Ericsson AB

RF TEST REPORT

Report Type:
FCC Part 27 RF report

PRODUCT NAME:
Radio 4415 B66A

REPORT NUMBER:
230701086SHA-001

ISSUE DATE:
August 17, 2023

DOCUMENT CONTROL NUMBER:
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Intertek Testing Services Shanghai
Building No.86, 1198 Qinzhou Road (North)
Caohejing Development Zone
Shanghai 200233, China

Telephone: 86 21 6127 8200
www.intertek.com

Total Quality. Assured.

TEST REPORT

Report no.: 230701086SHA-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:	TA8AKRC161644-3
IC:	287AB-AS1616443

SUMMARY:

The equipment is tested according to the following standard(s) or Specification:
FCC CFR 47 Part 27: 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:**
Victor Yang	Jackson Huang
Project Engineer Victor Yang	Reviewer Jackson Huang

Content

Revision History

Report No.	Version	Description	Issued Date
230701086SHA-001	Rev. 01	Initial issue of report	August 17, 2023

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 4415 B66A
Product number:	KRC 161 644/1, KRC 161 644/3
HVIN	AS1616443
Serial Number(s)	B441150169
Rating:	-48V DC
Software Version:	PIS: CXP9013268/15_R95JC, UP: CXP9024418/15_R80A131
Hardware Version:	R1C
Sample received date:	July 18, 2023
Date of test:	July 18, 2023 ~ July 21, 2023

1.2 Technical Specification

Frequency Range:	TX: 2110-2180 MHz, RX: 1710-1780 MHz
Number of Antenna ports:	4 TX/RX
Supported RAT:	SR/MR: WCDMA, LTE, NR
Max RF bandwidth (IBW):	70 MHz
Supported Number of Carriers:	Maximum 6 carriers per port
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 40W per port

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:	No. 5 Lize East Street, Ericsson Tower, Chaoyang District, Beijing 100102 P.R.C.
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 (2021)
FCC Part 2 (2021)
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 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 4415 B66A operates from a -48V DC.
EUT has 2 variants. KRC 161 644/1 without NEBS cover; KRC 161 644/3 with NEBS cover. We test KRC 161 644/1 as typical model and list the worst data.
The EUT includes 4 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.
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, 256QAM on one of the antenna ports, it was determined that QPSK for NR 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 D for all modes.
The settings below were used for all measurements unless otherwise noted:

NR

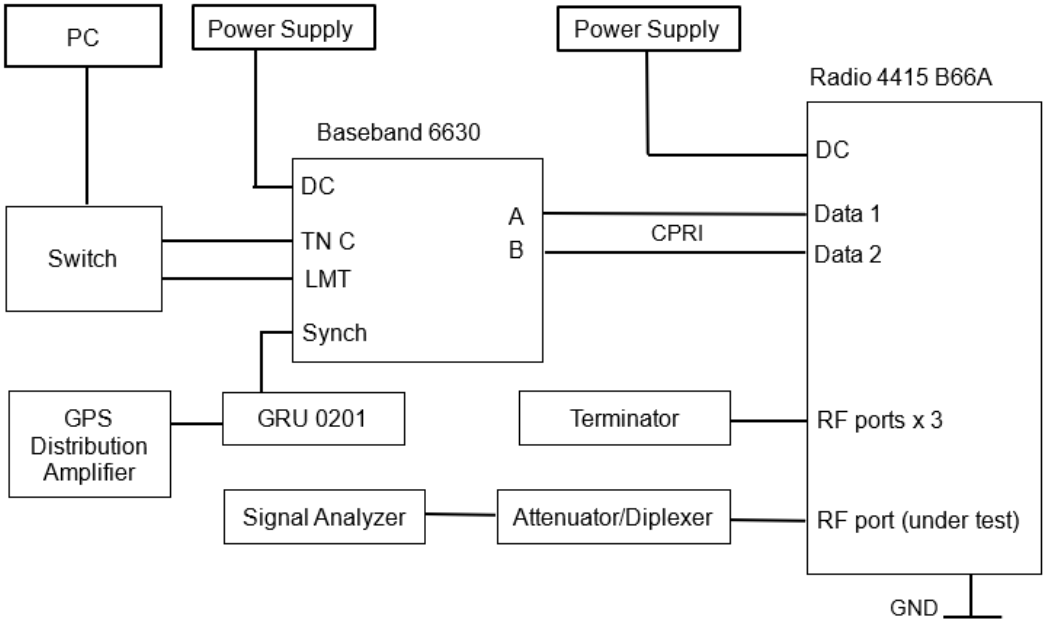
Configuration	No. of Carriers	NR Carrier Bandwidth (MHz)	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR-1C	1NR	25	2122.5	2145	2167.5
		30	2125	2145	2165
		35	2127.5	2145	2162.5
		40	2130	2145	2160
NR-2C	2NR	25	-	2122.5+2167.5	-
		30	-	2125+2165	-
		35	-	2127.5+2162.5	-

NR

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	-

2.4 Test Setup

Conducted Measurement:



No.	Auxiliary Equipment	Product Number / Model Type	Version
1	PC	PowerEdge R230	-
2	Baseband 6630	KDU 137 848/1	R2H
3	GRU 02 01	NCD 901 41/1	R1D
4	GPS Distribution Amplifier	58536A	-
5	Switch	LS-S5024E-CN	-
6	Terminator	60Z150/01020605006	-
7	Terminator	TF150/11081908	-
8	Terminator	TF150/06081408	-

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

2.5 Test environment condition:

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

2.6 Instrument list

RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	PXA Signal Analyzer	Keysight	N9030A	EC1046	2024.4.7
☐	Signal Generator	R&S	SMU200A	EC1050	2024.4.2
☒	Climatic Chamber	赛宝	117	EC1052	2023.9.19
☒	Humiture meter	托普	CEEC-WR16H-50W	EC1053	2024.2.21
☐	Power meter	R&S	NRP-Z21	EC1113	2023.8.9
☒	DC Power Supply	Keysight	N8737A	US23B3304A	N/A
☒	40dB Attenuator	SHX	DTS200	17070716	N/A
☒	20dB Attenuator	SHX	DTS50G	15092511	N/A
☒	Diplexer	K&L	WSD-00747-1	35	N/A
☒	40dB Attenuator	SHX	2.92TS50	21041401	N/A
☒	Network Analyzer	Keysight	E5071C	MY46631193	2023.10.17
☒	Network Analyzer	R&S	ZNA43	100948	2024.3.15

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:

FCC (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

IC 65 dBm e.i.r.p./MHz

Peak to Average Ratio: ≤13 dB

Note: Stricter limit 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

NR mode:

NR-1C

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	25	46.02	32.61	7.50	45.98	32.56	7.42	45.98	32.53	7.48
B	QPSK	25	46.02	32.61	7.50	45.99	32.58	7.43	46.04	32.62	7.46
C	QPSK	25	46.06	32.79	7.49	46.09	32.70	7.43	46.12	32.65	7.49
D	QPSK	25	46.03	32.75	7.50	46.01	32.60	7.43	46.03	32.60	7.50
Total conducted power			52.05	38.71	-	52.04	38.63	-	52.06	38.62	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
Max antenna gain			-	23.44	-	-	23.52	-	-	23.53	-

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	QPSK	30	46.03	31.82	7.49	46.10	31.93	7.39	46.07	31.84	7.48
B	QPSK	30	46.05	31.84	7.49	46.09	31.77	7.39	45.97	31.77	7.46
C	QPSK	30	46.08	31.97	7.48	46.04	31.99	7.38	46.15	31.93	7.49
D	QPSK	30	46.10	31.96	7.49	46.12	31.88	7.39	46.15	31.96	7.50
Total conducted power			52.09	37.92	-	52.11	37.91	-	52.11	37.90	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
Max antenna gain			-	24.23	-	-	24.24	-	-	24.25	-

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	QPSK	35	46.02	31.11	7.53	46.07	31.19	7.41	46.04	31.11	7.51
B	QPSK	35	45.90	31.04	7.51	45.92	31.05	7.41	45.98	31.04	7.50
C	QPSK	35	46.07	31.26	7.51	46.12	31.25	7.41	46.03	31.13	7.54
D	QPSK	35	46.03	31.18	7.52	46.11	31.19	7.41	46.11	31.23	7.54
Total conducted power			52.03	37.17	-	52.08	37.19	-	52.06	37.15	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
Max antenna gain			-	24.98	-	-	24.96	-	-	25.00	-

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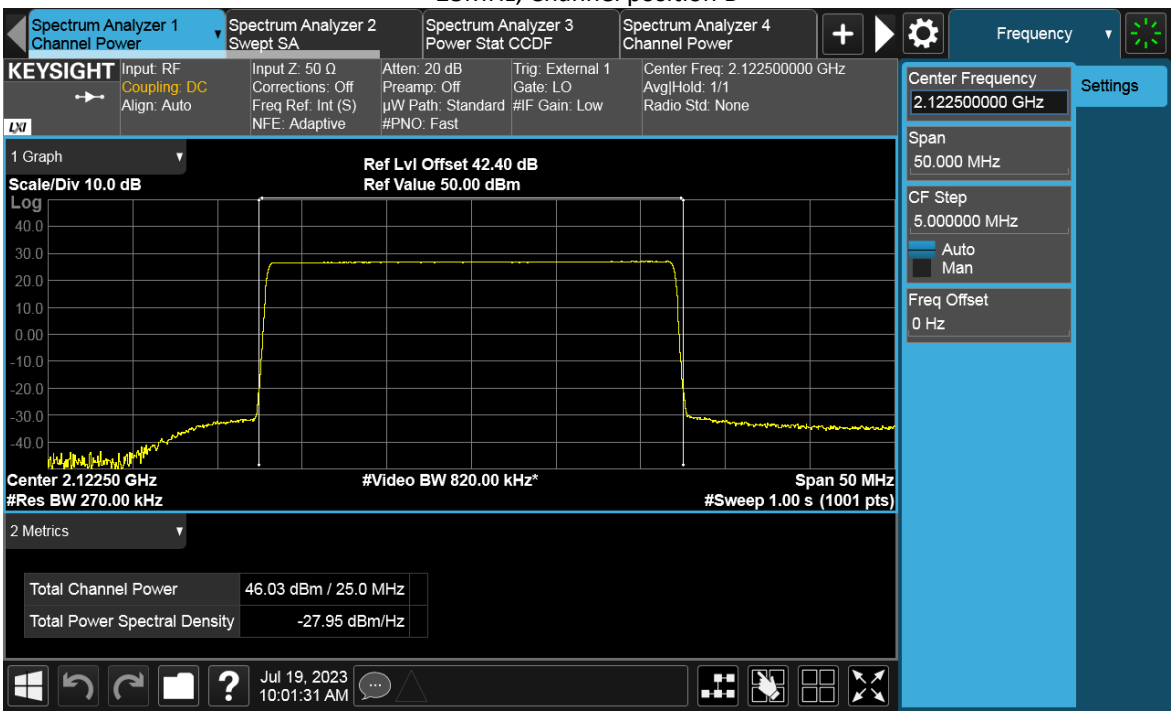
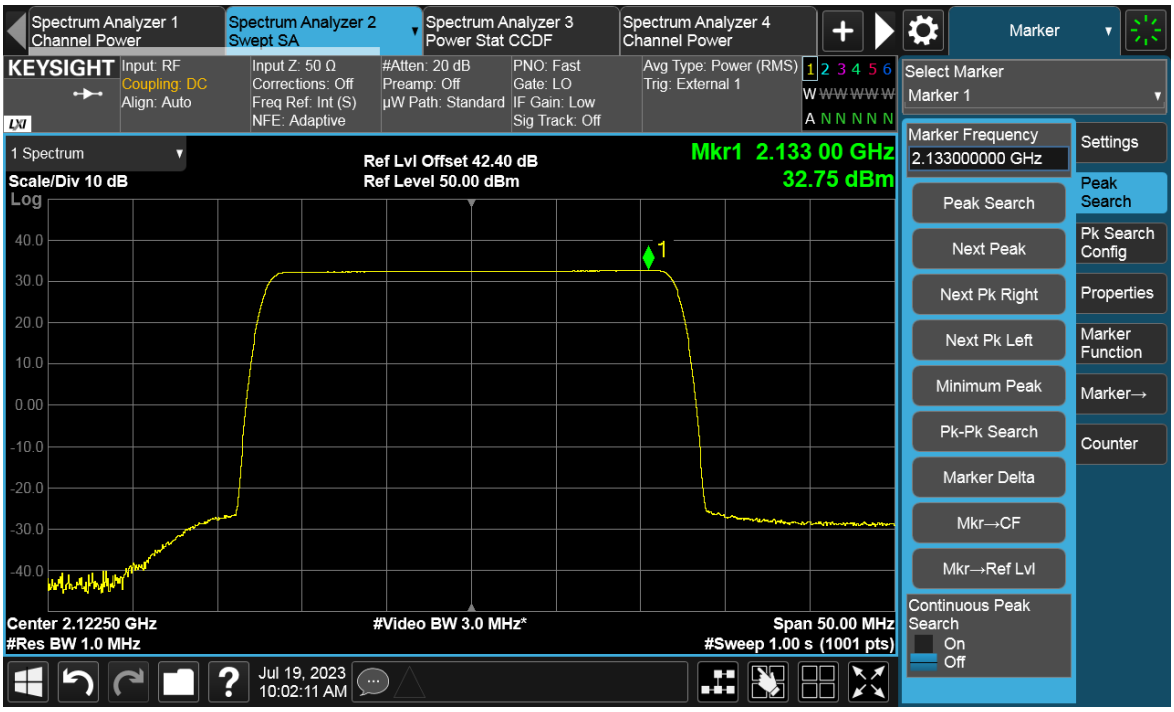
Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	40	45.97	30.52	7.56	46.07	30.57	7.42	45.97	30.46	7.53
B	QPSK	40	45.92	30.43	7.55	45.98	30.41	7.42	45.95	30.52	7.52
C	QPSK	40	45.97	30.60	7.52	46.04	30.71	7.42	46.07	30.63	7.57
D	QPSK	40	46.00	30.58	7.54	46.04	30.77	7.53	46.13	30.66	7.56
Total conducted power			51.99	36.55	-	52.05	36.64	-	52.05	36.59	-
EIRP limit			-	62.15	13.00	-	62.15	13.00	-	62.15	13.00
Max antenna gain			-	25.60	-	-	25.51	-	-	25.56	-

