Ericsson AB

RF TEST REPORT

Report Type:
RF report

PRODUCT NAME:
Radio 2212 B66A

REPORT NUMBER:
2407B1116SHA-001

ISSUE DATE:
July 15, 2024

DOCUMENT CONTROL NUMBER:
TTRFFCC Part 27_V1 © 2018 Intertek

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Total Quality. Assured.

TEST REPORT

Report no.: 2407B1116SHA-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:	TA8BKRC161630
IC:	287AB-BS161630

SUMMARY:

The equipment is tested according to the following standard(s) or Specification:

FCC CFR 47 Part 27 (2023): MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

ISED RSS-139 Issue 4: Advanced Wireless Services Equipment Operating in the Bands 1710-1780 MHz and 2110-2200 MHz

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

TEST REPORT

Content

Revision History

Report No.	Version	Description	Issued Date
2407B1116SHA-001	Rev. 01	Initial issue of report	July 15, 2024

Measurement result summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Max Output Power and Peak to Average Power Ratio and EIRP	27.50(d)	RSS-139 5.5	Pass
Occupied Bandwidth	27.53(h) 2.1049	RSS-GEN 6.7	Pass
Unwanted Emissions at Band Edge	27.53(h)	RSS-139 5.6	Pass
Conducted Unwanted Emission	27.53(h)	RSS-139 5.6	Pass
Frequency Stability	27.54	RSS-139 5.4	Pass

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Description:	Remote Radio Unit
Product name:	Radio 2212 B66A
Product number:	KRC 161 630/1, KRC161630/3
HVIN	BS161630
Serial Number(s)	B440819712
Rating:	-48V DC
Software Version:	CXP9013268%15_R99CB
Hardware Version:	R2B
Sample received date:	June 14, 2024
Date of test:	June 14, 2024 ~ July 3, 2024

1.2 Technical Specification

Frequency Range:	RX:1710-1780MHz, TX:2110-2180MHz (LTE, NR) RX:1710-1755MHz, TX:2110–2155MHz (WCDMA)
Number of Antenna ports:	2 TX/RX
Supported RAT:	LTE, WCDMA, NR, NB-IoT In-band
Max RF bandwidth (IBW):	NR:70MHz LTE:70MHz WCDMA:45MHz
Supported Number of Carriers:	Maximum 6 carriers per port for all configuration
Supported modulation:	WCDMA: QPSK, 16QAM, 64QAM NR, LTE: QPSK, 16QAM, 64QAM, 256QAM
Supported Channel Bandwidth:	WCDMA: 5MHz LTE: 5, 10, 15, 20 MHz NR: 5, 10, 15, 20, 25, 30, 35, 40 MHz
Declaration output power:	Maximum 49.0 dBm (80W), IBW≤60MHz Maximum 48.5 dBm (70W), IBW=70MHz

Note: Information in the 1.2 sheet declared by the manufacturer and Intertek has no responsibility of its accuracy.

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 Registration 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)
ISED RSS-139 issue 4 September 29, 2022
ISED RSS-Gen issue 5 March 2019 Amendment 1
ANSI C63.26:2015
KDB 971168 D01 v03r01
KDB 662911 D01 v02r01

2.2 Product Information

The Equipment Under Test (EUT) is an Ericsson Antenna Integrated Radio Unit working in the wireless communications services 2100MHz band which provides communication connections to network in WCDMA / LTE / NR modes and MSR modes. The Radio 2212 B66A operates from a -48V DC.

The EUT includes 2 TX/RX ports 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.

The EUT has two product number and KRC 161 630/3 is physically and electrically identical to KRC 161 630/1. The KRC 161 630/3 product is subject to additional product integrity testing qualified against NEBS. We test KRC 161 630/3 as a typical model and list the worst data.

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

2.3 Configuration Description

Initial pre-testing was carried out to determine the worst case modulation scheme by measuring the output power from QPSK, 16QAM, 64QAM and 256QAM on the middle channel of one antenna port. From these tests, it was determined that 256QAM was the worst case modulation scheme and was used for all testing as data listed below.

4TX/RX mode	Port	QPSK	16QAM	64QAM	256QAM
NR-1C 40M Middle	Port B	48.75dBm	48.80dBm	48.79dBm	48.91dBm

Complete testing was carried out on the worst case antenna port which was determined by the highest output power from the 2 measured ports on worst case modulation scheme and worst bandwidth. The worst antenna port was antenna B as data listed below.

4TX/RX mode	modulation	Port A	Port B
NR-1C 40M Middle	256QAM	48.61dBm	48.91dBm

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

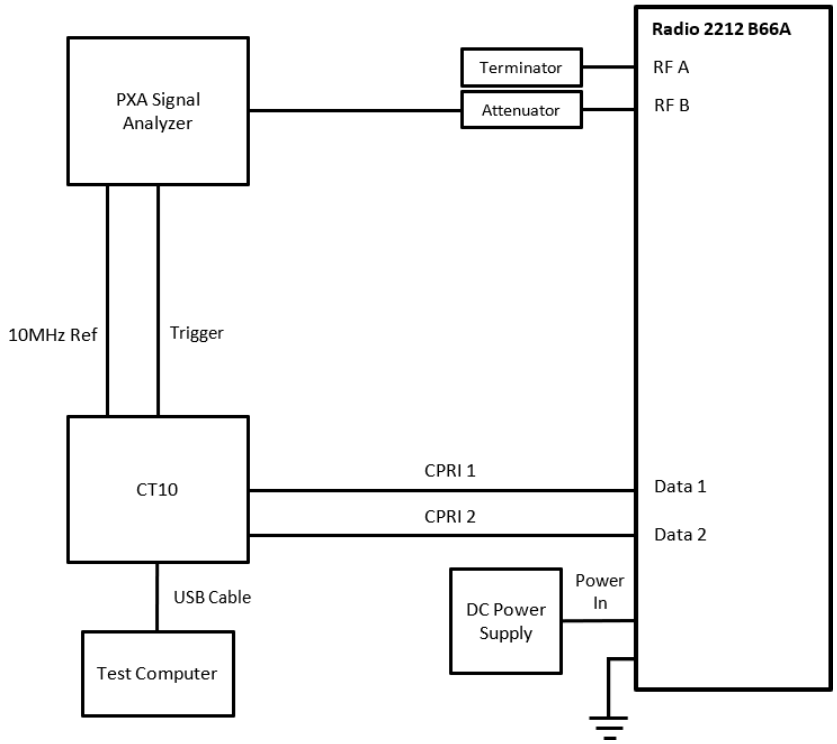
Configuration	No. of Carriers	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR-1C	1NR	25	2122.5	2145	2167.5
		30	2125	2145	2165
		35	2127.5	2145	2162.5
		40	2130	2145	2160
NR-2C	2NR	25	-	2122.5+2167.5	-
		30	-	2125+2165	-
		35	-	2127.5+2162.5	-

Configuration	No. of Carriers	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR-1C-BE	1NR	25	2122.5	-	2167.5
		30	2125	-	2165
		35	2127.5	-	2162.5
		40	2130	-	2160
NR-2C-BE	2NR	25	2122.5+2147.5	-	2142.5+2167.5
		30	2125+2155	-	2135+2165
		35	-	2127.5+2162.5	-

Configuration	No. of Carriers	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR-1C-UE	1NR	25	2122.5		2167.5
		30	2125		2165
		35	2127.5		2162.5
		40	2130		2160
NR-2C-UE	2NR	25	-	2122.5+2167.5	-
		30	-	2125+2165	-
		35	-	2127.5+2162.5	-

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	10db Attenuator	2.92TS100-10-26.5-A	-
5	10db Attenuator	DTS50GH-A-10-18-NMF	-
6	40db Attenuator	WDTS300-40Db-6G-NFF	-
7	40db Attenuator	47-40-43	-
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 will be chosen to use in relative test case. And the cable loss of specified Attenuator 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 8	

2.6 Instrument list

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
☒	Climatic Chamber	Chongqing Yinhe	SDJ61F	201700266	2025-06-27
☐	Climatic Chamber	Chongqing Yinhe	SDJ61F	201700268	2024-12-09
☐	TRUE RMS CLAMP METER	FLUKE	317	40500136WS	2024-07-22
☒	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:

(EIRP) 1640 W(62.15dBm) or 3280W(65.16dBm) for emission bandwidth ≤ 1MHz
1640 W/MHz(62.15dBm/MHz) or 3280W/MHz(65.16dBm/MHz) for emission bandwidth > 1MHz

Peak to Average Ratio: ≤13 dB
Note: Stricter limit for FCC & IC is applied.

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

According to the following test results, 23.52dBi is applied as maximum allowed antenna gain to comply with the e.i.r.p. limit.

NR-1C Declaration output power 49dBm per port:

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	48.63	35.53	7.21	48.56	35.25	7.09	48.49	35.29	7.20
B	256QAM	25	48.83	35.71	7.21	48.74	35.51	7.09	48.58	35.37	7.20
Total TRP			51.74	38.63	-	51.66	38.39	-	51.55	38.34	-
e.i.r.p. Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	23.52	-	-	23.76	-	-	23.81	-

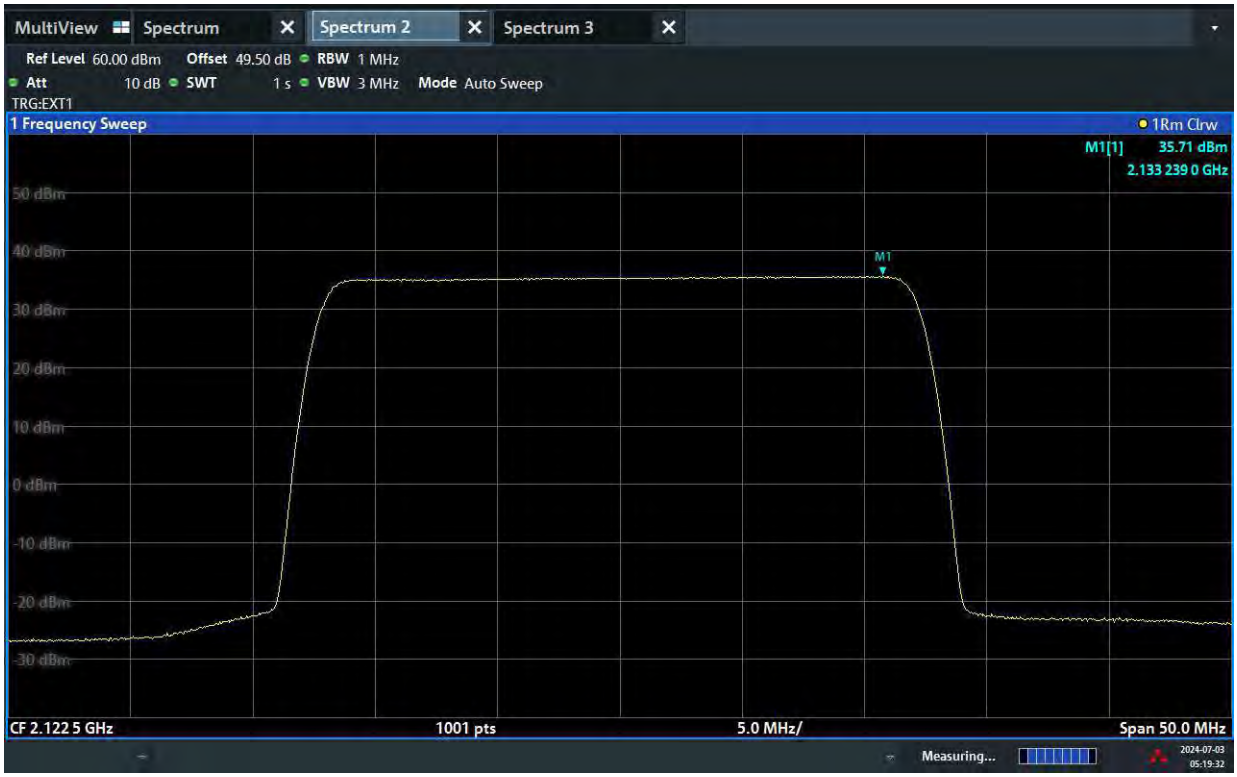
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	30	48.57	34.62	7.26	48.56	34.50	7.11	48.44	34.50	7.24
B	256QAM	30	48.88	34.97	7.27	48.80	34.73	7.11	48.67	34.65	7.24
Total TRP			51.74	37.81	-	51.69	37.63	-	51.57	37.59	-
e.i.r.p. Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	24.34	-	-	24.52	-	-	24.56	-

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	48.52	33.83	7.28	48.56	33.82	7.10	48.46	33.69	7.28
B	256QAM	35	48.90	34.27	7.28	48.84	34.04	7.10	48.78	34.00	7.26
Total TRP			51.72	37.07	-	51.71	36.94	-	51.63	36.86	-
e.i.r.p. Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	25.08	-	-	25.21	-	-	25.29	-

TEST REPORT

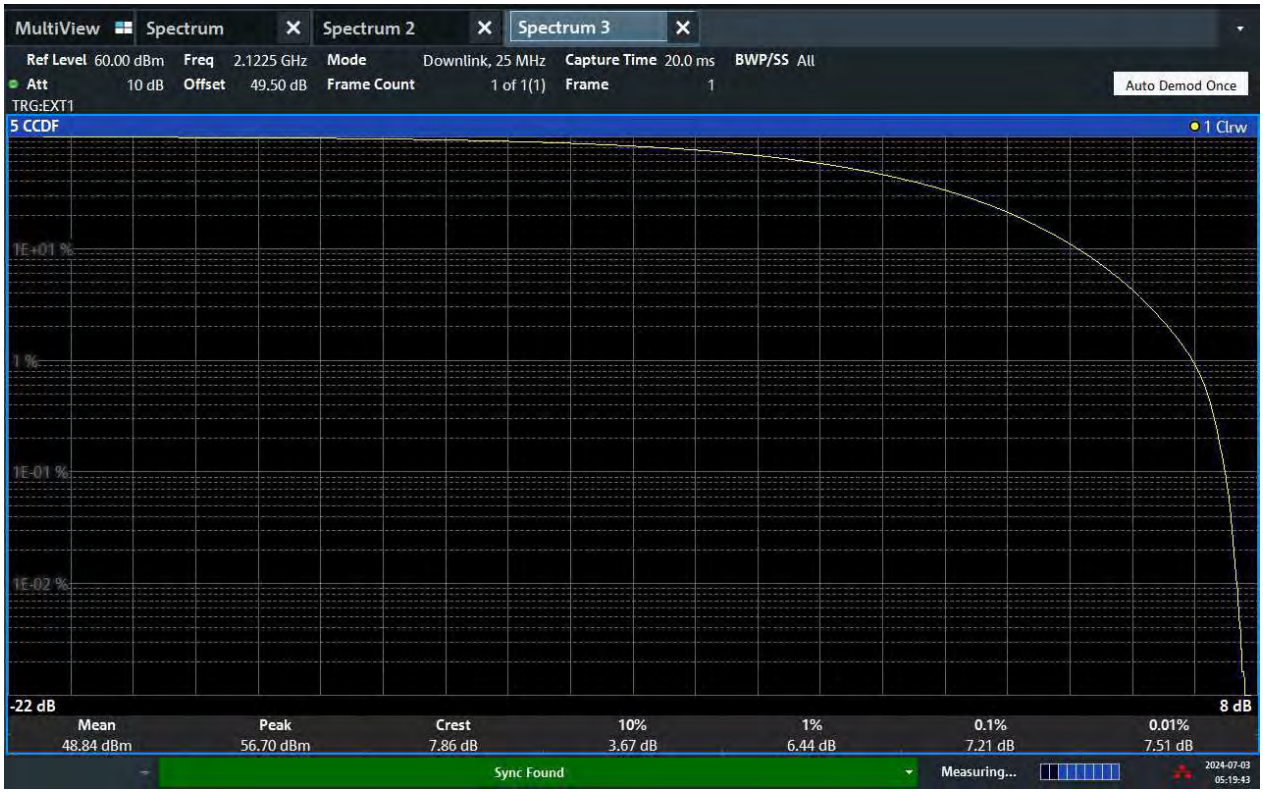
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	40	48.49	33.21	7.32	48.54	33.23	7.11	48.50	33.25	7.29
B	256QAM	40	48.90	33.64	7.31	48.91	33.52	7.12	48.78	33.48	7.30
Total TRP			51.71	36.44	-	51.74	36.39	-	51.65	36.38	-
e.i.r.p. Limit			-	62.15	13	-	62.15	13	-	62.15	13
maximum allowed antenna gain			-	25.71	-	-	25.76	-	-	25.77	-

