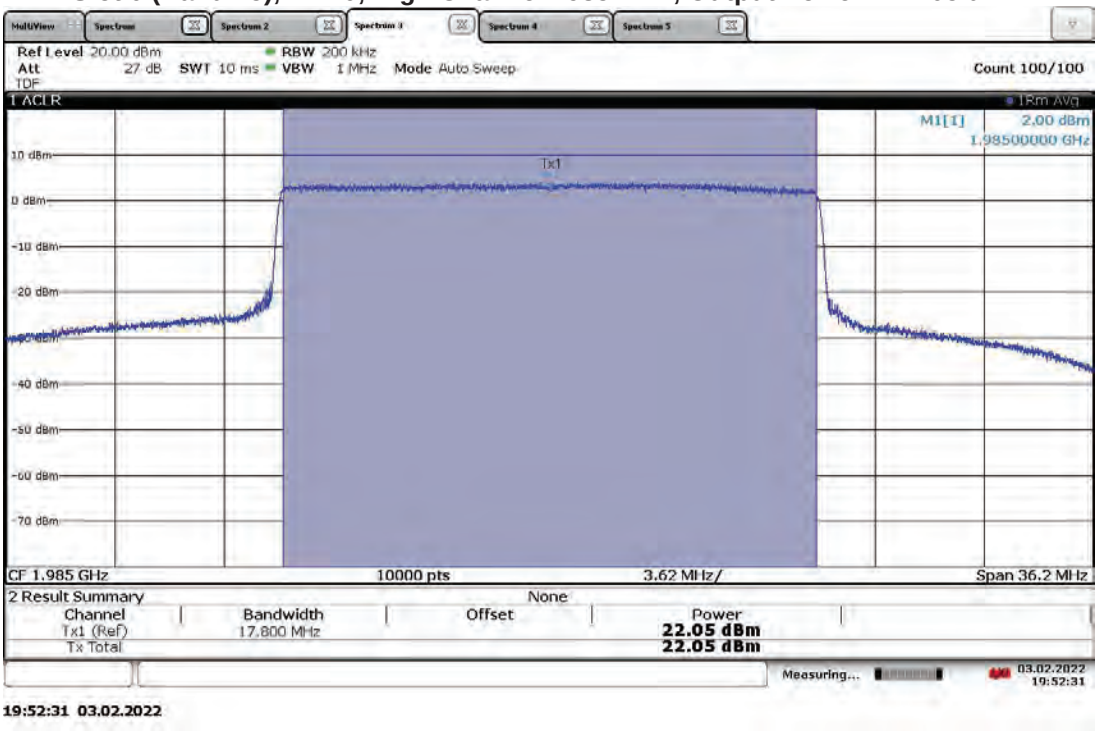
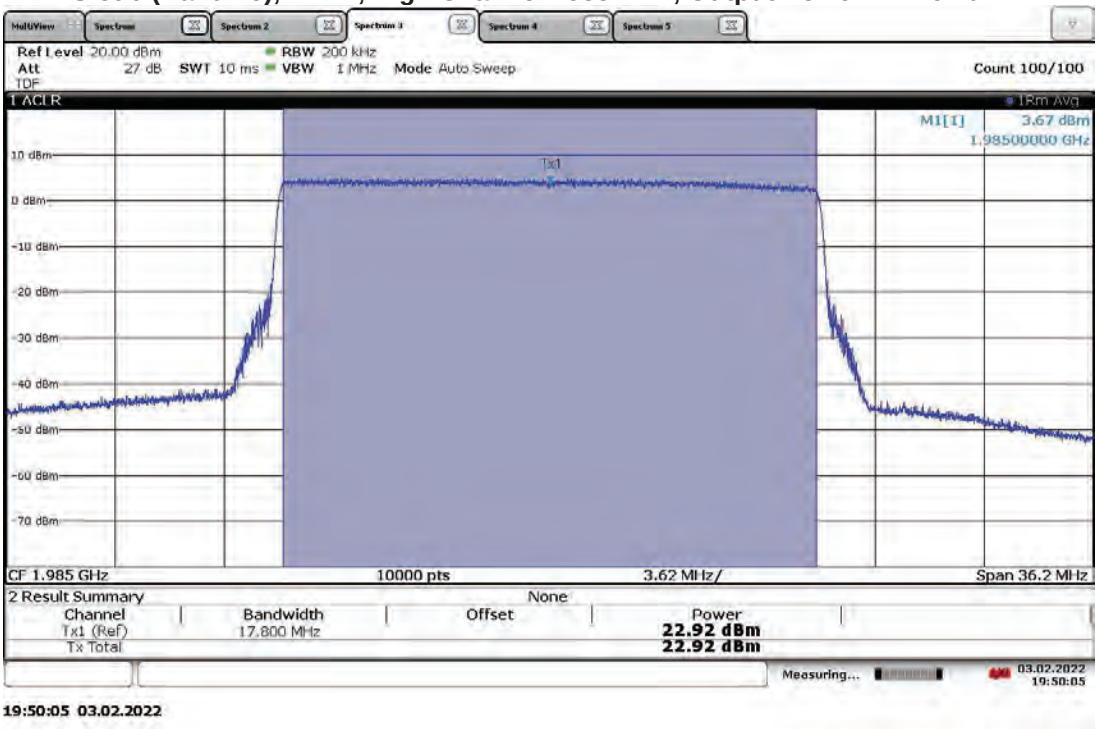
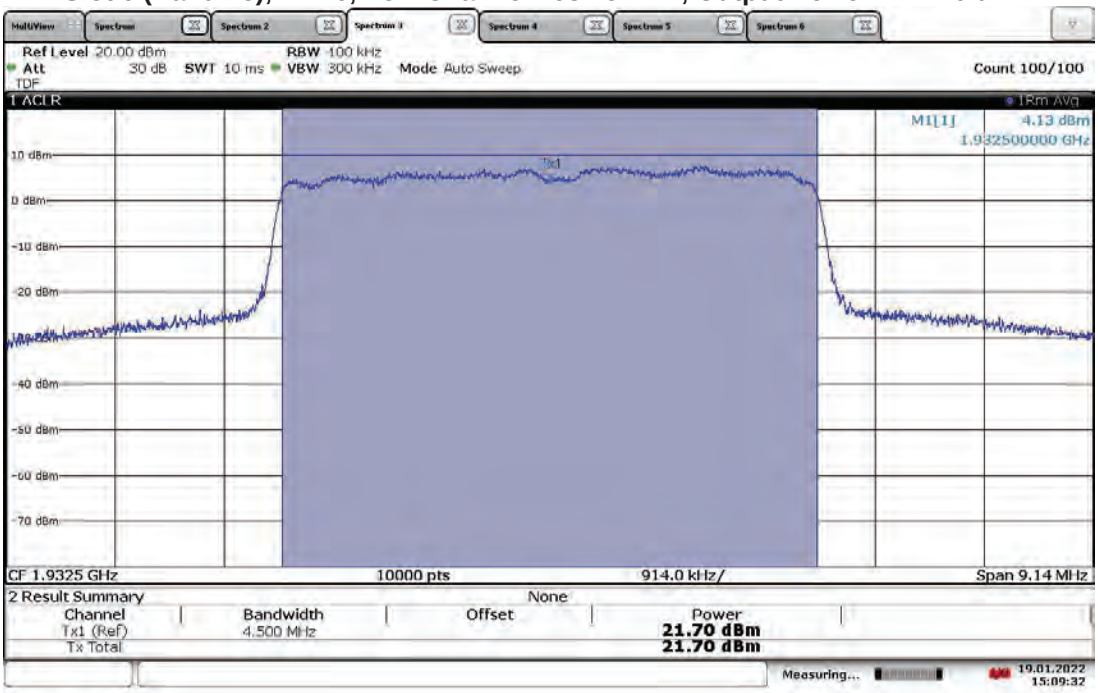
TM1.1-QPSK_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1985 MHz, Output Power = 22.05 dBm



TM1.1-QPSK_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1985 MHz, Output Power = 22.92 dBm

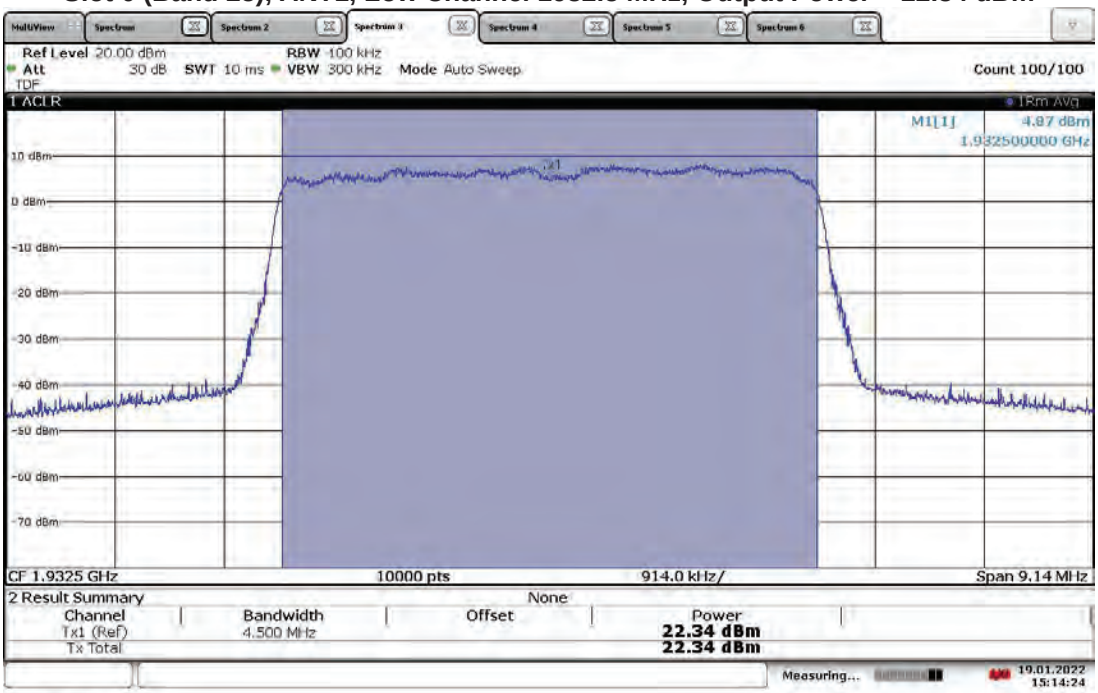


TM3.2-16QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1932.5 MHz, Output Power = 21.70 dBm



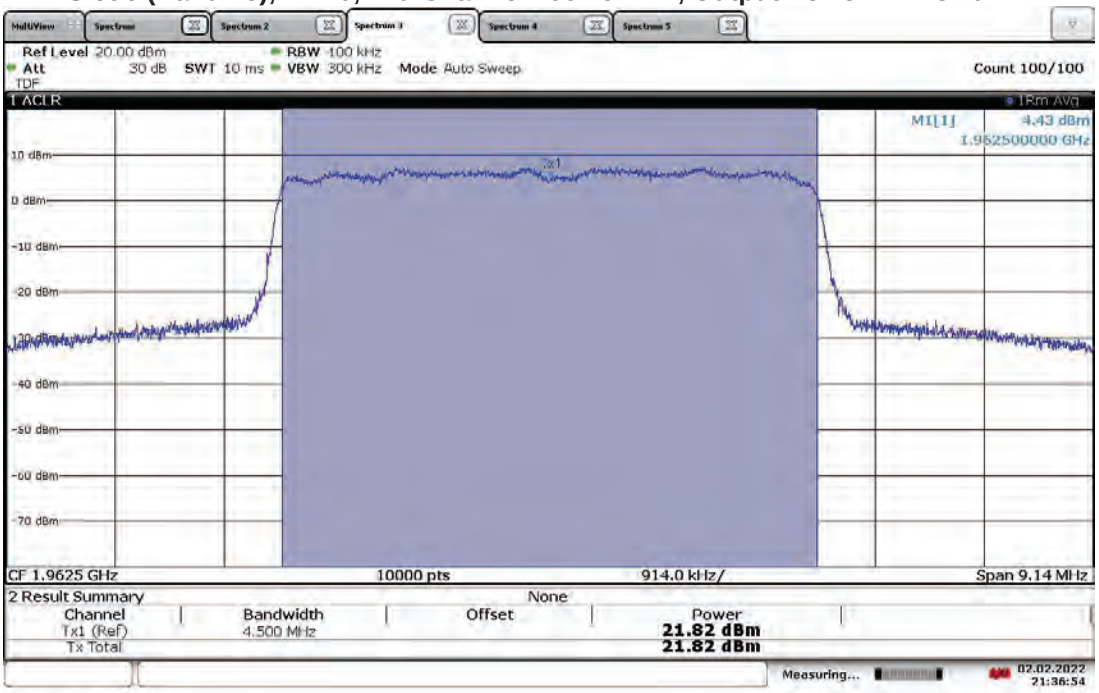
15:09:32 19.01.2022

TM3.2-16QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1932.5 MHz, Output Power = 22.34 dBm

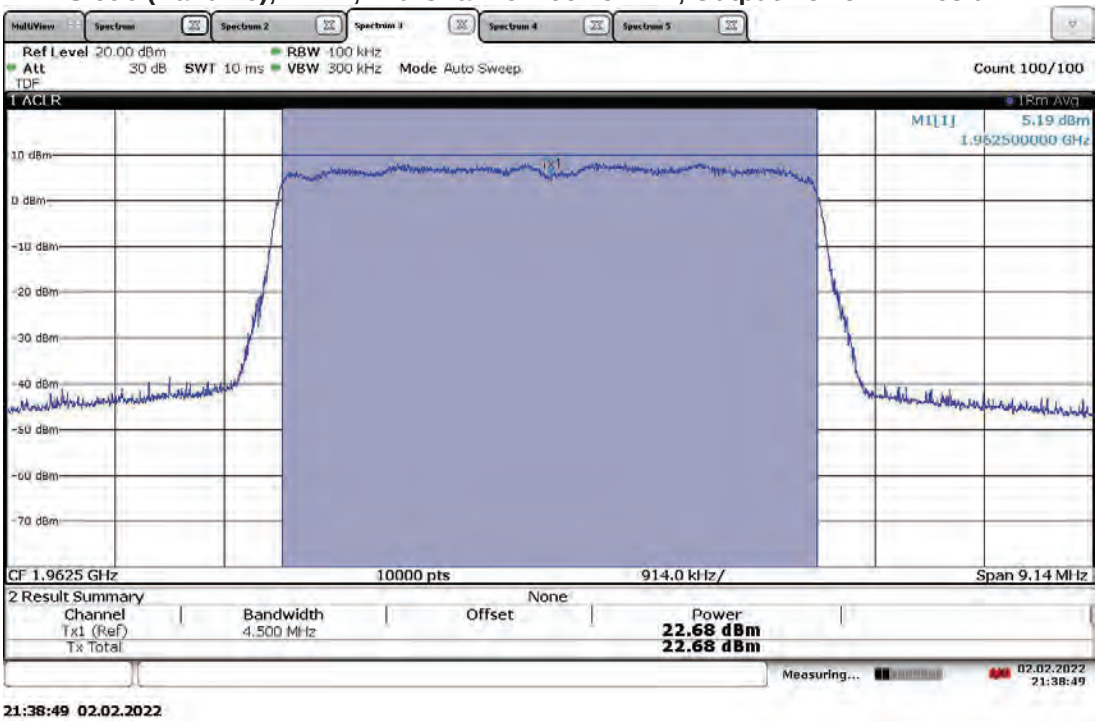


15:14:24 19.01.2022

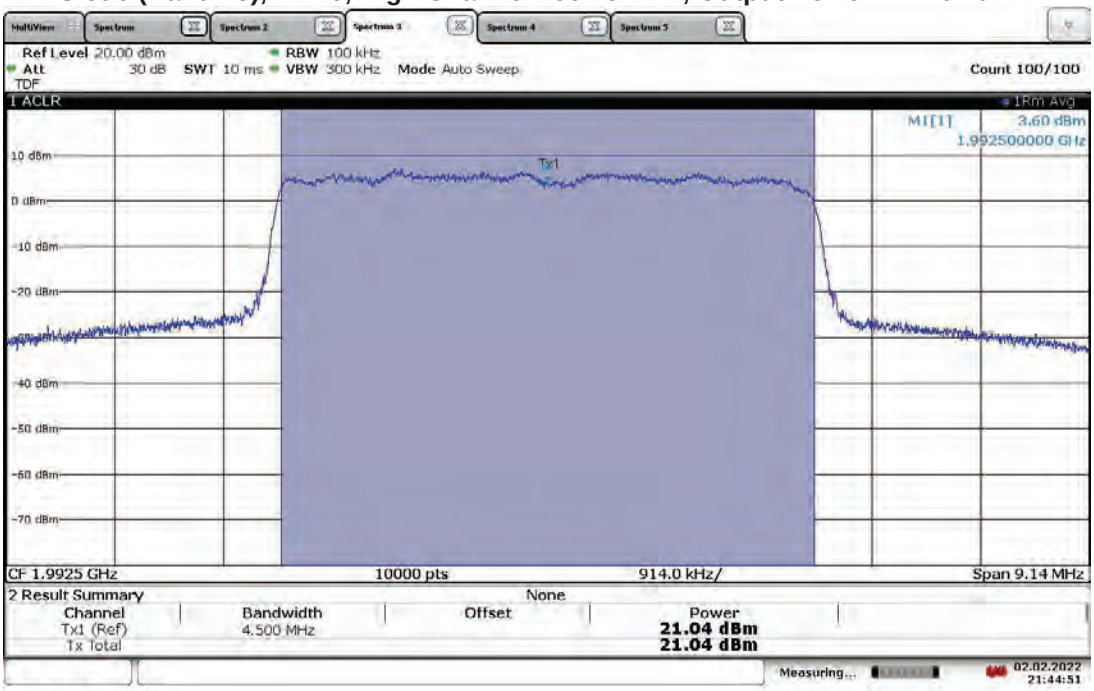
TM3.2-16QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.82 dBm



TM3.2-16QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 22.68 dBm

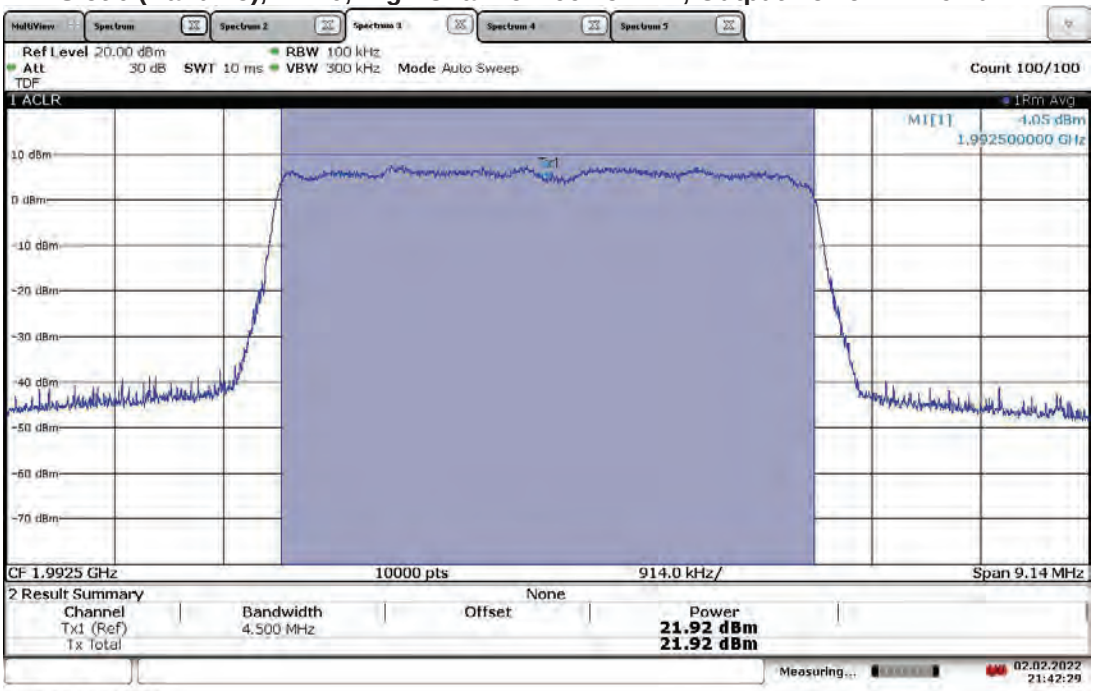


TM3.2-16QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1992.5 MHz, Output Power = 21.04 dBm



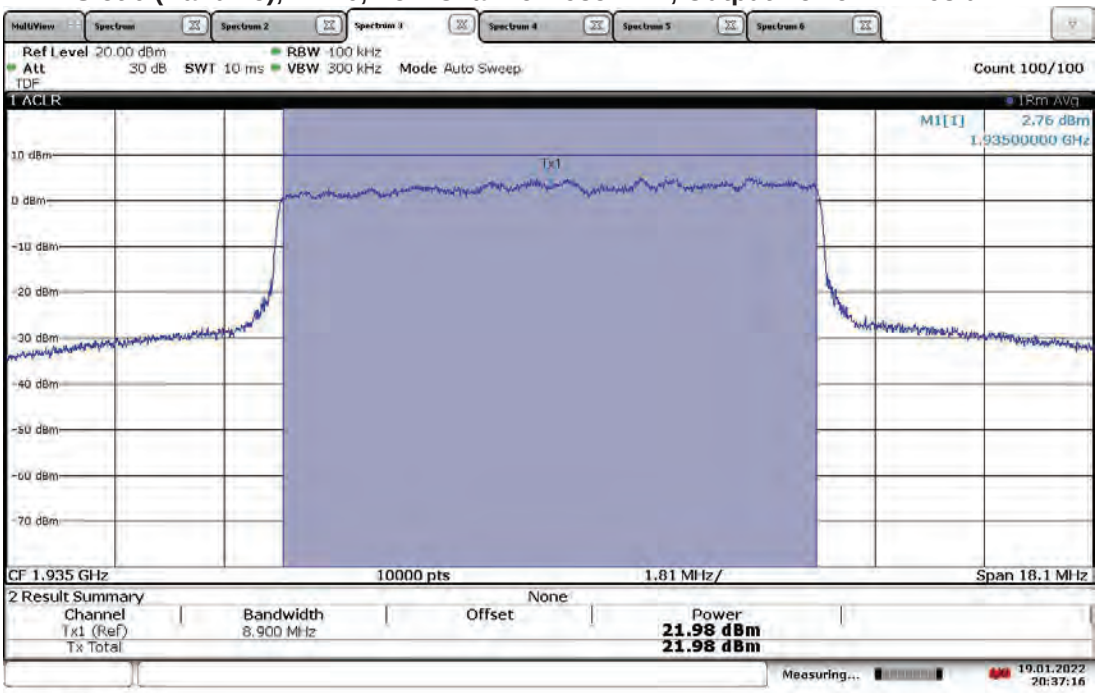
21:44:51 02.02.2022

TM3.2-16QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1992.5 MHz, Output Power = 21.92 dBm



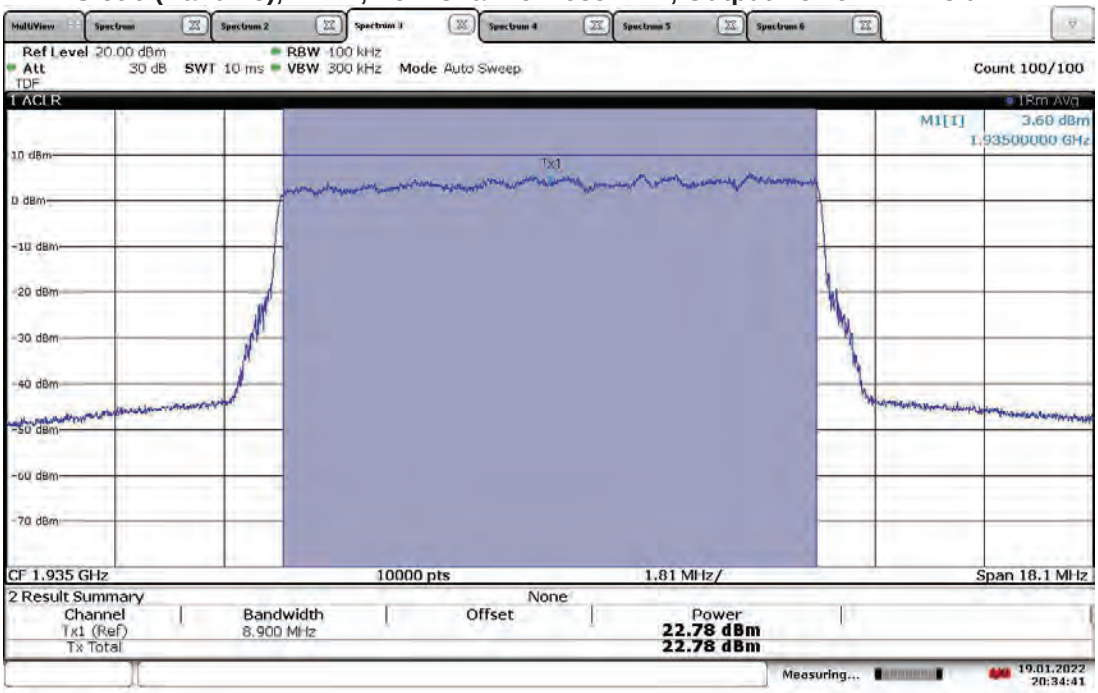
21:42:29 02.02.2022

TM3.2-16QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1935 MHz, Output Power = 21.98 dBm



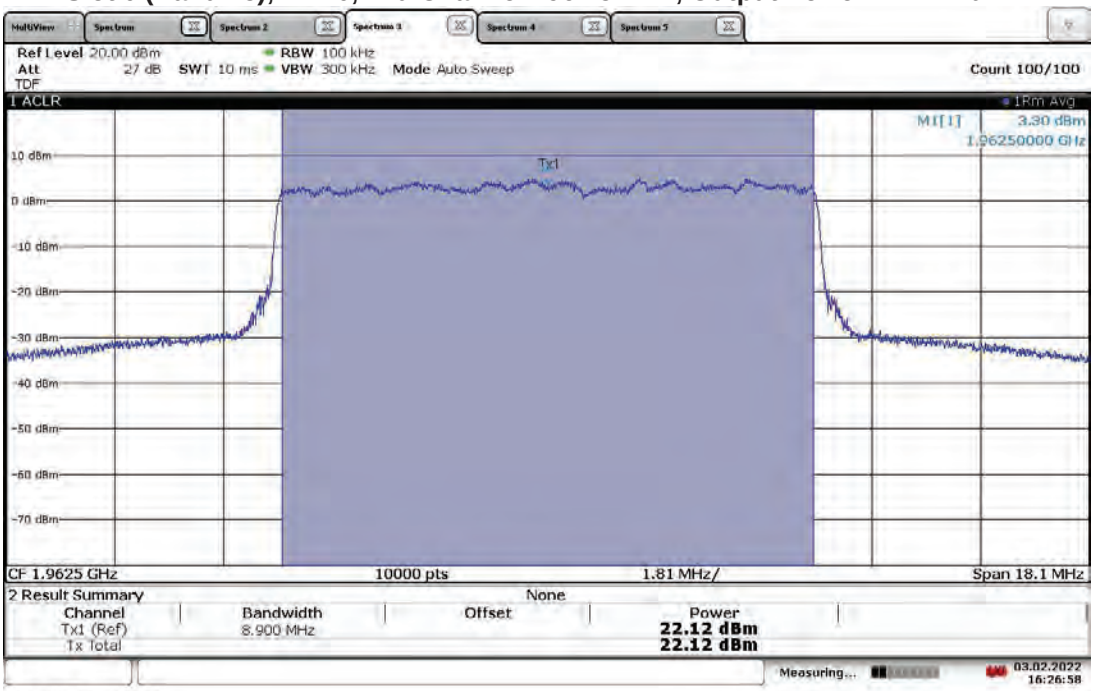
20:37:16 19.01.2022

TM3.2-16QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1935 MHz, Output Power = 22.78 dBm

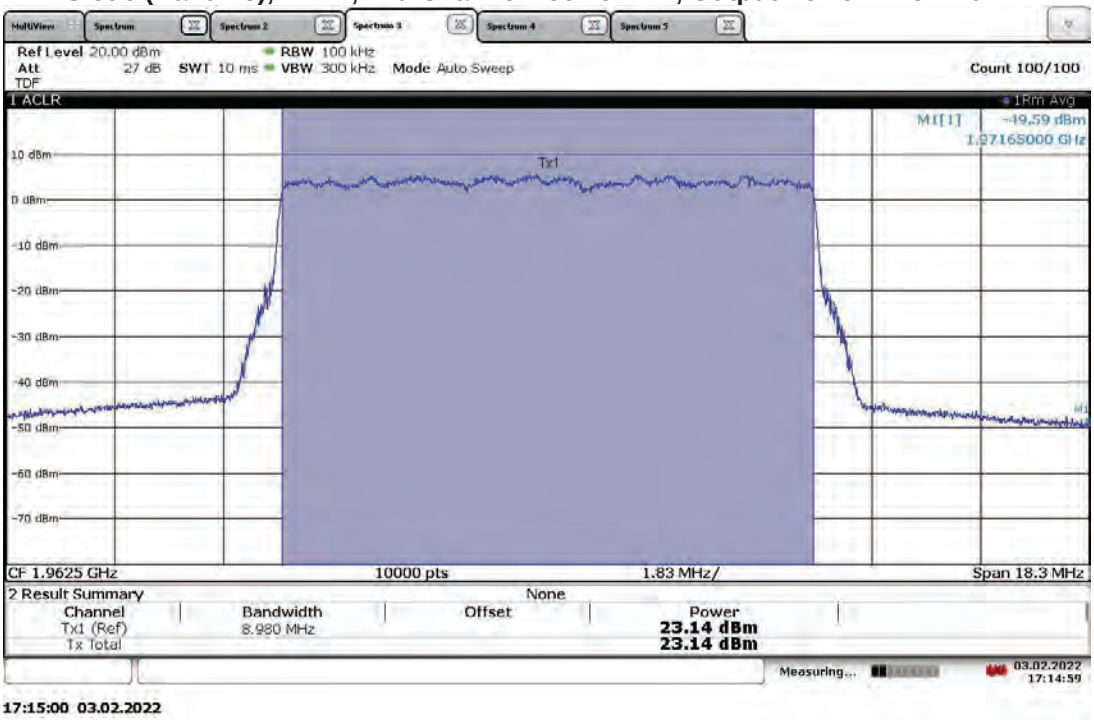


20:34:41 19.01.2022

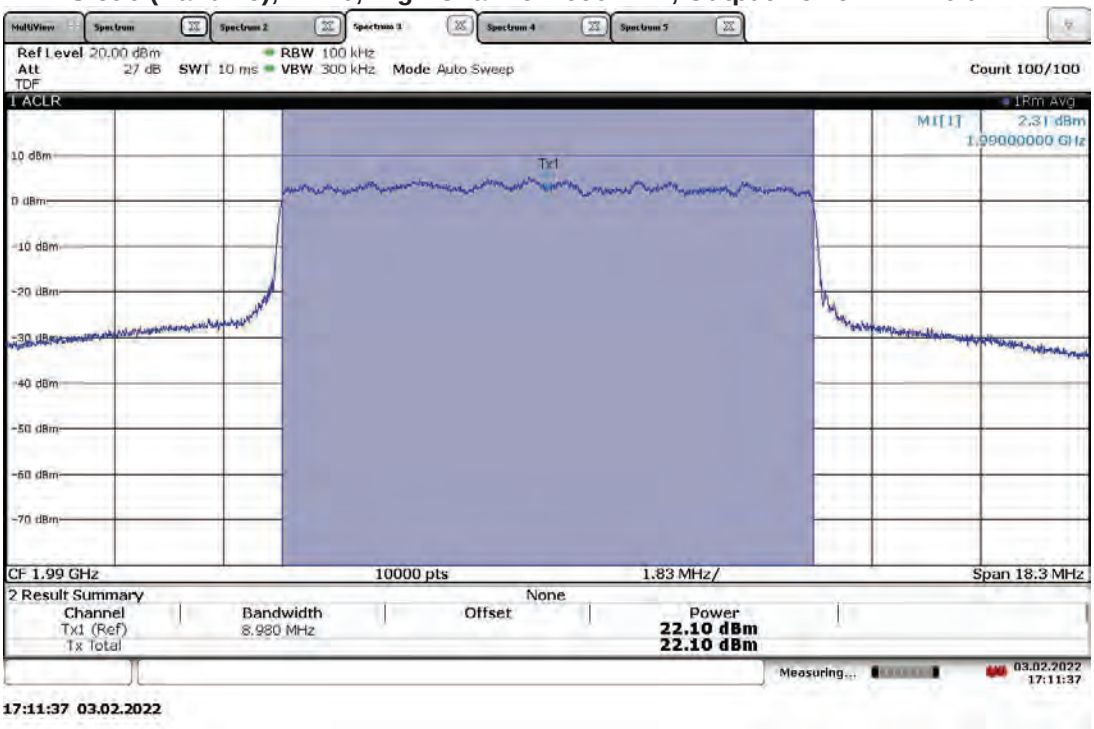
TM3.2-16QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 22.12 dBm



