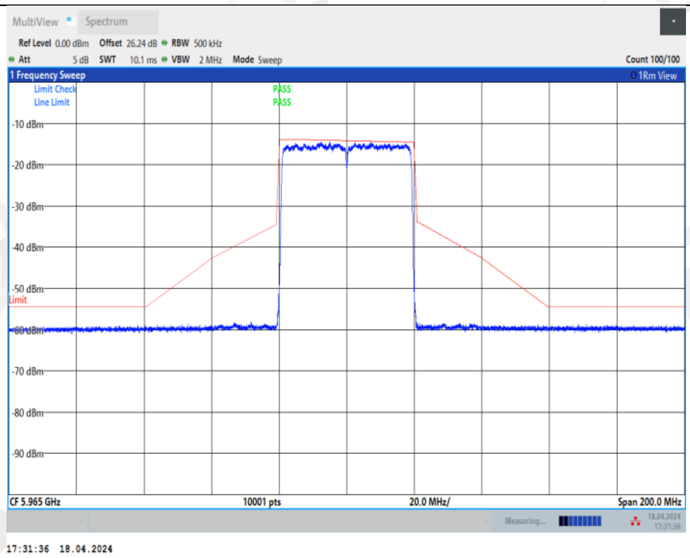

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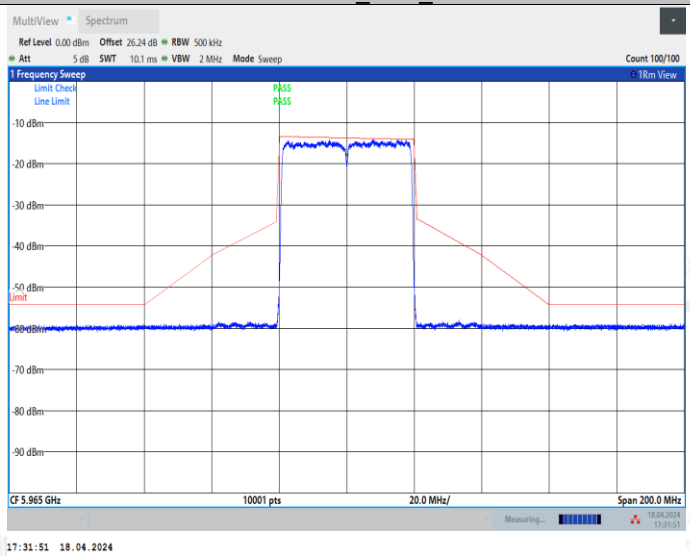

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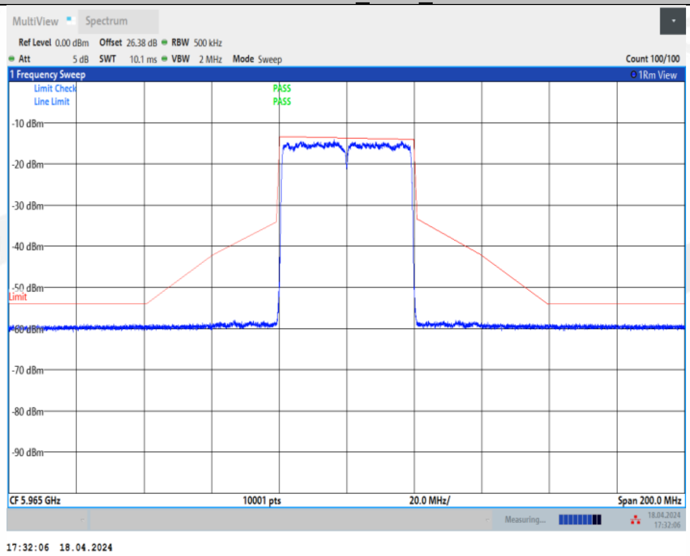

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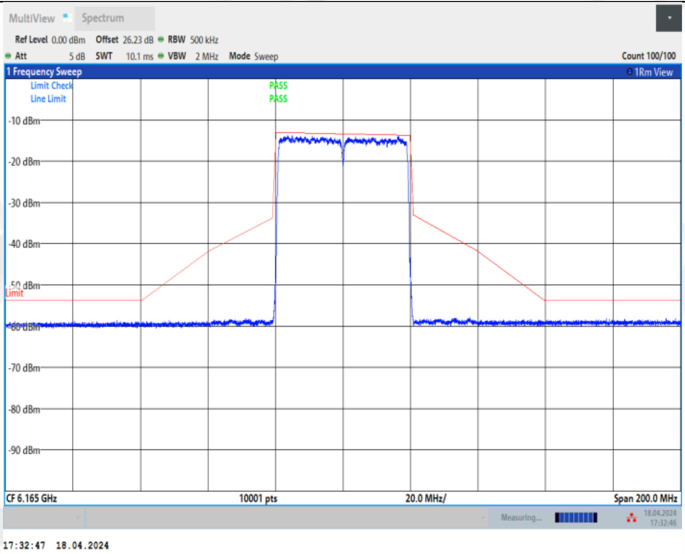

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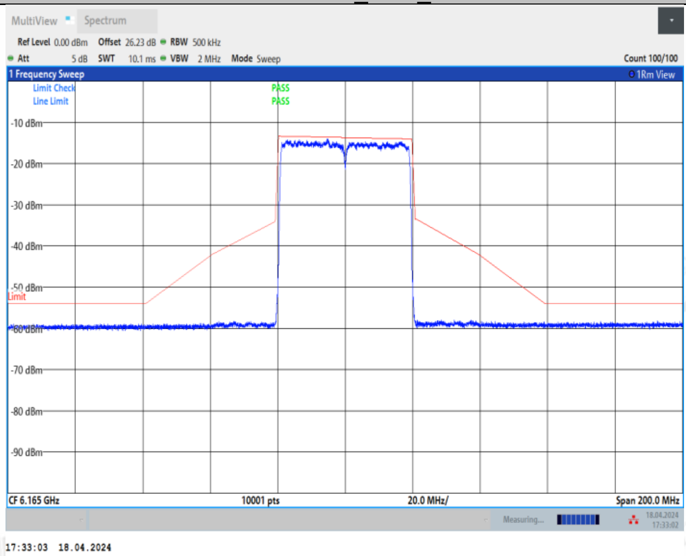

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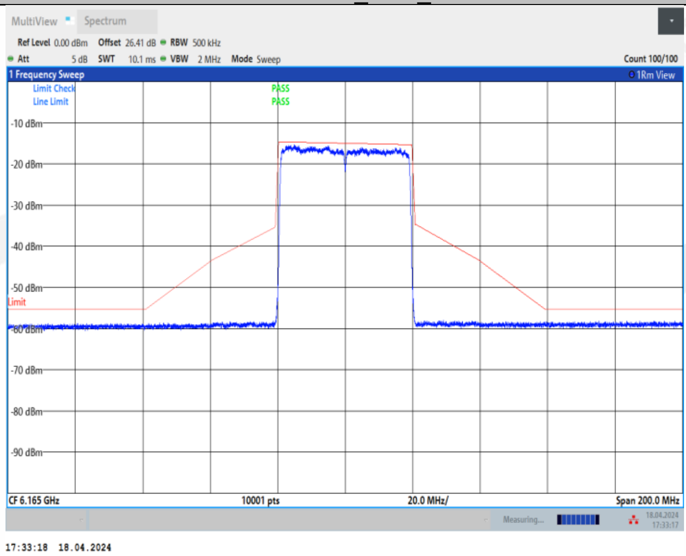

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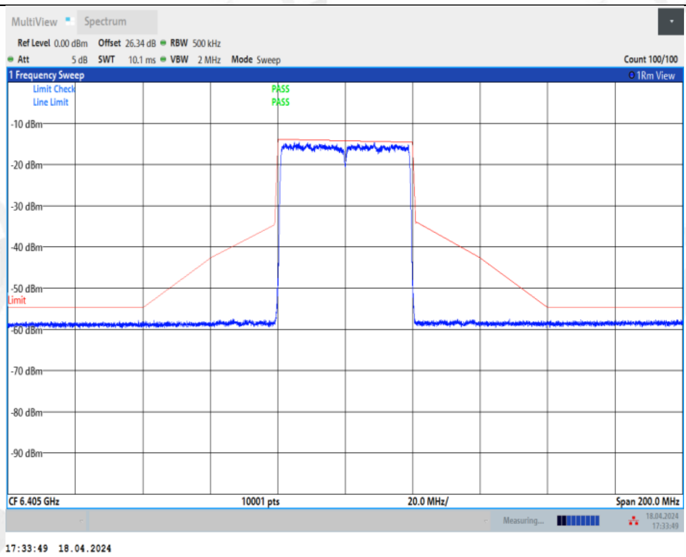

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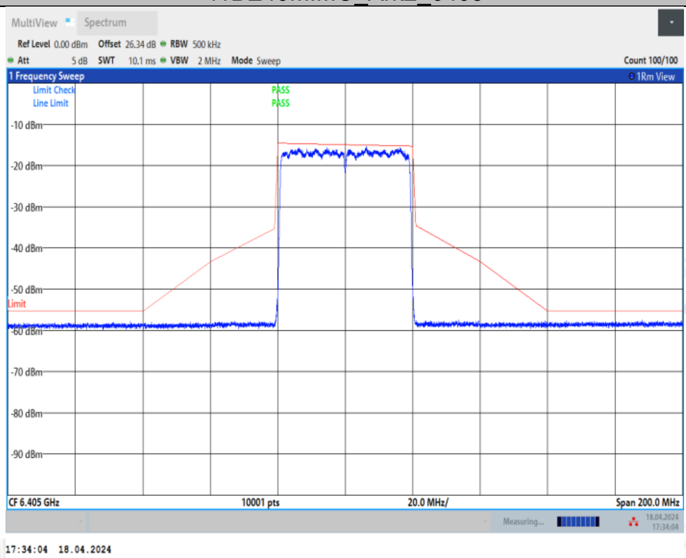

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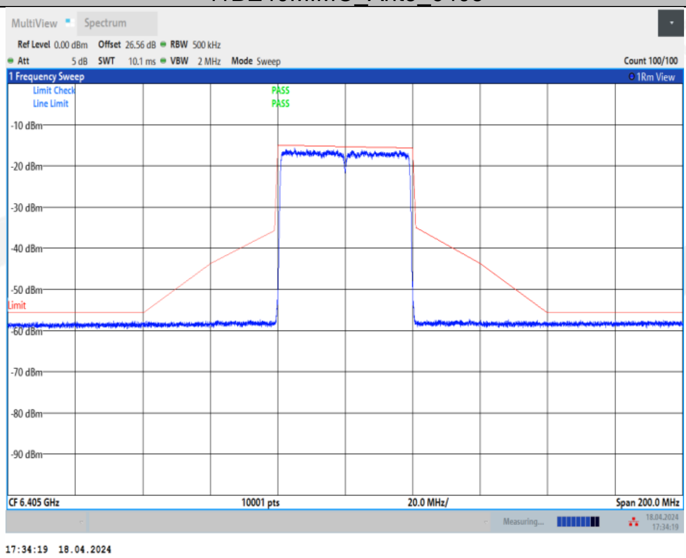

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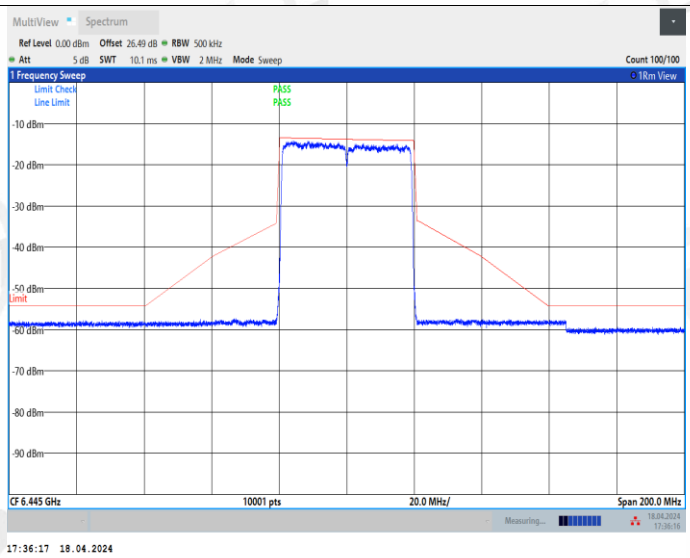

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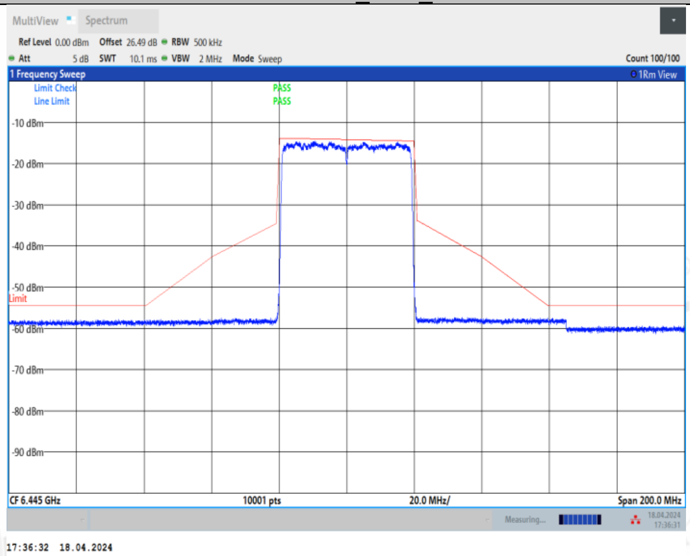

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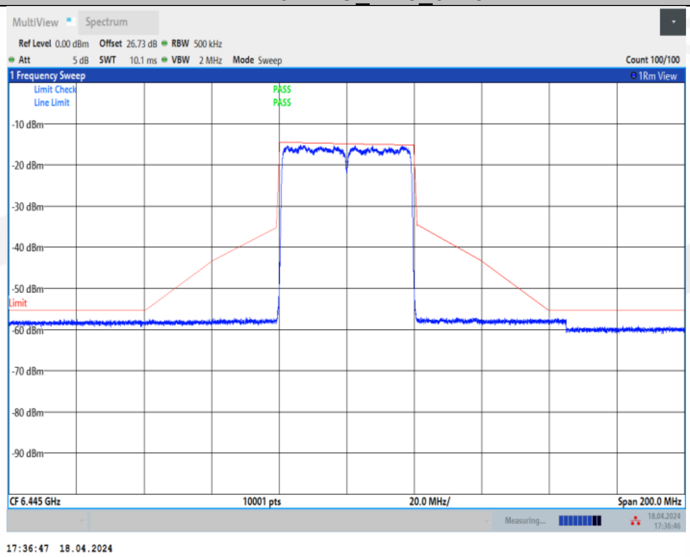

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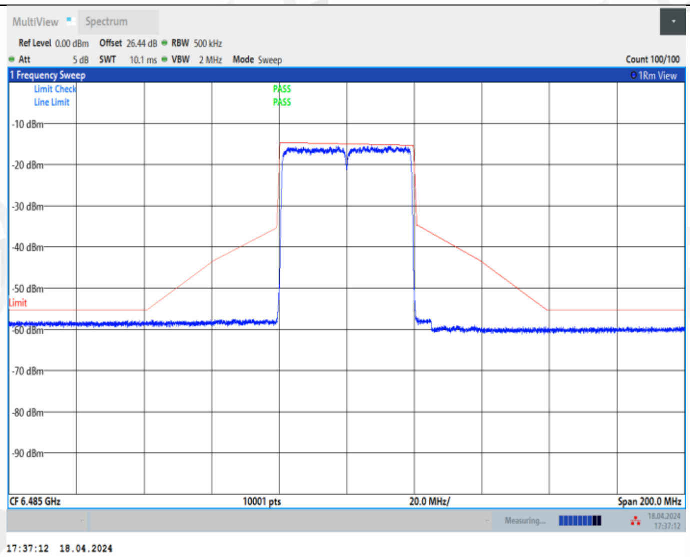

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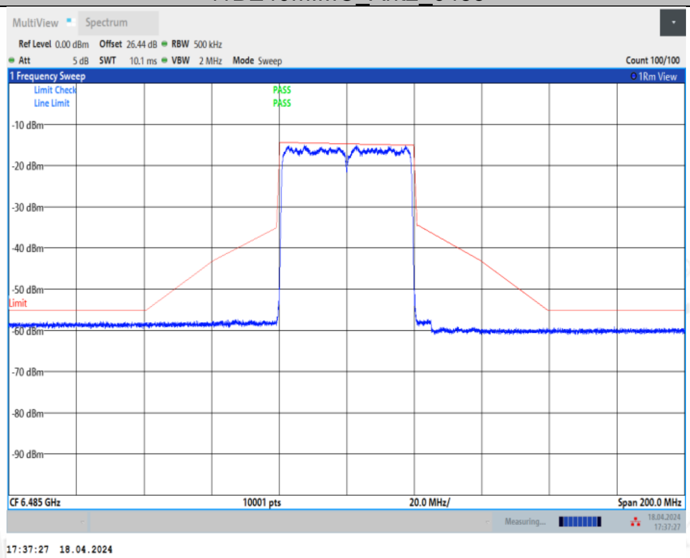

