Ericsson AB

RF TEST REPORT

Report Type:
FCC Part 24 RF report

PRODUCT NAME:
Radio 8843 B2 B66A

REPORT NUMBER:
2405B1992SHA-001

ISSUE DATE:
June 5, 2024

DOCUMENT CONTROL NUMBER:
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TEST REPORT

Report no.: 2405B1992SHA-001

Applicant:	Ericsson AB
	Isafjordsgatan 10 SE-164 80 Stockholm 16480 Sweden
Manufacturer:	Ericsson AB
	Isafjordsgatan 10 SE-164 80 Stockholm 16480 Sweden
FCC ID:	TA8AKRC161707-2

SUMMARY:

The equipment is tested according to the following standard(s) or Specification:
FCC CFR 47 Part 24: PERSONAL COMMUNICATIONS SERVICES

PREPARED BY:	**REVIEWED BY:**
Yang Xu	Jackson Huang
Project Engineer Yang Xu	Reviewer Jackson Huang

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TEST REPORT

Revision History

Report No.	Version	Description	Issued Date
2405B1992SHA-001	Rev. 01	Initial issue of report	June 5, 2024

TEST REPORT

Measurement result summary

TEST ITEM	FCC REFERANCE	RESULT
Max Output Power and Peak to Average Power Ratio and EIRP	24.232(a) 2.1046	Pass
Occupied Bandwidth	24.238(b) 2.1049	Pass
Unwanted Emissions at Band Edge	24.238(b) 2.1051	Pass
Conducted Unwanted Emission	24.238(b) 2.1051	Pass
Frequency Stability	24.235	Pass

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Description:	Remote Radio Unit
Product name:	Radio 8843 B2 B66A
Product number:	KRC 161 707/2
Serial Number(s)	CF8B166746
Rating:	-48V DC
Software Version:	CXP9013268%15_R99AC
Hardware Version:	R1J
Sample received date:	May 8, 2024
Date of test:	May 8, 2024 ~ May 23, 2024

1.2 Technical Specification

Frequency Range:	B2: TX: 1930-1990 MHz, RX: 1850-1910 MHz B66A: TX: 2110-2180 MHz, RX: 1710-1780 MHz
Number of Antenna ports:	B2:4TX/4RX, 2TX/2RX B66A:4TX/4RX, 2TX/2RX
Supported RAT:	B2: LTE, NR, NB_IoT (Inband, Guardband) B66A: LTE, NR, NB_IoT (Inband, Guardband)
Max RF bandwidth (IBW):	B2: 60 MHz; B66A: 70 MHz
Supported Number of Carriers:	Maximum 3 carriers per port
Supported modulation:	LTE: QPSK, 16 QAM, 64 QAM, 256 QAM NR: QPSK, 16 QAM, 64 QAM, 256 QAM
Supported Channel Bandwidth:	LTE: 5, 10, 15, 20 MHz NR: 5, 10, 15, 20, 25, 30,35,40 MHz
Declaration output power:	B2:40W/port (Port A, B, C, D); 60W/port (Port A, D) port B and C not used in this configuration B66A:60W/port (Port E, F, G, H); 80W/port (Port E, H) Port F and G not used in this configuration
Antenna Gain(dBi):	17.8(B2), 17.8(B66A)

1.3 Description of Test Facility

Name:	Intertek Testing Services Shanghai
Address 1:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Address 2:	F9&F8&F7, Tianfu Software Park E7 Tower, No. 1366 Tianfu Avenue Middle, Hightech Zone, Chengdu City, Sichuan Province, P.R. of China
Telephone:	+86 21 61278200
Telefax:	+86 21 54262353
The test facility is recognized, certified, or accredited by these organizations:	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	A2LA Accreditation Lab Certificate Number: 3309.02

2 TEST SPECIFICATIONS

2.1 Related documents

FCC Part 24 (2023)
FCC Part 2 (2023)
ANSI C63.26:2015
KDB 971168 D01 v03r01
KDB 662911 D01 v02r01

2.2 Product Information

The Equipment Under Test (EUT) is an Ericsson Radio Unit working in the wireless communications services 1930-1990MHz which provides communication connections to network in LTE/NR modes and MSR modes. The Radio 8843 B2 B66A operates from a -48V DC.

The EUT includes 4 TX/RX or 2TX/RX mode and it can be configured to transmit in MIMO mode, and MIMO mode was used for measurements as the worst configuration. The complete testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

A full technical description can be found in the Manufacturer’s documentation.

2.3 Configuration Description

Testing in this Report covers only B2 (1930-1990MHz). For additional configurations and test cases not contained within this test report, refer to the following reports: 2405B1993SHA-001.

The following settings were used to represent all traffic scenarios. The output power was measured on the bottom, middle and top channel of all applicable antenna ports. By measuring the output power of QPSK, 16QAM, 64QAM, 256QAM on one of the antenna ports, it was determined that 256QAM for 4TX/RX & 2TX/RX NR was the worst-case modulation schemes as data listed following and were used for all testing.

4TX/RX mode	Port	QPSK	16QAM	64QAM	256QAM
NR-1C 40M Middle	Port A	45.67dBm	45.66dBm	45.68dBm	45.70dBm

2TX/RX mode	Port	QPSK	16QAM	64QAM	256QAM
NR-1C 40M Middle	Port A	47.40dBm	47.40dBm	47.41dBm	47.42dBm

Complete testing was carried out on the worst-case antenna port which was determined by the highest output power from the 4/2 measured ports on worst-case modulation scheme and the worst antenna port was port A for 4TX/RX & 2TX/RX NR as data listed following.

4TX/RX mode	modulation	Port A	Port B	Port C	Port D
NR-1C 40M Middle	256QAM	45.70dBm	45.56dBm	45.61dBm	45.68dBm

2TX/RX mode	modulation	Port A	Port D
NR-1C 40M Middle	256QAM	47.42dBm	47.41dBm

The settings below were used for all measurements unless otherwise noted:
NR

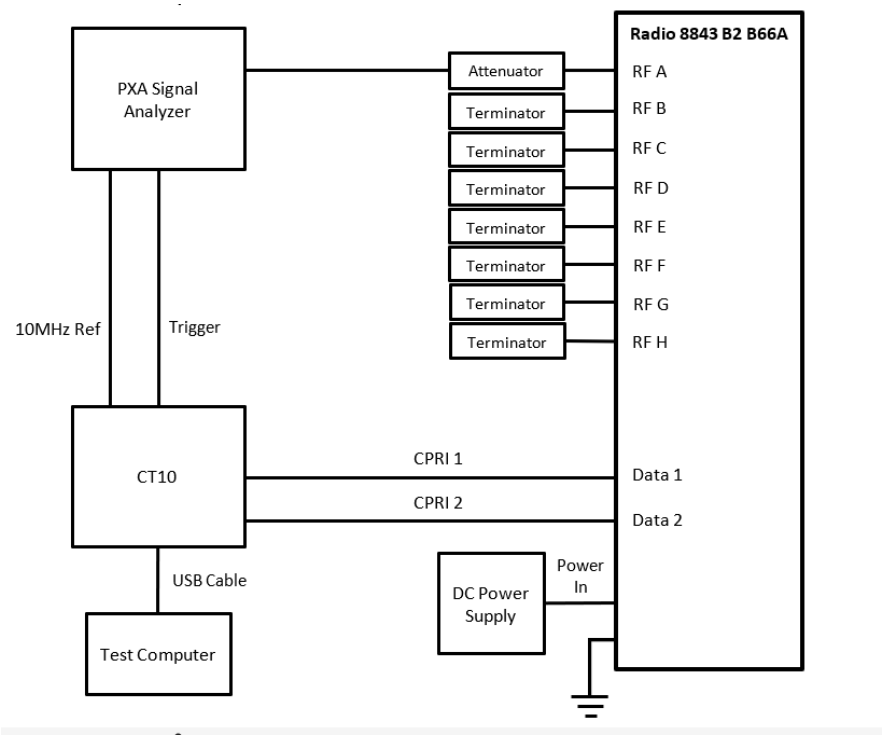
Configuration	No. of Carriers	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR-1C	1	25	1942.5	1960	1977.5
		30	1945	1960	1975
		35	1947.5	1960	1972.5
		40	1950	1960	1970
NR-2C	2	25	-	1942.5+1977.5	-
		30	-	1945+1975	-

NR

Configuration	No. of Carriers	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR-1C-UE	1	25	1942.5	1960	1977.5
		30	1945	1960	1975
		35	1947.5	1960	1972.5
		40	1950	1960	1970
NR-2C-UE	2	25	1942.5+1967.5	-	1952.5+1977.5
		30	-	1945+1975	-

2.4 Test Setup

Conducted Measurement:



No.	Auxiliary Equipment	Product Number / Model Type	Version
1	Test computer	DELL OptiPlex 3050	-
2	CT10	LPC 102487/1	R1C
3	DC Power Supply	US21E7359S	-
4	GNSS Rubidium clock	HJ5418A-V1	-
5	10db Attenuator	2.92TS100-10-26.5-A	-
6	10db Attenuator	DTS50GH-A-10-18-NMF	-
7	40db Attenuator	WDTS300-40Db-6G-NFF	
8	Terminator	WTF250-6-C	
9	Terminator	WTF300-6-NF	
10	Terminator	TF200-LIM-0360-DF	
11	Coupler	C40-560-4F	
12	Filter	W-FLTF-026-18000-26500	

Proper Attenuator/Filter will be chosen to use in relative test case. And the cable loss of specified Attenuator/Filter with connect cable will be calibrated before test for relative frequency range and the worst reading will be used as offset in the relative test case.

2.5 Test environment condition:

Test items	Temperature	Humidity
Max Output Power and Peak to Average Power Ratio and EIRP	23°C	54% RH
Occupied Bandwidth		
Unwanted Emissions at Band Edge		
Conducted Unwanted Emission		
Frequency Stability	Please refer to clause 7	

2.6 Instrument list

RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Signal Analyzer	R&S	FSVA3044	101087	2024-07-09
☒	Signal Analyzer	Keysight	N9030B	MY57140894	2024-07-09
☒	Climatic Chamber	Chongqing Yinhe	SDJ61F	201700266	2024-06-30
☒	Hygrometer	TESTO	608-H1	1745127471	2024-12-09
☒	Hygrometer	TESTO	608-H1	1745127476	2024-12-09

2.7 Measurement uncertainty

The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Measurement uncertainty
Maximum output power	0.73dB
Occupied Bandwidth	0.88%
Unwanted Emissions at Band Edge	3.03dB
Conducted Unwanted Emission	3.03dB
Frequency stability	0.77×10^{-7}

3 Maximum Output Power and Peak to Average Power Ratio and EIRP

Test result: Pass

3.1 Limit

Output Power: Base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz equivalent isotopically radiated power (EIRP) with an antenna height up to 300 meters HAAT

Peak to Average Ratio: ≤13 dB

3.2 Measurement Procedure

The EUT was configured to transmit on maximum power and proper modulation. The transmitter power shall be measured in terms of a root-mean-square (RMS) average value. In case of the EUT was configured to MIMO mode, since the EUT transmits on all antennas simultaneously in the same frequency range, using the Measure-and-Sum approach, the output power at all antennas were tested, and the total output power were then summed mathematically in linear power units according to FCC KDB 662911 D01.

A peak to average ratio measurement is performed at the conducted ports of the EUT for single carrier for single RAT mode. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) was used and 0.1% probability value recorded.

3.3 Measurement result

4TX/RX mode:
NR-1C

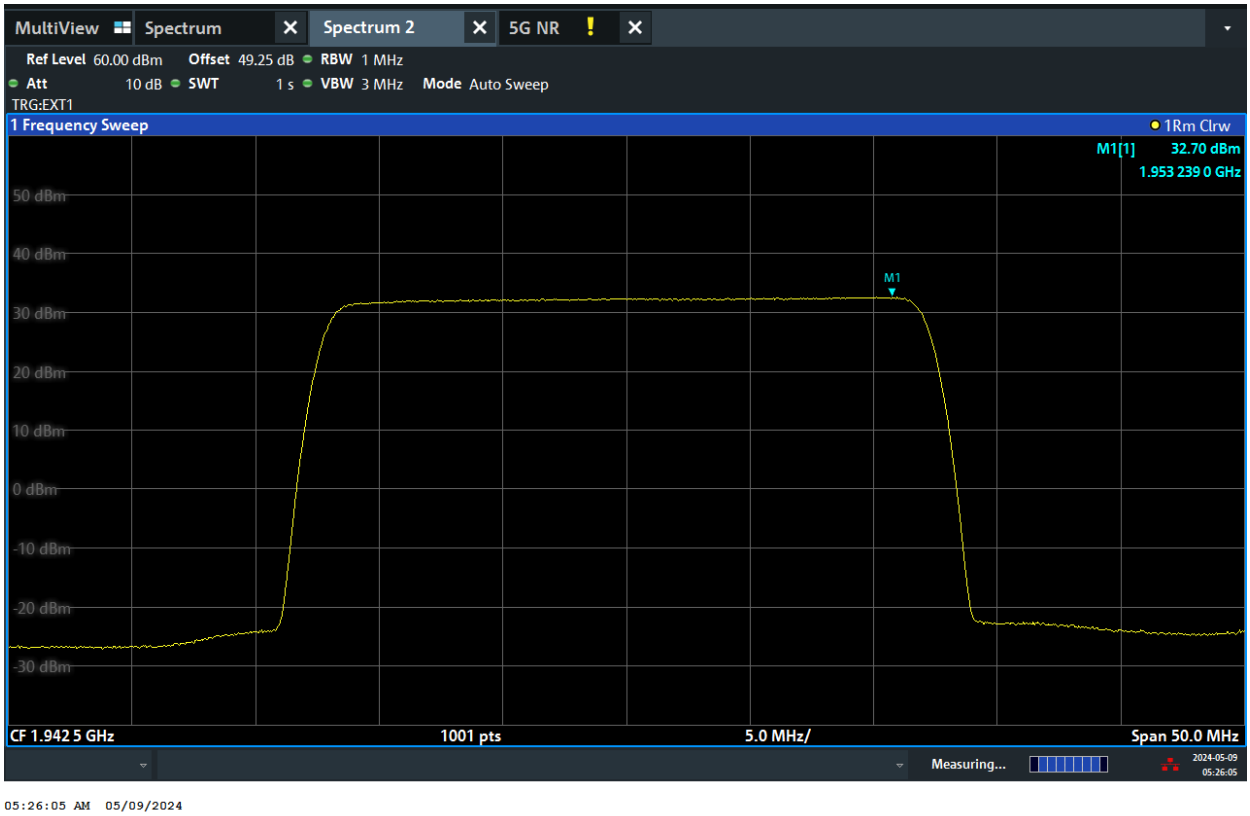
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	25	45.73	32.70	7.35	45.80	32.55	7.04	45.69	32.52	7.19
B	256QAM	25	45.55	32.47	7.33	45.60	32.38	7.03	45.52	32.28	7.18
C	256QAM	25	45.55	32.52	7.33	45.47	32.32	7.03	45.50	32.25	7.19
D	256QAM	25	45.68	32.58	7.37	45.73	32.48	7.03	45.65	32.45	7.15
Total conducted power			51.65	38.59	-	51.67	38.45	-	51.61	38.40	-
antenna gain			17.8								
EIRP			69.45	56.39	-	69.47	56.25	-	69.41	56.20	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	5.76	-	-	5.90	-	-	5.95	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	30	45.73	31.86	7.43	45.75	31.74	7.06	45.75	31.74	7.06
B	256QAM	30	45.59	31.69	7.42	45.61	31.61	7.05	45.61	31.61	7.05
C	256QAM	30	45.59	31.71	7.42	45.61	31.51	7.07	45.61	31.51	7.07
D	256QAM	30	45.65	31.77	7.44	45.70	31.67	7.08	45.70	31.67	7.08
Total conducted power			51.66	37.78	-	51.69	37.65	-	51.69	37.65	-
antenna gain			17.8								
EIRP			69.46	55.58	-	69.49	55.45	-	69.49	55.45	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	6.57	-	-	6.70	-	-	6.70	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	35	45.74	31.19	7.46	45.69	31.00	7.06	45.60	30.89	7.23
B	256QAM	35	45.53	30.86	7.46	45.55	30.86	7.08	45.55	30.82	7.21
C	256QAM	35	45.59	30.93	7.44	45.64	30.87	7.08	45.57	30.86	7.21
D	256QAM	35	45.62	31.02	7.46	45.73	30.98	7.09	45.69	30.97	7.19
Total conducted power			51.64	37.02	-	51.67	36.95	-	51.62	36.91	-
antenna gain			17.8								
EIRP			69.44	54.82	-	69.47	54.75	-	69.42	54.71	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	7.33	-	-	7.40	-	-	7.44	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	40	45.64	30.41	7.50	45.70	30.43	7.14	45.64	30.35	7.22
B	256QAM	40	45.54	30.28	7.49	45.56	30.25	7.13	45.53	30.24	7.20
C	256QAM	40	45.60	30.40	7.51	45.61	30.31	7.13	45.55	30.24	7.22
D	256QAM	40	45.69	30.49	7.53	45.68	30.45	7.13	45.66	30.33	7.19
Total conducted power			51.64	36.42	-	51.66	36.38	-	51.62	36.31	-
antenna gain			17.8								
EIRP			69.44	54.22	-	69.46	54.18	-	69.42	54.11	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	7.93	-	-	7.97	-	-	8.04	-

NR 25MHz, Channel B, Power



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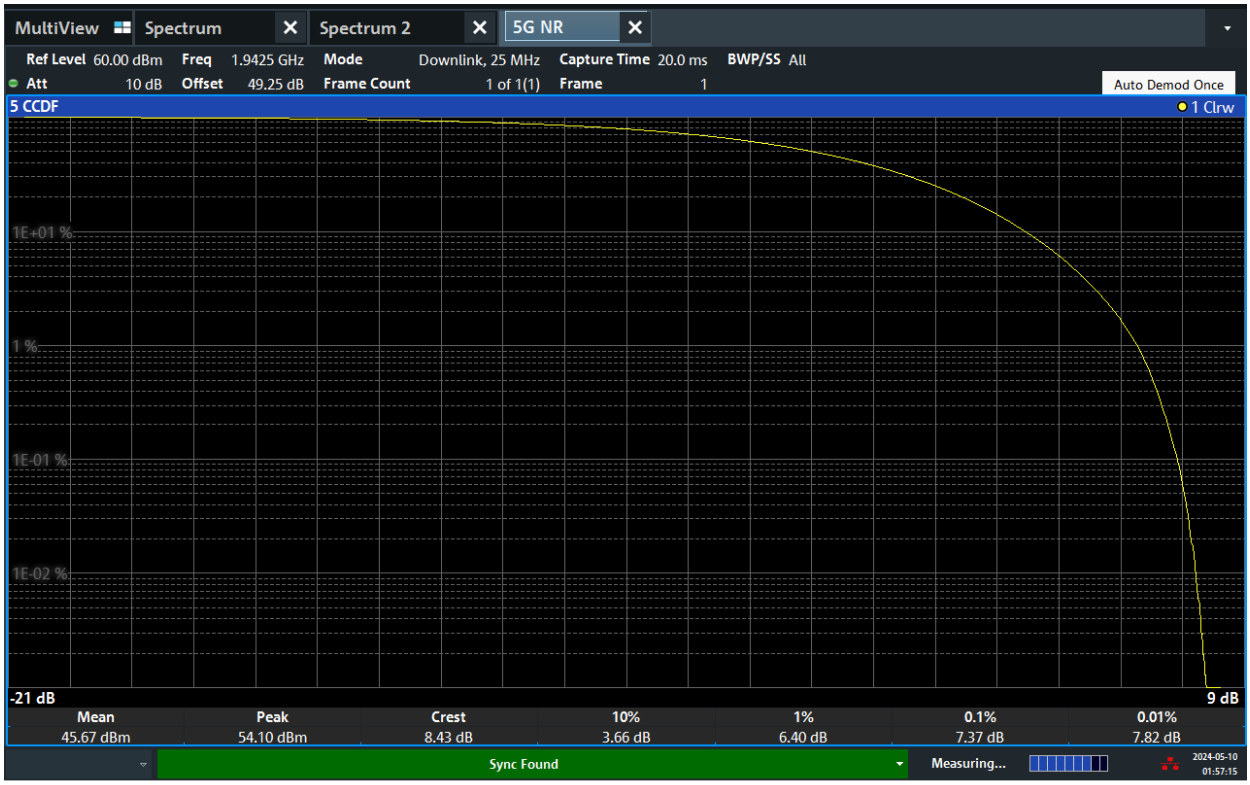
TEST REPORT

NR 25MHz, Channel B, PAR



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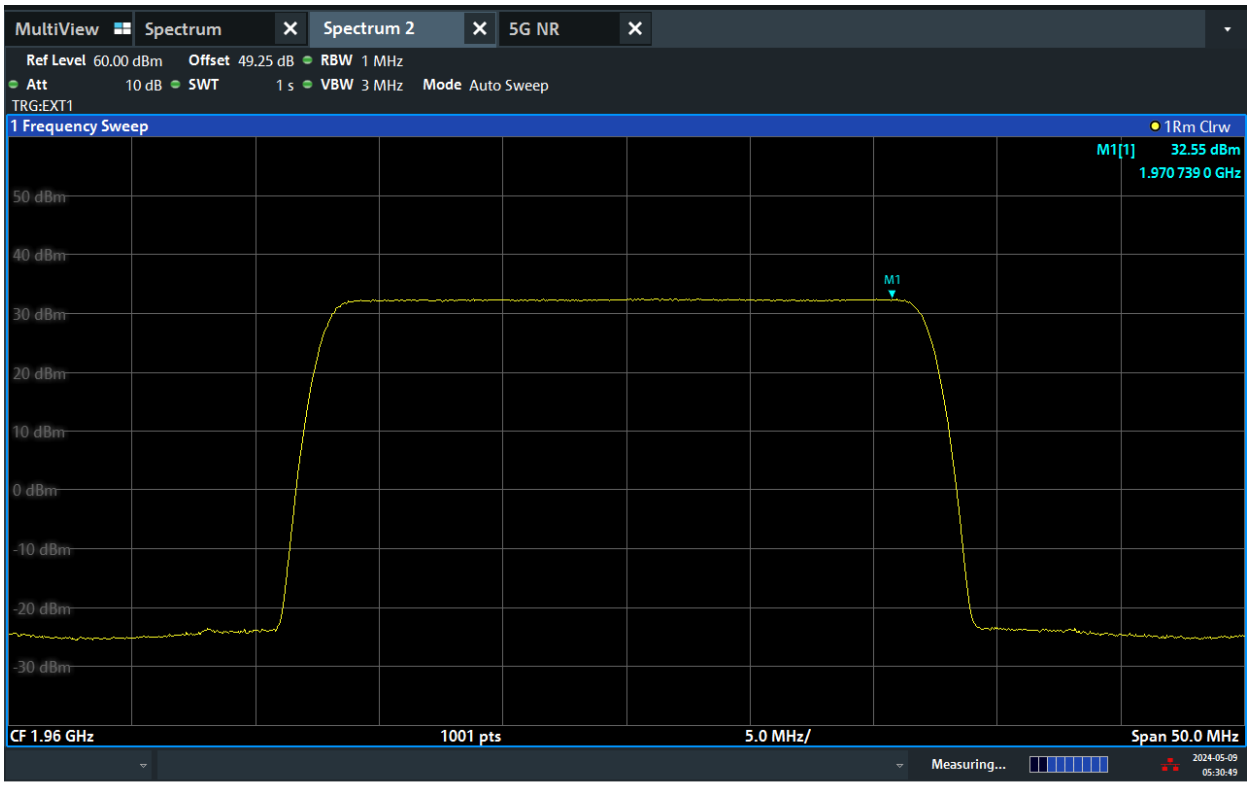

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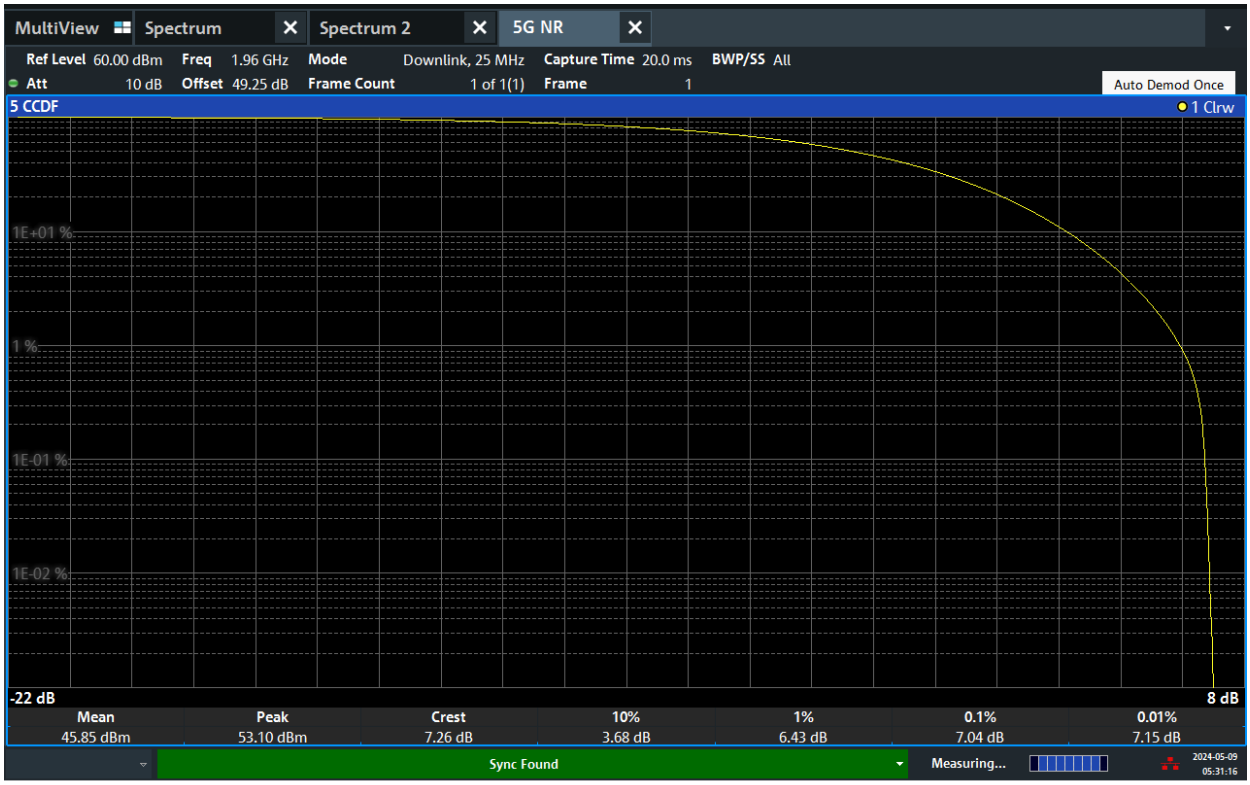
TEST REPORT

NR 25MHz, Channel M, PAR



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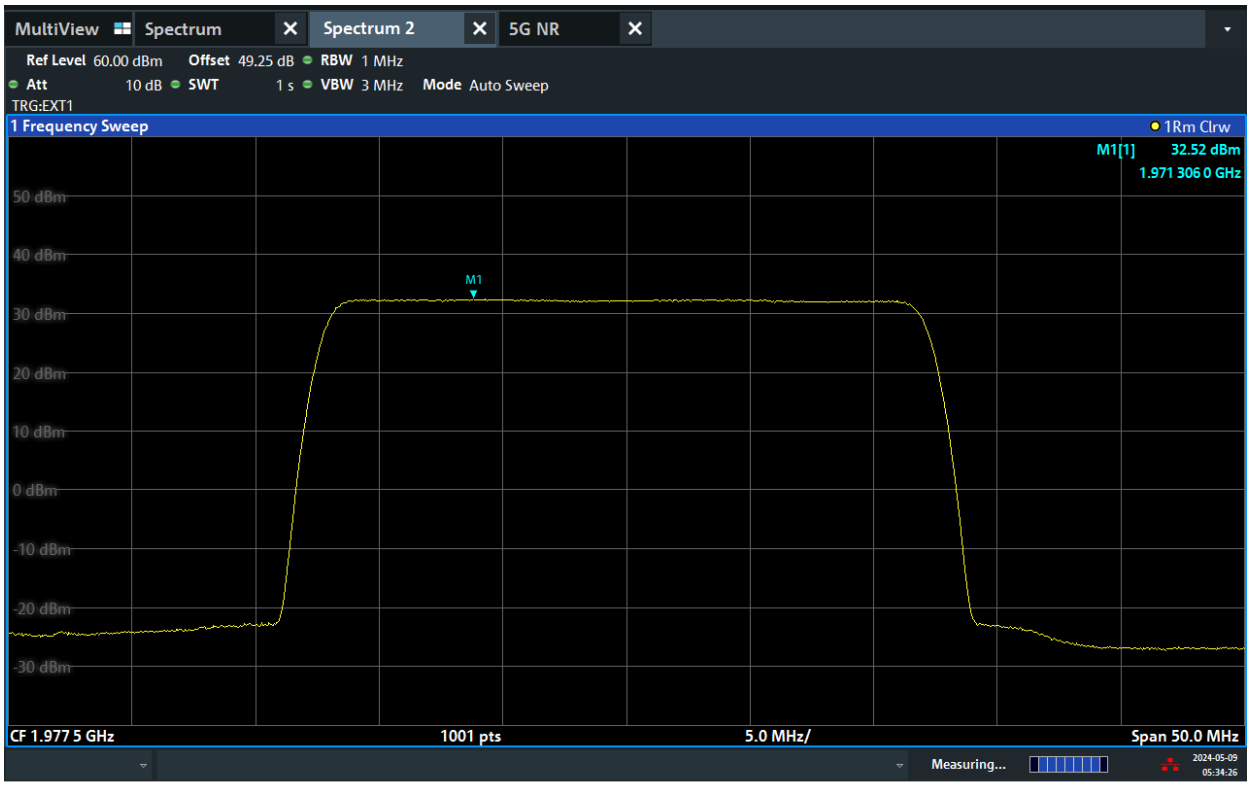

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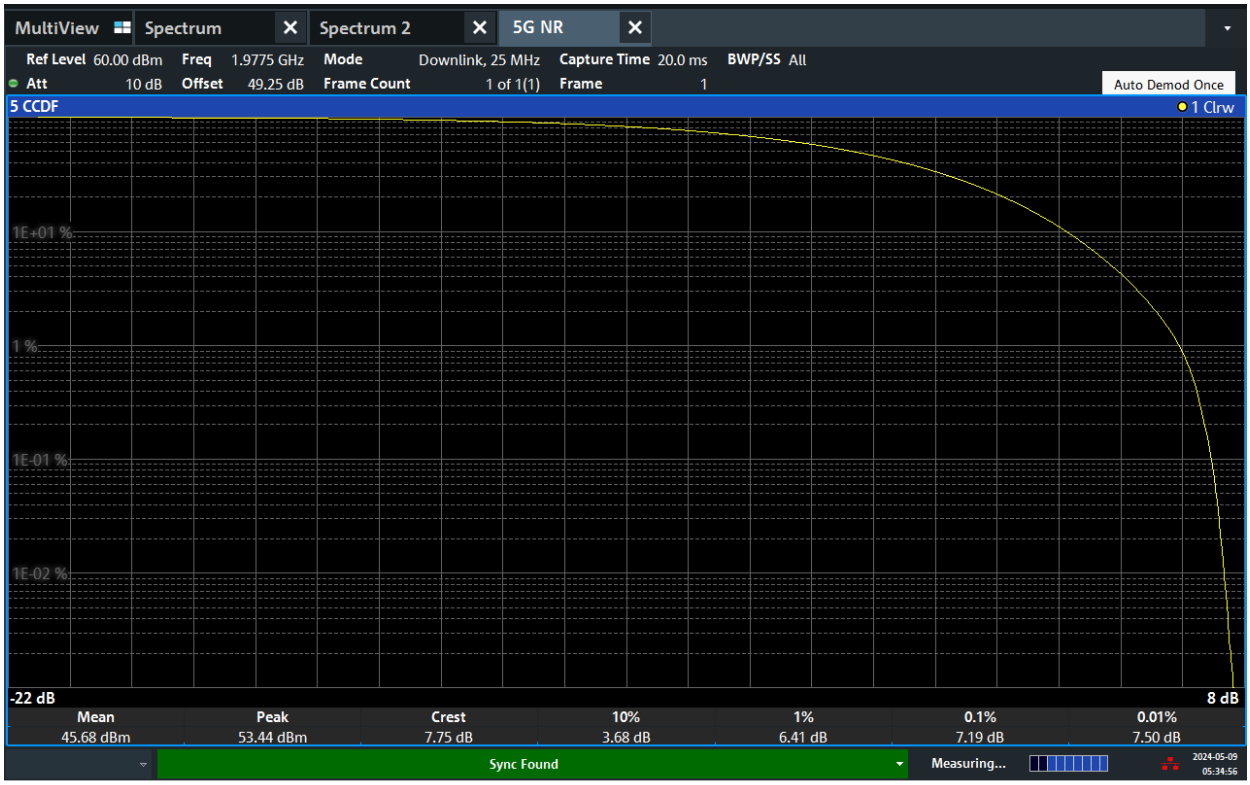
NR 25MHz, Channel T, PAR



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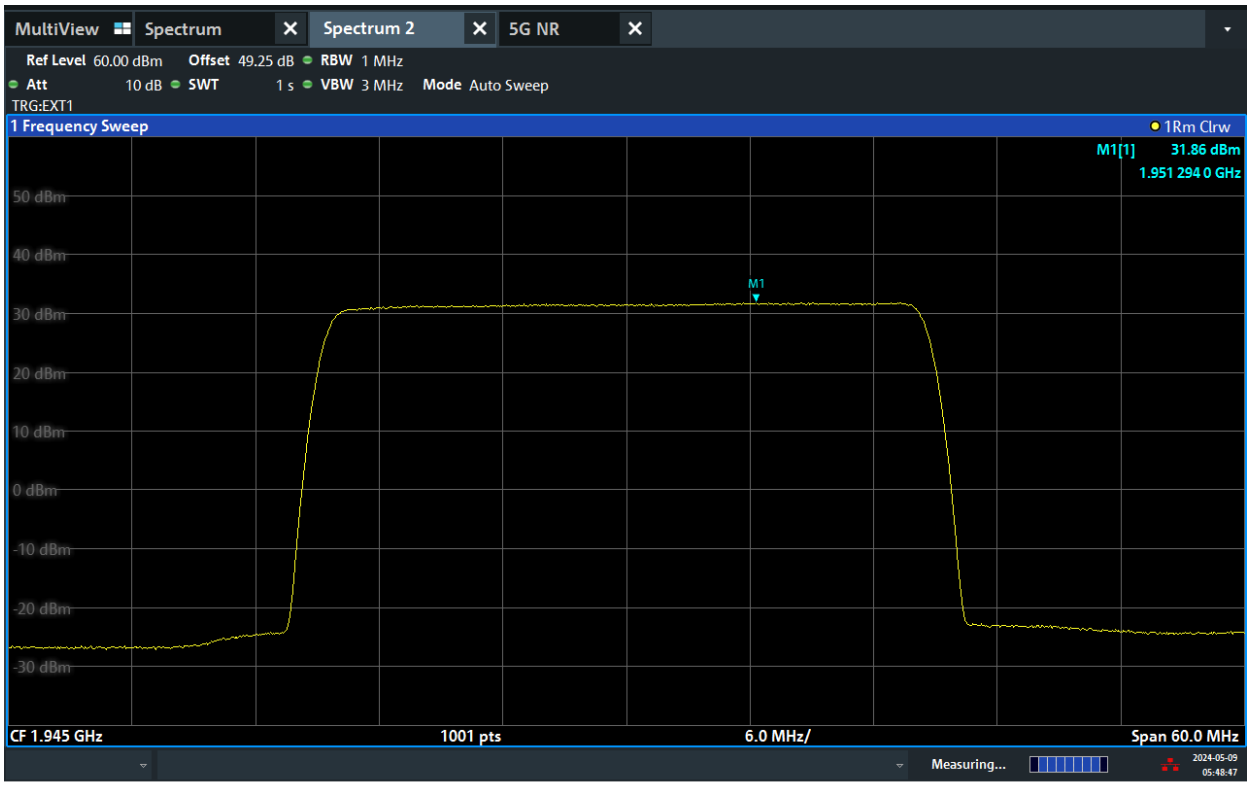

