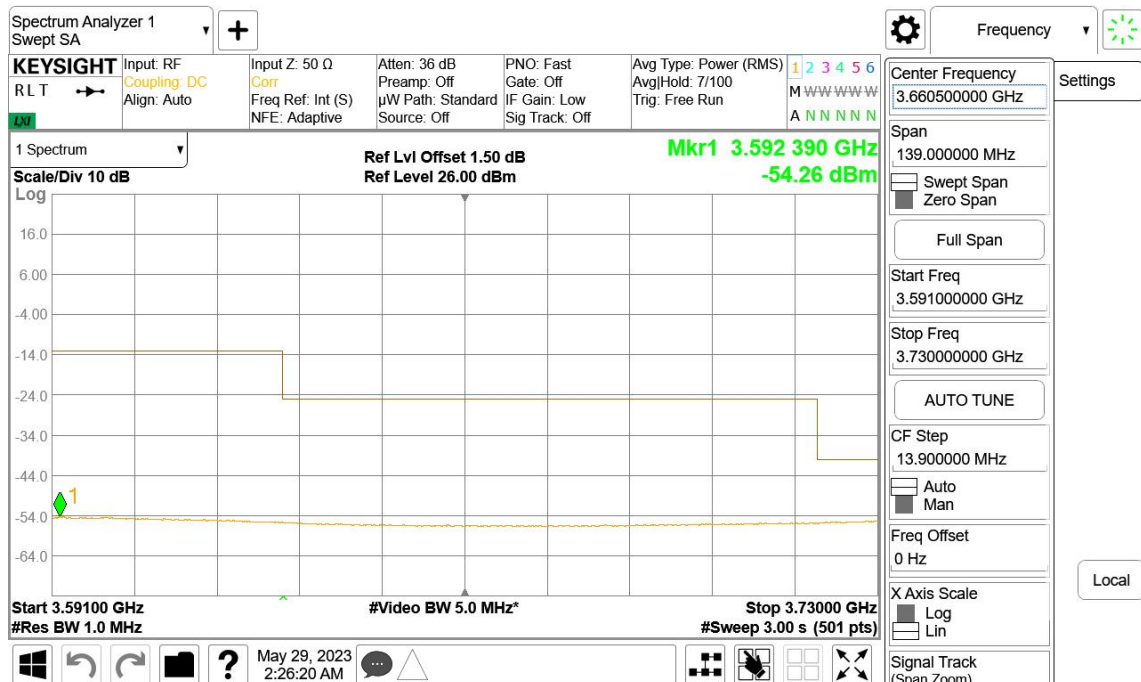
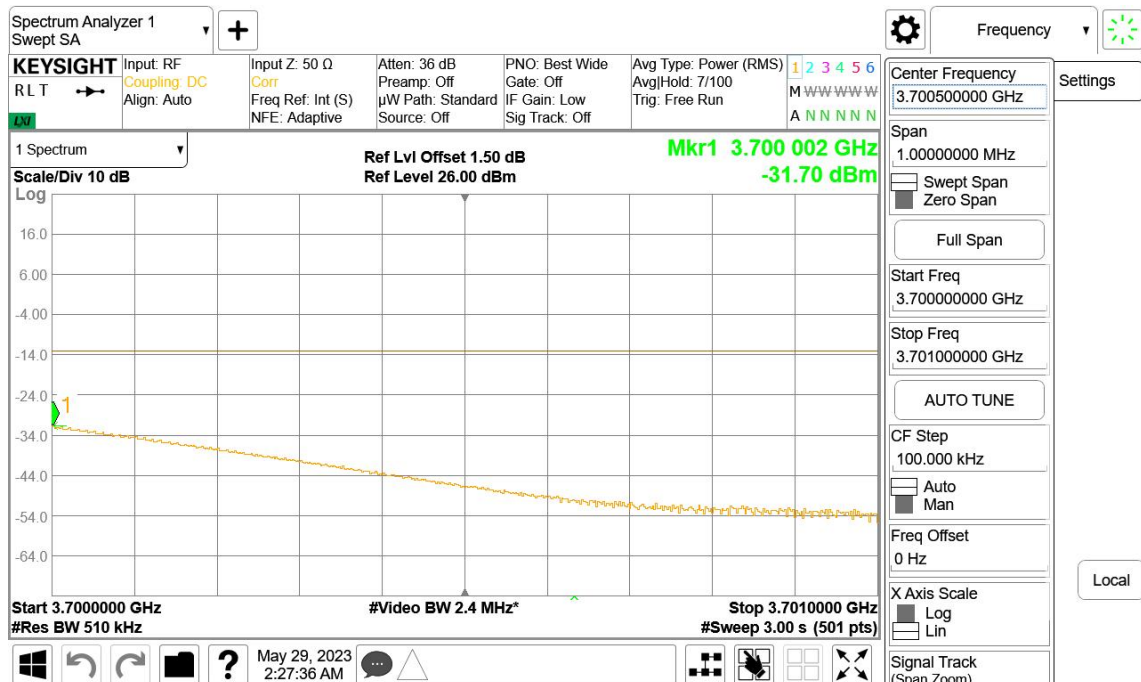




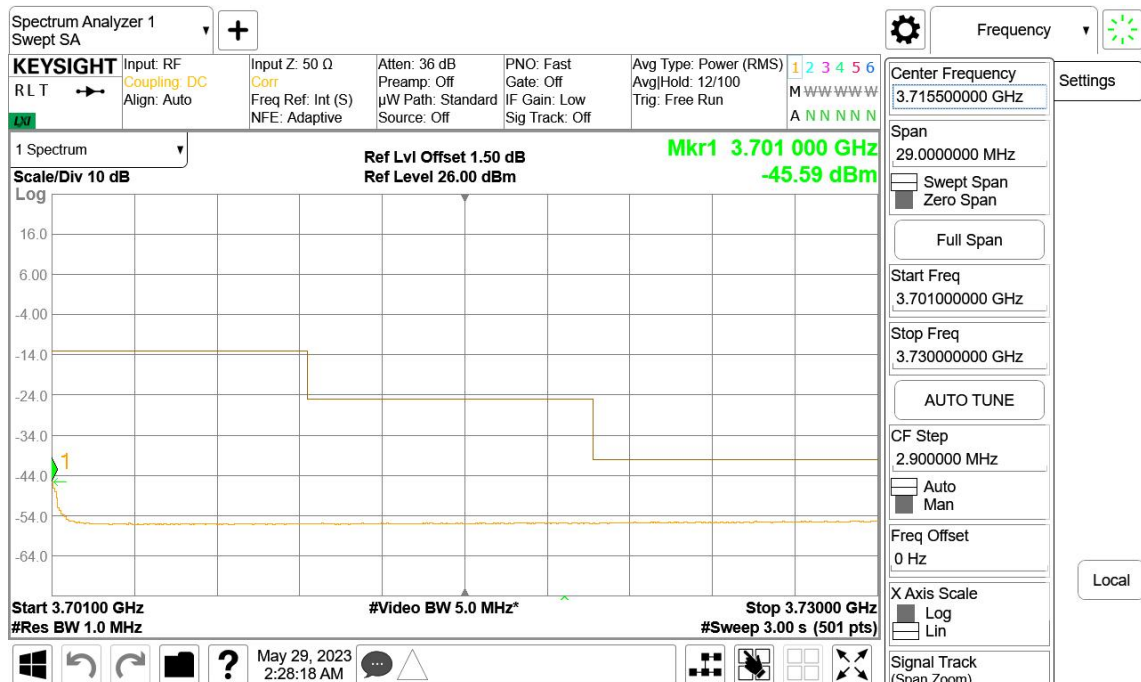
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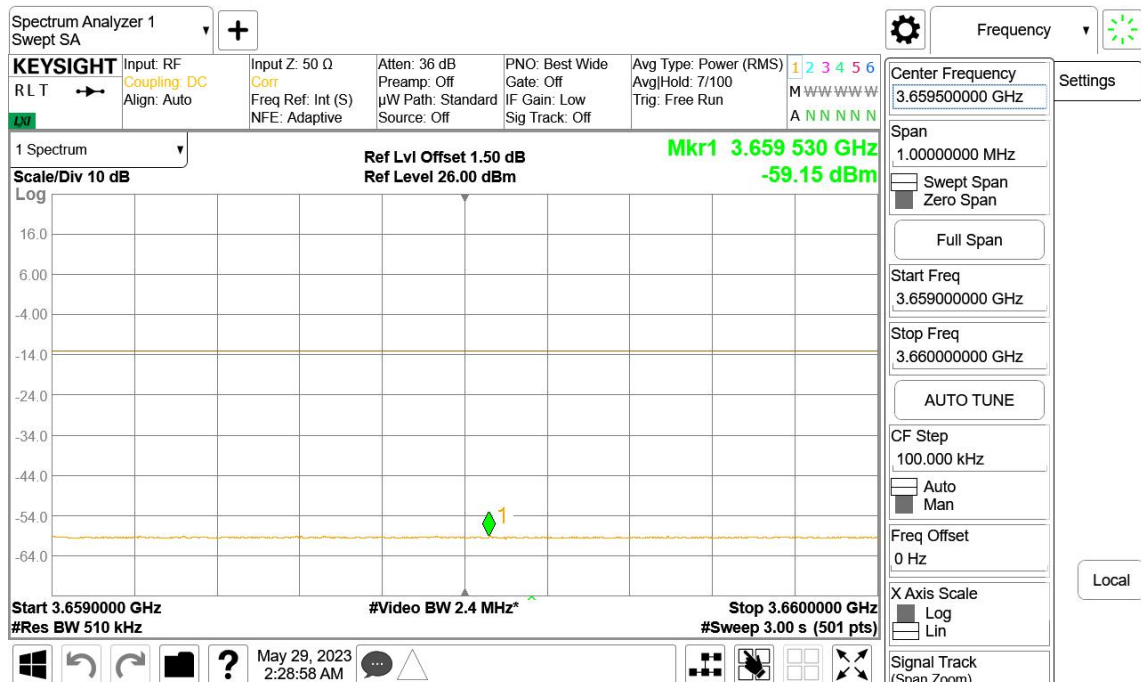
HIGH BAND EDGE BLOCK-1RB-HIGH_offset

