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Ericsson AB

RF TEST REPORT

Report Type:
FCC Part 27 RF report

PRODUCT NAME:
Radio 4467 44B77D 44B77G C

REPORT NUMBER:
2404B1643SHA-001

ISSUE DATE:
April 26, 2024

DOCUMENT CONTROL NUMBER:
TTRFFCC Part 27_V1 © 2018 Intertek

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TEST REPORT

Report no.: 2404B1643SHA-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:	TA8AKRC1610037-3

SUMMARY:

The equipment is tested according to the following standard(s) or Specification:
FCC CFR 47 Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

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

Content

Revision History

Report No.	Version	Description	Issued Date
2404B1643SHA-001	Rev. 01	Initial issue of report	April 26, 2024

TEST REPORT

Measurement result summary

TEST ITEM	FCC REFERANCE	RESULT
Max Output Power and Peak to Average Power Ratio and EIRP	27.50(j)(k) 2.1046	Pass
Occupied Bandwidth	2.1049	Pass
Unwanted Emissions at Band Edge	27.53(l)(n) 2.1051	Pass
Conducted Unwanted Emission	27.53(l)(n) 2.1051	Pass

TEST REPORT

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Description:	Remote Radio Unit
Product name:	Radio 4467 44B77D 44B77G C
Product number:	KRC 161 0037/3
Serial Number(s)	CF8C344444
Rating:	-48V DC
Software Version:	CXP9013268%21_R21A155
Hardware Version:	R1D
Sample received date:	April 10, 2024
Date of test:	April 10, 2024 ~ April 22, 2024

1.2 Technical Specification

Frequency Range:	B77D: 3700MHz-3980MHz B77G: 3450MHz-3550MHz
Number of Antenna ports:	4 TX/RX
Supported RAT:	NR
Max RF bandwidth (IBW):	B77D: 200MHz B77G: 100MHz
Supported Number of Carriers:	Maximum 6 carriers
Supported modulation:	QPSK, 16QAM, 64QAM, 256QAM
Supported Channel Bandwidth:	NR:10MHz,15MHz,20MHz,30MHz,40MHz,50MHz,60MHz,70MHz,80MHz,90MHz,100MHz with SCS 30kHz
Declaration output power:	Maximum 46.0dbm(40W) per port

Note: Information in the 1.2 sheet declared by the manufacturer.

1.3 Description of Test Facility

Conducted testing:

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 27 (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) Radio 4467 44B77D 44B77G C is an Ericsson Radio Unit working in the wireless communication services 3450-3550MHz and 3700-3980MHz band which provides communication connections to 3450-3550MHz and 3700-3980MHz network. Radio 4467 44B77D 44B77G C operates from a -48V DC.
The EUT includes 4 TX/RX ports. 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

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 and 256QAM on one of the antenna ports, it was determined that 256QAM for B77G and 64QAM for B77D was the worst case modulation schemes and were used for all testing.

Complete testing was carried out on the worst case antenna port which was established as being the highest output power from the 4 measured ports on worst case modulation scheme. This antenna port was Port C for B77G and B77D.

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

Configuration	Carrier	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NRG-1C	1	10	3455.01	3500.01	3545.01
		15	3457.50	3500.01	3542.52
NRG-2C	2	10	-	3455.01+3545.01	-
		15	-	3457.50+3542.49	-
NRG-6C	6	10	-	3455.01+3465.00+3475.02+ 3525.00+3535.02+3545.01	-
		15	-	3457.50+3472.50+3487.50+ 3512.52+3527.52+3542.49	-

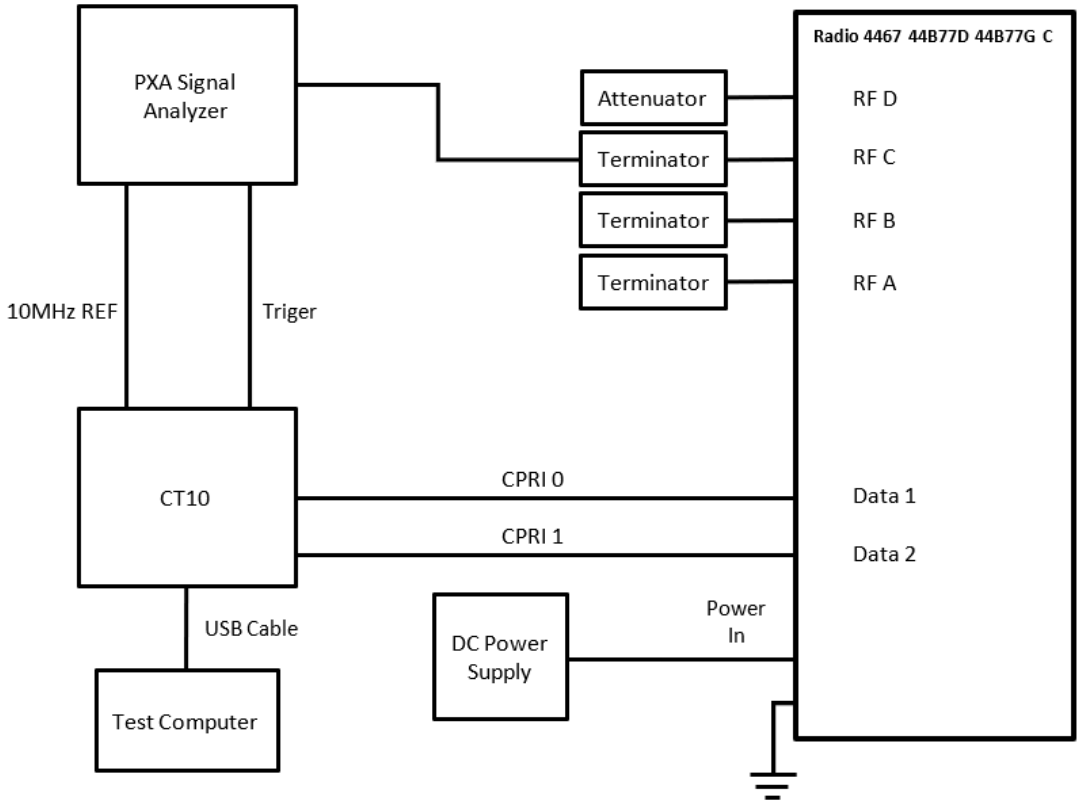
Configuration	Carrier	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NRG-1C-UE	1	10	3455.01	-	3545.01
		15	3457.50	-	3542.52
NRG-2C-UE	2	10	3455.01+3465.00	-	3535.02+3545.01
		15	3457.50+3472.50	-	3527.52+3542.52
NRG-6C-UE	6	10	3455.01+3465.00+ 3475.02+3485.01+ 3495.00+3505.02	-	3495.00+3505.02+ 3515.01+3525.00+ 3535.02+3545.01
		15	3457.50+3472.50+ 3487.50+3502.50+ 3517.50+3532.50	-	3467.52+3482.52+ 3497.52+3512.52+ 3527.52+3542.52

Configuration	Carrier	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NRD-1C	1	10	3705.00	3840.00	3975.00
		15	3707.52	3840.00	3972.51
NRD-2C	2	10	-	3745.02+3935.01	-
		15	-	3747.51+3932.49	-
NRD-6C	6	10	-	3745.02+3755.01+3765.00+ 3915.00+3925.02+3935.01	-
		15	-	3747.51+3762.51+3777.51+ 3902.52+3917.52+3932.49	-

Configuration	Carrier	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NRD-1C-UE	1	10	3705.00	-	3975.00
		15	3707.52	-	3972.51
NRD-2C-UE	2	10	3705.00+3715.02	-	3965.01+3975.00
		15	3707.52+3722.52	-	3957.51+3972.51
NRD-6C-UE	6	10	3705.00+3715.02+ 3725.01+3735.00+ 3745.02+3755.01	-	3925.02+3935.01+ 3945.00+3955.02+ 3965.01+3975.00
		15	3707.52+3722.52+ 3737.52+3752.52+ 3767.52+3782.52	-	3897.51+3912.51+ 3927.51+3942.51+ 3957.51+3972.51

2.4 Test Setup

Conducted Measurement:



TEST REPORT

No.	Auxiliary Equipment	Product Number / Model Type	Version
1	Test computer	DELL OptiPlex 3050	-
2	CT10	LPC 102487/1	R1C
3	DC Power Supply N8737A	US21E7359S	-
4	Signal Generator SMU200A	103211	
5	Signal Analyzer FSVA3044	101087	
6	PXA-Signal Analyzer N9030A	MY57140894	
7	10db Attenuator	2.92TS100-10-26.5-A	-
8	40db Coupler	C40-560-4F	-
9	Filter	CW-DPF-0-12750-E15-M2	-
10	Filter	M-DUPH-186-B77G(3450-3550)	-
11	Filter	W-FLTF-025-12750-18000	
12	Filter	W-FLTF-026-18000-26500	
13	Filter	W-FLTF-027-26500-40000	
14	Terminator	WTF100-6G-A-NJ	
15	40db Attenuator	47-40-33-LIM	

Proper Attenuator/Coupler/Filter will be chosen to use in relative test case. And the cable loss of specified Attenuator/Coupler/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	20°C to 24°C	45%RH to 55%RH
Occupied Bandwidth		
Unwanted Emissions at Band Edge		
Conducted Unwanted Emission		

2.6 Instrument list

Intertek Testing Services Shanghai					
Used	Equipment	Manufacturer	Type	S/N	Due date
☒	Signal Analyzer	Rohde & Schwarz	FSVA3044	101087	2024-07-09
☒	Signal Analyzer	Keysight	N9030B	MY57140894	2024-07-09
☒	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

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

Test result: **Pass**

3.1 Limit

27.50(j):
(1) The power of each fixed or base station transmitting in the 3700-3980 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to an equivalent isotropically radiated power (EIRP) of 3280 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.
(2) The power of each fixed or base station transmitting in the 3700-3980 MHz band and situated in any geographic location other than that described in paragraph (j)(1) of this section is limited to an EIRP of 1640 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.

Peak to Average Ratio: ≤13 dB

27.50(k):
(1) The power of each fixed or base station transmitting in the 3450-3550 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to an equivalent isotropically radiated power (EIRP) of 3280 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.
(2) The power of each fixed or base station transmitting in the 3450-3550 MHz band and situated in any geographic location other than that described in paragraph (k)(1) of this section is limited to an EIRP of 1640 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.

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

The EUT is tested without antenna. EIRP compliance is addressed at the time of licensing, as required by the responsible FCC Bureau. Licensee are required to take into account maximum allowed antenna gain used in combination with all power settings to prevent the radiated output power to exceed the limits.

B77G:

NRG-1C

Antenna Port	Modulation	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	10	44.82	36.05	7.35	45.13	36.18	7.39	44.72	35.92	7.36
B	256QAM	10	44.68	35.92	7.36	44.96	36.08	7.39	44.50	35.68	7.37
C	256QAM	10	44.95	36.16	7.36	45.21	36.29	7.39	44.73	35.95	7.36
D	256QAM	10	44.87	36.08	7.35	45.12	36.20	7.39	44.64	35.86	7.37
Total A-D Power			50.85	42.07	-	51.13	42.21	-	50.67	41.87	-
Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	20.08	-	-	19.94	-	-	20.28	-

Antenna Port	Modulation	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	15	44.85	33.97	7.40	45.16	34.20	7.39	44.61	33.84	7.39
B	256QAM	15	44.72	34.02	7.41	44.97	34.08	7.40	44.48	33.63	7.39
C	256QAM	15	44.97	34.12	7.40	45.17	34.21	7.40	44.67	33.83	7.40
D	256QAM	15	44.97	34.21	7.40	45.14	34.36	7.40	44.57	33.75	7.40
Total A-D Power			50.90	40.10	-	51.13	40.23	-	50.60	39.78	-
Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	22.05	-	-	21.92	-	-	22.37	-

NRG-2C

Antenna Port	Modulation	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	10	-	-	-	45.06	33.35	-	-	-	-
B	256QAM	10	-	-	-	45.08	33.33	-	-	-	-
C	256QAM	10	-	-	-	45.32	33.64	-	-	-	-
D	256QAM	10	-	-	-	45.32	33.67	-	-	-	-
Total A-D Power			-	-	-	51.22	39.52	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	22.63	-	-	-	-

Antenna Port	Modulation	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	15	-	-	-	45.14	31.38	-	-	-	-
B	256QAM	15	-	-	-	45.14	31.43	-	-	-	-
C	256QAM	15	-	-	-	45.35	31.61	-	-	-	-
D	256QAM	15	-	-	-	45.38	31.79	-	-	-	-
Total A-D Power			-	-	-	51.27	37.58	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	24.57	-	-	-	-

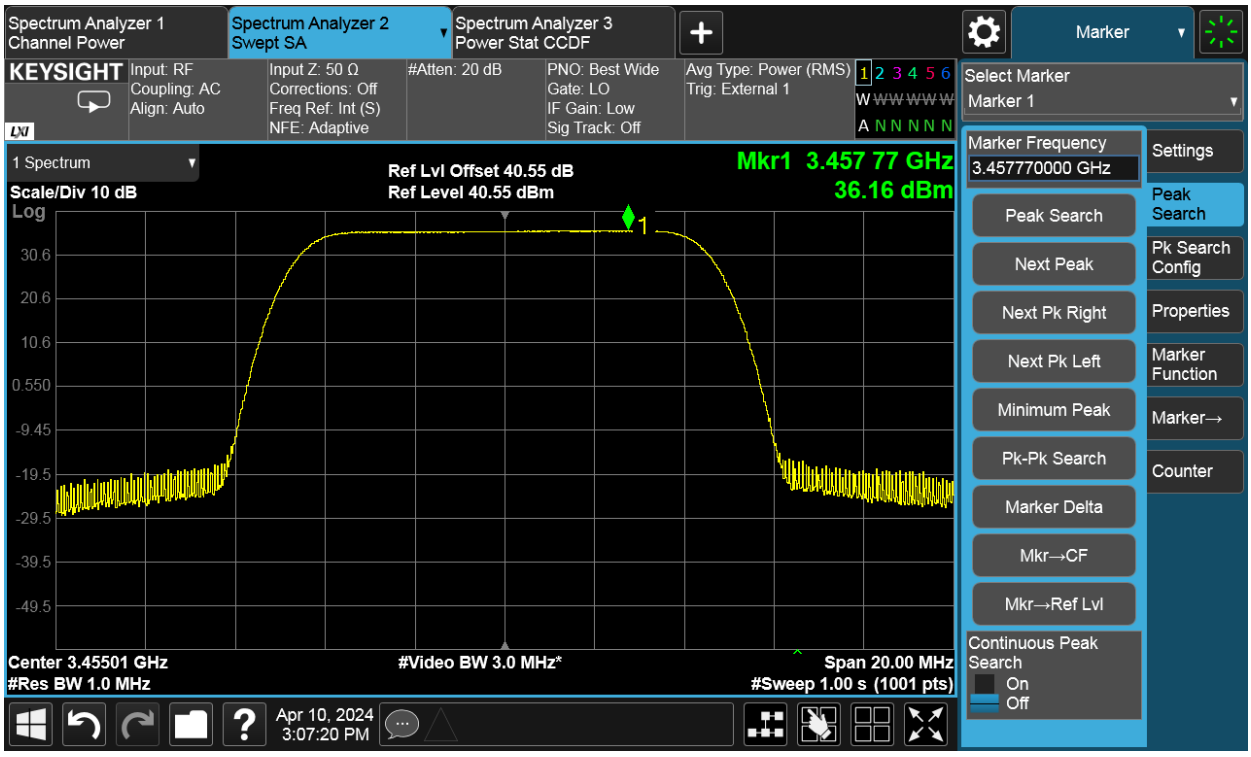
NRG-6C

Antenna Port	Modulation	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	10	-	-	-	45.69	29.39	-	-	-	-
B	256QAM	10	-	-	-	45.69	29.27	-	-	-	-
C	256QAM	10	-	-	-	45.89	29.43	-	-	-	-
D	256QAM	10	-	-	-	45.90	29.49	-	-	-	-
Total A-D Power			-	-	-	51.81	35.42	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	26.73	-	-	-	-

TEST REPORT

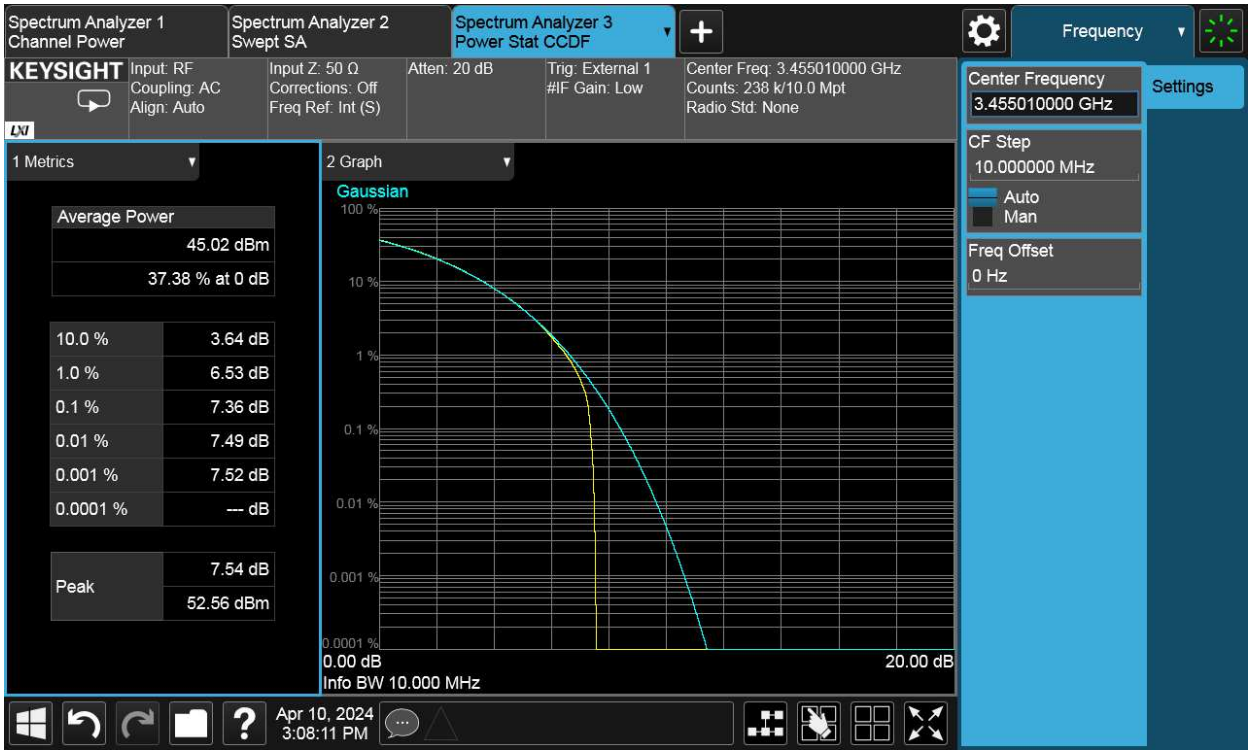
Antenna Port	Modulation	Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	15	-	-	-	45.74	27.40	-	-	-	-
B	256QAM	15	-	-	-	45.65	27.23	-	-	-	-
C	256QAM	15	-	-	-	45.80	27.36	-	-	-	-
D	256QAM	15	-	-	-	45.89	27.53	-	-	-	-
Total A-D Power			-	-	-	51.79	33.40	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	28.75	-	-	-	-

