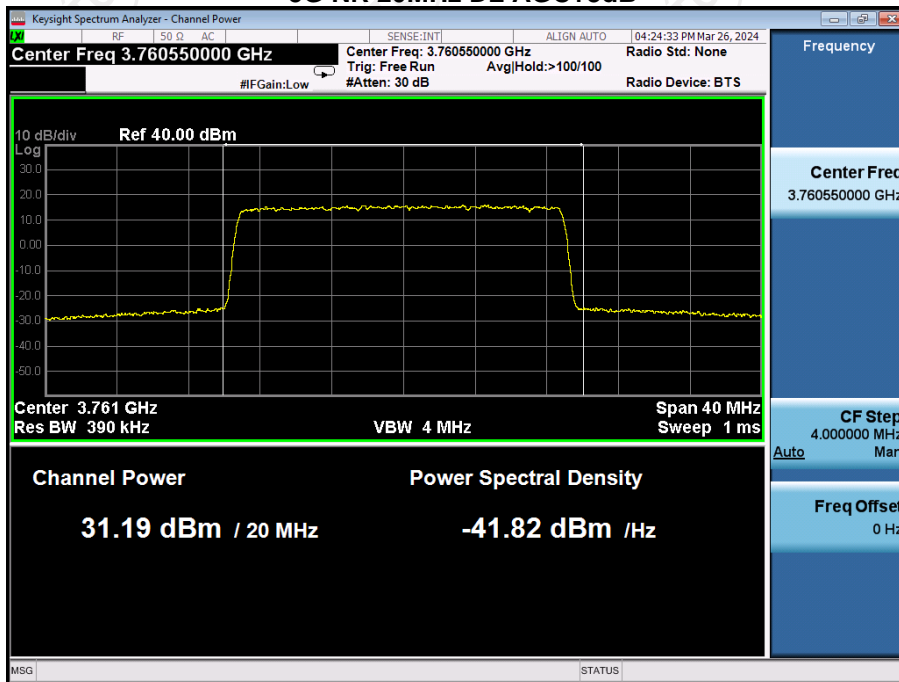
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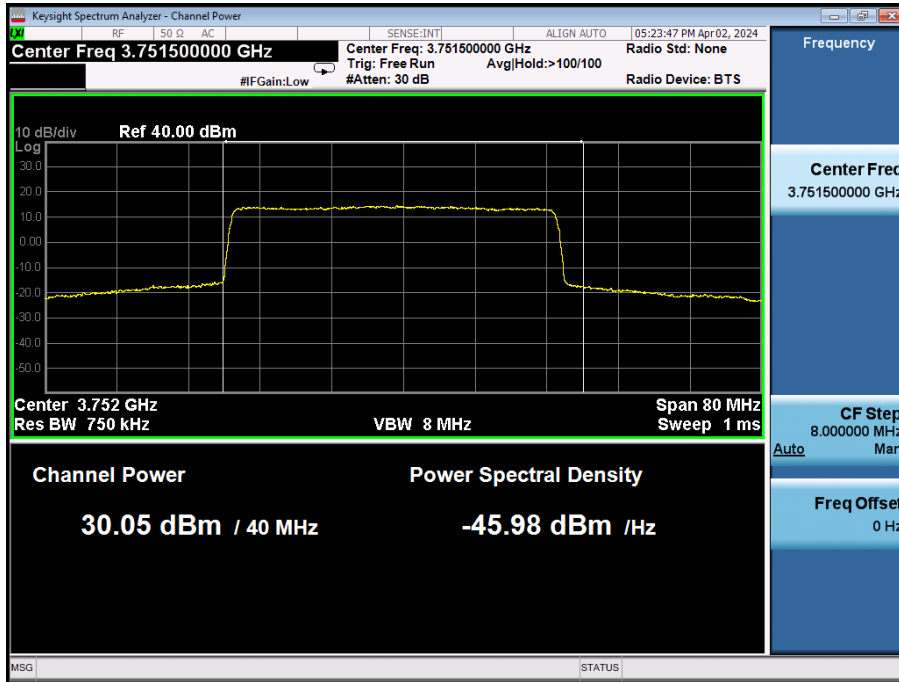
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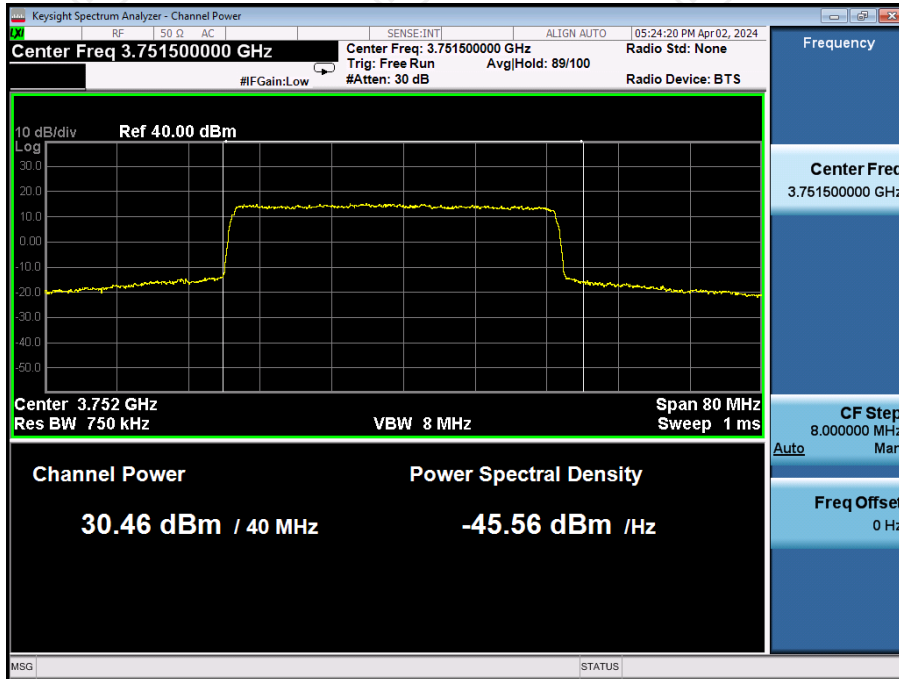
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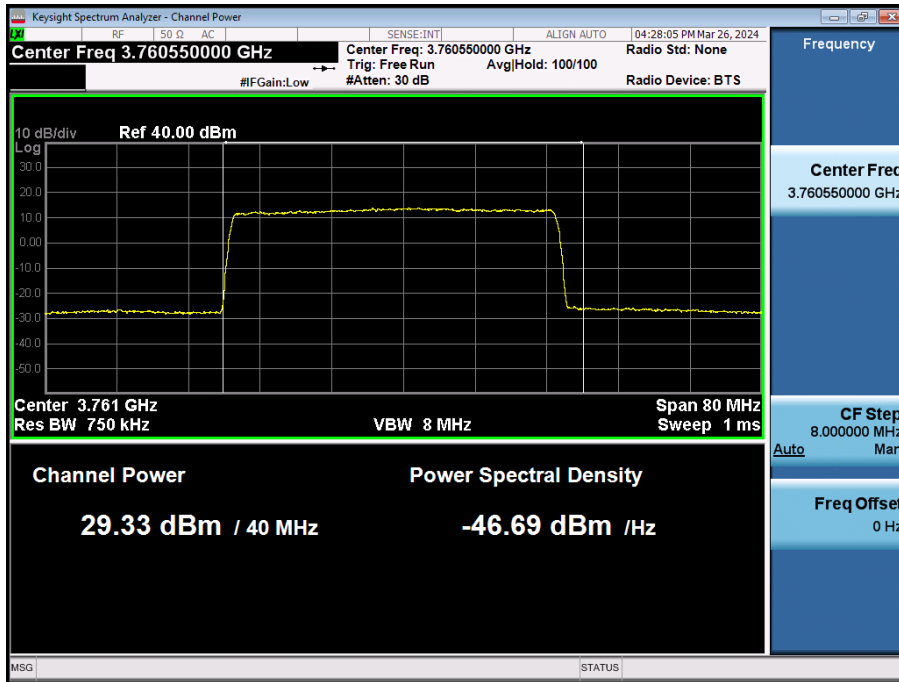
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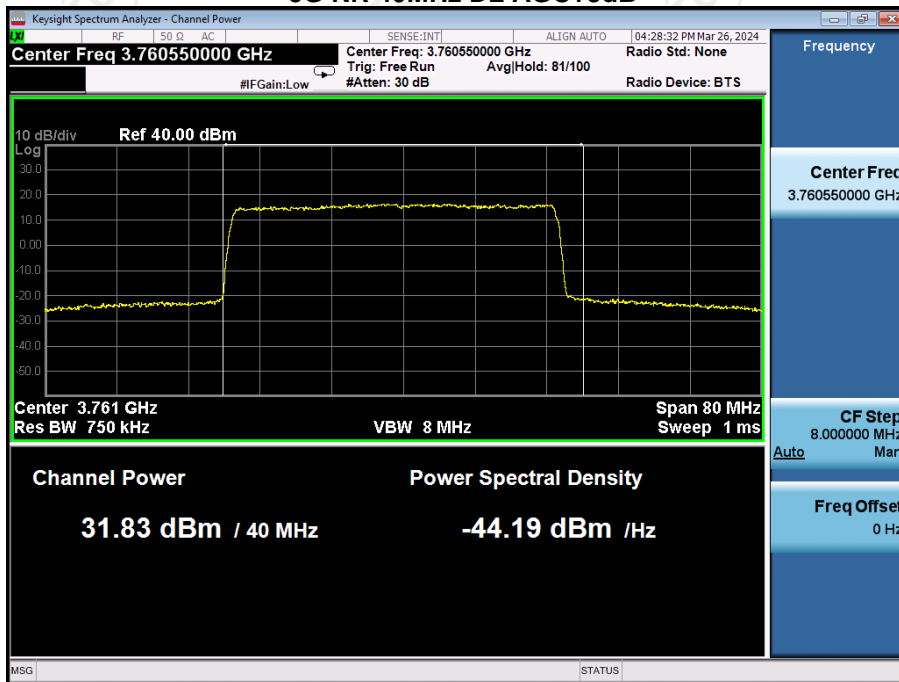
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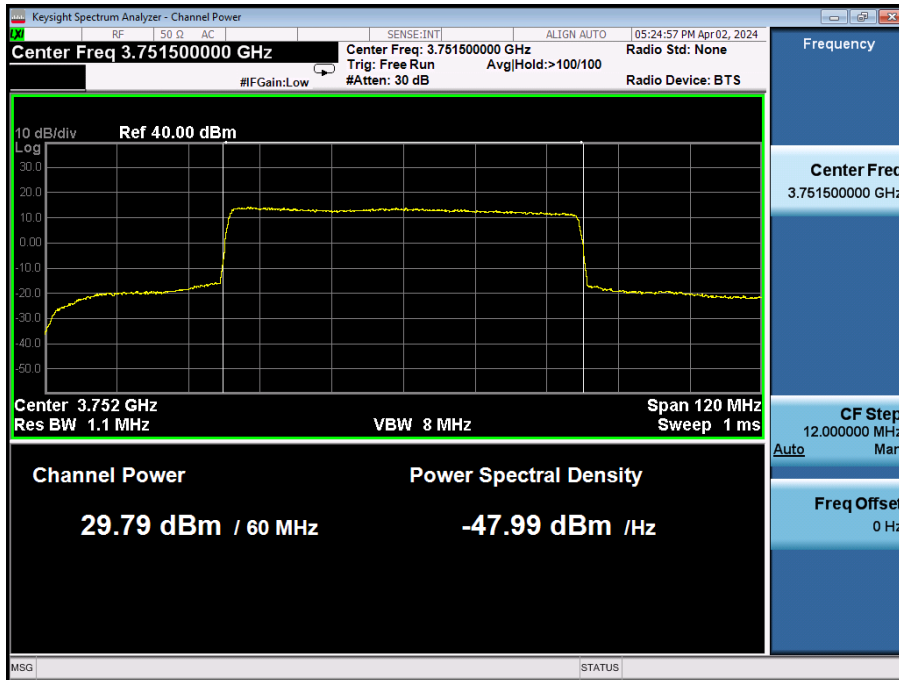
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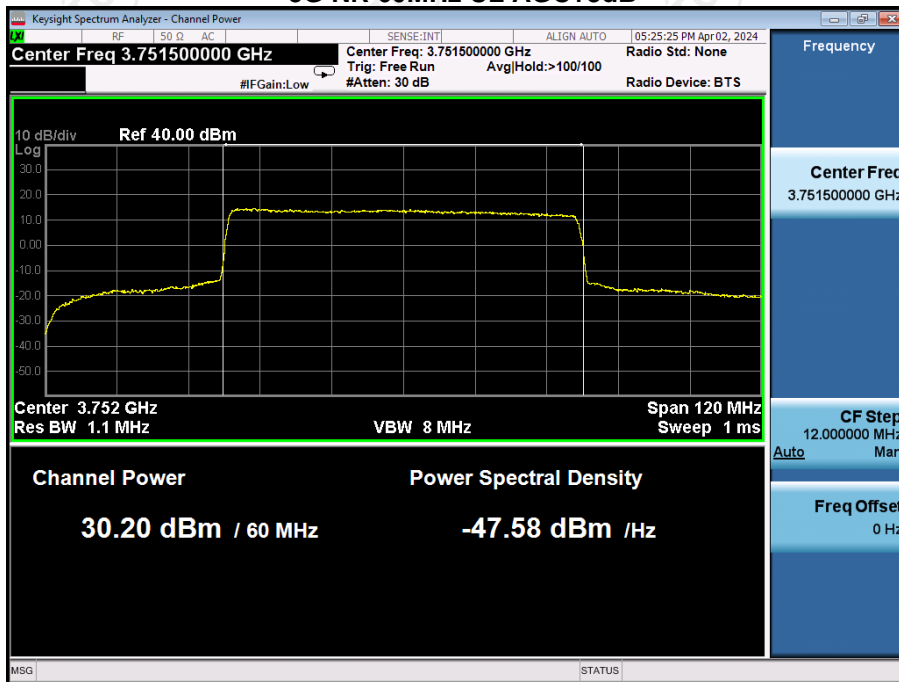
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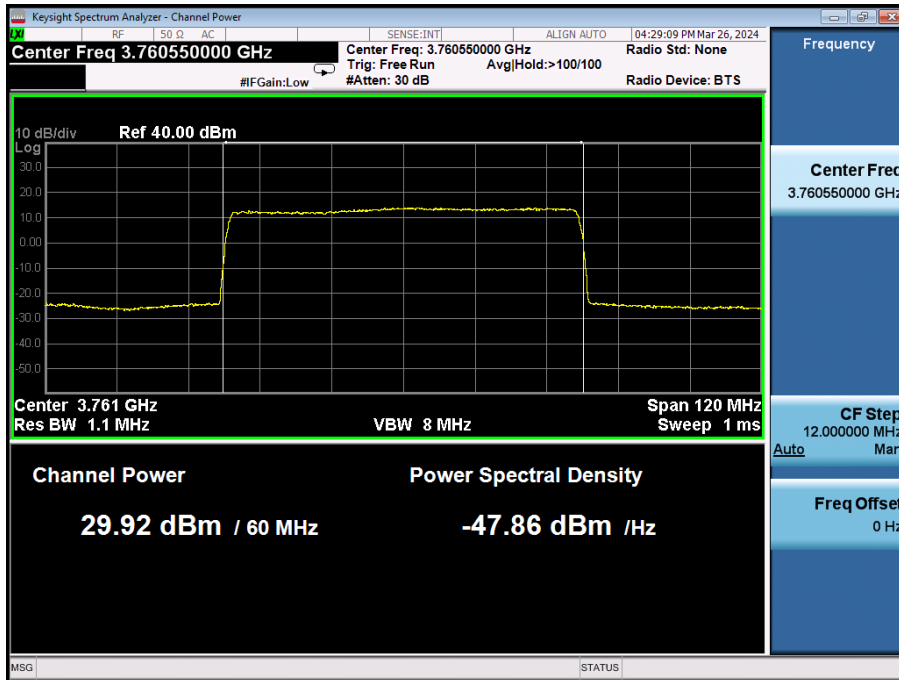
5G NR 60MHz UL Pre AGC