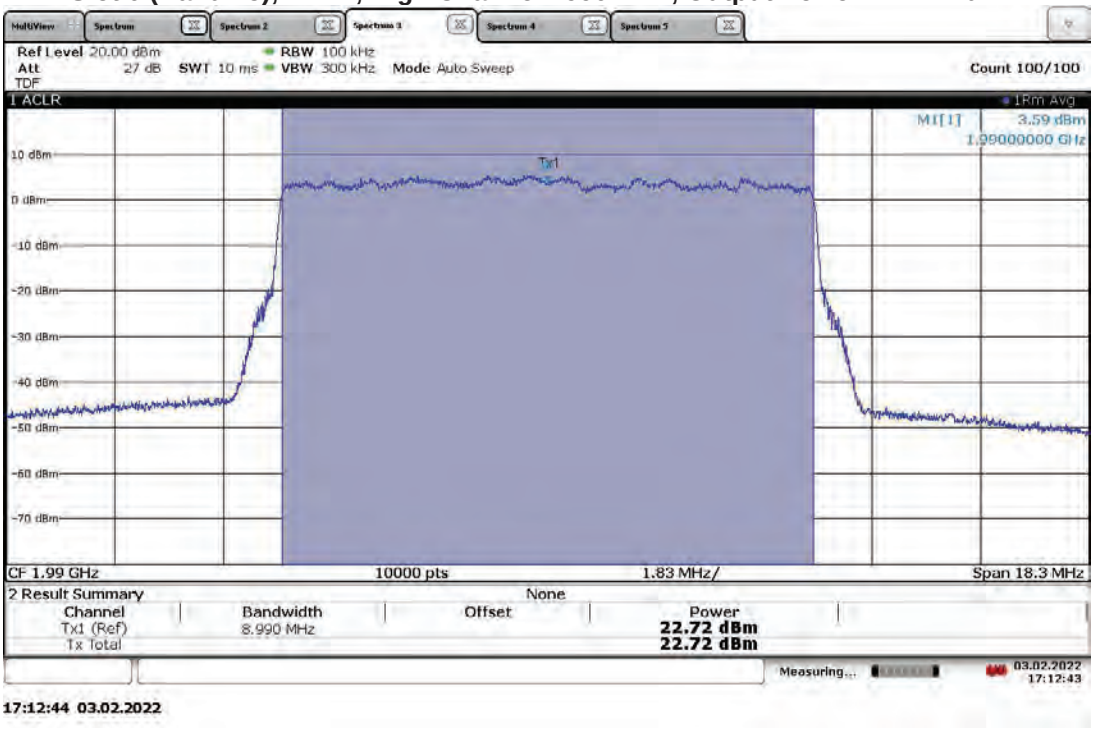
TM3.2-16QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 23.14 dBm



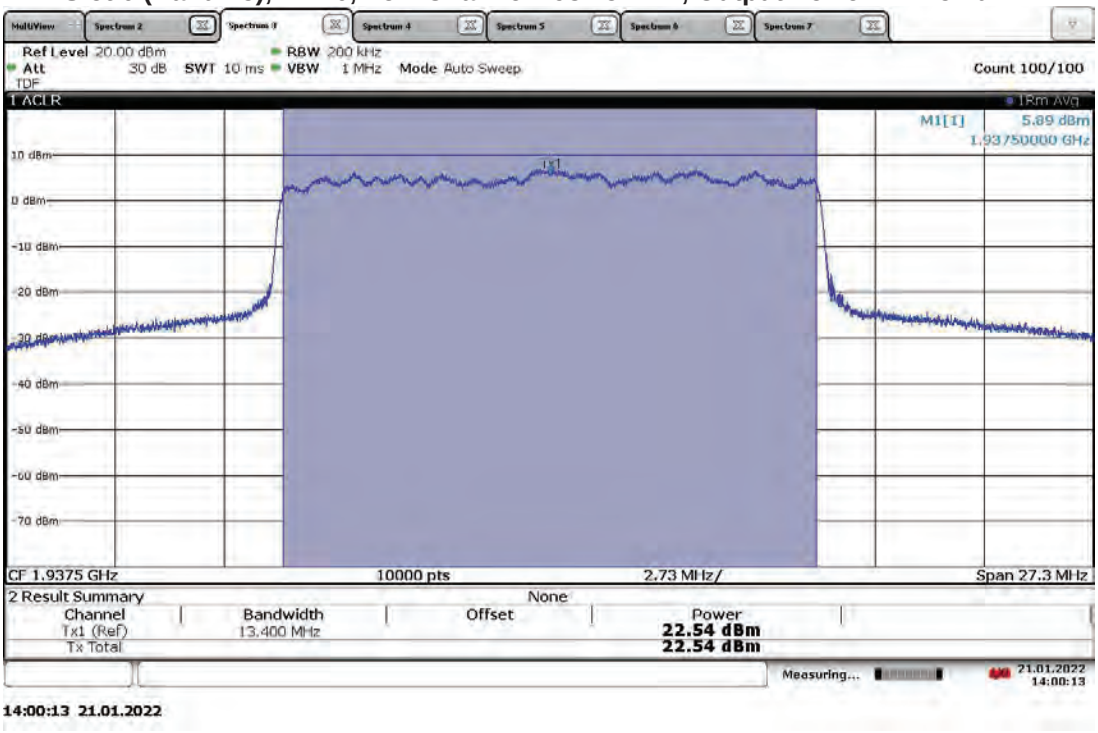
TM3.2-16QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1990 MHz, Output Power = 22.10 dBm



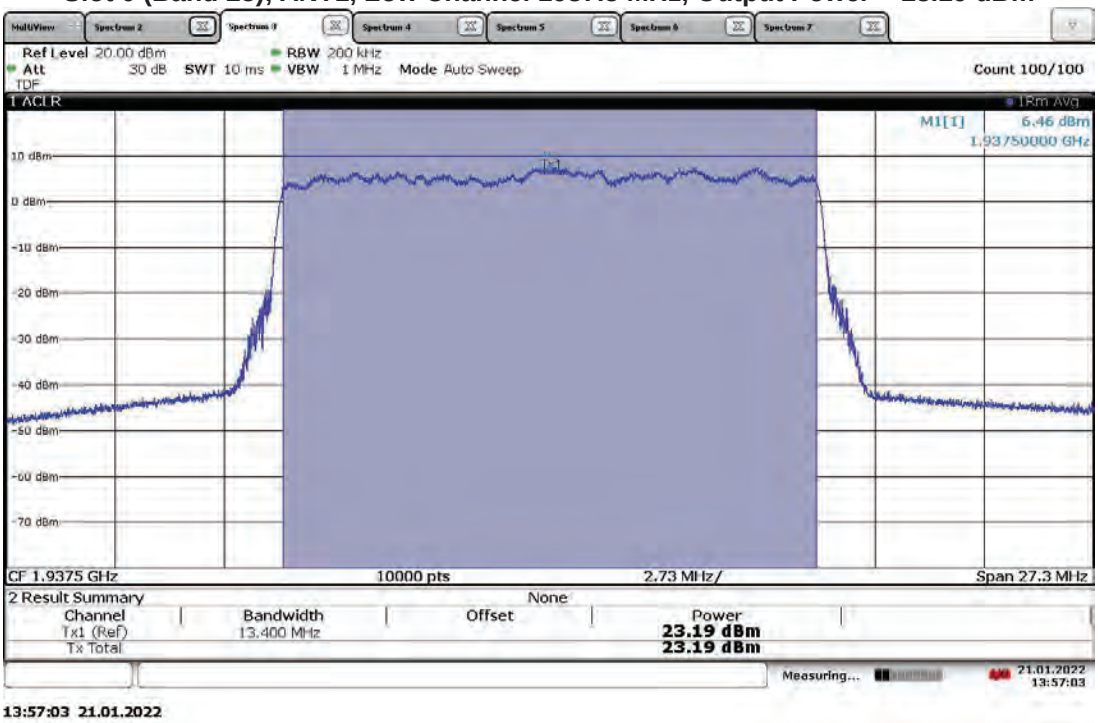
TM3.2-16QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1990 MHz, Output Power = 22.72 dBm



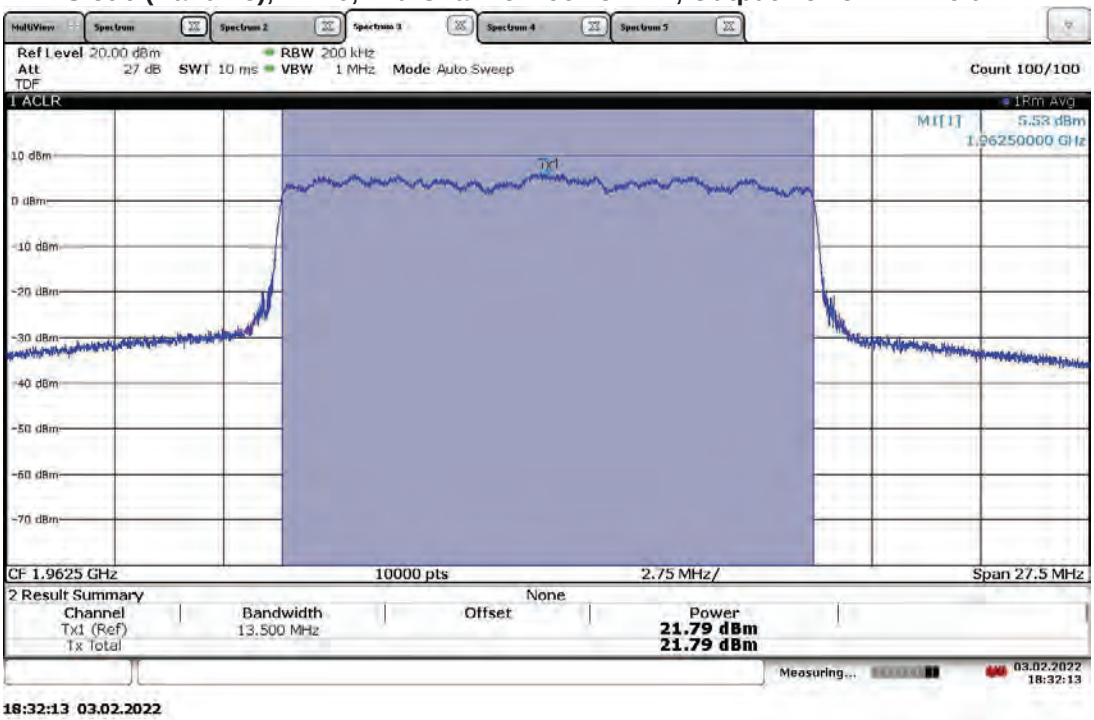
TM3.2-16QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1937.5 MHz, Output Power = 22.54 dBm



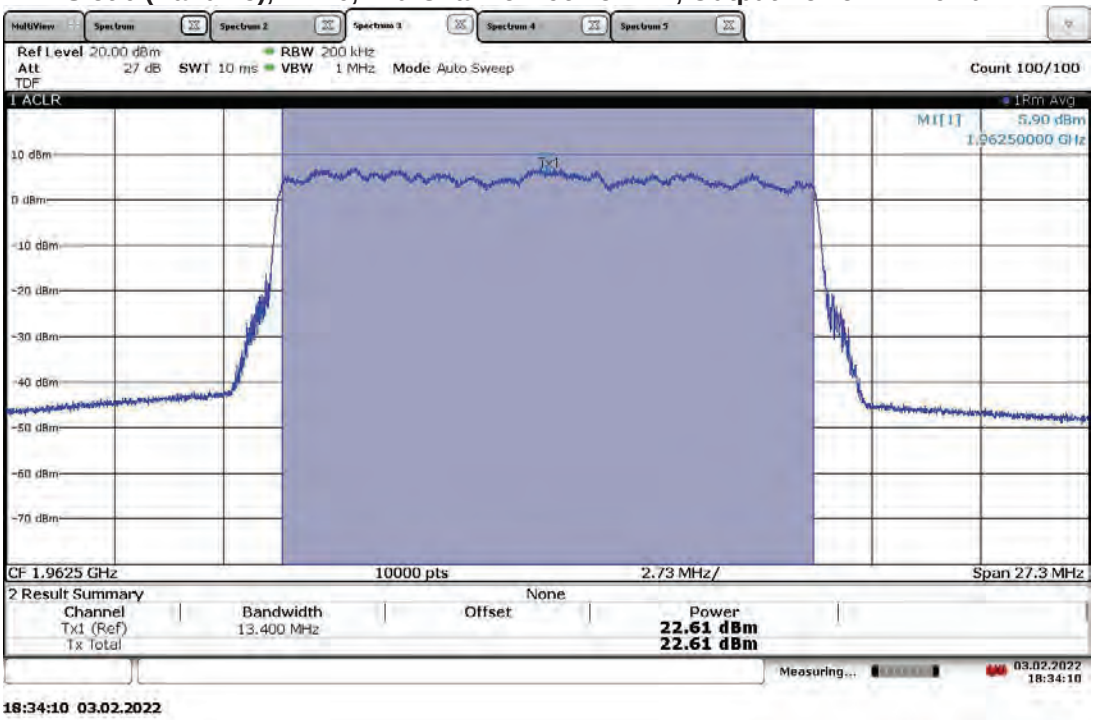
TM3.2-16QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1937.5 MHz, Output Power = 23.19 dBm



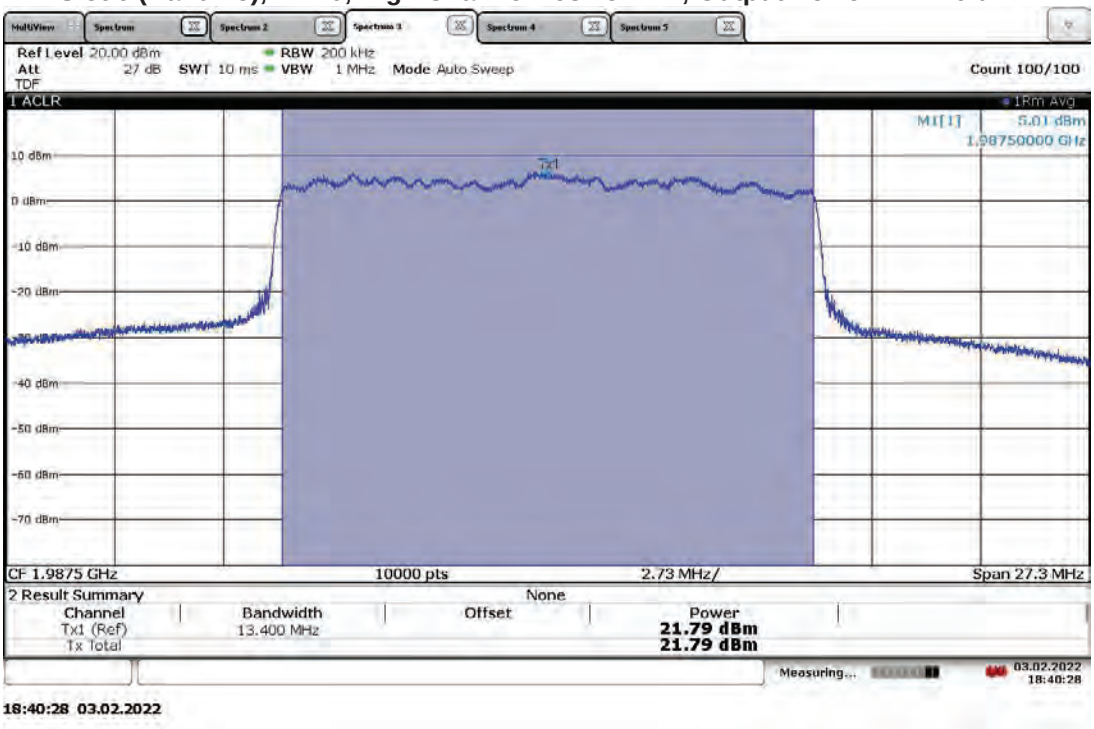
TM3.2-16QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.79 dBm



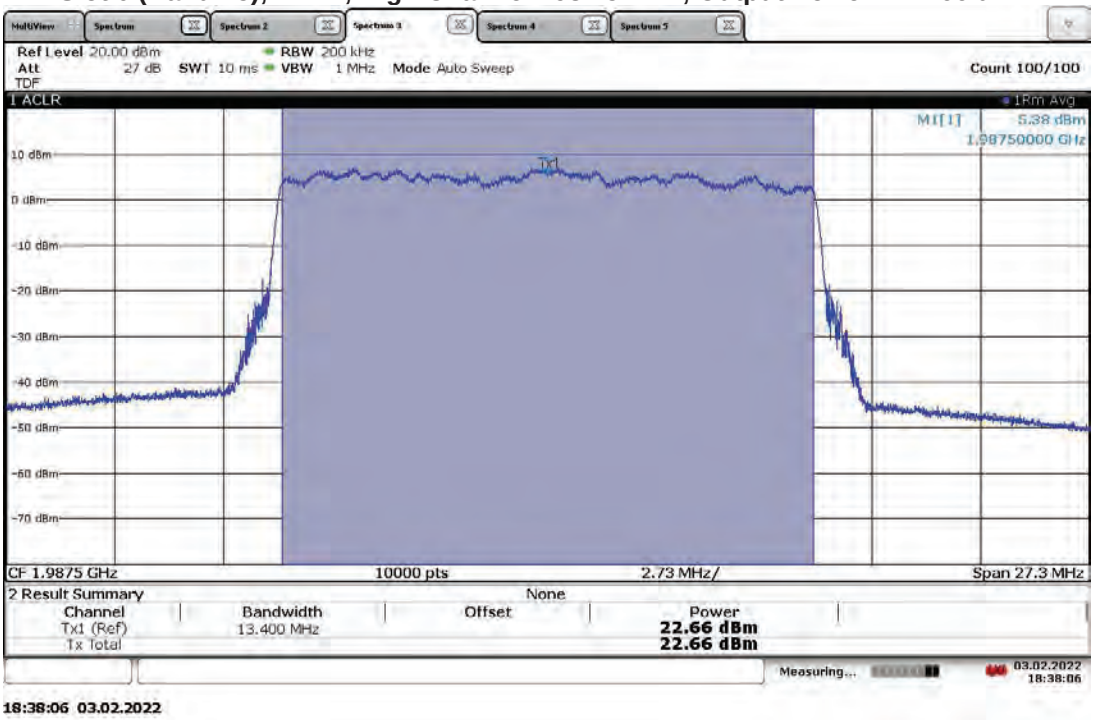
TM3.2-16QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 22.61 dBm



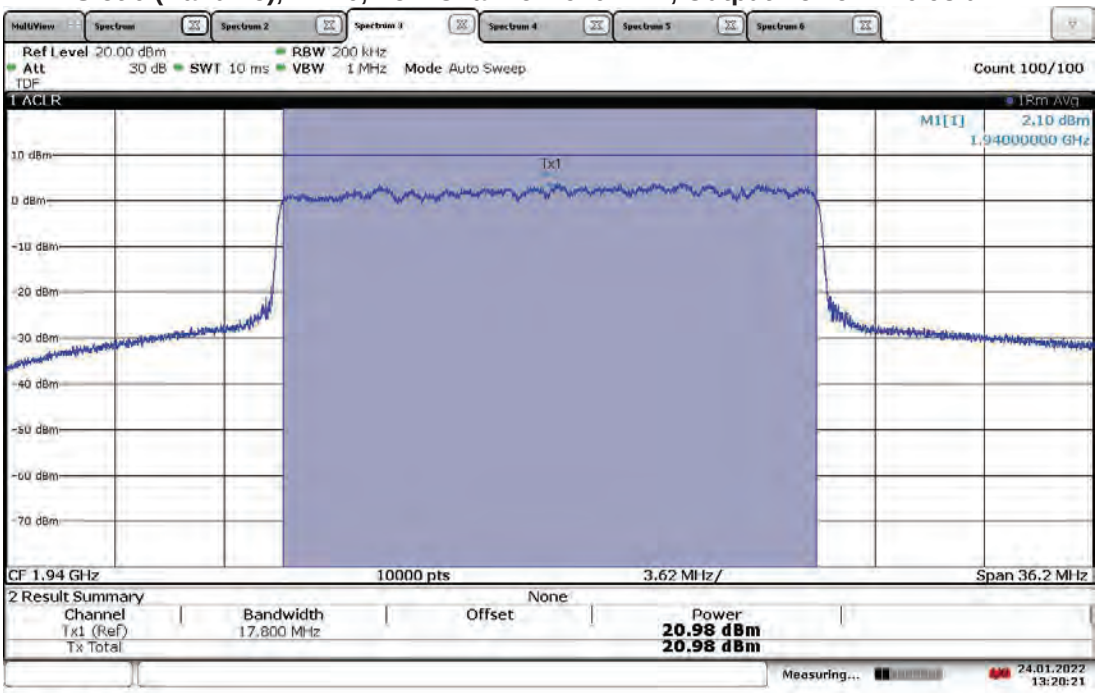
TM3.2-16QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1987.5 MHz, Output Power = 21.79 dBm



TM3.2-16QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1987.5 MHz, Output Power = 22.66 dBm

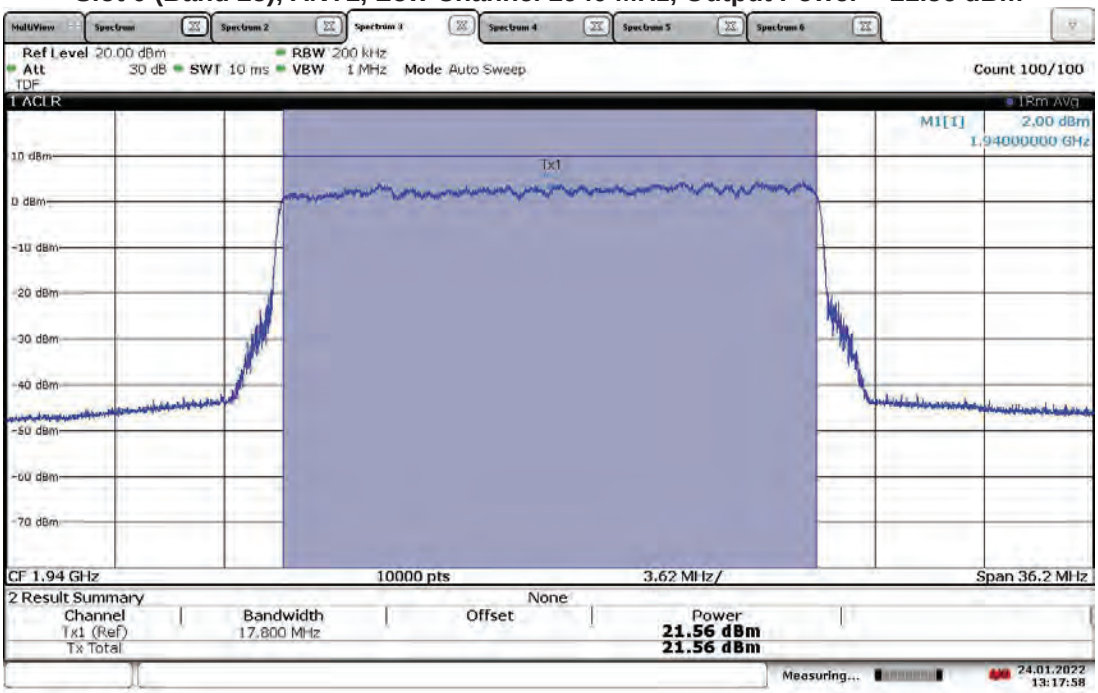


TM3.2-16QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1940 MHz, Output Power = 20.98 dBm



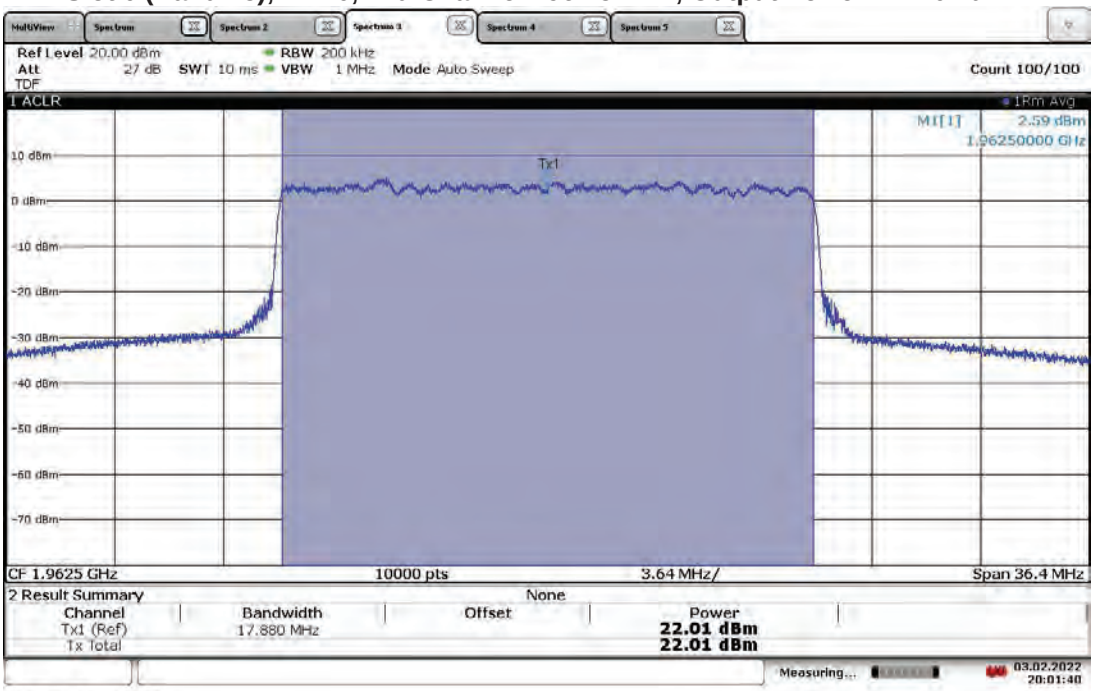
13:20:22 24.01.2022

TM3.2-16QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1940 MHz, Output Power = 21.56 dBm

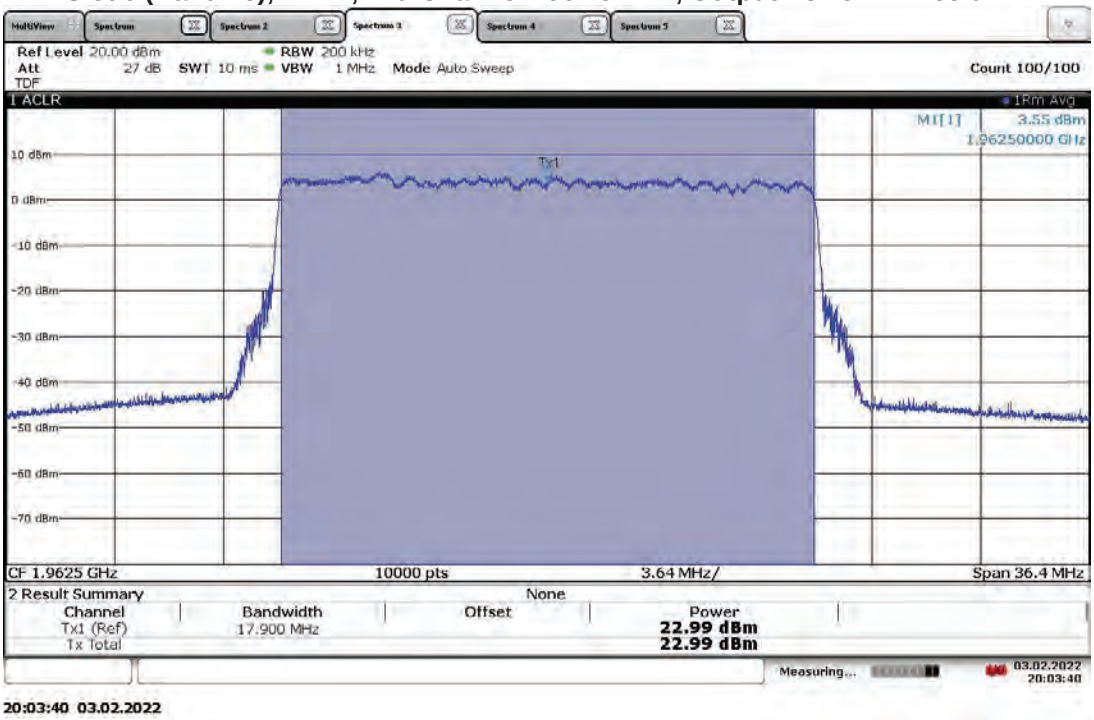


13:17:59 24.01.2022

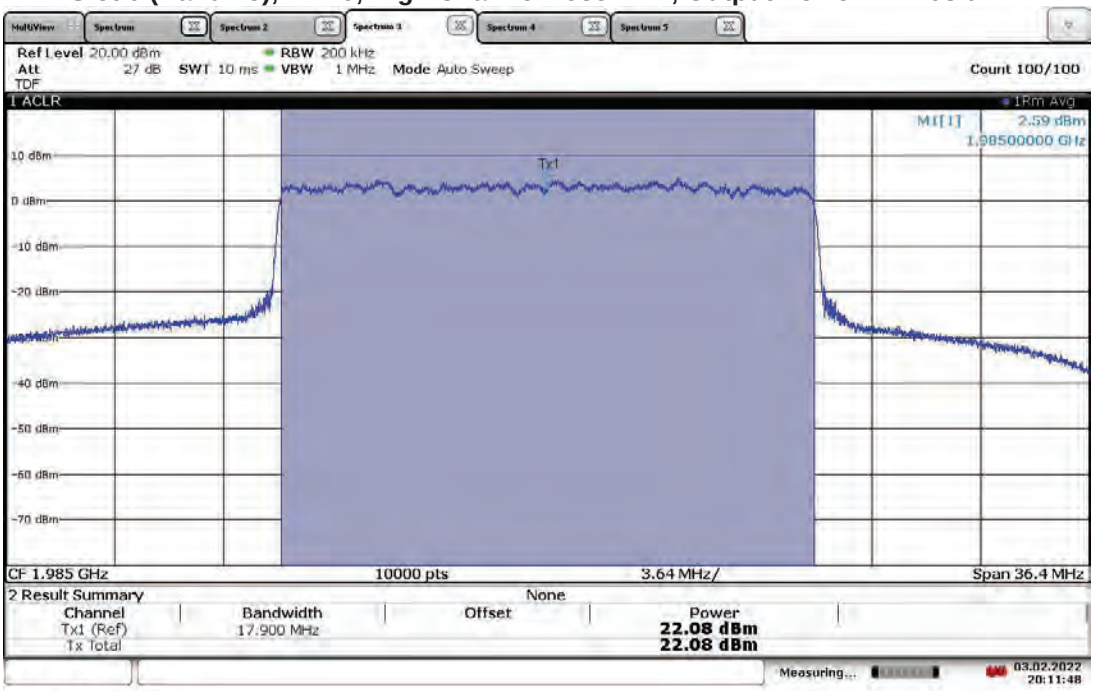
TM3.2-16QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 22.01 dBm



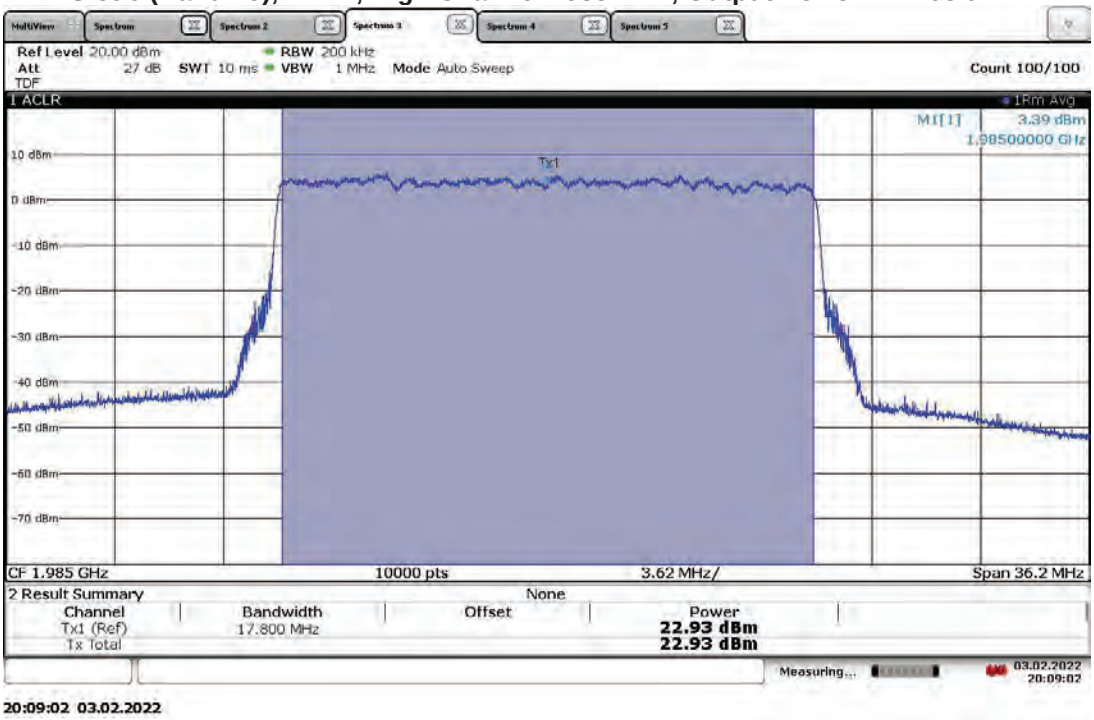
TM3.2-16QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 22.99 dBm