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HIGH BAND EDGE BLOCK-1RB-HIGH_offset



HIGH BAND EDGE BLOCK-1RB-HIGH_offset

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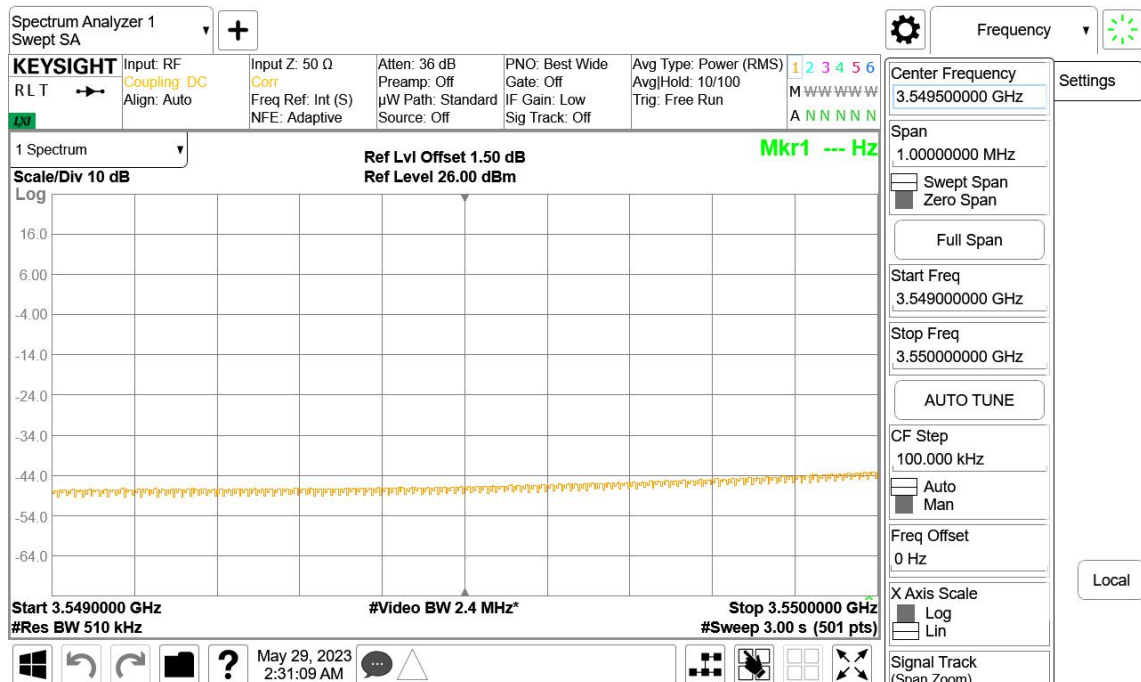
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LOW BAND EDGE BLOCK-40M-100%RB



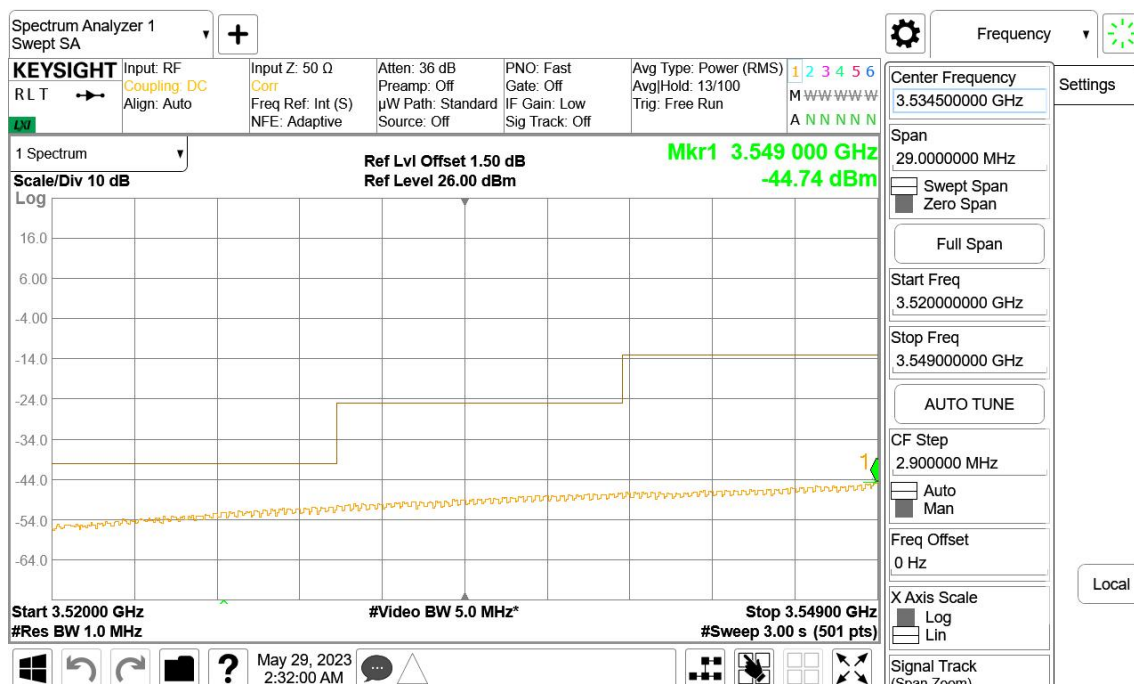
LOW BAND EDGE BLOCK-40M-100%RB

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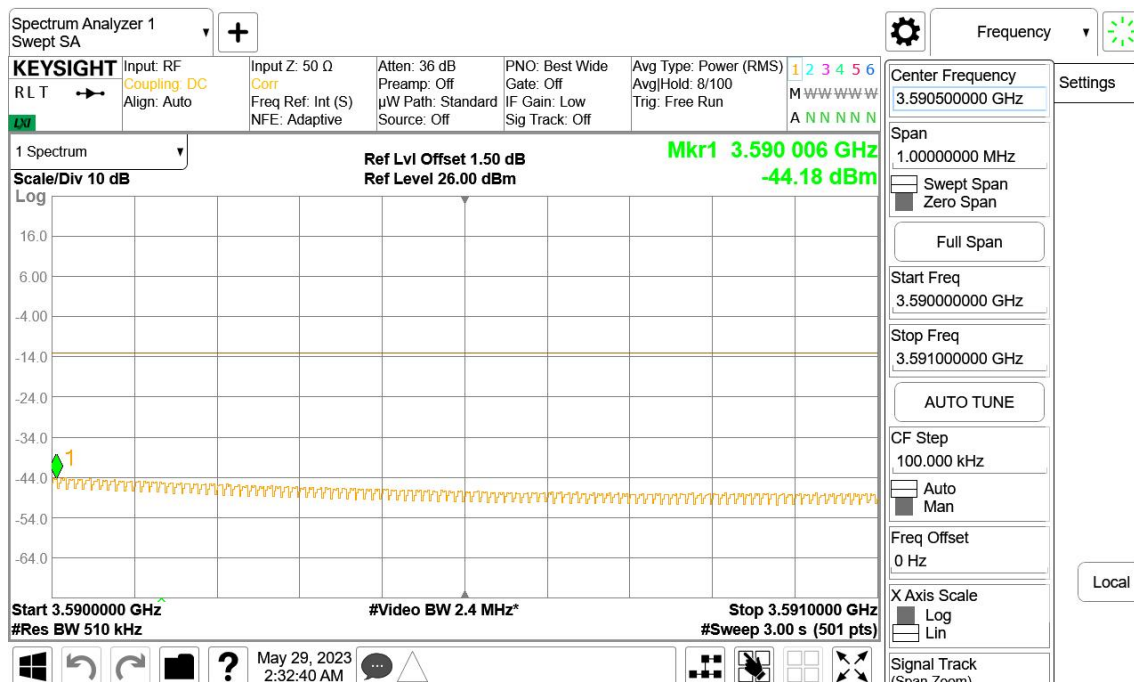
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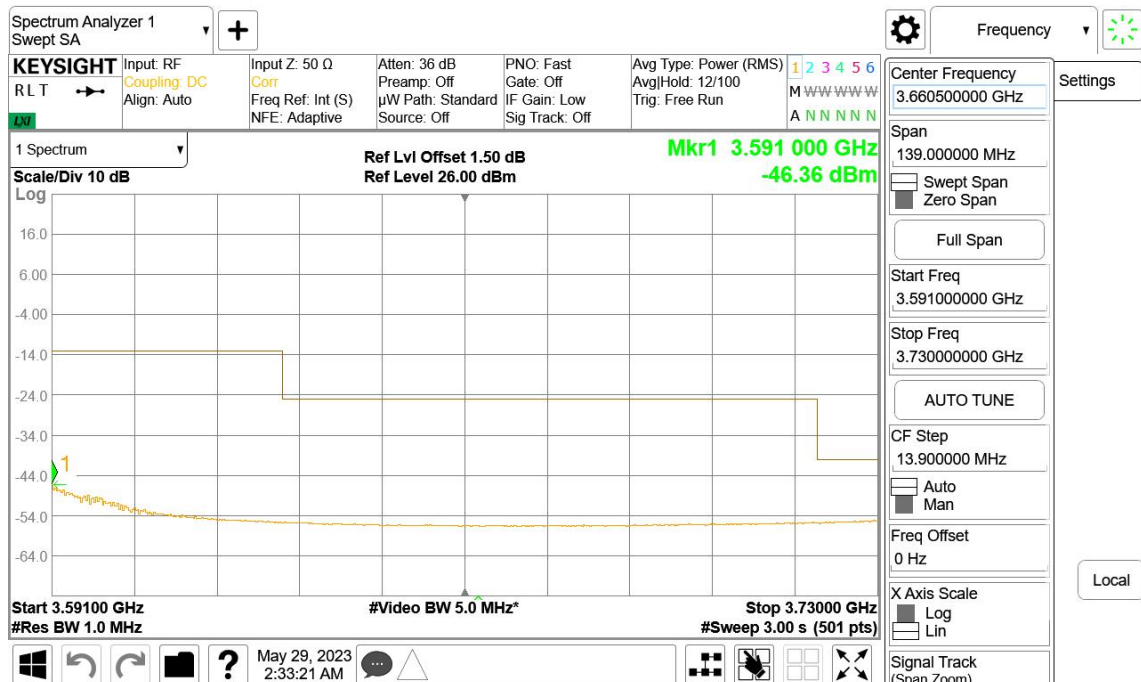
LOW BAND EDGE BLOCK-40M-100%RB



