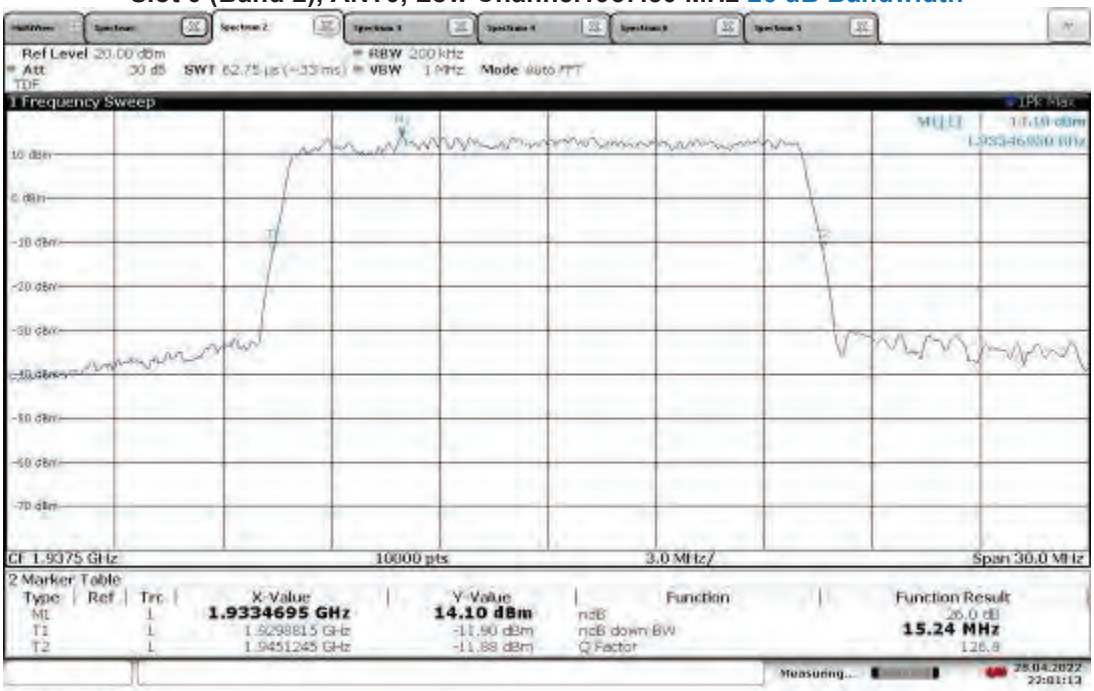
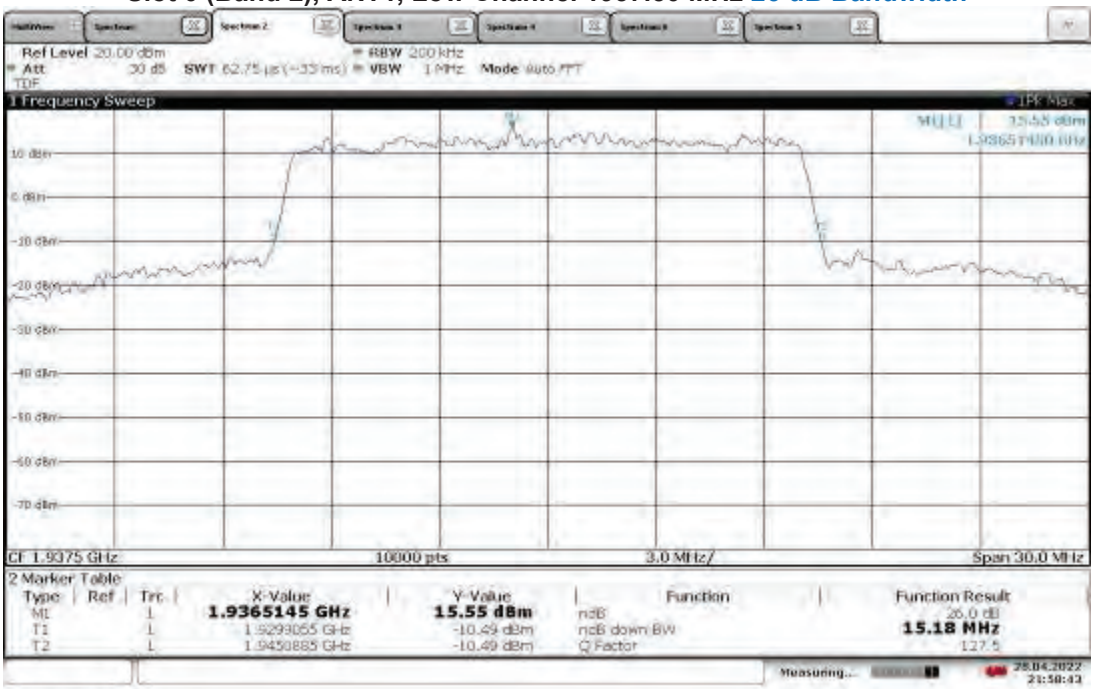
TM3.1-64QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Low Channel1937.50 MHz 26 dB Bandwidth



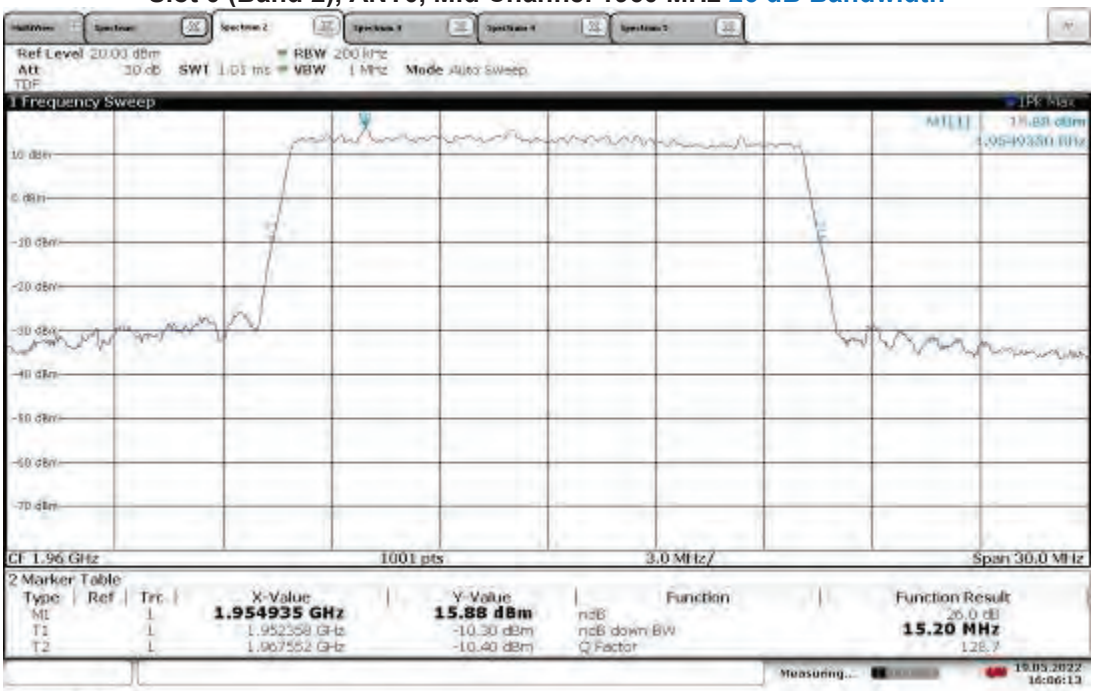
22:01:14 28.04.2022

TM3.1-64QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Low Channel 1937.50 MHz 26 dB Bandwidth

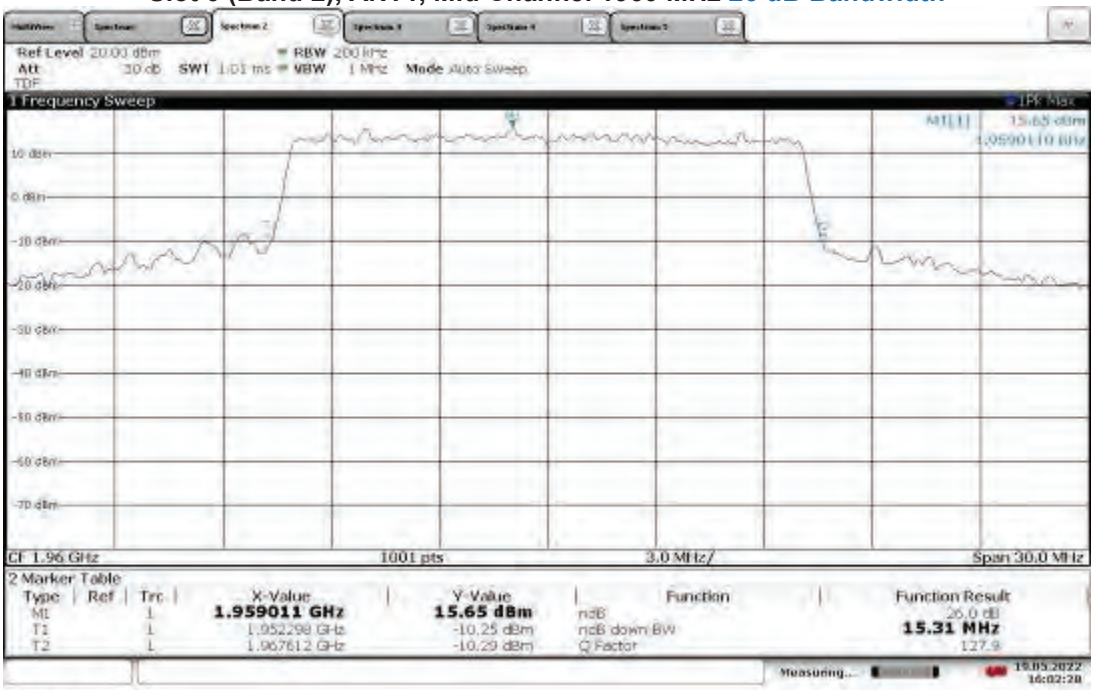


21:58:43 28.04.2022

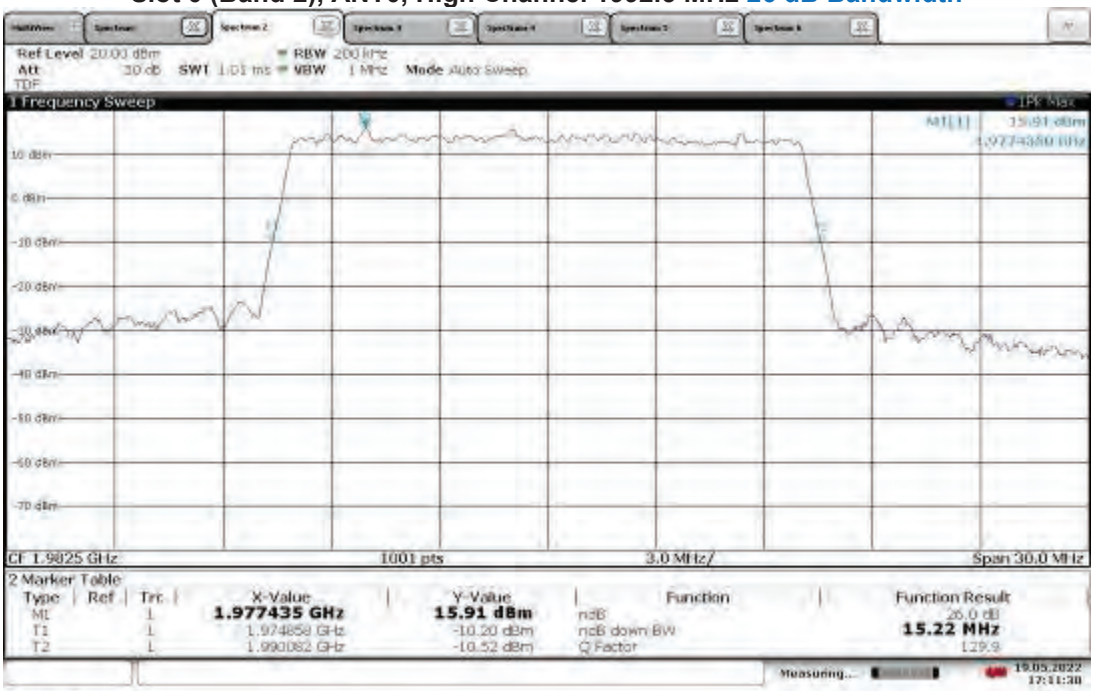
TM3.1-64QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Mid Channel 1960 MHz 26 dB Bandwidth



TM3.1-64QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Mid Channel 1960 MHz 26 dB Bandwidth

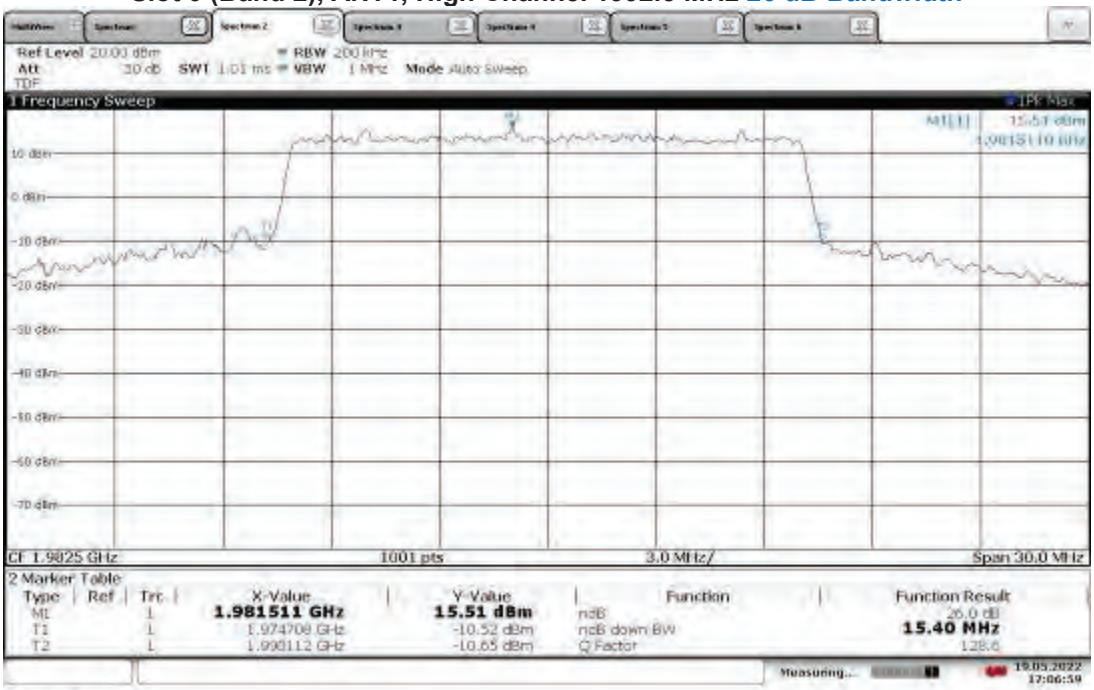


TM3.1-64QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, High Channel 1992.5 MHz 26 dB Bandwidth



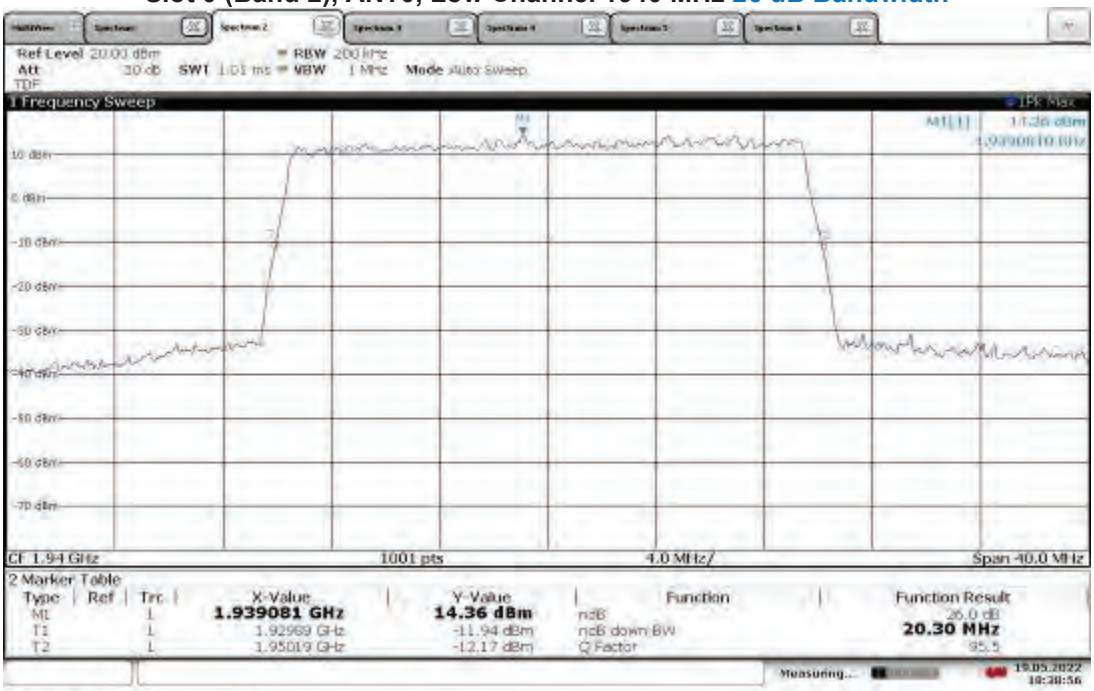
17:11:30 19.05.2022

TM3.1-64QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, High Channel 1992.5 MHz 26 dB Bandwidth



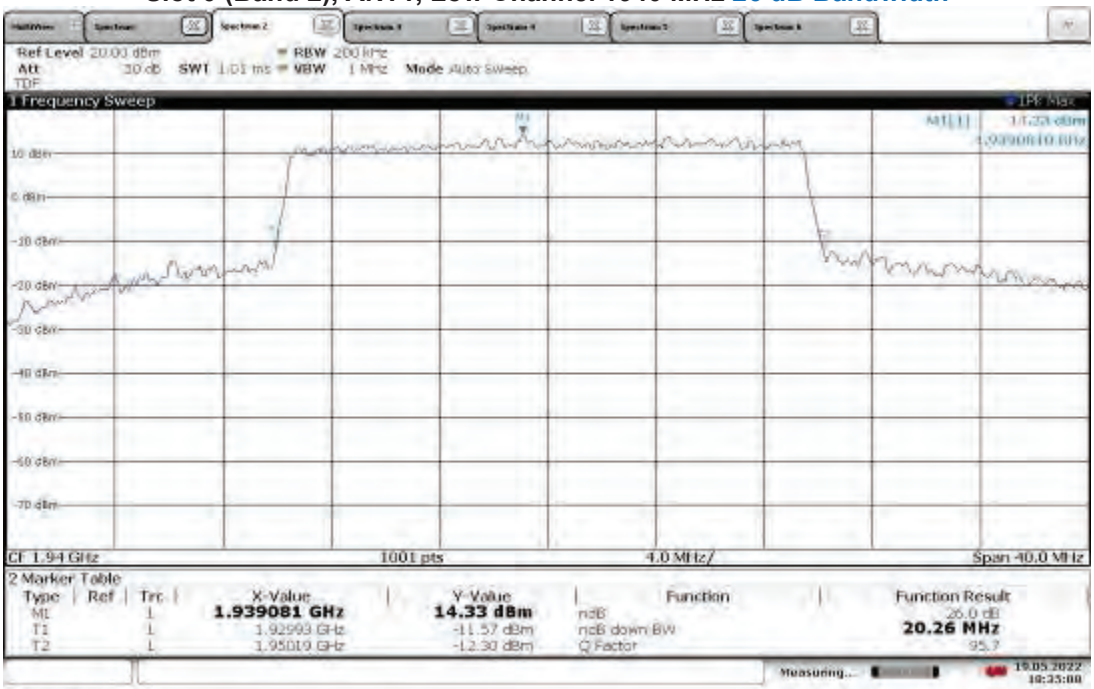
17:06:59 19.05.2022

TM3.1-64QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Low Channel 1940 MHz 26 dB Bandwidth



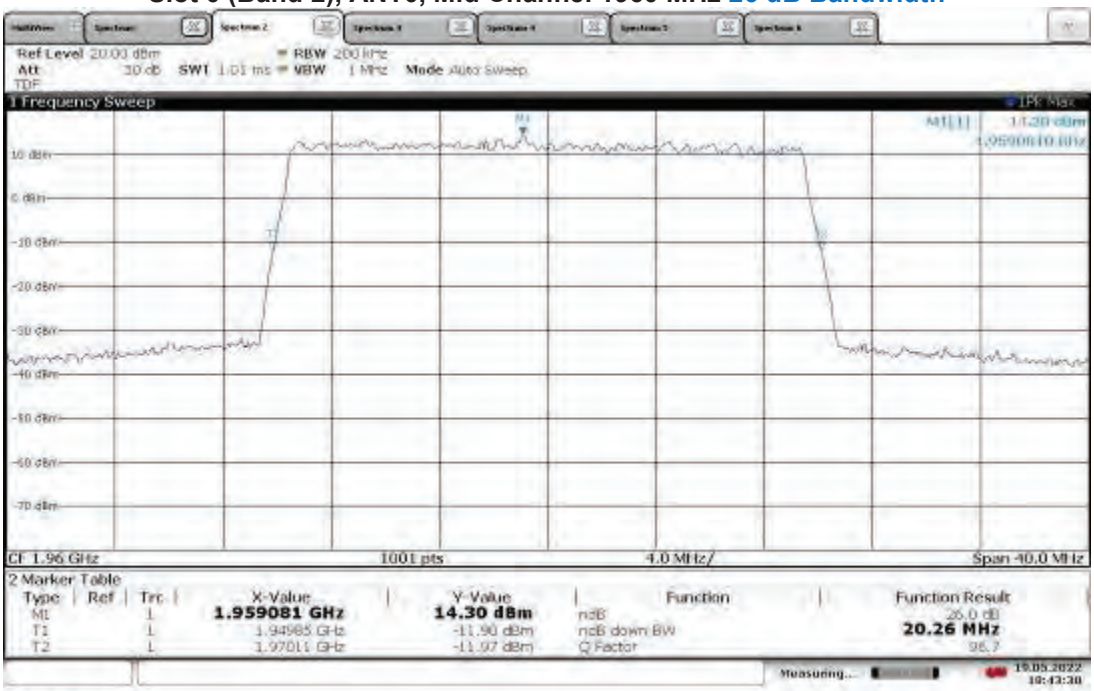
18:38:56 19.05.2022

TM3.1-64QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Low Channel 1940 MHz 26 dB Bandwidth



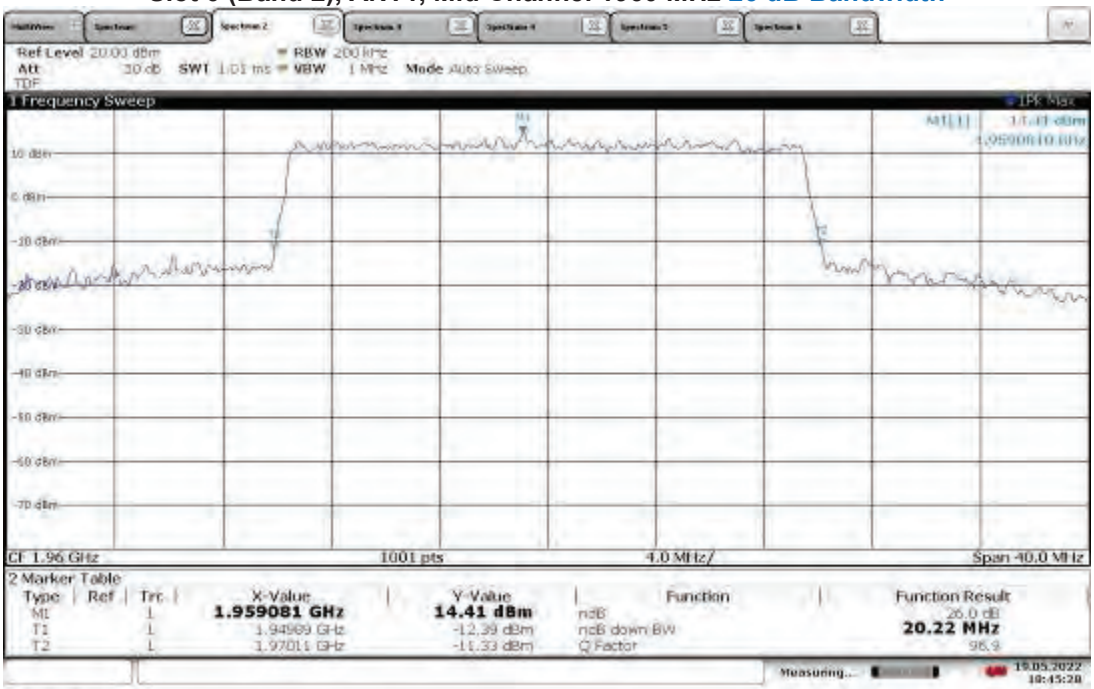
18:35:08 19.05.2022

TM3.1-64QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Mid Channel 1960 MHz 26 dB Bandwidth



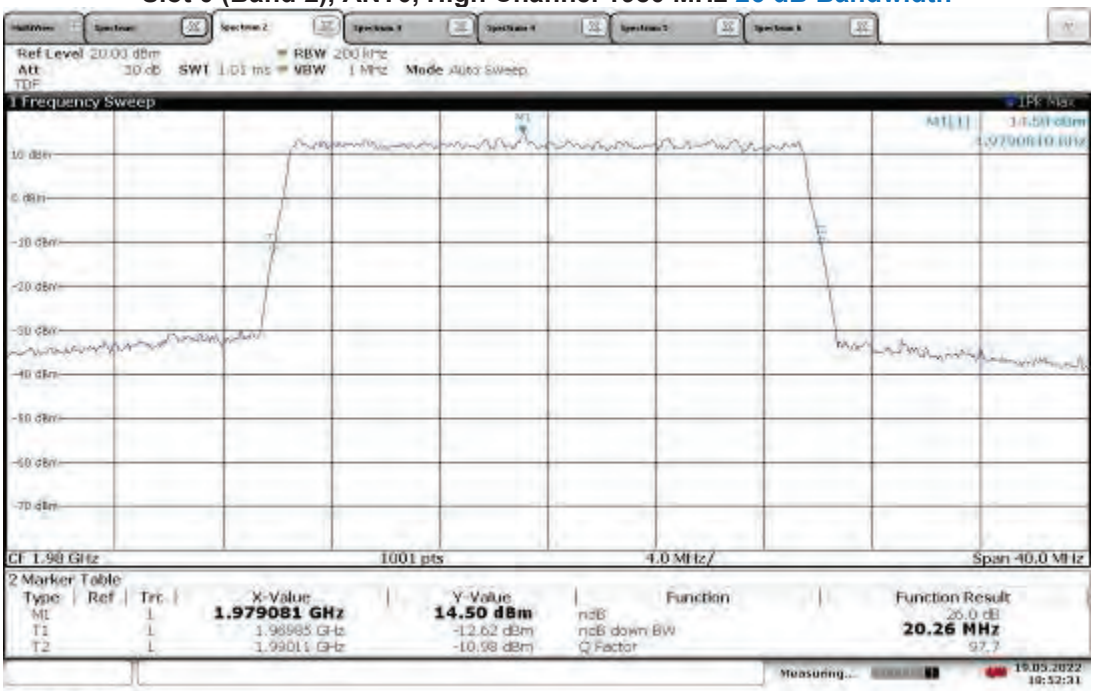
18:43:30 19.05.2022

TM3.1-64QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Mid Channel 1960 MHz 26 dB Bandwidth



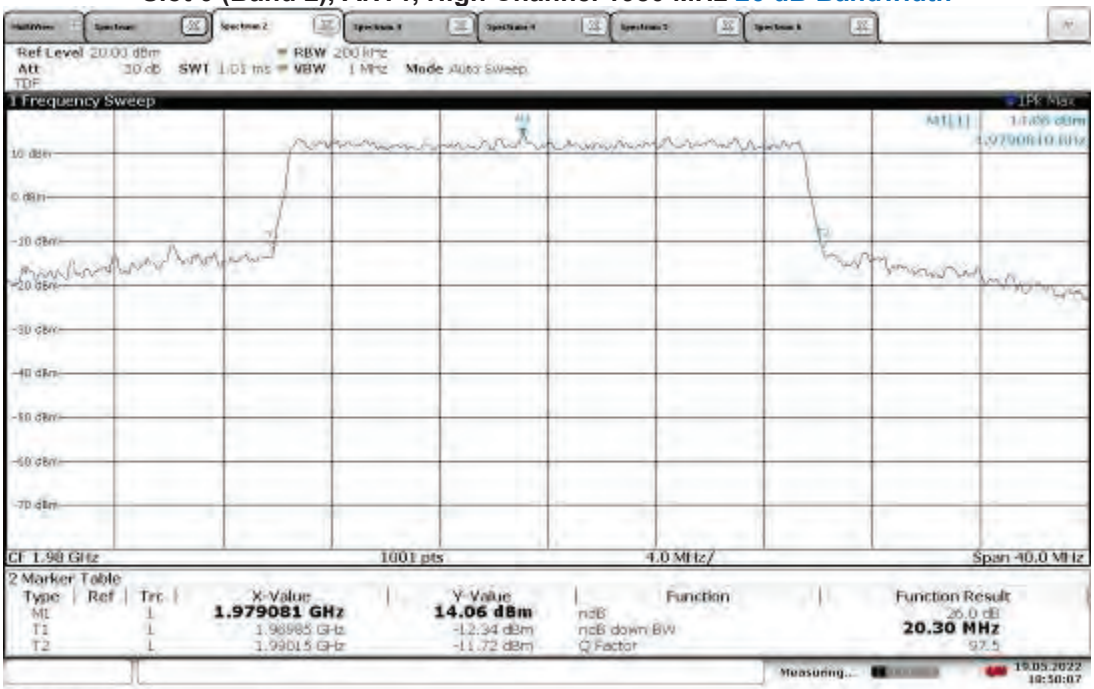
18:45:29 19.05.2022

TM3.1-64QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, High Channel 1980 MHz 26 dB Bandwidth



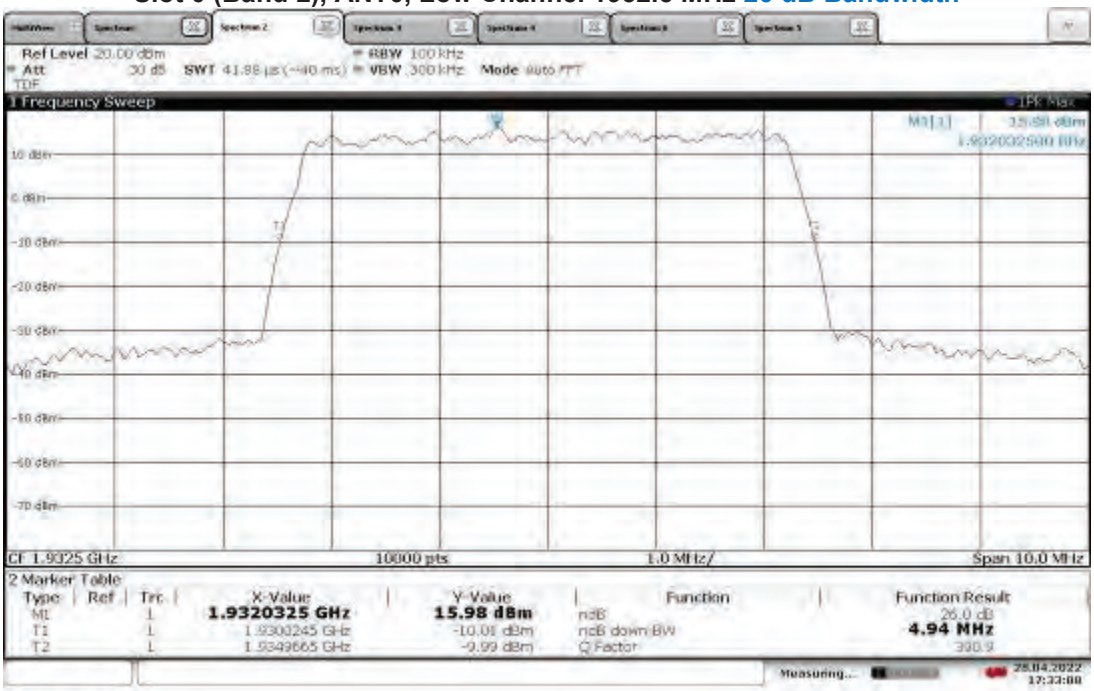
18:52:31 19.05.2022

TM3.1-64QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, High Channel 1980 MHz 26 dB Bandwidth



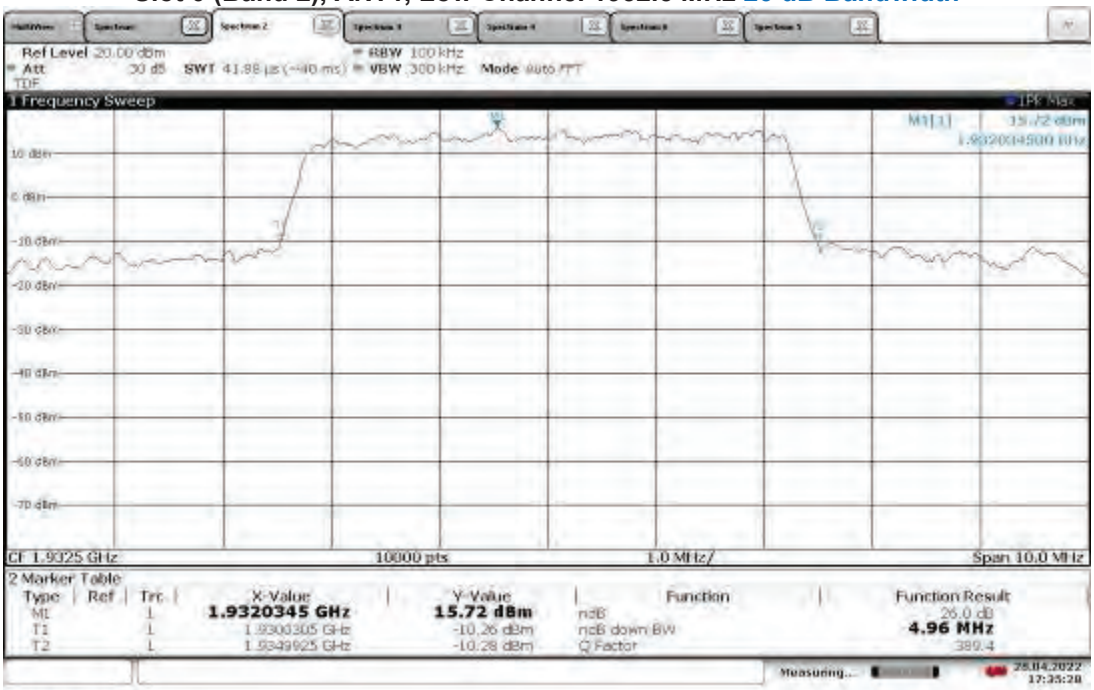
18:50:07 19.05.2022

TM3.1a-256QAM_5 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Low Channel 1932.5 MHz 26 dB Bandwidth



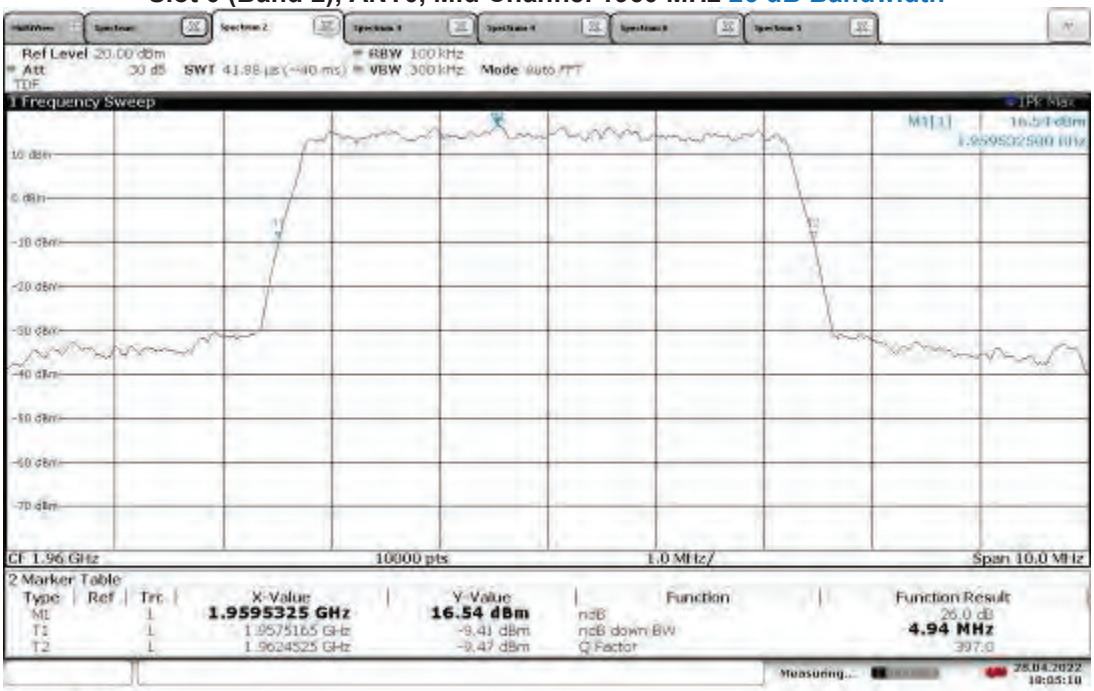
17:33:08 28.04.2022

TM3.1a-256QAM_5 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Low Channel 1932.5 MHz 26 dB Bandwidth

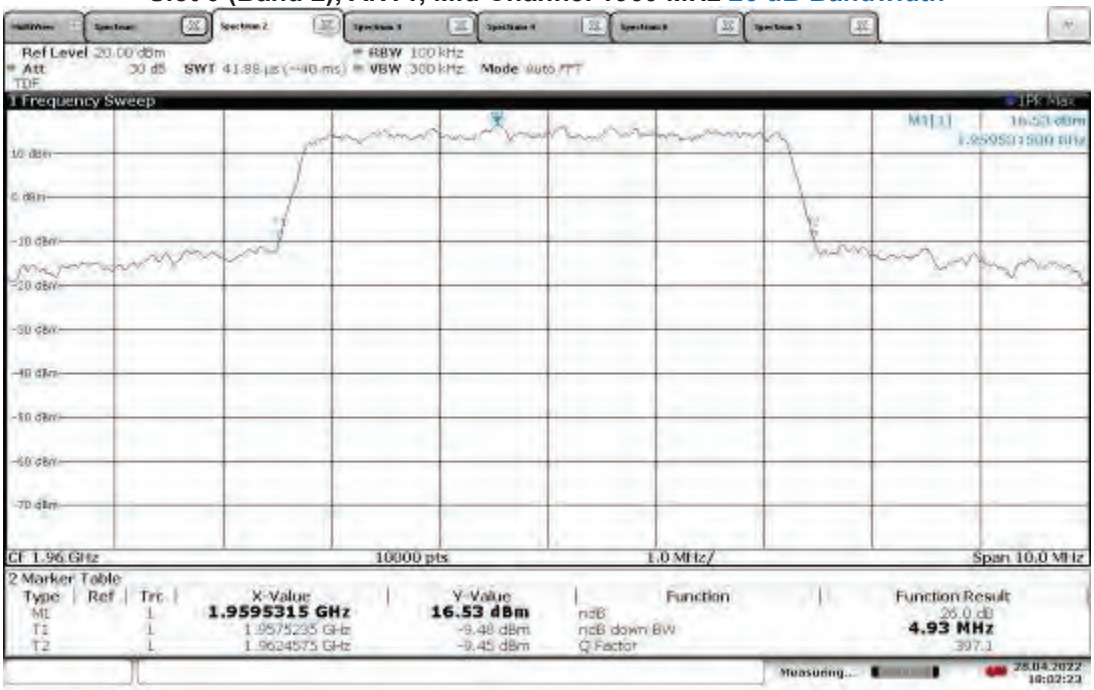


17:35:28 28.04.2022

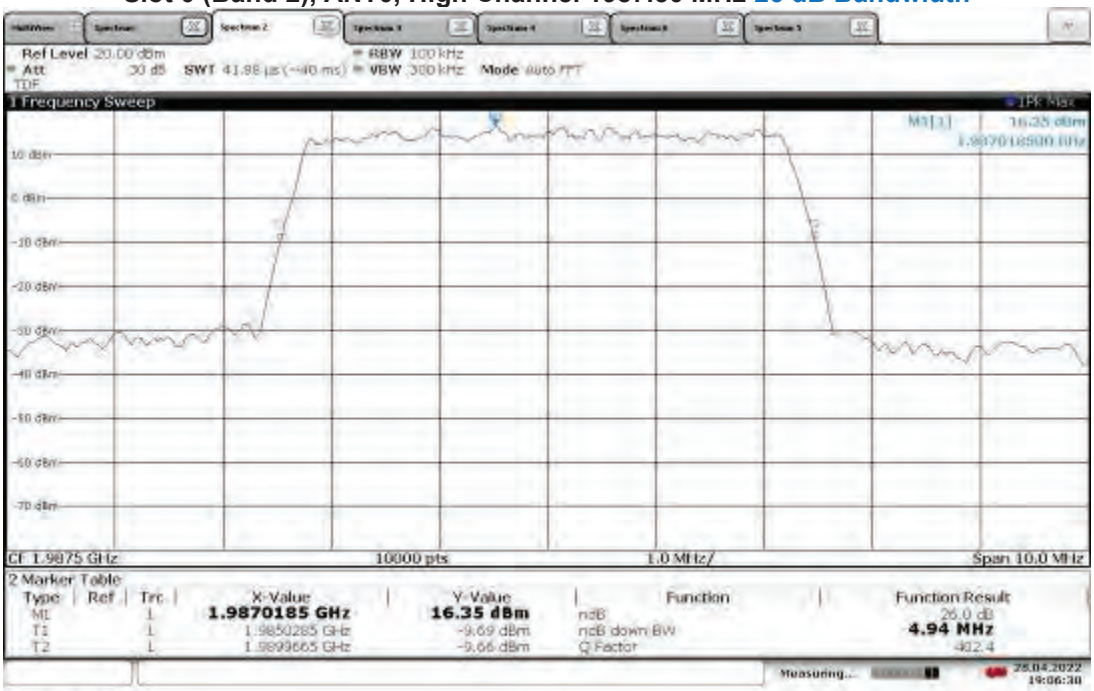
TM3.1a-256QAM_5 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Mid Channel 1960 MHz 26 dB Bandwidth



TM3.1a-256QAM_5 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Mid Channel 1960 MHz 26 dB Bandwidth

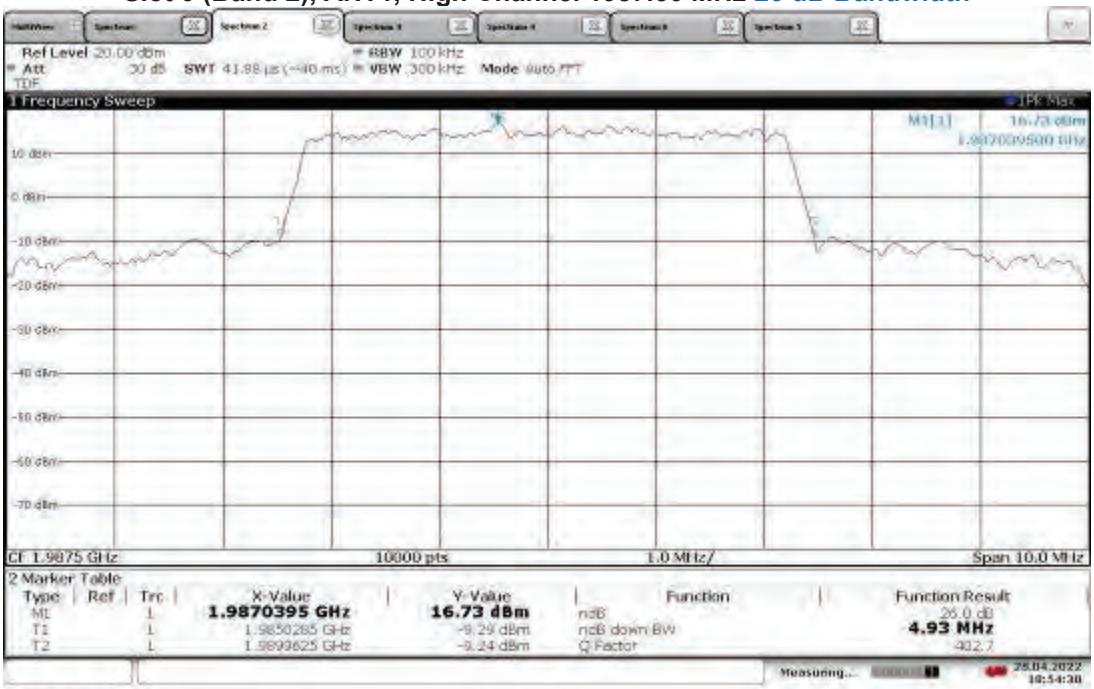


TM3.1a-256QAM_5 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, High Channel 1987.50 MHz 26 dB Bandwidth



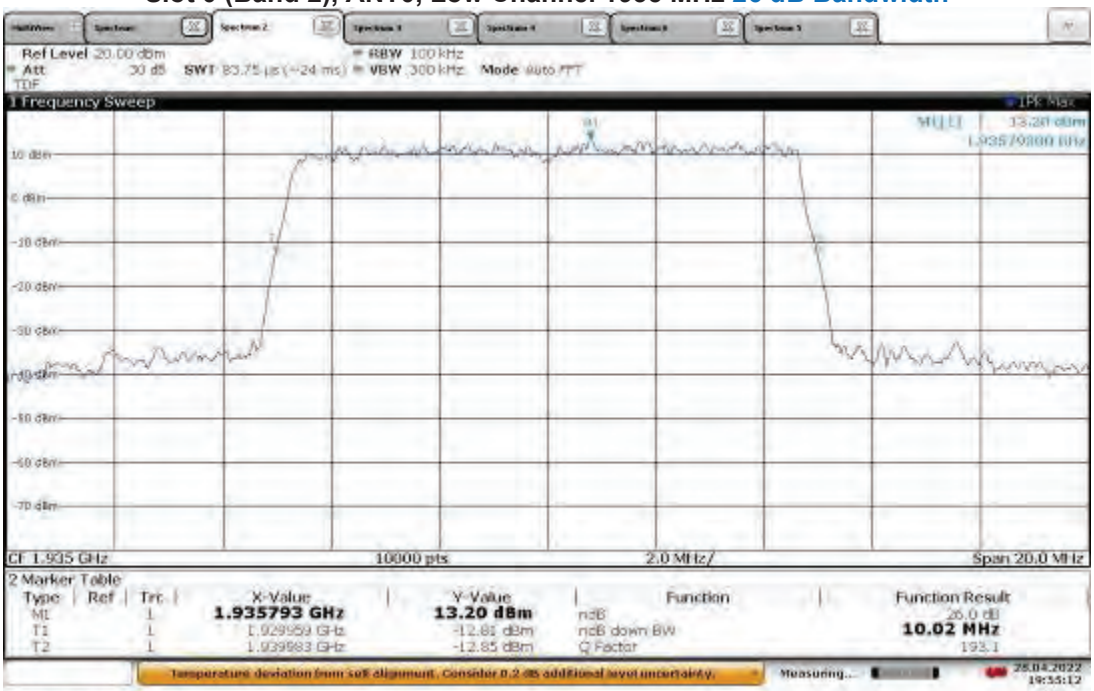
19:06:31 28.04.2022

TM3.1a-256QAM_5 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, High Channel 1987.50 MHz 26 dB Bandwidth

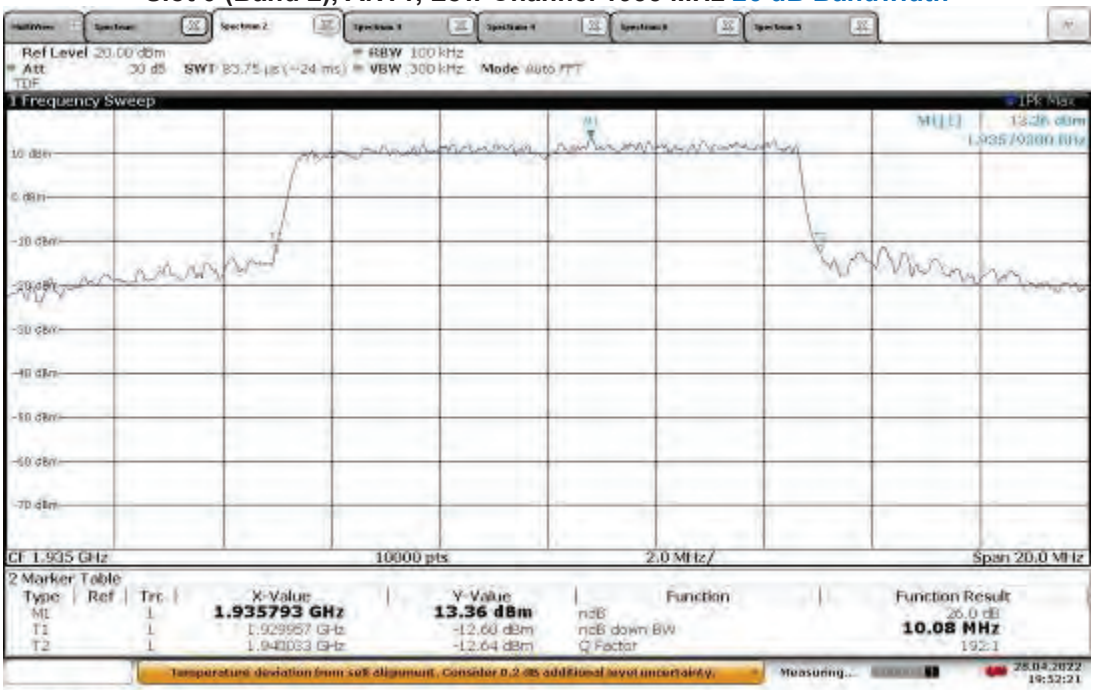


18:54:30 28.04.2022

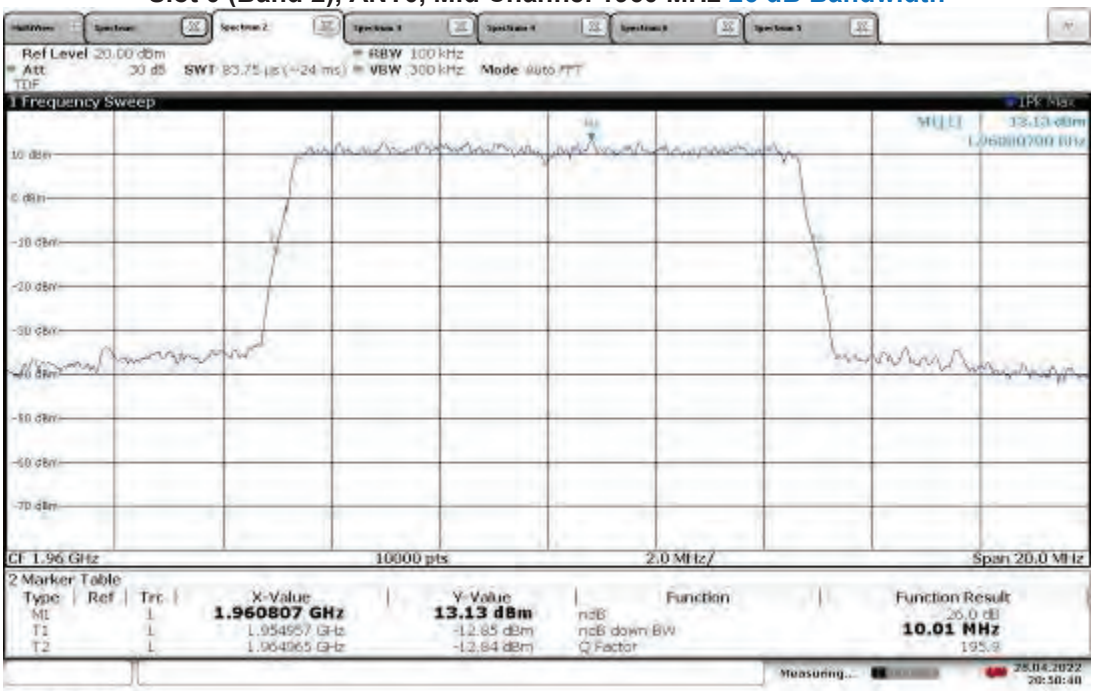
TM3.1a-256QAM_10 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Low Channel 1935 MHz 26 dB Bandwidth



TM3.1a-256QAM_10 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Low Channel 1935 MHz 26 dB Bandwidth

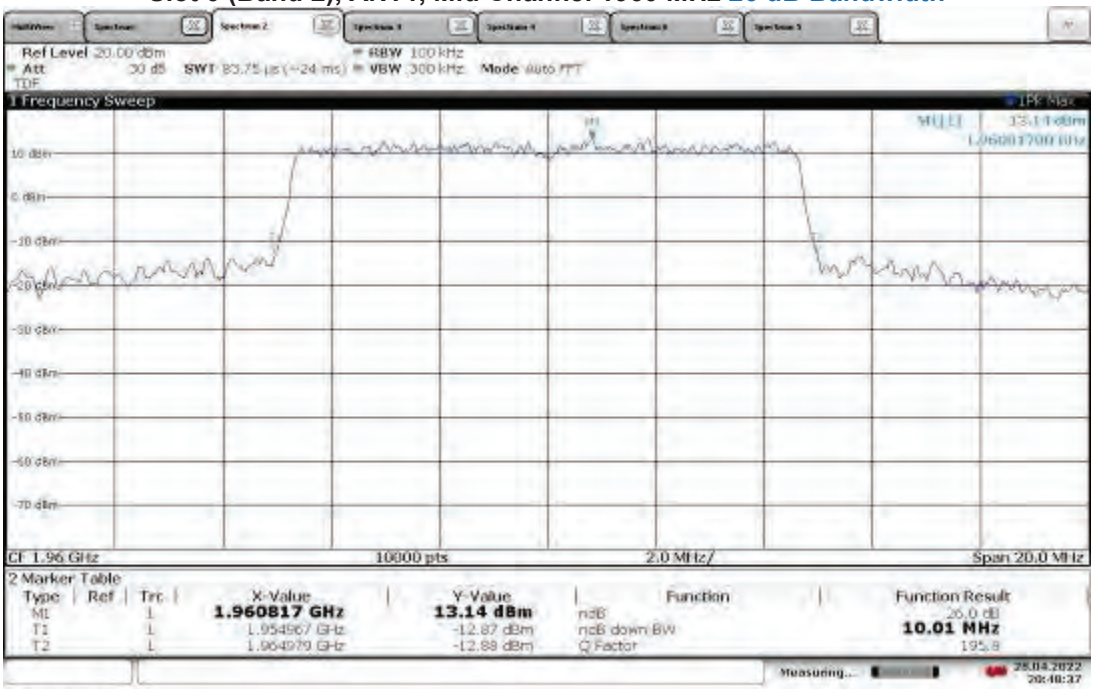


TM3.1a-256QAM_10 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Mid Channel 1960 MHz 26 dB Bandwidth



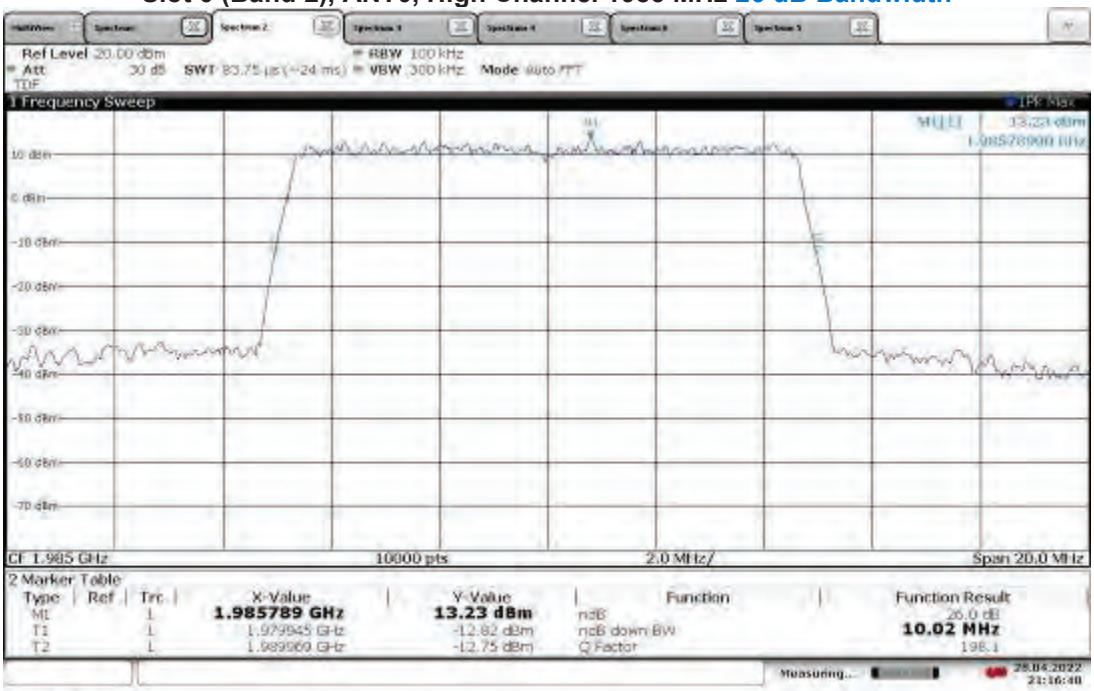
20:50:41 28.04.2022

TM3.1a-256QAM_10 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Mid Channel 1960 MHz 26 dB Bandwidth



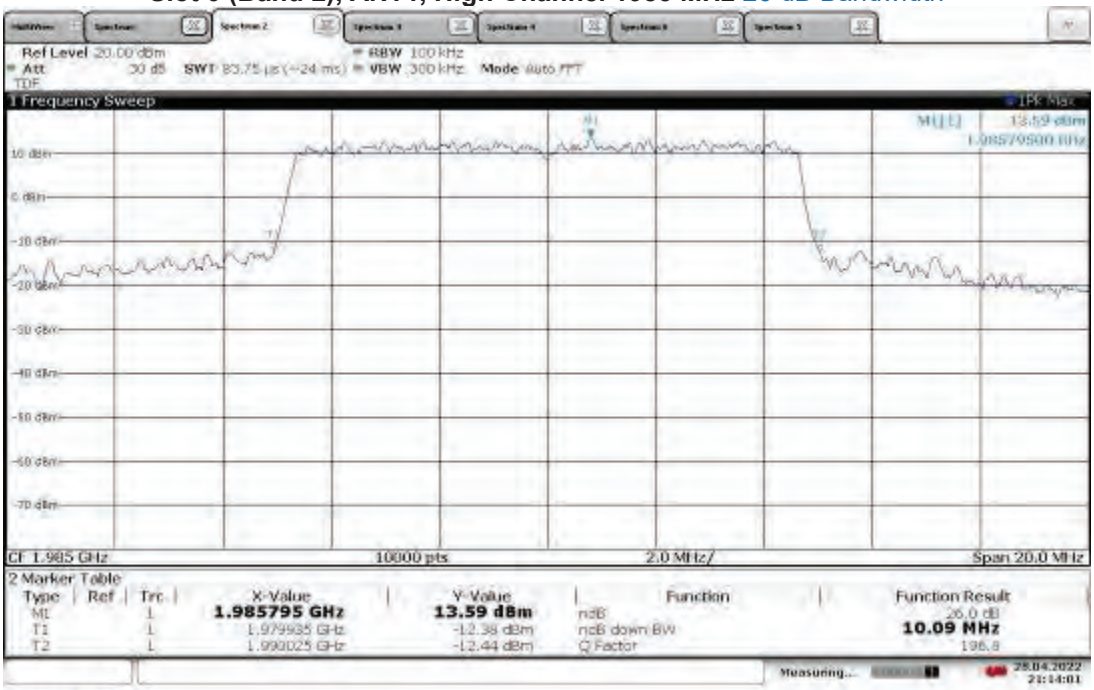
20:48:38 28.04.2022

TM3.1a-256QAM_10 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, High Channel 1985 MHz 26 dB Bandwidth