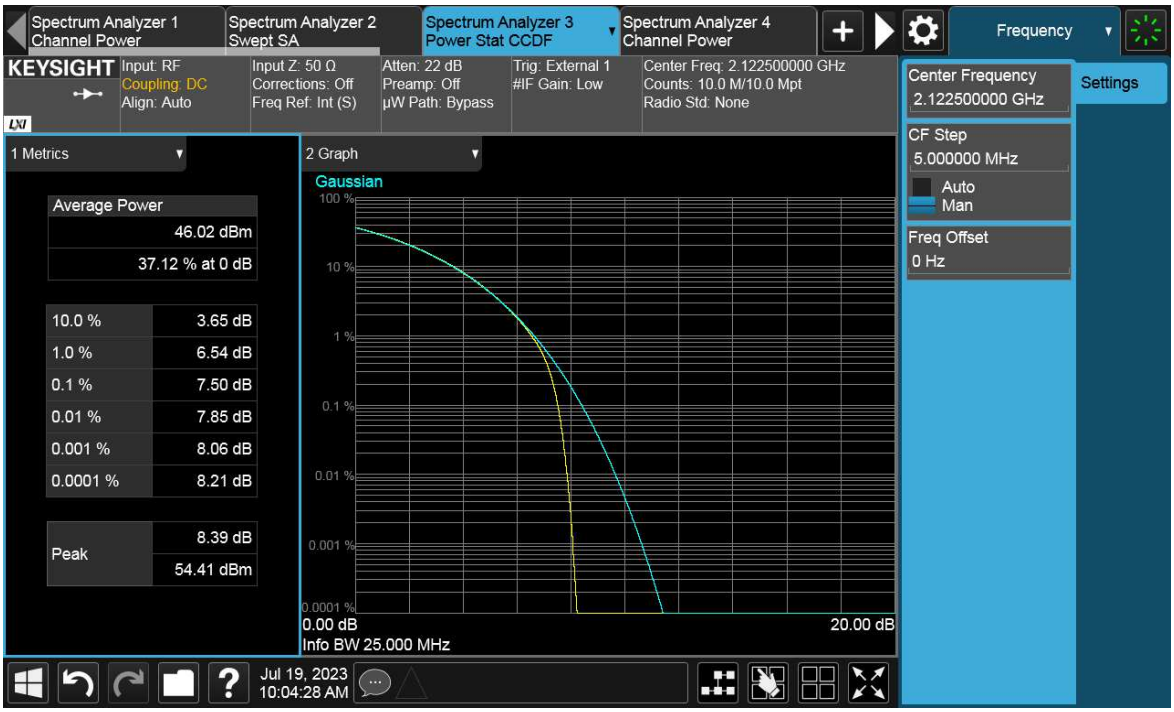
25MHz, Channel position B



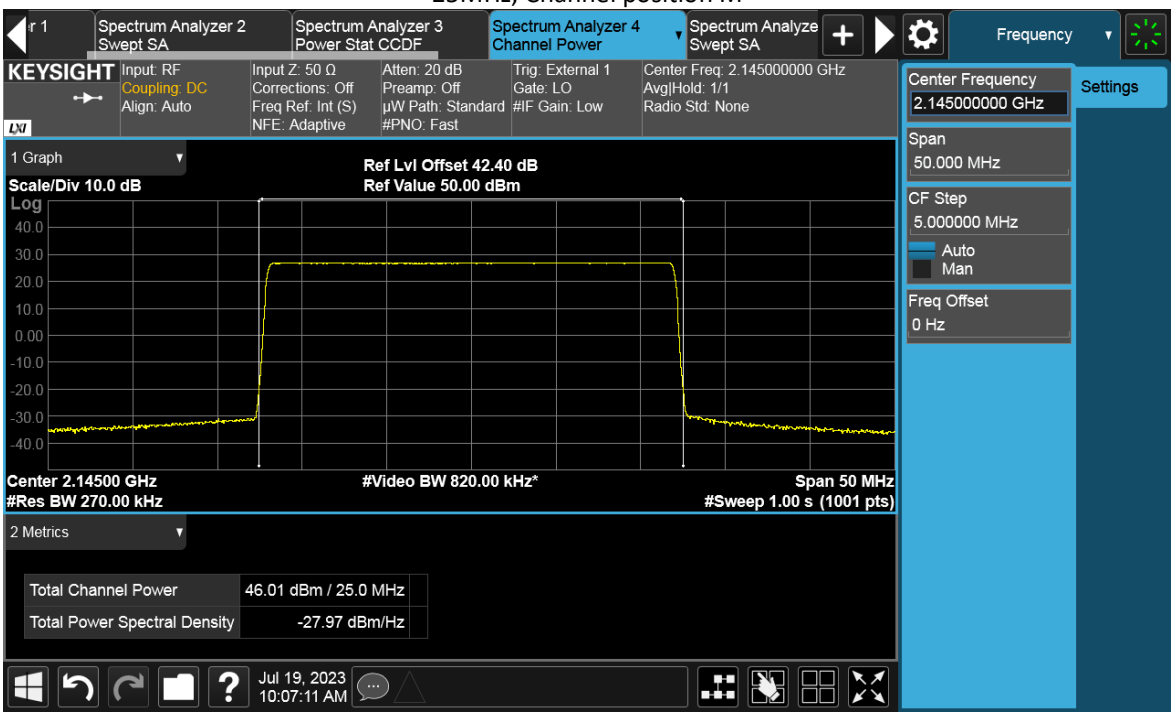
Total Quality. Assured.

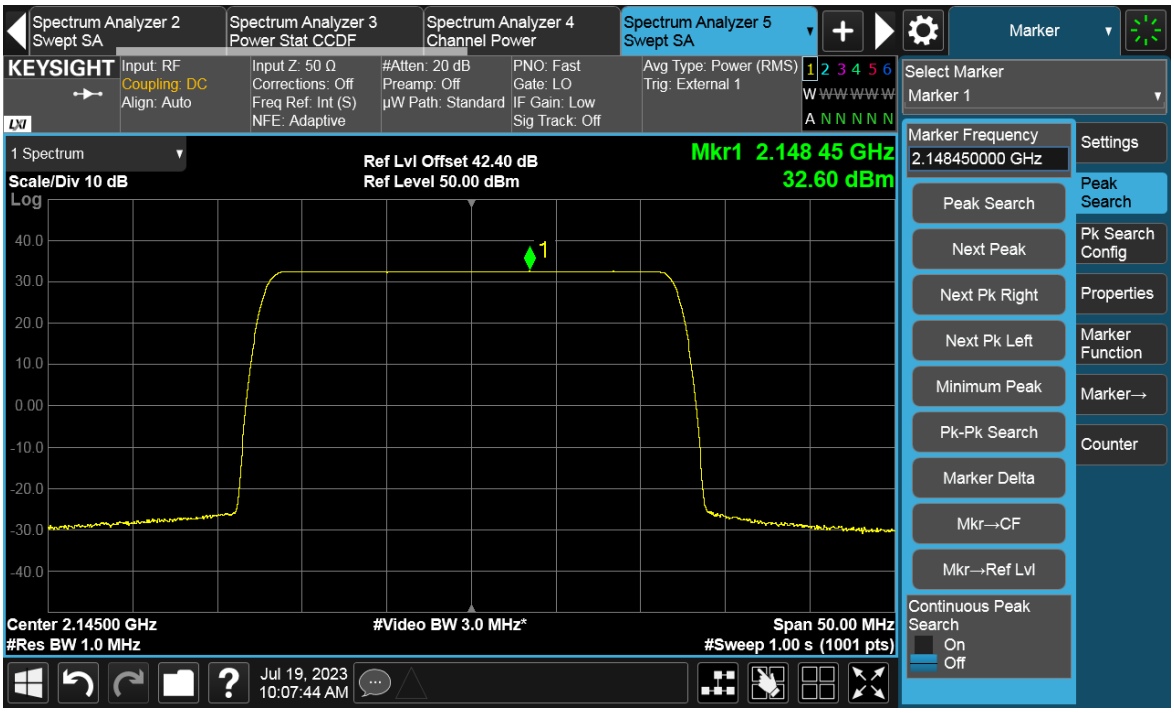
TEST REPORT





25MHz, Channel position M





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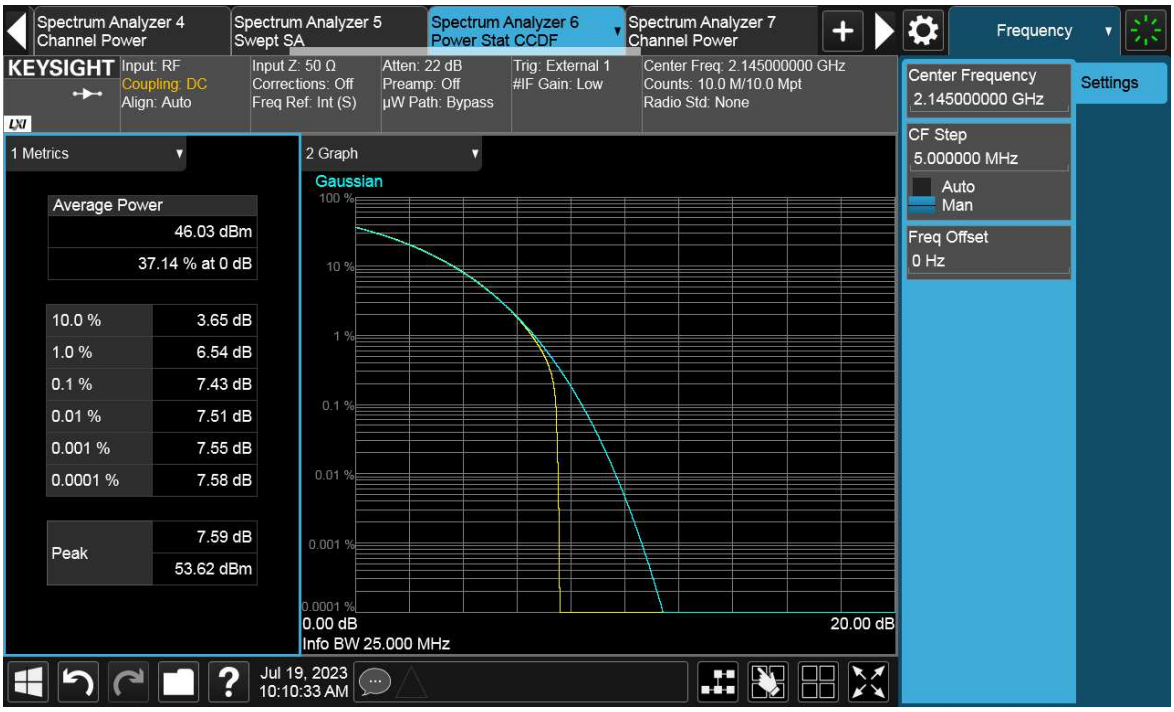
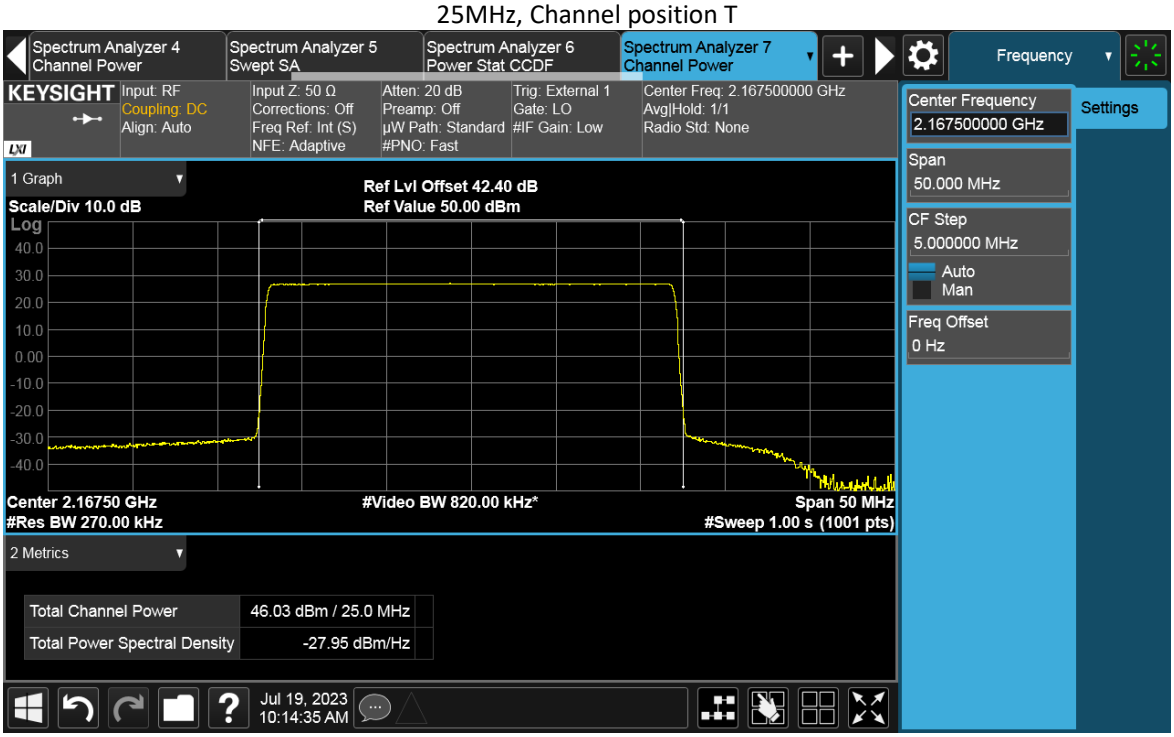
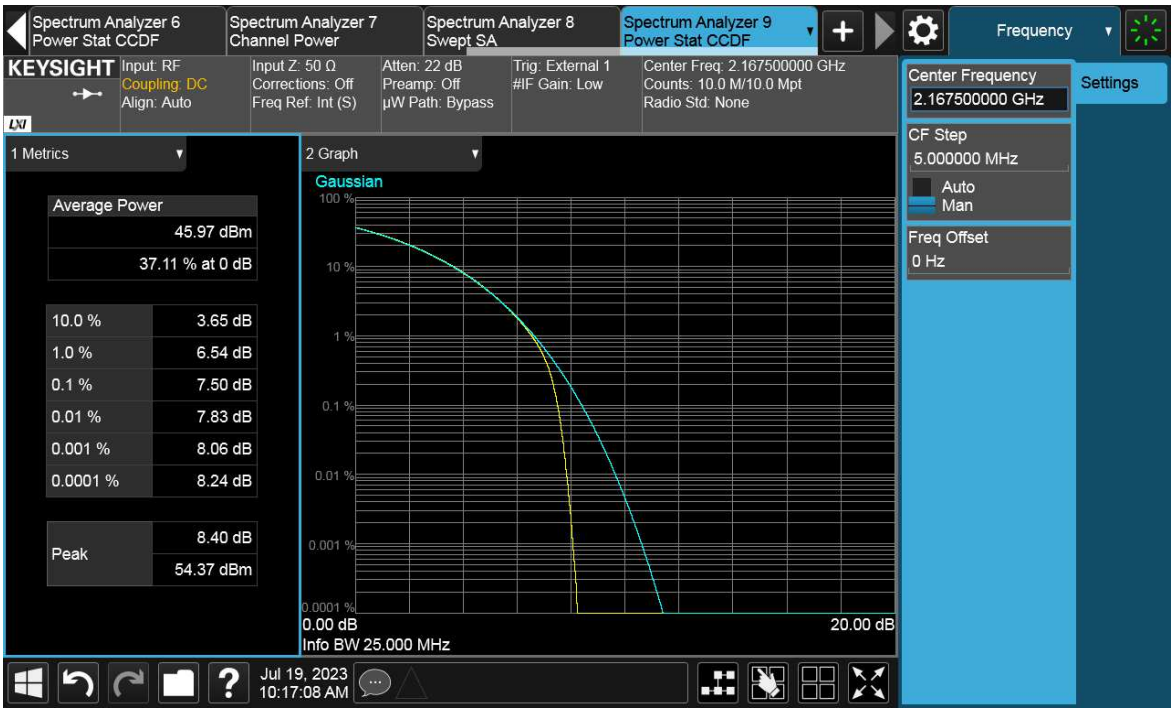