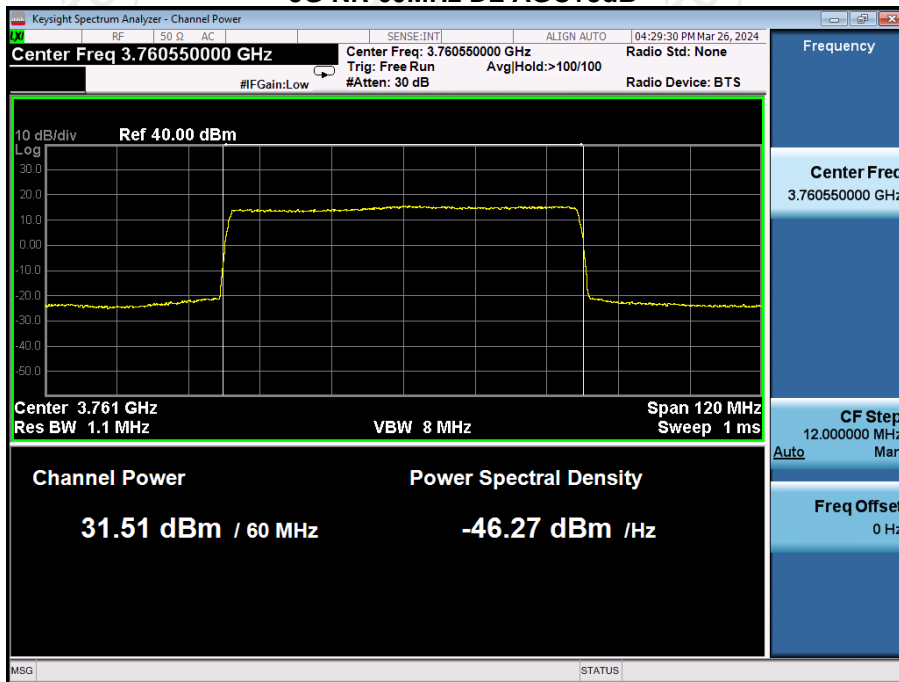
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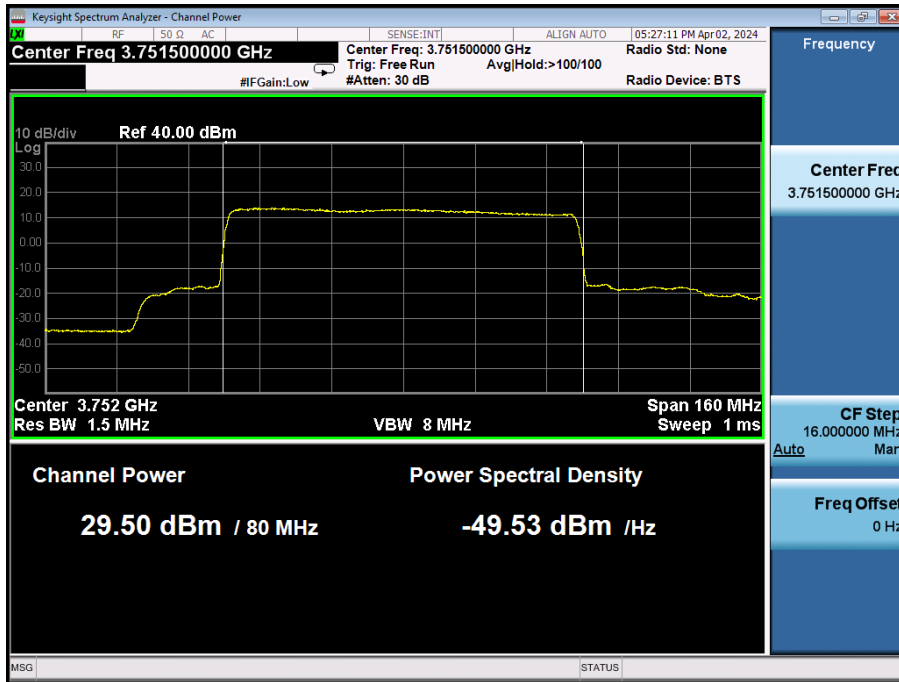
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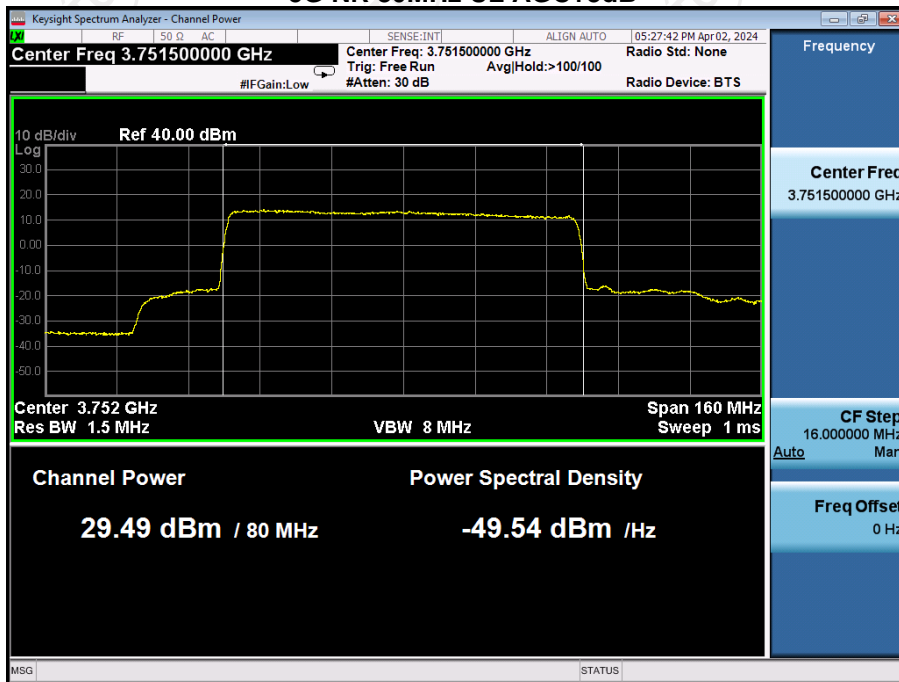
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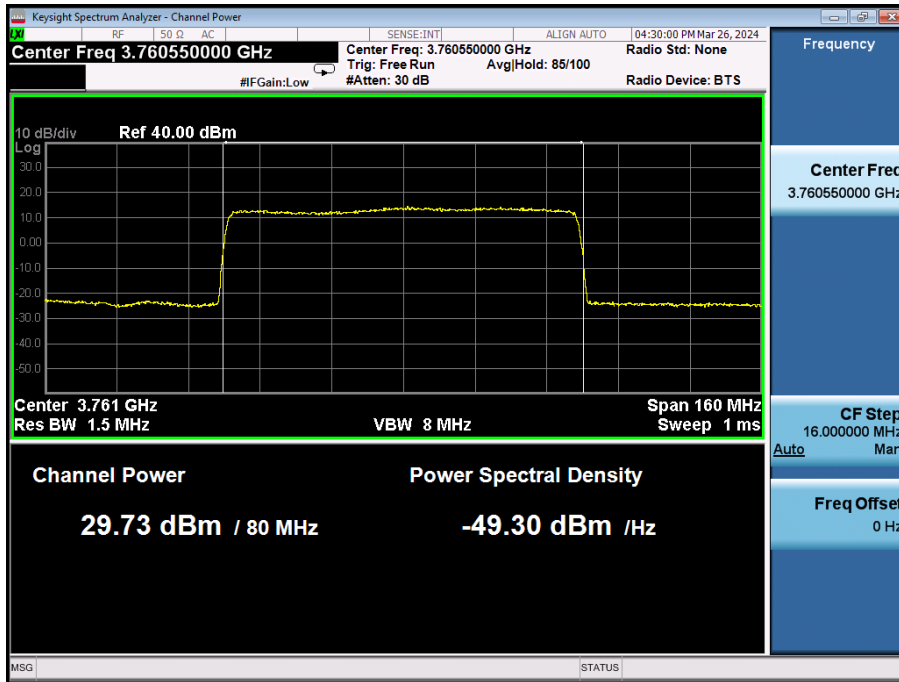
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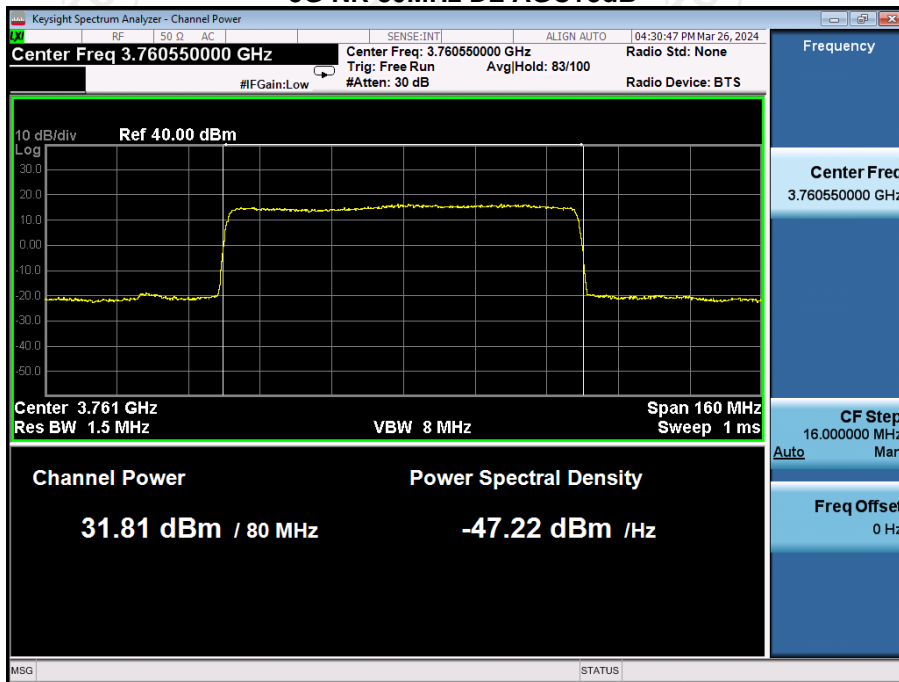
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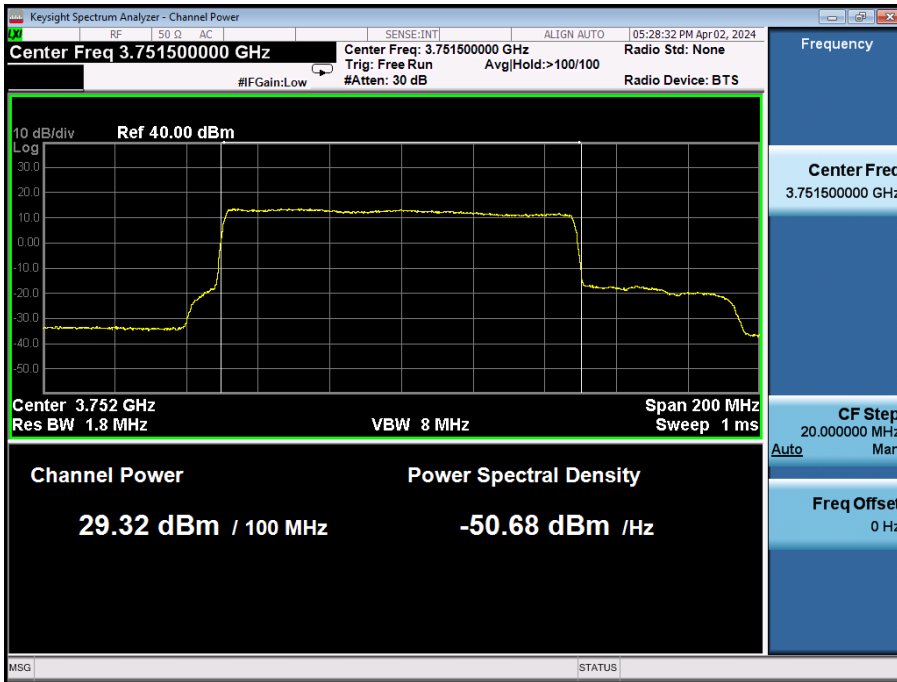
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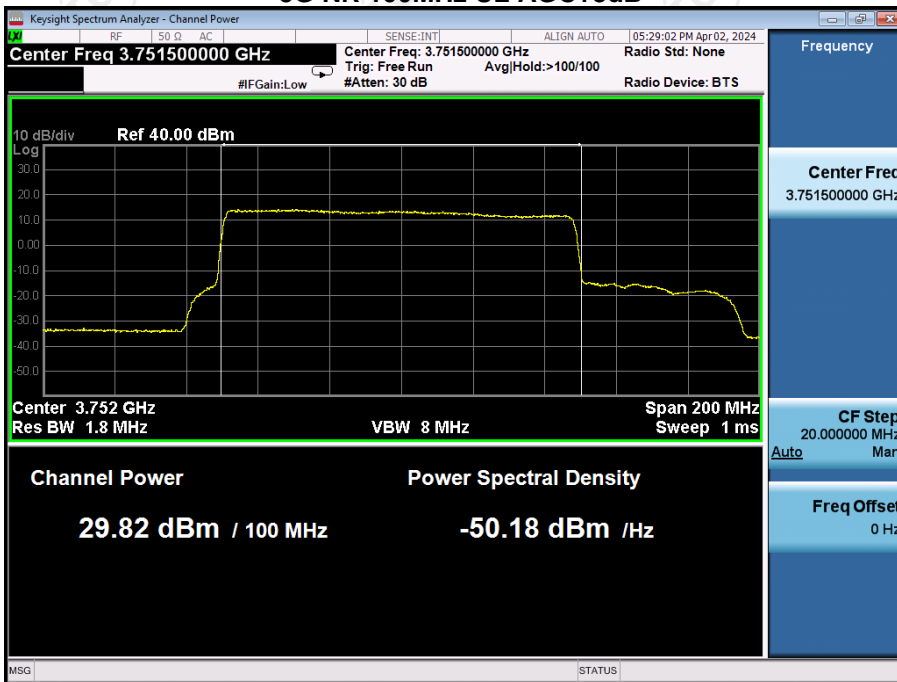
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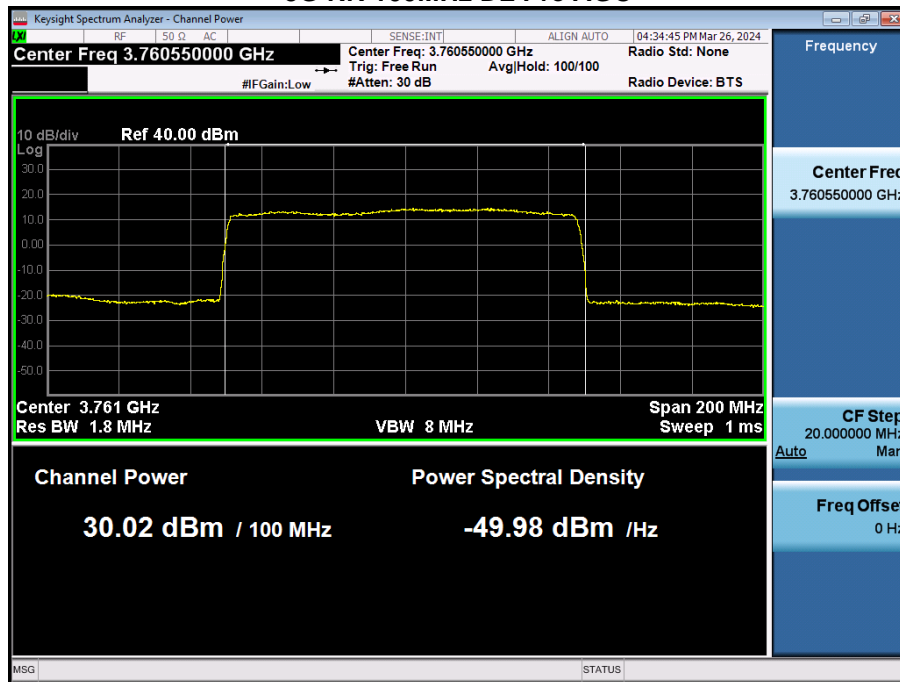
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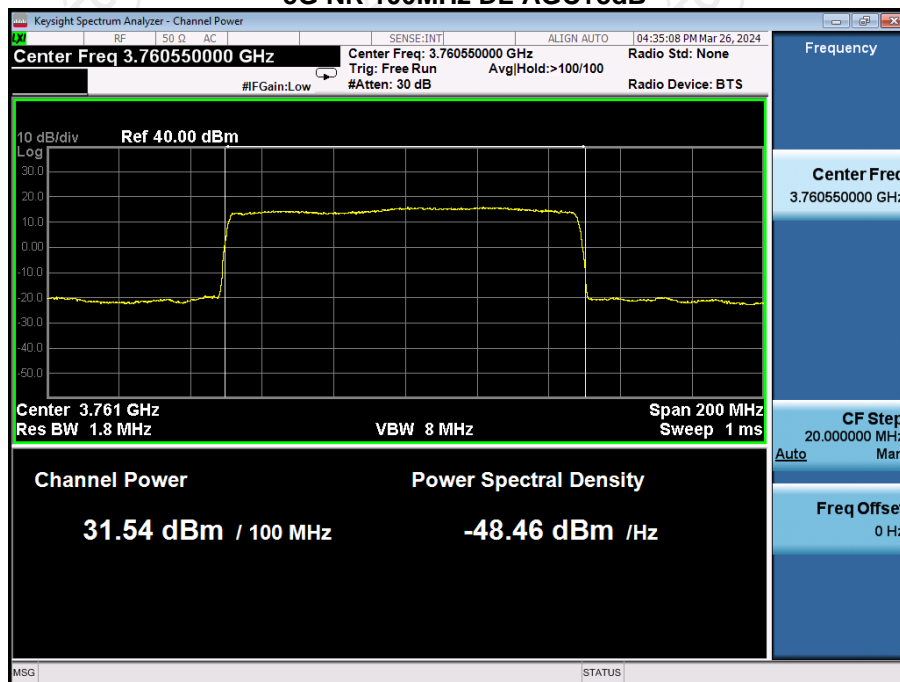
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5G NR 100MHz DL Pre AGC