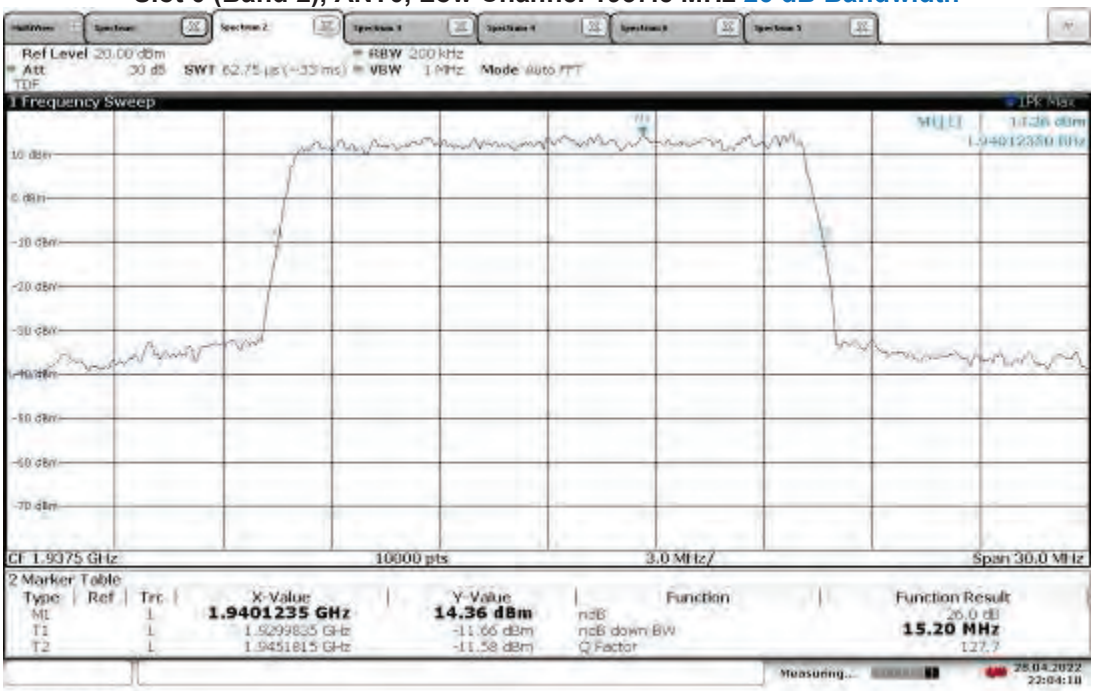
21:16:41 28.04.2022

TM3.1a-256QAM_10 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, High Channel 1985 MHz 26 dB Bandwidth

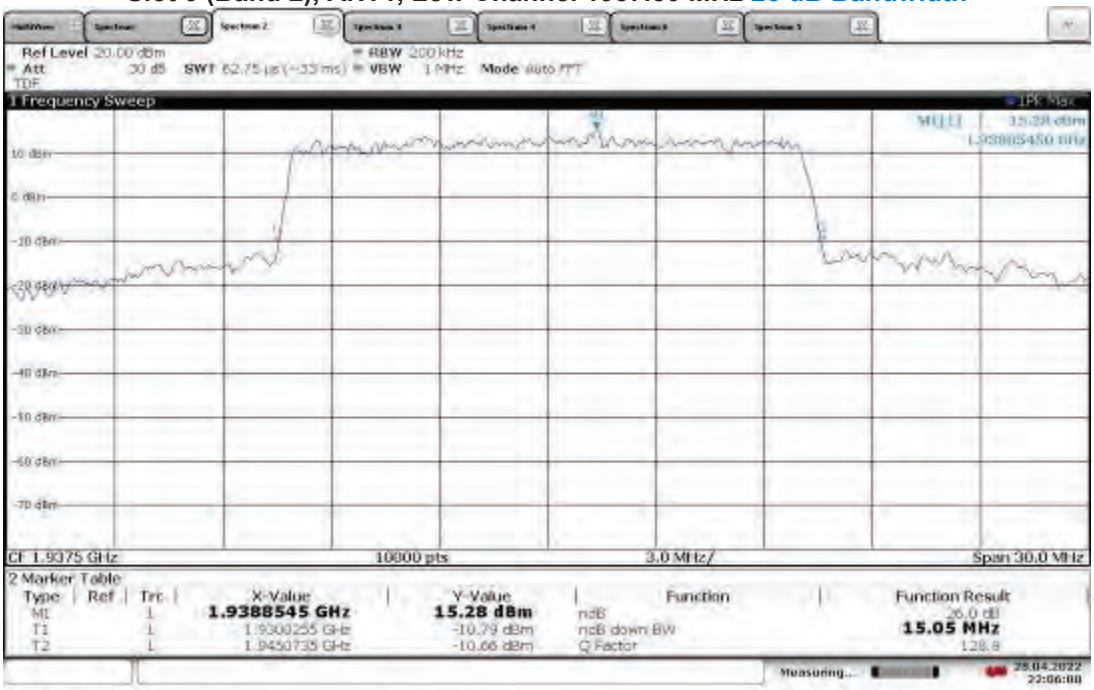


21:14:01 28.04.2022

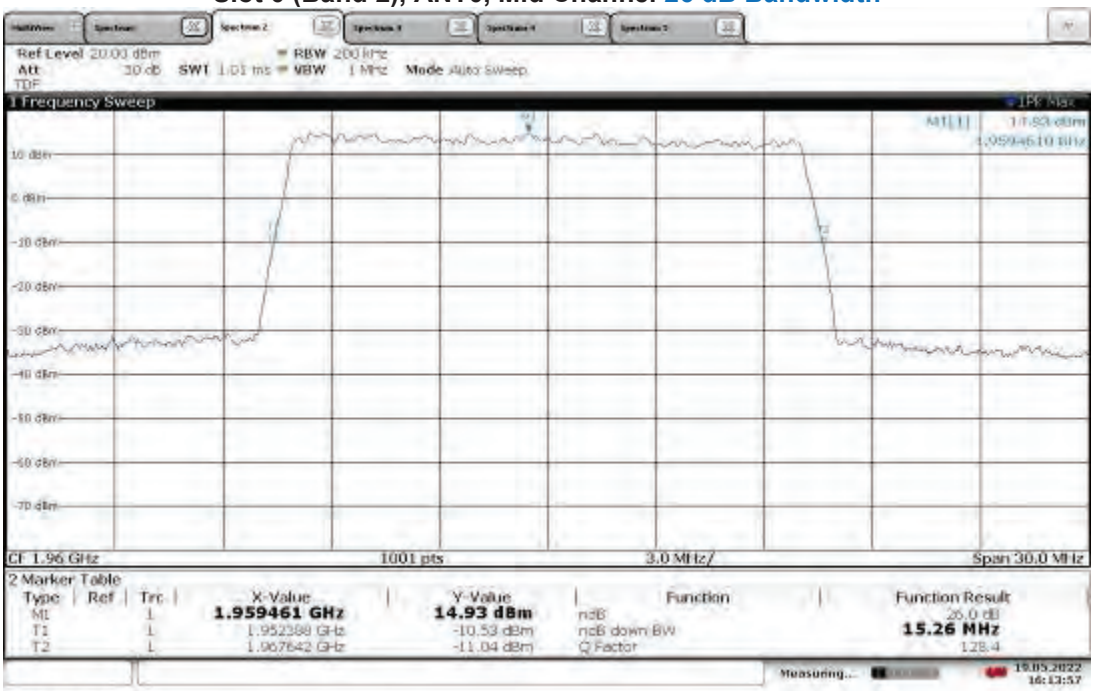
TM3.1a-256QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Low Channel 1937.5 MHz 26 dB Bandwidth



TM3.1a-256QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Low Channel 1937.50 MHz 26 dB Bandwidth

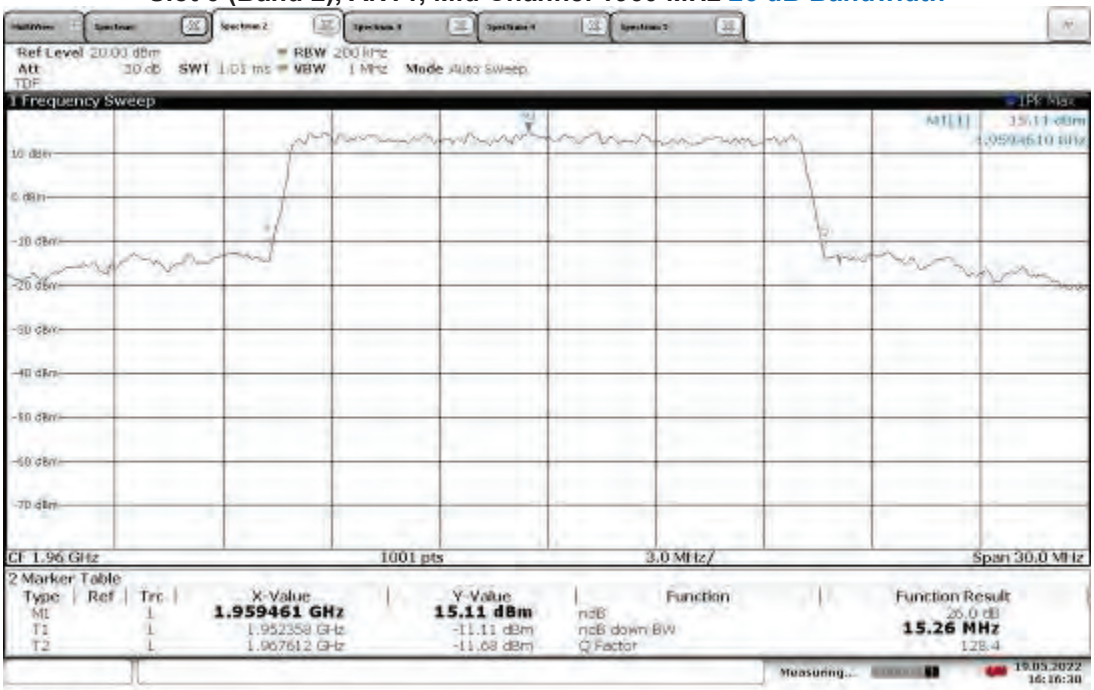


TM3.1a-256QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Mid Channel 26 dB Bandwidth



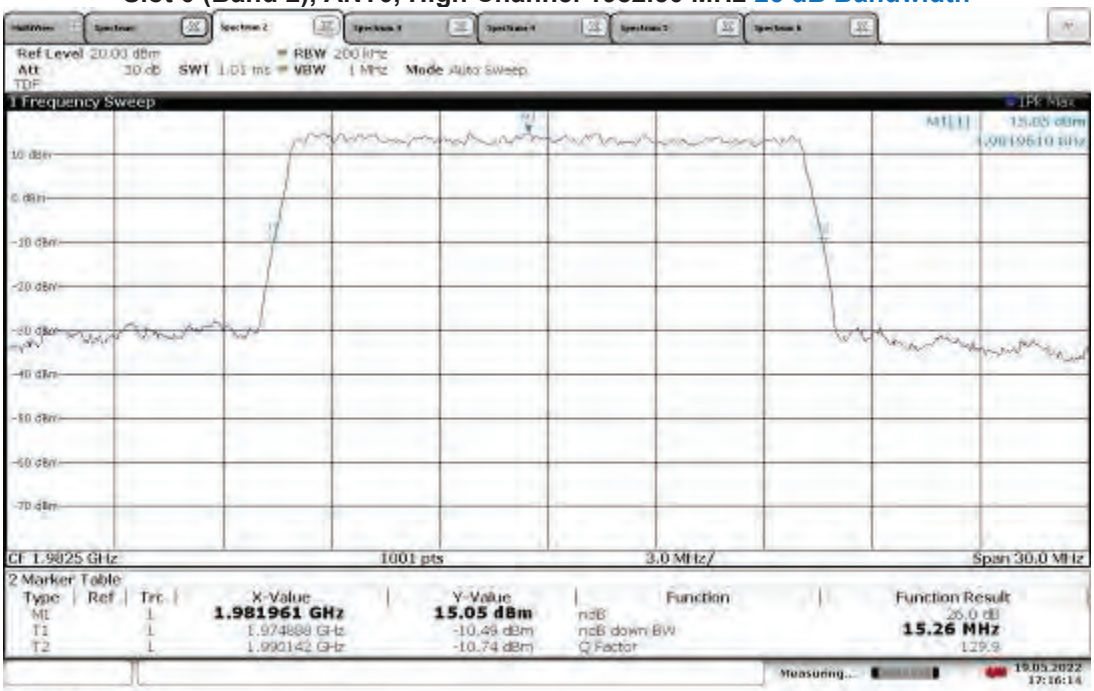
16:13:57 19.05.2022

TM3.1a-256QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Mid Channel 1960 MHz 26 dB Bandwidth

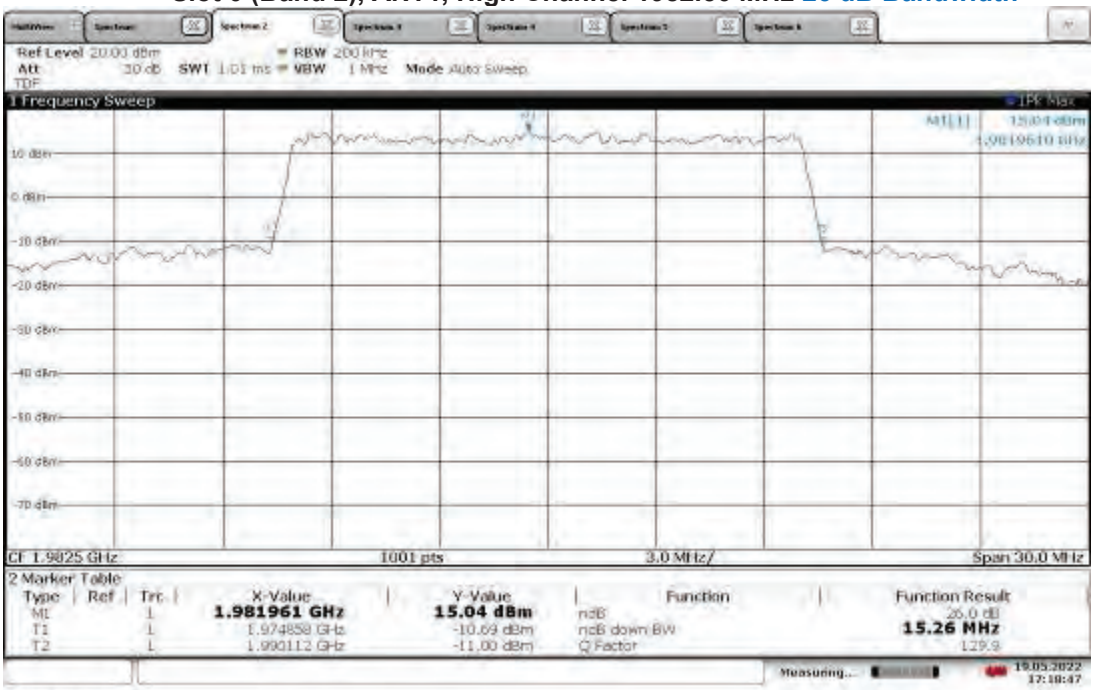


16:16:30 19.05.2022

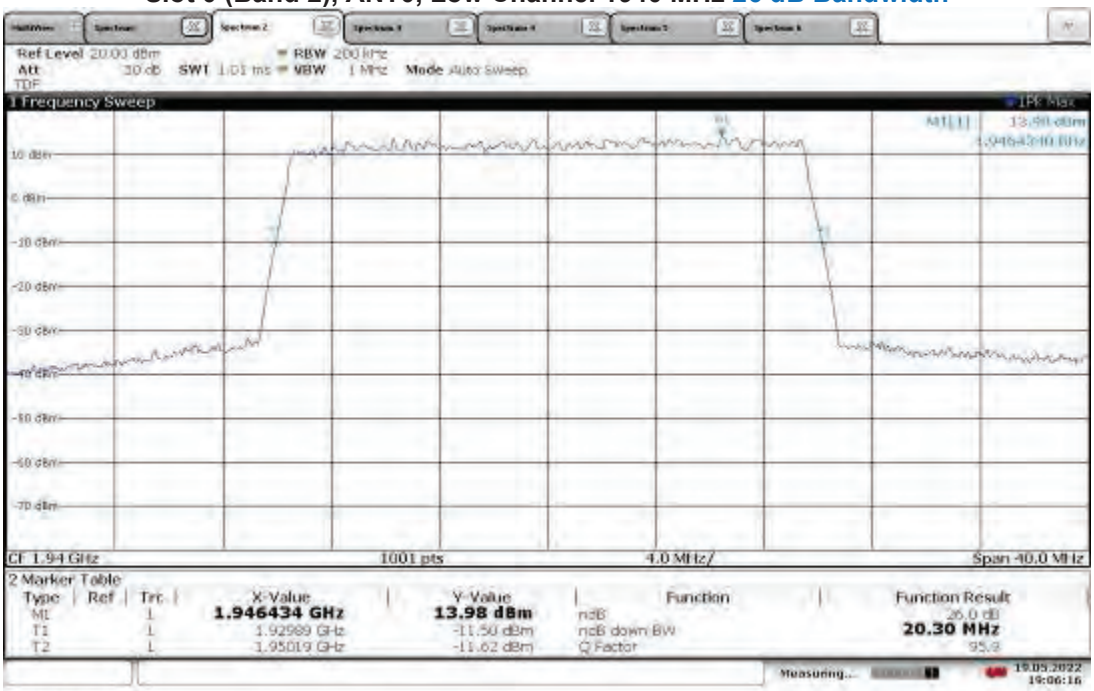
TM3.1a-256QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, High Channel 1982.50 MHz 26 dB Bandwidth



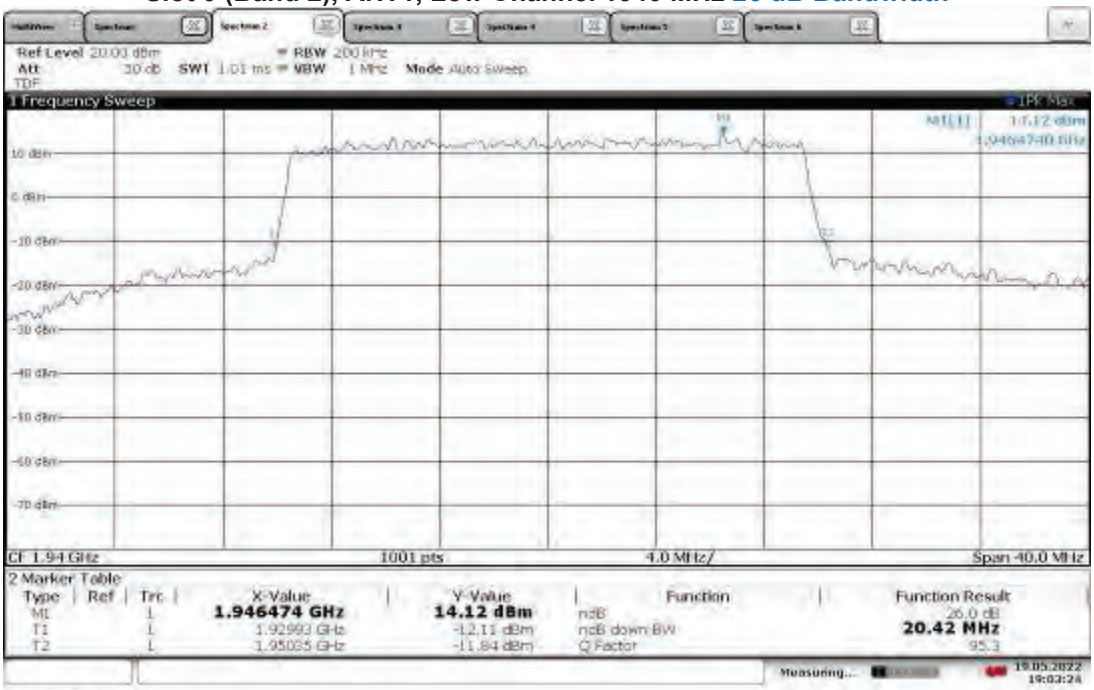
TM3.1a-256QAM_15 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, High Channel 1982.50 MHz 26 dB Bandwidth



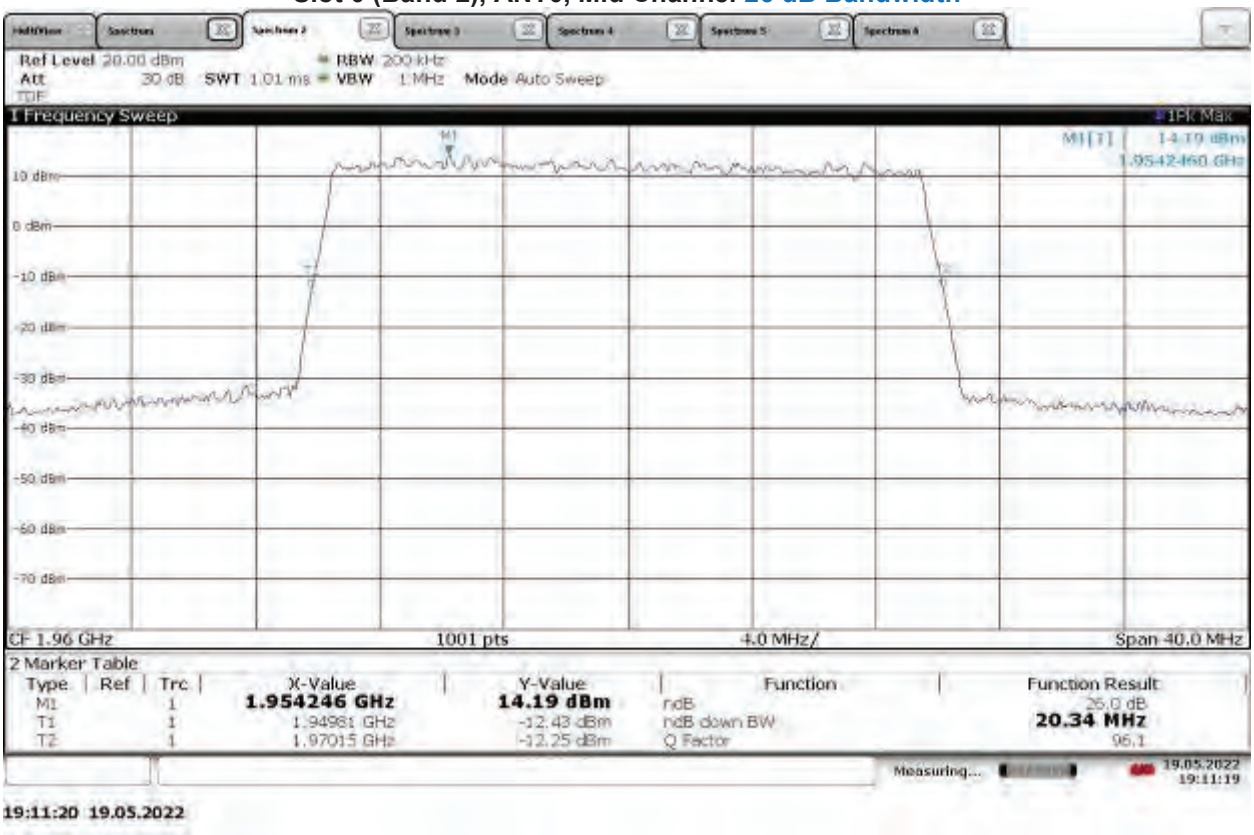
TM3.1a-256QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Low Channel 1940 MHz 26 dB Bandwidth



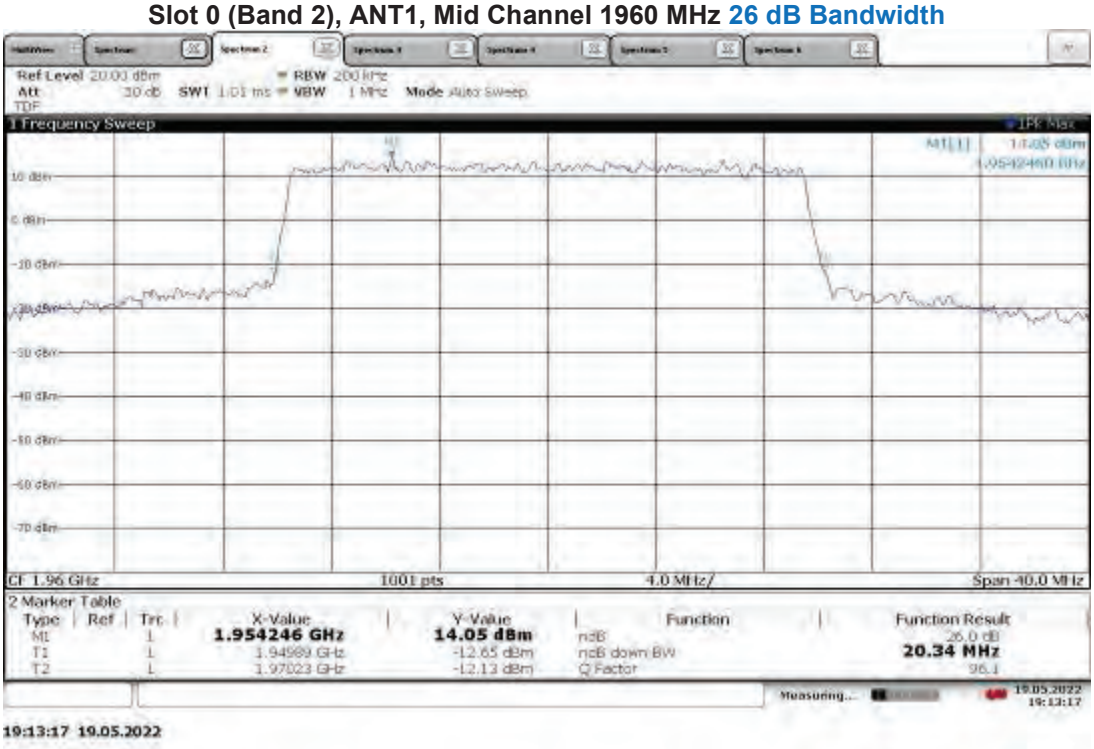
TM3.1a-256QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Low Channel 1940 MHz 26 dB Bandwidth



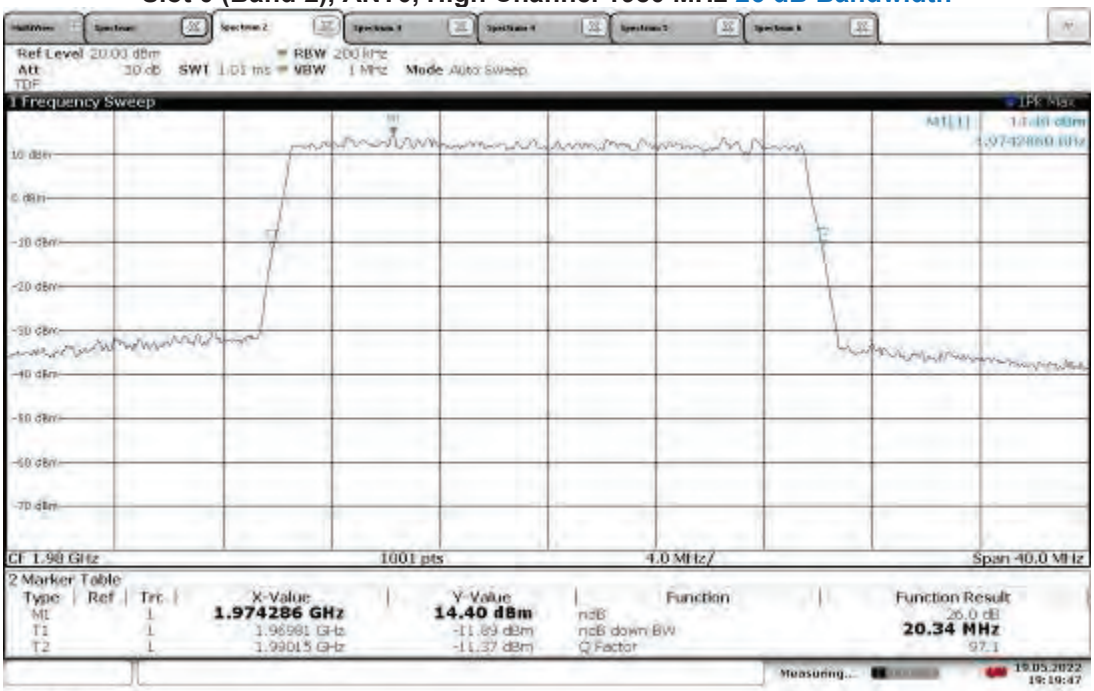
TM3.1a-256QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, Mid Channel 26 dB Bandwidth



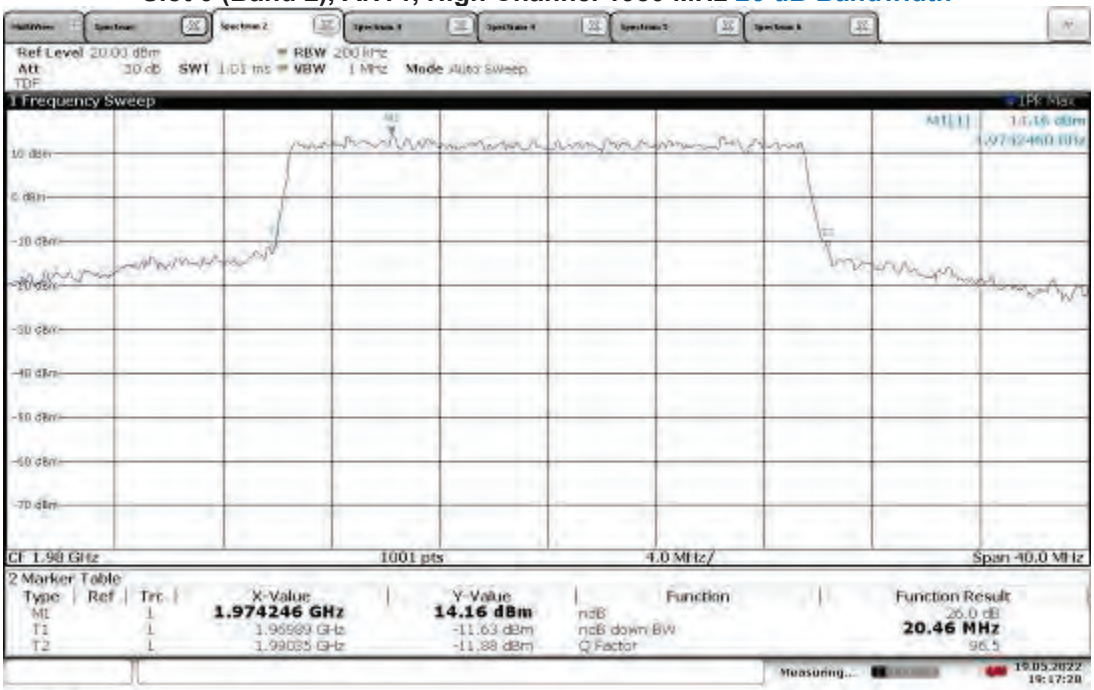
TM3.1a-256QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, Mid Channel 1960 MHz 26 dB Bandwidth



TM3.1a-256QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT0, High Channel 1980 MHz 26 dB Bandwidth



TM3.1a-256QAM_20 MHz Bandwidth (5G NR)
Slot 0 (Band 2), ANT1, High Channel 1980 MHz 26 dB Bandwidth



Test Personnel:	Kouma Sinn KPS	Test Date:	04/18/2022, 04/19/2022, 04/21/2022
Supervising/Reviewing Engineer: (Where Applicable)	Vathana F. Ven VFV		
Product Standard:	FCC Part 24	Limit Applied:	See report section 8.3
Input Voltage:	48 VDC (POE)		
Pretest Verification w/ Ambient Signals or BB Source:	N/A	Ambient Temperature:	25, 25, 24 ºC
		Relative Humidity:	18, 34, 23 %
		Atmospheric Pressure:	1015, 988, 1024 mbars

Deviations, Additions, or Exclusions: None

9 Band Edge Compliance

9.1 Method

Tests are performed in accordance with ANSI C63.26, CFR47 FCC Part §2.1051, and CFR47 FCC Part §24.

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.

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV005'	Weather Station	Davis	6250	MS191218083	02/11/2022	02/11/2023
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	02/10/2023	02/10/2023

Software Utilized:

Name	Manufacturer	Version
None	--	--

9.3 Results:

The sample tested was found to Comply. Since the two antenna ports transmit uncorrelated data streams and use cross polarized antennas, no adjustments to the test results were applied due to MIMO operation, per KDB 662911.

Limits – FCC Part §24.238(a): 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.
(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Slot 0 (Band 2), Bandwidth: 5 MHz, Modulation: TM1.1-QPSK (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1932.50	ANT0	-30.38	-13	-17.38
		ANT1	-15.97	-13	-2.97
High	1987.50	ANT0	-30.64	-13	-17.64
		ANT1	-13.10	-13	-0.1

Slot 0 (Band 2), Bandwidth: 10 MHz, Modulation: TM1.1-QPSK (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1935	ANT0	-30.89	-13	-17.89
		ANT1	-16.33	-13	-3.33
High	1985	ANT0	-30.44	-13	-17.44
		ANT1	-14.57	-13	-1.57

Slot 0 (Band 2), Bandwidth: 15 MHz, Modulation: TM1.1-QPSK (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1937.50	ANT0	-29.58	-13	-16.58
		ANT1	-17.56	-13	-4.56
High	1982.50	ANT0	-28.78	-13	-15.78
		ANT1	-16.57	-13	-3.57

Slot 0 (Band 2), Bandwidth: 20 MHz, Modulation: TM1.1-QPSK (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1940	ANT0	-31.12	-13	-18.12
		ANT1	-19.62	-13	-6.62
High	1980	ANT0	-29.58	-13	-16.58
		ANT1	-18.64	-13	-5.64

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1932.50	ANT0	-29.41	-13	-16.41
		ANT1	-14.27	-13	-1.27
High	1987.50	ANT0	-31.00	-13	-18
		ANT1	-13.07	-13	-0.07

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1935	ANT0	-30.10	-13	-17.1
		ANT1	-15.99	-13	-2.99
High	1985	ANT0	-31.63	-13	-18.63
		ANT1	-15.70	-13	-2.7

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1937.50	ANT0	-17.48	-13	-4.48
		ANT1	-17.72	-13	-4.72
High	1982.50	ANT0	-29.60	-13	-16.6
		ANT1	-16.26	-13	-3.26

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1940	ANT0	-32.63	-13	-19.63
		ANT1	-19.07	-13	-6.07
High	1980	ANT0	-32.59	-13	-19.59
		ANT1	-18.92	-13	-5.92

Slot 0 (Band 2), Bandwidth: 5 MHz, Modulation: TM3.1-64QAM (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1932.50	ANT0	-30.13	-13	-17.13
		ANT1	-15.19	-13	-2.19
High	1987.50	ANT0	-29.81	-13	-16.81
		ANT1	-13.50	-13	-0.5

Slot 0 (Band 2), Bandwidth: 10 MHz, Modulation: TM3.1-64QAM (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1935	ANT0	-30.36	-13	-17.36
		ANT1	-17.13	-13	-4.13
High	1985	ANT0	-31.24	-13	-18.24
		ANT1	-15.58	-13	-2.58

Slot 0 (Band 2), Bandwidth: 15 MHz, Modulation: TM3.1-64QAM (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1937.50	ANT0	-21.12	-13	-8.12
		ANT1	-17.92	-13	-4.92
High	1982.50	ANT0	-32.51	-13	-19.51
		ANT1	-17.50	-13	-4.5

Slot 0 (Band 2), Bandwidth: 20 MHz, Modulation: TM3.1-64QAM (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1940	ANT0	-31.12	-13	-18.12
		ANT1	-20.65	-13	-7.65
High	1980	ANT0	-30.46	-13	-17.46
		ANT1	-18.97	-13	-5.97

Slot 0 (Band 2), Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1932.50	ANT0	-30.40	-13	-17.4
		ANT1	-14.41	-13	-1.41
High	1987.50	ANT0	-29.12	-13	-16.12
		ANT1	-13.20	-13	-0.2

Slot 0 (Band 2), Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1935	ANT0	-30.39	-13	-17.39
		ANT1	-16.76	-13	-3.76
High	1985	ANT0	-30.53	-13	-17.53
		ANT1	-15.09	-13	-2.09

Slot 0 (Band 2), Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM (5G NR)

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1937.50	ANT0	-31.81	-13	-18.81
		ANT1	-18.35	-13	-5.35
High	1982.50	ANT0	-31.54	-13	-18.54
		ANT1	-16.49	-13	-3.49

Slot 0 (Band 2), Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM (5G NR)

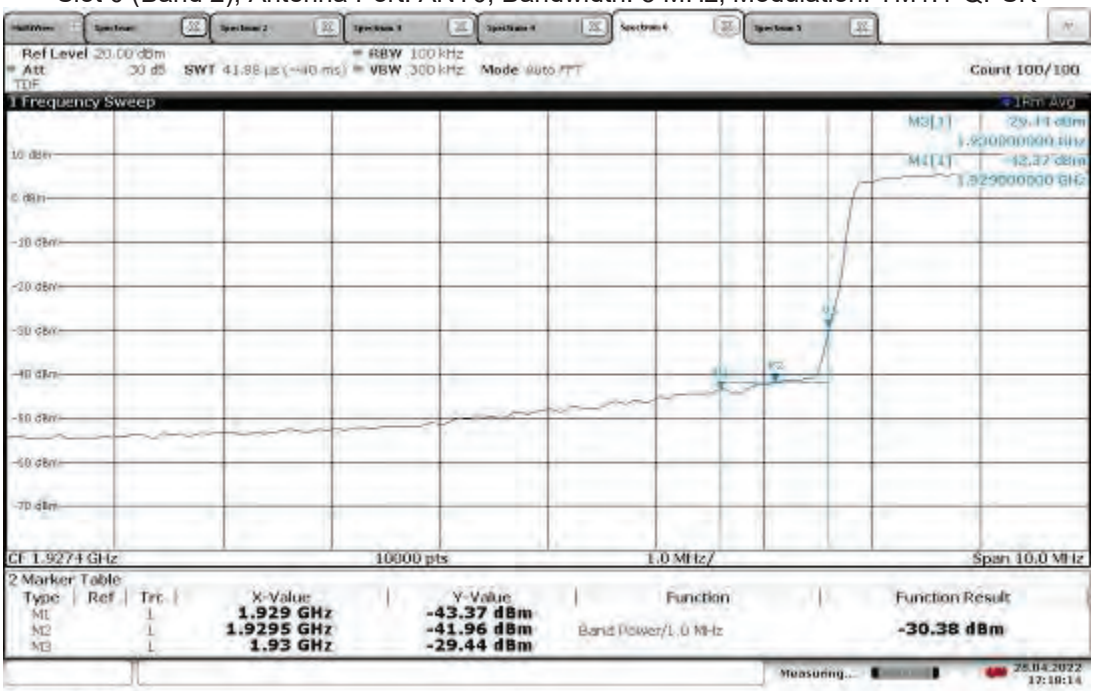
Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)	Limit (dBm)	Margin (dB)
Low	1940	ANT0	-31.99	-13	-18.99
		ANT1	-19.41	-13	-6.41
High	1980	ANT0	-29.03	-13	-16.03
		ANT1	-18.54	-13	-5.54

9.4 Setup Photograph:

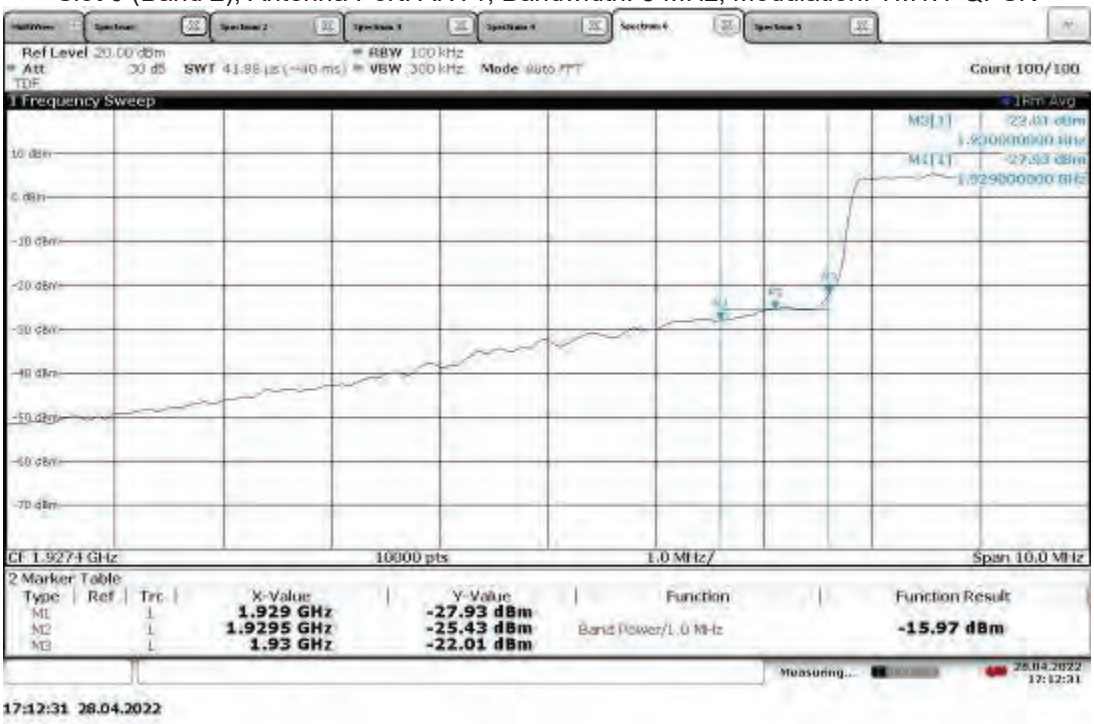
Confidential – Photos not included in this report

9.5 Plots/Data:

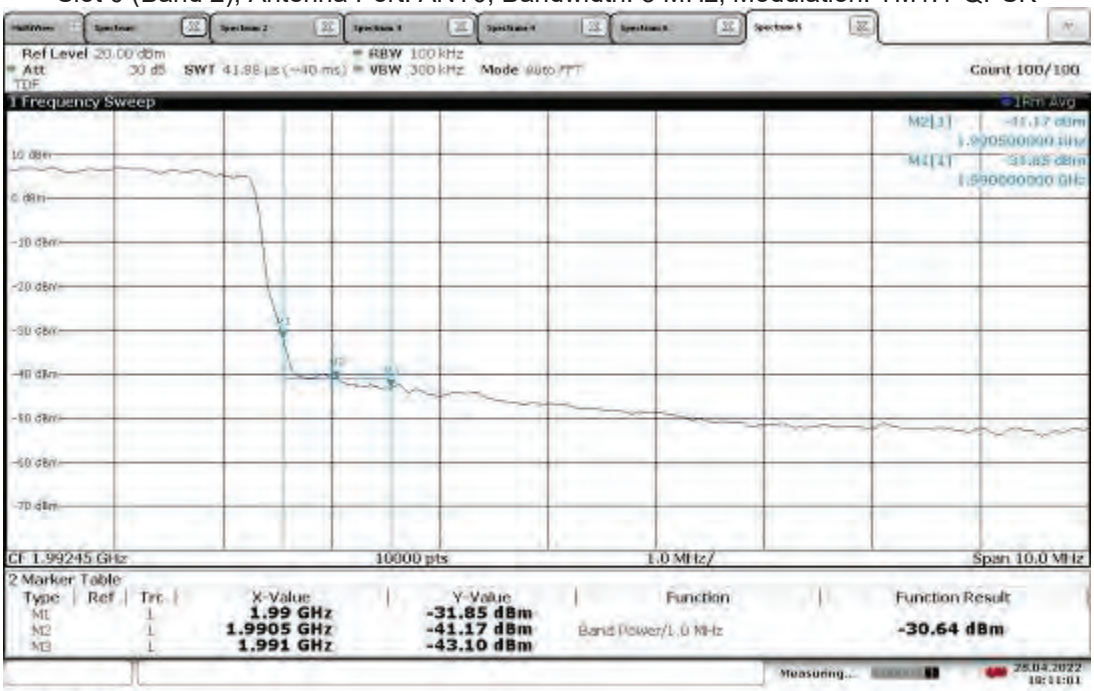
Band Edge Compliant, Lower Band Edge, 1932.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



Band Edge Compliant, Lower Band Edge, 1932.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK

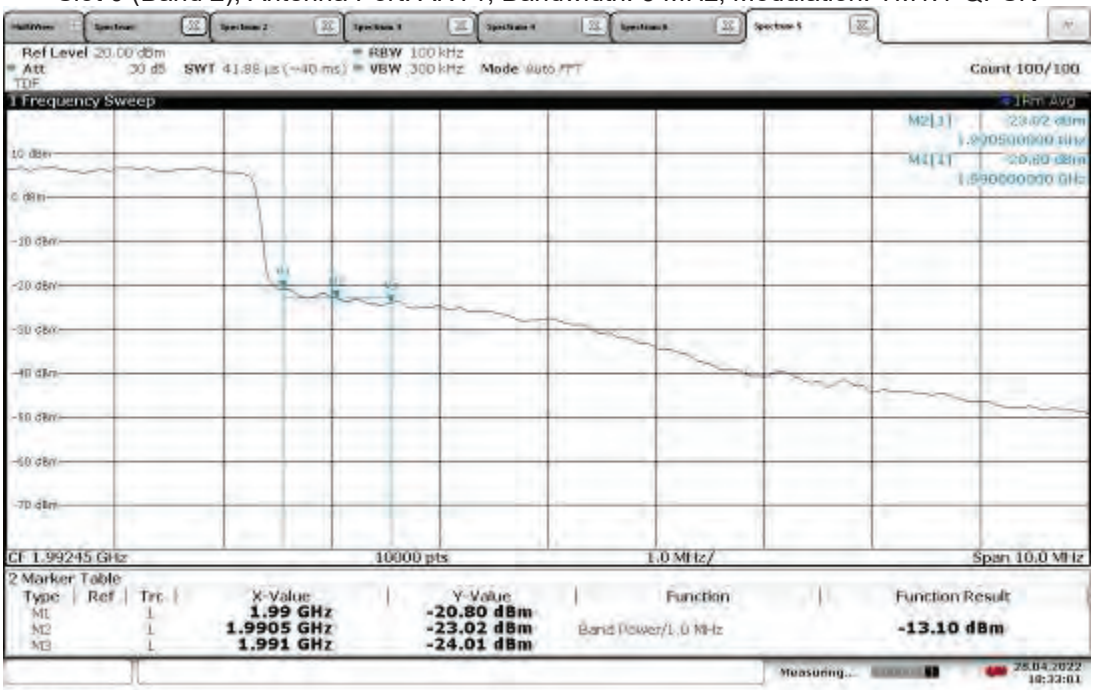


Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



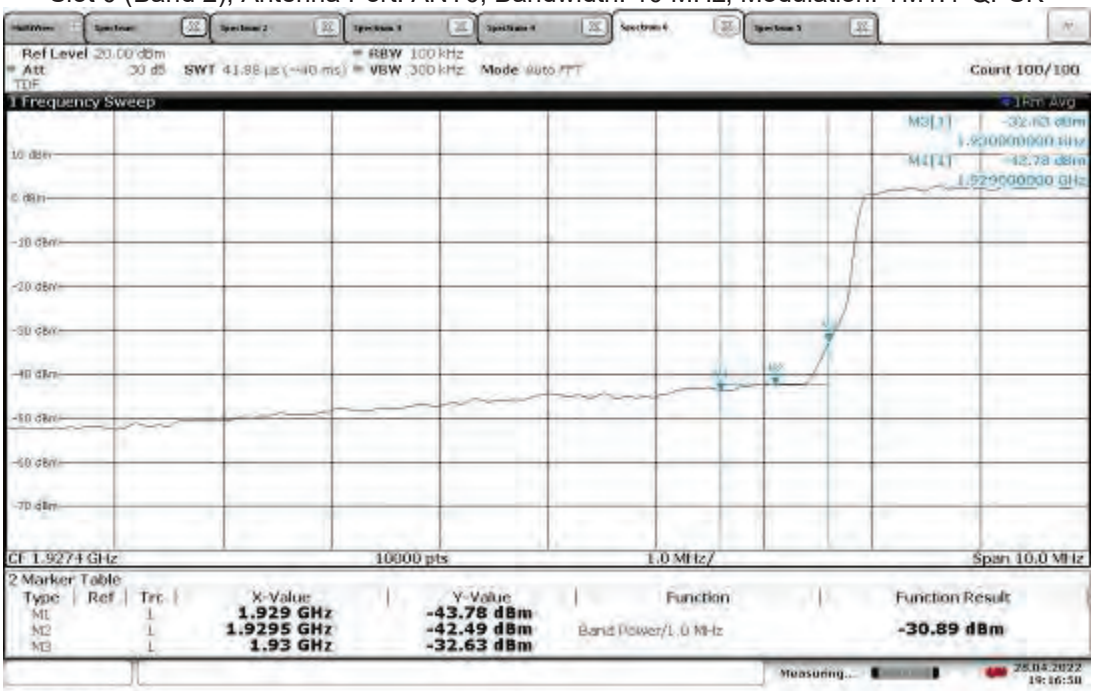
18:11:01 28.04.2022

Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



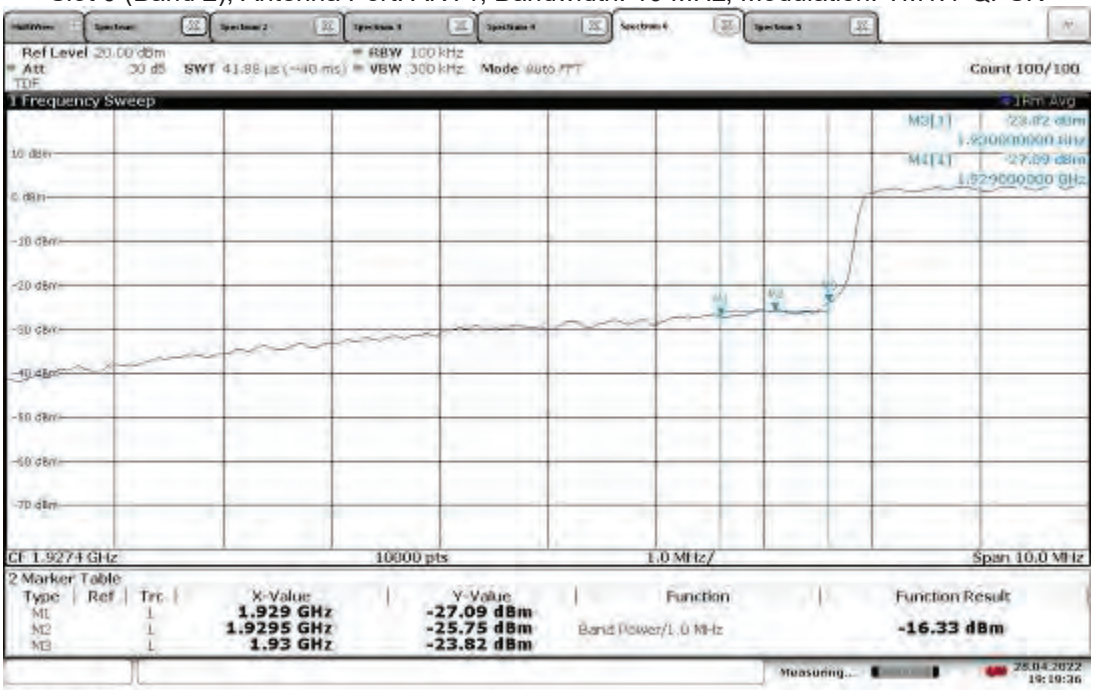
18:33:02 28.04.2022

Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



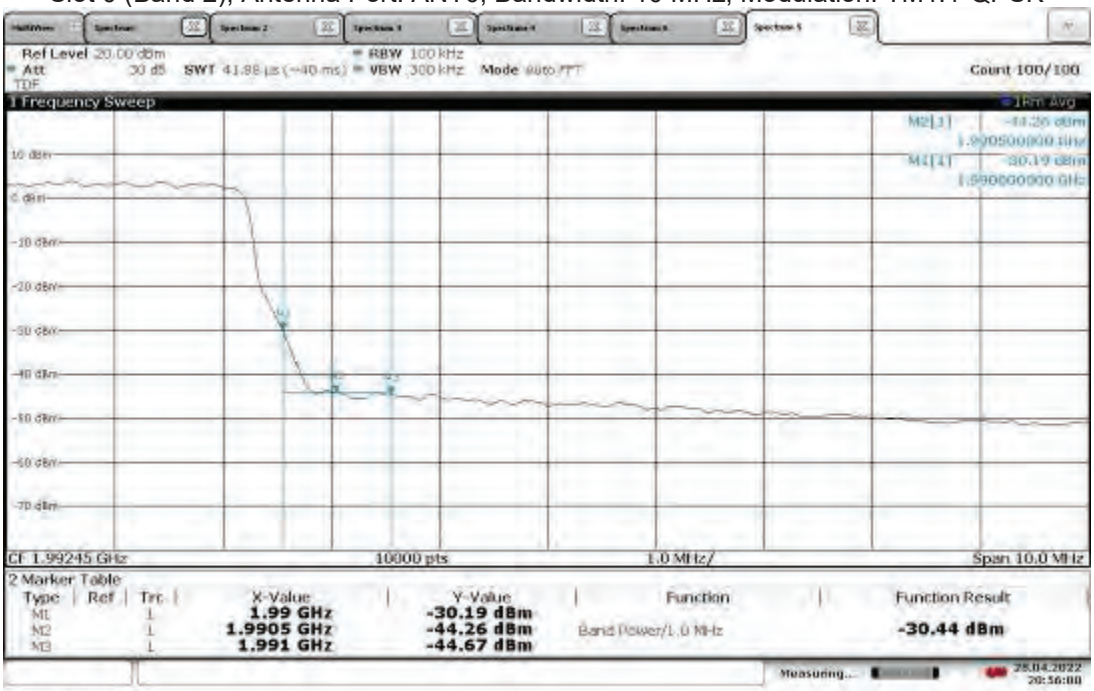
19:16:50 28.04.2022

Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



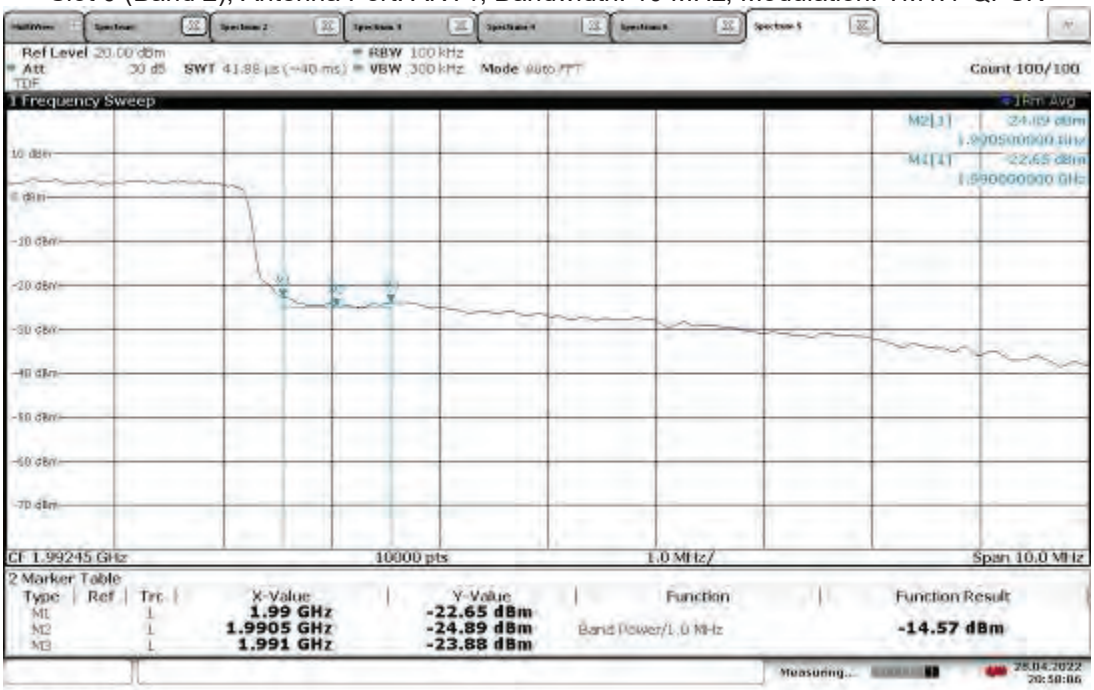
19:19:37 28.04.2022

Band Edge Compliant, Upper Edge, 1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



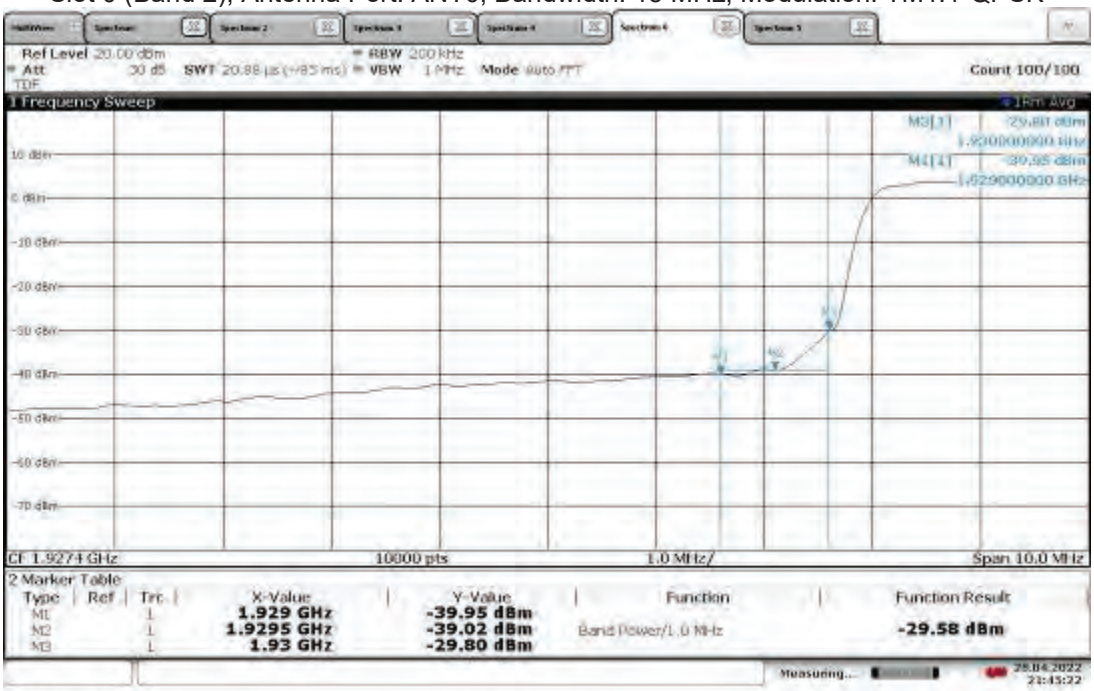
20:56:00 28.04.2022

Band Edge Compliant, Upper Edge,1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