NR 25MHz, Channel B, Power

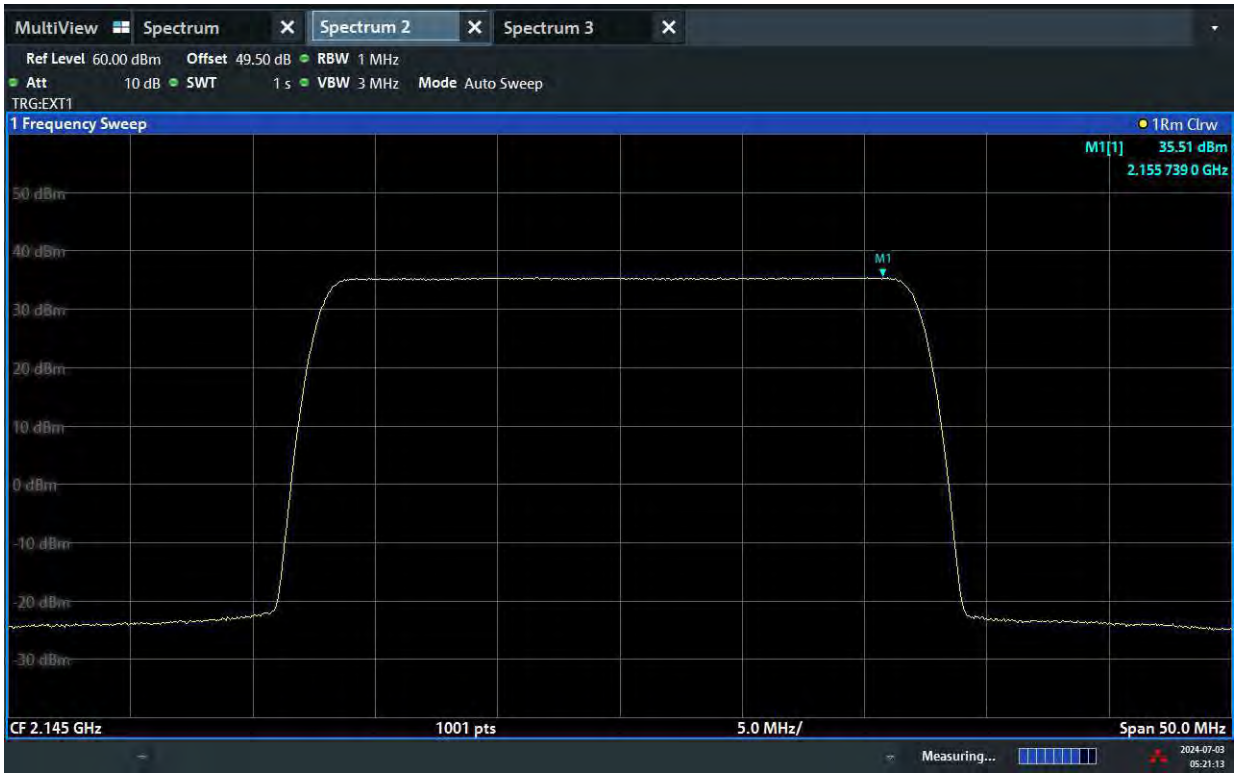


TEST REPORT

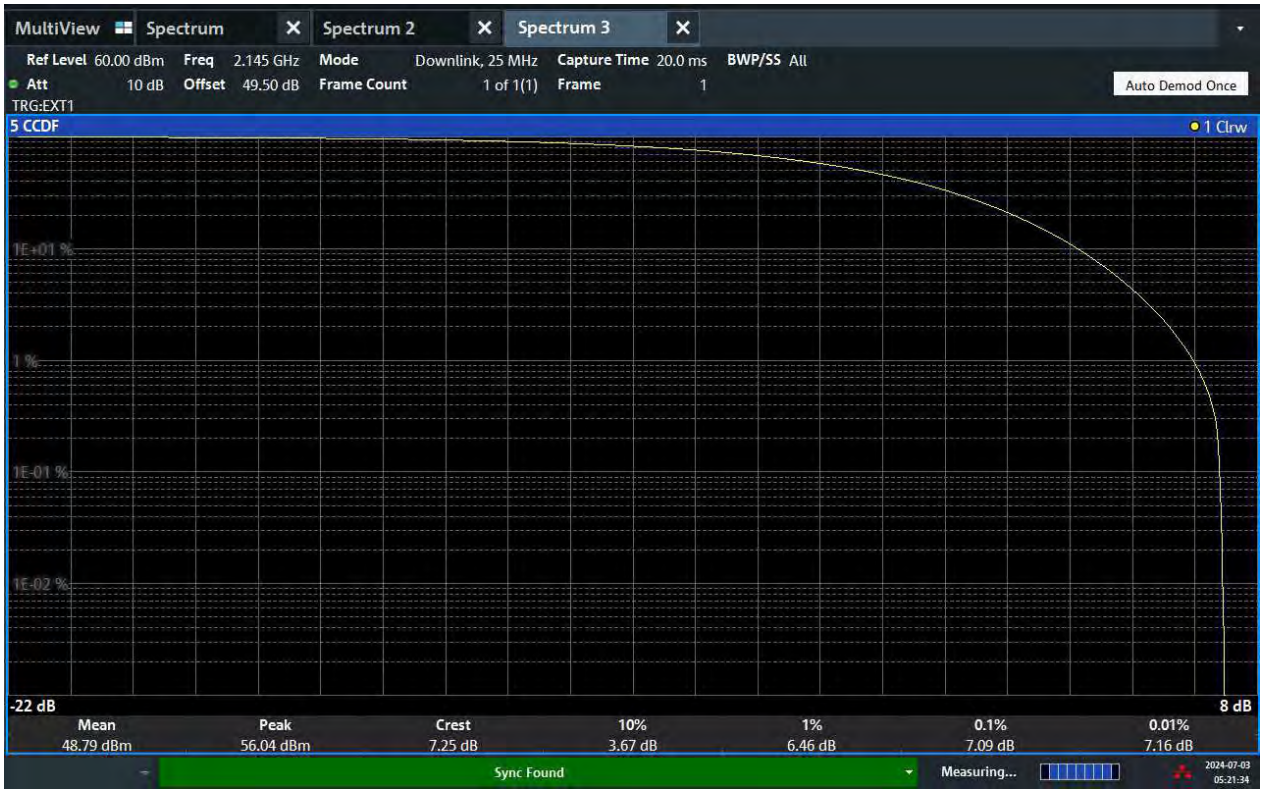
NR 25MHz, Channel B, PAR



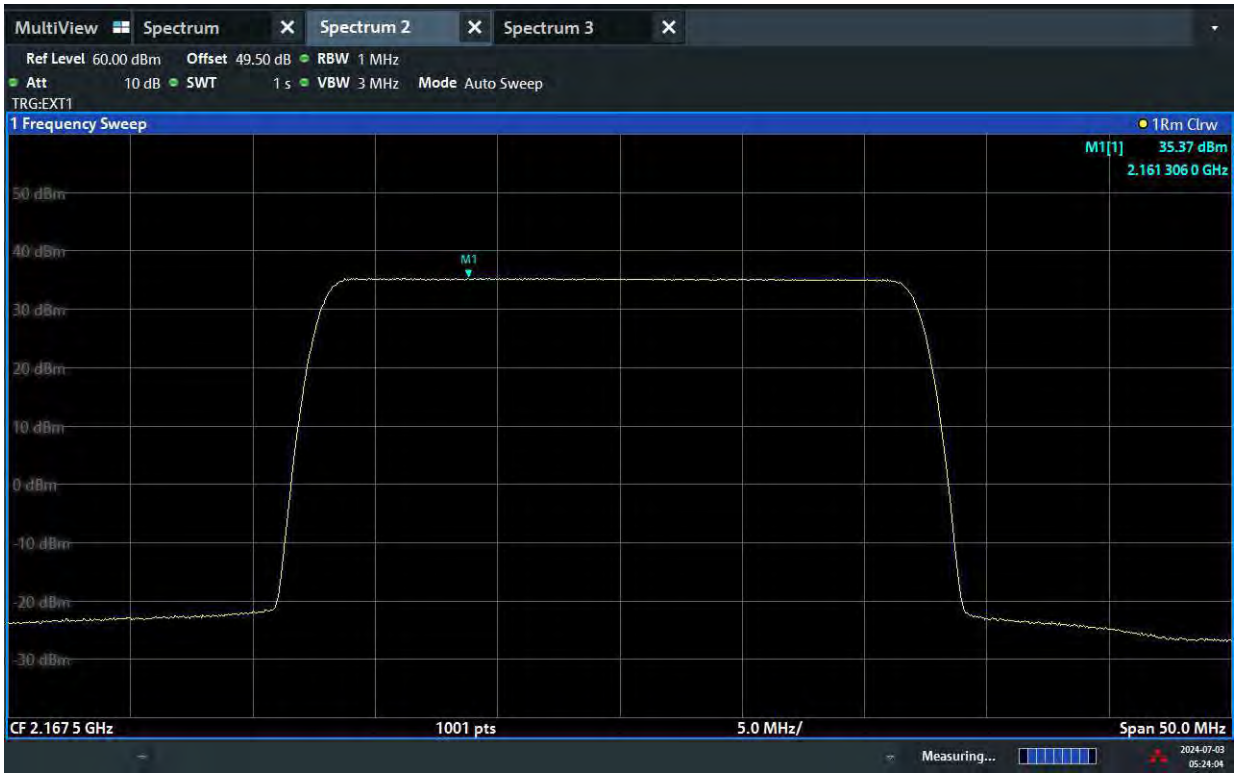
NR 25MHz, Channel M, Power



NR 25MHz, Channel M, PAR

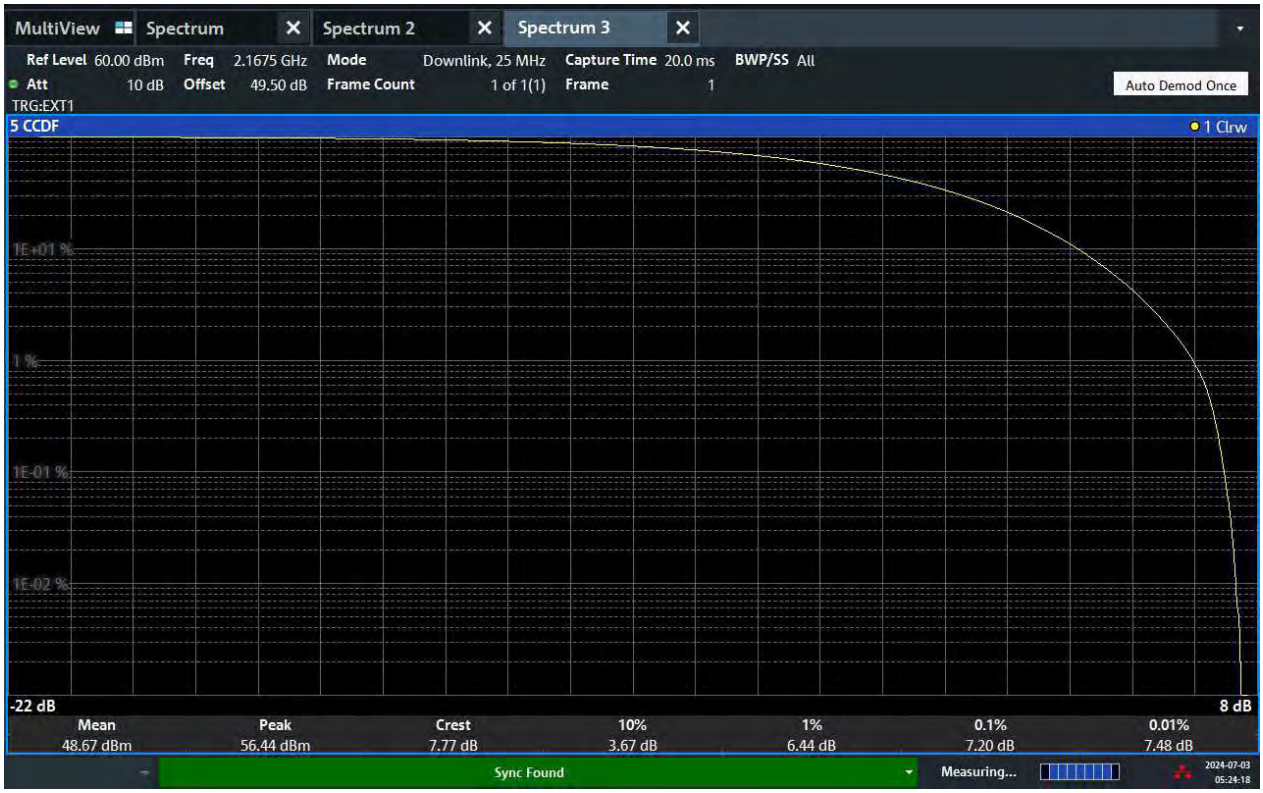


NR 25MHz, Channel T, Power

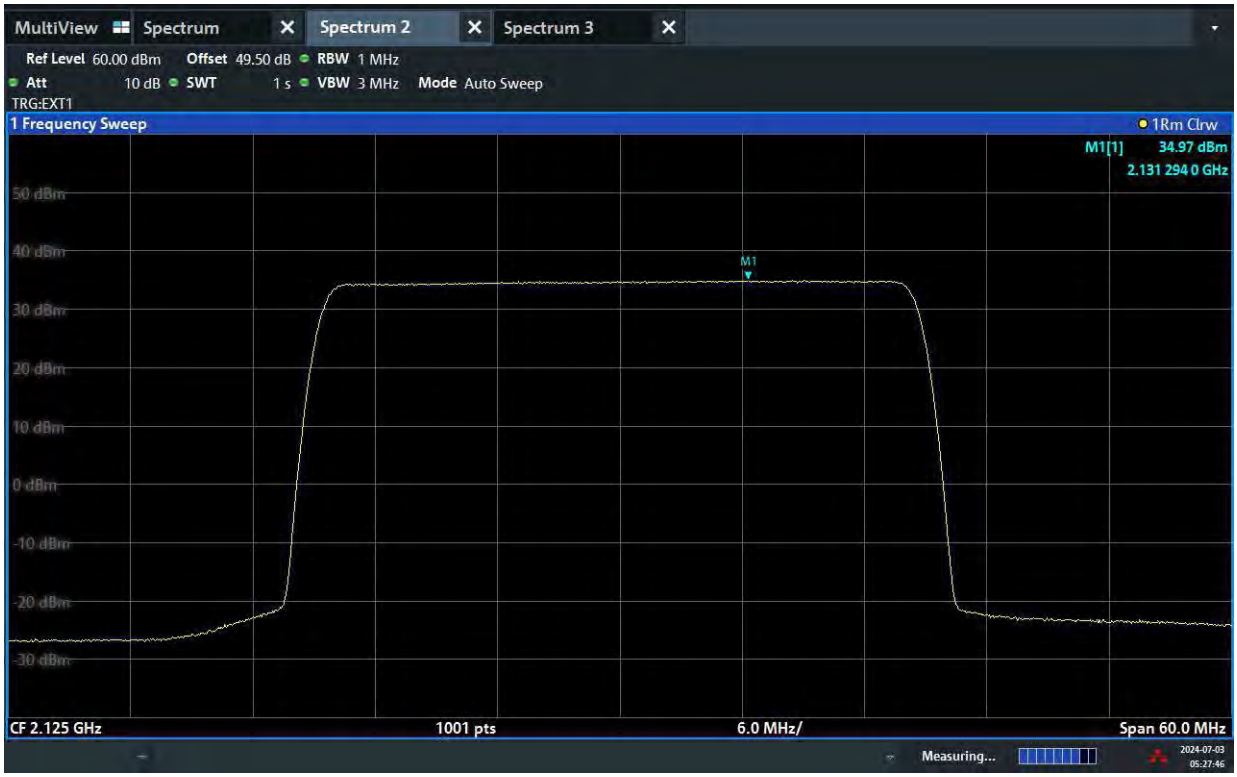


TEST REPORT

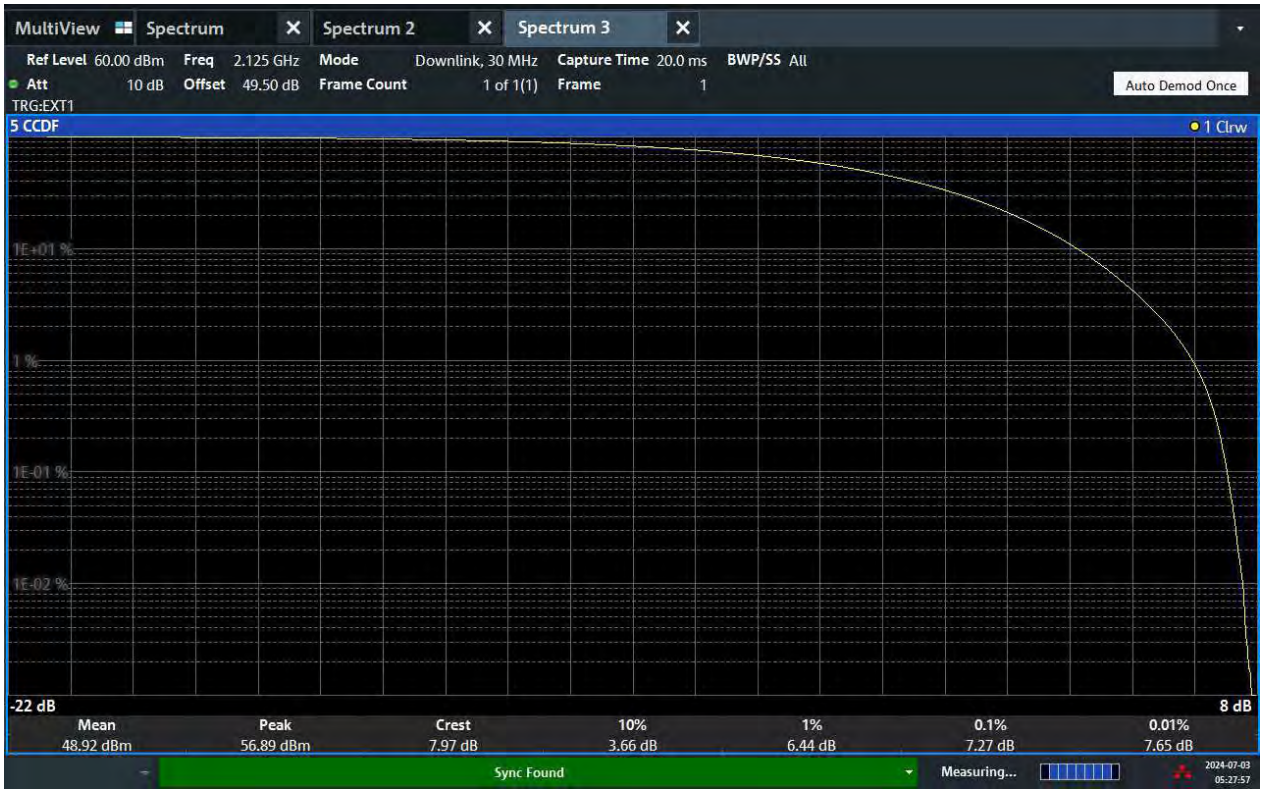
NR 25MHz, Channel T, PAR



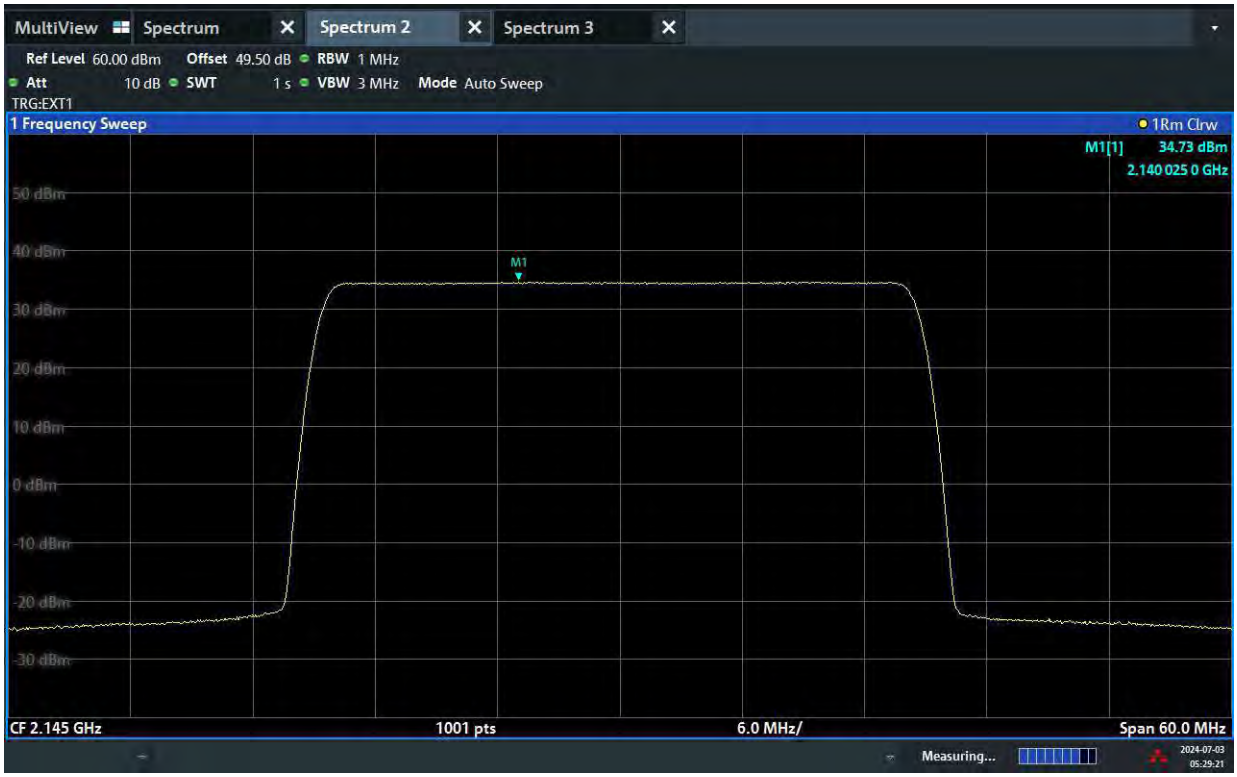
NR 30MHz, Channel B, Power



NR 30MHz, Channel B, PAR

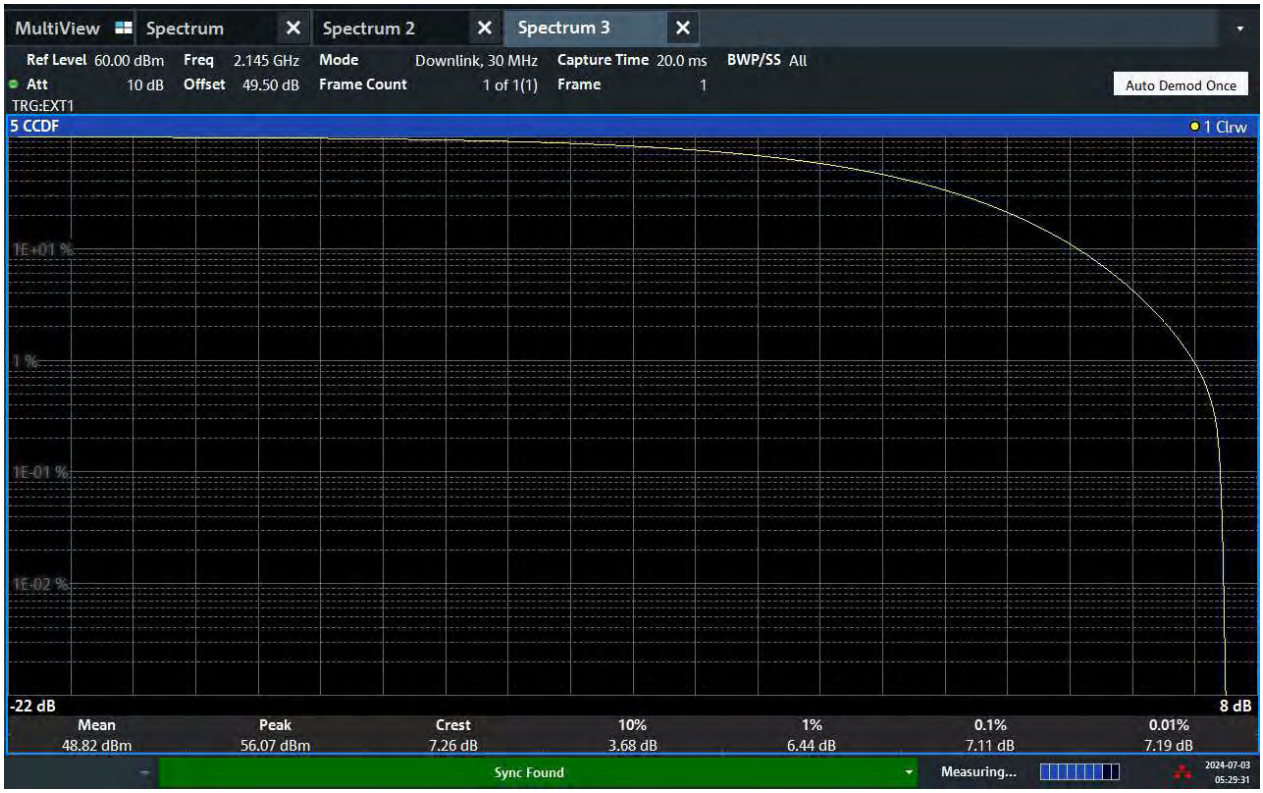


NR 30MHz, Channel M, Power

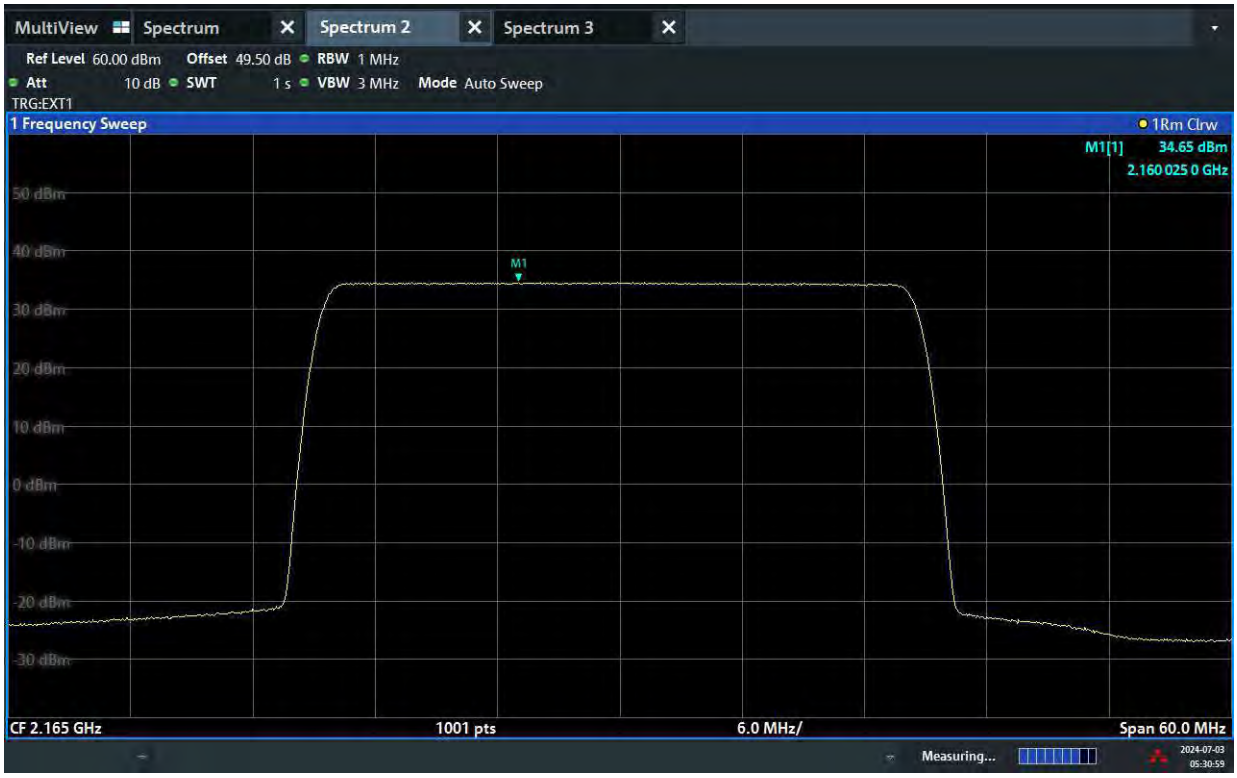


TEST REPORT

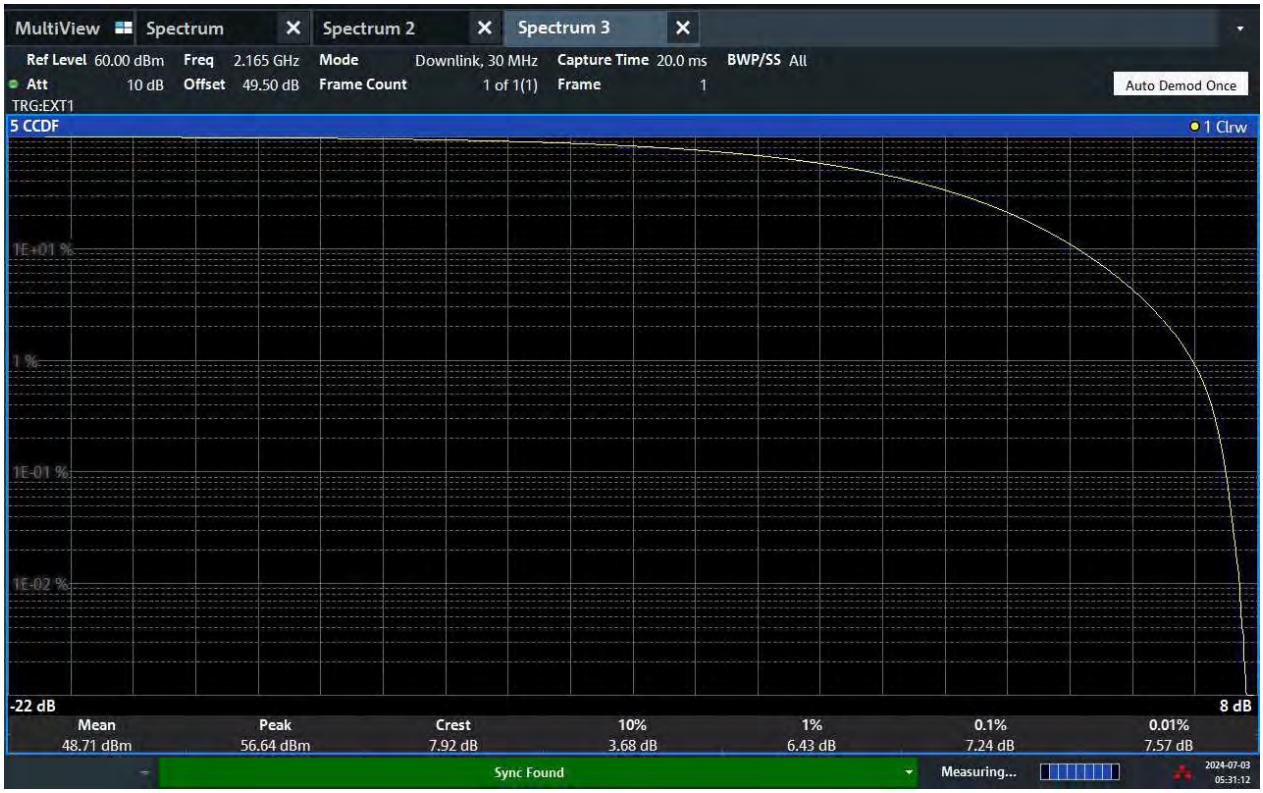
NR 30MHz, Channel M, PAR



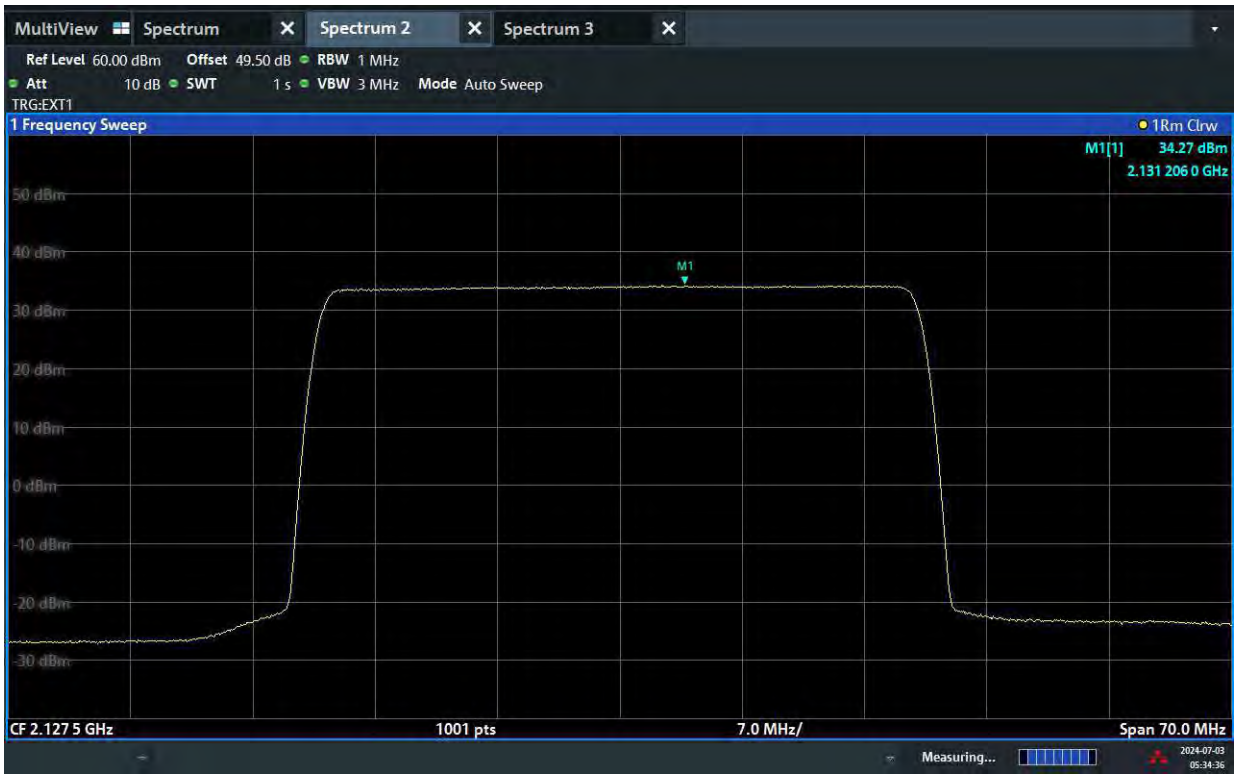
NR 30MHz, Channel T, Power



NR 30MHz, Channel T, PAR

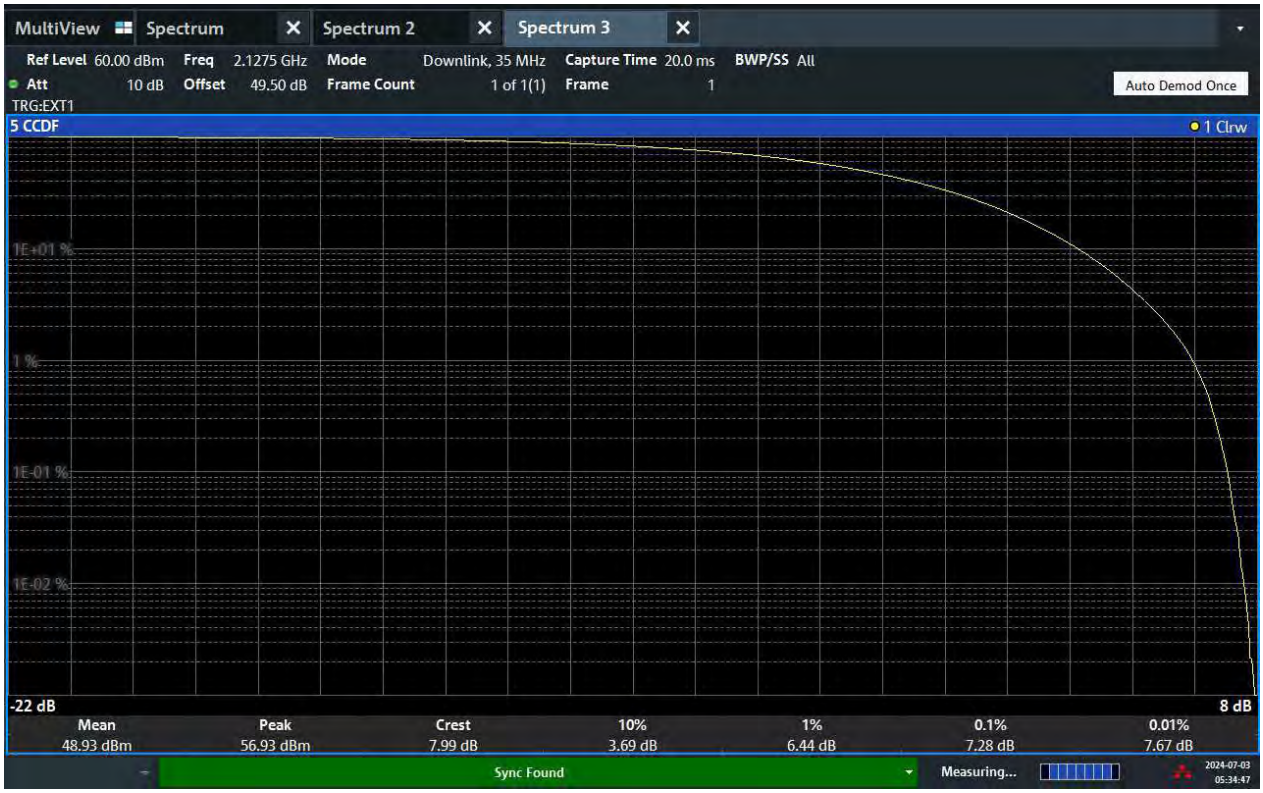


NR 35MHz, Channel B, Power

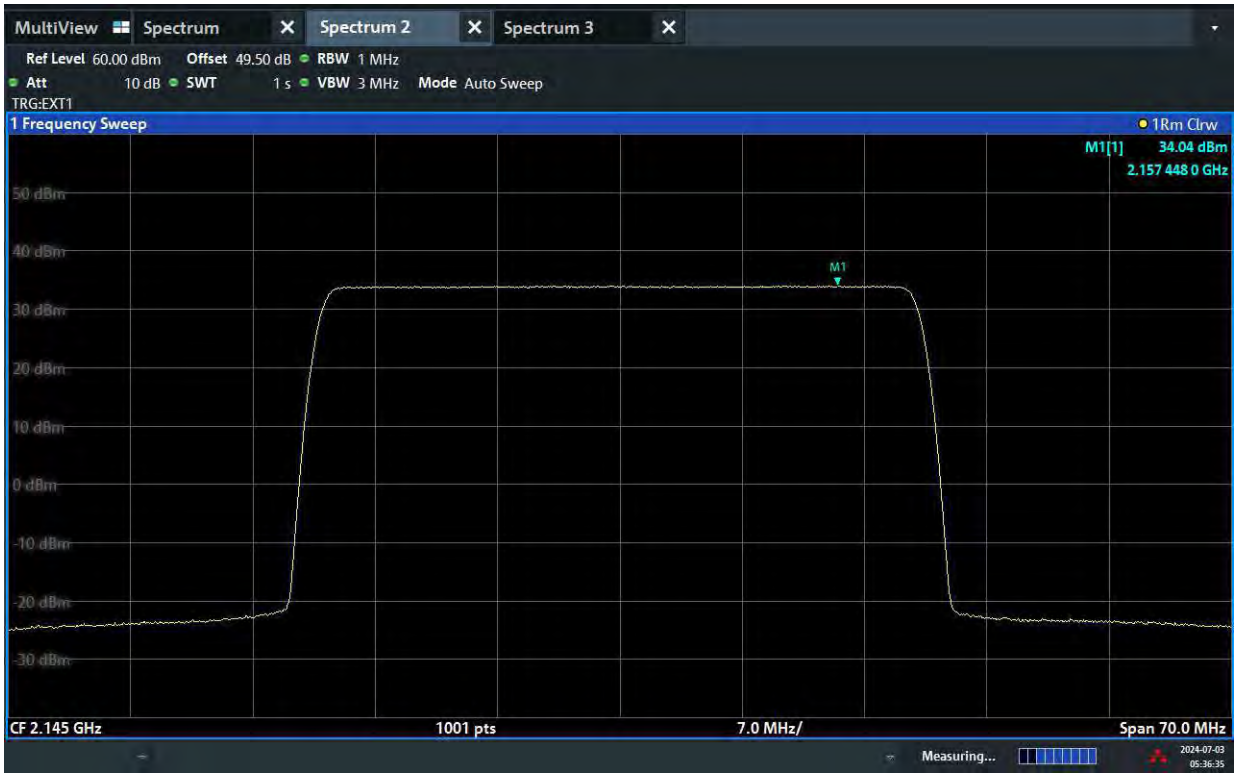


TEST REPORT

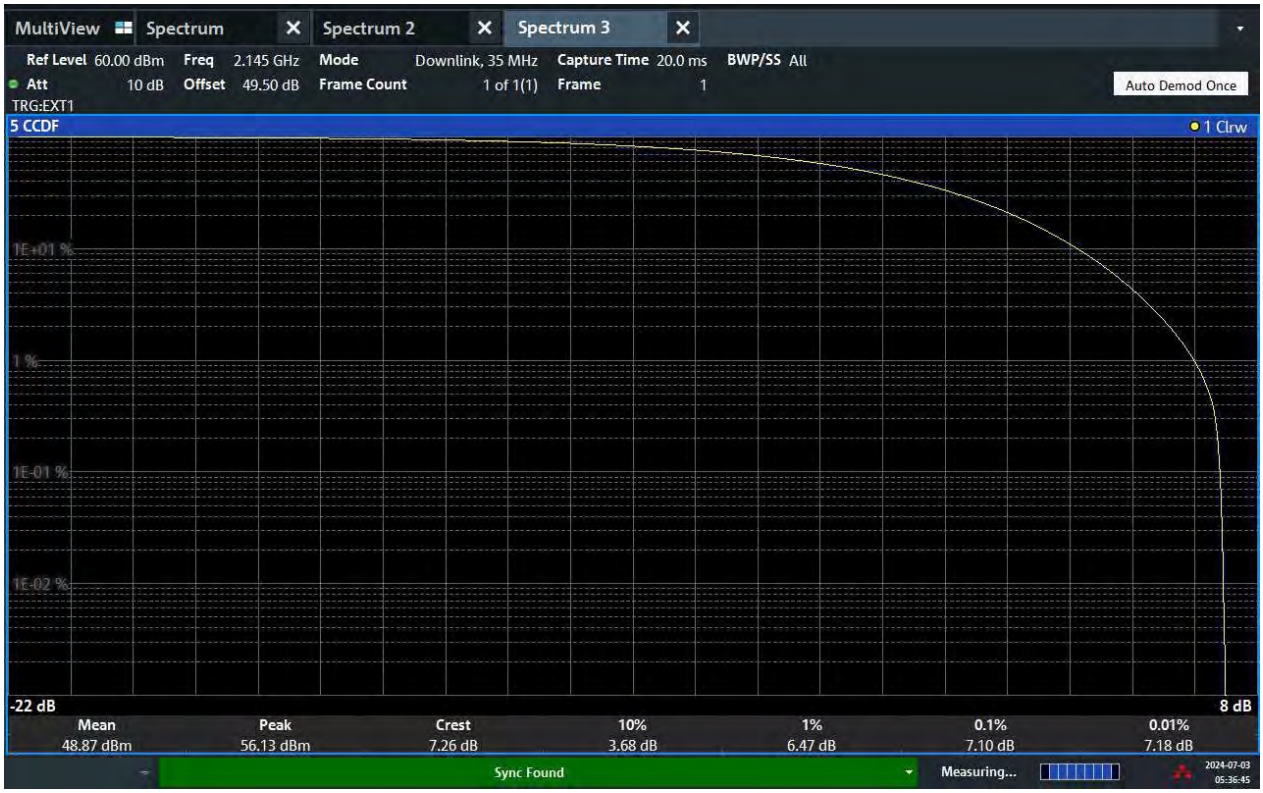
NR 35MHz, Channel B, PAR



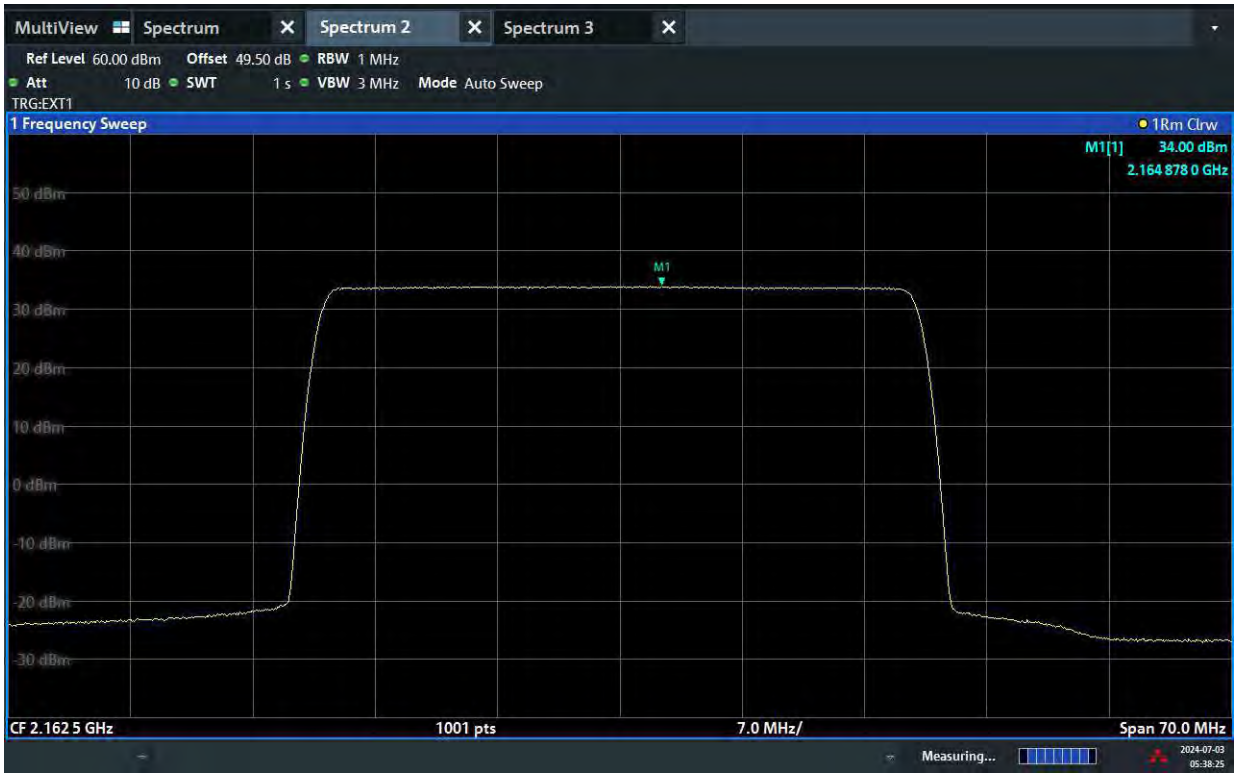
NR 35MHz, Channel M, Power



NR 35MHz, Channel M, PAR

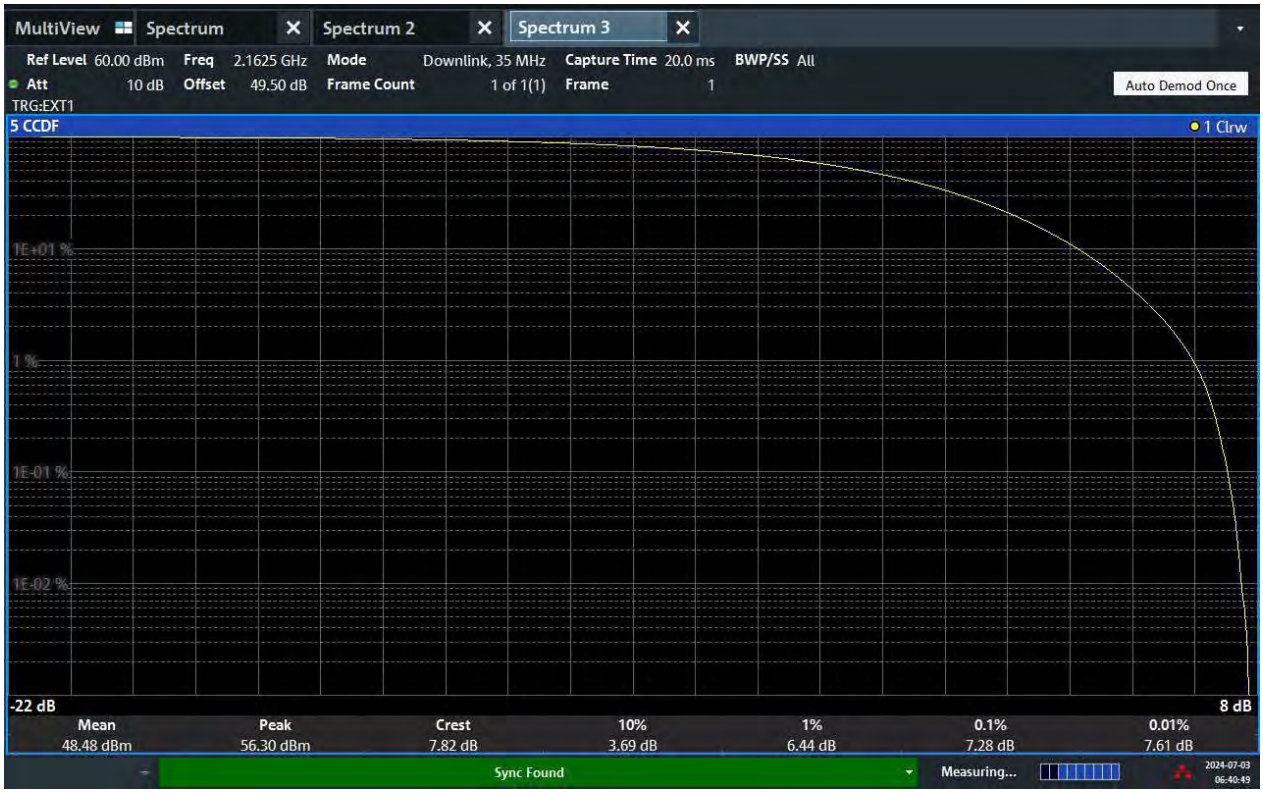


NR 35MHz, Channel T, Power

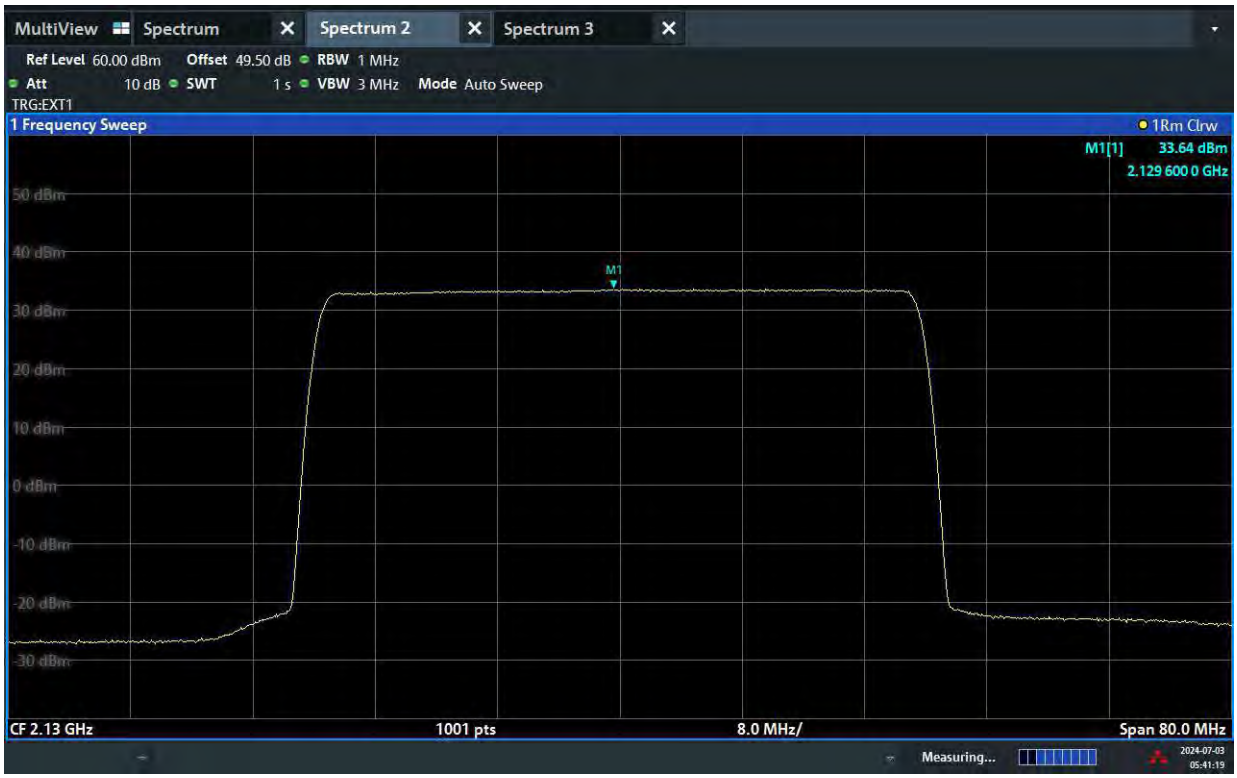


TEST REPORT

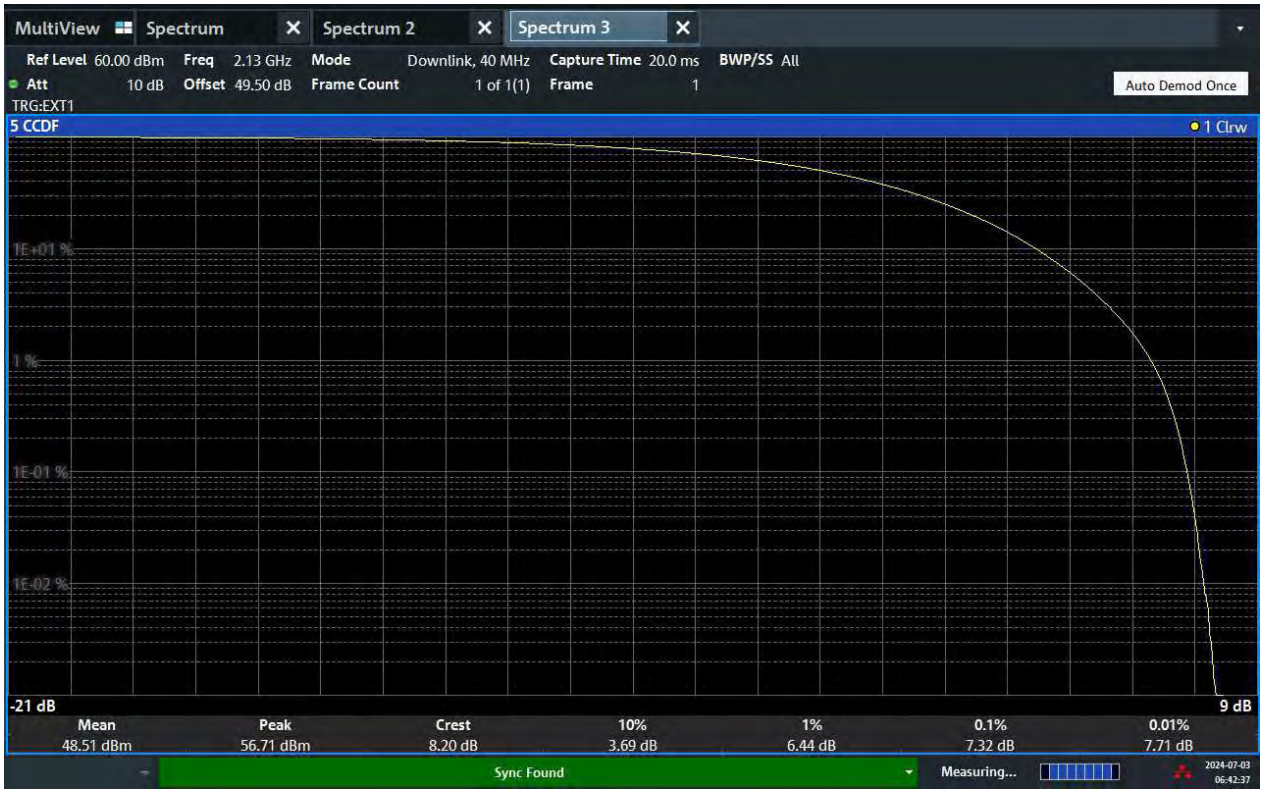
NR 35MHz, Channel T, PAR



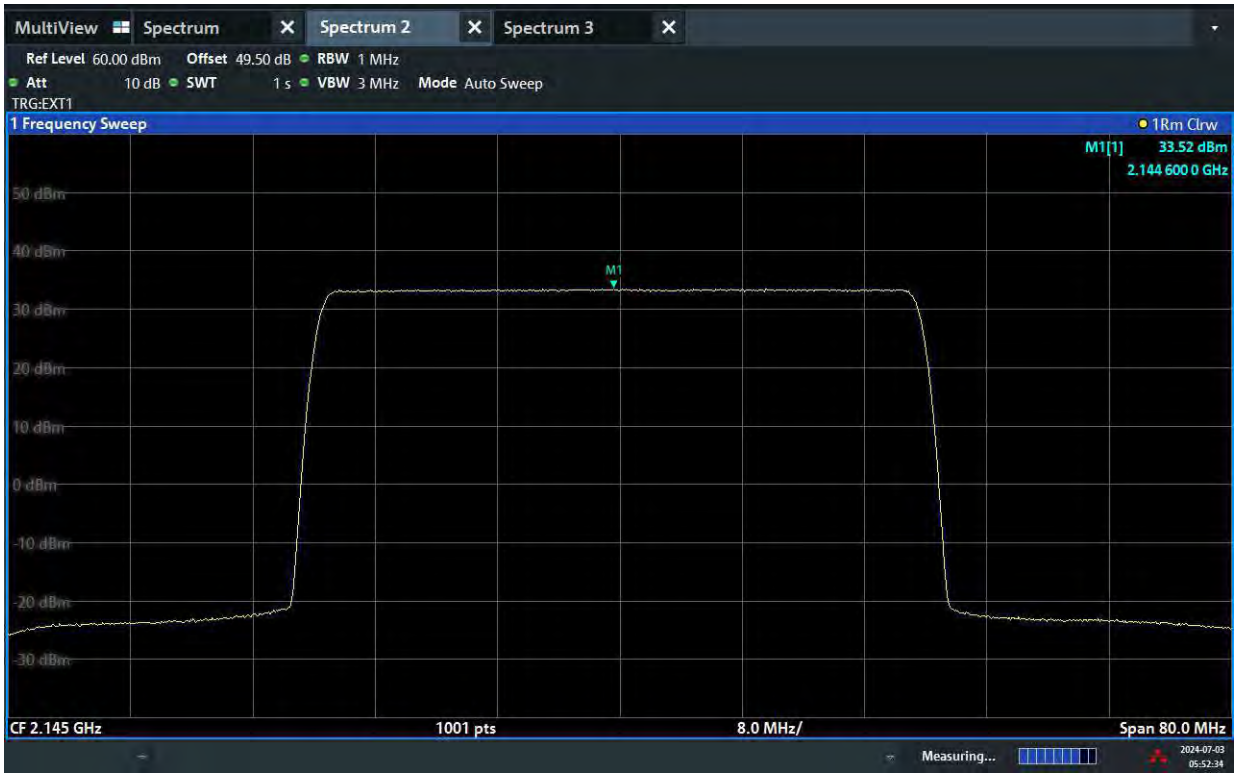
NR 40MHz, Channel B, Power



NR 40MHz, Channel B, PAR

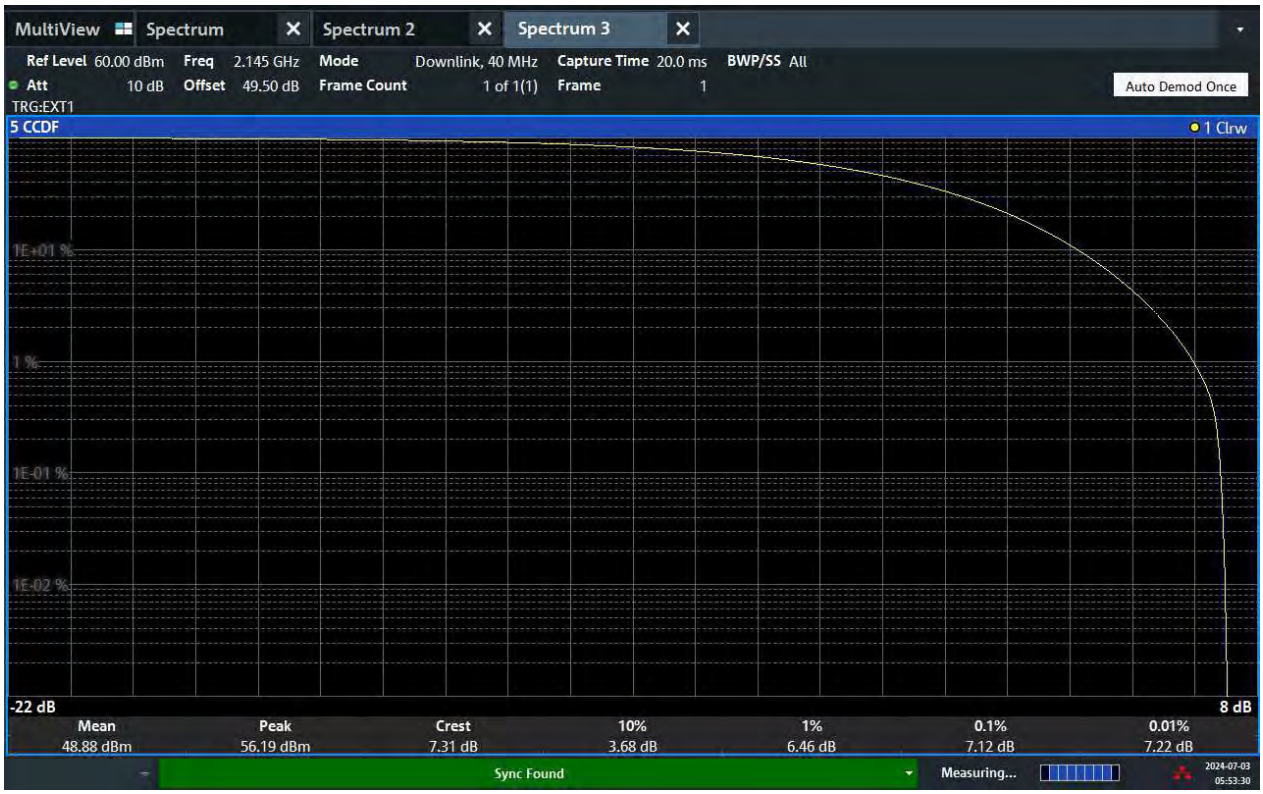


NR 40MHz, Channel M, Power

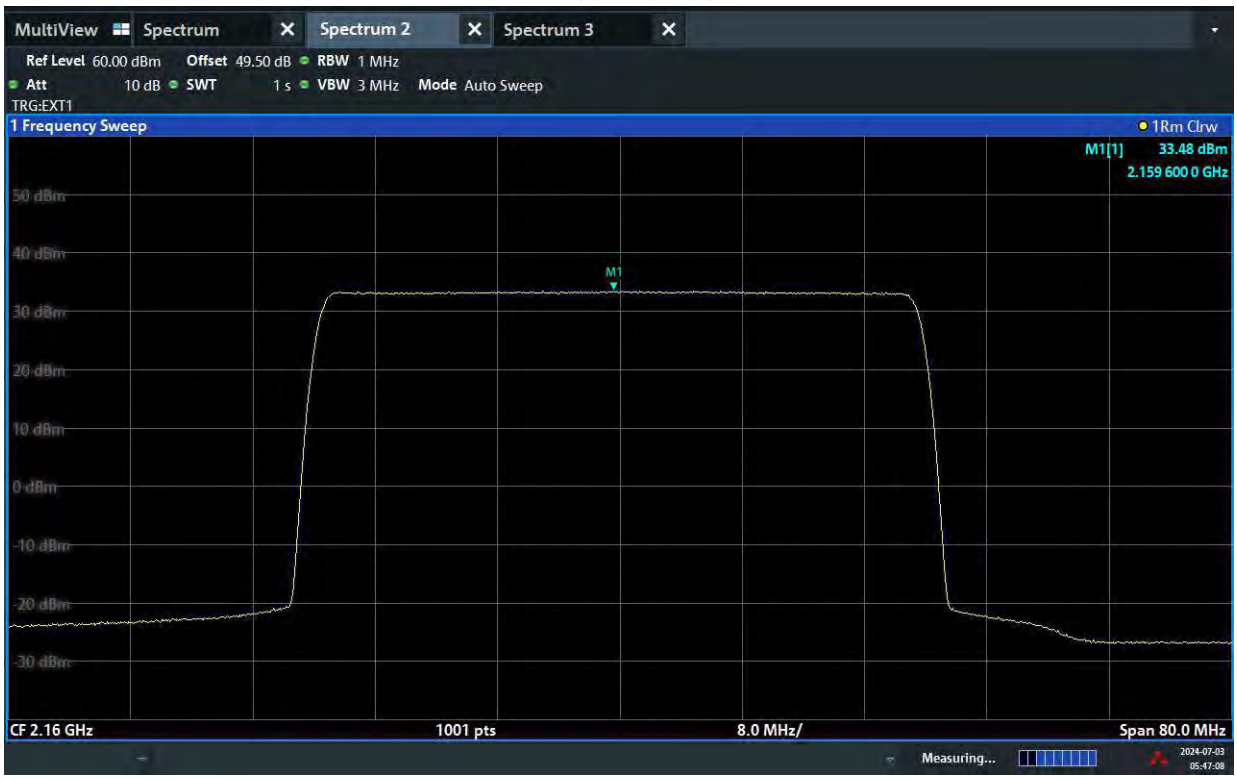


TEST REPORT

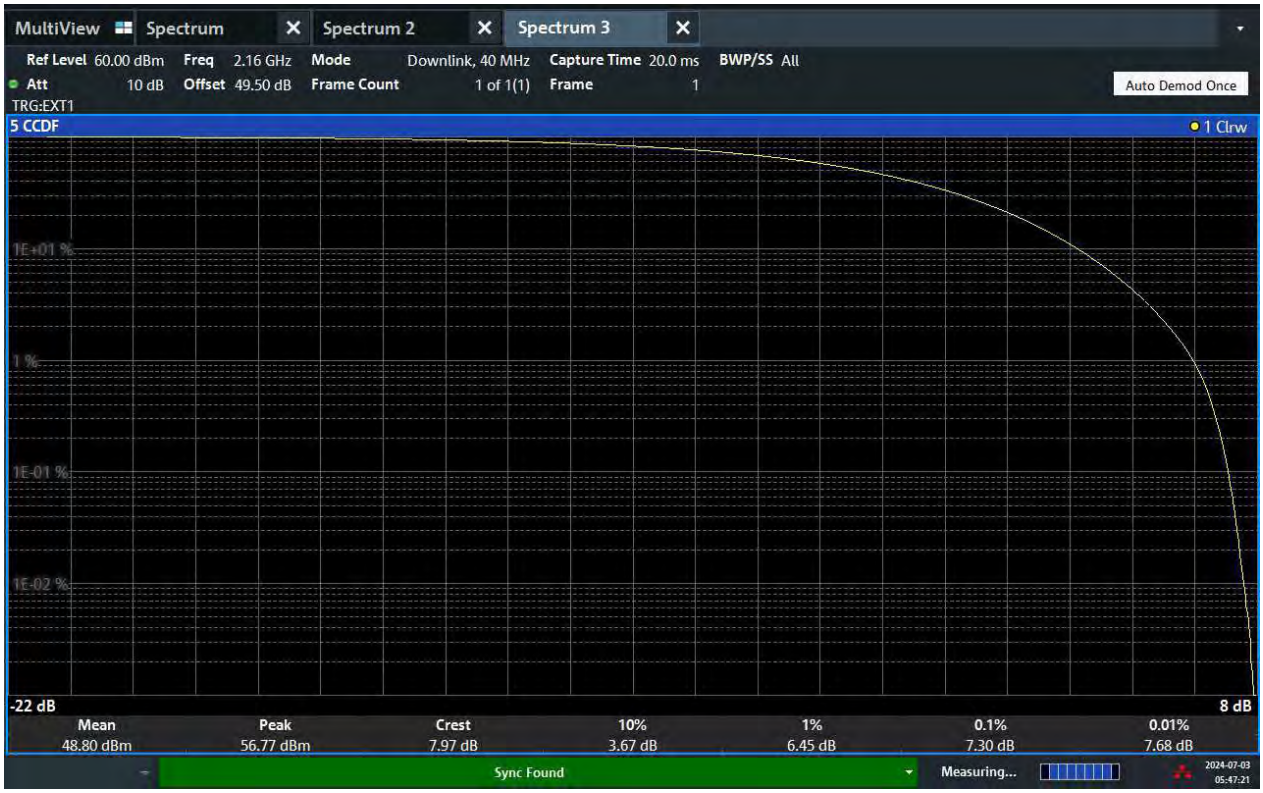
NR 40MHz, Channel M, PAR



NR 40MHz, Channel T, Power



NR 40MHz, Channel T, PAR



NR-2C Declaration output power 48.5dBm per port:

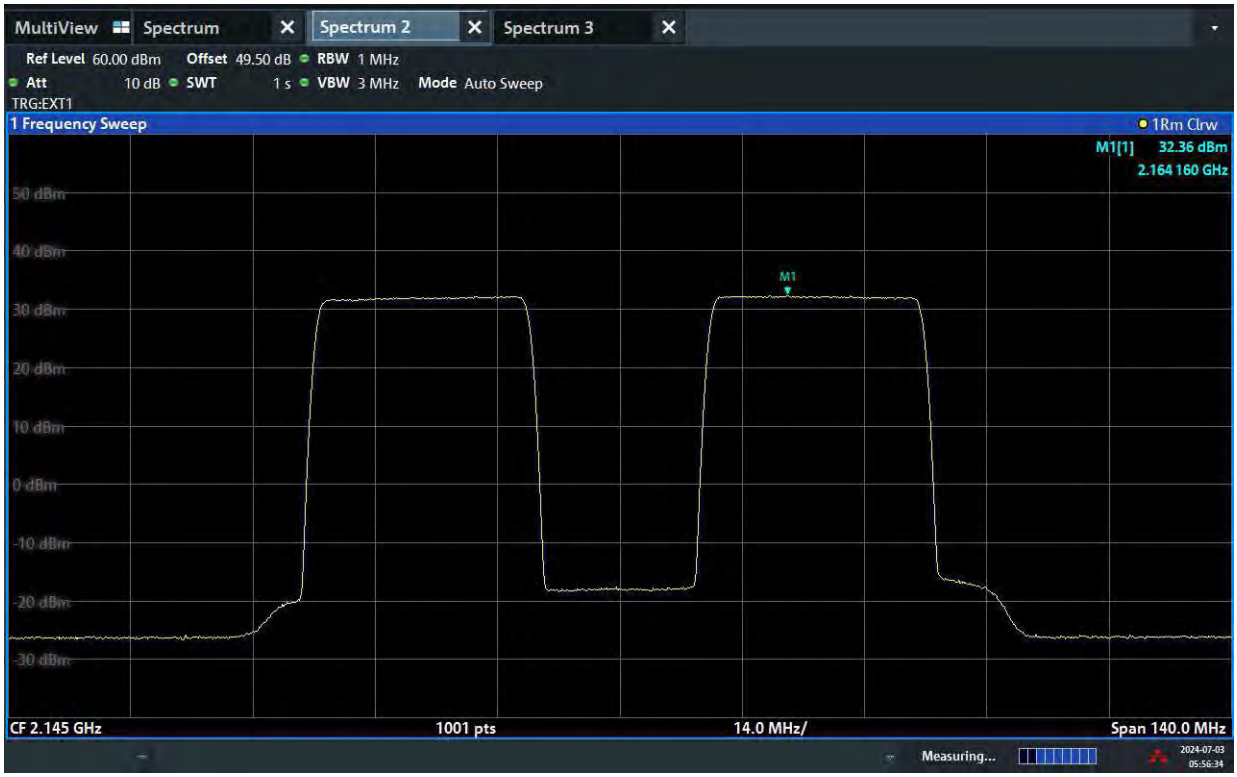
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	25	-	-	-	48.12	31.94	-	-	-	-
B	256QAM	25	-	-	-	48.49	32.36	-	-	-	-
Total TRP			-	-	-	51.32	35.17	-	-	-	-
e.i.r.p. Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	26.98	-	-	-	-