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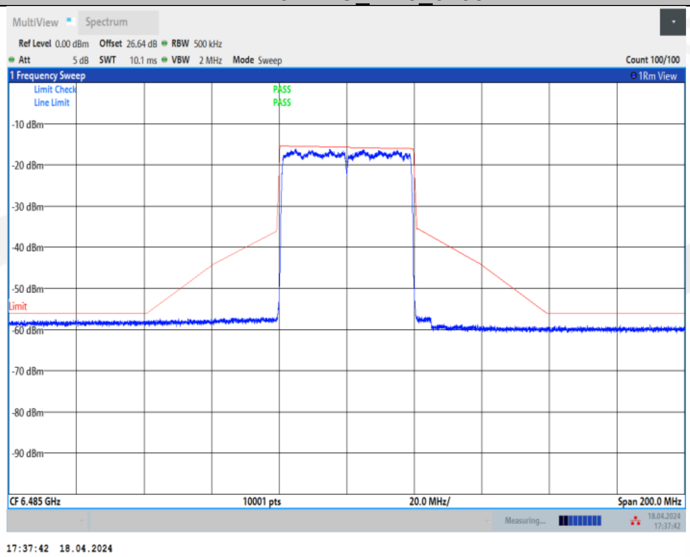

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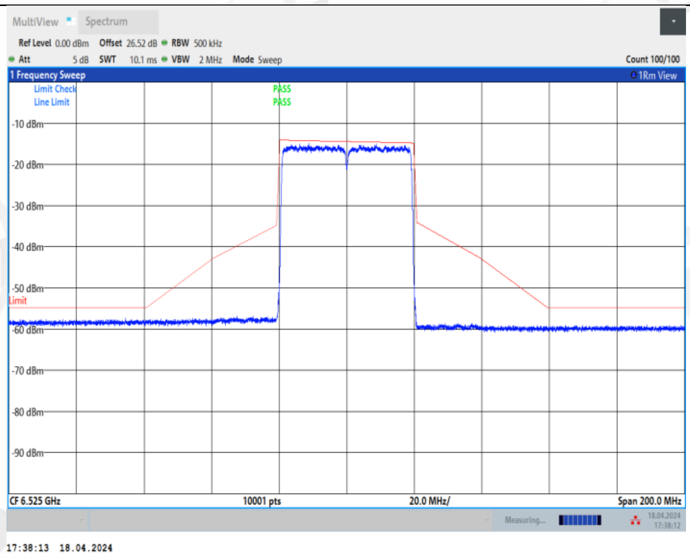

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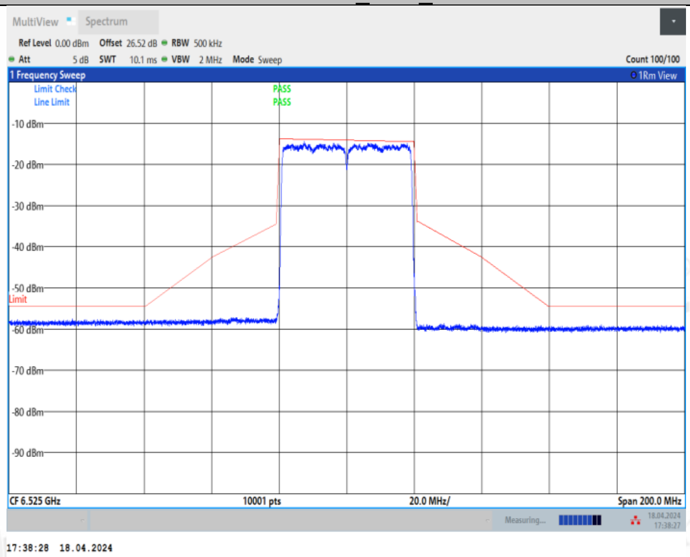

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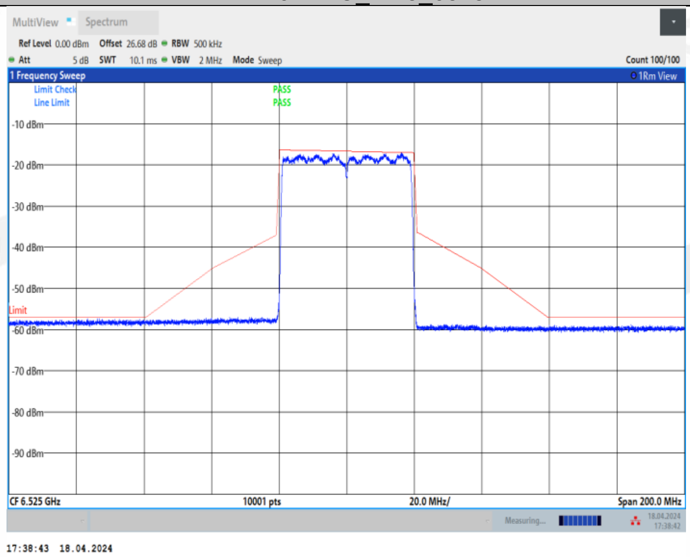

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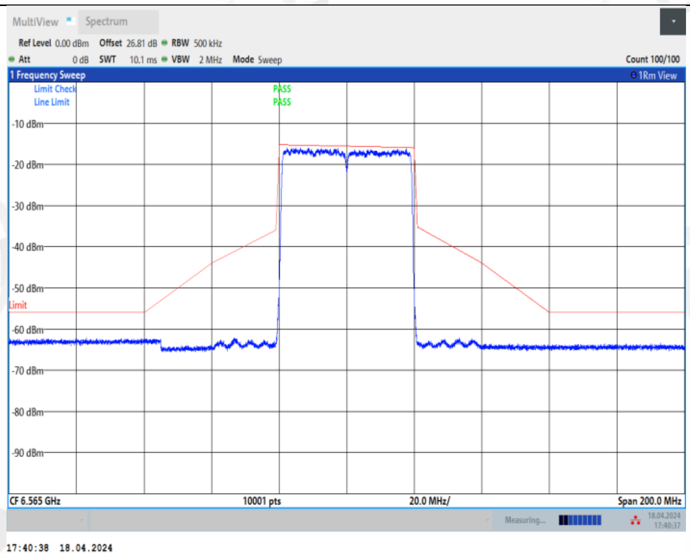

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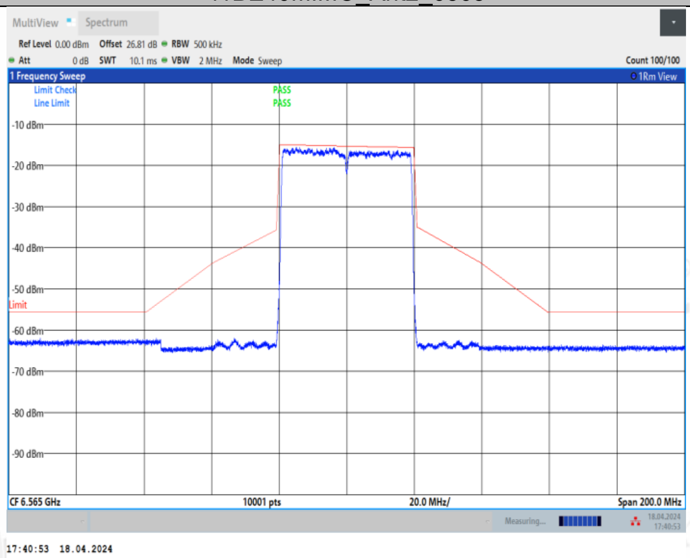

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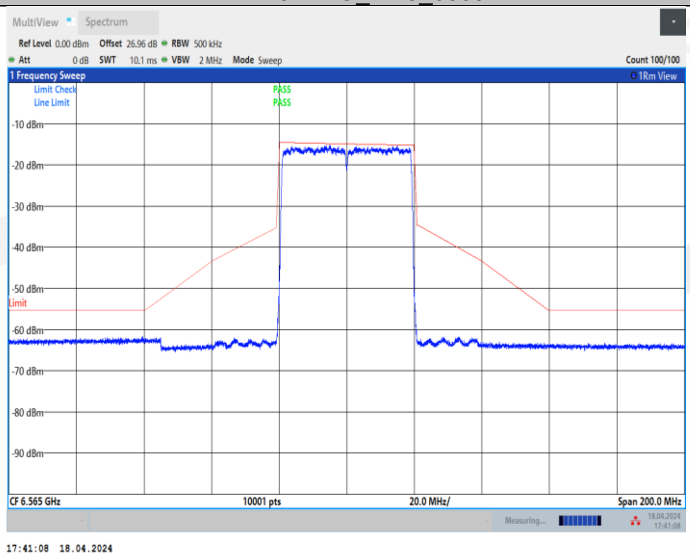

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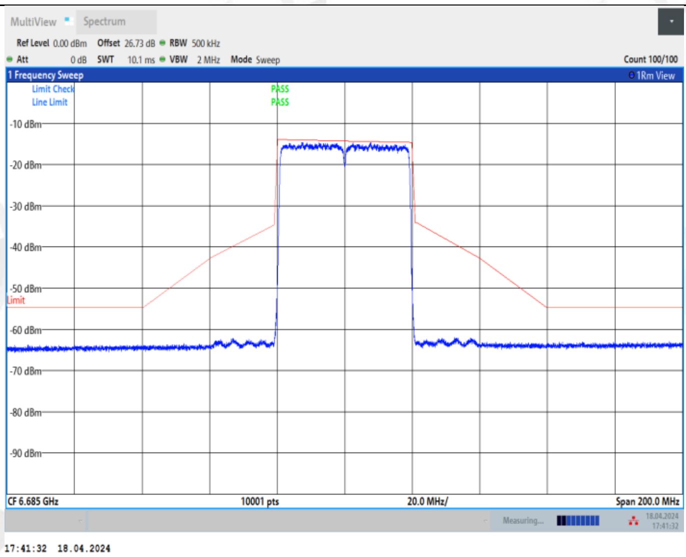

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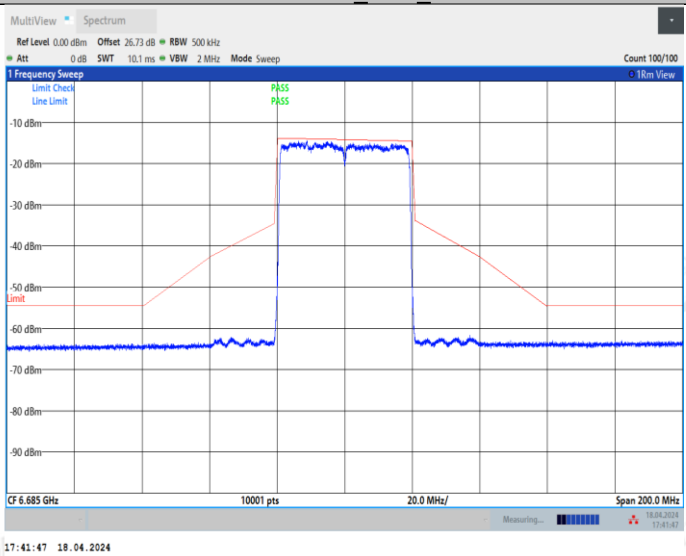

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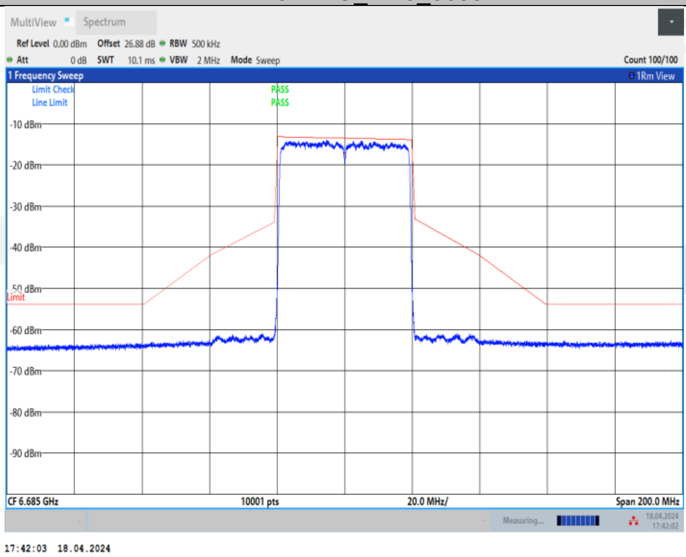

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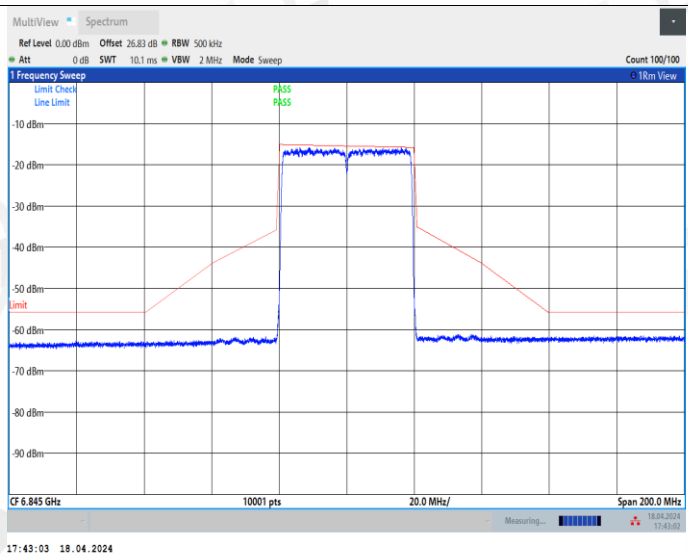

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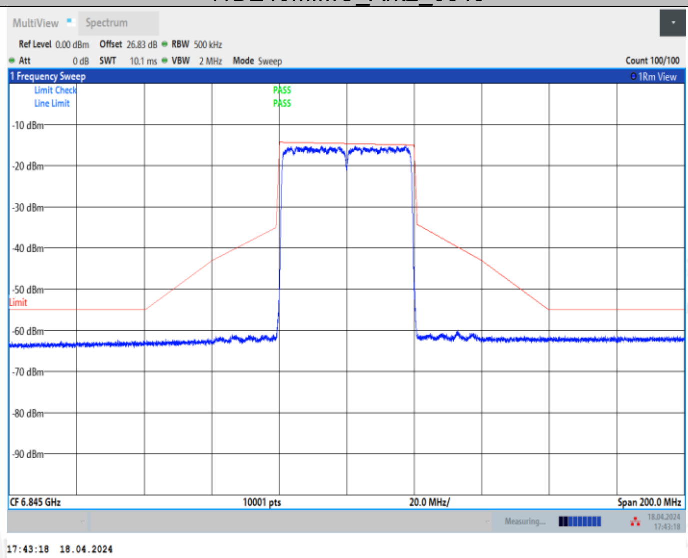

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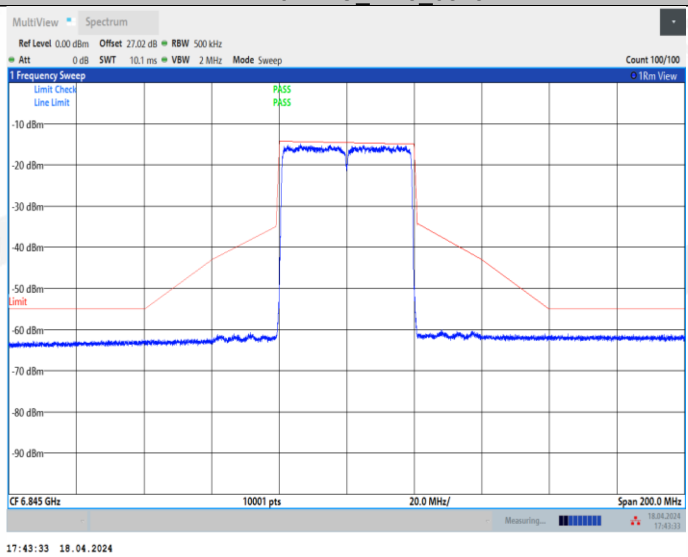

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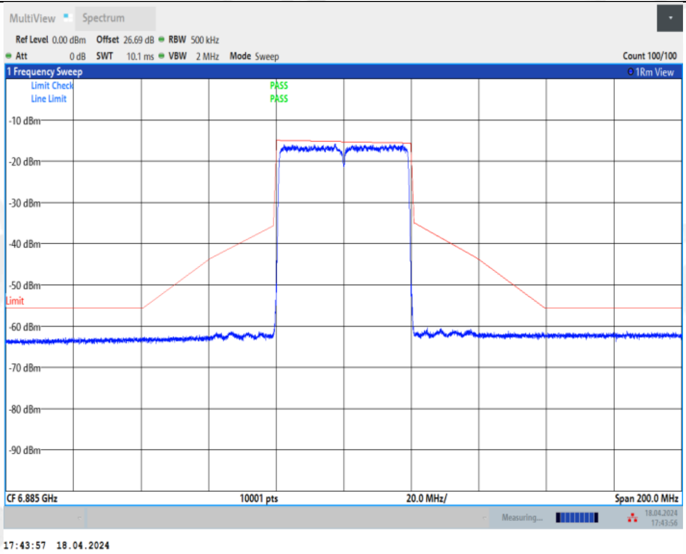

