

FCC Test Report

Report No.: AGC16840241206FR02

FCC ID : 2BCRN-BREAKX2D

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION : Smart Karaoke Machine

BRAND NAME : Ikarao

MODEL NAME : Break X2

APPLICANT : Dongguan Aika Electronic Technology Co., Ltd.

DATE OF ISSUE : Oct. 22, 2025

STANDARD(S) : FCC Part 15 Subpart C §15.247

REPORT VERSION : V1.0

Attestation Of Global Compliance (Shenzhen) Co., Ltd



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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 22, 2025	Valid	Initial Release

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1. General Information

Applicant	Dongguan Aika Electronic Technology Co., Ltd.
Address	Room 201, Building 2, No. 388, Bihu Road, Fenggang Town, Dongguan City, Guangdong Province, China
Manufacturer	Guangdong Taide Zhilian Technology Co., Ltd.
Address	No.388 Bihu Avenue, Fenggang Town, Dongguan City, Guangdong Province, China
Factory	Guangdong Taide Zhilian Technology Co., Ltd.
Address	No.388 Bihu Avenue, Fenggang Town, Dongguan City, Guangdong Province, China
Product Designation	Smart Karaoke Machine
Brand Name	Ikarao
Test Model	Break X2
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Sep. 06, 2025
Date of Test	Sep. 06, 2025~Oct. 22, 2025
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-SRD-2.4G-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By



CiCi Li
(Project Engineer)

Oct. 22, 2025

Reviewed By



Bibo Zhang
(Reviewer)

Oct. 22, 2025

Approved By



Angela Li
(Authorized Officer)

Oct. 22, 2025

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2. Product Information

2.1 Product Technical Description

Technology Type	Custom 2.4G
Frequency Band	2400MHz-2483.5MHz
Operation Frequency Range	2402MHz-2480MHz
Modulation Type	2.4G_SRD ☒ GFSK 1Mbps ☒ GFSK 2Mbps
Number of channels	40
Carrier Frequency of Each Channel	40 Channels
Channel Separation	2 MHz
Maximum Transmitter Power	ANT 4: 2.4G_SRD (1Mbps): 2.711dBm 2.4G_SRD (2Mbps): 2.701dBm ANT 5: 2.4G_SRD (1Mbps): 2.335dBm 2.4G_SRD (2Mbps): 2.368dBm
Hardware Version	V1.0
Software Version	V0.3.76
Antenna Designation	FPC Antenna
Antenna Gain	ANT 4: 2.82dBi ANT 5: 5.46dBi
Power Supply	DC 5V
Battery Information	DC 14.8V 4800mAh 71.04Wh

2.2 Test Frequency List

Frequency Band	Channel Number	Test Frequency
2400~2483.5MHz	0	2402 MHz
	1	2404 MHz
	:	:
	19	2440MHz
	:	:
	38	2478 MHz
	39	2480 MHz
Note: $f = 2402 + 2 \cdot k$ MHz, $k = 0, \dots, 39$ f is the operating frequency (MHz); k is the operating channel.		

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2.3 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: 2BCRN-BREAKX2D, filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

2.4 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2020	American National Standard for Testing Unlicensed Wireless Devices
4	KDB 558074 D01 15.247 Meas Guidance v05r02	Guidance for compliance measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum system, and Hybrid system devices operating under Section 15.247 of the FCC rules

2.5 Special Accessories

Not available for this EUT intended for grant.

2.6 Equipment Modifications

Not available for this EUT intended for grant.

2.7 Antenna Requirement

Standard Requirement
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi
EUT Antenna
The non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna 4 is 2.82dBi. The gain of the antenna 5 is 5.46dBi.

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3. Test Environment

3.1 Address of the Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

3.3 Environmental Conditions

	Normal Conditions
Temperature range (°C)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106
Power supply	DC 5V

3.4 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$
Uncertainty of total RF Power, Conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF Power Density, Conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of Spurious Emissions, Conducted	$U_c = \pm 2 \%$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$
Uncertainty of Dwell Time	$U_c = \pm 2 \%$

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3.5 List of Equipment Use

● RF Conducted Test System							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2025-05-08	2026-05-07
☐	AGC-ER-E062	Power Sensor	Agilent	U2021XA	MY54110007	2025-01-14	2026-01-13
☐	AGC-ER-E063	Power Sensor	Agilent	U2021XA	MY54110009	2025-01-14	2026-01-13
☒	AGC-ER-A007	6dB Fixed Attenuator	Mini circuits	BW-S6-2W263A+	N/A	2025-01-30	2026-01-29
☐	AGC-ER-E083	Signal Generator	Agilent	E4421B	US39340815	2025-05-21	2026-05-20
☒	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A

● Radiated Spurious Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2025-01-14	2026-01-13
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2025-05-08	2026-05-07
☒	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2025-03-14	2027-03-13
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2025-03-27	2026-03-26
☒	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2025-09-10	2027-09-09
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23
☒	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2025-05-16	2026-05-15
☒	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2025-05-16	2027-05-15
☒	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2025-05-16	2027-05-15

● AC Power Line Conducted Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2025-05-08	2026-05-07
☒	AGC-EM-A171	Attenuator	Mini-Circuits	UNAT-10A+	N/A	2024-02-01	2026-01-31
☒	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2025-05-08	2026-05-07

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● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71
☒	AGC-EM-S003	RE Test System	FARA	EZ-EMC	VRA-03A
☐	AGC-EM-S004	RE Test System	Tonscend	TS+Ver2.1(JS32-RE)	4.0.0.0
☒	AGC-ER-S012	BT/WIFI Test System	Tonscend	JS1120-2	2.6
☒	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0

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4. System Test Configuration

4.1 EUT Configuration

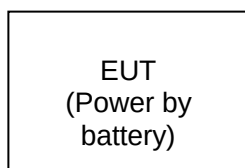
The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT Exercise

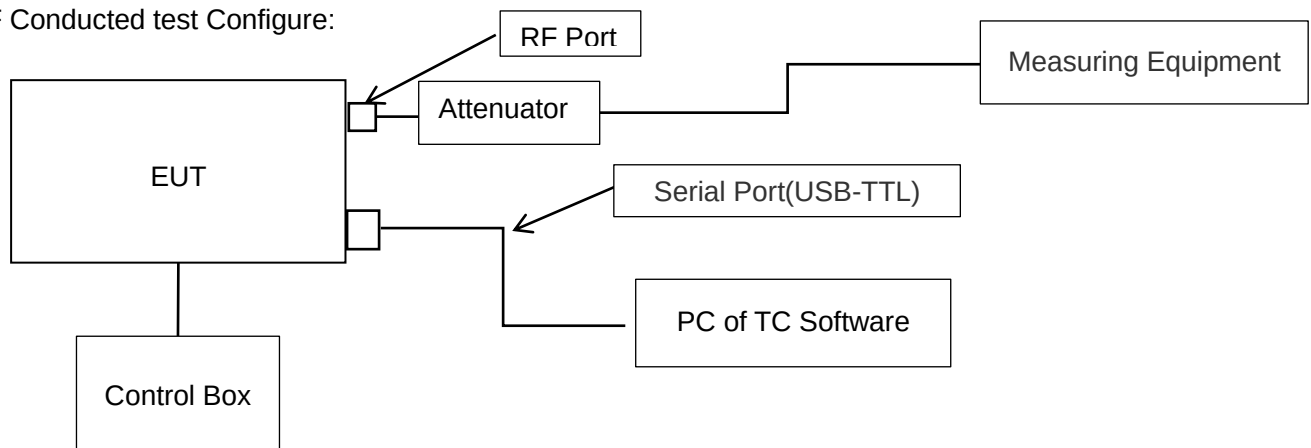
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

4.3 Configuration of Tested System

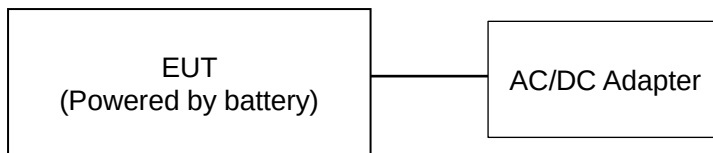
Radiated Emission Configure:



RF Conducted test Configure:



AC Power Line Conducted Emission Configure:



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4.4 Equipment Used In Tested System

The following peripheral devices and interface cables were connected during the measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	Control Box	RISYM	USB-TTL	--	--
2	Adapter	Apple	A2452	--	--
3	Redmi Notebook PC	Redmi	XMA2002-AB	--	--

☐ Test Accessories Come From The Manufacturer

No.	Equipment	Manufacturer	Model No.	Specification Information	Cable
1	--	--	--	--	--

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4.5 Summary of Test Results

Item	FCC Rules	Description of Test	Result
1	§15.203&15.247(b)(4)	Antenna Equipment	Pass
2	§15.247 (b)(3)	RF Output Power	Pass
3	§15.247 (a)(2)	6 dB Bandwidth	Pass
4	§15.247 (e)	Power Spectral Density	Pass
5	§15.247 (d)	Conducted Band Edge and Out-of-Band Emissions	Pass
6	§15.209	Radiated Emission& Band Edge	Pass
7	§15.207	AC Power Line Conducted Emission	Pass

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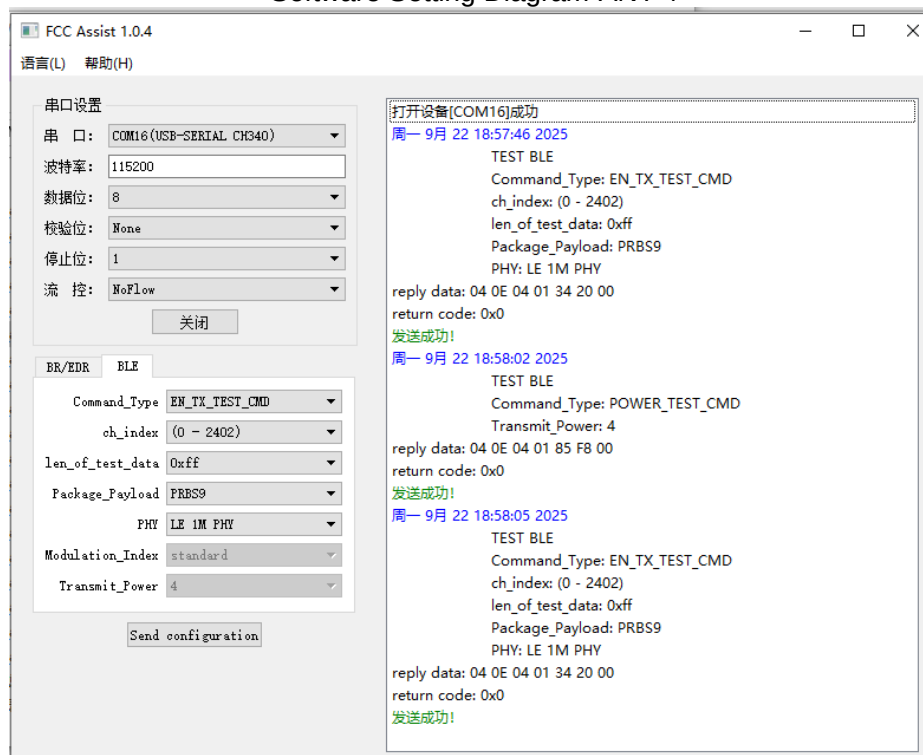
5. Description of Test Modes

Summary Table of Test Cases	
Test Item	Data Rate / Modulation
	2.4G_SRD(1Mbps/2Mbps)/GFSK
Radiated & Conducted Test Cases	Mode 1:2.4G_SRD Tx CH00_2402 MHz_1Mbps(Battery powered or AC/DC adapter)
	Mode 2:2.4G_SRD Tx CH19_2440 MHz_1Mbps(Battery powered or AC/DC adapter)
	Mode 3:2.4G_SRD Tx CH39_2480 MHz_1Mbps(Battery powered or AC/DC adapter)
	Mode 4:2.4G_SRD Tx CH00_2402 MHz_2Mbps(Battery powered or AC/DC adapter)
	Mode 5:2.4G_SRD Tx CH19_2440 MHz_2Mbps(Battery powered or AC/DC adapter)
	Mode 6 2.4G_SRD Tx CH39_2480 MHz_2Mbps(Battery powered or AC/DC adapter)
AC Conducted Emission	Mode 1: 2.4G_SRD Link + Battery + USB Cable (Charging from AC Adapter)

Note:

- Only the result of the worst case was recorded in the report, if no other cases.
- The battery is full-charged during the test.
- For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- For Conducted Test method, a temporary antenna connector is provided by the manufacture.
- The manufacturer of RF external cable claims that the cable loss is 0.8dB, and the cable loss and attenuator have been compensated into the Corrections Configuration of measuring equipment.
- Input correction factor includes external cable loss and attenuator amplitude compensation. The formula is:
Input compensation coefficient (dB) = Cable Loss (dB) + Attenuator attenuation value (dB)

Software Setting Diagram-ANT 4



The screenshot shows the FCC Assist 1.0.4 software interface. On the left, the '串口设置' (Serial Port Settings) panel is visible, showing the following configuration:

- 串 口: COM16(USB-SERIAL CH340)
- 波特率: 115200
- 数据位: 8
- 校验位: None
- 停止位: 1
- 流 控: NoFlow

Below the settings, there are tabs for 'BR/EDR' and 'BLE'. The 'BLE' tab is selected, showing the following configuration:

- Command_Type: EN_TX_TEST_CMD
- ch_index: (0 - 2402)
- len_of_test_data: 0xff
- Package_Payload: PRBS9
- PHY: LE 1M PHY
- Modulation_Index: standard
- Transmit_Power: 4

A 'Send configuration' button is located at the bottom of the BLE settings. On the right, a log window titled '打开设备(COM16)成功' (Open device (COM16) success) displays the following test results:

```

周一 9月 22 18:57:46 2025
TEST BLE
Command_Type: EN_TX_TEST_CMD
ch_index: (0 - 2402)
len_of_test_data: 0xff
Package_Payload: PRBS9
PHY: LE 1M PHY
reply data: 04 0E 04 01 34 20 00
return code: 0x0
发送成功!

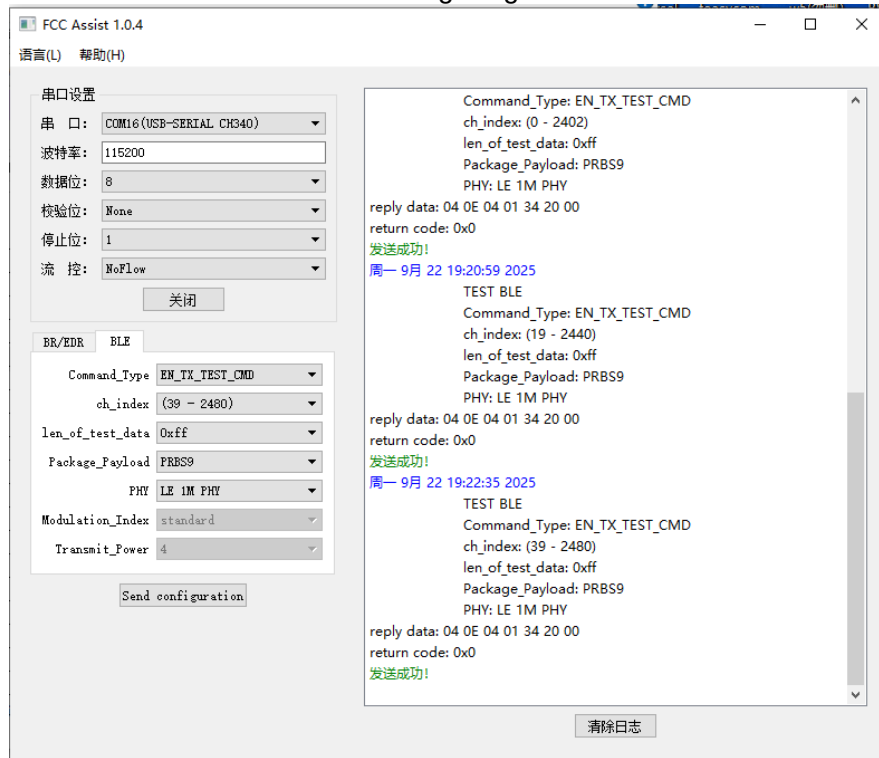
周一 9月 22 18:58:02 2025
TEST BLE
Command_Type: POWER_TEST_CMD
Transmit_Power: 4
reply data: 04 0E 04 01 85 F8 00
return code: 0x0
发送成功!

周一 9月 22 18:58:05 2025
TEST BLE
Command_Type: EN_TX_TEST_CMD
ch_index: (0 - 2402)
len_of_test_data: 0xff
Package_Payload: PRBS9
PHY: LE 1M PHY
reply data: 04 0E 04 01 34 20 00
return code: 0x0
发送成功!

```

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Software Setting Diagram-ANT 5



FCC Assist 1.0.4

语言(L) 帮助(H)

串口设置

串 口: COM16 (USB-SERIAL CH340)

波特率: 115200

数据位: 8

校验位: None

停止位: 1

流 控: NoFlow

关闭

BR/EDR BLE

Command_Type: EN_TX_TEST_CMD

ch_index: (39 - 2480)

len_of_test_data: 0xff

Package_Payload: PRBS9

PHY: LE 1M PHY

Modulation_Index: standard

Transmit_Power: 4

Send configuration

Command_Type: EN_TX_TEST_CMD
ch_index: (0 - 2402)
len_of_test_data: 0xff
Package_Payload: PRBS9
PHY: LE 1M PHY
reply data: 04 0E 04 01 34 20 00
return code: 0x0
发送成功!
周一 9月 22 19:20:59 2025

TEST BLE
Command_Type: EN_TX_TEST_CMD
ch_index: (19 - 2440)
len_of_test_data: 0xff
Package_Payload: PRBS9
PHY: LE 1M PHY
reply data: 04 0E 04 01 34 20 00
return code: 0x0
发送成功!
周一 9月 22 19:22:35 2025

TEST BLE
Command_Type: EN_TX_TEST_CMD
ch_index: (39 - 2480)
len_of_test_data: 0xff
Package_Payload: PRBS9
PHY: LE 1M PHY
reply data: 04 0E 04 01 34 20 00
return code: 0x0
发送成功!