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	-	-	-	48.15	31.12	-	-	-	-
B	256QAM	30	-	-	-	48.52	31.56	-	-	-	-
Total TRP			-	-	-	51.35	34.36	-	-	-	-
e.i.r.p. Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	27.79	-	-	-	-

TEST REPORT

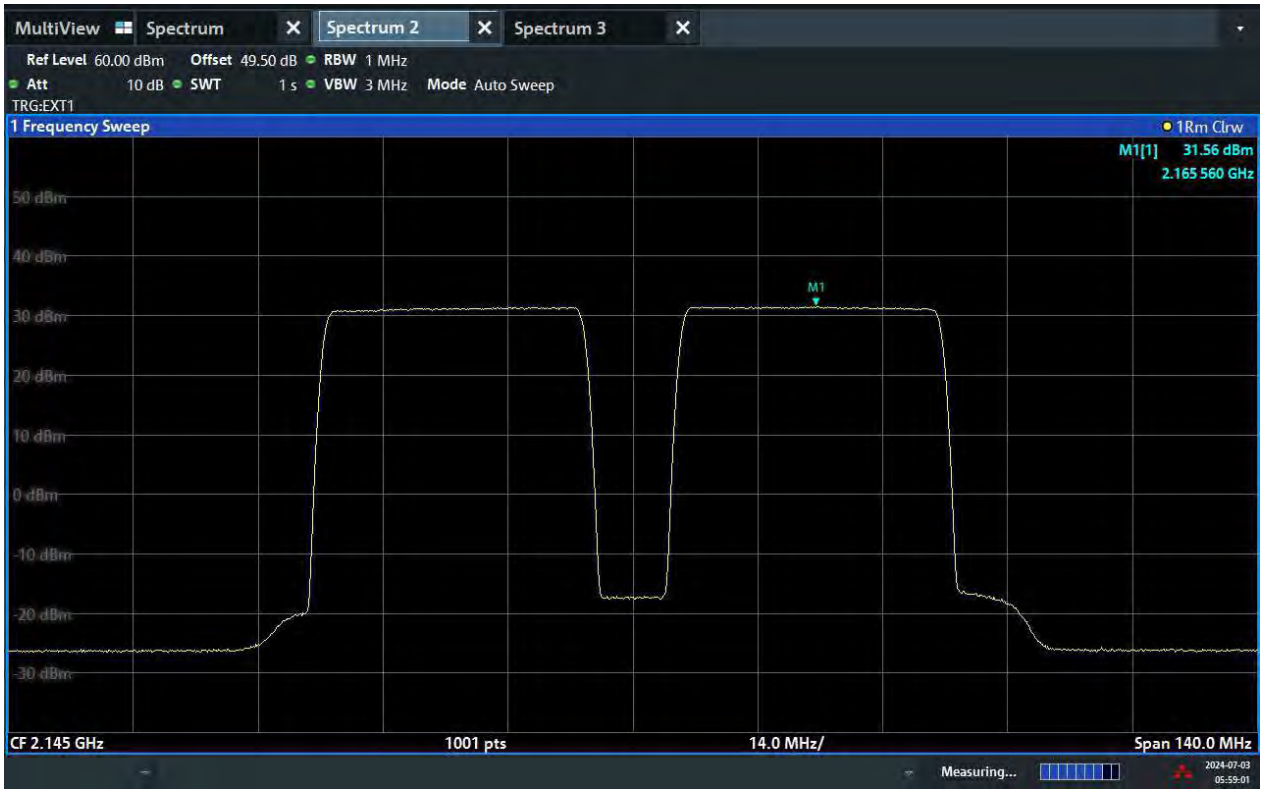
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	256QAM	35	-	-	-	48.14	30.46	-	-	-	-
B	256QAM	35	-	-	-	48.48	30.82	-	-	-	-
Total TRP			-	-	-	51.32	33.65	-	-	-	-
e.i.r.p. Limit			-	-	-	-	62.15	-	-	-	-
maximum allowed antenna gain			-	-	-	-	28.50	-	-	-	-

NR 25MHz, Channel M, Power

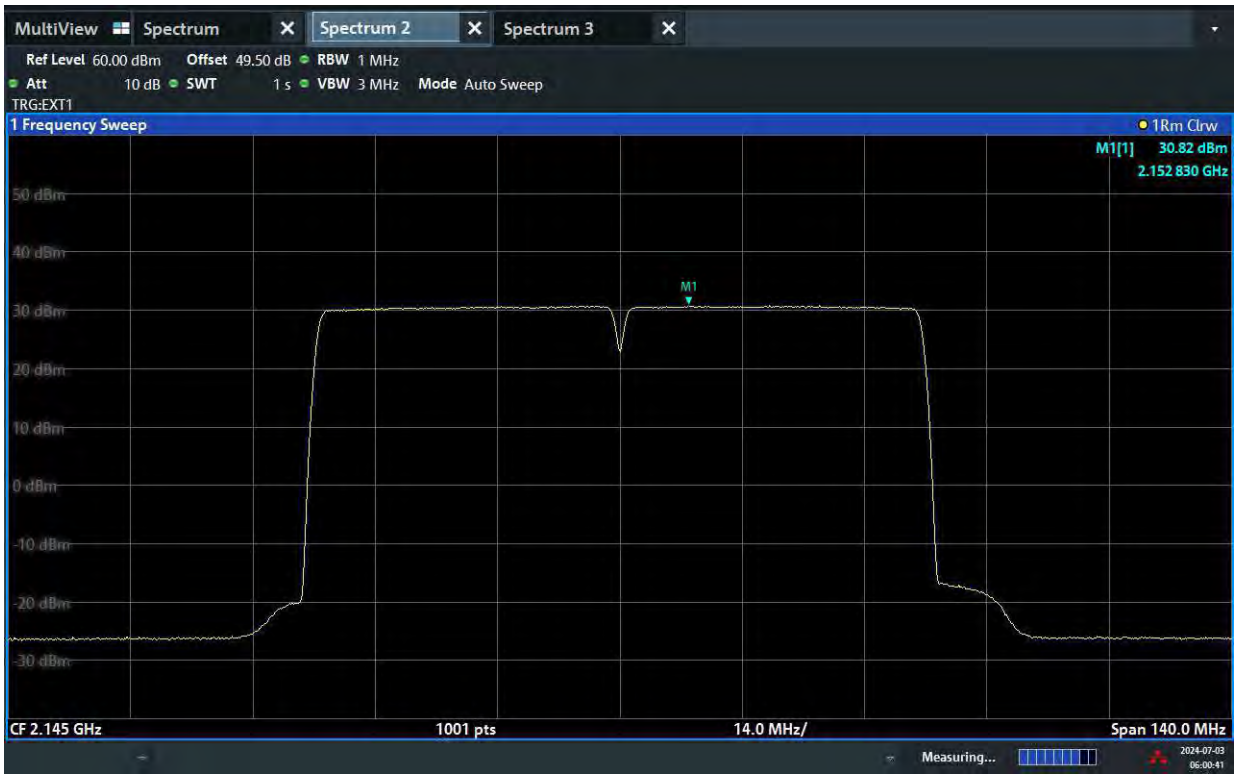


TEST REPORT

NR 30MHz, Channel M, Power



NR 35MHz, 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

NR-1C

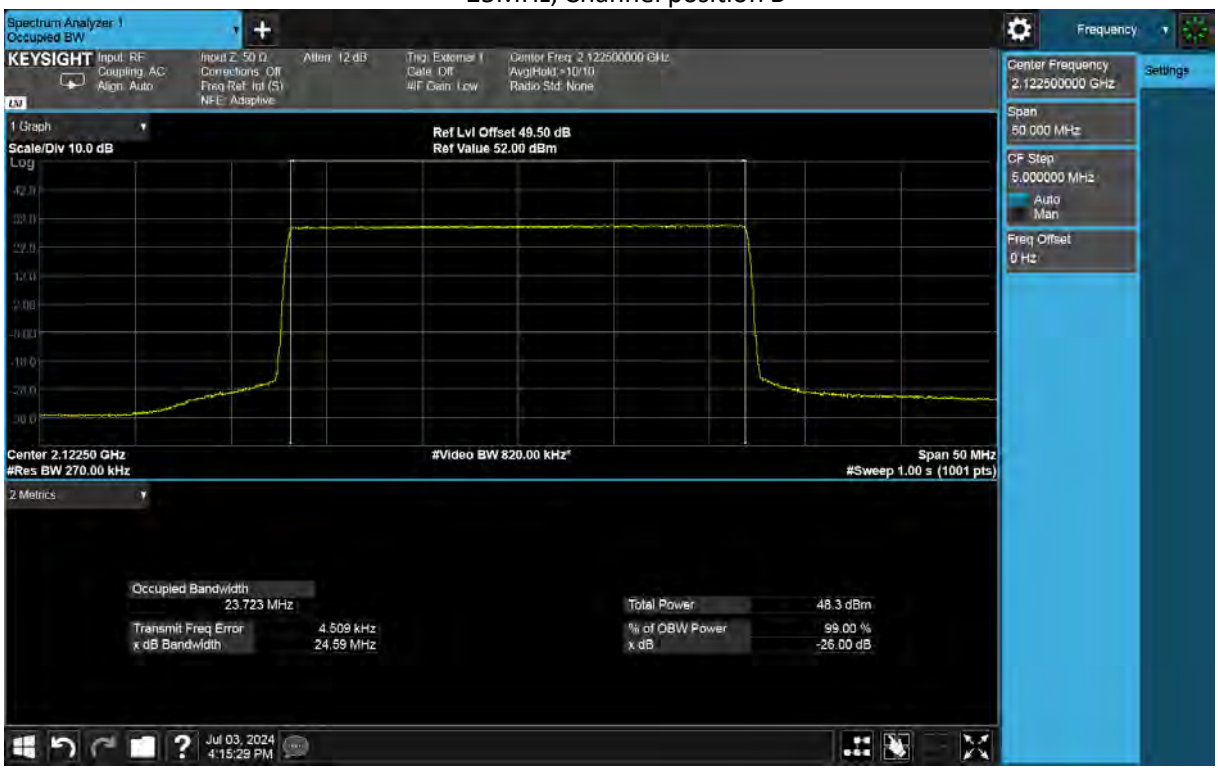
99% Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
B	256QAM	25MHz	23.723	23.726	23.723
B	256QAM	30MHz	28.536	28.541	28.534
B	256QAM	35MHz	33.516	33.522	33.515
B	256QAM	40MHz	38.513	38.526	38.522

-26dBc Occupied Bandwidth

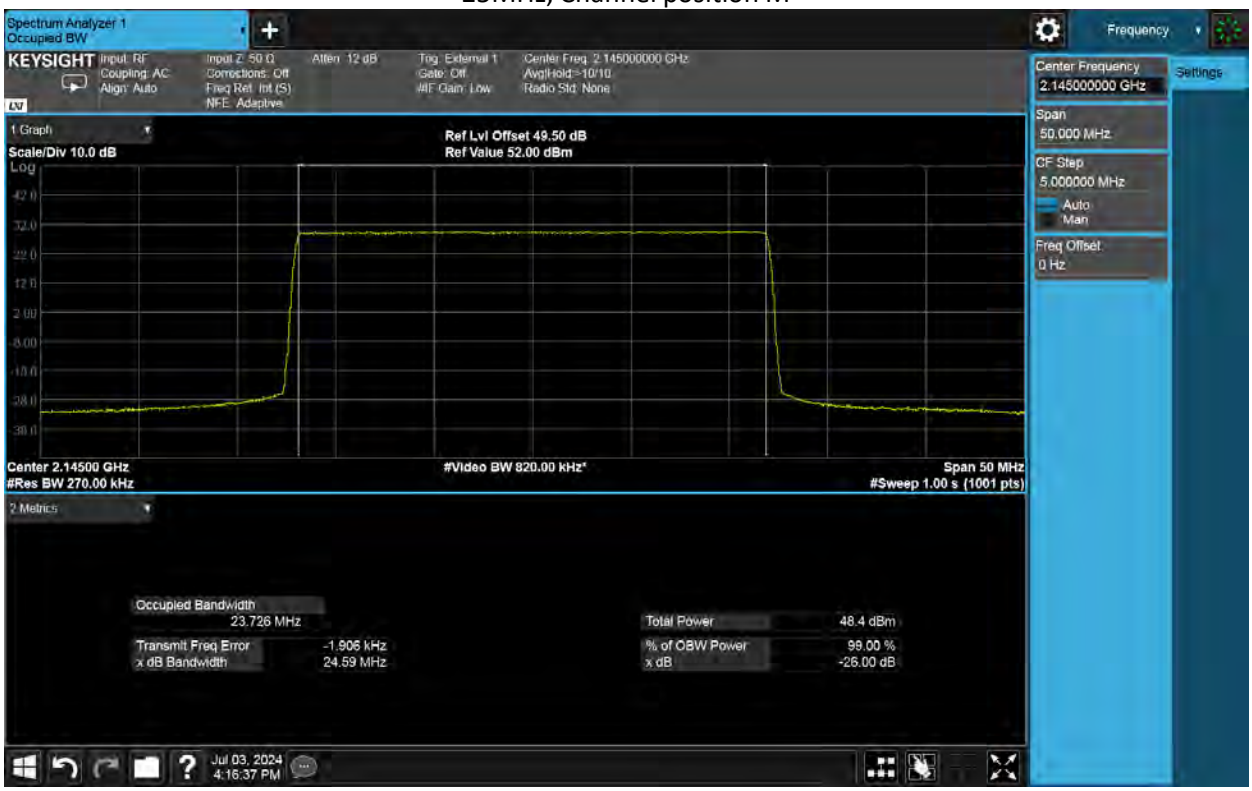
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
B	256QAM	25MHz	24.59	24.59	24.59
B	256QAM	30MHz	29.50	29.51	29.50
B	256QAM	35MHz	34.69	34.69	34.69
B	256QAM	40MHz	39.89	39.90	39.90

25MHz, Channel position B



TEST REPORT

25MHz, Channel position M



25MHz, Channel position T

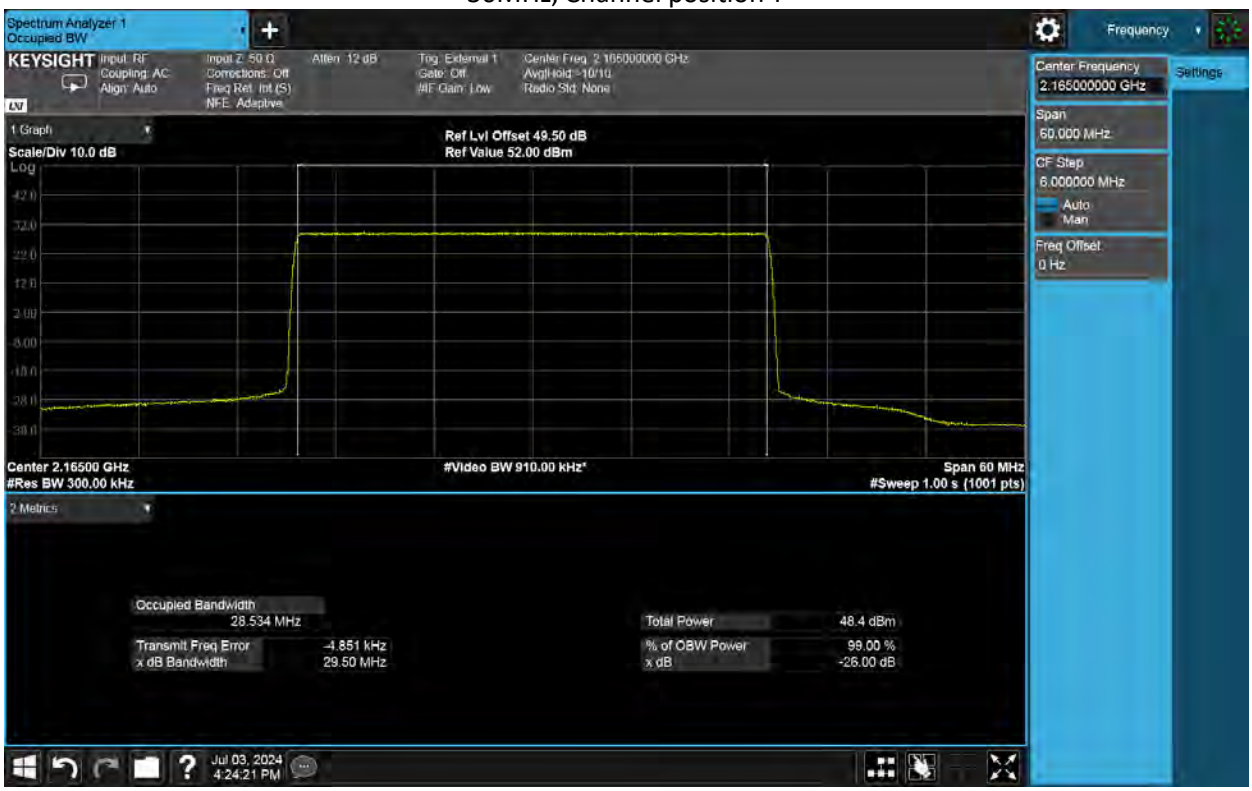
TEST REPORT

30MHz, Channel position B

30MHz, Channel position M

TEST REPORT

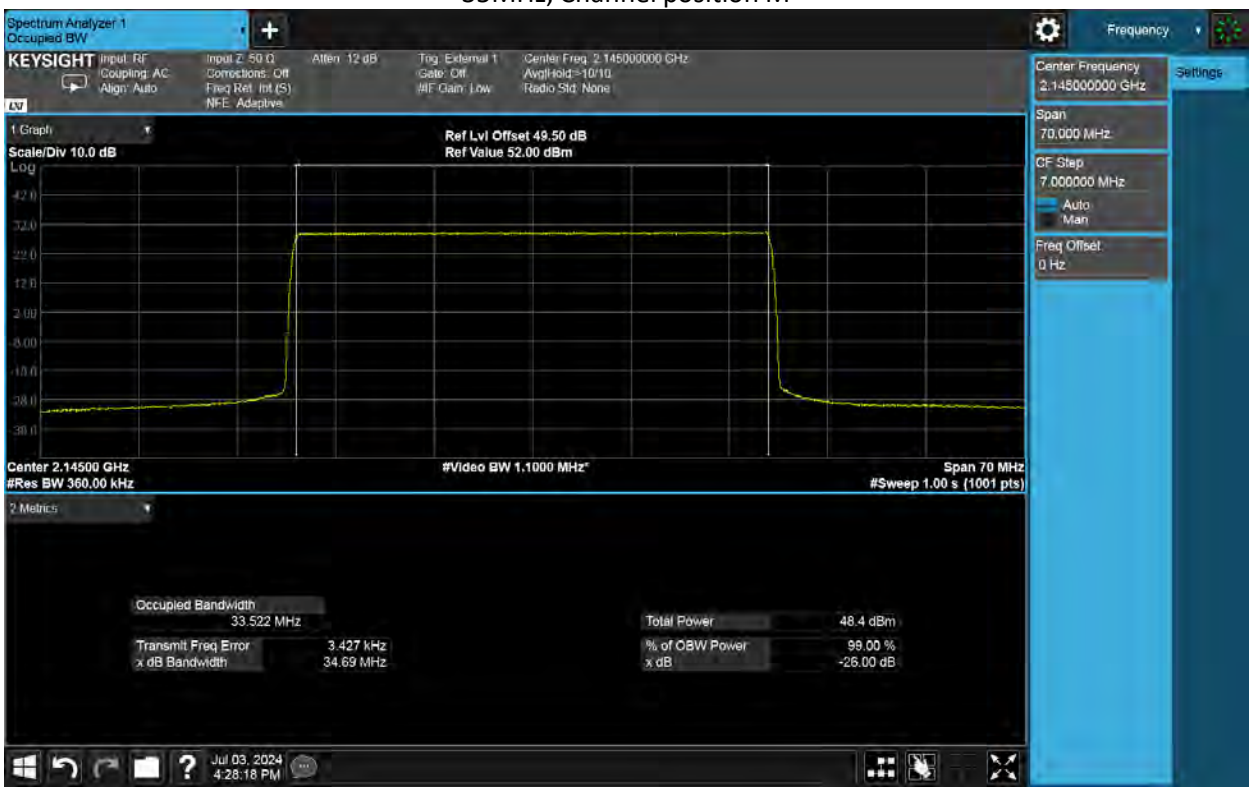
30MHz, Channel position T



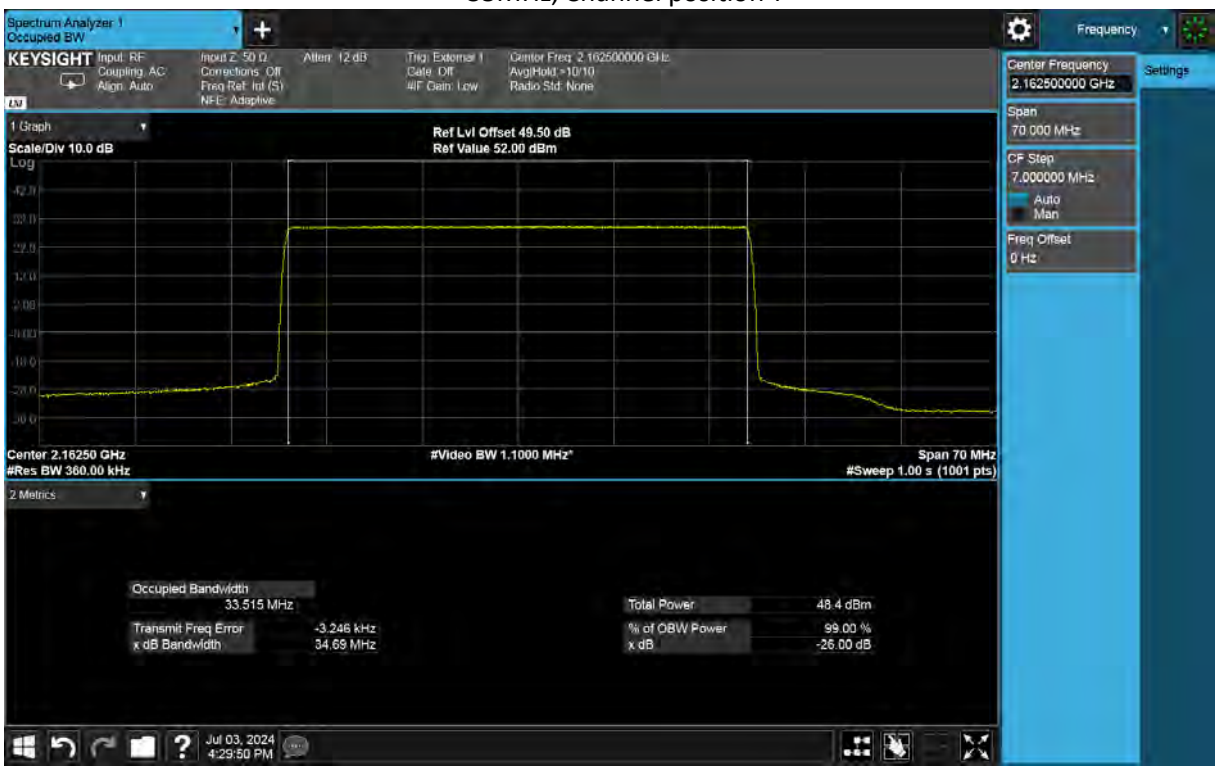
35MHz, Channel position B

TEST REPORT

35MHz, Channel position M



35MHz, Channel position T



TEST REPORT

40MHz, Channel position B

40MHz, Channel position M

TEST REPORT

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 mode configurations, the limit was adjusted with a correction of -3.02dB [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 -16.02dBm.

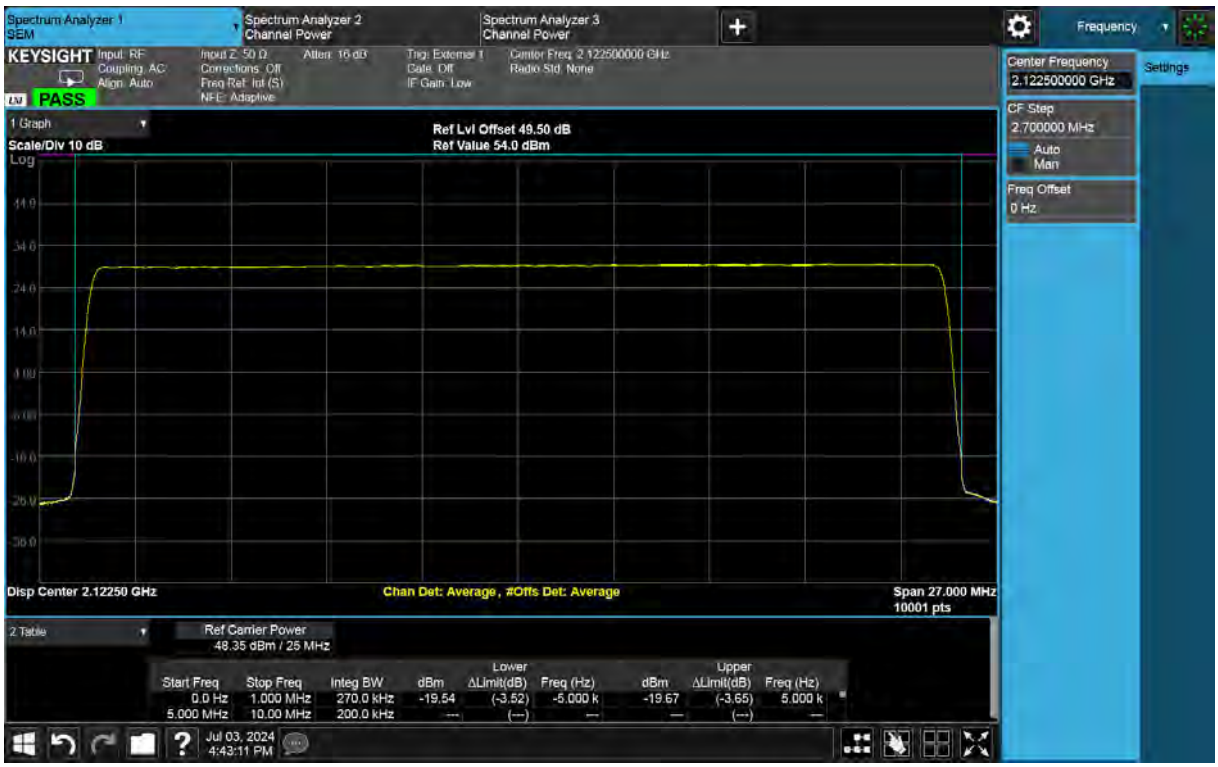
Spectrum analyzer detector was set as RMS.