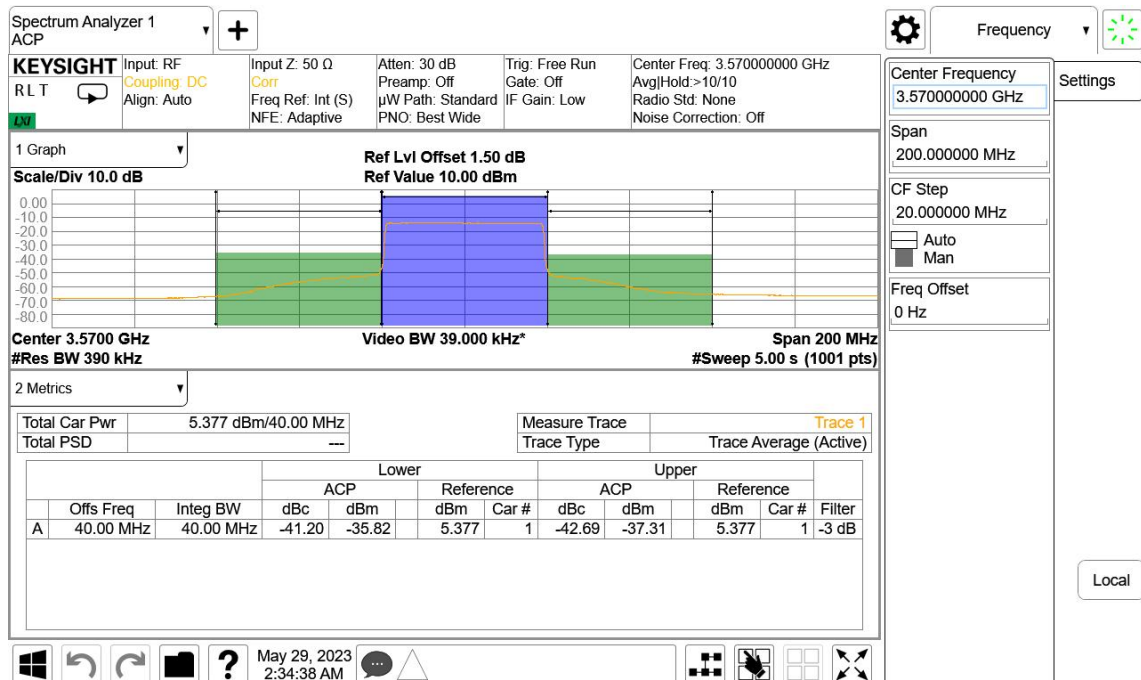
LOW BAND EDGE BLOCK-40M-100%RB

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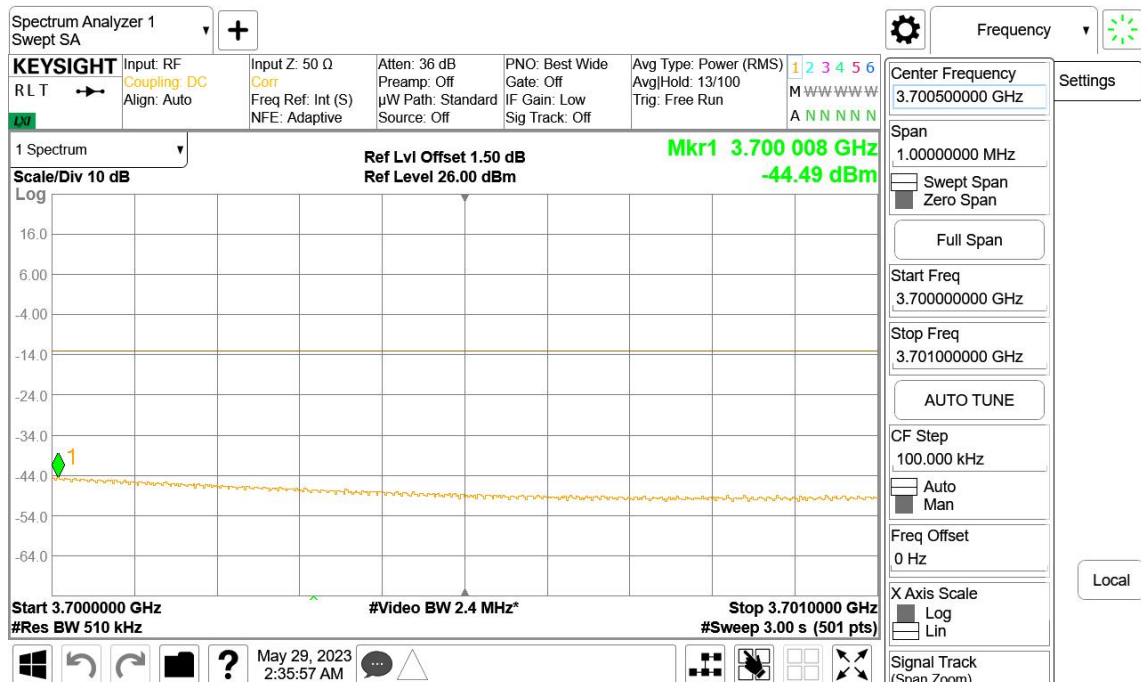
Channel power