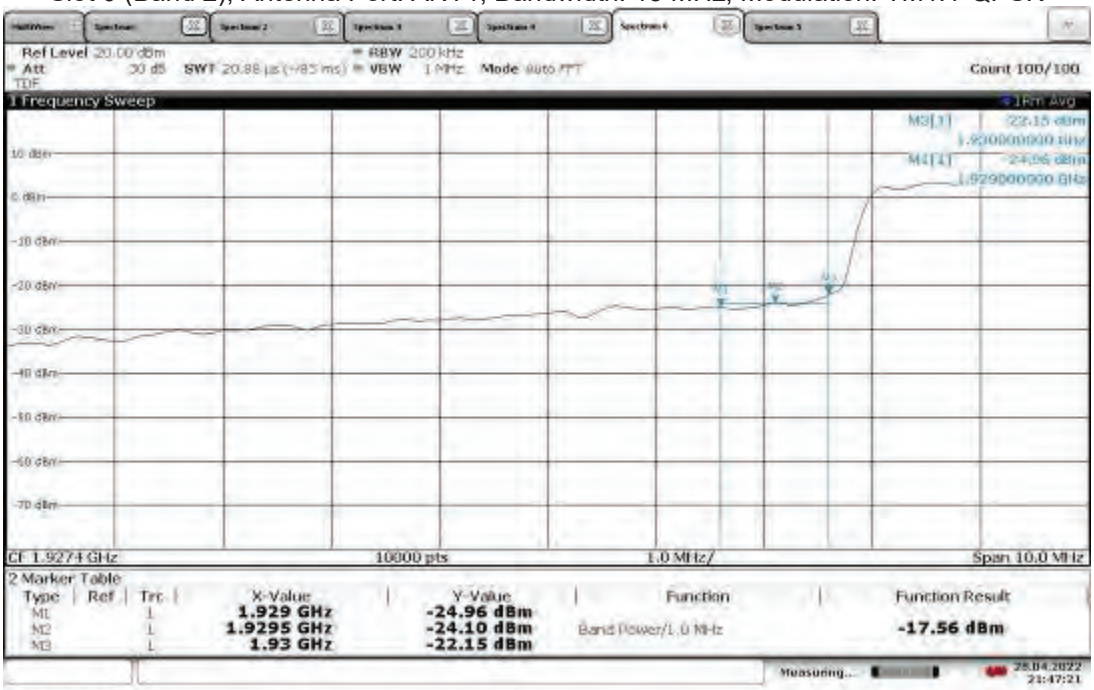
20:58:06 28.04.2022

Band Edge Compliant, Lower Band Edge, 1937.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



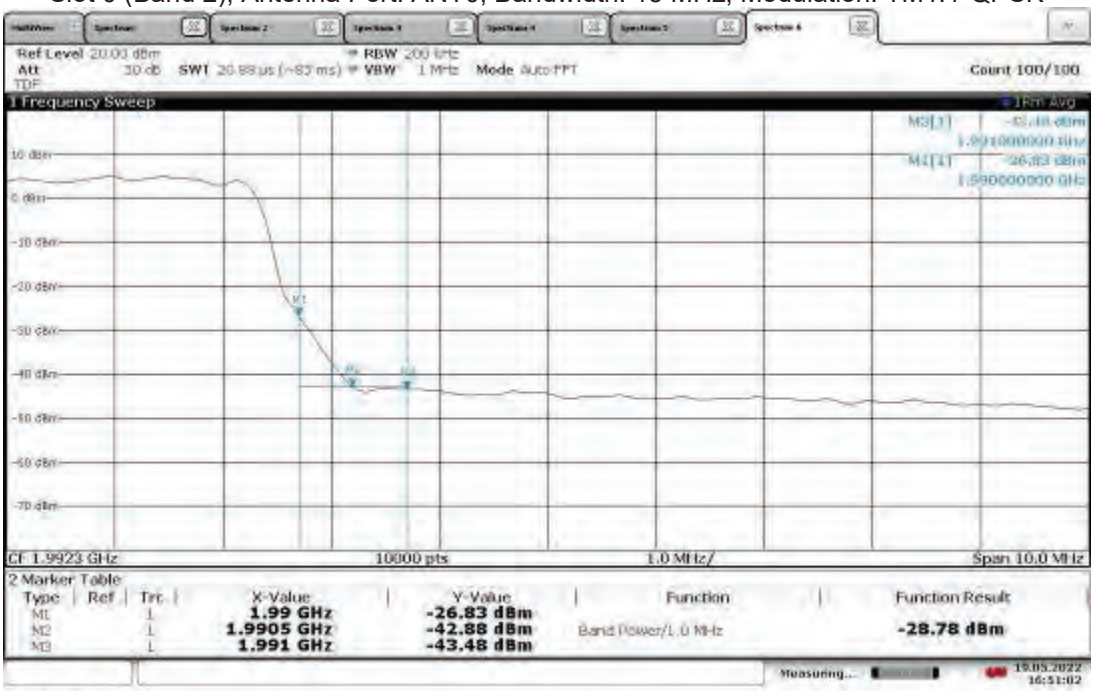
21:45:22 28.04.2022

Band Edge Compliant, Lower Band Edge, 1937.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



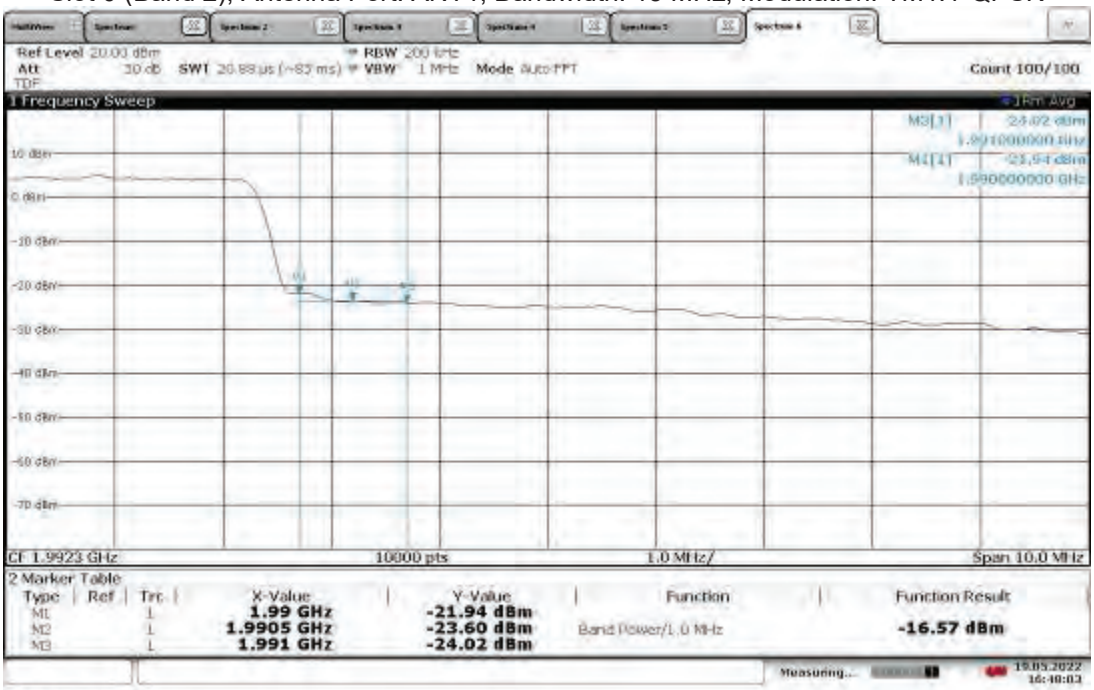
21:47:22 28.04.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



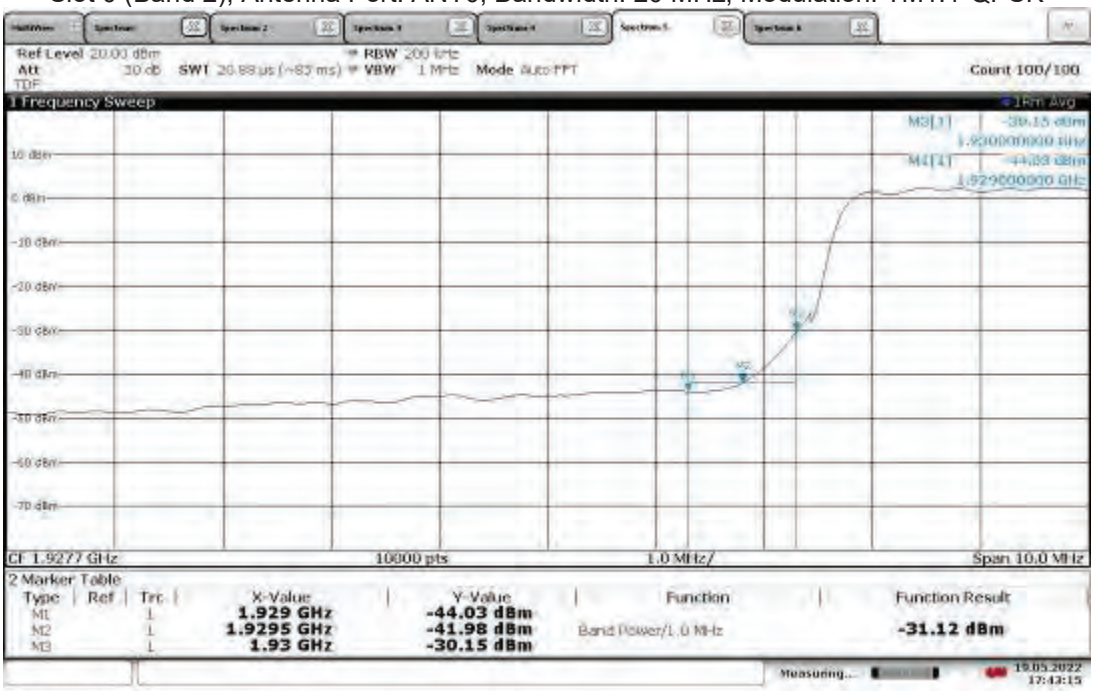
16:51:03 19.05.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



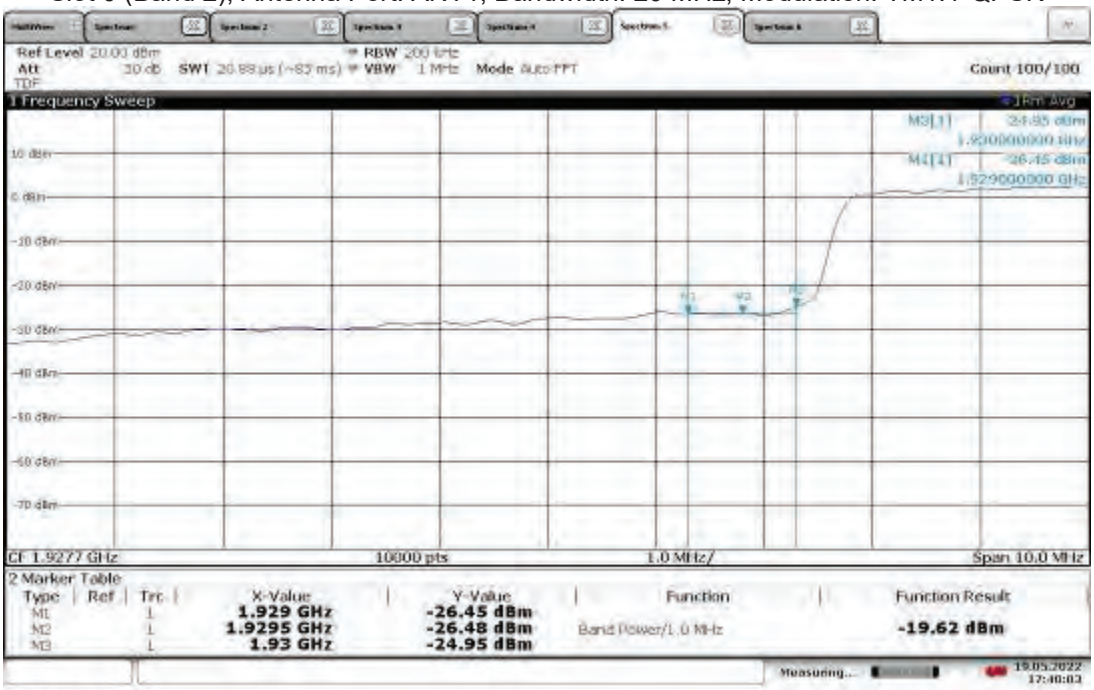
16:48:03 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



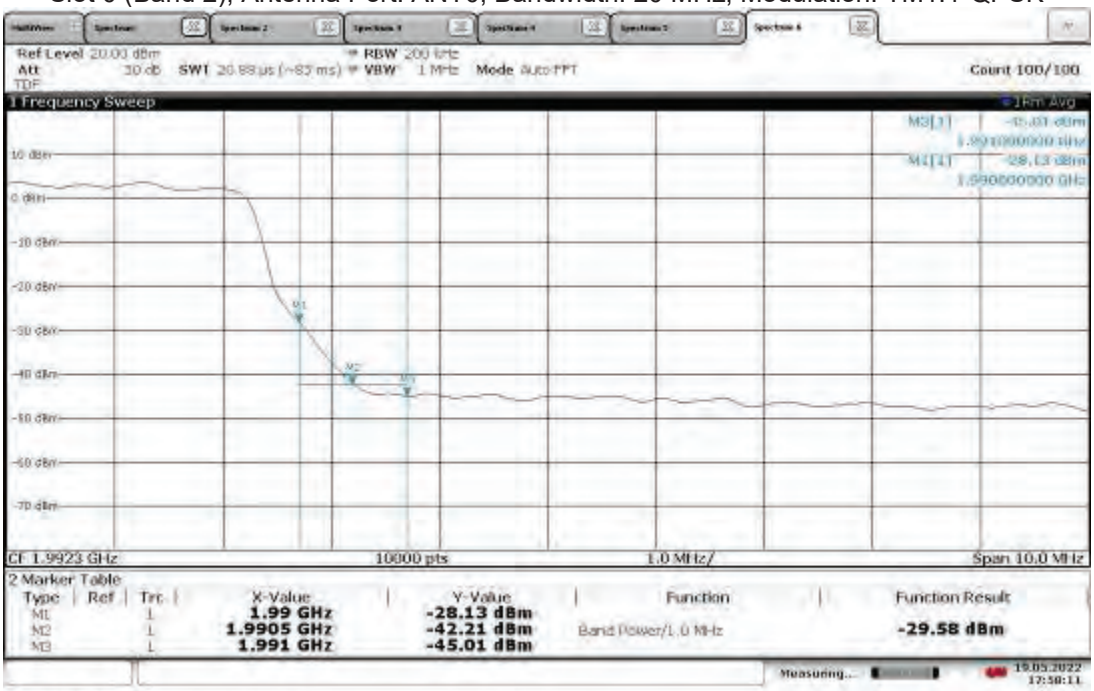
17:43:15 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



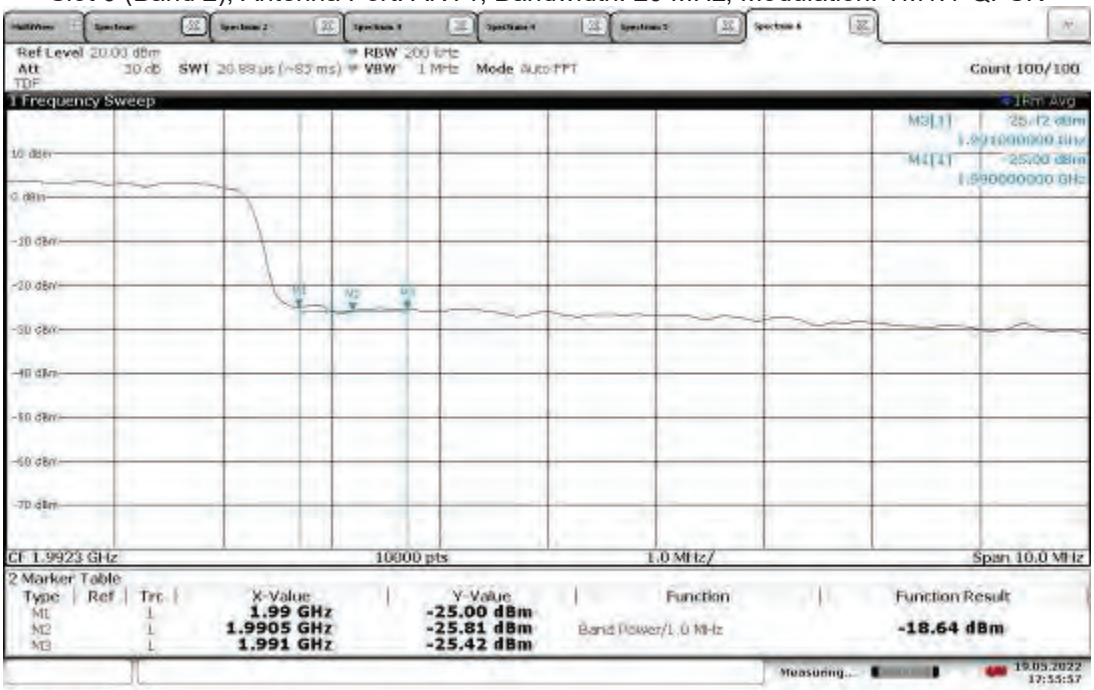
17:40:04 19.05.2022

Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



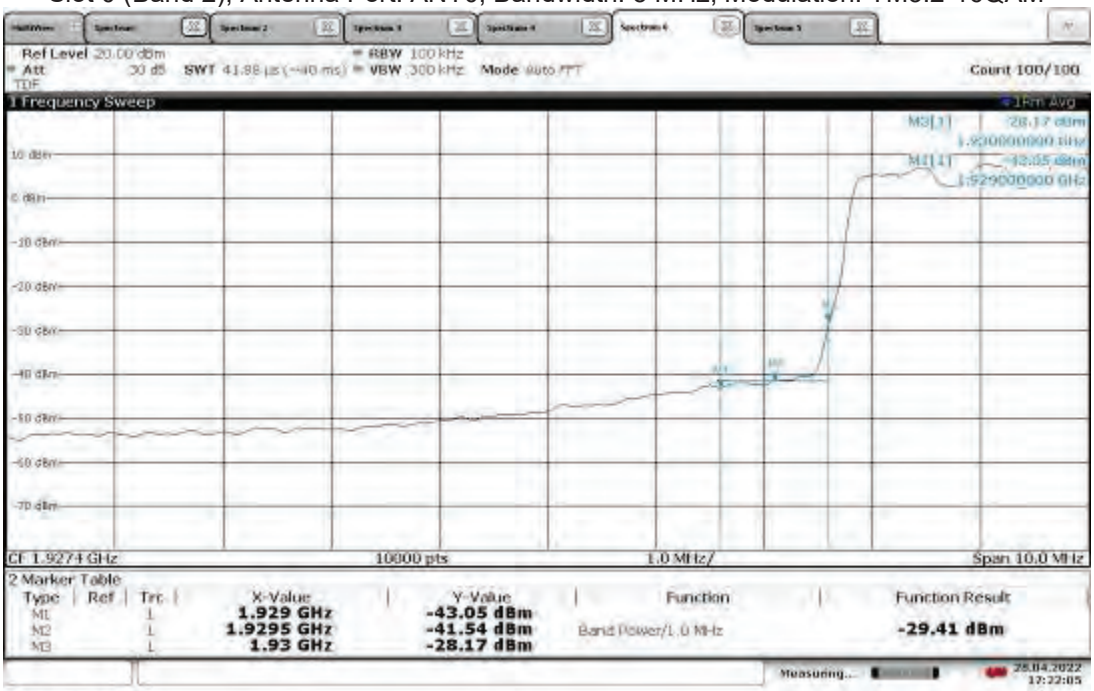
17:58:11 19.05.2022

Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



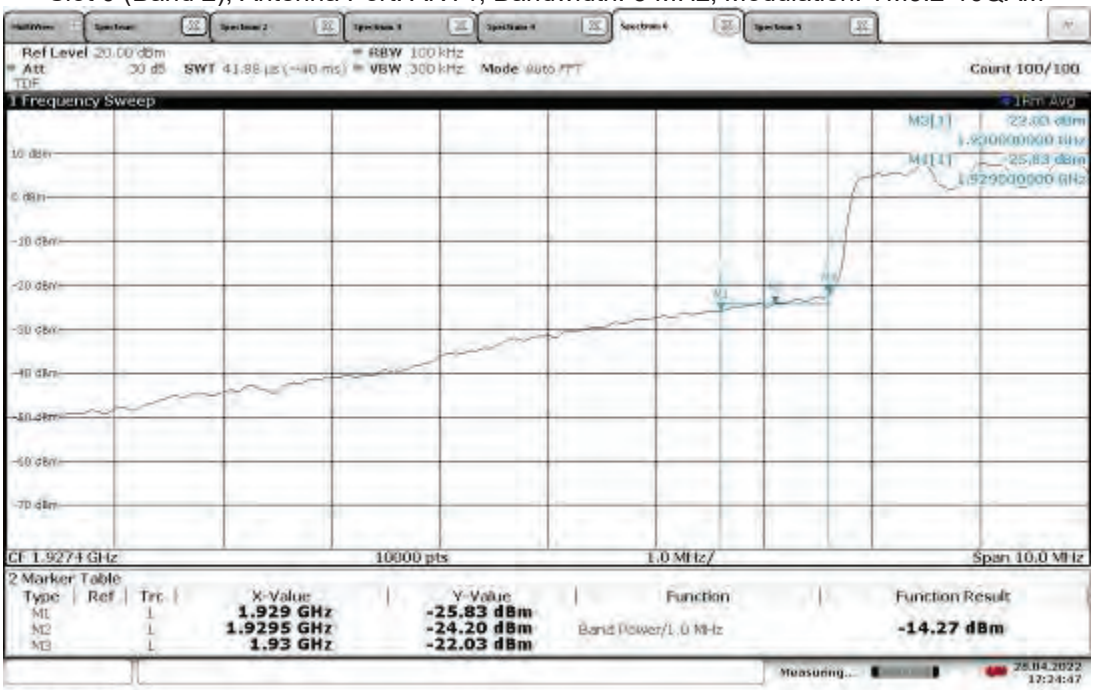
17:55:57 19.05.2022

Band Edge Compliant, Lower Band Edge, 1932.5MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



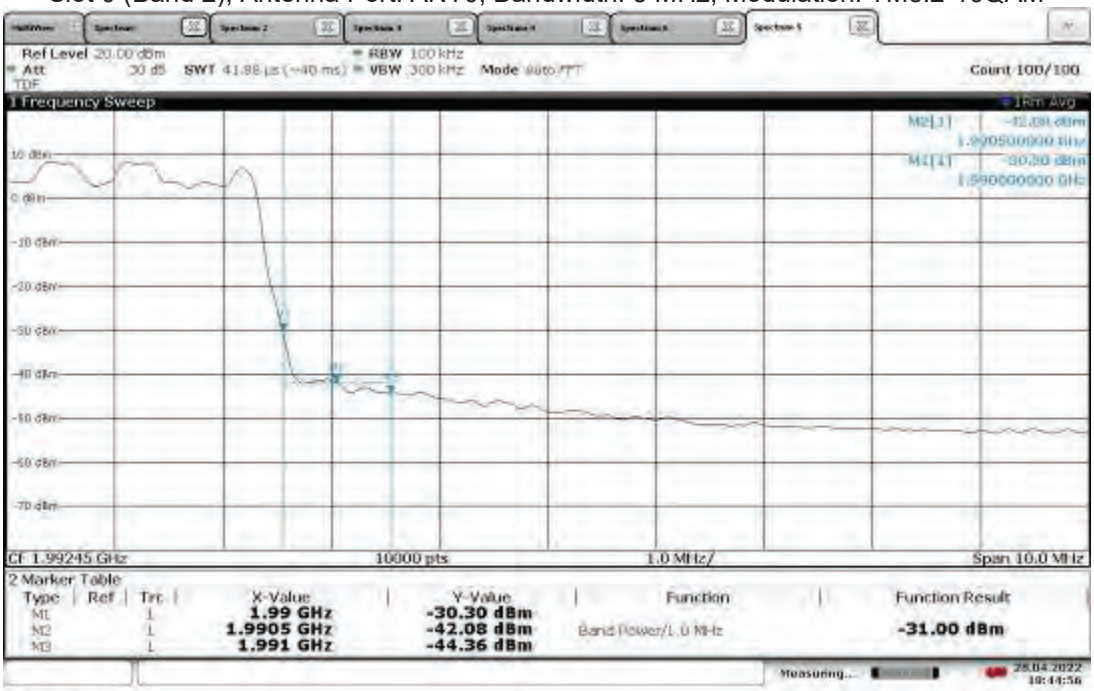
17:22:06 28.04.2022

Band Edge Compliant, Lower Band Edge, 1932.5MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



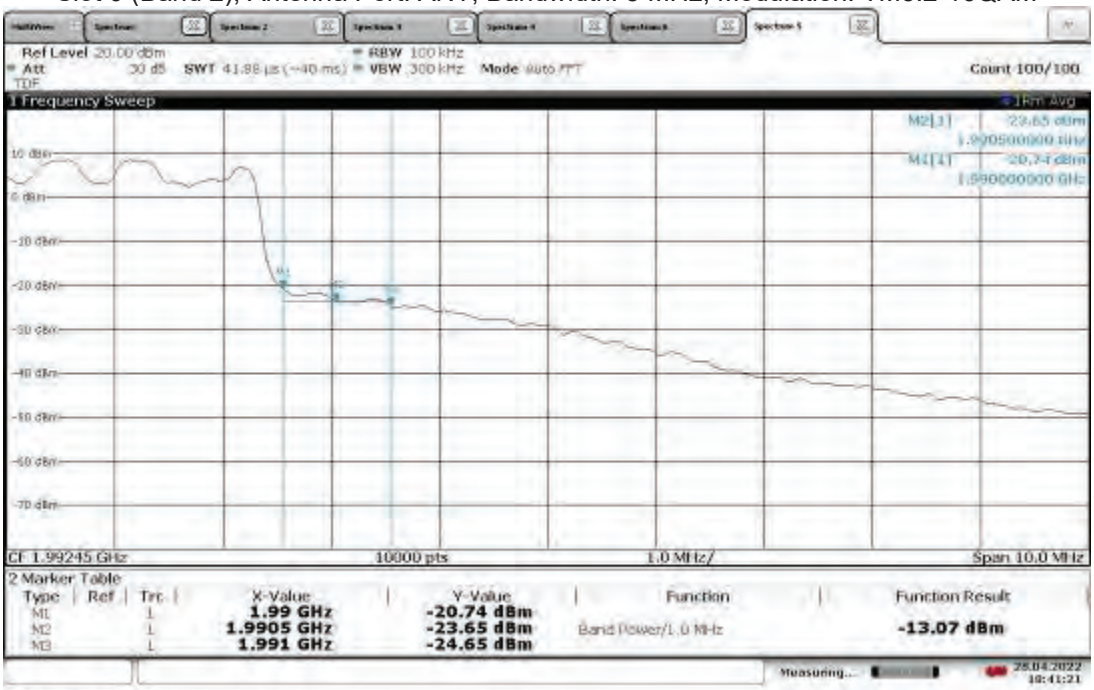
17:24:47 28.04.2022

Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



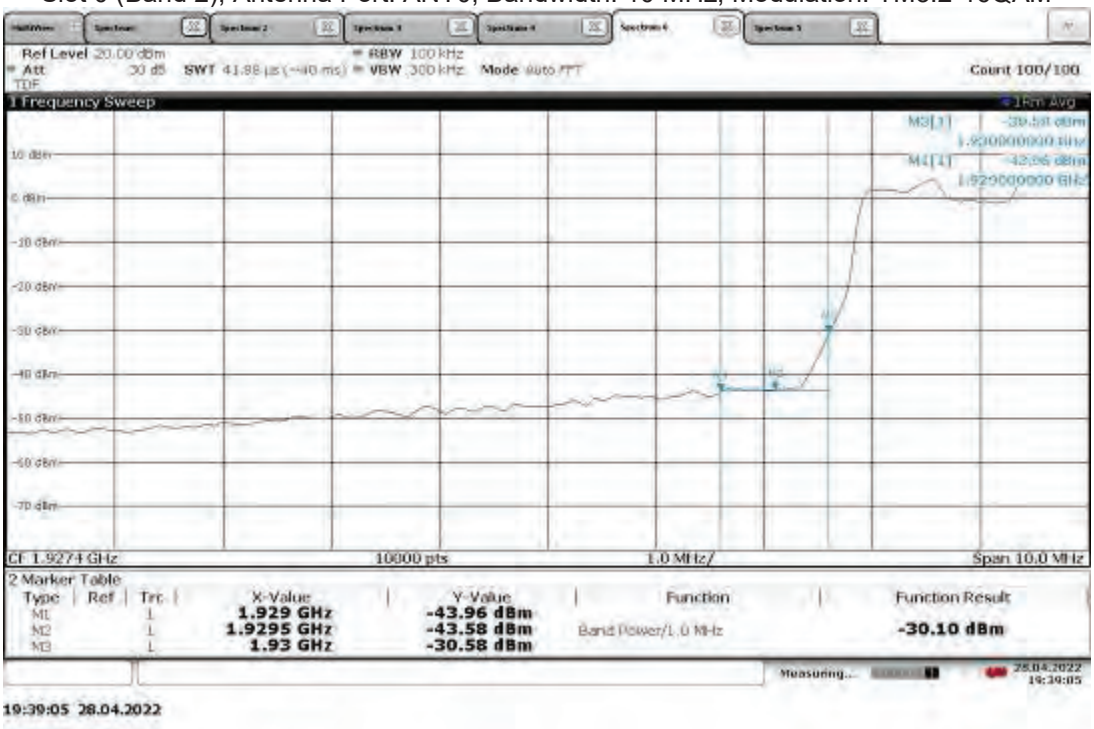
18:44:57 28.04.2022

Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM

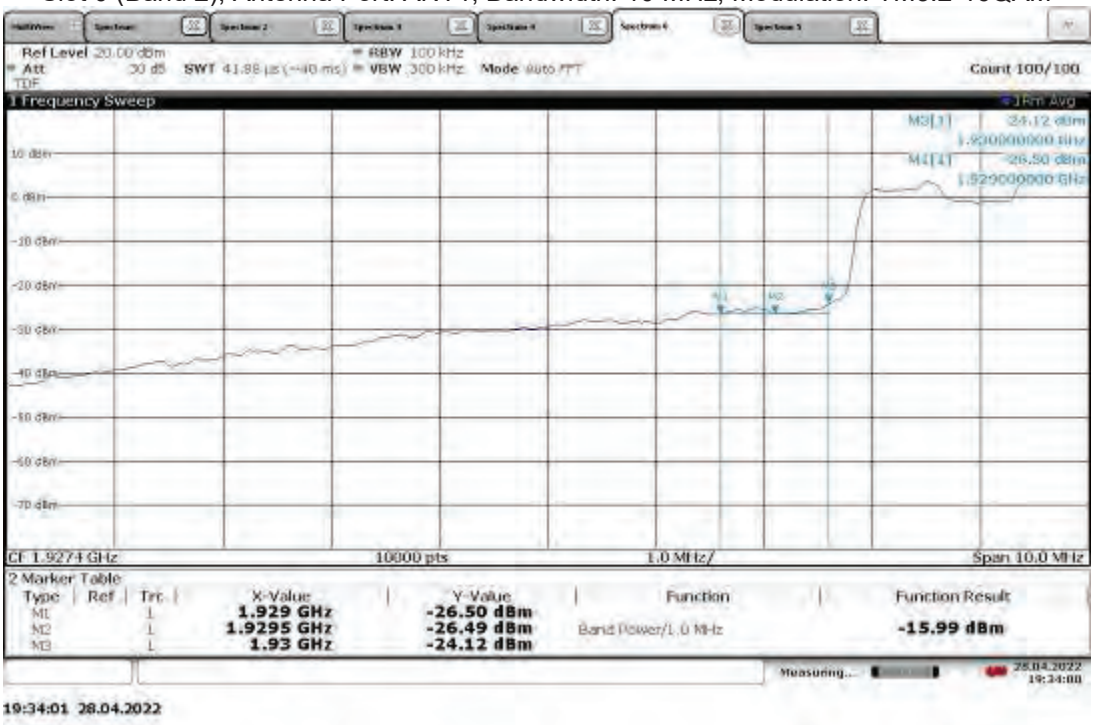


18:41:21 28.04.2022

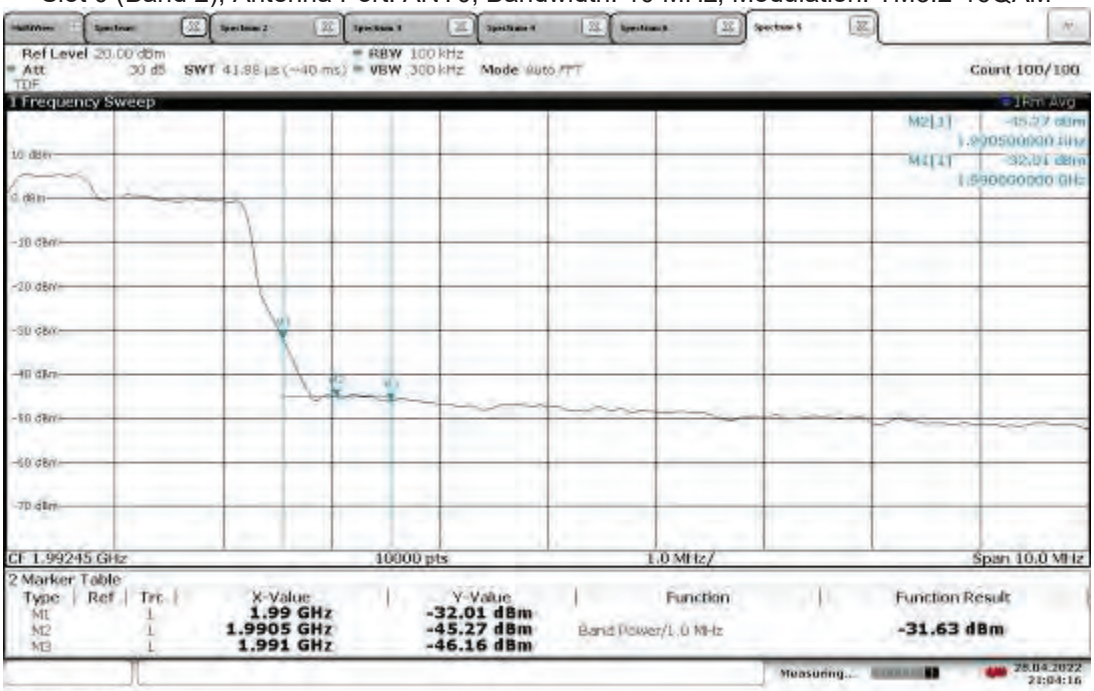
Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



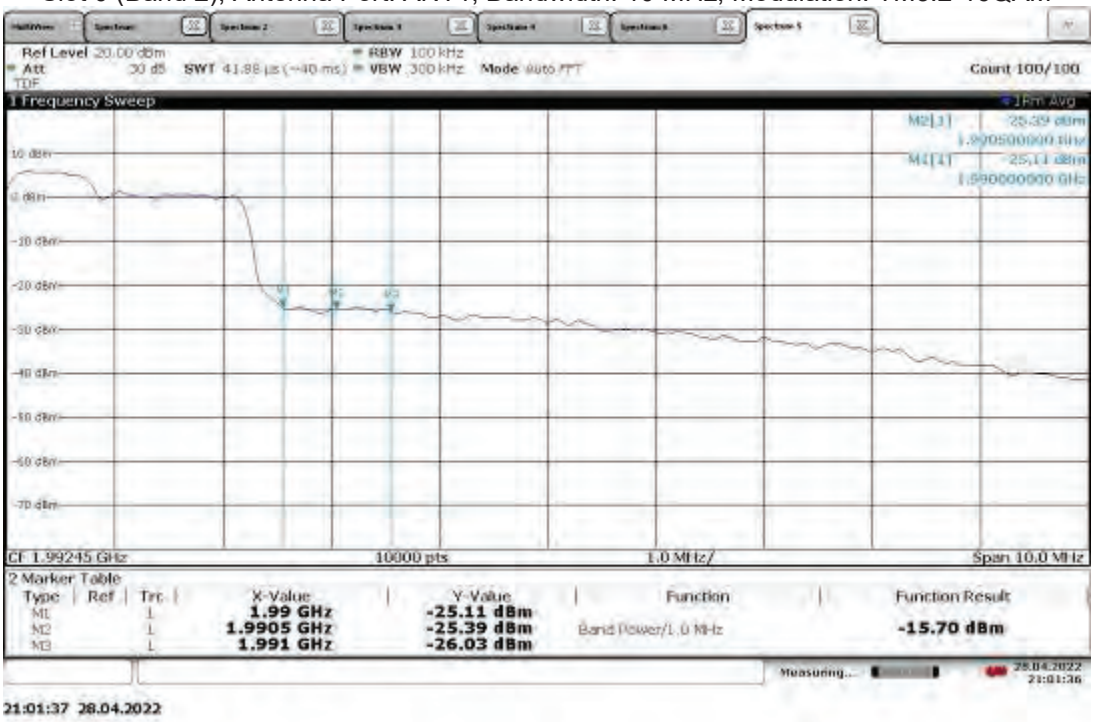
Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



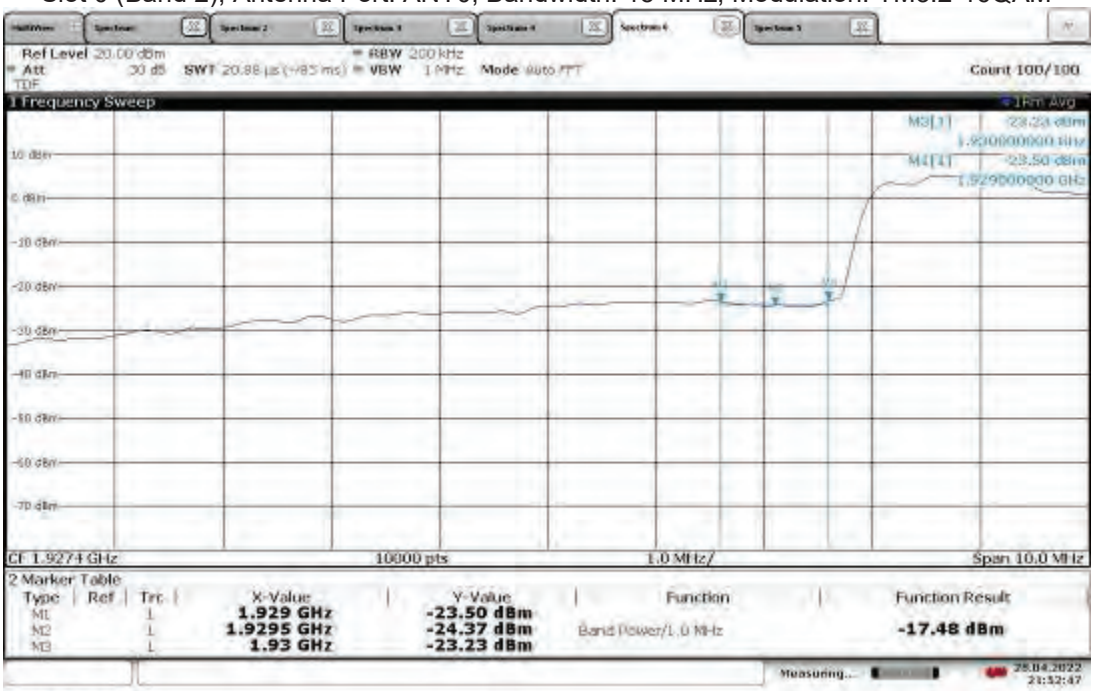
Band Edge Compliant, Upper Band Edge, 1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



Band Edge Compliant, Upper Band Edge, 1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM

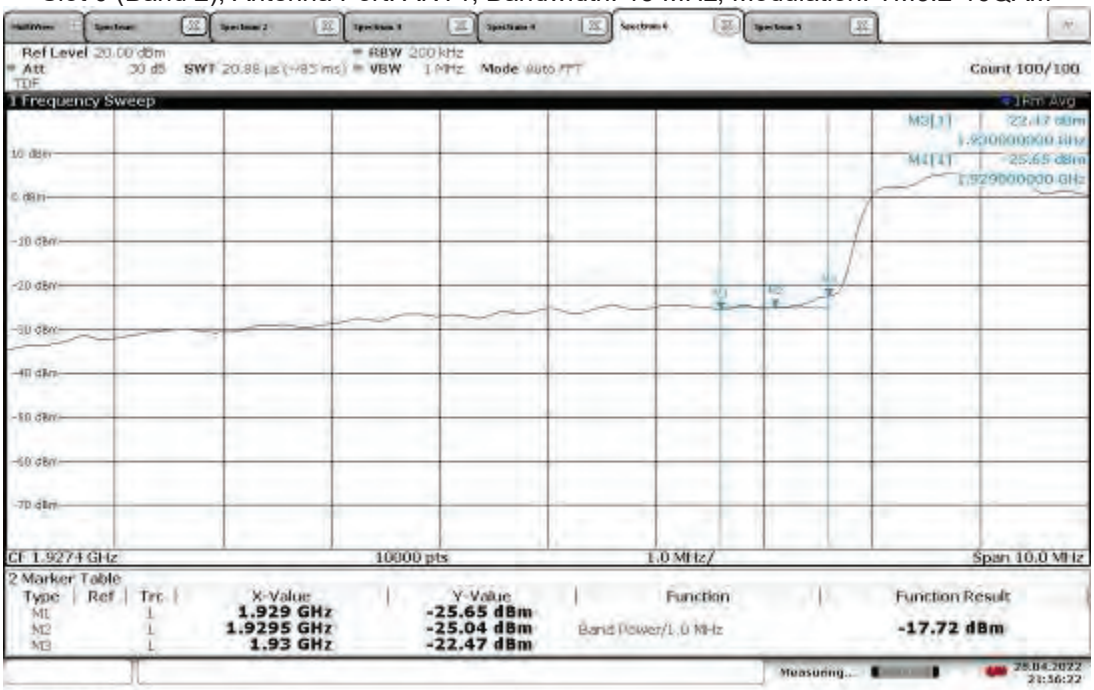


Band Edge Compliant, Lower Band Edge, 1937.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



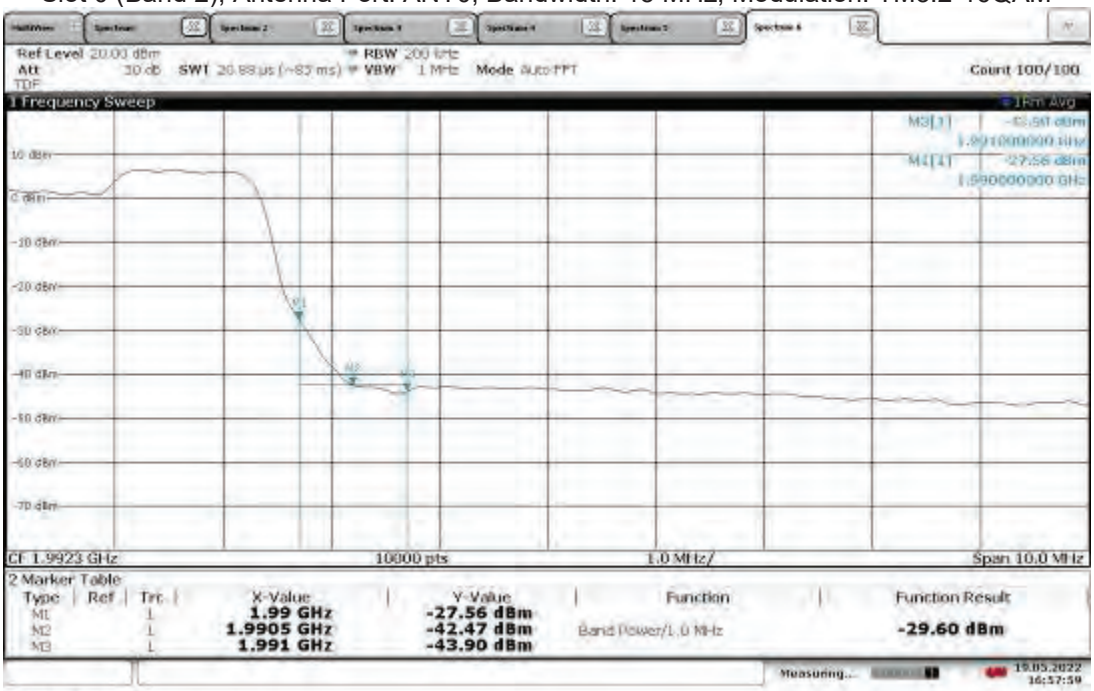
21:52:48 28.04.2022

Band Edge Compliant, Lower Band Edge, 1937.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



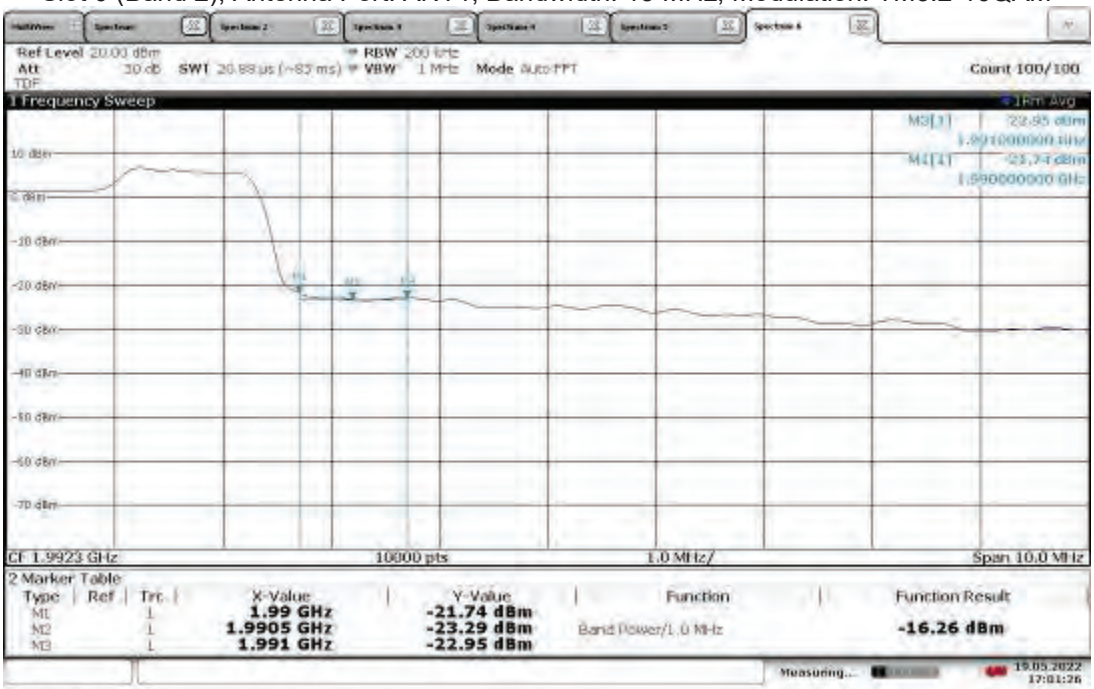
21:56:22 28.04.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



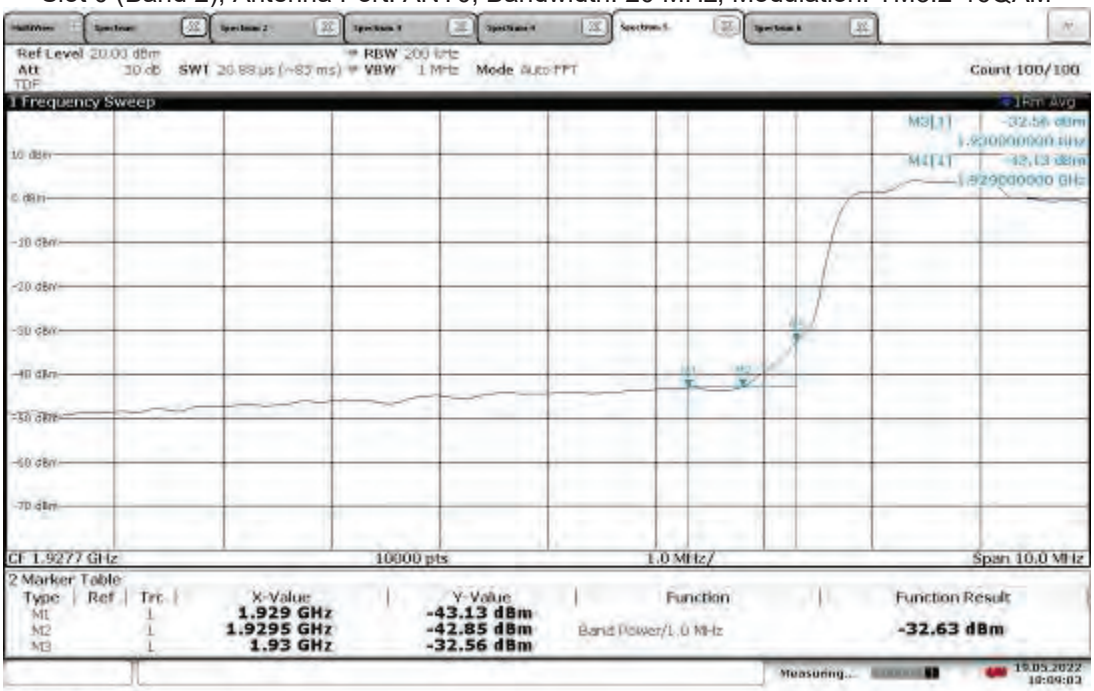
16:57:59 19.05.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



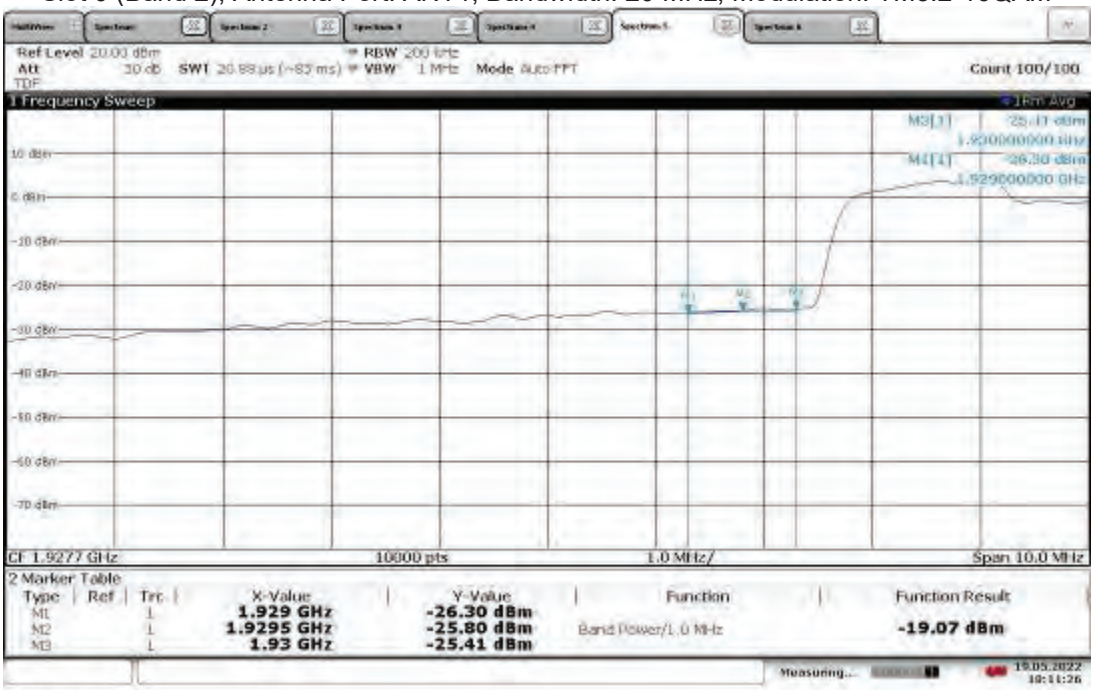
17:01:26 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



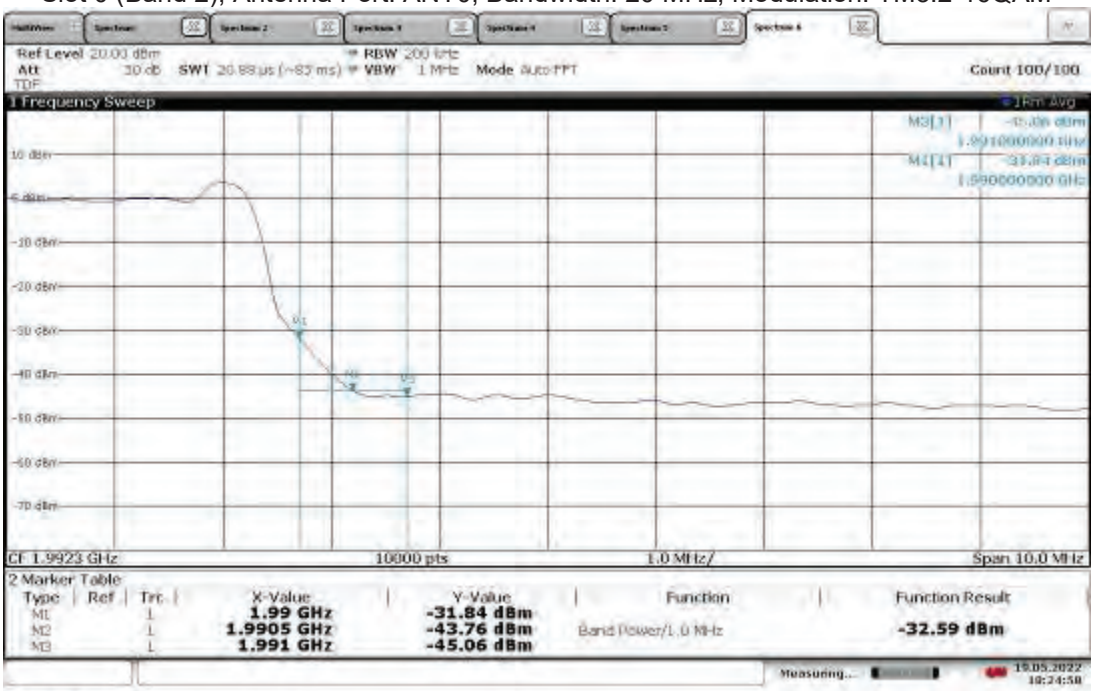
18:09:03 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



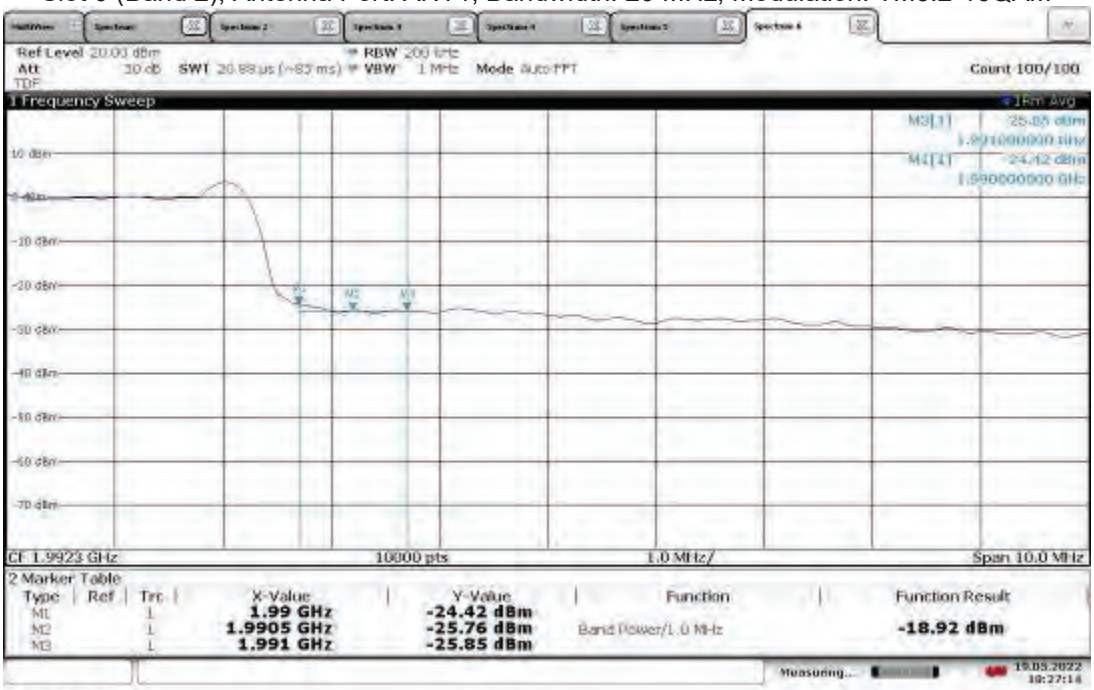
18:11:27 19.05.2022

Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



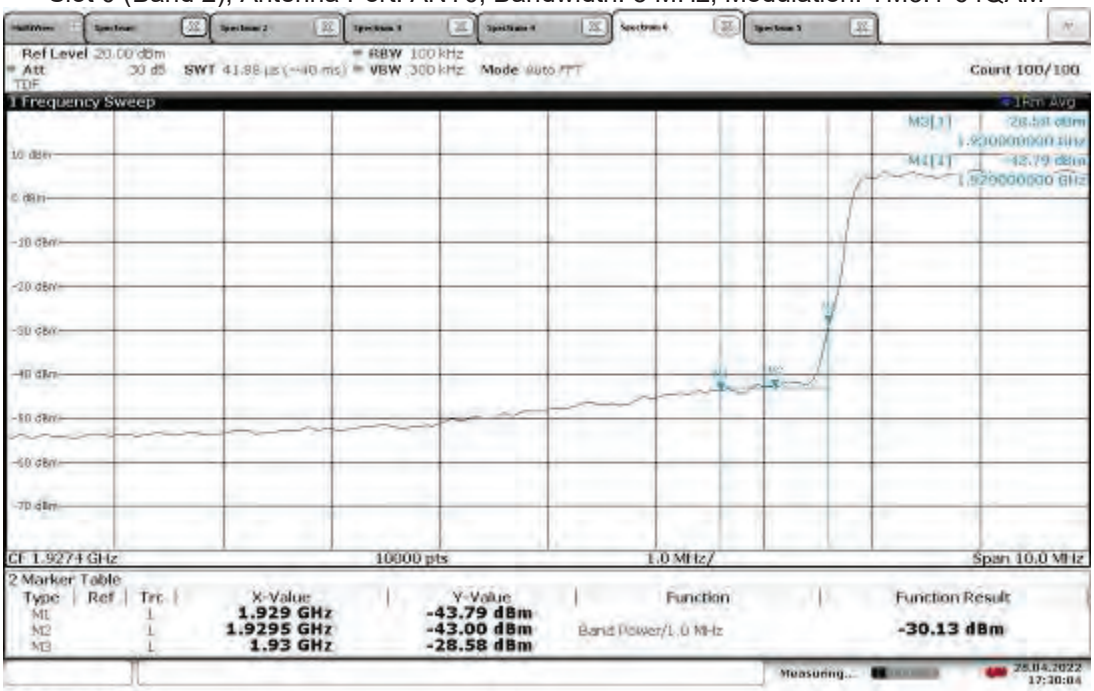
18:24:58 19.05.2022

Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



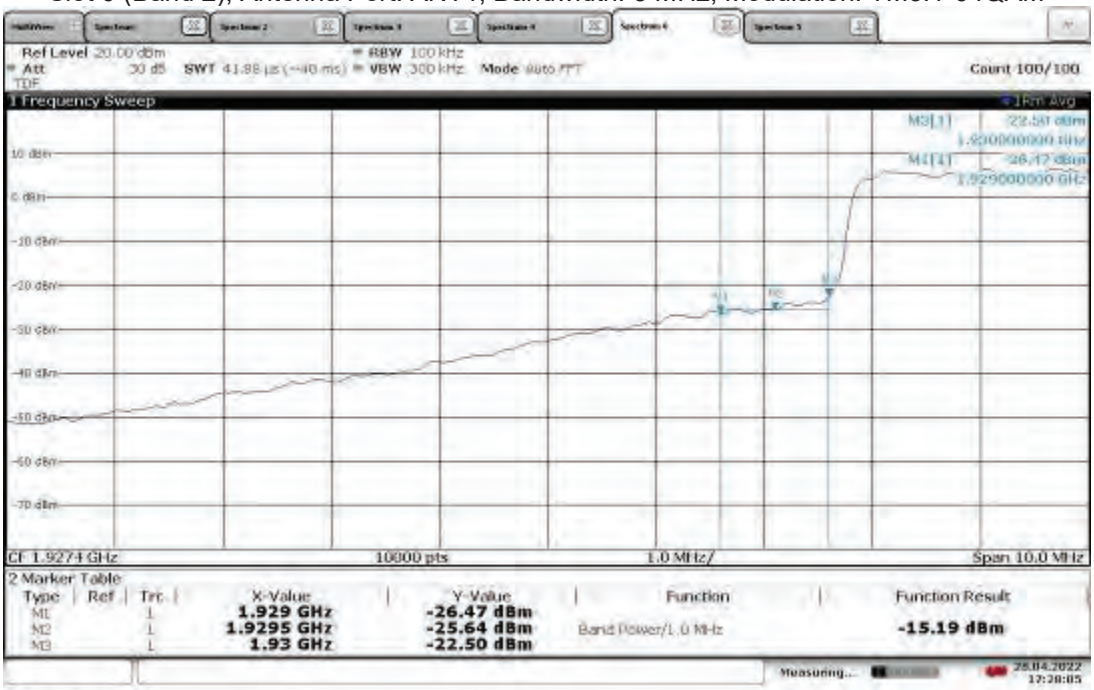
18:27:14 19.05.2022

Band Edge Compliant, Lower Band Edge, 1932.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



