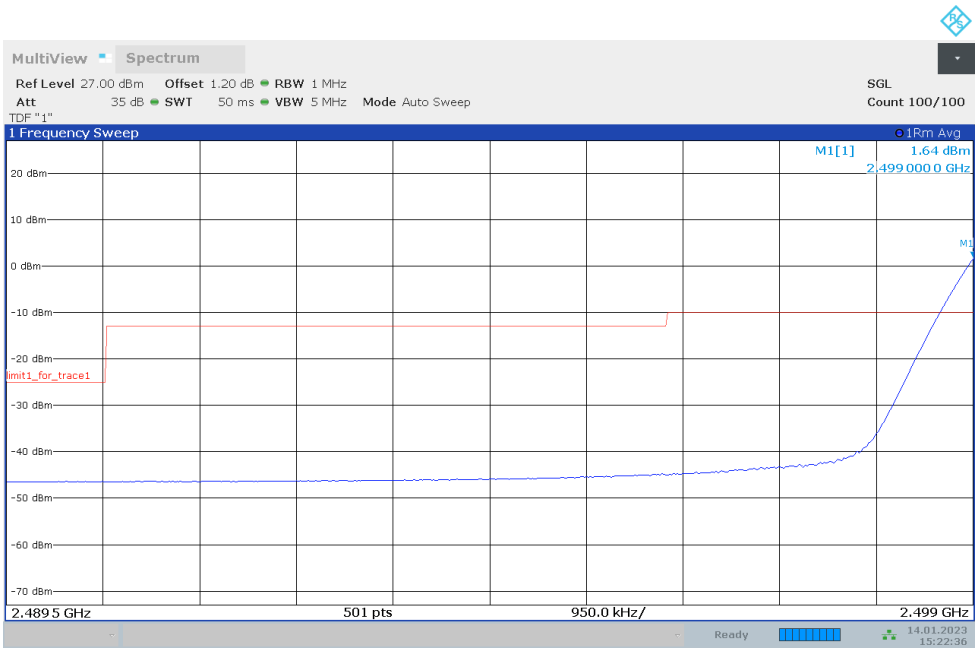
LOW BAND EDGE BLOCK-1RB-LOW_offset



15:22:36 14.01.2023

Channel power

15:22:59 14.01.2023

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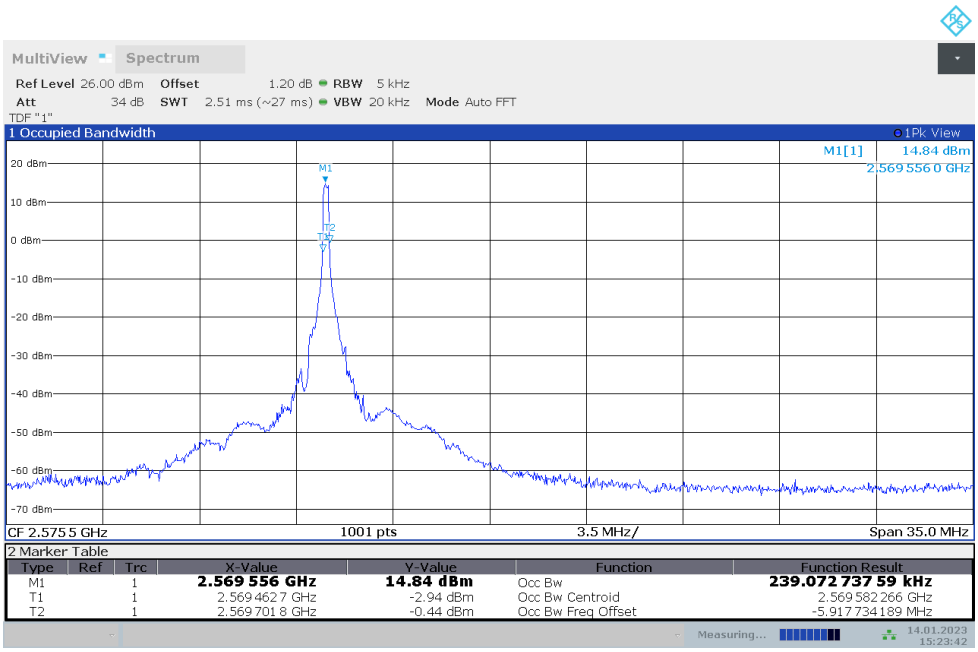
OBW: 1RB-HIGH_offset



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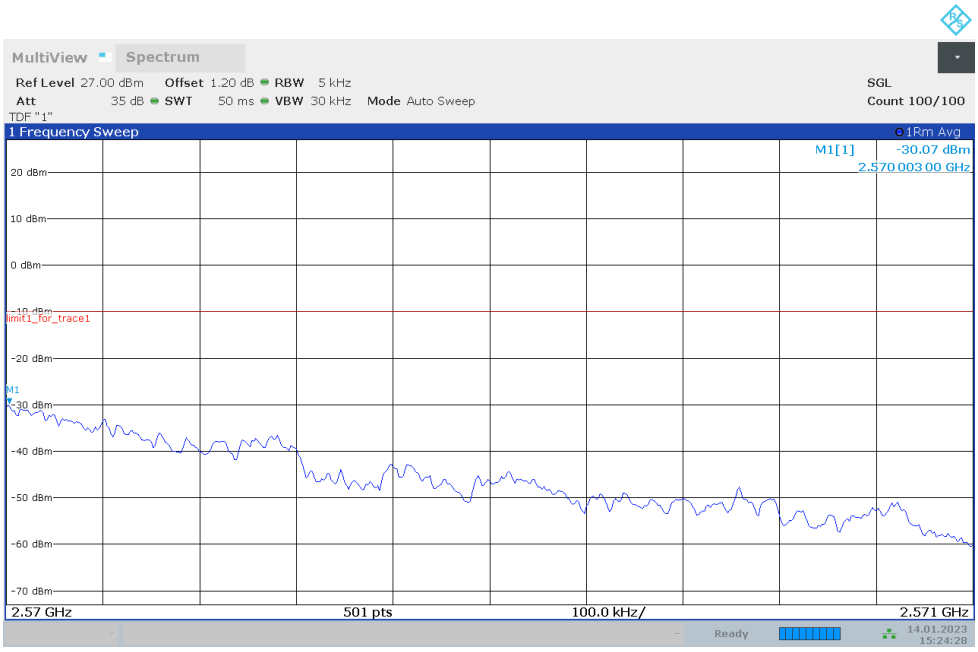
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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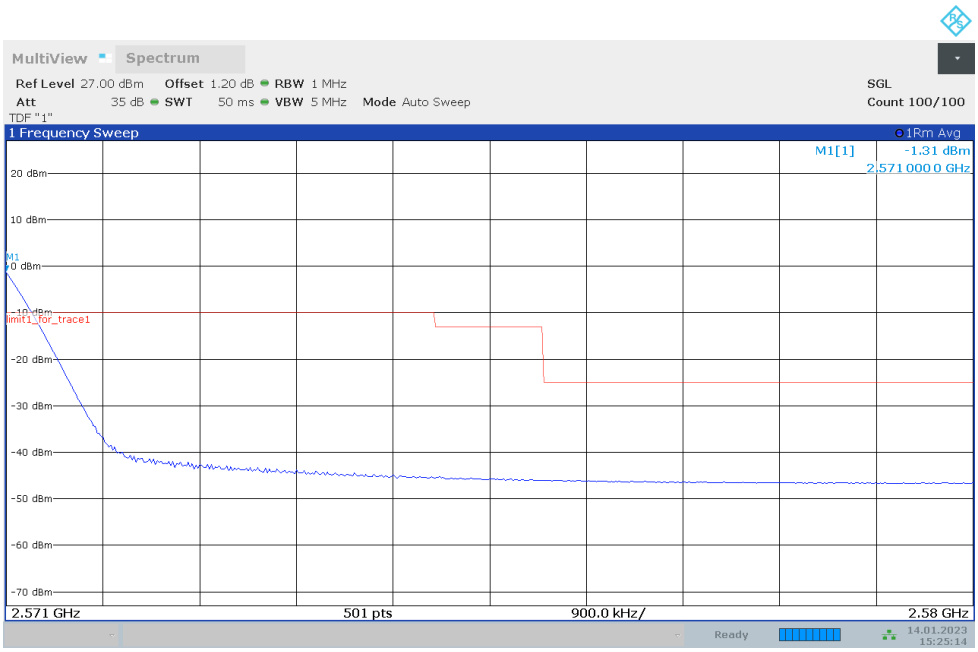
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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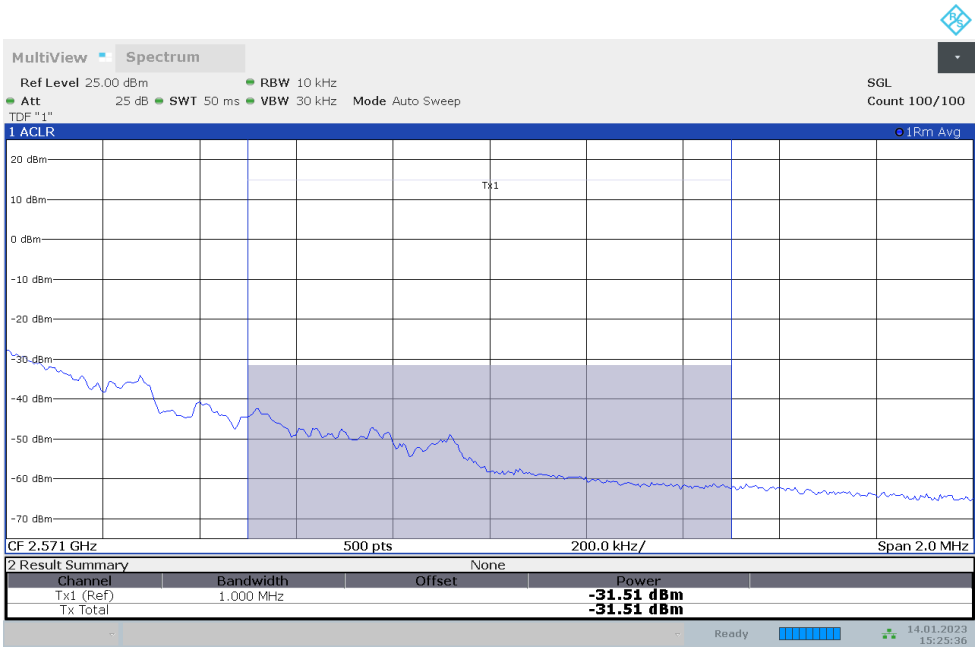
Channel power



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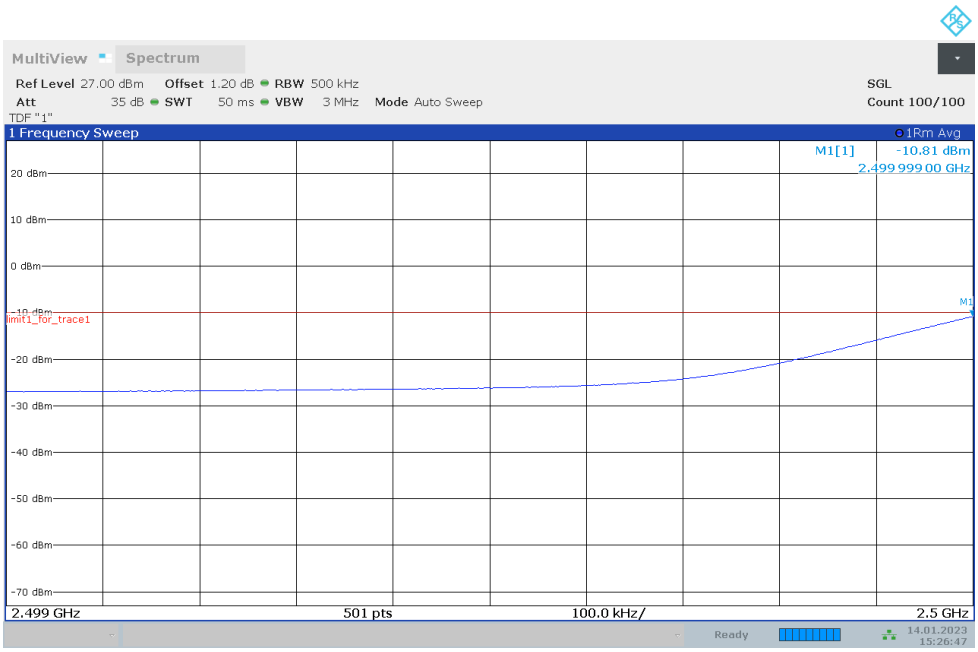
LOW BAND EDGE BLOCK-20M-100%RB



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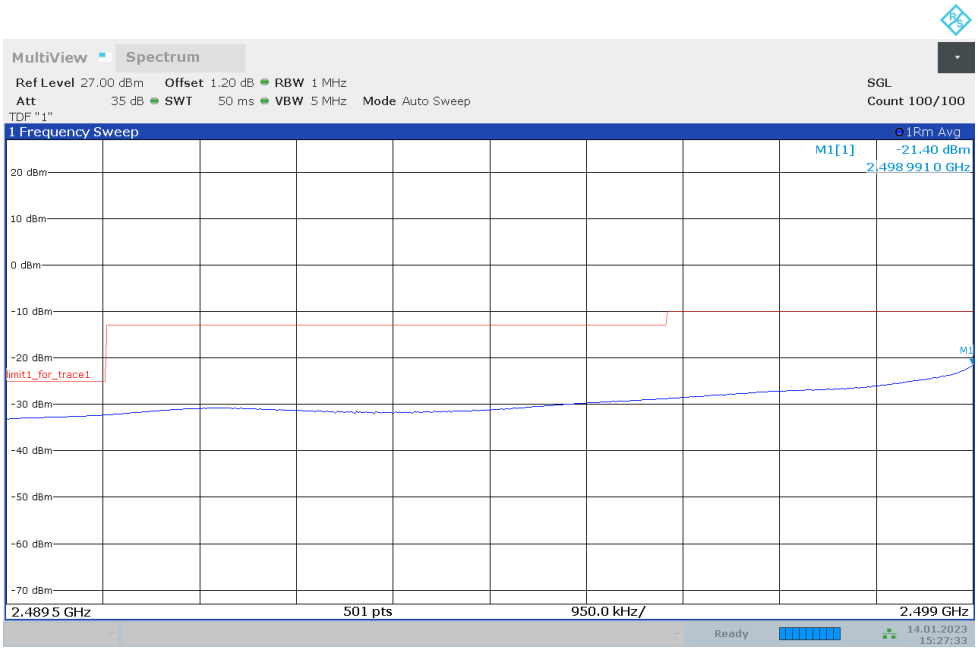

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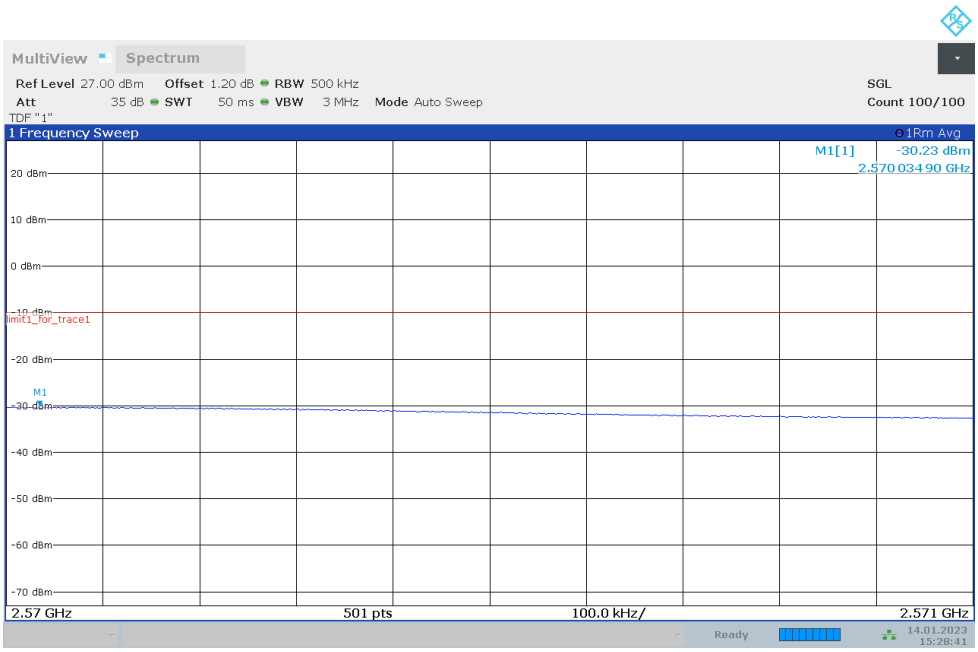
HIGH BAND EDGE BLOCK-20M-100%RB



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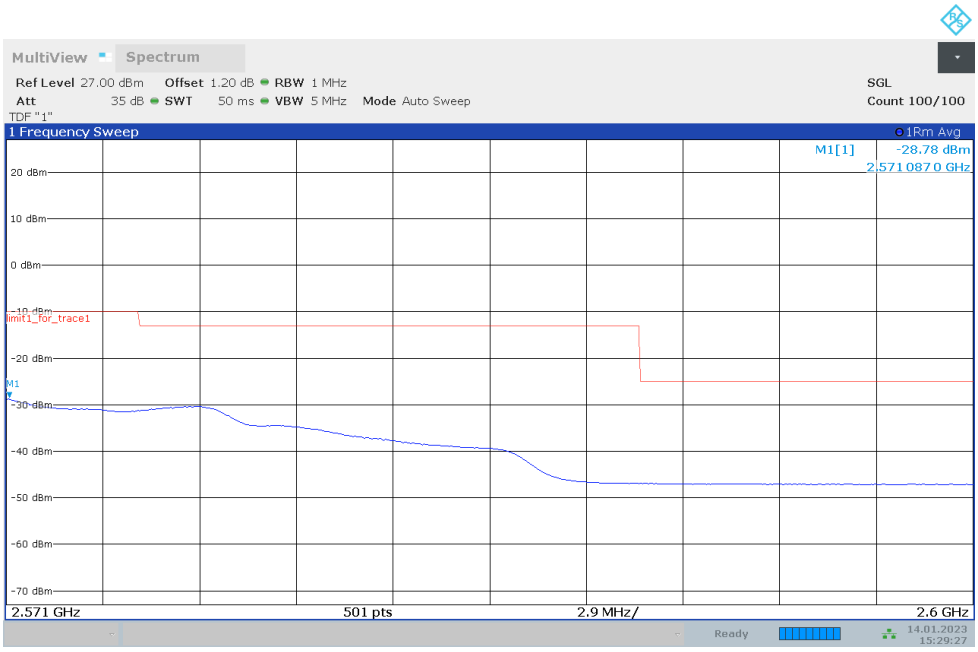
HIGH BAND EDGE BLOCK-20M-100%RB



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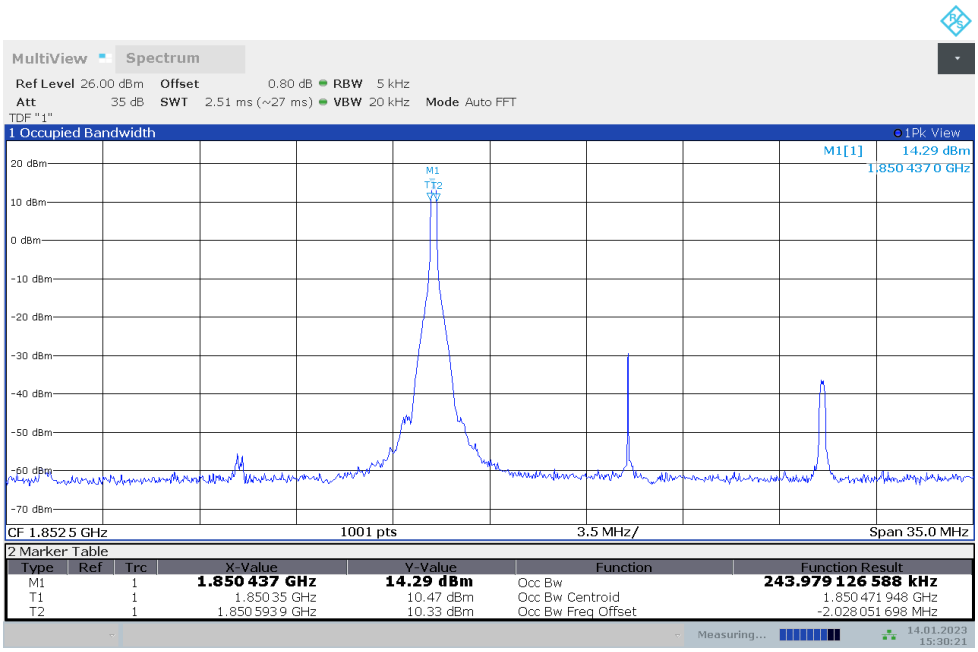
NR n25

OBW: 1RB-LOW_offset



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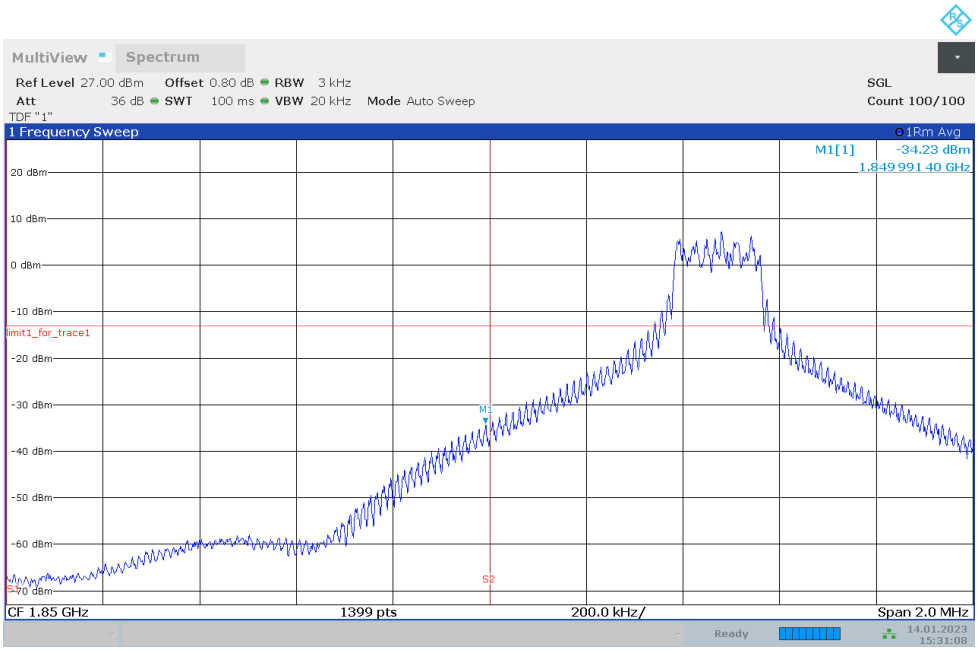

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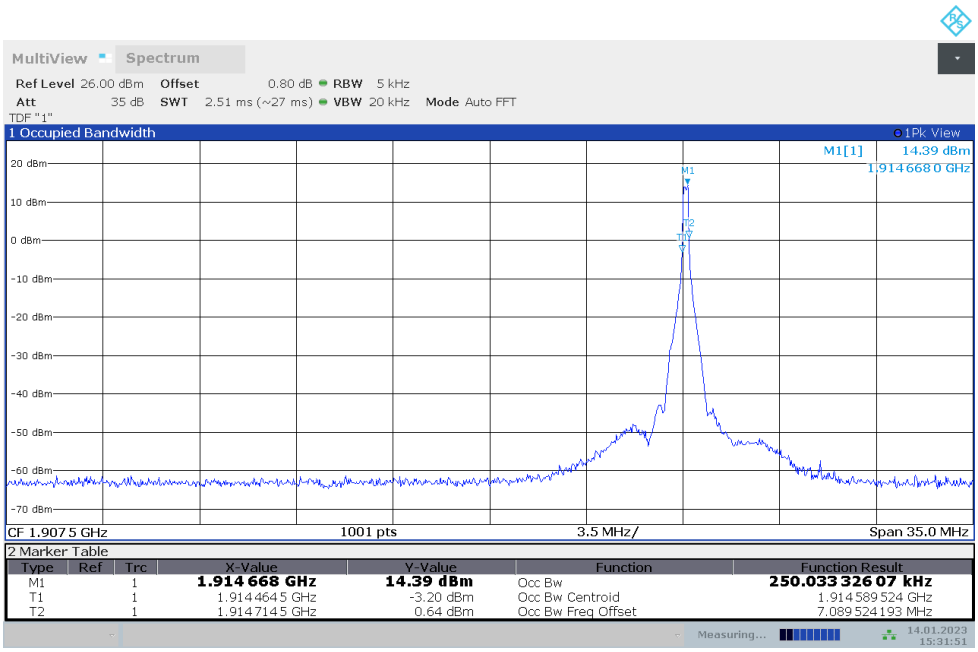
OBW: 1RB-HIGH_offset



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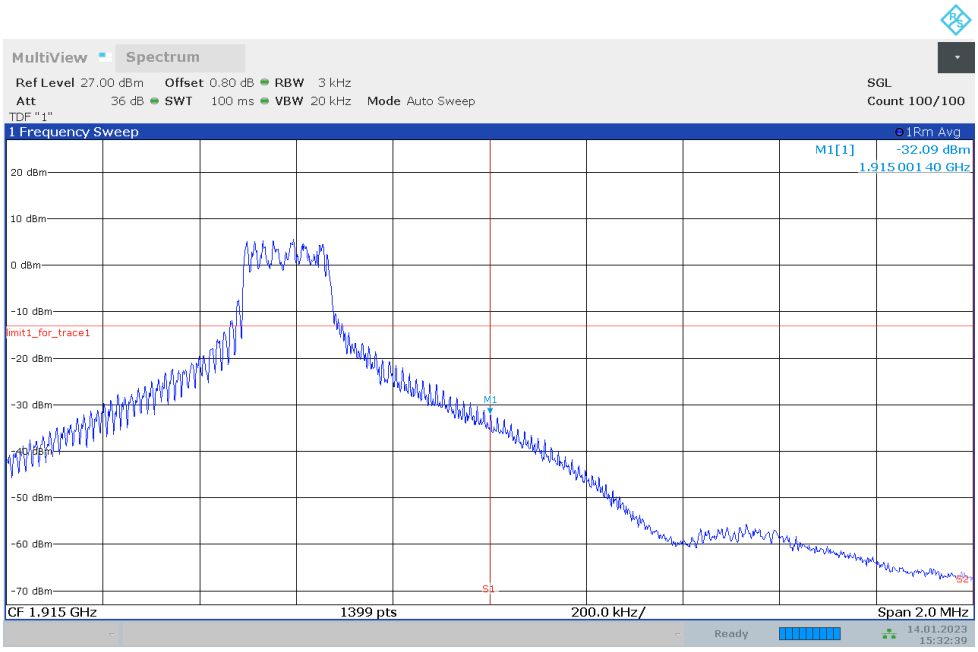
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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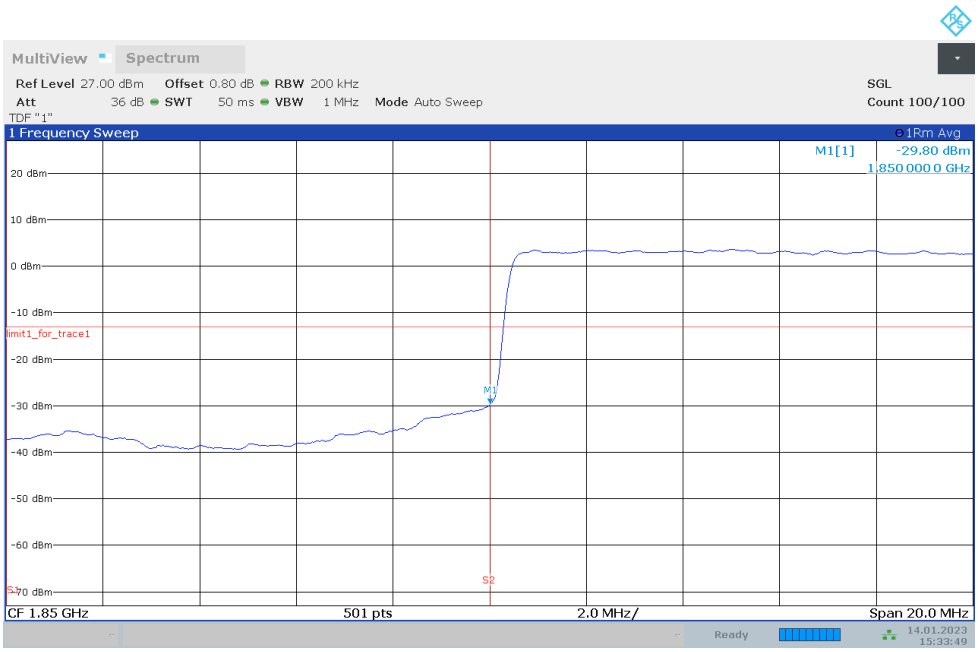
LOW BAND EDGE BLOCK-20M-100%RB