5.3 Measurement result

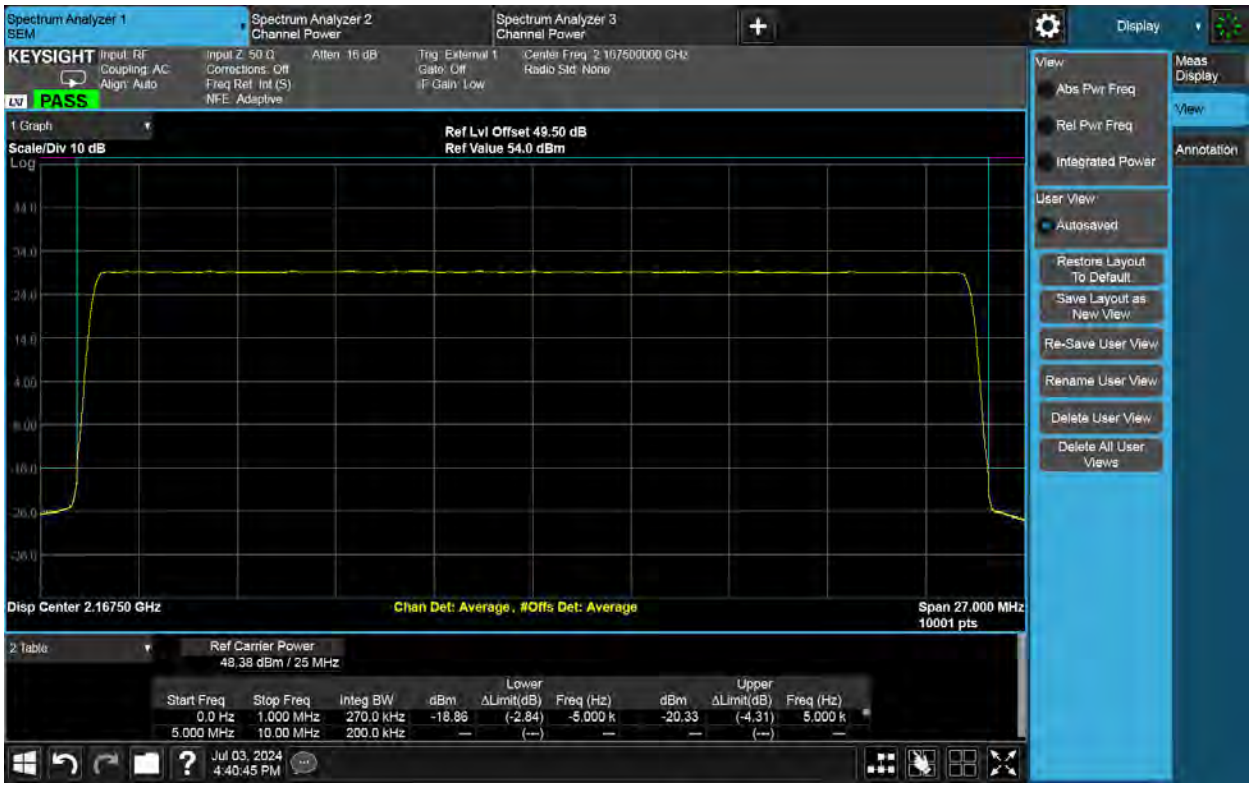
NR-1C-BE

Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	25	270	-16.02
B	T	256QAM	25	270	-16.02

Channel Position B

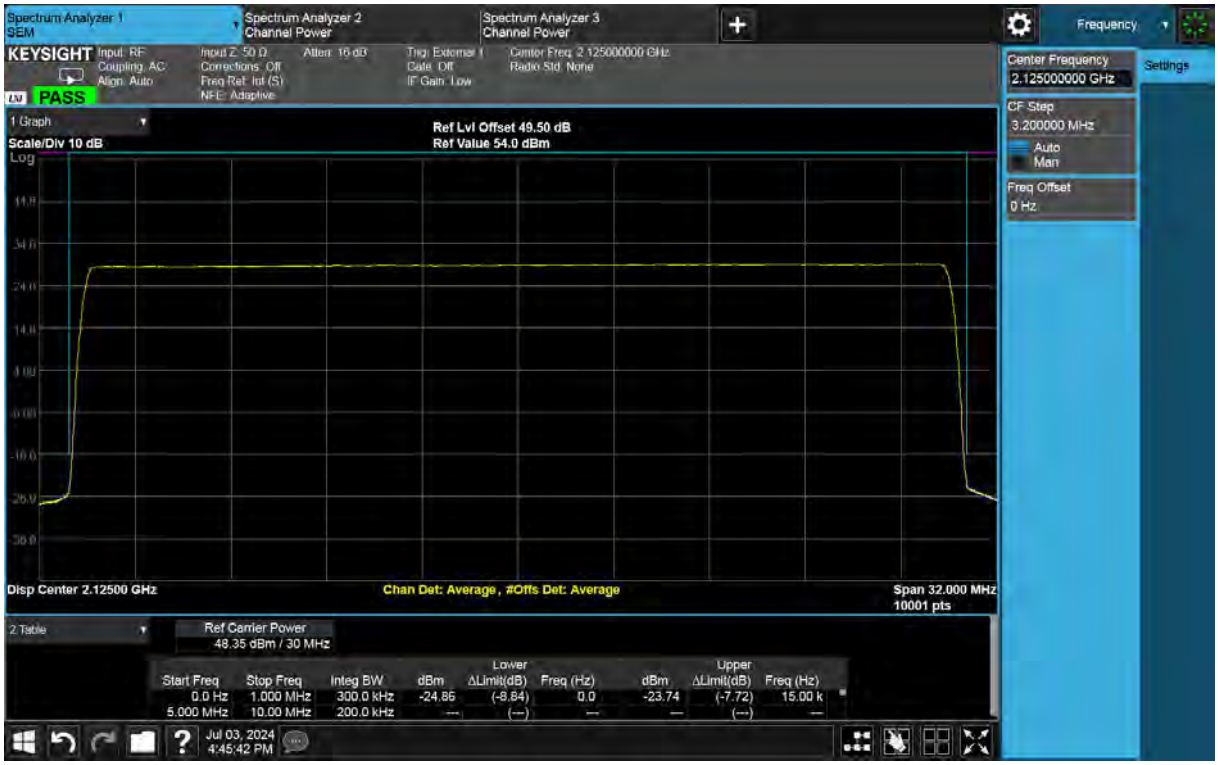


Channel Position T

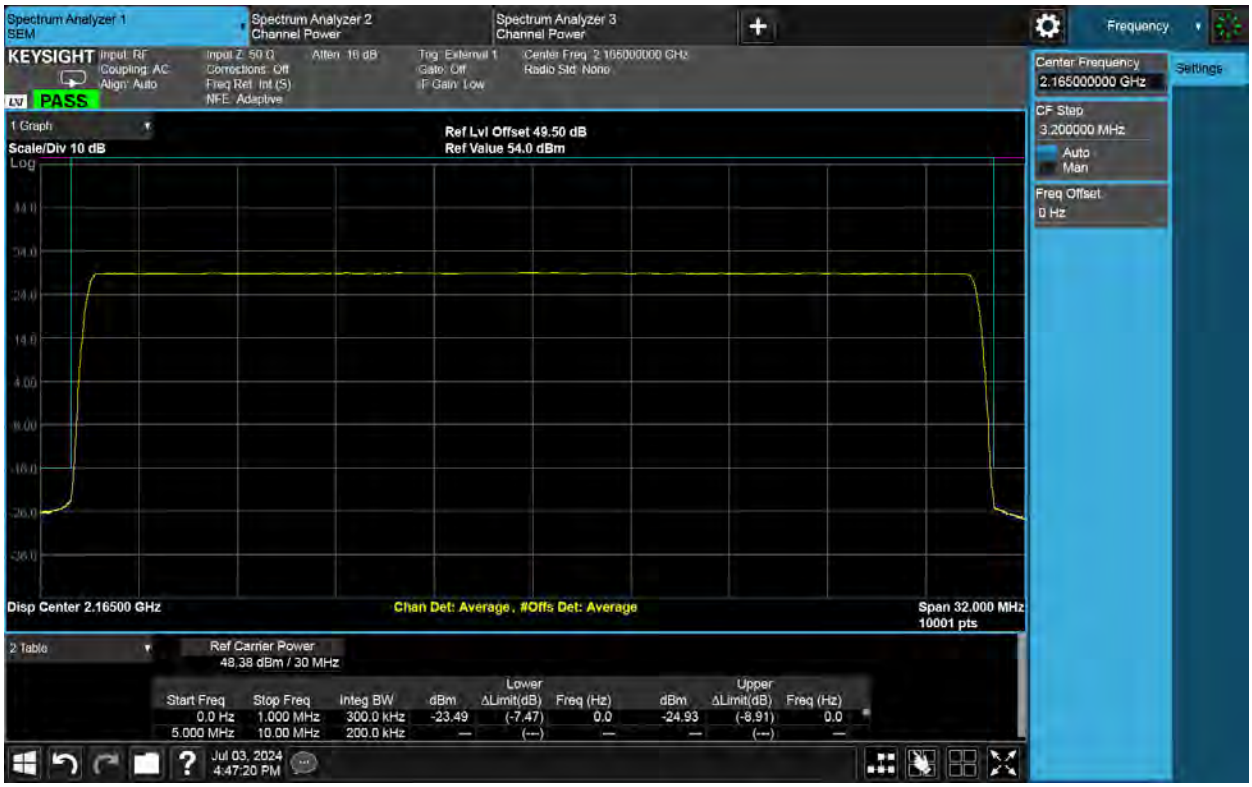


Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	30	300	-16.02
B	T	256QAM	30	300	-16.02

Channel Position B

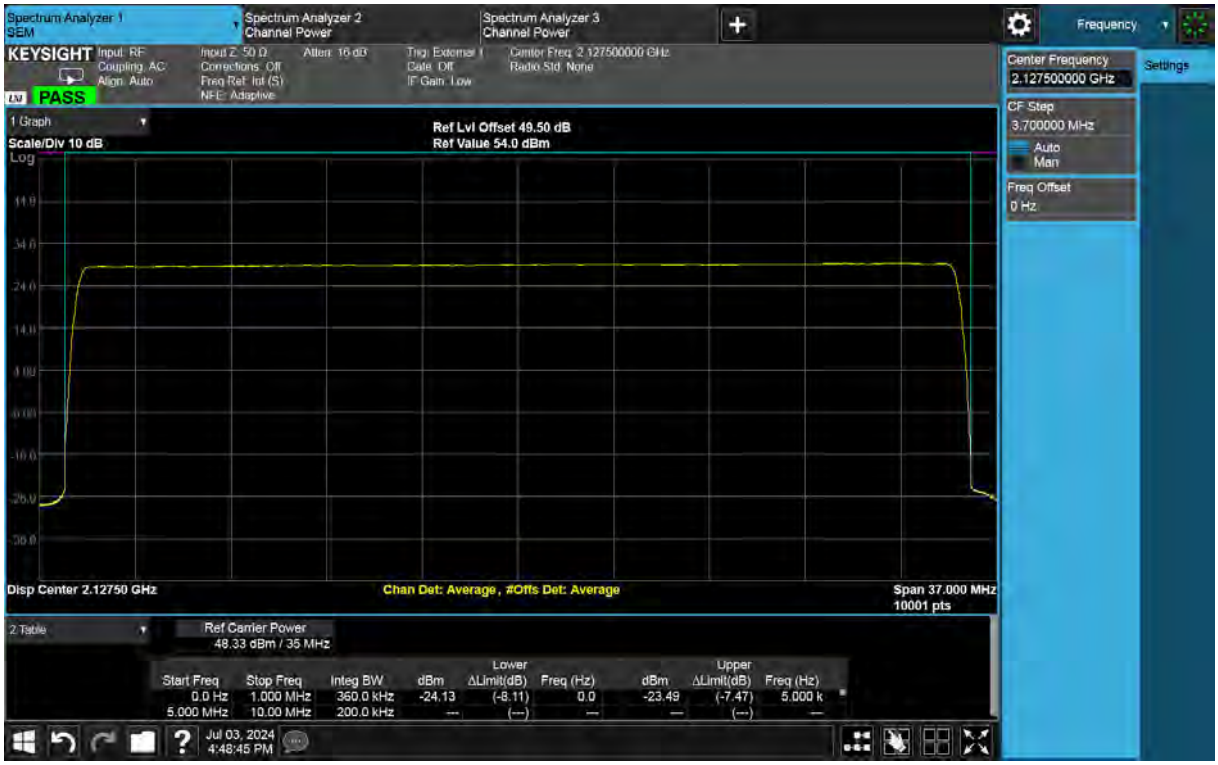


Channel Position T

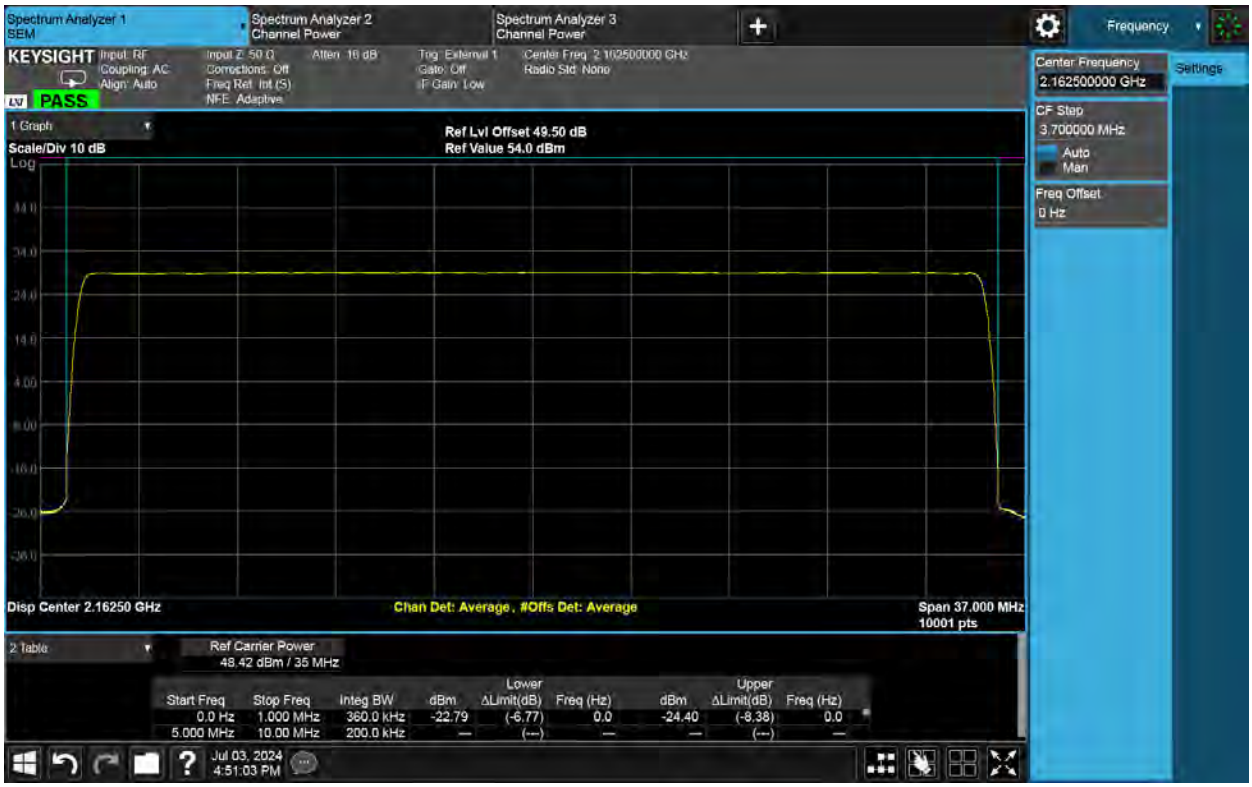


Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	35	360	-16.02
B	T	256QAM	35	360	-16.02

Channel Position B

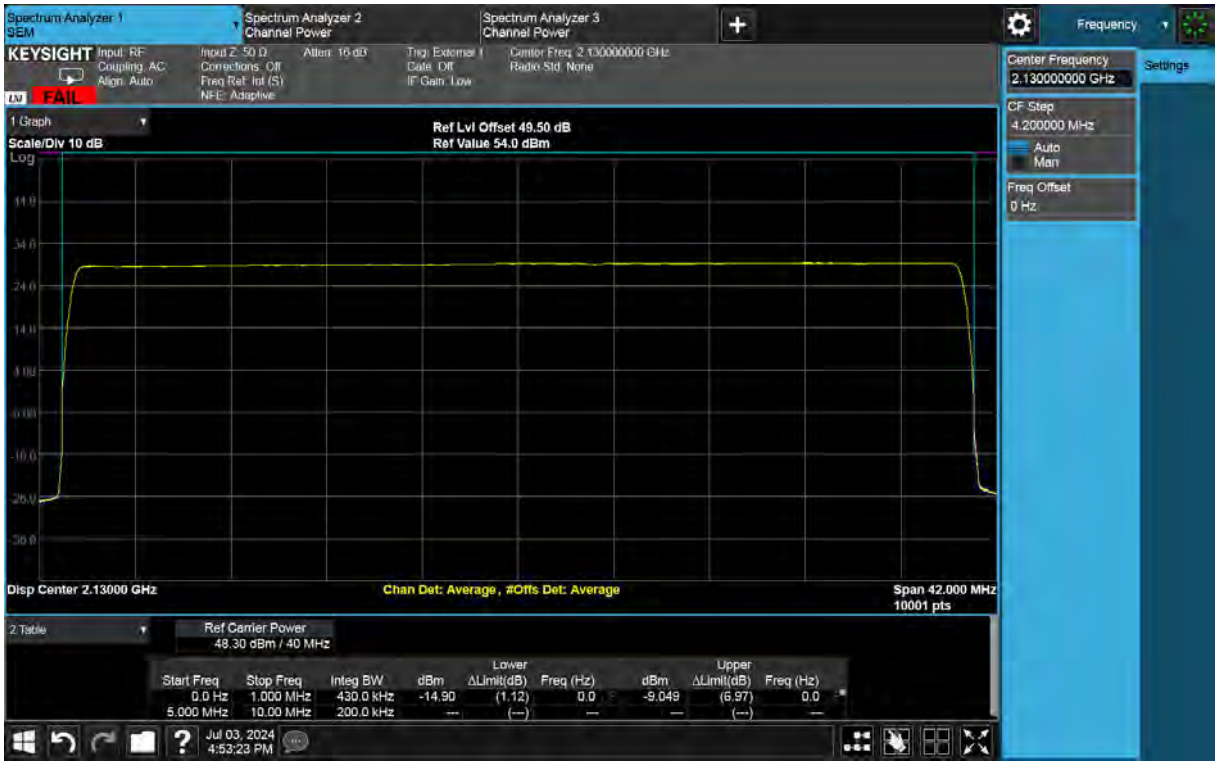


Channel Position T

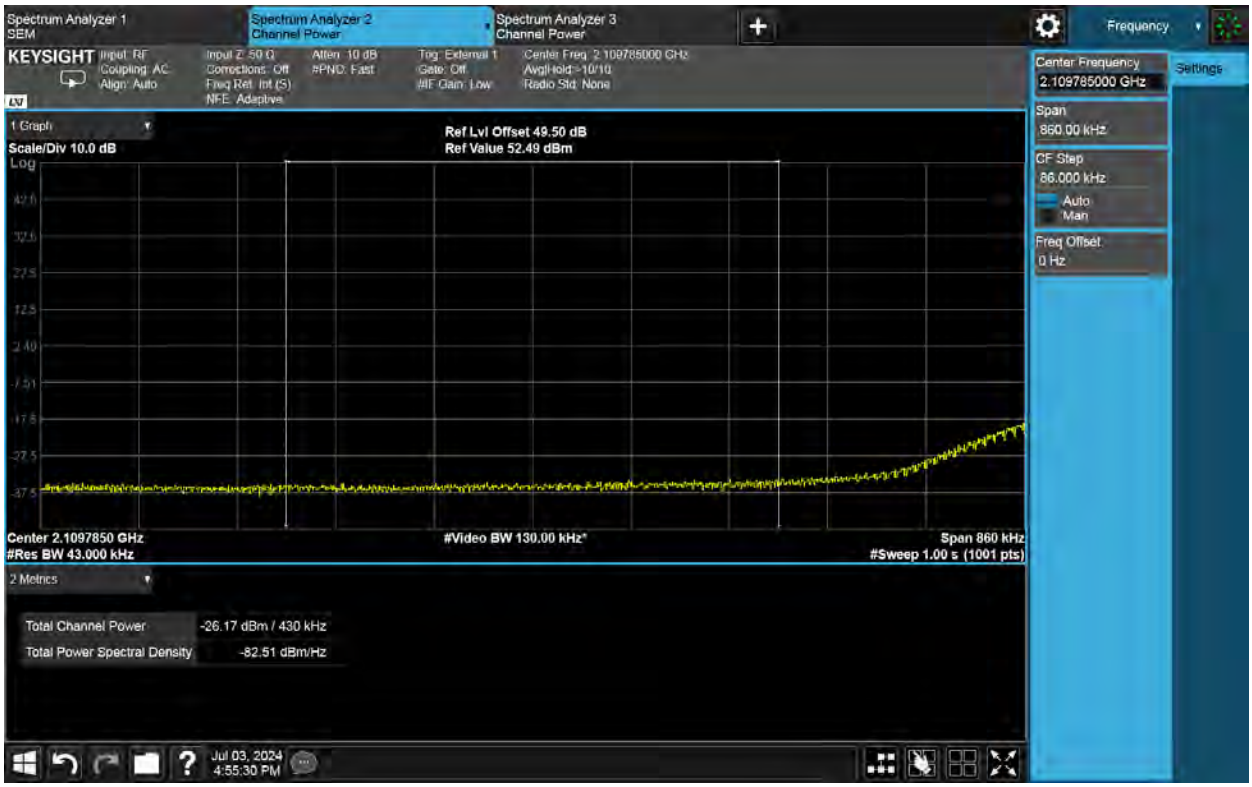


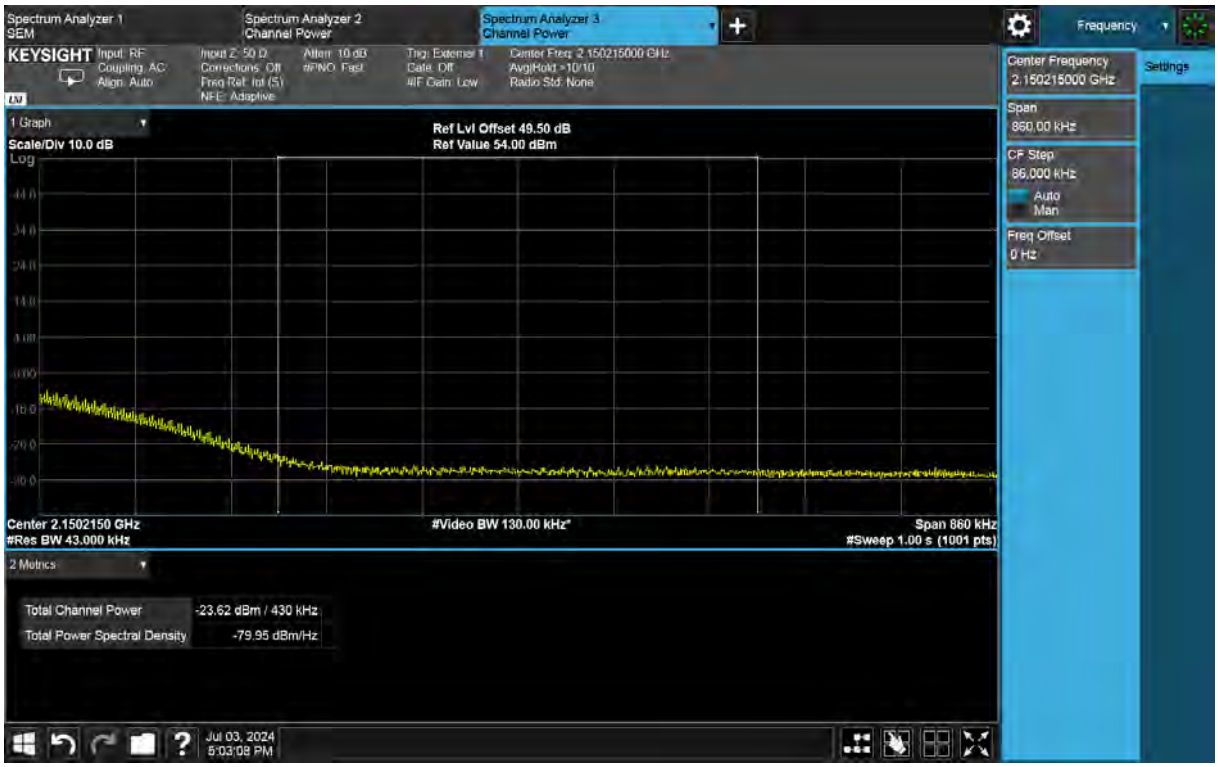
Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	40	430	-16.02
B	T	256QAM	40	430	-16.02

Channel Position B



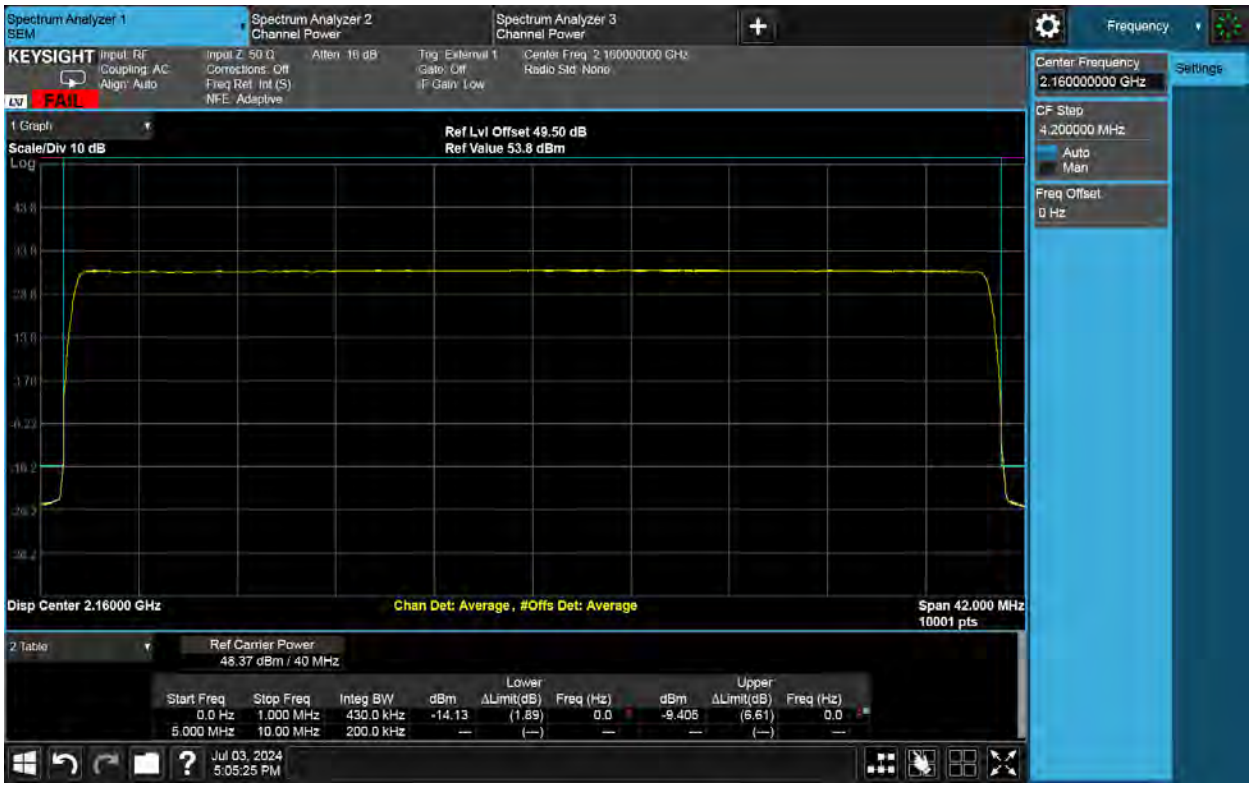
TEST REPORT

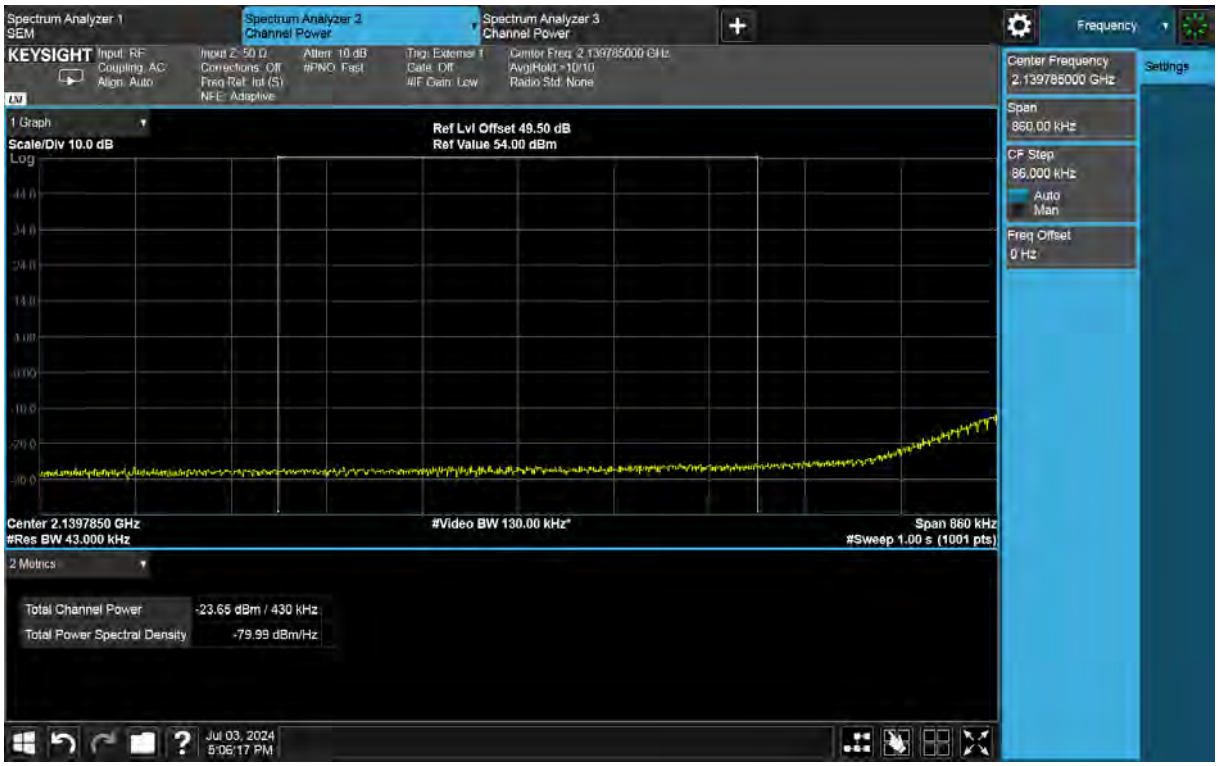

Spectrum Analyzer 1
SEM
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 3
Channel Power
KEYSIGHT
Frequency
Center Frequency
2.109785000 GHz
Settings
Span
860.00 kHz
CF Step
86.000 kHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Scale/Div 10.0 dB
Ref Lvl Offset 49.50 dB
Ref Value 52.49 dBm
Log
Center 2.1097850 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
-26.17 dBm / 430 kHz
Total Power Spectral Density
-82.51 dBm/Hz
Jul 03, 2024
4:55:30 PM


Spectrum Analyzer 1
SEM
Spectrum Analyzer 2
Channel Power
Spectrum Analyzer 3
Channel Power
KEYSIGHT
Frequency
Center Frequency
2.150215000 GHz
Settings
Span
860.00 kHz
CF Step
86.000 kHz
Auto
Man
Freq Offset
0 Hz
1 Graph
Scale/Div 10.0 dB
Ref Lvl Offset 49.50 dB
Ref Value 54.00 dBm
Log
Center 2.1502150 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
-23.62 dBm / 430 kHz
Total Power Spectral Density
-79.95 dBm/Hz
Jul 03, 2024
5:03:08 PM

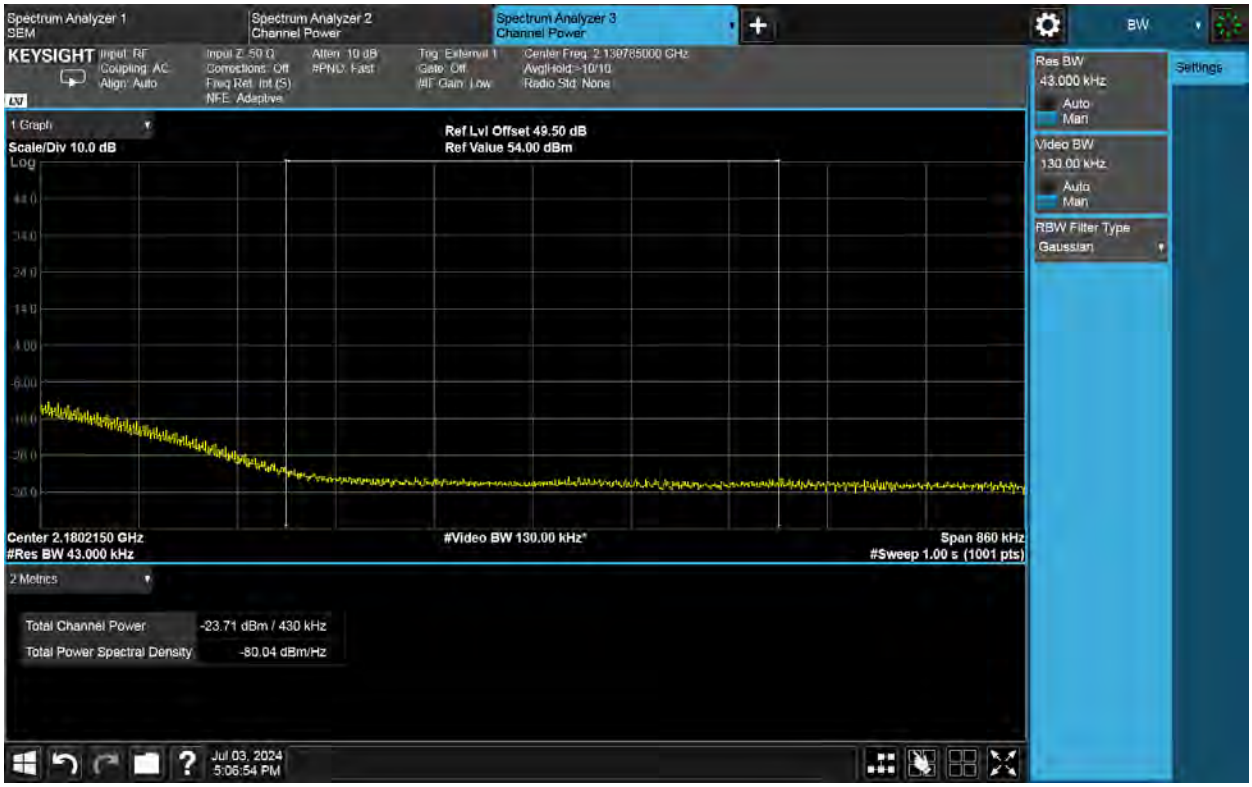
TEST REPORT

Channel Position T





TEST REPORT

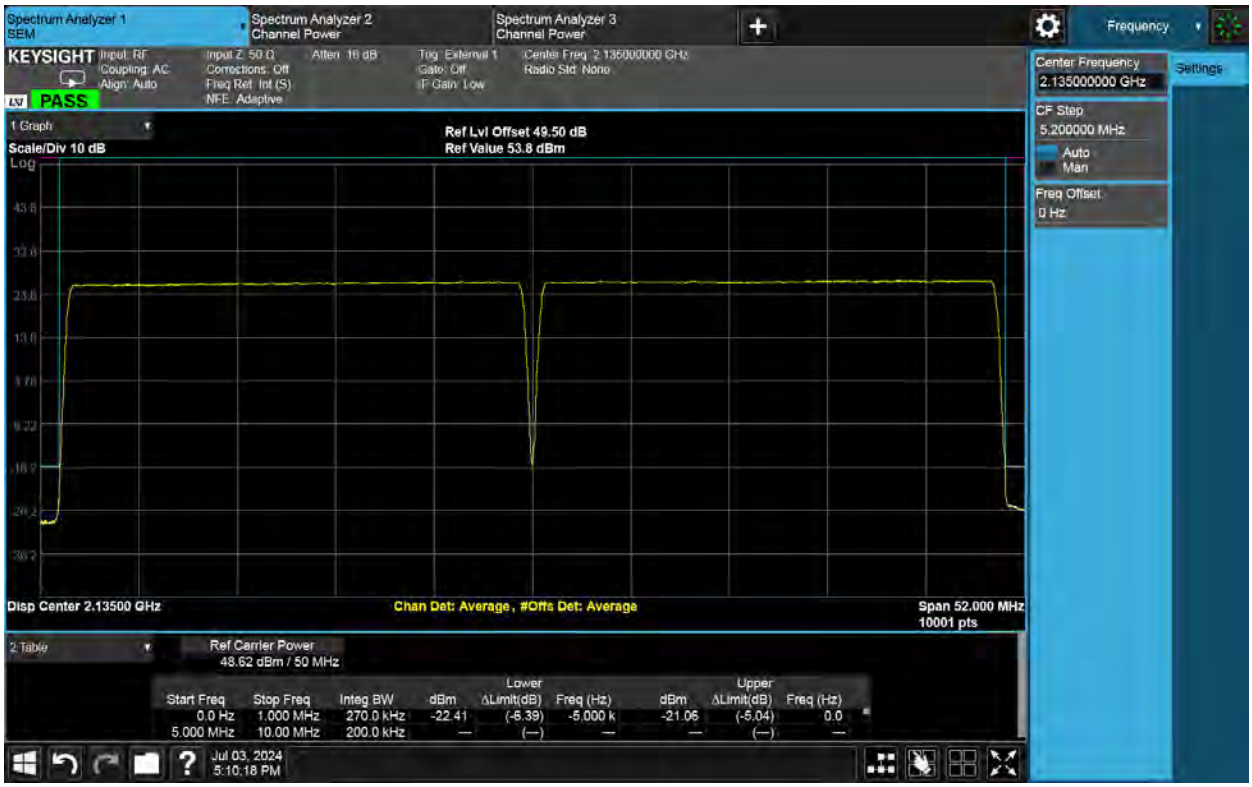


NR-2C-BE

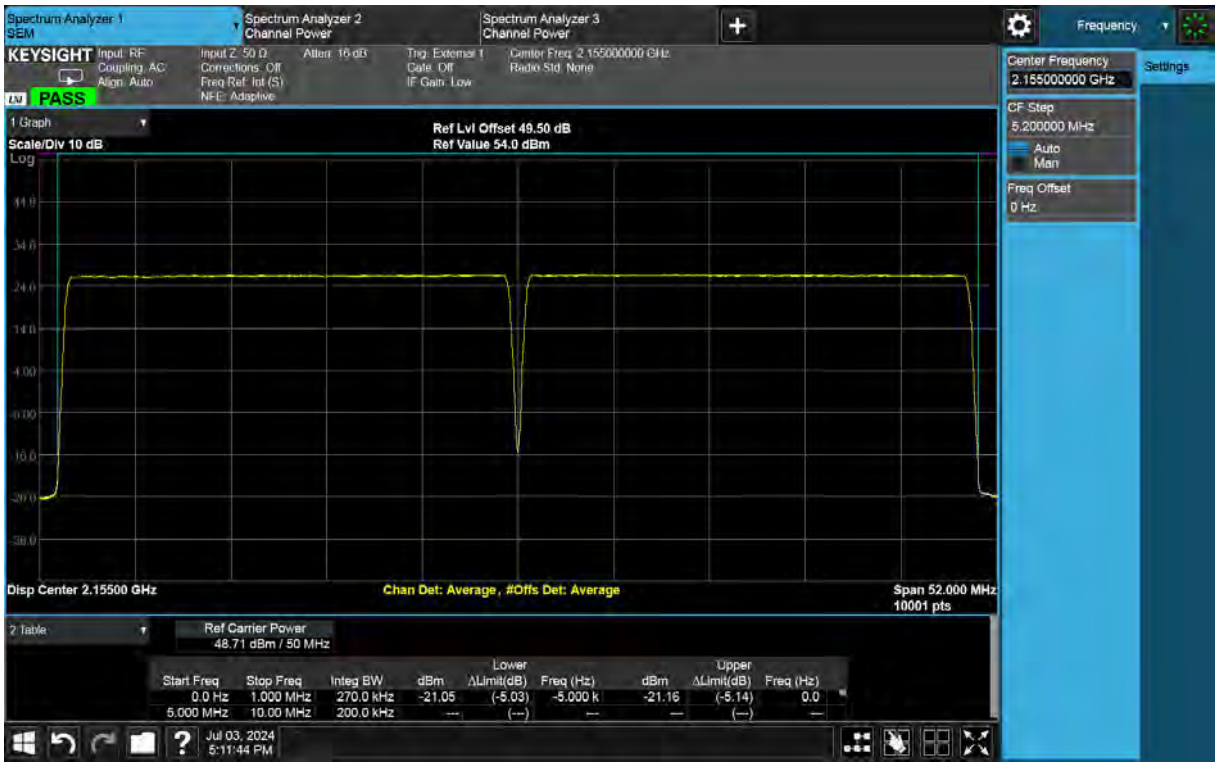
Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	25	270	-16.02
B	T	256QAM	25	270	-16.02

