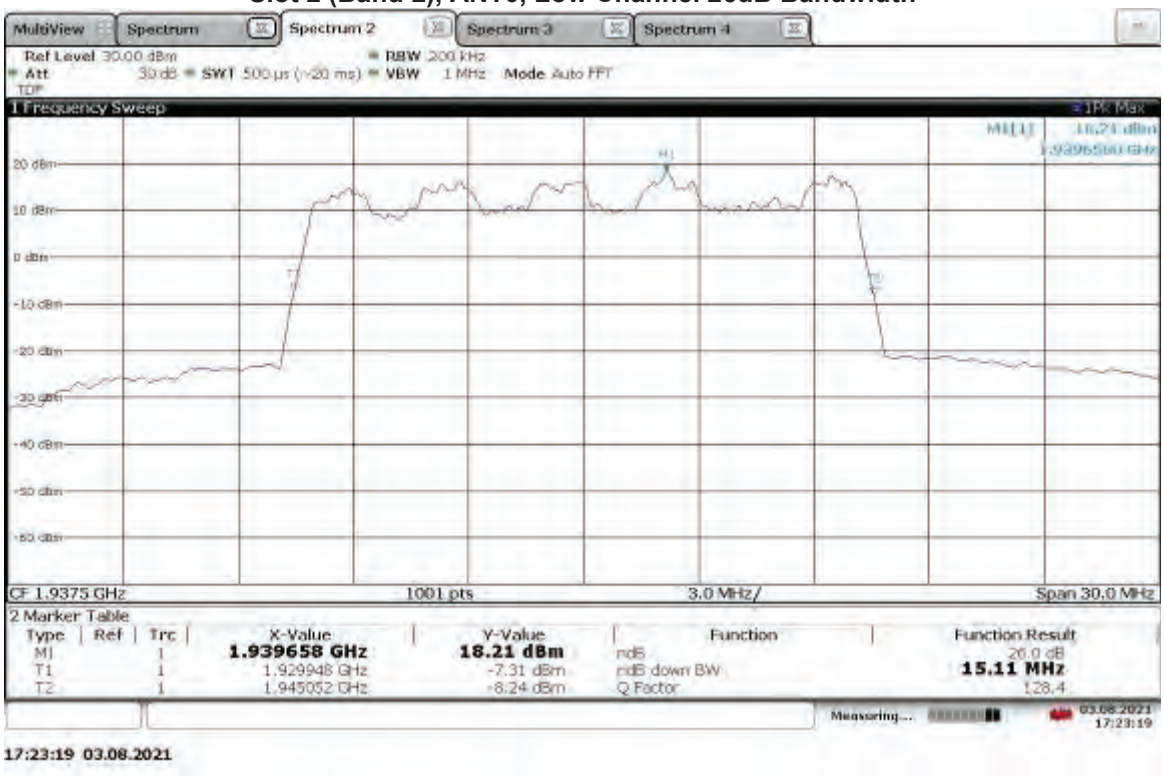
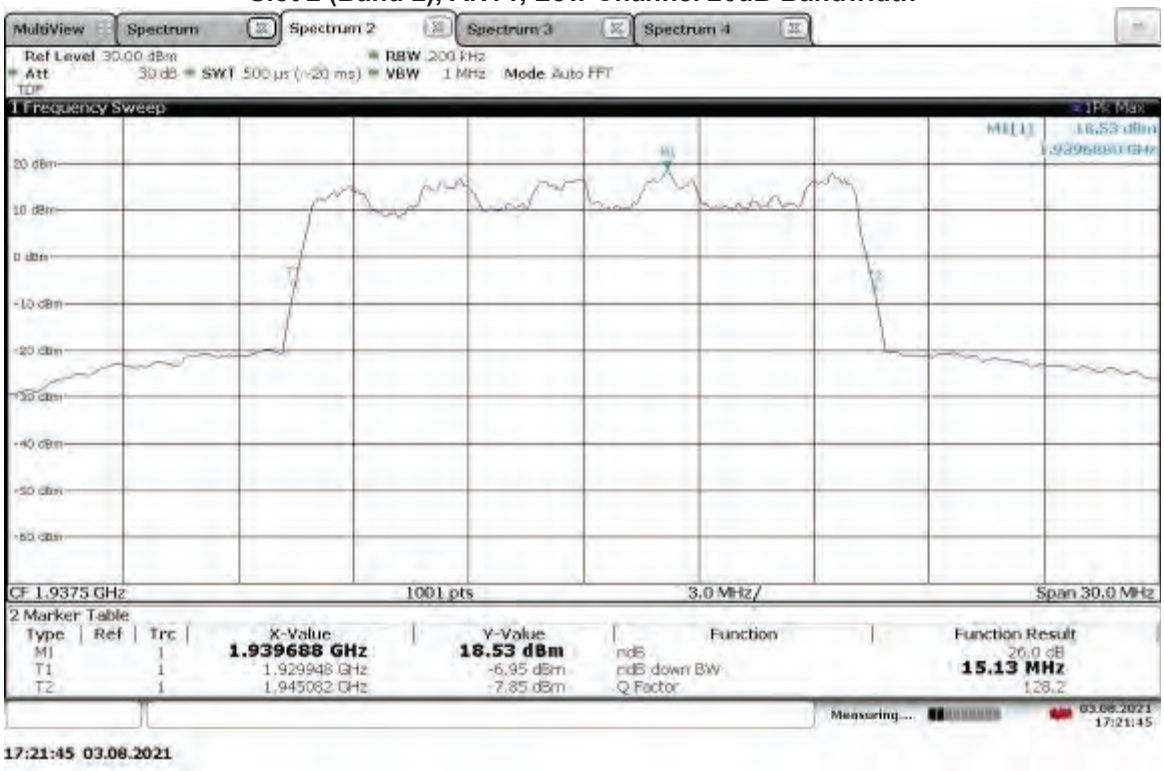
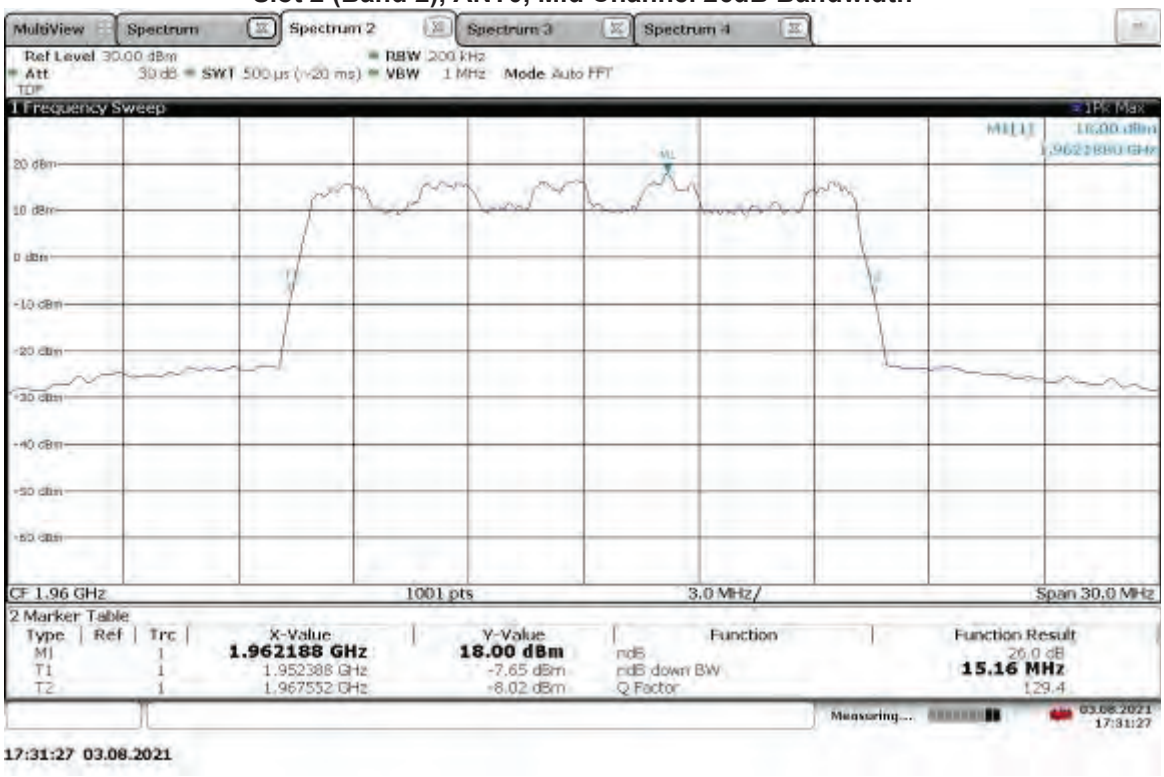
TM3.2-16QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



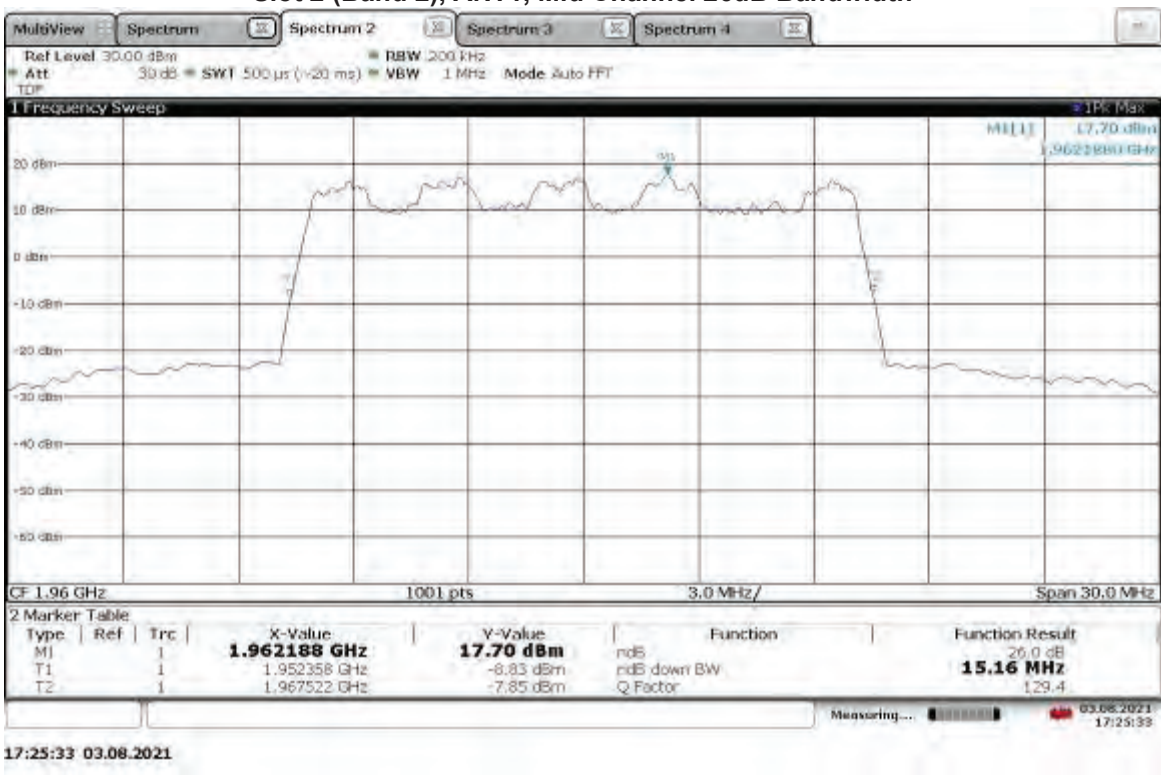
TM3.2-16QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



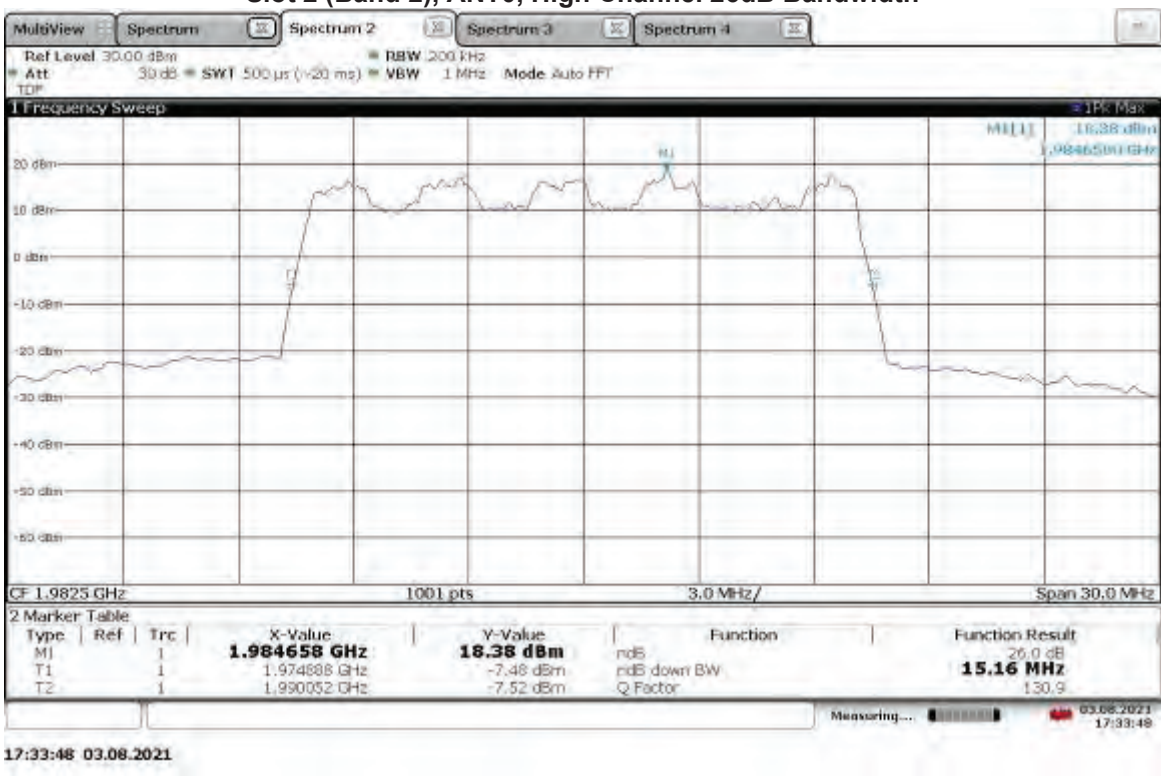
TM3.2-16QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



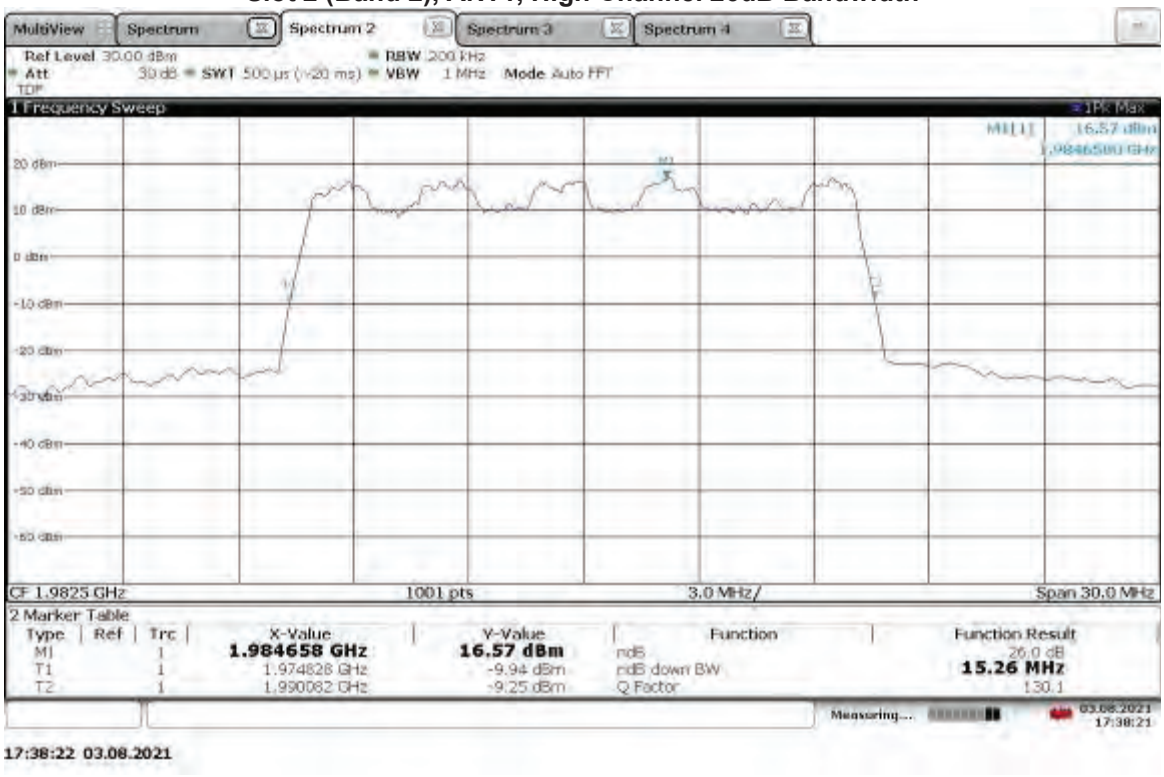
TM3.2-16QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



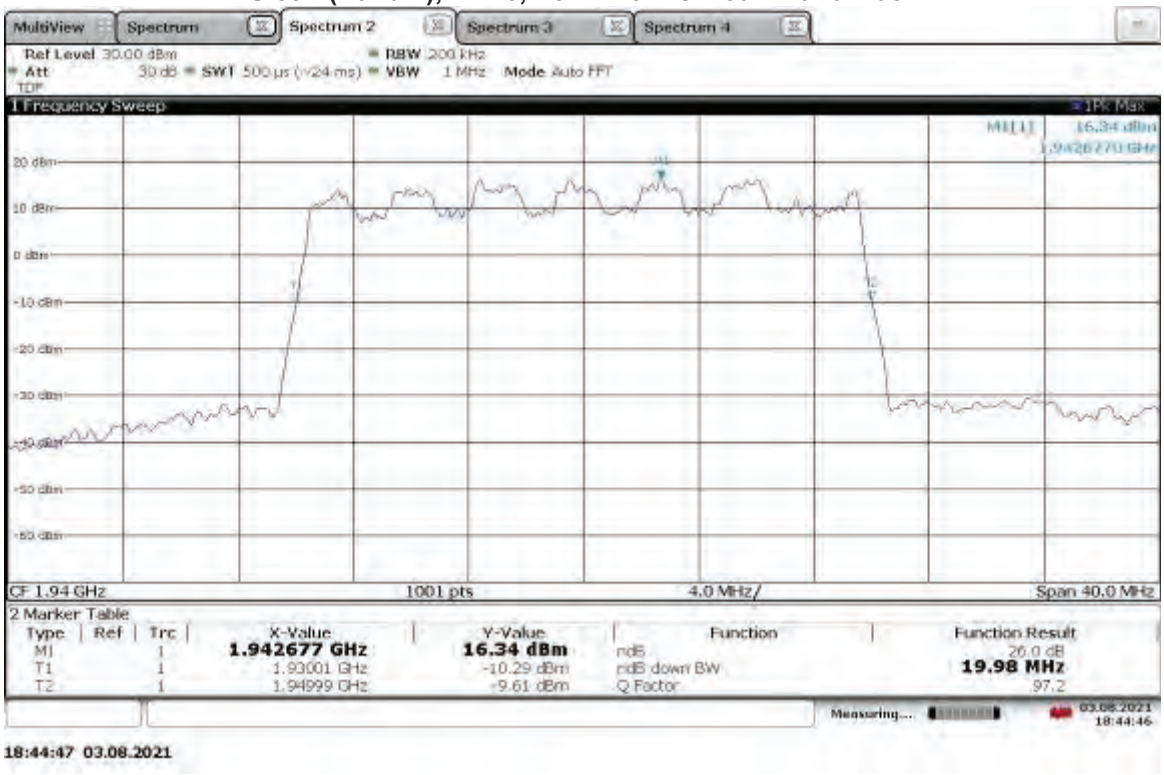
TM3.2-16QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



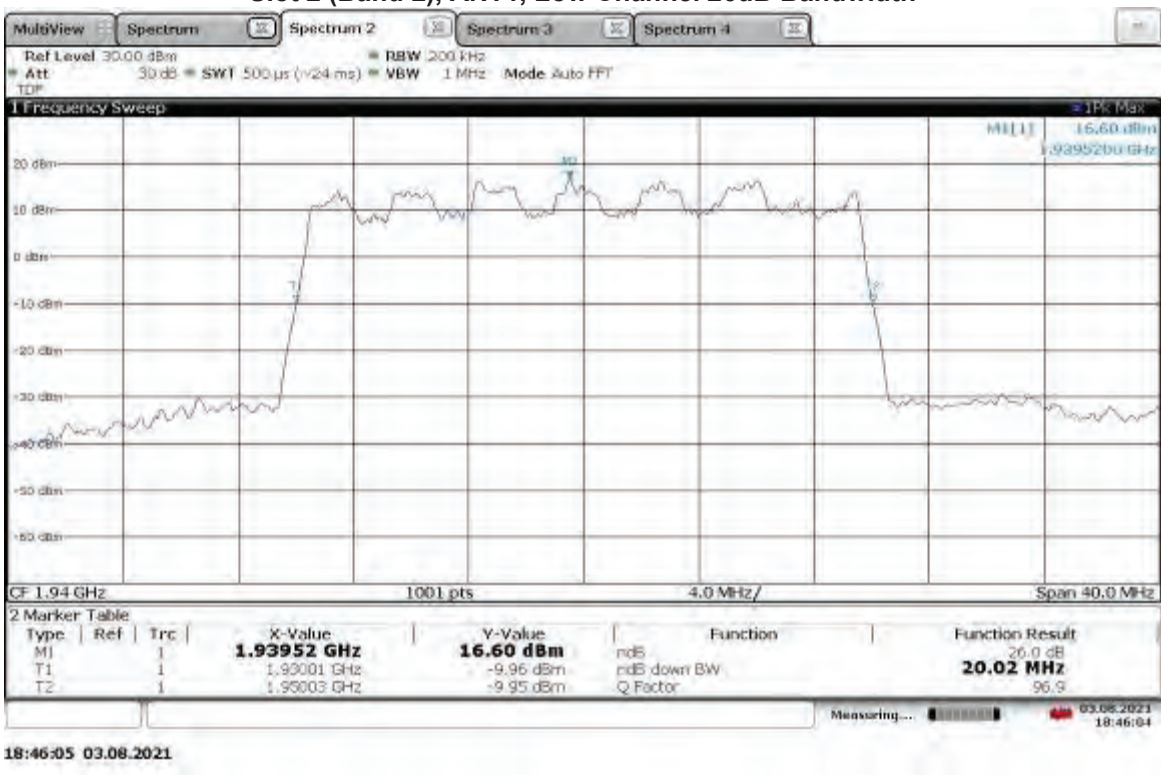
TM3.2-16QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



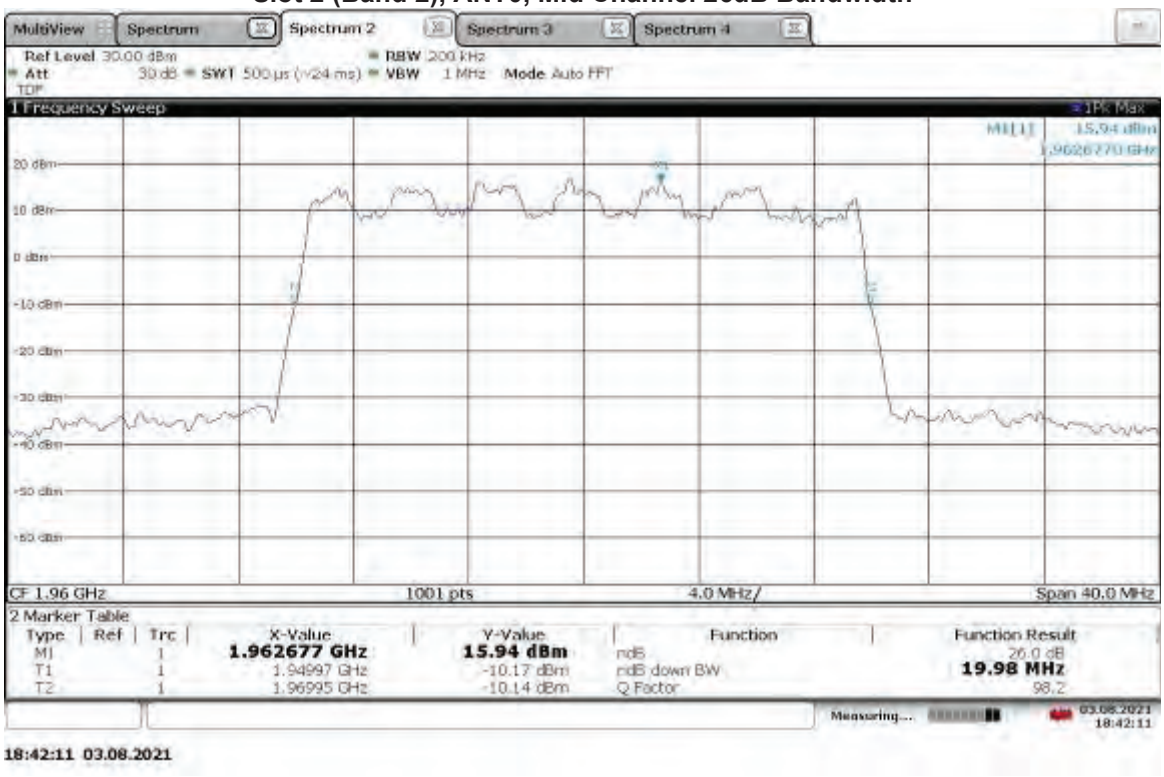
TM3.2-16QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



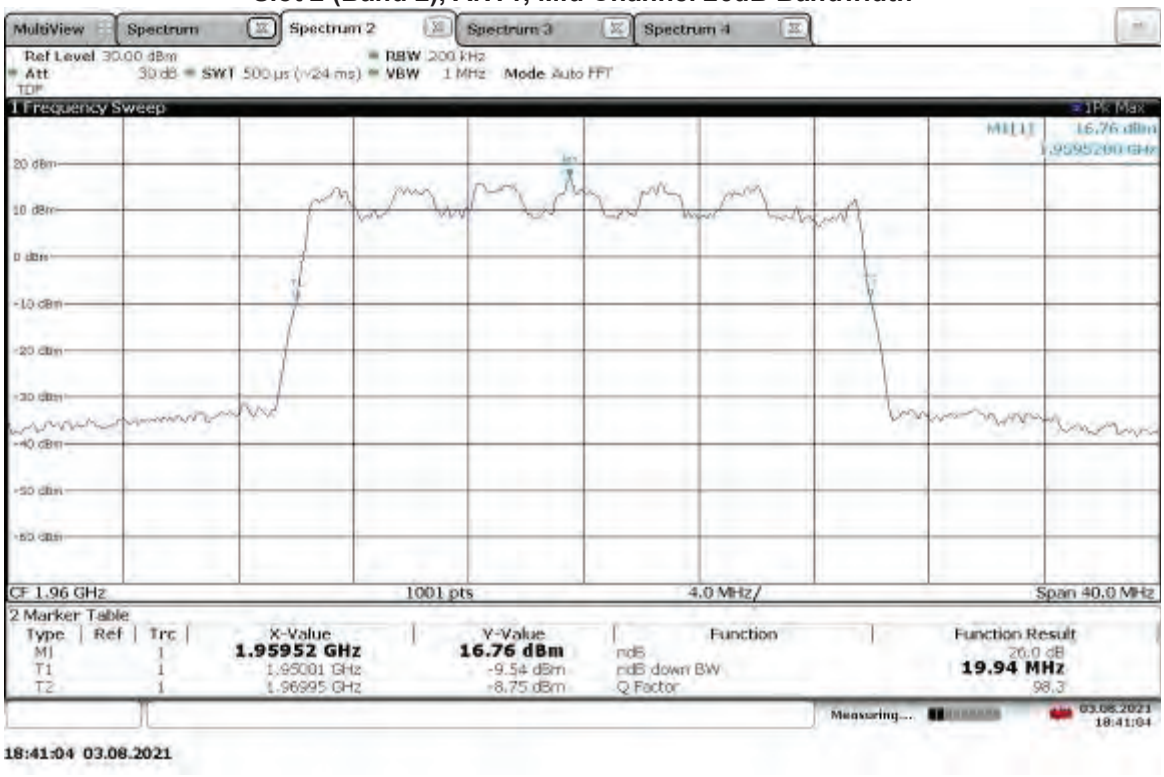
TM3.2-16QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



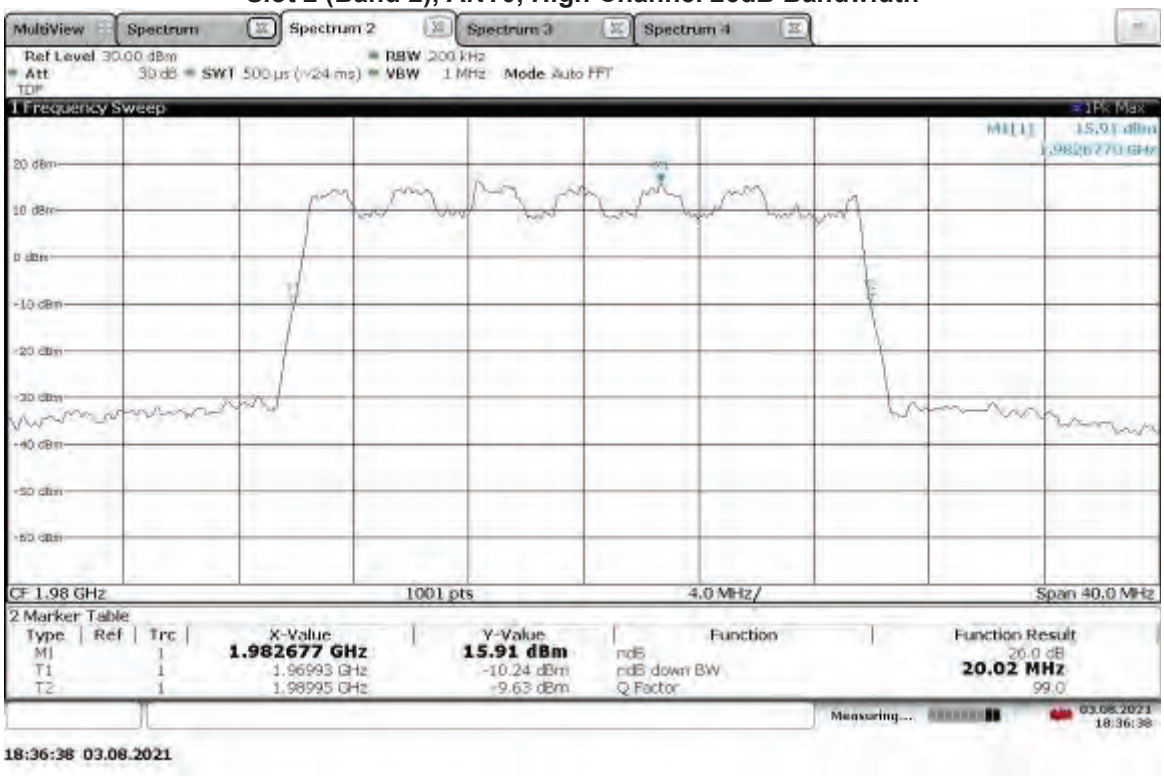
TM3.2-16QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



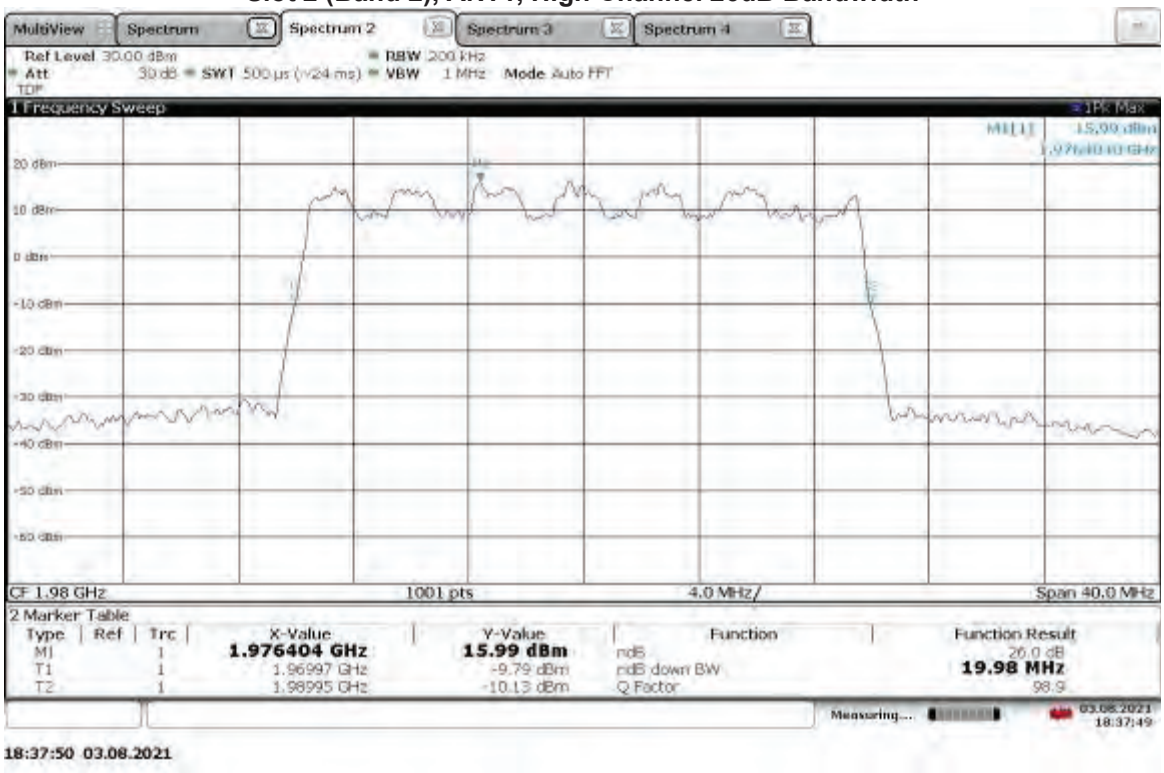
TM3.2-16QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



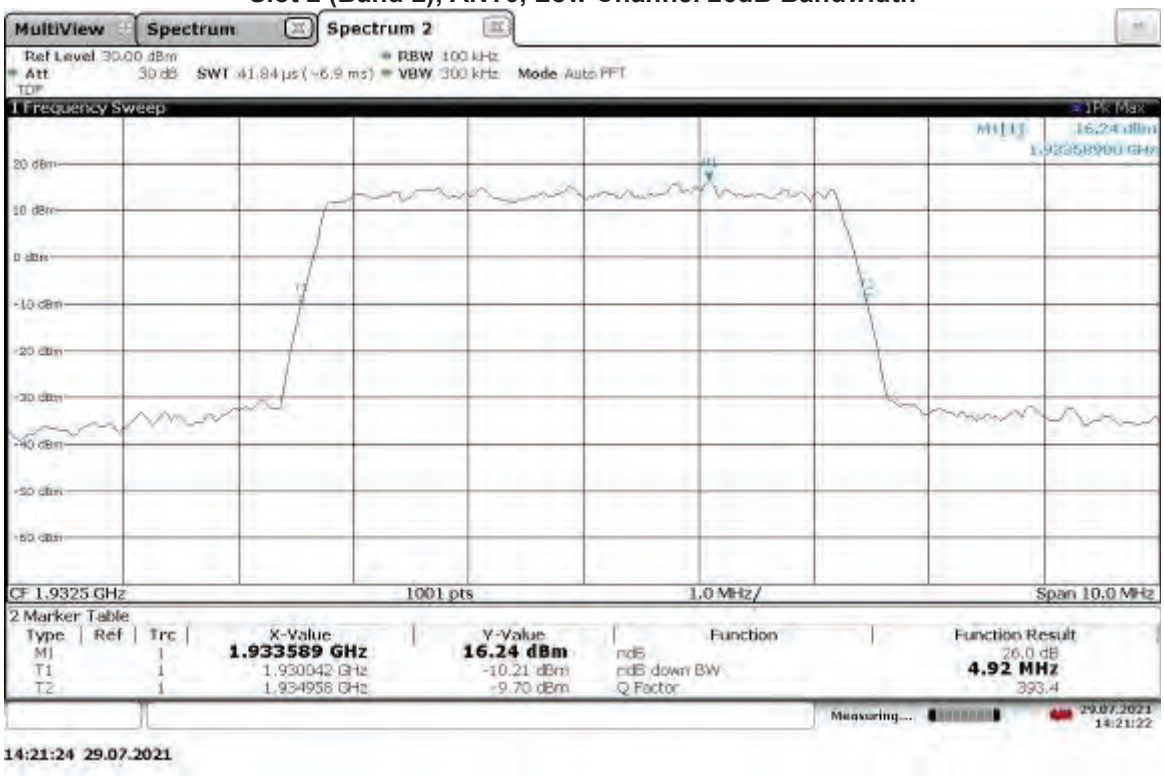
TM3.2-16QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



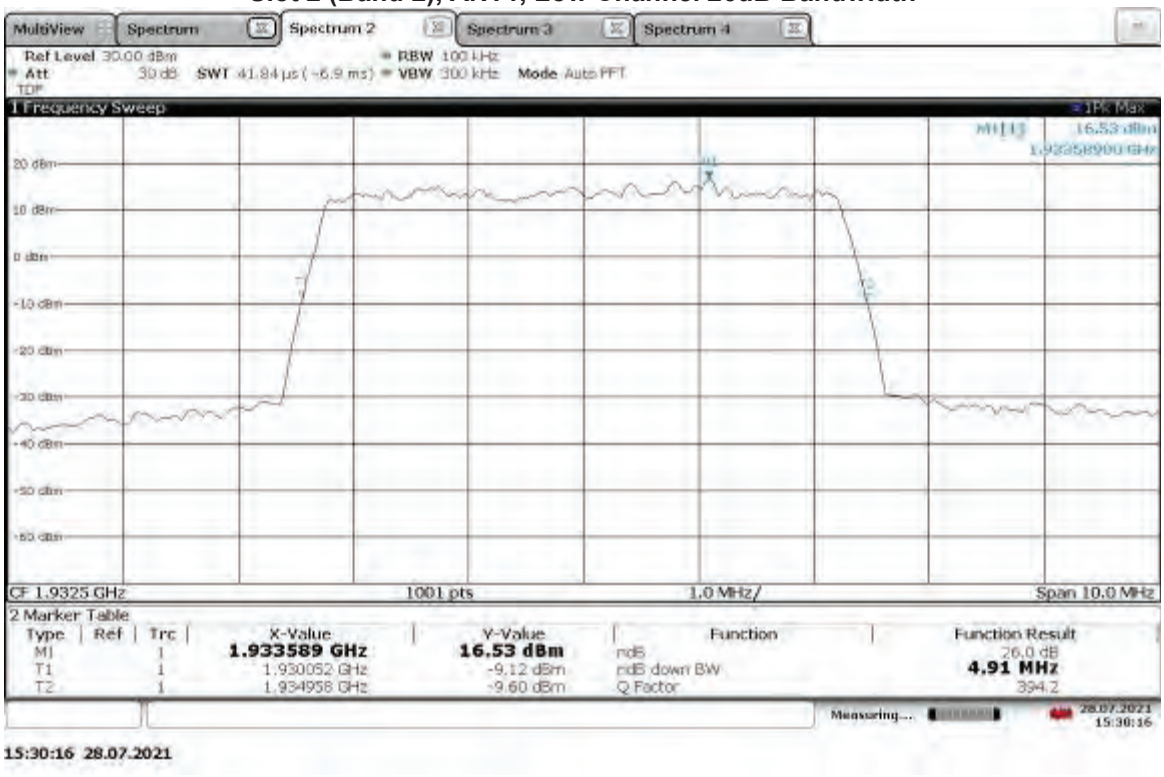
TM3.2-16QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



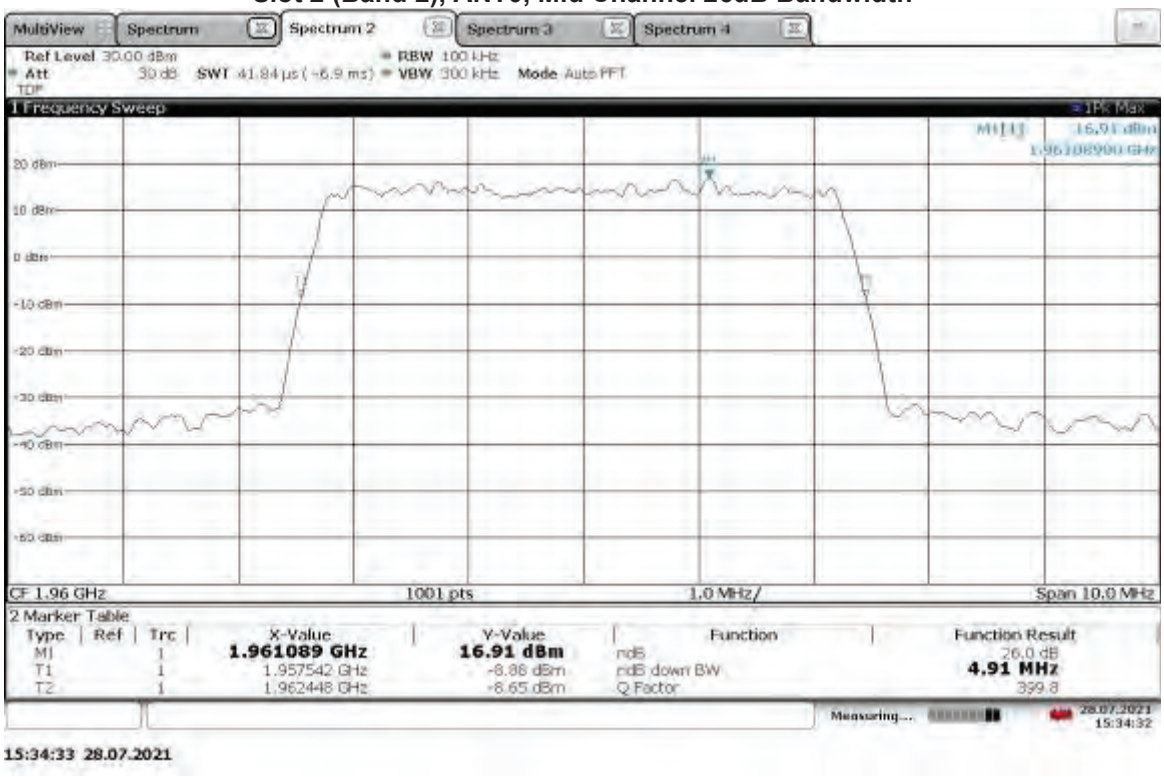
TM3.1-64QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



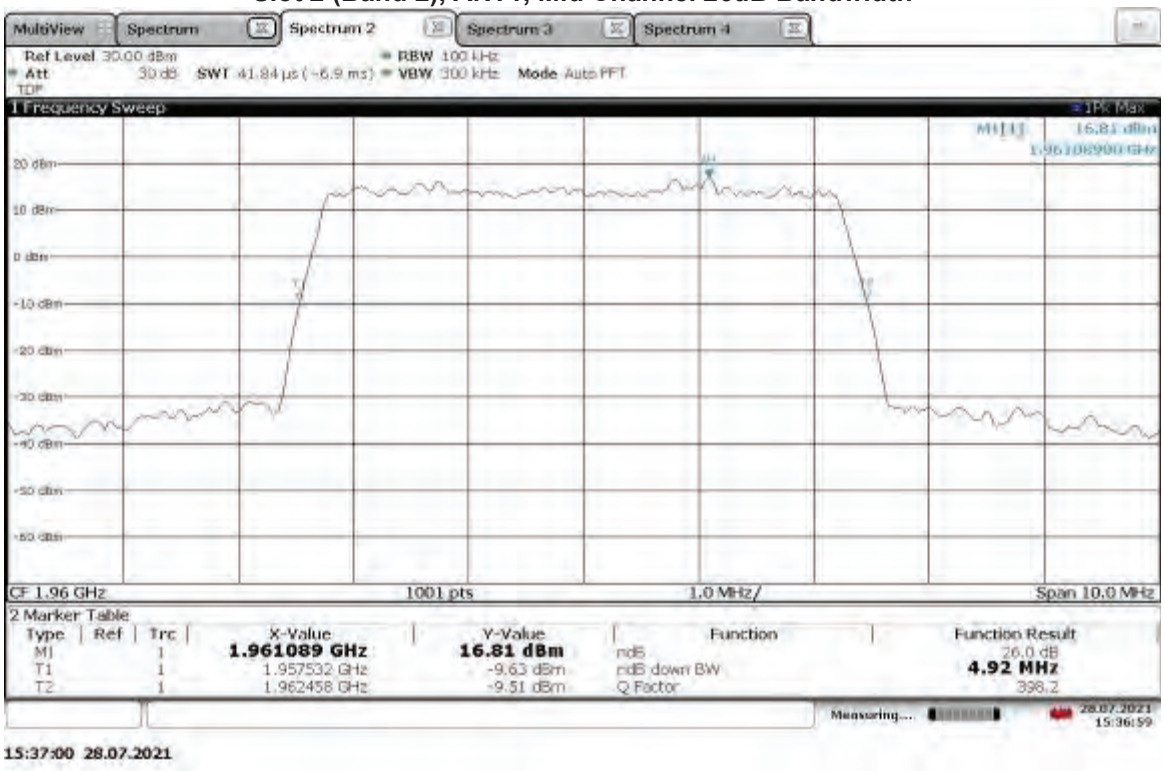
TM3.1-64QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



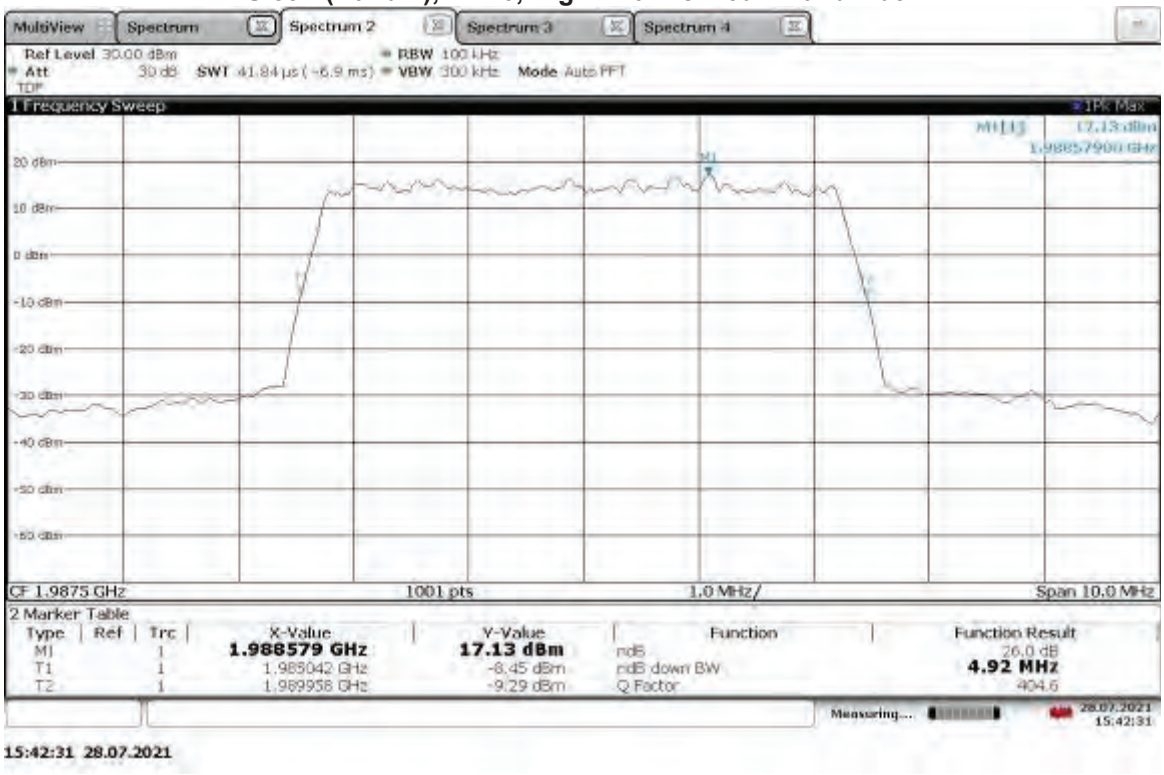
TM3.1-64QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



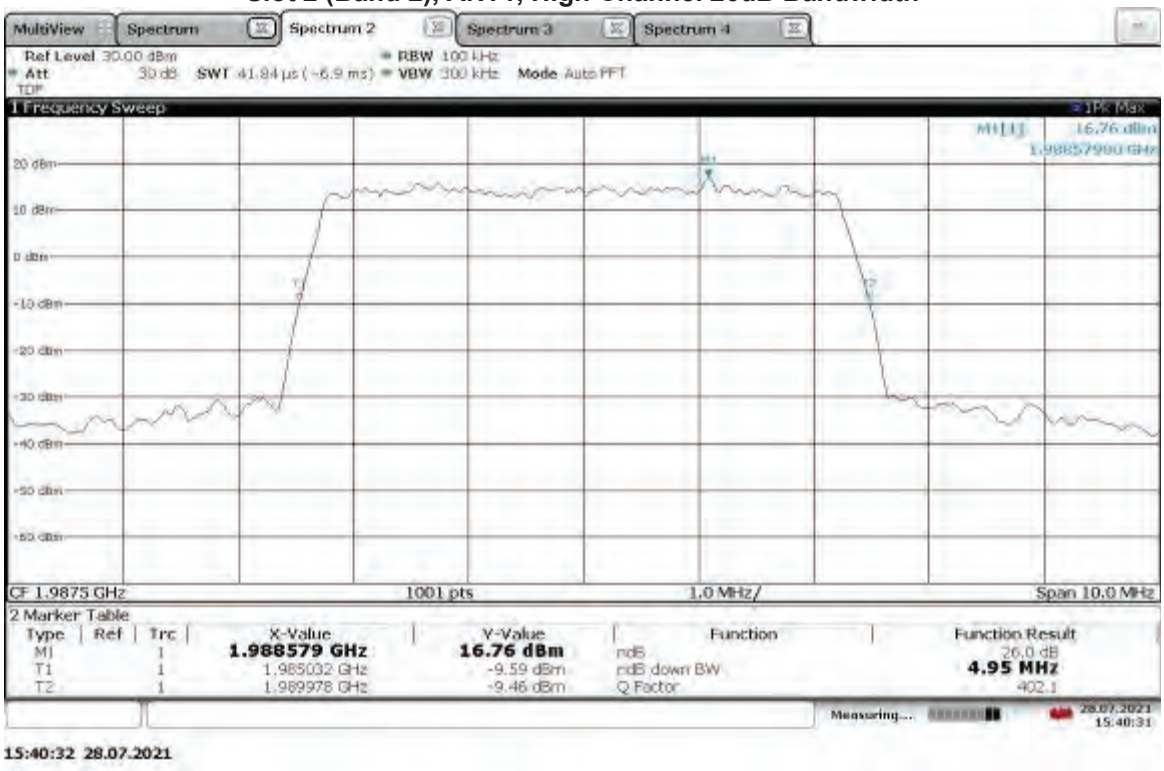
TM3.1-64QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



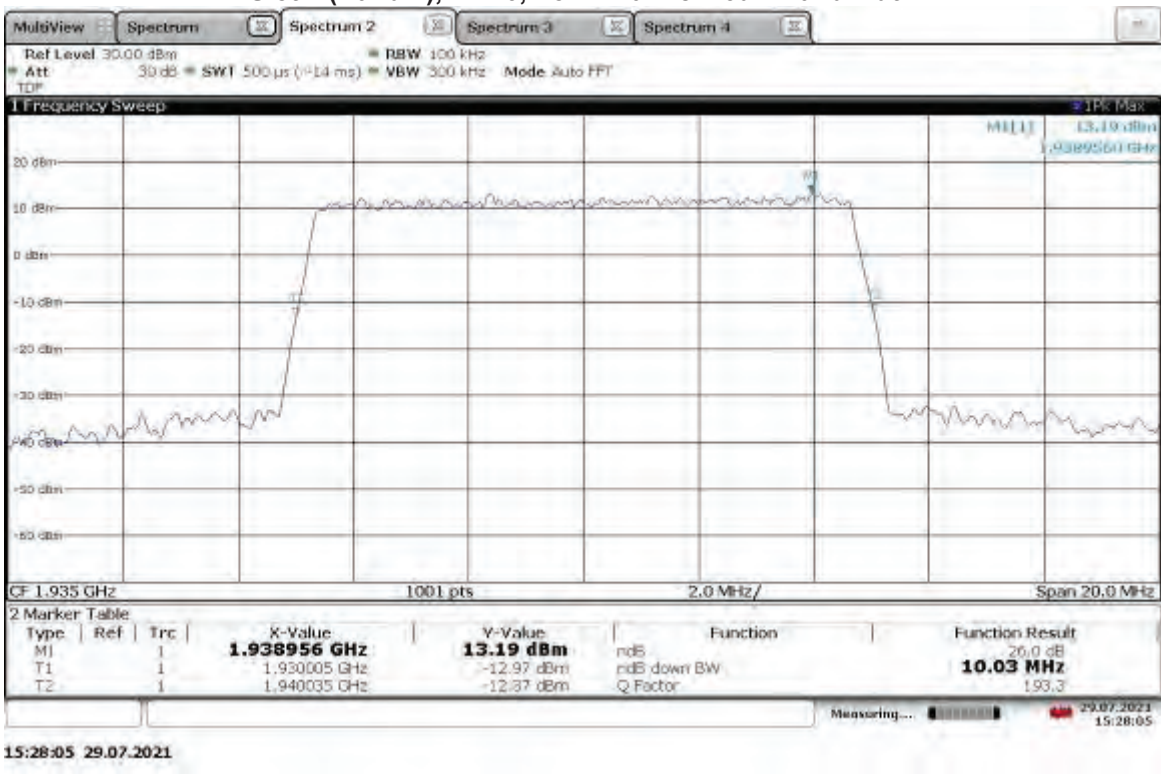
TM3.1-64QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



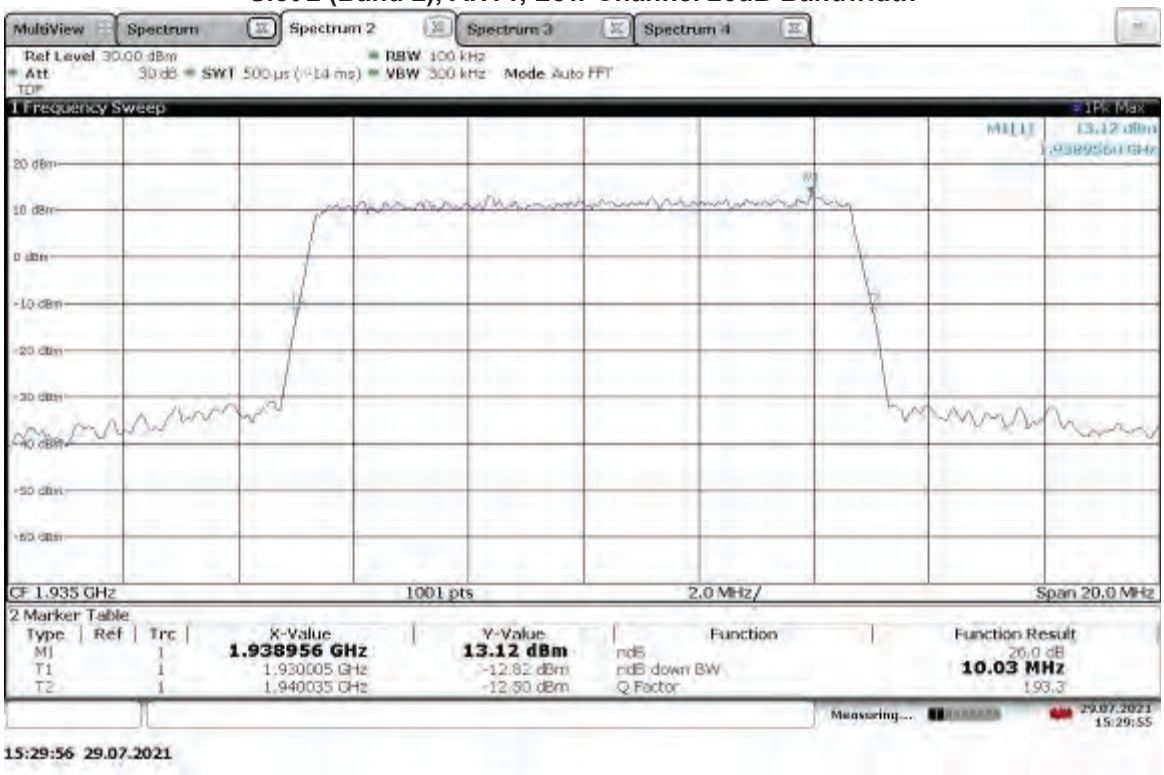
TM3.1-64QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



