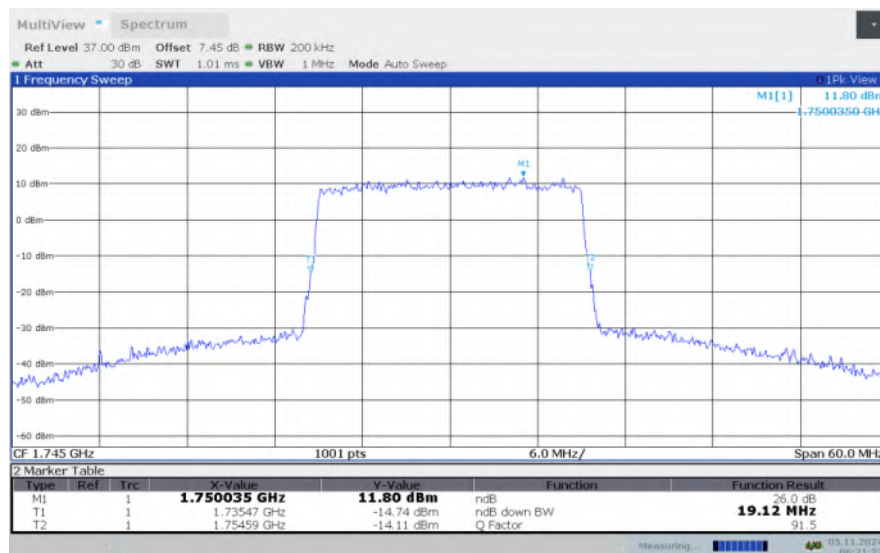
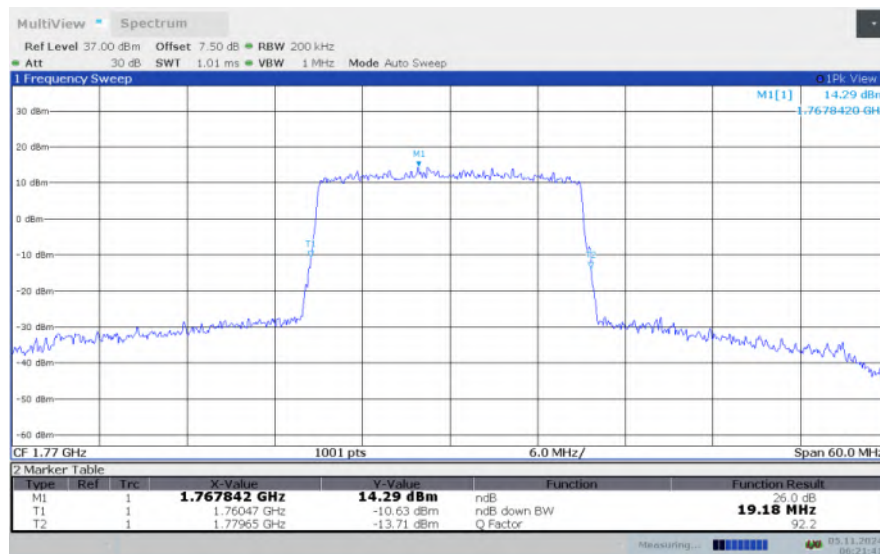


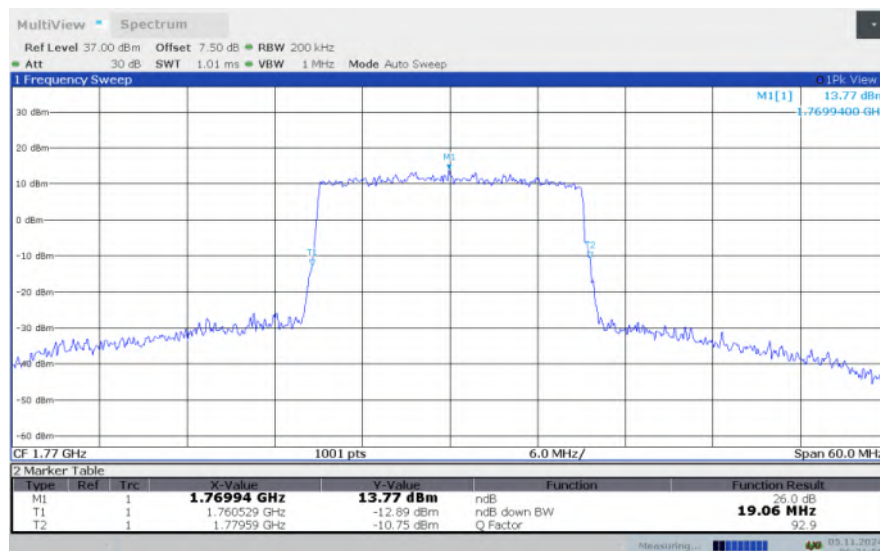
### LTE band 66 , 20MHz Bandwidth, MID, 64QAM (-26dBc BW)



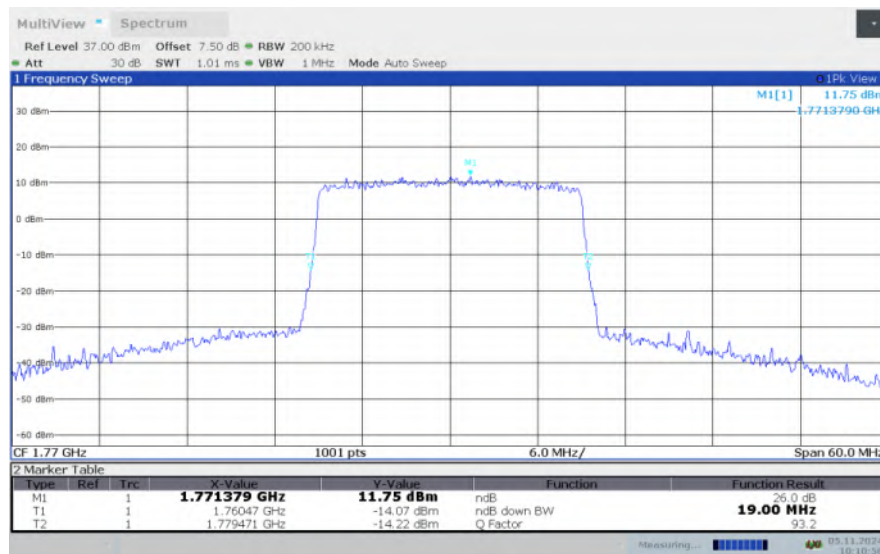
### LTE band 66 , 20MHz Bandwidth, HIGH, QPSK (-26dBc BW)



### LTE band 66 , 20MHz Bandwidth, HIGH, 16QAM (-26dBc BW)



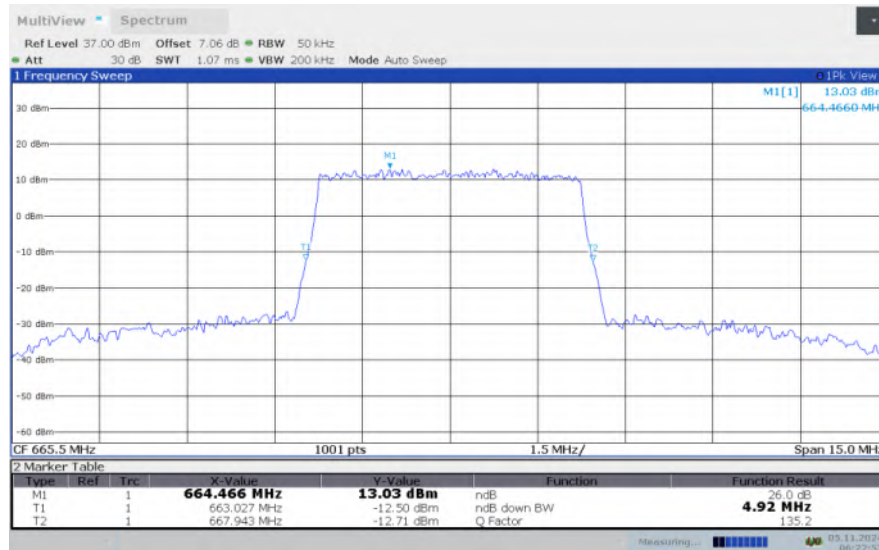
### LTE band 66 , 20MHz Bandwidth, HIGH, 64QAM (-26dBc BW)



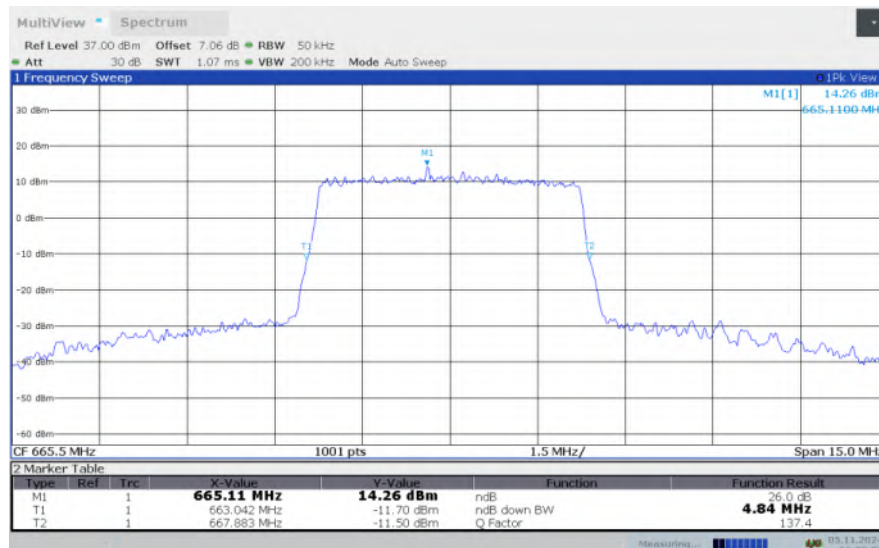
### LTE band 71,5MHz(-26dBc OBW)

Frequency(MHz)	Emission Bandwidth (-26dBc OBW)(MHz)		
	QPSK	16QAM	64QAM
665.5	4.915	4.840	4.900
680.5	4.915	4.930	4.930
695.5	4.900	4.930	4.885

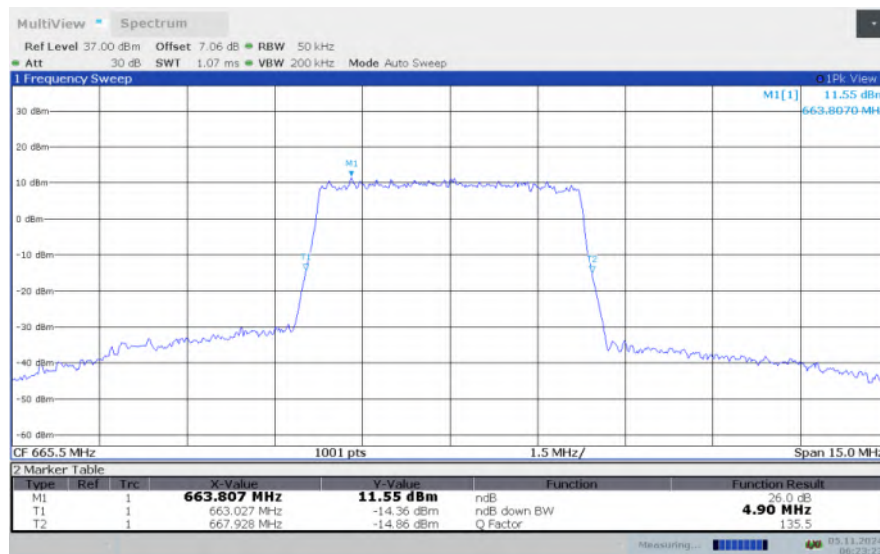
### LTE band 71 , 5MHz Bandwidth, LOW, QPSK (-26dBc BW)



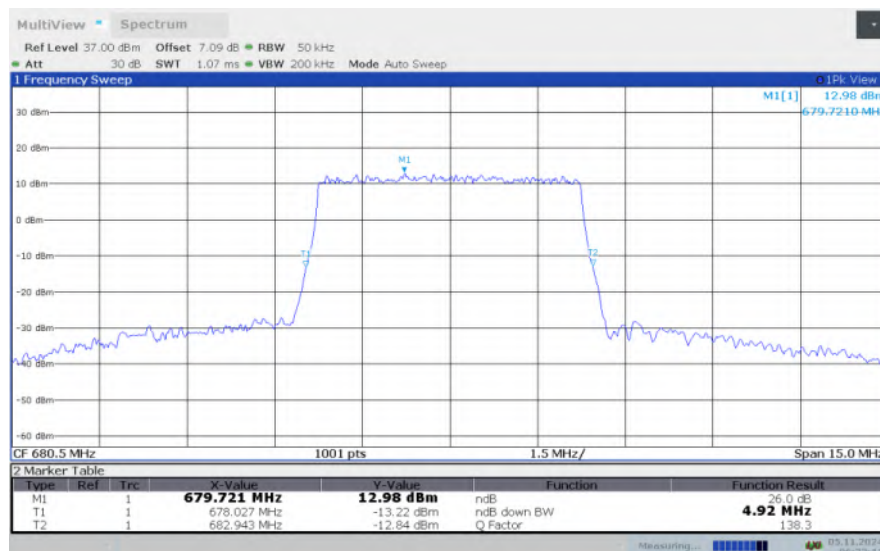
### LTE band 71 , 5MHz Bandwidth, LOW, 16QAM (-26dBc BW)



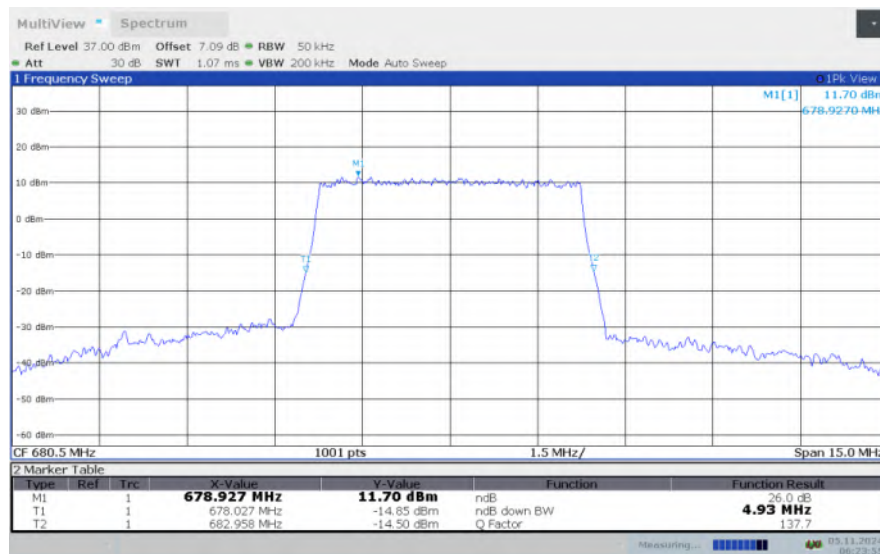
### LTE band 71 , 5MHz Bandwidth, LOW, 64QAM (-26dBc BW)



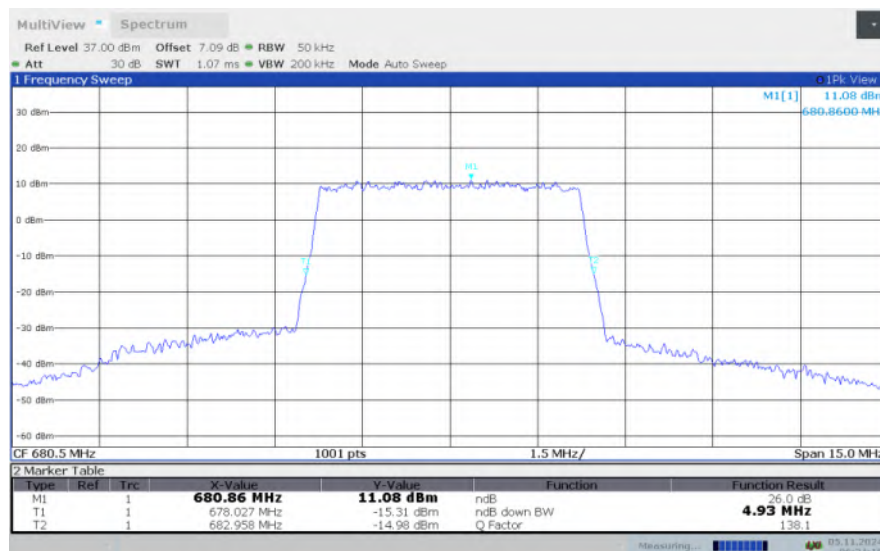
### LTE band 71 , 5MHz Bandwidth, MID, QPSK (-26dBc BW)



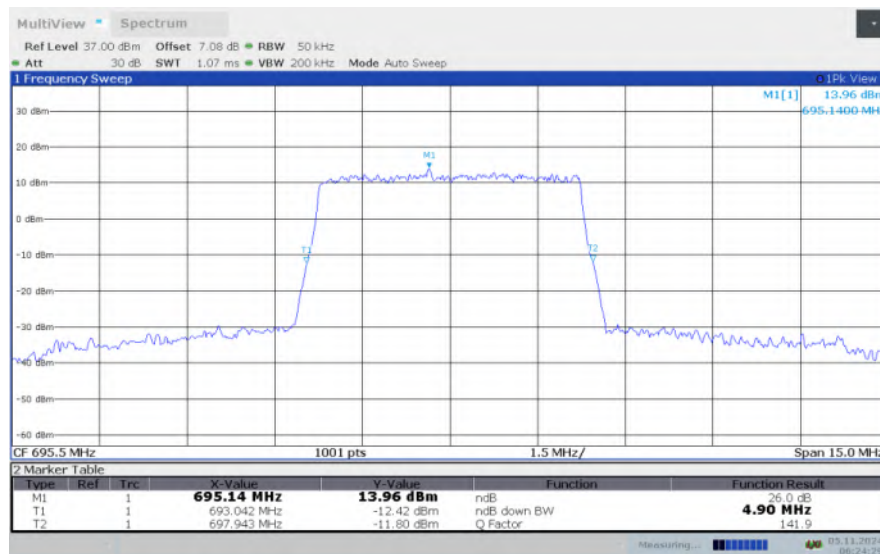
### LTE band 71 , 5MHz Bandwidth, MID, 16QAM (-26dBc BW)



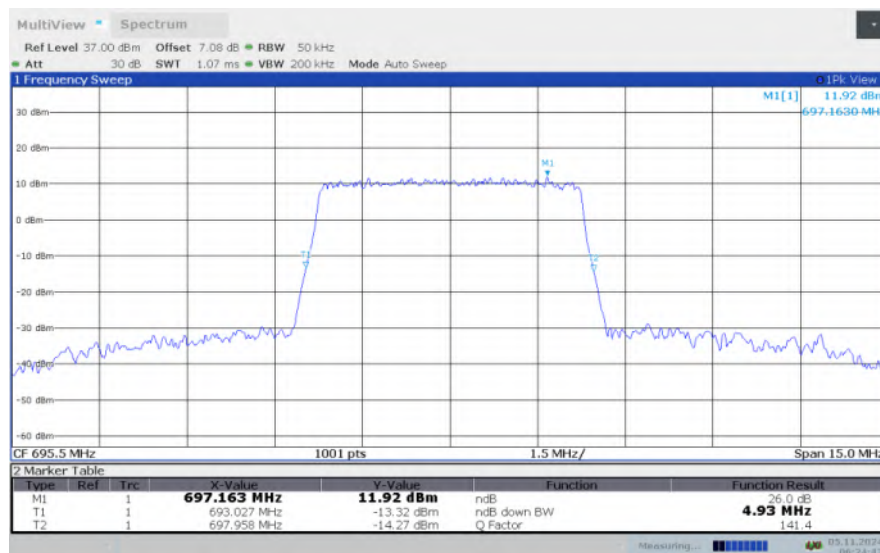
### LTE band 71 , 5MHz Bandwidth, MID, 64QAM (-26dBc BW)



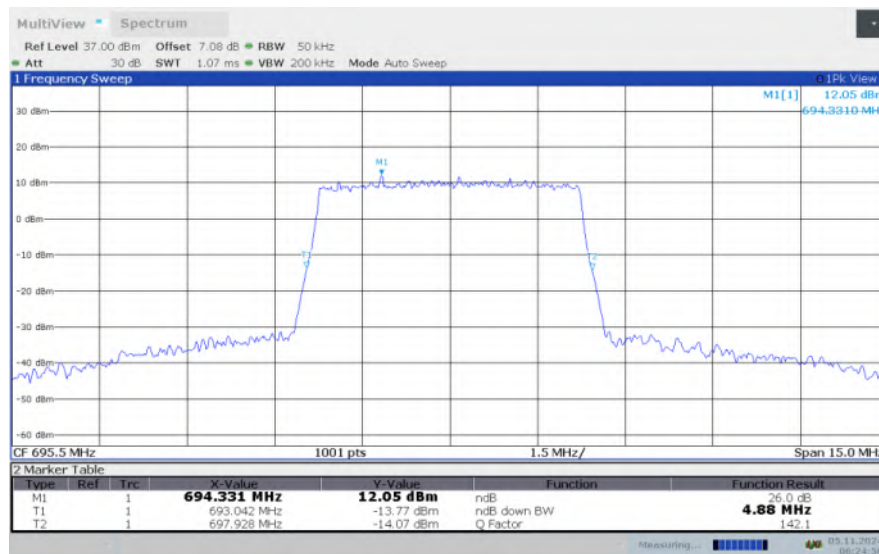
### LTE band 71 , 5MHz Bandwidth, HIGH, QPSK (-26dBc BW)



LTE band 71 , 5MHz Bandwidth, HIGH, 16QAM (-26dBc BW)



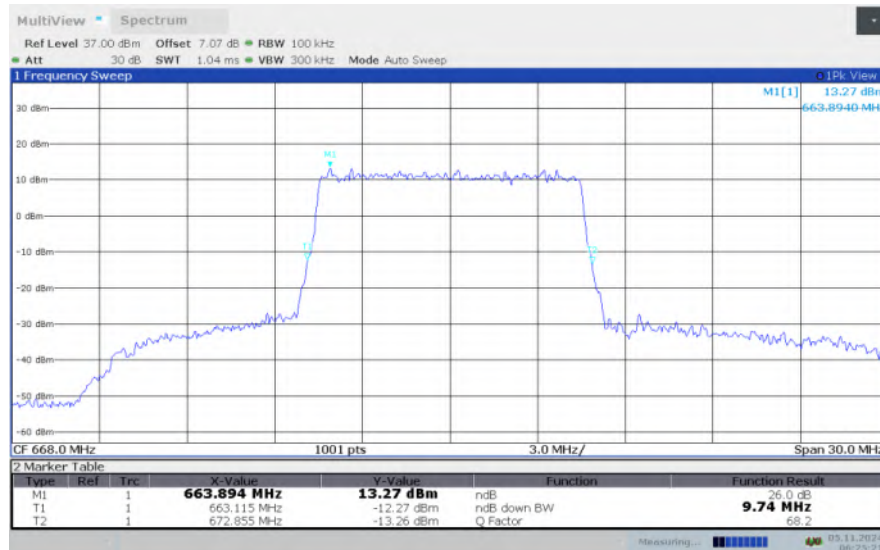
LTE band 71 , 5MHz Bandwidth, HIGH, 64QAM (-26dBc BW)



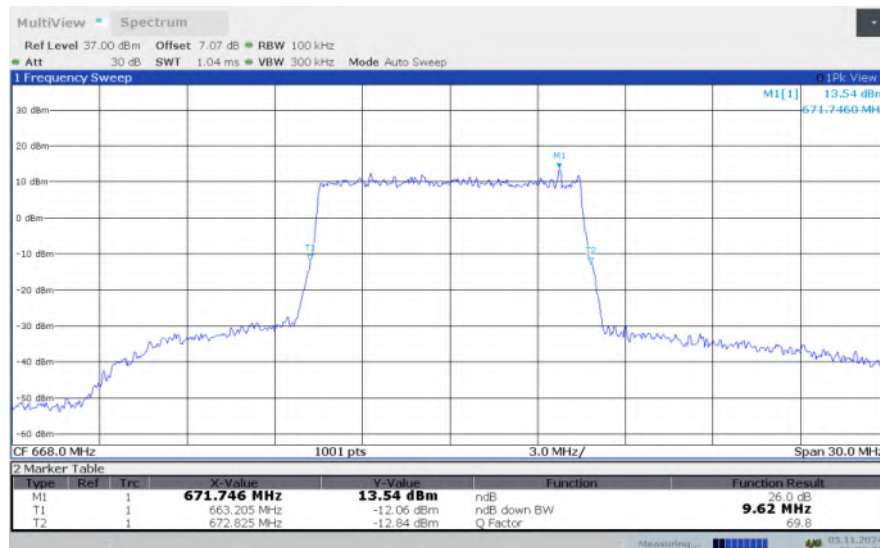
### LTE band 71,10MHz(-26dBc OBW)

Frequency(MHz)	Emission Bandwidth (-26dBc OBW)(MHz)		
	QPSK	16QAM	64QAM
668	9.740	9.620	9.680
680.5	9.650	9.650	9.650
693	9.650	9.620	9.590

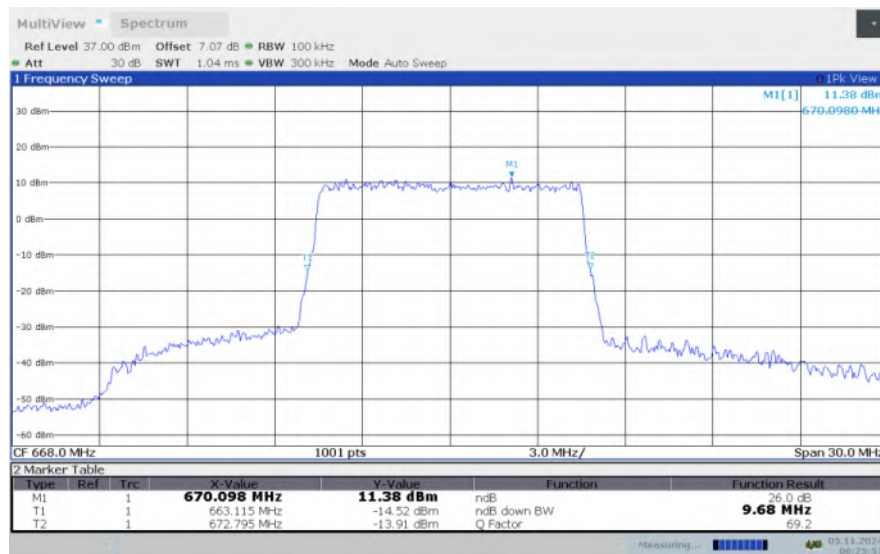
### LTE band 71 , 10MHz Bandwidth, LOW, QPSK (-26dBc BW)



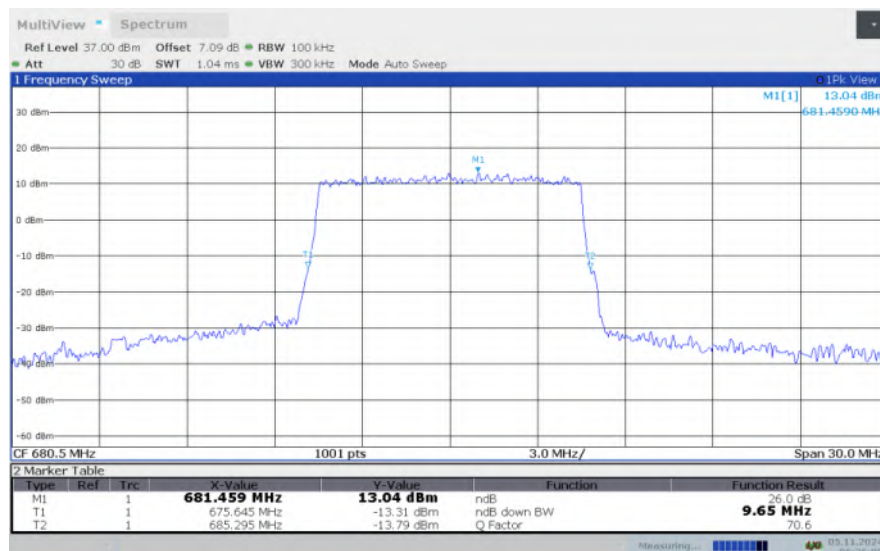
### LTE band 71 , 10MHz Bandwidth, LOW, 16QAM (-26dBc BW)



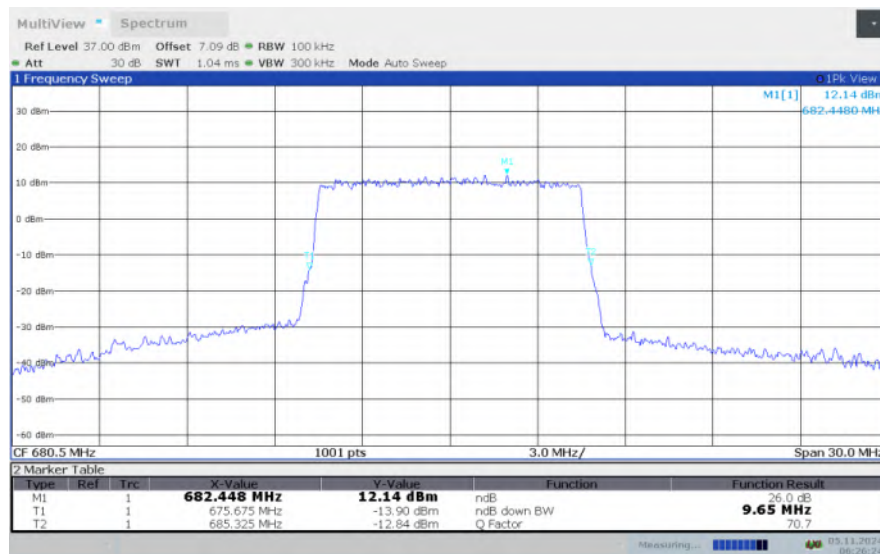
### LTE band 71 , 10MHz Bandwidth, LOW, 64QAM (-26dBc BW)



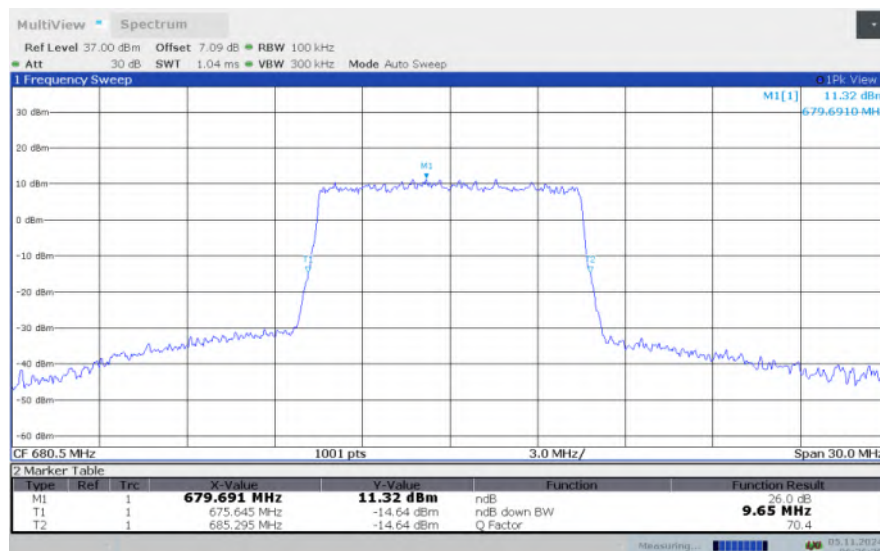
### LTE band 71 , 10MHz Bandwidth, MID, QPSK (-26dBc BW)



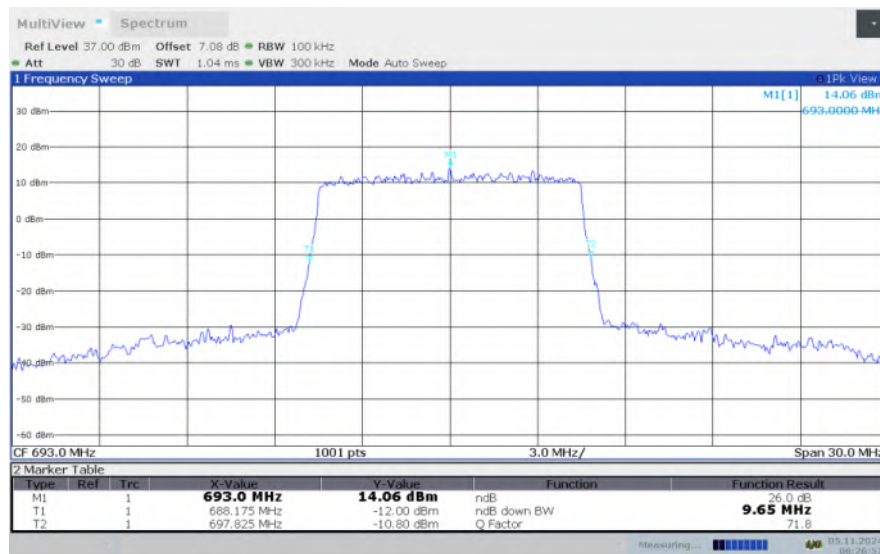
### LTE band 71 , 10MHz Bandwidth, MID, 16QAM (-26dBc BW)



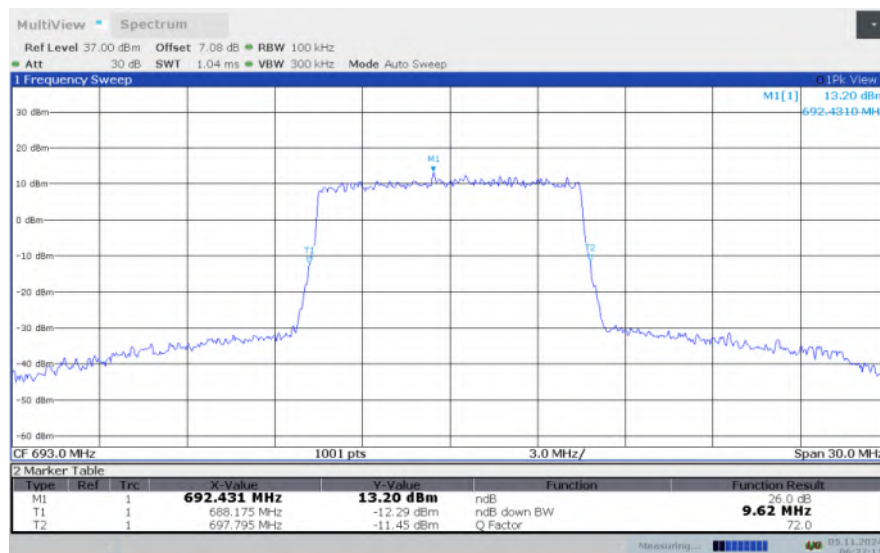
### LTE band 71 , 10MHz Bandwidth, MID, 64QAM (-26dBc BW)



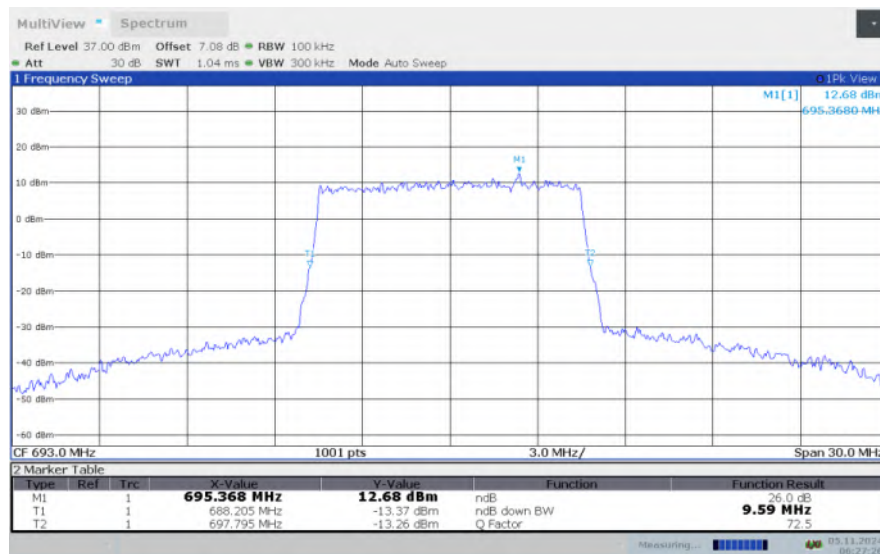
### LTE band 71 , 10MHz Bandwidth, HIGH, QPSK (-26dBc BW)