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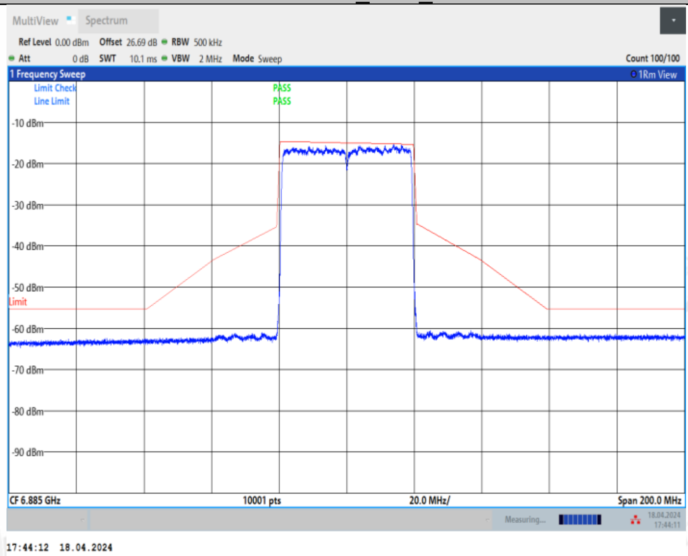

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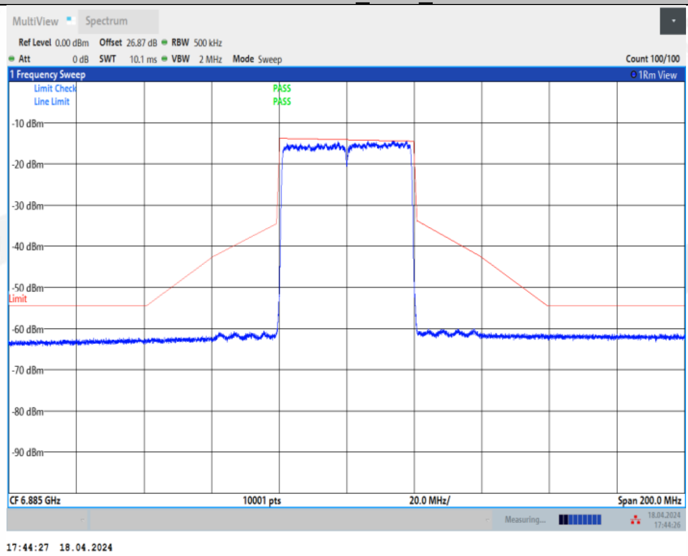

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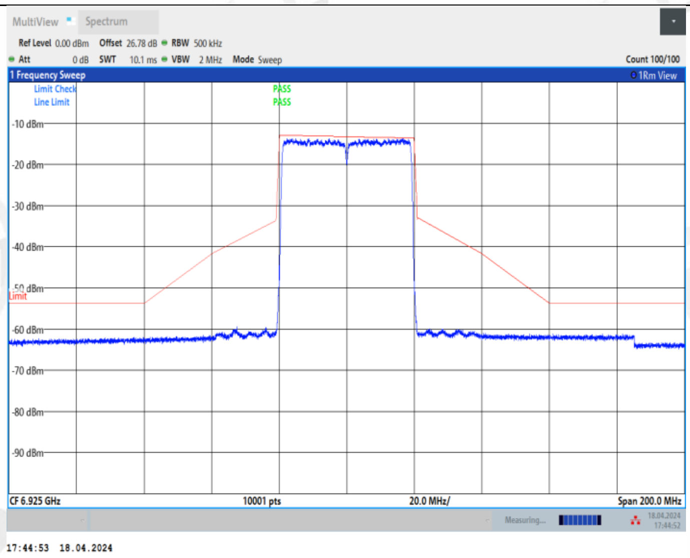

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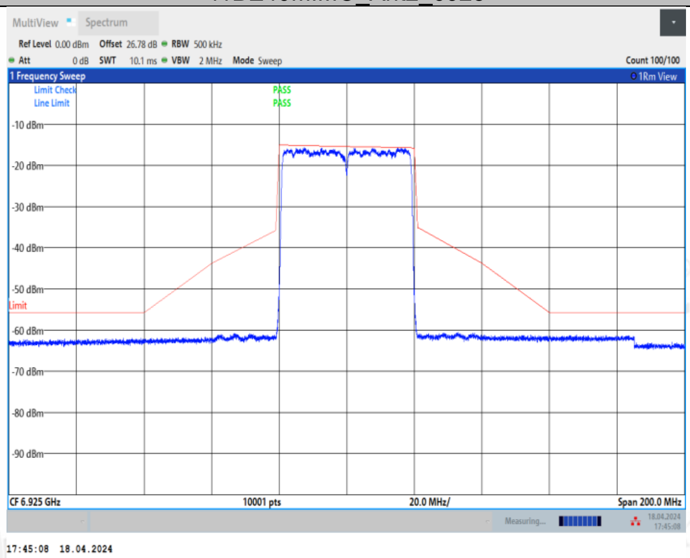

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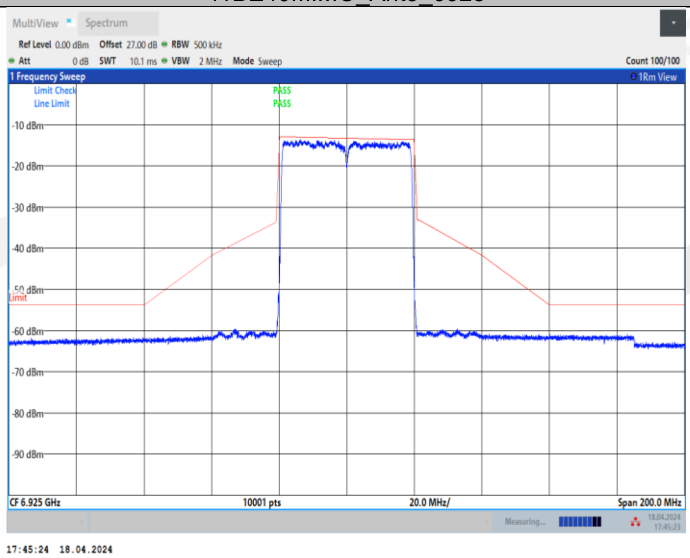

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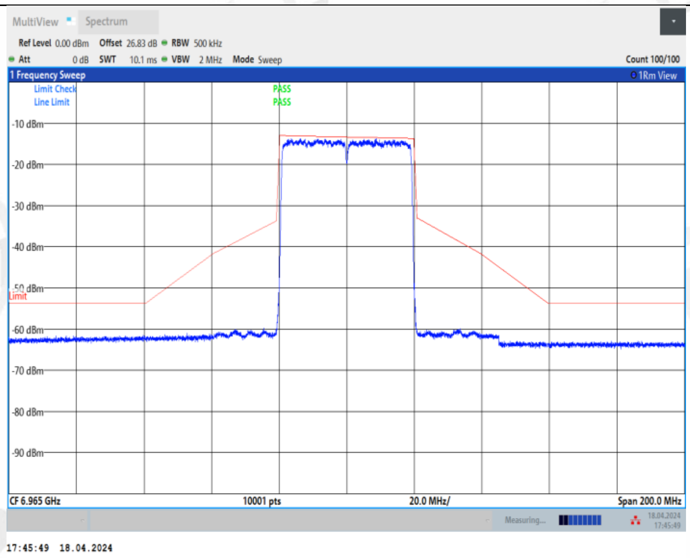

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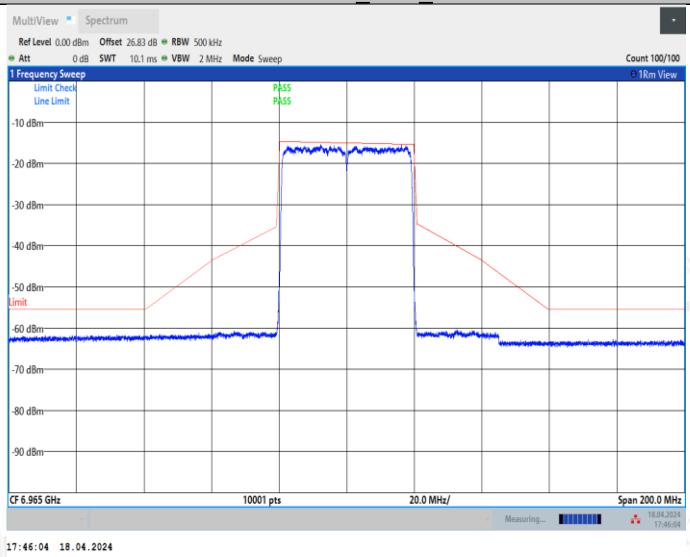

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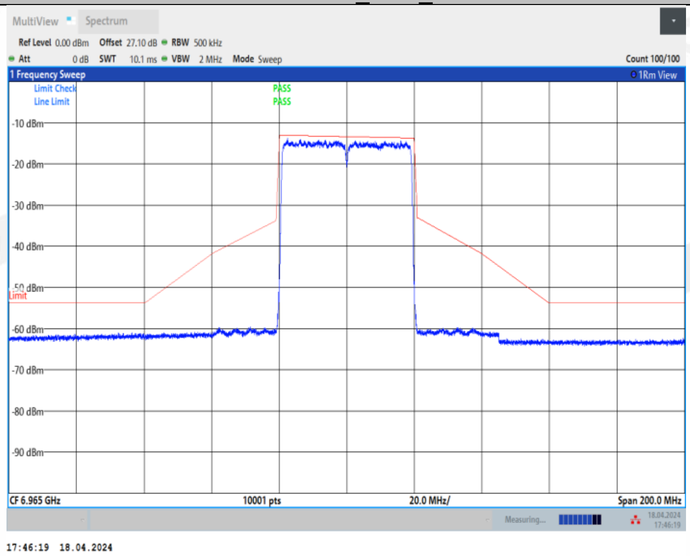

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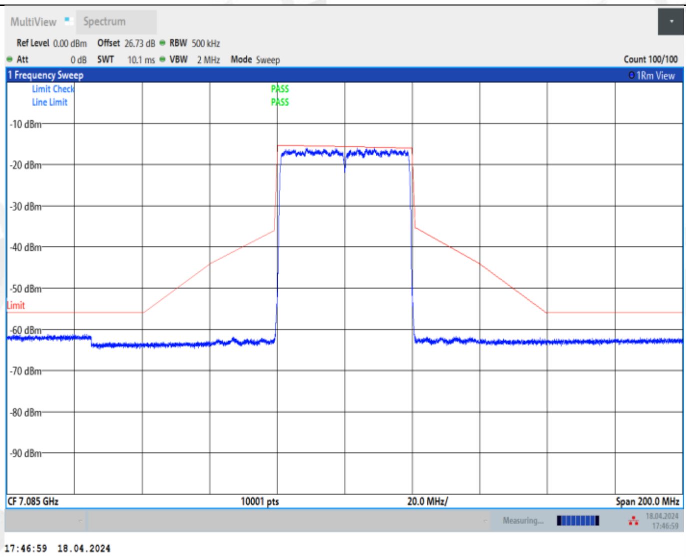

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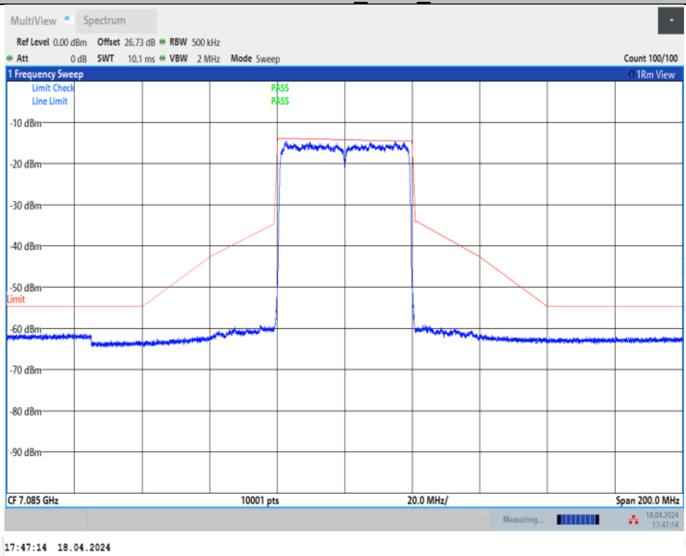

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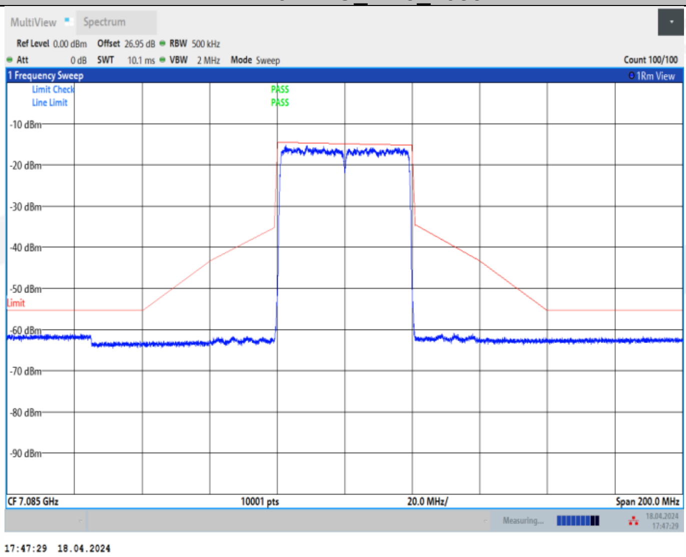

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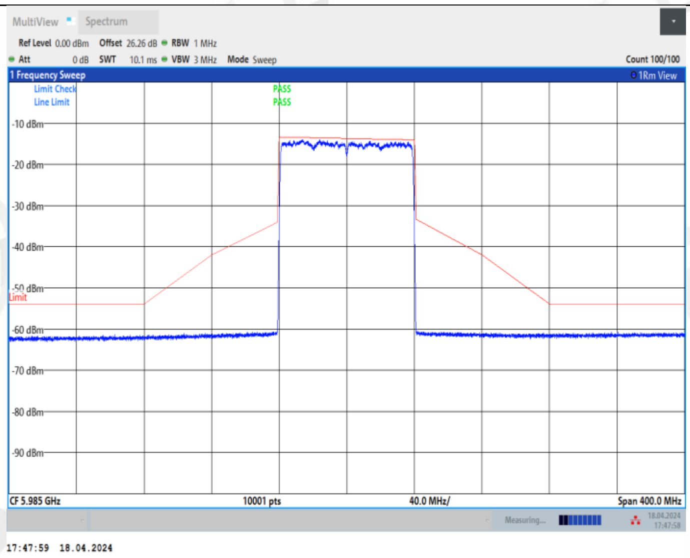

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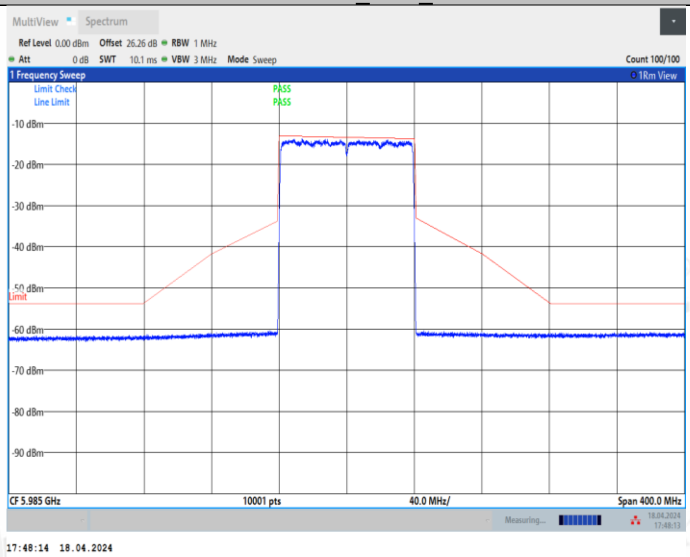

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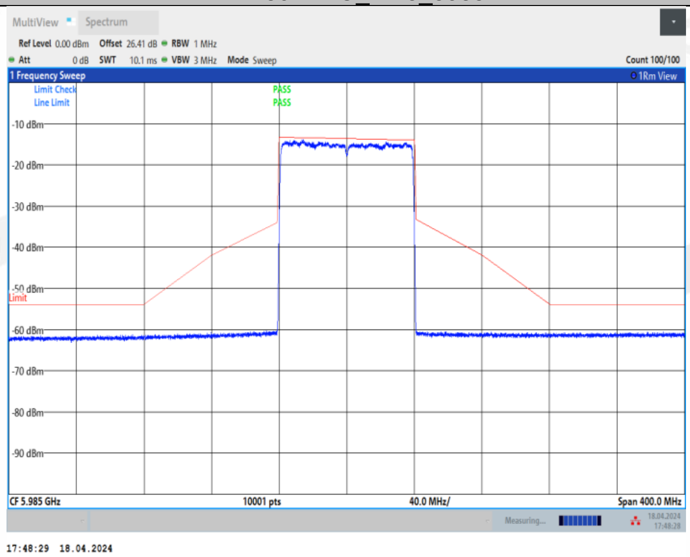