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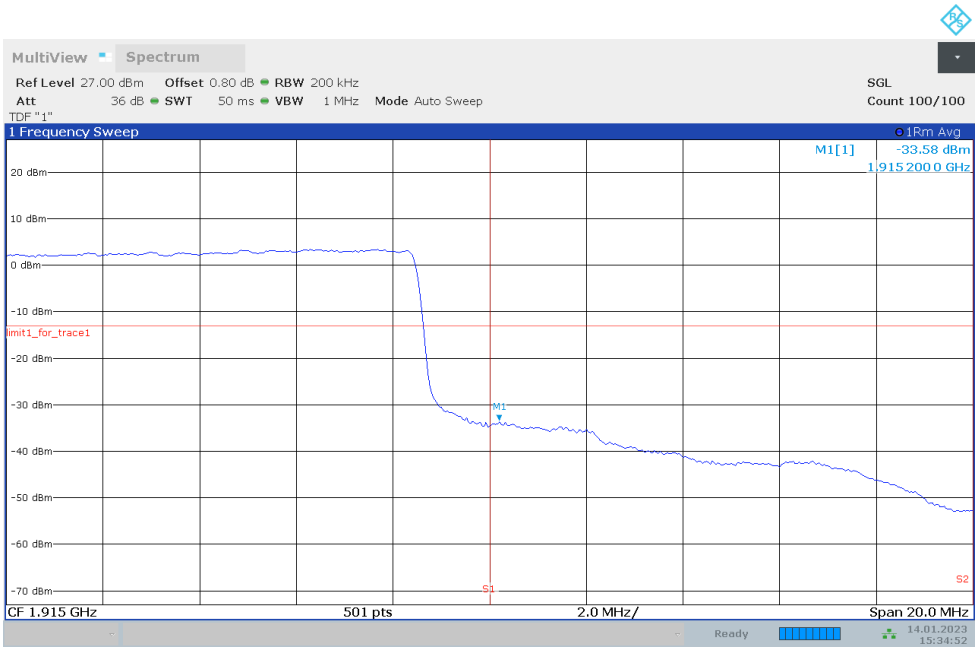

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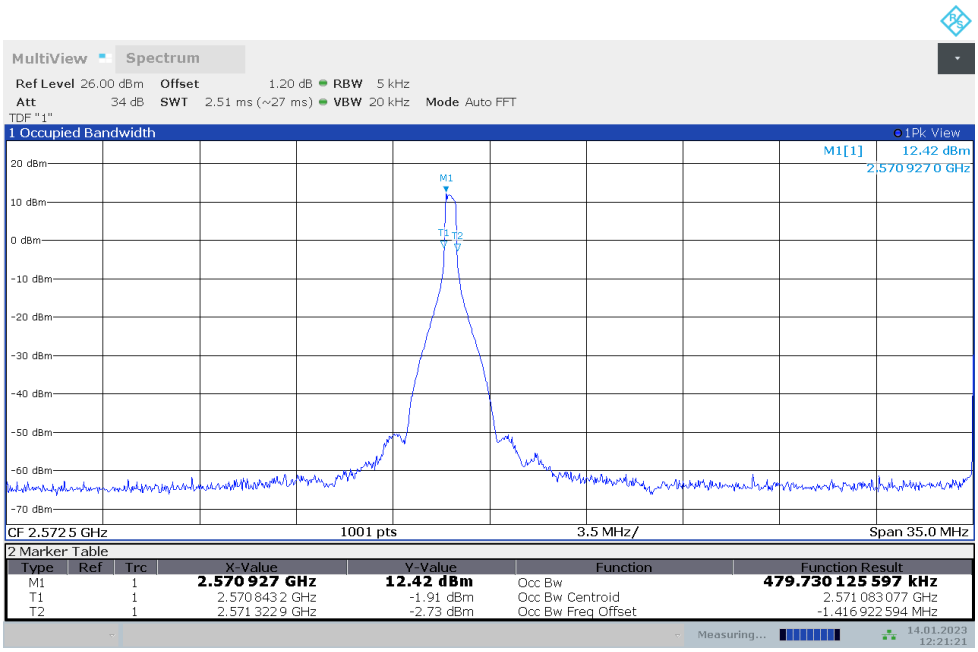
NR n38

OBW: 1RB-LOW_offset



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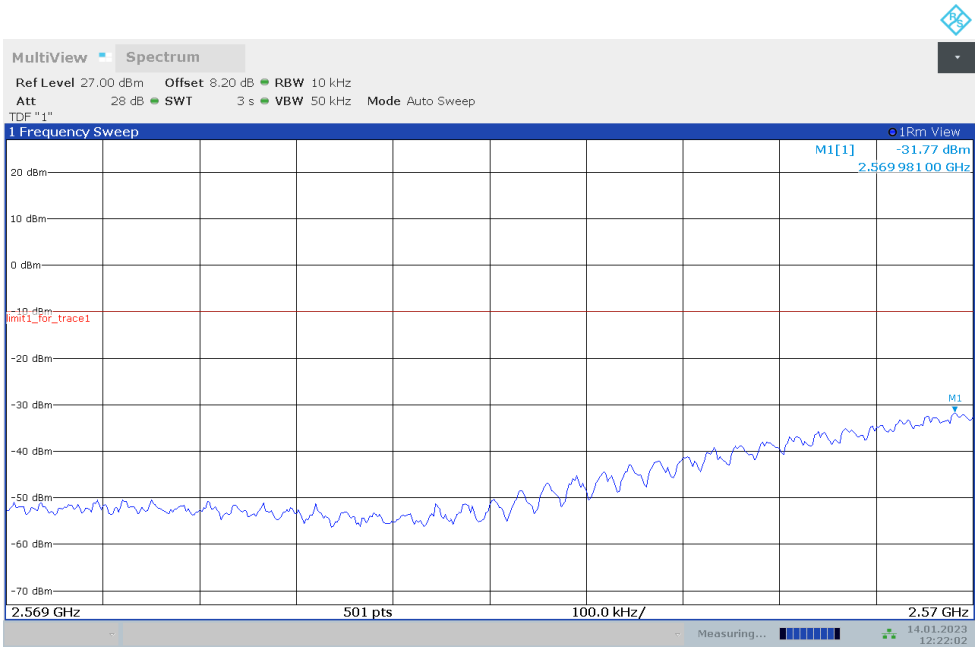

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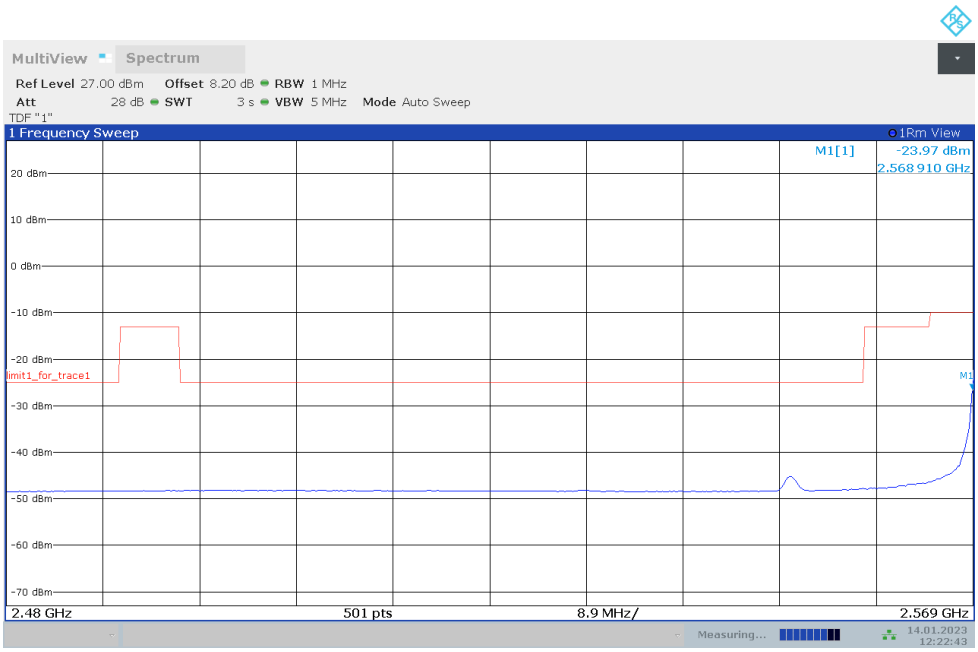
LOW BAND EDGE BLOCK-1RB-LOW_offset



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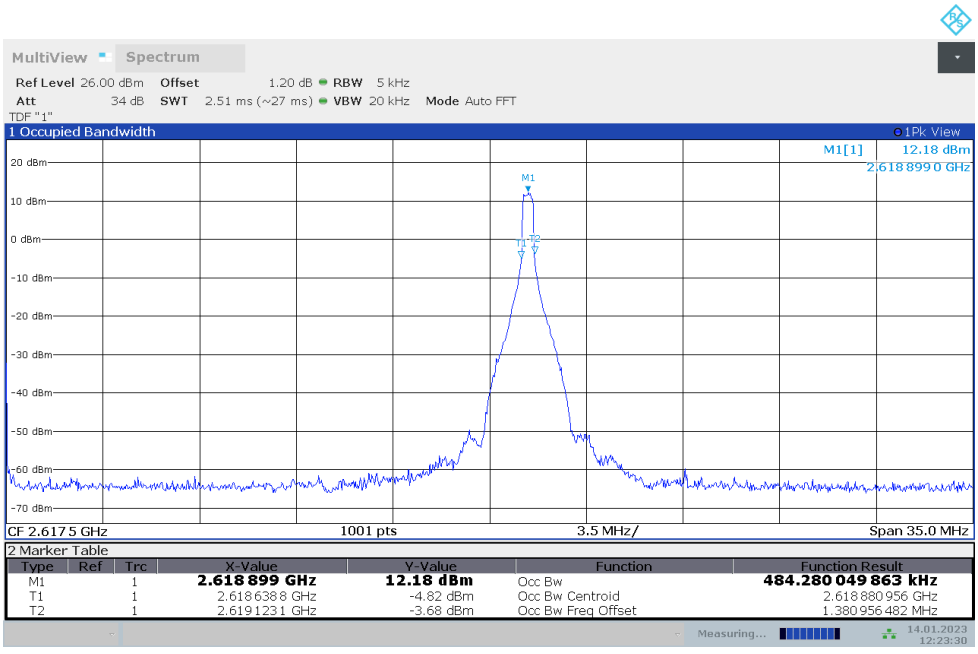

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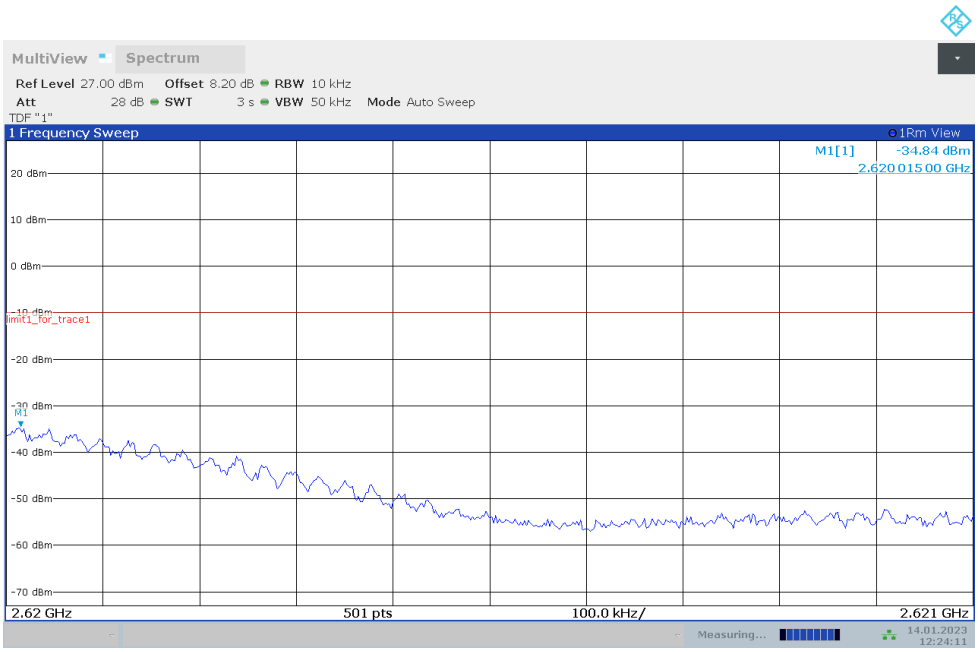
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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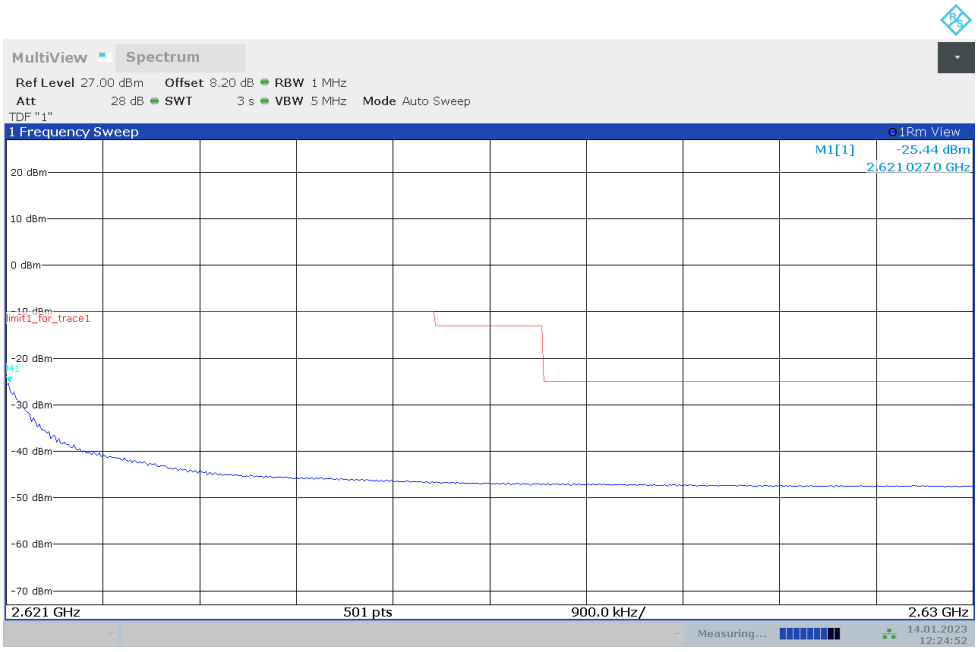
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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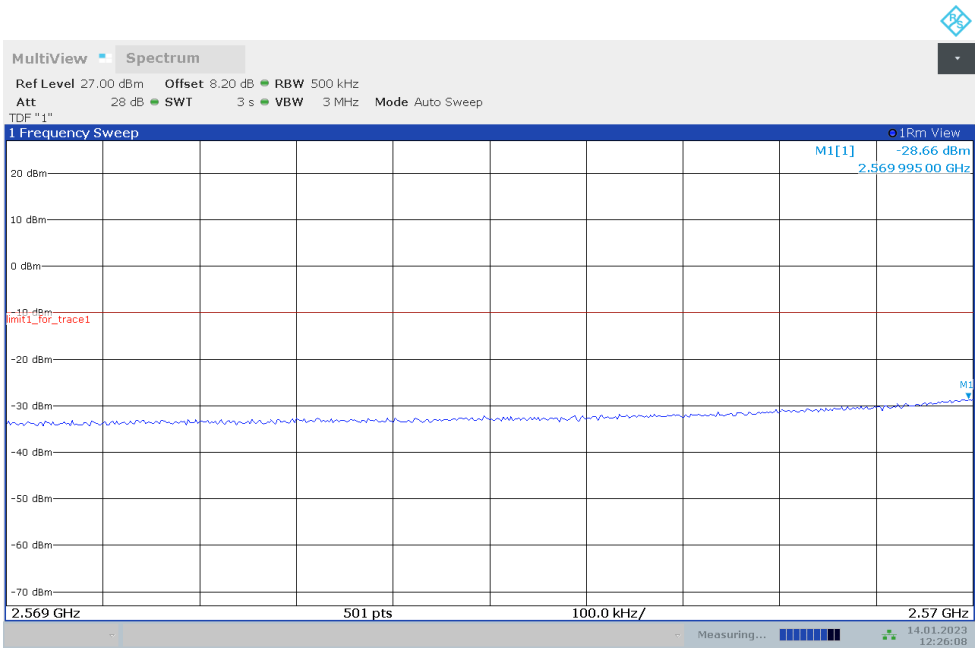
LOW BAND EDGE BLOCK-40M-100%RB



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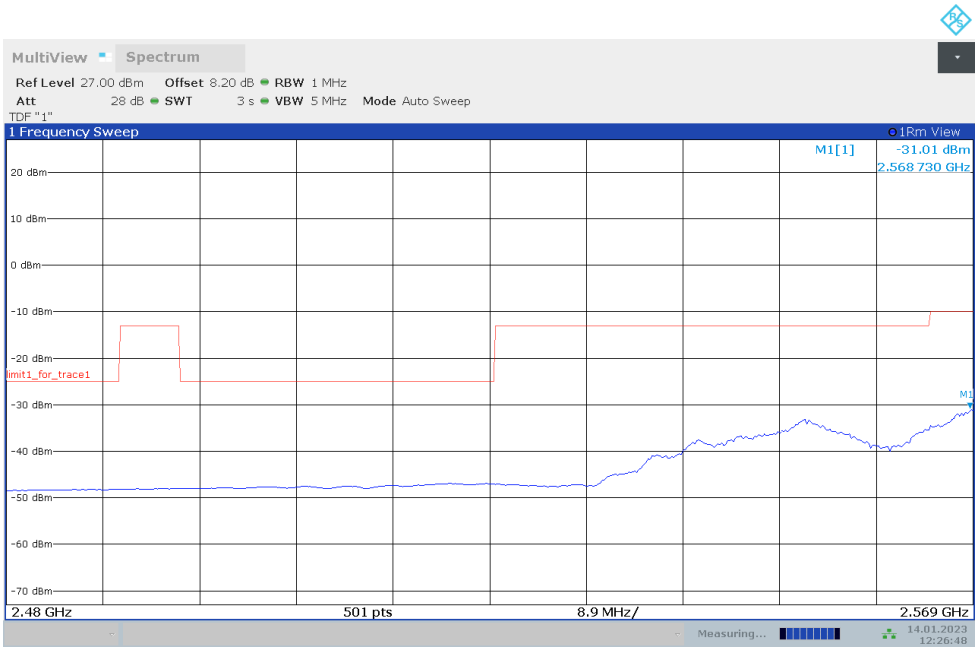

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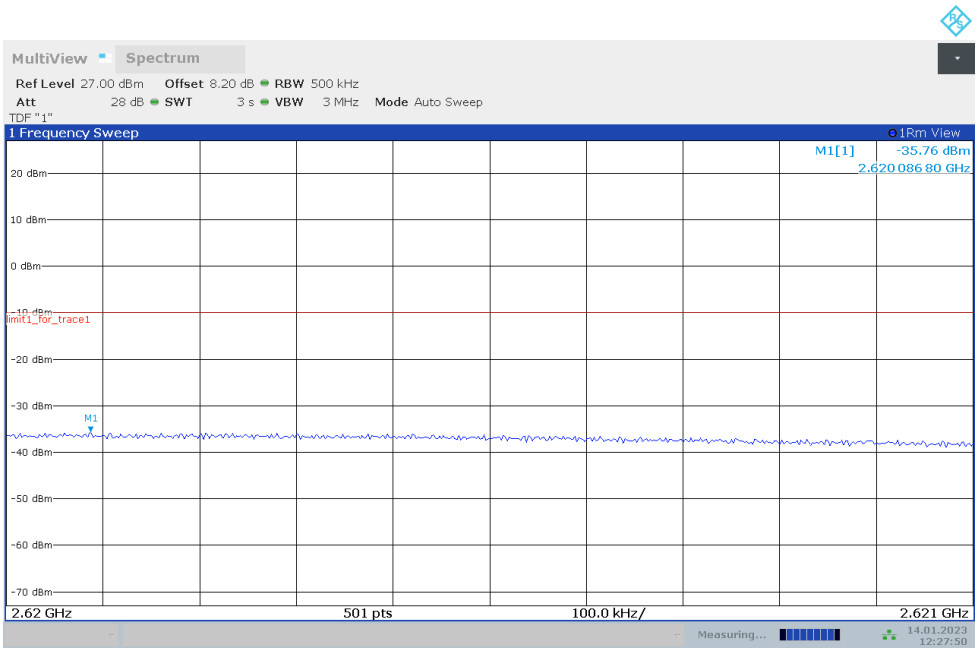
HIGH BAND EDGE BLOCK-40M-100%RB



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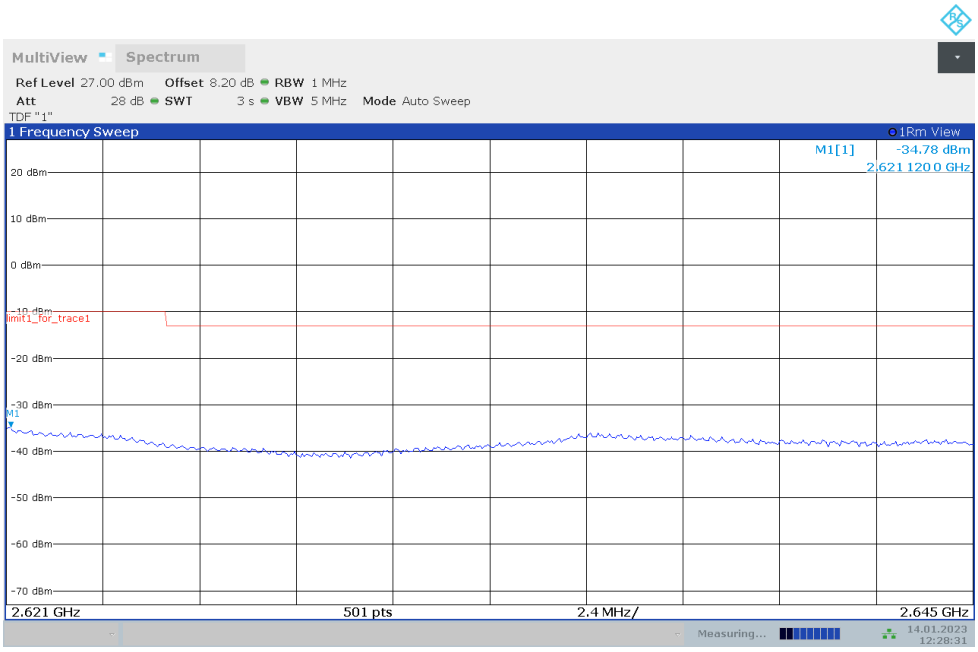
HIGH BAND EDGE BLOCK-40M-100%RB



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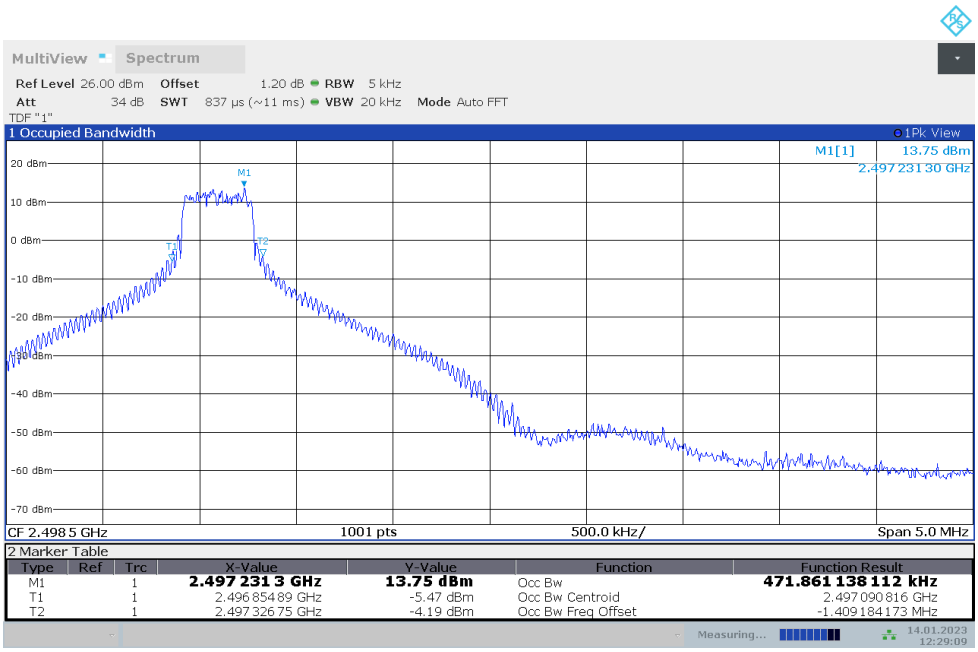
NR n41

OBW: 1RB-LOW_offset



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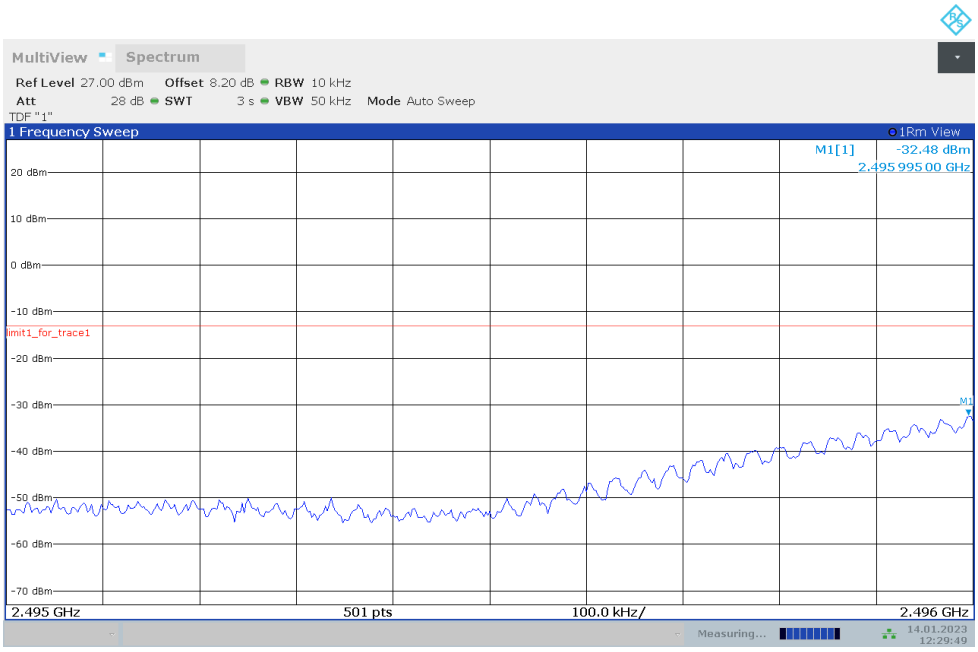

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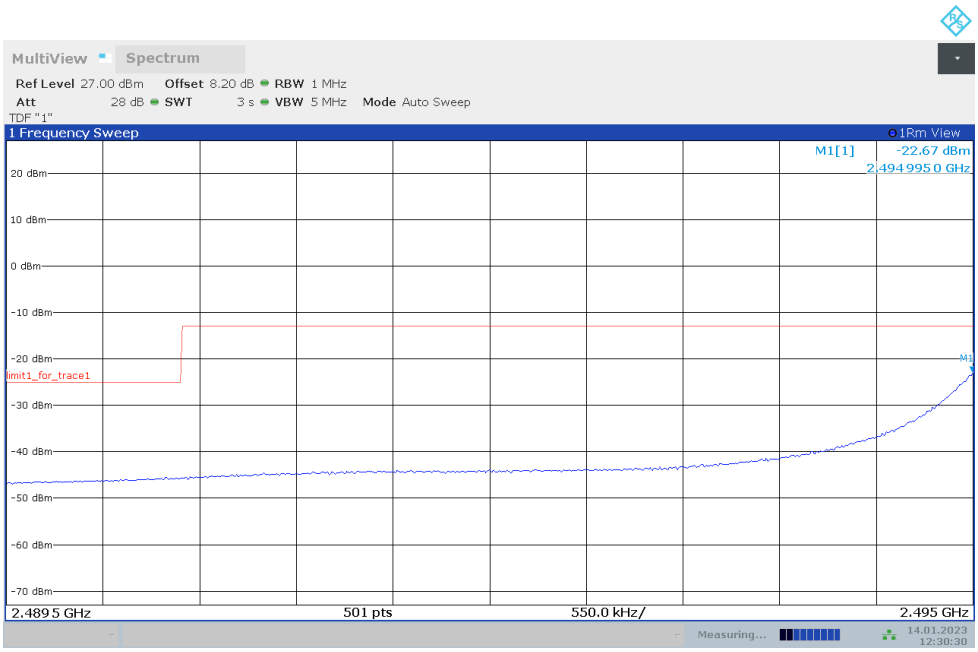
LOW BAND EDGE BLOCK-1RB-LOW_offset