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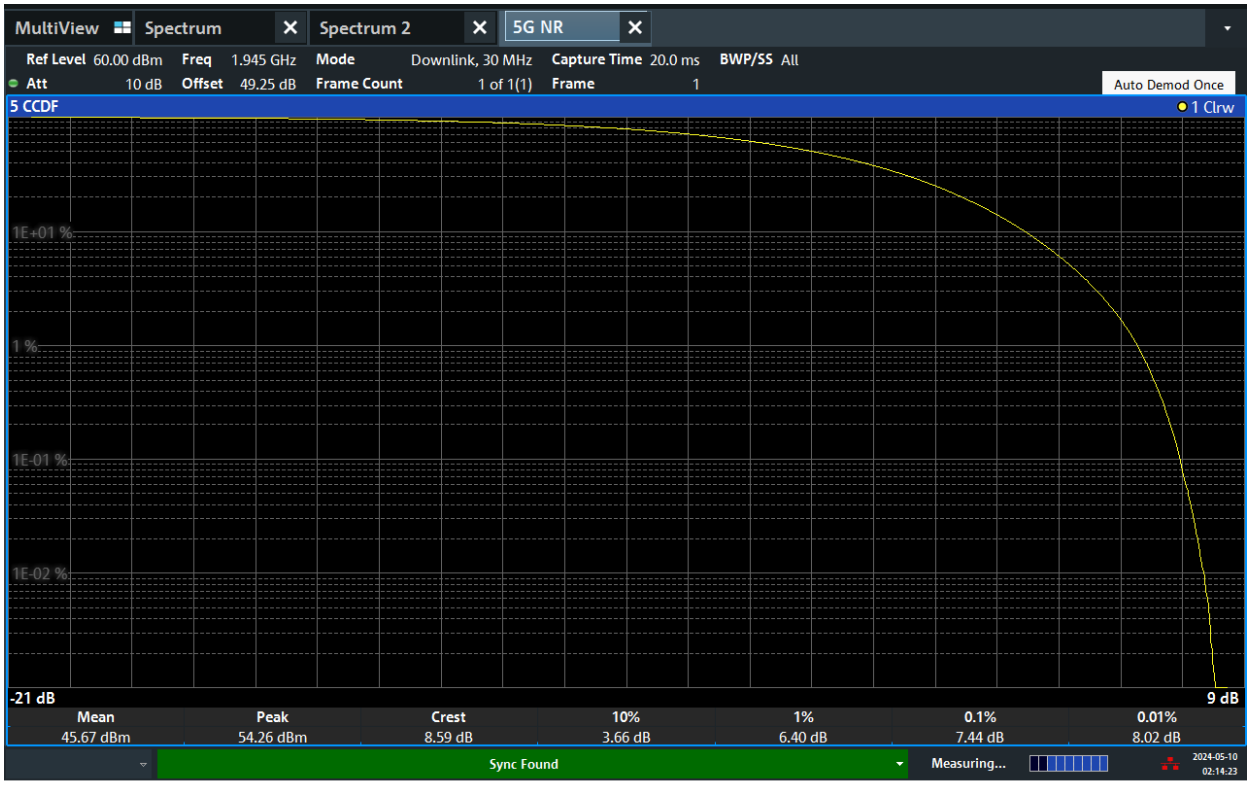
TEST REPORT

NR 30MHz, Channel B, PAR



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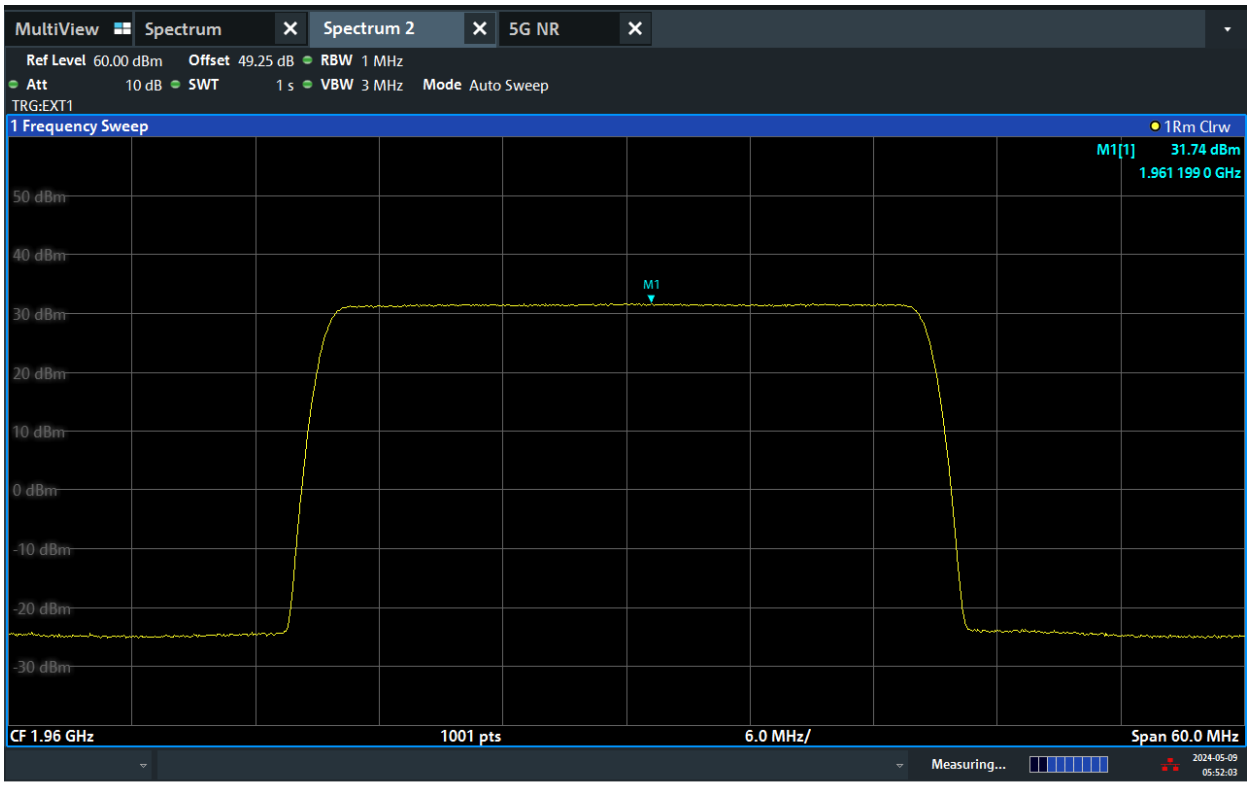

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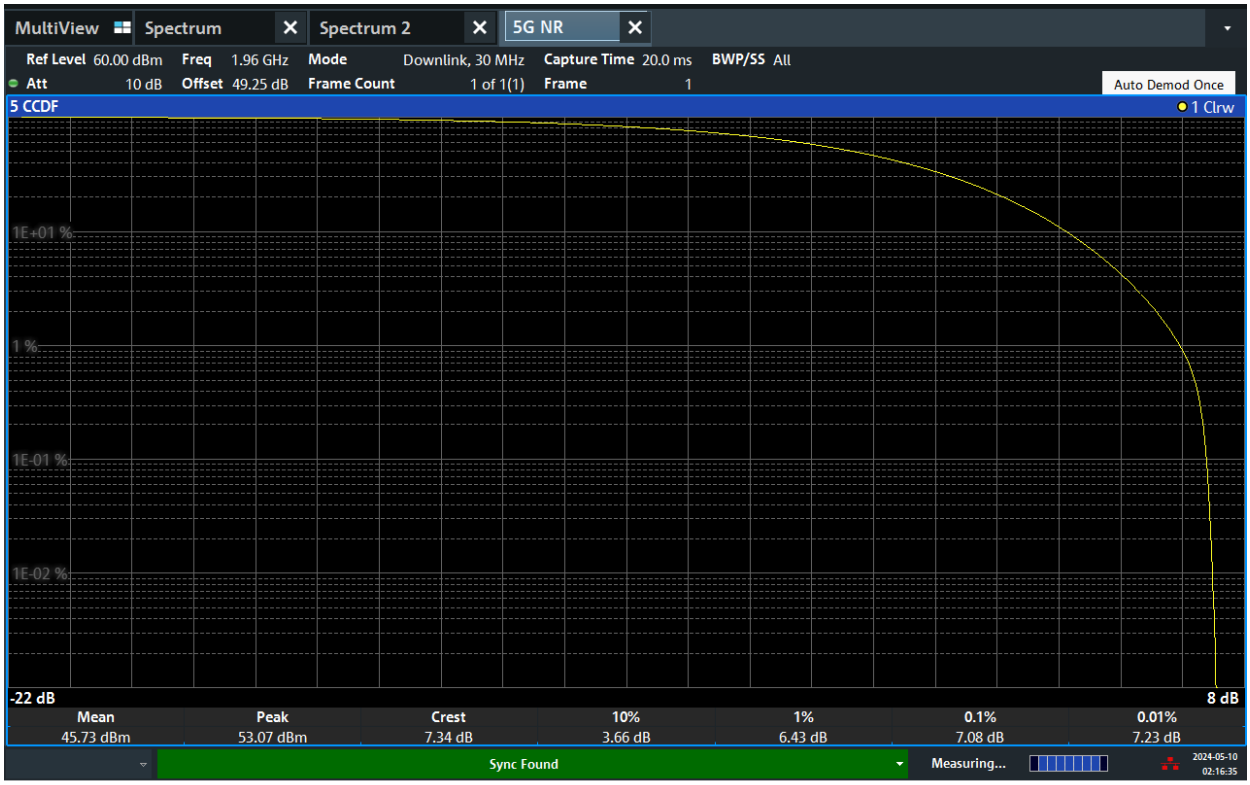
TEST REPORT

NR 30MHz, Channel M, PAR



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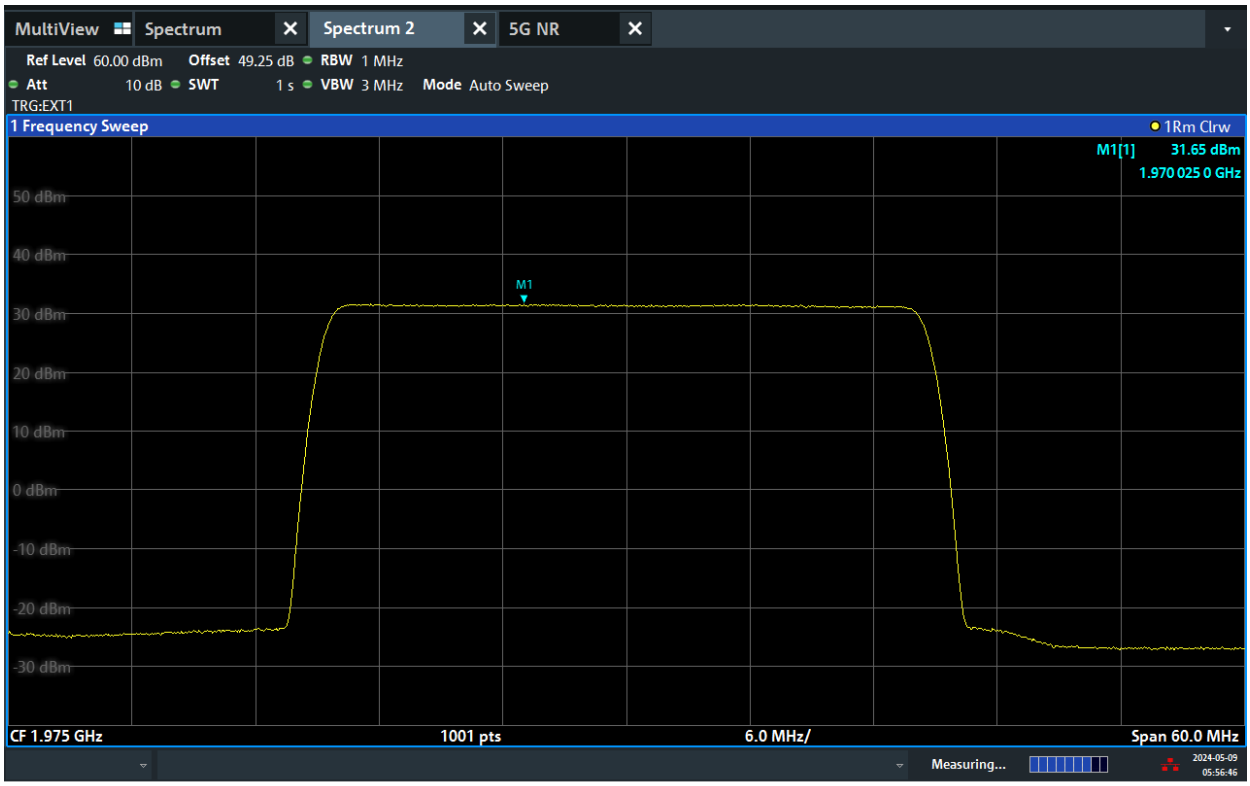
NR 30MHz, Channel T, Power



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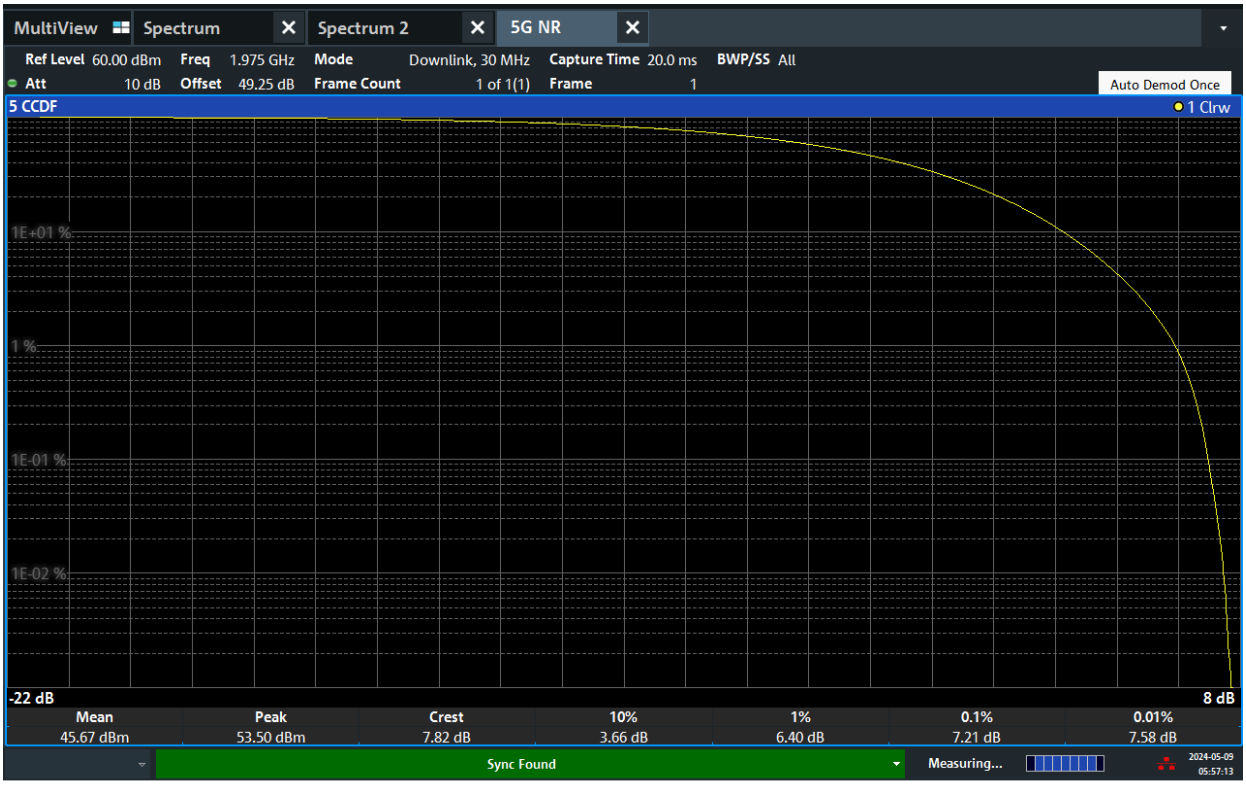
TEST REPORT

NR 30MHz, Channel T, PAR



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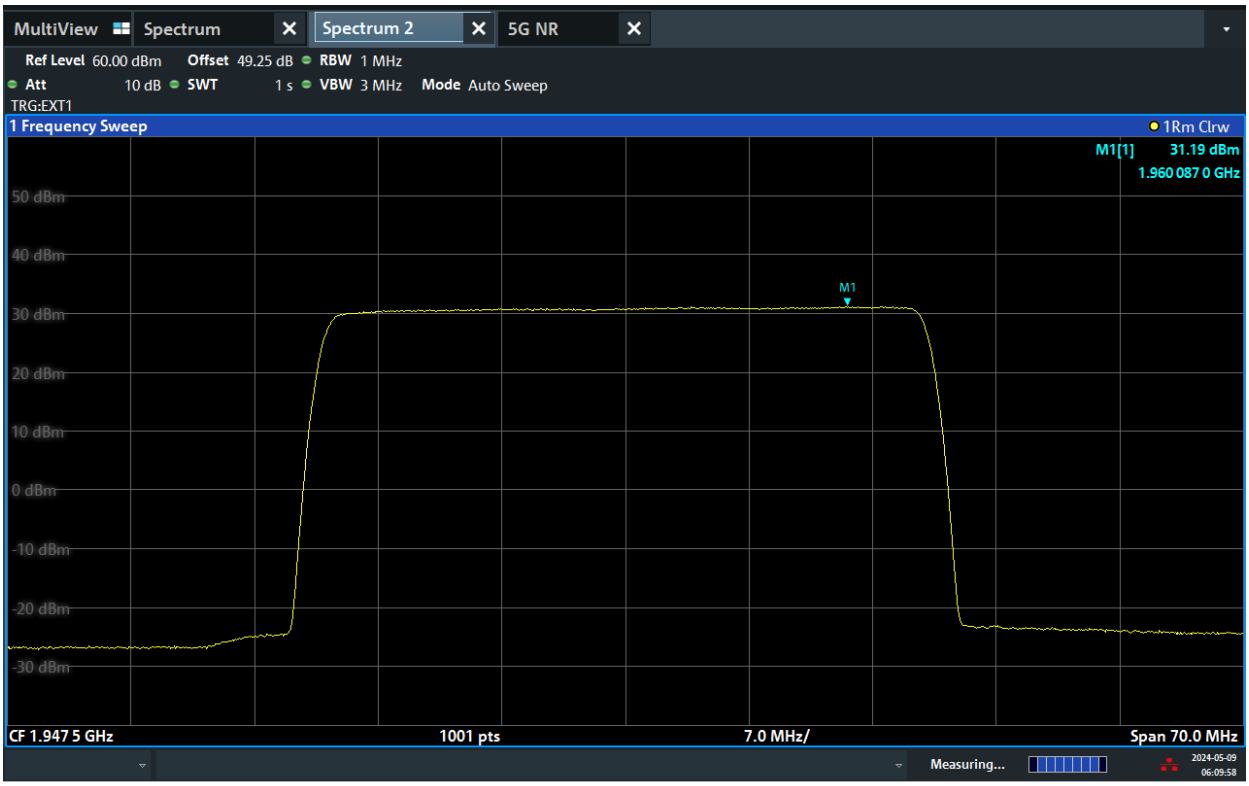
NR 35MHz, Channel B, Power



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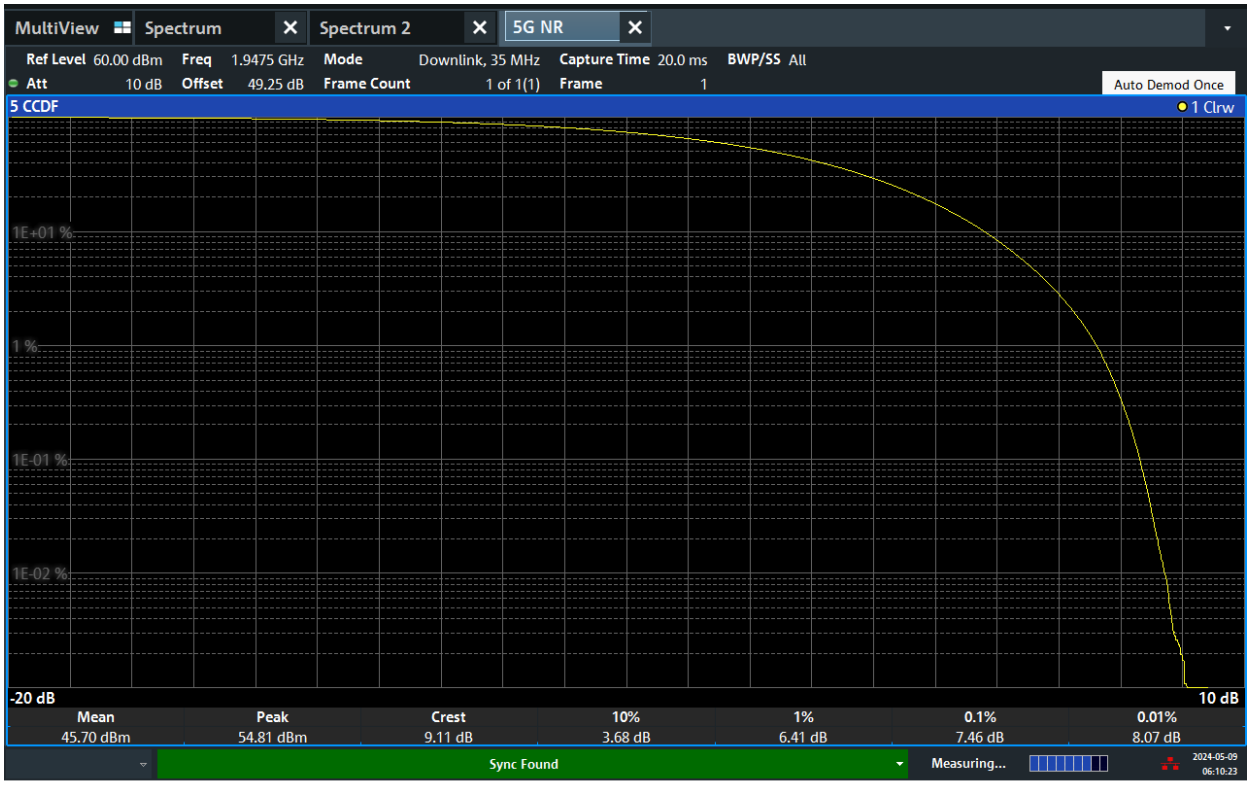
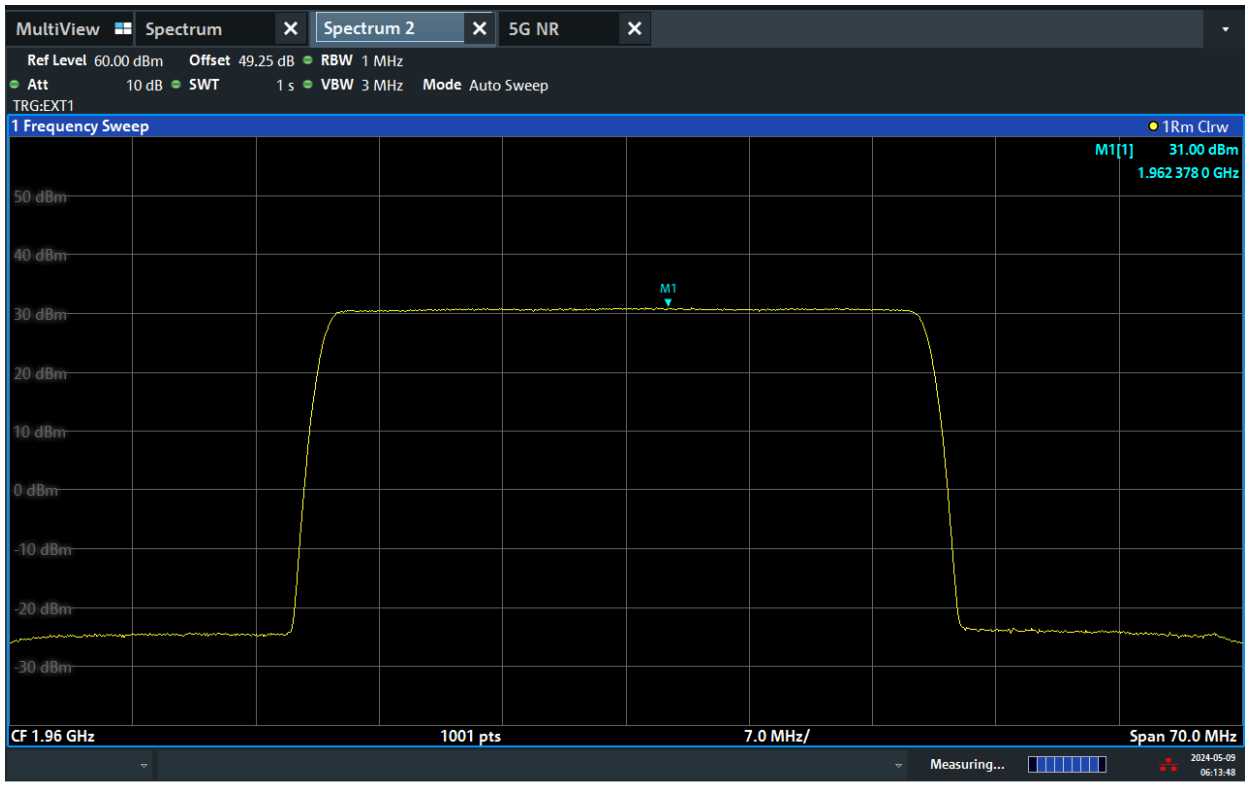
TEST REPORT

NR 35MHz, Channel B, PAR

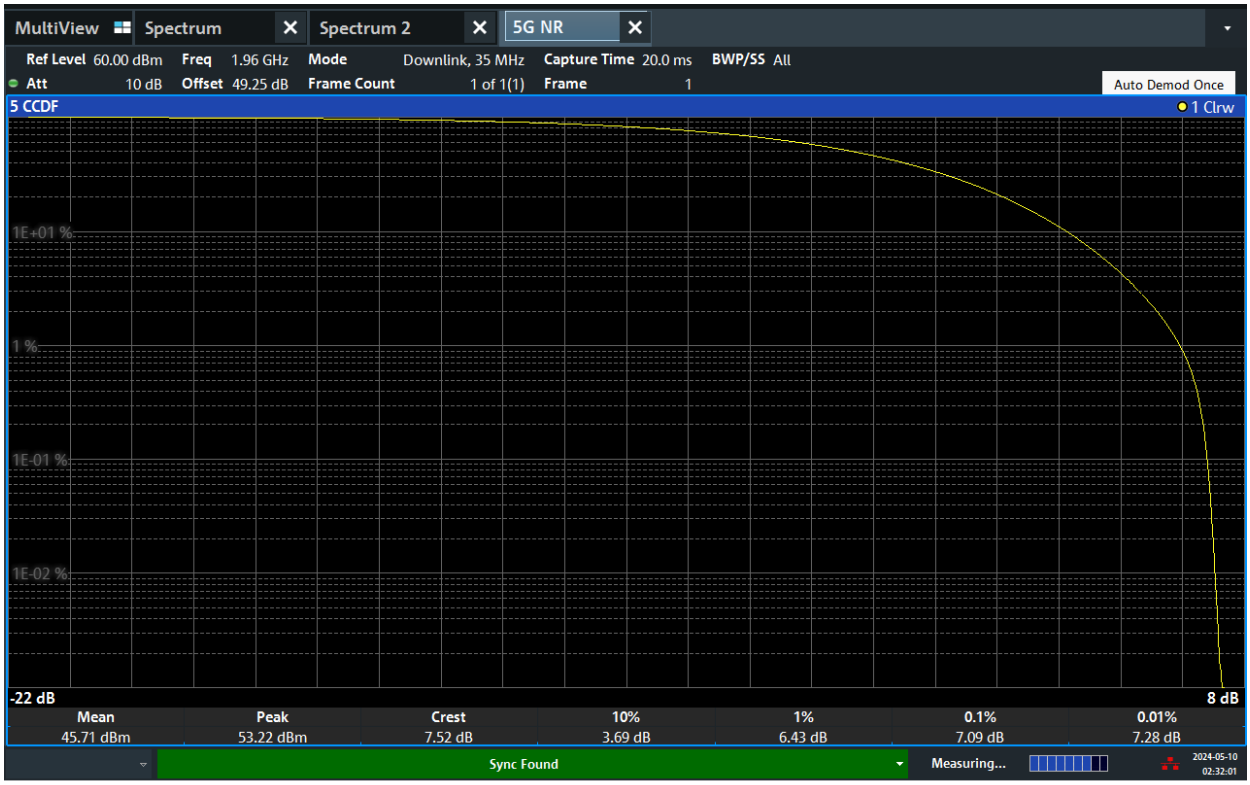


NR 35MHz, Channel M, Power



TEST REPORT

NR 35MHz, Channel M, PAR



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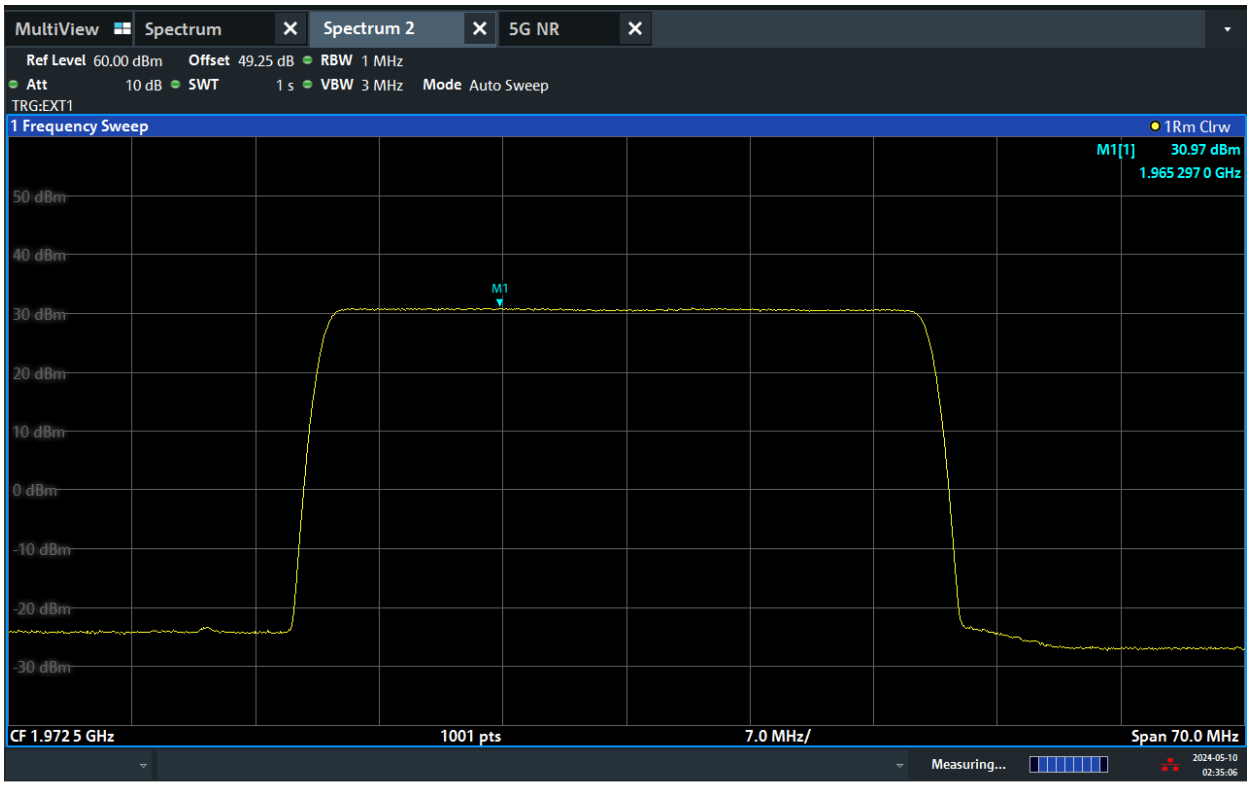
NR 35MHz, Channel T, Power



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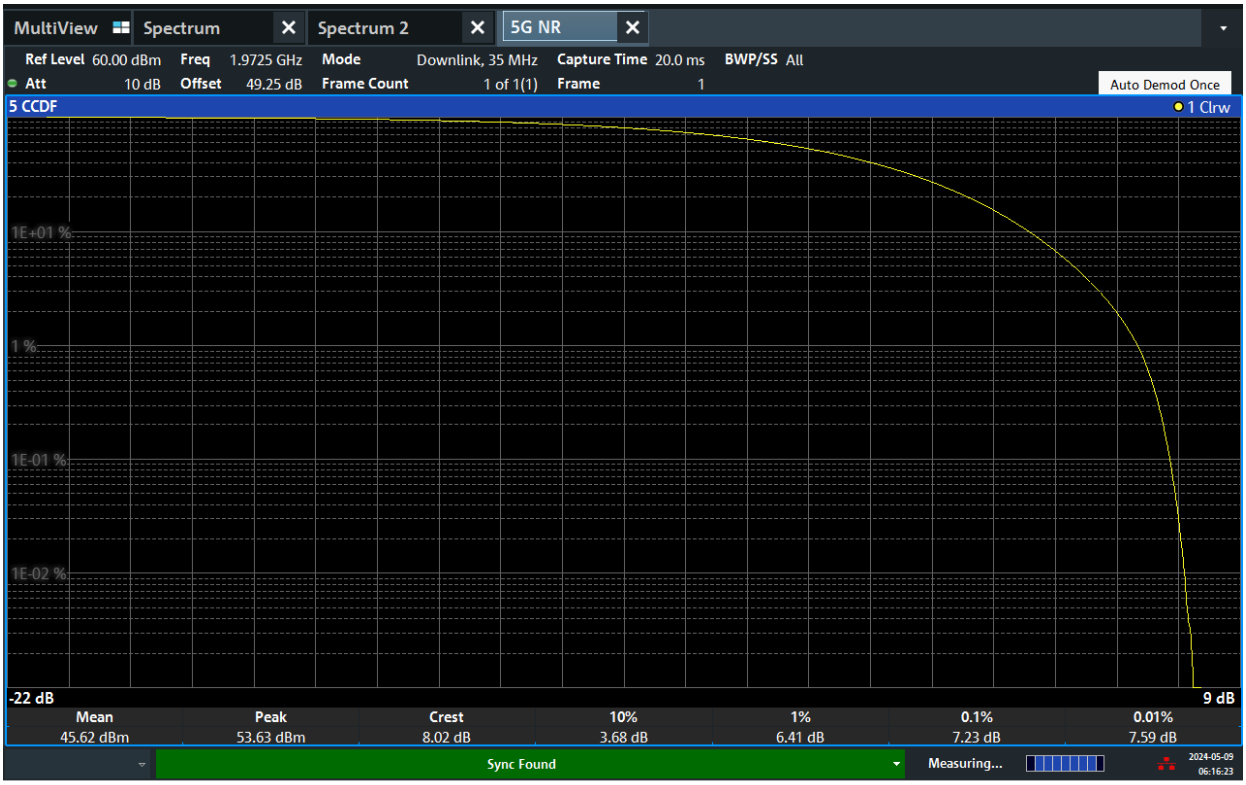
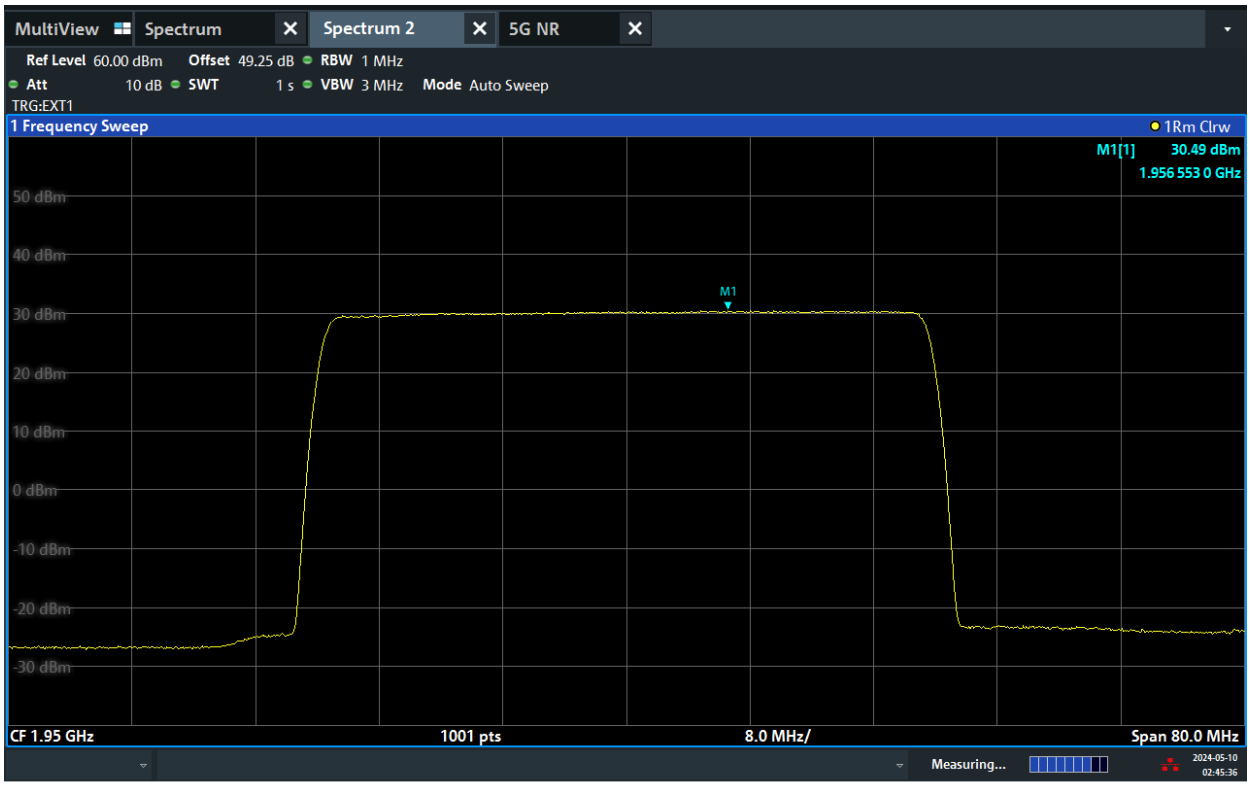
TEST REPORT