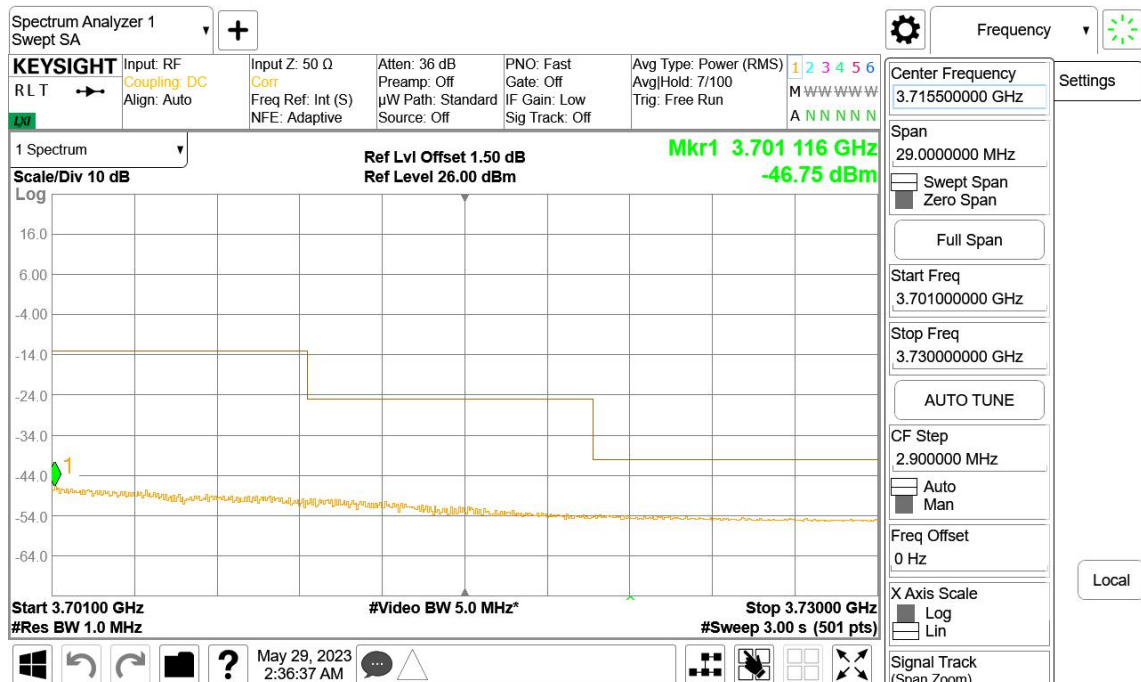
HIGH BAND EDGE BLOCK-40M-100%RB

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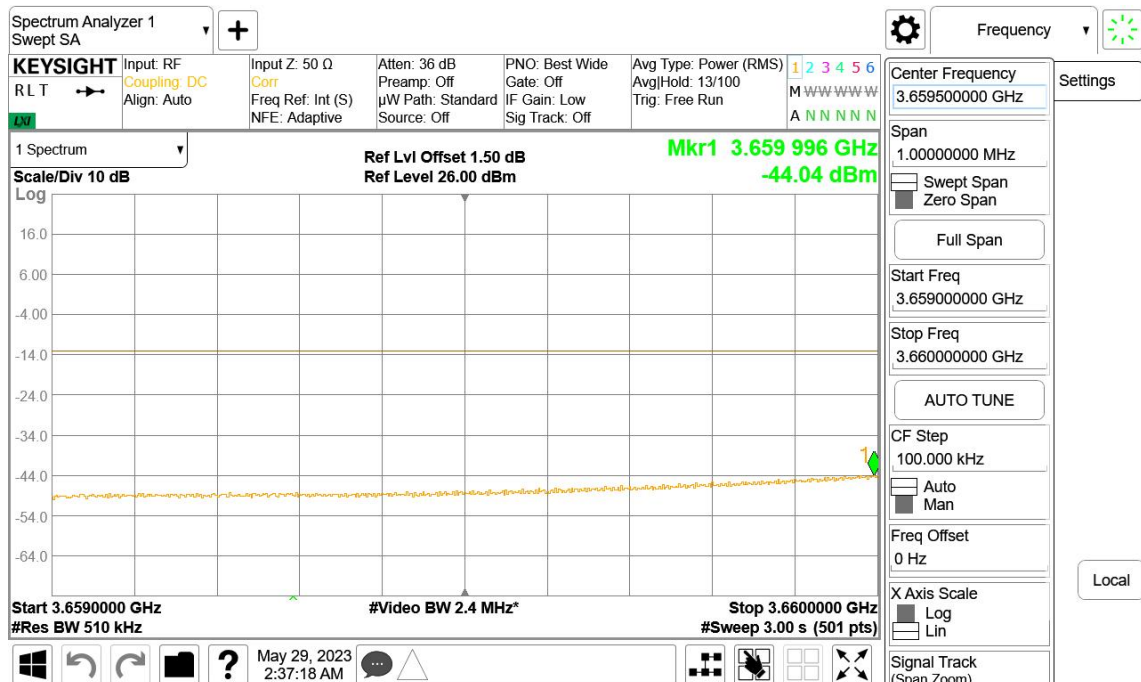
HIGH BAND EDGE BLOCK-40M-100%RB



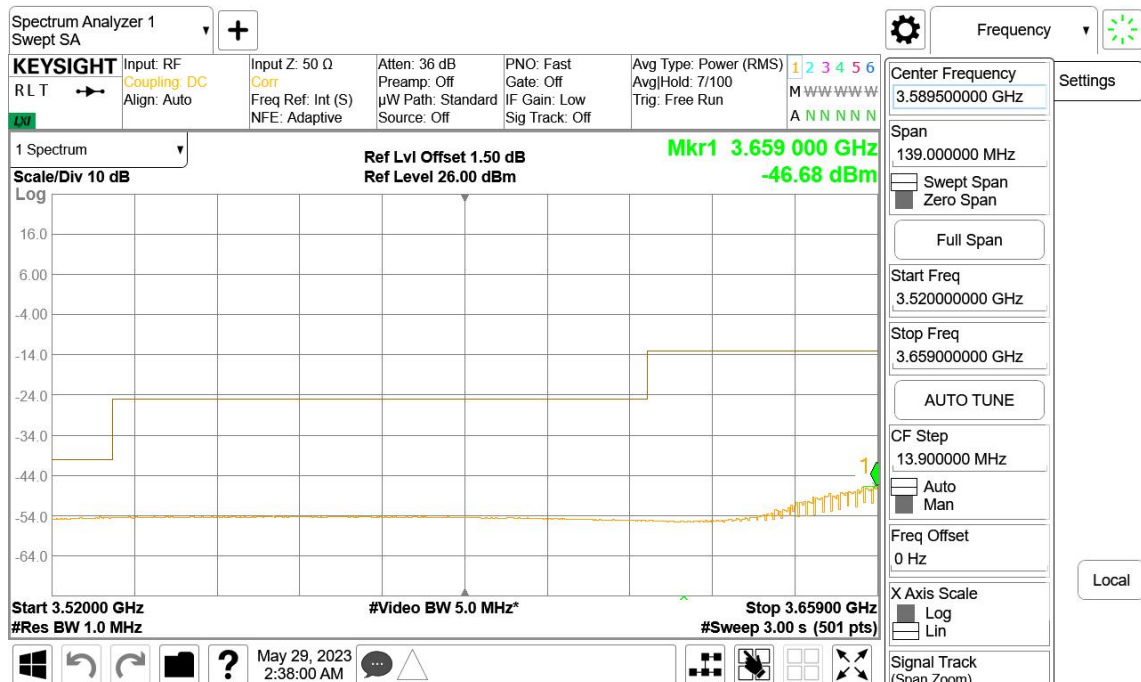
HIGH BAND EDGE BLOCK-40M-100%RB

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HIGH BAND EDGE BLOCK-40M-100%RB



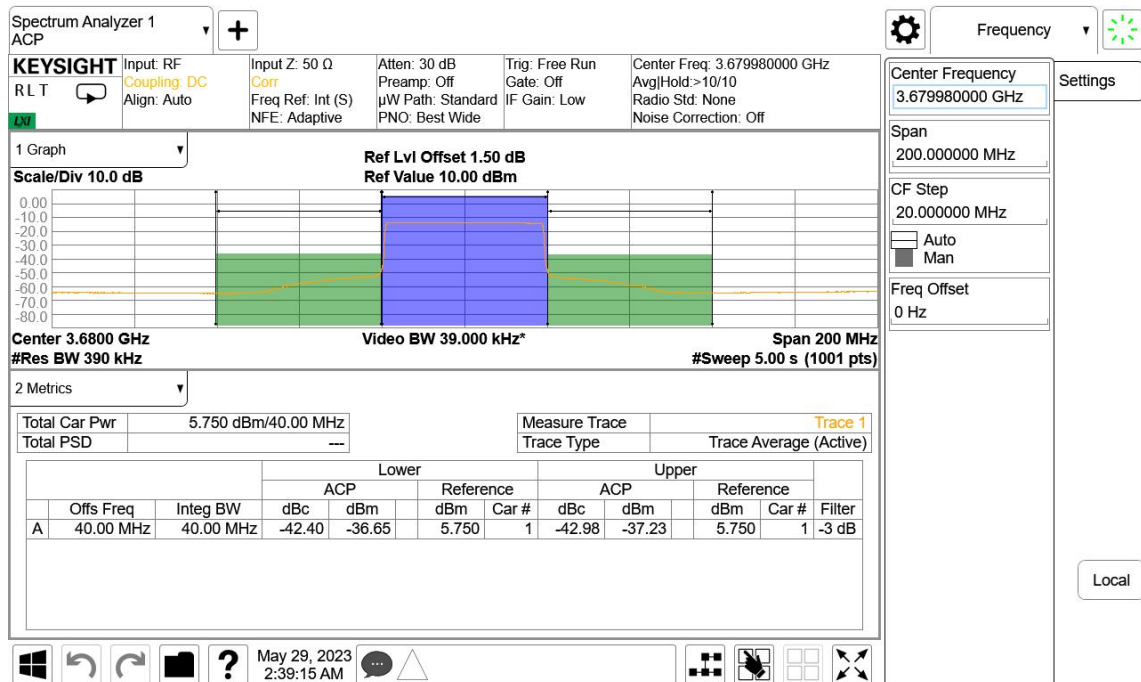
Channel power

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6.8. Frequency Stability

Specifications:	FCC Part 2.1055,96.41
DUT Serial Number:	IMEI:864680060006479
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit	
Frequency deviation [ppm]	±2.5

Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	1.54 Hz (k=2)

Test Method

Frequency stability is a measure of the frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at +20 °C and rated supply voltage. Two reference points are established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwanted emissions specification of the applicable regulatory standard. These reference points measured using the lowest and highest channel of operation shall be identified as FL and FH respectively.