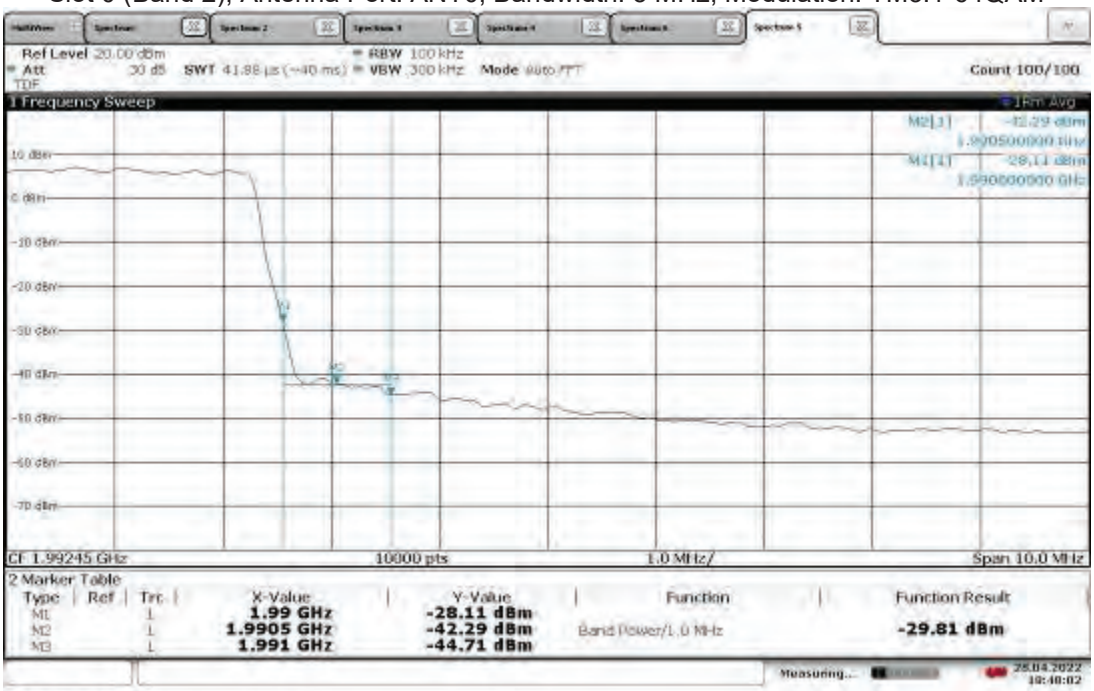
17:30:04 28.04.2022

Band Edge Compliant, Lower Band Edge, 1932.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM

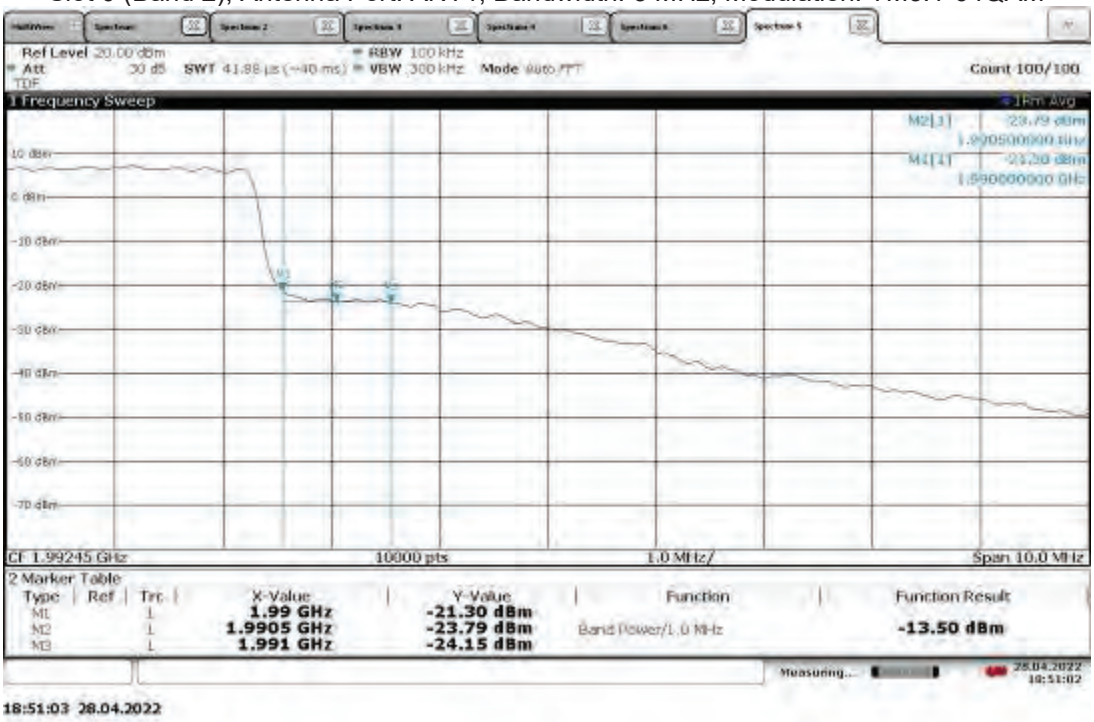


17:28:06 28.04.2022

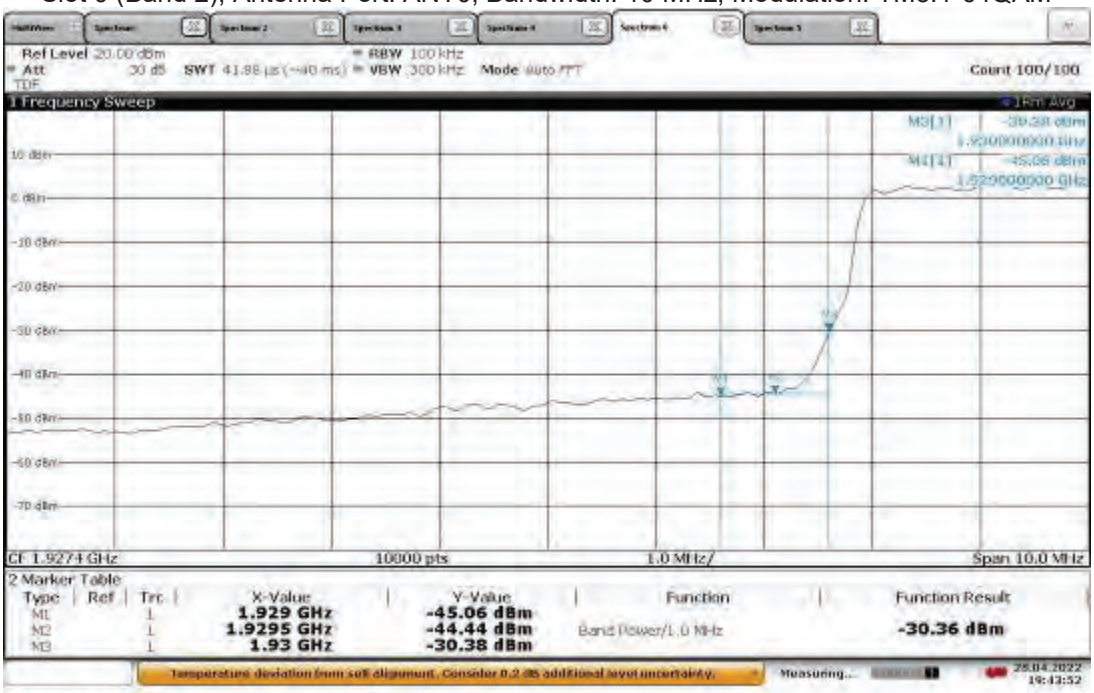
Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM

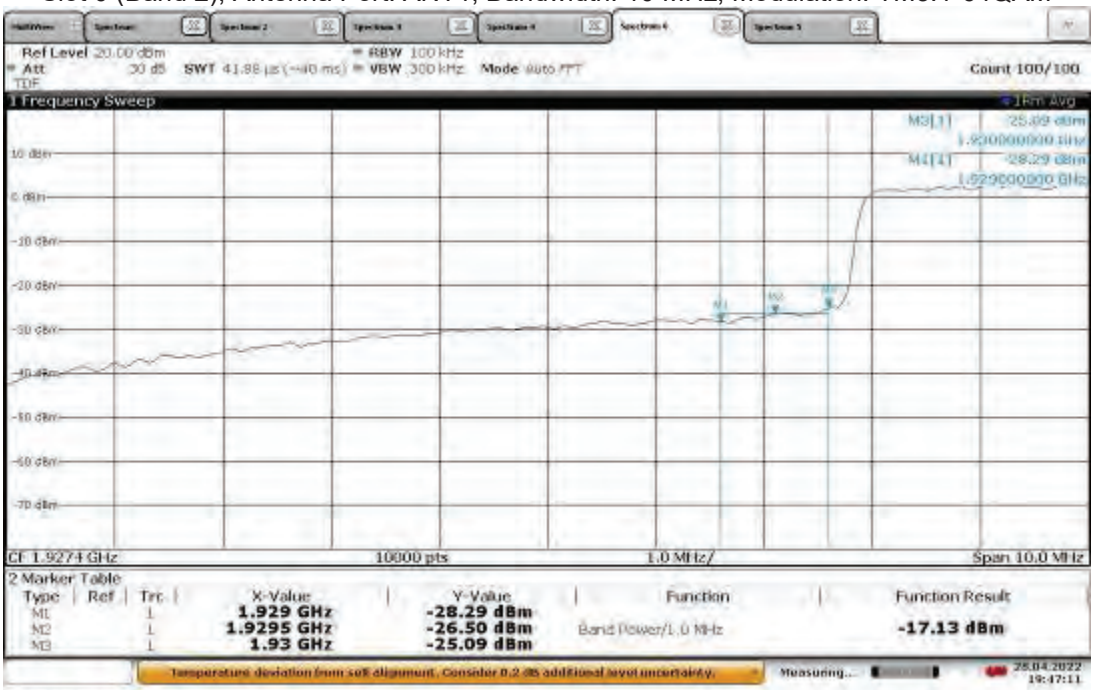


Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



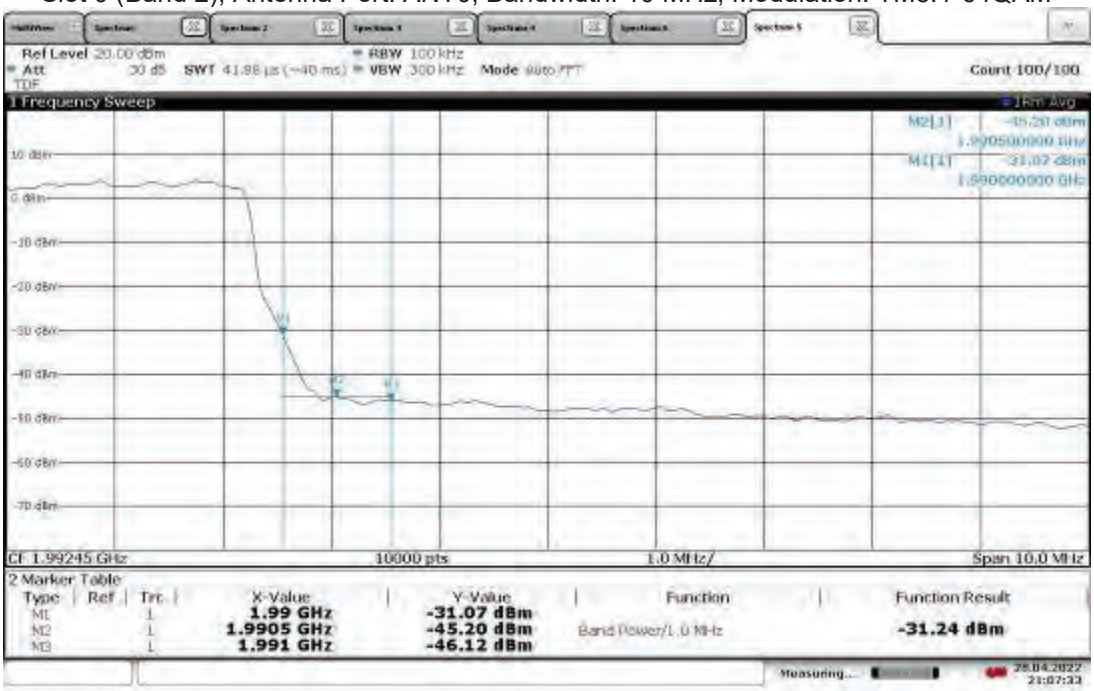
19:43:52 28.04.2022

Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM

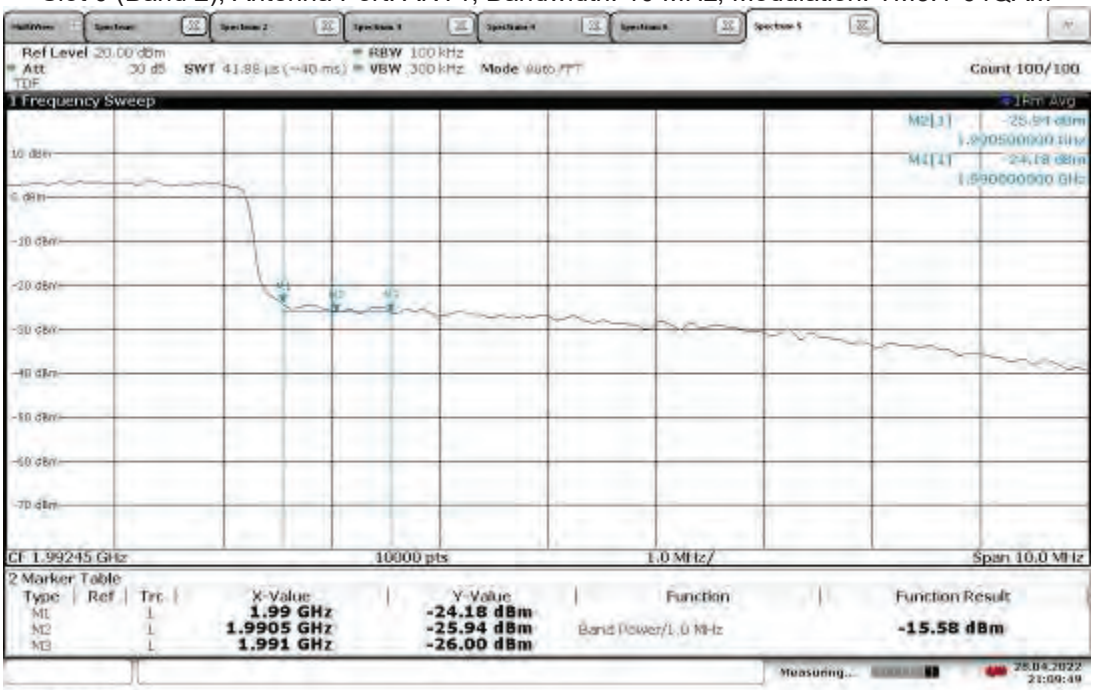


19:47:11 28.04.2022

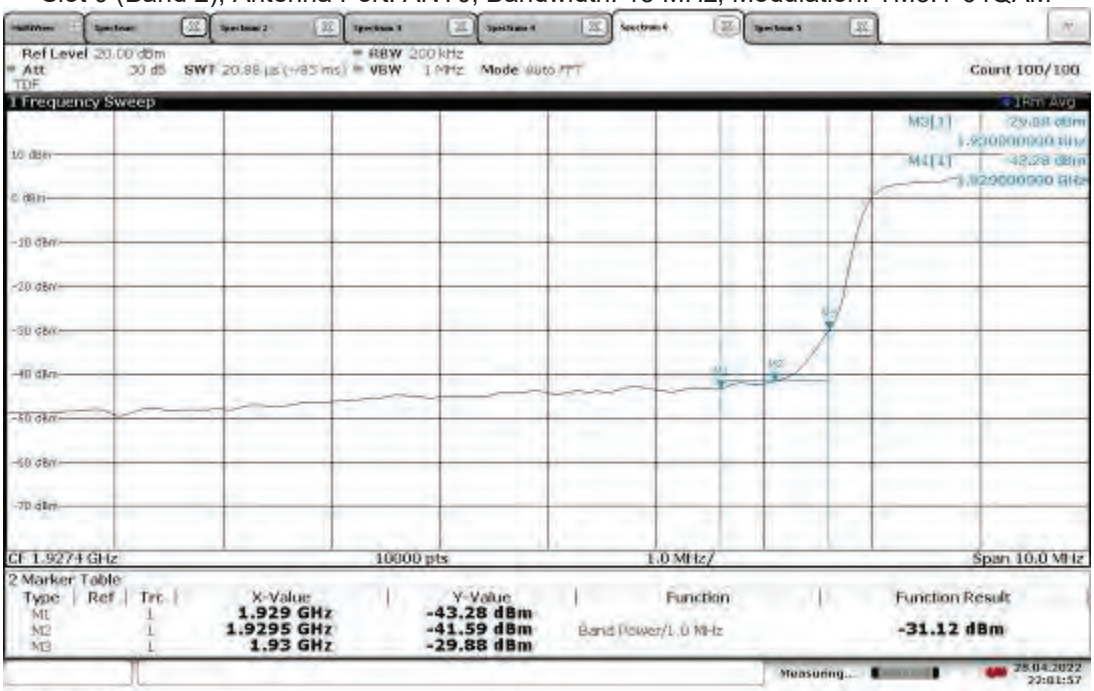
Band Edge Compliant, Upper Band Edge, 1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



Band Edge Compliant, Upper Band Edge, 1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM

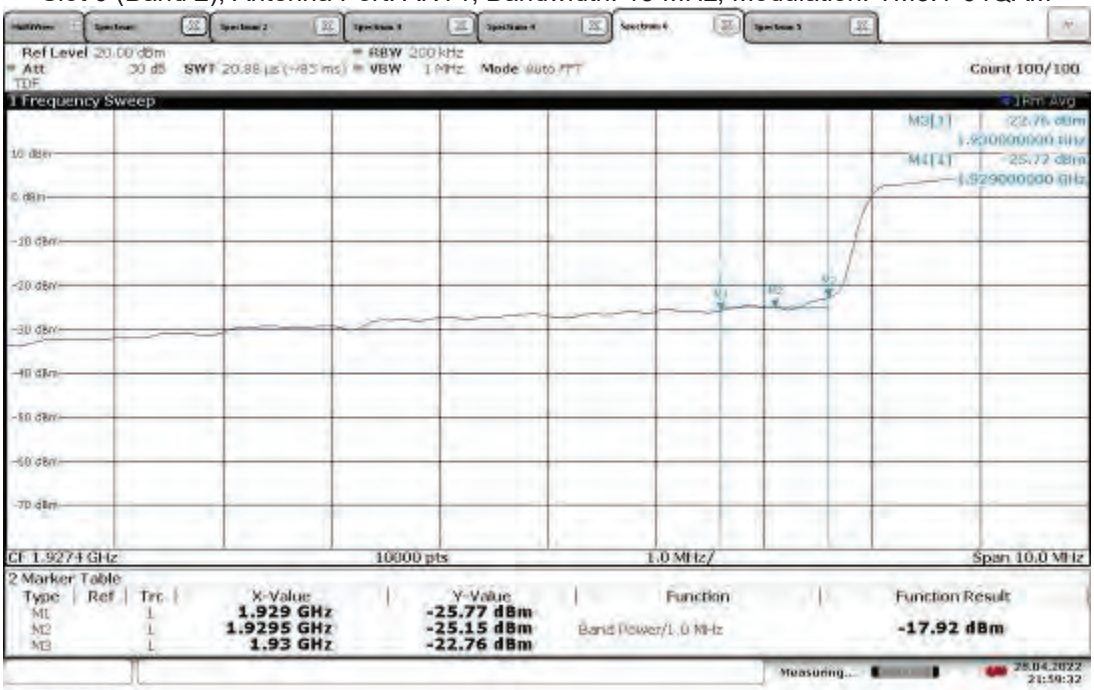


Band Edge Compliant, Lower Band Edge, 1937.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



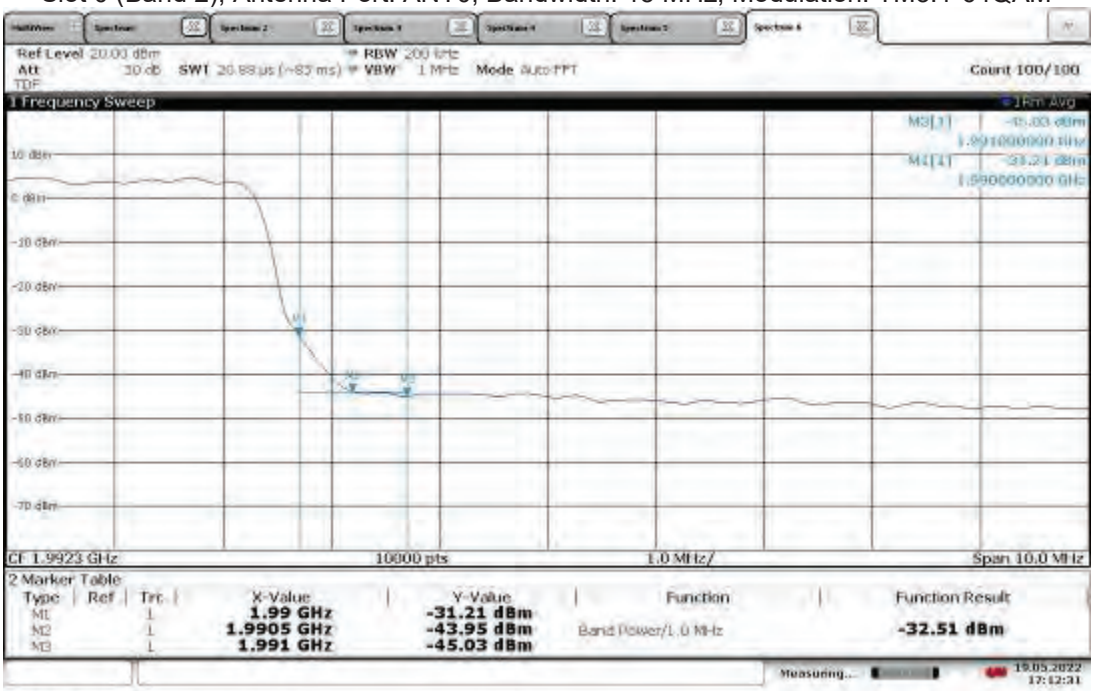
22:01:57 28.04.2022

Band Edge Compliant, Lower Band Edge, 1937.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



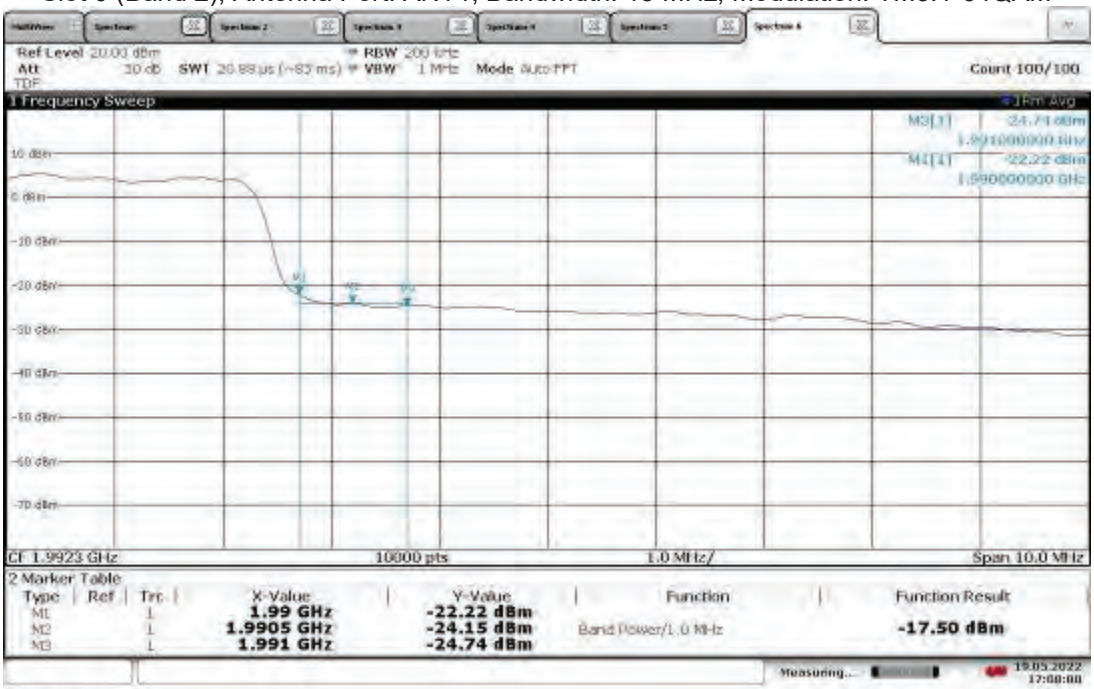
21:59:32 28.04.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



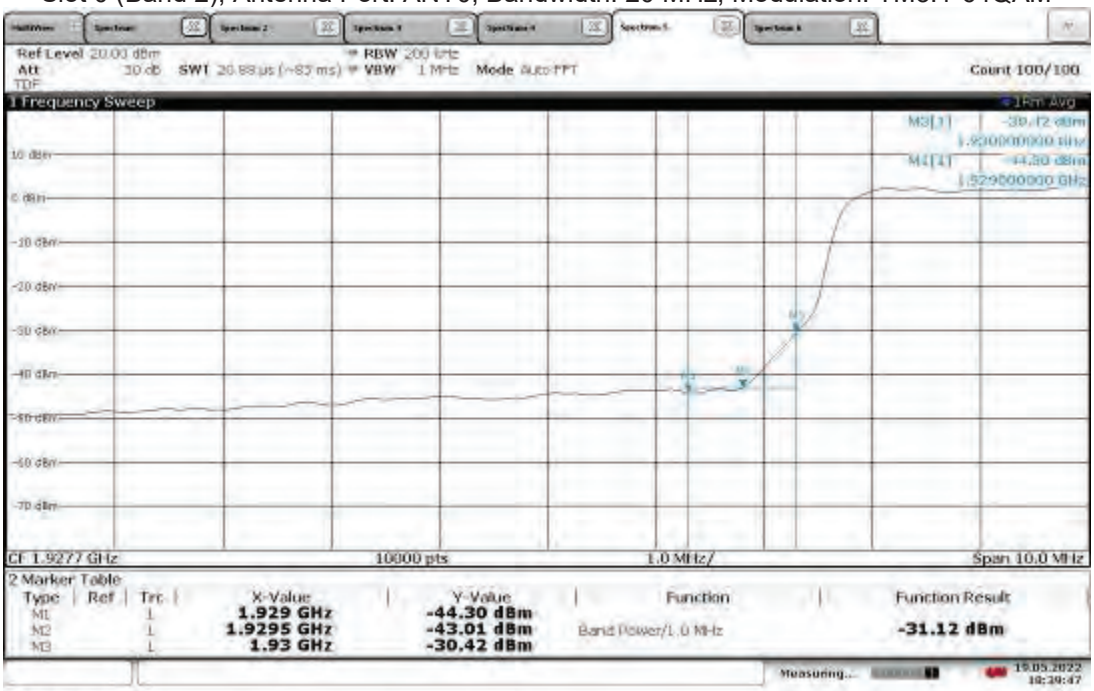
17:12:31 19.05.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



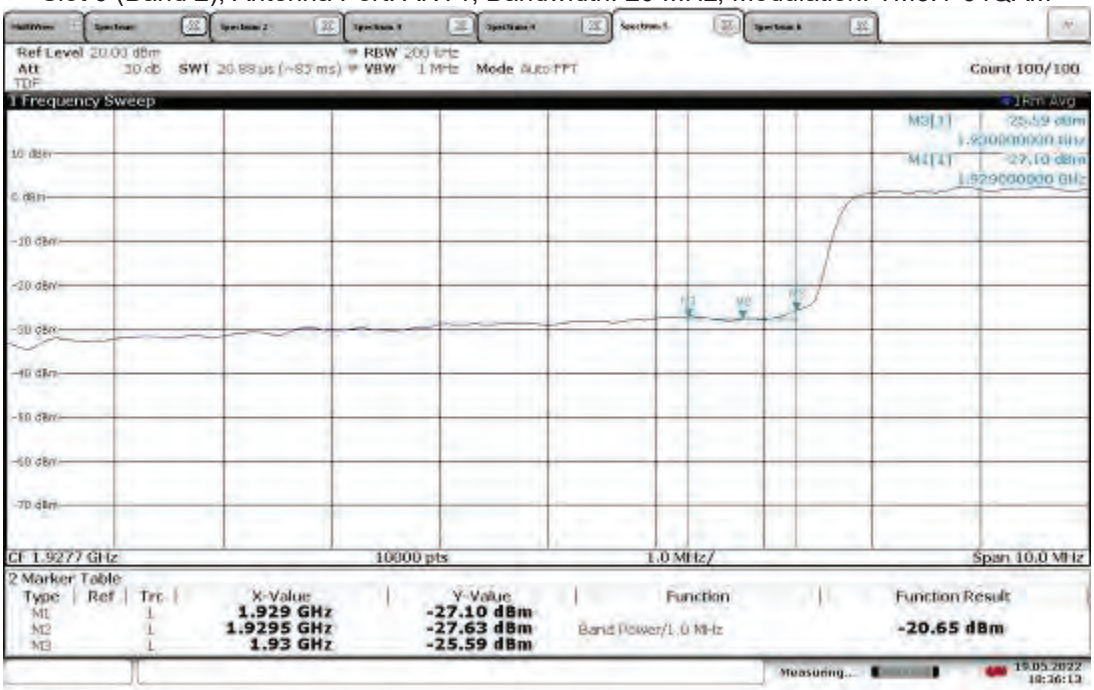
17:08:01 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



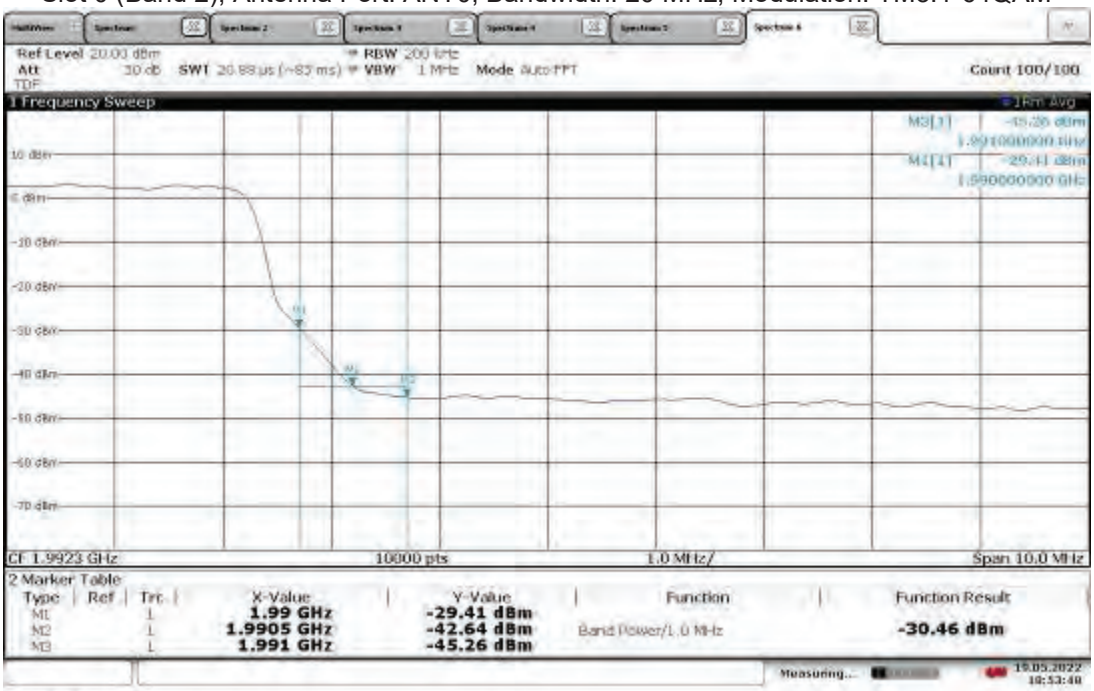
18:39:47 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



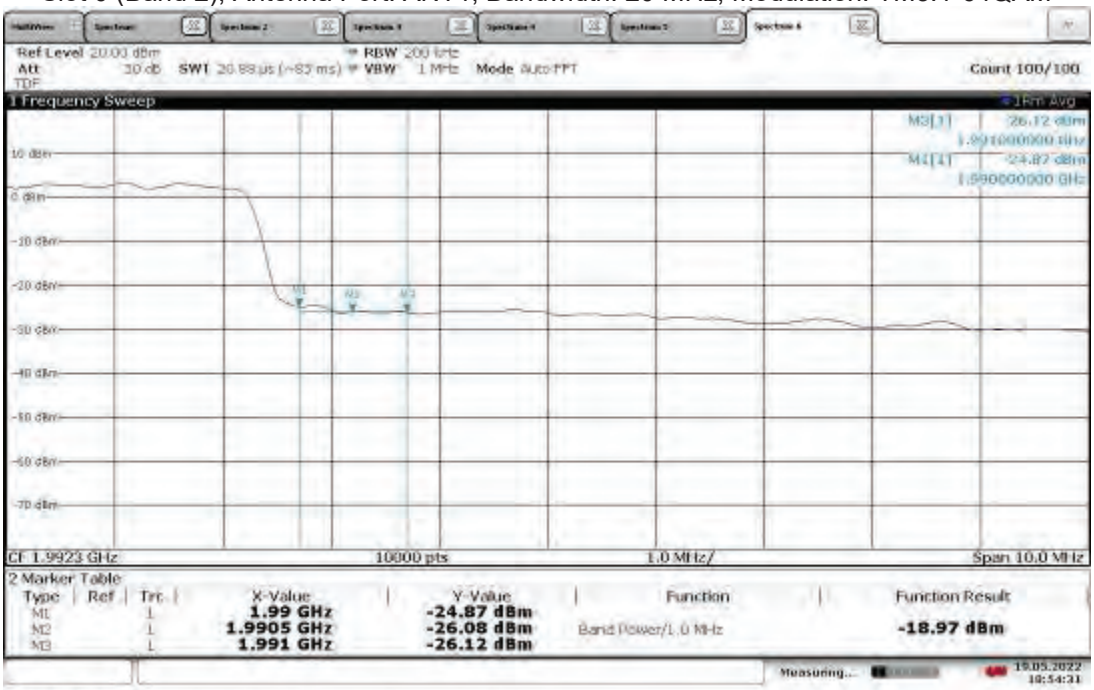
18:36:13 19.05.2022

Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



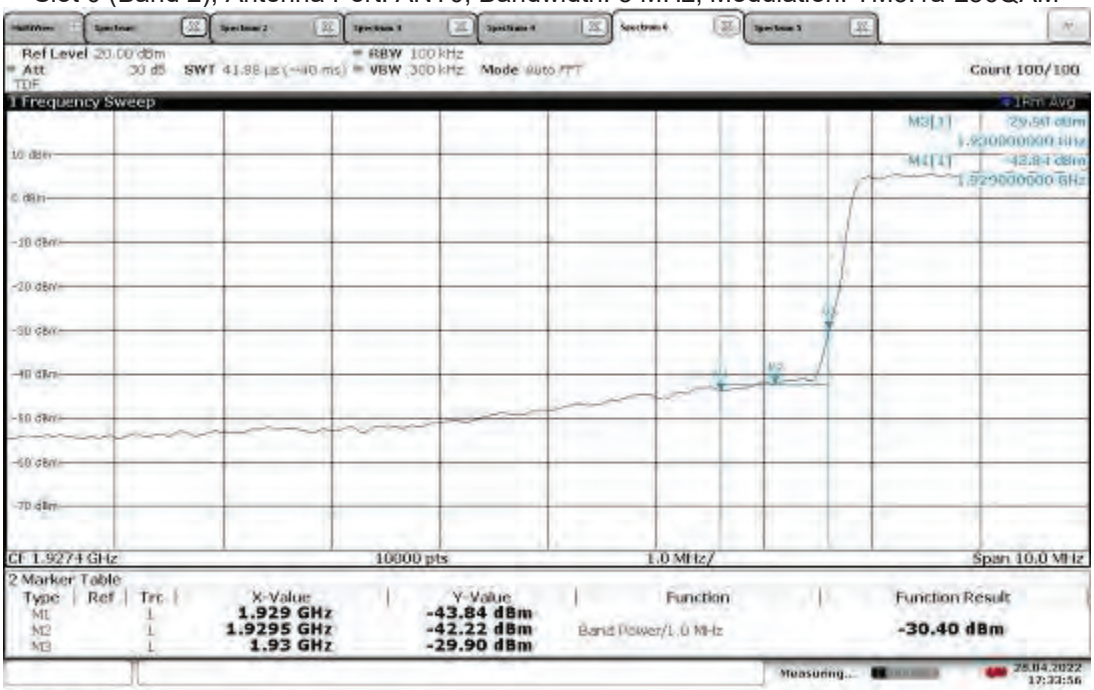
18:53:48 19.05.2022

Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



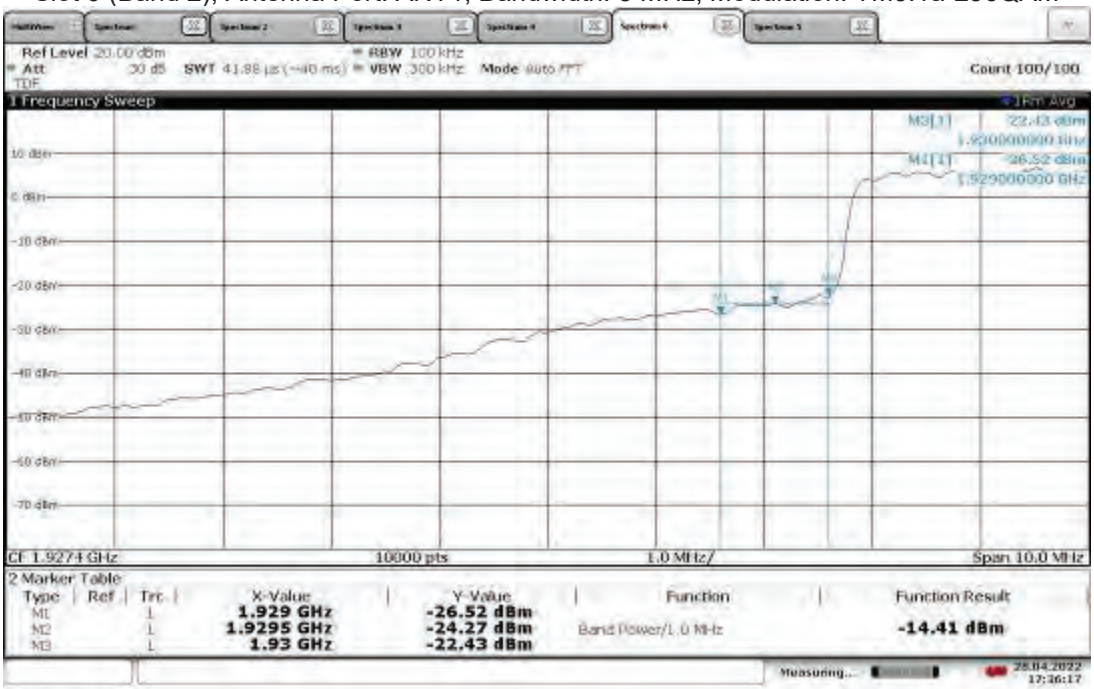
18:54:31 19.05.2022

Band Edge Compliant, Lower Band Edge, 1932.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



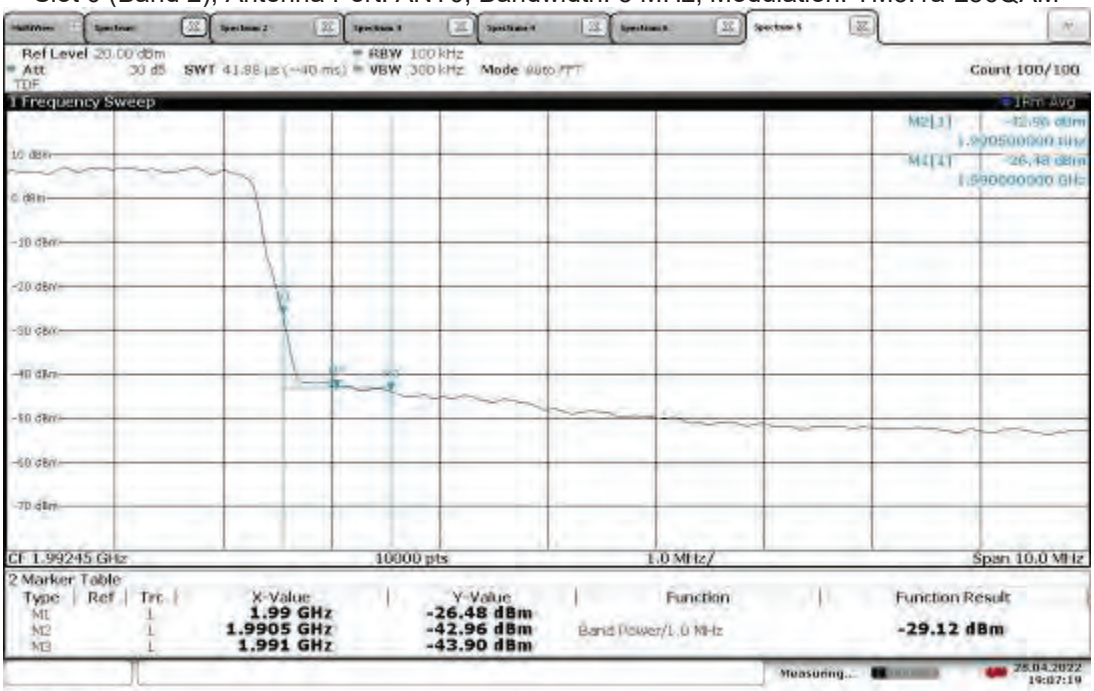
17:33:56 28.04.2022

Band Edge Compliant, Lower Band Edge, 1932.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



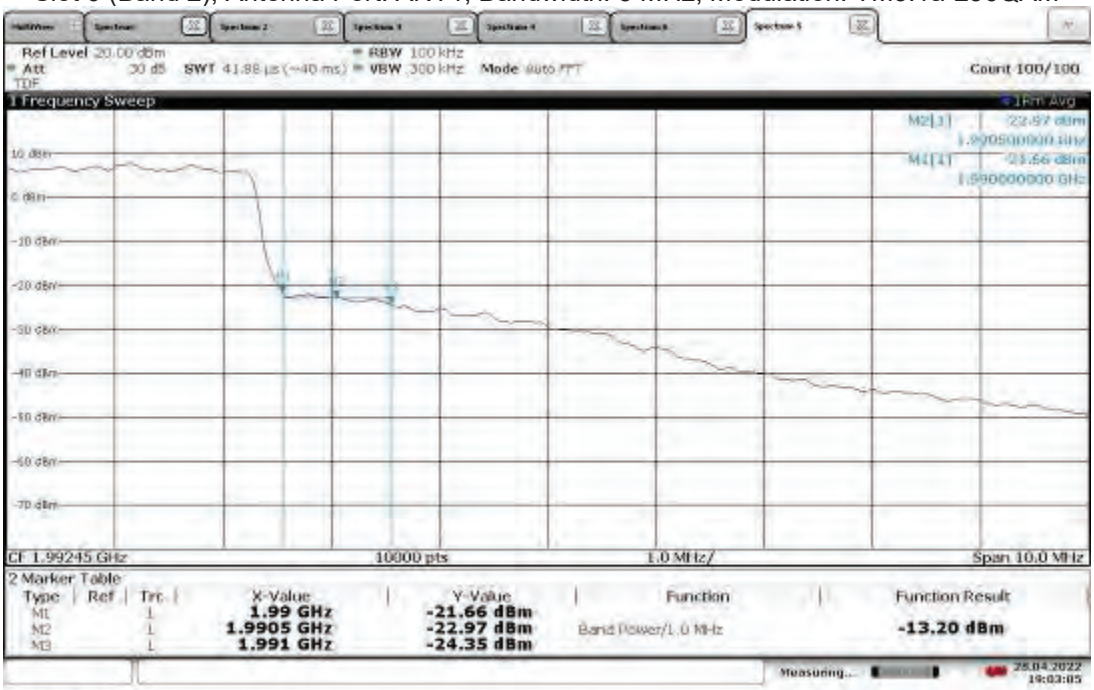
17:36:18 28.04.2022

Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



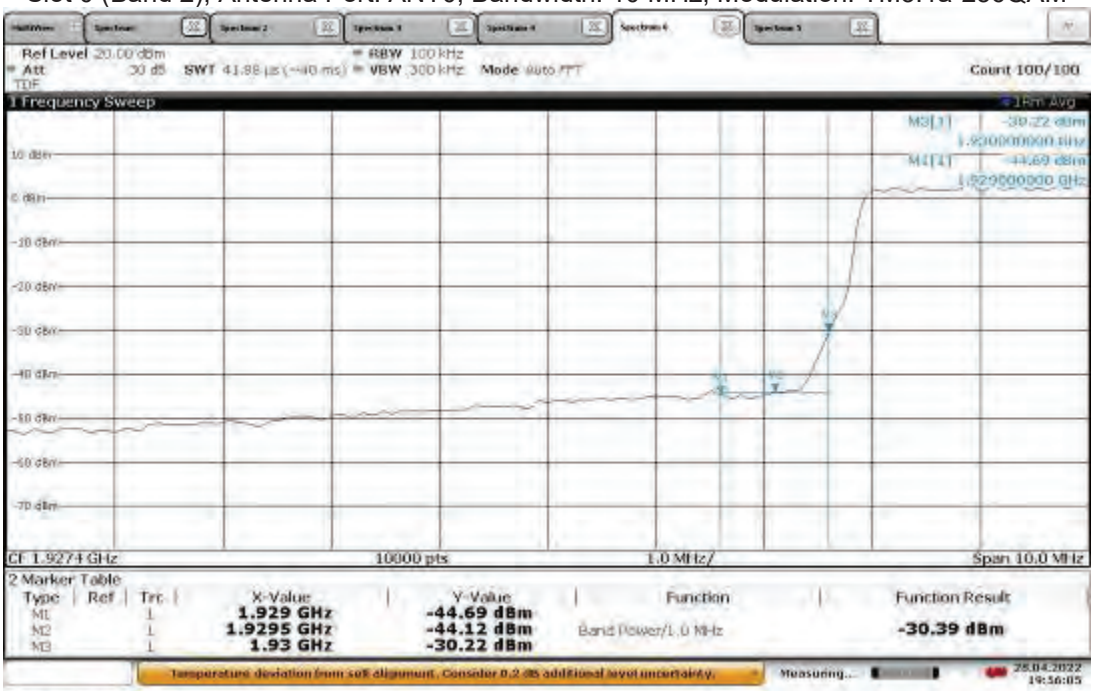
19:07:19 28.04.2022

Band Edge Compliant, Upper Band Edge, 1987.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM

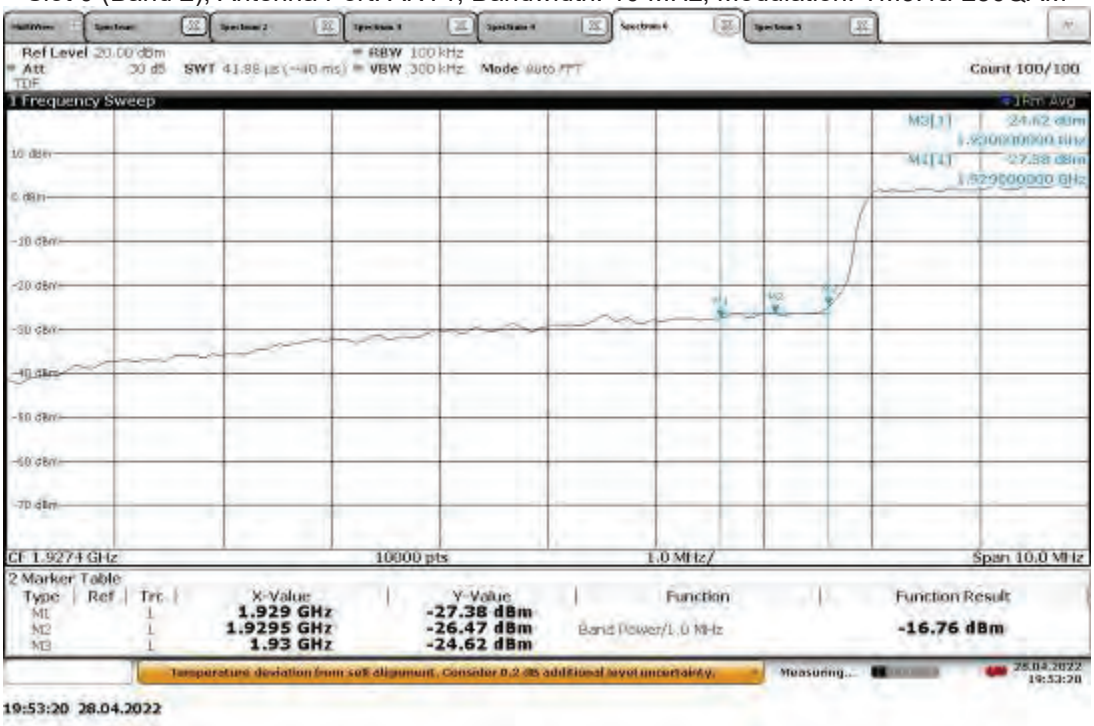


19:03:06 28.04.2022

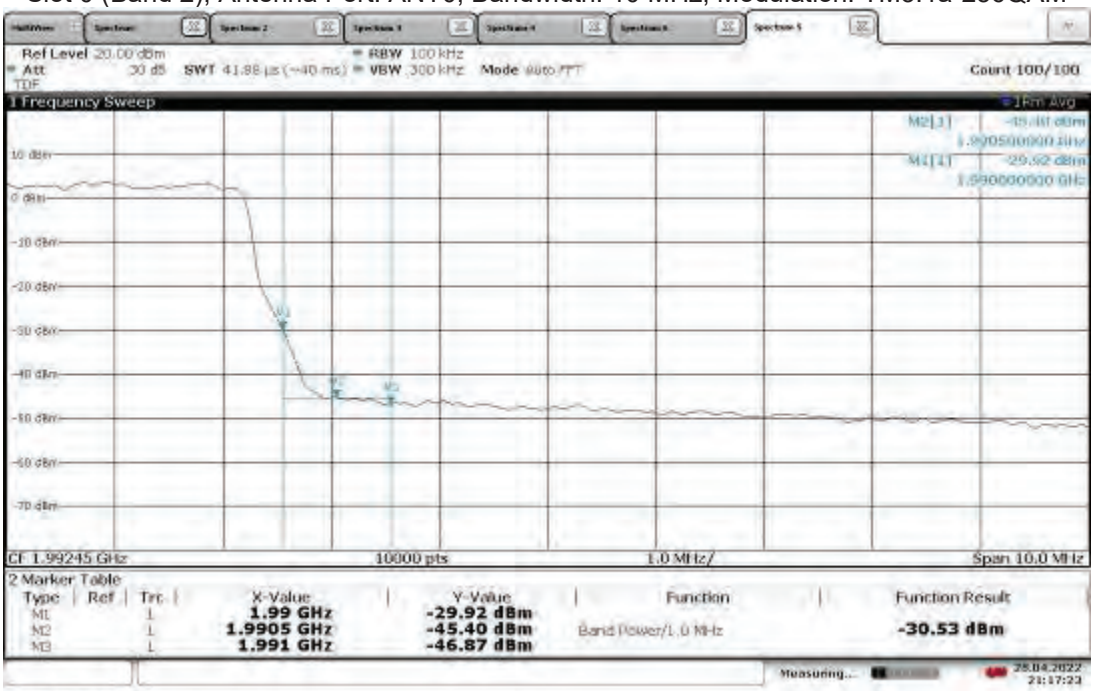
Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



Band Edge Compliant, Lower Band Edge, 1935 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM

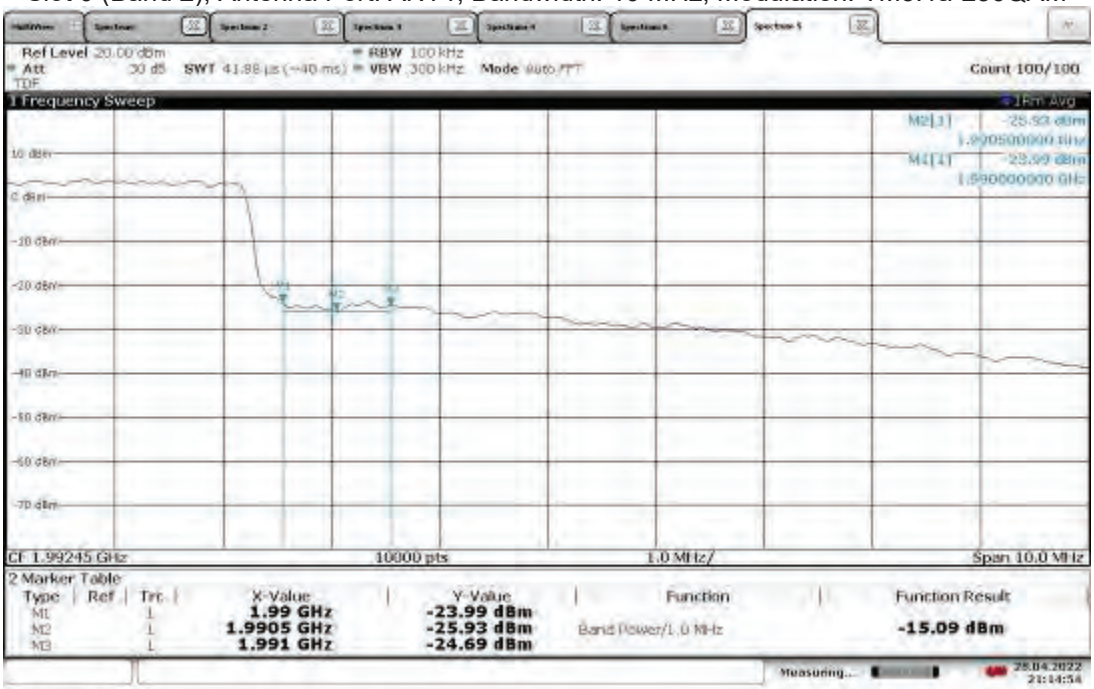


Band Edge Compliant, Upper Band Edge, 1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



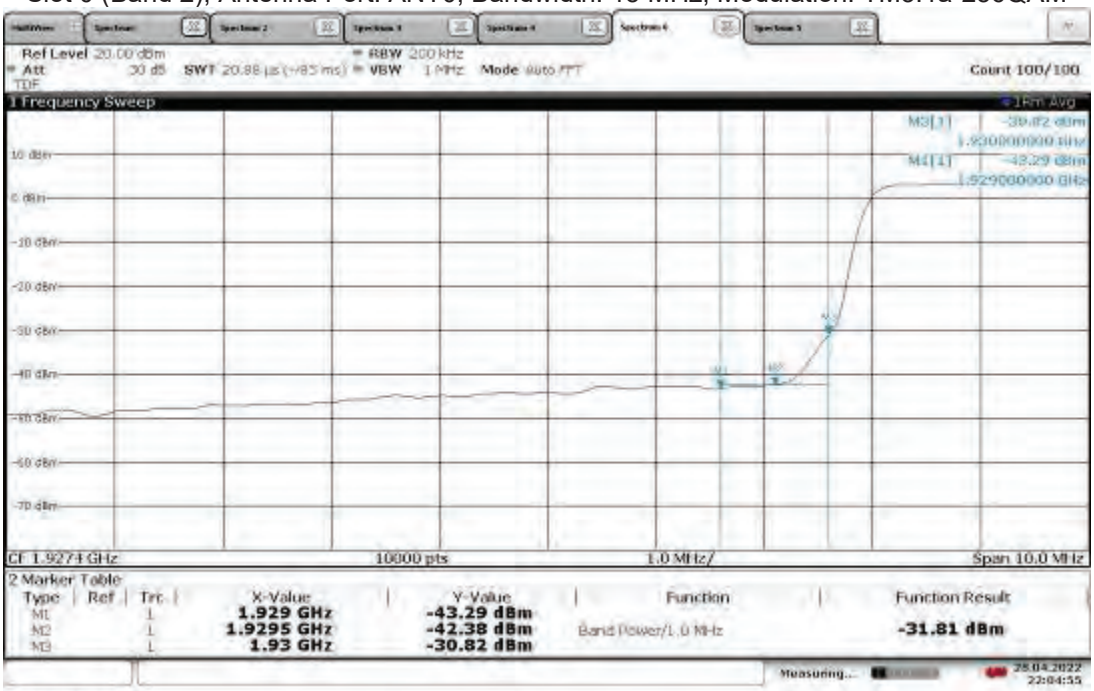
21:17:23 28.04.2022

Band Edge Compliant, Upper Band Edge, 1985 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