### LTE band 71 , 10MHz Bandwidth, HIGH, 16QAM (-26dBc BW)



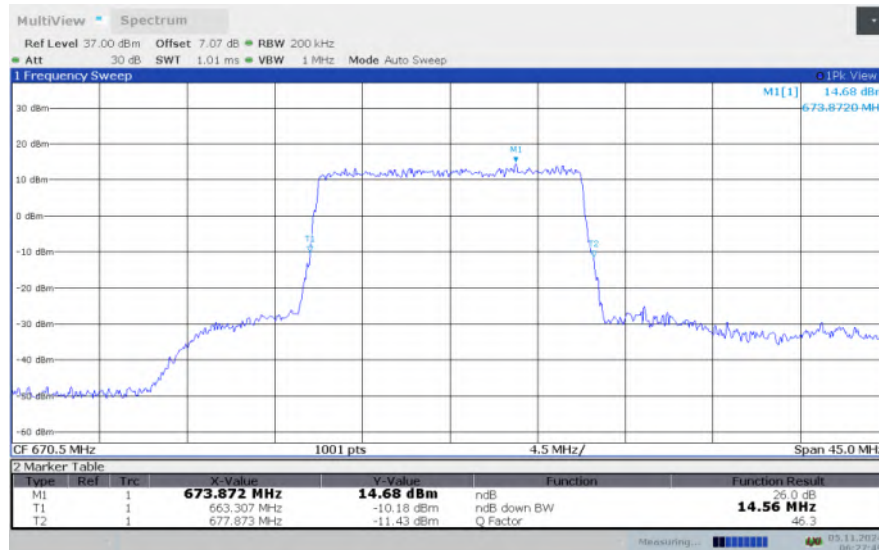
### LTE band 71 , 10MHz Bandwidth, HIGH, 64QAM (-26dBc BW)



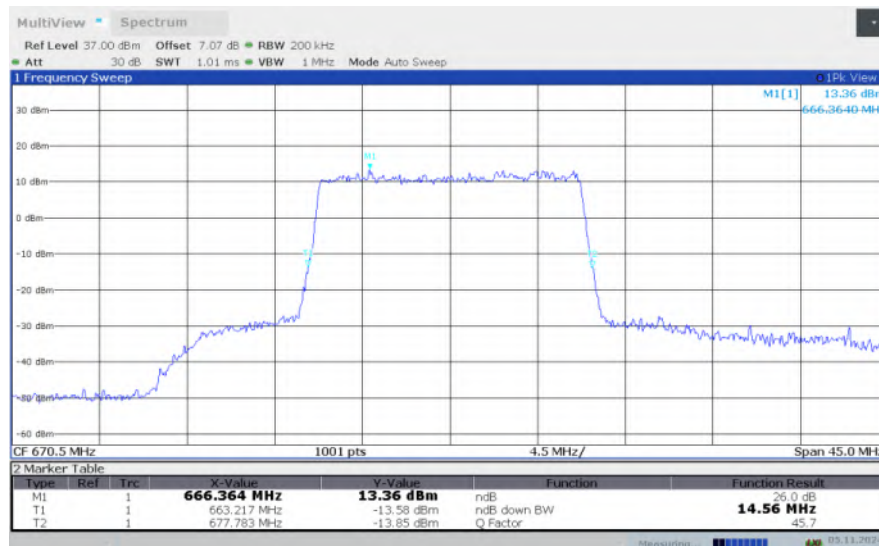
### LTE band 71,15MHz(-26dBc OBW)

Frequency(MHz)	Emission Bandwidth (-26dBc OBW)(MHz)		
	QPSK	16QAM	64QAM
670.5	14.565	14.565	14.520
680.5	14.476	14.520	14.431
690.5	14.520	14.431	14.431

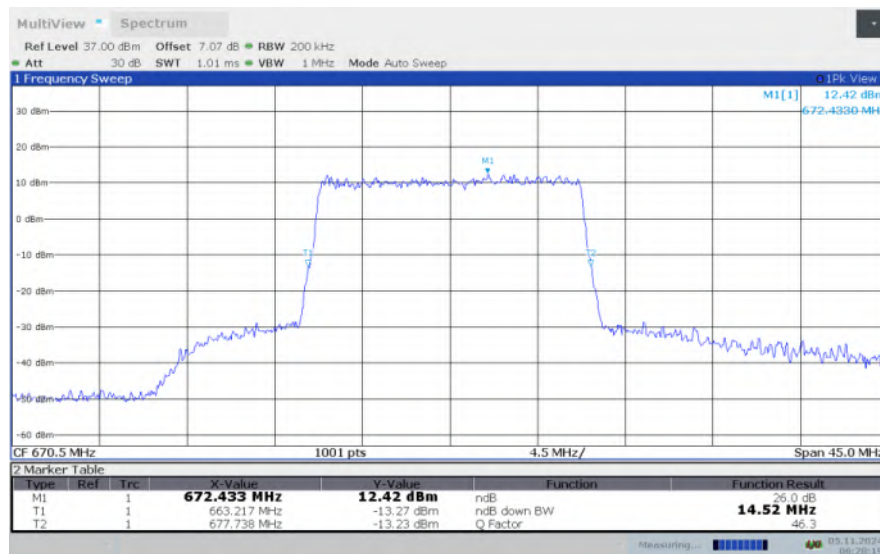
### LTE band 71 , 15MHz Bandwidth, LOW, QPSK (-26dBc BW)



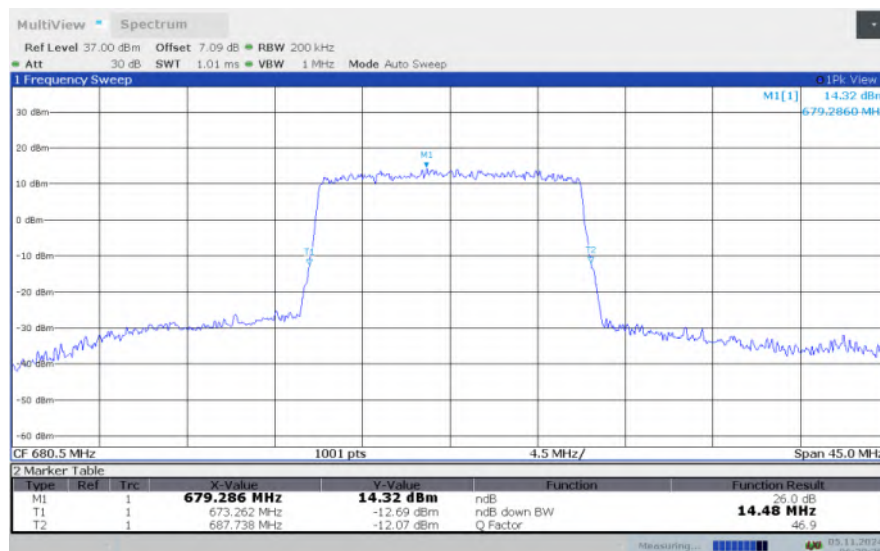
### LTE band 71 , 15MHz Bandwidth, LOW, 16QAM (-26dBc BW)



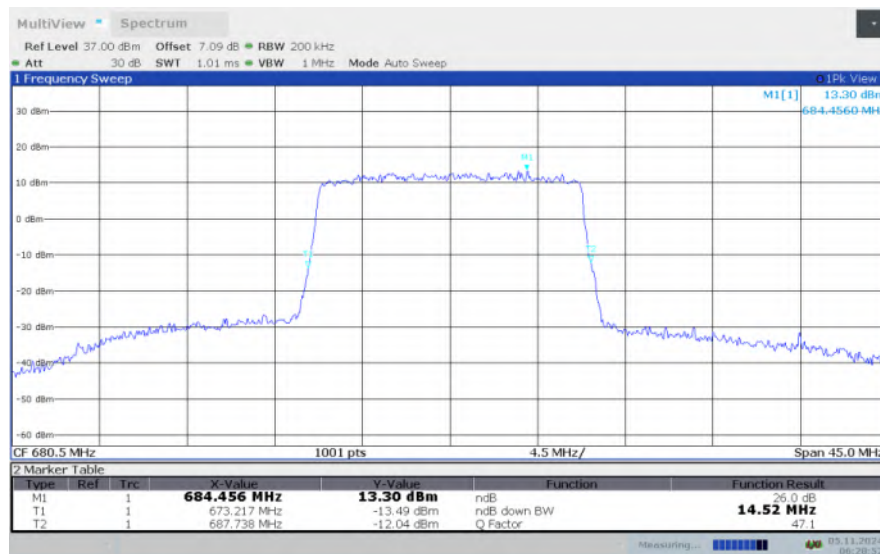
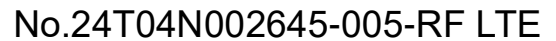
### LTE band 71 , 15MHz Bandwidth, LOW, 64QAM (-26dBc BW)



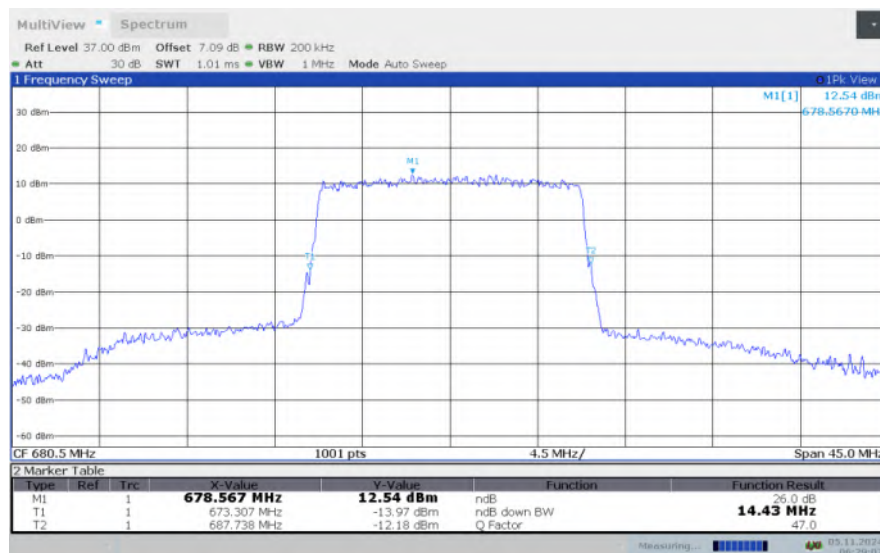
### LTE band 71 , 15MHz Bandwidth, MID, QPSK (-26dBc BW)



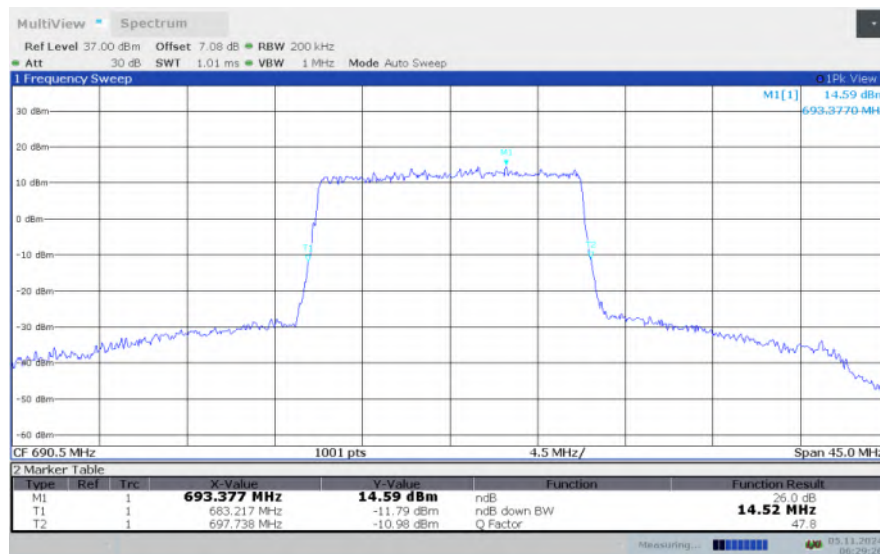
### LTE band 71 , 15MHz Bandwidth, MID, 16QAM (-26dBc BW)



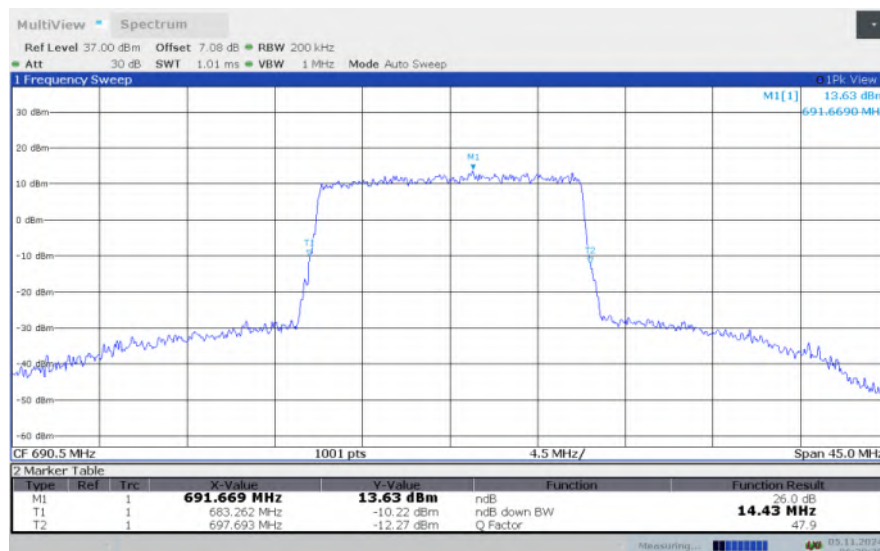
**LTE band 71 , 15MHz Bandwidth, MID, 64QAM (-26dBc BW)**



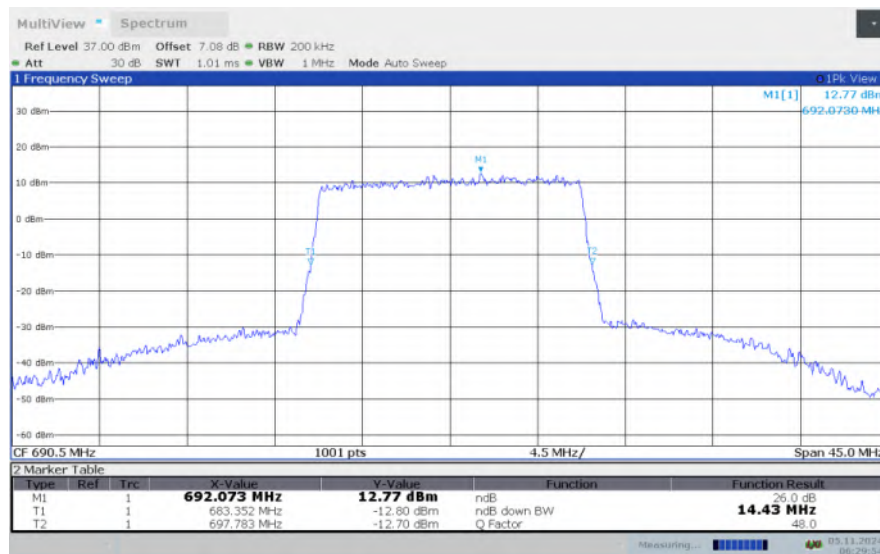
**LTE band 71 , 15MHz Bandwidth, HIGH, QPSK (-26dBc BW)**



LTE band 71 , 15MHz Bandwidth, HIGH, 16QAM (-26dBc BW)



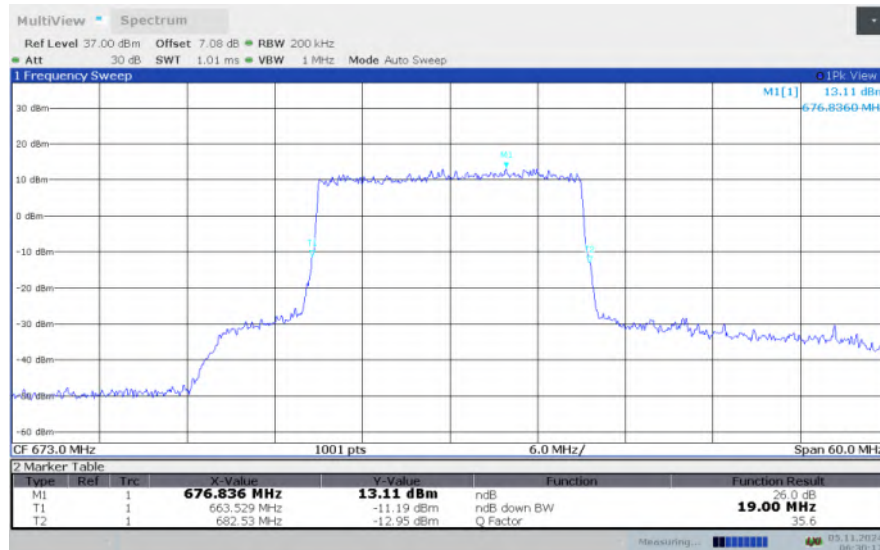
LTE band 71 , 15MHz Bandwidth, HIGH, 64QAM (-26dBc BW)



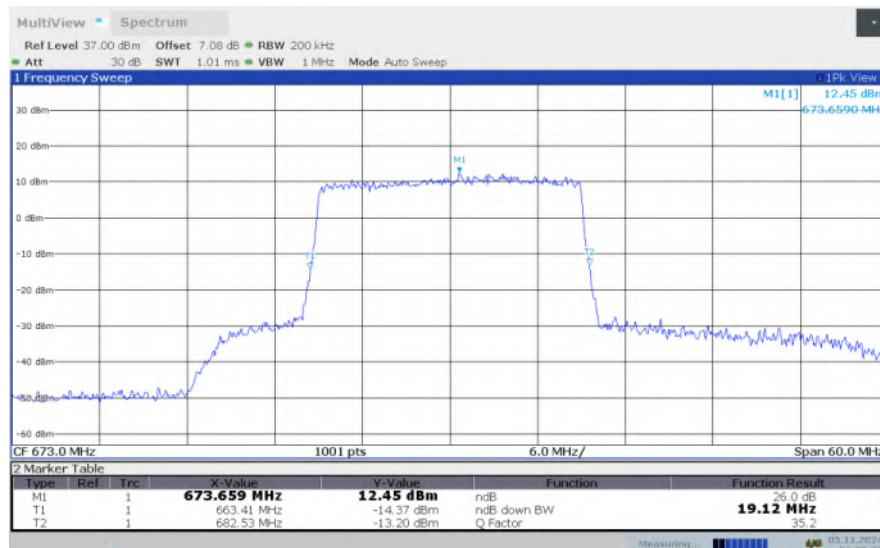
### LTE band 71,20MHz(-26dBc OBW)

Frequency(MHz)	Emission Bandwidth (-26dBc OBW)(MHz)		
	QPSK	16QAM	64QAM
673	19.001	19.121	19.061
683	19.121	19.121	19.001
688	19.241	19.001	19.121

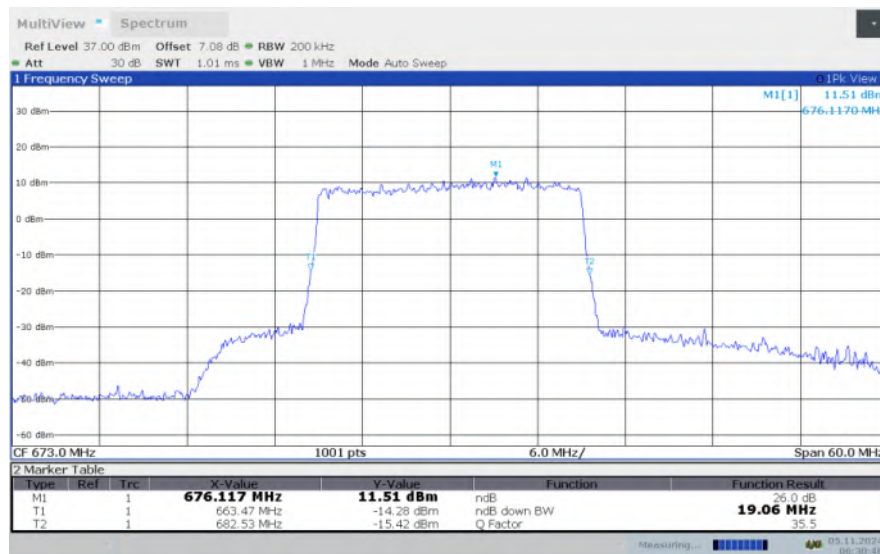
### LTE band 71 , 20MHz Bandwidth, LOW, QPSK (-26dBc BW)



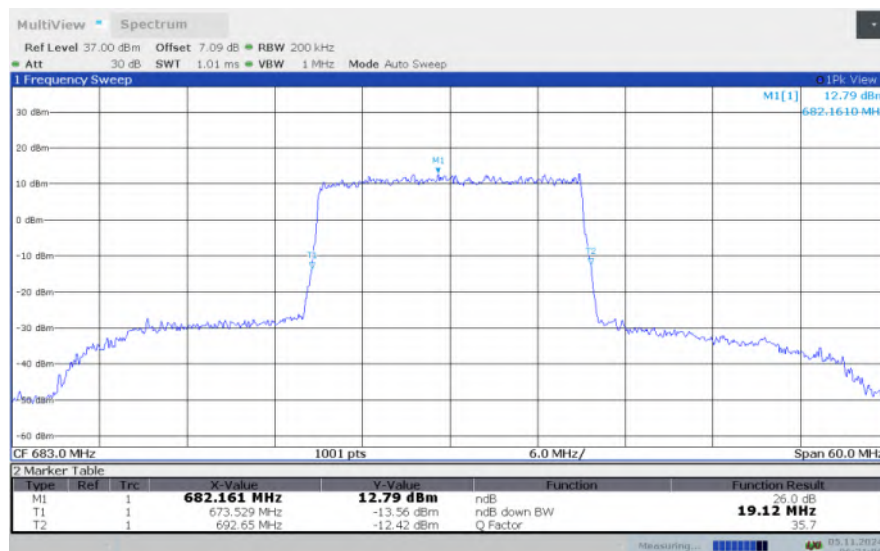
### LTE band 71 , 20MHz Bandwidth, LOW, 16QAM (-26dBc BW)



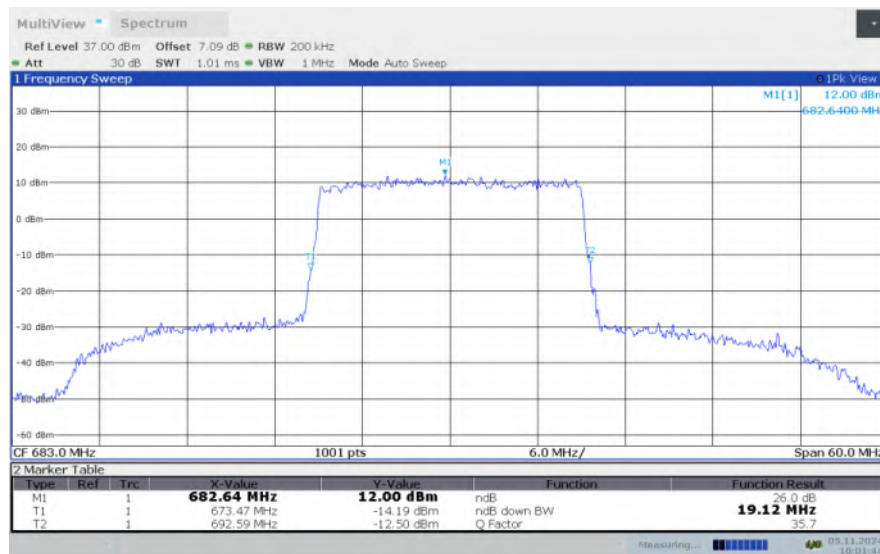
### LTE band 71 , 20MHz Bandwidth, LOW, 64QAM (-26dBc BW)



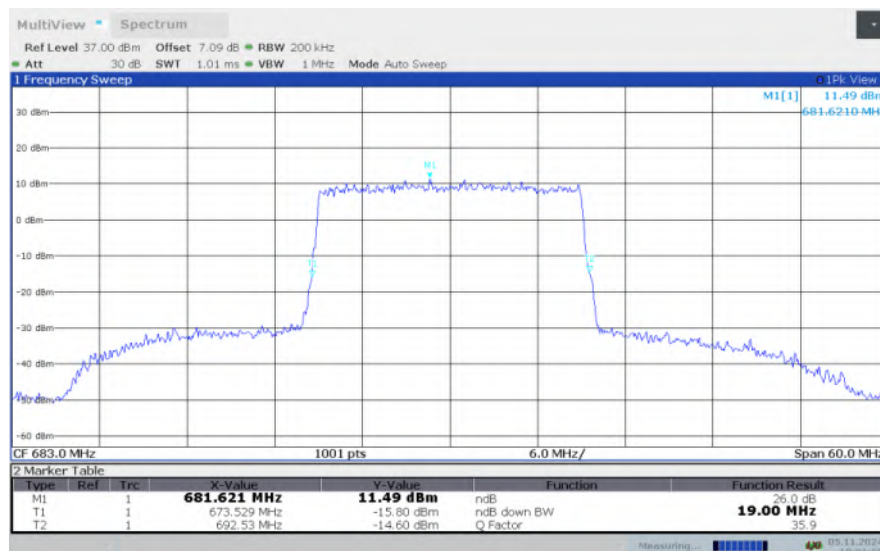
### LTE band 71 , 20MHz Bandwidth, MID, QPSK (-26dBc BW)



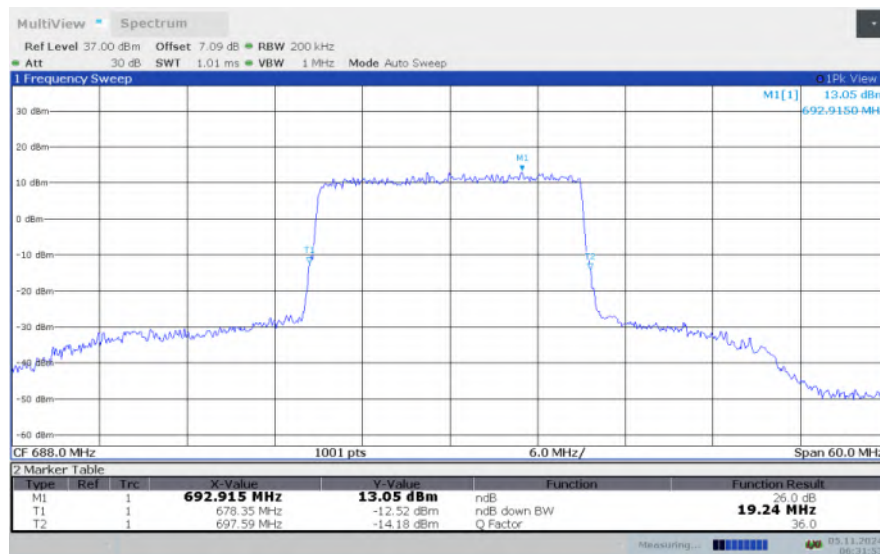
### LTE band 71 , 20MHz Bandwidth, MID, 16QAM (-26dBc BW)



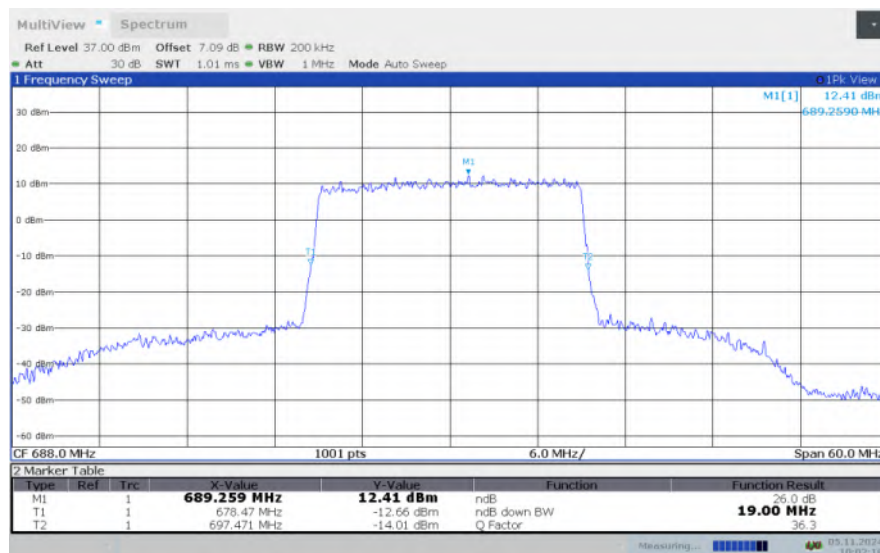
### LTE band 71 , 20MHz Bandwidth, MID, 64QAM (-26dBc BW)



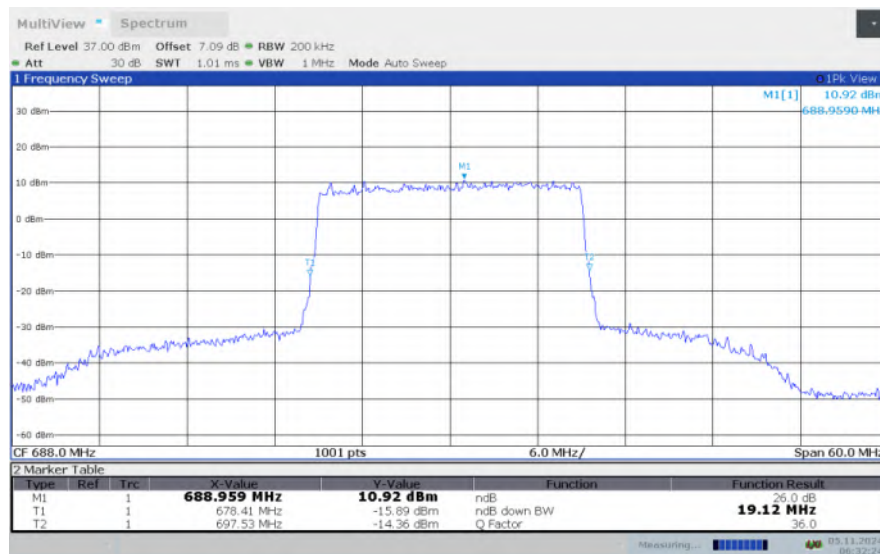
### LTE band 71 , 20MHz Bandwidth, HIGH, QPSK (-26dBc BW)



### LTE band 71 , 20MHz Bandwidth, HIGH, 16QAM (-26dBc BW)



### LTE band 71 , 20MHz Bandwidth, HIGH, 64QAM (-26dBc BW)



Note: Expanded measurement uncertainty is  $U = 3428 \text{ Hz}$ ,  $k = 2$

## **A.6 BAND EDGE COMPLIANCE**

### **A.6.1 Measurement limit**

**For Band2/25:** Part 24.238(a) 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.

**For Band4/66:** 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.

**For Band5/26(824MHz-849MHz):** Part 22.917(a) specify that for operations in the 824–849MHz band, the FCC limit is  $43 + 10 \log(P)$  dB below the transmitter power(P) in a 100kHz bandwidth. However, in the 1MHz 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.

**For Band7/38/41:** Part 27.53(m)(4) 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 than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5MHz. 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.

**For Band12/17/71:** Part 27.53(g) specifies 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.

**For Band13:** Part 27.53(c) specifies For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following:(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands

immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

**For Band14:** Part 90.543(e) specifies For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the 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, in accordance with the following:(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations.(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log (P)$  dB.(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

**For Band26(814MHz-824MHz):** Part 90.691(a) specifies (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

**For Band30:** Part 27.53(a)(4) specifies For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands: (i) By a factor of not less than:  $43 + 10 \log (P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log (P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log (P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log (P)$  dB on all frequencies between 2328 and 2337 MHz;(ii) By a factor of not less than  $43 + 10 \log (P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log (P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log (P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log (P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log (P)$  dB below 2288 MHz;(iii) By a factor of not less than  $43 + 10 \log (P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log (P)$  dB above 2365 MHz.

The spectrum analyzer readings are corrected by  $[10 \log (1/\text{duty cycle})]$  for the non-continuous transmitting scenario.

## A.6.2 Measurement Procedure

The testing follows ANSI C63.26

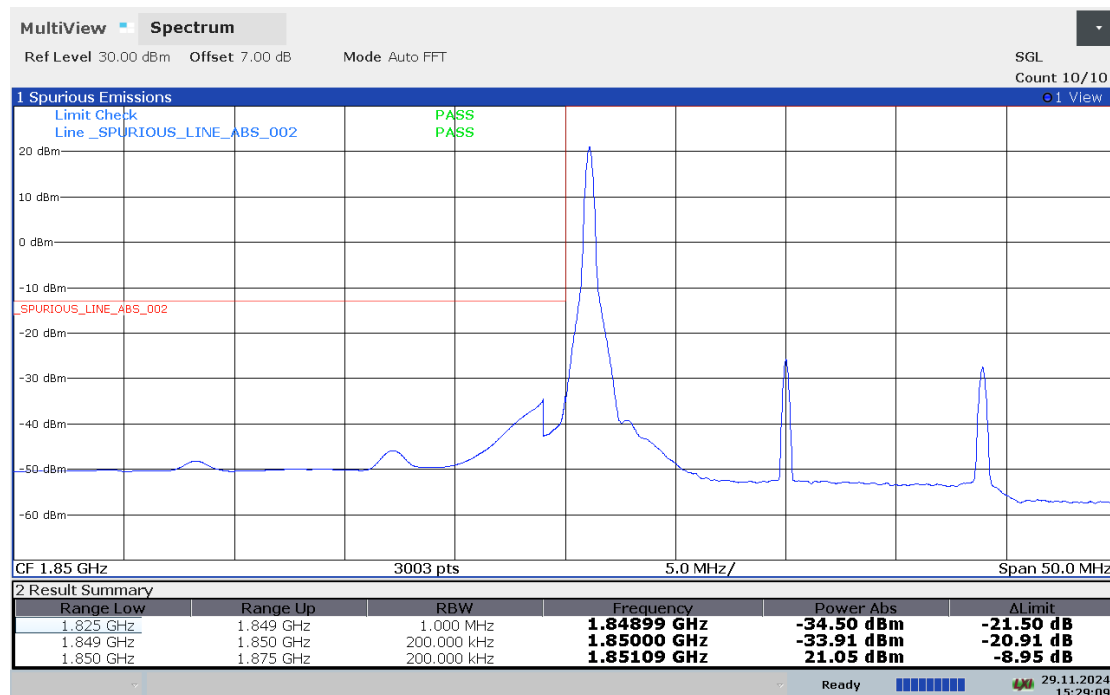
- The EUT was connected to spectrum analyzer and system simulator via a power divider.
- The band edges of low and high channels for the highest RF powers were measured.
- Set RBW  $\geq 1\%$  EBW in the 1MHz band immediately outside and adjacent to the band edge.
- Set spectrum analyzer with RMS detector.
- The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- Checked that all the results comply with the emission limit line.