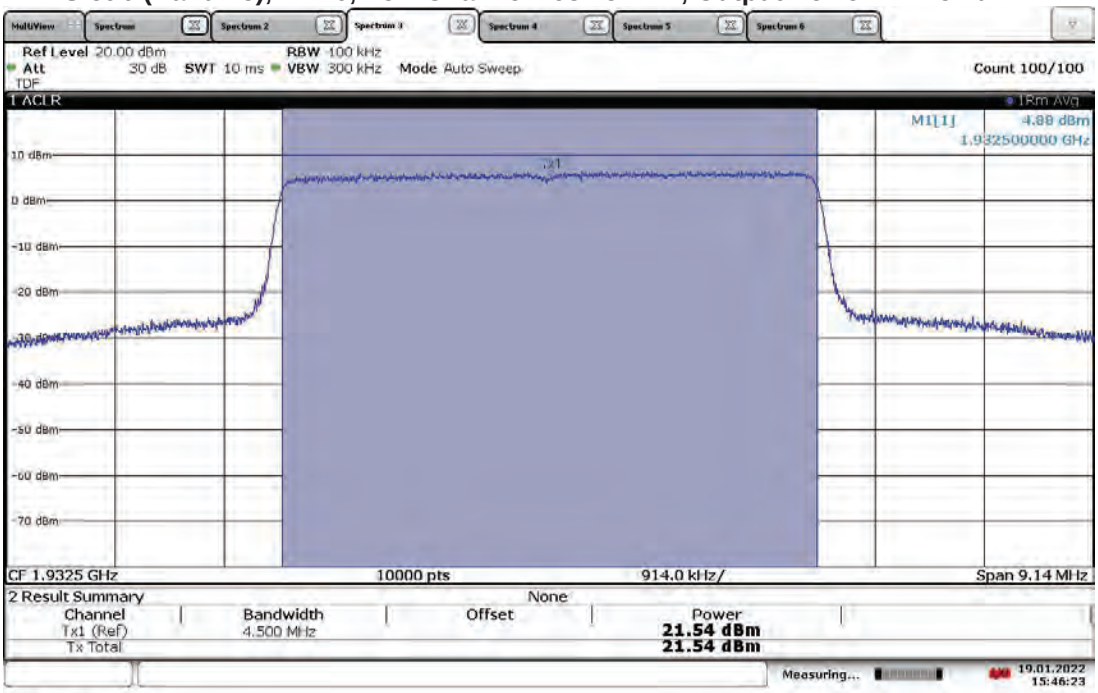
TM3.2-16QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1985 MHz, Output Power = 22.08 dBm



TM3.2-16QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1985 MHz, Output Power = 22.93 dBm

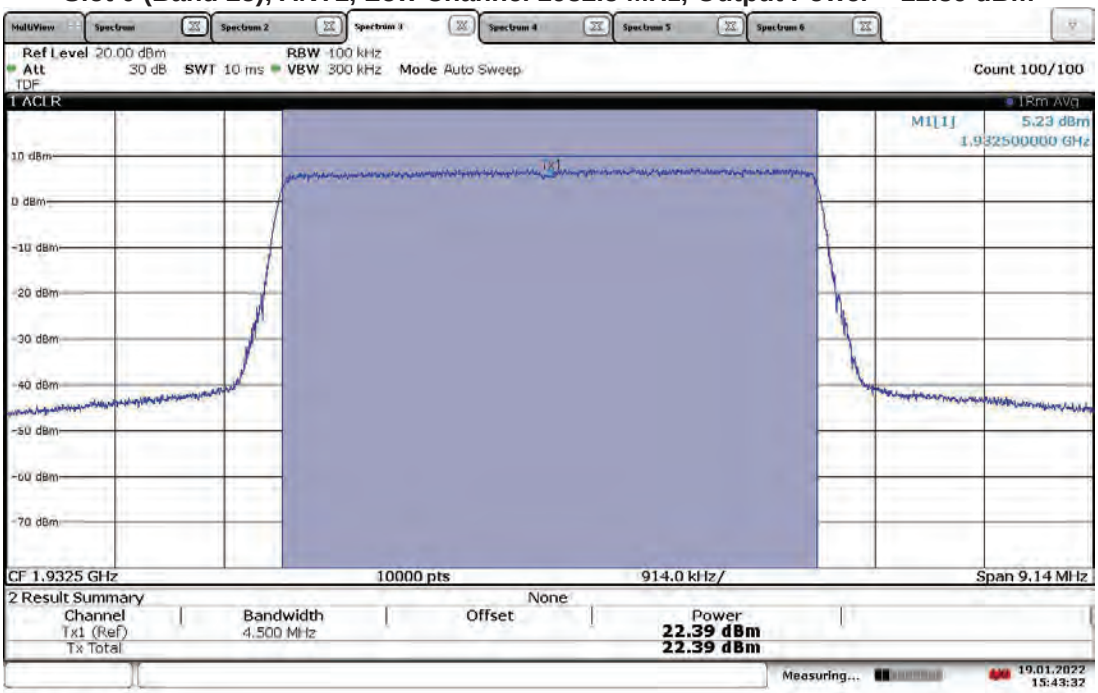


TM3.1-64QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1932.5 MHz, Output Power = 21.54 dBm



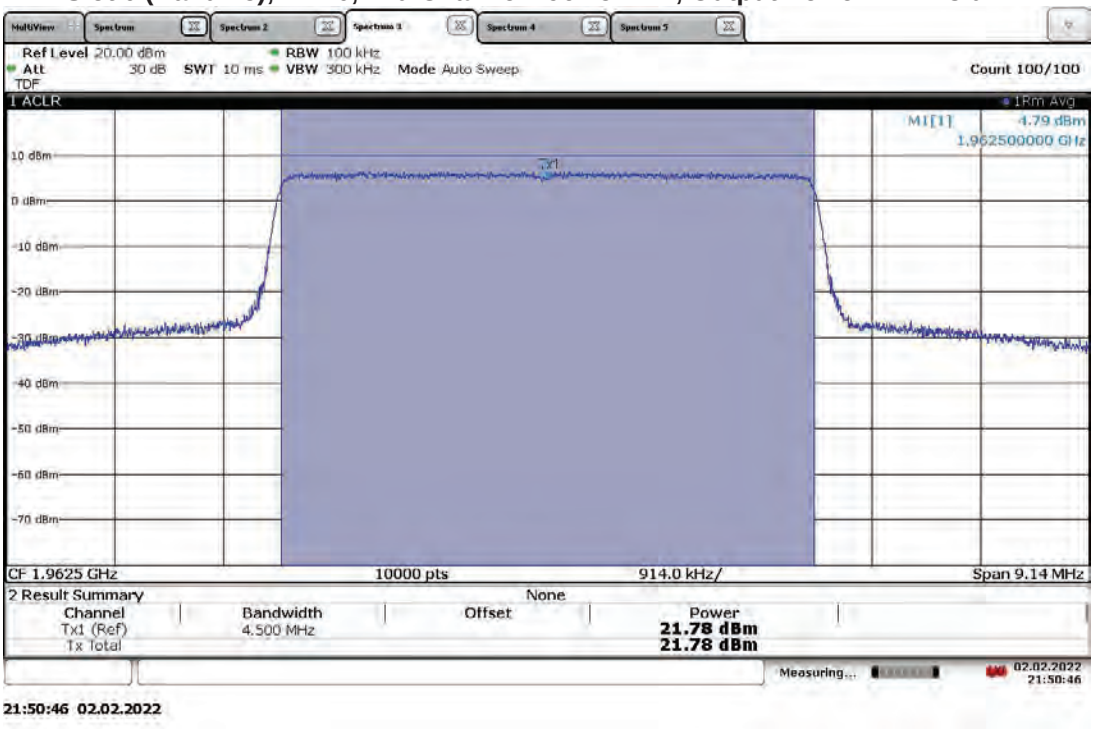
15:46:23 19.01.2022

TM3.1-64QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1932.5 MHz, Output Power = 22.39 dBm

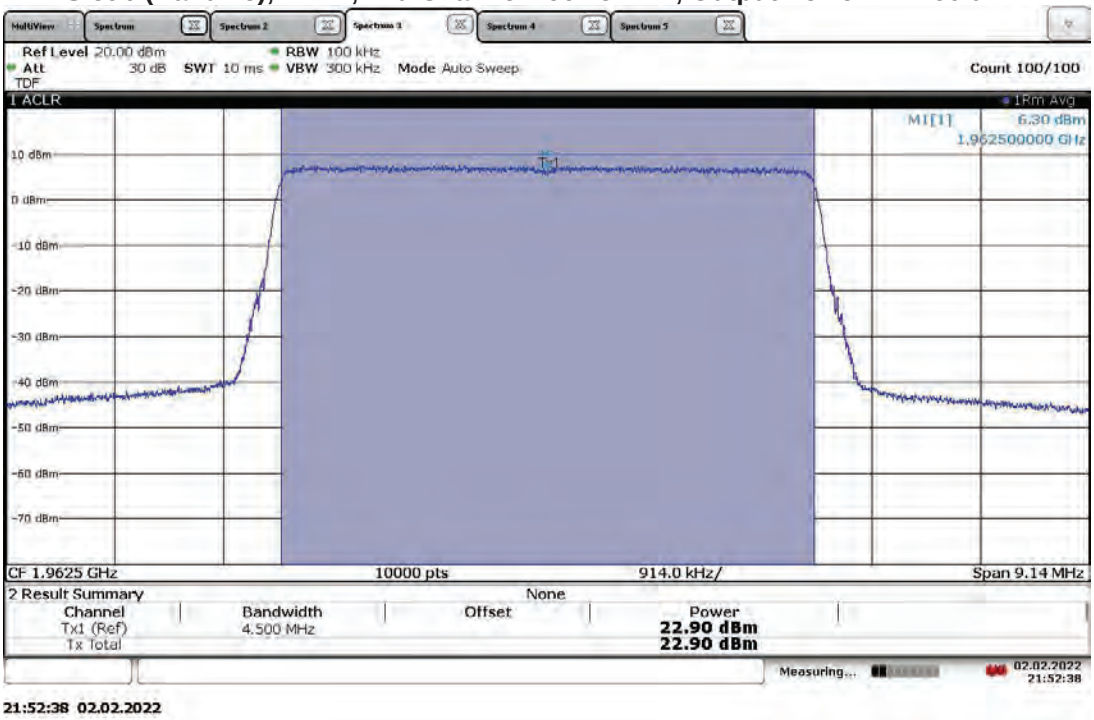


15:43:33 19.01.2022

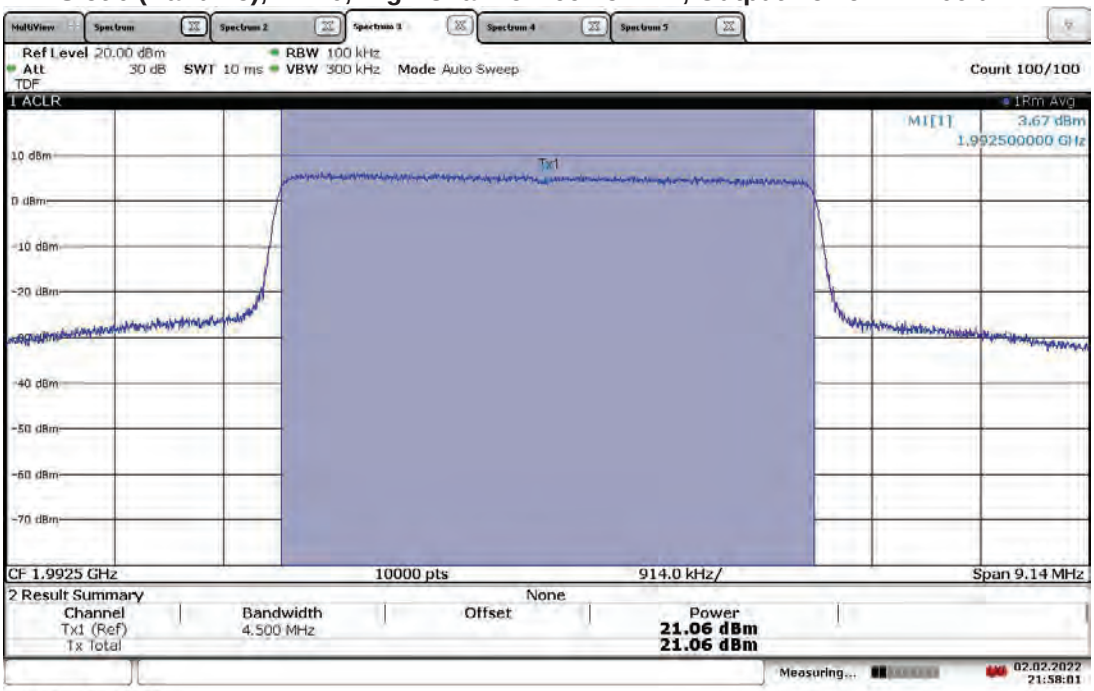
TM3.1-64QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.78 dBm



TM3.1-64QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 22.90 dBm

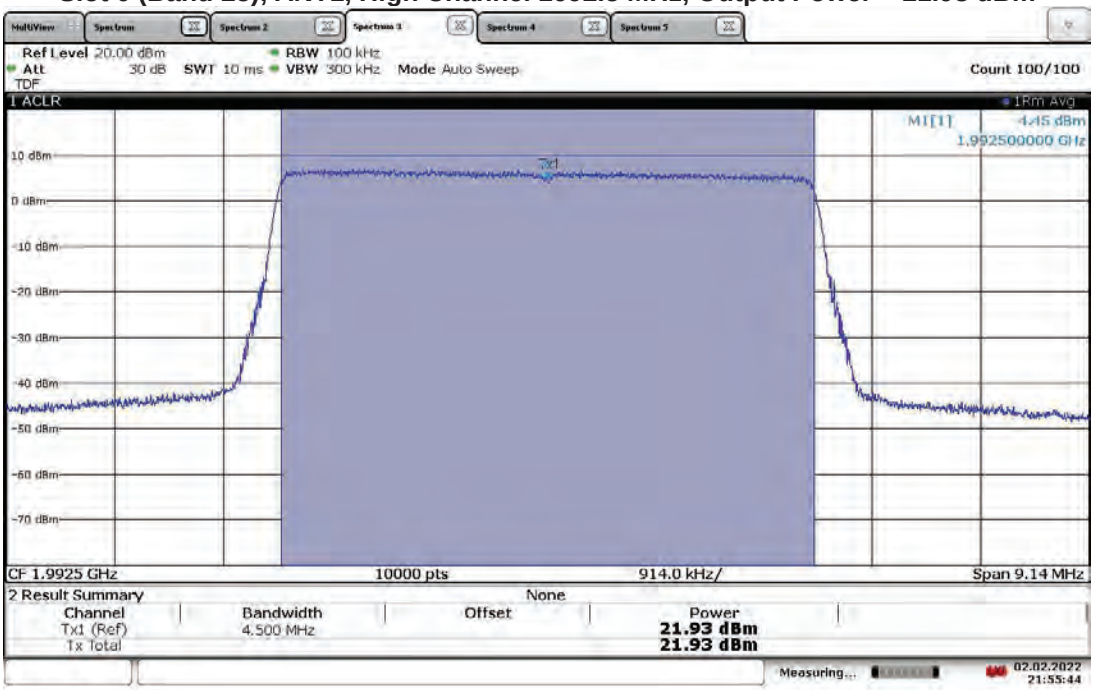


TM3.1-64QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1992.5 MHz, Output Power = 21.06 dBm



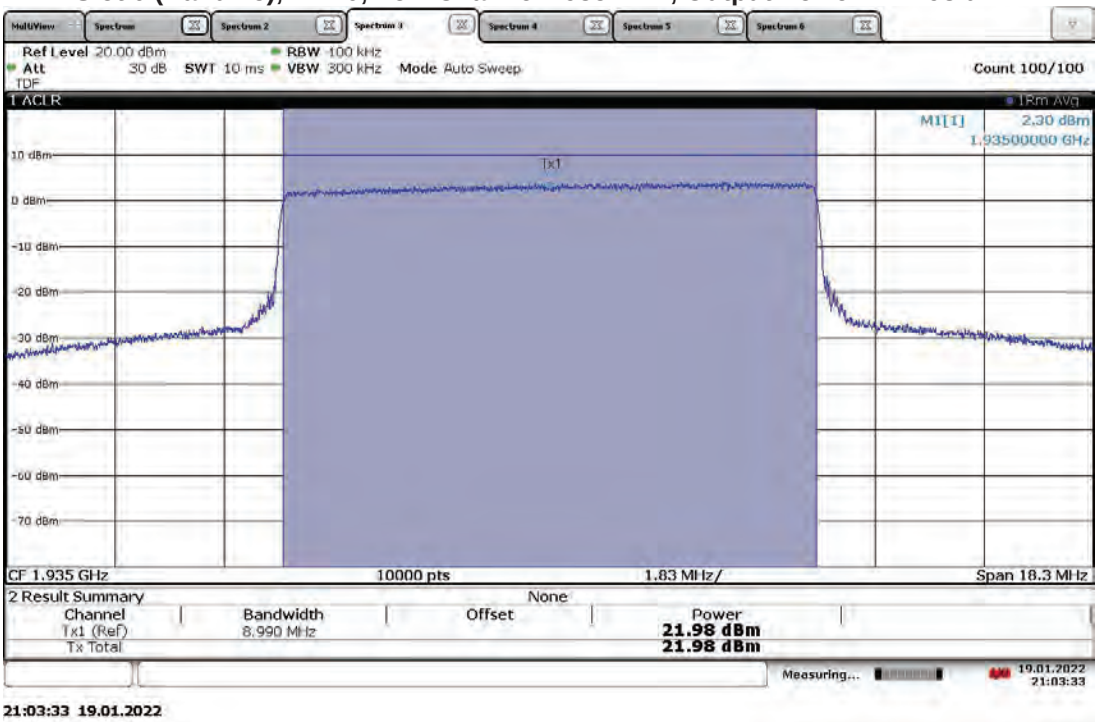
21:58:01 02.02.2022

TM3.1-64QAM_5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1992.5 MHz, Output Power = 21.93 dBm

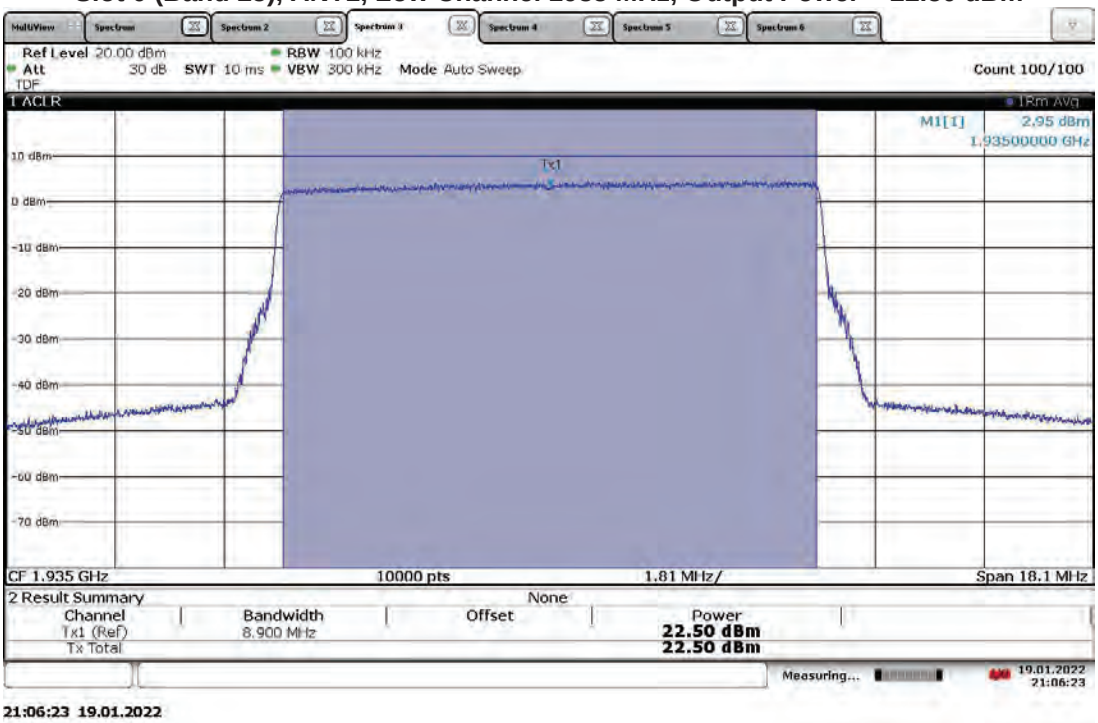


21:55:45 02.02.2022

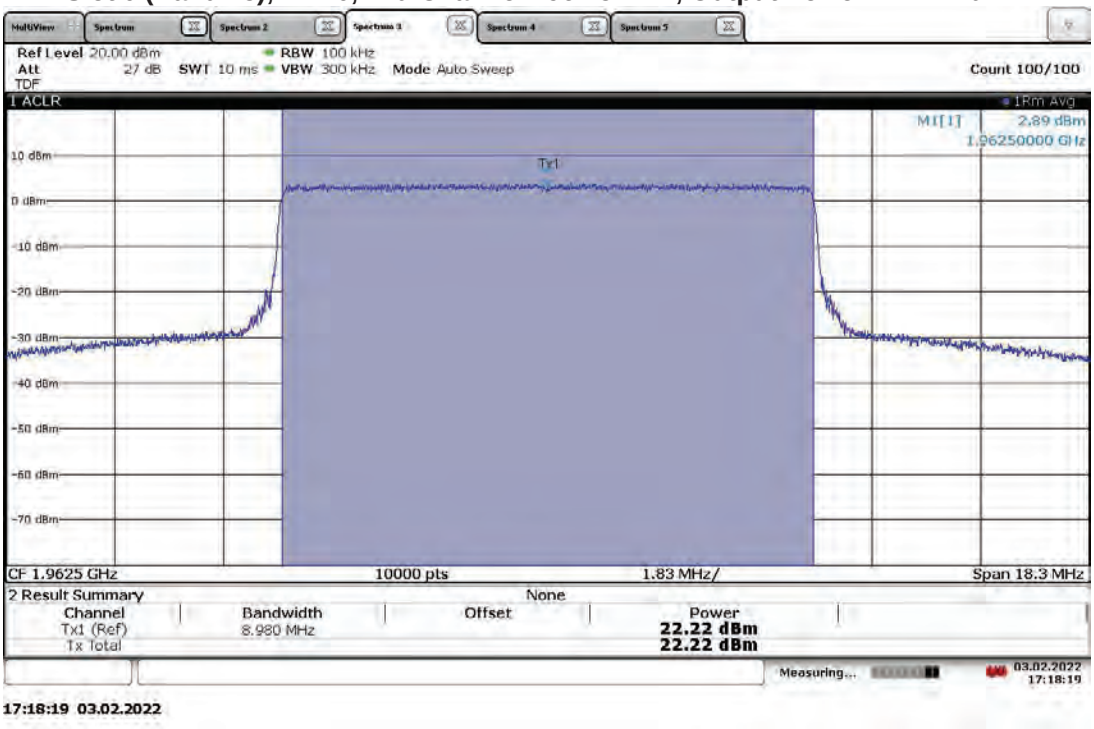
TM3.1-64QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1935 MHz, Output Power = 21.98 dBm



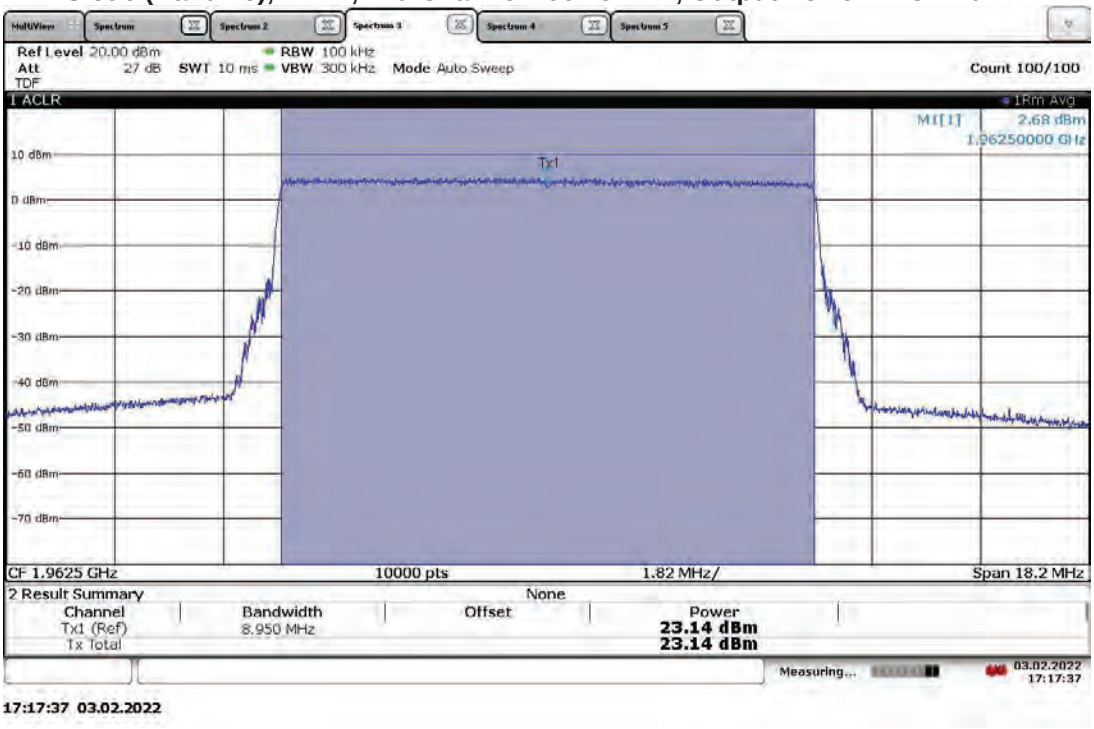
TM3.1-64QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1935 MHz, Output Power = 22.50 dBm



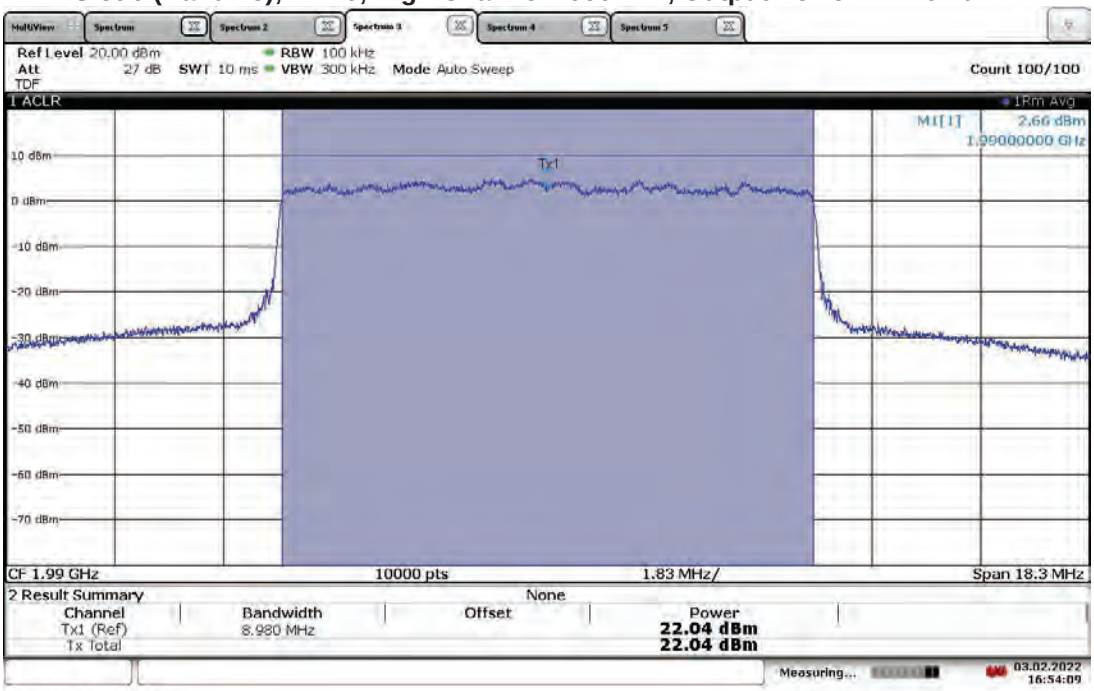
TM3.1-64QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 22.22 dBm



TM3.1-64QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 23.14 dBm

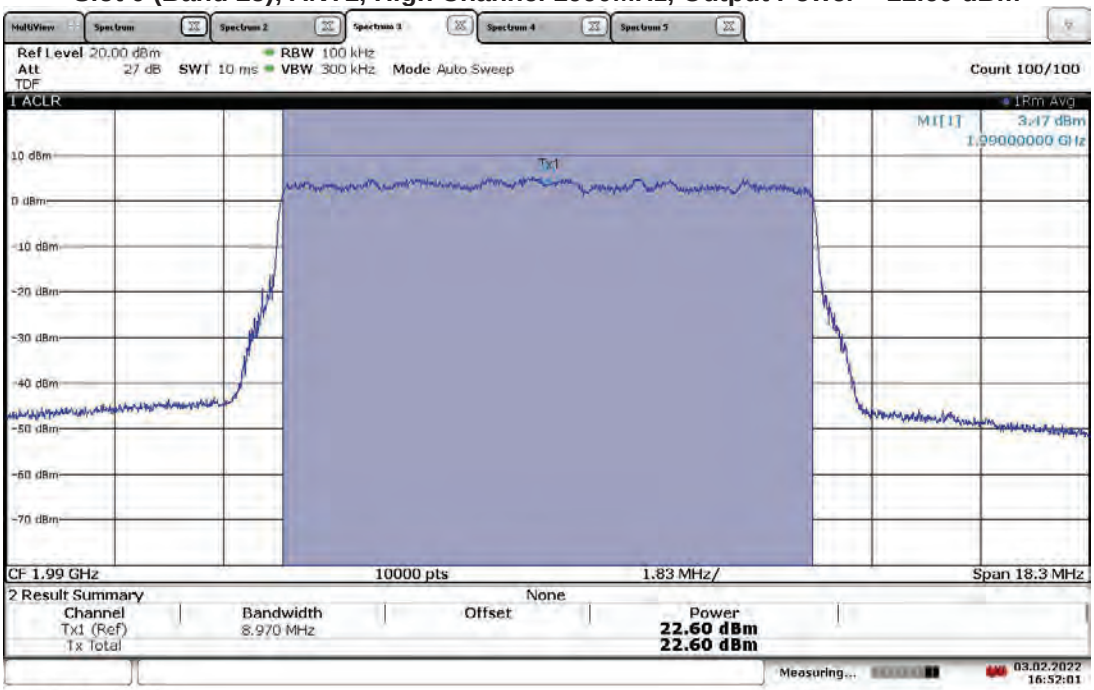


TM3.1-64QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1990MHz, Output Power = 22.04 dBm



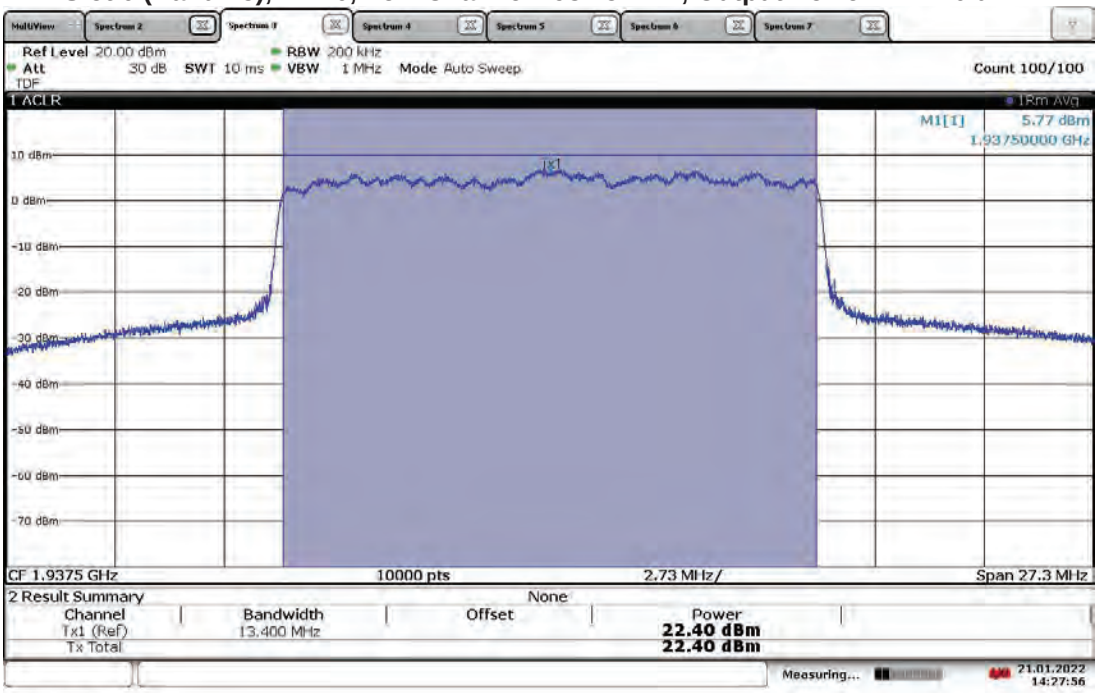
16:54:10 03.02.2022

TM3.1-64QAM_10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1990MHz, Output Power = 22.60 dBm