TEST REPORT

Channel Position B



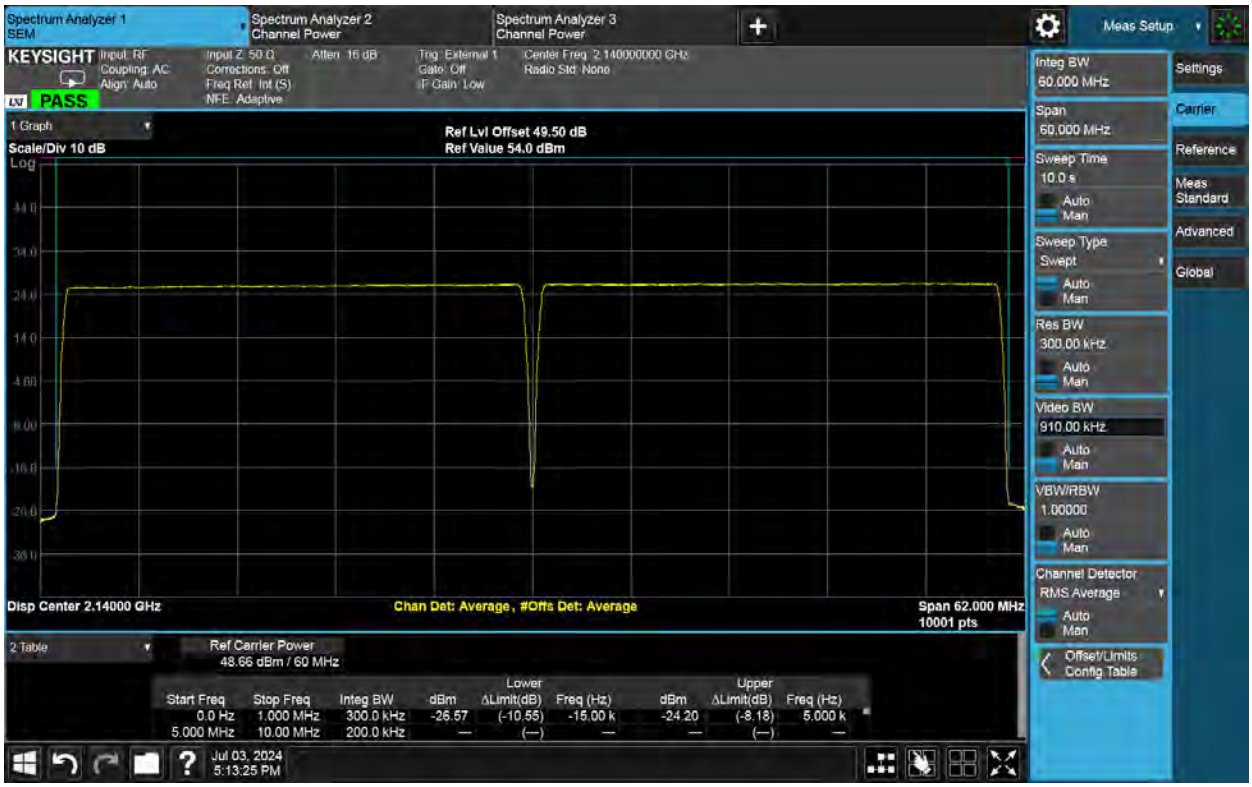
Channel Position T



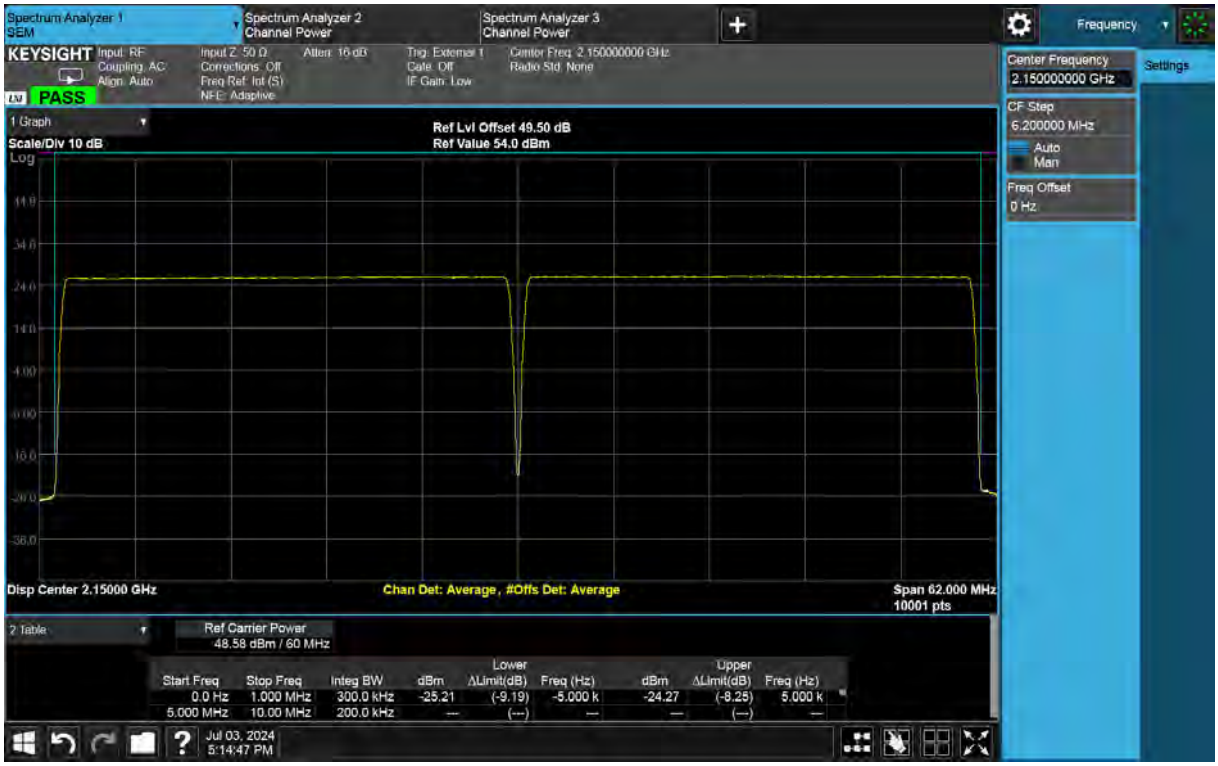
TEST REPORT

Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	30	300	-16.02
B	T	256QAM	30	300	-16.02

Channel Position B



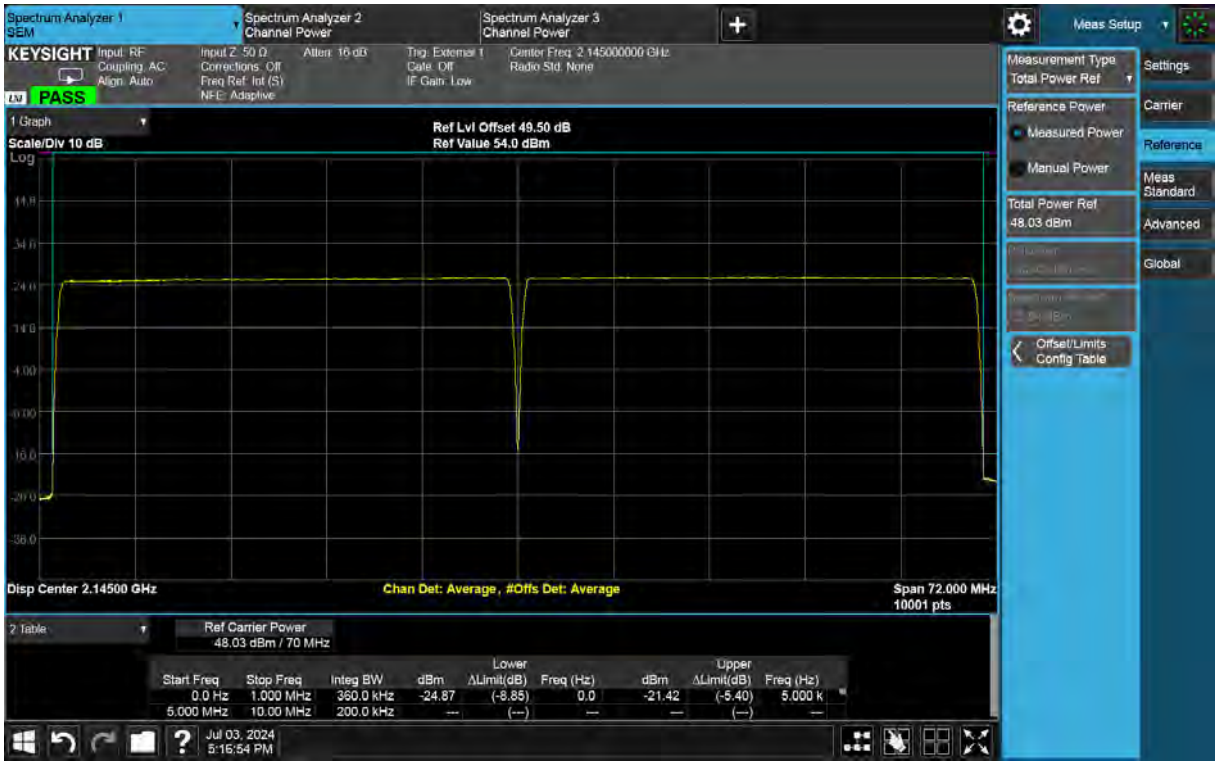
Channel Position T



TEST REPORT

Port	Channel Position	Modulation	Carrier BW (MHz)	RBW (kHz)	Limit (dBm)
B	M	256QAM	35	360	-16.02

Channel Position M



6 Conducted Unwanted Emission

Test result: **Pass**

6.1 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.

6.2 Measurement Procedure

In accordance with FCC rules, 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.

The spurious emissions from the antenna terminal were measured. The transmitter output power was attenuated using an attenuator and the frequency spectrum investigated from 9kHz to 22GHz. The resolution bandwidth of 1MHz was employed for frequency band 9kHz to 22GHz. The spectrum analyzer detector was set to RMS.

For MIMO mode configurations, the limit was adjusted with a correction of -3.02dB [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 -16.02dBm.

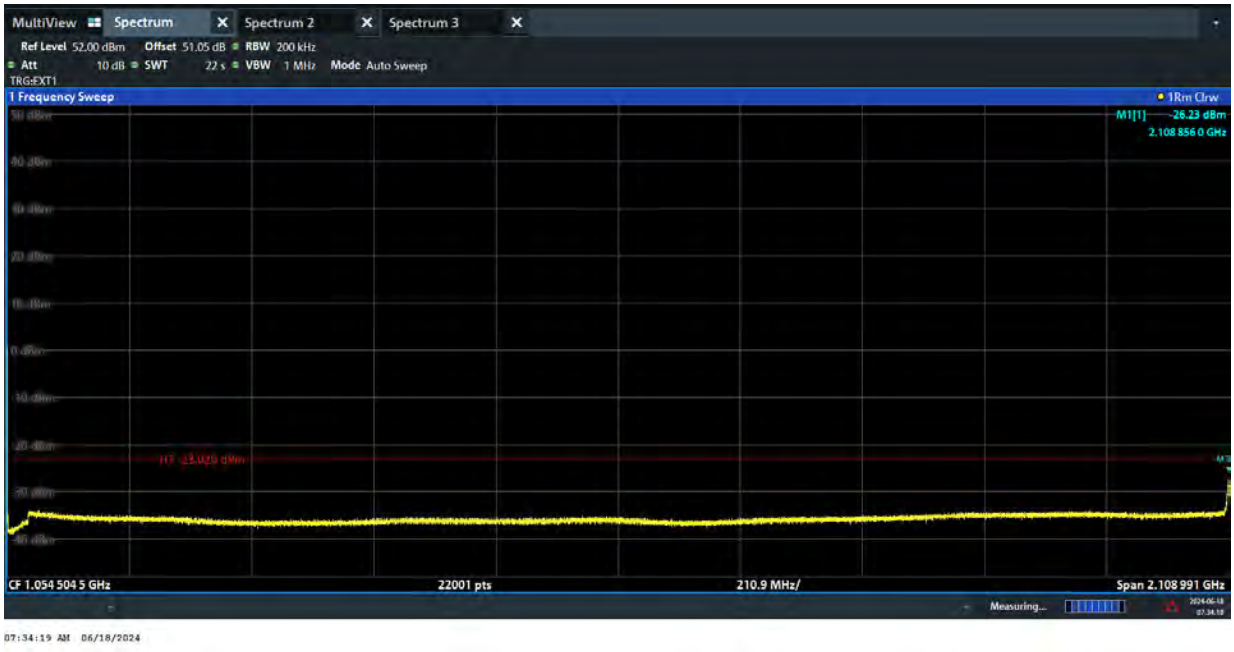
Note: If necessary, the limit was adjusted with -7.00dB [10Log(200/1000)] to compensate for the reduce measurement bandwidth 200kHz for emission more than 1MHz away from the band edges. For MIMO mode, the limit of -23.02dBm was used for emission more than 1MHz away from the band edges.

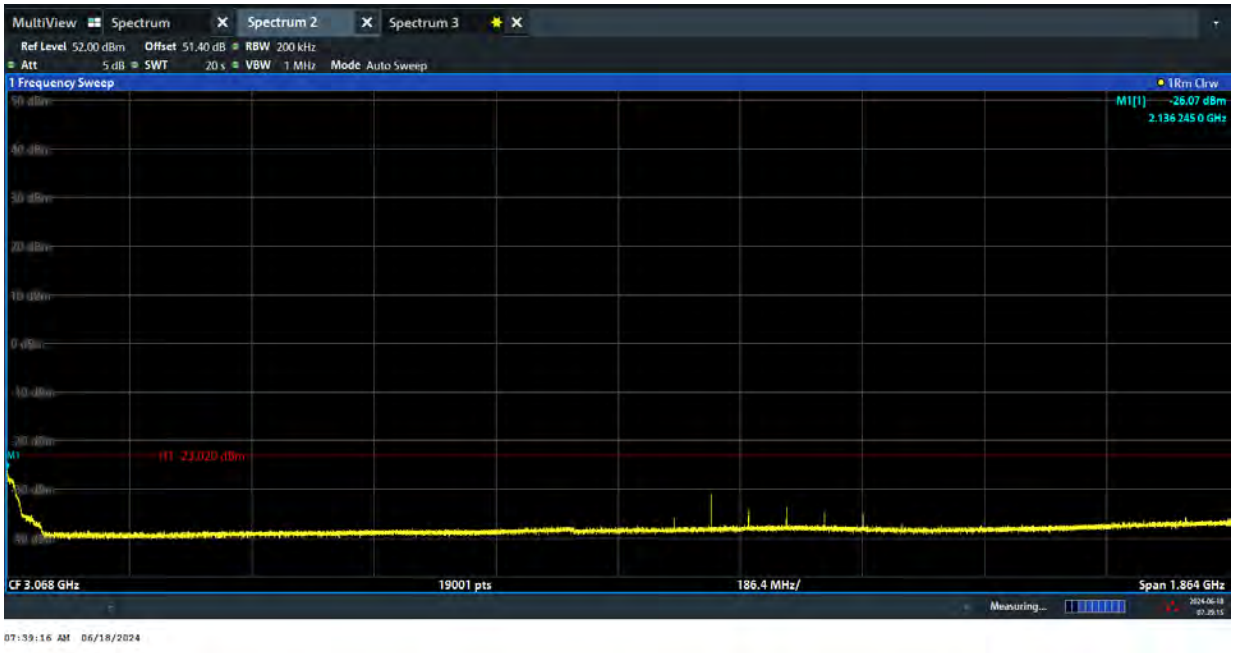
6.3 Measurement result

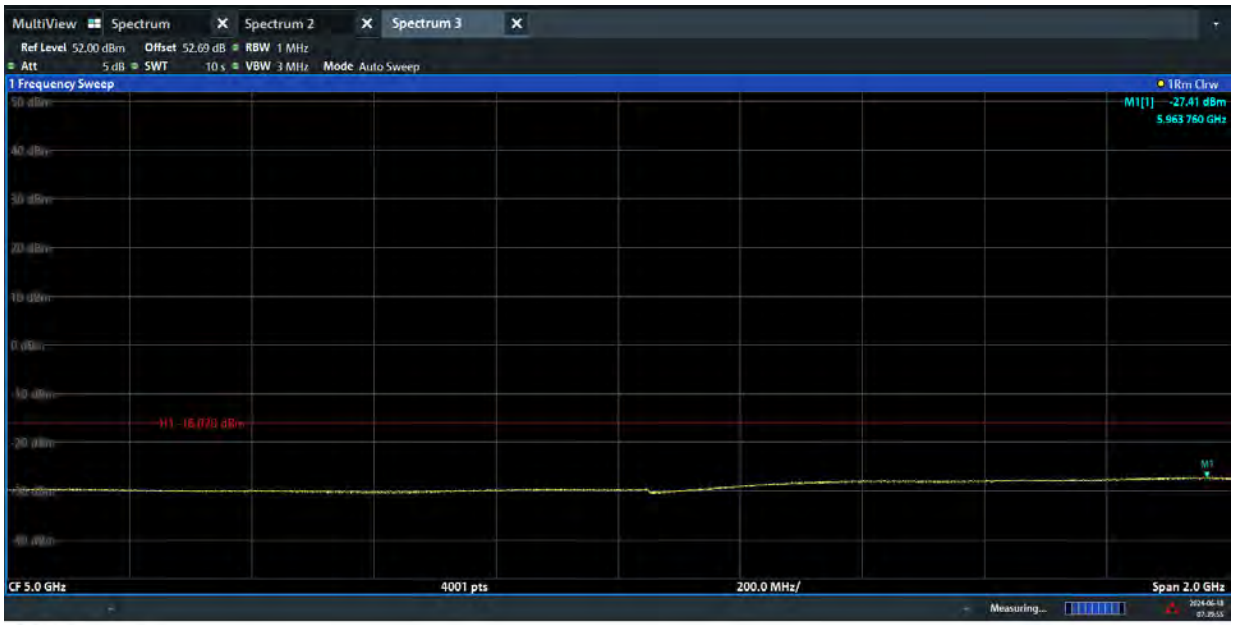
NR-1C-UE

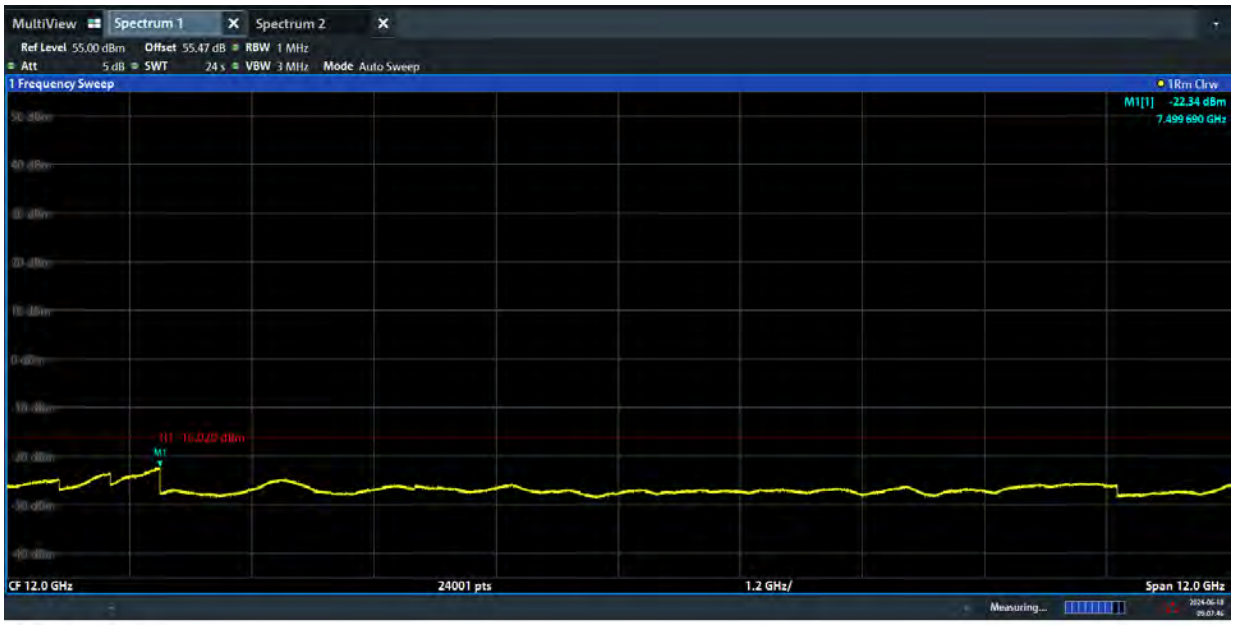
Antenna Port	Channel Position	NR Modulation	NR Channel BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	25	1000/200	-16.02/-23.02
B	T	256QAM	25	1000/200	-16.02/-23.02

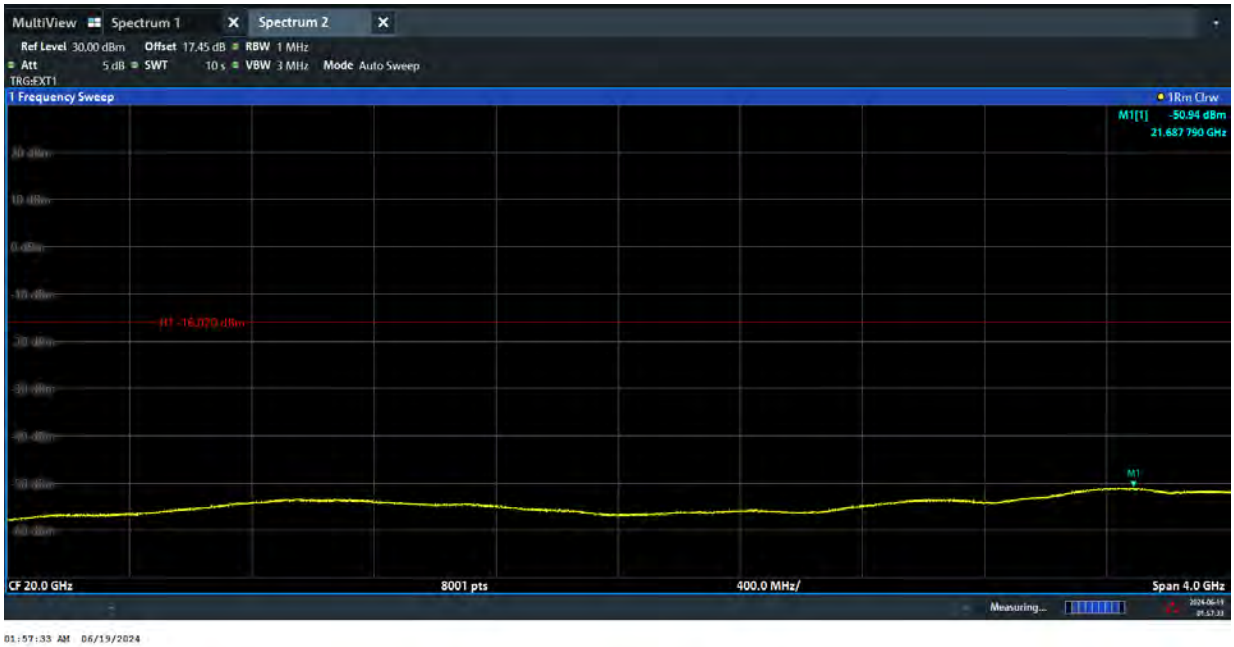
Channel Position B



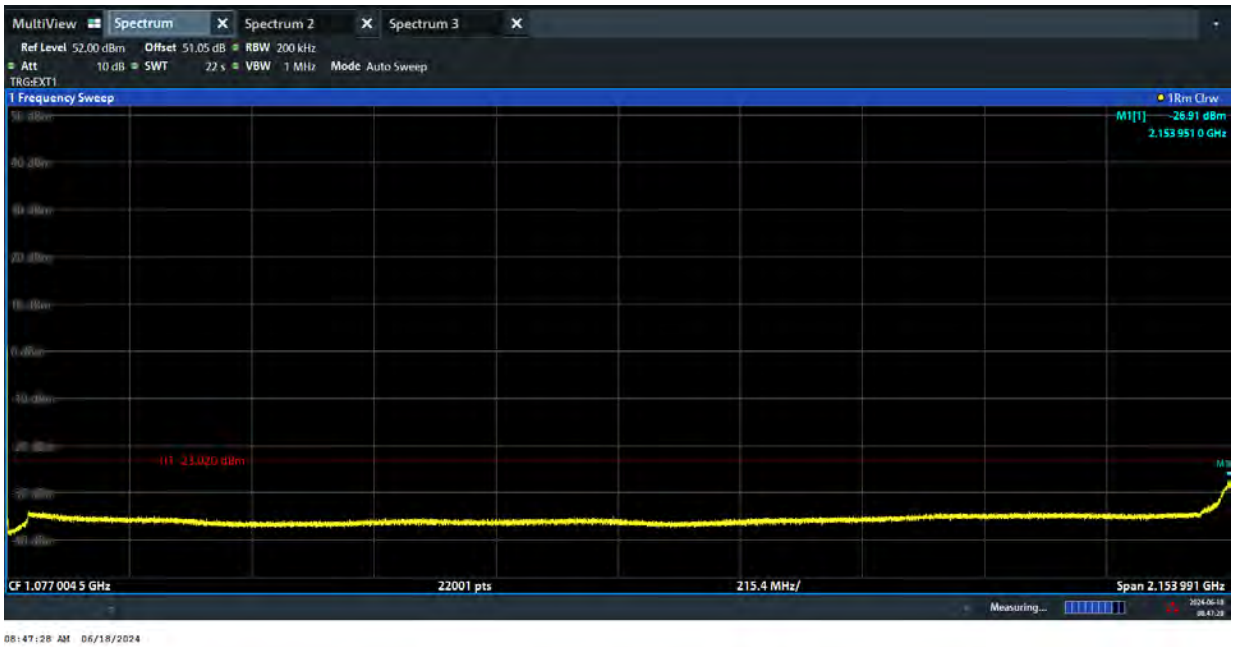



MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm
Offset 52.69 dB
RBW 1 MHz
Att 5 dB
SWT 10 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.41 dBm
5.963 760 GHz
CF 5.0 GHz
4001 pts
200.0 MHz/
Span 2.0 GHz
Measuring...
07:39:56 AM 06/18/2024


MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm
Offset 55.47 dB
RBW 1 MHz
Att 5 dB
SWT 24 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.34 dBm
7.499 680 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
09:07:47 AM 06/18/2024

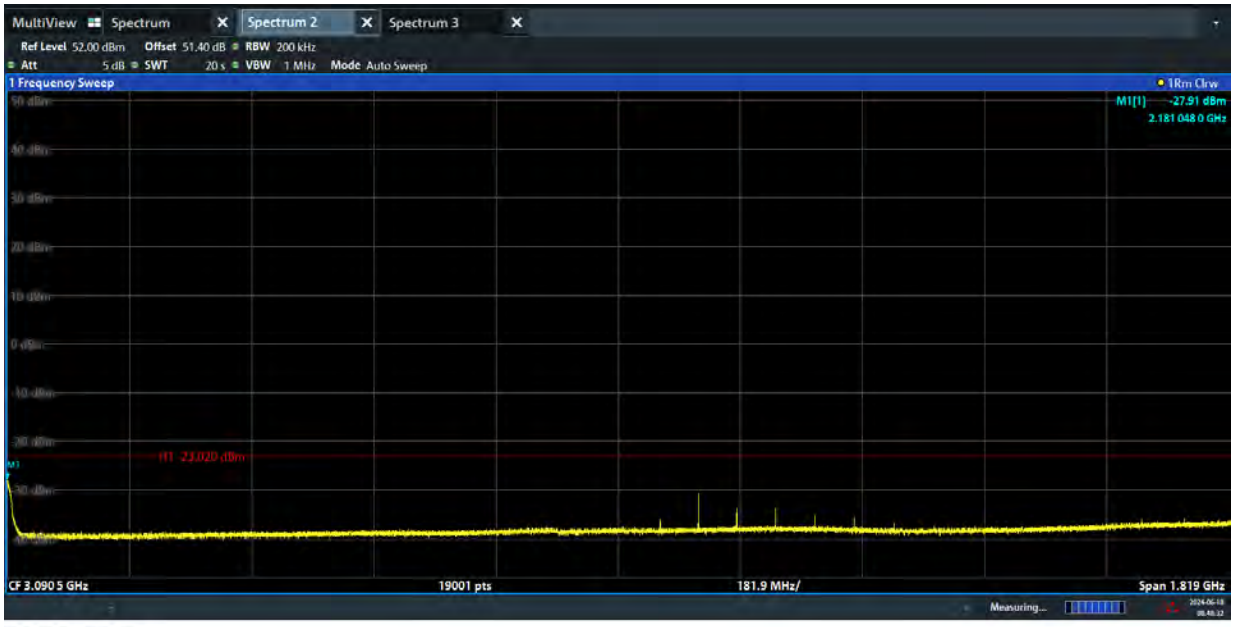


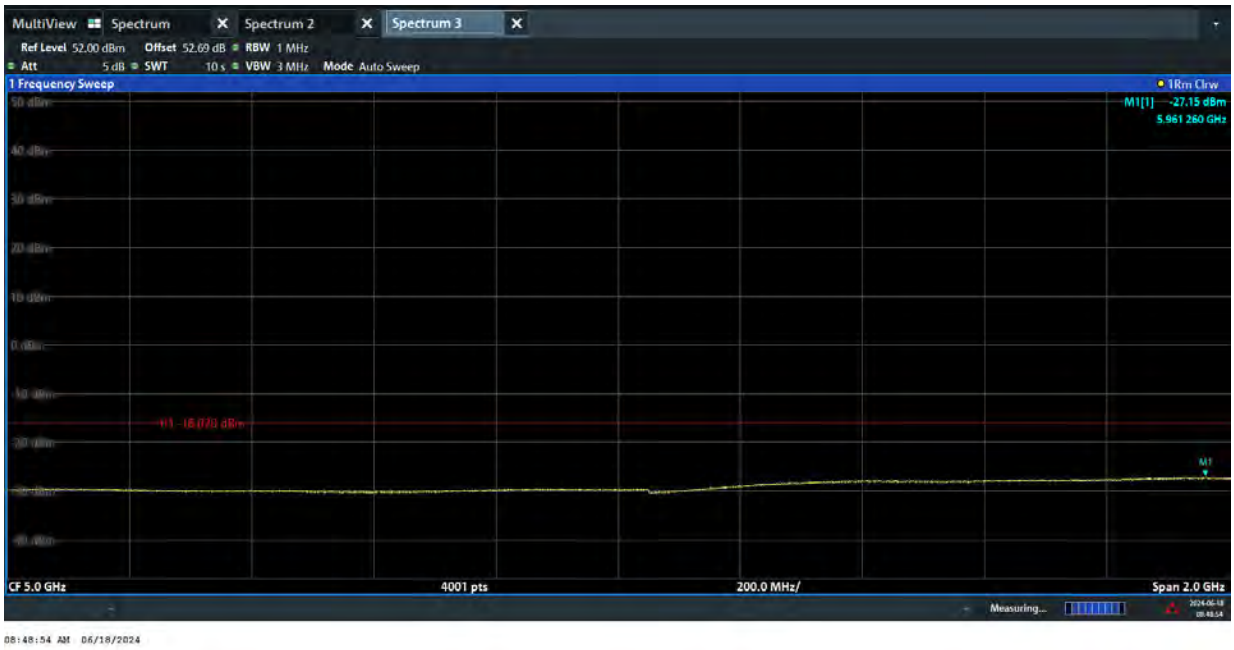
Channel Position T



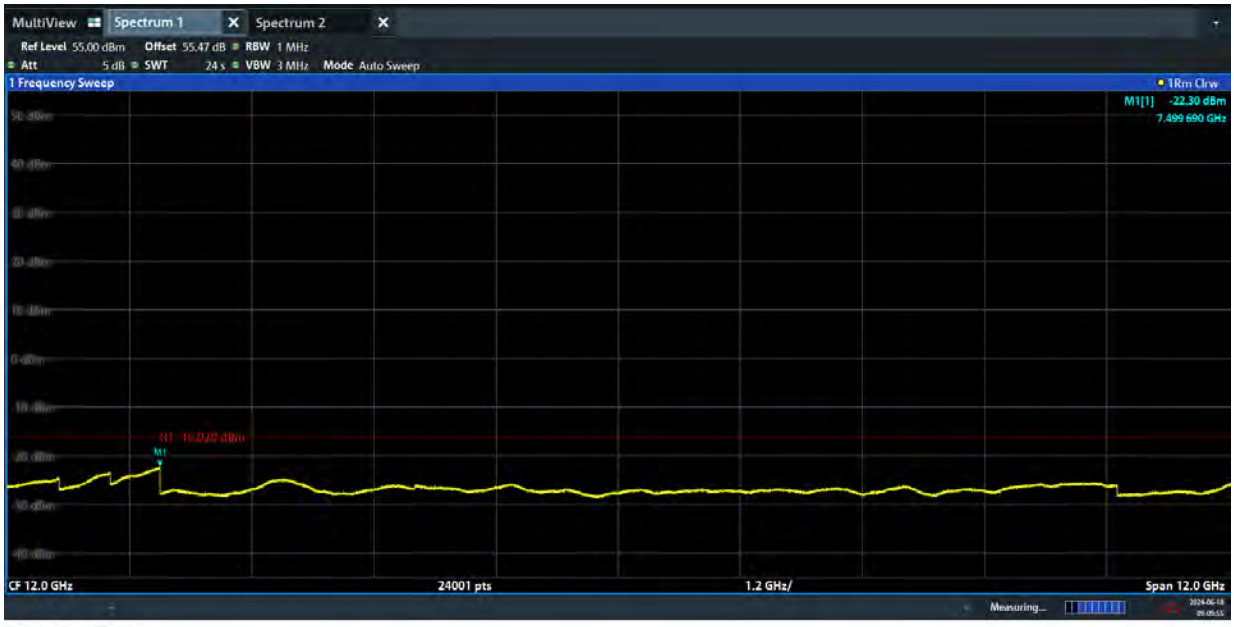
Total Quality. Assured.

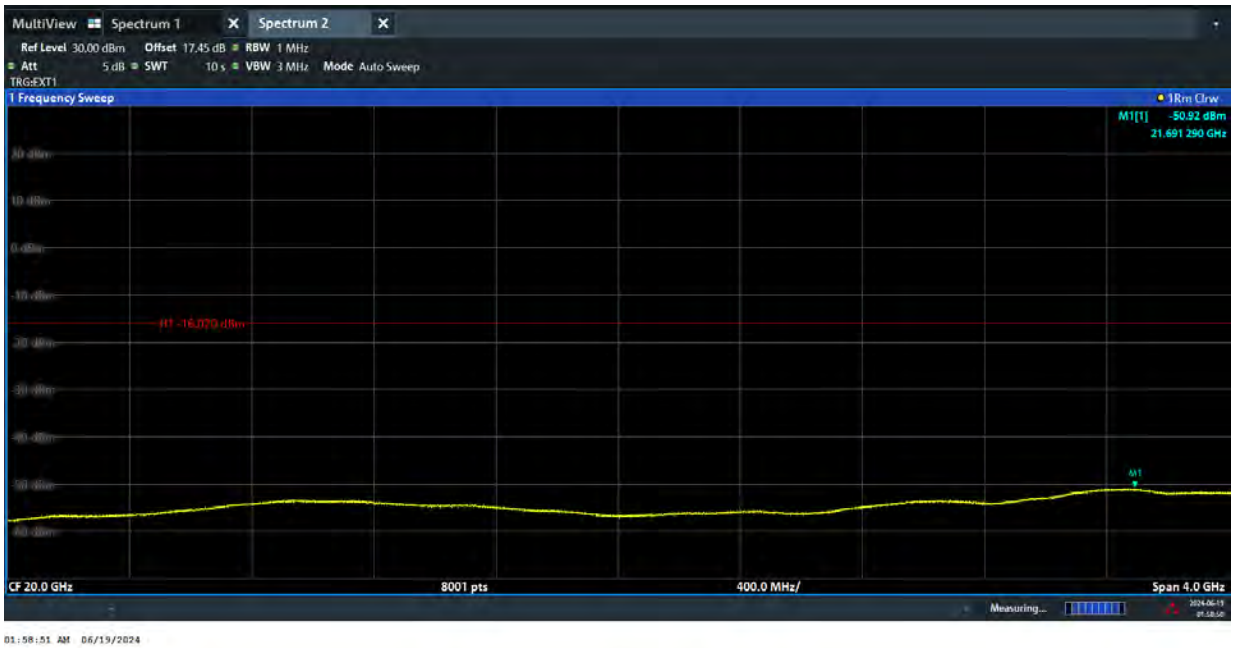
TEST REPORT





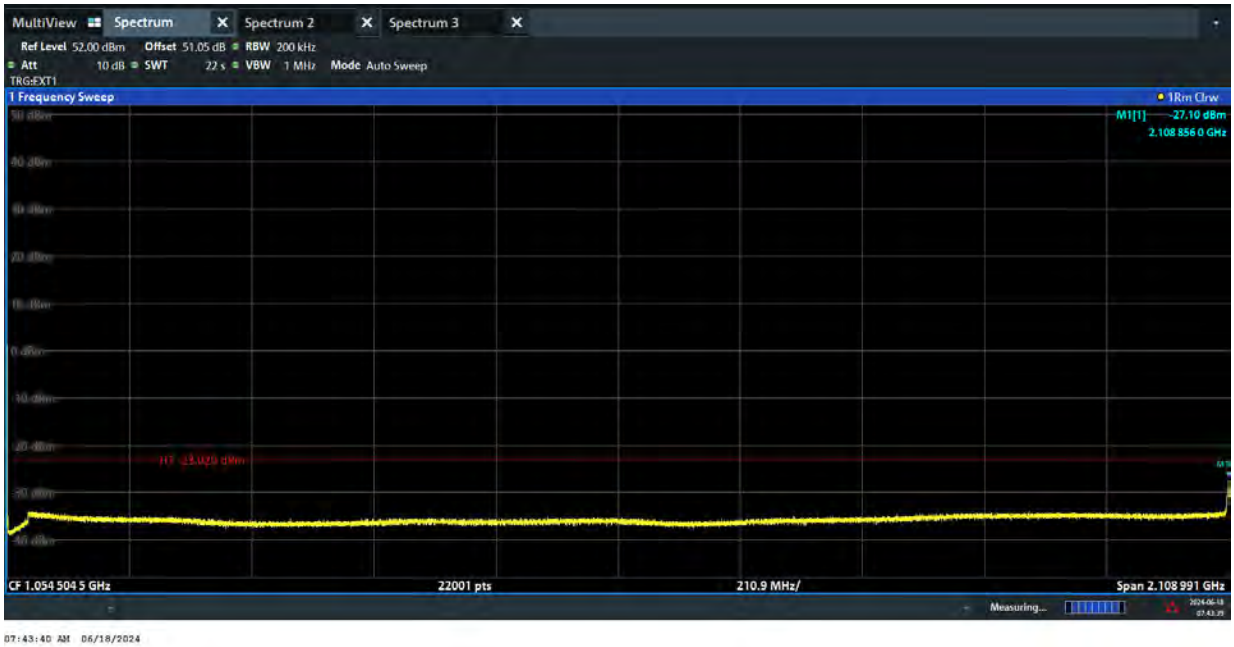
TEST REPORT

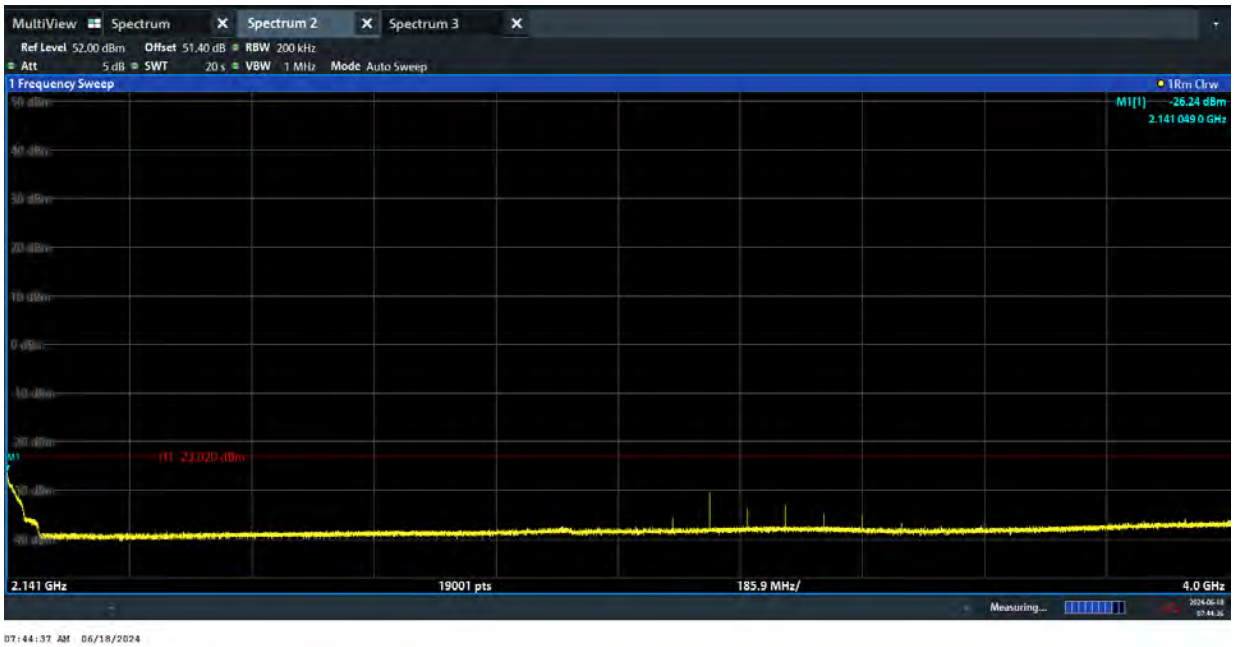

MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm Offset 55.47 dB RBW 1 MHz
Att 5 dB SWT 24 s VBW 3 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.30 dBm
7.499 690 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
09:09:55 AM 06/18/2024