## A.6.3 Measurement result

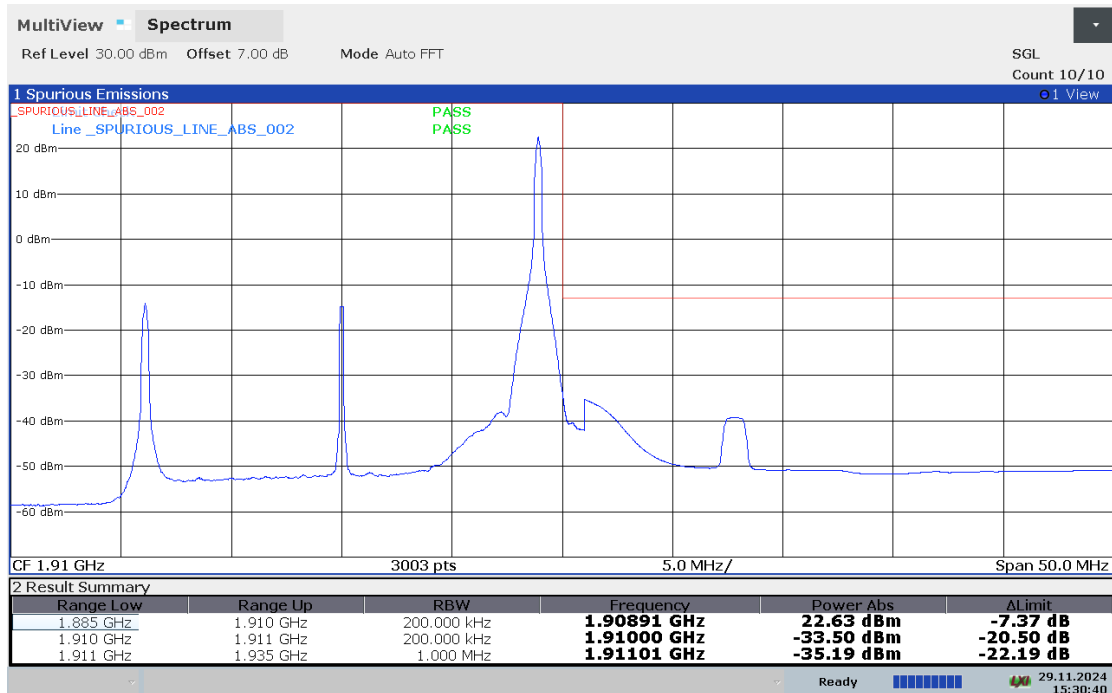
Only worst case result is given below

LTE band 2

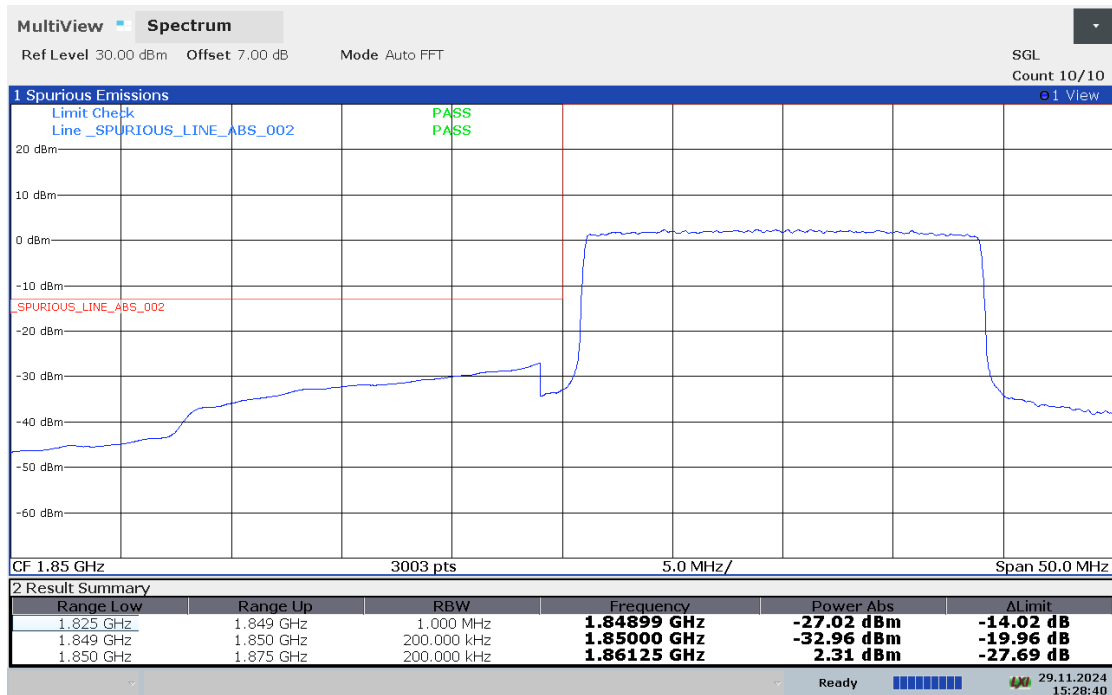
LOW BAND EDGE BLOCK-1RB-low\_offset



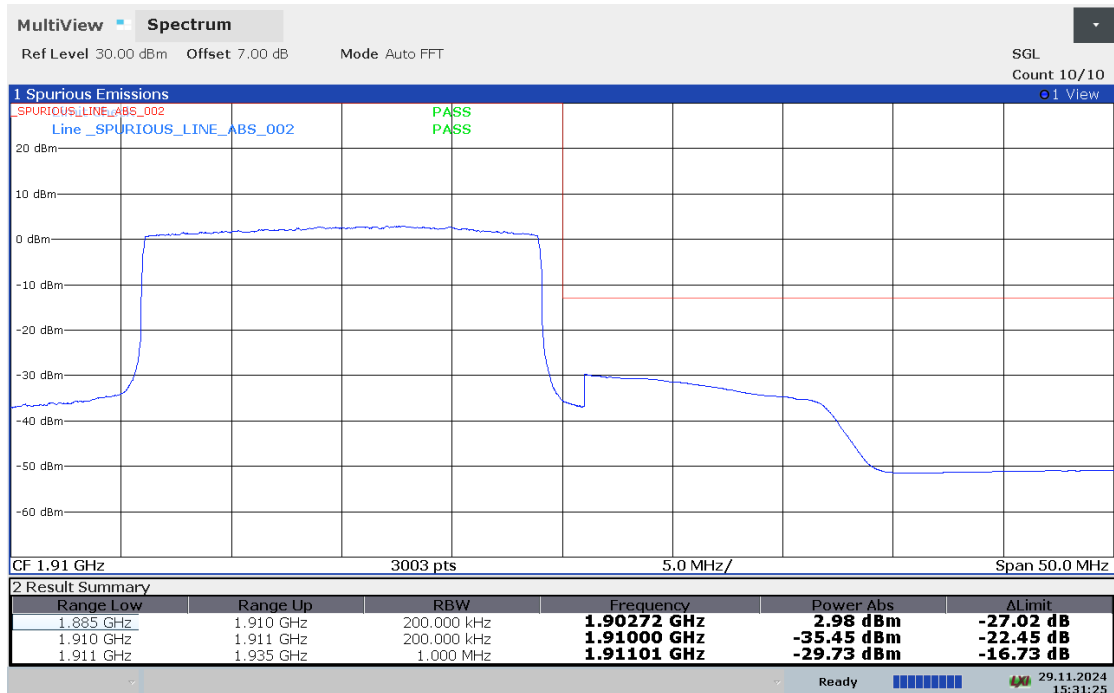
HIGH BAND EDGE BLOCK-1RB-high\_offset



### LOW BAND EDGE BLOCK-20MHz-100%RB

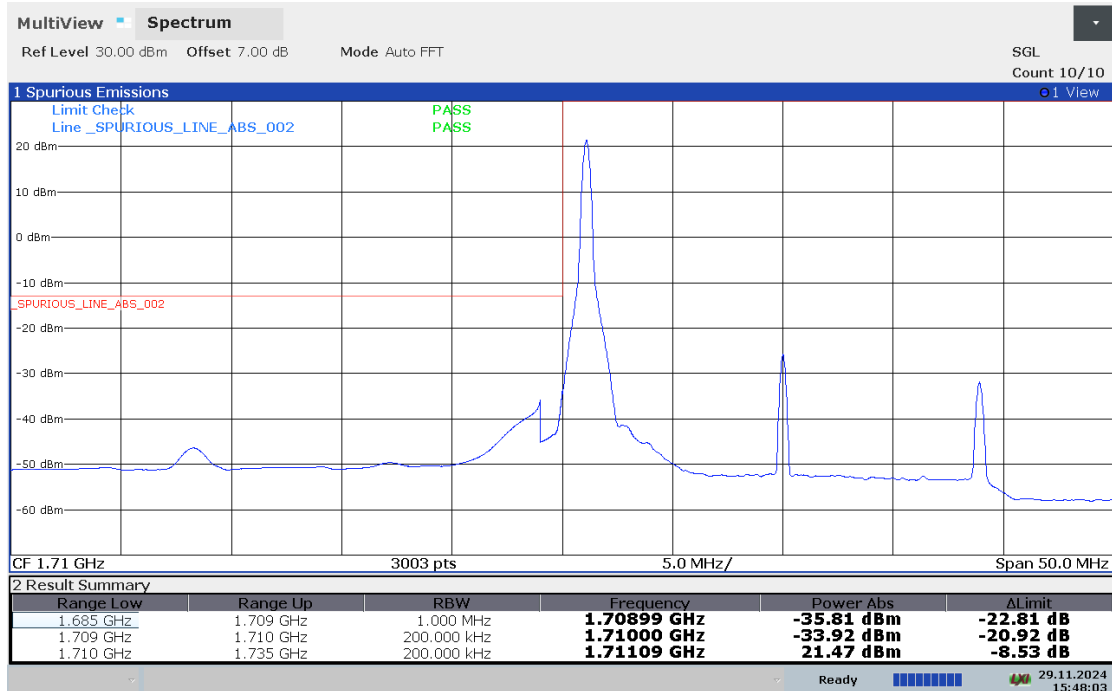


### HIGH BAND EDGE BLOCK-20MHz-100%RB

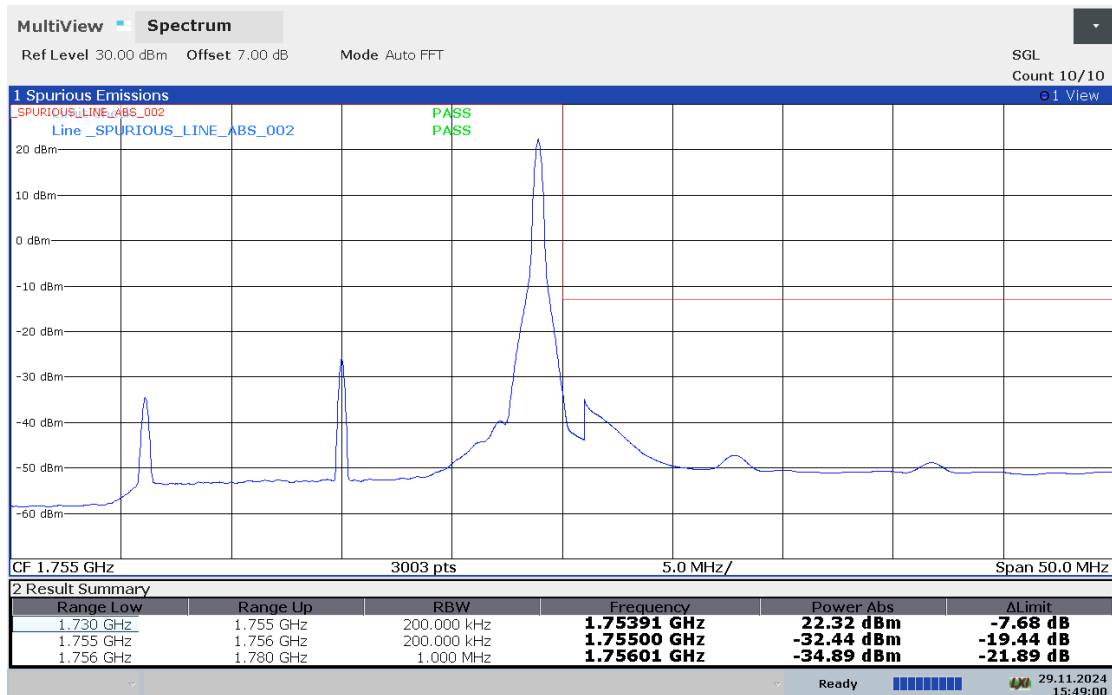


## LTE band 4

### LOW BAND EDGE BLOCK-1RB-low\_offset

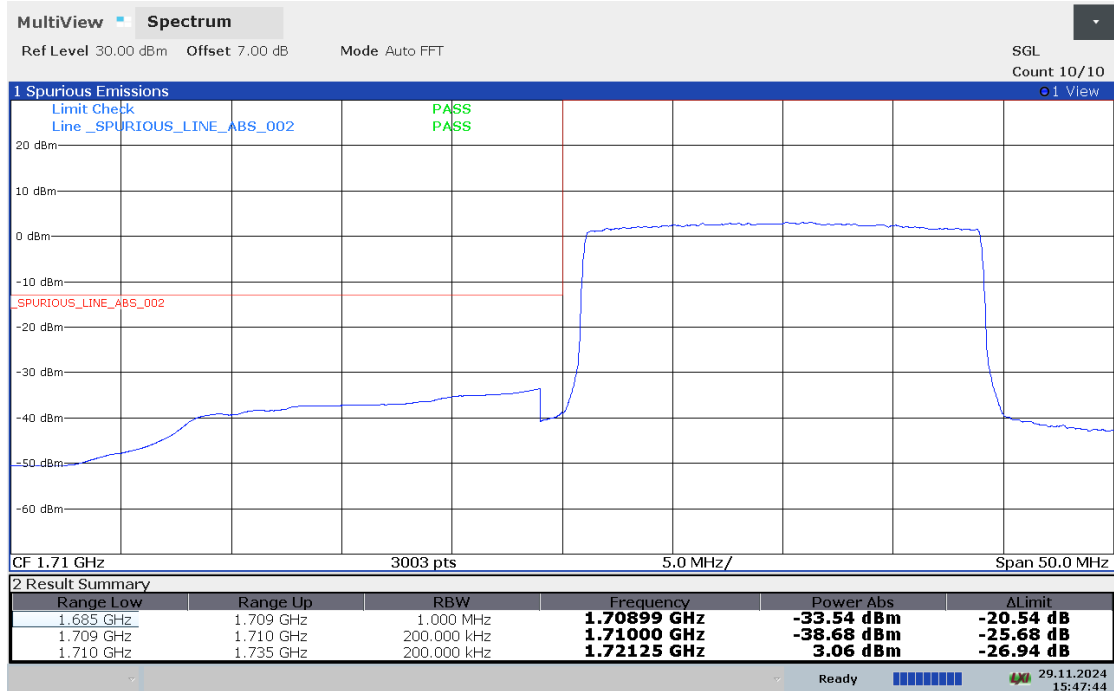


### HIGH BAND EDGE BLOCK-1RB-high\_offset

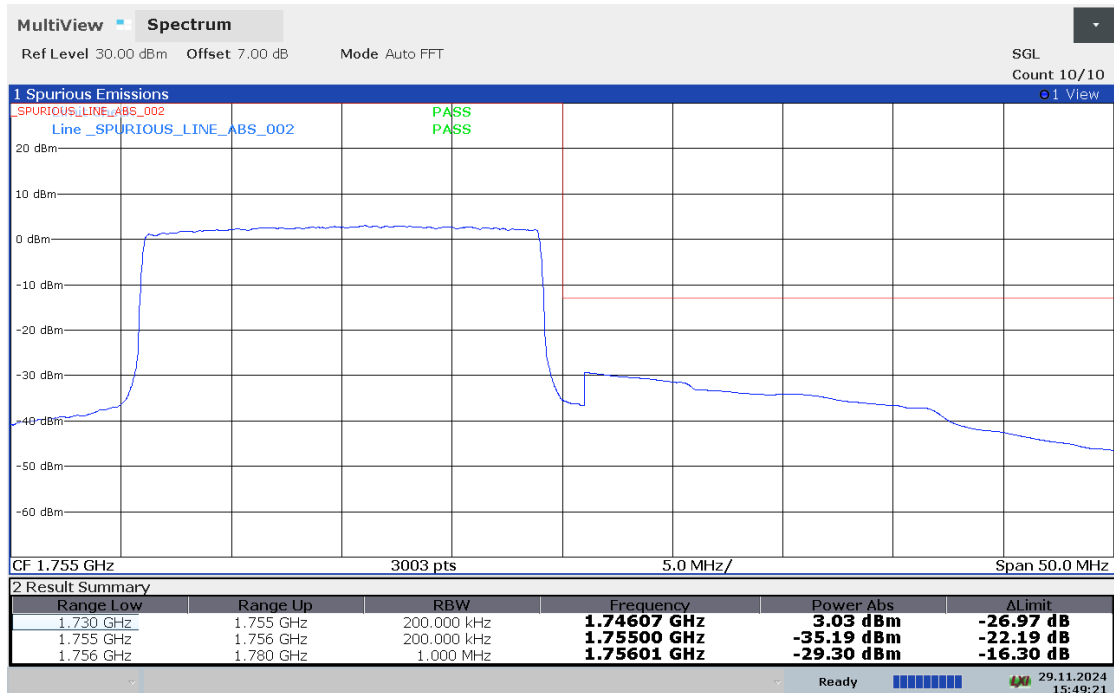




## LOW BAND EDGE BLOCK-20MHz-100%RB



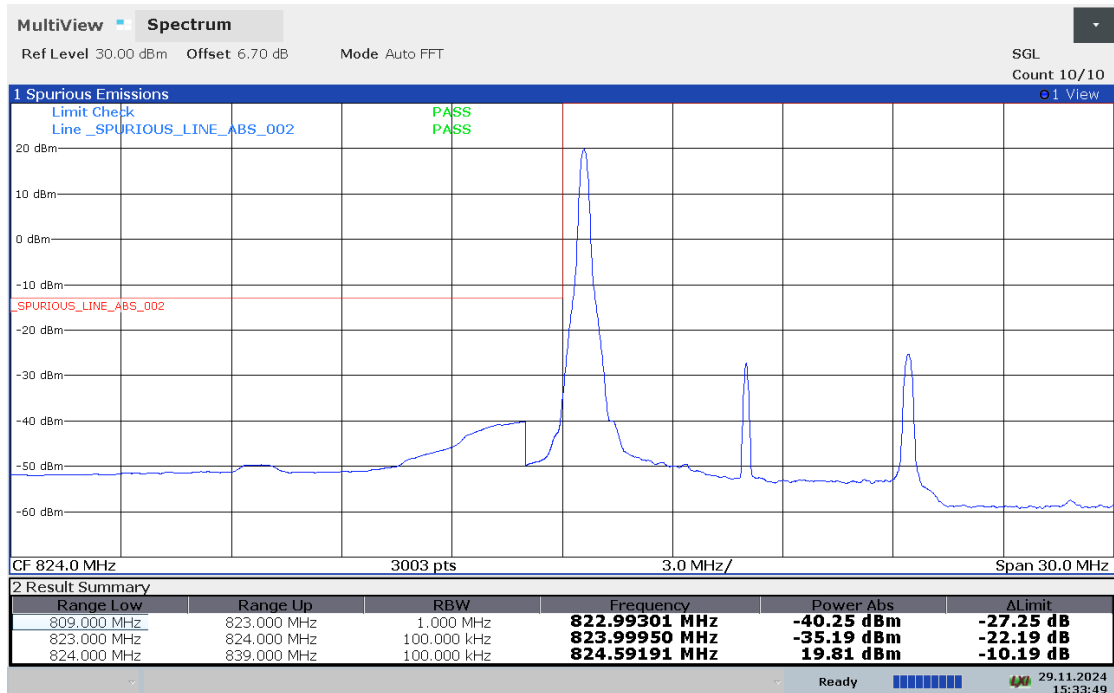
## HIGH BAND EDGE BLOCK-20MHz-100%RB



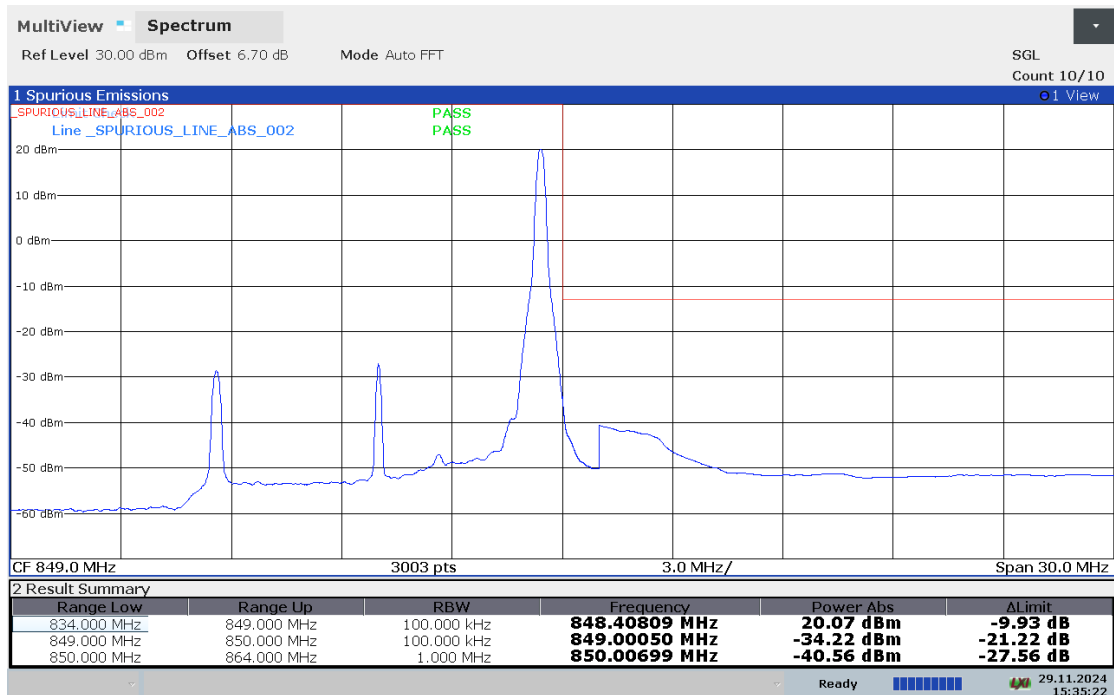


## LTE band 5

## LOW BAND EDGE BLOCK-1RB-low\_offset

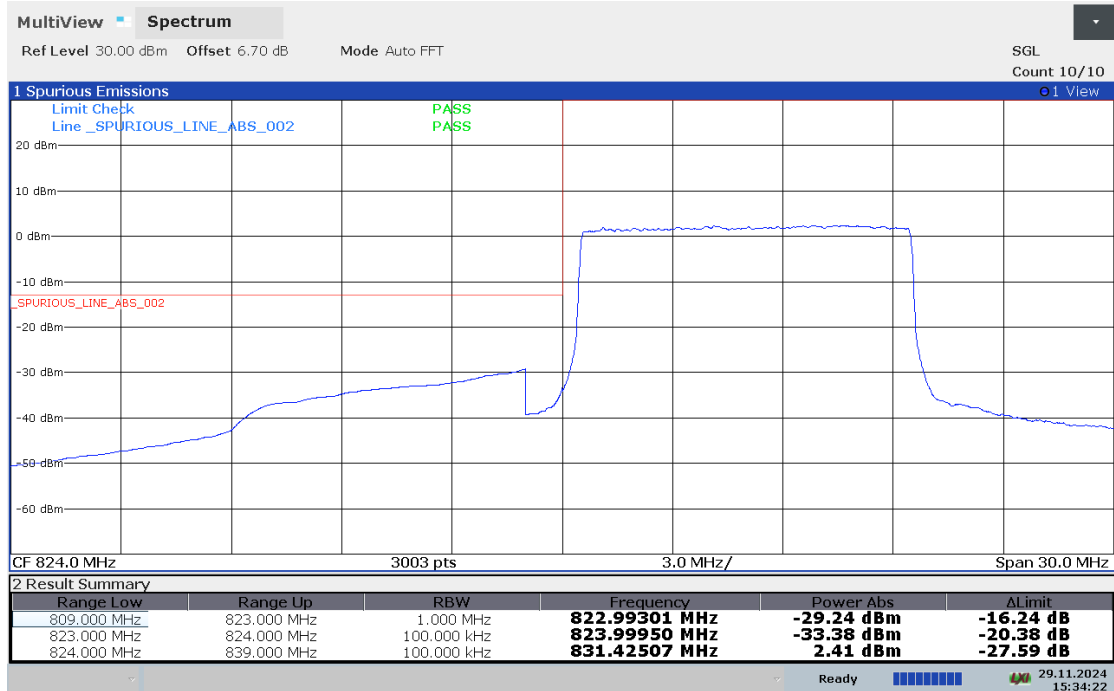


## HIGH BAND EDGE BLOCK-1RB-high\_offset

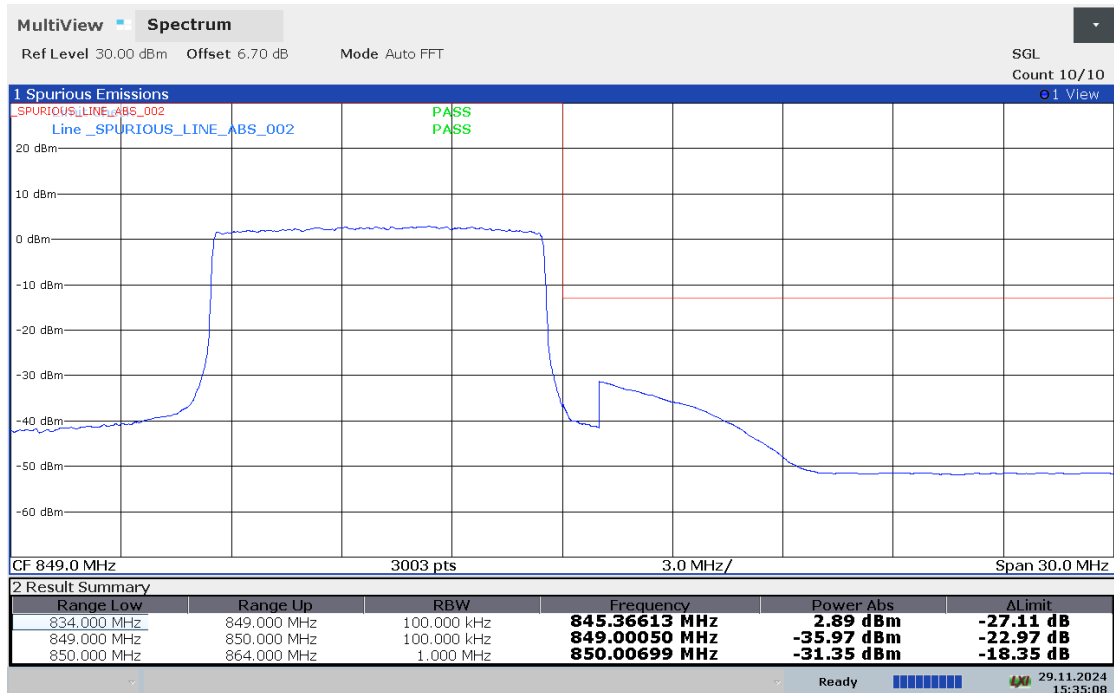




## LOW BAND EDGE BLOCK-10MHz-100%RB

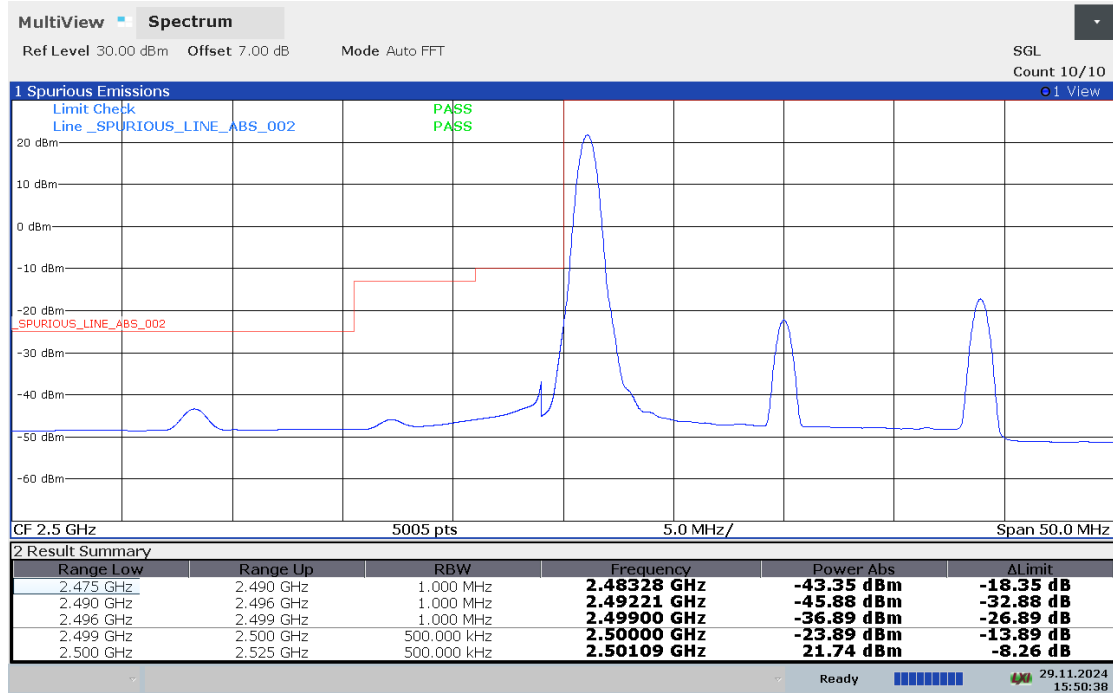


## HIGH BAND EDGE BLOCK-10MHz-100%RB

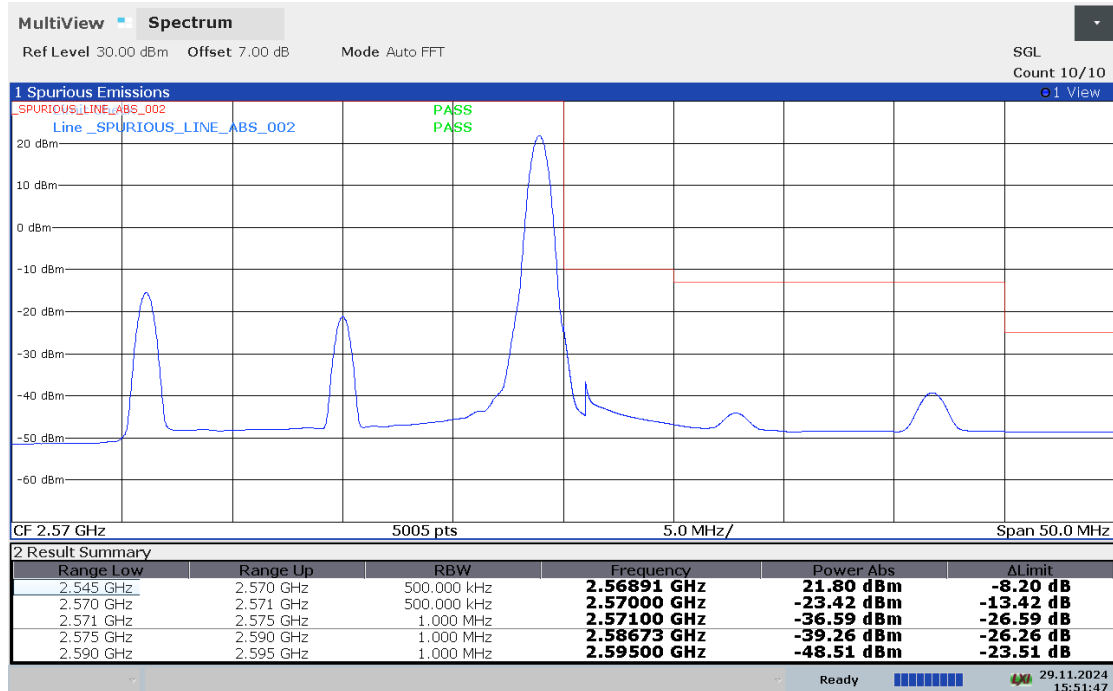


## LTE band 7

### LOW BAND EDGE BLOCK-1RB-low\_offset

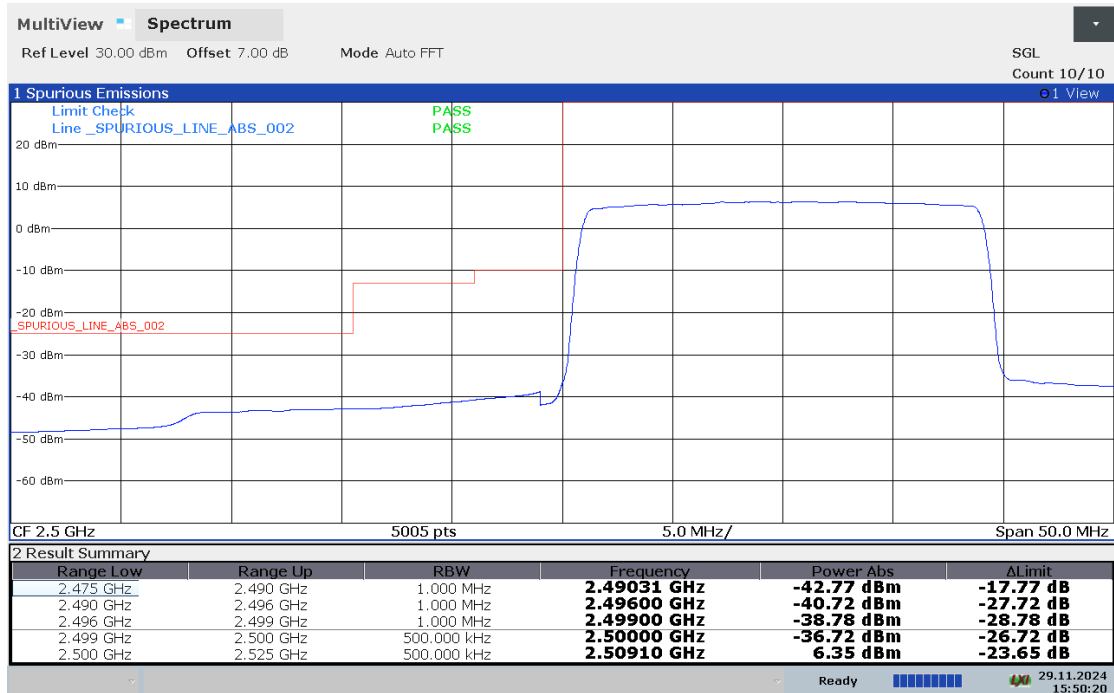


### HIGH BAND EDGE BLOCK-1RB-high\_offset

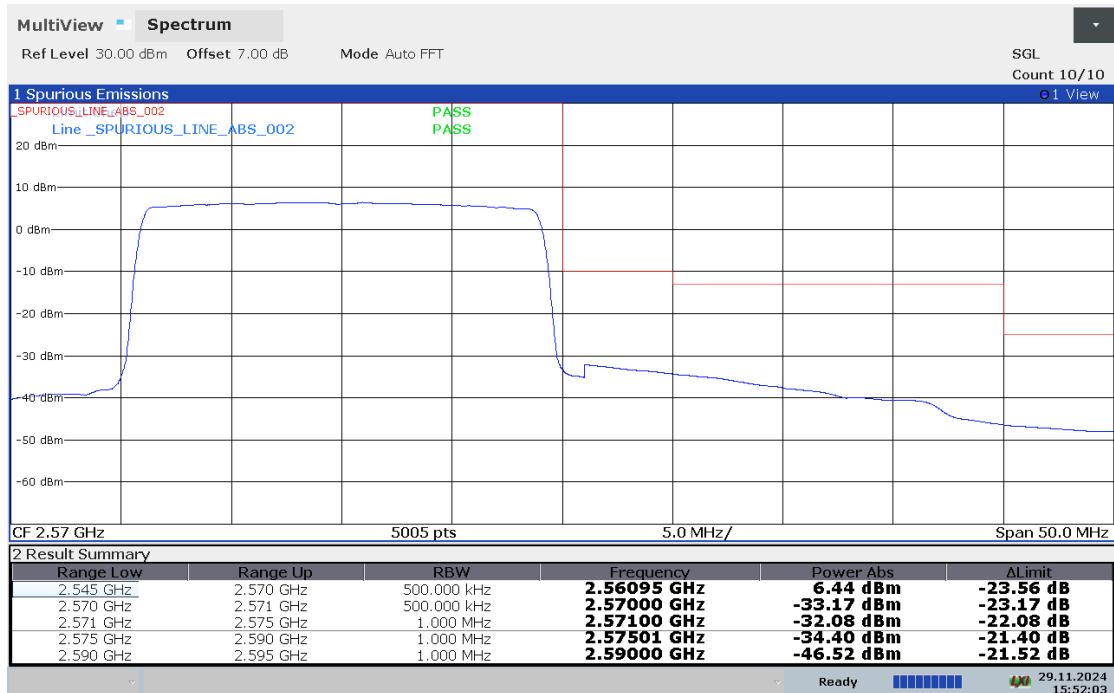




## LOW BAND EDGE BLOCK-20MHz-100%RB



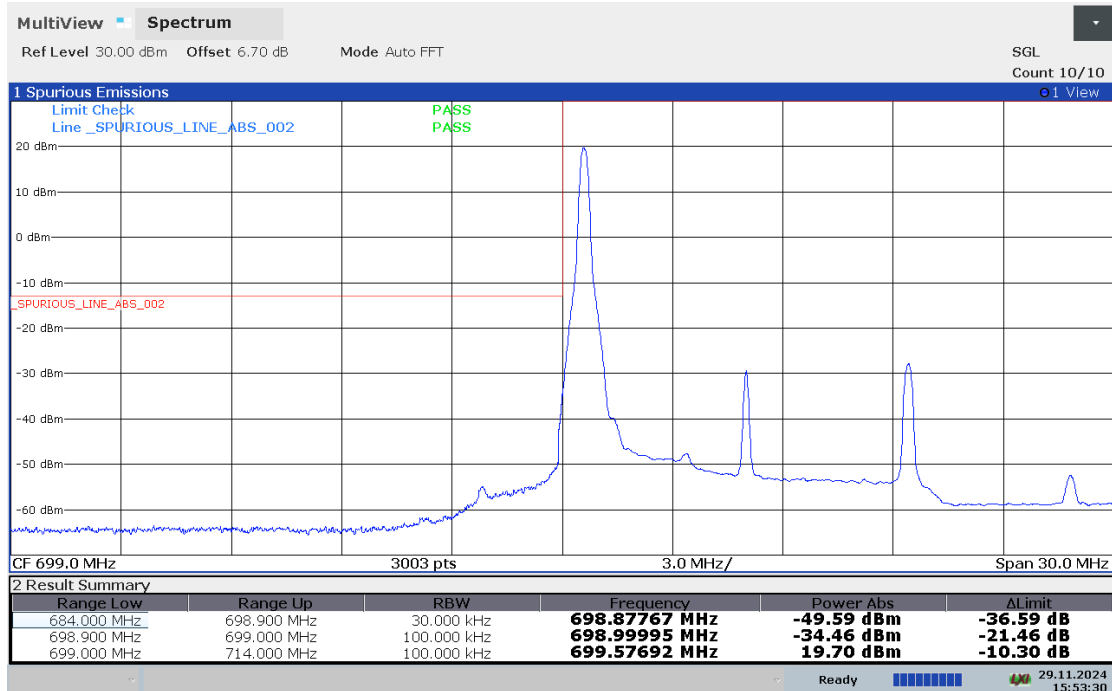