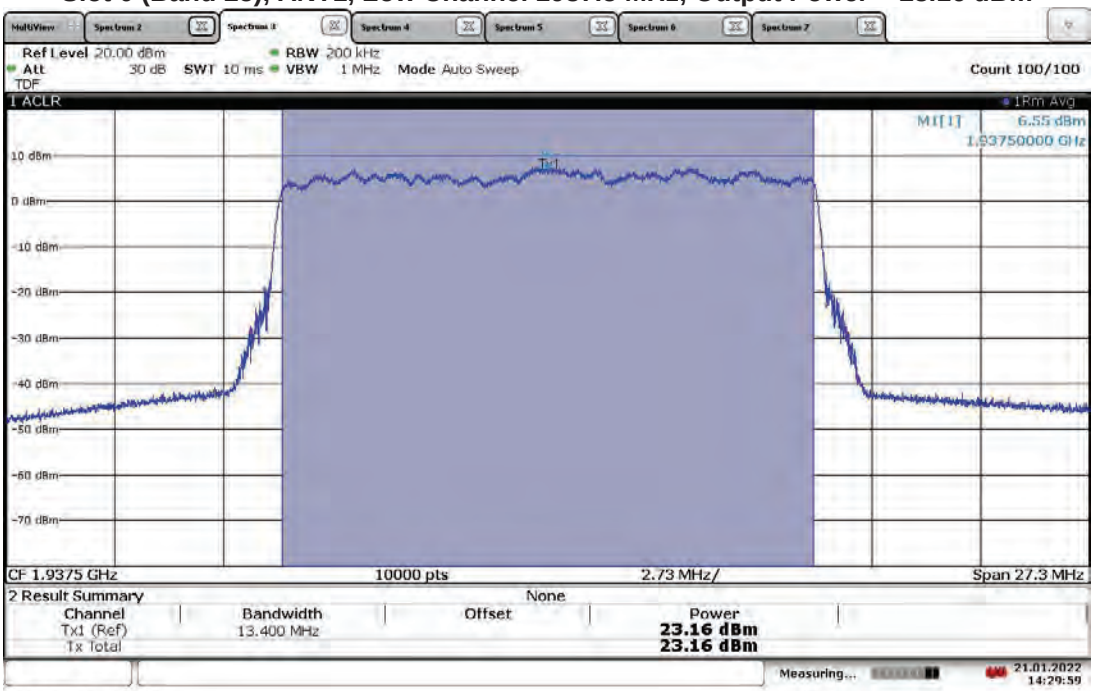
16:52:01 03.02.2022

TM3.1-64QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1937.5 MHz, Output Power = 22.40 dBm



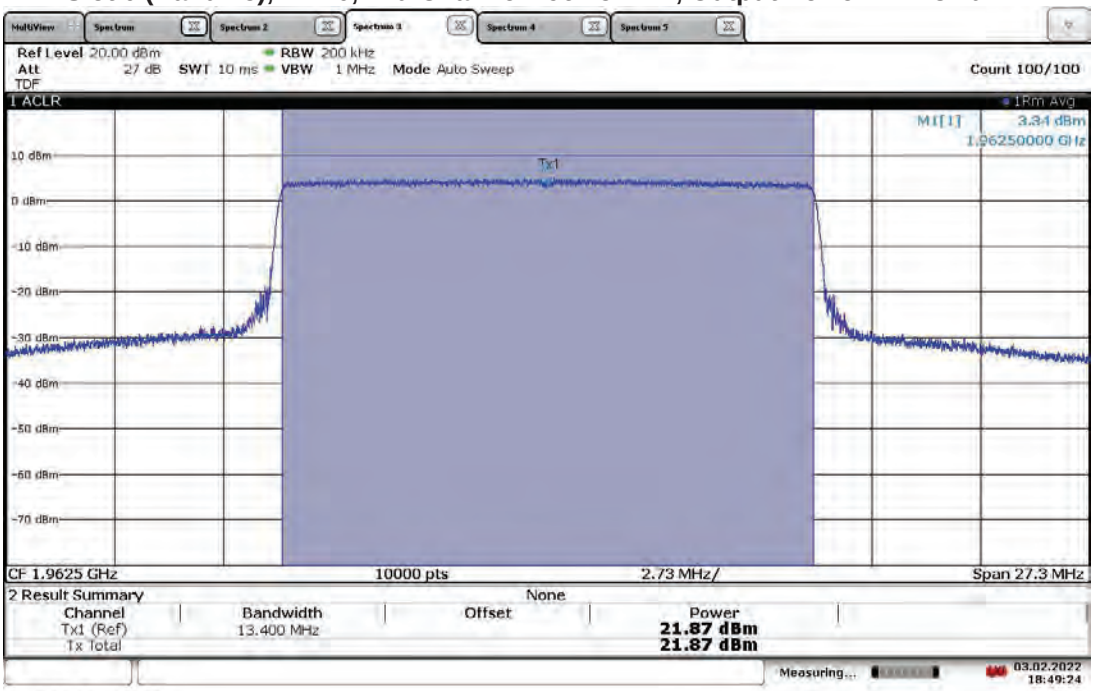
14:27:57 21.01.2022

TM3.1-64QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1937.5 MHz, Output Power = 23.16 dBm



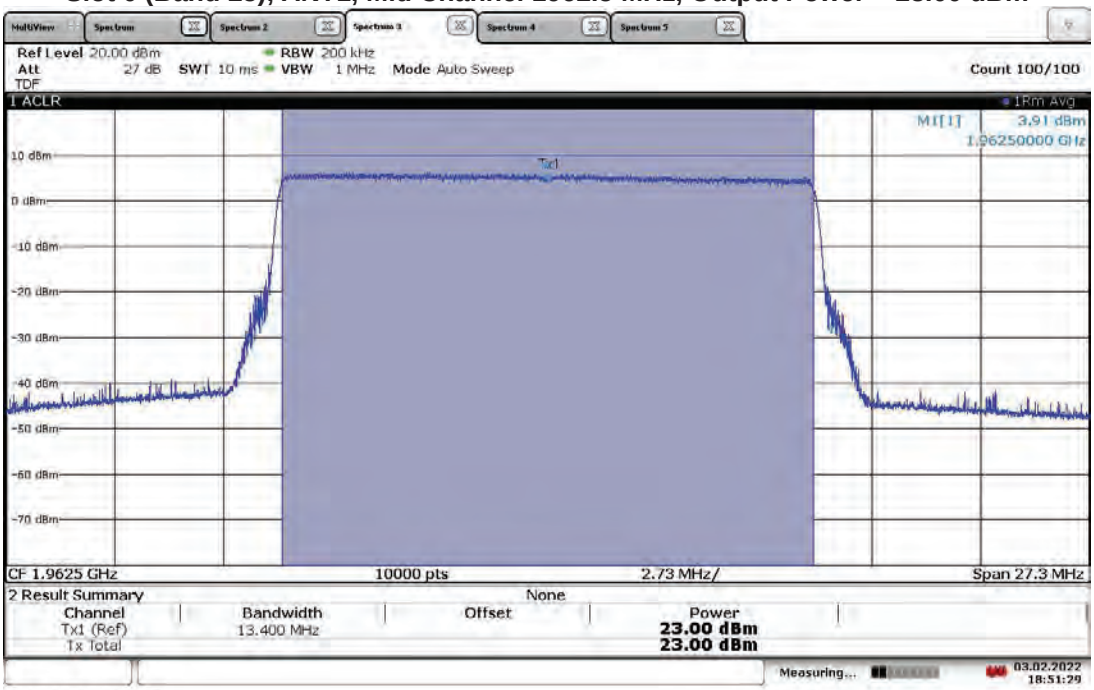
14:29:59 21.01.2022

TM3.1-64QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.87 dBm



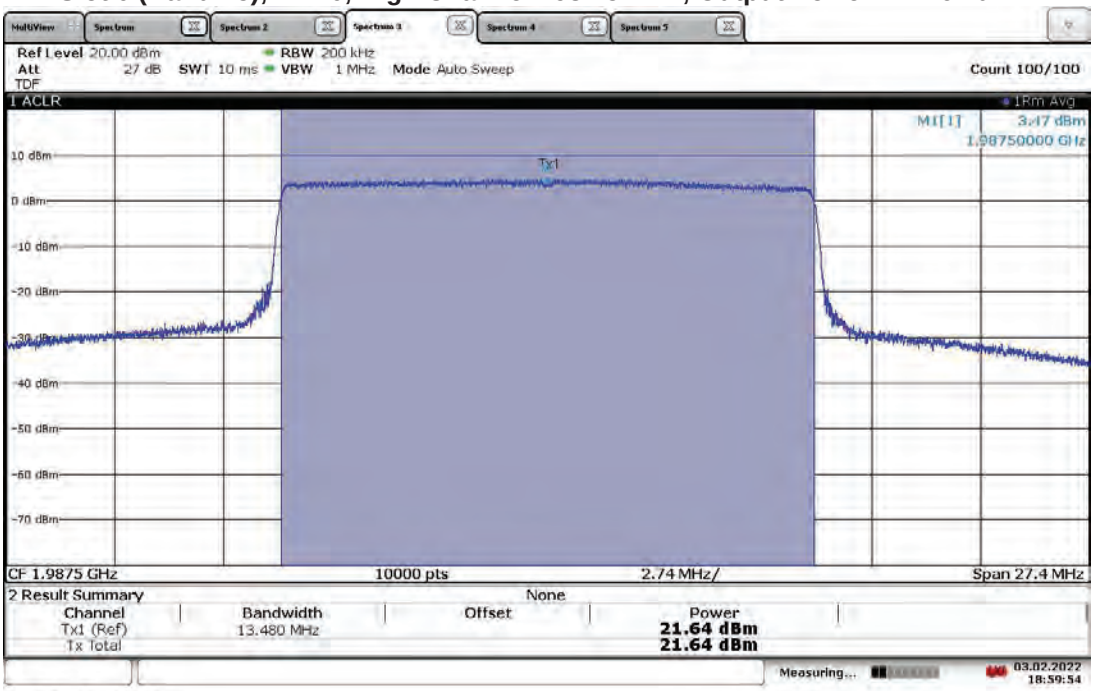
18:49:25 03.02.2022

TM3.1-64QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 23.00 dBm



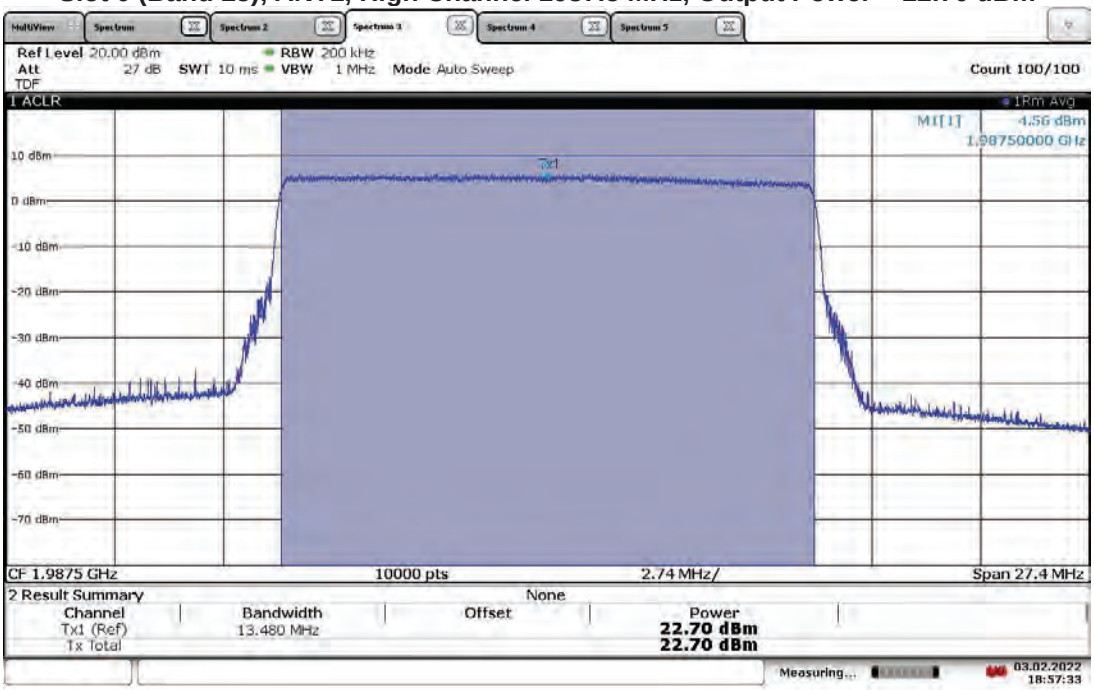
18:51:29 03.02.2022

TM3.1-64QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1987.5 MHz, Output Power = 21.64 dBm



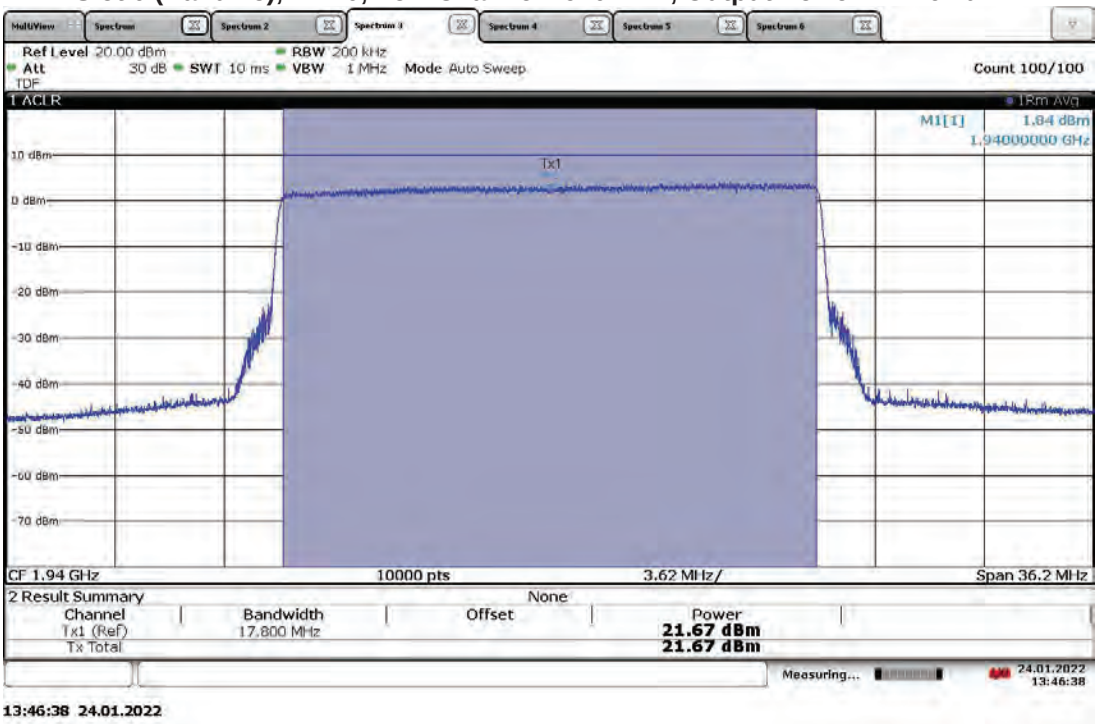
18:59:54 03.02.2022

TM3.1-64QAM_15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1987.5 MHz, Output Power = 22.70 dBm

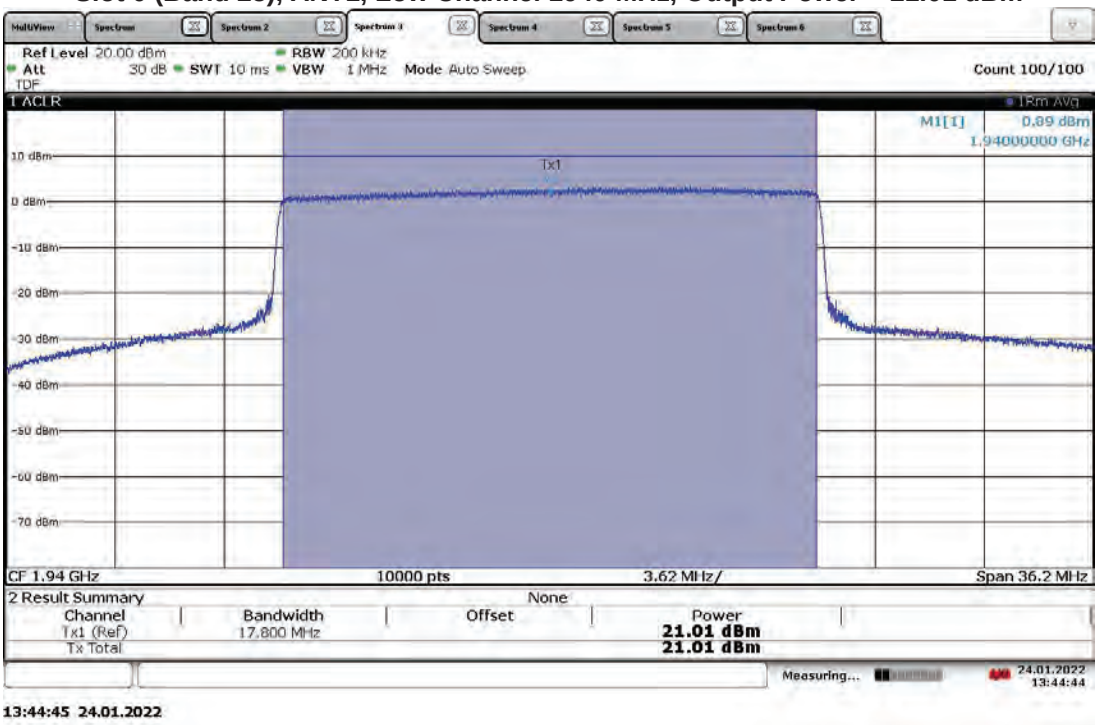


18:57:33 03.02.2022

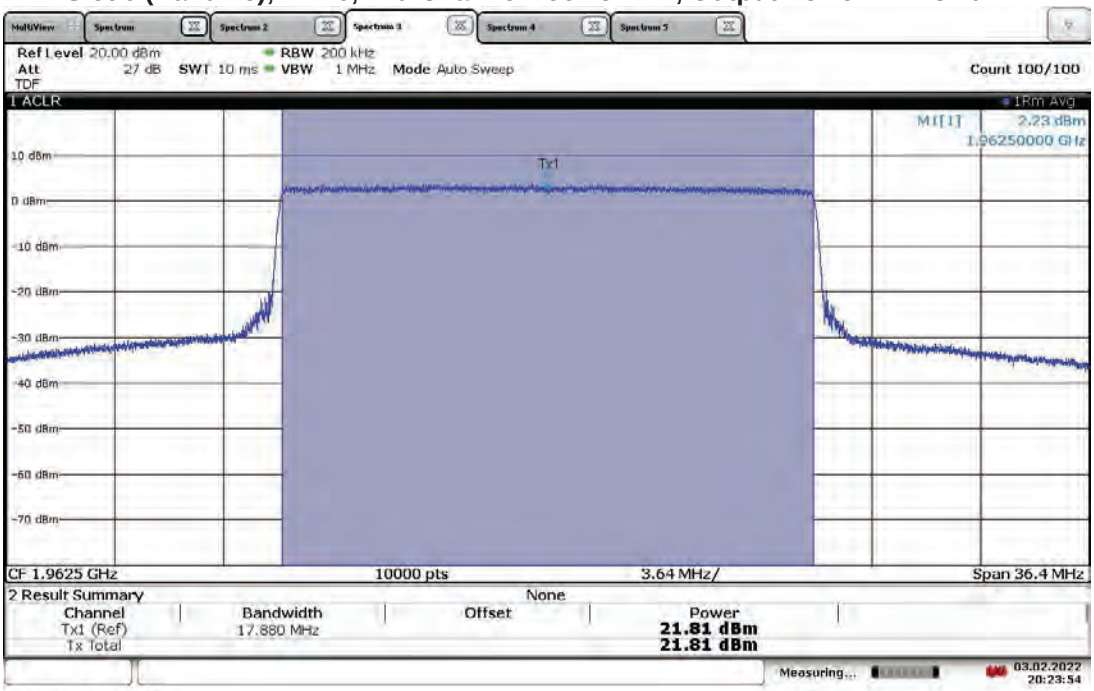
TM3.1-64QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1940 MHz, Output Power = 21.67 dBm



TM3.1-64QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1940 MHz, Output Power = 21.01 dBm

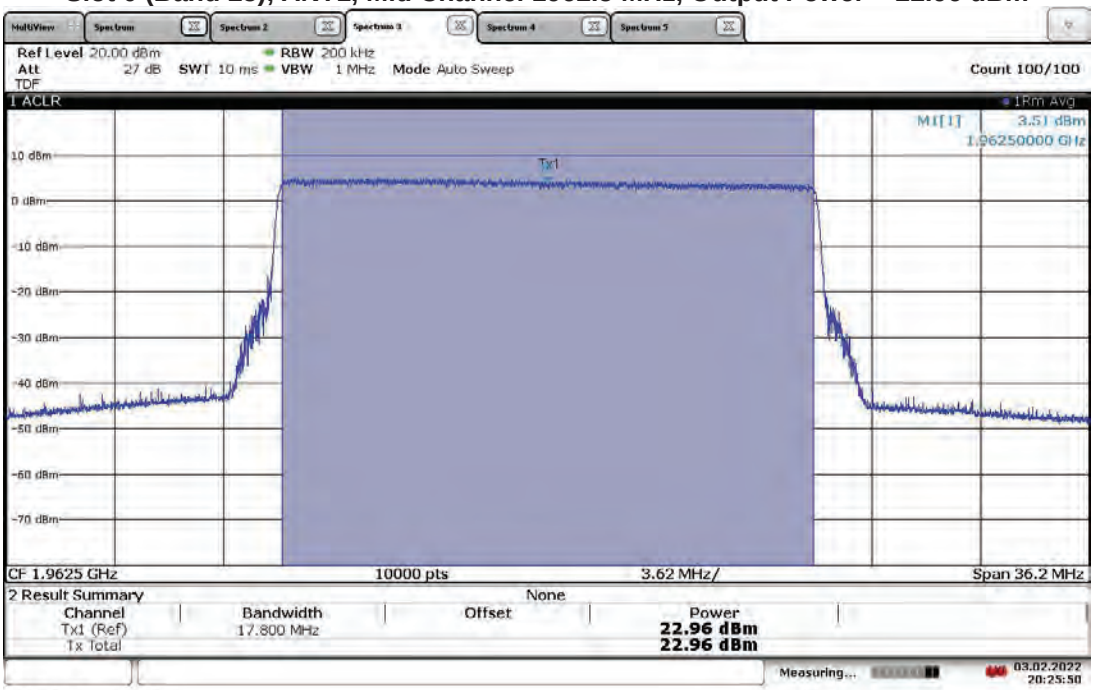


TM3.1-64QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.81 dBm



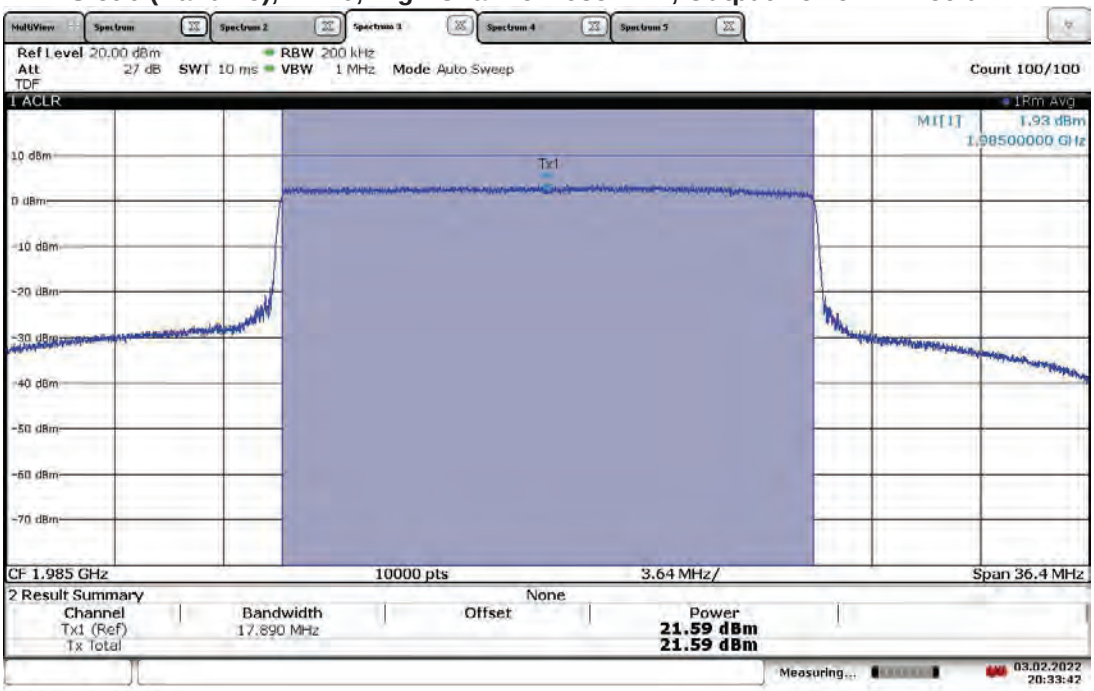
20:23:55 03.02.2022

TM3.1-64QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 22.96 dBm

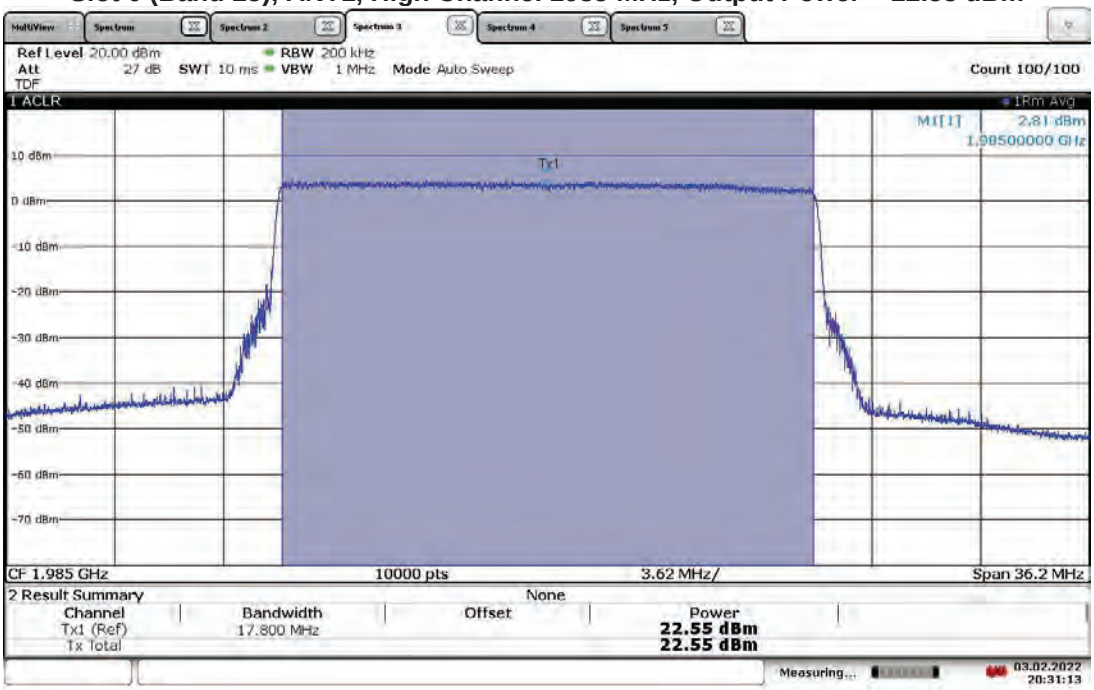


20:25:50 03.02.2022

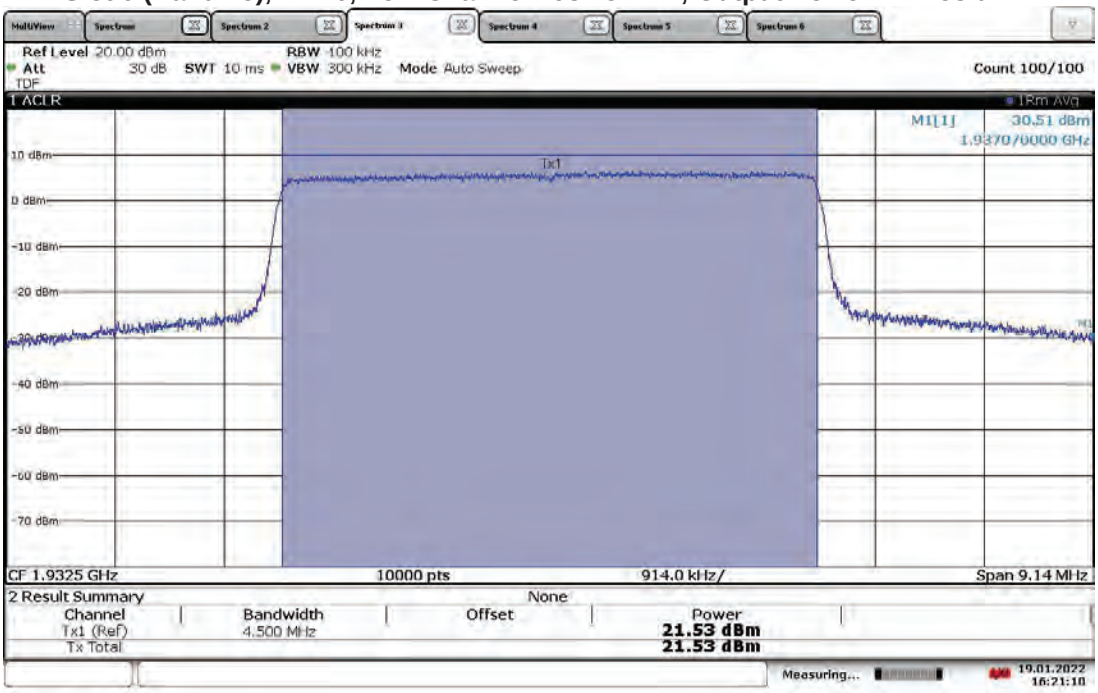
TM3.1-64QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1985 MHz, Output Power = 21.59 dBm



TM3.1-64QAM_20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1985 MHz, Output Power = 22.55 dBm

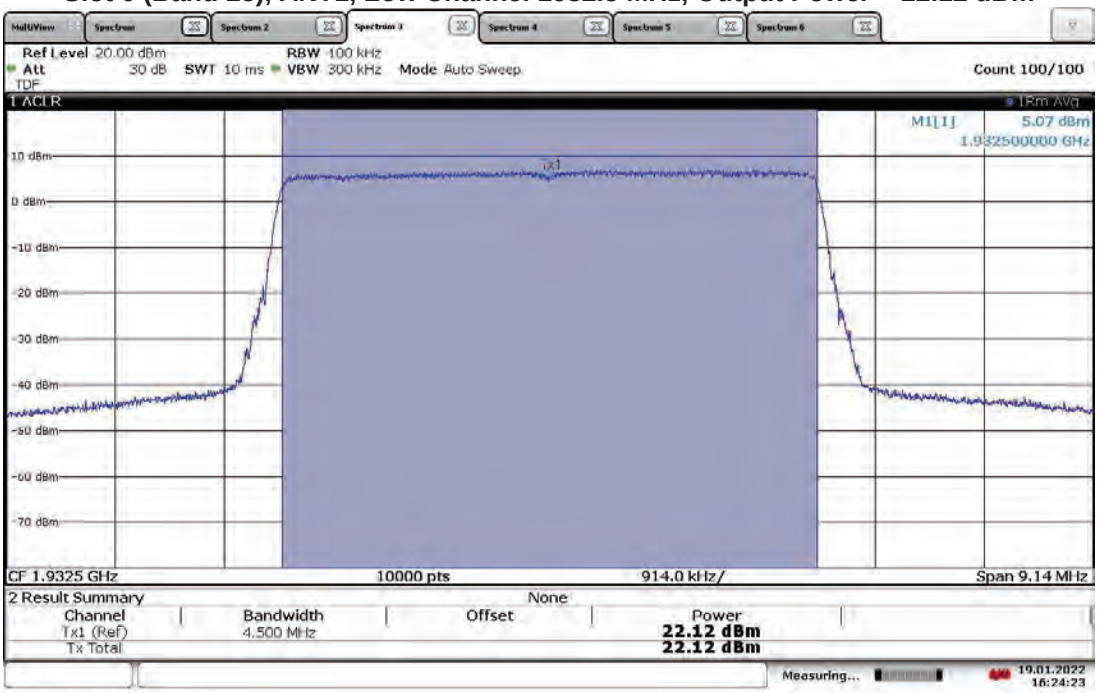


TM3.1a-256QAM _5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1932.5 MHz, Output Power = 21.53 dBm



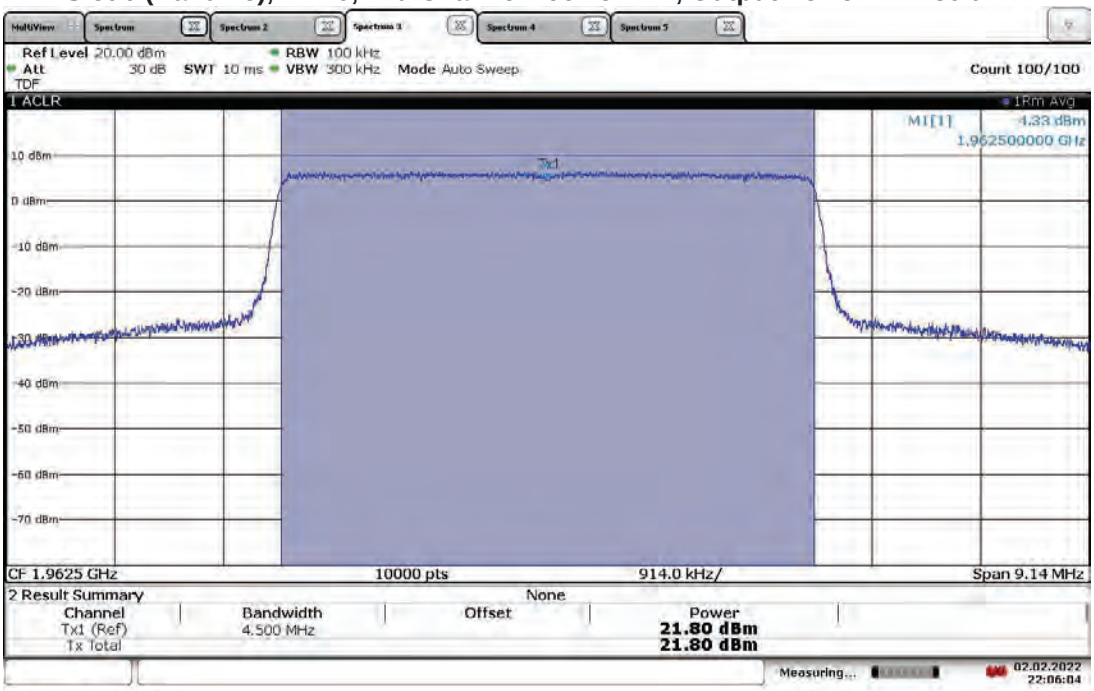
16:21:11 19.01.2022

TM3.1a-256QAM _5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1932.5 MHz, Output Power = 22.12 dBm