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OBW: 1RB-HIGH_offset

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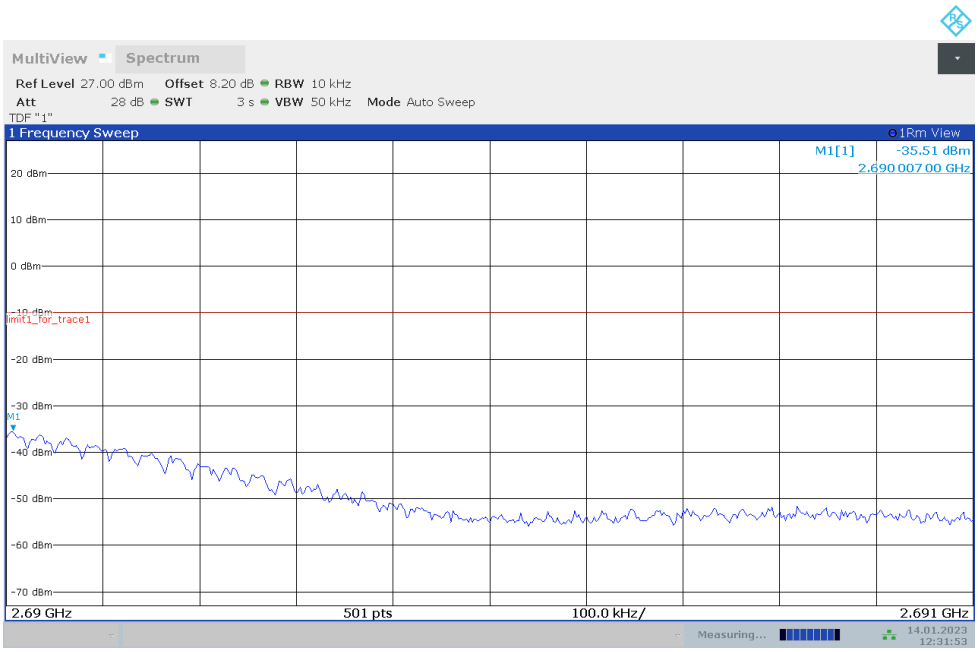
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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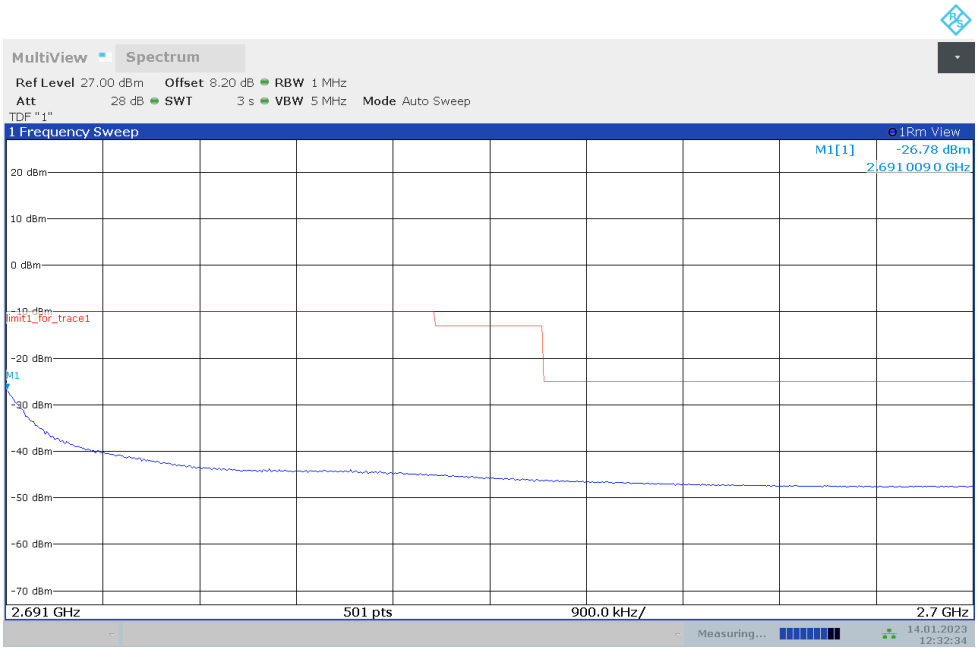
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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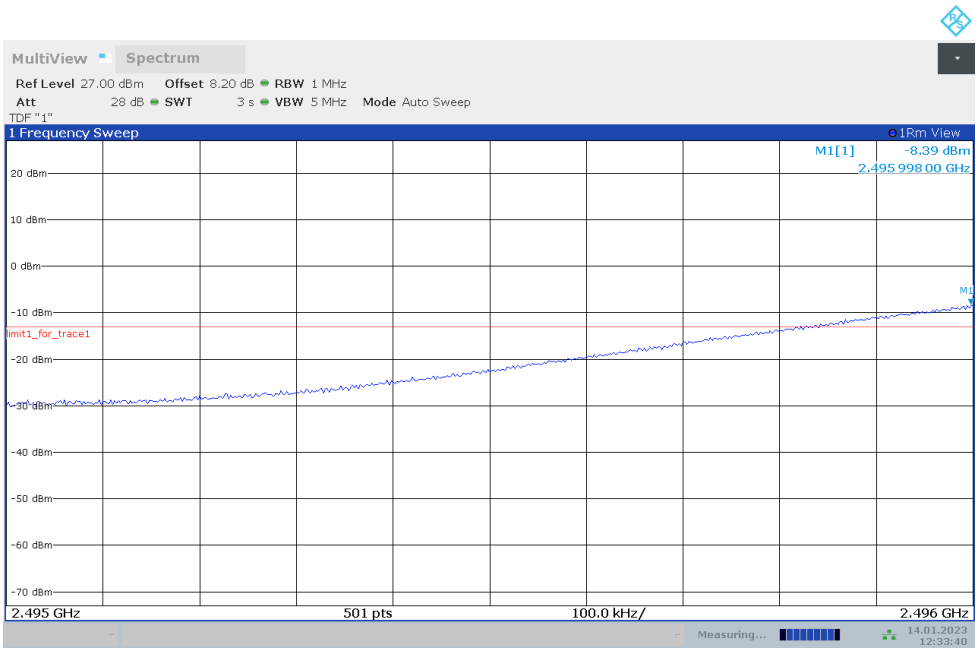
LOW BAND EDGE BLOCK-100M-100%RB



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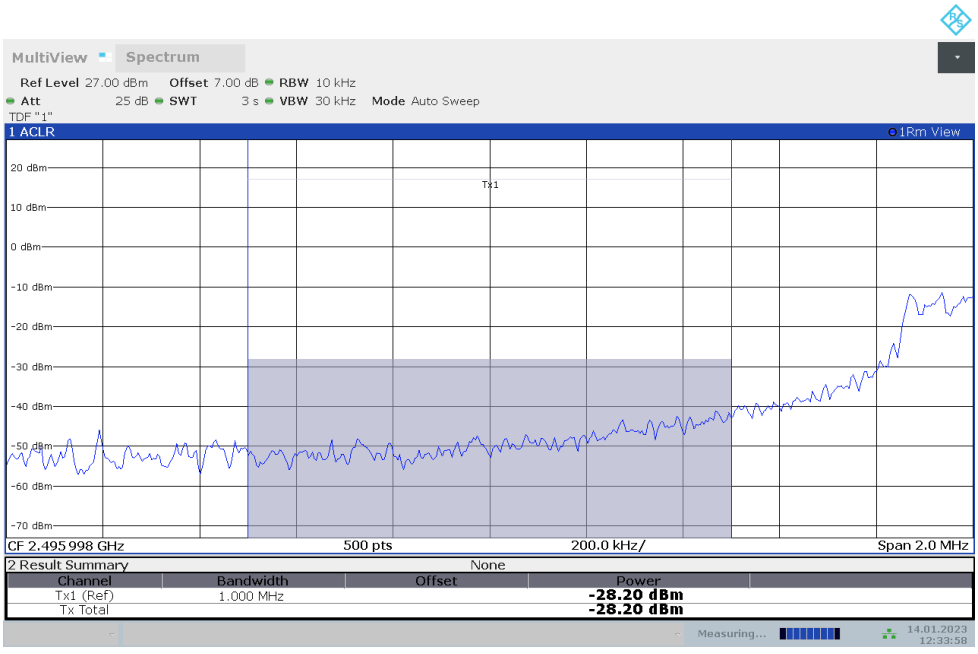
Channel power



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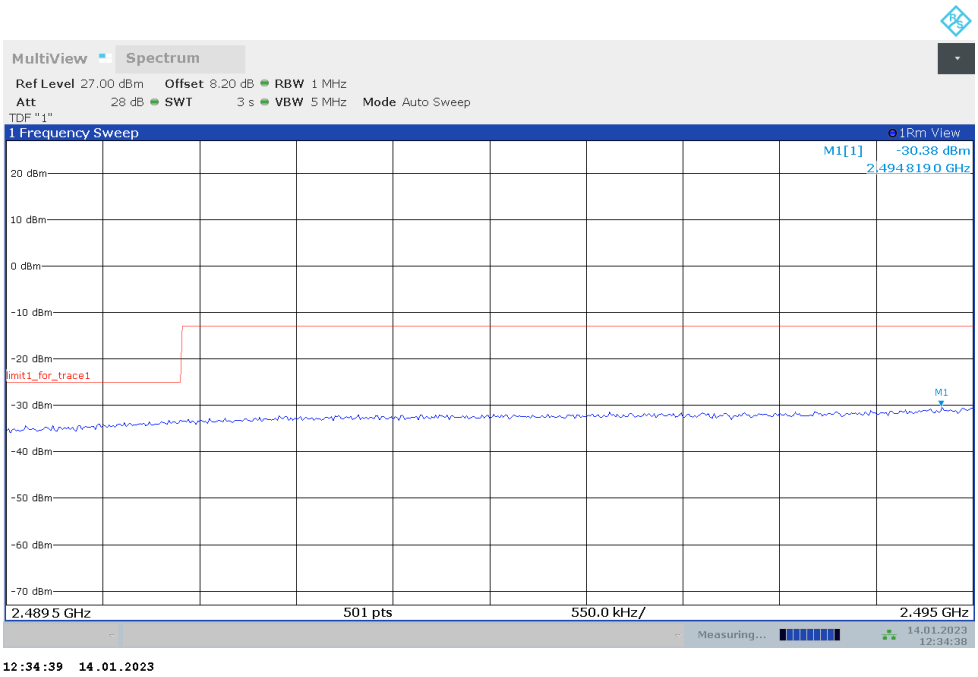
LOW BAND EDGE BLOCK-100M-100%RB



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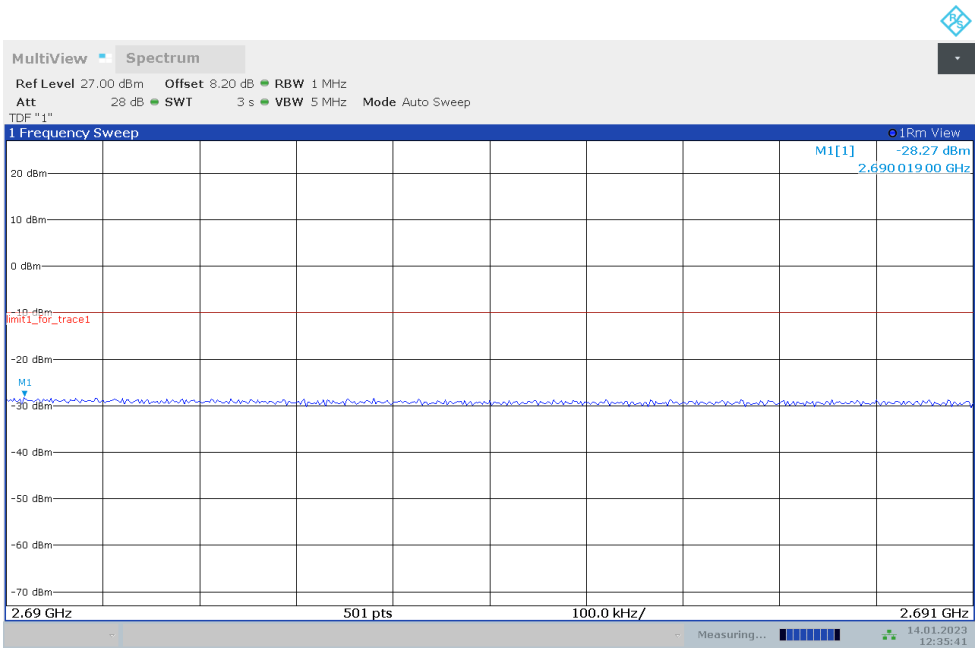
HIGH BAND EDGE BLOCK-100M-100%RB



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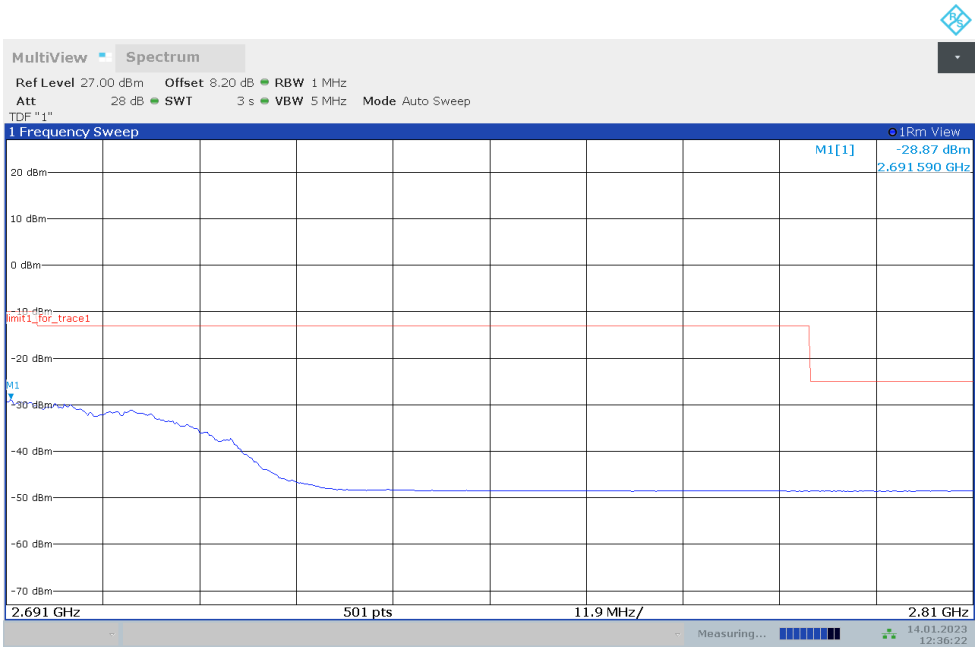
HIGH BAND EDGE BLOCK-100M-100%RB



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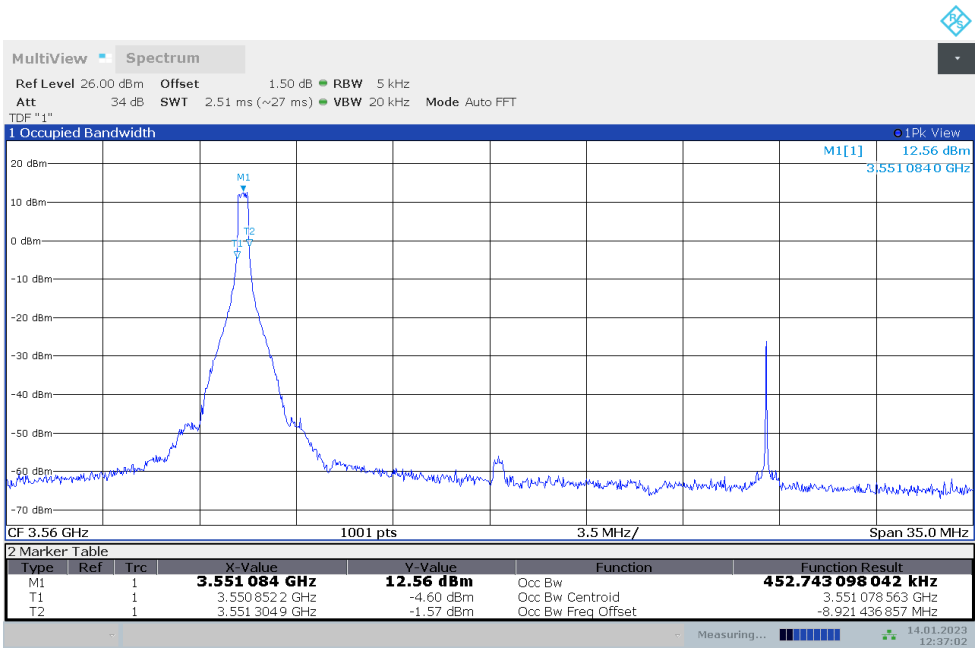
NR n48

OBW: 1RB-LOW_offset



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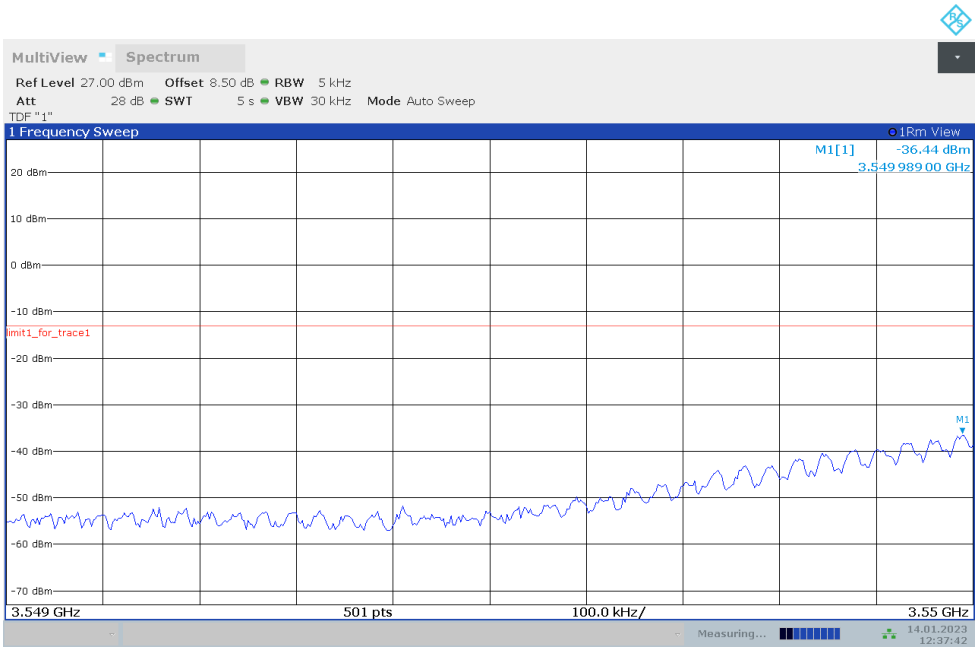

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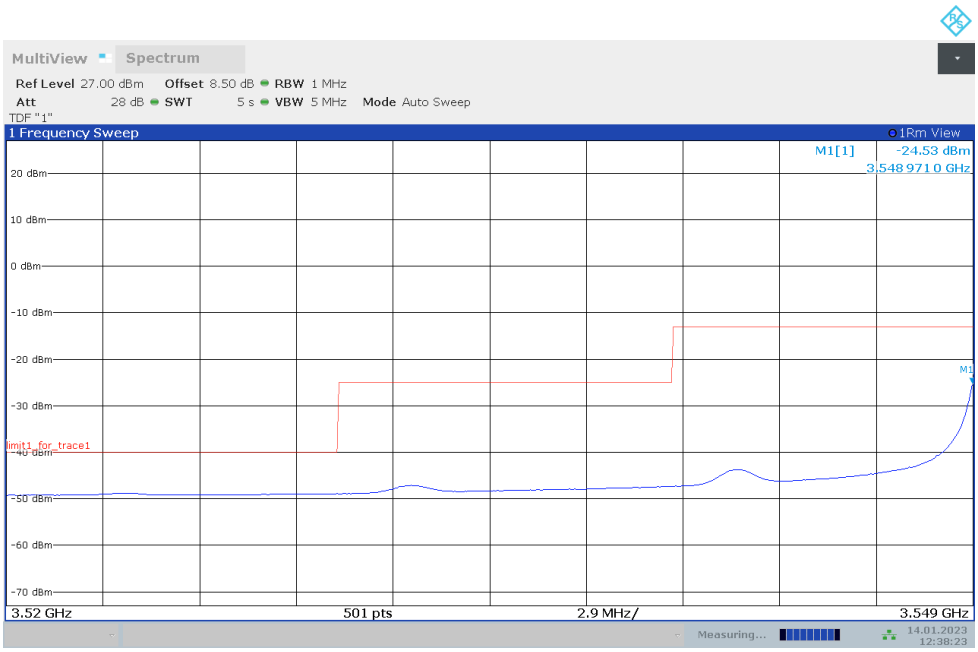
LOW BAND EDGE BLOCK-1RB-LOW_offset



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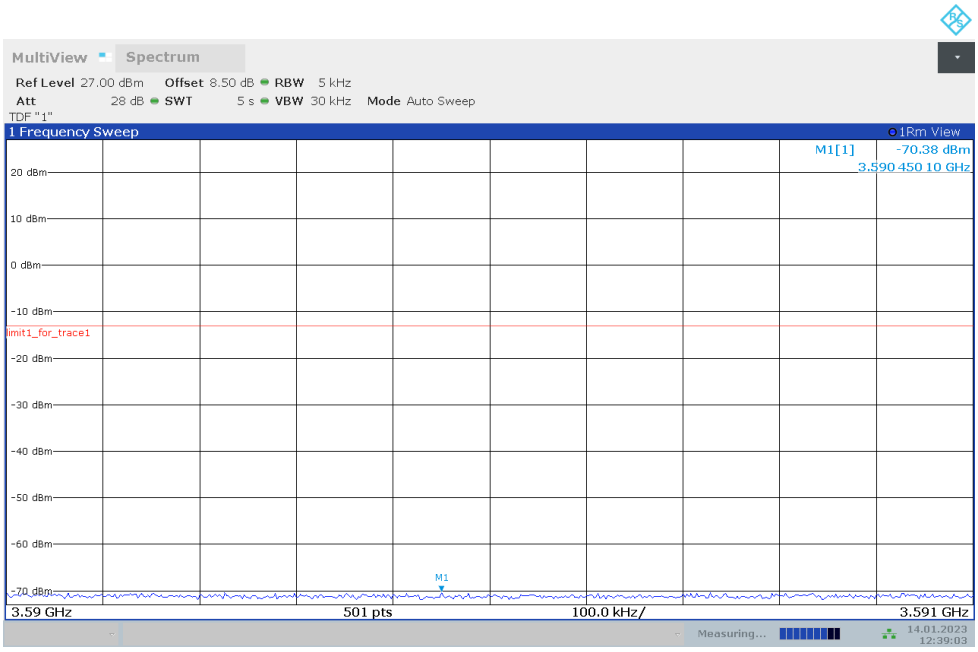

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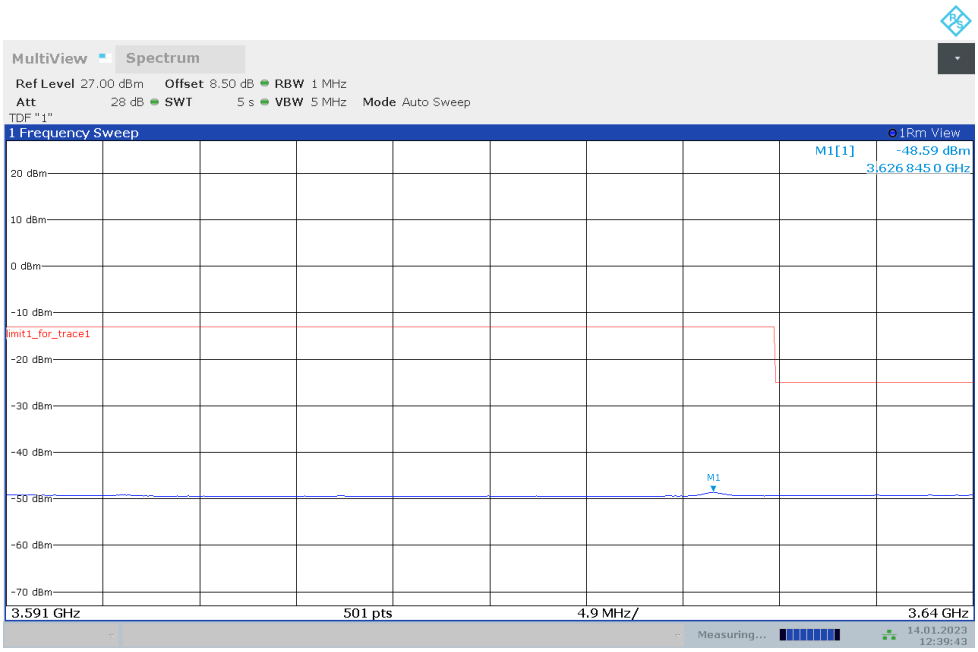
LOW BAND EDGE BLOCK-1RB-LOW_offset



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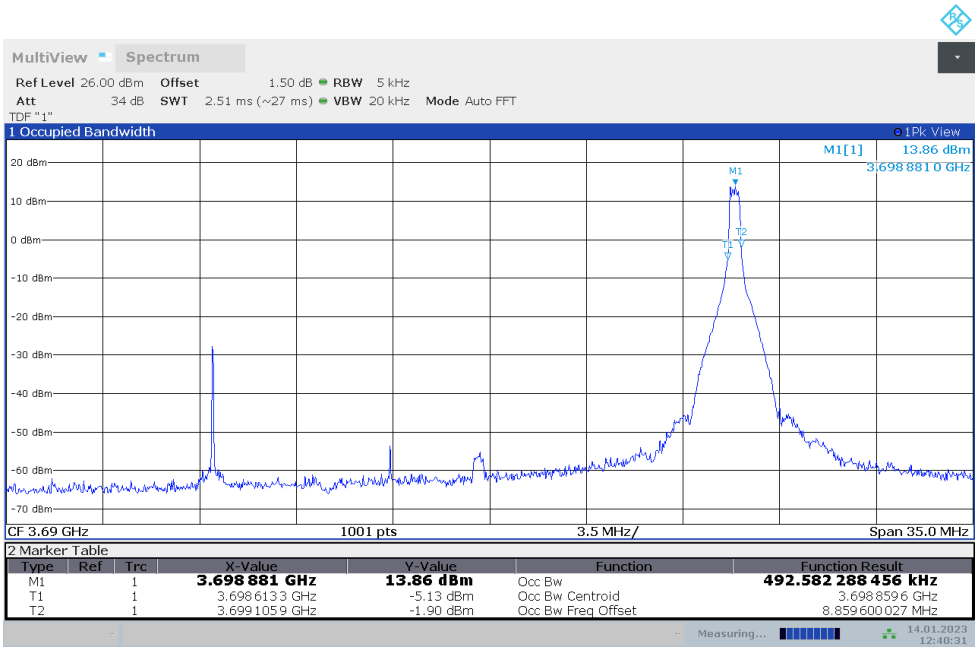
OBW: 1RB-HIGH_offset