## HIGH BAND EDGE BLOCK-20MHz-100%RB



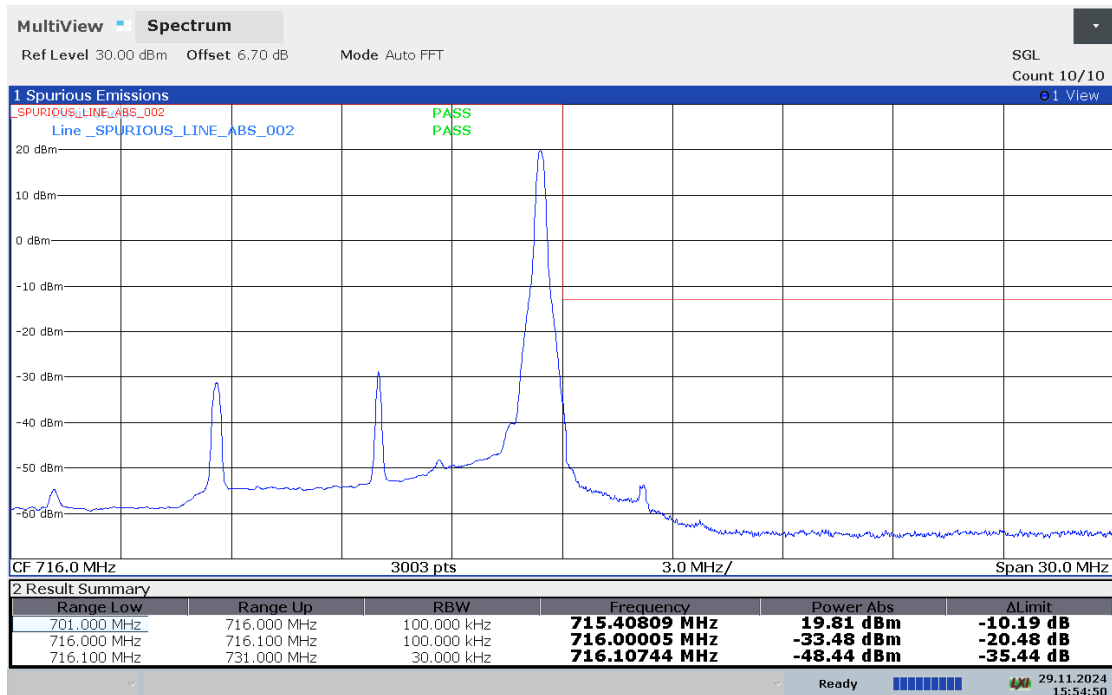


## LTE band 12

## LOW BAND EDGE BLOCK-1RB-low\_offset

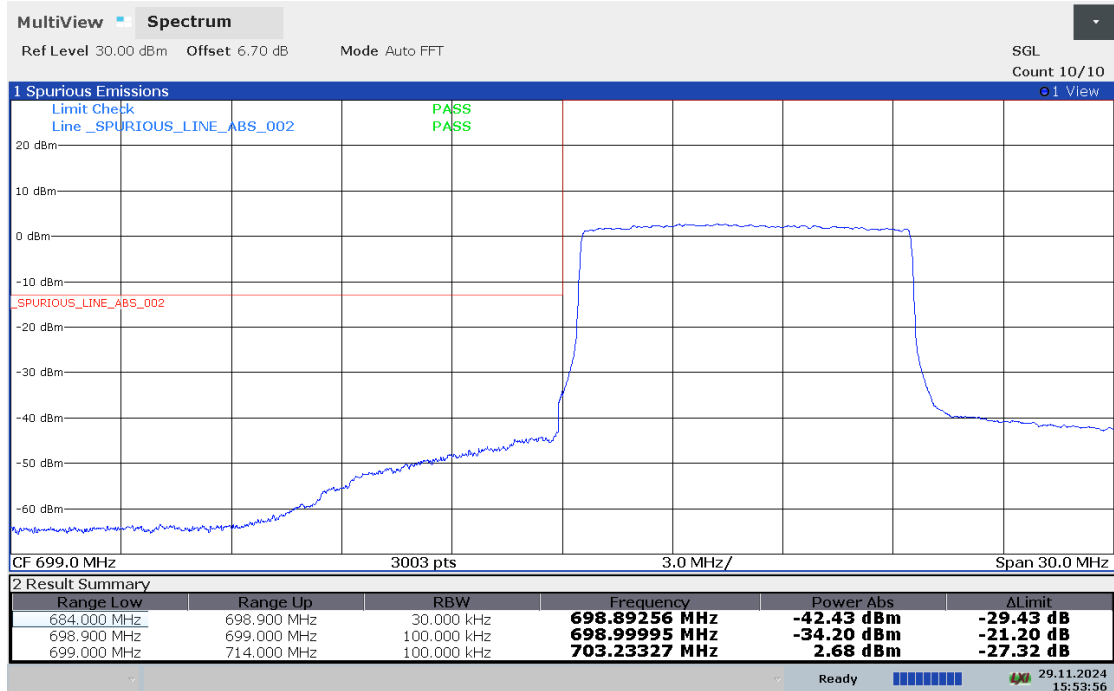


## HIGH BAND EDGE BLOCK-1RB-high\_offset

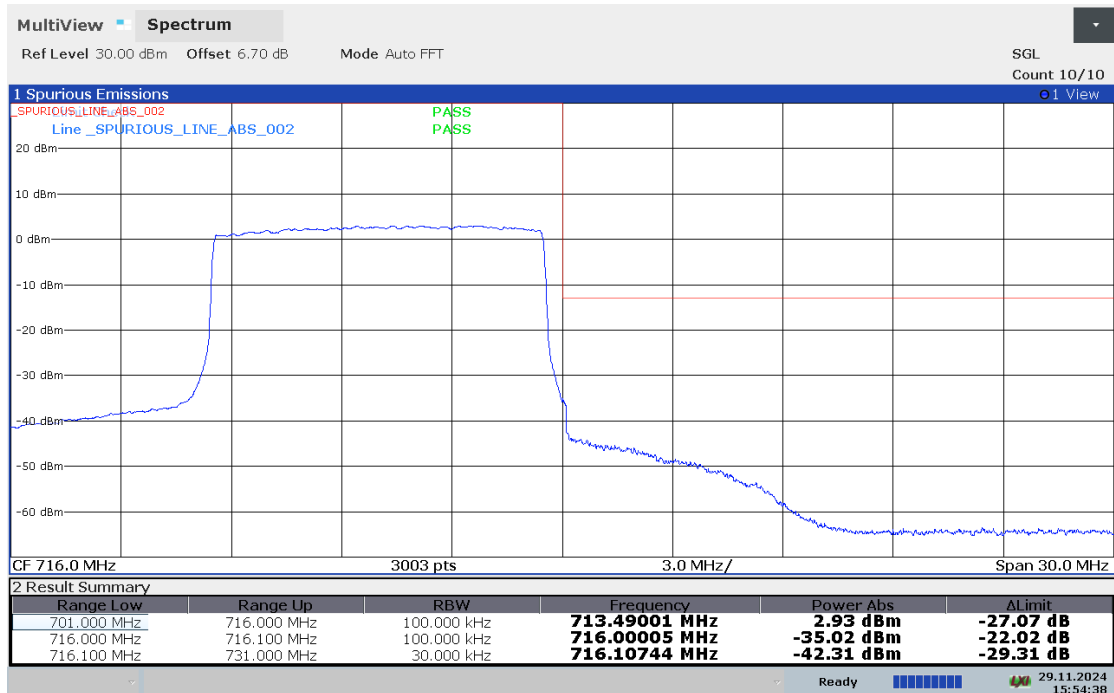




## LOW BAND EDGE BLOCK-10MHz-100%RB

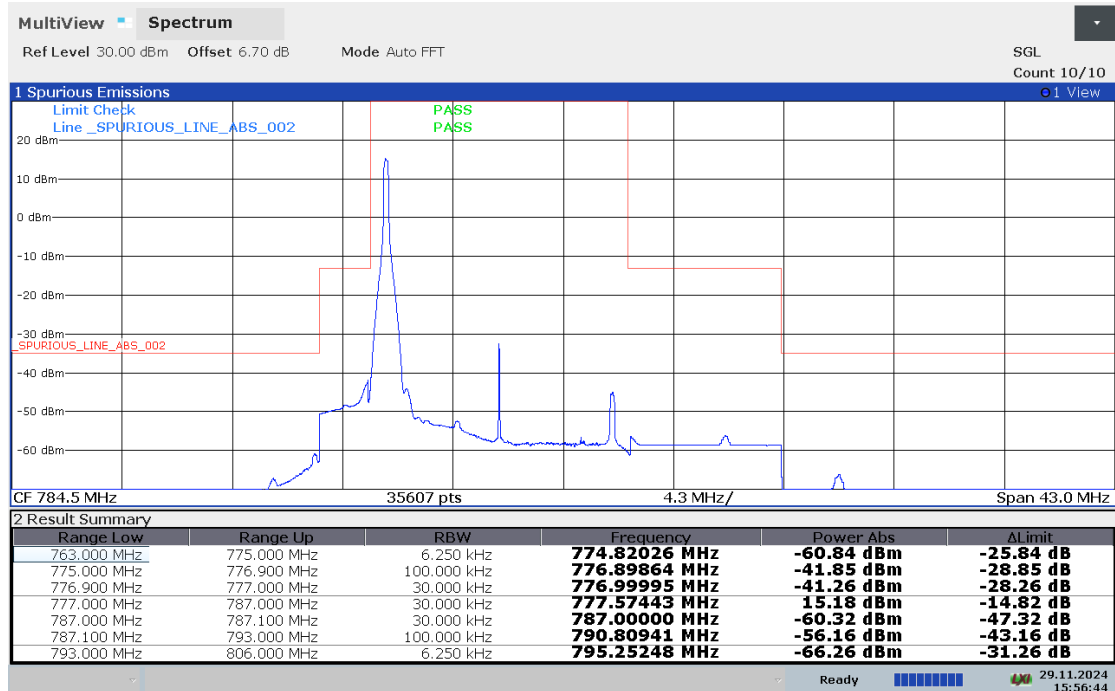


## HIGH BAND EDGE BLOCK-10MHz-100%RB

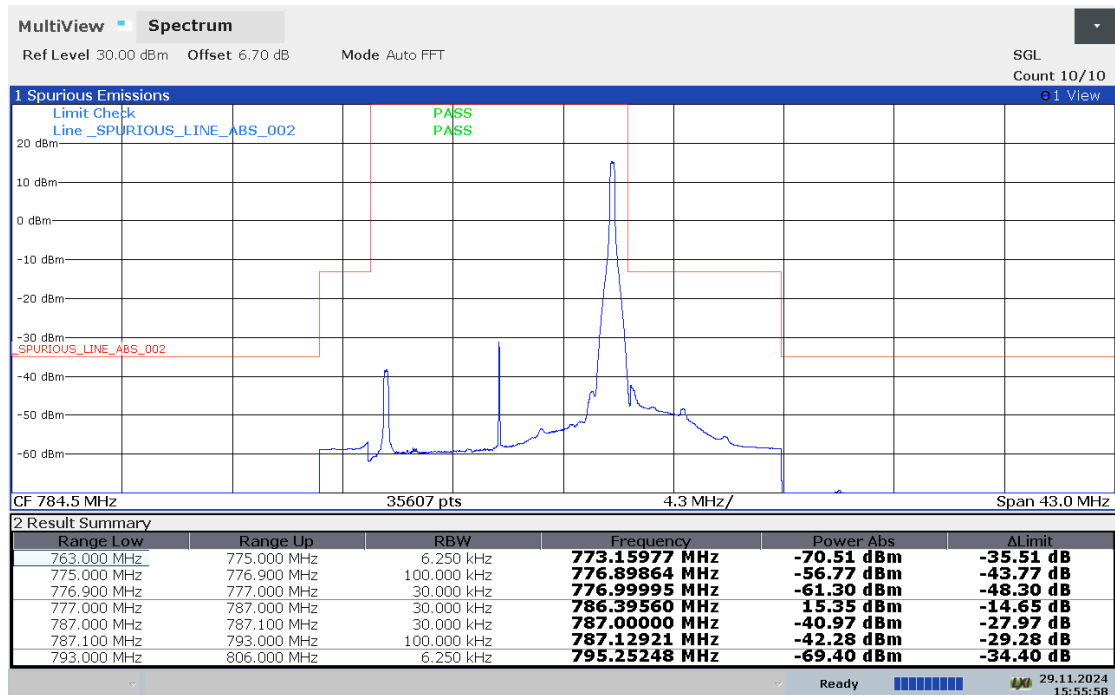


# LTE band 13

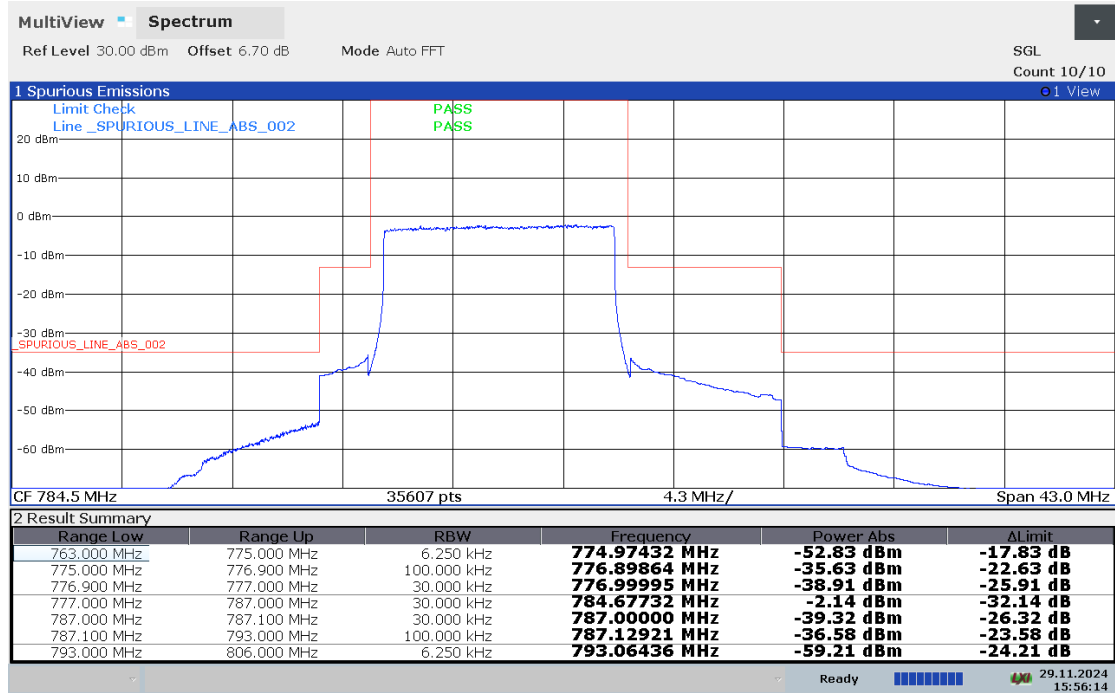
## LOW BAND EDGE BLOCK-1RB-low\_offset



## HIGH BAND EDGE BLOCK-1RB-high\_offset

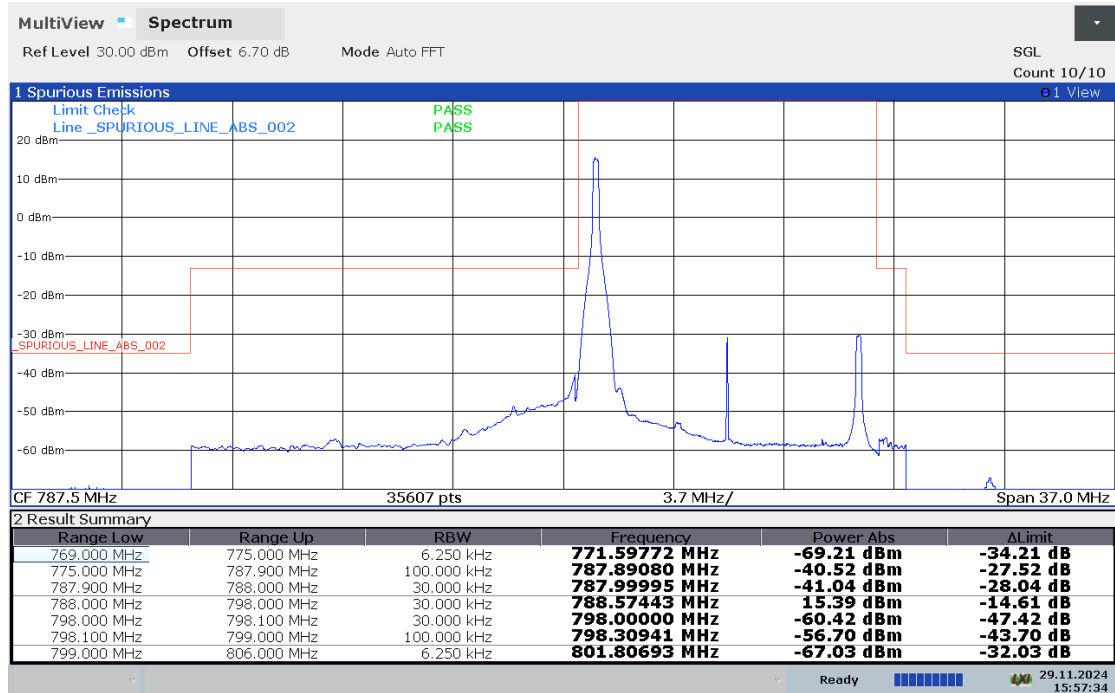


## EDGE BLOCK-10MHz-100%RB

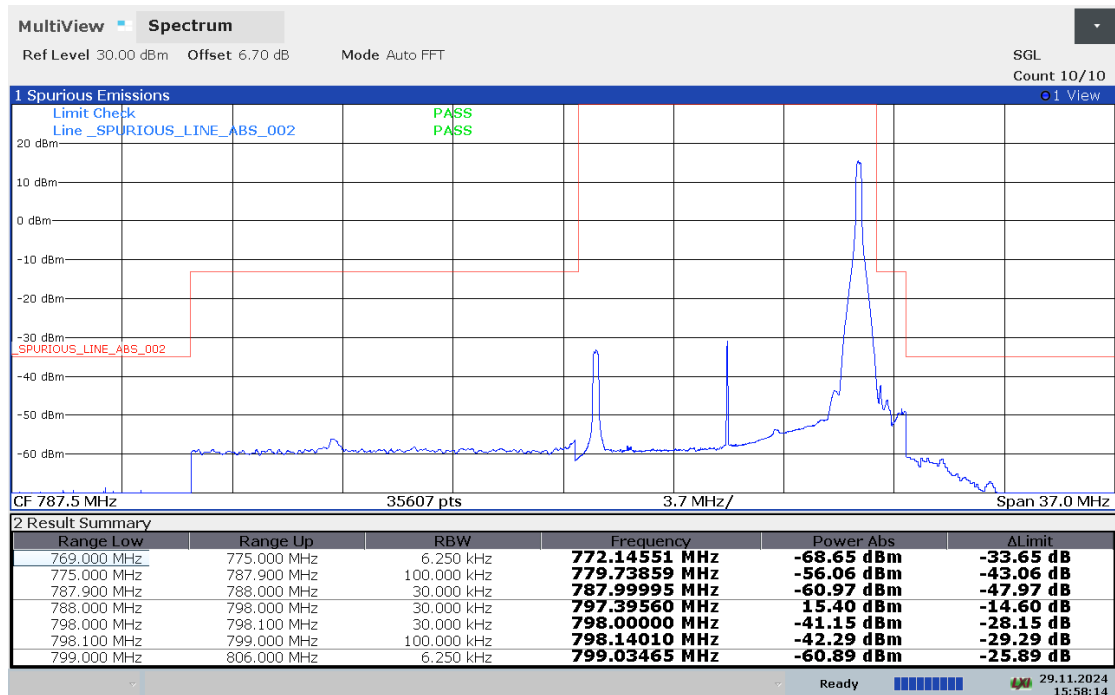


# LTE band 14

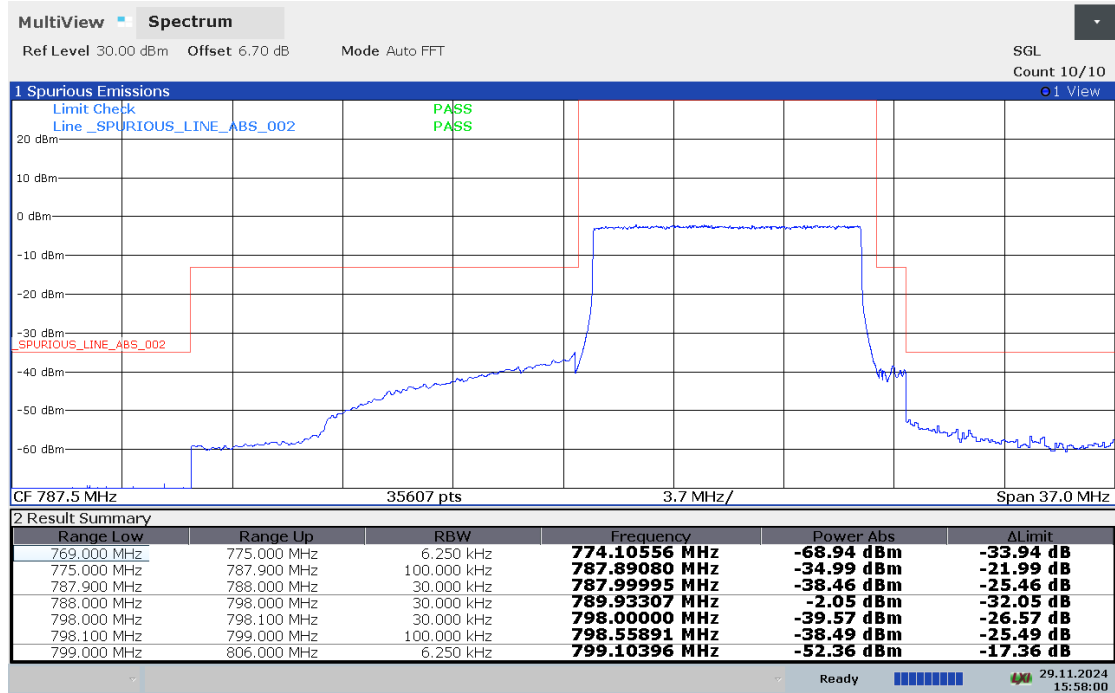
## LOW BAND EDGE BLOCK-1RB-low\_offset



## HIGH BAND EDGE BLOCK-1RB-high\_offset



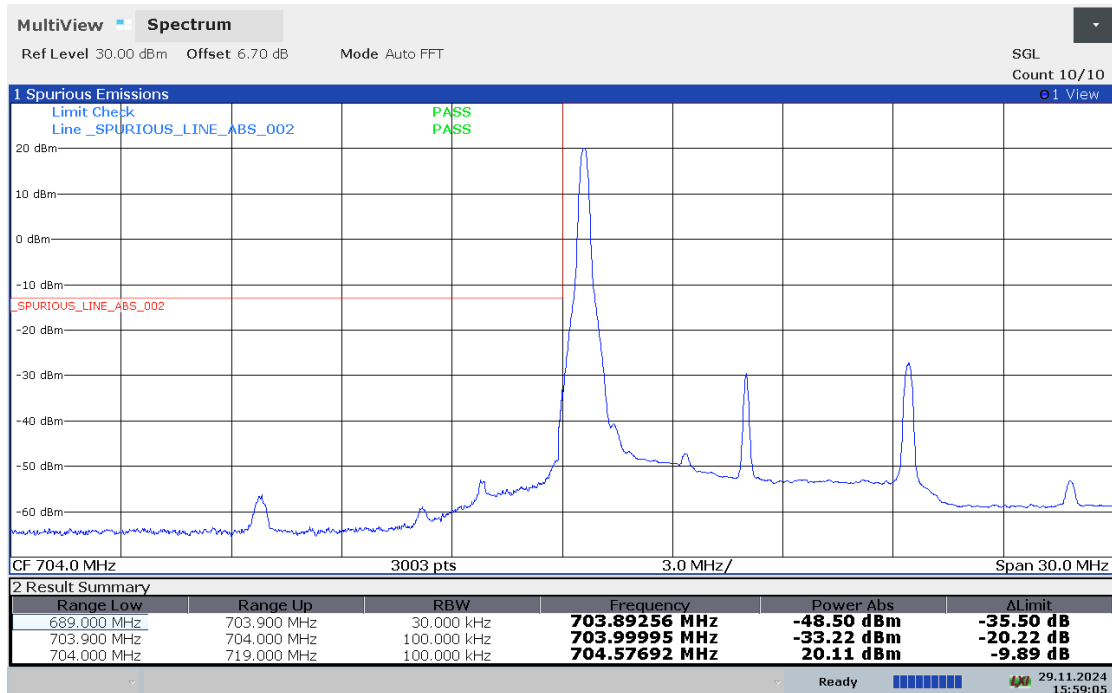
# EDGE BLOCK-10MHz-100%RB



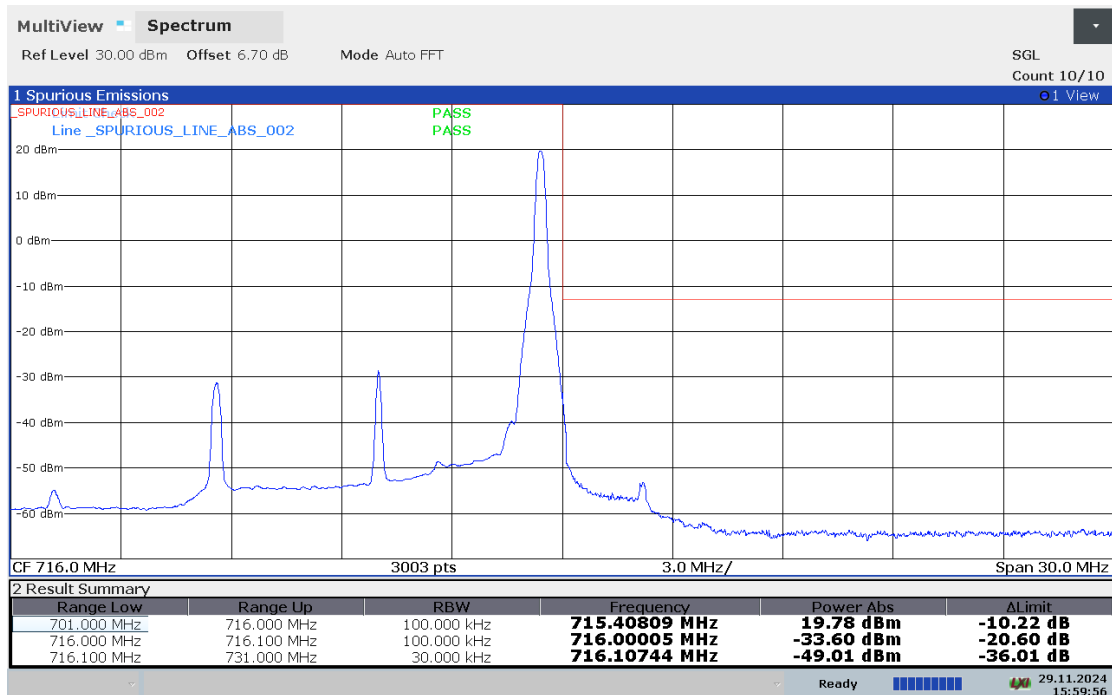


## LTE band 17

### LOW BAND EDGE BLOCK-1RB-low\_offset

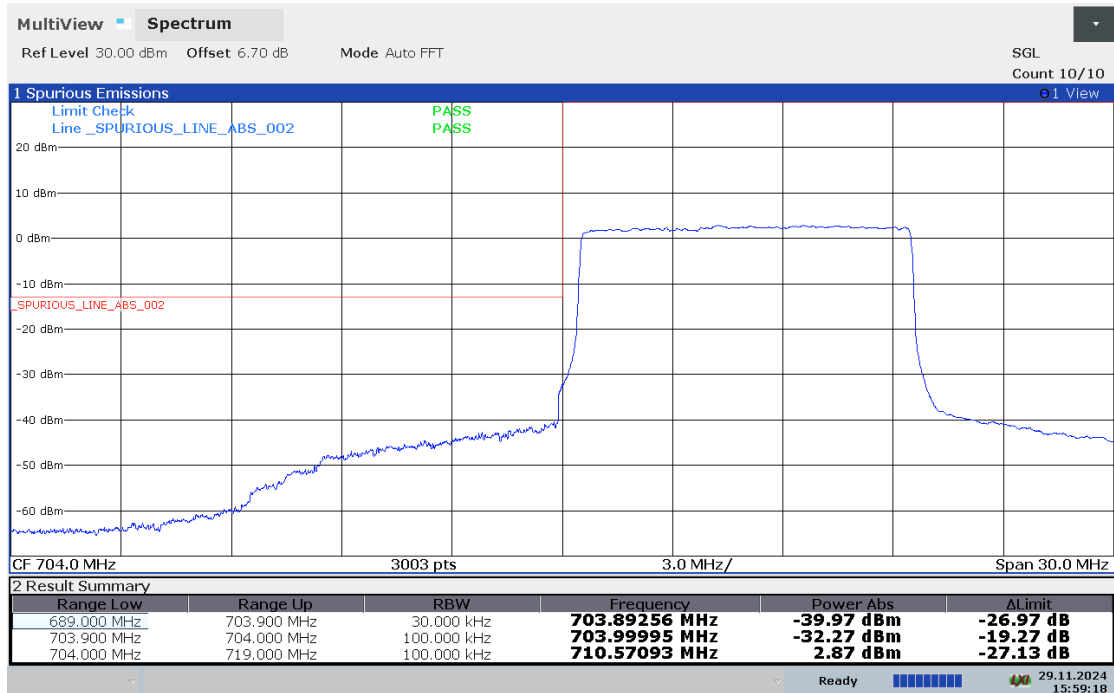


### HIGH BAND EDGE BLOCK-1RB-high\_offset

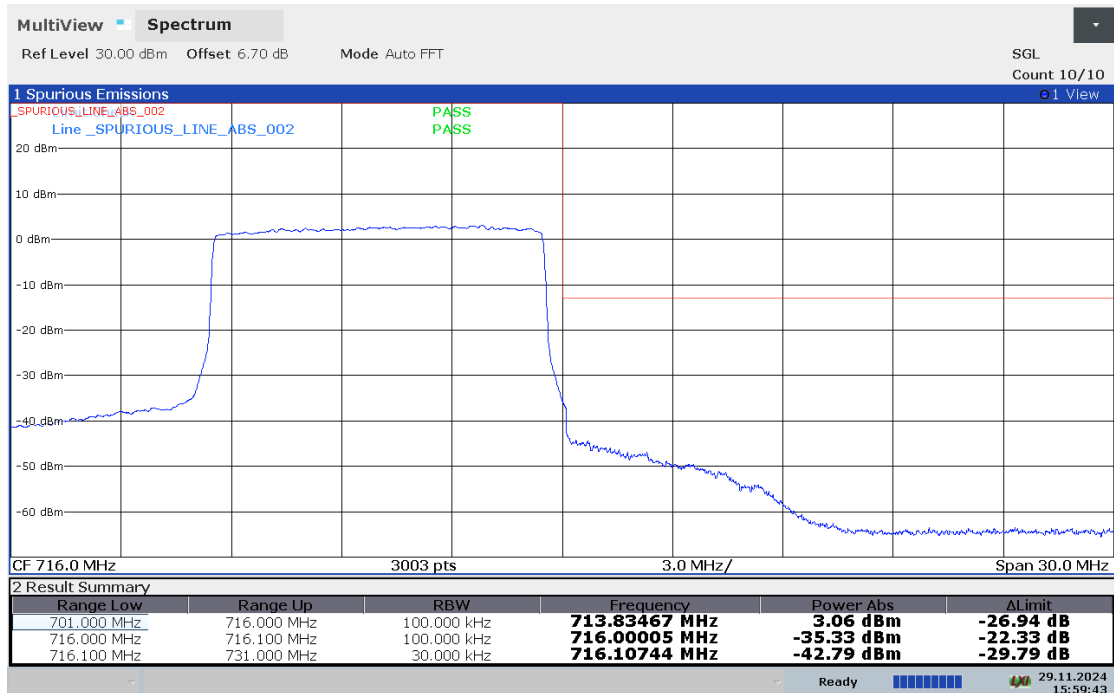




## LOW BAND EDGE BLOCK-20MHz-100%RB

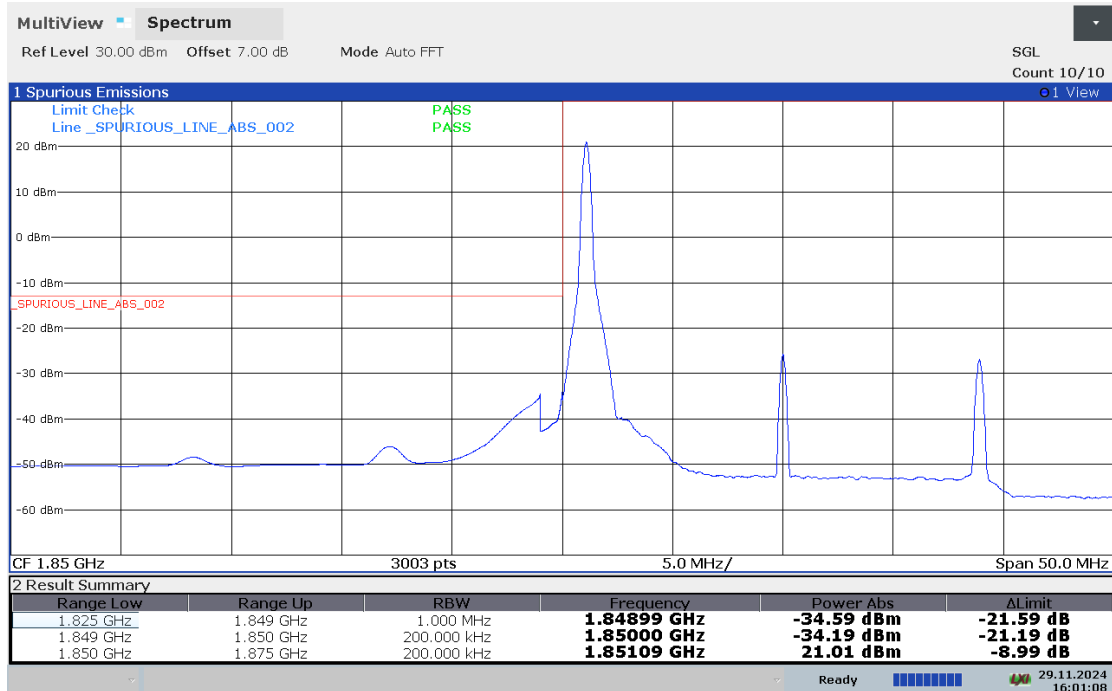


## HIGH BAND EDGE BLOCK-20MHz-100%RB

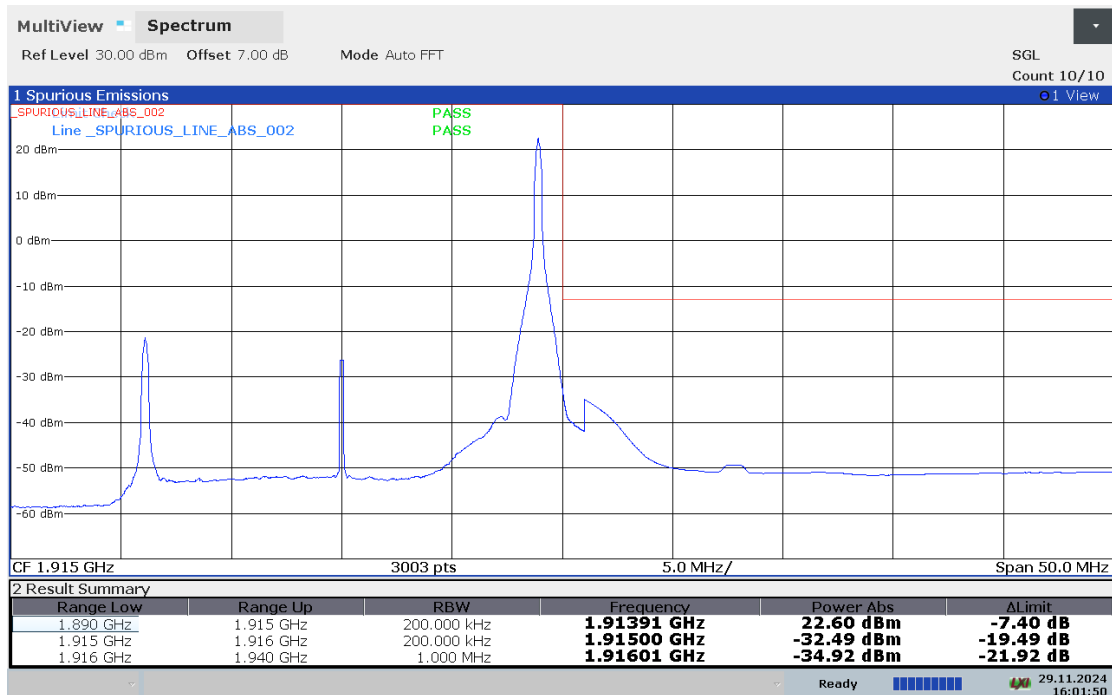


## LTE band 25

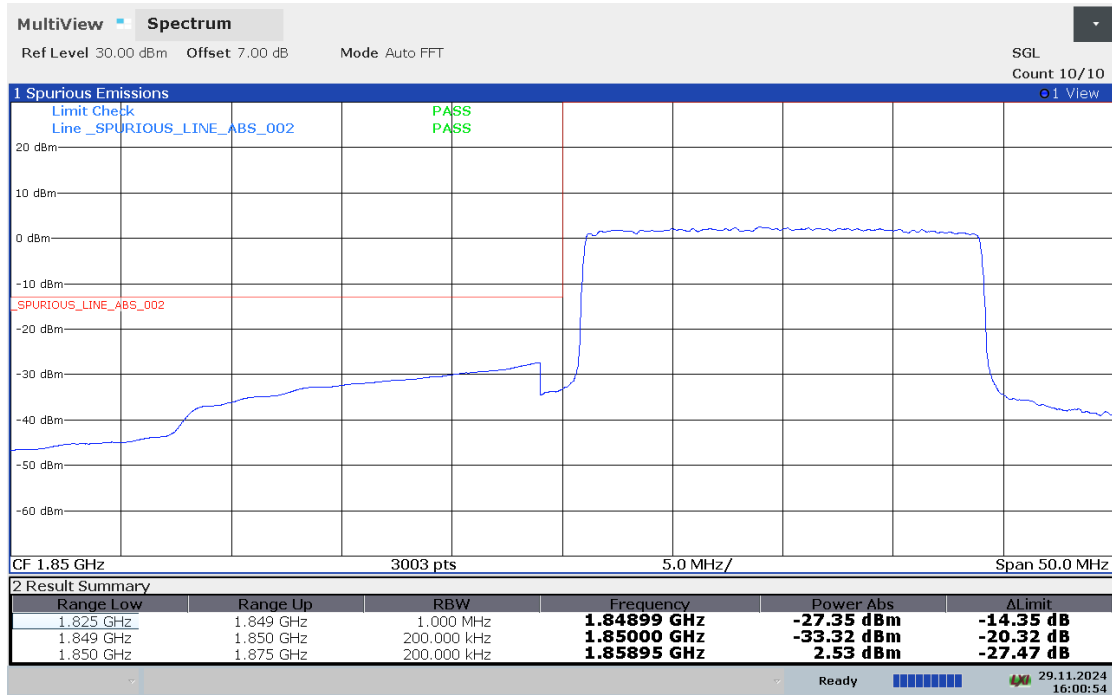
### LOW BAND EDGE BLOCK-1RB-low\_offset



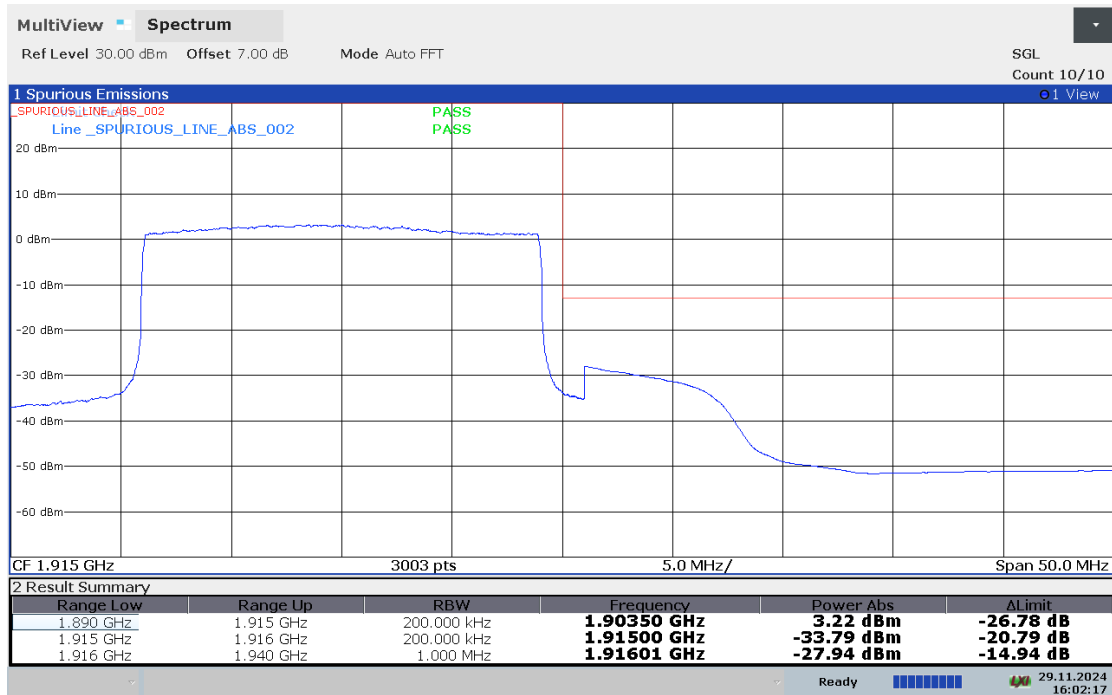
### HIGH BAND EDGE BLOCK-1RB-high\_offset