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of CMW500.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -30°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500, and in a simulated call on middle channel for each LTE band, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.

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6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the center channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C increments from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

6.8.1 Frequency Stability over Temperature Variation Results

n48

Frequency Error vs Temperature

Temperature (°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	3624.99	0.07	0.0000
50			14.01	0.0039
40			1.07	0.0003
30			5.61	0.0015
10			2.01	0.0006
0			5.77	0.0016
-10			8.37	0.0023
-20			0.52	0.0001
-30			0.44	0.0001

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	3624.99	-2.93	0.0008
4.4			2.37	0.0007

n48-MIMO

Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.8	3624.99	1.29	0.0004
50			2.37	0.0007
40			1.64	0.0005
30			-2.63	0.0007
10			-2.17	0.0006
0			-3.46	0.0010
-10			3.90	0.0011

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-20			-2.45	0.0007
-30			-4.28	0.0012

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	Center frequency(MHz)	Offset(Hz)	Frequency error(ppm)
3.3	20	3624.99	1.48	0.0004
4.4			5.63	0.0016

6.9. Peak to Average Ratio

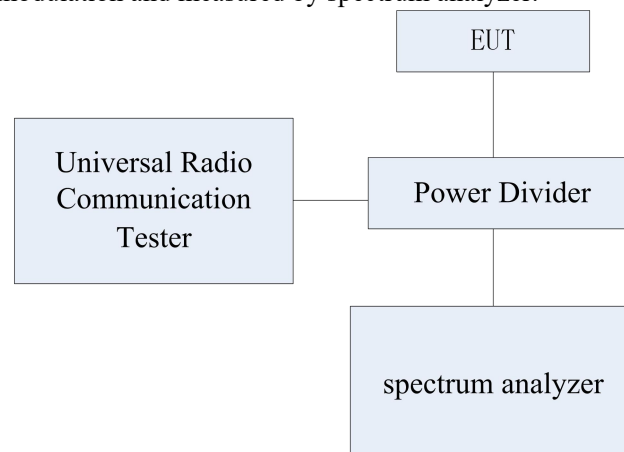
Specifications:	FCC Part 96.41
DUT Serial Number:	IMEI:864680060006479
Test conditions:	Ambient Temperature:15°C-35°C Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	Pass

Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Measurement Uncertainty:

Item	Uncertainty
Expanded Uncertainty	0.22 dB (k=2)

Test Method

The transmitter output was connected to a CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each Band on the Spectrum Analyzer.

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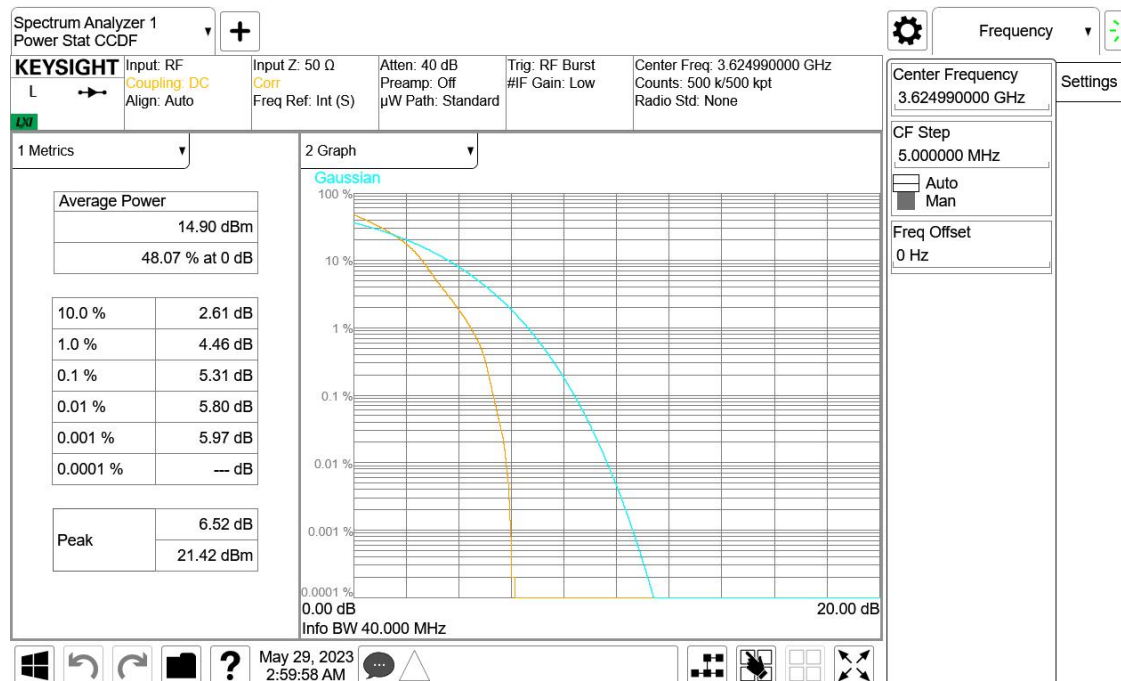
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6.9.1 Peak to Average Ratio Results

n48,40MHz

Frequency (MHz)	PAPR (dB)								
	DFT-s-pi/2 BPSK	DFT-s-QPSK	DFT-s-16QAM	DFT-s-64QAM	DFT-s-256QAM	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
3624.99	5.31	5.68	6.48	6.73	6.71	7.59	7.70	8.97	9.53

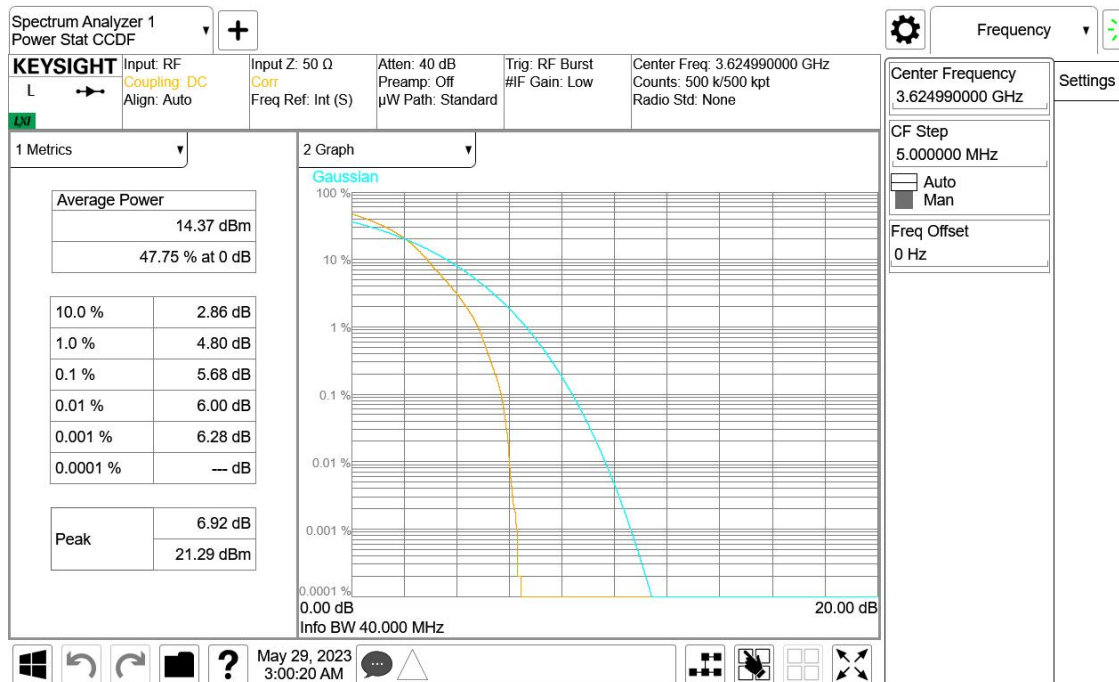
Band n48 , 40MHz Bandwidth,DFT-s-pi/2 BPSK