清除日志

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6. Duty Cycle Measurement

The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Peak. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

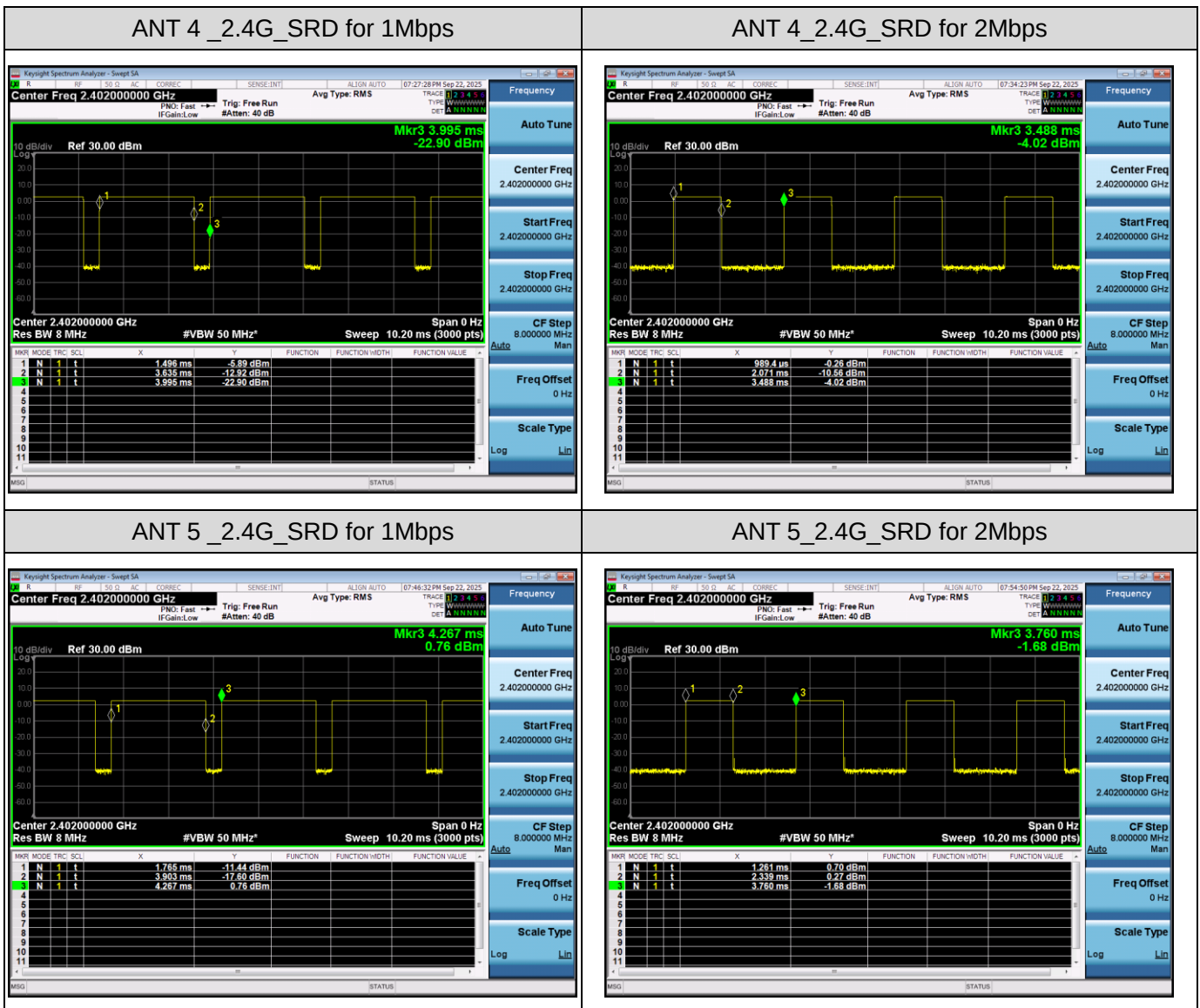
Operating mode	T(μs)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/ T Minimum VBW (kHz)
ANT 4_2.4G_SRD_1Mbps	2139	85.59	0.68	0.47
ANT 4_2.4G_SRD_2Mbps	1081.6	43.29	3.64	0.92
ANT 5_2.4G_SRD_1Mbps	2138	85.45	0.68	0.47
ANT 5_2.4G_SRD_2Mbps	1078	43.14	3.65	0.93

Remark:

1. Duty Cycle factor = $10 * \log (1/ \text{Duty cycle})$
2. The duty cycle of each frequency band mode reflects the determination requirements of the low channel measurement value

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- The test plots as follows:



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7. RF Output Power Measurement

7.1 Provisions Applicable

For DTSs employing digital modulation techniques operating in the bands 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W.

7.2 Measurement Procedure

☒ For Peak Power, the testing follows ANSI C63.10 Section 11.9.1.1 Method Max peak power:

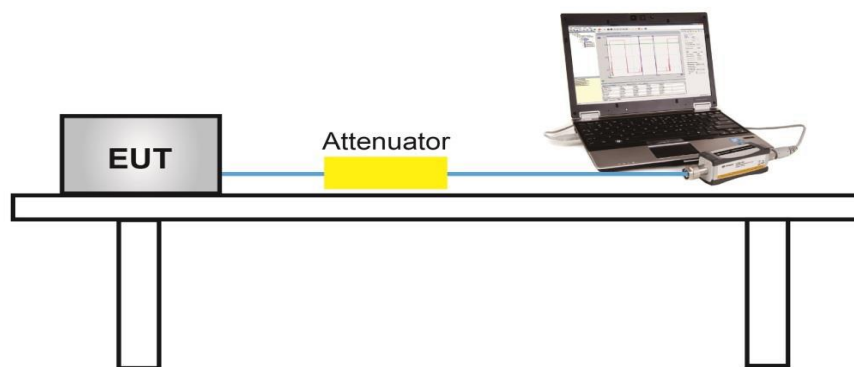
1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the RBW $\geq$ DTS bandwidth
3. Set the VBW $\geq$ $[3 \times \text{RBW}]$.
4. Span $\geq$ $[3 \times \text{RBW}]$.
5. Sweep= auto couple.
6. Detector Function= Peak.
7. Trace mode= Max hold.
8. Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

☐ For Average power, the testing follows ANSI C63.10 Section 11.9.2.3.2 Method AVGPM-G:

1. The RF output of EUT was connected to the power meter by RF cable and attenuator.
2. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

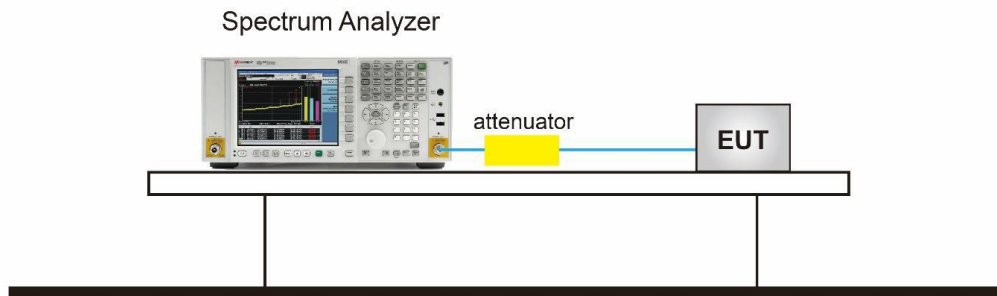
7.3 Measurement Setup (Block Diagram of Configuration)

☐ For Average power test setup



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☒ For peak power test setup



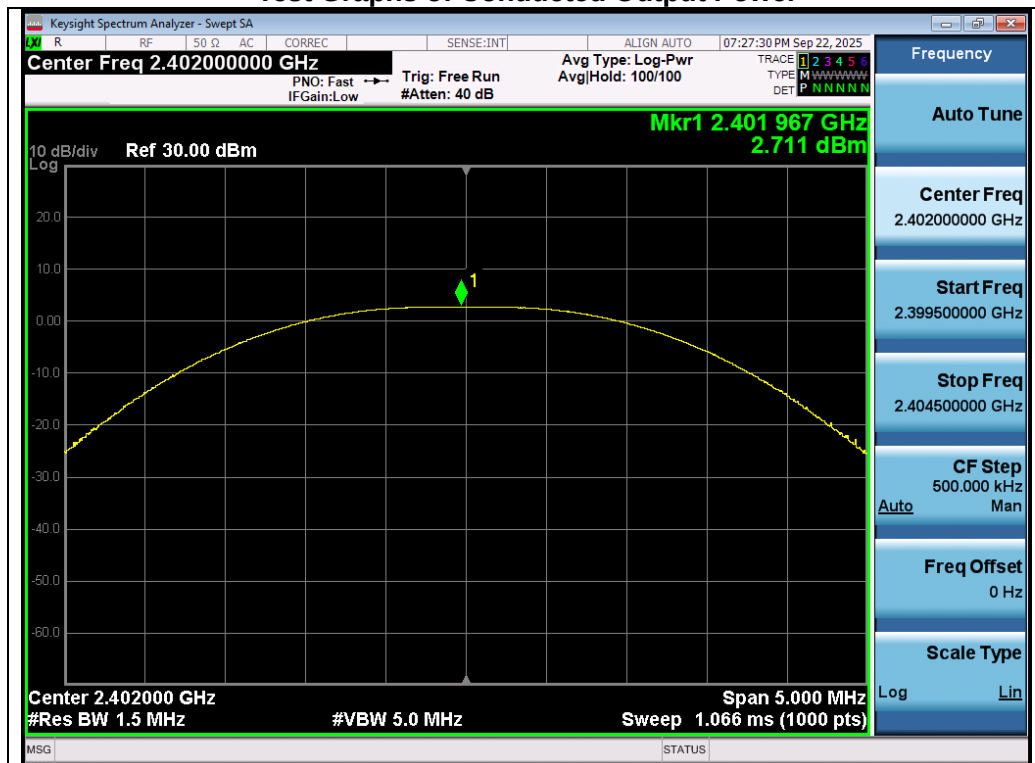
7.4 Measurement Result

Test Data of Conducted Output Power-ANT 4				
Test Mode	Test Frequency (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail
2.4G_SRD_1Mbps	2402	2.711	≤ 30	Pass
	2440	2.512	≤ 30	Pass
	2480	2.083	≤ 30	Pass
2.4G_SRD_2Mbps	2402	2.701	≤ 30	Pass
	2440	2.537	≤ 30	Pass
	2480	2.136	≤ 30	Pass

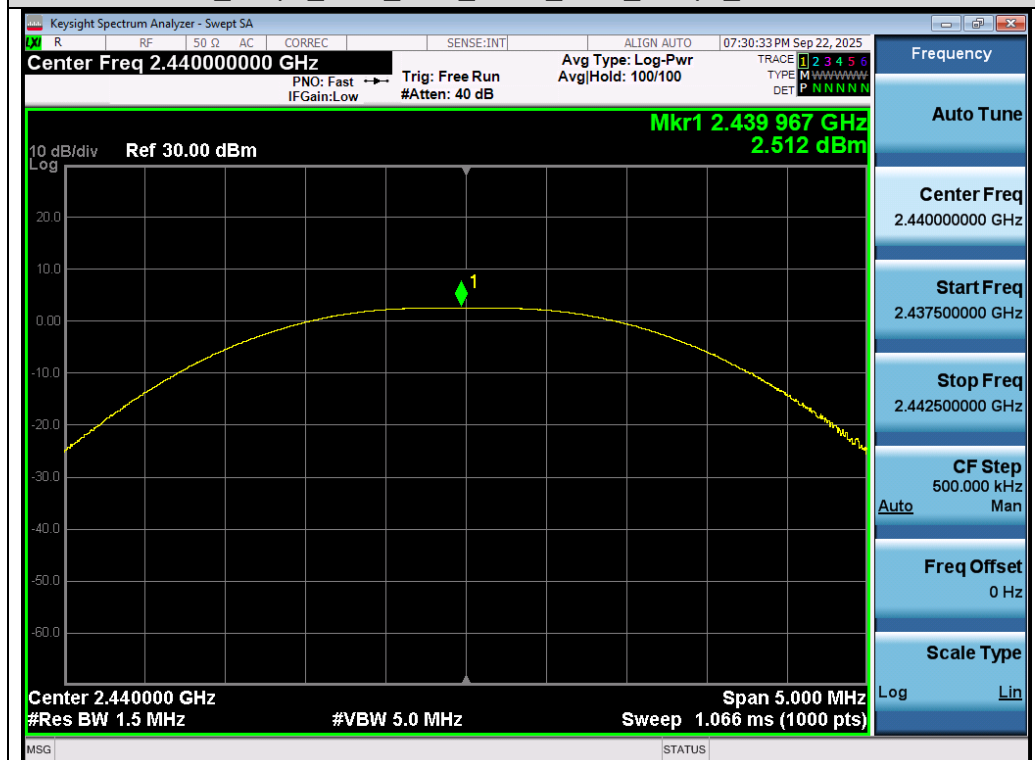
Test Data of Conducted Output Power-ANT 5				
Test Mode	Test Frequency (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail
2.4G_SRD_1Mbps	2402	2.316	≤ 30	Pass
	2440	2.335	≤ 30	Pass
	2480	2.132	≤ 30	Pass
2.4G_SRD_2Mbps	2402	2.324	≤ 30	Pass
	2440	2.368	≤ 30	Pass
	2480	2.187	≤ 30	Pass

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Test Graphs of Conducted Output Power

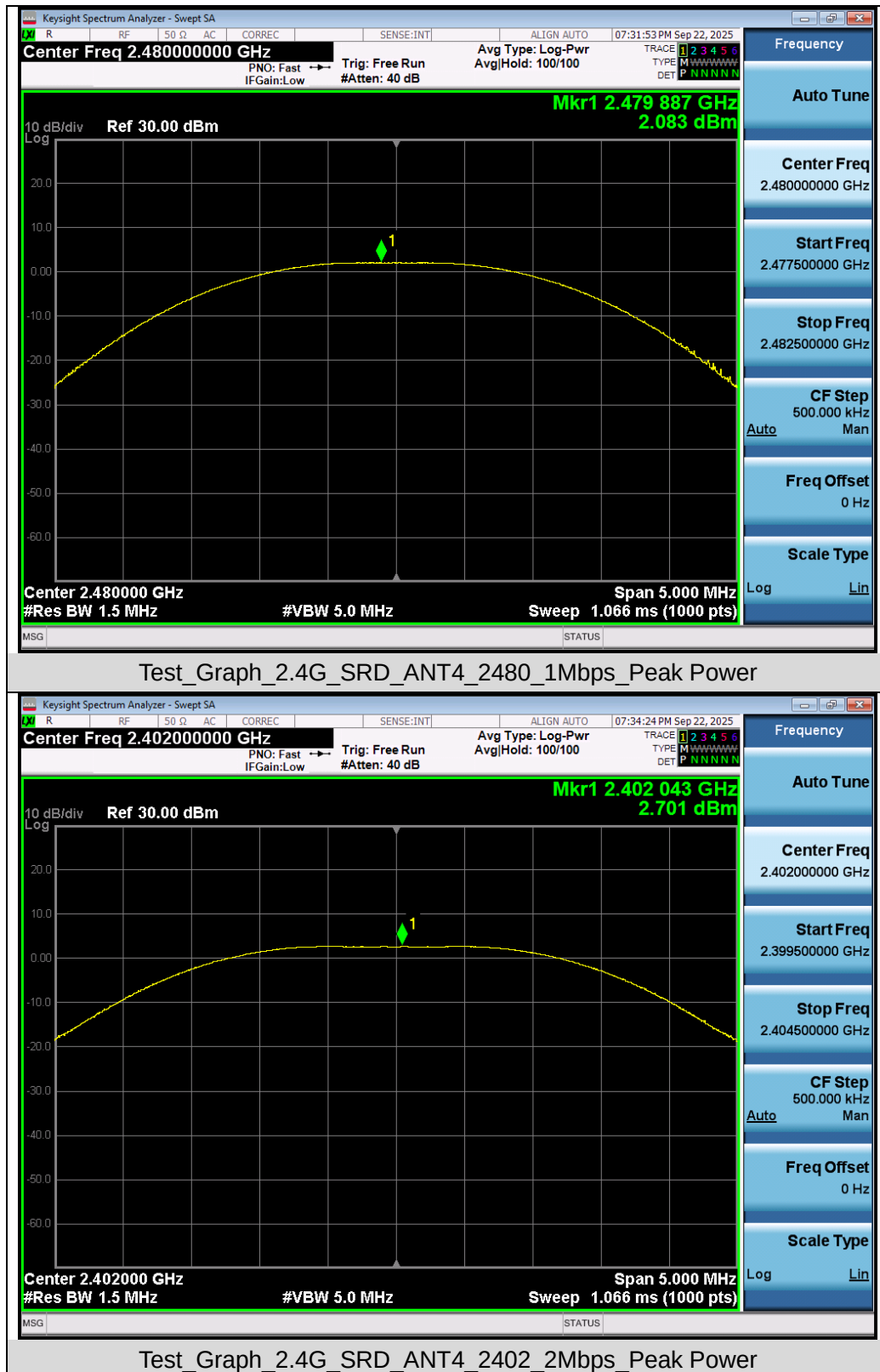


Test_Graph_2.4G_SRD_ANT4_2402_1Mbps_Peak Power



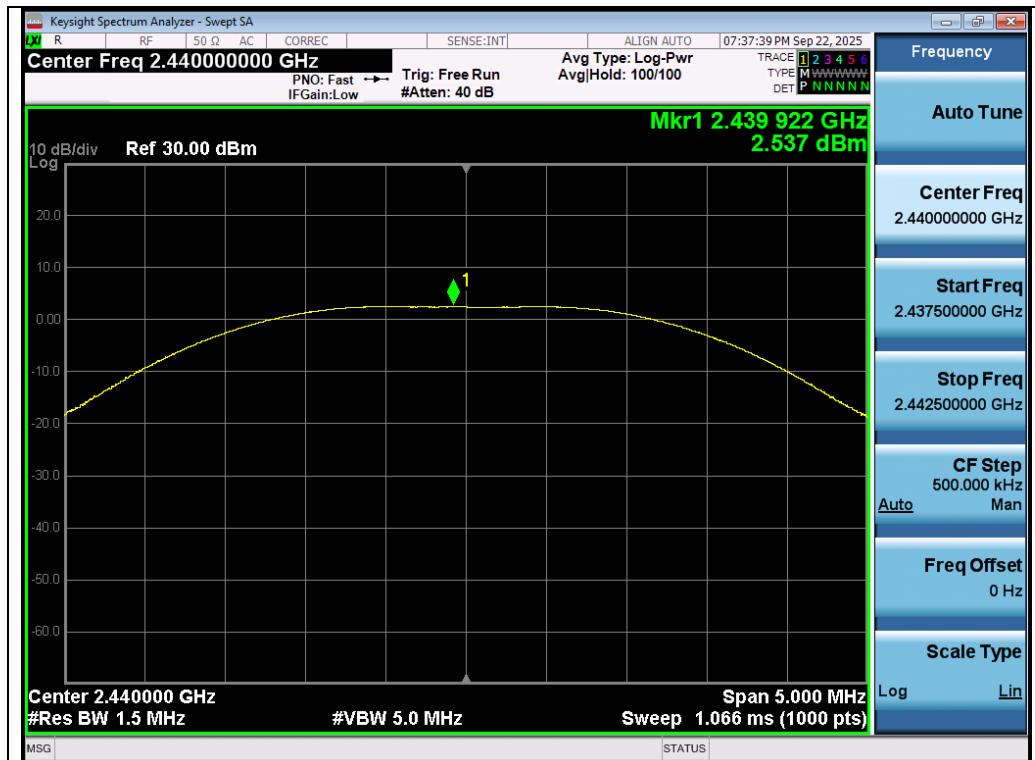
Test_Graph_2.4G_SRD_ANT4_2440_1Mbps_Peak Power