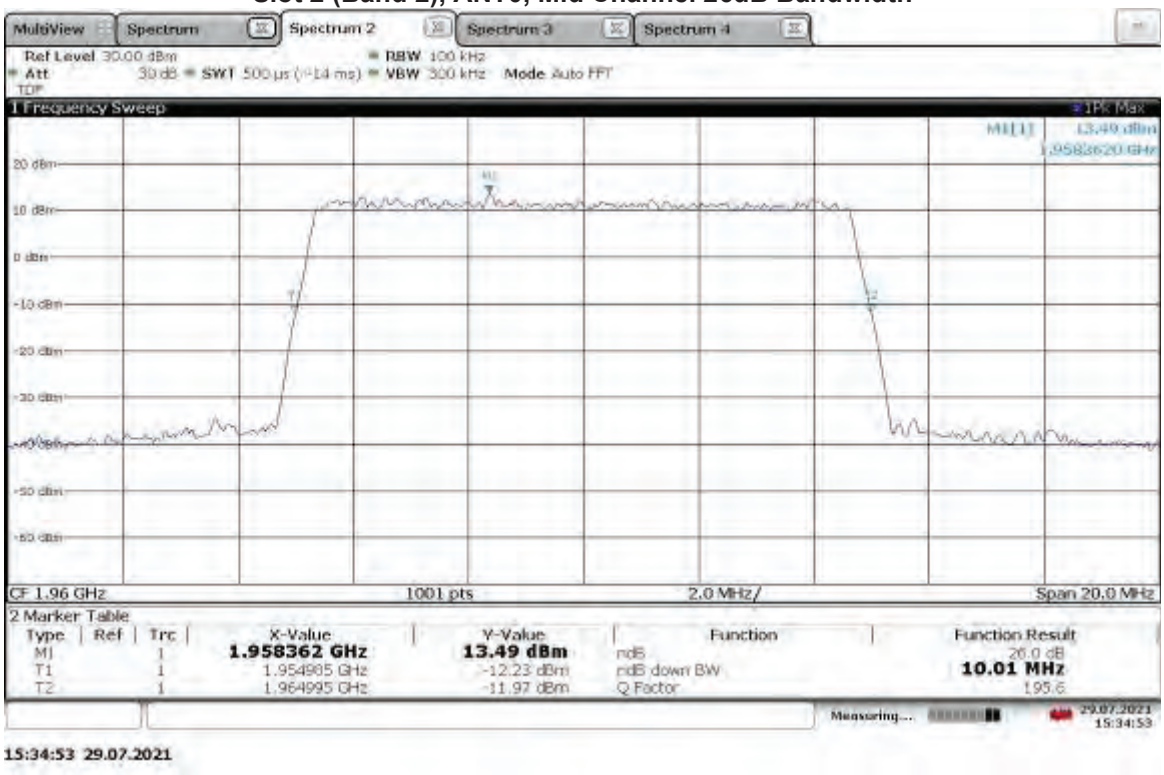
TM3.1-64QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



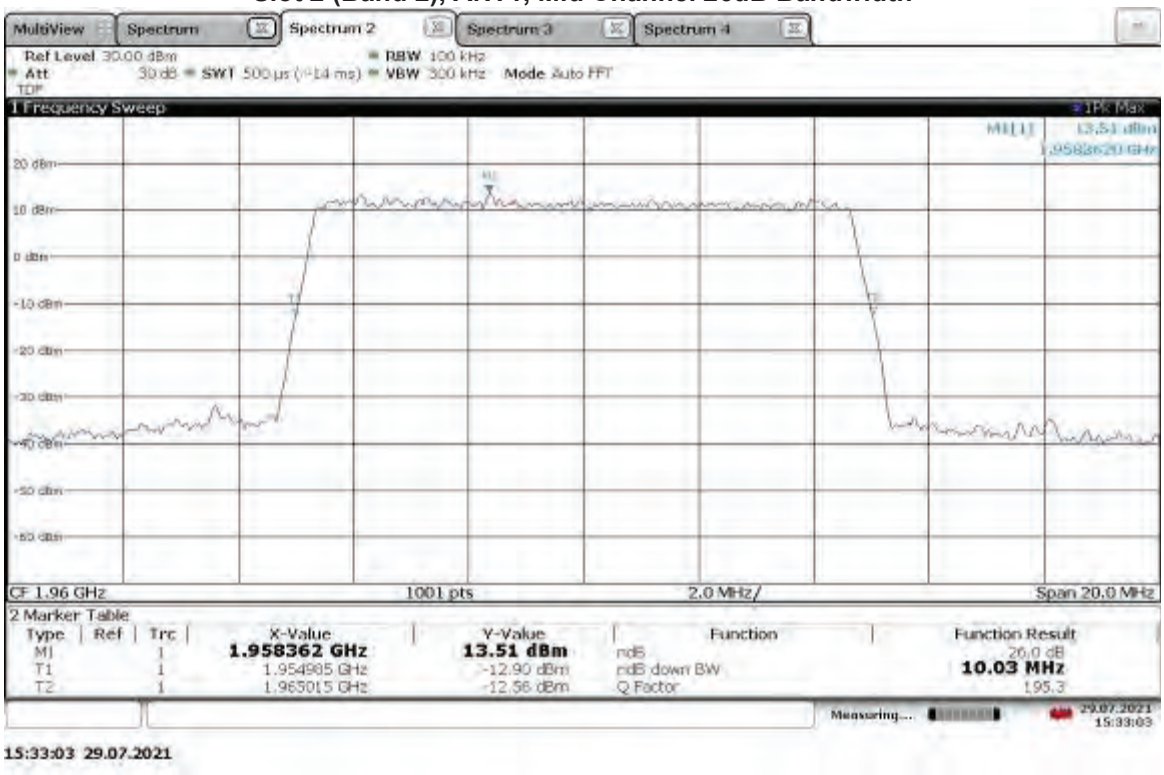
TM3.1-64QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



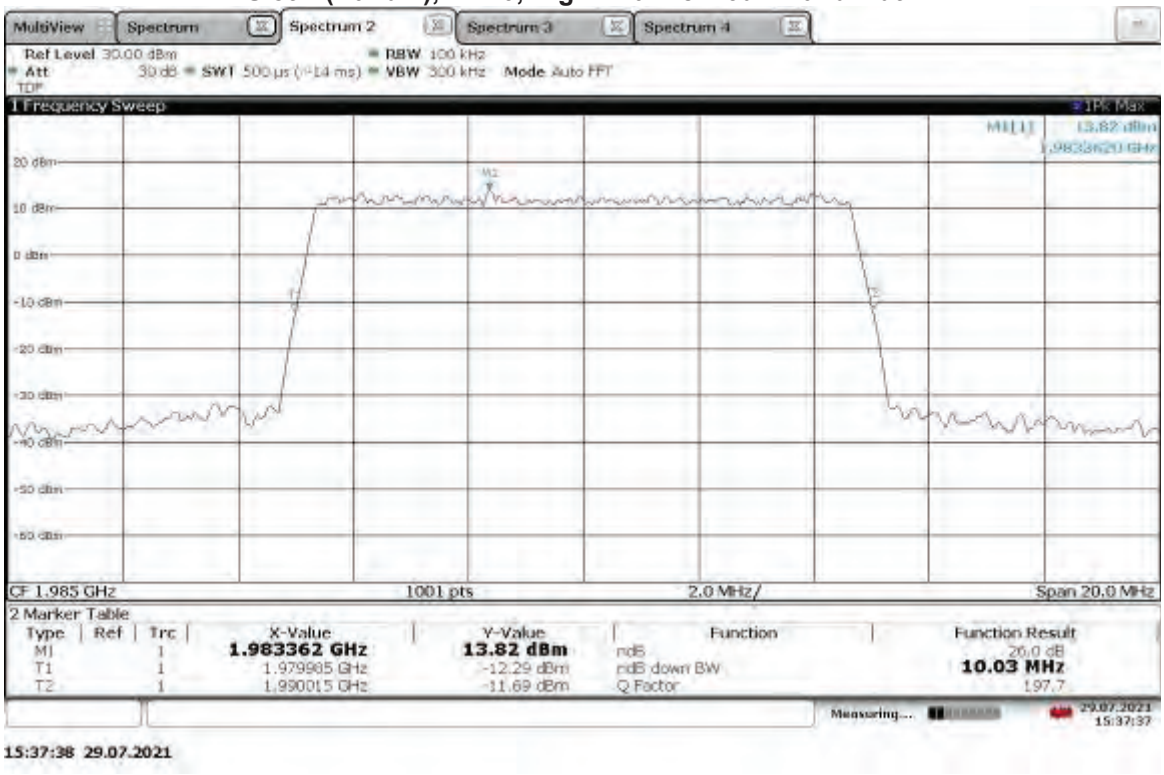
TM3.1-64QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



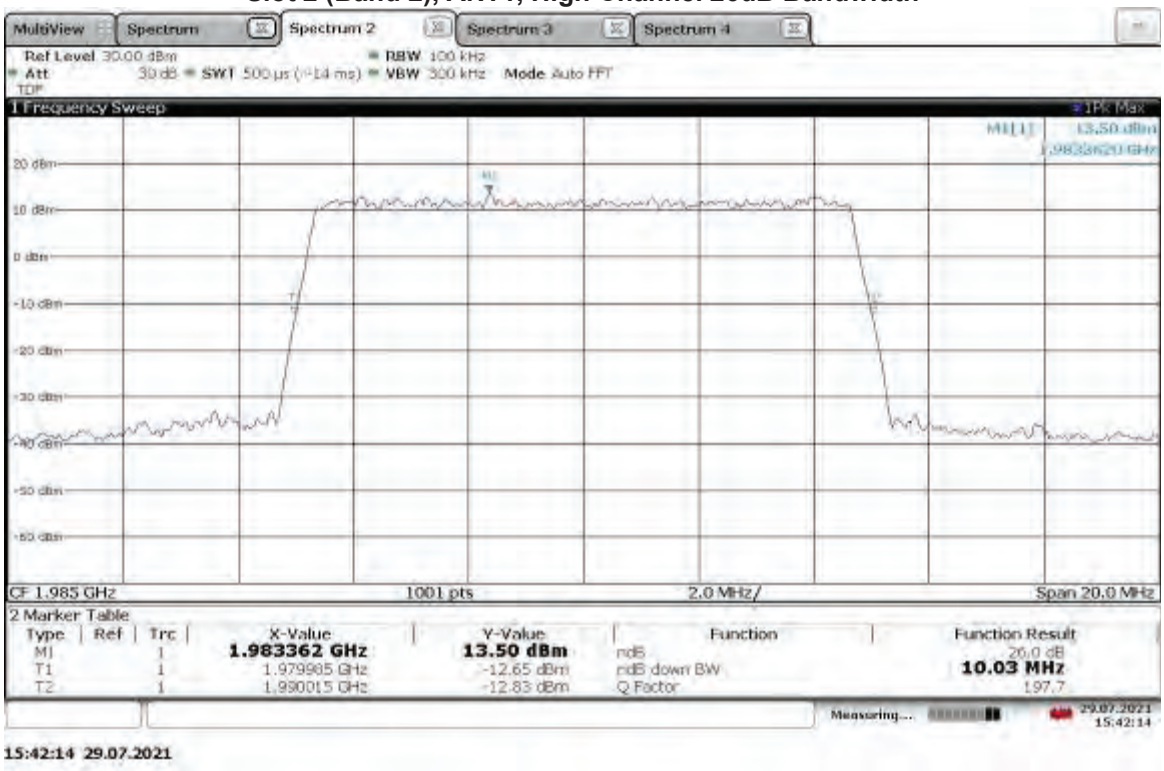
TM3.1-64QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



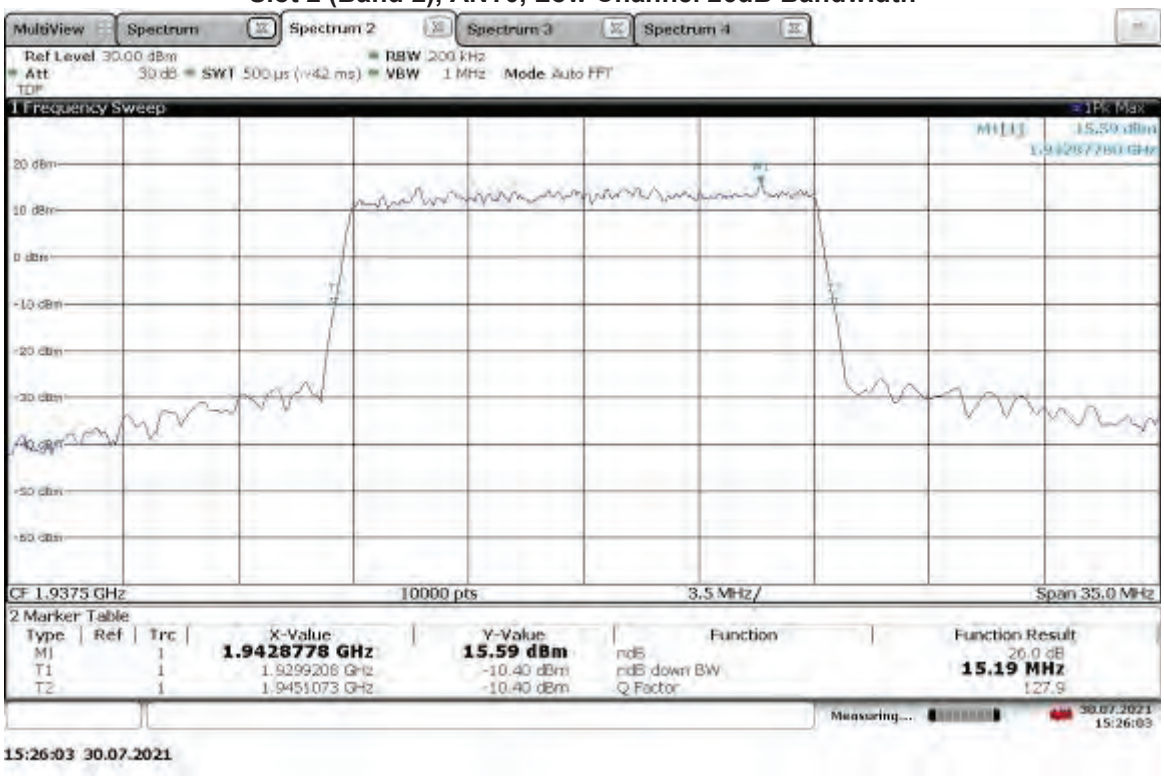
TM3.1-64QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



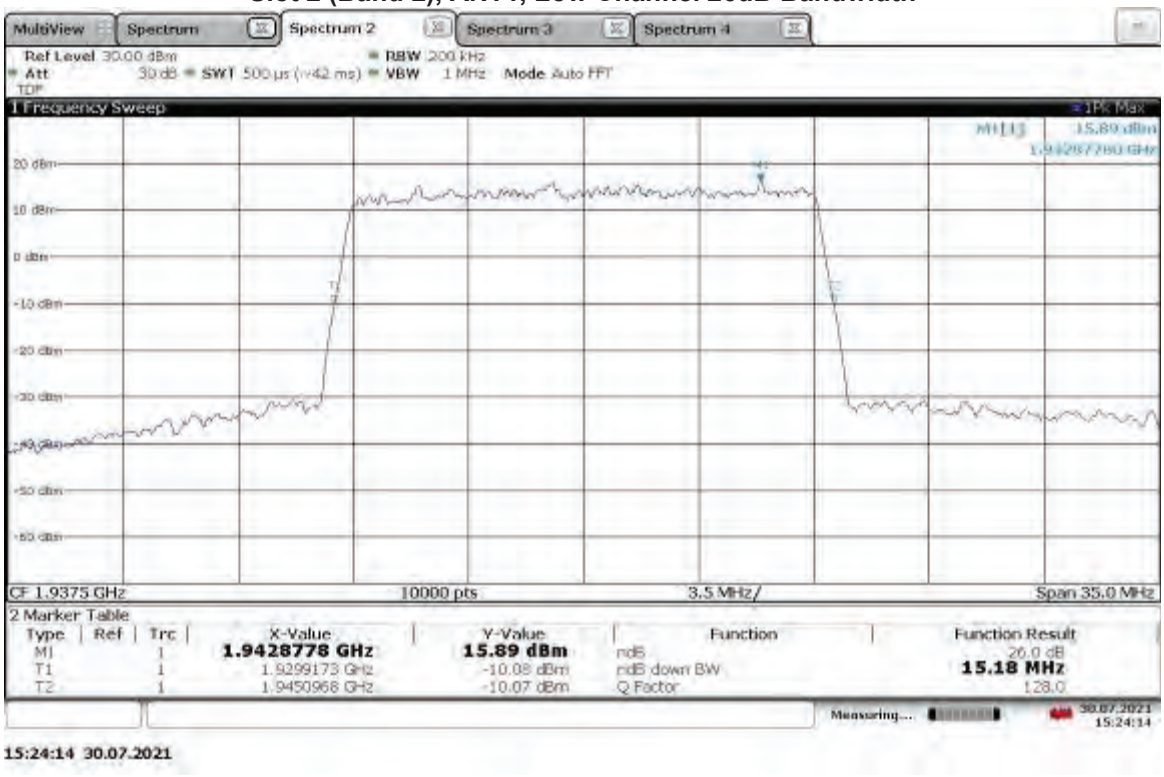
TM3.1-64QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



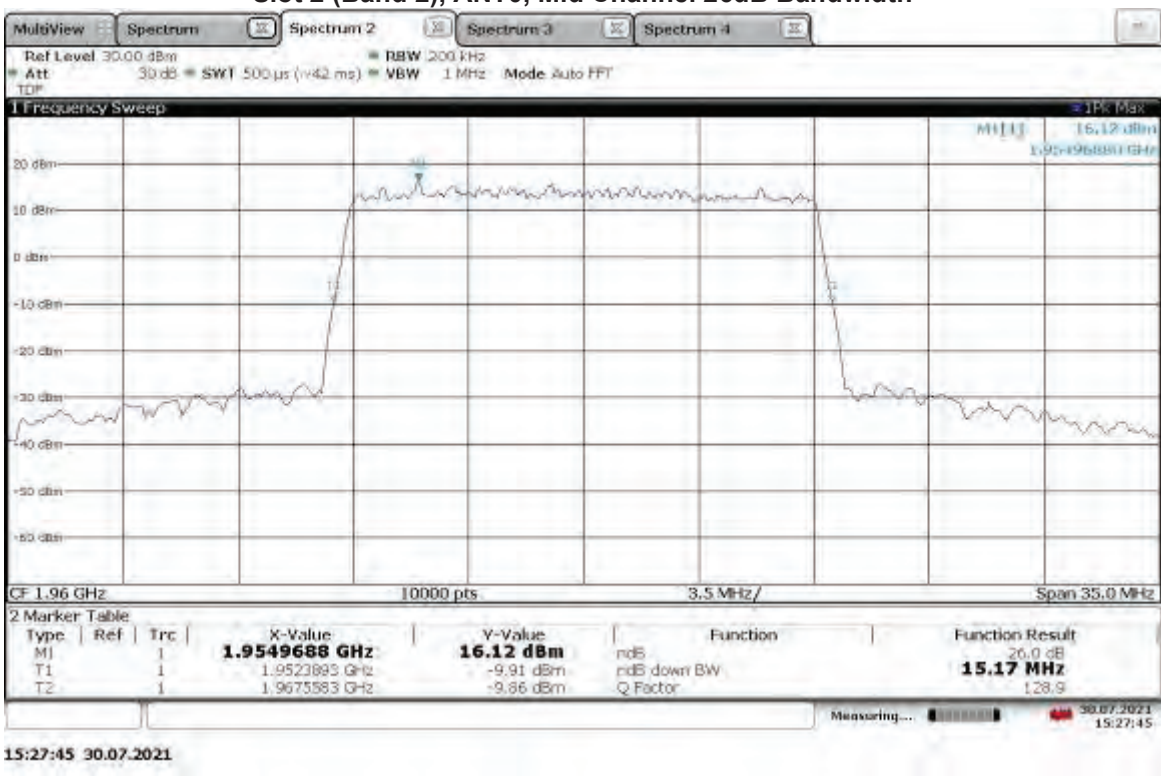
TM3.1-64QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



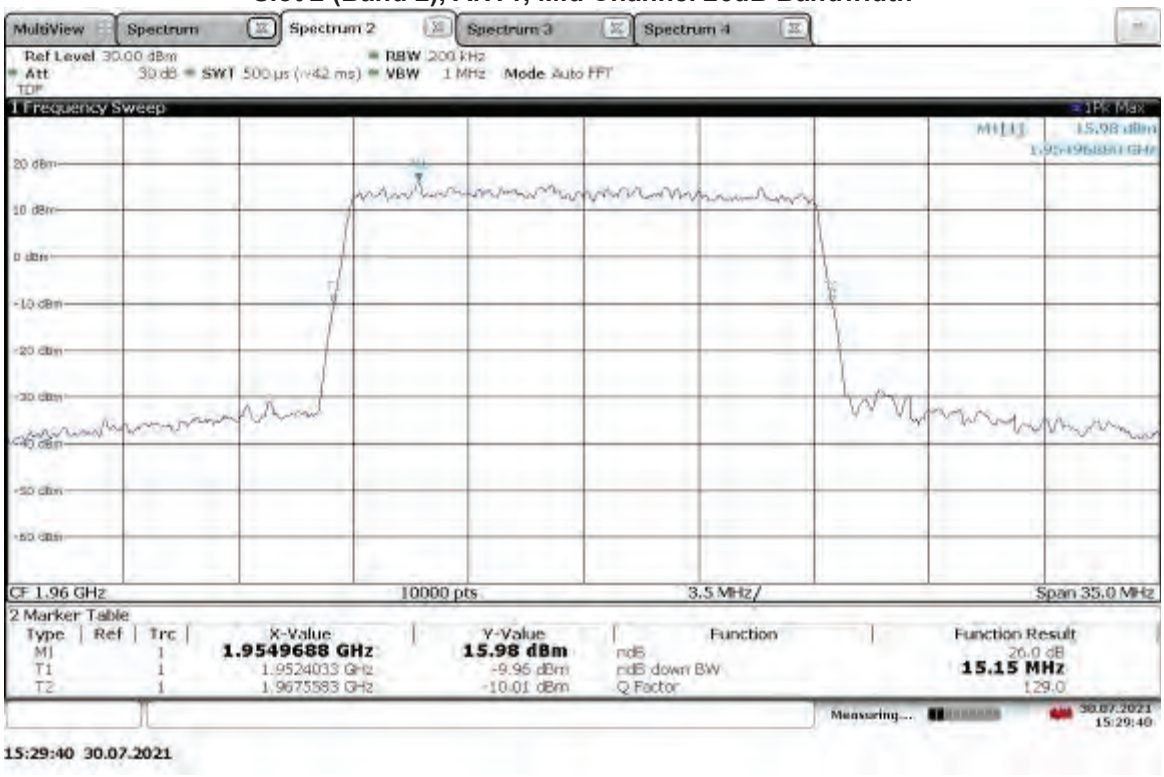
TM3.1-64QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



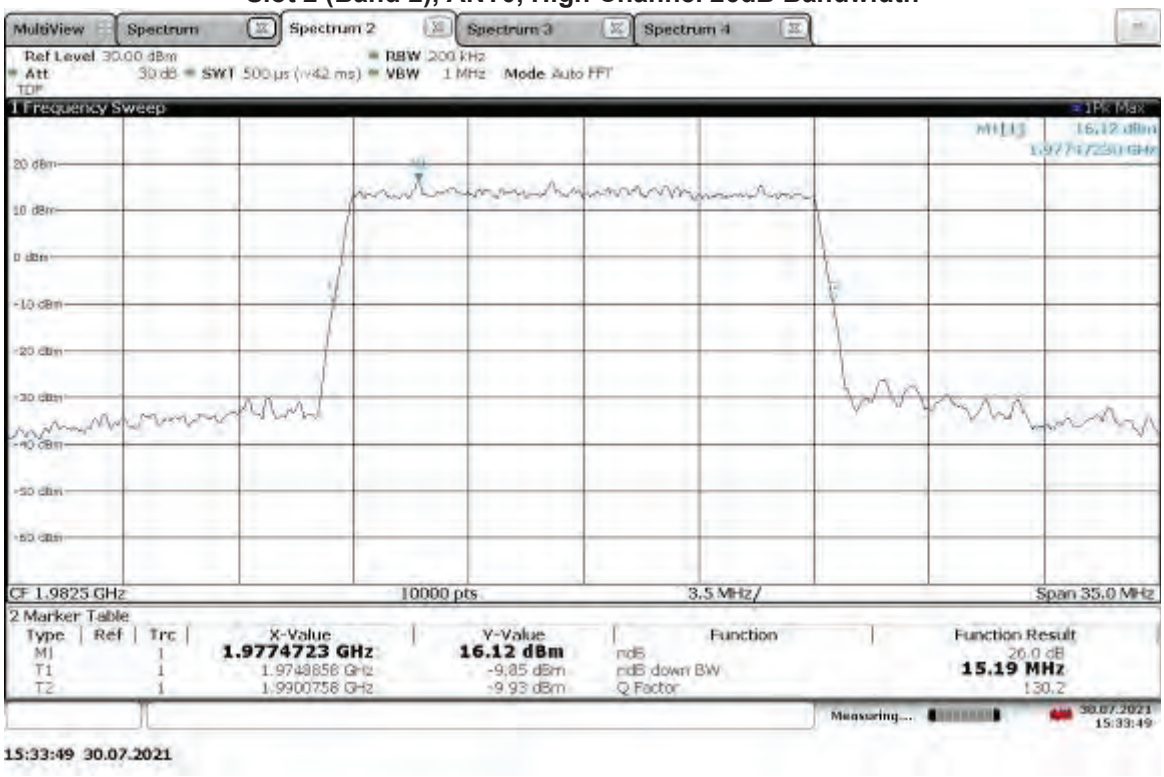
TM3.1-64QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



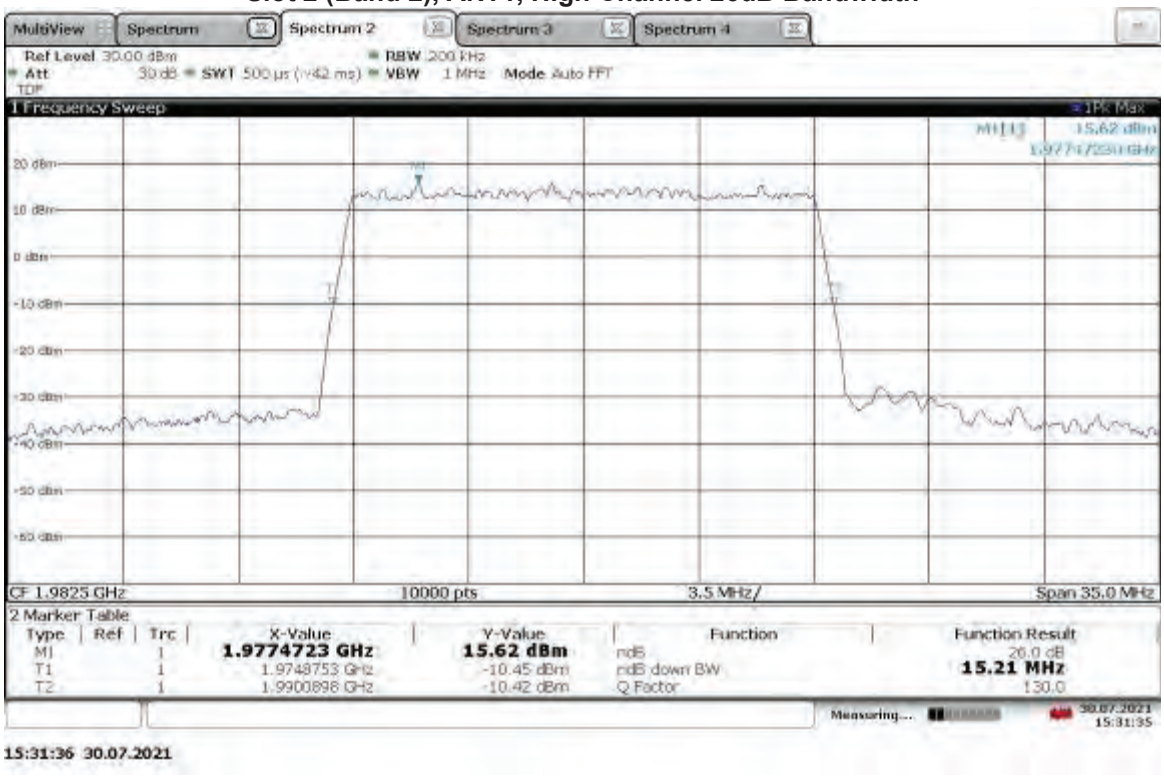
TM3.1-64QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



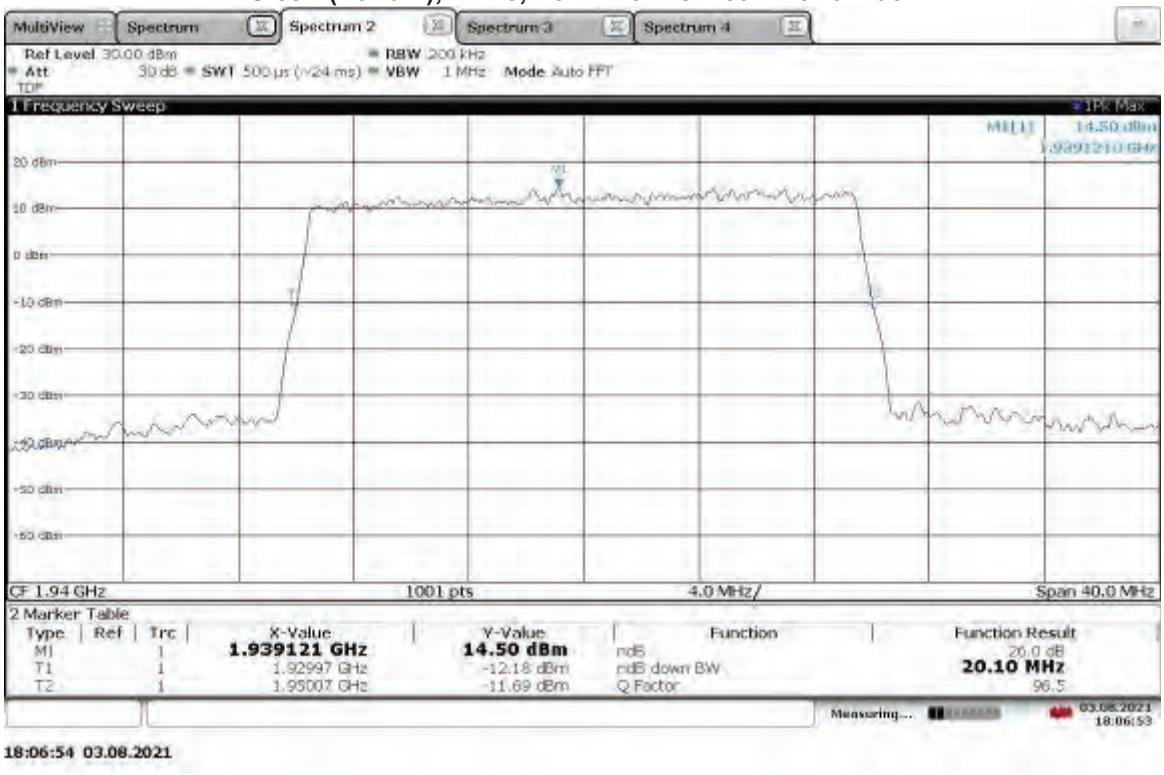
TM3.1-64QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



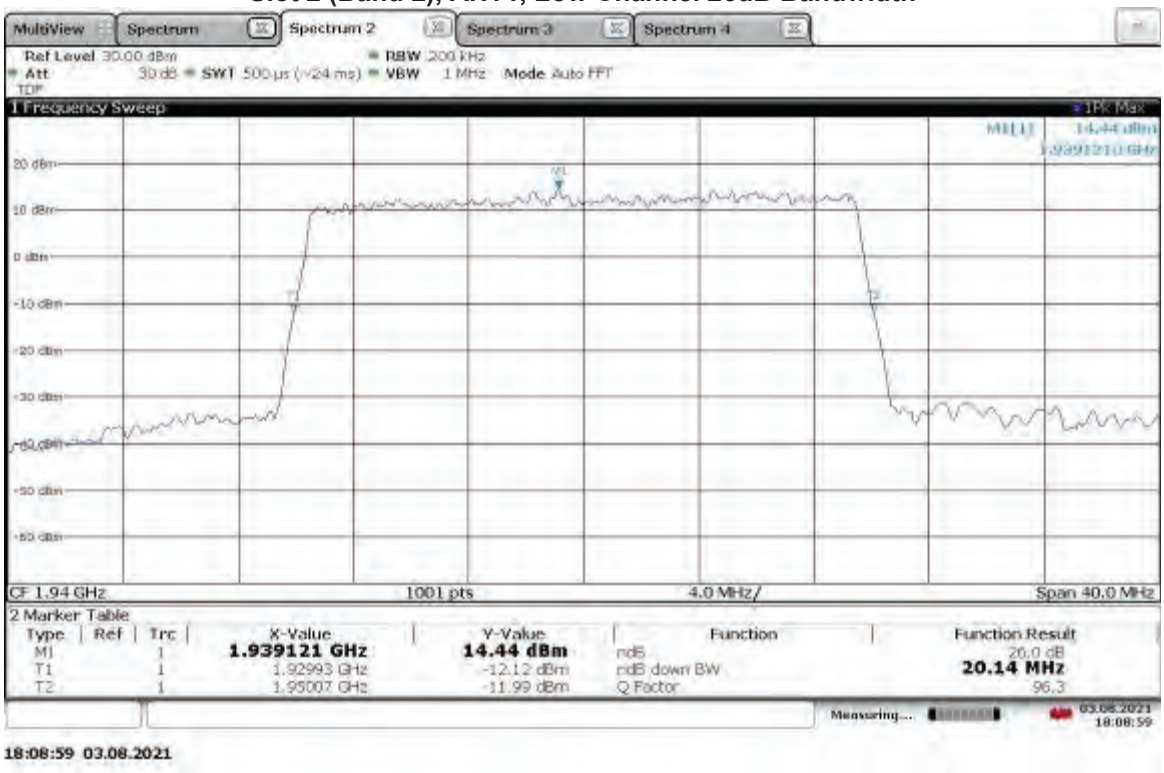
TM3.1-64QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



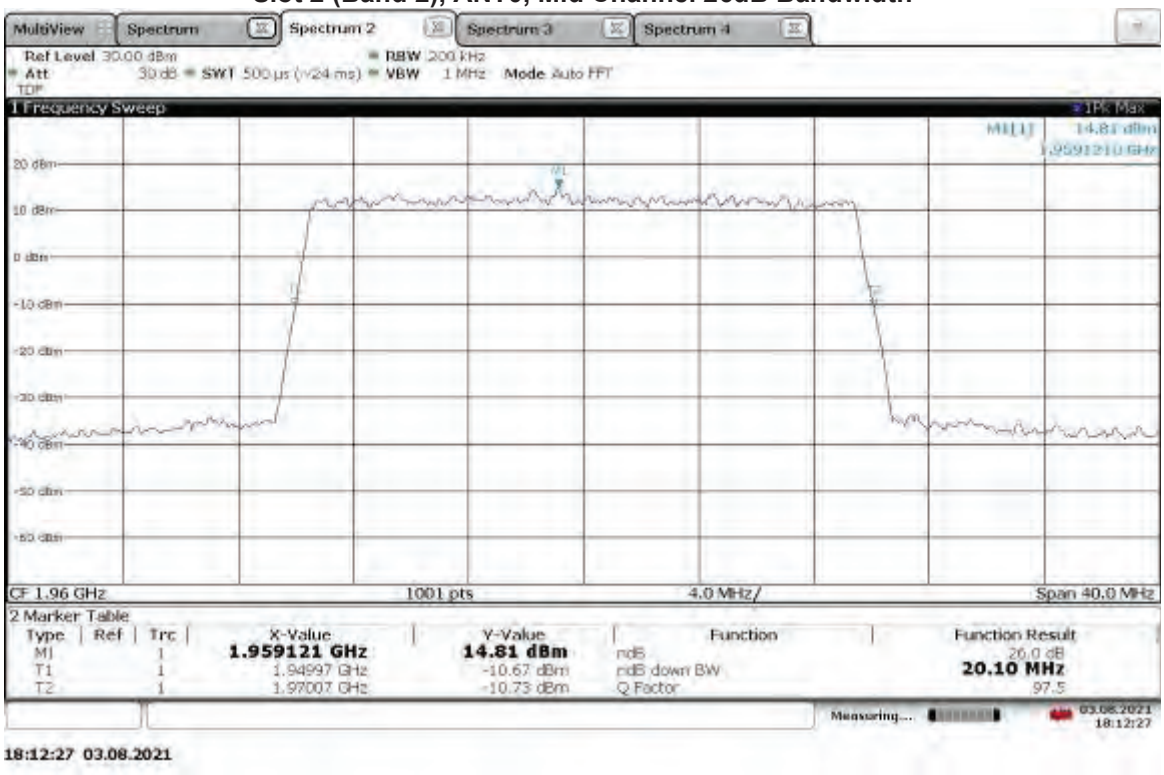
TM3.1-64QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



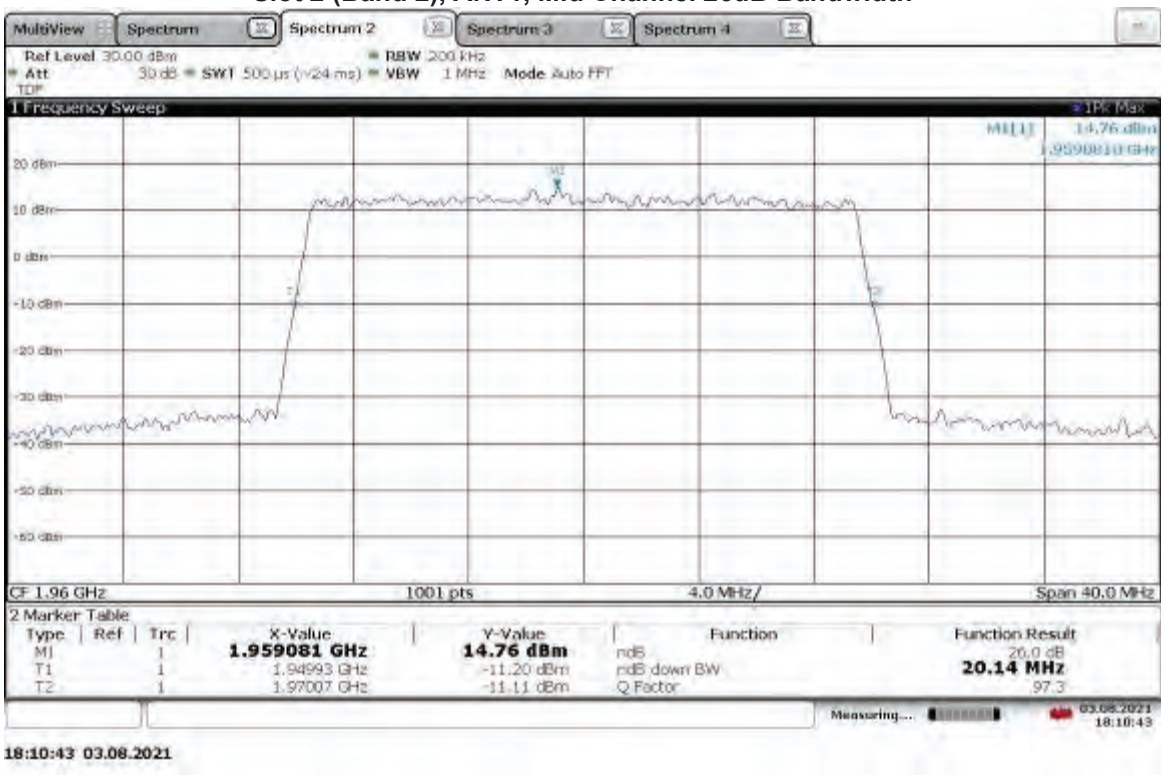
TM3.1-64QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



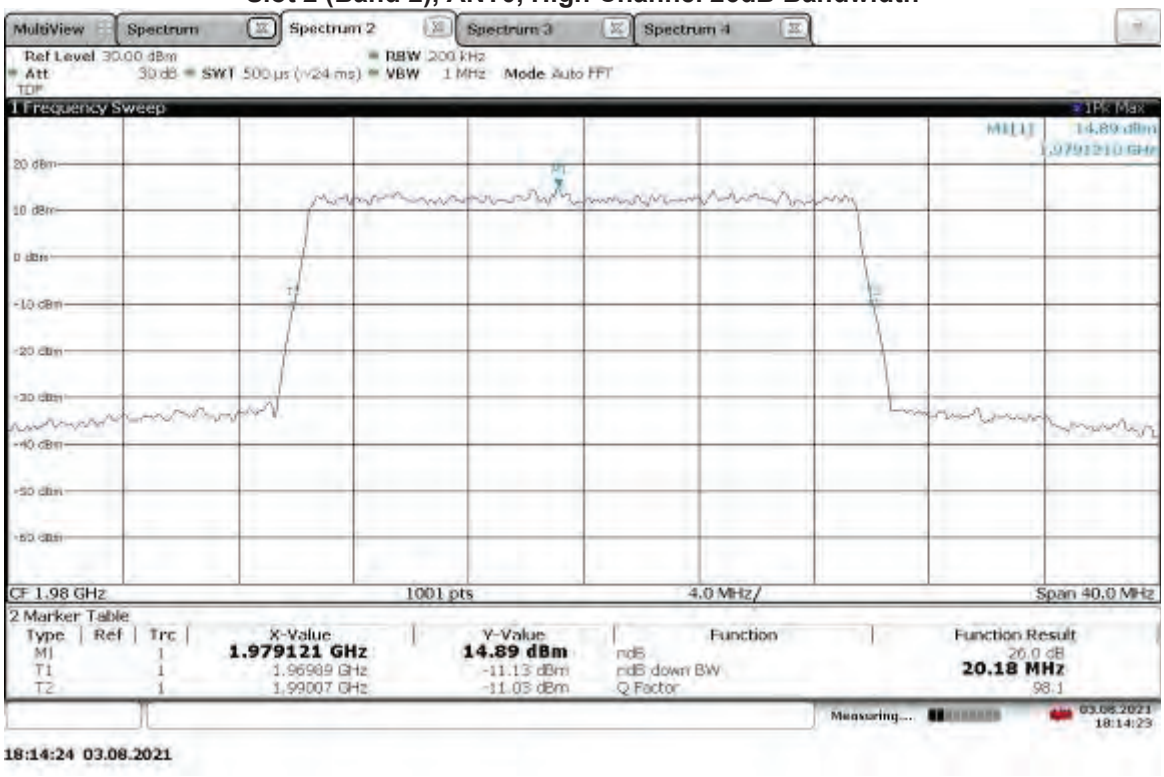
TM3.1-64QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



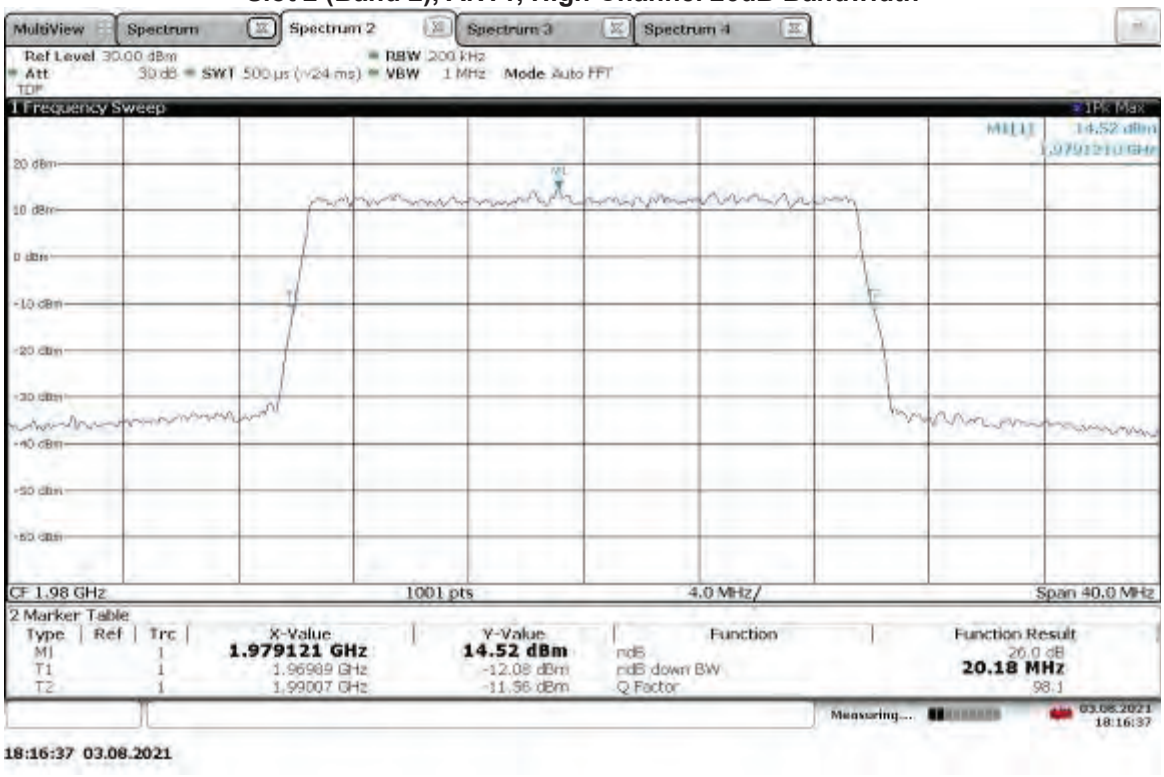
TM3.1-64QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



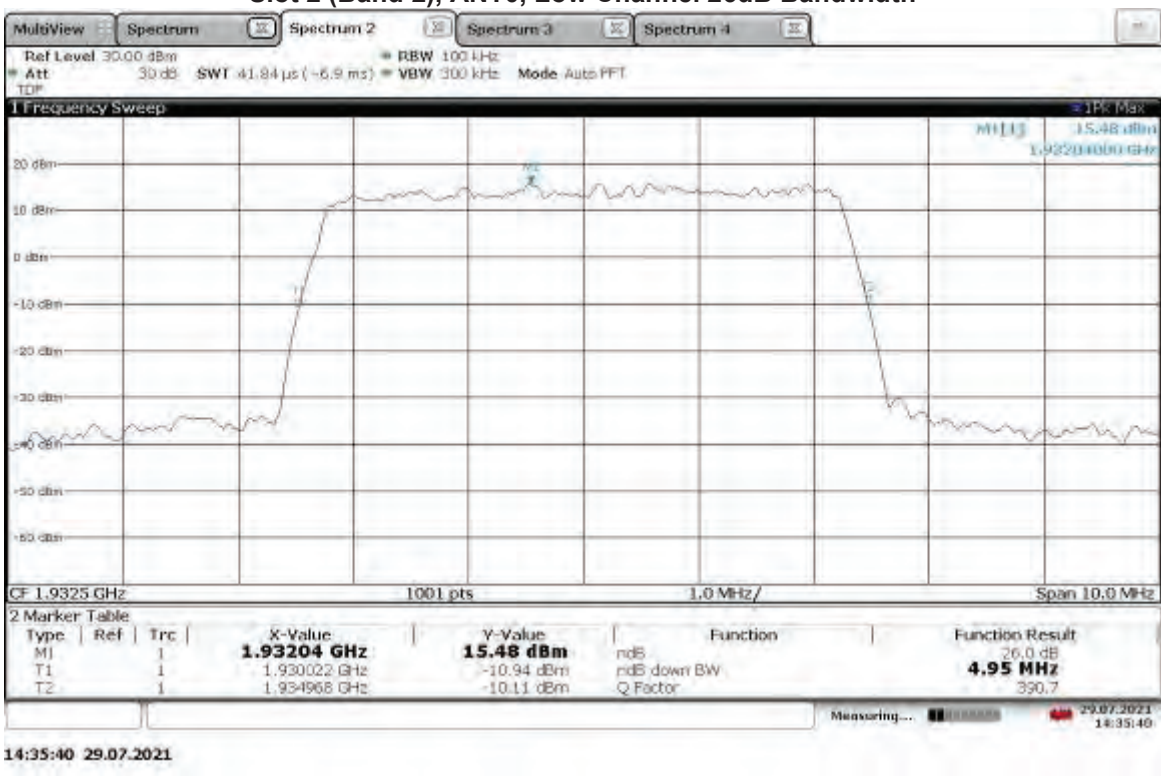
TM3.1-64QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



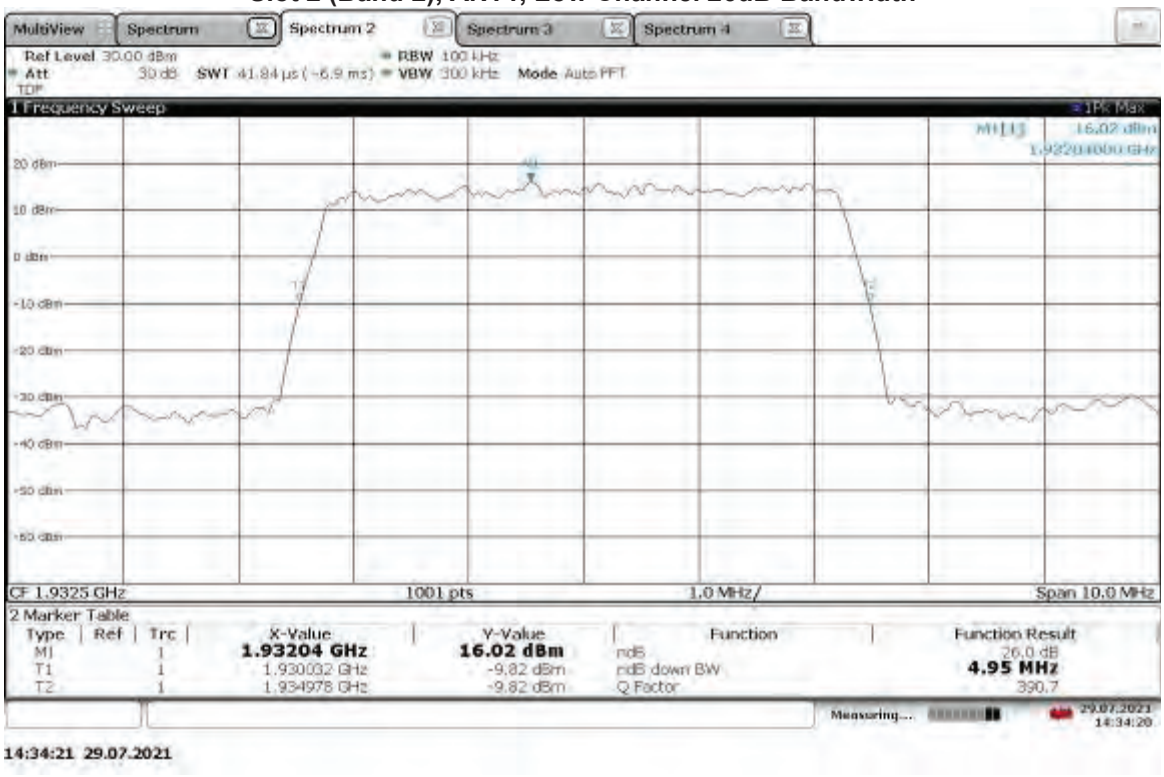
TM3.1-64QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



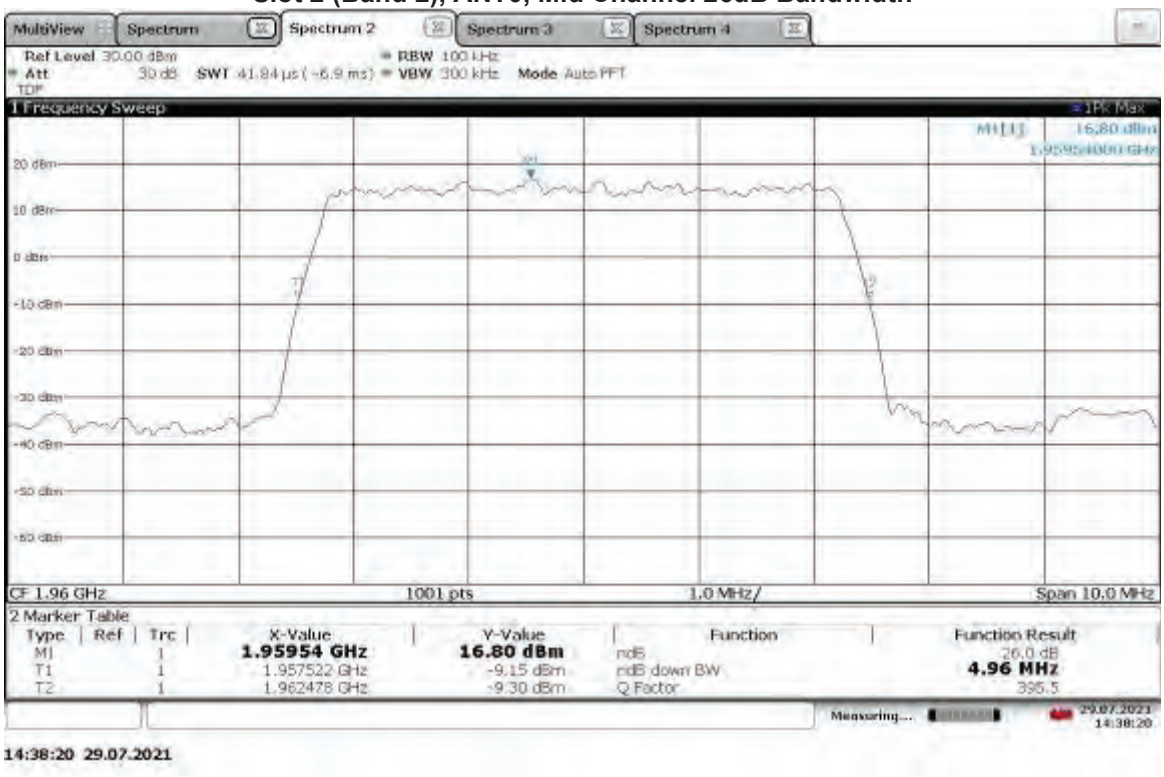
TM3.1a-256QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