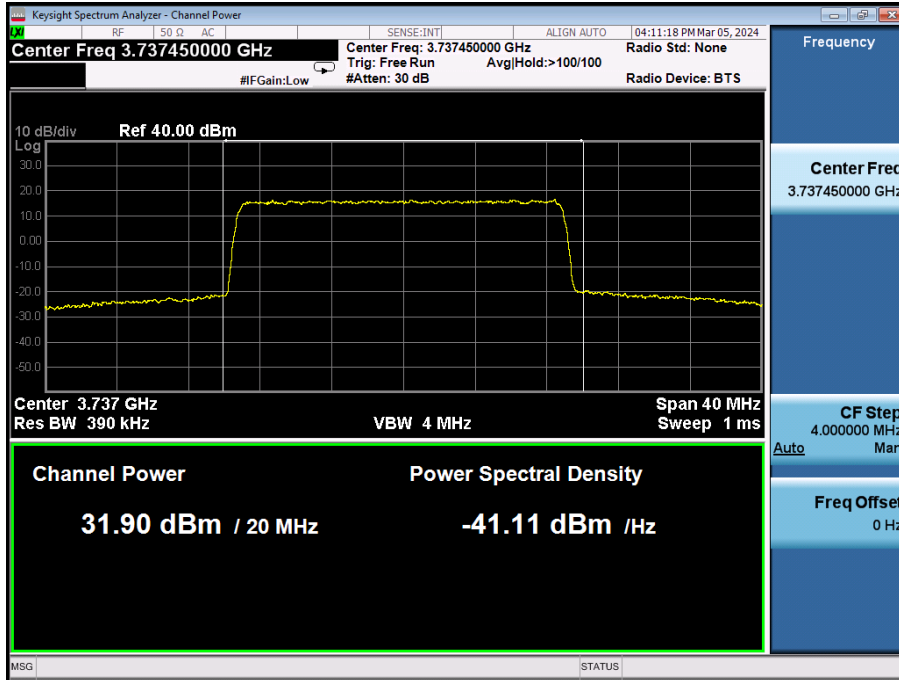
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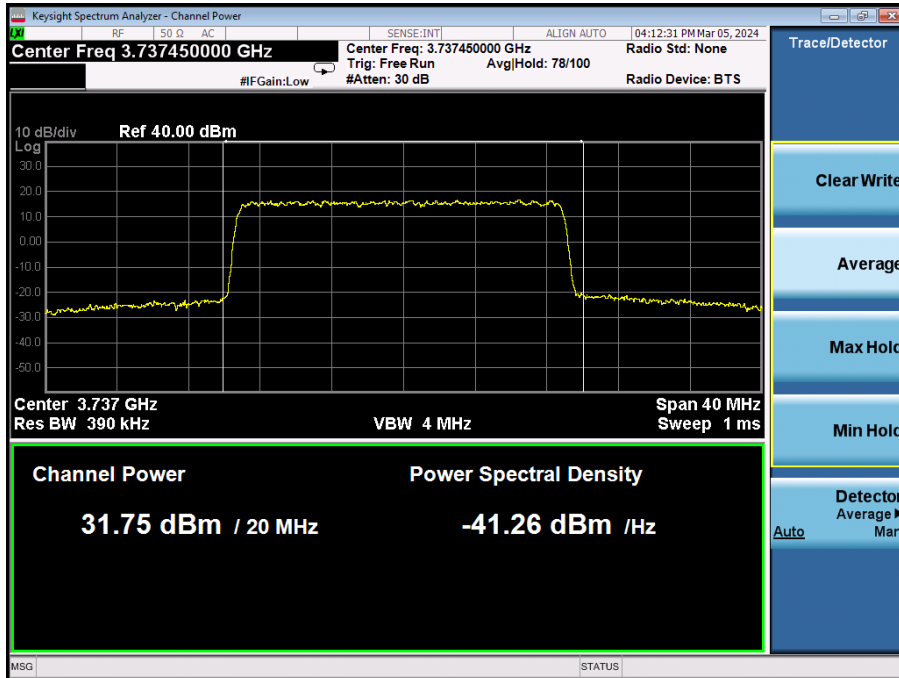
Path 2