MultiView
Spectrum 1
Spectrum 2
Ref Level 30.00 dBm Offset 17.45 dB RBW 1 MHz
Att 5 dB SWT 10 s VBW 3 MHz Mode Auto Sweep
TRG:EXT1
1 Frequency Sweep
1Rm Clrw
M1[1] -50.92 dBm
21.691 290 GHz
CF 20.0 GHz
8001 pts
400.0 MHz/
Span 4.0 GHz
Measuring...
01:58:51 AM 06/19/2024

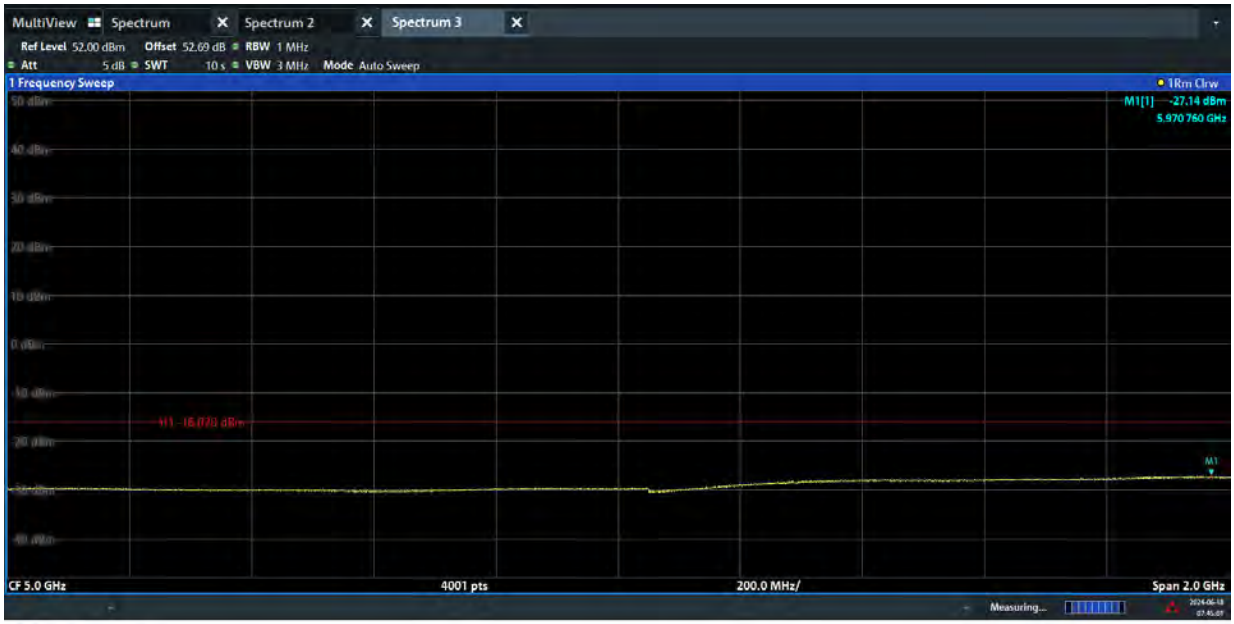
Antenna Port	Channel Position	NR Modulation	NR Channel BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	30	1000/200	-16.02/-23.02
B	T	256QAM	30	1000/200	-16.02/-23.02

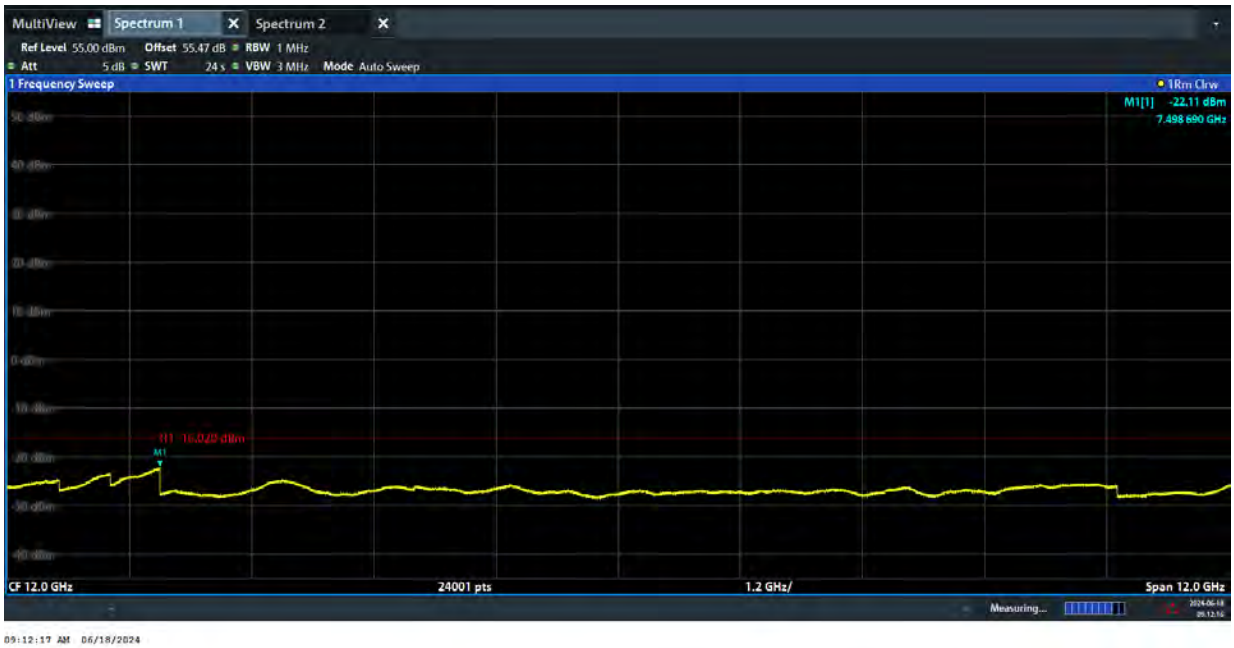
Channel Position B

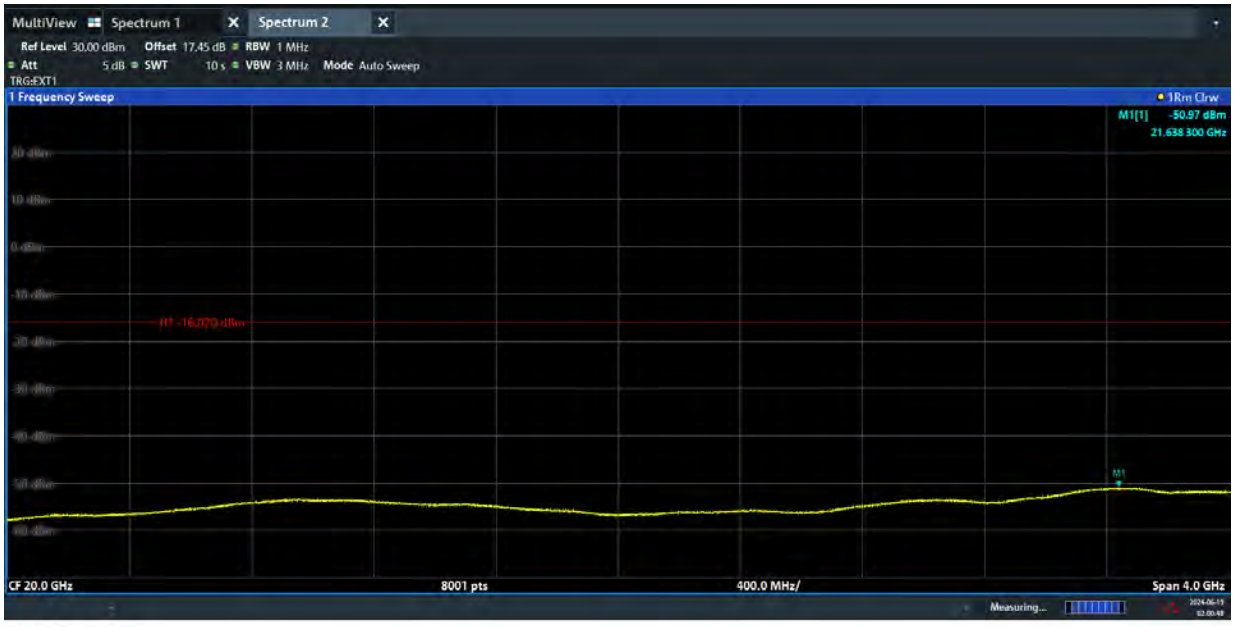




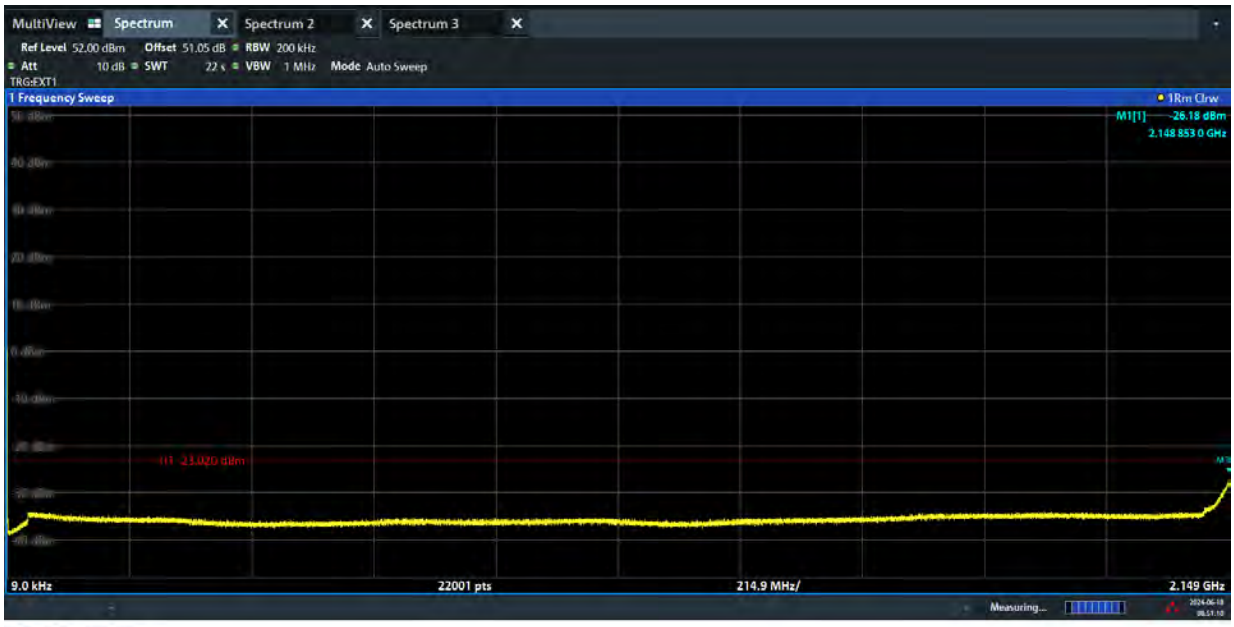
TEST REPORT


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm
Offset 52.69 dB
RBW 1 MHz
Att 5 dB
SWT 10 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.14 dBm
5.970 760 GHz
CF 5.0 GHz
4001 pts
200.0 MHz/
Span 2.0 GHz
Measuring...
07:45:01 AM 06/18/2024


MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm
Offset 55.47 dB
RBW 1 MHz
Att 5 dB
SWT 24 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.11 dBm
7.498 690 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
09:12:17 AM 06/18/2024

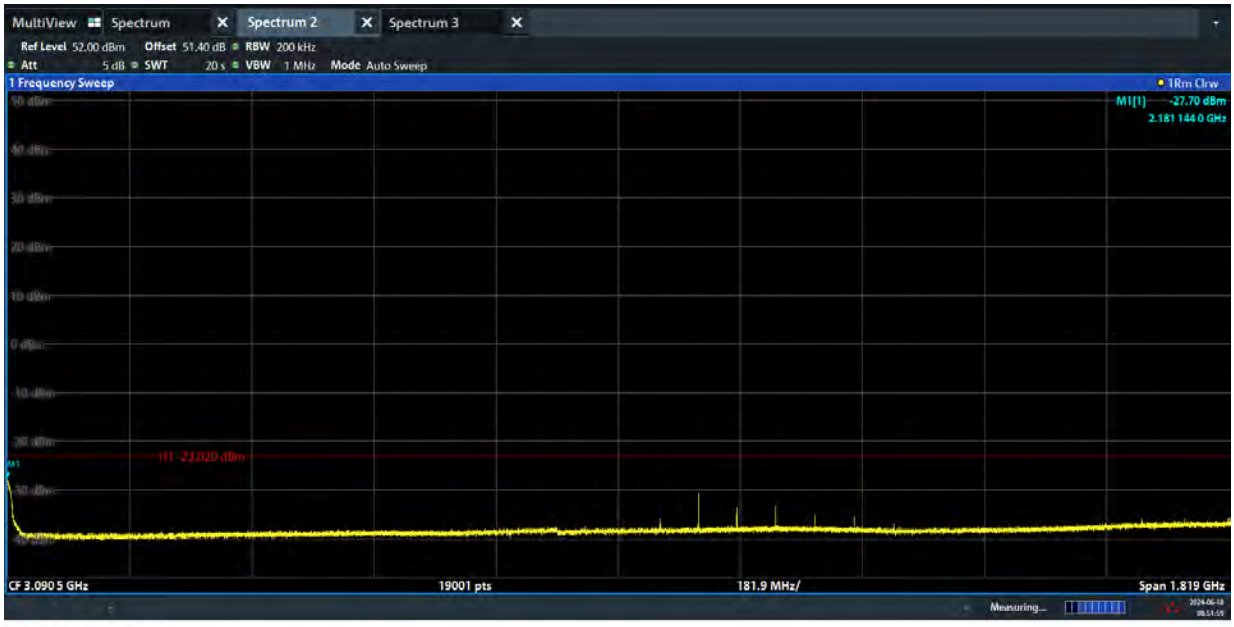


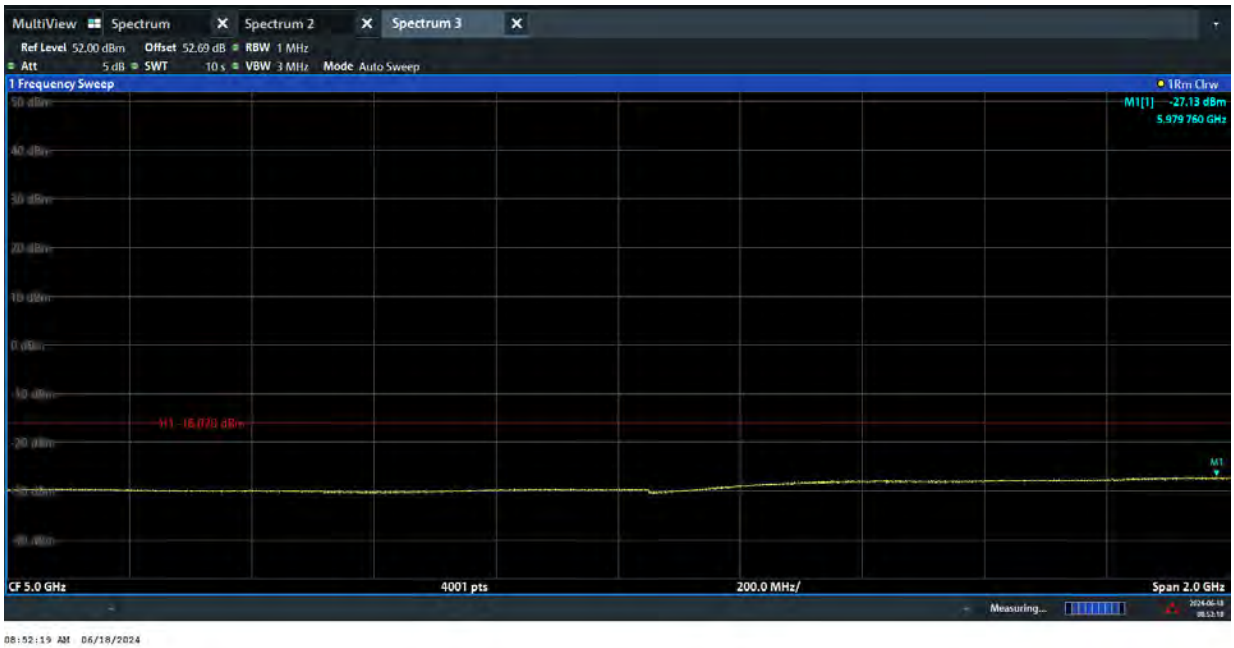
Channel Position T



Total Quality. Assured.

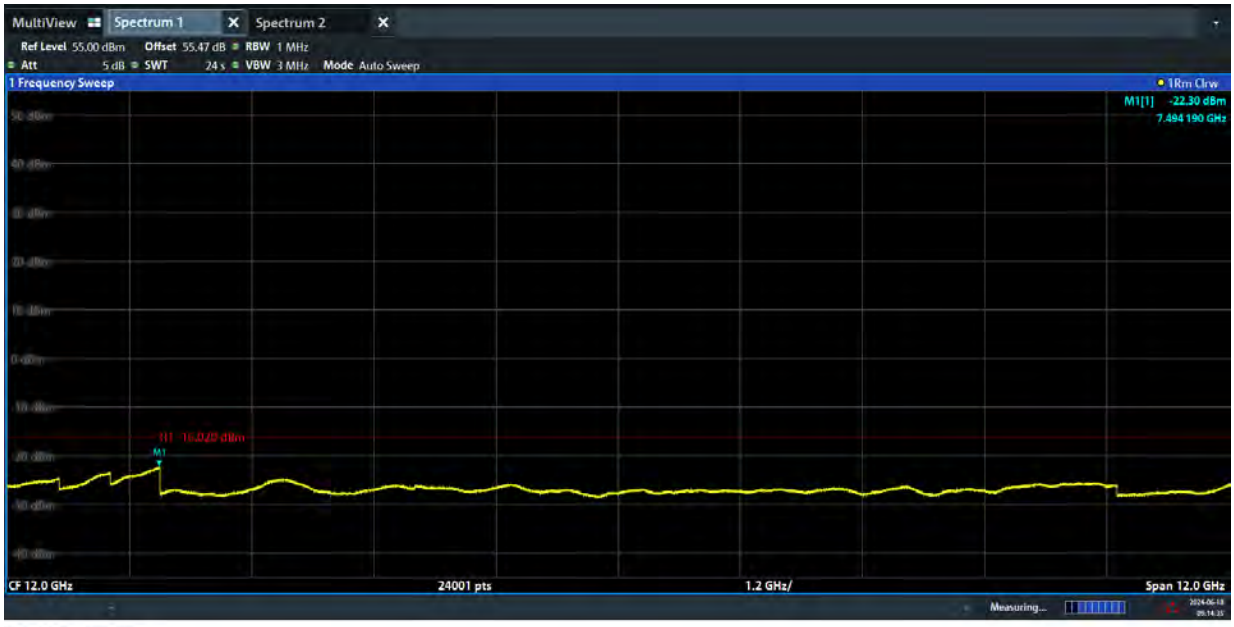
TEST REPORT

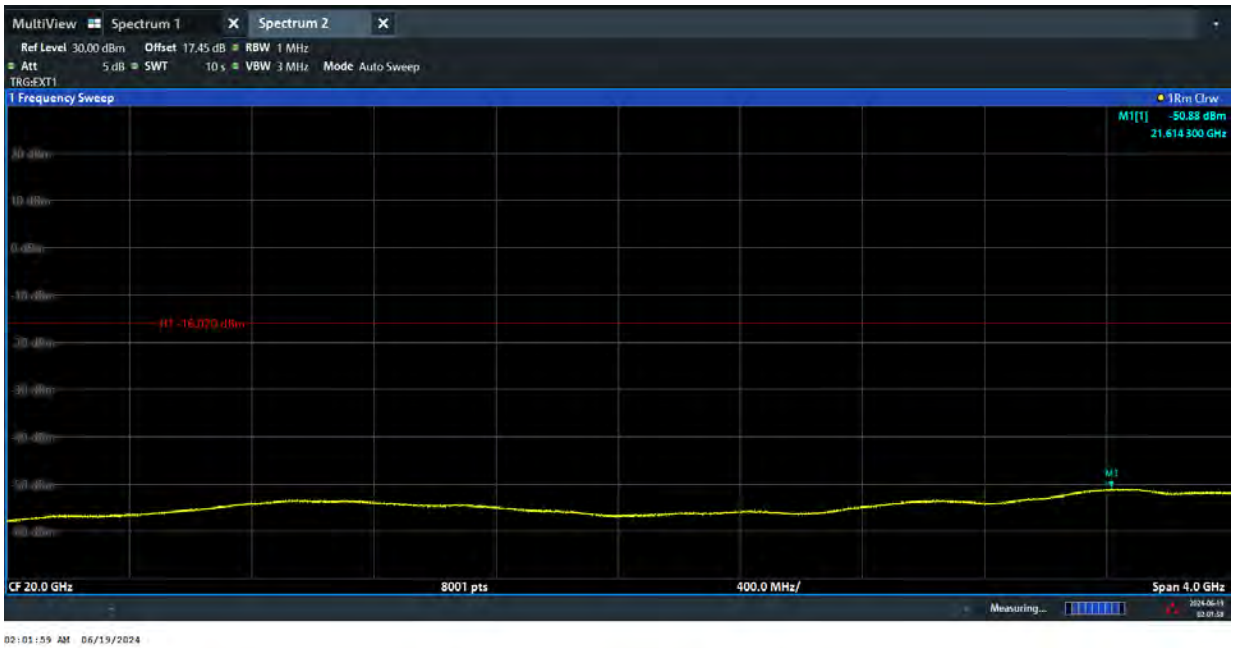




Total Quality. Assured.

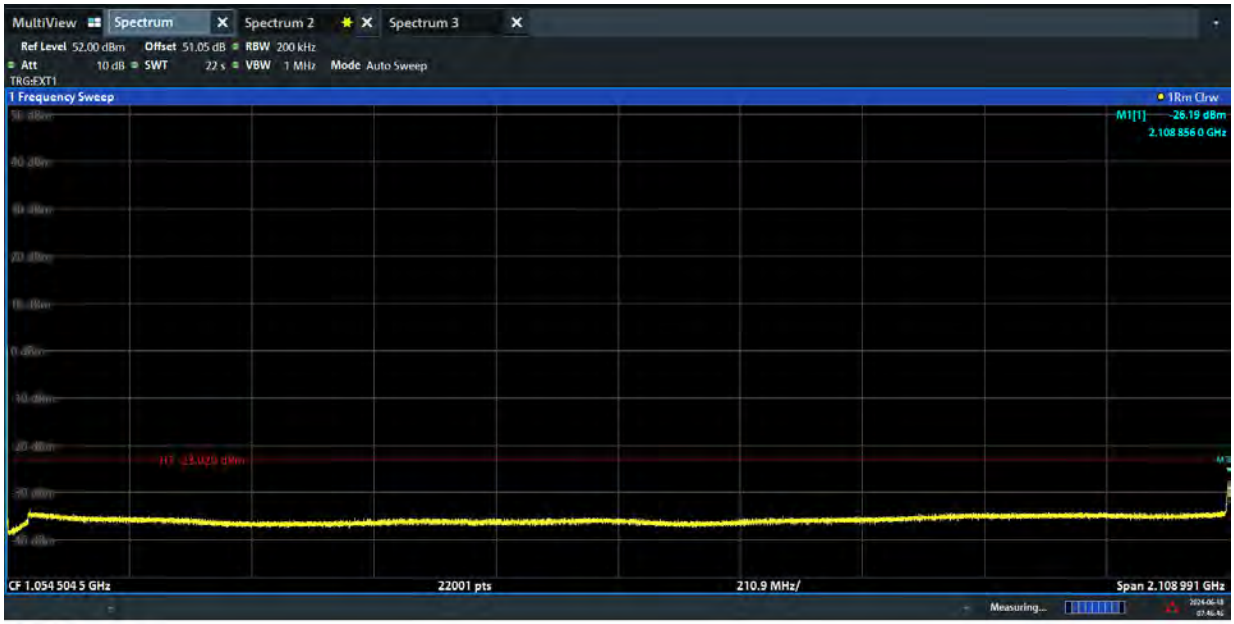
TEST REPORT

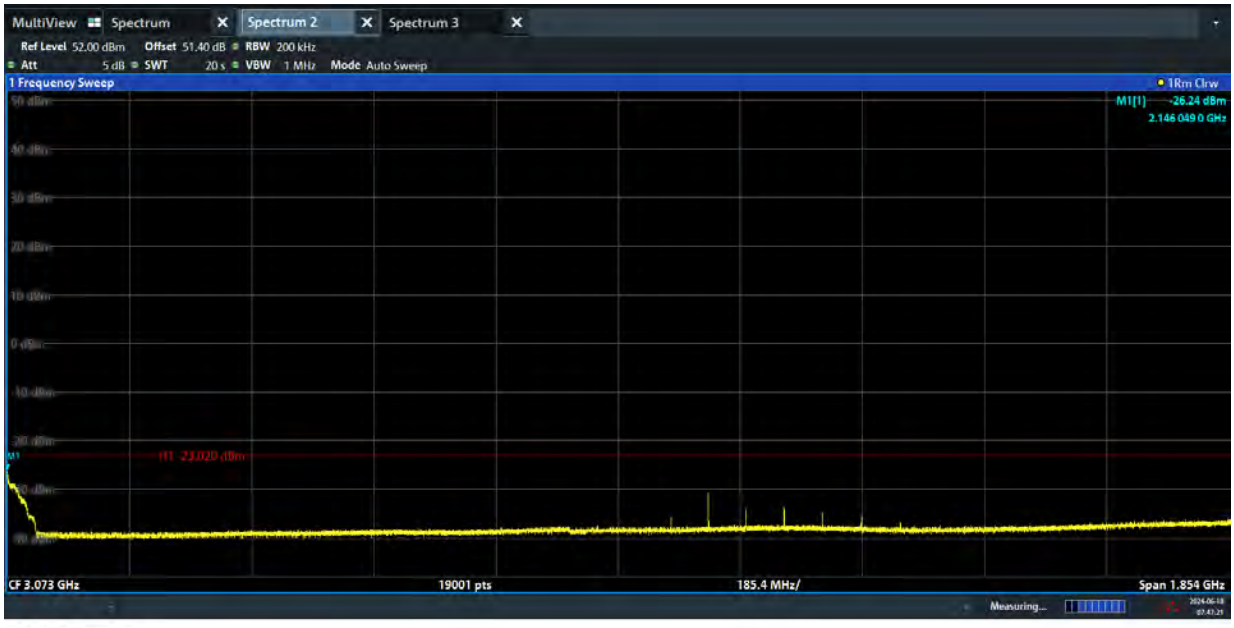




Antenna Port	Channel Position	NR Modulation	NR Channel BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	35	1000/200	-16.02/-23.02
B	T	256QAM	35	1000/200	-16.02/-23.02

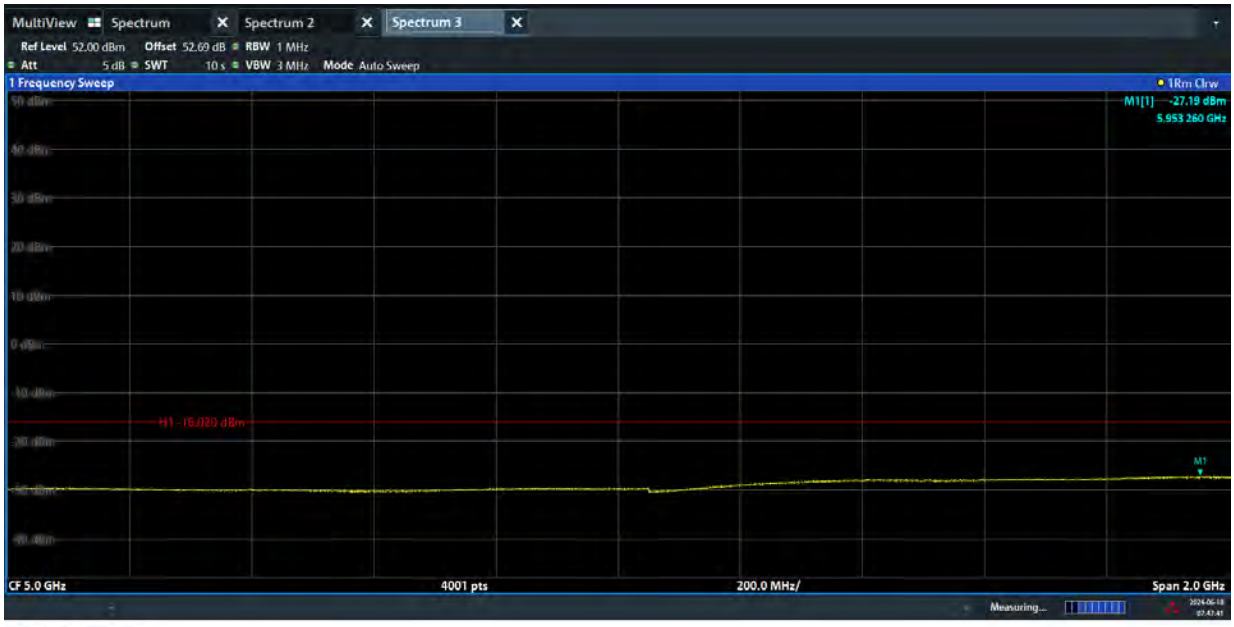
Channel Position B

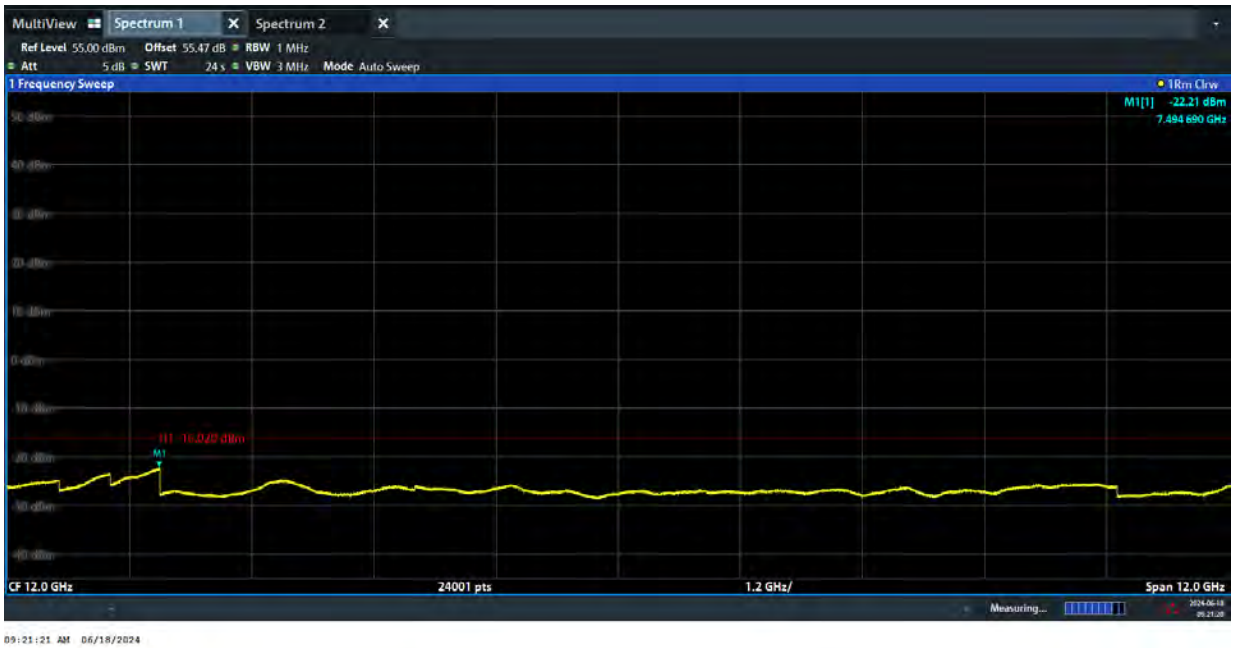


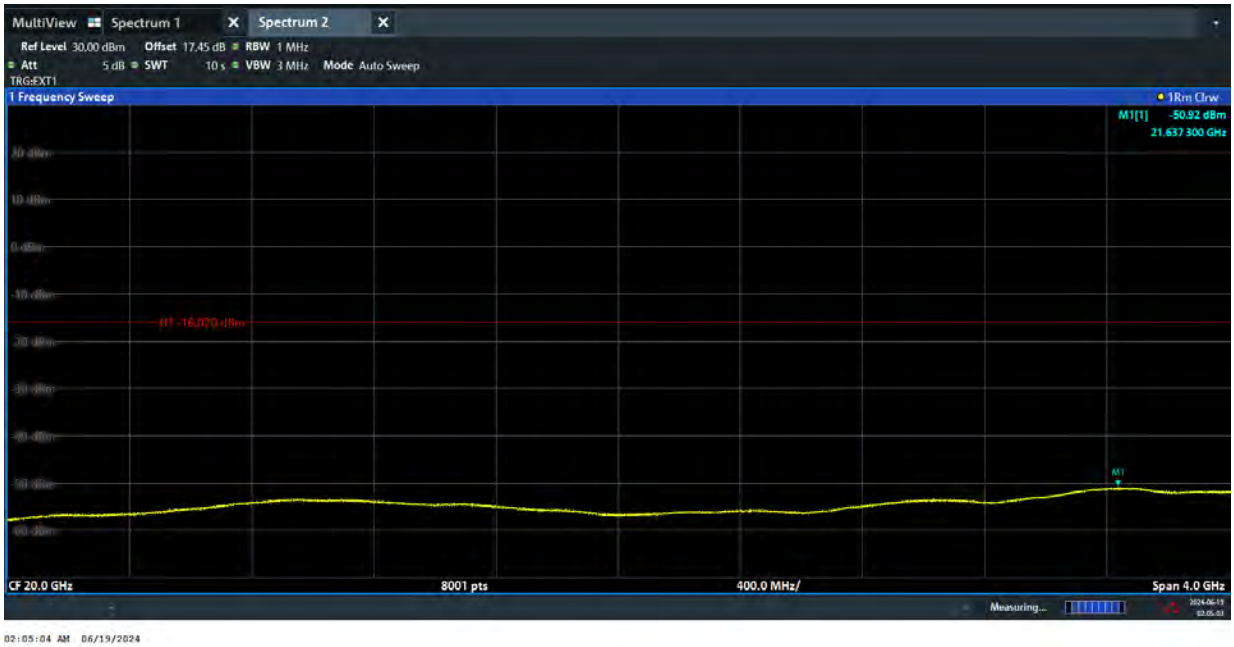


Total Quality. Assured.

