



# TEST REPORT

**APPLICANT** : Sonim Technologies, Inc.

**PRODUCT NAME** : 5G smartphone

**MODEL NAME** : P200

**BRAND NAME** : Sonim

**FCC ID** : WYPP200

**STANDARD(S)** : 47 CFR Part 2  
47 CFR Part 22  
47 CFR Part 24  
47 CFR Part 27  
47 CFR Part 90

**RECEIPT DATE** : 2023-12-21

**TEST DATE** : 2024-01-31 to 2024-03-27

**ISSUE DATE** : 2024-05-16



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Change History		
Version	Date	Reason for change
1.0	2024-05-16	First edition



# 1. Technical Information

Note: Provide by applicant.

## 1.1. Applicant and Manufacturer Information

<b>Applicant:</b>	Sonim Technologies, Inc.
<b>Applicant Address:</b>	4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA
<b>Manufacturer:</b>	Sonim Technologies, Inc.
<b>Manufacturer Address:</b>	4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA

## 1.2. Equipment Under Test (EUT) Description

<b>Product Name:</b>	5G smartphone	
<b>Sample No.:</b>	21#	
<b>Hardware Version:</b>	V1.0	
<b>Software Version:</b>	P200.AT01.30D	
<b>Modulation Type:</b>	QPSK, 16QAM, 64QAM	
<b>Operation Band:</b>	Uplink: 2A_5A; 2A_12A; 2A_14A; 2A_66A; 5A_66A; 12A_66A; 14A_66A	
<b>Frequency Range:</b>	Band 2	Tx: 1850MHz–1910MHz
		Rx: 1930MHz–1990MHz
	Band 5	Tx: 824MHz–849MHz
		Rx: 869MHz–894MHz
	Band 12	Tx: 699MHz–716MHz
		Rx: 729MHz–746MHz
	Band 14	Tx: 788MHz–798MHz
		Rx: 758MHz–768MHz
	Band 66	Tx: 1710MHz –1780MHz
		Rx: 2110MHz–2200MHz
<b>Channel Bandwidth:</b>	Band 2	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
	Band 5	1.4MHz, 3MHz, 5MHz, 10MHz
	Band 12	1.4MHz, 3 MHz, 5 MHz, 10MHz
	Band 14	5MHz, 10MHz
	Band 66	1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
<b>Antenna Type:</b>	PIFA Antenna	



<b>Antenna Gain:</b>	Band 2	ANT1:0.01dBi,ANT5:-0.61dBi
	Band 5	ANT2: -3.19dBi
	Band 12	ANT2: -4.25dBi
	Band 14	ANT2: -3.65dBi
	Band 66	ANT5: -1.96dBi
<b>Accessory Information:</b>	Battery	
	Brand Name:	N/A
	Model No.:	BAT-05000-11S
	Serial No.:	N/A
	Capacity:	5000mAh
	Rated Voltage:	3.87V
	Charge Limit:	4.45V
	Manufacturer:	Shenzhen Aerospace Electronic Co.,Ltd.
	AC Adapter	
	Brand Name:	N/A
	Model No.:	1-CHUSQ302-097
	Serial No.:	N/A
	Rated Output:	100-240V~50/60HZ, 0.5A
	Rated Input:	5V=3A or 9V=2A or 12V=1.5A
	Manufacturer:	HUIZHOU PUAN ELEOTRONICS CO.,LTD

**Note1:** For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.



### 1.3. Maximum E.R.P./E.I.R.P. and Emission Designator

Channel bandwidth	Maximum ERP/EIRP (W)			
	QPSK	16QAM	64QAM	256QAM
CA_12A-66A	QPSK	16QAM	64QAM	256QAM
5+20	0.133	/	/	/
CA_14A-66A	QPSK	16QAM	64QAM	256QAM
10+20	0.167	/	/	/
CA_2A-12A	QPSK	16QAM	64QAM	256QAM
20+5	0.163	/	/	/
CA_2A-14A	QPSK	16QAM	64QAM	256QAM
20+10	0.163	/	/	/
CA_2A-5A	QPSK	16QAM	64QAM	256QAM
20+10	0.164	/	/	
CA_5A-66A	QPSK	16QAM	64QAM	256QAM
10+20	0.104	/	/	/
CA_2A-66A	QPSK	16QAM	64QAM	256QAM
20+20	0.164	/	/	/



## 1.4. Test Standards and Results

The objective of the report is to perform testing according to Part 2, Part 22, Part 24, Part 27 and Part 90 for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22	Public Mobile Services
3	47 CFR Part 24	Personal Communications Services
4	47 CFR Part 27	Miscellaneous Wireless Communications Services
5	47 CFR Part 90	Miscellaneous Wireless Communications Services

B2			
Item	FCC Rule No.	Requirements	Result
Effective (Isotropic) Radiated Power Output Data	§2.1046, §24.232(c)	EIRP $\leq$ 2 W	PASS
Peak-Average Ratio	§24.232(d)	Limit $\leq$ 13 dB	PASS
Bandwidth	§2.1049	OBW: No limit EBW: No limit	PASS
Band Edges Compliance	§2.1051, §24.238(a)(b)	Refer to section 2.6	PASS
Spurious Emission at Antenna Terminals	§2.1051, §24.238(a)(b)	$\leq$ -13 dBm/1MHz	PASS
Field Strength of Spurious Radiation	§2.1053, §24.238(a)	$\leq$ -13 dBm/1MHz	PASS
Frequency Stability	§2.1055, §24.235	No limit	N/A

B4 & B66			
Item	FCC Rule No.	Requirements	Result
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(d)(4)	EIRP $\leq$ 1 W	PASS
Peak-Average Ratio	§27.50(d) (5)	Limit $\leq$ 13 dB	PASS



Bandwidth	§2.1049	OBW: No limit. EBW: No limit.	PASS
Band Edges Compliance	§2.1051, §27.53(h)(1) §27.53(h)(3)(i)	Refer to section 2.6	PASS
Spurious Emission at Antenna Terminals	§2.1051, §27.53(h)(1)	≤ -13 dBm/1MHz	PASS
Field Strength of Spurious Radiation	§2.1053, §27.53(h)(1)	≤ -13 dBm/1MHz.	PASS
Frequency Stability	§2.1055, §27.54	No limit	N/A

<b>B12</b>			
Item	FCC Rule No.	Requirements	Result
Effective (Isotropic) Radiated Power Output Data	§2.1046, §27.50(c)(10)	ERP ≤3W	PASS
Peak-Average Ratio	N/A	N/A	N/A
Bandwidth	§2.1049	OBW: No limit EBW: No limit	PASS
Band Edges Compliance	§2.1051, §27.53(g)	Refer to section the following description	PASS
Spurious Emission at Antenna Terminals	§2.1051, §27.53(g)	≤ -13 dBm/1MHz	PASS
Field Strength of Spurious Radiation	§2.1053, §27.53(g)	≤ -13 dBm/1MHz	PASS
Frequency Stability	§2.1055, §27.54	No limit	N/A



B5			
Item	FCC Rule No.	Requirements	Result
Effective (Isotropic) Radiated Power Output Data	§2.1046, §22.913(a)(5)	ERP ≤ 7W	PASS
Peak-Average Ratio	N/A	N/A	N/A
Bandwidth	§2.1049	OBW: No limit EBW: No limit	PASS
Band Edges Compliance	§2.1051, §22.917(a)(b)	Refer to section 2.6	PASS
Spurious Emission at Antenna Terminals	§2.1051, §22.917(a)	≤ -13 dBm/1MHz	PASS
Field Strength of Spurious Radiation	§2.1053, §22.355	≤ -13 dBm/1MHz	PASS
Frequency Stability	§2.1055, §22.355	≤ ±2.5ppm	PASS

B14			
Item	FCC Rule No.	Requirements	Result
Effective (Isotropic) Radiated Power Output Data	§2.1046, §90.541(d)	ERP ≤ 3W	PASS
Peak-Average Ratio	N/A	N/A	N/A
Bandwidth	§2.1049	OBW: No limit EBW: No limit	PASS
Band Edges Compliance	§2.1051, §90.543(e)	Refer to section the following description	PASS
Spurious Emission at Antenna Terminals	§2.1051, §90.543(f)	≤ -13 dBm/1MHz	PASS
Field Strength of Spurious Radiation	§2.1053, §90.543(c)	≤ -13 dBm/1MHz	PASS
Frequency Stability	§2.1055, §90.543	No limit	N/A





Test detailed items/section required by FCC rules and results are as below:

Test Item	Test Engineer	Result	Method Determination /Remark
Transmitter Conducted Output Power and E.R.P./E.I.R.P.	Gan Jing	PASS	No deviation
Occupied Bandwidth	Gan Jing	PASS <sup>[5]</sup>	No deviation
Peak to Average Ratio	Gan Jing	PASS <sup>[5]</sup>	No deviation
Conducted Spurious Emissions	Gan Jing	PASS	No deviation
Band Edge	Gan Jing	PASS <sup>[5]</sup>	No deviation
Radiated Spurious Emissions	Gao Jianrou Su Zhan	PASS	No deviation

**Note 1:** The tests were performed according to the method of measurements prescribed in KDB971168 D01 v03 and ANSI/TIA-603-E-2016.

**Note 2:** The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 23.5dB contains two parts that cable loss 13.5dB and Attenuator 10dB.

**Note 3:** When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

**Note 4:** Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.

**Note 5:** The test items of inter band CA were cover by LTE single carrier due to the CA power is lower than single carrier power.

## 1.5. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15-35
Relative Humidity (%):	30-60

## 2. Summary Test Results And Description

### 2.1. Transmitter Conducted Output Power

#### 2.1.1. Requirement

According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

According to FCC section 24.232 (c) for LTE Band 2, Mobile and portable stations are limited to 2 watts E.I.R.P. and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

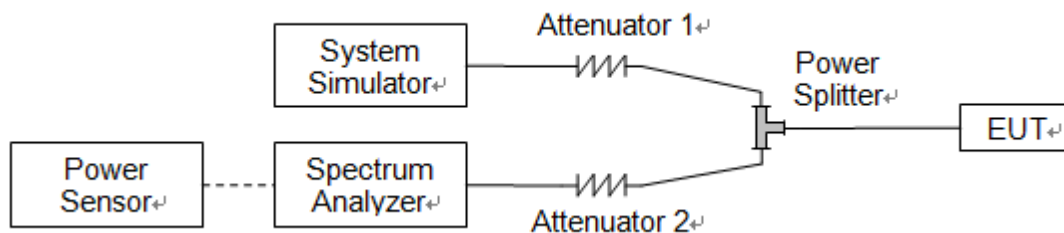
According to FCC section 27.50 (d)(4) for LTE Band 4/66, Fixed, mobile and portable (hand-held) stations in the 1710-1755MHz band are limited to 1wat E.I.R.P.

According to FCC section 22.913 (a)(2) for LTE Band 5, the E.R.P. of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC section 27.50 (c)(10)for LTE Band 12, Portable stations (hand-held devices) operating in the 704-716MHz band are limited to 3watts E.R.P.

According to FCC section §90.541(d) for LTE Band 14, the transmitting power of a portable (hand-held) unit must not exceed 3 watts ERP.

#### 2.1.2. Test Description



The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.



**2.1.3. Test Procedure**

KDB 971168 D01v03 Section 5.2 and ANSI/TIA-603-E-2016.

E.I.R.P. (dBm) = Conducted Output Power (dBm) + Antenna Gain (dBi)

E.R.P. (dBm) = E.I.R.P. (dBm) - 2.15

**2.1.4. Result**

**Conducted Output Power**

Configure	CA Configuration	PCC				
		Band	BW (MHz)	UL Channel	UL Fre. (MHz)	UL Mode (Modulation/RB/Offset)
Inter-band	CA_12A-66A	12	5	23035	701.5	QPSK/1#0
	CA_14A-66A	14	10	23330	793	QPSK/1#0
	CA_2A-12A	2	20	18700	1860	QPSK/1#0
	CA_2A-14A	2	20	18700	1860	QPSK/1#0
	CA_2A-5A	2	20	18700	1860	QPSK/1#0
	CA_5A-66A	5	10	20450	829	QPSK/1#0
	CA_2A-66A	2	20	18700	1860	QPSK/1#0

SCC				
Band	BW (MHz)	UL Channel	UL Fre. (MHz)	Measured Power(dBm)
66	20	67236	2190	23.21
66	20	67236	2190	24.20
12	5	23155	713.5	22.12
14	10	23330	793	22.10
5	10	20600	844	22.15
66	20	67236	2190	22.11
66	20	67236	2190	22.14
66	20	67236	2190	23.21



**Effective Radiated Power and Effective Isotropic Radiated Power**

Configure	CA Configuration	PCC				
		Band	BW (MHz)	UL Channel	UL Fre. (MHz)	UL Mode (Modulation/RB/Offset)
Inter-band	CA_12A-66A	12	5	23035	701.5	QPSK/1#0
	CA_14A-66A	14	10	23330	793	QPSK/1#0
	CA_2A-12A	2	20	18700	1860	QPSK/1#0
	CA_2A-14A	2	20	18700	1860	QPSK/1#0
	CA_2A-5A	2	20	18700	1860	QPSK/1#0
	CA_5A-66A	5	10	20450	829	QPSK/1#0
	CA_2A-66A	2	20	18700	1860	QPSK/1#0

SCC					
Band	BW (MHz)	UL Channel	UL Fre. (MHz)	Measured Power(dBm)	EIRP(W)
66	20	67236	2190	21.25	0.133
66	20	67236	2190	22.24	0.167
12	5	23155	713.5	22.13	0.163
14	10	23330	793	22.11	0.163
5	10	20600	844	22.16	0.164
66	20	67236	2190	20.15	0.104
66	20	67236	2190	22.15	0.164



## 2.2. Conducted Spurious Emissions

### 2.2.1. Requirement

According to FCC section 2.1051, 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. This calculated to be -13dBm.

Additional requirement for LTE Band 2:

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. This calculated to be -13dBm.

Additional requirement for LTE Band 4/66:

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB. This calculated to be -13dBm.

Additional requirement for LTE Band 5:

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. This calculated to be -13dBm.

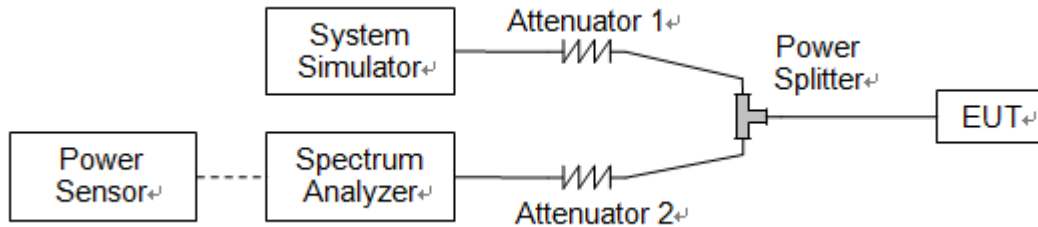
Additional requirement for LTE Band 12:

For operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB. This calculated to be -13dBm

Additional requirement for LTE Band 14:

On any frequency outside of the frequency ranges covered by the ACP tables in this section, the power of any emission must be reduced below the mean output power (P) by at least  $43 + 10\log(P)$  dB measured in a 100 kHz bandwidth for frequencies less than 1 GHz, and in a 1 MHz bandwidth for frequencies greater than 1 GHz.

### 2.2.2. Test Description

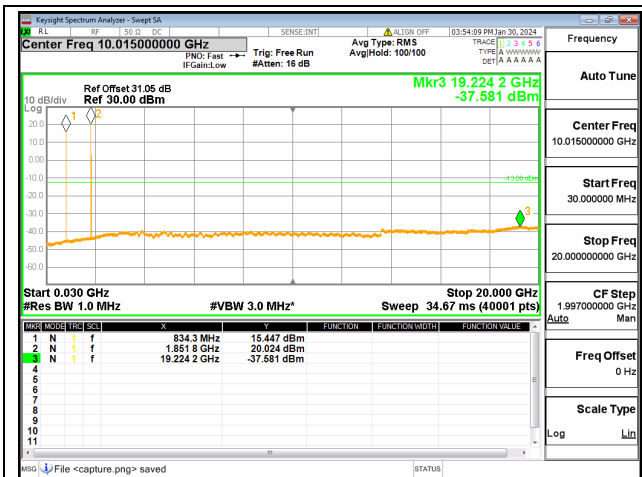


The EUT is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power. A call is established between the EUT and the SS.

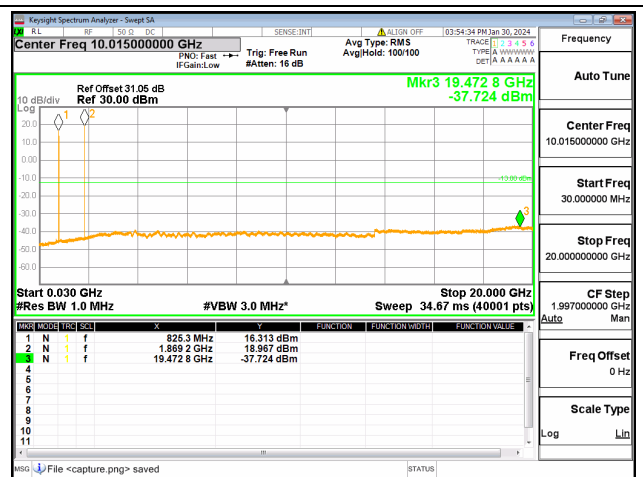
### 2.2.3. Test Procedure

KDB 971168 D01v03 Section 6.0 and ANSI/TIA-603-E-2016.