Full-Band Mode

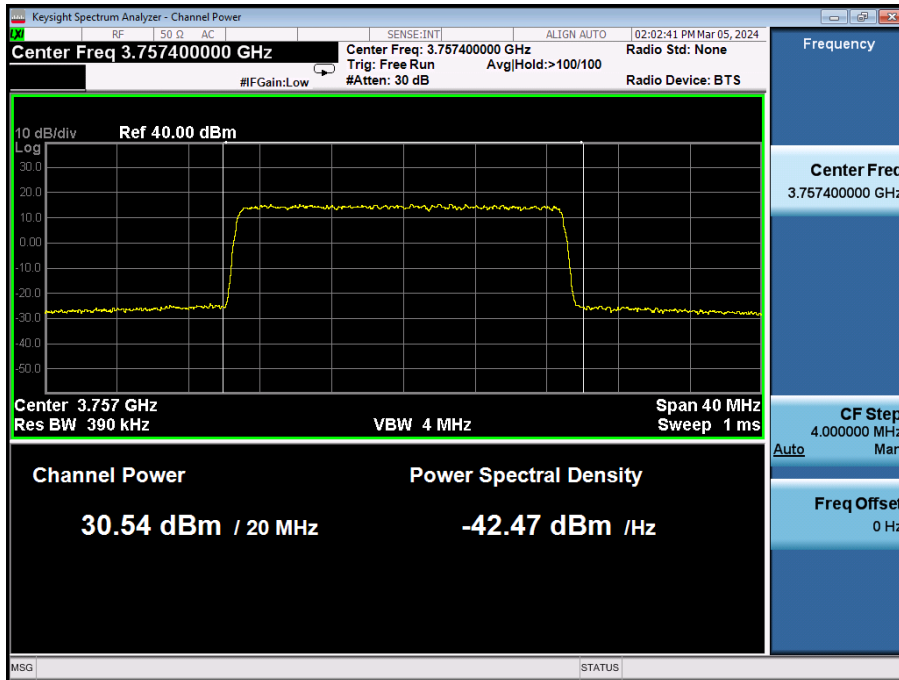
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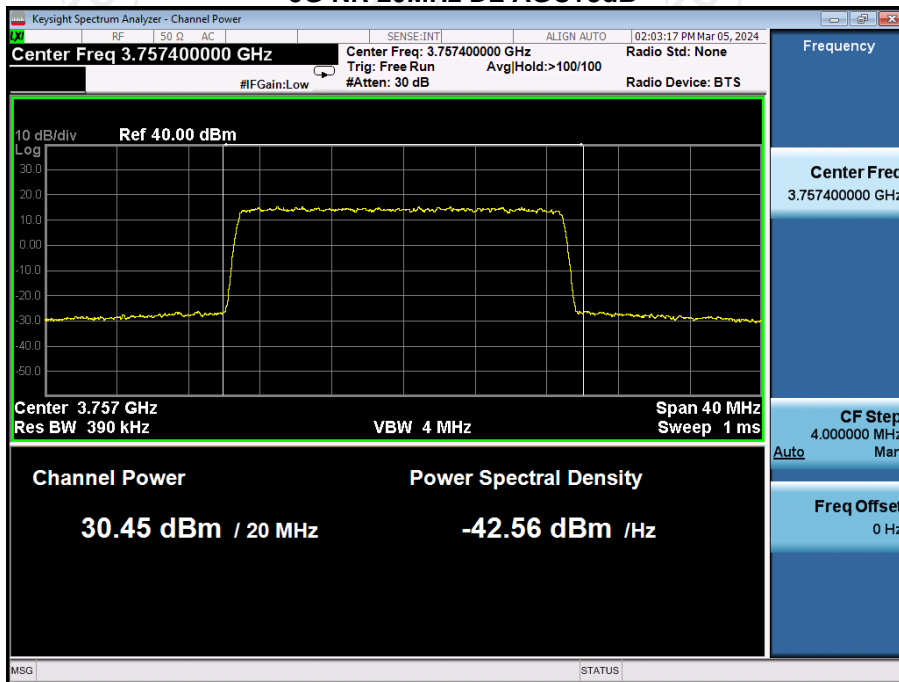
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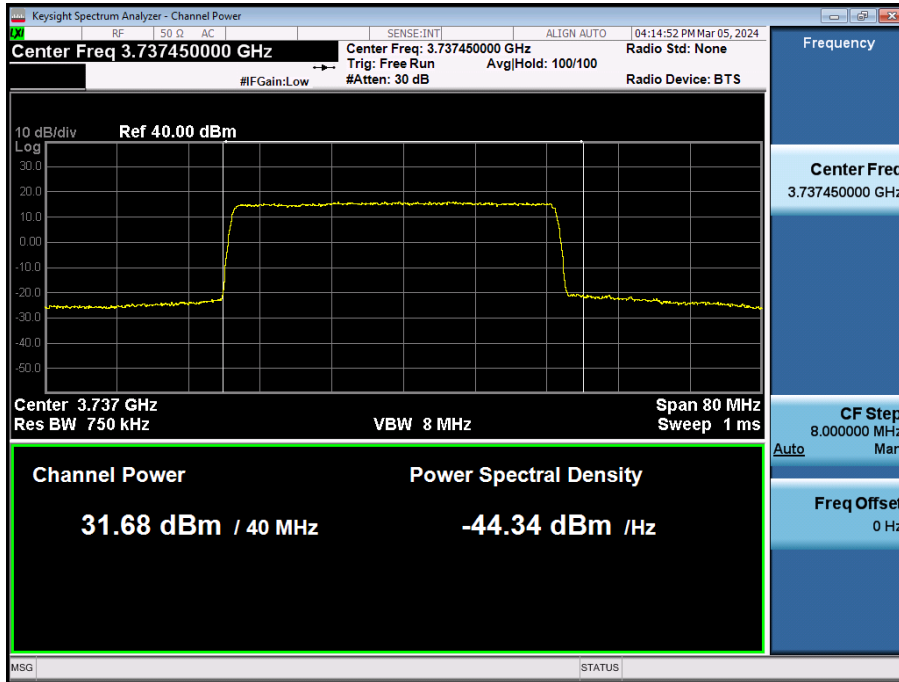
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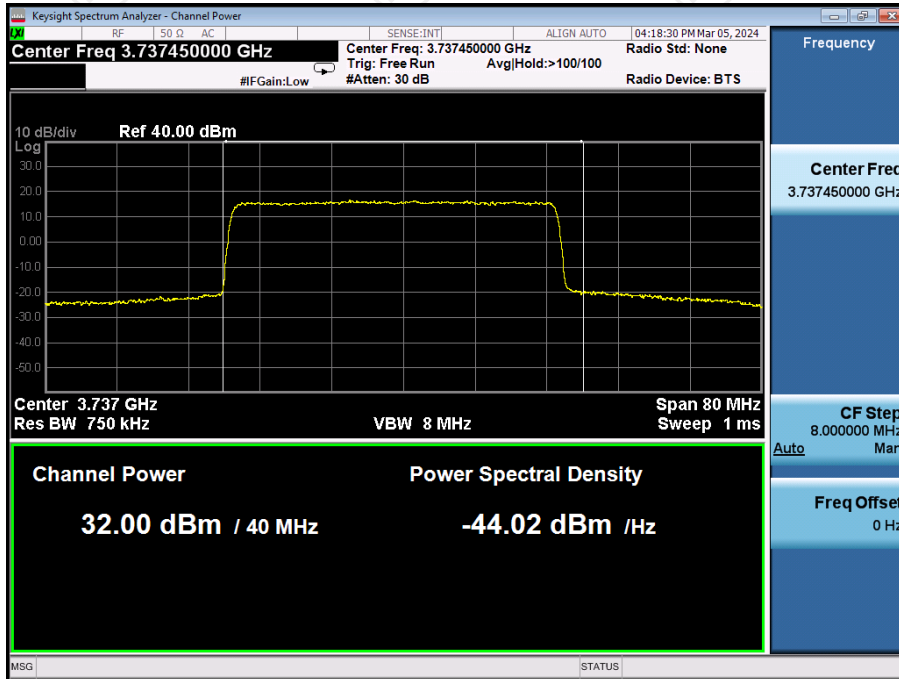
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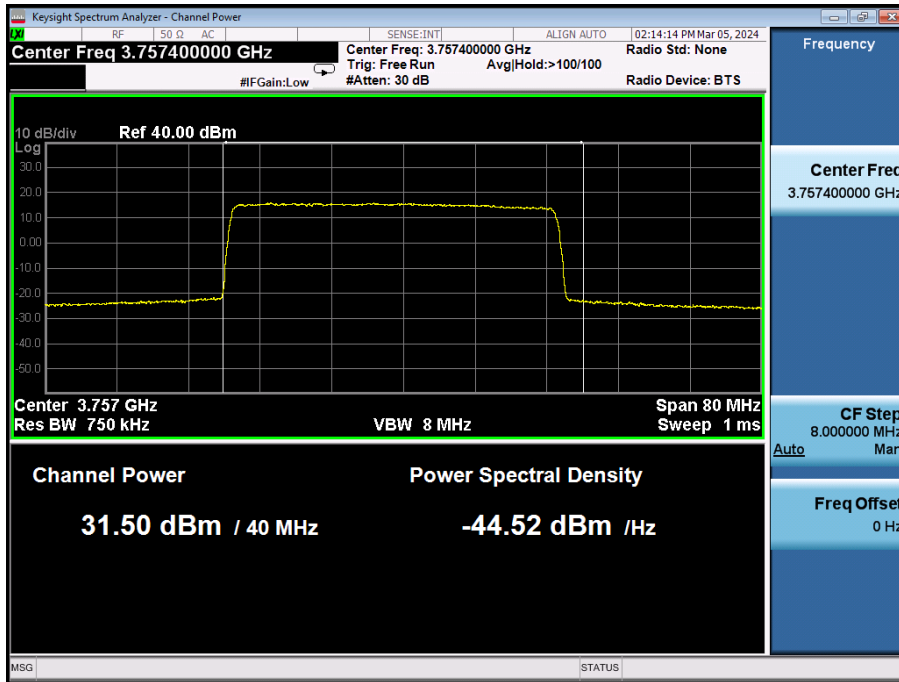
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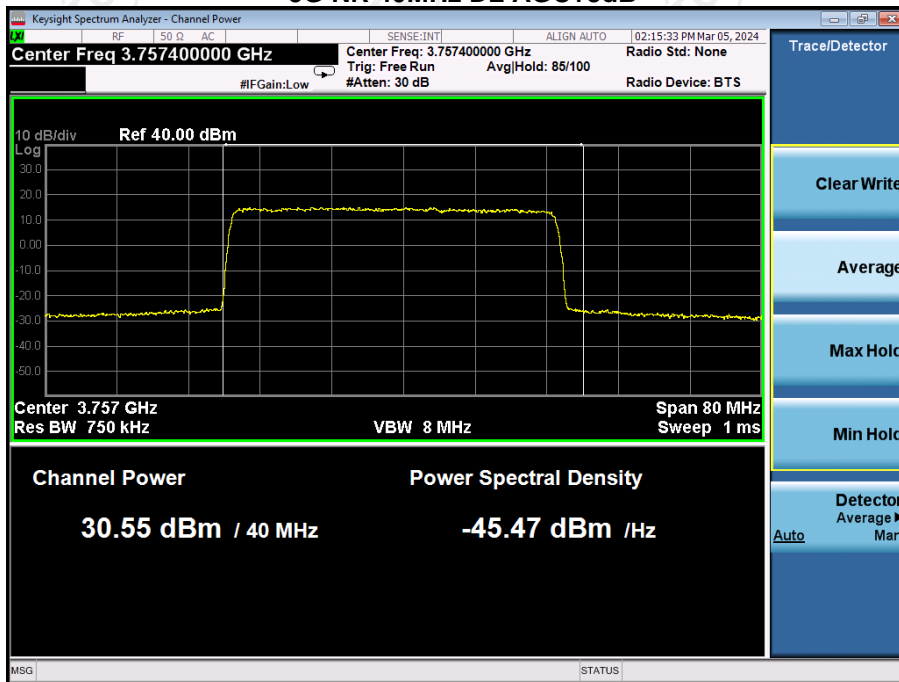
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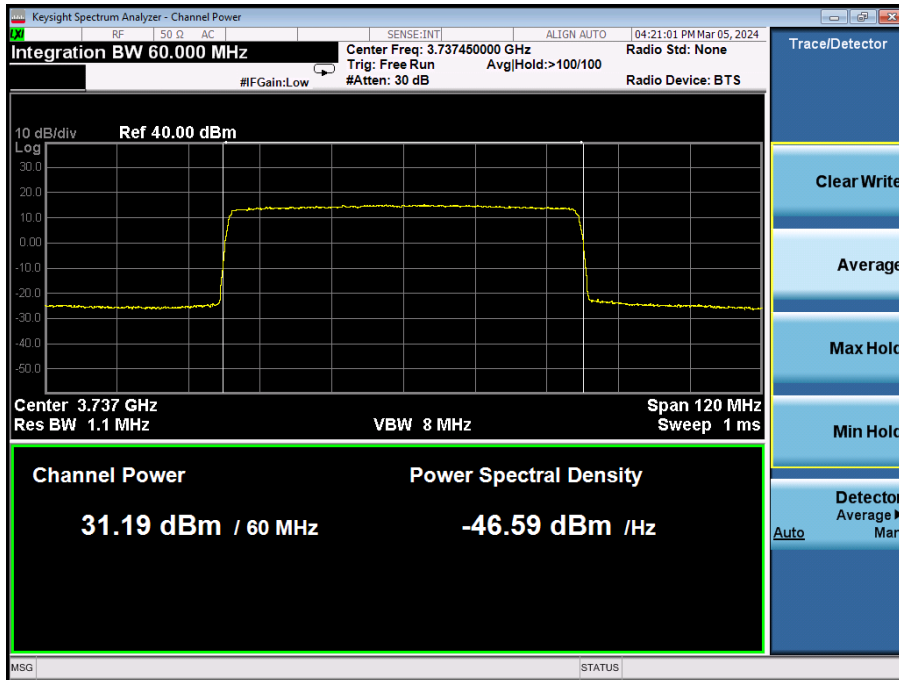
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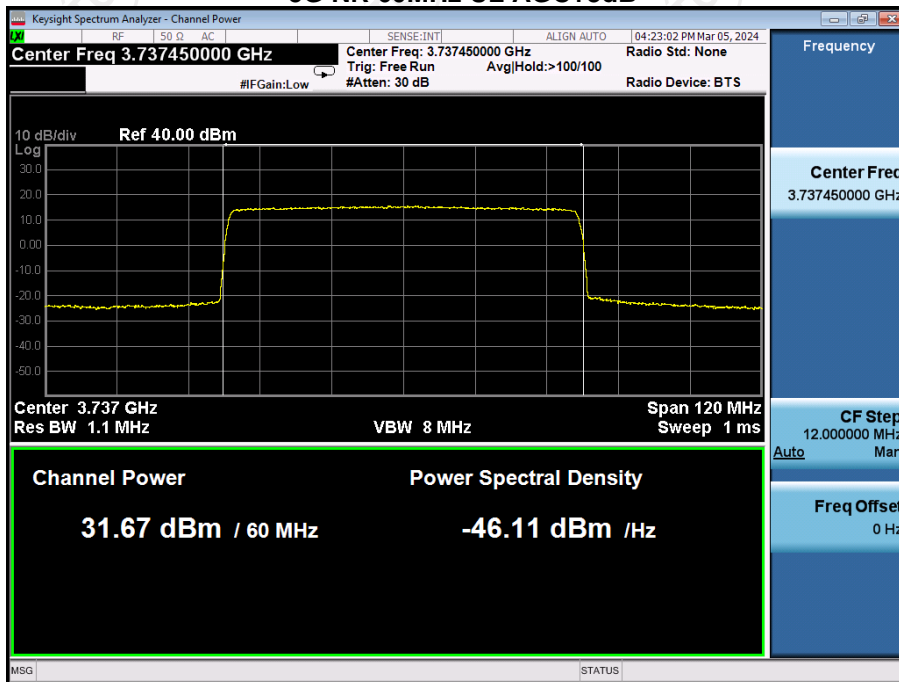
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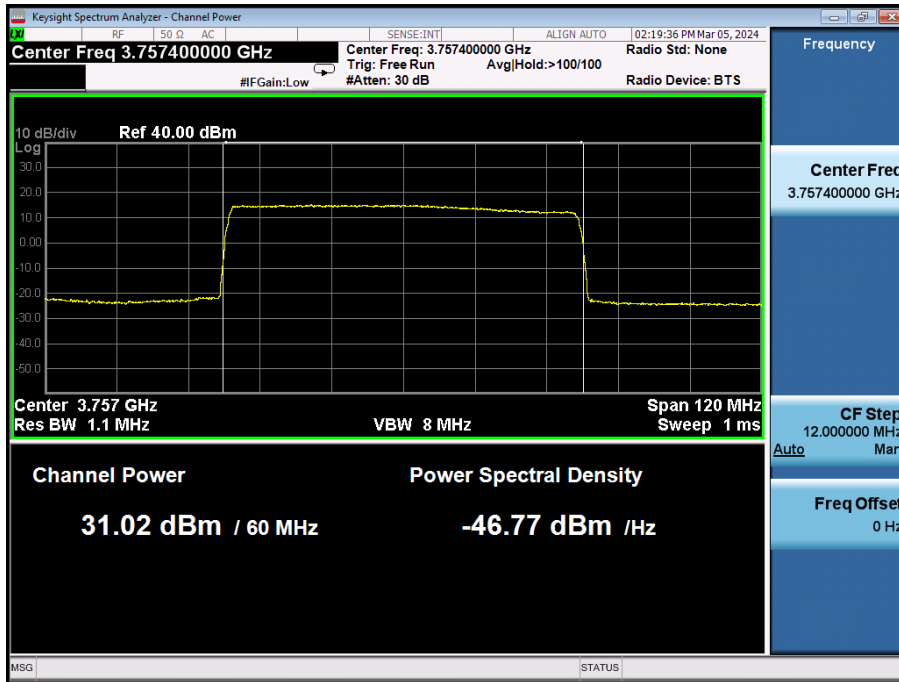
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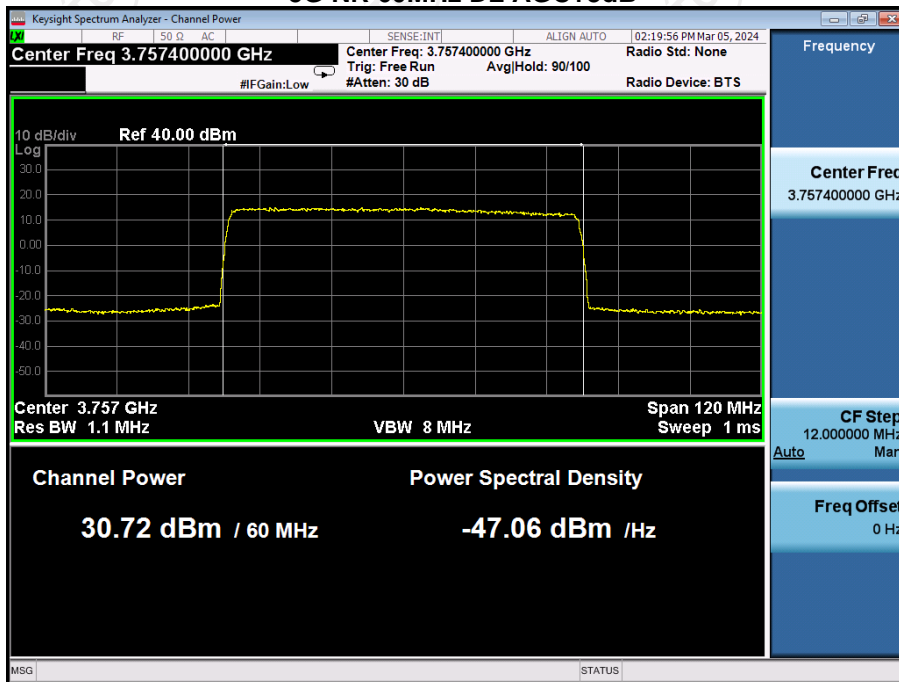
