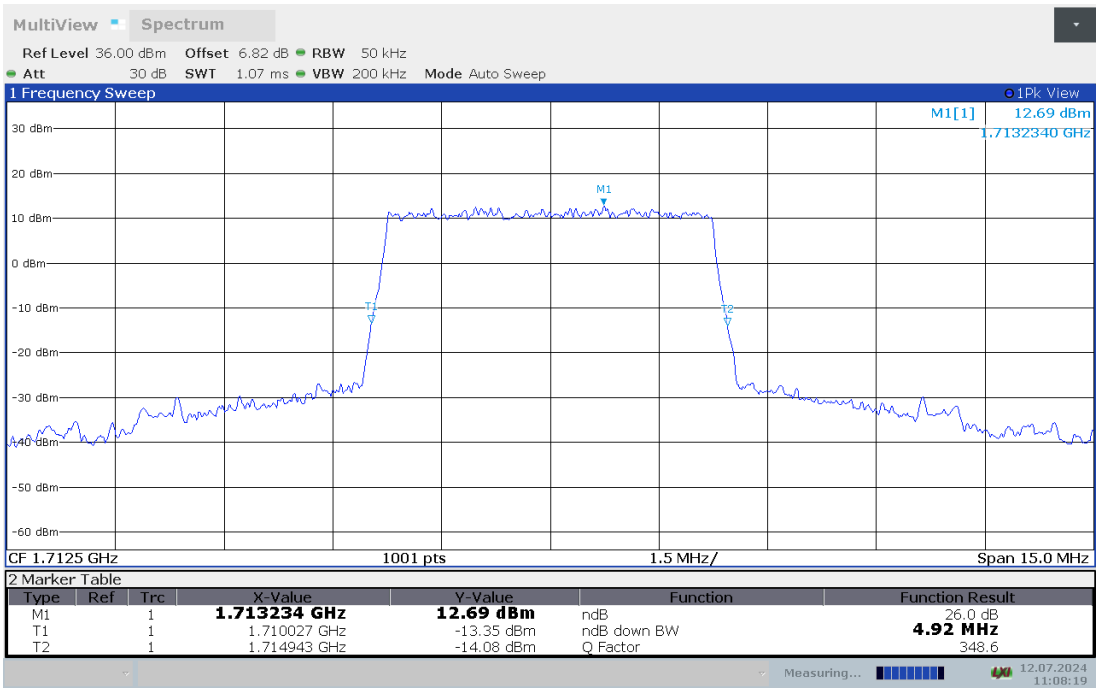
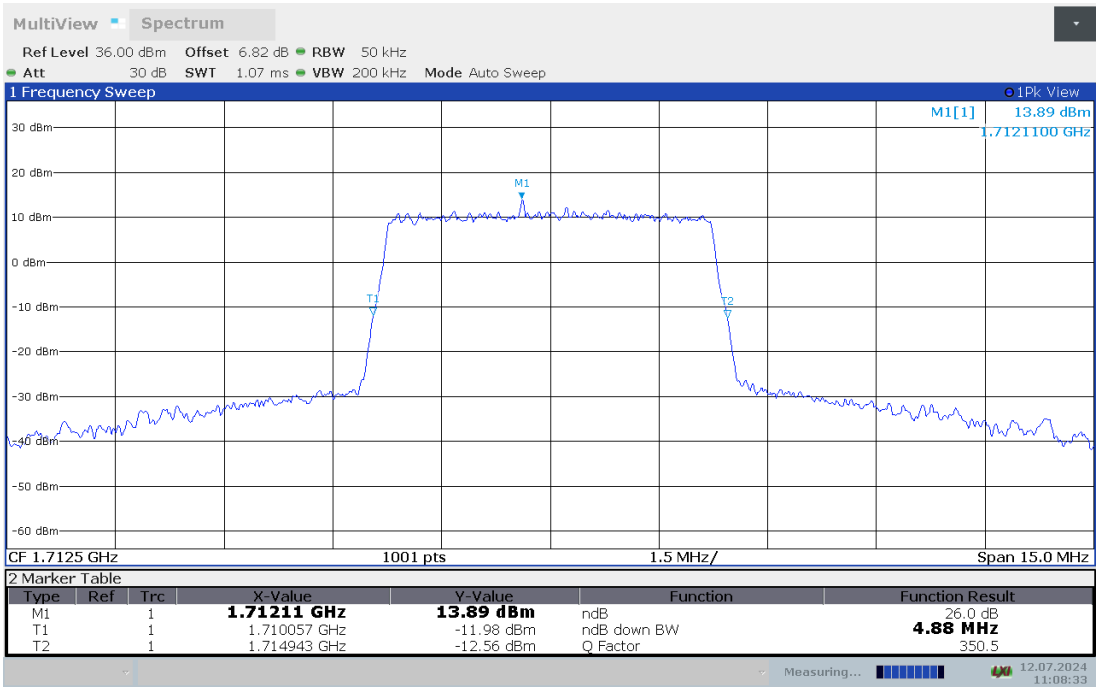
LTE band 66,5MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1712.5	4.915	4.885
1745	4.930	4.945
1777.5	4.915	4.930

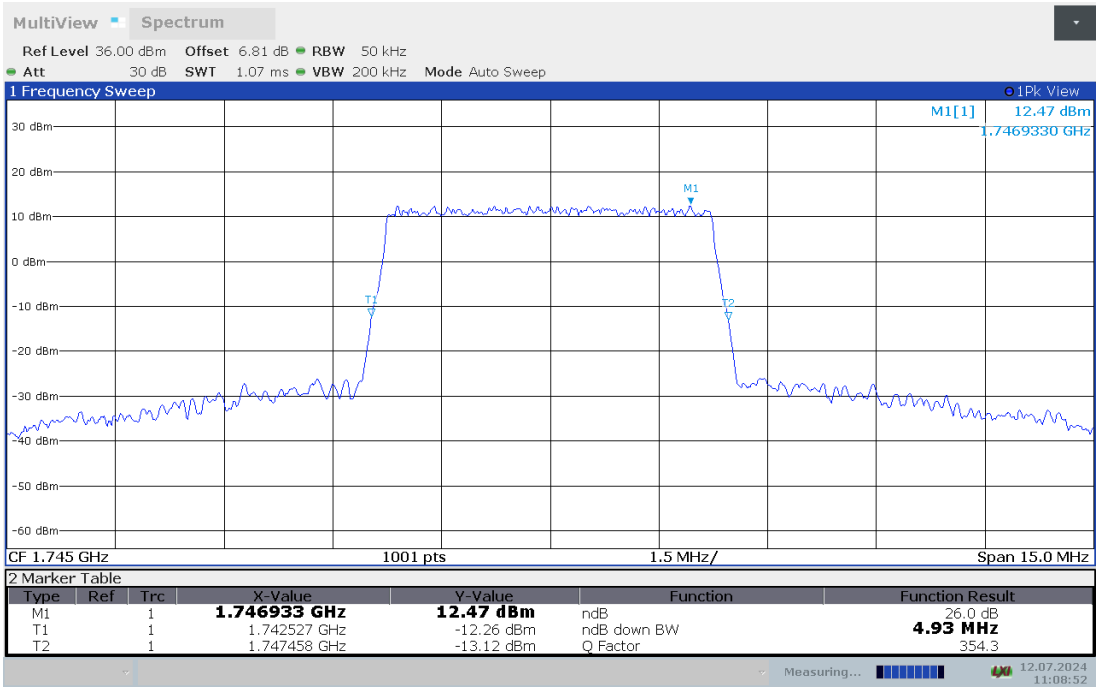
LTE band 66 , 5MHz Bandwidth,LOW,QPSK (-26dBc BW)



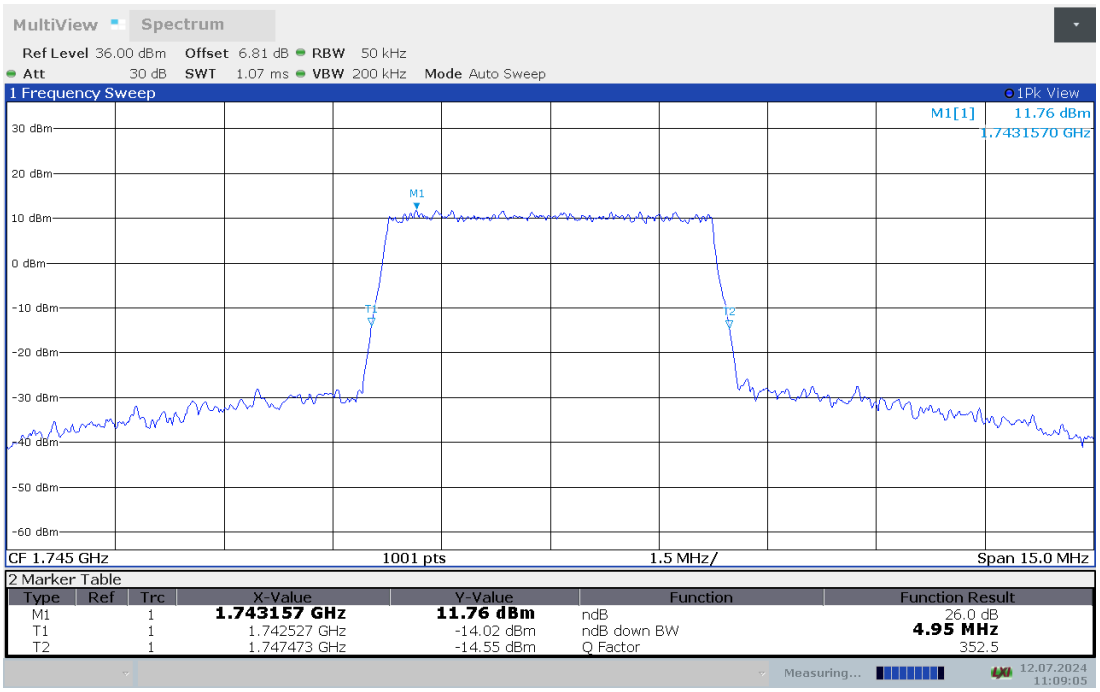
LTE band 66 , 5MHz Bandwidth,LOW,16QAM (-26dBc BW)



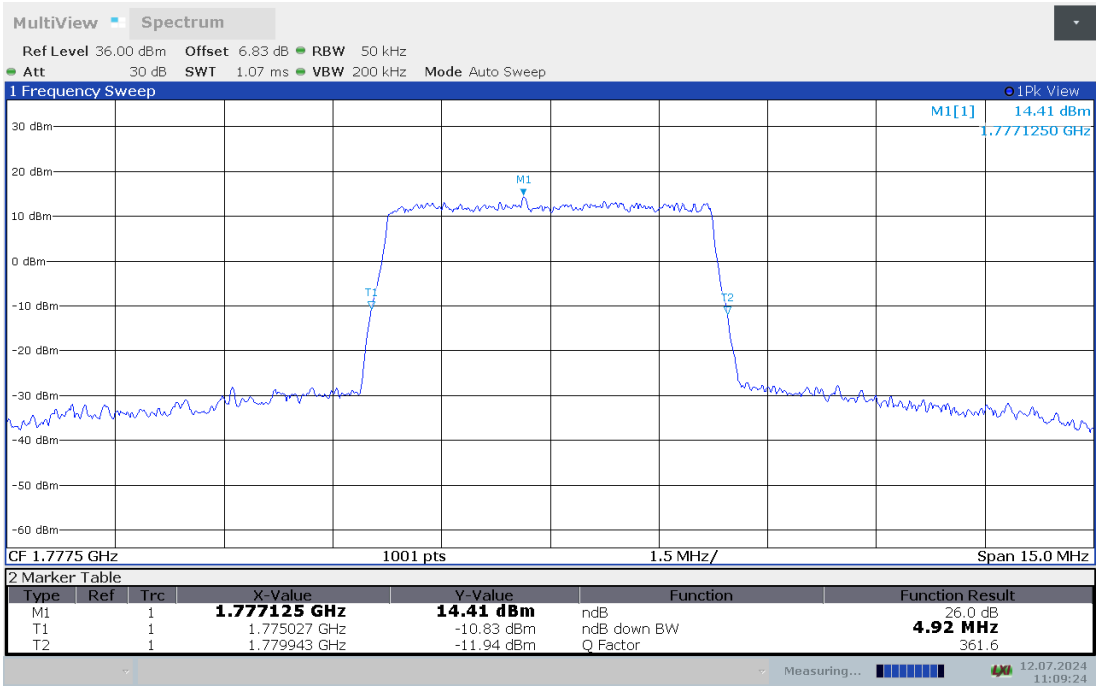
LTE band 66 , 5MHz Bandwidth,MID,QPSK (-26dBc BW)



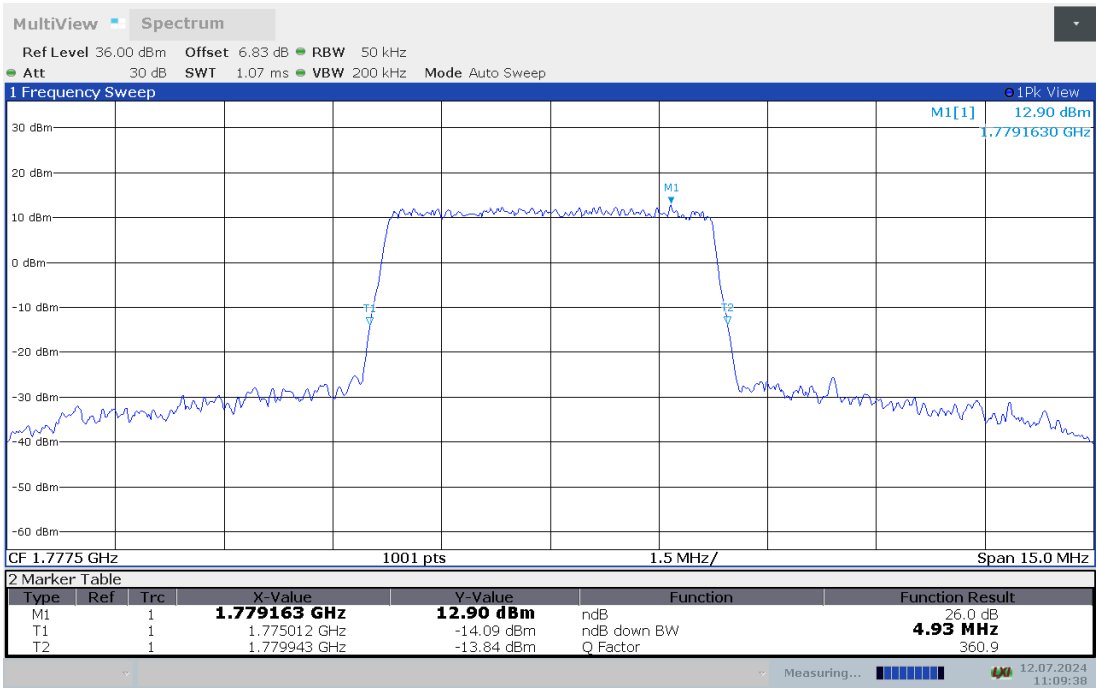
LTE band 66 , 5MHz Bandwidth,MID,16QAM (-26dBc BW)



LTE band 66 , 5MHz Bandwidth,HIGH,QPSK (-26dBc BW)



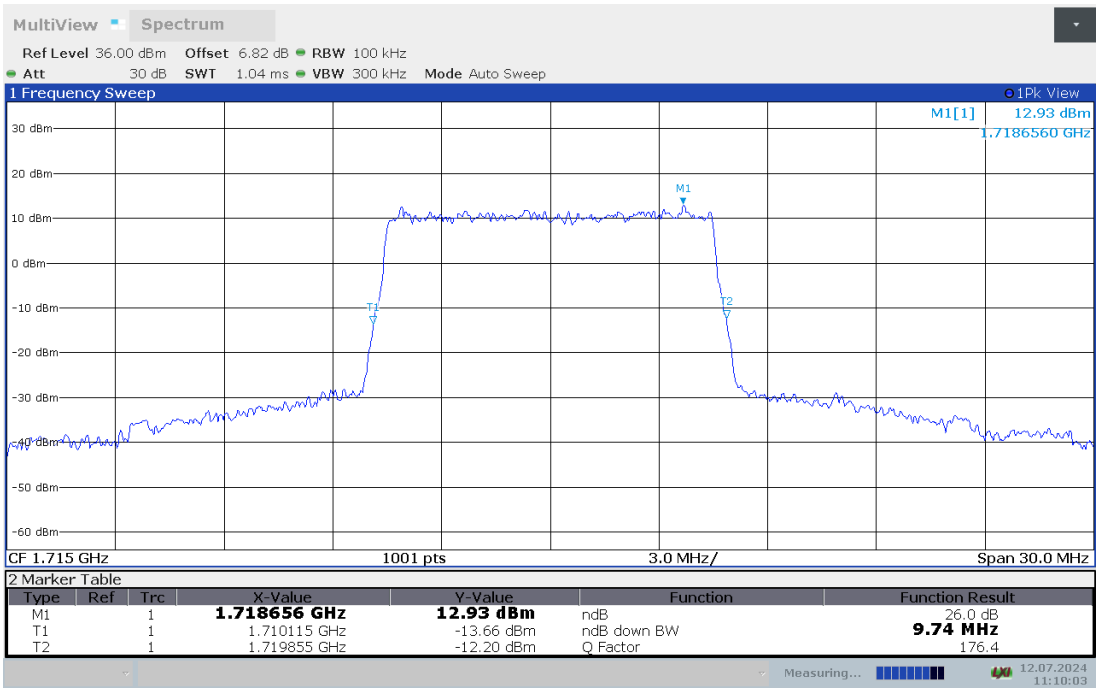
LTE band 66 , 5MHz Bandwidth,HIGH,16QAM (-26dBc BW)



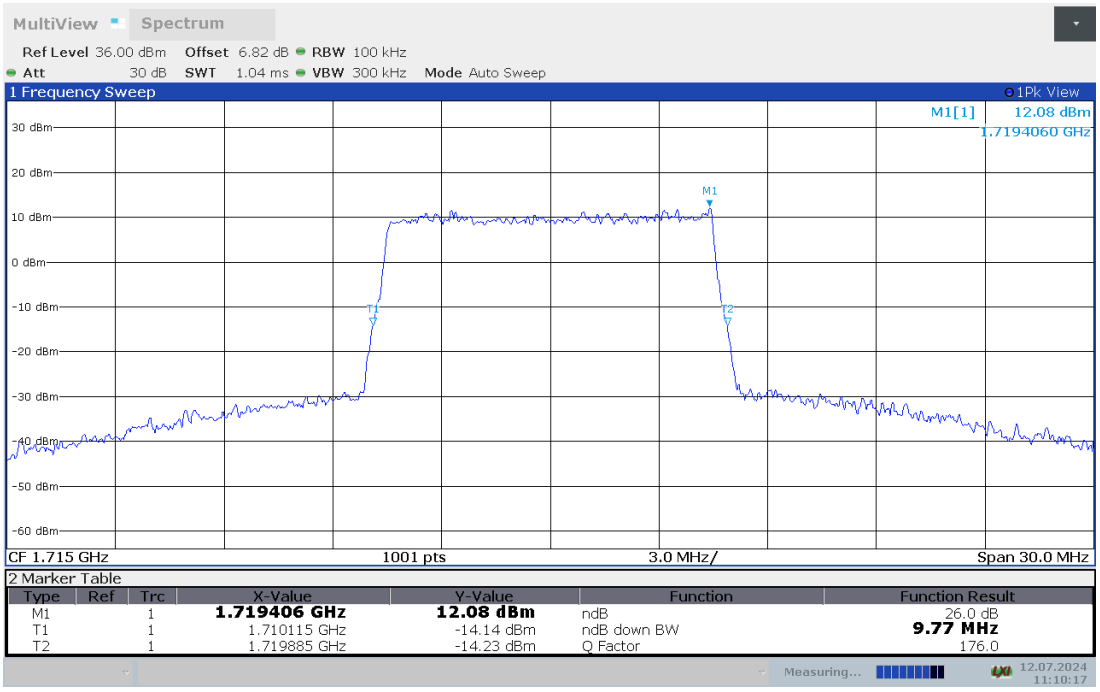
LTE band 66,10MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1715	9.740	9.770
1745	9.680	9.740
1775	9.830	9.830

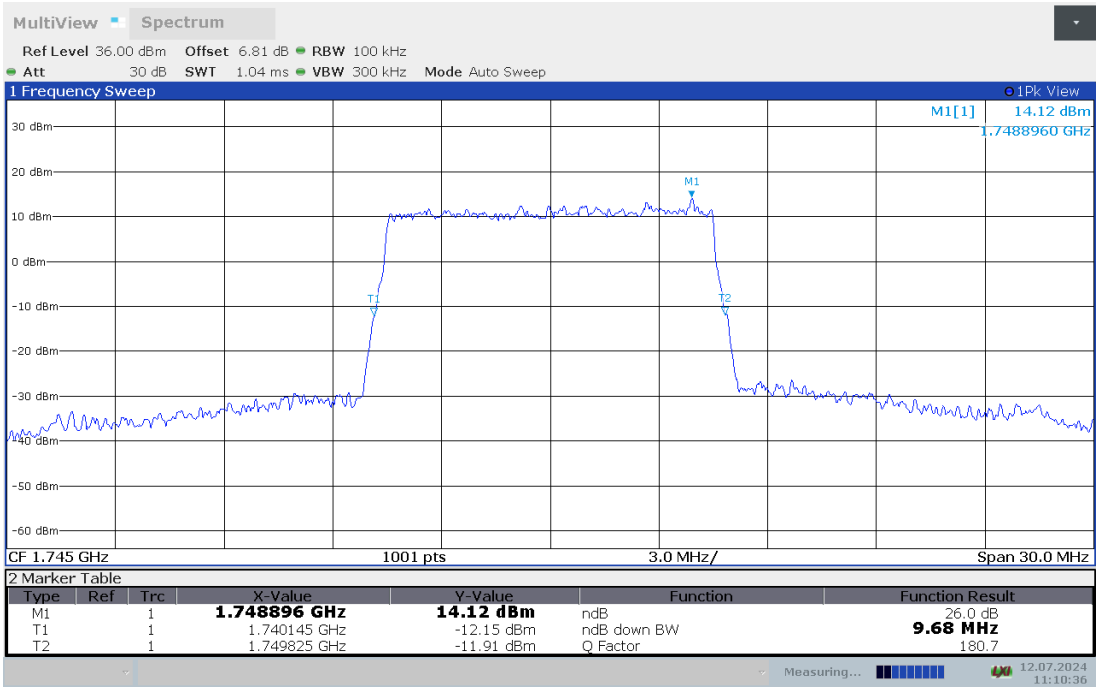
LTE band 66 , 10MHz Bandwidth,LOW,QPSK (-26dBc BW)



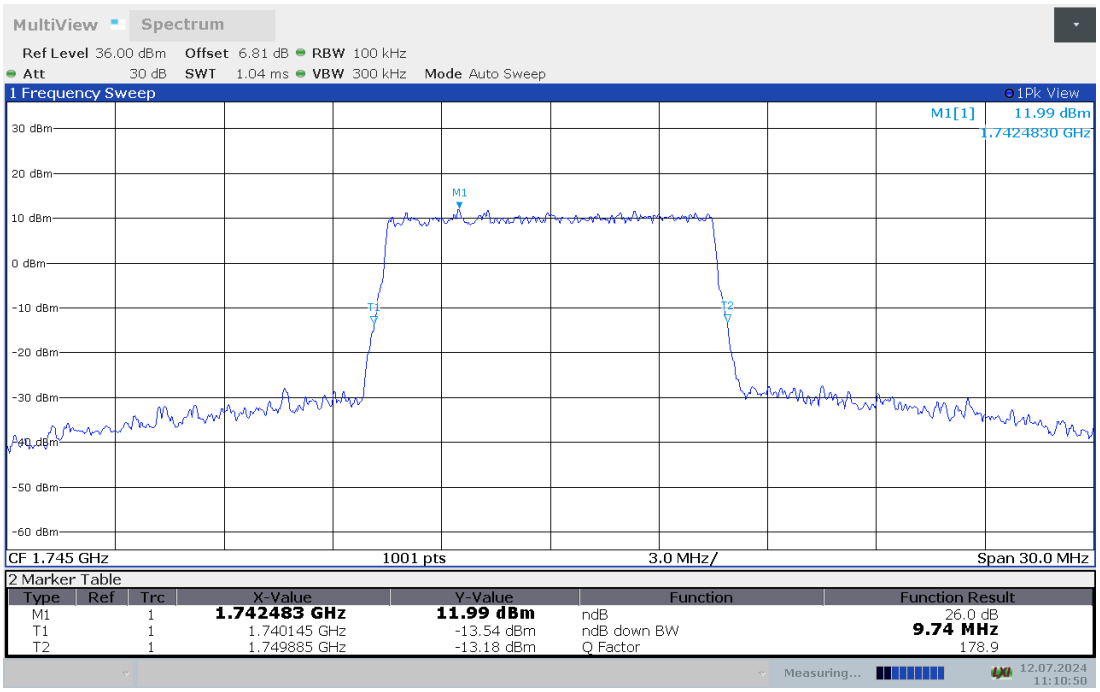
LTE band 66 , 10MHz Bandwidth,LOW,16QAM (-26dBc BW)



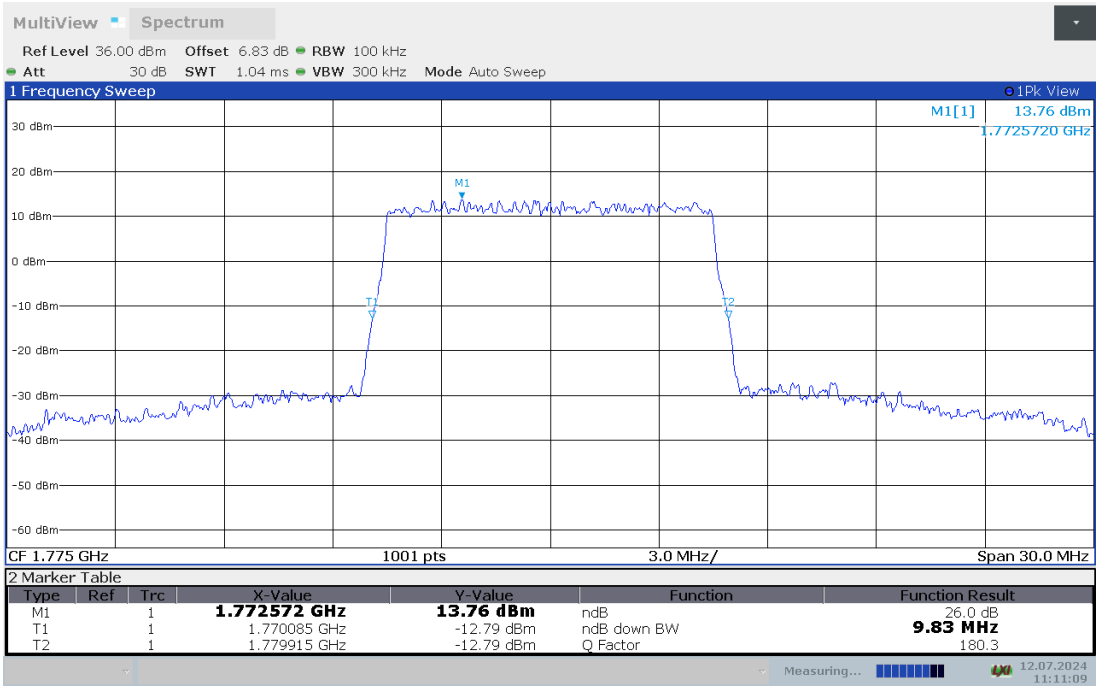
LTE band 66 , 10MHz Bandwidth,MID,QPSK (-26dBc BW)



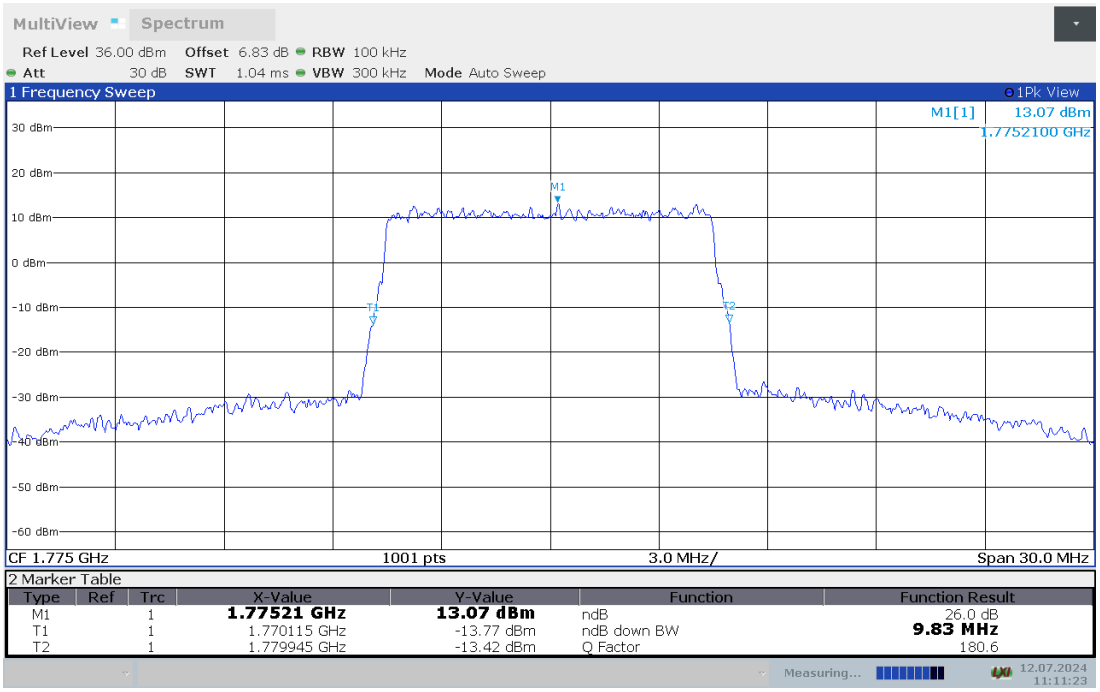
LTE band 66 , 10MHz Bandwidth,MID,16QAM (-26dBc BW)



LTE band 66 , 10MHz Bandwidth,HIGH,QPSK (-26dBc BW)



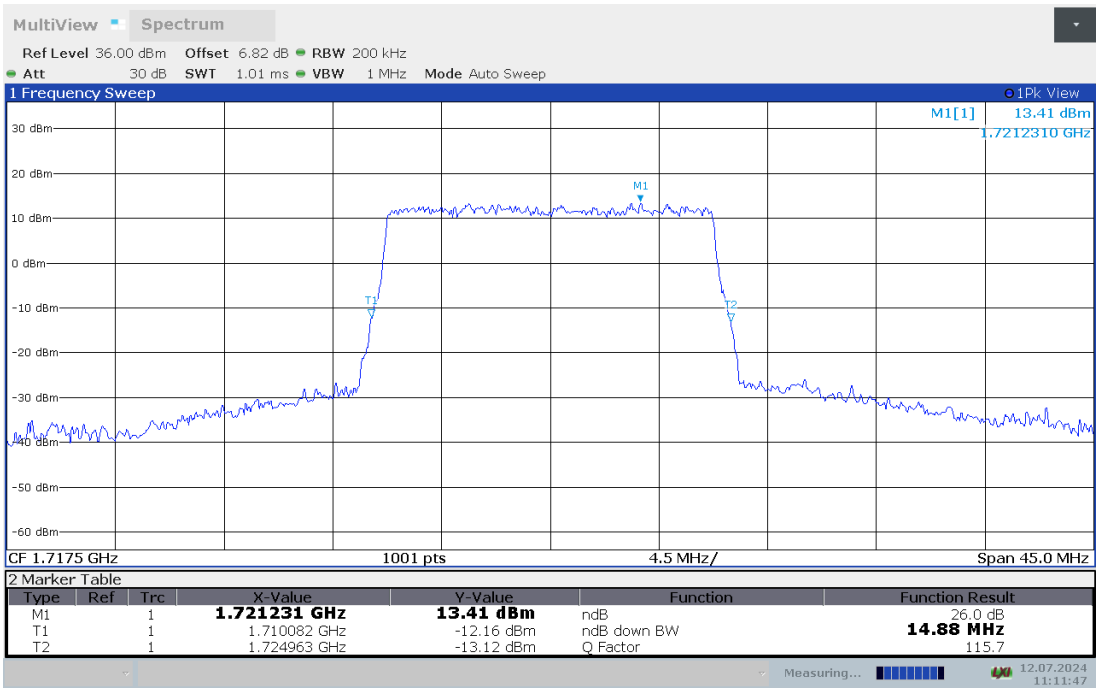
LTE band 66 , 10MHz Bandwidth,HIGH,16QAM (-26dBc BW)