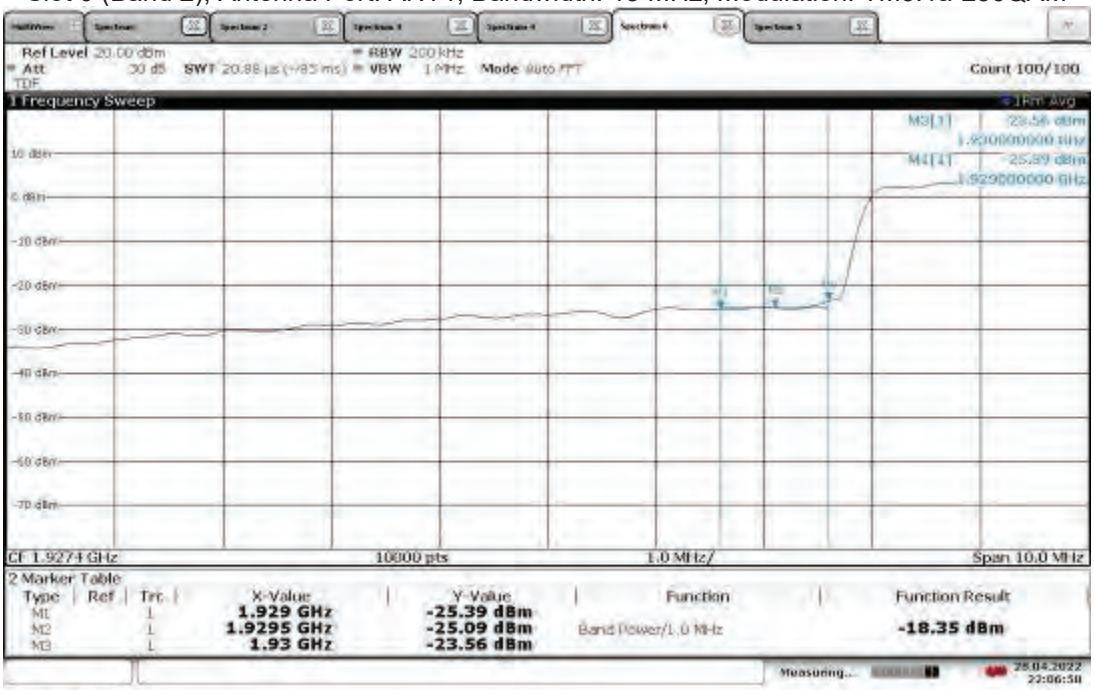
21:14:54 28.04.2022

Band Edge Compliant, Lower Band Edge,1937.5MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



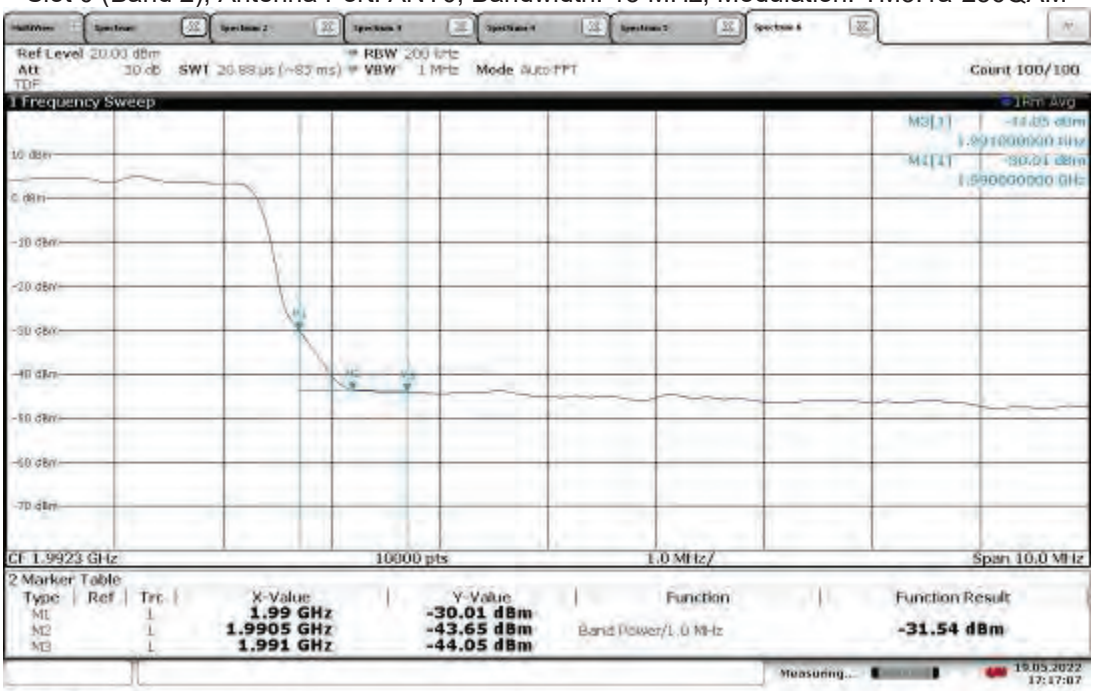
22:04:55 28.04.2022

Band Edge Compliant, Lower Band Edge,1937.5MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



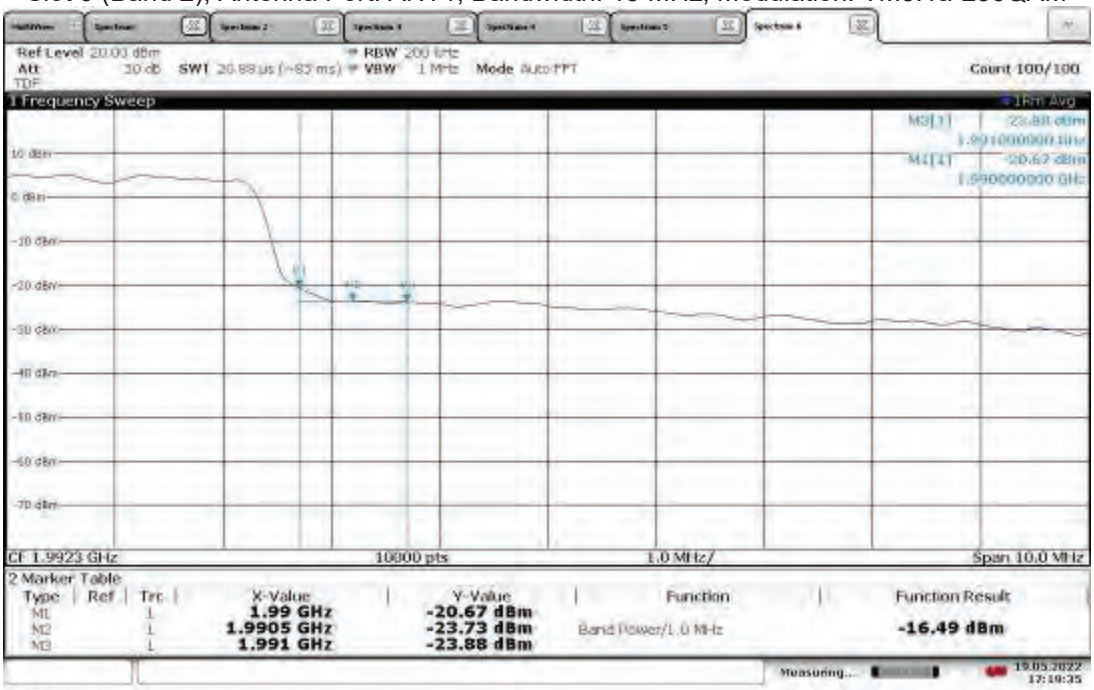
22:06:51 28.04.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



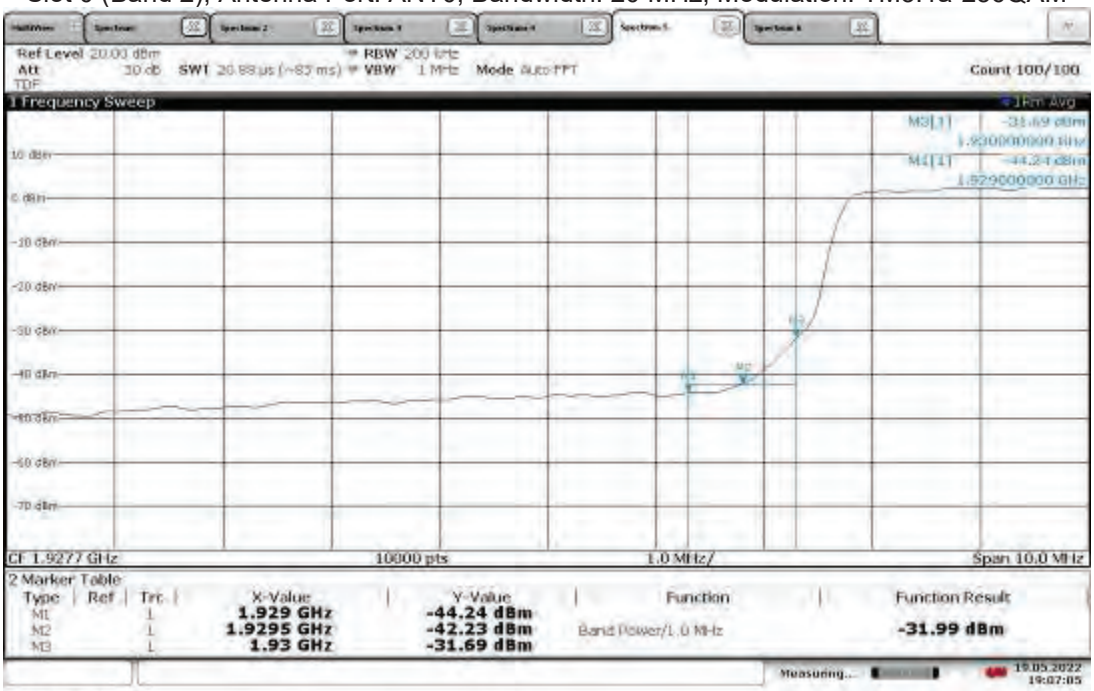
17:17:08 19.05.2022

Band Edge Compliant, Upper Band Edge, 1982.5 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



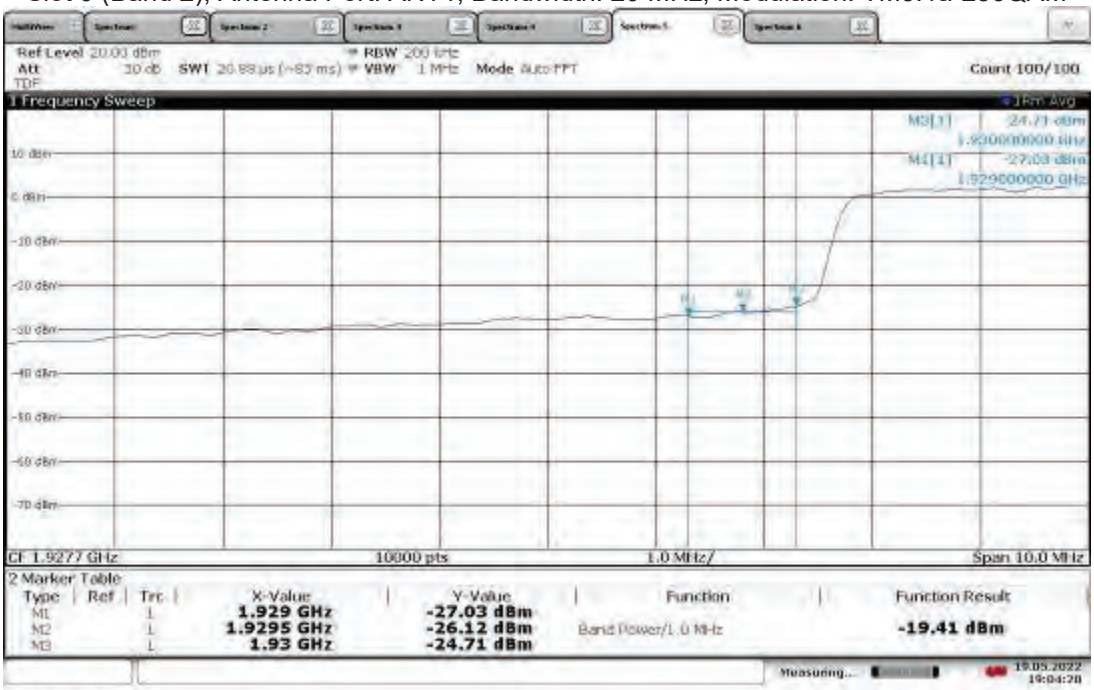
17:19:36 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



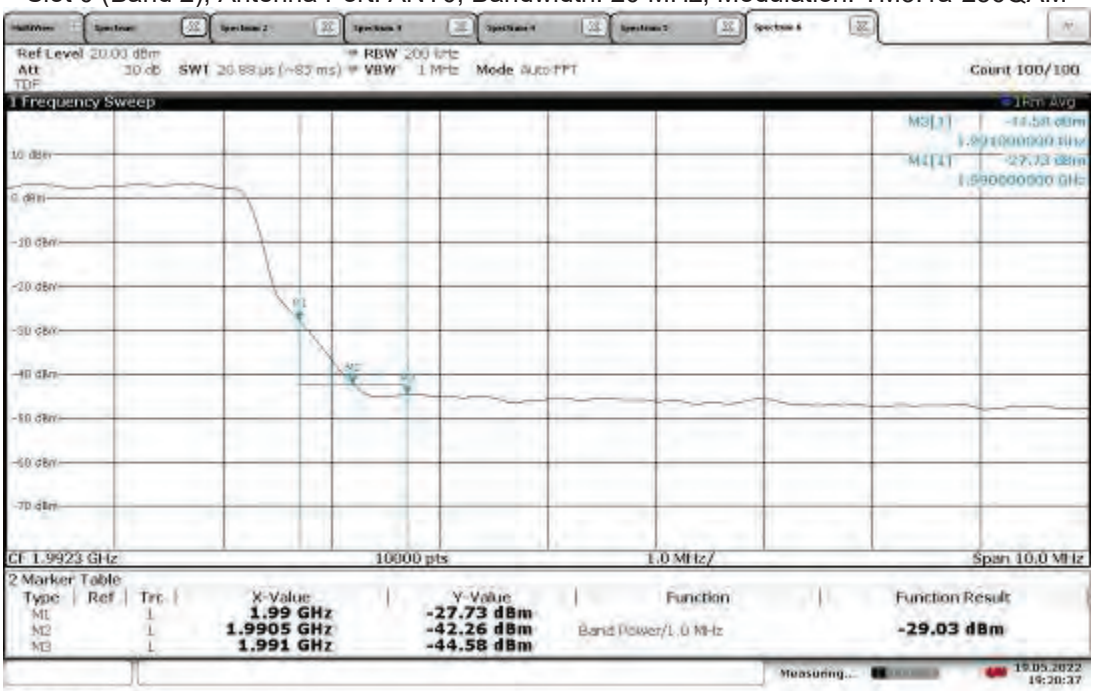
19:07:06 19.05.2022

Band Edge Compliant, Lower Band Edge, 1940 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM

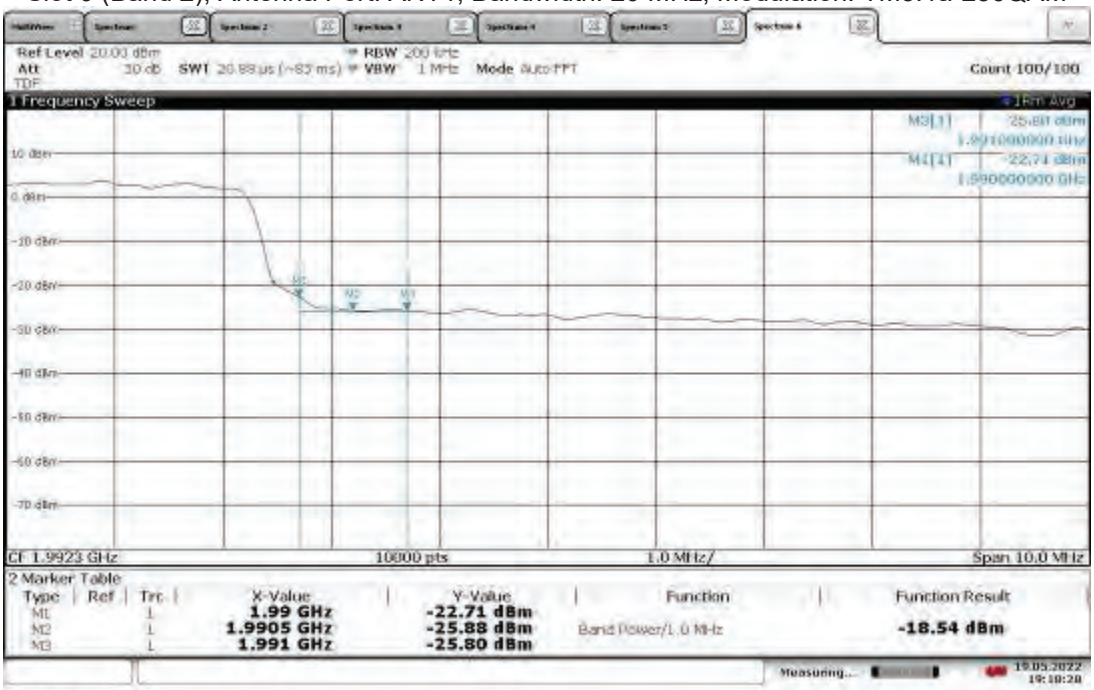


19:04:21 19.05.2022

Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



Band Edge Compliant, Upper Band Edge, 1980 MHz (5G NR)
Slot 0 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



Test Personnel:	Kouma Sinn KPS	Test Date:	04/18/2022, 04/21/2022, 05/12/2022
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
Product Standard:	FCC Part 24	Limit Applied:	See report section 9.3
Input Voltage:	48 VDC (POE)		
Pretest Verification w/ Ambient Signals or BB Source:	N/A	Ambient Temperature:	25, 24, 25 ºC
		Relative Humidity:	18, 23, 46 %
		Atmospheric Pressure:	1015, 1024, 1017 mbars

Deviations, Additions, or Exclusions: None

10 Frequency Stability

10.1 Method

Tests are performed in accordance with ANSI C63.26 and CFR47 FCC Parts 2.1055 and 24.

TEST SITE: Safety Lab

10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
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	02/10/2023	02/10/2023
SAF1153'	Freezing Rain\Icing\Temp\Humidity\ -73deg C to +190deg C, 95% humidity, Ice Freezing Rain	Cincinnati Sub-Zero	CTH-(FR)64-6-6-SC/AC	12-CT15628	11/22/2021	11/22/2022
148012'	Temp/Humidity Chamber	Envirotronics	SH27C	08015563S11263	11/22/2021	11/18/2022
DAV005'	Weather Station	Davis	6250	MS191218083	02/07/2021	02/07/2022

Software Utilized:

Name	Manufacturer	Version
None	--	--

10.3 Results:

The sample tested was found to Comply.

FCC Part §24.235 Frequency stability – The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. The occupied bandwidth measurement was used to make sure the lower and upper frequencies of the occupied bandwidth remains within the assigned band of 1930-1990 MHz MHz.

Frequency stability over temperature (5 MHz Bandwidth, Low Channel)

Band 2, Mod: 16QAM (worst-case output power, 22.12 dBm), BW: 5MHz, Antenna Port: ANT0 , Channel: Low 1932.5 MHz

Equipment used: 148012, ROS005-1, CEN001, CBLHF2012-5M-2, DAV005 25 deg C 65% 1007 mB

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9302581	-2.6E-06	-1.34697E-06	-0.01	2.5
-20	1.9302581	-2.6E-06	-1.34697E-06	-0.01	2.5
-10	1.9302565	-1E-06	-5.18066E-07	-0.01	2.5
0	1.9302561	6E-07	3.1084E-07	0.00	2.5
10	1.9302548	-7E-07	-3.62646E-07	0.00	2.5
20	1.9302555	0	0	0.00	--
30	1.9302544	-1.1E-06	-5.69873E-07	-0.01	2.5
40	1.9302548	-7E-07	-3.62646E-07	0.00	2.5
50	1.9302536	-1.9E-06	-9.84326E-07	-0.01	2.5

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9347753	-3.7E-06	-1.91237E-06	-0.02	2.5
-20	1.9347747	-3.1E-06	-1.60226E-06	-0.02	2.5
-10	1.9347729	-1.3E-06	-6.71914E-07	-0.01	2.5
0	1.9347716	0	0	0.00	2.5
10	1.934772	4E-07	2.06743E-07	0.00	2.5
20	1.9347716	0	0	0.00	--
30	1.9347714	-2E-07	-1.03371E-07	0.00	2.5
40	1.9347712	-4E-07	-2.06743E-07	0.00	2.5
50	1.9347711	-5E-07	-2.58428E-07	0.00	2.5

Frequency stability over temperature (5 MHz Bandwidth, High Channel)

Band 2, Mod: 64QAM (worst-case output power, 22.88 dBm), BW: 5MHz, Antenna Port: ANT1 , Channel: High 1987.5 MHz

Equipment used: 148012, ROS005-1, CEN001, CBLHF2012-5M-2, DAV005 25 deg C 65% 1007 mB

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9852419	-8.7E-06	-4.38236E-06	-0.04	2.5
-20	1.985242	-8.8E-06	-4.43273E-06	-0.04	2.5
-10	1.9852421	-8.9E-06	-4.4831E-06	-0.04	2.5
0	1.985242	8.8E-06	4.43273E-06	0.04	2.5
10	1.985242	8.8E-06	4.43273E-06	0.04	2.5
20	1.9852332	0	0	0.00	--
30	1.9852337	5E-07	2.5186E-07	0.00	2.5
40	1.9852417	8.5E-06	4.28161E-06	0.04	2.5
50	1.9852419	8.7E-06	4.38236E-06	0.04	2.5

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9897215	1.25E-05	6.28225E-06	0.06	2.5
-20	1.9897215	1.25E-05	6.28225E-06	0.06	2.5
-10	1.9897213	1.27E-05	6.38276E-06	0.06	2.5
0	1.9897216	-1.24E-05	-6.23199E-06	-0.06	2.5
10	1.9897217	-1.23E-05	-6.18173E-06	-0.06	2.5
20	1.989734	0	0	0.00	--
30	1.9897334	-6E-07	-3.01548E-07	0.00	2.5
40	1.9897197	-1.43E-05	-7.18689E-06	-0.07	2.5
50	1.9897196	-1.44E-05	-7.23715E-06	-0.07	2.5

Frequency stability over temperature (20 MHz Bandwidth, Low Channel)

Band 2, Modulation: 256QAM, Bandwidth: 20MHz, Antenna Port: ANT0 , Channel: Low 1940 MHz

Worst-case output power, 22.68 dBm

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9305729	-2.32E-05	-1.20173E-05	-0.12	2.5
-20	1.930567	-1.73E-05	-8.96118E-06	-0.09	2.5
-10	1.9305609	-1.12E-05	-5.80146E-06	-0.06	2.5
0	1.9305555	5.8E-06	3.00433E-06	0.03	2.5
10	1.9305521	2.4E-06	1.24317E-06	0.01	2.5
20	1.9305497	0	0	0.00	--
30	1.9305475	-2.2E-06	-1.13957E-06	-0.01	2.5
40	1.930545	-4.7E-06	-2.43454E-06	-0.02	2.5
50	1.9305408	-8.9E-06	-4.61009E-06	-0.05	2.5

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9494838	-5.3E-06	-2.71868E-06	-0.03	2.5
-20	1.9494825	-4E-06	-2.05183E-06	-0.02	2.5
-10	1.9494812	-2.7E-06	-1.38499E-06	-0.01	2.5
0	1.94948	1.5E-06	7.69437E-07	0.01	2.5
10	1.9494795	1E-06	5.12958E-07	0.01	2.5
20	1.9494785	0	0	0.00	--
30	1.9494779	-6E-07	-3.07775E-07	0.00	2.5
40	1.9494778	-7E-07	-3.5907E-07	0.00	2.5
50	1.9494782	-3E-07	-1.53887E-07	0.00	2.5

Frequency stability over temperature (20 MHz Bandwidth, High Channel)

Band 2, Modulation: 16QAM, Bandwidth: 20MHz, Antenna Port: ANT0 , Channel: High 1980 MHz

Worst-case output power, 22.76 dBm

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9704888	3.1E-06	1.57321E-06	0.02	2.5
-20	1.9704903	1.6E-06	8.1198E-07	0.01	2.5
-10	1.970491	9E-07	4.56739E-07	0.00	2.5
0	1.9704911	-8E-07	-4.0599E-07	0.00	2.5
10	1.9704925	6E-07	3.04492E-07	0.00	2.5
20	1.9704919	0	0	0.00	--
30	1.9704924	5E-07	2.53744E-07	0.00	2.5
40	1.9704893	-2.6E-06	-1.31947E-06	-0.01	2.5
50	1.9704894	-2.5E-06	-1.26872E-06	-0.01	2.5

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9894901	1.3E-06	6.53433E-07	0.01	2.5
-20	1.9894903	1.1E-06	5.52905E-07	0.01	2.5
-10	1.9894903	1.1E-06	5.52905E-07	0.01	2.5
0	1.9894908	-6E-07	-3.01585E-07	0.00	2.5
10	1.9894914	0	0	0.00	2.5
20	1.9894914	0	0	0.00	--
30	1.9894906	-8E-07	-4.02113E-07	0.00	2.5
40	1.9894083	-8.31E-05	-4.17695E-05	-0.42	2.5
50	1.9894042	-8.72E-05	-4.38303E-05	-0.44	2.5

Frequency stability over voltages (5 MHz Band, Low and High Channels)

Band 2 (5G NR), Modulation: 16QAM, Bandwidth: 5MHz, Antenna Port: ANT0 , Low Ch. 1932.5 MHz

Worst-case output power 21.12 dBm

Low Channel 1940 MHz, Low Edge of Occupied Bandwidth

Voltage	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.9302442	2E-07	1.03614E-07	0.00	2.5
48	1.930244	0	0	0.00	--
57	1.9302443	3E-07	1.55421E-07	0.00	2.5

Low Channel 1940 MHz, Upper Edge of Occupied Bandwidth

Voltage	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.9347841	1E-07	5.16854E-08	0.00	2.5
48	1.934784	0	0	0.00	--
57	1.9347841	1E-07	5.16854E-08	0.00	2.5

Band 2 (5G NR), Modulation: 64QAM, Bandwidth: 5MHz, Antenna Port: ANT0 , High Ch. 1987.5 MHz

Worst-case output power 22.88 dBm

High Channel 1980 MHz, Low Edge of Occupied Bandwidth

Voltage	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.9852324	-2E-07	-1.00744E-07	0.00	2.5
48	1.9852326	0	0	0.00	--
57	1.9852325	-1E-07	-5.03719E-08	0.00	2.5

High Channel 1980 MHz, Upper Edge of Occupied Bandwidth

Voltage	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.989735	1E-07	5.0258E-08	0.00	2.5
48	1.9897349	0	0	0.00	--
57	1.9897351	2E-07	1.00516E-07	0.00	2.5

Frequency stability over voltages (20 MHz Bandwidth, Low and High Channels)

Band 2 (5G NR), Modulation: 256QAM, Bandwidth: 20MHz, Antenna Port: ANT0 , Low Ch. 1940 MHz

Worst-case output 22.68 dBm

Low Channel 1940 MHz, Low Edge of Occupied Bandwidth

Voltage	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.9305479	-3E-07	-1.55396E-07	0.00	2.5
48	1.9305482	0	0	0.00	--
57	1.9305479	-3E-07	-1.55396E-07	0.00	2.5

Low Channel 1940 MHz, Upper Edge of Occupied Bandwidth

Voltage	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.9494787	0	0	0.00	2.5
48	1.9494787	0	0	0.00	--
57	1.9494785	-2E-07	-1.02592E-07	0.00	2.5

Band 2 (5G NR), Modulation: 16QAM, Bandwidth: 20MHz, Antenna Port: ANT0 , High Ch. 1980 MHz

Worst-case output power 22.76 dBm

High Channel 1980 MHz, Low Edge of Occupied Bandwidth

Voltage	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.9704913	-5E-07	-2.53744E-07	0.00	2.5
48	1.9704918	0	0	0.00	--
57	1.9704921	3E-07	1.52246E-07	0.00	2.5

High Channel 1980 MHz, Upper Edge of Occupied Bandwidth

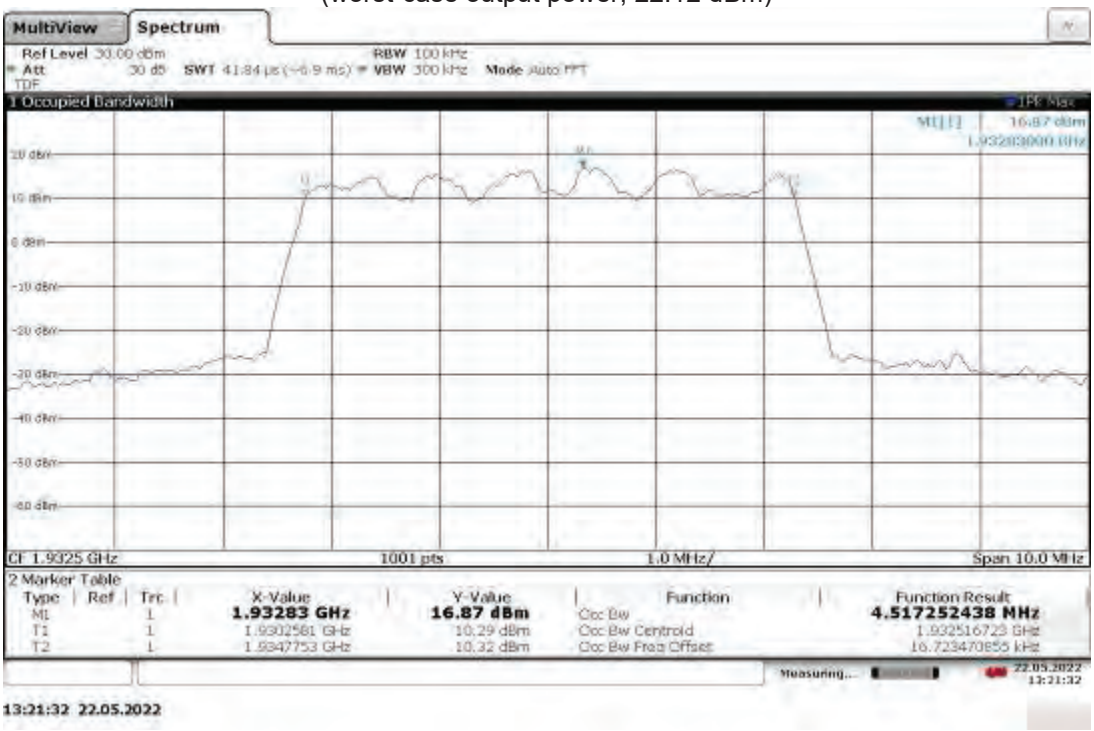
Voltage	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(VDC)	(GHz)	(GHz)	--	--	PPM
41.1	1.9894912	1E-07	5.02641E-08	0.00	2.5
48	1.9894911	0	0	0.00	--
57	1.989491	-1E-07	-5.02641E-08	0.00	2.5

10.4 Setup Photographs:

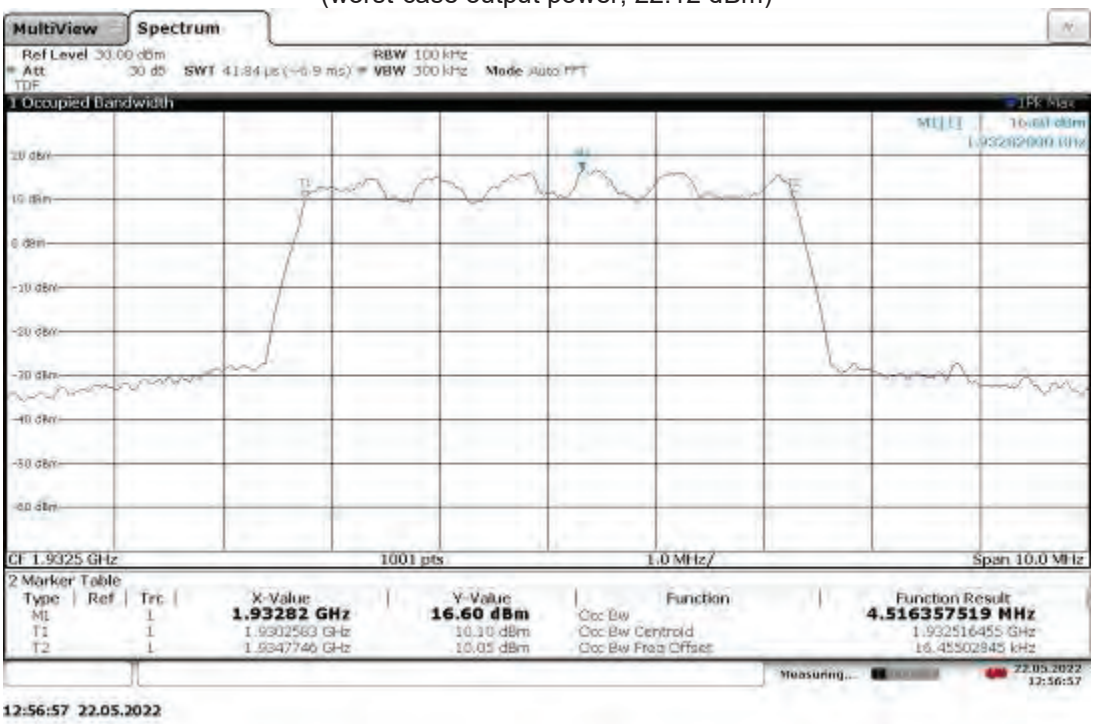
Confidential – Photos not included in this report

10.5 Plots/Data:

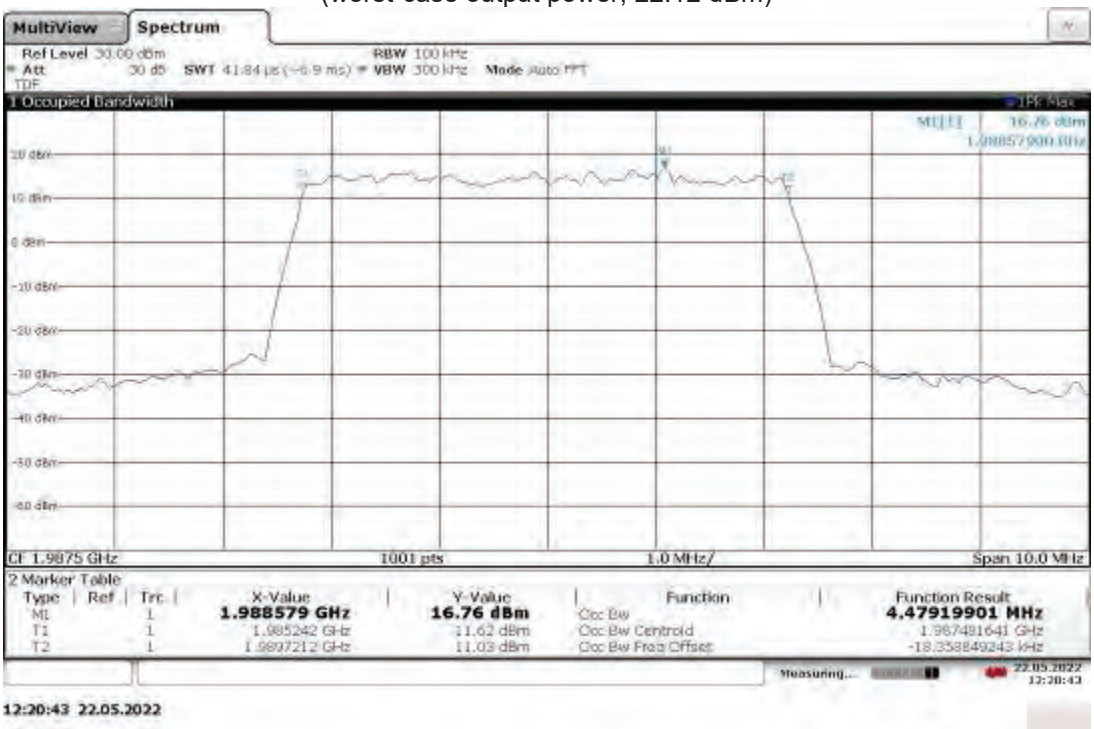
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, -30 ºC (5G NR)
(worst-case output power, 22.12 dBm)



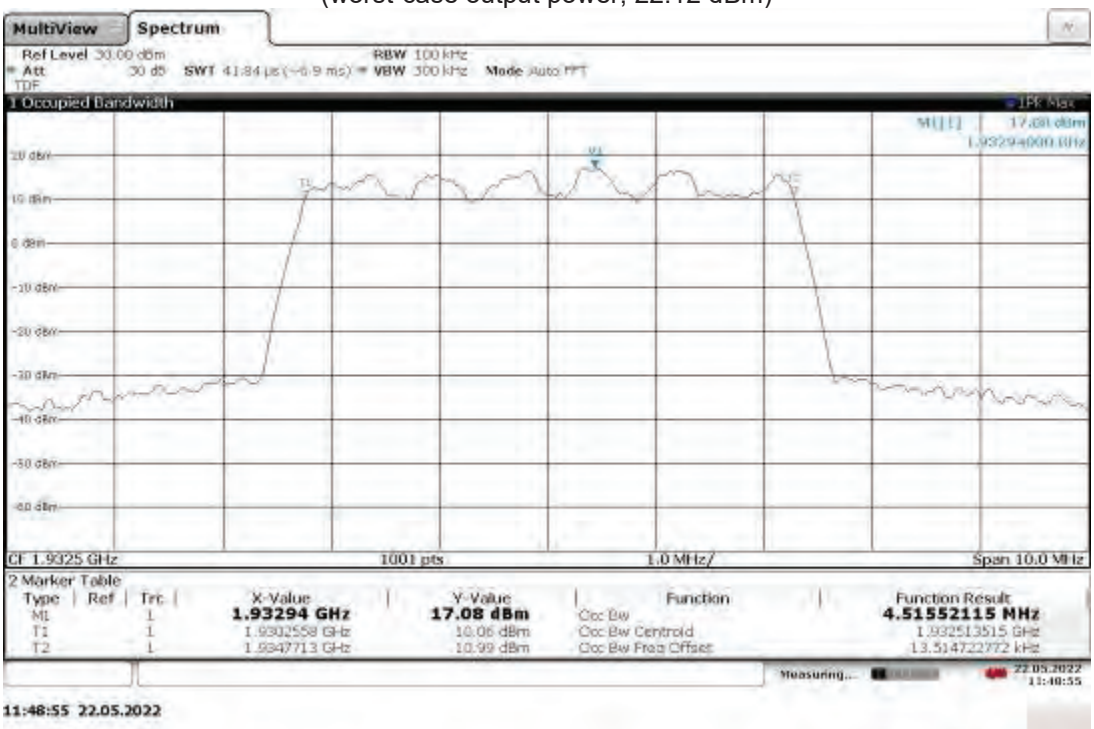
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, -20 ºC (5G NR)
(worst-case output power, 22.12 dBm)



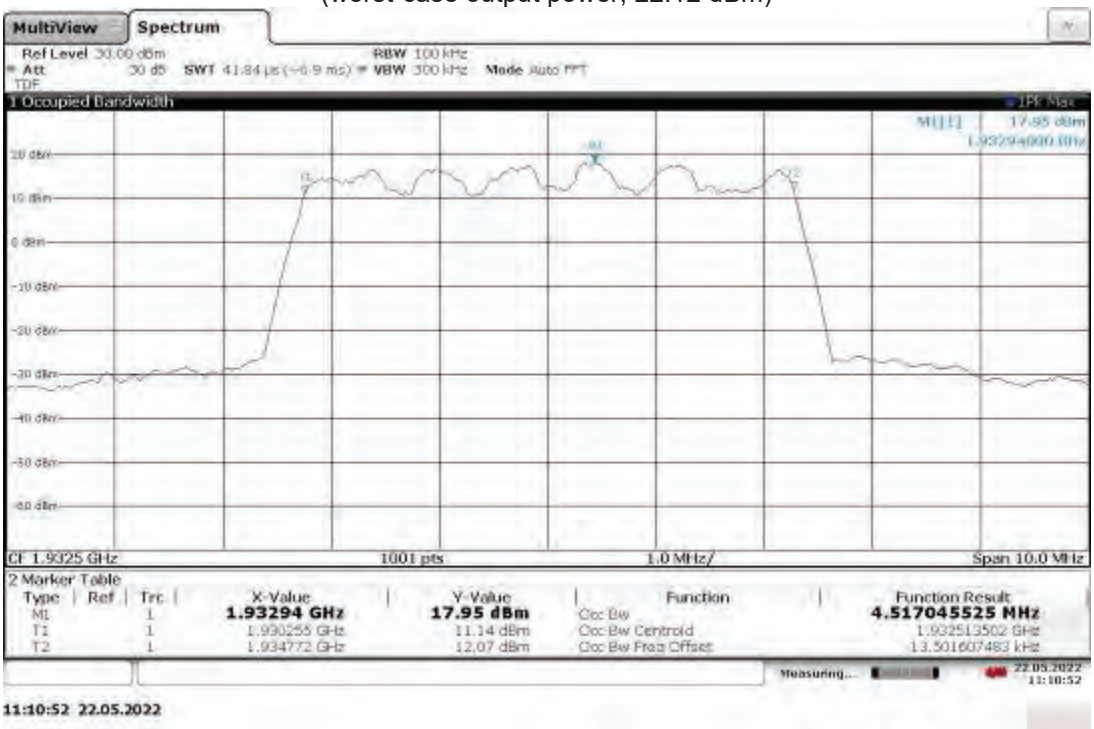
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, -10 ºC (5G NR)
(worst-case output power, 22.12 dBm)



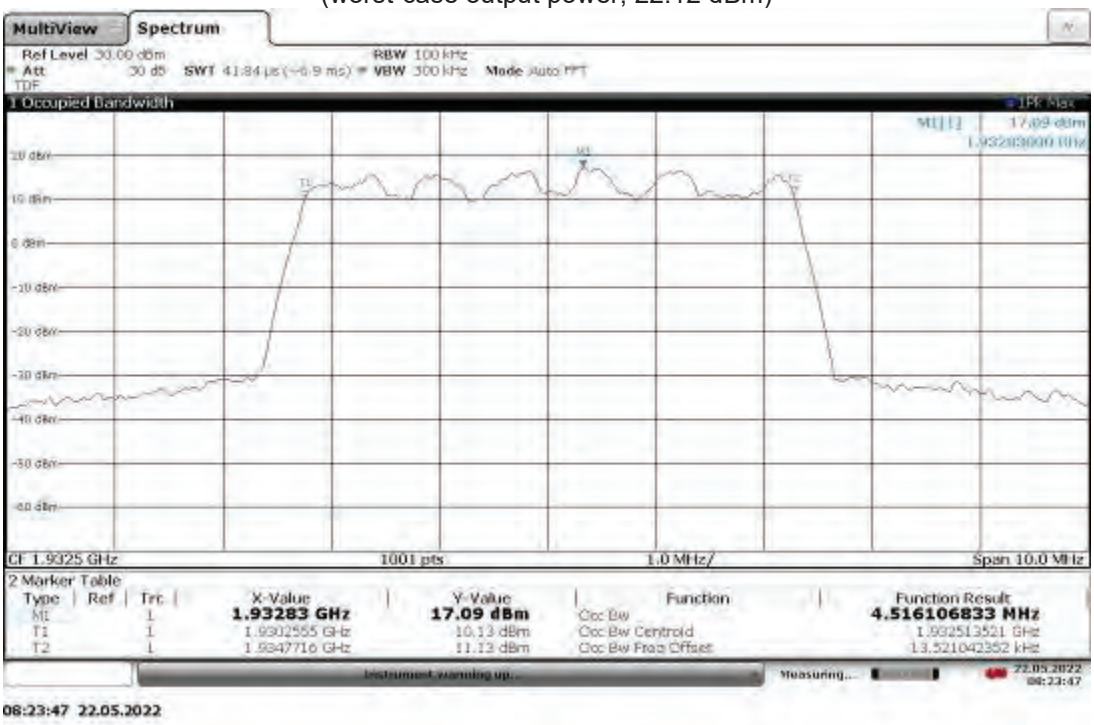
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, 0 ºC (5G NR)
(worst-case output power, 22.12 dBm)



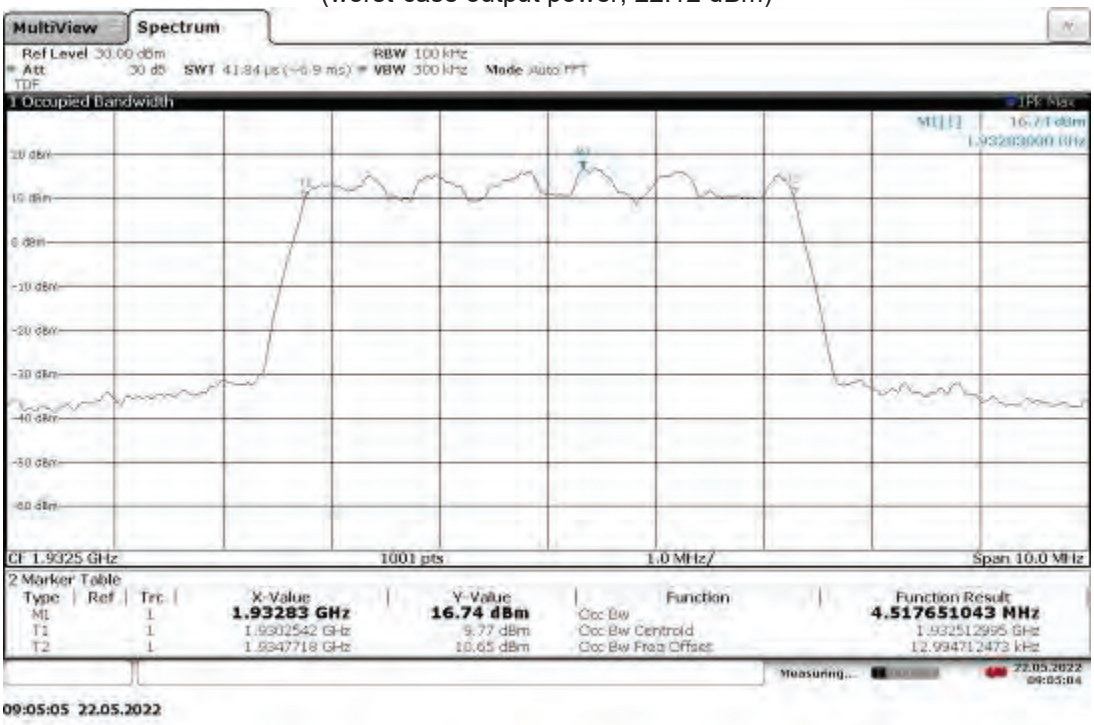
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, 10 ºC (5G NR)
(worst-case output power, 22.12 dBm)



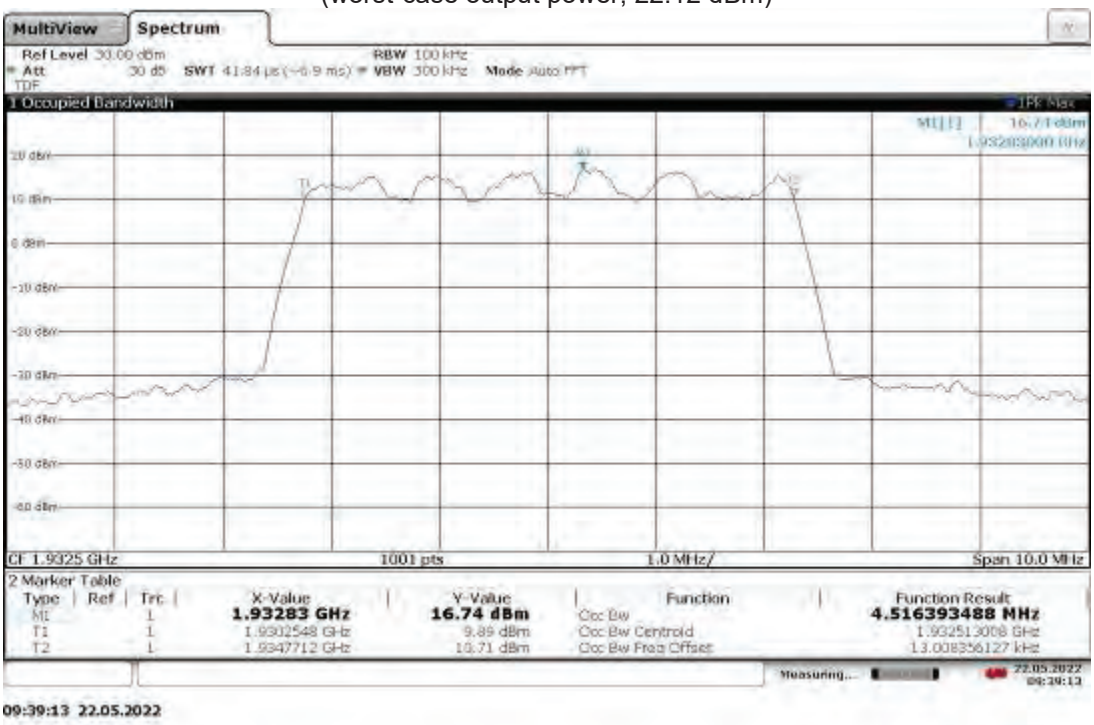
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, 20 ºC (5G NR)
(worst-case output power, 22.12 dBm)



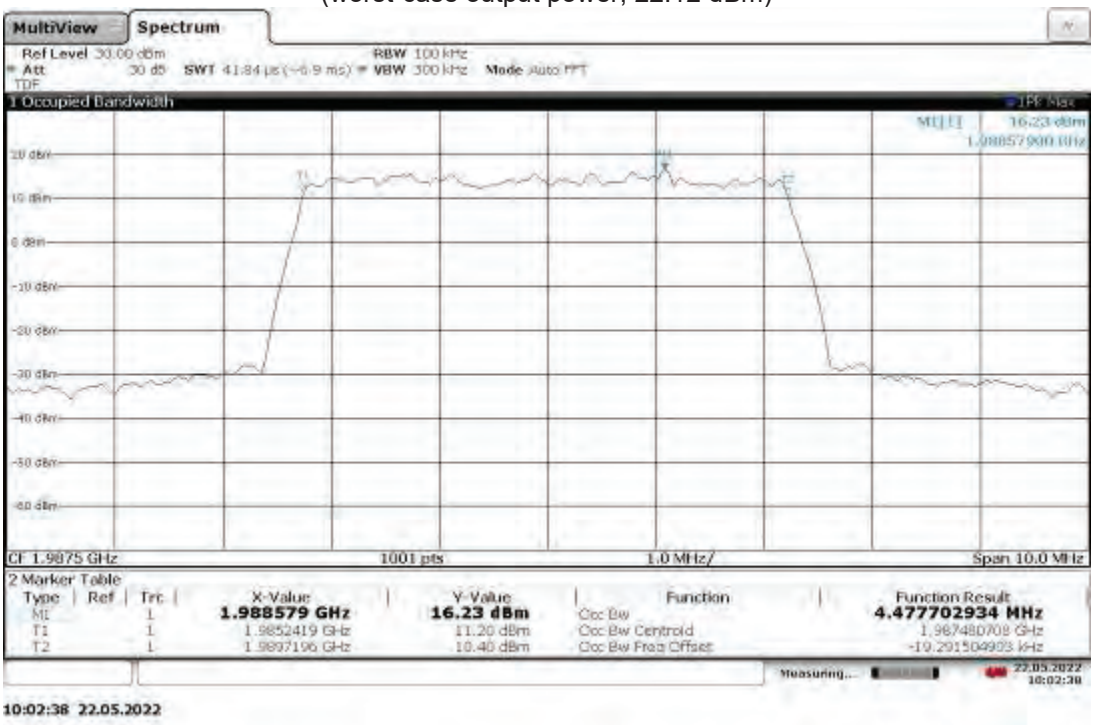
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, 30 ºC (5G NR)
(worst-case output power, 22.12 dBm)



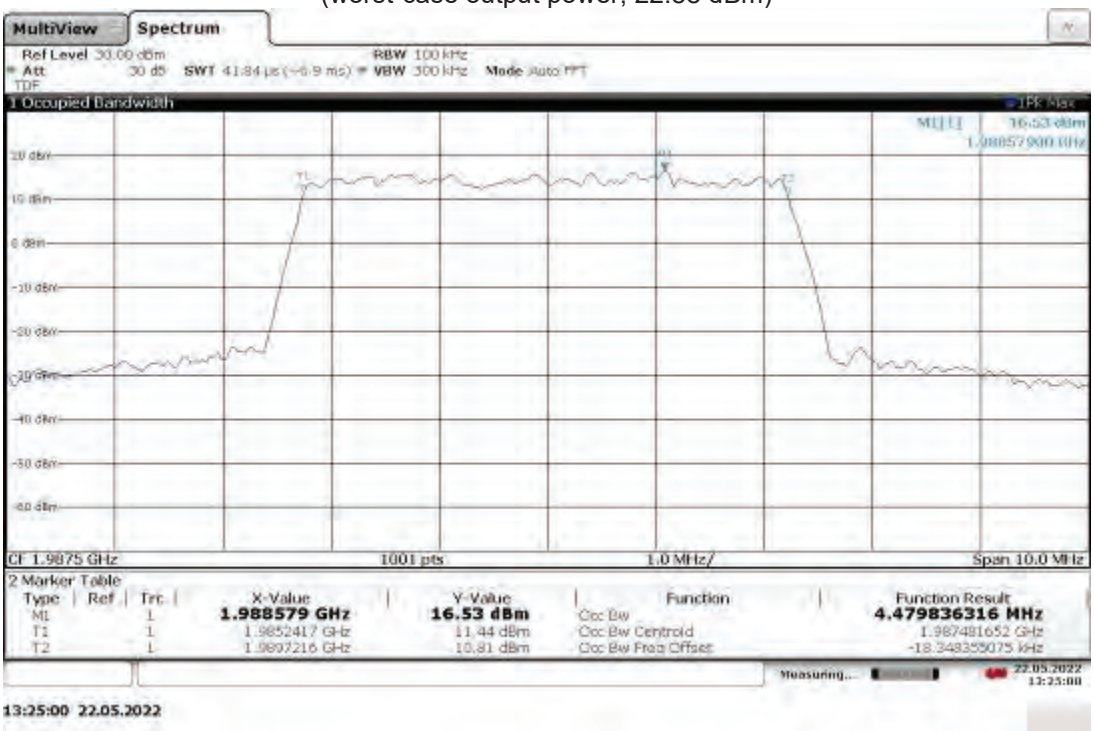
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, 40 ºC (5G NR)
(worst-case output power, 22.12 dBm)



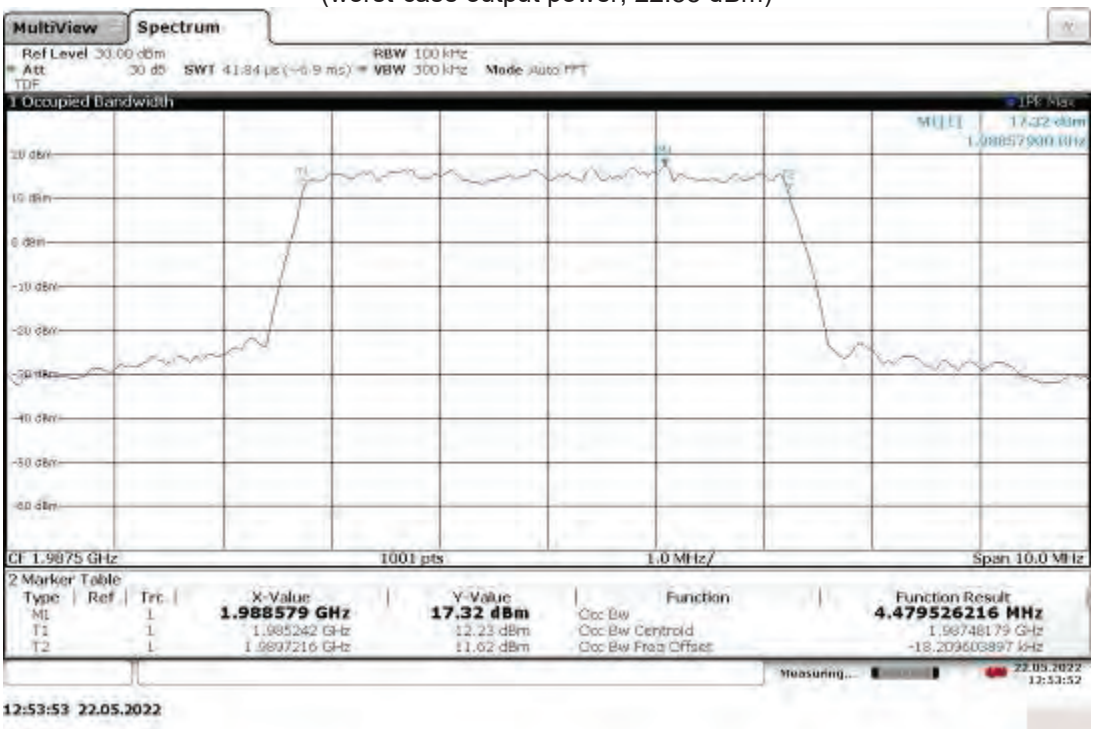
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz Low Ch. 1932.5 MHz, 50 ºC (5G NR)
(worst-case output power, 22.12 dBm)



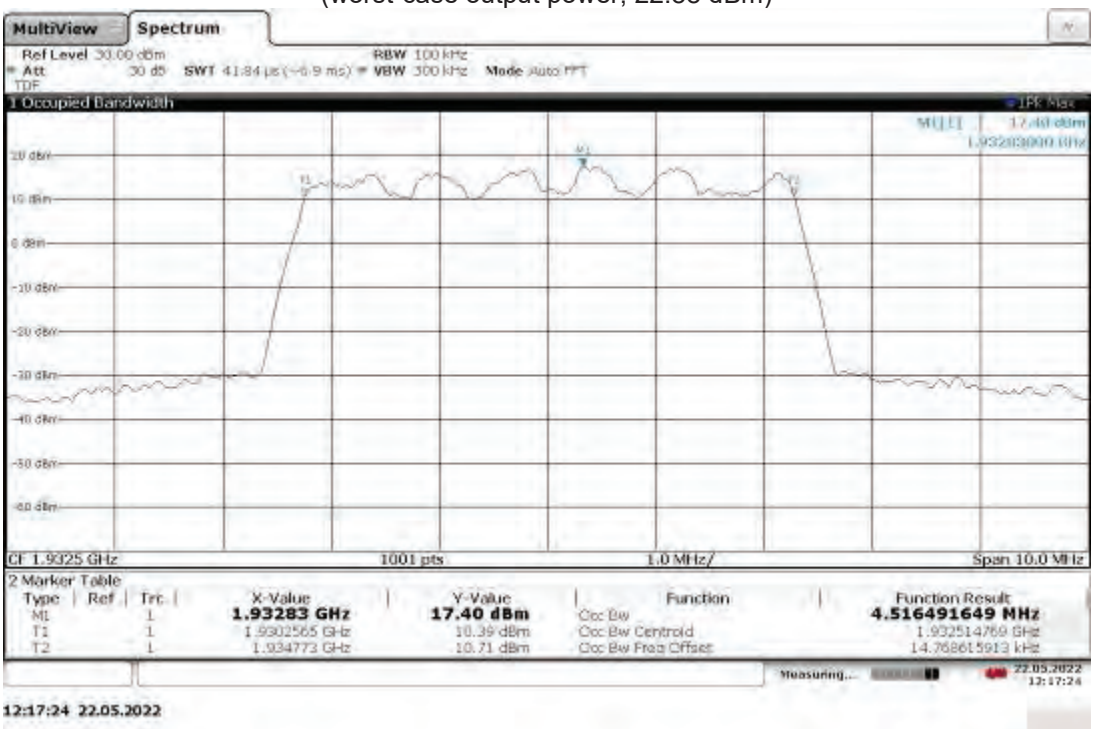
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, -30 ºC (5G NR)
(worst-case output power, 22.88 dBm)