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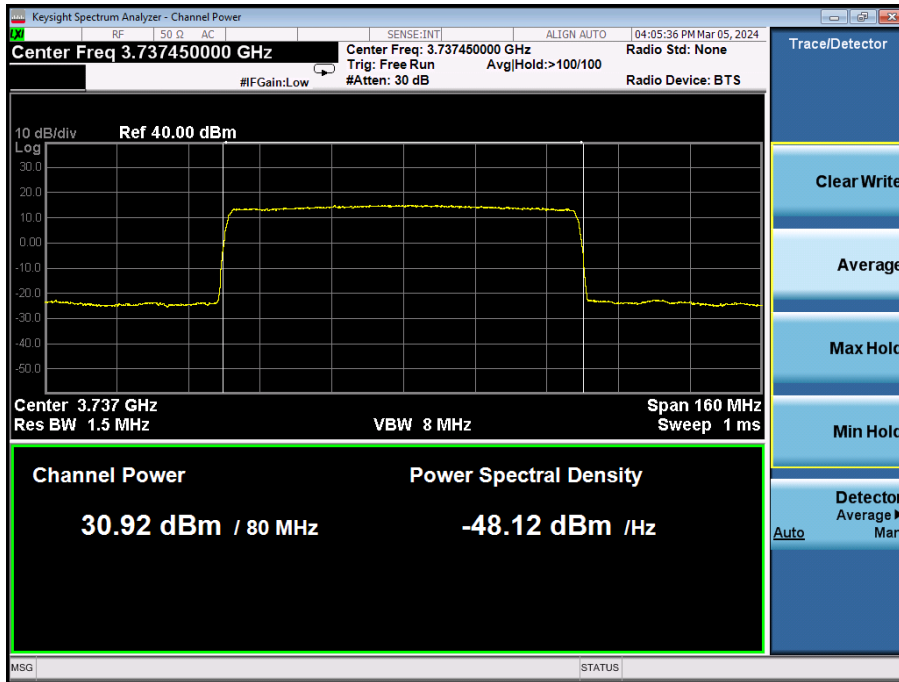
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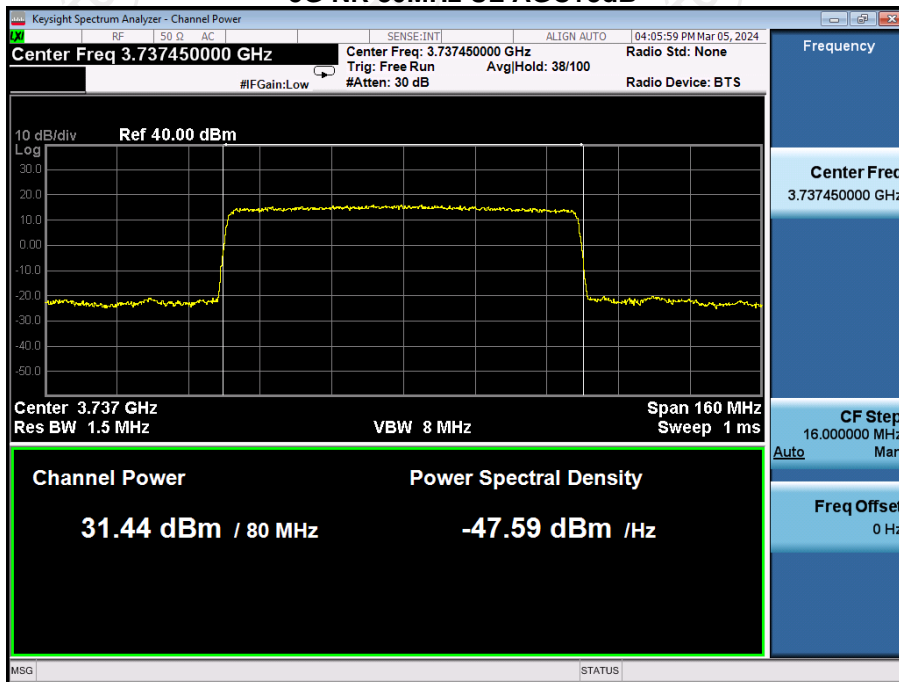
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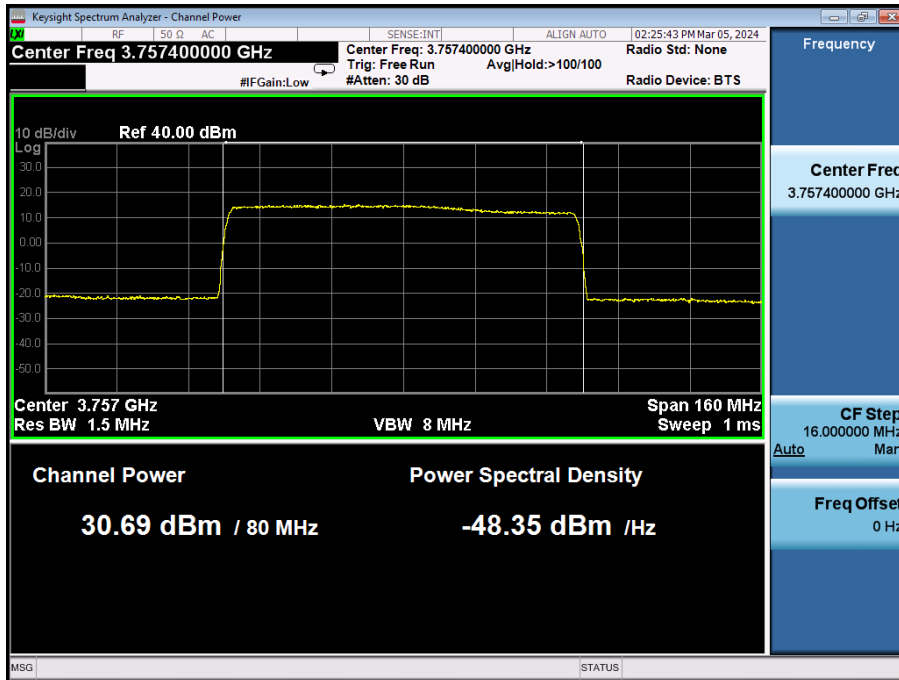
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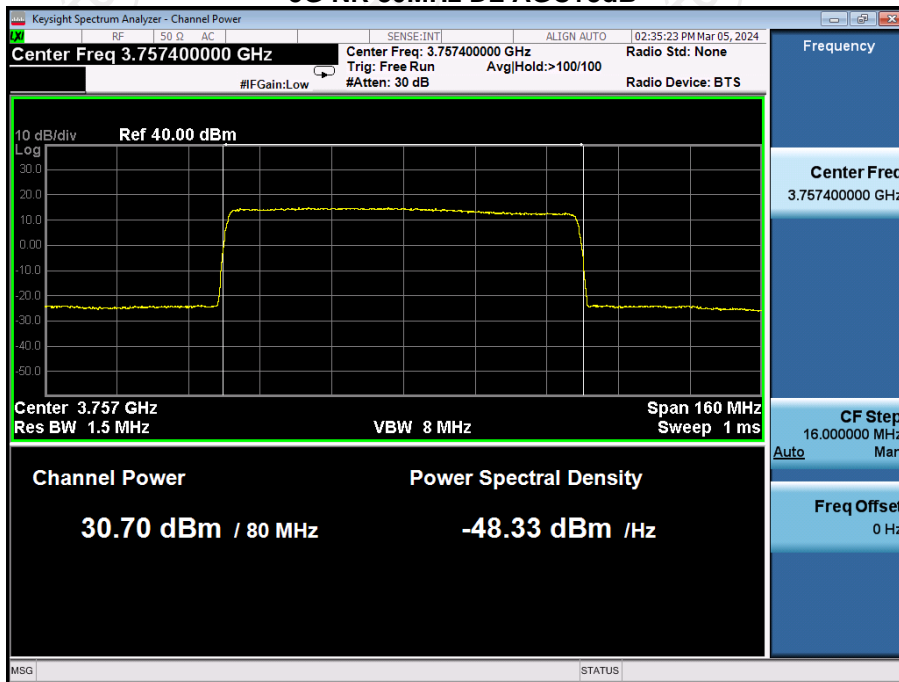
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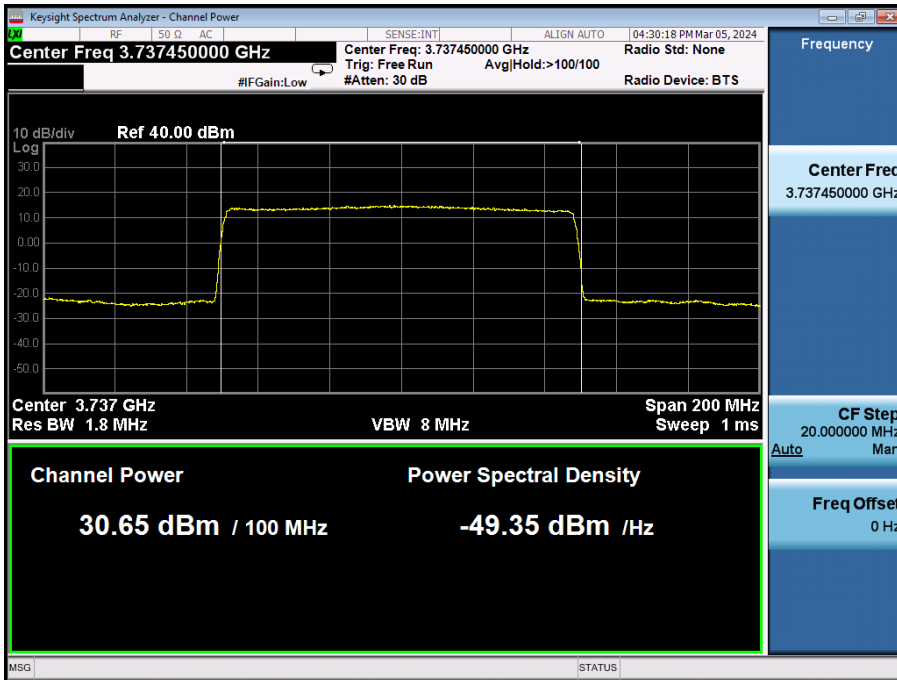
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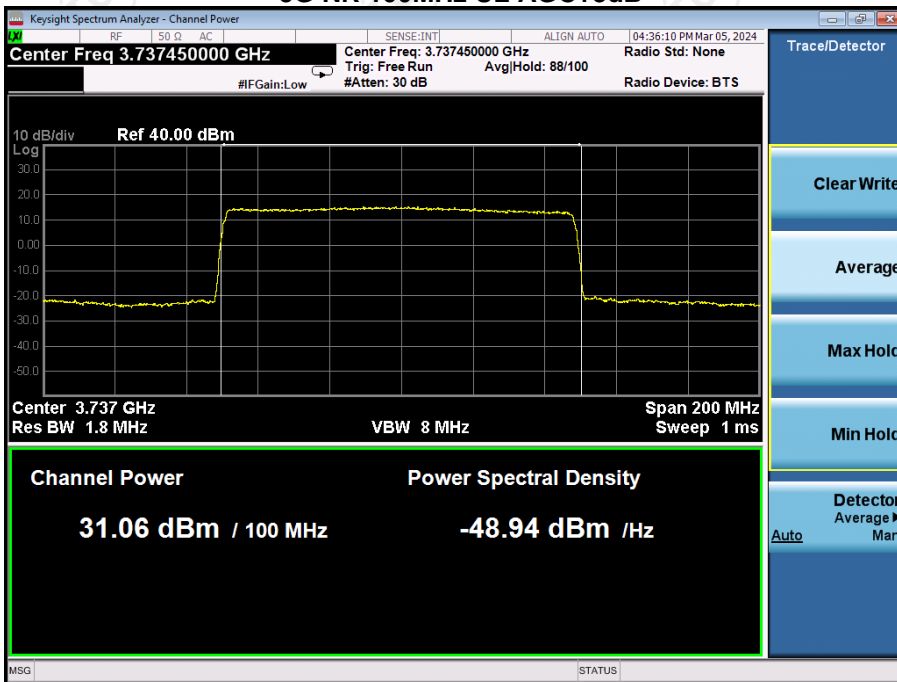
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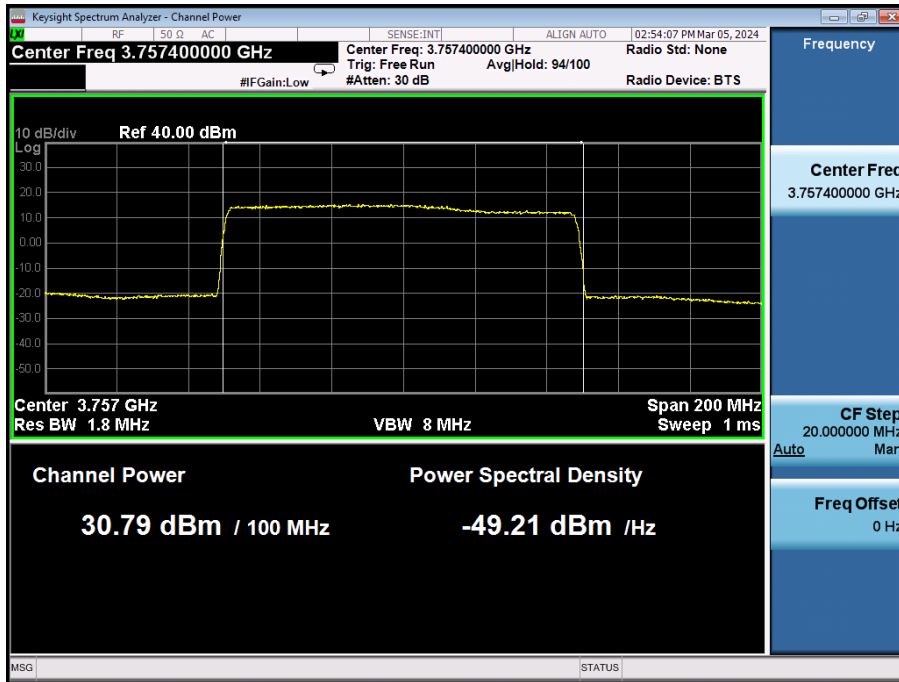
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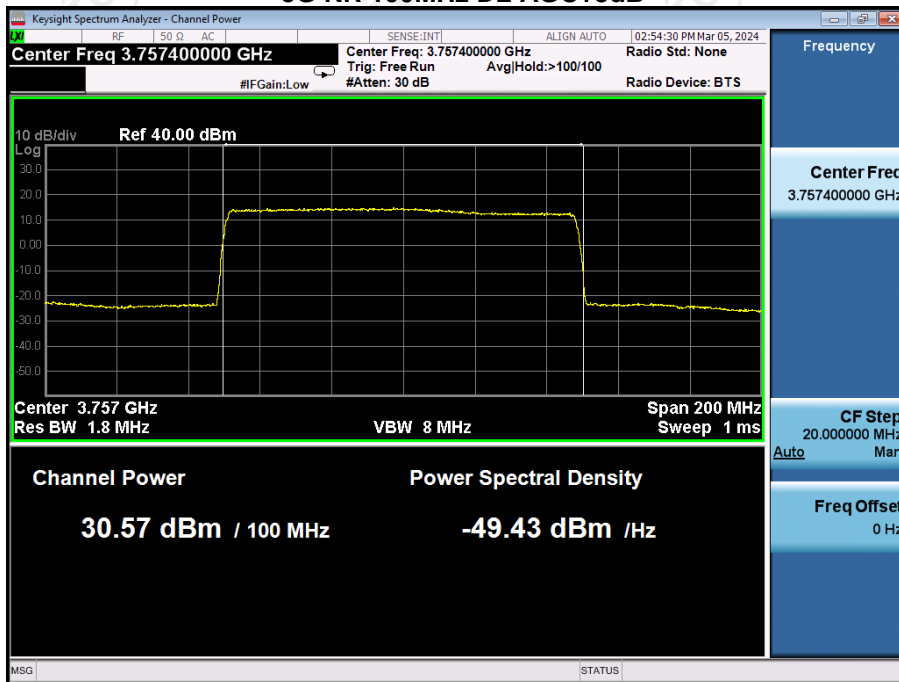
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5G NR 100MHz DL Pre AGC