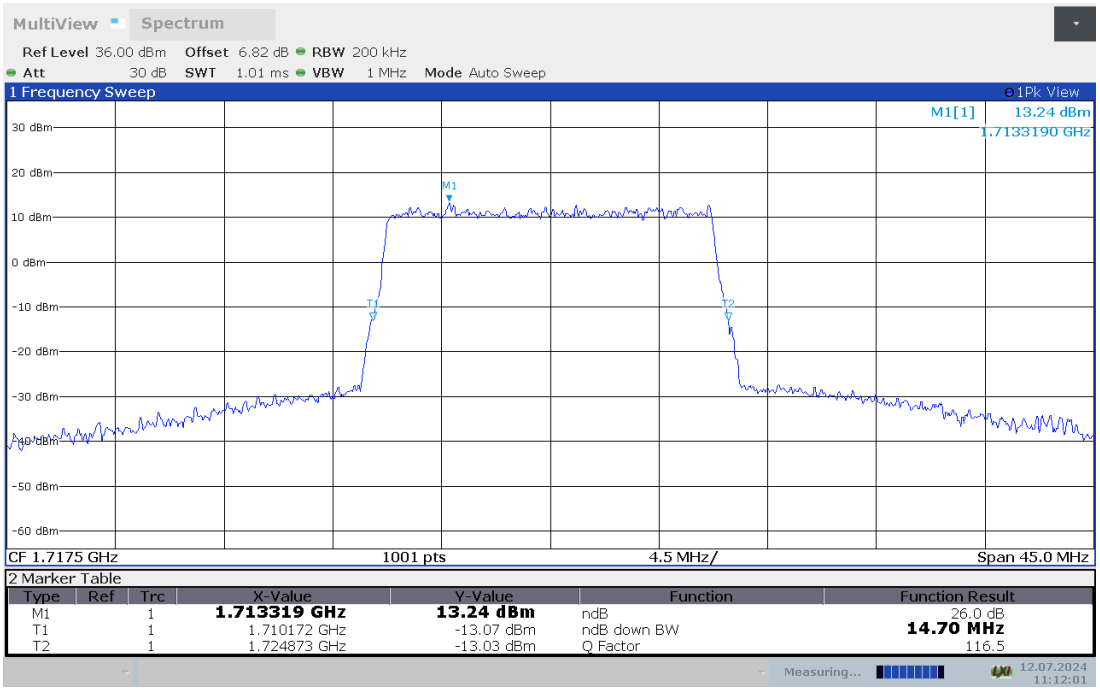
LTE band 66,15MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1717.5	14.880	14.700
1745	14.745	14.655
1772.5	14.745	14.745

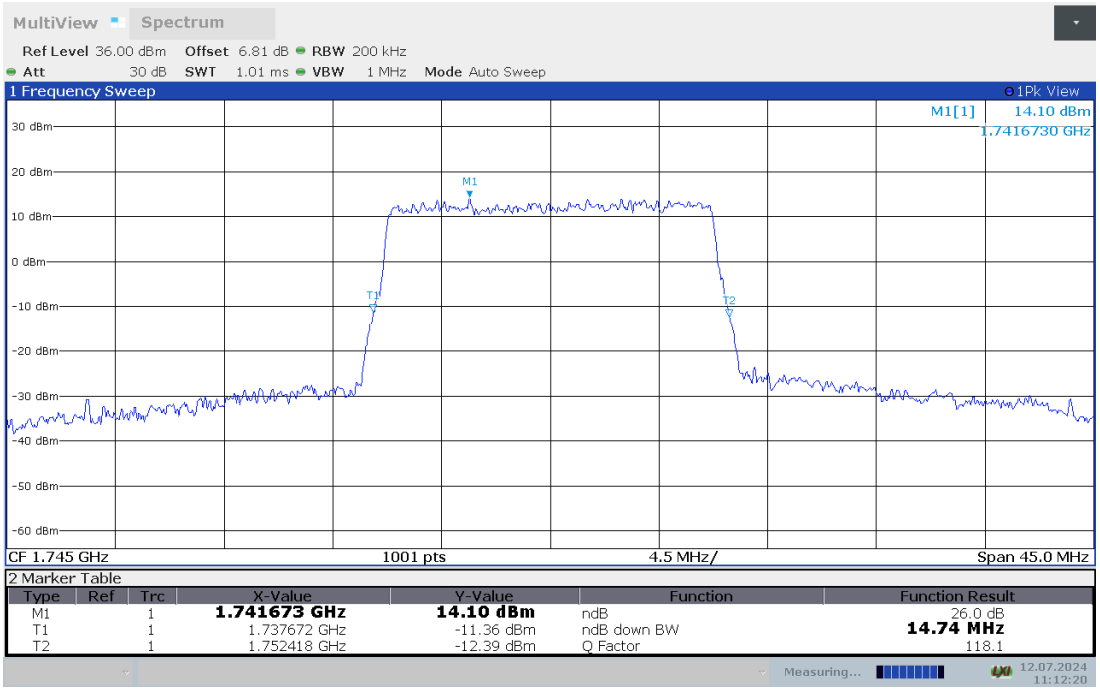
LTE band 66 , 15MHz Bandwidth,LOW,QPSK (-26dBc BW)



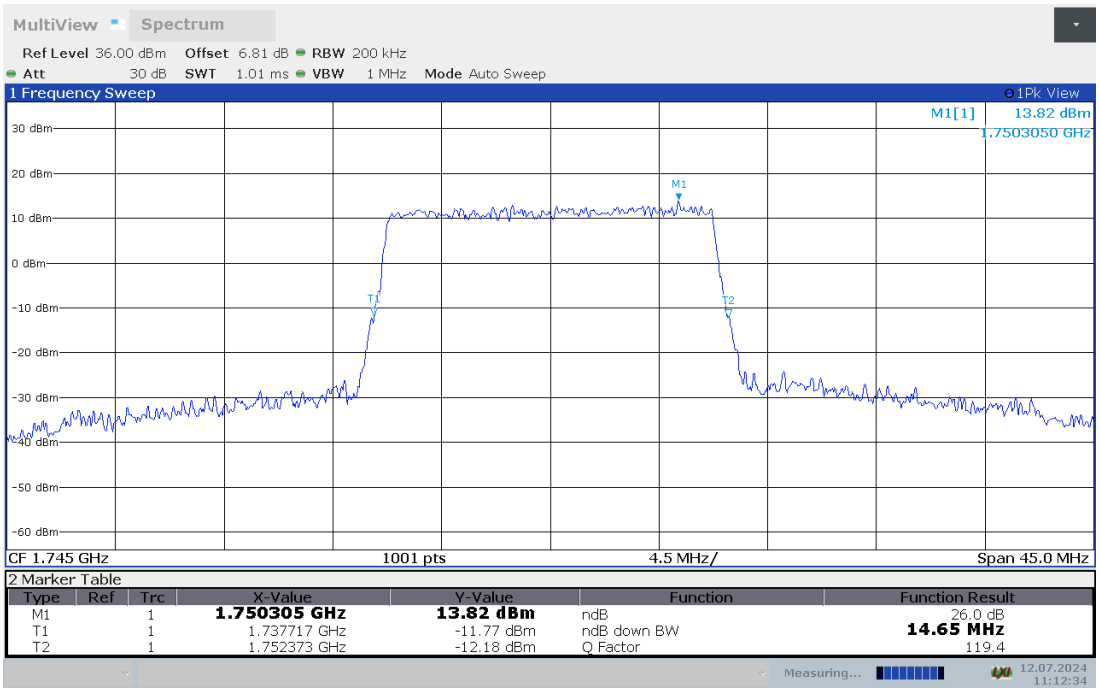
LTE band 66 , 15MHz Bandwidth,LOW,16QAM (-26dBc BW)



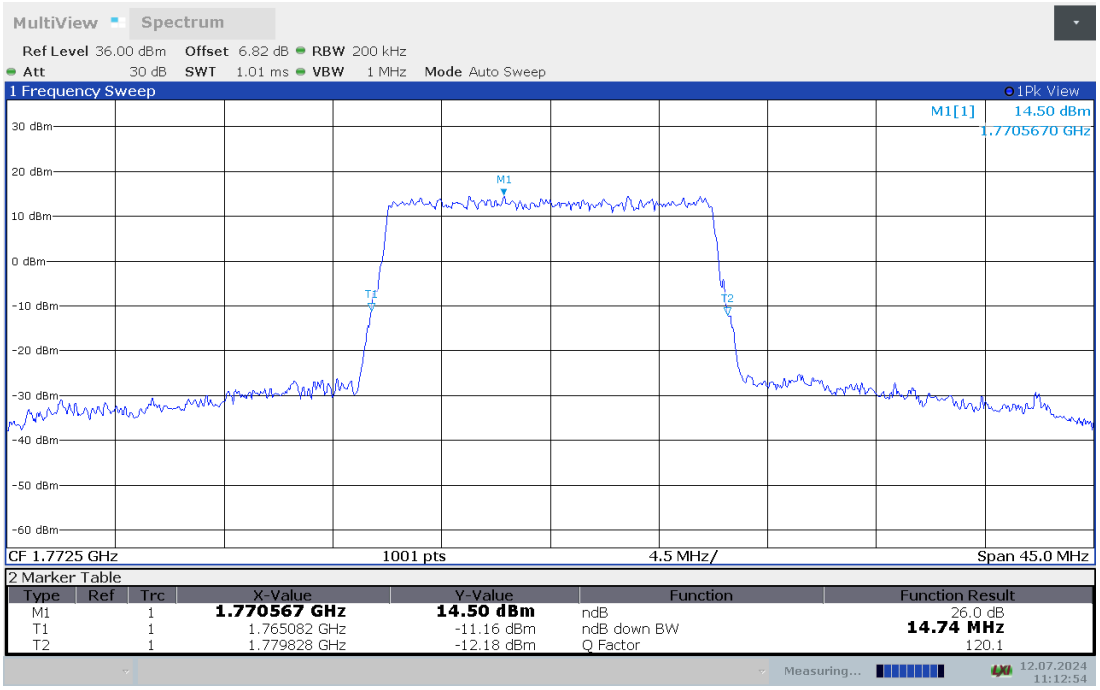
LTE band 66 , 15MHz Bandwidth,MID,QPSK (-26dBc BW)



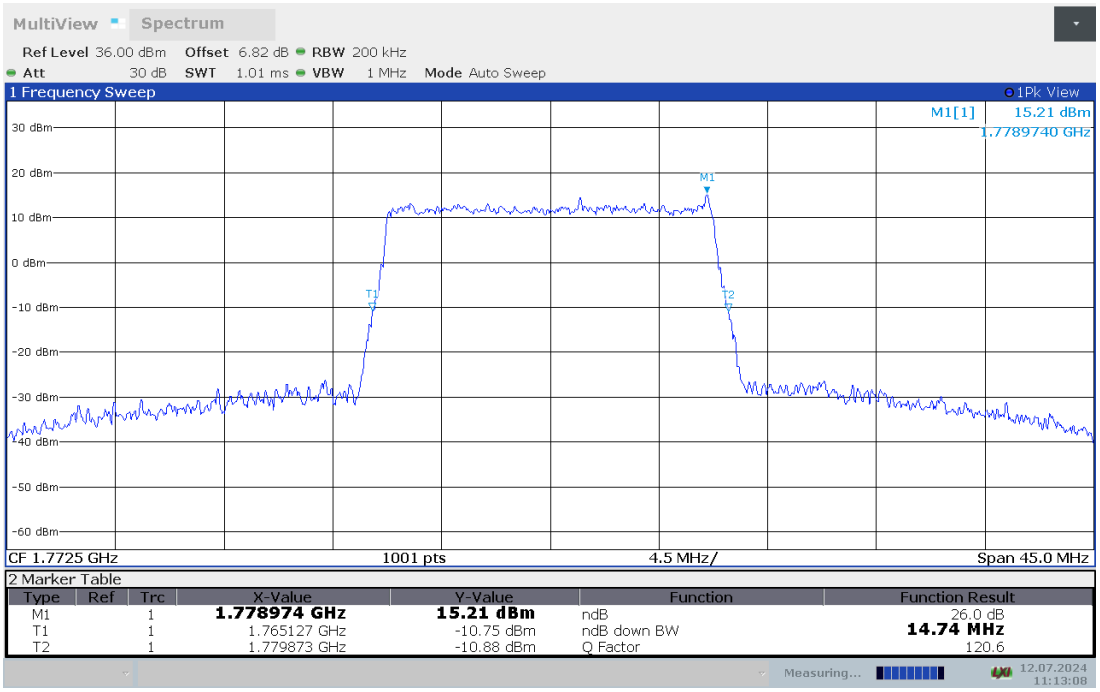
LTE band 66 , 15MHz Bandwidth,MID,16QAM (-26dBc BW)



LTE band 66 , 15MHz Bandwidth,HIGH,QPSK (-26dBc BW)



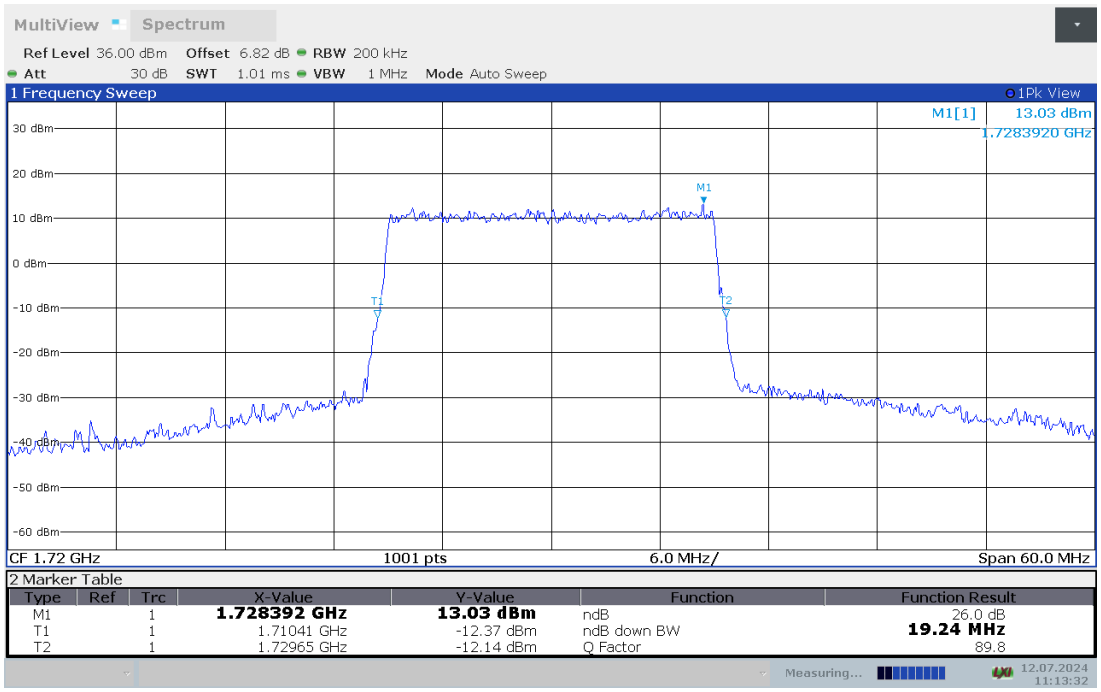
LTE band 66 , 15MHz Bandwidth,HIGH,16QAM (-26dBc BW)



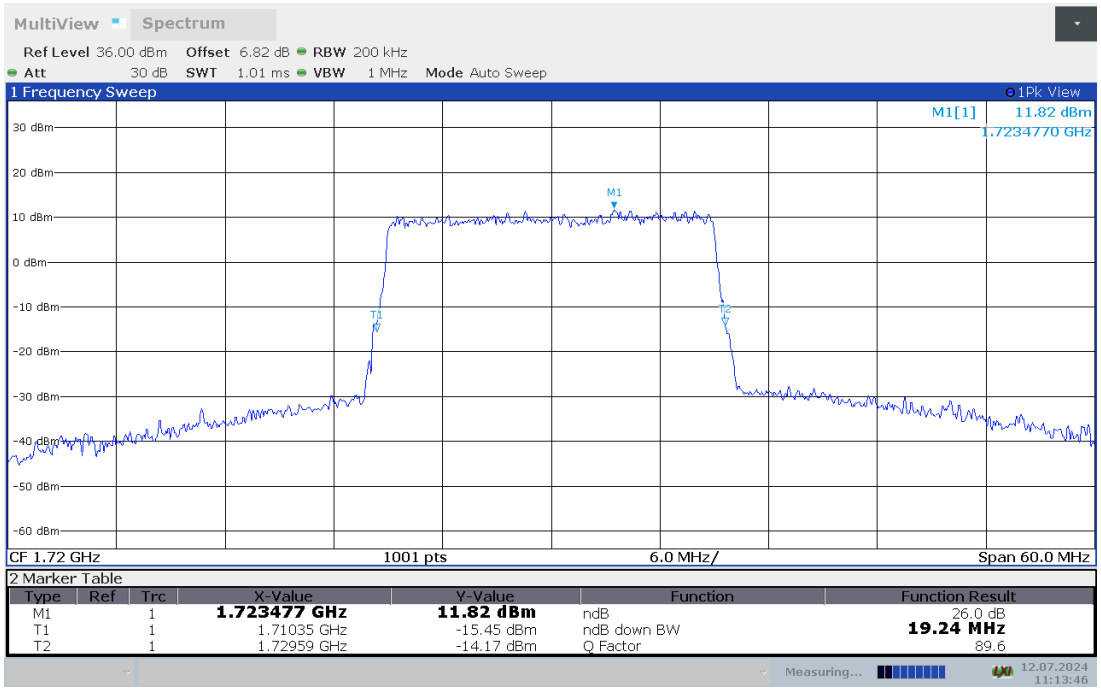
LTE band 66,20MHz(-26dBc)

Frequency(MHz)	Emission Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1720	19.241	19.241
1745	19.121	19.481
1770	19.421	19.481

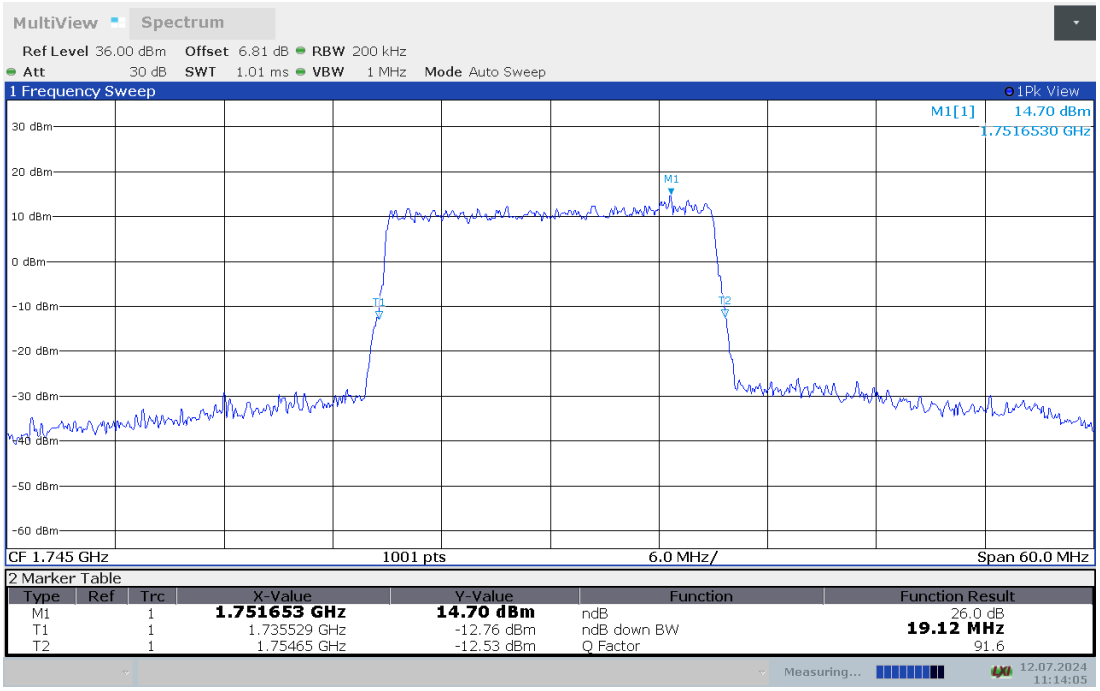
LTE band 66 , 20MHz Bandwidth,LOW,QPSK (-26dBc BW)



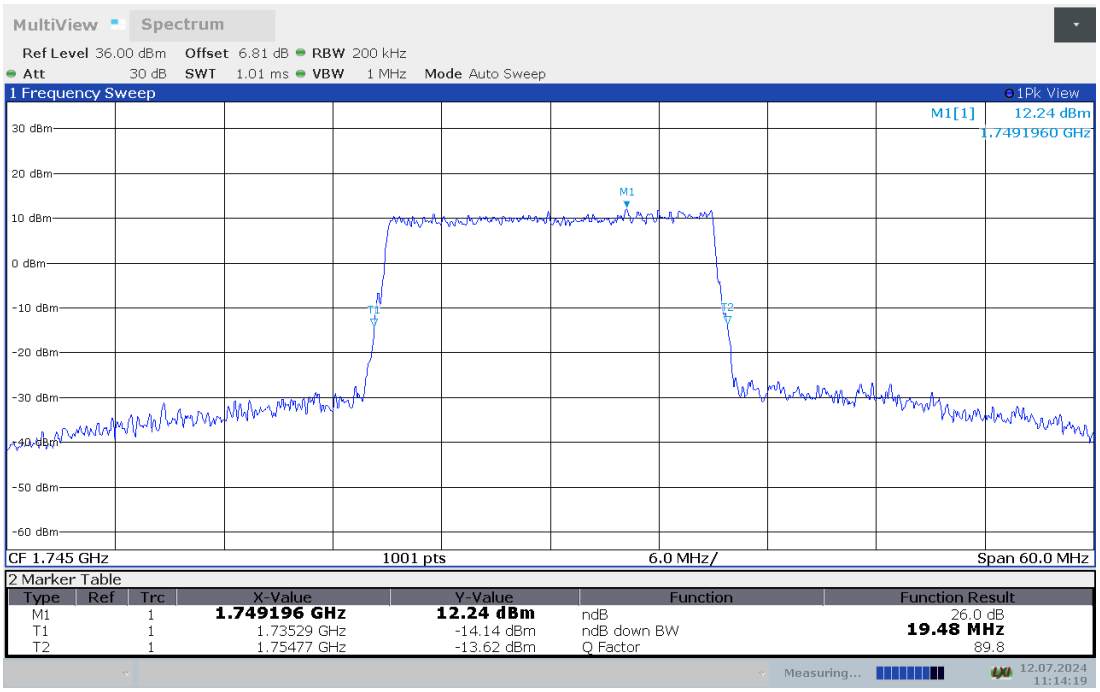
LTE band 66 , 20MHz Bandwidth,LOW,16QAM (-26dBc BW)



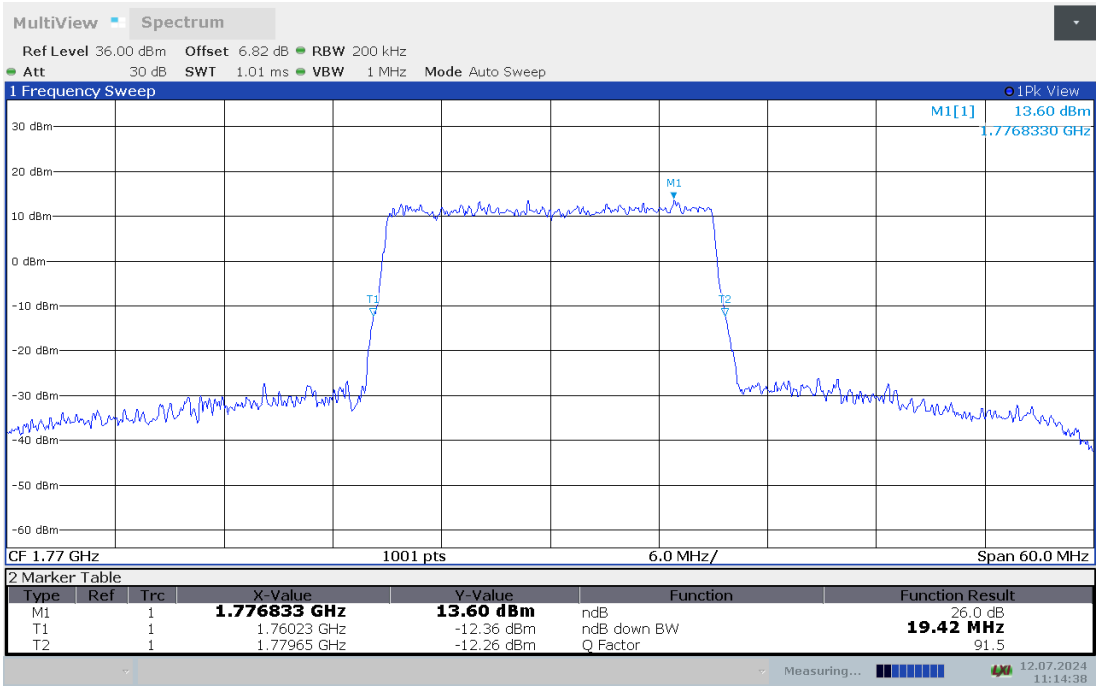
LTE band 66 , 20MHz Bandwidth,MID,QPSK (-26dBc BW)



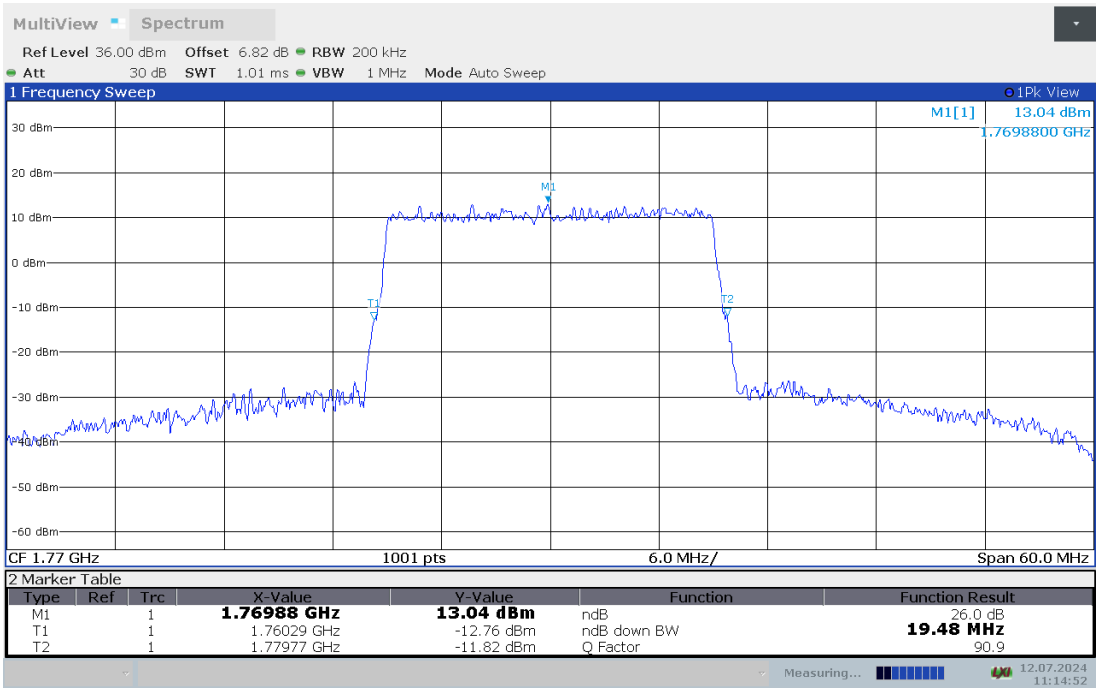
LTE band 66 , 20MHz Bandwidth,MID,16QAM (-26dBc BW)



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



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



Note: Expanded measurement uncertainty is U = 3428 Hz, k = 2

A.6 BAND EDGE COMPLIANCE

Reference

FCC: CFR Part 2.1051, 22.917, 24.238, 27.53.

A.6.1 Measurement limit

Part 22.917 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.

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 + 10log (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.

A.6.2Measurement Procedure

The testing follows ANSI C63.26

a) The EUT was connected to spectrum analyzer and system simulator via a power divider.

b) The band edges of low and high channels for the highest RF powers were measured.

c) Set RBW >= 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.

d) Set spectrum analyzer with RMS detector.

e) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

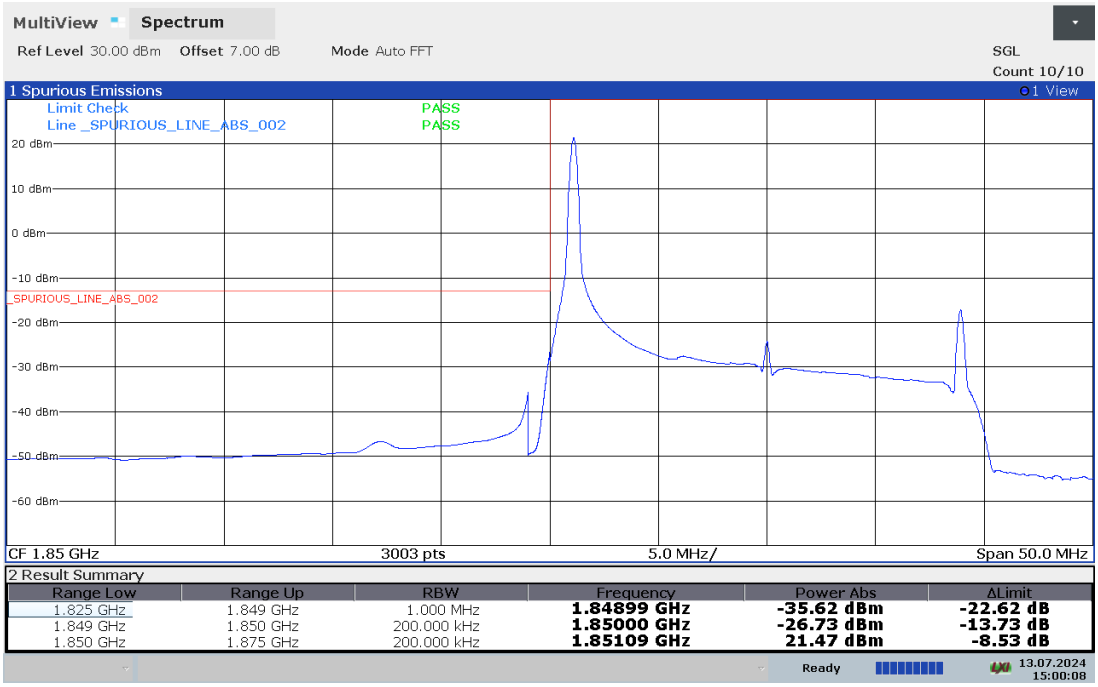
f) Checked that all the results comply with the emission limit line.