NR 35MHz, Channel T, PAR



06:16:24 AM 05/09/2024

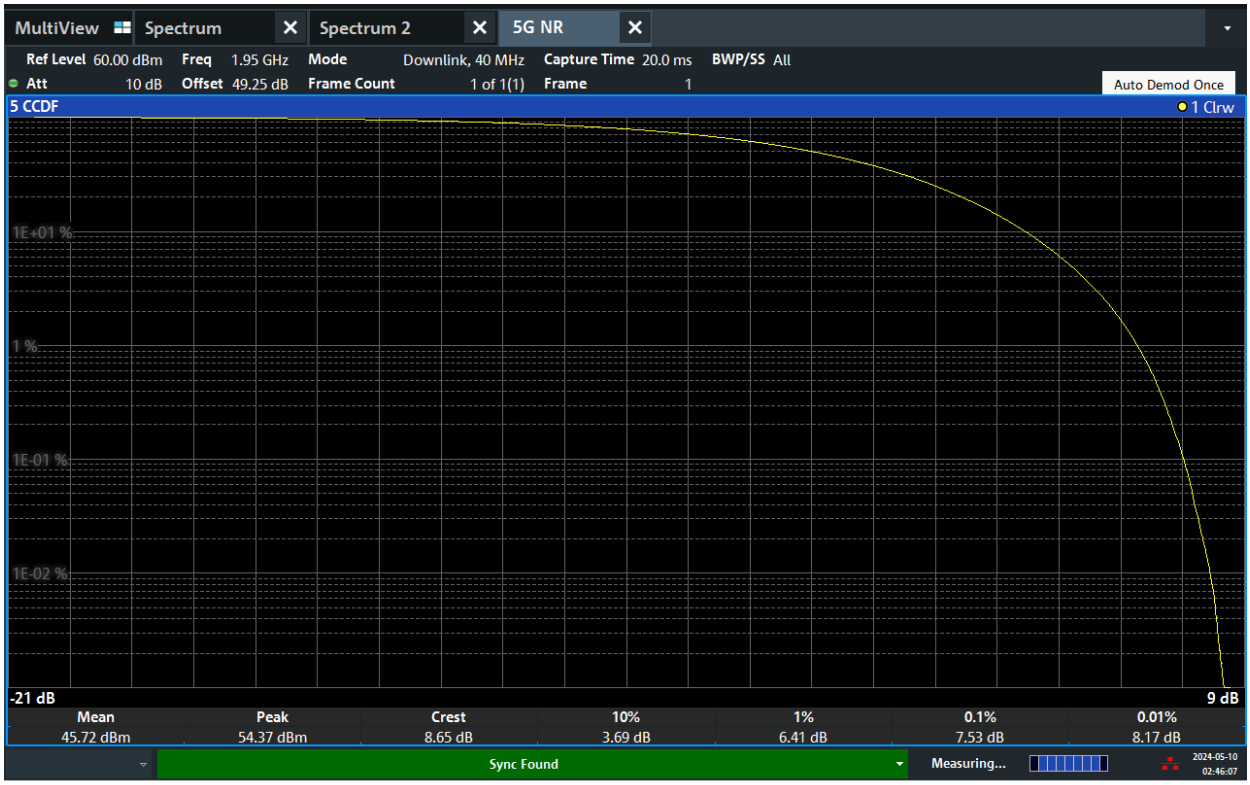
NR 40MHz, Channel B, Power



02:45:37 AM 05/10/2024

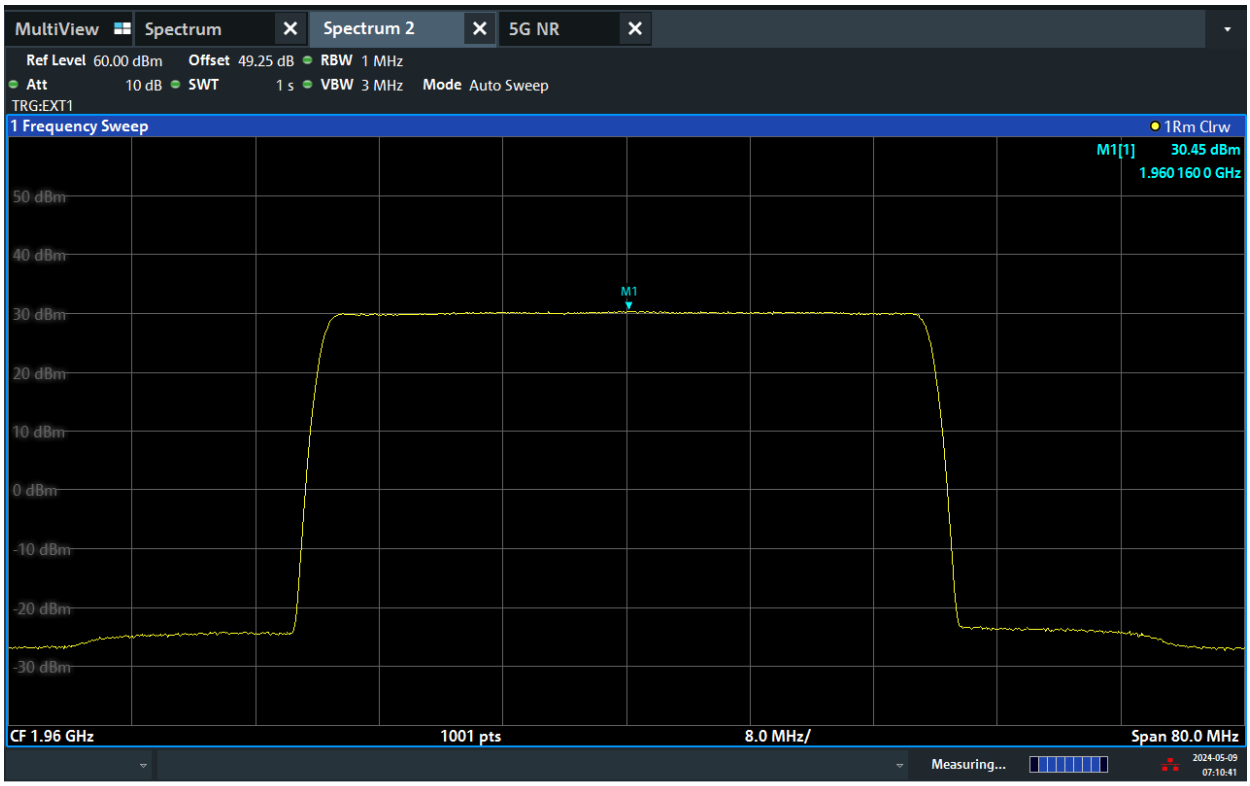
TEST REPORT

NR 40MHz, Channel B, PAR



02:46:08 AM 05/10/2024

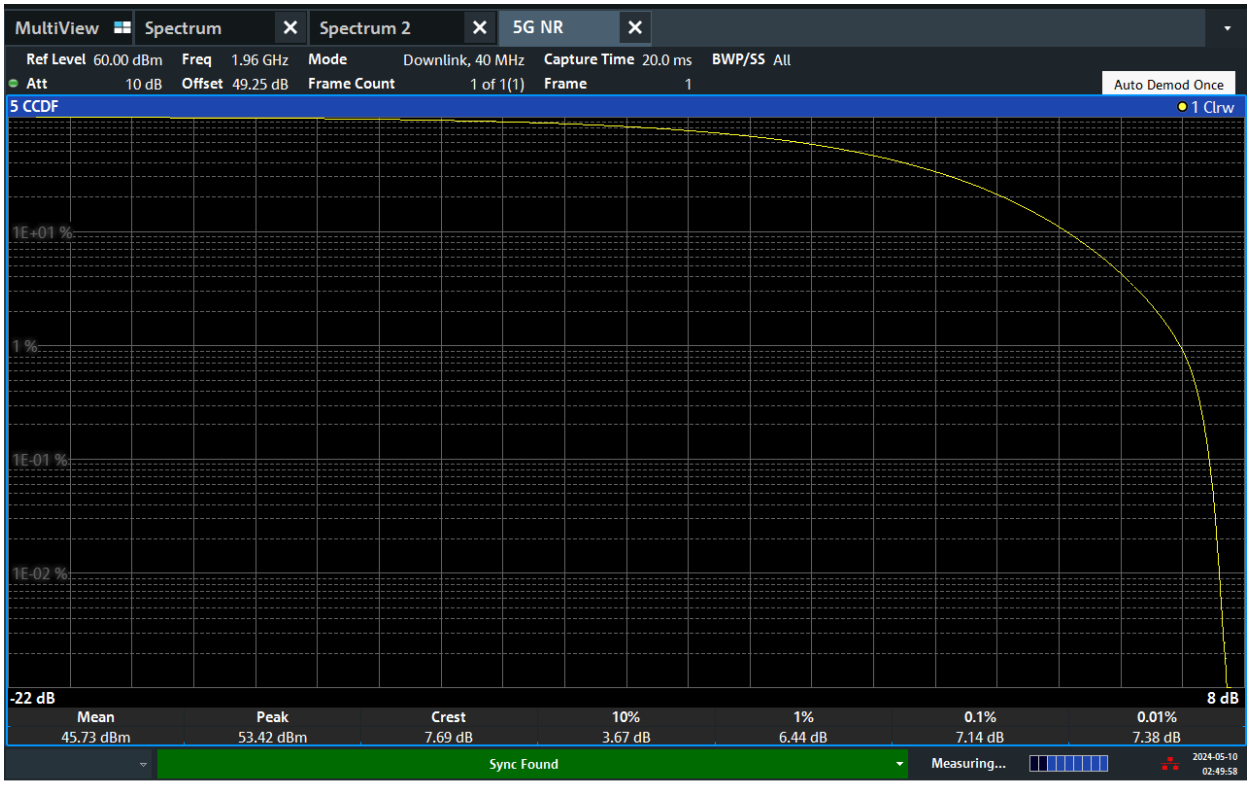
NR 40MHz, Channel M, Power



07:10:42 AM 05/09/2024

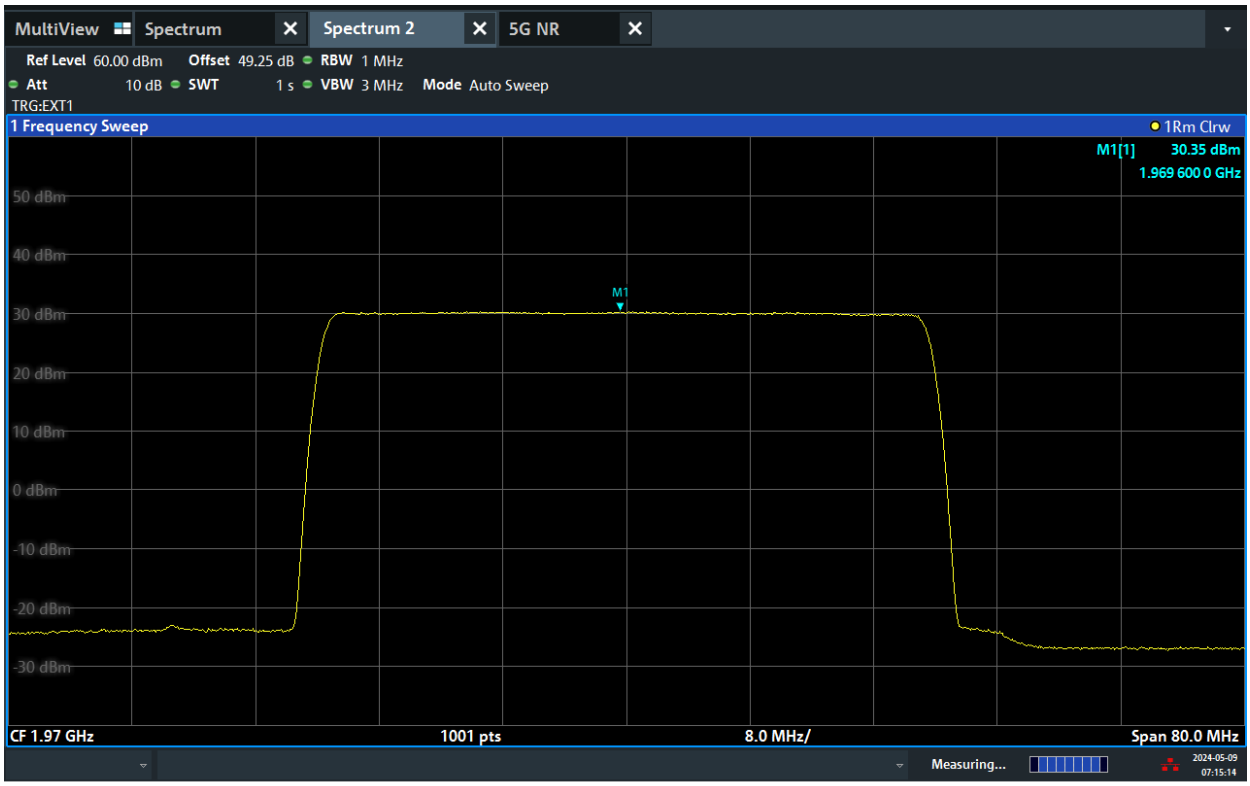
TEST REPORT

NR 40MHz, Channel M, PAR



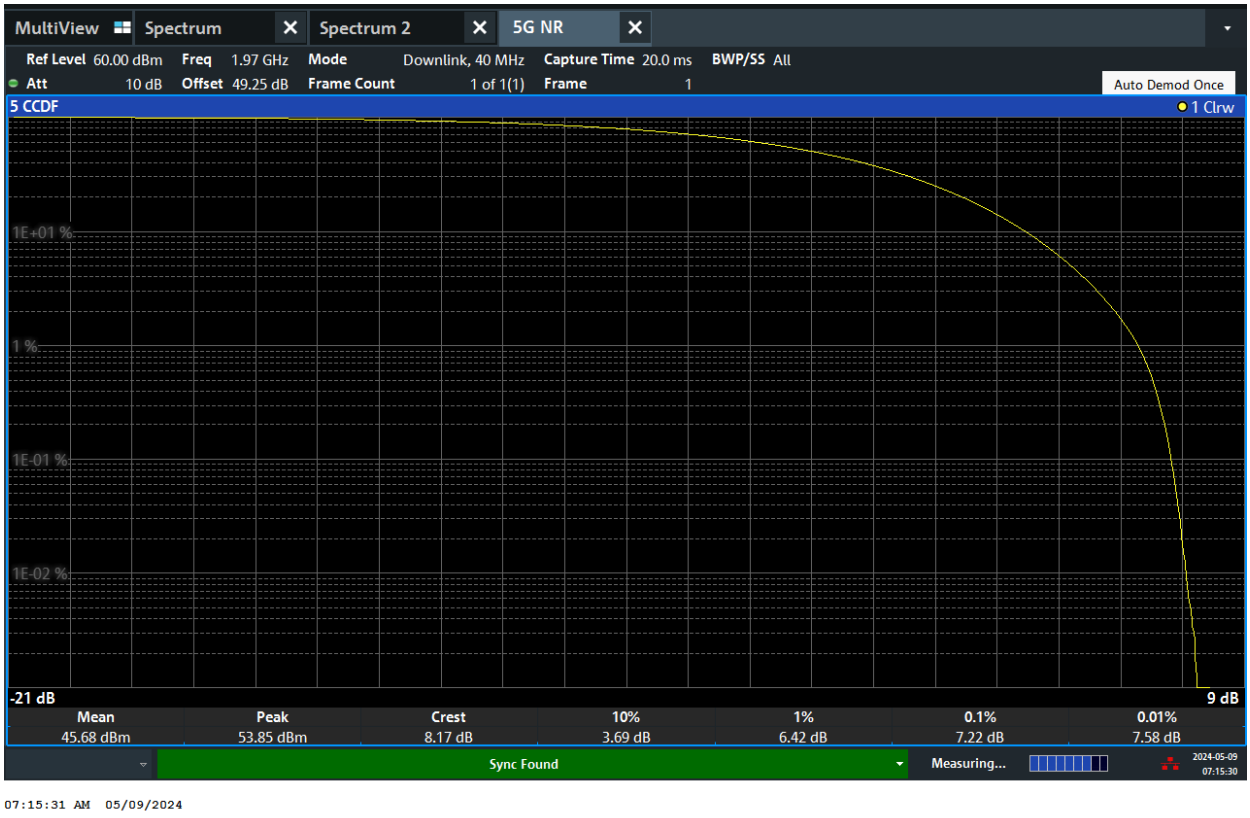
02:49:59 AM 05/10/2024

NR 40MHz, Channel T, Power



07:15:14 AM 05/09/2024

NR 40MHz, Channel T, PAR



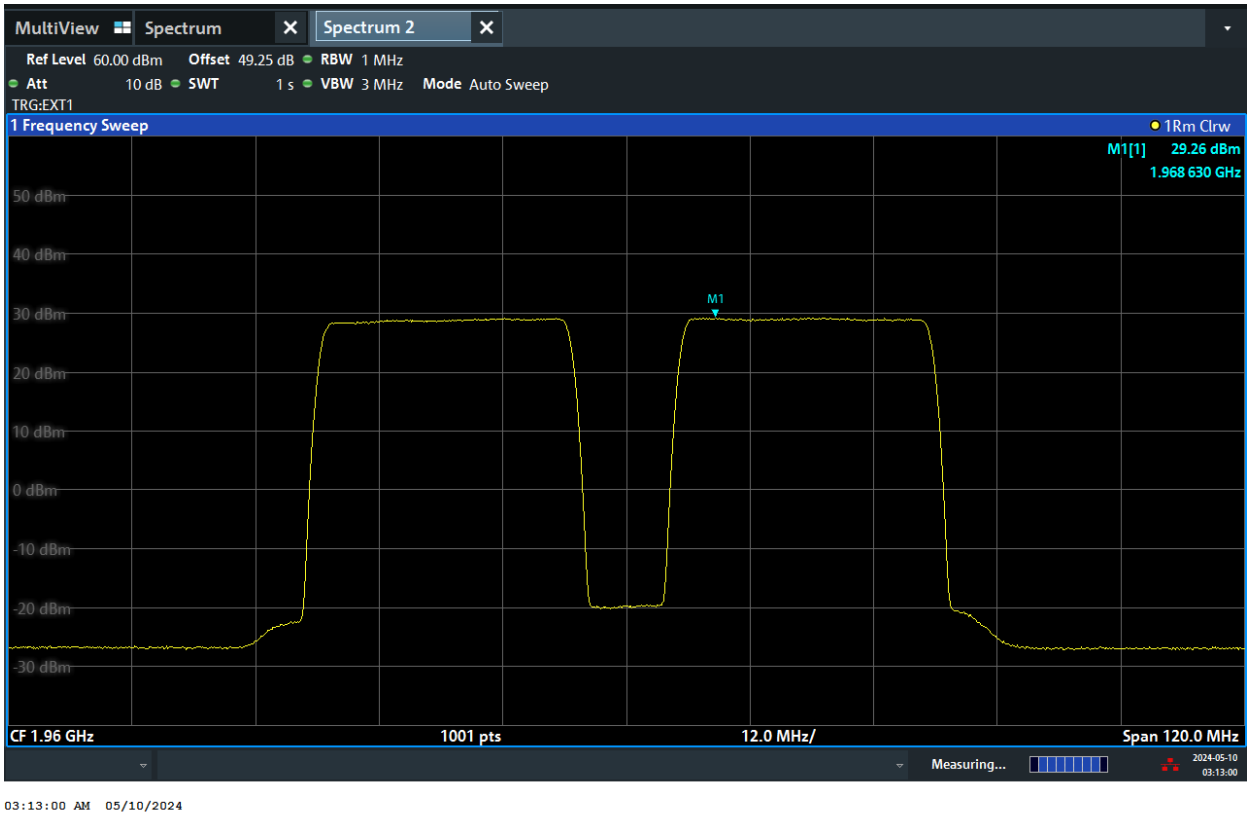
NR-2C

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	25	-	-	-	45.33	29.20	-	-	-	-
B	256QAM	25	-	-	-	45.12	28.96	-	-	-	-
C	256QAM	25	-	-	-	45.29	29.20	-	-	-	-
D	256QAM	25	-	-	-	45.40	29.26	-	-	-	-
Total conducted power			-	-	-	51.31	35.18	-	-	-	-
antenna gain			17.8								
EIRP			-	-	-	69.11	52.98	-	-	-	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	-	-	-	9.17	-	-	-	-

TEST REPORT

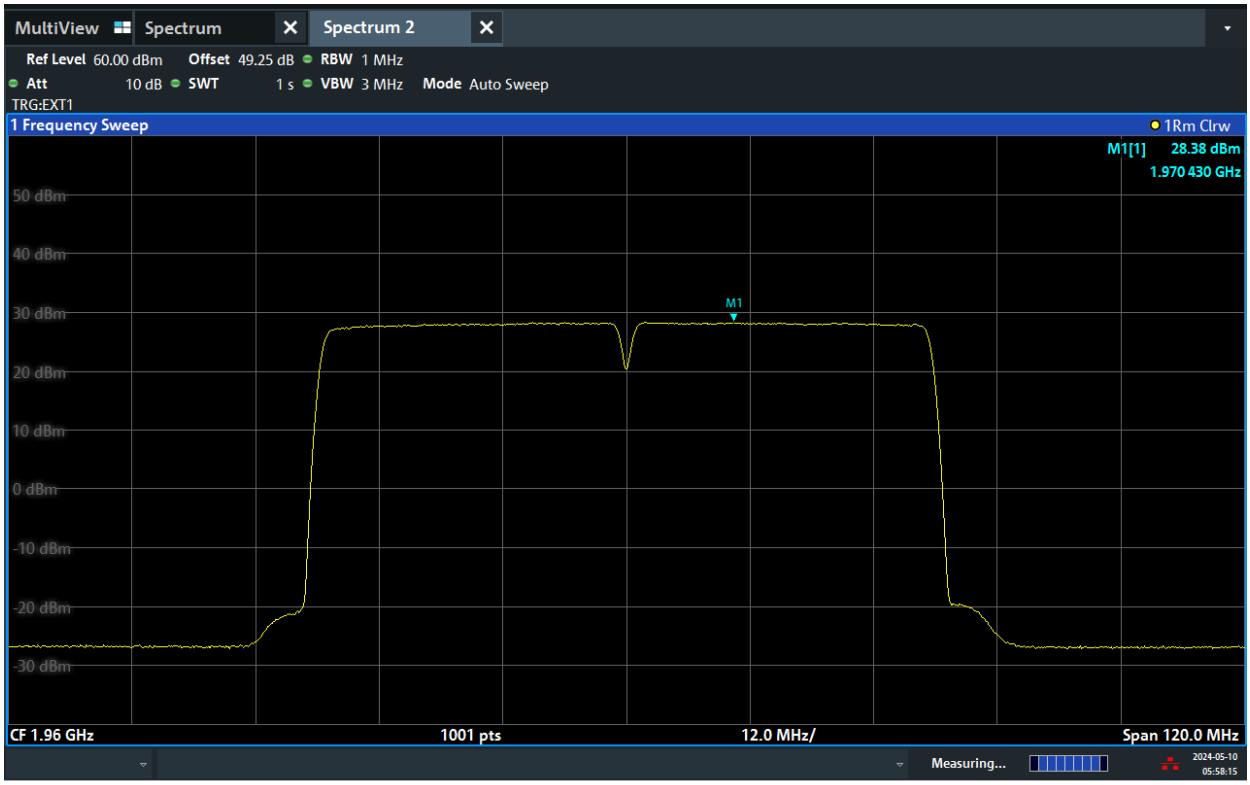
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	30	-	-	-	45.32	28.38	-	-	-	-
B	256QAM	30	-	-	-	45.20	28.25	-	-	-	-
C	256QAM	30	-	-	-	45.32	28.36	-	-	-	-
D	256QAM	30	-	-	-	45.44	28.24	-	-	-	-
Total conducted power			-	-	-	51.34	34.33	-	-	-	-
antenna gain			17.8								
EIRP			-	-	-	69.14	52.13	-	-	-	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	-	-	-	10.02	-	-	-	-

NR 25MHz, Channel M, Power



03:13:00 AM 05/10/2024

NR 30MHz, Channel M, Power



05:58:16 AM 05/10/2024

2TX/RX mode:

NR-1C

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	25	47.48	34.48	7.34	47.55	34.23	7.04	47.40	34.15	7.19
D	256QAM	25	47.48	34.36	7.33	47.47	34.22	7.02	47.41	34.13	7.17
Total conducted power			50.49	37.43	-	50.52	37.24	-	50.42	37.15	-
antenna gain			17.8								
EIRP			68.29	55.23	-	68.32	55.04	-	68.22	54.95	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	6.92	-	-	7.11	-	-	7.20	-

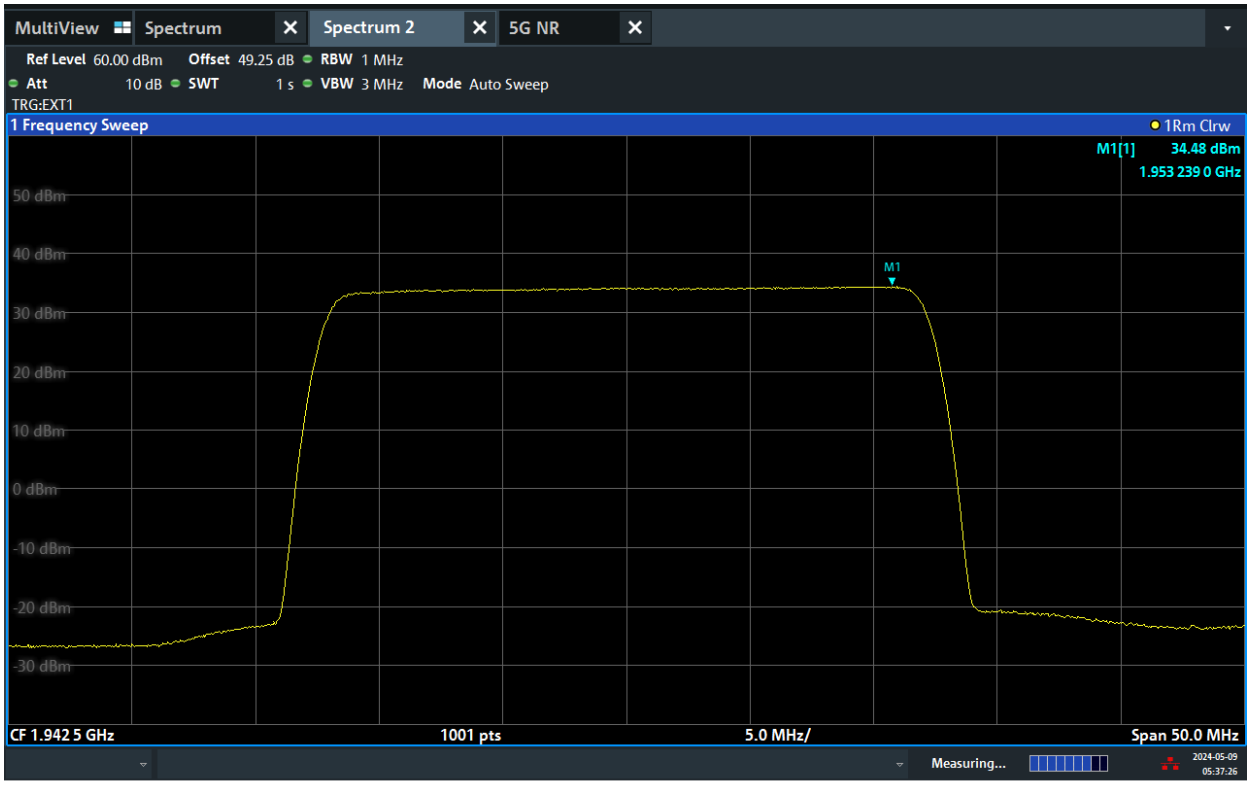
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	30	47.46	33.16	7.44	47.47	33.46	7.06	47.34	33.35	7.21
D	256QAM	30	47.47	33.52	7.41	47.41	33.39	7.07	47.41	33.40	7.19
Total conducted power			50.48	36.35	-	50.45	36.44	-	50.39	36.39	-
antenna gain			17.8								
EIRP			68.28	54.15	-	68.25	54.24	-	68.19	54.19	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	8.00	-	-	7.91	-	-	7.96	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	35	47.47	32.90	7.45	47.45	32.70	7.06	47.33	32.60	7.21
D	256QAM	35	47.36	32.75	7.45	47.39	32.68	7.07	47.41	32.69	7.18
Total conducted power			50.43	35.84	-	50.43	35.70	-	50.38	35.66	-
antenna gain			17.8								
EIRP			68.23	53.64	-	68.23	53.50	-	68.18	53.46	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	8.51	-	-	8.65	-	-	8.69	-

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	40	47.43	32.23	7.51	47.42	32.17	7.12	47.33	32.03	7.21
D	256QAM	40	47.41	32.20	7.51	47.31	31.99	7.13	47.43	32.10	7.18
Total conducted power			50.43	35.23	-	50.38	35.09	-	50.39	35.08	-
antenna gain			17.8								
EIRP			68.23	53.03	-	68.18	52.89	-	68.19	52.88	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
margin			-	9.12	-	-	9.26	-	-	9.27	-