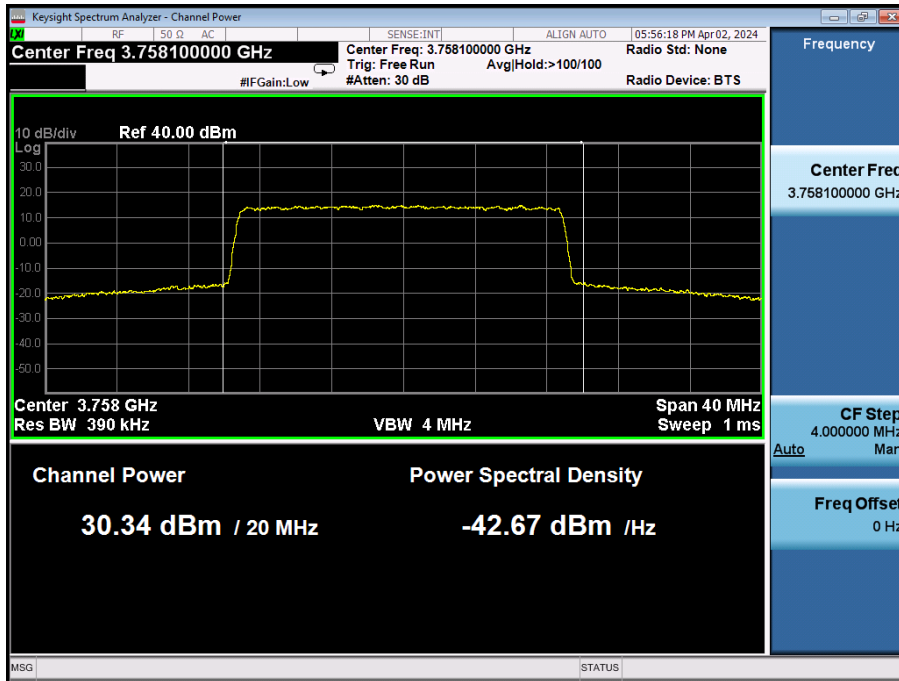


5G NR 100MHz DL AGC+3dB

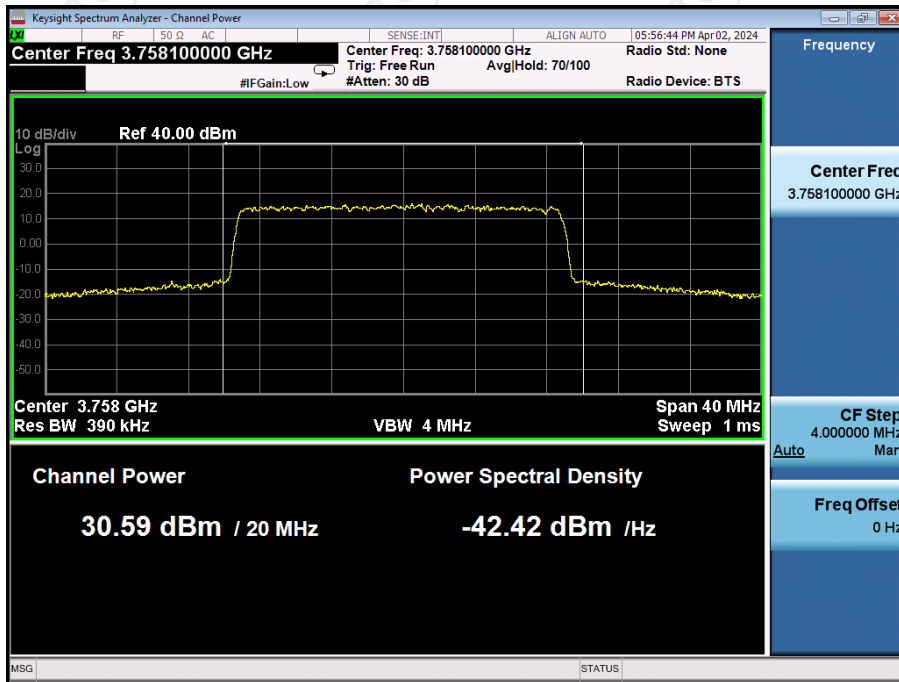


Sub-Band Mode

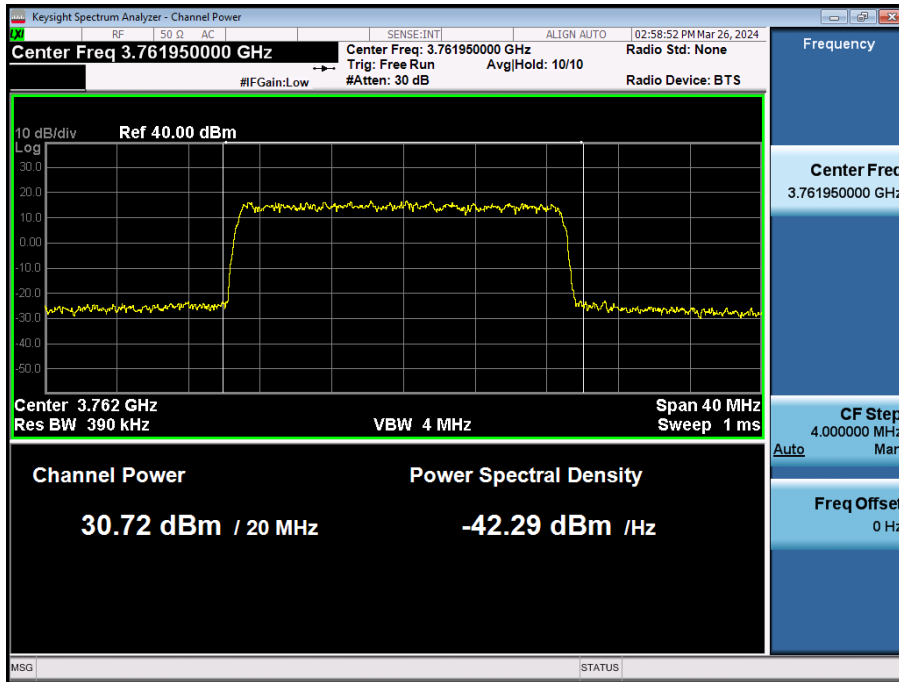
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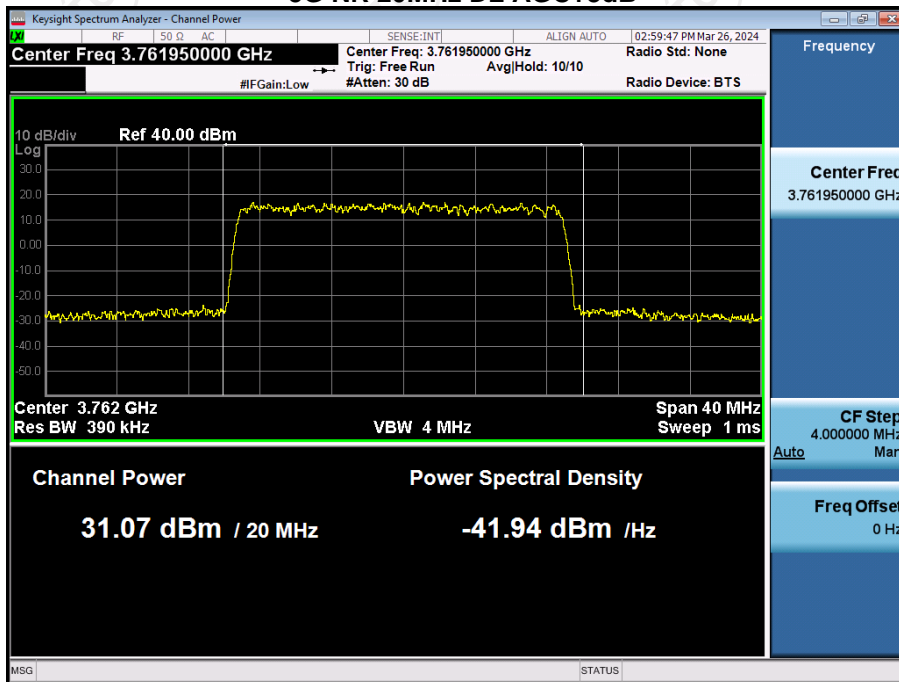
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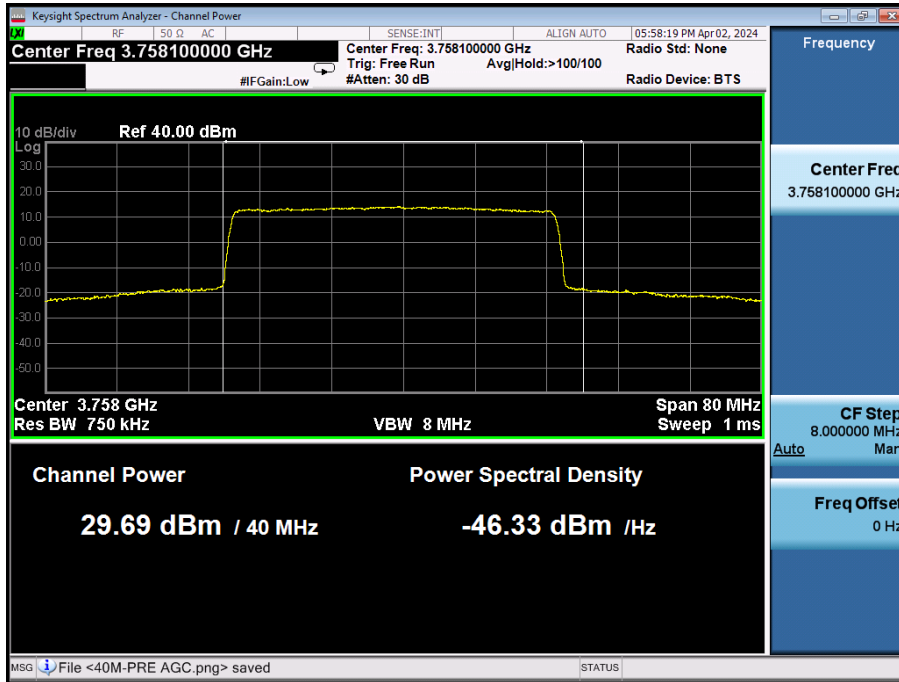
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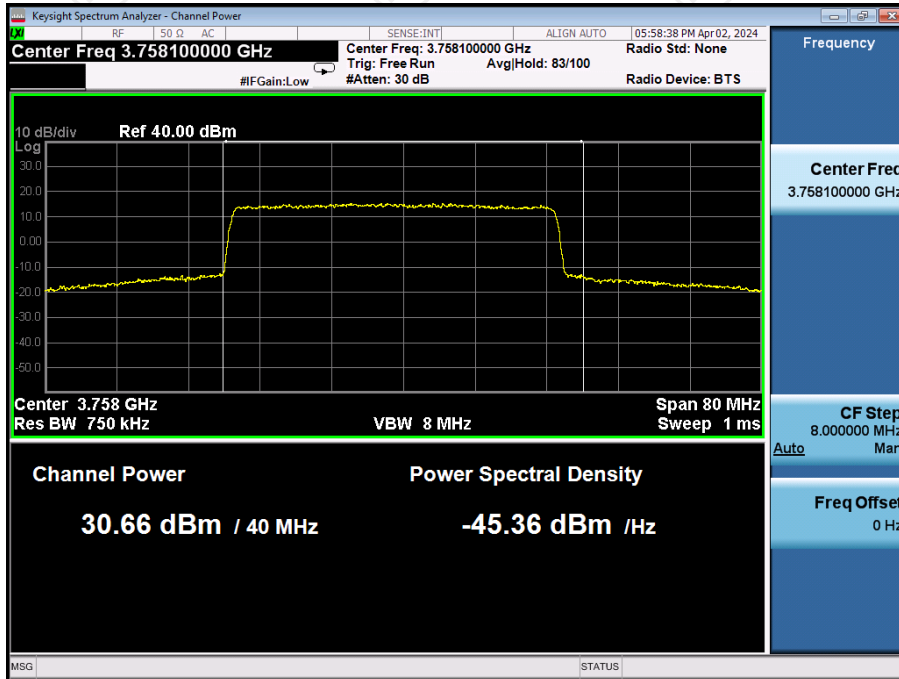
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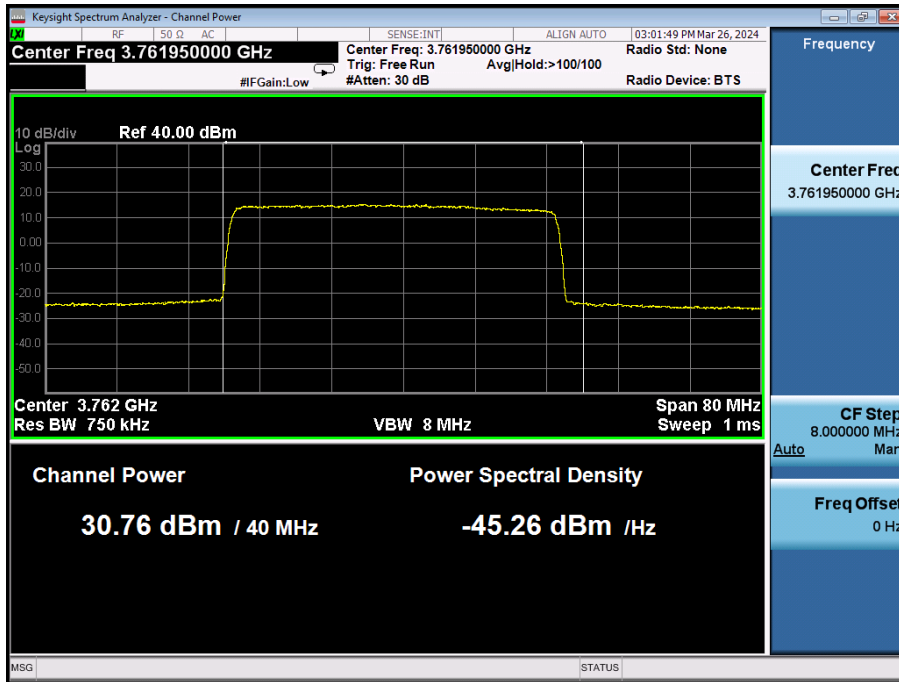
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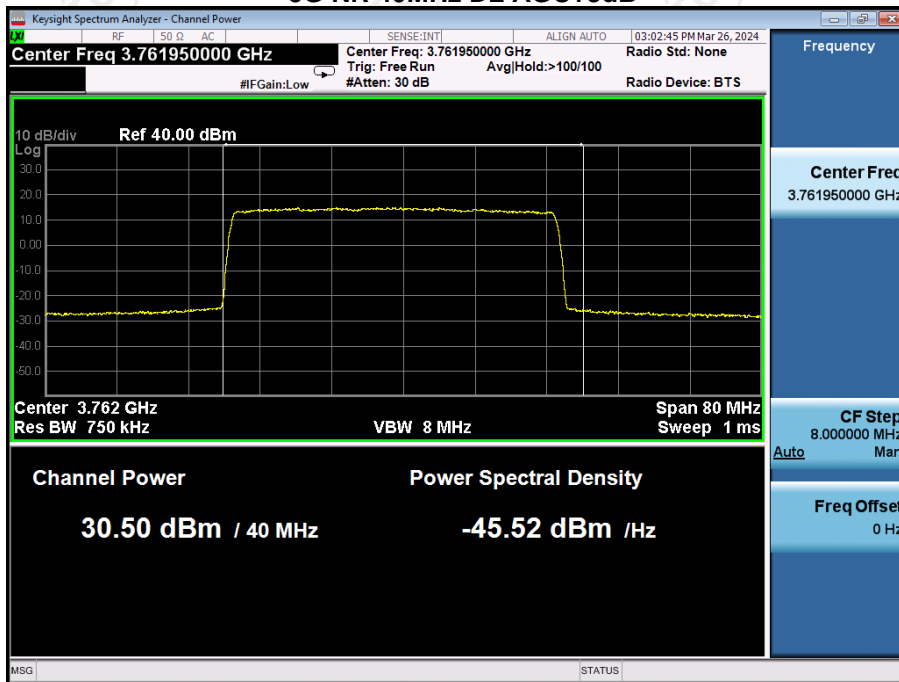
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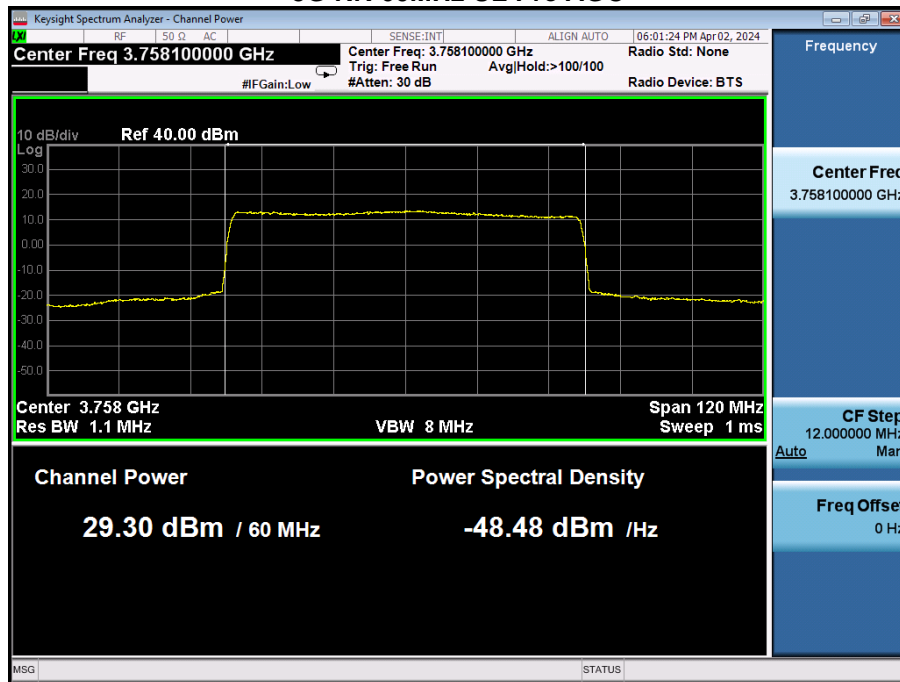
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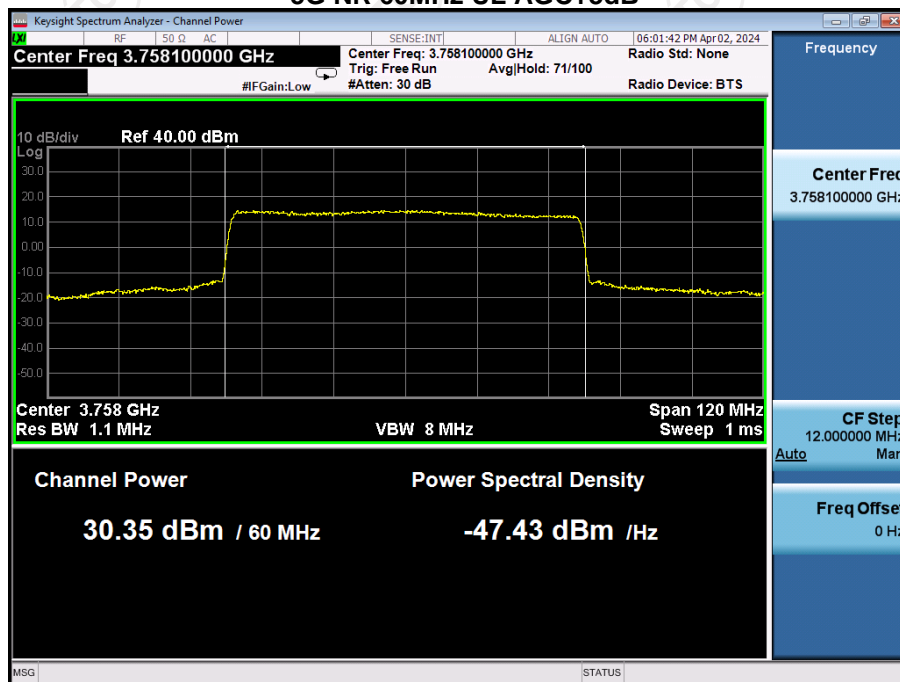
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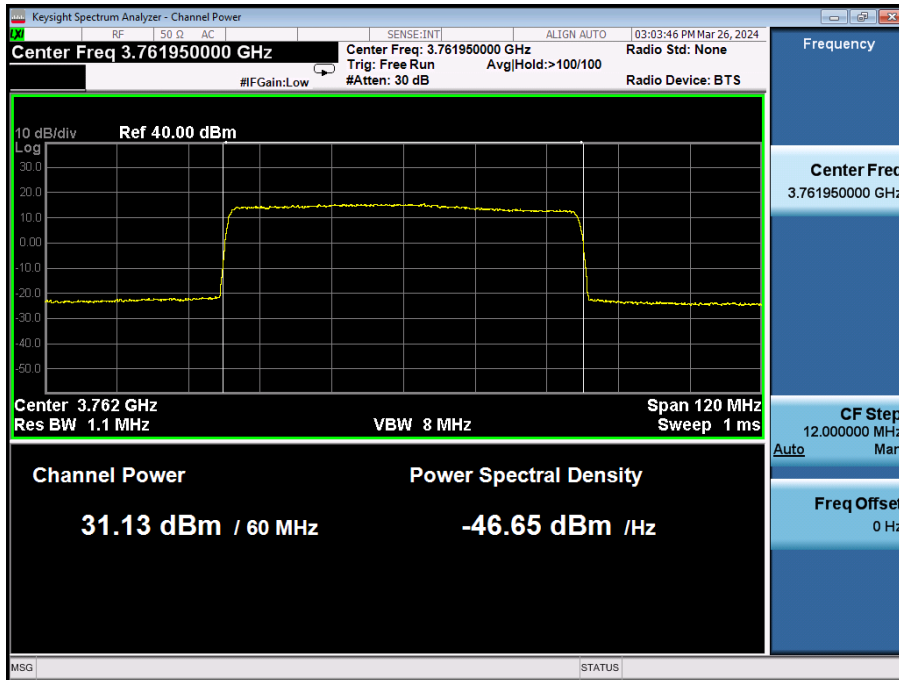
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5G NR 60MHz UL AGC+3dB