NRG-1C, 10MHz, Channel B, Power



TEST REPORT

NRG-1C, 10MHz, Channel B, PAR



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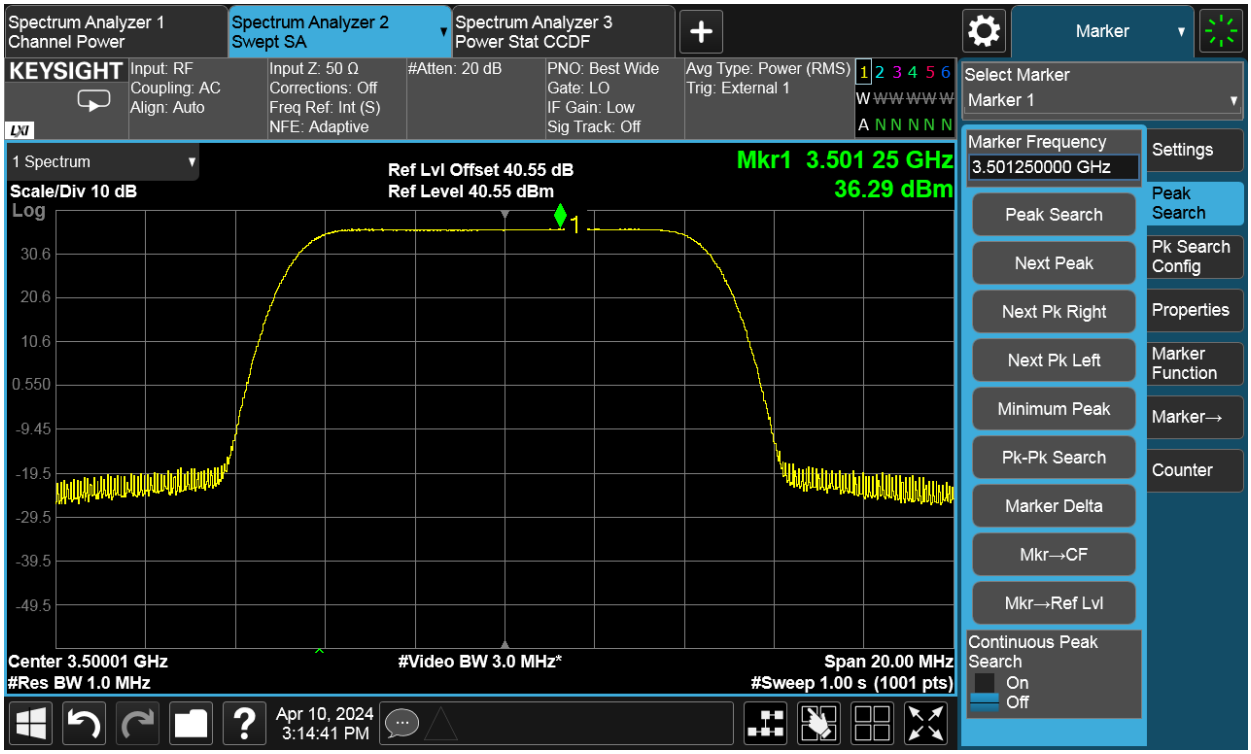
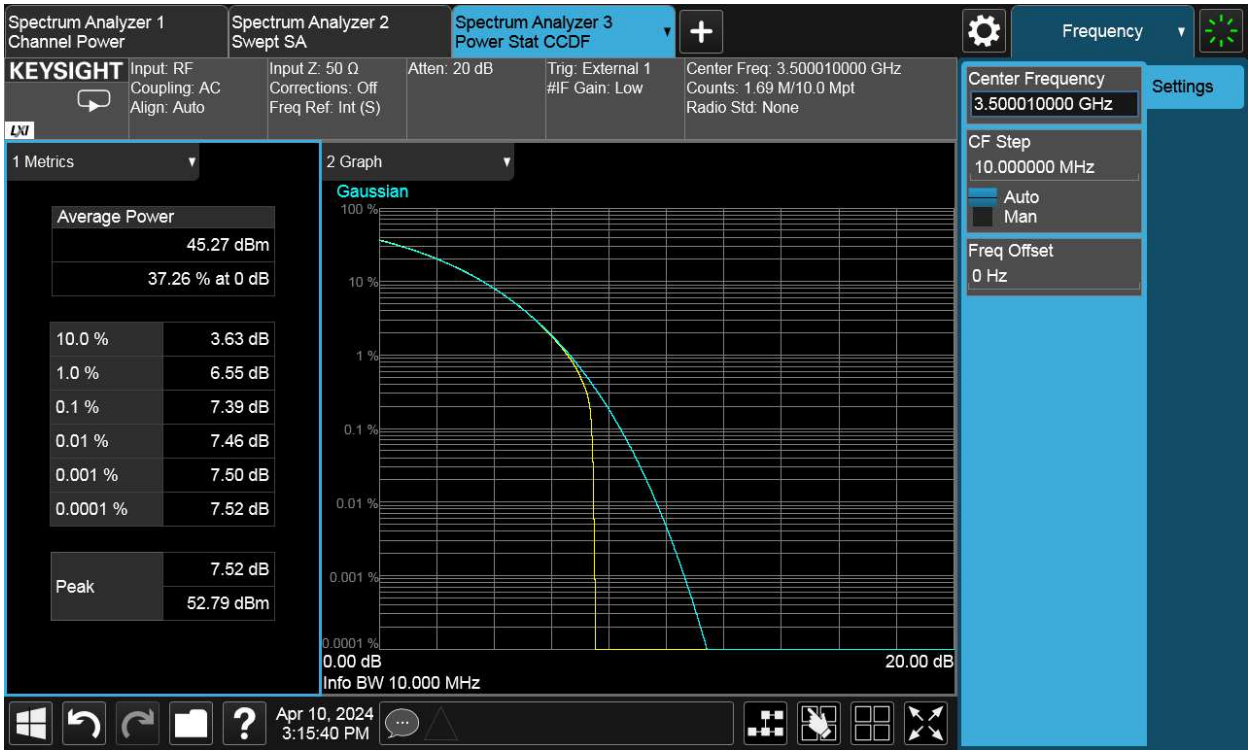


TEST REPORT

NRG-1C, 10MHz, Channel M, PAR



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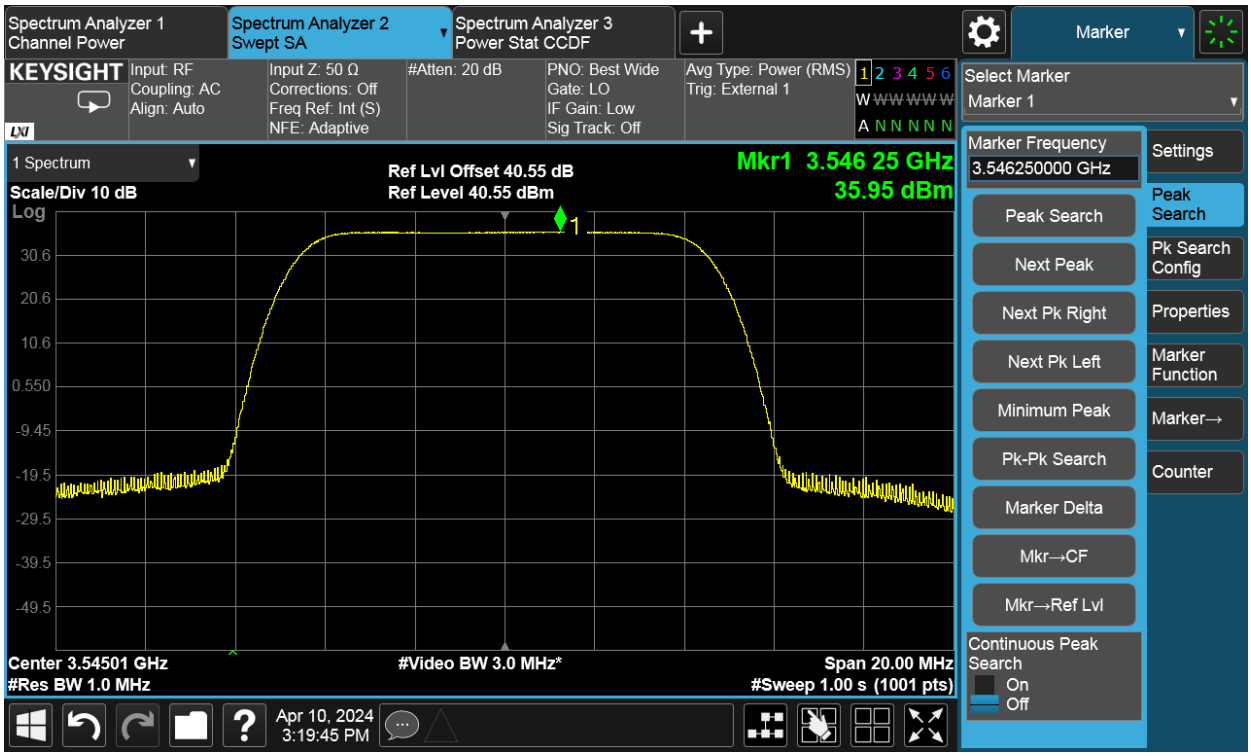
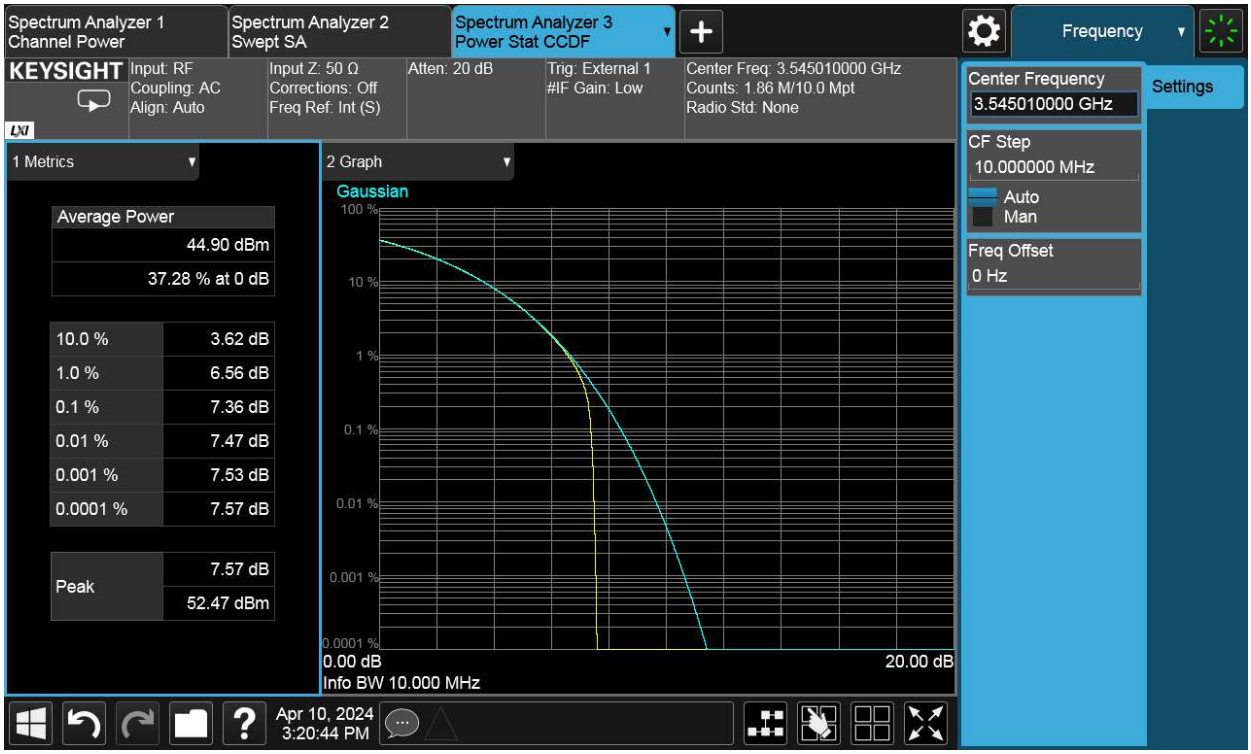
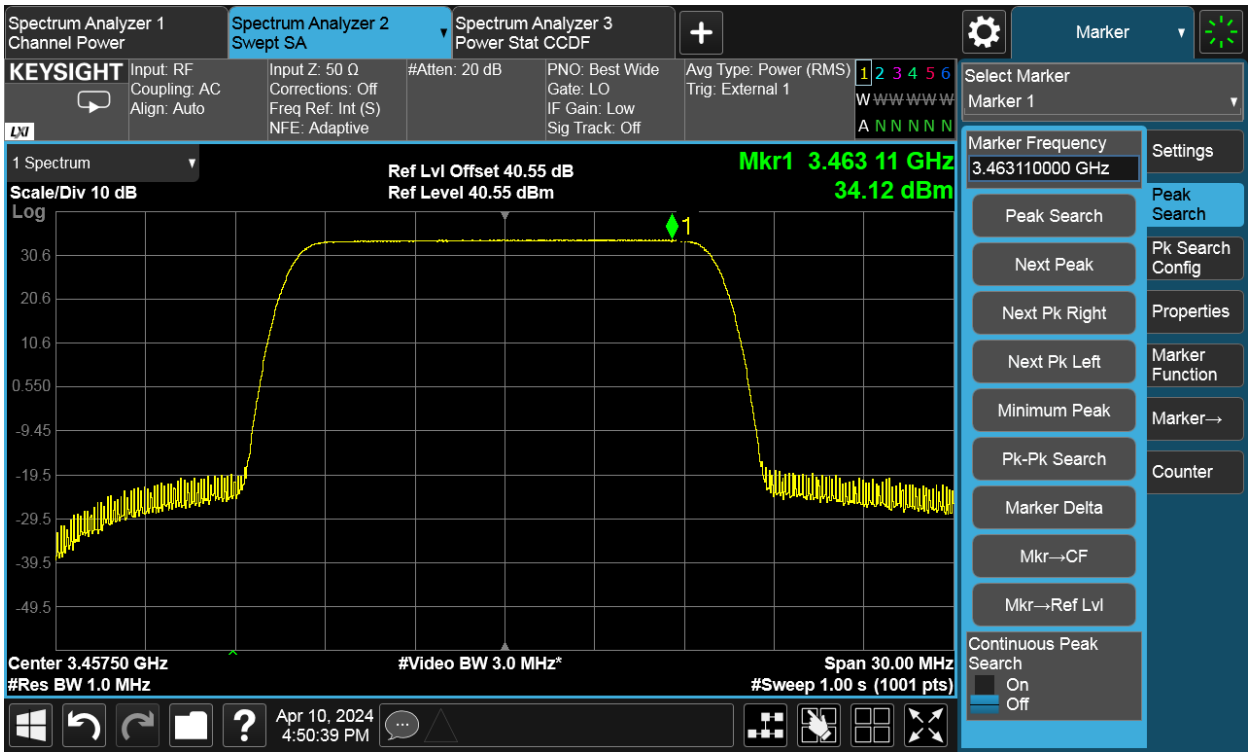