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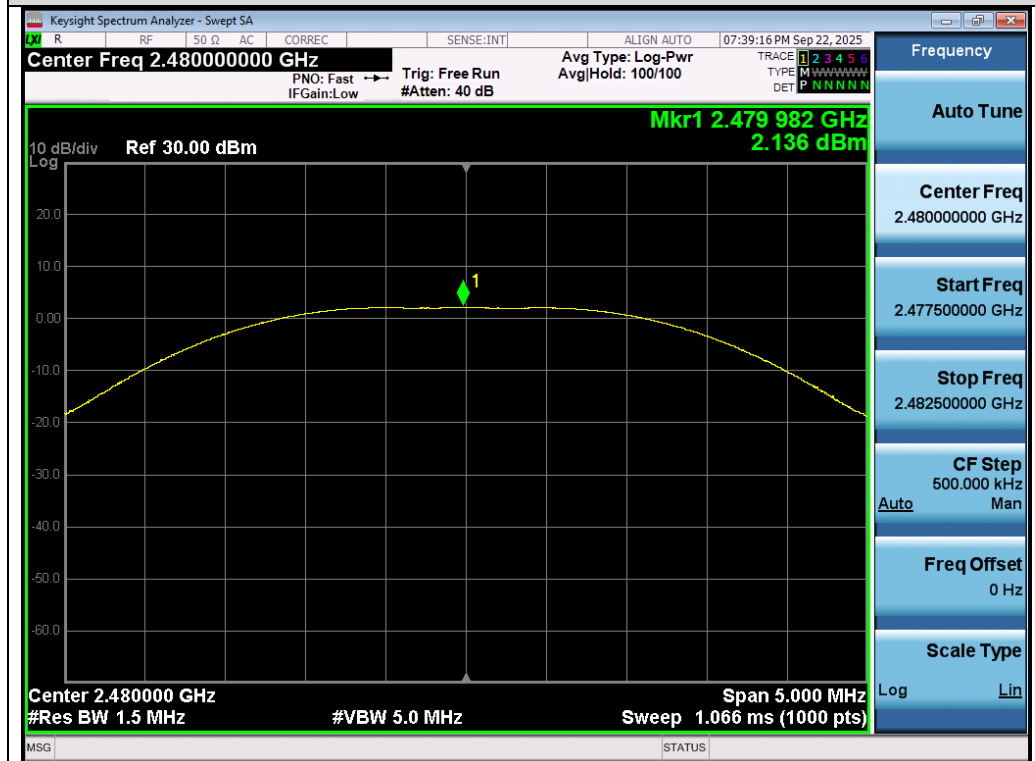


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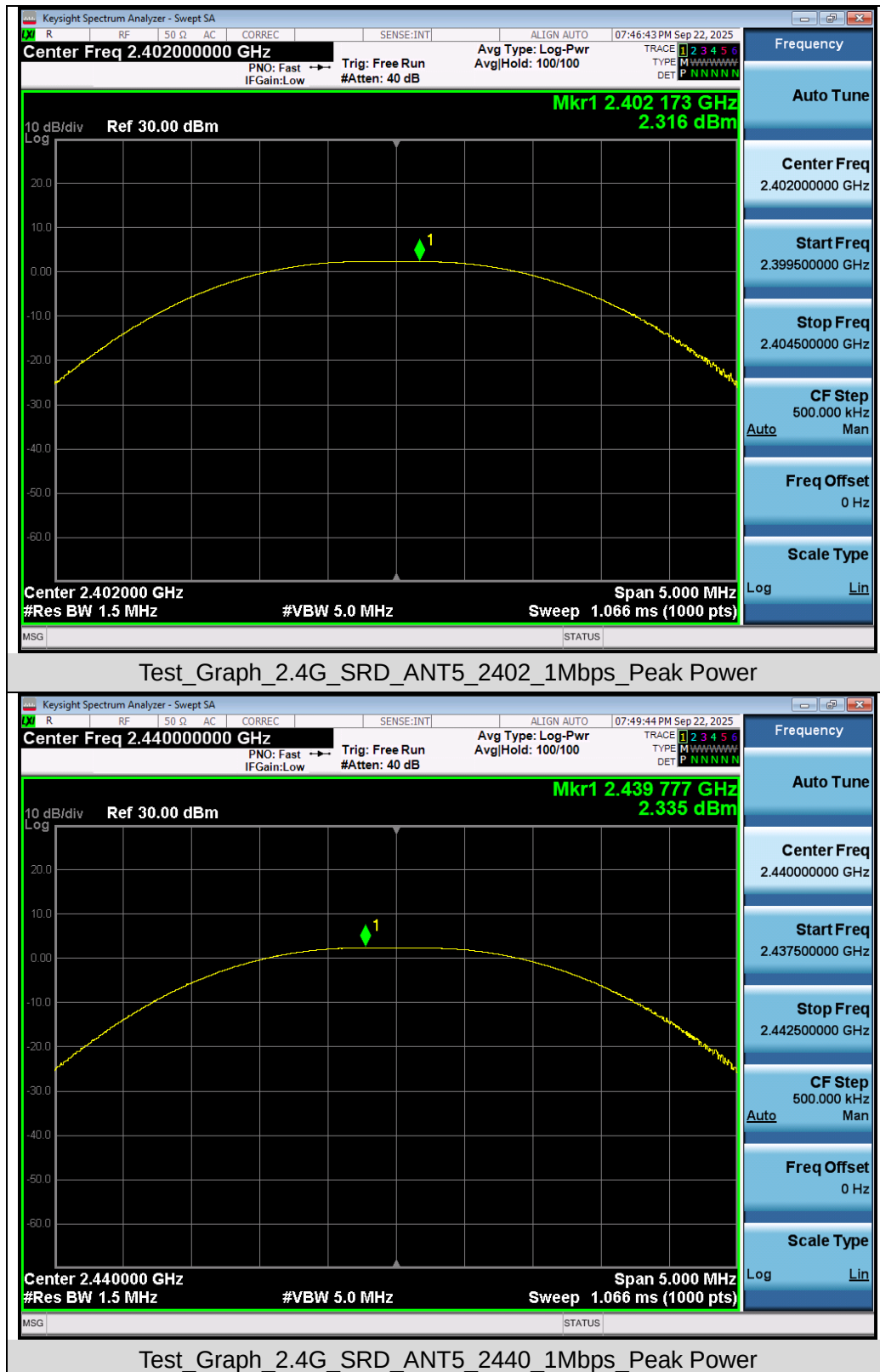
Test_Graph_2.4G_SRD_ANT4_2440_2Mbps_Peak Power



Test_Graph_2.4G_SRD_ANT4_2480_2Mbps_Peak Power

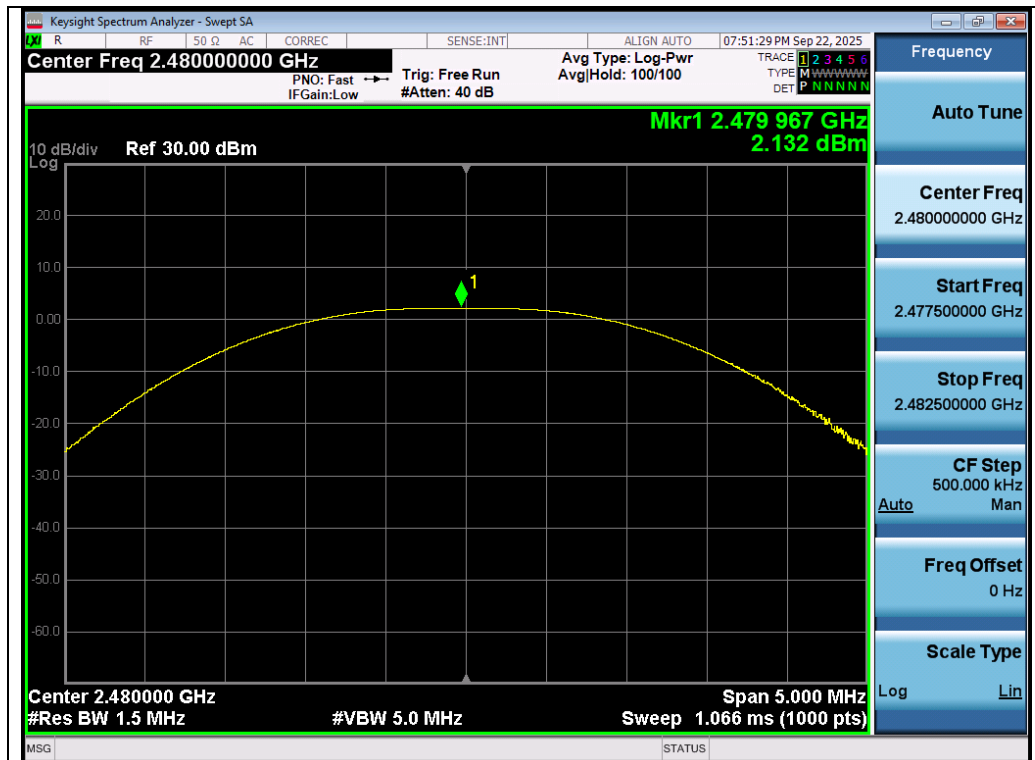
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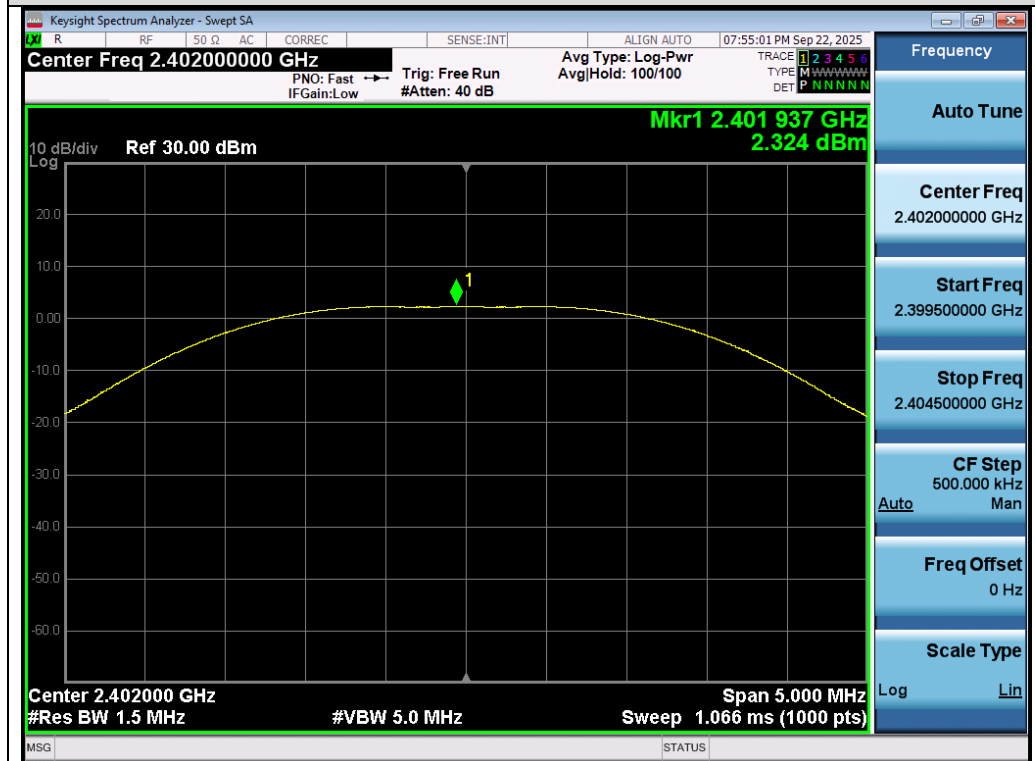


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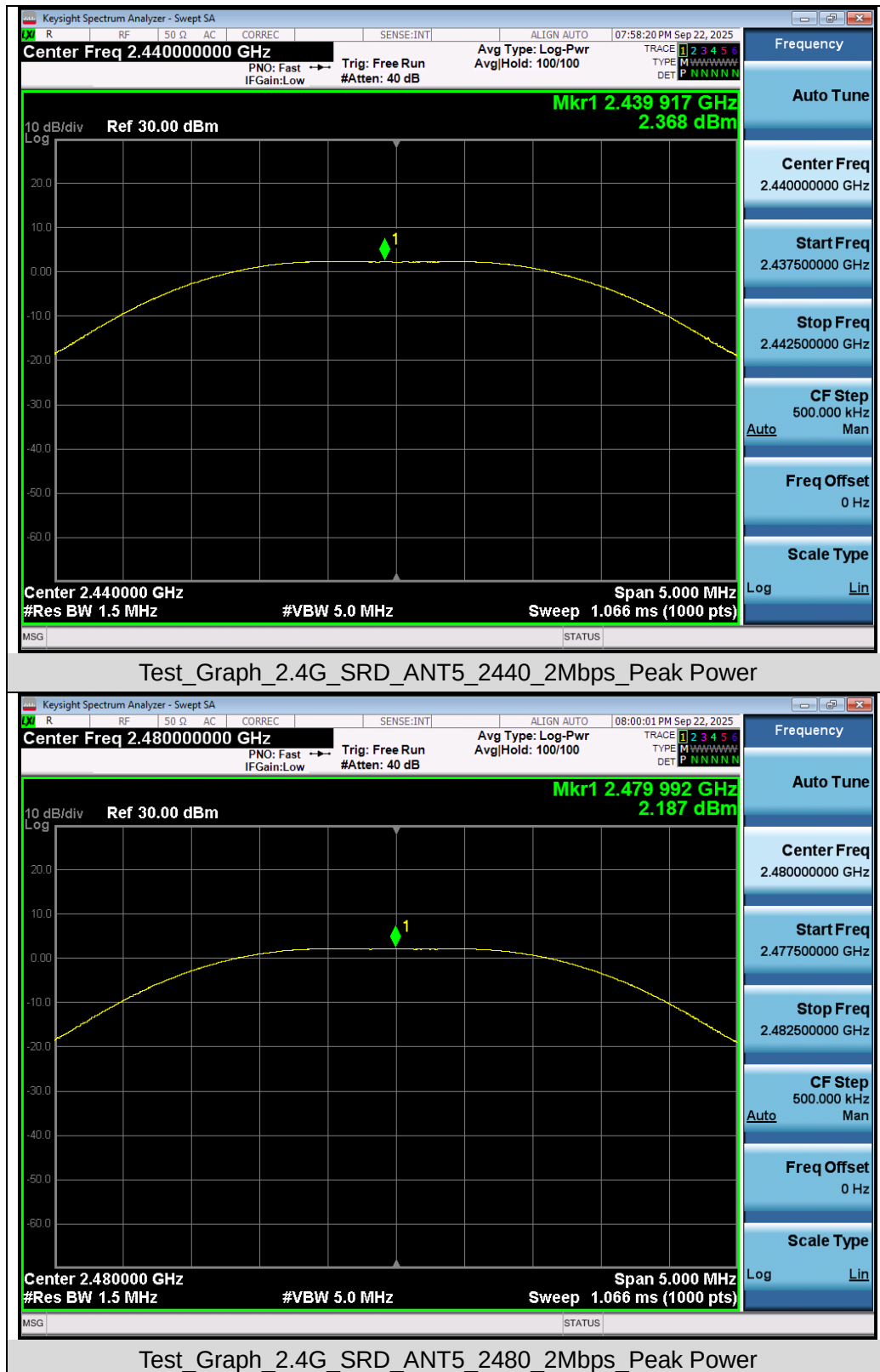
Test_Graph_2.4G_SRD_ANT5_2480_1Mbps_Peak Power



Test_Graph_2.4G_SRD_ANT5_2402_2Mbps_Peak Power

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8. 6dB Bandwidth Measurement

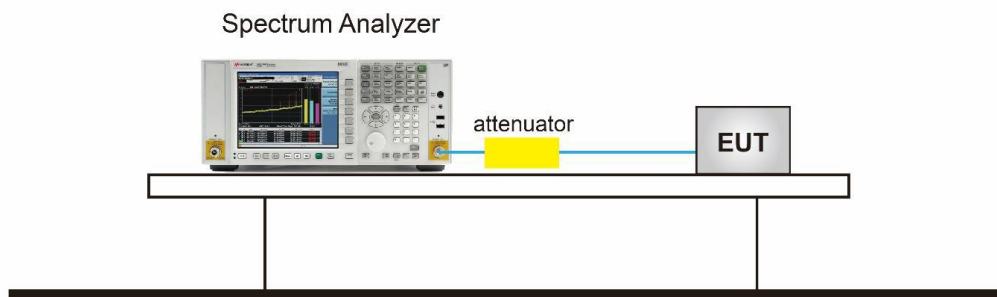
8.1 Provisions Applicable

The minimum 6dB bandwidth shall be 500 kHz.

8.2 Measurement Procedure

- The testing follows the ANSI C63.10 Section 6.9.3 (OBW) and 11.8.1 (6dB BW).
1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
 2. Set to the maximum power setting and enable the EUT transmit continuously.
 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
 4. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the OBW and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$.
 5. Measure and record the results in the test report.