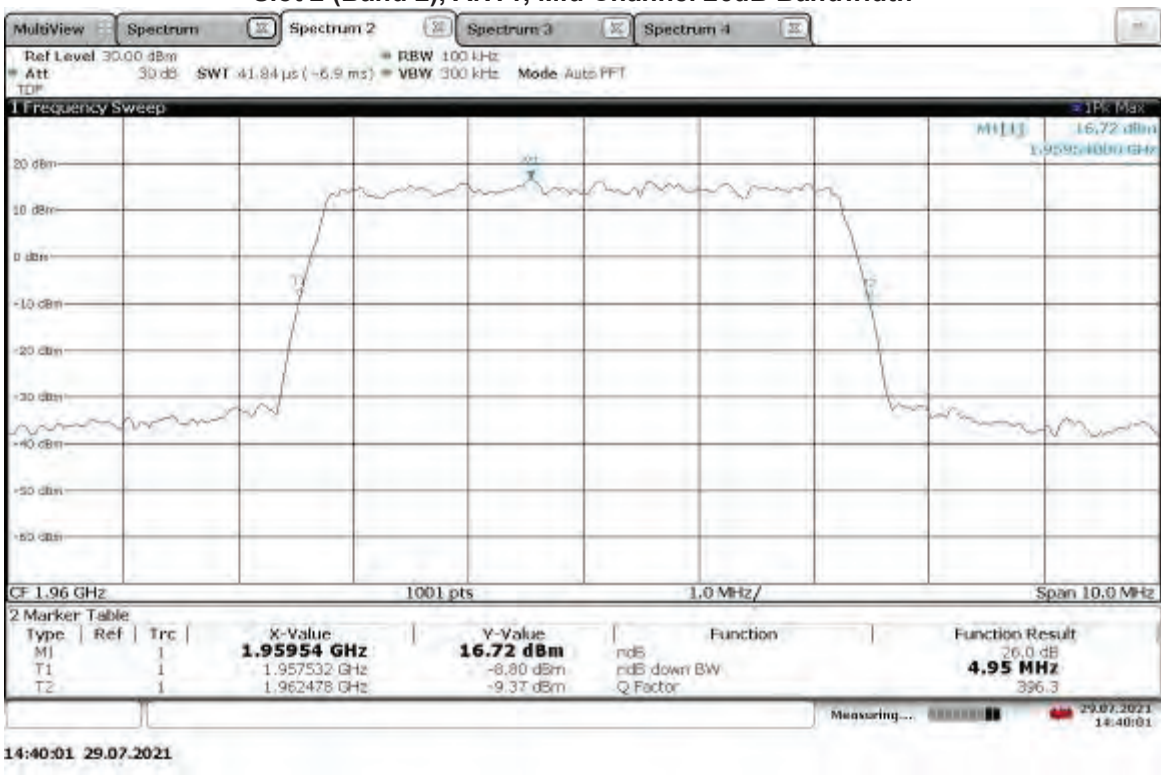
TM3.1a-256QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



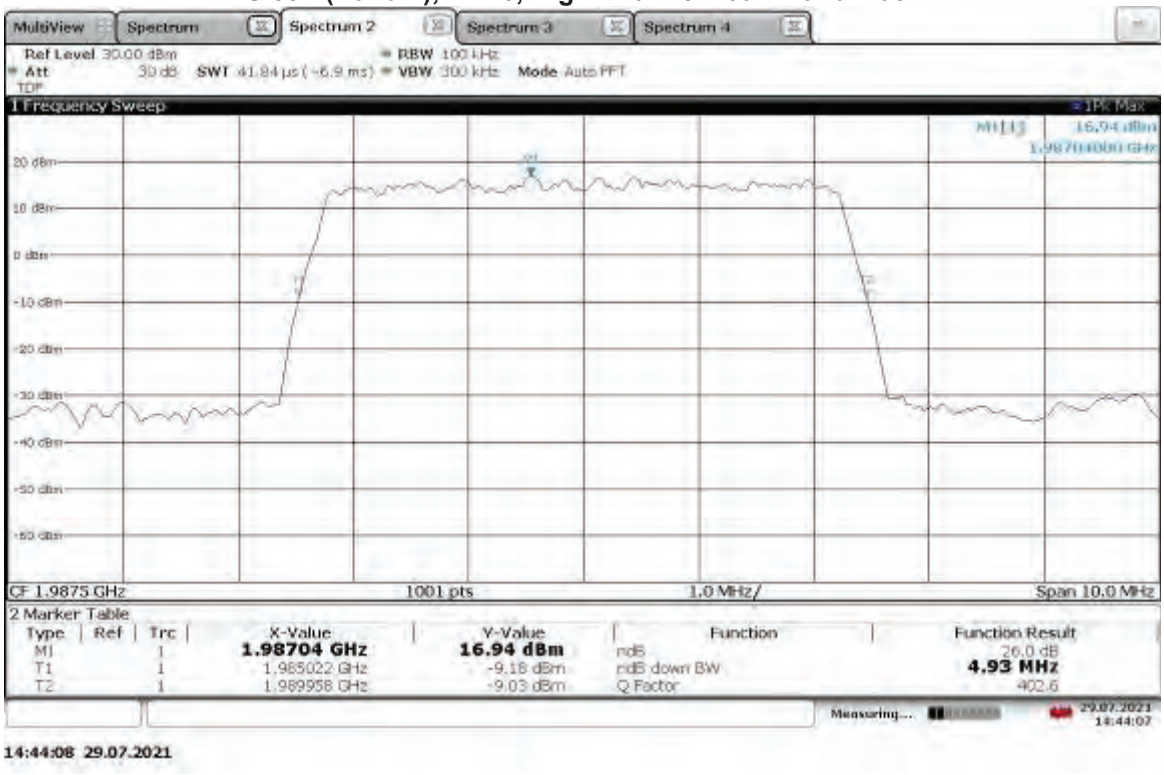
TM3.1a-256QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



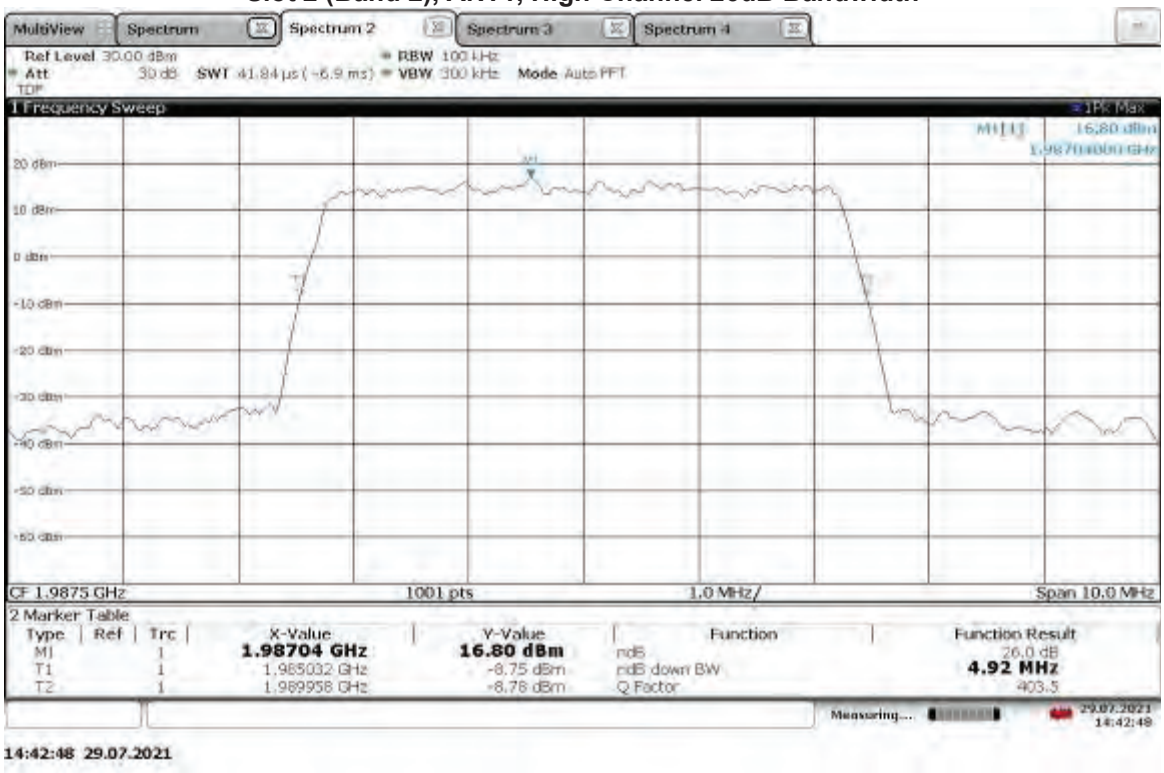
TM3.1a-256QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



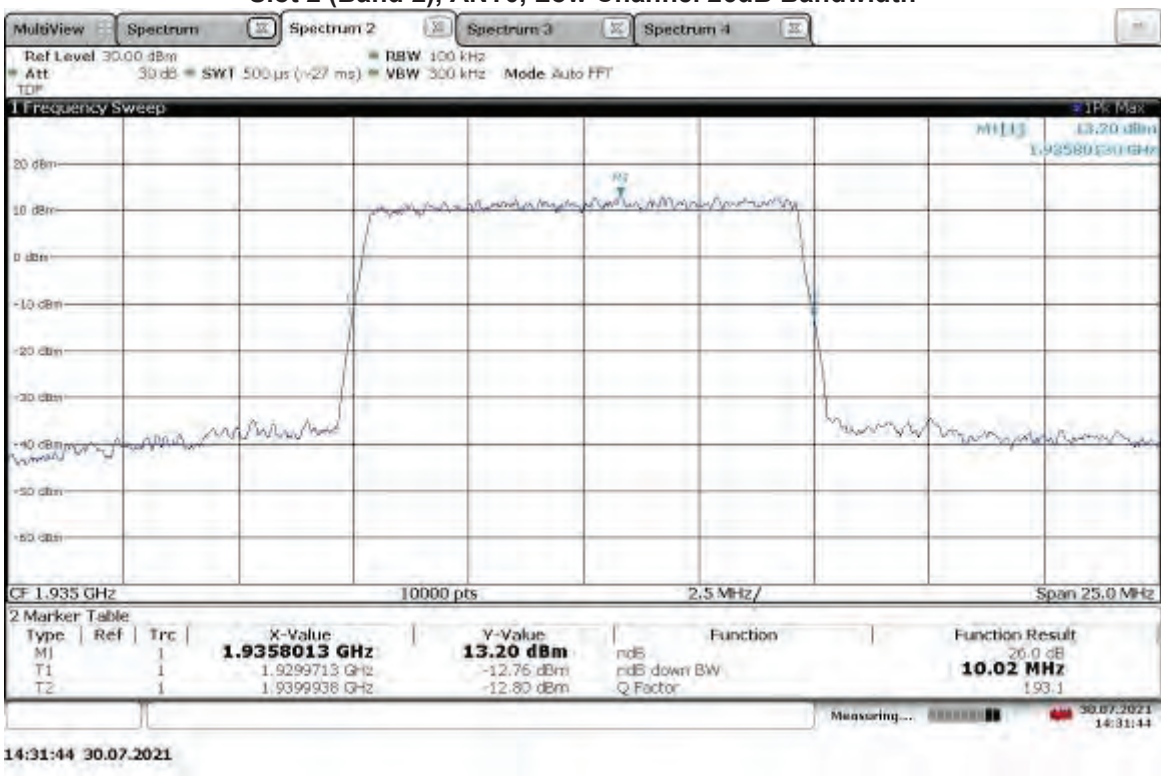
TM3.1a-256QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



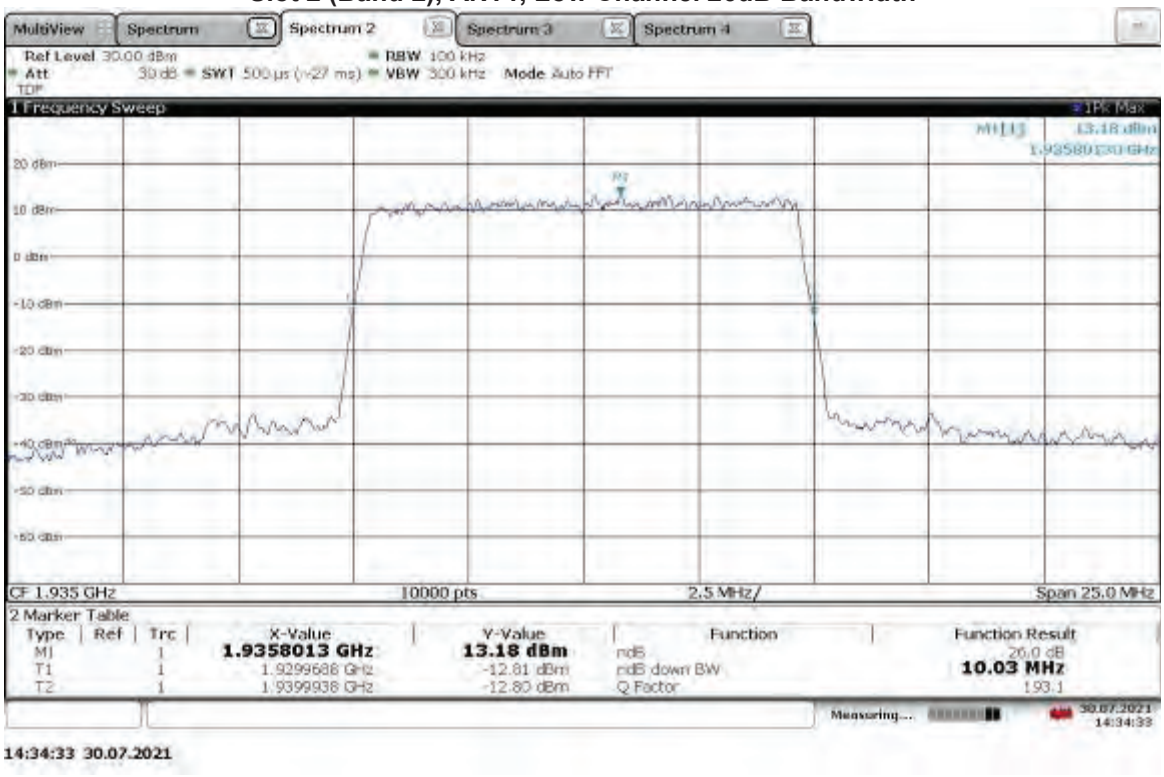
TM3.1a-256QAM_5 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



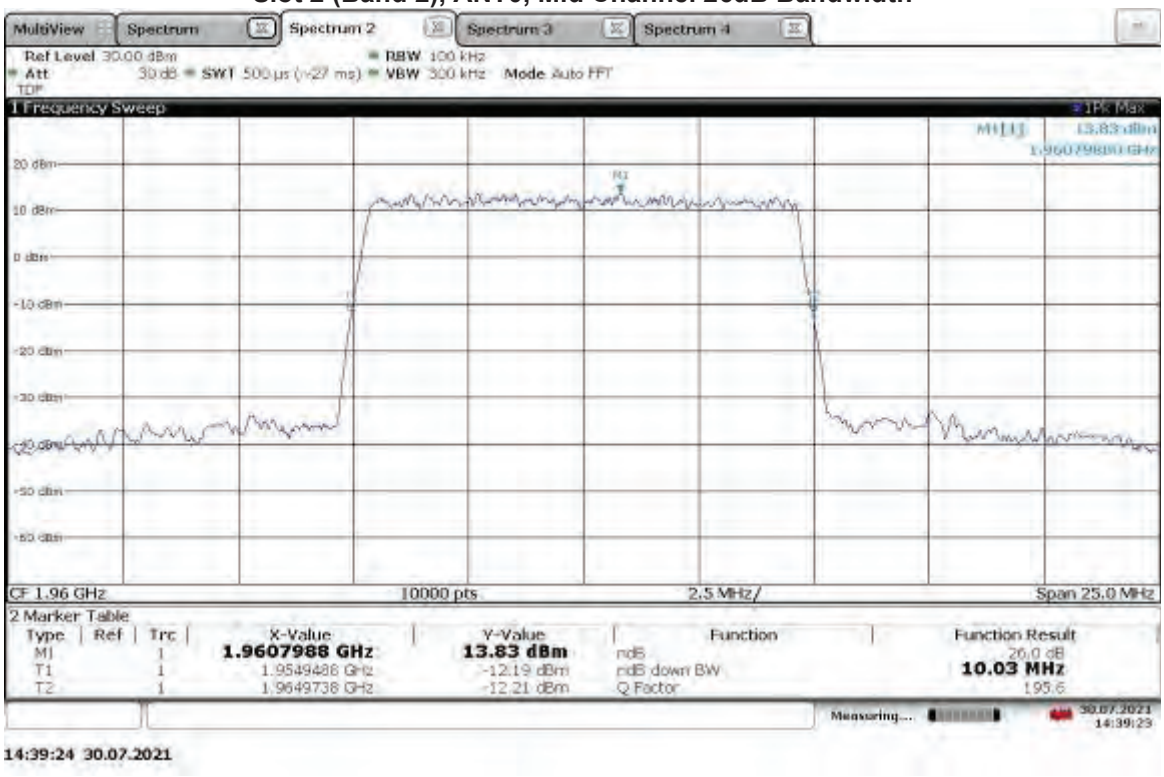
TM3.1a-256QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



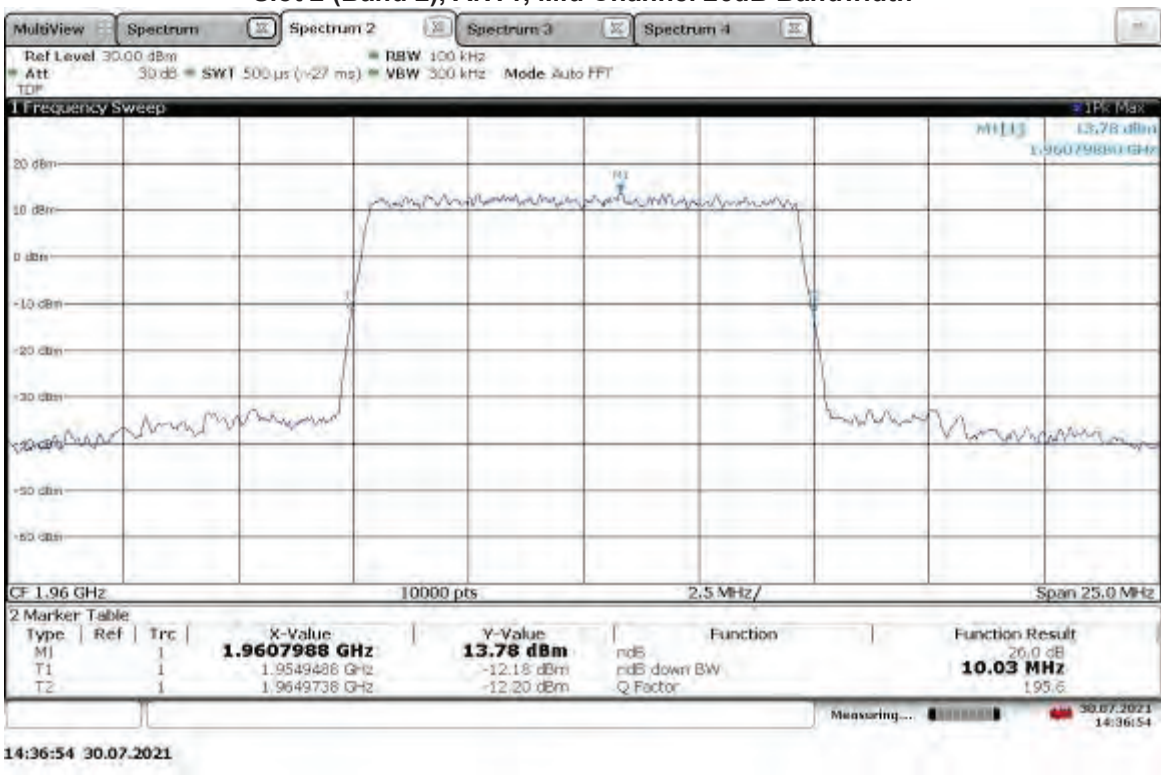
TM3.1a-256QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



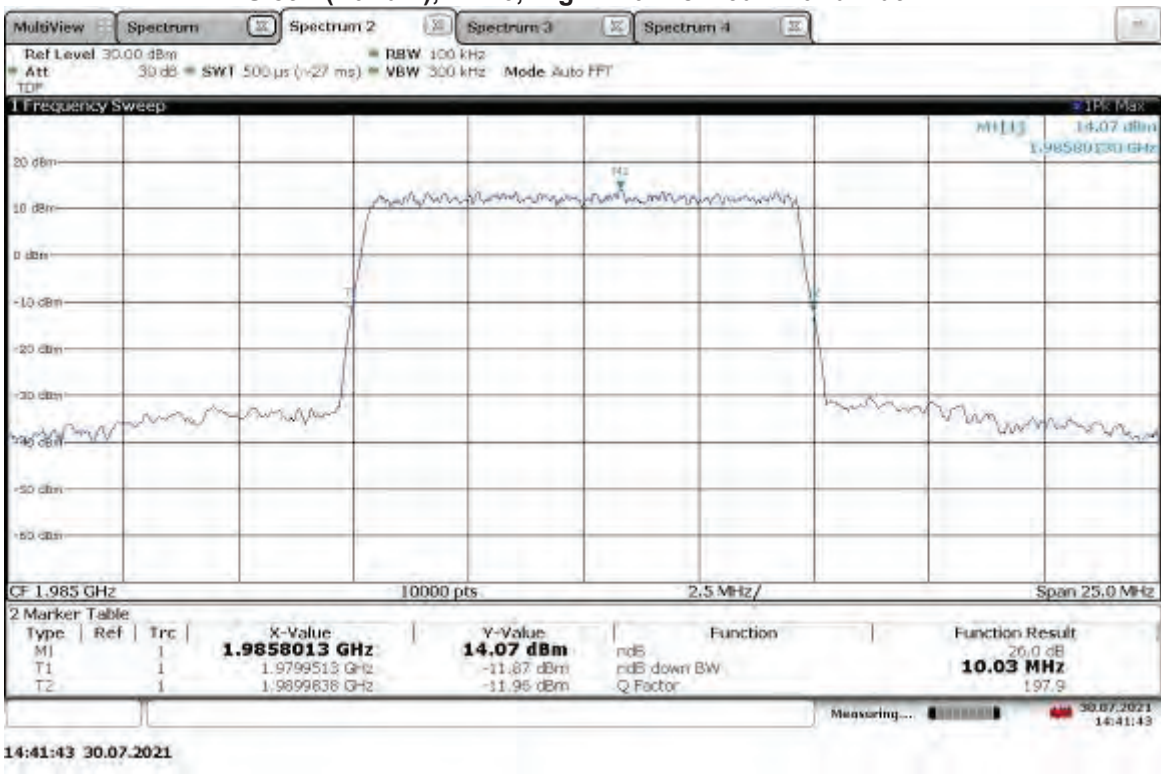
TM3.1a-256QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



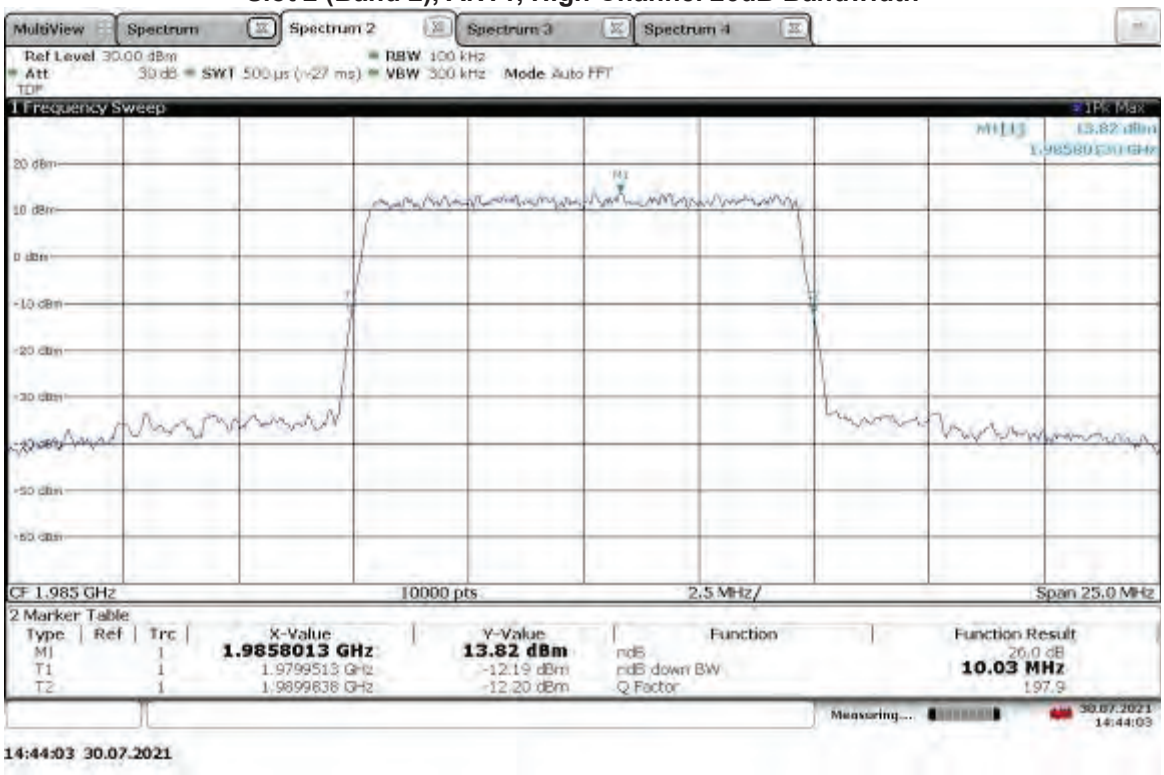
TM3.1a-256QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



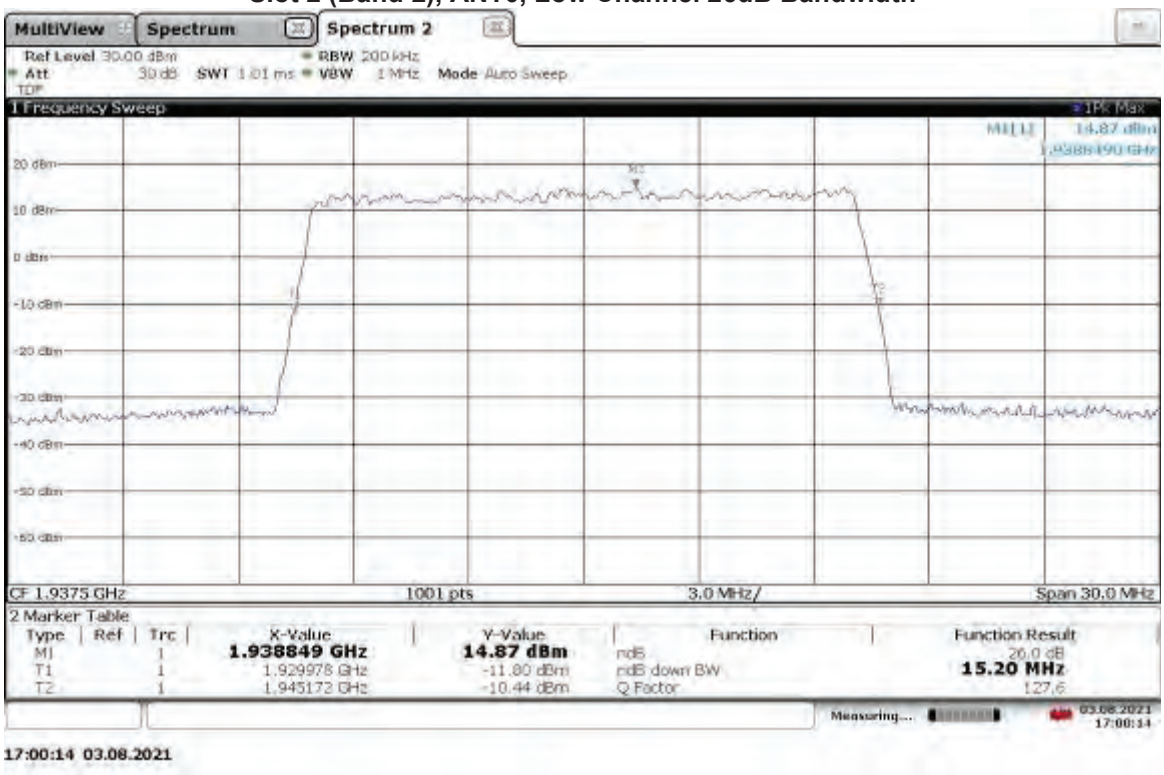
TM3.1a-256QAM_10 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



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



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



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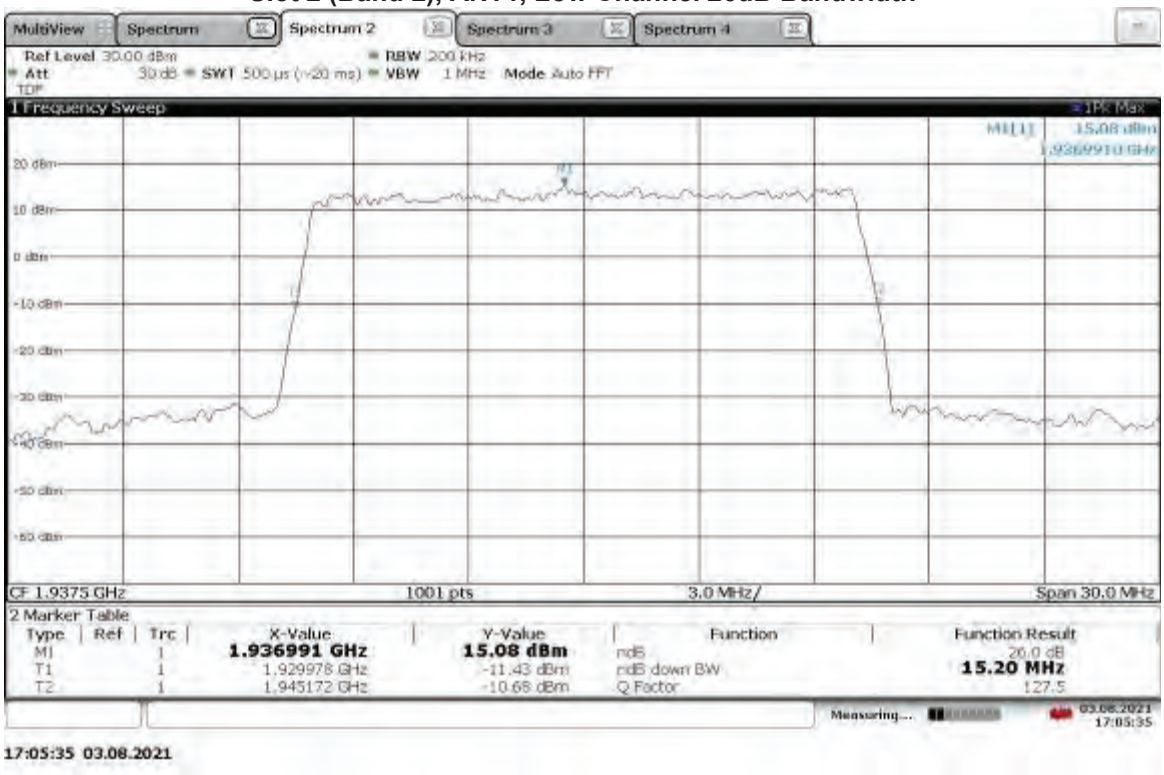
TM3.1a-256QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, Low Channel 26dB Bandwidth



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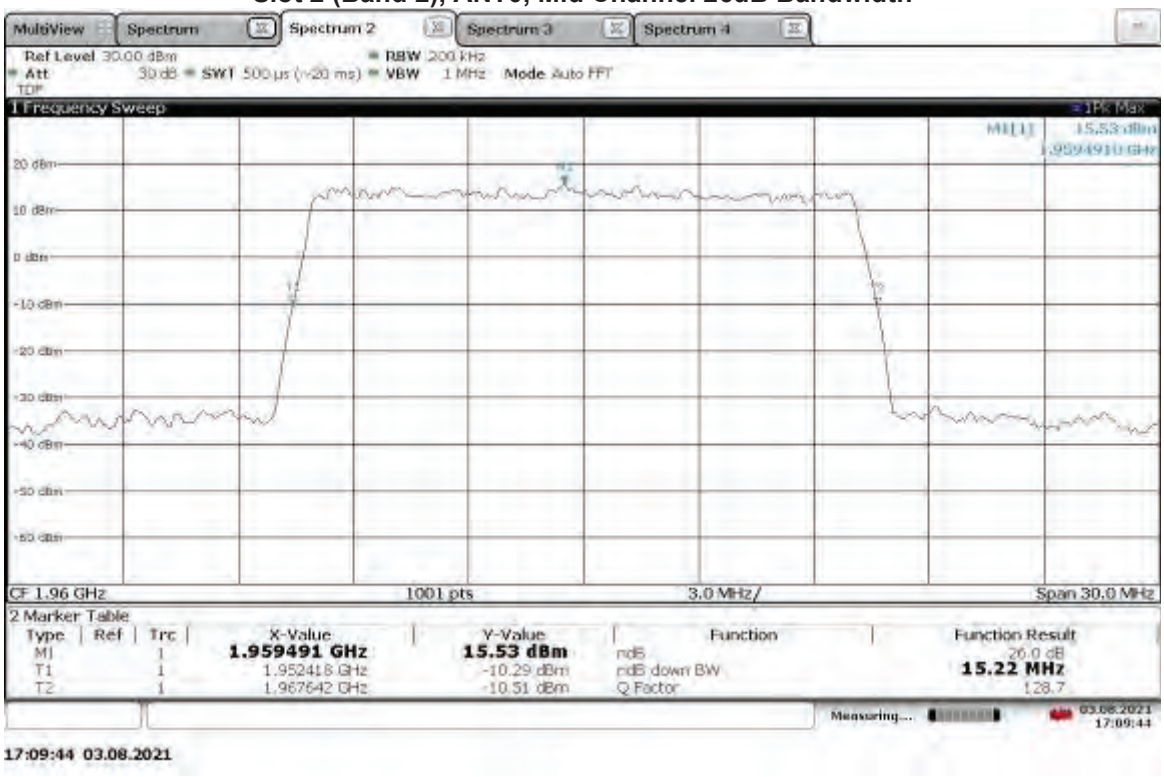
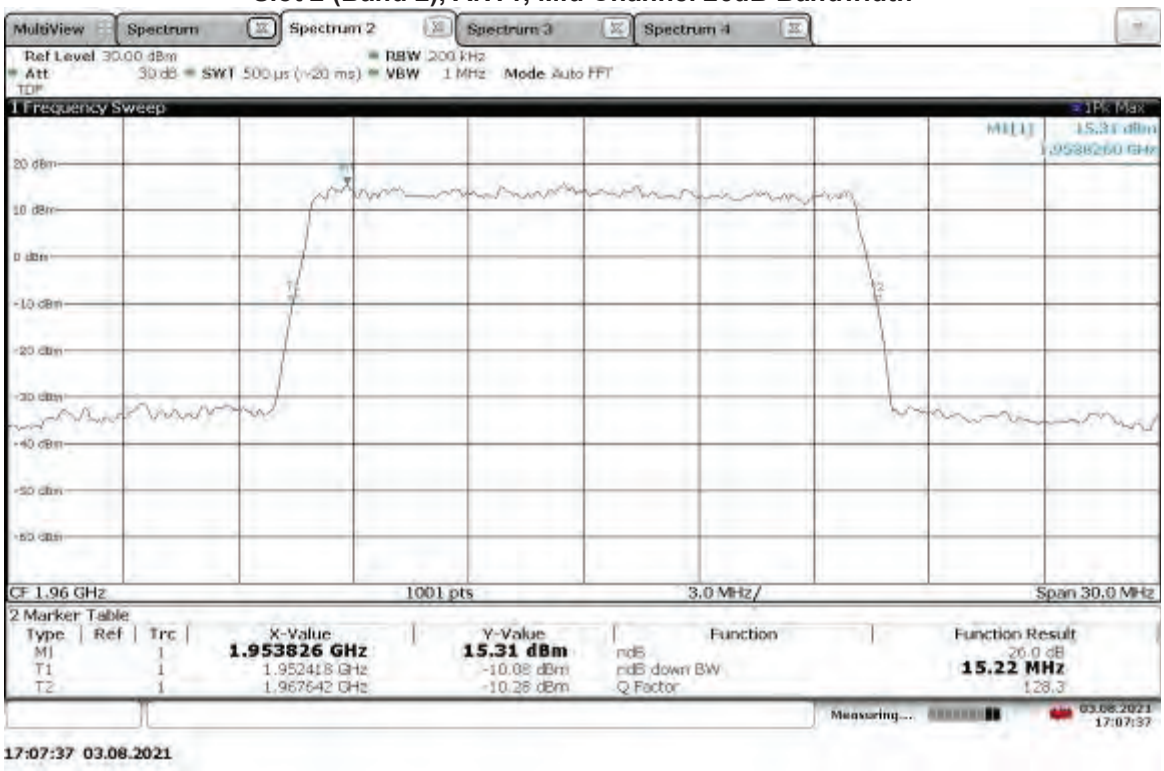
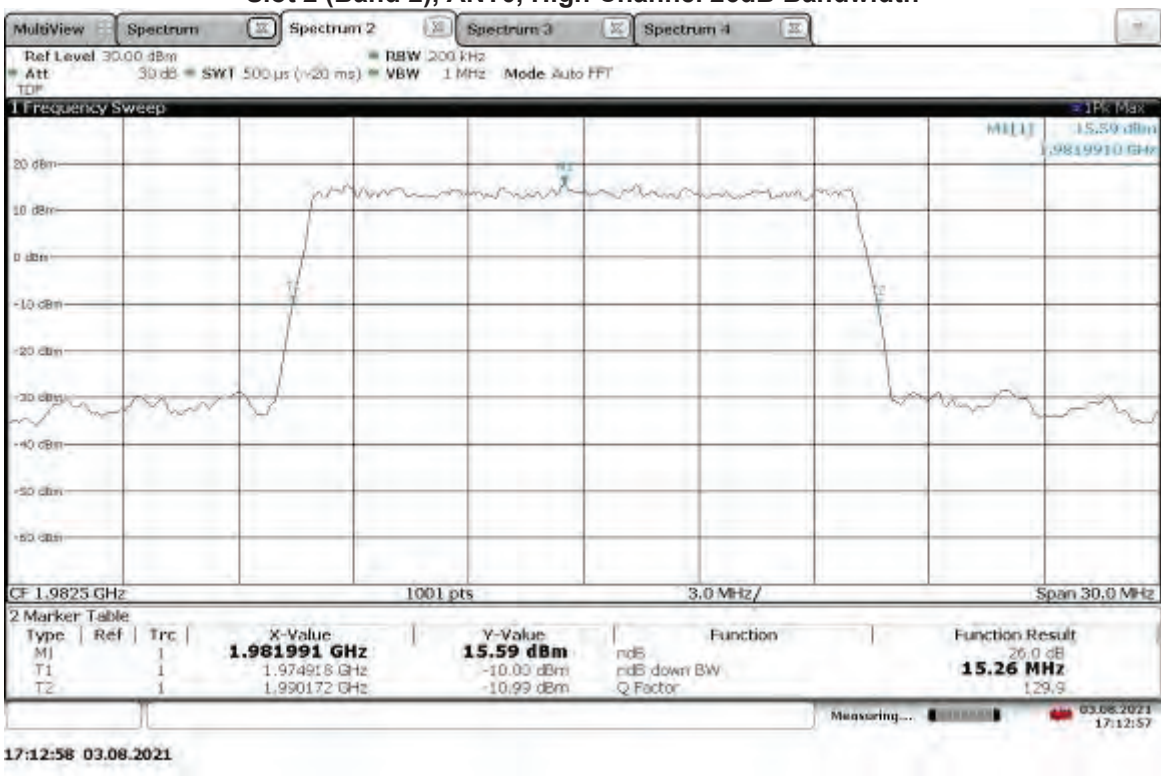
TM3.1a-256QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



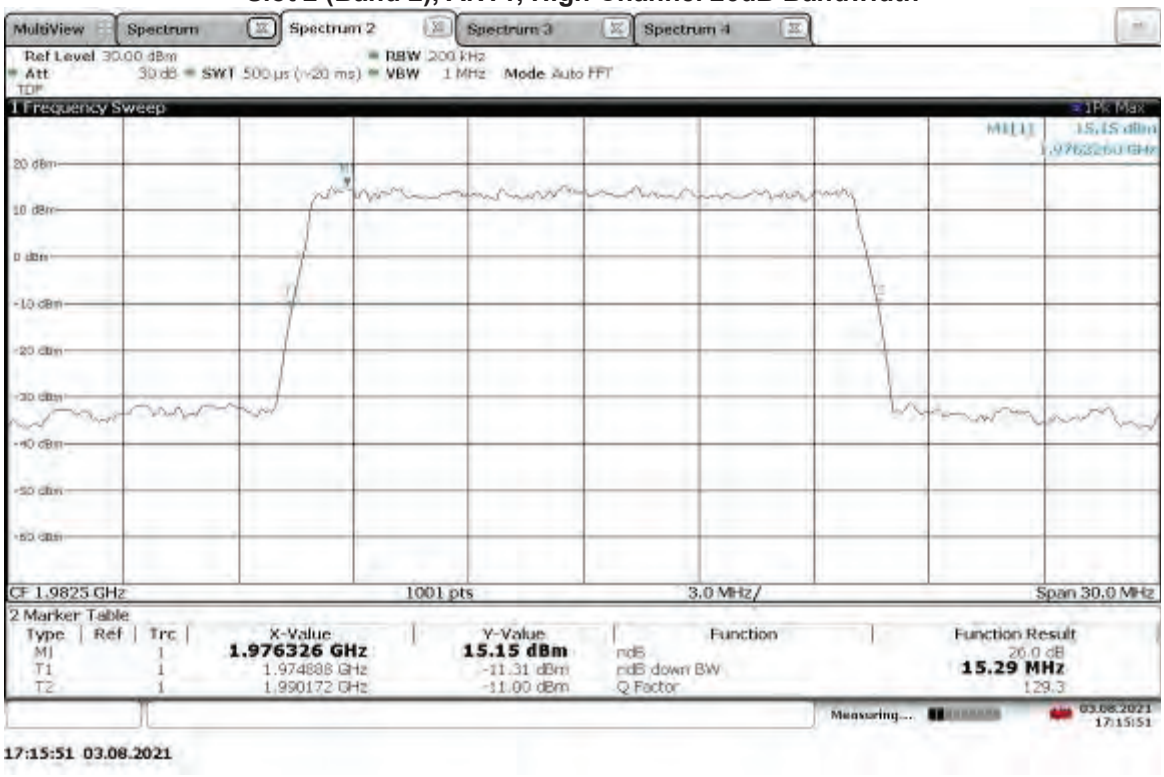
TM3.1a-256QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, Mid Channel 26dB Bandwidth



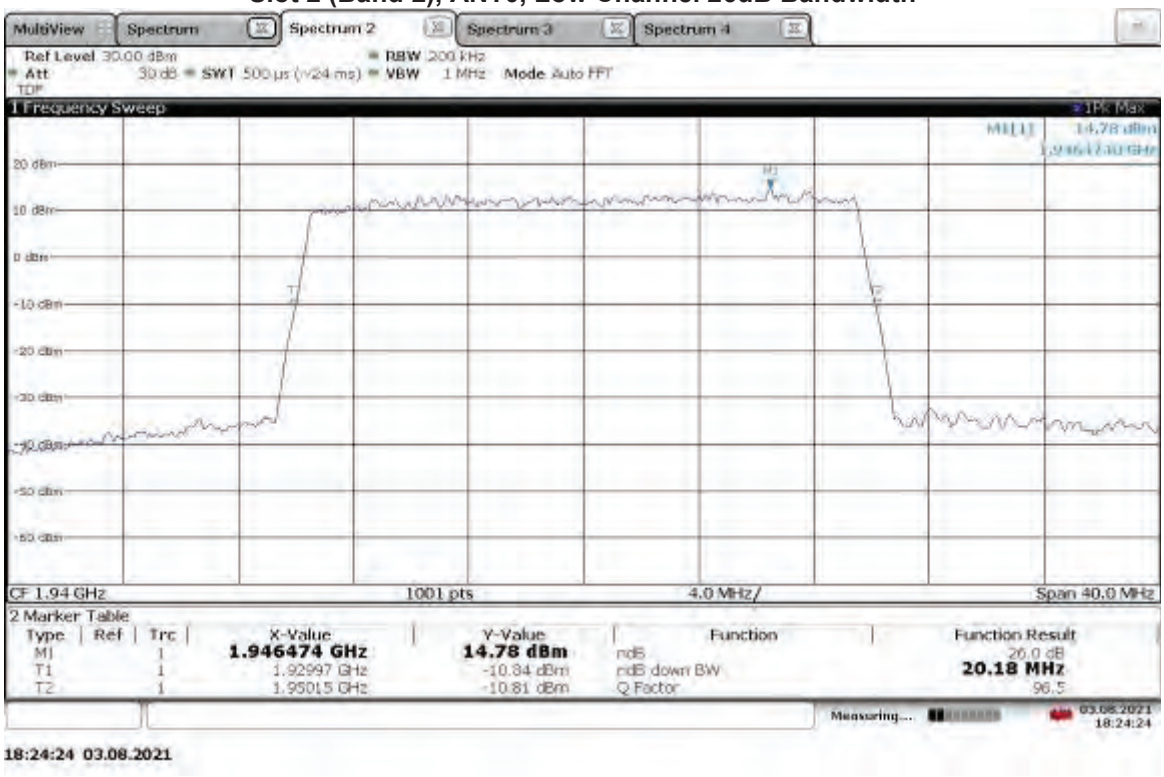
TM3.1a-256QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT0, High Channel 26dB Bandwidth



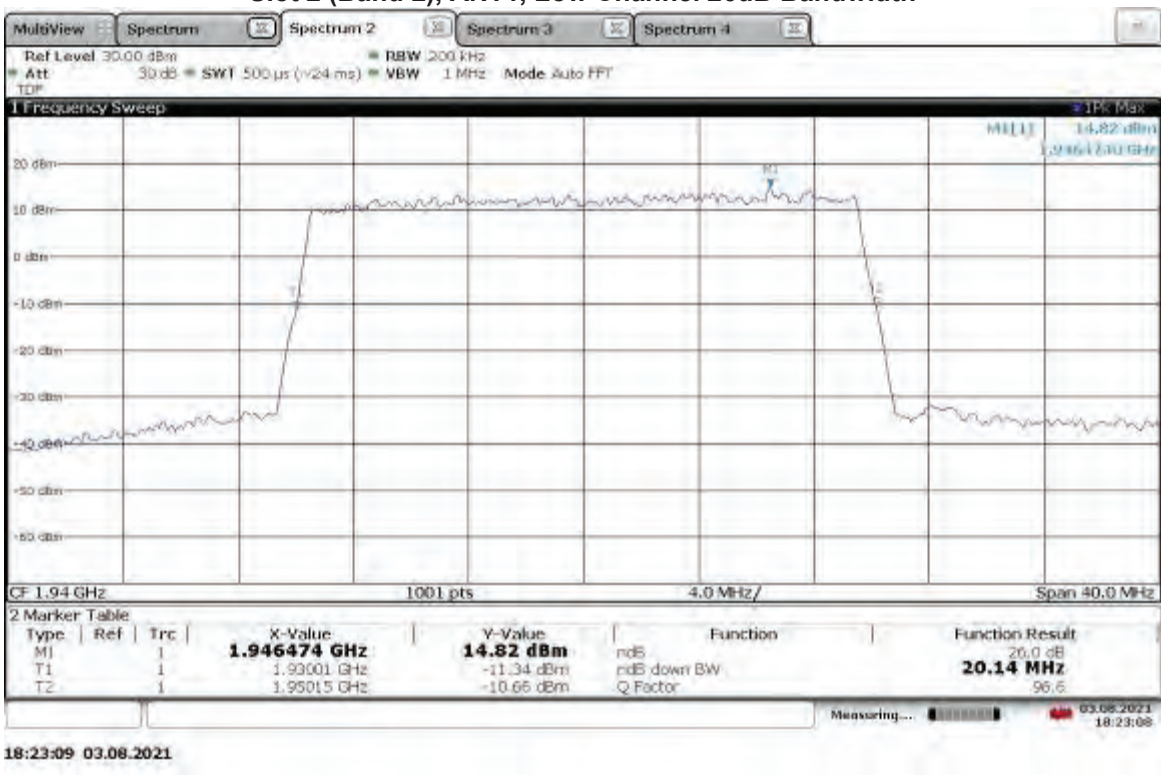
TM3.1a-256QAM_15 MHz Bandwidth
Slot 2 (Band 2), ANT1, High Channel 26dB Bandwidth



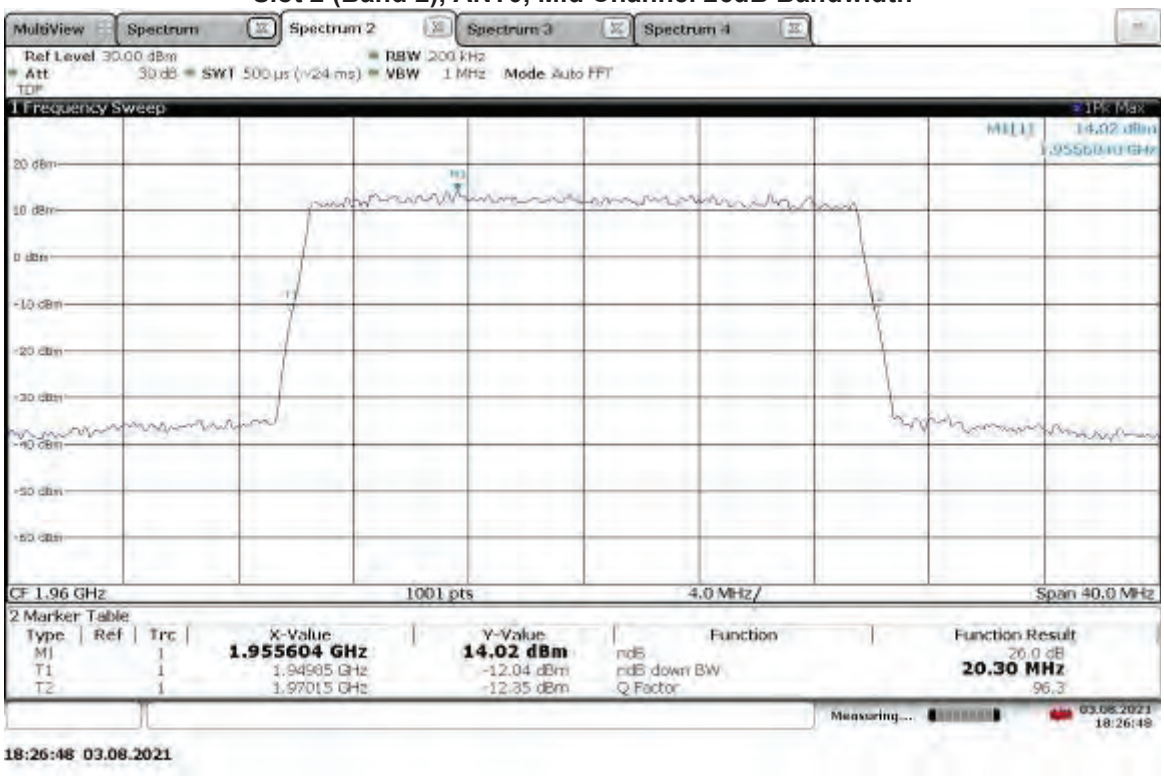
TM3.1a-256QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, Low Channel 26dB Bandwidth



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

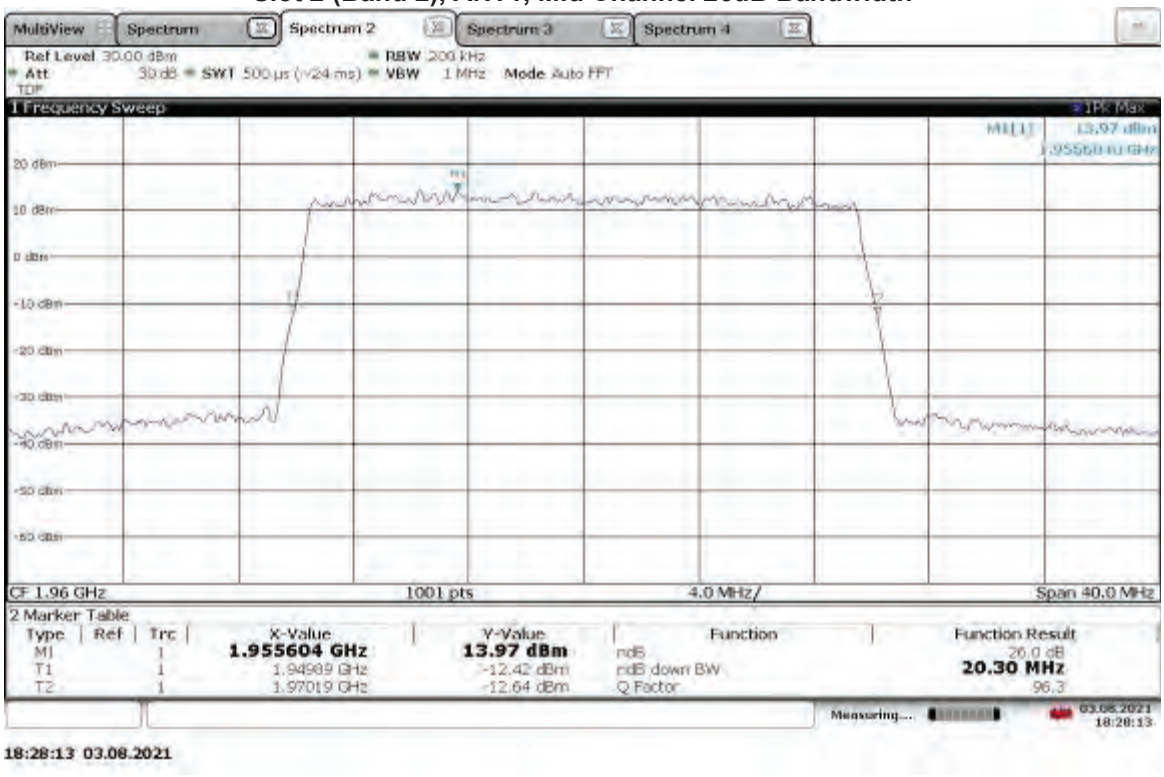


TM3.1a-256QAM_20 MHz Bandwidth
Slot 2 (Band 2), ANT0, Mid Channel 26dB Bandwidth



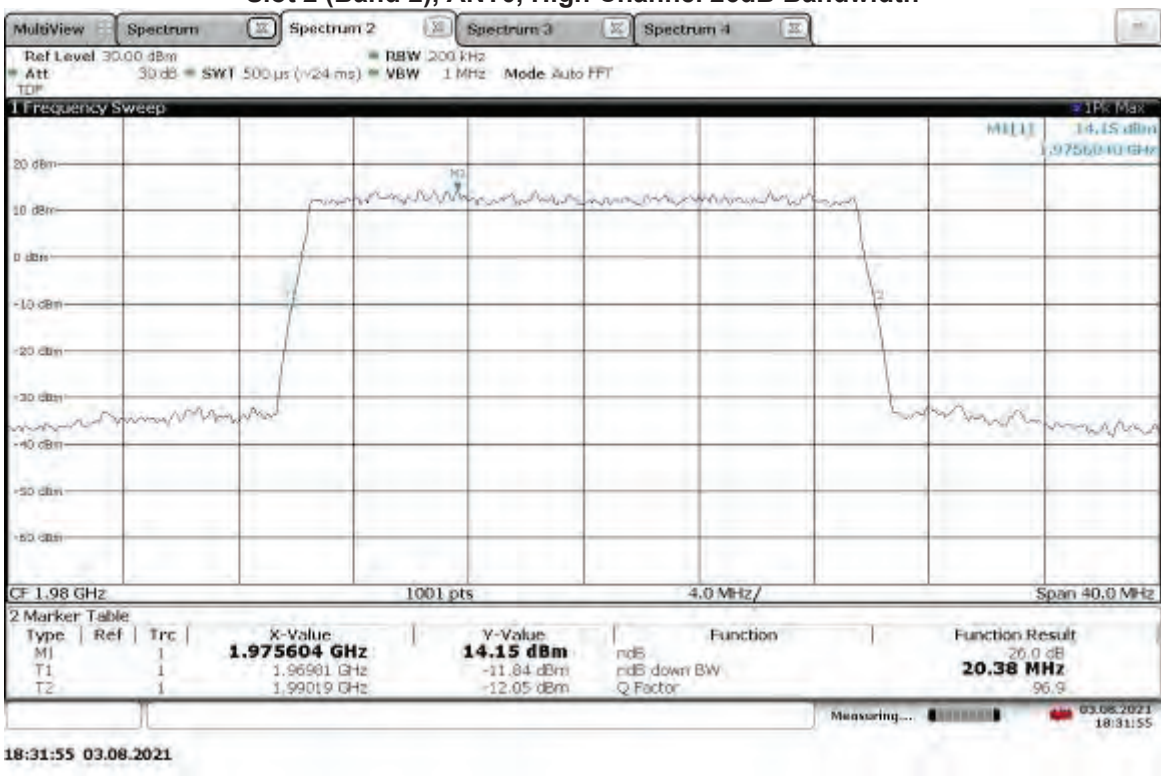
18:26:48 03.08.2021

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

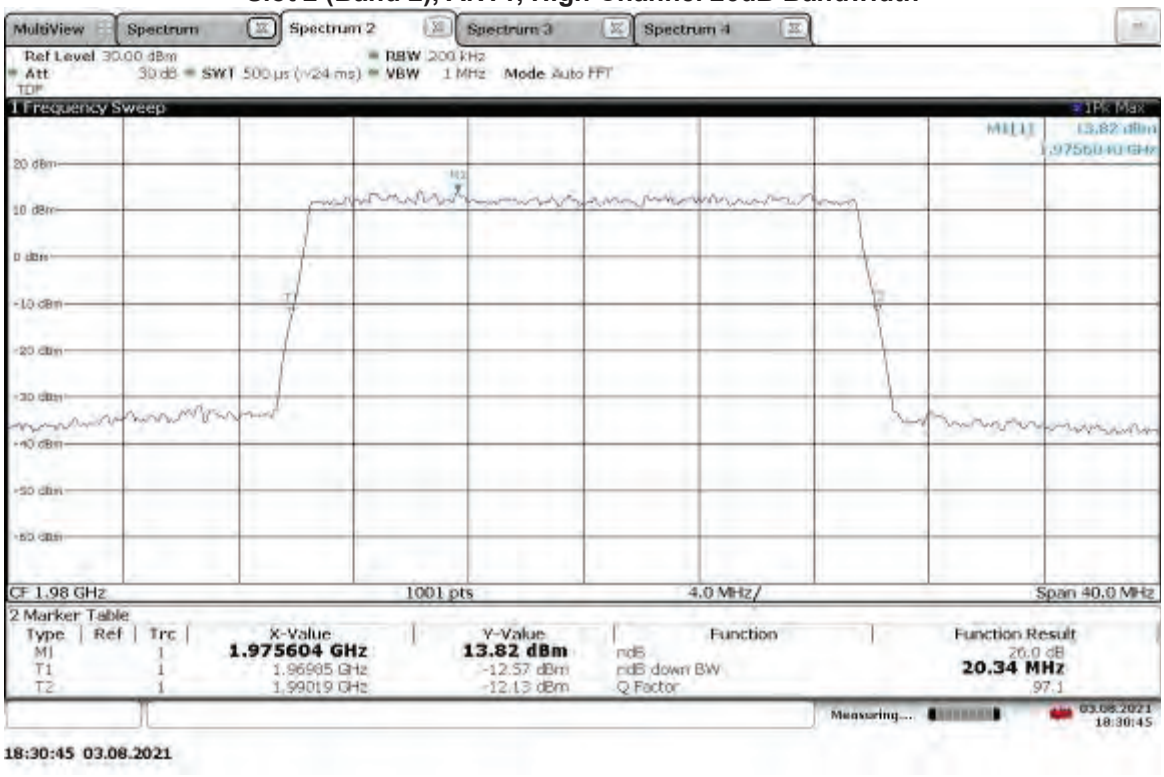


18:28:13 03.08.2021

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



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



Test Personnel:	Vathana Ven	Test Date:	07/28/2021, 07/29/2021, 07/30/2021, 08/03/2021
Supervising/Reviewing Engineer: (Where Applicable)	N/A		
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:	22, 23, 23, 23 ºC
		Relative Humidity:	21, 15, 26, 47, 20, 22 %
		Atmospheric Pressure:	1004, 1013, 1004, 980 mbars

Deviations, Additions, or Exclusions: None

9 Band Edge Compliance

9.1 Method

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

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	01/22/2021	01/22/2022
CBLSHF204'	Cable, SMA - SMA, 9kHz -40GHz, (Cable Kit 5)	Huber + Suhner	Sucoflex 102EA	234714001	02/03/2021	02/03/2022
ROS005-1'	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	10/27/2020	10/27/2021
DAV005'	Weather Station	Davis	6250	MS191218083	02/07/2021	02/07/2022

Software Utilized:

Name	Manufacturer	Version
None	--	--

9.3 Results:

The sample tested was found to Comply.