## LOW BAND EDGE BLOCK-20MHz-100%RB

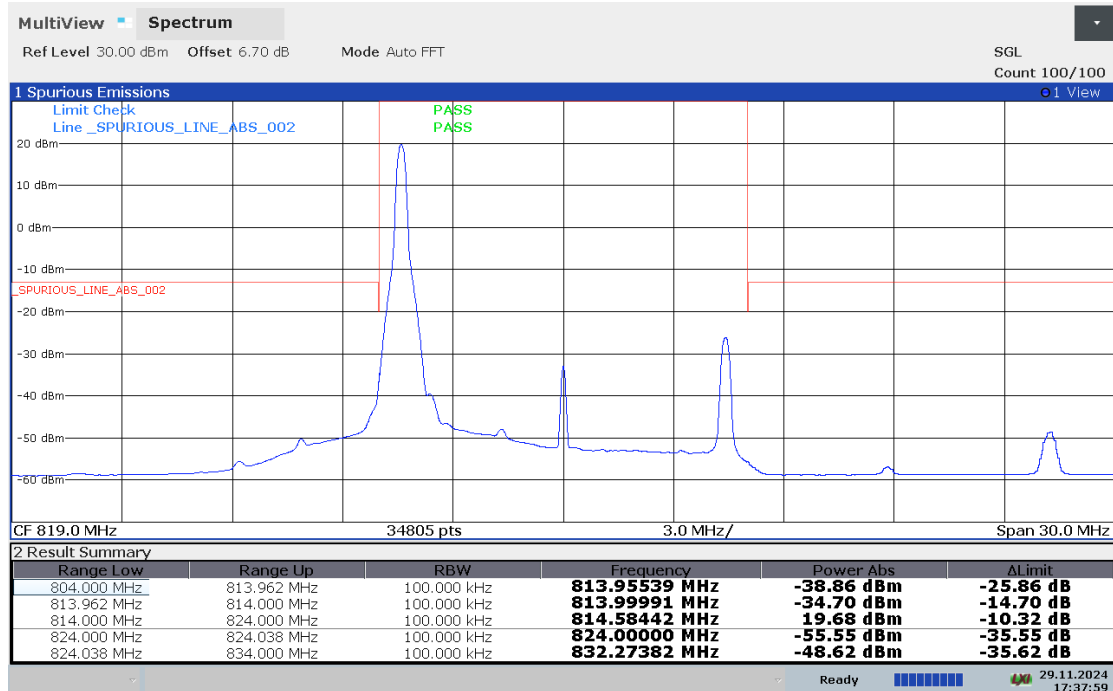


## HIGH BAND EDGE BLOCK-20MHz-100%RB

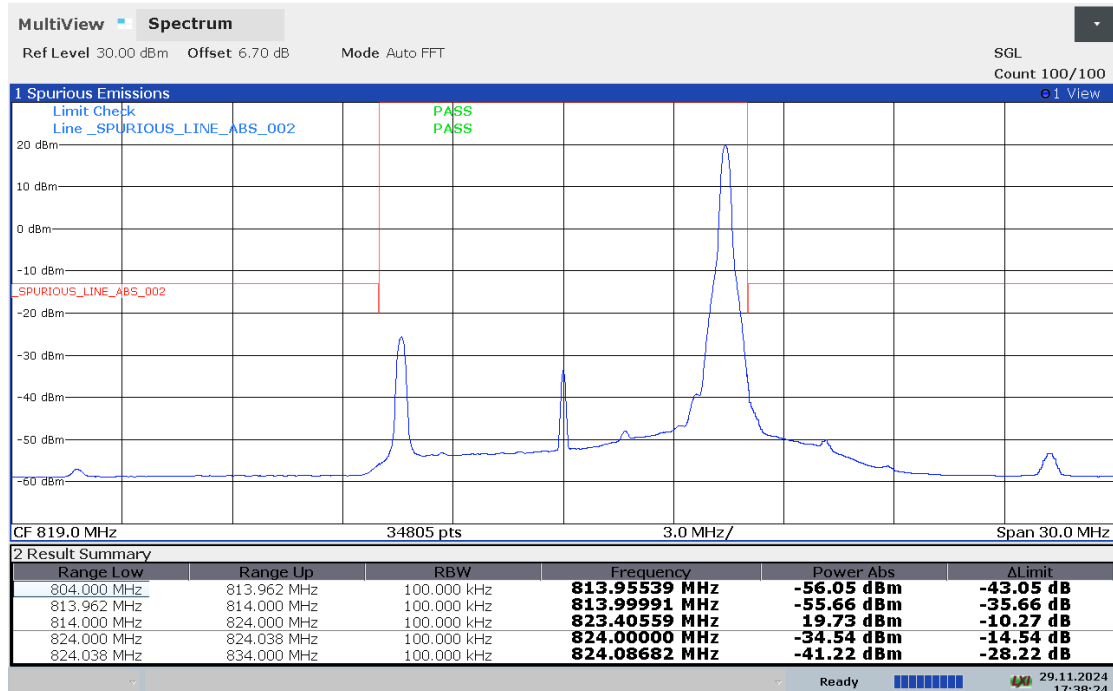


# LTE band 26(814MHz-824MHz)

## LOW BAND EDGE BLOCK-1RB-low\_offset

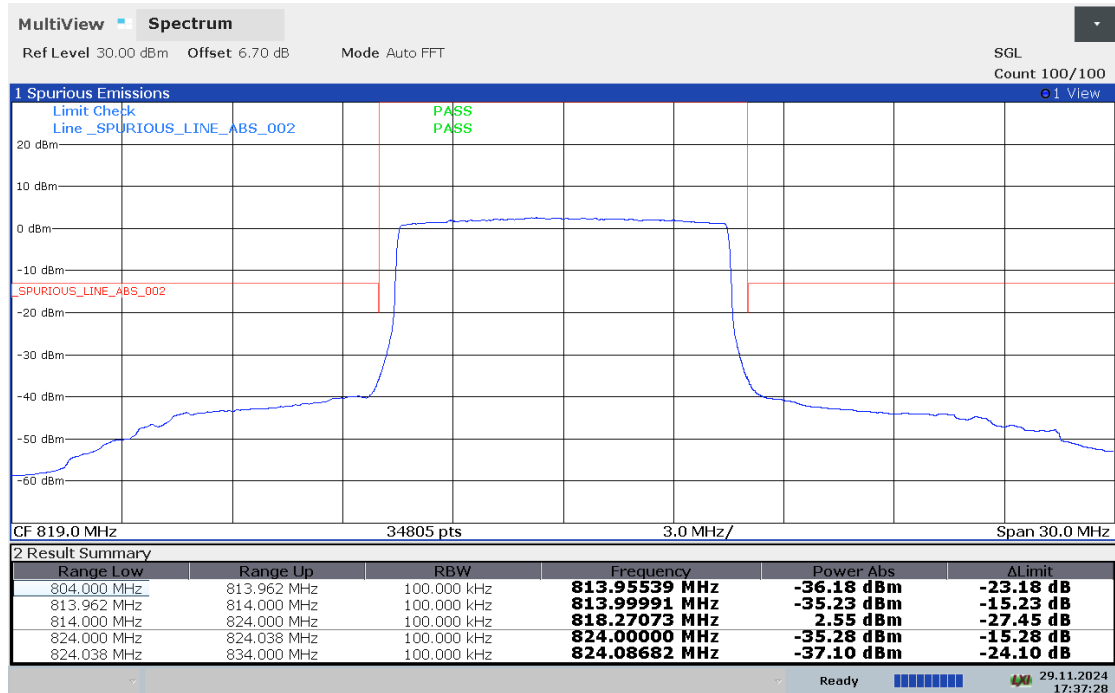


## HIGH BAND EDGE BLOCK-1RB-high\_offset





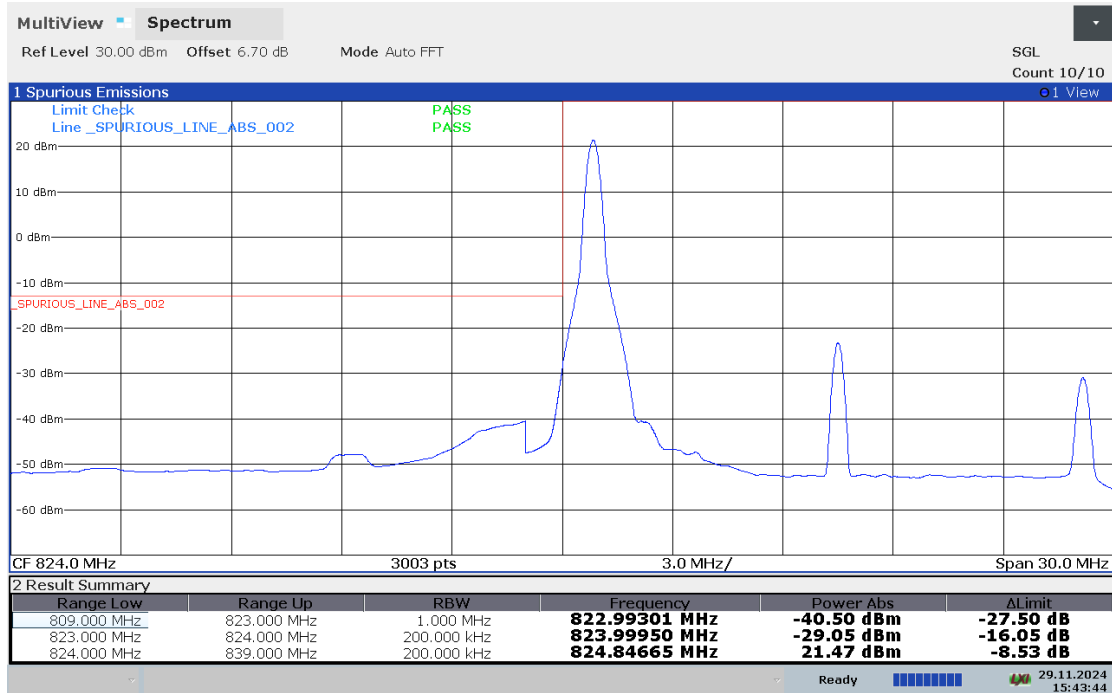
## BAND EDGE BLOCK-10MHz-100%RB



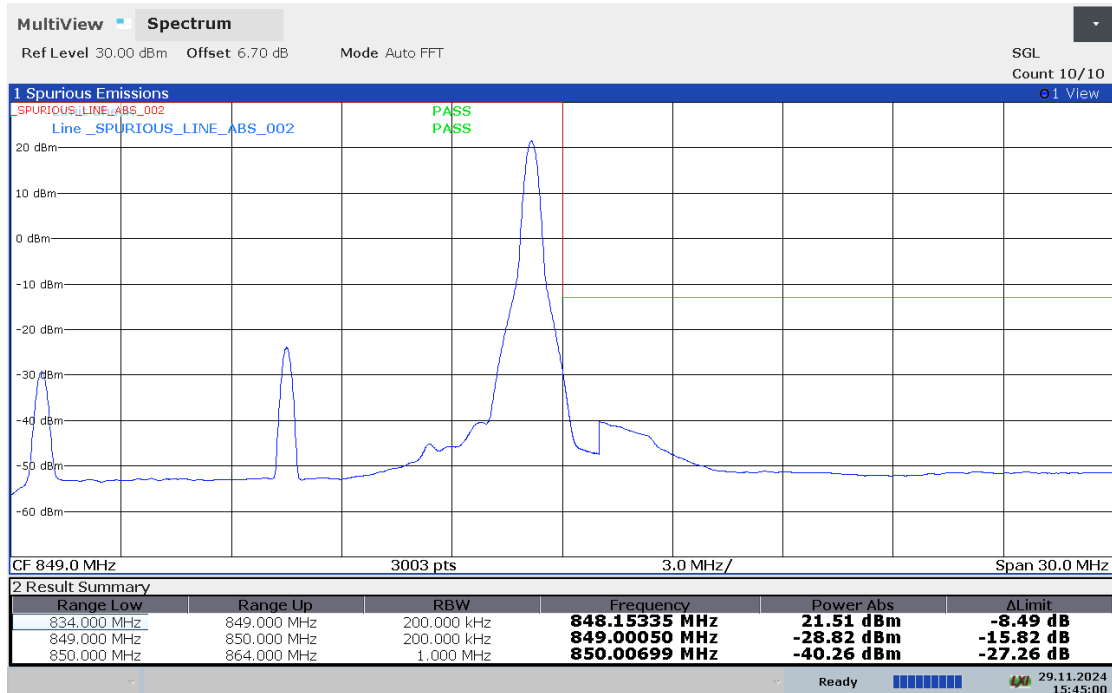


## LTE band 26(824MHz-849MHz)

## LOW BAND EDGE BLOCK-1RB-low\_offset

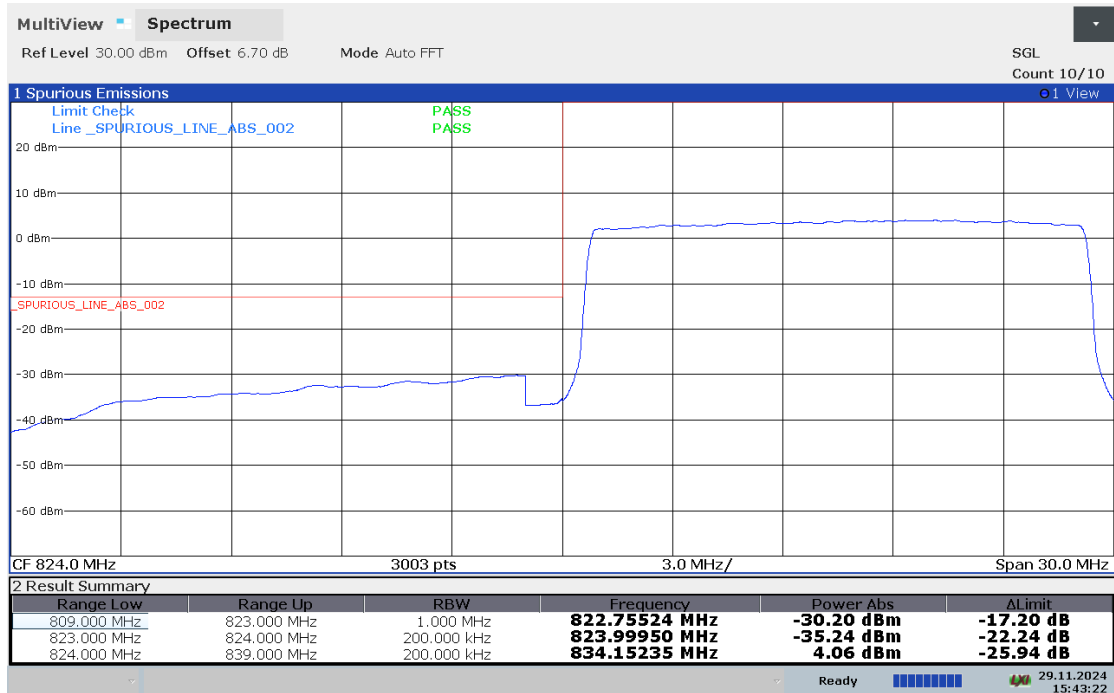


## HIGH BAND EDGE BLOCK-1RB-high\_offset

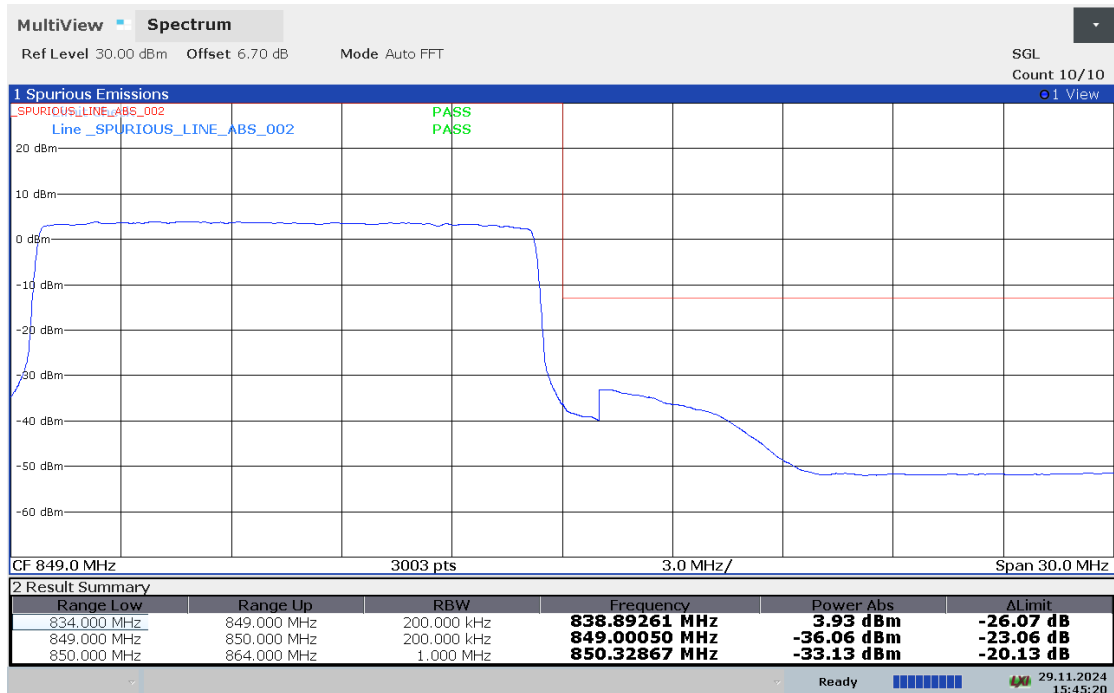




## LOW BAND EDGE BLOCK-15MHz-100%RB

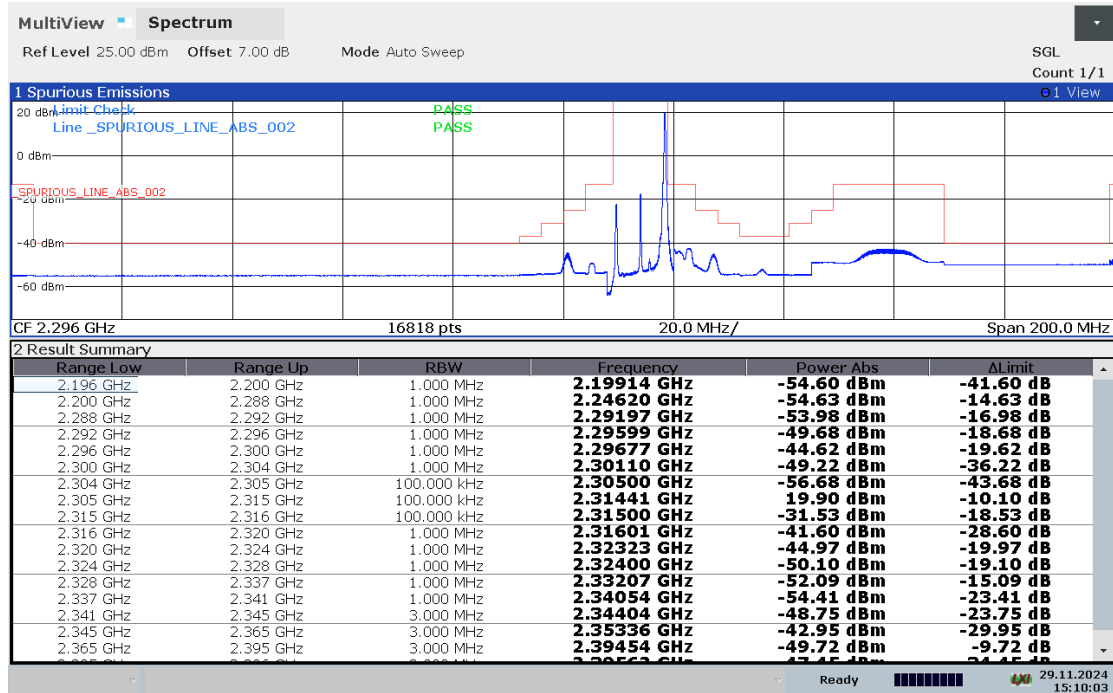


## HIGH BAND EDGE BLOCK-15MHz-100%RB

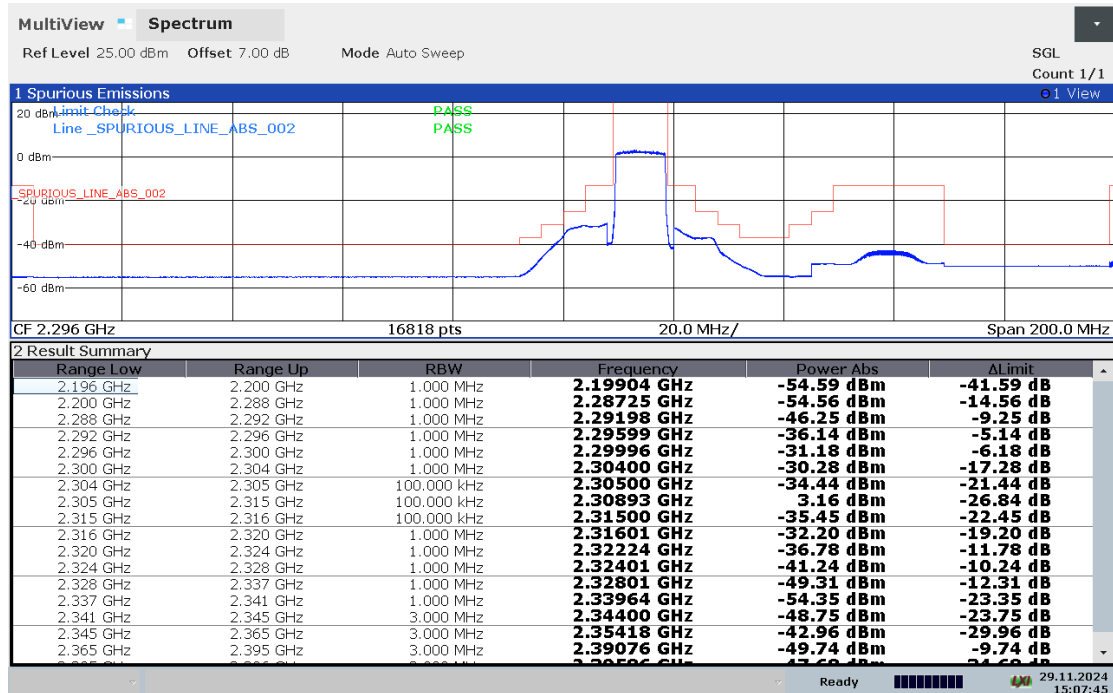


# LTE band 30

## LOW BAND EDGE BLOCK-1RB-low\_offset

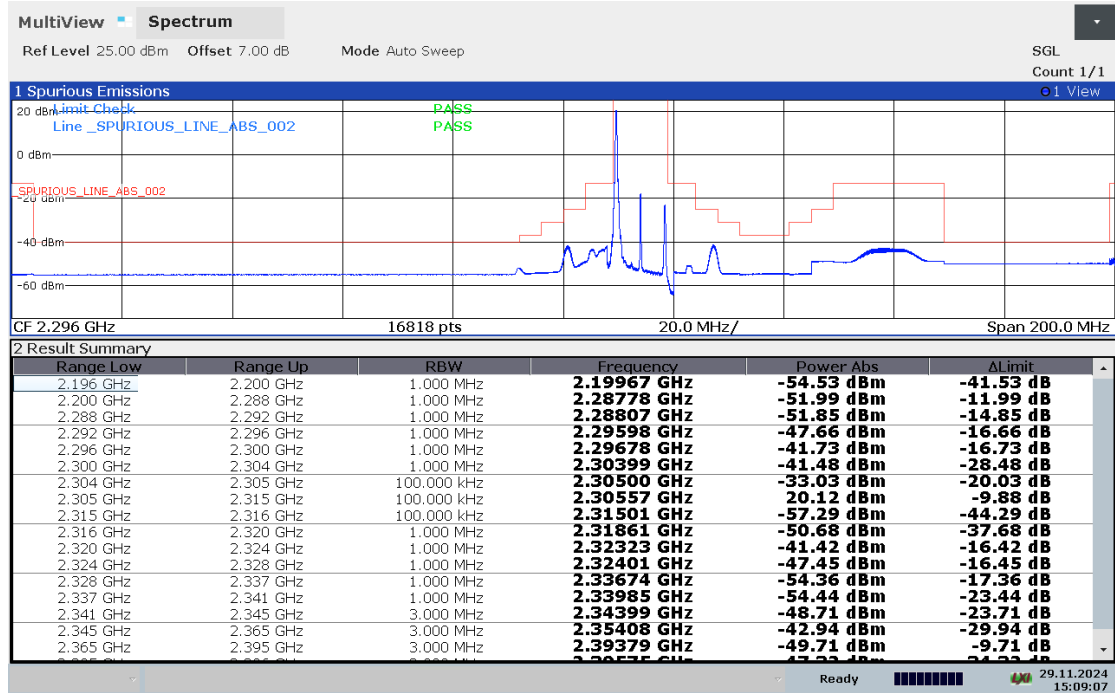


## HIGH BAND EDGE BLOCK-1RB-high\_offset



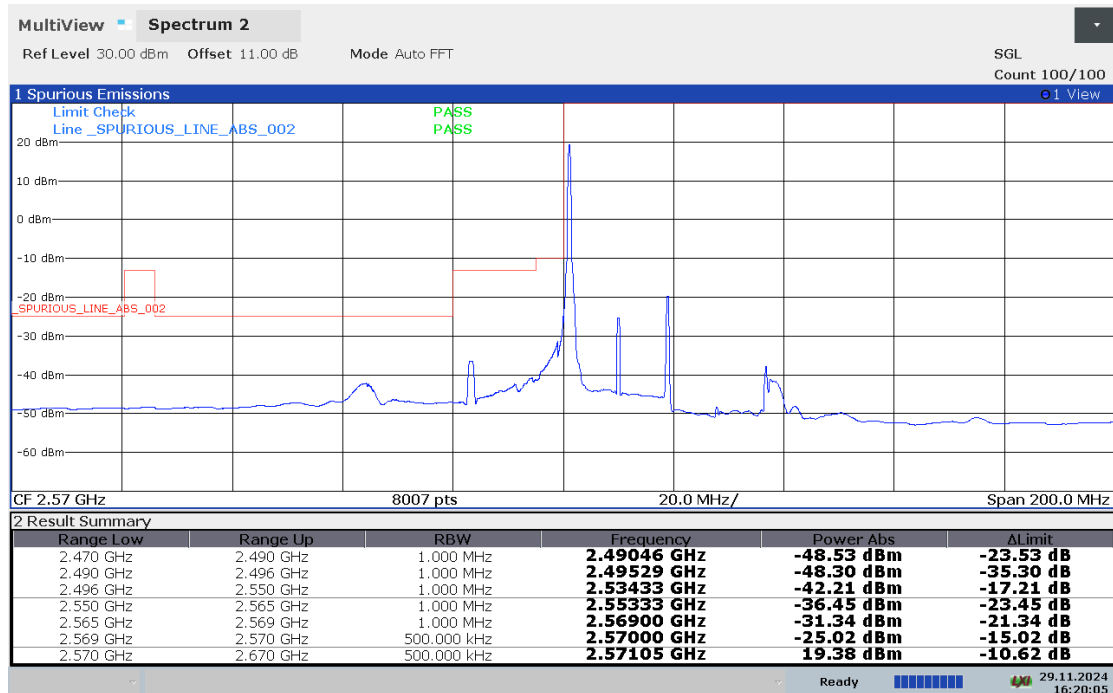


## EDGE BLOCK-10MHz-100%RB

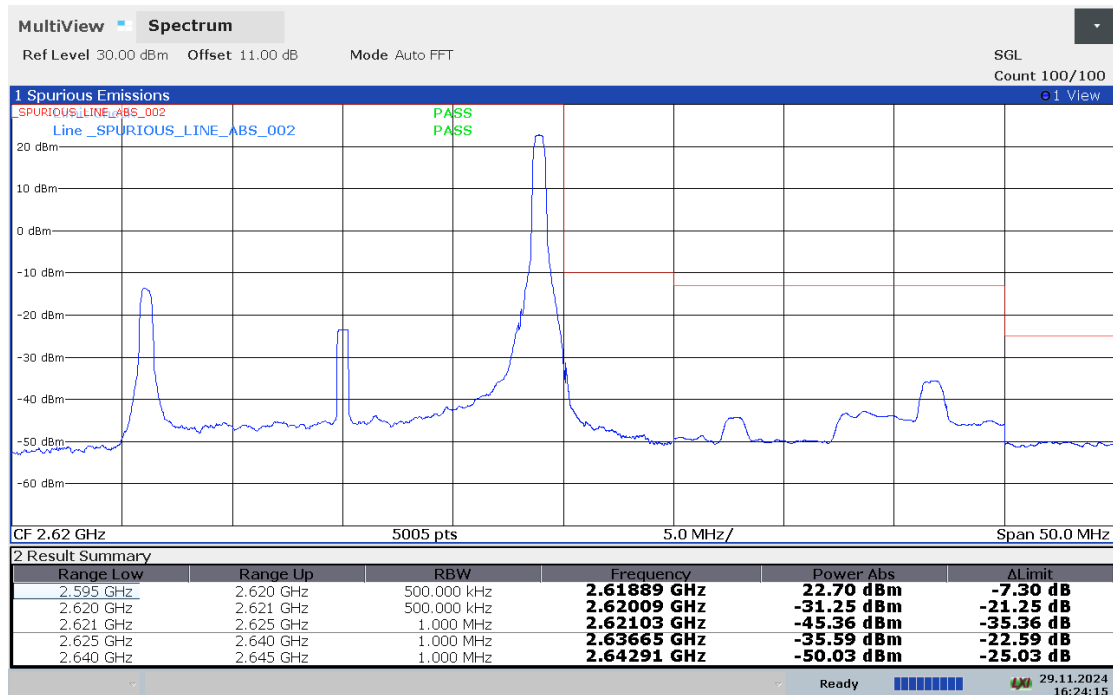


# LTE band 38

## LOW BAND EDGE BLOCK-1RB-low\_offset

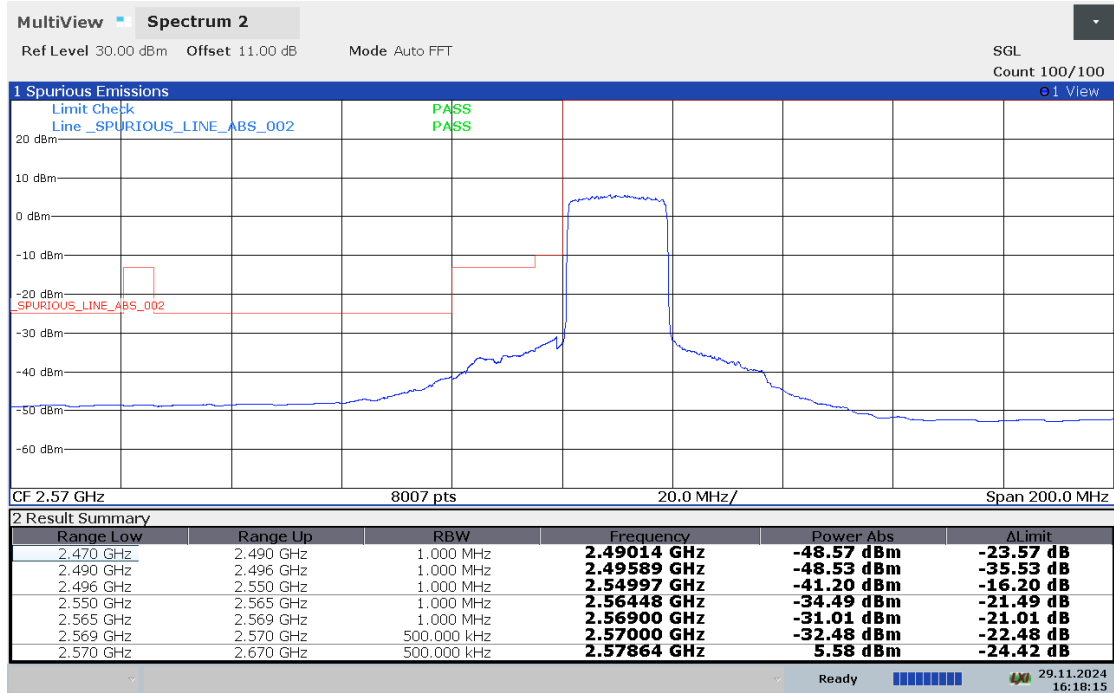


## HIGH BAND EDGE BLOCK-1RB-high\_offset

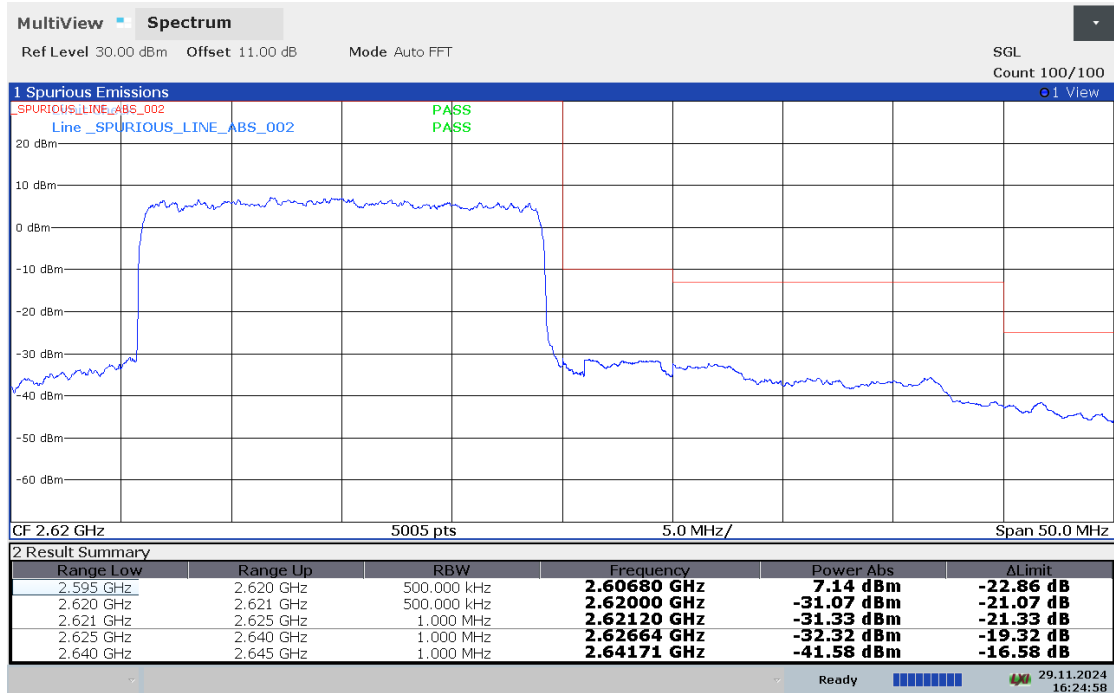




## LOW BAND EDGE BLOCK-20MHz-100%RB



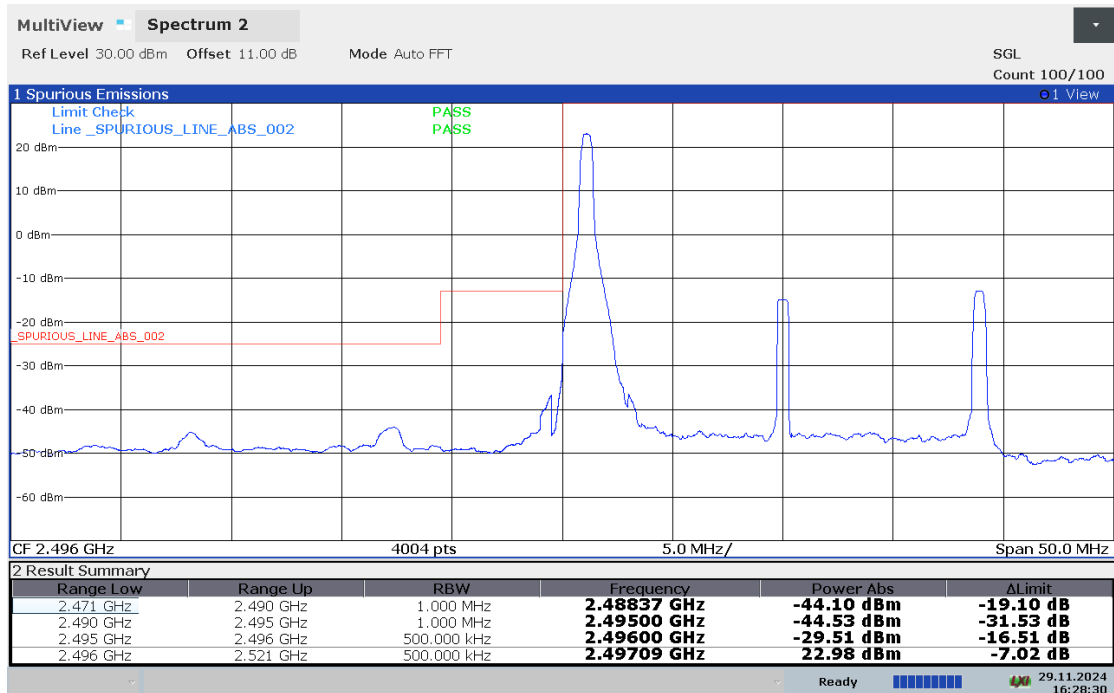
## HIGH BAND EDGE BLOCK-20MHz-100%RB



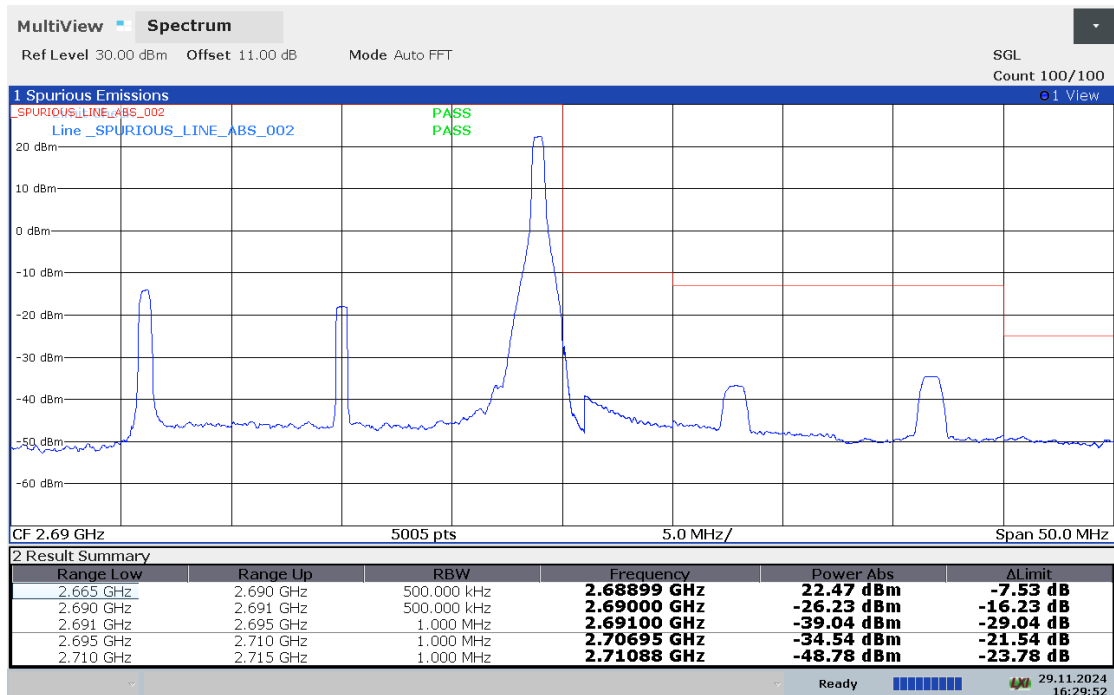


## LTE band 41

## LOW BAND EDGE BLOCK-1RB-low\_offset

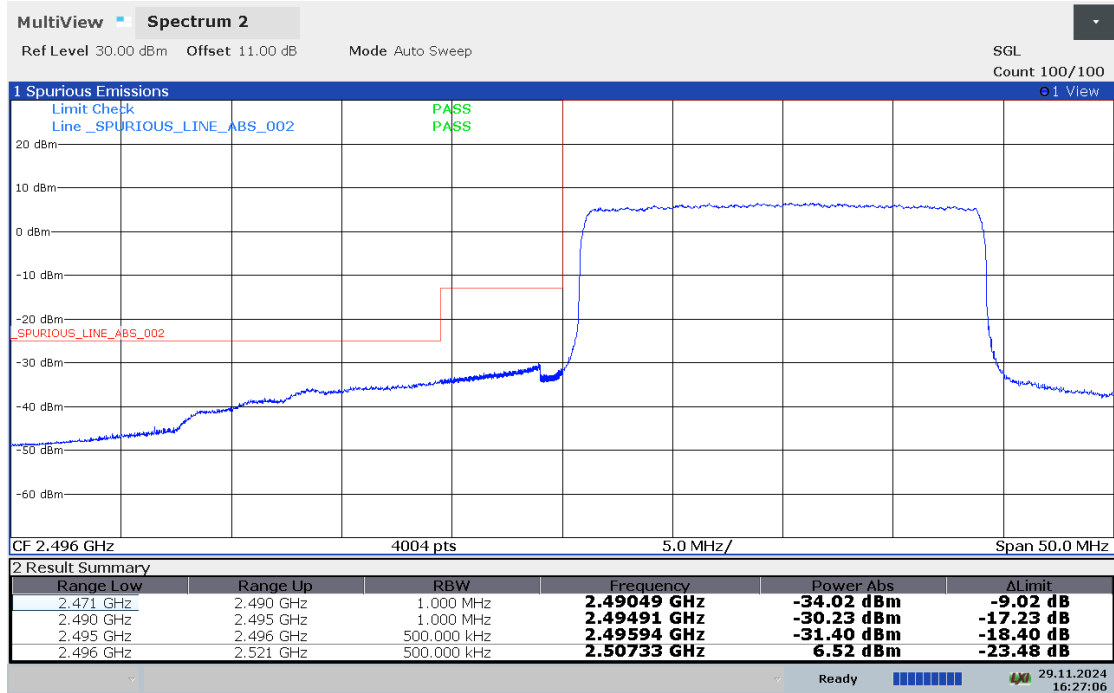


## HIGH BAND EDGE BLOCK-1RB-high\_offset

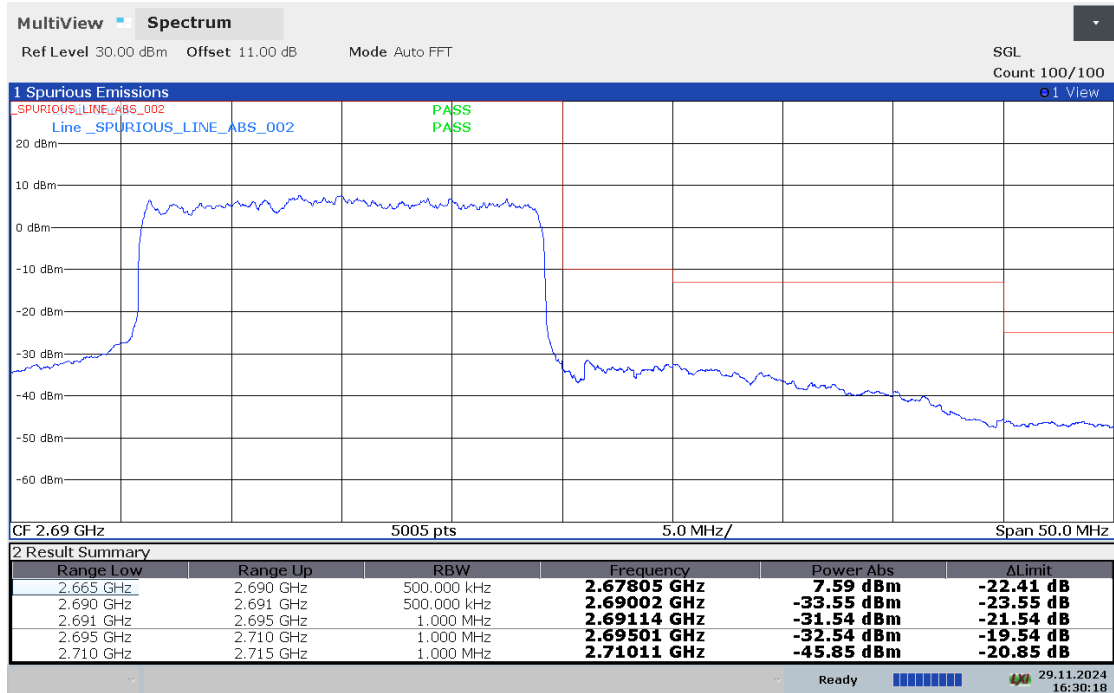




## LOW BAND EDGE BLOCK-20MHz-100%RB



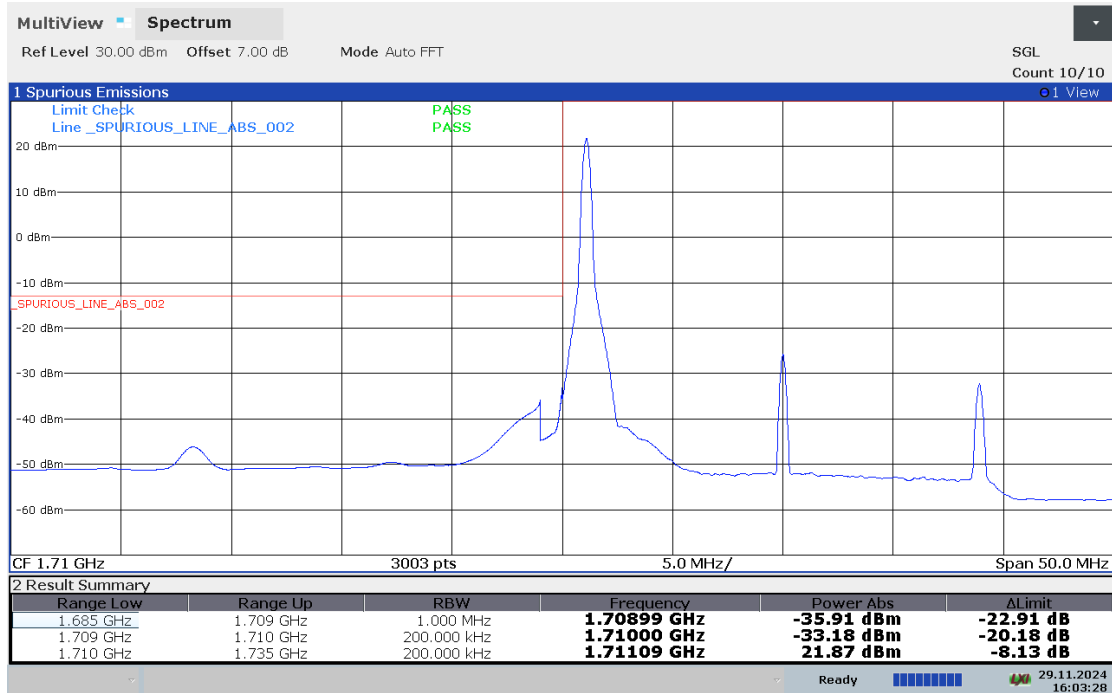
## HIGH BAND EDGE BLOCK-20MHz-100%RB



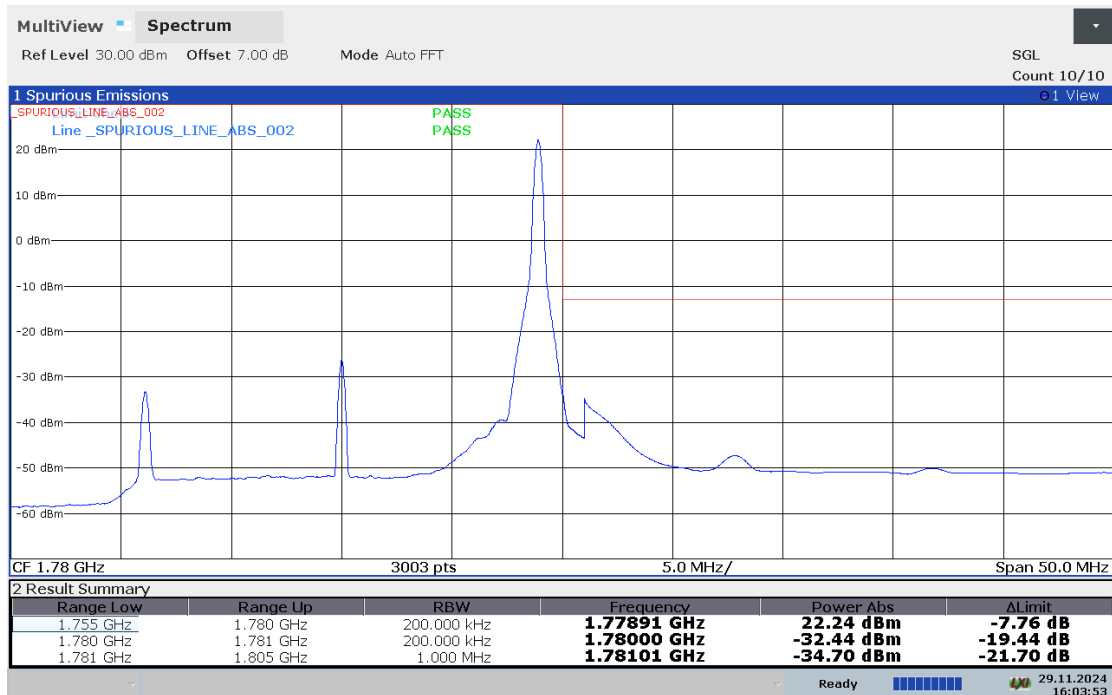


## LTE band 66

### LOW BAND EDGE BLOCK-1RB-low\_offset

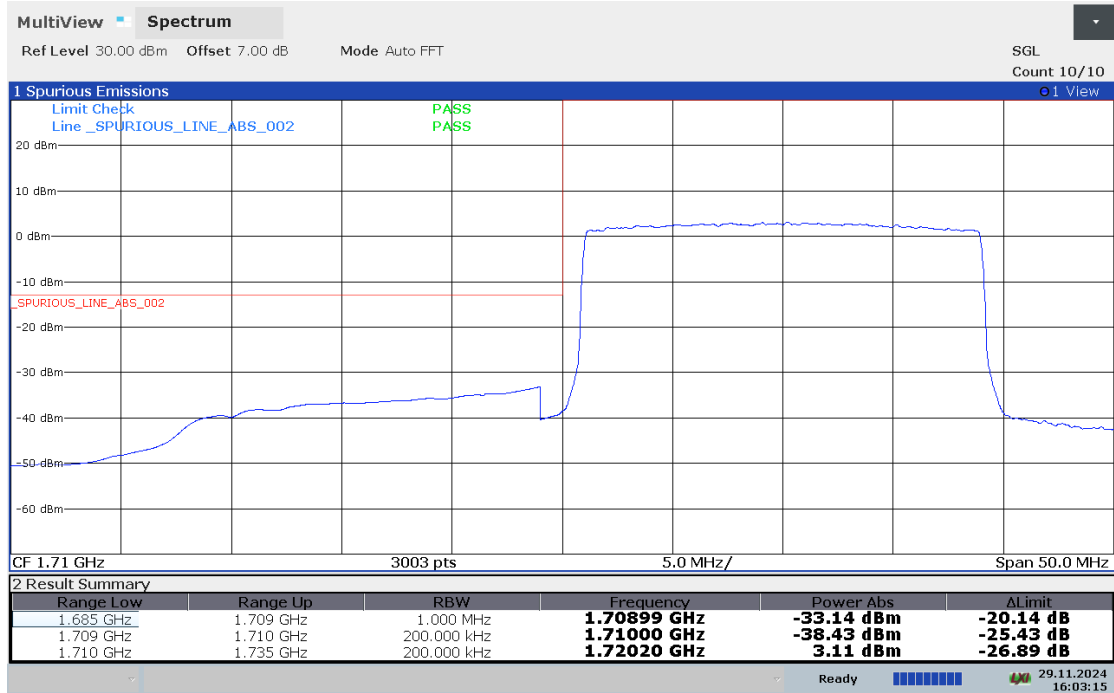


### HIGH BAND EDGE BLOCK-1RB-high\_offset

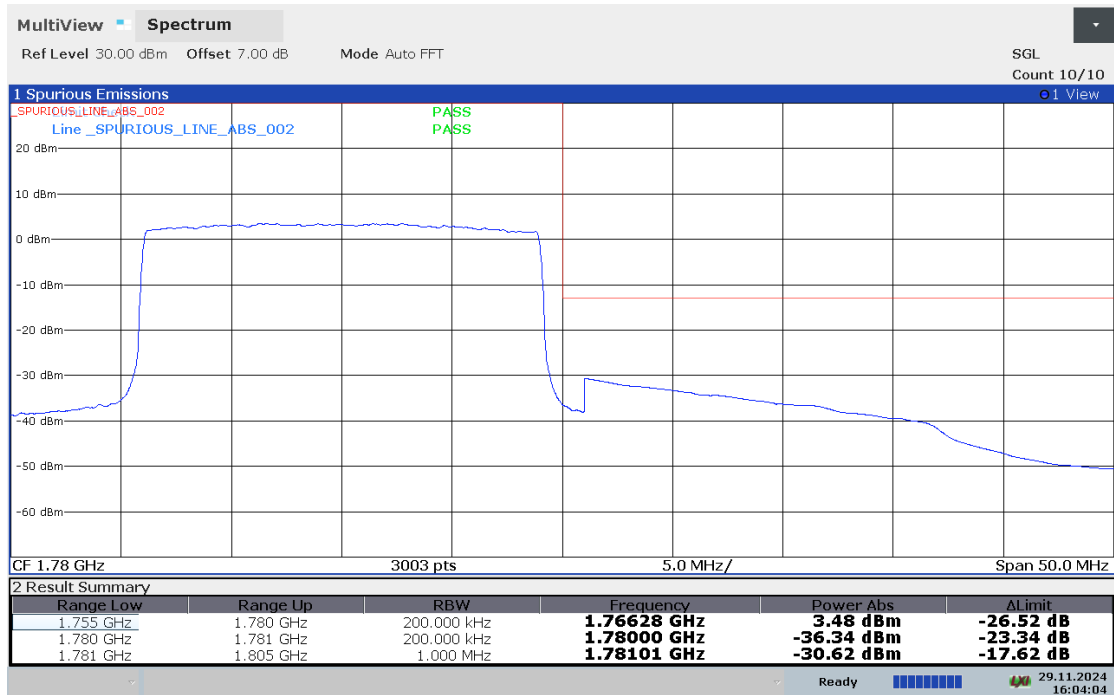




## LOW BAND EDGE BLOCK-20MHz-100%RB



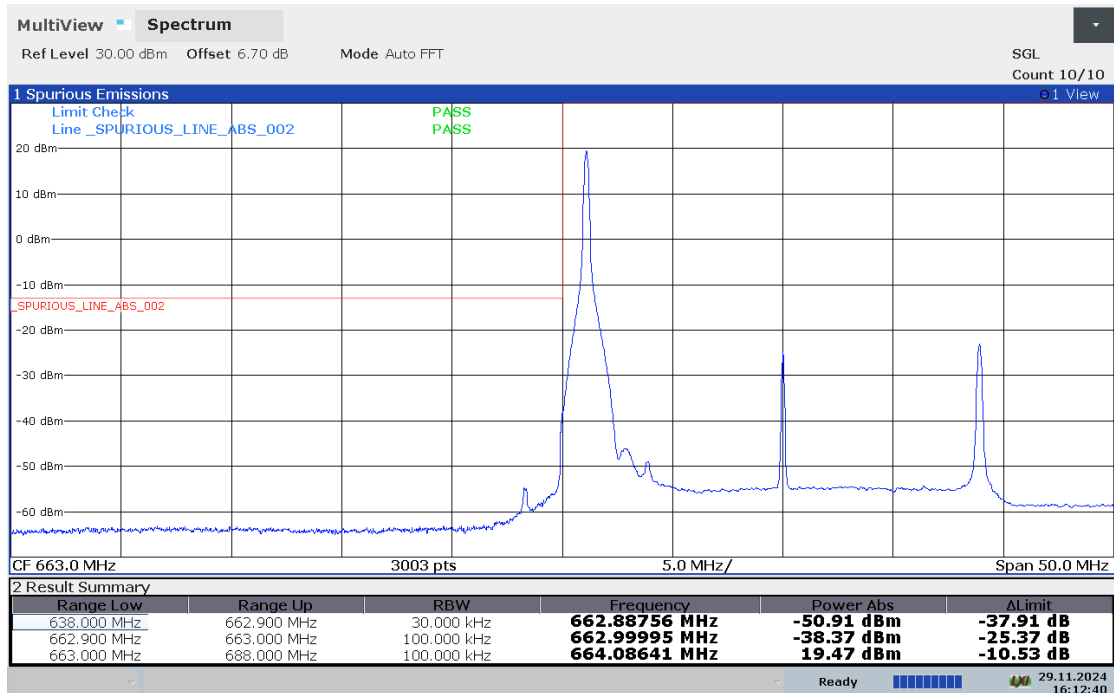
## HIGH BAND EDGE BLOCK-20MHz-100%RB



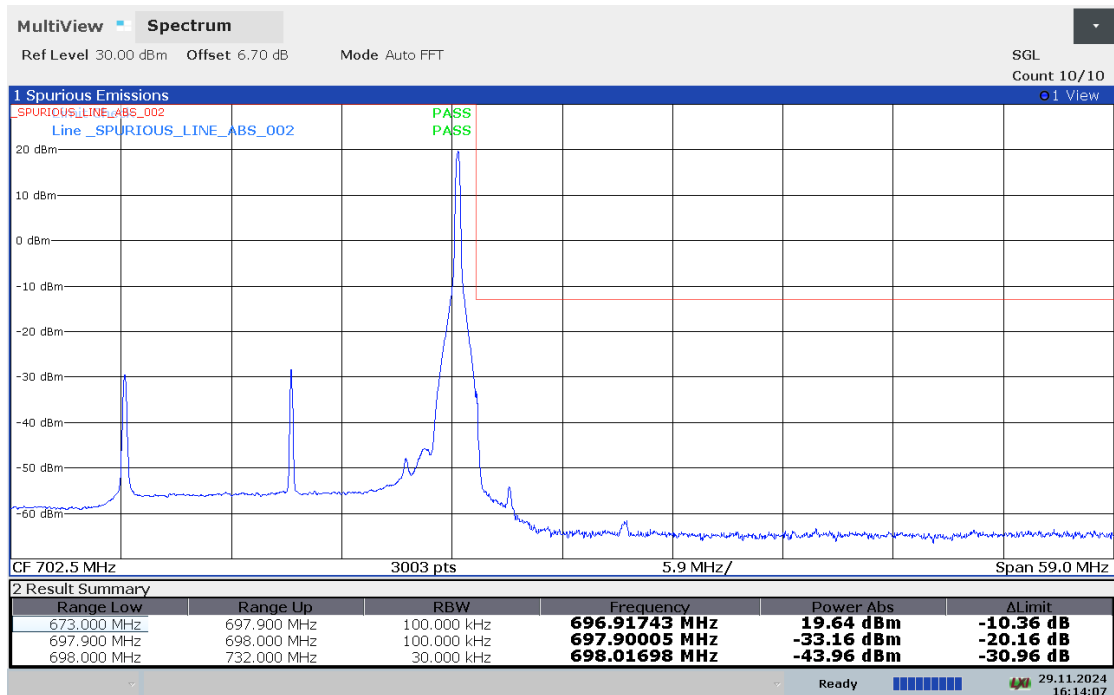


## LTE band 71

## LOW BAND EDGE BLOCK-1RB-low\_offset

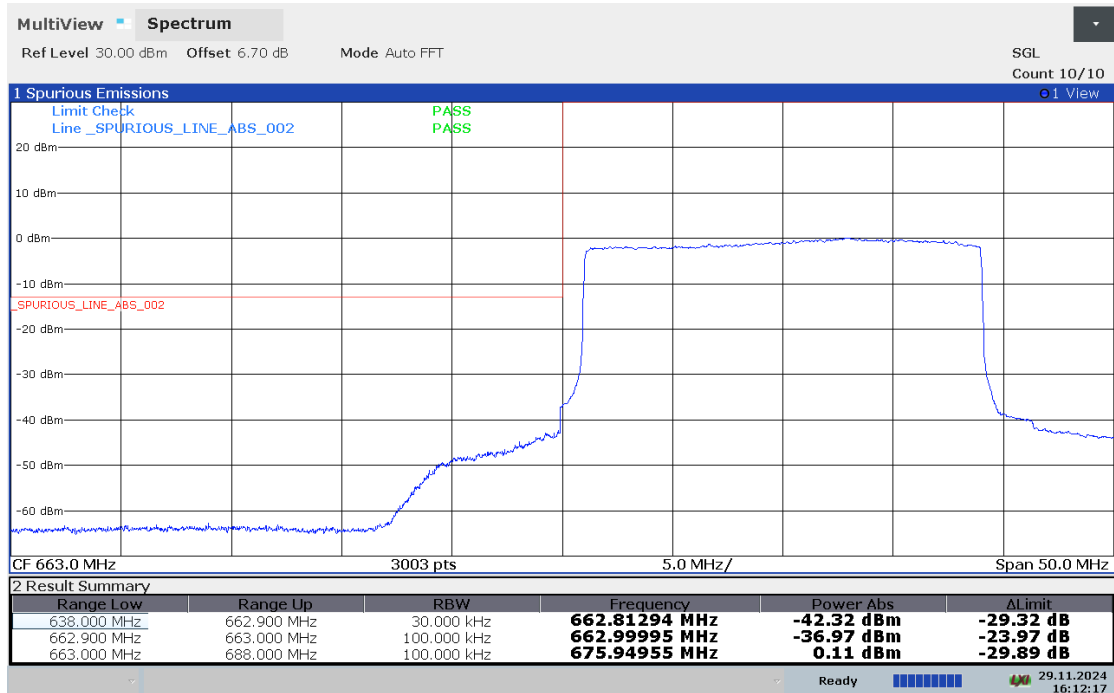


## HIGH BAND EDGE BLOCK-1RB-high\_offset

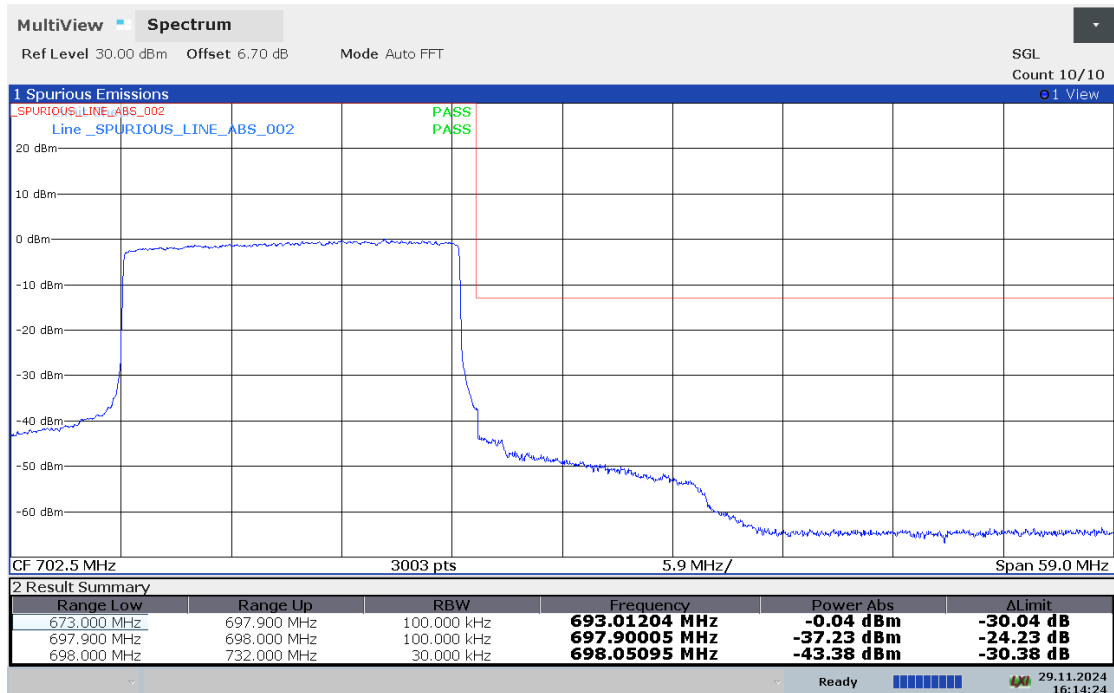




## LOW BAND EDGE BLOCK-20MHz-100%RB



## HIGH BAND EDGE BLOCK-20MHz-100%RB



Note: Expanded measurement uncertainty is  $U = 0.49\text{dB}(100\text{kHz}-2\text{GHz})/1.21\text{dB}(2\text{GHz}-26.5\text{GHz})$ ,  $k = 1.96$