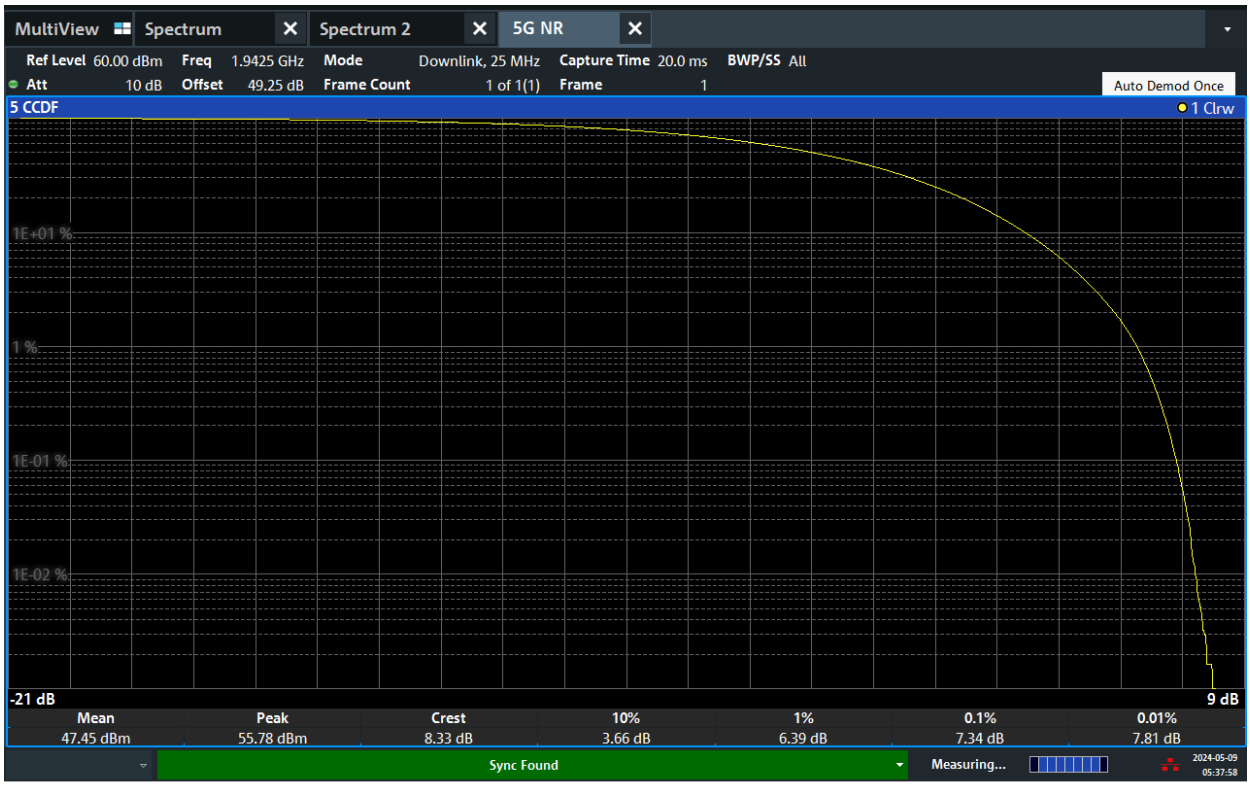
TEST REPORT

NR 25MHz, Channel B, Power



05:37:27 AM 05/09/2024

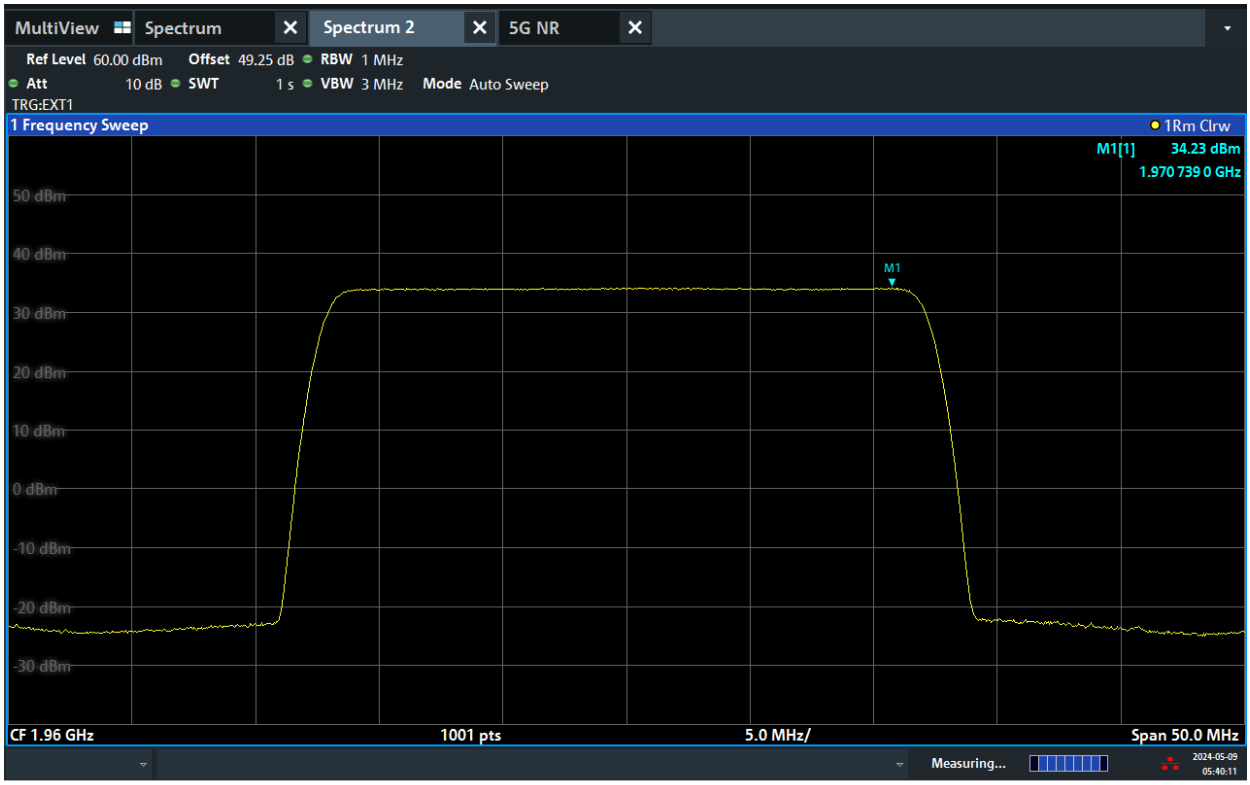
NR 25MHz, Channel B, PAR



05:37:59 AM 05/09/2024

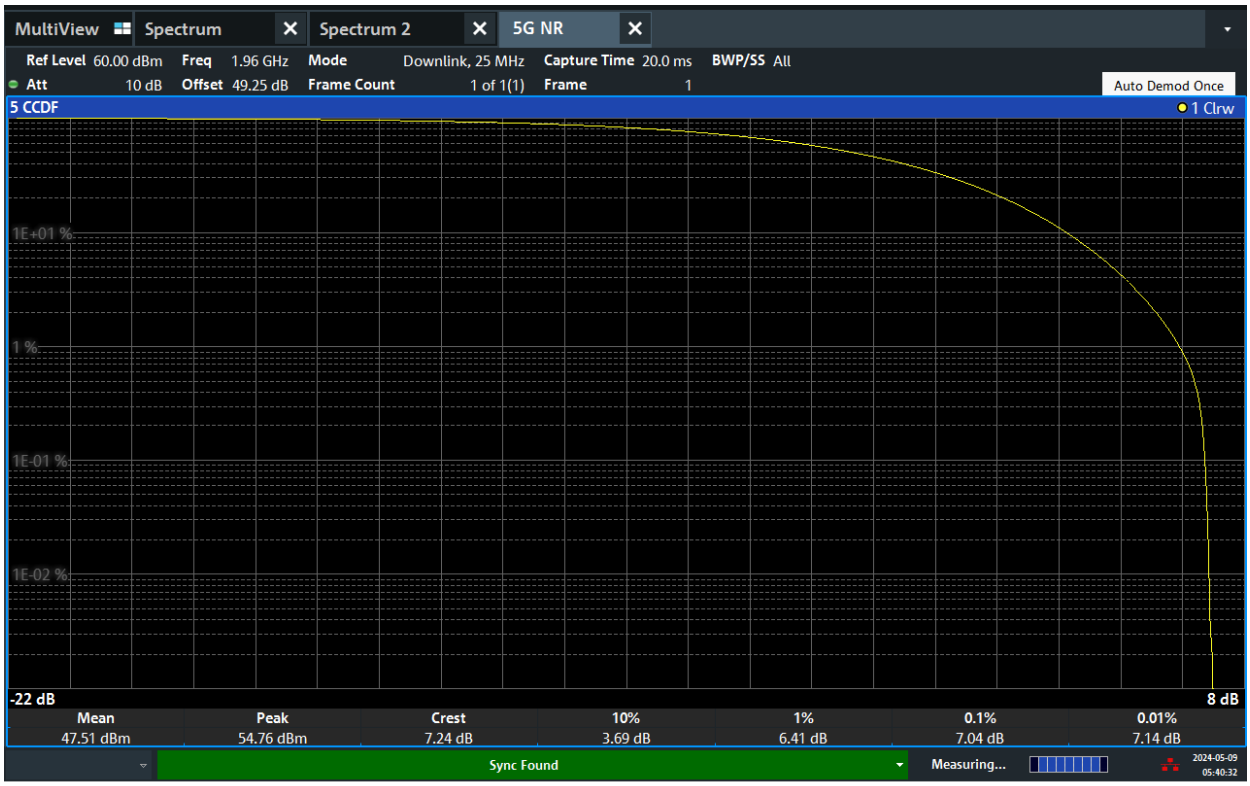
TEST REPORT

NR 25MHz, Channel M, Power



05:40:12 AM 05/09/2024

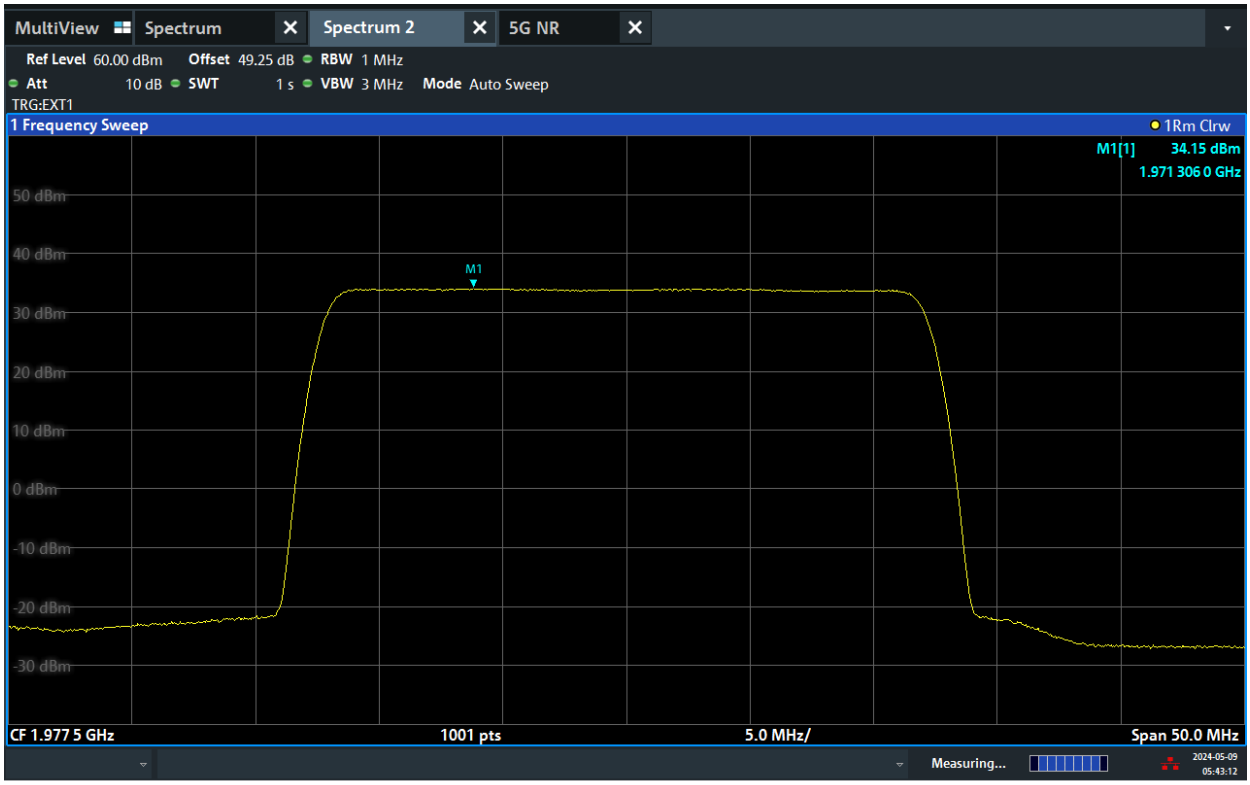
NR 25MHz, Channel M, PAR



05:40:33 AM 05/09/2024

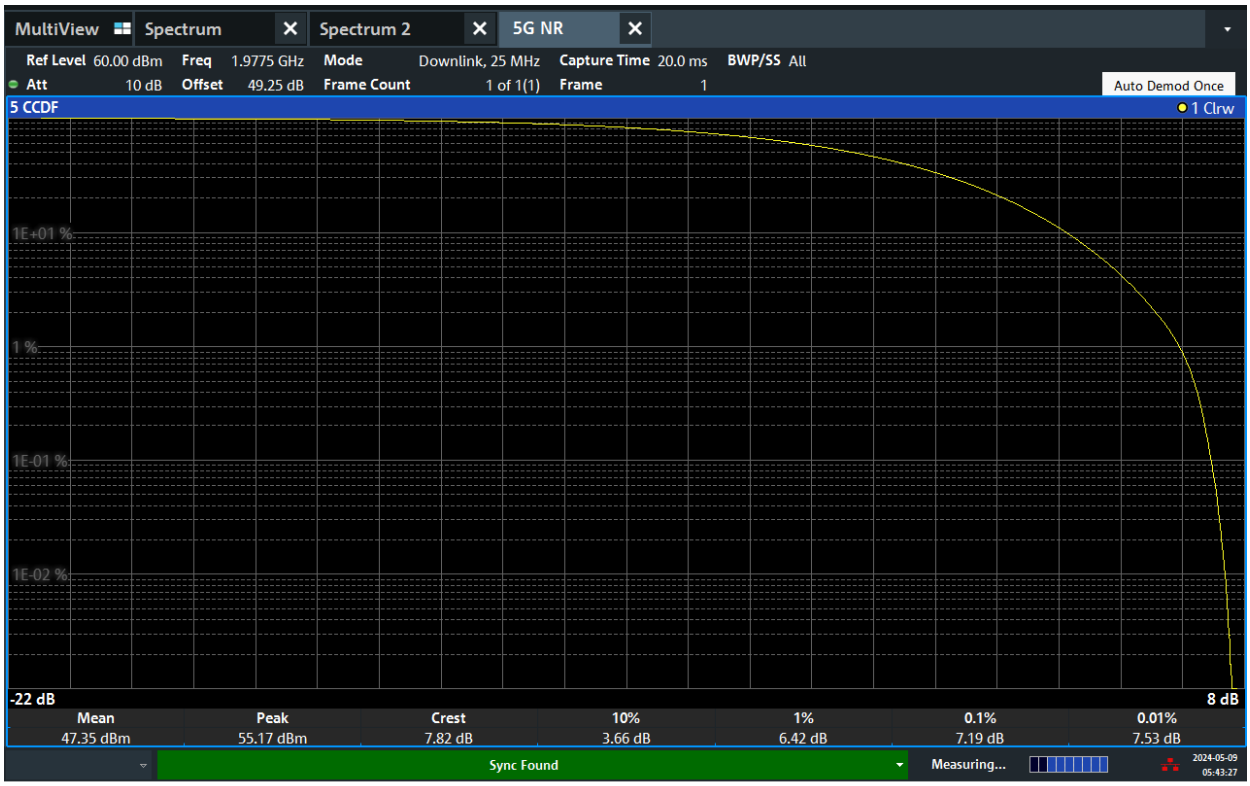
TEST REPORT

NR 25MHz, Channel T, Power



05:43:12 AM 05/09/2024

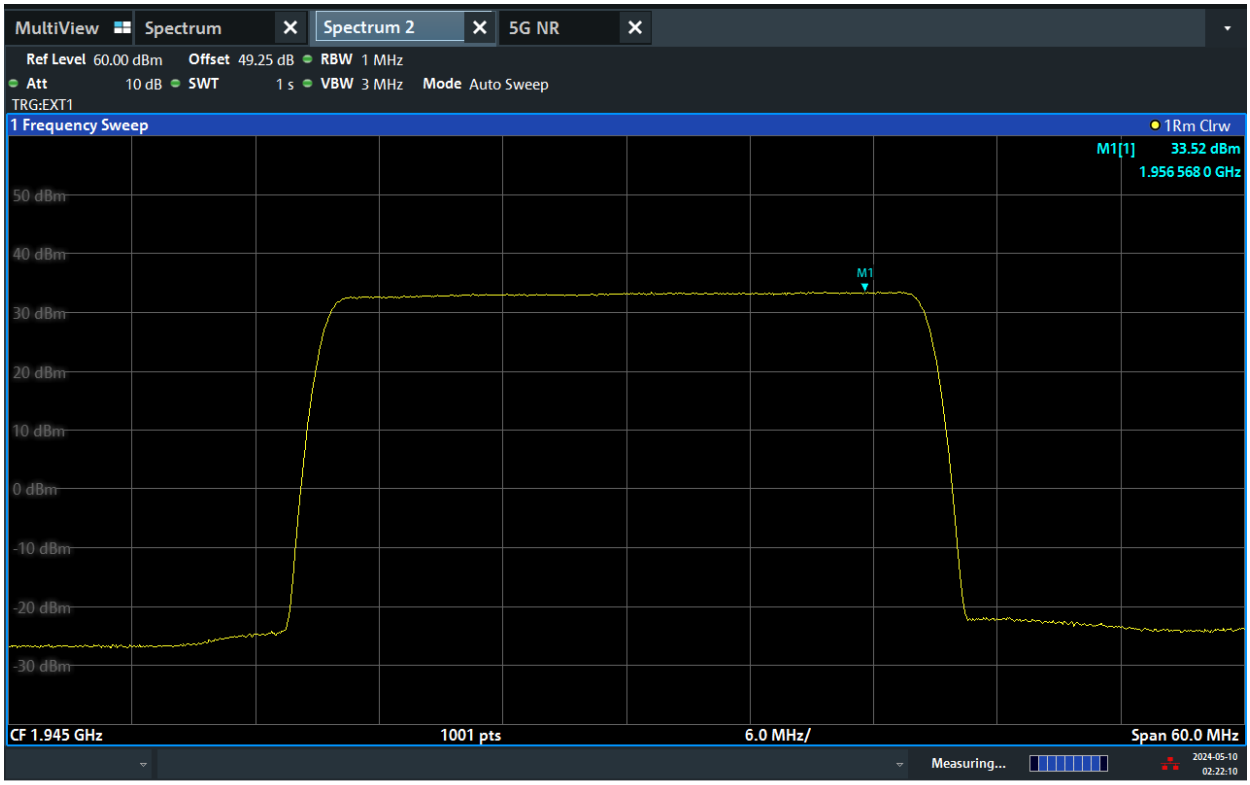
NR 25MHz, Channel T, PAR



05:43:27 AM 05/09/2024

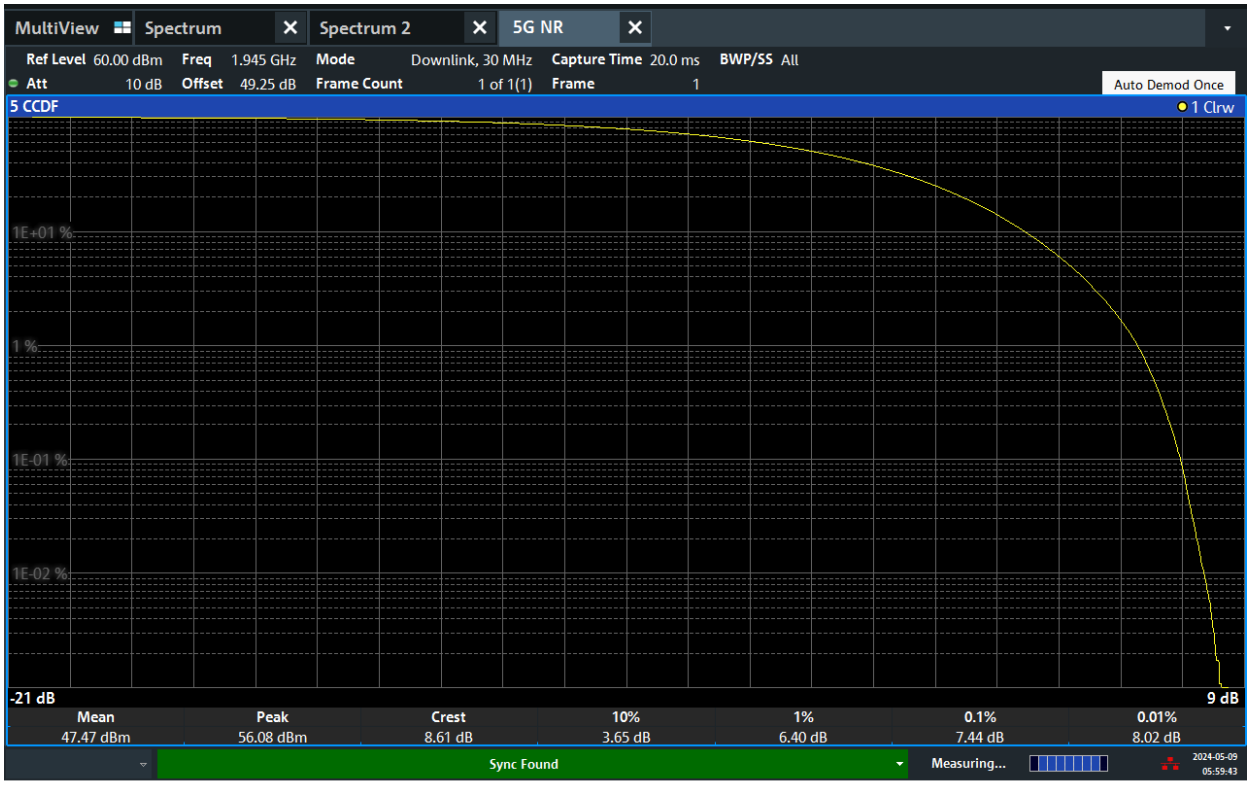
TEST REPORT

NR 30MHz, Channel B, Power



02:22:10 AM 05/10/2024

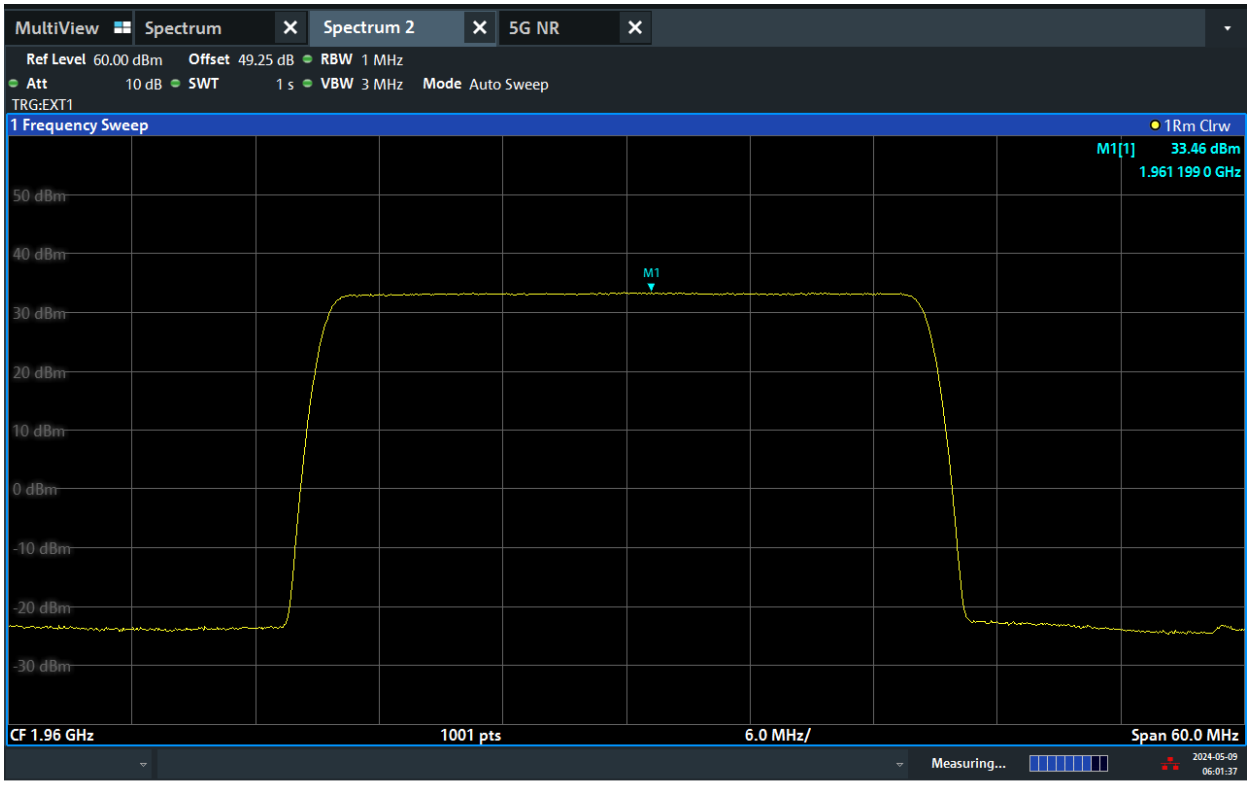
NR 30MHz, Channel B, PAR



05:59:44 AM 05/09/2024

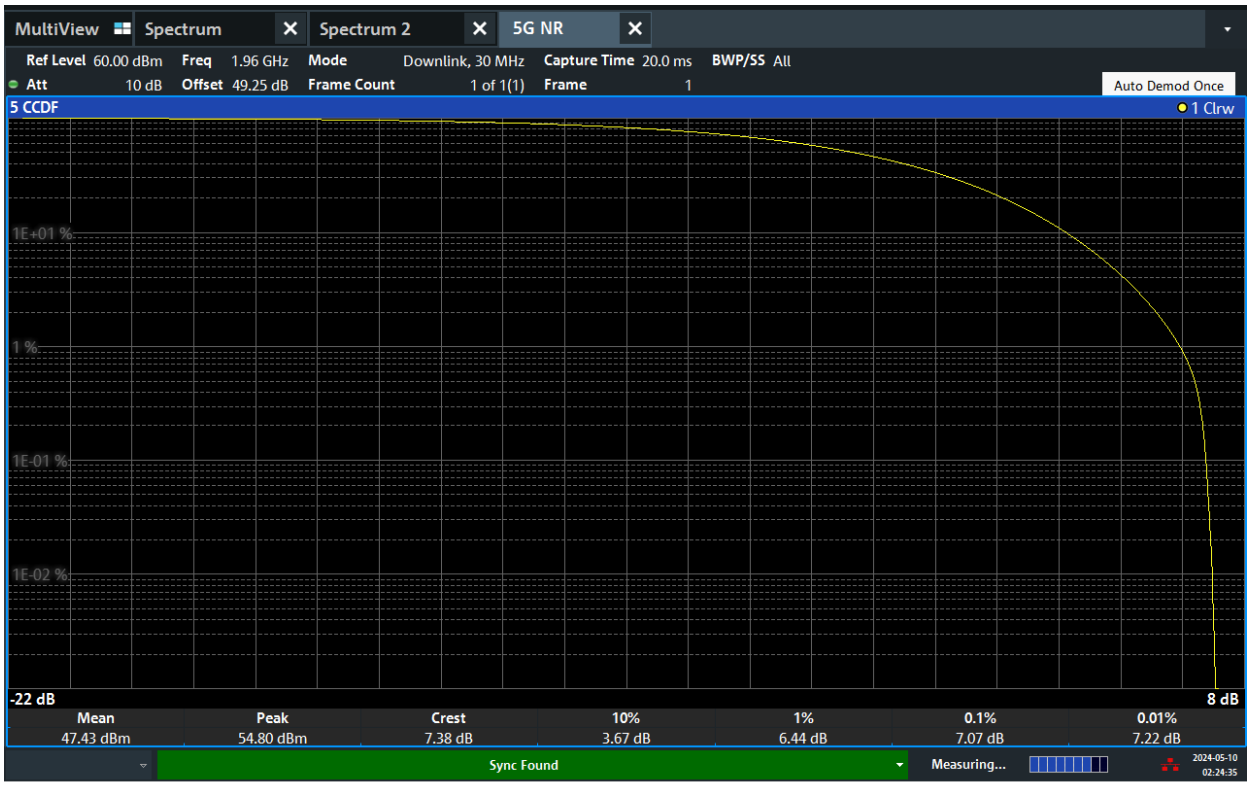
TEST REPORT

NR 30MHz, Channel M, Power



06:01:37 AM 05/09/2024

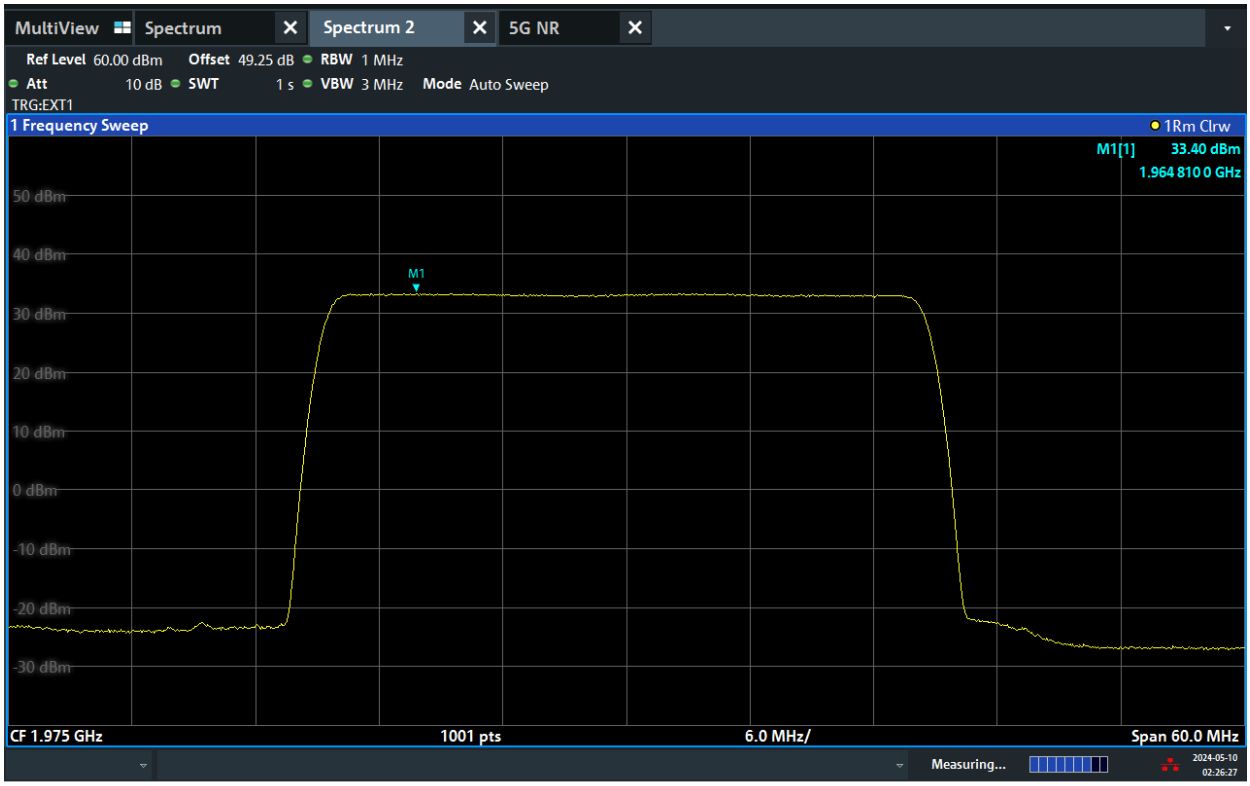
NR 30MHz, Channel M, PAR



02:24:36 AM 05/10/2024

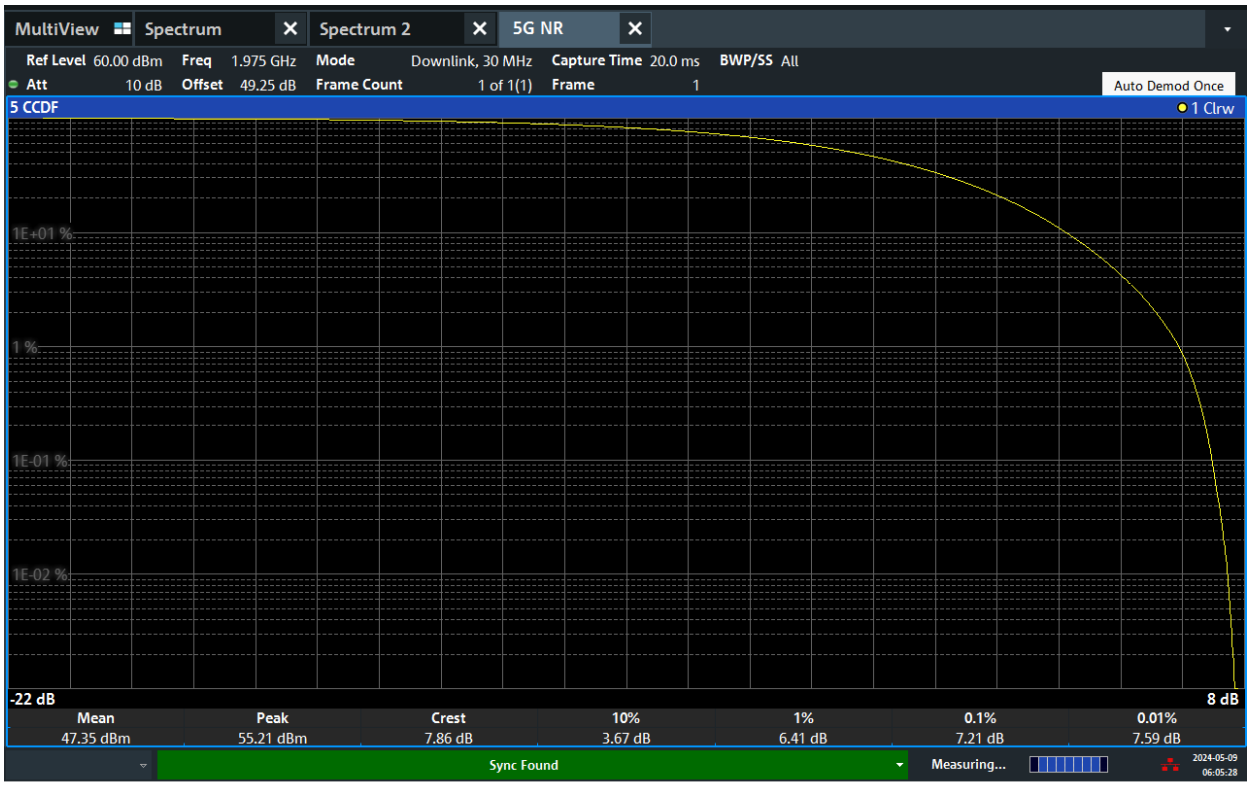
TEST REPORT

NR 30MHz, Channel T, Power



02:26:27 AM 05/10/2024

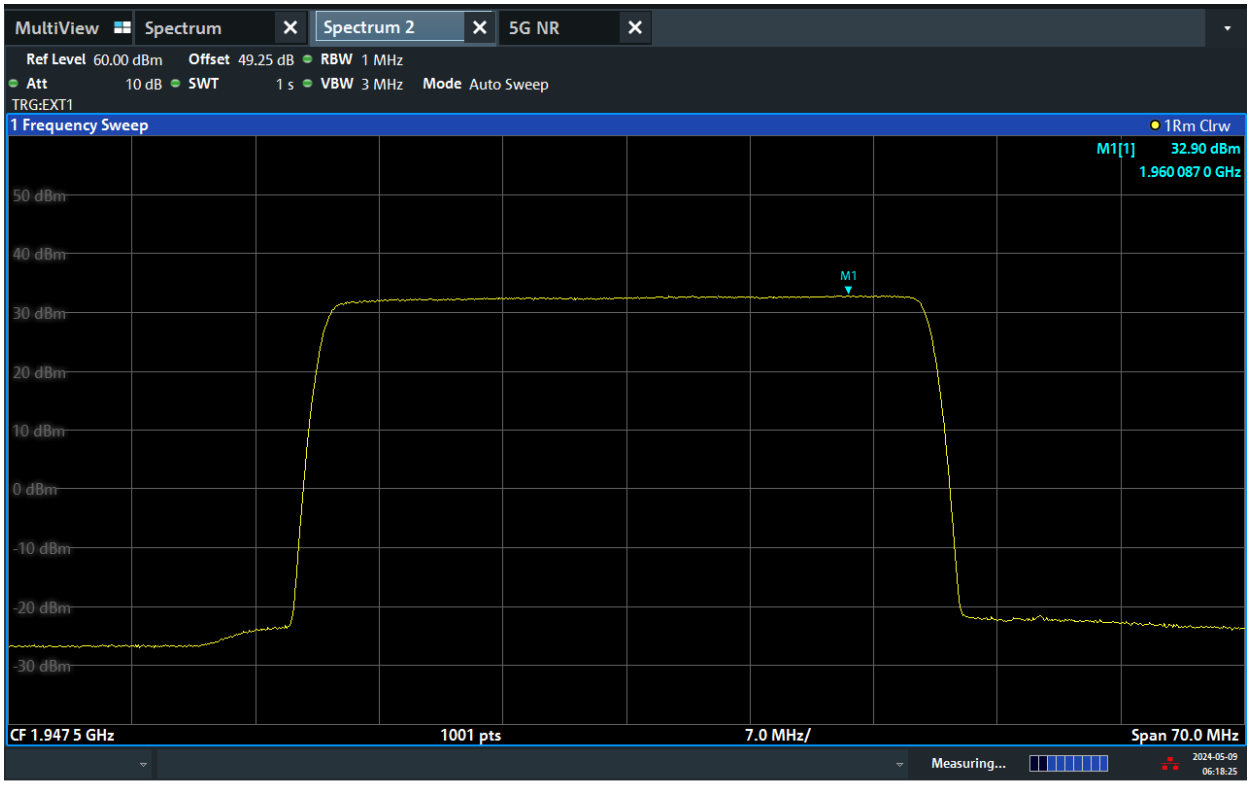
NR 30MHz, Channel T, PAR



06:05:29 AM 05/09/2024

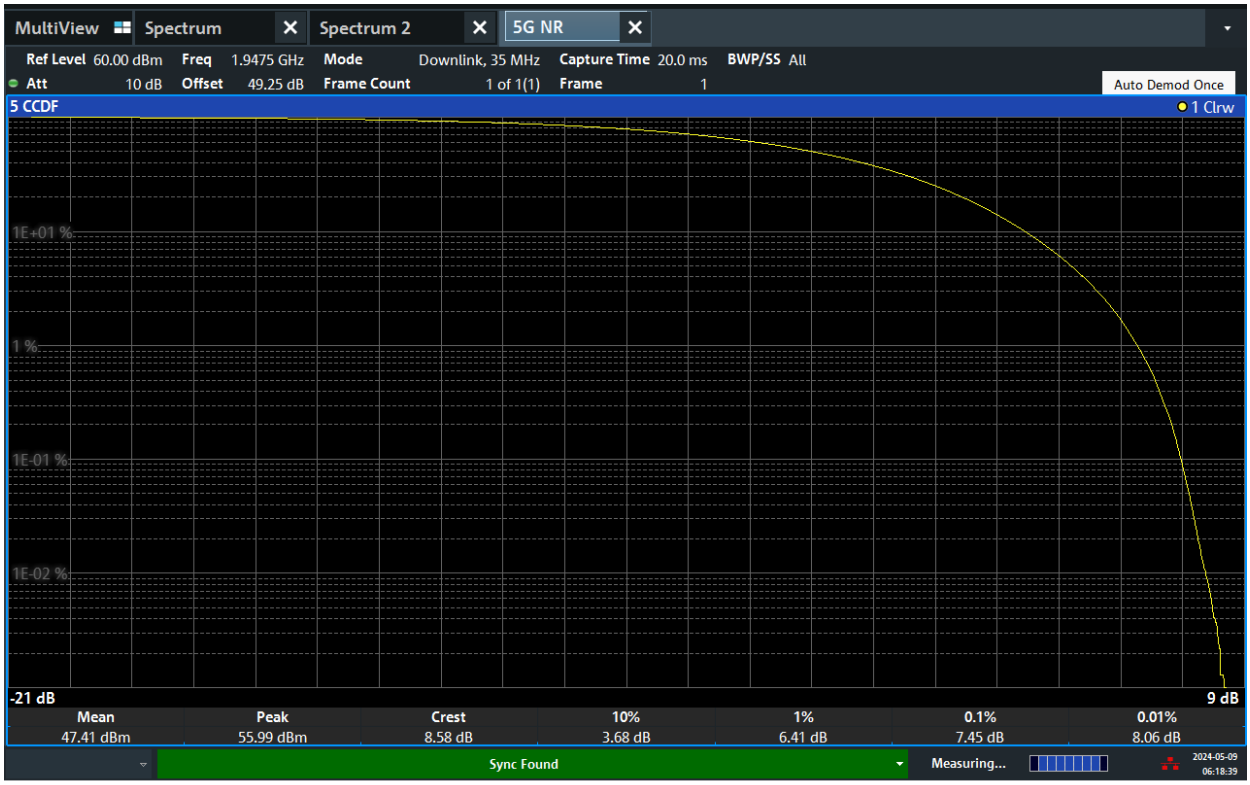
TEST REPORT

NR 35MHz, Channel B, Power



06:18:26 AM 05/09/2024

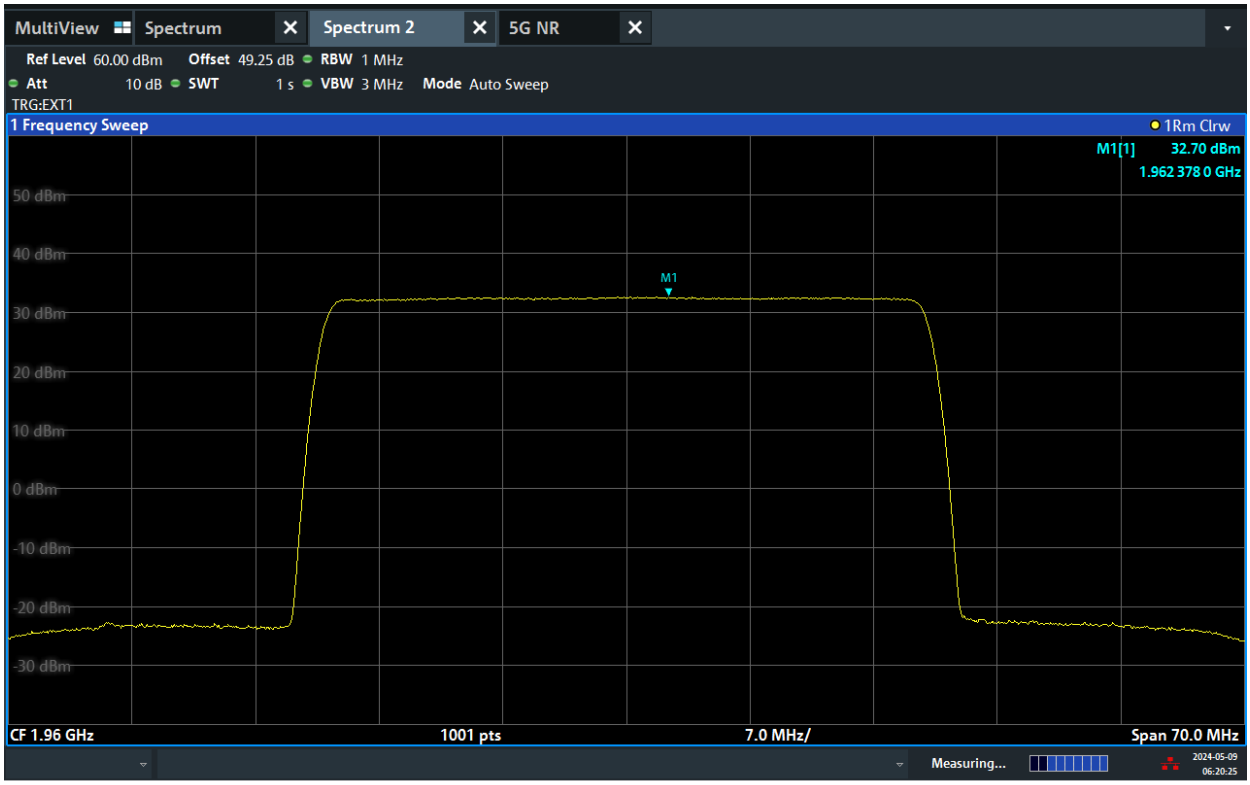
NR 35MHz, Channel B, PAR



06:18:39 AM 05/09/2024

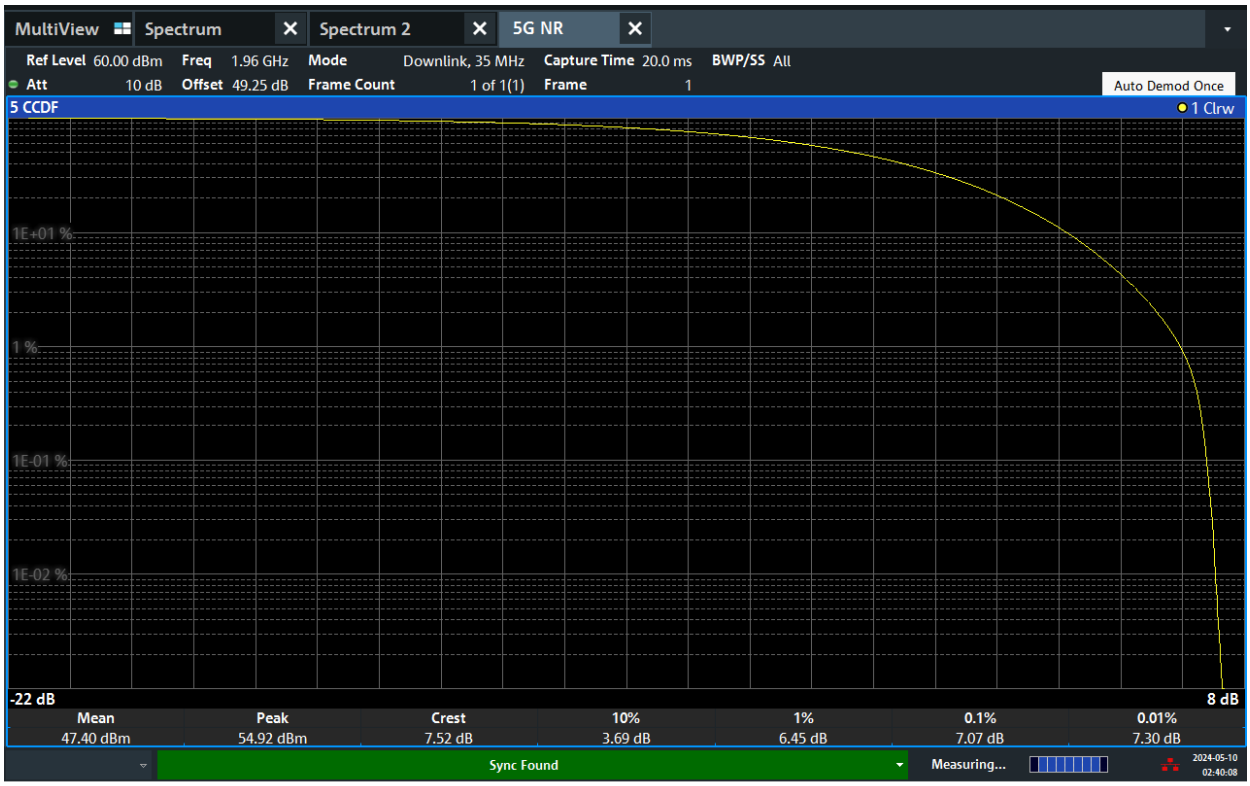
TEST REPORT

NR 35MHz, Channel M, Power



06:20:25 AM 05/09/2024

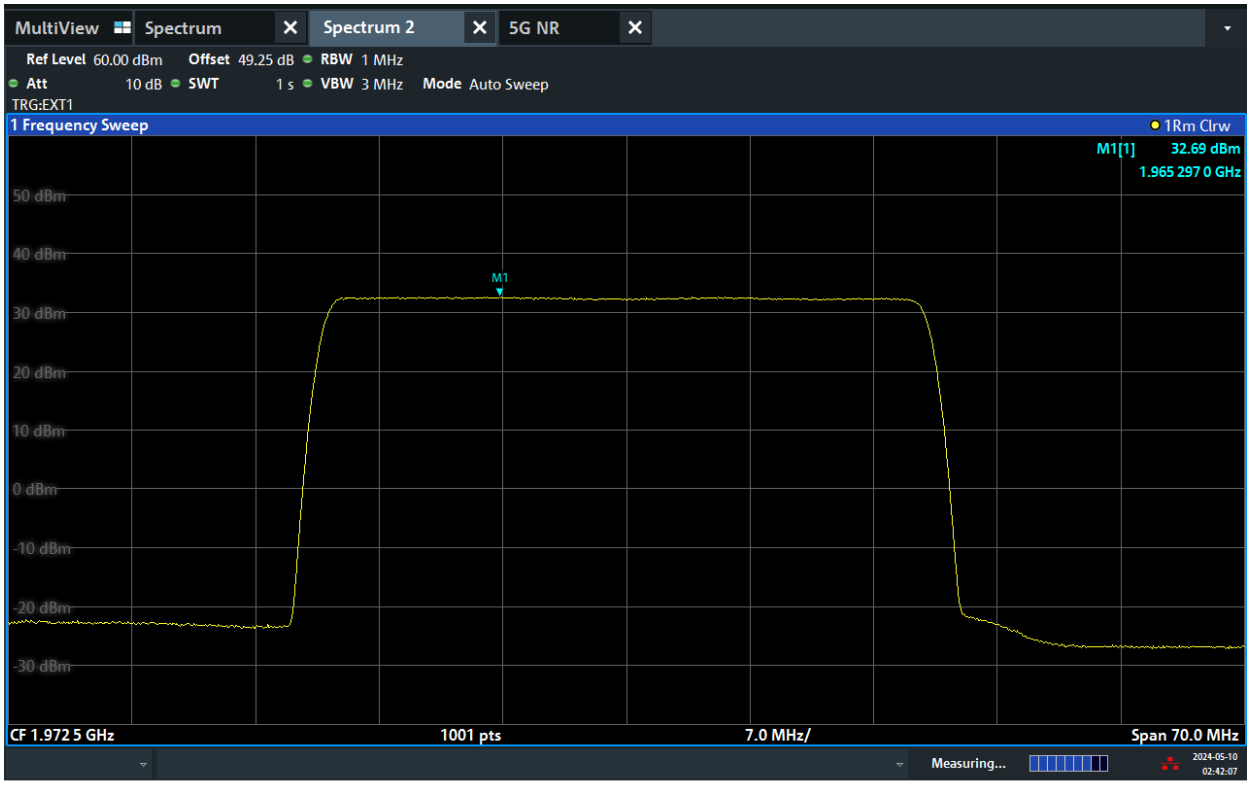
NR 35MHz, Channel M, PAR



02:40:08 AM 05/10/2024

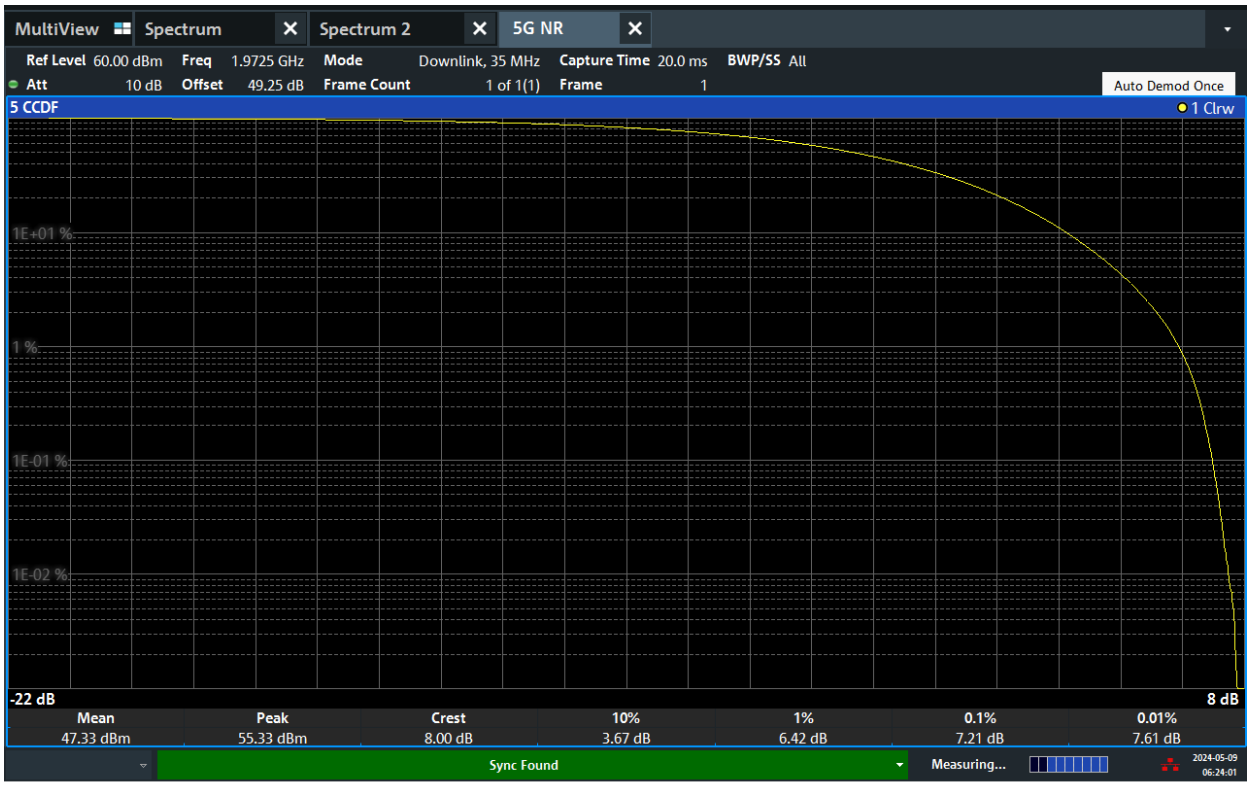
TEST REPORT

NR 35MHz, Channel T, Power



02:42:07 AM 05/10/2024

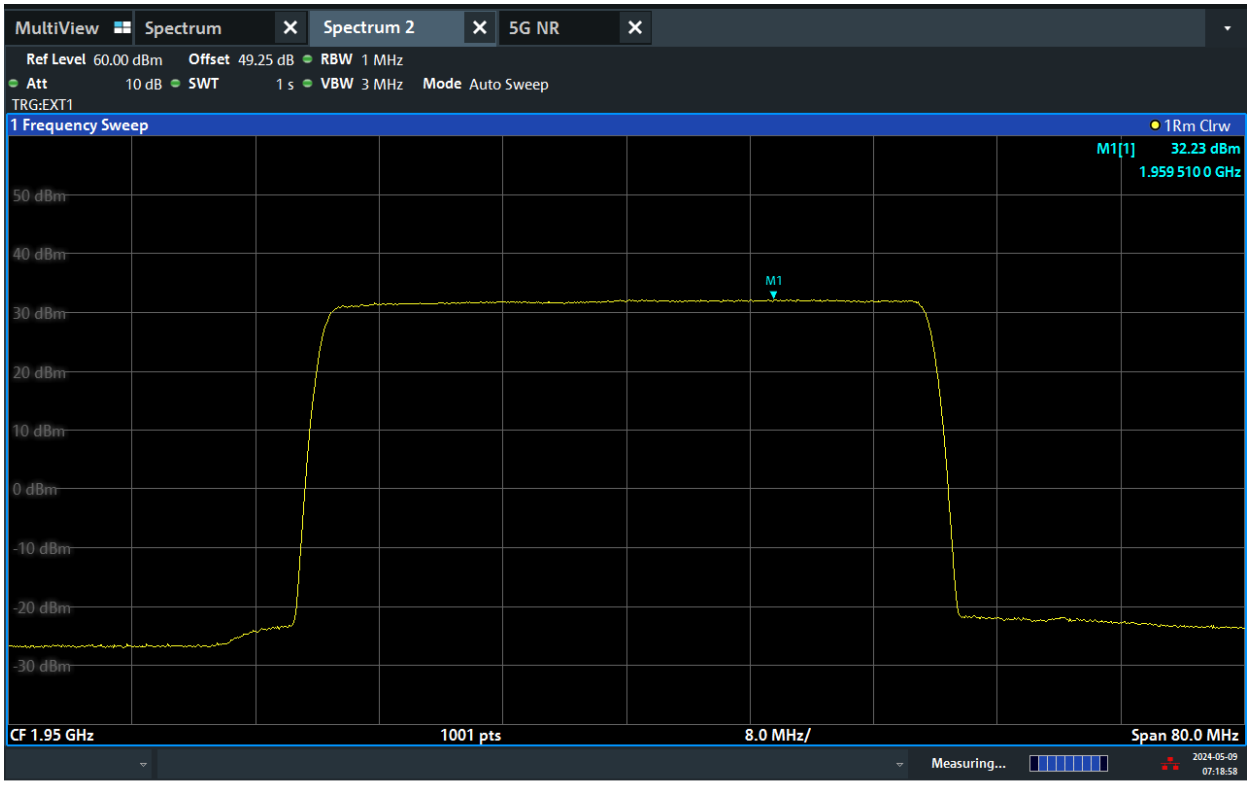
NR 35MHz, Channel T, PAR



06:24:02 AM 05/09/2024