25MHz, Channel position T



TEST REPORT


Spectrum Analyzer 6
Power Stat CCDF
Spectrum Analyzer 7
Channel Power
Spectrum Analyzer 8
Swept SA
Marker
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
#Atten: 20 dB
Preamp: Off
µW Path: Standard
PNO: Fast
Gate: LO
IF Gain: Low
Sig Track: Off
Avg Type: Power (RMS)
Trig: External 1
Select Marker
Marker 1
1 Spectrum
Scale/Div 10 dB
Ref Lvl Offset 42.40 dB
Ref Level 50.00 dBm
Mkr1 2.162 60 GHz
32.60 dBm
Log
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 2.16750 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Span 50.00 MHz
#Sweep 1.00 s (1001 pts)
Marker Frequency
2.162600000 GHz
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Minimum Peak
Pk-Pk Search
Marker Delta
Mkr→CF
Mkr→Ref Lvl
Continuous Peak Search
On
Off
Settings
Peak Search
Pk Search Config
Properties
Marker Function
Marker→
Counter
Jul 19, 2023
10:15:36 AM


Spectrum Analyzer 6
Power Stat CCDF
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Channel Power
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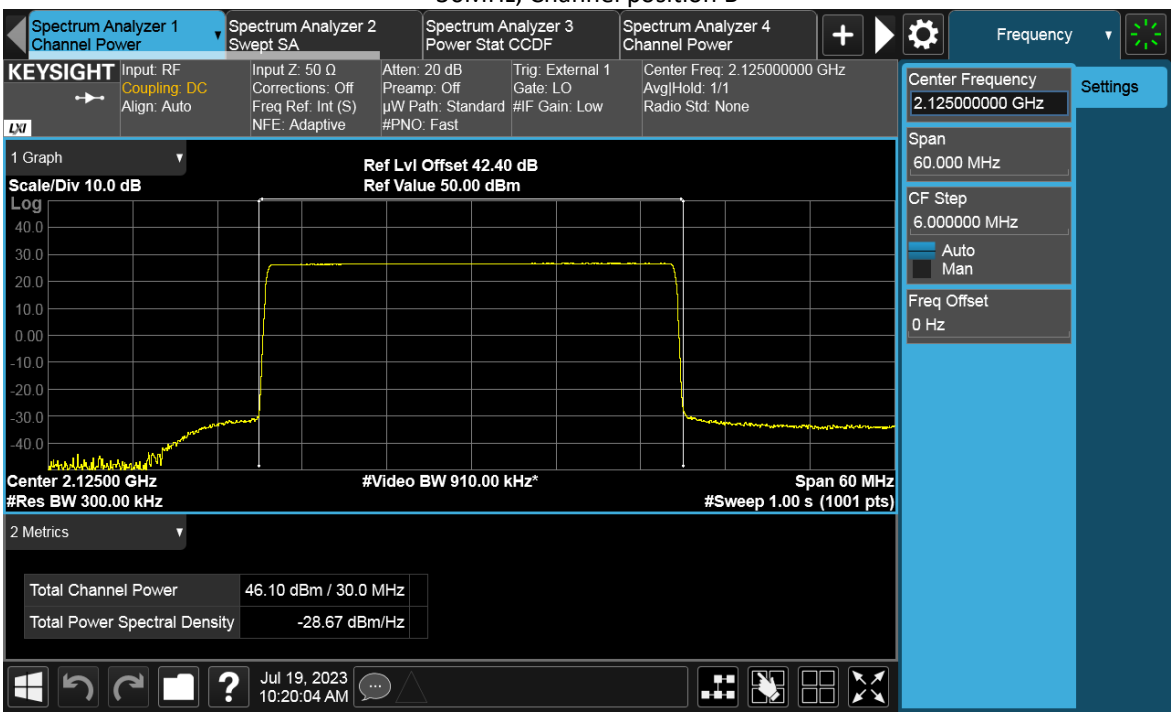
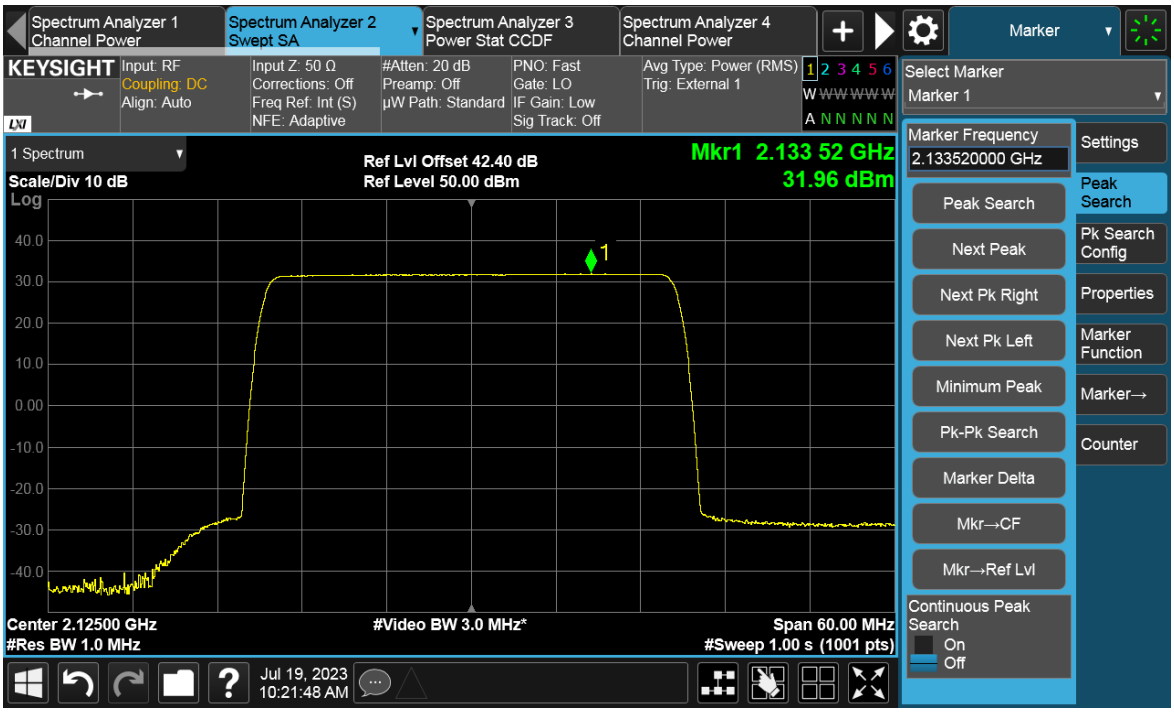
Swept SA
Spectrum Analyzer 9
Power Stat CCDF
Frequency
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
Atten: 22 dB
Preamp: Off
µW Path: Bypass
Trig: External 1
#IF Gain: Low
Center Freq: 2.167500000 GHz
Counts: 10.0 M/10.0 Mpt
Radio Std: None
1 Metrics
Average Power
45.97 dBm
37.11 % at 0 dB
10.0 % 3.65 dB
1.0 % 6.54 dB
0.1 % 7.50 dB
0.01 % 7.83 dB
0.001 % 8.06 dB
0.0001 % 8.24 dB
Peak
8.40 dB
54.37 dBm
2 Graph
Gaussian
100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0.00 dB
20.00 dB
Info BW 25.000 MHz
Center Frequency
2.167500000 GHz
CF Step
5.000000 MHz
Auto
Man
Freq Offset
0 Hz
Settings
Jul 19, 2023
10:17:08 AM

TEST REPORT

30MHz, Channel position B





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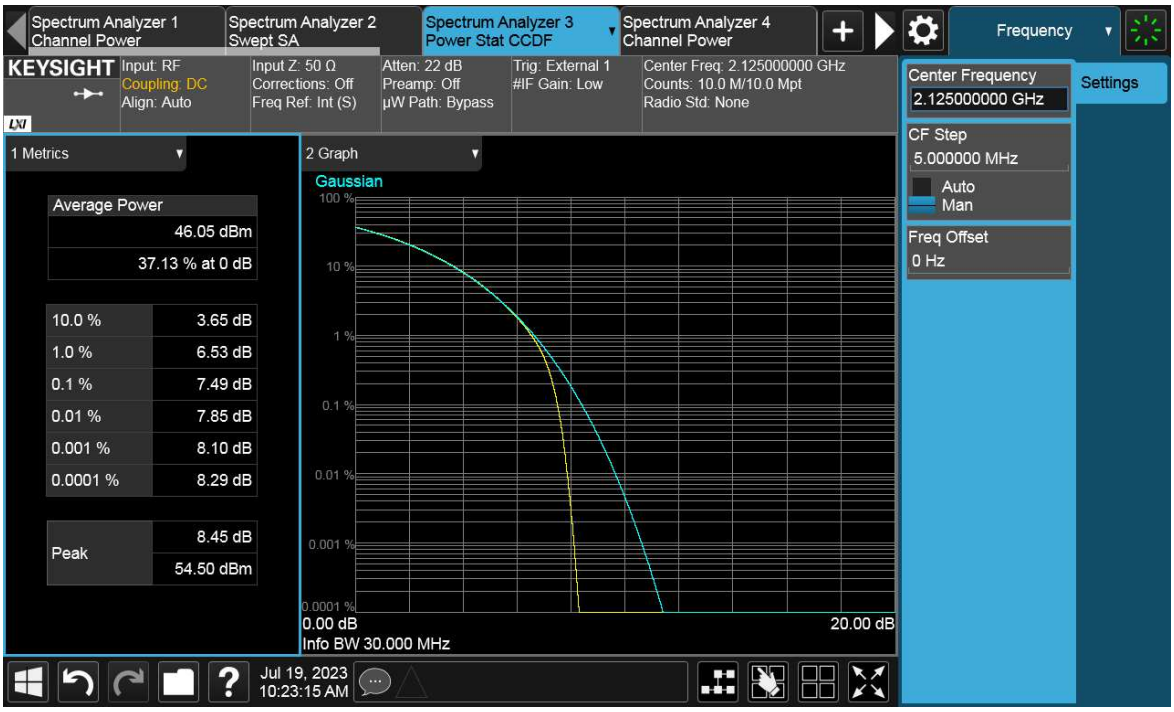
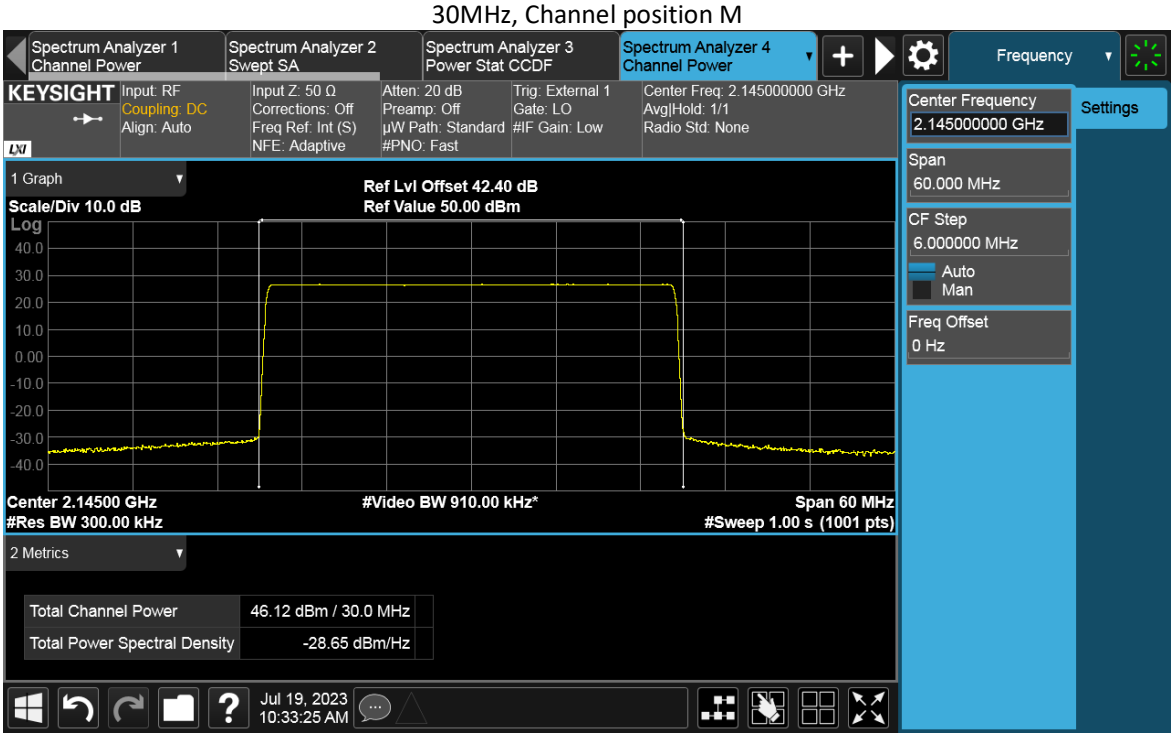
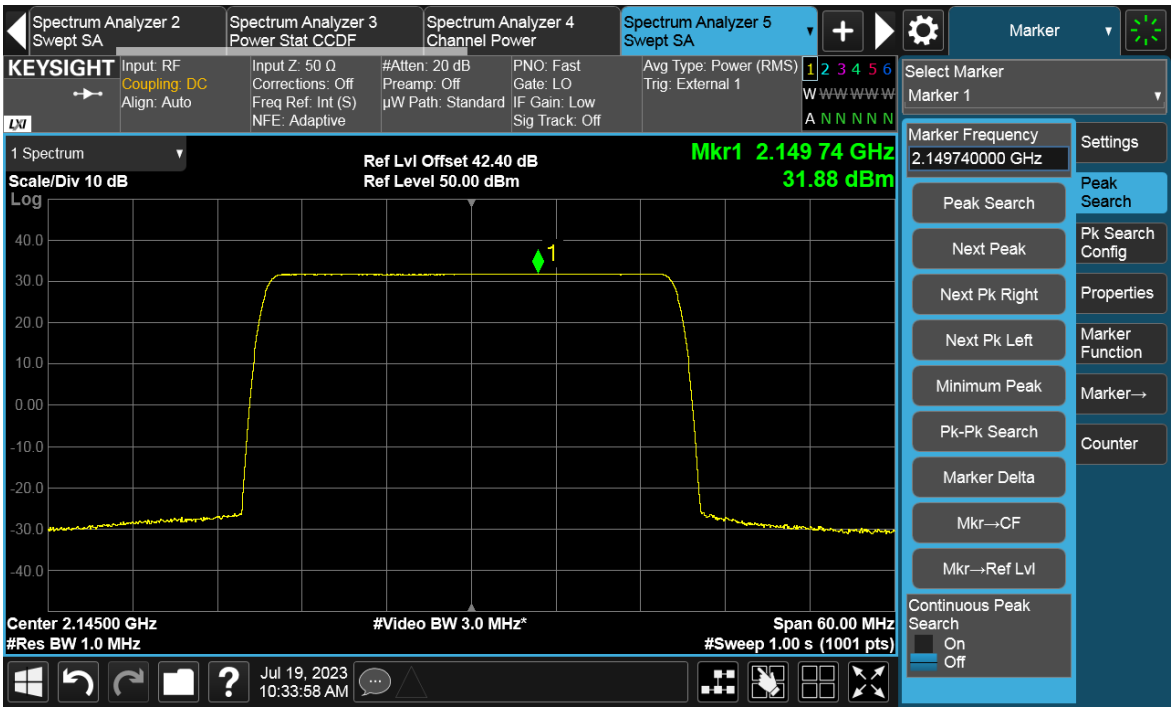