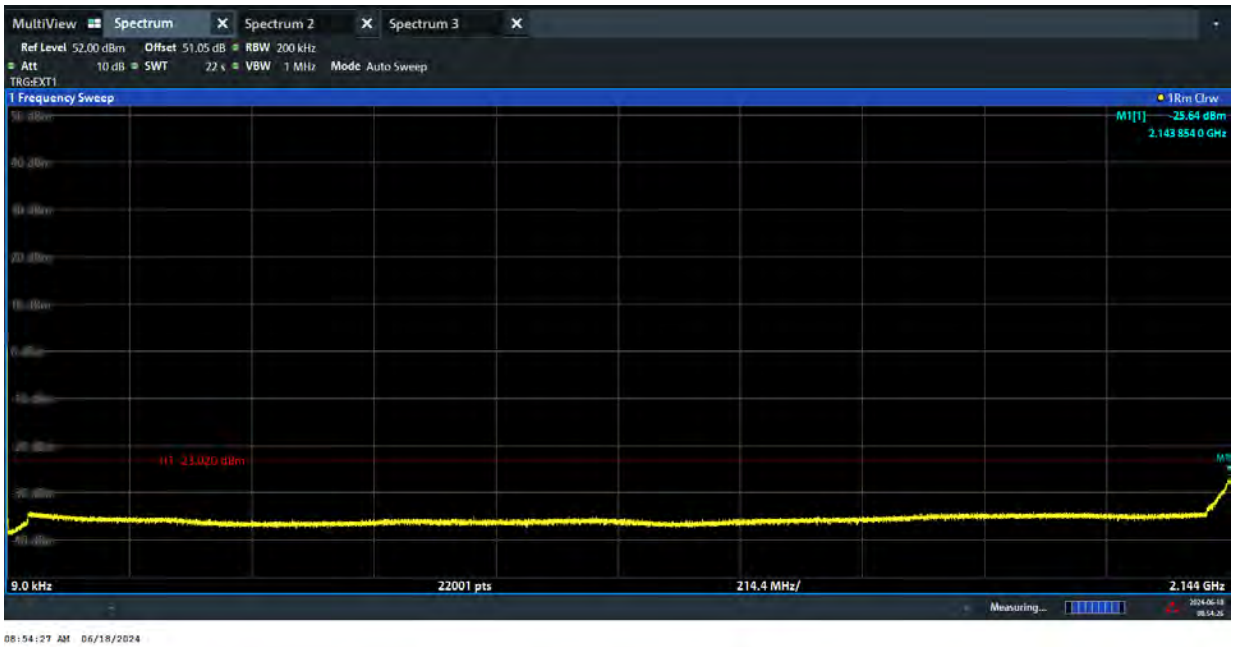
TEST REPORT



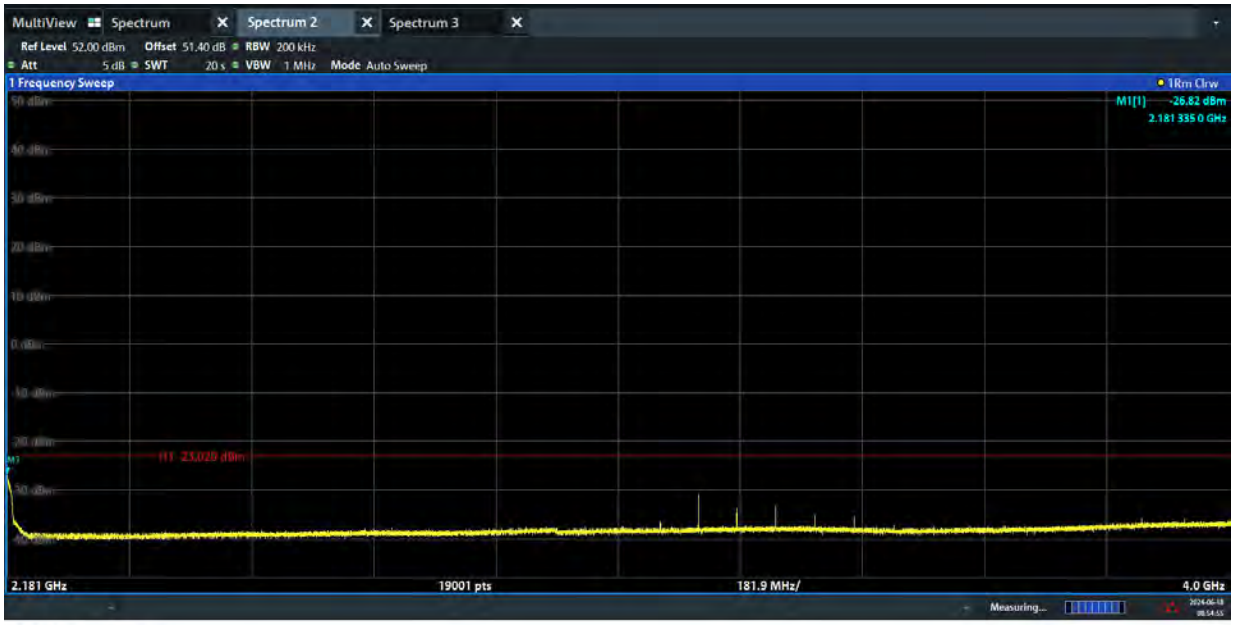


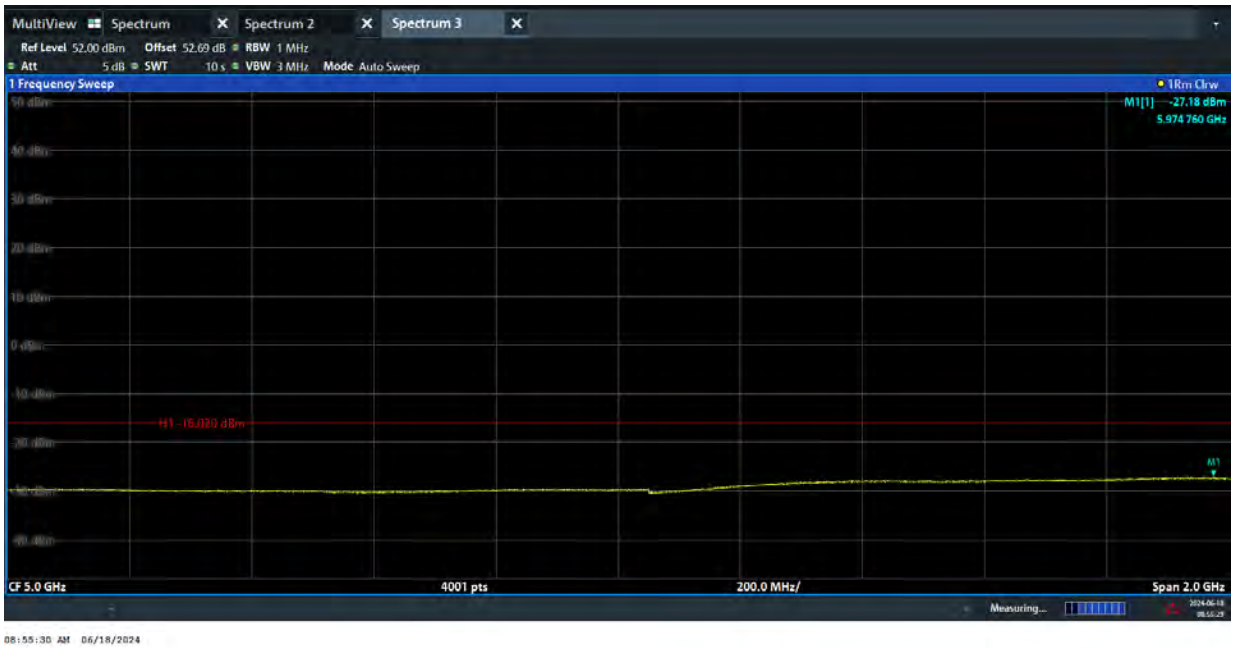


Channel Position T

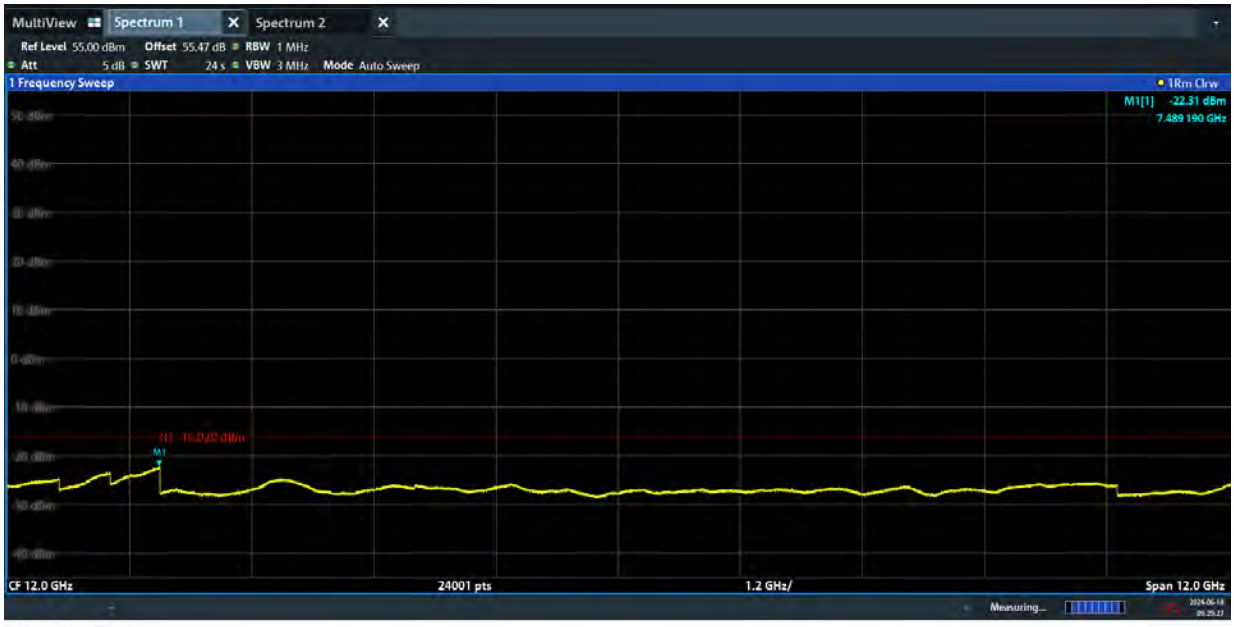


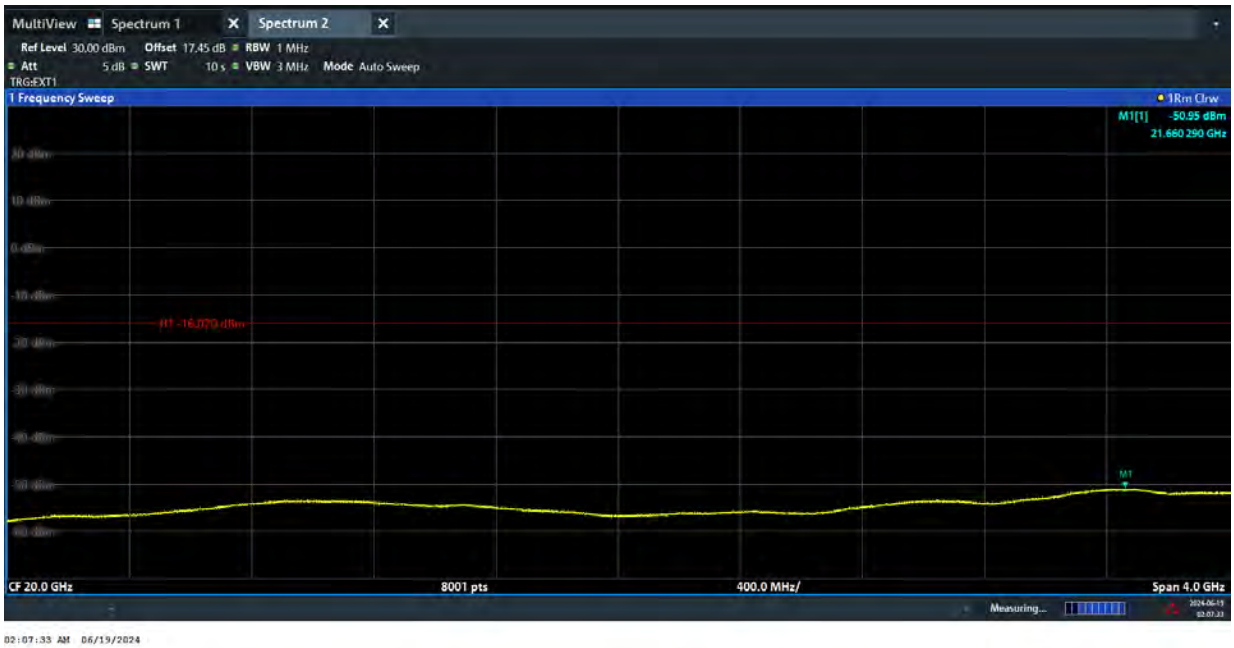
TEST REPORT


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm Offset 51.40 dB RBW 200 kHz
Att 5 dB SWT 20 s VBW 1 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -26.82 dBm
2.181 335 0 GHz
2.181 GHz
19001 pts
181.9 MHz/
4.0 GHz
Measuring...
08:54:56 AM 06/18/2024


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm Offset 52.69 dB RBW 1 MHz
Att 5 dB SWT 10 s VBW 3 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.18 dBm
5.974 760 GHz
CF 5.0 GHz
4001 pts
200.0 MHz/
Span 2.0 GHz
Measuring...
08:55:30 AM 06/18/2024

TEST REPORT

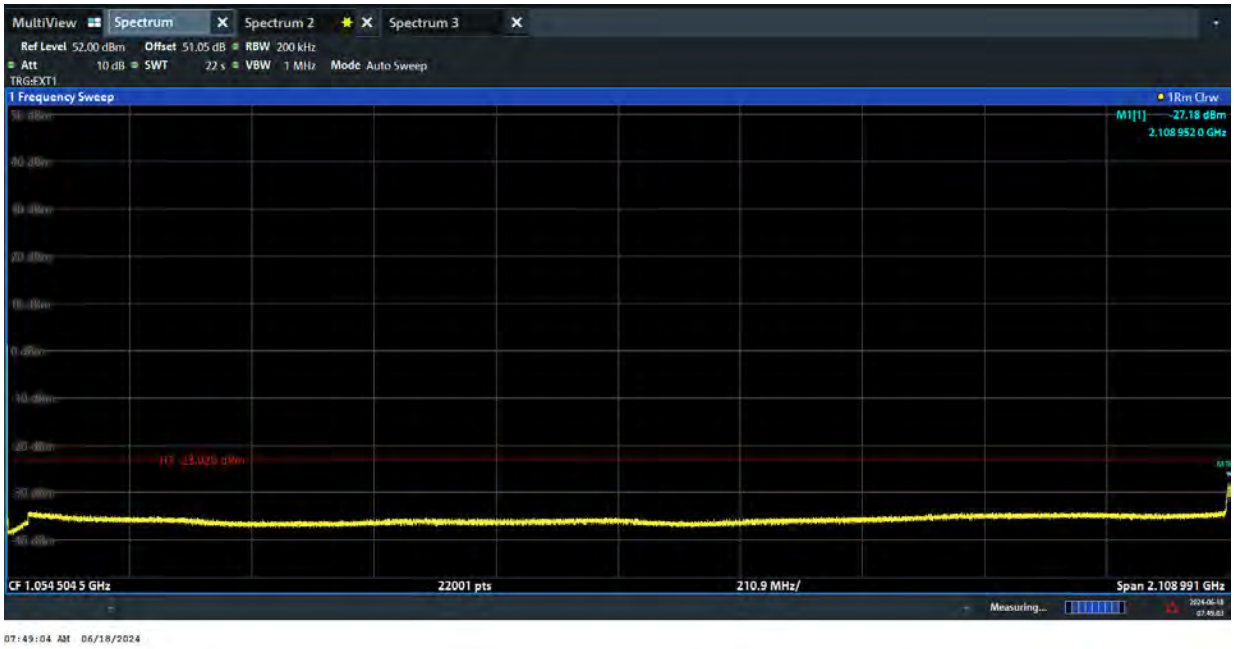

MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm Offset 55.47 dB RBW 1 MHz
Att 5 dB SWT 24 s VBW 3 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.31 dBm
7.489 190 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
09:29:28 AM 06/18/2024

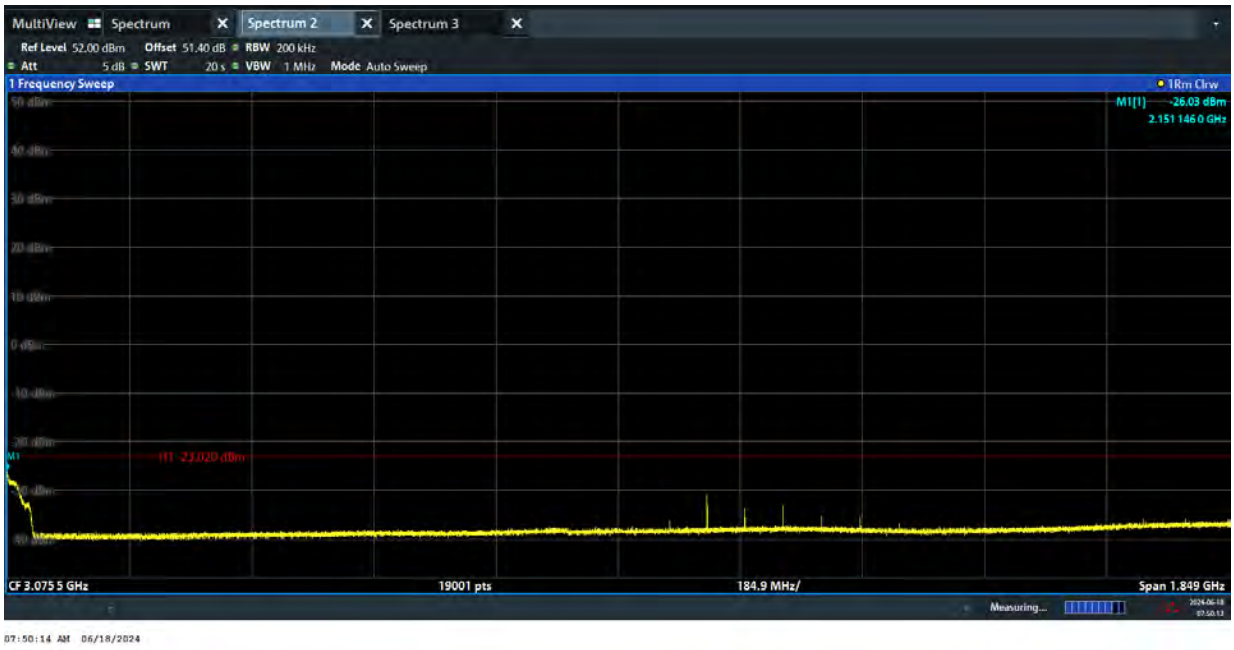

MultiView
Spectrum 1
Spectrum 2
Ref Level 30.00 dBm Offset 17.45 dB RBW 1 MHz
Att 5 dB SWT 10 s VBW 3 MHz Mode Auto Sweep
TRG:EXT1
1 Frequency Sweep
1Rm Clrw
M1[1] -50.95 dBm
21.660 290 GHz
CF 20.0 GHz
8001 pts
400.0 MHz/
Span 4.0 GHz
Measuring...
02:07:33 AM 06/19/2024

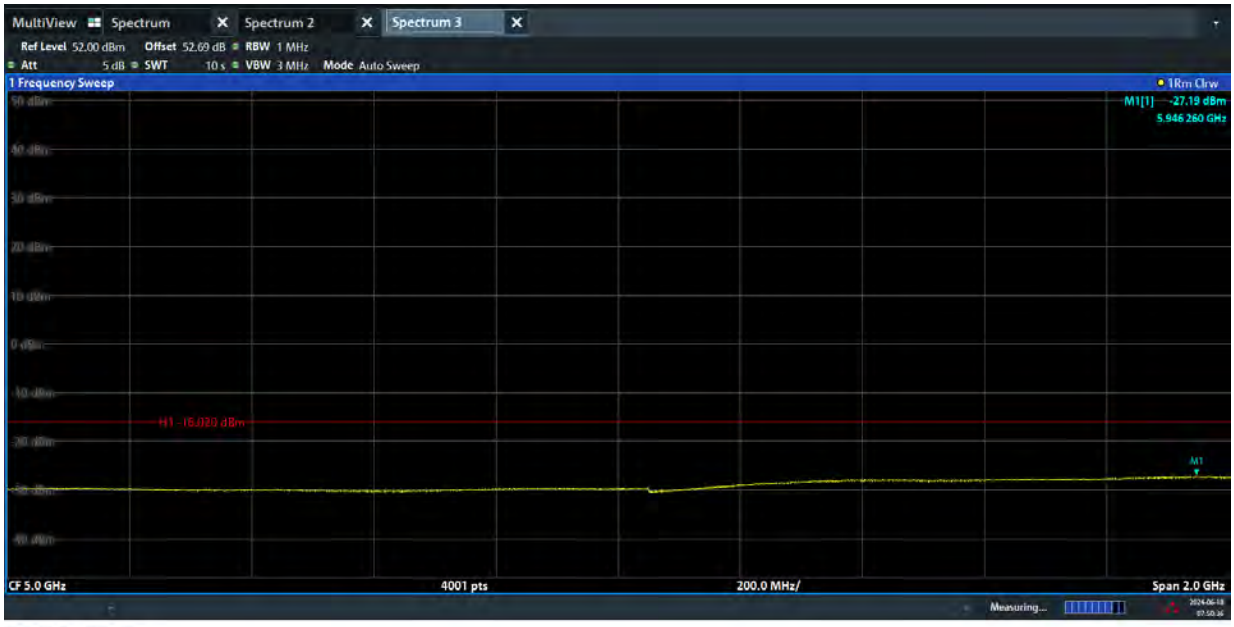
TEST REPORT

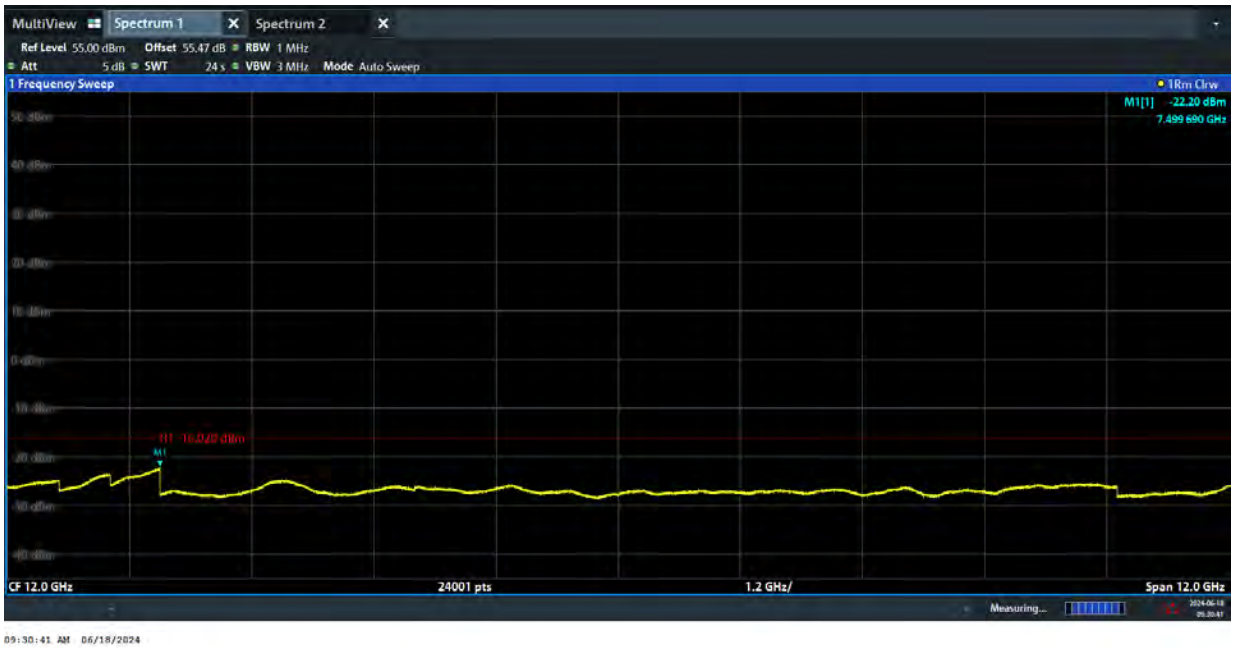
Antenna Port	Channel Position	NR Modulation	NR Channel BW (MHz)	RBW (kHz)	Limit (dBm)
B	B	256QAM	40	1000/200	-16.02/-23.02
B	T	256QAM	40	1000/200	-16.02/-23.02

Channel Position B



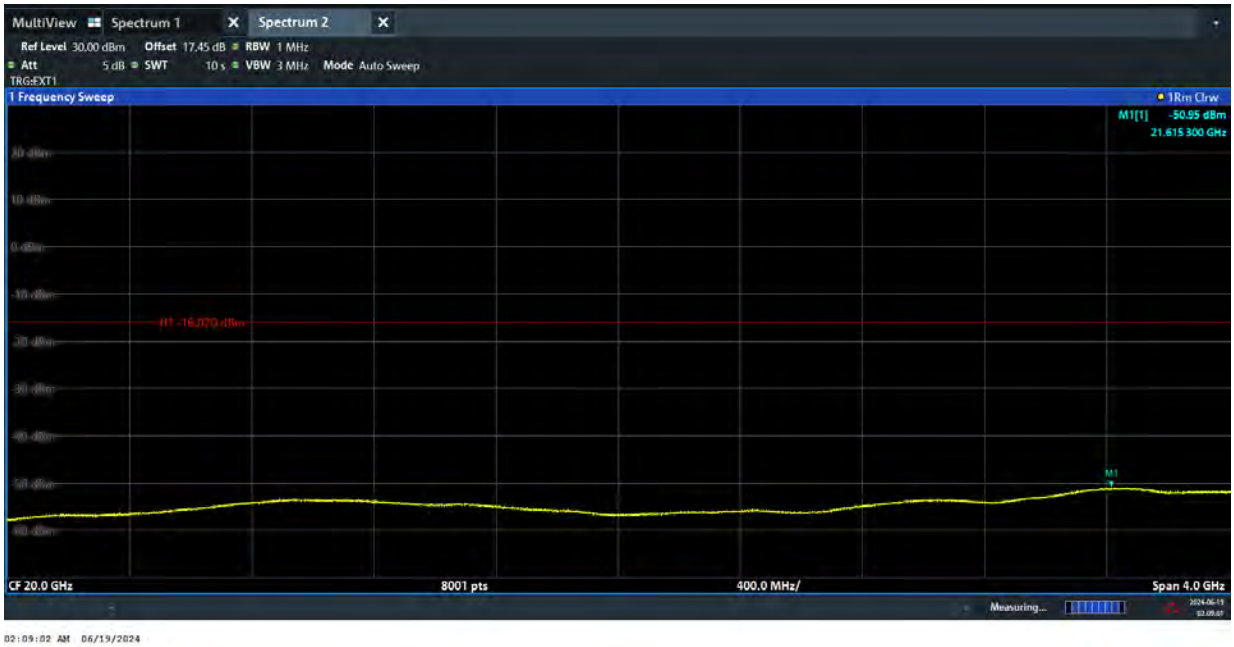



MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm
Offset 52.69 dB
RBW 1 MHz
Att 5 dB
SWT 10 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.19 dBm
5.946 260 GHz
H1 -16.020 dBm
M1
CF 5.0 GHz
4001 pts
200.0 MHz/
Span 2.0 GHz
Measuring...
07:50:37 AM 06/18/2024

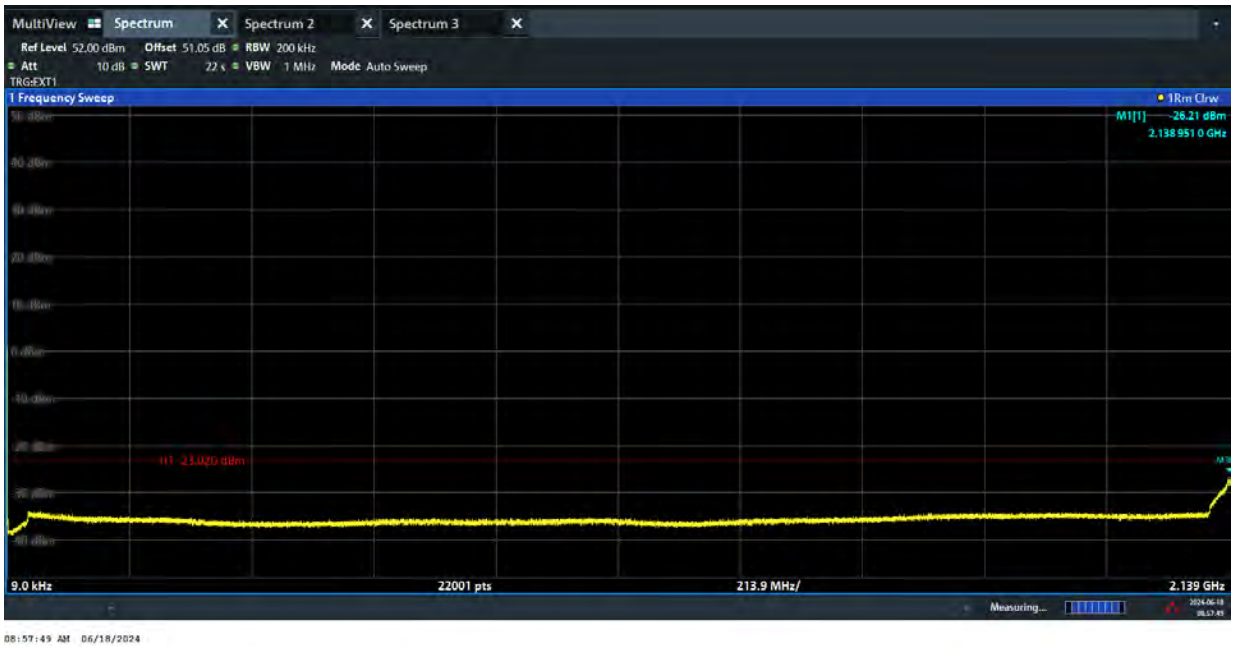

MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm
Offset 55.47 dB
RBW 1 MHz
Att 5 dB
SWT 24 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.20 dBm
7.499 690 GHz
H1 -16.020 dBm
M1
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
09:30:41 AM 06/18/2024

Total Quality. Assured.

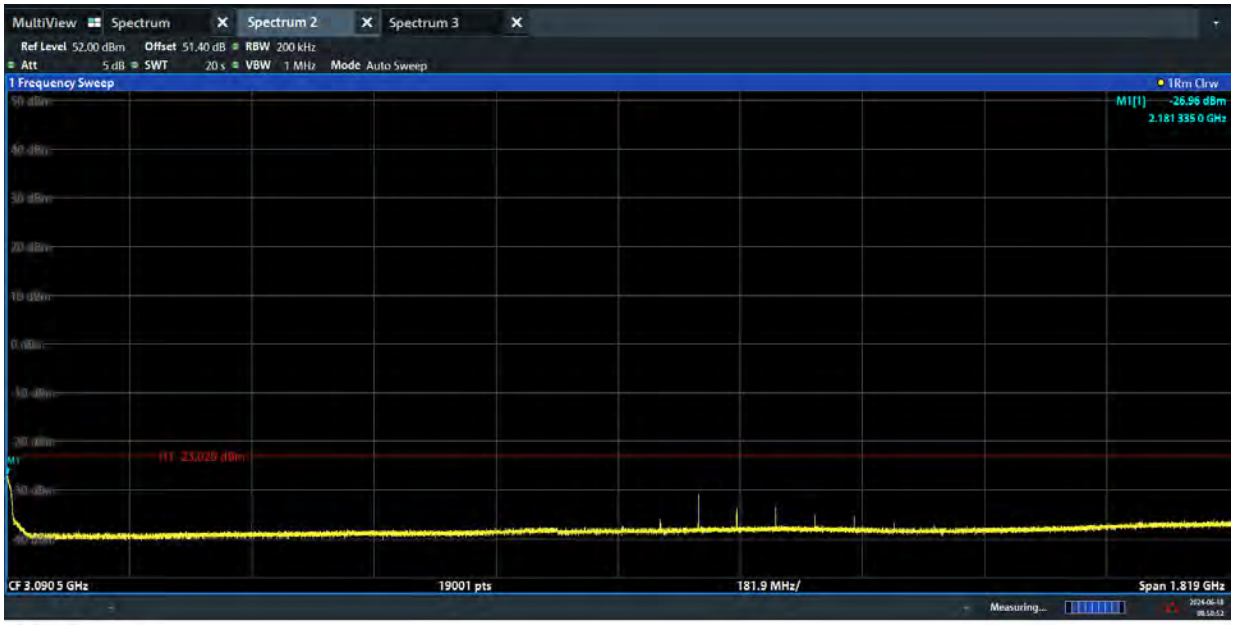
TEST REPORT

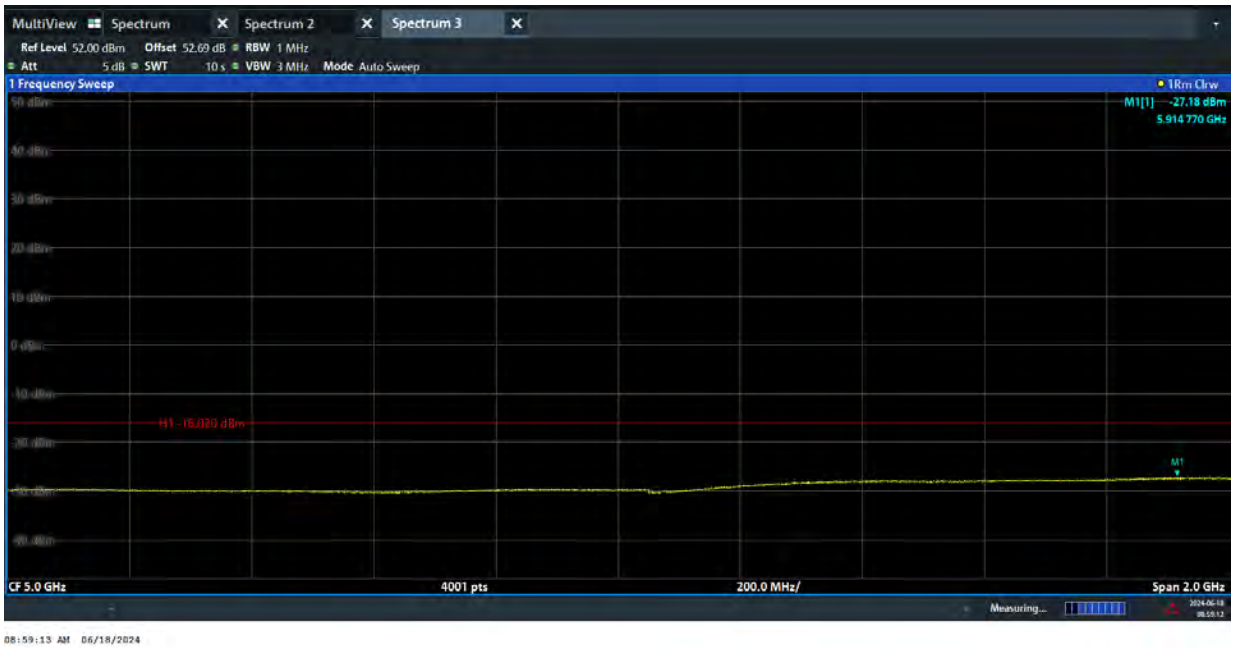


Channel Position T

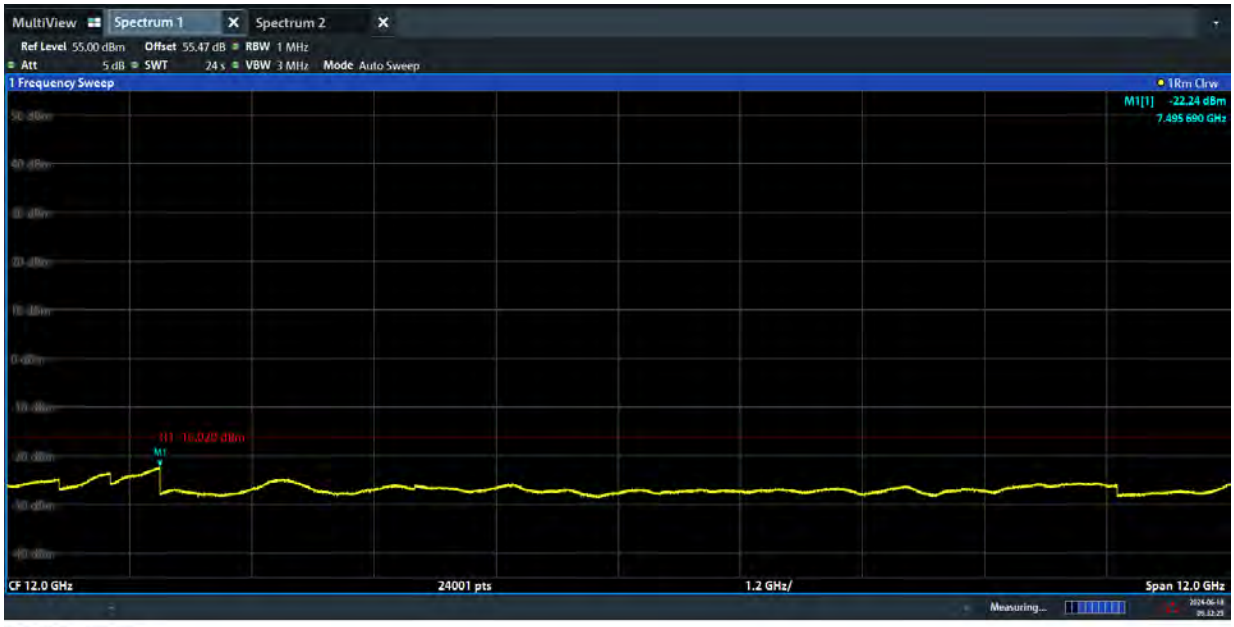


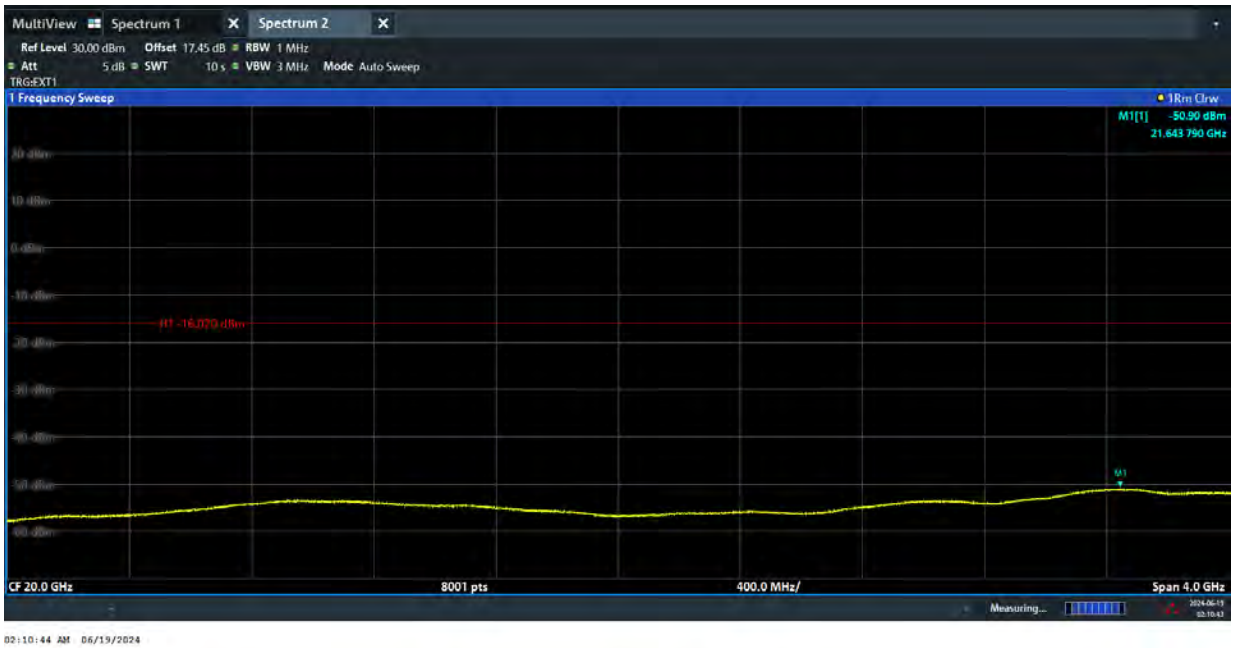
TEST REPORT


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm Offset 51.40 dB RBW 200 kHz
Att 5 dB SWT 20 s VBW 1 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -26.96 dBm
2.181 335 0 GHz
CF 3.090 5 GHz
19001 pts
181.9 MHz/
Span 1.819 GHz
Measuring...
08:58:52 AM 06/18/2024


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm Offset 52.69 dB RBW 1 MHz
Att 5 dB SWT 10 s VBW 3 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.18 dBm
5.914 770 GHz
CF 5.0 GHz
4001 pts
200.0 MHz/
Span 2.0 GHz
Measuring...
08:59:13 AM 06/18/2024

TEST REPORT


MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm Offset 55.47 dB RBW 1 MHz
Att 5 dB SWT 24 s VBW 3 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.24 dBm
7.495 690 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
09:32:29 AM 06/18/2024

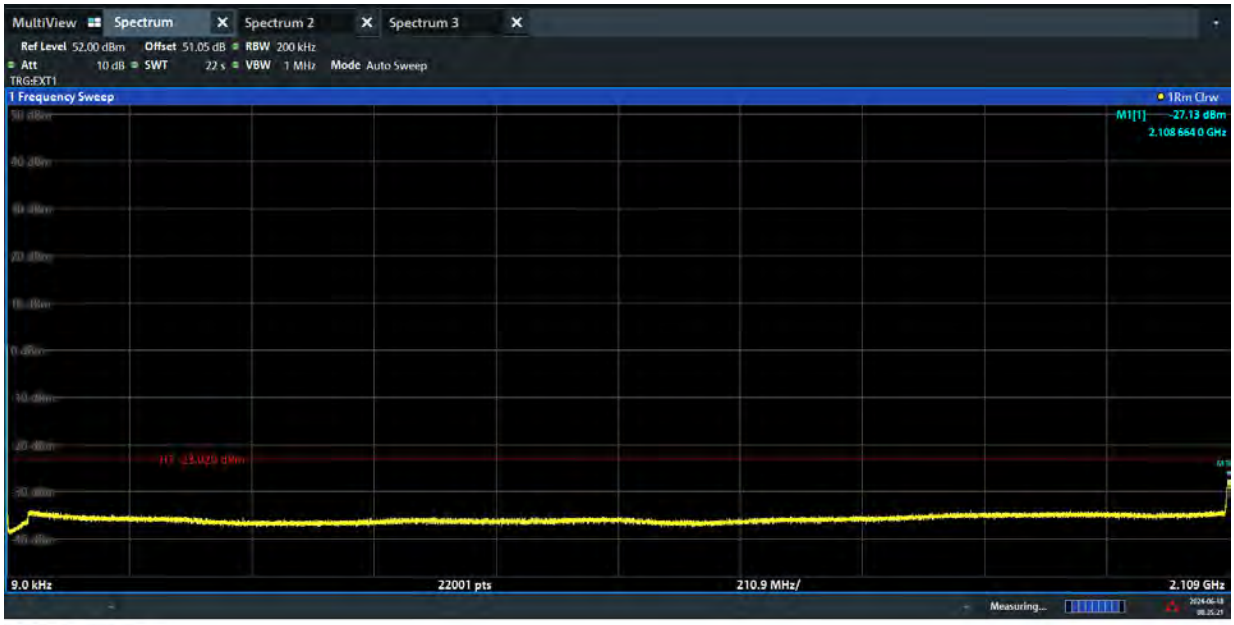

MultiView
Spectrum 1
Spectrum 2
Ref Level 30.00 dBm Offset 17.45 dB RBW 1 MHz
Att 5 dB SWT 10 s VBW 3 MHz Mode Auto Sweep
TRG:EXT1
1 Frequency Sweep
1Rm Clrw
M1[1] -50.90 dBm
21.643 790 GHz
CF 20.0 GHz
8001 pts
400.0 MHz/
Span 4.0 GHz
Measuring...
02:10:44 AM 06/19/2024