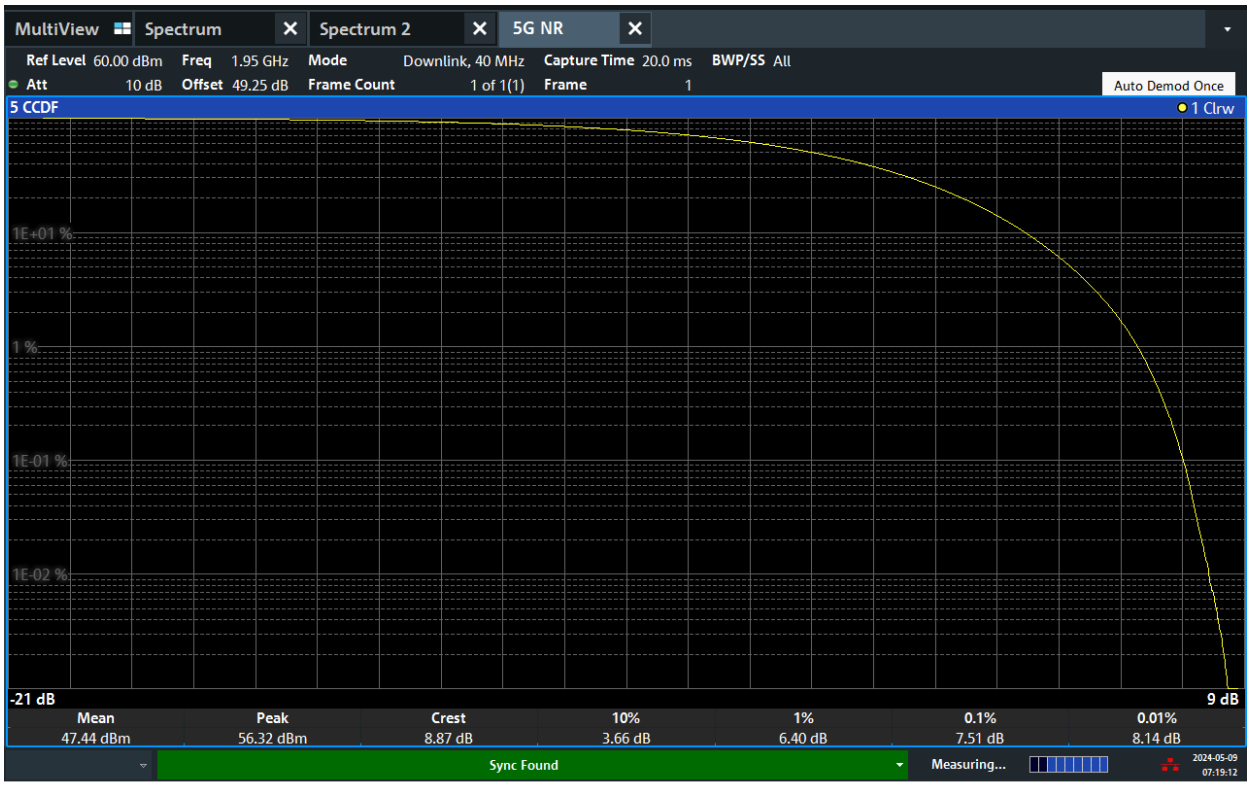
TEST REPORT

NR 40MHz, Channel B, Power



07:18:58 AM 05/09/2024

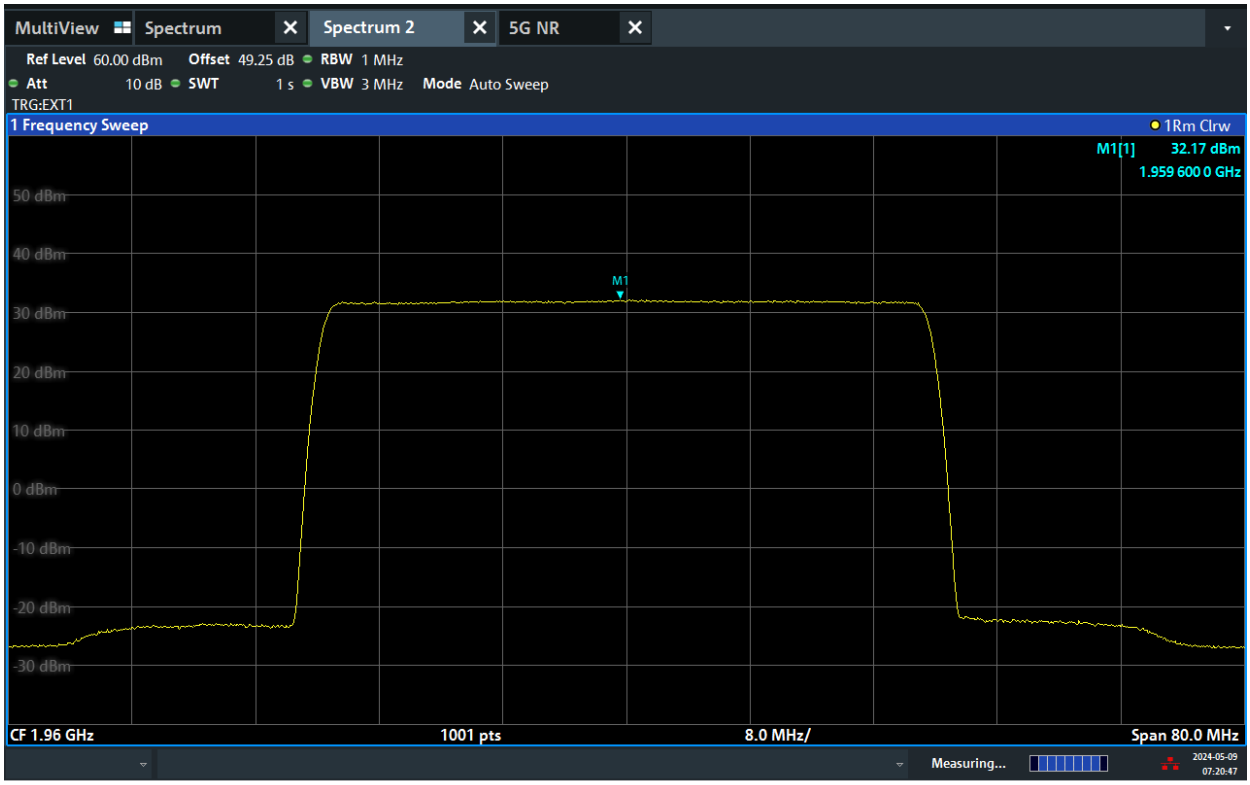
NR 40MHz, Channel B, PAR



07:19:12 AM 05/09/2024

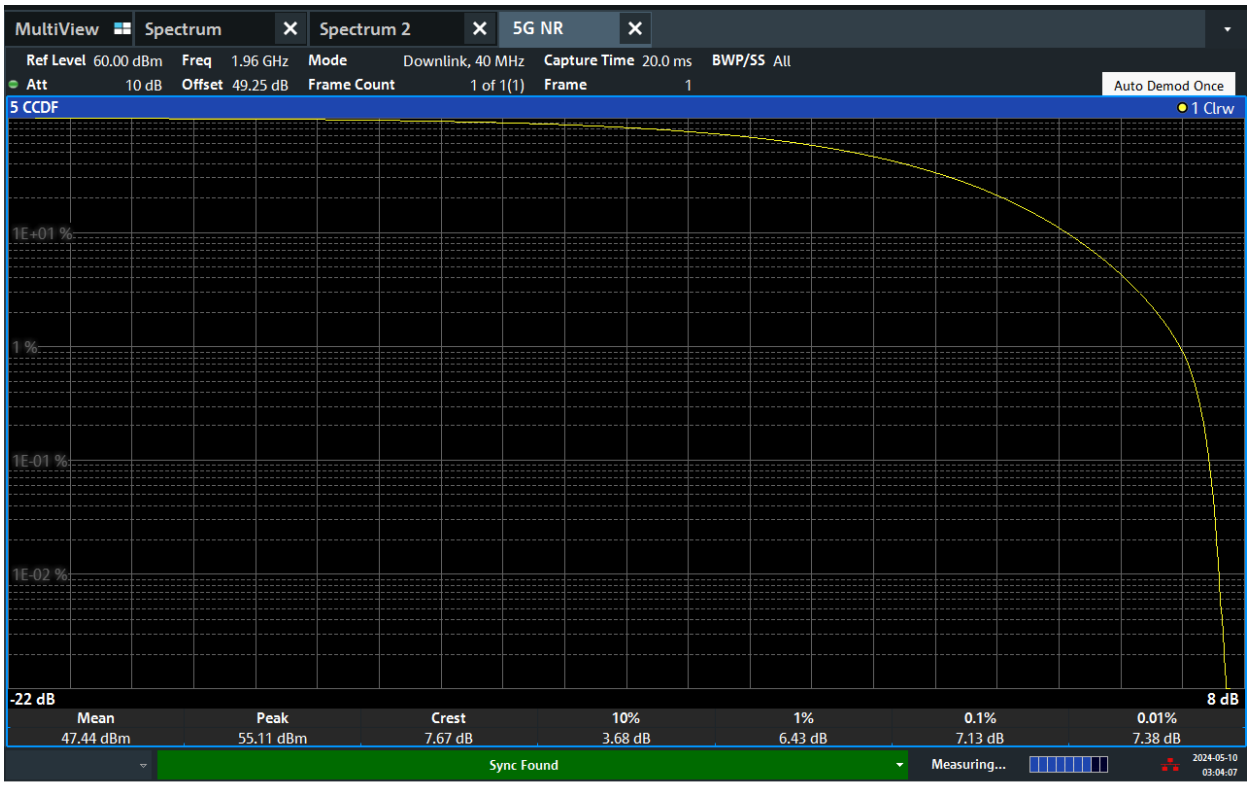
TEST REPORT

NR 40MHz, Channel M, Power



07:20:48 AM 05/09/2024

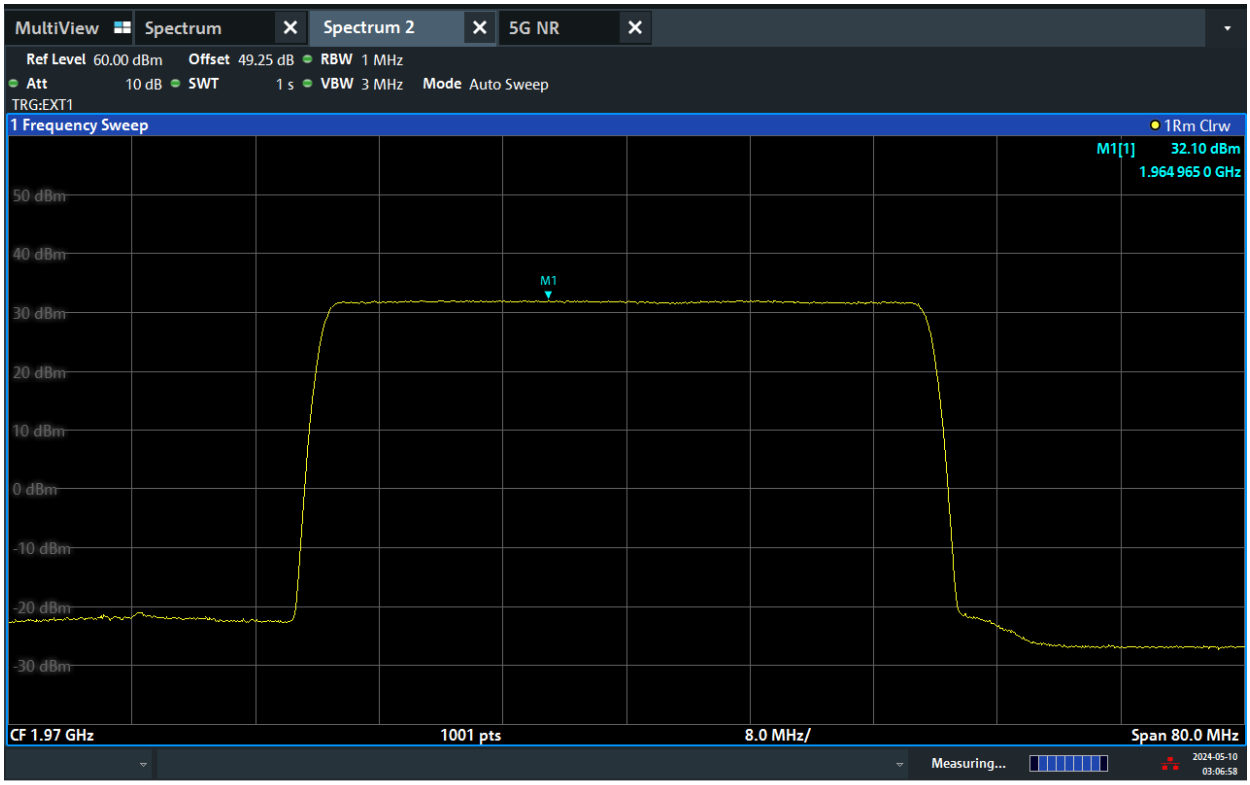
NR 40MHz, Channel M, PAR



03:04:07 AM 05/10/2024

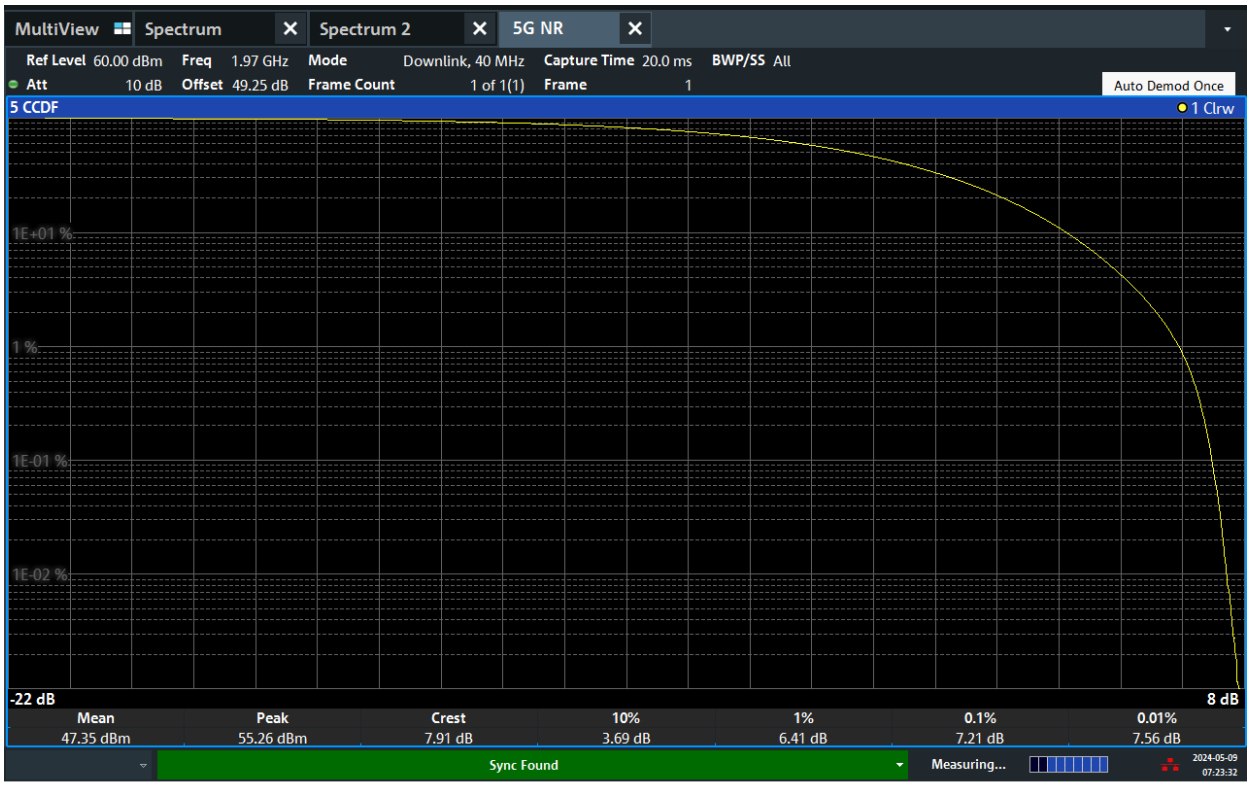
TEST REPORT

NR 40MHz, Channel T, Power



03:06:58 AM 05/10/2024

NR 40MHz, Channel T, PAR



07:23:33 AM 05/09/2024

4 Occupied Bandwidth

Test result: Pass

4.1 Measurement Procedure

The EUT was set to transmit at maximum power and testing was carried out on bottom, middle and top channels. Using the Occupied Bandwidth measurement function in the spectrum analyzer, the 26dB bandwidth was measured in accordance with FCC KDB 971168 D01 Clause 4.2.

The measurement method is from KDB 971168 4.2:
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation product s including the emission skirts (i.e., two to five times the OBW).
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.
d) Set the detection mode to peak, and the trace mode to max hold.
e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

4.2 Measurement result

4TX/RX mode:

NR-1C

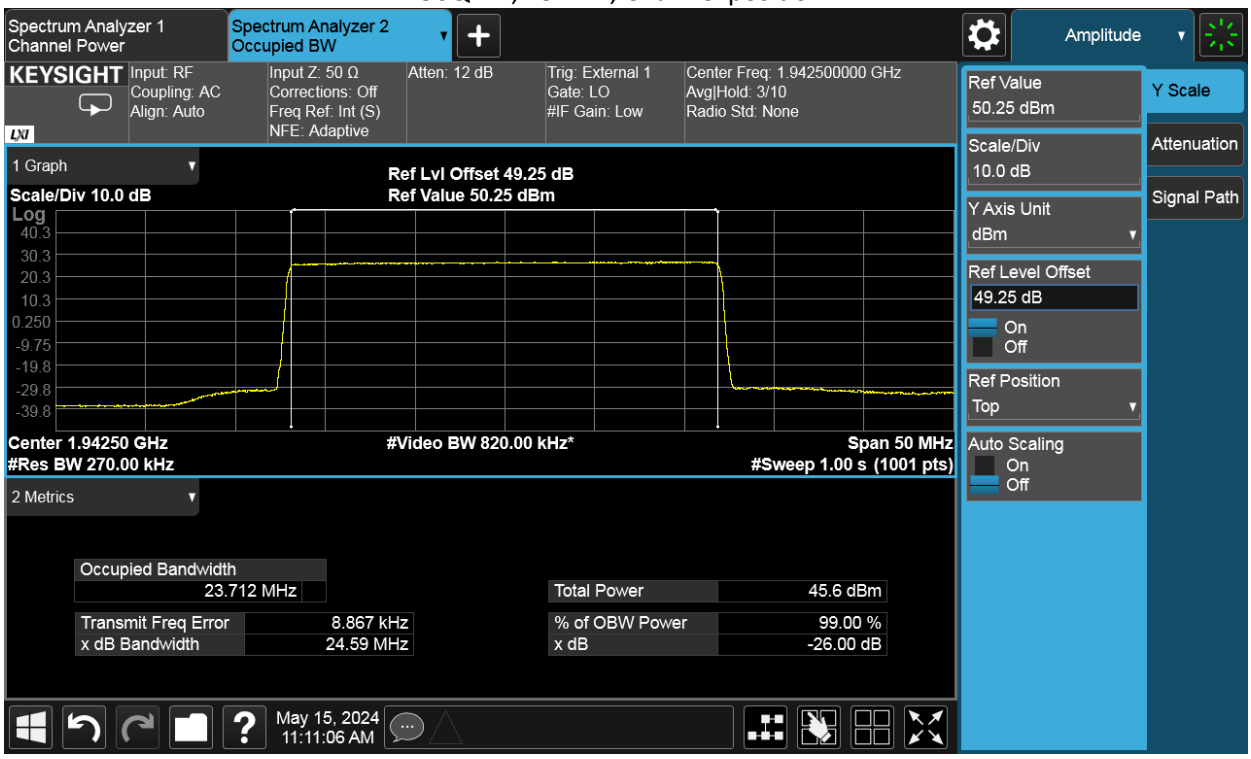
99% Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
A	256QAM	25MHz	23.712	23.724	23.720
A	256QAM	30MHz	28.512	28.526	28.532
A	256QAM	35MHz	33.510	33.534	33.532
A	256QAM	40MHz	38.497	38.528	38.524

-26dBc Occupied Bandwidth

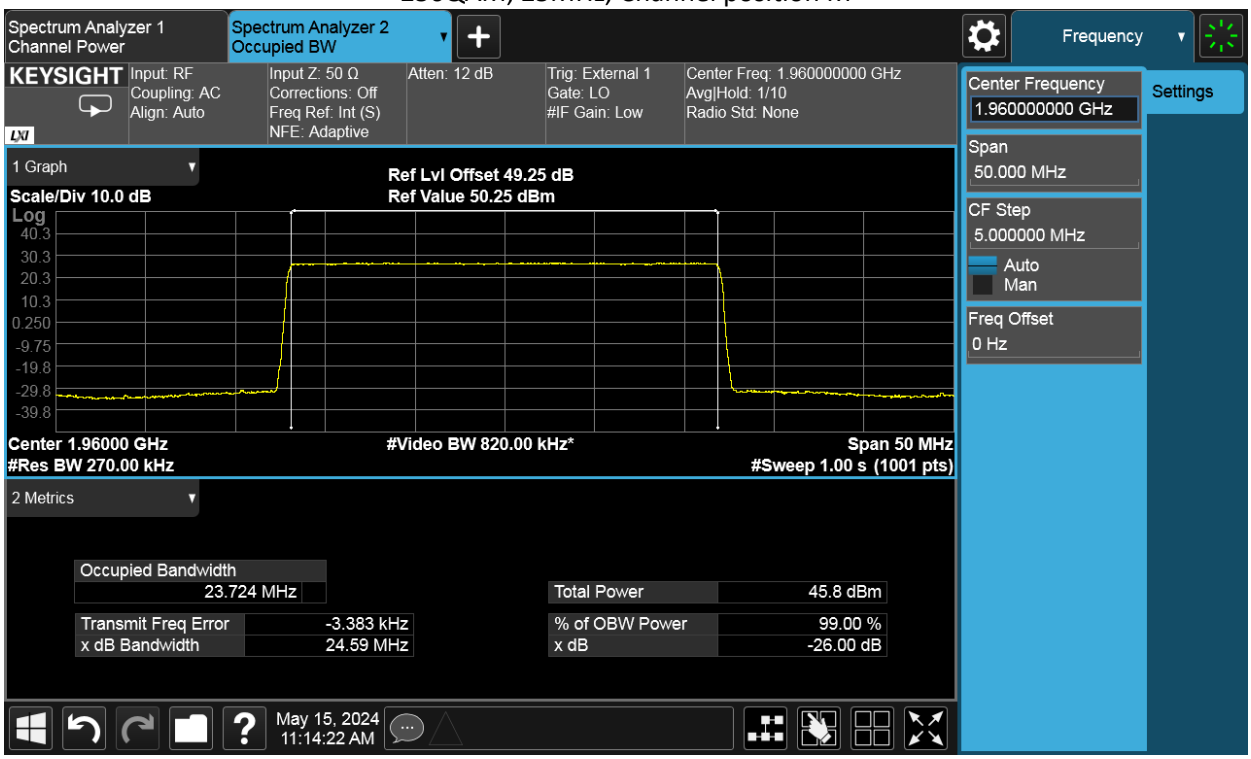
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
A	256QAM	25MHz	24.59	24.59	24.59
A	256QAM	30MHz	29.50	29.51	29.51
A	256QAM	35MHz	34.69	34.69	34.69
A	256QAM	40MHz	39.89	39.90	39.90