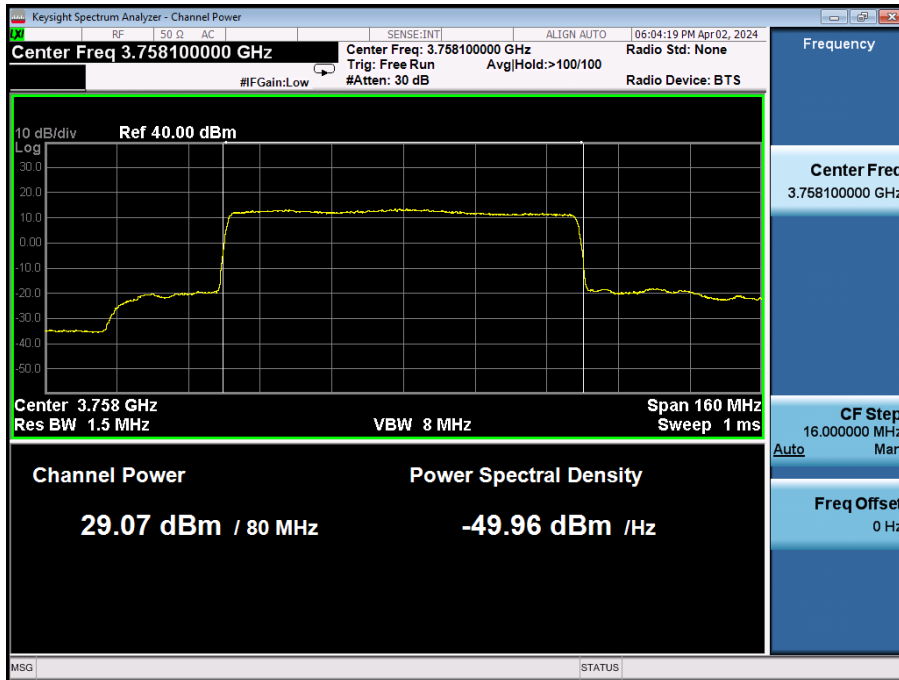
5G NR 60MHz DL Pre AGC



5G NR 60MHz DL AGC+3dB



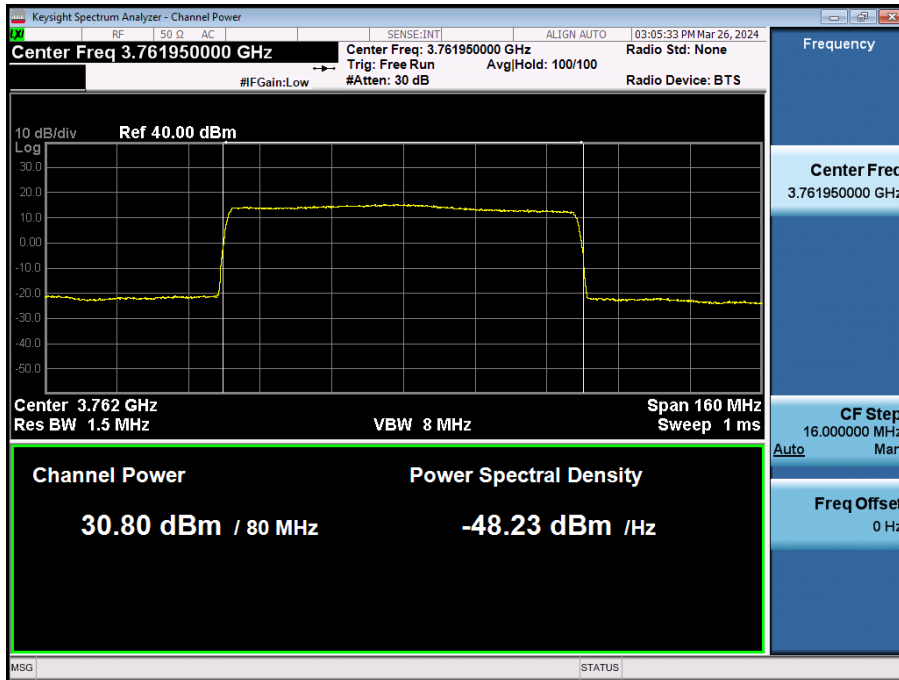
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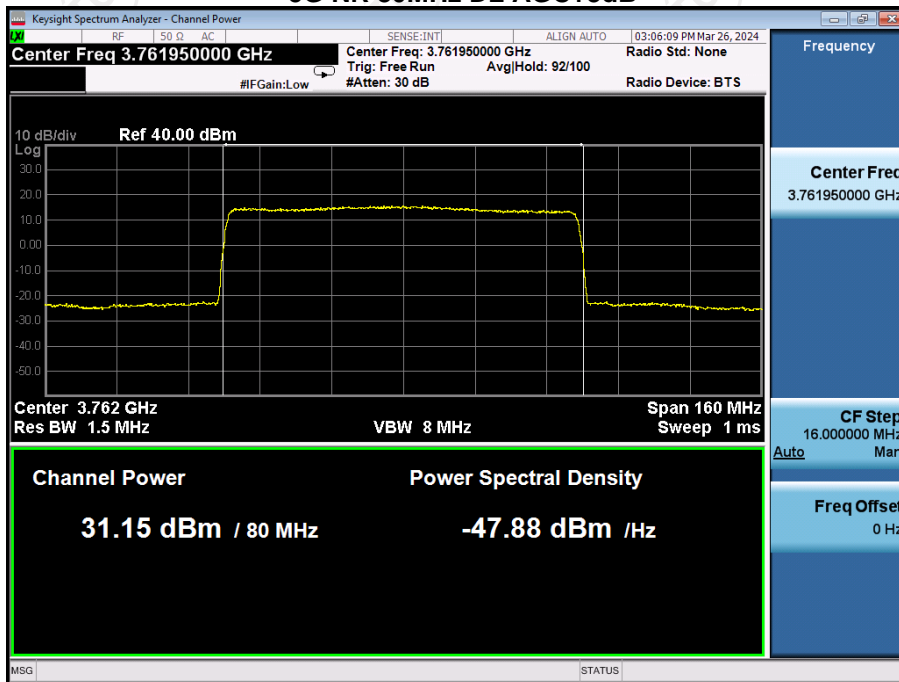
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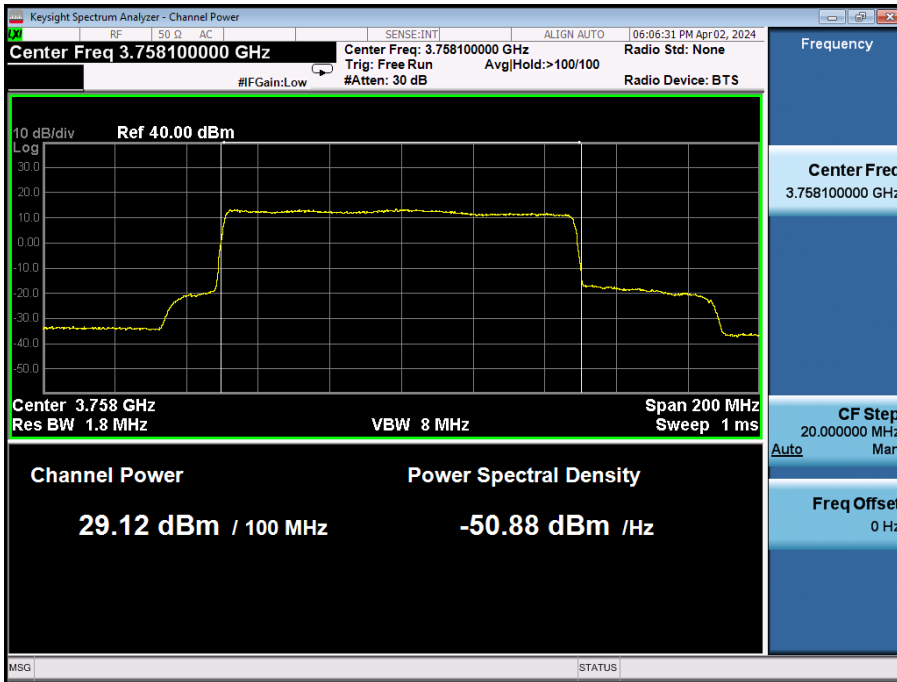
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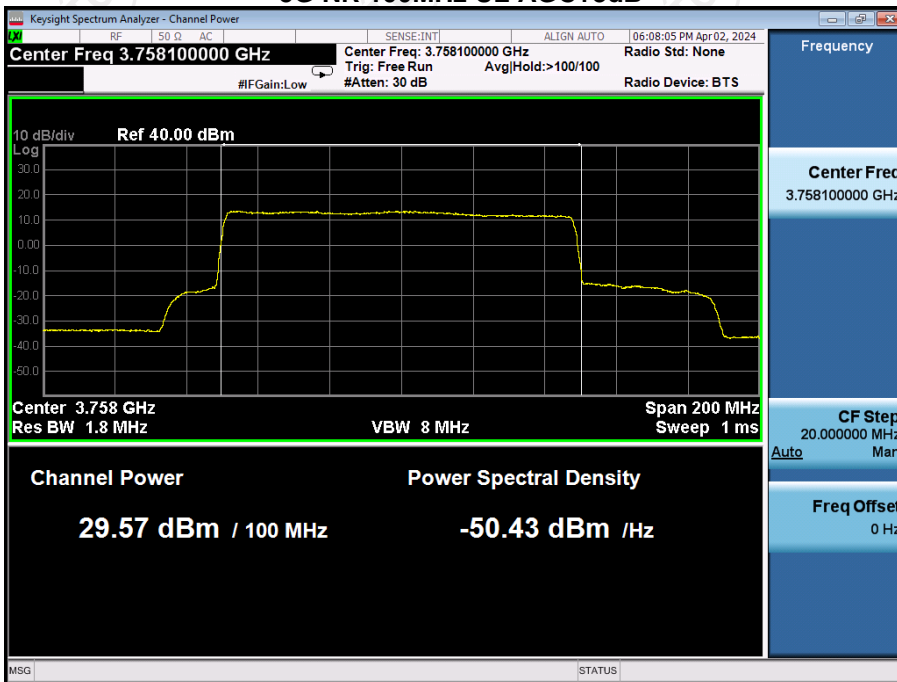
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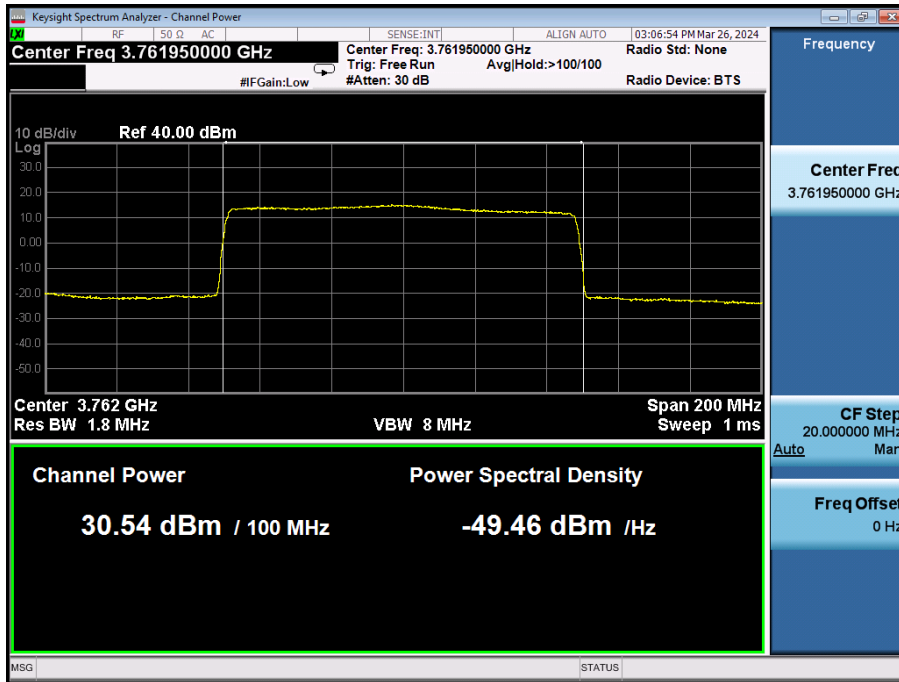
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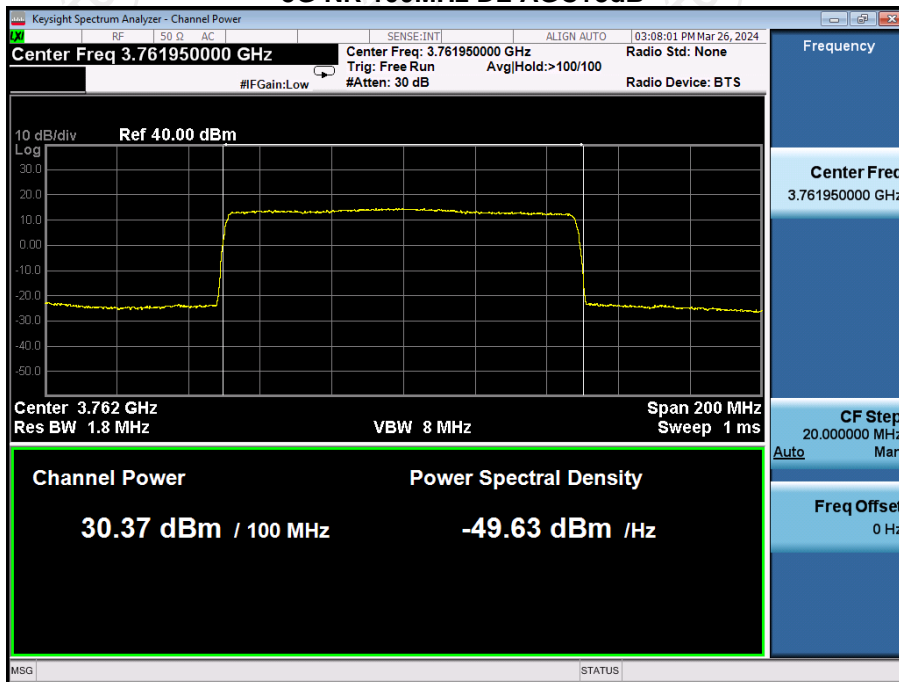
5G NR 100MHz UL AGC+3dB