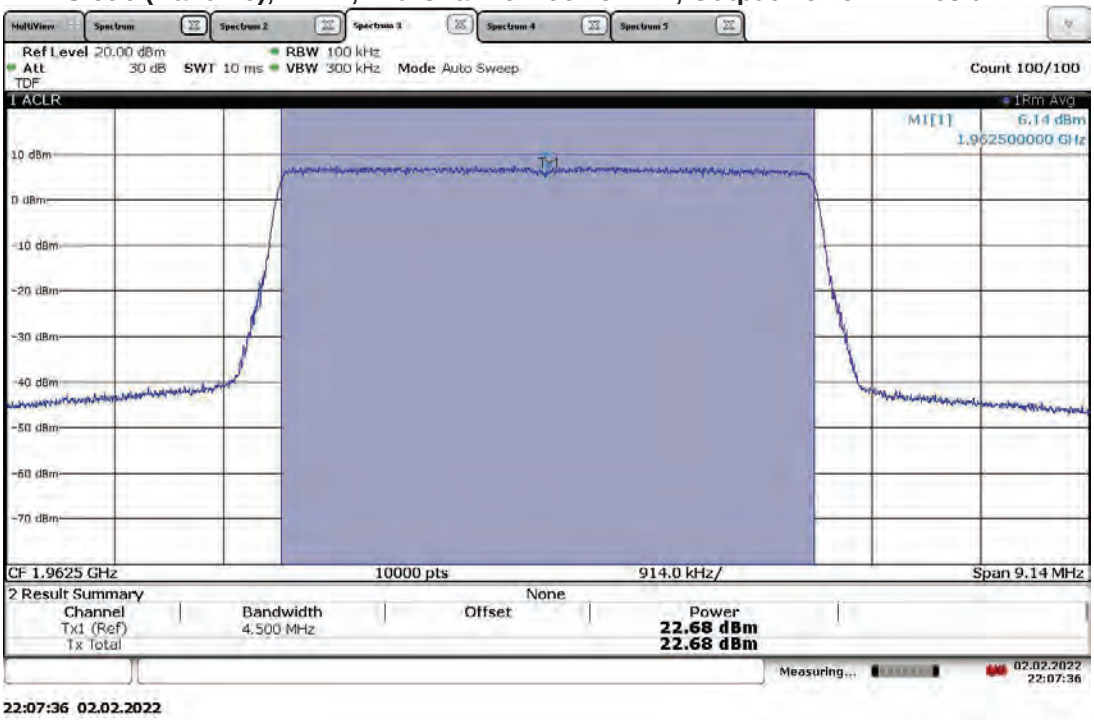


16:24:24 19.01.2022

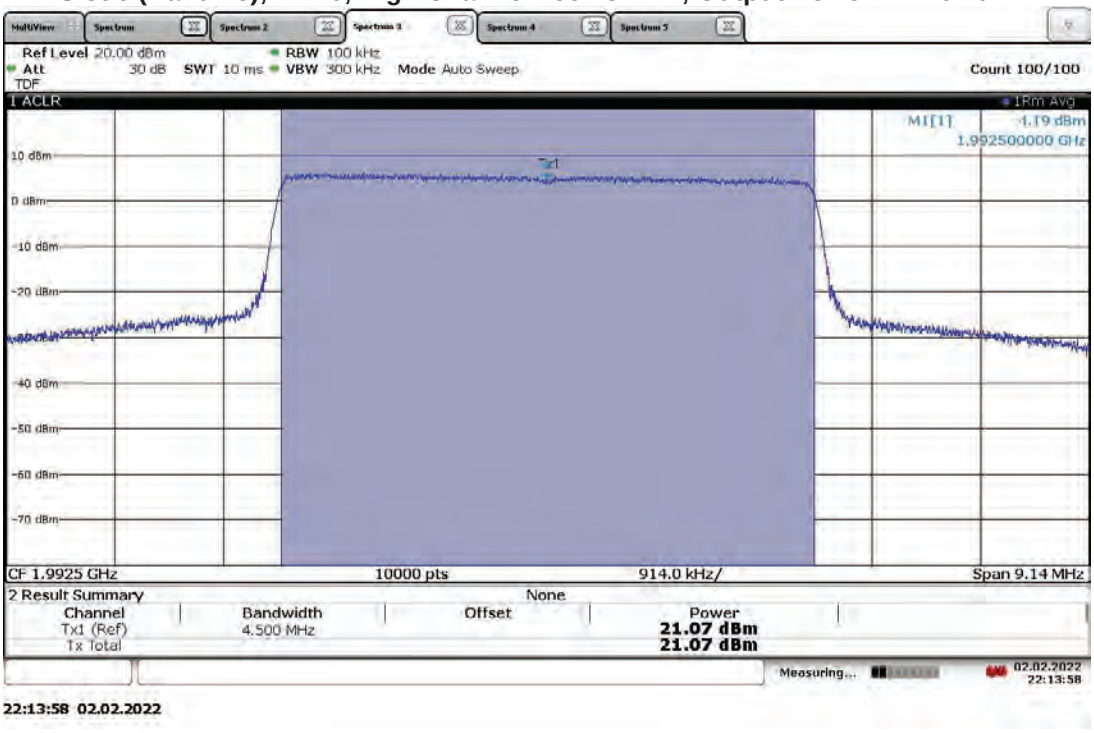
TM3.1a-256QAM _5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.80 dBm



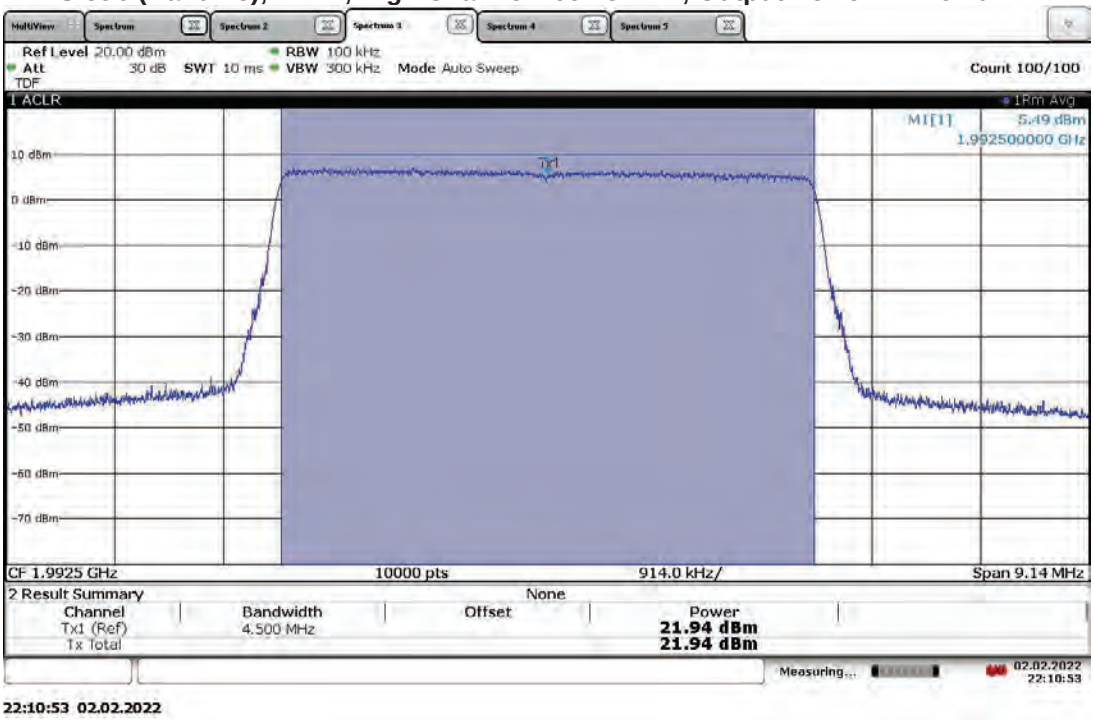
TM3.1a-256QAM _5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 22.68 dBm



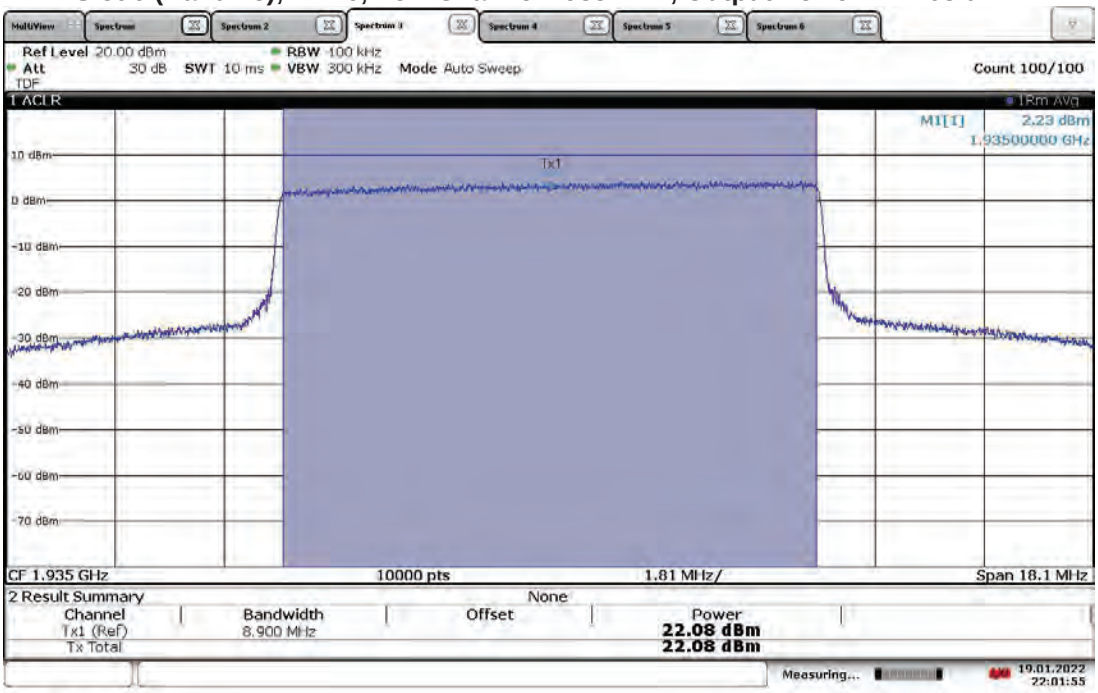
TM3.1a-256QAM _5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1992.5 MHz, Output Power = 21.07 dBm



TM3.1a-256QAM _5 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1992.5 MHz, Output Power = 21.94 dBm

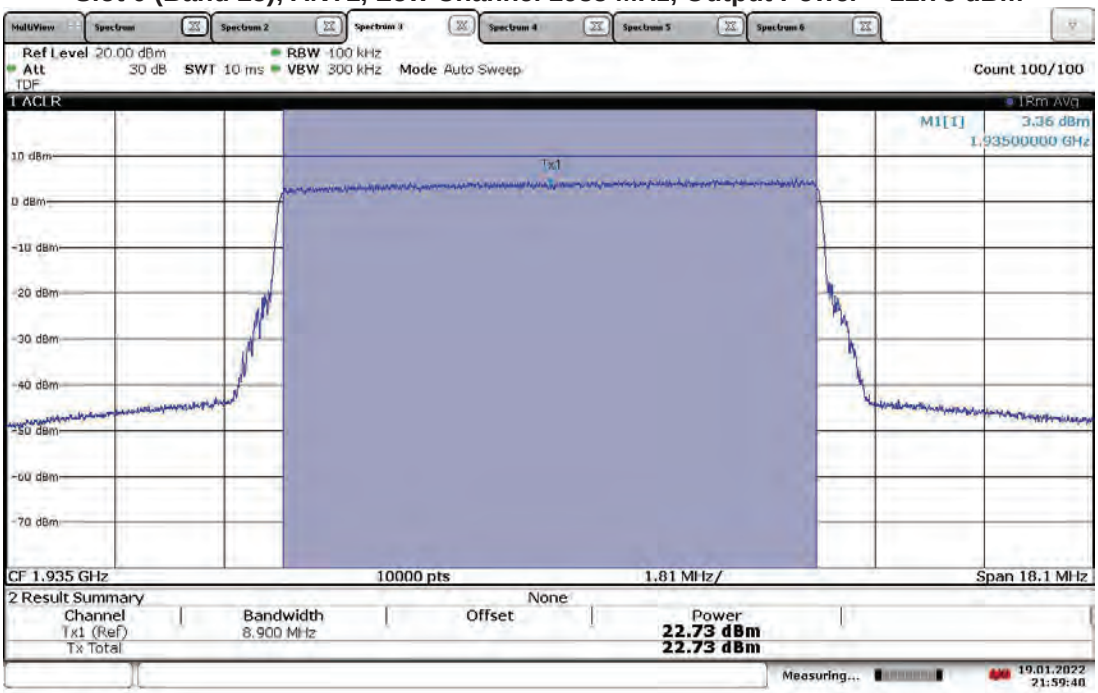


TM3.1a-256QAM _10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1935 MHz, Output Power = 22.08 dBm



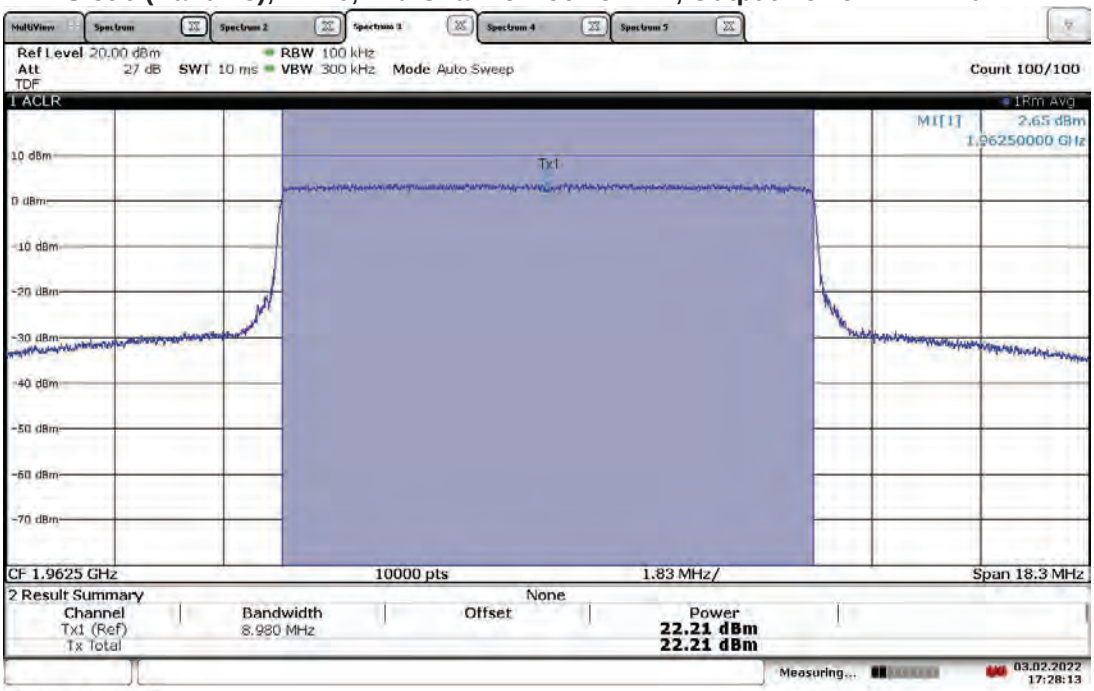
22:01:55 19.01.2022

TM3.1a-256QAM _10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1935 MHz, Output Power = 22.73 dBm



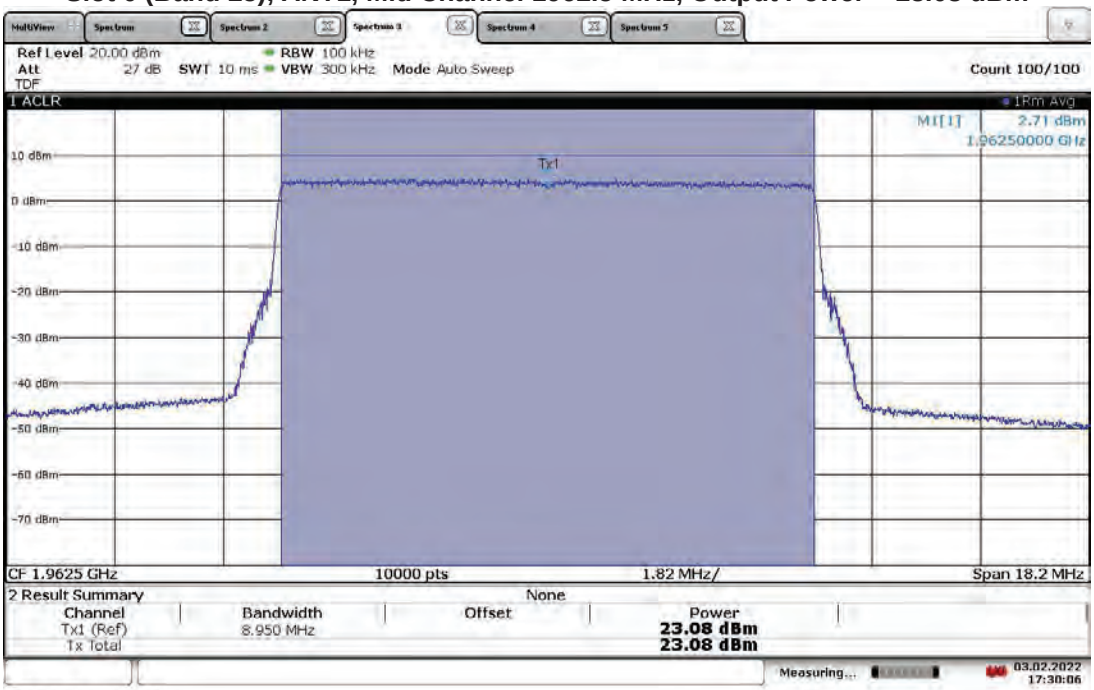
21:59:40 19.01.2022

TM3.1a-256QAM _10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 22.21 dBm



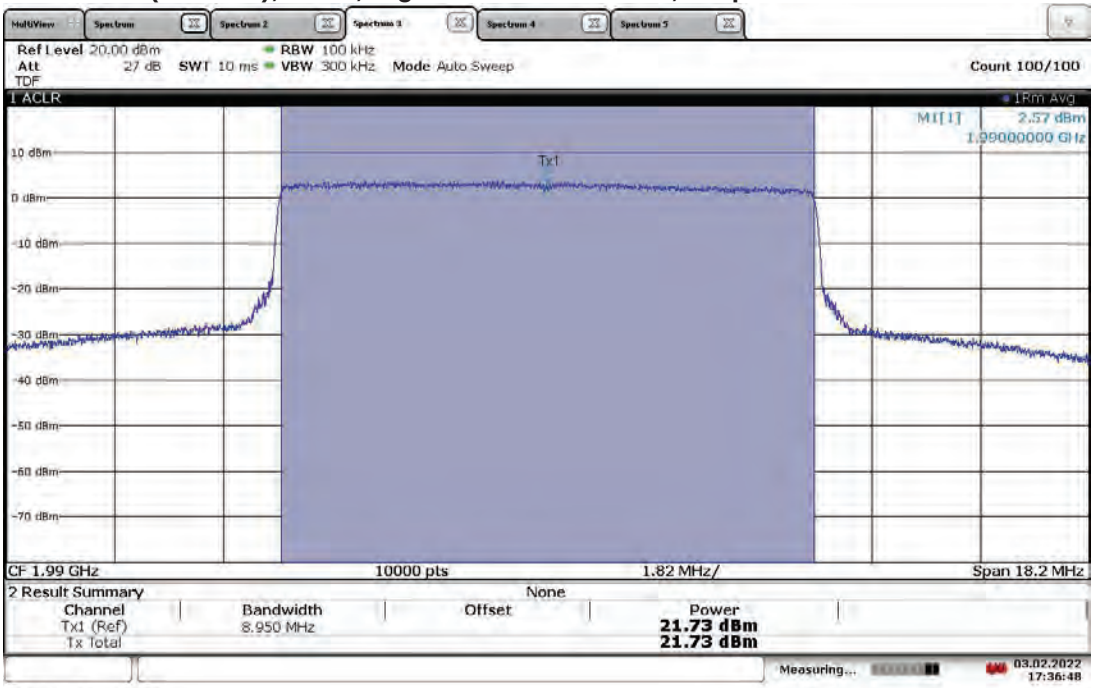
17:28:14 03.02.2022

TM3.1a-256QAM _10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 23.08 dBm



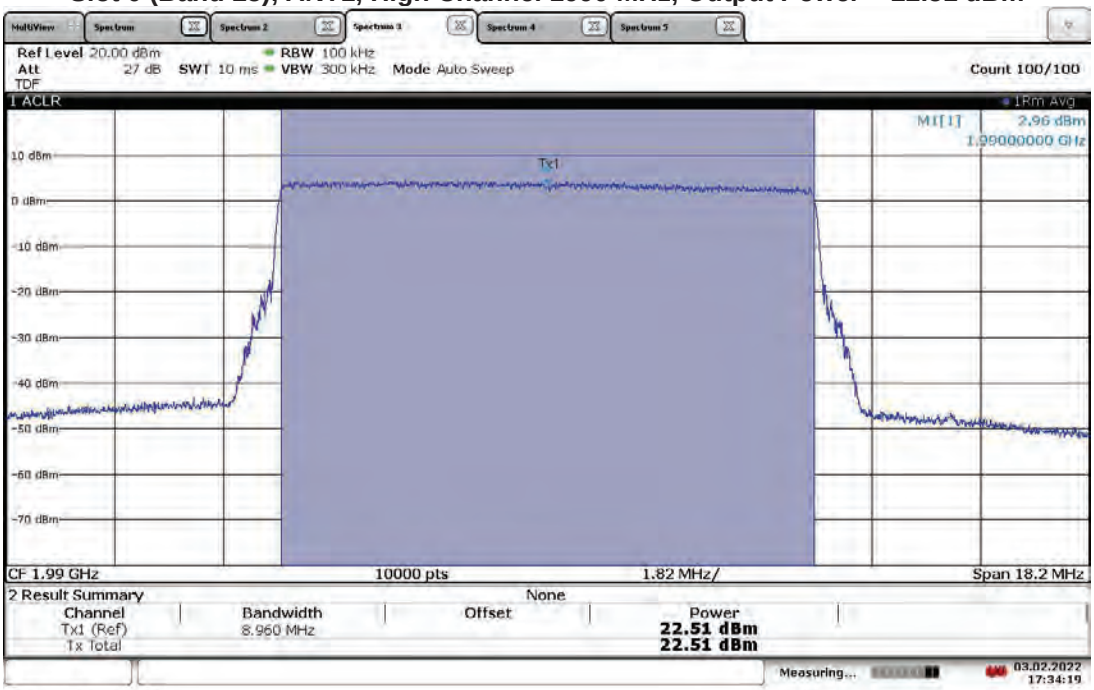
17:30:06 03.02.2022

TM3.1a-256QAM _10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1990 MHz, Output Power = 21.73 dBm



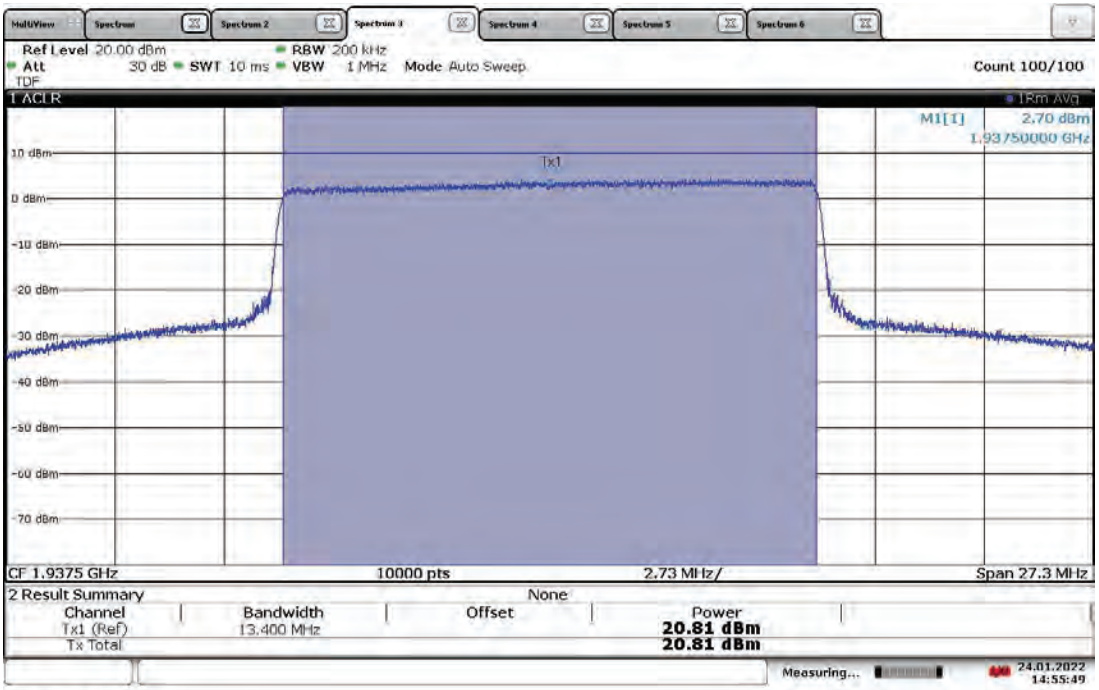
17:36:48 03.02.2022

TM3.1a-256QAM _10 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1990 MHz, Output Power = 22.51 dBm

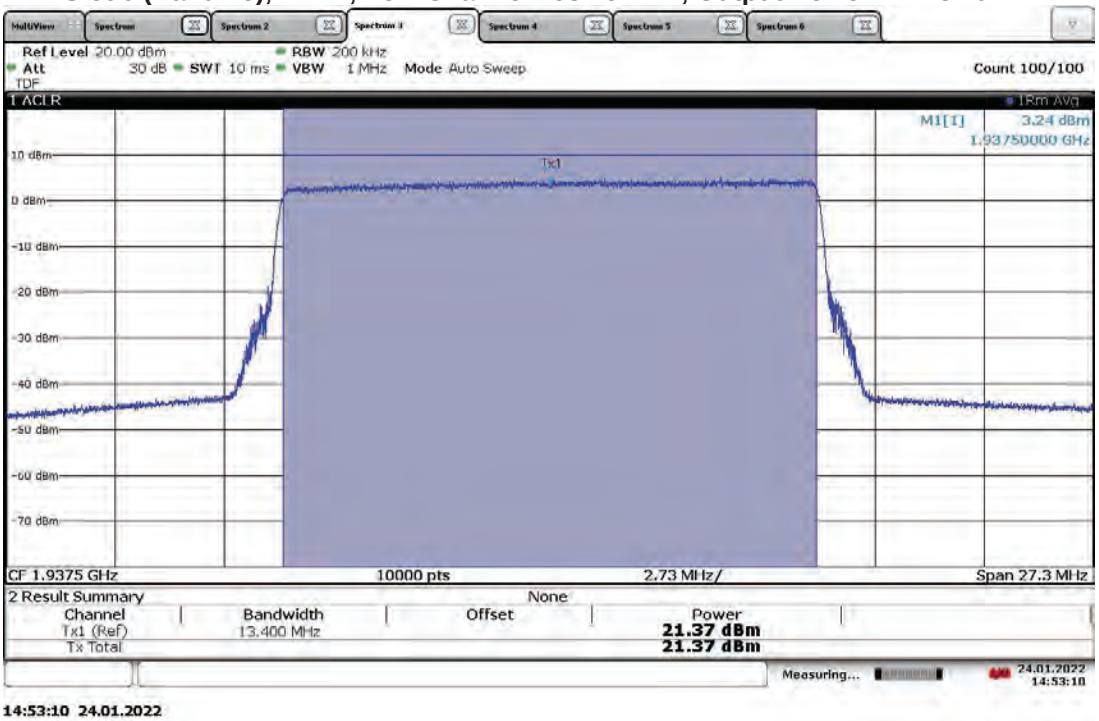


17:34:19 03.02.2022

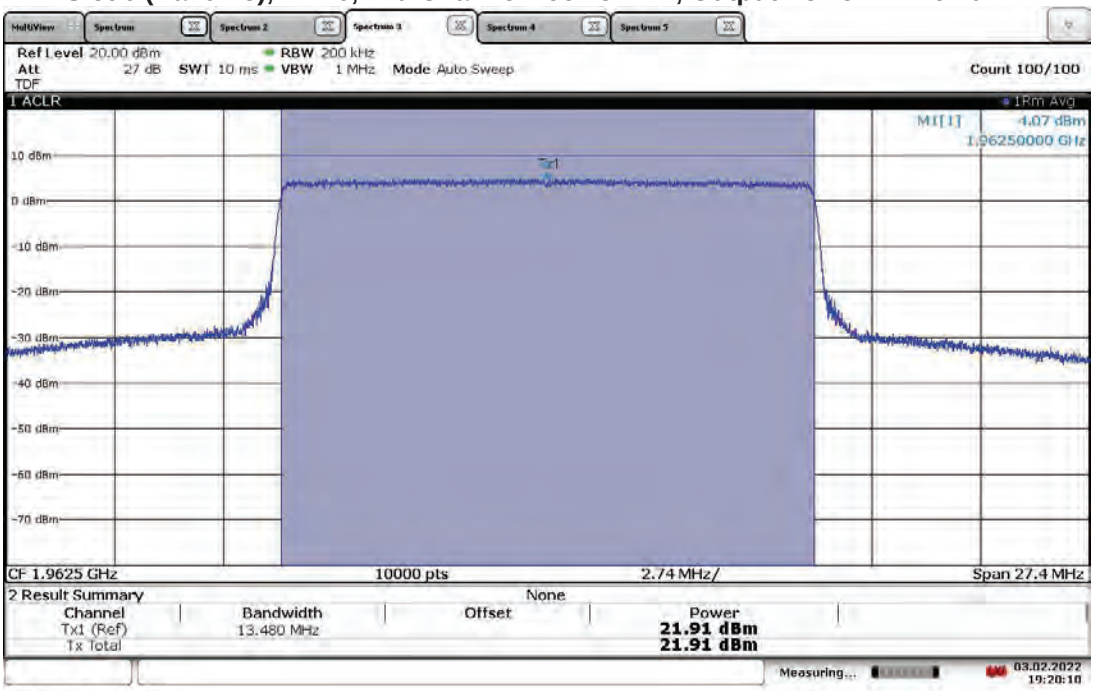
TM3.1a-256QAM _15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1937.5 MHz, Output Power = 20.81 dBm



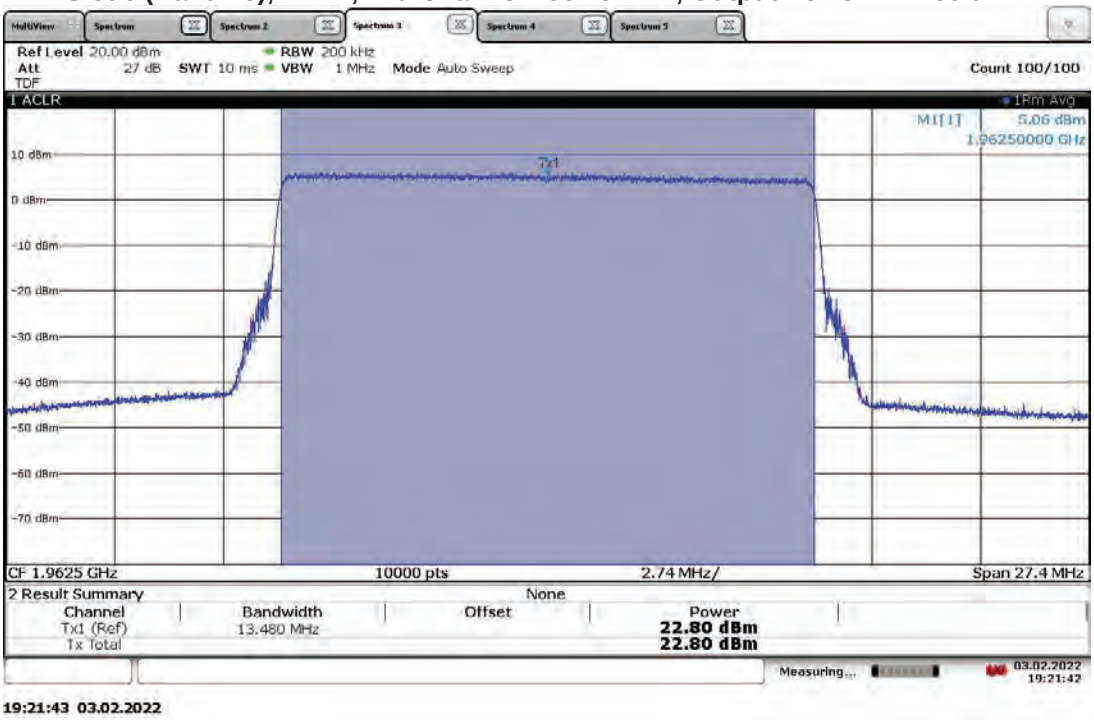
TM3.1a-256QAM _15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1937.5 MHz, Output Power = 21.37 dBm