TEST REPORT

NRG-1C, 10MHz, Channel T, PAR

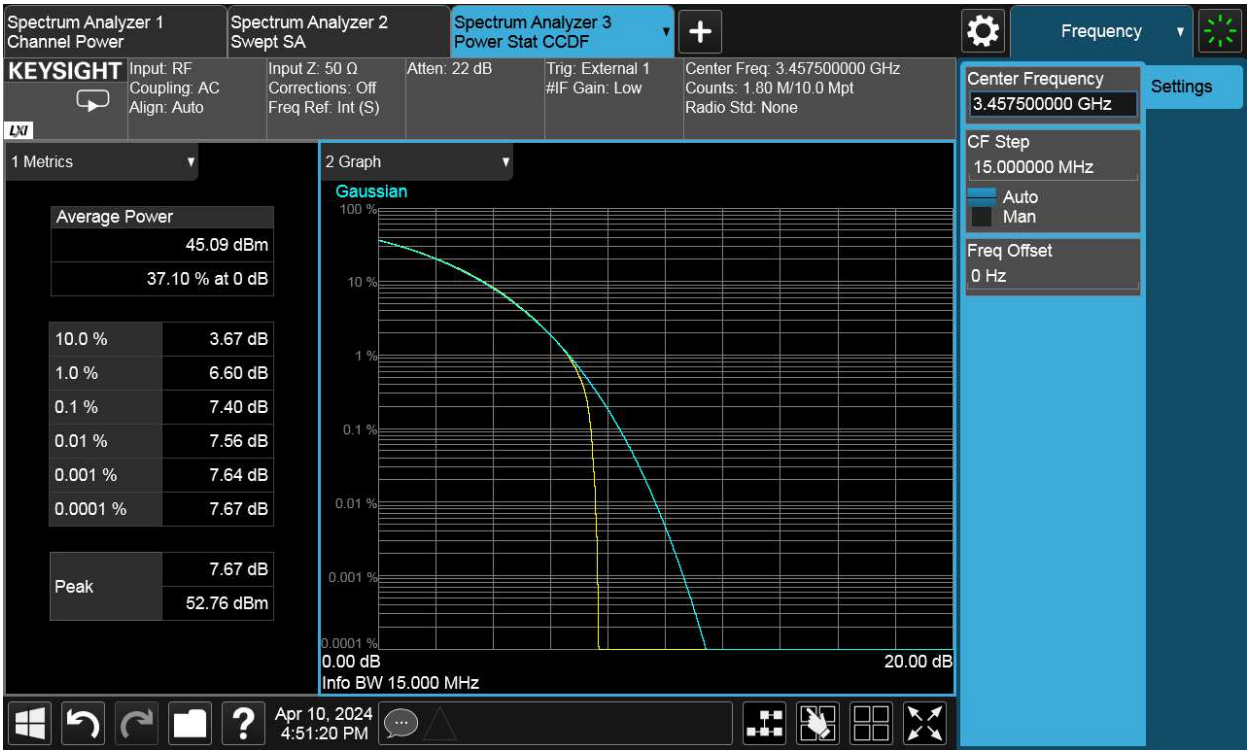


NRG-1C, 15MHz, Channel B, Power

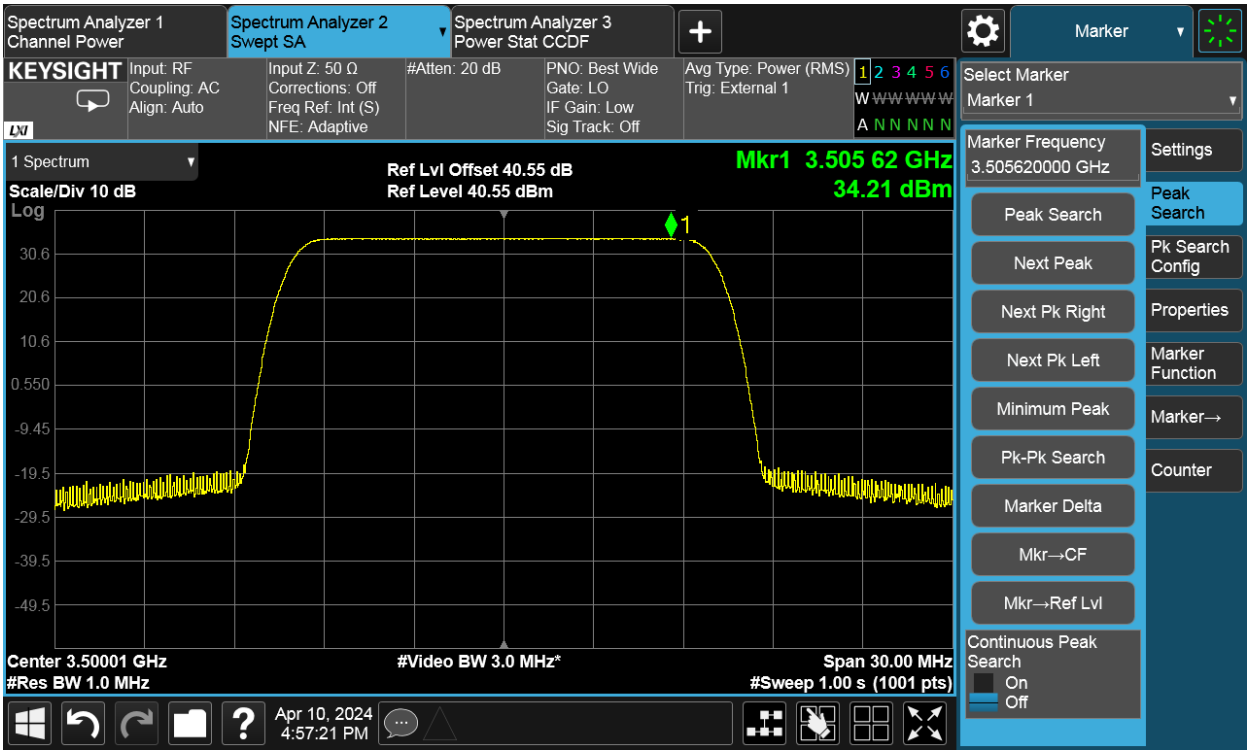


TEST REPORT

NRG-1C, 15MHz, Channel B, PAR

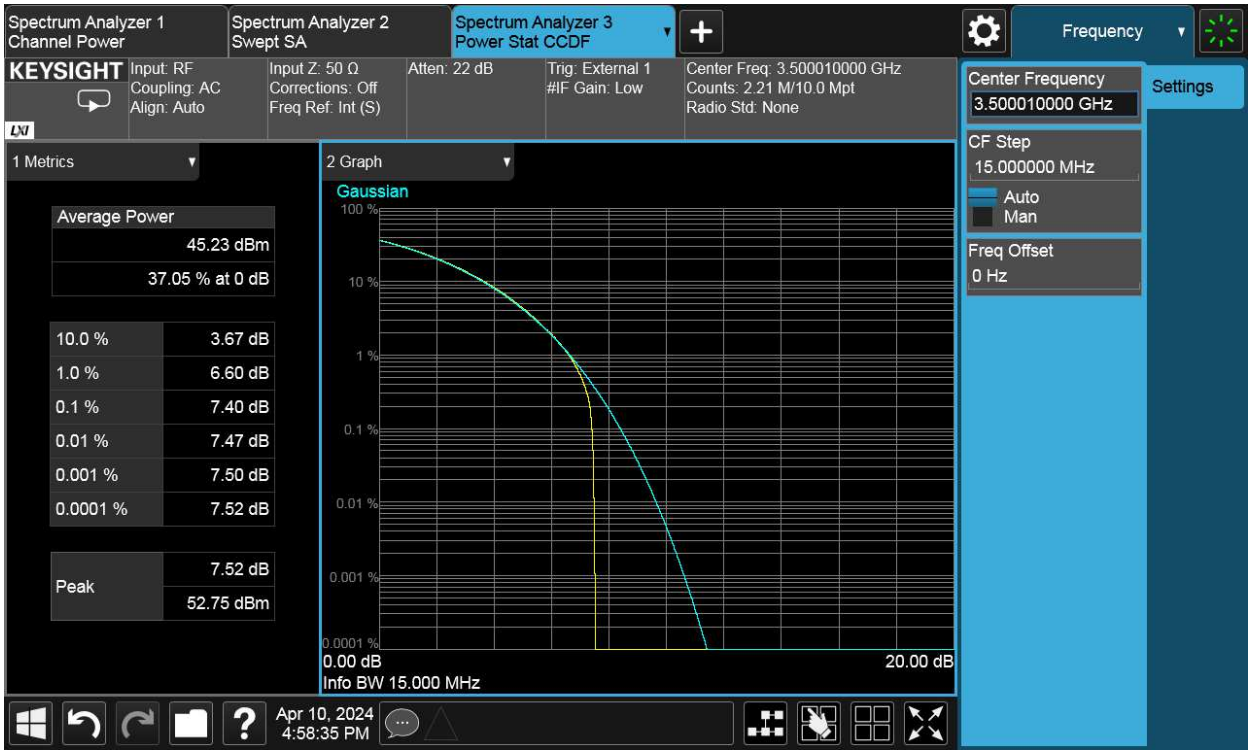


NRG-1C, 15MHz, Channel M, Power

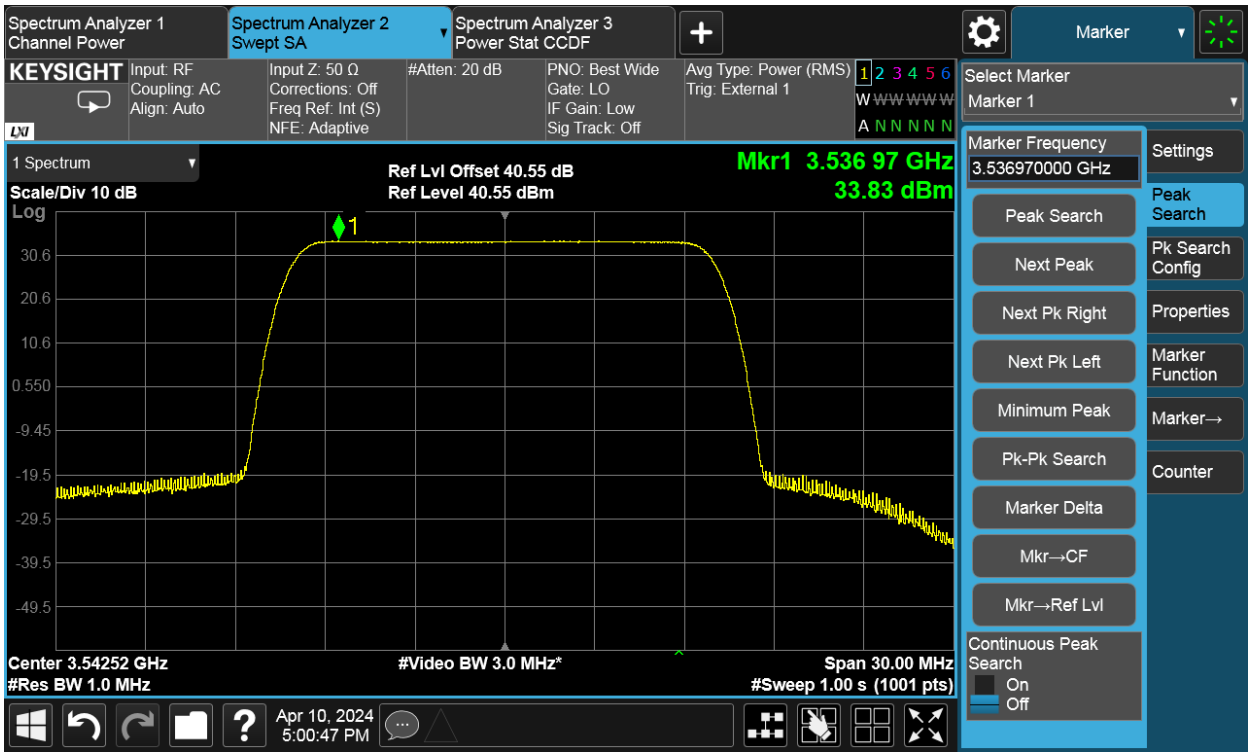


TEST REPORT

NRG-1C, 15MHz, Channel M, PAR

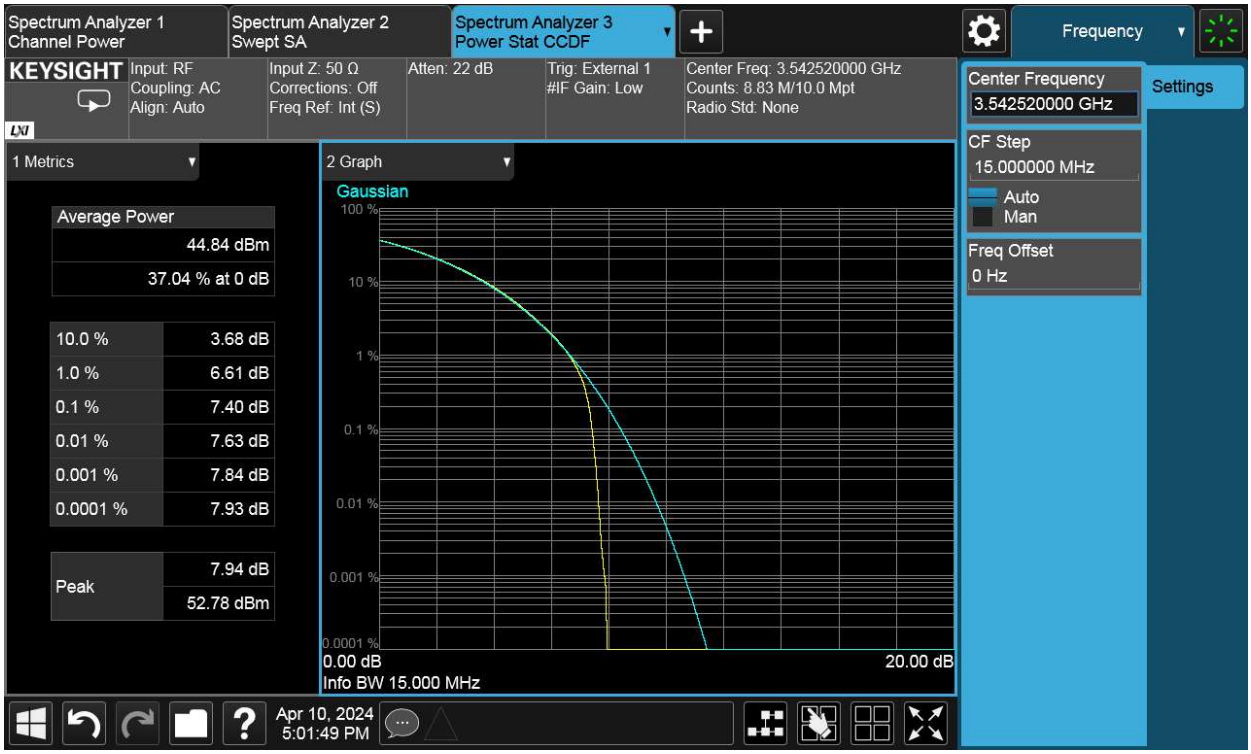


NRG-1C, 15MHz, Channel T, Power

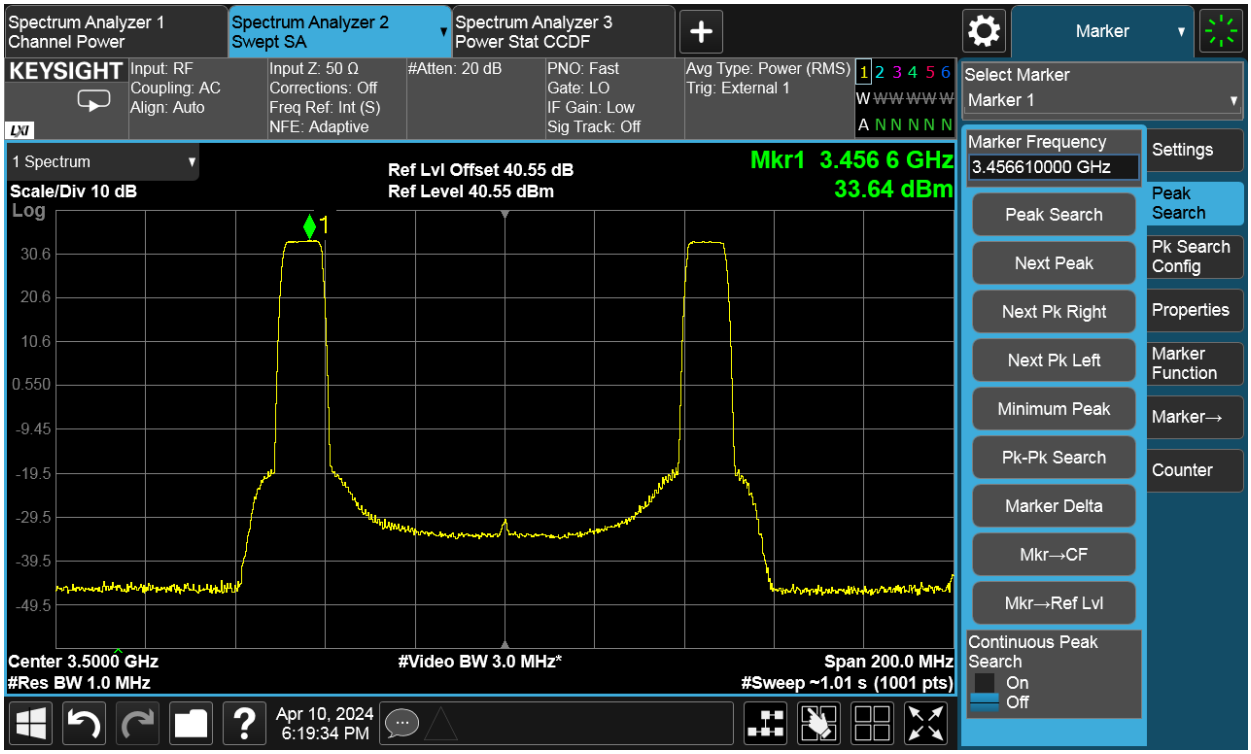


TEST REPORT

NRG-1C, 15MHz, Channel T, PAR

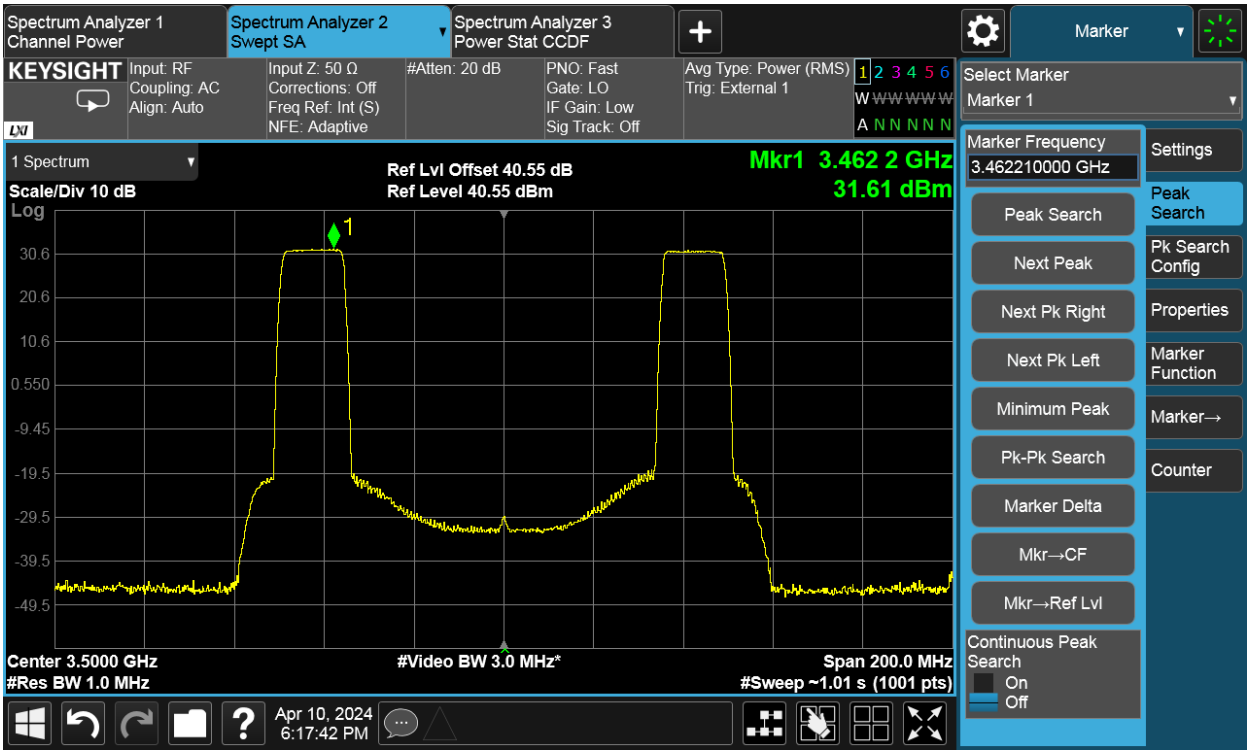


NRG-2C, 10MHz, Channel M, Power

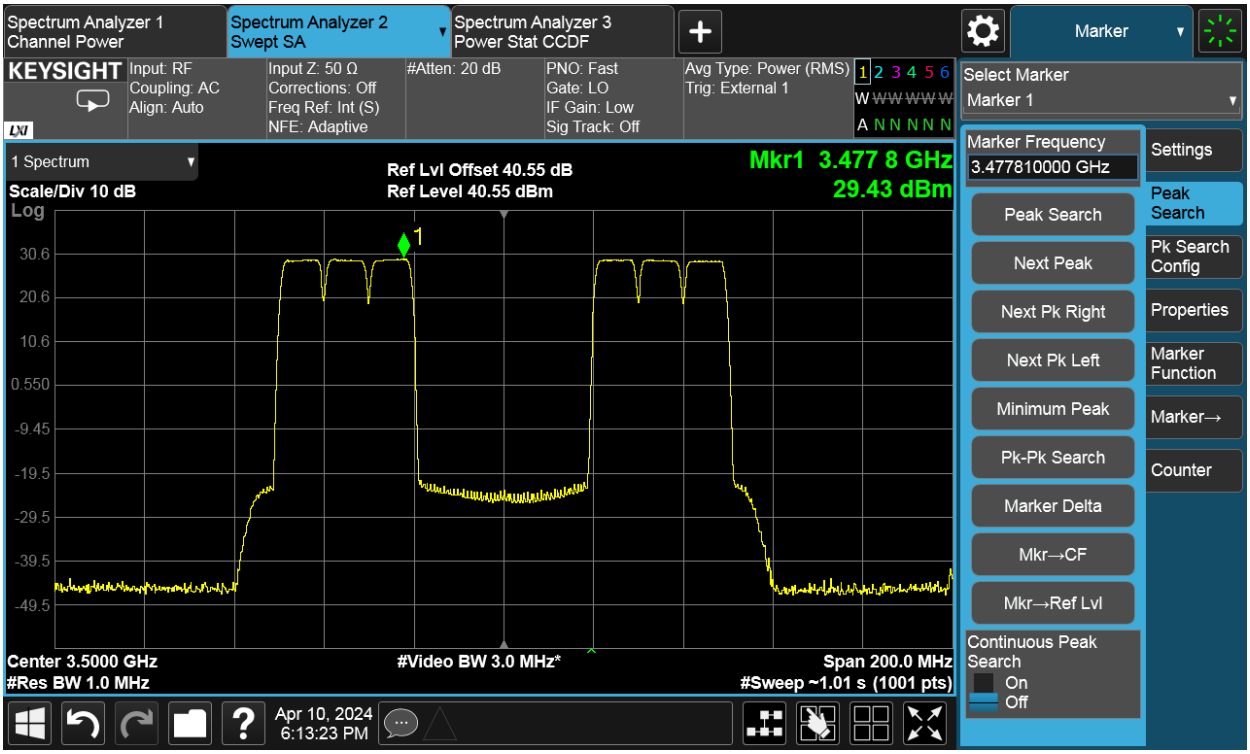


TEST REPORT

NRG-2C, 15MHz, Channel M, Power

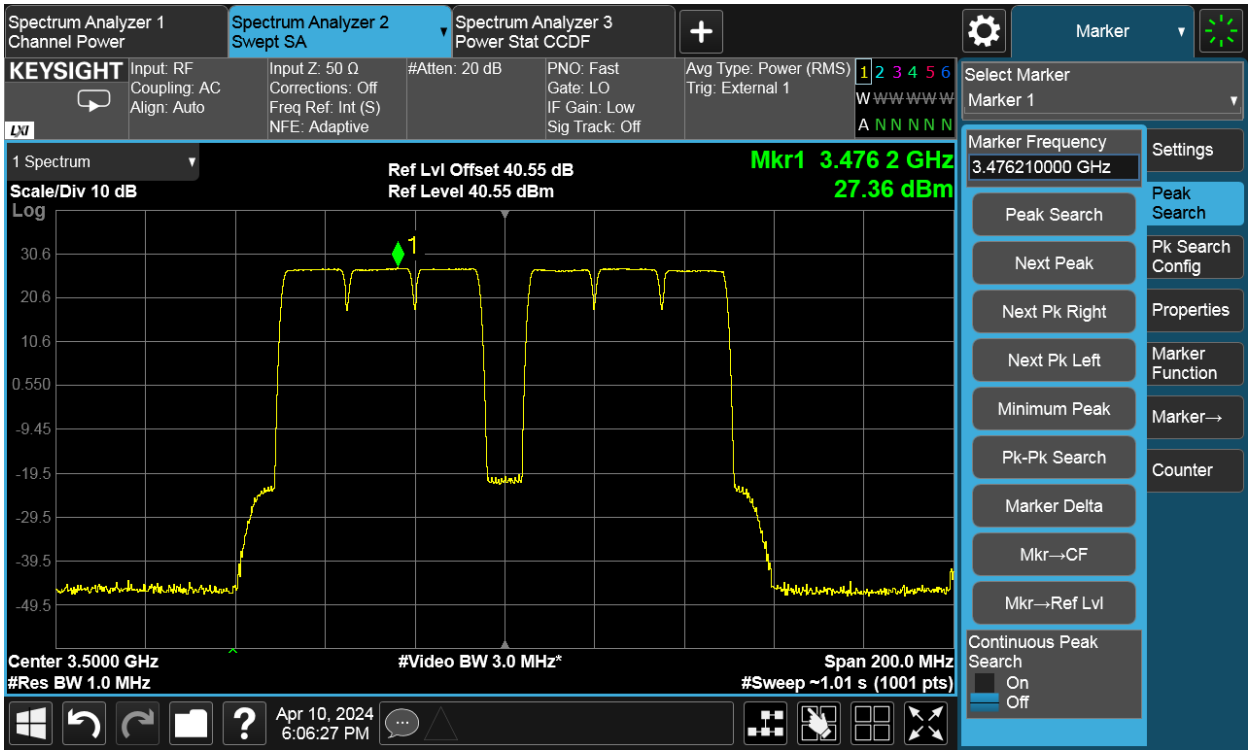


NRG-6C, 10MHz, Channel M, Power



TEST REPORT

NRG-6C, 15MHz, Channel M, Power



B77D:

NRD-1C

Antenna Port	Modulation	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	64QAM	10	44.22	35.33	7.46	45.03	35.98	7.46	44.97	36.10	7.43
B	64QAM	10	44.26	35.42	7.45	45.14	36.12	7.46	44.96	36.07	7.42
C	64QAM	10	44.25	35.38	7.45	45.20	36.09	7.46	45.06	36.14	7.43
D	64QAM	10	44.22	35.24	7.46	44.97	35.84	7.46	44.74	35.83	7.43
Total A-D Power			50.26	41.36	-	51.11	42.03	-	50.95	42.06	-
Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	20.79	-	-	20.12	-	-	20.09	-