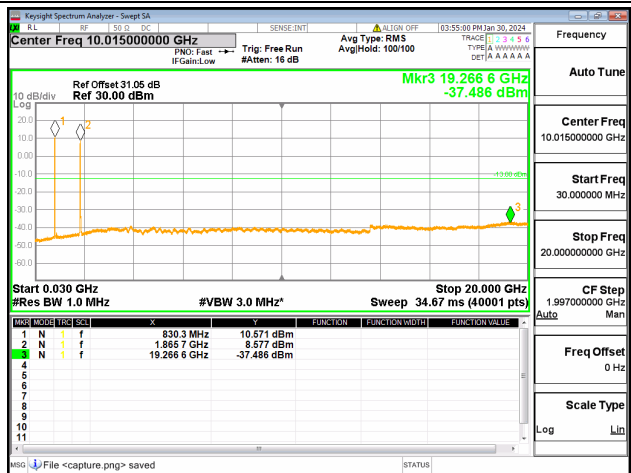
### 2.2.4. Test Result



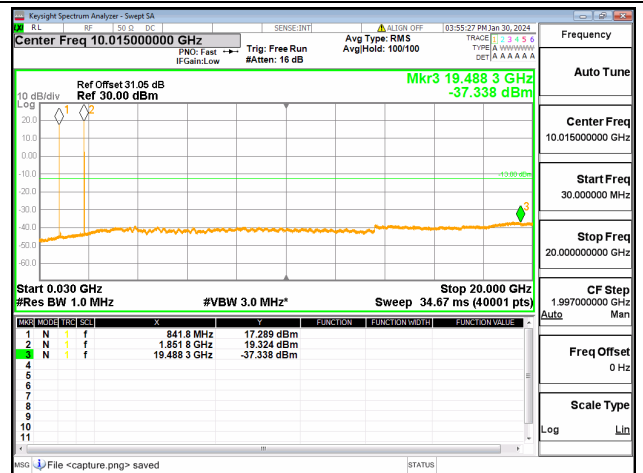
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1@0-1@49



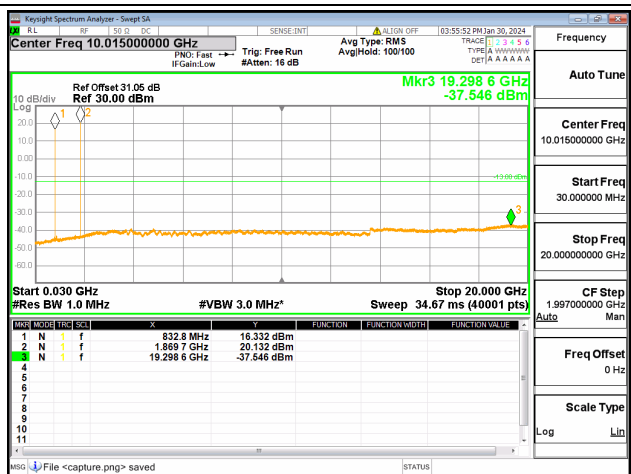
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1@99-1@0



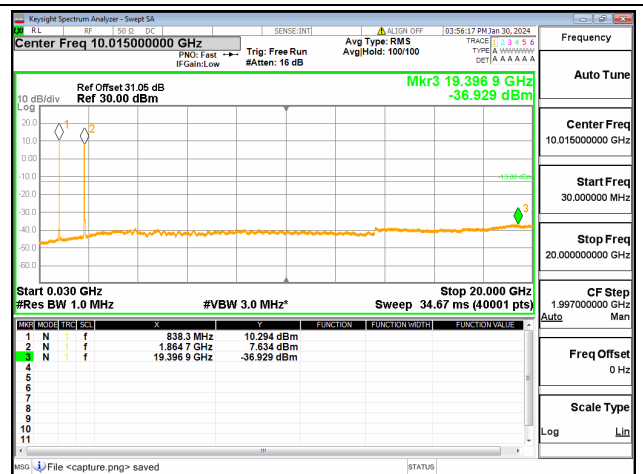
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100@0-50@0



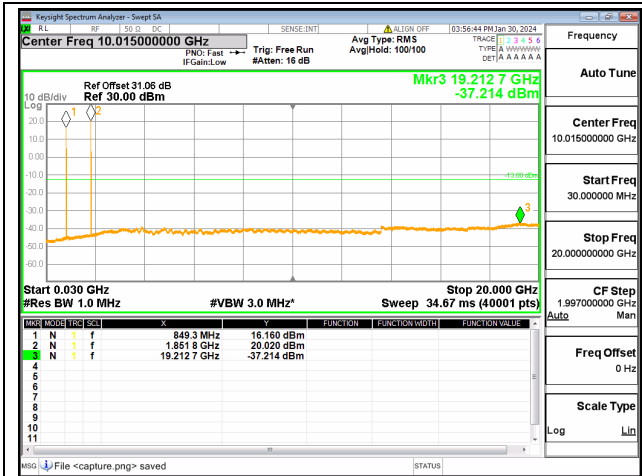
2A-5A / 20+10MHz / QPSK / Low+Mid CH /  
1@0-1@49



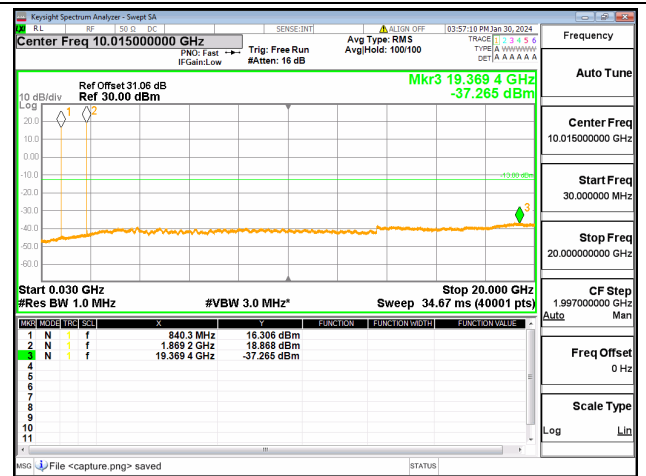
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1@99-1@0



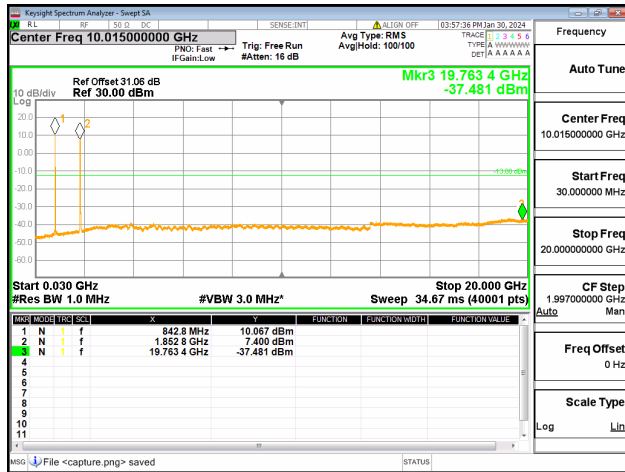
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100@0-50@0



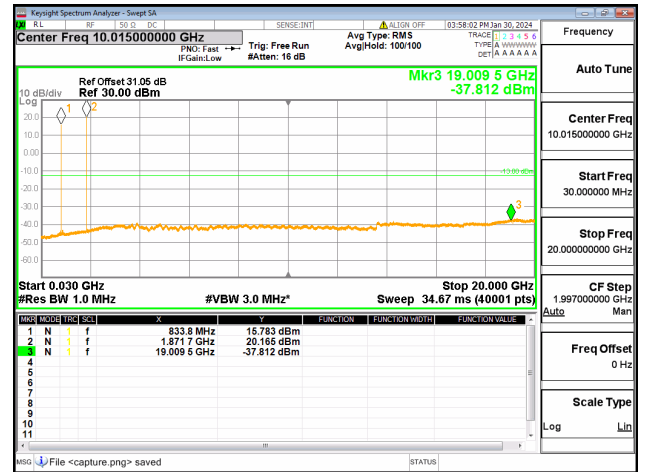
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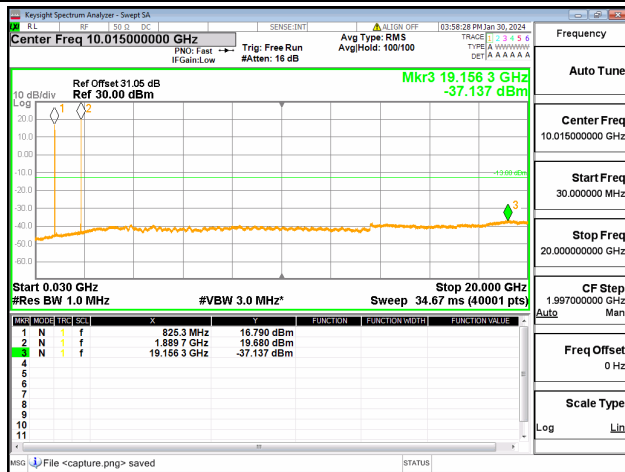
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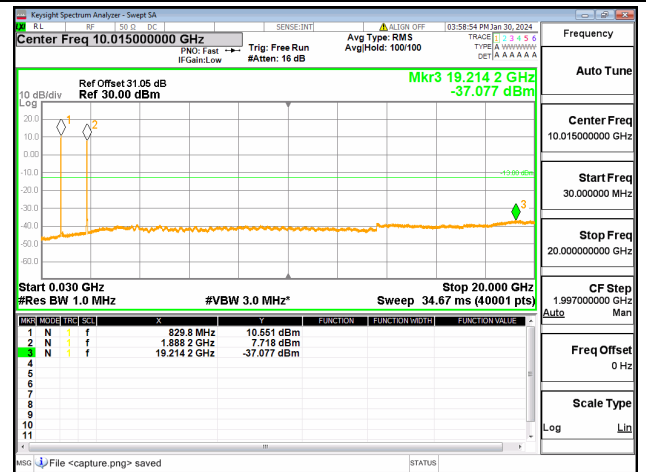
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2A-5A / 20+10MHz / QPSK / Mid+Low CH / 1@0-1@49

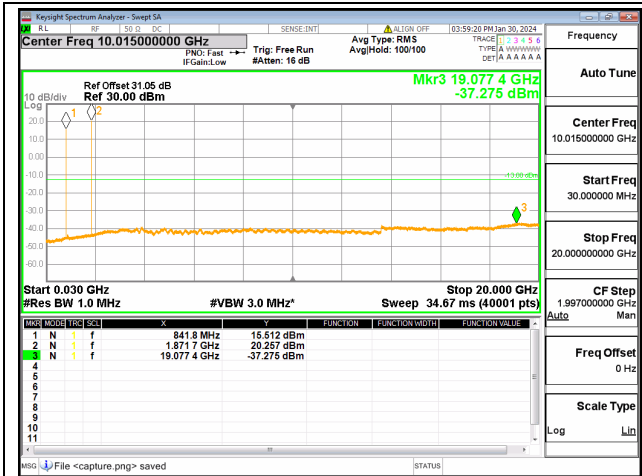


2A-5A / 20+10MHz / QPSK / Mid+Low CH / 1@99-1@0

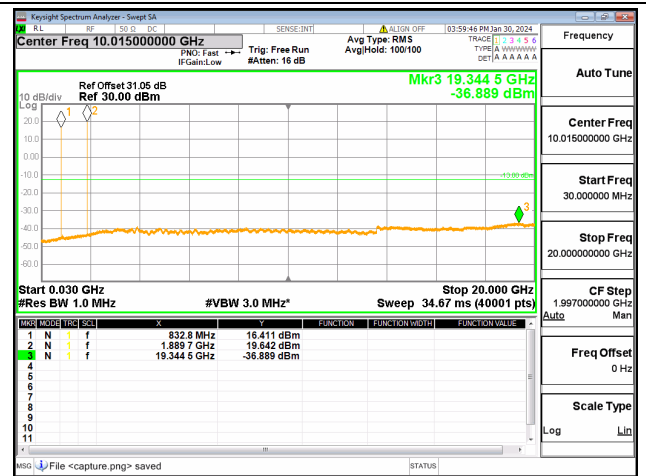


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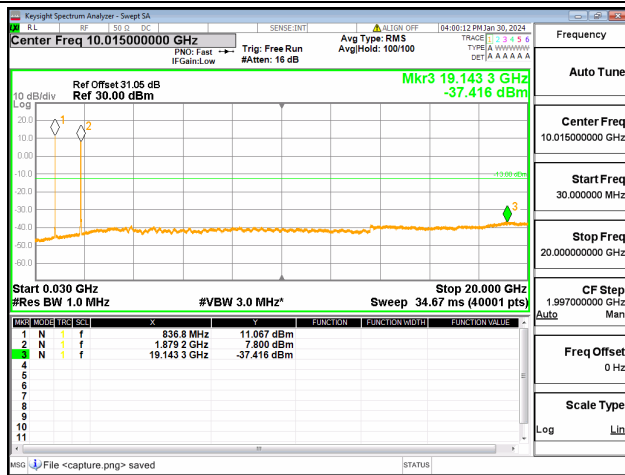




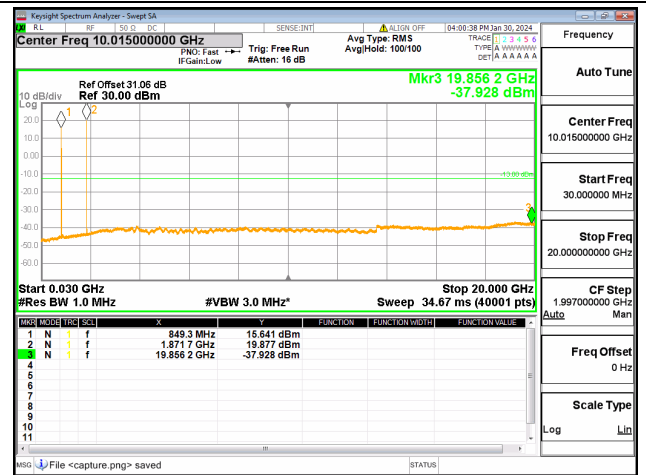
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1@0-1@49



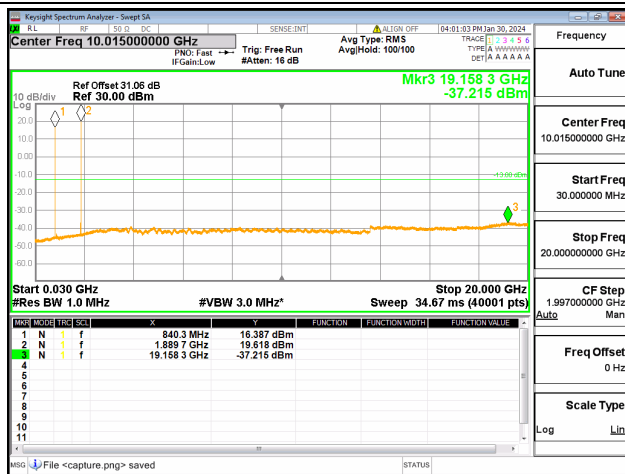
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1@99-1@0



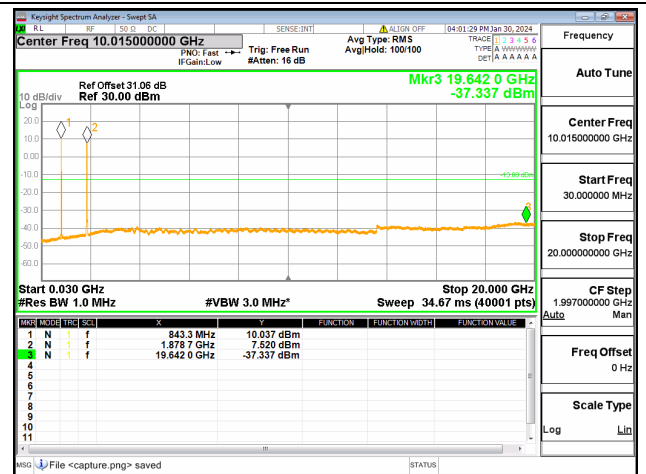
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100@0-50@0



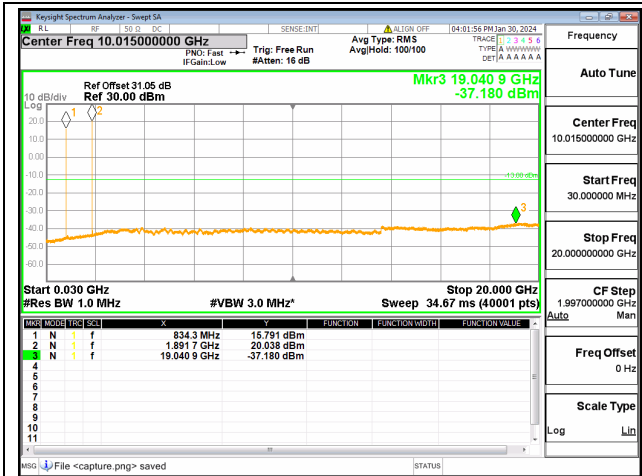
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1@0-1@49



2A-5A / 20+10MHz / QPSK / Mid+High CH /  
1@99-1@0



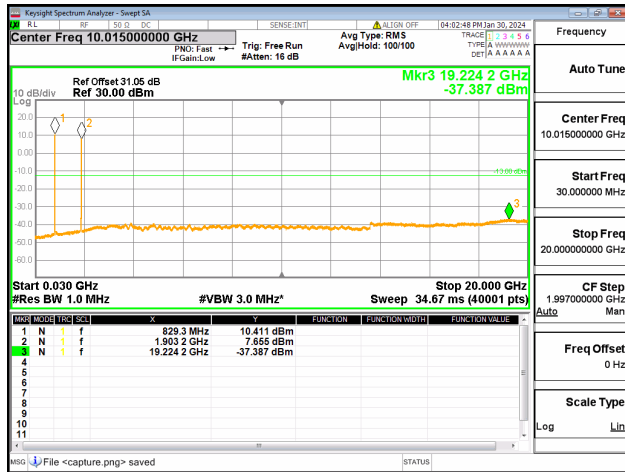
2A-5A / 20+10MHz / QPSK / Mid+High CH /  
100@0-50@0



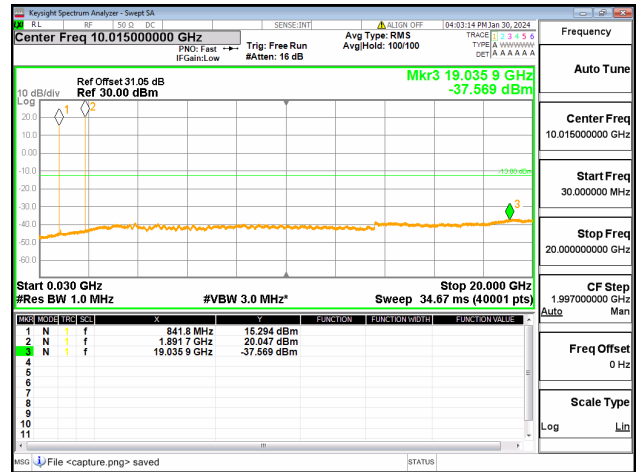
2A-5A / 20+10MHz / QPSK / High+Low CH / 1@0-1@49