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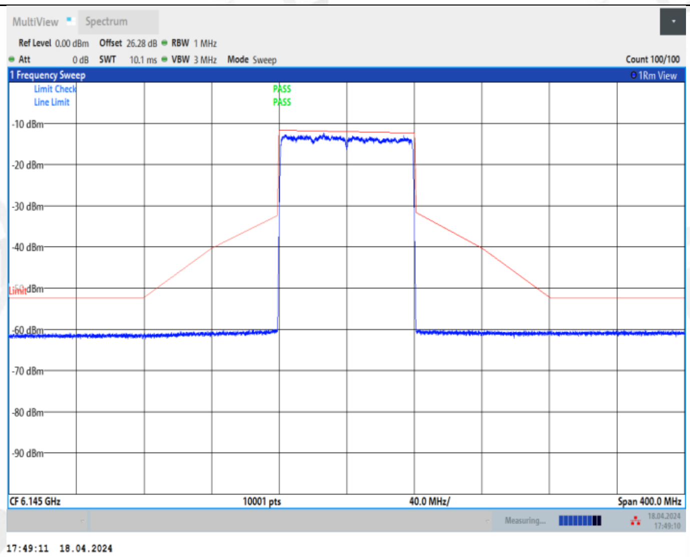

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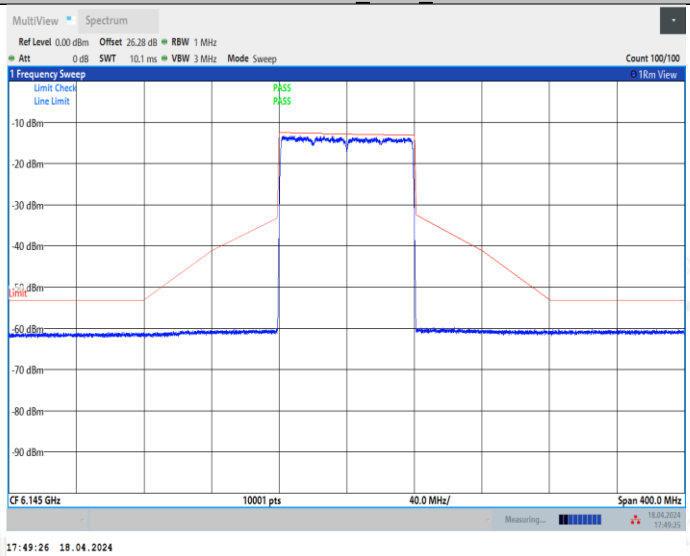

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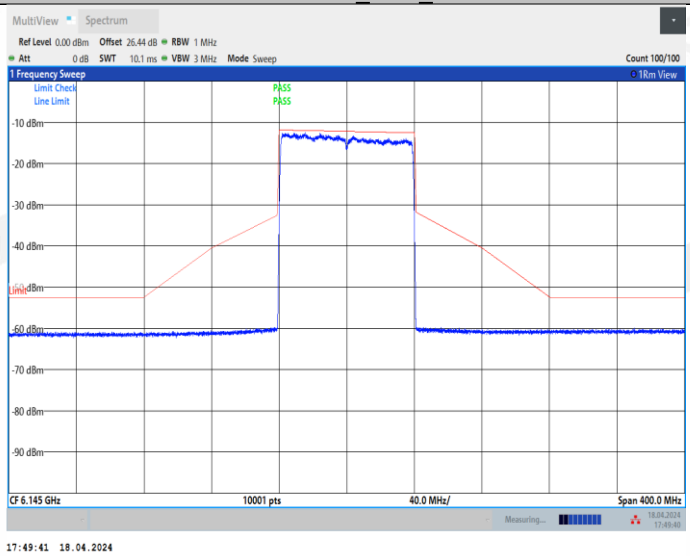

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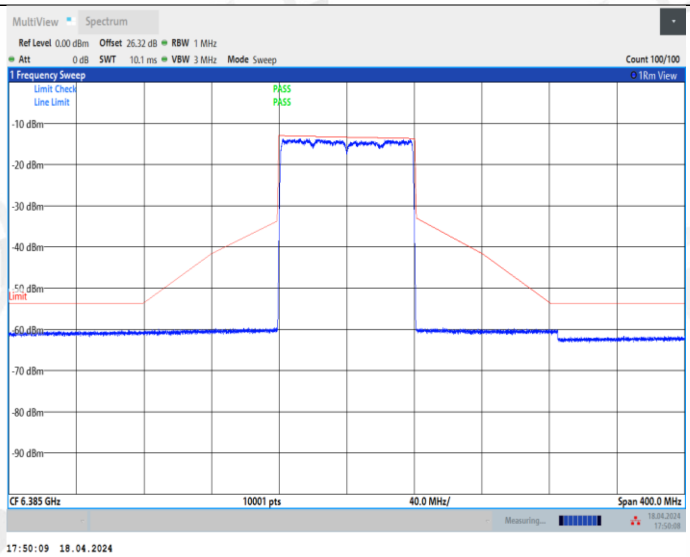

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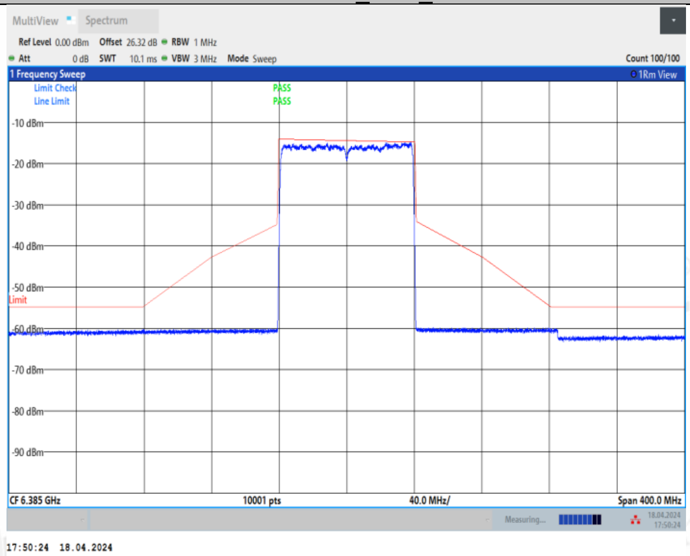

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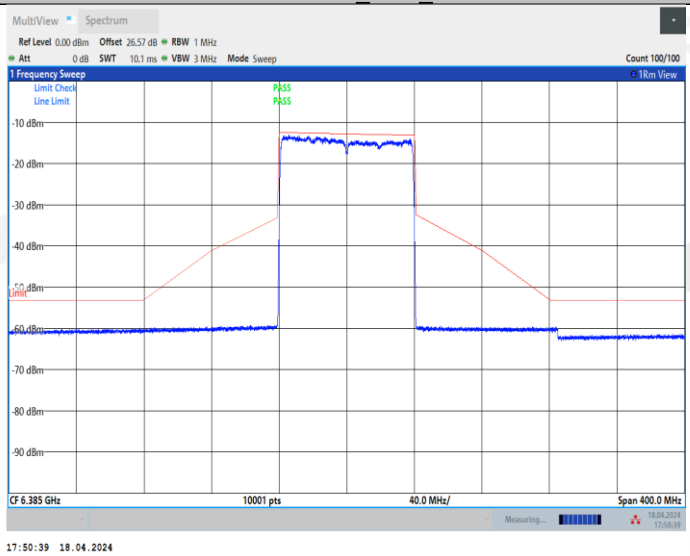

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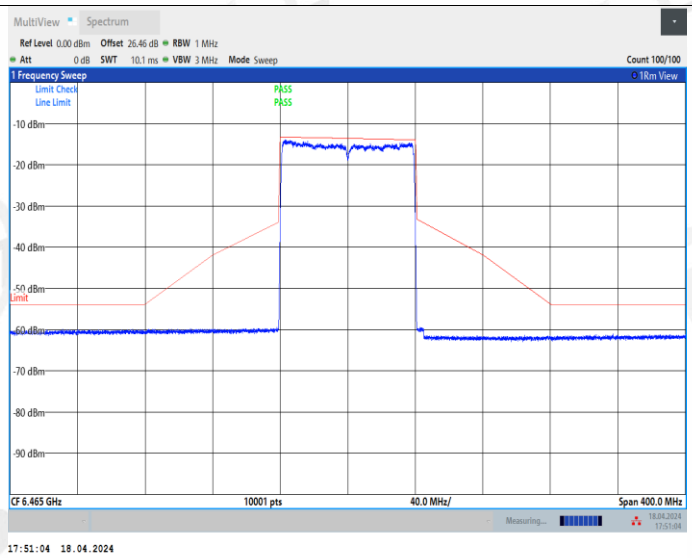

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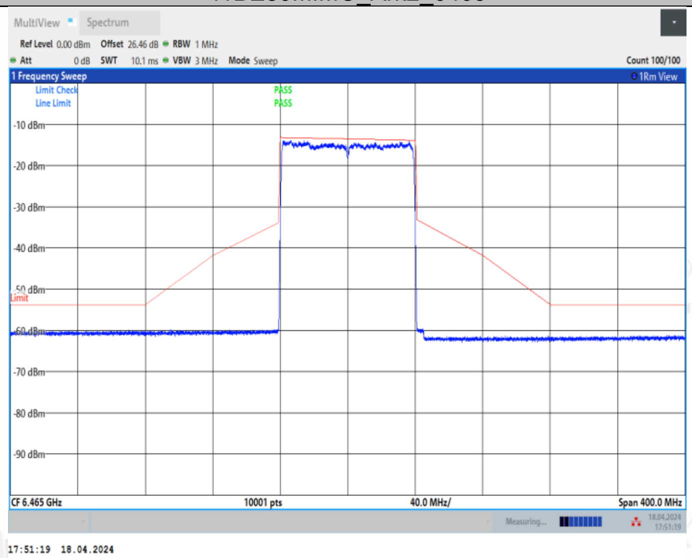

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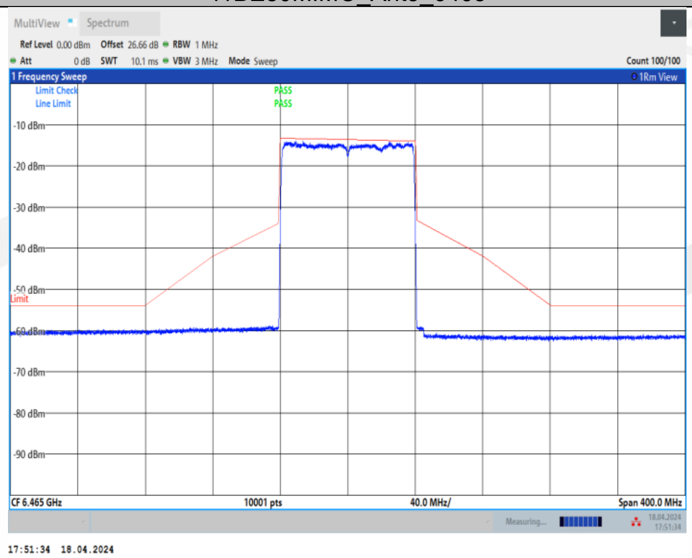

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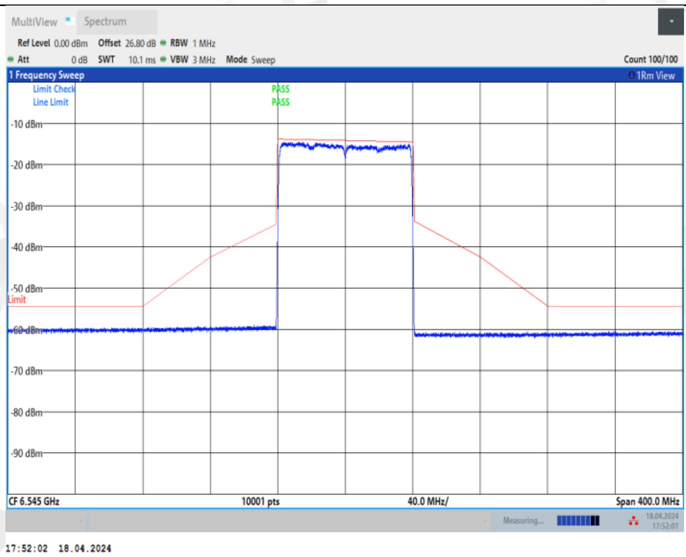

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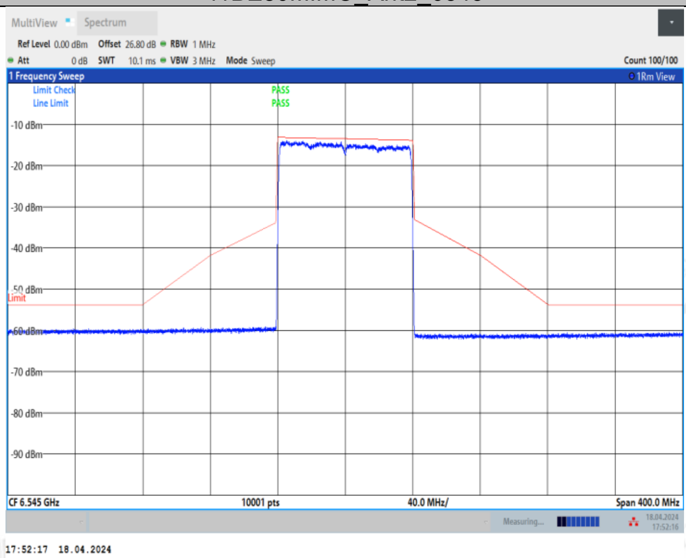

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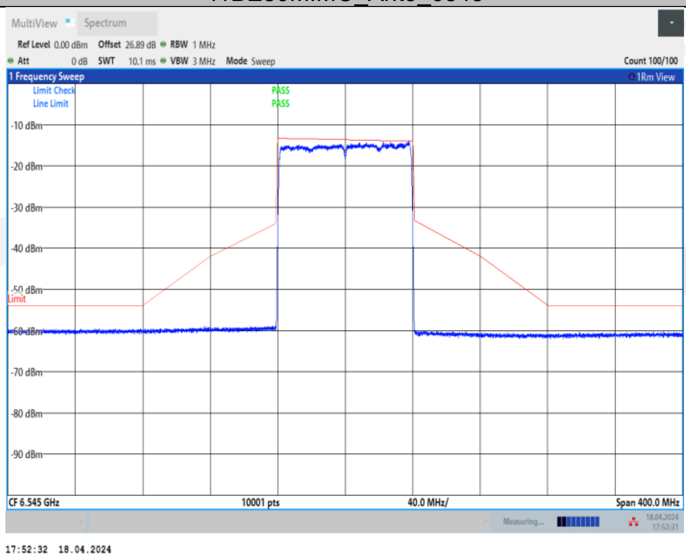

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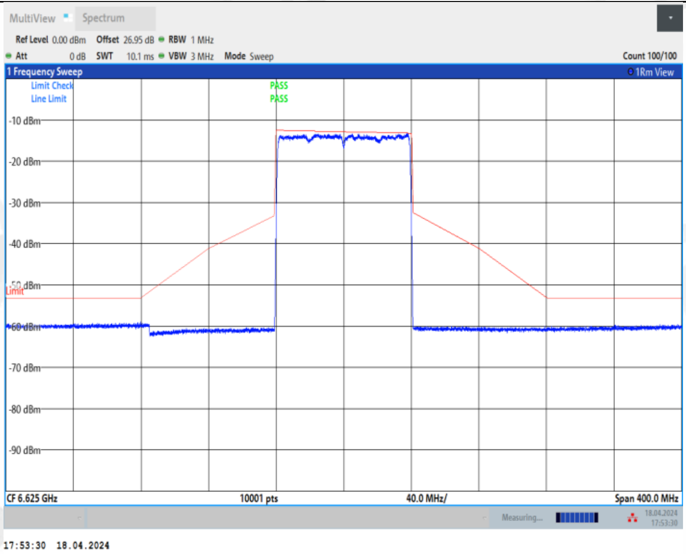

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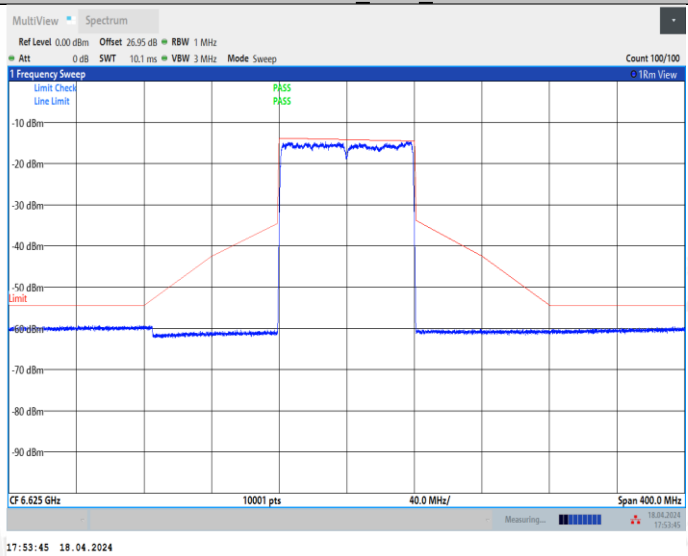