Antenna Port	Modulation	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	64QAM	15	44.40	33.58	7.47	45.12	34.14	7.46	45.02	34.12	7.47
B	64QAM	15	44.33	33.48	7.43	45.12	34.03	7.45	44.94	34.09	7.46
C	64QAM	15	44.31	33.38	7.47	45.07	34.05	7.46	44.82	33.86	7.47
D	64QAM	15	44.24	33.23	7.48	44.96	33.94	7.46	44.78	33.88	7.47
Total A-D Power			50.34	39.44	-	51.09	40.06	-	50.91	40.01	-
Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	22.71	-	-	22.09	-	-	22.14	-

NRD-2C

Antenna Port	Modulation	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	64QAM	10	-	-	-	45.47	33.44	-	-	-	-
B	64QAM	10	-	-	-	45.66	33.76	-	-	-	-
C	64QAM	10	-	-	-	45.55	33.73	-	-	-	-
D	64QAM	10	-	-	-	45.55	33.63	-	-	-	-
Total A-D Power			-	-	-	51.58	39.66	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	22.49	-	-	-	-

Antenna Port	Modulation	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	64QAM	15	-	-	-	45.51	31.51	-	-	-	-
B	64QAM	15	-	-	-	45.69	31.77	-	-	-	-
C	64QAM	15	-	-	-	45.57	31.71	-	-	-	-
D	64QAM	15	-	-	-	45.65	31.75	-	-	-	-
Total A-D Power			-	-	-	51.63	37.71	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	24.44	-	-	-	-

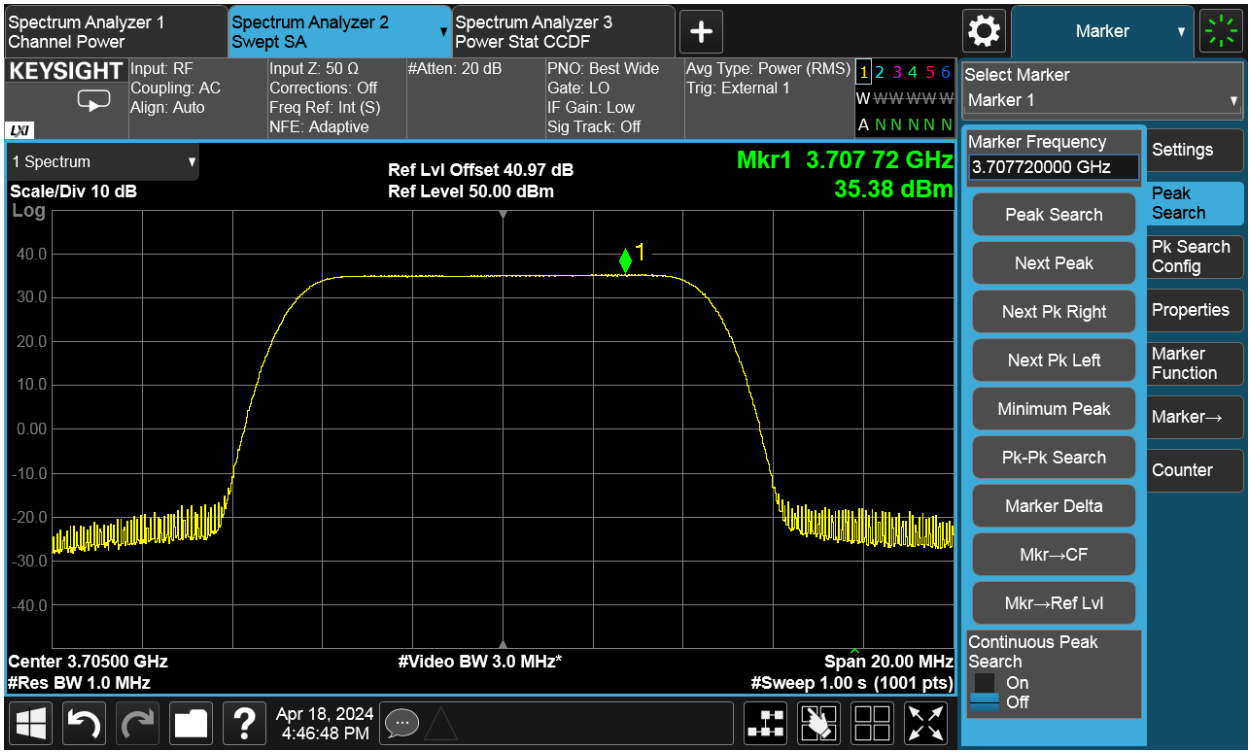
NRD-6C

Antenna Port	Modulation	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	64QAM	10	-	-	-	44.49	27.75	-	-	-	-
B	64QAM	10	-	-	-	44.70	28.06	-	-	-	-
C	64QAM	10	-	-	-	44.57	27.93	-	-	-	-
D	64QAM	10	-	-	-	44.63	27.93	-	-	-	-
Total A-D Power			-	-	-	50.62	33.94	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	28.21	-	-	-	-

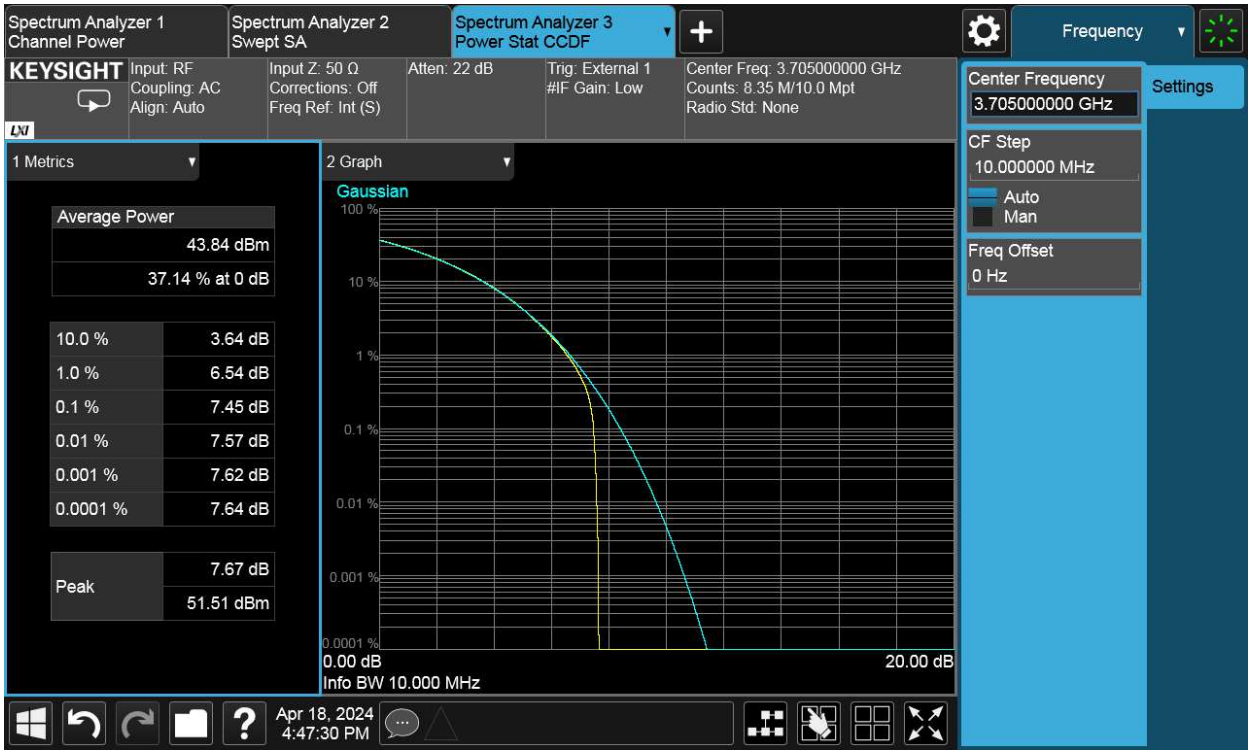
Antenna Port	Modulation	Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	64QAM	15	-	-	-	44.45	26.03	-	-	-	-
B	64QAM	15	-	-	-	44.59	25.94	-	-	-	-
C	64QAM	15	-	-	-	44.51	25.93	-	-	-	-
D	64QAM	15	-	-	-	44.55	25.84	-	-	-	-
Total A-D Power			-	-	-	50.55	31.96	-	-	-	-
Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	30.19	-	-	-	-