§24.238(a)(b) 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.

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1932.50	ANT0	-32.74
		ANT1	-31.25
High	1987.50	ANT0	-25.96
		ANT1	-26.73

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1935.00	ANT0	-32.24
		ANT1	-31.54
High	1985.00	ANT0	-26.84
		ANT1	-27.00

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1937.50	ANT0	-32.96
		ANT1	-31.59
High	1982.50	ANT0	-24.94
		ANT1	-25.13

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1940	ANT0	-34.84
		ANT1	-34.41
High	1980	ANT0	-28.14
		ANT1	-27.85

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1932.50	ANT0	-32.61
		ANT1	-31.83
High	1987.50	ANT0	-28.48
		ANT1	-28.30

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1935.00	ANT0	-31.57
		ANT1	-31.27
High	1985.00	ANT0	-30.17
		ANT1	-30.35

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1937.50	ANT0	-31.79
		ANT1	-31.07
High	1982.50	ANT0	-25.54
		ANT1	-25.50

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1940.00	ANT0	-33.80
		ANT1	-33.24
High	1980.00	ANT0	-27.45
		ANT1	-27.53

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1932.50	ANT0	-33.03
		ANT1	-32.12
High	1987.50	ANT0	-25.46
		ANT1	-25.38

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1935.00	ANT0	-32.24
		ANT1	-31.54
High	1985.00	ANT0	-27.25
		ANT1	-27.35

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1937.50	ANT0	-32.73
		ANT1	-31.89
High	1982.50	ANT0	-25.59
		ANT1	-25.41

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1940.00	ANT0	-33.64
		ANT1	-33.08
High	1980.00	ANT0	-28.17
		ANT1	-28.44

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1932.50	ANT0	-33.54
		ANT1	-31.97
High	1987.50	ANT0	-26.03
		ANT1	-26.02

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1935.00	ANT0	-32.57
		ANT1	-31.75
High	1985.00	ANT0	-27.57
		ANT1	-27.75

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1937.00	ANT0	-34.68
		ANT1	-33.14
High	1982.50	ANT0	-24.90
		ANT1	-25.29

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

Band Edge	Frequency (MHz)	Antenna Port	Reading (dBm)
Low	1940.50	ANT0	-33.69
		ANT1	-33.23
High	1980.00	ANT0	-25.37

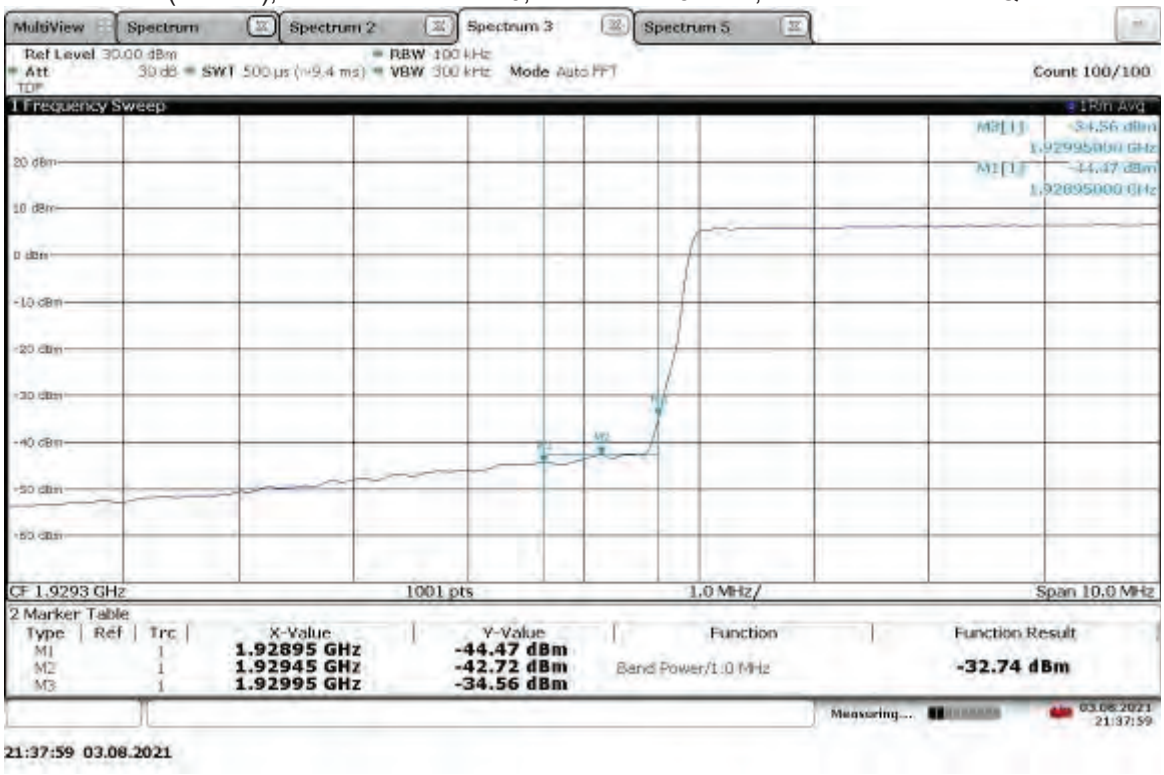
		ANT1	-25.23

9.4 Setup Photograph:

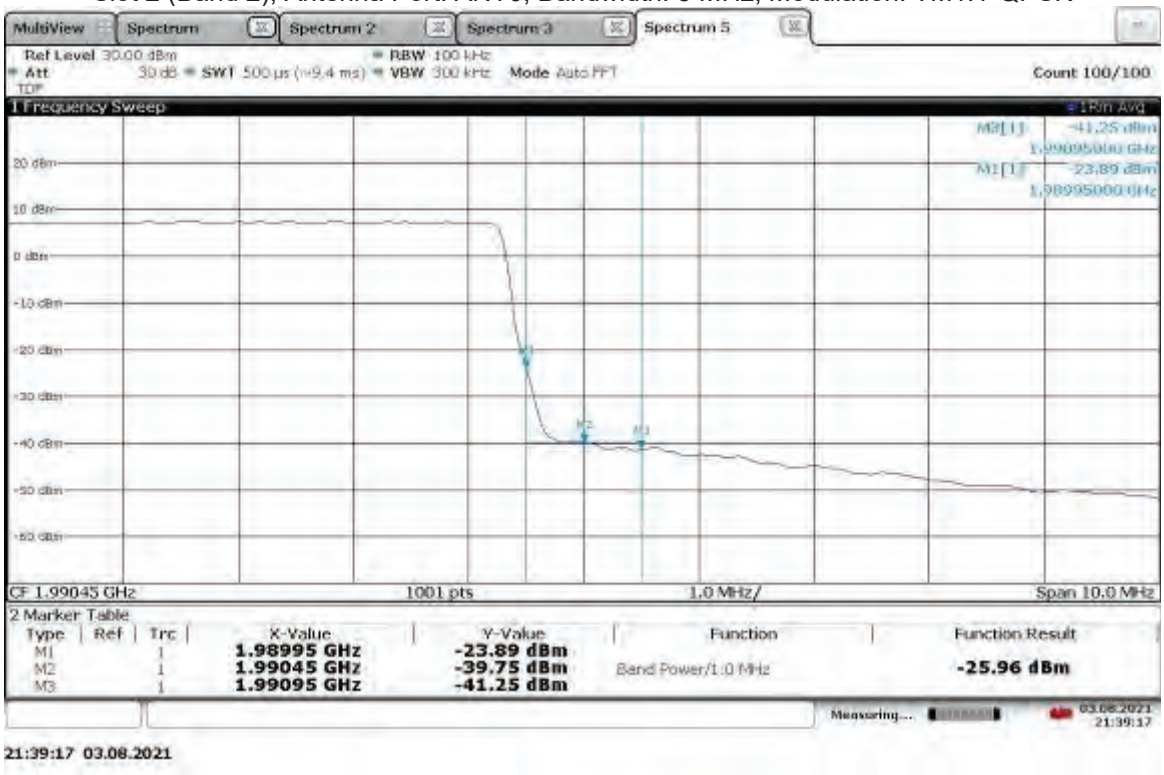
Photographs are available in a separate exhibit

9.5 Plots/Data:

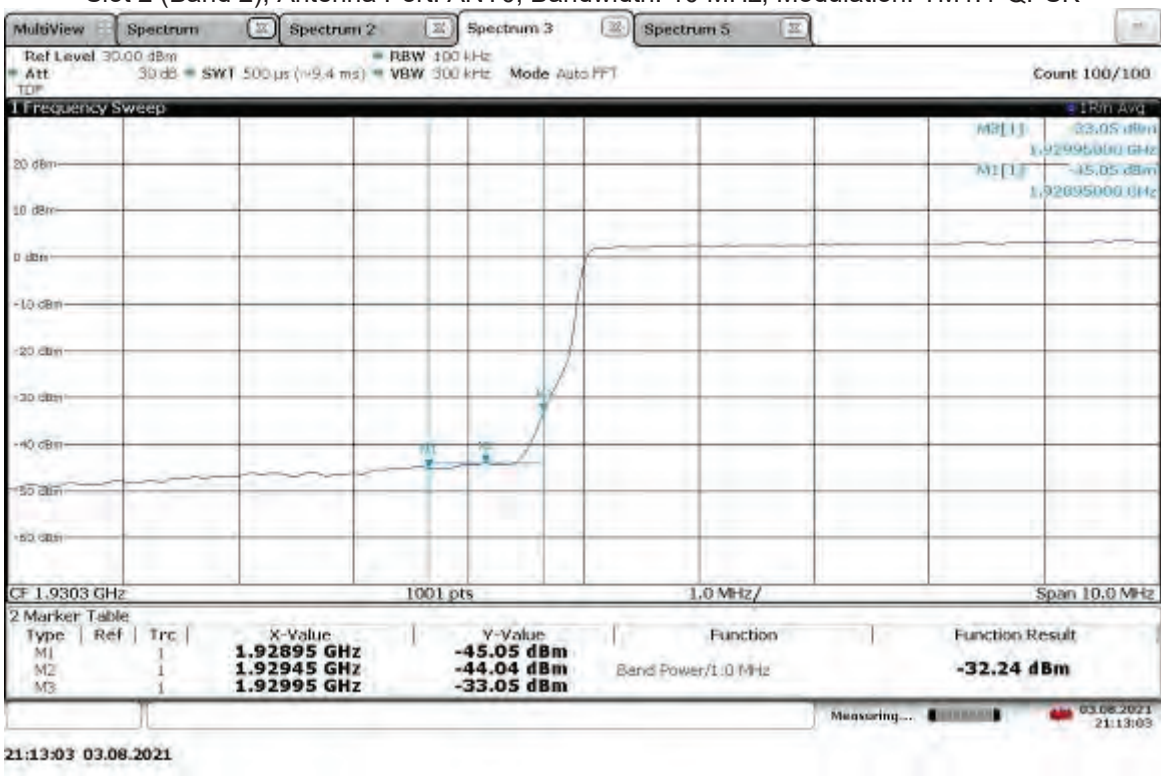
Band Edge Compliant, Lower Band Edge, 1932.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



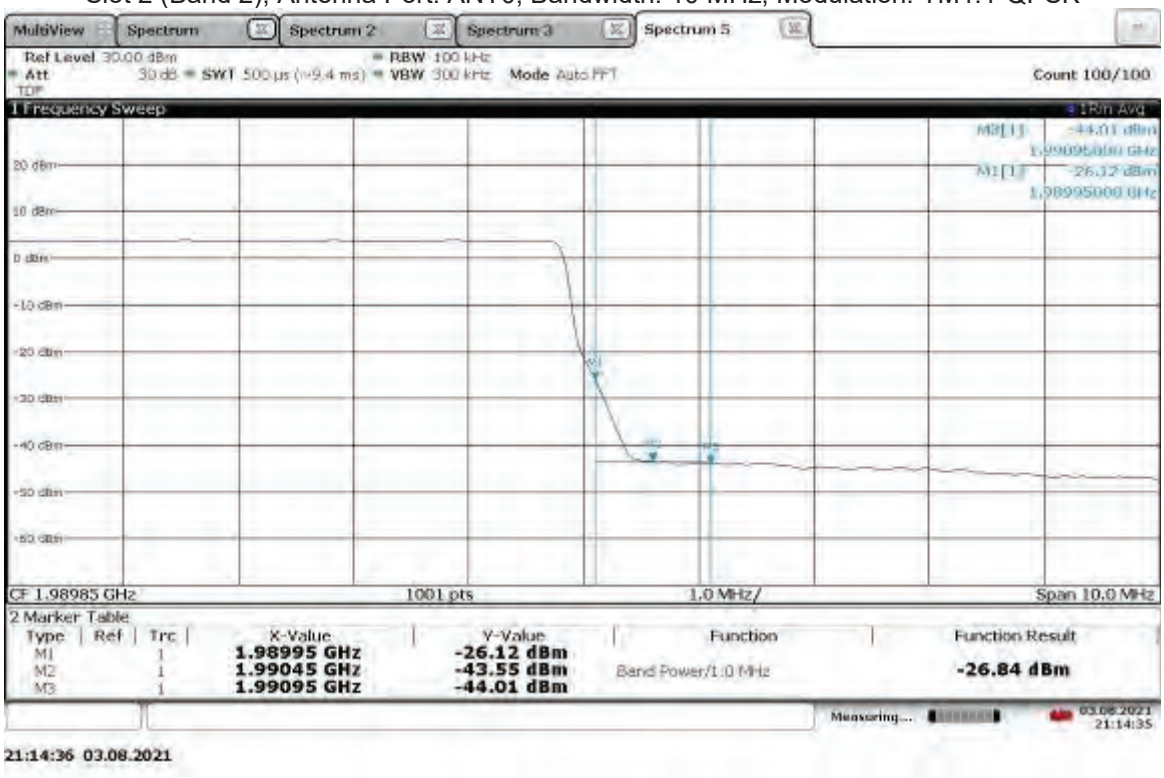
Band Edge Compliant, Upper Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



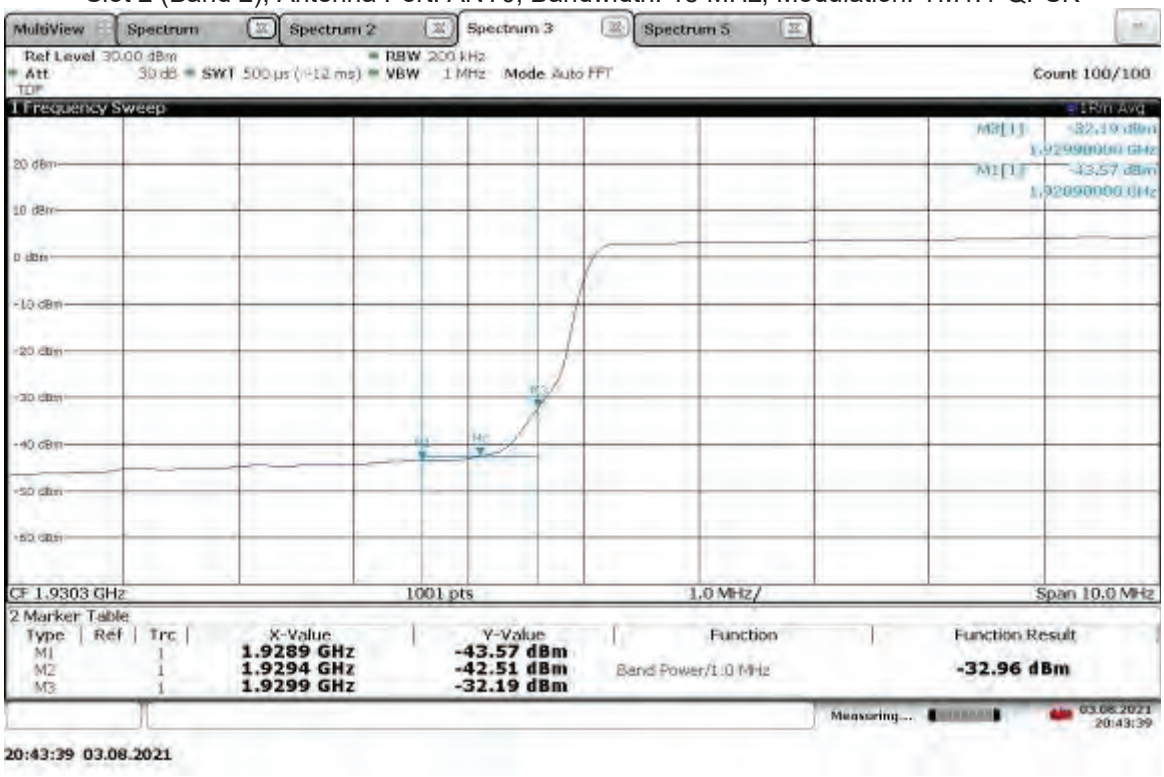
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



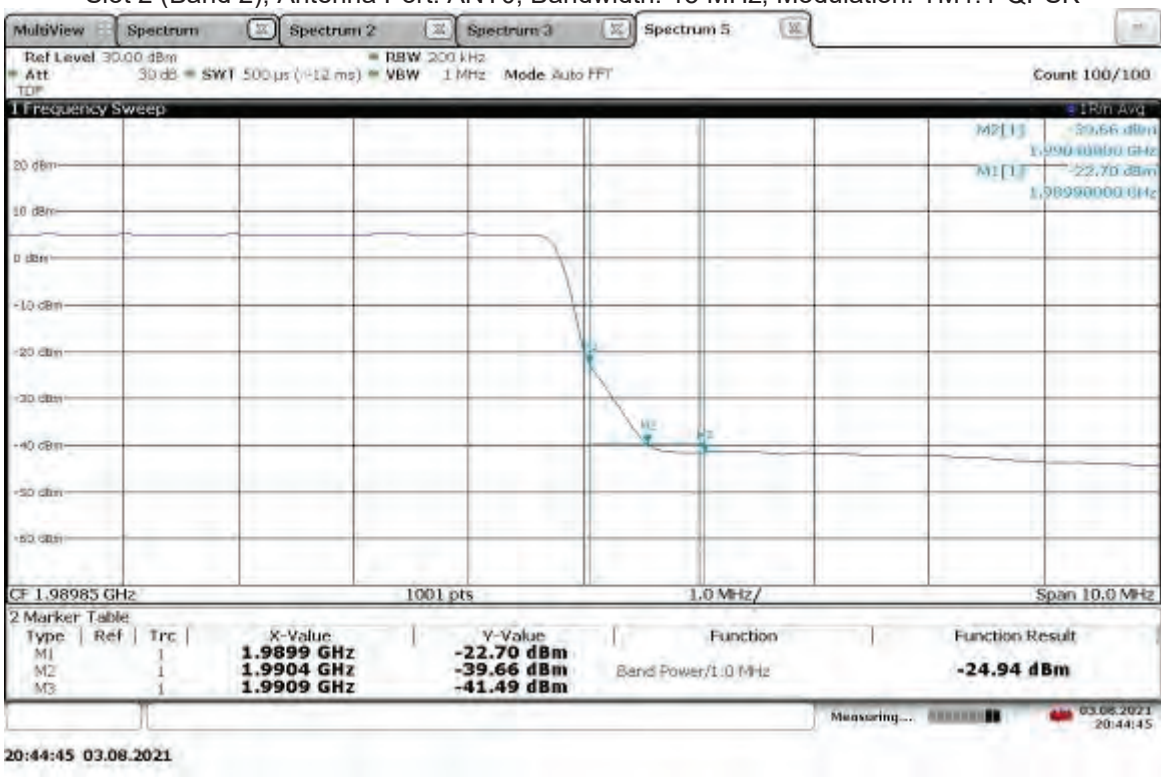
Band Edge Compliant, Upper Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



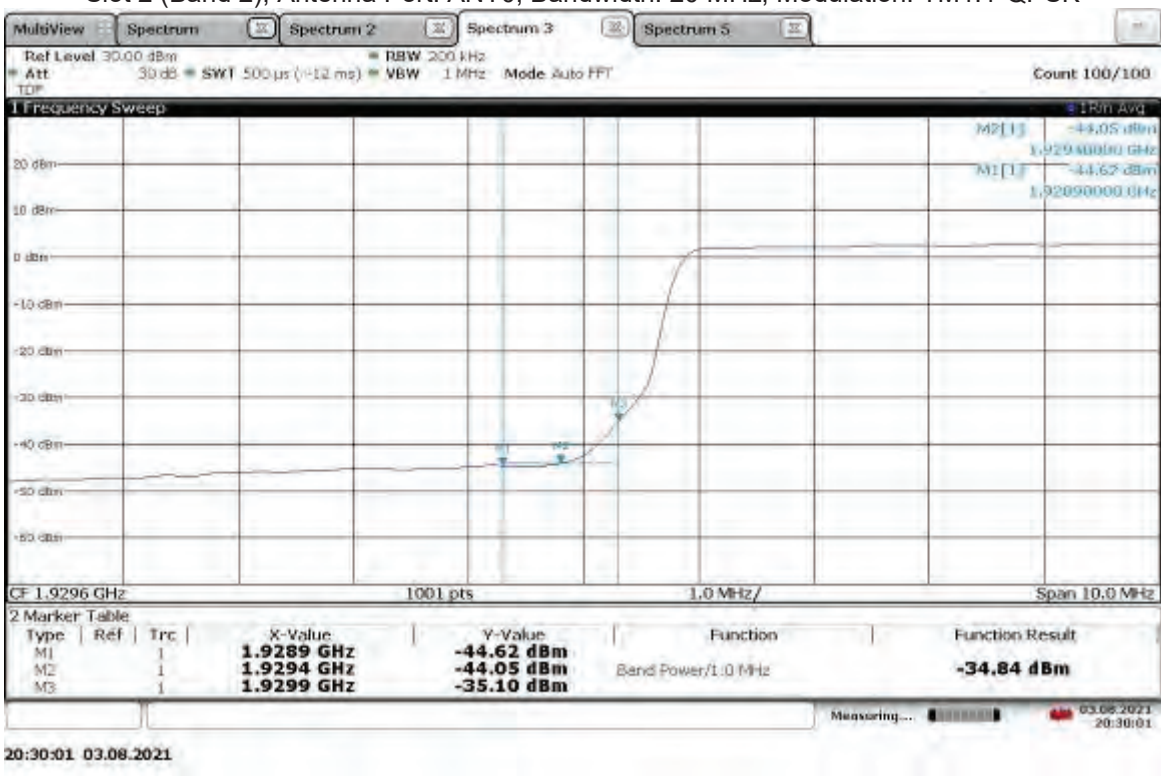
Band Edge Compliant, Lower Band Edge, 1937.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



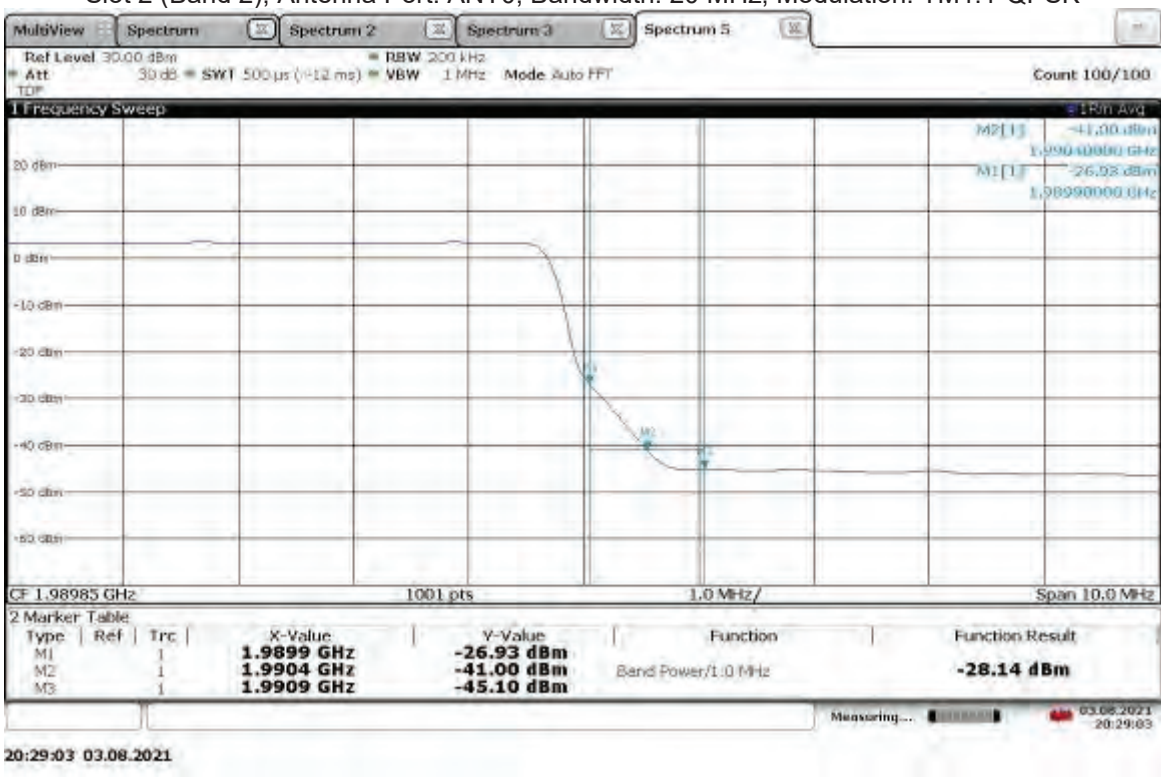
Band Edge Compliant, Upper Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



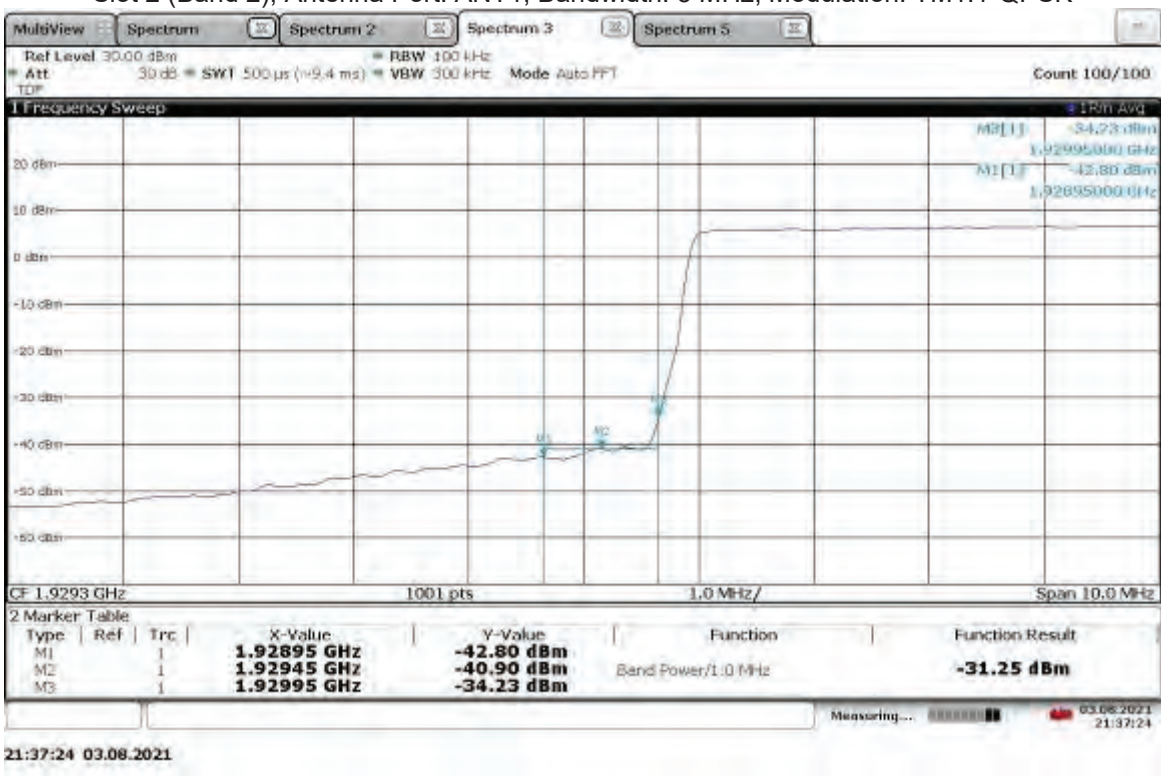
Band Edge Compliant, Lower Band Edge, 1940 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



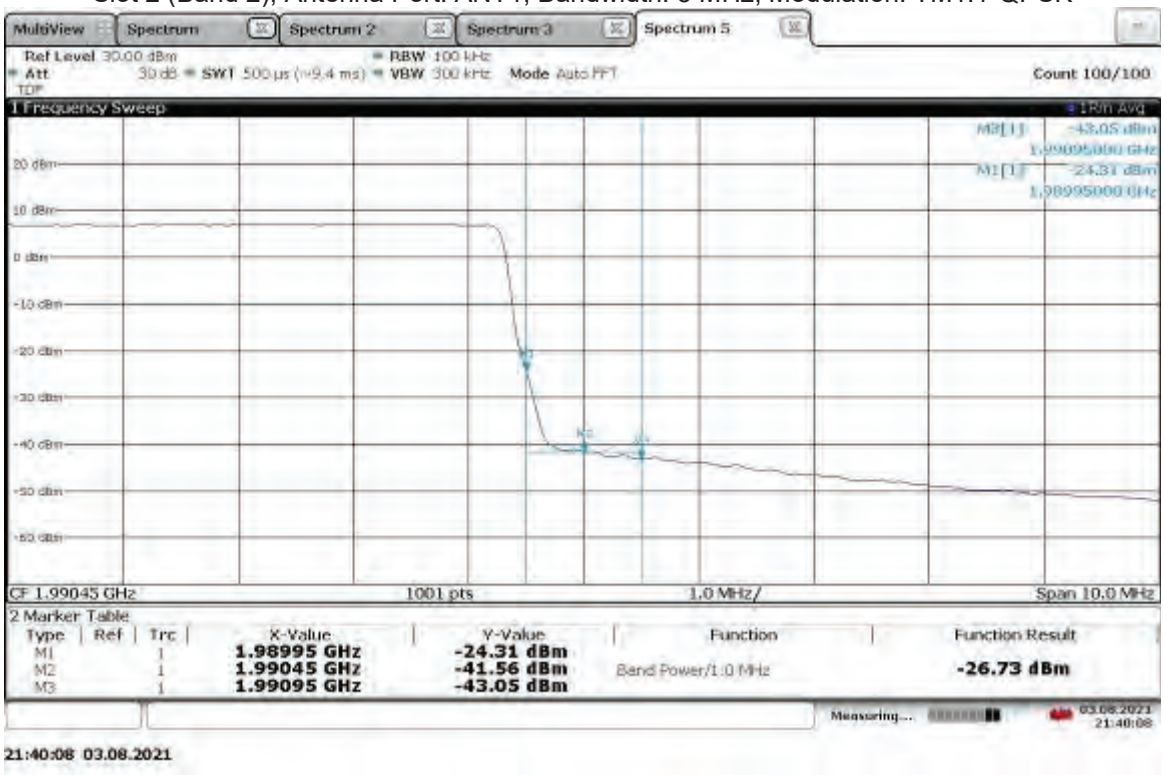
Band Edge Compliant, Upper Band Edge, 1980 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



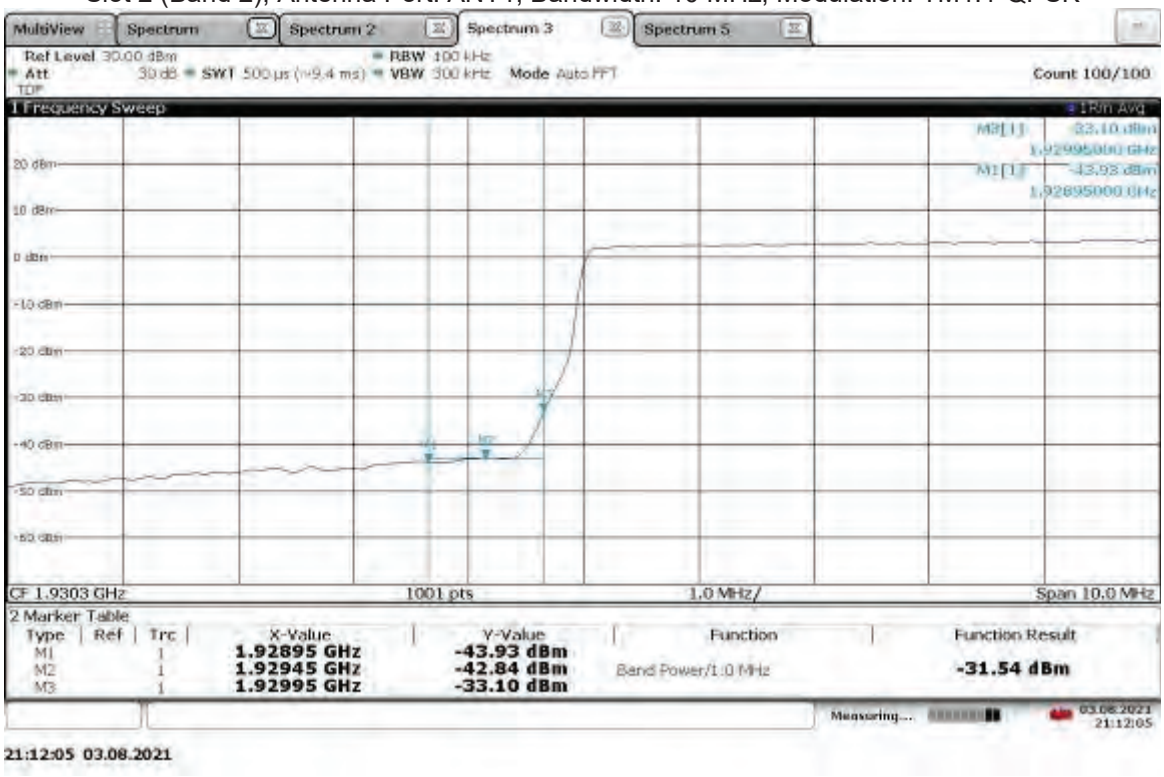
Band Edge Compliant, Lower Band Edge, 1932.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



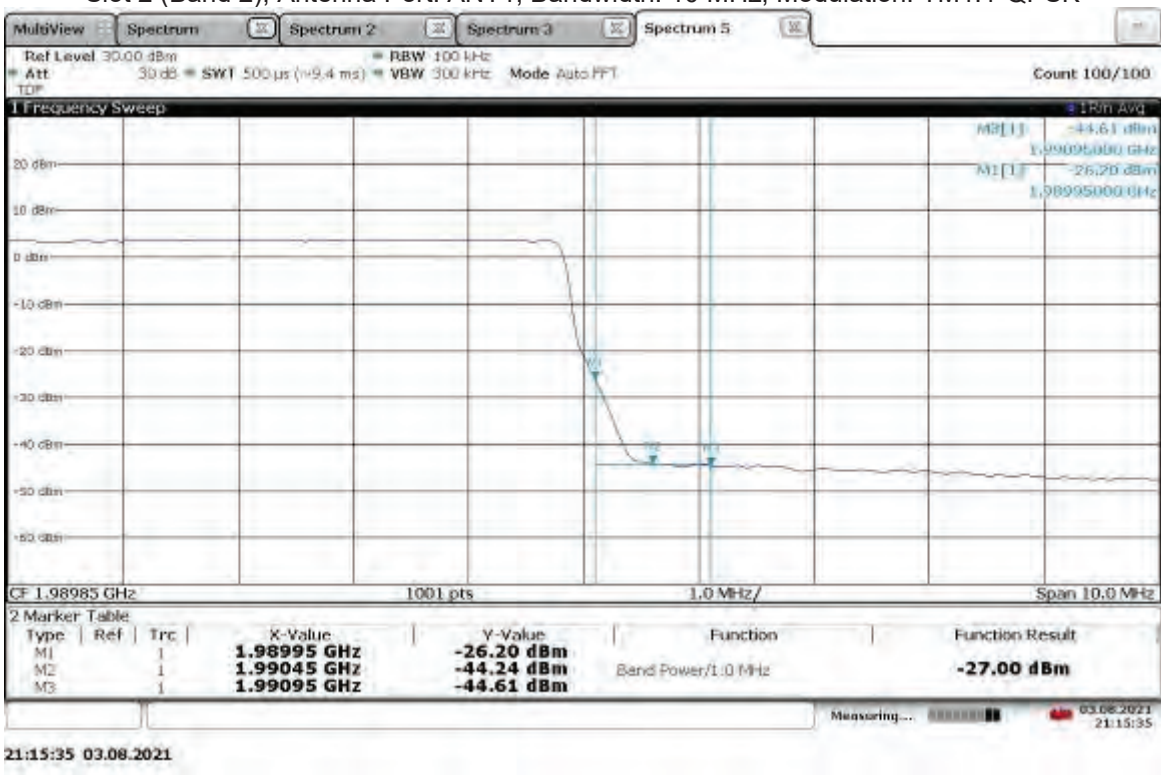
Band Edge Compliant, Lower Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM1.1-QPSK



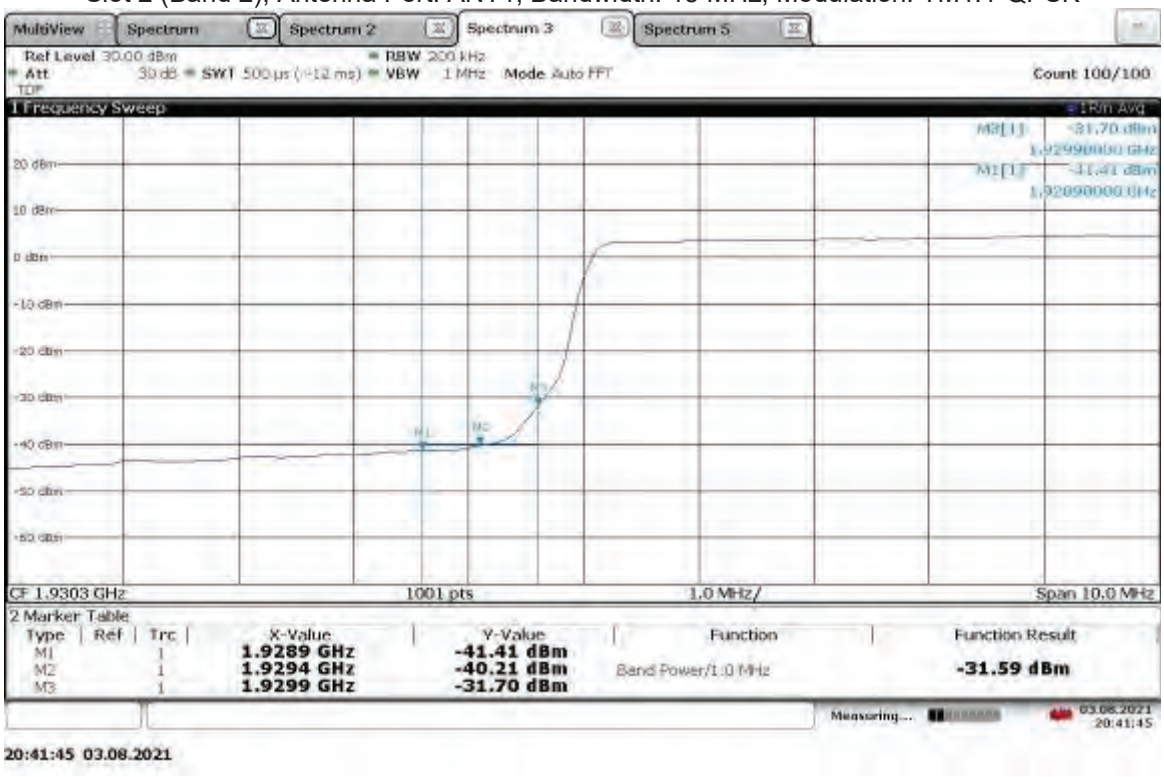
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



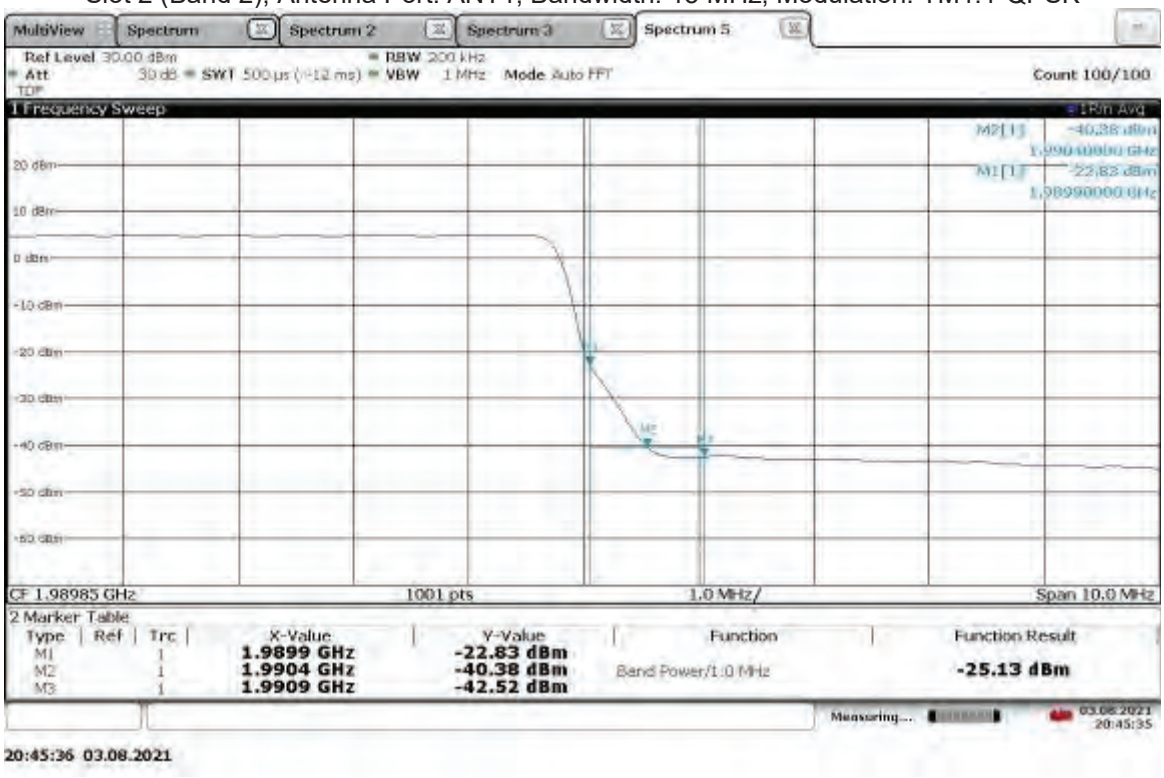
Band Edge Compliant, Lower Band Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM1.1-QPSK



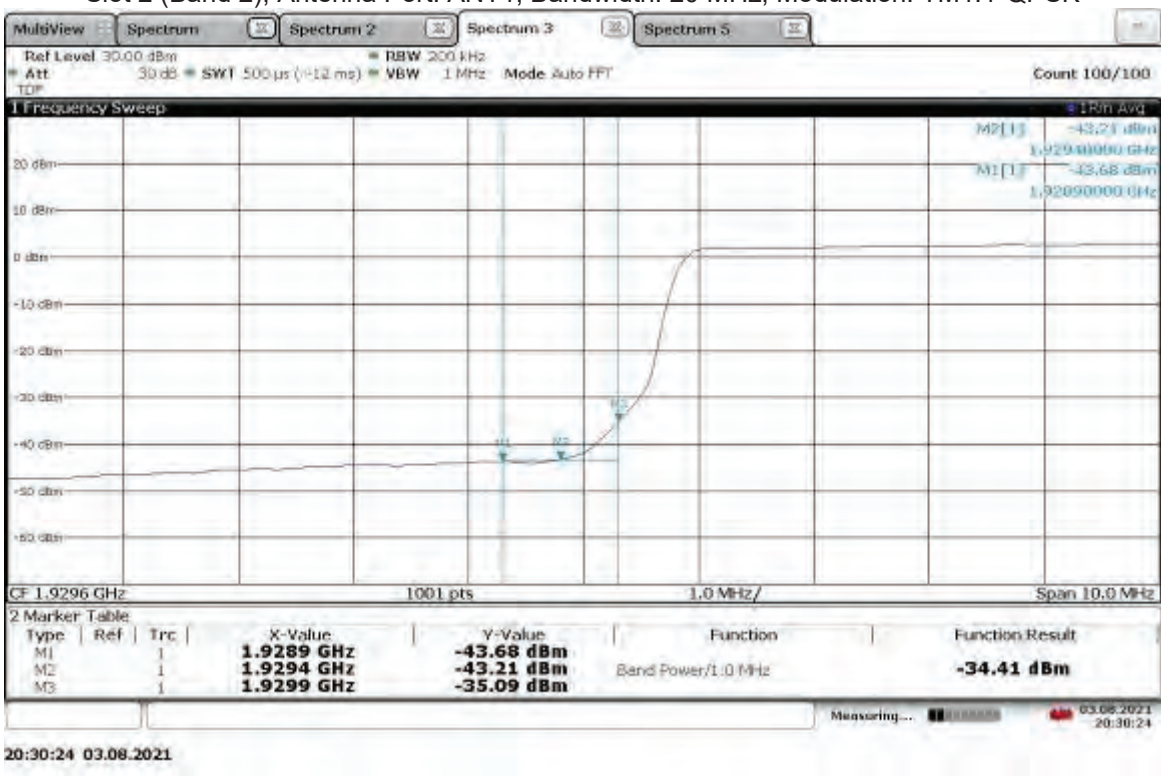
Band Edge Compliant, Lower Band Edge, 1937.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



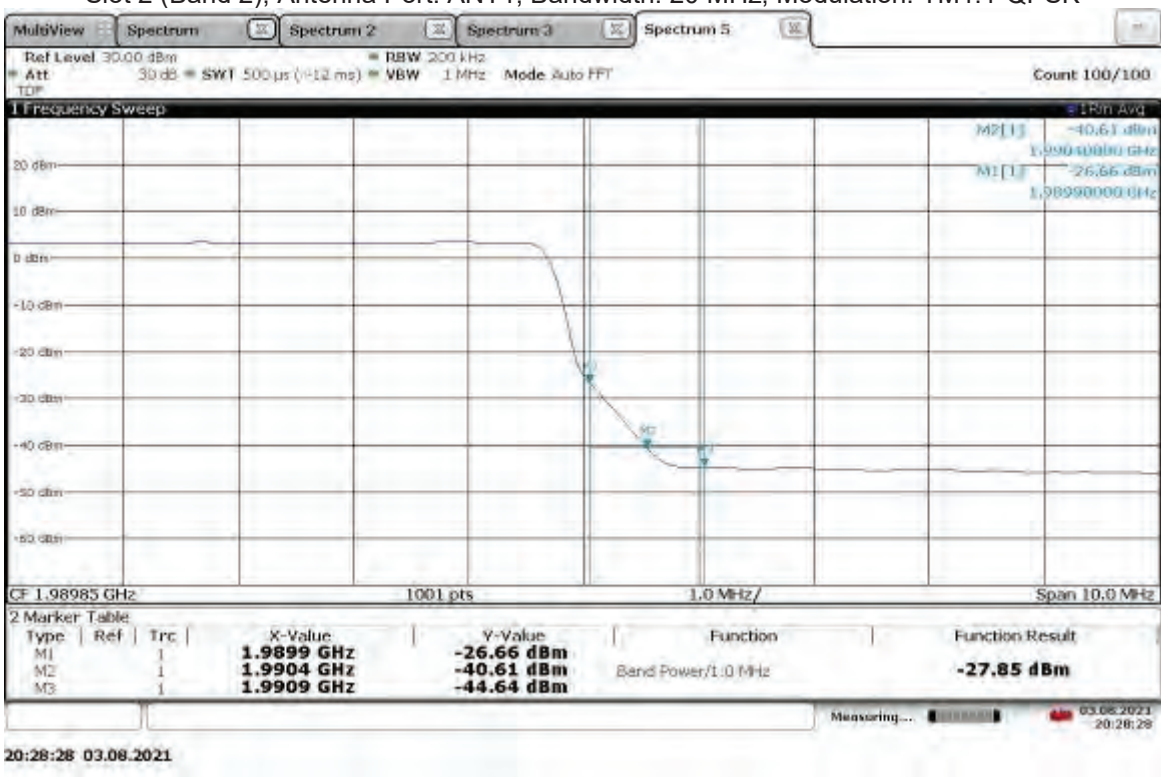
Band Edge Compliant, Lower Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM1.1-QPSK



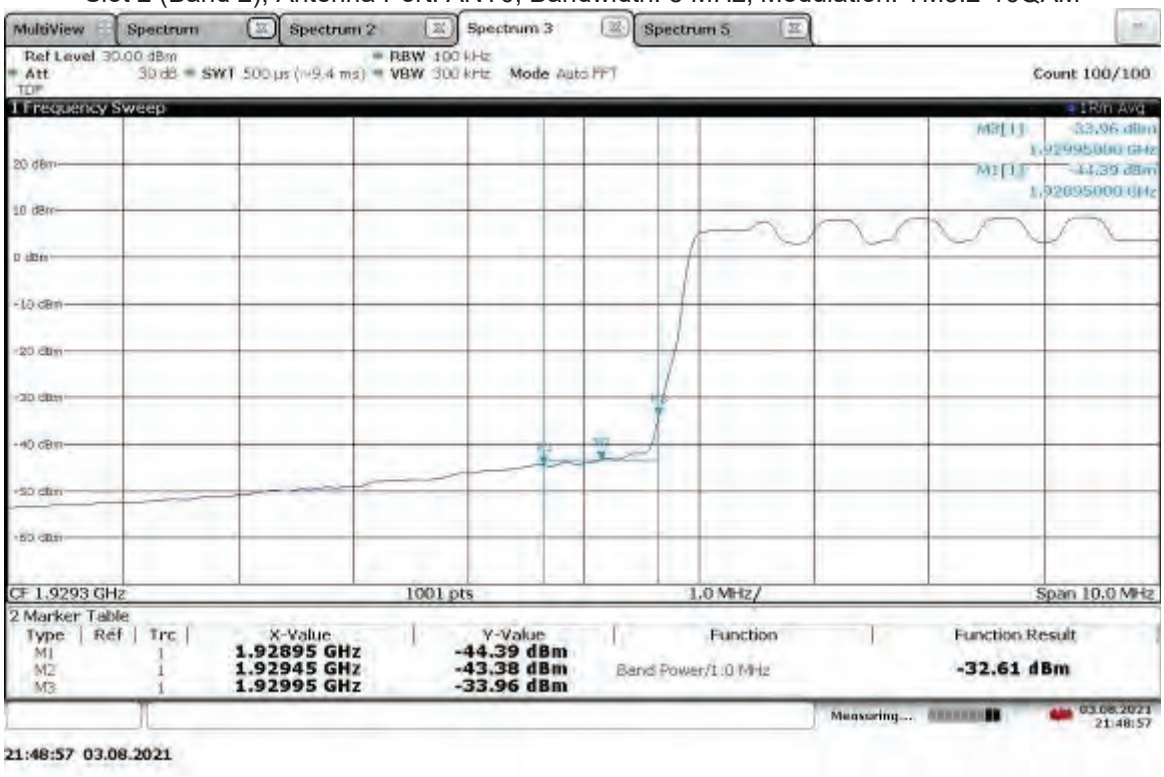
Band Edge Compliant, Lower Band Edge, 1940 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