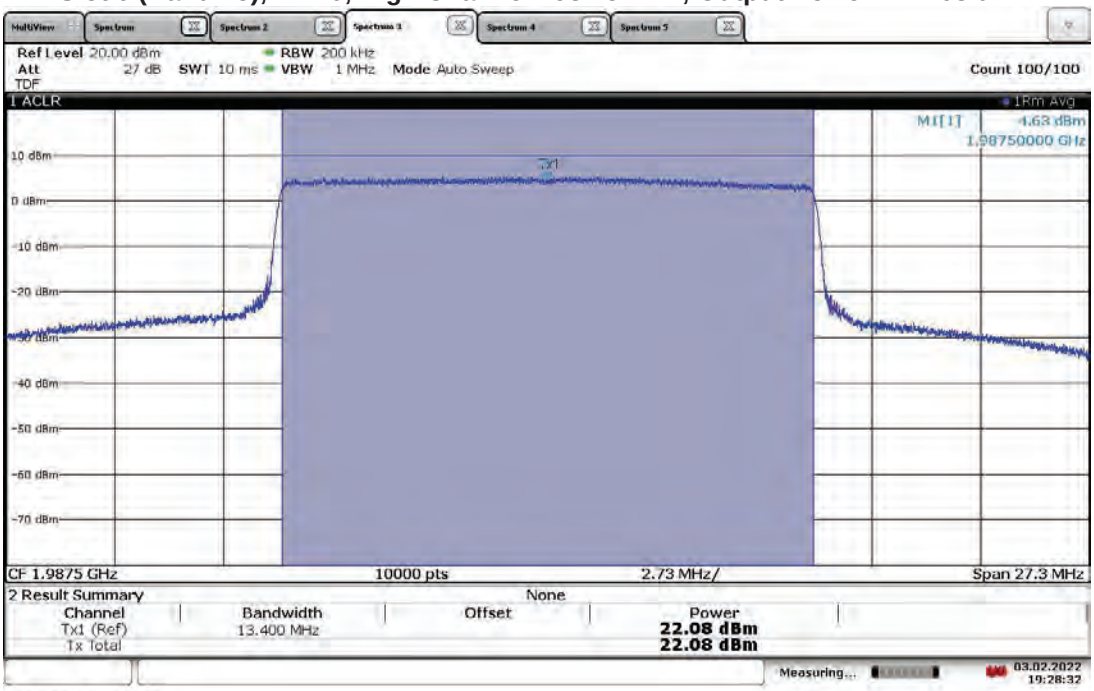
TM3.1a-256QAM _15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.91 dBm



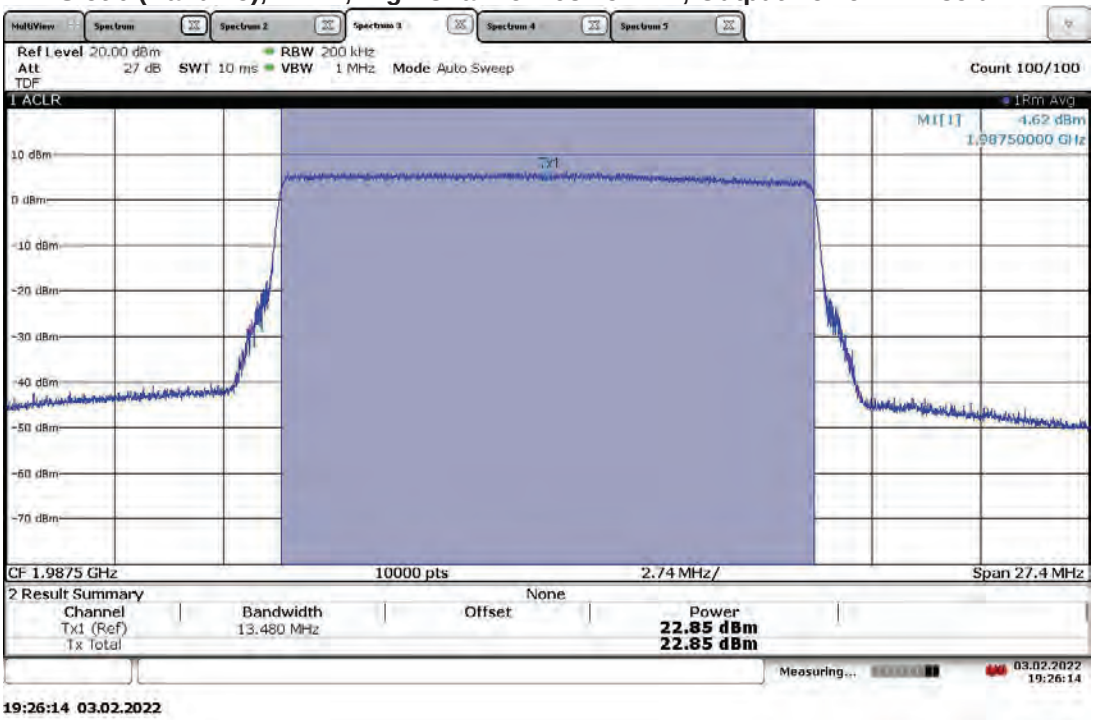
TM3.1a-256QAM _15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 22.80 dBm



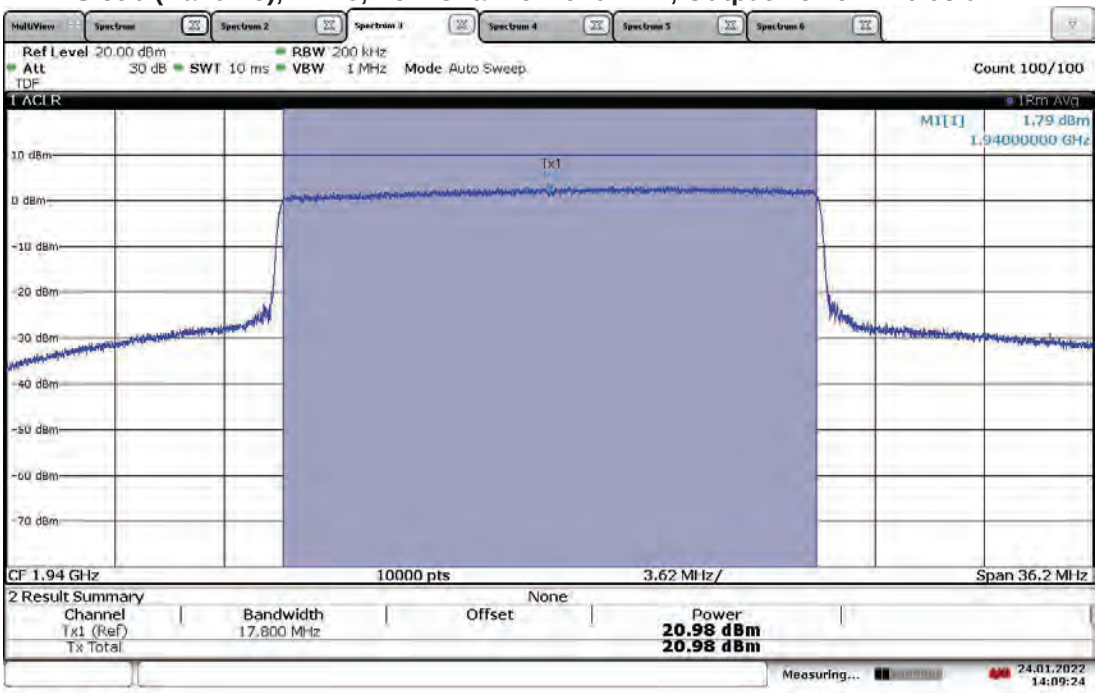
TM3.1a-256QAM _15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1987.5 MHz, Output Power = 22.08 dBm



TM3.1a-256QAM _15 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1987.5 MHz, Output Power = 22.85 dBm

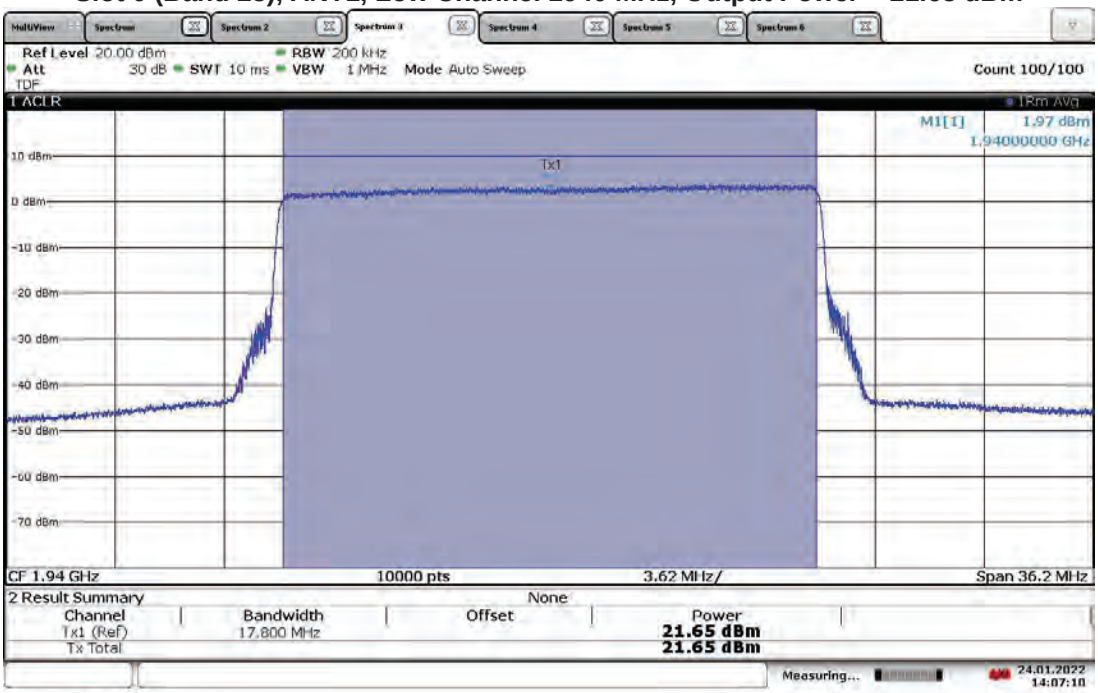


TM3.1a-256QAM _20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Low Channel 1940 MHz, Output Power = 20.98 dBm



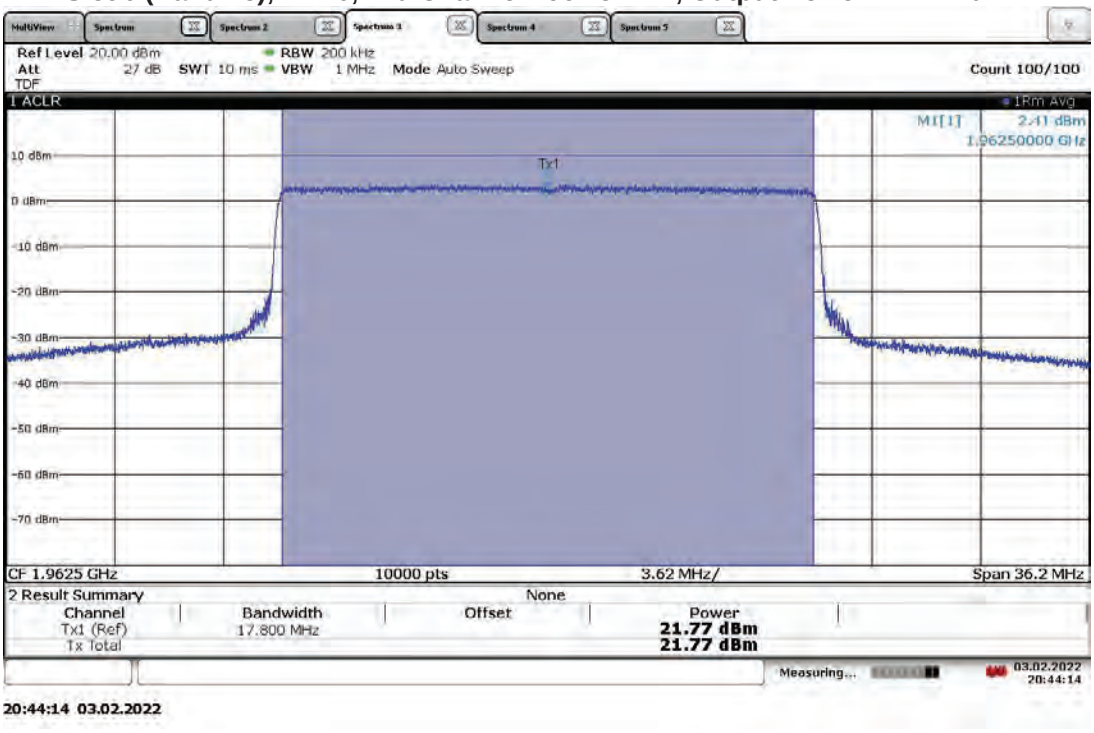
14:09:24 24.01.2022

TM3.1a-256QAM _20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Low Channel 1940 MHz, Output Power = 21.65 dBm

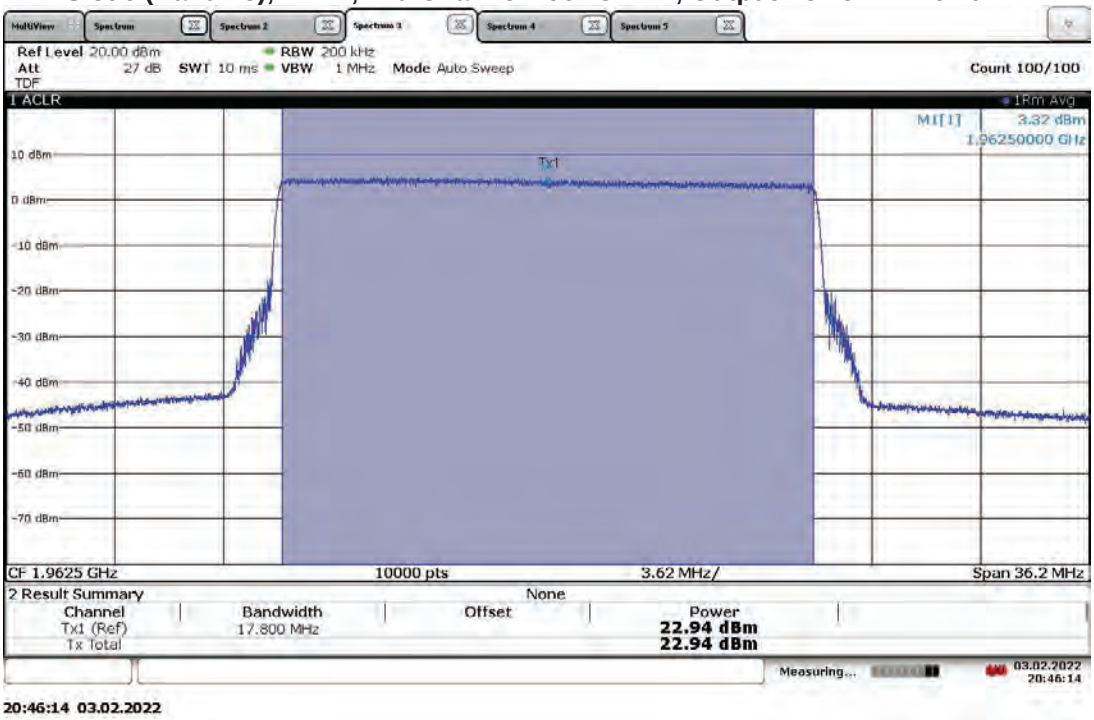


14:07:11 24.01.2022

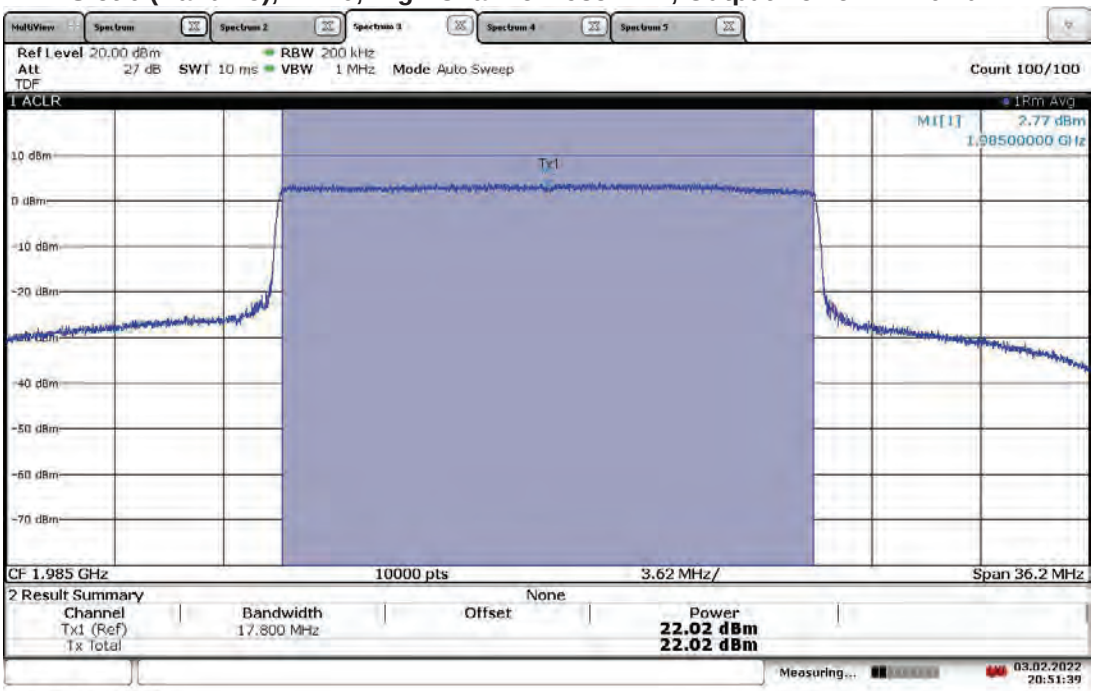
TM3.1a-256QAM _20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, Output Power = 21.77 dBm



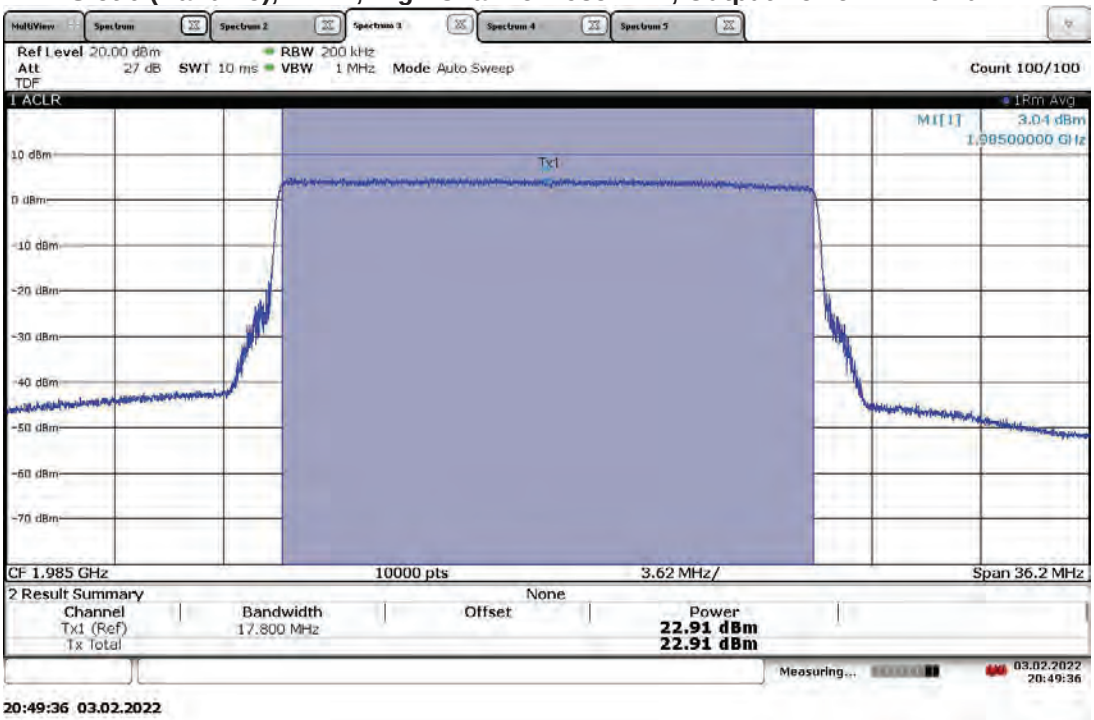
TM3.1a-256QAM _20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, Output Power = 22.94 dBm



TM3.1a-256QAM _20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT0, High Channel 1985 MHz, Output Power = 22.02 dBm



TM3.1a-256QAM _20 MHz Bandwidth (5G nR)
Slot 0 (Band 25), ANT1, High Channel 1985 MHz, Output Power = 22.91 dBm



Limit for Maximum Permissible Exposure (MPE)

FCC Human RF Exposure Limits:

The FCC §1.1310 The criteria listed in table 1 was used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices shall be evaluated according to the provisions of §2.1093 of this chapter.

Part §1.1310 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

(1) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure. The phrase *fully aware* in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of *transient* persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. Such training is not required for *transient* persons, but they must receive written and/or verbal information and notification (for example, using signs) concerning their exposure potential and appropriate means available to mitigate their exposure. The phrase *exercise control* means that an exposed person is allowed to and knows how to reduce or avoid exposure by administrative or engineering controls and work practices, such as use of personal protective equipment or time averaging of exposure.

(2) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Test Procedure

RF exposure for licensed transmitter is handled at the time of licensing, however, an MPE calculation was performed in order to show the distance at which the device is compliant with the limits of §1.1310, assuming antenna gains of 0 dBi and 4 dBi. The highest measured conducted output power was used, adjusted by +3dB to account for two antenna MIMO operation.

FCC Limit For General Population/Uncontrolled Exposure at 1982.5 MHz = 1 mW/cm^2

Power Density = [EIRP] / [4π x (D_{cm})^2]

Where EIRP is in milliwatts and D is in centimeters. Setting the power density equal to the limit of 1 mW/cm^2 and solving for D_{cm} yields the following results.

Results:
EUT EIRP = Conducted power + Array Gain + Antenna gain in dBi

Power Density Limit = [EIRP] / [4π x (D_{cm})^2]
1 mW/cm^2 = [EIRP] / [4π x (D_{cm})^2]
D_{cm} = ([EIRP] / [4π])$^{1/2}$

For Gain = 0 dBi,
EIRP = 23.19 dBm + 10*LOG(2) + 0 dBi = 23.19 dBm + 3 dB + 0dBi
EIRP = 26.19 dBm or 415.91 mW
Therefore, the minimum safe distance D_{cm} is D_{cm} = ([415.91] / [4π])$^{1/2}$
D_{cm} = 5.75 cm at 0 dBi gain two antenna MIMO

For Gain = 4 dBi,
EIRP = 23.19 dBm + 10*LOG(2) + 4 dBi = 23.19 dBm + 3 dB + 4dBi
EIRP = 30.19 dBm or 1044.72 mW
Therefore, the minimum safe distance D_{cm} is D_{cm} = ([1044.72] / [4π])$^{1/2}$
D_{cm} = 9.12 cm at 4 dBi gain two antenna MIMO

For Gain = X dBi,
EIRP = 23.19 dBm + 10*LOG(2) + X dBi = 23.19 dBm + 3 dB + XdBi
EIRP = 26.19 + X dBm or 415.91 + 10^(X/10) mW
Therefore, the minimum safe distance D_{cm} is D_{cm} = ([415.91 + 10^(X/10)] / [4π])$^{1/2}$
D_{cm} = 0.282 * (415.91 + 10^(X/10))$^{1/2}$ cm at X dBi gain two antenna MIMO

Test Personnel:	Kouma Sinn KPS	Test Date:	01/19/2022, 01/21/2022, 01/24/2022
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 24	Limit Applied:	See report section 6.3
Input Voltage:	48 VDC (POE)		
Pretest Verification w/ Ambient Signals or BB Source:	N/A	Ambient Temperature:	24, 24, 23 ºC
		Relative Humidity:	15, 8, 12 %
		Atmospheric Pressure:	1003, 1025, 1002 mbars

Deviations, Additions, or Exclusions: None

7 Peak-to-Average Power Ratio (PAPR)

7.1 Method

Tests are performed in accordance with CFR47 FCC Part 24 and ANSI C63.26:2015.

TEST SITE: EMC Lab

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV005'	Weather Station	Davis	6250	MS191218083	02/07/2021	02/07/2022
ROS005-1'	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	11/02/2021	11/02/2022
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	01/26/2022	01/26/2023
CBLHF2012-2M-2'	2m 9kHz-40GHz Coaxial Cable - SET2	Huber & Suhner	SF102	252675002	02/10/2021	02/10/2022
MIN26	50Watt 20dB attenuator	Mini Circuits	BW-N20W50+	VY573711721	07/23/2021	07/23/2022
DS40'	Temp, humidity, pressure gauge	Digi Sense	68000-49	181717625	11/09/2021	11/09/2022

Software Utilized:

Name	Manufacturer	Version
None	--	--

7.3 Results:

The sample tested was found to Comply.

Limit:
§24.232(d) The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM1.1-QPSK (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	7.00	13	-6.00
		ANT1	10.78	13	-2.22
Mid	1962.50	ANT0	8.02	13	-4.98
		ANT1	10.93	13	-2.07
High	1992.50	ANT0	6.97	13	-6.03
		ANT1	9.89	13	-3.11

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM1.1-QPSK (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	7.31	13	-5.69
		ANT1	11.03	13	-1.97
Mid	1962.50	ANT0	7.61	13	-5.39
		ANT1	11.10	13	-1.9
High	1990.00	ANT0	7.22	13	-5.78
		ANT1	9.65	13	-3.35

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM1.1-QPSK (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.52	13	-5.48
		ANT1	11.67	13	-1.33
Mid	1962.50	ANT0	8.01	13	-4.99
		ANT1	11.04	13	-1.96
High	1987.5	ANT0	7.60	13	-5.4
		ANT1	10.78	13	-2.22

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM1.1-QPSK (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.55	13	-5.45
		ANT1	10.31	13	-2.69
Mid	1962.50	ANT0	8.10	13	-4.9
		ANT1	10.35	13	-2.65
High	1985.00	ANT0	8.20	13	-4.8
		ANT1	10.53	13	-2.47

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM3.2-16QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	6.89	13	-5.45
		ANT1	10.57	13	-2.69
Mid	1962.50	ANT0	7.77	13	-4.9
		ANT1	10.81	13	-2.65
High	1992.50	ANT0	7.22	13	-4.8
		ANT1	10.56	13	-2.47

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM3.2-16QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	6.85	13	-6.15
		ANT1	9.85	13	-3.15
Mid	1962.50	ANT0	7.76	13	-5.24
		ANT1	10.66	13	-2.34
High	1990.00	ANT0	7.31	13	-5.69
		ANT1	10.48	13	-2.52

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM3.2-16QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.48	13	-5.52
		ANT1	10.20	13	-2.8
Mid	1962.50	ANT0	7.79	13	-5.21
		ANT1	10.70	13	-2.3
High	1987.5	ANT0	7.79	13	-5.21
		ANT1	10.48	13	-2.52

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM3.2-16QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.03	13	-5.97
		ANT1	10.38	13	-2.62
Mid	1962.50	ANT0	7.76	13	-5.24
		ANT1	10.78	13	-2.22
High	1985.00	ANT0	8.21	13	-4.79
		ANT1	11.14	13	-1.86

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM3.1-64QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	6.74	13	-6.26
		ANT1	9.97	13	-3.03
Mid	1962.50	ANT0	7.50	13	-5.5
		ANT1	9.96	13	-3.04
High	1992.50	ANT0	9.93	13	-3.07
		ANT1	7.25	13	-5.75

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM3.1-64QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	7.00	13	-6
		ANT1	10.67	13	-2.33
Mid	1962.50	ANT0	7.56	13	-5.44
		ANT1	9.93	13	-3.07
High	1990.00	ANT0	7.21	13	-5.79
		ANT1	10.48	13	-2.52

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM3.1-64QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.28	13	-5.72
		ANT1	10.31	13	-2.69
Mid	1962.50	ANT0	7.78	13	-5.22
		ANT1	11.42	13	-1.58
High	1987.5	ANT0	7.28	13	-5.72
		ANT1	11.31	13	-1.69

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM3.1-64QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.17	13	-5.83
		ANT1	10.04	13	-2.96
Mid	1962.50	ANT0	8.02	13	-4.98
		ANT1	10.72	13	-2.28
High	1985.00	ANT0	9.79	13	-3.21
		ANT1	11.02	13	-1.98

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	6.97	13	-6.03
		ANT1	10.16	13	-2.84
Mid	1962.50	ANT0	7.46	13	-5.54
		ANT1	9.89	13	-3.11
High	1992.50	ANT0	7.26	13	-5.74
		ANT1	10.15	13	-2.85

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	6.83	13	-6.17
		ANT1	9.94	13	-3.06
Mid	1962.50	ANT0	7.53	13	-5.47
		ANT1	10.37	13	-2.63
High	1990.00	ANT0	7.26	13	-5.74
		ANT1	10.41	13	-2.59

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.13	13	-5.87
		ANT1	10.82	13	-2.18
Mid	1962.50	ANT0	7.91	13	-5.09
		ANT1	11.02	13	-1.98
High	1987.5	ANT0	7.92	13	-5.08
		ANT1	10.94	13	-2.06

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM (4G LTE)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.31	13	-5.69
		ANT1	10.11	13	-2.89
Mid	1962.50	ANT0	7.83	13	-5.17
		ANT1	10.22	13	-2.78
High	1985.00	ANT0	7.79	13	-5.21
		ANT1	10.26	13	-2.74

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM1.1-QPSK (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	7.03	13	-5.97
		ANT1	10.54	13	-2.46
Mid	1962.50	ANT0	7.46	13	-5.54
		ANT1	10.52	13	-2.48
High	1992.50	ANT0	7.10	13	-5.9
		ANT1	10.48	13	-2.52

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM1.1-QPSK (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	6.82	13	-6.18
		ANT1	9.83	13	-3.17
Mid	1962.50	ANT0	7.53	13	-5.47
		ANT1	9.88	13	-3.12
High	1990.00	ANT0	7.12	13	-5.88
		ANT1	10.46	13	-2.54

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM1.1-QPSK (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.29	13	-5.71
		ANT1	11.35	13	-1.65
Mid	1962.50	ANT0	8.00	13	-5
		ANT1	11.33	13	-1.67
High	1987.5	ANT0	7.71	13	-5.29
		ANT1	10.34	13	-2.66

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM1.1-QPSK (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.18	13	-5.82
		ANT1	10.94	13	-2.06
Mid	1962.50	ANT0	8.00	13	-5
		ANT1	10.79	13	-2.21
High	1985.00	ANT0	7.58	13	-5.42
		ANT1	10.76	13	-2.24

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM3.2-16QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	6.90	13	-6.1
		ANT1	10.74	13	-2.26
Mid	1962.50	ANT0	7.48	13	-5.52
		ANT1	10.61	13	-2.39
High	1992.50	ANT0	7.12	13	-5.88
		ANT1	10.40	13	-2.6

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM3.2-16QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	6.87	13	-6.13
		ANT1	10.06	13	-2.94
Mid	1962.50	ANT0	7.27	13	-5.73
		ANT1	10.19	13	-2.81
High	1990.00	ANT0	7.28	13	-5.72
		ANT1	10.21	13	-2.79

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM3.2-16QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.16	13	-5.84
		ANT1	9.86	13	-3.14
Mid	1962.50	ANT0	7.88	13	-5.12
		ANT1	10.69	13	-2.31
High	1987.5	ANT0	7.44	13	-5.56
		ANT1	9.99	13	-3.01

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM3.2-16QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.23	13	-5.77
		ANT1	10.99	13	-2.01
Mid	1962.50	ANT0	7.86	13	-5.14
		ANT1	10.64	13	-2.36
High	1985.00	ANT0	7.52	13	-5.48
		ANT1	10.45	13	-2.55

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM3.1-64QAM

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	6.89	13	-6.11
		ANT1	9.94	13	-3.06
Mid	1962.50	ANT0	7.28	13	-5.72
		ANT1	10.03	13	-2.97
High	1992.50	ANT0	7.04	13	-5.96
		ANT1	9.92	13	-3.08

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM3.1-64QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	6.87	13	-6.13
		ANT1	10.75	13	-2.25
Mid	1962.50	ANT0	7.41	13	-5.59
		ANT1	10.58	13	-2.42
High	1990.00	ANT0	7.09	13	-5.91
		ANT1	9.88	13	-3.12

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM3.1-64QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.46	13	-5.54
		ANT1	9.82	13	-3.18
Mid	1962.50	ANT0	7.78	13	-5.22
		ANT1	11.46	13	-1.54
High	1987.5	ANT0	7.73	13	-5.27
		ANT1	10.89	13	-2.11

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM3.1-64QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.03	13	-5.97
		ANT1	11.01	13	-1.99
Mid	1962.50	ANT0	8.09	13	-4.91
		ANT1	10.33	13	-2.67
High	1985.00	ANT0	8.30	13	-4.7
		ANT1	11.12	13	-1.88

Slot 0 (Band 25), Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1932.50	ANT0	6.93	13	-6.07
		ANT1	10.28	13	-2.72
Mid	1962.50	ANT0	7.28	13	-5.72
		ANT1	10.46	13	-2.54
High	1992.50	ANT0	7.00	13	-6
		ANT1	10.01	13	-2.99

Slot 0 (Band 25), Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1935.00	ANT0	6.62	13	-6.38
		ANT1	9.92	13	-3.08
Mid	1962.50	ANT0	7.18	13	-5.82
		ANT1	10.29	13	-2.71
High	1990.00	ANT0	7.17	13	-5.83
		ANT1	10.43	13	-2.57