## **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  $2 \times \text{span} / \text{RBW}$

### **A. 7.2 Measurement Limit**

**For Band2/25:** Part 24.238(a) 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.

**For Band4/66:** 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.

**For Band5/26(824MHz-849MHz):** Part 22.917(a) specify that for operations in the 824–849MHz band, the FCC limit is  $43 + 10 \log(P)$  dB below the transmitter power(P) in a 100kHz bandwidth. However, in the 1MHz 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.

**For Band7/38/41:** Part 27.53(m)(4) 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 than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5MHz. 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.

**For Band12/17/71:** Part 27.53(g) specifies 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.

**For Band13:** Part 27.53(c) specifies For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following:(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

**For Band14:** Part 90.543(e) specifies For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the 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, in accordance with the following:(1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations.(2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.(3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least  $43 + 10 \log (P)$  dB.(4) Compliance with the provisions of paragraphs (e)(1) and (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.(5) Compliance with the provisions of paragraph (e)(3) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 30 kHz may be employed.

**For Band26(814MHz-824MHz):** Part 90.691(a) specifies (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

**For Band30:** Part 27.53(a)(4) specifies For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands: (i) By a factor of not less than:  $43 + 10 \log (P)$  dB on

all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log (P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log (P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log (P)$  dB on all frequencies between 2328 and 2337 MHz;(ii) By a factor of not less than  $43 + 10 \log (P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log (P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log (P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log (P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log (P)$  dB below 2288 MHz;(iii) By a factor of not less than  $43 + 10 \log (P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log (P)$  dB above 2365 MHz.

The spectrum analyzer readings are corrected by  $[10 \log (1/\text{duty cycle})]$  for the non-continuous transmitting scenario.