A.6.3 Measurement result

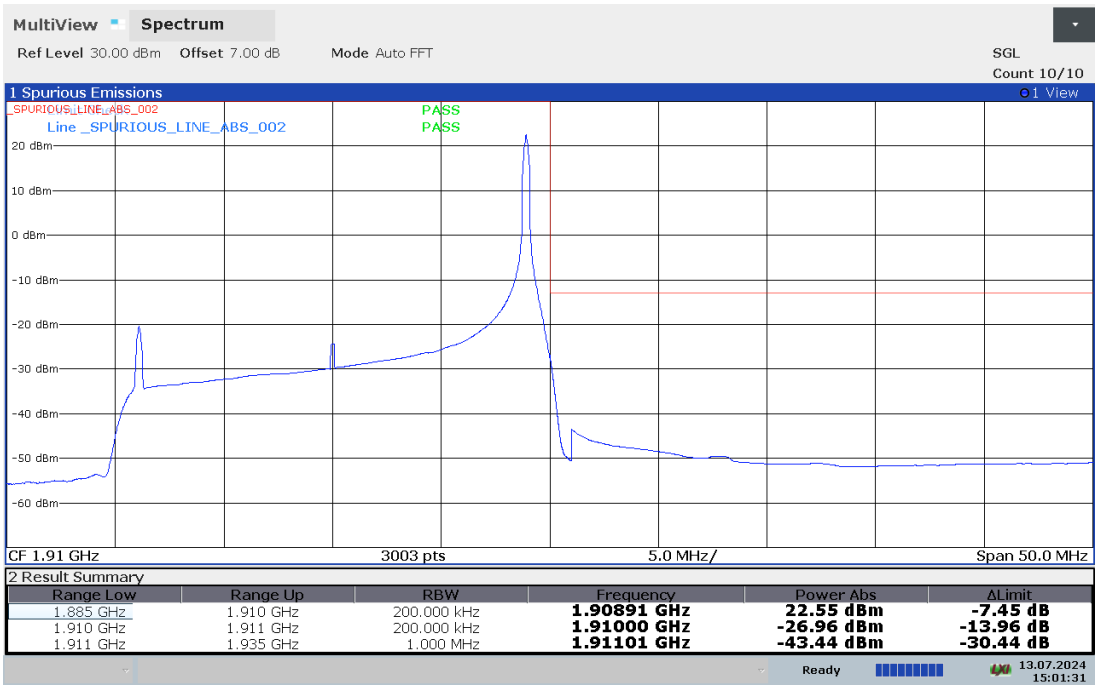
Only worst case result is given below

LTE band 2

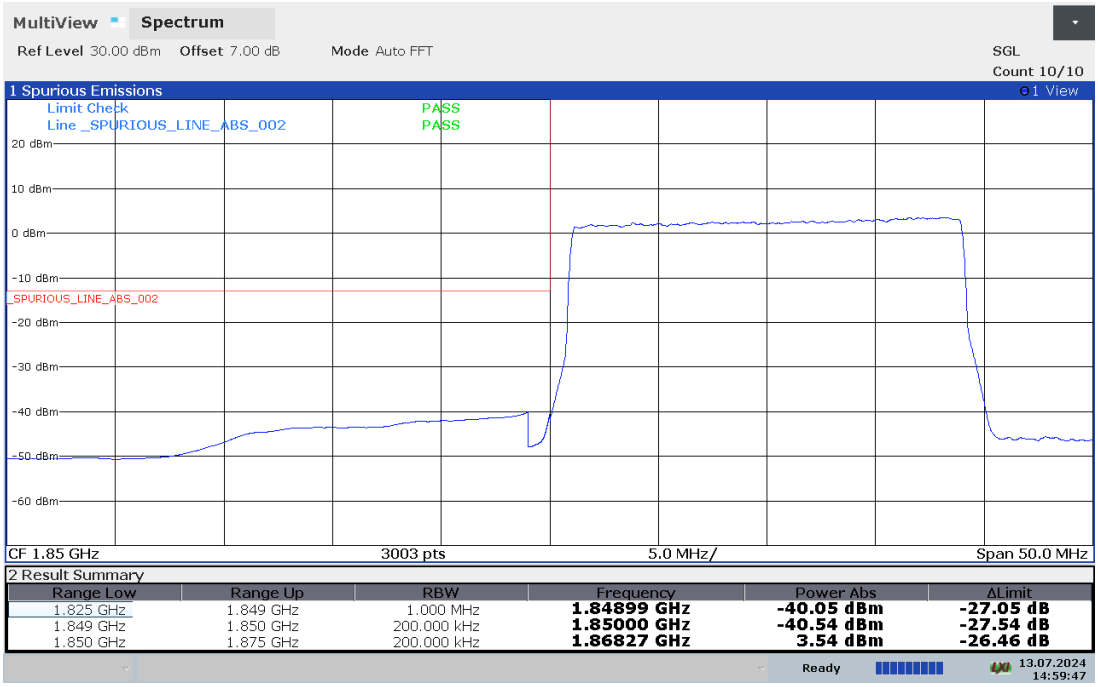
LOW BAND EDGE BLOCK-1RB-low_offset



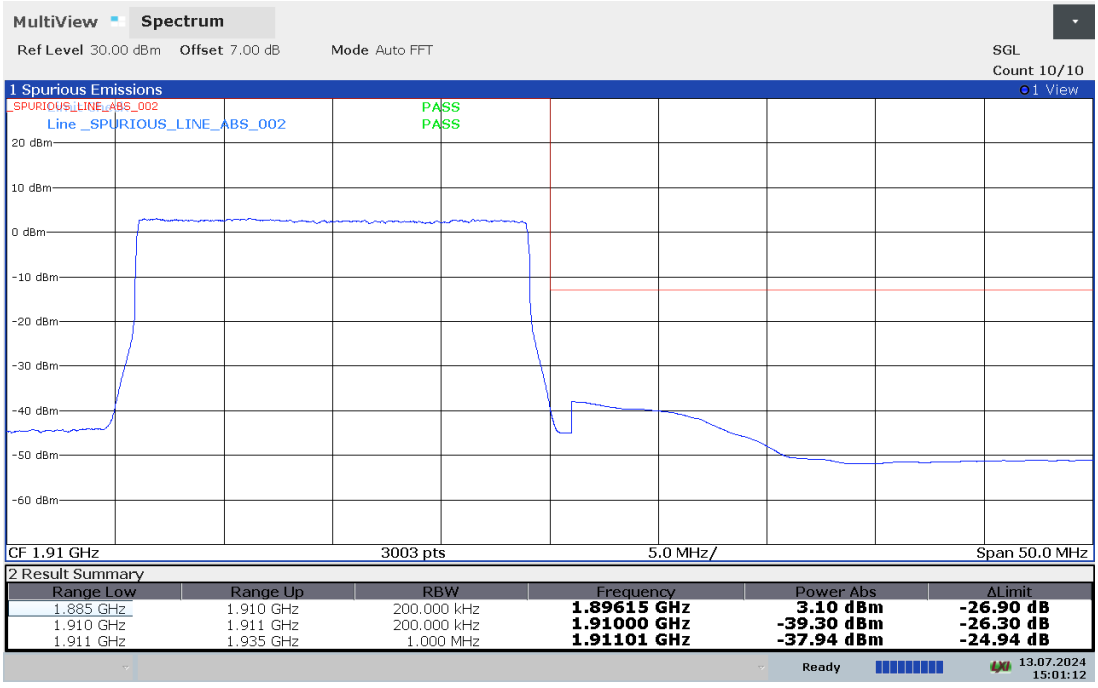
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB

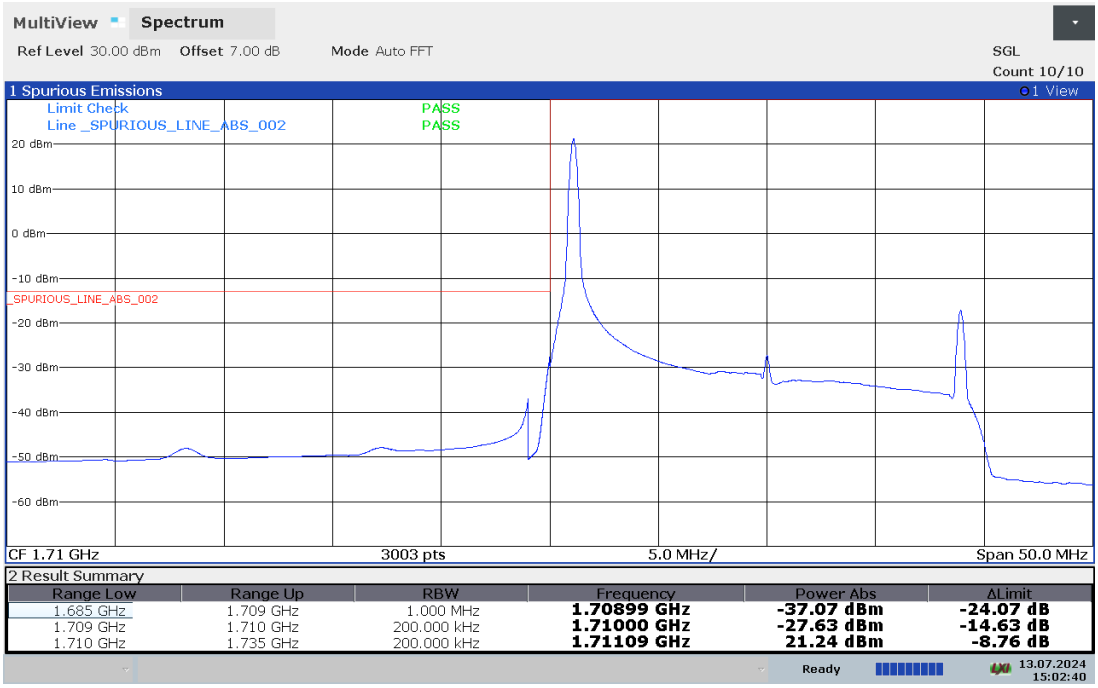


HIGH BAND EDGE BLOCK-20MHz-100%RB

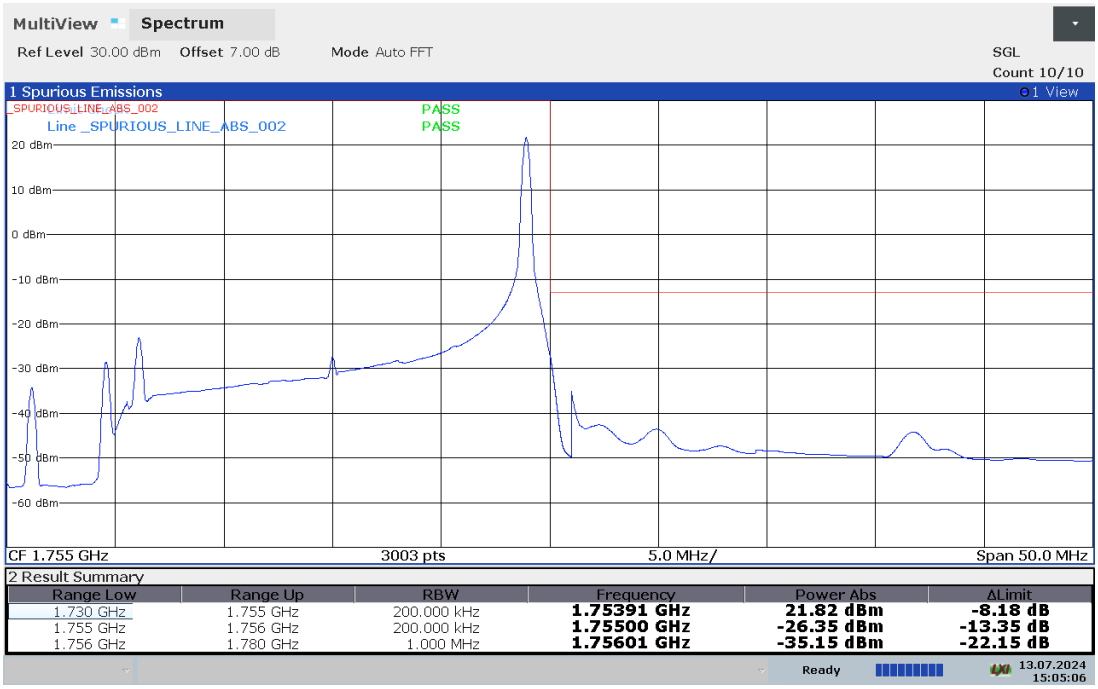


LTE band 4

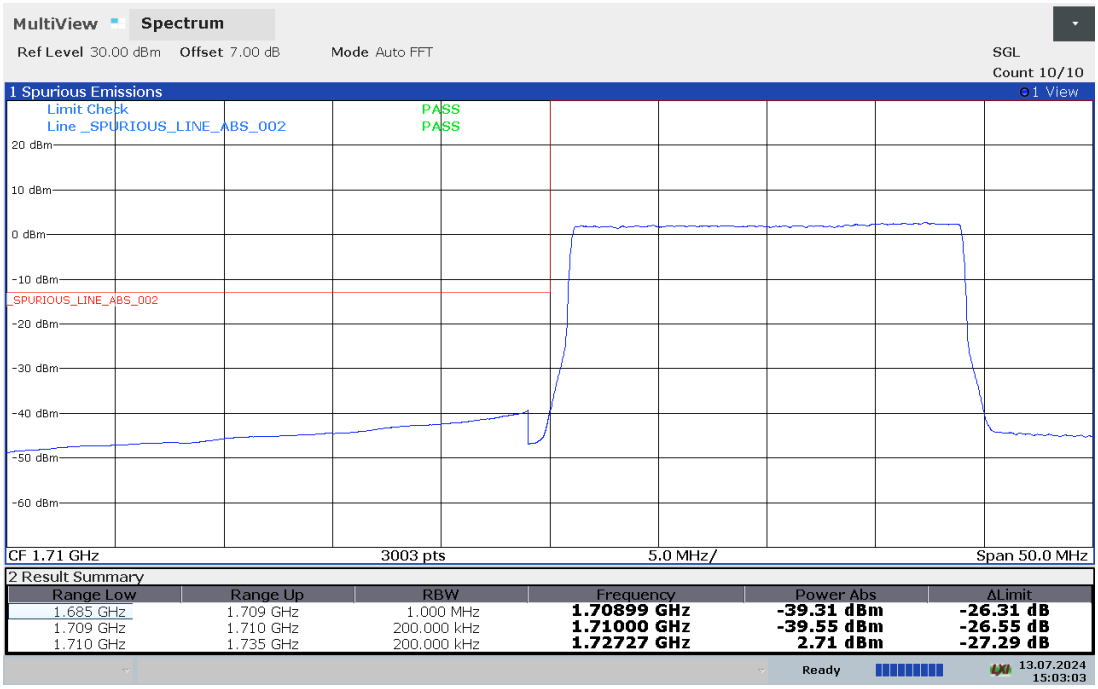
LOW BAND EDGE BLOCK-1RB-low_offset



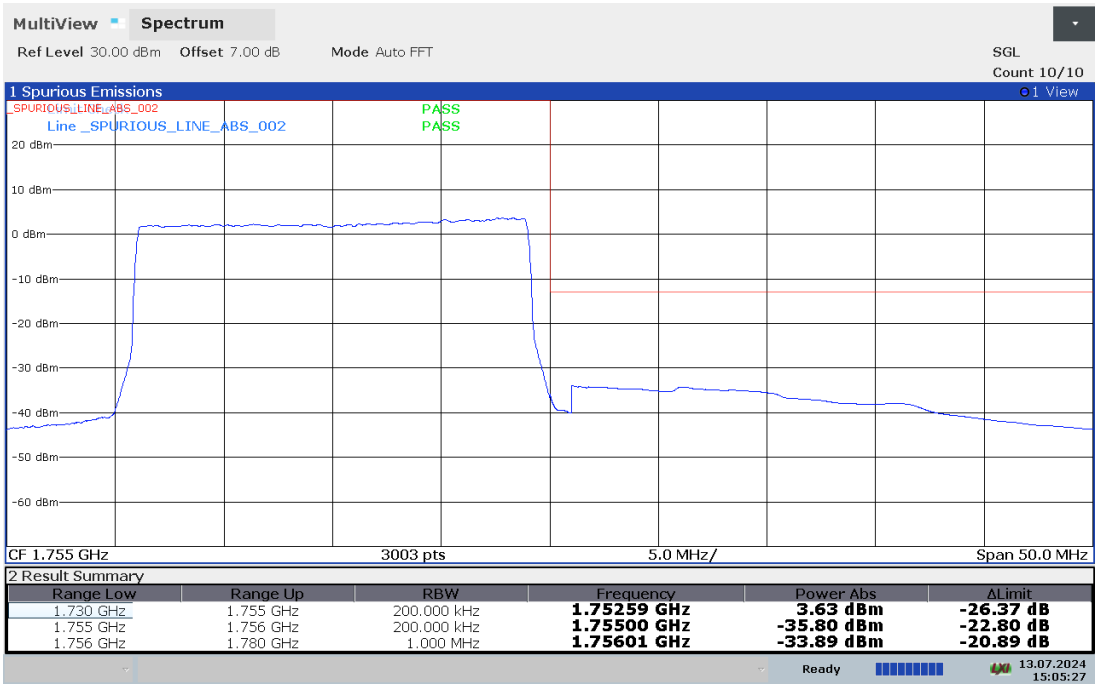
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB

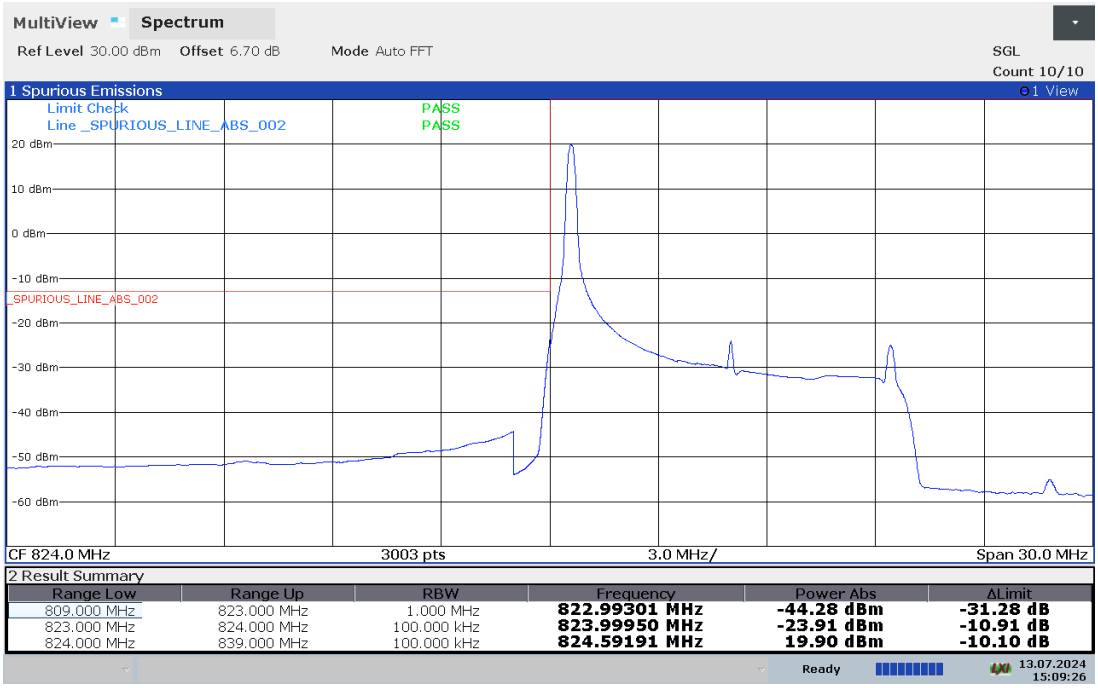


HIGH BAND EDGE BLOCK-20MHz-100%RB

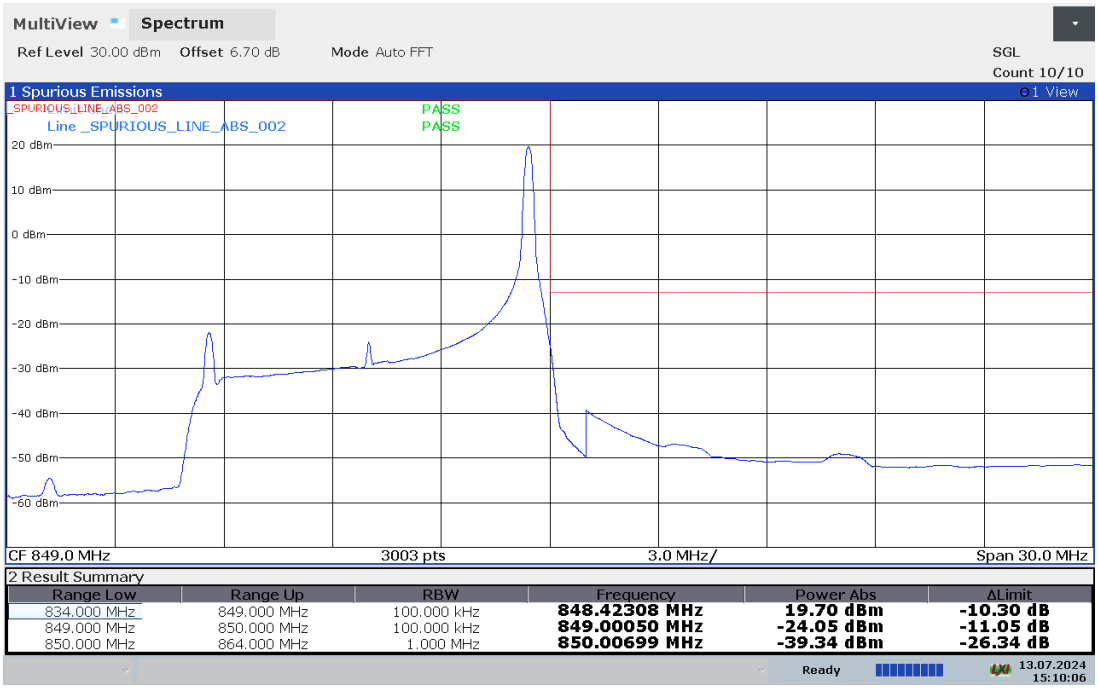


LTE band 5

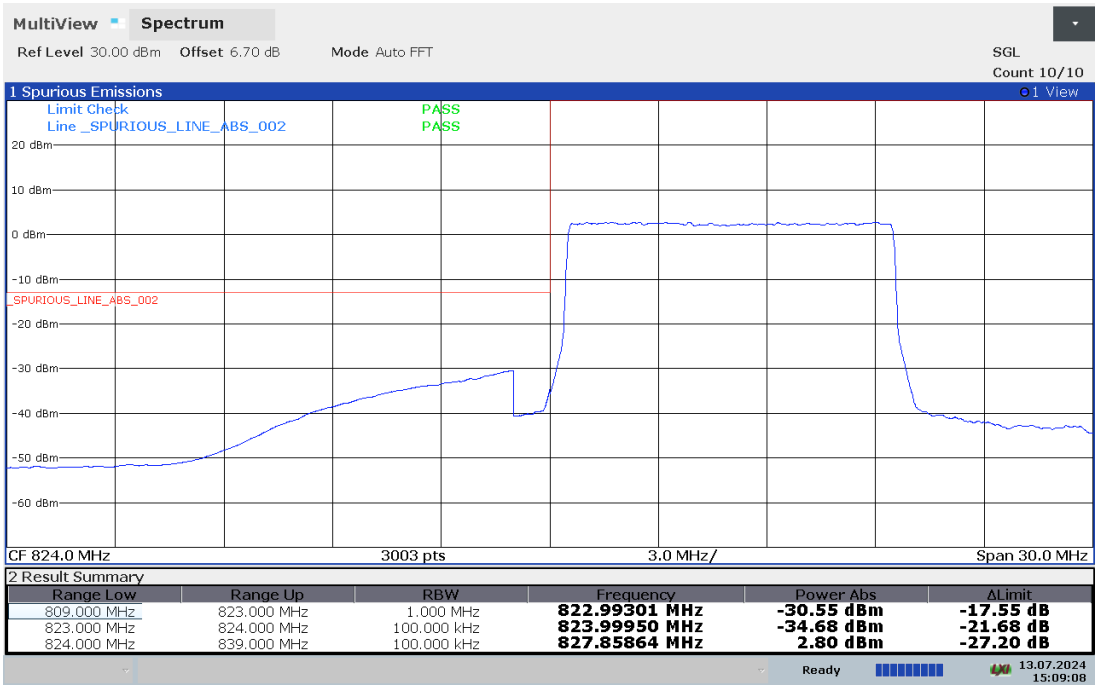
LOW BAND EDGE BLOCK-1RB-low_offset



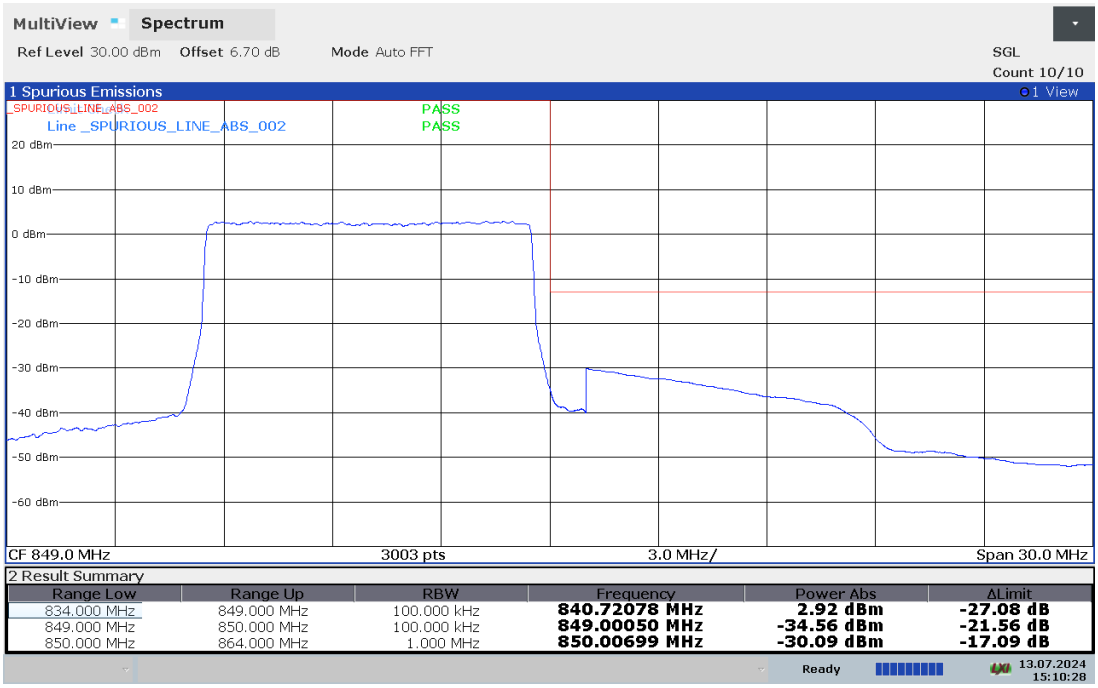
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-10MHz-100%RB

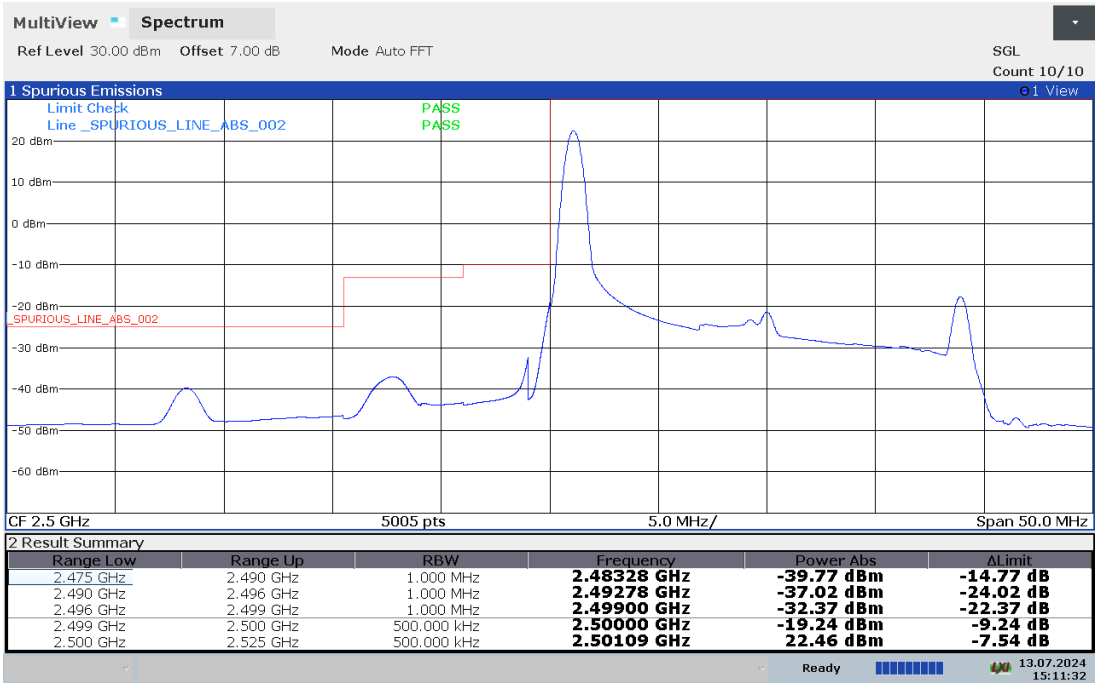


HIGH BAND EDGE BLOCK-10MHz-100%RB

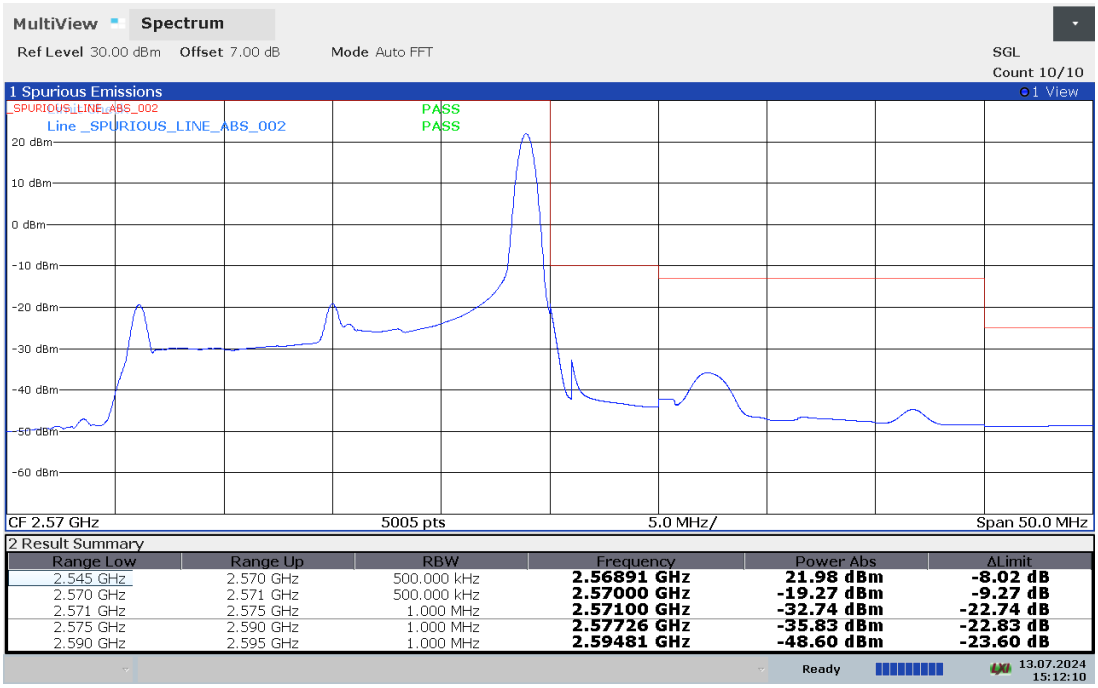


LTE band 7

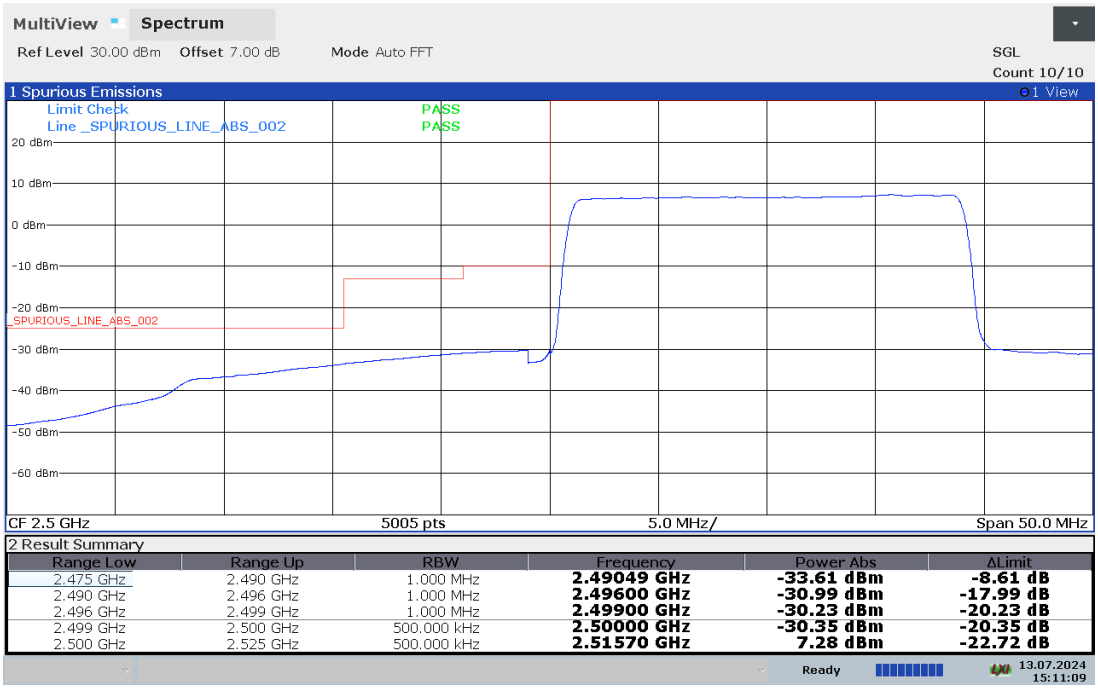
LOW BAND EDGE BLOCK-1RB-low_offset



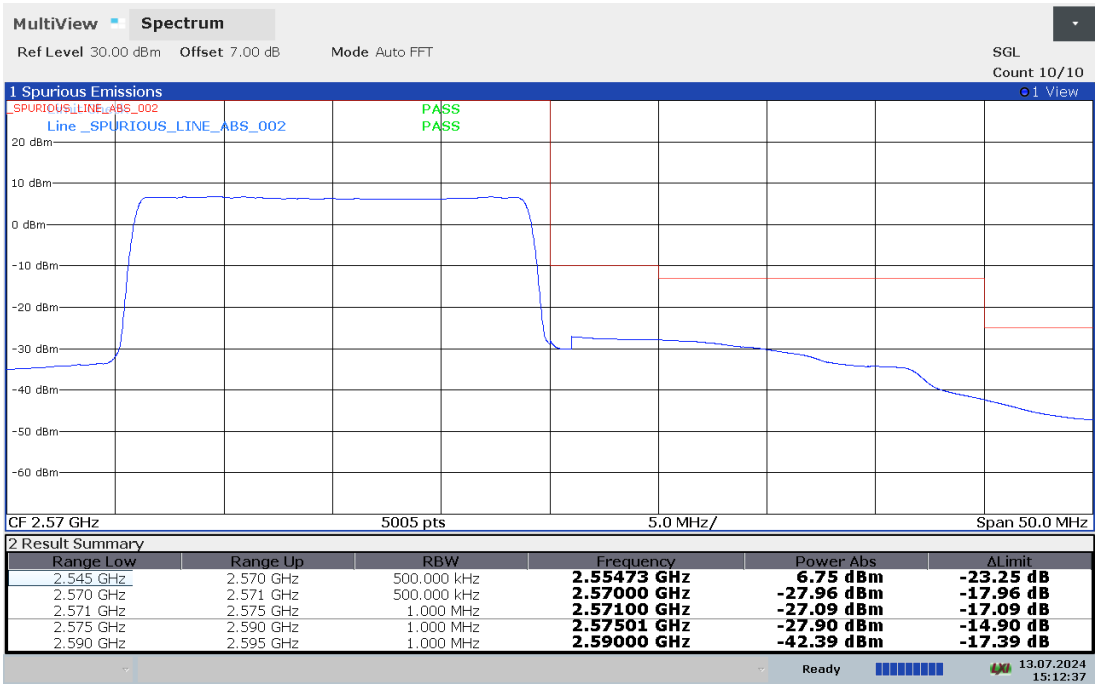
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB