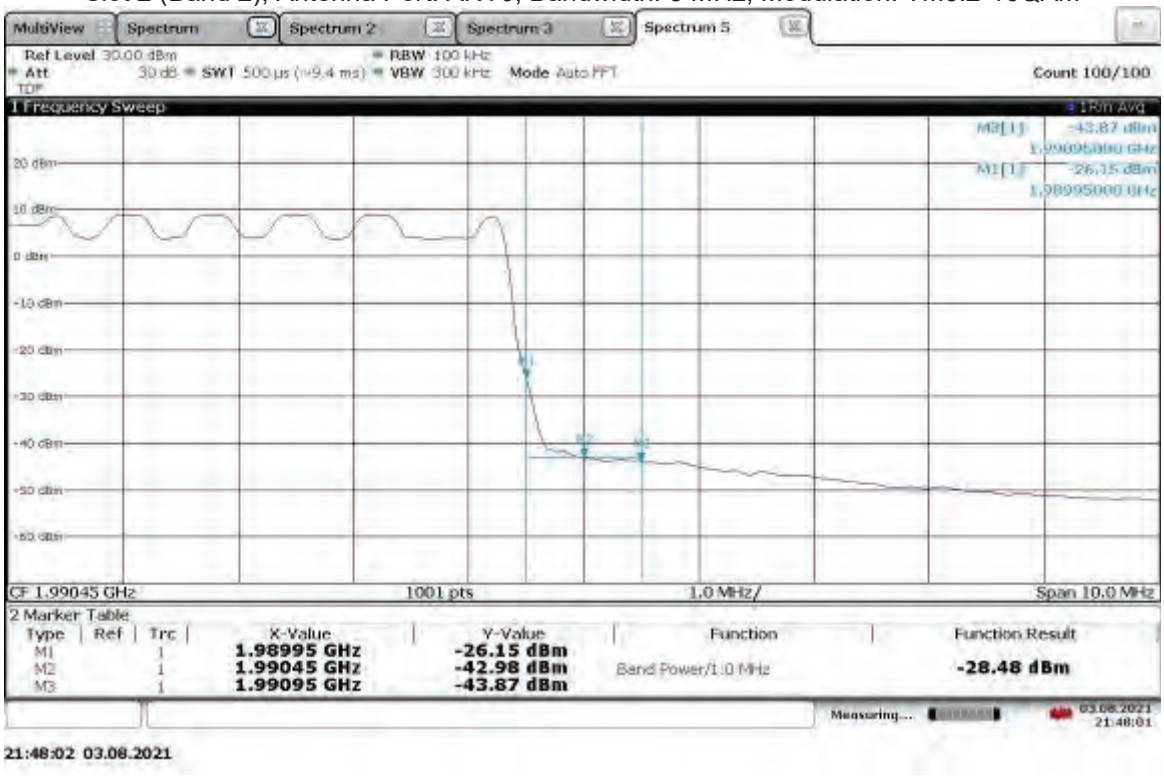
Band Edge Compliant, Upper Band Edge, 1980 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM1.1-QPSK



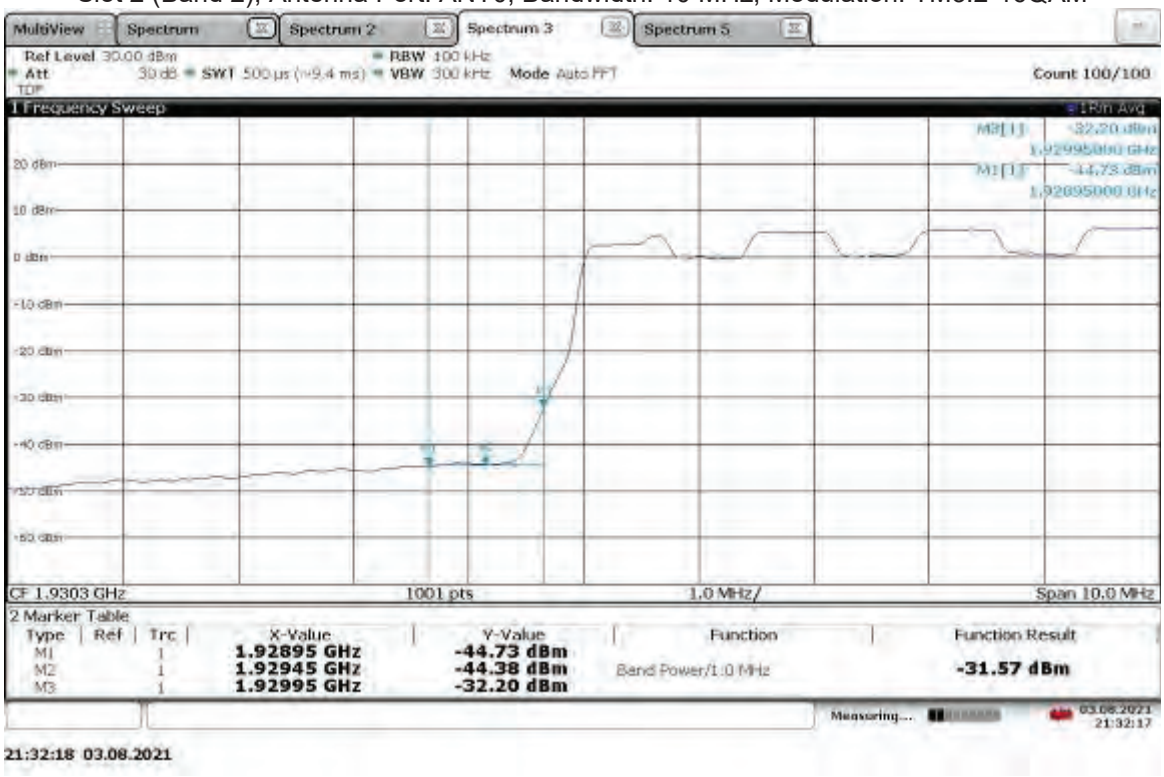
Band Edge Compliant, Lower Band Edge, 1932.5MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



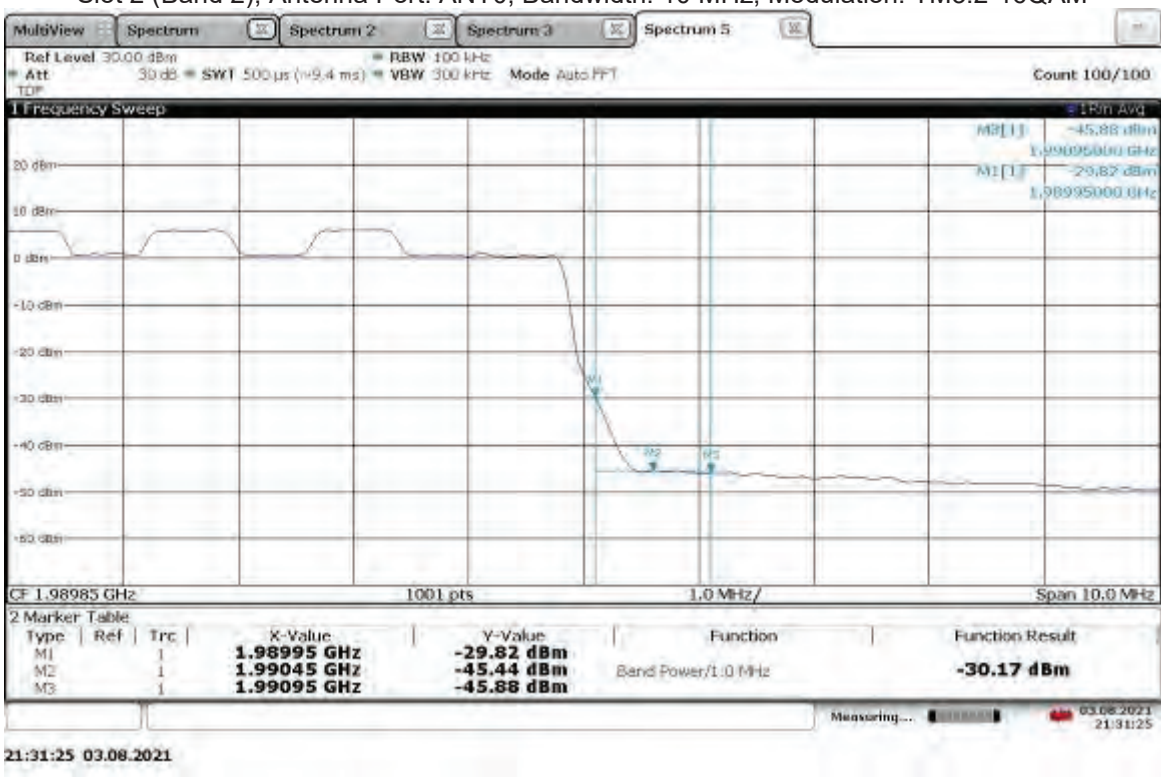
Band Edge Compliant, Upper Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



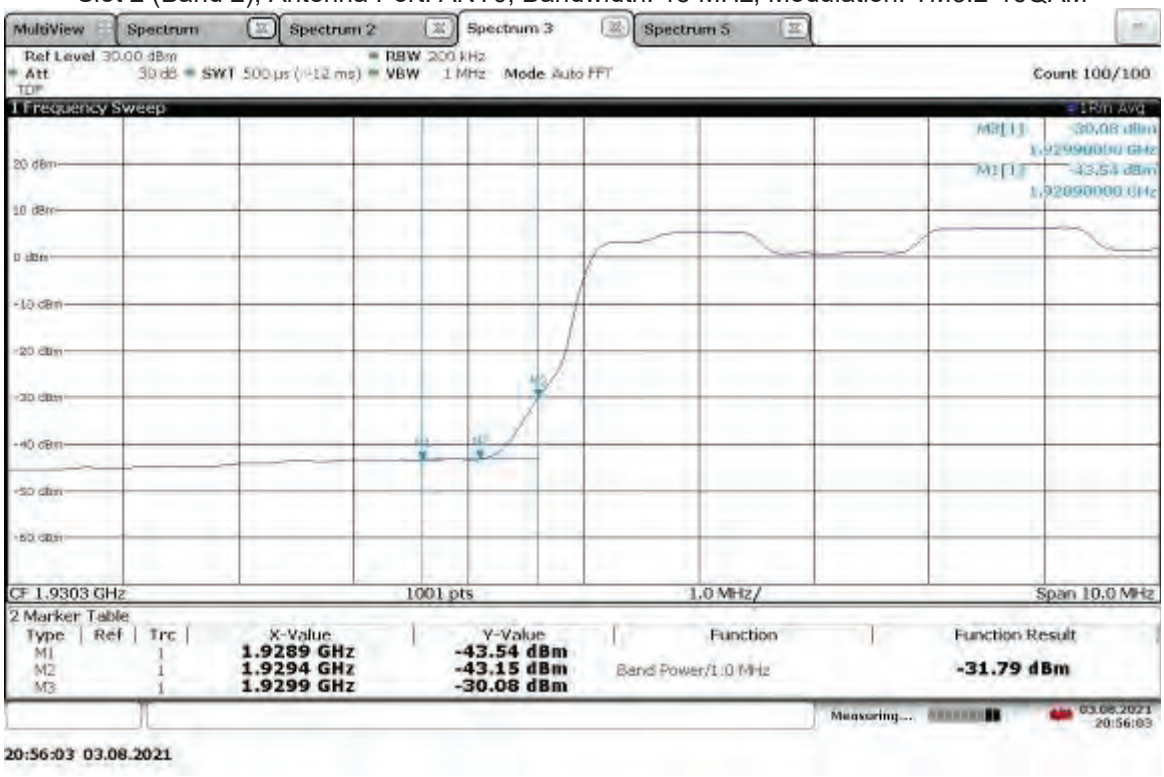
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



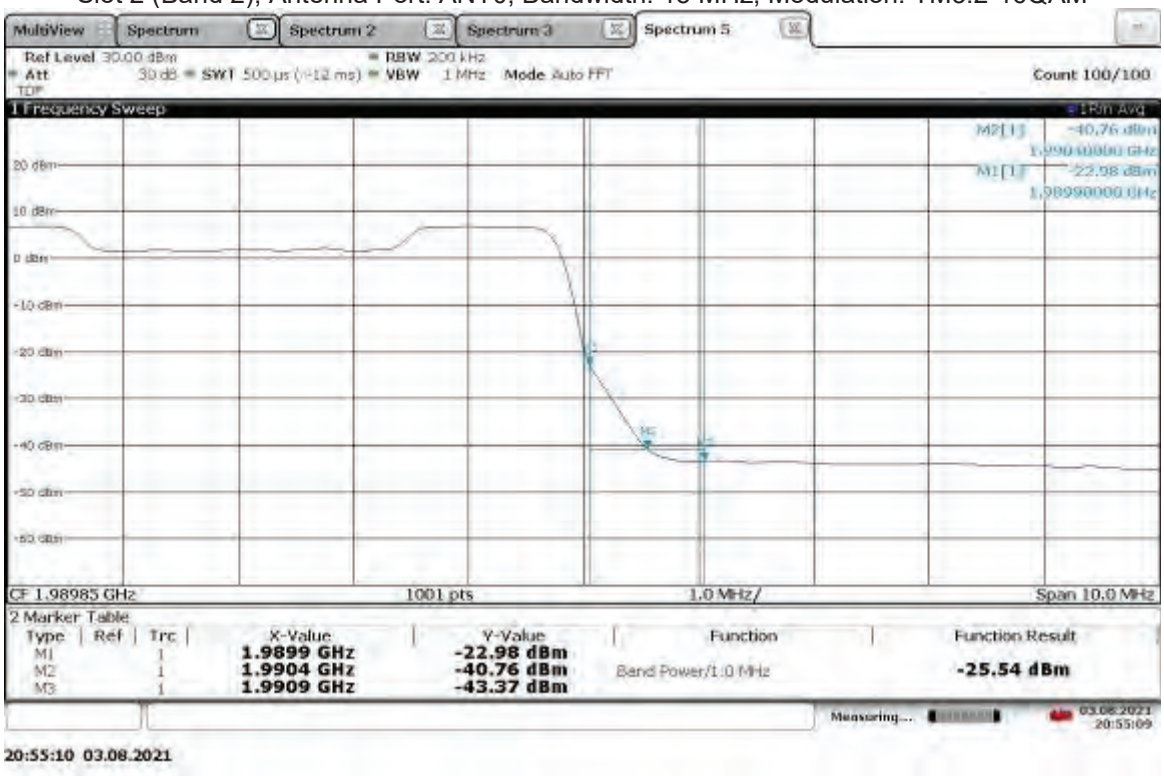
Band Edge Compliant, Upper Band Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



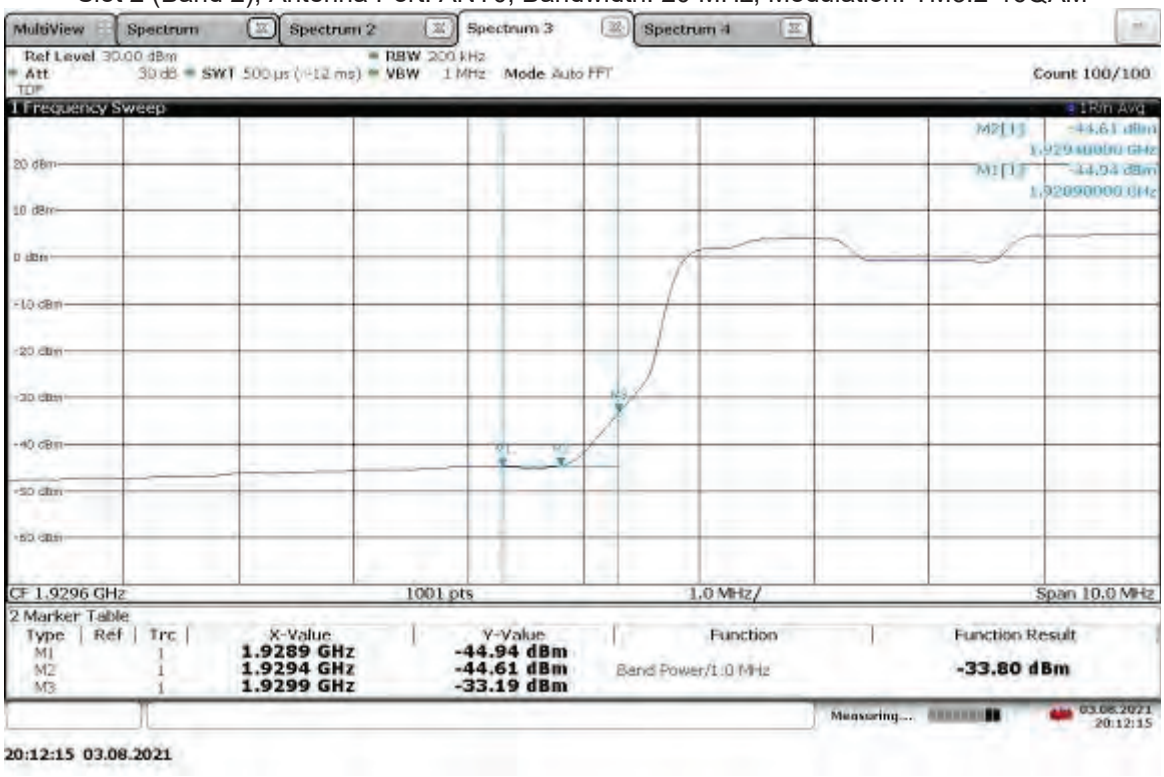
Band Edge Compliant, Lower Band Edge, 1937.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



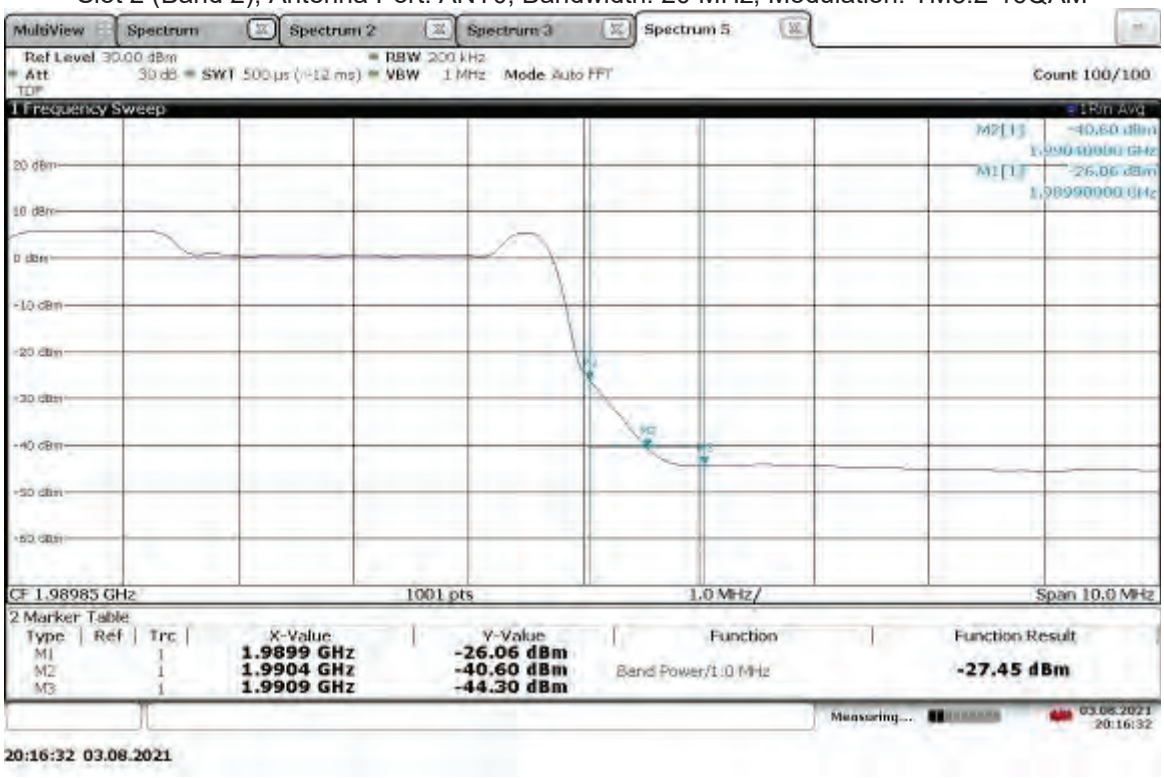
Band Edge Compliant, Upper Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



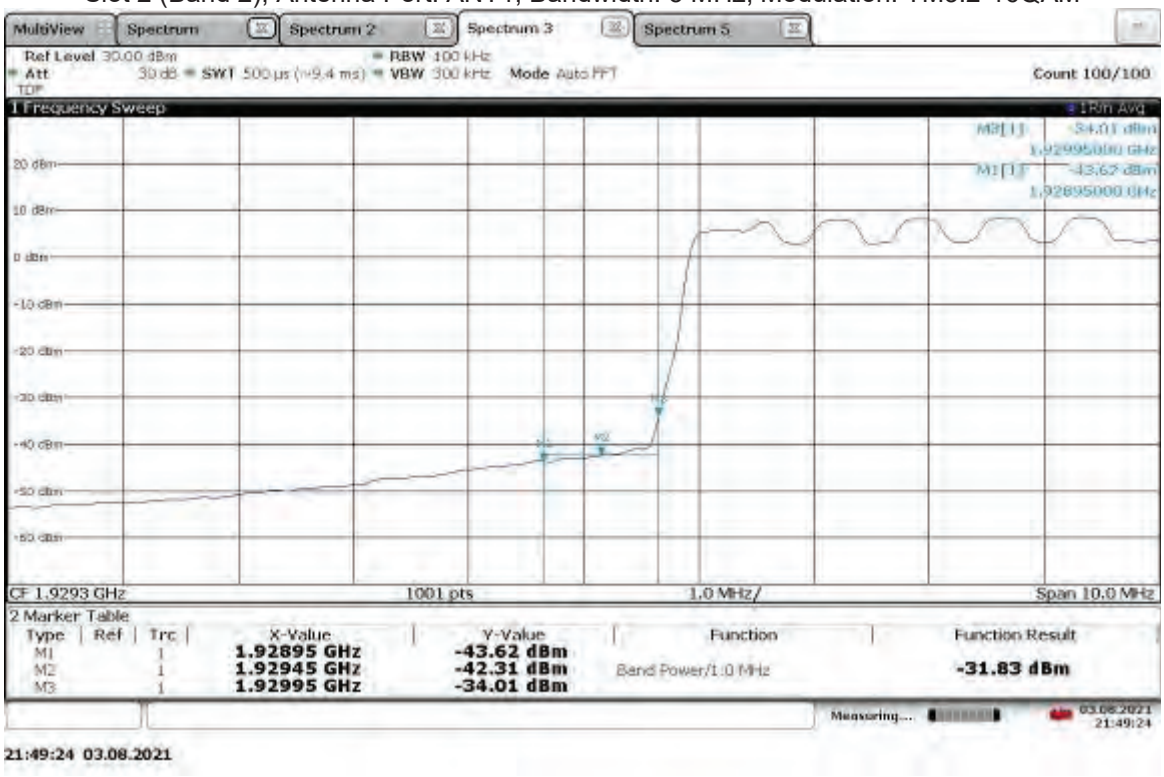
Band Edge Compliant, Lower Band Edge, 1940 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



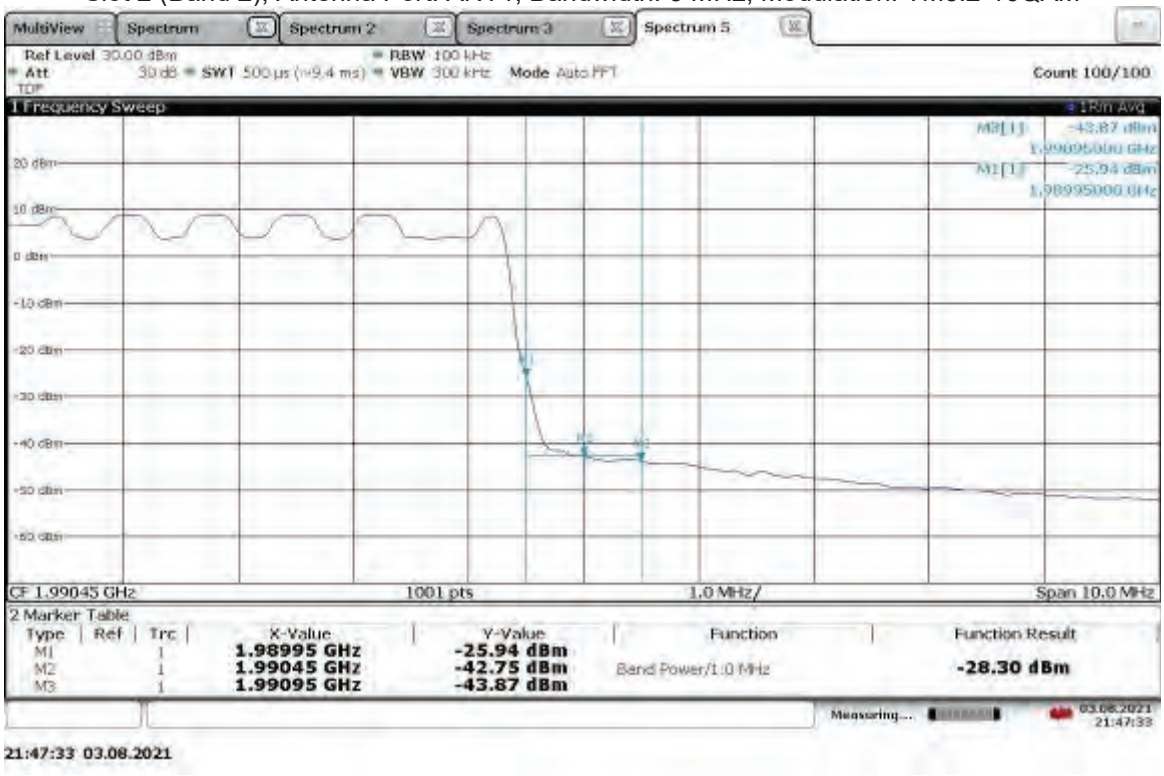
Band Edge Compliant, Upper Band Edge, 1980 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



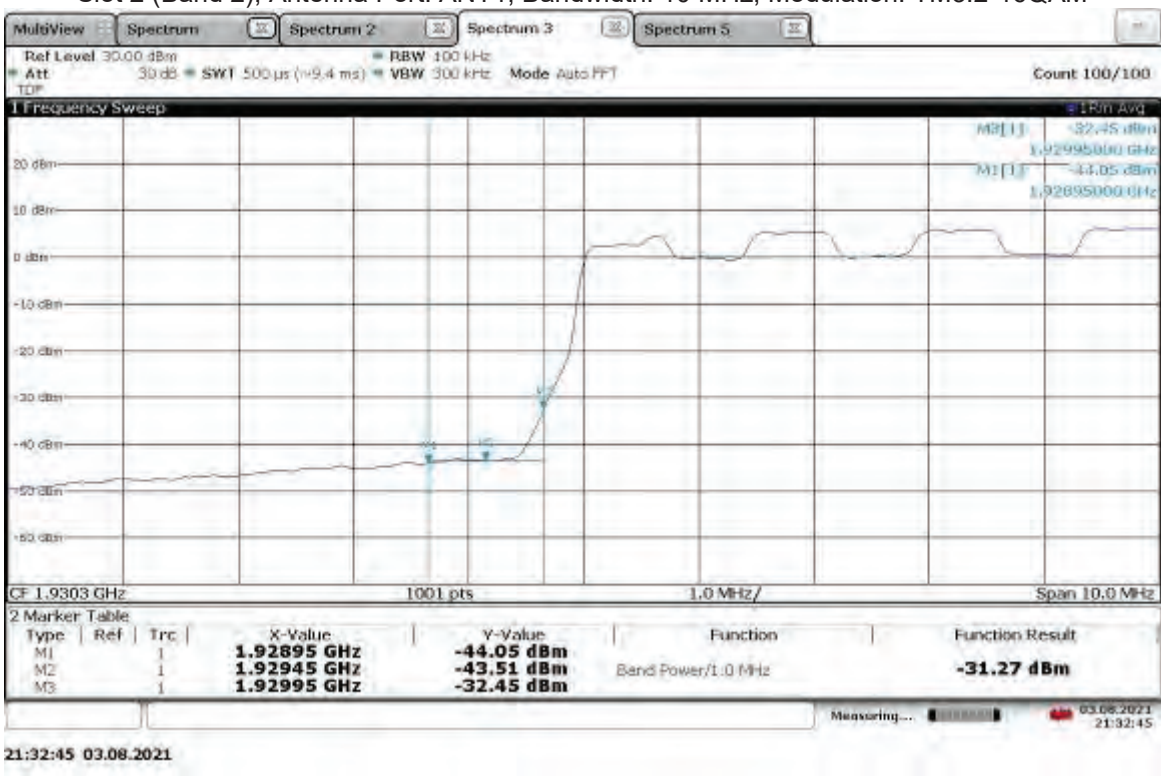
Band Edge Compliant, Lower Band Edge, 1932.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



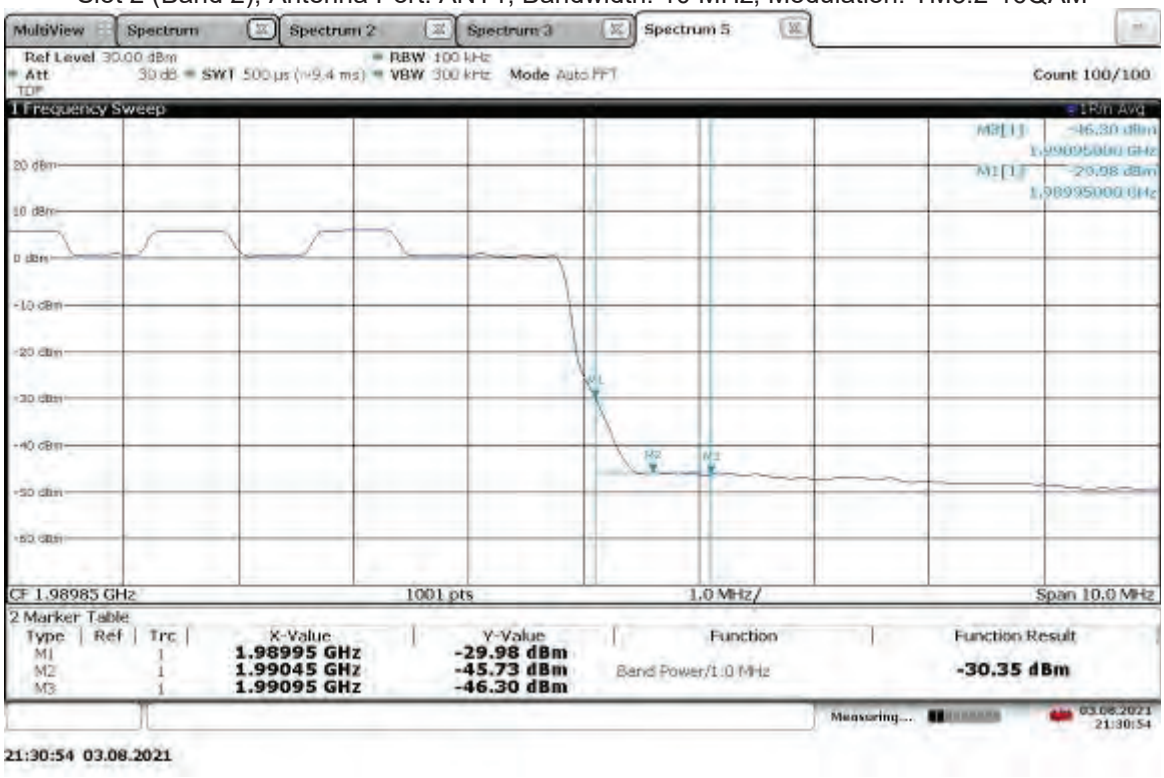
Band Edge Compliant, Upper Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.2-16QAM



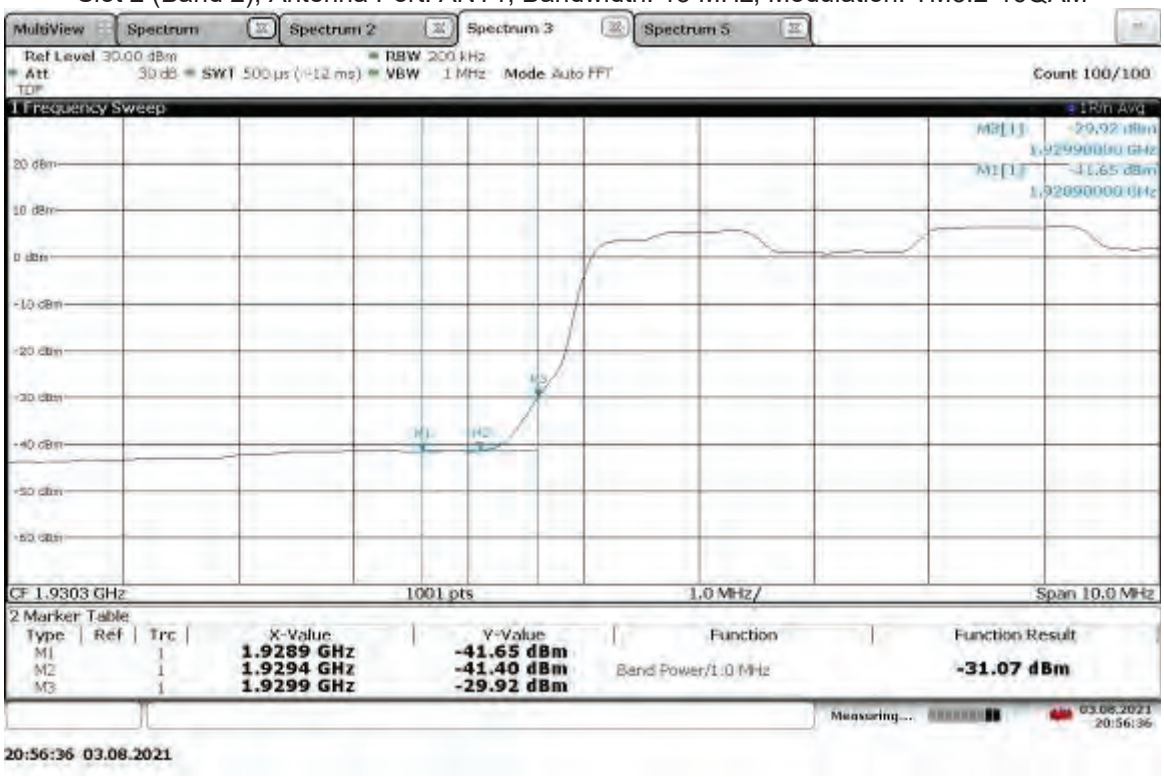
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



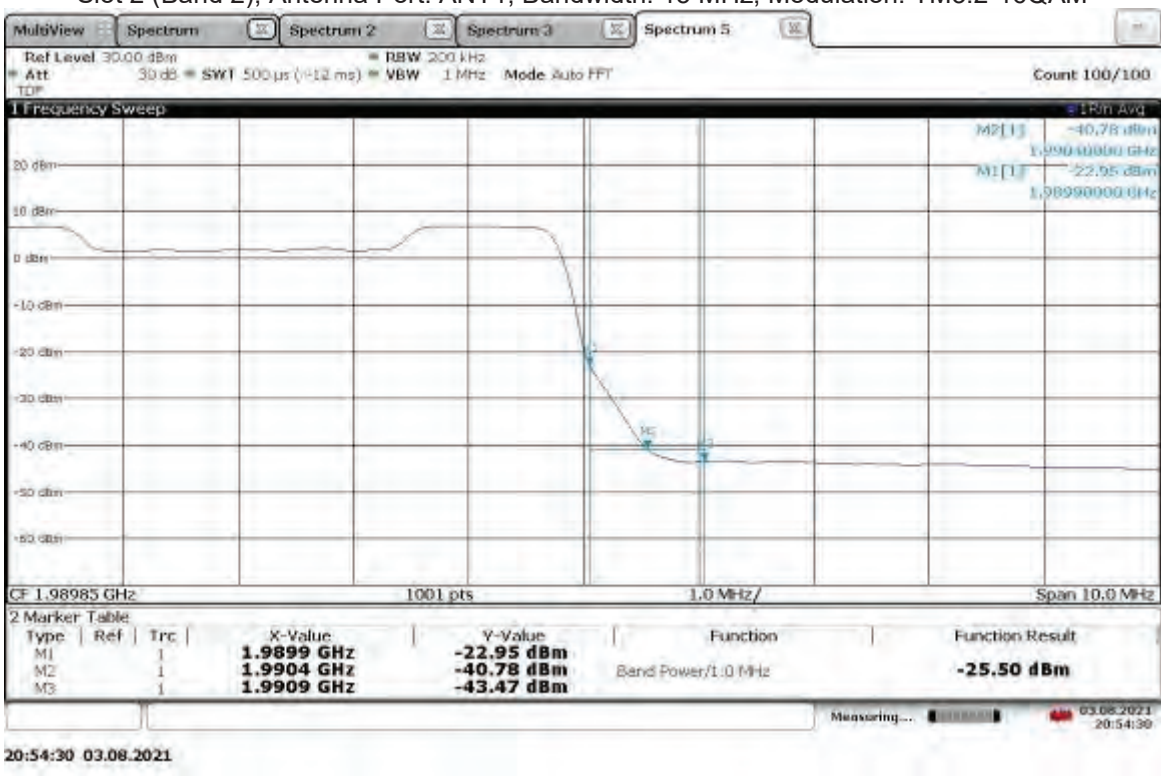
Band Edge Compliant, Upper Band Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.2-16QAM



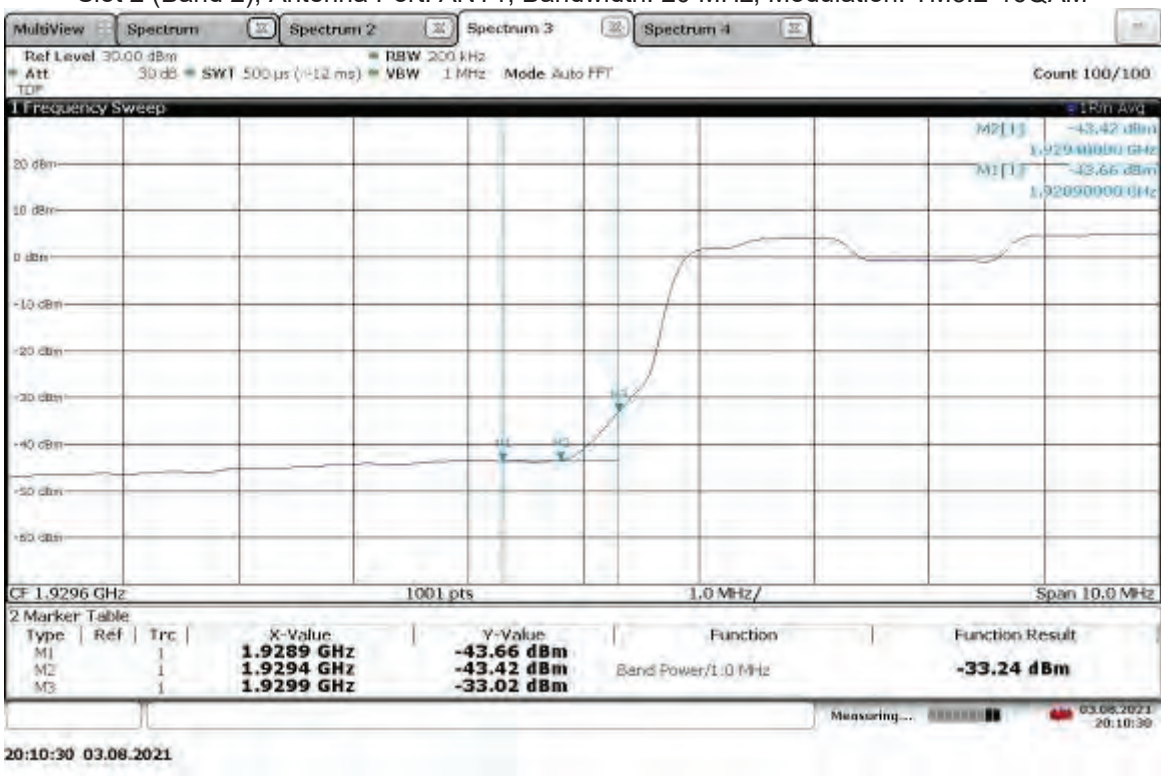
Band Edge Compliant, Lower Band Edge, 1937.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



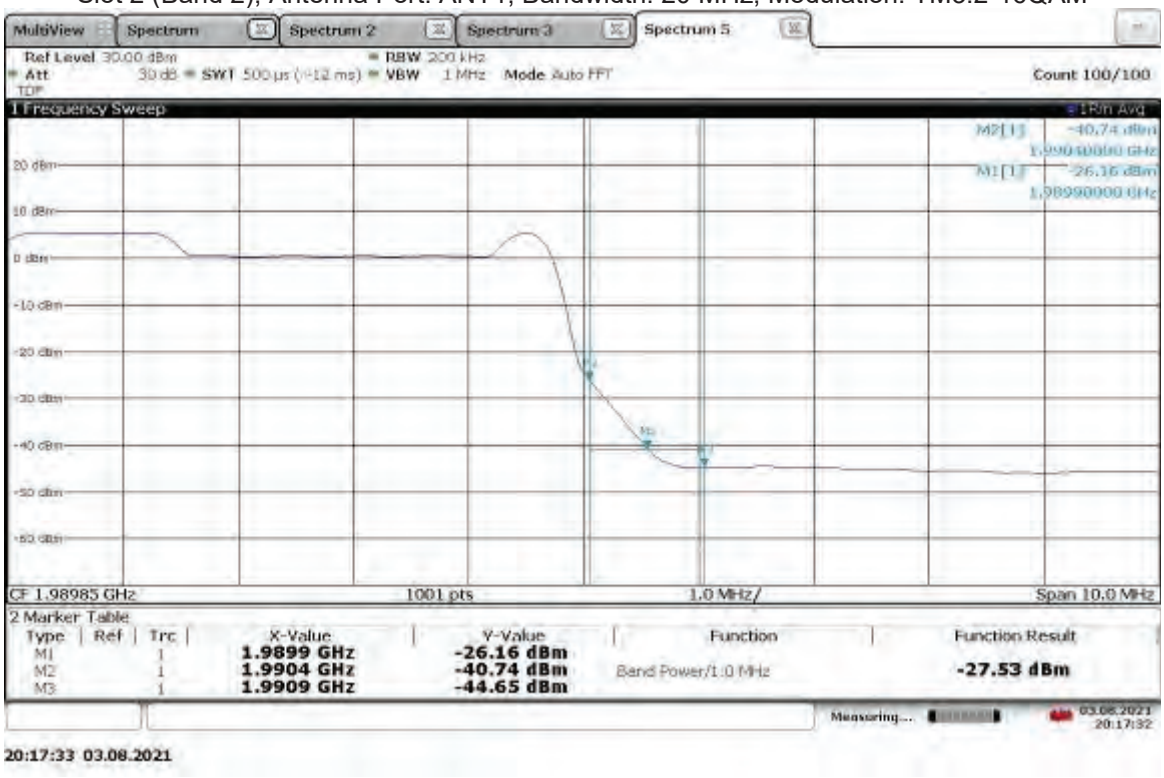
Band Edge Compliant, Upper Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.2-16QAM



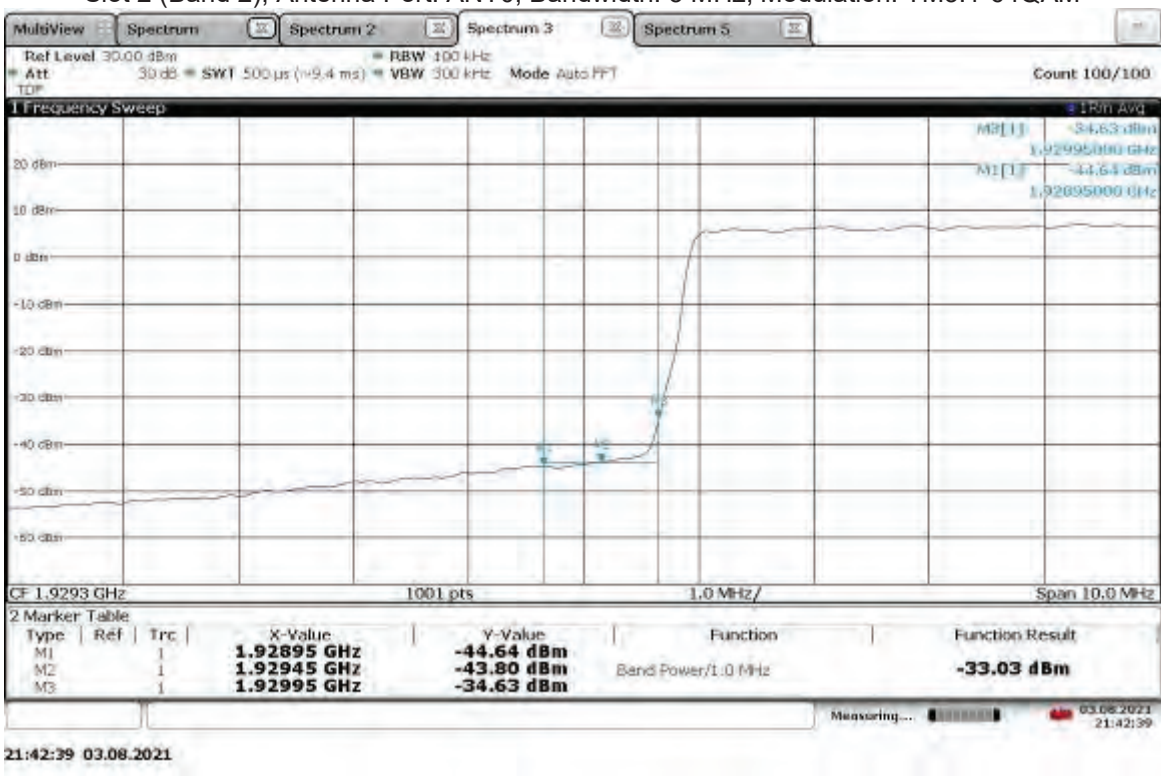
Band Edge Compliant, Lower Band Edge, 1940 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



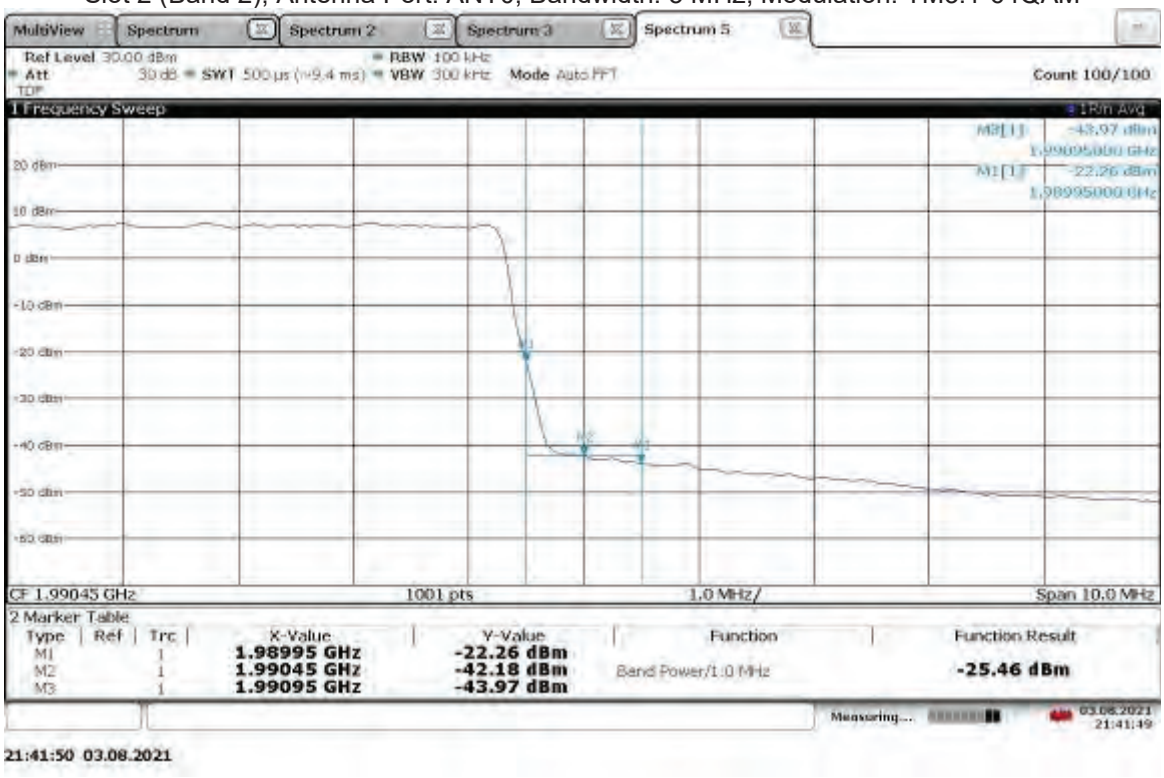
Band Edge Compliant, Upper Band Edge, 1980 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.2-16QAM



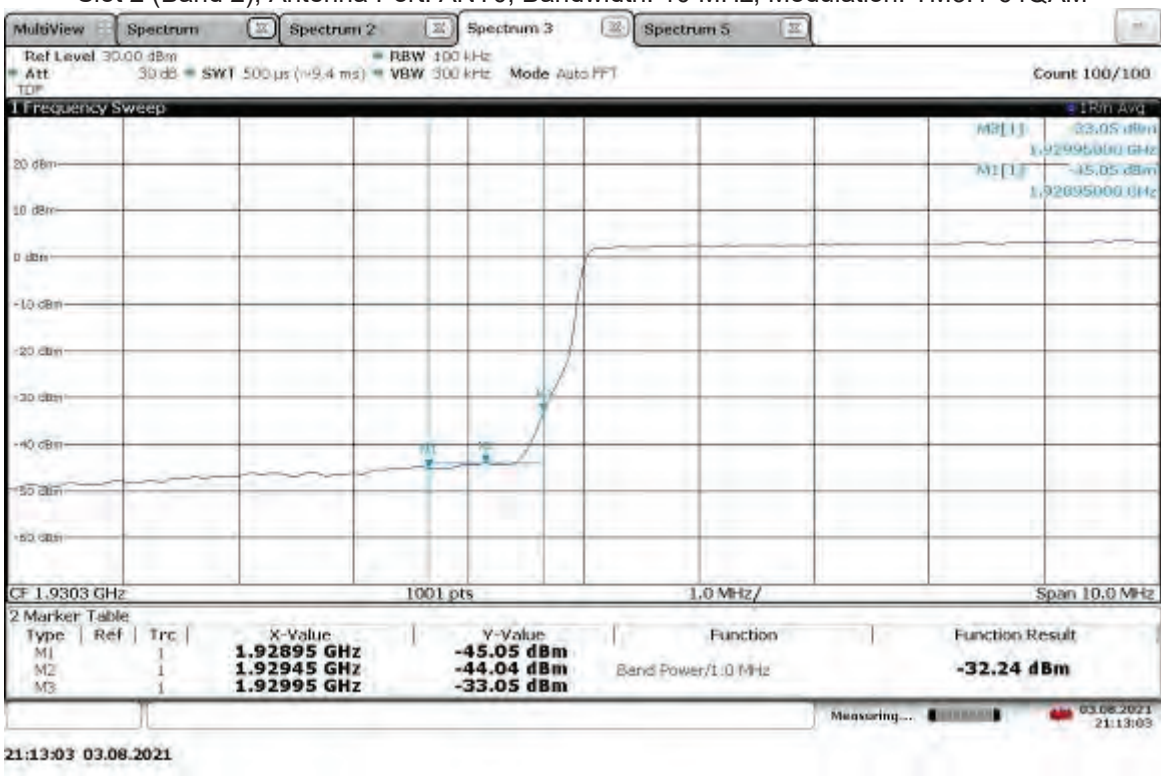
Band Edge Compliant, Lower Band Edge, 1932.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



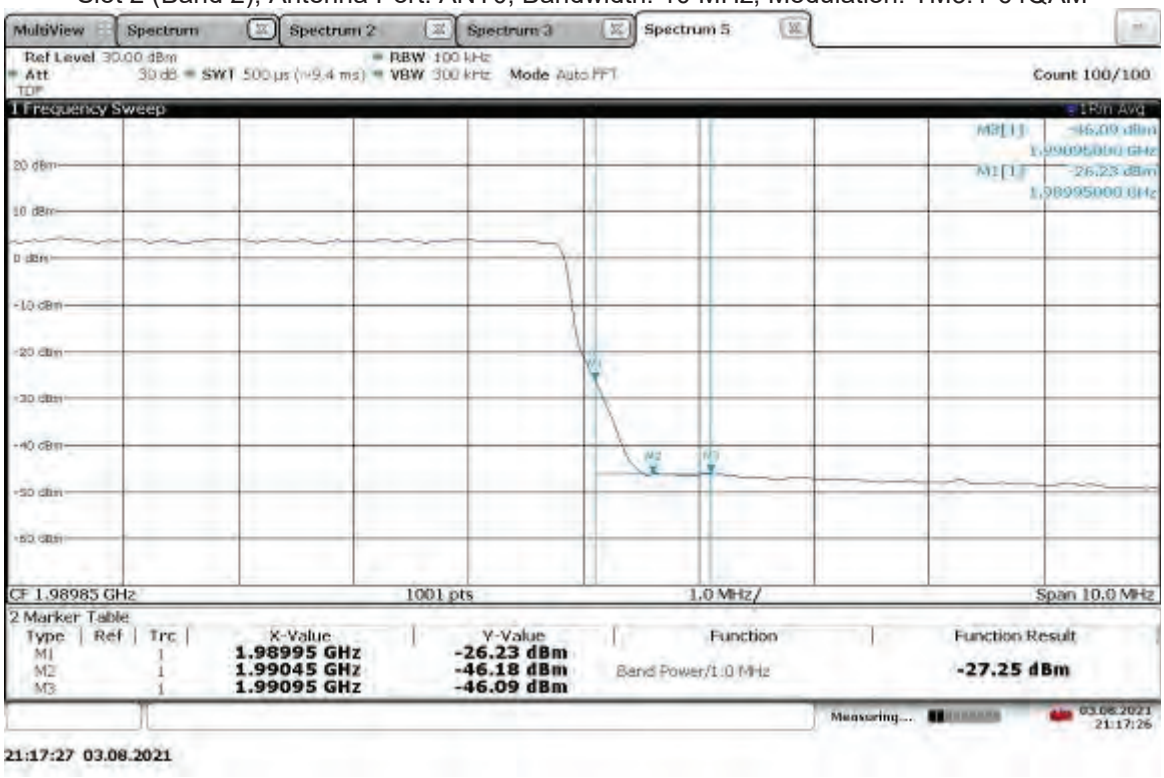
Band Edge Compliant, Upper Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



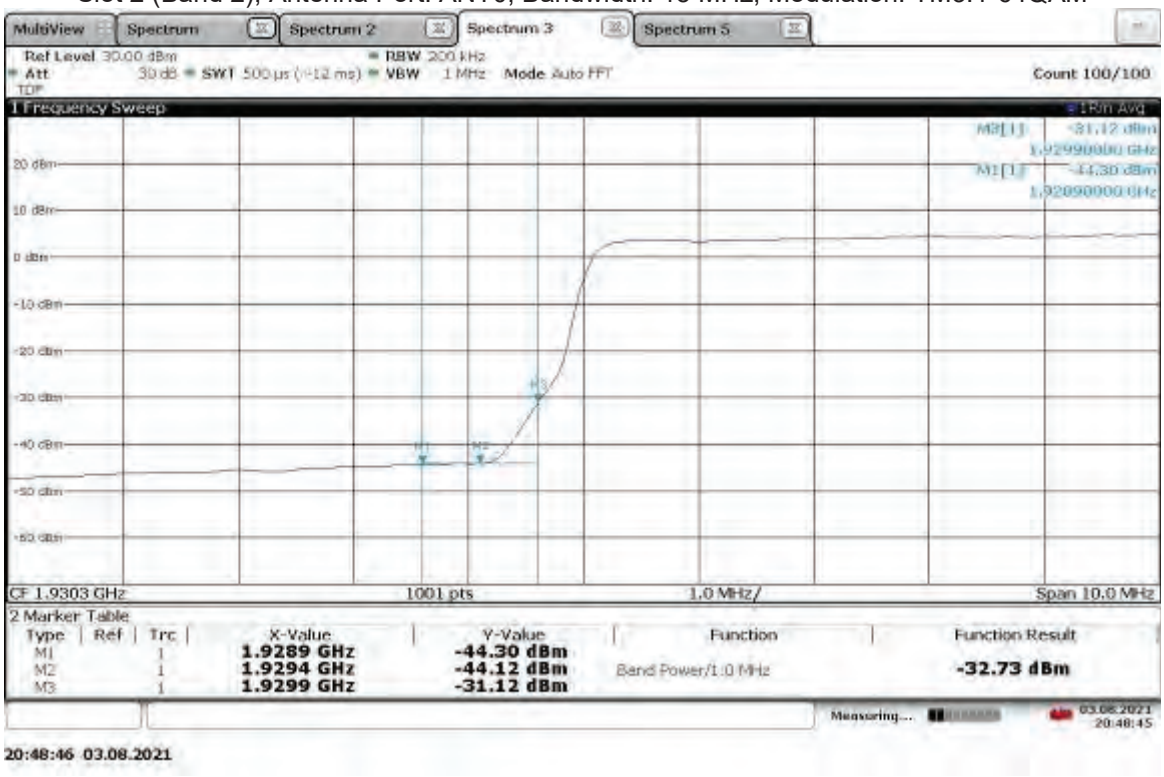
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