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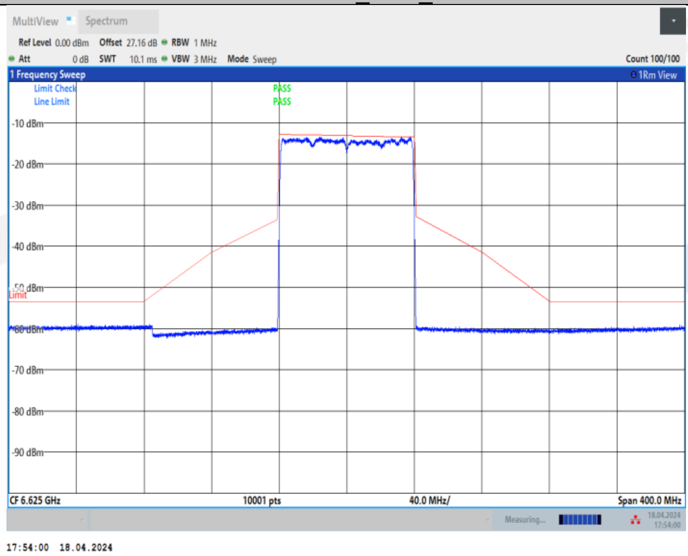

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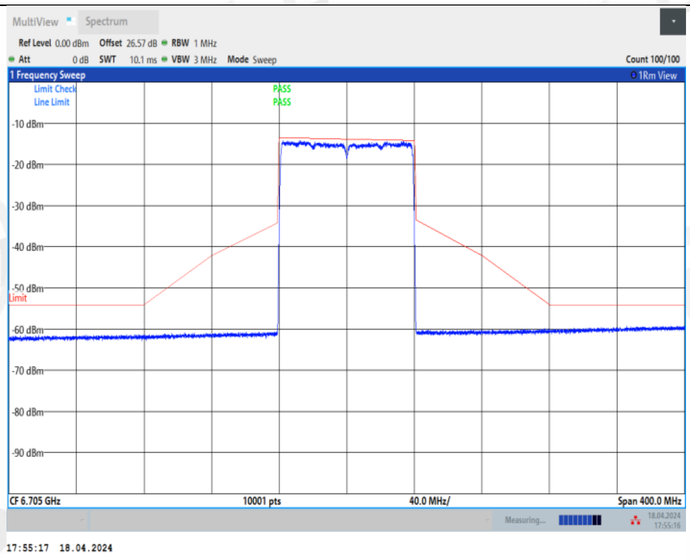

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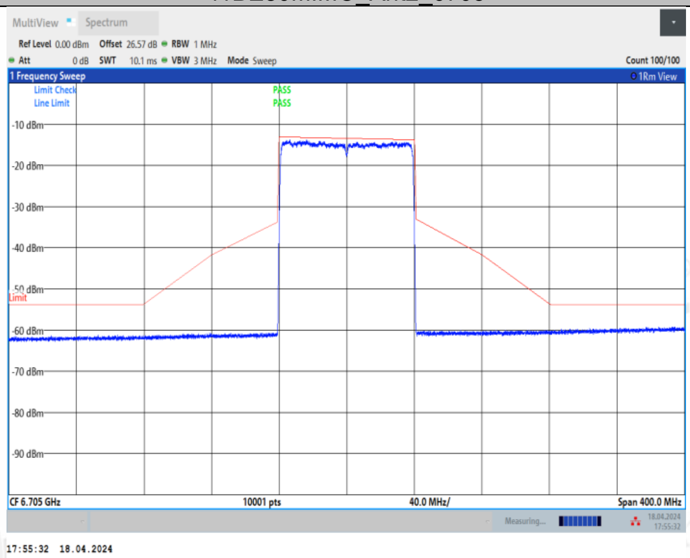

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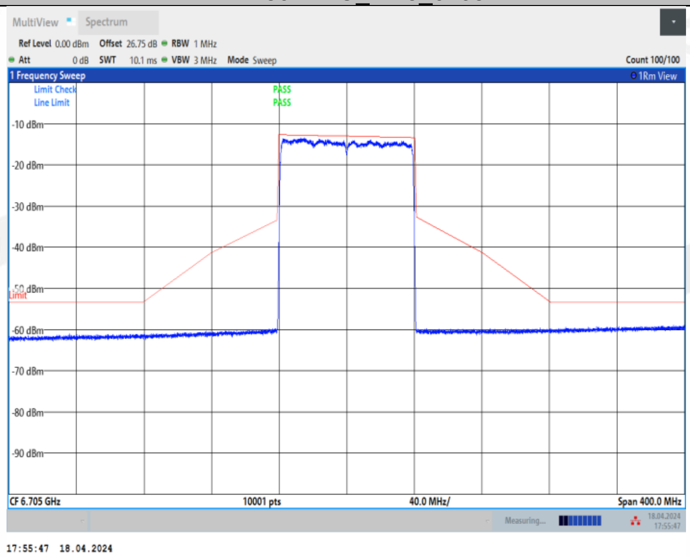

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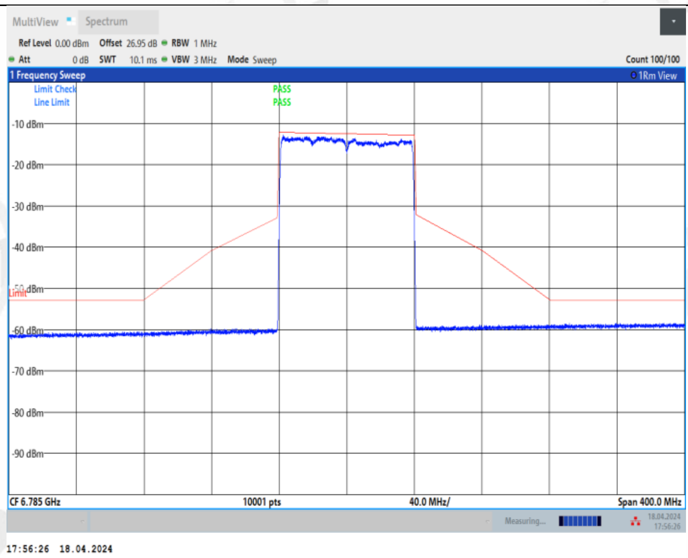

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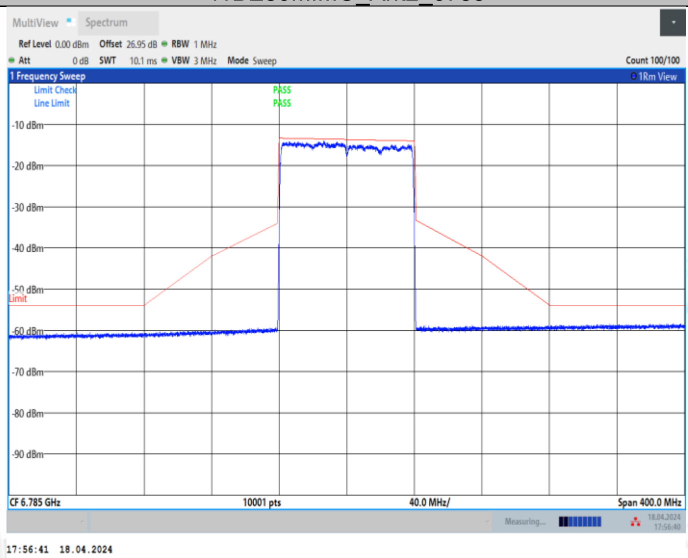

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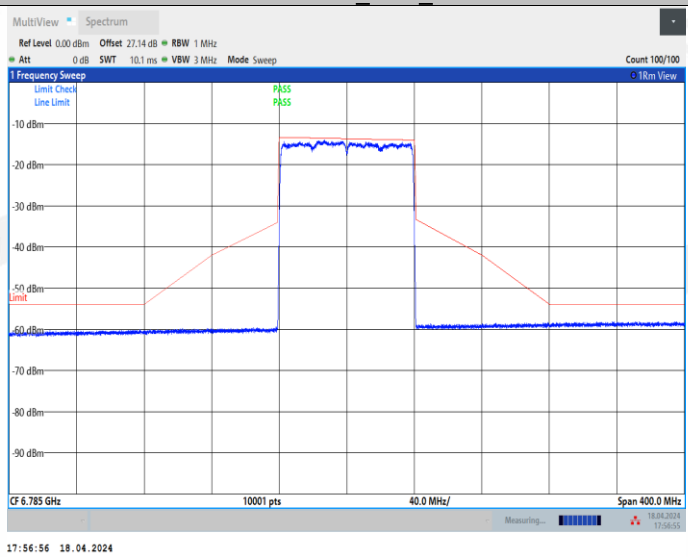

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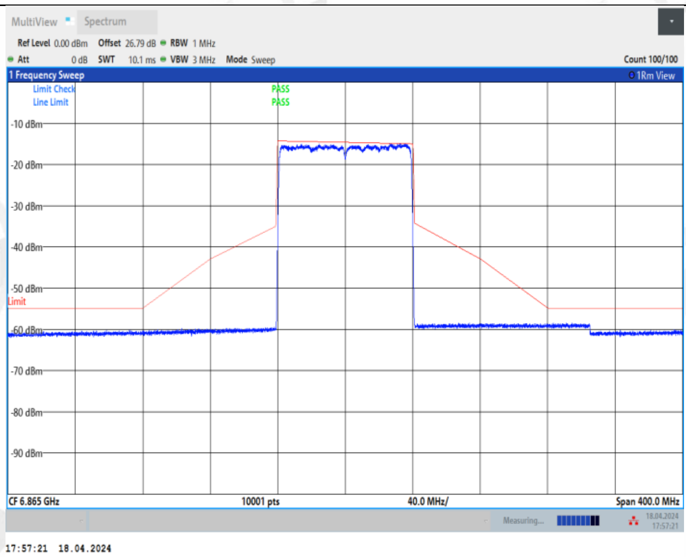

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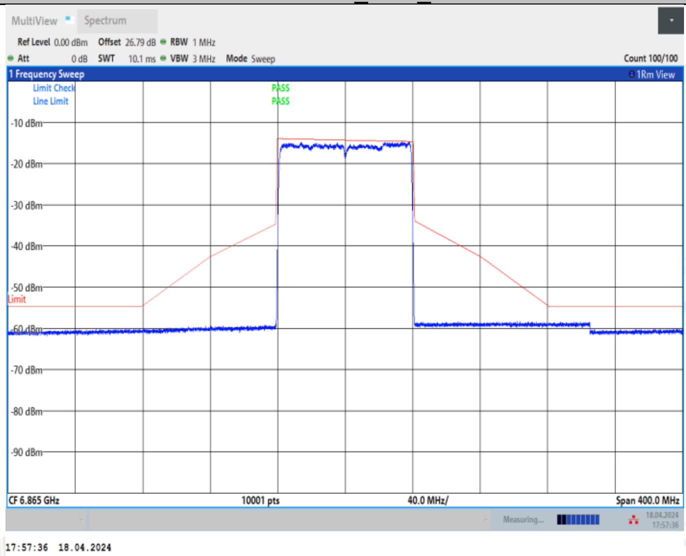

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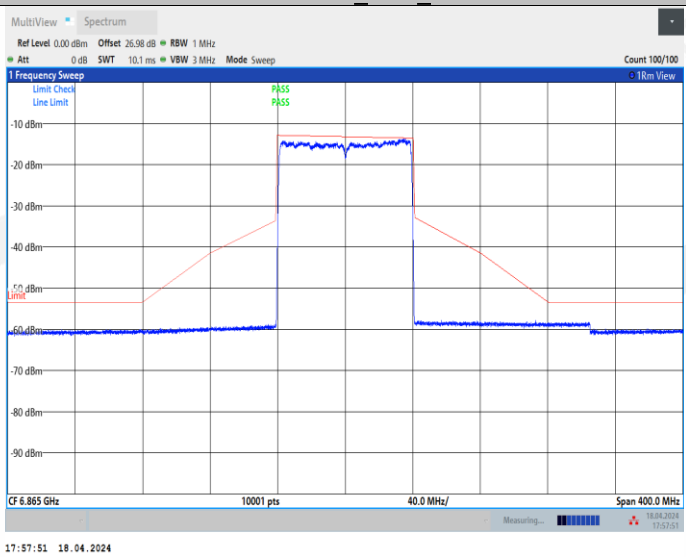

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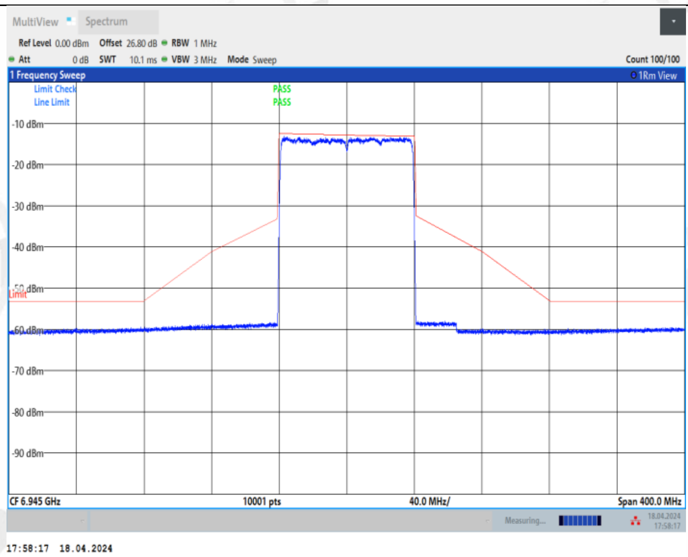

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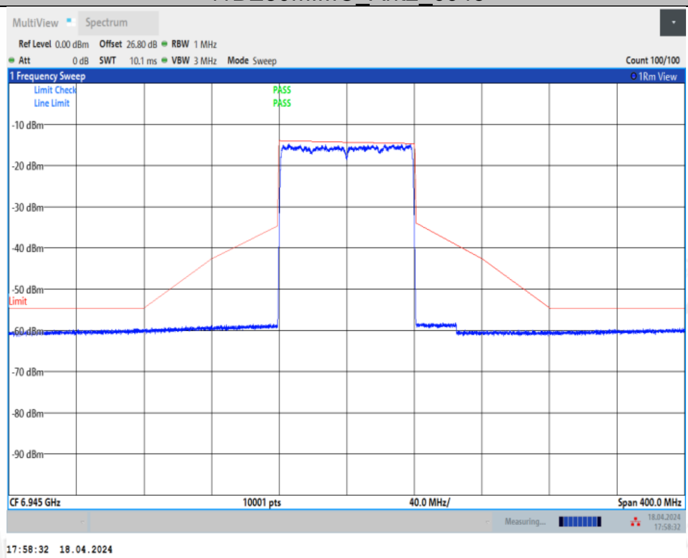

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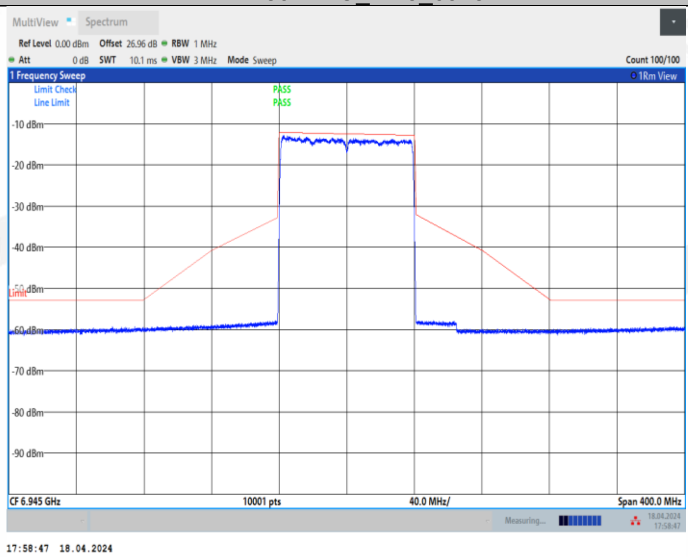

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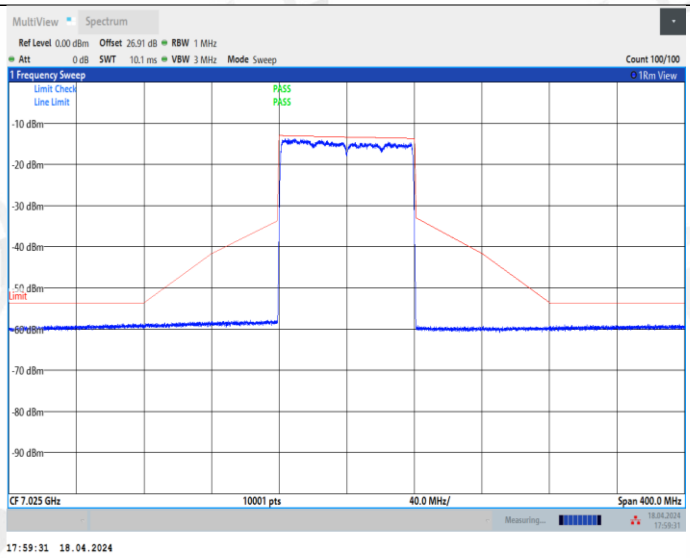