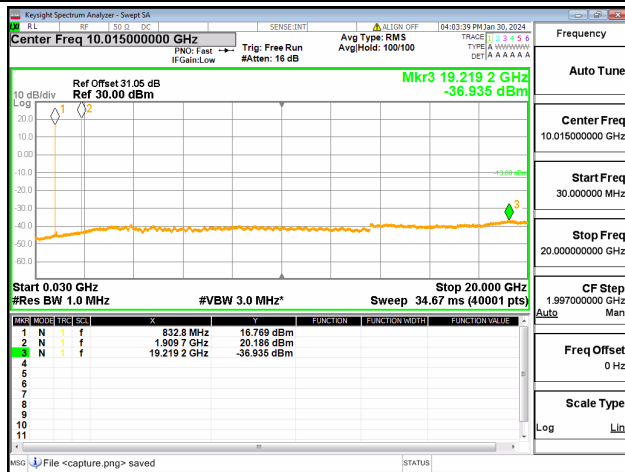
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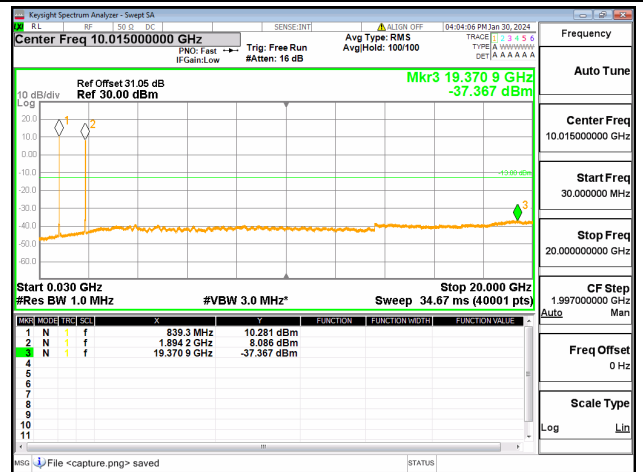
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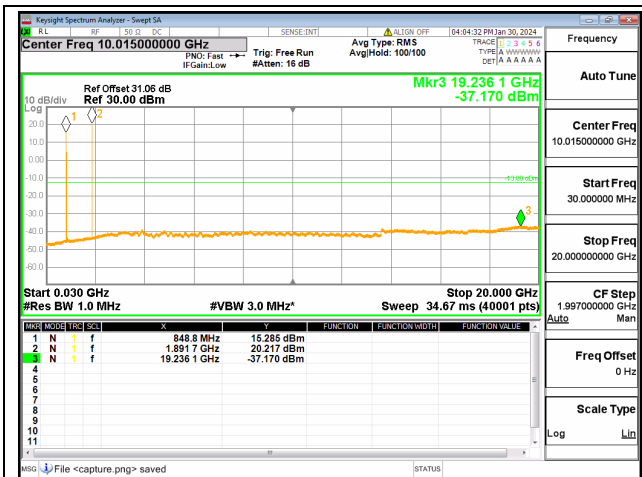
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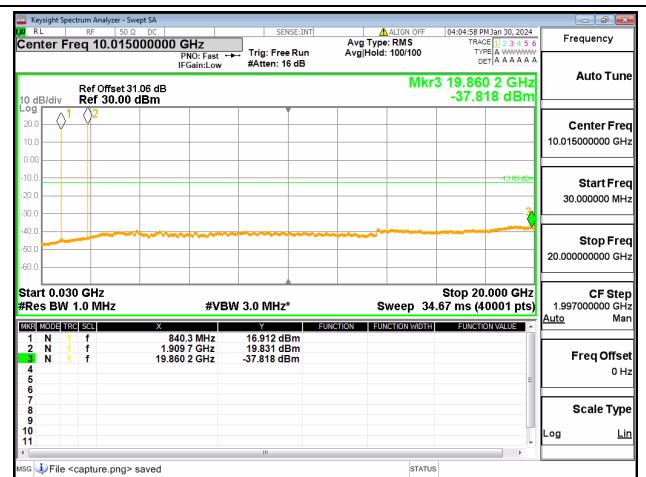
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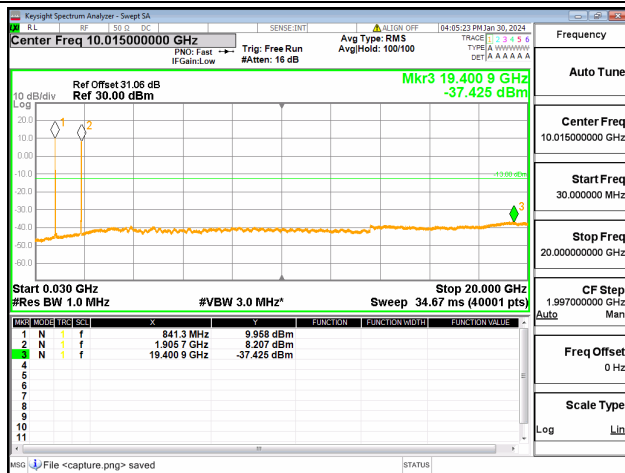
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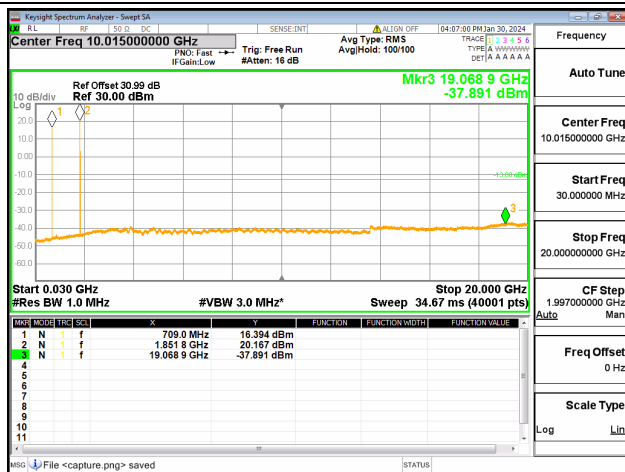
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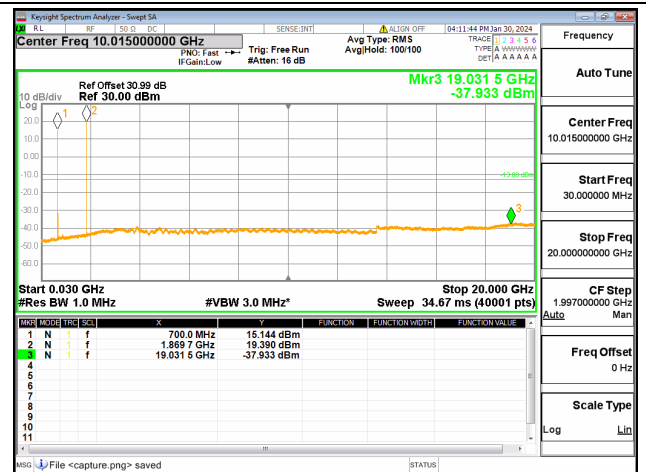
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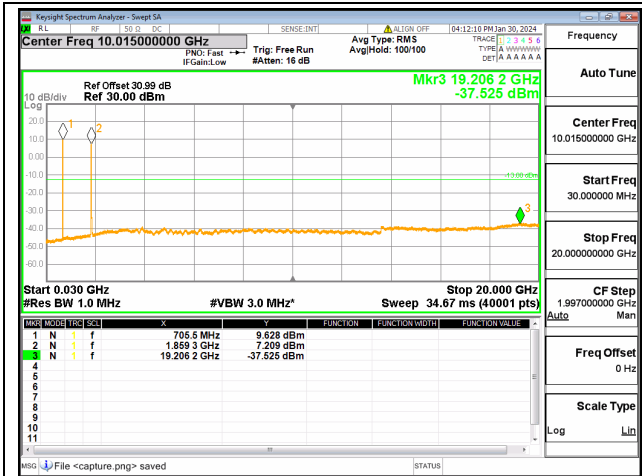
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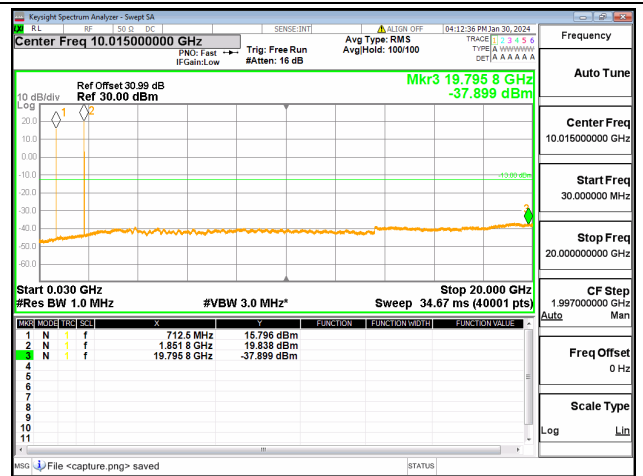
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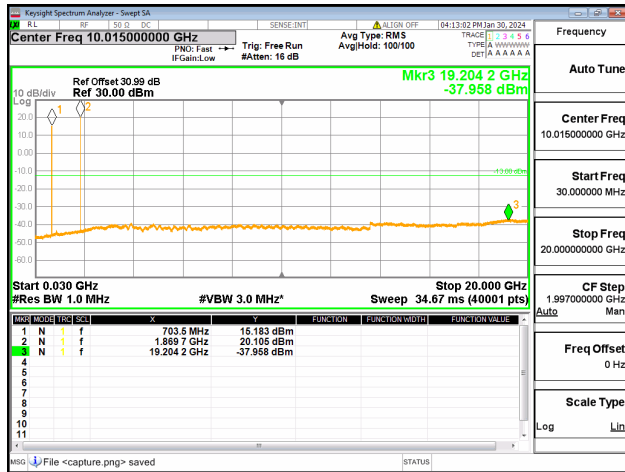
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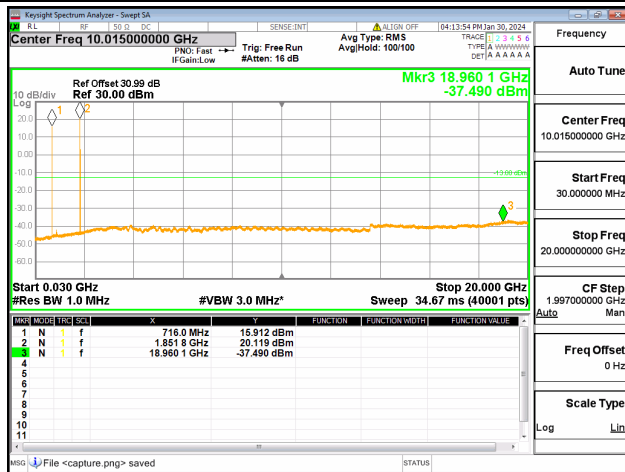
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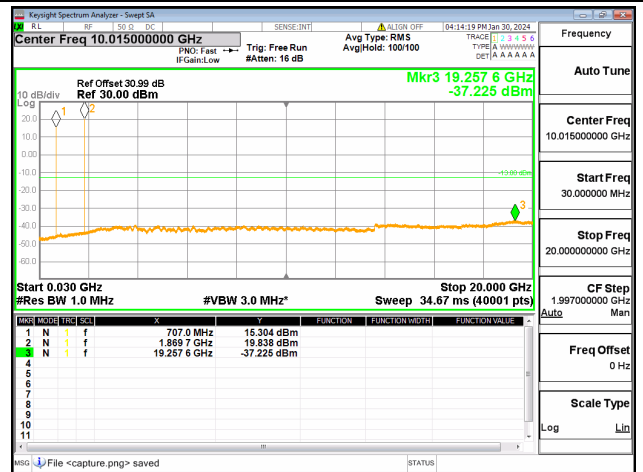
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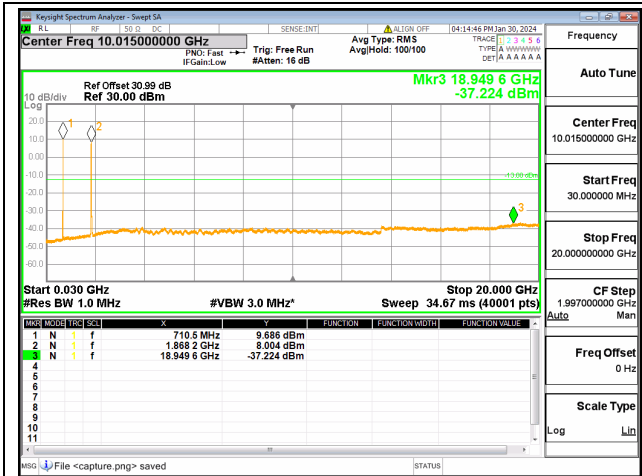
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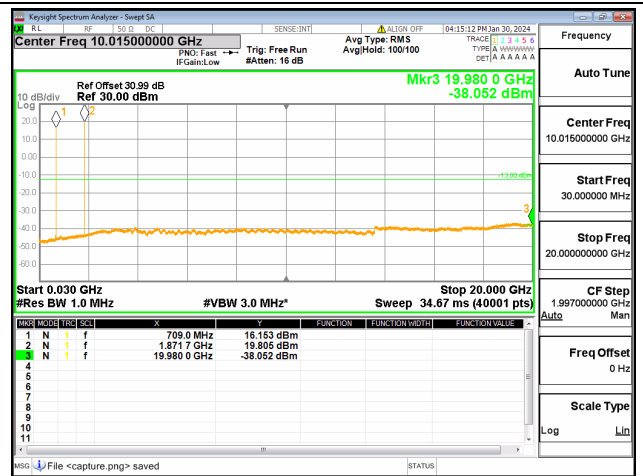
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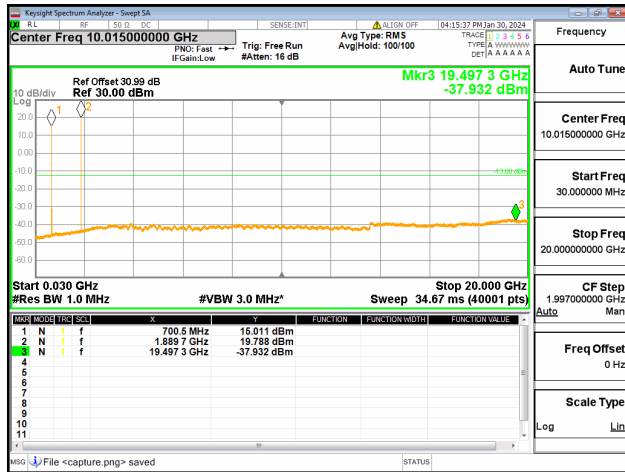
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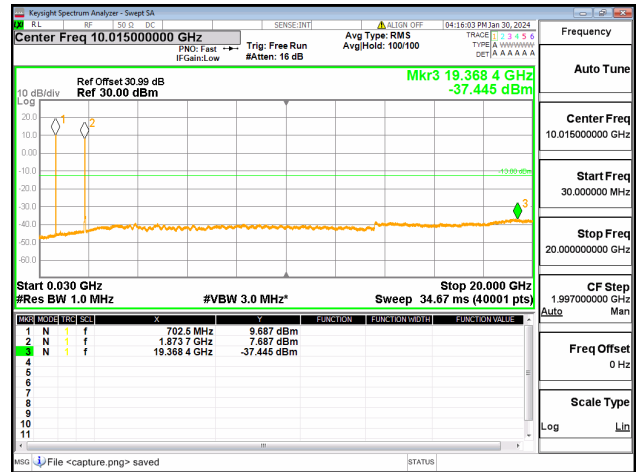
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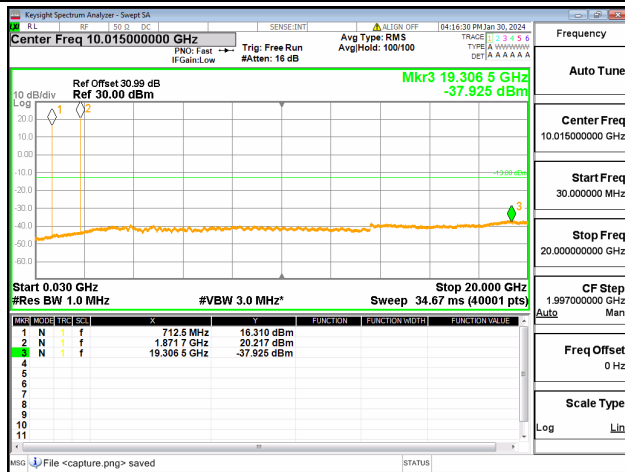
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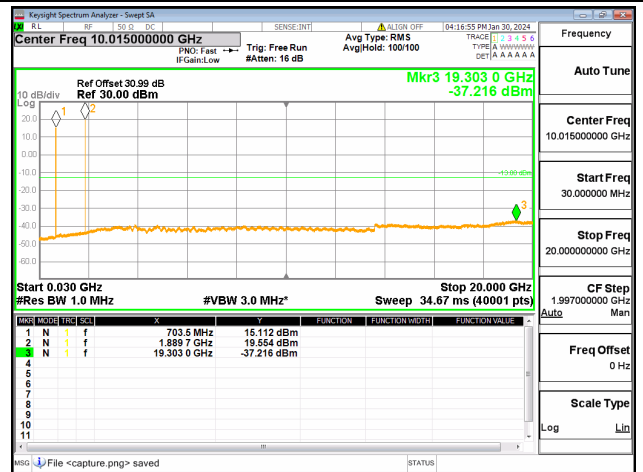
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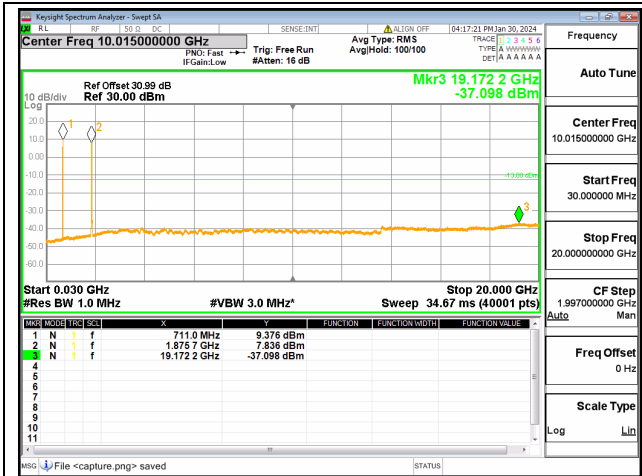