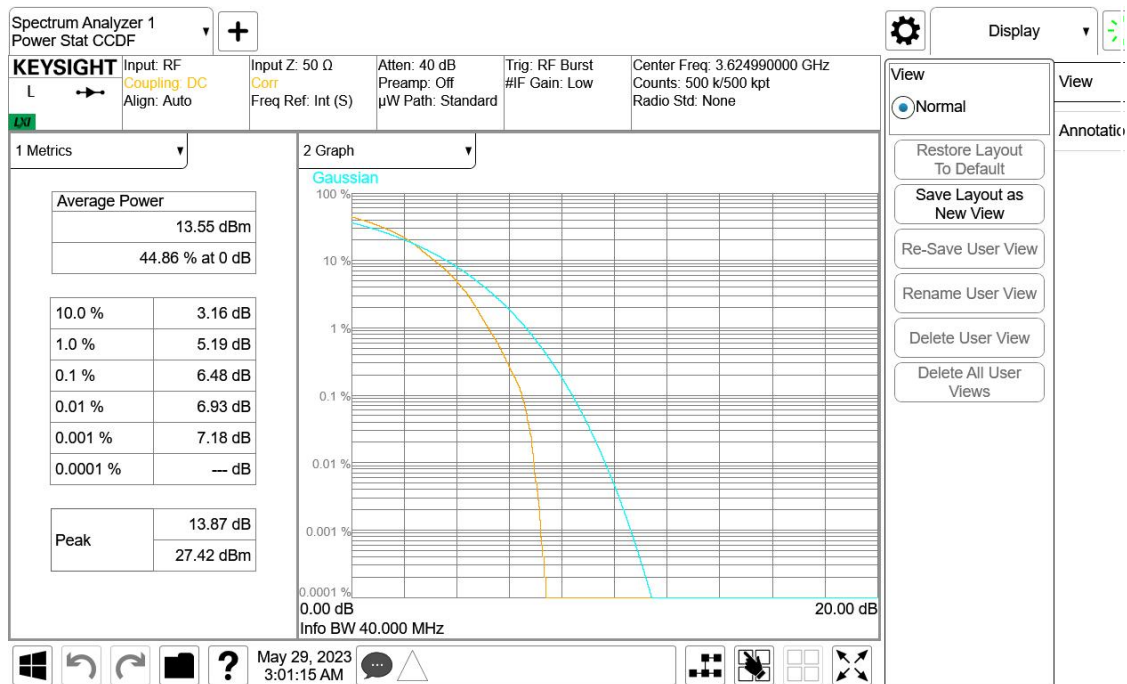
Band n48 , 40MHz Bandwidth,DFT-s-QPSK

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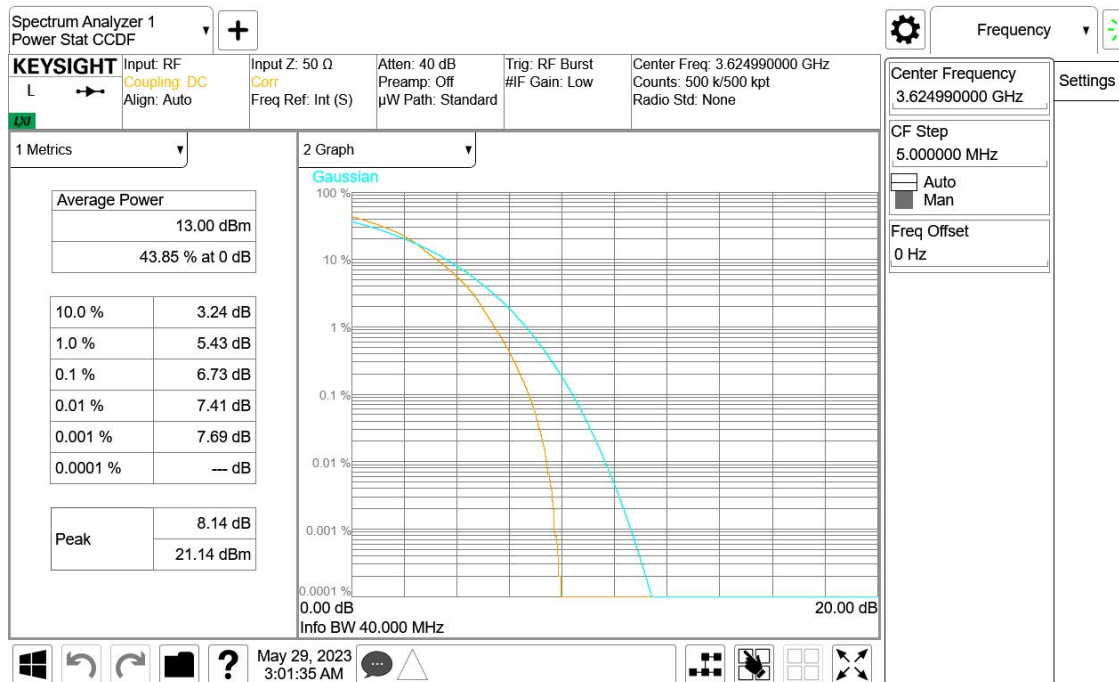
Band n48 , 40MHz Bandwidth,DFT-s-16QAM



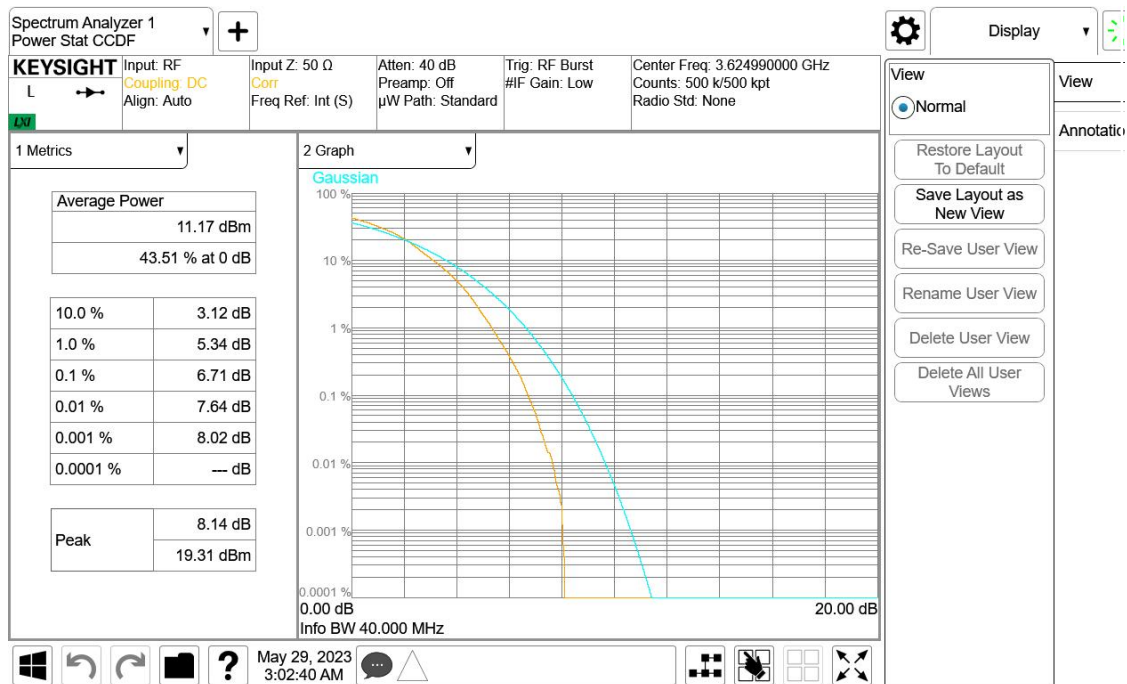
Band n48 , 40MHz Bandwidth,DFT-s-64QAM

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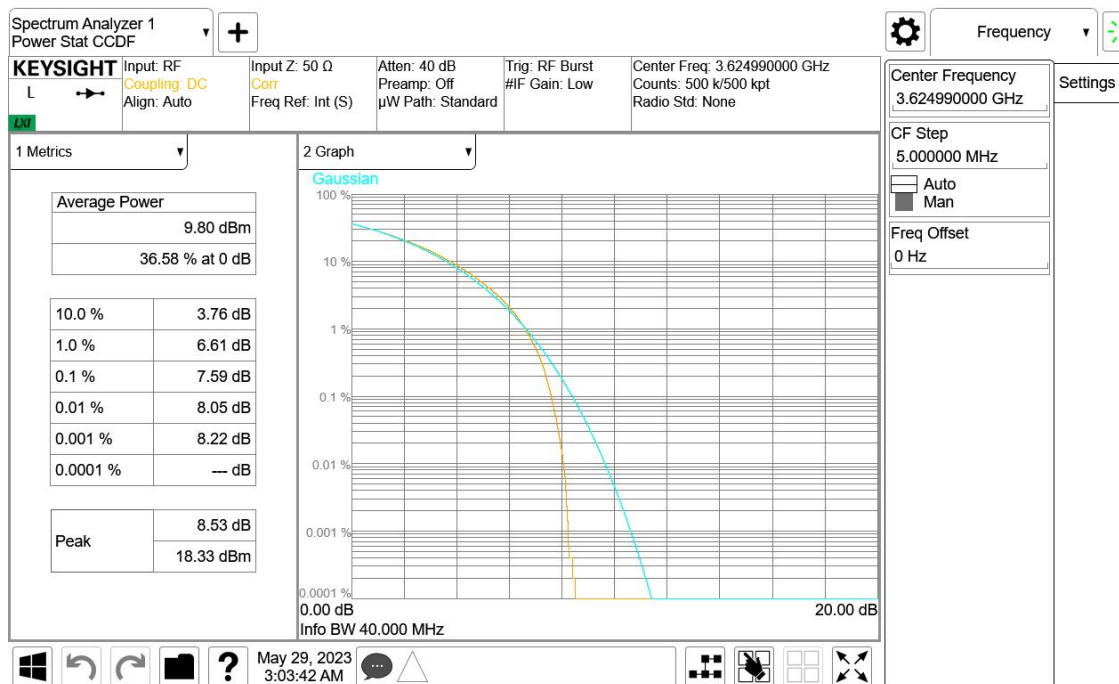
Band n48 , 40MHz Bandwidth,DFT-s-256QAM