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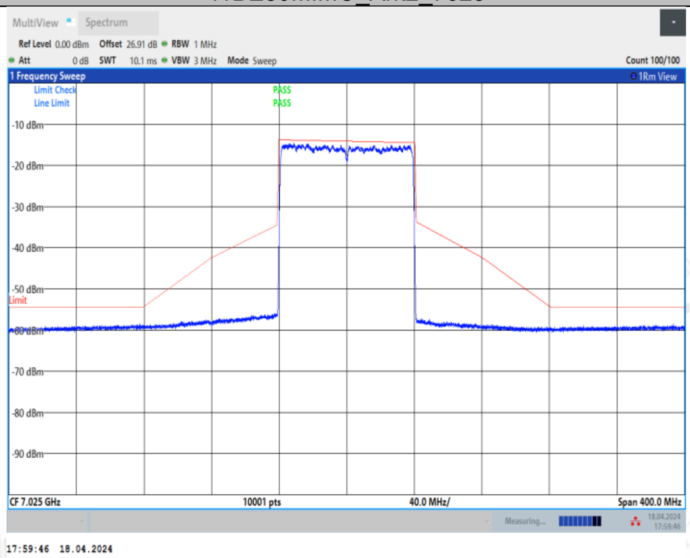

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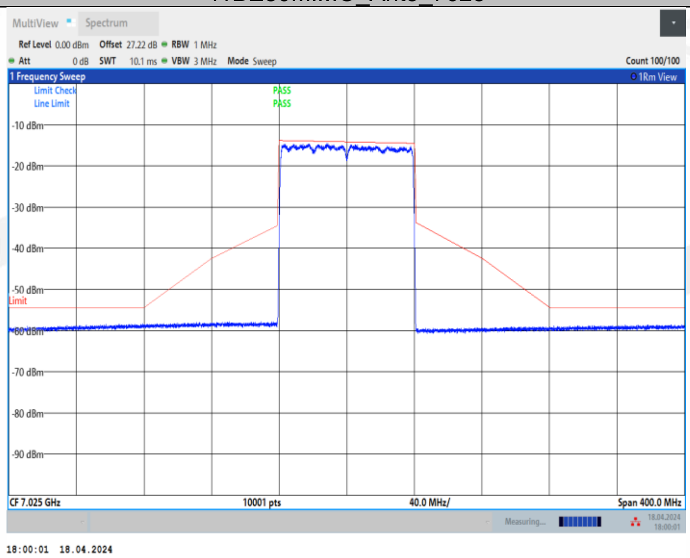

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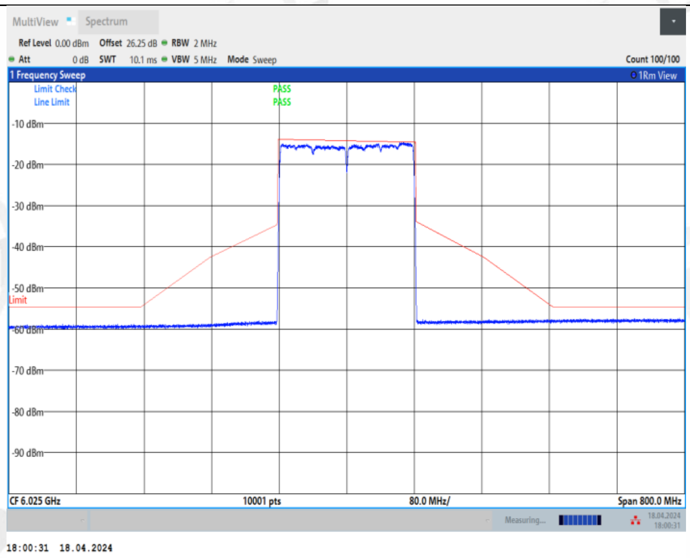

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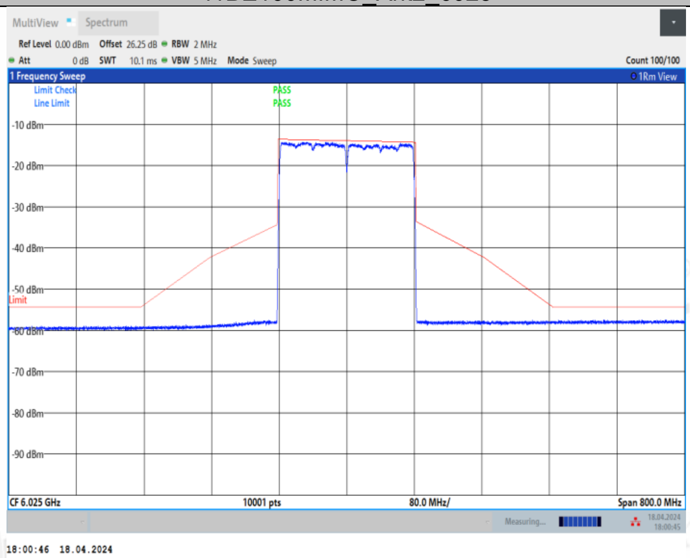

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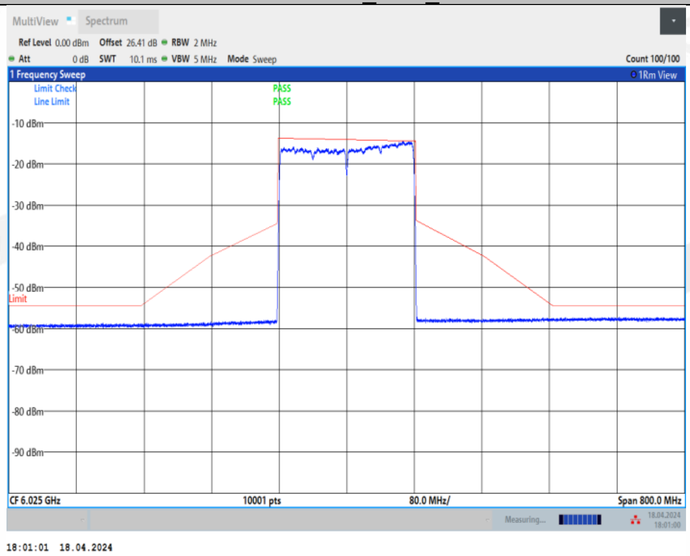

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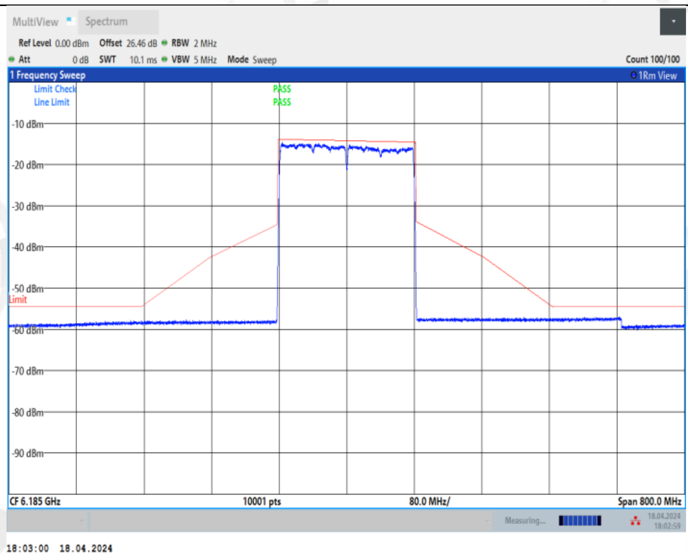

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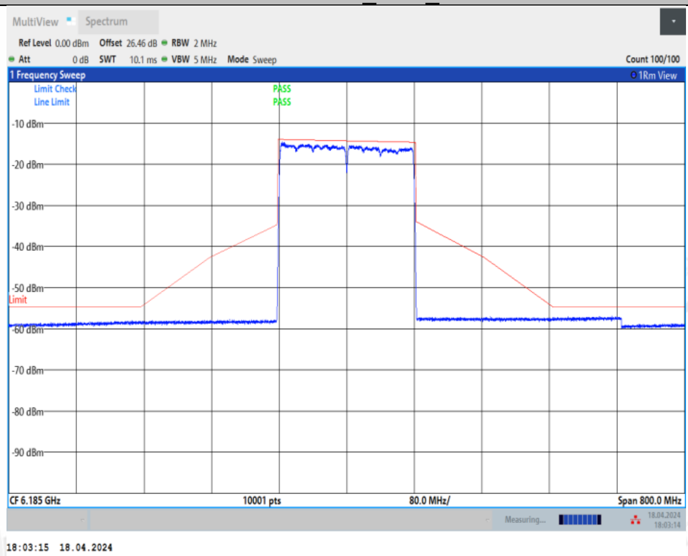

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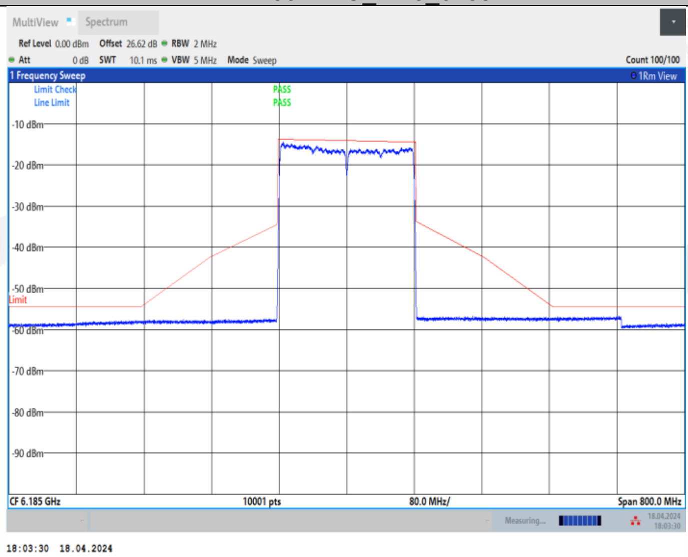

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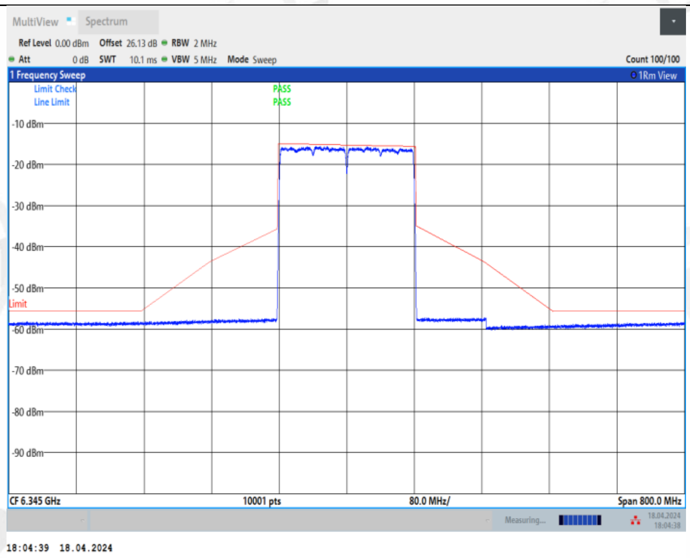

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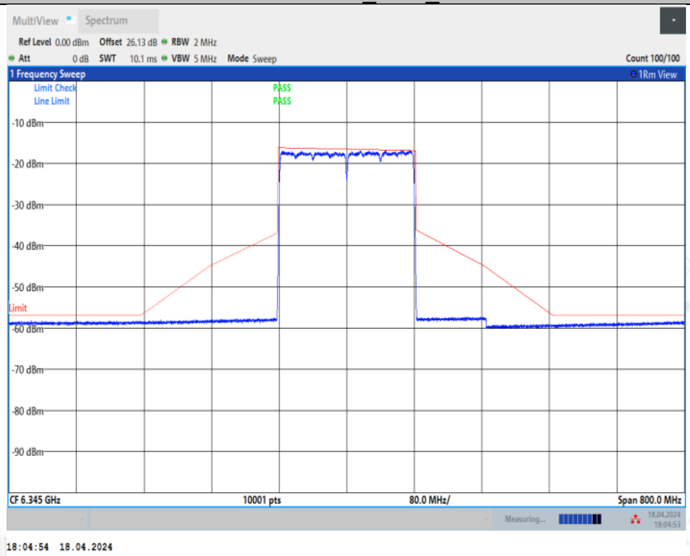

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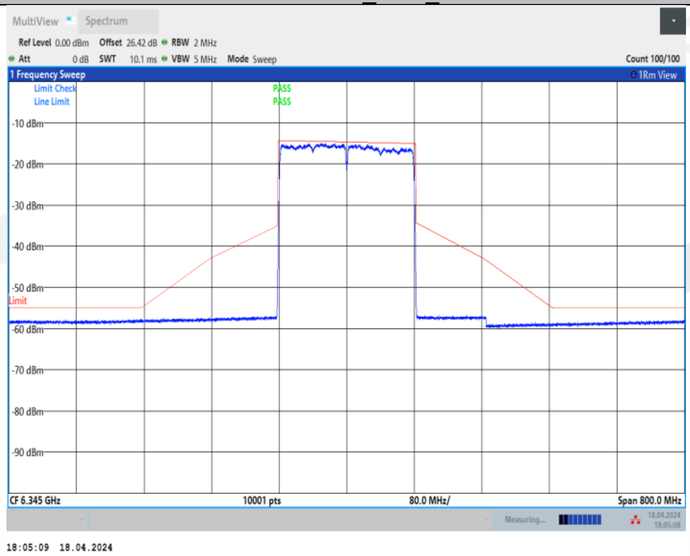

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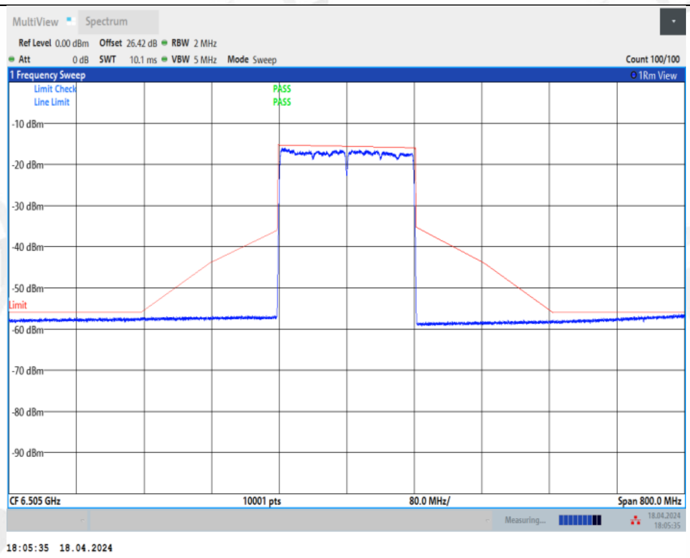

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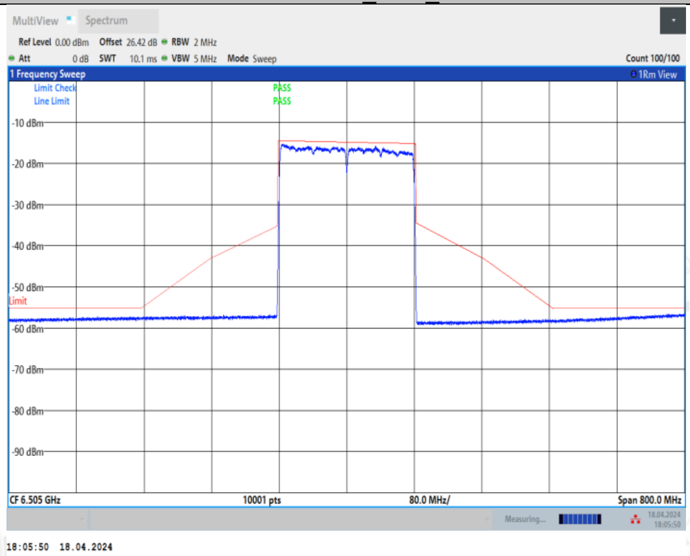

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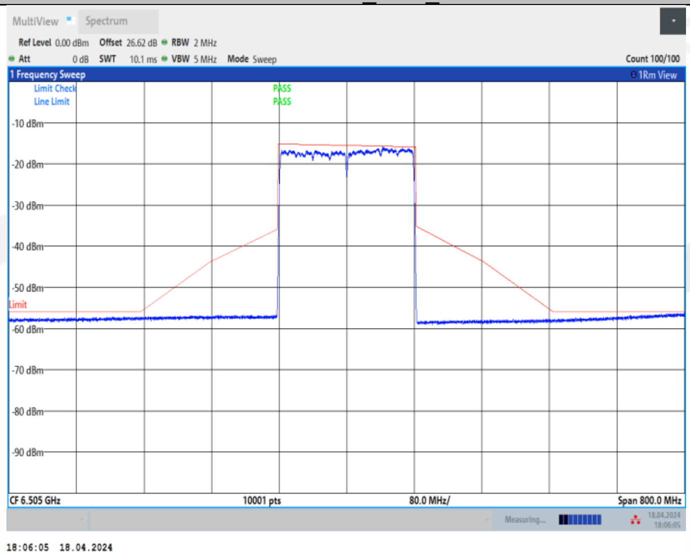