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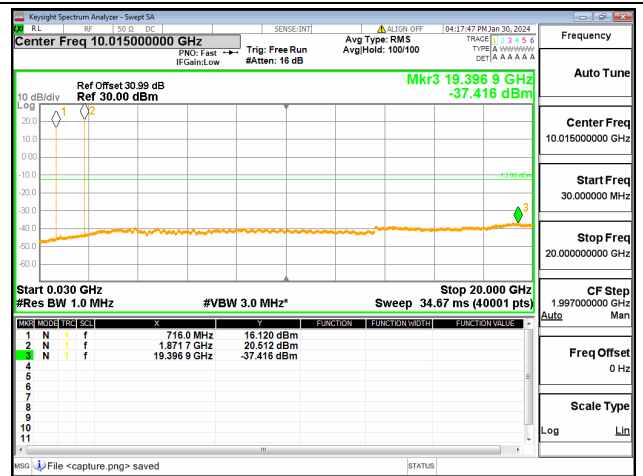


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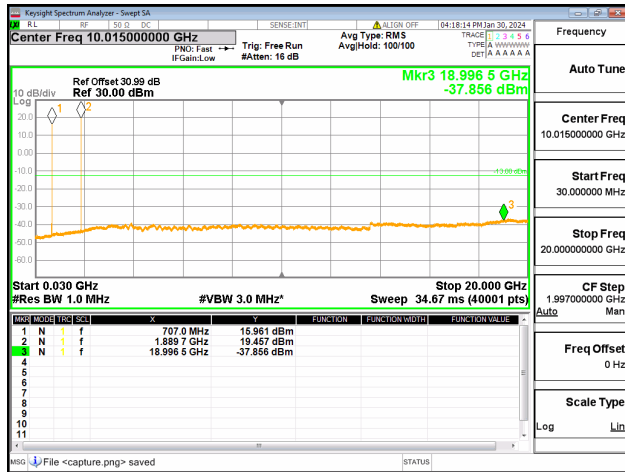




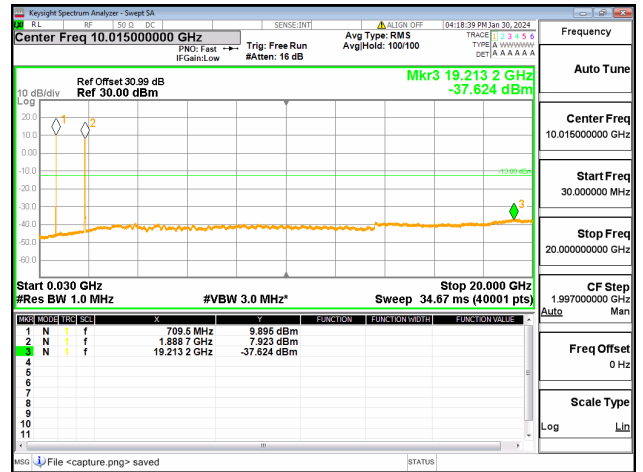
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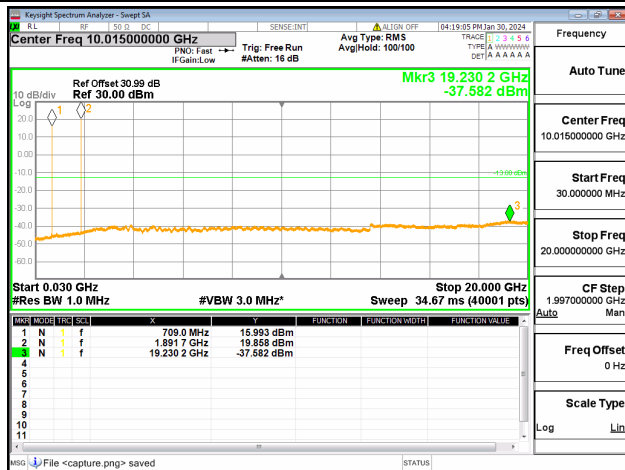
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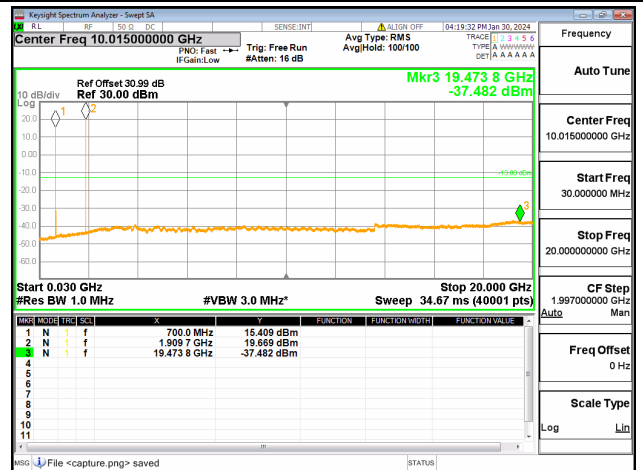
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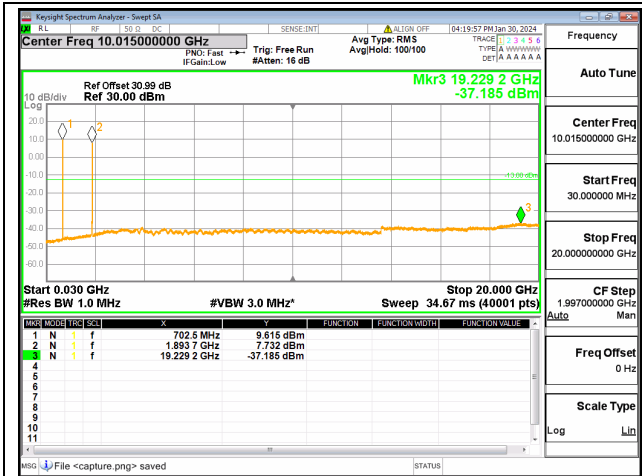
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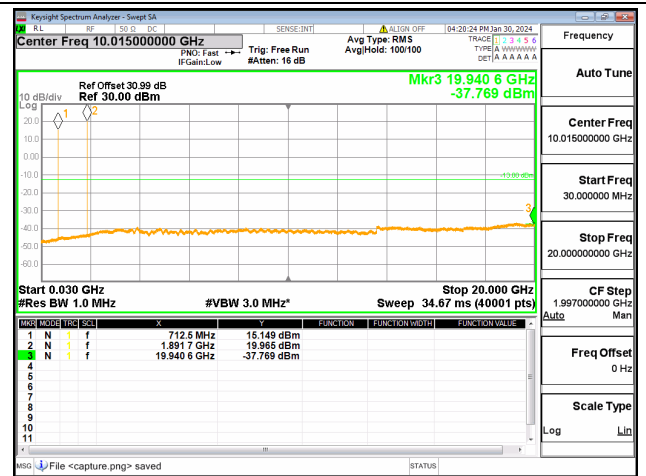
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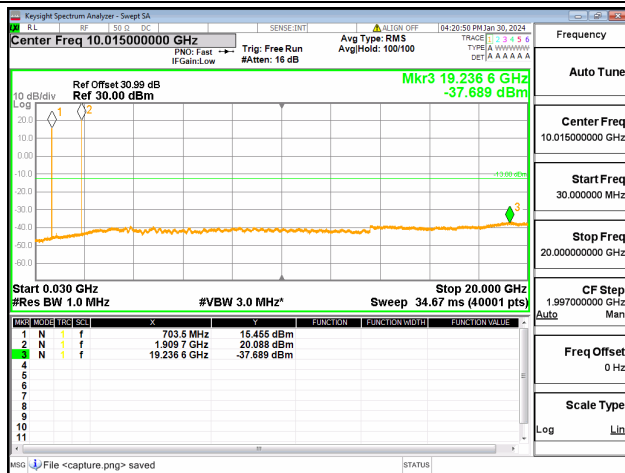
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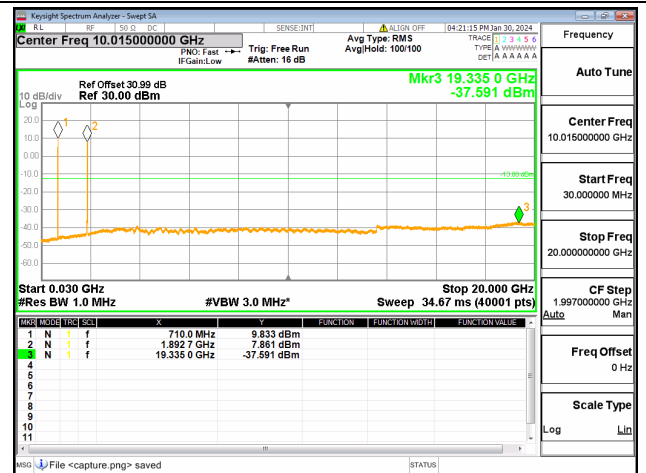
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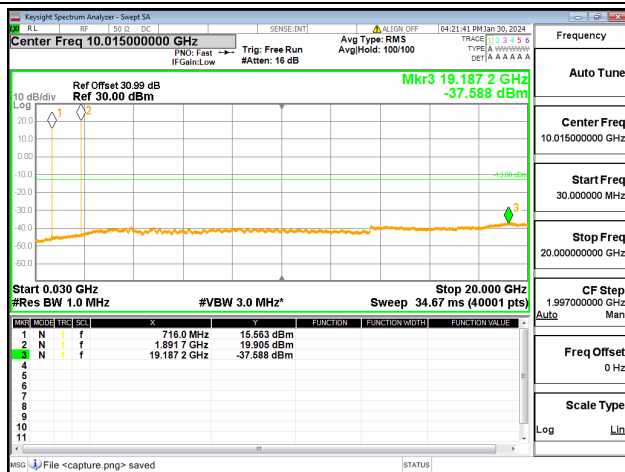
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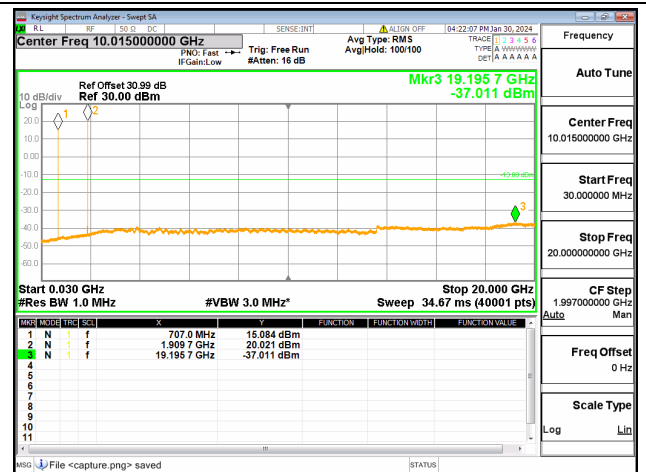
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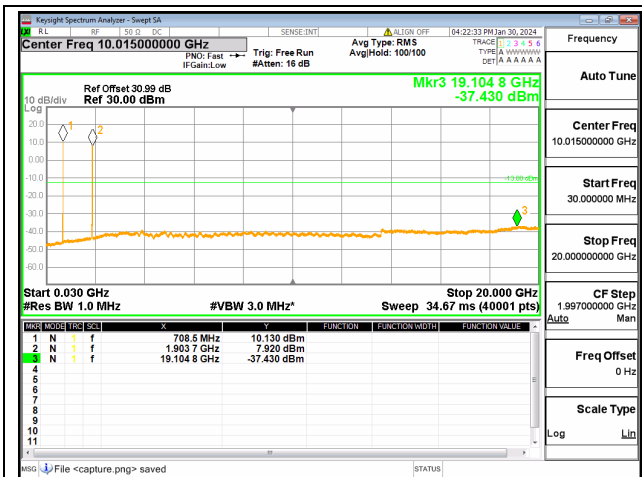
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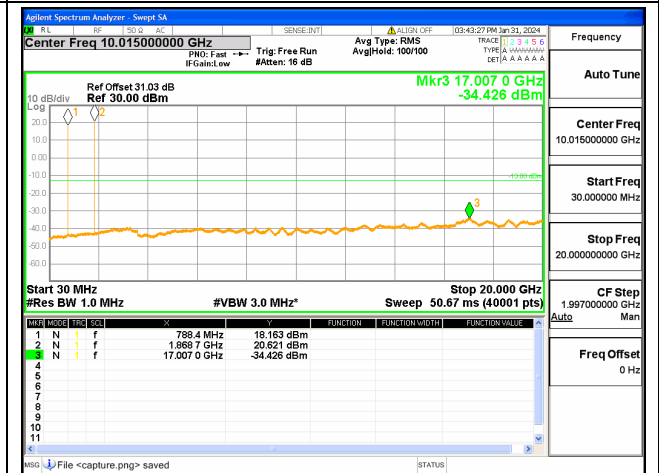
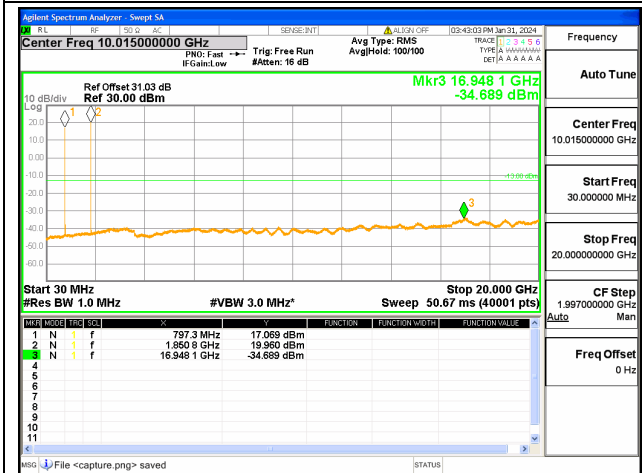
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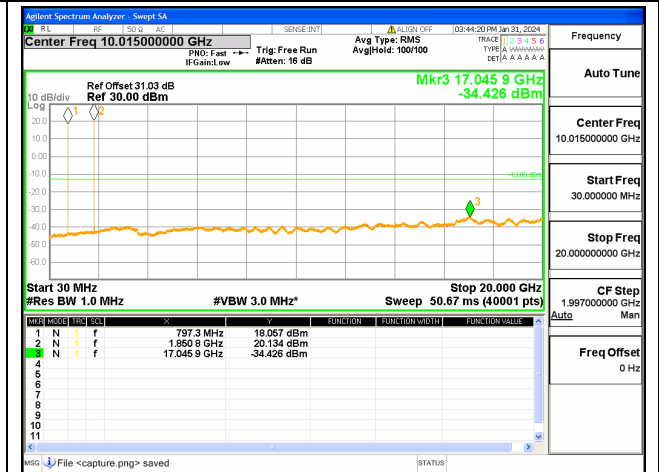
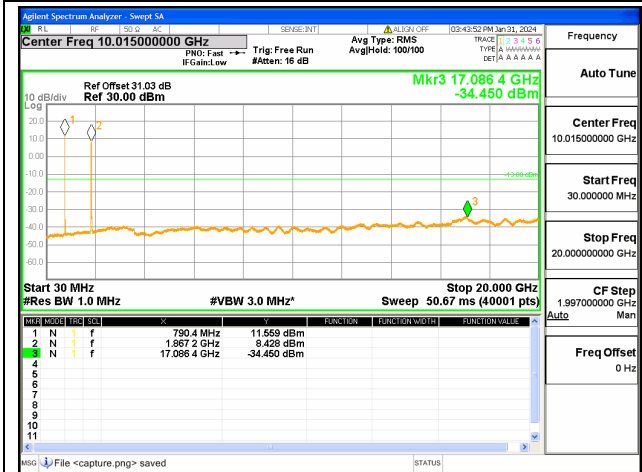
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100@0-50@0



2A-14A / 20+10MHz / QPSK / Low+Low CH /  
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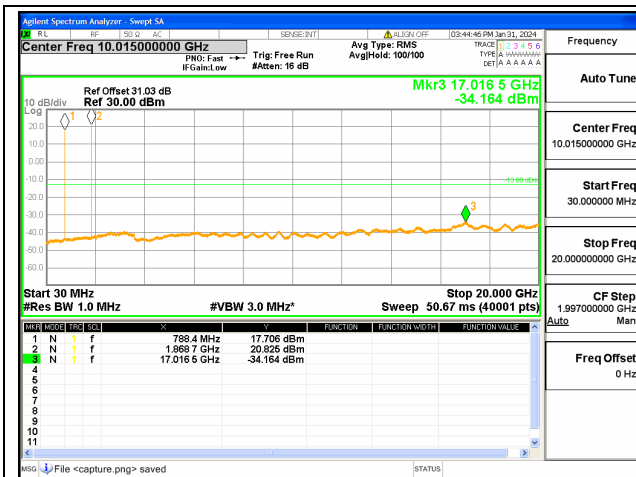


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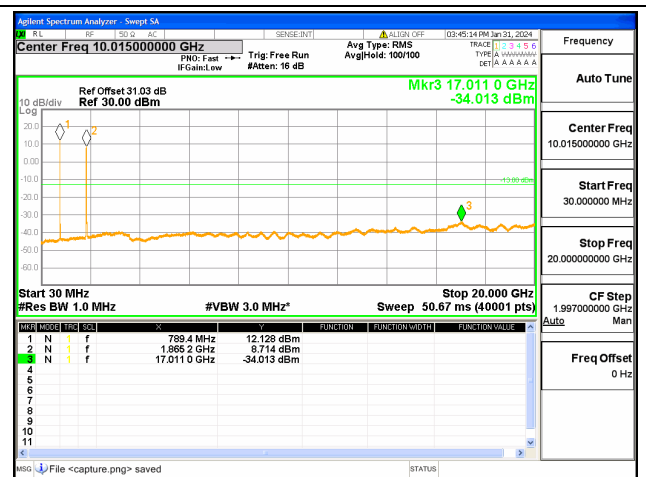


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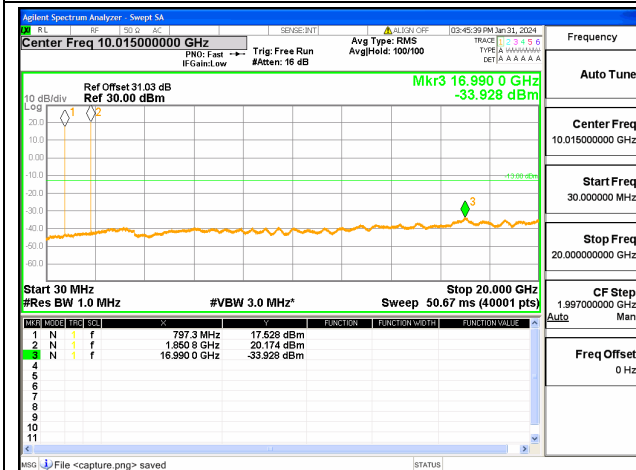