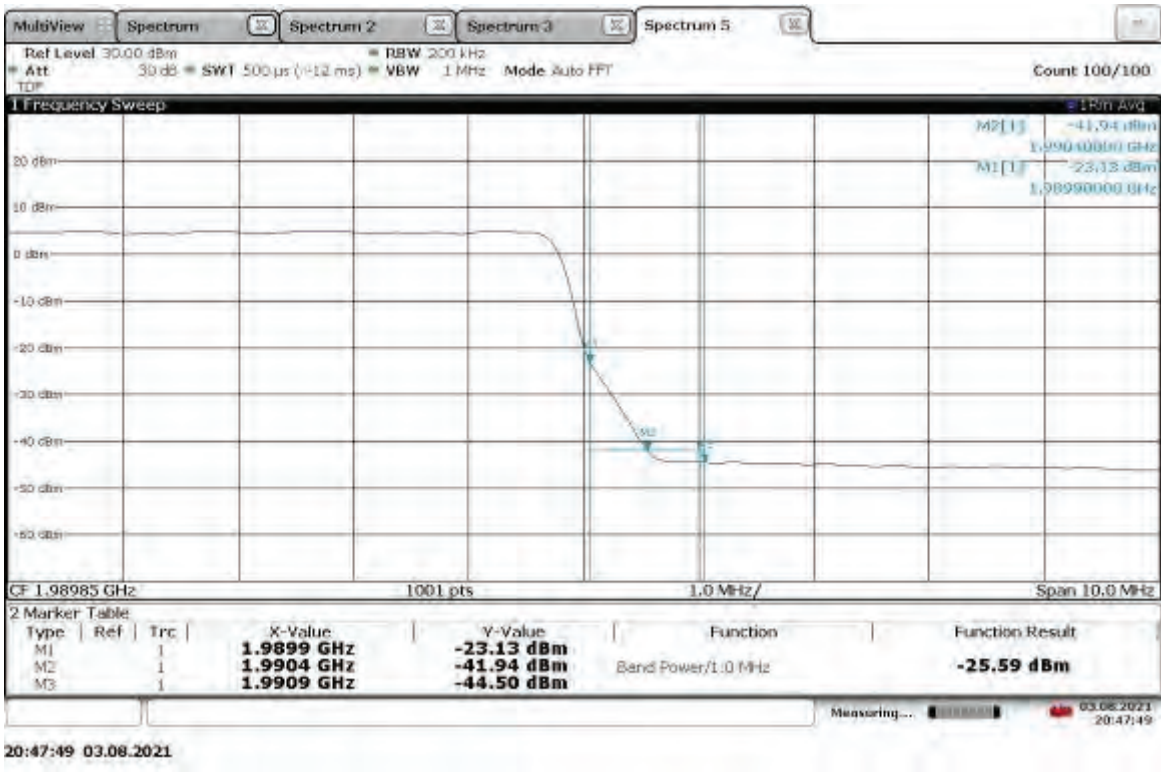
Band Edge Compliant, Upper Band Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



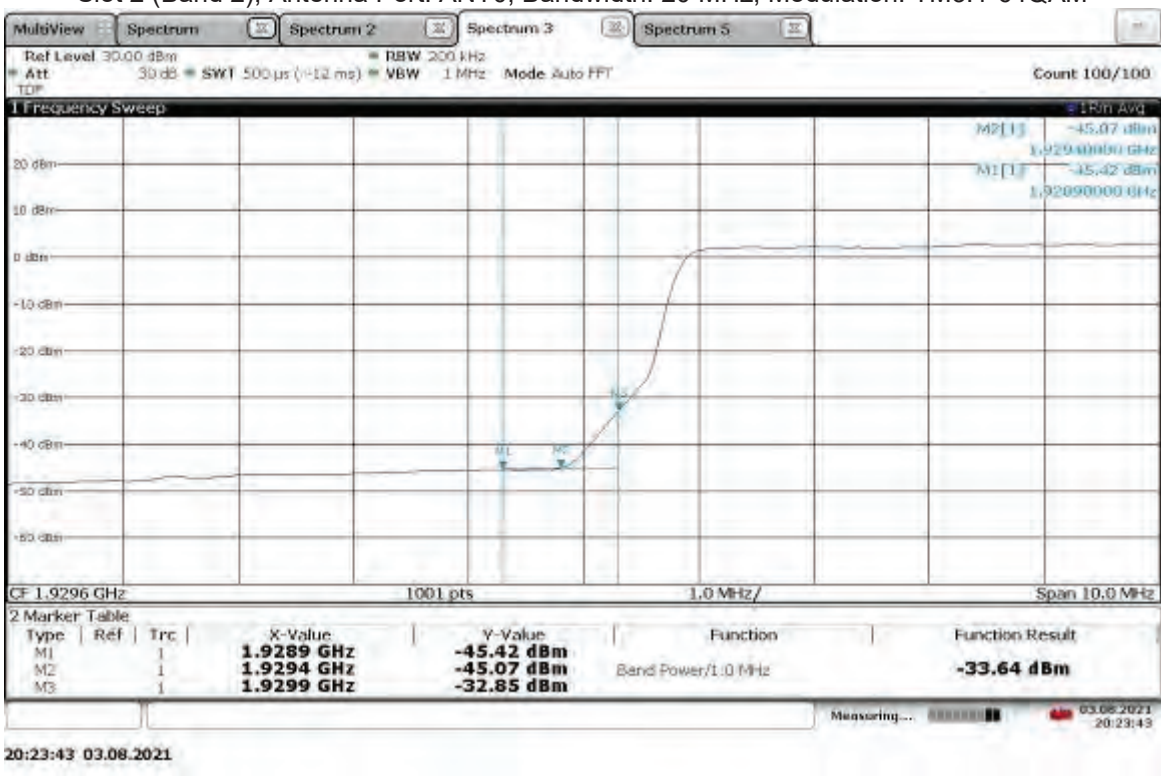
Band Edge Compliant, Lower Band Edge, 1937.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



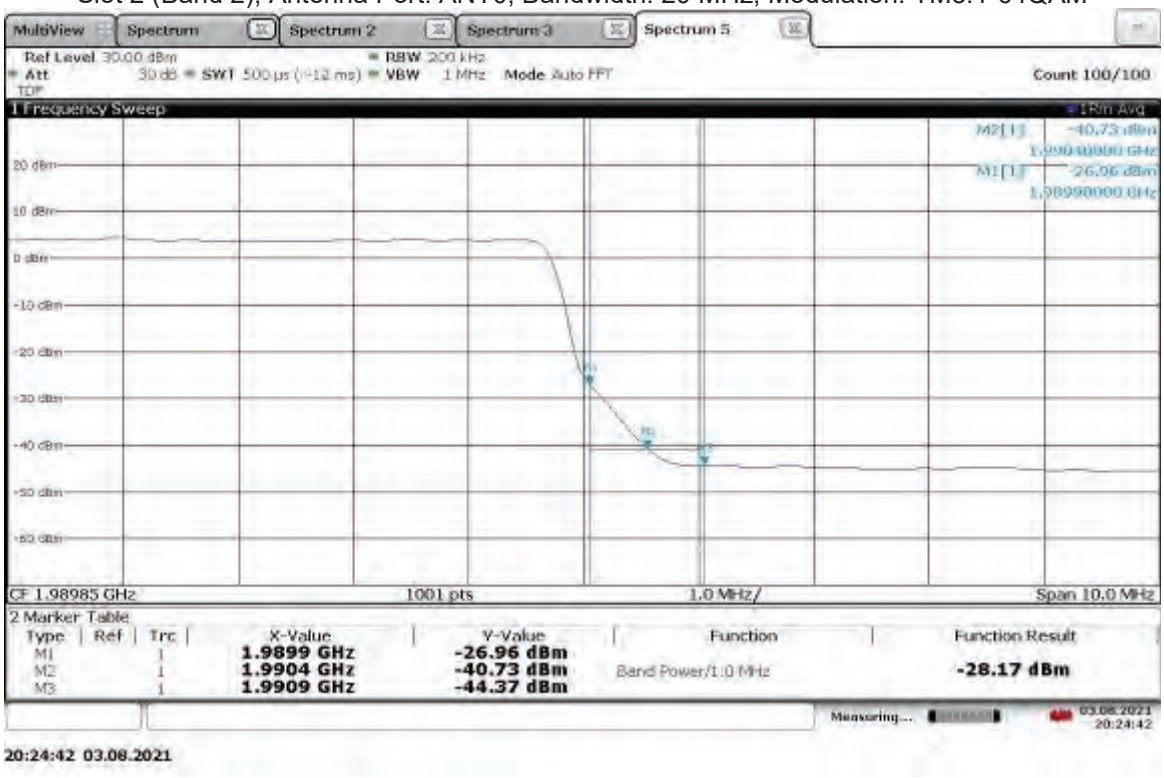
Band Edge Compliant, Upper Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



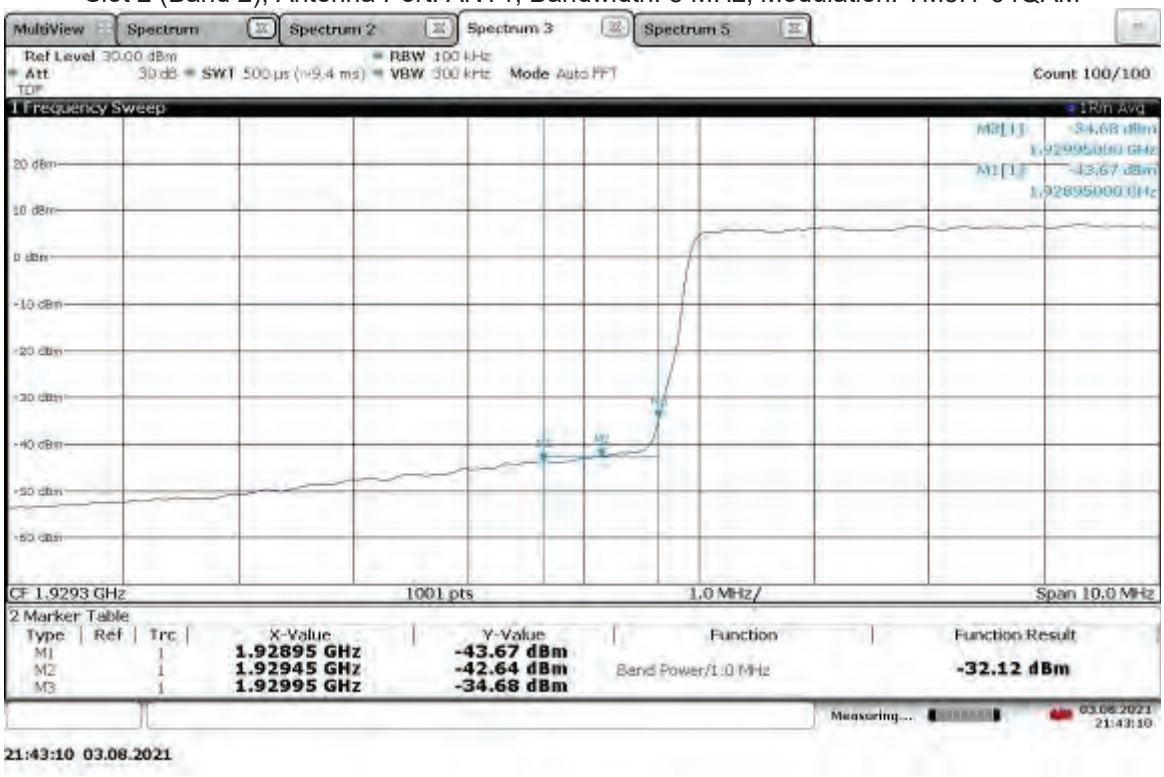
Band Edge Compliant, Lower Band Edge, 1940 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



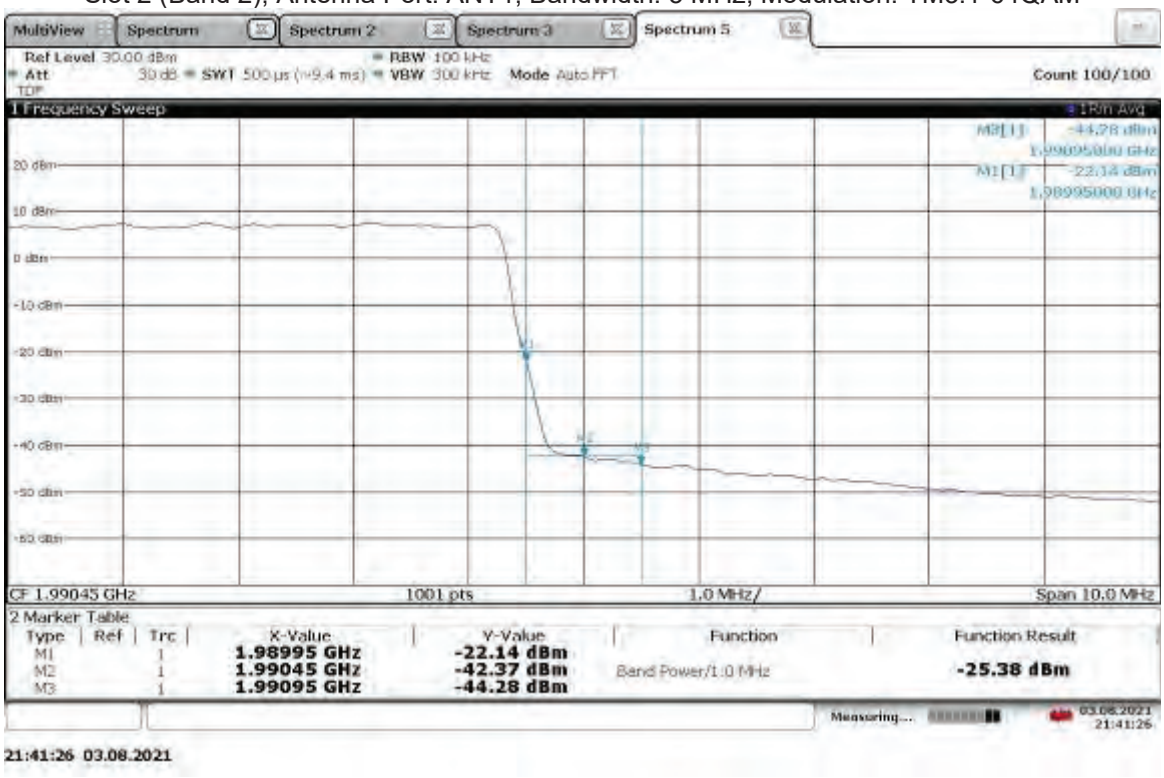
Band Edge Compliant, Upper Band Edge, 1980 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



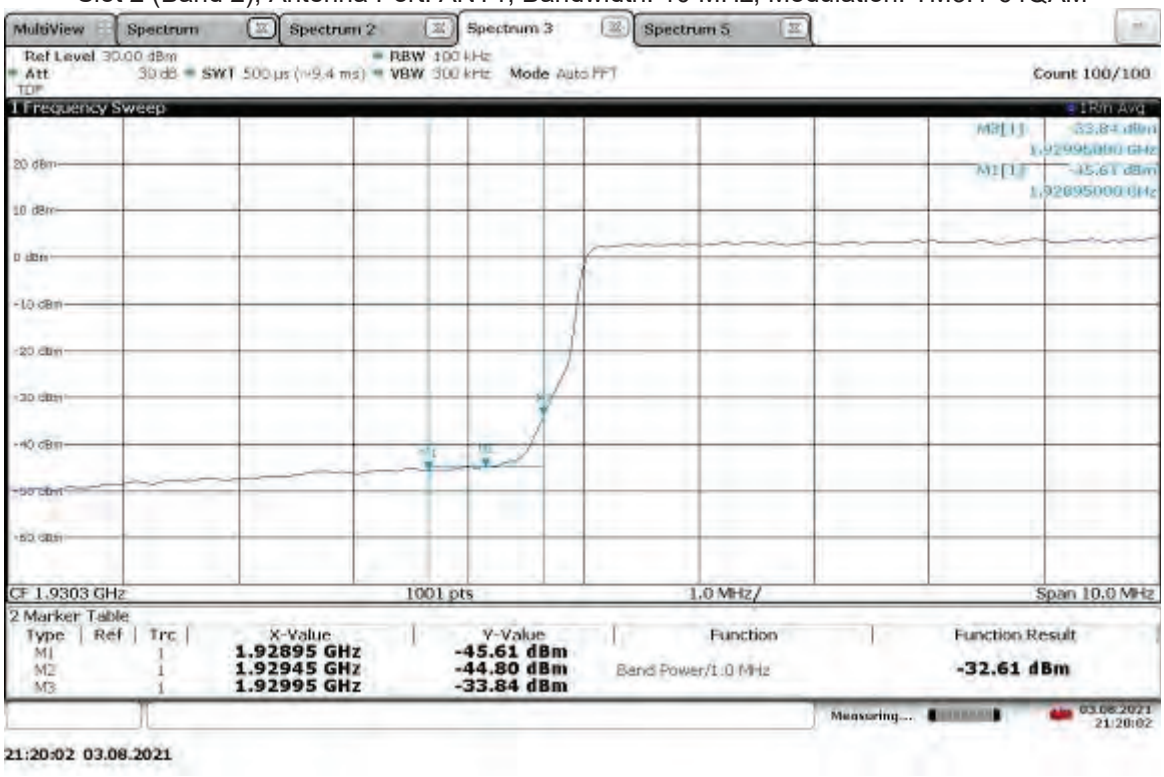
Band Edge Compliant, Lower Band Edge, 1932.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



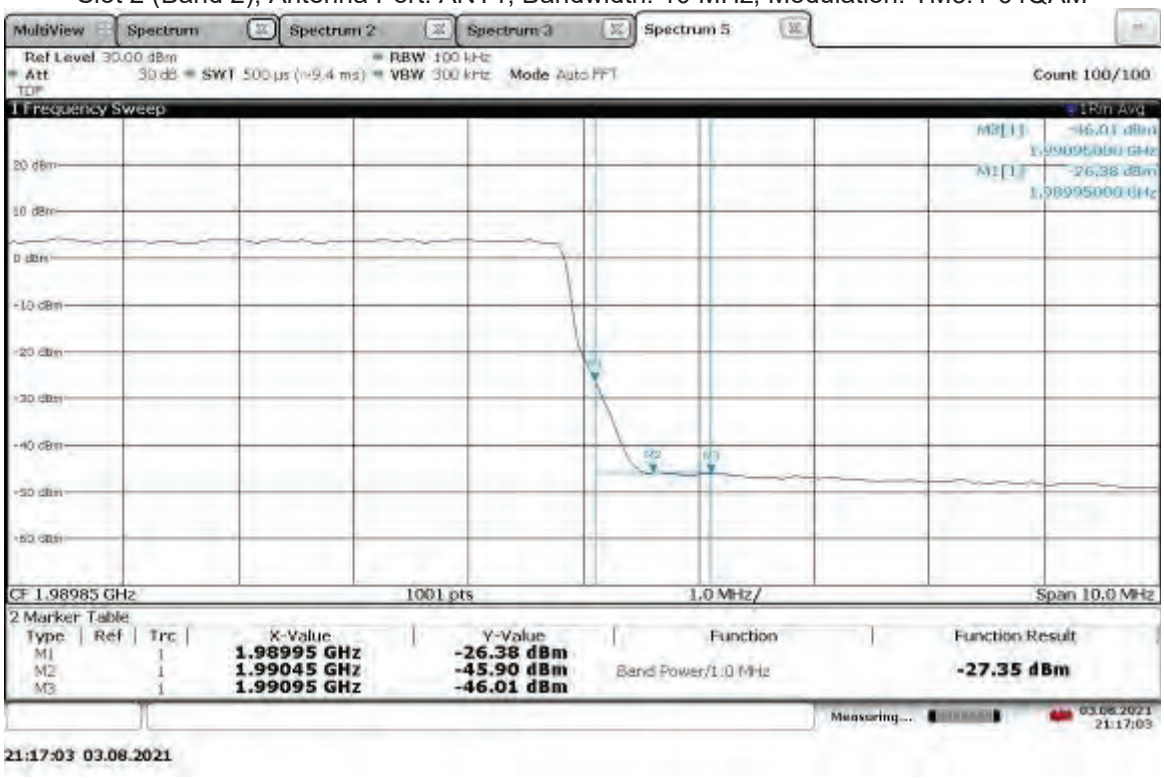
Band Edge Compliant, Upper Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1-64QAM



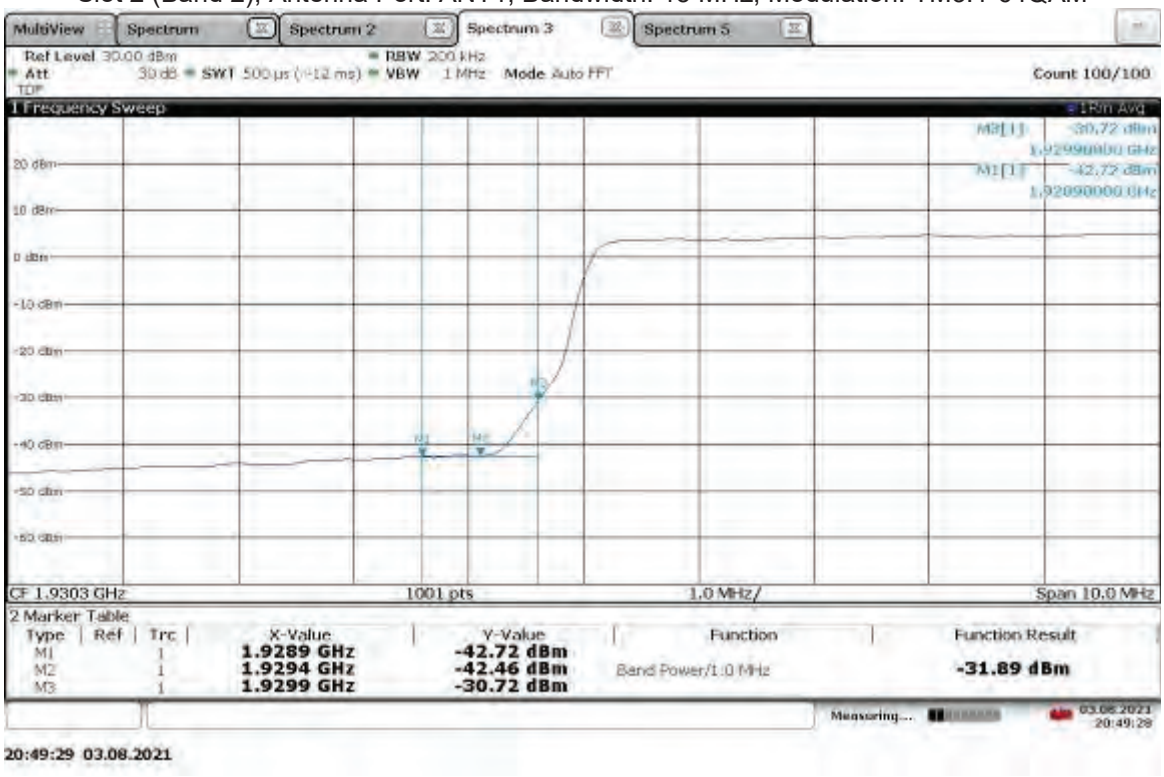
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



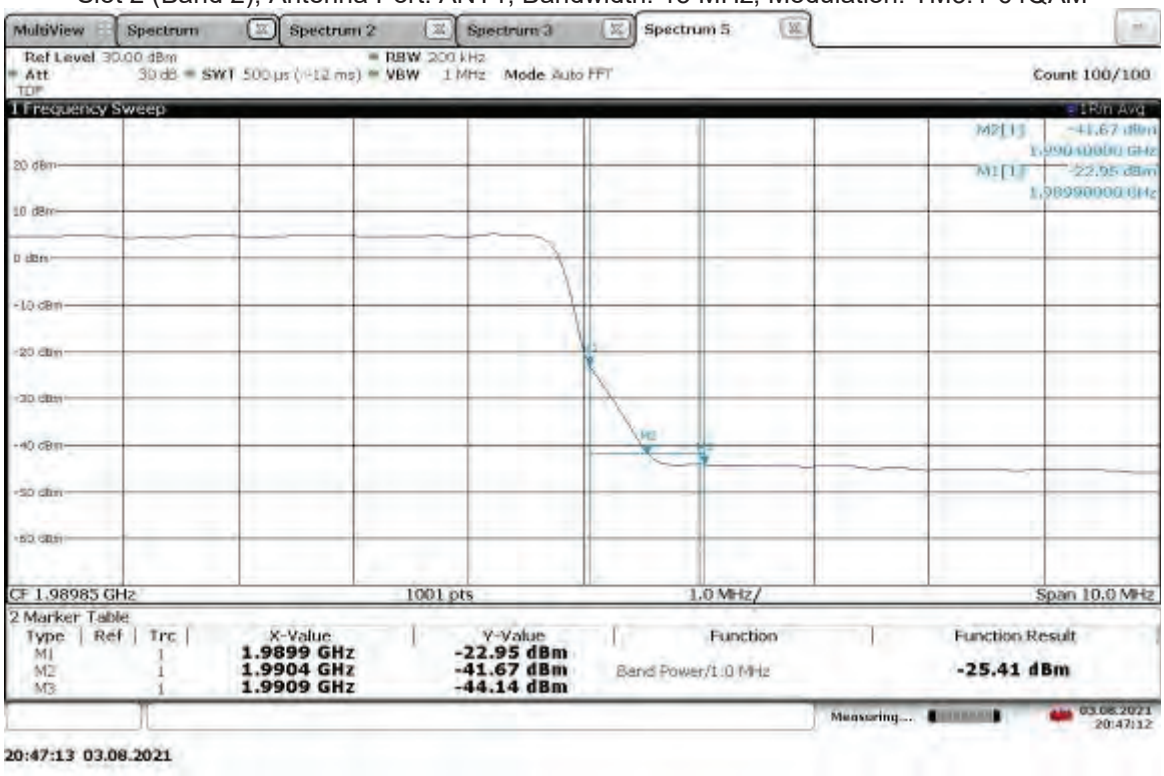
Band Edge Compliant, Upper Band Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1-64QAM



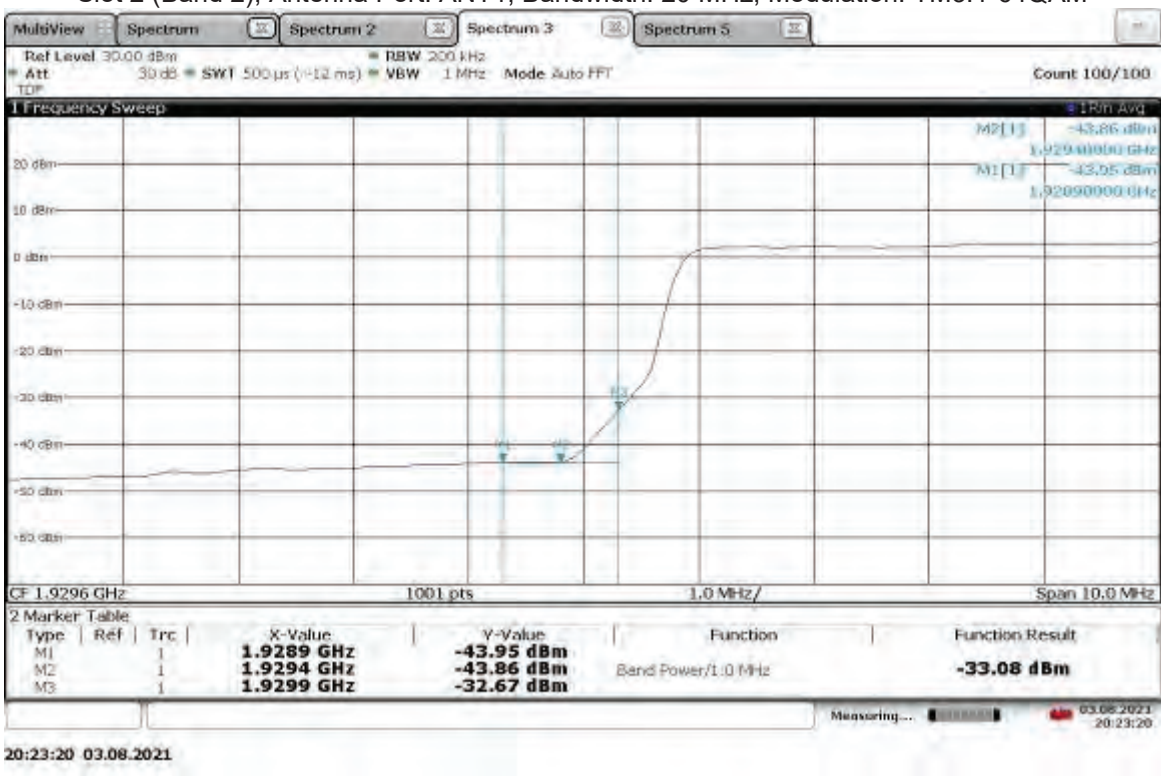
Band Edge Compliant, Lower Band Edge, 1937.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



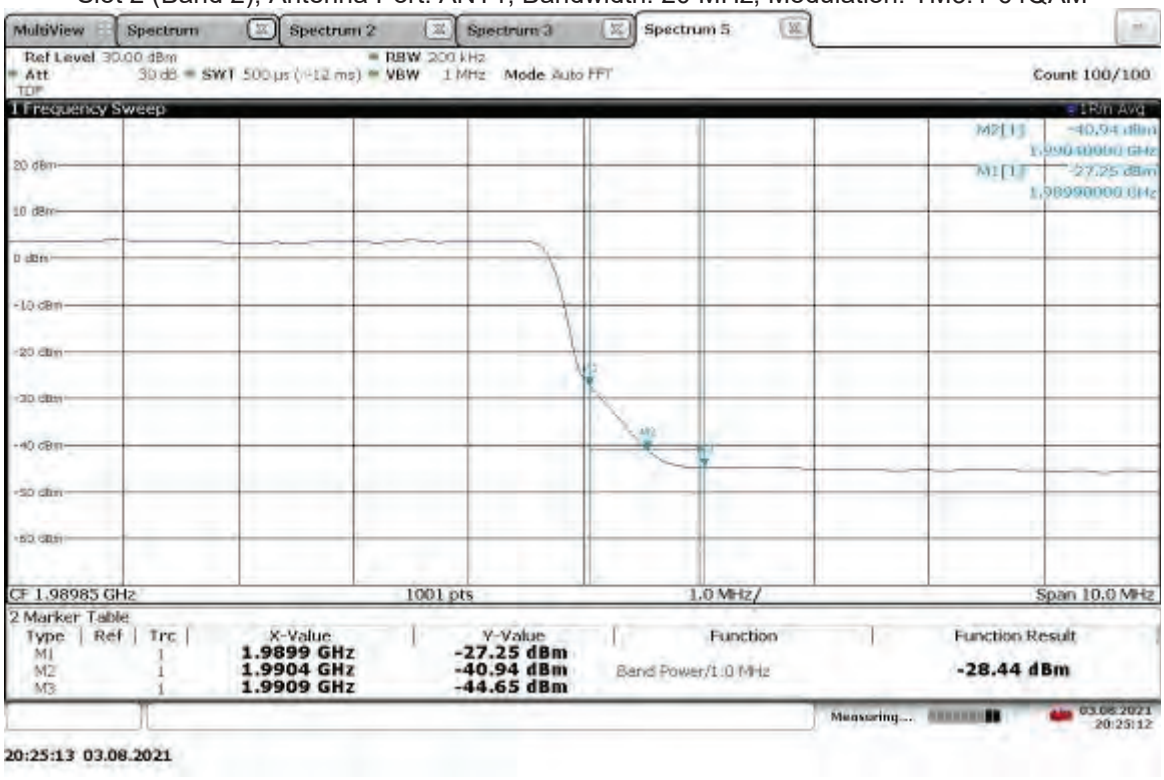
Band Edge Compliant, Upper Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1-64QAM



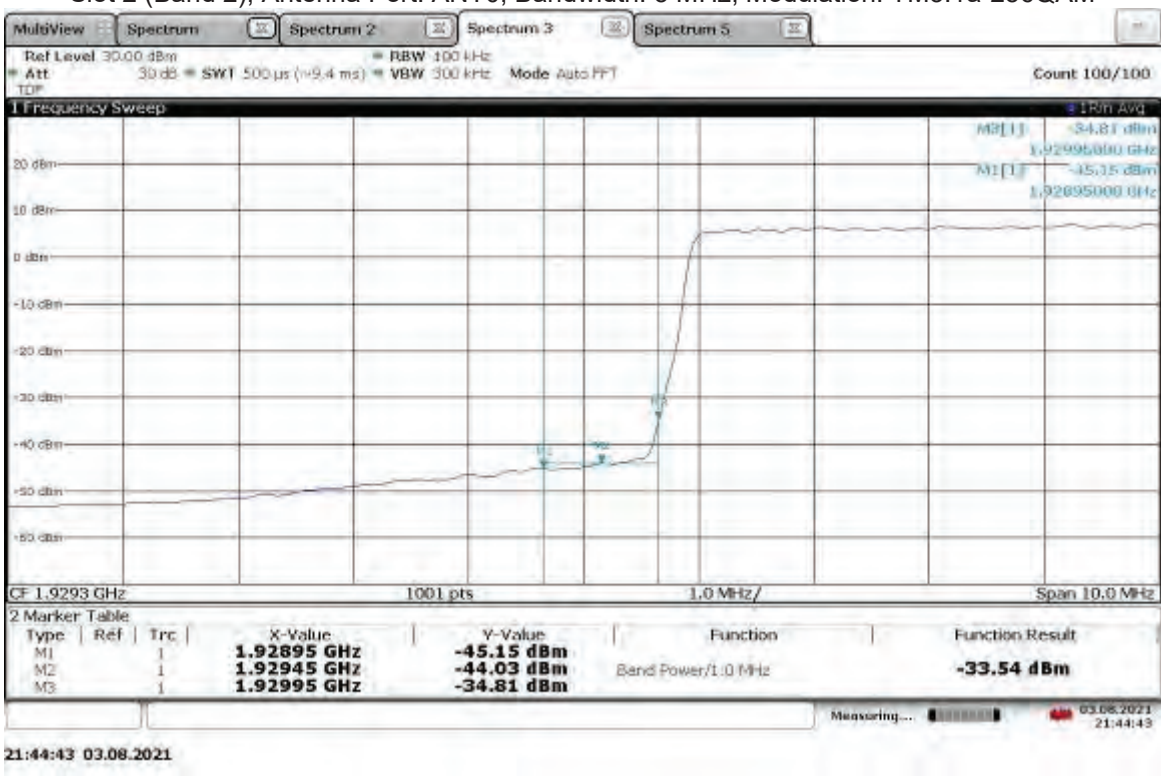
Band Edge Compliant, Lower Band Edge, 1940 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



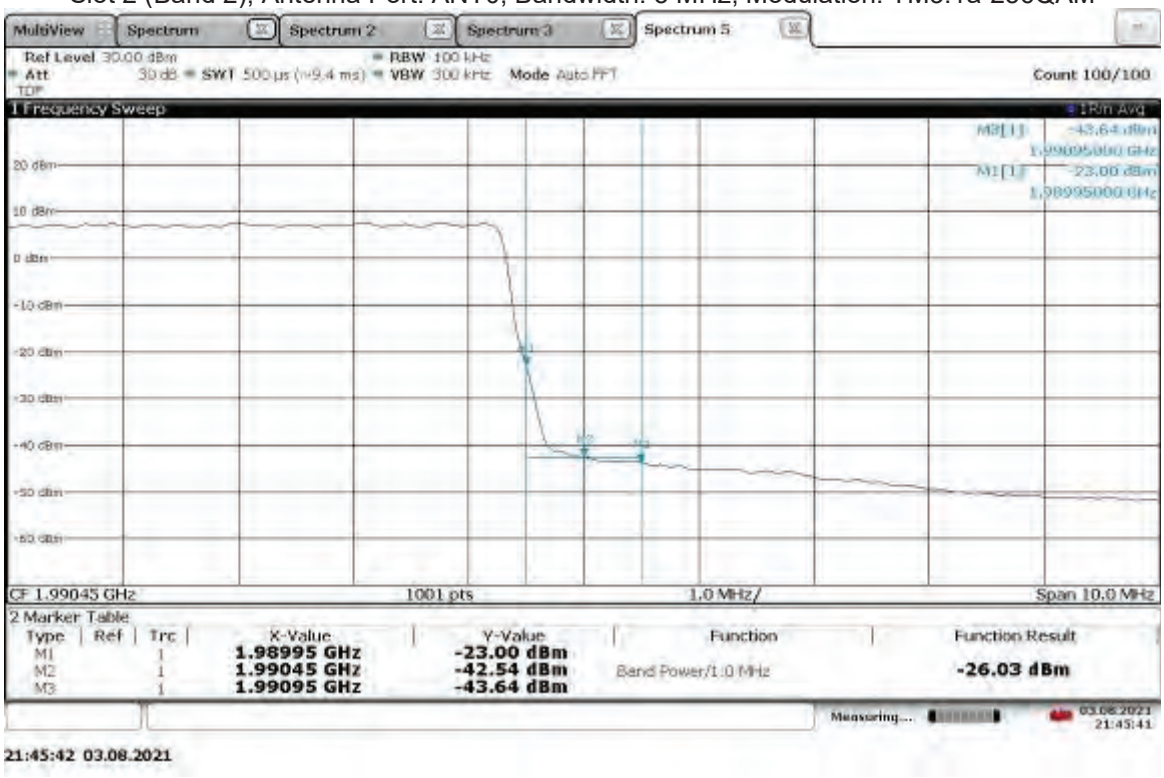
Band Edge Compliant, Upper Band Edge, 1980 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 20 MHz, Modulation: TM3.1-64QAM



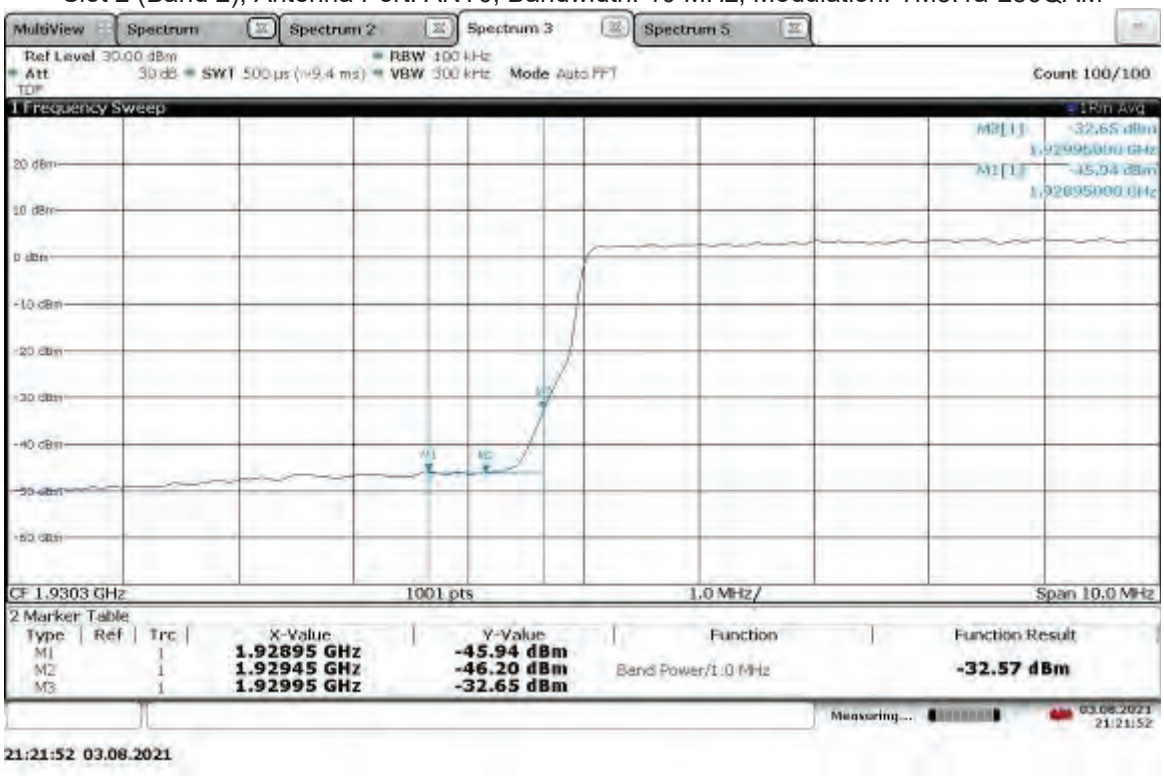
Band Edge Compliant, Lower Band Edge, 1932.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



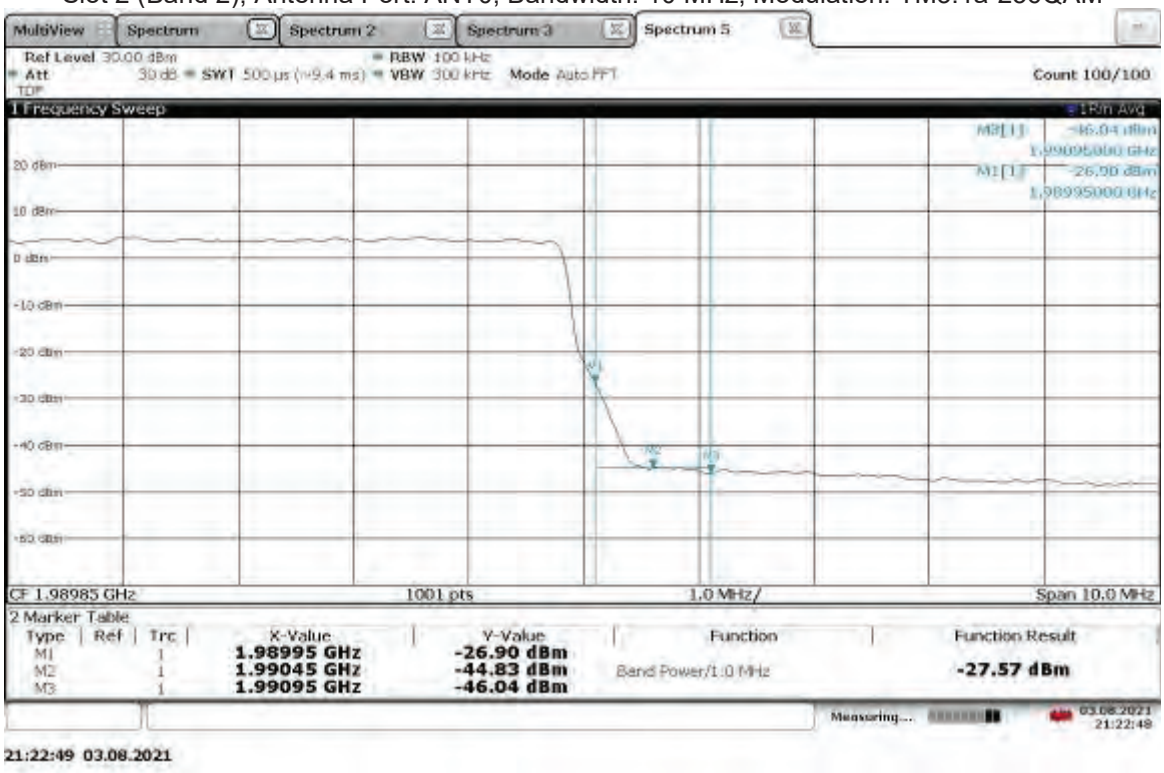
Band Edge Compliant, Upper Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



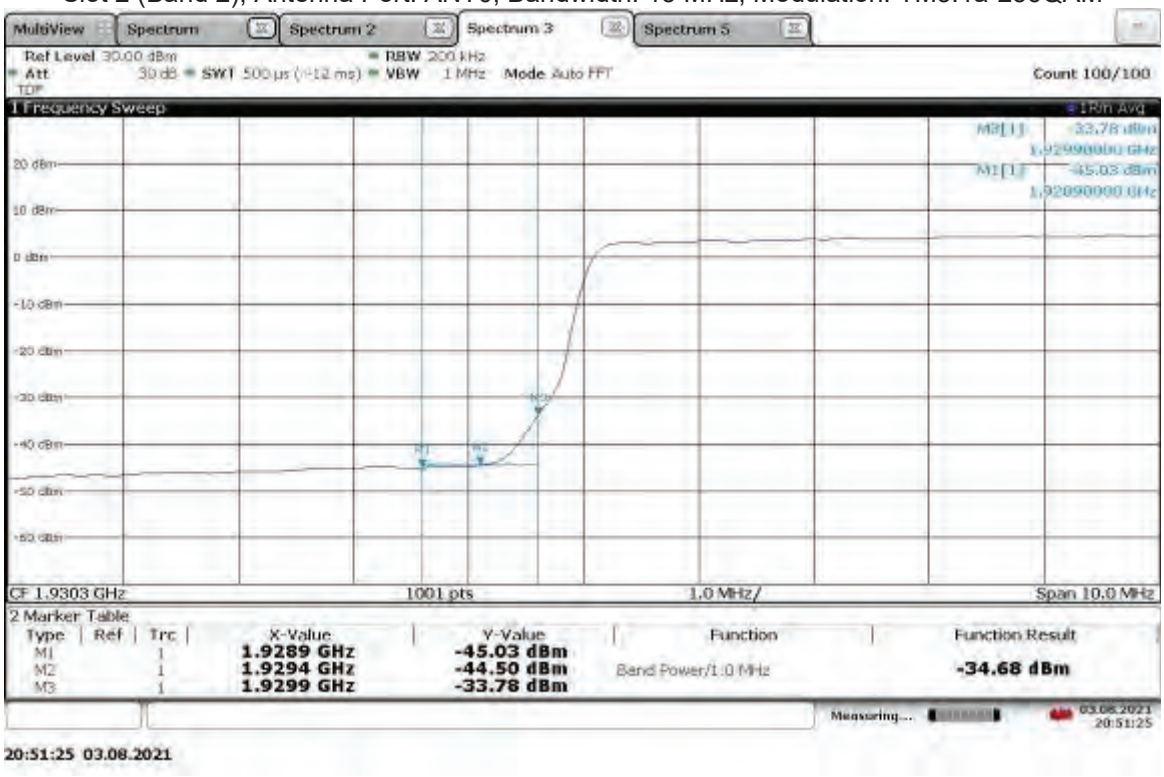
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



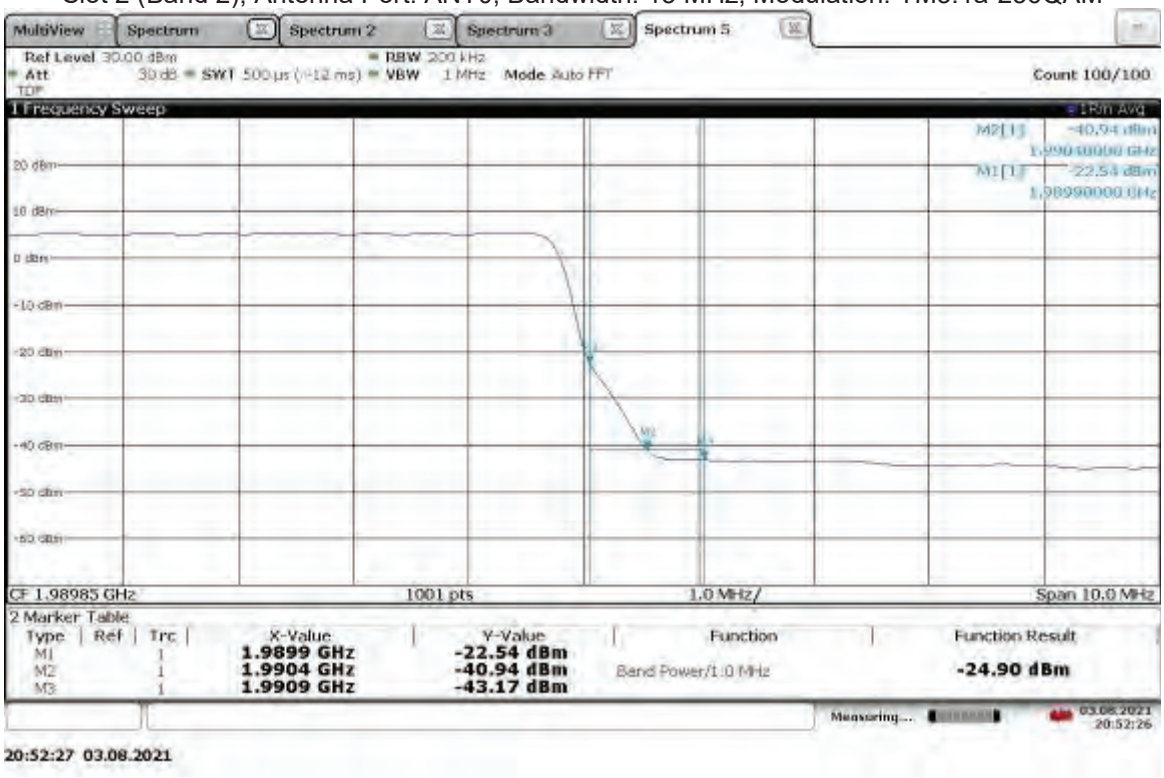
Band Edge Compliant, Upper Band Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



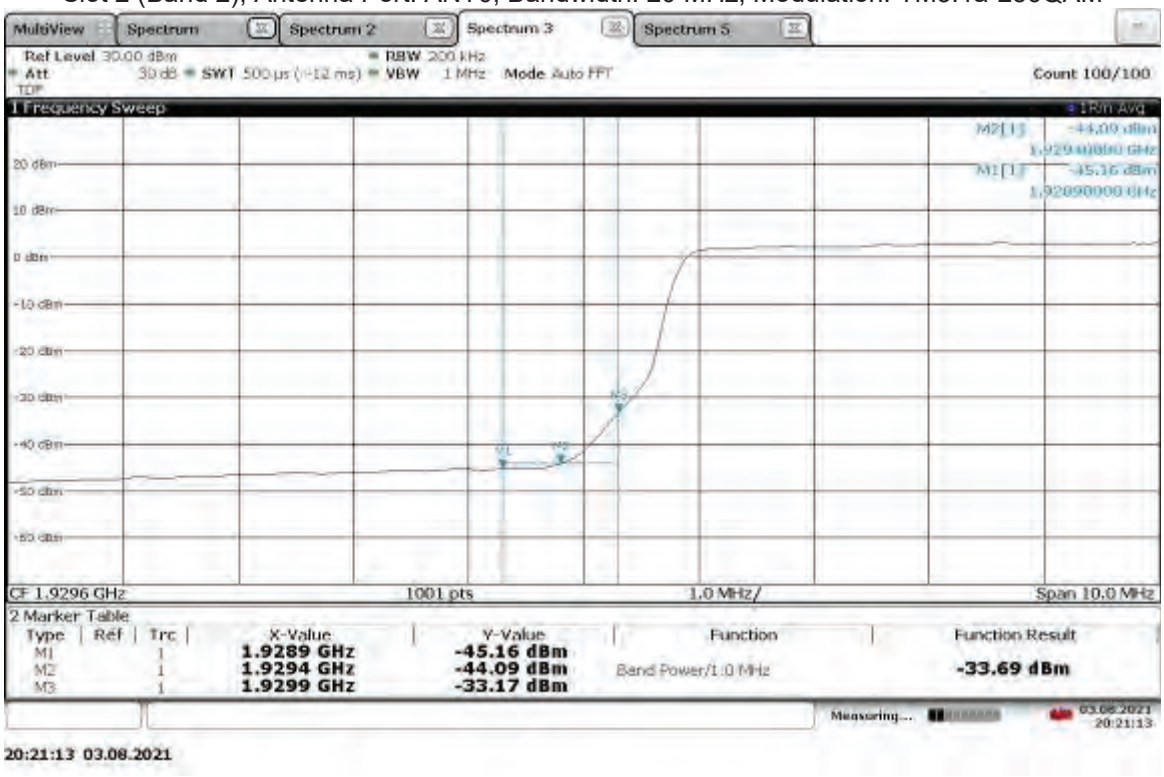
Band Edge Compliant, Lower Band Edge,1937.5MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



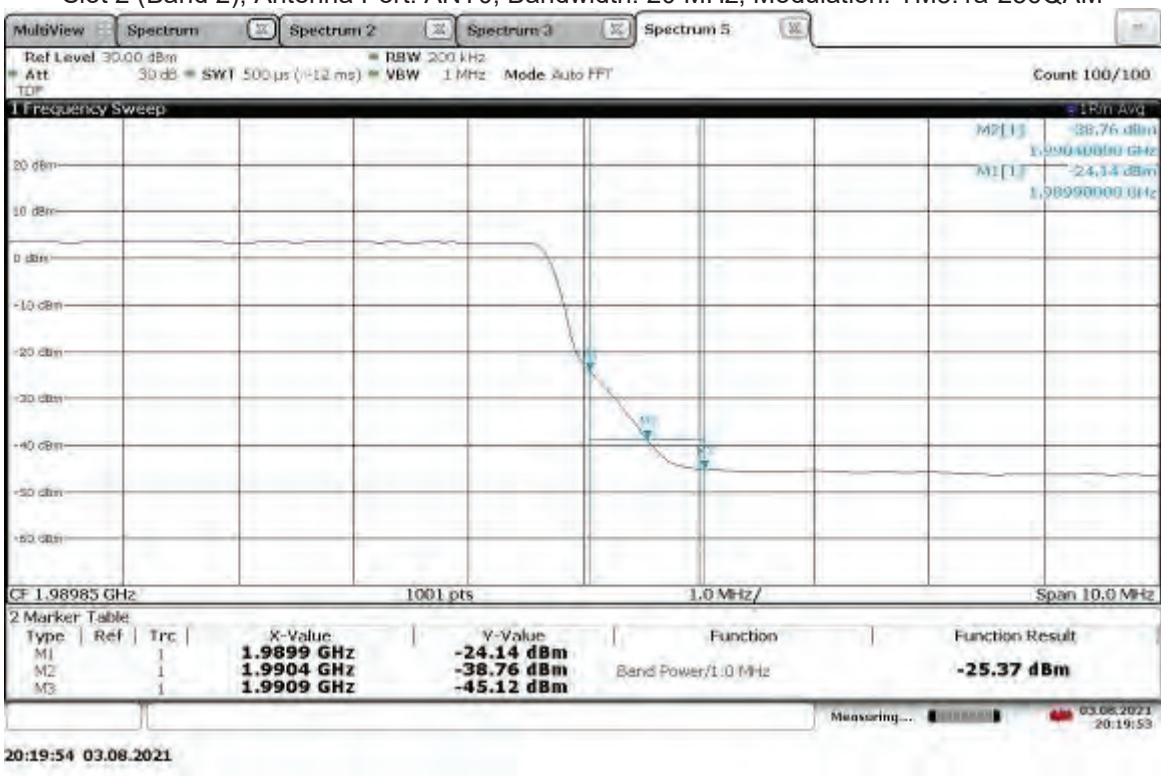
Band Edge Compliant, Upper Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