TEST REPORT

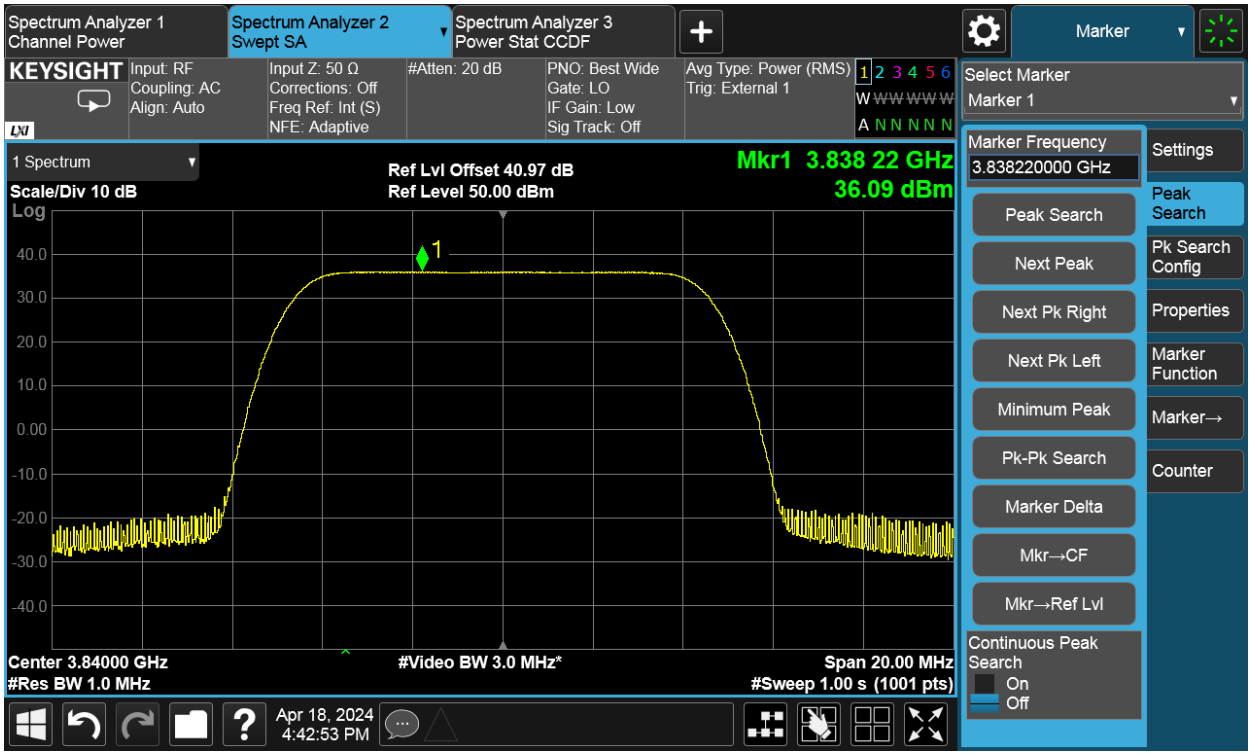
NRD-1C, 10MHz, Channel B, Power



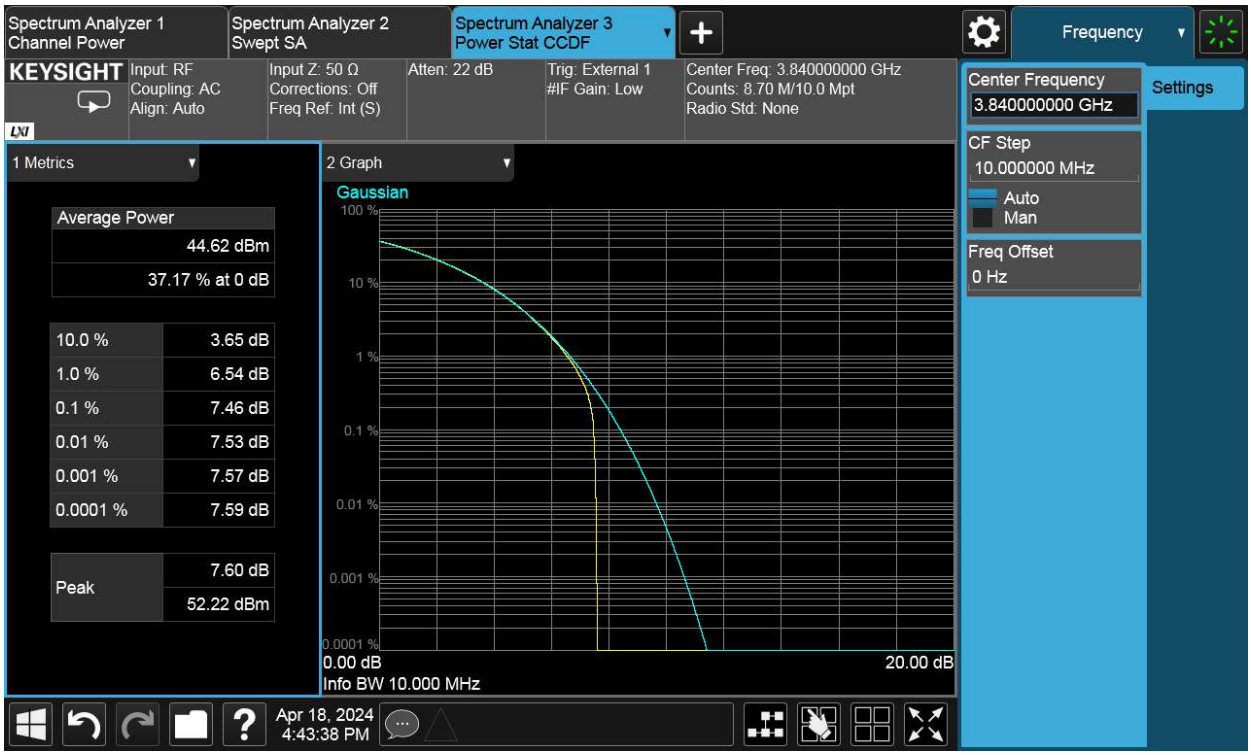
NRD-1C, 10MHz, Channel B, PAR



NRD-1C, 10MHz, Channel M, Power

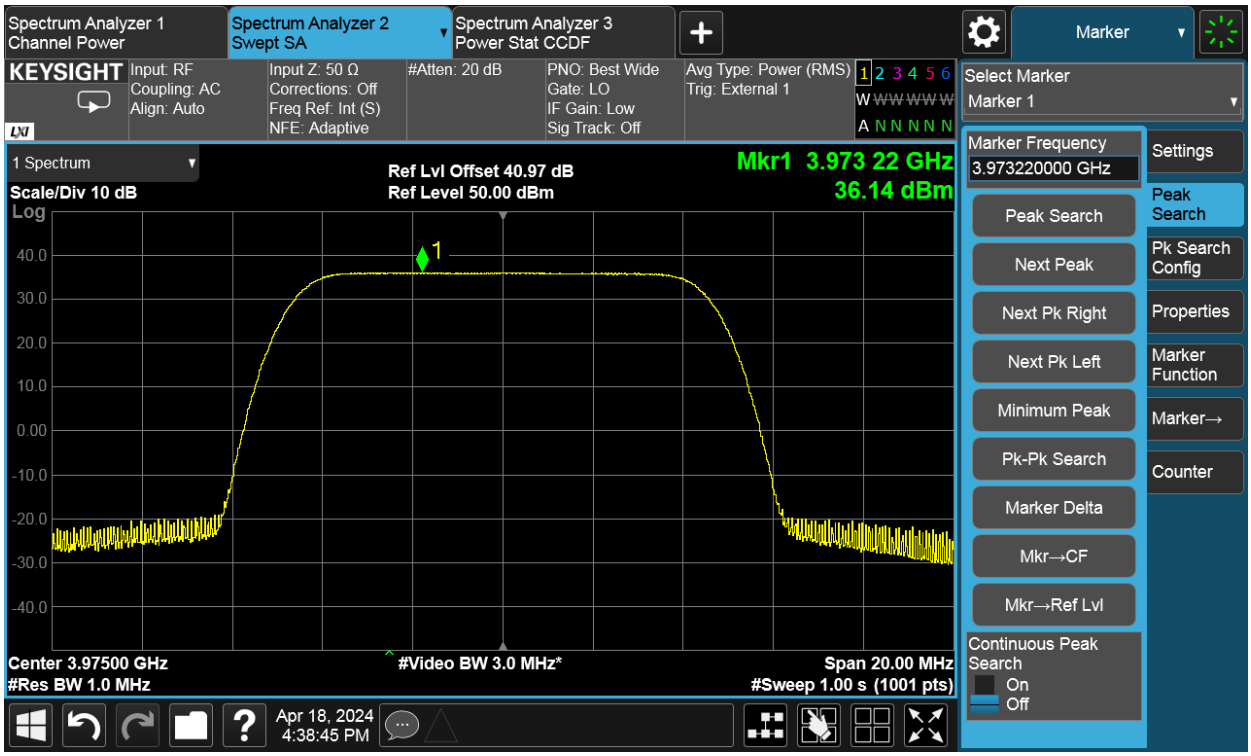


NRD-1C, 10MHz, Channel M, PAR

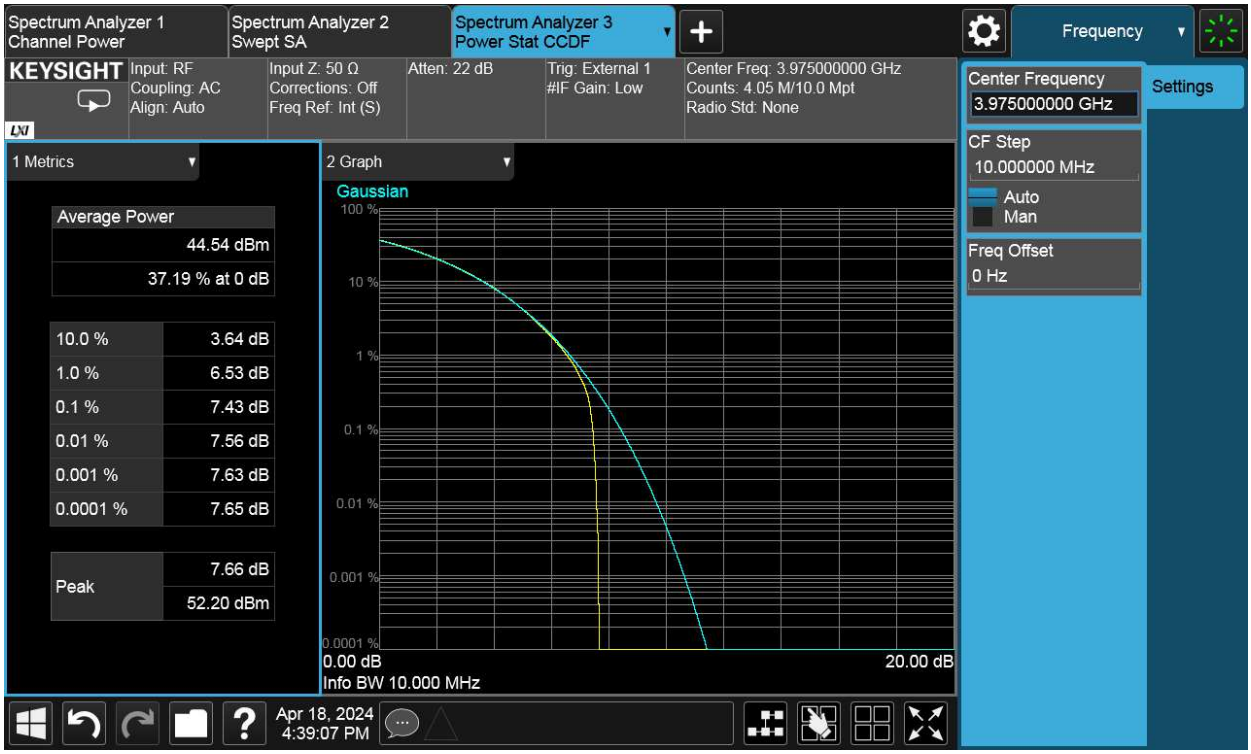


TEST REPORT

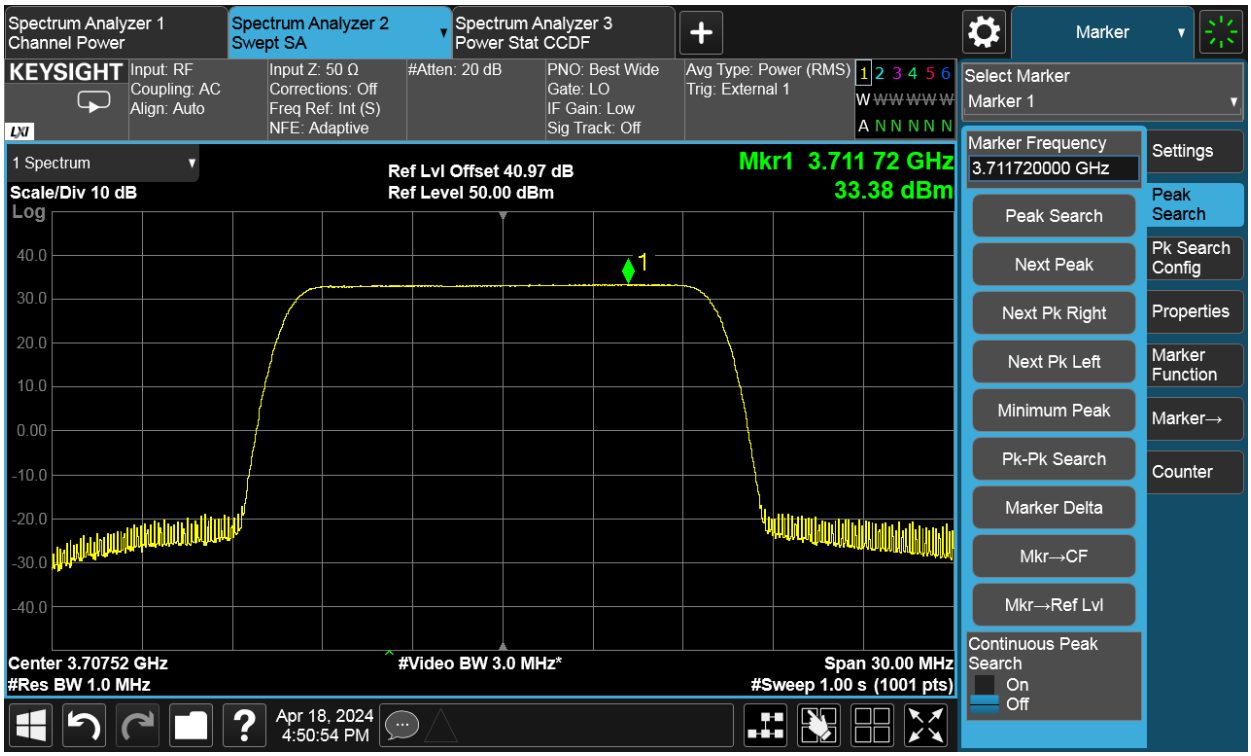
NRD-1C, 10MHz, Channel T, Power



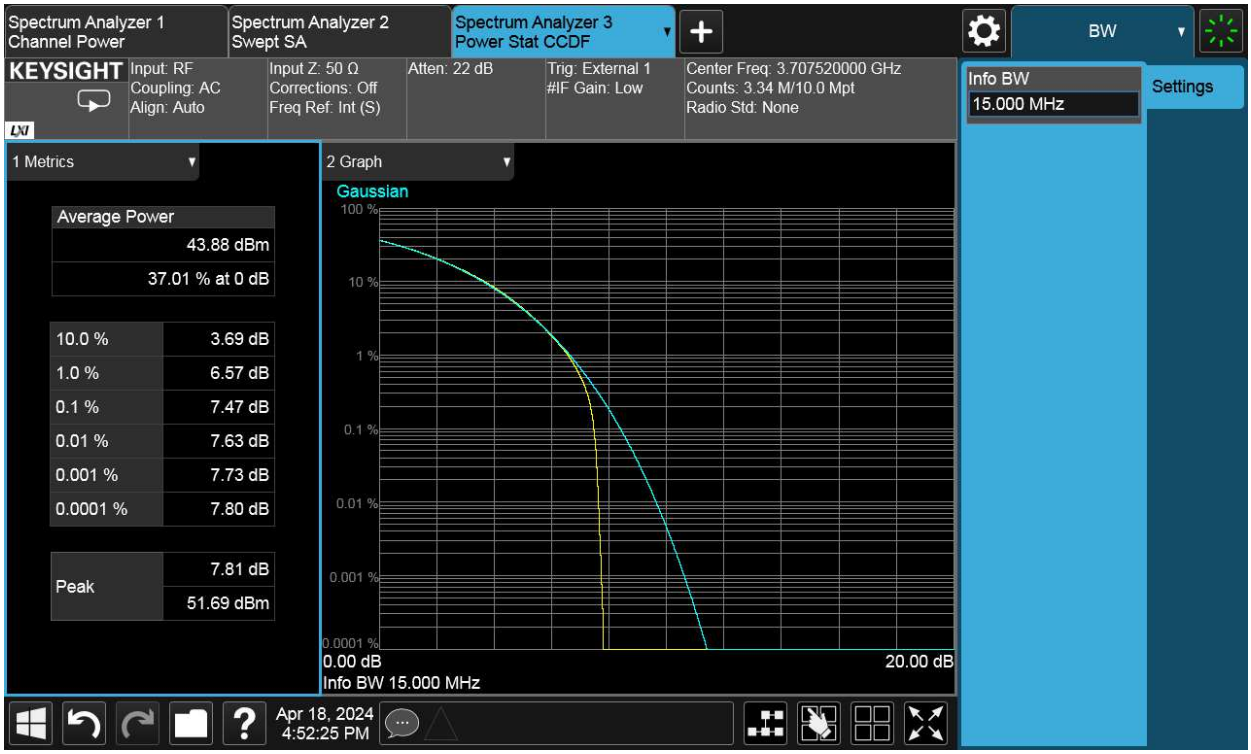
NRD-1C, 10MHz, Channel T, PAR



NRD-1C, 15MHz, Channel B, Power

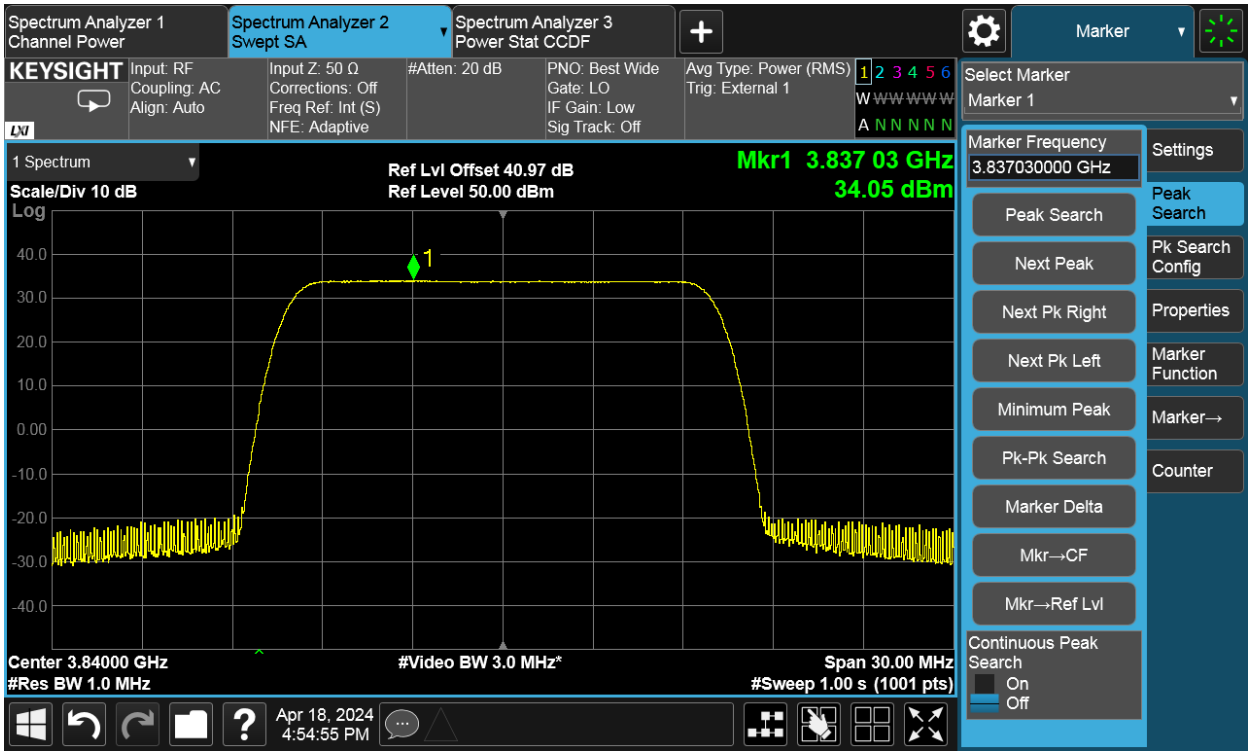


NRD-1C, 15MHz, Channel B, PAR

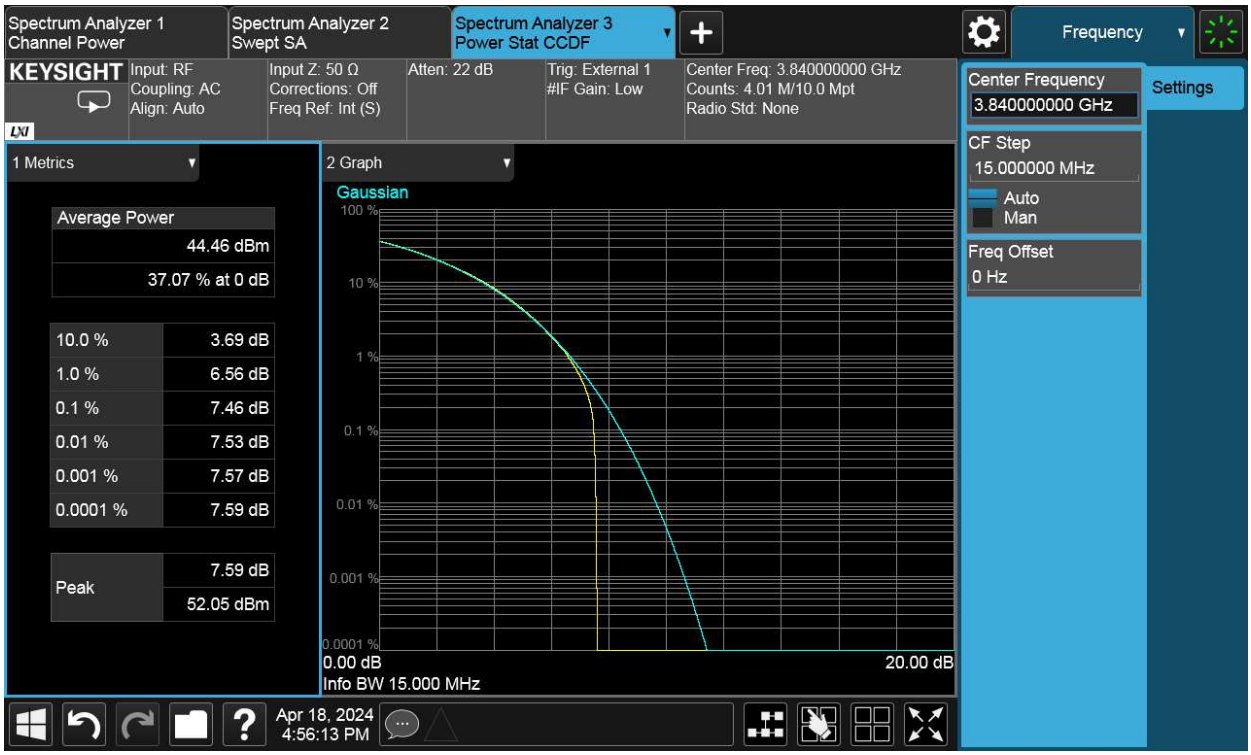


TEST REPORT

NRD-1C, 15MHz, Channel M, Power

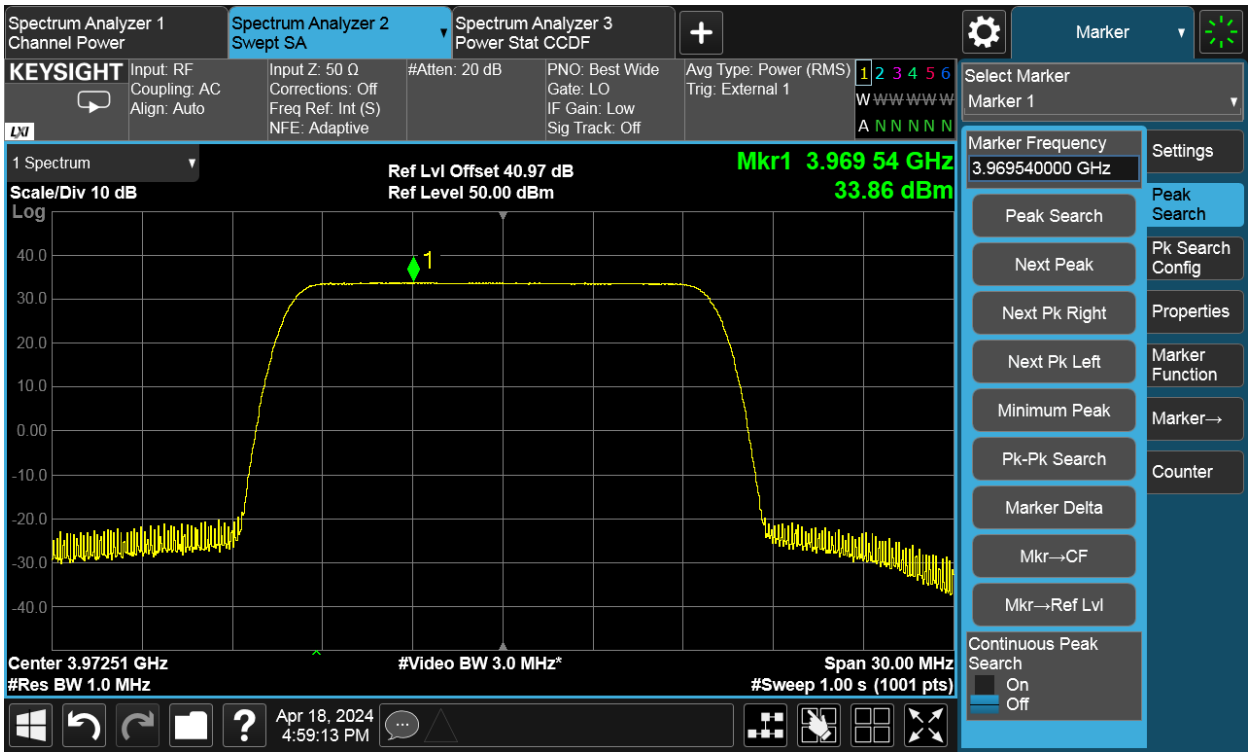


NRD-1C, 15MHz, Channel M, PAR

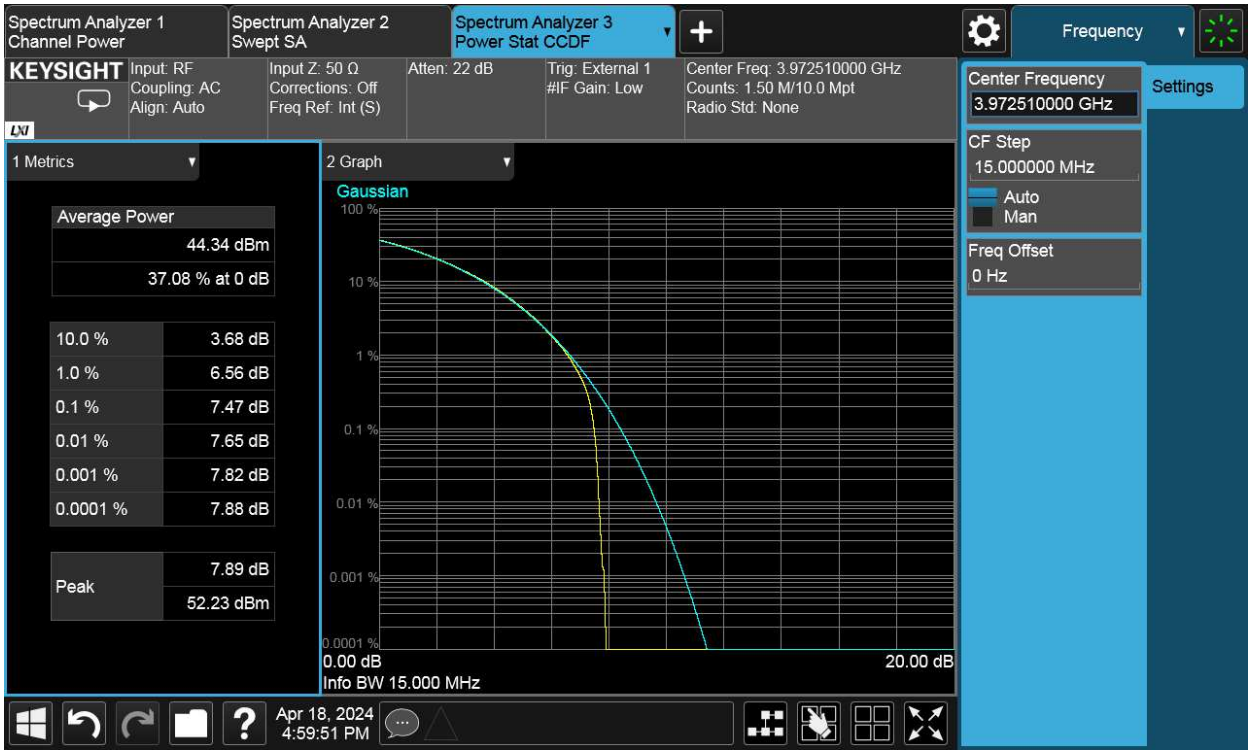


TEST REPORT