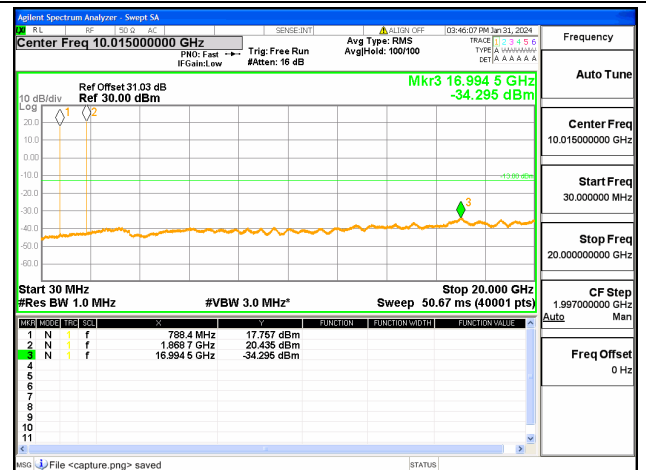
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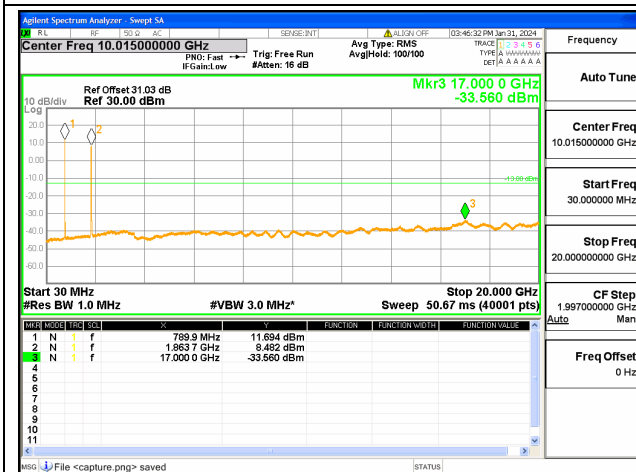
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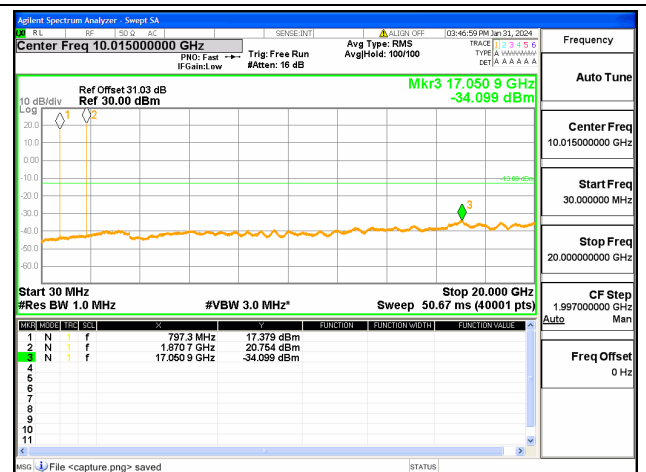
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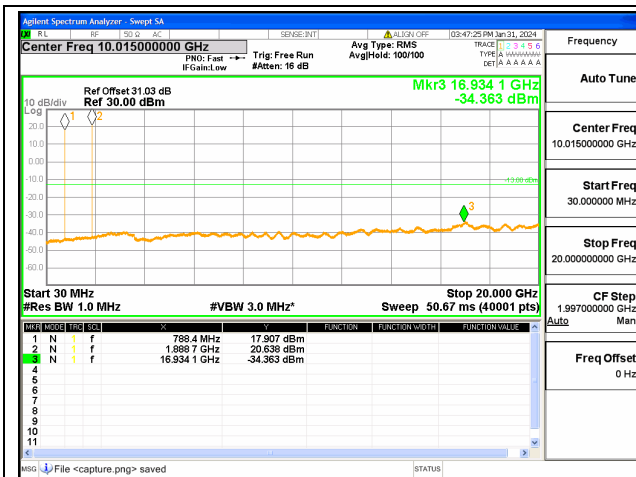
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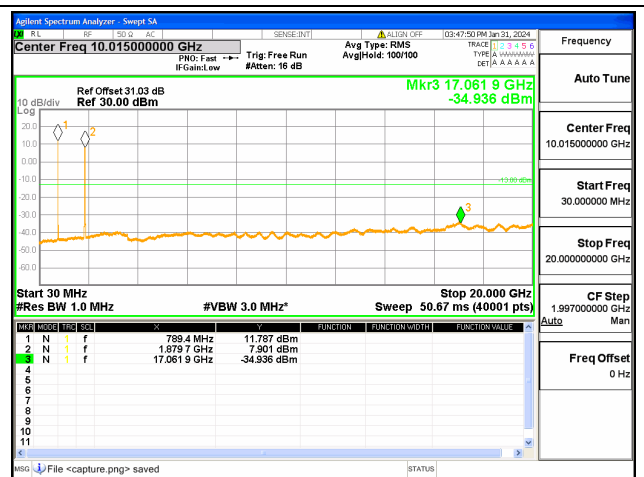
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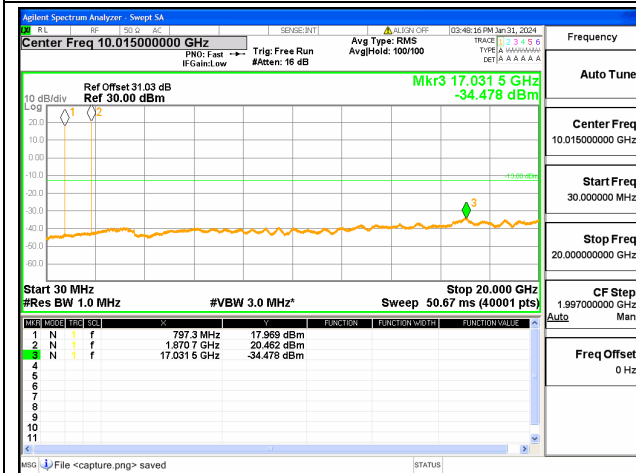
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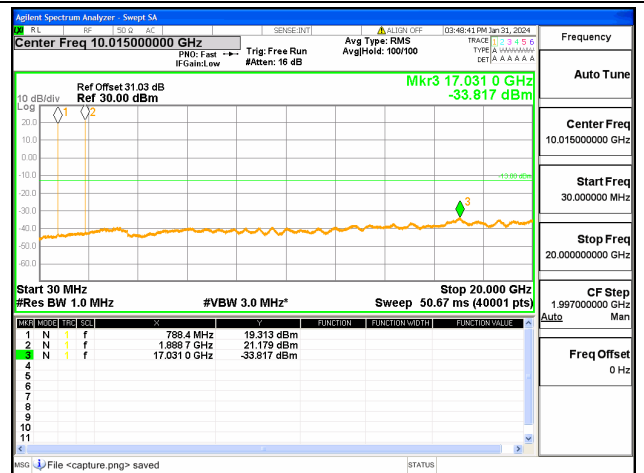
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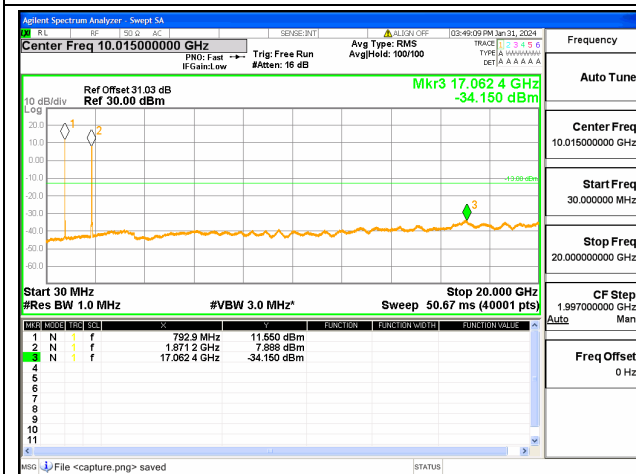
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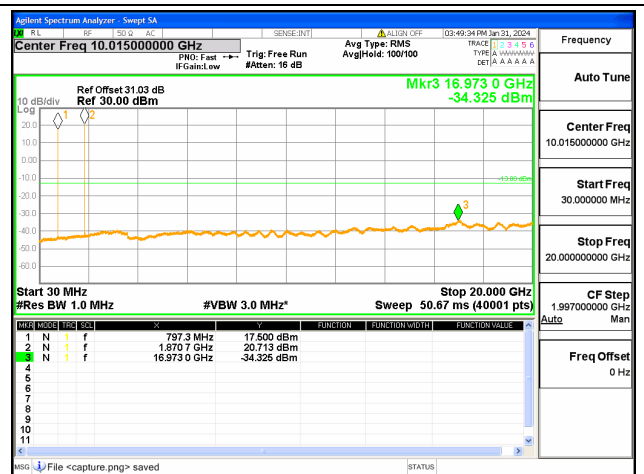
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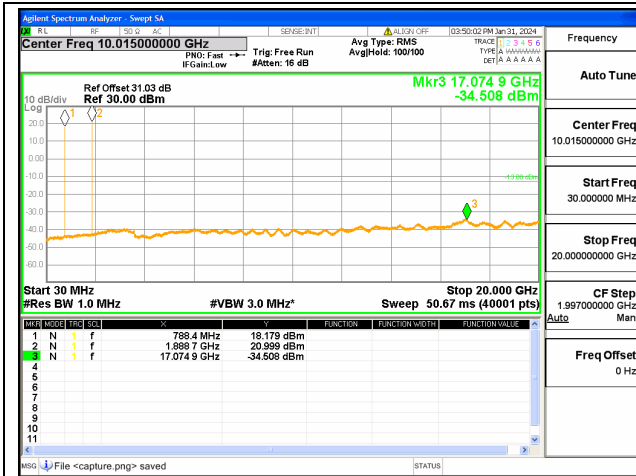
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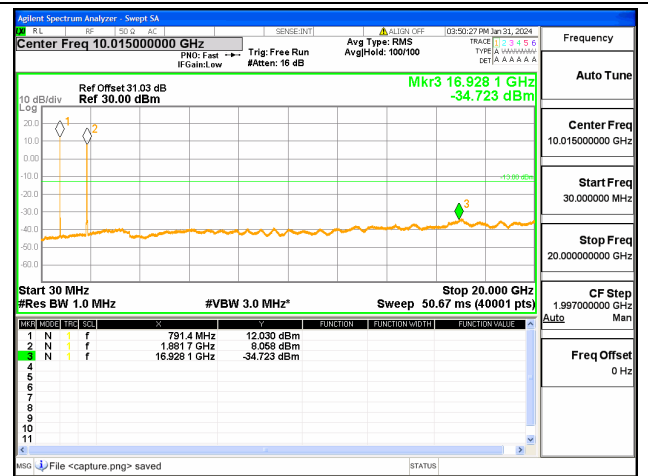
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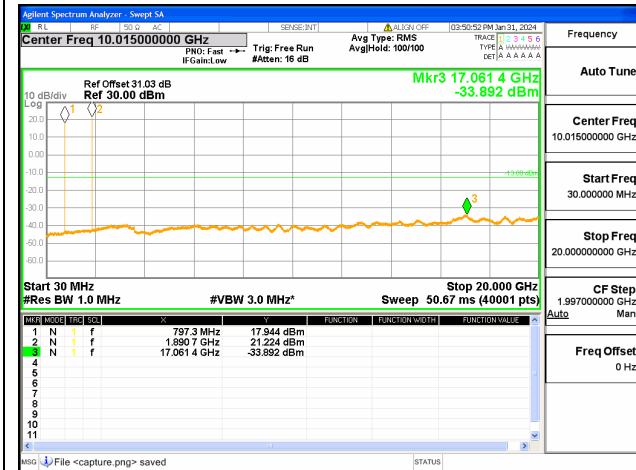
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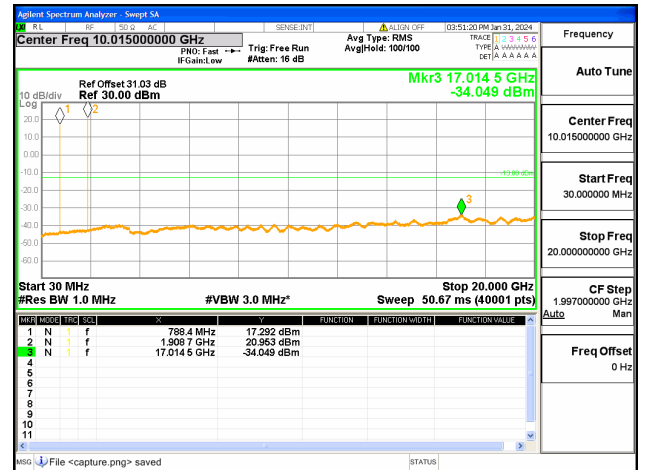
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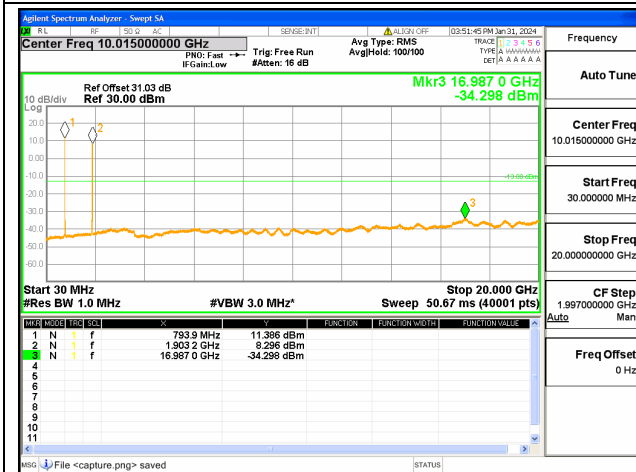
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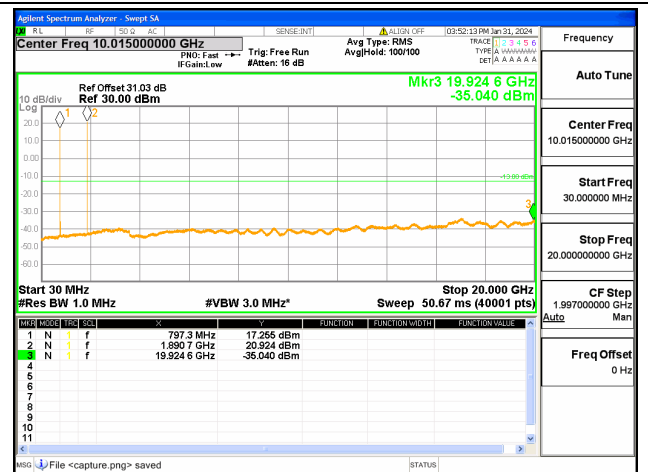
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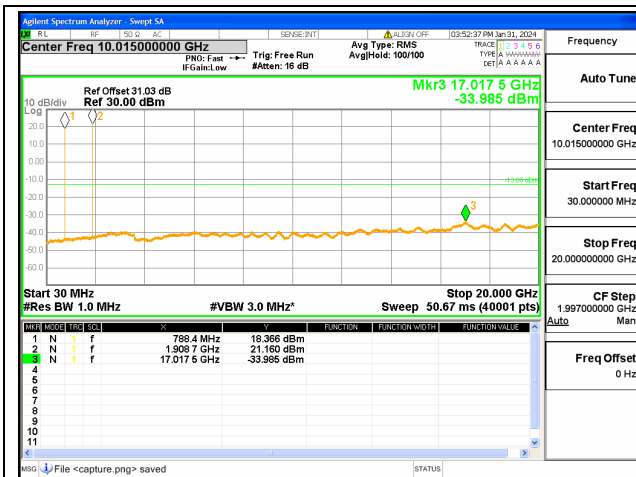
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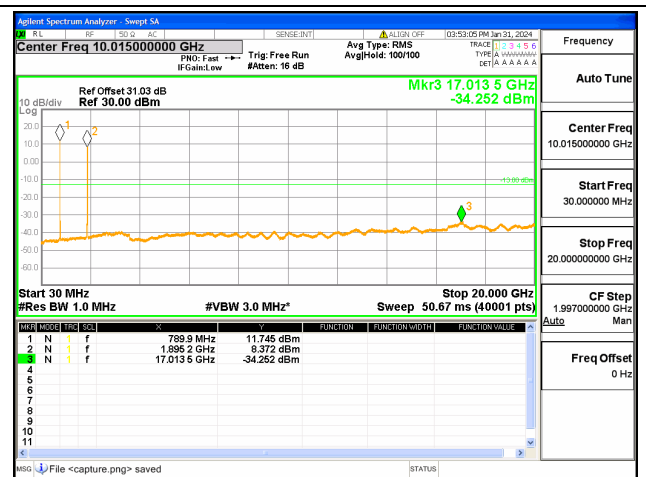
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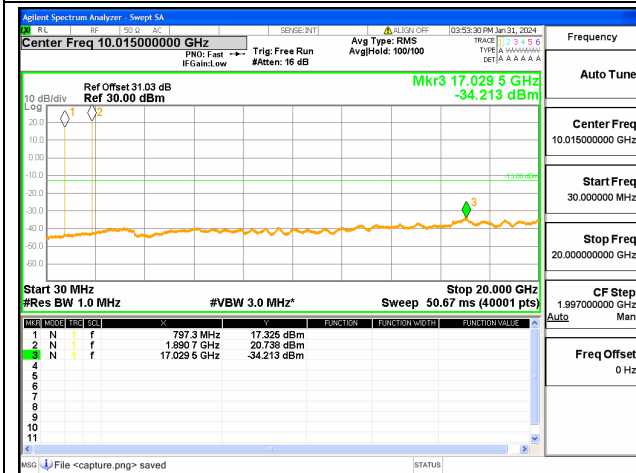
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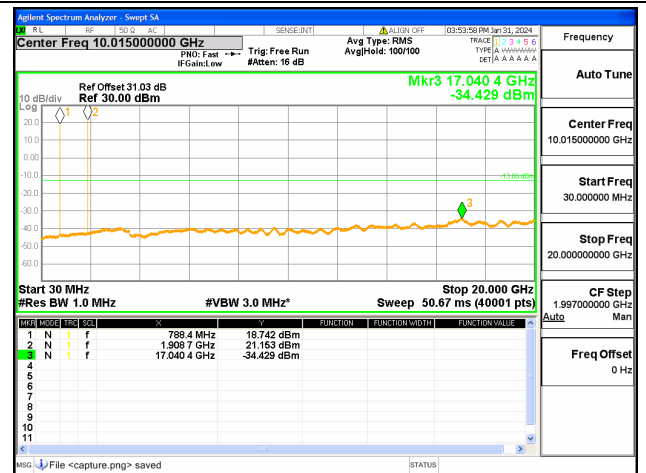
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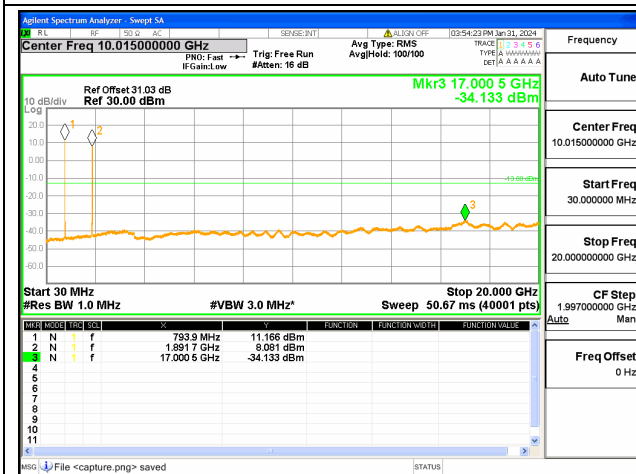
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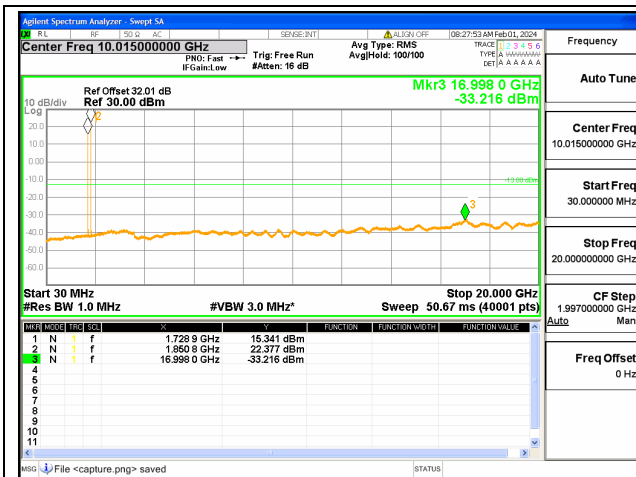
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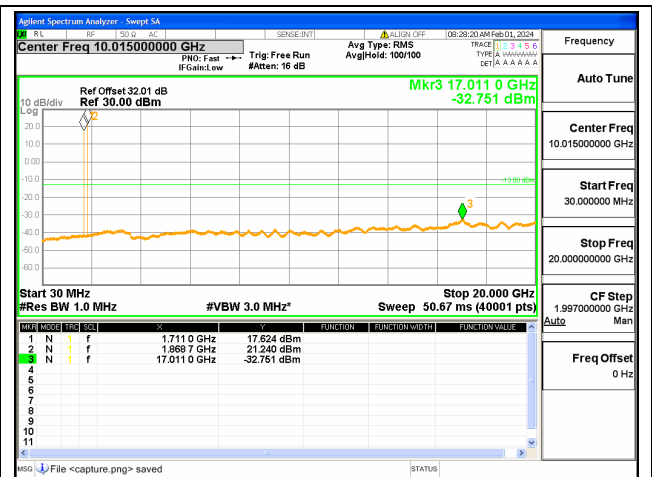
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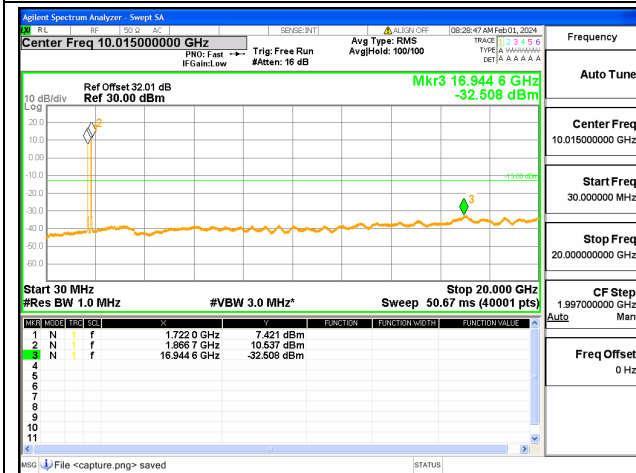
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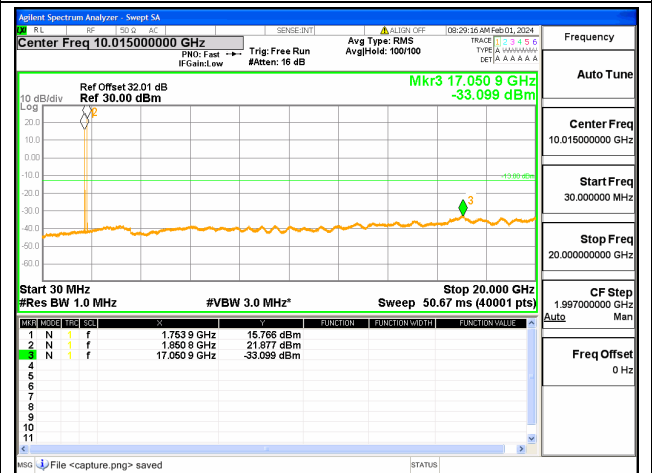
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1@0-1@99