256QAM, 25MHz, Channel position B

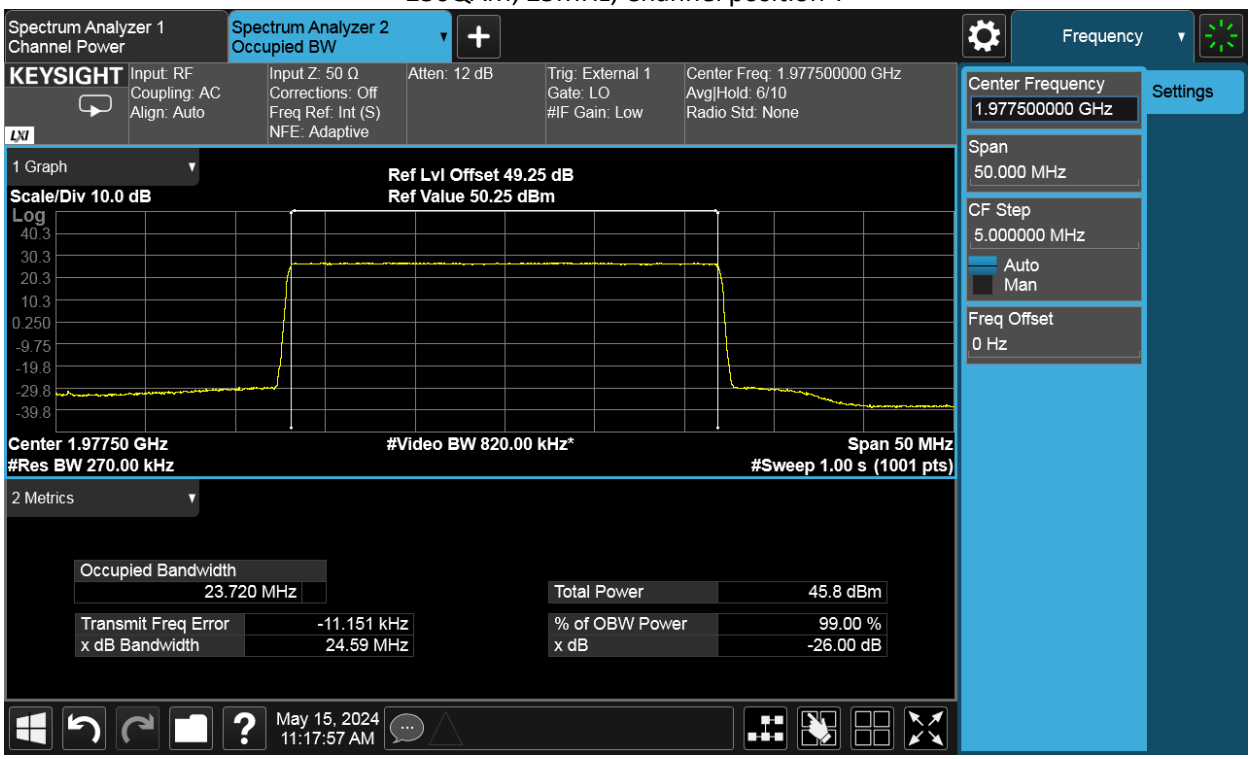


TEST REPORT

256QAM, 25MHz, Channel position M

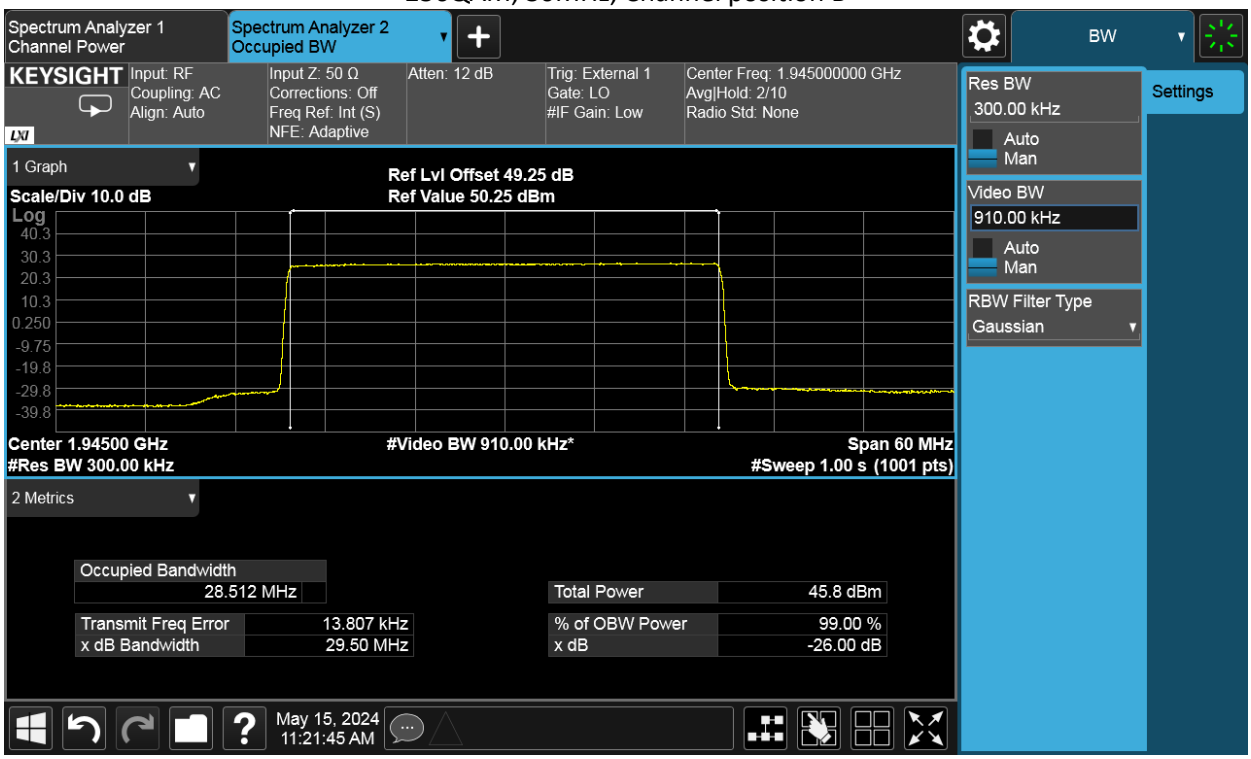


256QAM, 25MHz, Channel position T

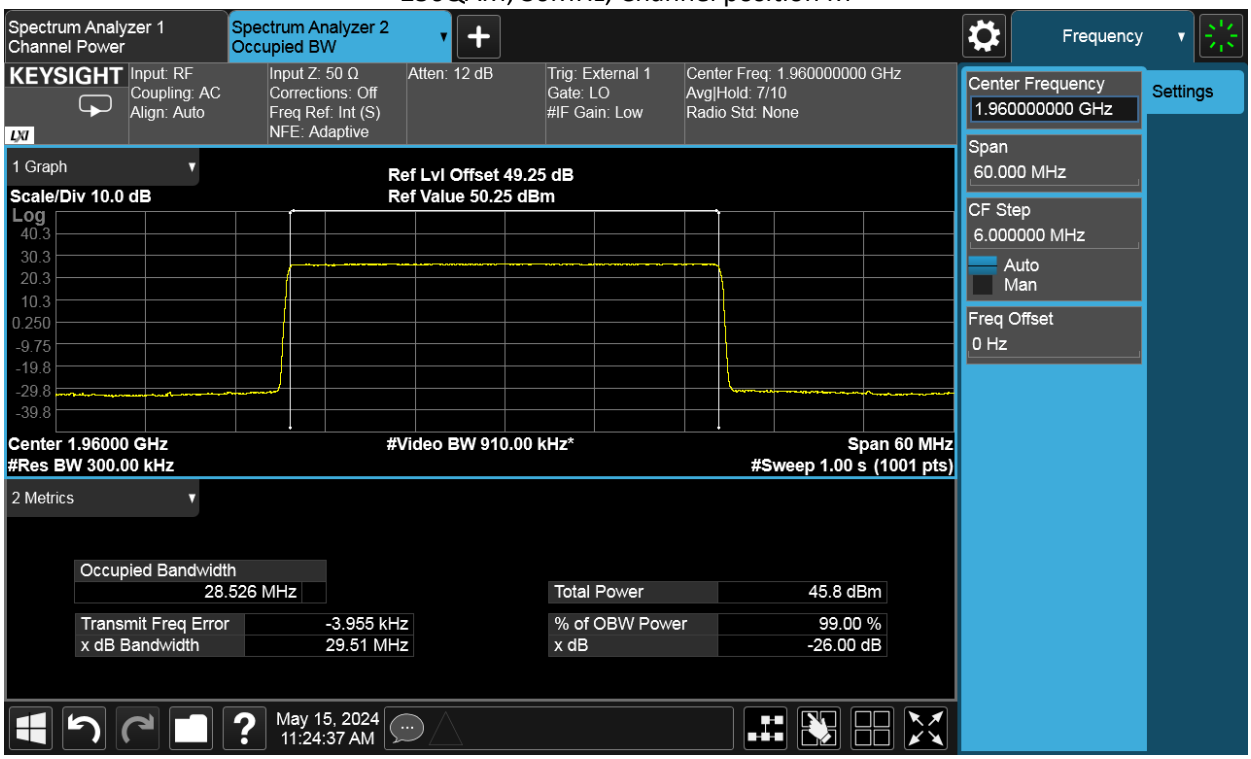


TEST REPORT

256QAM, 30MHz, Channel position B

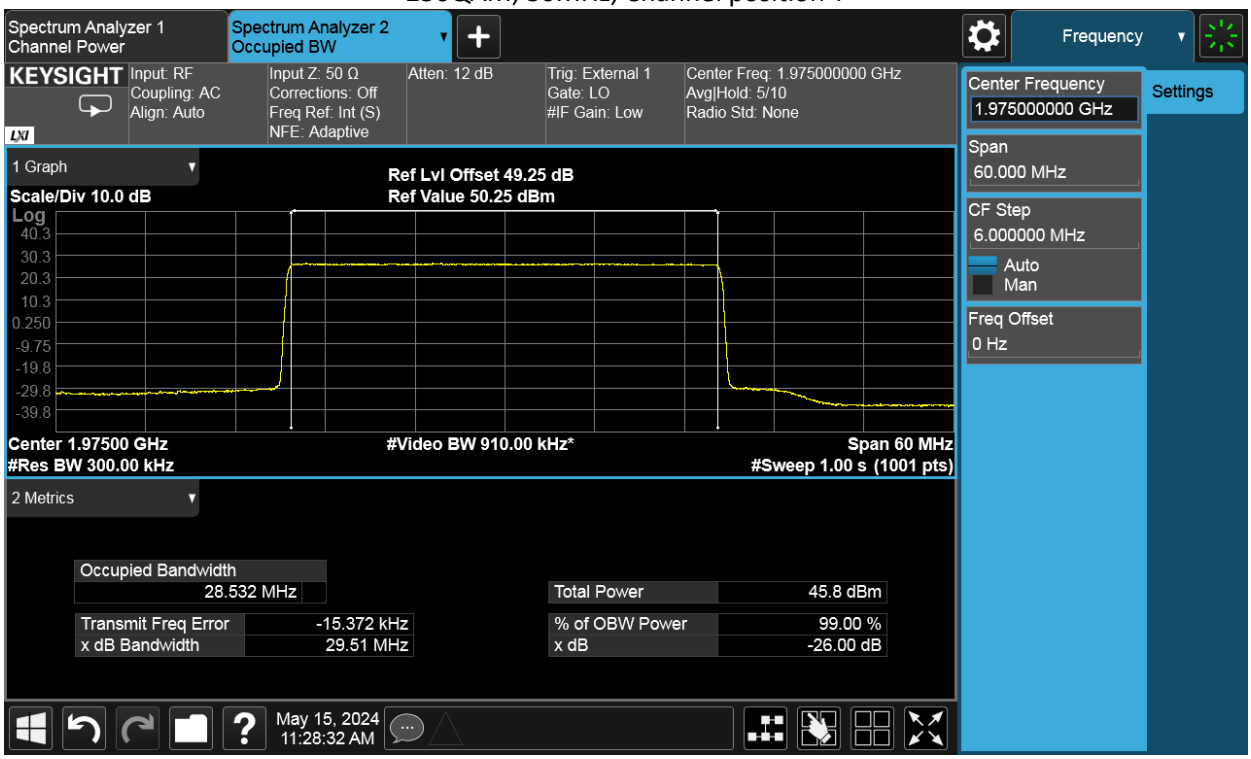


256QAM, 30MHz, Channel position M

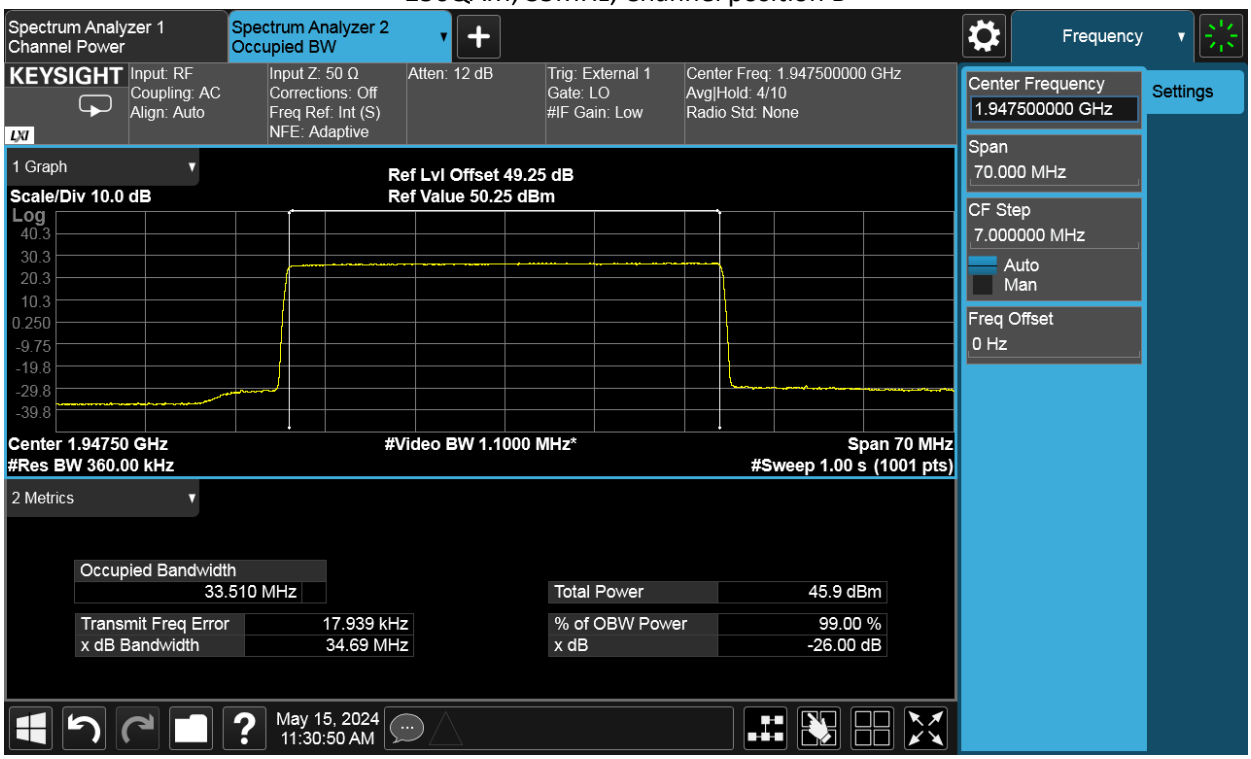


TEST REPORT

256QAM, 30MHz, Channel position T

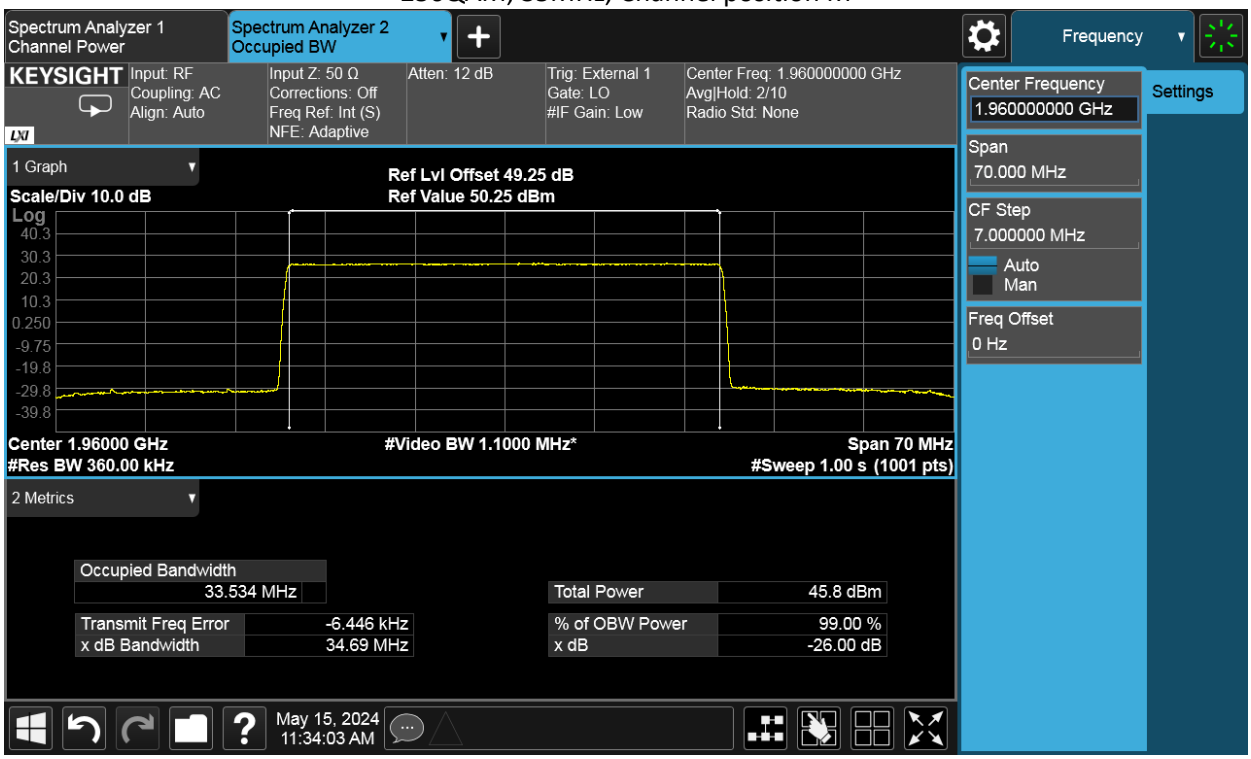


256QAM, 35MHz, Channel position B

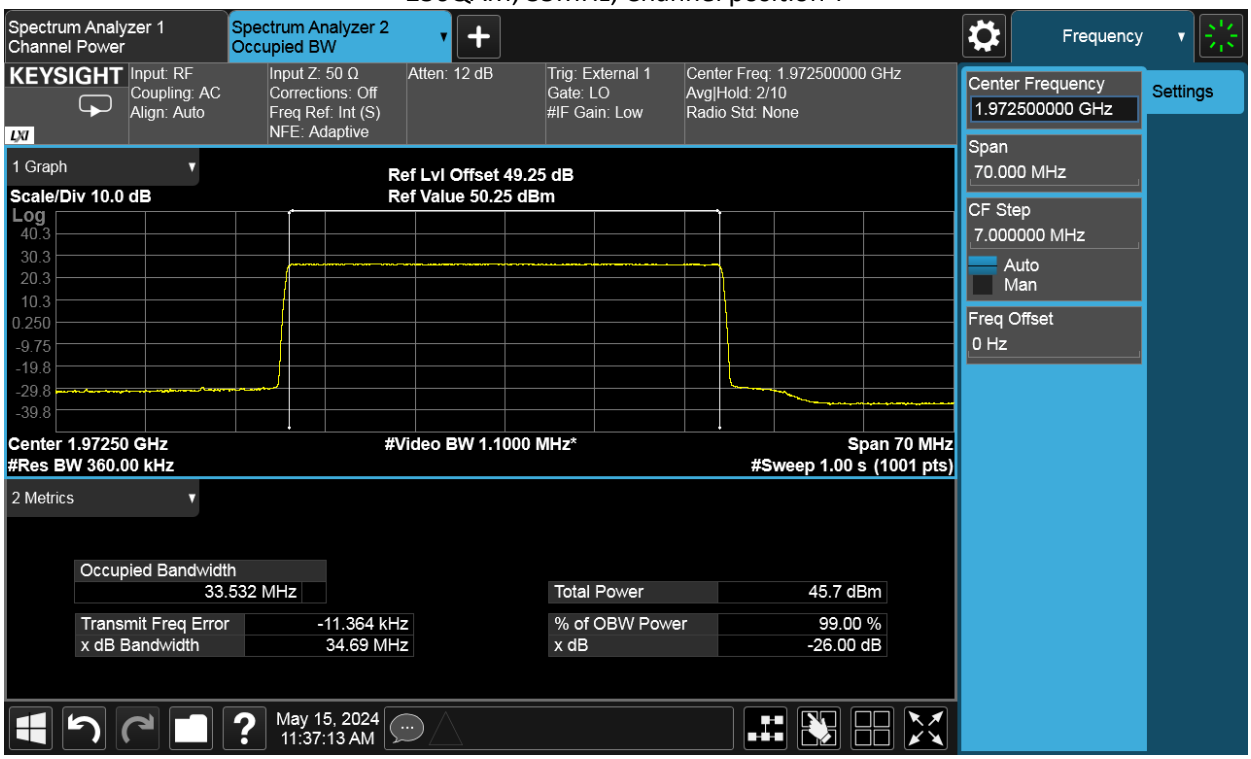


TEST REPORT

256QAM, 35MHz, Channel position M

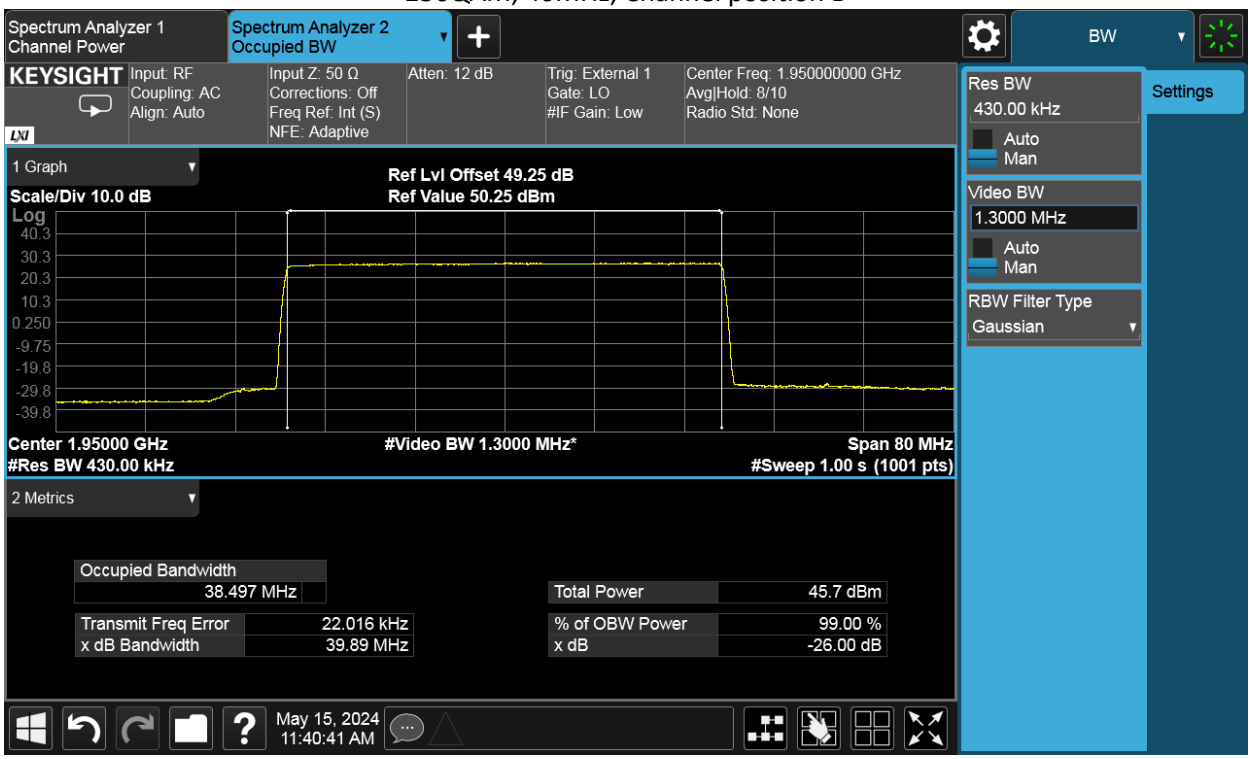


256QAM, 35MHz, Channel position T

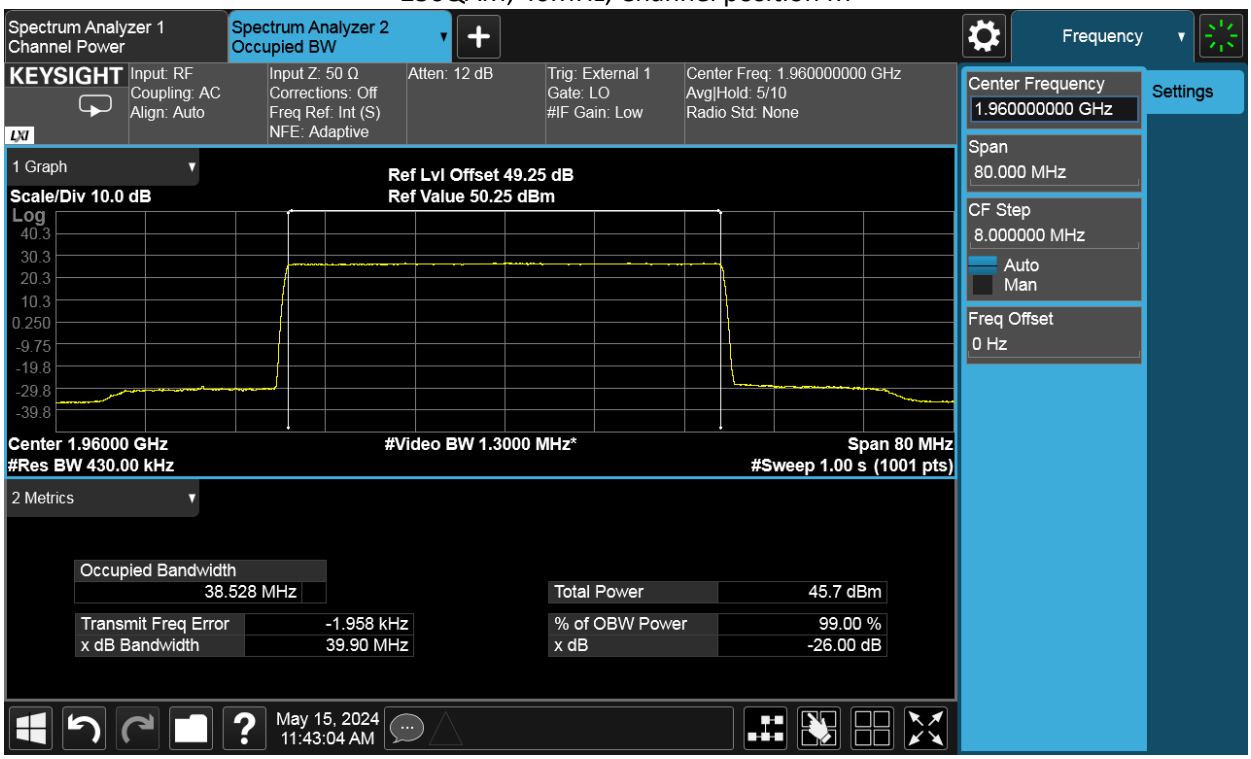


TEST REPORT

256QAM, 40MHz, Channel position B

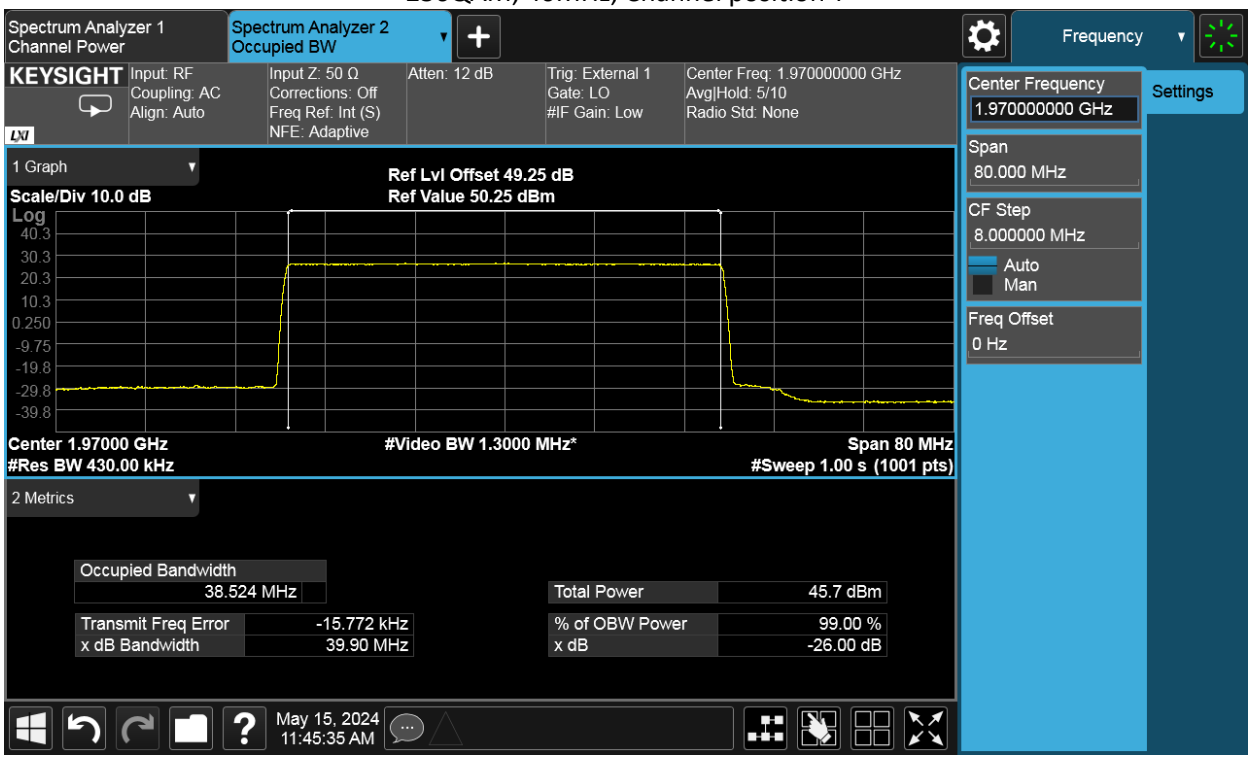


256QAM, 40MHz, Channel position M



TEST REPORT

256QAM, 40MHz, Channel position T



2TX/RX mode:

NR-1C

99% Occupied Bandwidth

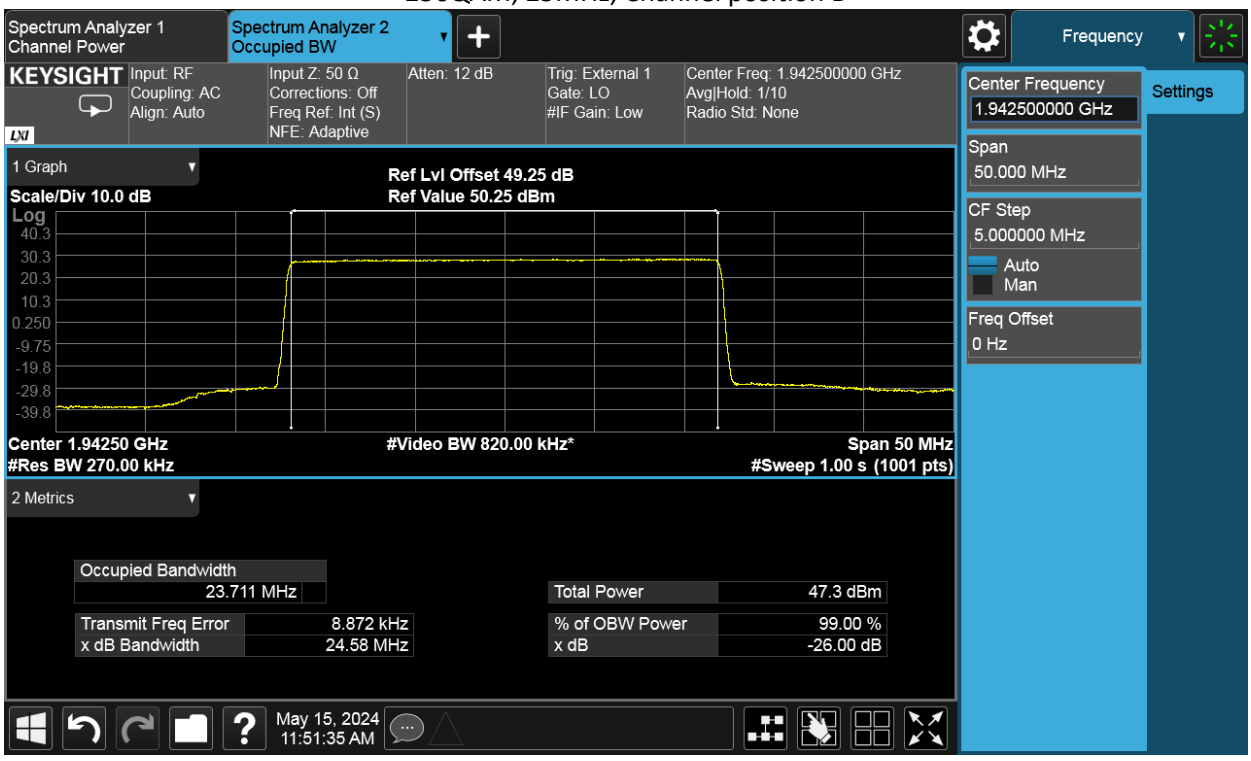
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
A	256QAM	25MHz	23.711	23.723	23.719
A	256QAM	30MHz	28.513	28.526	28.531
A	256QAM	35MHz	33.511	33.534	33.531
A	256QAM	40MHz	38.497	38.528	38.520

-26dBc Occupied Bandwidth

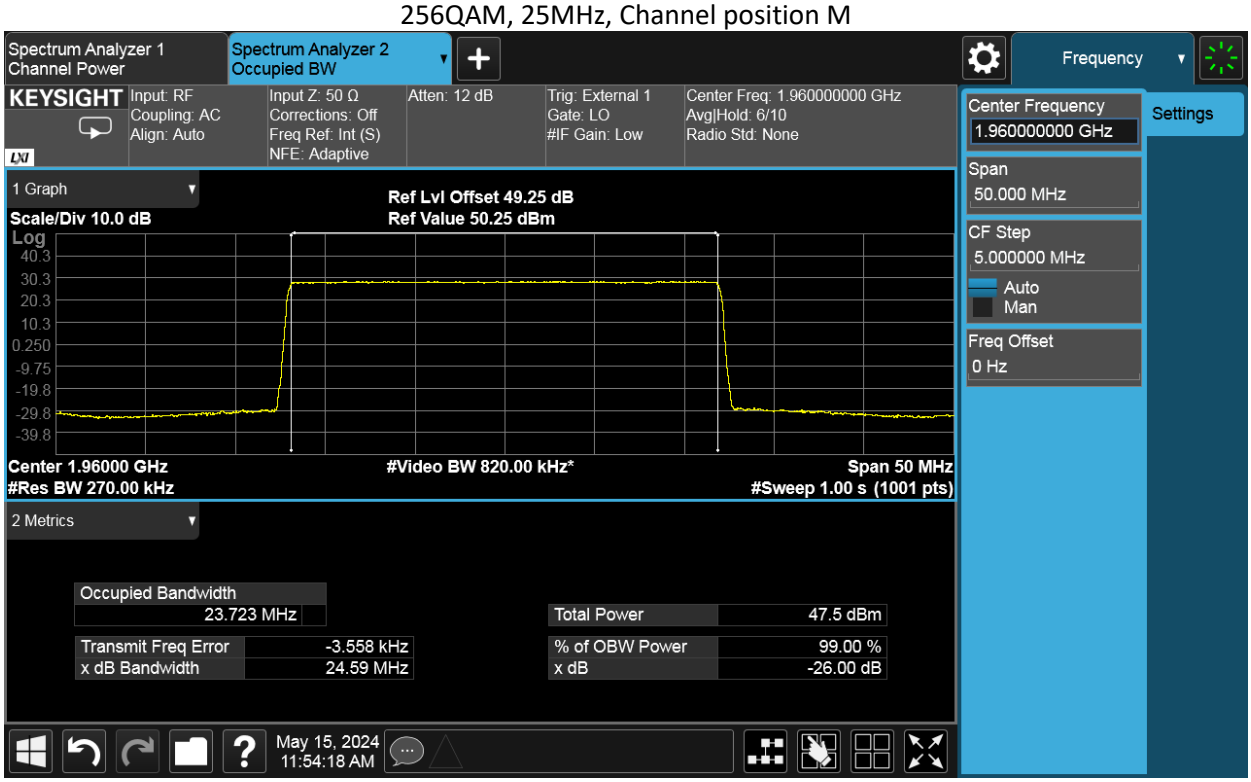
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
A	256QAM	25MHz	24.58	24.59	24.59
A	256QAM	30MHz	29.50	29.51	29.51
A	256QAM	35MHz	34.69	34.69	34.69
A	256QAM	40MHz	39.89	39.90	39.90