Slot 0 (Band 25), Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM (5G nR)

Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1937.50	ANT0	7.31	13	-5.69
		ANT1	10.69	13	-2.31
Mid	1962.50	ANT0	7.99	13	-5.01
		ANT1	11.00	13	-2
High	1987.5	ANT0	7.33	13	-5.67
		ANT1	10.76	13	-2.24

Slot 0 (Band 25), Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM (5G nR)

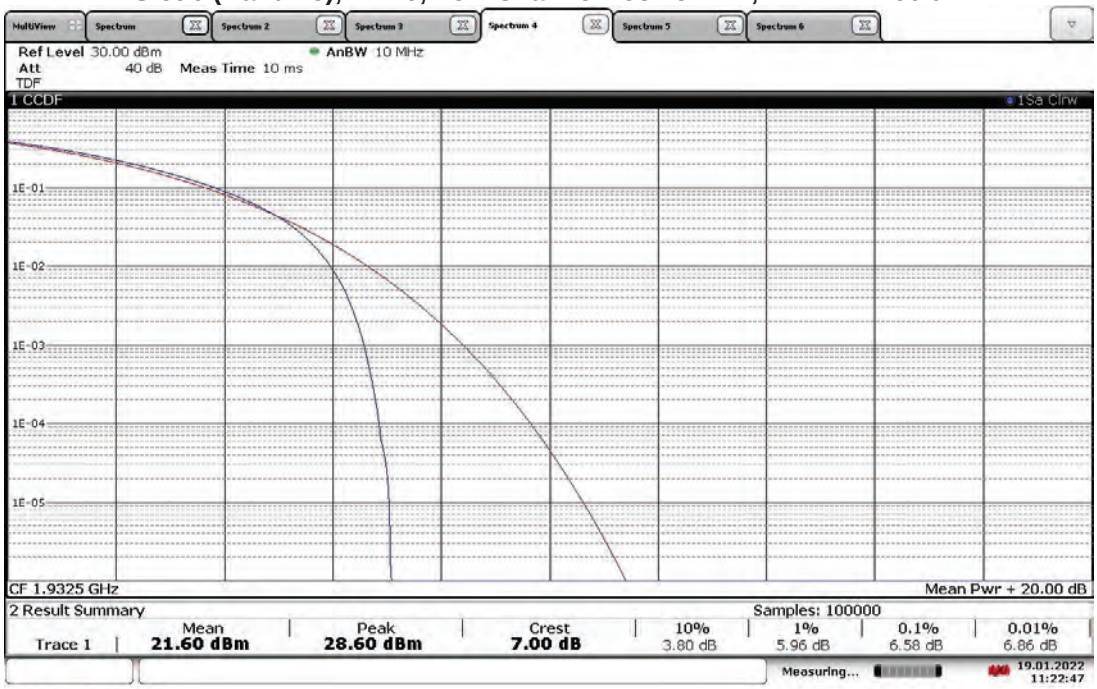
Channel	Frequency (MHz)	Antenna Port	PAR (dB)	Limit (dB)	Margin (dB)
Low	1940.00	ANT0	7.36	13	-5.64
		ANT1	10.29	13	-2.71
Mid	1962.50	ANT0	7.96	13	-5.04
		ANT1	10.22	13	-2.78
High	1985.00	ANT0	8.16	13	-4.84
		ANT1	10.26	13	-2.74

7.4 Setup Photograph:

Confidential – Photos not included in this report

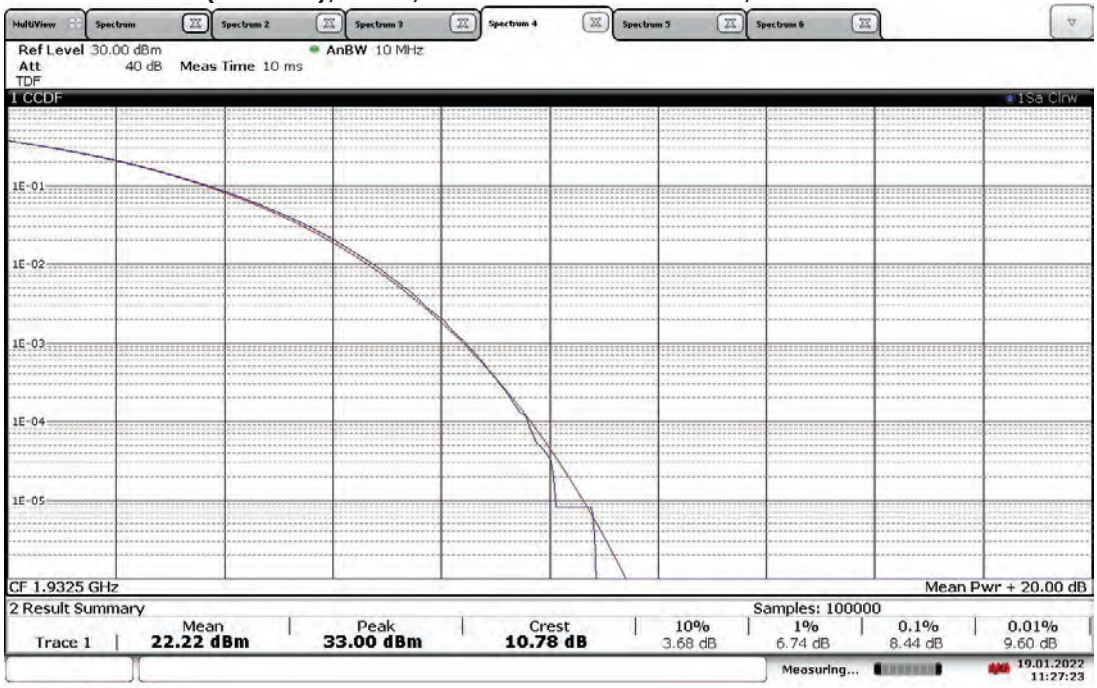
7.5 Plots/Data:

TM1.1-QPSK_5 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Low Channel 1932.5 MHz, PAPR = 7.00 dB



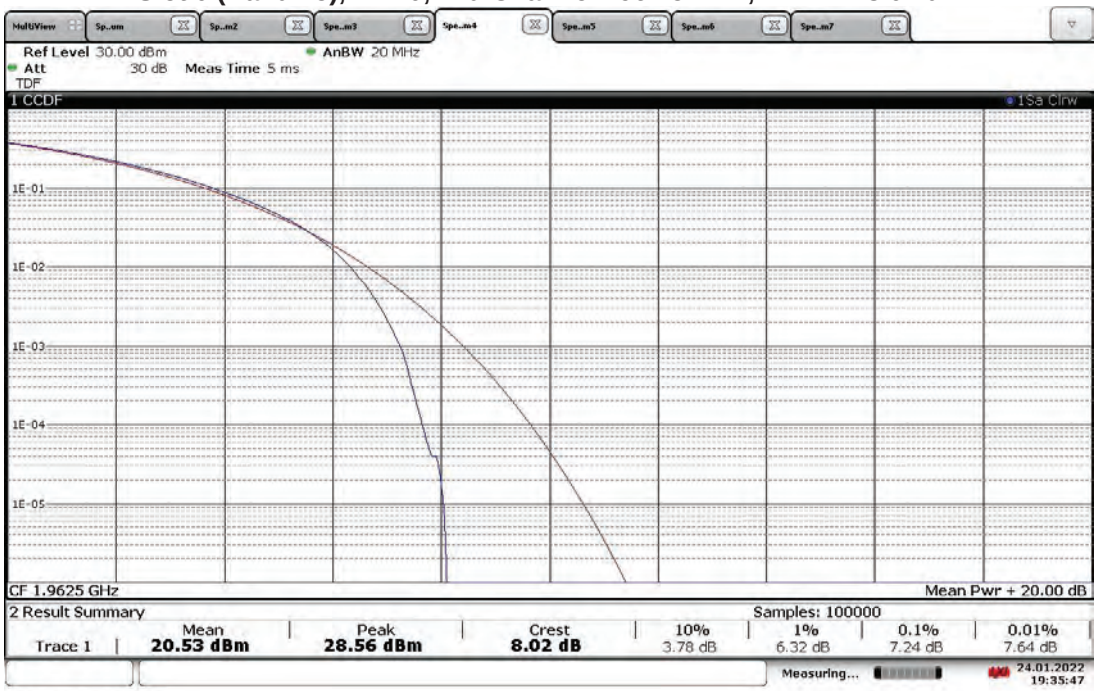
11:22:47 19.01.2022

TM1.1-QPSK_5 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Low Channel 1932.5 MHz, PAPR = 10.78 dB



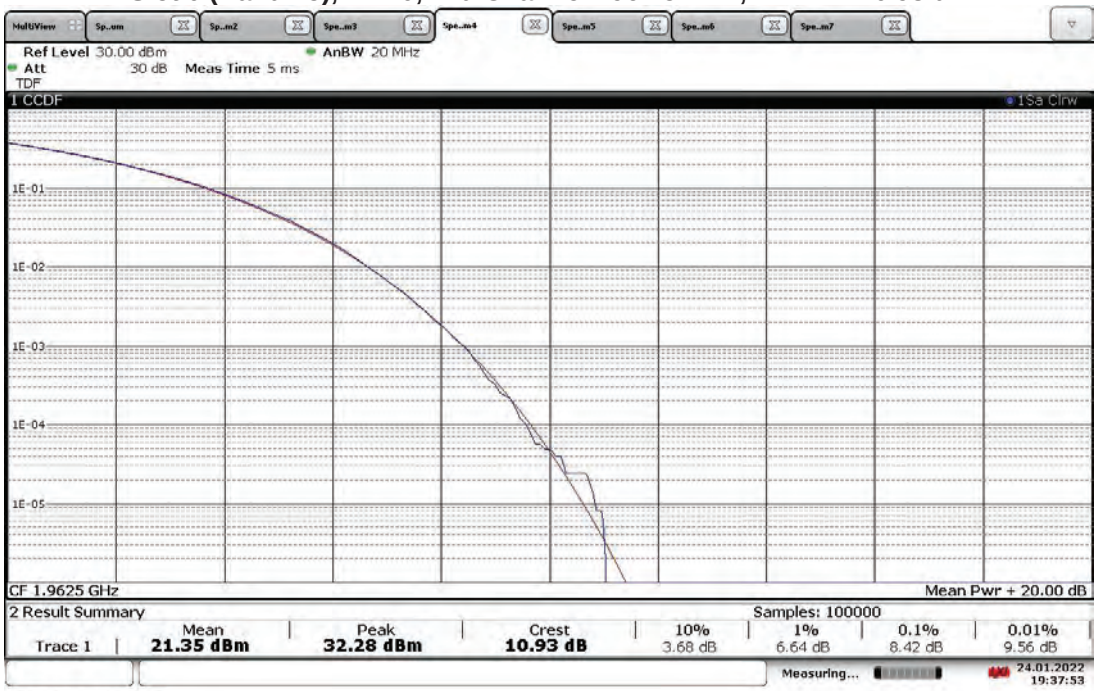
11:27:23 19.01.2022

TM1.1-QPSK_5 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, PAPR = 8.02 dB



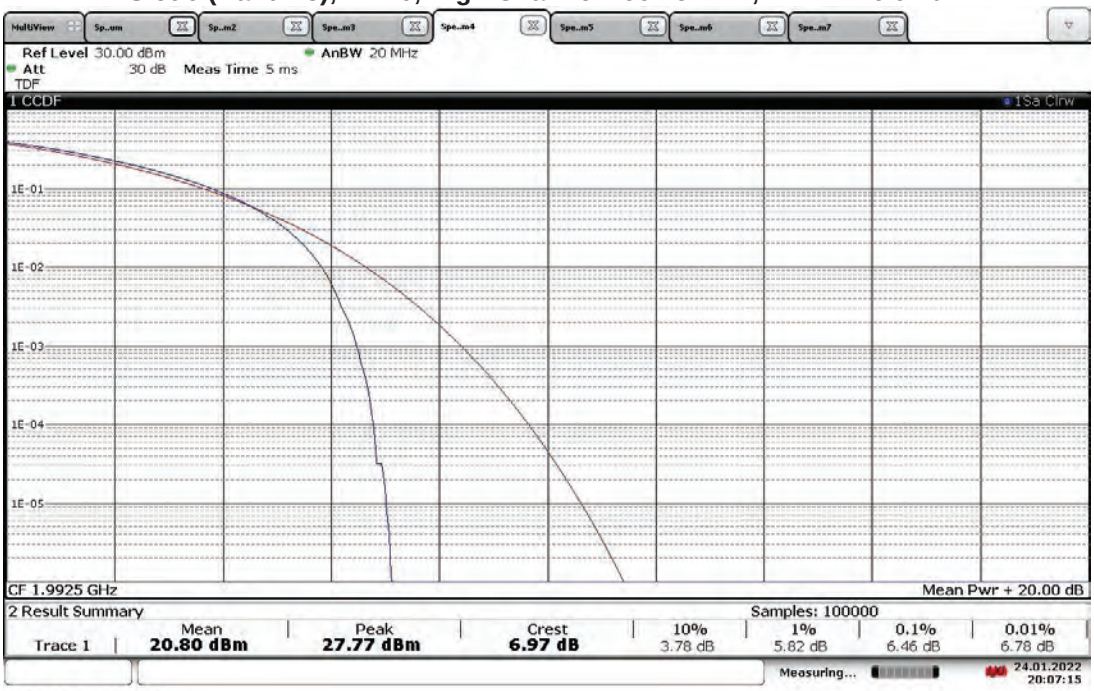
19:35:47 24.01.2022

TM1.1-QPSK_5 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, PAPR = 10.93 dB



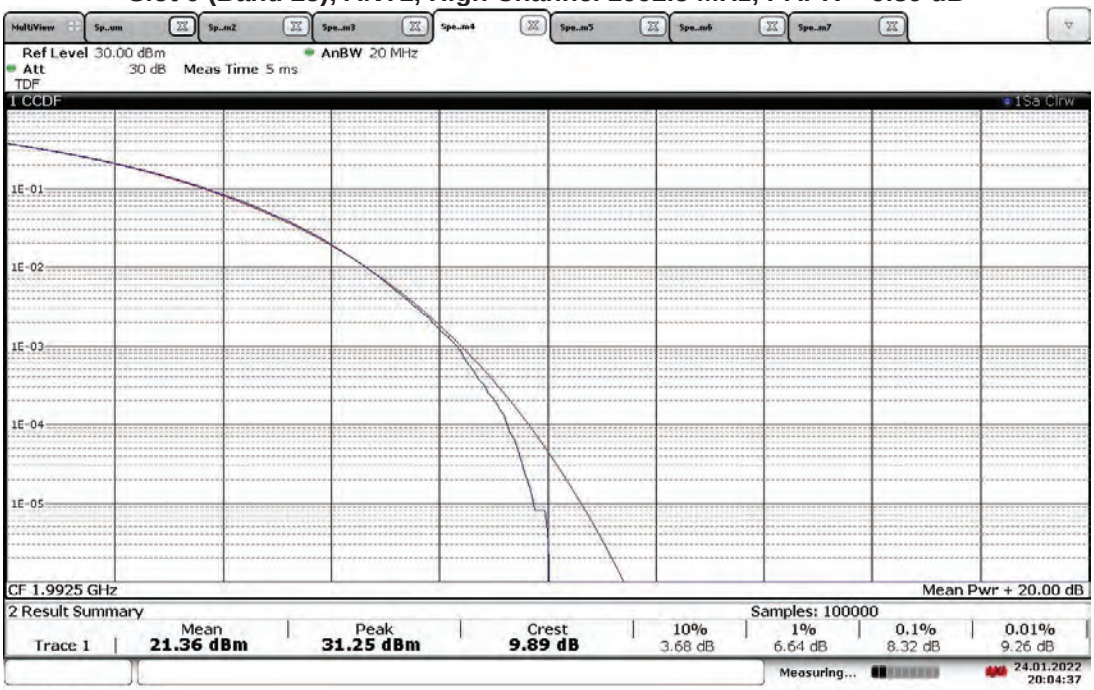
19:37:53 24.01.2022

TM1.1-QPSK_5 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, High Channel 1992.5 MHz, PAPR = 6.97 dB



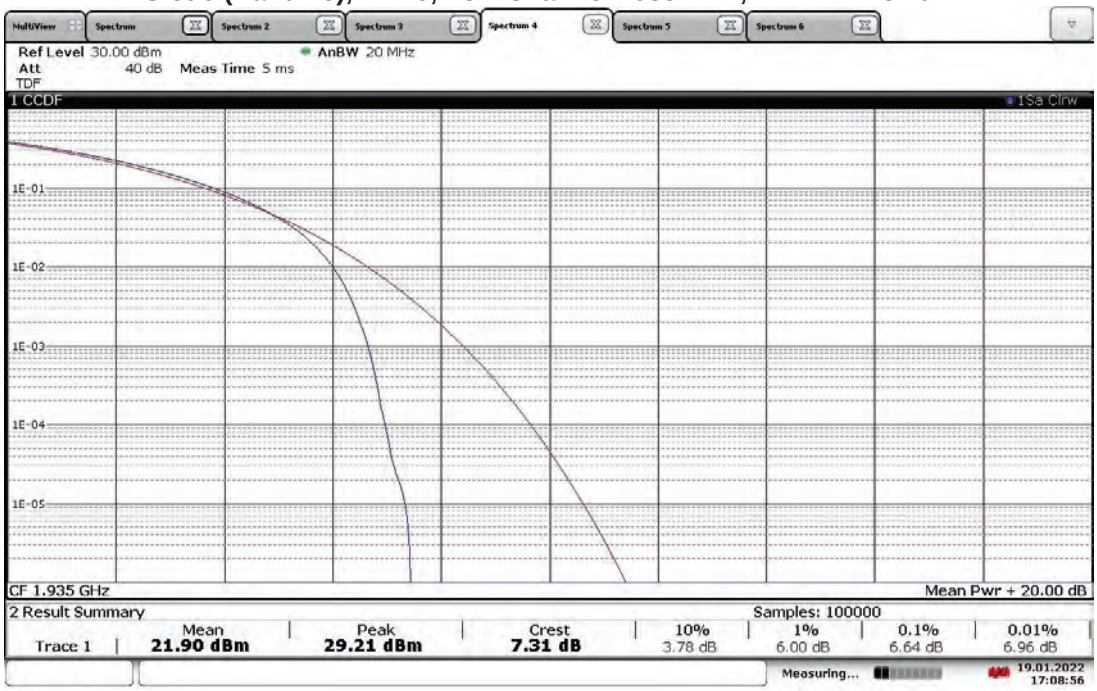
20:07:16 24.01.2022

TM1.1-QPSK_5 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, High Channel 1992.5 MHz, PAPR = 9.89 dB



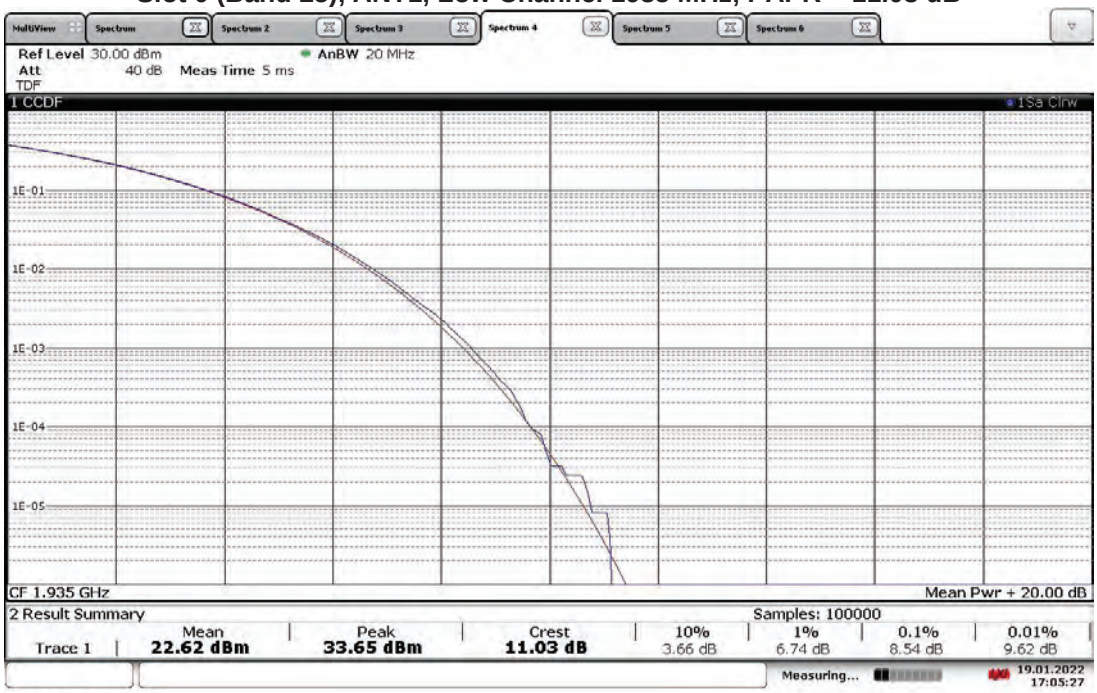
20:04:38 24.01.2022

TM1.1-QPSK_10 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Low Channel 1935 MHz, PAPR = 7.31 dB



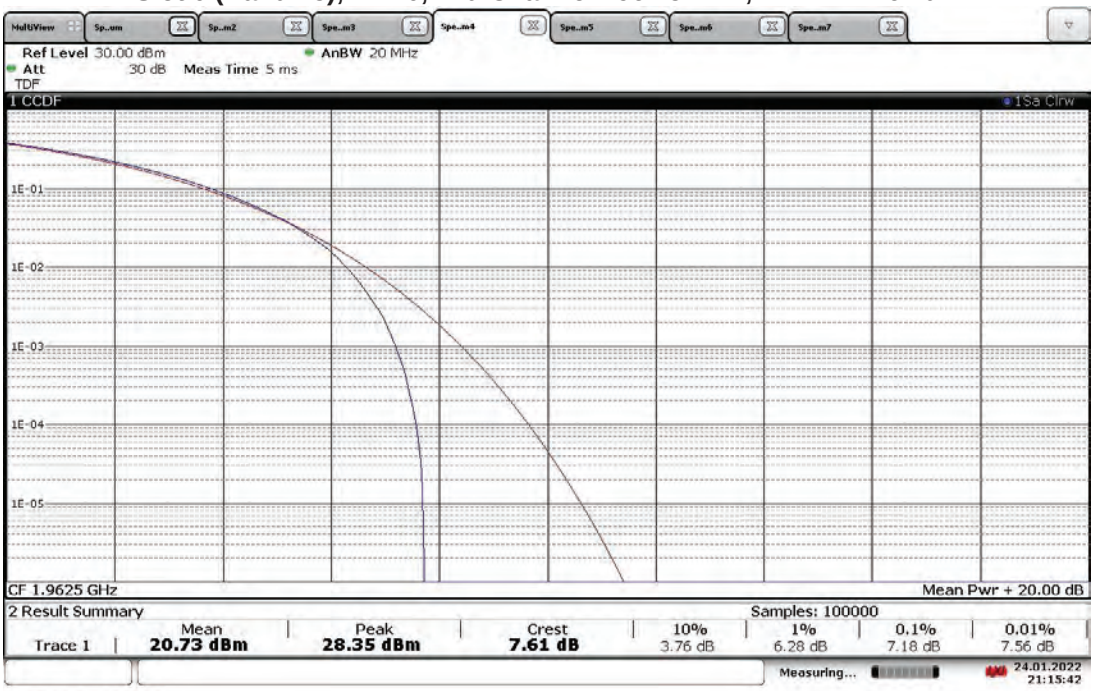
17:08:56 19.01.2022

TM1.1-QPSK_10 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Low Channel 1935 MHz, PAPR = 11.03 dB



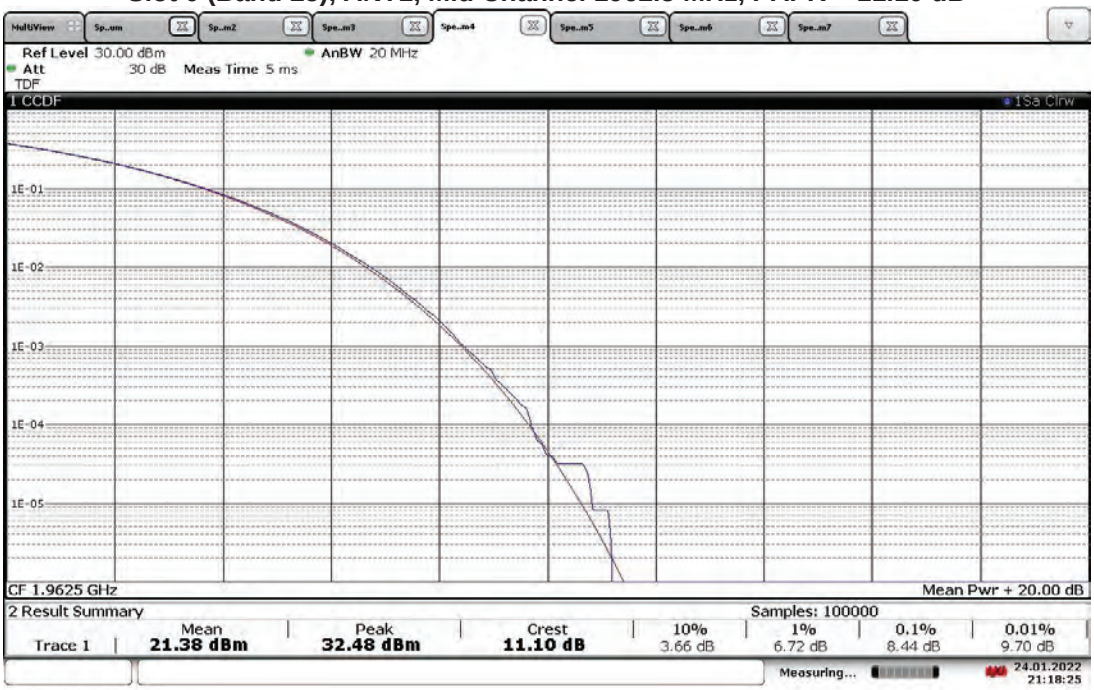
17:05:28 19.01.2022

TM1.1-QPSK_10 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, PAPR = 7.61 dB



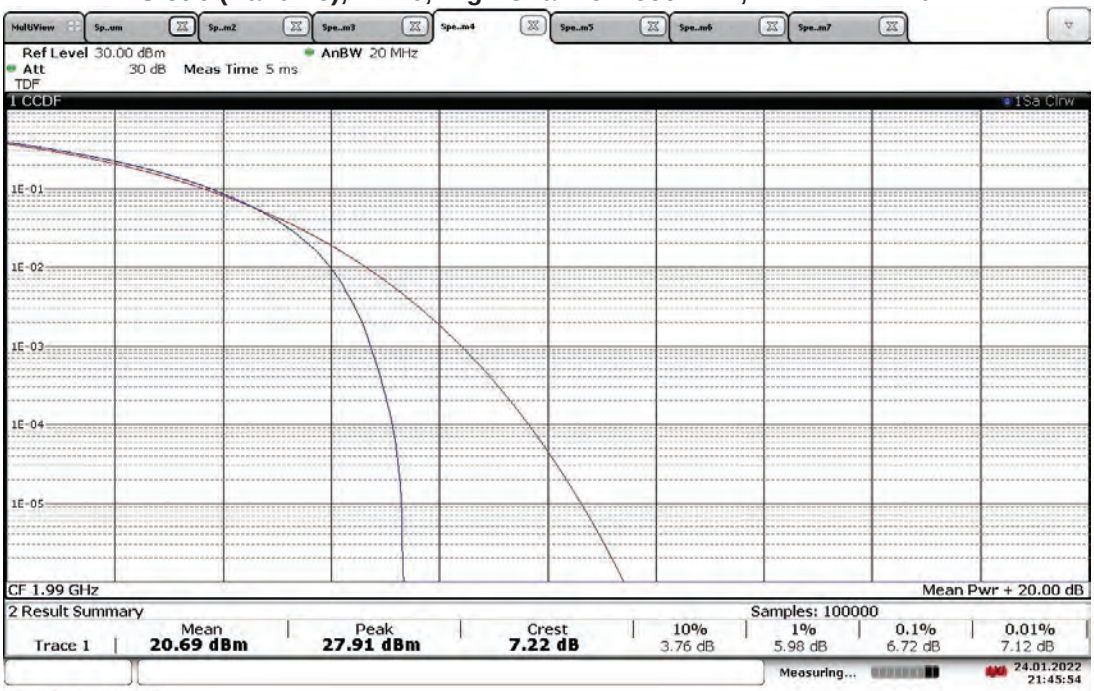
21:15:43 24.01.2022

TM1.1-QPSK_10 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, PAPR = 11.10 dB



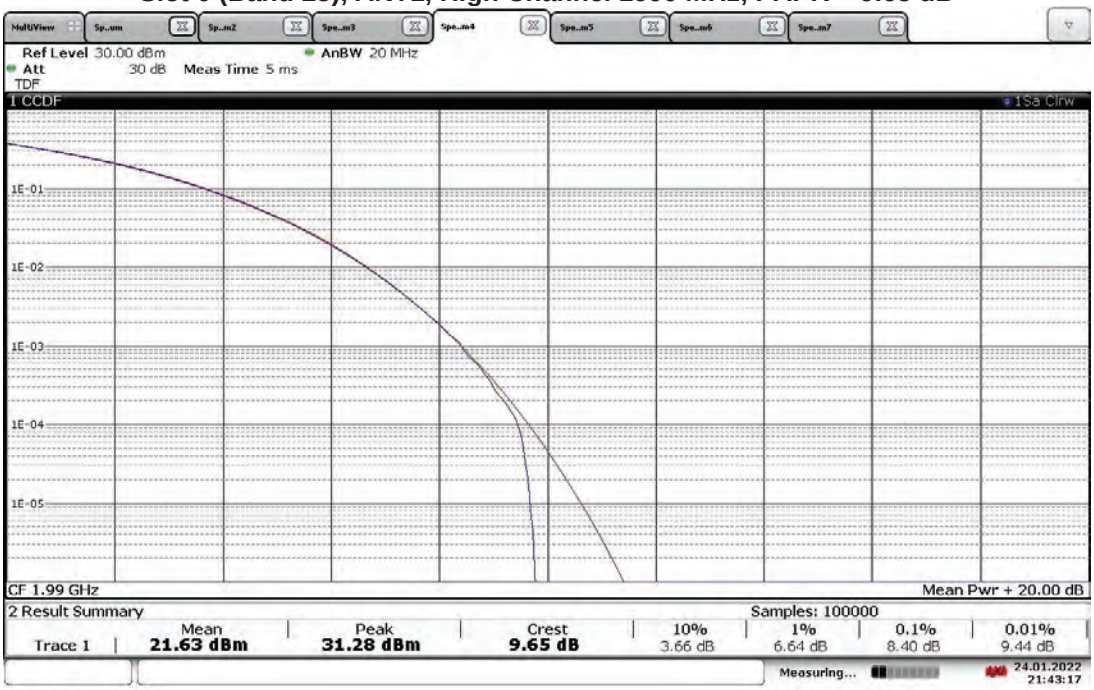
21:18:25 24.01.2022

TM1.1-QPSK_10 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, High Channel 1990 MHz, PAPR = 7.22 dB



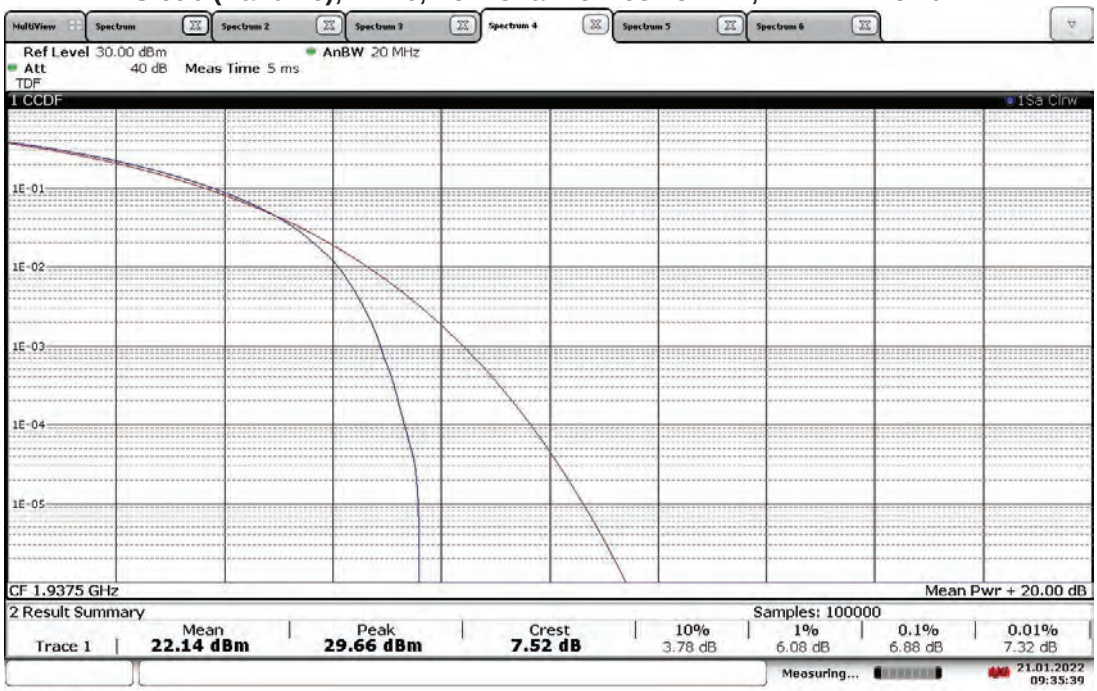
21:45:54 24.01.2022

TM1.1-QPSK_10 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, High Channel 1990 MHz, PAPR = 9.65 dB