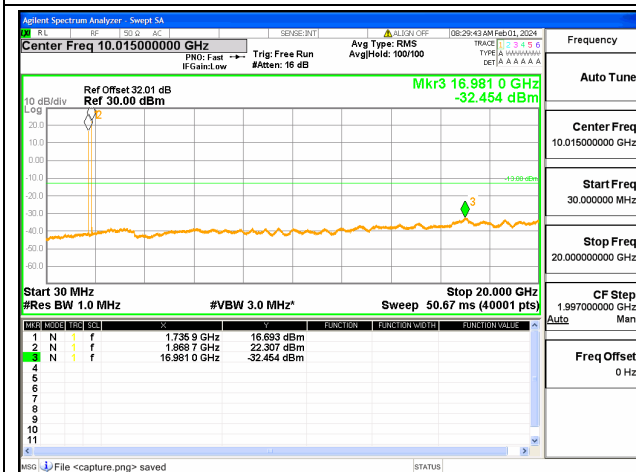
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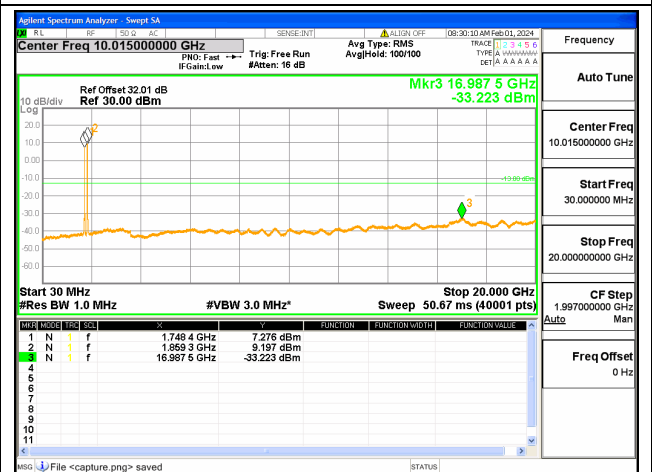
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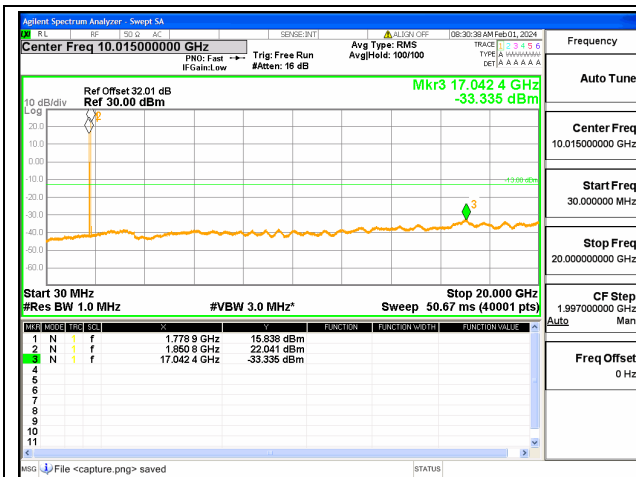
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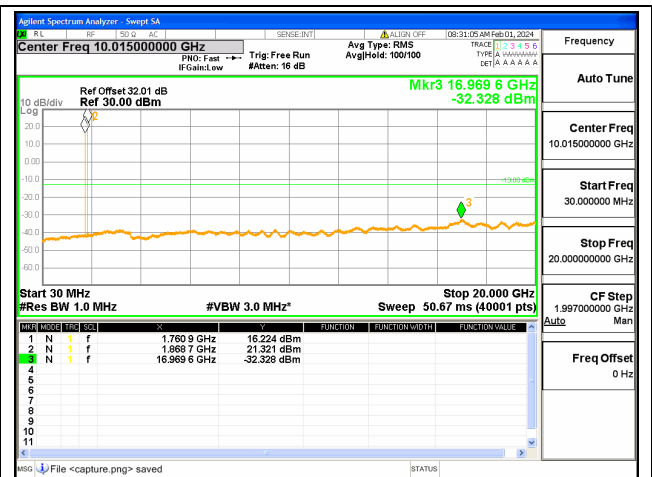
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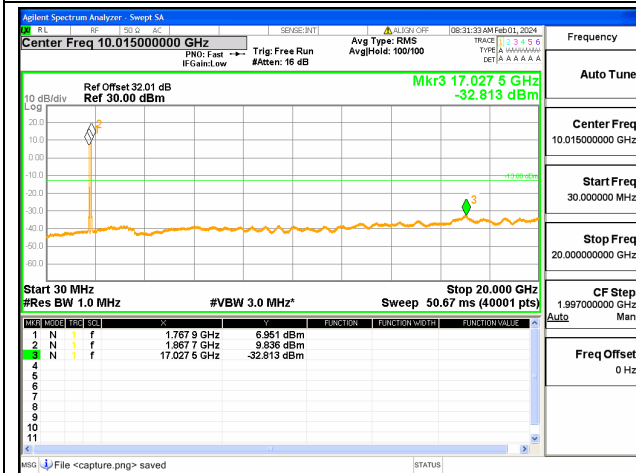
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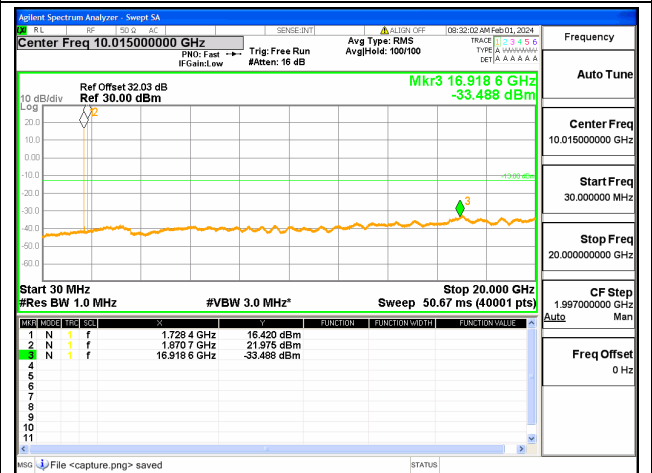
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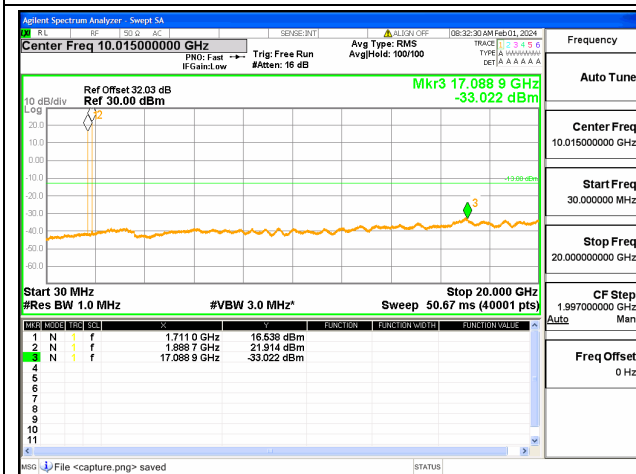
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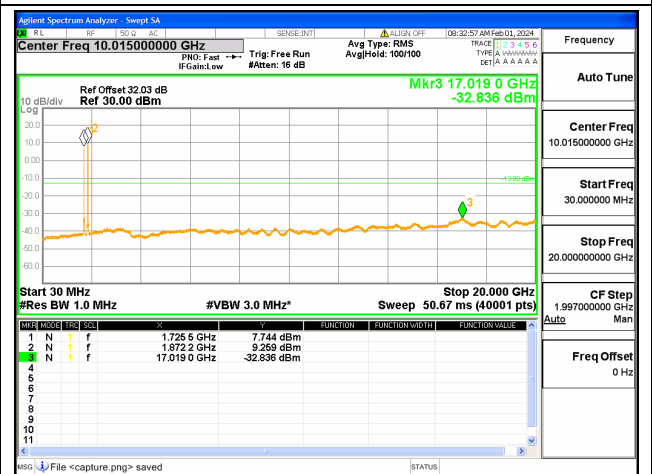
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2A-66A / 20+20MHz / QPSK / Mid+Low CH / 1@0-1@99

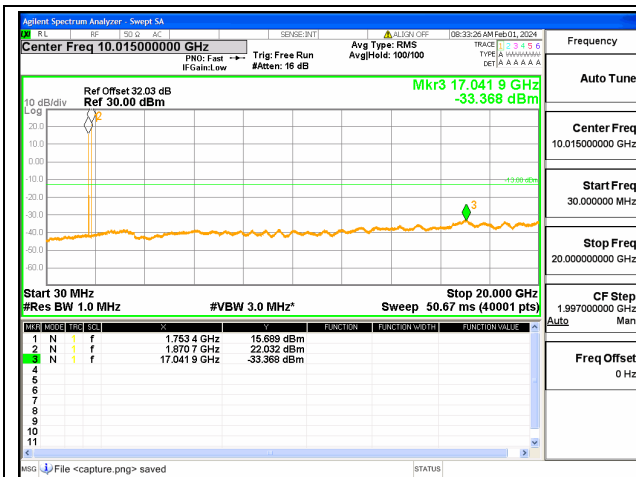


2A-66A / 20+20MHz / QPSK / Mid+Low CH / 1@99-1@0

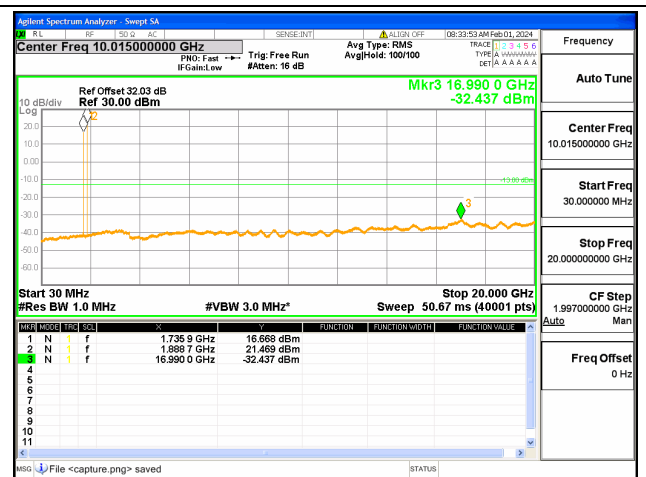


2A-66A / 20+20MHz / QPSK / Mid+Low CH / 100@0-100@0

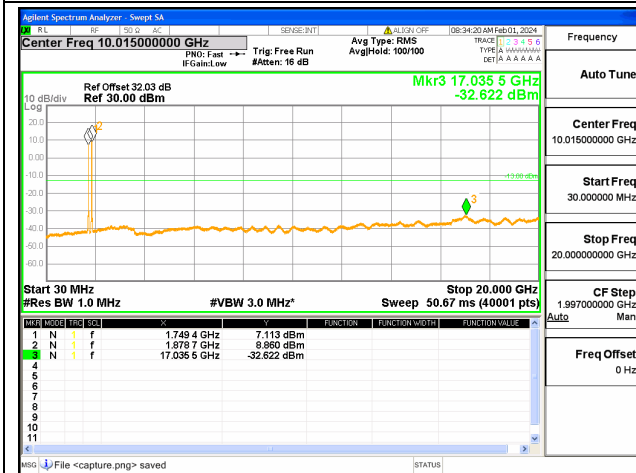




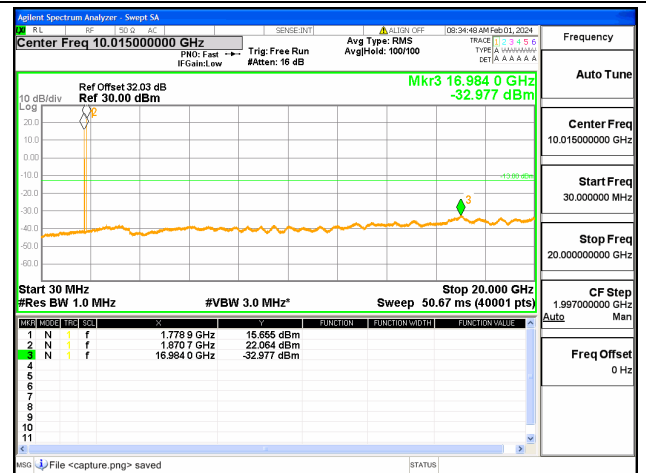
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1@0-1@99