8.3 Measurement Setup (Block Diagram of Configuration)



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8.4 Measurement Results

Test Data of Occupied Bandwidth and DTS Bandwidth-ANT 4					
Test Mode	Test Frequency (MHz)	Occupied Bandwidth (MHz)	DTS BW (MHz)	DTS BW Limits	Pass or Fail
2.4G_SRD_1Mbps	2402	1.035	0.665	≥ 0.5	Pass
	2440	1.026	0.671	≥ 0.5	Pass
	2480	1.027	0.664	≥ 0.5	Pass
2.4G_SRD_2Mbps	2402	2.053	1.139	≥ 0.5	Pass
	2440	2.039	1.152	≥ 0.5	Pass
	2480	2.045	1.161	≥ 0.5	Pass

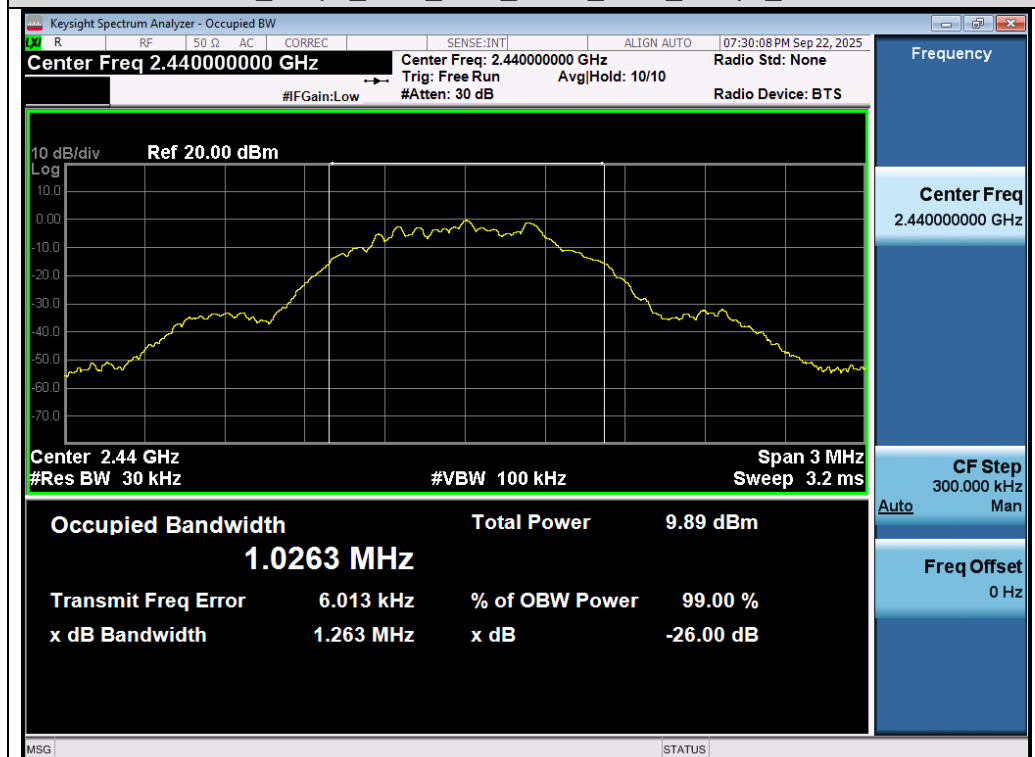
Test Data of Occupied Bandwidth and DTS Bandwidth-ANT 5					
Test Mode	Test Frequency (MHz)	Occupied Bandwidth (MHz)	DTS BW (MHz)	DTS BW Limits	Pass or Fail
2.4G_SRD_1Mbps	2402	1.032	0.669	≥ 0.5	Pass
	2440	1.028	0.668	≥ 0.5	Pass
	2480	1.029	0.670	≥ 0.5	Pass
2.4G_SRD_2Mbps	2402	2.051	1.147	≥ 0.5	Pass
	2440	2.049	1.157	≥ 0.5	Pass
	2480	2.047	1.129	≥ 0.5	Pass

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Test Graphs of Occupied Bandwidth

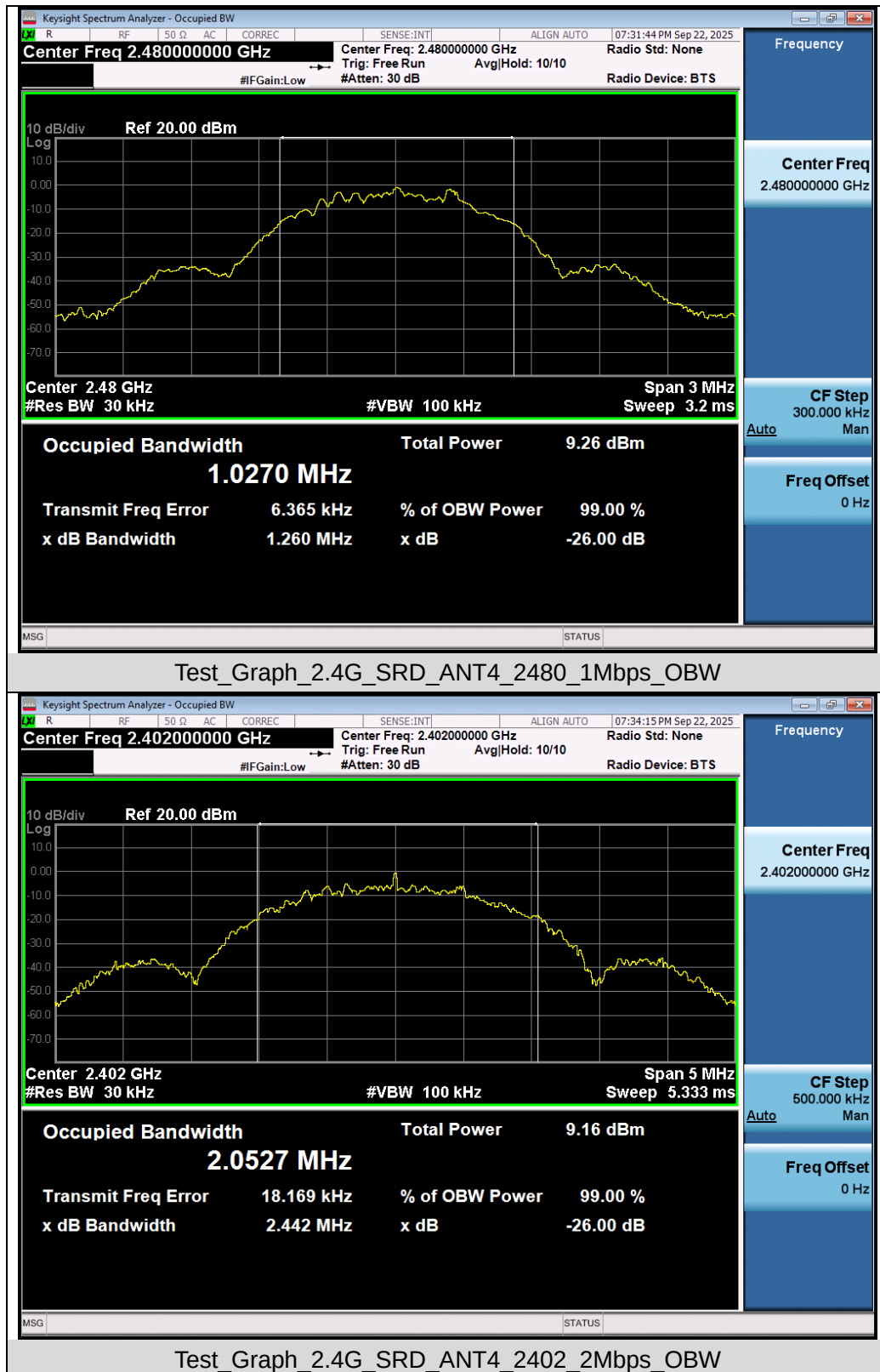


Test_Graph_2.4G_SRD_ANT4_2402_1Mbps_OBW

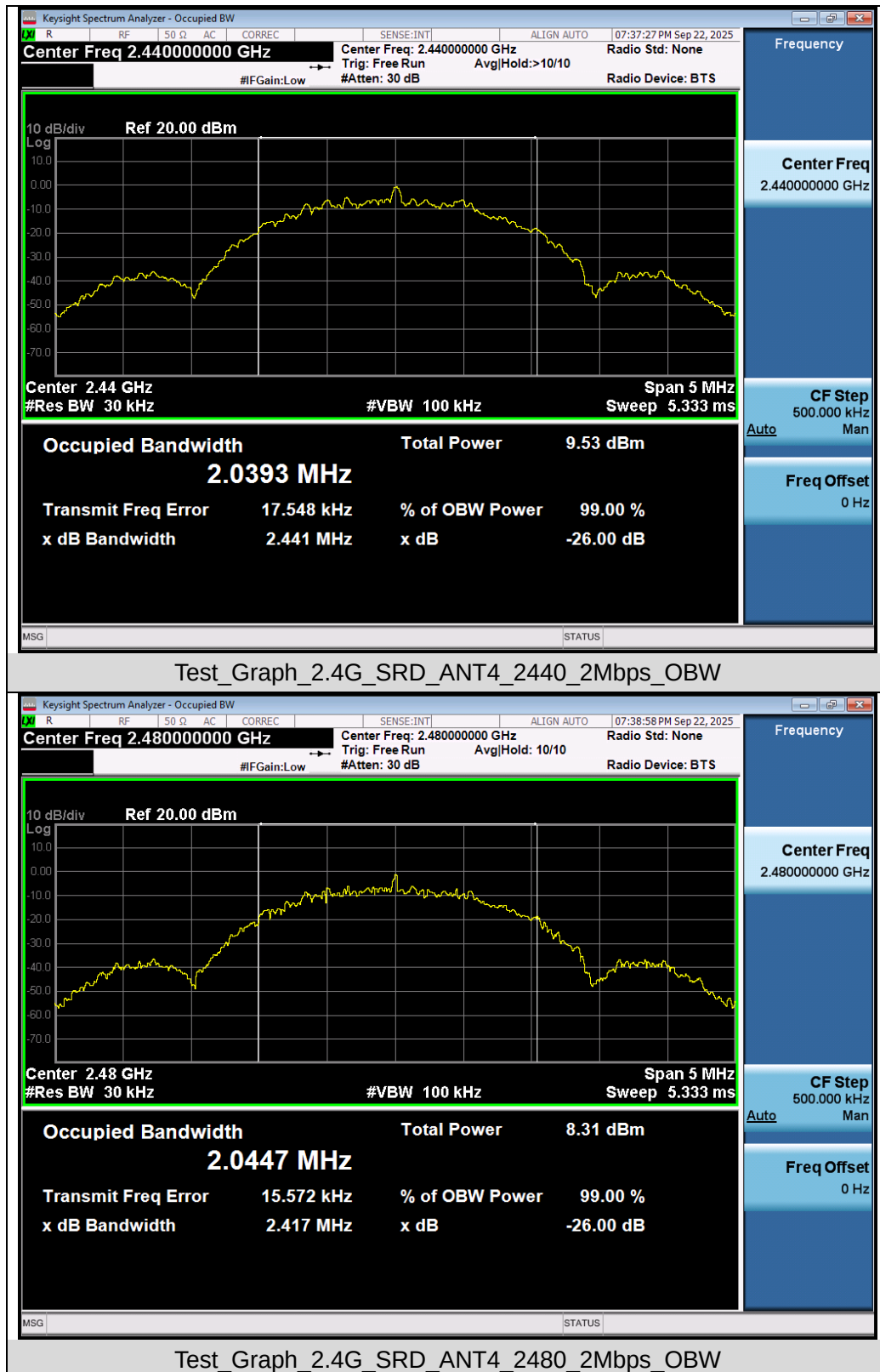


Test_Graph_2.4G_SRD_ANT4_2440_1Mbps_OBW

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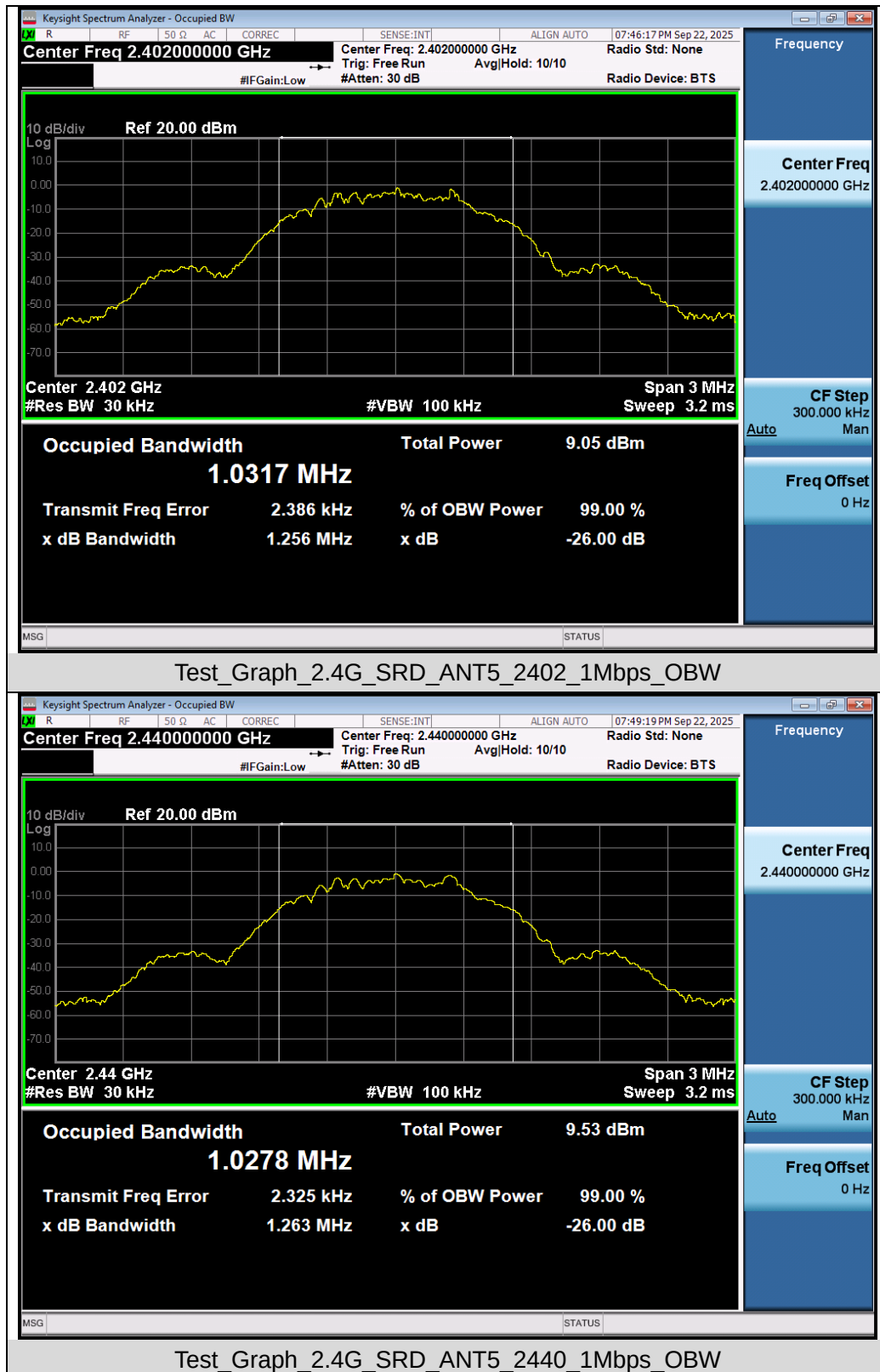


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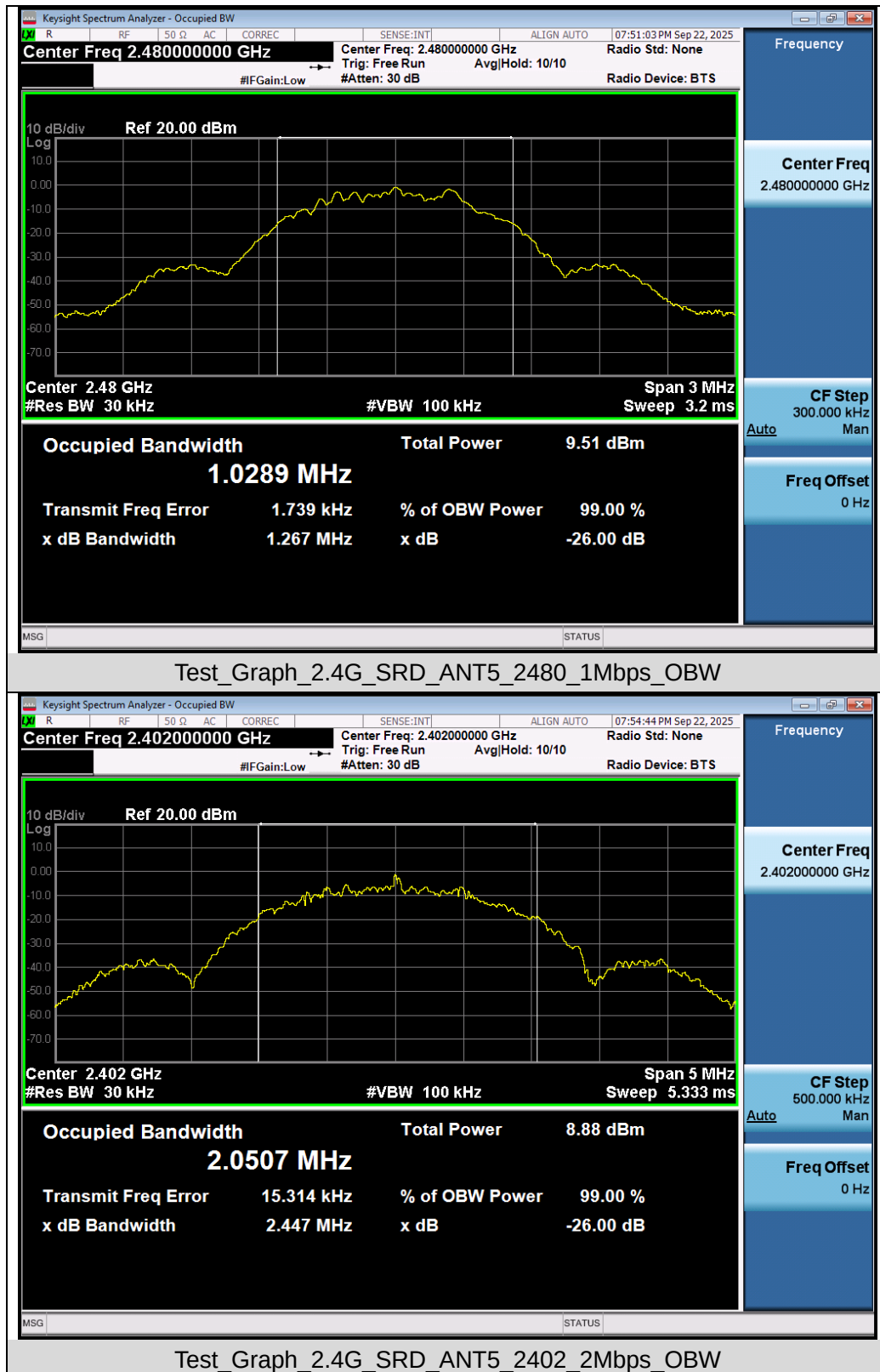