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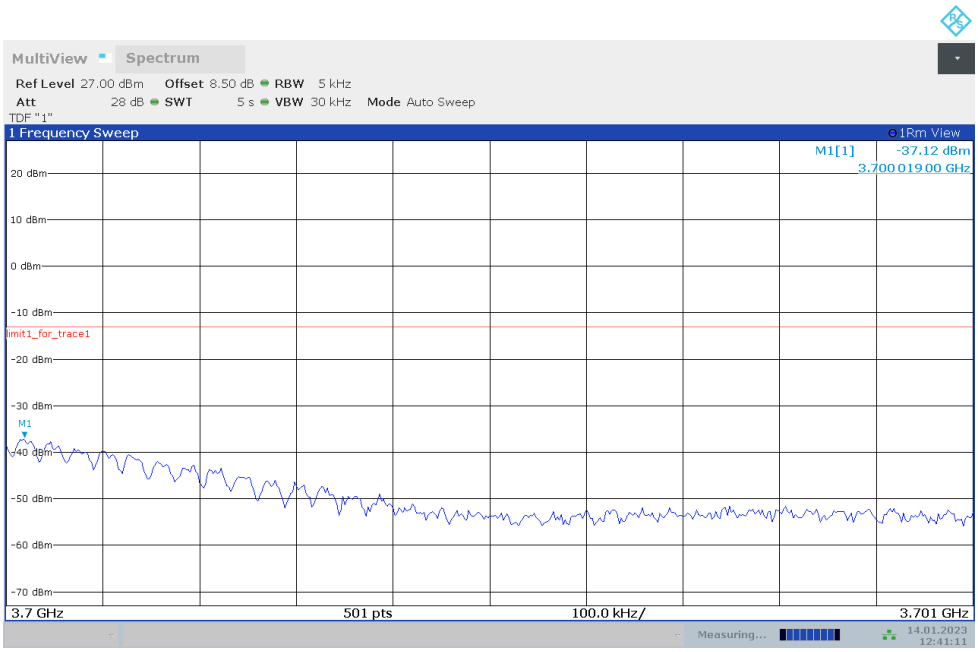
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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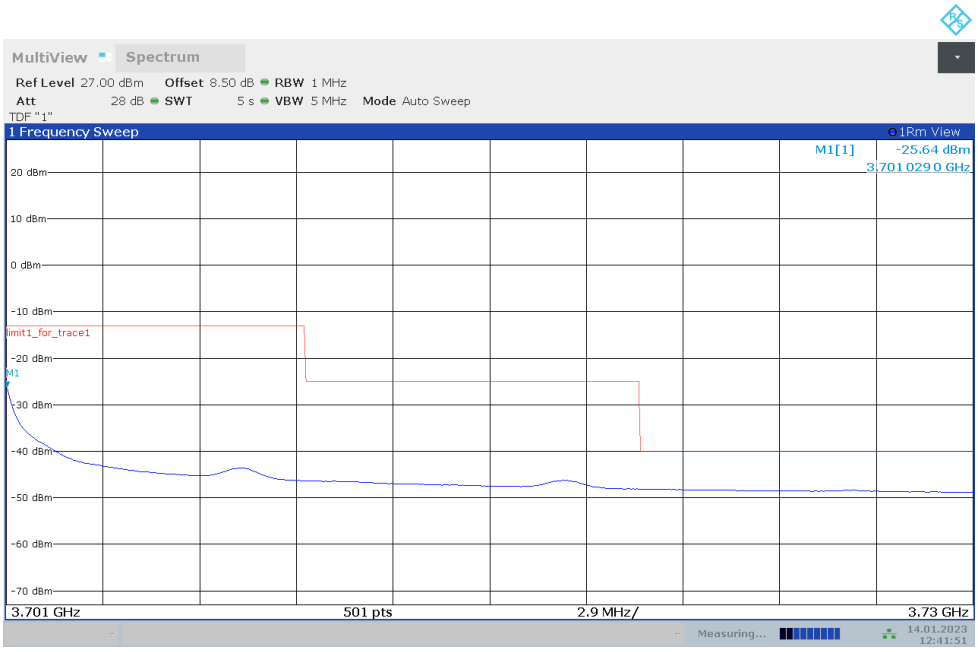
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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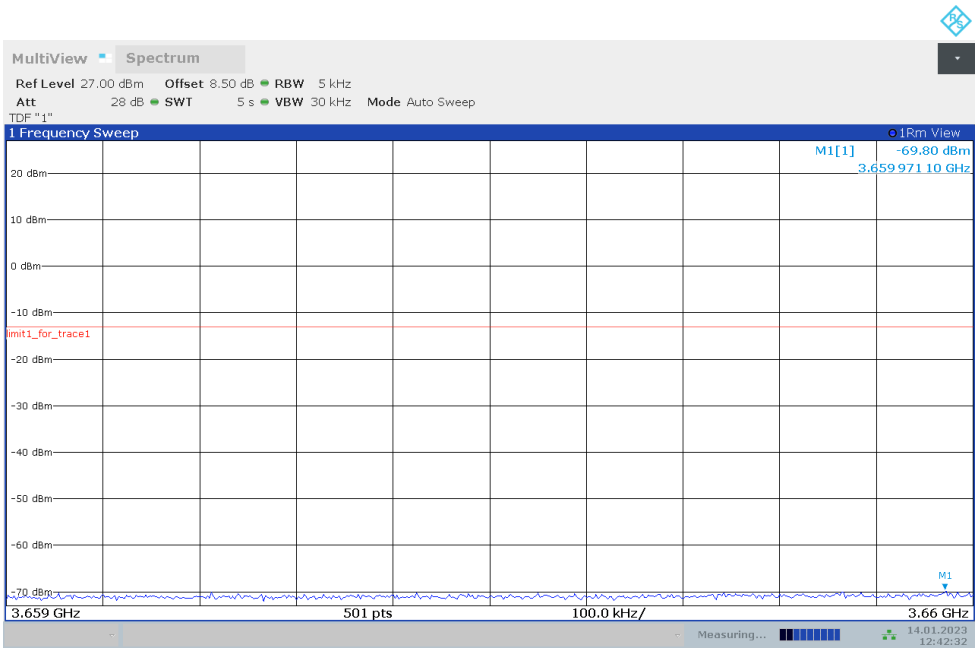
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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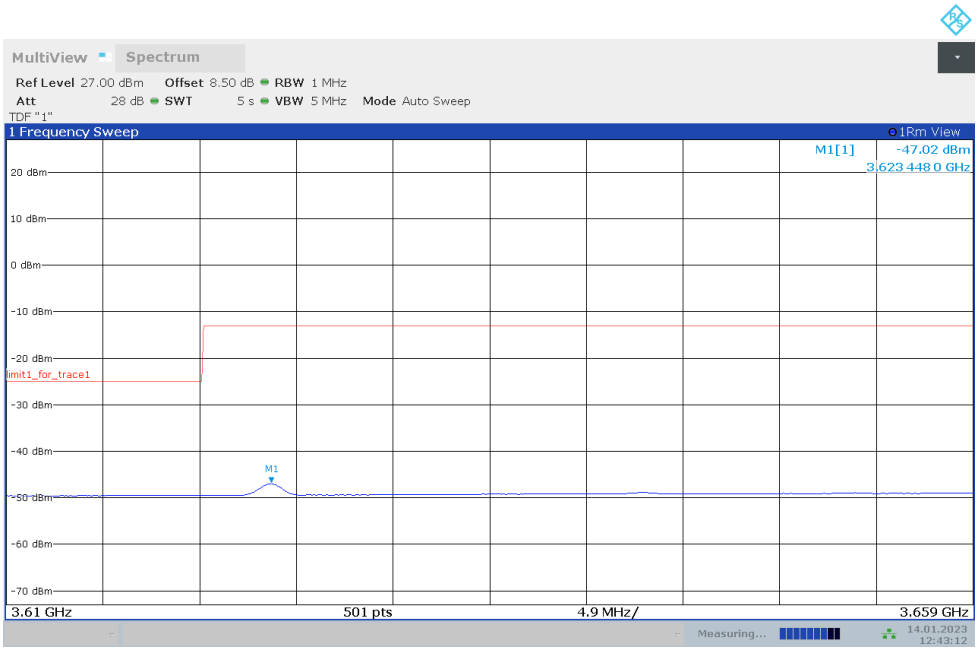
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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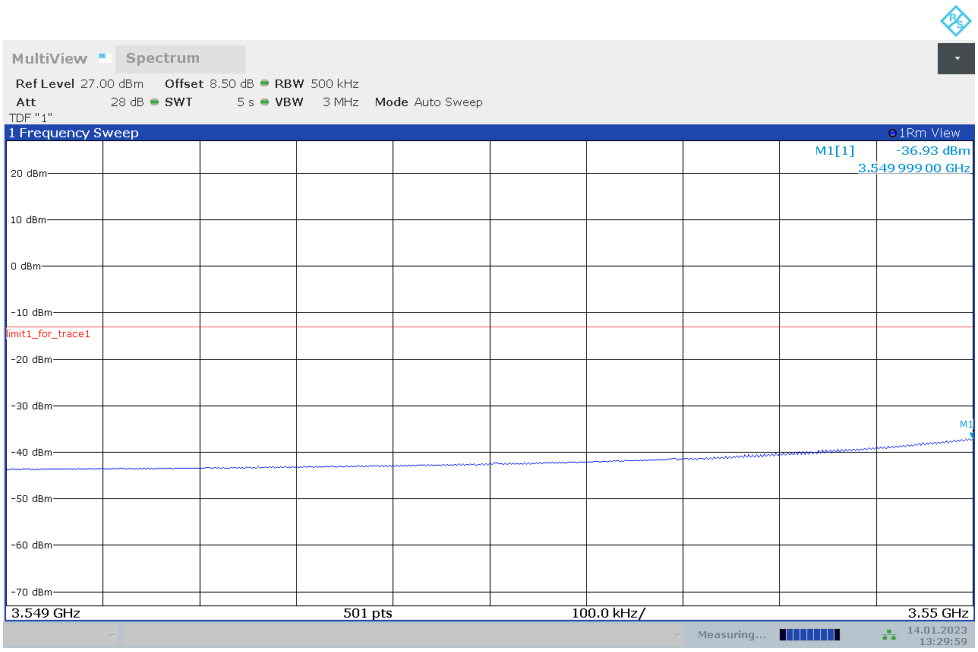
LOW BAND EDGE BLOCK-40M-100%RB



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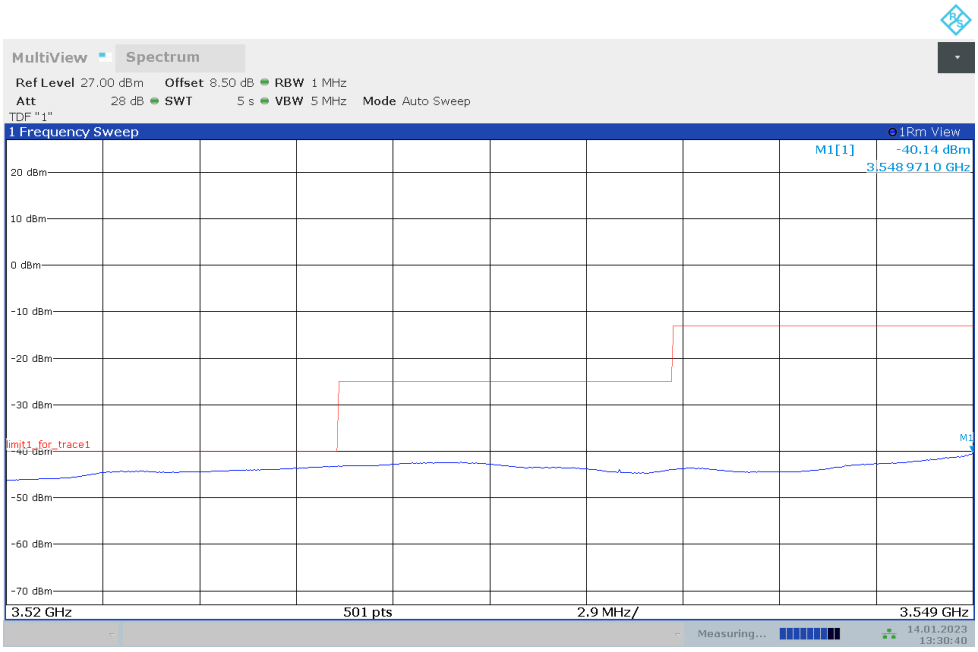
LOW BAND EDGE BLOCK-40M-100%RB



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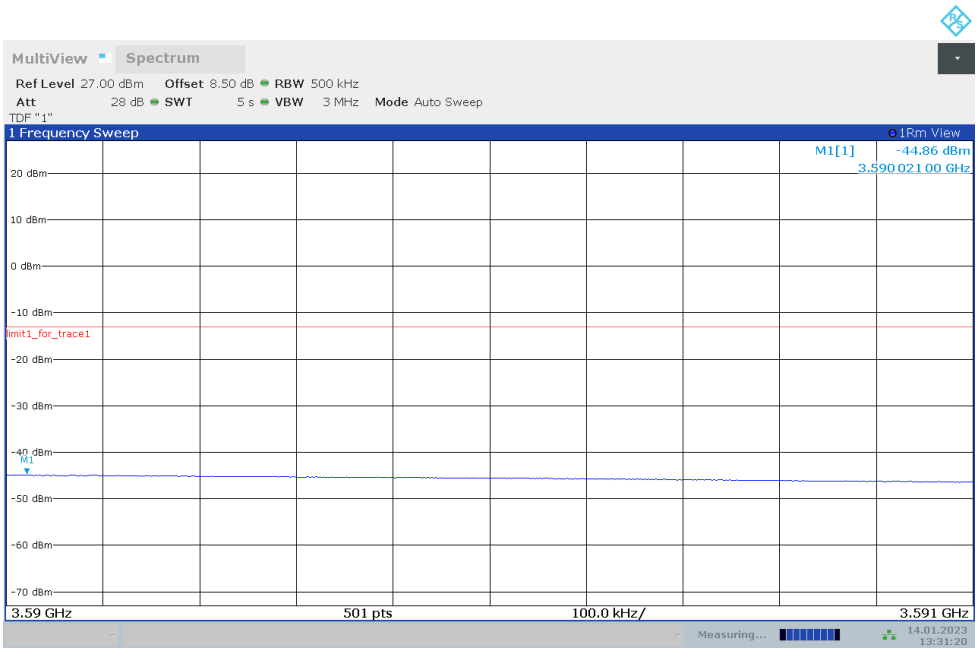
LOW BAND EDGE BLOCK-40M-100%RB



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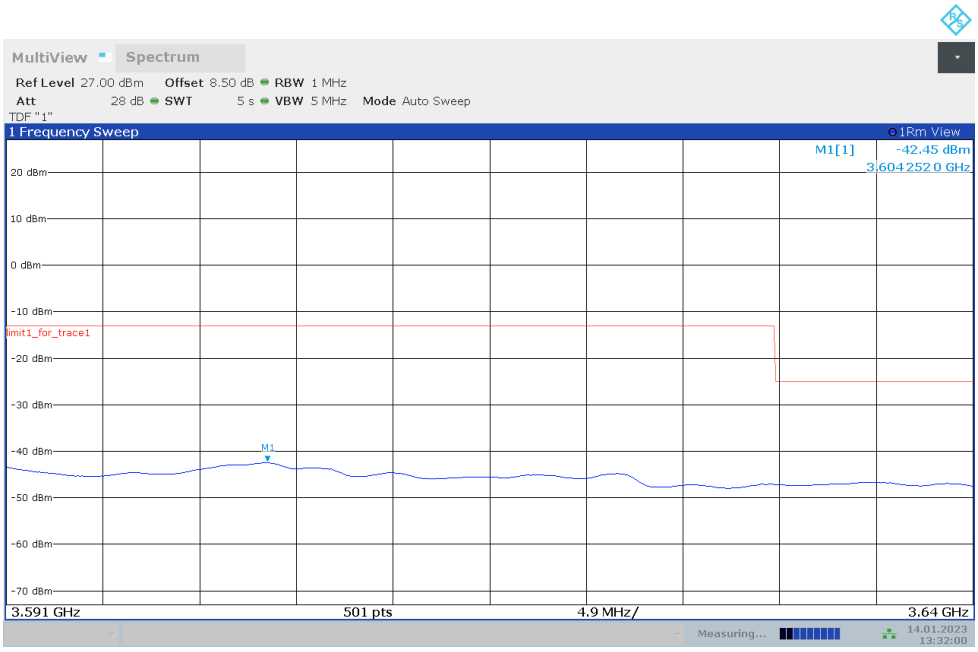

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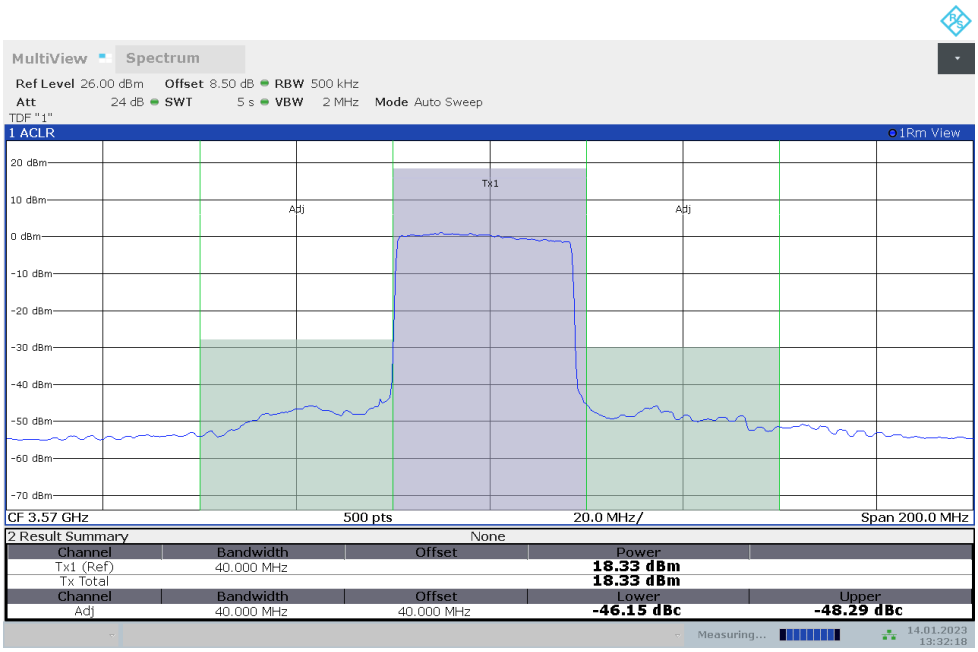
ACLR



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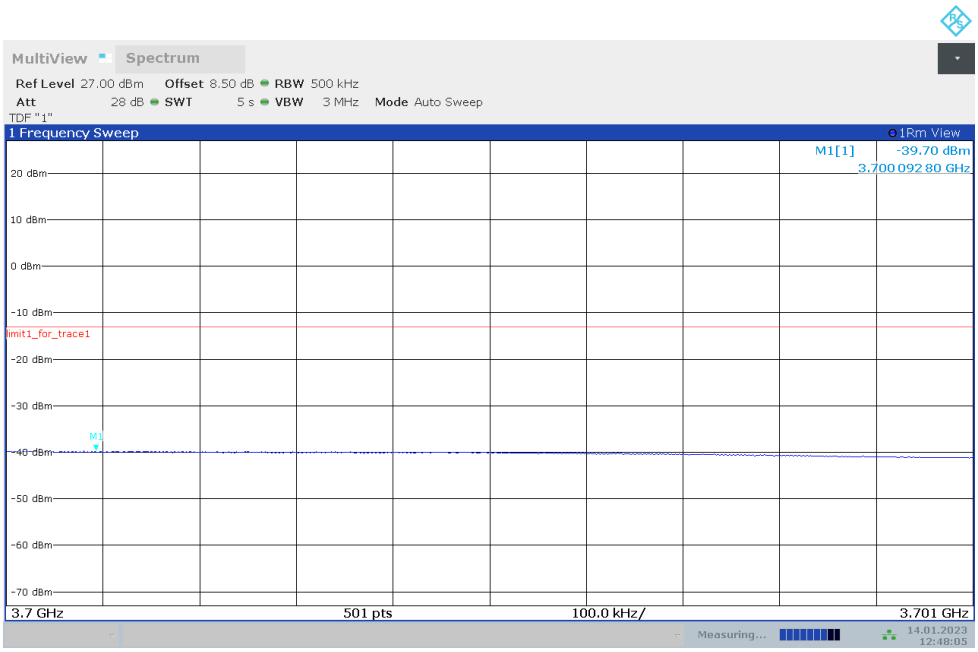

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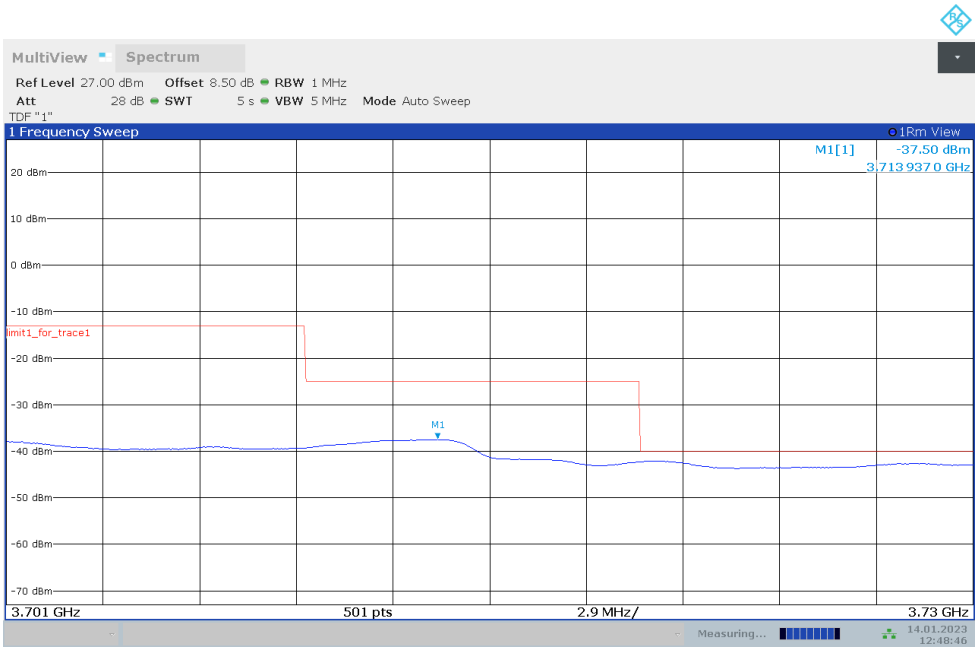

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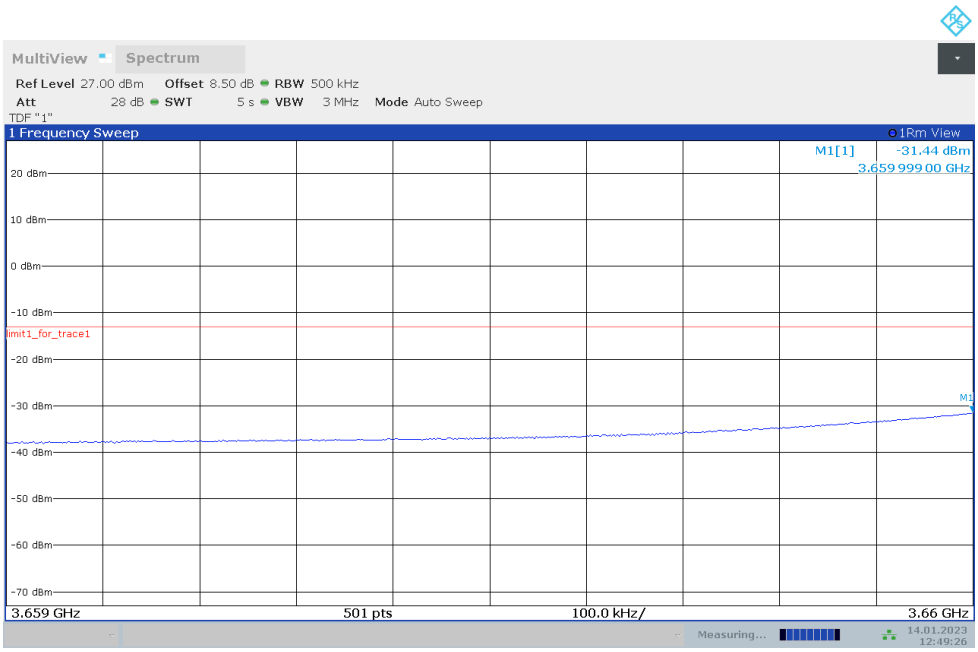

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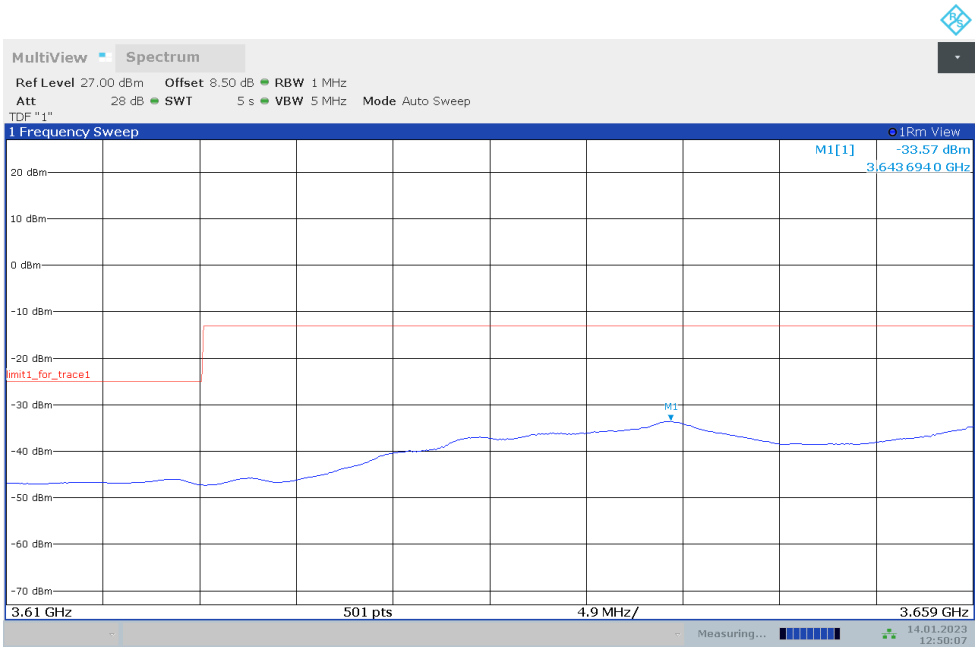

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ACLR

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NR n71

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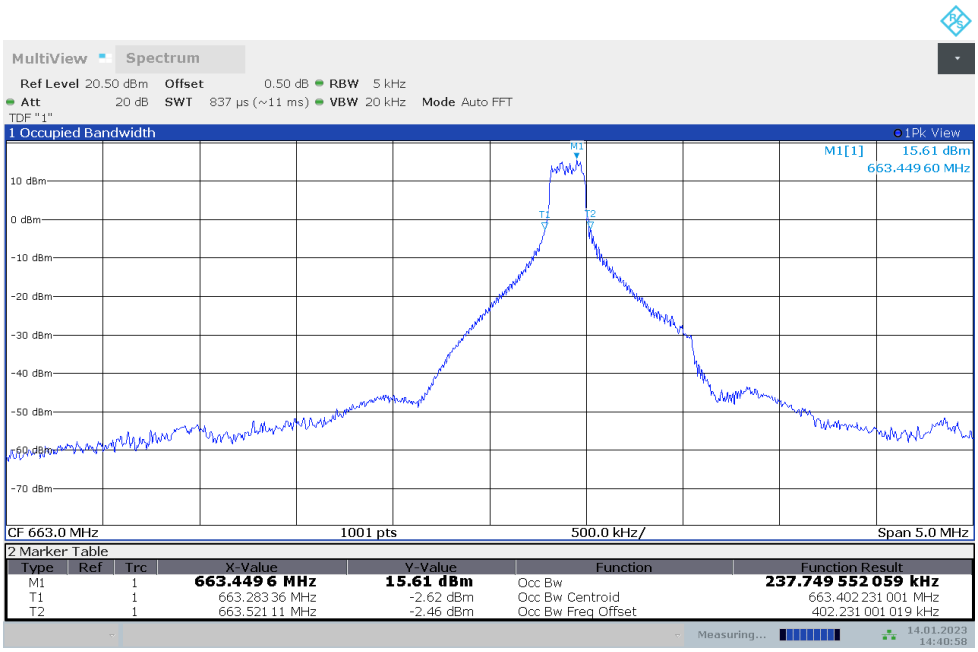