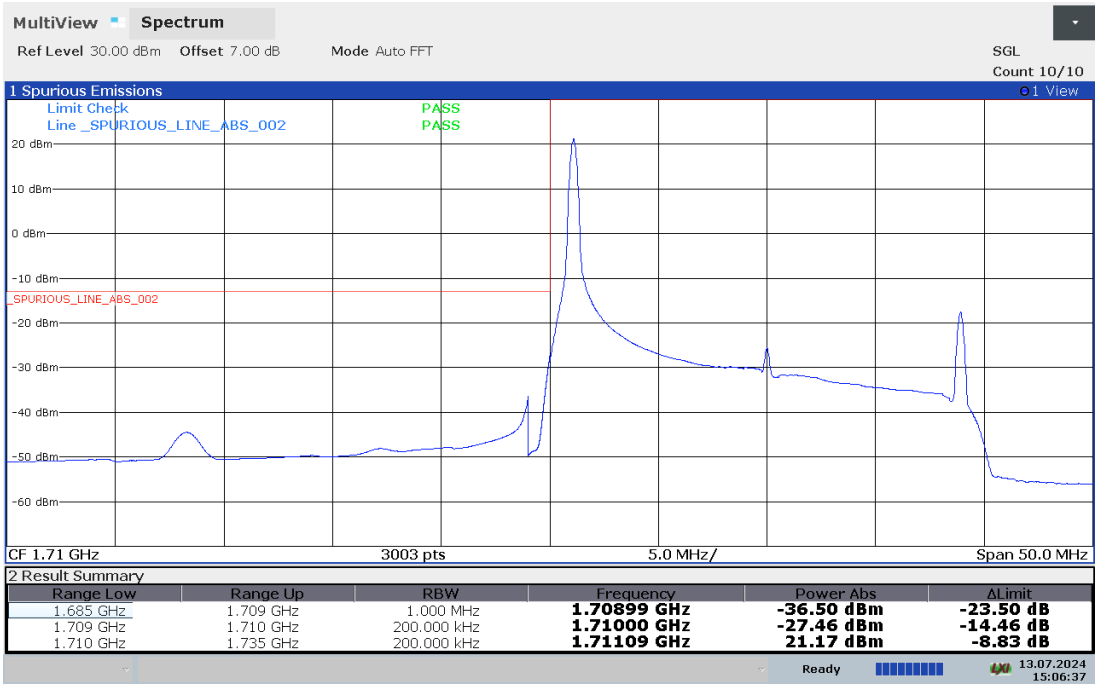


HIGH BAND EDGE BLOCK-20MHz-100%RB

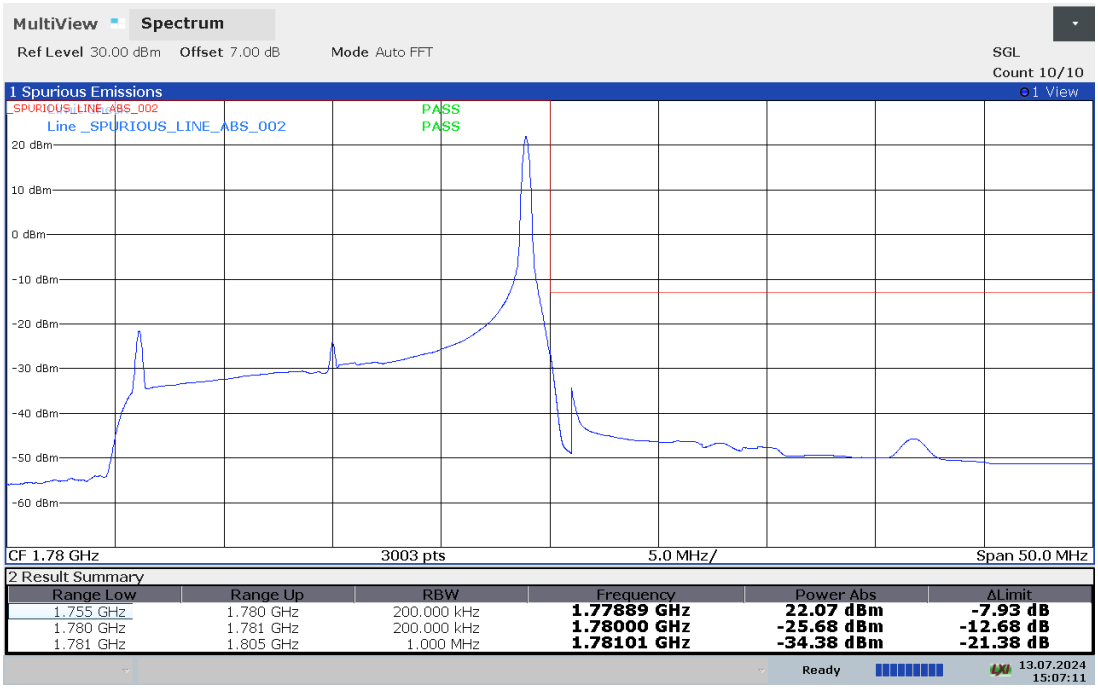


LTE band 66

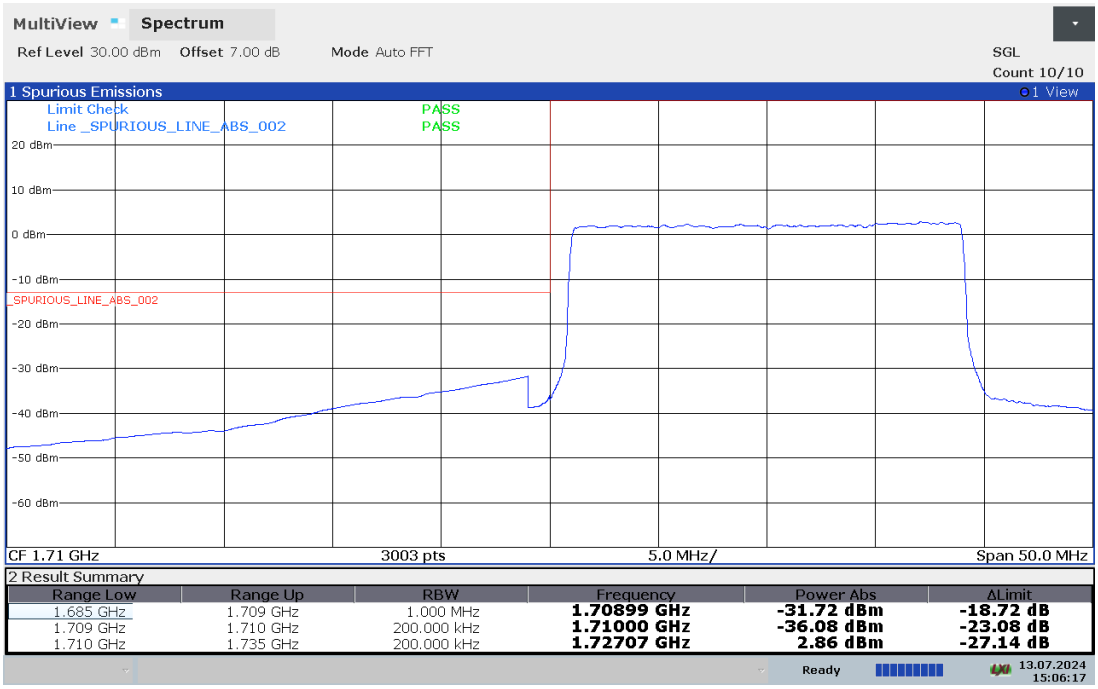
LOW BAND EDGE BLOCK-1RB-low_offset



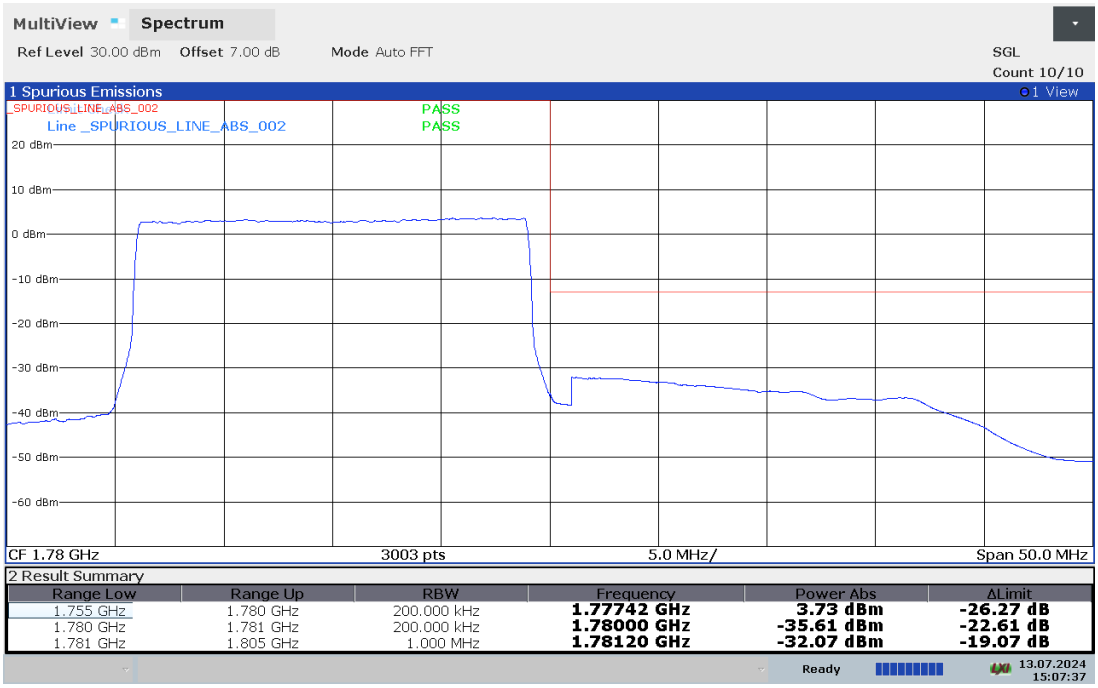
HIGH BAND EDGE BLOCK-1RB-high_offset



LOW BAND EDGE BLOCK-20MHz-100%RB



HIGH BAND EDGE BLOCK-20MHz-100%RB



Note: Expanded measurement uncertainty is U = 0.49dB(100KHz-2GHz)/1.21dB(2GHz-26.5GHz), k = 1.96

A.7 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 2.1051, 22.917, 24.238, 27.53.

A.7.1 Measurement Method

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

1. Determine frequency range for measurements: From CFR 2.1051 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
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 set to 30001 which is greater than 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.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

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 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.

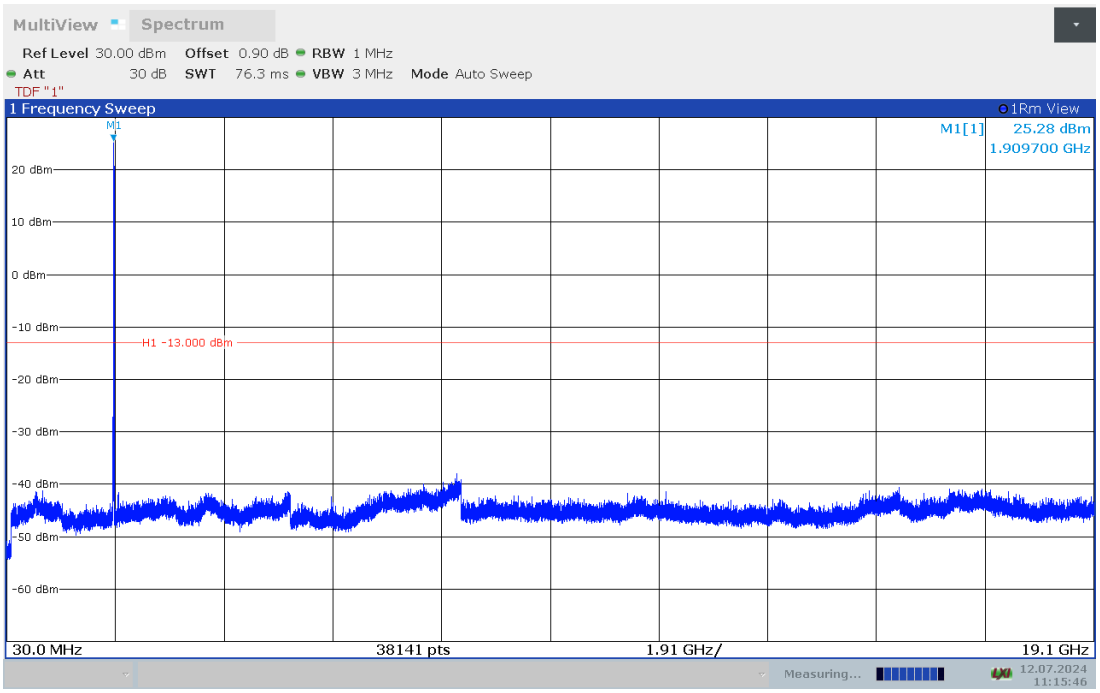
A. 7.3 Measurement result

Only worst case result is given below

LTE band 2 : 30MHz – 19.1GHz

Spurious emission limit –13dBm.

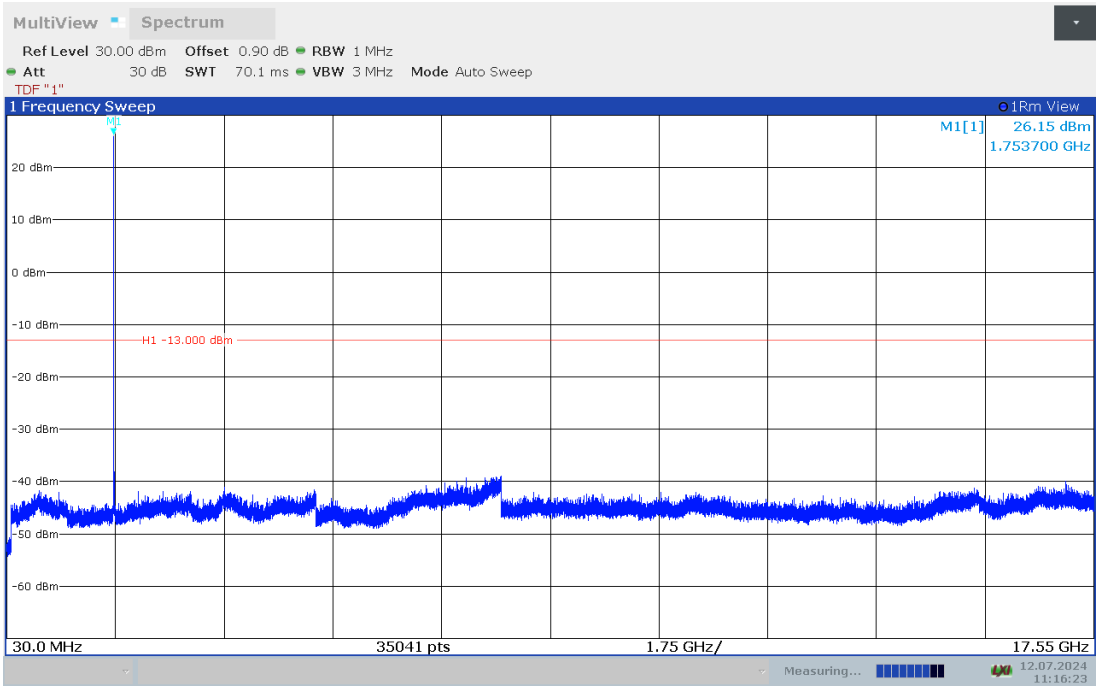
NOTE: peak above the limit line is the carrier frequency.



LTE band 4 : 30MHz – 17.55GHz

Spurious emission limit –13dBm.

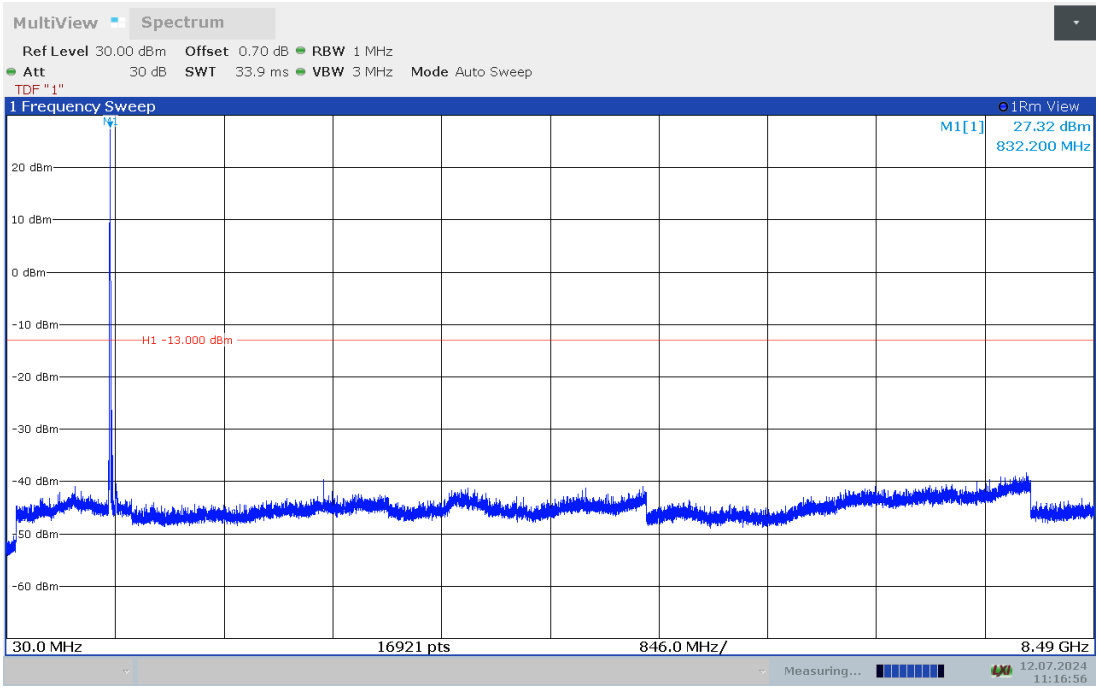
NOTE: peak above the limit line is the carrier frequency.



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

Spurious emission limit –25dBm.

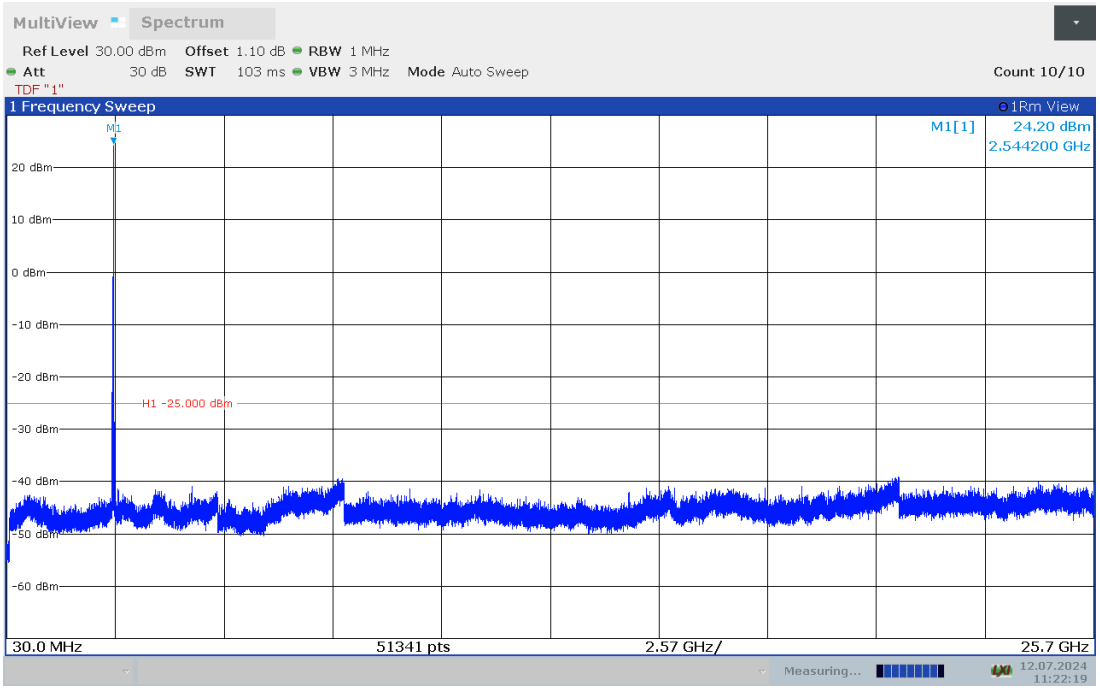
NOTE: peak above the limit line is the carrier frequency.



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

Spurious emission limit –25dBm.

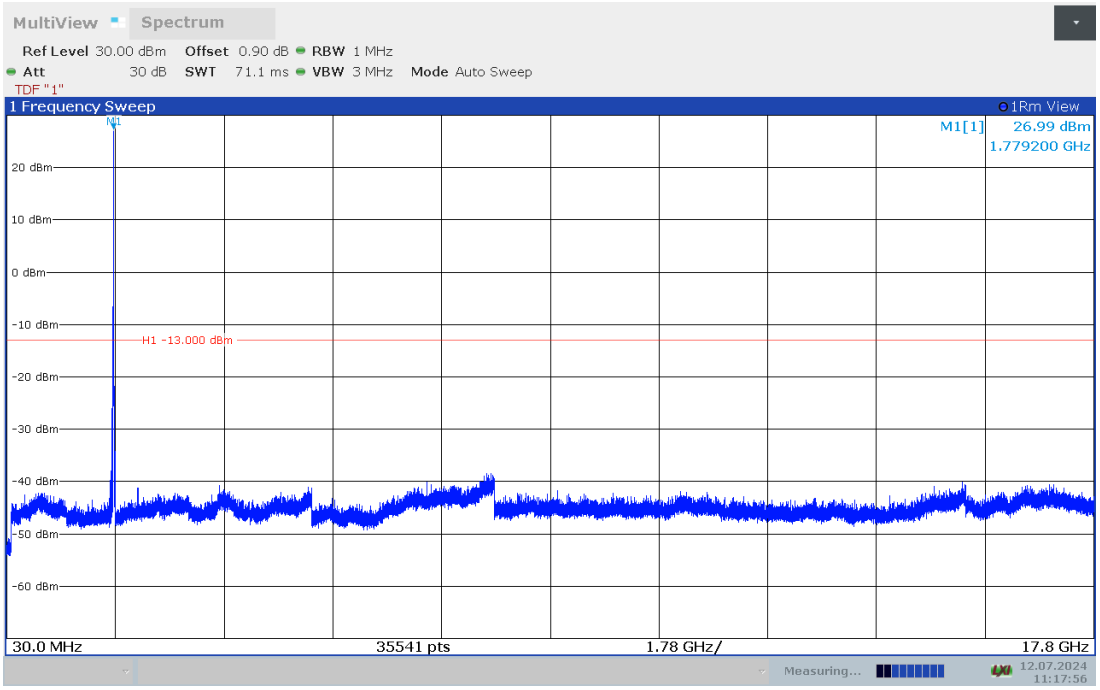
NOTE: peak above the limit line is the carrier frequency.



LTE Band 66: 30MHz – 17.8GHz

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.