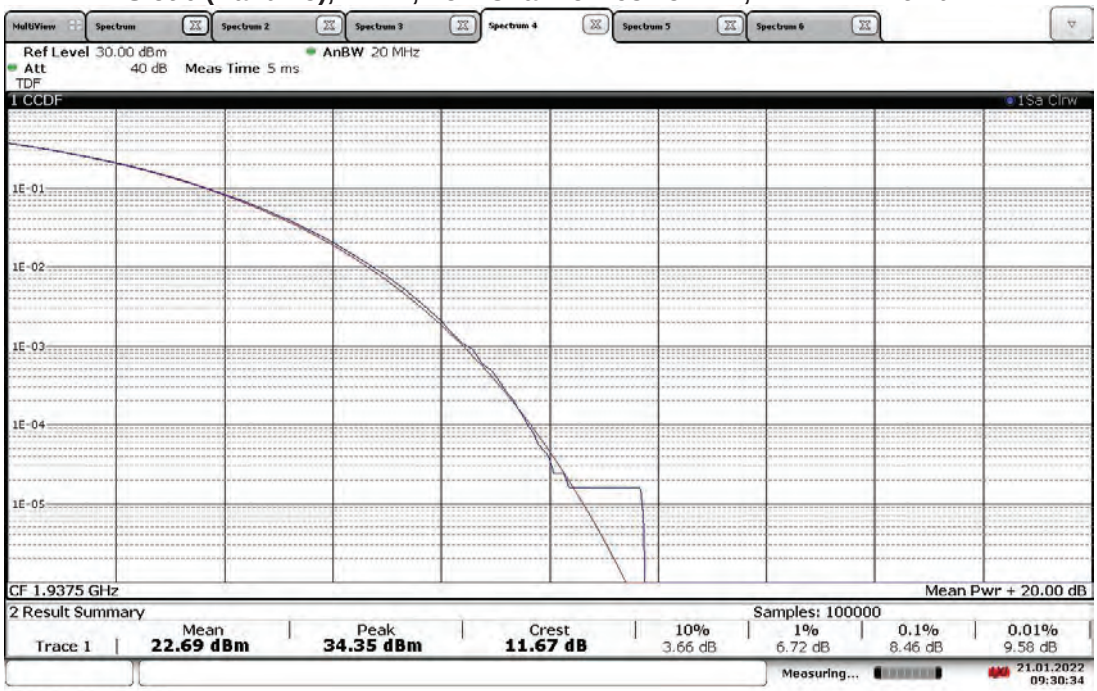
21:43:18 24.01.2022

TM1.1-QPSK_15 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Low Channel 1937.5 MHz, PAPR = 7.52 dB



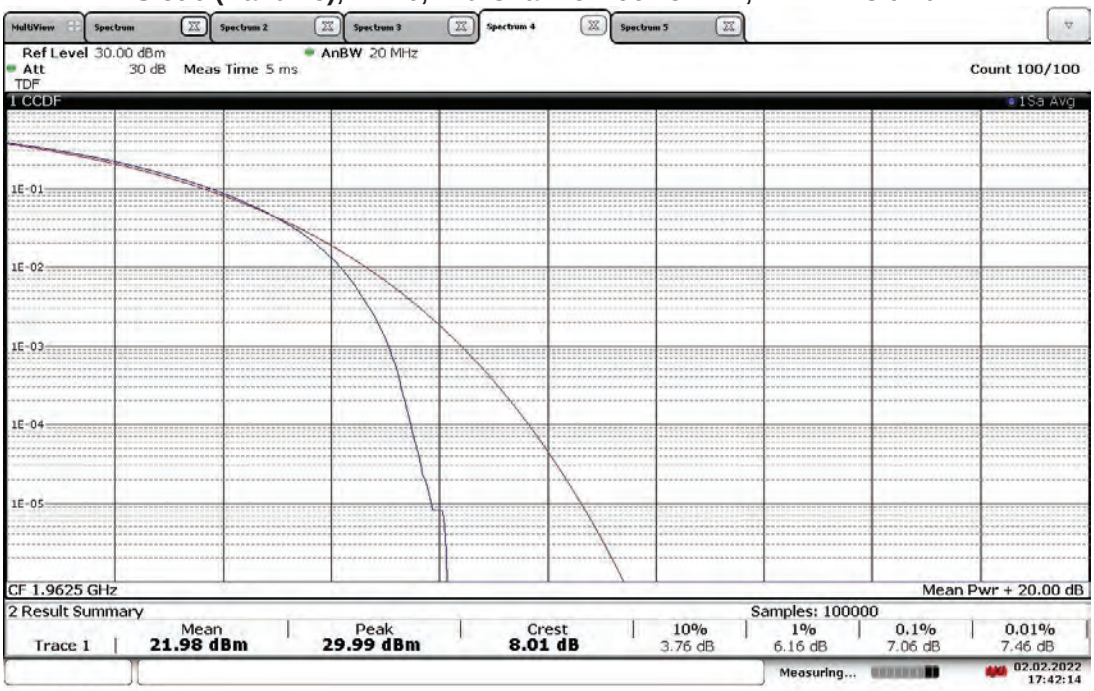
09:35:39 21.01.2022

TM1.1-QPSK_15 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Low Channel 1937.5 MHz, PAPR = 11.67 dB



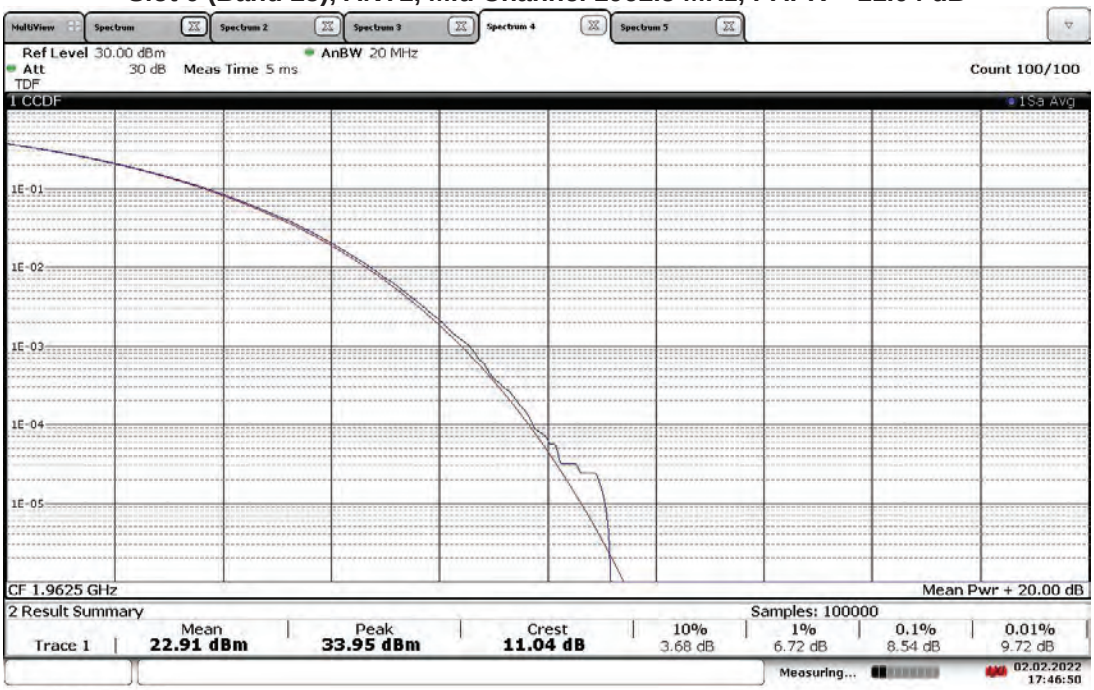
09:30:34 21.01.2022

TM1.1-QPSK_15 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, PAPR = 8.01 dB



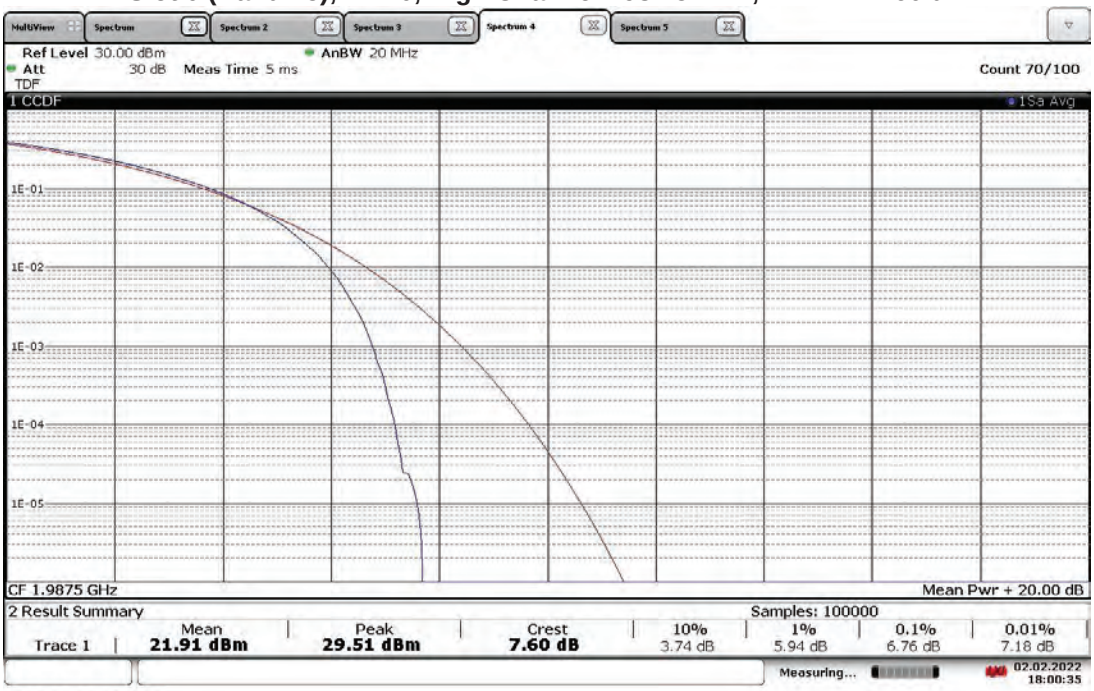
17:42:14 02.02.2022

TM1.1-QPSK_15 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, PAPR = 11.04 dB



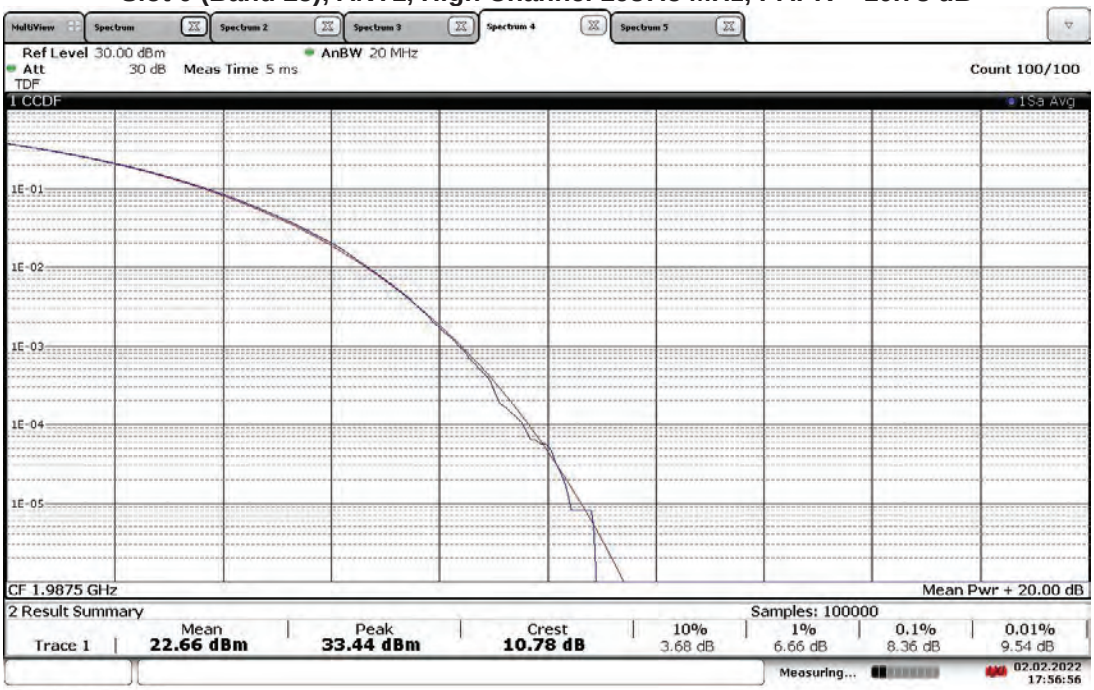
17:46:50 02.02.2022

TM1.1-QPSK_15 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, High Channel 1987.5 MHz, PAPR = 7.60 dB



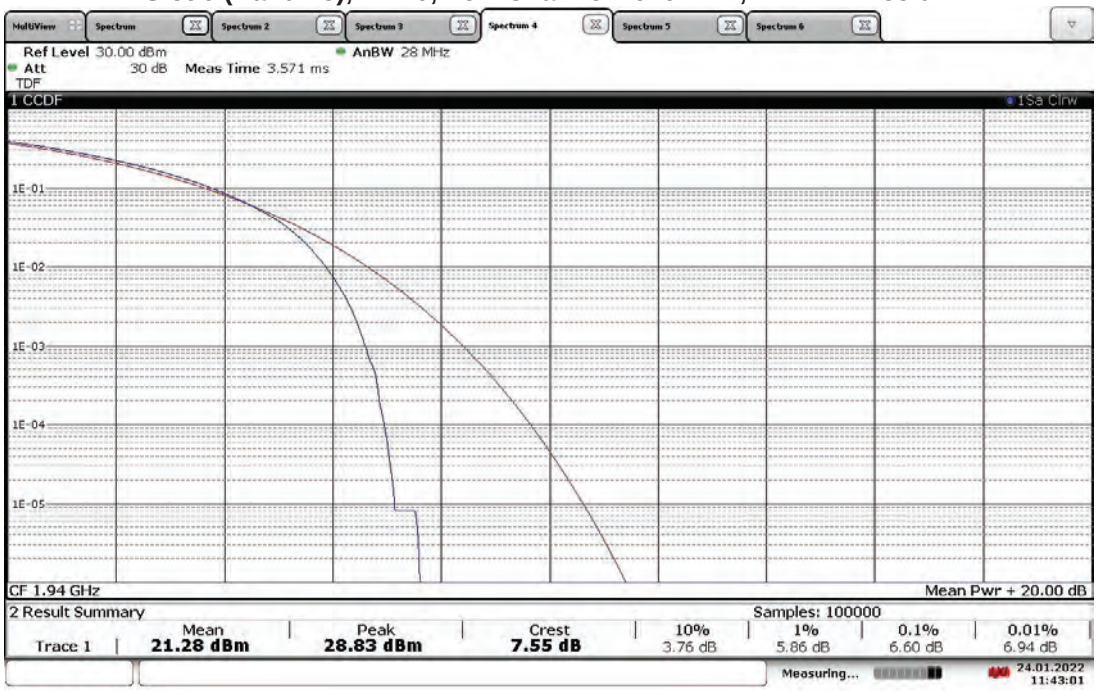
18:00:36 02.02.2022

TM1.1-QPSK_15 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, High Channel 1987.5 MHz, PAPR = 10.78 dB



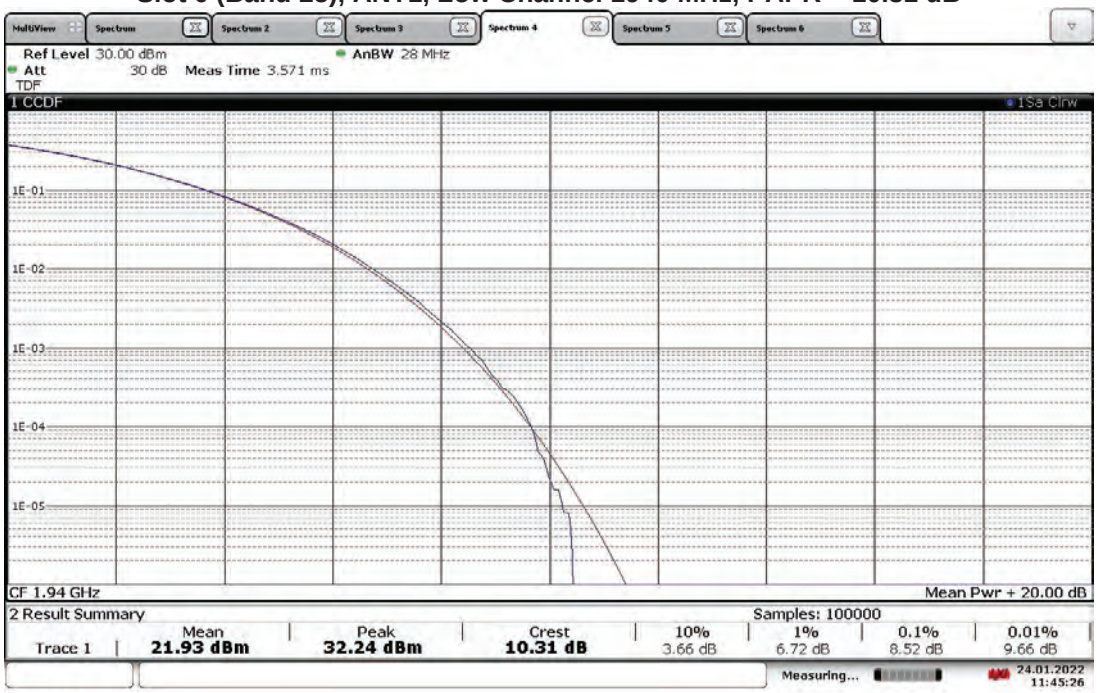
17:56:56 02.02.2022

TM1.1-QPSK_20 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Low Channel 1940 MHz, PAPR = 7.55 dB



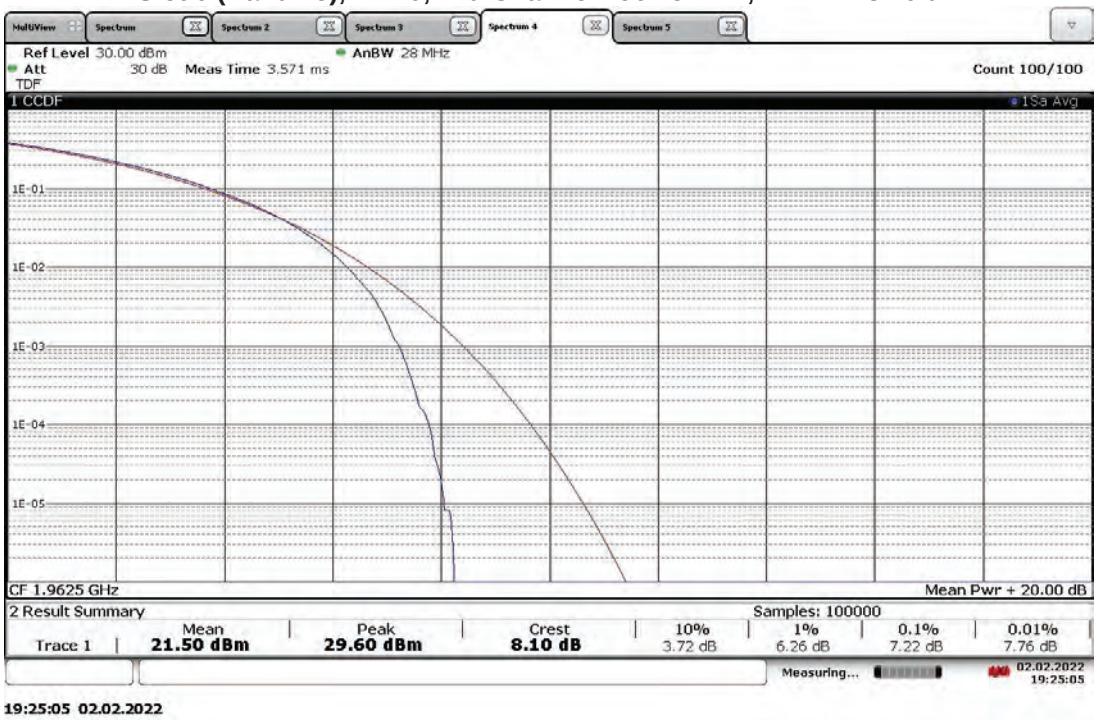
11:43:01 24.01.2022

TM1.1-QPSK_20 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Low Channel 1940 MHz, PAPR = 10.31 dB



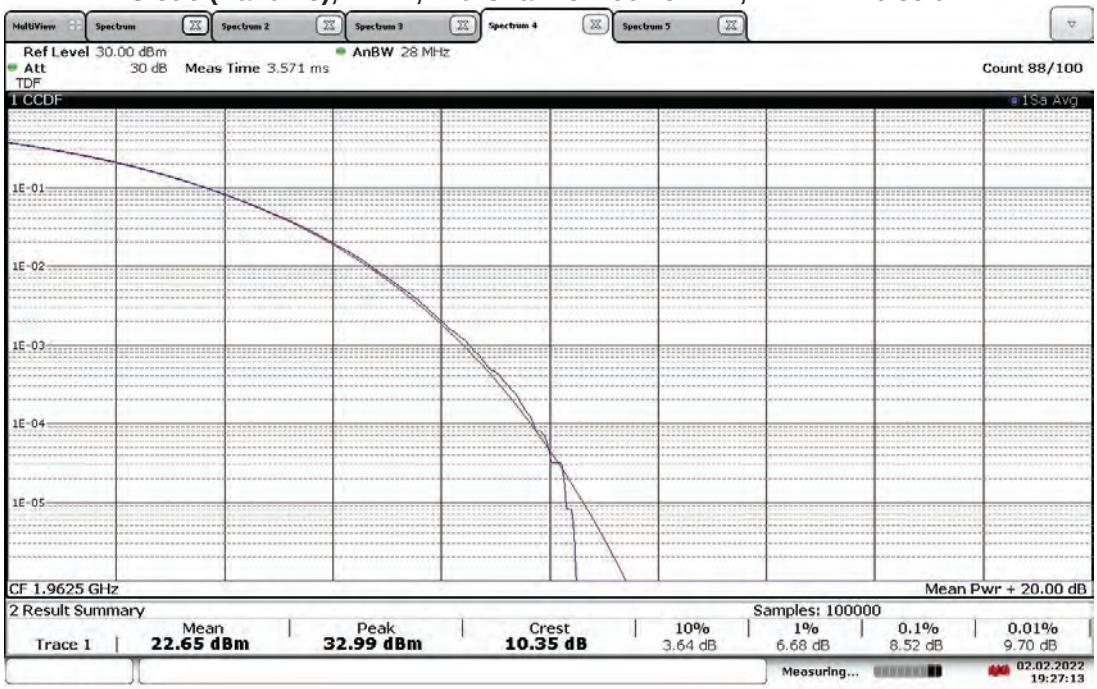
11:45:26 24.01.2022

TM1.1-QPSK_20 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Mid Channel 1962.5 MHz, PAPR = 8.10 dB



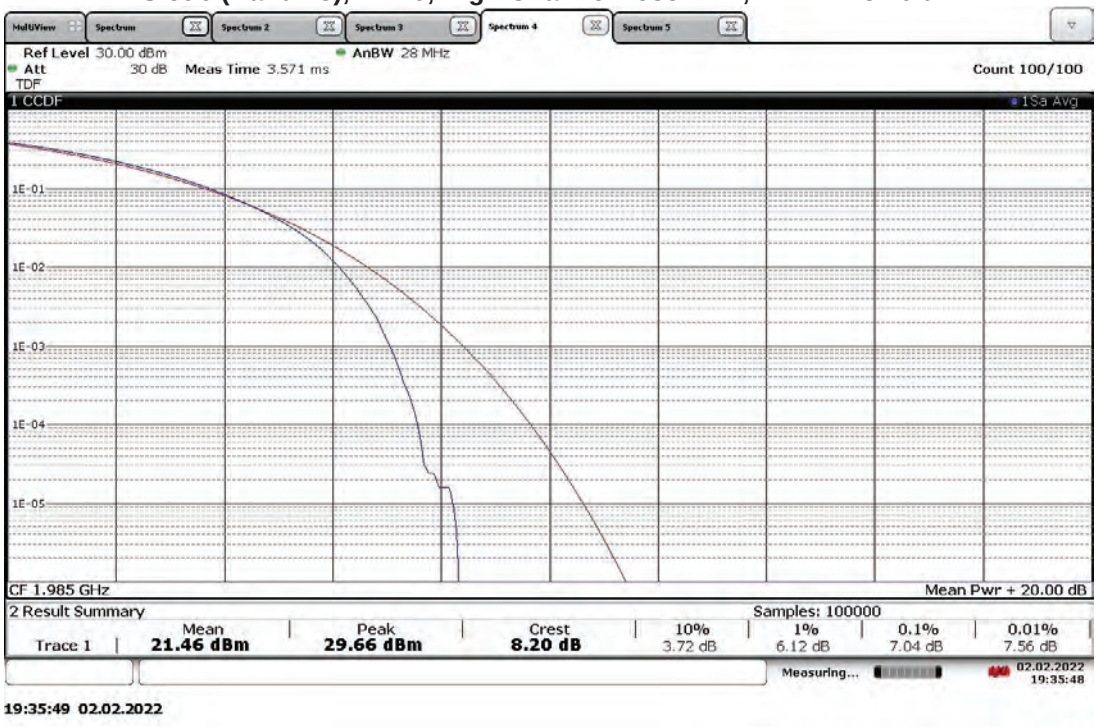
19:25:05 02.02.2022

TM1.1-QPSK_20 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Mid Channel 1962.5 MHz, PAPR = 10.35 dB

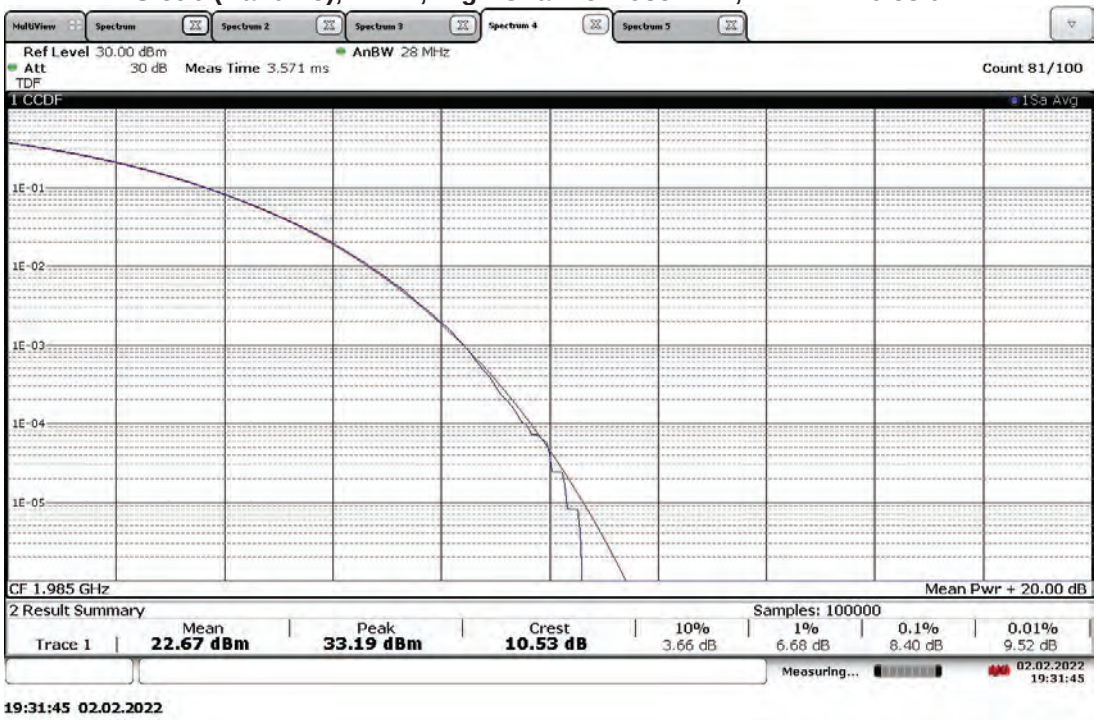


19:27:13 02.02.2022

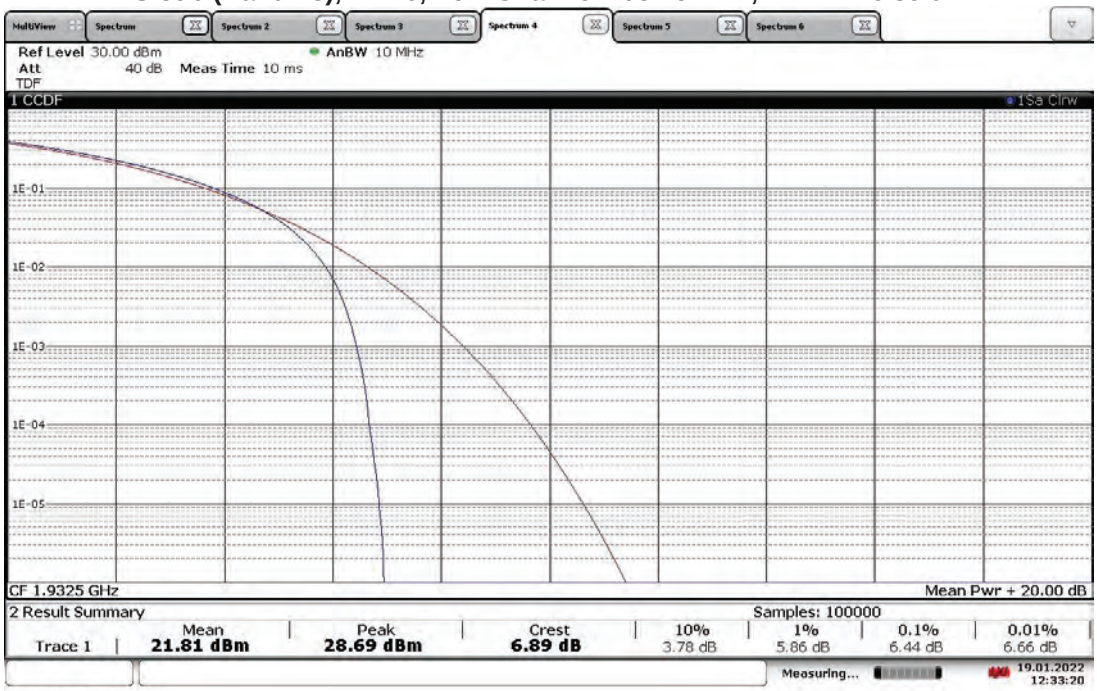
TM1.1-QPSK_20 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, High Channel 1985 MHz, PAPR = 8.20 dB



TM1.1-QPSK_20 MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, High Channel 1985 MHz, PAPR = 10.53 dB

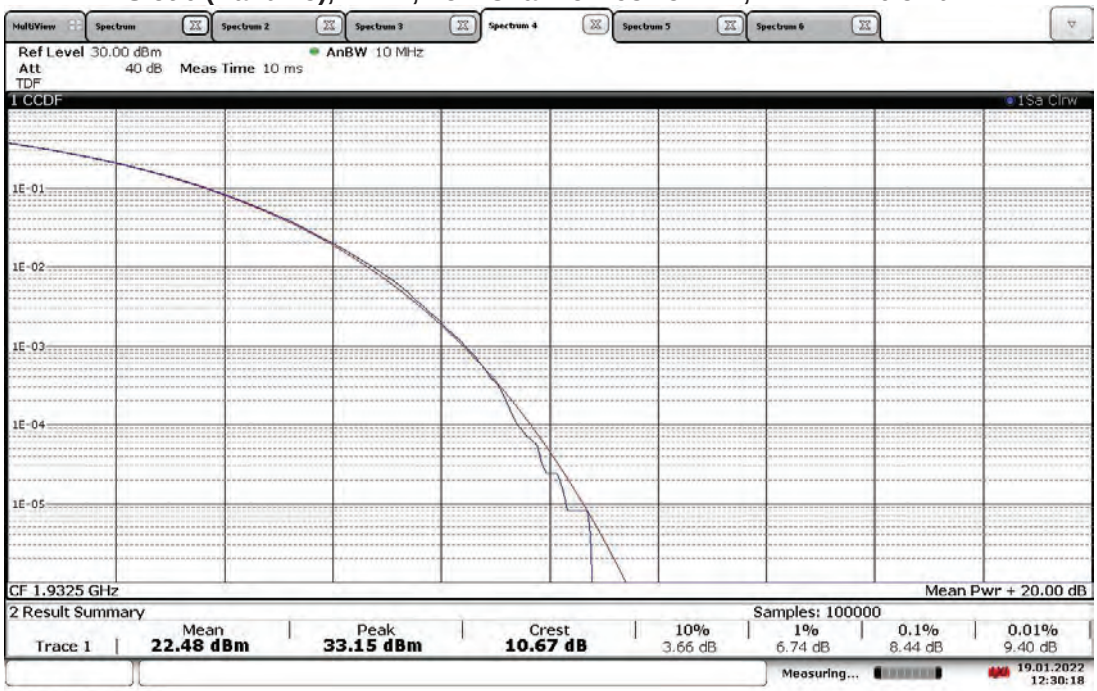


TM3.2 - 16QAM_5MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT0, Low Channel 1932.5 MHz, PAPR = 6.89 dB



12:33:20 19.01.2022

TM3.2 - 16QAM_5MHz Bandwidth (4G LTE)
Slot 0 (Band 25), ANT1, Low Channel 1932.5 MHz, PAPR = 10.57 dB



12:30:18 19.01.2022