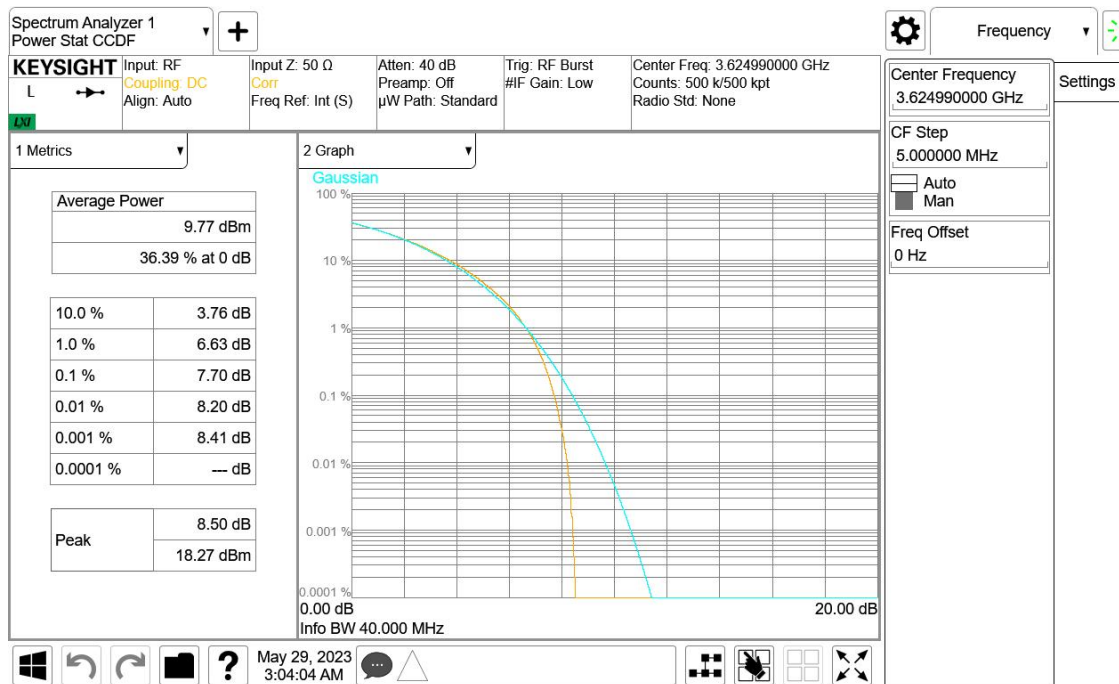
Band n48 , 40MHz Bandwidth,CP-QPSK

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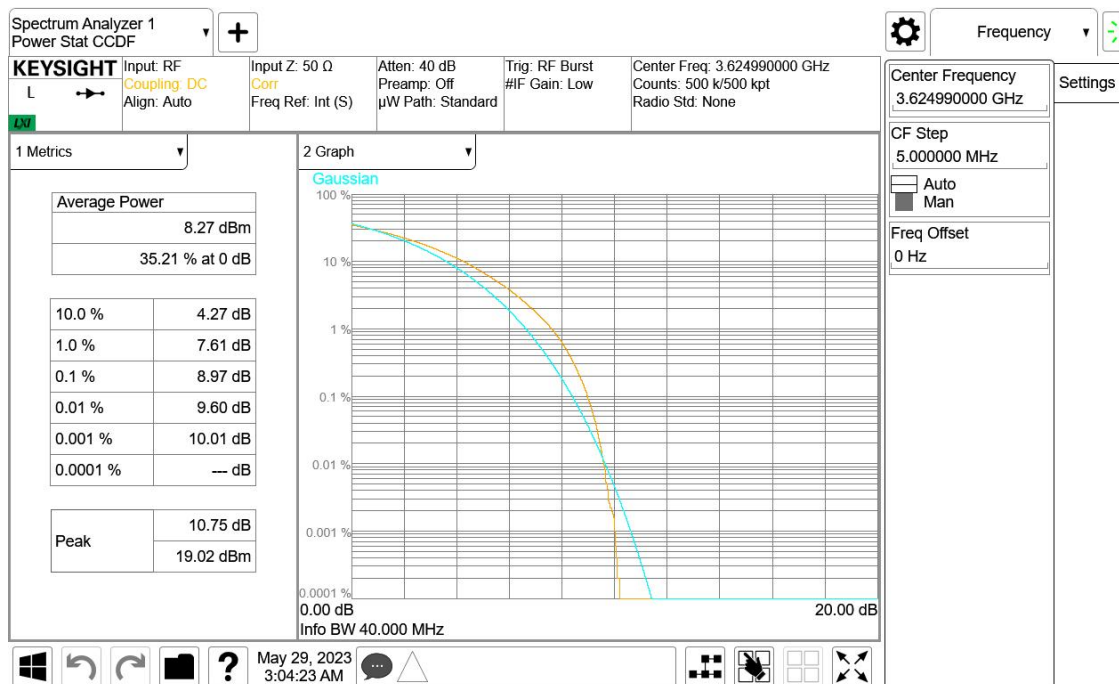
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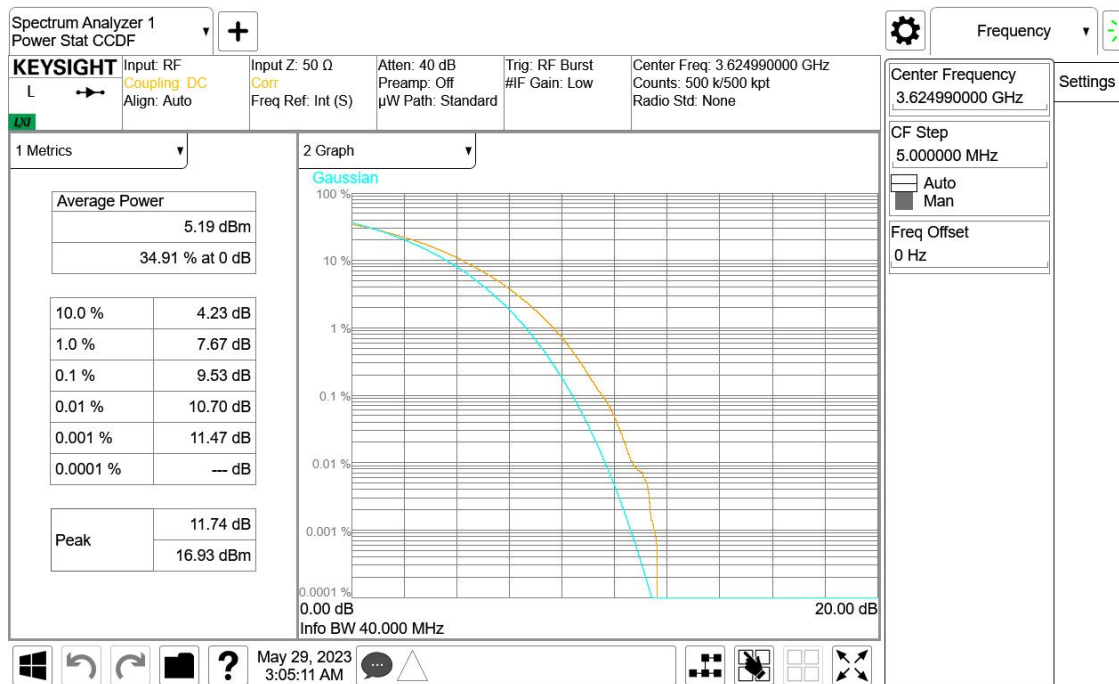
Band n48 , 40MHz Bandwidth,CP-64QAM

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Band n48 , 40MHz Bandwidth,CP-256QAM