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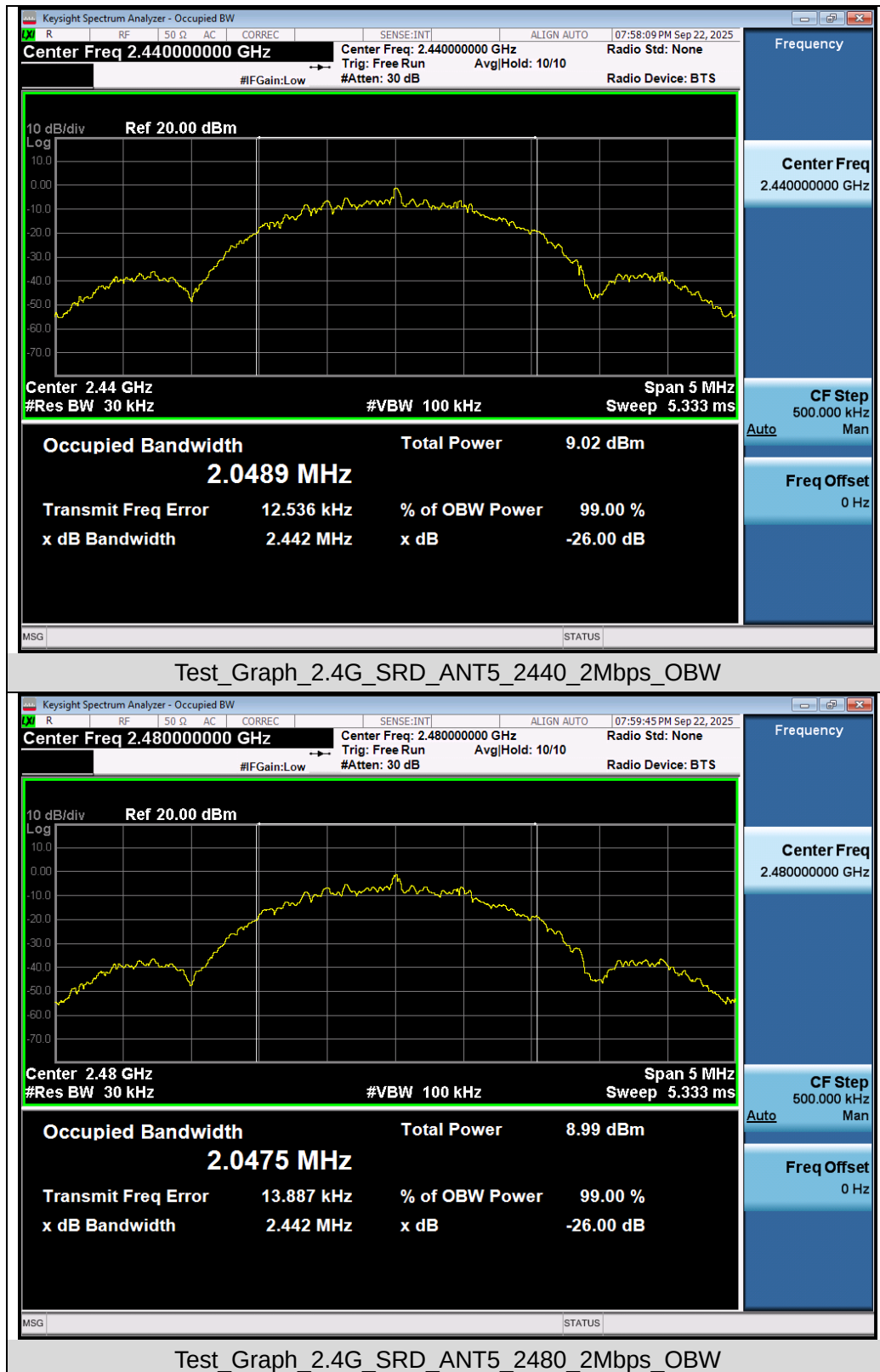
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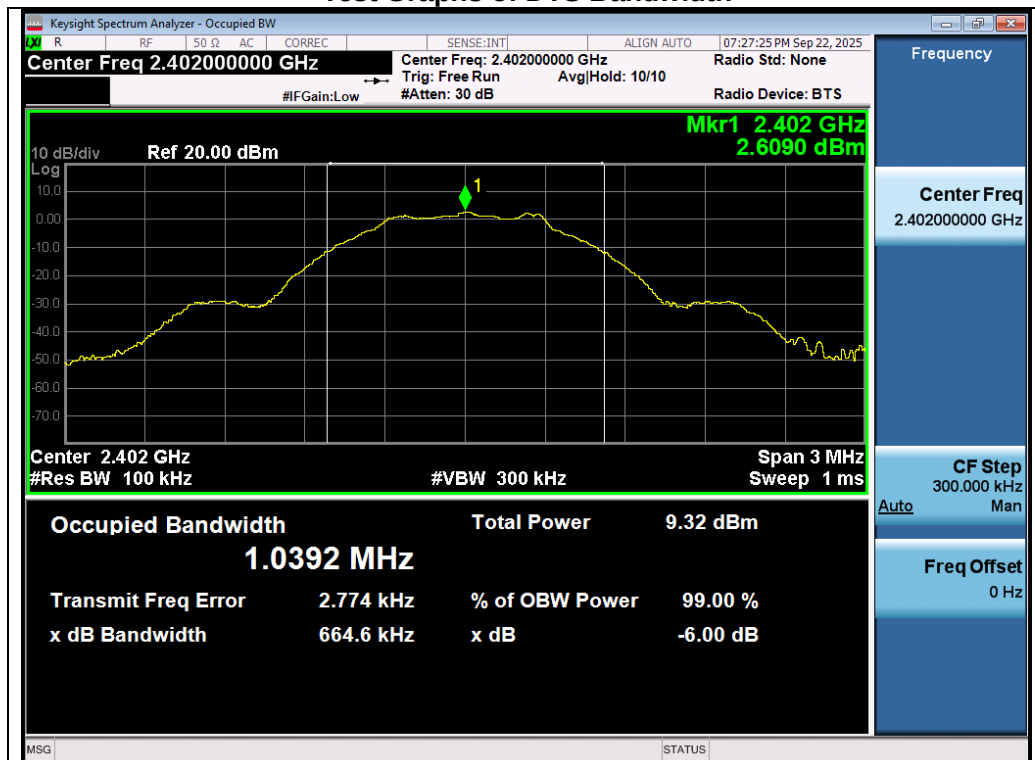
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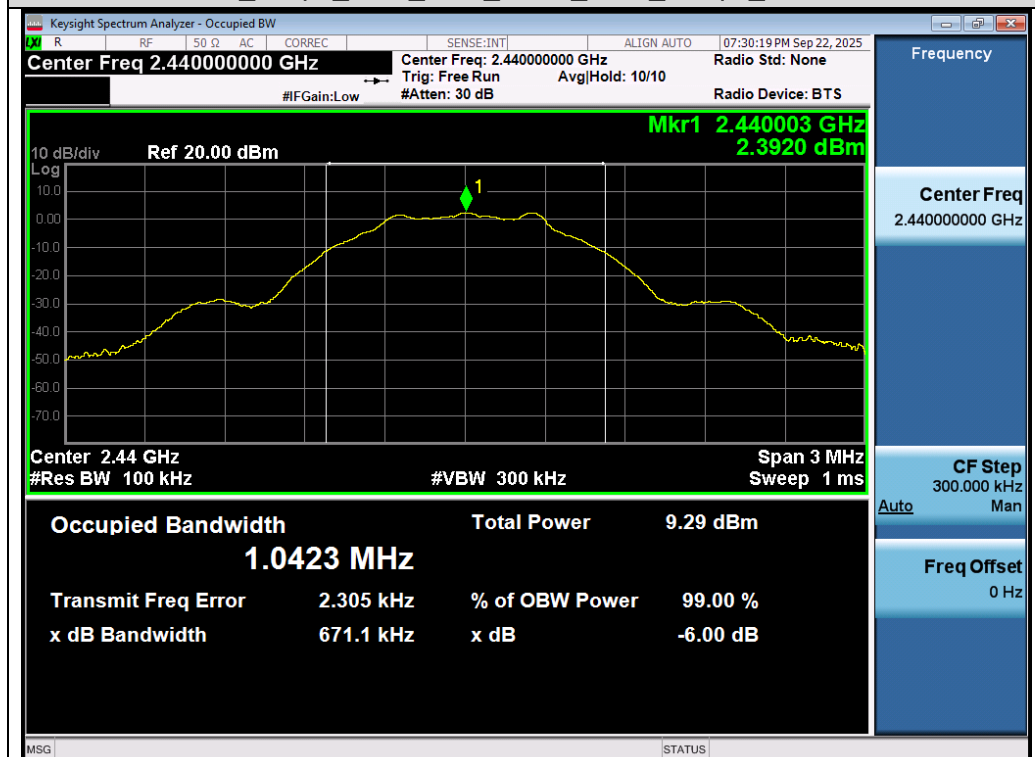
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Test Graphs of DTS Bandwidth

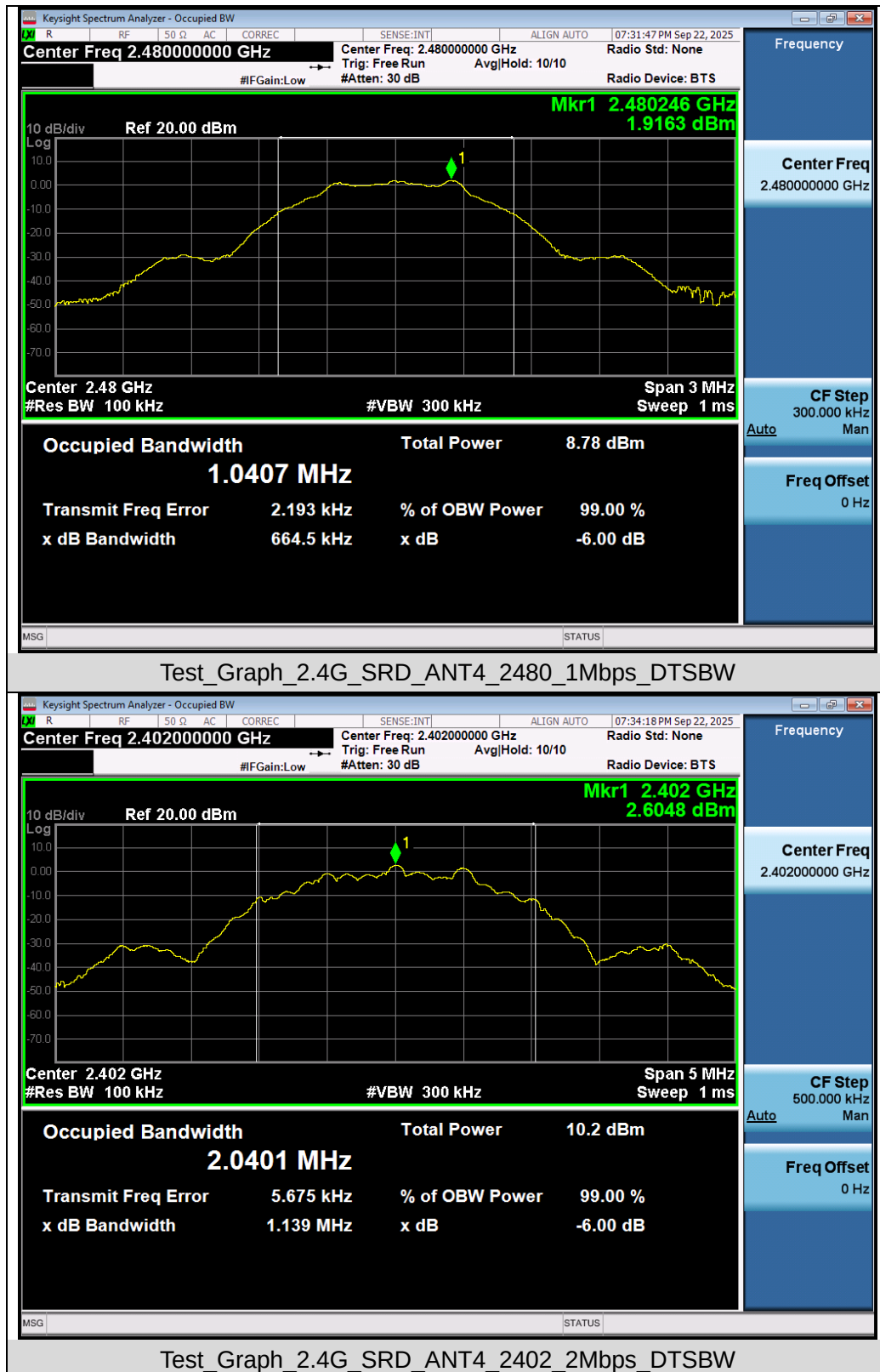


Test_Graph_2.4G_SRD_ANT4_2402_1Mbps_DTSBW



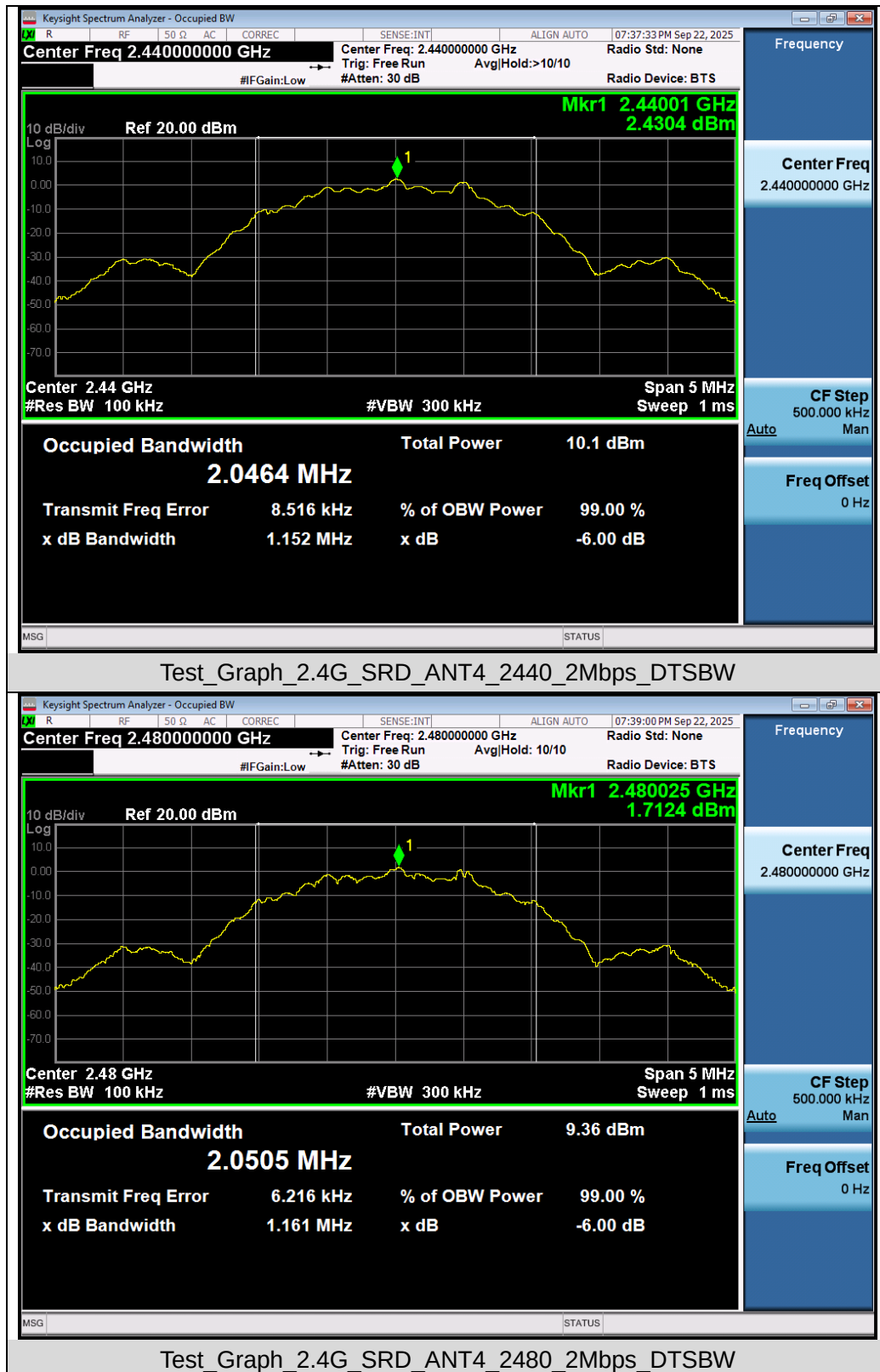
Test_Graph_2.4G_SRD_ANT4_2440_1Mbps_DTSBW

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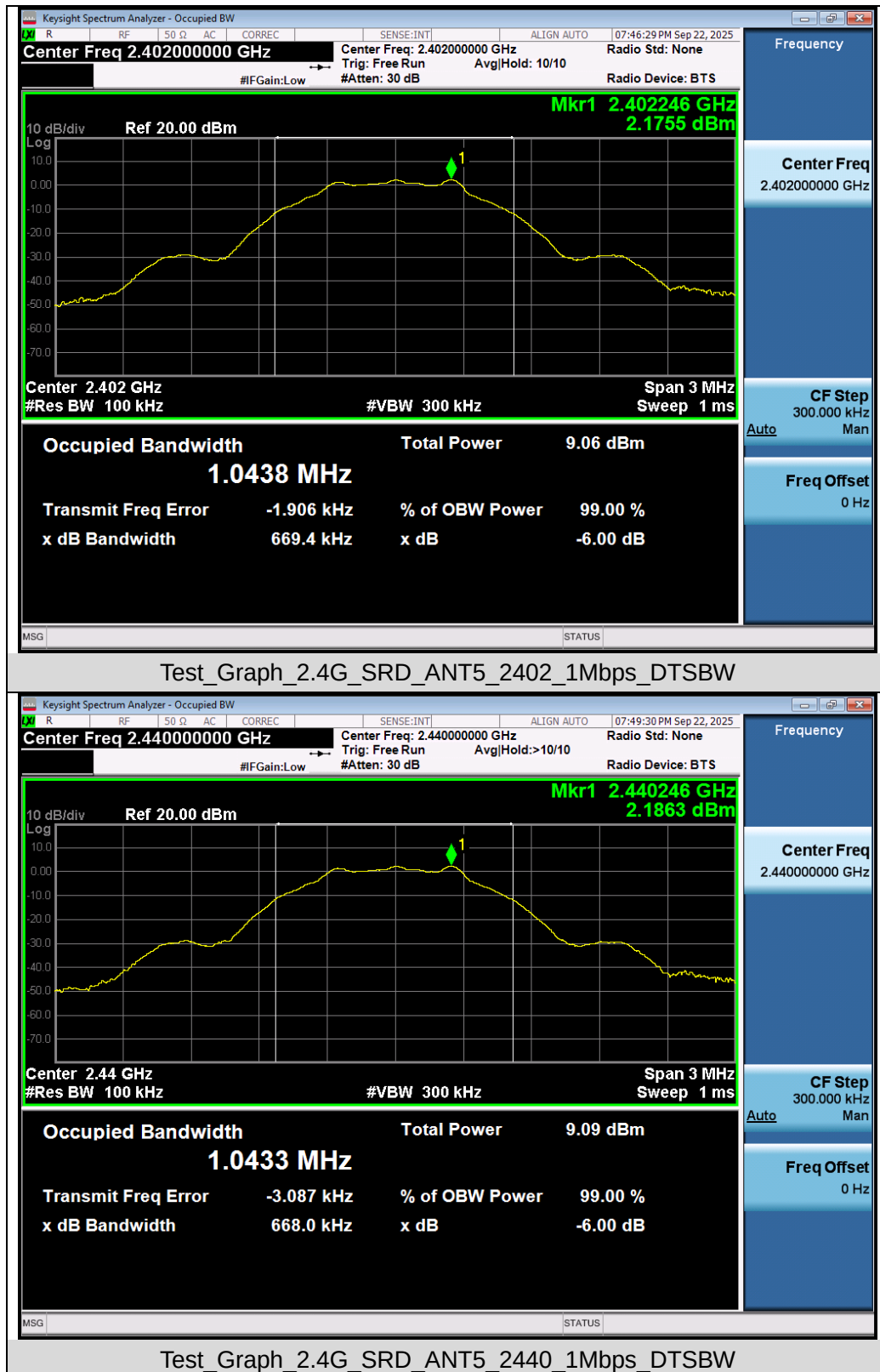