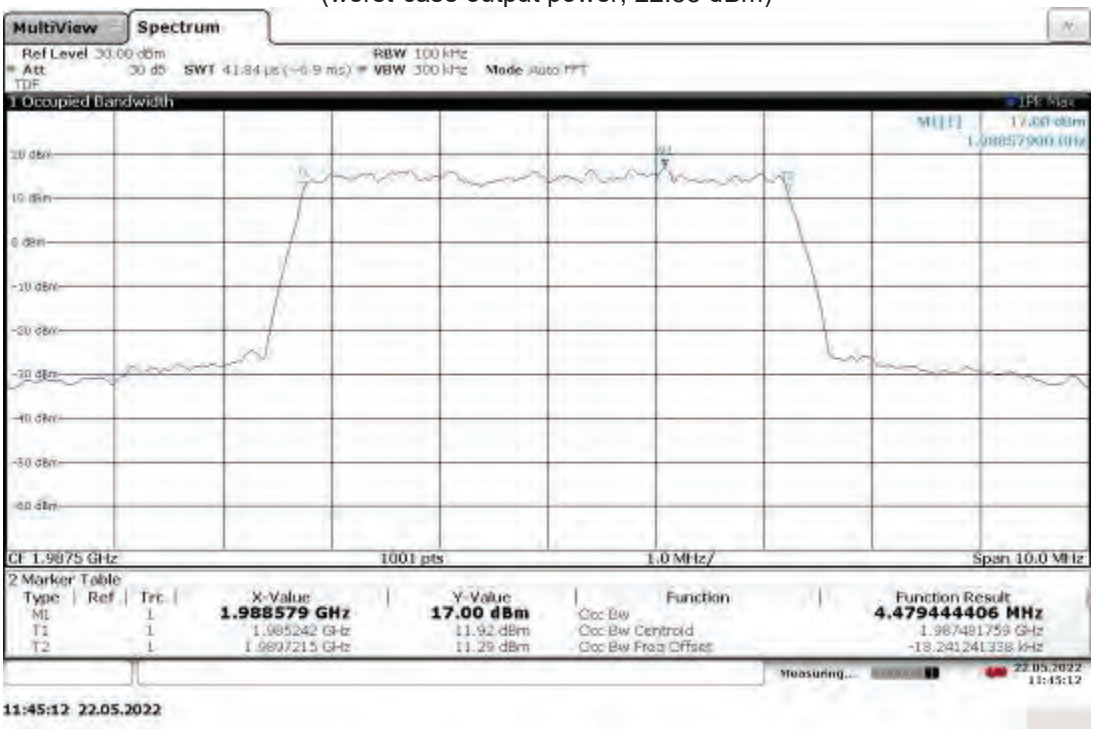
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, -20 ºC (5G NR)
(worst-case output power, 22.88 dBm)



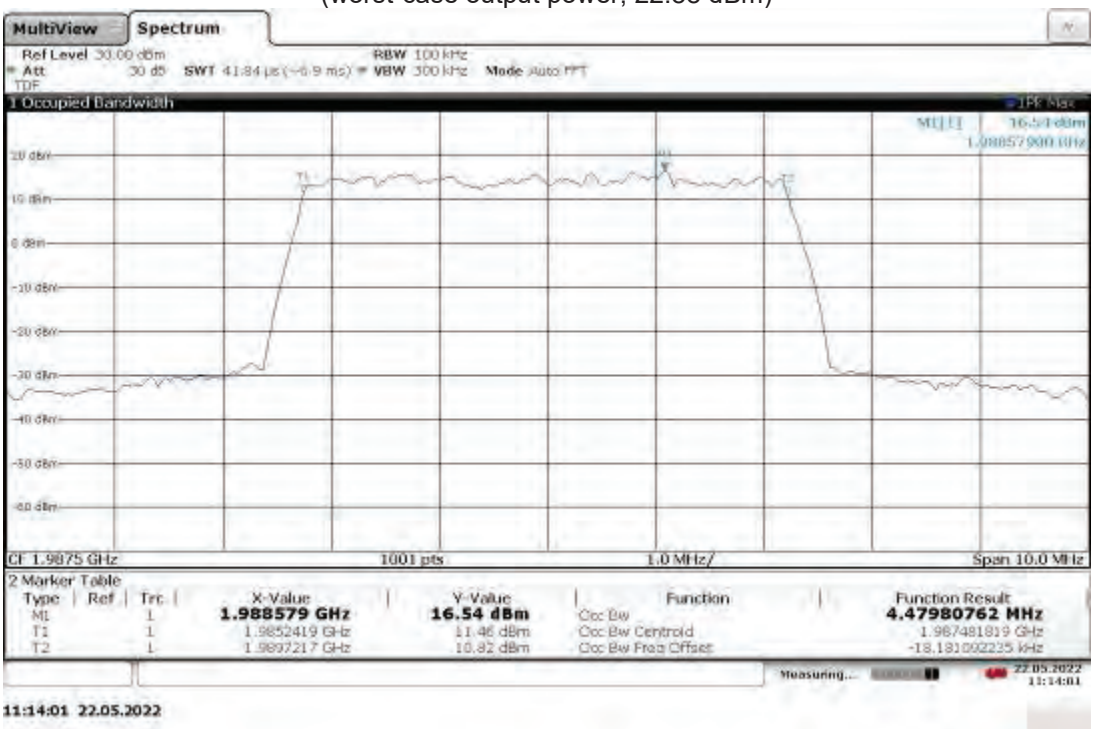
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, -10 ºC (5G NR)
(worst-case output power, 22.88 dBm)



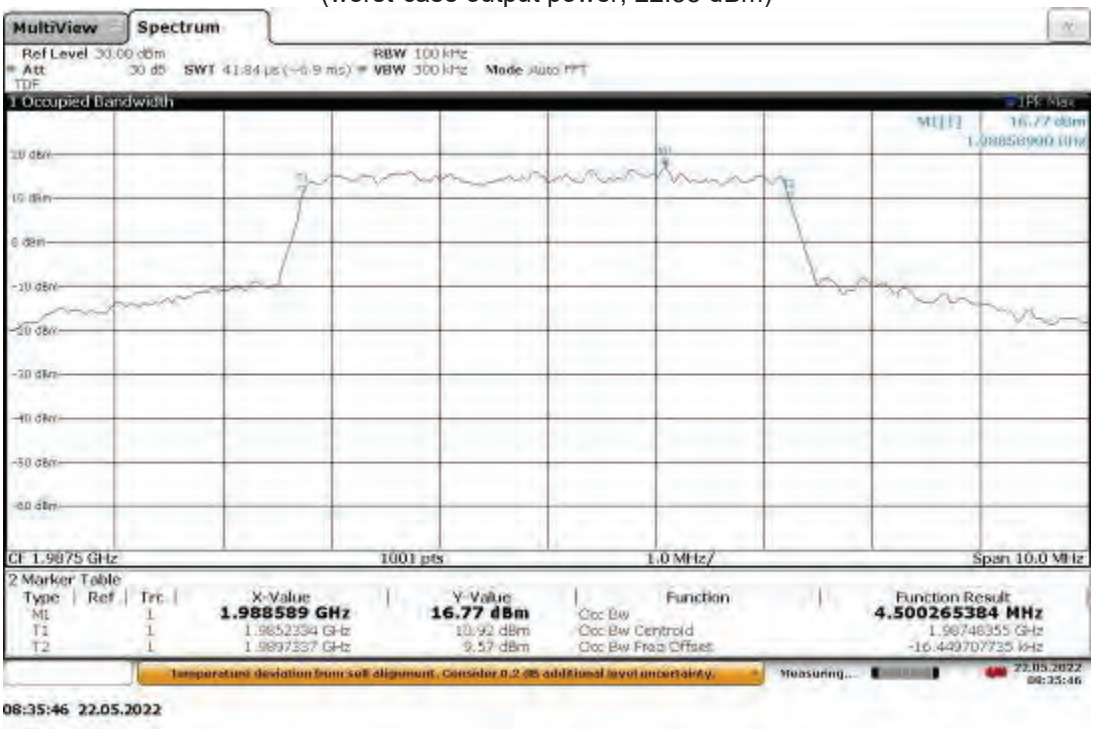
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, 0 ºC (5G NR)
(worst-case output power, 22.88 dBm)



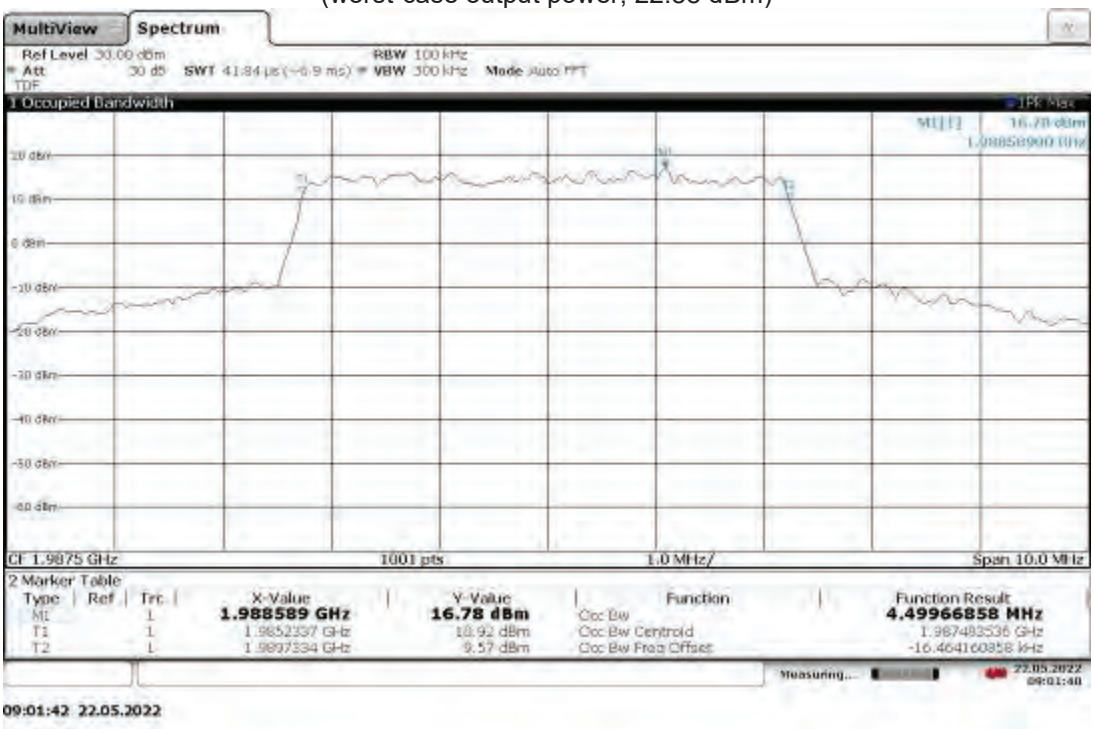
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, 10 ºC (5G NR)
(worst-case output power, 22.88 dBm)



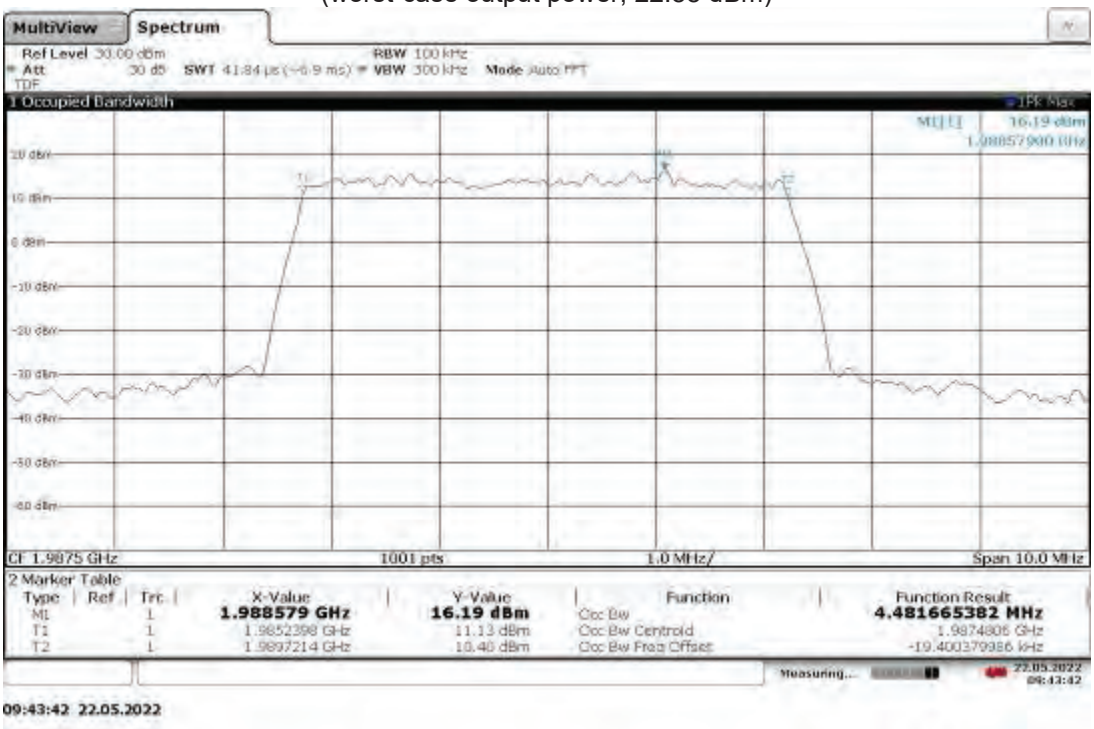
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, 20 ºC (5G NR)
(worst-case output power, 22.88 dBm)



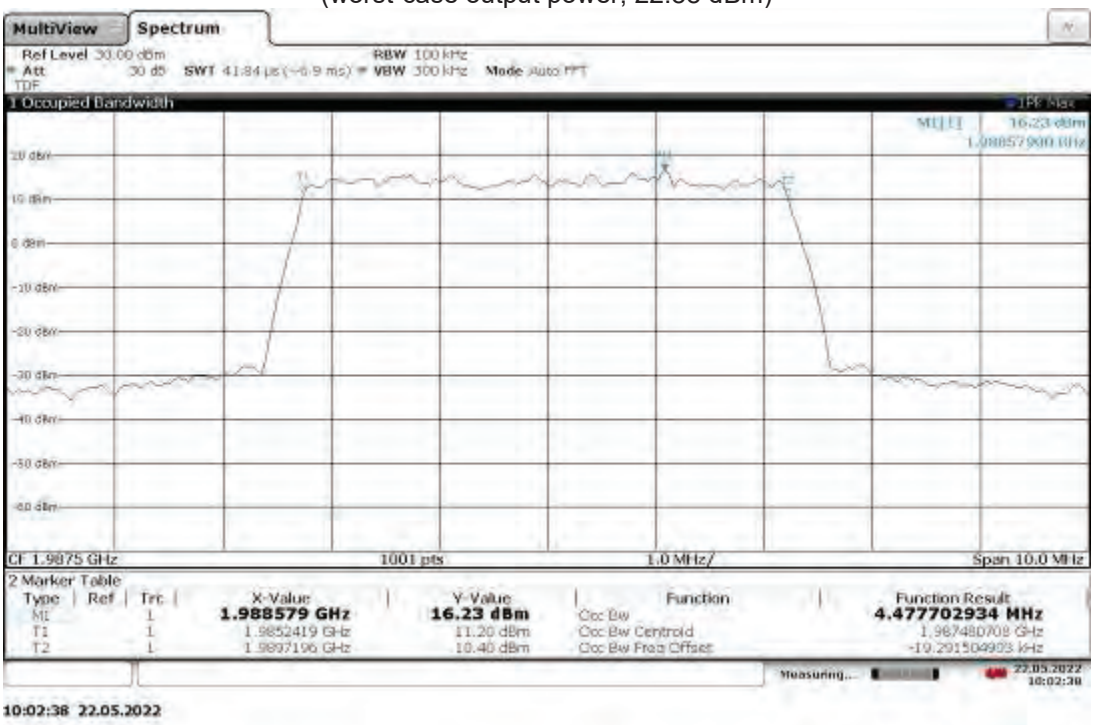
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, 30 ºC (5G NR)
(worst-case output power, 22.88 dBm)



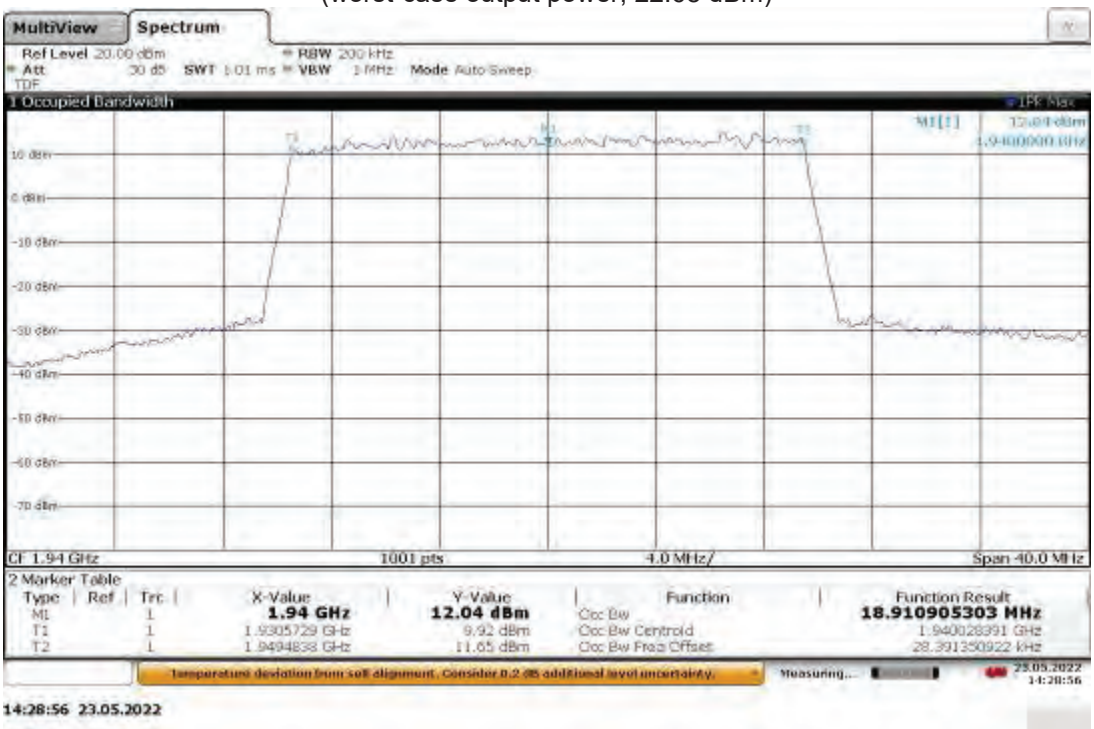
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, 40 ºC (5G NR)
(worst-case output power, 22.88 dBm)



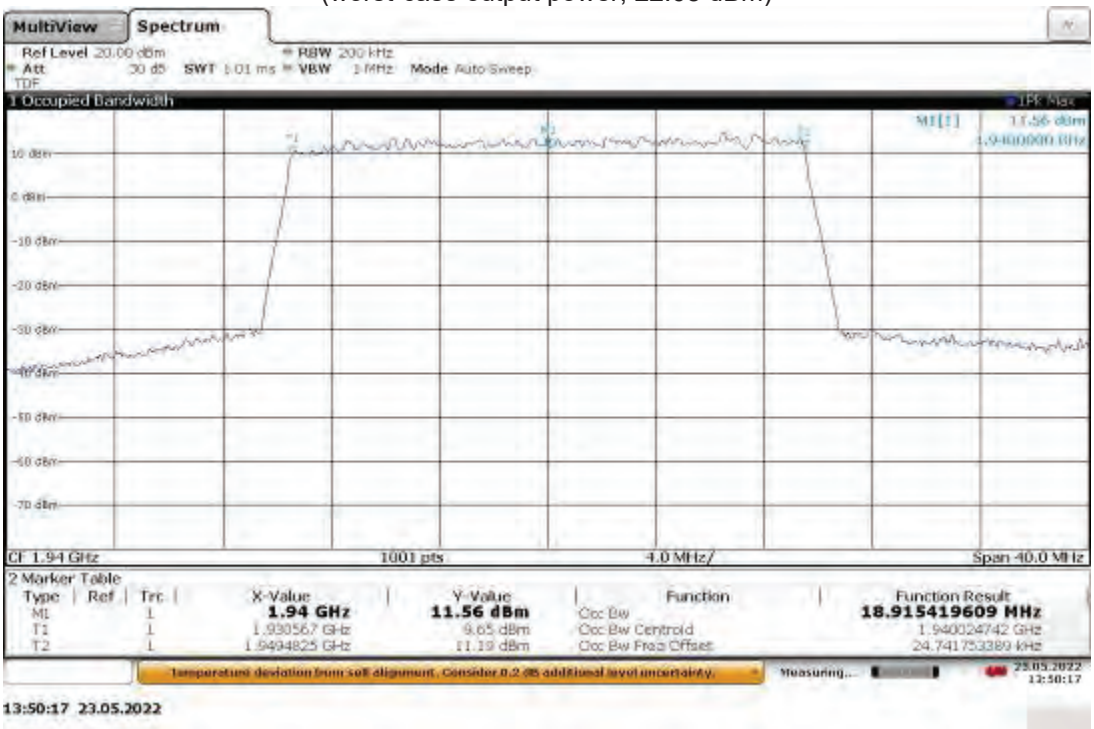
Slot 0 (Band 2), ANT1, Modulation: 64QAM, Bandwidth: 5 MHz High Ch. 1987.5 MHz, 50 ºC (5G NR)
(worst-case output power, 22.88 dBm)



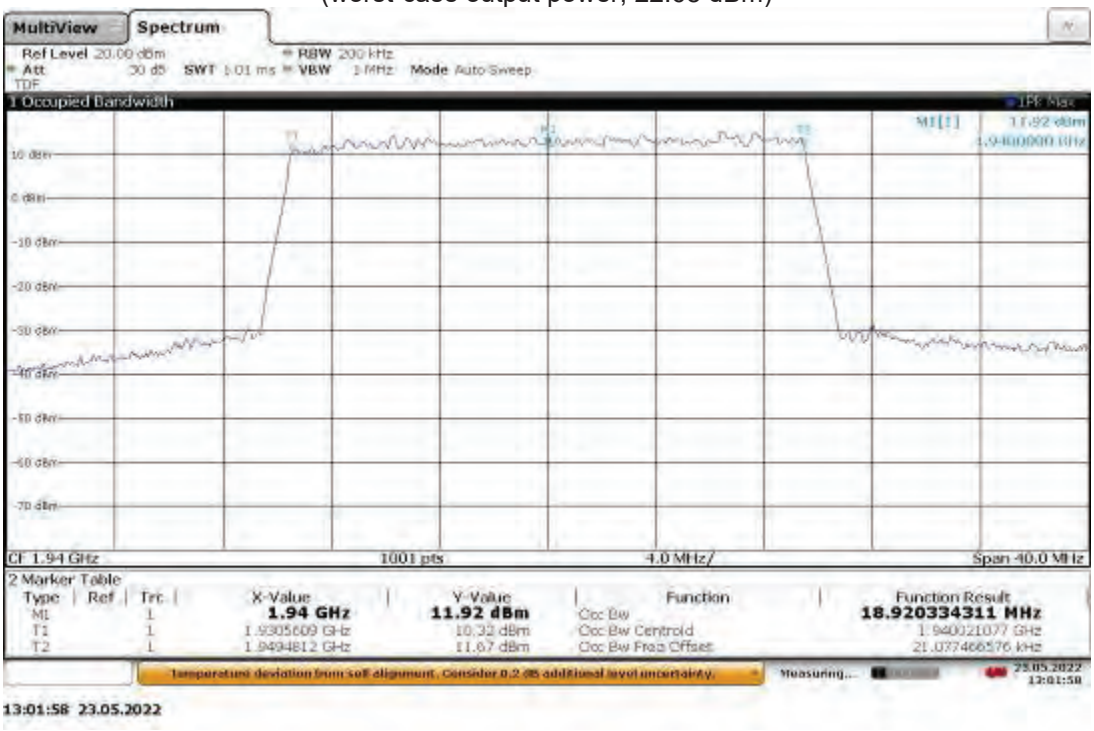
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, -30 ºC (5G NR)
(worst-case output power, 22.68 dBm)



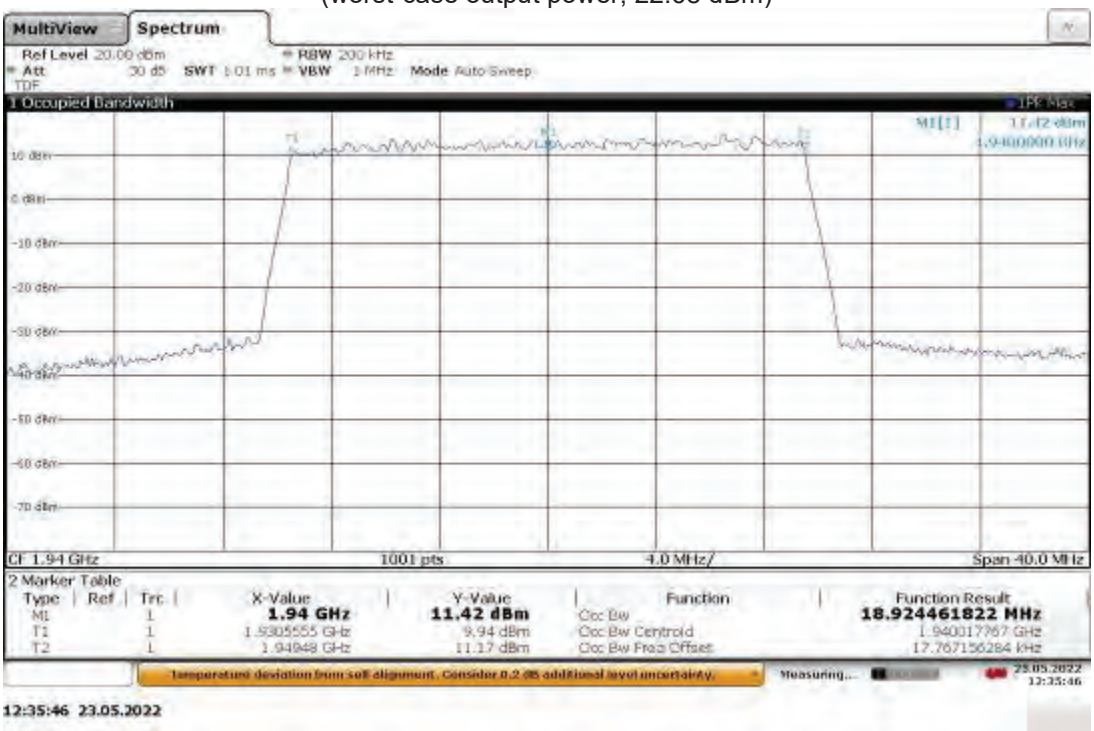
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, -20 ºC (5G NR)
(worst-case output power, 22.68 dBm)



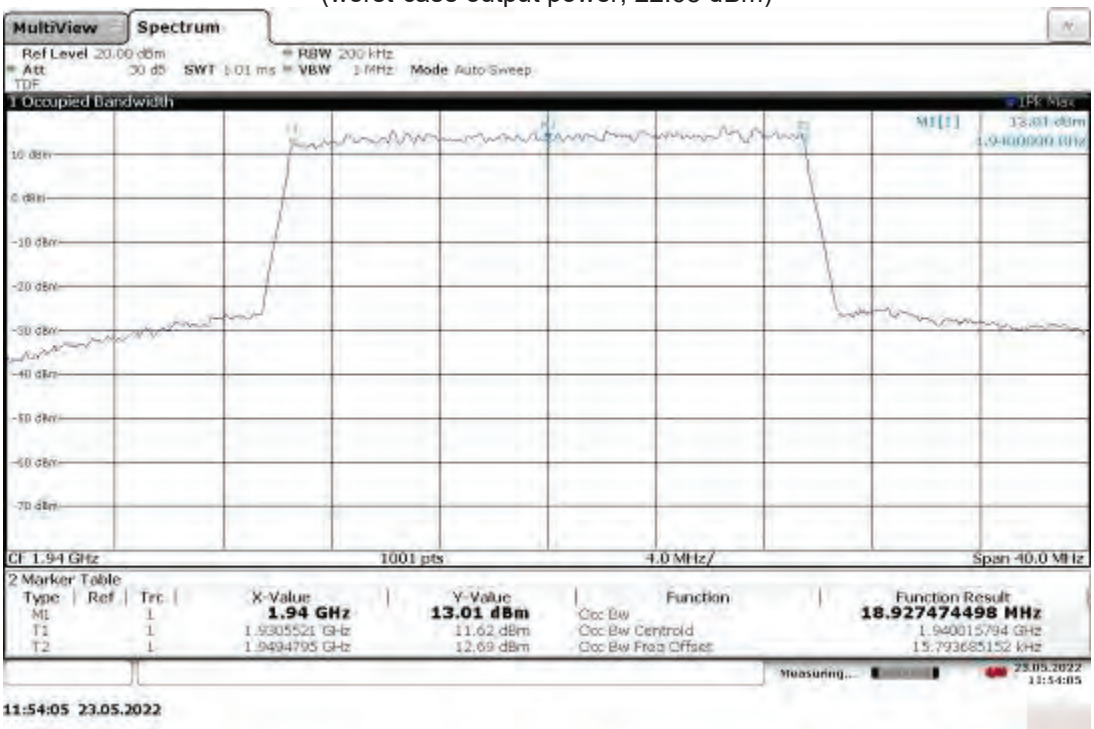
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, -10 ºC (5G NR)
(worst-case output power, 22.68 dBm)



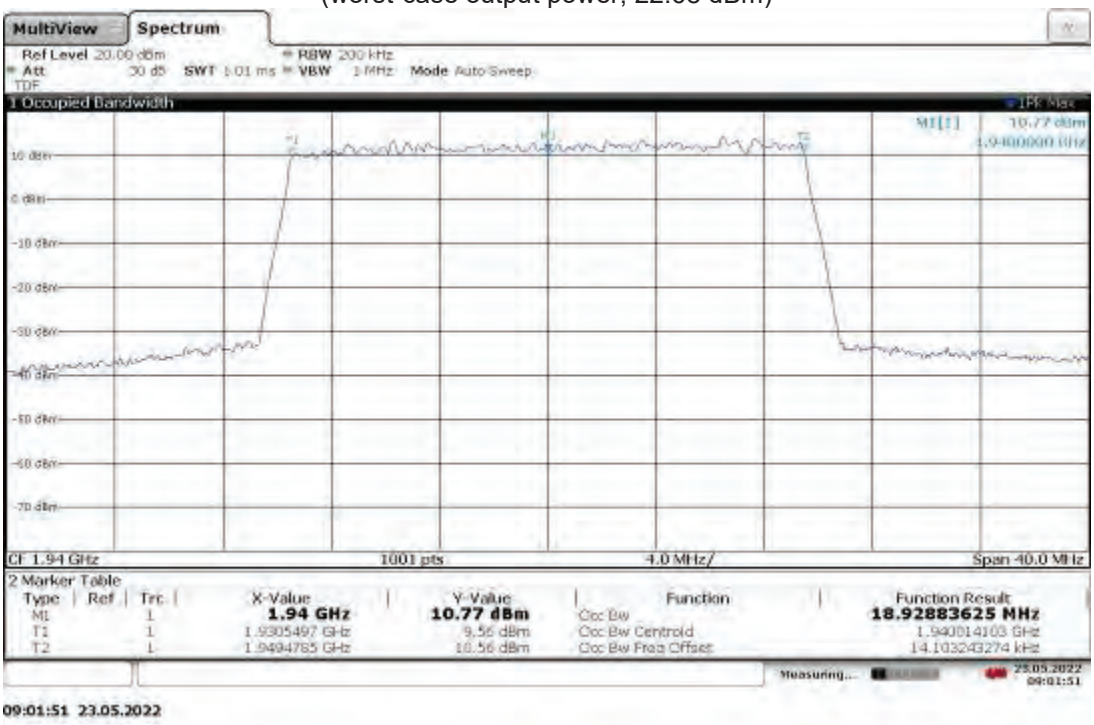
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, 0 ºC (5G NR)
(worst-case output power, 22.68 dBm)



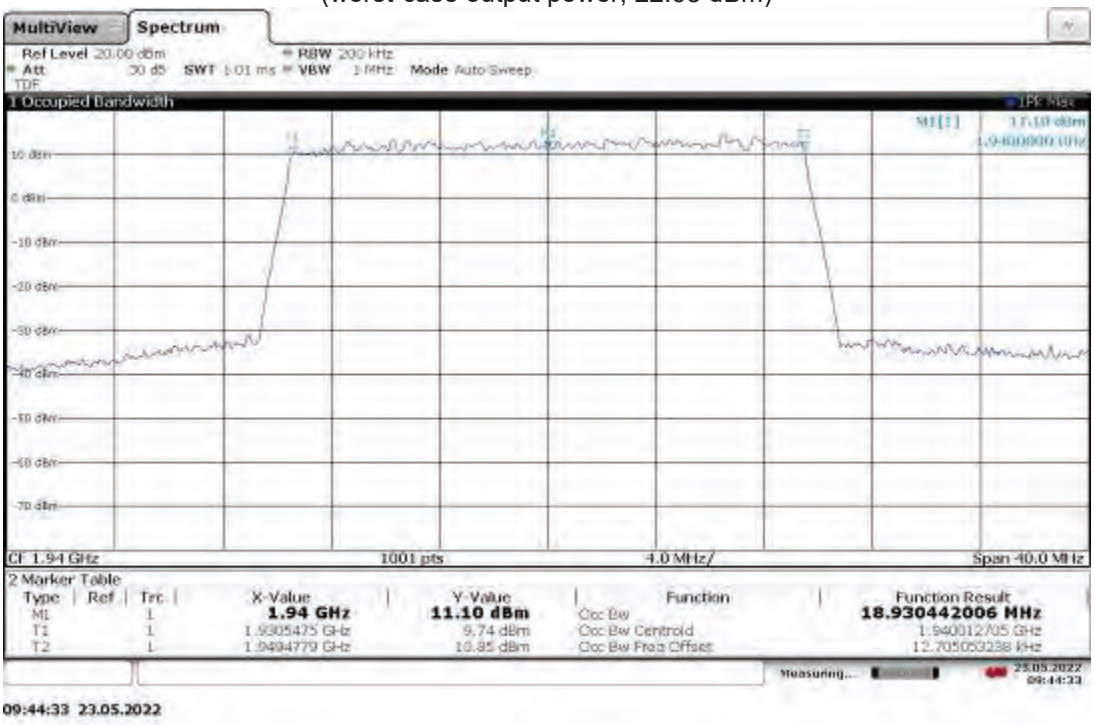
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, 10 ºC (5G NR)
(worst-case output power, 22.68 dBm)



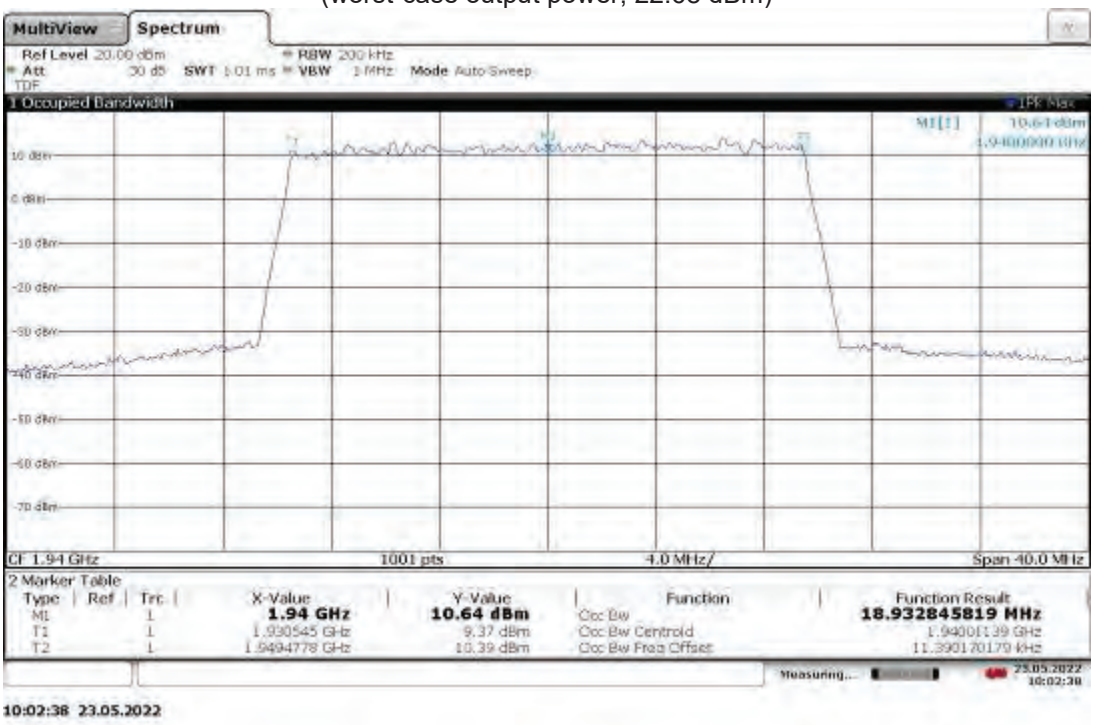
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, 20 ºC (5G NR)
(worst-case output power, 22.68 dBm)



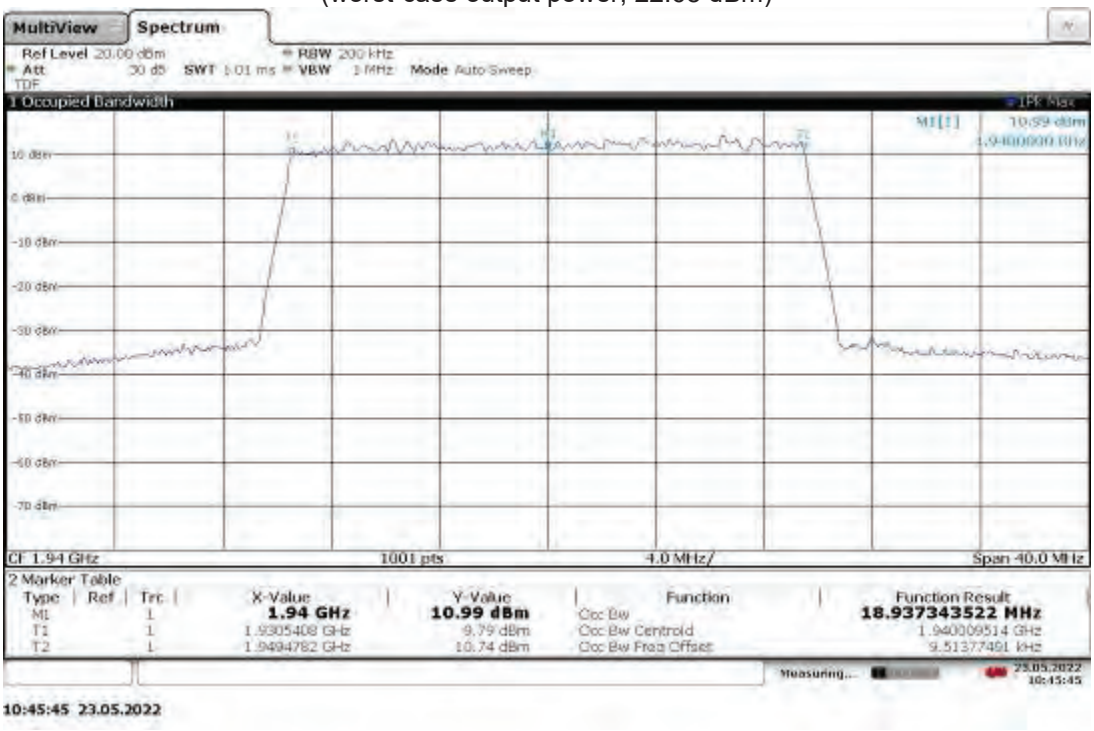
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, 30 ºC (5G NR)
(worst-case output power, 22.68 dBm)



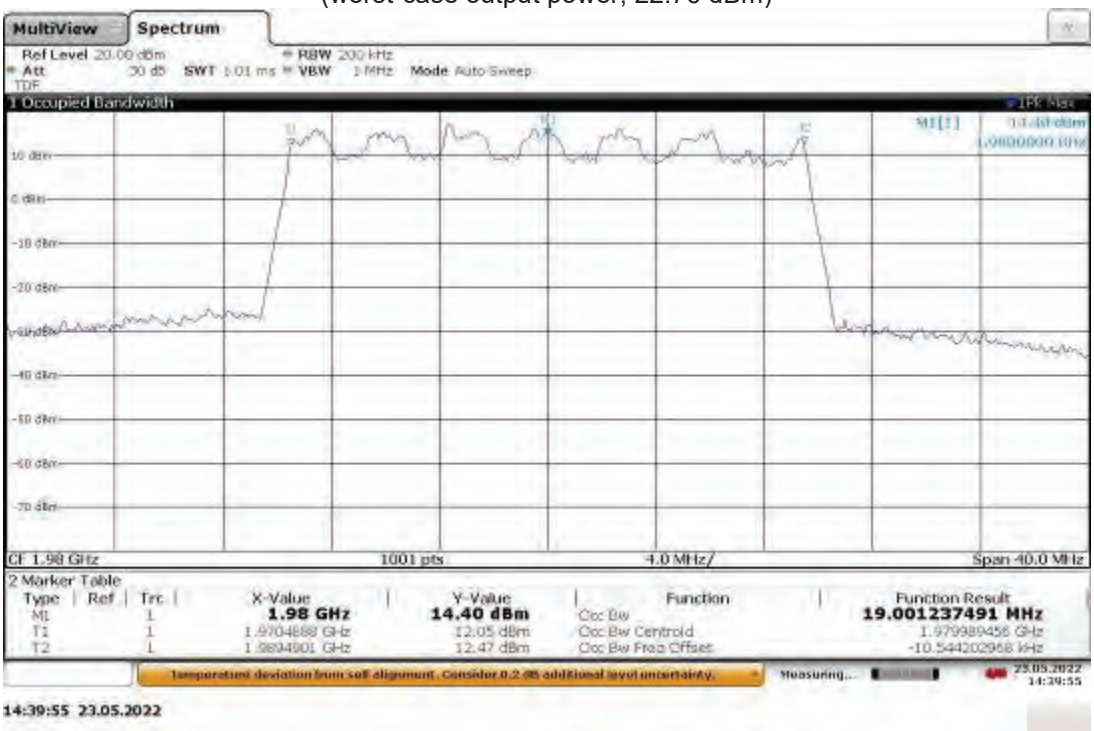
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, 40 ºC (5G NR)
(worst-case output power, 22.68 dBm)



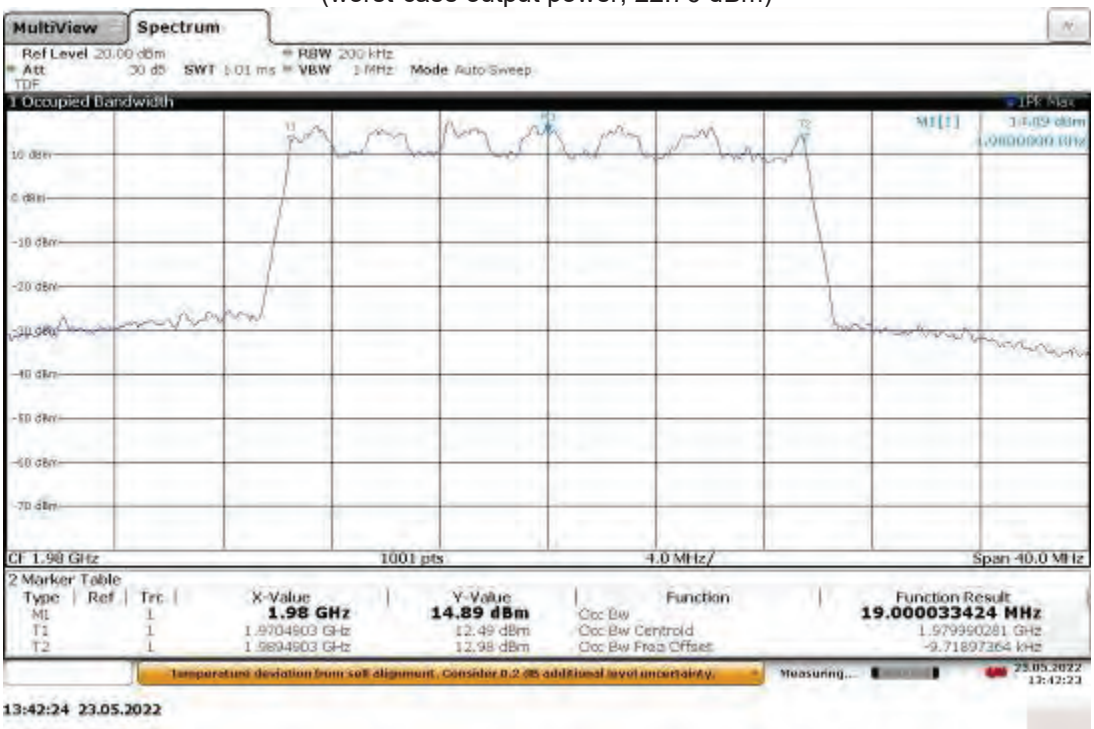
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz Low Ch. 1940 MHz, 50 ºC (5G NR)
(worst-case output power, 22.68 dBm)



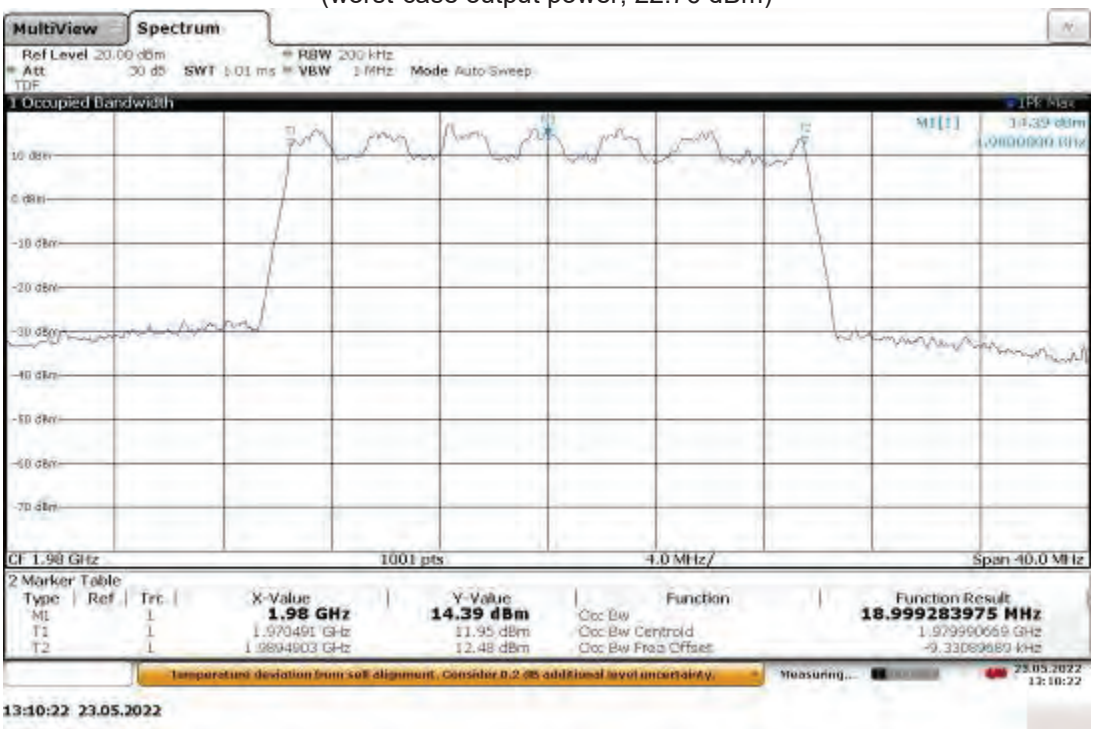
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, -30 ºC (5G NR)
(worst-case output power, 22.76 dBm)



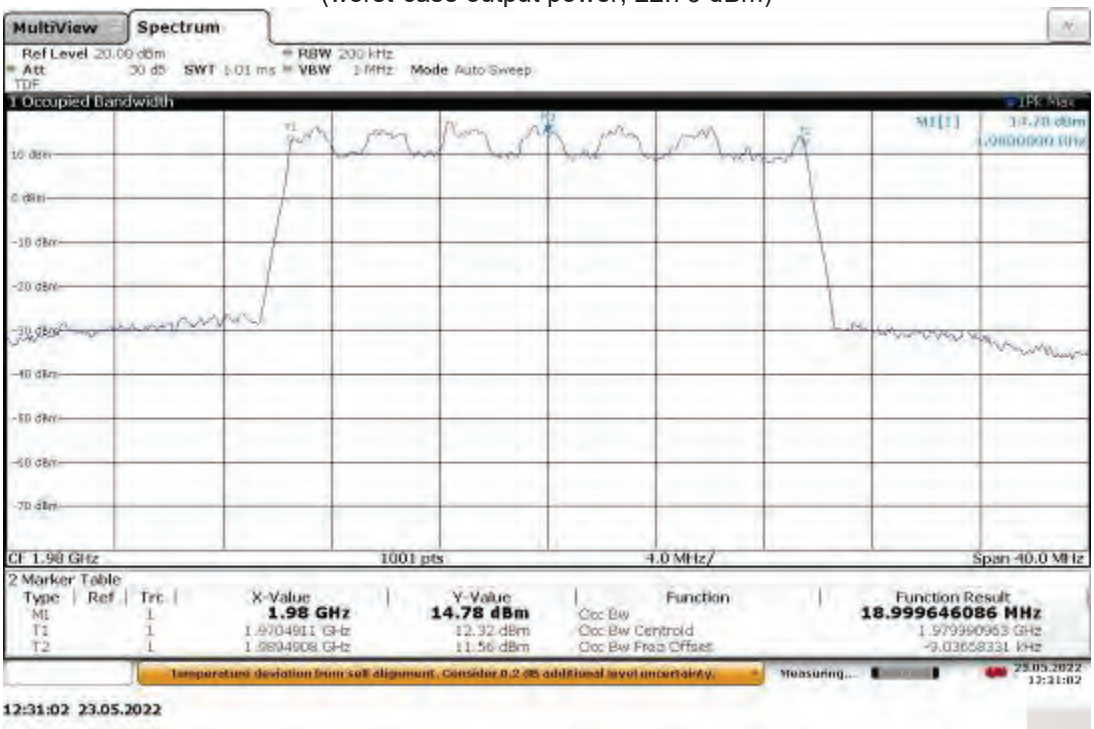
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, -20 ºC (5G NR)
(worst-case output power, 22.76 dBm)



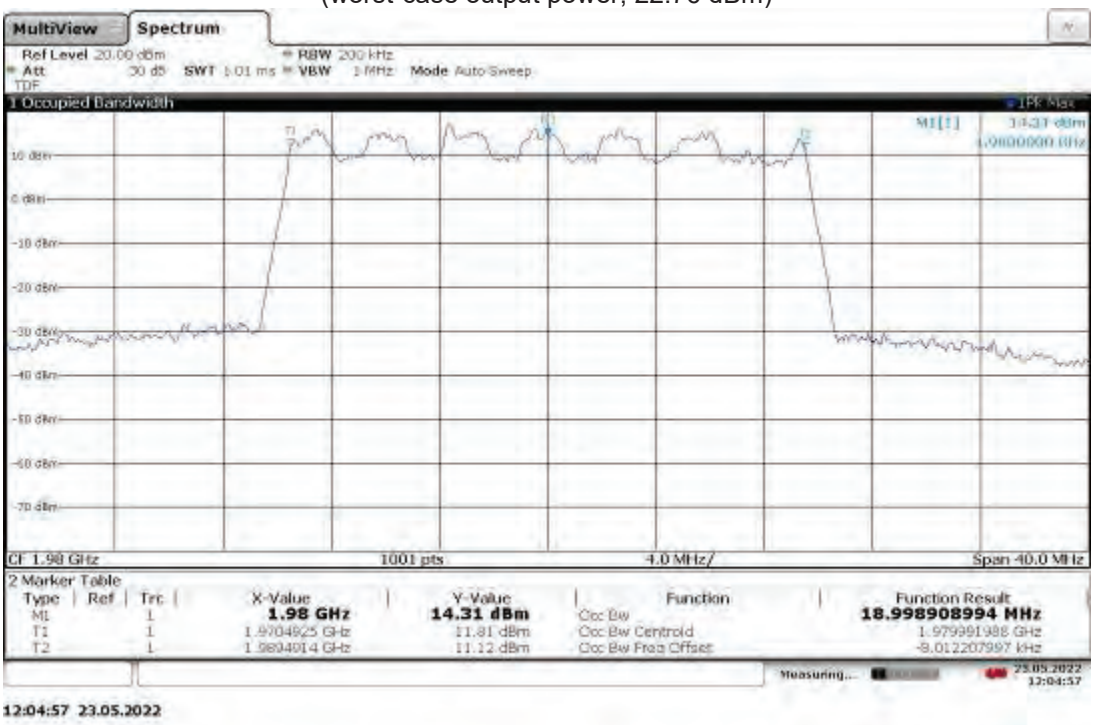
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, -10 ºC (5G NR)
(worst-case output power, 22.76 dBm)



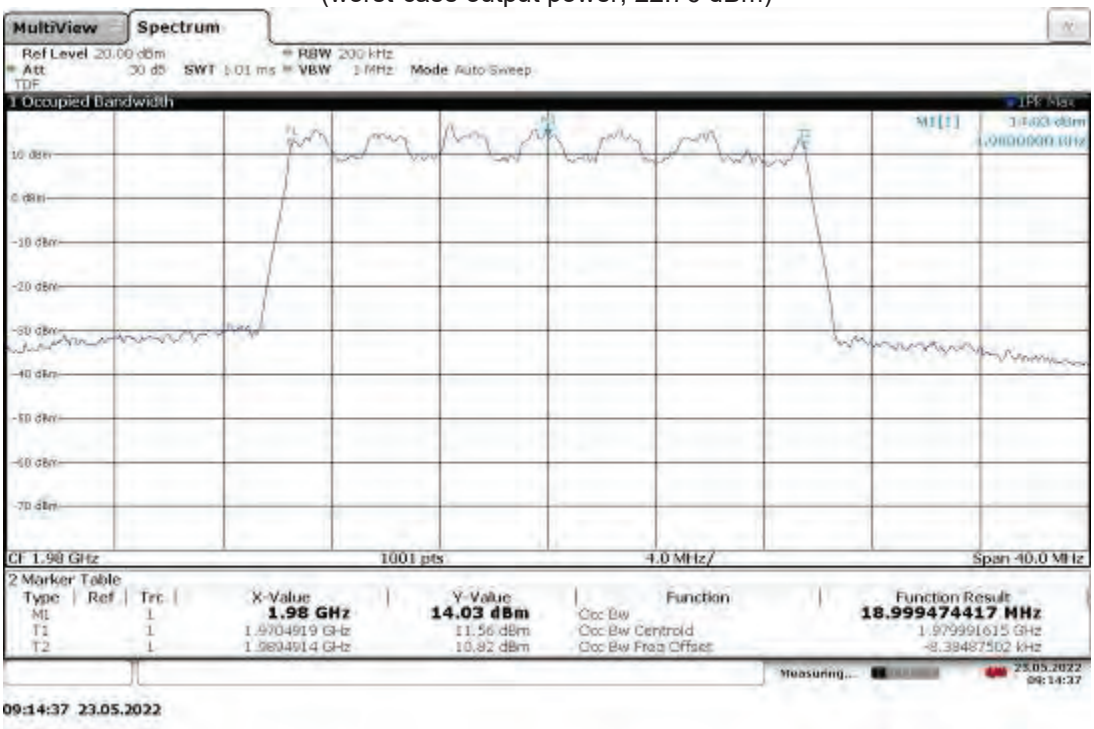
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, 0 ºC (5G NR)
(worst-case output power, 22.76 dBm)



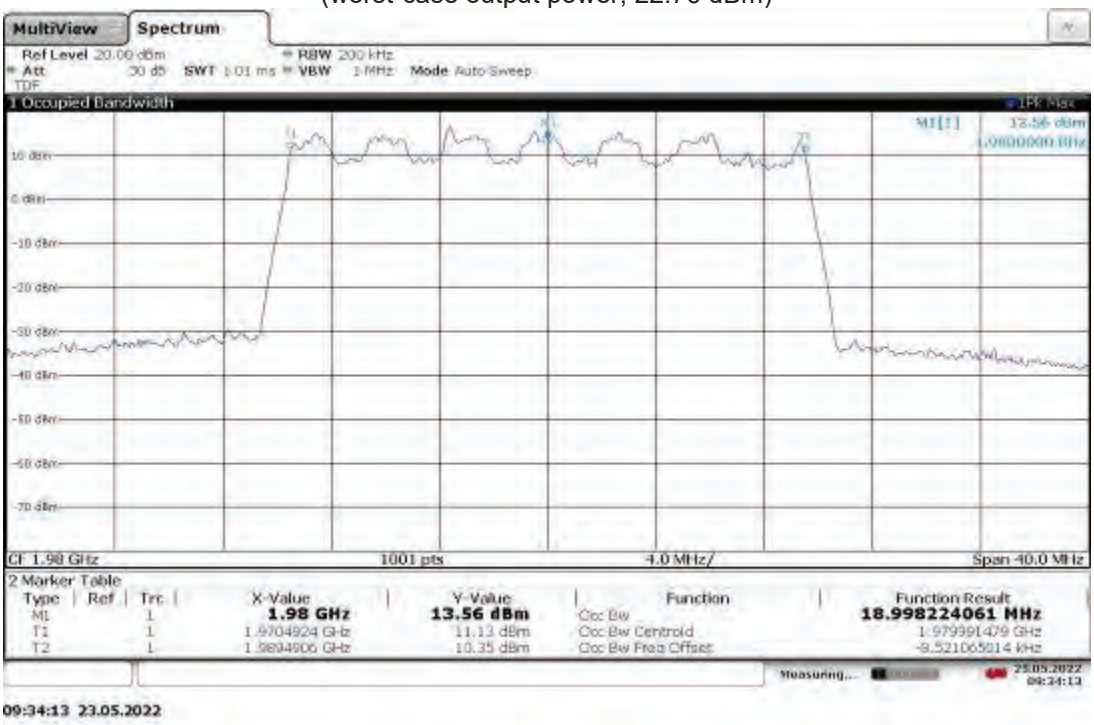
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, 10 ºC (5G NR)
(worst-case output power, 22.76 dBm)



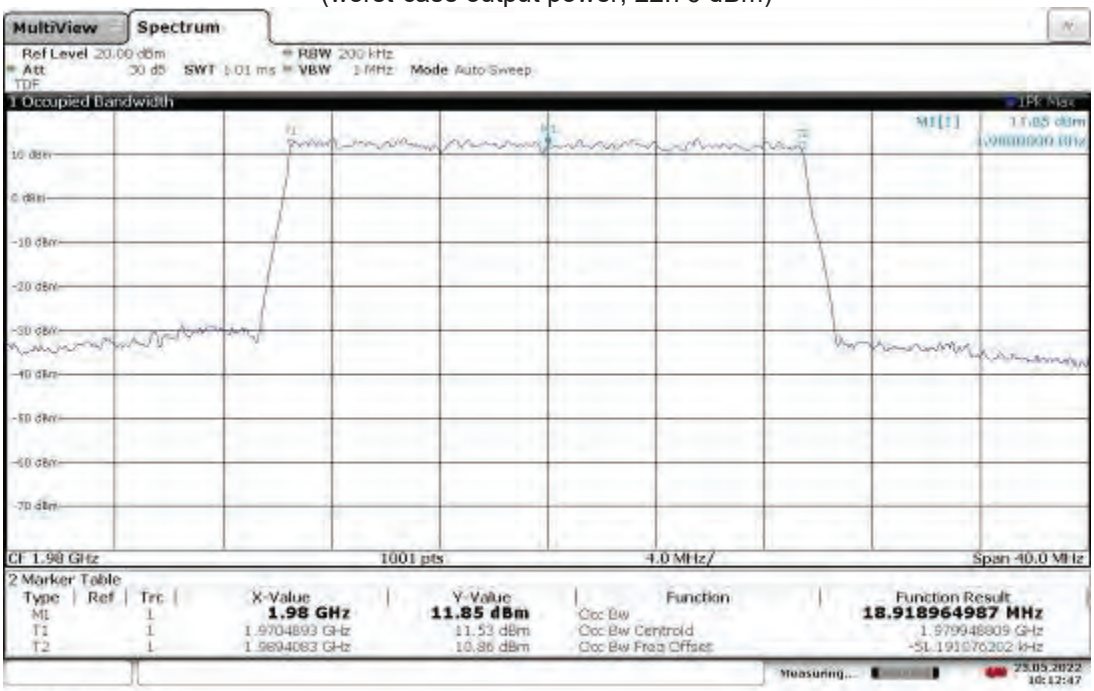
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, 20 ºC (5G NR)
(worst-case output power, 22.76 dBm)