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) Set the measurement interval to 1 ms

e)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

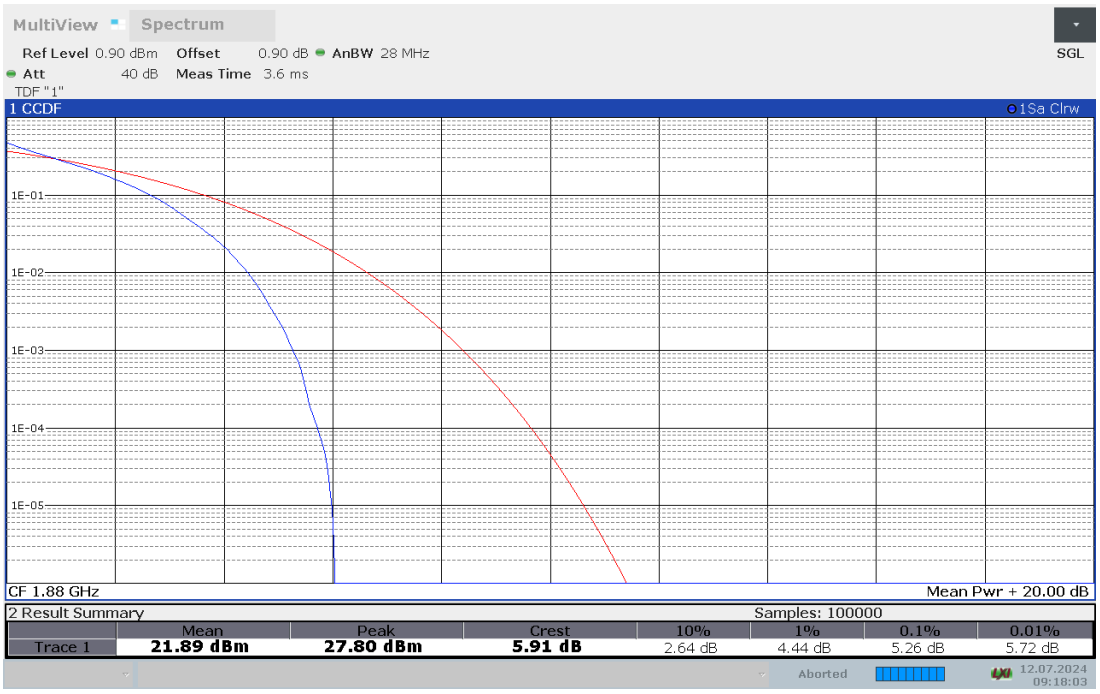
Only worst case result is given below

LTE band 2

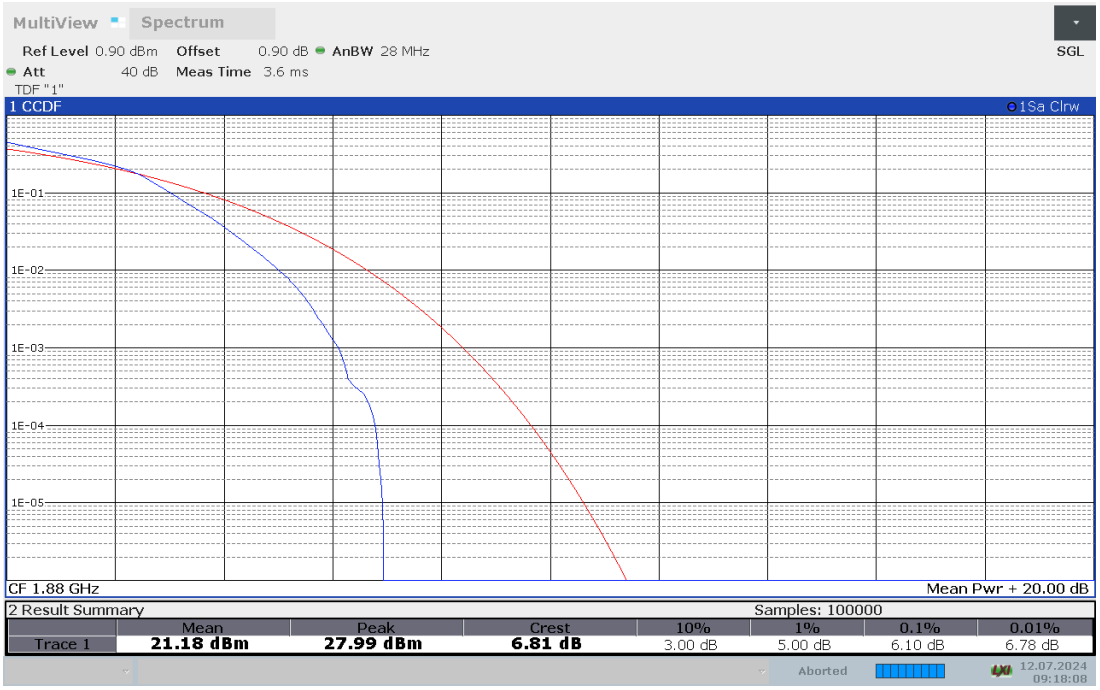
LTE Band 2, BW1.4MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1880	100%,0	5.26	6.10

LTE band 2 , 1.4MHz Bandwidth,QPSK



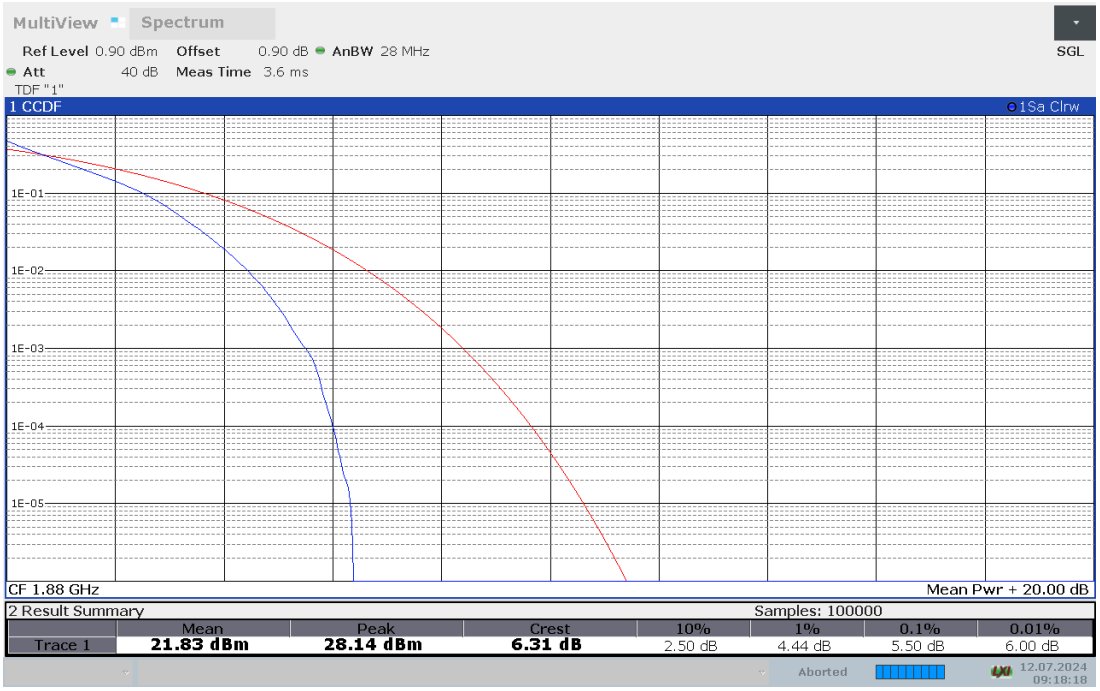
LTE band 2 , 1.4MHz Bandwidth,16QAM



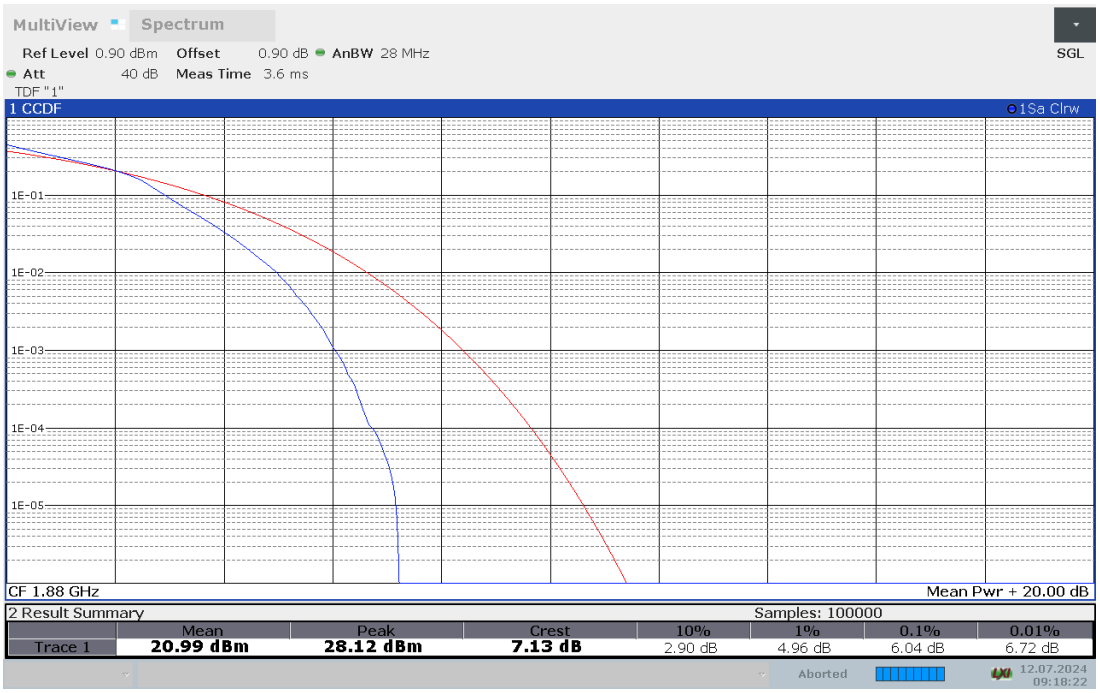
LTE Band 2, 3MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1880	100%,0	5.50	6.04

LTE band 2 , 3MHz Bandwidth,QPSK



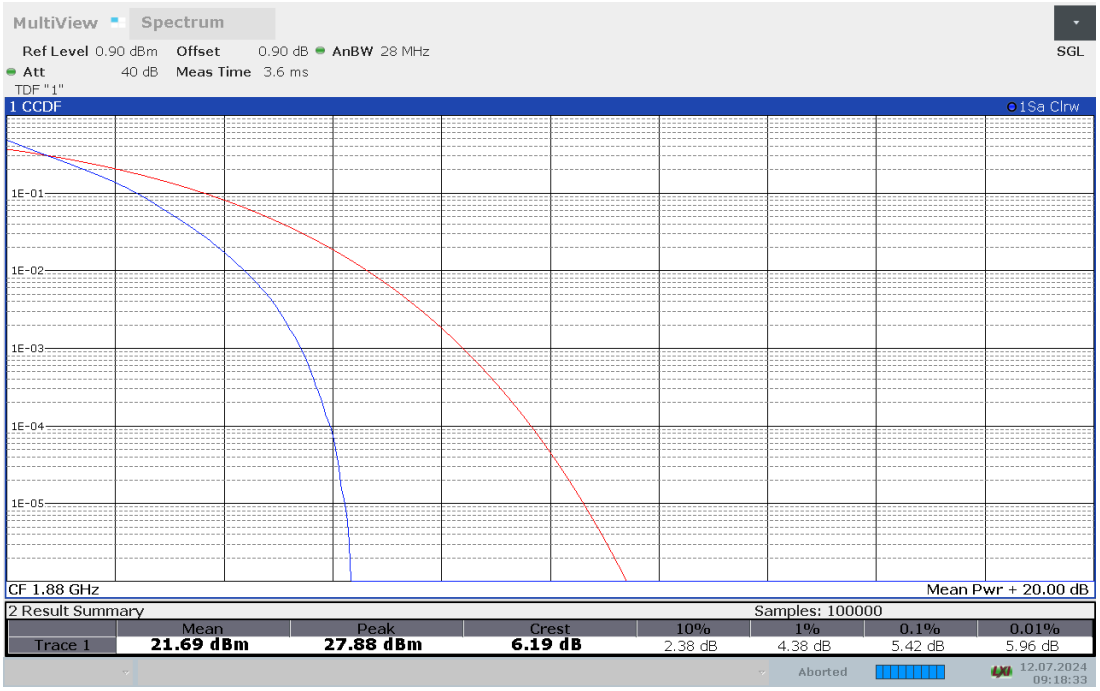
LTE band 2 , 3MHz Bandwidth,16QAM



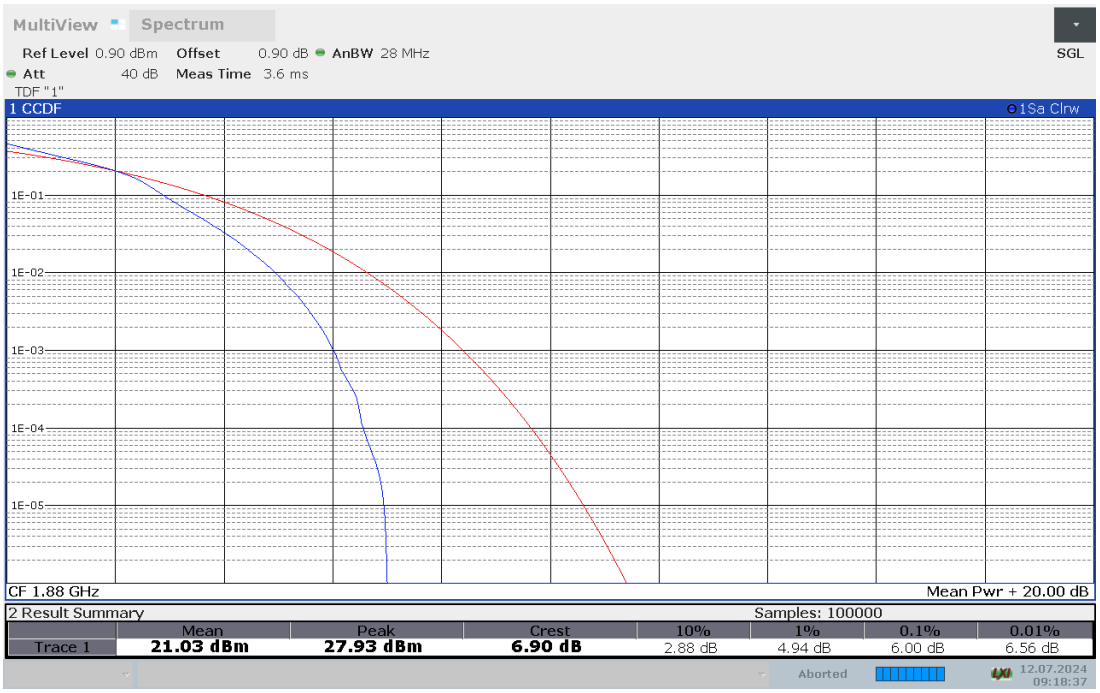
LTE Band 2, 5MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1880	100%,0	5.42	6.00

LTE band 2 , 5MHz Bandwidth,QPSK



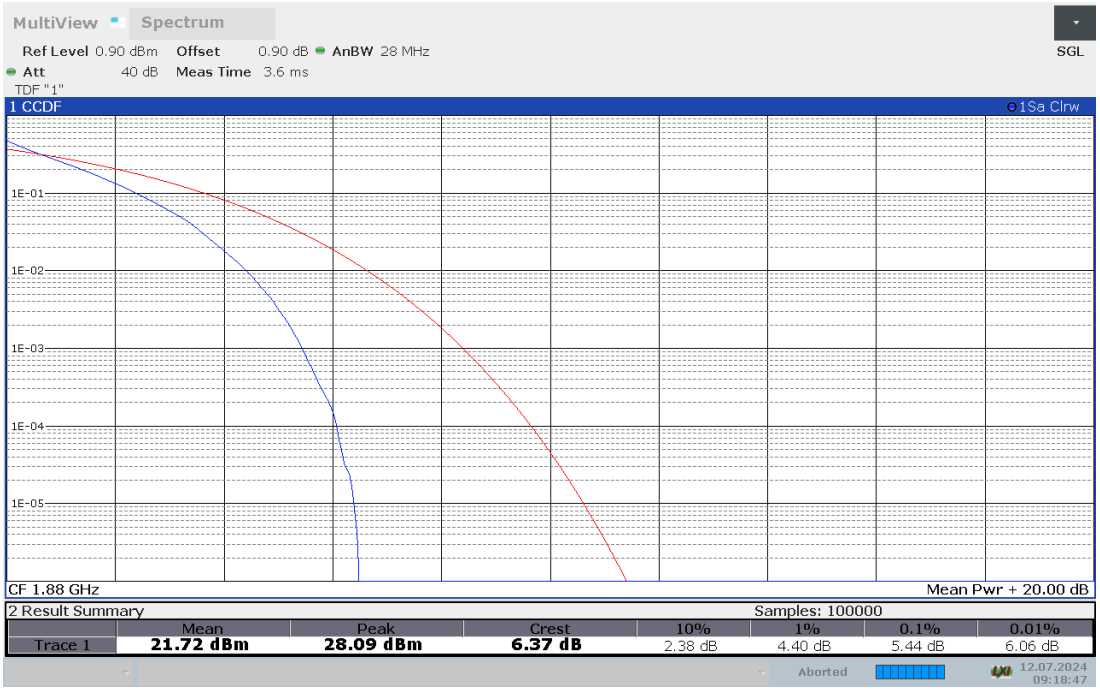
LTE band 2 , 5MHz Bandwidth,16QAM



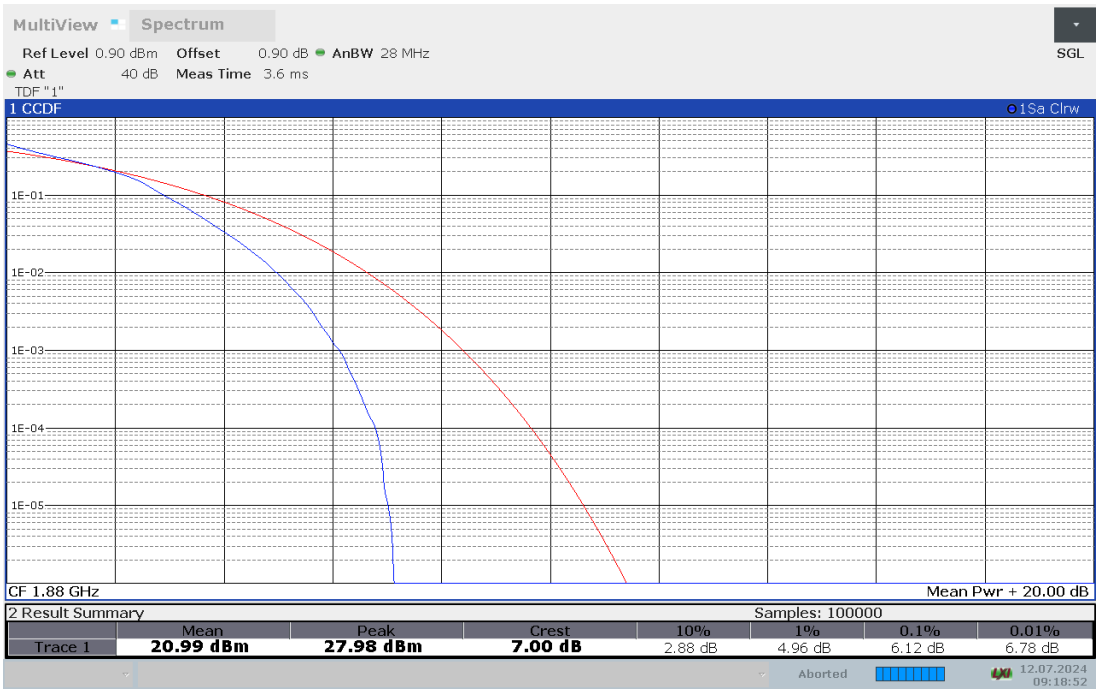
LTE Band 2, 10MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1880	100%,0	5.44	6.12

LTE band 2 , 10MHz Bandwidth,QPSK



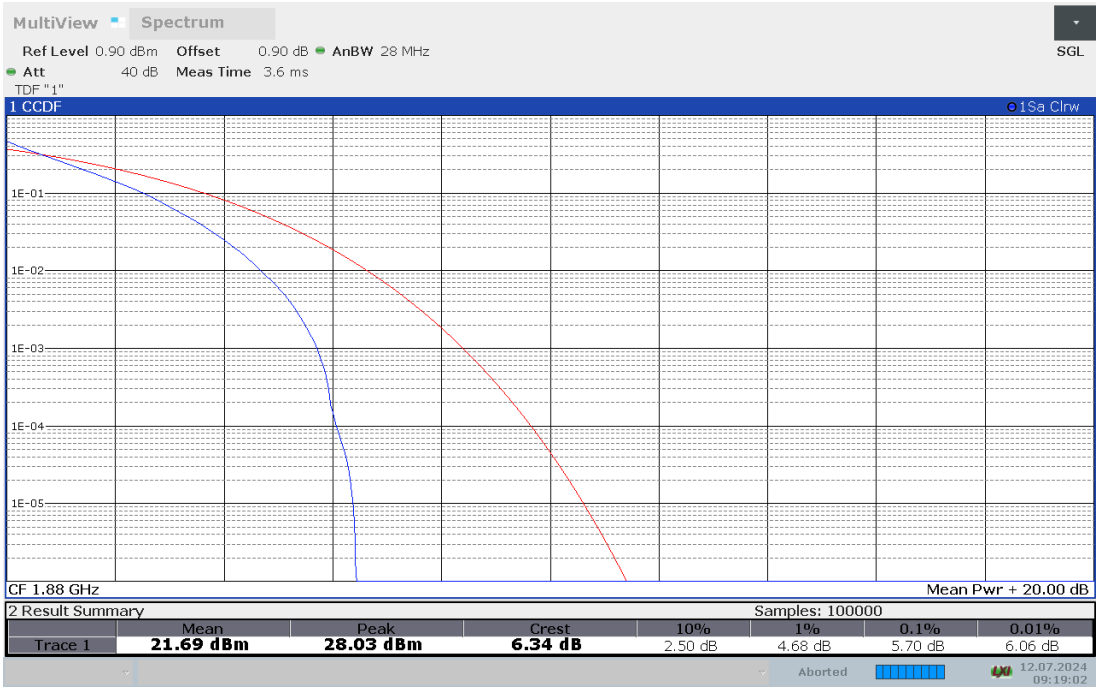
LTE band 2 , 10MHz Bandwidth,16QAM



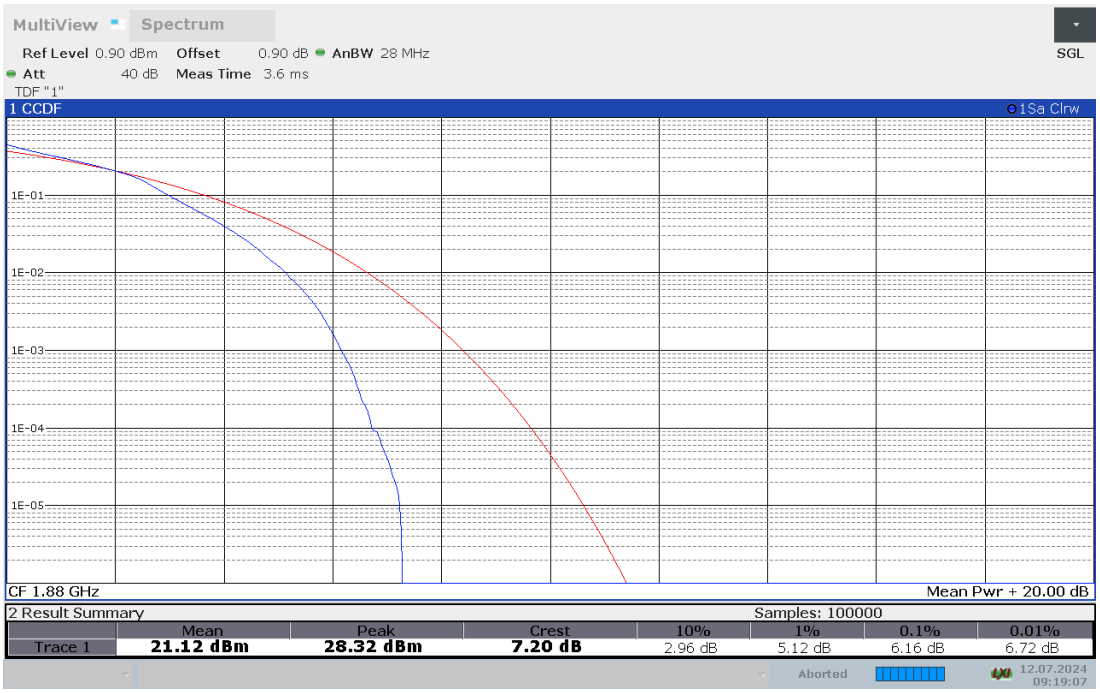
LTE Band 2, 15MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1880	100%,0	5.70	6.16

LTE band 2 , 15MHz Bandwidth,QPSK



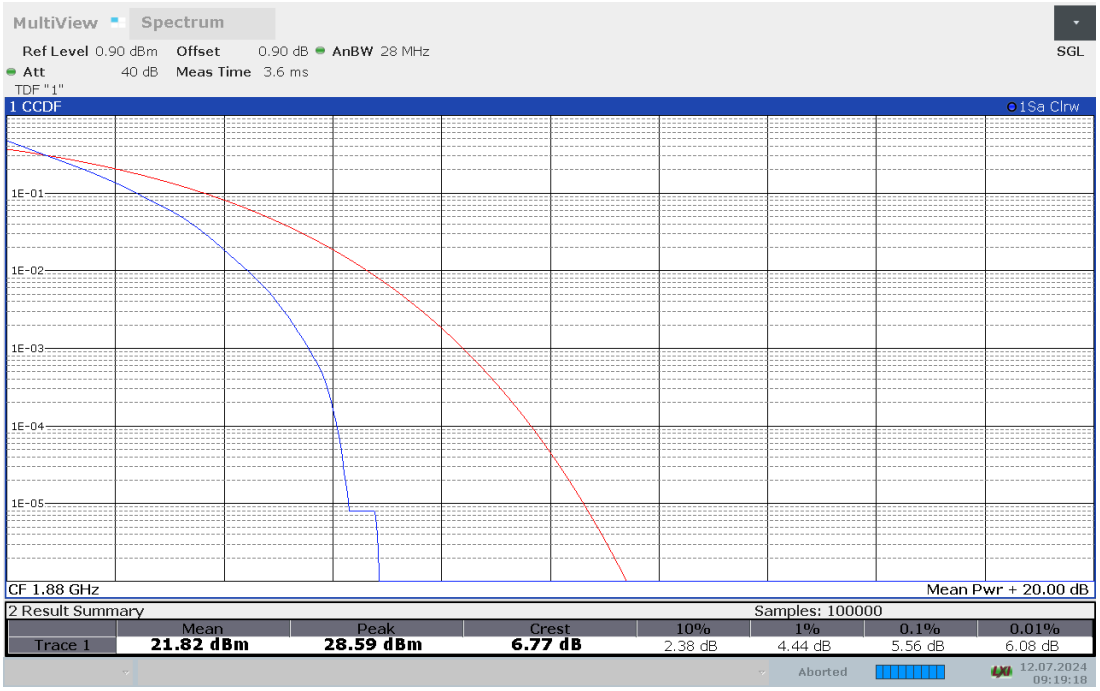
LTE band 2 , 15MHz Bandwidth,16QAM



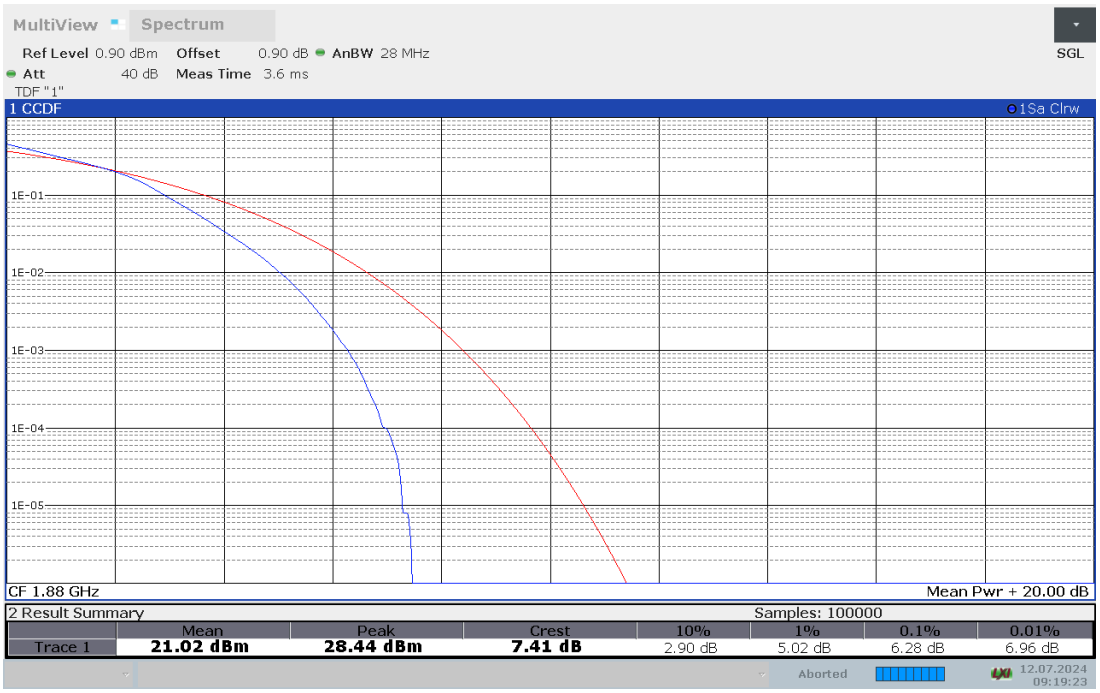
LTE Band 2, 20MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1880	100%,0	5.56	6.28

LTE band 2 , 20MHz Bandwidth,QPSK



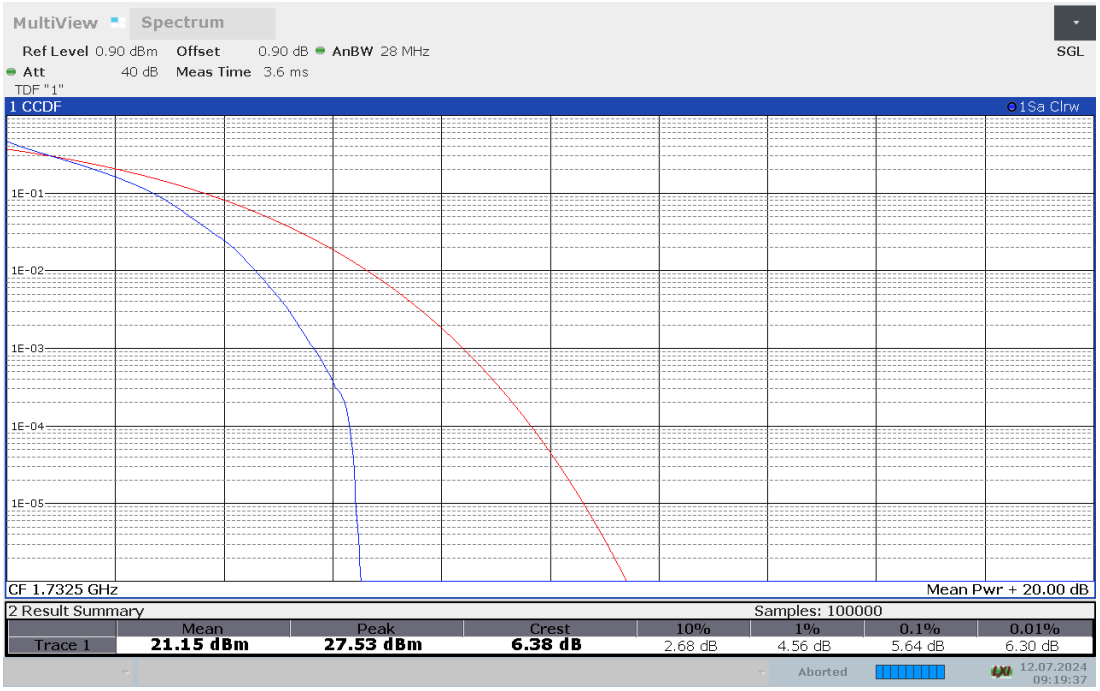
LTE band 2 , 20MHz Bandwidth,16QAM



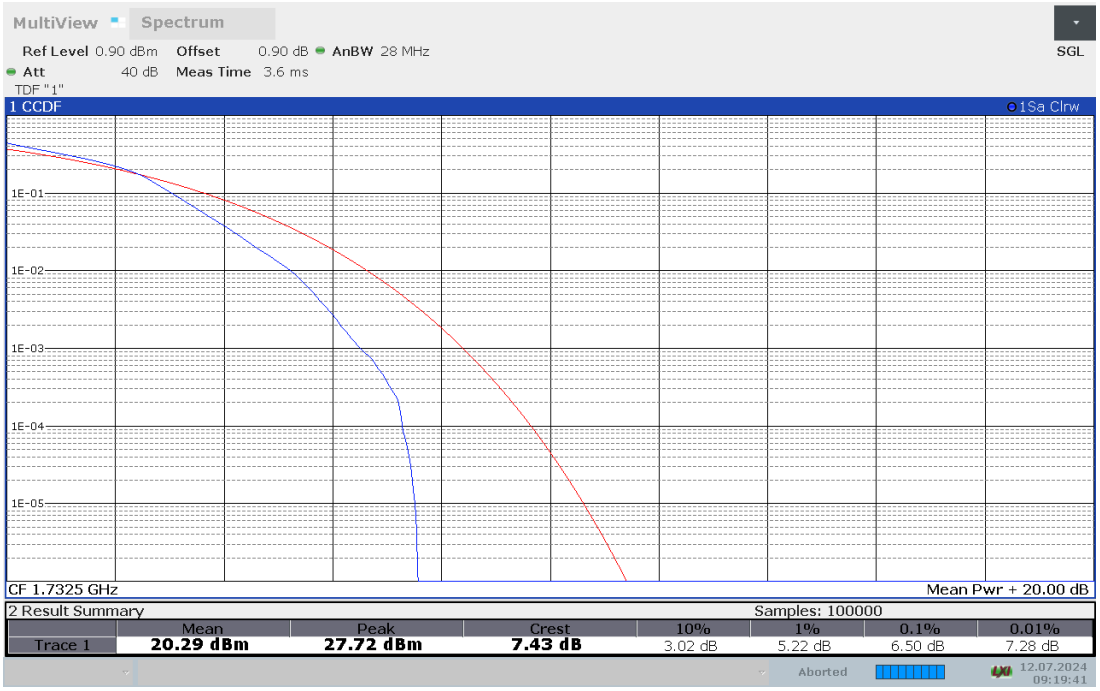
LTE Band 4, BW1.4MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1732.5	100%,0	5.64	6.50