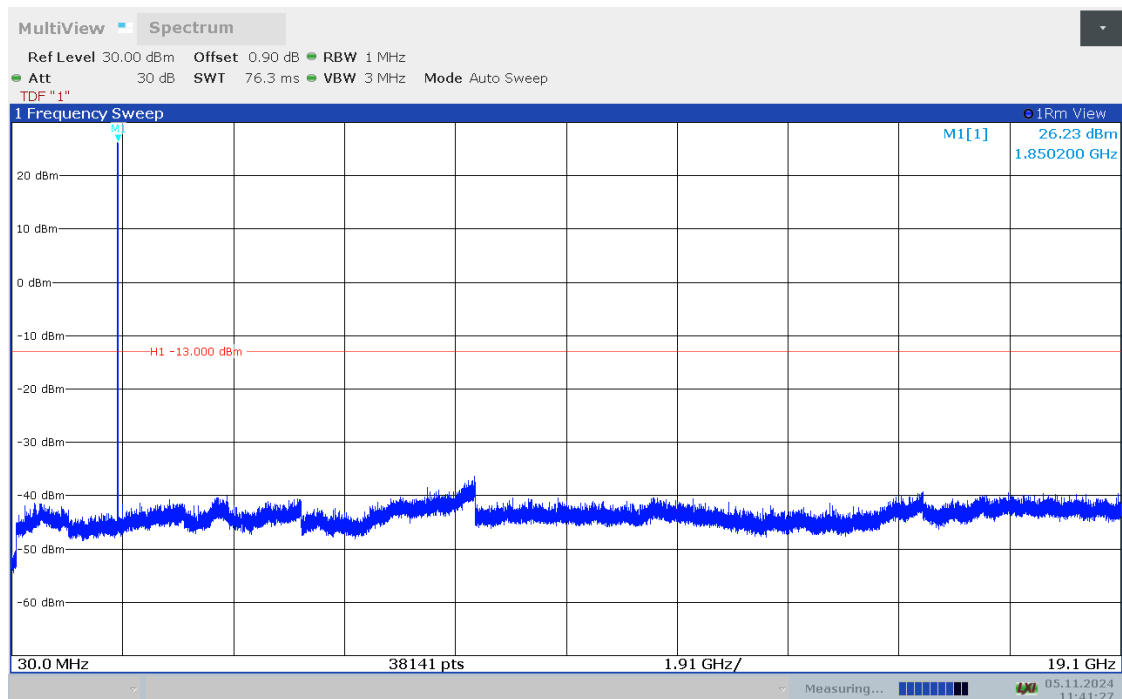
### A. 7.3 Measurement result

Only worst case result is given below

LTE band 2 : 30MHz – 19.1GHz

Spurious emission limit –13dBm.

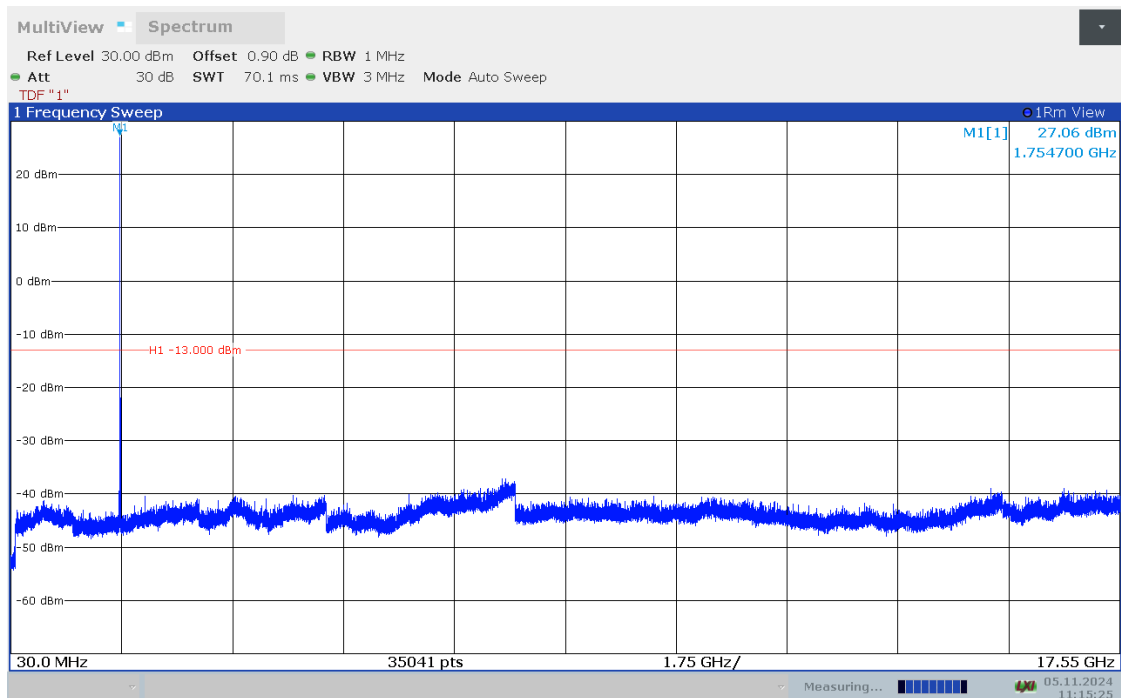
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 4 : 30MHz – 17.55GHz

Spurious emission limit –13dBm.

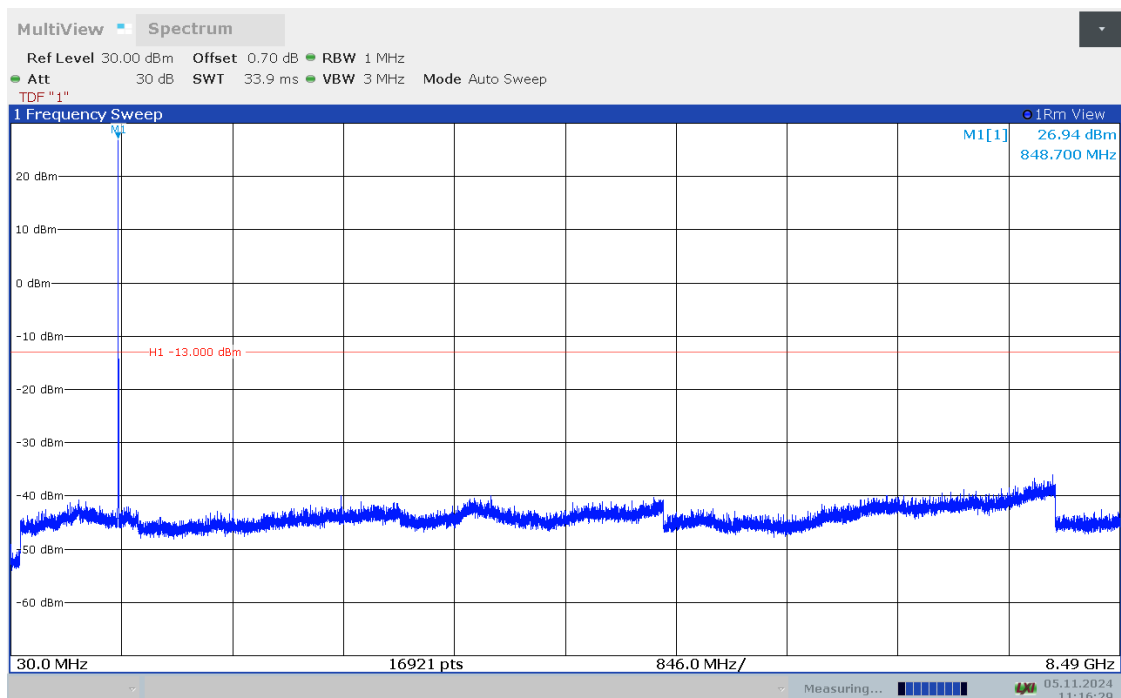
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 5 20MHz QPSK: 30MHz – 8.49GHz

Spurious emission limit –25dBm.

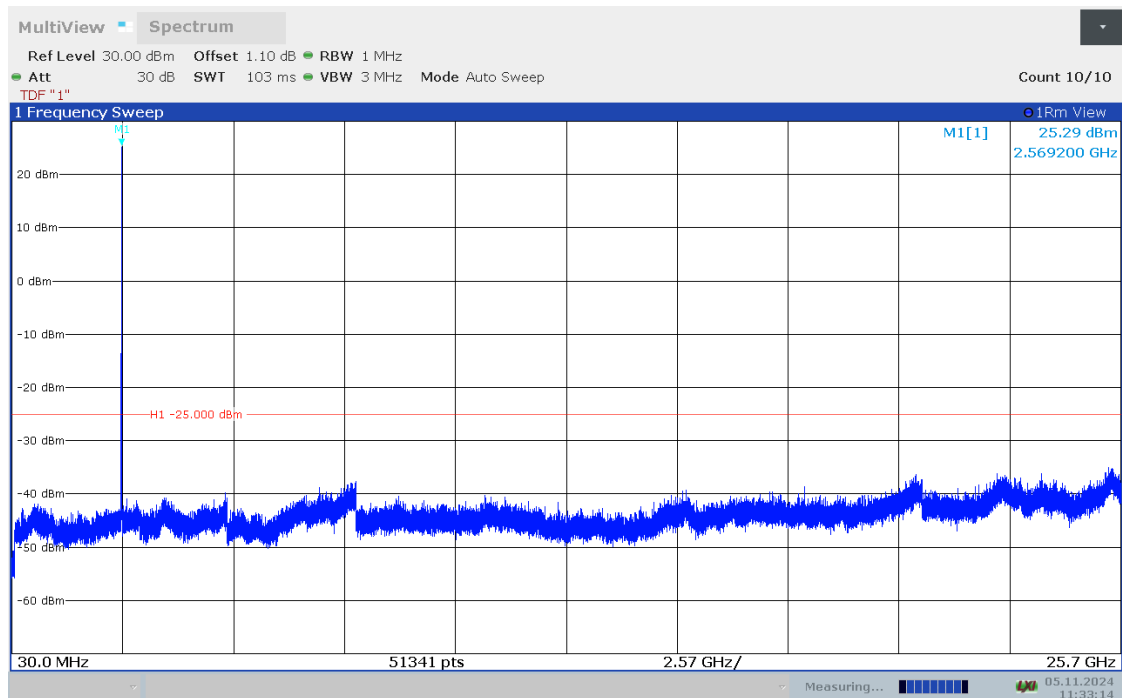
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 7 20MHz QPSK: 30MHz – 25.7GHz

Spurious emission limit –25dBm.

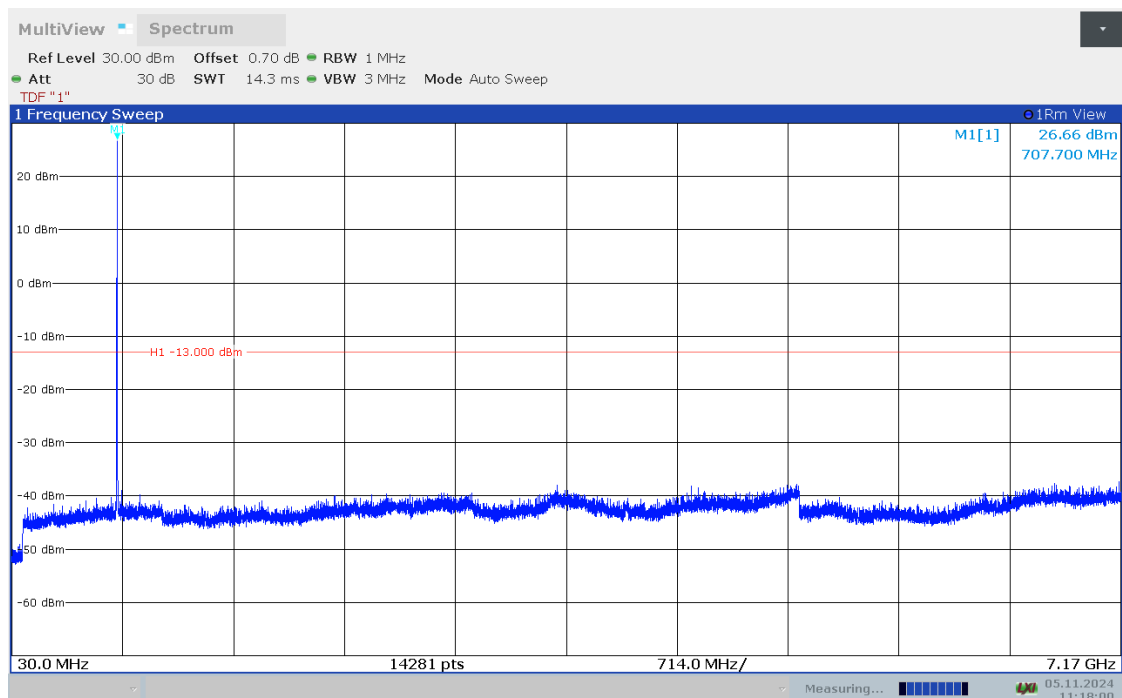
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 12: 30MHz – 7.16GHz

Spurious emission limit –13dBm.

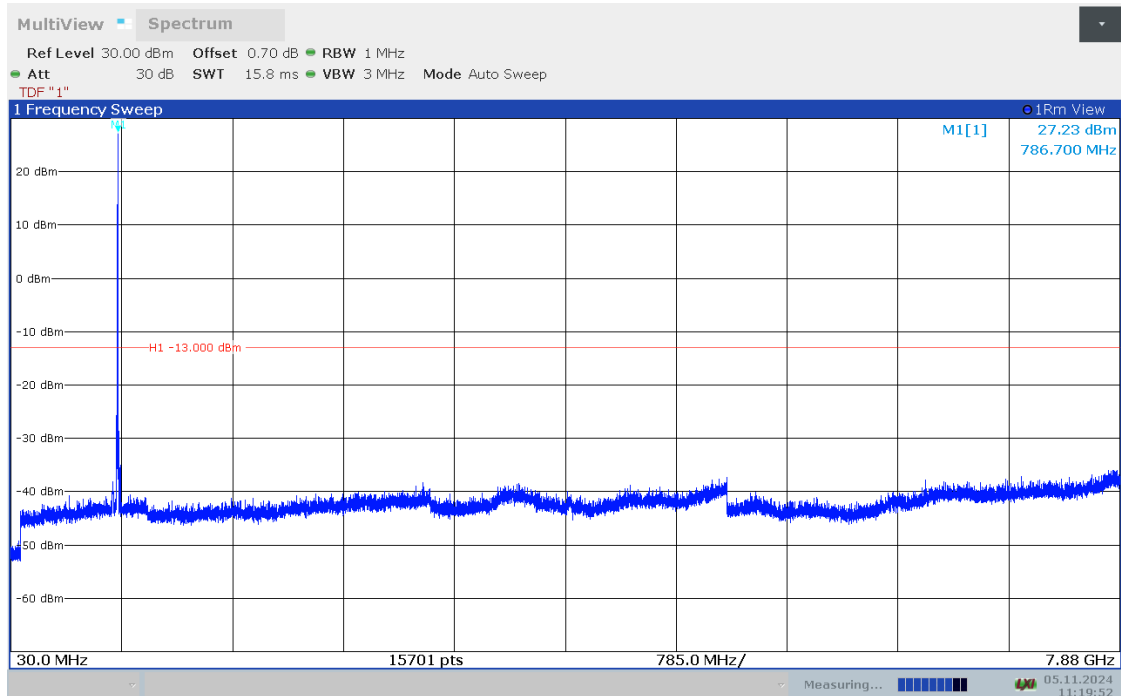
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 13: 30MHz – 7.87GHz

Spurious emission limit –13dBm.

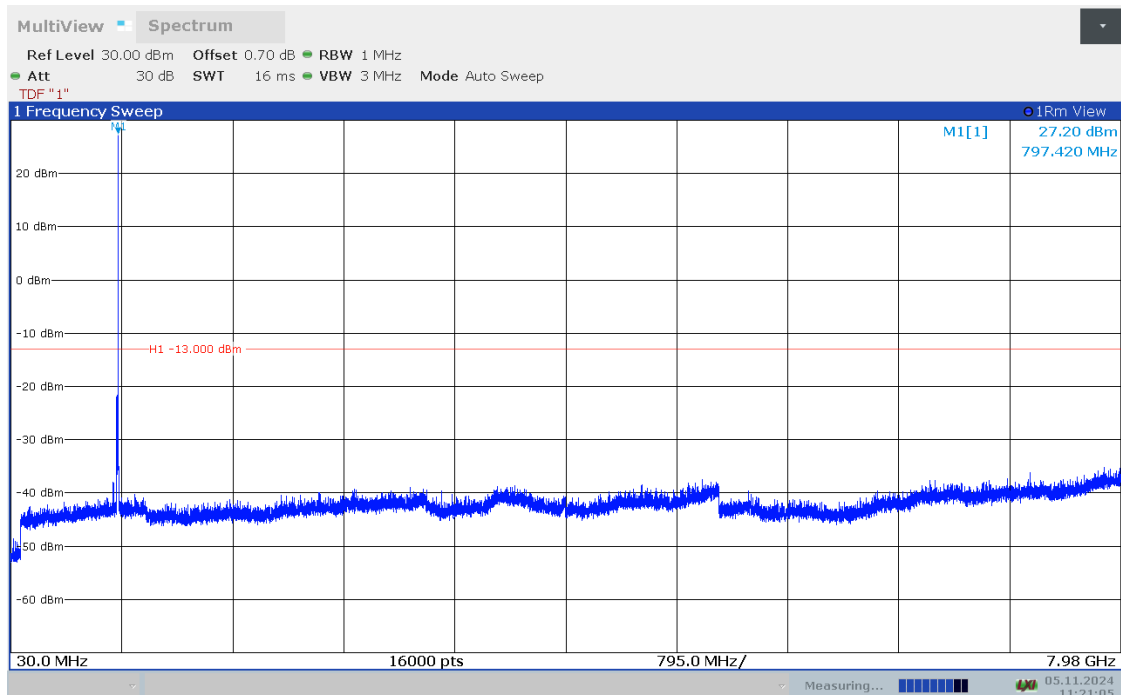
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 14: 30MHz – 7.98GHz

Spurious emission limit –13dBm.

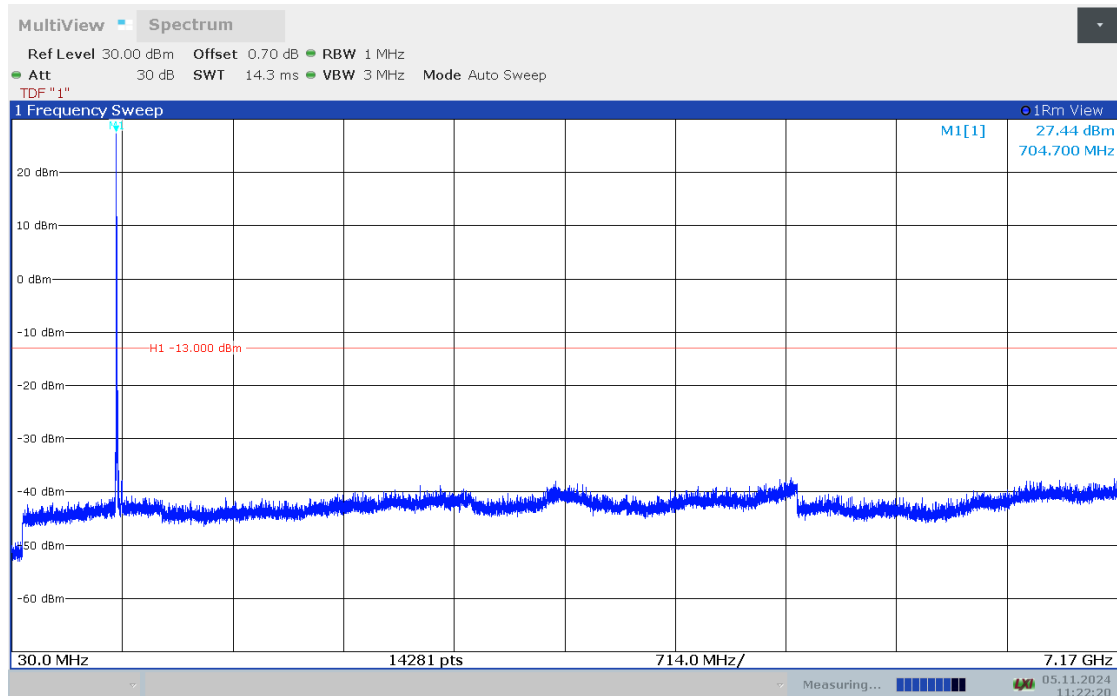
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 17: 30MHz – 7.17GHz

Spurious emission limit –13dBm.

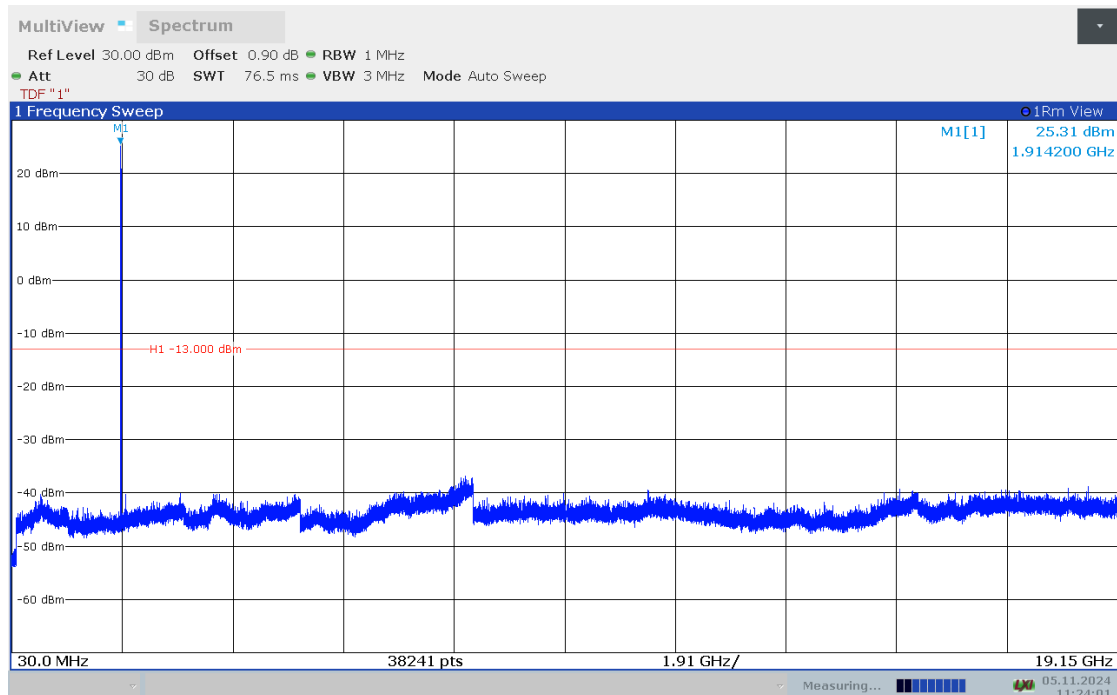
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 25: 30MHz – 19.15GHz

Spurious emission limit –13dBm.

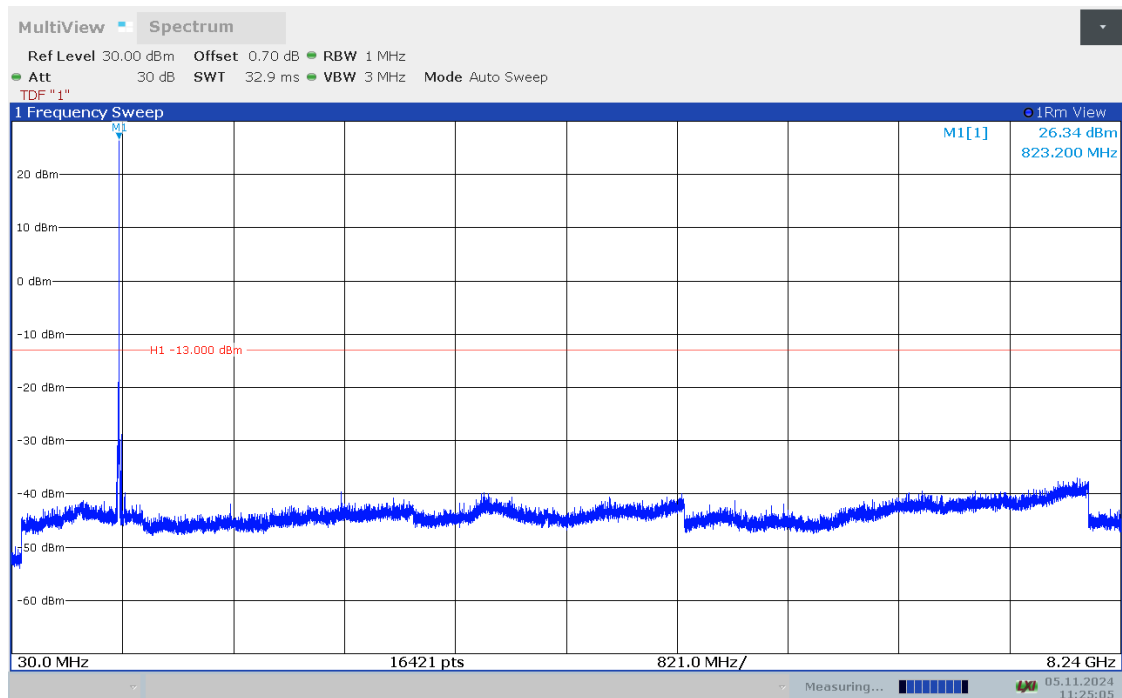
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 26(814MHz-824MHz): 30MHz – 8.24GHz

Spurious emission limit –13dBm.

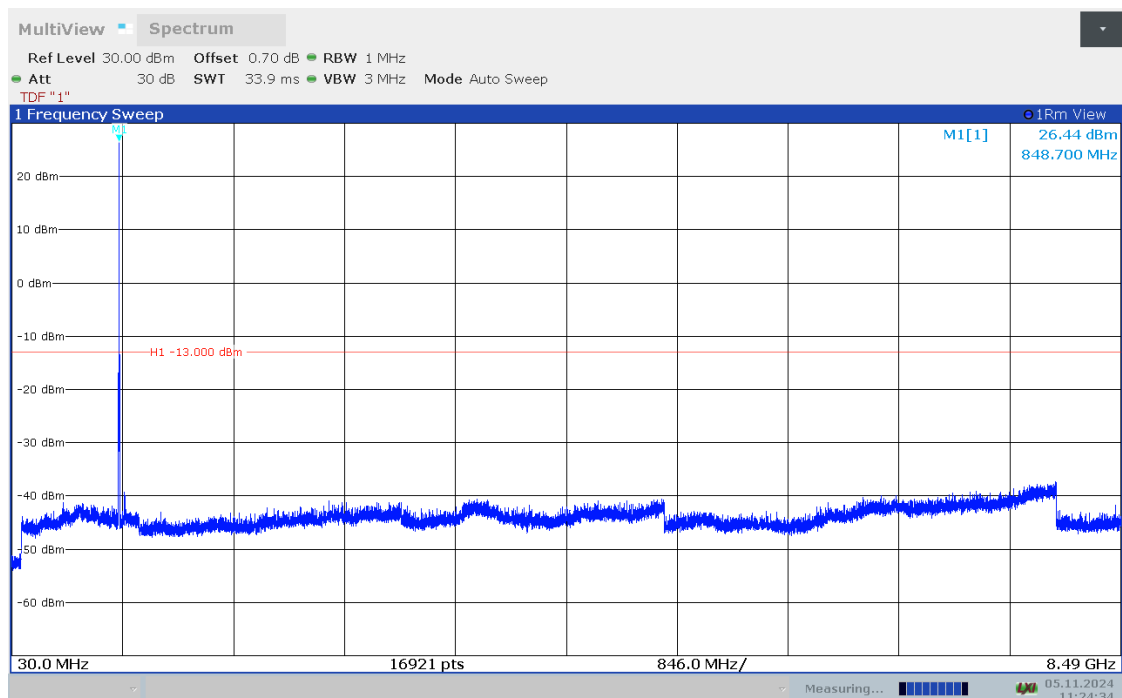
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 26(824MHz-849MHz): 30MHz – 8.49GHz

Spurious emission limit –13dBm.

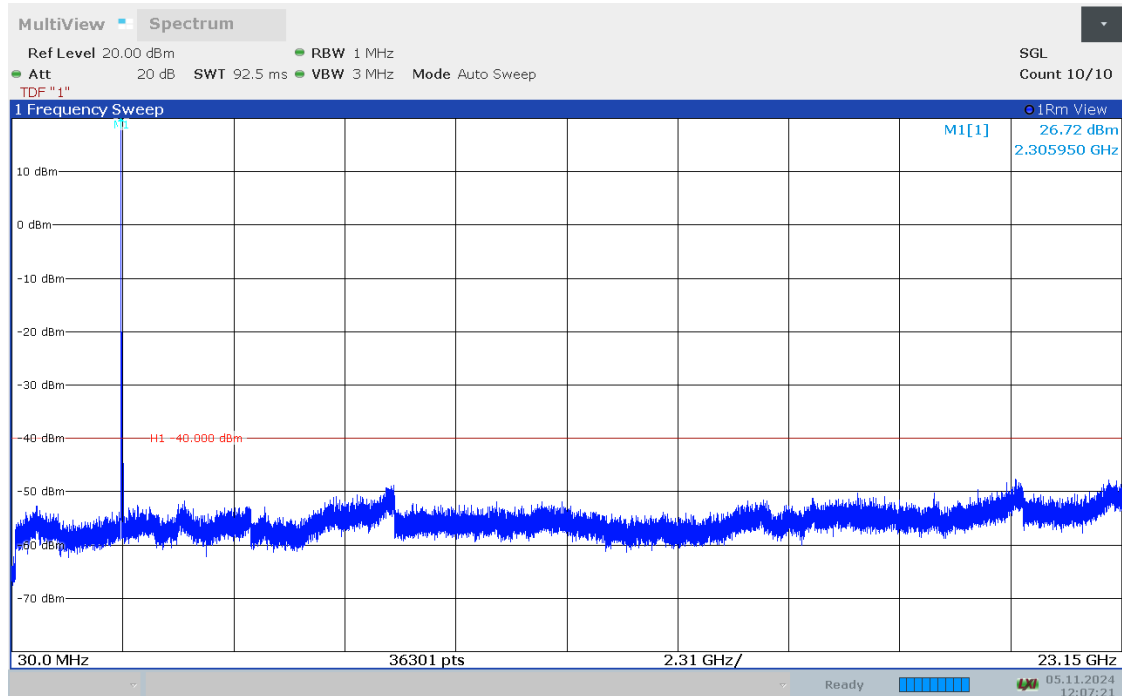
**NOTE: peak above the limit line is the carrier frequency.**



### LTE band 30: 30MHz – 23.15GHz

Spurious emission limit –40dBm.

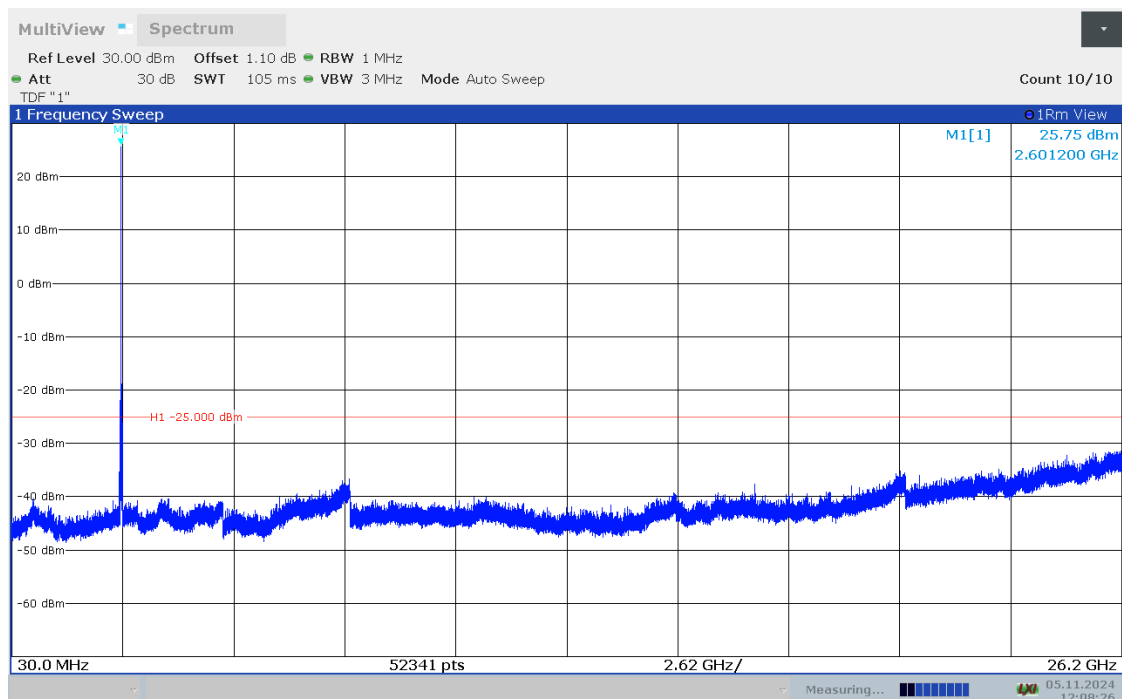
**NOTE:** peak above the limit line is the carrier frequency.



### LTE band 38: 30MHz – 26.2GHz

Spurious emission limit –25dBm.

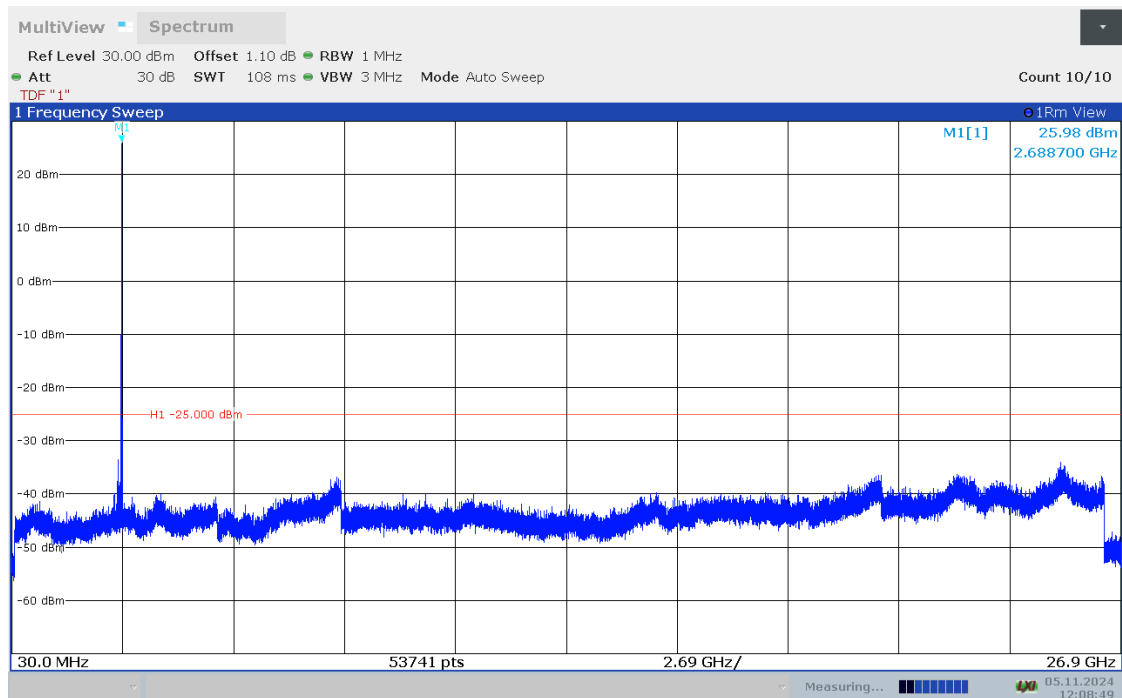
**NOTE:** peak above the limit line is the carrier frequency.



### LTE band 41: 30MHz – 26.9GHz

Spurious emission limit –25dBm.

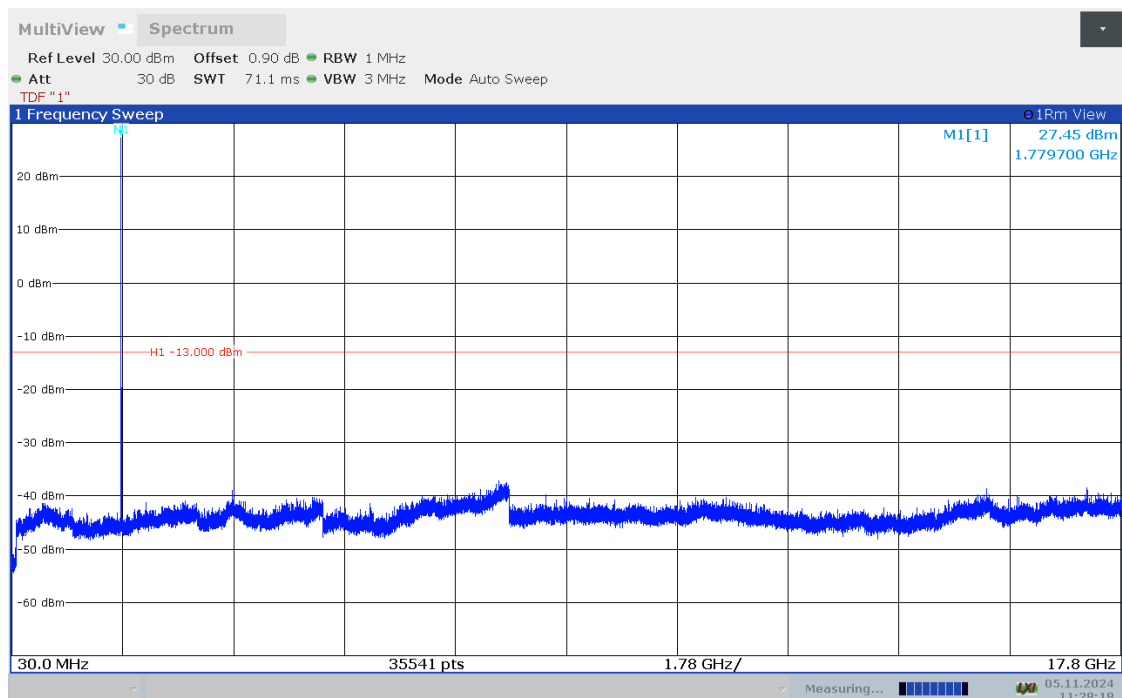
**NOTE: peak above the limit line is the carrier frequency.**



### LTE Band 66: 30MHz – 17.8GHz

Spurious emission limit –13dBm.