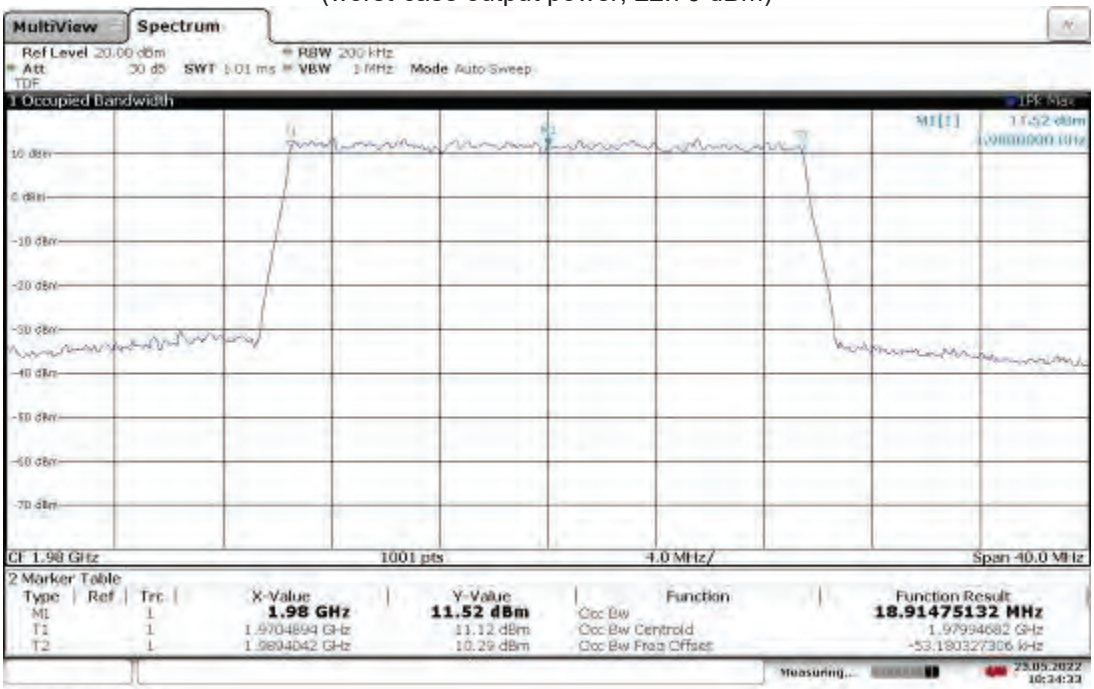
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, 30 ºC (5G NR)
(worst-case output power, 22.76 dBm)



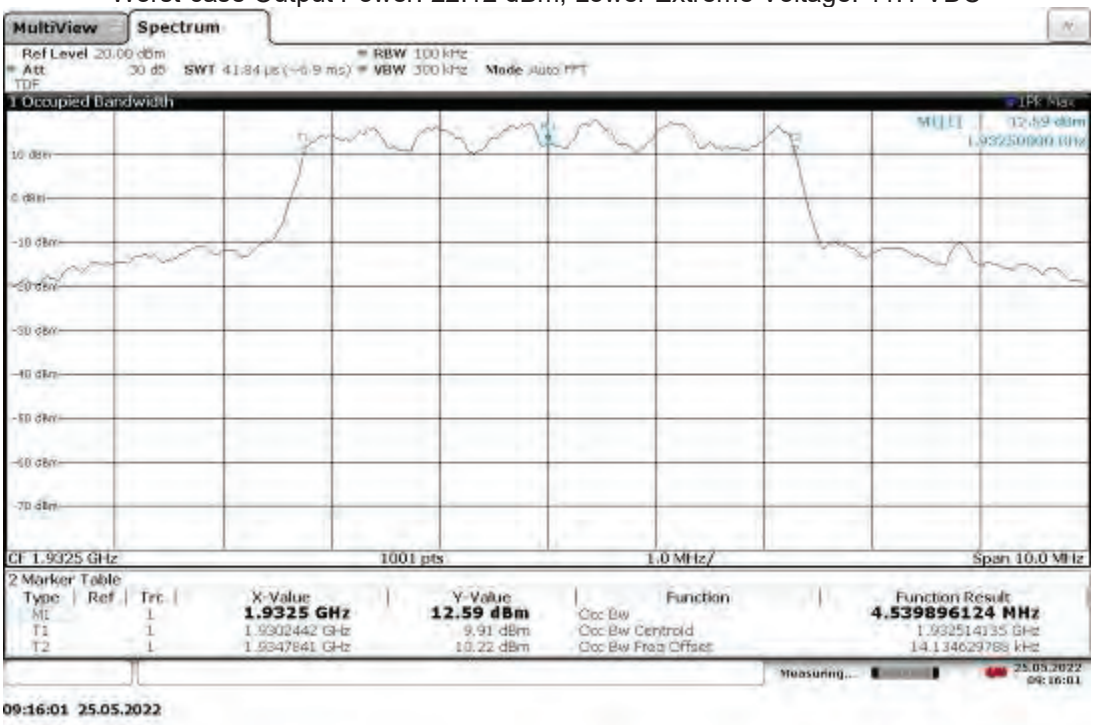
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, 40 ºC (5G NR)
(worst-case output power, 22.76 dBm)



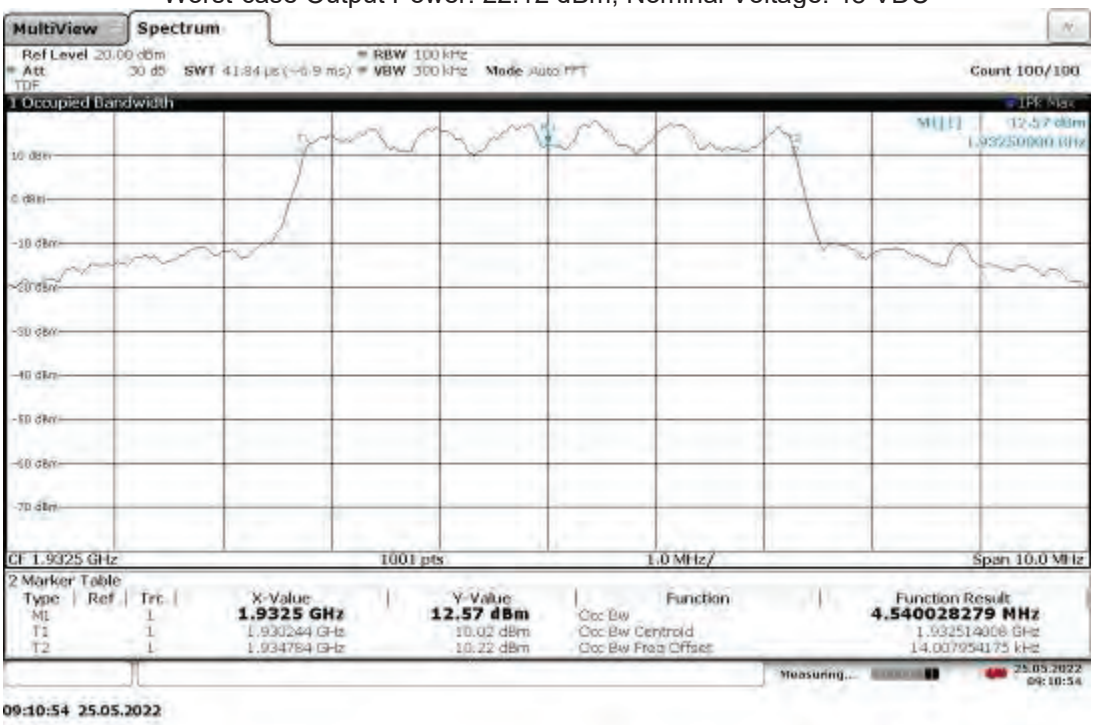
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz High Ch. 1980 MHz, 50 ºC (5G NR)
(worst-case output power, 22.76 dBm)



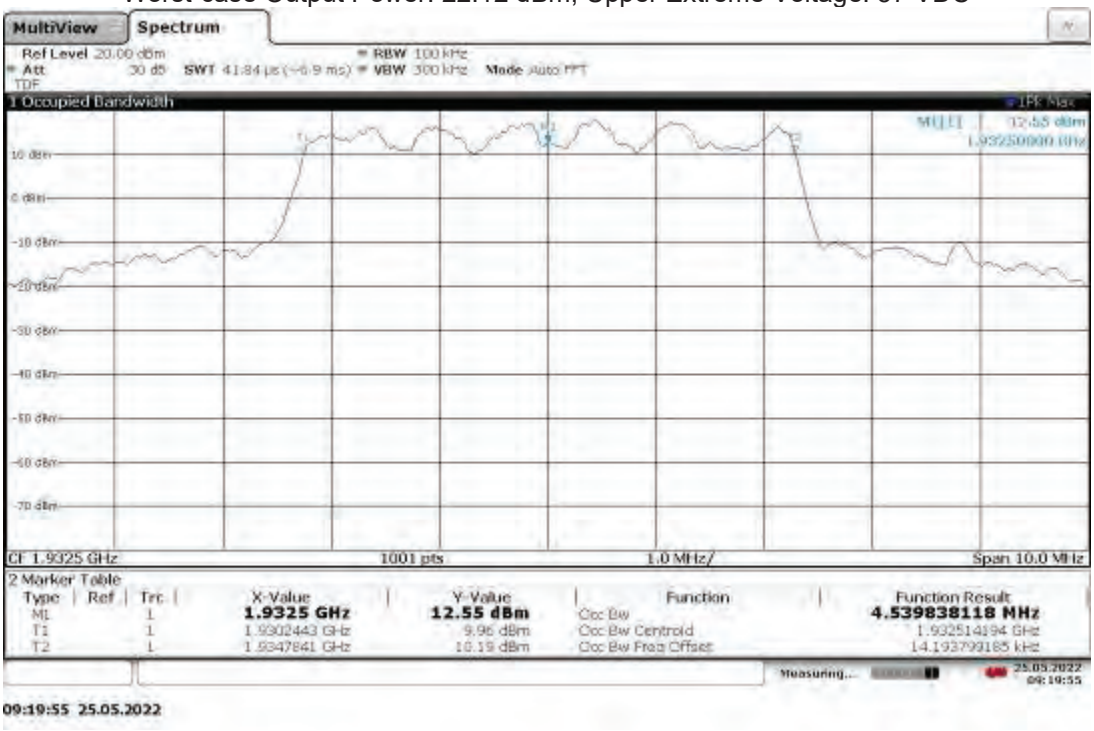
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz, Low Channel 1932.5 MHz (5G NR)
Worst-case Output Power: 22.12 dBm, Lower Extreme Voltage: 41.1 VDC



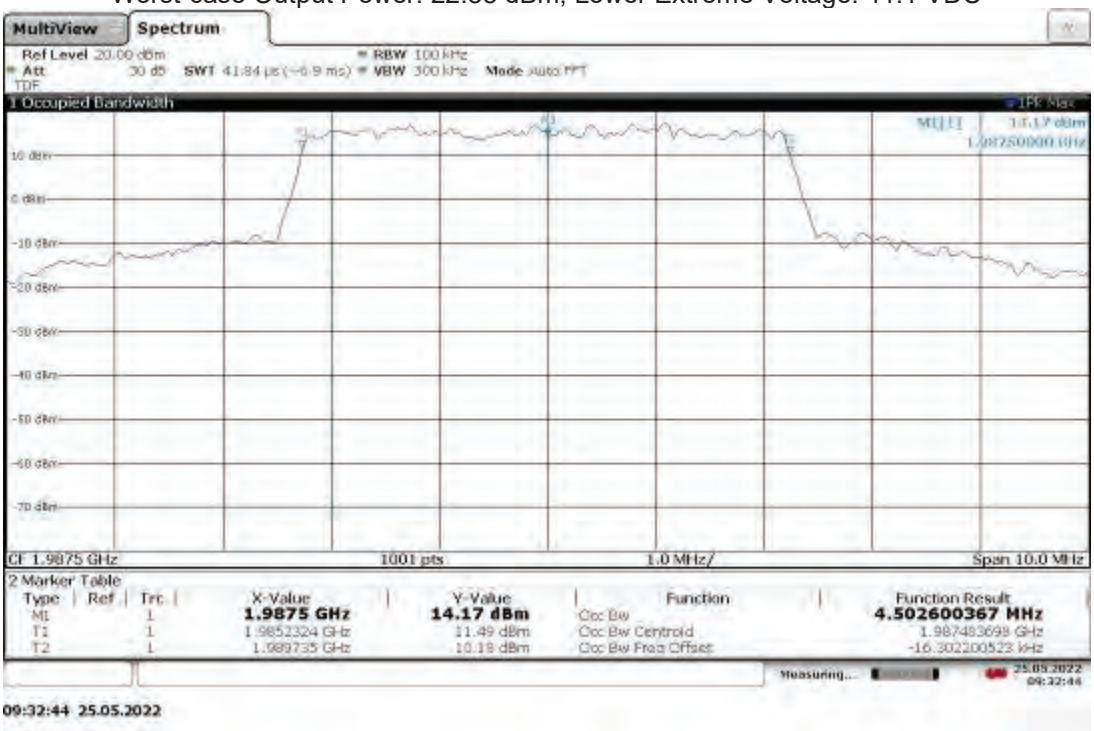
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz, Low Channel 1932.5 MHz (5G NR)
Worst-case Output Power: 22.12 dBm, Nominal Voltage: 48 VDC



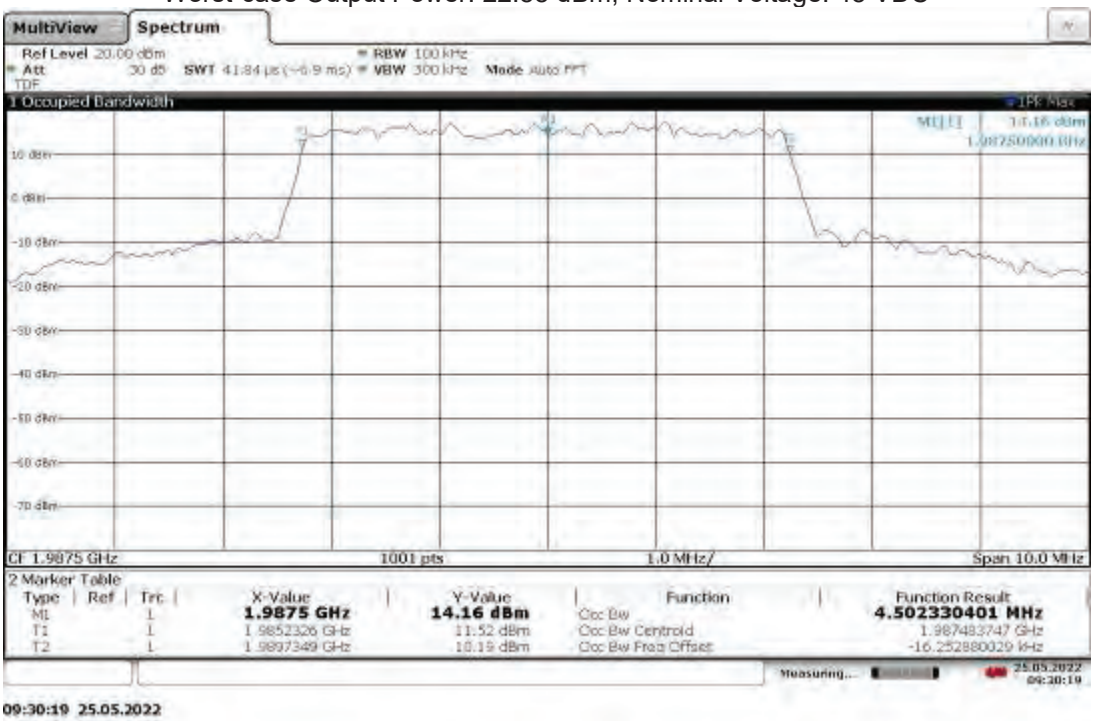
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 5 MHz, Low Channel 1932.5 MHz (5G NR)
Worst-case Output Power: 22.12 dBm, Upper Extreme Voltage: 57 VDC



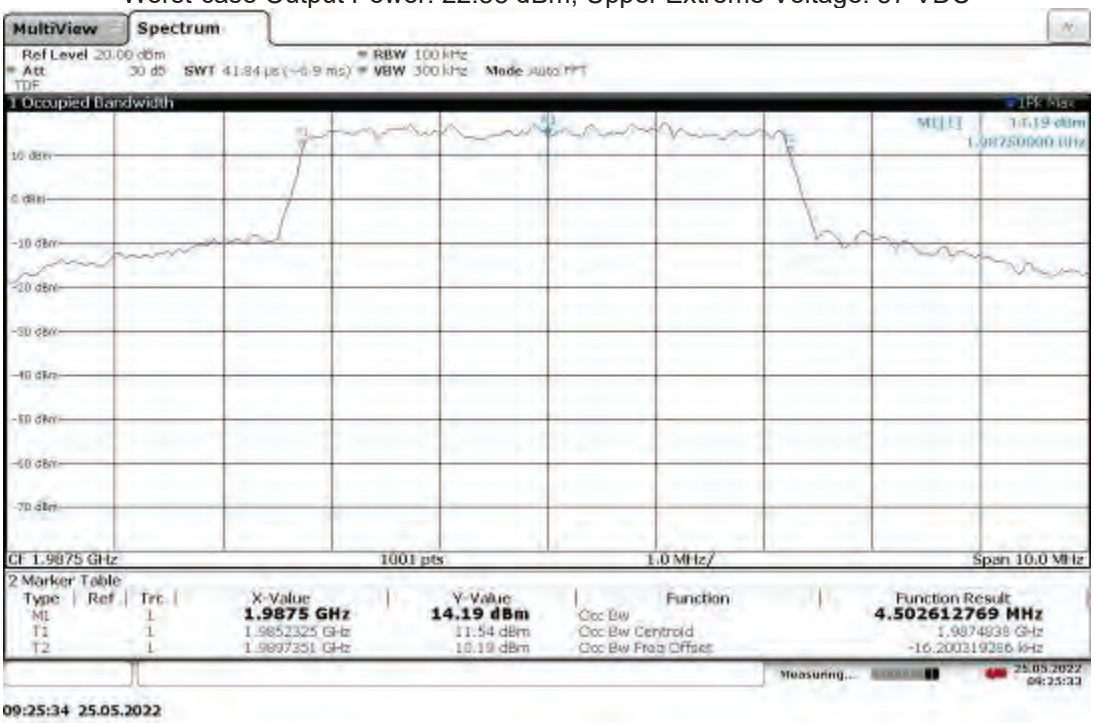
Slot 0 (Band 2), ANT0, Modulation: 64QAM, Bandwidth: 5 MHz, High Channel 1987.5 MHz (5G NR)
Worst-case Output Power: 22.88 dBm, Lower Extreme Voltage: 41.1 VDC



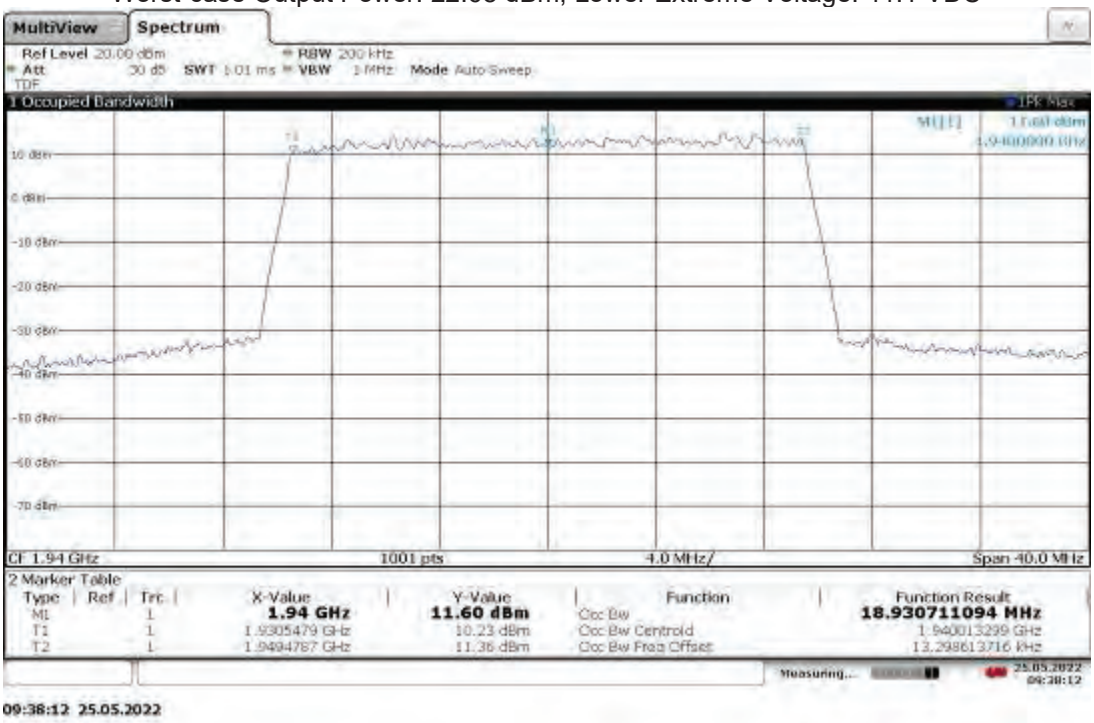
Slot 0 (Band 2), ANT0, Modulation: 64QAM, Bandwidth: 5 MHz, High Channel 1987.5 MHz (5G NR)
Worst-case Output Power: 22.88 dBm, Nominal Voltage: 48 VDC



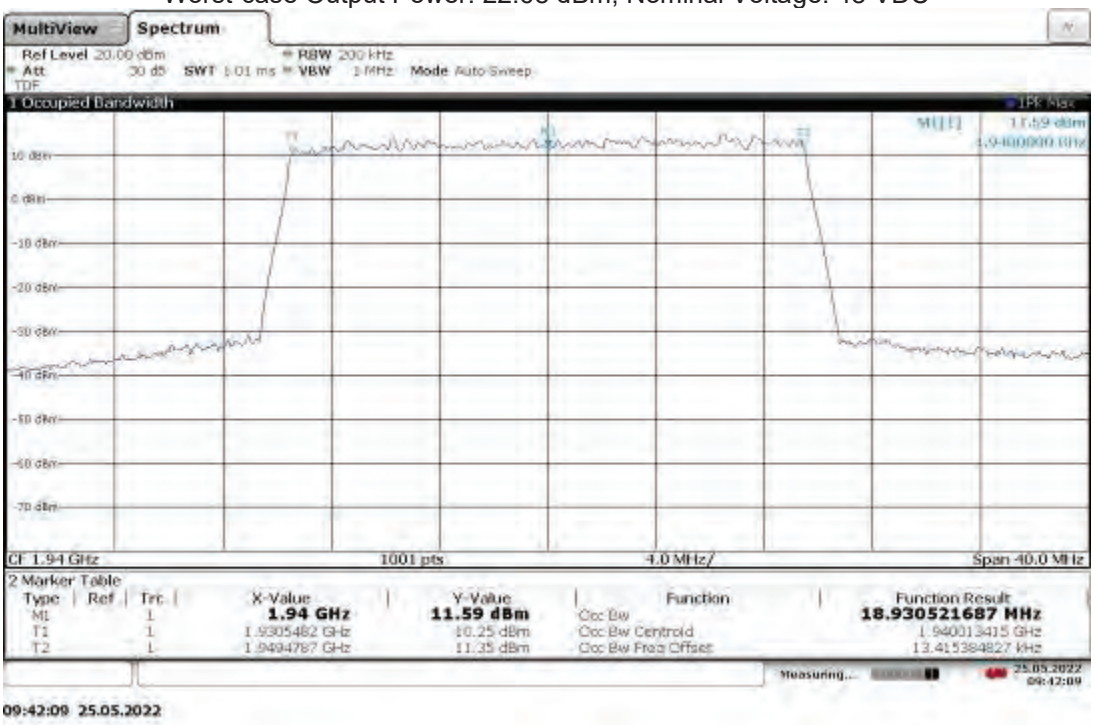
Slot 0 (Band 2), ANT0, Modulation: 64QAM, Bandwidth: 5 MHz, High Channel 1987.5 MHz (5G NR)
Worst-case Output Power: 22.88 dBm, Upper Extreme Voltage: 57 VDC



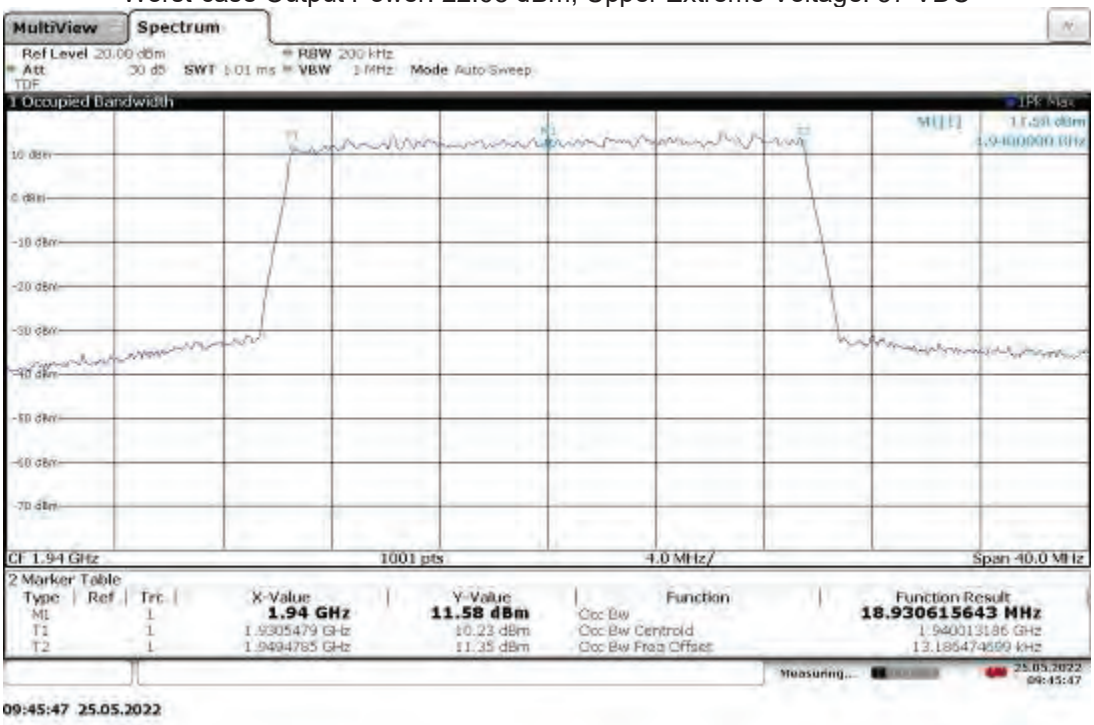
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz, Low Channel 1940 MHz (5G NR)
Worst-case Output Power: 22.68 dBm, Lower Extreme Voltage: 41.1 VDC



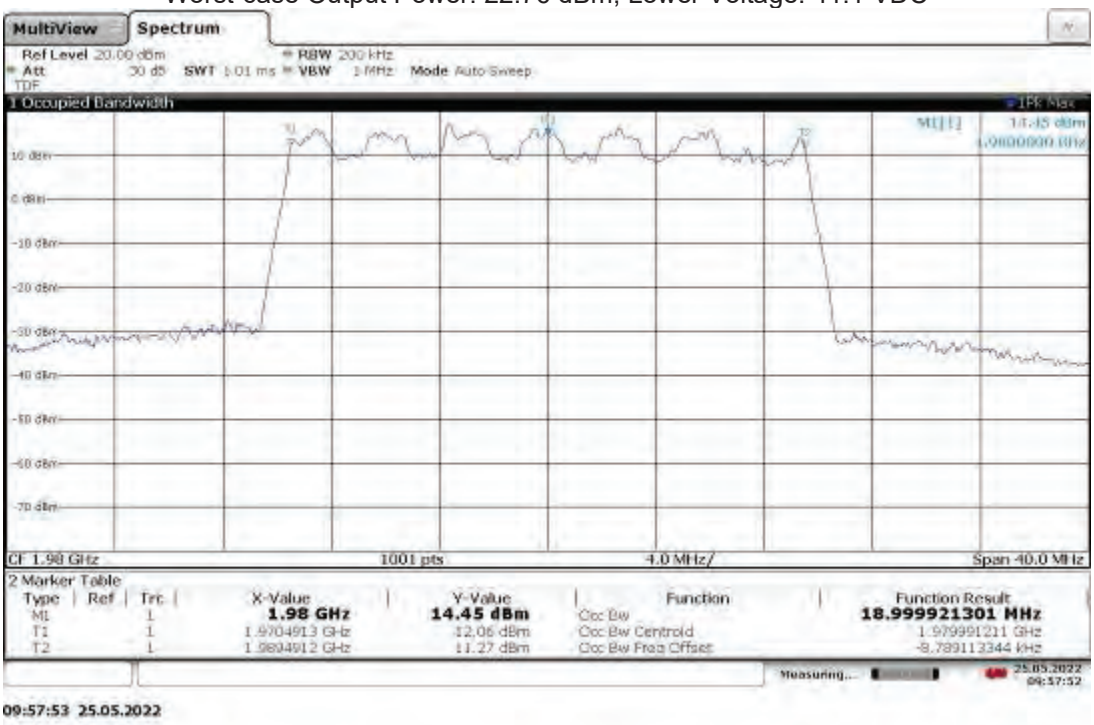
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz, Low Channel 1940 MHz (5G NR)
Worst-case Output Power: 22.68 dBm, Nominal Voltage: 48 VDC



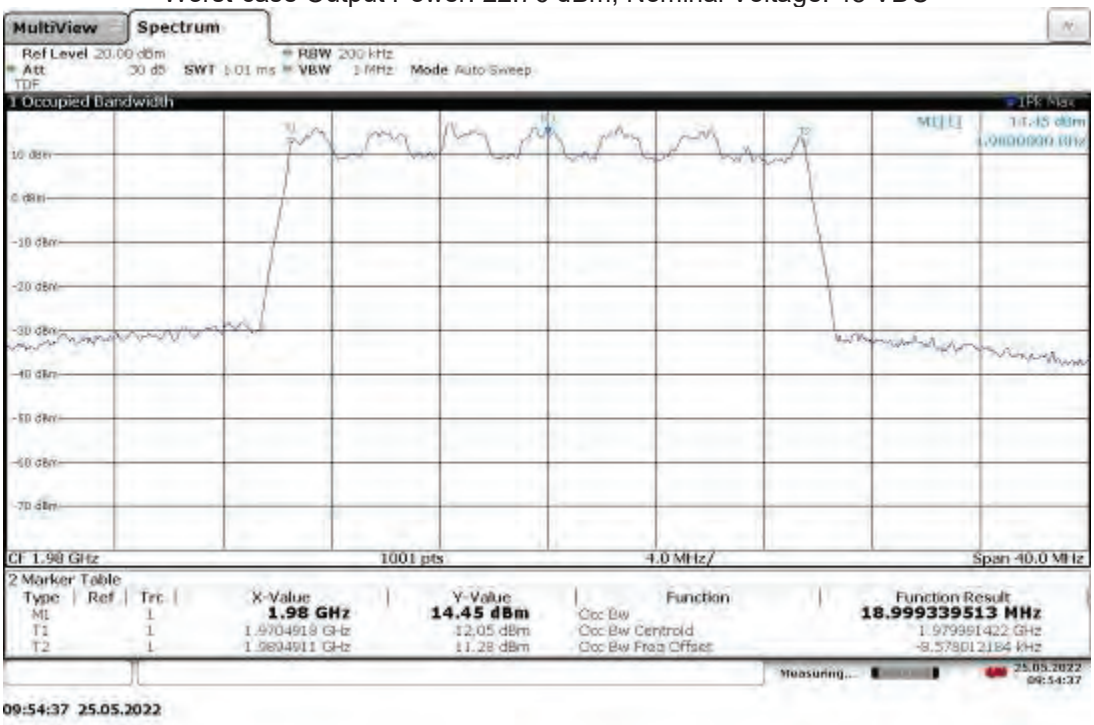
Slot 0 (Band 2), ANT0, Modulation: 256QAM, Bandwidth: 20 MHz, Low Channel 1940 MHz (5G NR)
Worst-case Output Power: 22.68 dBm, Upper Extreme Voltage: 57 VDC



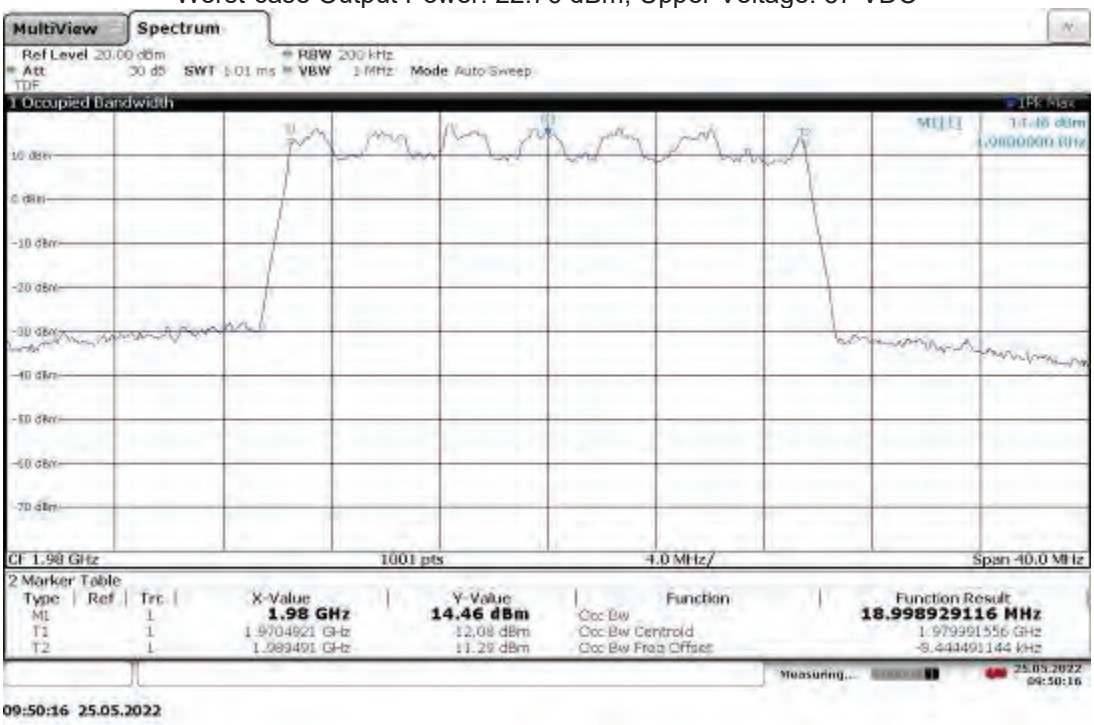
Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz, High Channel 1980 MHz (5G NR)
Worst-case Output Power: 22.76 dBm, Lower Voltage: 41.1 VDC



Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz, High Channel 1980 MHz (5G NR)
Worst-case Output Power: 22.76 dBm, Nominal Voltage: 48 VDC



Slot 0 (Band 2), ANT0, Modulation: 16QAM, Bandwidth: 20 MHz, High Channel 1980 MHz (5G NR)
Worst-case Output Power: 22.76 dBm, Upper Voltage: 57 VDC



Test Personnel:	Kouma Sinn KPS	Test Date:	05/03/2022-05/05/2022, 05/25/2022
Supervising/Reviewing Engineer: (Where Applicable)	Vathana F. Ven VFV N/A		05/22/2022
Product Standard:	FCC Part 24	Limit Applied:	See report section 10.3
Input Voltage:	48VDC (POE)		
Pretest Verification w/ Ambient Signals or BB Source:	N/A	Ambient Temperature:	23 ºC (05/25/2022)
		Relative Humidity:	39 % (05/25/2022)
		Atmospheric Pressure:	1020 mbar (05/25/2022)

Deviations, Additions, or Exclusions: None

11 Transmitter spurious emissions

11.1 Method

Tests are performed in accordance with ANSI C63.26 and CFR47 FCC Parts 2.1051, 2.1053, 2.1057, and 24.

TEST SITE: EMC Lab & 10m ALSE

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.

The 10m ALSE is 13m (Length) x 21m (Depth) x 10m (Height) with the effective size in terms of space from the tips of the absorber is 12m (Length) x 20m (Depth) x 8.5m (Height). This chamber achieves broadband performance using a unique arrangement of hybrid and ferrite tile absorber. This chamber has a built in 3m diameter turntable (Embedded type). The metal structure of the table makes electrical connection around the entire circumference of the turntable to the ground plane with a metal brush type connection. The turntable is located on one end of the chamber and the antennas are mounted 3 and 10 meters away at the other end of the chamber on the adjustable an Antenna Mast. The antenna mast is a non-conductive bore sighted type with remote control of antenna height and polarization. The Antenna Mast and the turntable can be remotely controlled through the controller located in the adjacent Control room. A Styrofoam table 80 cm high is used for table-top equipment.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 10m	30-1000 MHz	4.6dB	6.3 dB
Radiated Emissions, 3m	30-1000 MHz	5.3 dB	6.3 dB
Radiated Emissions, 3m	1-6 GHz	4.5 dB	5.2 dB
Radiated Emissions, 3m	6-15 GHz	5.2 dB	5.5 dB
Radiated Emissions, 3m	15-18 GHz	5.0 dB	5.5 dB
Radiated Emissions, 3m	18-40 GHz	5.0 dB	5.5 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

Alternately, when BAT-EMC Emission Software is used, the “Level” includes all losses and gains and is comPAPRed directly in the “Margin” column to the “Limit”. The “Correction” includes Antenna Factor, Preamp, and Cable Loss. These are already accounted for in the “Level” column.

11.2 Test Equipment Used:

Test equipment used for antenna port conducted measurements

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV005'	Weather Station	Davis	6250	MS191218083	02/11/2022	02/11/2023
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	02/10/2023	02/10/2023

Software Utilized:

Name	Manufacturer	Version
None	--	--

Test equipment used for radiated emissions from 9 kHz-30 MHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/08/2022	03/08/2023
145-414'	Cables 145-400 145-403 145-405 145-409	Huber + Suhner	3m Track A cables	multiple	07/09/2021	07/09/2022
IW001'	2 meter cable	Insulated Wire	2801-NPS	001	09/23/2021	09/23/2022
IW002'	2 meter Armored cable	Insulated Wire	2800-NPS	002	09/23/2021	09/23/2022
IW003'	8.4 meter cable	Insulated Wire	2800-NPS	003	10/15/2022	10/15/2022
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/22/2021	06/22/2022
ETS003'	9kHz-30MHz Active Loop Antenna	ETS Lindgren	6502	00143396	08/26/2021	08/26/2022

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	Nexio	3.18.0.16

Test equipment used for radiated emissions from 30-1000 MHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
IW001'	2 meter cable	Insulated Wire	2801-NPS	001	09/23/2021	09/23/2022
145106'	Bilog Antenna (30MHz - 5GHz)	Sunol Sciences	JB5	A111003	07/15/2021	07/15/2022
HS002'	DC-18GHz cable 1.5M long	Huber & Suhner	SucoFlex 106A	HS002	12/06/2021	12/06/2022
IW006'	DC-18GHz cable 8.4m long	Insulated Wire	2800-NPS	IW006	07/22/2021	07/22/2022
PRE11'	50dB gain pre-amp	Pasternack	PRE11	PRE11	09/02/2021	09/02/2022
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/08/2022	03/08/2023
145145'	Broadband Hybrid Antenna 30 MHz - 3 GHz	Sunol Sciences Corp.	JB3	A122313	06/09/2021	06/09/2022
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/22/2021	06/22/2022

Software Utilized:

Name	Manufacturer	Version
BAT-EMC	Nexio	3.18.0.16

Test equipment used for radiated emissions from 1-18 GHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/08/2022	03/08/2023
145-414'	Cables 145-400 145-403 145-405 145-409	Huber + Suhner	3m Track A cables	multiple	07/09/2021	07/09/2022
IW001'	2 meter cable	Insulated Wire	2801-NPS	001	09/23/2021	09/23/2022
IW002'	2 meter Armored cable	Insulated Wire	2800-NPS	002	09/23/2021	09/23/2022
IW003'	8.4 meter cable	Insulated Wire	2800-NPS	003	10/15/2022	10/15/2022
145108'	EMI Test Receiver (20Hz - 40GHz)	Rohde & Schwarz	ESIB40	100209	06/22/2021	06/22/2022
ETS002'	1-18GHz DRG Horn Antenna	ETS Lindgren	3117	00143260	08/24/2021	08/24/2022
PRE12'	Pre-amplifier	Com Power	PAM-118A	18040117	12/06/2021	12/06/2022

Test equipment used for radiated emissions from 18-20 GHz

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
DAV007'	Weather Station Vantage Vue	Davis	6250	MS191212003	03/08/2022	03/08/2023
PRE8'	PREAMPLFIER 1- 40 GHz	MITEQ	NSP4000-NF	507145	12/27/2021	12/27/2022
CBLHF2012-5M-2'	5m 9kHz-40GHz Coaxial Cable - SET2	Huber & Suhner	SF102	252676002	02/16/2022	02/16/2023
CBLSHF202'	Cable, SMA - SMA, 9kHz-40GHz	Sucoflex (Huber Suhn	104PE	CBLSHF202	01/21/2022	02/21/2023
ETS004'	18-40GHZ horn antenna	ets004	3116C	00218579	03/11/2022	03/11/2023
ROS005-1'	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	11/02/2021	11/02/2022

11.3 Results:

The sample tested was found to Comply. Where a resolution bandwidth of less than 1 MHz was used, more than 10 dB margin to the limit is shown. Since the two antenna ports transmit uncorrelated data streams and use cross polarized antennas, no adjustments to the test results were applied due to MIMO operation, per KDB 662911.

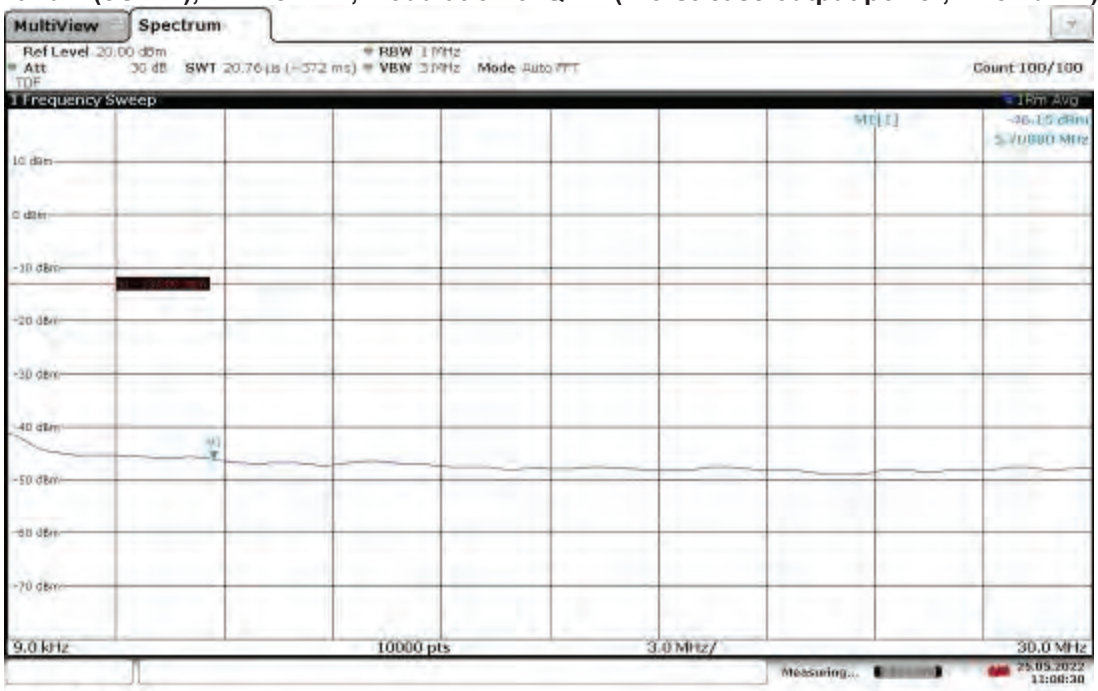
§24.238(a): The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.
(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

11.4 Setup Photographs:

Confidential – Photos not included in this report

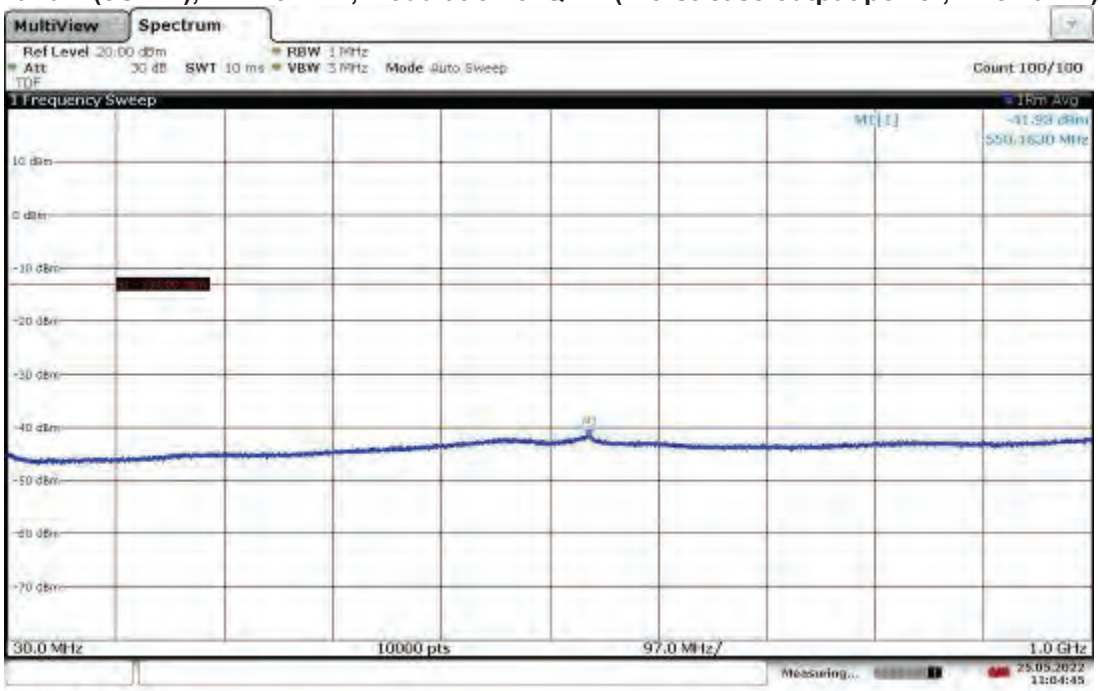
11.5 Plots/Data:

Low Channel 1937.50 MHz, Antenna Port (ANT0) Conducted Emissions, 9kHz-30MHz Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.81 dBm)



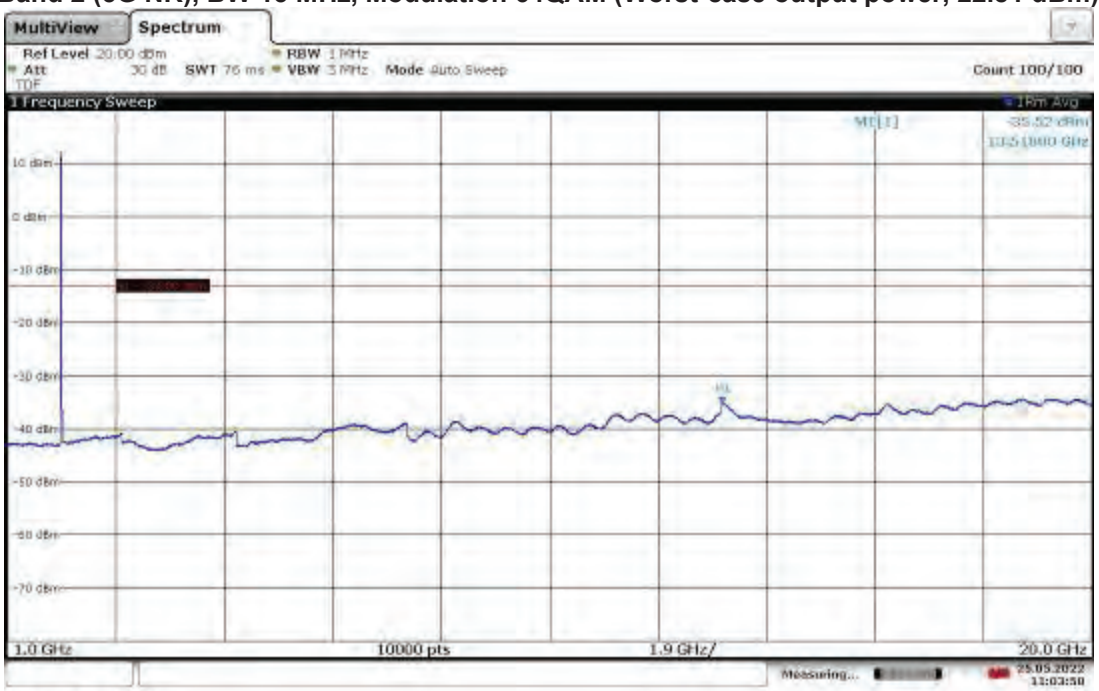
11:08:30 25.05.2022

Low Channel 1937.50 MHz, Antenna Port (ANT0) Conducted Emissions, 30-1000 MHz Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.81 dBm)

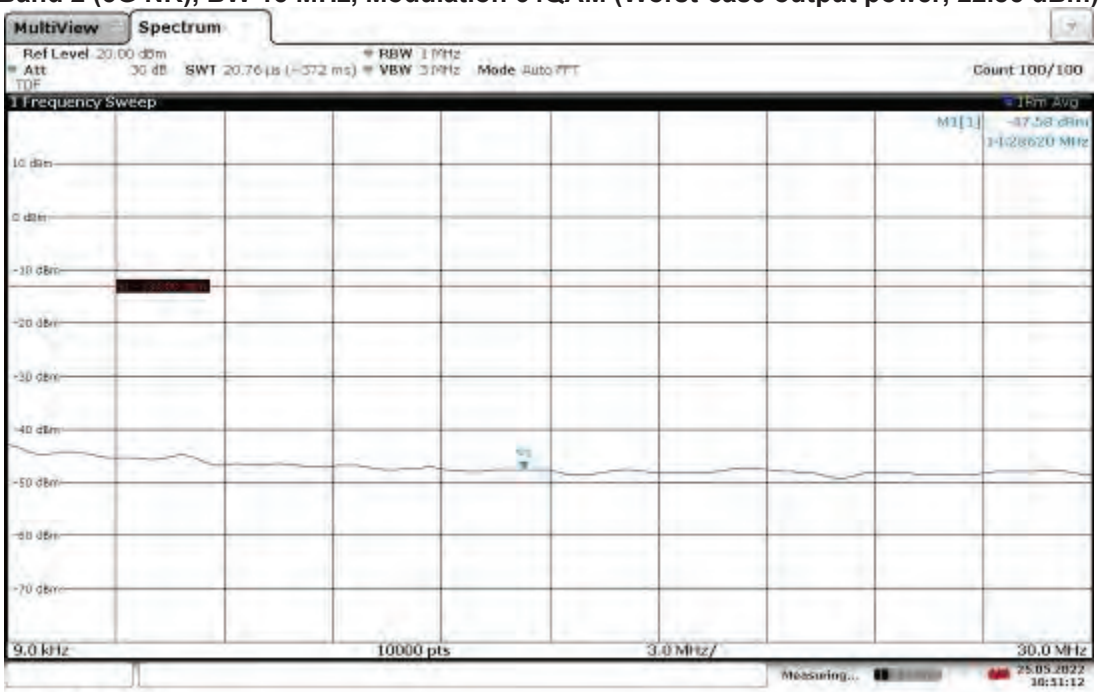


11:04:45 25.05.2022

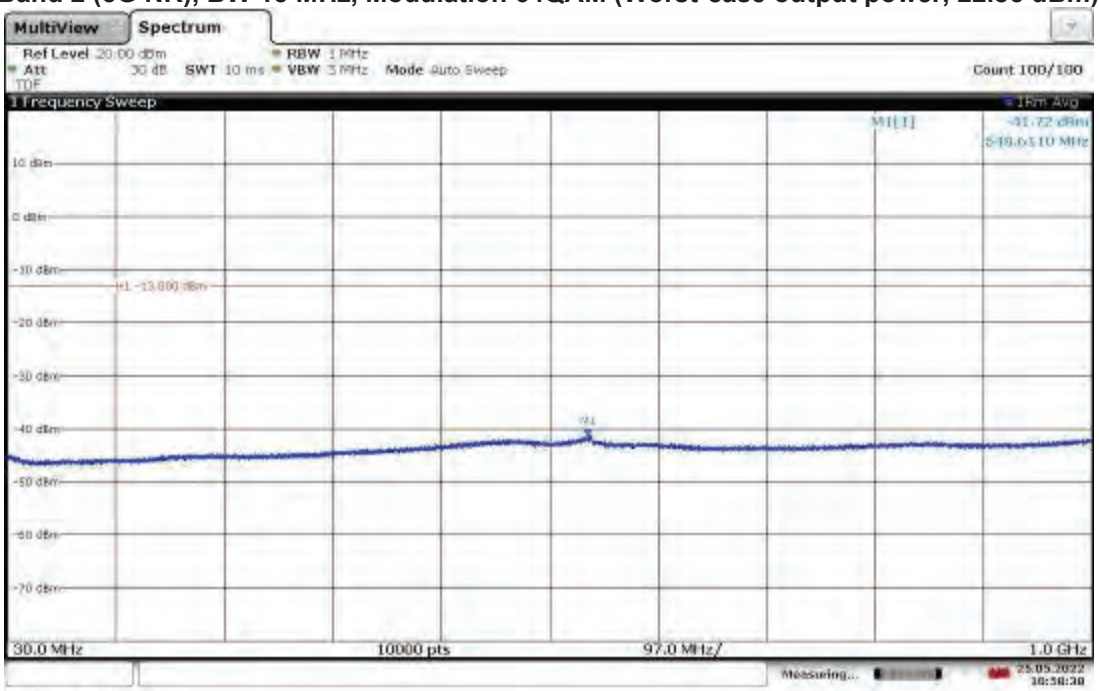
Low Channel 1937.50 MHz, Antenna Port (ANT0) Conducted Emissions, 1-20 GHz Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.81 dBm)



Low Channel 1937.50 MHz, Antenna Port (ANT1) Conducted Emissions, 9kHz-30MHz Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.85 dBm)

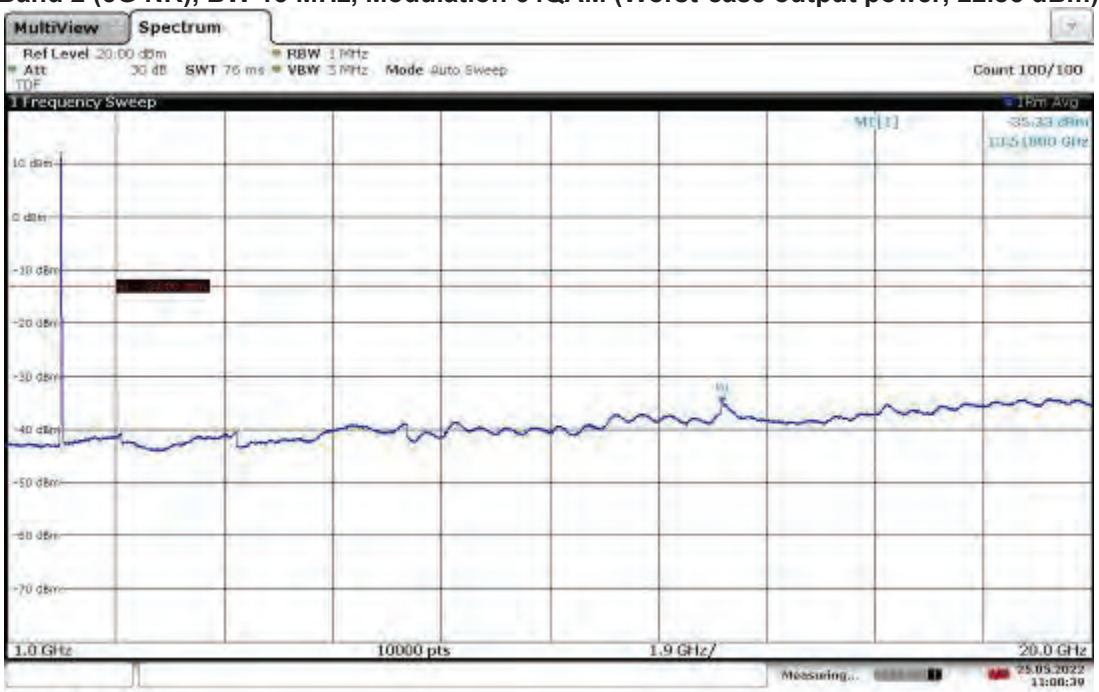


Low Channel 1937.50 MHz, Antenna Port (ANT1) Conducted Emissions, 30-1000 MHz Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.85 dBm)



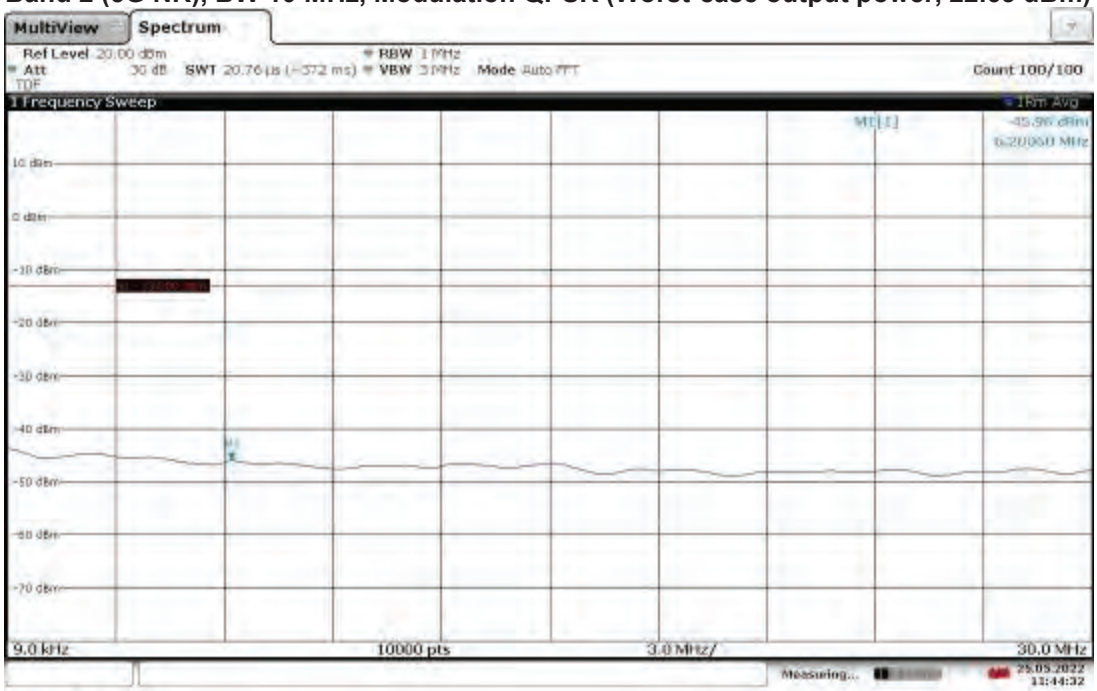
10:58:38 25.05.2022

Low Channel 1937.50 MHz, Antenna Port (ANT1) Conducted Emissions, 1-20 GHz Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.85 dBm)