LTE band 4 , 1.4MHz Bandwidth,QPSK



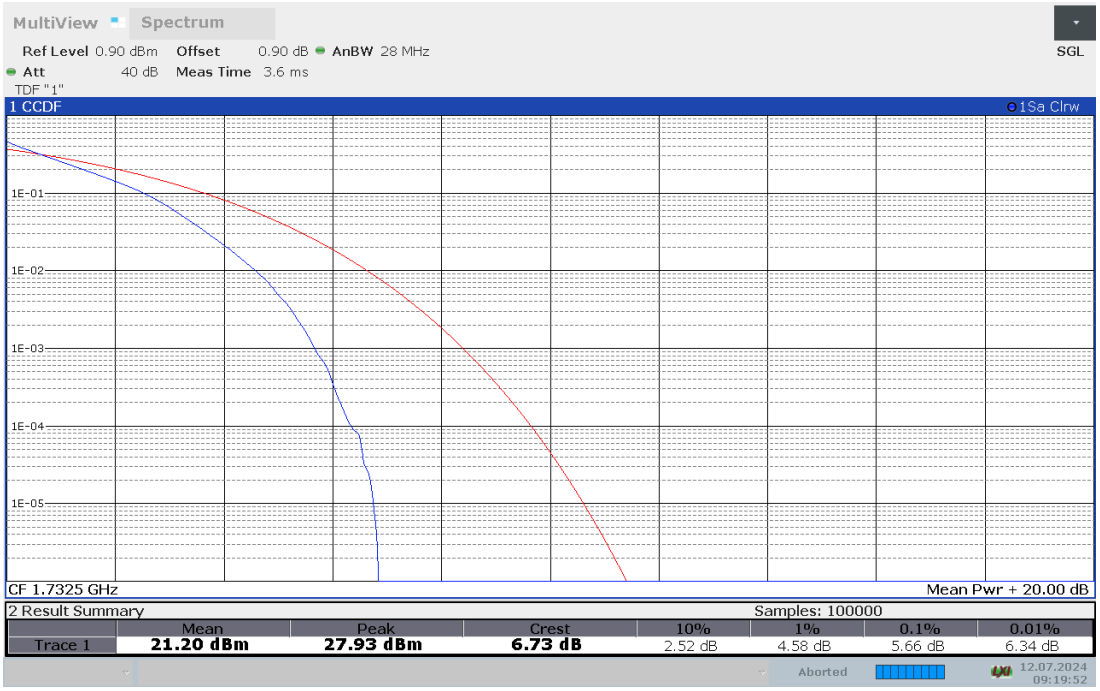
LTE band 4 , 1.4MHz Bandwidth,16QAM



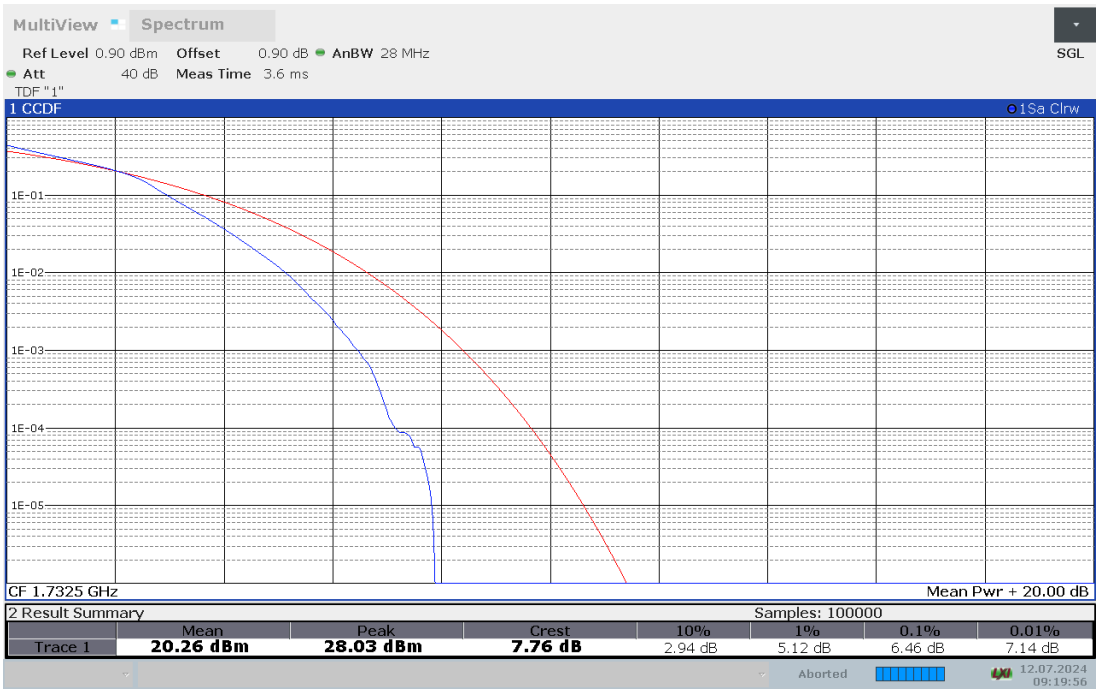
LTE Band 4, 3MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1732.5	100%,0	5.66	6.46

LTE band 4 , 3MHz Bandwidth,QPSK



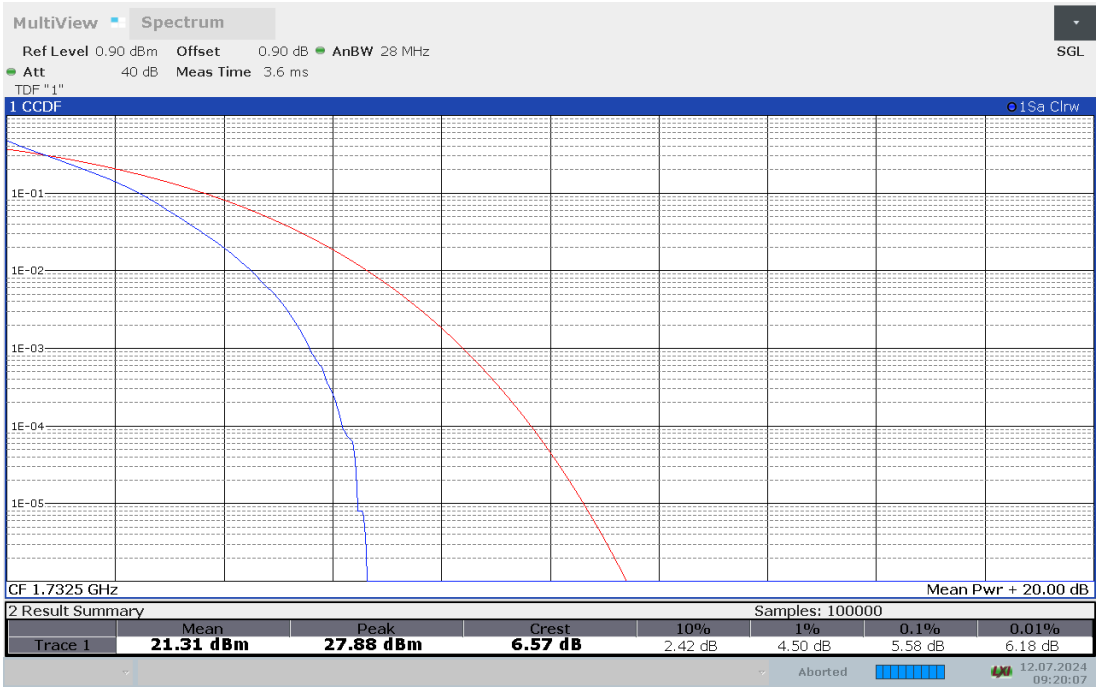
LTE band 4 , 3MHz Bandwidth,16QAM



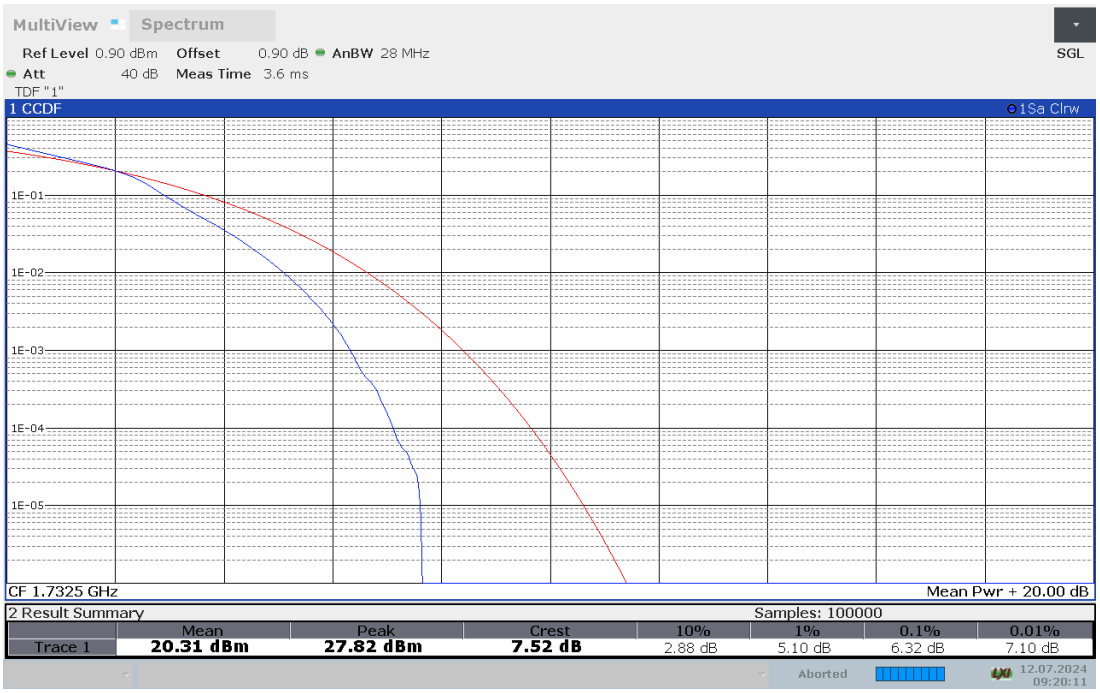
LTE Band 4, 5MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1732.5	100%,0	5.58	6.32

LTE band 4 , 5MHz Bandwidth,QPSK



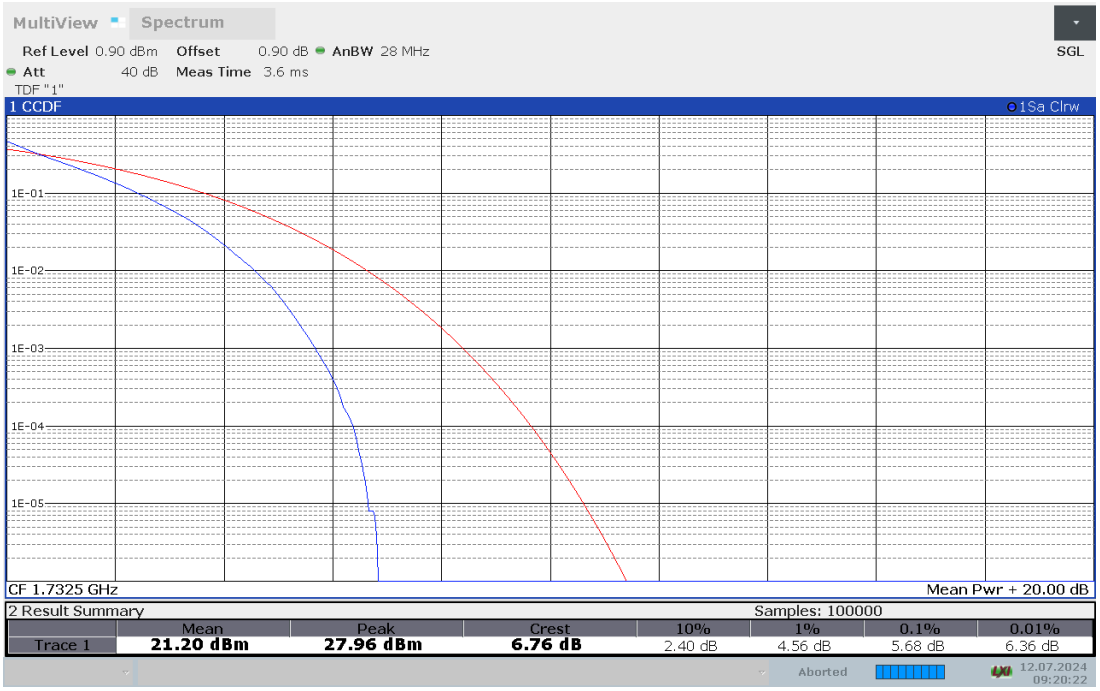
LTE band 4 , 5MHz Bandwidth,16QAM



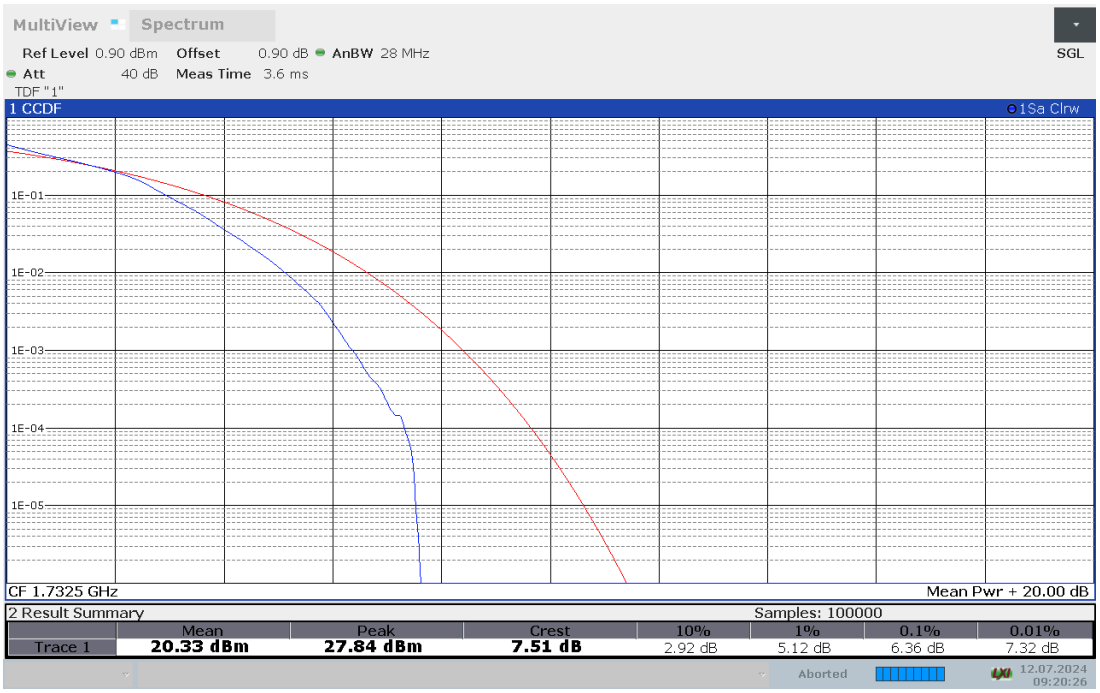
LTE Band 4, 10MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1732.5	100%,0	5.68	6.36

LTE band 4 , 10MHz Bandwidth,QPSK



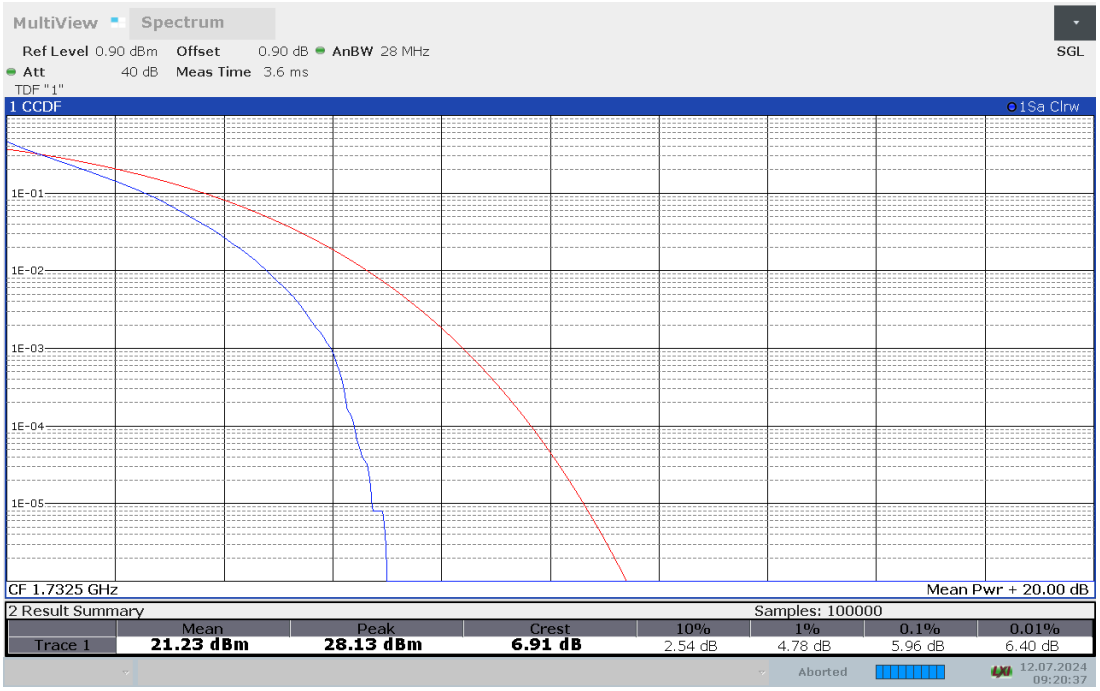
LTE band 4 , 10MHz Bandwidth,16QAM



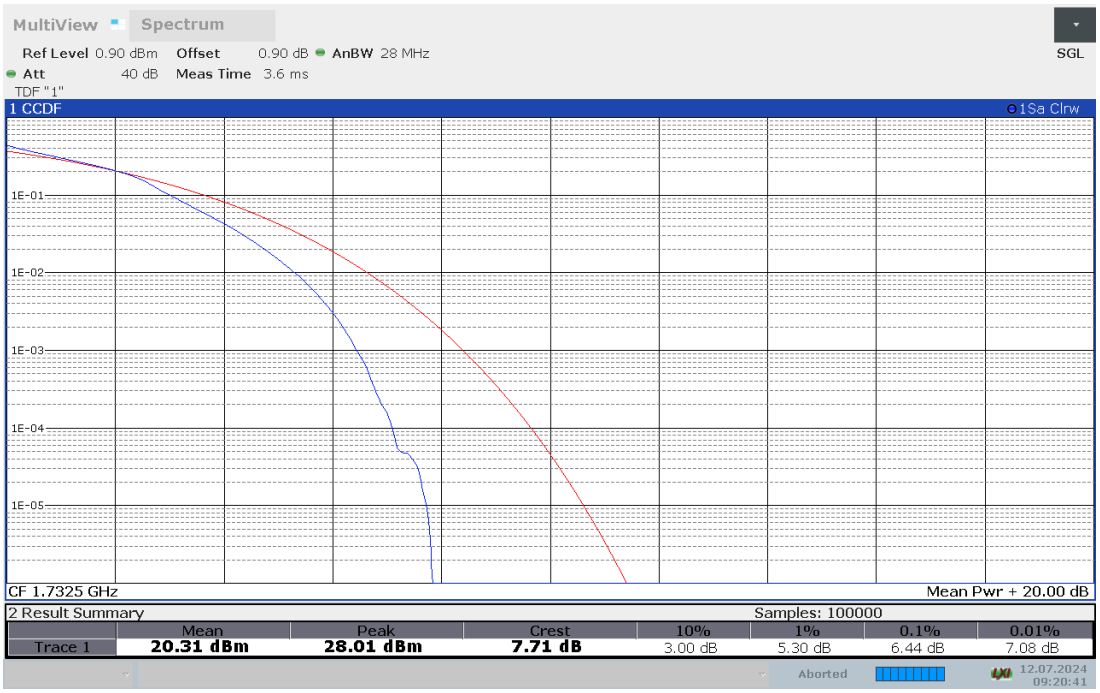
LTE Band 4, 15MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1732.5	100%,0	5.96	6.44

LTE band 4 , 15MHz Bandwidth,QPSK



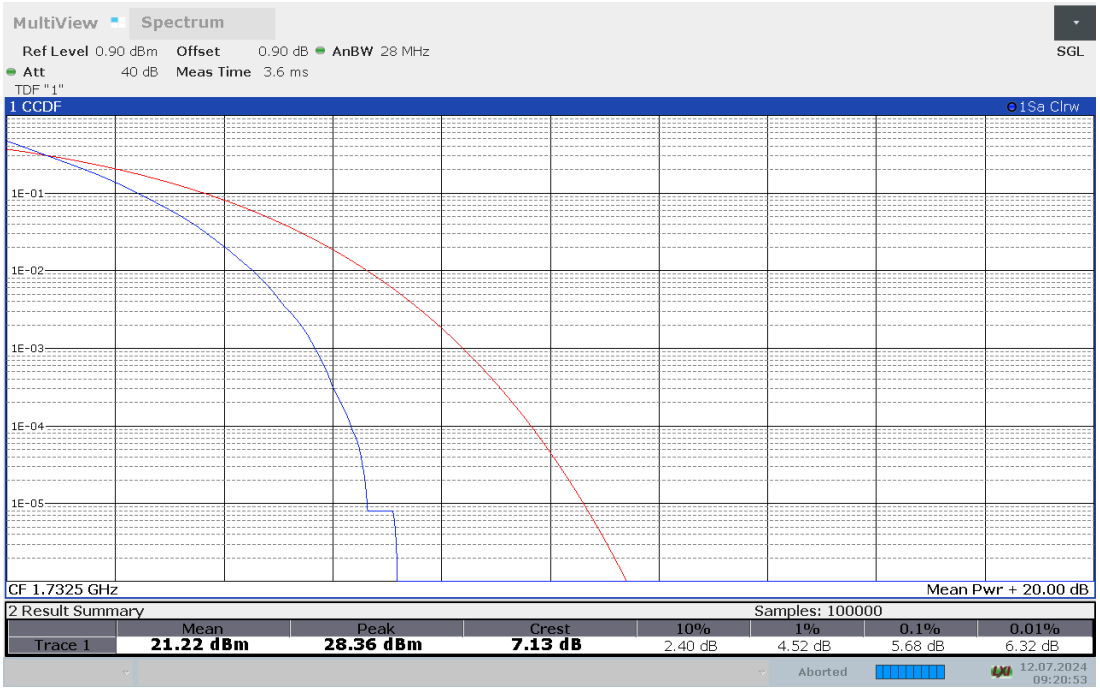
LTE band 4 , 15MHz Bandwidth,16QAM



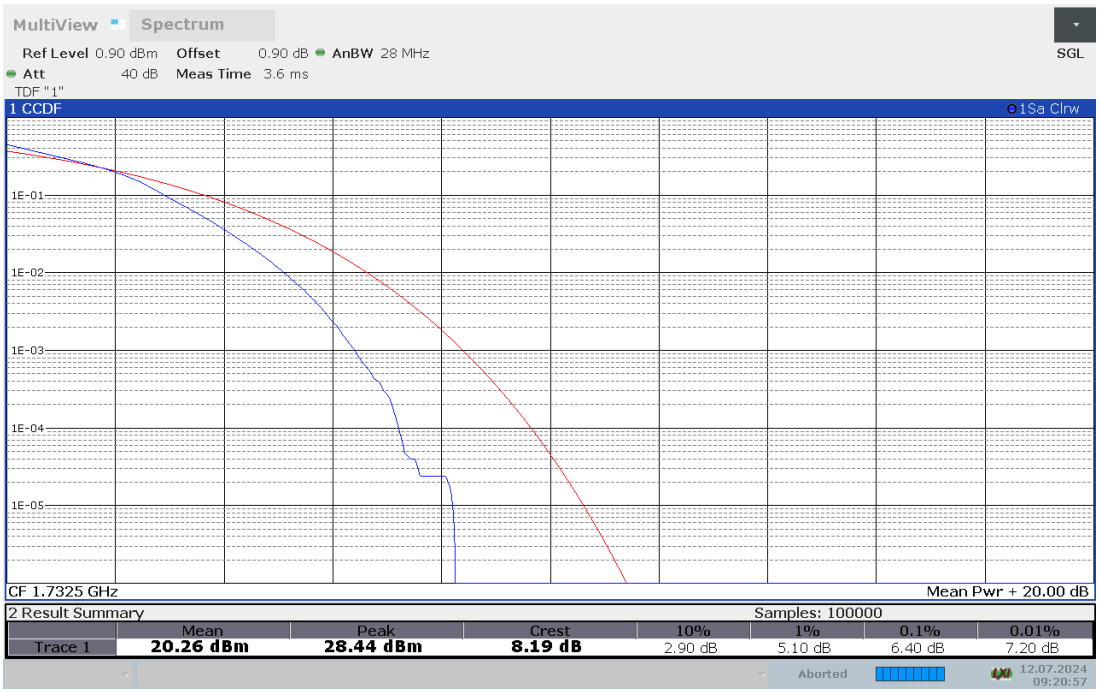
LTE Band 4, 20MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1732.5	100%,0	5.68	6.40

LTE band 4 , 20MHz Bandwidth,QPSK



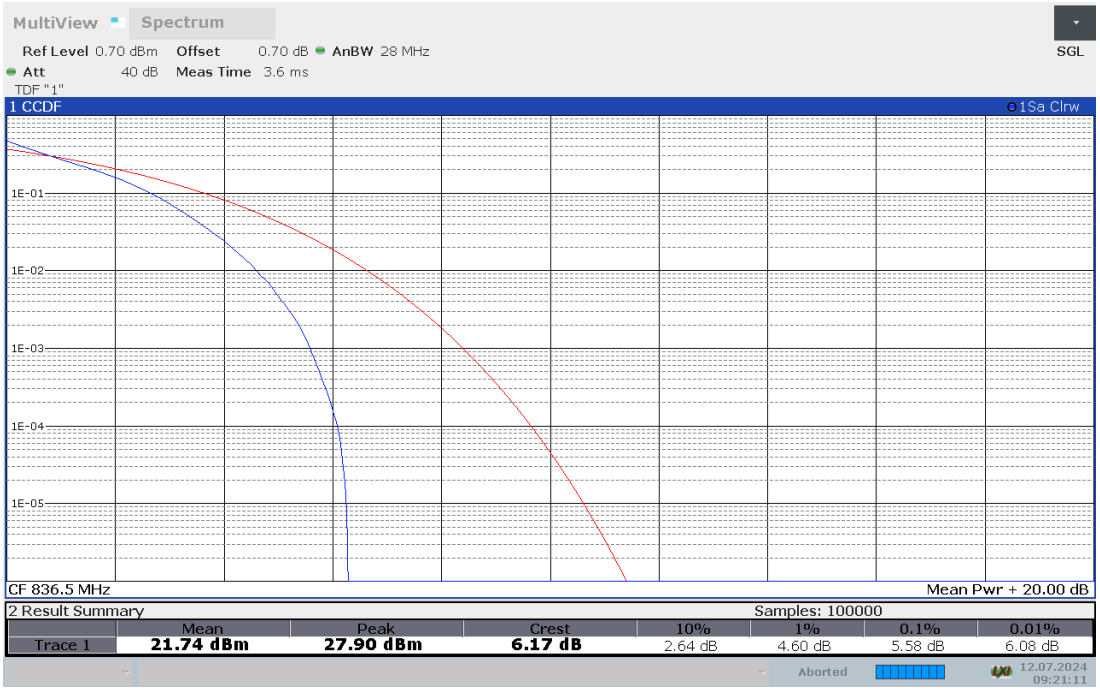
LTE band 4 , 20MHz Bandwidth,16QAM



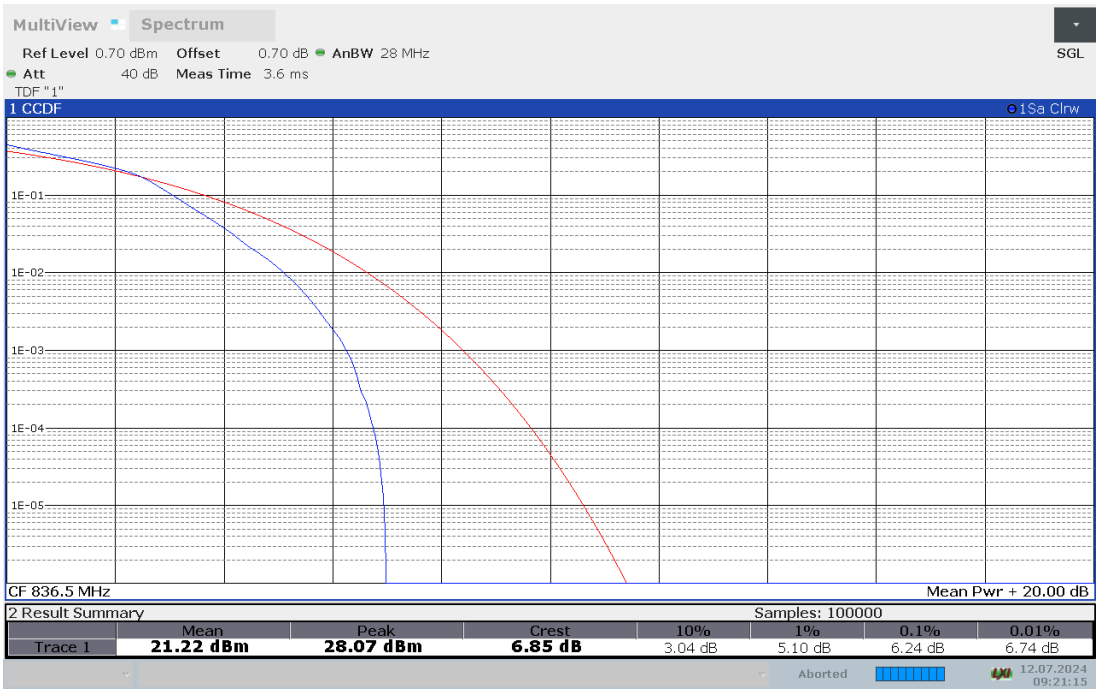
LTE Band 5, BW1.4MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
836.5	100%,0	5.58	6.24

LTE band 5 , 1.4MHz Bandwidth,QPSK



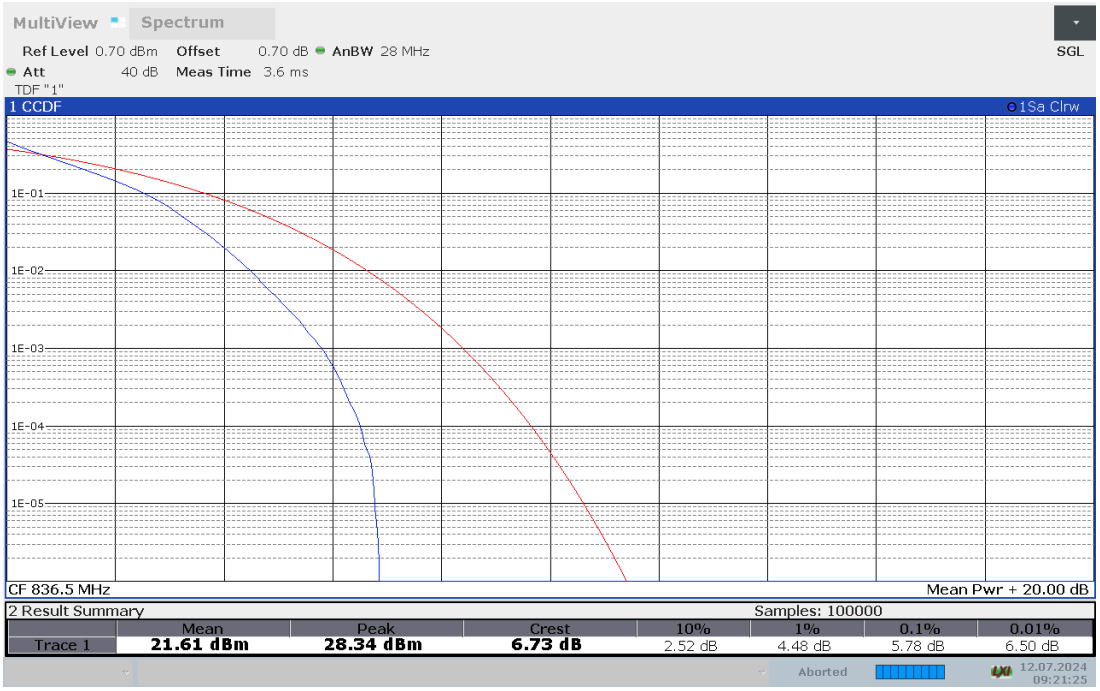
LTE band 5 , 1.4MHz Bandwidth,16QAM



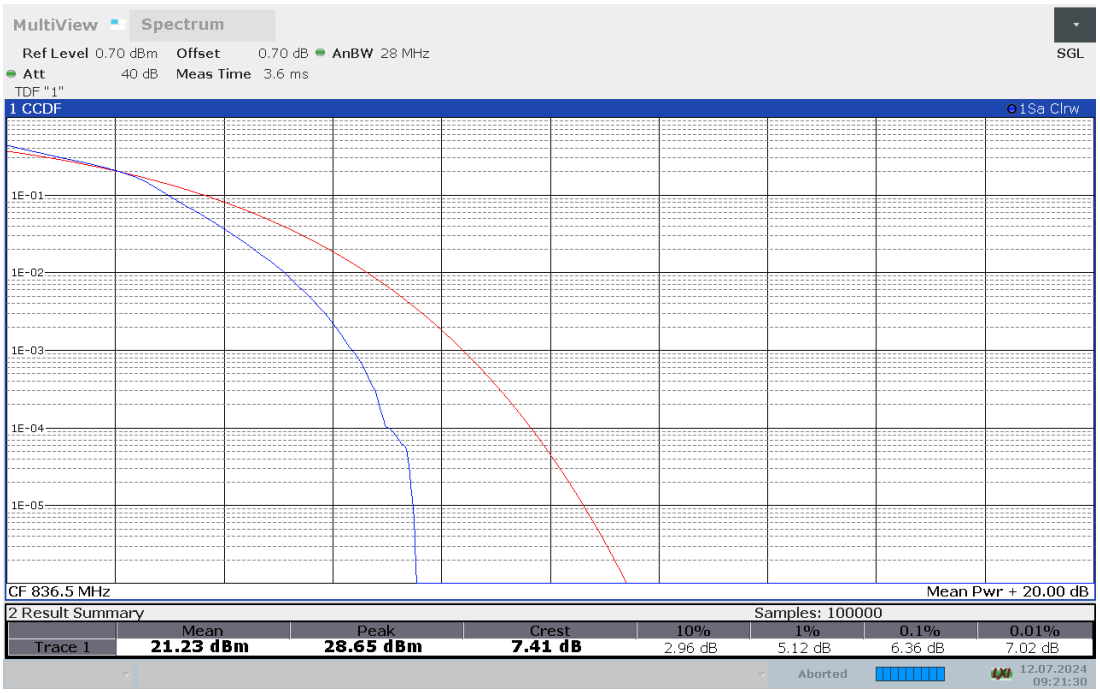
LTE Band 5, 3MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
836.5	100%,0	5.78	6.36