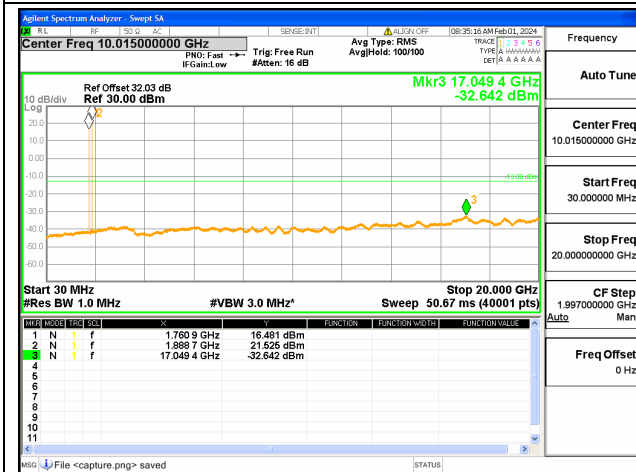
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1@99-1@0



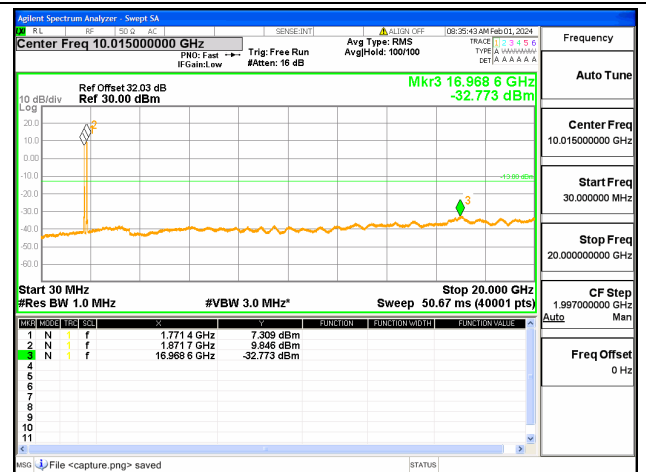
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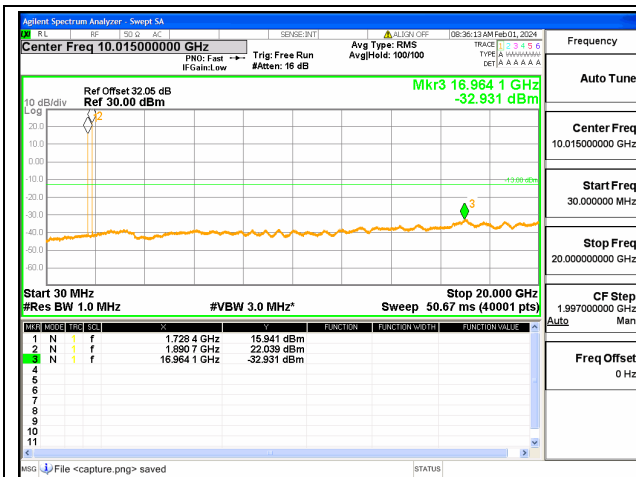
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1@0-1@99



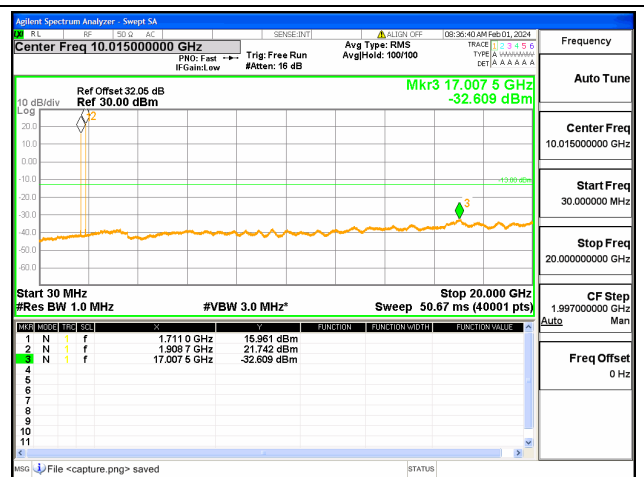
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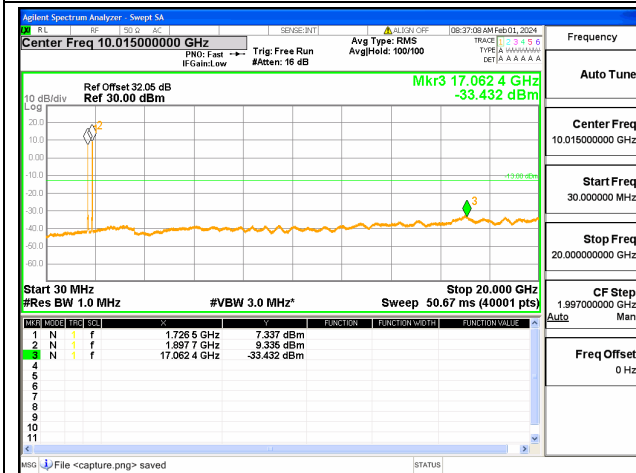
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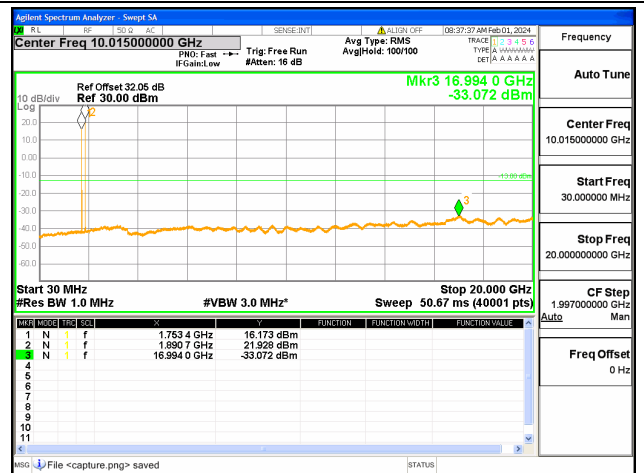
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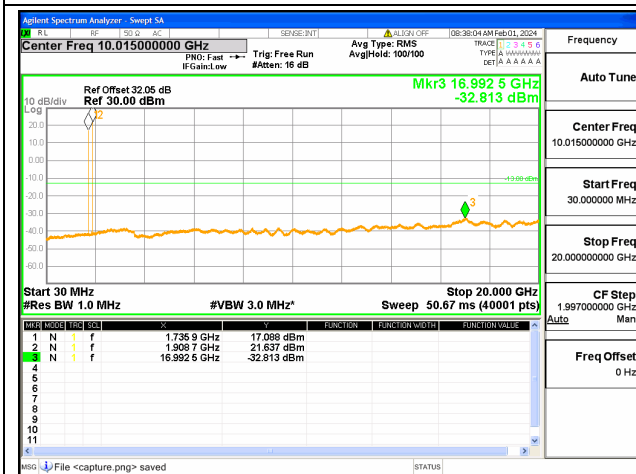
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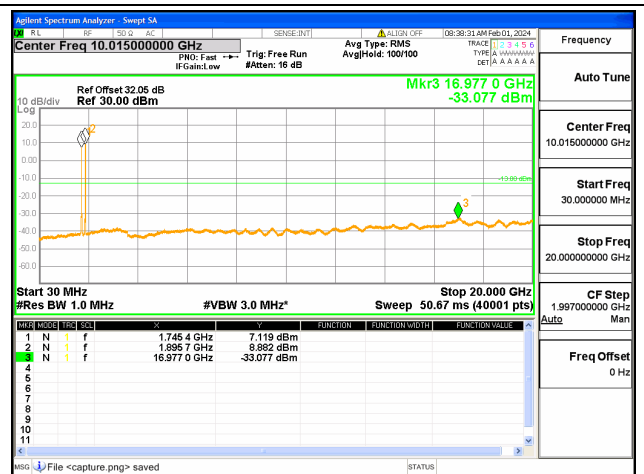
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2A-66A / 20+20MHz / QPSK / High+Mid CH / 1@0-1@99

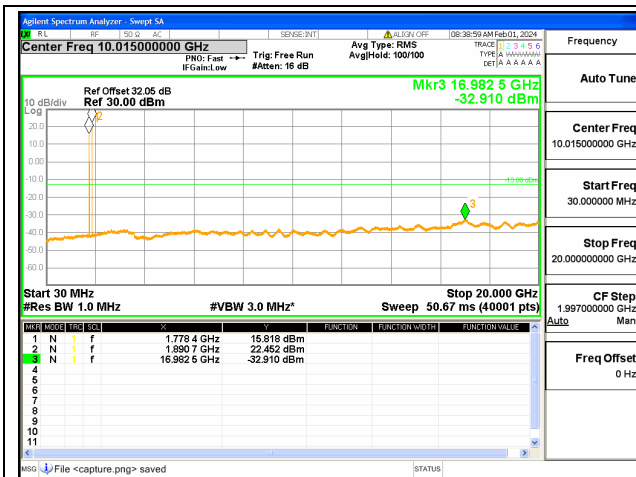


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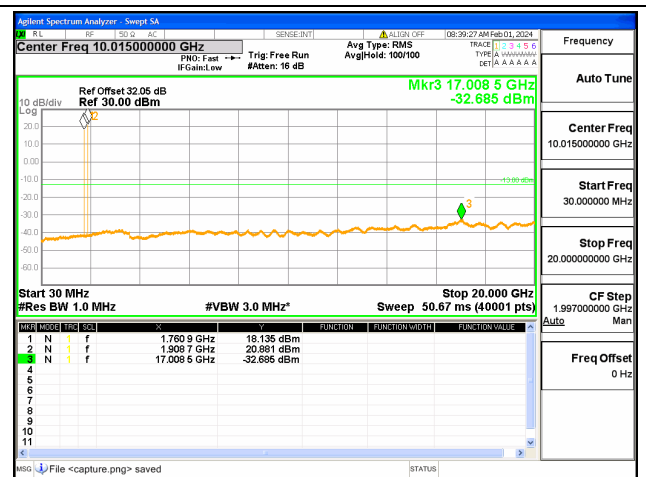


2A-66A / 20+20MHz / QPSK / High+Mid CH / 100@0-100@0

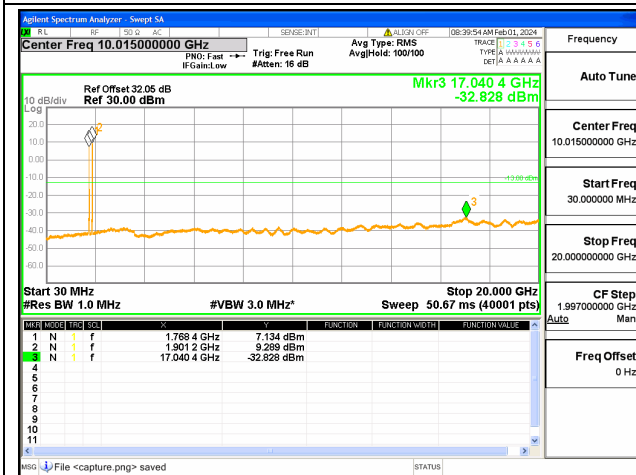




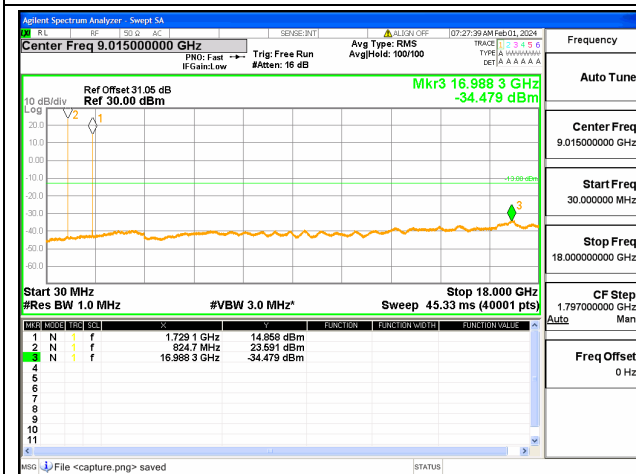
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1@0-1@99



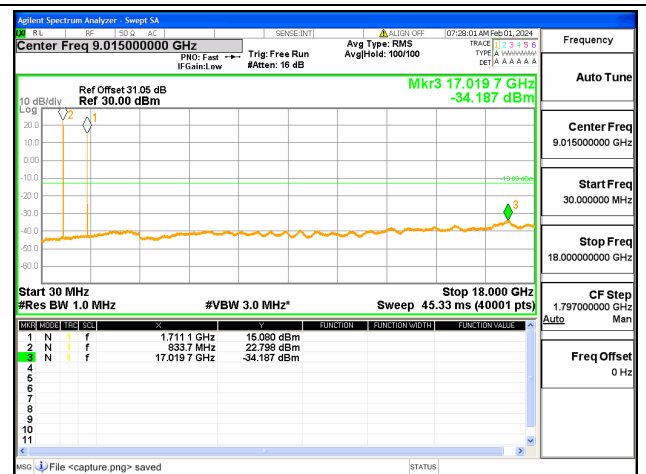
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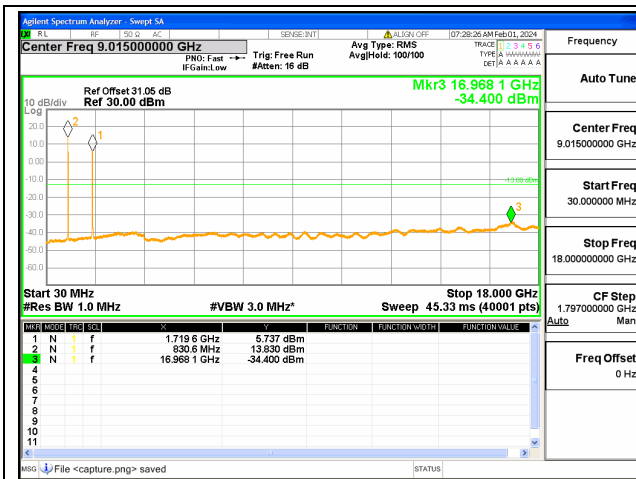
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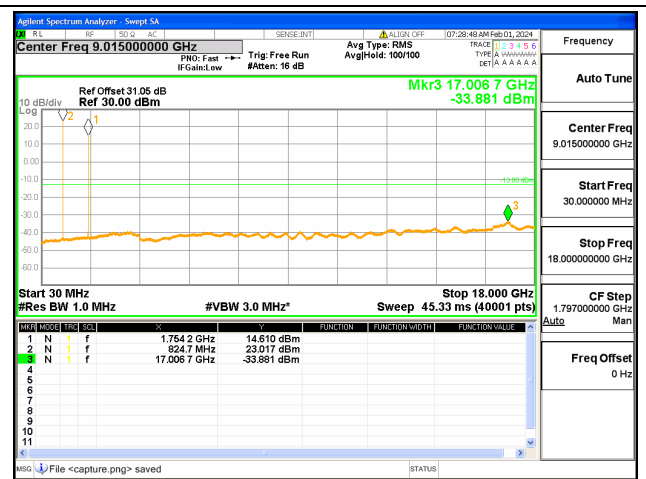
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1@0-1@99



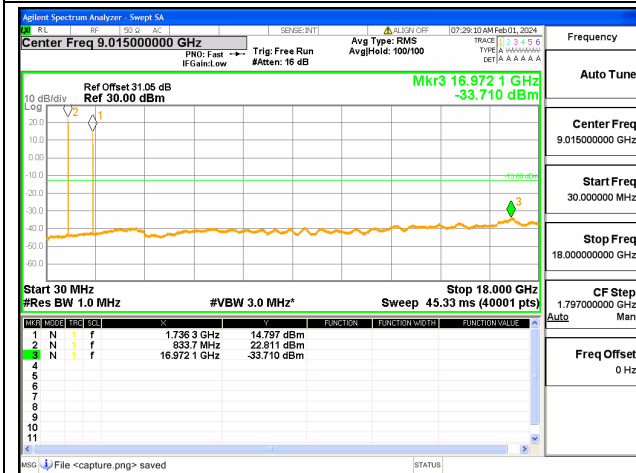
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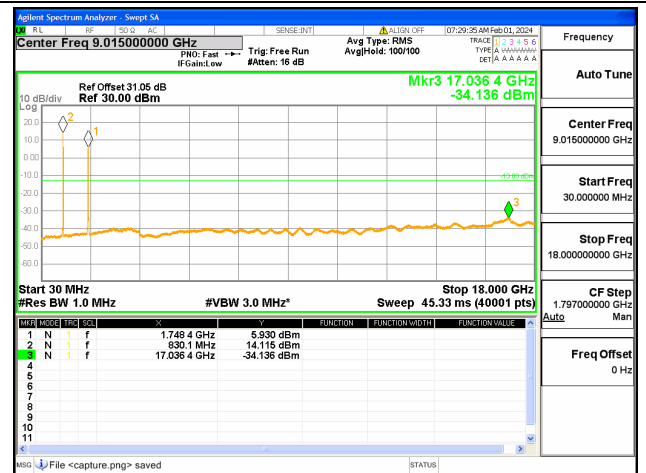
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50@0-100@0