TEST REPORT

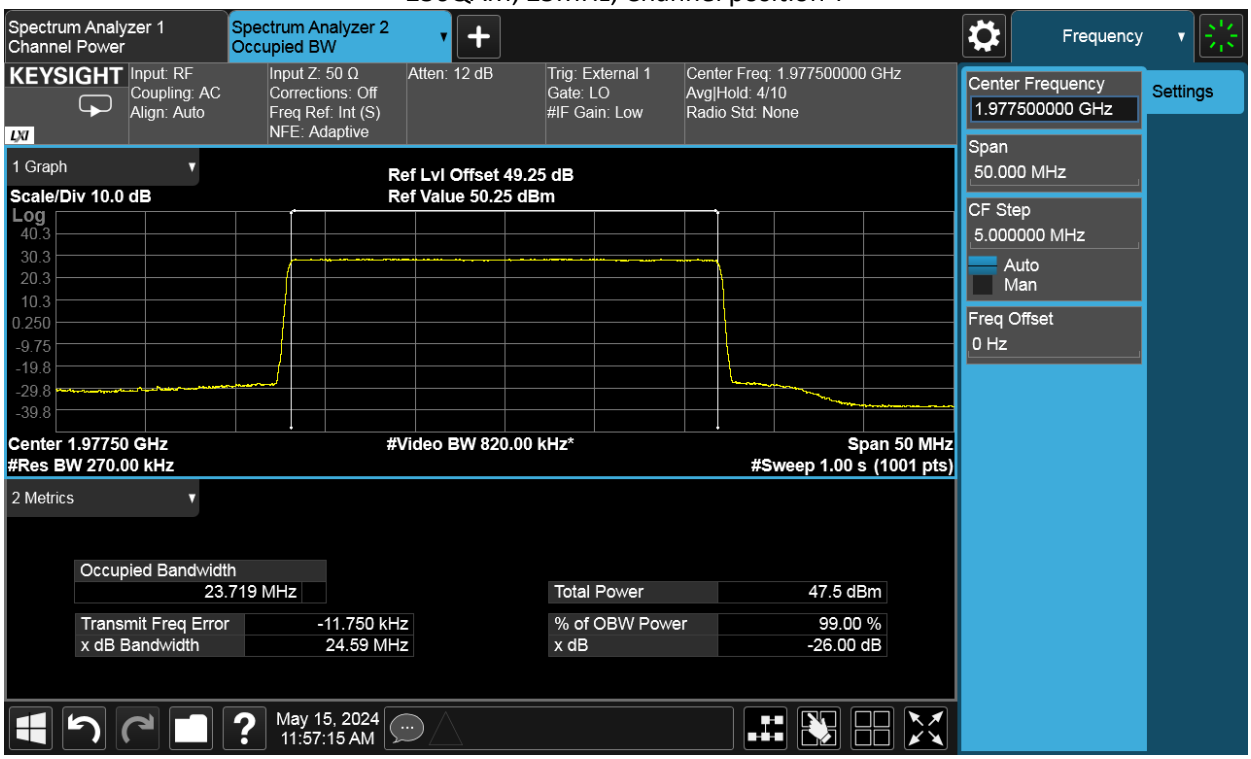
256QAM, 25MHz, Channel position B



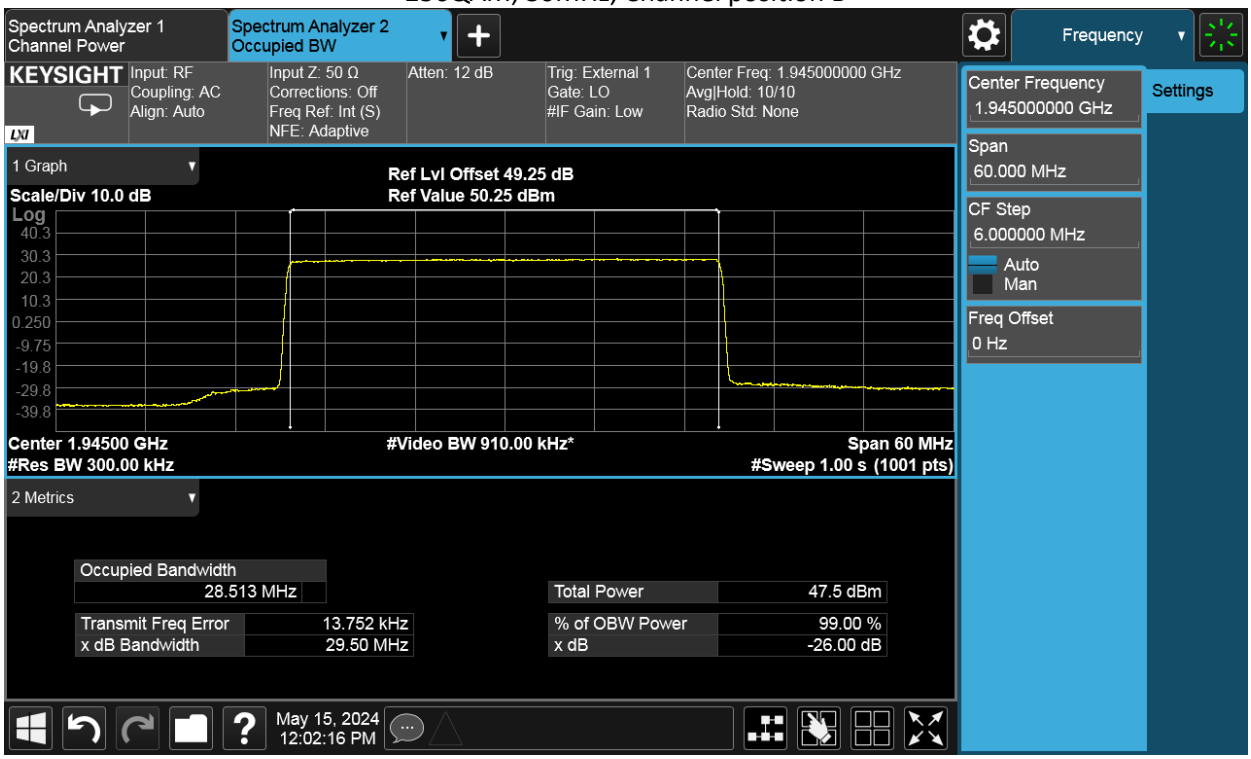
256QAM, 25MHz, Channel position M



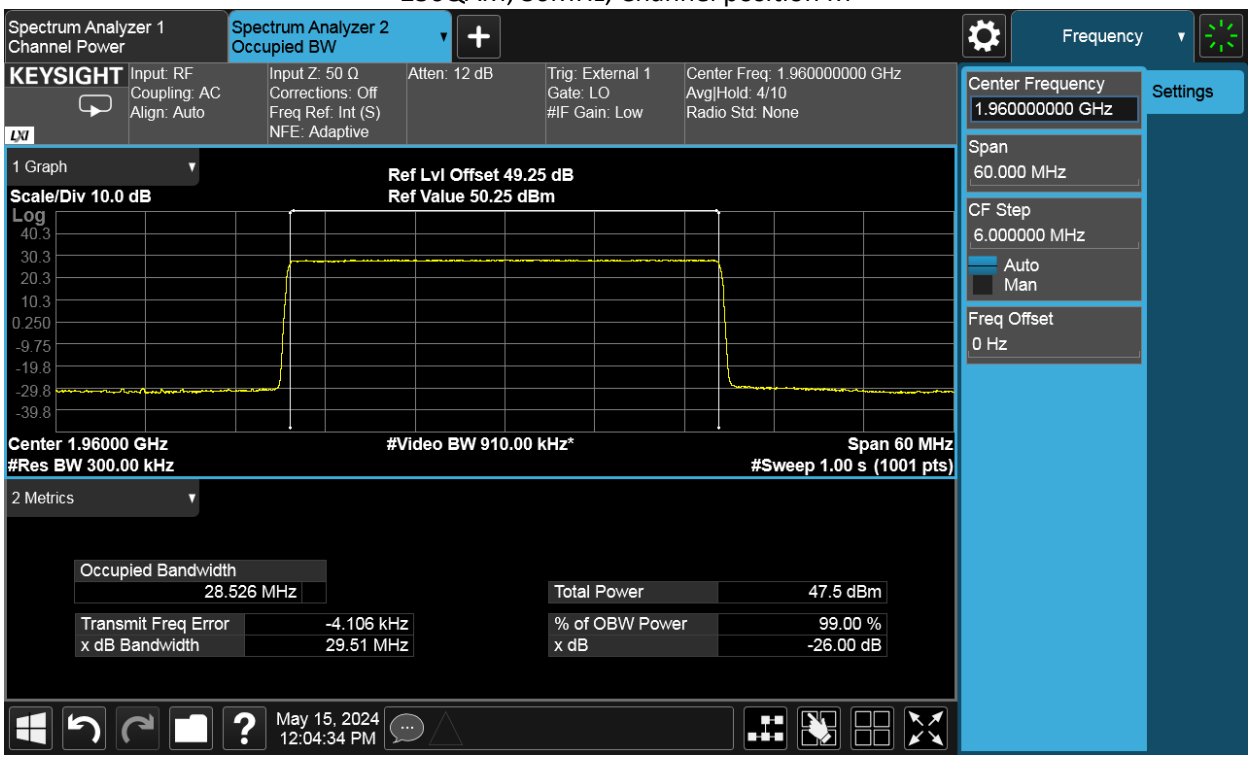
256QAM, 25MHz, Channel position T



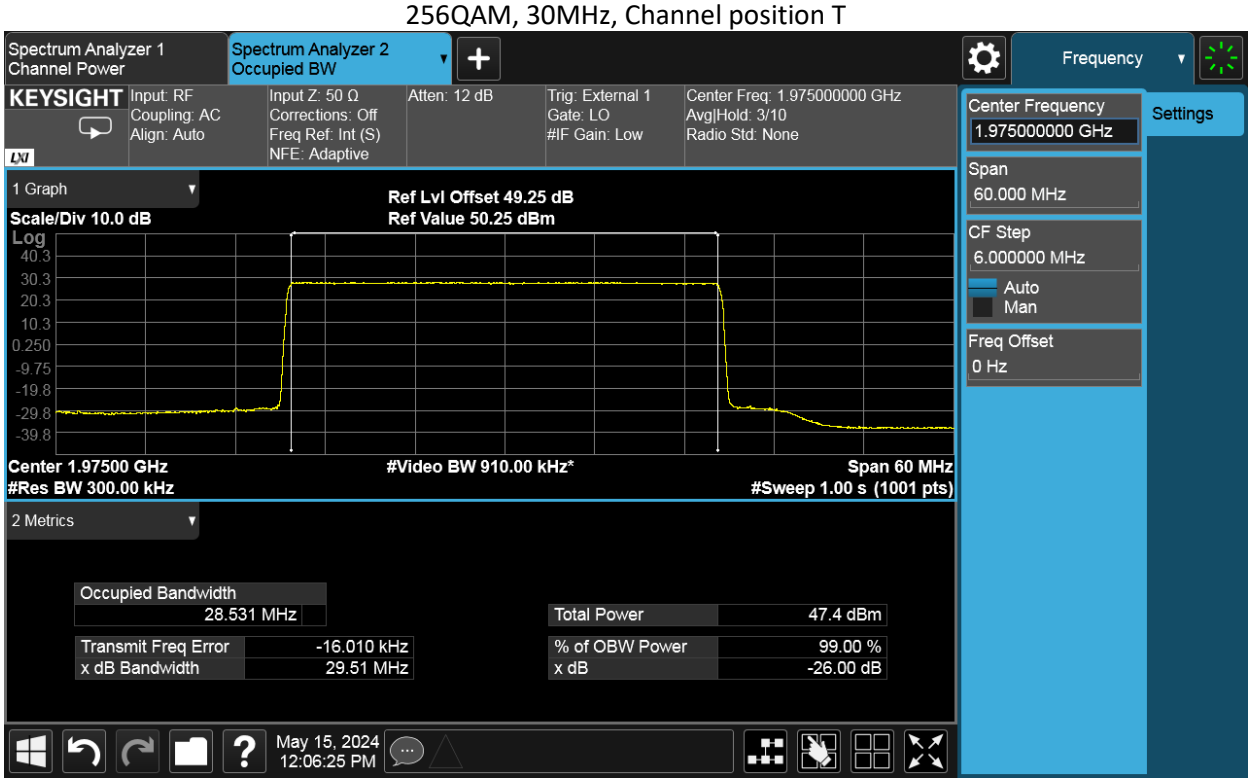
256QAM, 30MHz, Channel position B



256QAM, 30MHz, Channel position M

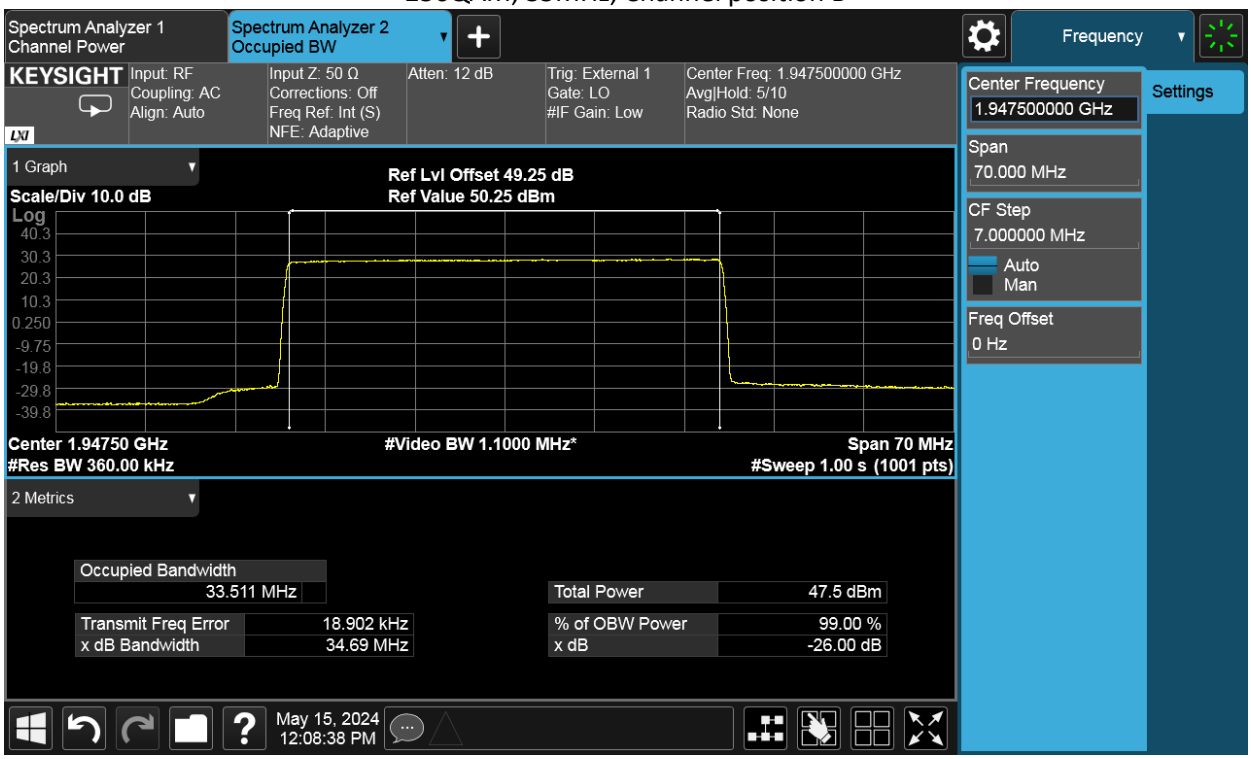


256QAM, 30MHz, Channel position T

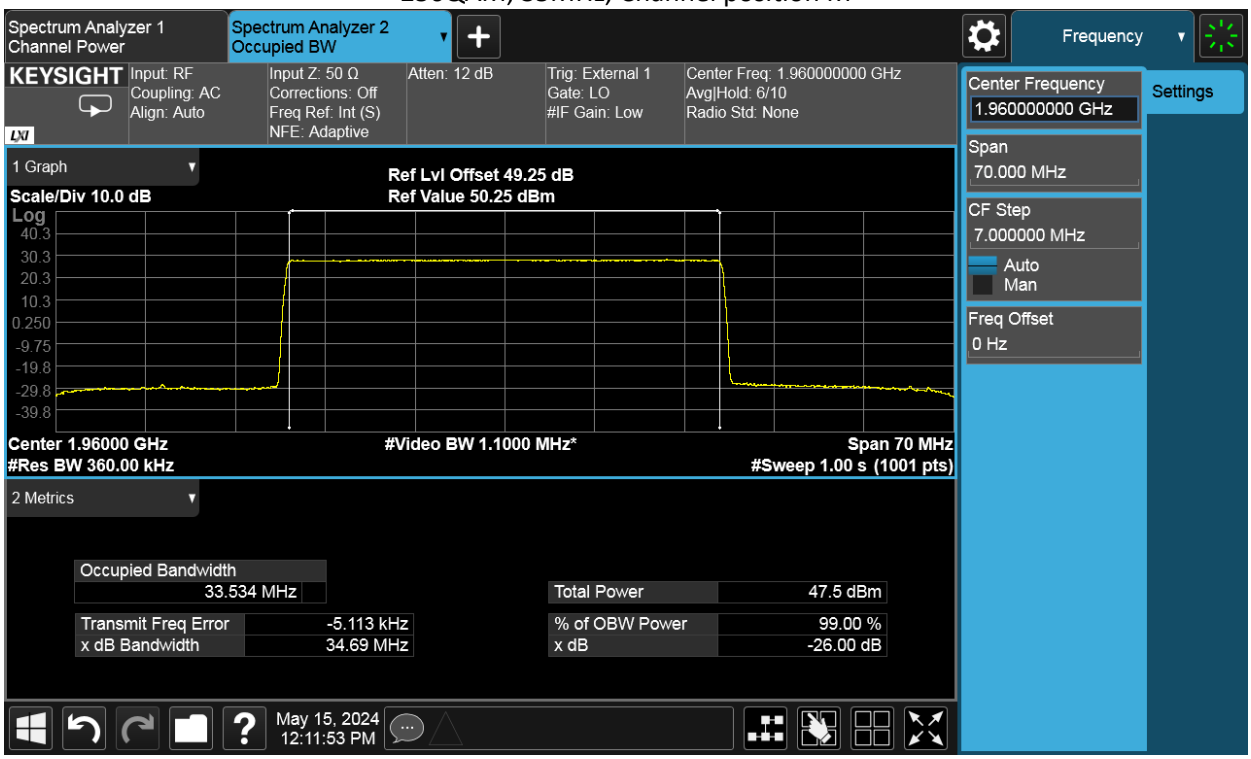


TEST REPORT

256QAM, 35MHz, Channel position B

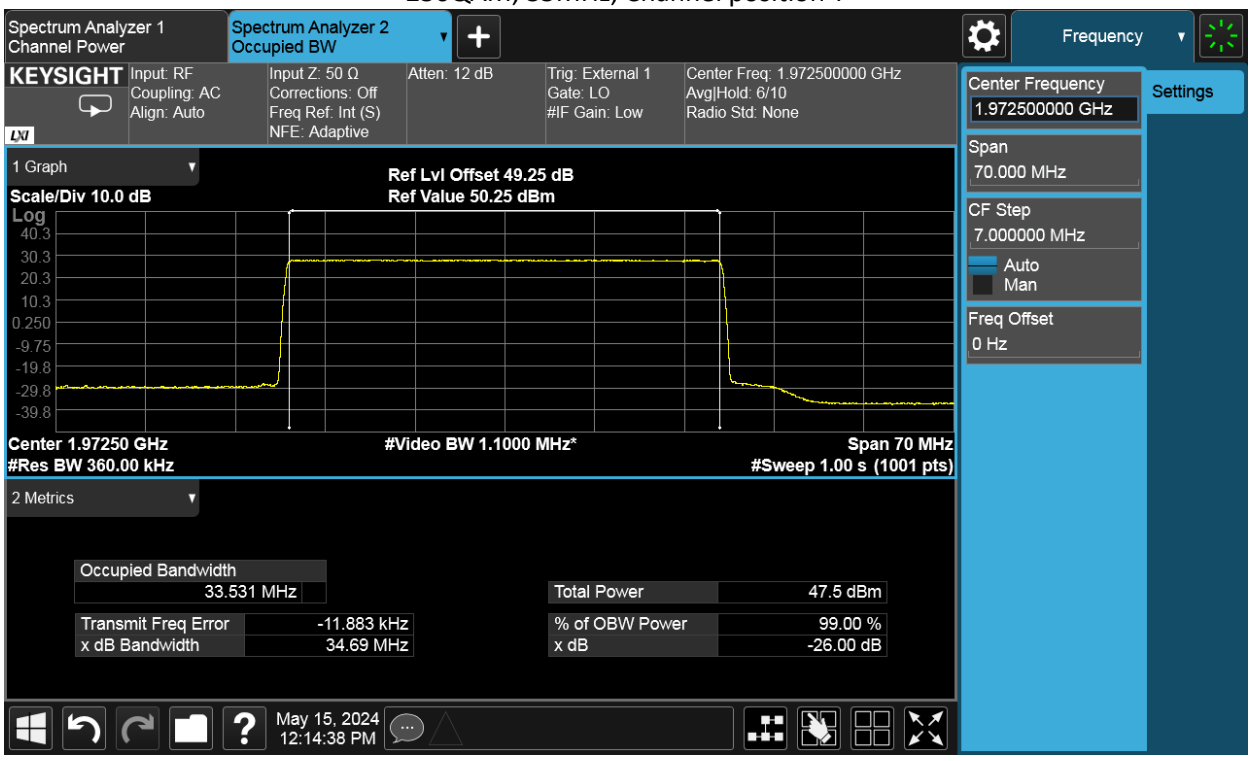


256QAM, 35MHz, Channel position M

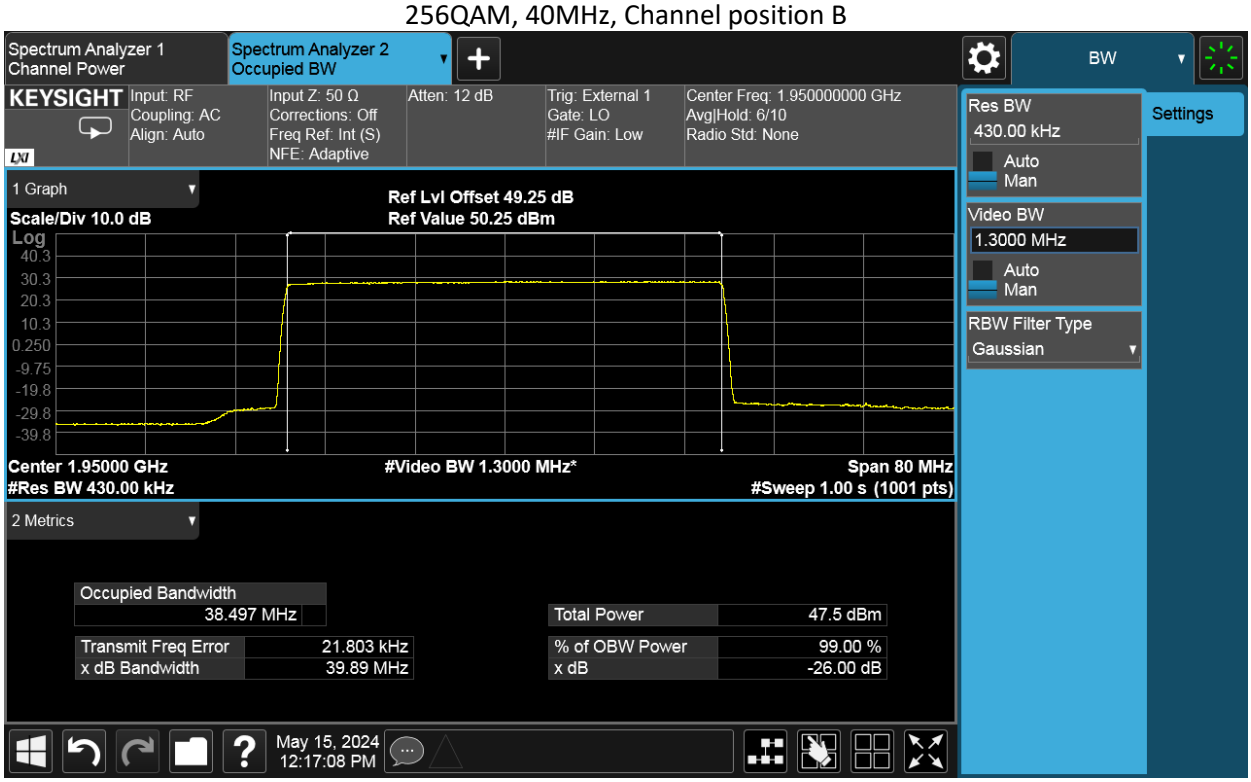


TEST REPORT

256QAM, 35MHz, Channel position T

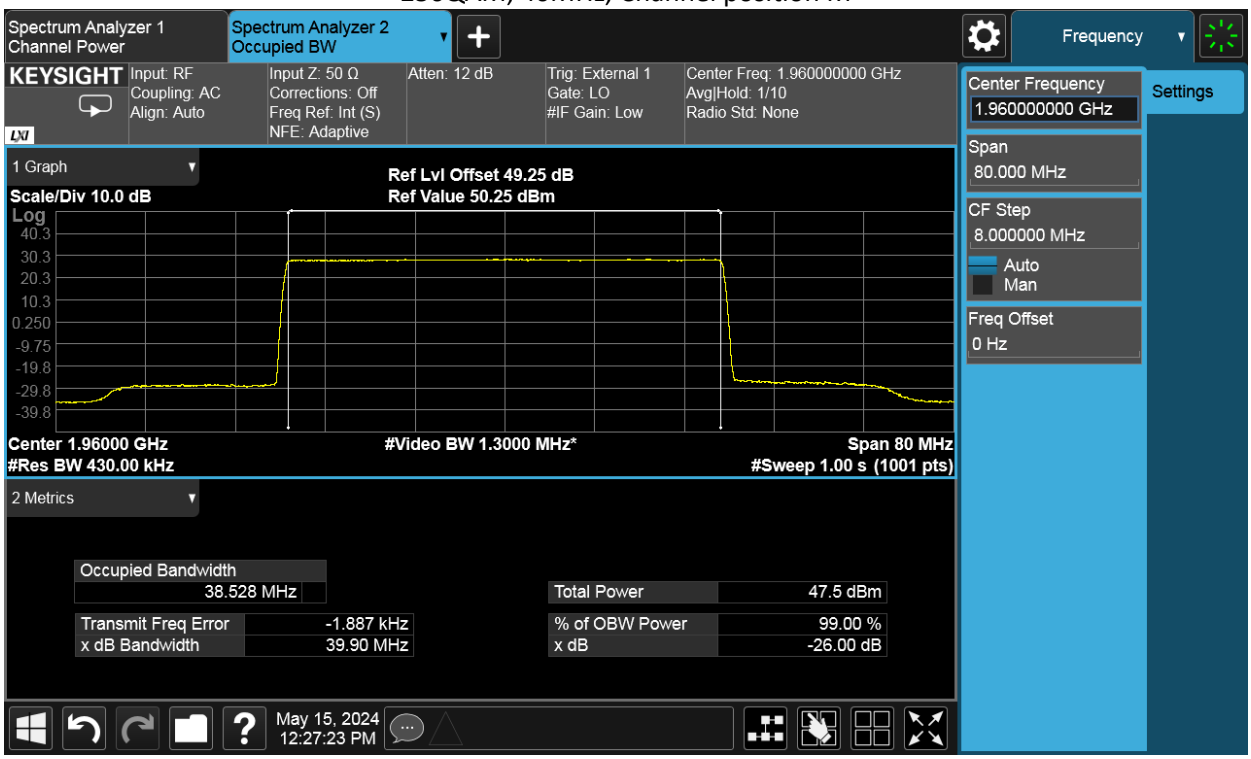


256QAM, 40MHz, Channel position B

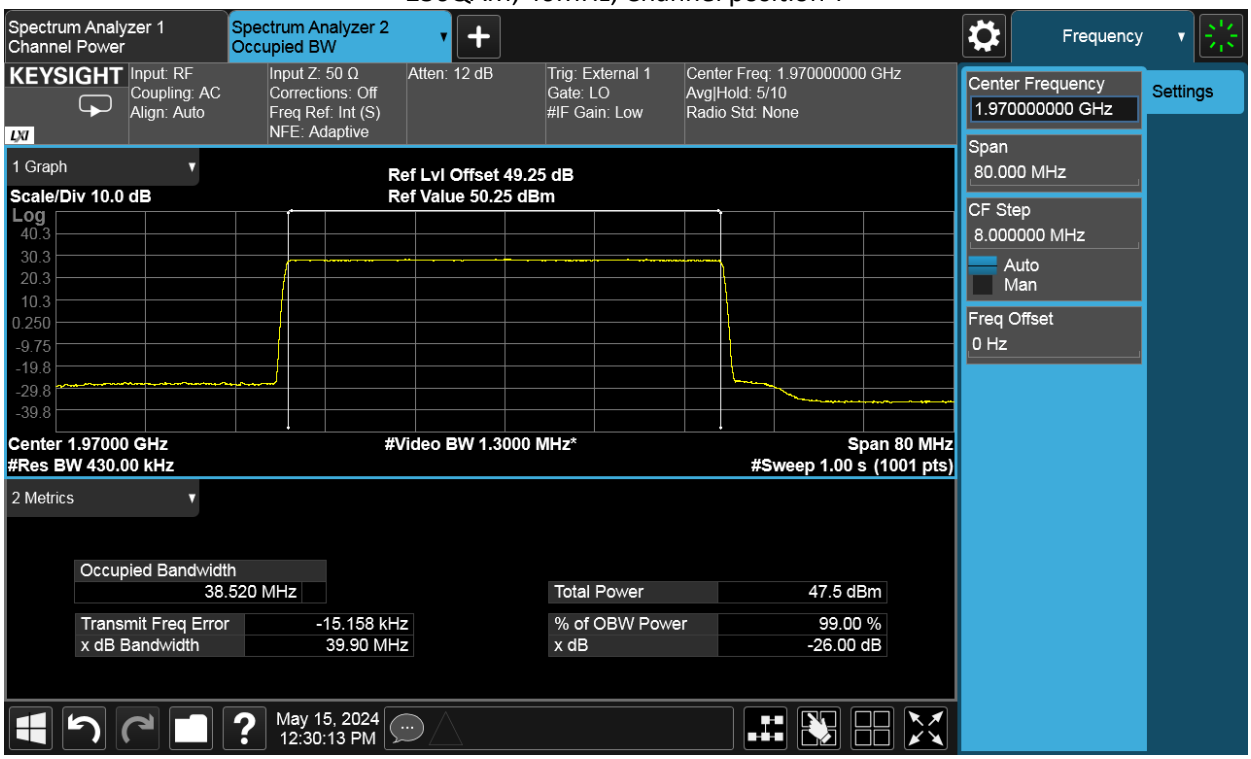


TEST REPORT

256QAM, 40MHz, Channel position M



256QAM, 40MHz, Channel position T



5 Unwanted Emissions at Band Edge

Test result: **Pass**

5.1 Limit

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 + 10log(P) dB.

5.2 Measurement Procedure

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 + 10log(P) dB.

For MIMO 4TX/RX or 2TX/RX mode configurations, the limit was adjusted with a correction of -6.02dB [10Log(1/4)] or -3.01dB [10Log(1/2)] by using the Measure and Add 10Log(N) dB technique according to KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from antenna ports . Then the limit was adjusted to -19.02 or -16.01dBm.

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 and a RBW of 1MHz for measurements of emissions > 1MHz away from the band edges.

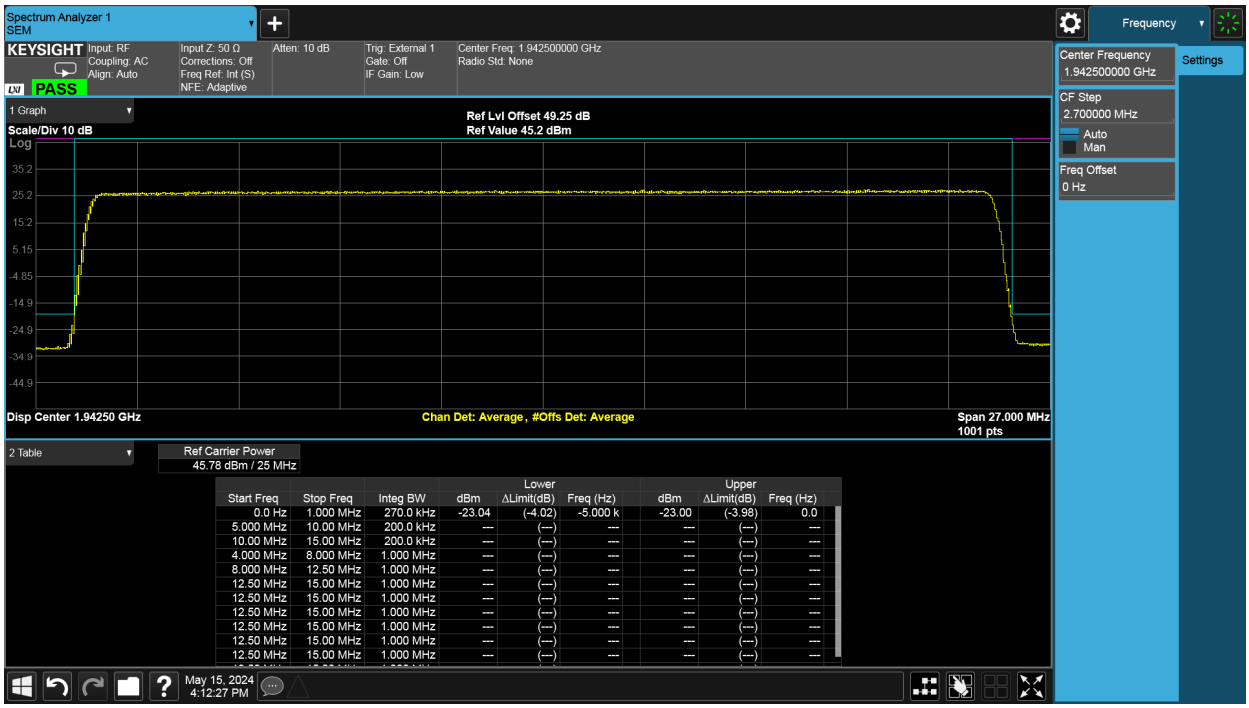
Spectrum analyzer detector was set as RMS.