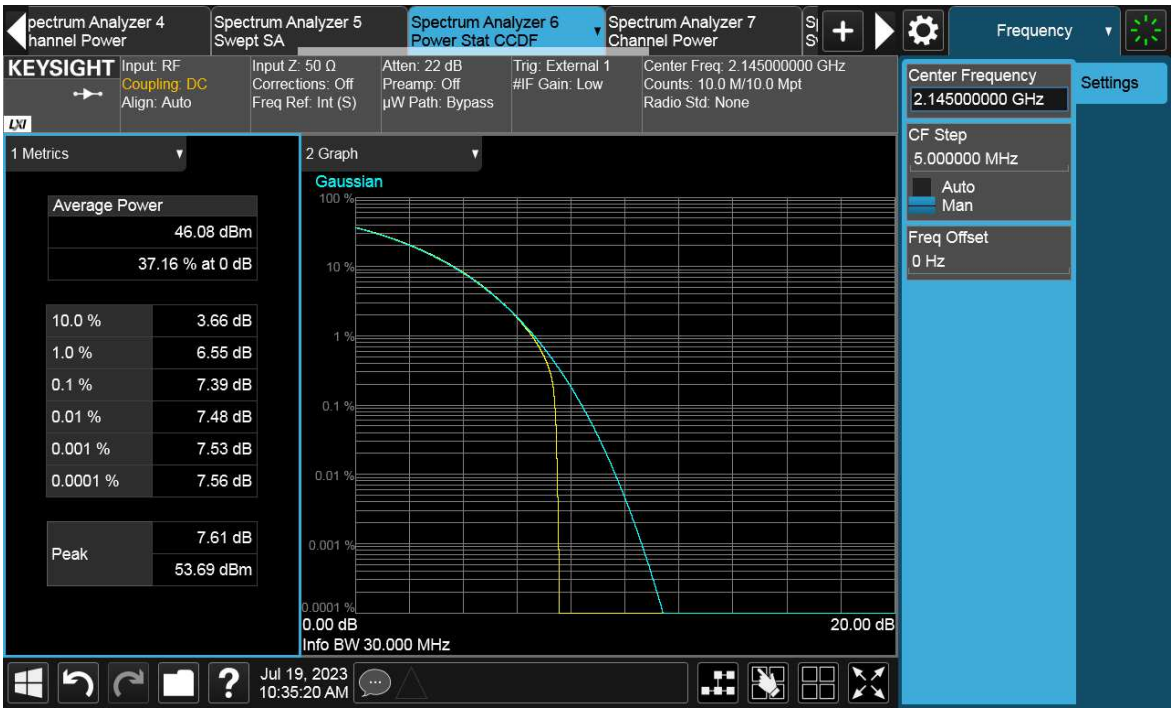
30MHz, Channel position M



Total Quality. Assured.