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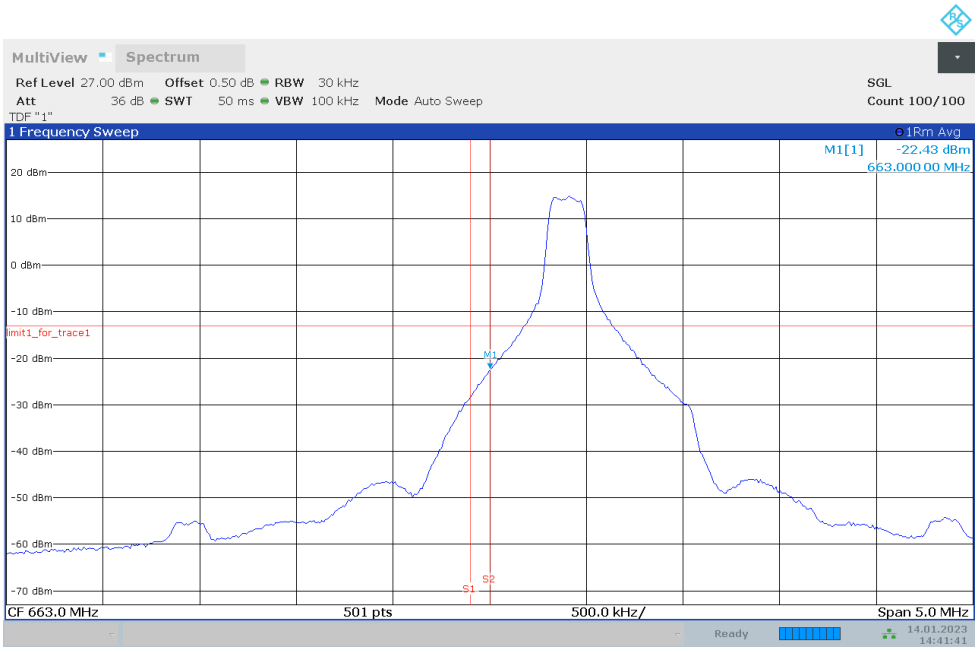

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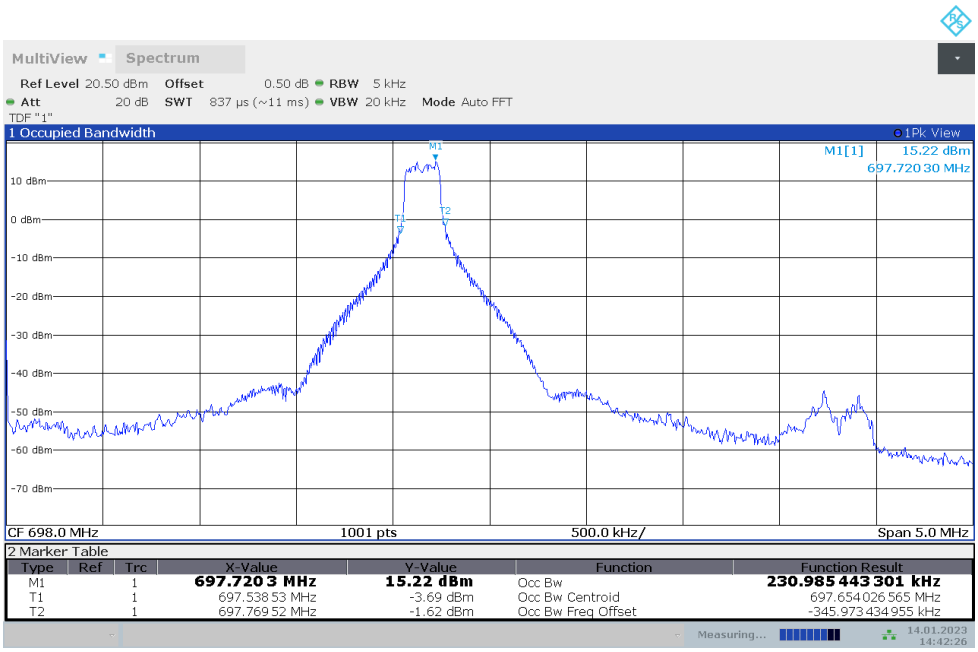

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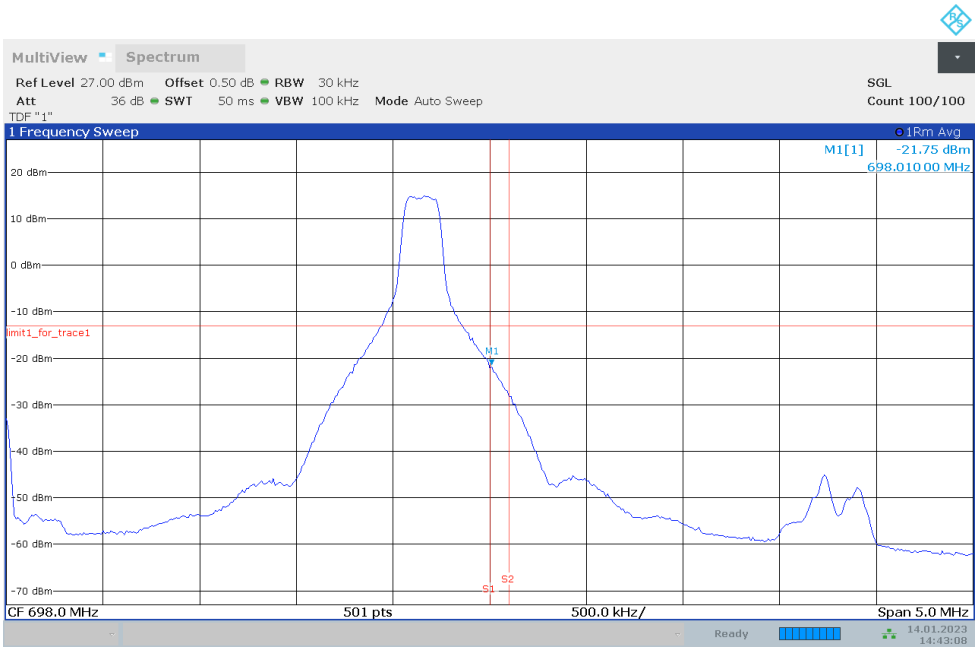

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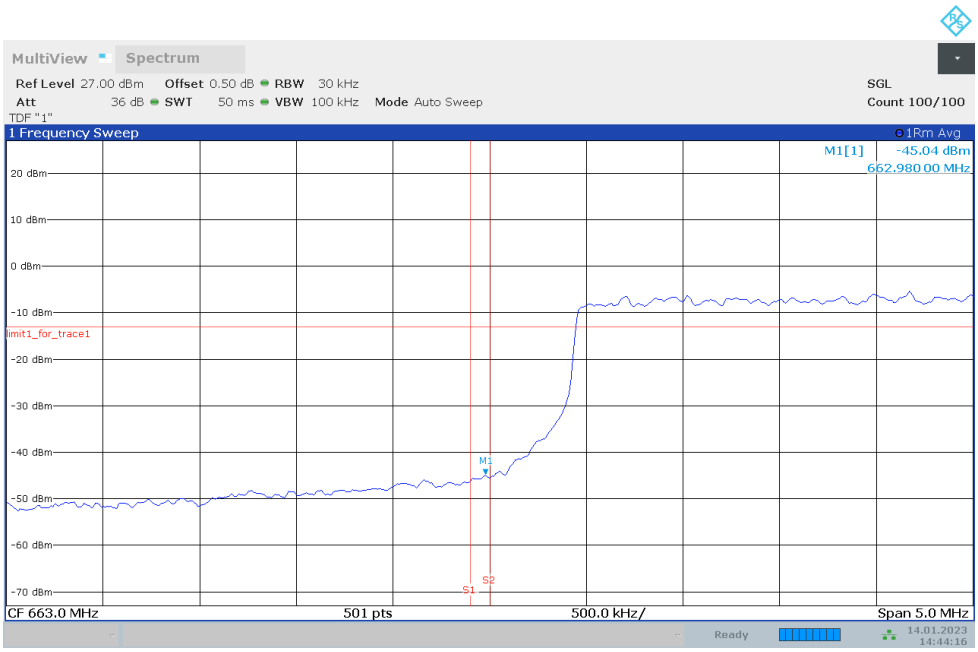

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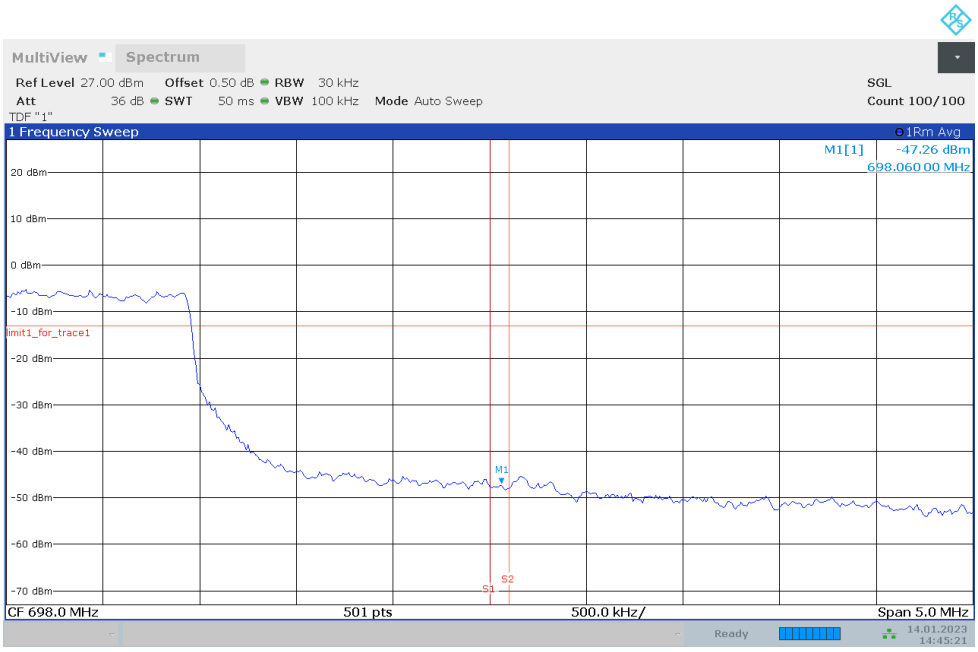

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NR n77L

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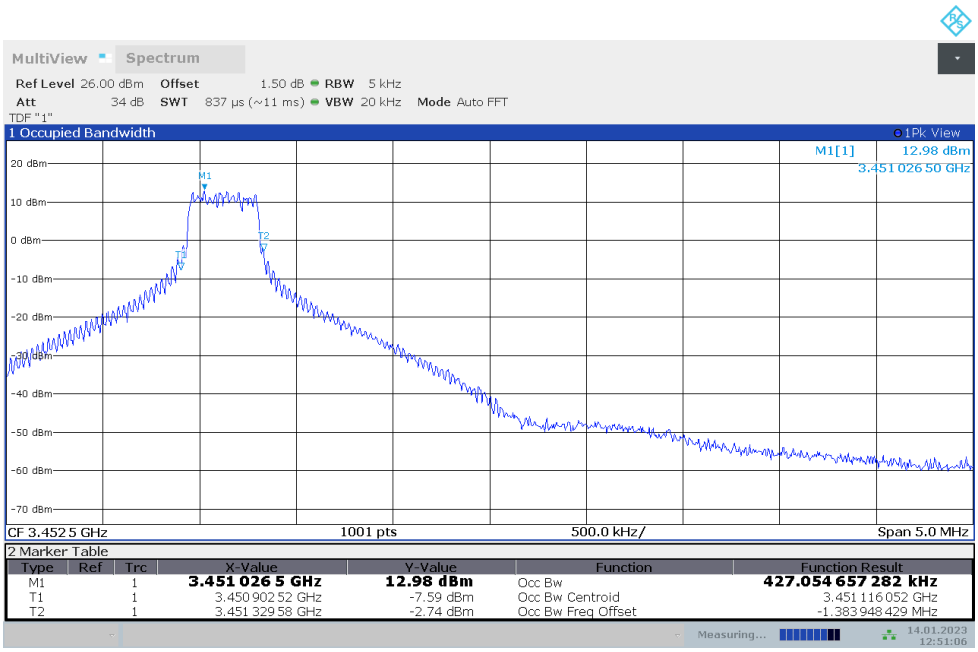

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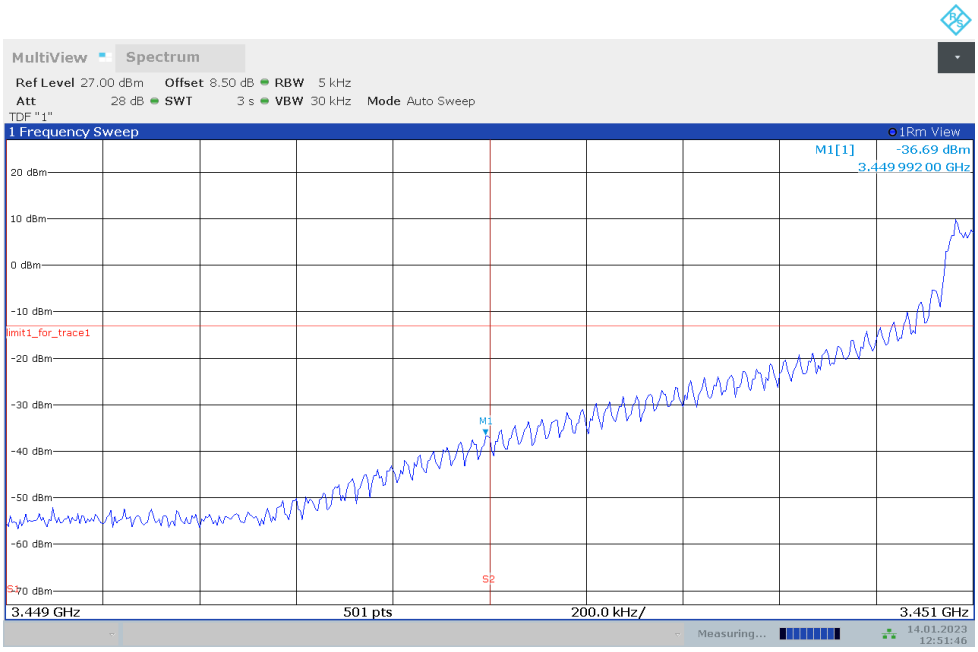

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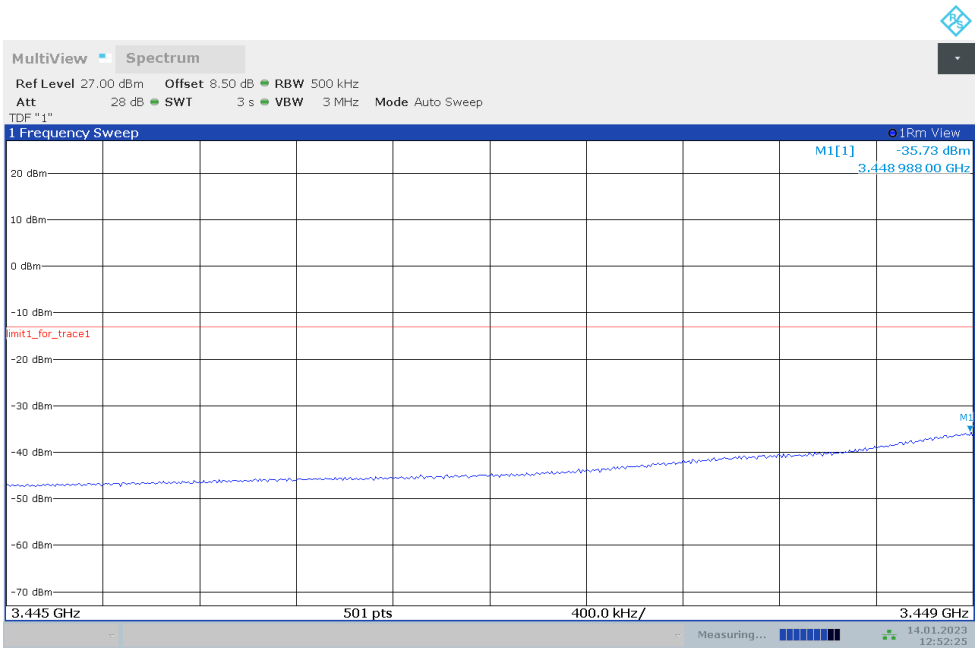

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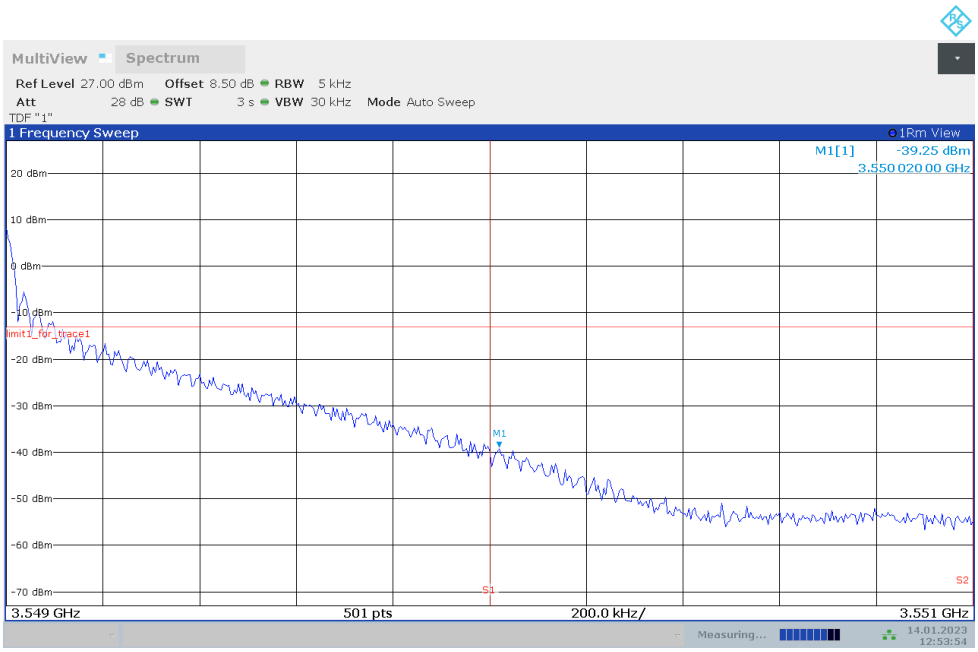

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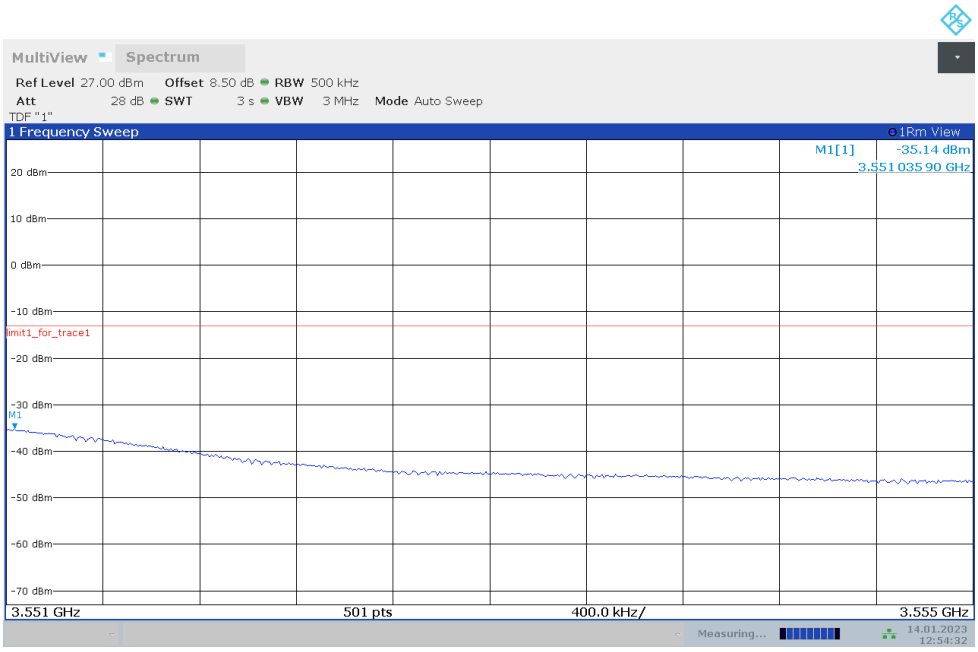

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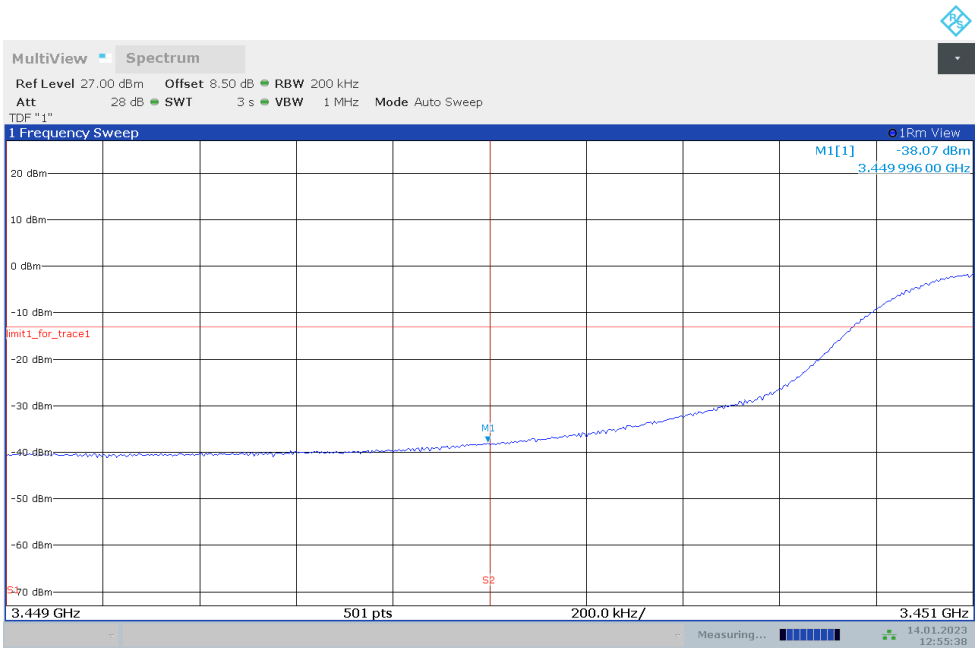
LOW BAND EDGE BLOCK-90M-100%RB



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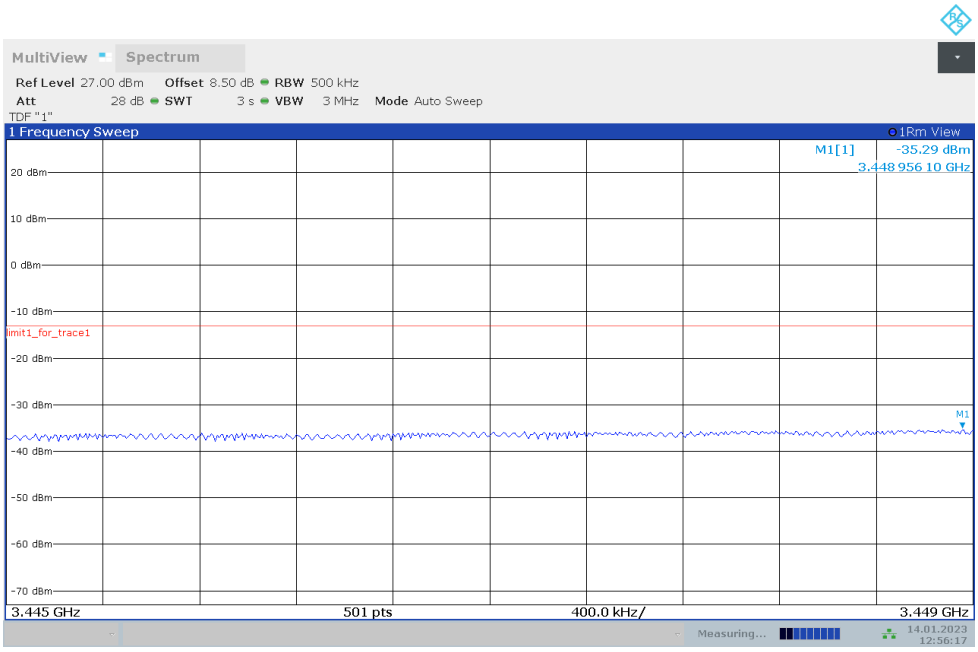

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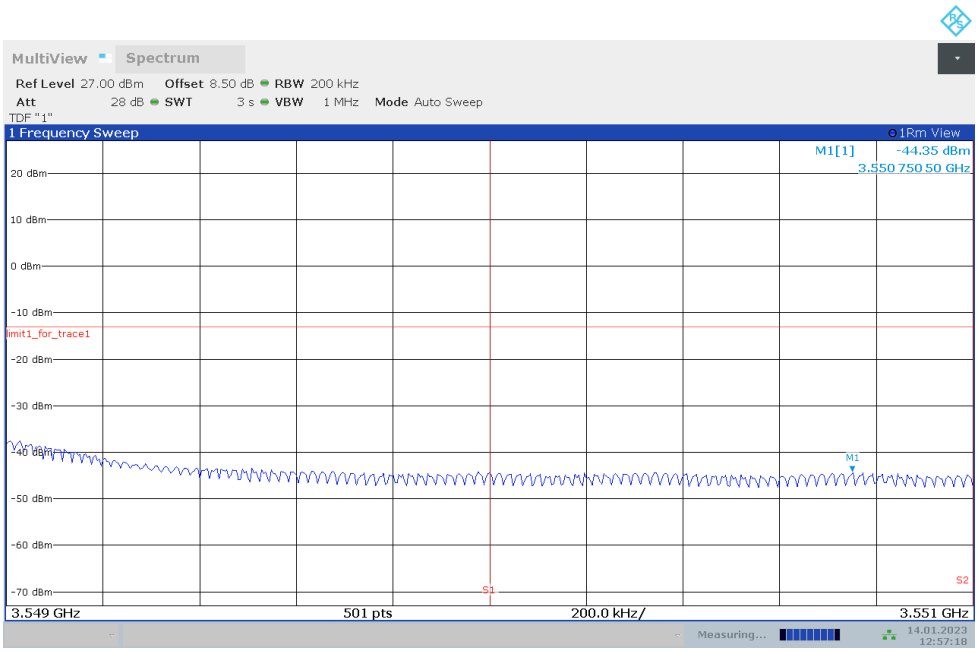

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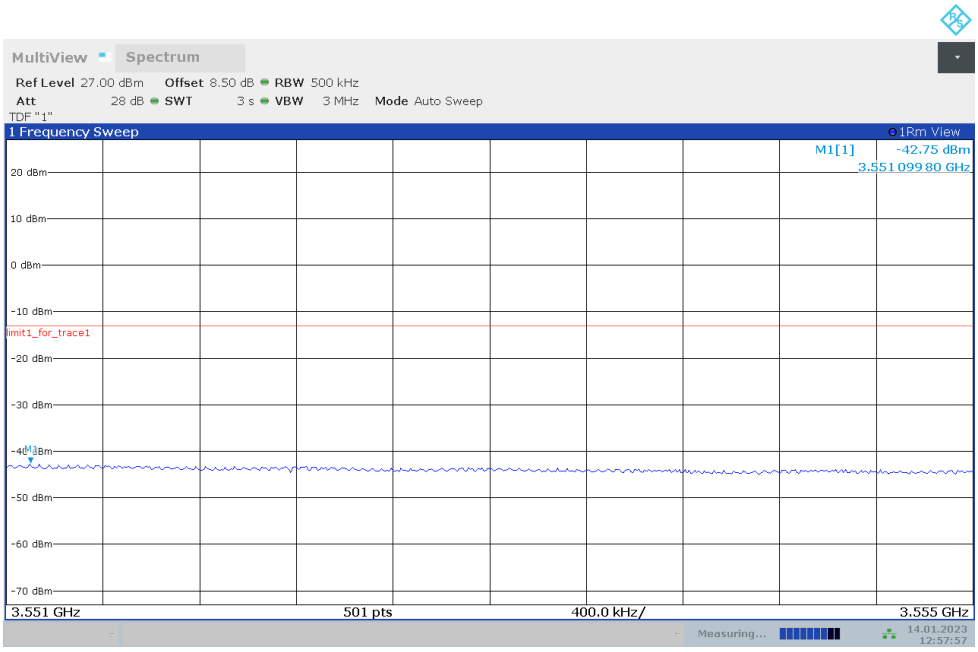