NRD-1C, 15MHz, Channel T, Power

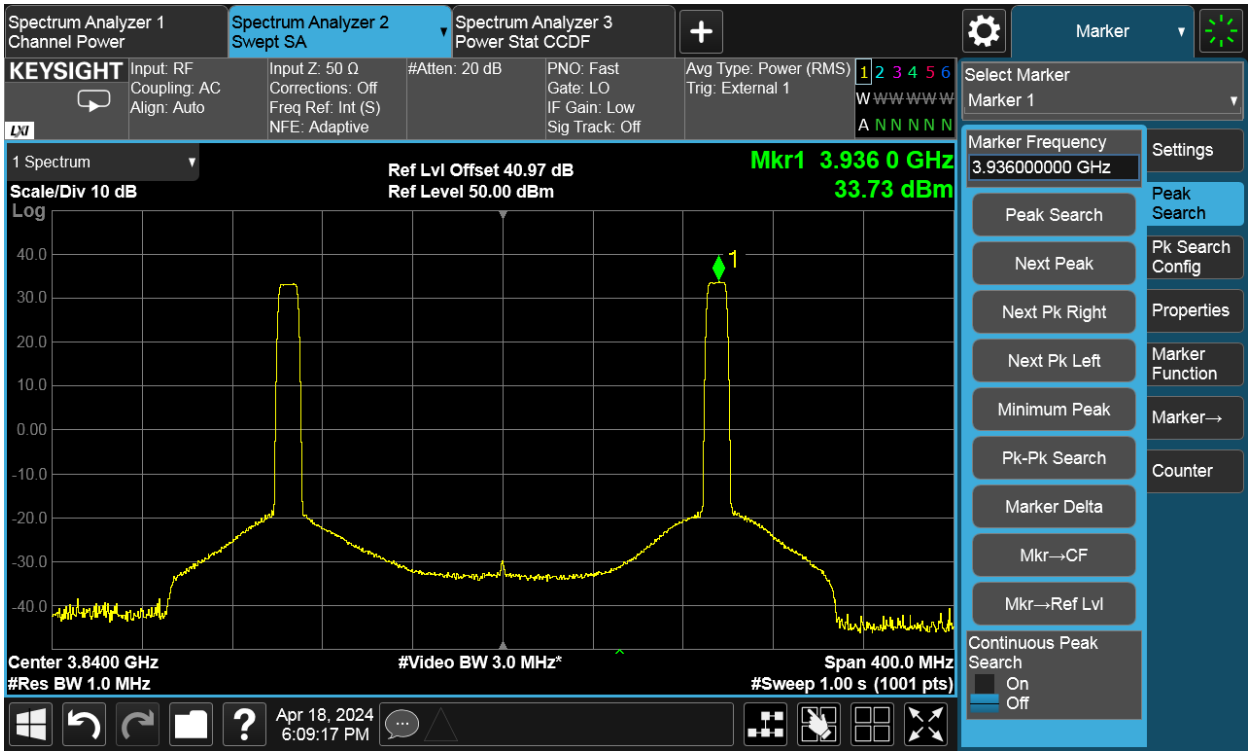


NRD-1C, 15MHz, Channel T, PAR

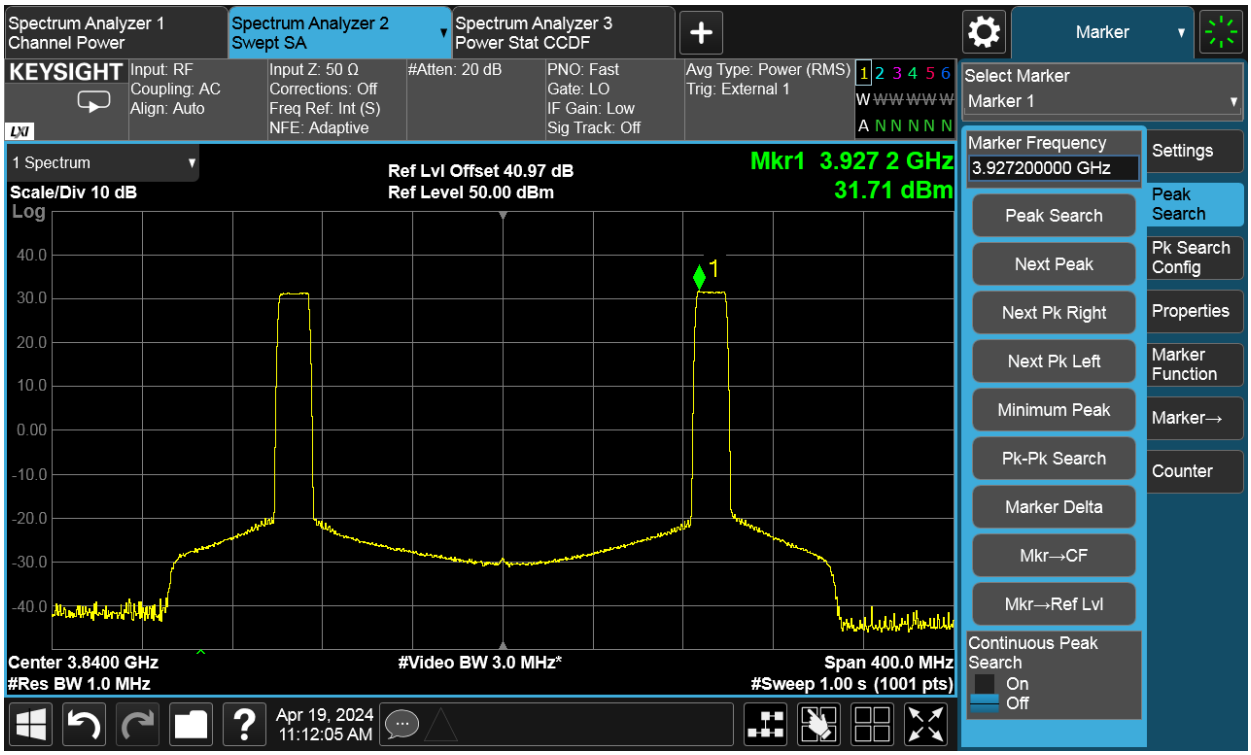


TEST REPORT

NRD-2C, 10MHz, Channel M, Power

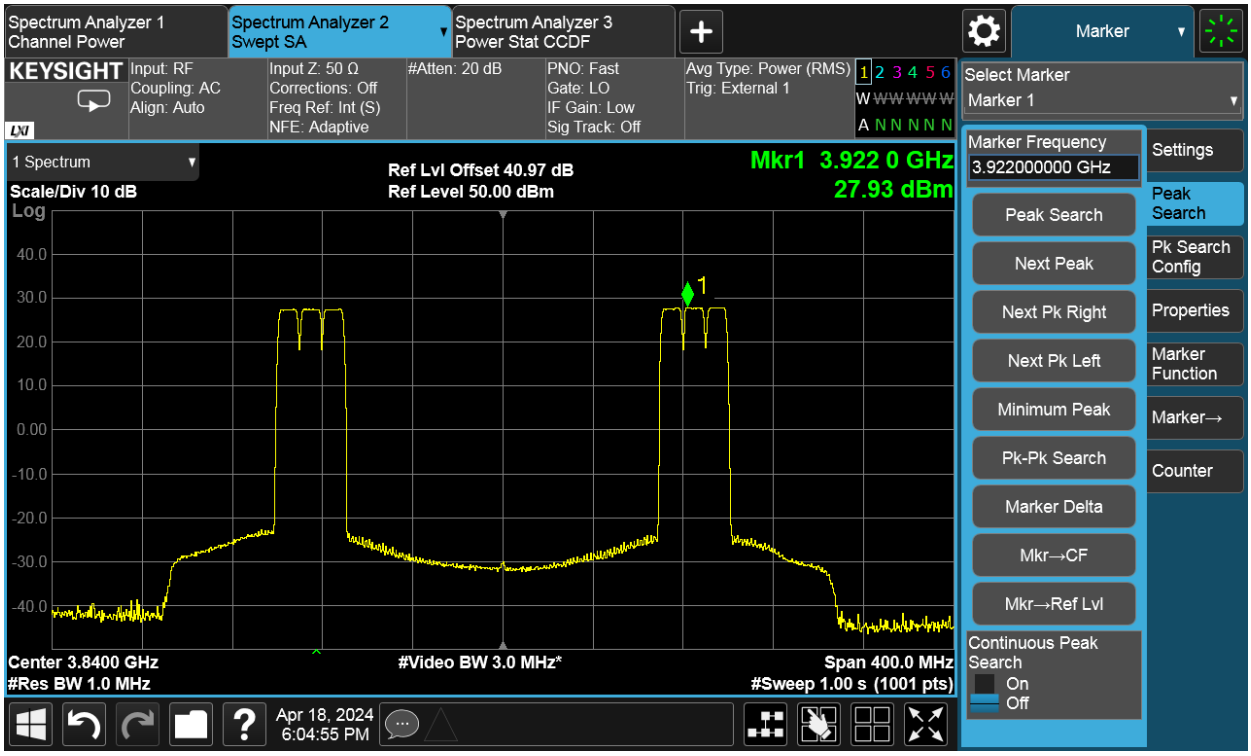


NRD-2C, 15MHz, Channel M, Power

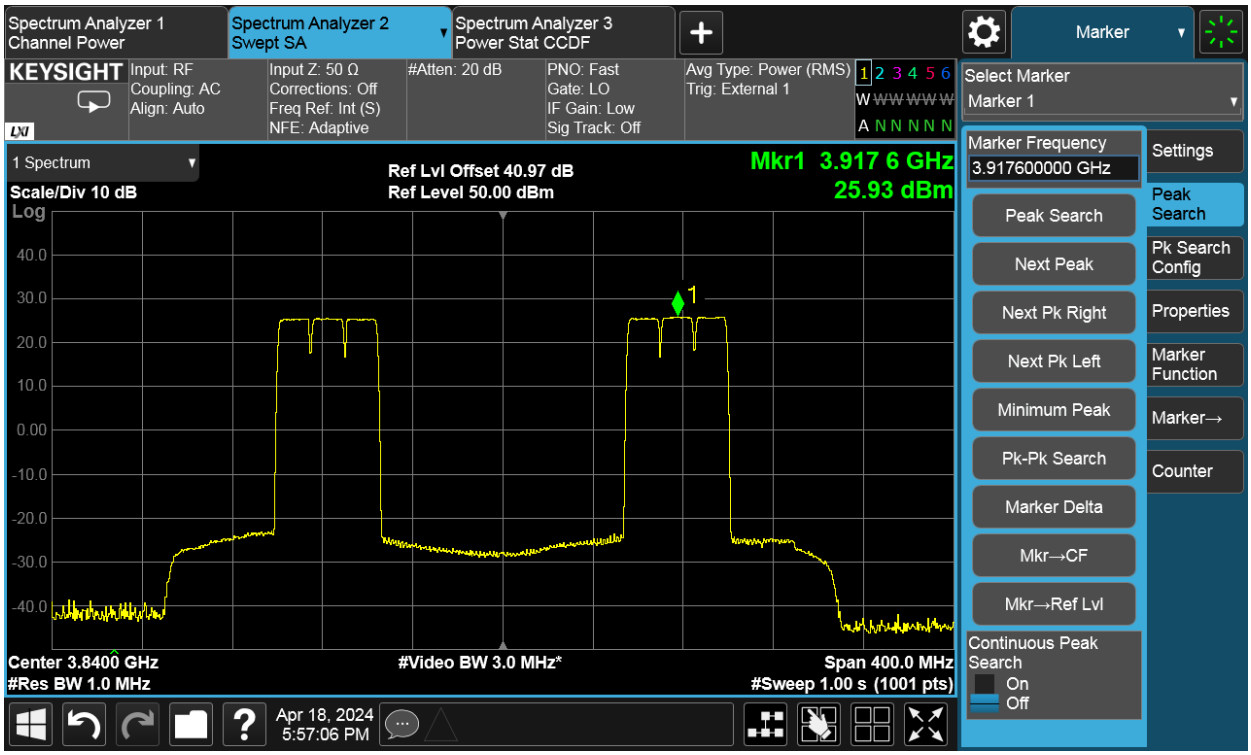


TEST REPORT

NRD-6C, 10MHz, Channel M, Power



NRD-6C, 15MHz, Channel M, Power



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

NRG-1C

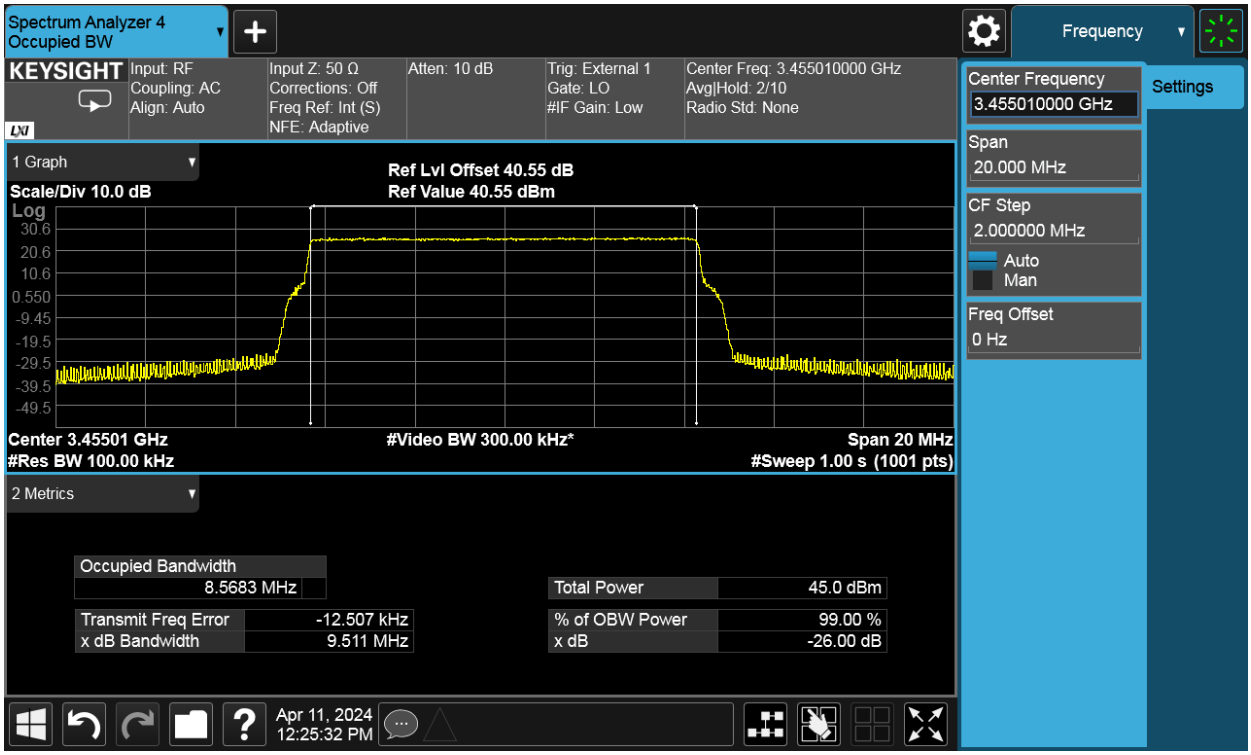
99% Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
C	256QAM	10MHz	8.5683	8.5695	8.5666
C	256QAM	15MHz	13.554	13.558	13.559

-26dBc Occupied Bandwidth

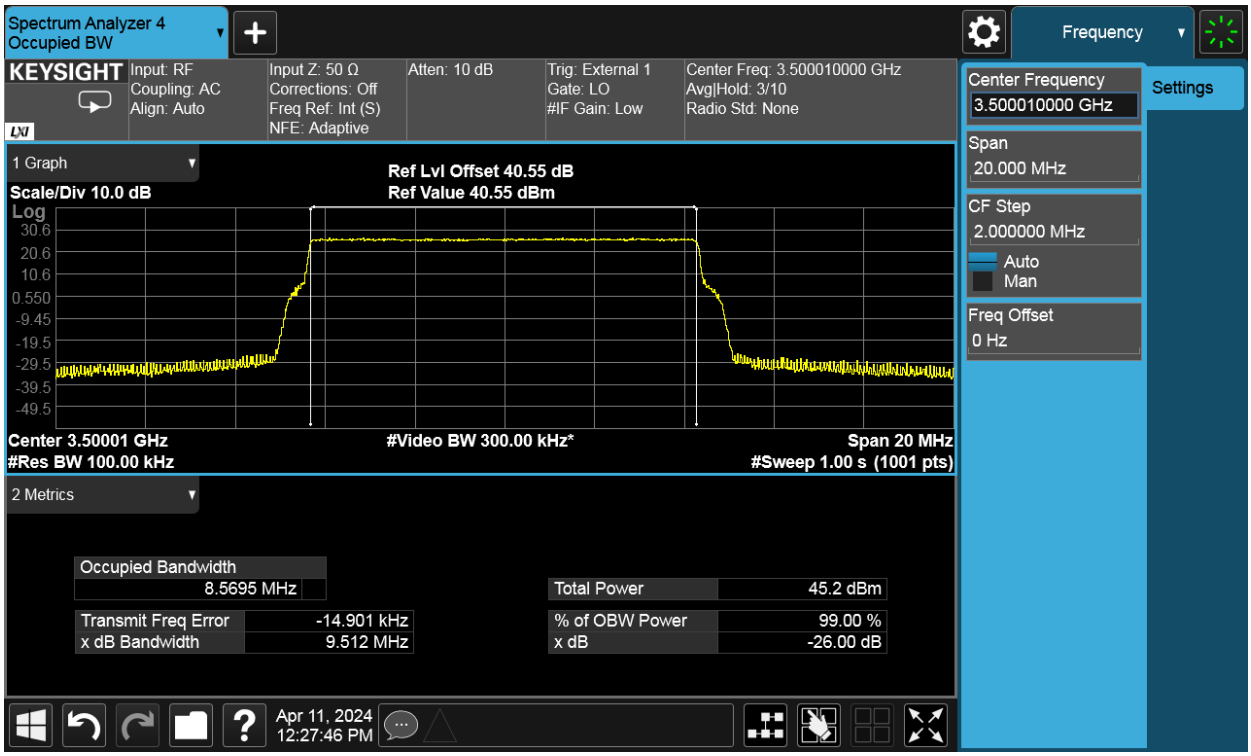
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
C	256QAM	10MHz	9.511	9.512	9.509
C	256QAM	15MHz	14.40	14.41	14.40