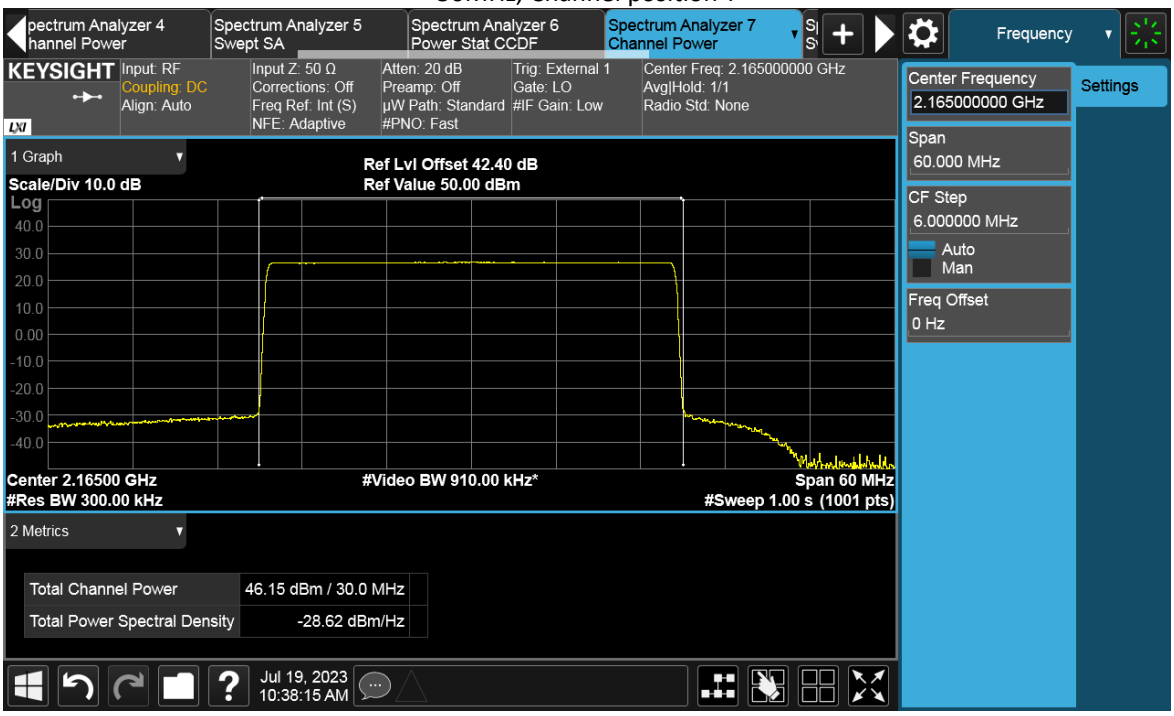
TEST REPORT

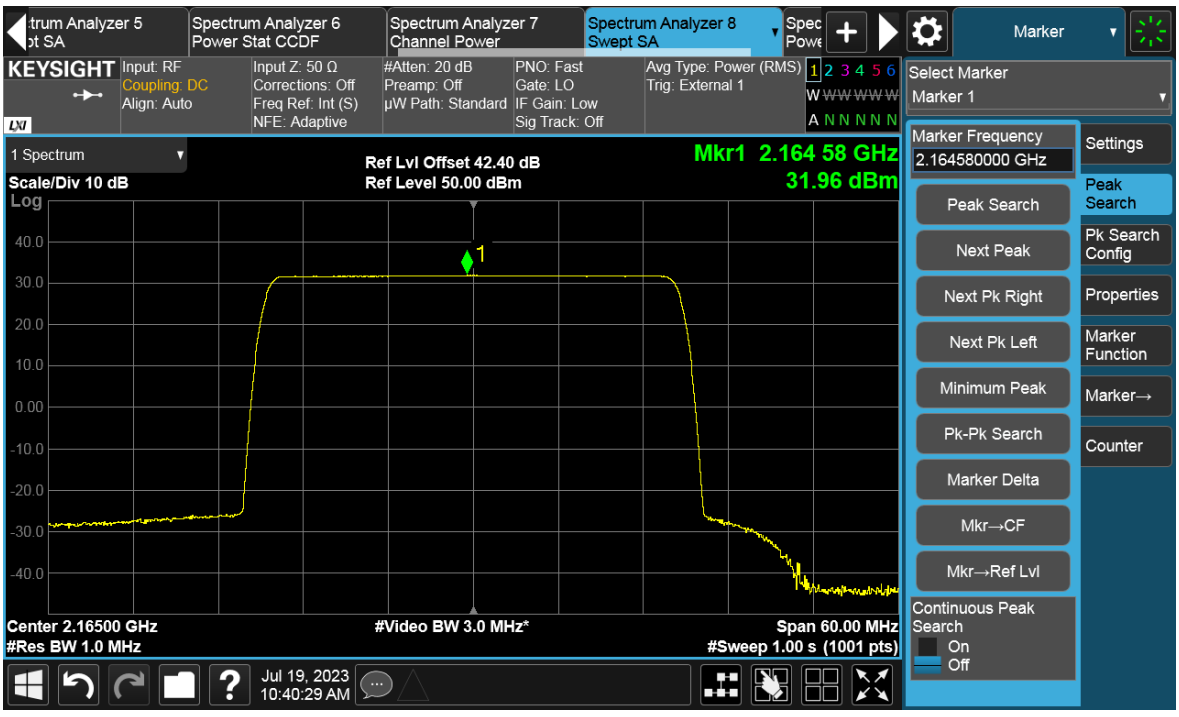




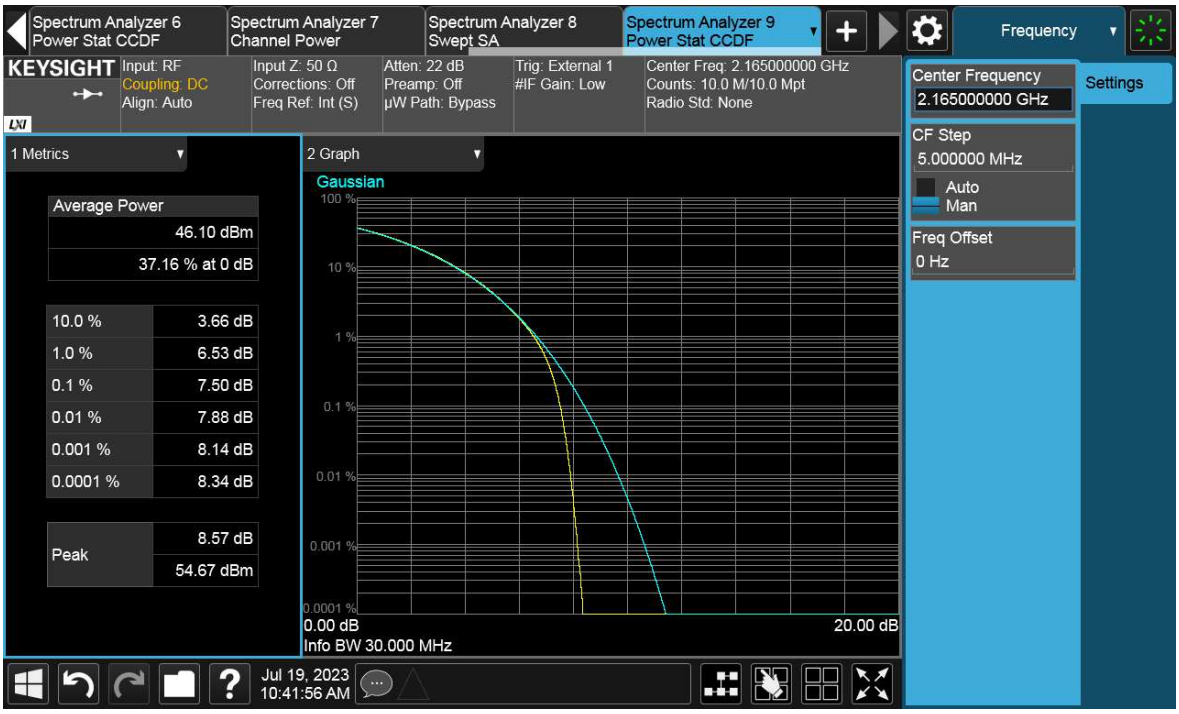
TEST REPORT

30MHz, Channel position T

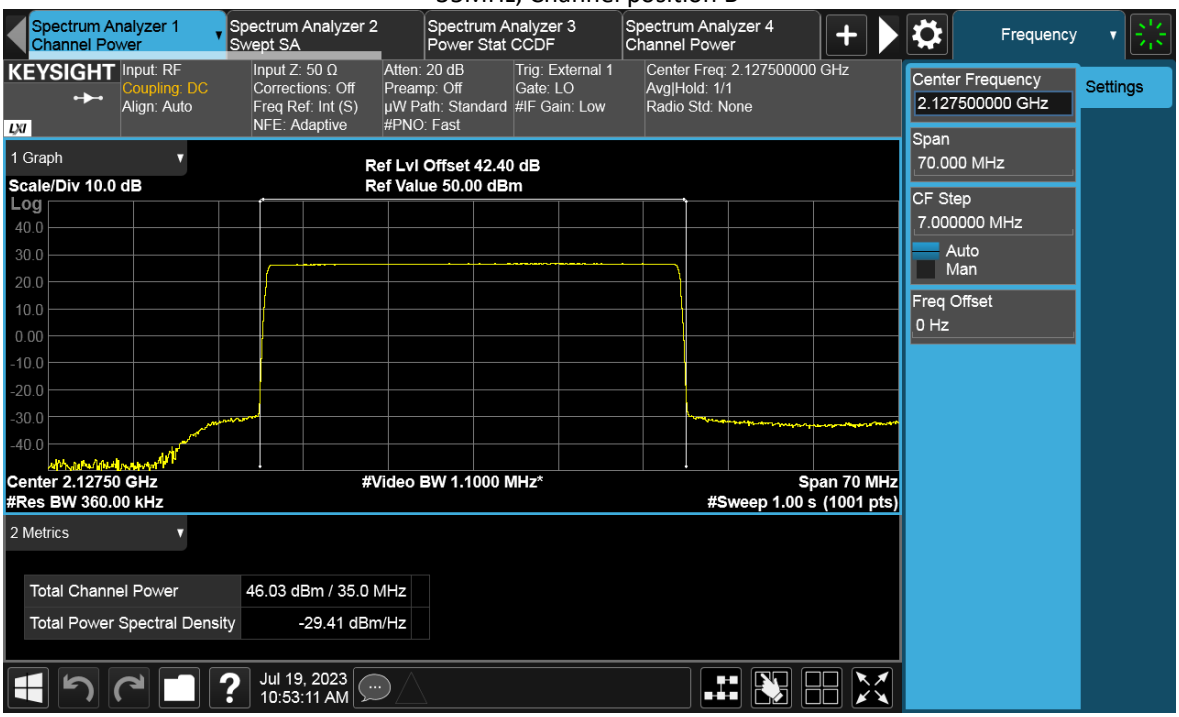




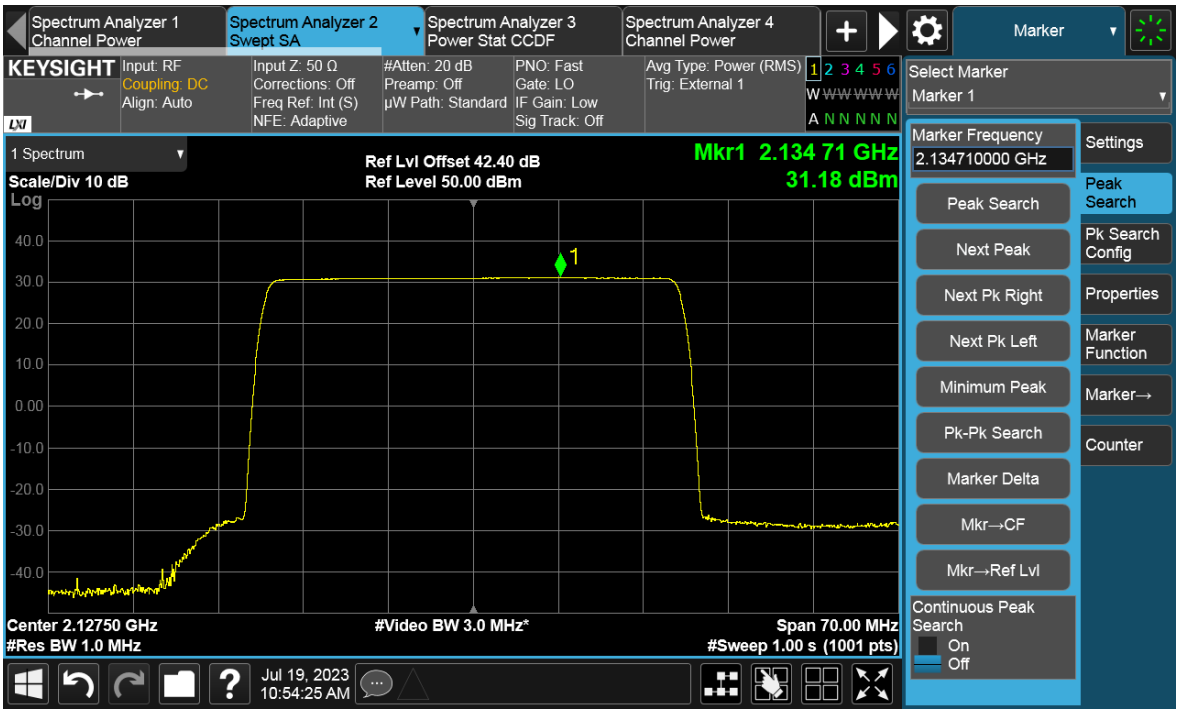
TEST REPORT



35MHz, Channel position B



TEST REPORT


Spectrum Analyzer 1
Channel Power
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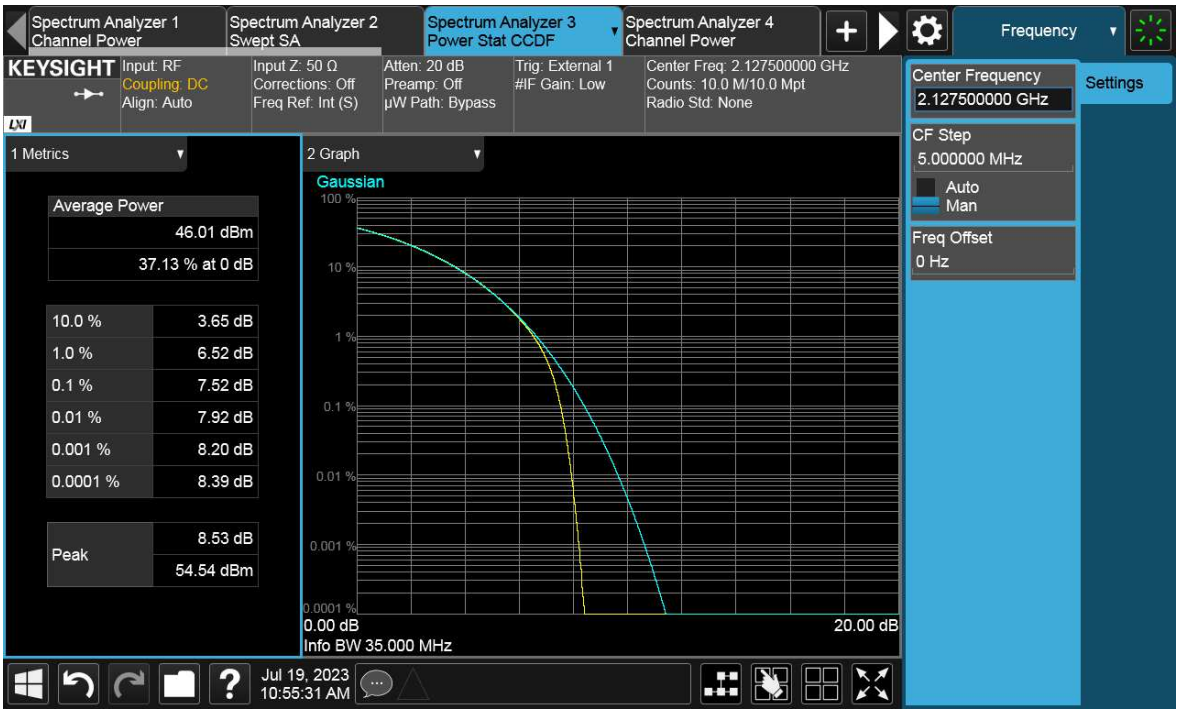
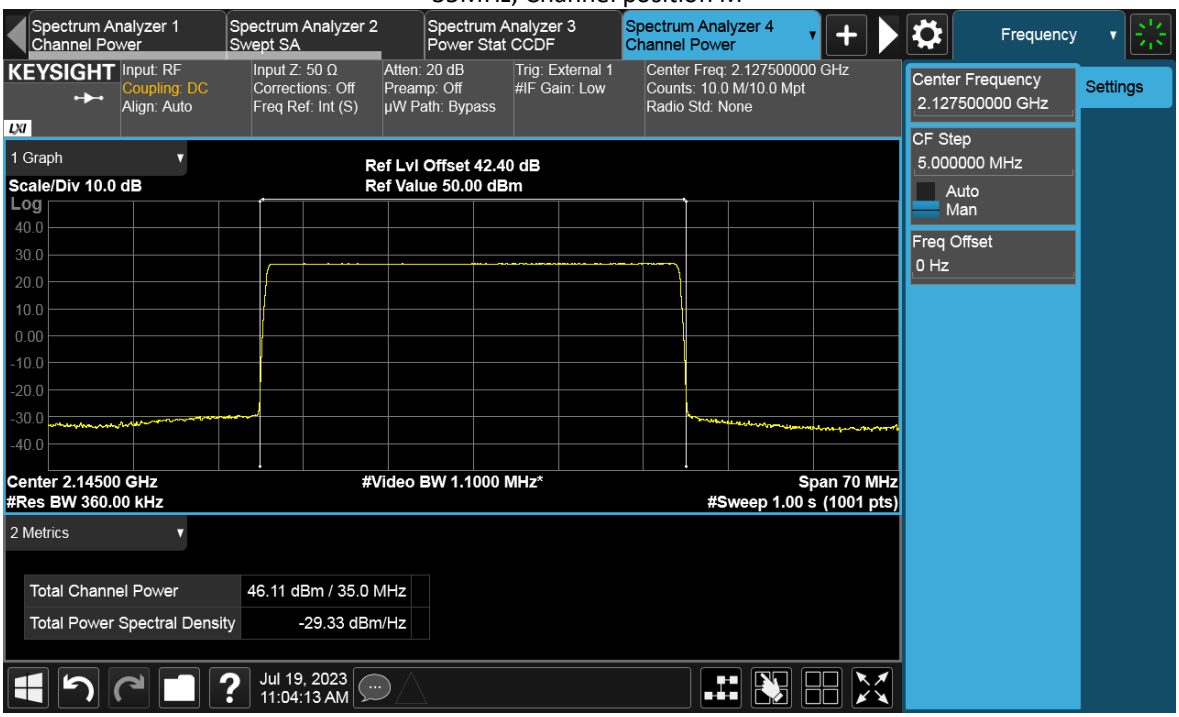
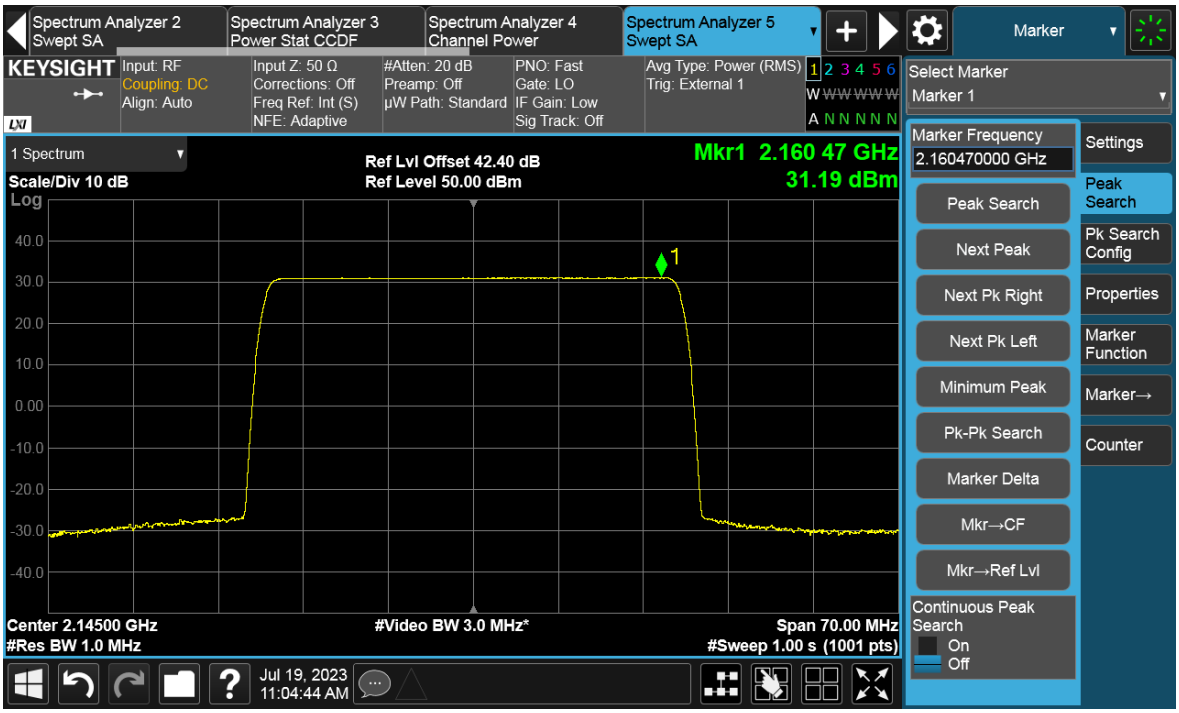
Spectrum Analyzer 4
Channel Power
Marker
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
#Atten: 20 dB
Preamp: Off
µW Path: Standard
PNO: Fast
Gate: LO
IF Gain: Low
Sig Track: Off
Avg Type: Power (RMS)
Trig: External 1
Select Marker
Marker 1
1 Spectrum
Ref Lvl Offset 42.40 dB
Ref Level 50.00 dBm
Mkr1 2.134 71 GHz
31.18 dBm
Scale/Div 10 dB
Log
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 2.12750 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Span 70.00 MHz
#Sweep 1.00 s (1001 pts)
Marker Frequency
2.134710000 GHz
Settings
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Minimum Peak
Pk-Pk Search
Marker Delta
Mkr→CF
Mkr→Ref Lvl
Pk Search Config
Properties
Marker Function
Marker→
Counter
Continuous Peak Search
On
Off
Jul 19, 2023
10:54:25 AM


Spectrum Analyzer 1
Channel Power
Spectrum Analyzer 2
Swept SA
Spectrum Analyzer 3
Power Stat CCDF
Spectrum Analyzer 4
Channel Power
Frequency
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
Atten: 20 dB
Preamp: Off
µW Path: Bypass
Trig: External 1
#IF Gain: Low
Center Freq: 2.127500000 GHz
Counts: 10.0 M/10.0 Mpt
Radio Std: None
1 Metrics
Average Power
46.01 dBm
37.13 % at 0 dB
10.0 % 3.65 dB
1.0 % 6.52 dB
0.1 % 7.52 dB
0.01 % 7.92 dB
0.001 % 8.20 dB
0.0001 % 8.39 dB
Peak
8.53 dB
54.54 dBm
2 Graph
Gaussian
100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0.00 dB
20.00 dB
Info BW 35.000 MHz
Center Frequency
2.127500000 GHz
Settings
CF Step
5.000000 MHz
Auto
Man
Freq Offset
0 Hz
Jul 19, 2023
10:55:31 AM