5.3 Measurement result

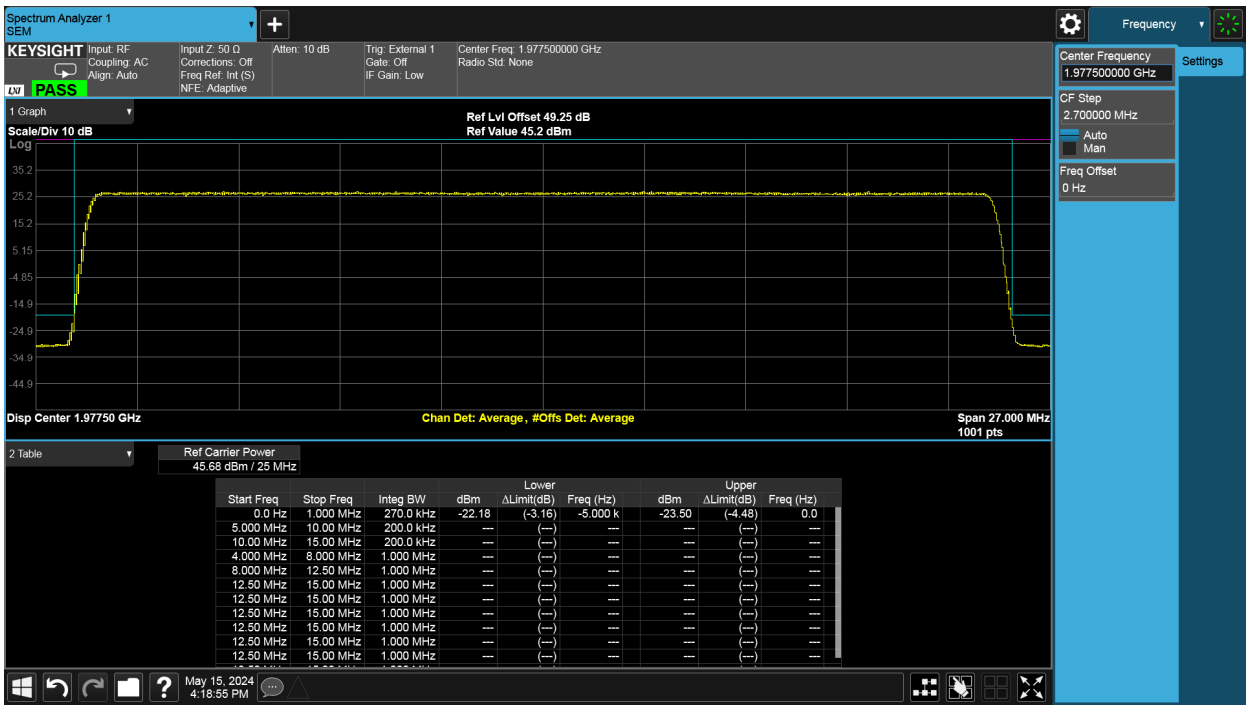
4TX/RX mode:
NR-1C-UE

Antenna Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
A	B	256QAM	25	270	-19.02
A	T	256QAM	25	270	-19.02

Channel Position B



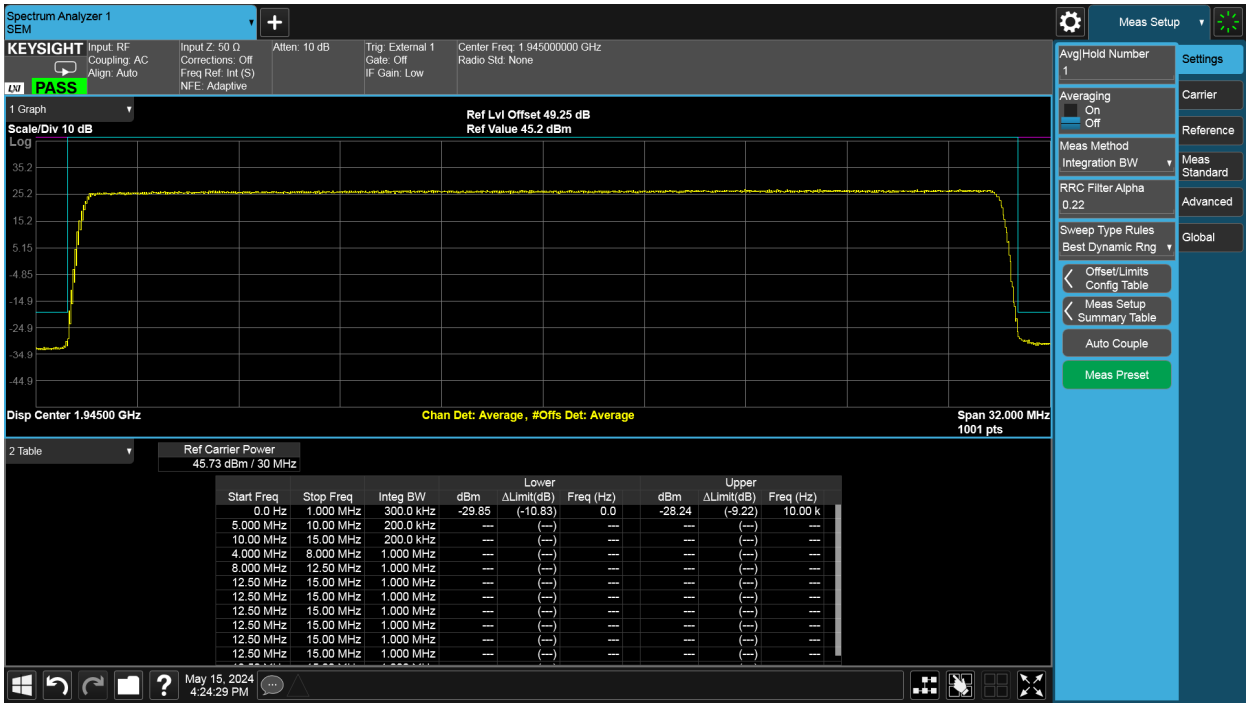
Channel Position T



TEST REPORT

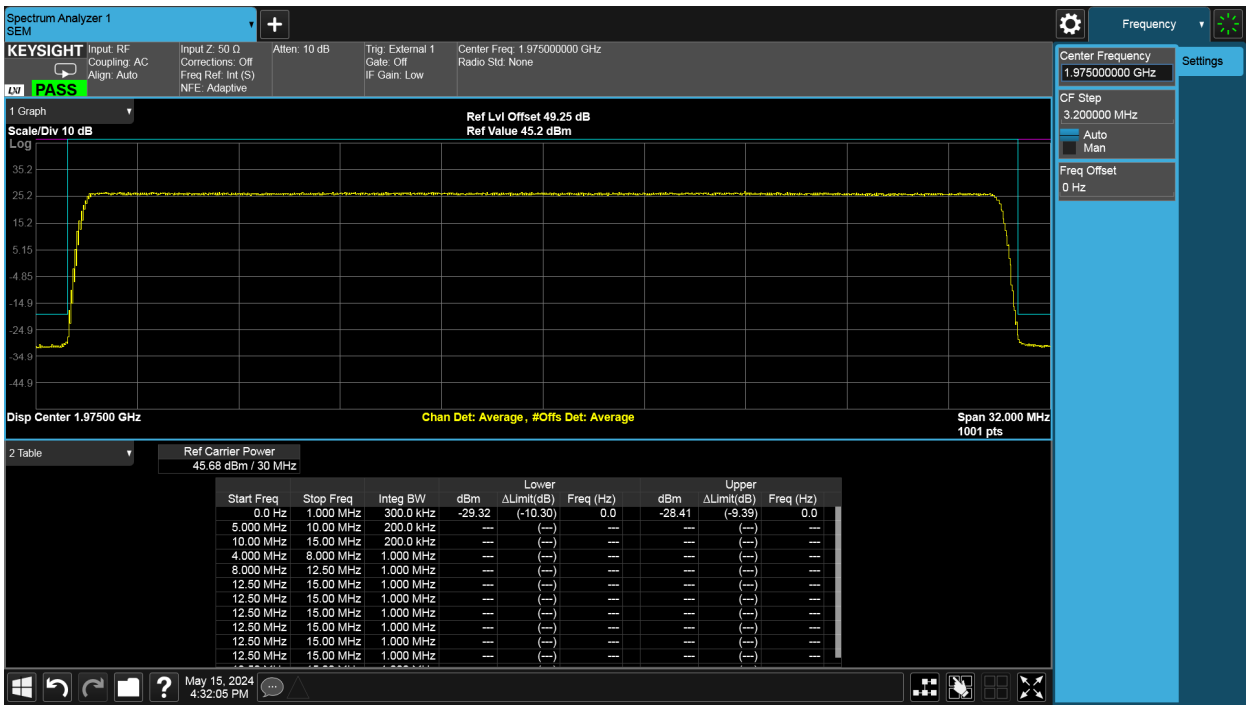
Antenna Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
A	B	256QAM	30	300	-19.02
A	T	256QAM	30	300	-19.02

Channel Position B



Start Freq	Stop Freq	Integ BW	Lower dBm	Lower ΔLimit(dB)	Lower Freq (Hz)	Upper dBm	Upper ΔLimit(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	300.0 kHz	-29.85	(-10.83)	0.0	-28.24	(-9.22)	10.00 k
5.000 MHz	10.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
10.00 MHz	15.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Channel Position T

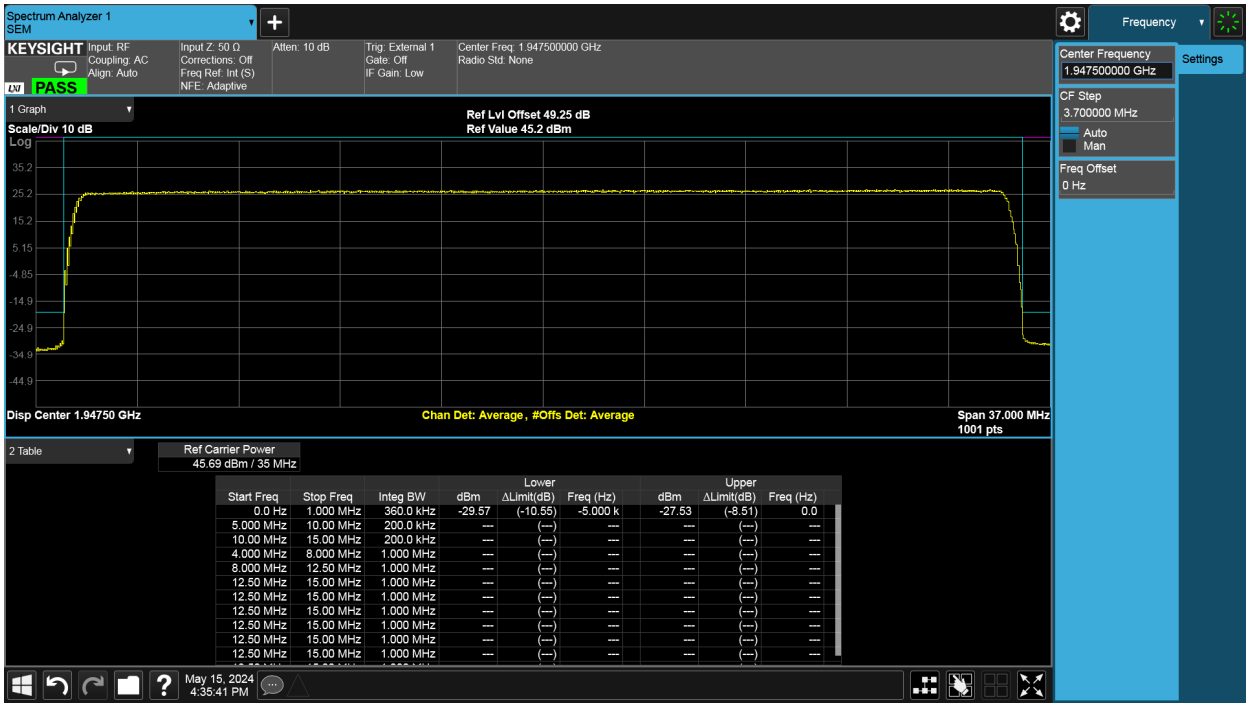


Start Freq	Stop Freq	Integ BW	Lower dBm	Lower ΔLimit(dB)	Lower Freq (Hz)	Upper dBm	Upper ΔLimit(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	300.0 kHz	-29.32	(-10.30)	0.0	-28.41	(-9.39)	0.0
5.000 MHz	10.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
10.00 MHz	15.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

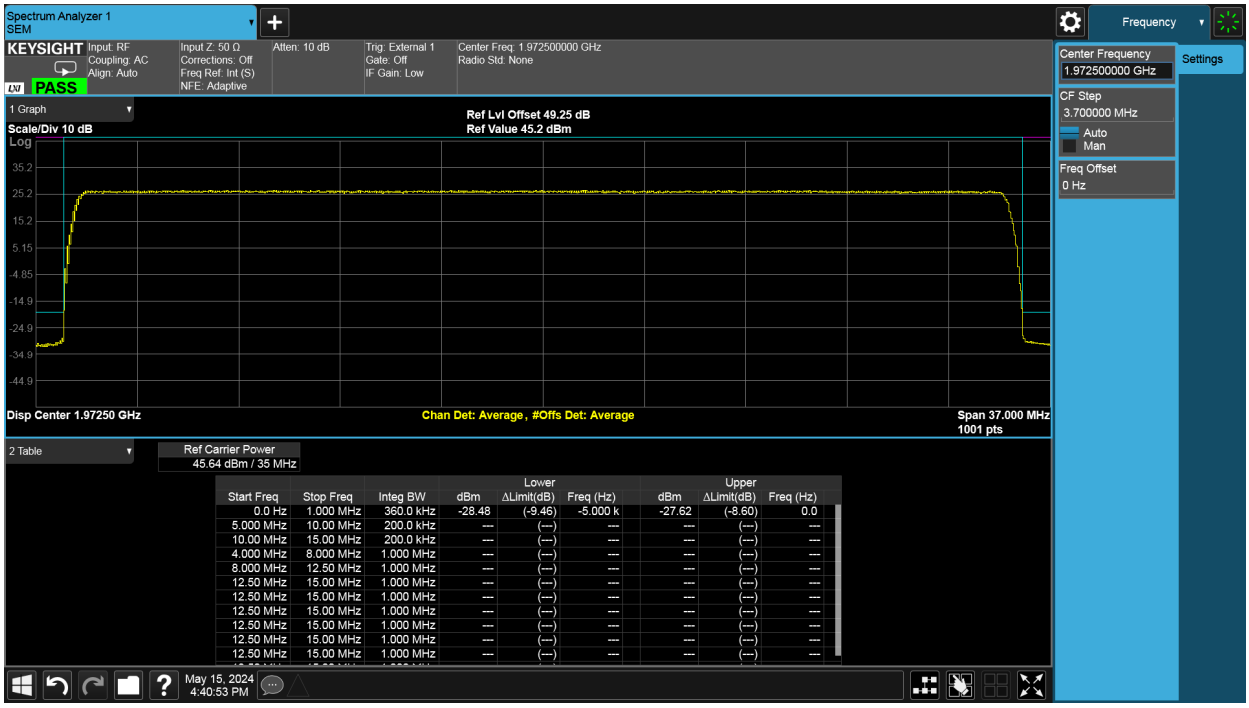
TEST REPORT

Antenna Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
A	B	256QAM	35	360	-19.02
A	T	256QAM	35	360	-19.02

Channel Position B



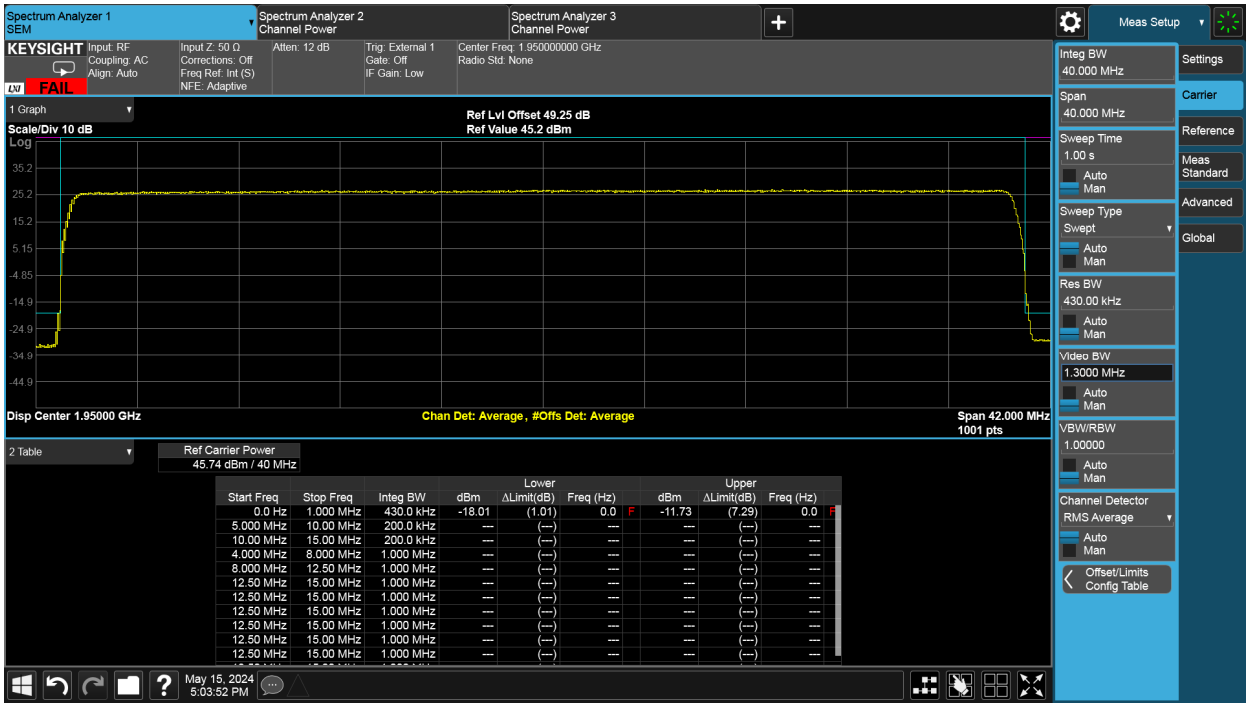
Channel Position T

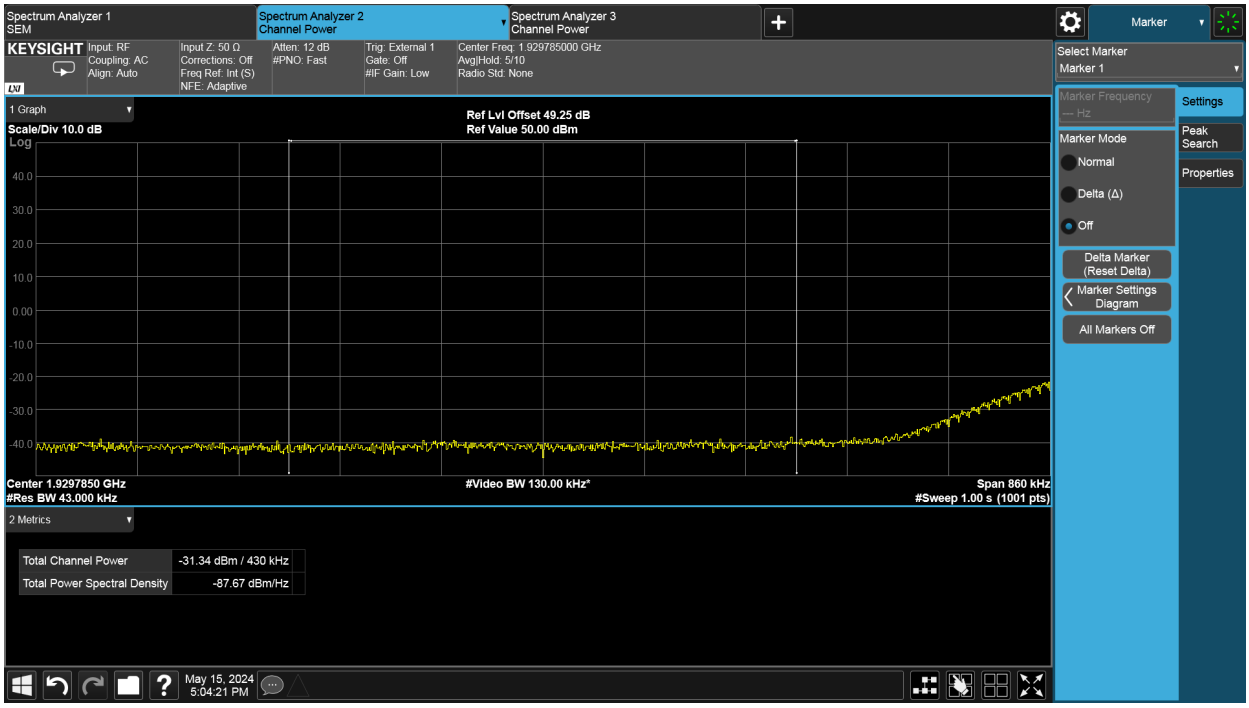


TEST REPORT

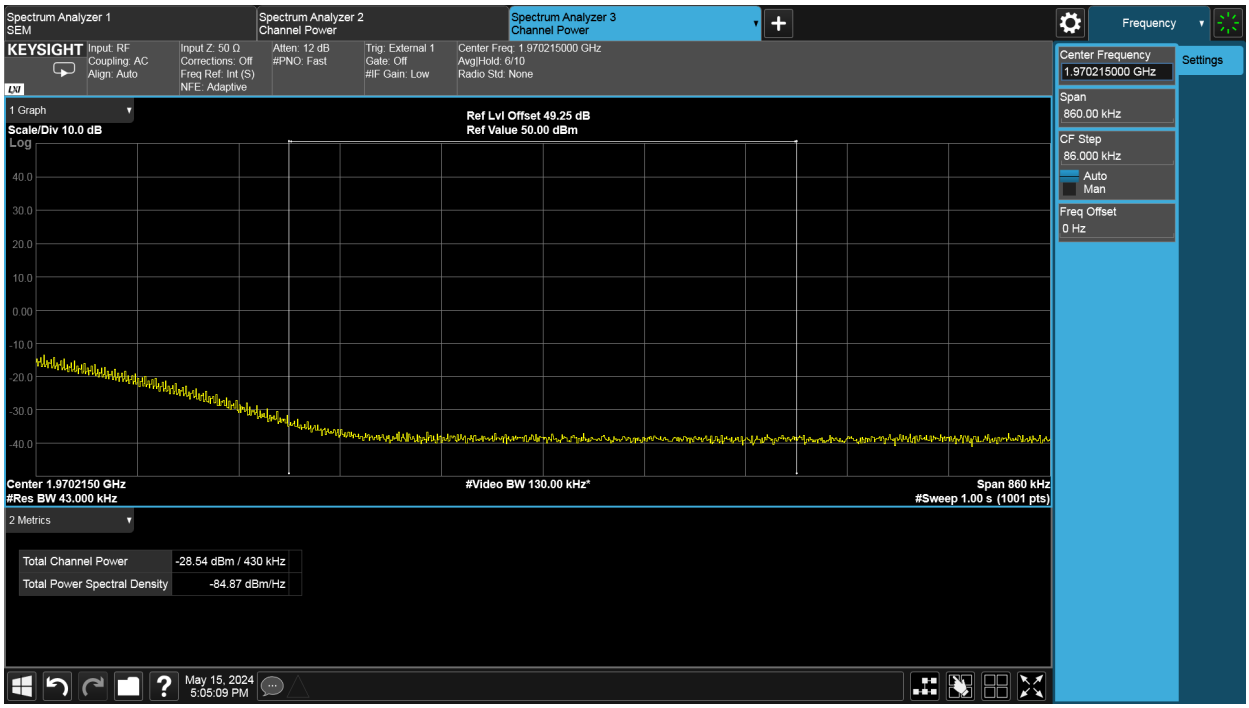
Antenna Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
A	B	256QAM	40	430	-19.02
A	T	256QAM	40	430	-19.02

Channel Position B

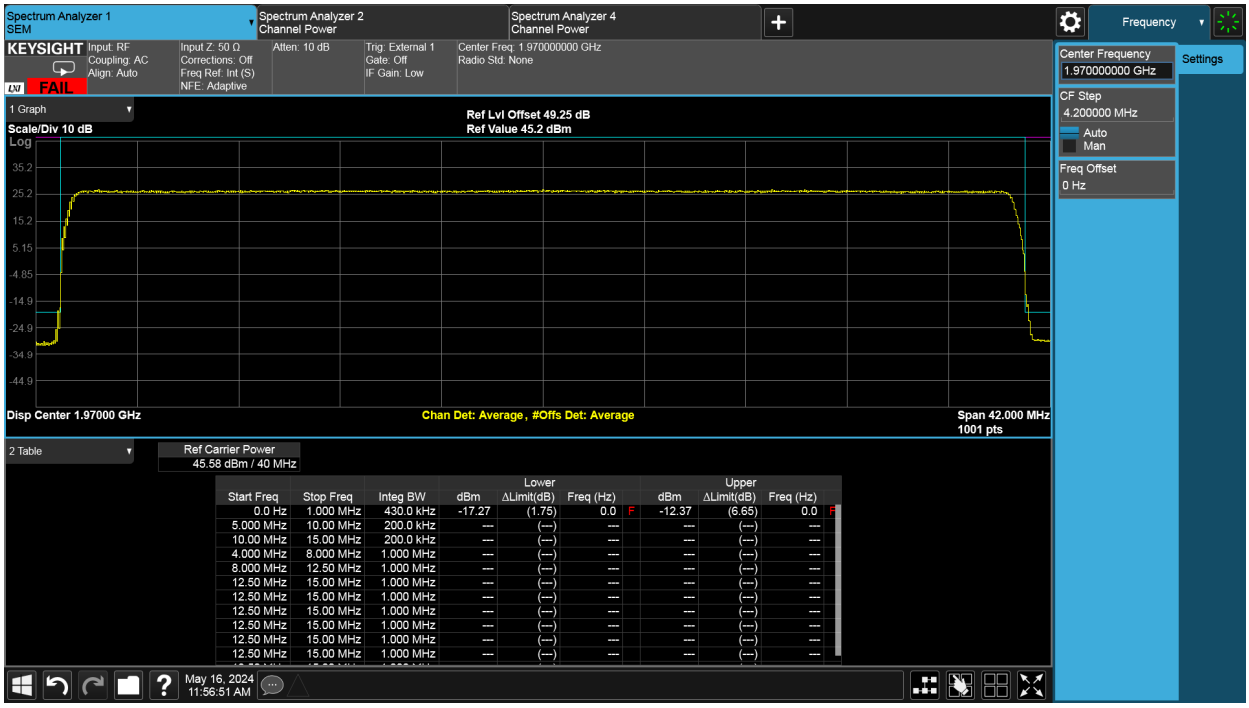




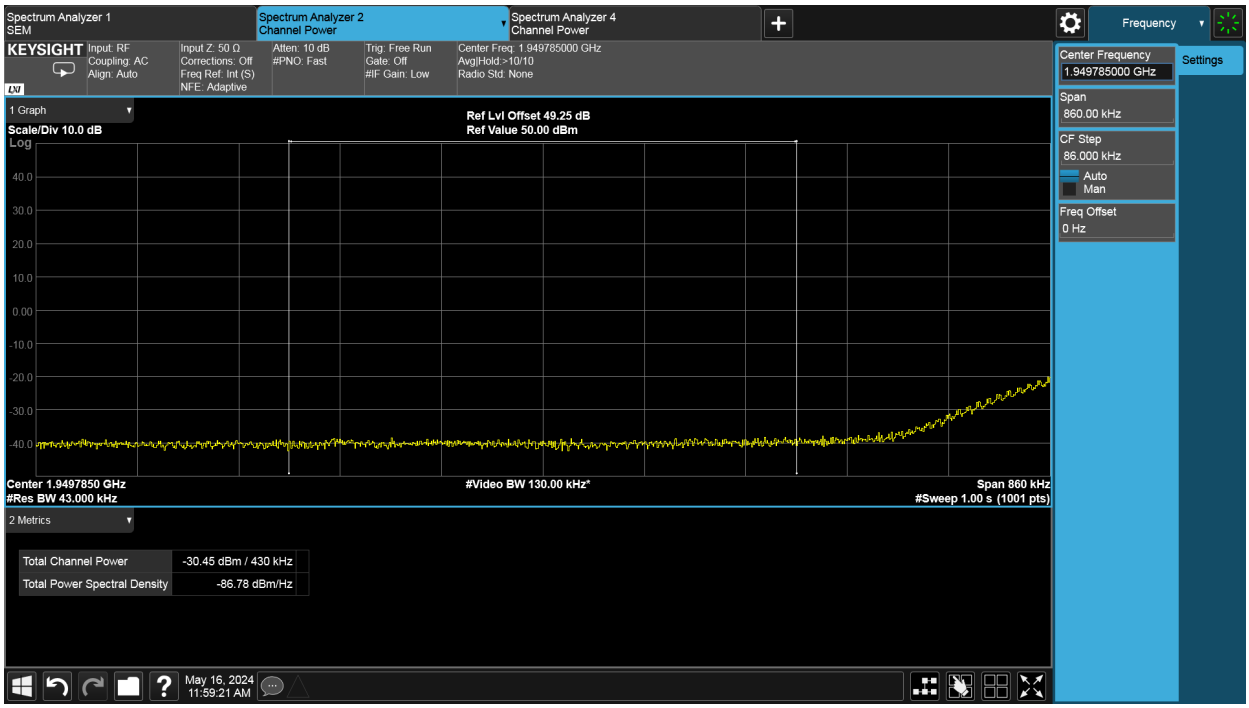
TEST REPORT

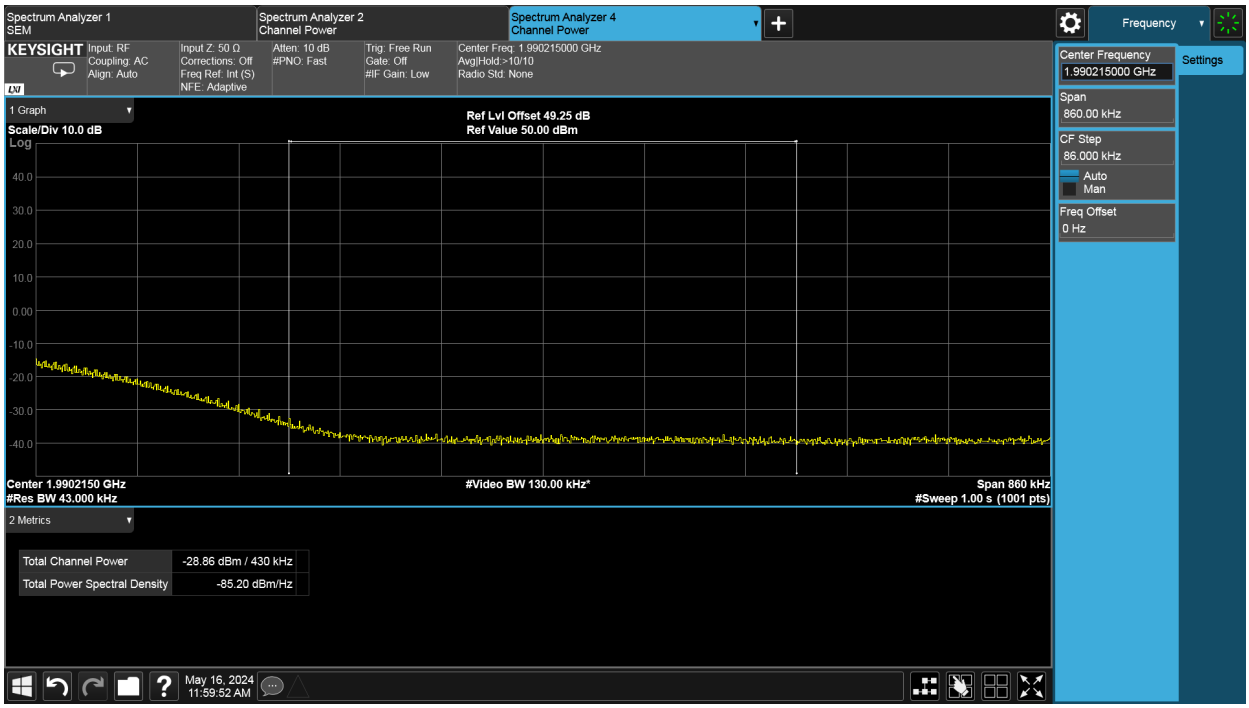


Channel Position T



TEST REPORT


Spectrum Analyzer 1
SEM
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 4
Channel Power
KEYSIGHT
Input: RF
Coupling: AC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
Atten: 10 dB
#PNO: Fast
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 1.949785000 GHz
Avg|Hold:>10/10
Radio Std: None
Frequency
Center Frequency
1.949785000 GHz
Settings
Span
860.00 kHz
CF Step
86.000 kHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Scale/Div 10.0 dB
Log
Ref Lvl Offset 49.25 dB
Ref Value 50.00 dBm
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 1.9497850 GHz
#Res BW 43.000 kHz
#Video BW 130.00 kHz*
Span 860 kHz
#Sweep 1.00 s (1001 pts)
2 Metrics
Total Channel Power
-30.45 dBm / 430 kHz
Total Power Spectral Density
-86.78 dBm/Hz
May 16, 2024
11:59:21 AM

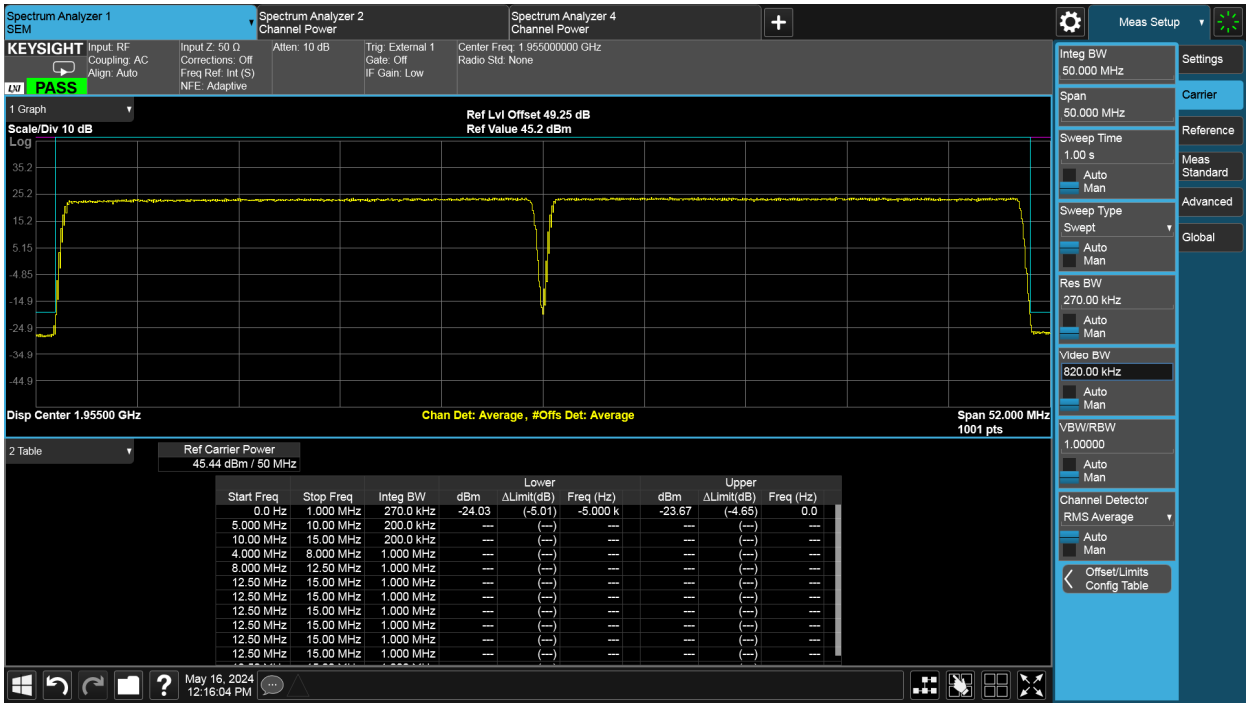

Spectrum Analyzer 1
SEM
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 4
Channel Power
KEYSIGHT
Input: RF
Coupling: AC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
Atten: 10 dB
#PNO: Fast
Trig: Free Run
Gate: Off
#IF Gain: Low
Center Freq: 1.990215000 GHz
Avg|Hold:>10/10
Radio Std: None
Frequency
Center Frequency
1.990215000 GHz
Settings
Span
860.00 kHz
CF Step
86.000 kHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Scale/Div 10.0 dB
Log
Ref Lvl Offset 49.25 dB
Ref Value 50.00 dBm
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 1.9902150 GHz
#Res BW 43.000 kHz
#Video BW 130.00 kHz*
Span 860 kHz
#Sweep 1.00 s (1001 pts)
2 Metrics
Total Channel Power
-28.86 dBm / 430 kHz
Total Power Spectral Density
-85.20 dBm/Hz
May 16, 2024
11:59:52 AM

TEST REPORT

NR-2C-UE

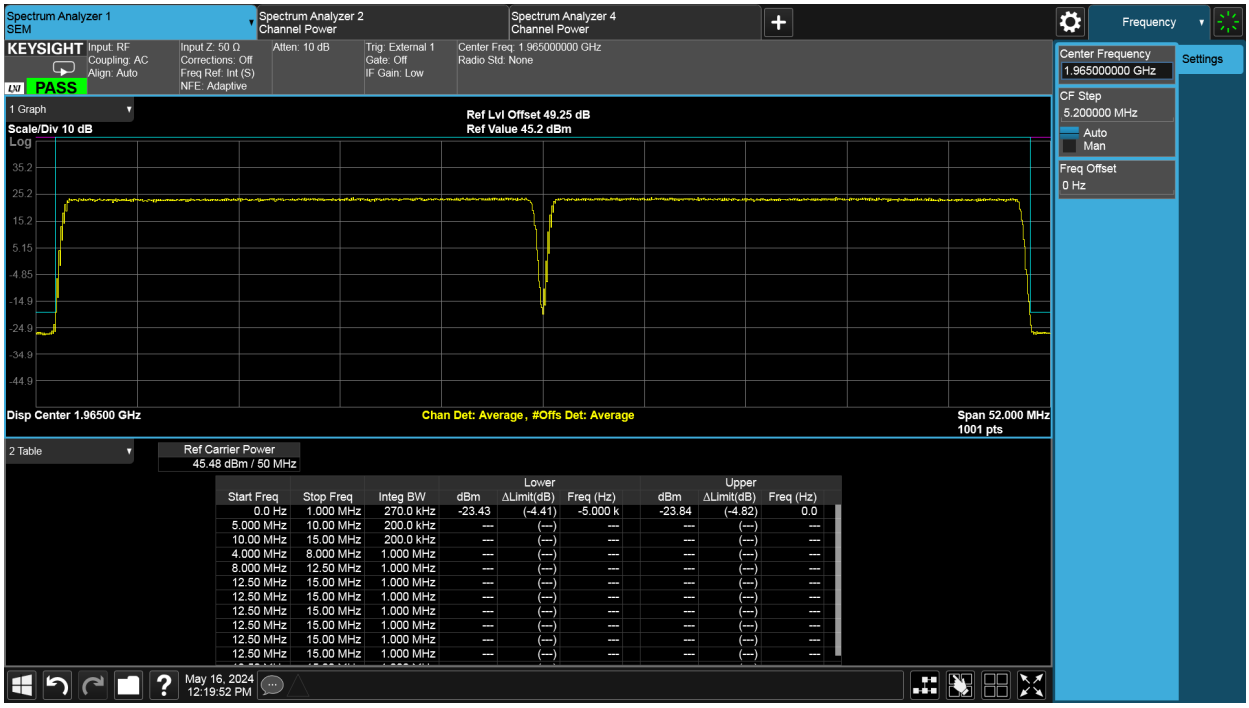
Antenna Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
A	B	256QAM	25	270	-19.02
A	T	256QAM	25	270	-19.02

Channel Position B



Start Freq	Stop Freq	Integ BW	Lower dBm	Lower ΔLimit(dB)	Lower Freq (Hz)	Upper dBm	Upper ΔLimit(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	270.0 kHz	-24.03	(-5.01)	-5.000 k	-23.67	(-4.65)	0.0
5.000 MHz	10.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
10.00 MHz	15.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---

Channel Position T



Start Freq	Stop Freq	Integ BW	Lower dBm	Lower ΔLimit(dB)	Lower Freq (Hz)	Upper dBm	Upper ΔLimit(dB)	Upper Freq (Hz)
0.0 Hz	1.000 MHz	270.0 kHz	-23.43	(-4.41)	-5.000 k	-23.84	(-4.82)	0.0
5.000 MHz	10.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
10.00 MHz	15.00 MHz	200.0 kHz	---	(---)	---	---	(---)	---
4.000 MHz	8.000 MHz	1.000 MHz	---	(---)	---	---	(---)	---
8.000 MHz	12.50 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---
12.50 MHz	15.00 MHz	1.000 MHz	---	(---)	---	---	(---)	---