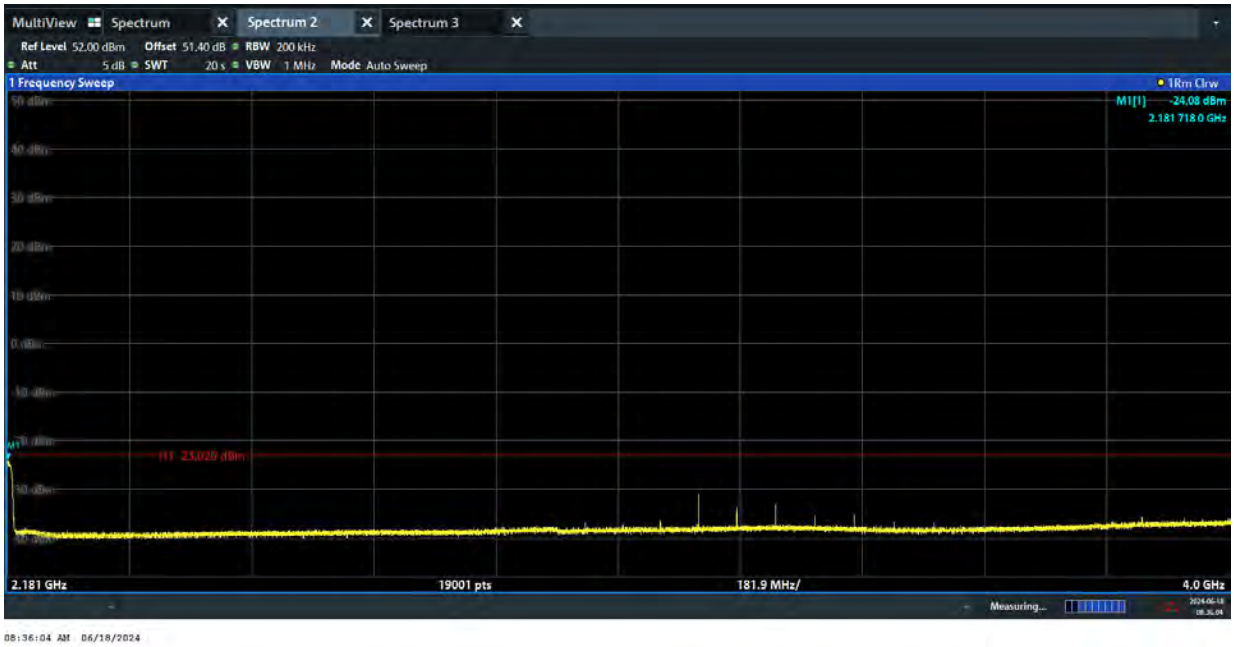
TEST REPORT

NR-2C-UE

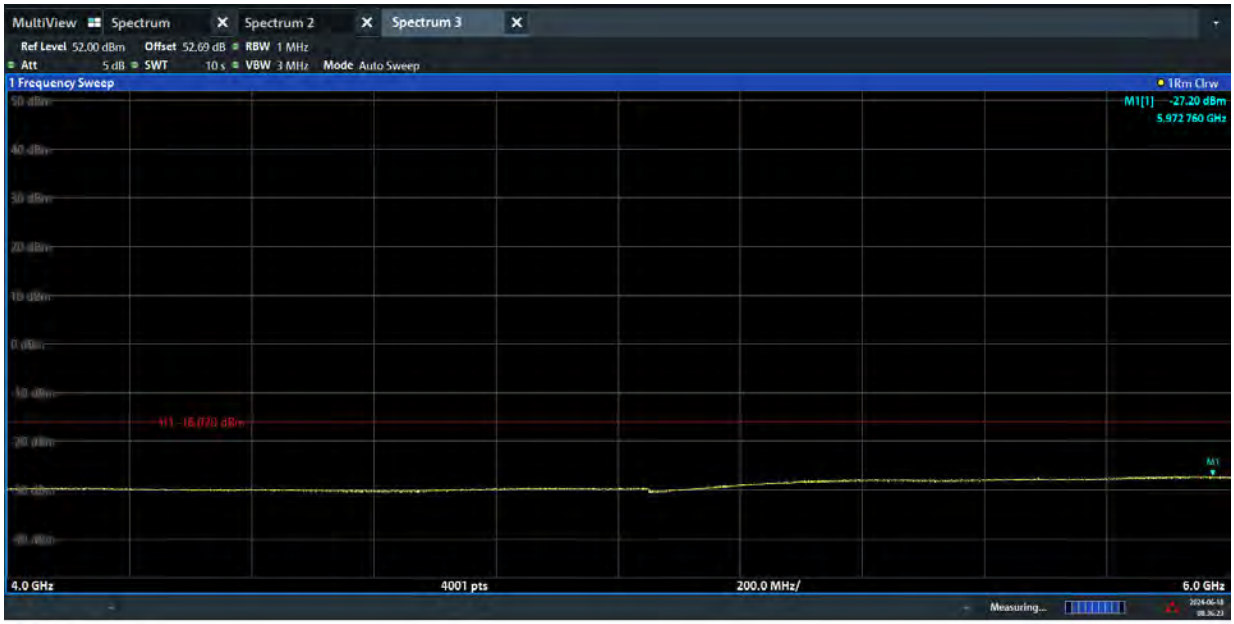
Antenna Port	Channel Position	NR Modulation	NR Channel BW (MHz)	RBW (kHz)	Limit (dBm)
B	M	256QAM	25	1000/200	-16.02/-23.02

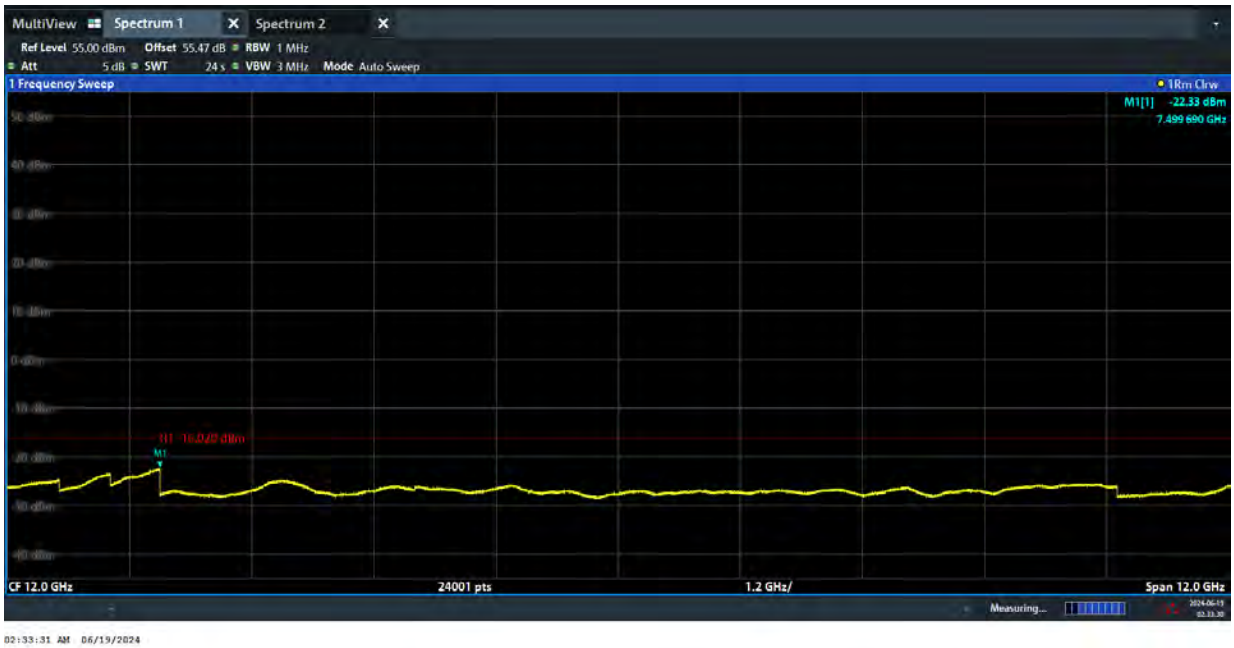
Channel Position M

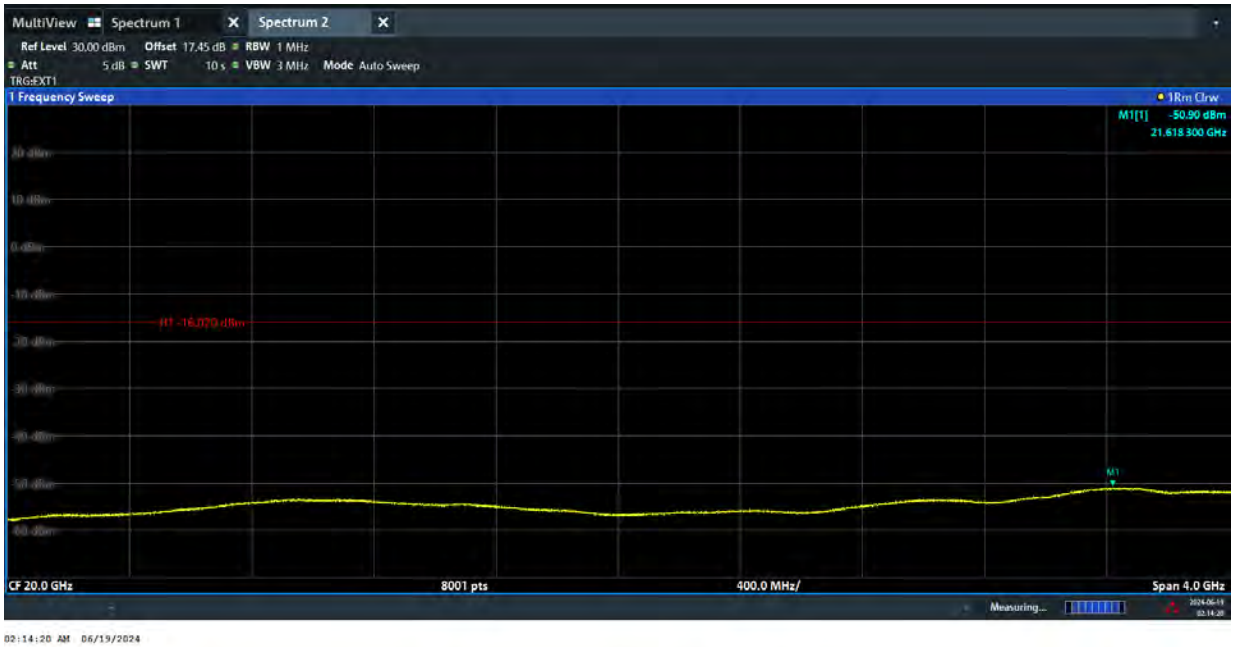




TEST REPORT

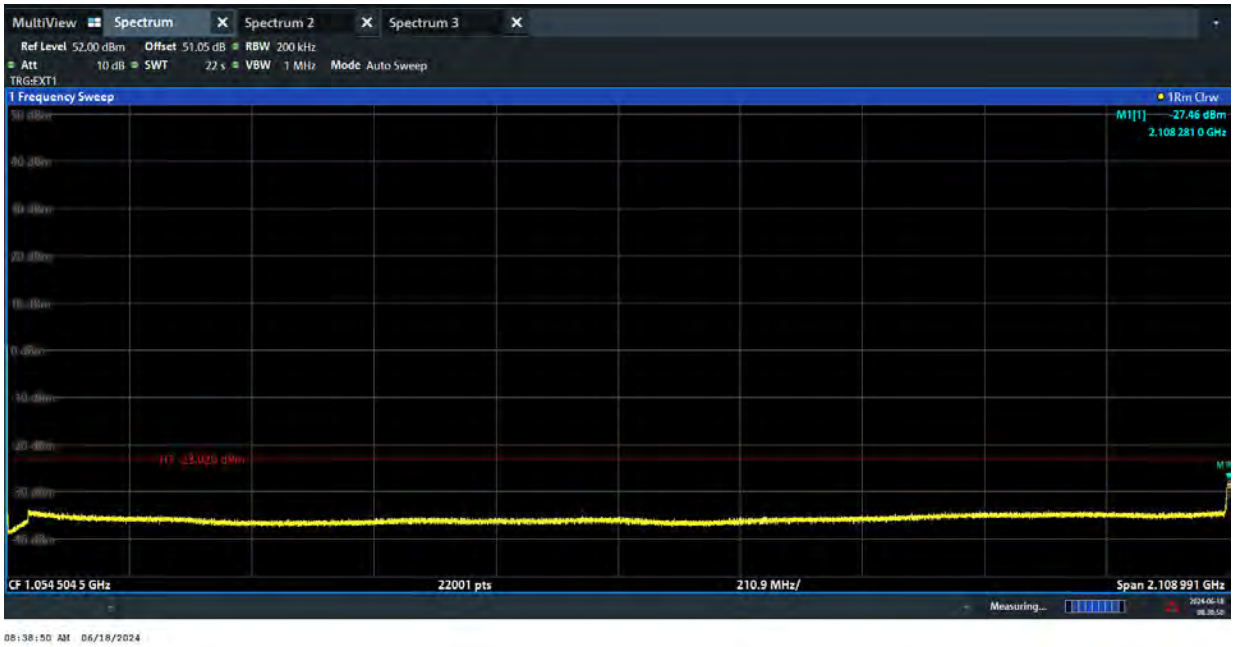

MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm
Offset 52.69 dB
RBW 1 MHz
Att 5 dB
SWT 10 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.20 dBm
5.972 760 GHz
4.0 GHz
4001 pts
200.0 MHz/
6.0 GHz
Measuring...
08:36:23 AM 06/18/2024


MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm
Offset 55.47 dB
RBW 1 MHz
Att 5 dB
SWT 24 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.33 dBm
7.499 690 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
02:33:31 AM 06/19/2024

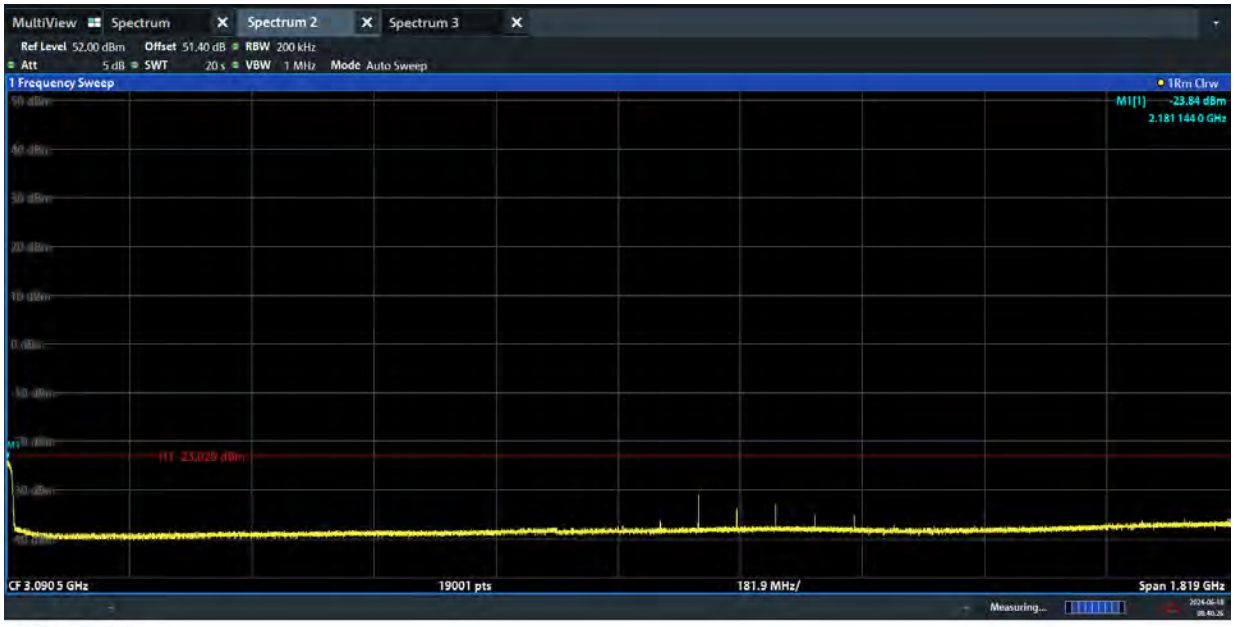


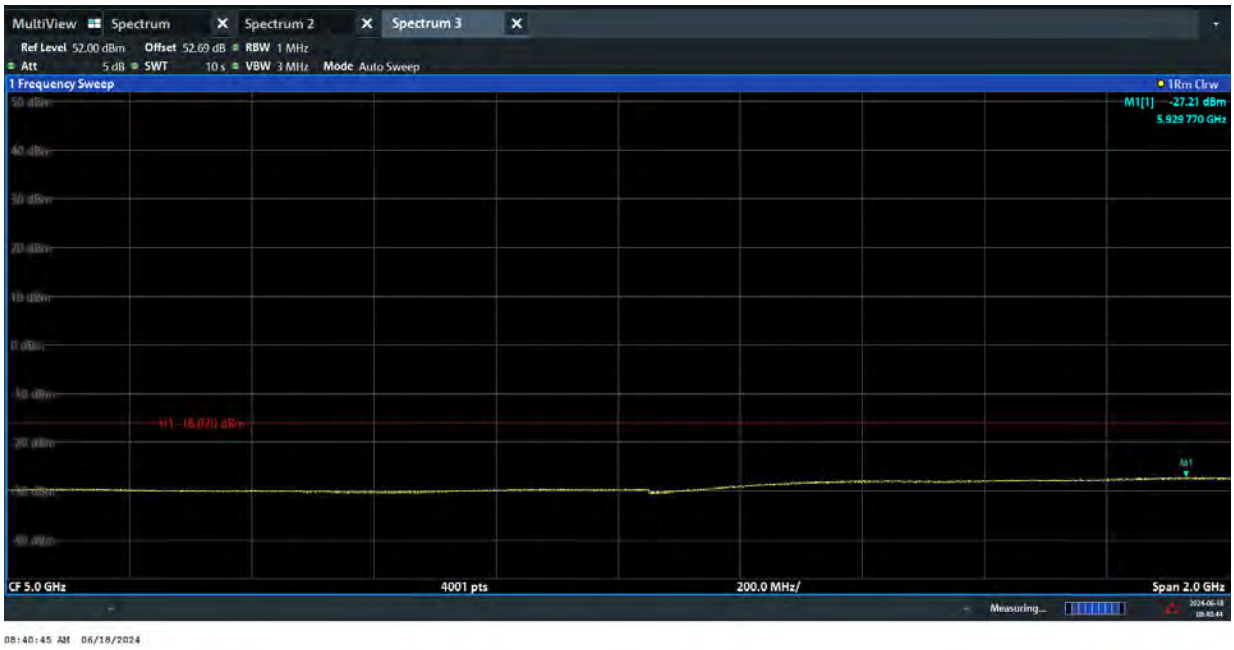
Antenna Port	Channel Position	NR Modulation	NR Channel BW (MHz)	RBW (kHz)	Limit (dBm)
B	M	256QAM	30	1000/200	-16.02/-23.02

Channel Position M

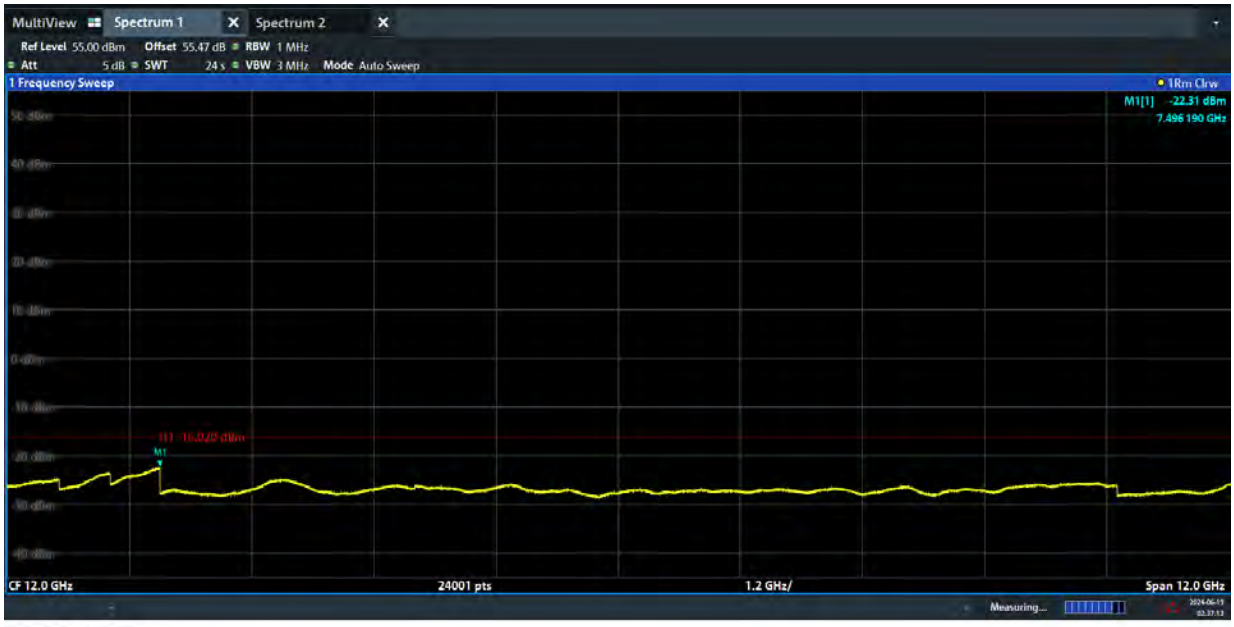


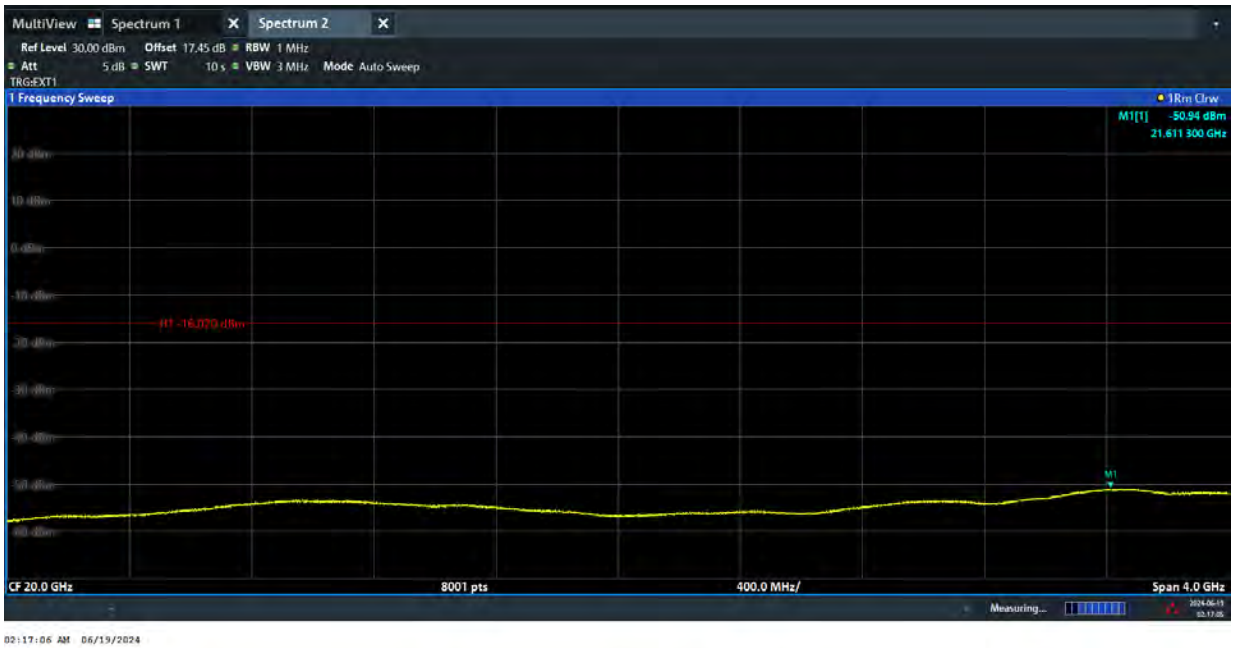
TEST REPORT


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm Offset 51.40 dB RBW 200 kHz
Att 5 dB SWT 20 s VBW 1 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -23.84 dBm
2.181 144 0 GHz
CF 3.090 5 GHz
19001 pts
181.9 MHz/
Span 1.819 GHz
Measuring...
08:40:26 AM 06/18/2024


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm Offset 52.69 dB RBW 1 MHz
Att 5 dB SWT 10 s VBW 3 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.21 dBm
5.929 770 GHz
CF 5.0 GHz
4001 pts
200.0 MHz/
Span 2.0 GHz
Measuring...
08:40:45 AM 06/18/2024

TEST REPORT

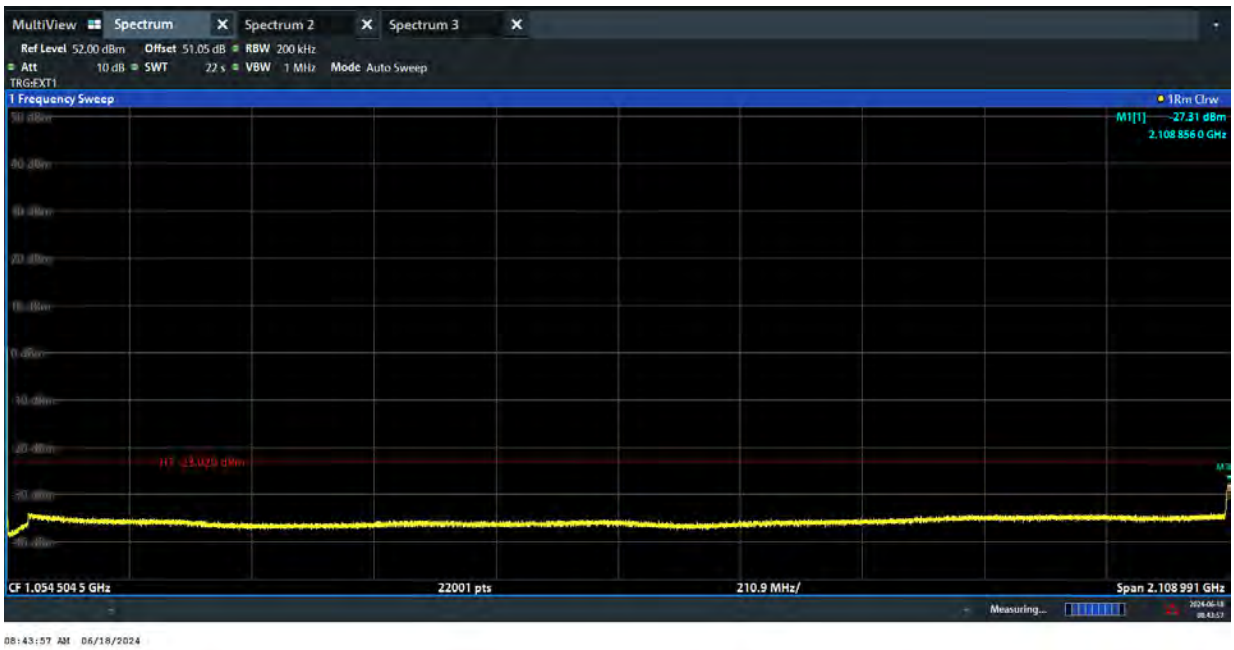

MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm Offset 55.47 dB RBW 1 MHz
Att 5 dB SWT 24 s VBW 3 MHz Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.31 dBm
7.496 190 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
02:37:13 AM 06/19/2024

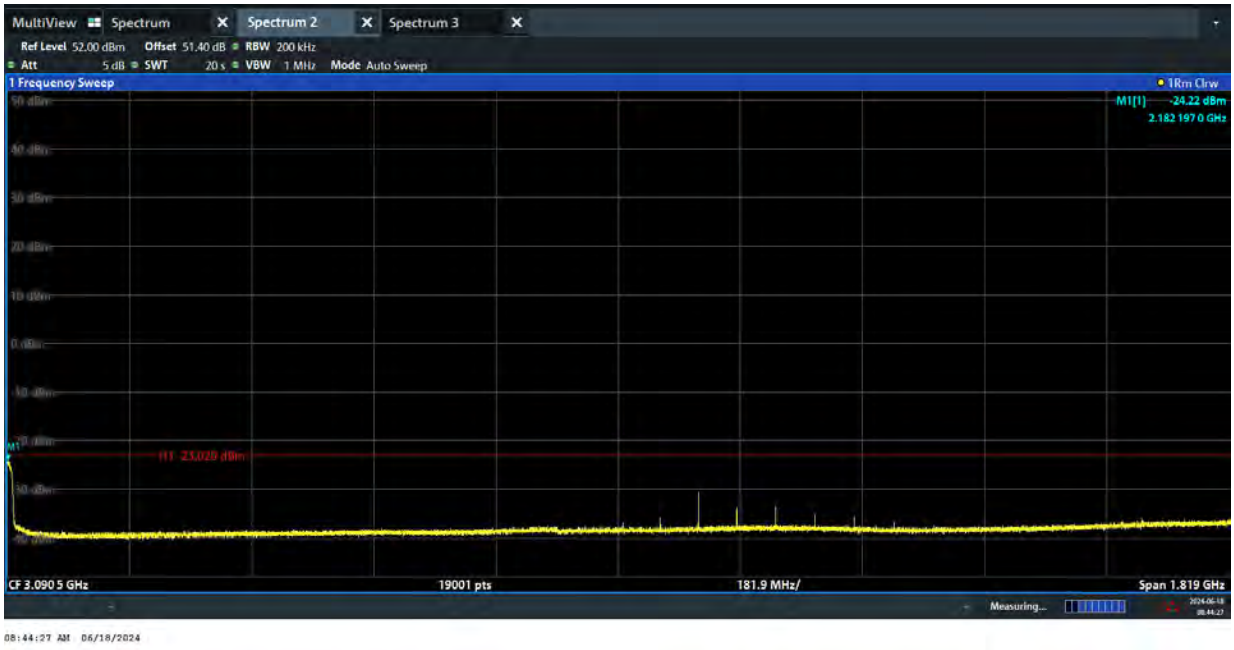

MultiView
Spectrum 1
Spectrum 2
Ref Level 30.00 dBm Offset 17.45 dB RBW 1 MHz
Att 5 dB SWT 10 s VBW 3 MHz Mode Auto Sweep
TRG:EXT1
1 Frequency Sweep
1Rm Clrw
M1[1] -50.94 dBm
21.611 300 GHz
CF 20.0 GHz
8001 pts
400.0 MHz/
Span 4.0 GHz
Measuring...
02:17:06 AM 06/19/2024

TEST REPORT

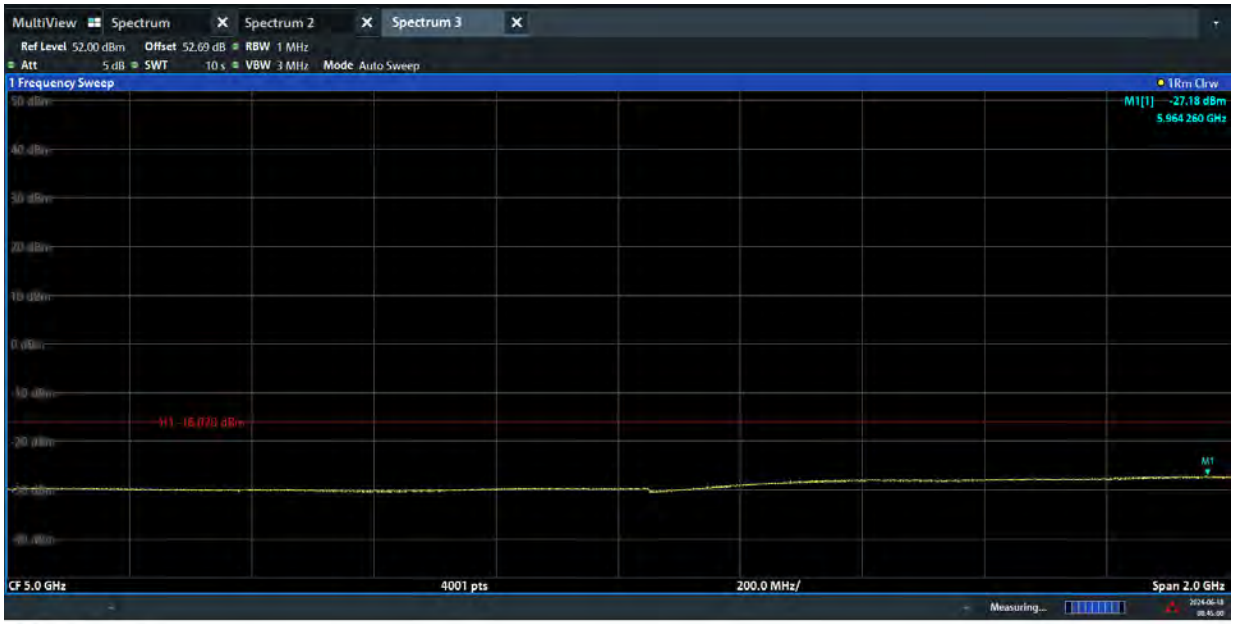
Antenna Port	Channel Position	NR Modulation	NR Channel BW (MHz)	RBW (kHz)	Limit (dBm)
B	M	256QAM	35	1000/200	-16.02/-23.02

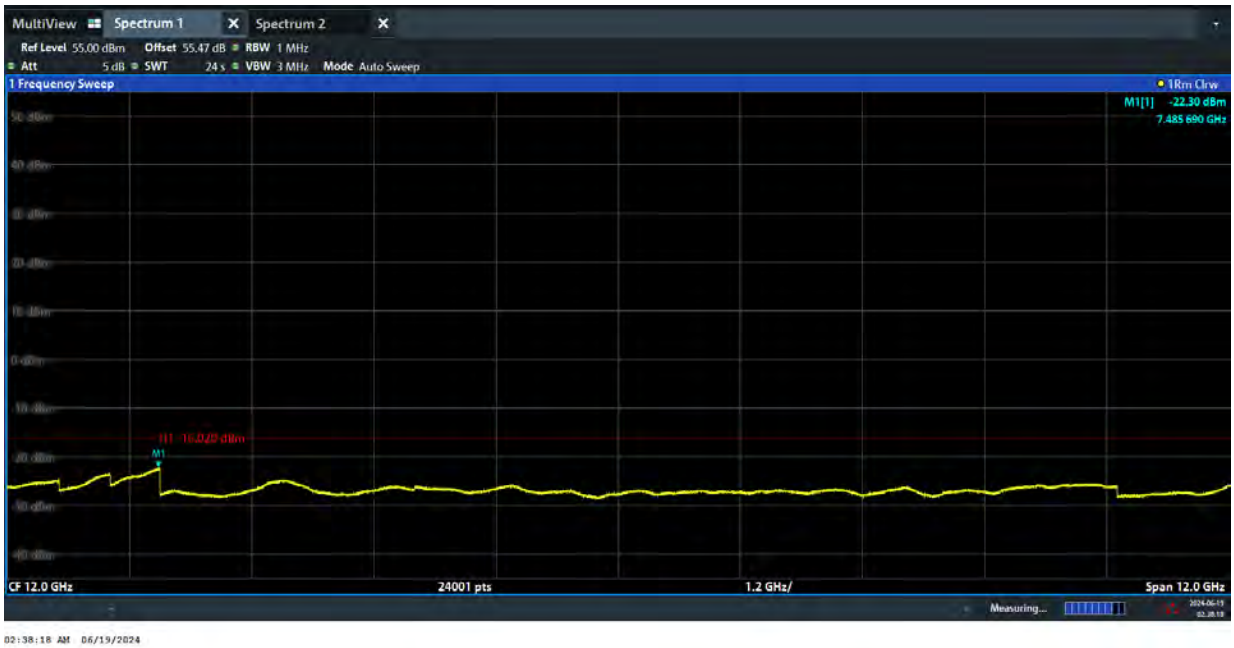
Channel Position M





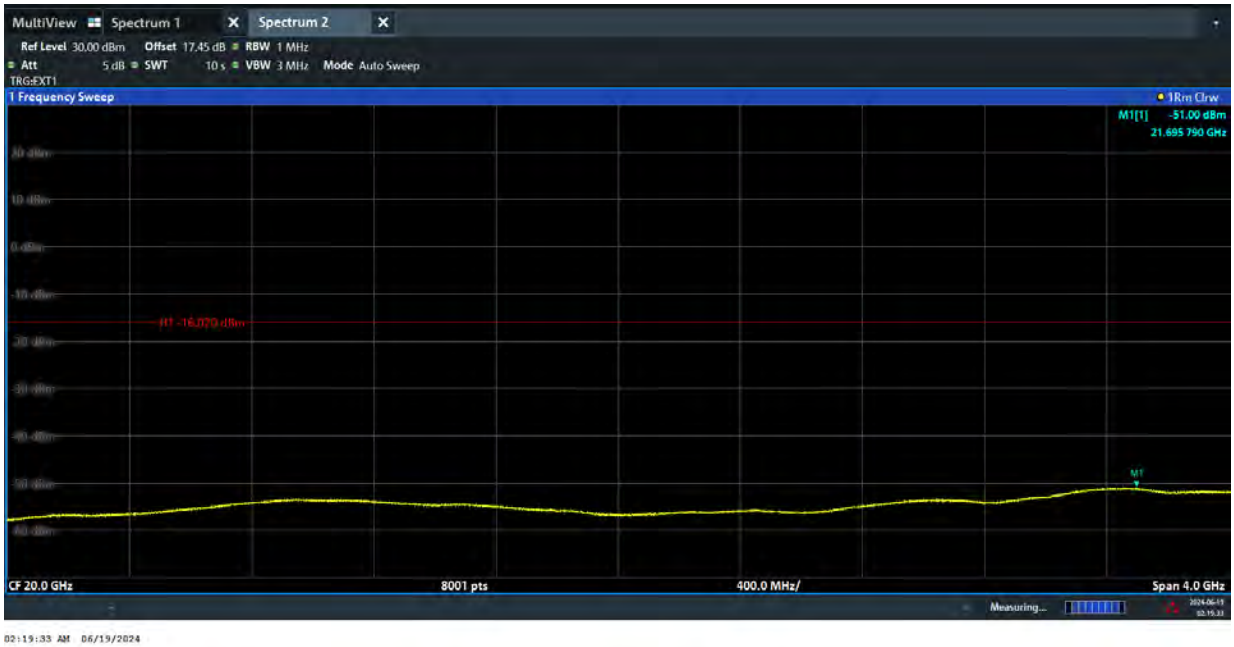
TEST REPORT


MultiView
Spectrum
Spectrum 2
Spectrum 3
Ref Level 52.00 dBm
Offset 52.69 dB
RBW 1 MHz
Att 5 dB
SWT 10 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -27.18 dBm
5.964 260 GHz
CF 5.0 GHz
4001 pts
200.0 MHz/
Span 2.0 GHz
Measuring...
08:45:01 AM 06/18/2024


MultiView
Spectrum 1
Spectrum 2
Ref Level 55.00 dBm
Offset 55.47 dB
RBW 1 MHz
Att 5 dB
SWT 24 s
VBW 3 MHz
Mode Auto Sweep
1 Frequency Sweep
1Rm Clrw
M1[1] -22.30 dBm
7.485 690 GHz
CF 12.0 GHz
24001 pts
1.2 GHz/
Span 12.0 GHz
Measuring...
02:38:18 AM 06/19/2024

Total Quality. Assured.

TEST REPORT



7 Frequency Stability

Test result: **Tested**

7.1 Limit

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

7.2 Measurement Procedure

Temperature Variation
The EUT was tested over the temperature range -40°C to +55°C in 10°C steps with -48 VDC Power Supply. At each temperature step, the Base Station was configured to transmit at maximum power on the middle channel of the operating band.

Voltage Variation
The EUT was tested at the supplied voltages varied from 85 to 115 percent of the nominal values of -48 VDC. At +20°C, the Base Station was configured to transmit at maximum power on the middle channel of the frequency block.

7.3 Measurement result

Frequency Error – Temperature Variation

Configuration NR-1C, Channel Bandwidth: 40MHz

Antenna Port	Modulation	Temperature (°C)	Frequency Stability (Hz)		
			Channel Position B	Channel Position M	Channel Position T
B	256QAM	50	-0.20	0.58	-0.38
		40	0.76	0.11	0.68
		30	0.05	-0.34	0.19
		20	-0.50	0.49	-0.46
		10	-0.70	-0.07	-0.37
		0	-0.63	1.43	-0.80
		-10	0.37	0.57	0.15
		-20	0.48	-0.35	-0.40
		-30	0.33	-0.33	0.41

Frequency Error – Voltage Variation

Configuration NR-1C, Channel Bandwidth: 40MHz

Antenna Port	Modulation	Temperature (°C)	Supply Voltage (V)	Frequency Stability (Hz)		
				Channel Position B	Channel Position M	Channel Position T
B	256QAM	20	-40.8	-0.11	0.65	-0.33
			-48.0	-0.50	0.49	-0.46
			-55.2	-0.51	0.69	-0.74

********** END **********