n48-MIMO,40MHz

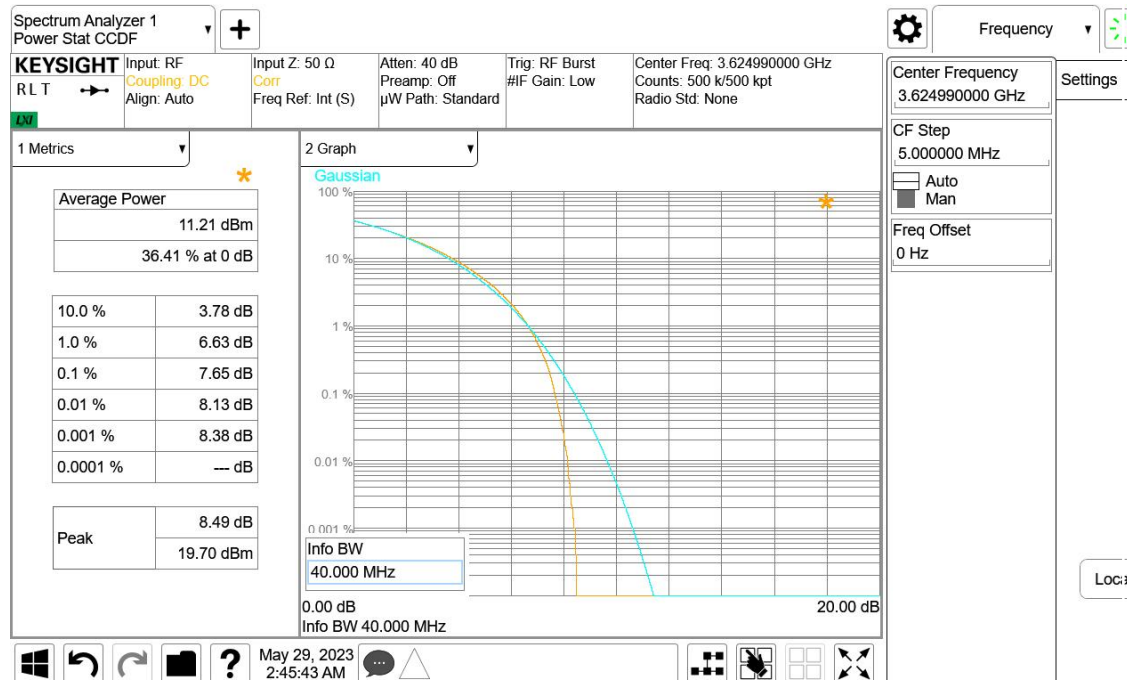
Frequency (MHz)	PAPR (dB)
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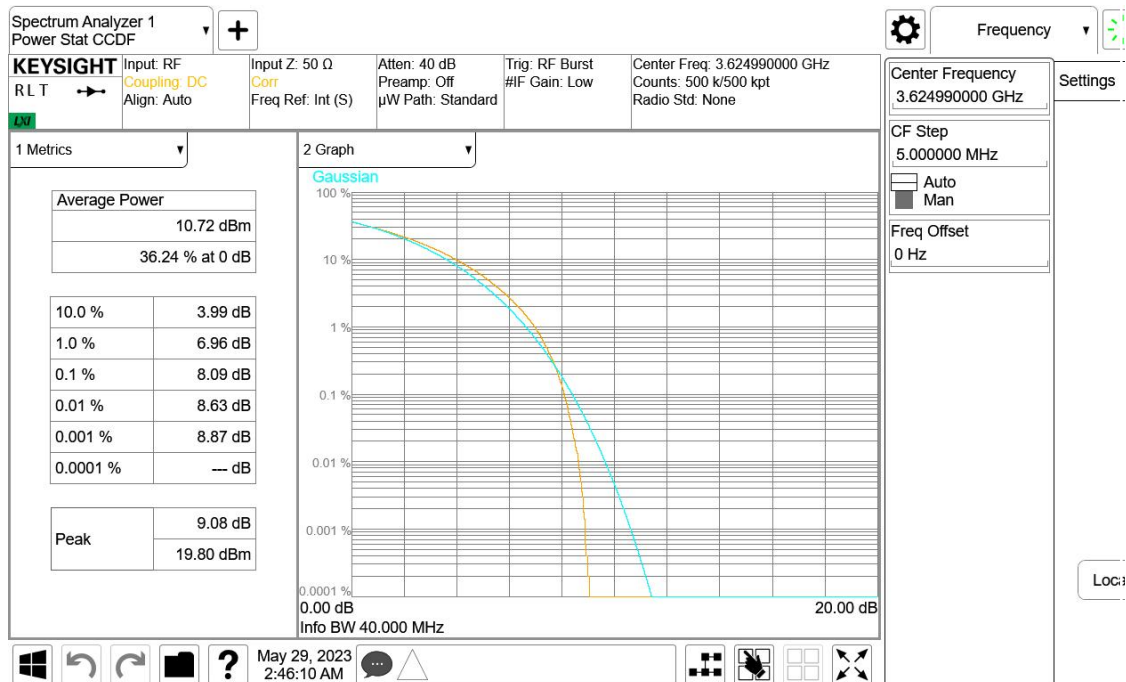
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	CP-QPSK	CP-16QAM	CP-64QAM	CP-256QAM
				M
3624.99	7.65	8.09	8.98	9.18

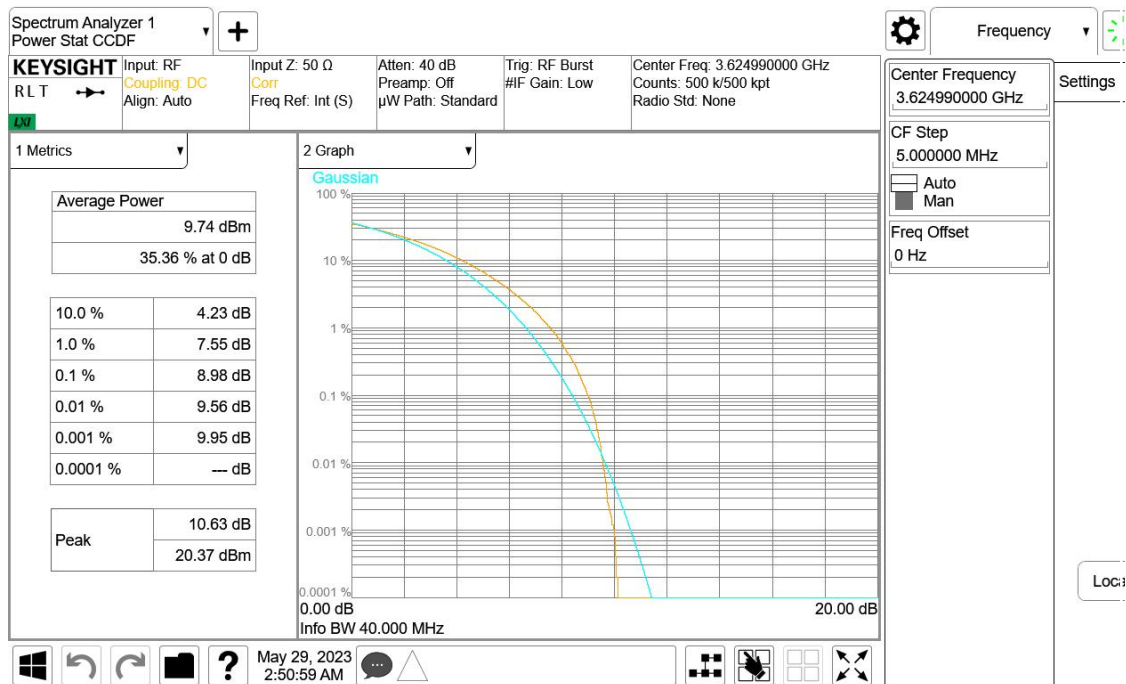
Band N48 , 40MHz Bandwidth,CP-QPSK



Band N48 , 40MHz Bandwidth,CP-16QAM



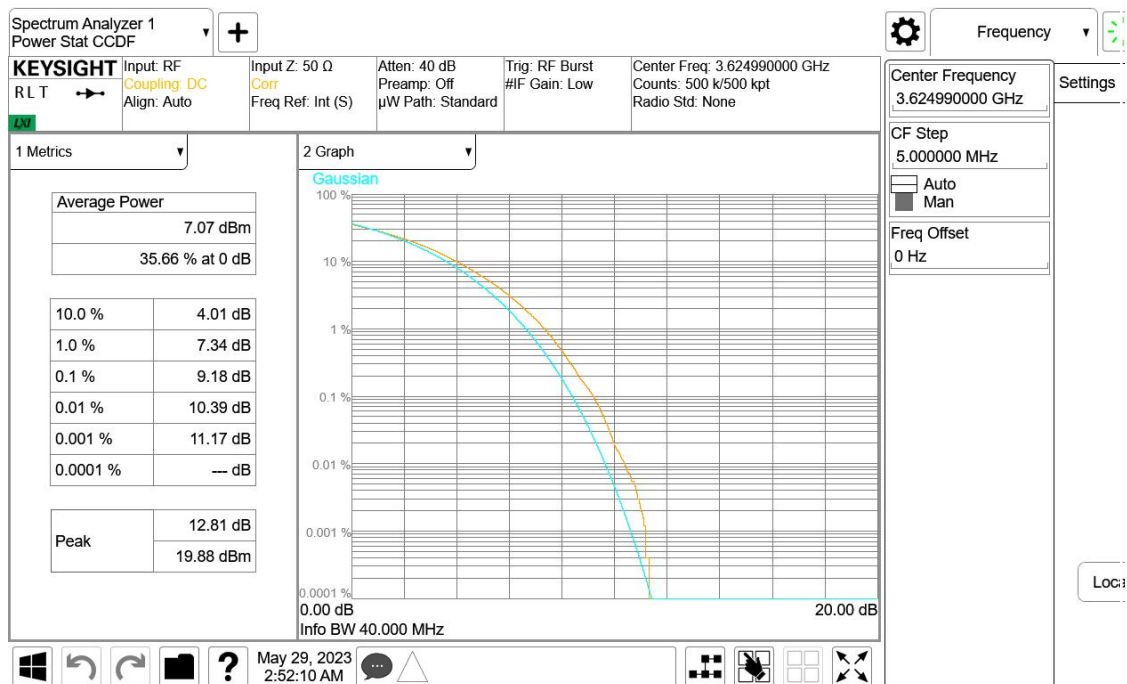
Band N48 , 40MHz Bandwidth,CP-64QAM



Band N48 , 40MHz Bandwidth,CP-256QAM

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Annex A EUT Photos

See the document "I23W00005-External Photos".

See the document "I23W00005-Internal Photos".

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ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

*****END OF REPORT*****

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