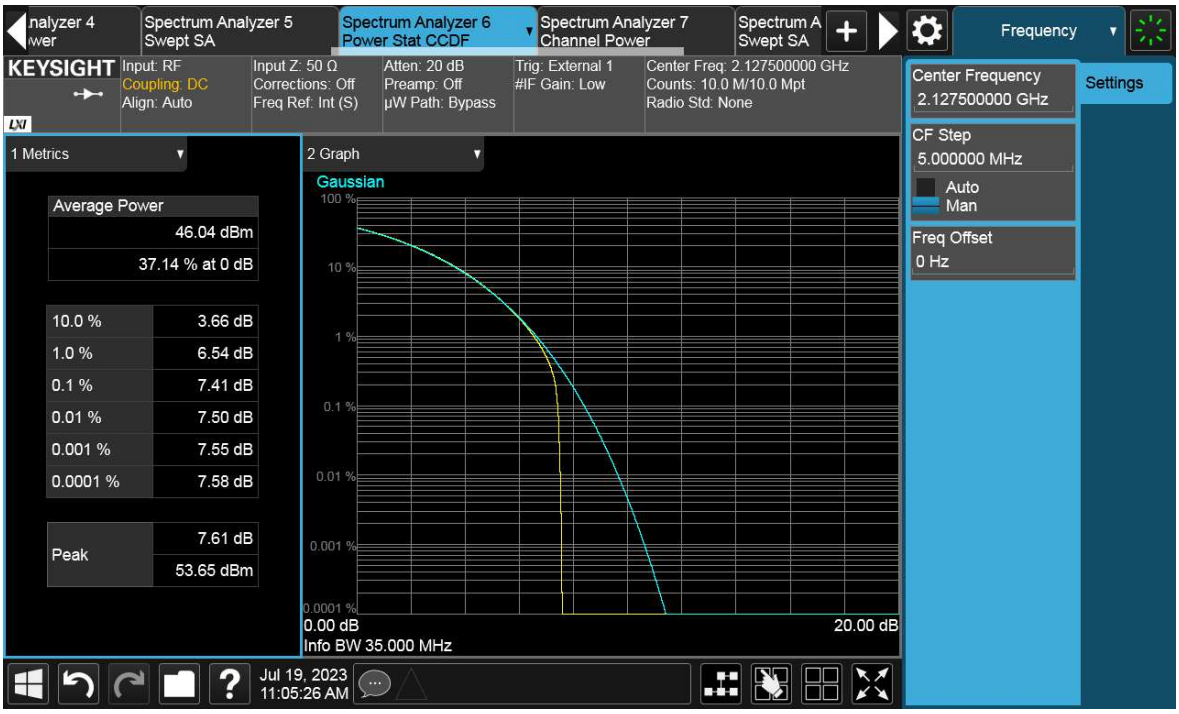
TEST REPORT

35MHz, Channel position M





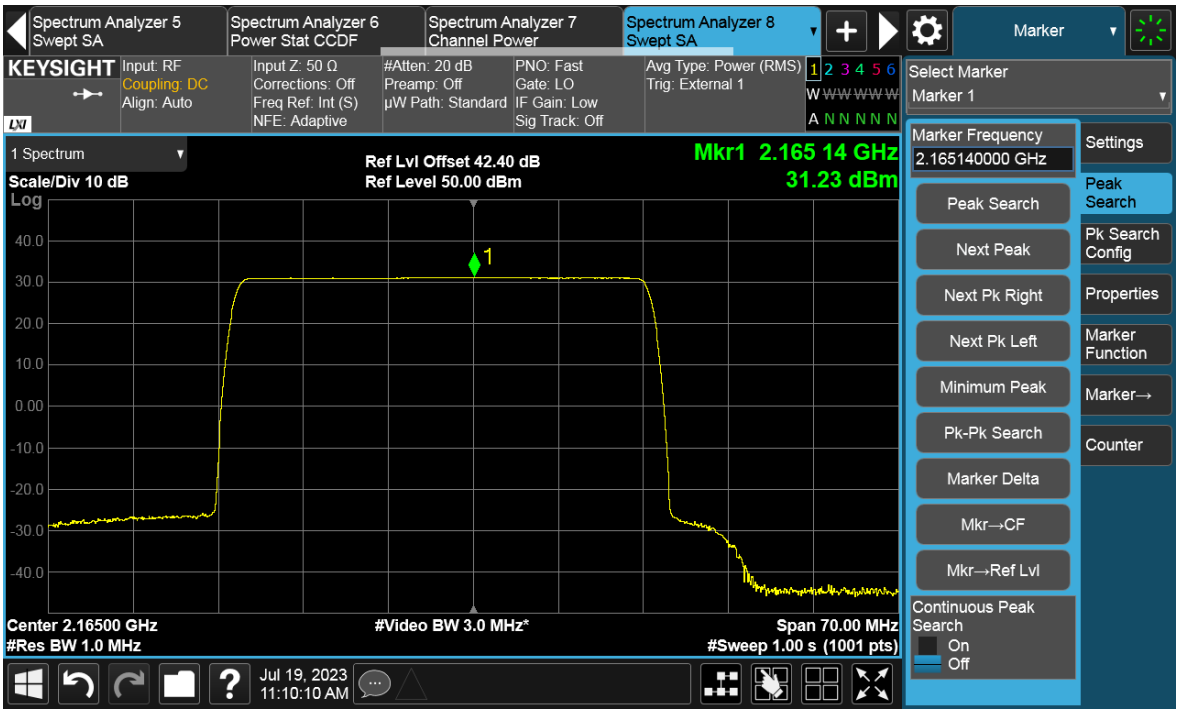
TEST REPORT

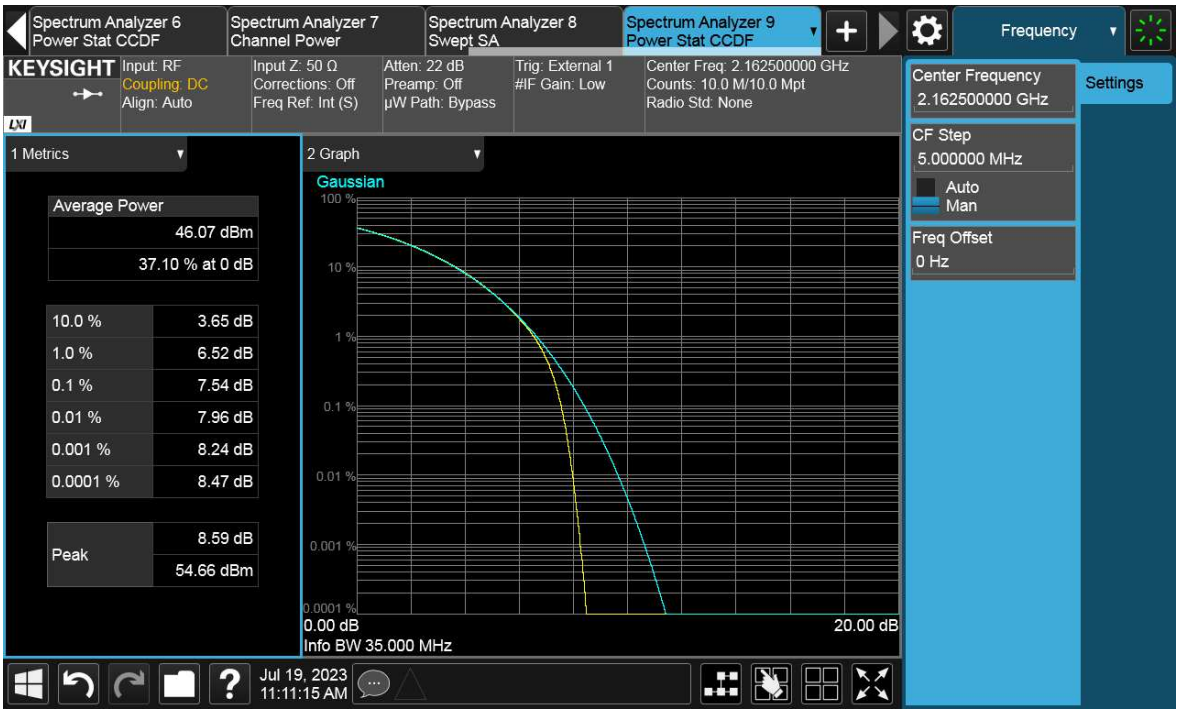


35MHz, Channel position T

Total Quality. Assured.