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NR n77H

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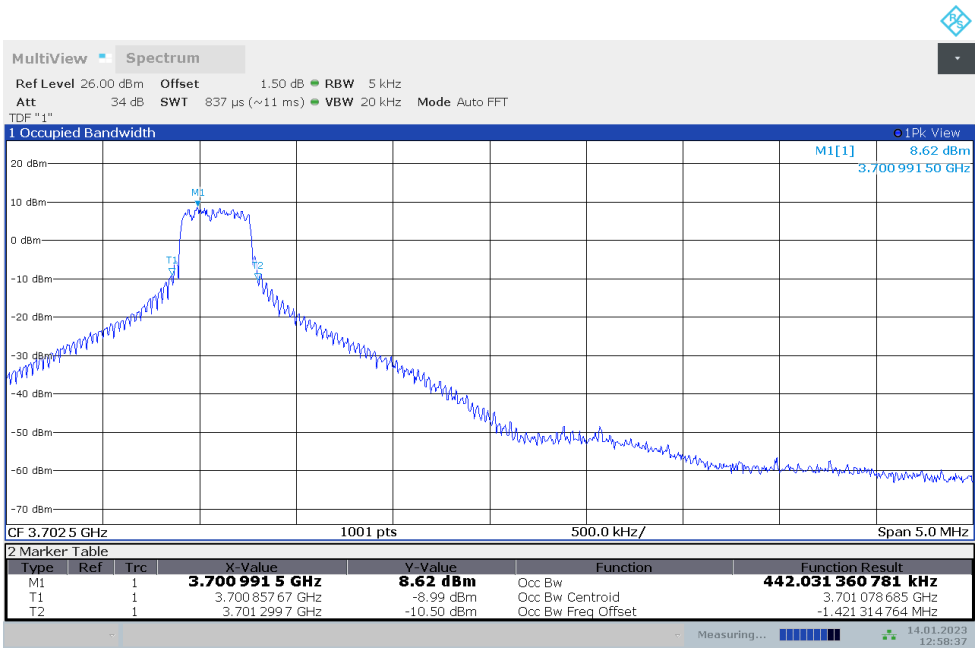

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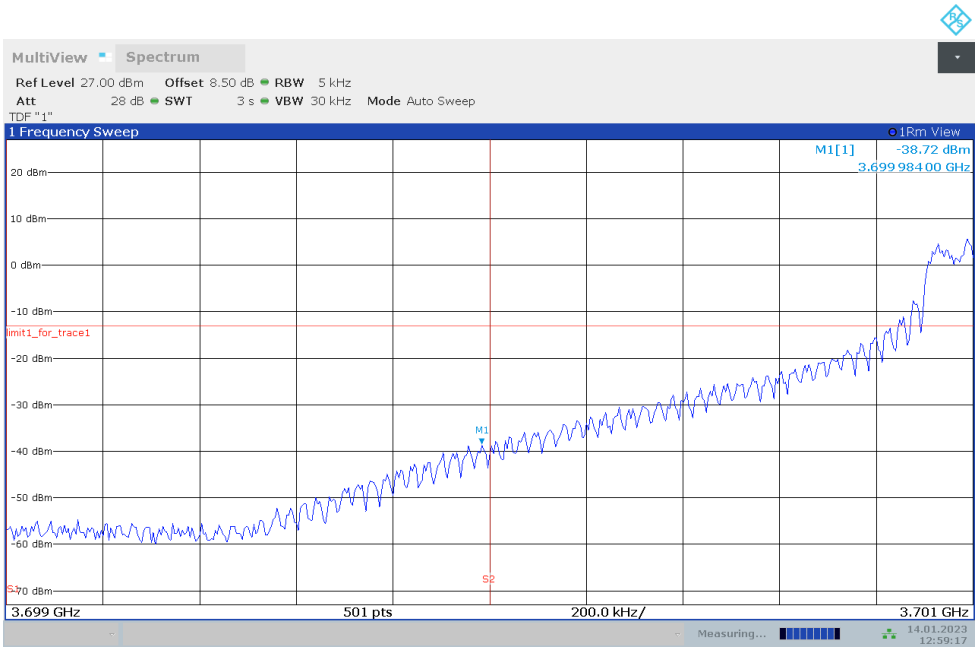

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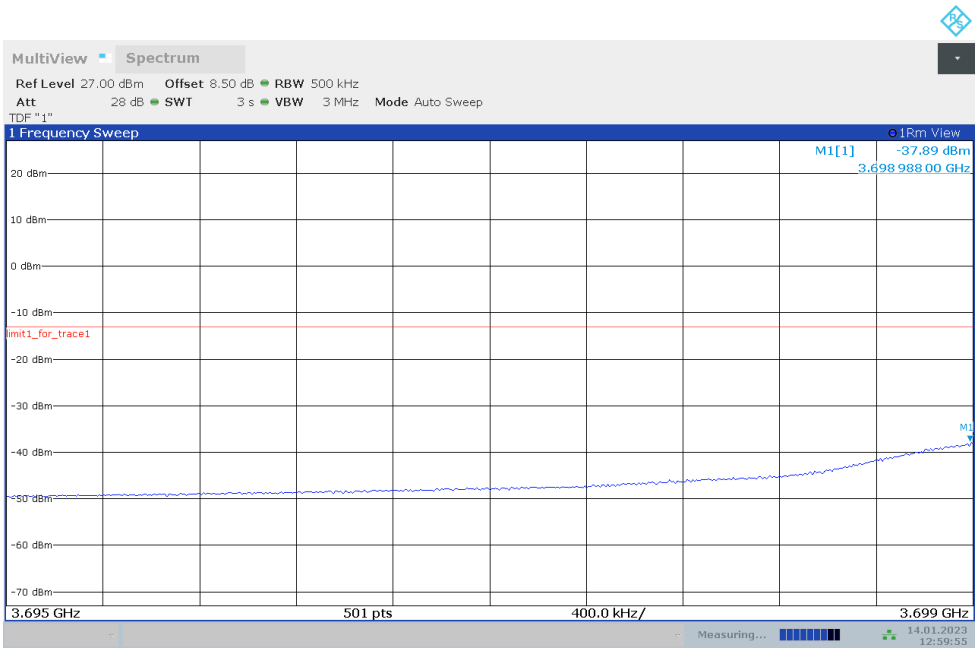

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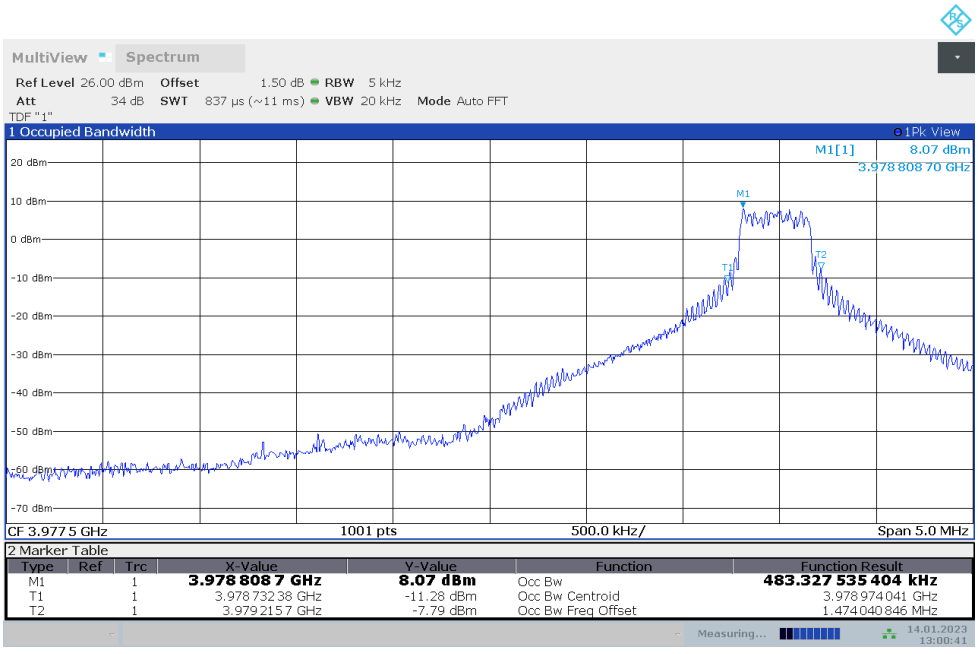

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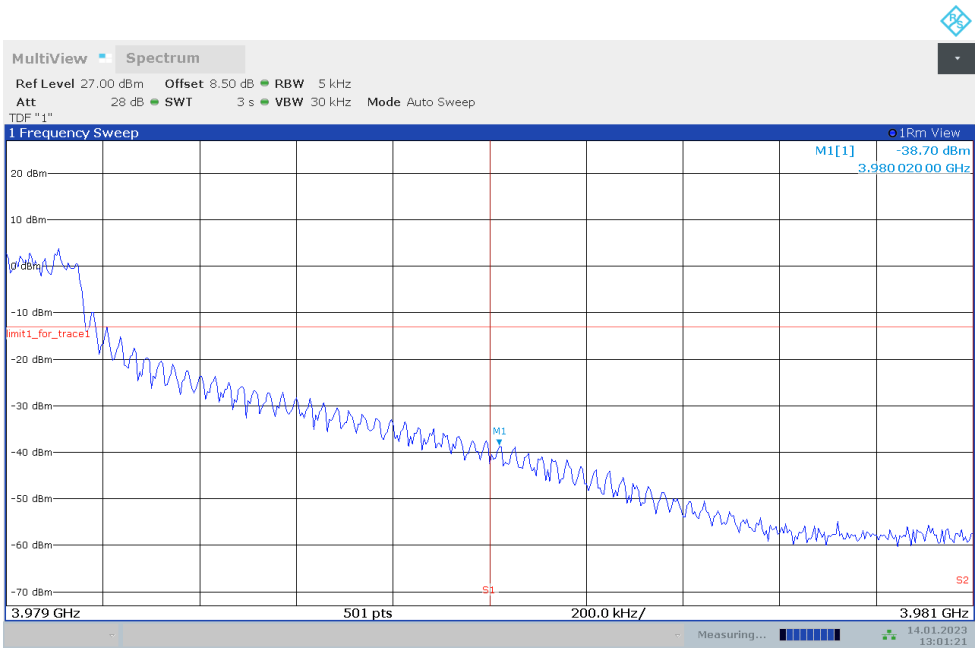

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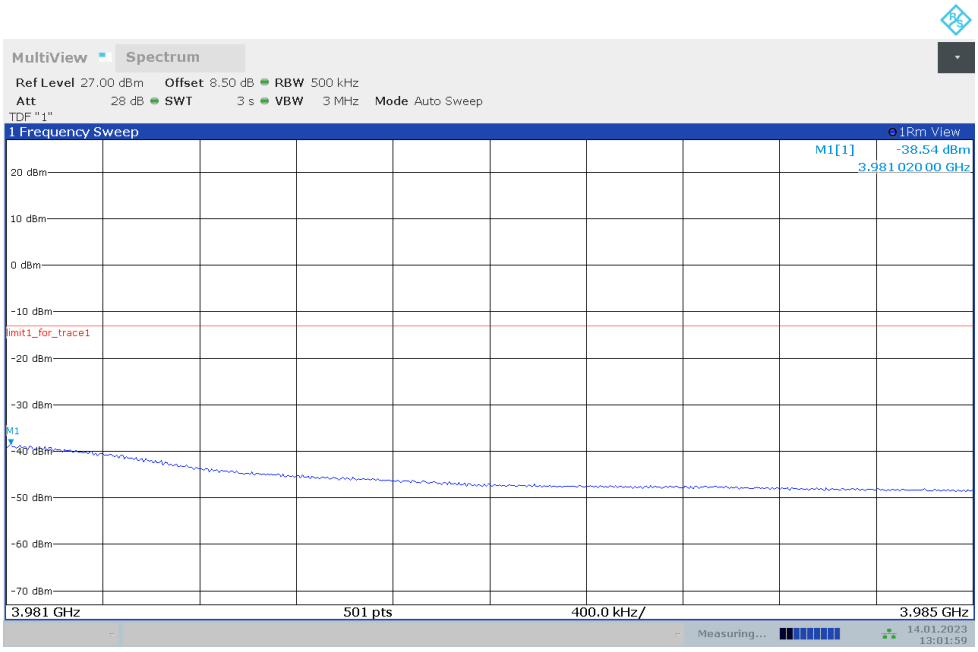

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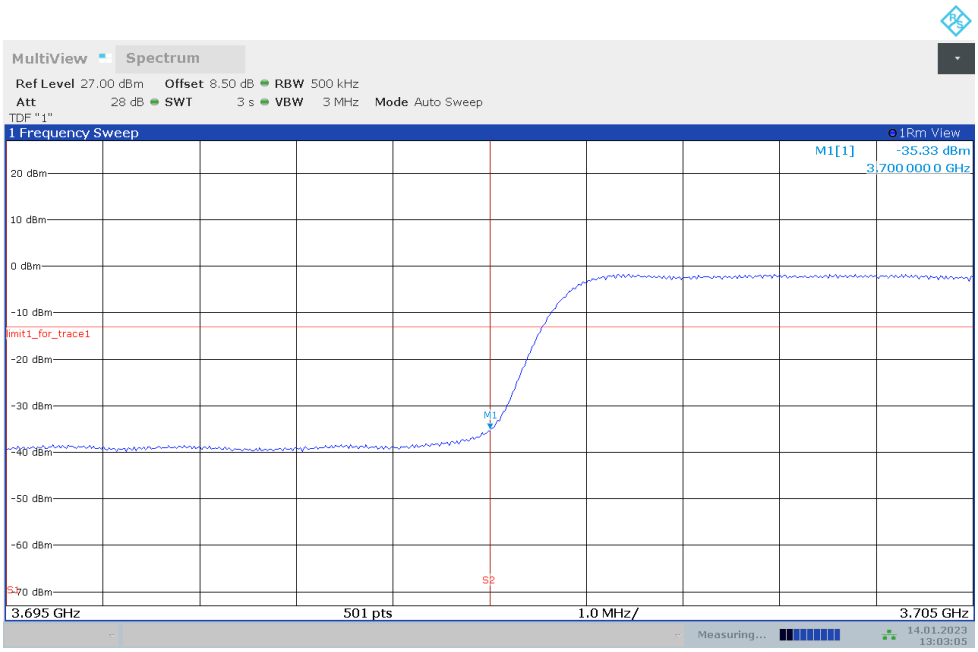

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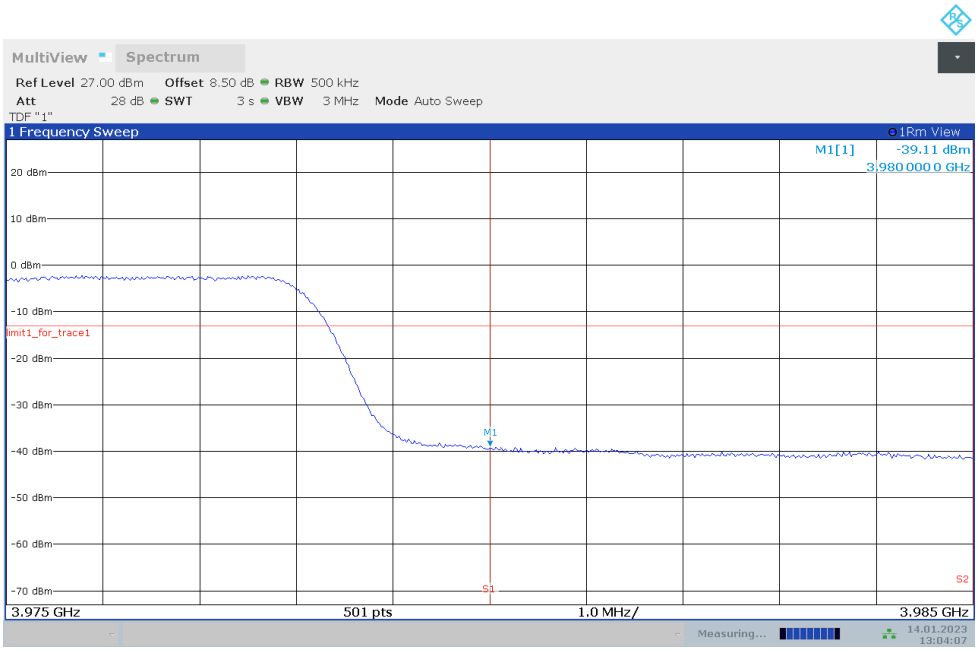

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NR n78L

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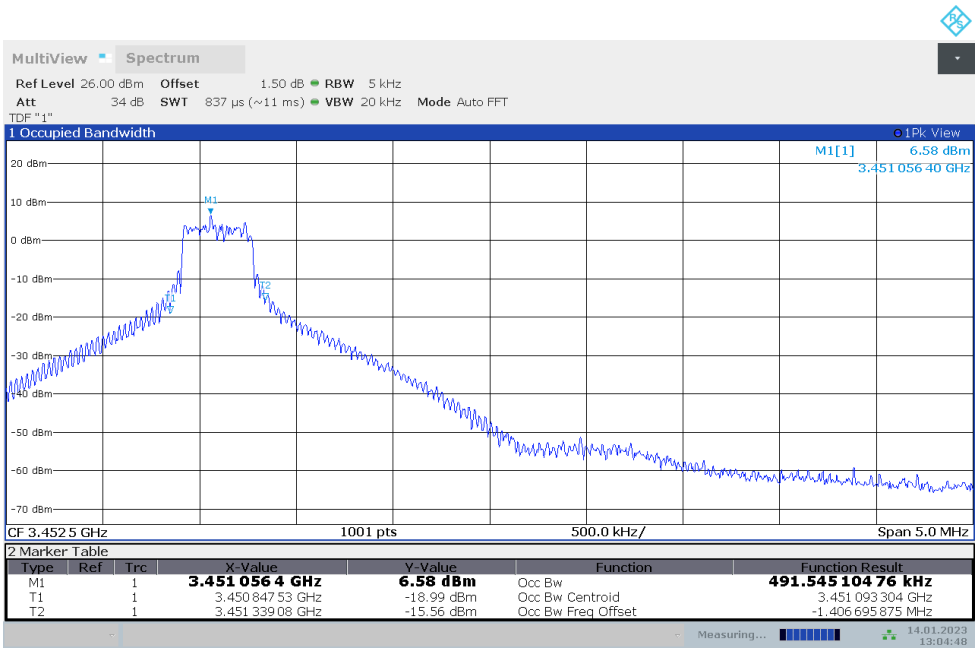

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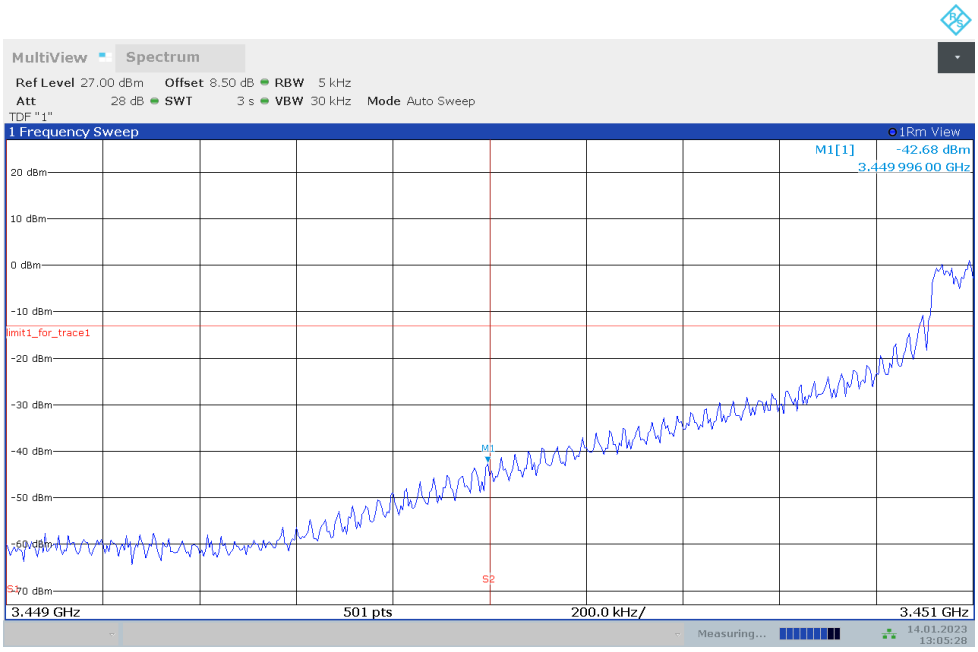

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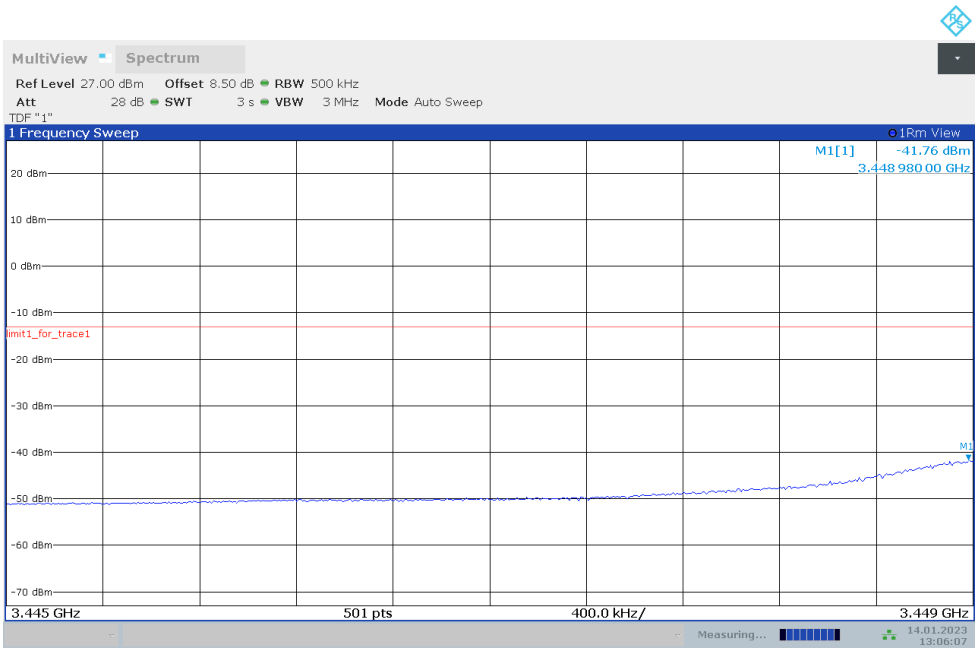

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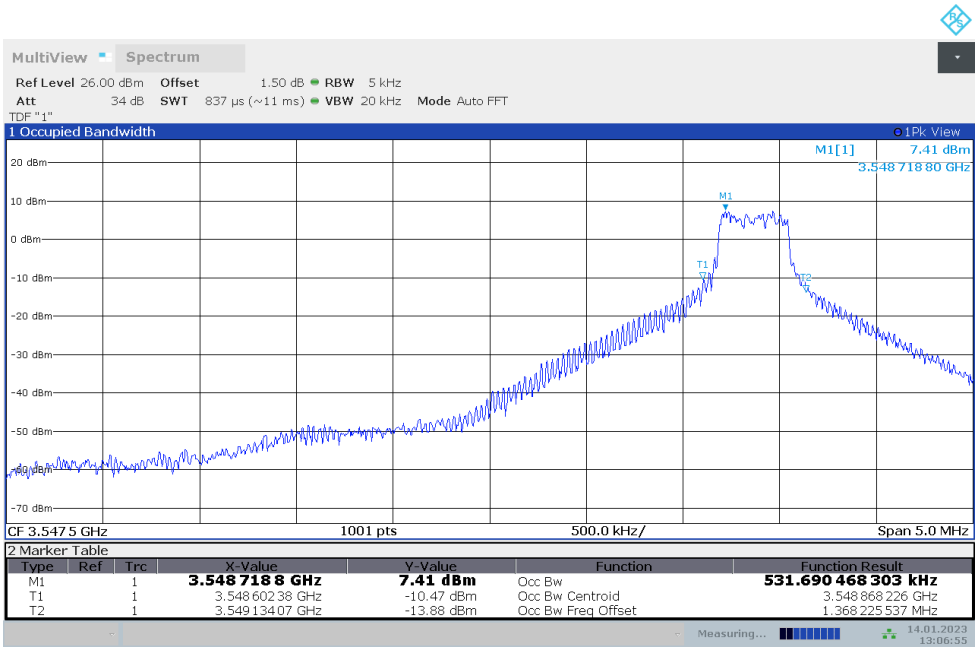

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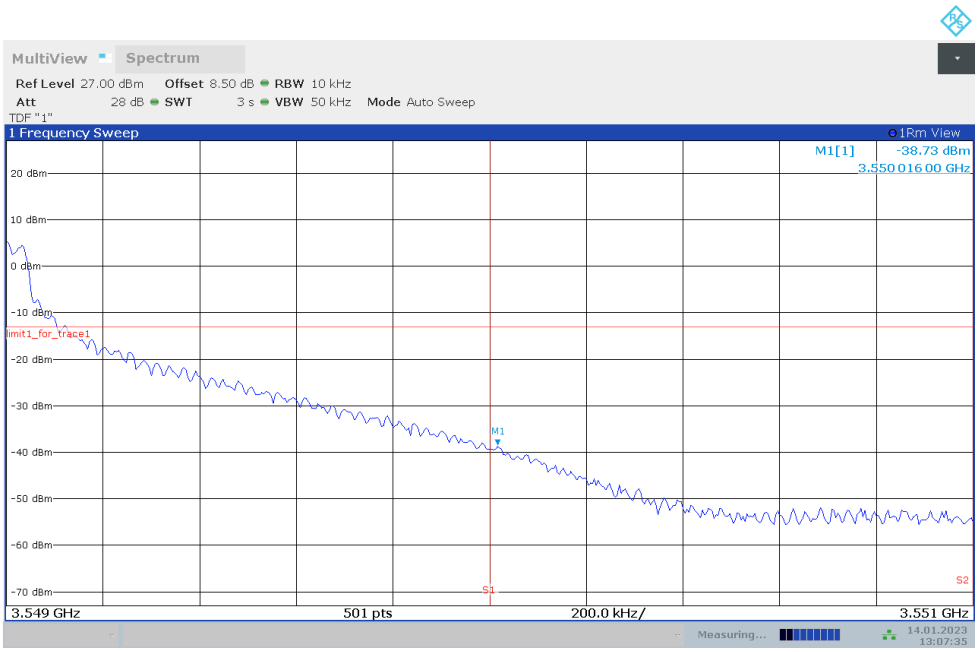

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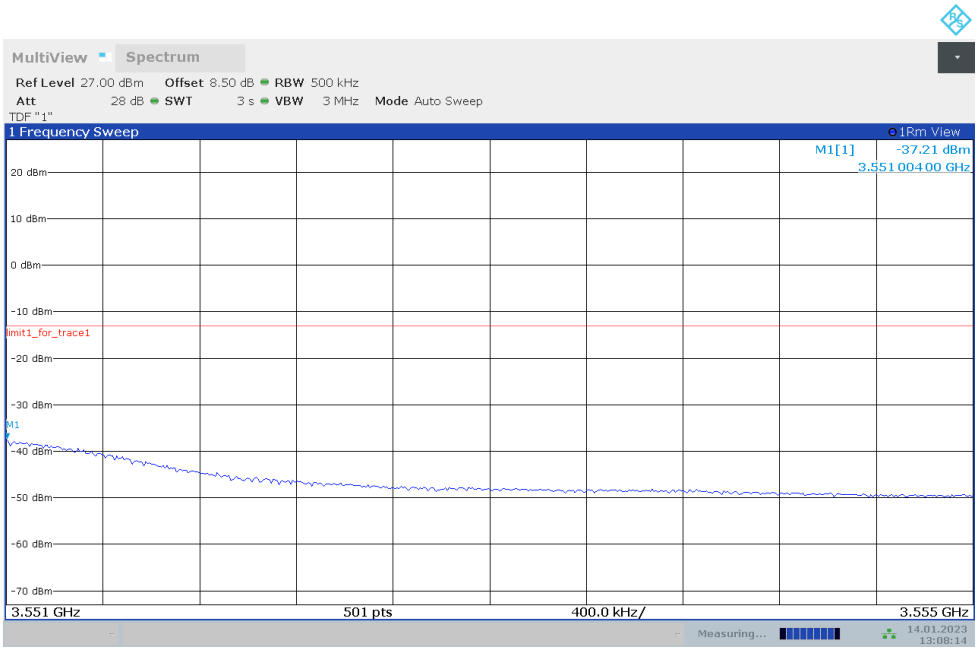

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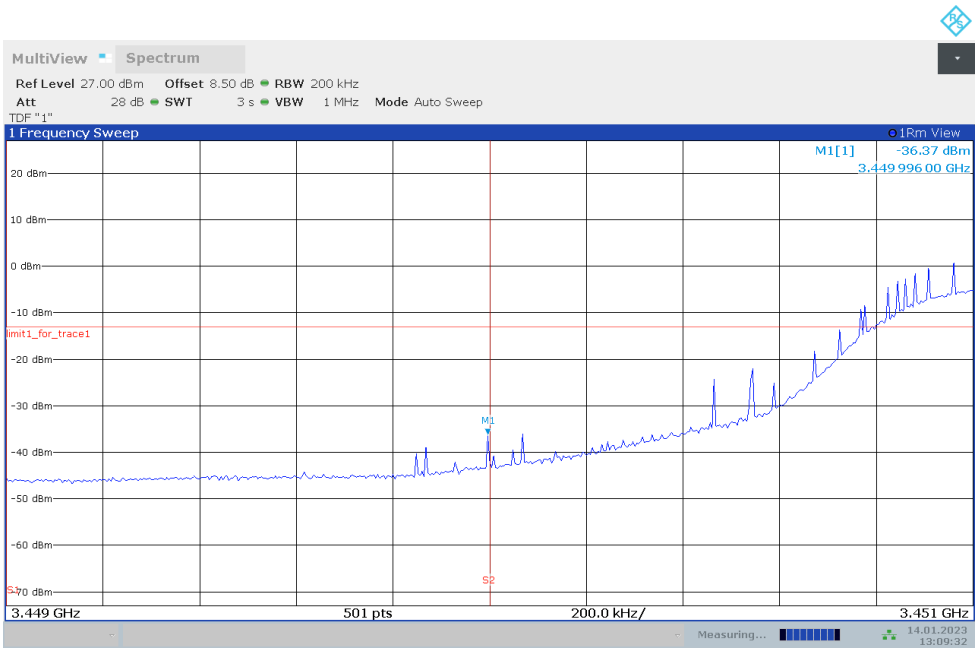
LOW BAND EDGE BLOCK-90M-100%RB