5G NR 100MHz DL Pre AGC



5G NR 100MHz DL AGC+3dB



5.5. Out-of-Band/Out-of-Block Emission

5.5.1. Test Specification

Test Requirement:	FCC Part 2.1051; FCC Part 27.53(l)(1)
Test Method:	KDB 935210 D05 Indus Booster Basic Meas v01r04
Limit:	-13dBm
Test Setup:	<pre> graph LR SG[Signal Generator] --> EUT[EUT] EUT --> RA[RF Attenuator (if required)] RA --> SA[Spectrum Analyzer] </pre>
Test Procedure:	<p>a) Connect a signal generator to the input of the EUT. If the signal generator is not capable of generating two modulated carriers simultaneously, then two discrete signal generators can be connected with an appropriate combining network to support this two-signal test.</p> <p>b) Set the signal generator to produce two signals that specified in section 3.3 of this report. Set the signal generator amplitudes so that the power from each into the EUT is equivalent.</p> <p>c) Set the center frequencies such that the signals occupy adjacent channels, as defined by industry standards such as 3GPP or 3GPP2, at the upper edge of the frequency band or block under test.</p> <p>d) Set the composite power levels such that the input signal is just below the AGC threshold (see 3.2), but not more than 0.5 dB below. The composite power can be measured using the procedures provided in KDB Publication 971168 [R8], but it will be necessary to expand the power integration bandwidth so as to include both of the transmit channels. Alternatively, the composite power can be measured using an average power meter as described in KDB Publication 971168 [R8].</p> <p>e) Connect a spectrum analyzer to the output of the EUT using appropriate attenuation as necessary.</p> <p>f) Set the RBW = reference bandwidth in the applicable rule section for the supported frequency band (typically 1 % of the EBW or 100 kHz or 1 MHz)</p> <p>g) Set the VBW = 3 × RBW.</p> <p>h) Set the detector to power averaging (rms) detector.</p> <p>i) Set the Sweep time = auto-couple.</p> <p>j) Set the spectrum analyzer start frequency to the upper</p>

	<p>block edge frequency, and the stop frequency to the upper block edge frequency plus 300 kHz or 3 MHz, for frequencies below and above 1 GHz, respectively.</p> <p>k) Trace average at least 100 traces in power averaging (rms) mode.</p> <p>l) Use the marker function to find the maximum power level.</p> <p>m) Capture the spectrum analyzer trace of the power level for inclusion in the test report.</p> <p>n) Repeat steps k) to m) with the composite input power level set to 3 dB above the AGC threshold.</p> <p>o) Reset the frequencies of the input signals to the lower edge of the frequency block or band under test.</p> <p>p) Reset the spectrum analyzer start frequency to the lower block edge frequency minus 300 kHz or 3 MHz, for frequencies below and above 1 GHz, respectively, and the stop frequency to the lower band or block edge frequency.</p> <p>q) Repeat steps k) to n).</p> <p>r) Repeat steps a) to q) with the signal generator configured for a single test signal tuned as close as possible to the block edges.</p> <p>s) Repeat steps a) to r) with the narrowband test signal.</p> <p>t) Repeat steps a) to s) for all authorized frequency bands or blocks used by the EUT.</p> <p>Note: In some bands, RBW was reduced to 10 % of the reference bandwidth for measuring out-of band emissions, so the limit lines were compensated -10dB according to section 5.7.2 of ANSI C63.26-2015.</p>
Test Result:	PASS

5.5.2. Test Instruments

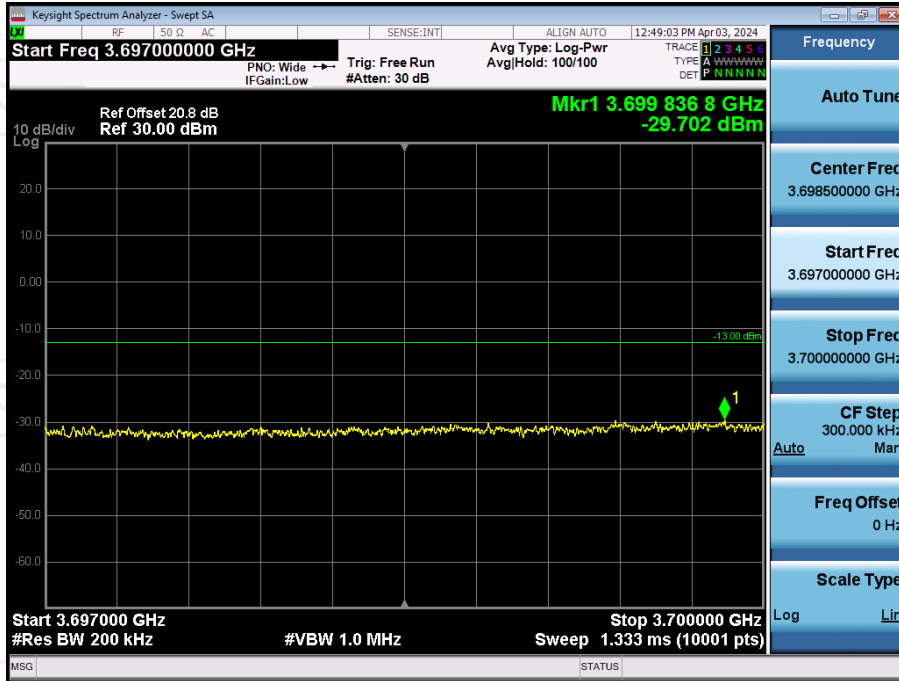
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	N5182B	MY53052214	Jun. 29, 2023	Jun. 28, 2024
Signal Generator	Agilent	N5182B	MY57300842	Feb. 01, 2024	Jan. 31, 2025
Spectrum Analyzer	Agilent	N9020A	MY49100619	Jun. 29, 2023	Jun. 28, 2024
Attenuator	50FP-006-H3	JFW	907763	/	/

5.5.3. Test data

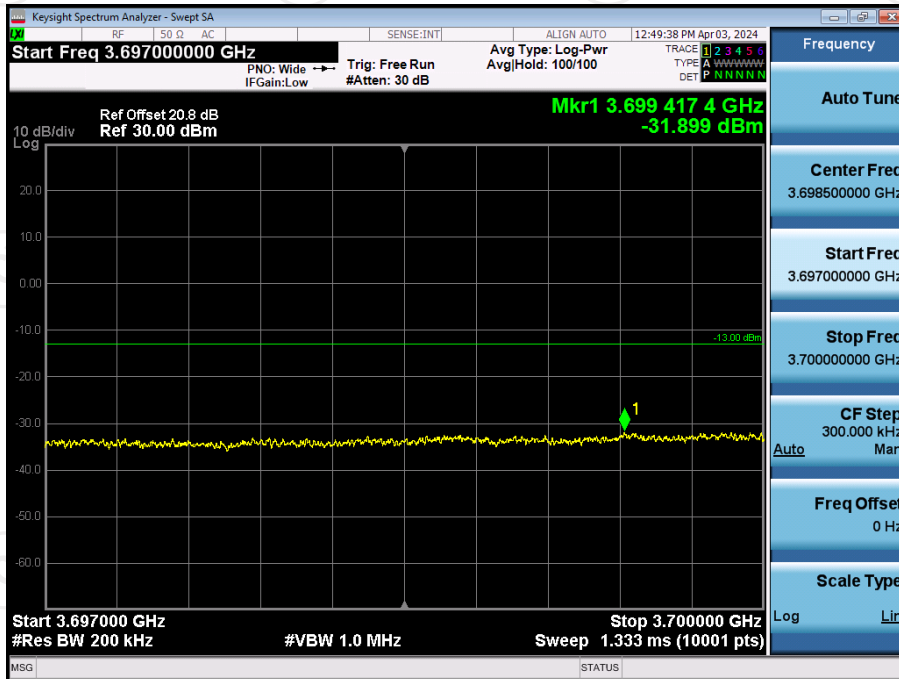
Test Plots

Path1 Full Band Mode Single Signal

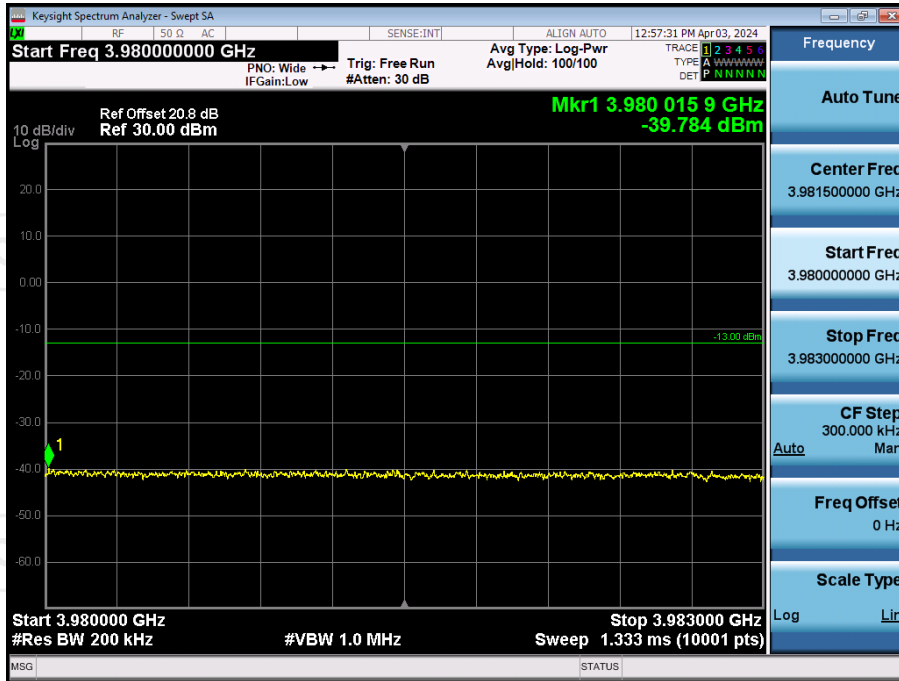
5G NR 20 MHz UL Left Side Pre AGC



5G NR 20 MHz UL Left Side Pre AGC + 3 dB



5G NR 20 MHz UL Right Side Pre AGC



5G NR 20 MHz UL Right Side Pre AGC + 3 dB