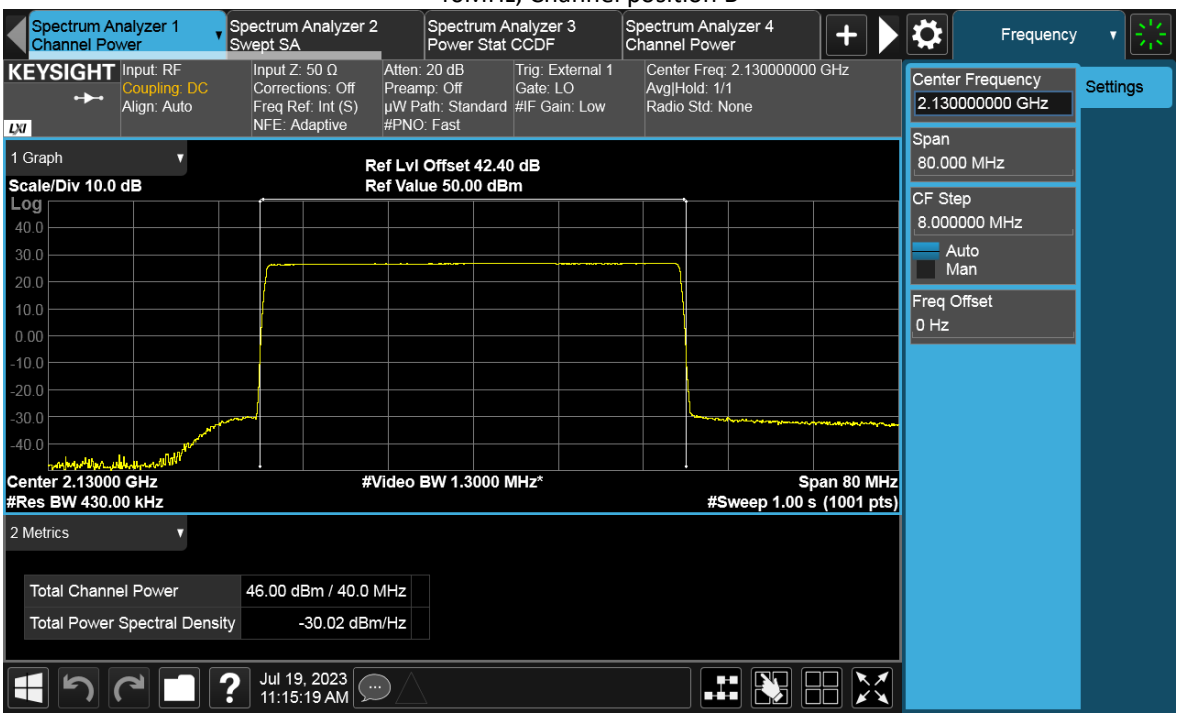
TEST REPORT

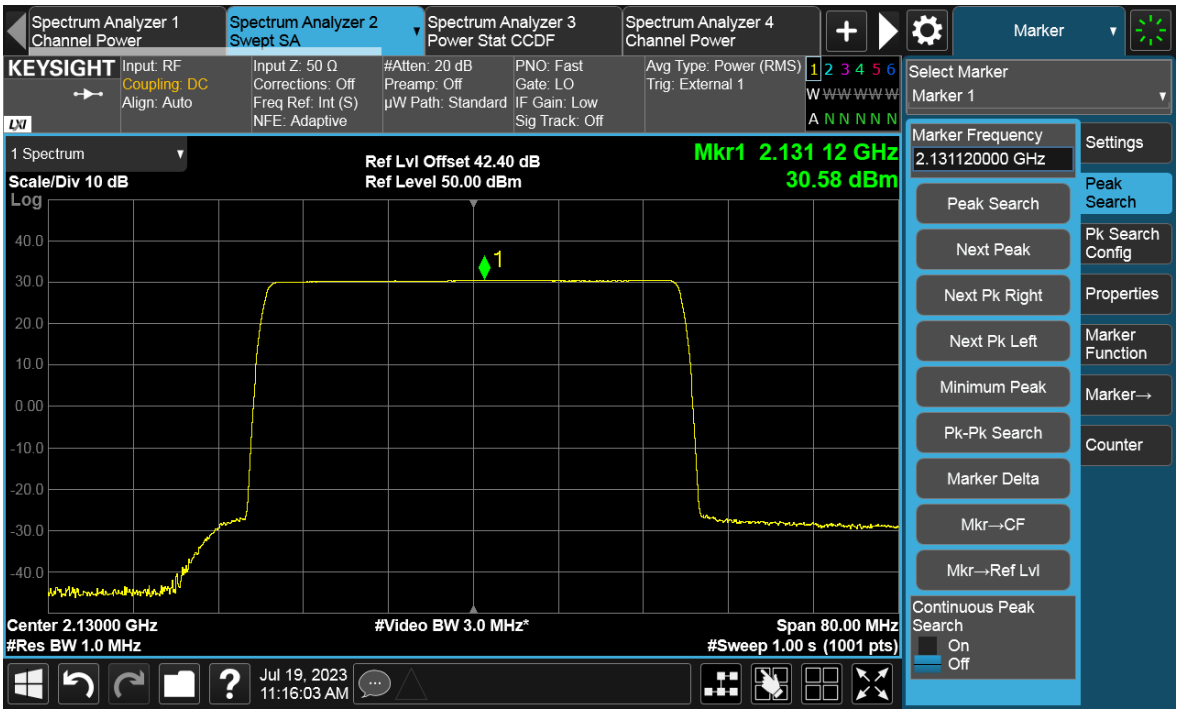




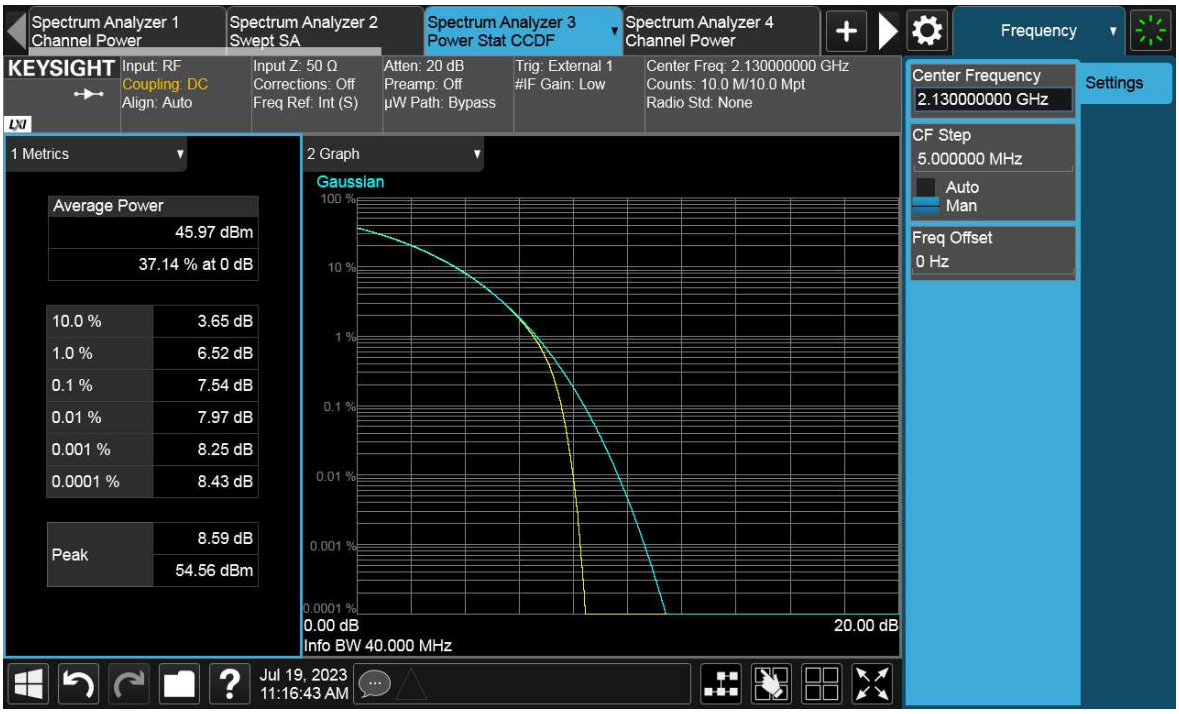
TEST REPORT

40MHz, Channel position B

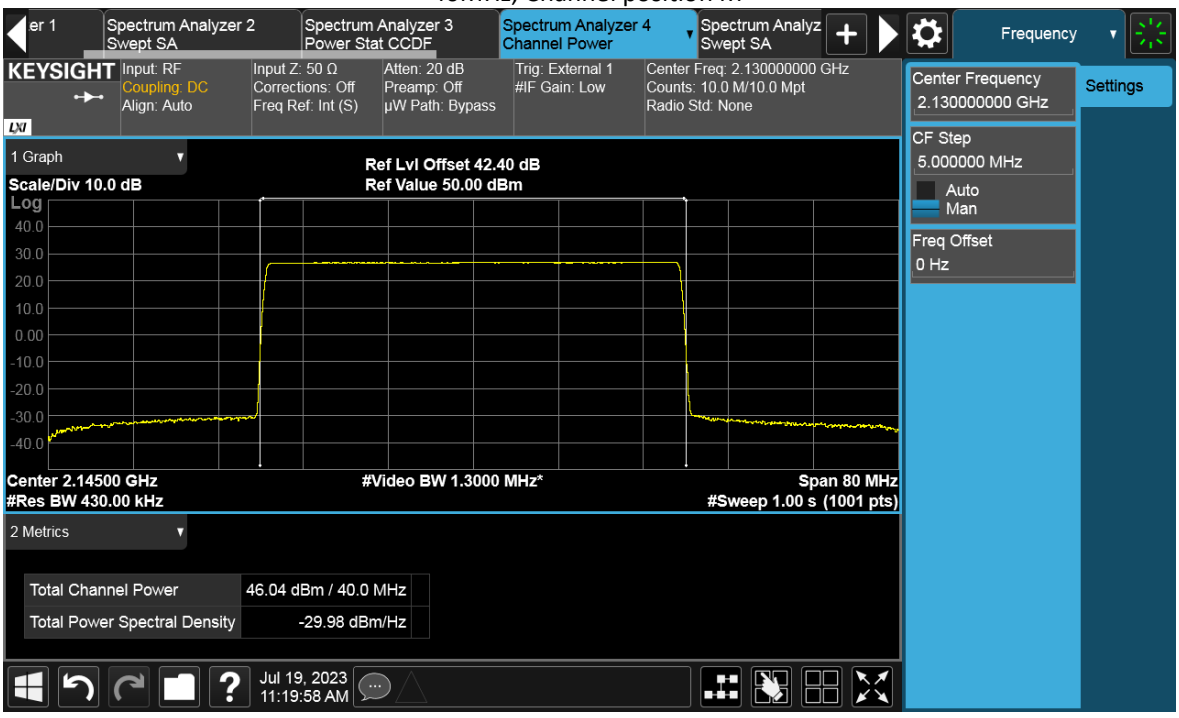




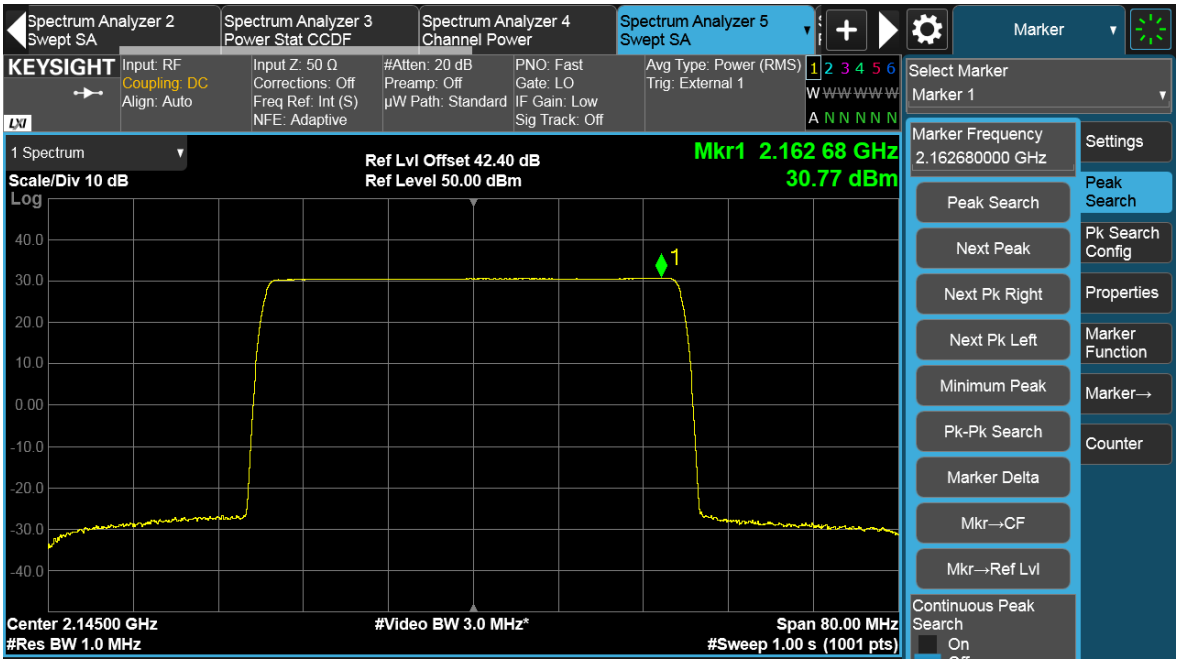
TEST REPORT

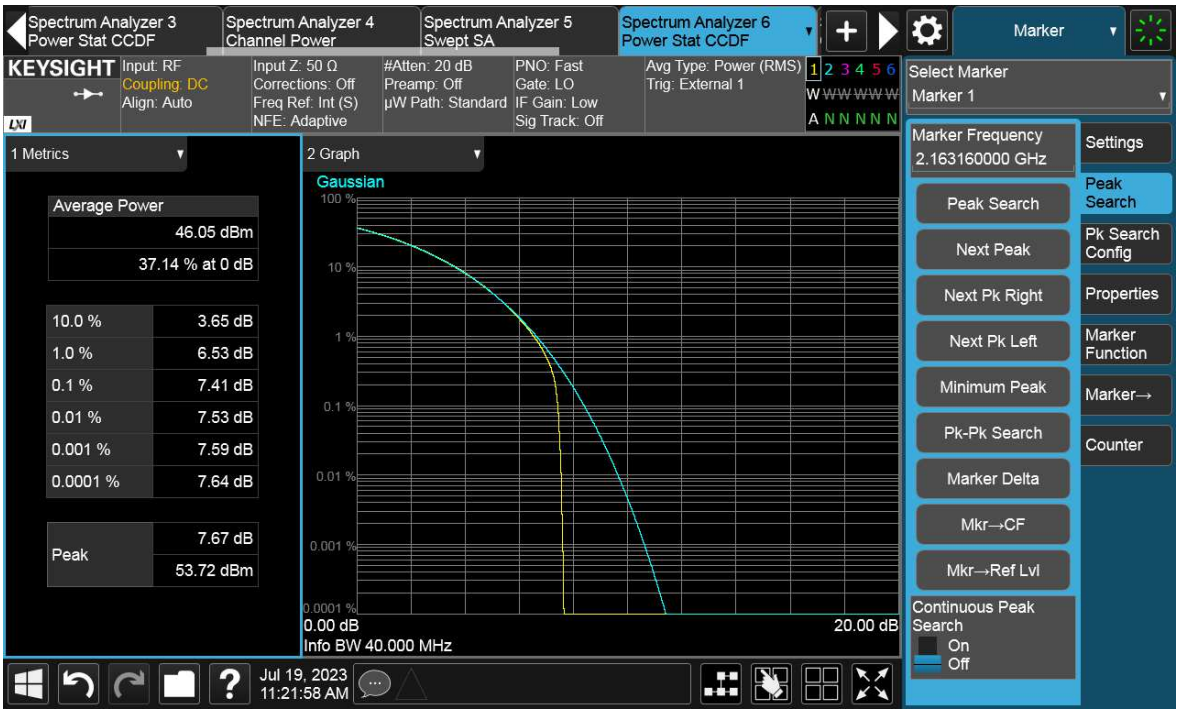


40MHz, Channel position M



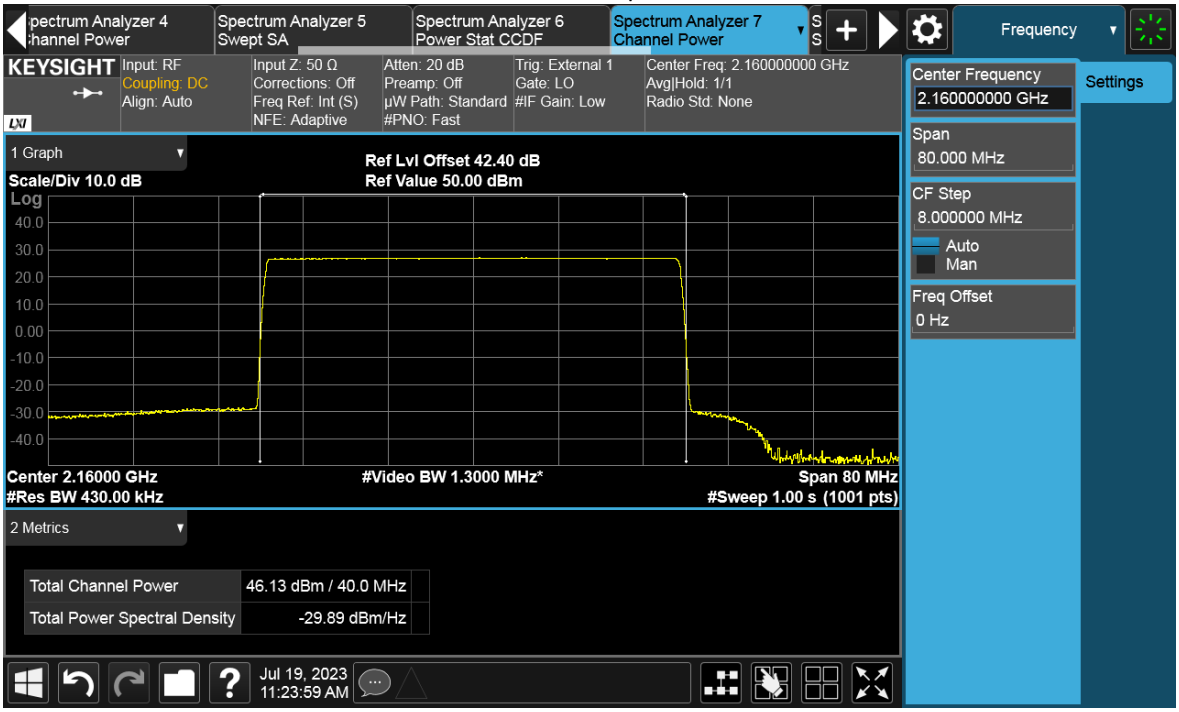
TEST REPORT

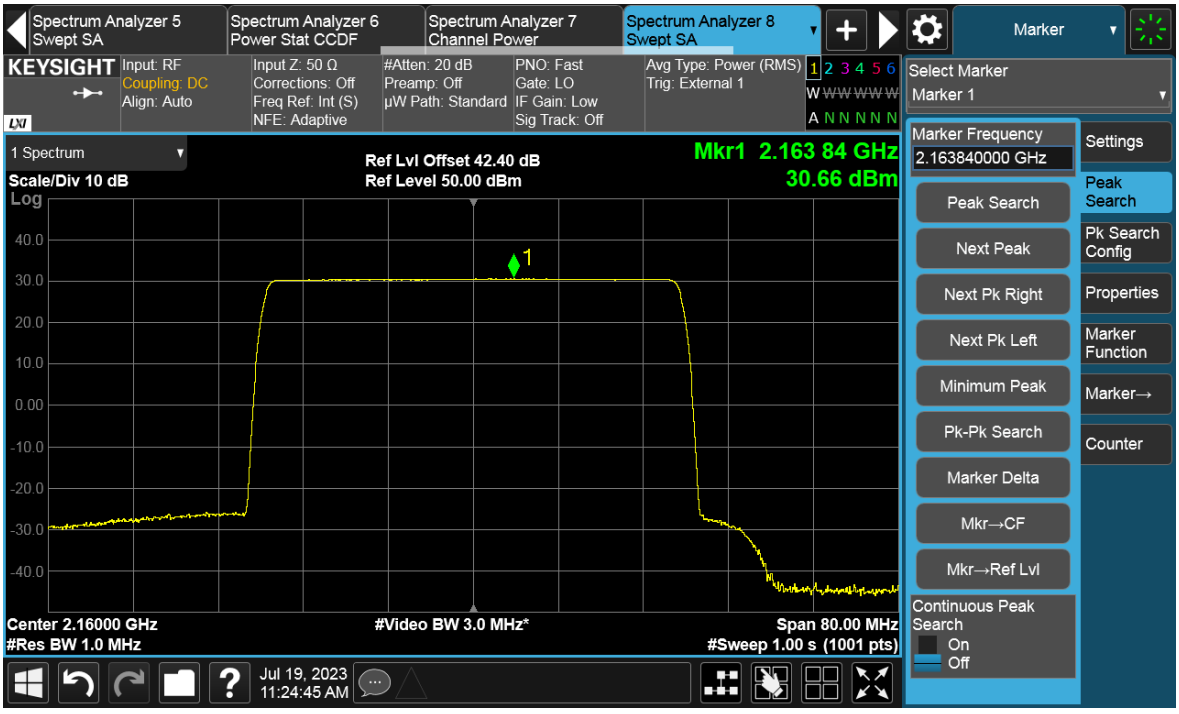

Spectrum Analyzer 2 Swept SA
Spectrum Analyzer 3 Power Stat CCDF
Spectrum Analyzer 4 Channel Power
Spectrum Analyzer 5 Swept SA
Marker
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
#Atten: 20 dB
Preamp: Off
µW Path: Standard
PNO: Fast
Gate: LO
IF Gain: Low
Sig Track: Off
Avg Type: Power (RMS)
Trig: External 1
Select Marker
Marker 1
1 Spectrum
Scale/Div 10 dB
Ref Lvl Offset 42.40 dB
Ref Level 50.00 dBm
Mkr1 2.162 68 GHz
30.77 dBm
Log
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 2.14500 GHz
#Res BW 1.0 MHz
#Video BW 3.0 MHz*
Span 80.00 MHz
#Sweep 1.00 s (1001 pts)
Marker Frequency
2.162680000 GHz
Settings
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Minimum Peak
Pk-Pk Search
Marker Delta
Mkr→CF
Mkr→Ref Lvl
Pk Search Config
Properties
Marker Function
Marker→
Counter
Continuous Peak Search
On


Spectrum Analyzer 3 Power Stat CCDF
Spectrum Analyzer 4 Channel Power
Spectrum Analyzer 5 Swept SA
Spectrum Analyzer 6 Power Stat CCDF
Marker
KEYSIGHT
Input: RF
Coupling: DC
Align: Auto
Input Z: 50 Ω
Corrections: Off
Freq Ref: Int (S)
NFE: Adaptive
#Atten: 20 dB
Preamp: Off
µW Path: Standard
PNO: Fast
Gate: LO
IF Gain: Low
Sig Track: Off
Avg Type: Power (RMS)
Trig: External 1
Select Marker
Marker 1
1 Metrics
Average Power
46.05 dBm
37.14 % at 0 dB
10.0 % 3.65 dB
1.0 % 6.53 dB
0.1 % 7.41 dB
0.01 % 7.53 dB
0.001 % 7.59 dB
0.0001 % 7.64 dB
Peak 7.67 dB
53.72 dBm
2 Graph
Gaussian
100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0.00 dB
20.00 dB
Info BW 40.000 MHz
Jul 19, 2023
11:21:58 AM
Marker Frequency
2.163160000 GHz
Settings
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Minimum Peak
Pk-Pk Search
Marker Delta
Mkr→CF
Mkr→Ref Lvl
Pk Search Config
Properties
Marker Function
Marker→
Counter
Continuous Peak Search
On
Off