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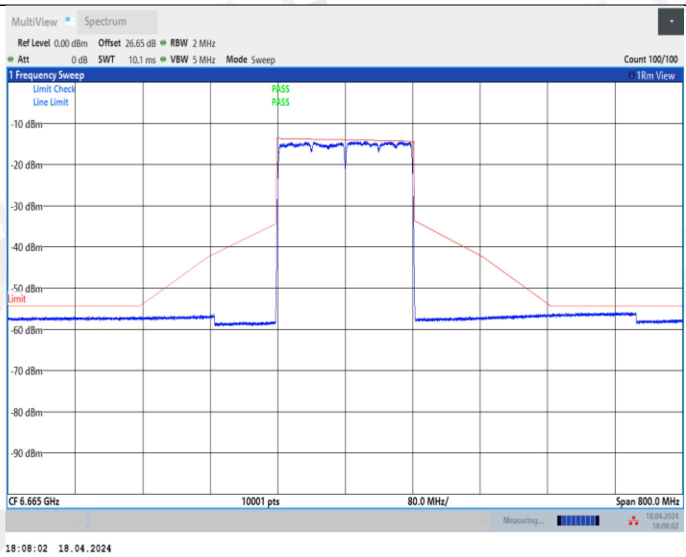

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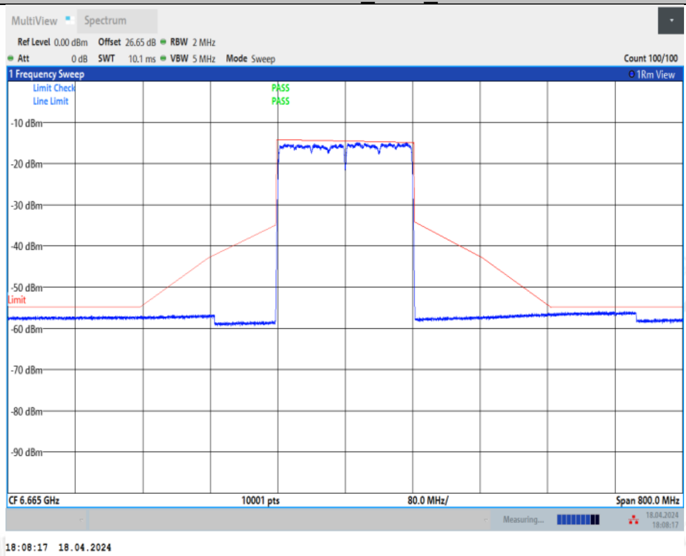

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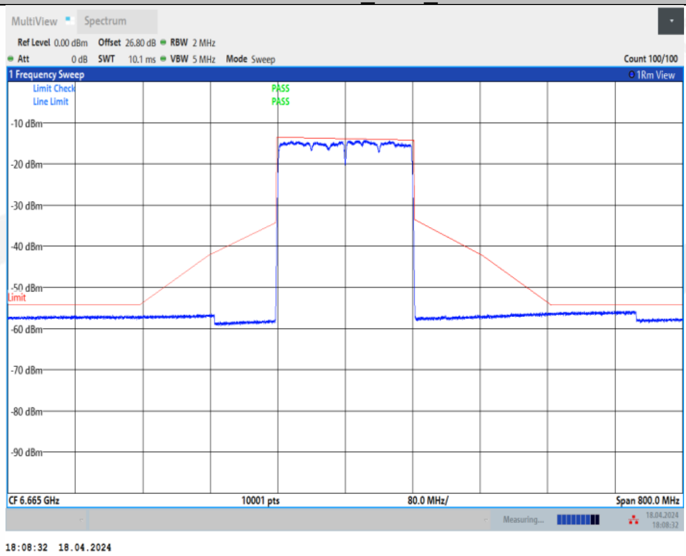

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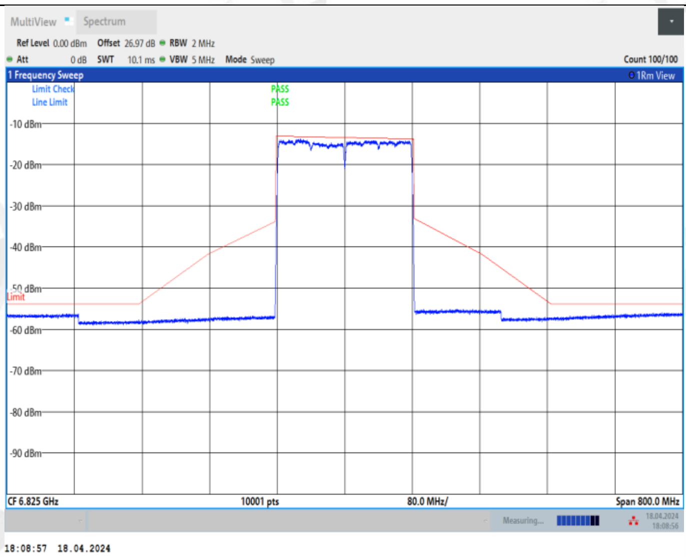

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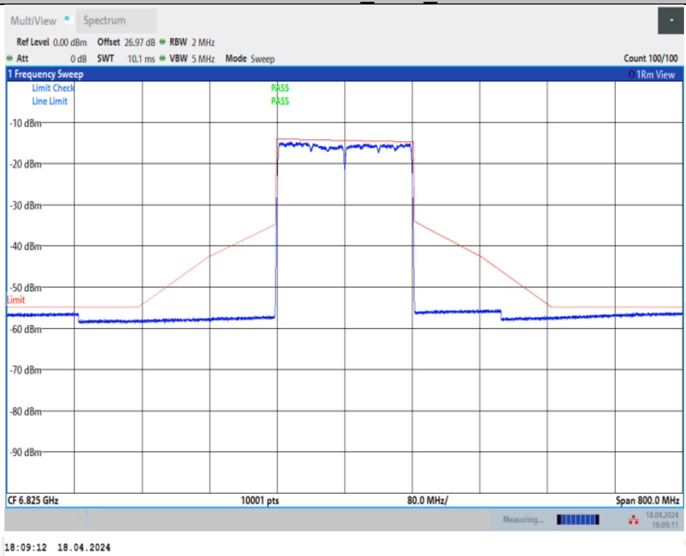

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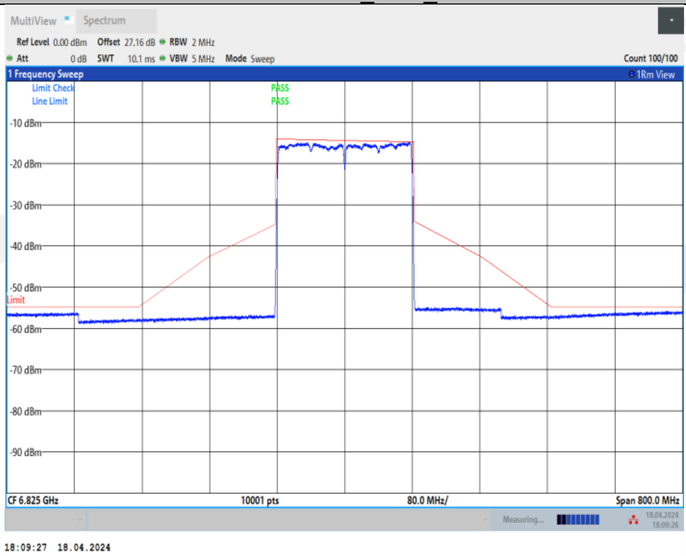

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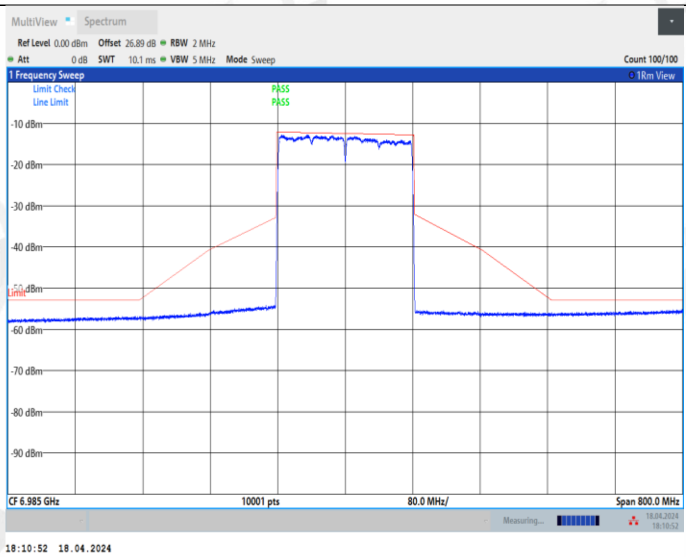

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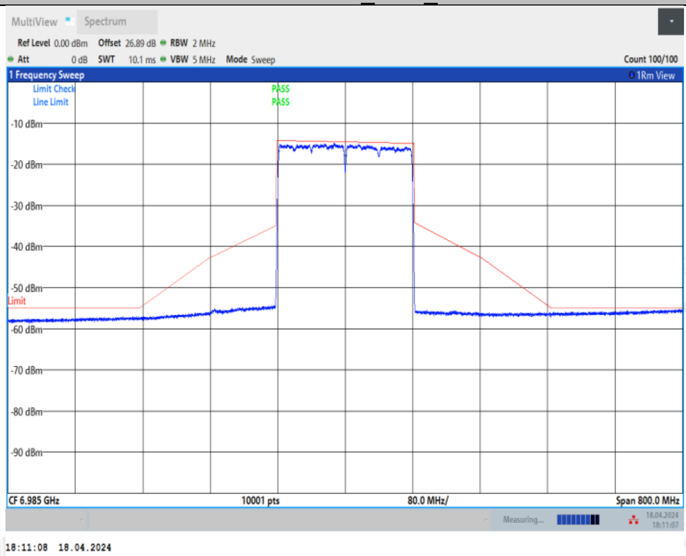

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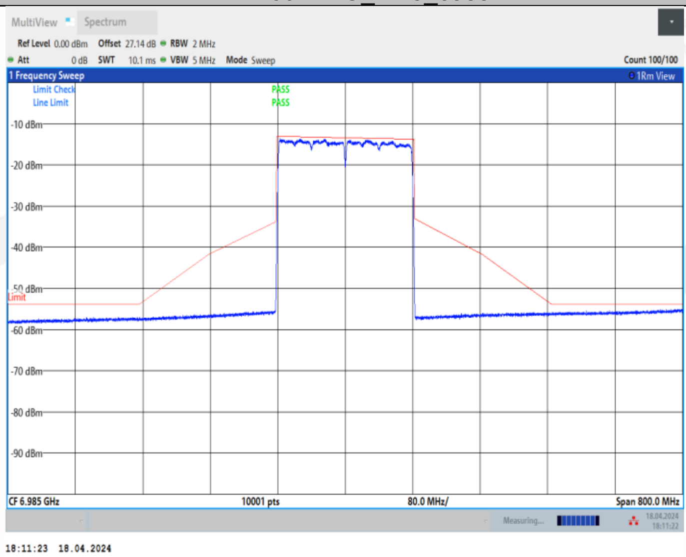

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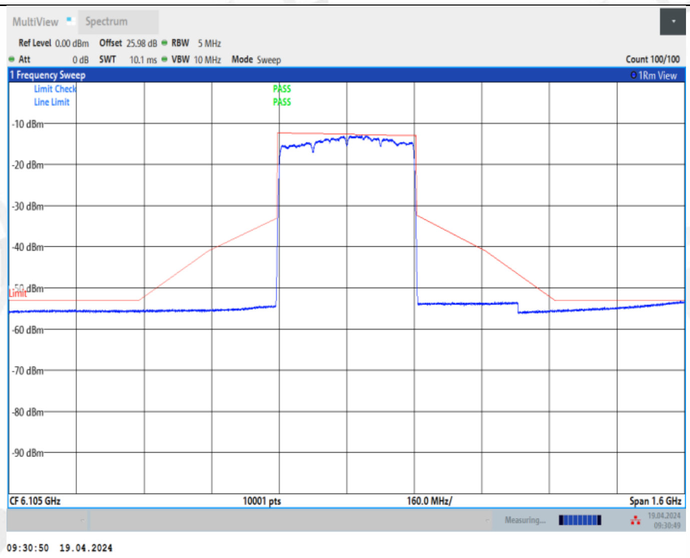

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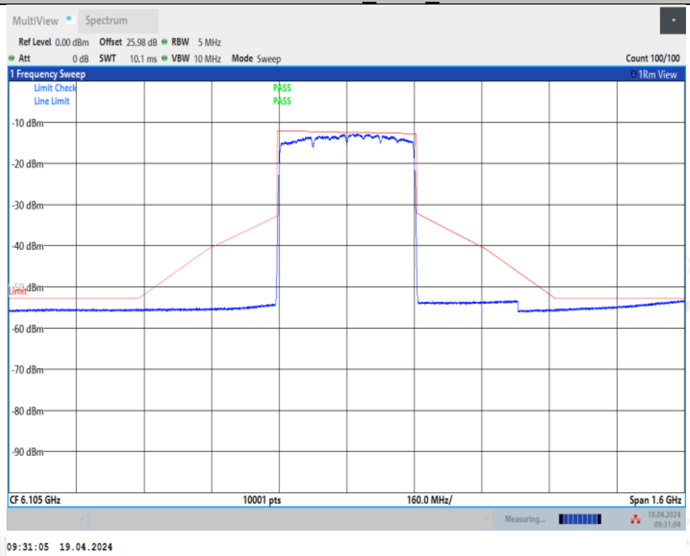

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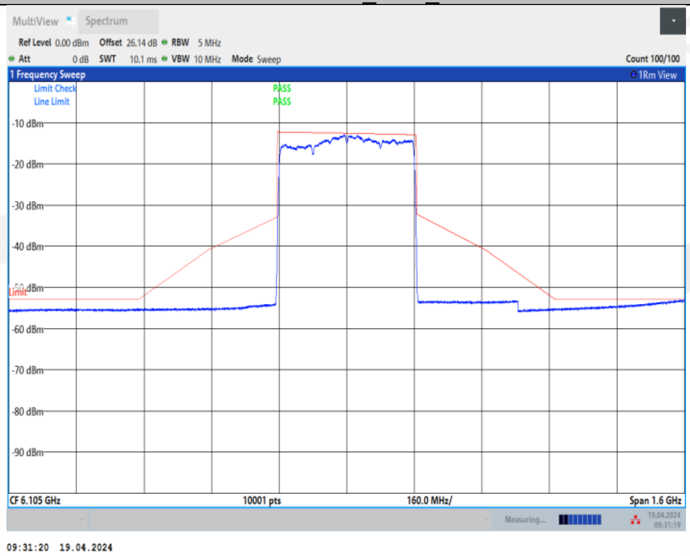

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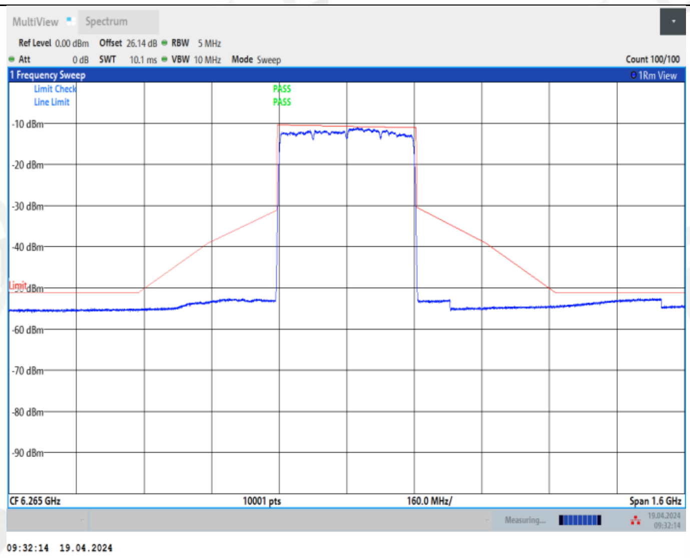

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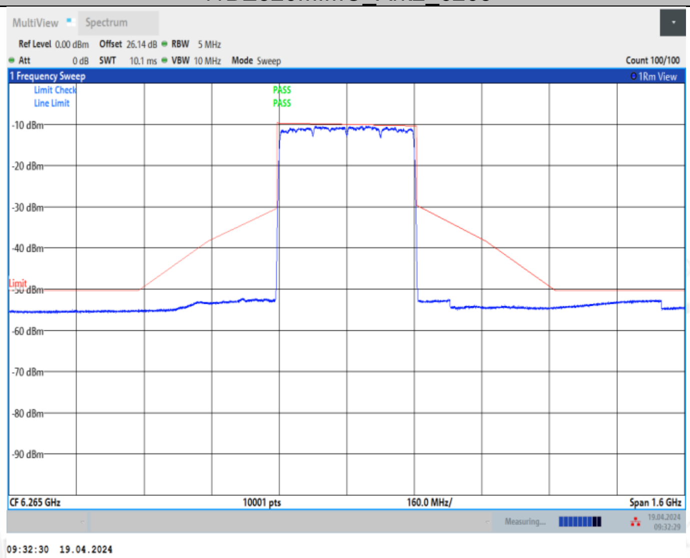

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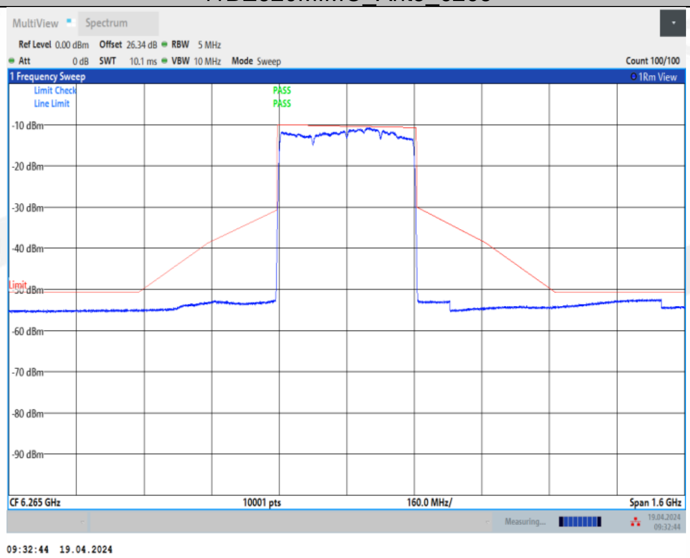