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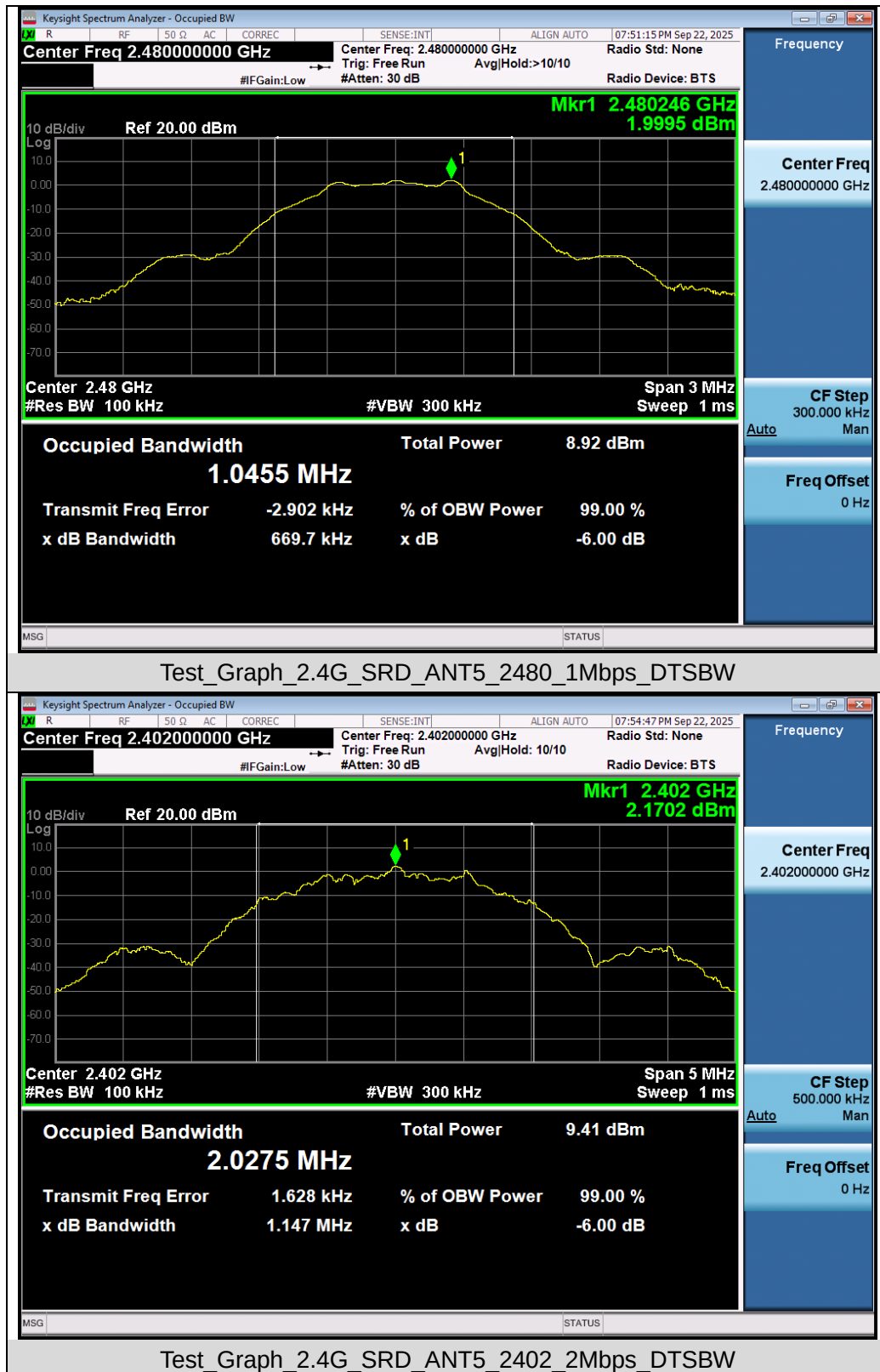


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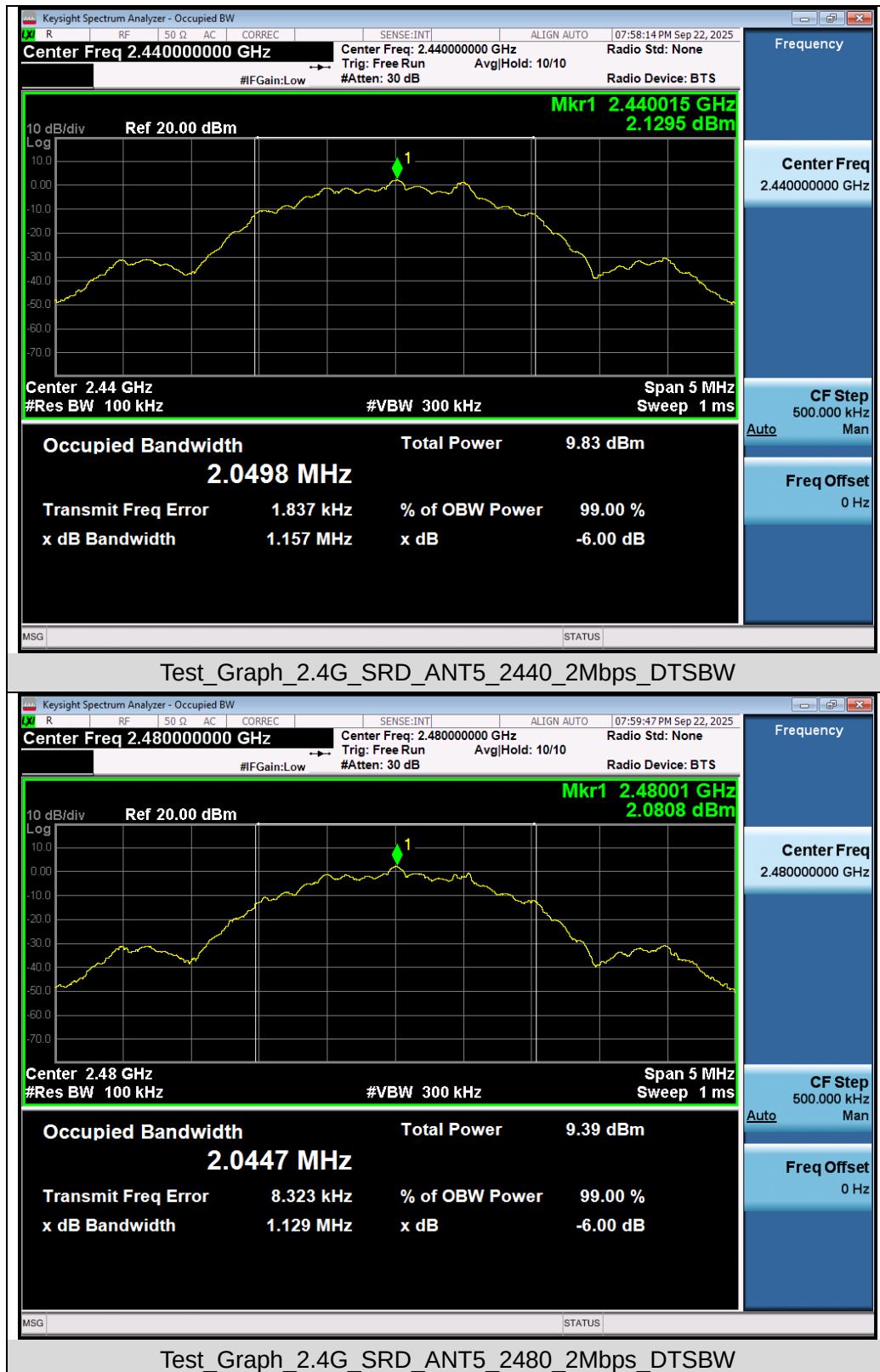
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9. Power Spectral Density Measurement

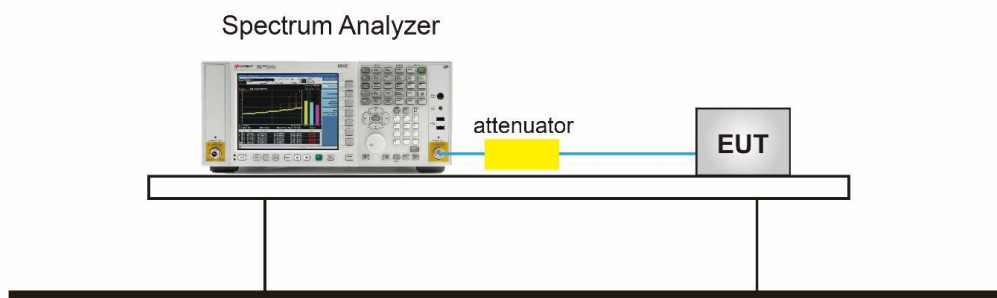
9.1 Provisions Applicable

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

9.2 Measurement Procedure

- The testing follows the ANSI C63.10 Section 11.10.2 Method PKPSD.
- 1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz in order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
- 4. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
- 5. Measure and record the results in the test report.
- 6. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

9.3 Measurement Setup (Block Diagram of Configuration)



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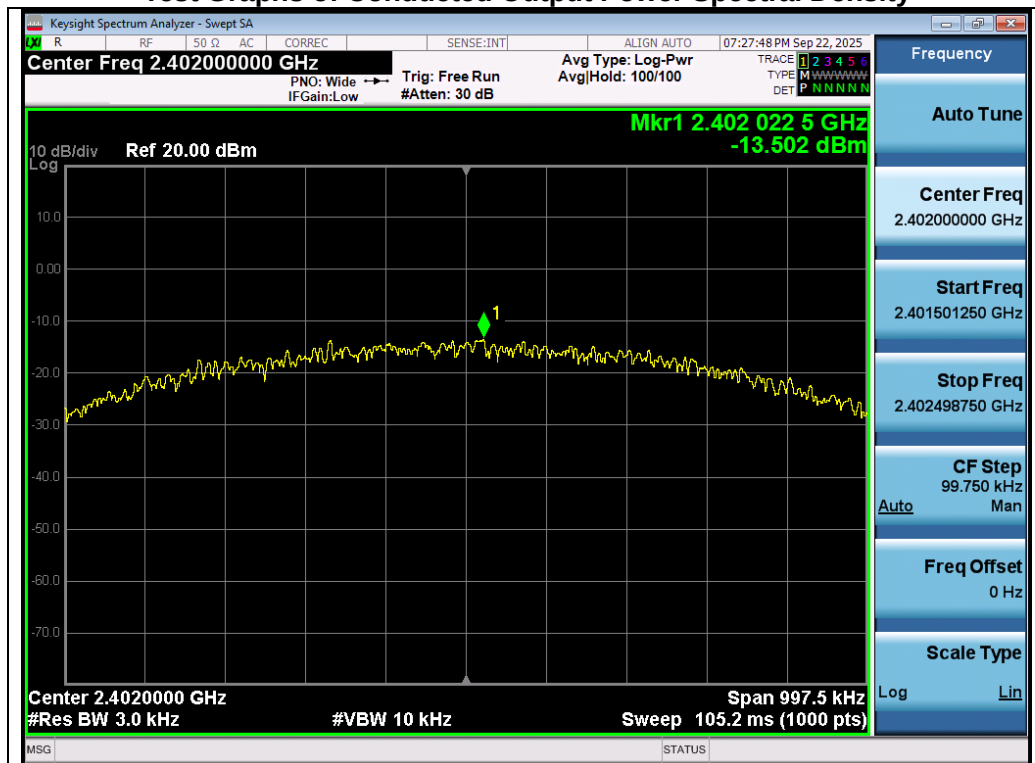
9.4 Measurement Results

Test Data of Conducted Output Power Spectral Density-ANT 4				
Test Mode	Test Frequency (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail
2.4G_SRD_1Mbps	2402	-13.502	≤ 8	Pass
	2440	-13.614	≤ 8	Pass
	2480	-13.935	≤ 8	Pass
2.4G_SRD_2Mbps	2402	-15.189	≤ 8	Pass
	2440	-15.379	≤ 8	Pass
	2480	-15.651	≤ 8	Pass

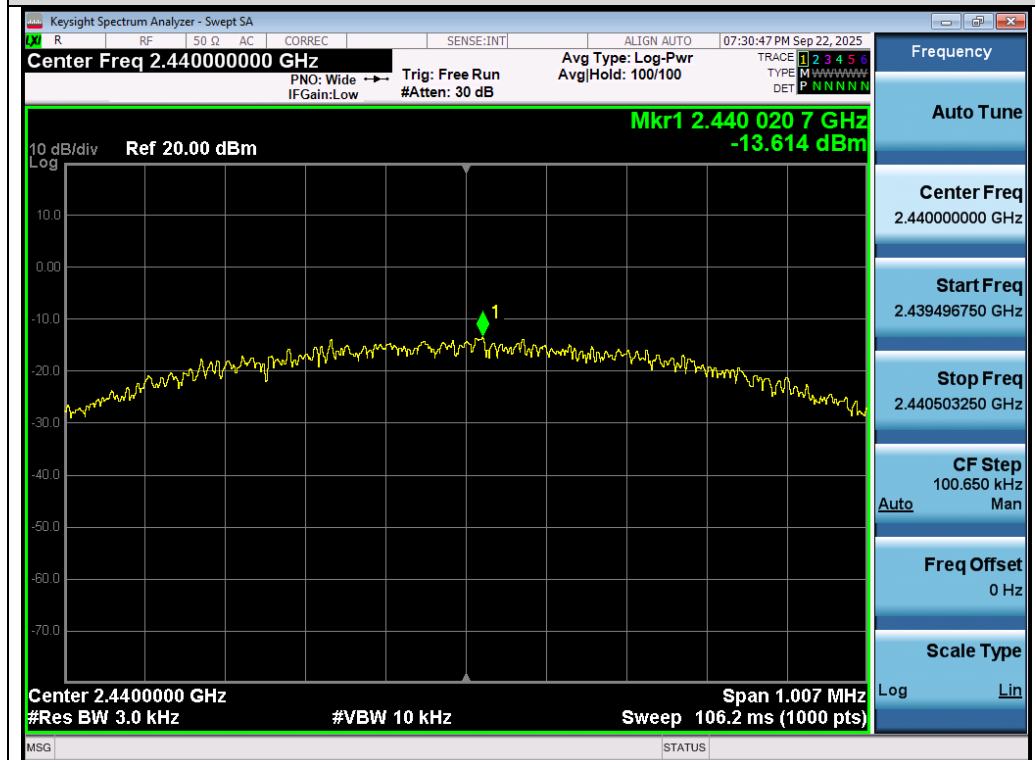
Test Data of Conducted Output Power Spectral Density-ANT 5				
Test Mode	Test Frequency (MHz)	Power density (dBm/3kHz)	Limit (dBm/3kHz)	Pass or Fail
2.4G_SRD_1Mbps	2402	-13.843	≤ 8	Pass
	2440	-13.804	≤ 8	Pass
	2480	-13.976	≤ 8	Pass
2.4G_SRD_2Mbps	2402	-15.511	≤ 8	Pass
	2440	-15.554	≤ 8	Pass
	2480	-15.659	≤ 8	Pass

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Test Graphs of Conducted Output Power Spectral Density