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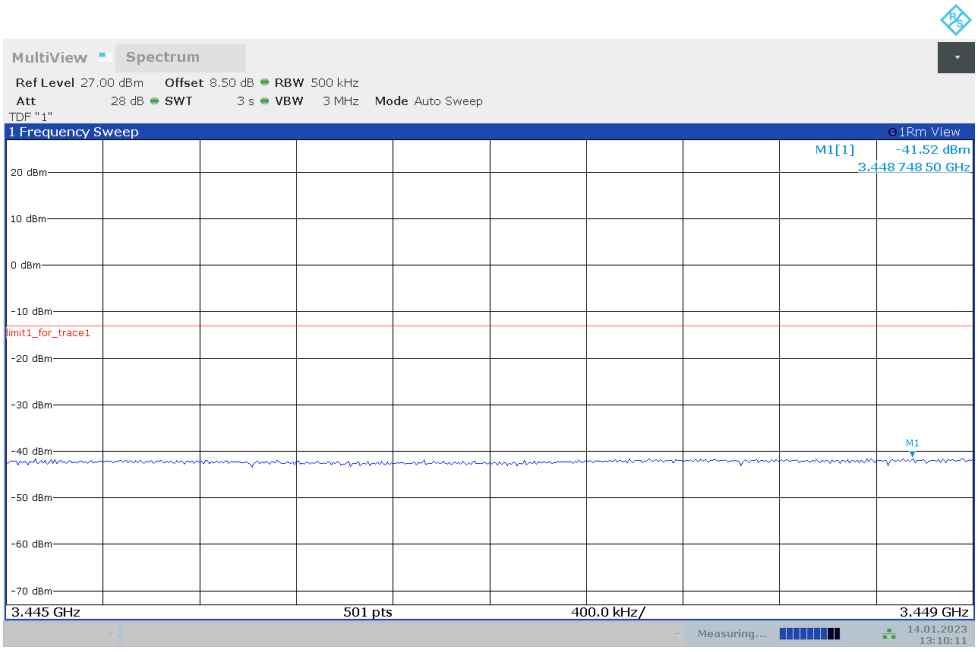

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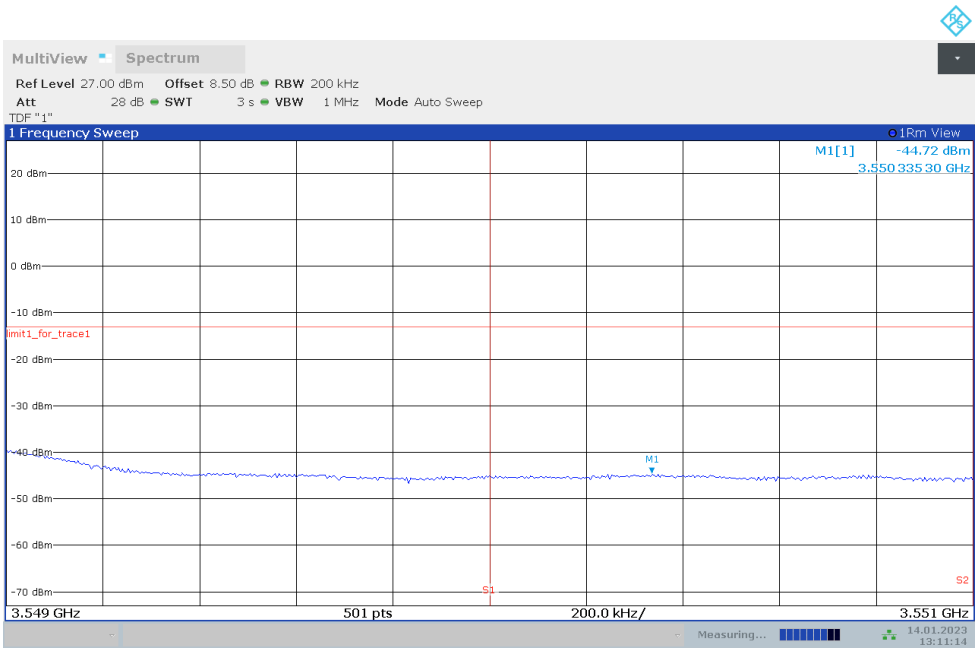

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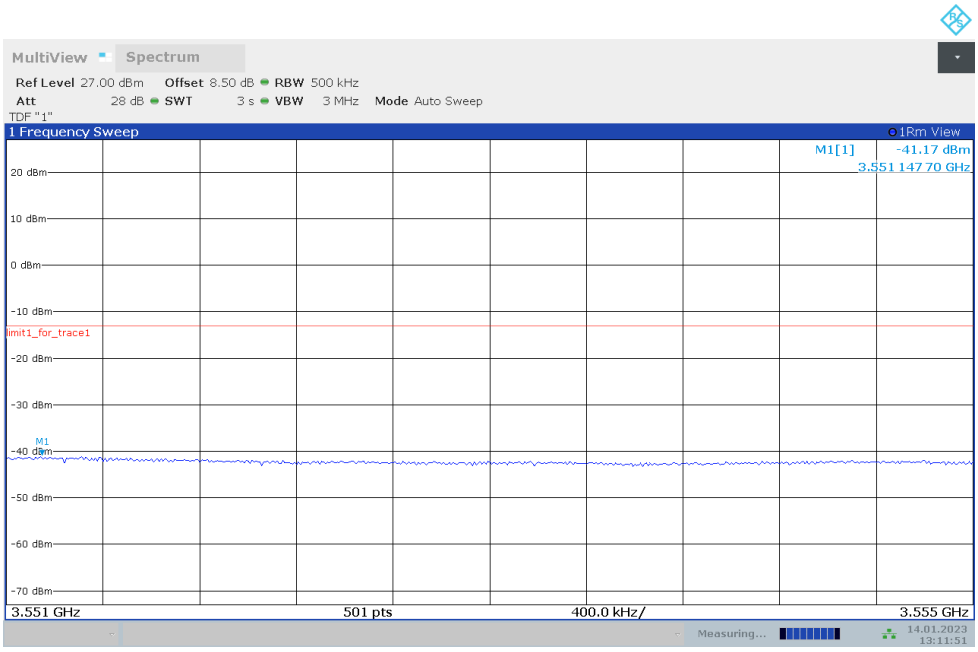

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LTE Band 12+NR n66

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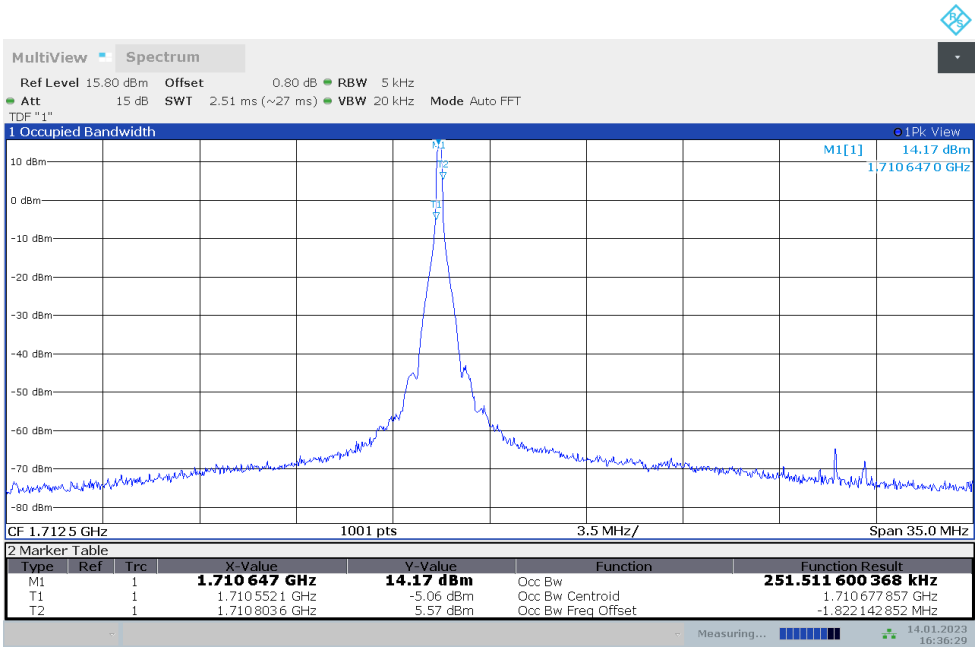

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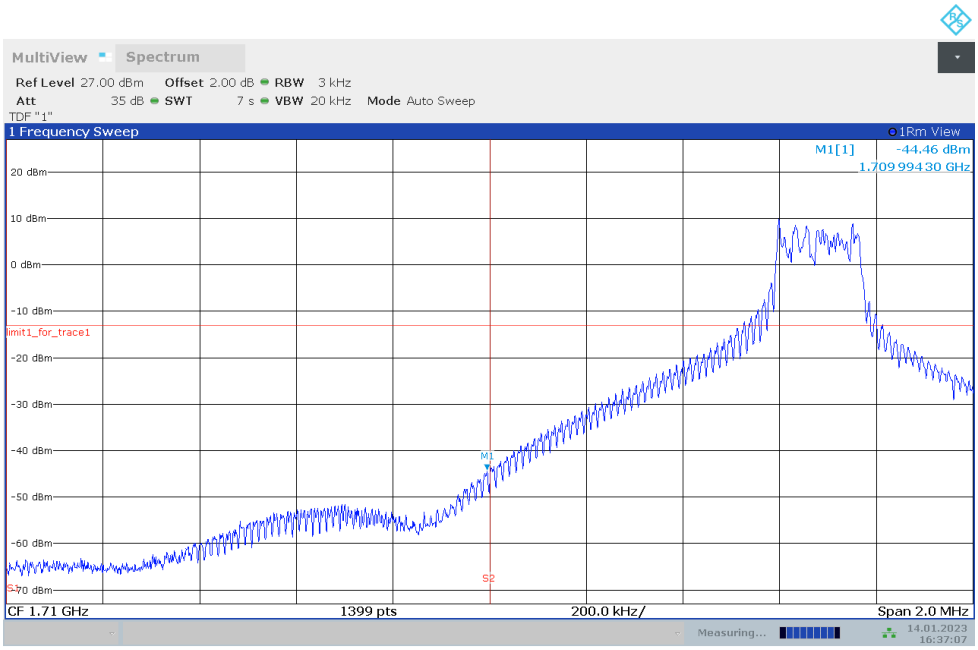

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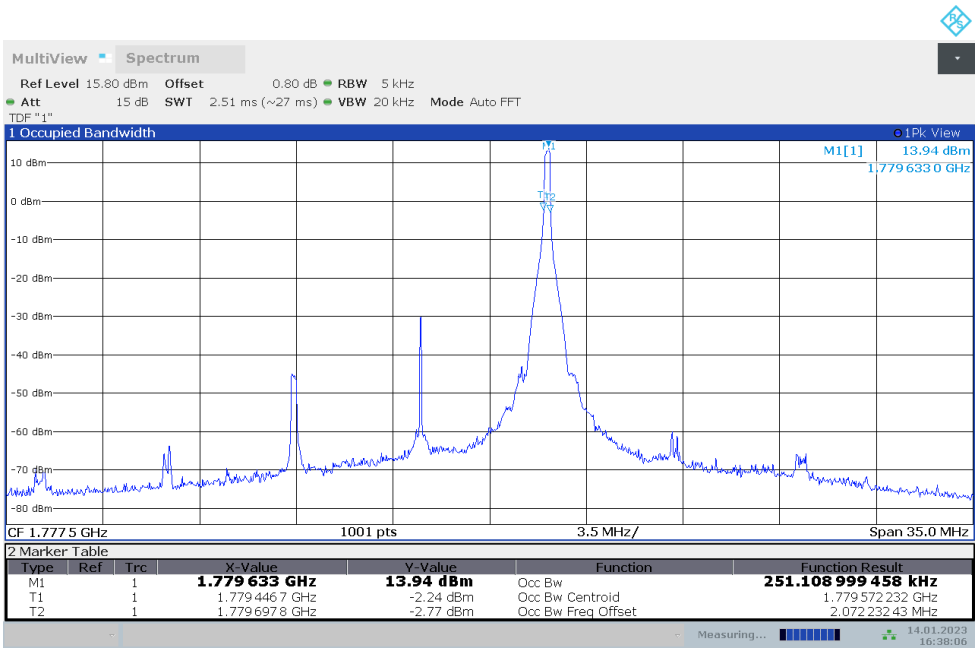

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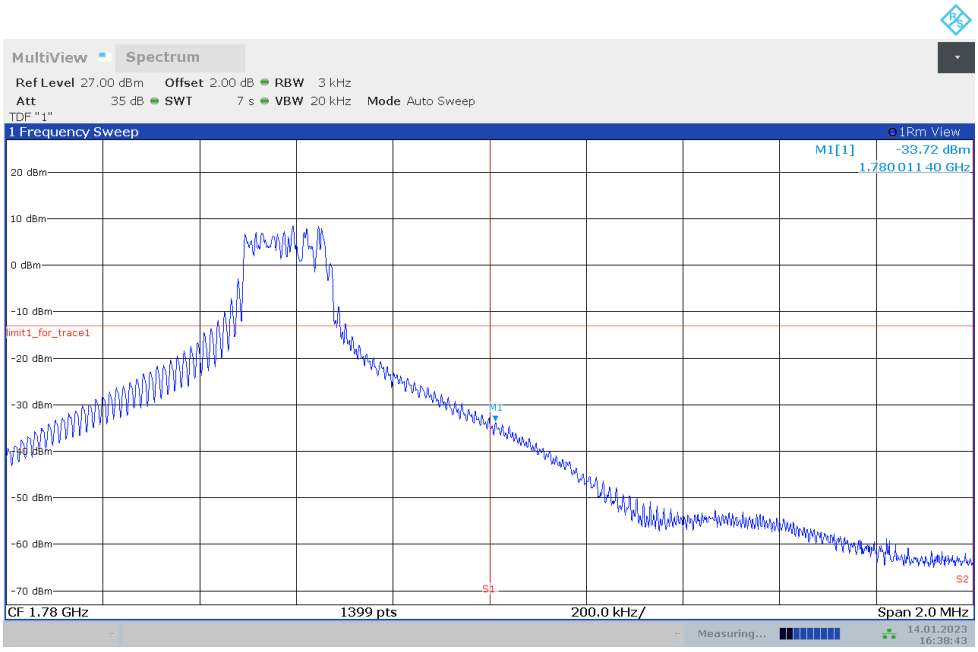

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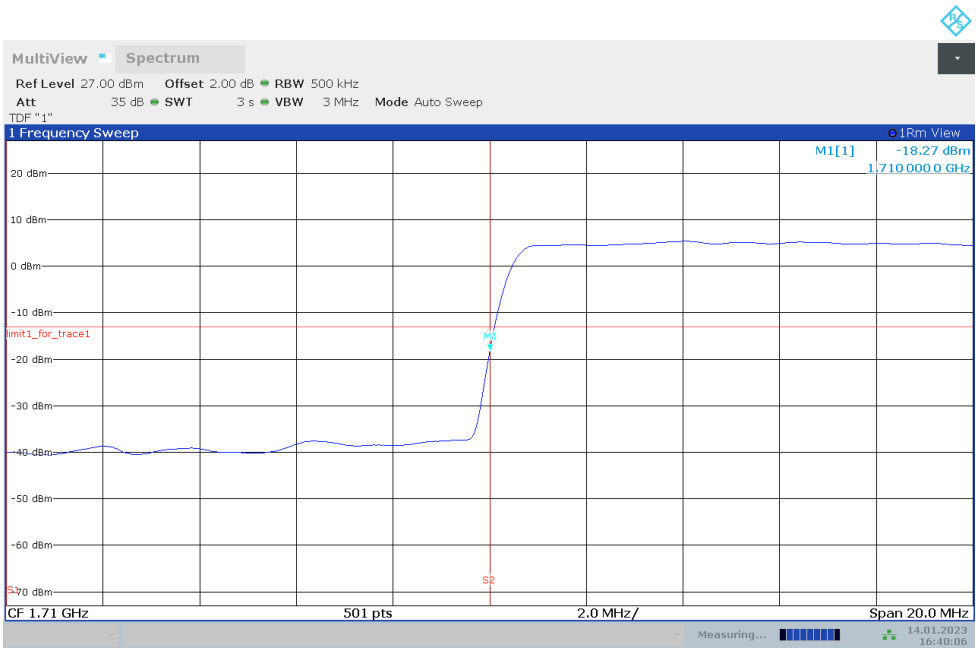
LOW BAND EDGE BLOCK-40M-100%RB



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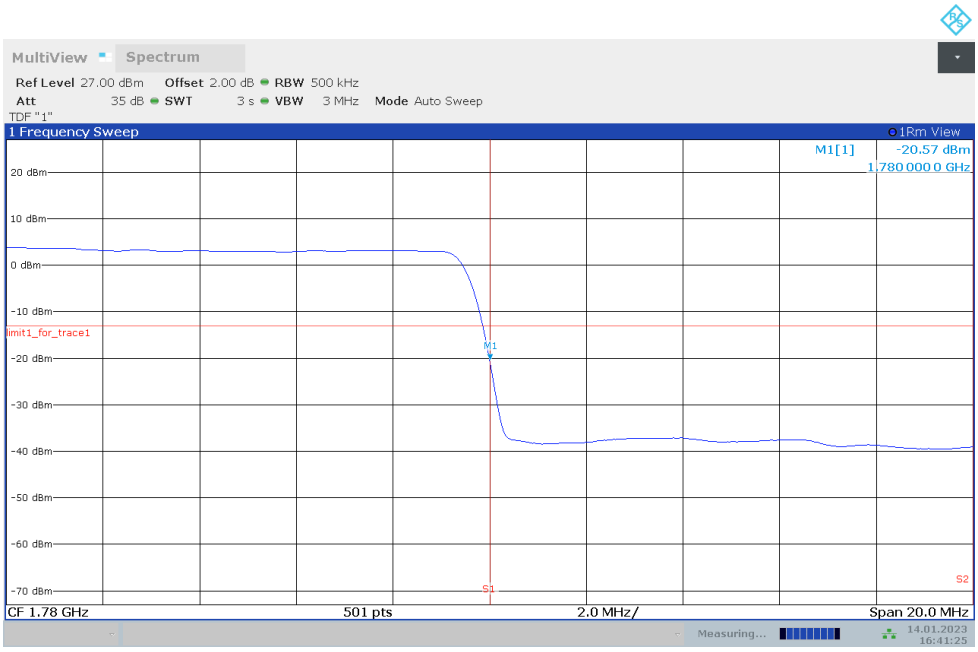

16:41:26 14.01.2023

Note: The maximum value of expanded measurement uncertainty for this test item is U = 0.626 kHz, k = 2.

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A.7 Conducted Spurious Emission

A.7.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given below:
   (a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
   (b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is greater than 2×span/RBW.

A. 7.2 Measurement Limit

Part 22.917, Part 24.238 and Part 27.53(h) specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

Part 27.53(m) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 27.53(g) states for operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

Part 96.41(e) states for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and

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within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed −25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

Part 27.53(n) states for mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Part 27.53(l) states for mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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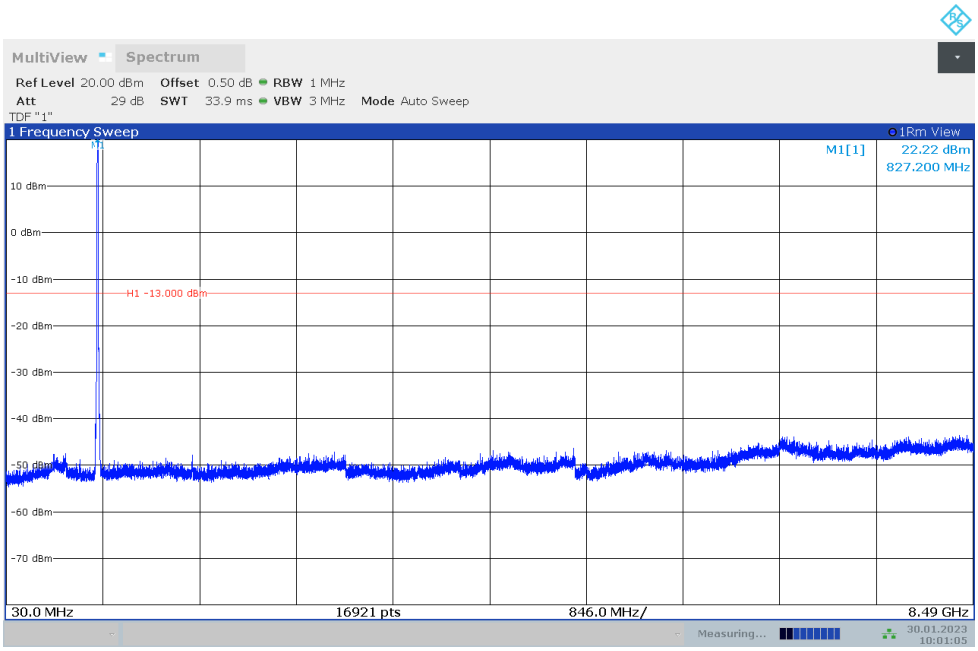
A. 7.3 Measurement result

n5

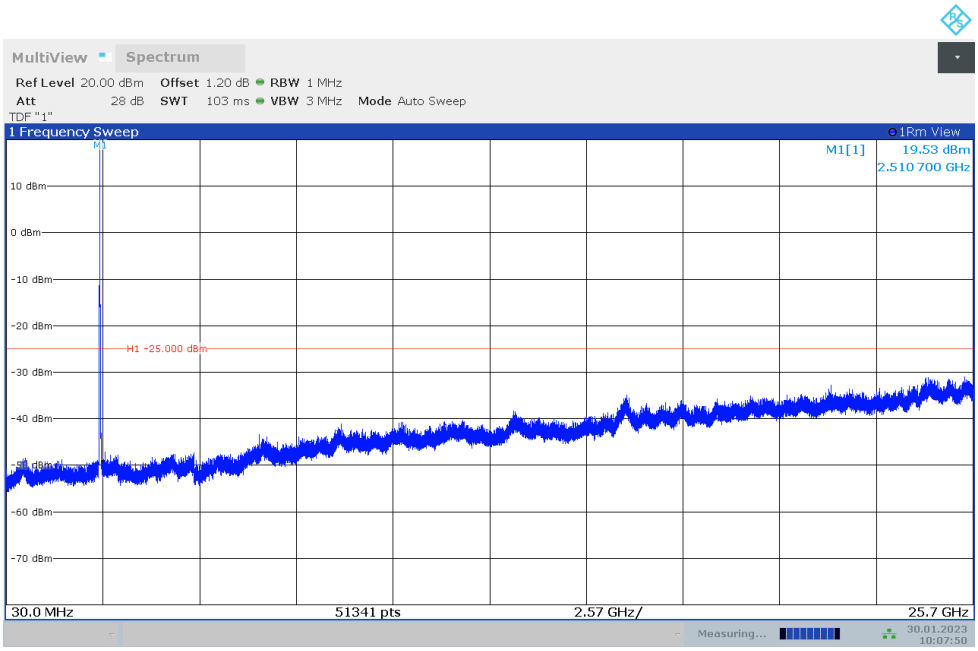
NOTE: peak above the limit line is the carrier frequency.



10:01:05 30.01.2023

n7

NOTE: peak above the limit line is the carrier frequency.



10:07:51 30.01.2023

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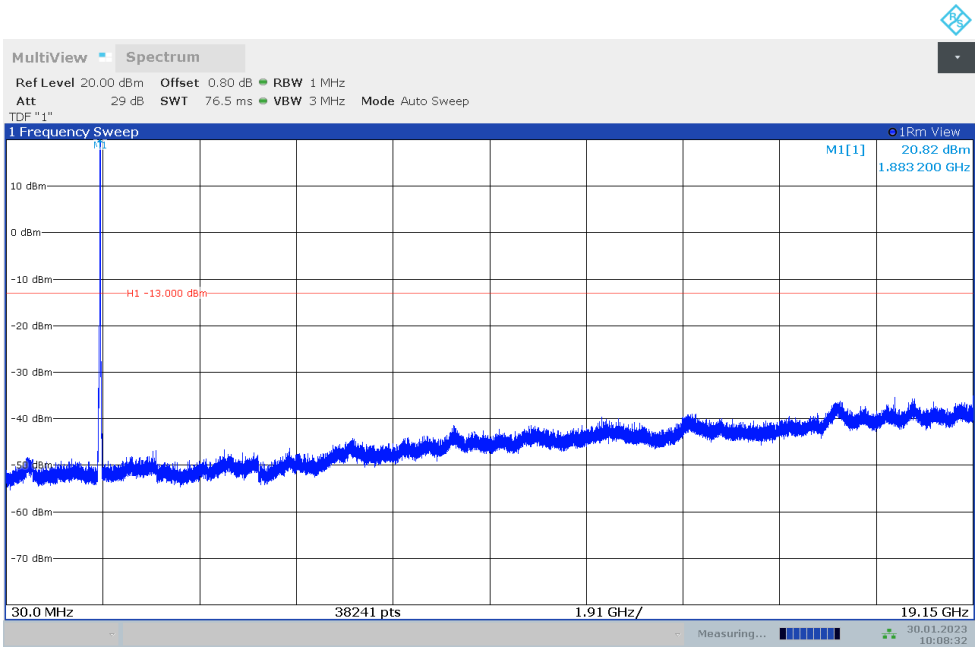
n25

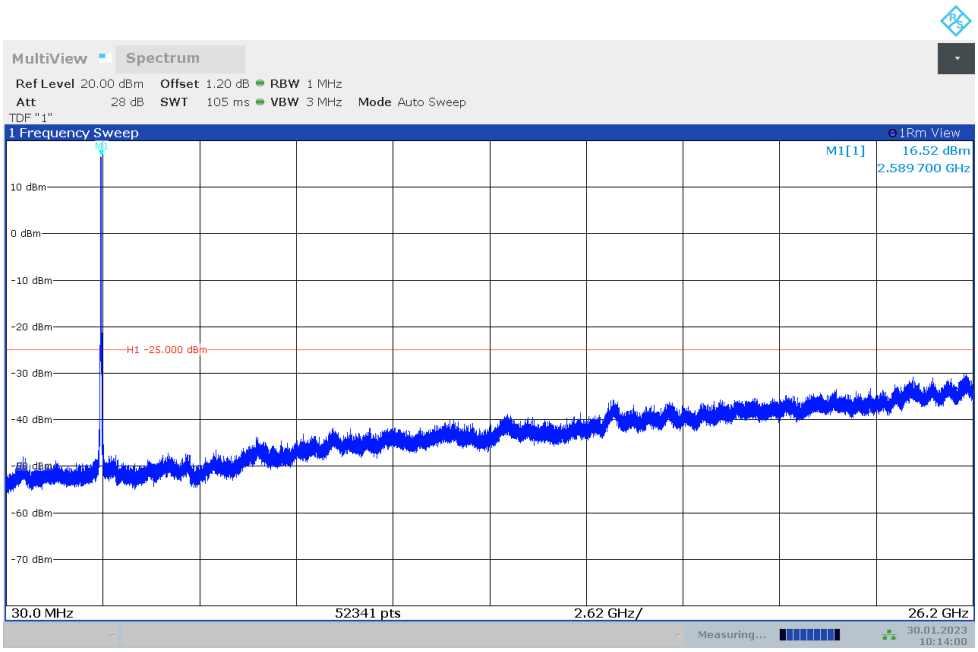
NOTE: peak above the limit line is the carrier frequency.



10:08:33 30.01.2023

n38

NOTE: peak above the limit line is the carrier frequency.