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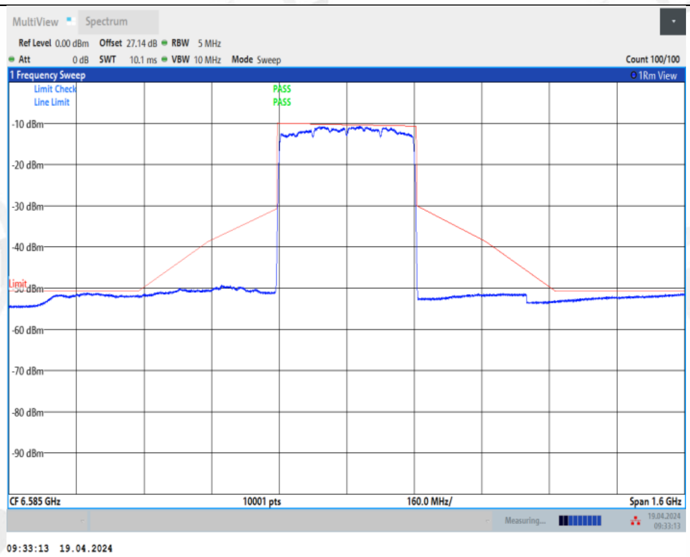

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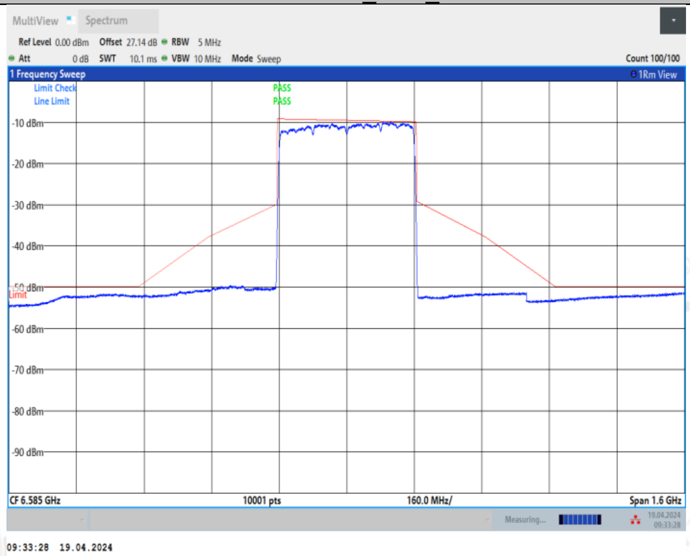

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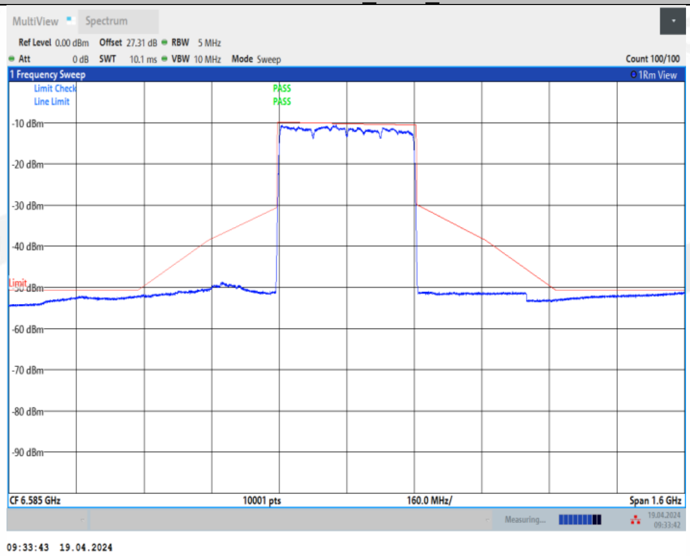

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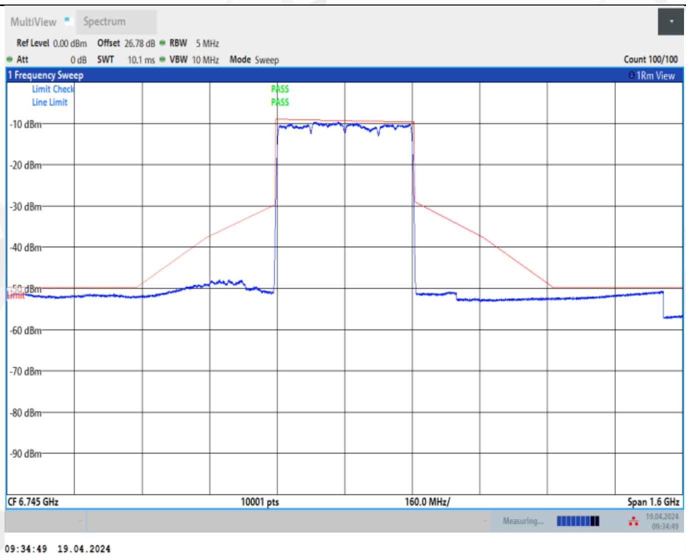

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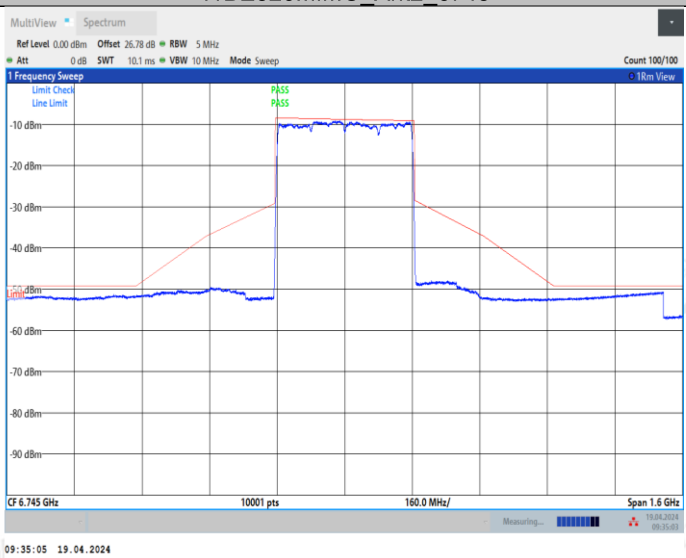

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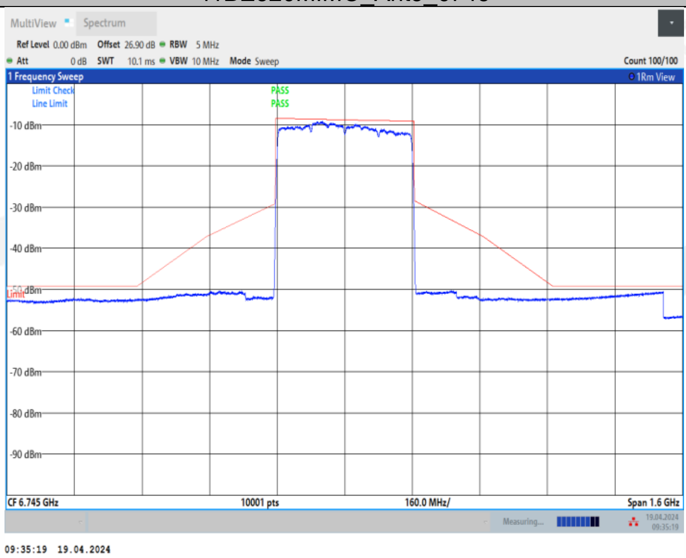

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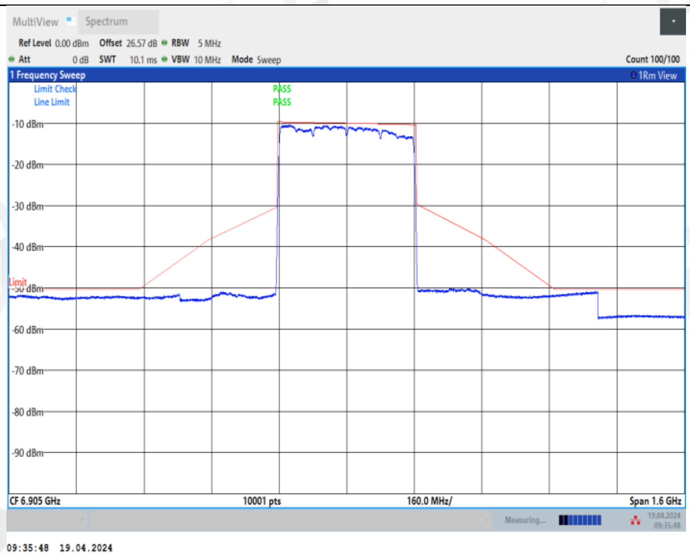

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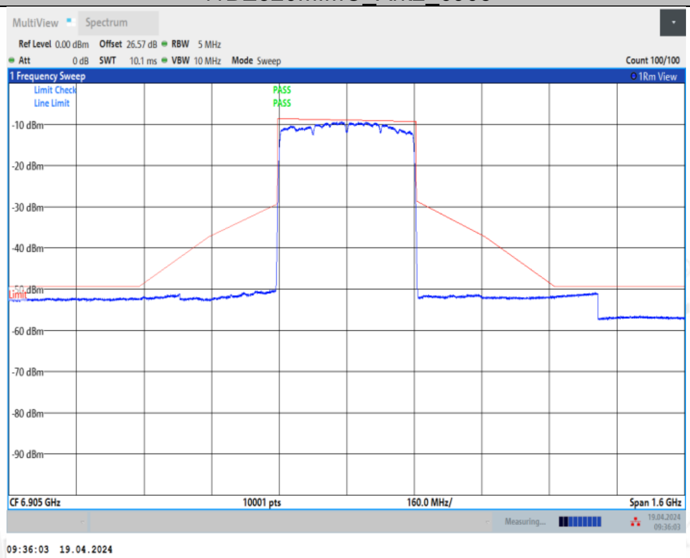

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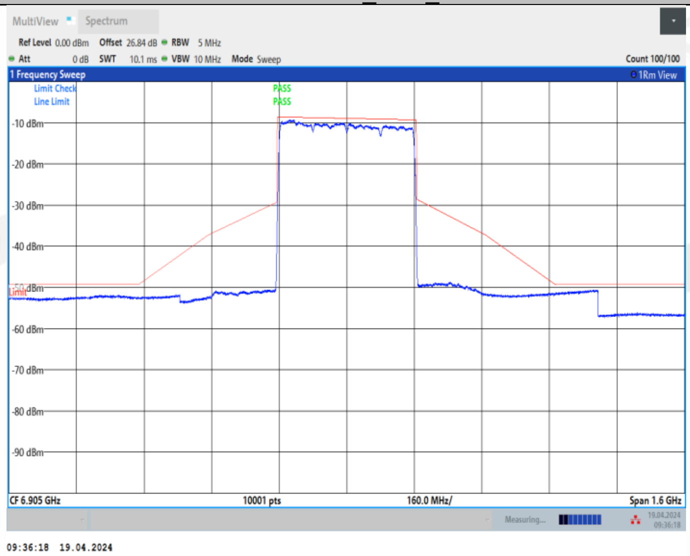
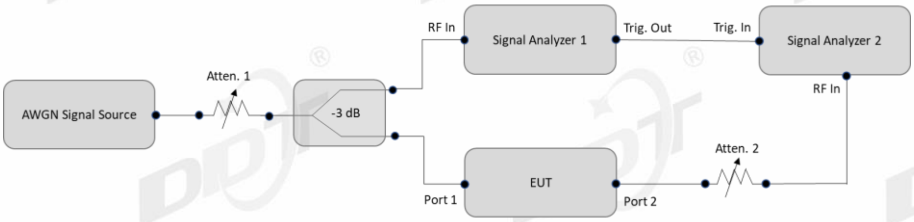


10. Contention Based Protocol

10.1. Block diagram of test setup



10.2. Limits

Indoor access points, subordinate devices and client devices operating in the 5.925-7.125 GHz band (herein referred to as unlicensed devices) are required to use technologies that include a contention-based protocol to avoid co-channel interference with incumbent devices sharing the band. To ensure incumbent co-channel operations are detected in a technology-agnostic manner, unlicensed devices are required to detect co-channel radio frequency energy (energy detect) and avoid simultaneous transmission.

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel (in which incumbent signal is transmitted) and stay off the incumbent channel as long as

detected radio frequency power is equal to or greater than the threshold (-62 dBm)1. The -55.01 dBm (or lower) threshold is referenced to a 6.99 dBi antenna gain.

To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

10.3. Test procedure

Table 1. Criteria to determine number of times detection threshold test may be performed

If	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Tune incumbent and EUT transmissions ($f_{c1} = f_{c2}$)
$BW_{Inc} < BW_{EUT} \leq 2BW_{Inc}$	Once	Incumbent transmission is contained within BW_{EUT}
$2BW_{Inc} < BW_{EUT} \leq 4BW_{Inc}$	Twice. Incumbent transmission is contained within BW_{EUT}	Incumbent transmission is located as closely as possible to the lower edge and upper edge, respectively, of the EUT channel
$BW_{EUT} > 4BW_{Inc}$	Three times	Incumbent transmission is located as closely as possible to the lower edge of the EUT channel, in the middle of EUT channel, and as closely as possible to the upper edge of the EUT channel

1. Configure the EUT to transmit with a constant duty cycle.

2. Set the operating parameters of the EUT including power level, operating frequency, modulation and bandwidth.

3. Set the signal analyzer center frequency to the nominal EEUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Connect the output port of the EUT to the signal analyzer 2, as shown in Figure 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.

4. Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters set at step two.

5. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.

6. Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT as shown in Figure 2.

7. Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.

8. Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.

9. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.

10. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 5, choose a different center frequency for the AWGN signal and repeat the process.

10.4. Test result

Contention Based protocol for 802.11be_Bandwidth_20MHz												
UNII Band	Channel Number	EUT Frequency (MHz)	AWGN Frequency (MHz)	Injected AWGN Power (dBm)	Ant Gain (dBi)	Path loss (dB)	AWGN Power (dBm)	Detection Limit (dBm)	Number Detected [n]	Result [%]	Limit [%]	Verdict
5	1	5955	5955	-53.34	6.99	2	-55.34	-55.01	10	100	90	PASS
6	97	6435	6435	-53.25	6.99	2	-55.25	-55.01	10	100	90	PASS
7	117	6535	6535	-53.28	6.99	2	-55.28	-55.01	10	100	90	PASS
8	189	6895	6895	-53.4	6.99	2	-55.4	-55.01	10	100	90	PASS

Contention Based protocol for 802.11be_Bandwidth_320MHz												
UNII Band	Channel Number	EUT Frequency (MHz)	AWGN Frequency (MHz)	Injected AWGN Power (dBm)	Ant Gain (dBi)	Path loss (dB)	AWGN Power (dBm)	Detection Limit (dBm)	Number Detected [n]	Result [%]	Limit [%]	Verdict
5	31	6105	5950	-53.26	6.99	2	-55.26	-55.01	9	90	90	PASS
		6105	6105	-53.43	6.99	2	-55.43	-55.01	9	90	90	PASS
		6105	6260	-53.42	6.99	2	-55.42	-55.01	9	90	90	PASS
6	127	6585	6430	-53.32	6.99	2	-55.32	-55.01	10	100	90	PASS
		6585	6585	-53.49	6.99	2	-55.49	-55.01	9	90	90	PASS
		6585	6740	-53.27	6.99	2	-55.27	-55.01	10	100	90	PASS
7	159	6745	6590	-53.24	6.99	2	-55.24	-55.01	10	100	90	PASS
		6745	6745	-53.49	6.99	2	-55.49	-55.01	10	100	90	PASS
		6745	6900	-53.46	6.99	2	-55.46	-55.01	10	100	90	PASS
8	191	6905	6750	-53.43	6.99	2	-55.43	-55.01	9	90	90	PASS
		6905	6905	-53.25	6.99	2	-55.25	-55.01	10	100	90	PASS
		6905	7060	-53.49	6.99	2	-55.49	-55.01	10	100	90	PASS

Contention Based protocol for 802.11be_Bandwidth_320MHz_6105_2*996+484_7											
Channel Number	EUT Frequency (MHz)	AWGN Frequency (MHz)	Injected AWGN Power (dBm)	Ant Gain (dBi)	Path loss (dB)	AWGN Power (dBm)	Detection Limit (dBm)	Number Detected [n]	Result [%]	Limit [%]	Verdict
31	6105	5950	-53.37	6.99	2	-55.37	-55.01	9	90	90	PASS
	6105	6105	-53.47	6.99	2	-55.47	-55.01	9	90	90	PASS
	6105	6260	-53.50	6.99	2	-55.50	-55.01	9	90	90	PASS

Note: The device support channel puncturing, All mode have been tested, and only the worst case is shown in report.