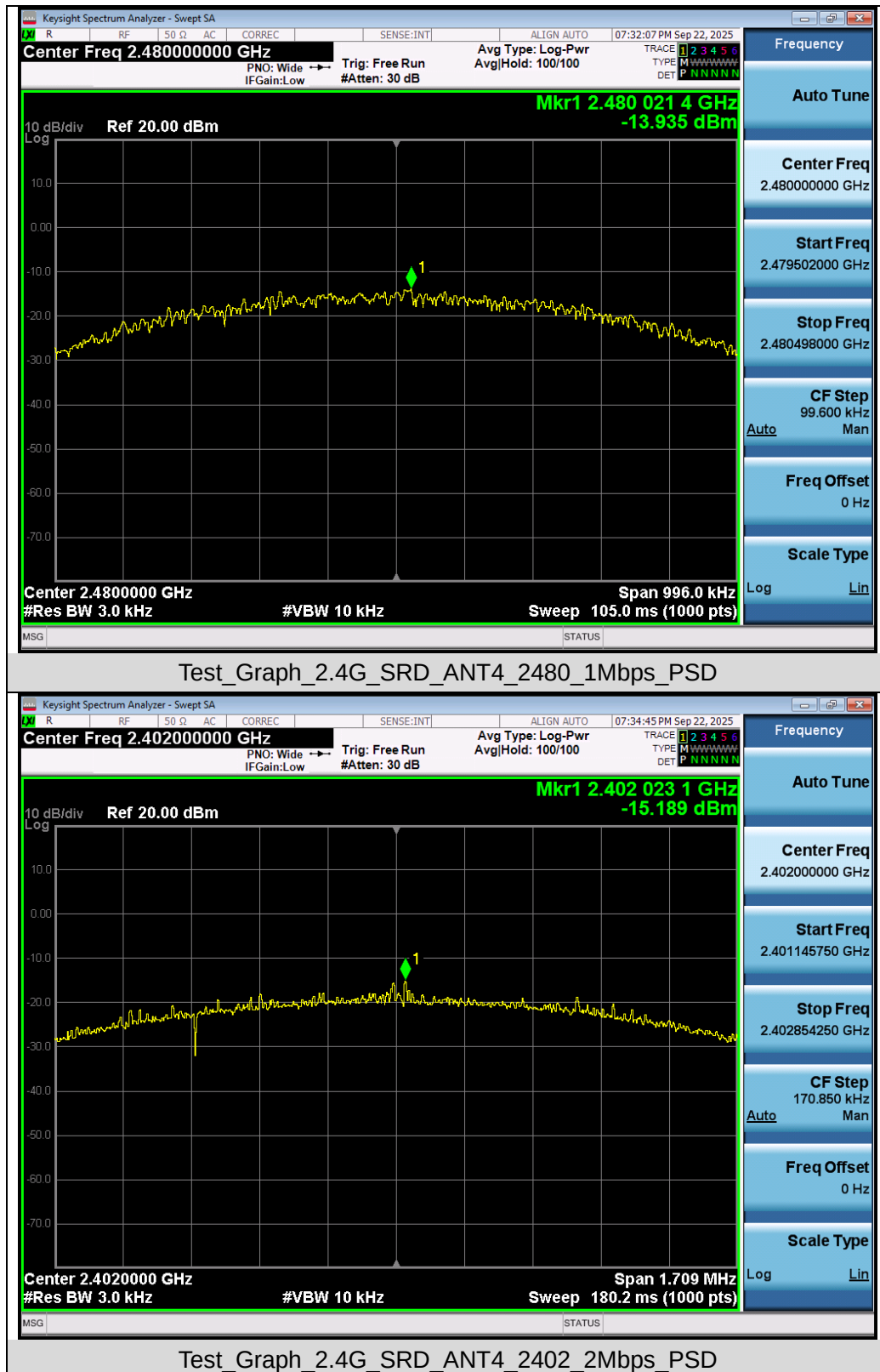


Test_Graph_2.4G_SRD_ANT4_2402_1Mbps_PSD



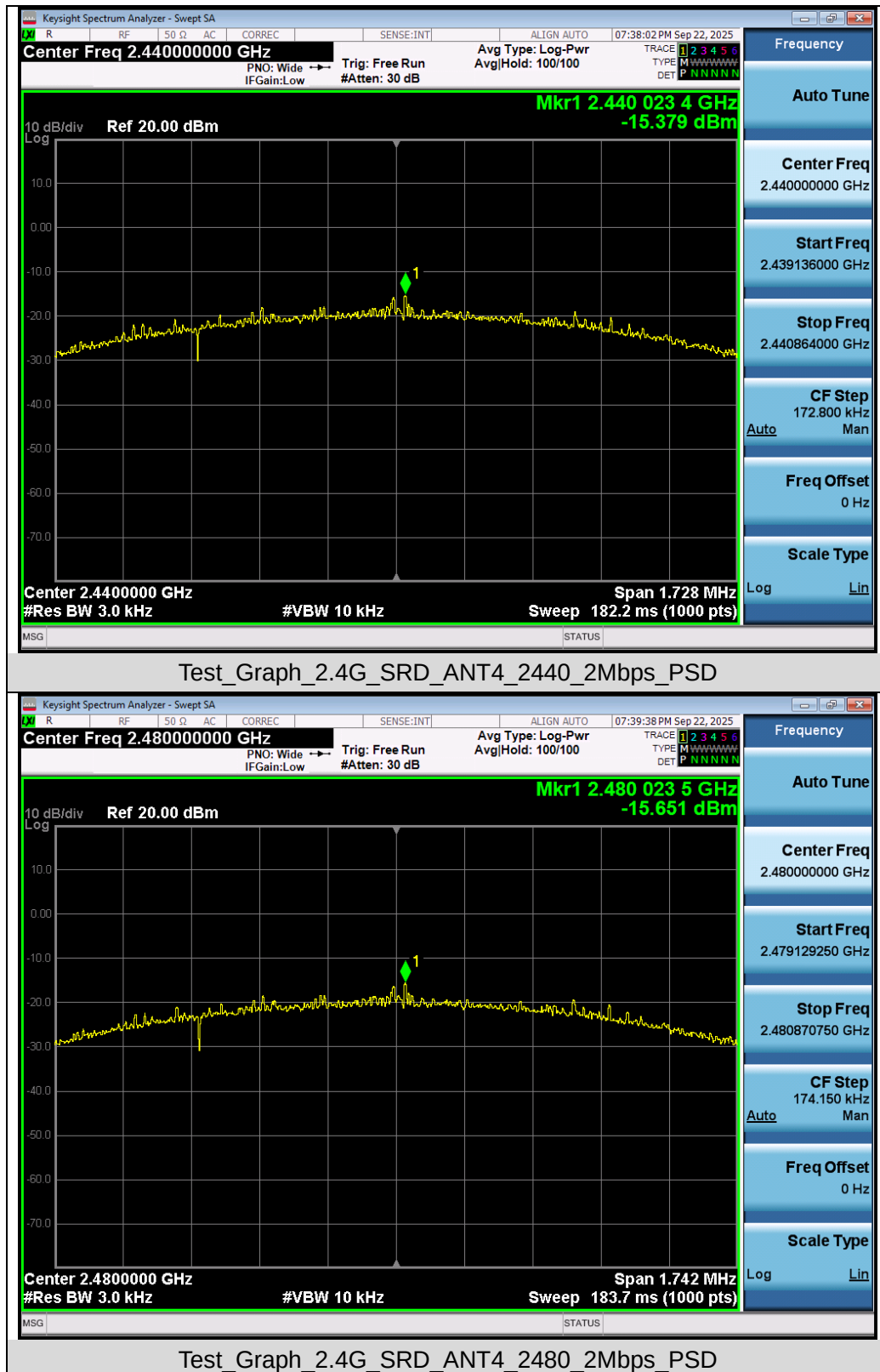
Test_Graph_2.4G_SRD_ANT4_2440_1Mbps_PSD

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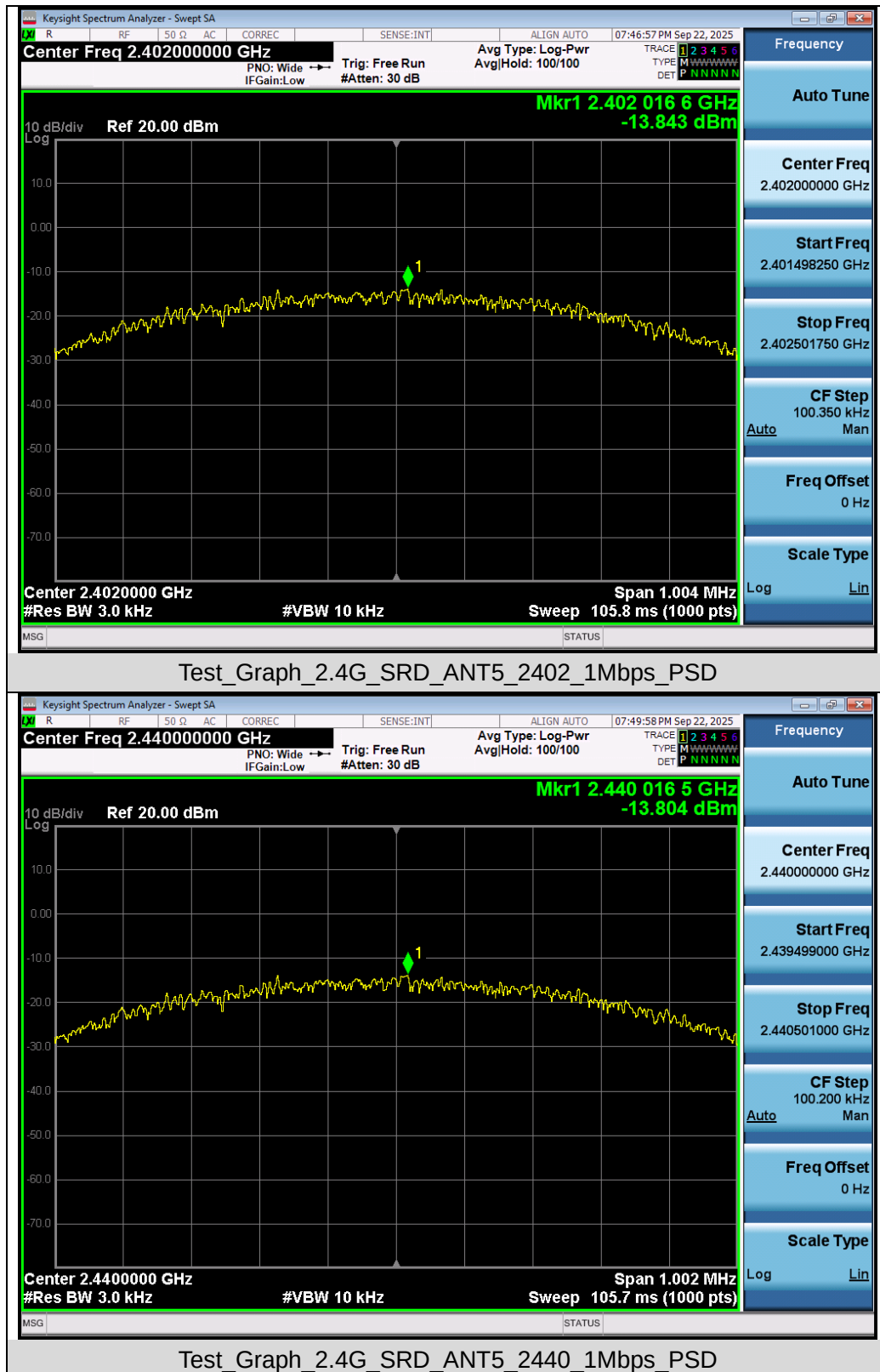
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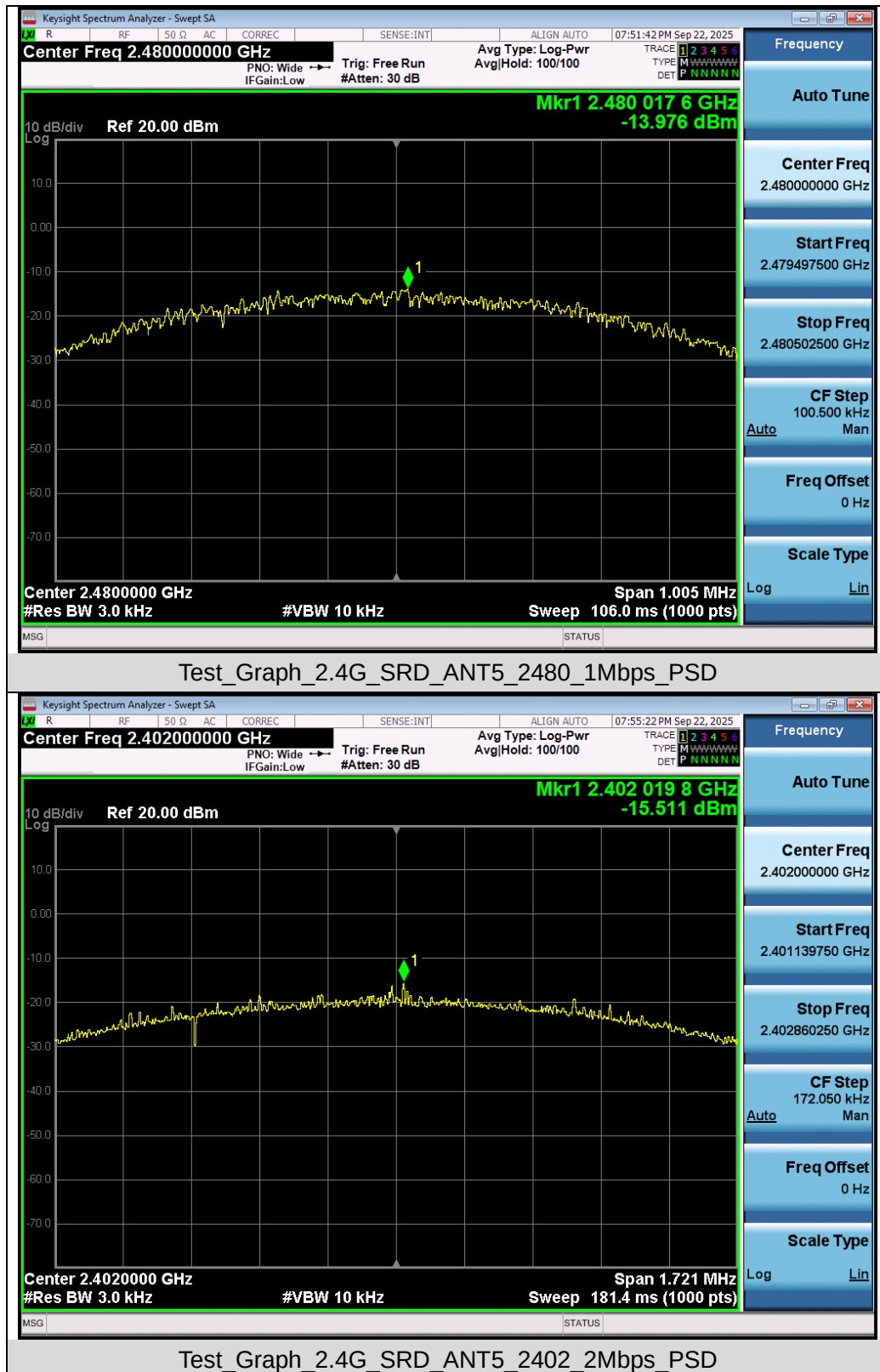
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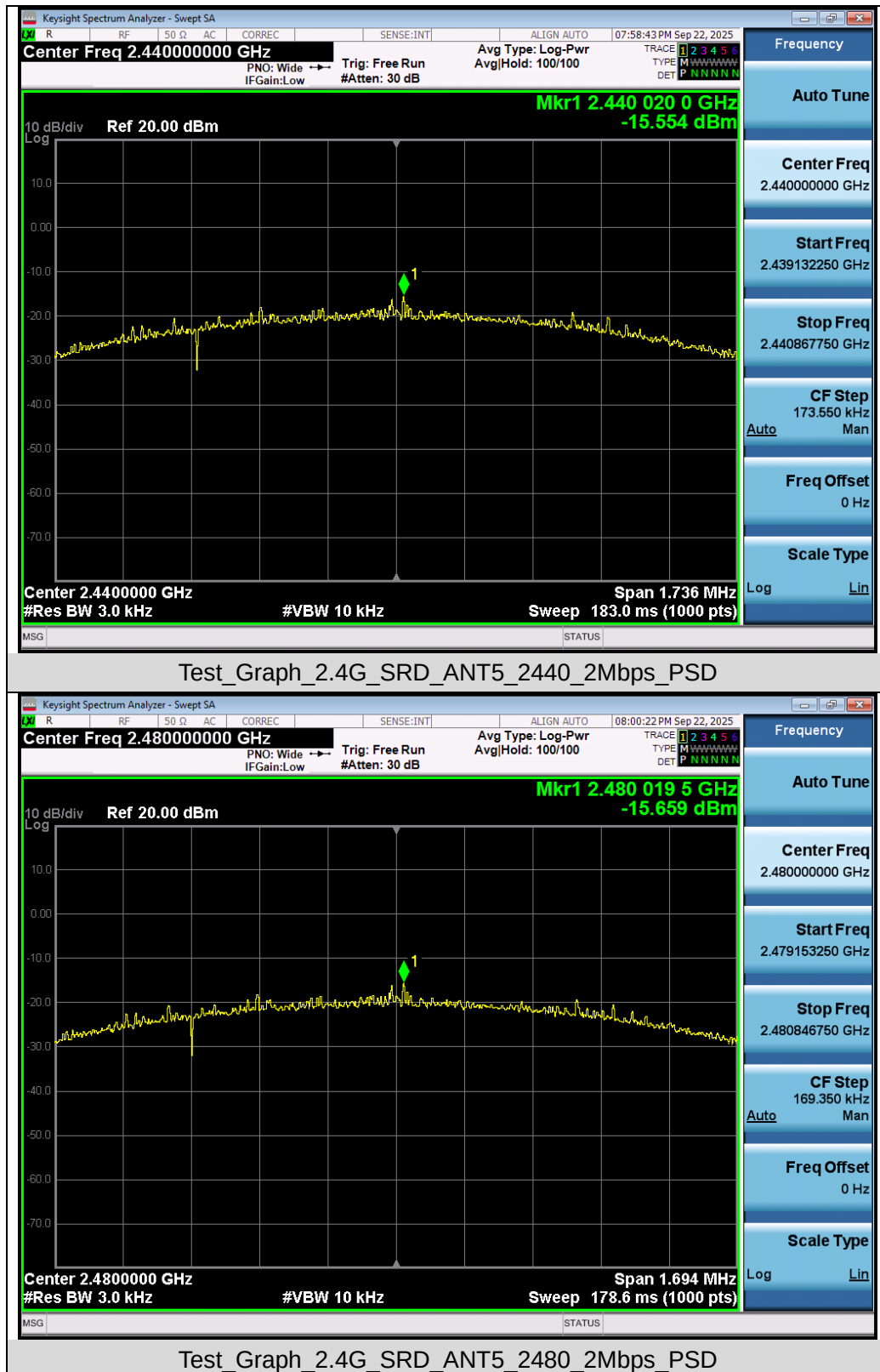
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10. Conducted Band Edge and Out-of-Band Emissions

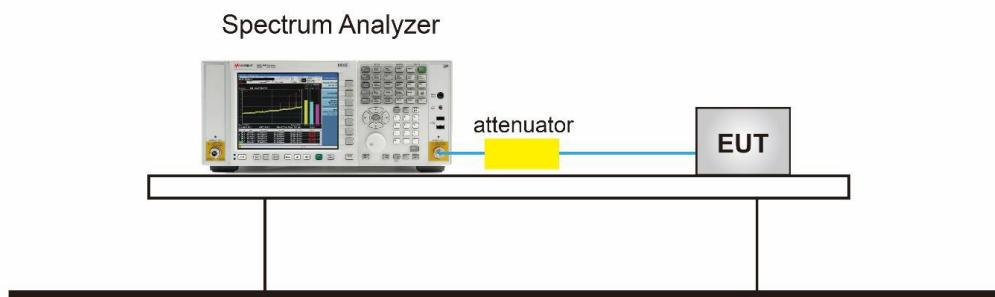
10.1 Provisions Applicable

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100kHz bandwidth per the PSD procedure.