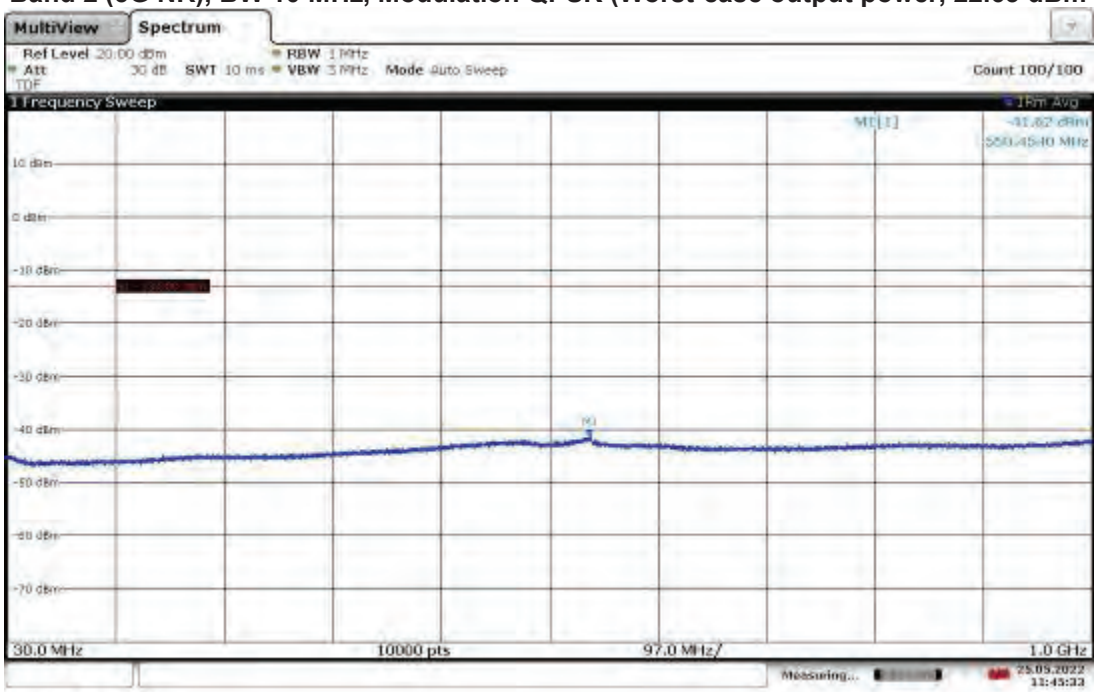


11:00:40 25.05.2022

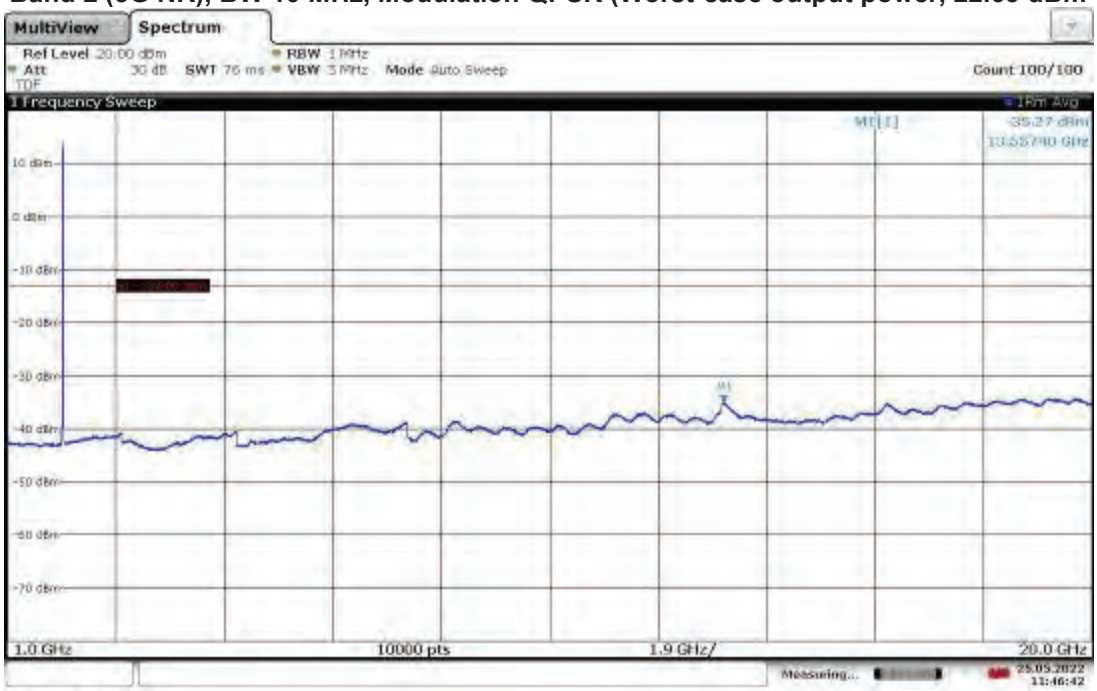
Mid Channel 1960 MHz, Antenna Port (ANT0) Conducted Emissions, 9kHz-30MHz Band 2 (5G NR), BW 10 MHz, Modulation QPSK (Worst-case output power, 22.63 dBm)



Mid Channel 1960 MHz, Antenna Port (ANT0) Conducted Emissions, 30MHz-1GHz Band 2 (5G NR), BW 10 MHz, Modulation QPSK (Worst-case output power, 22.63 dBm

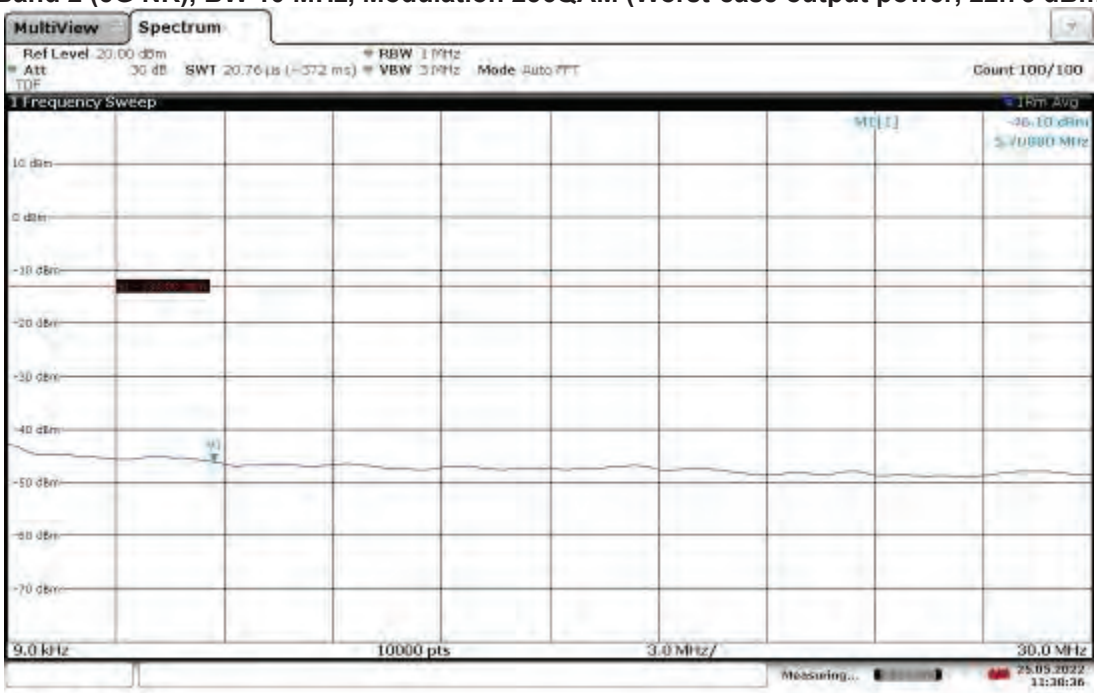


Mid Channel 1960 MHz, Antenna Port (ANT0) Conducted Emissions, 1-20 GHz
Band 2 (5G NR), BW 10 MHz, Modulation QPSK (Worst-case output power, 22.63 dBm



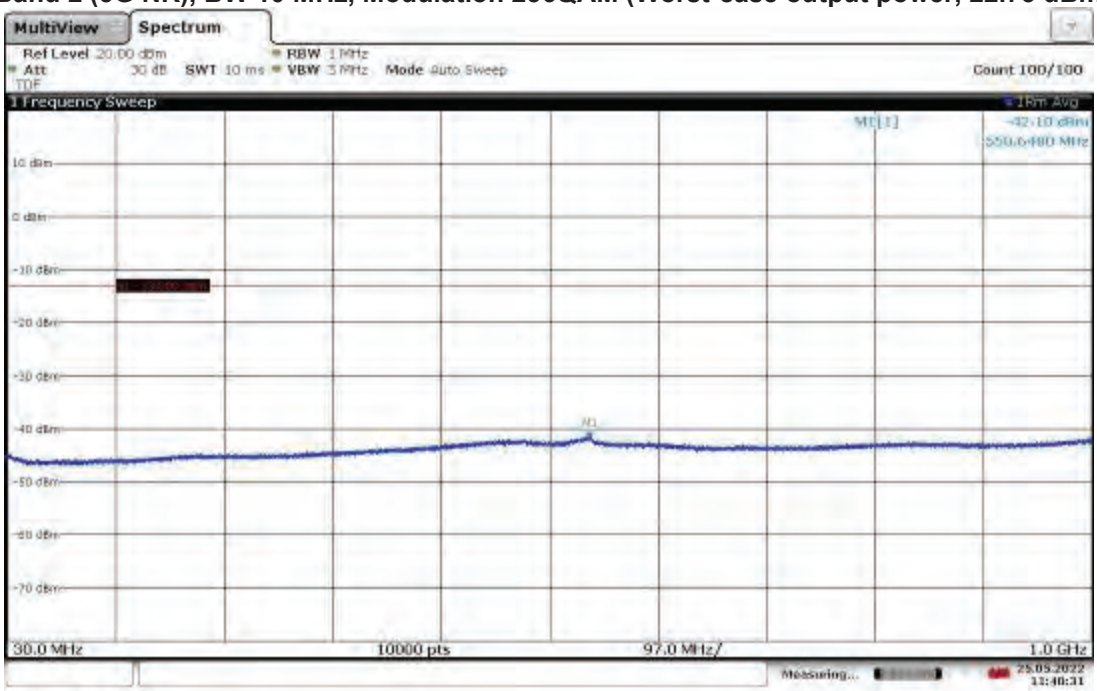
11:46:42 25.05.2022

Mid Channel 1960 MHz, Antenna Port (ANT1) Conducted Emissions, 9kHz-30MHz
Band 2 (5G NR), BW 10 MHz, Modulation 256QAM (Worst-case output power, 22.73 dBm



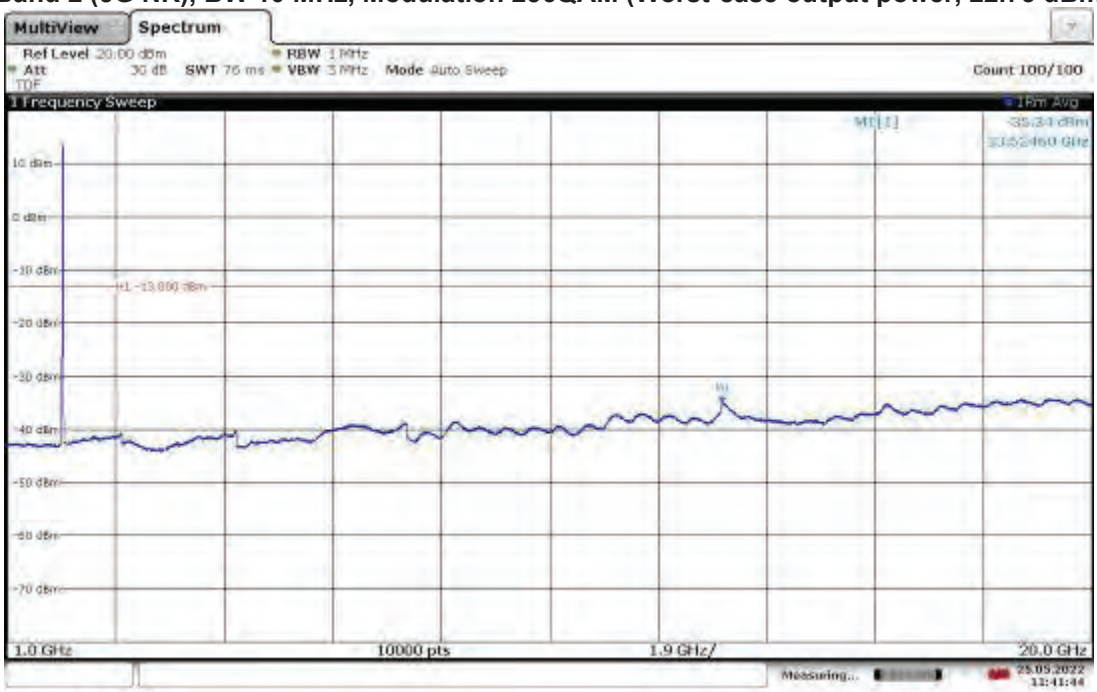
11:38:36 25.05.2022

Mid Channel 1960 MHz, Antenna Port (ANT1) Conducted Emissions, 30-1000 MHz
Band 2 (5G NR), BW 10 MHz, Modulation 256QAM (Worst-case output power, 22.73 dBm



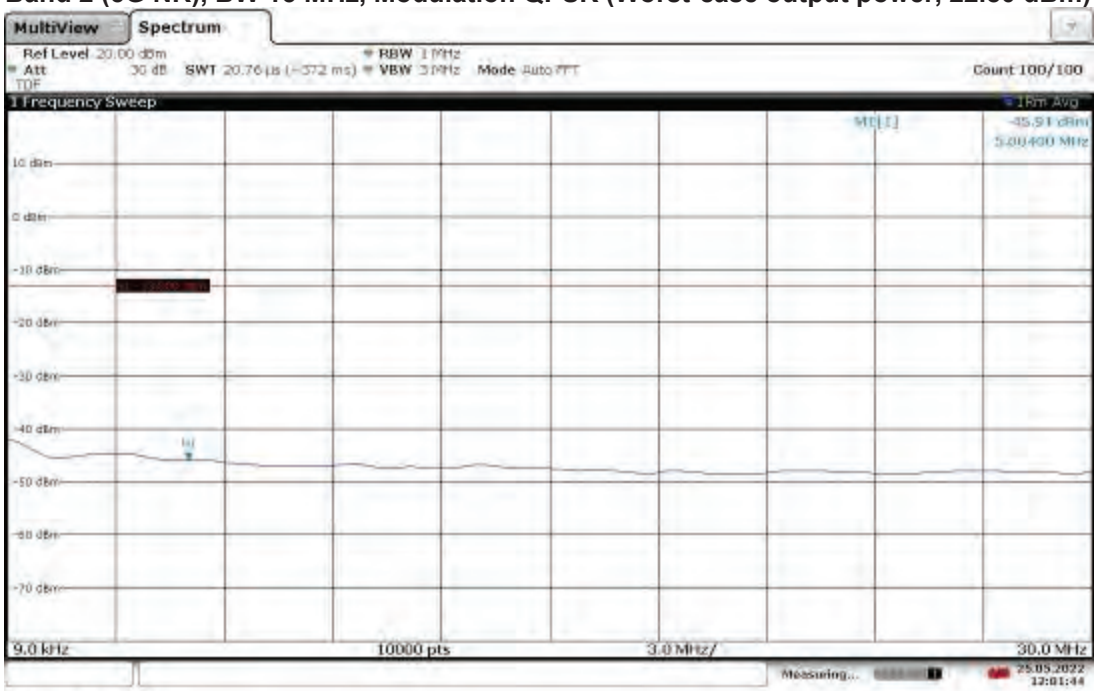
11:40:31 25.05.2022

Mid Channel 1960 MHz, Antenna Port (ANT1) Conducted Emissions, 1-20 GHz
Band 2 (5G NR), BW 10 MHz, Modulation 256QAM (Worst-case output power, 22.73 dBm

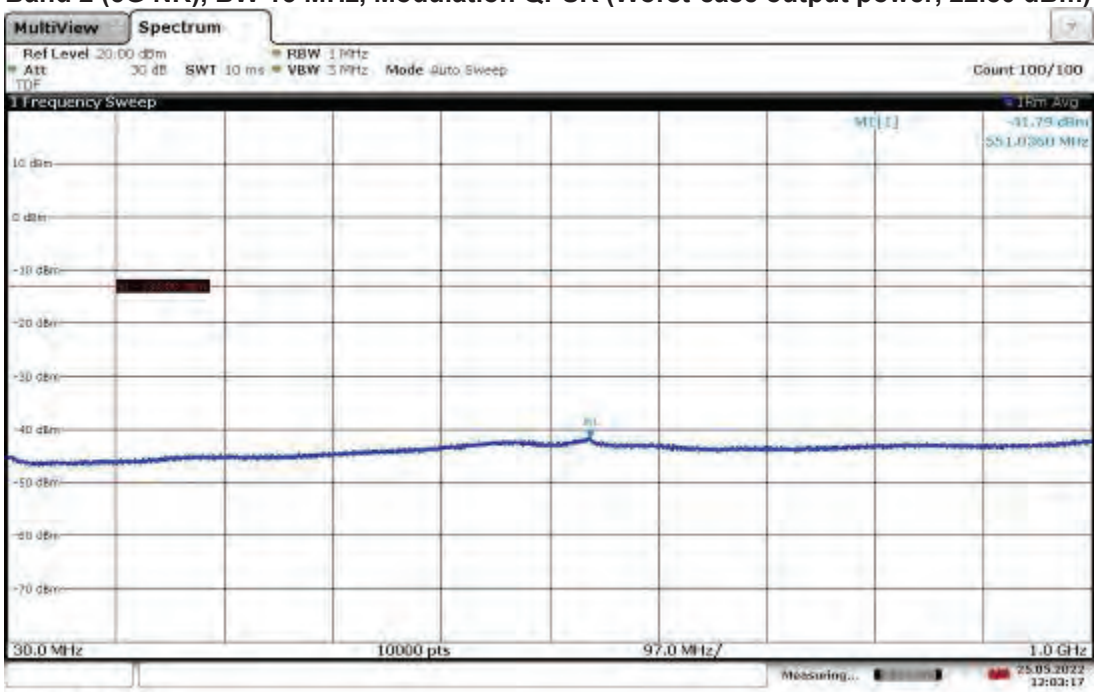


11:41:44 25.05.2022

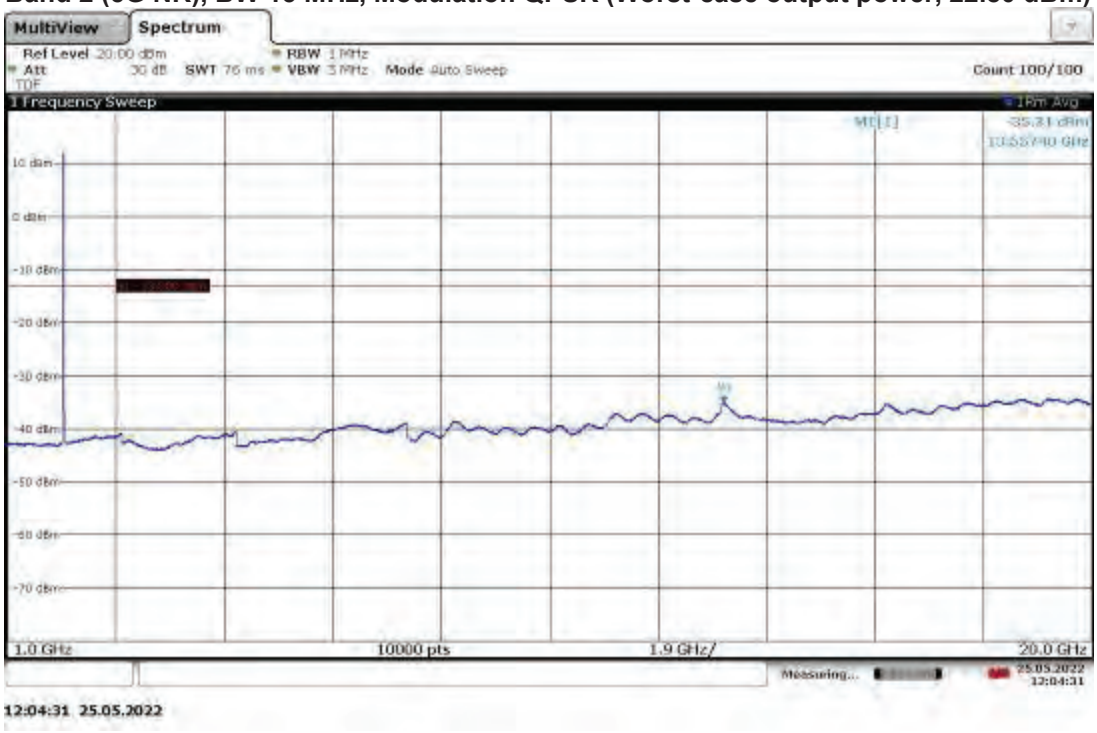
High Channel 1982.50 MHz, Antenna Port (ANT0) Conducted Emissions, 9kHz-30MHz Band 2 (5G NR), BW 15 MHz, Modulation QPSK (Worst-case output power, 22.80 dBm)



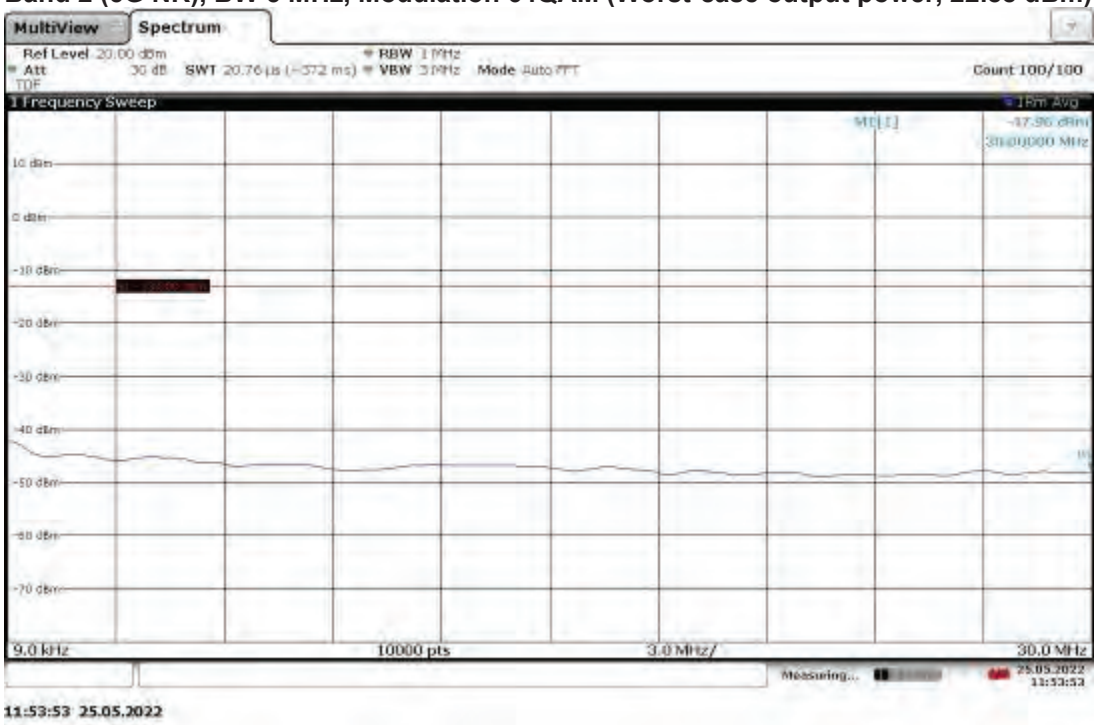
High Channel 1982.50 MHz, Antenna Port (ANT0) Conducted Emissions, 30MHz-1GHz Band 2 (5G NR), BW 15 MHz, Modulation QPSK (Worst-case output power, 22.80 dBm)



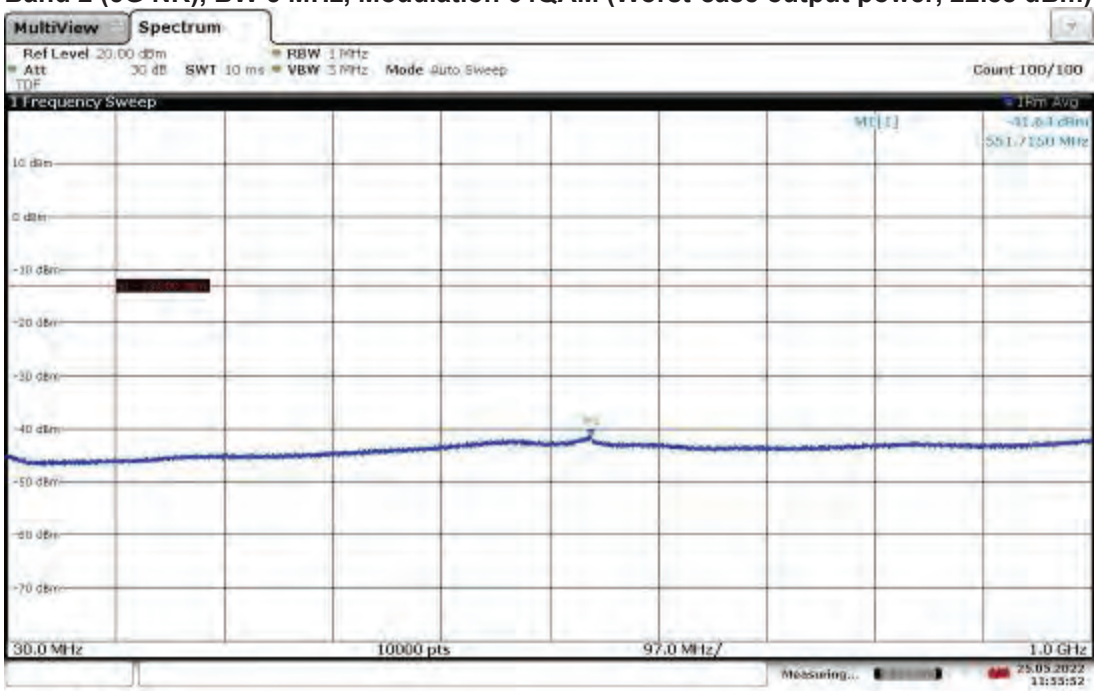
High Channel 1982.50 MHz, Antenna Port (ANT0) Conducted Emissions, 1-20 GHz Band 2 (5G NR), BW 15 MHz, Modulation QPSK (Worst-case output power, 22.80 dBm)



High Channel 1987.50 MHz, Antenna Port (ANT1) Conducted Emissions, 9kHz-30MHz Band 2 (5G NR), BW 5 MHz, Modulation 64QAM (Worst-case output power, 22.88 dBm)

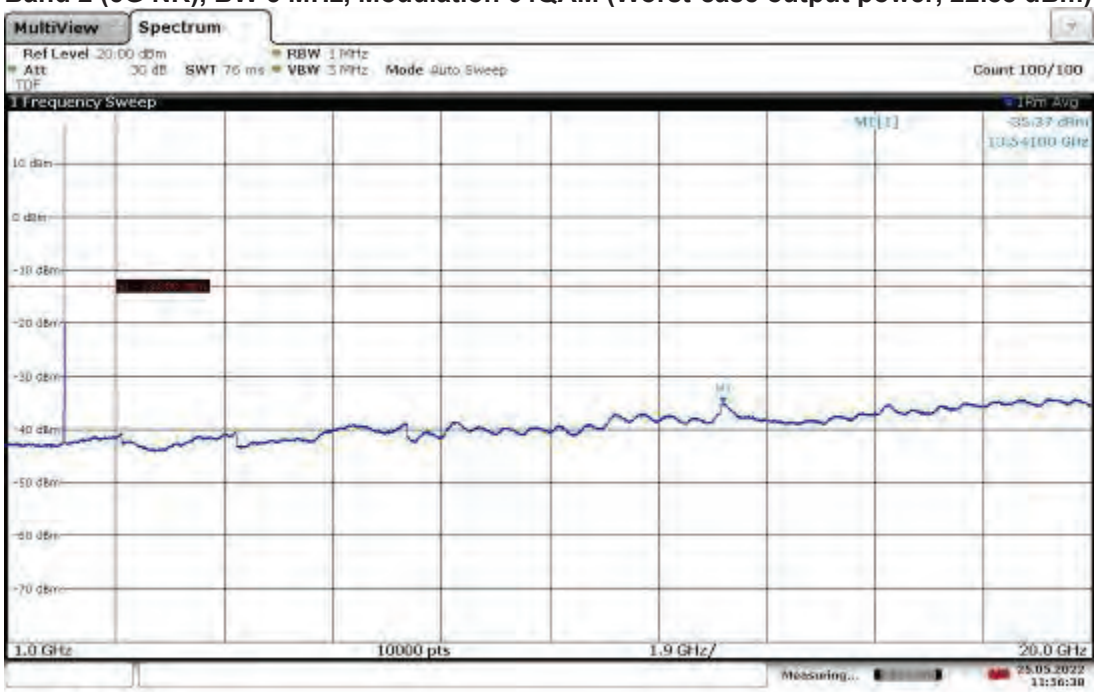


High Channel 1987.50 MHz, Antenna Port (ANT1) Conducted Emissions, 30MHz-1GHz Band 2 (5G NR), BW 5 MHz, Modulation 64QAM (Worst-case output power, 22.88 dBm)



11:55:52 25.05.2022

High Channel 1987.50 MHz, Antenna Port (ANT1) Conducted Emissions, 1-20 GHz Band 2 (5G NR), BW 5 MHz, Modulation 64QAM (Worst-case output power, 22.88 dBm)



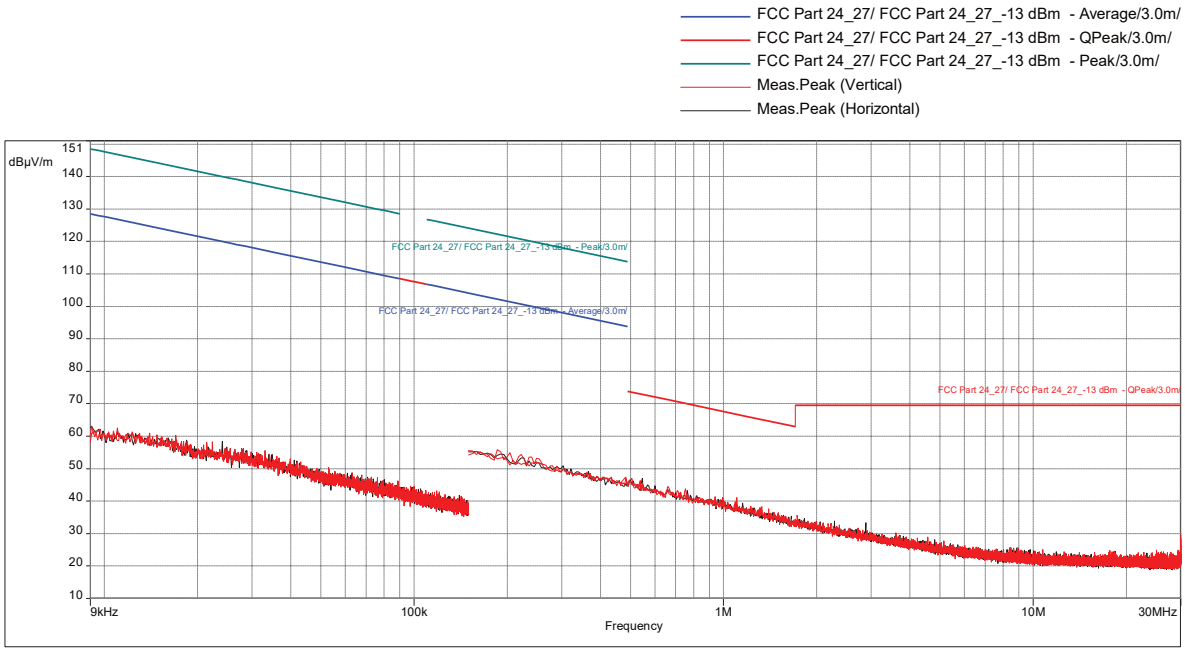
11:56:38 25.05.2022

High Channel 19 87.5 MHz, Radiated Emissions, 9 kHz-30 MHz
Band 2 (5G NR), BW 5 MHz, Modulation 64QAM (Worst-case output power, 22.88 dBm)

Test Information:

Date and Time	5/20/2022 4:47:50 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	27 C
Humidity	34 %
Atmospheric Pressure	1005 mbar
Comments	Scan 1: Band 2, H Ch 1987.5 MHz (BW: 5 MHz, Mod: 64QAM, ANT1: 22.88 dBm - worst-case power), RE 9kHz-30MHz at 3m

Graph:



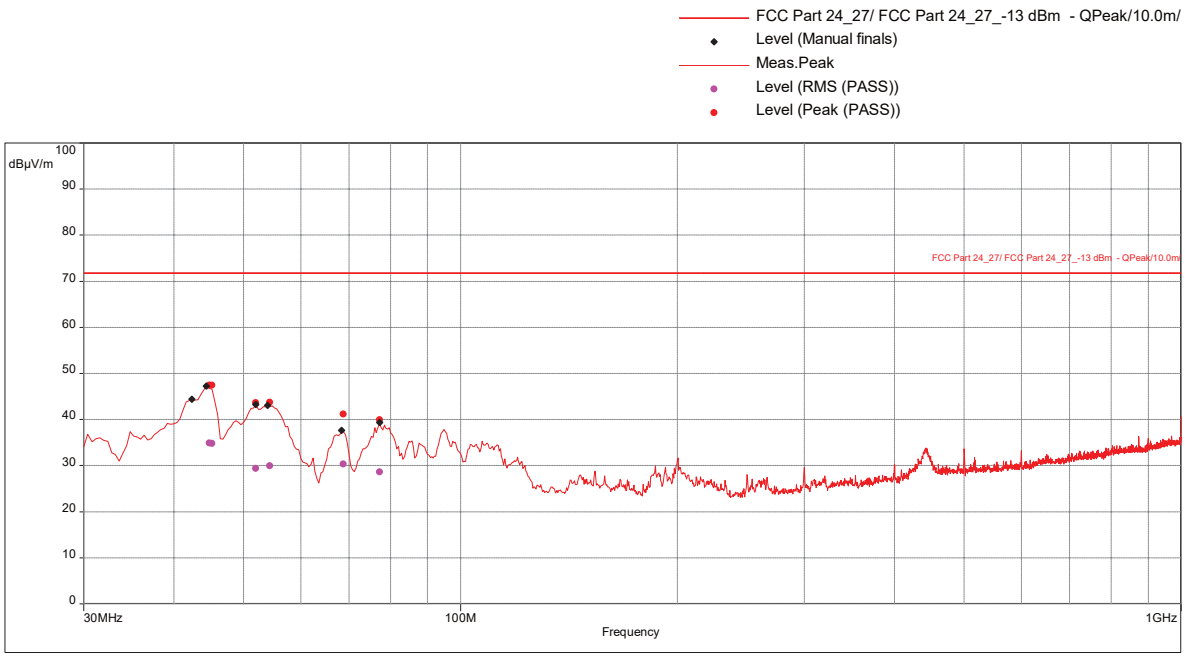
Results: Only one worst-case channel was selected for testing from 9 kHz-30 MHz. No emission was detected.

Low Channel 1937.50 MHz, Radiated Emissions, 30-1000 MHz
Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.85 dBm)

Test Information:

Date and Time	5/20/2022 8:41:49 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	27 C
Humidity	34 %
Atmospheric Pressure	1005 mbar
Comments	Scan 3: Band 2, L1937.5 MHz, BW: 15 MHz, Mod:64QAM, ANT1:22.85 dBm (Worst-case Output Power), RE 30-1000MHz SA mode

Graph:



Results:

EIRP Peak (PASS) (6)

Frequency (MHz)	Peak Level (dBµV/m)	EIRP Level (dBm)	Limit (dBm)	EIRP Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
44.92631579	47.40	-47.86	-13	-34.86	61.00	2.26	Vertical	1000000.00	-22.74
45.03157895	47.48	-47.78	-13	-34.78	68.00	2.79	Vertical	1000000.00	-22.81
52	43.68	-51.58	-13	-38.58	31.00	1.30	Vertical	1000000.00	-25.99
54.26315789	43.76	-51.50	-13	-38.50	17.00	1.00	Vertical	1000000.00	-26.27
68.92631579	41.13	-54.13	-13	-41.13	10.00	2.46	Vertical	1000000.00	-25.11
77.2	39.96	-55.30	-13	-42.30	163.00	3.22	Vertical	1000000.00	-25.35

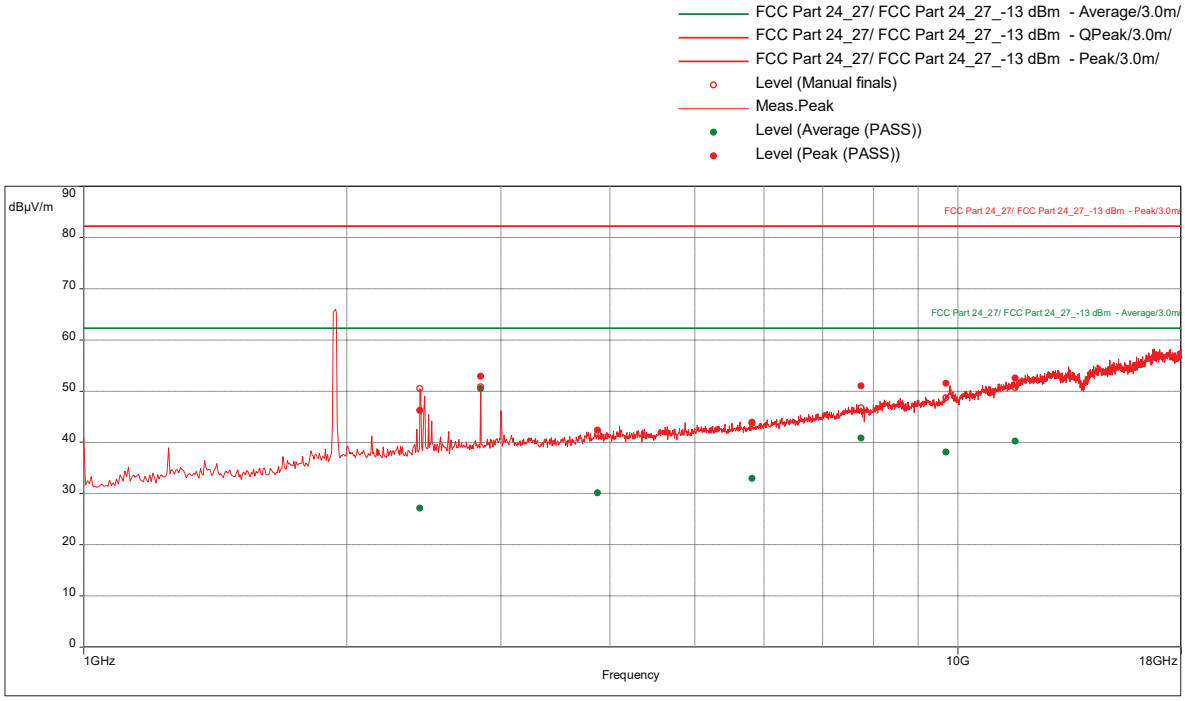
Notes:
The level in EIRP (dBm) is calculated from the peak readings as EIRP (dBm) = E Peak (dBµV/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

Low Channel 1937.50 MHz, Radiated Emissions, 1-20 GHz
Band 2 (5G NR), BW 15 MHz, Modulation 64QAM (Worst-case output power, 22.85 dBm)

Test Information:

Date and Time	5/21/2022 11:49:22 AM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	25 C
Humidity	49 %
Atmospheric Pressure	1007 mbar
Comments	Scan 10: Band 2, L1937.50MHz, BW: 15 MHz, Mod: 64QAM, ANT1: 22.85 dBm (Worst-case Output Power), RE 1-18 GHz SA mode

Graph:



Results:

EIRP Peak (7)

Frequency (MHz)	Peak Level (dBµV/m)	EIRP Level (dBm)	Limit (dBm)	EIRP Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
2425.789474	46.22	-49.04	-13	-36.04	60.00	3.79	Vertical	1000000.00	-3.57
2844.473684	52.89	-42.37	-13	-29.37	112.00	1.45	Vertical	1000000.00	-2.82
3872.105263	42.38	-52.88	-13	-39.88	140.00	1.85	Horizontal	1000000.00	-1.09
5814.210526	43.87	-51.39	-13	-38.39	83.00	1.80	Vertical	1000000.00	2.98
7750	51.00	-44.26	-13	-31.26	0.00	1.00	Horizontal	1000000.00	6.30
9690.789474	51.50	-43.76	-13	-30.76	118.00	2.80	Vertical	1000000.00	8.99
11628.15789	52.53	-42.73	-13	-29.73	184.00	3.84	Horizontal	1000000.00	12.14

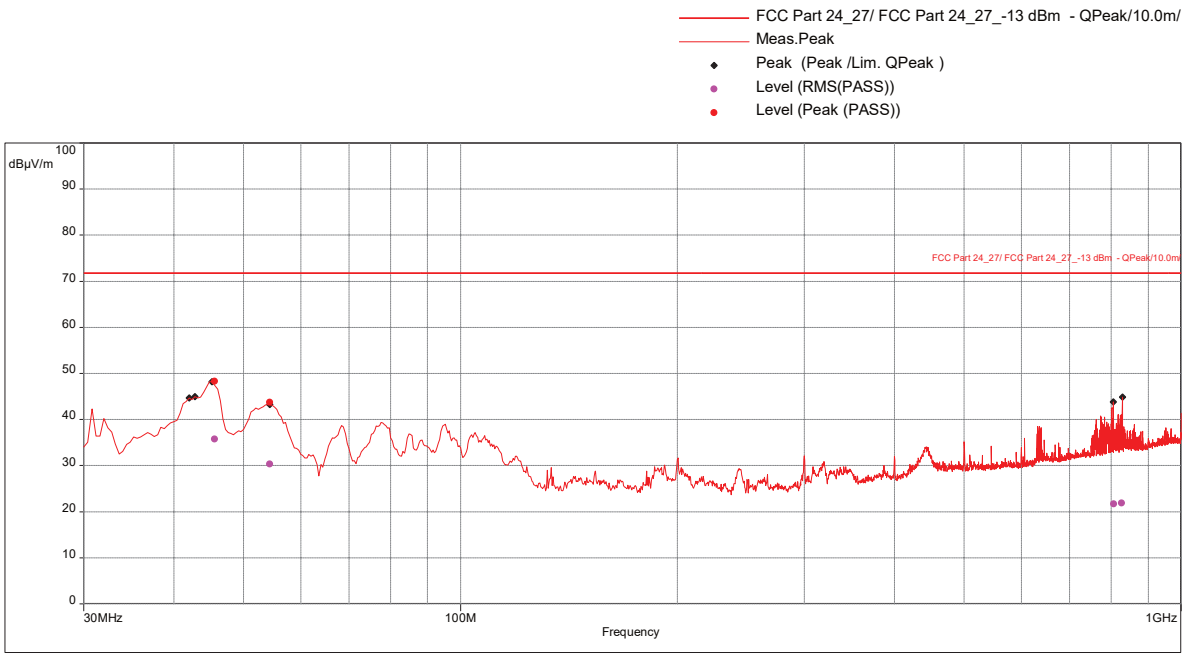
Notes:
The level in EIRP (dBm) is calculated from the peak readings as EIRP (dBm) = E Peak (dBµV/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter. Manual scan was performed from 18-20 GHz at a distance of 10 cm with no emission was detected above measuring instrument noise floor.

Mid Channel 1960 MHz, Radiated Emissions, 30-1000 MHz
Band 2 (5G NR), BW 10 MHz, Modulation 256QAM (Worst-case output power, 22.73 dBm)

Test Information:

Date and Time	5/20/2022 8:48:25 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	27 C
Humidity	34 %
Atmospheric Pressure	1005 mbar
Comments	Scan 4: Band 2, M1960 MHz, BW: 10 MHz, Mod: 256QAM, ANT1:22.73 dBm (Worst-case Output Power), RE 30-1000MHz SA mode

Graph:



Results:

EIRP Peak (PASS) (4)

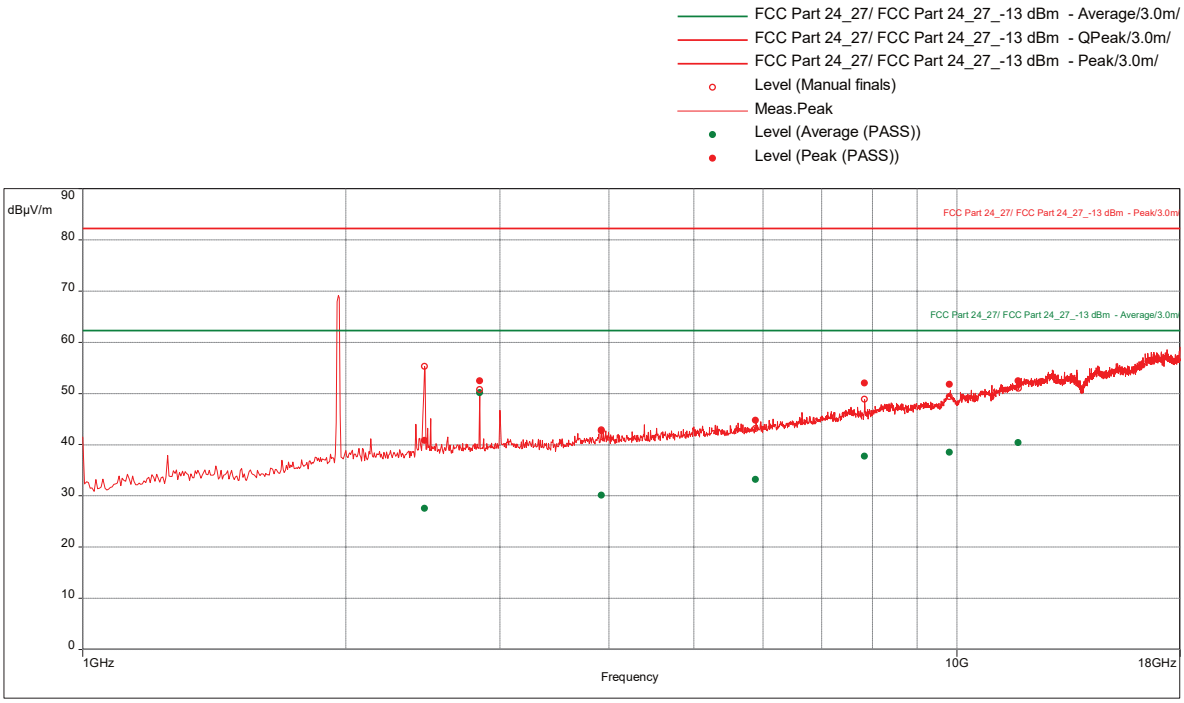
Frequency (MHz)	Peak Level (dBµV/m)	EIRP Level (dBm)	Limit (dBm)	EIRP Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
45.46315789	48.28	-36.52	-13	-23.52	68.00	2.84	Vertical	1000000.00	-23.10
54.4	43.76	-41.04	-13	-28.04	54.00	1.30	Vertical	1000000.00	-26.27
805.8631579	34.63	-50.17	-13	-37.17	126.00	1.52	Vertical	1000000.00	-7.79
826.9578947	34.73	-50.07	-13	-37.07	178.00	2.73	Vertical	1000000.00	-7.42

Notes:
The level in EIRP (dBm) is calculated from the peak readings as EIRP (dBm) = E Peak (dBµV/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

Mid Channel 1960 MHz, Radiated Emissions, 1-20 GHz
Band 2 (5G NR), BW 10 MHz, Modulation 256QAM (Worst-case output power, 22.73 dBm)

Date and Time	5/21/2022 12:29:46 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	25 C
Humidity	49 %
Atmospheric Pressure	1007 mbar
Comments	Scan 11: Band 2, M1960 MHz, BW: 10 MHz, Mod: 256QAM, ANT1: 22.73 dBm (Worst-case Output Power), RE 1-18 GHz SA mode

Graph:



Results:

EIRP Peak (7)

Frequency (MHz)	Peak Level (dBµV/m)	EIRP Level (dBm)	Limit (dBm)	EIRP Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
2459.473684	40.85	-54.41	-13	-41.41	148.00	1.00	Vertical	1000000.00	-3.30
2844.473684	52.49	-42.77	-13	-29.77	112.00	1.50	Vertical	1000000.00	-2.82
3918.947368	42.71	-52.55	-13	-39.55	228.00	2.65	Vertical	1000000.00	-1.03
5879.736842	44.71	-50.55	-13	-37.55	148.00	2.30	Vertical	1000000.00	3.17
7840.263158	52.06	-43.2	-13	-30.2	17.00	1.30	Horizontal	1000000.00	6.69
9798.684211	51.78	-43.48	-13	-30.48	162.00	2.55	Vertical	1000000.00	9.96
11756.57895	52.42	-42.84	-13	-29.84	0.00	3.10	Horizontal	1000000.00	12.53

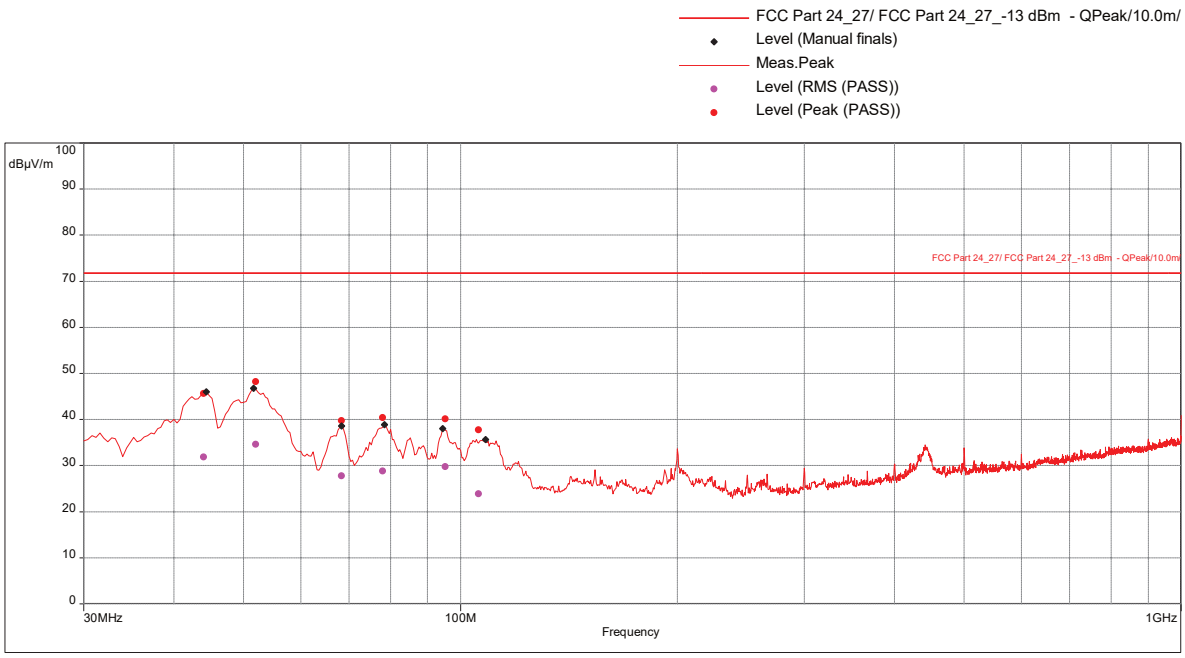
Notes:
The level in EIRP (dBm) is calculated from the peak readings as EIRP (dBm) = E Peak (dBµV/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter

High Channel 1987.5 MHz, Radiated Emissions, 30-1000 MHz
Band 2 (5G NR), BW 5 MHz, Modulation 64QAM (Worst-case output power, 22.88 dBm)

Test Information:

Date and Time	5/20/2022 9:51:28 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	27 C
Humidity	34 %
Atmospheric Pressure	1005 mbar
Comments	Scan 5: Band 2, H1987.5 MHz, BW: 5 MHz, Mod: 64QAM, ANT1: 22.88 dBm (Worst-case Output Power), RE 30-1000MHz SA mode

Graph:



Results:

EIRP Peak (PASS) (6)

Frequency (MHz)	Peak Level (dBµV/m)	EIRP Level (dBm)	Limit (dBm)	EIRP Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
44.13684211	45.65	-39.15	-13	-26.15	38.00	2.40	Vertical	1000000.00	-22.28
51.86315789	48.20	-36.6	-13	-23.6	83.00	1.00	Vertical	1000000.00	-25.97
68.4	39.77	-45.03	-13	-32.03	31.00	2.48	Vertical	1000000.00	-25.12
78.13684211	40.41	-44.39	-13	-31.39	169.00	3.94	Vertical	1000000.00	-25.43
95.18947368	40.13	-44.67	-13	-31.67	193.00	2.24	Vertical	1000000.00	-24.03
106.0315789	37.79	-47.01	-13	-34.01	301.00	1.41	Vertical	1000000.00	-21.10

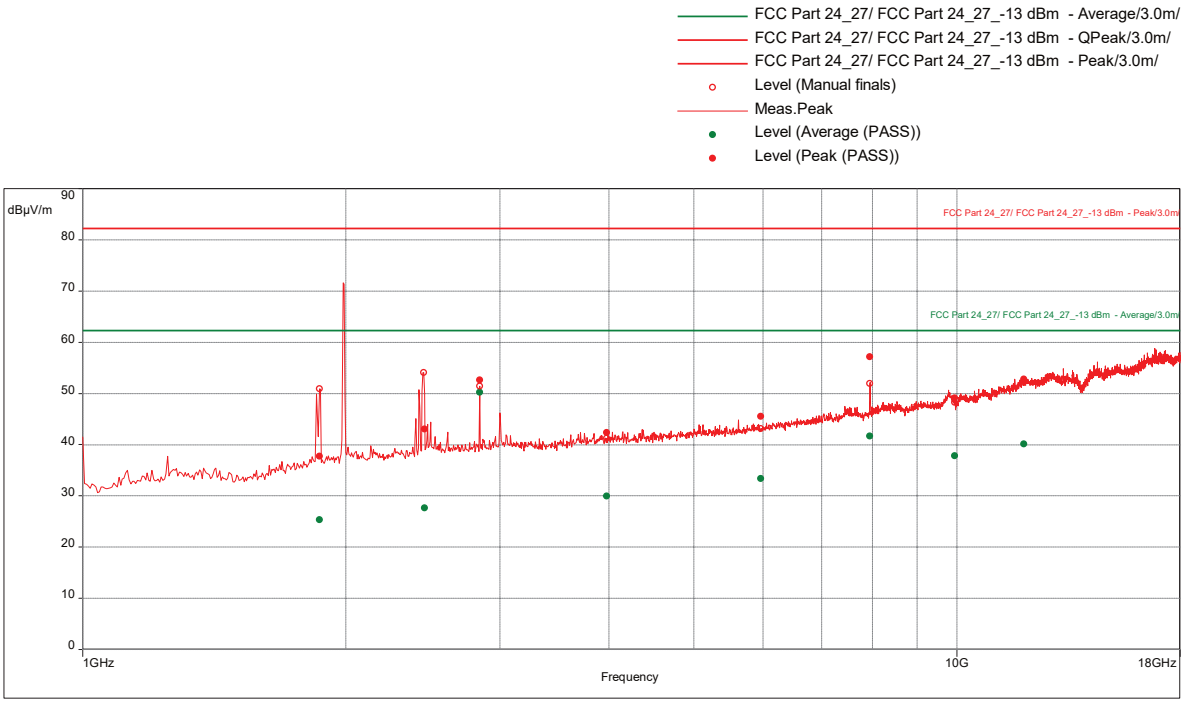
Notes:
The level in EIRP (dBm) is calculated from the peak readings as EIRP (dBm) = E Peak (dBµV/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter.

High Channel 1987.5 MHz, Radiated Emissions, 1-20 GHz
Band 2 (5G NR), BW 5 MHz, Modulation 64QAM (Worst-case output power, 22.88 dBm)

Test Information:

Date and Time	5/21/2022 1:12:11 PM
Client and Project Number	Commscope
Engineer	Kouma Sinn
Temperature	25 C
Humidity	49 %
Atmospheric Pressure	1007 mbar
Comments	Scan 12: Band 2, H1987.50 MHz, BW: 5 MHz, Mod: 64QAM, ANT1: 22.88 dBm (Worst-case Output Power), RE 1 to 18 GHz SA mode

Graph:



Results:

EIRP Peak (8)

Frequency (MHz)	Peak Level (dBµV/m)	EIRP Level (dBm)	Limit (dBm)	EIRP Margin (dB)	Azimuth (°)	Height (m)	Pol.	RBW (Hz)	Correction (dB)
1864.736842	37.74	-57.52	-13	-44.52	96.00	1.01	Horizontal	1000000.00	-4.90
2460	43.00	-52.26	-13	-39.26	133.00	2.71	Vertical	1000000.00	-3.29
2844.473684	52.62	-42.64	-13	-29.64	112.00	1.45	Vertical	1000000.00	-2.82
3974.210526	42.36	-52.9	-13	-39.9	10.00	3.49	Vertical	1000000.00	-0.98
5965.789474	45.49	-49.77	-13	-36.77	359.00	3.84	Vertical	1000000.00	3.40
7950	57.13	-38.13	-13	-25.13	338.00	1.10	Vertical	1000000.00	7.15
9938.947368	49.13	-46.13	-13	-33.13	68.00	3.34	Vertical	1000000.00	9.39
11926.05263	52.78	-42.48	-13	-29.48	278.00	2.40	Vertical	1000000.00	12.81

Notes:
The level in EIRP (dBm) is calculated from the peak readings as EIRP (dBm) = E Peak (dBµV/m) + 20*Log(d) – 104.8, where d is the measurement distance (in the far field region) in meter. Manual scan was performed from 18-20 GHz at a distance of 10 cm with no emission was detected above measuring instrument noise floor.

Test Personnel:	Kouma Sinn KPS	Test Date:	05/20/2022, 05/21/2022
Supervising/Reviewing Engineer: (Where Applicable)	Vathana F. Ven VFV		
Product Standard:	FCC Part 24	Limit Applied:	See report section 11.3
Input Voltage:	48 VDC (POE)		
Pretest Verification w/ Ambient Signals or BB Source:	N/A	Ambient Temperature:	27, 24 ºC
		Relative Humidity:	34, 49 %
		Atmospheric Pressure:	1005, 1007 mbars

Deviations, Additions, or Exclusions: None

12 Revision History

Revision Level	Date	Report Number	PrePAPRed By	Reviewed By	Notes
0	06/08/2022	105029958BOX-005b	KPS KPS	VFV VFV	Original Issue