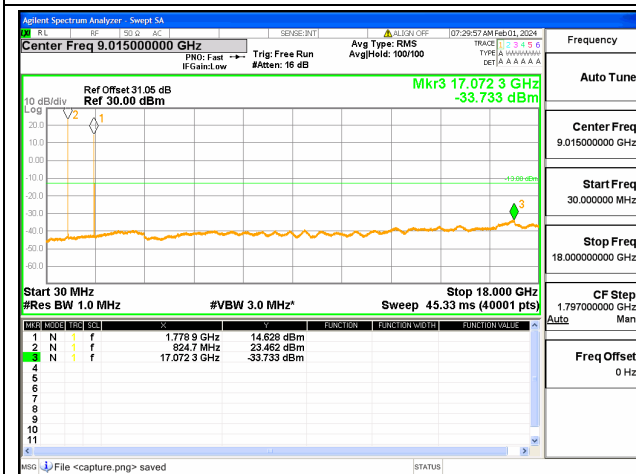
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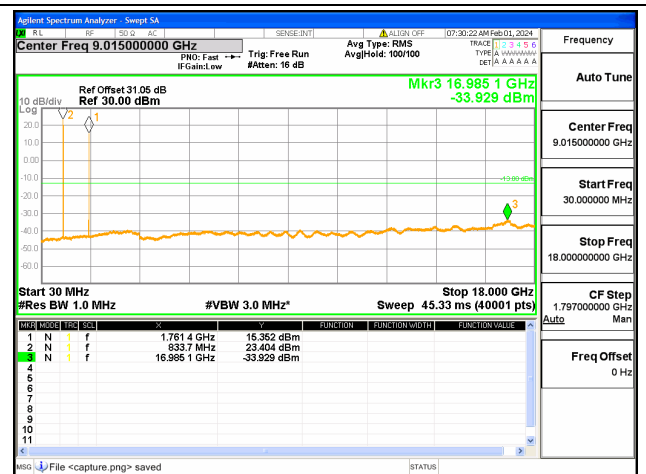
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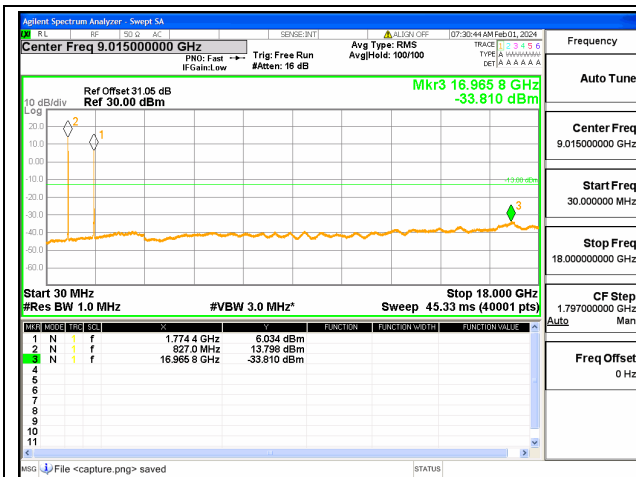
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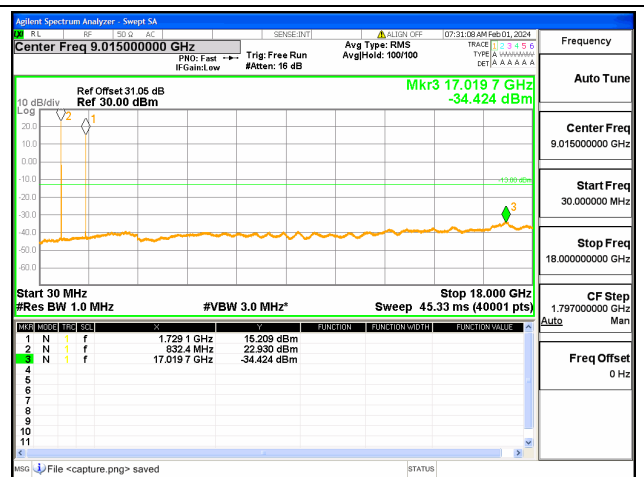
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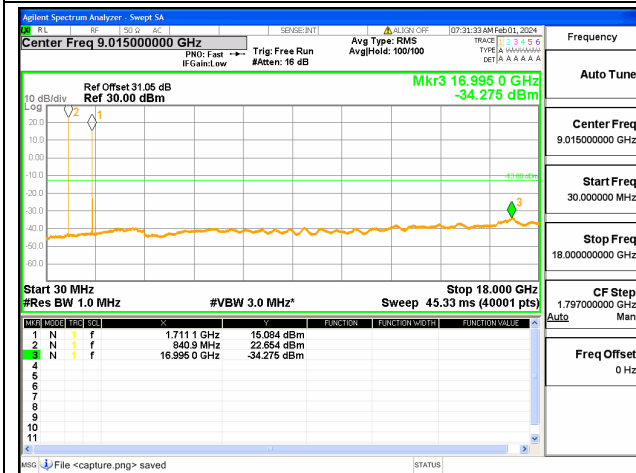
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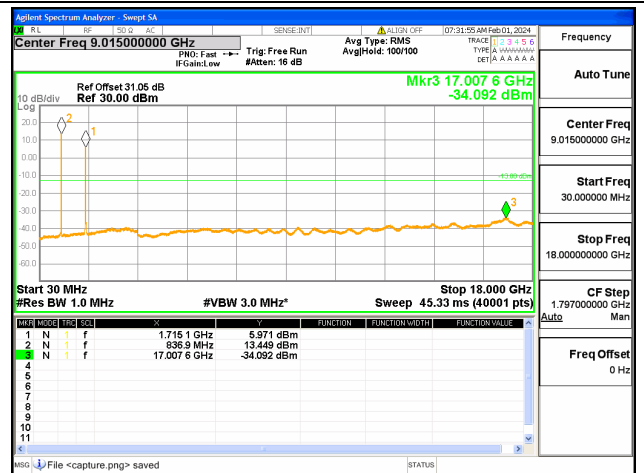
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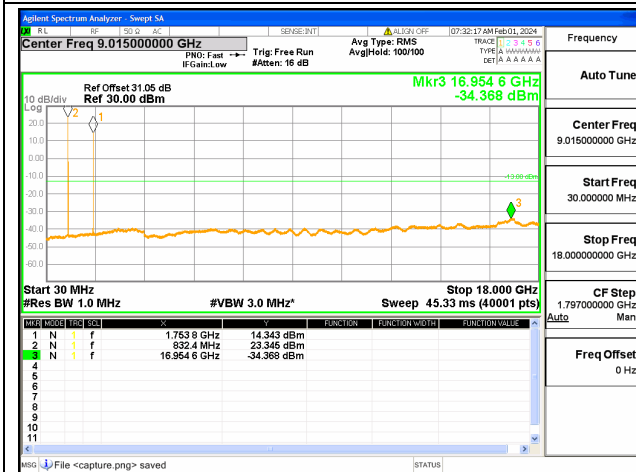
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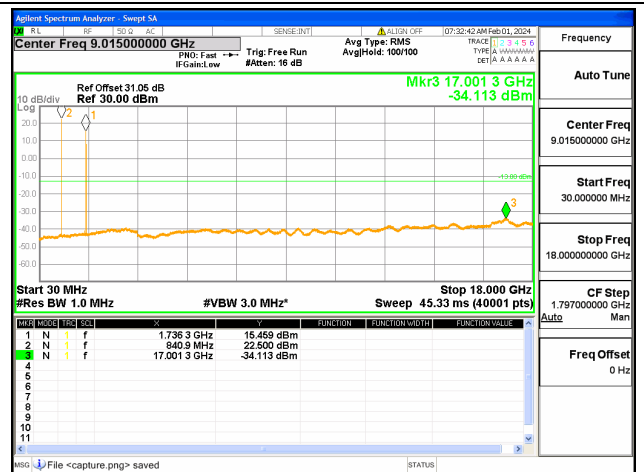
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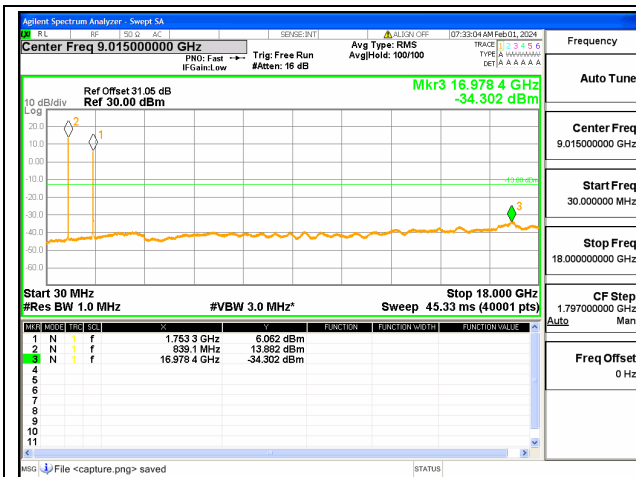
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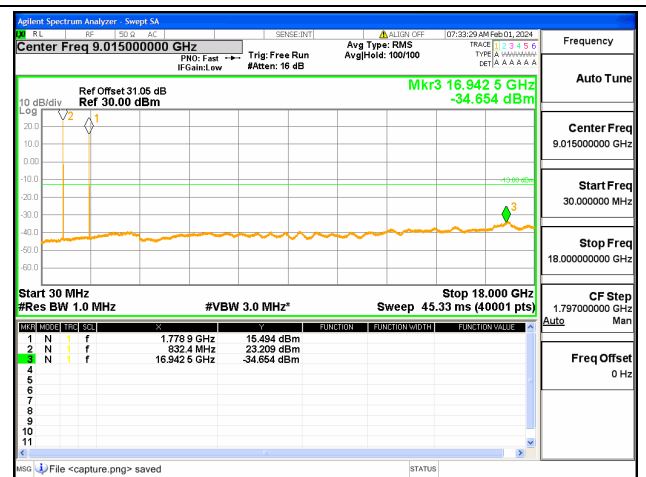
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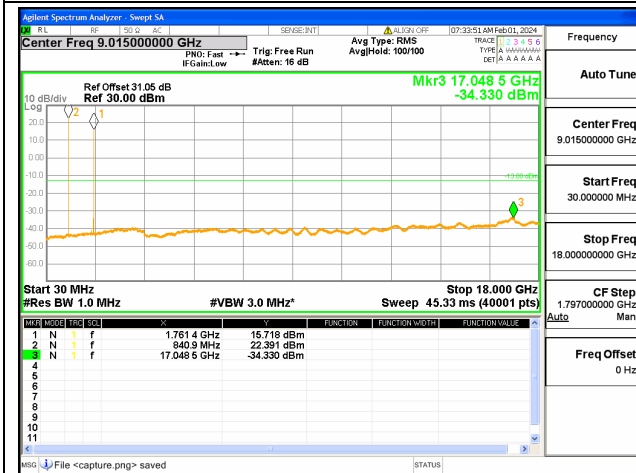
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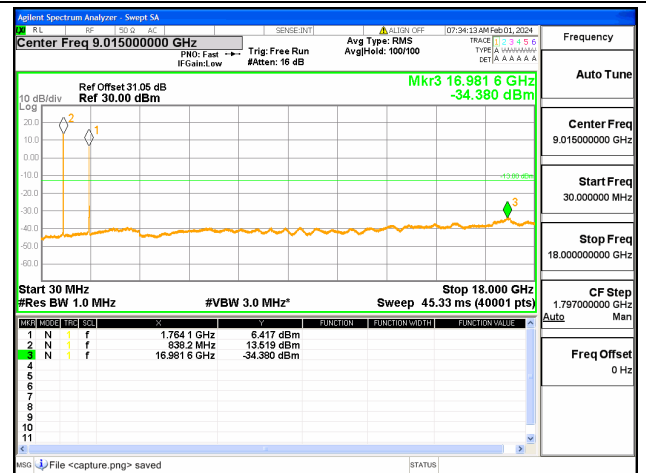
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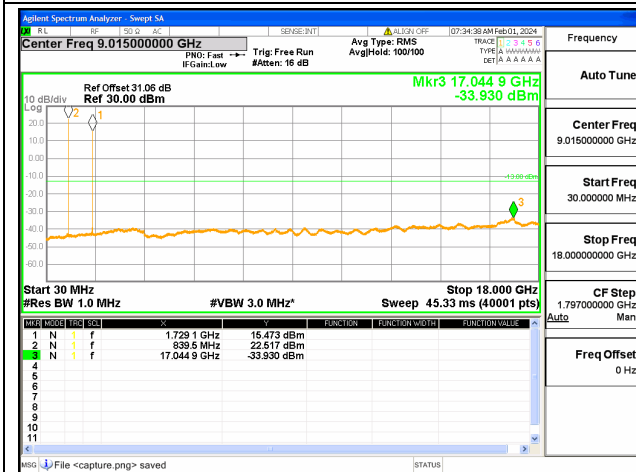
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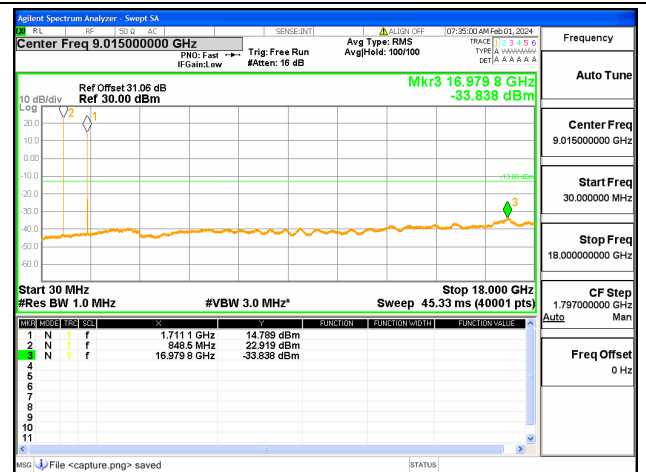
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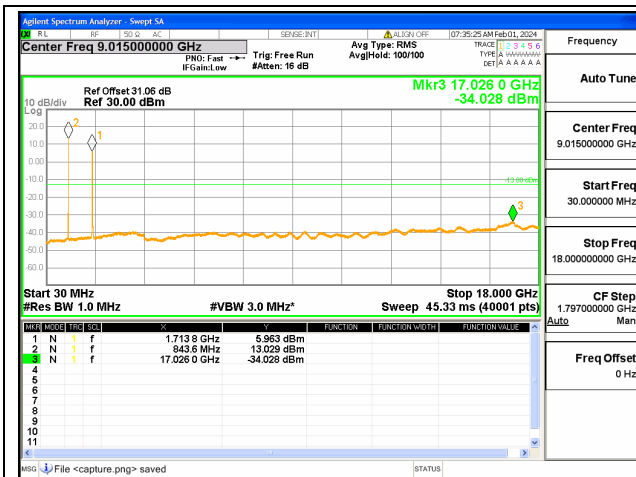
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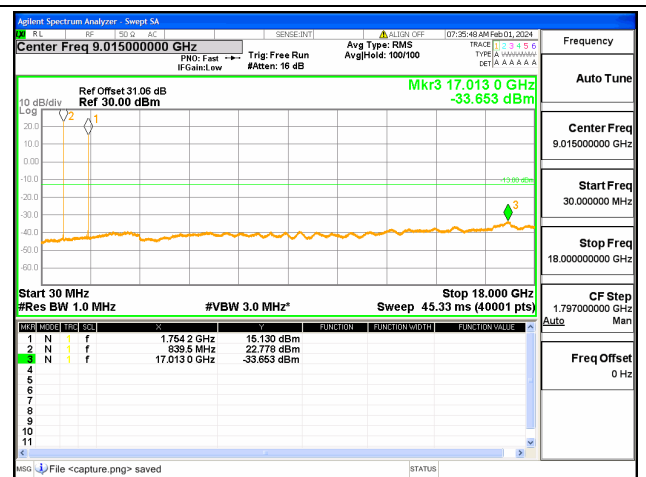
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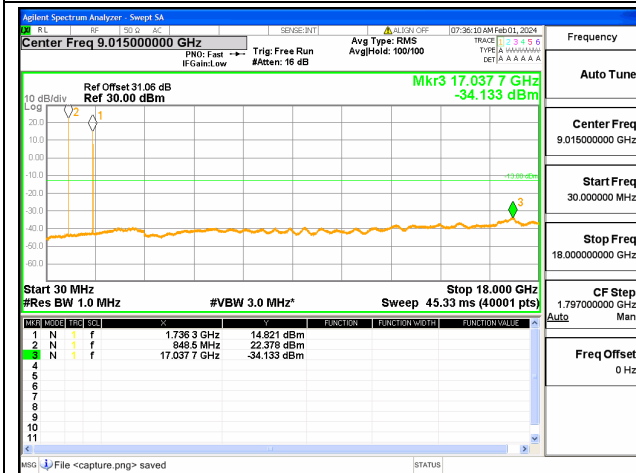
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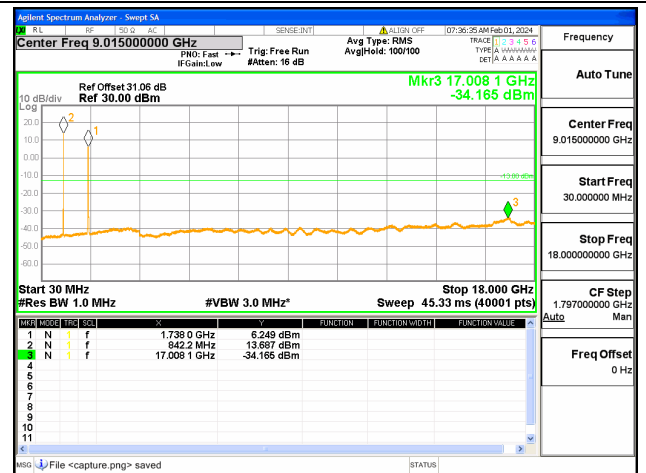
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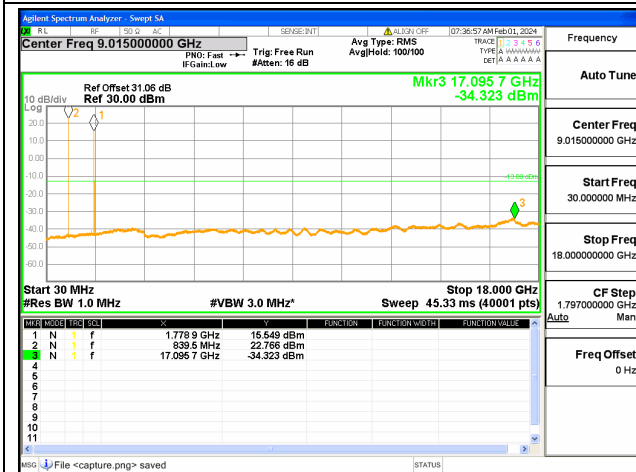
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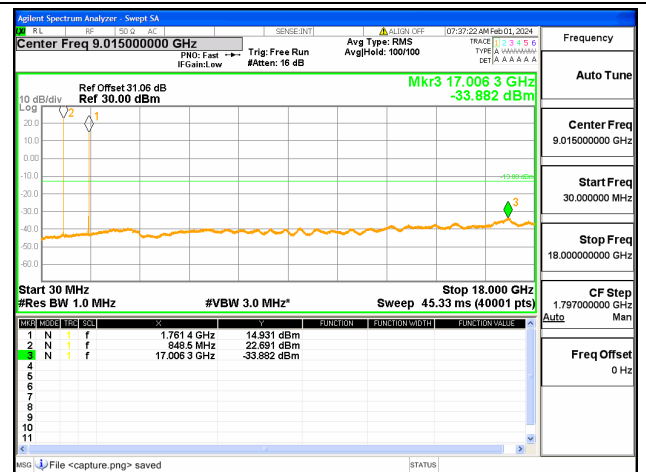
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5A-66A / 10+20MHz / QPSK / High+High CH / 1@0-1@99



5A-66A / 10+20MHz / QPSK / High+High CH / 1@49-1@0