10:14:01 30.01.2023

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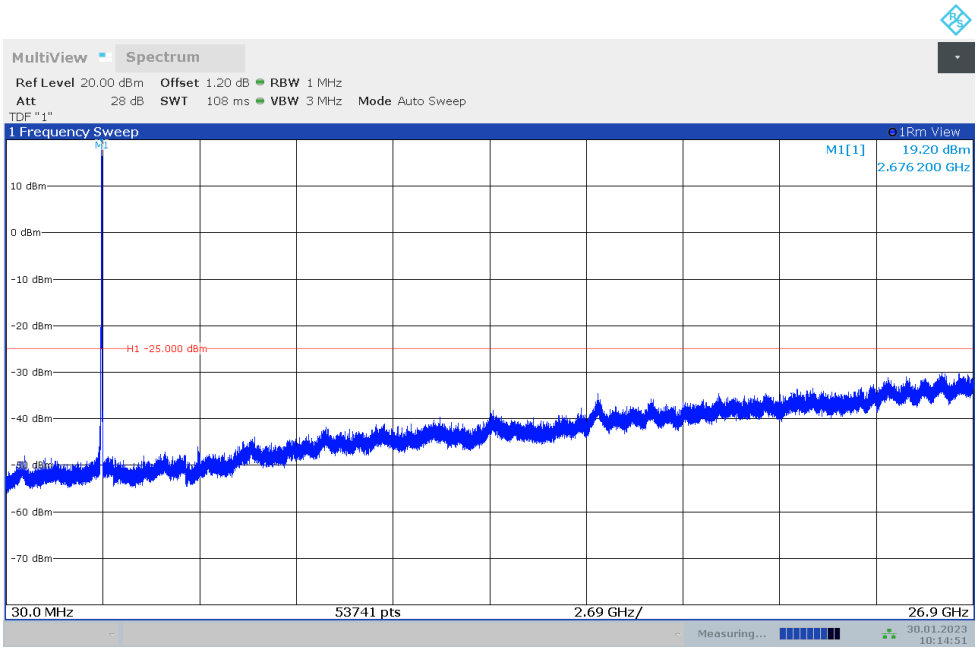
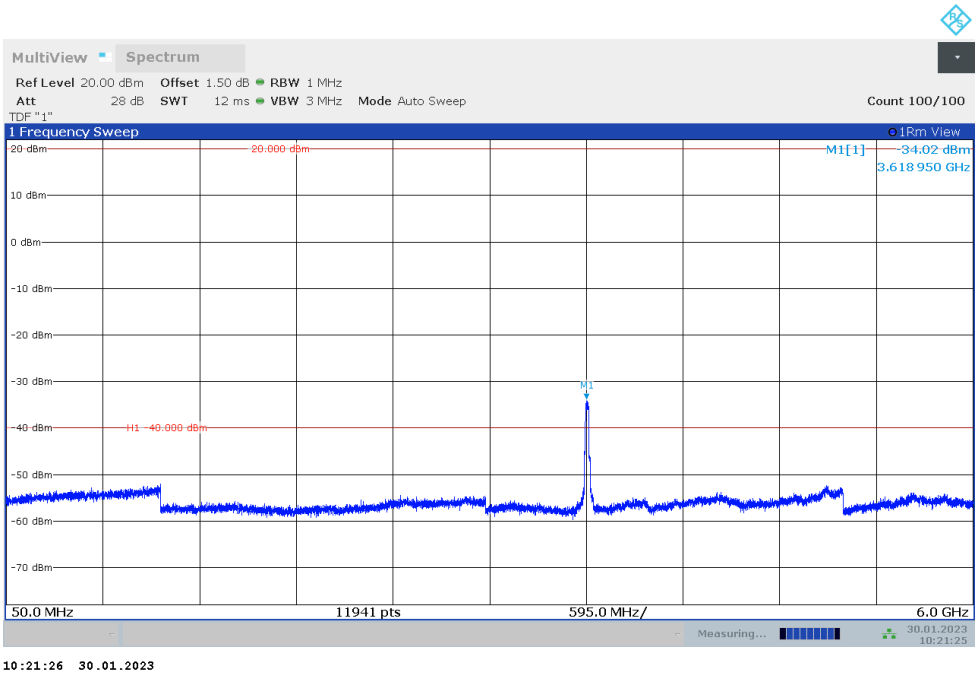
n41

NOTE: peak above the limit line is the carrier frequency.



n48

NOTE: peak above the limit line is the carrier frequency.



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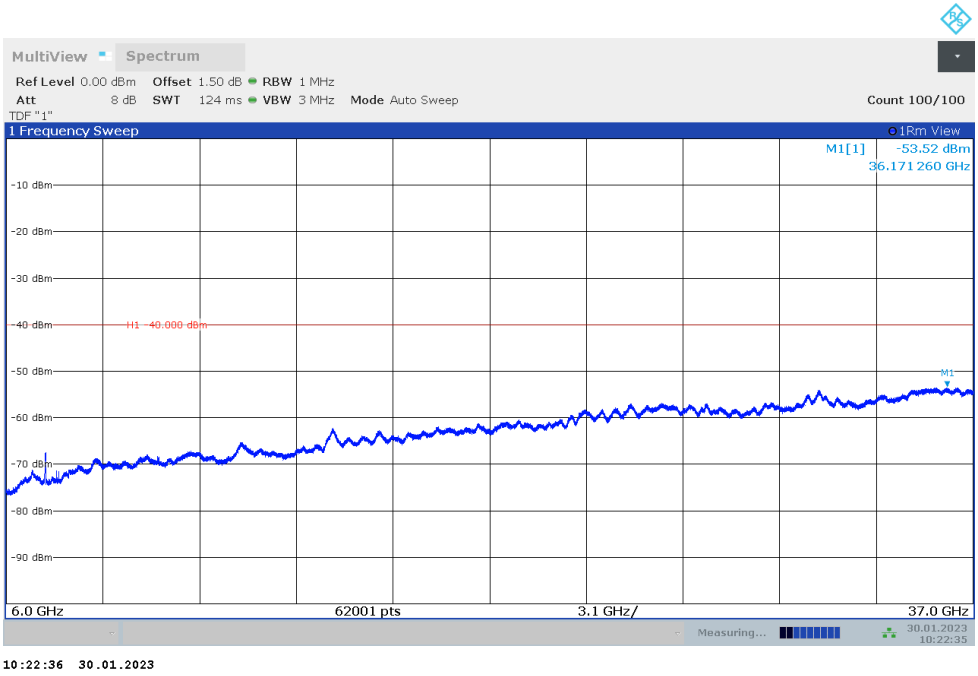
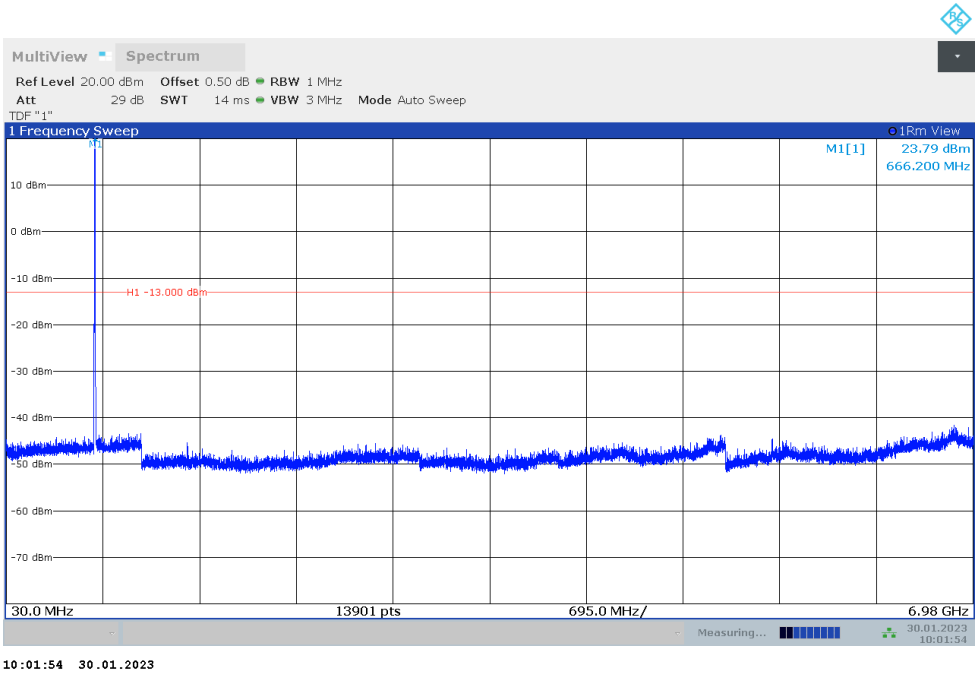


10:22:36 30.01.2023

n71

NOTE: peak above the limit line is the carrier frequency.



10:01:54 30.01.2023

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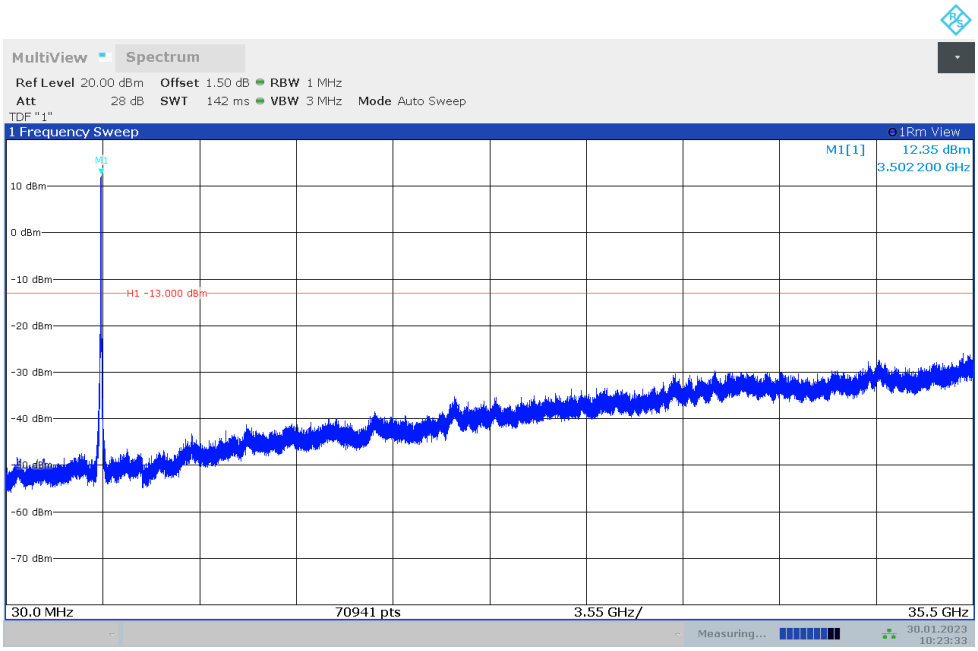
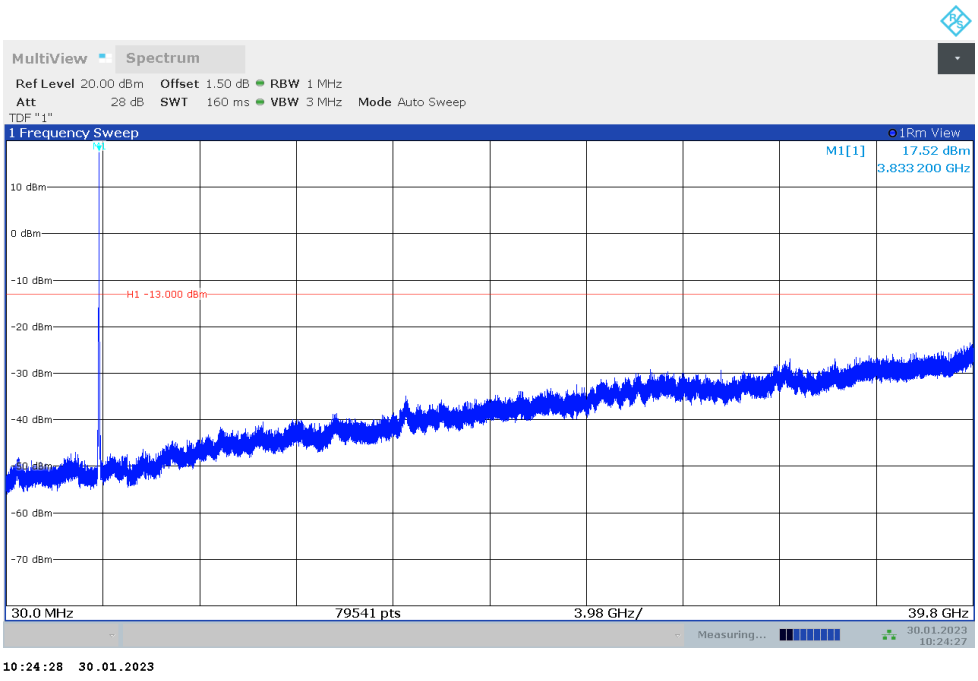
n77L

NOTE: peak above the limit line is the carrier frequency.



n77H

NOTE: peak above the limit line is the carrier frequency.



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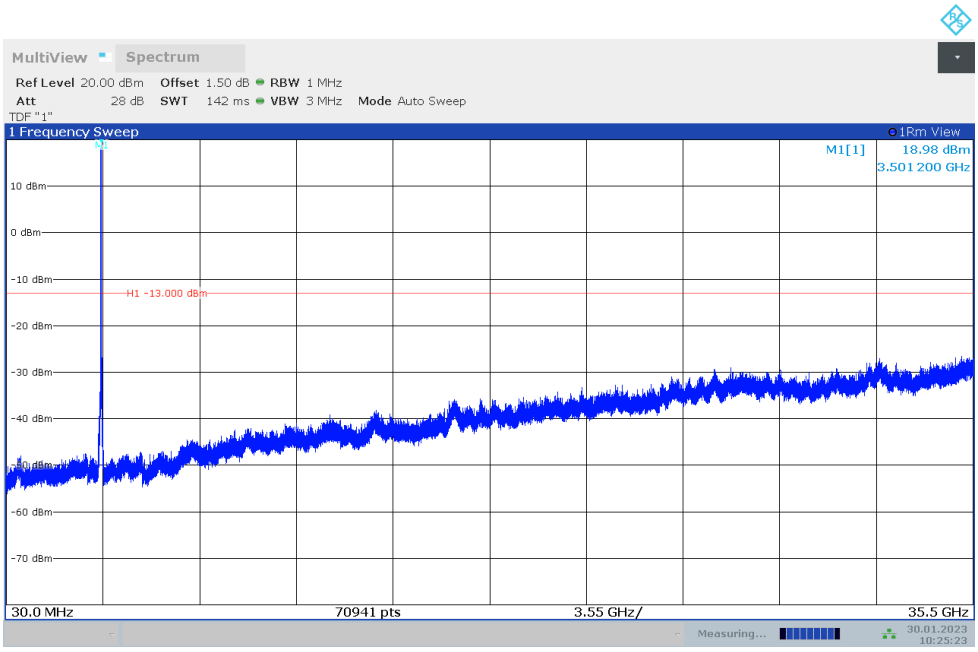
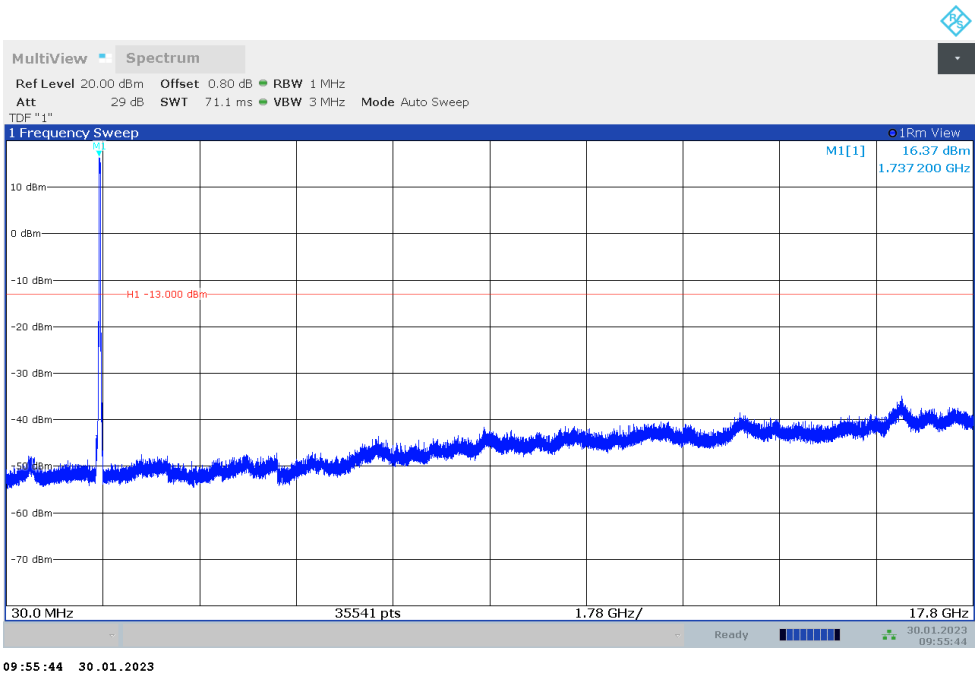
n78L

NOTE: peak above the limit line is the carrier frequency.



LTE Band 12+NR n66

NOTE: peak above the limit line is the carrier frequency.



Note: The maximum value of expanded measurement uncertainty for this test item is U = 0.372 dB, k = 2.

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A.8 Peak-to-Average Power Ratio

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Record the maximum PAPR level associated with a probability of 0.1%.

Measurement results

n7,20MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
2535	4.22	5.22	6.14	6.30	6.80	6.96	6.90	7.40	8.66

n25,20MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
1882.5	4.12	5.16	6.02	6.12	6.44	6.90	6.80	7.26	8.24

n38,40MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
2595	3.96	5.24	6.13	6.34	6.49	7.27	7.38	7.75	8.31

n41,100MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
2592.99	4.33	5.81	6.45	6.63	6.58	7.49	7.46	7.43	8.28

n48,40MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
3624.99	3.80	5.33	6.24	6.49	6.70	7.76	7.81	8.12	9.73

n71,20MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
680.5	4.30	5.66	6.74	6.60	6.68	7.36	8.08	7.84	8.58

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n77L,90MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
3500.01	4.53	4.92	5.89	6.31	6.67	6.97	6.91	7.83	8.60

n77H,100MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
3840	3.78	4.80	6.28	6.59	6.73	7.74	8.00	8.23	8.38

n78L,90MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
3500.01	4.46	4.93	5.92	6.30	6.64	7.12	7.03	7.35	8.59

LTE Band 12+NR n66,40MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
1745	6.20	6.22	7.28	7.68	7.74	8.70	8.88	8.80	9.62

Note: The maximum value of expanded measurement uncertainty for this test item is U = 0.356 dB, k = 2.

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A.9 End User Device Additional Requirement (CBSD Protocol)

A.9.1 Measurement Limit

End user device additional requirements (CBSD Protocol) are tested per the test procedures listed below. During testing, the EUT is connected to a certified CBSD (Baicells BSC7048A243 FCC ID: 2AG32 BSC7048A243) as a companion device to show compliance with Part 96.47.
End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.
An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

A.9.2 Measurement Method

The EUT was connected via an RF cable to a certified CBSD and spectrum analyzer.
1. Run#1:
a. Setup frequency with 3614.18MHz – 3634.18MHz.
b. Check EUT Tx frequency.
c. Disable AP service and check EUT stop transmission within 10s.
2. Run#2:
a. Setup frequency with 3659.18MHz – 3679.18MHz.
b. Check EUT Tx frequency.
c. Disable AP service and check EUT stop transmission within 10s.

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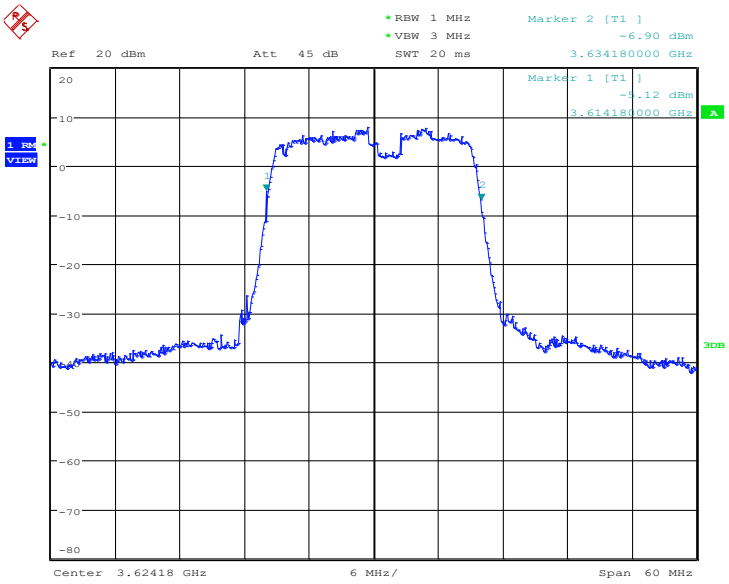
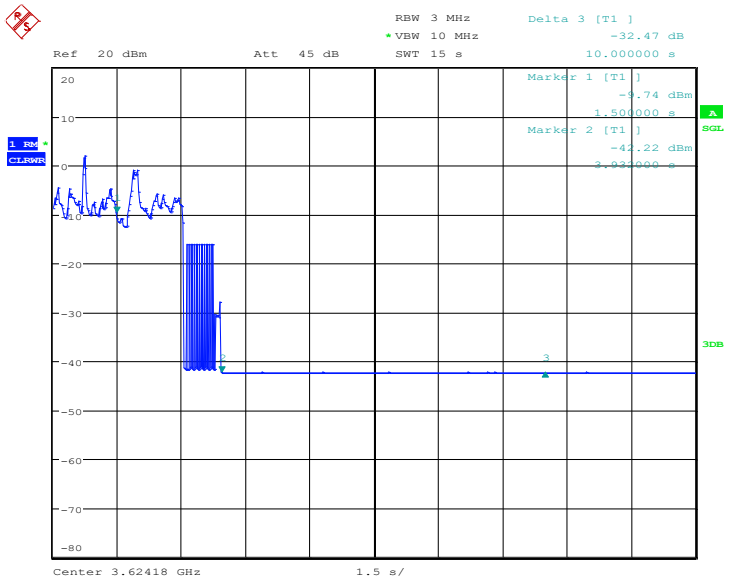
RUN#1：



Date: 12.JAN.2023 17:22:05



Date: 12.JAN.2023 17:24:46

Note:

Marker 1: CBSD sends instructions to discontinue NR operations.

Marker 2: EUT discontinues operation.

Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT.

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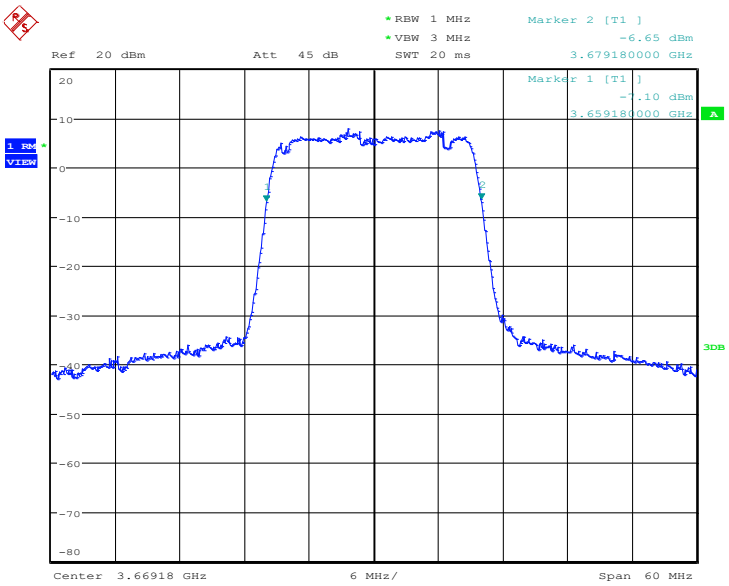
RUN#2：



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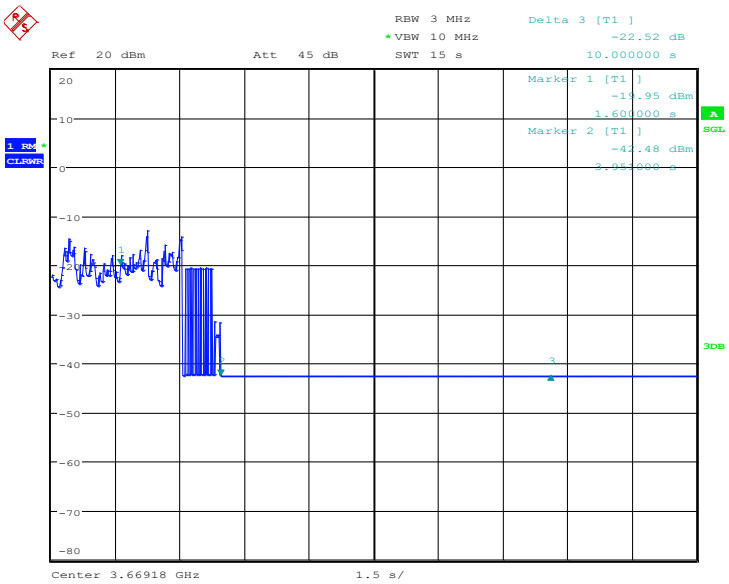

Date: 12.JAN.2023 18:27:05

Note:

Marker 1: CBSD sends instructions to discontinue NR operations.

Marker 2: EUT discontinues operation.

Marker 3: 10 seconds elapsed time from CBSD sending instructions to EUT

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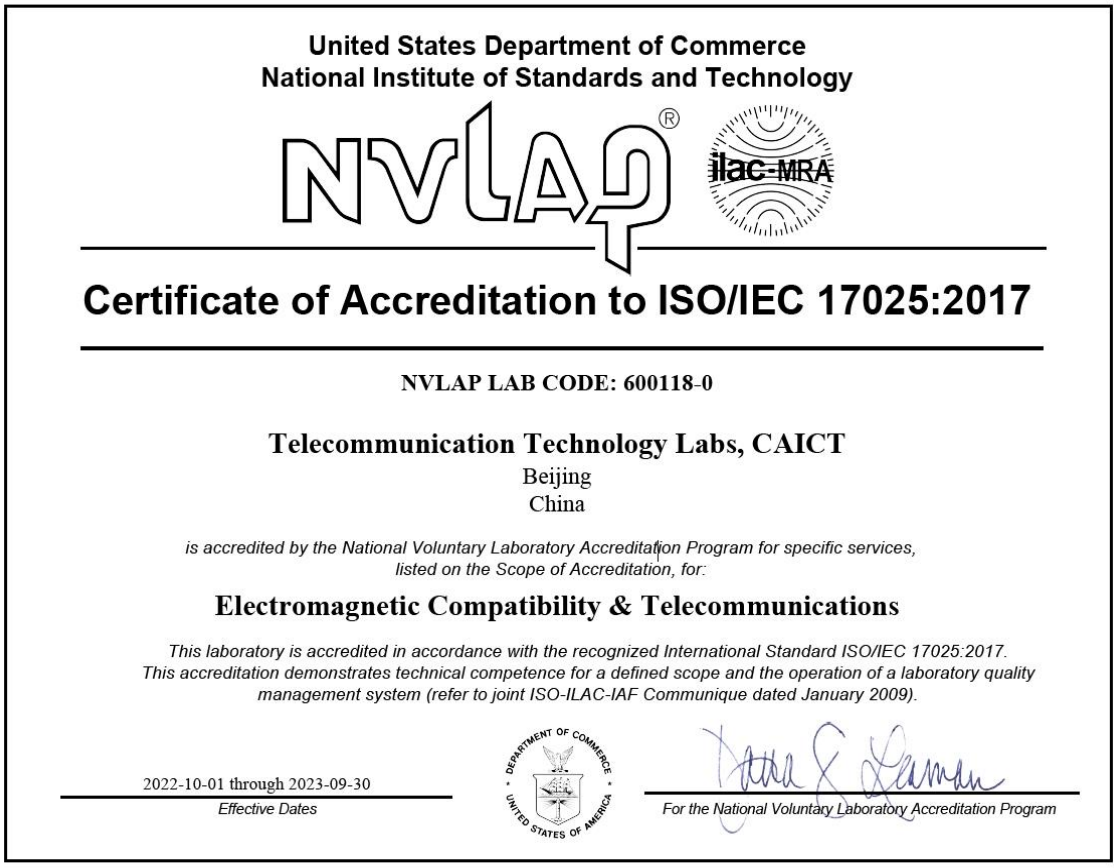
Annex B: Accreditation Certificate



United States Department of Commerce
National Institute of Standards and Technology

NVLAP® ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600118-0

Telecommunication Technology Labs, CAICT
Beijing
China

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Electromagnetic Compatibility & Telecommunications

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2022-10-01 through 2023-09-30
Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

*****END OF REPORT*****

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