LTE band 5 , 3MHz Bandwidth,QPSK



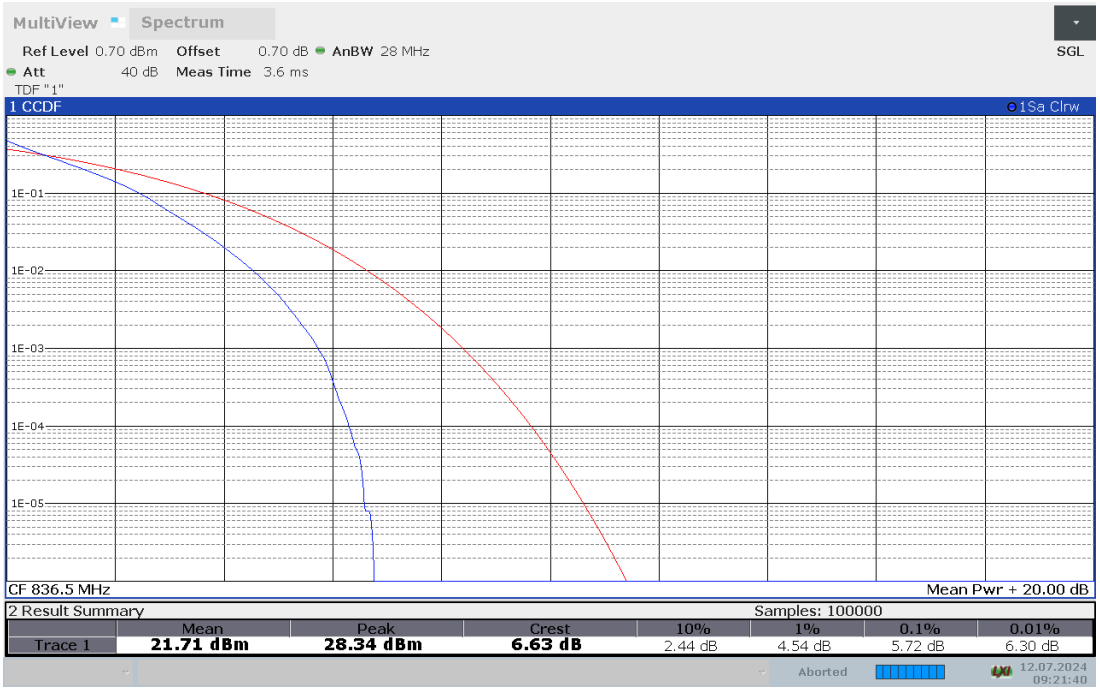
LTE band 5 , 3MHz Bandwidth,16QAM



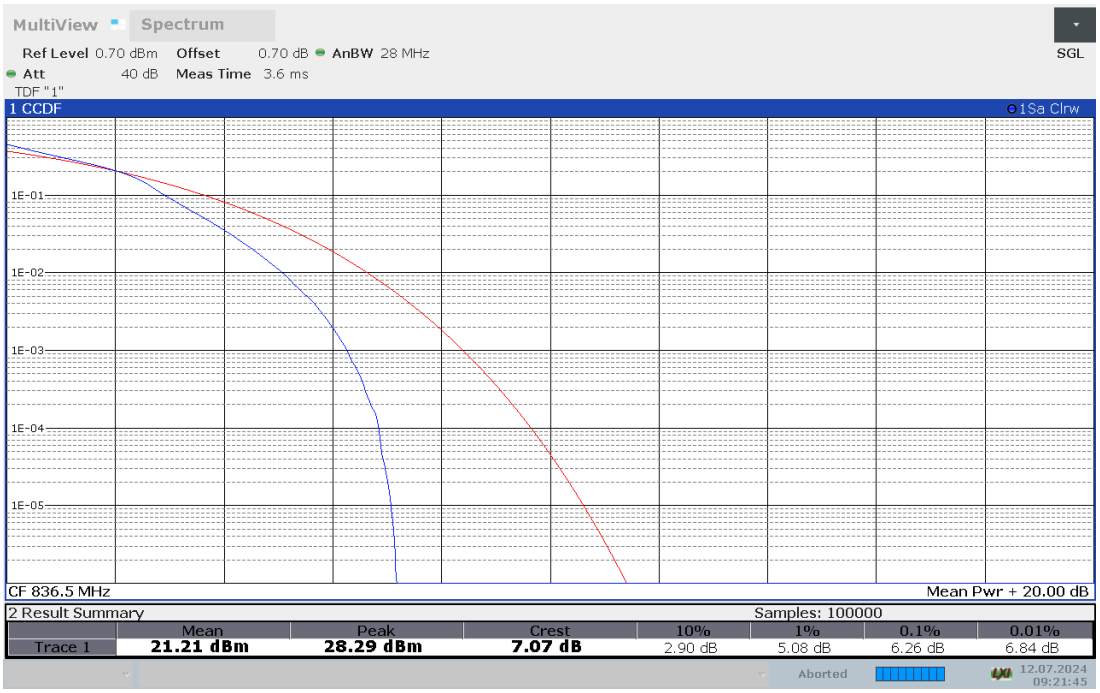
LTE Band 5, 5MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
836.5	100%,0	5.72	6.26

LTE band 5 , 5MHz Bandwidth,QPSK



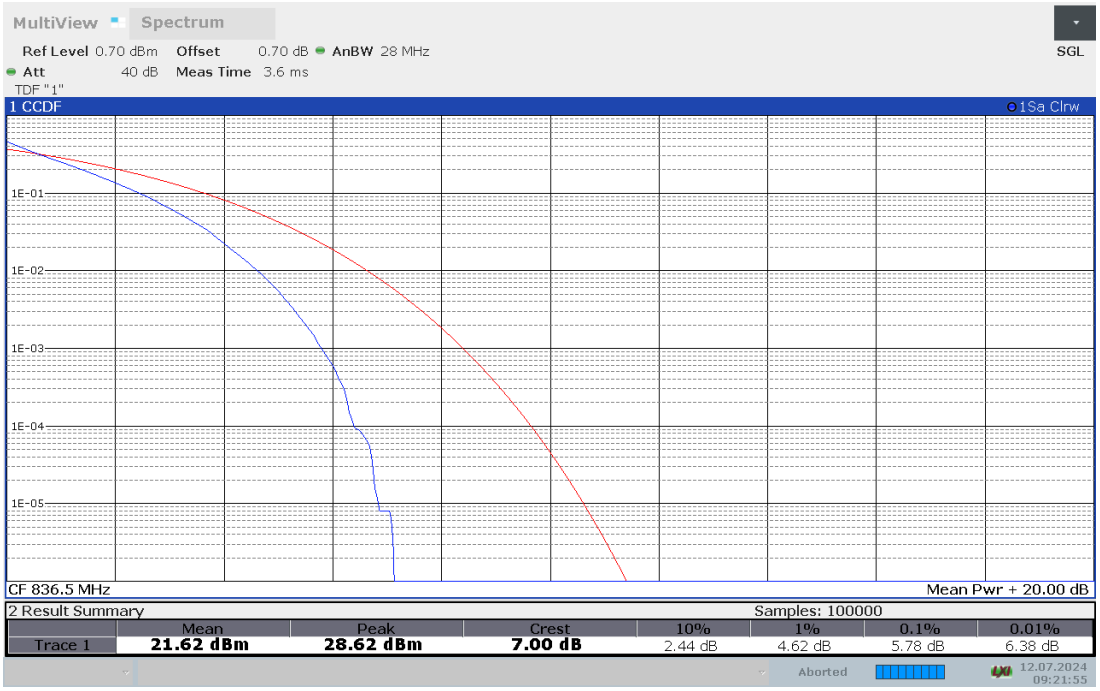
LTE band 5 , 5MHz Bandwidth,16QAM



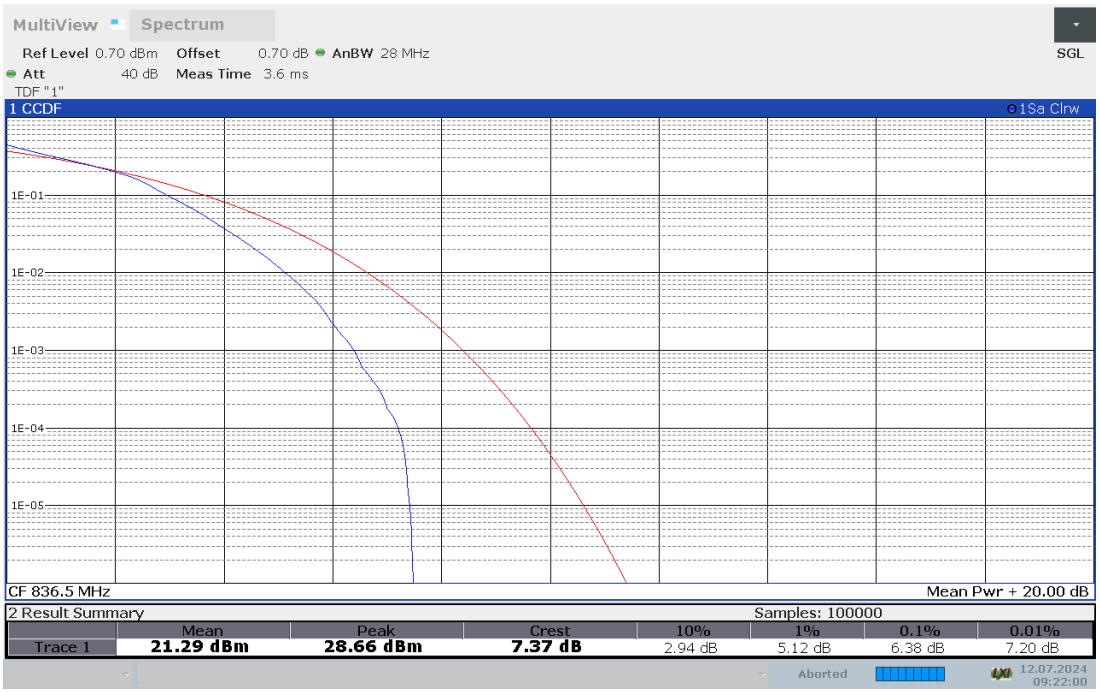
LTE Band 5, 10MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
836.5	100%,0	5.78	6.38

LTE band 5 , 10MHz Bandwidth,QPSK



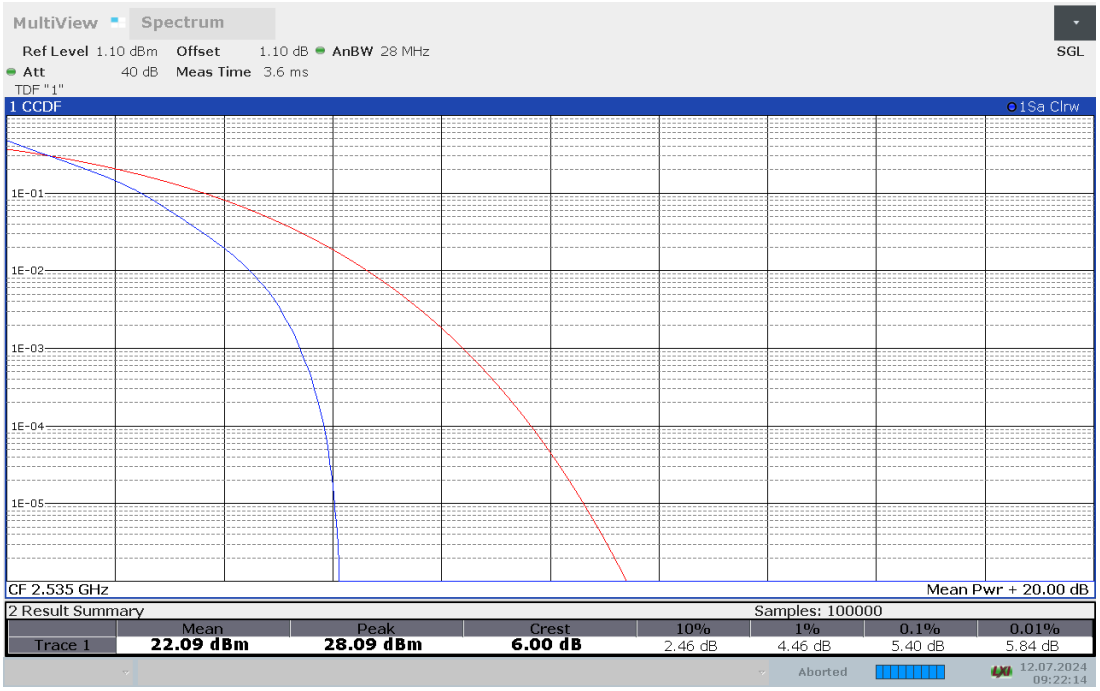
LTE band 5 , 10MHz Bandwidth,16QAM



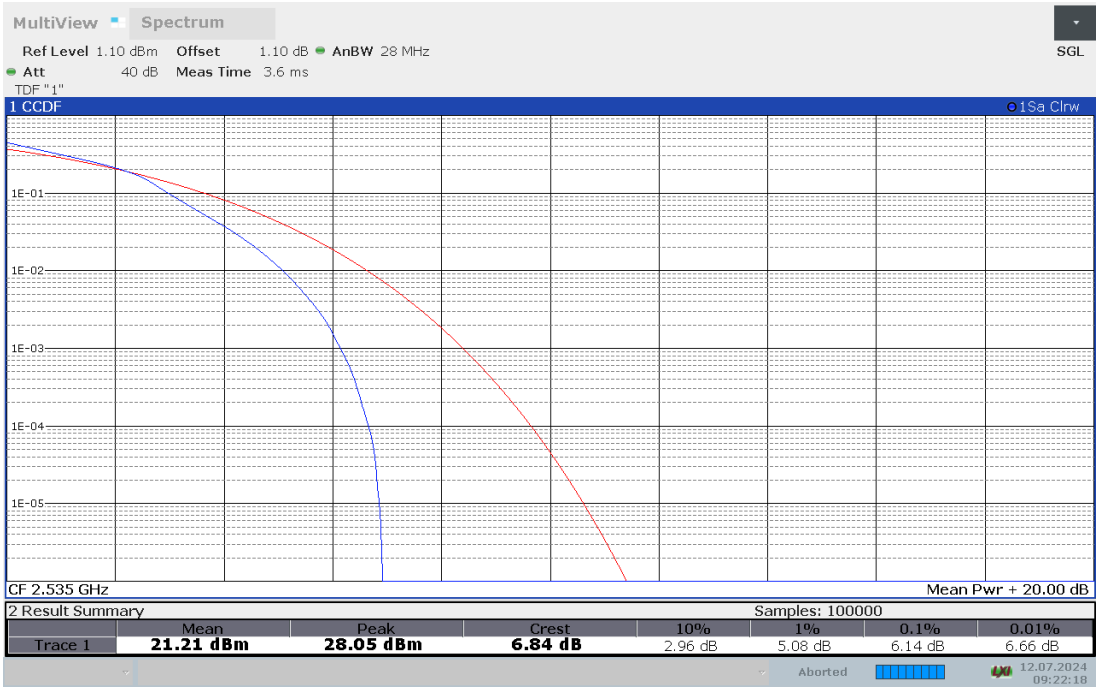
LTE Band 7, 5MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
2535	100%,0	5.40	6.14

LTE band 7 , 5MHz Bandwidth,QPSK



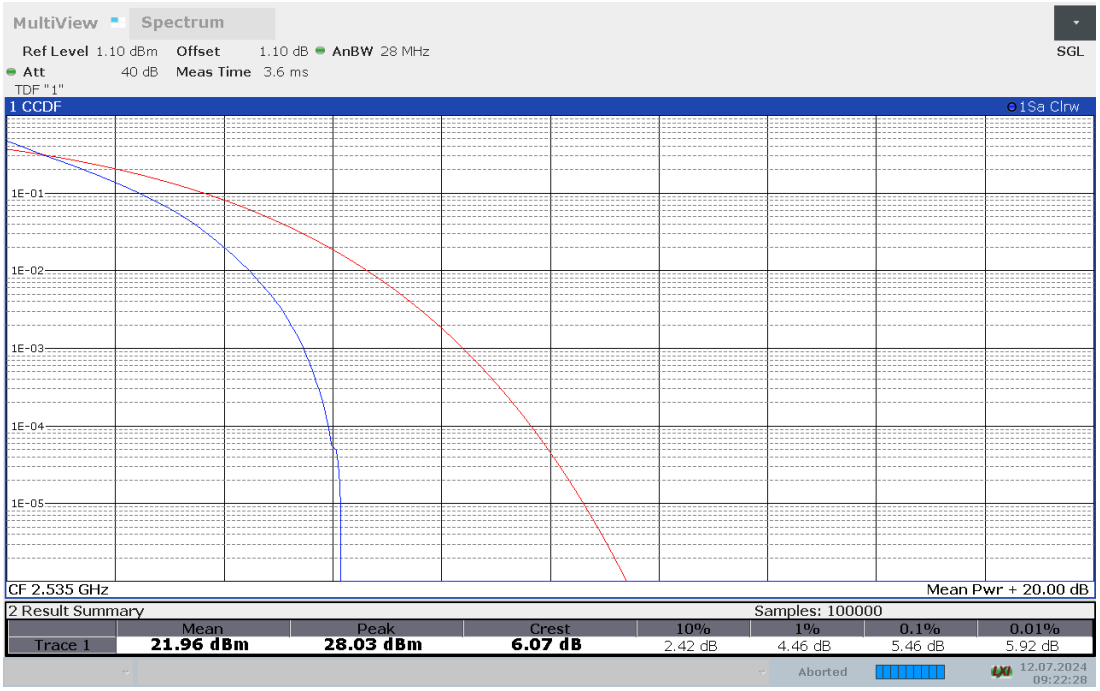
LTE band 7 , 5MHz Bandwidth,16QAM



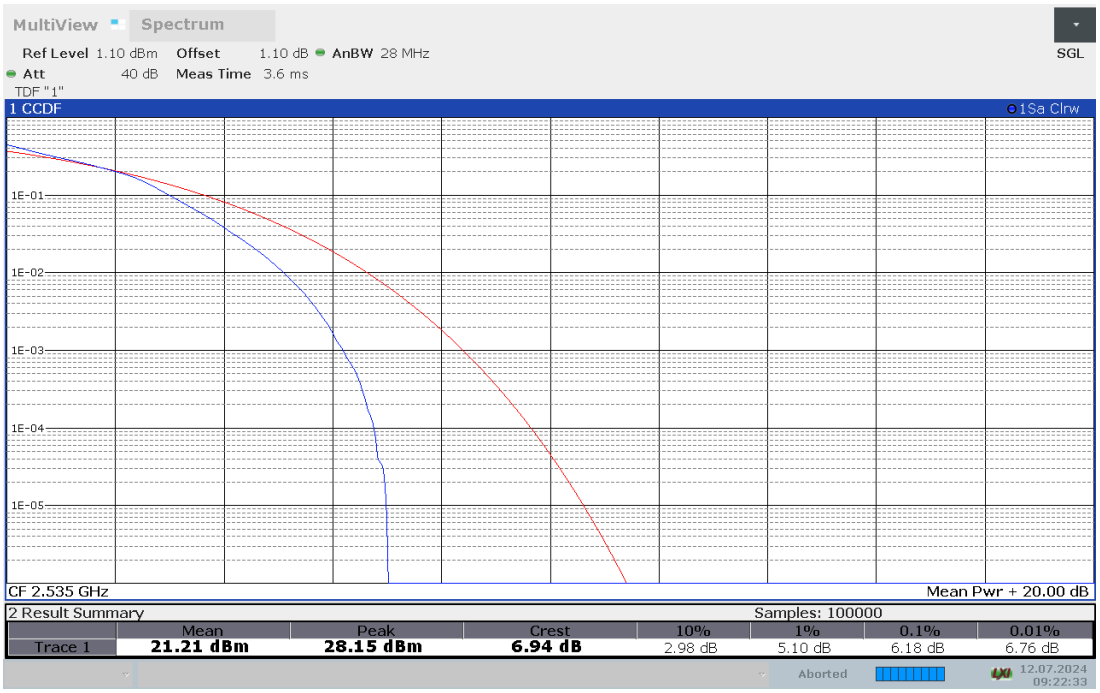
LTE Band 7, 10MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
2535	100%,0	5.46	6.18

LTE band 7 , 10MHz Bandwidth,QPSK



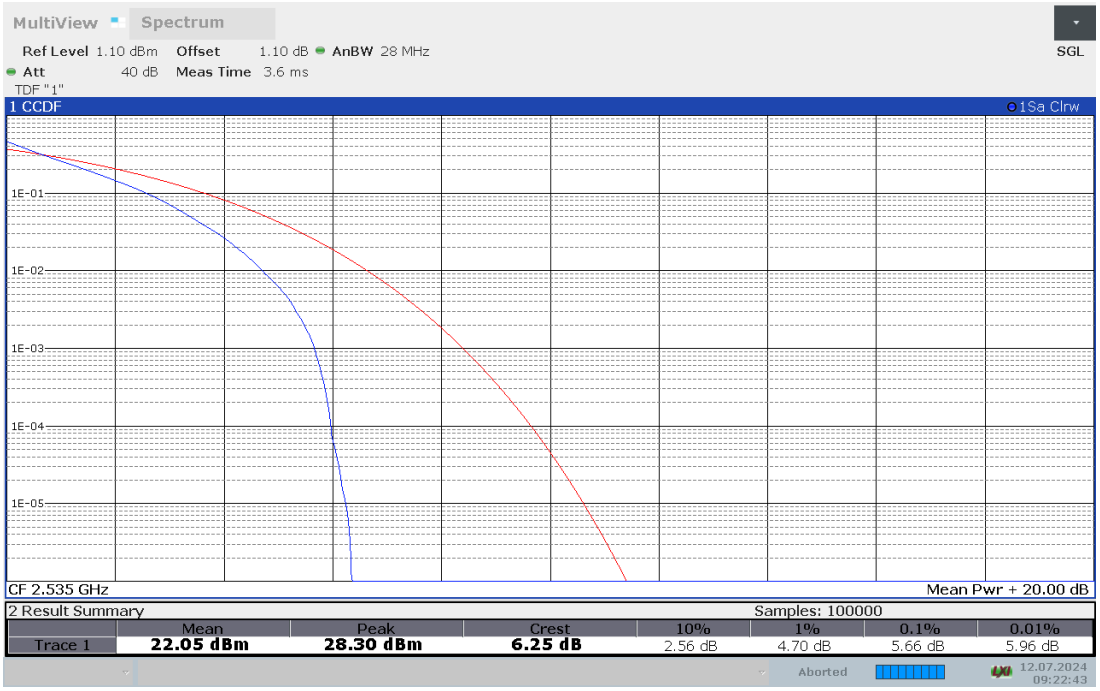
LTE band 7 , 10MHz Bandwidth,16QAM



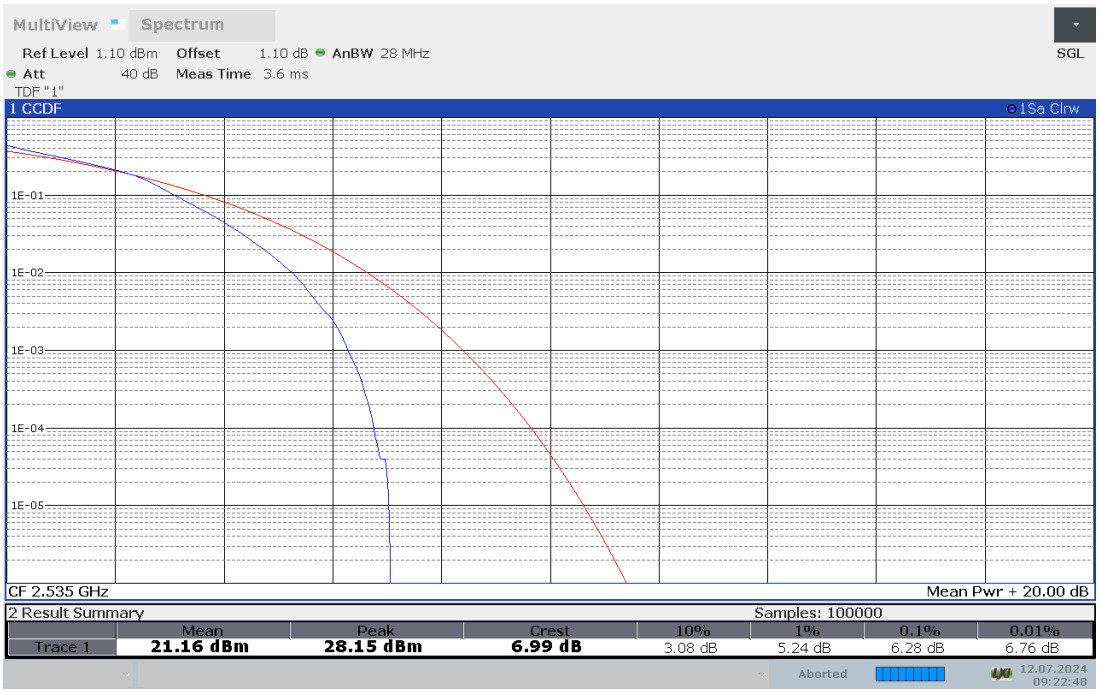
LTE Band 7, 15MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
2535	100%,0	5.66	6.28

LTE band 7 , 15MHz Bandwidth,QPSK



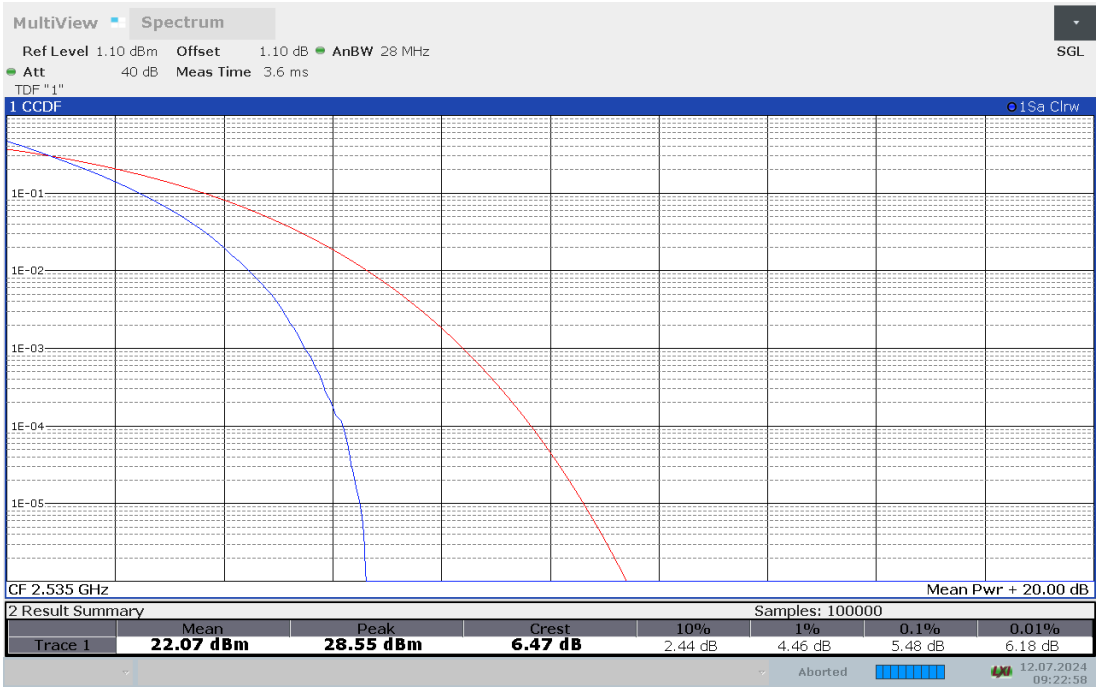
LTE band 7 , 15MHz Bandwidth,16QAM



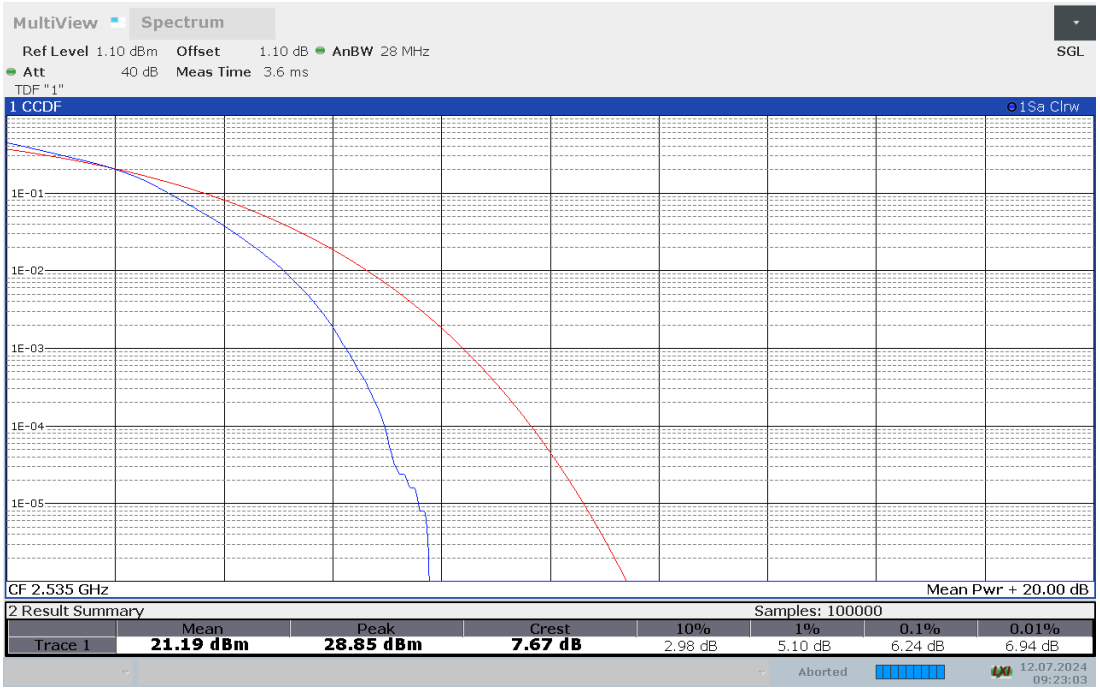
LTE Band 7, 20MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
2535	100%,0	5.48	6.24