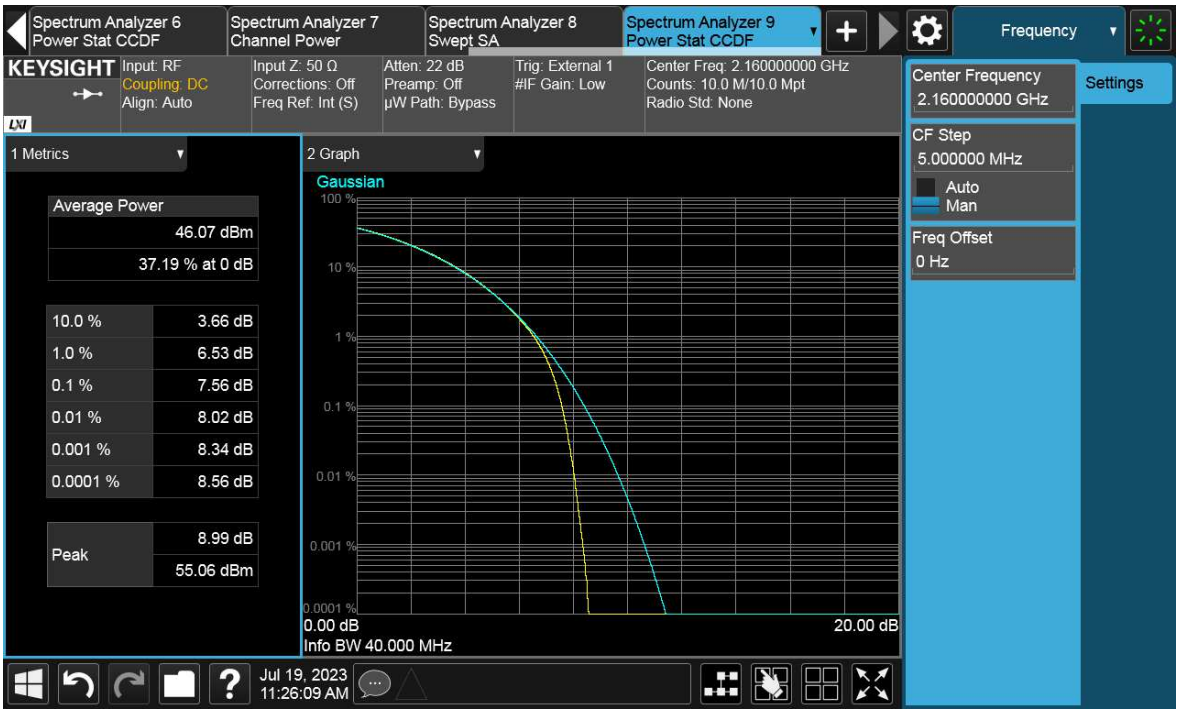
TEST REPORT

40MHz, Channel position T





TEST REPORT



NR-2C

Antenna Port	NR Modulation	NR Carrier Bandwidth (MHz)	Output power / Peak-to-Average Ratio (PAR)								
			Channel position B			Channel position M			Channel position T		
			Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)	Power (dBm)	Power (dBm /MHz)	PAR (dB)
A	QPSK	25	-	-	-	45.82	29.53	-	-	-	-
B	QPSK	25	-	-	-	45.79	29.39	-	-	-	-
C	QPSK	25	-	-	-	45.77	29.64	-	-	-	-
D	QPSK	25	-	-	-	45.74	29.50	-	-	-	-
Total conducted power			-	-	-	51.80	35.54	-	-	-	-
EIRP limit			-	-	-	-	62.15	-	-	-	-
Max antenna gain			-	-	-	-	26.61	-	-	-	-

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	QPSK	30	-	-	-	45.88	28.82	-	-	-	-
B	QPSK	30	-	-	-	45.87	28.69	-	-	-	-
C	QPSK	30	-	-	-	45.87	28.88	-	-	-	-
D	QPSK	30	-	-	-	45.84	28.81	-	-	-	-
Total conducted power			-	-	-	51.89	34.82			-	-
EIRP limit			-	-	-	-	62.15	-		-	-
Max antenna gain			-	-	-	-	27.33	-		-	-

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	QPSK	35	-	-	-	45.86	28.04	-	-	-	-
B	QPSK	35	-	-	-	45.71	27.81	-	-	-	-
C	QPSK	35	-	-	-	45.82	28.13	-	-	-	-
D	QPSK	35	-	-	-	45.69	28.02	-	-	-	-
Total conducted power			-	-	-	51.79	34.02	-	-	-	-
EIRP limit			-	-	-	-	62.15	-	-	-	-
Max antenna gain			-	-	-	-	28.13	-	-	-	-

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

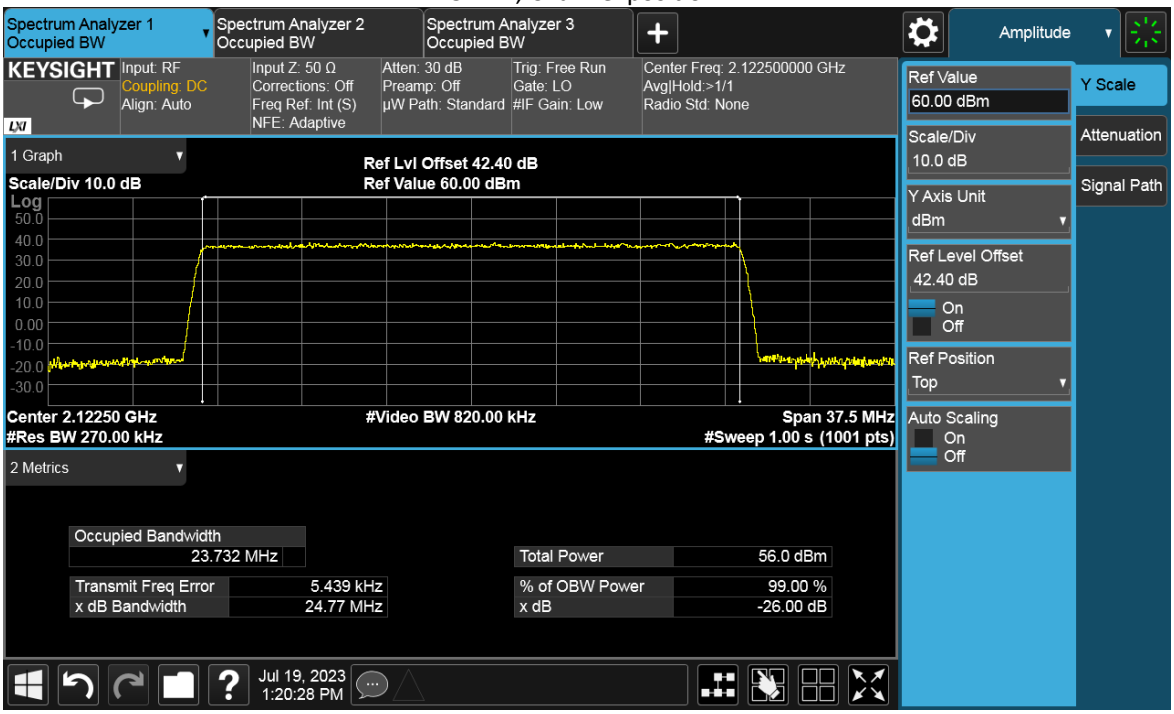
99% Occupied Bandwidth

Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
D	QPSK	25MHz	23.732	23.736	23.731
D	QPSK	30MHz	28.510	28.501	28.495
D	QPSK	35MHz	33.516	33.523	33.500
D	QPSK	40MHz	38.508	38.516	38.531

-26dBc Occupied Bandwidth

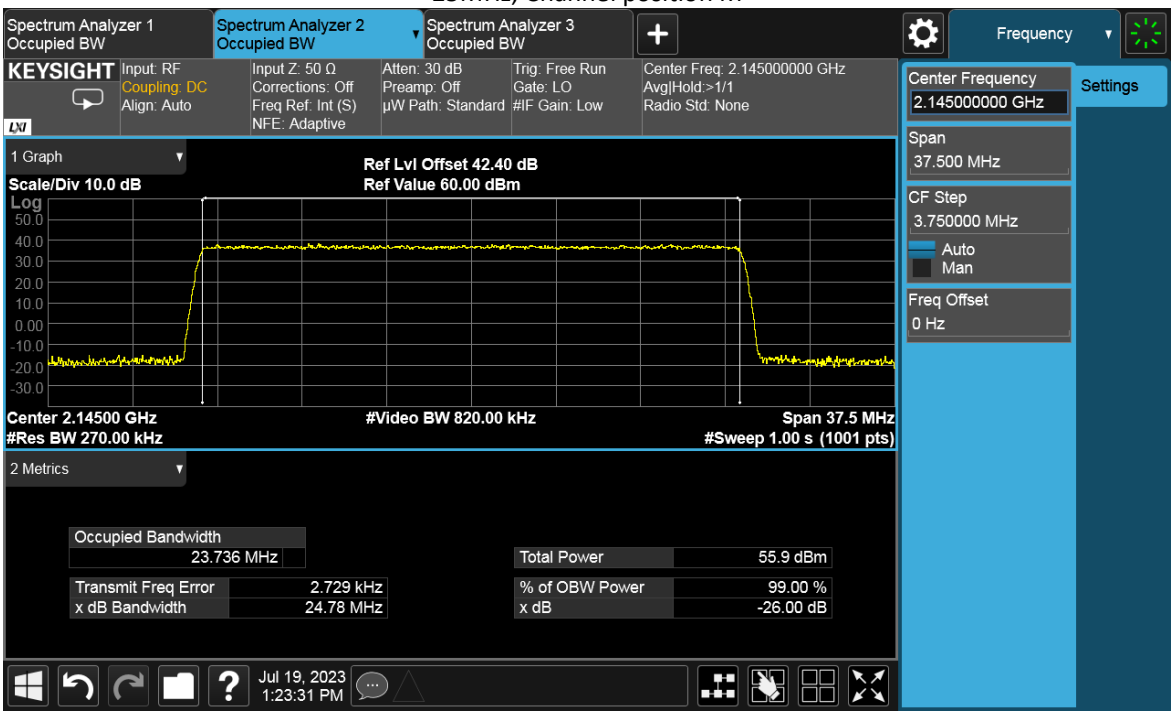
Antenna Port	Modulation	Bandwidth	Occupied Bandwidth (MHz)		
			Channel Position B	Channel Position M	Channel Position T
D	QPSK	25MHz	24.77	24.78	24.77
D	QPSK	30MHz	29.57	29.57	29.54
D	QPSK	35MHz	34.67	34.70	34.67
D	QPSK	40MHz	40.05	40.04	40.08

25MHz, Channel position B

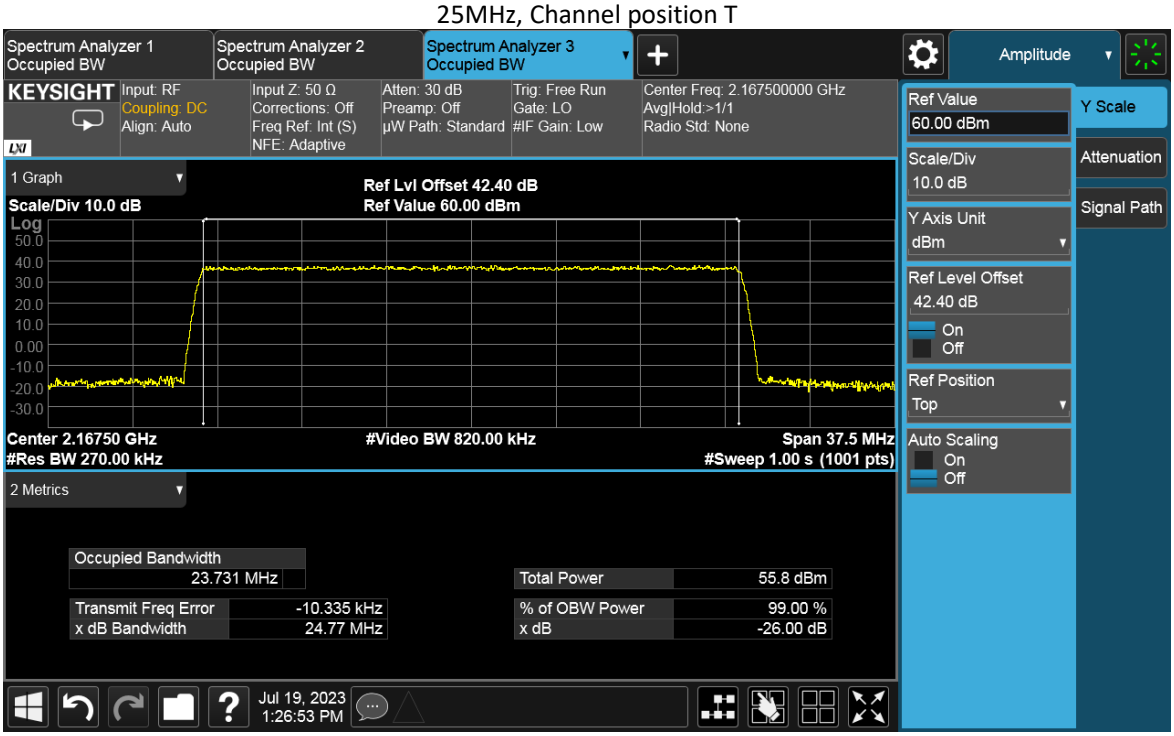


TEST REPORT

25MHz, Channel position M

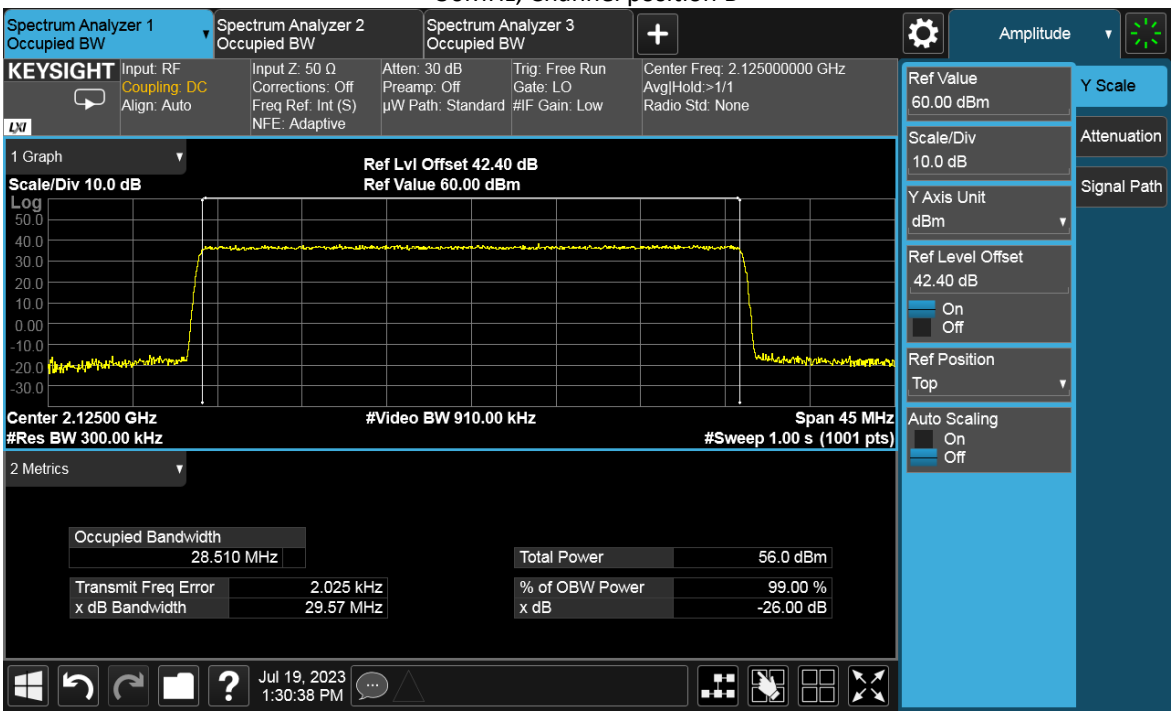


25MHz, Channel position T



TEST REPORT

30MHz, Channel position B



30MHz, Channel position M