NRG-1C, 10MHz, Channel B

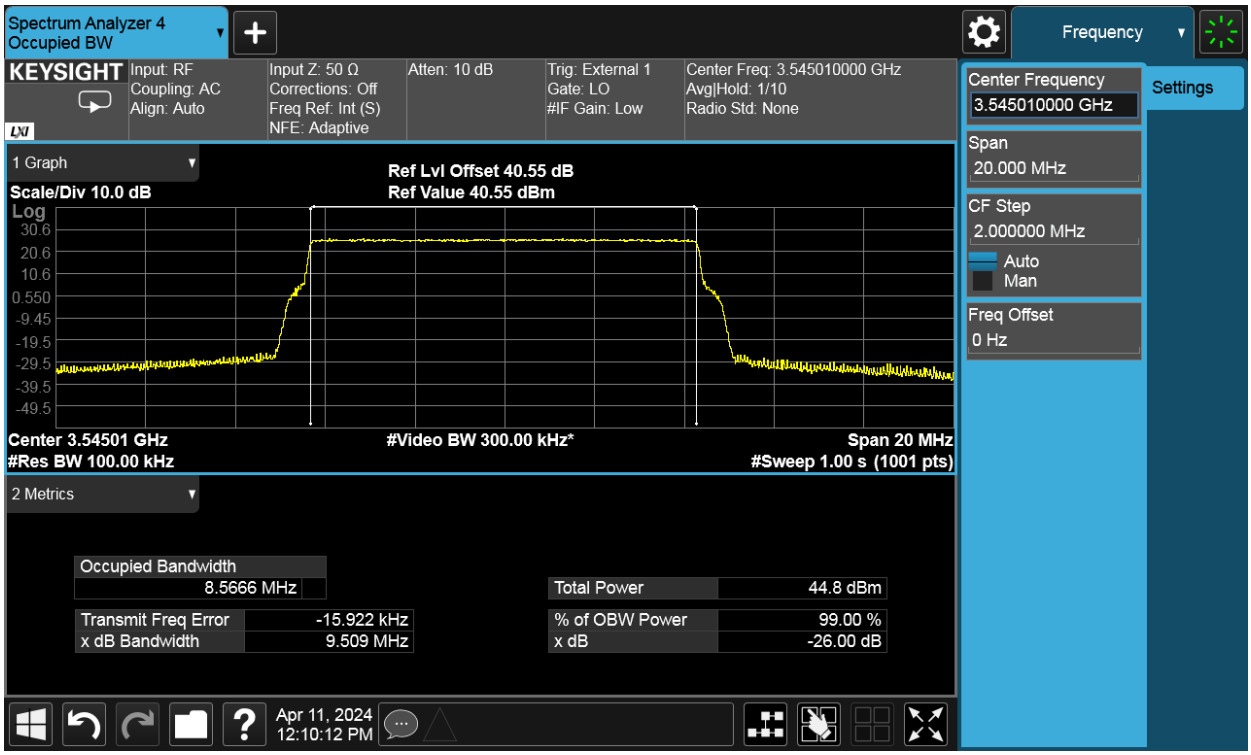


TEST REPORT

NRG-1C, 10MHz, Channel M

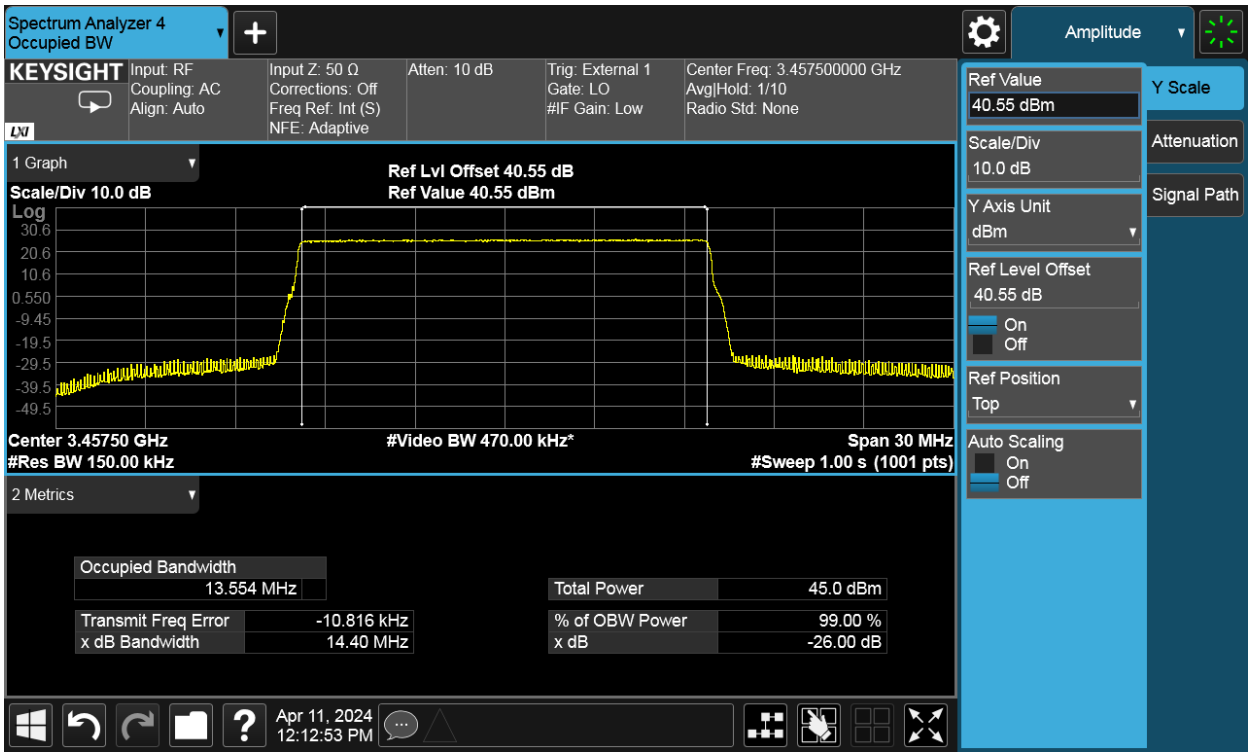


NRG-1C, 10MHz, Channel T

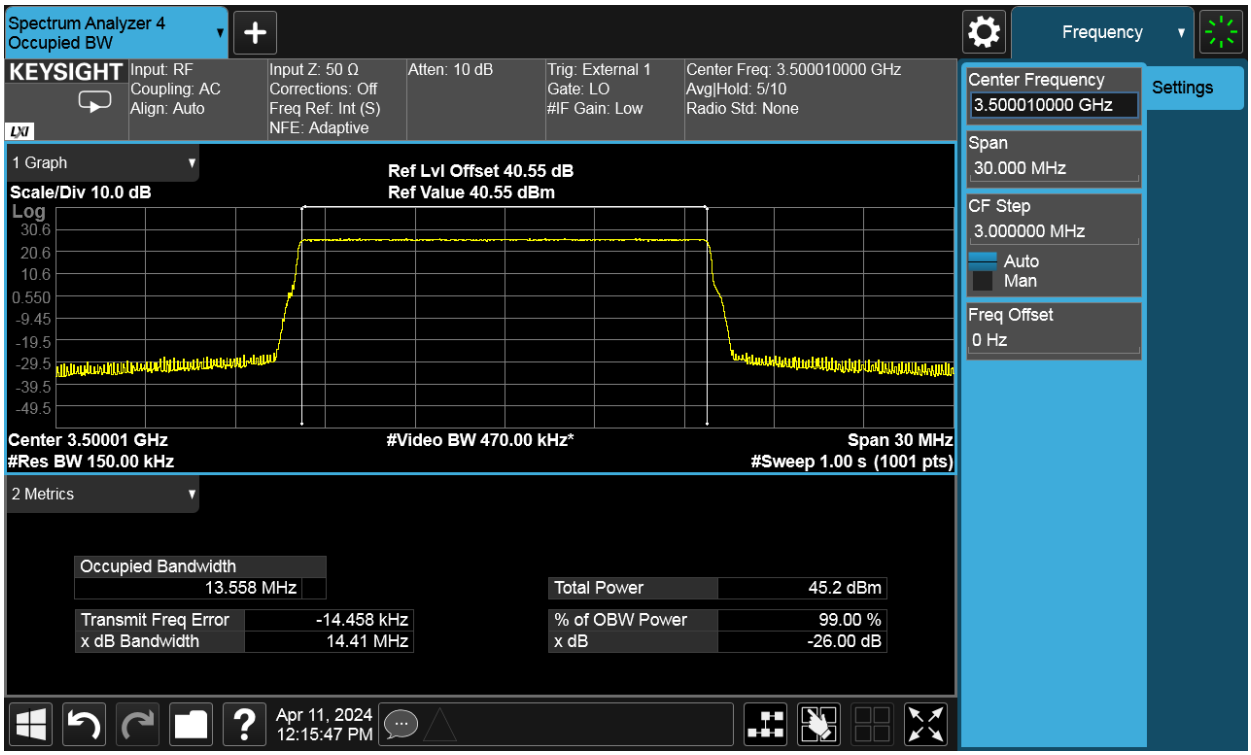


TEST REPORT

NRG-1C, 15MHz, Channel B

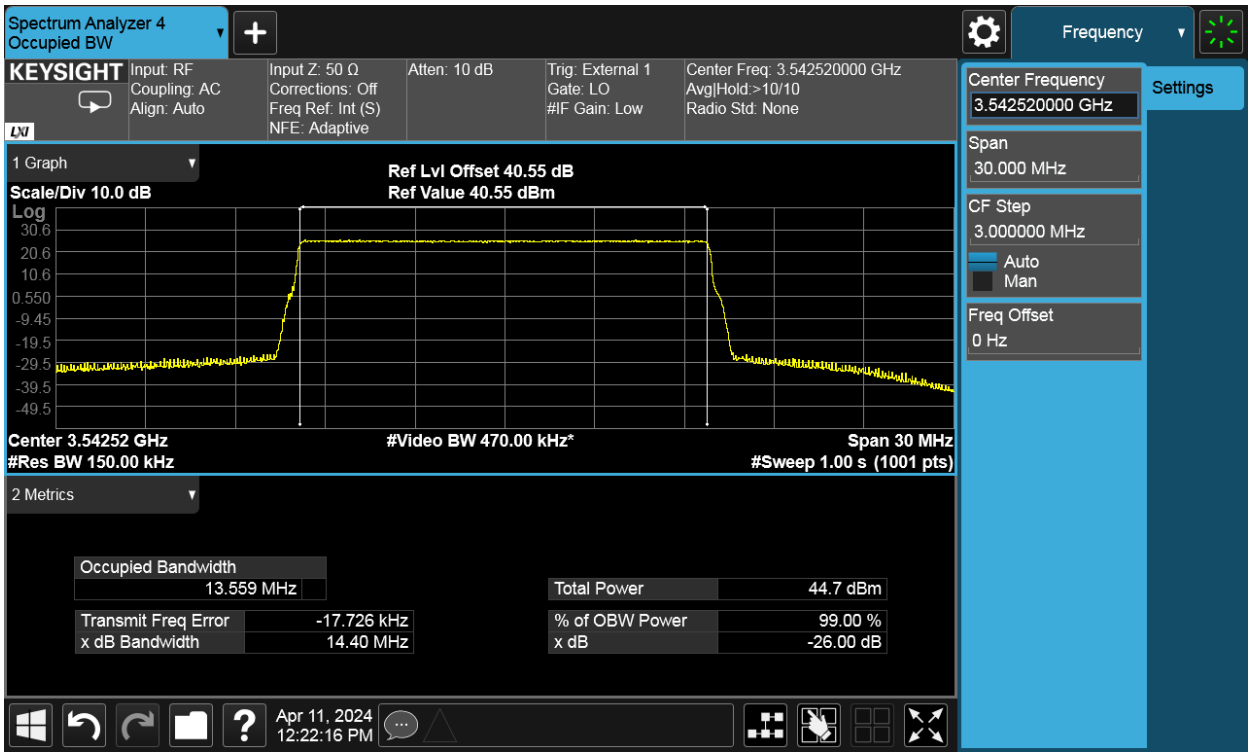


NRG-1C, 15MHz, Channel M



TEST REPORT

NRG-1C, 15MHz, Channel T



NRD-1C

99% Occupied Bandwidth

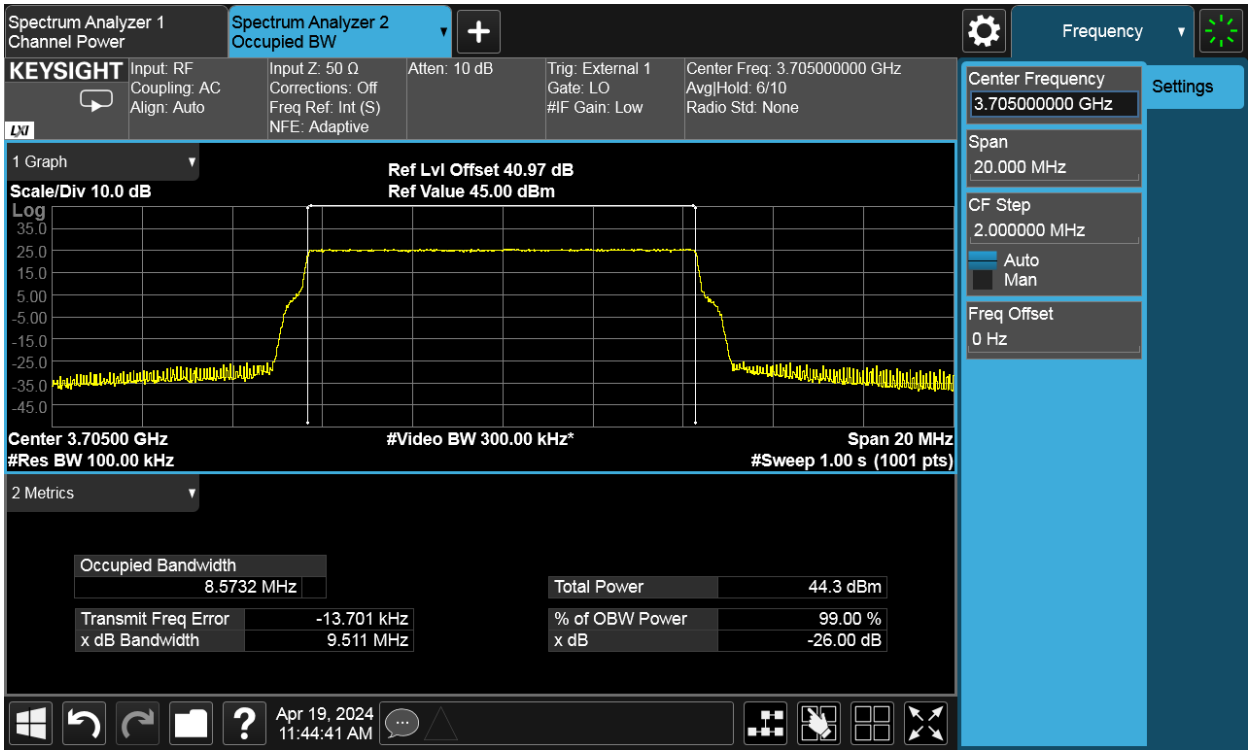
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
C	64QAM	10MHz	8.5732	8.5729	8.5711
C	64QAM	15MHz	13.562	13.563	13.561

-26dBc Occupied Bandwidth

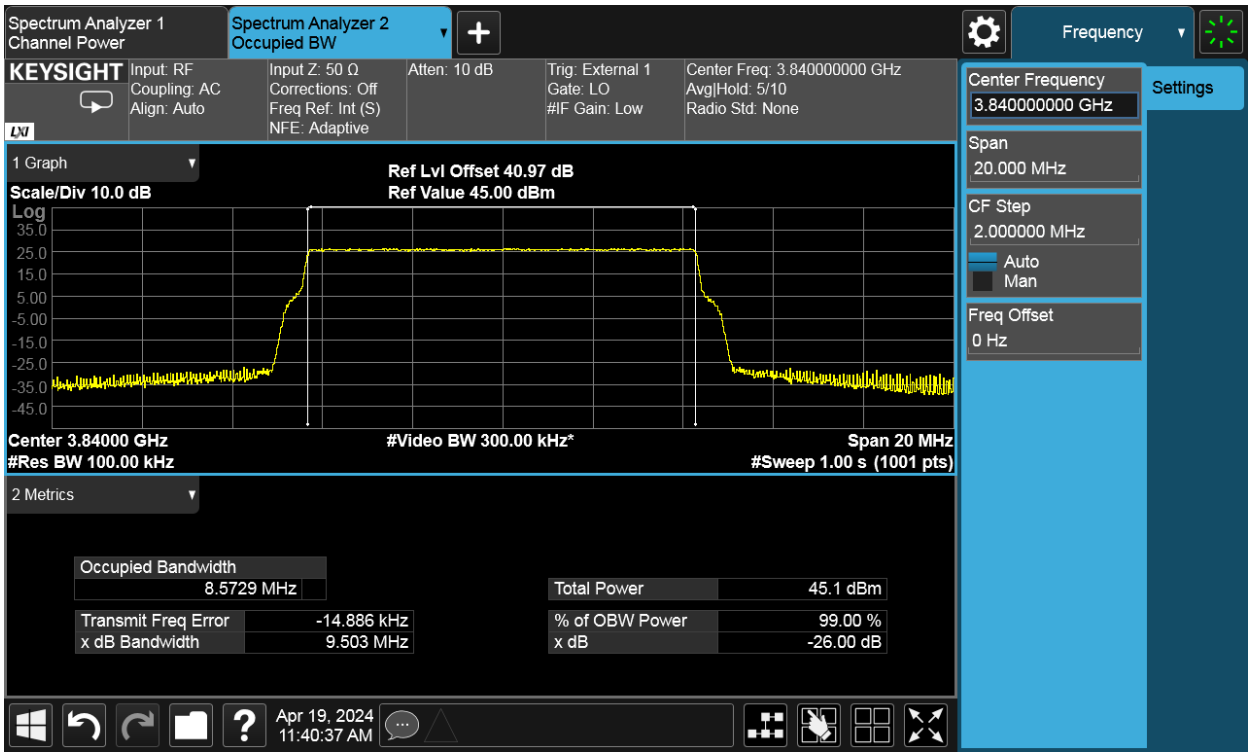
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
C	64QAM	10MHz	9.511	9.503	9.492
C	64QAM	15MHz	14.45	14.45	14.44