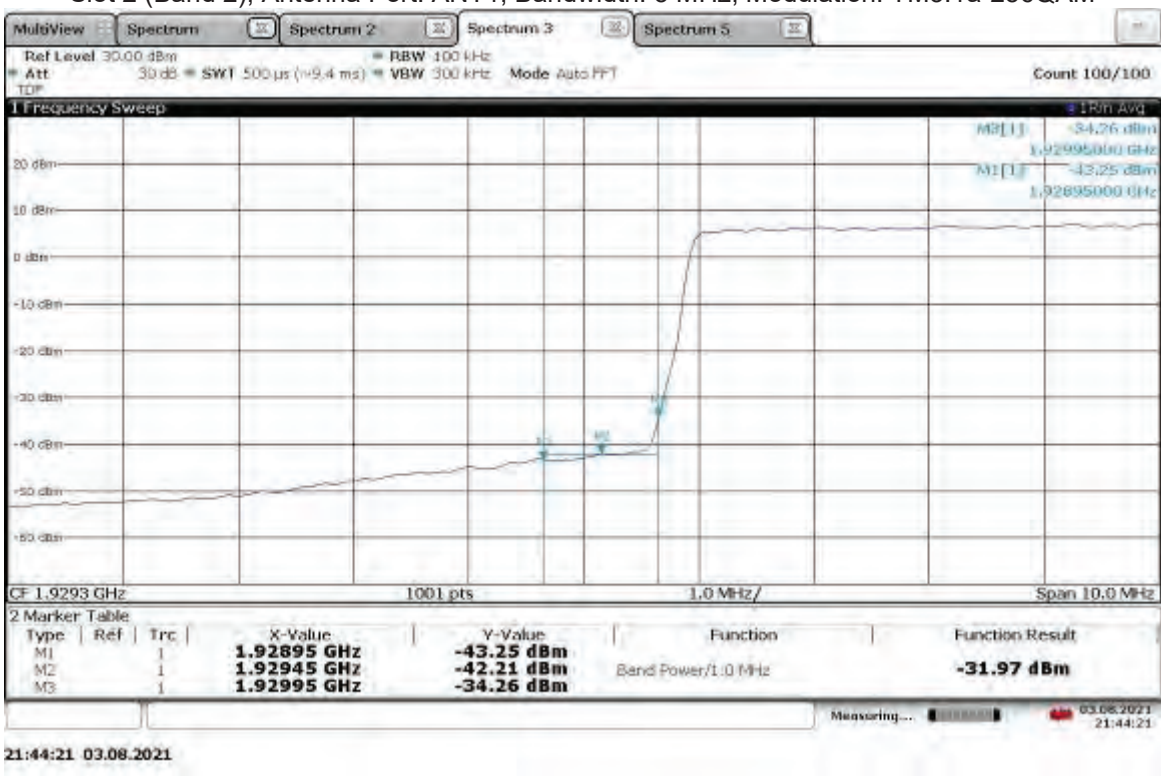
Band Edge Compliant, Lower Band Edge, 1940 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



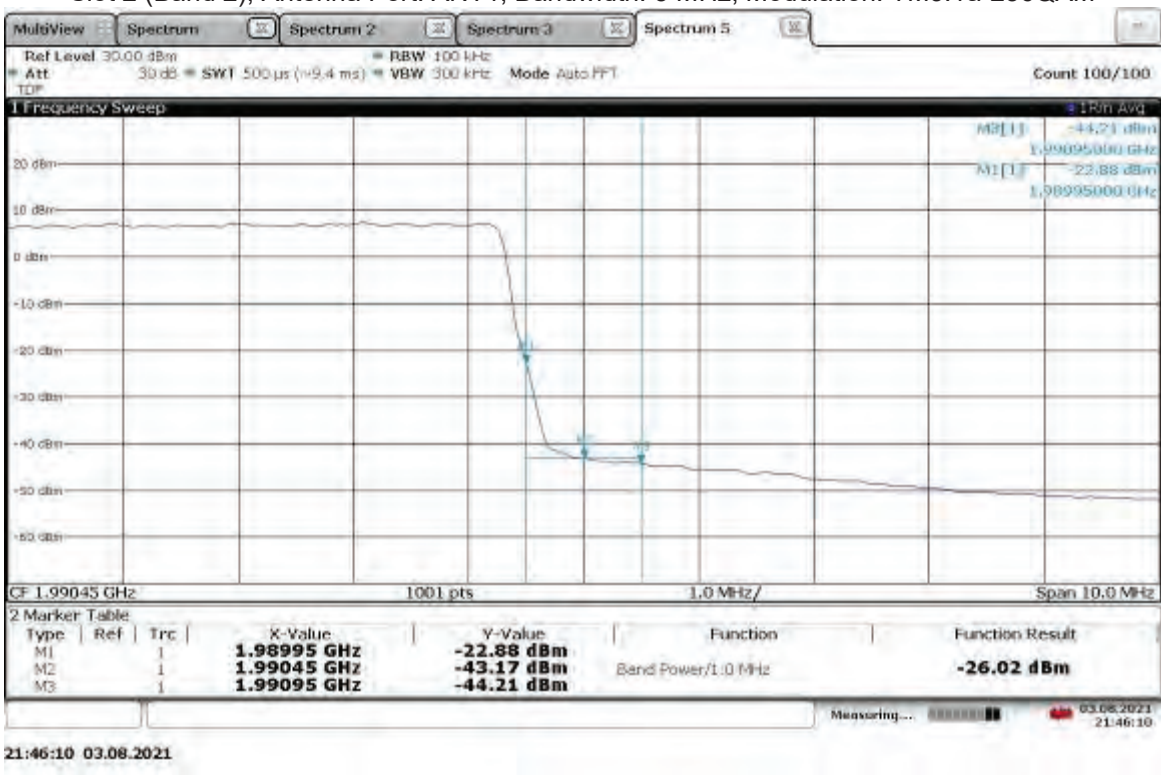
Band Edge Compliant, Upper Band Edge, 1980 MHz
Slot 2 (Band 2), Antenna Port: ANT0, Bandwidth: 20 MHz, Modulation: TM3.1a-256QAM



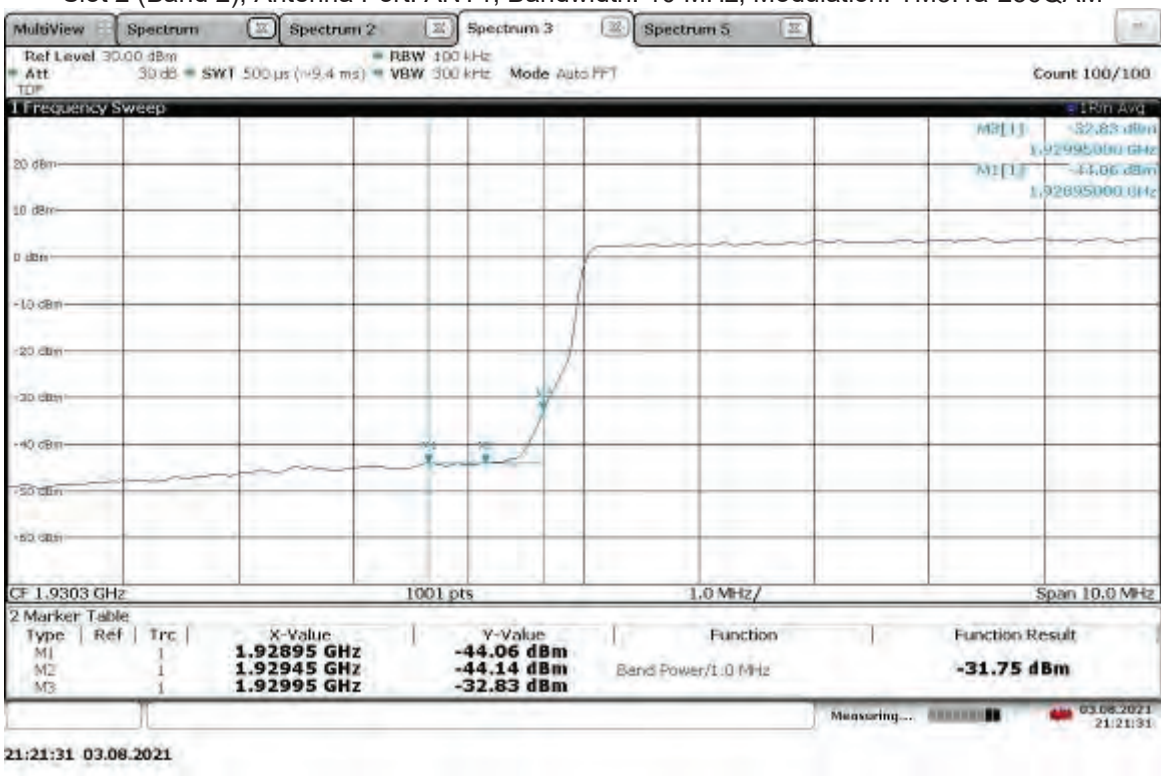
Band Edge Compliant, Lower Band Edge, 1932.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



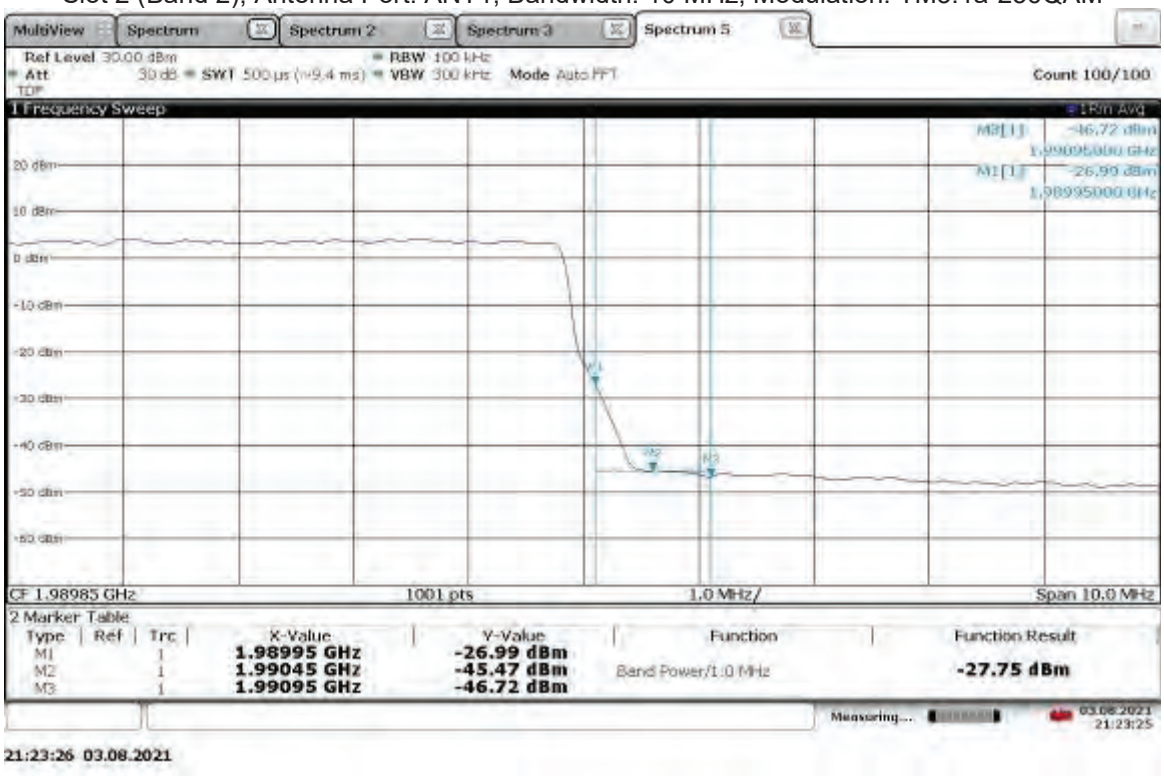
Band Edge Compliant, Upper Band Edge, 1987.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 5 MHz, Modulation: TM3.1a-256QAM



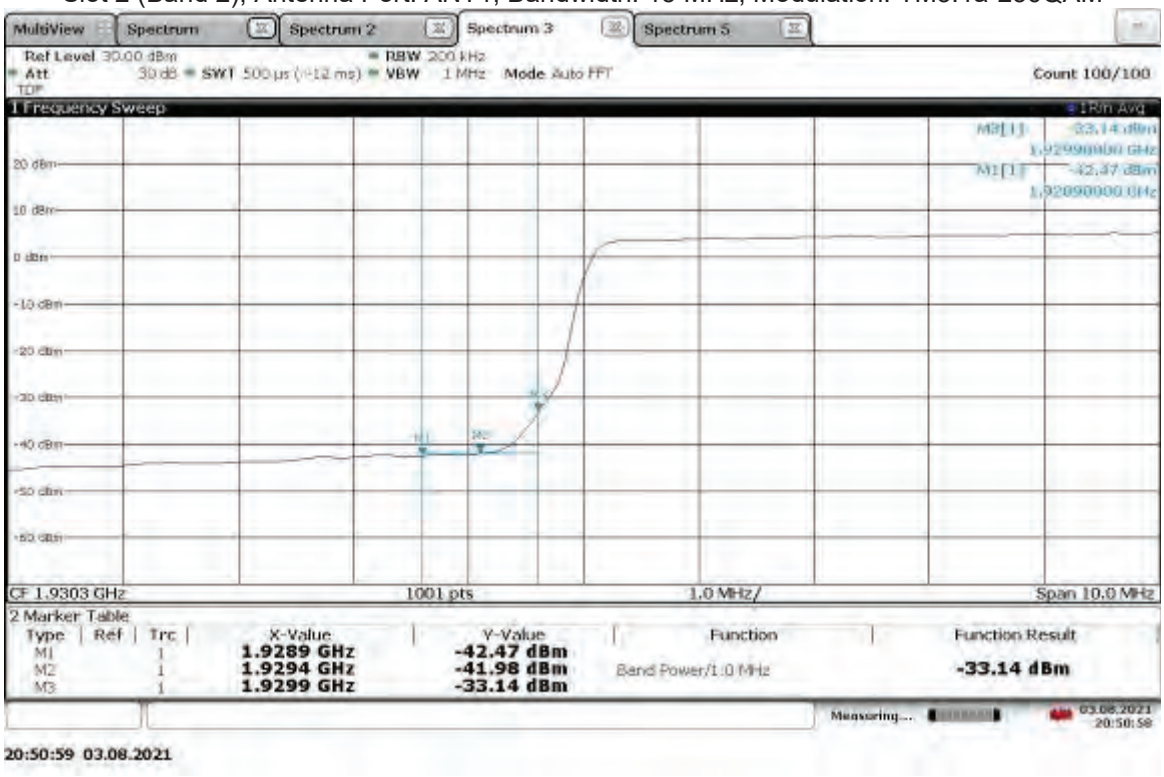
Band Edge Compliant, Lower Band Edge, 1935 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



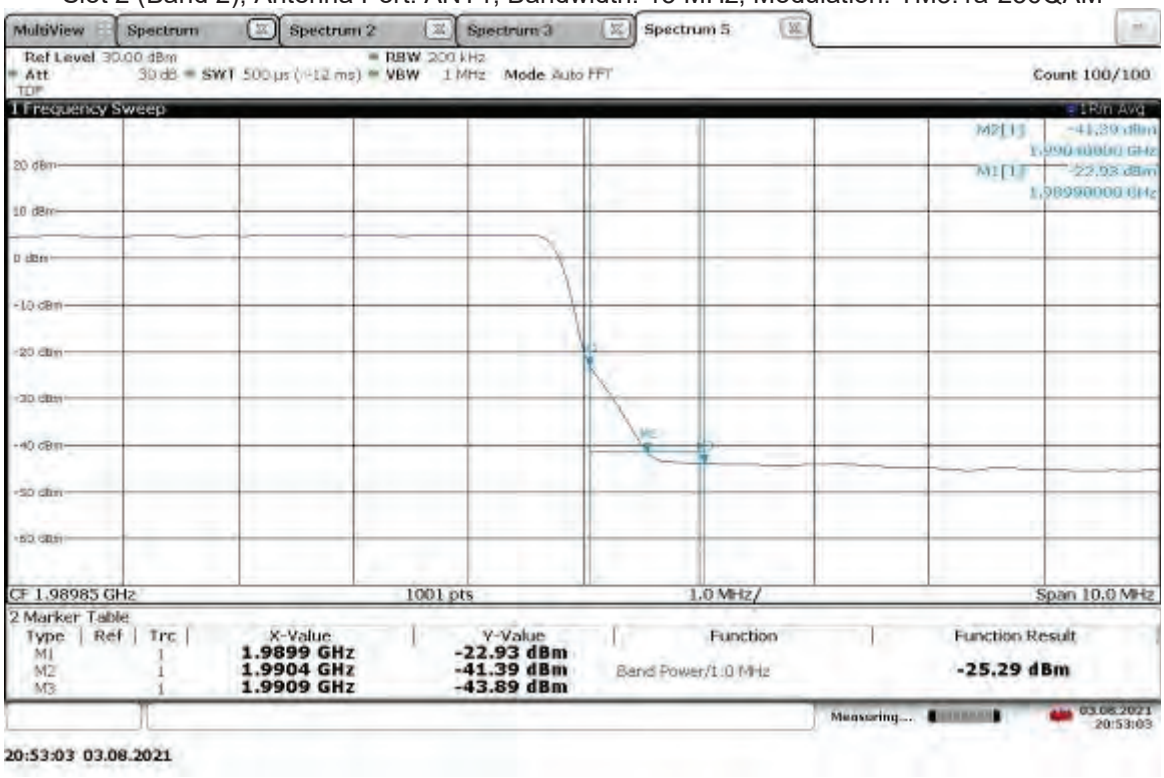
Band Edge Compliant, Upper Band Edge, 1985 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 10 MHz, Modulation: TM3.1a-256QAM



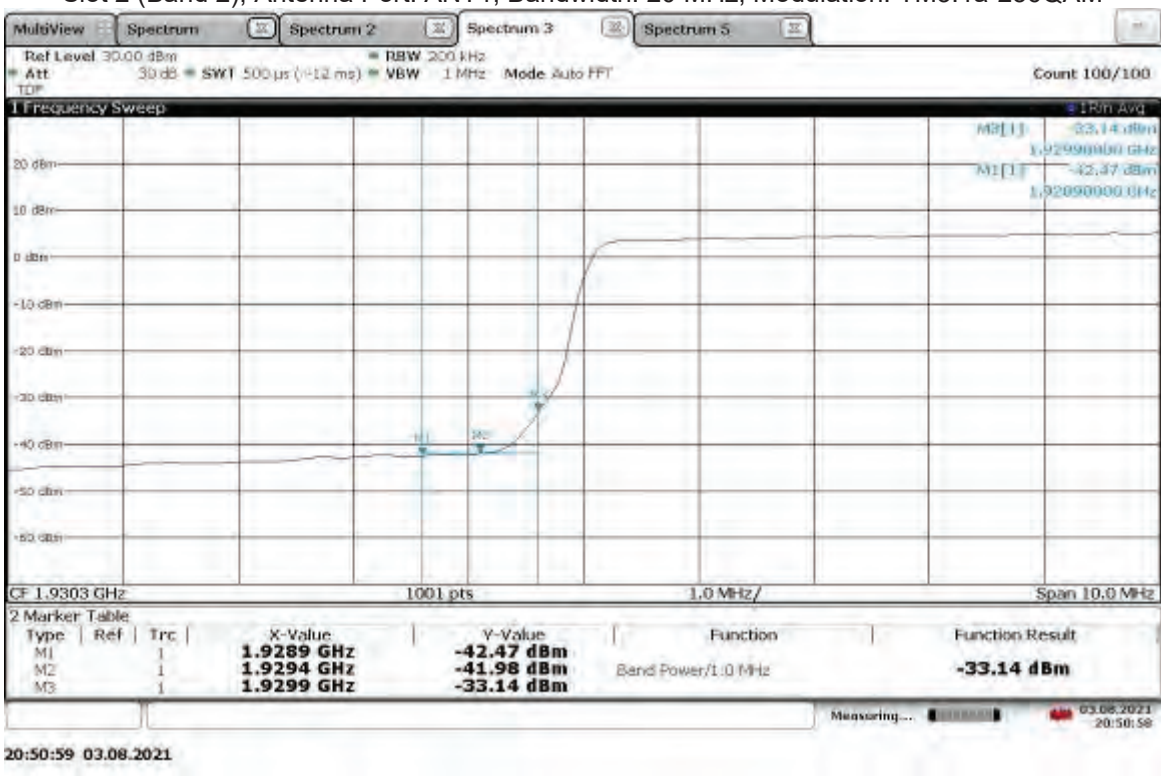
Band Edge Compliant, Lower Band Edge, 1937.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



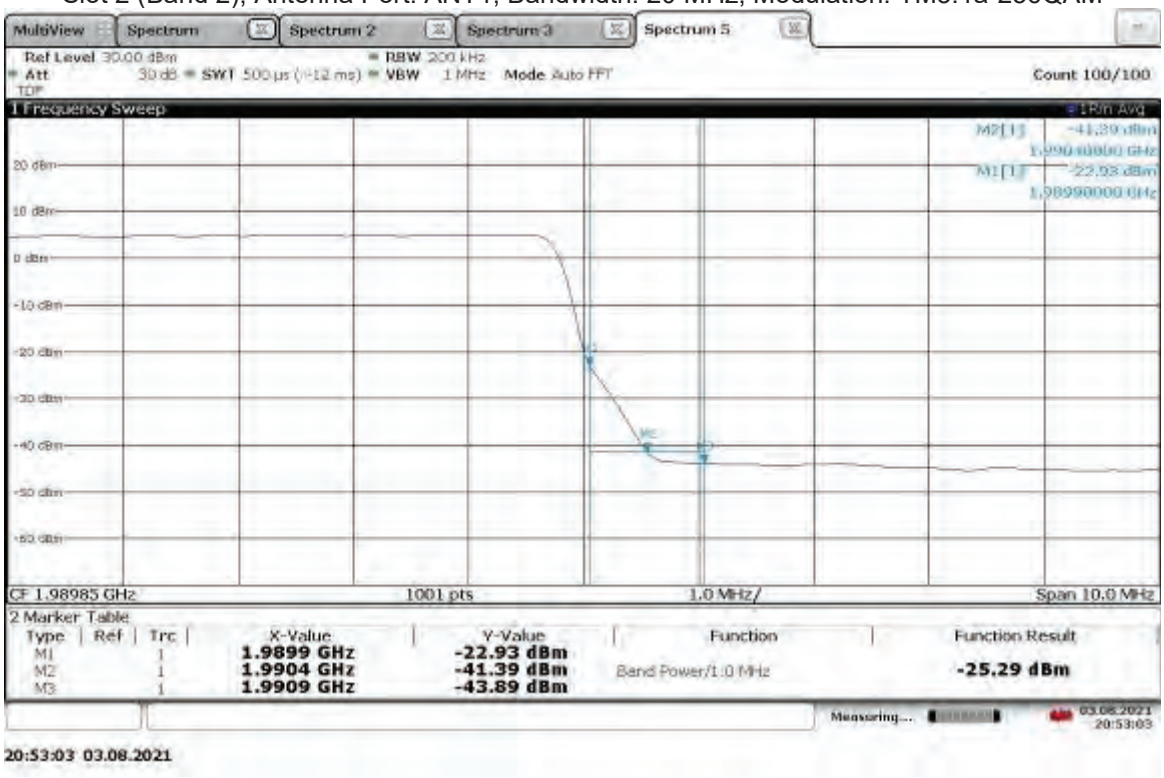
Band Edge Compliant, Upper Band Edge, 1982.5 MHz
Slot 2 (Band 2), Antenna Port: ANT1, Bandwidth: 15 MHz, Modulation: TM3.1a-256QAM



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



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



Test Personnel:	Vathana Ven	Test Date:	07/28/2021, 07/29/2021, 07/30/2021, 08/03/2021
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:	22, 23, 23, 23 ºC
		Relative Humidity:	21, 15, 26, 47, 20, 22 %
		Atmospheric Pressure:	1004, 1013, 1004, 980 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
CEN001'	DC-40GHz attenuator 20dB	Centric RF	C411-20	CEN001	01/22/2021	01/22/2022
CBLHF2012-5M-2'	5m 9kHz-40GHz Coaxial Cable - SET2	Huber & Suhner	SF102	252676002	02/19/2021	02/19/2022
ROS005-1'	Signal and Spectrum Analyzer	Rohde and Shwartz	FSW43	100646	10/27/2020	10/27/2021
DAV005'	Weather Station	Davis	6250	MS191218083	02/07/2021	02/07/2022
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	11/18/2020	11/18/2021

Software Utilized:

Name	Manufacturer	Version
None	--	--

10.3 Results:

The sample tested was found to Comply.

§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

Band 2, Modulation: TM1.1 QPSK, Bandwidth: 5MHz, Antenna Port: ANT1 , Channel: Low 1932.5

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9302636	-1.4E-06	-7.2529E-07	-0.01	2.5
-20	1.9302629	-7E-07	-3.62645E-07	0.00	2.5
-10	1.9302621	1E-07	5.18064E-08	0.00	2.5
0	1.9302618	-4E-07	-2.07226E-07	0.00	2.5
10	1.9302618	-4E-07	-2.07226E-07	0.00	2.5
20	1.9302622	0	0	0.00	--
30	1.9302629	7E-07	3.62645E-07	0.00	2.5
40	1.9302619	-3E-07	-1.55419E-07	0.00	2.5
50	1.93022619	-3.601E-05	-1.86555E-05	-0.19	2.5

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9347342	-2.5E-06	-1.29217E-06	-0.01	2.5
-20	1.9347328	-1.1E-06	-5.68554E-07	-0.01	2.5
-10	1.9347327	-1E-06	-5.16868E-07	-0.01	2.5
0	1.9347327	1E-06	5.16868E-07	0.01	2.5
10	1.9347332	1.5E-06	7.75301E-07	0.01	2.5
20	1.9347317	0	0	0.00	--
30	1.934733	1.3E-06	6.71928E-07	0.01	2.5
40	1.9347327	1E-06	5.16868E-07	0.01	2.5
50	1.9347325	8E-07	4.13494E-07	0.00	2.5

Frequency stability over temperature

Band 2, Modulation: TM1.1 QPSK, Bandwidth: 5MHz, Antenna Port: ANT1 , Channel: High 1987.5 MHz

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9852549	7E-07	3.52599E-07	0.00	2.5
-20	1.9852551	5E-07	2.51857E-07	0.00	2.5
-10	1.9852554	2E-07	1.00743E-07	0.00	2.5
0	1.9852535	-2.1E-06	-1.0578E-06	-0.01	2.5
10	1.9852554	-2E-07	-1.00743E-07	0.00	2.5
20	1.9852556	0	0	0.00	--
30	1.985257	1.4E-06	7.05199E-07	0.01	2.5
40	1.9852556	0	0	0.00	2.5
50	1.9852552	-4E-07	-2.01485E-07	0.00	2.5

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9897281	8E-07	4.02065E-07	0.00	2.5
-20	1.9897284	5E-07	2.51291E-07	0.00	2.5
-10	1.9897282	7E-07	3.51807E-07	0.00	2.5
0	1.9897288	-1E-07	-5.02581E-08	0.00	2.5
10	1.9897285	-4E-07	-2.01032E-07	0.00	2.5
20	1.9897289	0	0	0.00	--
30	1.9897274	-1.5E-06	-7.53872E-07	-0.01	2.5
40	1.9897277	-1.2E-06	-6.03097E-07	-0.01	2.5
50	1.9897275	-1.4E-06	-7.03613E-07	-0.01	2.5

Frequency stability over temperature

Band 2, Modulation: TM1.1 QPSK, Bandwidth: 20MHz, Antenna Port: ANT1 , Channel: Low 1940 MHz

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9305789	-9.9E-06	-5.12802E-06	-0.05	2.5
-20	1.930576	-7E-06	-3.62587E-06	-0.04	2.5
-10	1.9305746	-5.6E-06	-2.9007E-06	-0.03	2.5
0	1.9305709	1.9E-06	9.84166E-07	0.01	2.5
10	1.930571	2E-06	1.03596E-06	0.01	2.5
20	1.930569	0	0	0.00	--
30	1.9305683	-7E-07	-3.62587E-07	0.00	2.5
40	1.9305707	1.7E-06	8.80569E-07	0.01	2.5
50	1.9305682	-8E-07	-4.14386E-07	0.00	2.5

Upper Edge of Occupied Bandwidth

Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9494513	5E-07	2.56482E-07	0.00	2.5
-20	1.9494518	0	0	0.00	2.5
-10	1.9494512	6E-07	3.07779E-07	0.00	2.5
0	1.9494552	3.4E-06	1.74408E-06	0.02	2.5
10	1.9494532	1.4E-06	7.18151E-07	0.01	2.5
20	1.9494518	0	0	0.00	--
30	1.9494499	-1.9E-06	-9.74633E-07	-0.01	2.5
40	1.9494497	-2.1E-06	-1.07723E-06	-0.01	2.5
50	1.9494489	-2.9E-06	-1.4876E-06	-0.01	2.5

Frequency stability over temperature

Band 2, Modulation: TM1.1 QPSK, Bandwidth: 20MHz, Antenna Port: ANT1 , Channel: High 1980 MHz

Low Edge of Occupied Bandwidth

Temperature	Low Edge	Low Edge Deviation	Low Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9705043	3.7E-06	1.87769E-06	0.02	2.5
-20	1.9705074	6E-07	3.0449E-07	0.00	2.5
-10	1.9705086	-6E-07	-3.0449E-07	0.00	2.5
0	1.9705062	-1.8E-06	-9.1347E-07	-0.01	2.5
10	1.9705091	1.1E-06	5.58232E-07	0.01	2.5
20	1.970508	0	0	0.00	--
30	1.9705107	2.7E-06	1.37021E-06	0.01	2.5
40	1.9705136	5.6E-06	2.84191E-06	0.03	2.5
50	1.9705115	3.5E-06	1.77619E-06	0.02	2.5

Upper Edge of Occupied Bandwidth

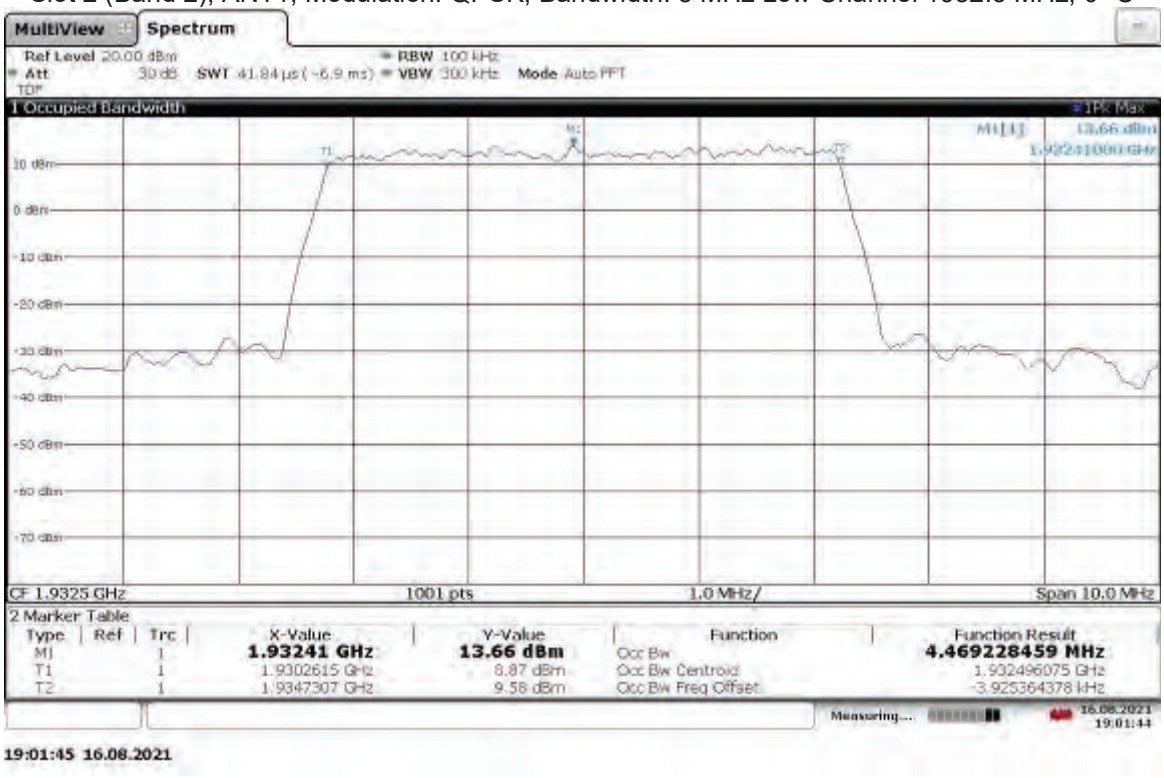
Temperature	Upper Edge	Upper Edge Deviation	Upper Edge (%)	PPM	Limit
(Deg. C)	(GHz)	(GHz)	--	--	PPM
-30	1.9894287	1.2E-06	6.03188E-07	0.01	2.5
-20	1.9894326	-2.7E-06	-1.35717E-06	-0.01	2.5
-10	1.989436	-6.1E-06	-3.06621E-06	-0.03	2.5
0	1.9894347	4.8E-06	2.41275E-06	0.02	2.5
10	1.9894314	1.5E-06	7.53985E-07	0.01	2.5
20	1.9894299	0	0	0.00	--
30	1.9894298	-1E-07	-5.02657E-08	0.00	2.5
40	1.9894305	6E-07	3.01594E-07	0.00	2.5
50	1.9894305	6E-07	3.01594E-07	0.00	2.5

10.4 Setup Photographs:

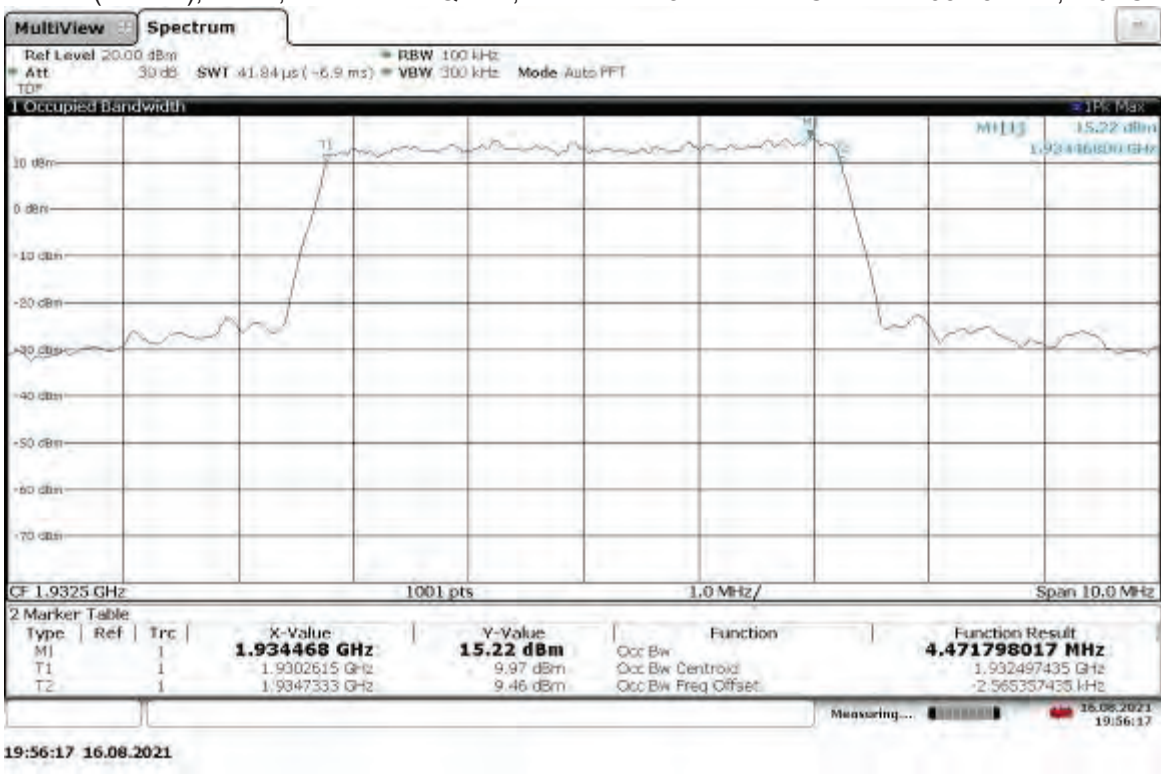
Photographs are available in a separate exhibit

10.5 Plots/Data:

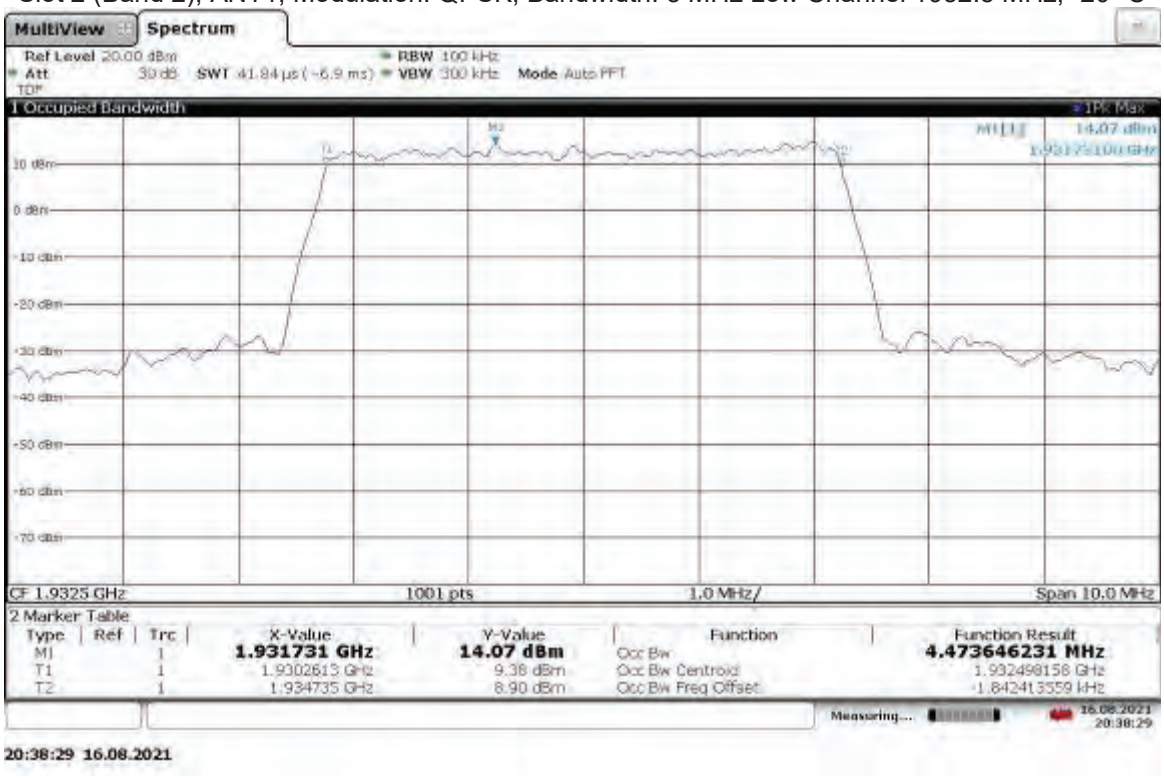
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, 0 ºC



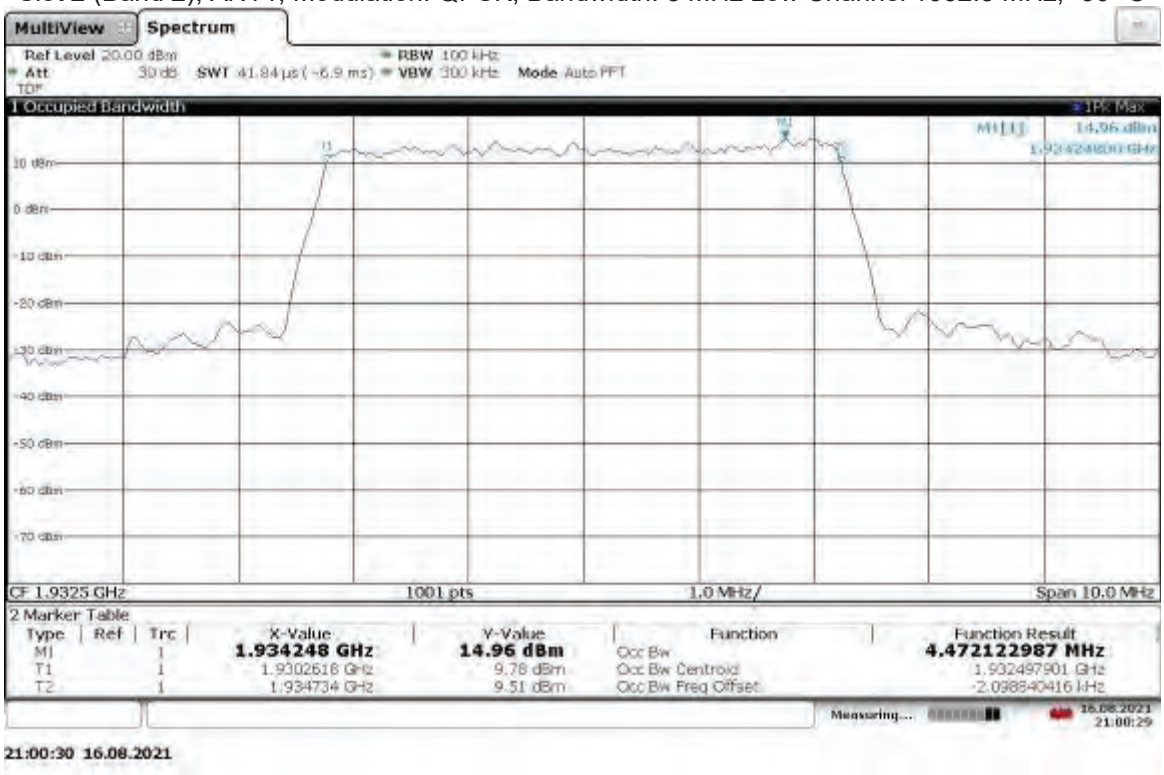
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, -10 ºC



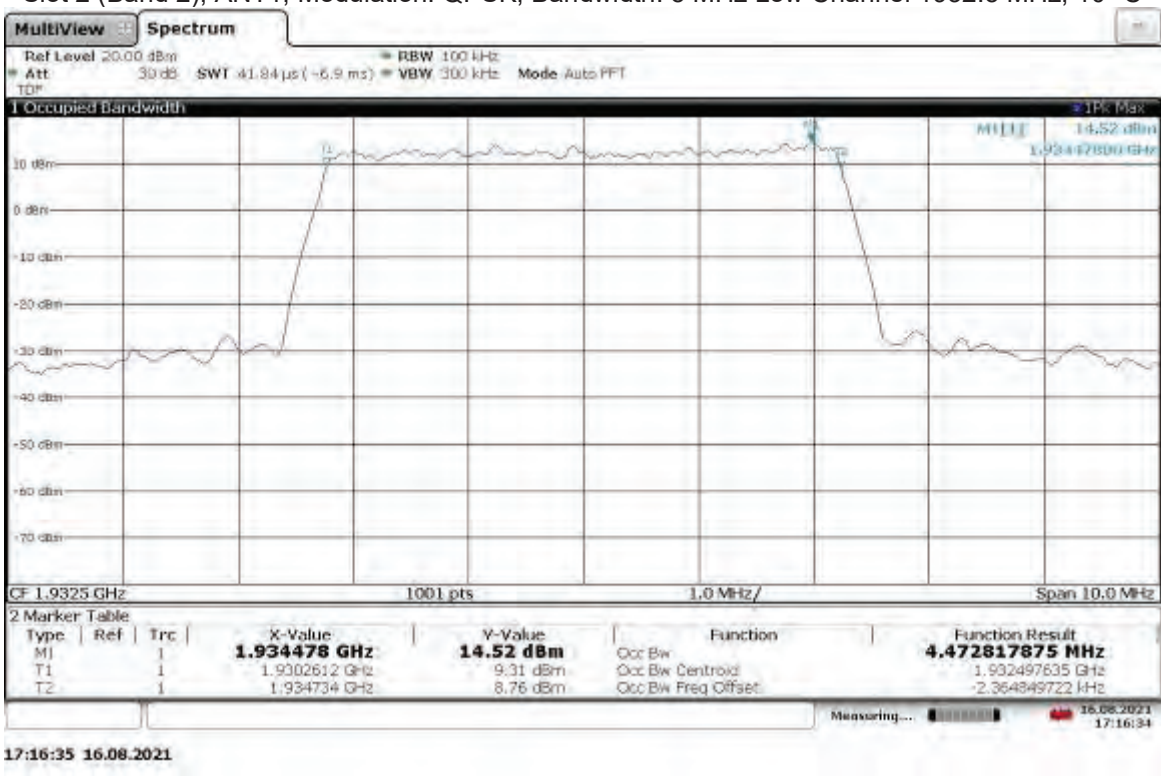
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, -20 ºC



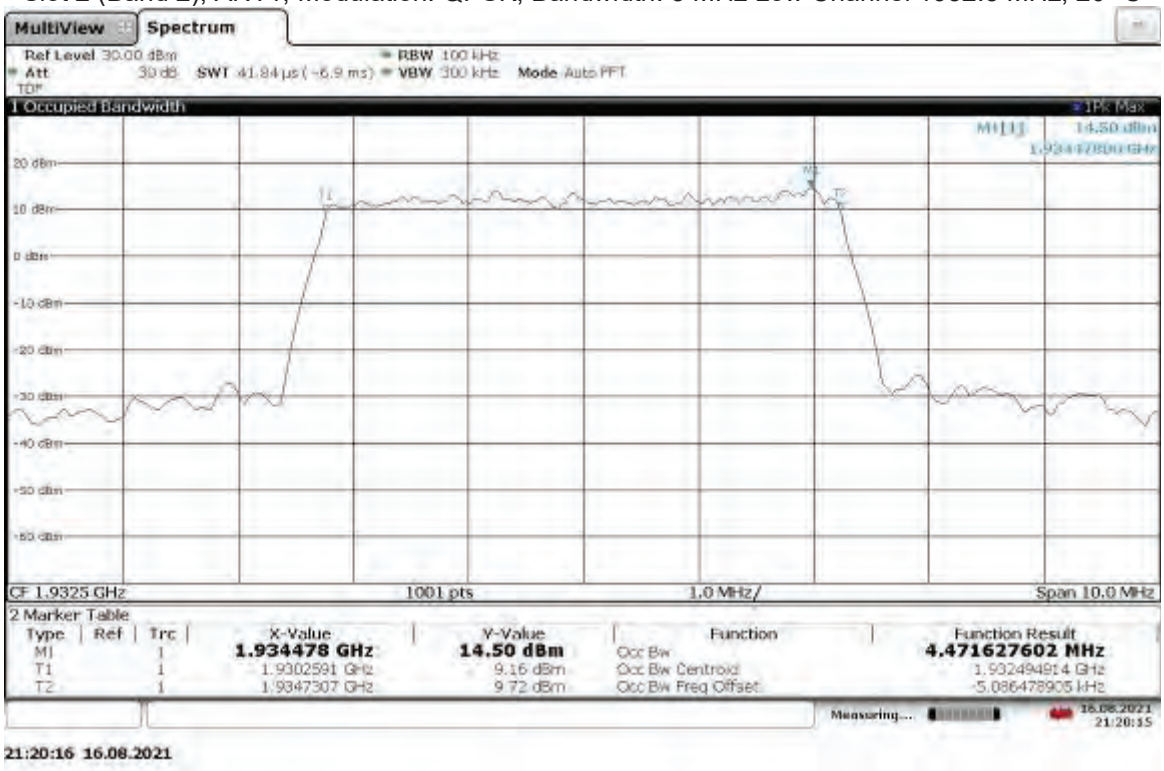
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, -30 ºC



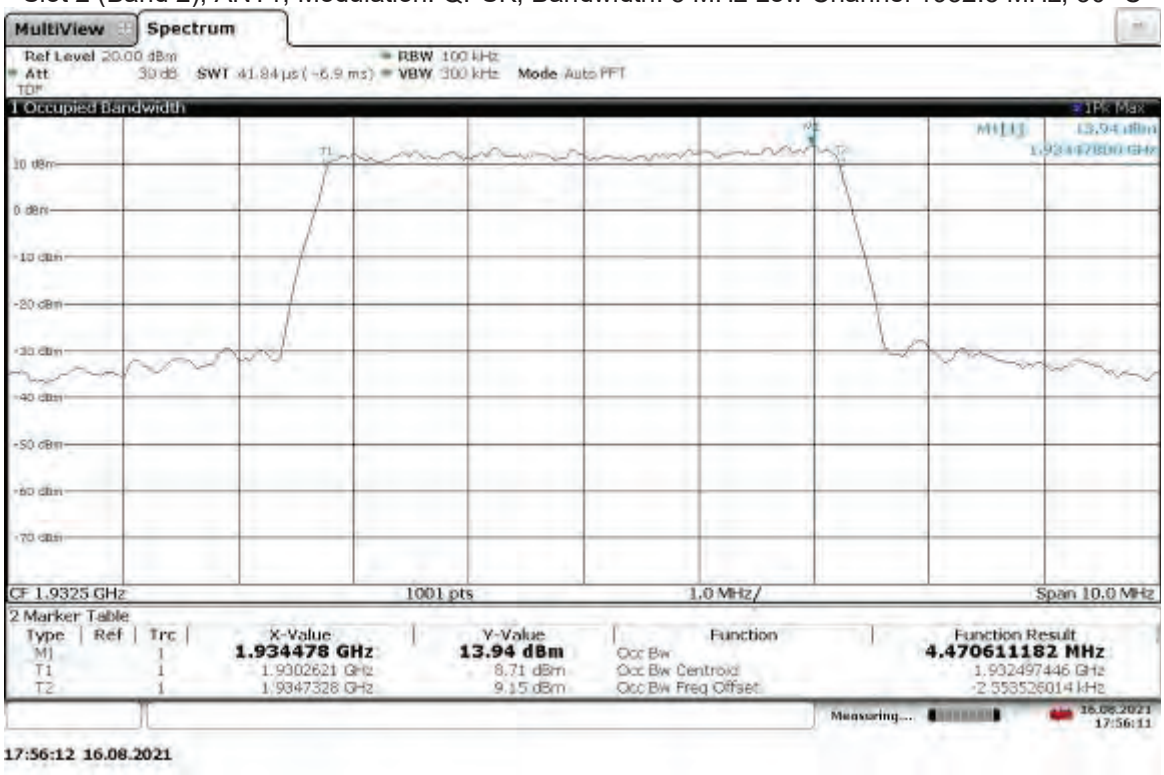
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, 10 ºC



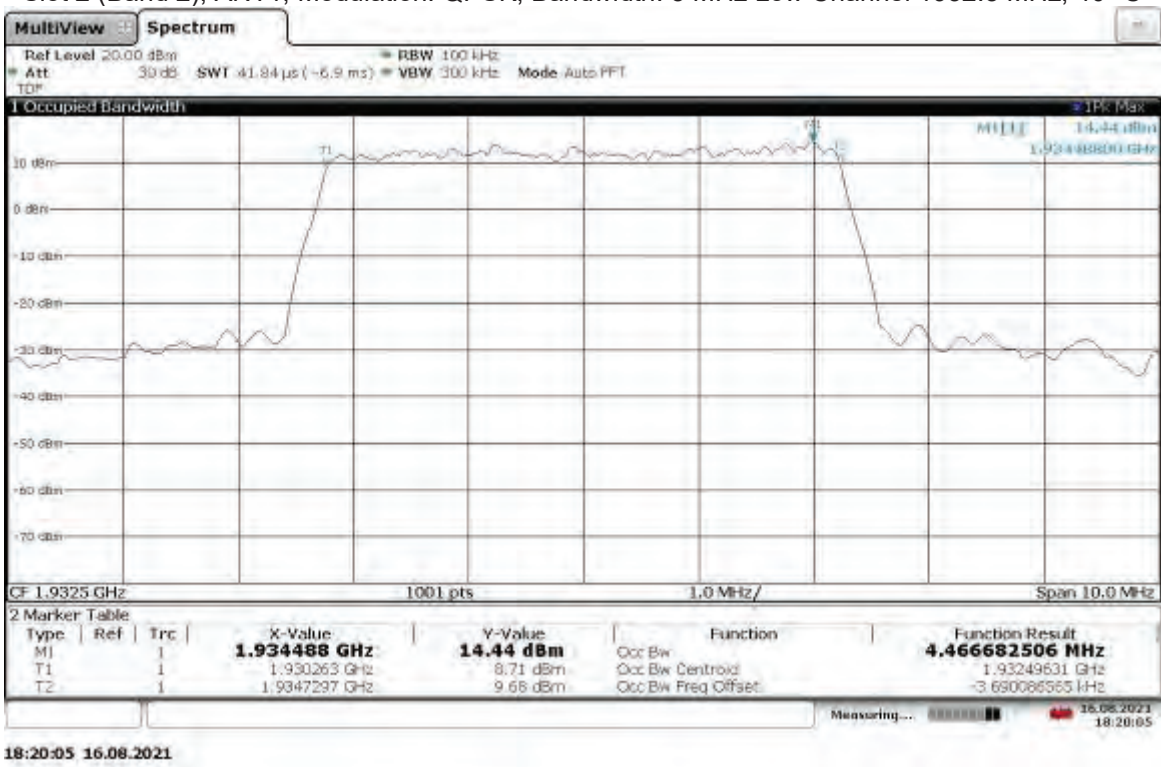
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, 20 ºC



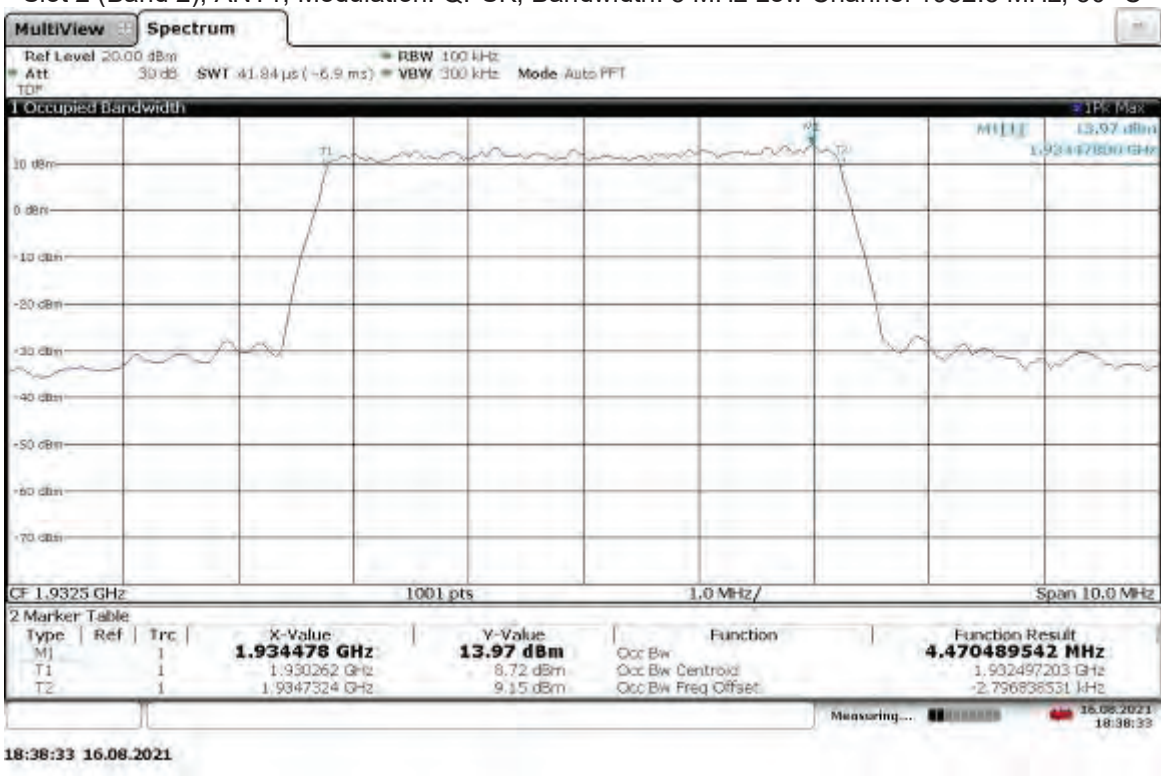
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, 30 ºC



Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, 40 ºC

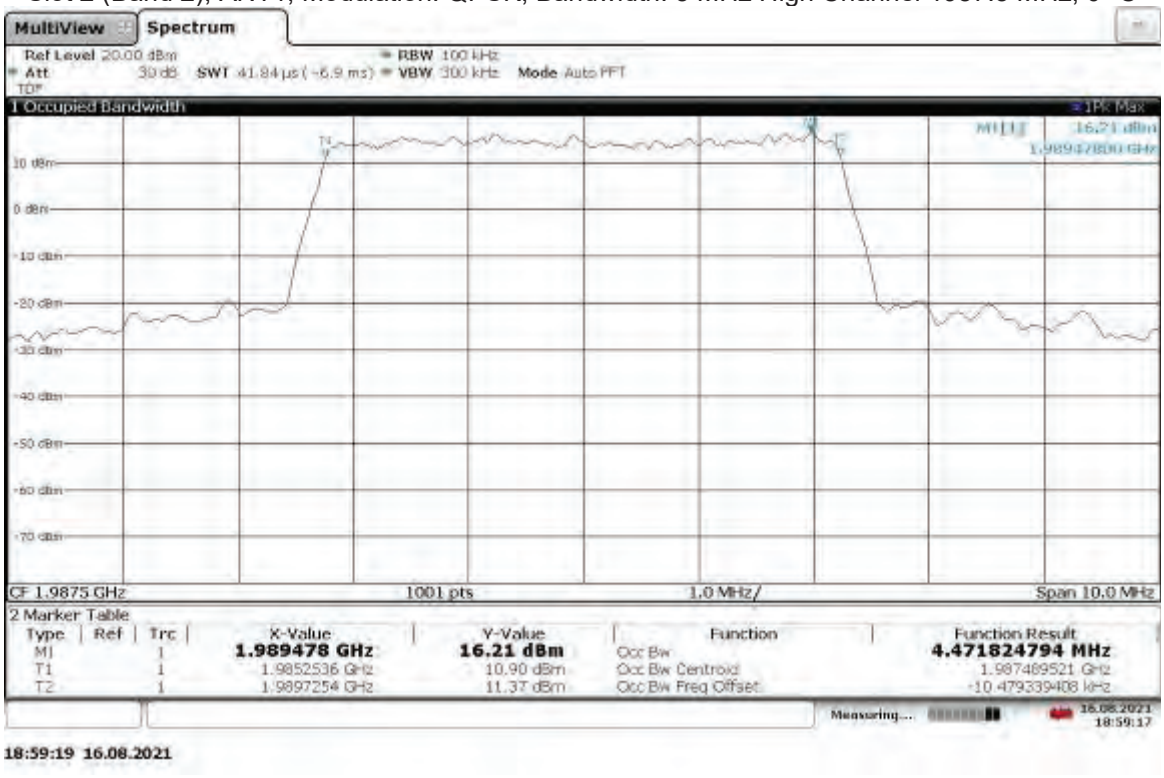


Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz Low Channel 1932.5 MHz, 50 ºC



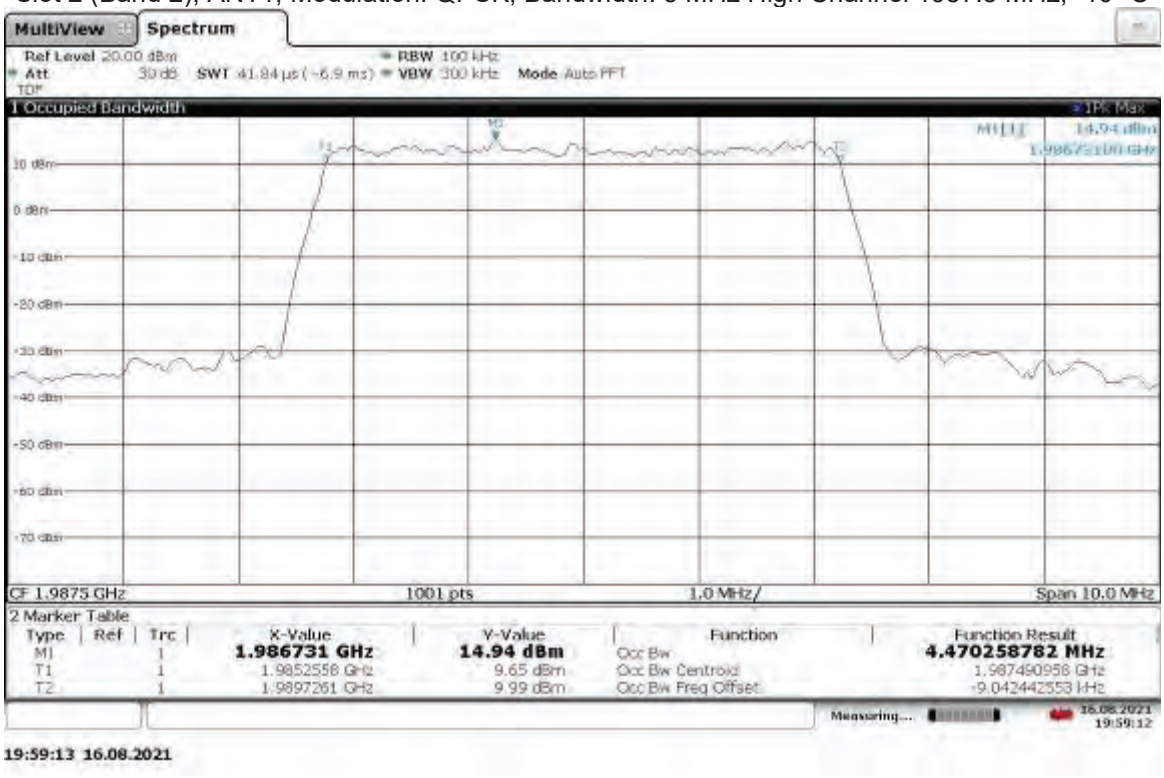
18:38:33 16.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, 0 ºC



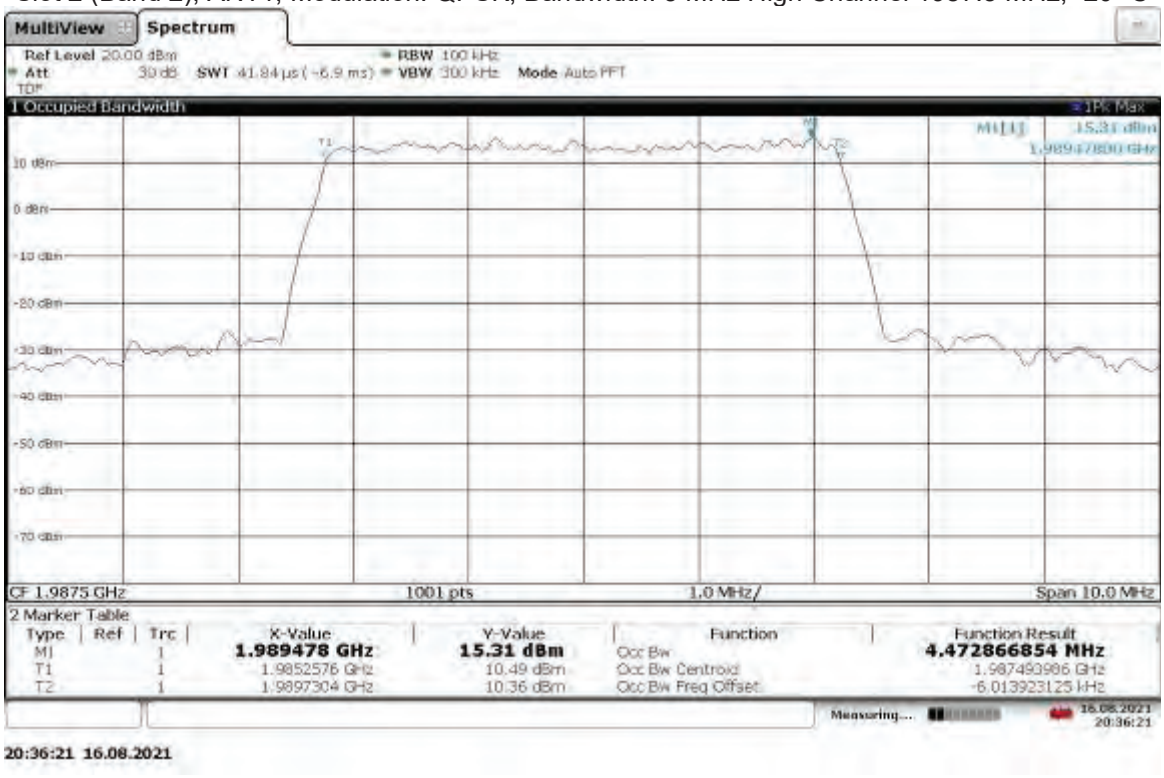
18:59:19 16.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, -10 ºC



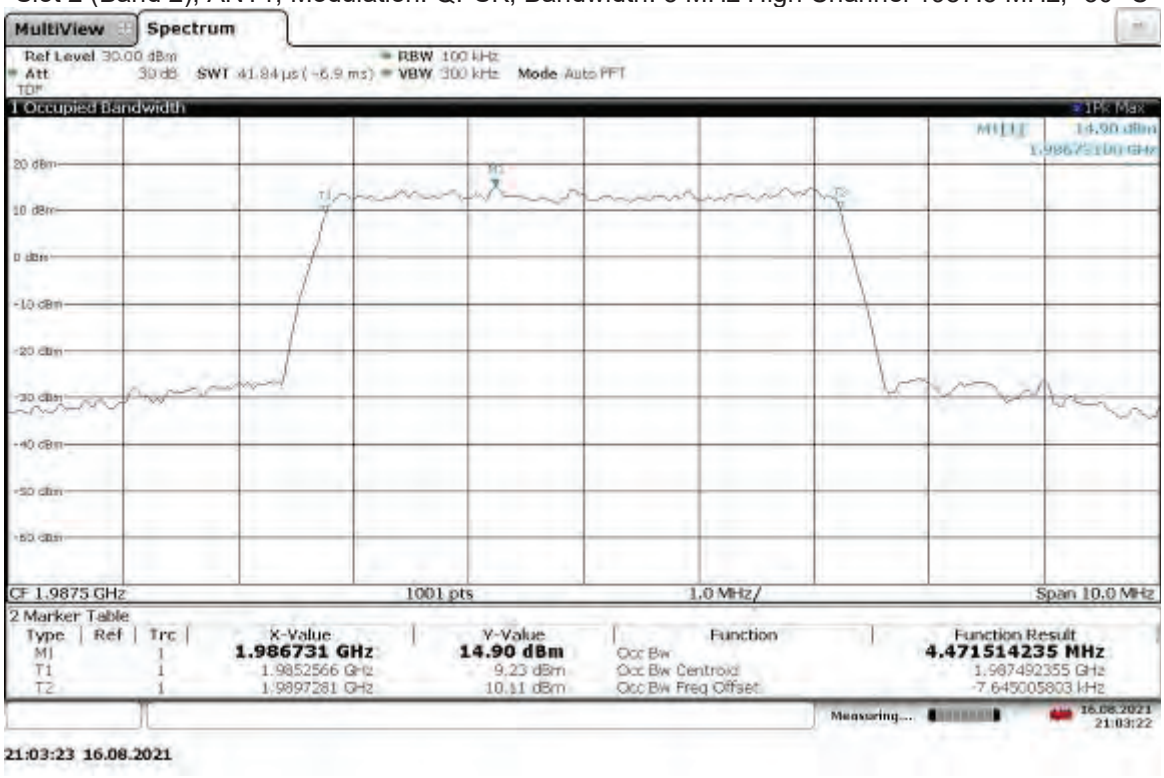
19:59:13 16.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, -20 ºC

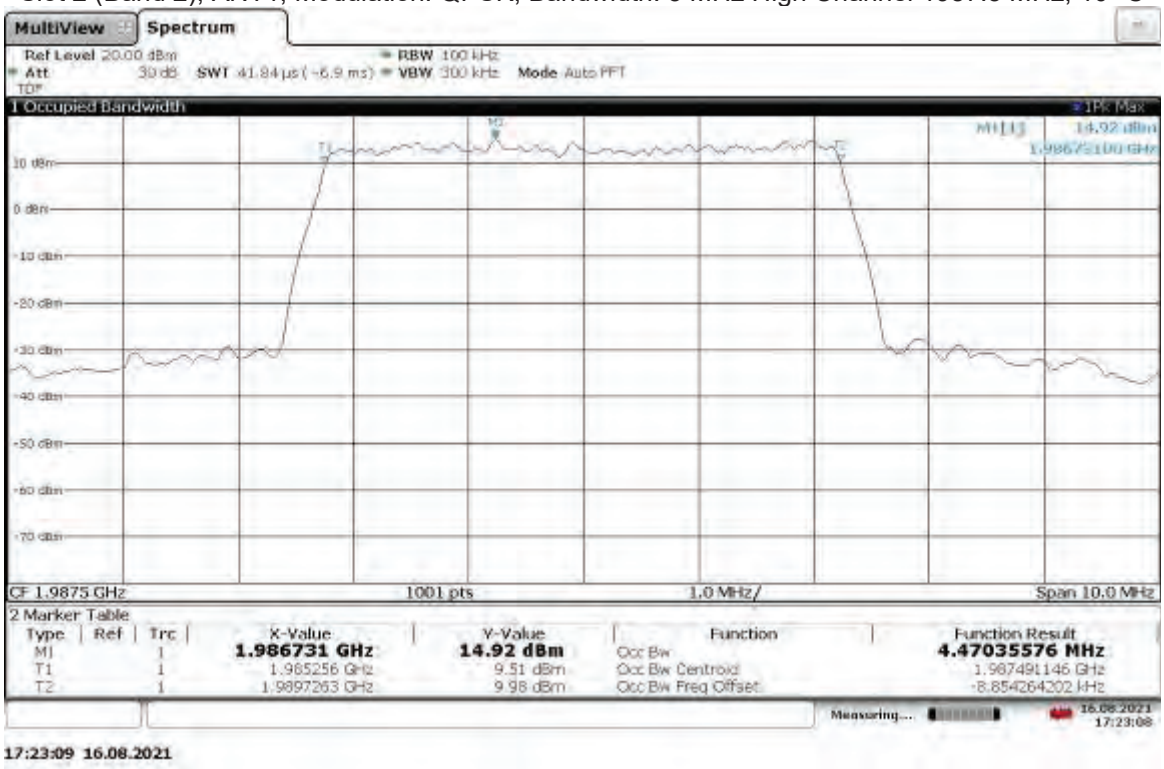


20:36:21 16.08.2021

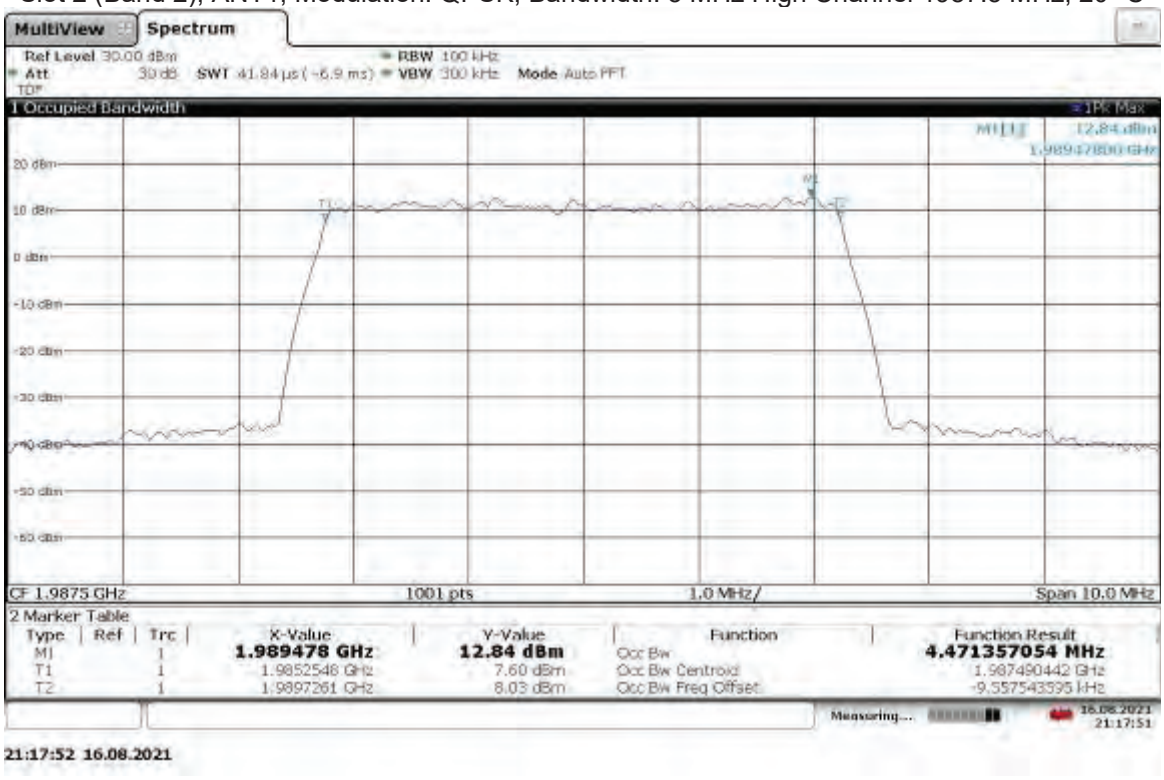
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, -30 ºC



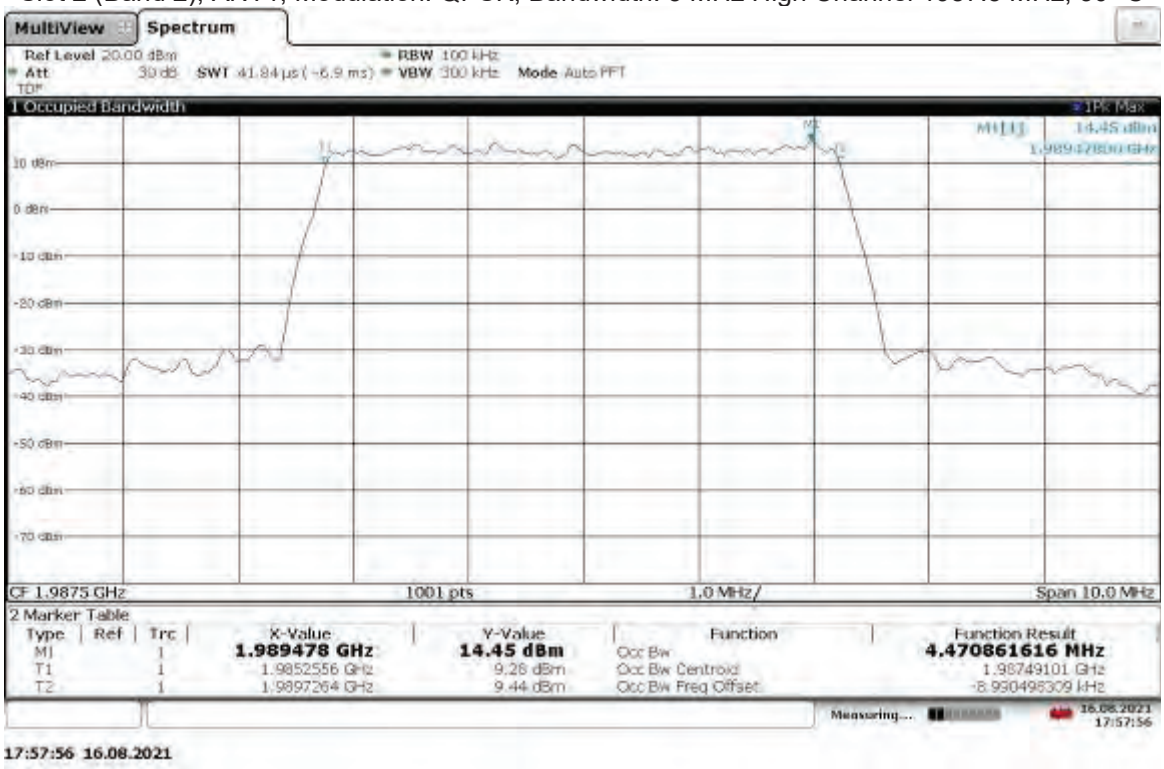
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, 10 ºC



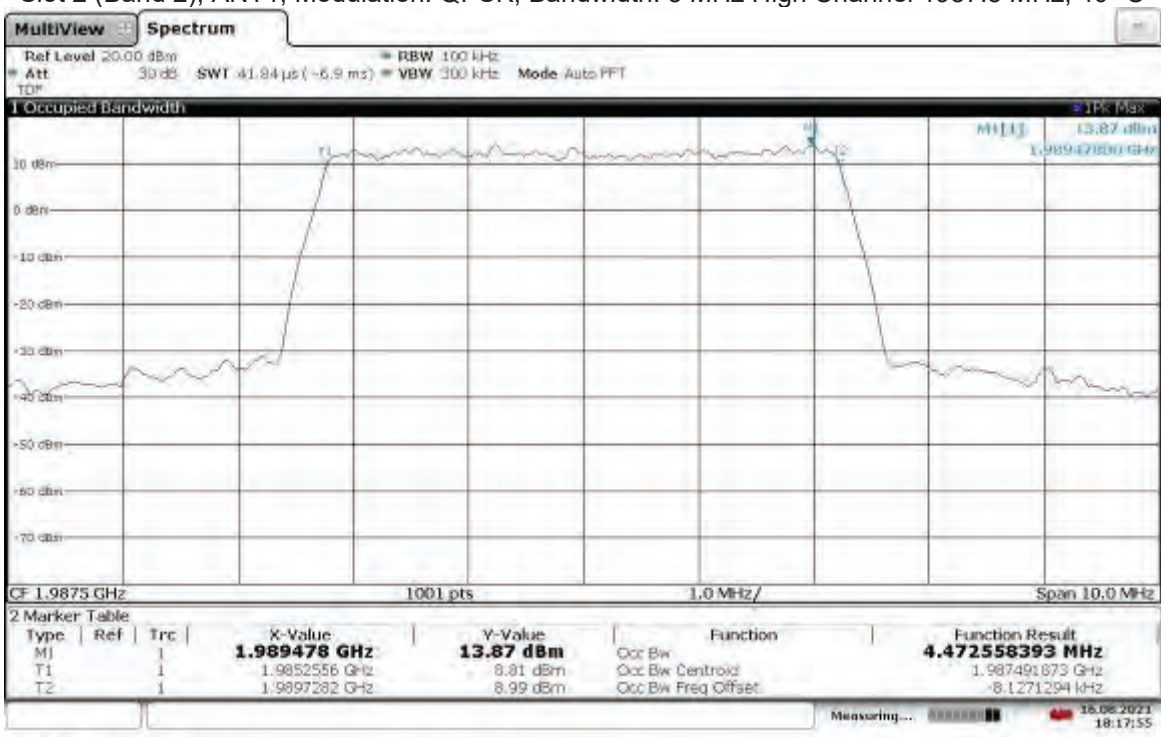
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, 20 ºC



Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, 30 ºC

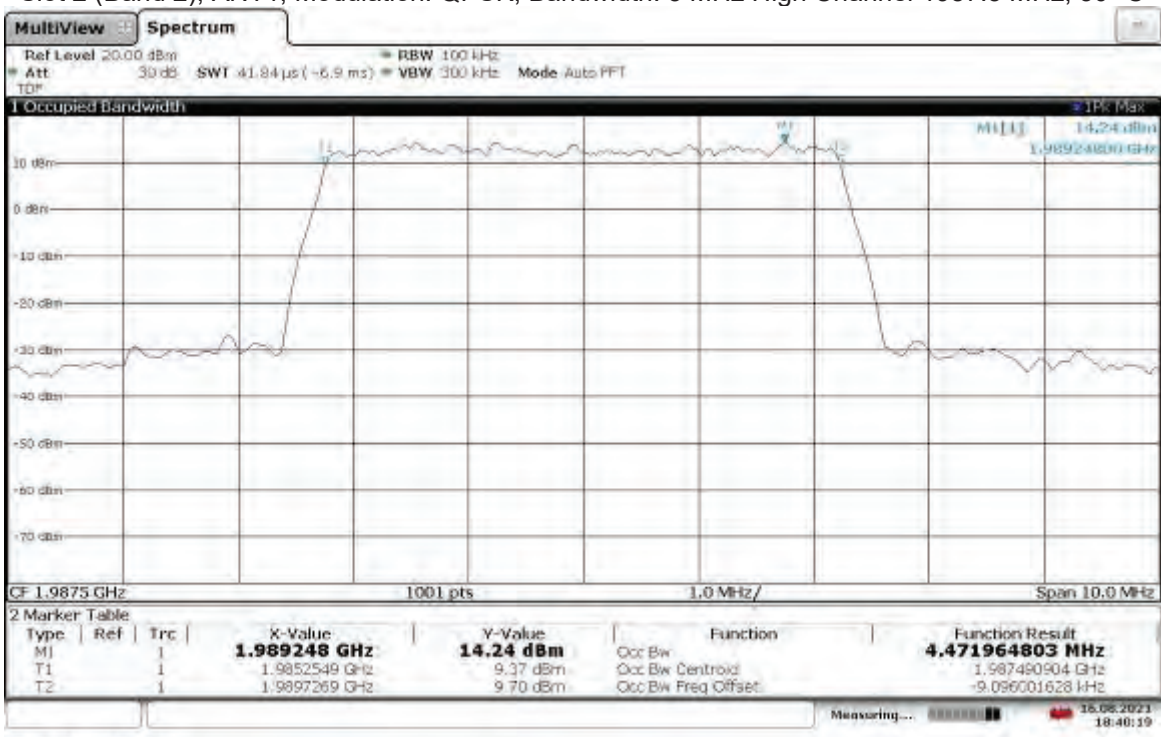


Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, 40 ºC



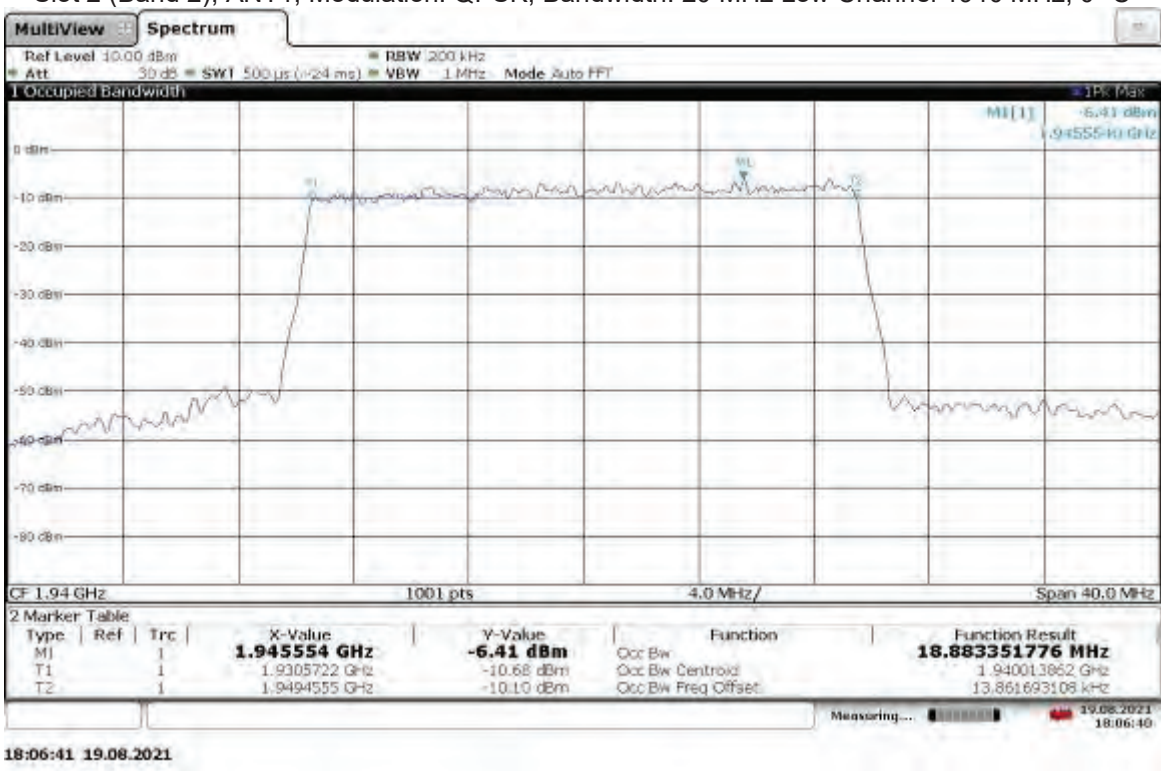
18:17:56 16.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 5 MHz High Channel 1987.5 MHz, 50 ºC



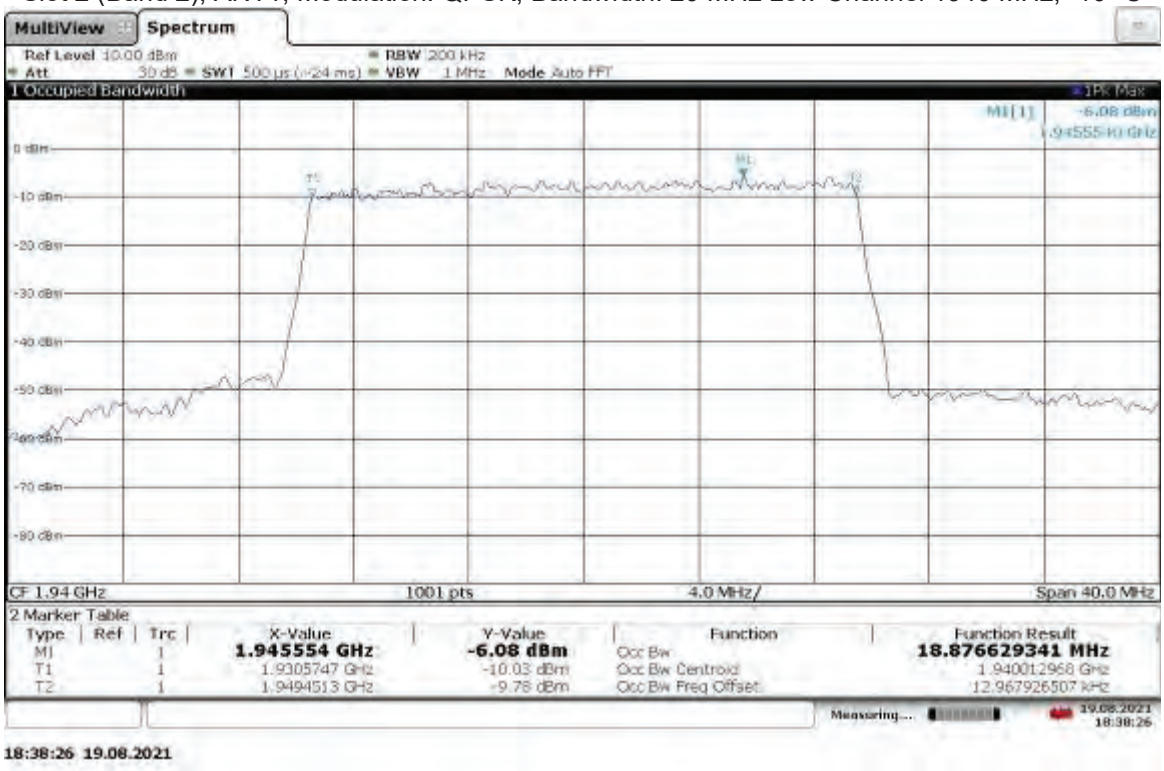
18:40:19 16.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 0 ºC



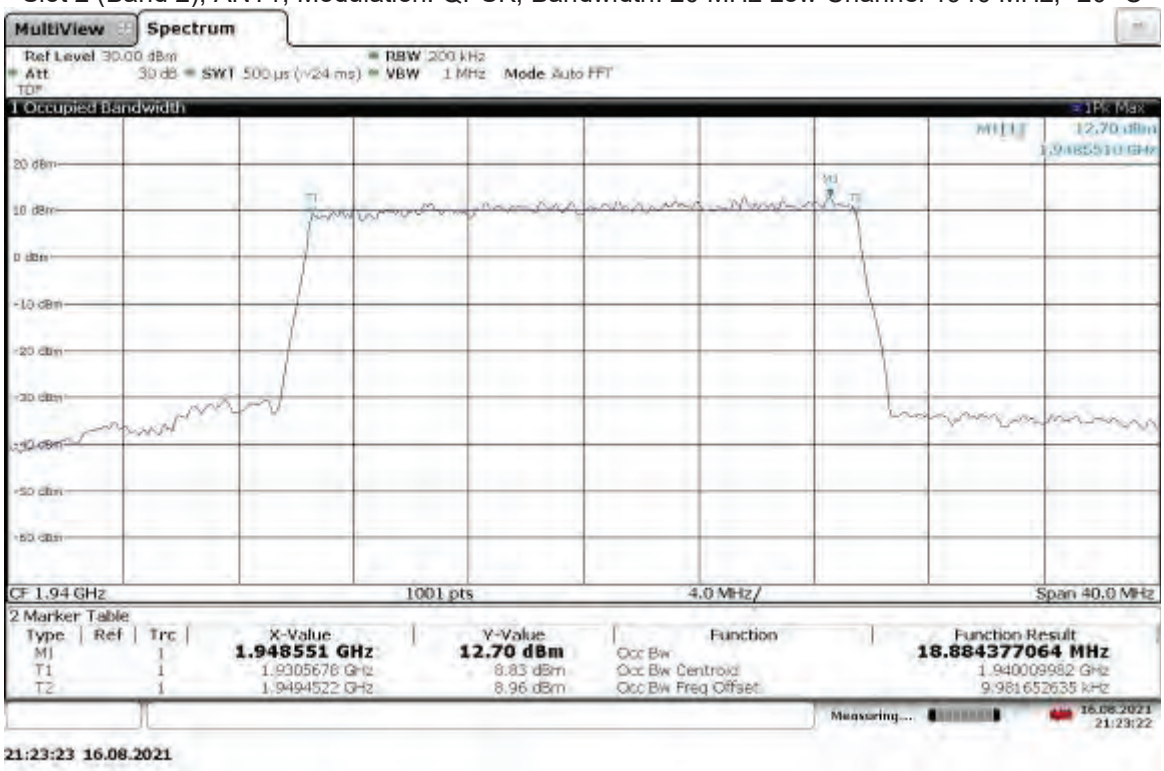
18:06:41 19.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, -10 ºC



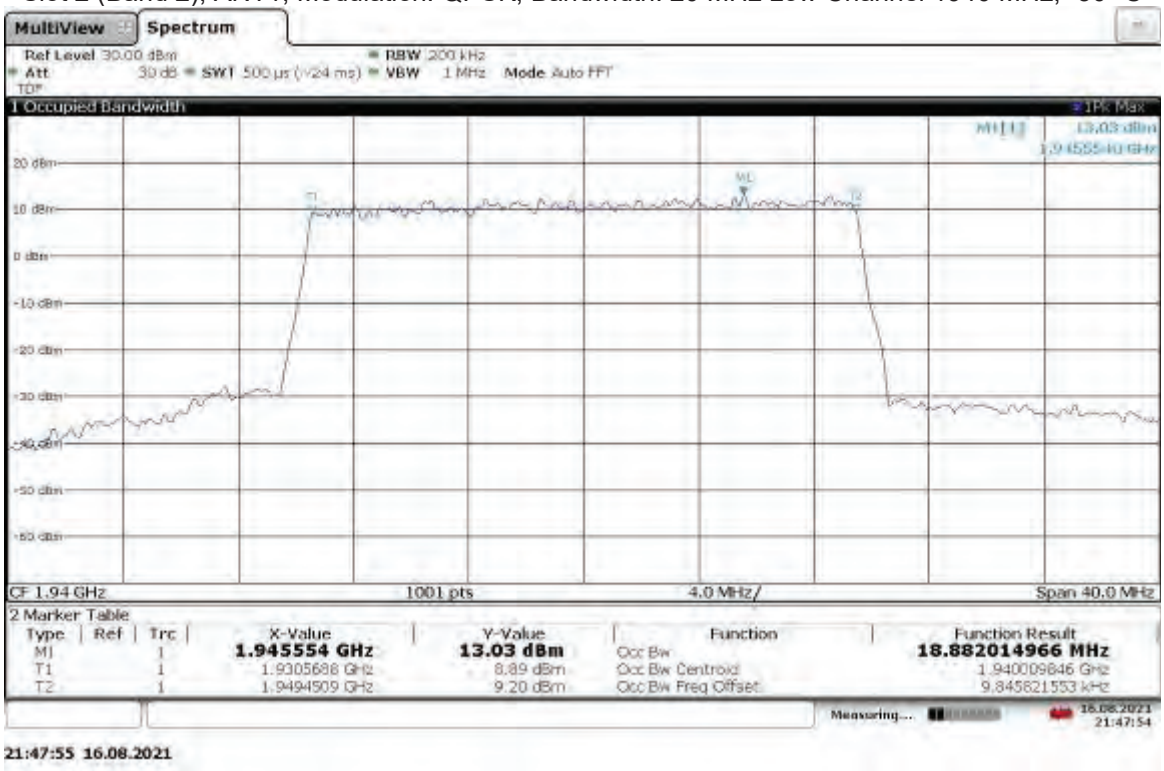
18:38:26 19.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, -20 ºC



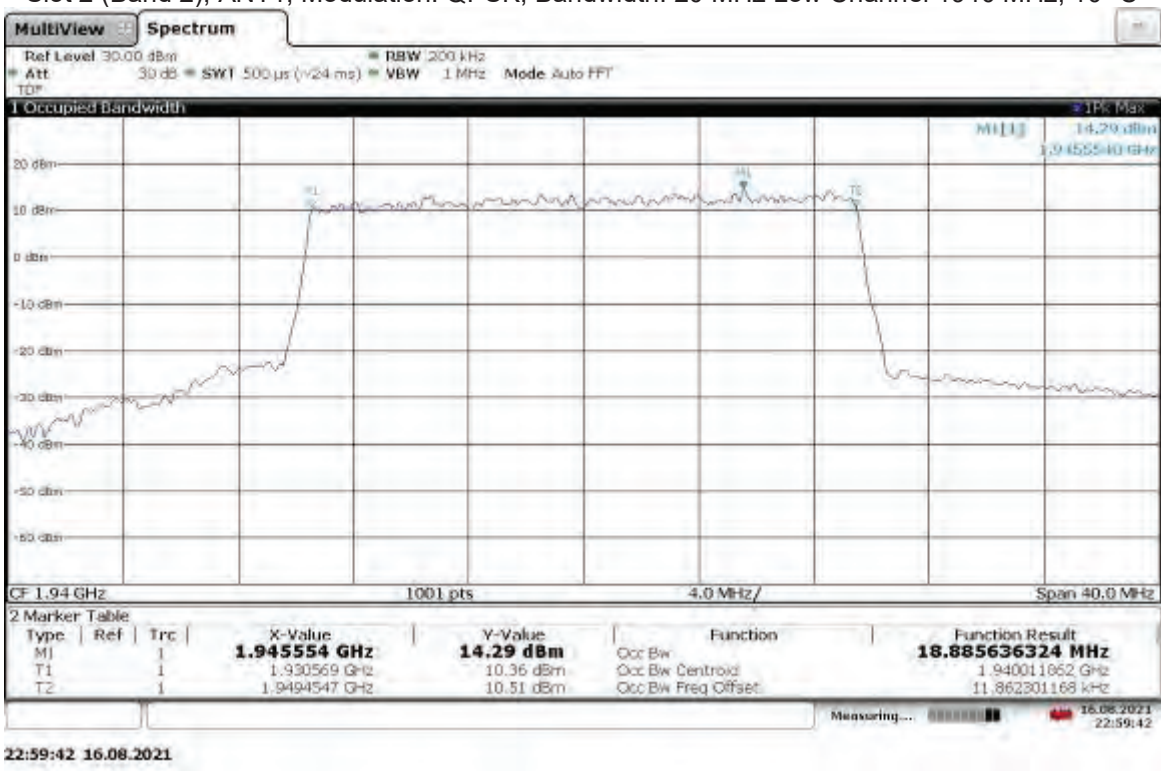
21:23:23 16.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, -30 ºC

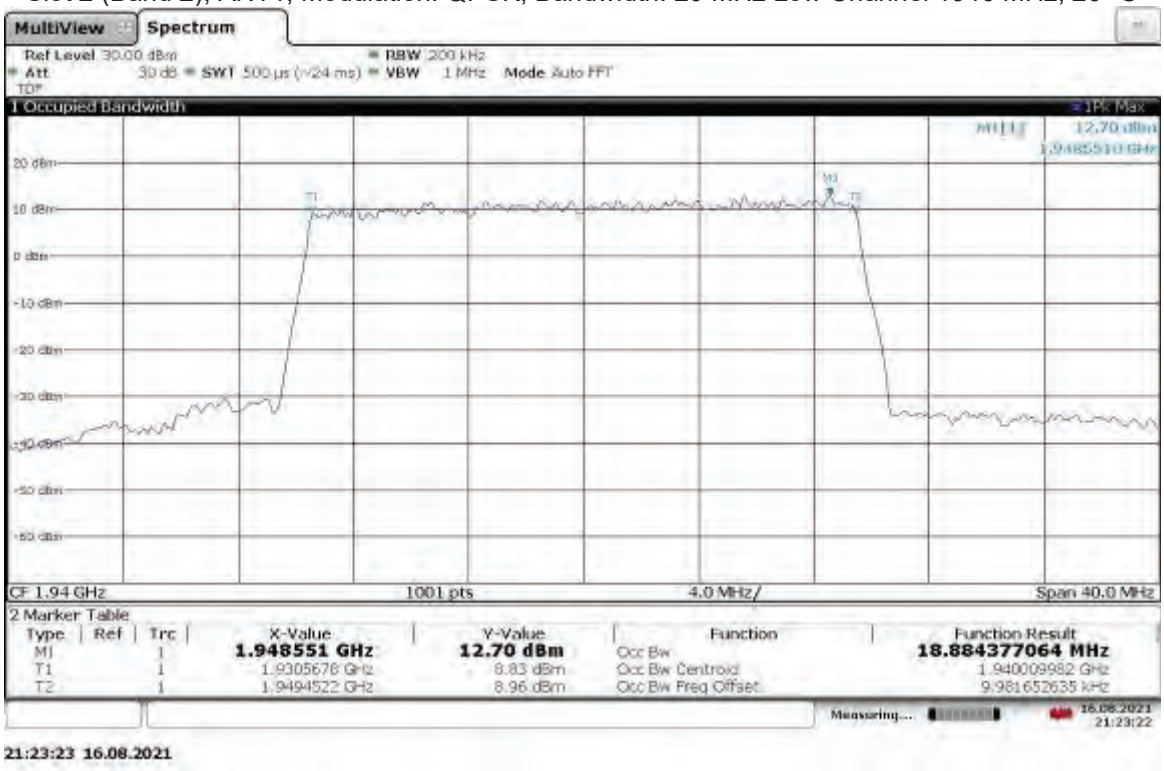


21:47:55 16.08.2021

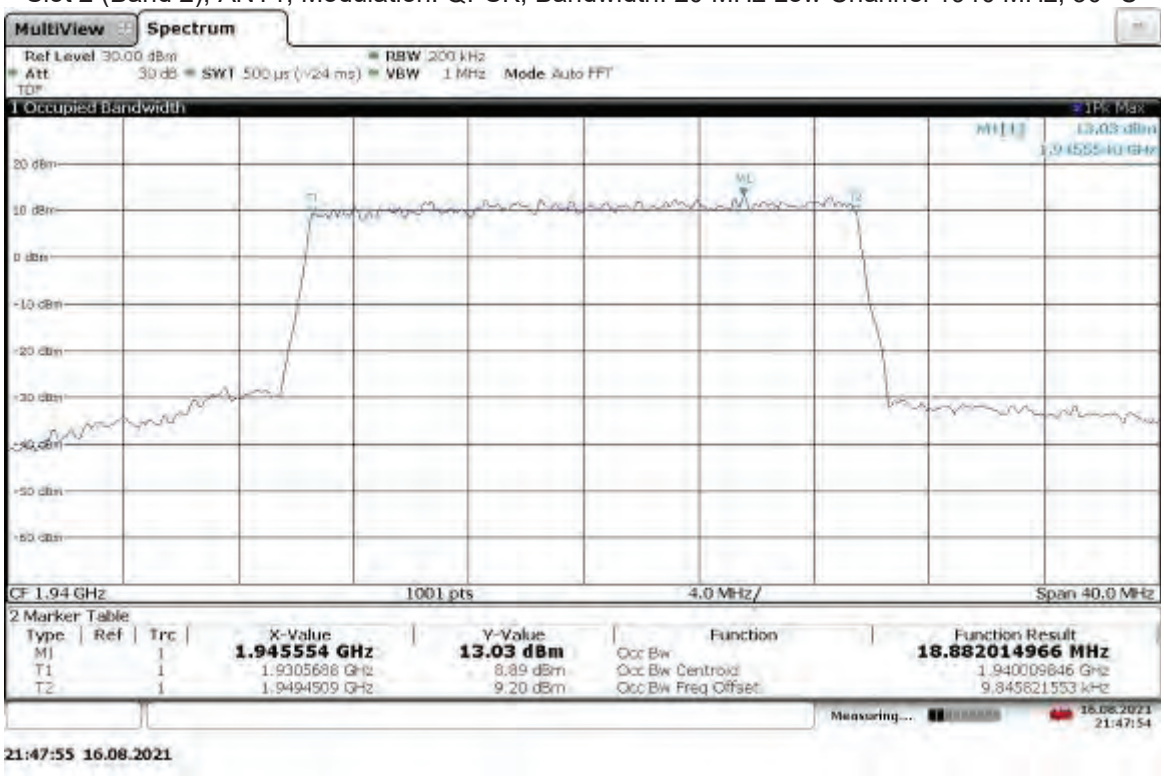
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 10 ºC



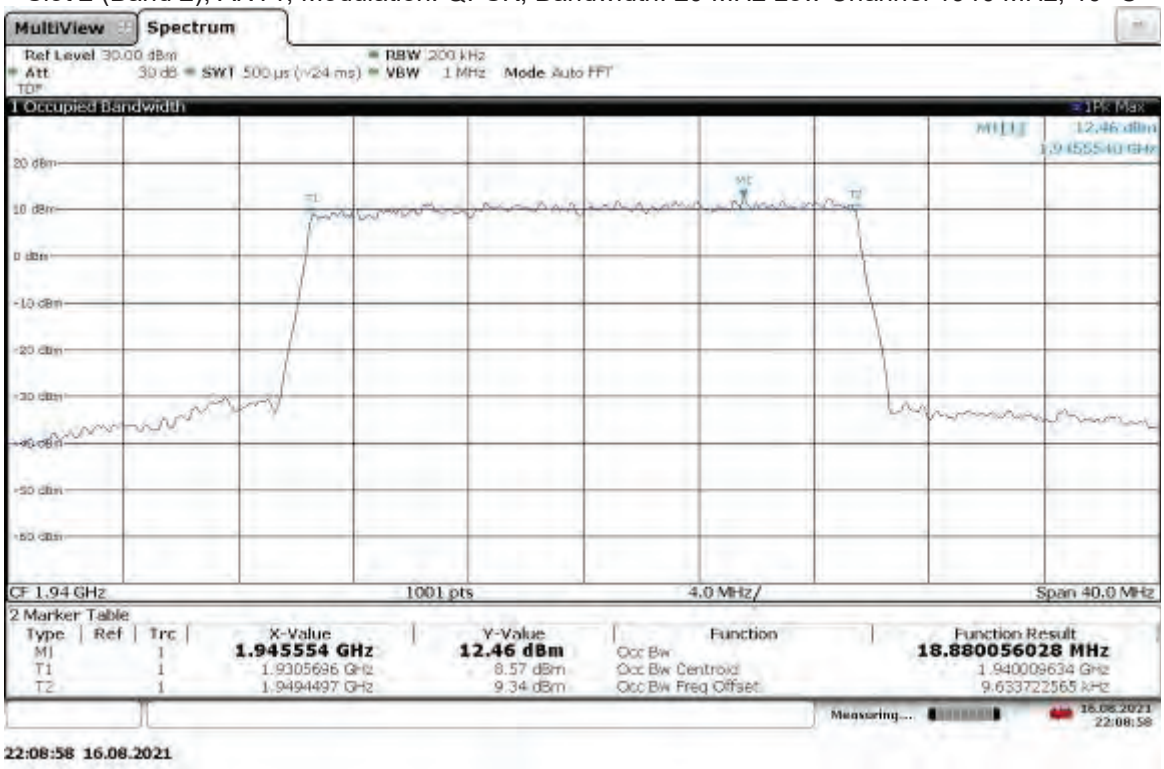
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 20 ºC



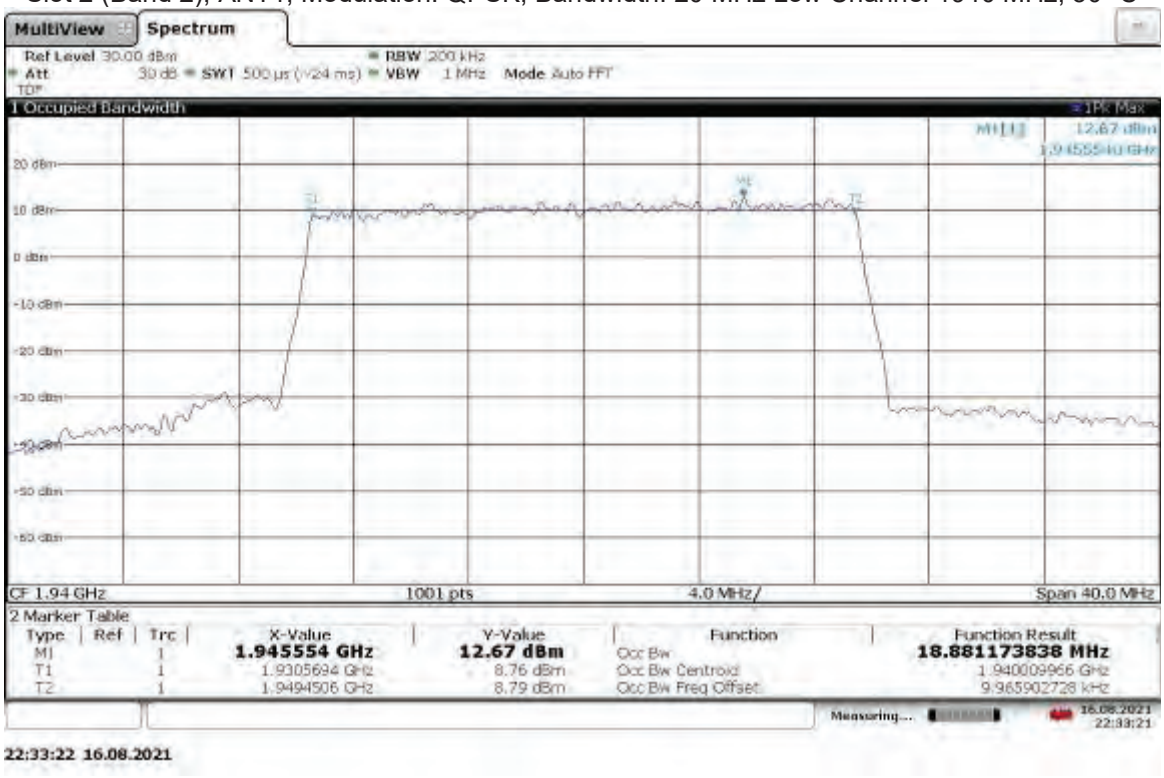
Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 30 ºC



Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 40 ºC

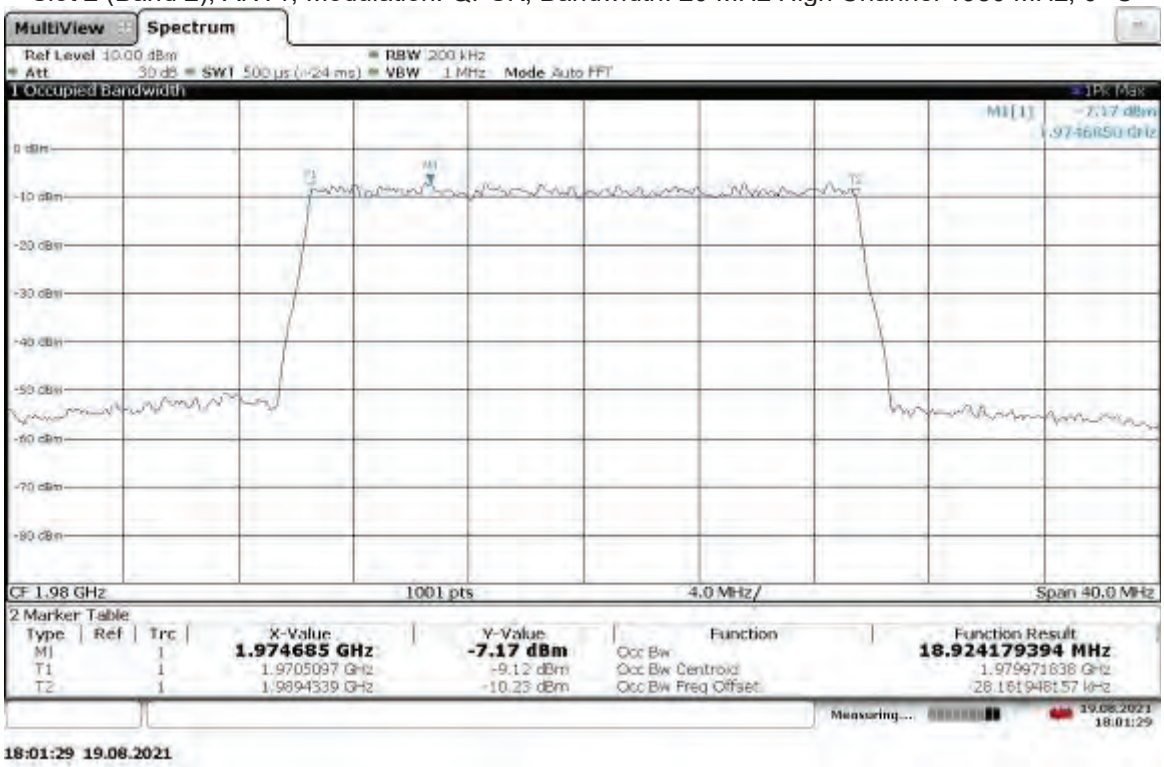


Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz Low Channel 1940 MHz, 50 ºC



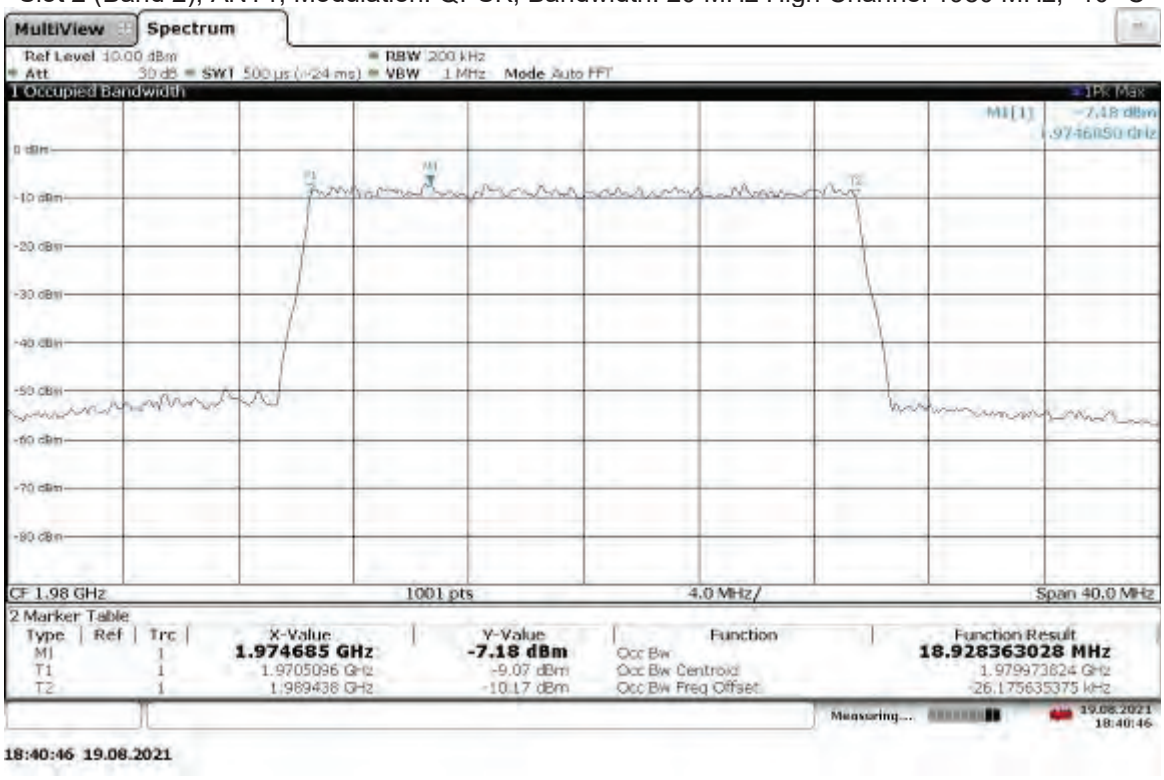
22:33:22 16.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, 0 ºC



18:01:29 19.08.2021

Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, -10 ºC



Slot 2 (Band 2), ANT1, Modulation: QPSK, Bandwidth: 20 MHz High Channel 1980 MHz, -20 ºC