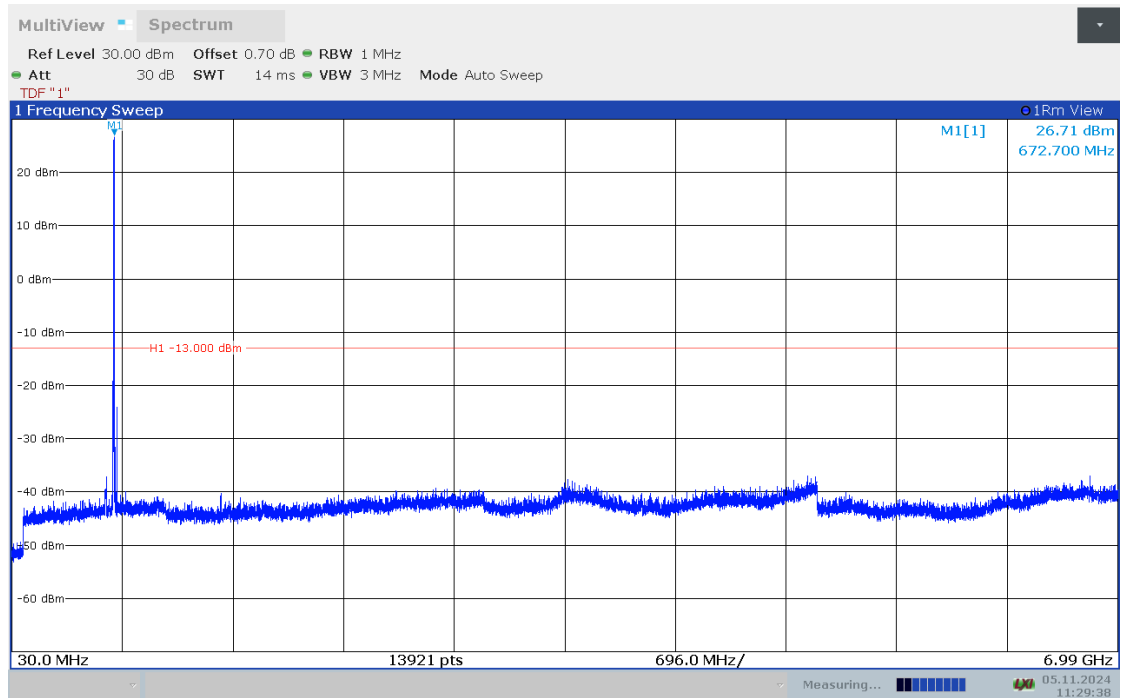
**NOTE: peak above the limit line is the carrier frequency.**



# LTE Band 71: 30MHz – 6.99GHz

Spurious emission limit –13dBm.

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



## A.8 PEAK-TO-AVERAGE POWER RATIO

### Reference

FCC: CFR Part 24.232, 27.50(d), KDB971168 D01(5.7).

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

- Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
- Set the number of counts to a value that stabilizes the measured CCDF curve;
- Set the measurement interval to 1 ms
- Record the maximum PAPR level associated with a probability of 0.1%

### A.8.1 Measurement limit

not exceed 13 dB

### A.8.2 Measurement results

Only worst case result is given below

LTE band 2, 1.4MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1880	100%,0	5.86	6.52	6.84

LTE band 2 , 1.4MHz Bandwidth,QPSK



### LTE band 2 , 1.4MHz Bandwidth,16QAM



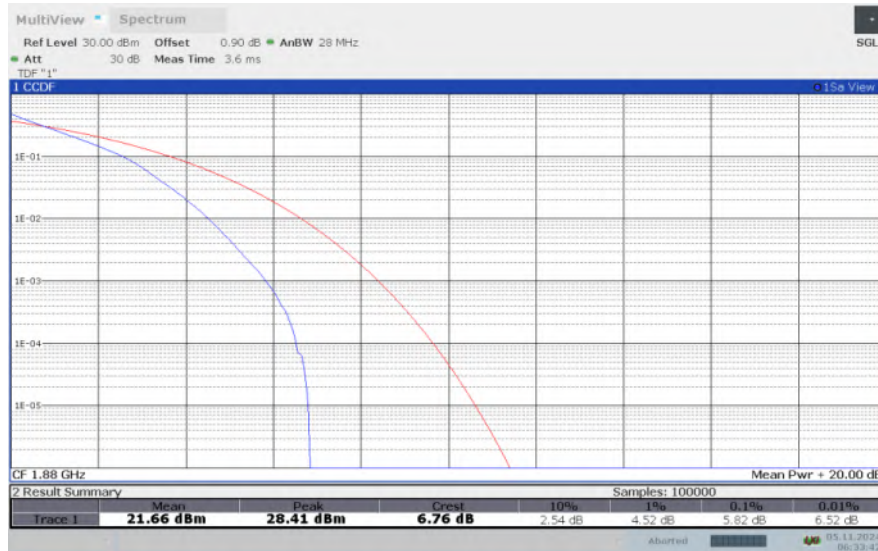
### LTE band 2 , 1.4MHz Bandwidth,64QAM



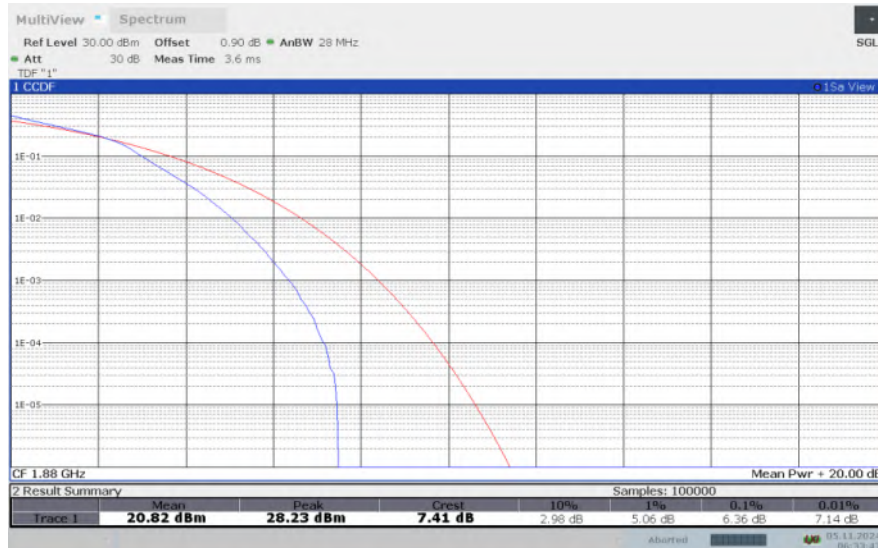
### LTE Band 2, 3MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1880	100%,0	5.82	6.36	6.72

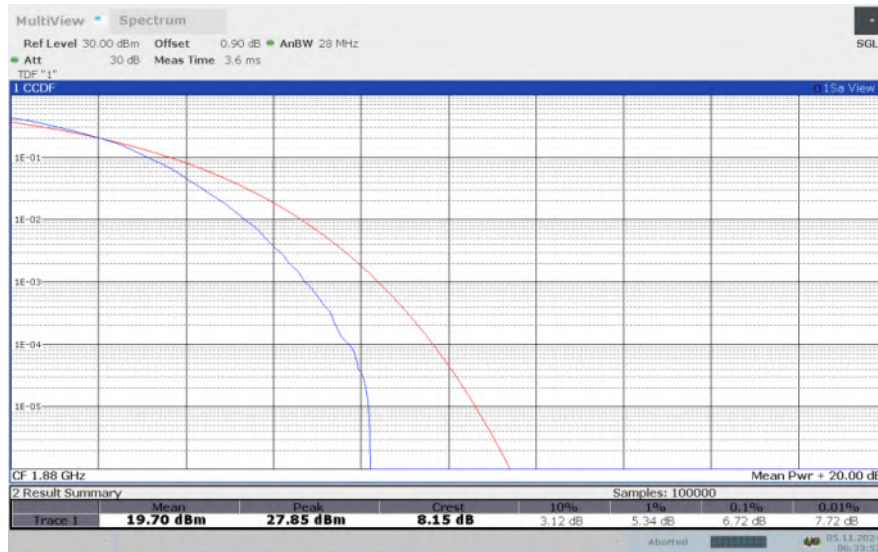
### LTE band 2 , 3MHz Bandwidth,QPSK



### LTE band 2 , 3MHz Bandwidth,16QAM



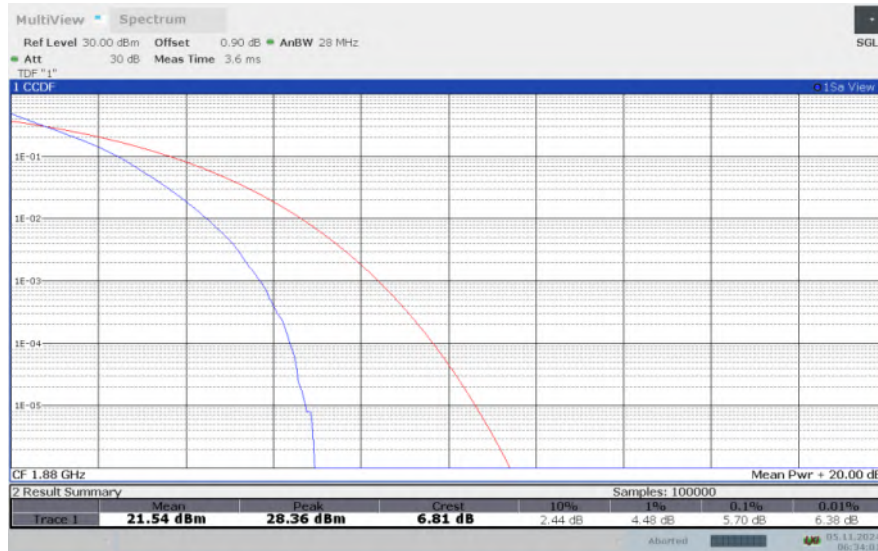
# LTE band 2 , 3MHz Bandwidth,64QAM



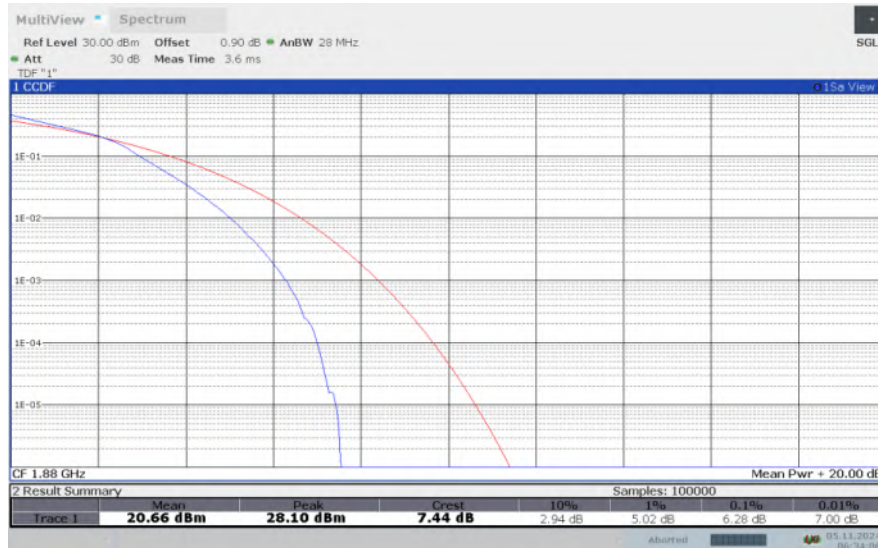
### LTE Band 2, 5MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1880	100%,0	5.70	6.28	6.52

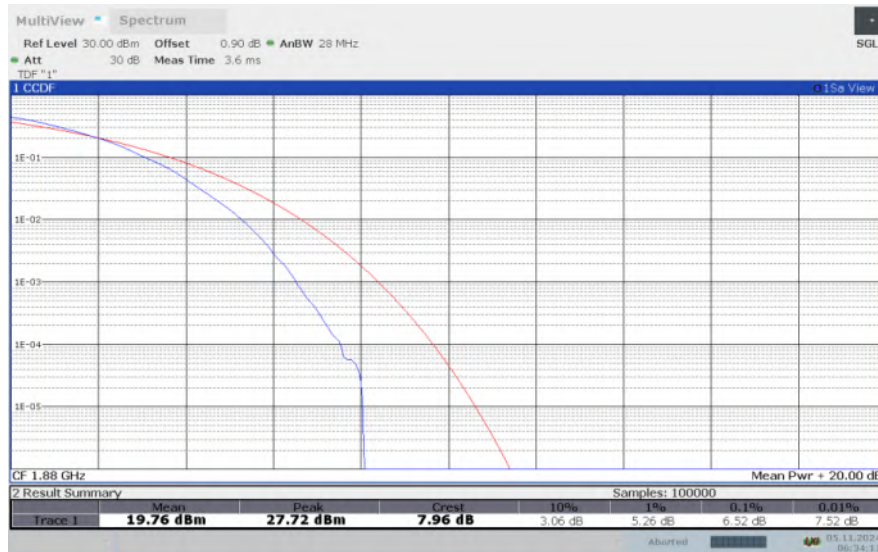
### LTE band 2 , 5MHz Bandwidth,QPSK



### LTE band 2 , 5MHz Bandwidth,16QAM



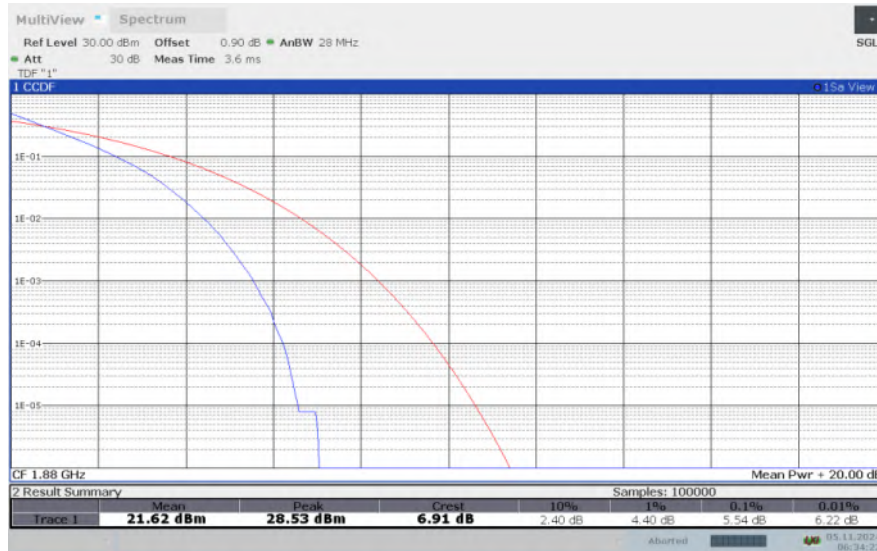
LTE band 2 , 5MHz Bandwidth,64QAM



### LTE Band 2, 10MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1880	100%,0	5.54	6.36	6.58

### LTE band 2 , 10MHz Bandwidth,QPSK



### LTE band 2 , 10MHz Bandwidth,16QAM



# LTE band 2 , 10MHz Bandwidth,64QAM



### LTE Band 2, 15MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1880	100%,0	5.86	6.40	6.52

### LTE band 2 , 15MHz Bandwidth,QPSK



### LTE band 2 , 15MHz Bandwidth,16QAM



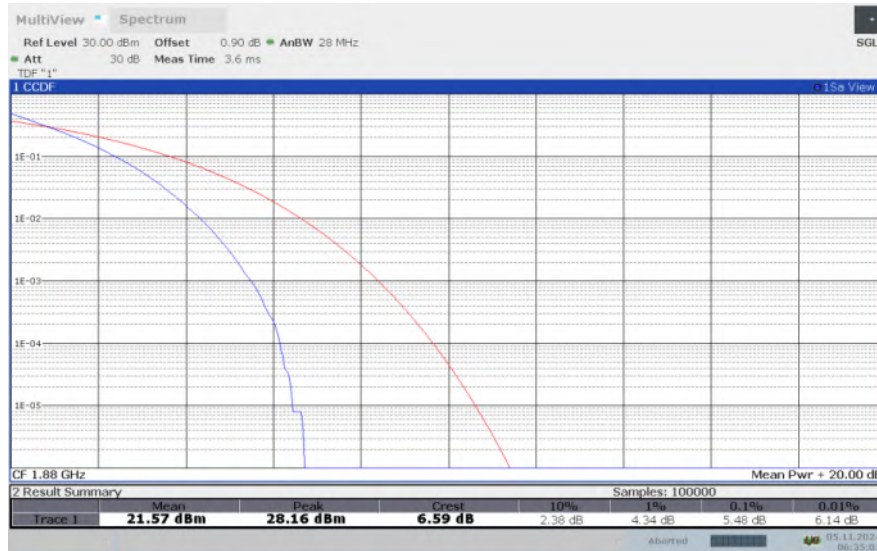
# LTE band 2 , 15MHz Bandwidth,64QAM



### LTE Band 2, 20MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1880	100%,0	5.48	6.38	6.62

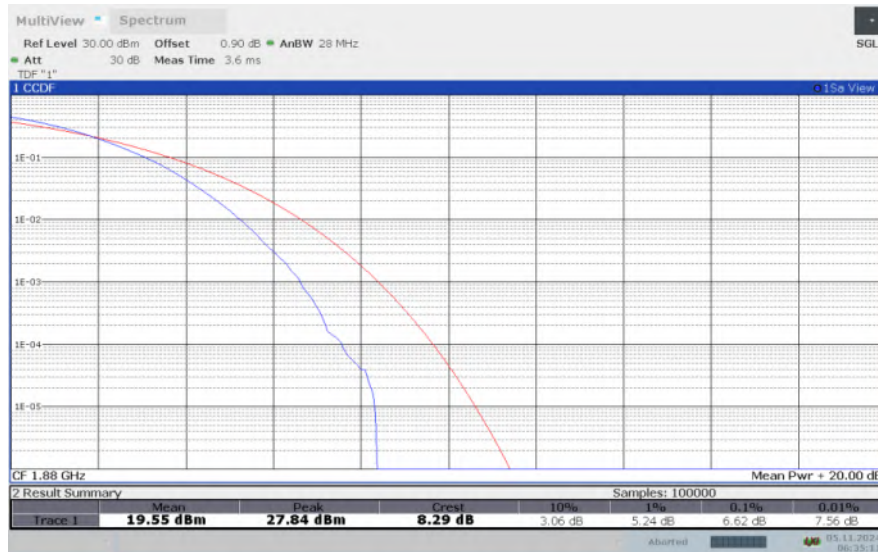
### LTE band 2 , 20MHz Bandwidth,QPSK



### LTE band 2 , 20MHz Bandwidth,16QAM



# LTE band 2 , 20MHz Bandwidth,64QAM



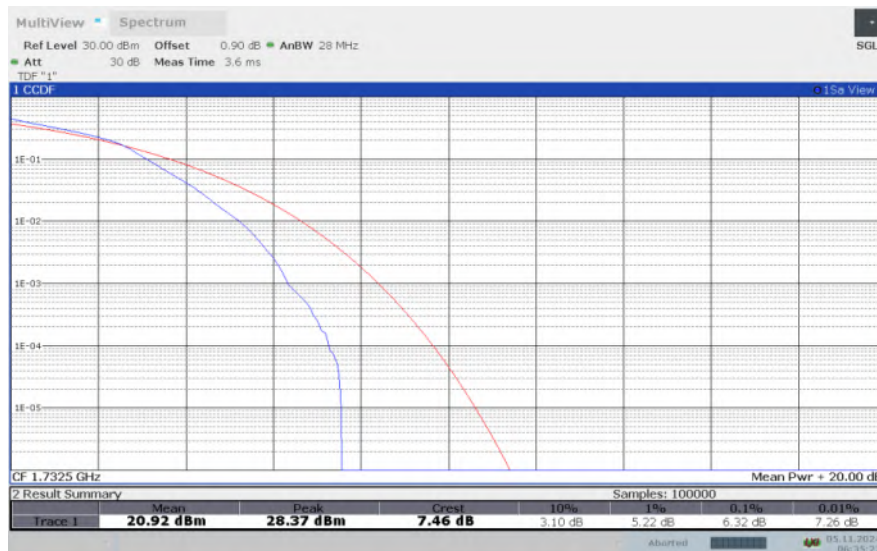
### LTE Band 4, 1.4MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1732.5	100%,0	5.52	6.32	6.68

### LTE band 4 , 1.4MHz Bandwidth,QPSK



### LTE band 4 , 1.4MHz Bandwidth,16QAM



LTE band 4 , 1.4MHz Bandwidth,64QAM



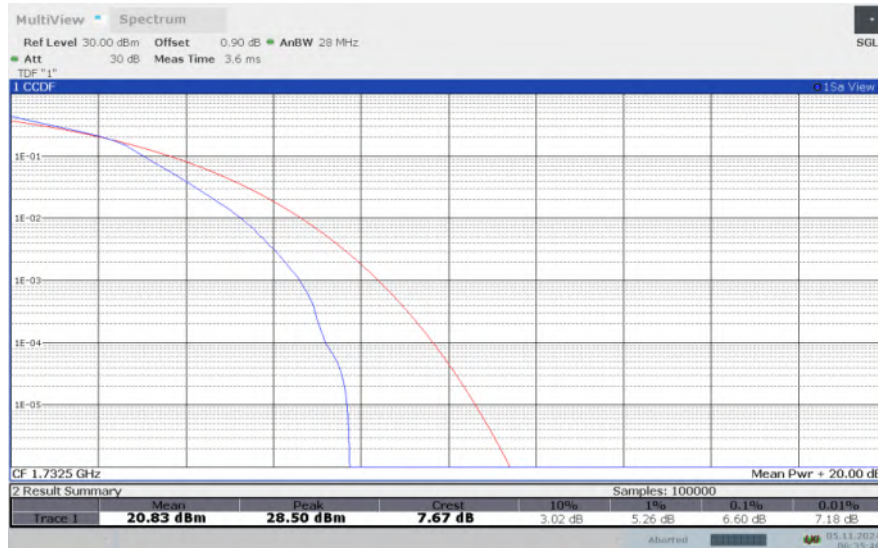
### LTE Band 4, 3MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1732.5	100%,0	5.66	6.60	6.86

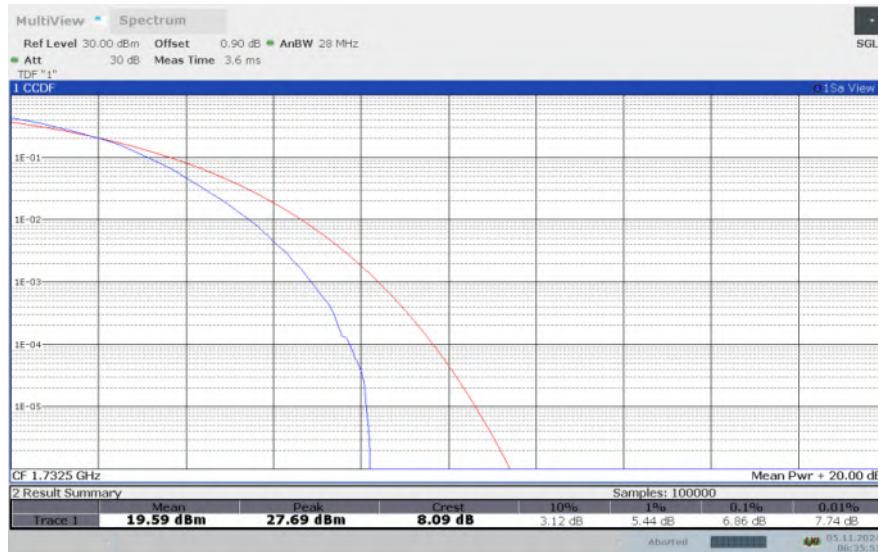
### LTE band 4 , 3MHz Bandwidth,QPSK



### LTE band 4 , 3MHz Bandwidth,16QAM



LTE band 4 , 3MHz Bandwidth,64QAM



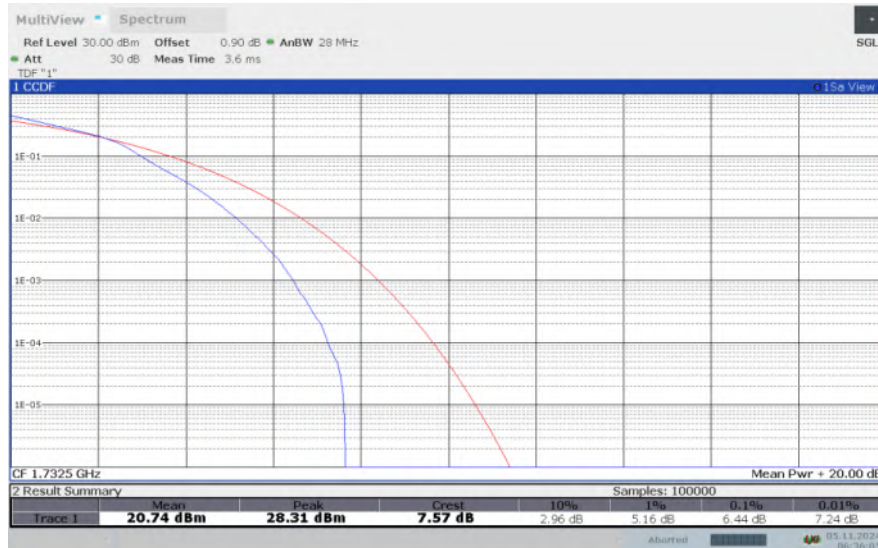
### LTE Band 4, 5MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1732.5	100%,0	5.58	6.44	6.72

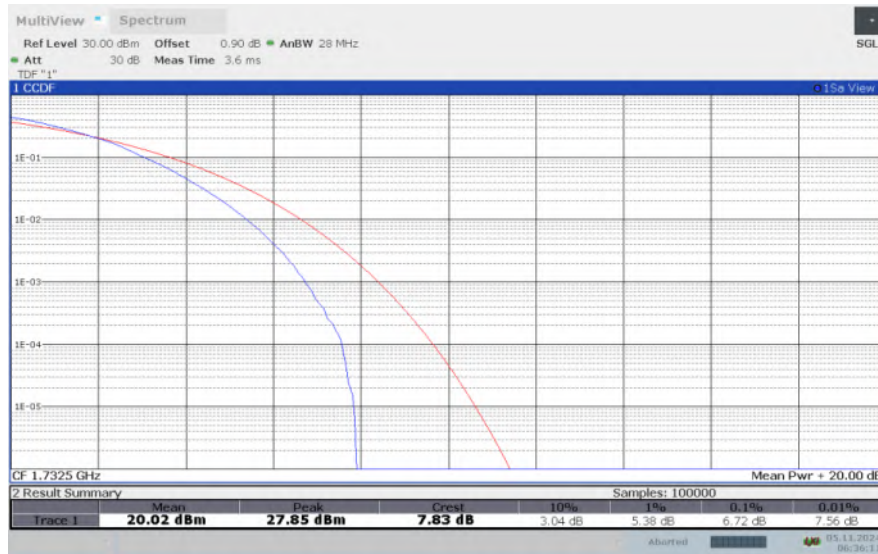
### LTE band 4 , 5MHz Bandwidth,QPSK



### LTE band 4 , 5MHz Bandwidth,16QAM



# LTE band 4 , 5MHz Bandwidth,64QAM



### LTE Band 4, 10MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1732.5	100%,0	5.58	6.42	6.64

### LTE band 4 , 10MHz Bandwidth,QPSK



### LTE band 4 , 10MHz Bandwidth,16QAM



# LTE band 4 , 10MHz Bandwidth,64QAM



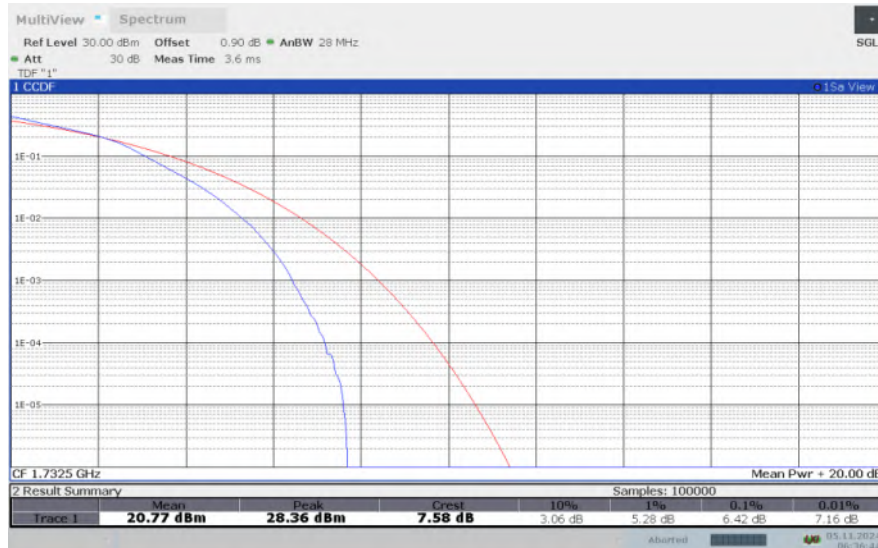
### LTE Band 4, 15MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1732.5	100%,0	5.86	6.42	6.68

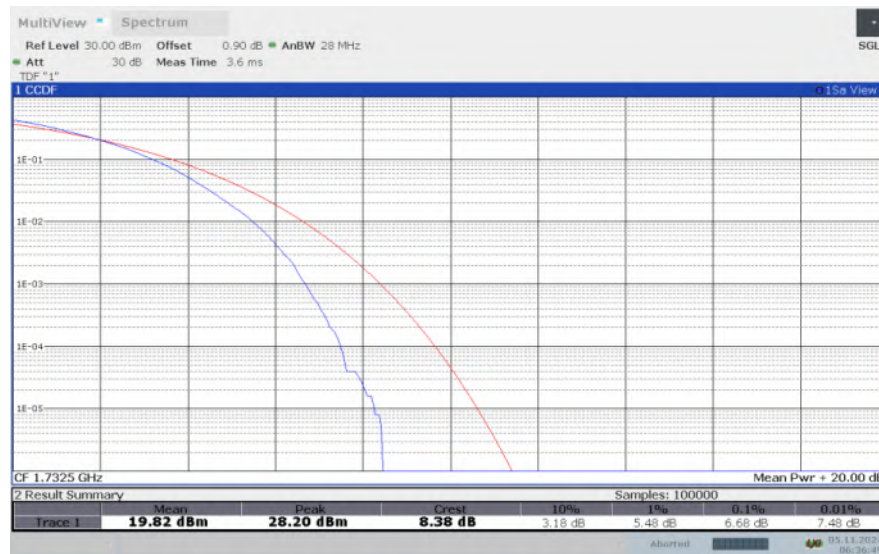
### LTE band 4 , 15MHz Bandwidth,QPSK



### LTE band 4 , 15MHz Bandwidth,16QAM



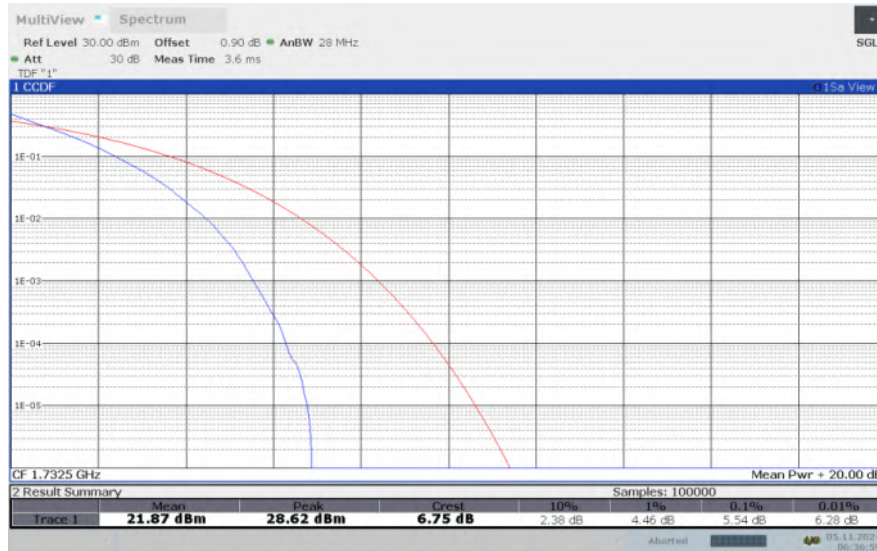
# LTE band 4 , 15MHz Bandwidth,64QAM



### LTE Band 4, 20MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
1732.5	100%,0	5.54	6.36	6.74

### LTE band 4 , 20MHz Bandwidth,QPSK



### LTE band 4 , 20MHz Bandwidth,16QAM



# LTE band 4 , 20MHz Bandwidth,64QAM



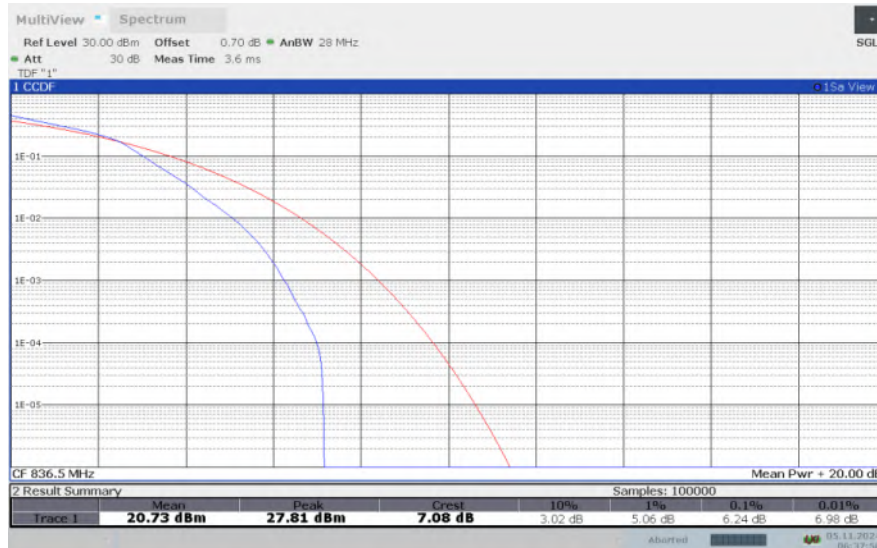
### LTE Band 5, 1.4MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
836.5	100%,0	5.48	6.24	6.86

### LTE band 5 , 1.4MHz Bandwidth,QPSK



### LTE band 5 , 1.4MHz Bandwidth,16QAM



LTE band 5 , 1.4MHz Bandwidth,64QAM



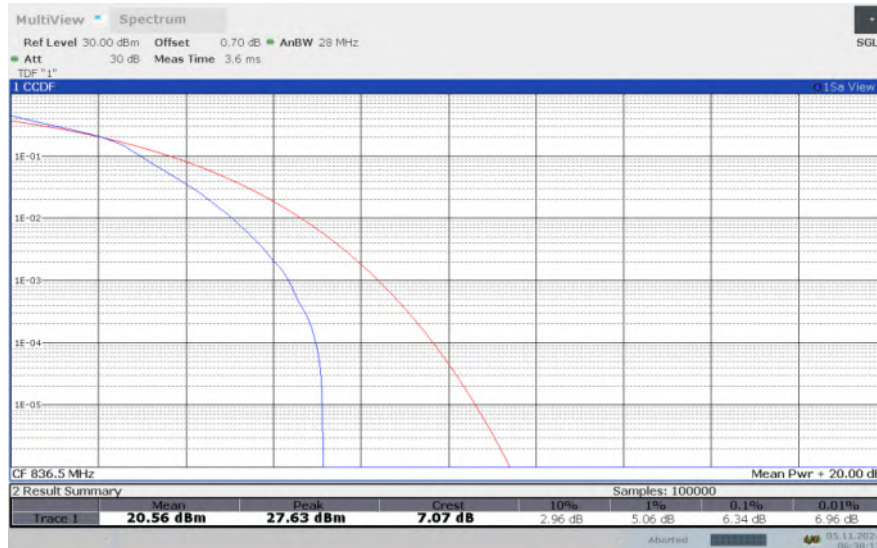
### LTE Band 5, 3MHz

Frequency (MHz)	RB	PAPR (dB)		
		QPSK	16QAM	64QAM
836.5	100%,0	5.54	6.34	6.70

### LTE band 5 , 3MHz Bandwidth,QPSK



### LTE band 5 , 3MHz Bandwidth,16QAM



LTE band 5 , 3MHz Bandwidth,64QAM