LTE band 7 , 20MHz Bandwidth,QPSK



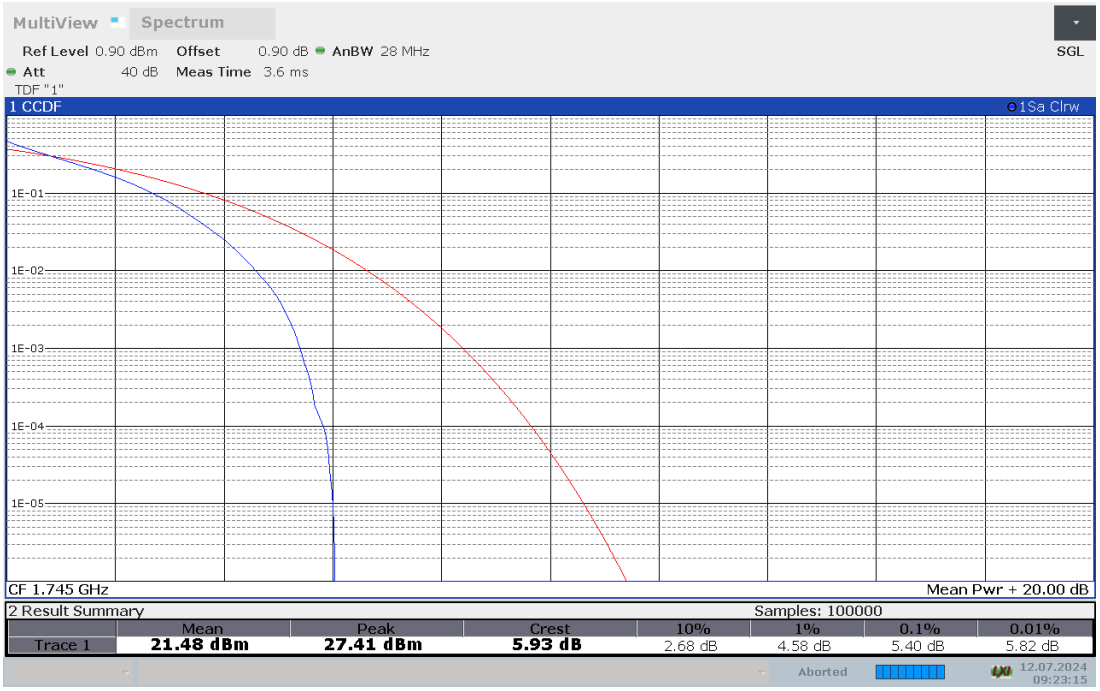
LTE band 7 , 20MHz Bandwidth,16QAM



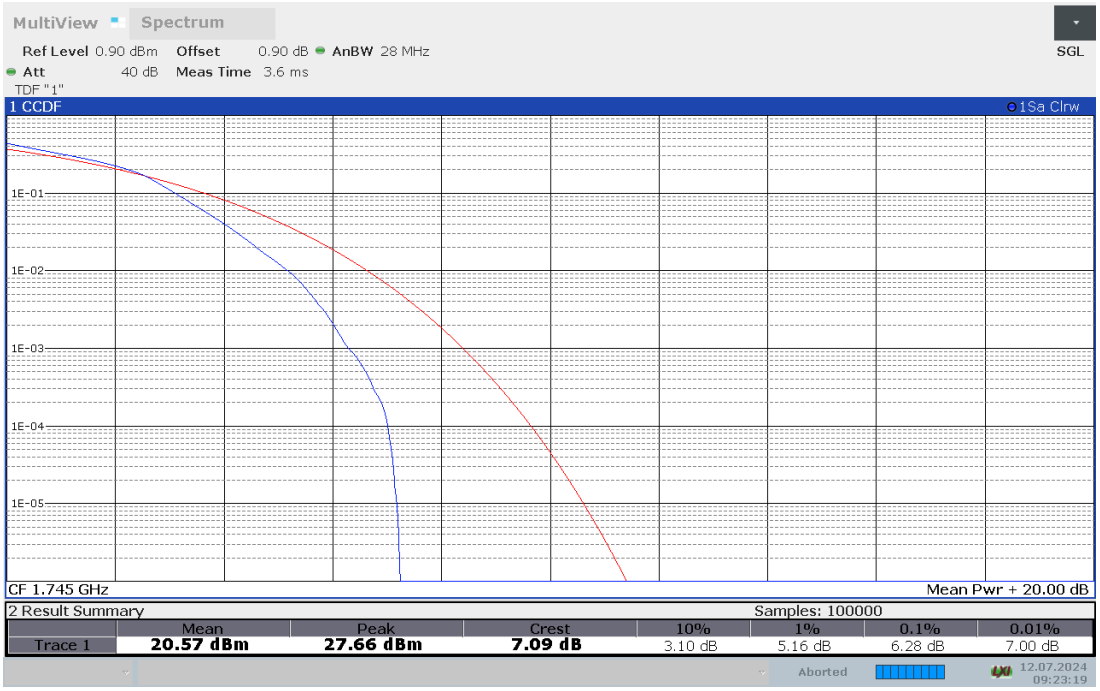
LTE Band 66, BW1.4MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1745	100%,0	5.40	6.28

LTE band 66 , 1.4MHz Bandwidth,QPSK



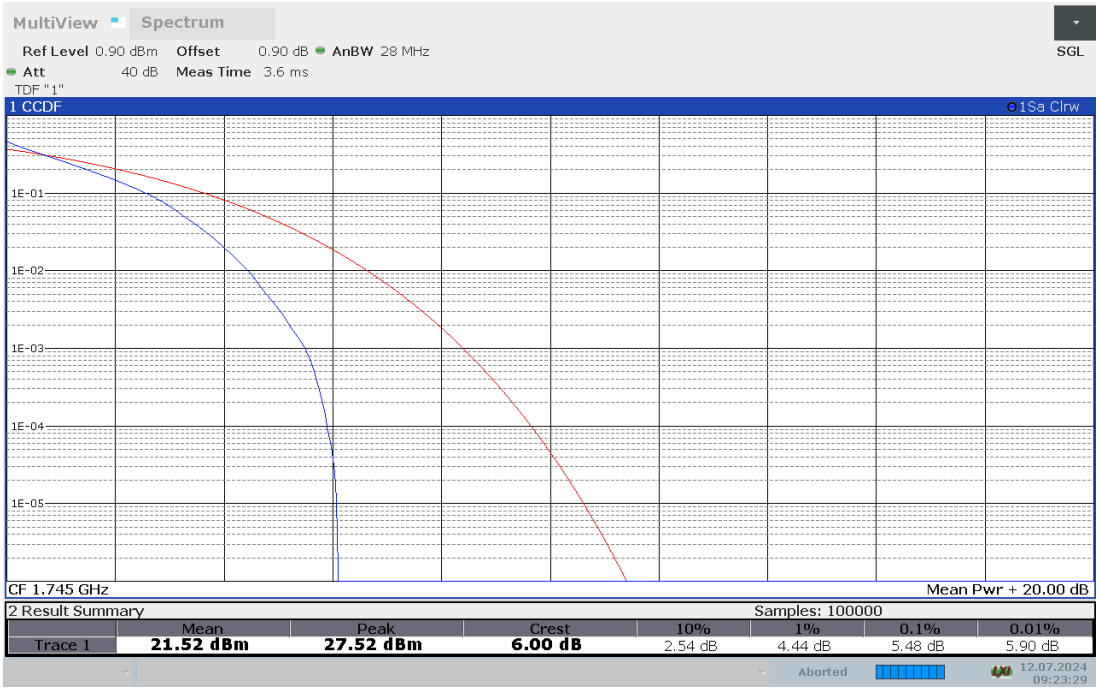
LTE band 66 , 1.4MHz Bandwidth,16QAM



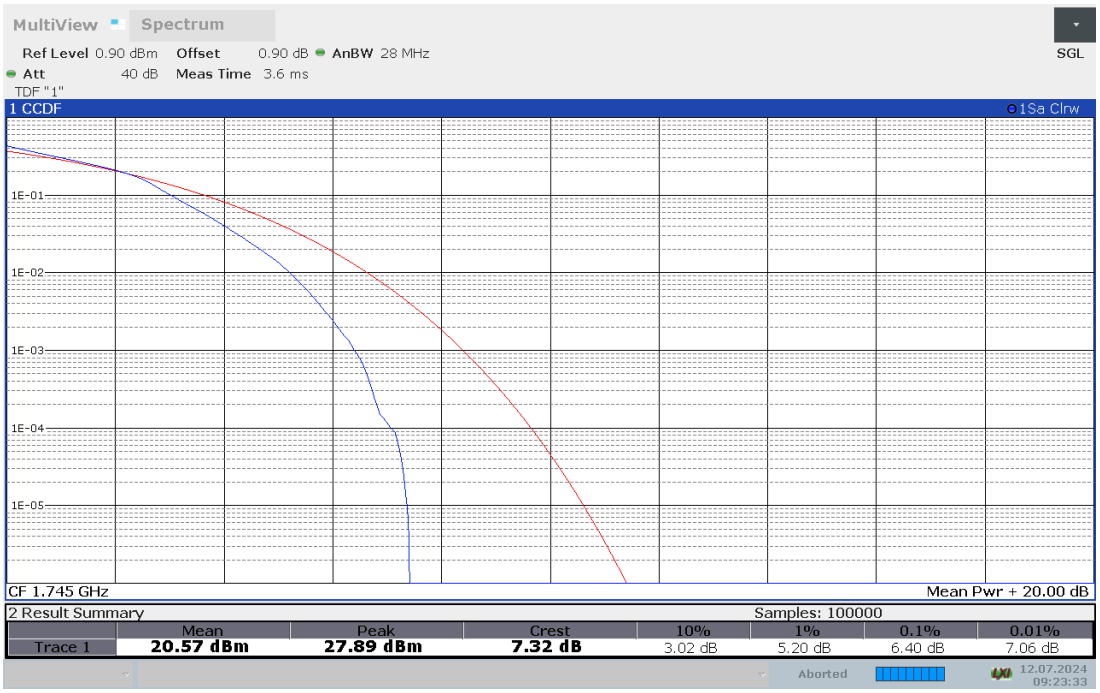
LTE Band 66, 3MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1745	100%,0	5.48	6.40

LTE band 66 , 3MHz Bandwidth,QPSK



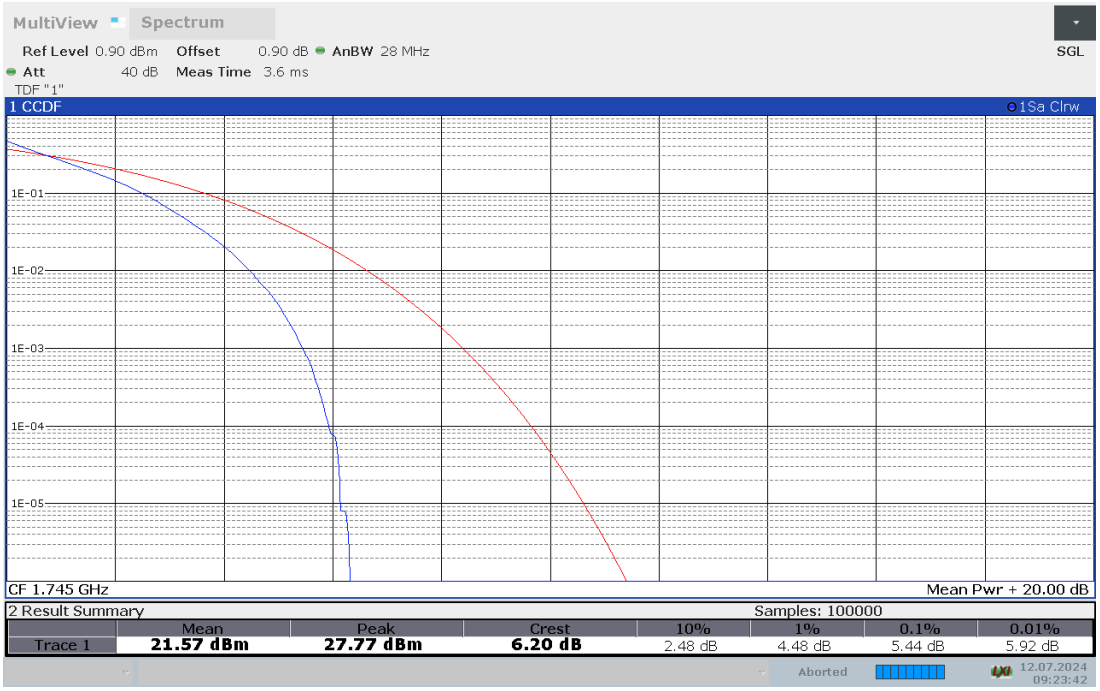
LTE band 66 , 3MHz Bandwidth,16QAM



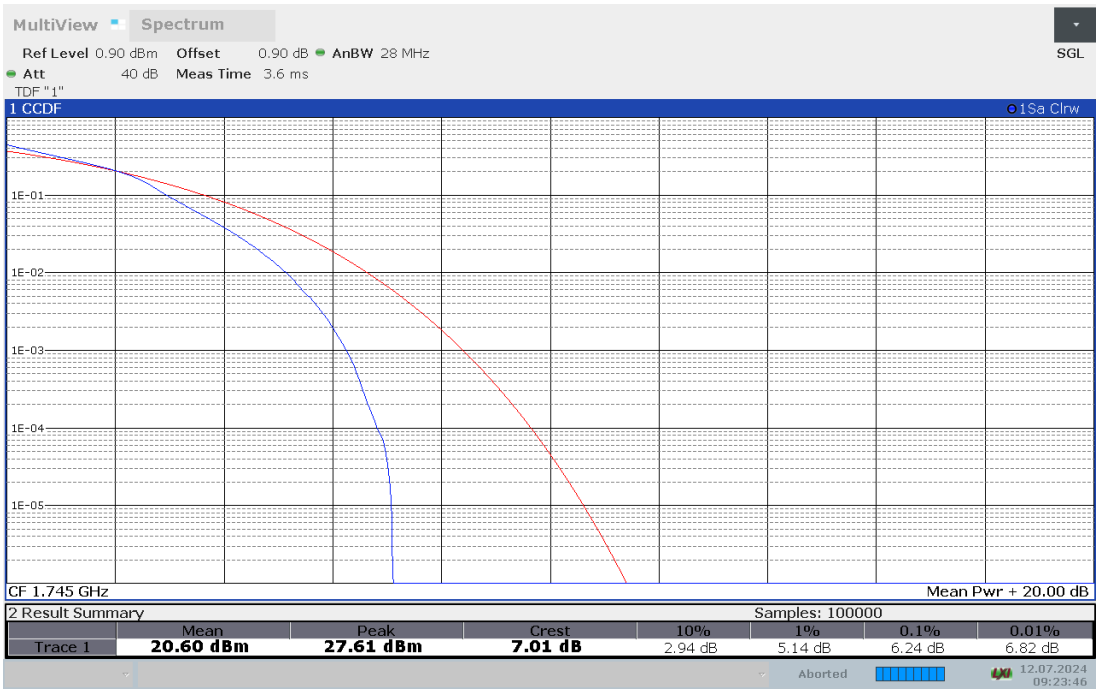
LTE Band 66, 5MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1745	100%,0	5.44	6.24

LTE band 66 , 5MHz Bandwidth,QPSK



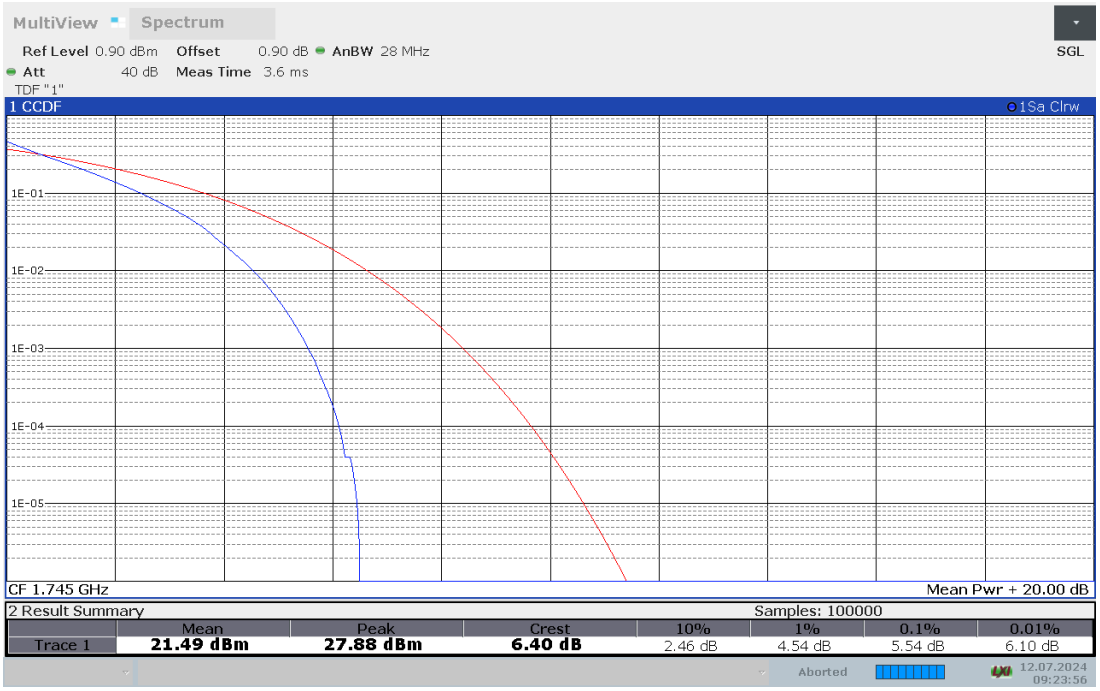
LTE band 66 , 5MHz Bandwidth,16QAM



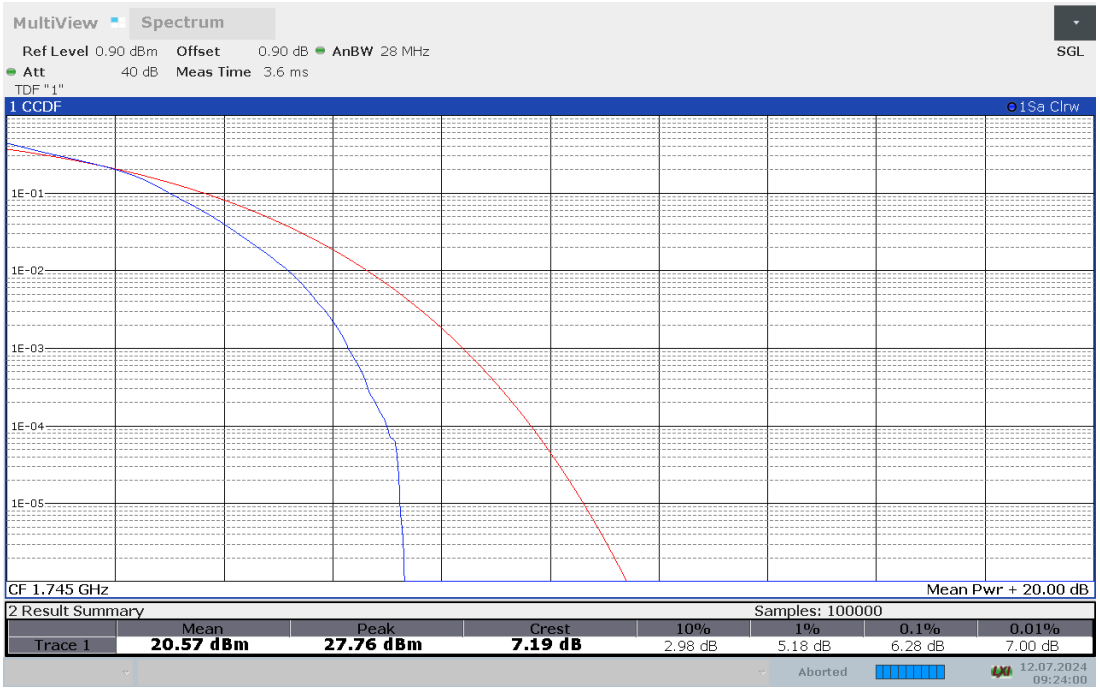
LTE Band 66, 10MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1745	100%,0	5.54	6.28

LTE band 66 , 10MHz Bandwidth,QPSK



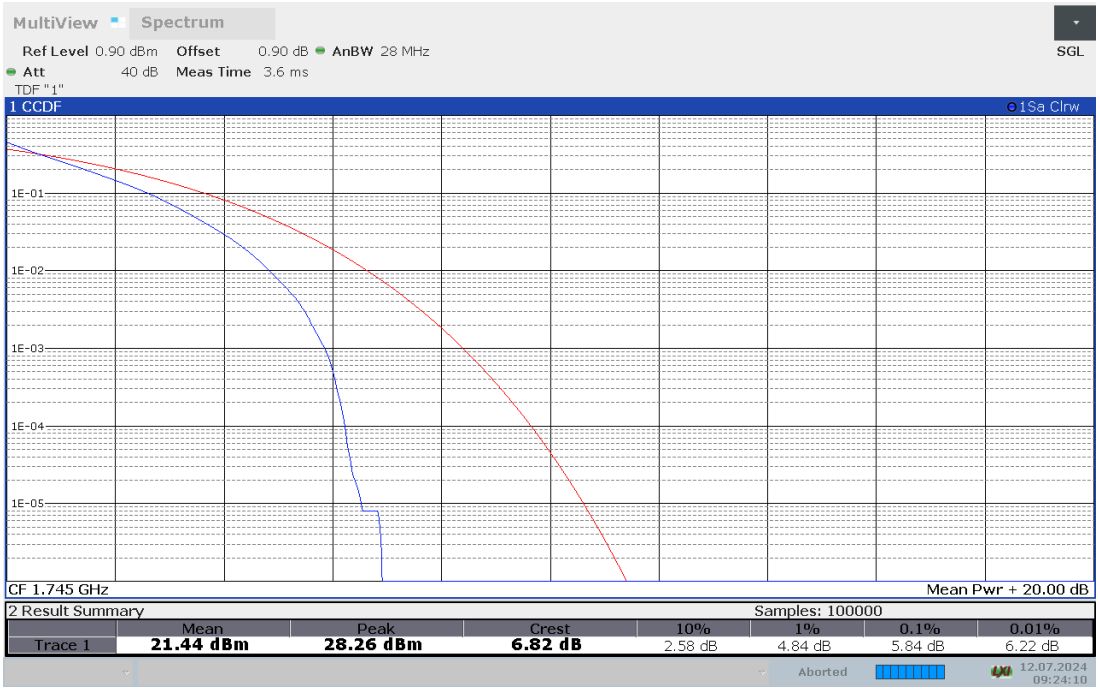
LTE band 66 , 10MHz Bandwidth,16QAM



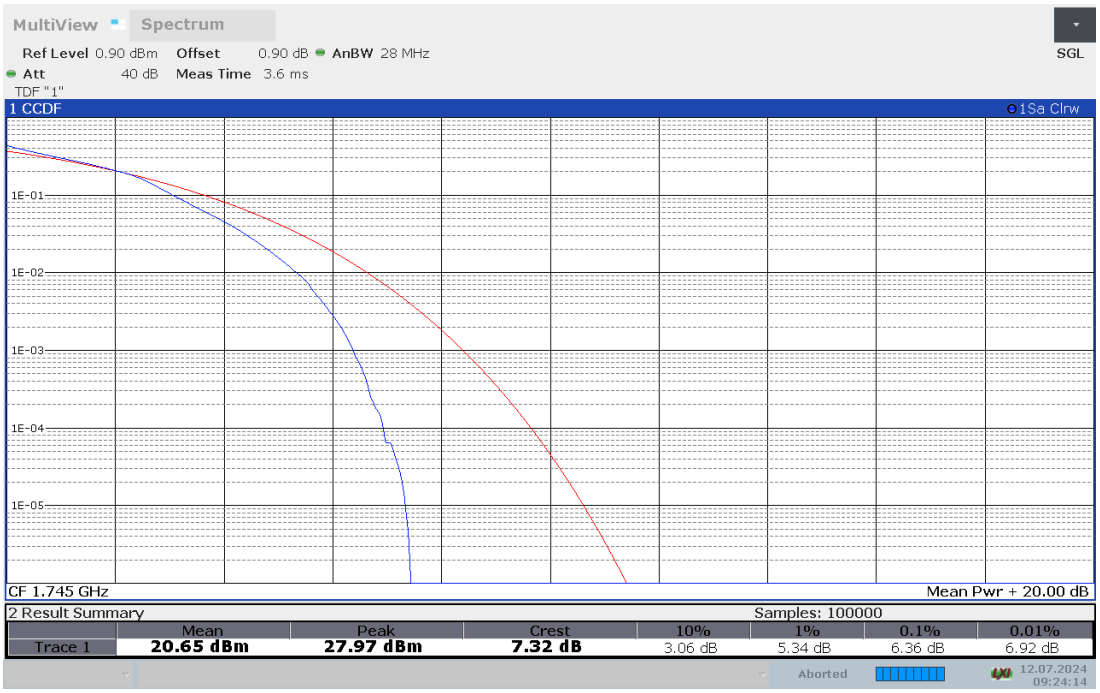
LTE Band 66, 15MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1745	100%,0	5.84	6.36

LTE band 66 , 15MHz Bandwidth,QPSK



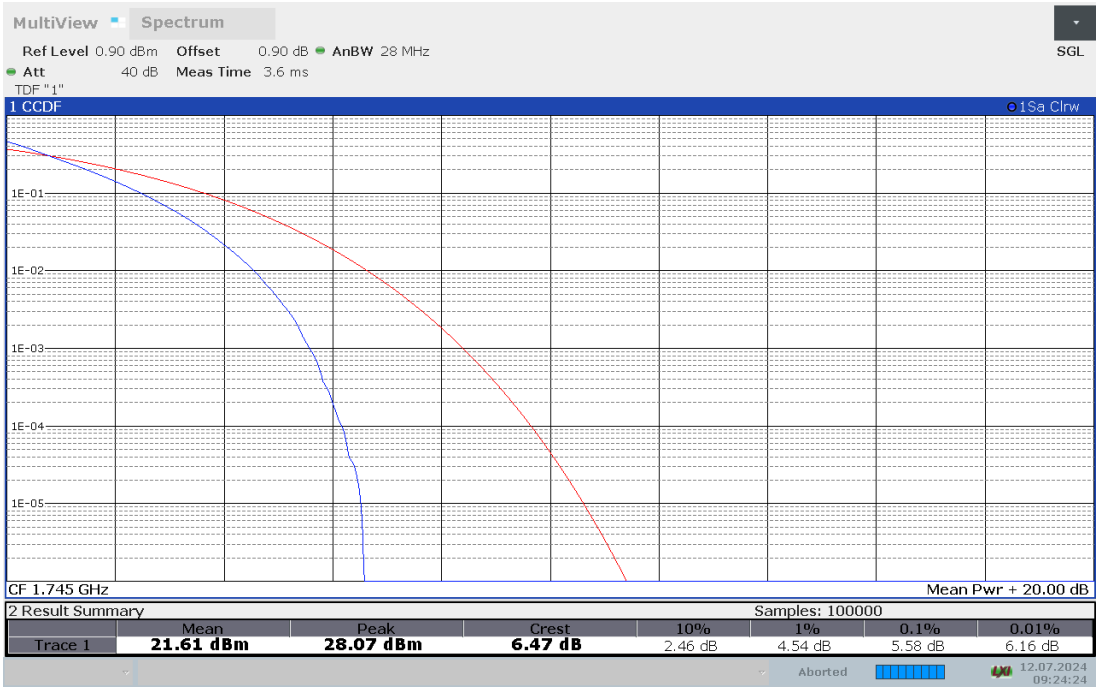
LTE band 66 , 15MHz Bandwidth,16QAM



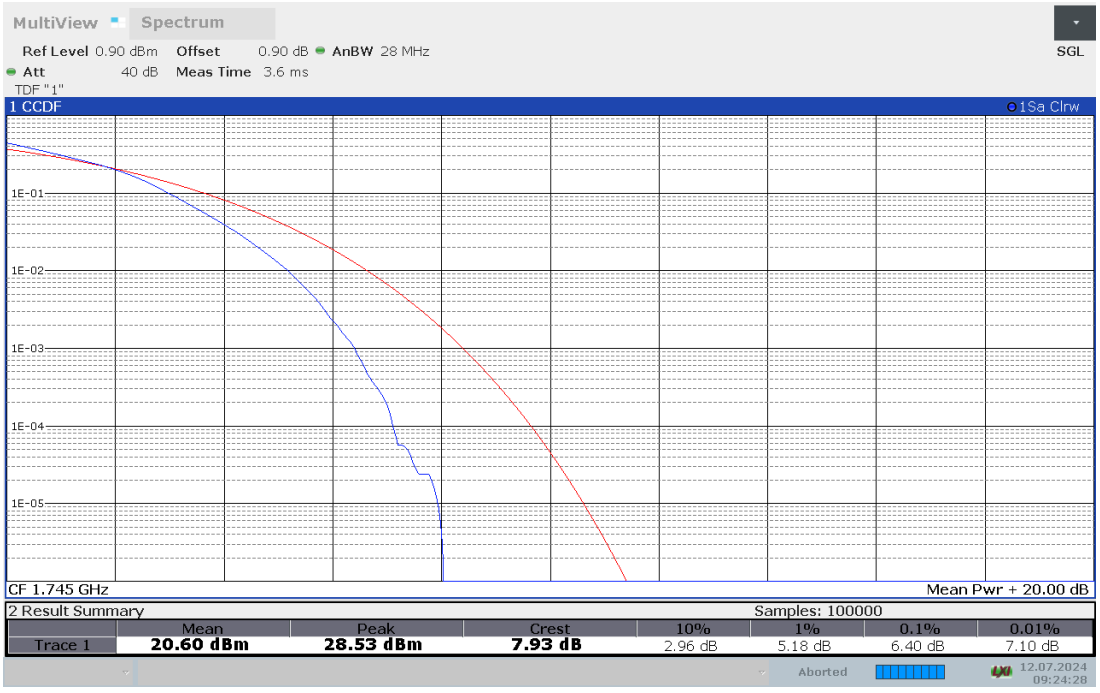
LTE Band 66, 20MHz

Frequency (MHz)	RB	PAPR (dB)	
		QPSK	16QAM
1745	100%,0	5.58	6.40

LTE band 66 , 20MHz Bandwidth,QPSK



LTE band 66 , 20MHz Bandwidth,16QAM



Note: Expanded measurement uncertainty is U = 0.48, k = 2

ANNEX B: Accreditation Certificate

Accredited Laboratory

A2LA has accredited

SHENZHEN ACADEMY OF INFORMATION AND COMMUNICATIONS TECHNOLOGY

Shenzhen, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 14th day of November 2023.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 4353.01
Valid to November 30, 2025

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

ANNEX C: Certificate of Brand Authorization

编号 No.：CTTL-001

TTL泰尔实验室

品牌授权书

Certificate of Brand Authorization

兹授权 **深圳信息通信研究院** 为“泰尔实验室”品牌实验室，可以使用“泰尔实验室”品牌开展检验检测相关业务，本授权书有效期至 **2024** 年 **10** 月 **31** 日。

This is to certify that **Shenzhen Academy of Information and Communications Technology** is authorized as the brand laboratory of “CTTL”, which may undertake inspection and testing related business using the “CTTL” brand. This certificate is valid for the period to **31 October 2024**.

“泰尔实验室”品牌是属于中国信息通信研究院所有的检验检测品牌，为了维护良好的品牌形象，不断提高品牌的价值，被授权机构必须严格遵照《“泰尔实验室”品牌管理手册》要求开展相关业务活动。

The brand “CTTL” is the inspection and testing brand owned by China Academy of Information and Communication Technology. In order to maintain a good brand image, and continuously improve the brand value, the authorized institutions must strictly comply with the requirements of *"CTTL" brand management manual* to carry out relevant business activities.

授权单位：中国信息通信研究院

China Academy of Information and Communication Technology（CAICT）

授权日期：2019 年 10 月 30 日

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