TEST REPORT

NRG-1C, 10MHz, Channel B

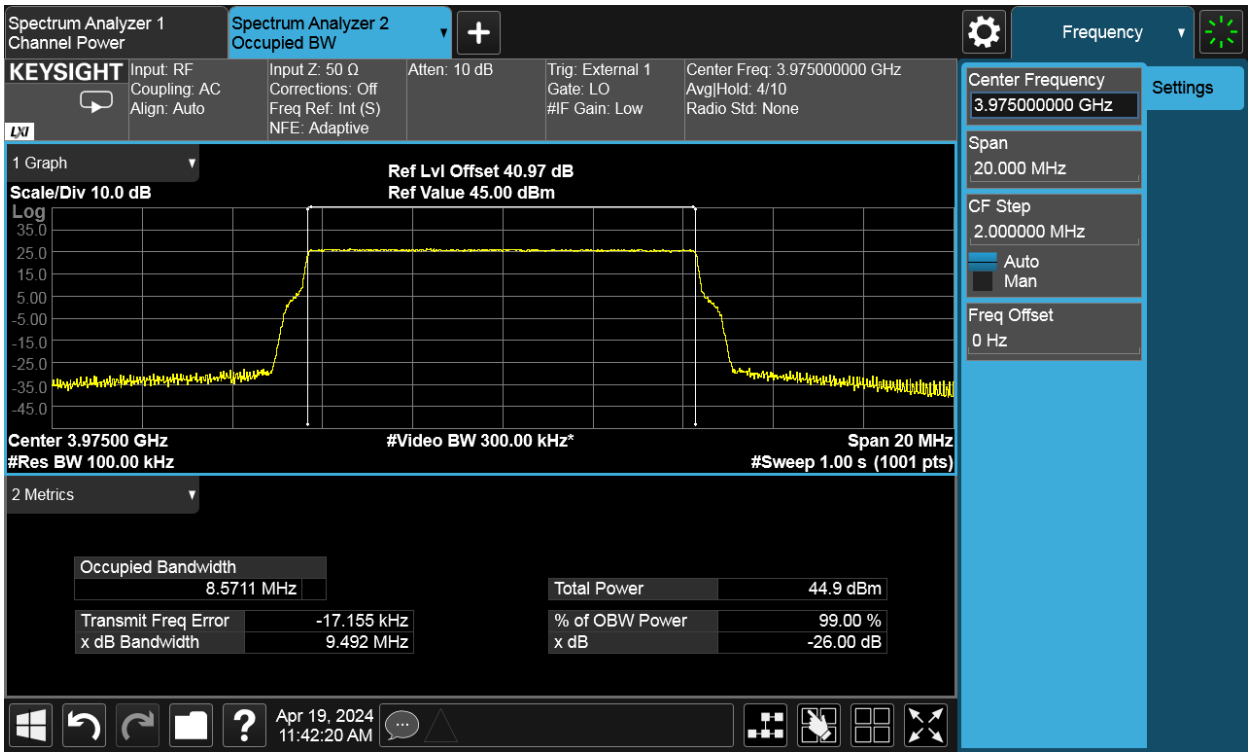


NRG-1C, 10MHz, Channel M

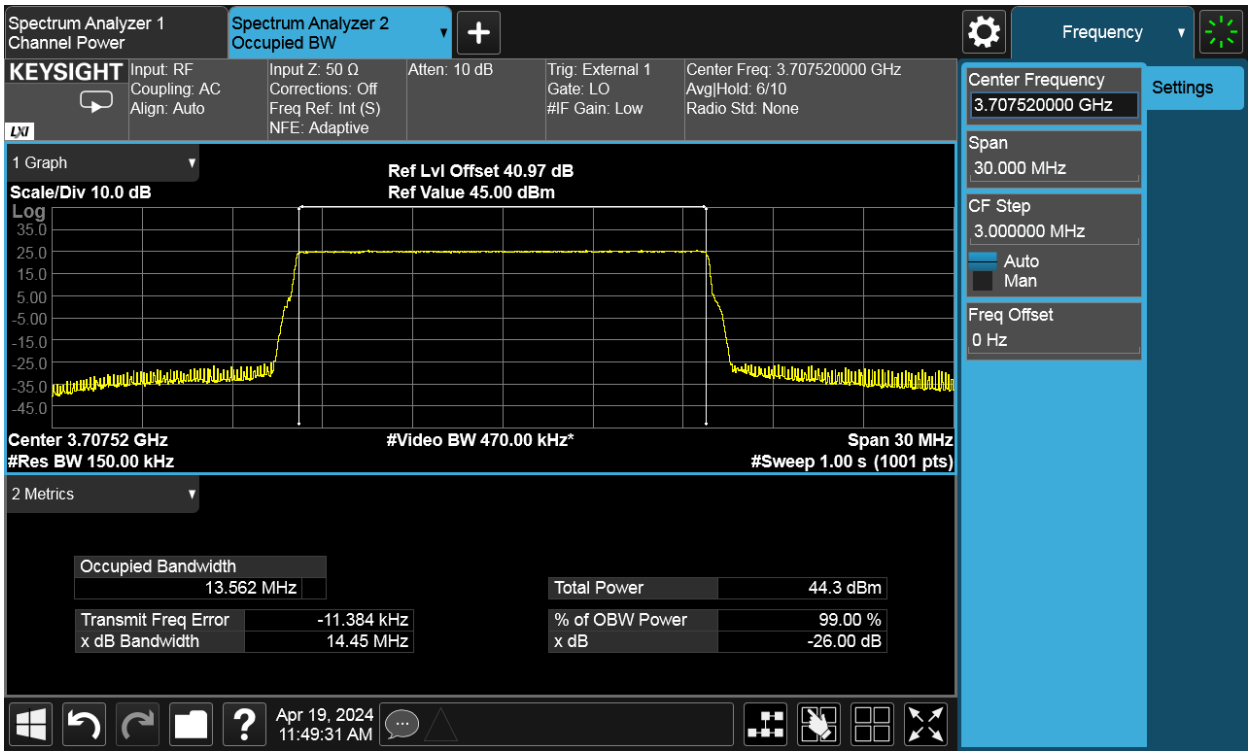


TEST REPORT

NRG-1C, 10MHz, Channel T

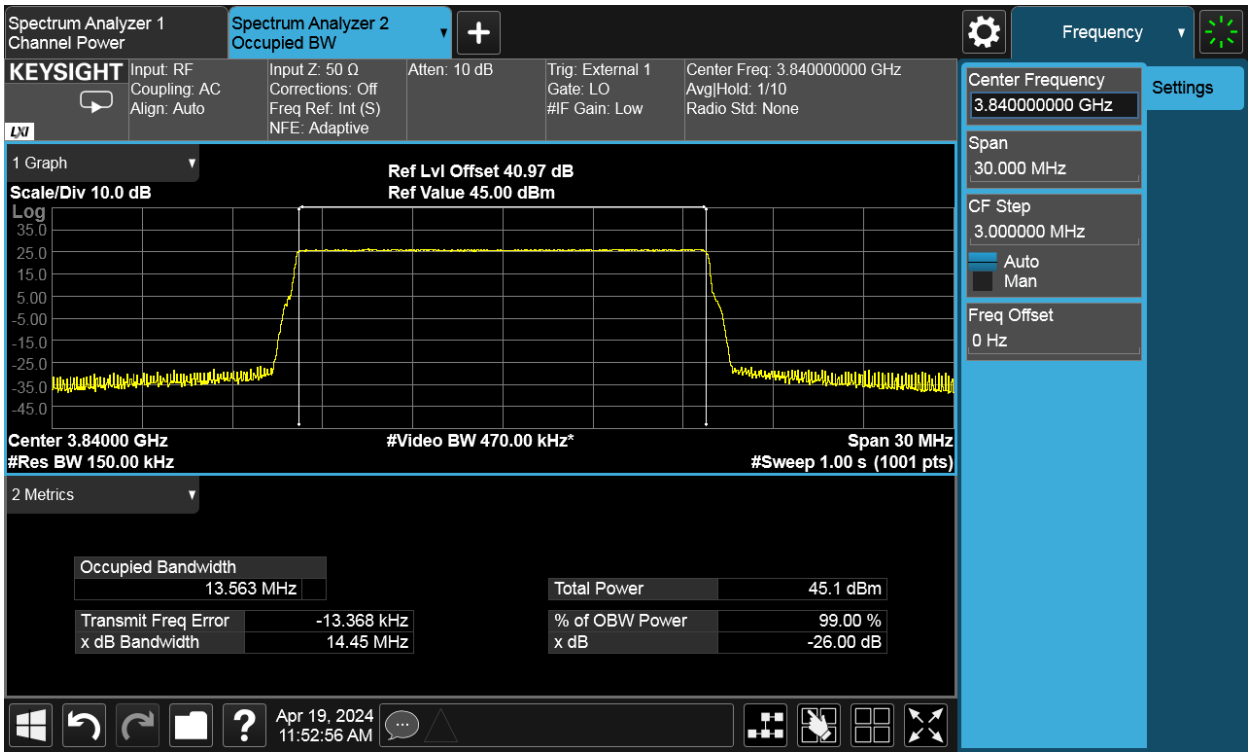


NRG-1C, 15MHz, Channel B

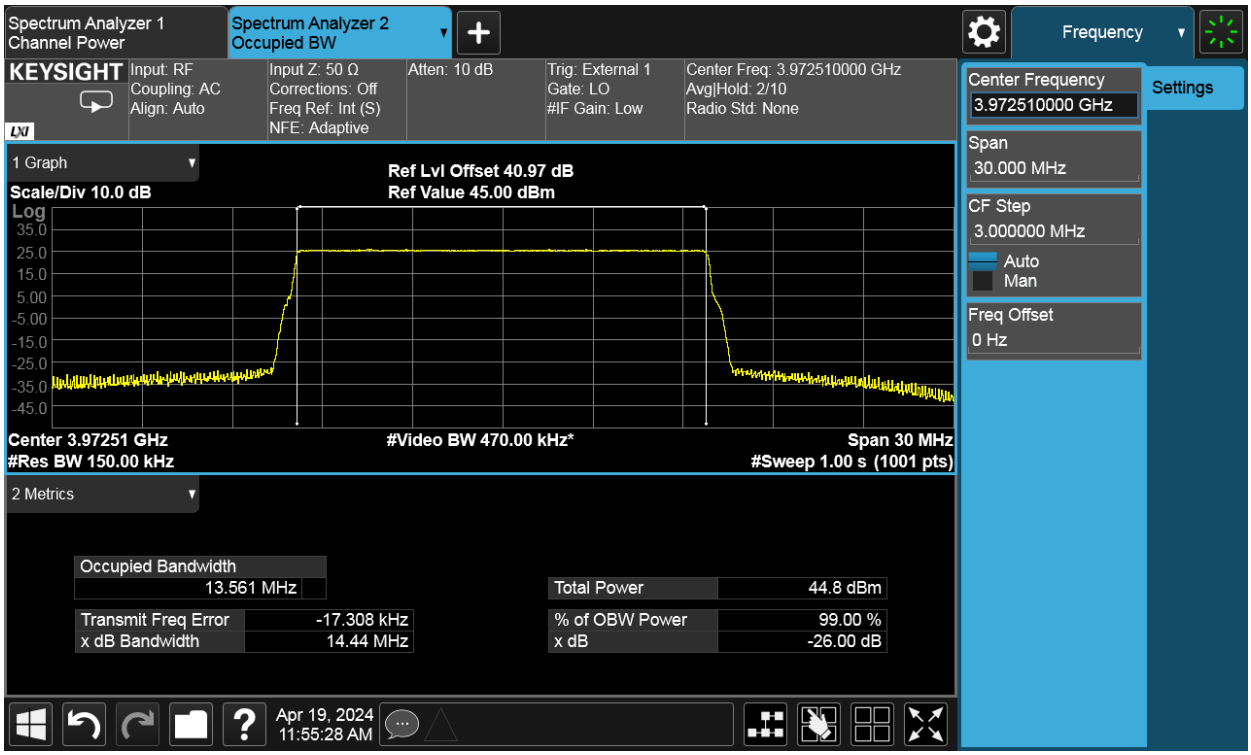


TEST REPORT

NRG-1C, 15MHz, Channel M



NRG-1C, 15MHz, Channel T



5 Unwanted Emissions at Band Edge

Test result: **Pass**

5.1 Limit

27.53 (l):
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.
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.

27.53 (n):
For base station operations in the 3450–3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed -13 dBm/MHz. Compliance with the provisions of this paragraph (n)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. Notwithstanding the channel edge requirement of -13 dBm per megahertz, for base station operations in the 3450–3550 MHz band, the conducted power of any emission below 3440 MHz or above 3560 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3430 MHz or above 3570 MHz shall not exceed -40 dBm/MHz.

5.2 Measurement Procedure

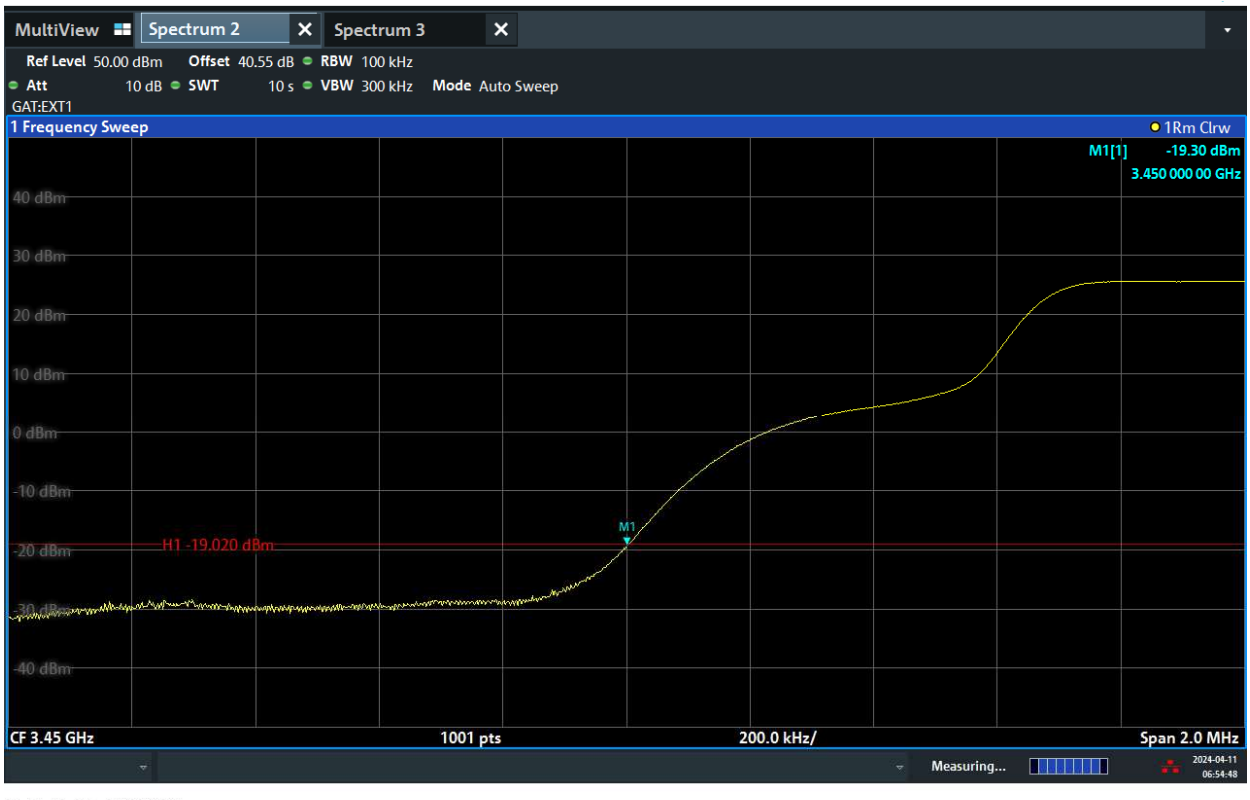
For MIMO mode configurations, the limit was adjusted with a correction of -6.02dB [10Log(1/4)] by using the Measure and Add 10Log(N) dB technique according to KDB 662911 D01 Multiple Transmitter Output accounting for simultaneous transmission from antenna ports . Then the limit was adjusted to -19.02/-31.02dBm accordingly.
Spectrum analyzer detector was set as RMS.

5.3 Measurement result

NRG-1C-UE

Antenna Port	Channel Position	Modulation	BW (MHz)	Frequency range (MHz)	RBW (kHz)	Limit (dBm)
C	B	256QAM	10	3449-3450	100	-19.02
				3440-3449	1000	-19.02
				3430-3440	1000	-31.02
C	T	256QAM	10	3550-3551	100	-19.02
				3551-3560	1000	-19.02
				3560-3570	1000	-31.02

Channel Position B



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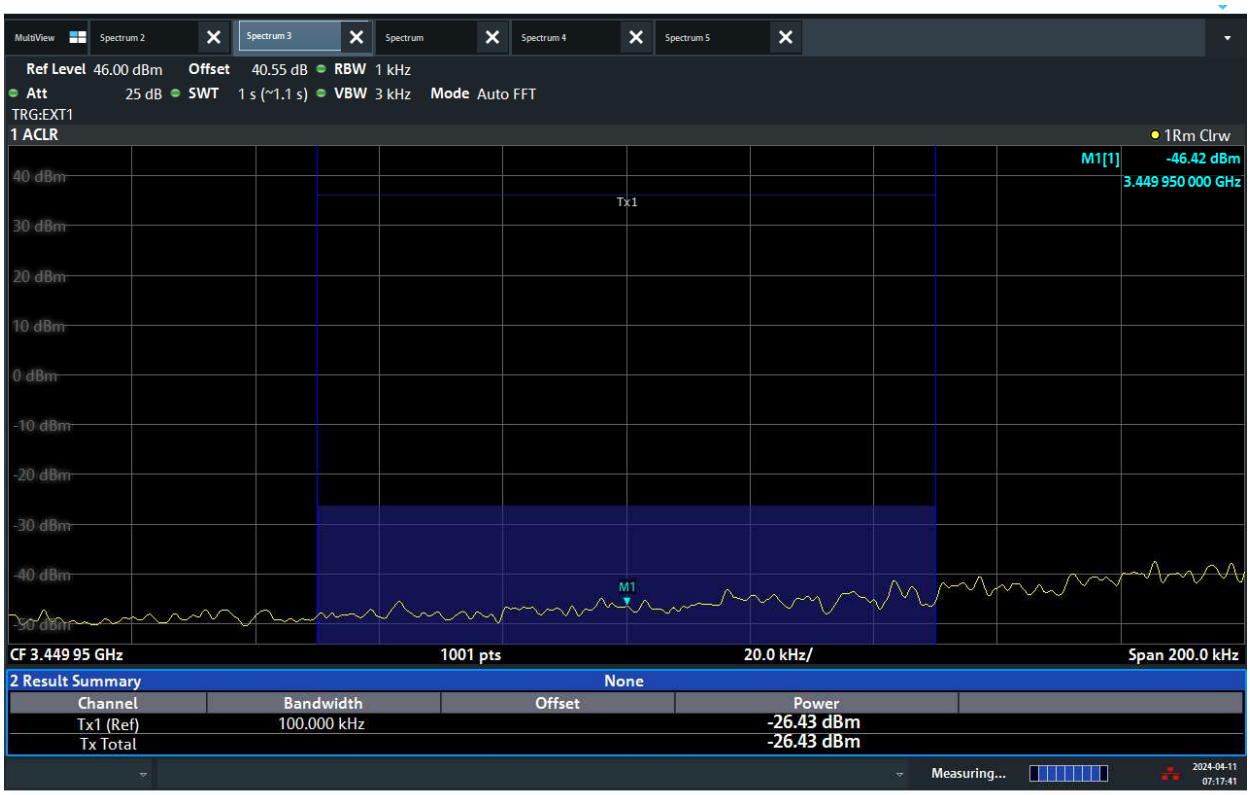
TEST REPORT



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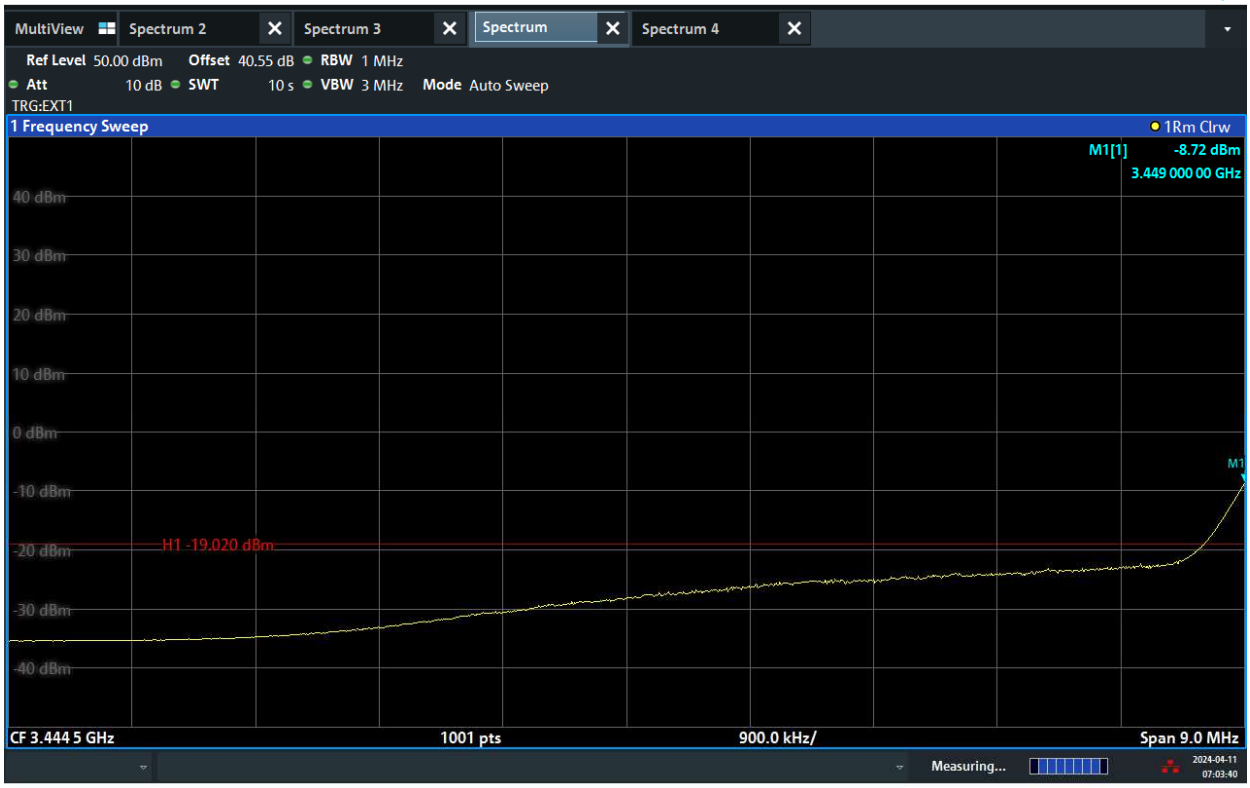

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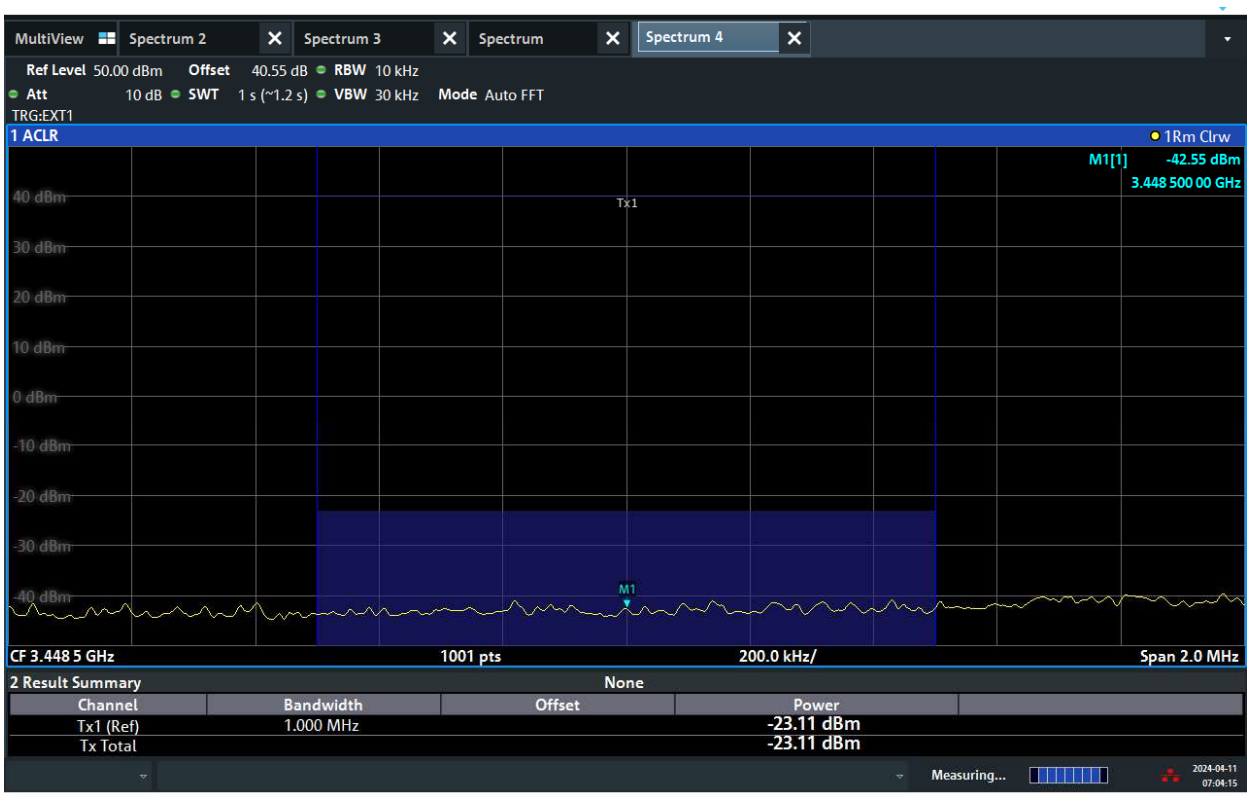
TEST REPORT



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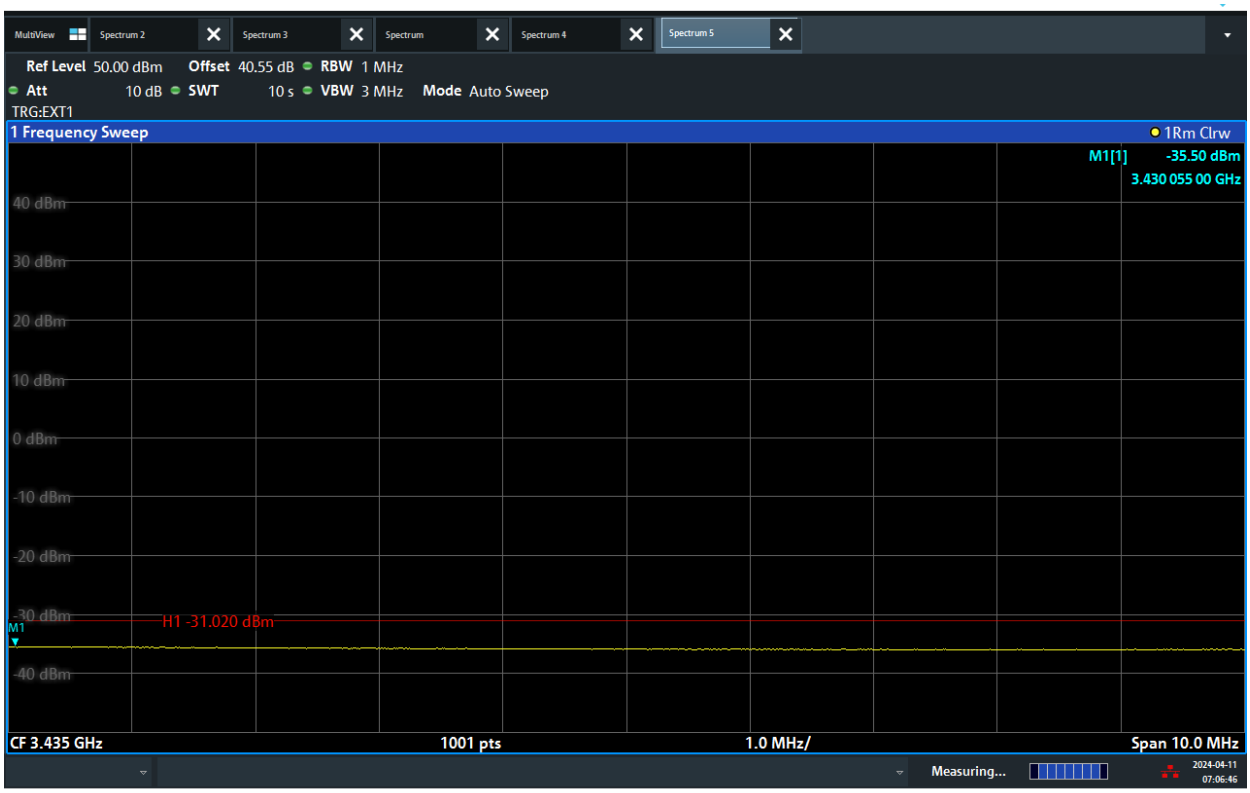

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