10.2 Measurement Procedure

- Reference level measurement
 1. Set instrument center frequency to DTS channel center frequency
 2. Set the span to ≥ 1.5 times the DTS bandwidth
 3. Set the RBW = 100 kHz
 4. Set the VBW $\geq 3 \times$ RBW
 5. Detector = peak
 6. Sweep time = auto couple
 7. Trace mode = max hold
 8. Allow trace to fully stabilize
 9. Input compensation coefficient (dB) = Cable Loss (dB) + Attenuator attenuation value (dB)
- Emission level measurement
 1. Set the center frequency and span to encompass frequency range to be measured
 2. RBW = 100kHz
 3. VBW = 300kHz
 4. Detector = Peak
 5. Trace mode = max hold
 6. Sweep time = auto couple
 7. The trace was allowed to stabilize
 8. Input compensation coefficient (dB) = Cable Loss (dB) + Attenuator attenuation value (dB)

10.3 Measurement Setup (Block Diagram of Configuration)



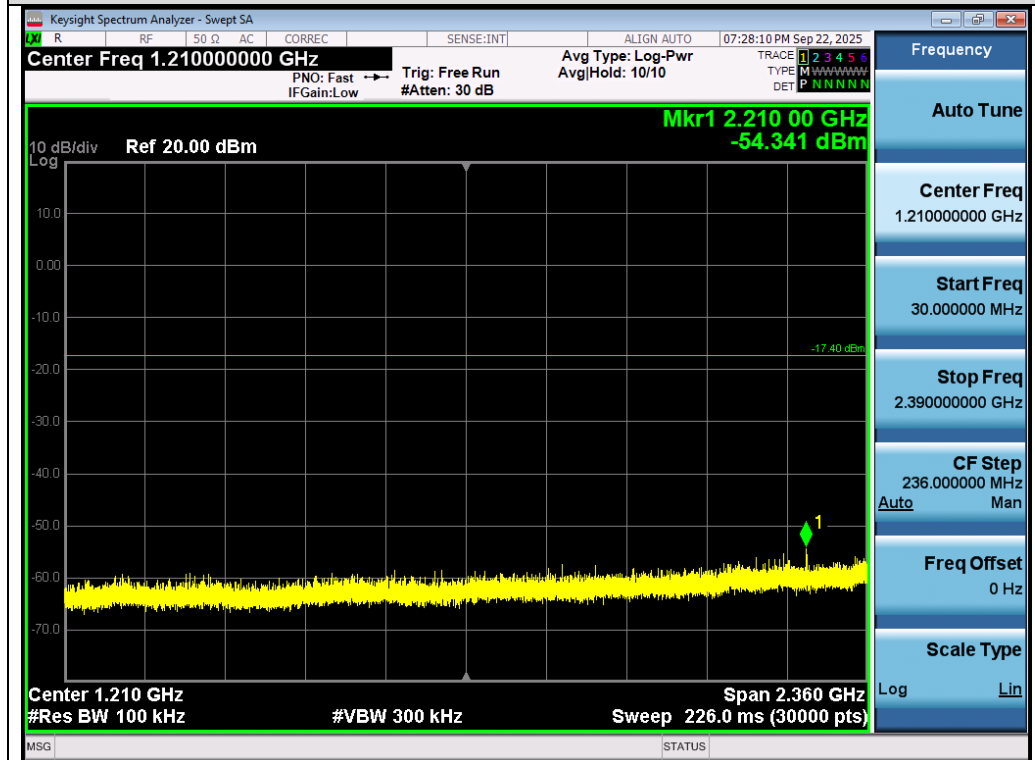
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10.4 Measurement Results

Test Graphs of Spurious Emissions in Non-Restricted Frequency Bands

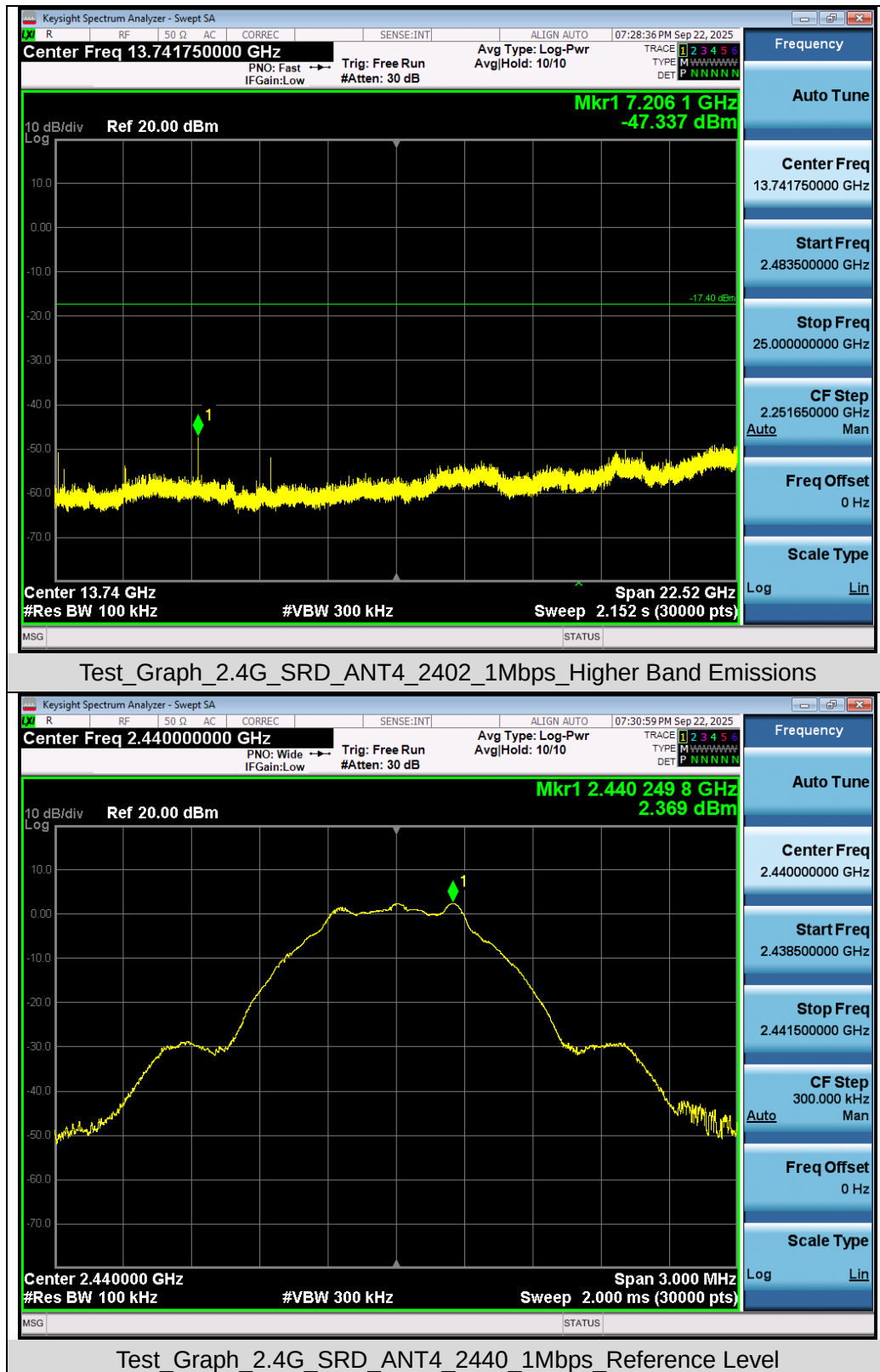


Test_Graph_2.4G_SRD_ANT4_2402_1Mbps_Reference Level

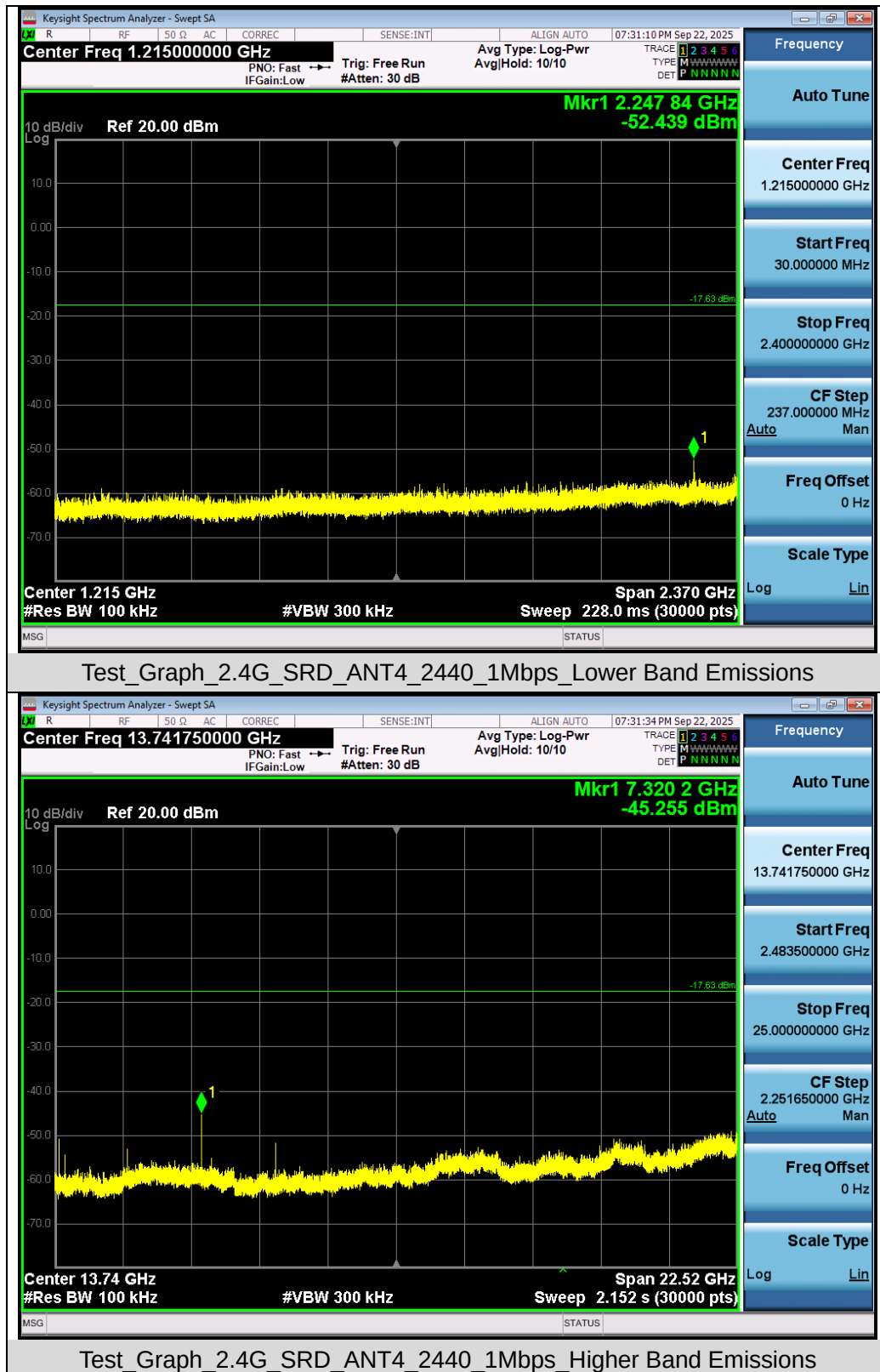


Test_Graph_2.4G_SRD_ANT4_2402_1Mbps_Lower Band Emissions

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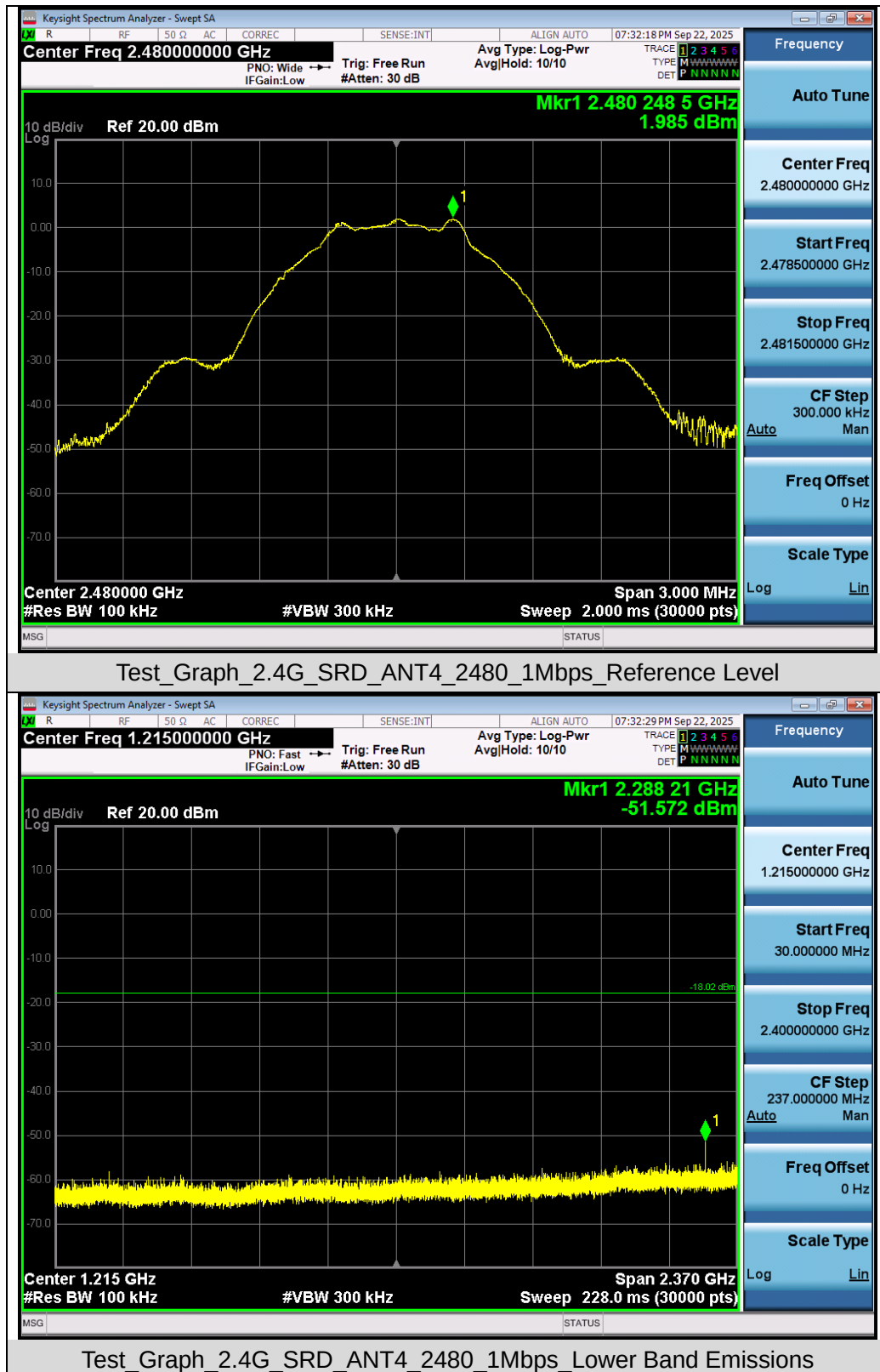


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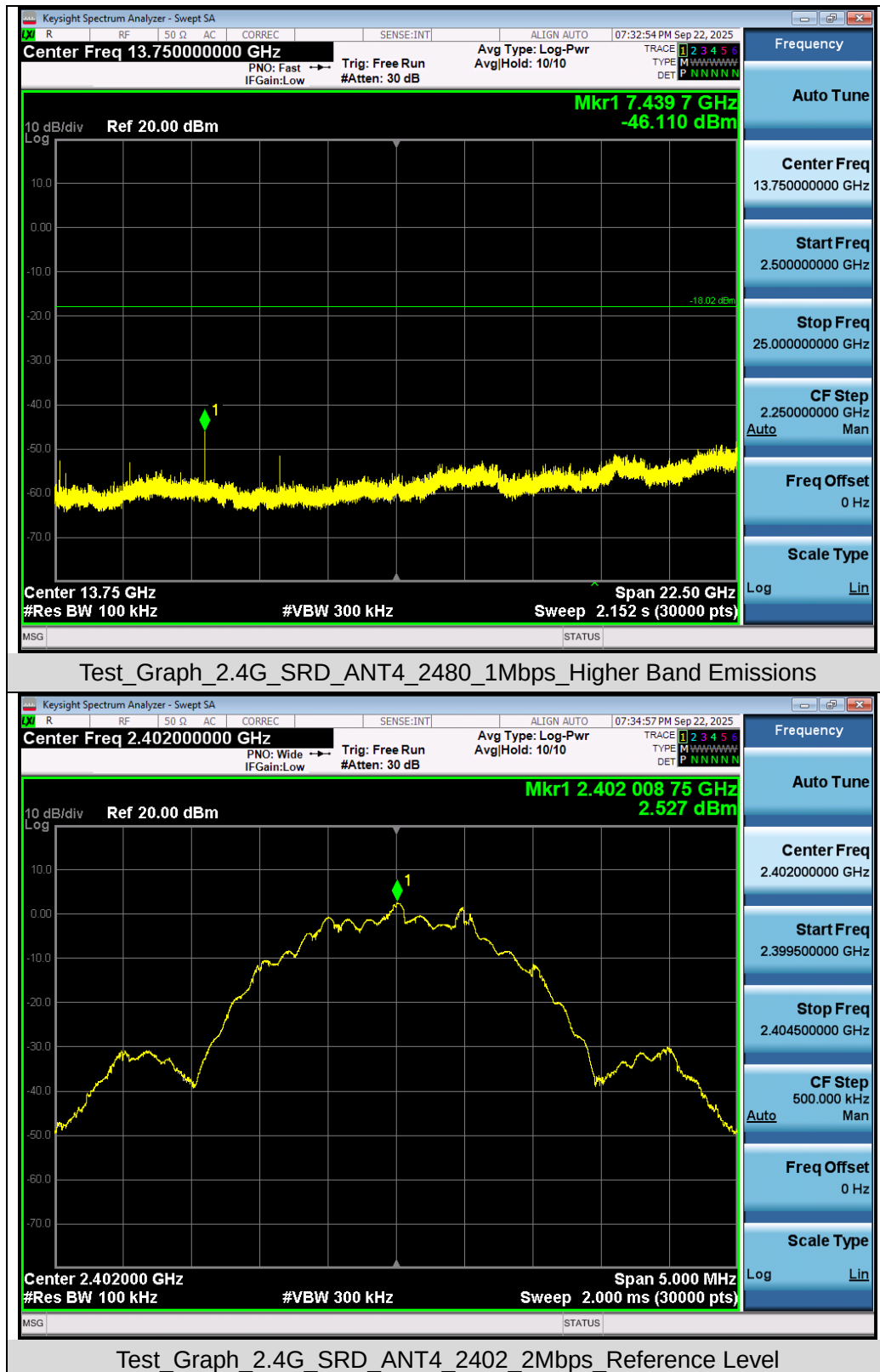
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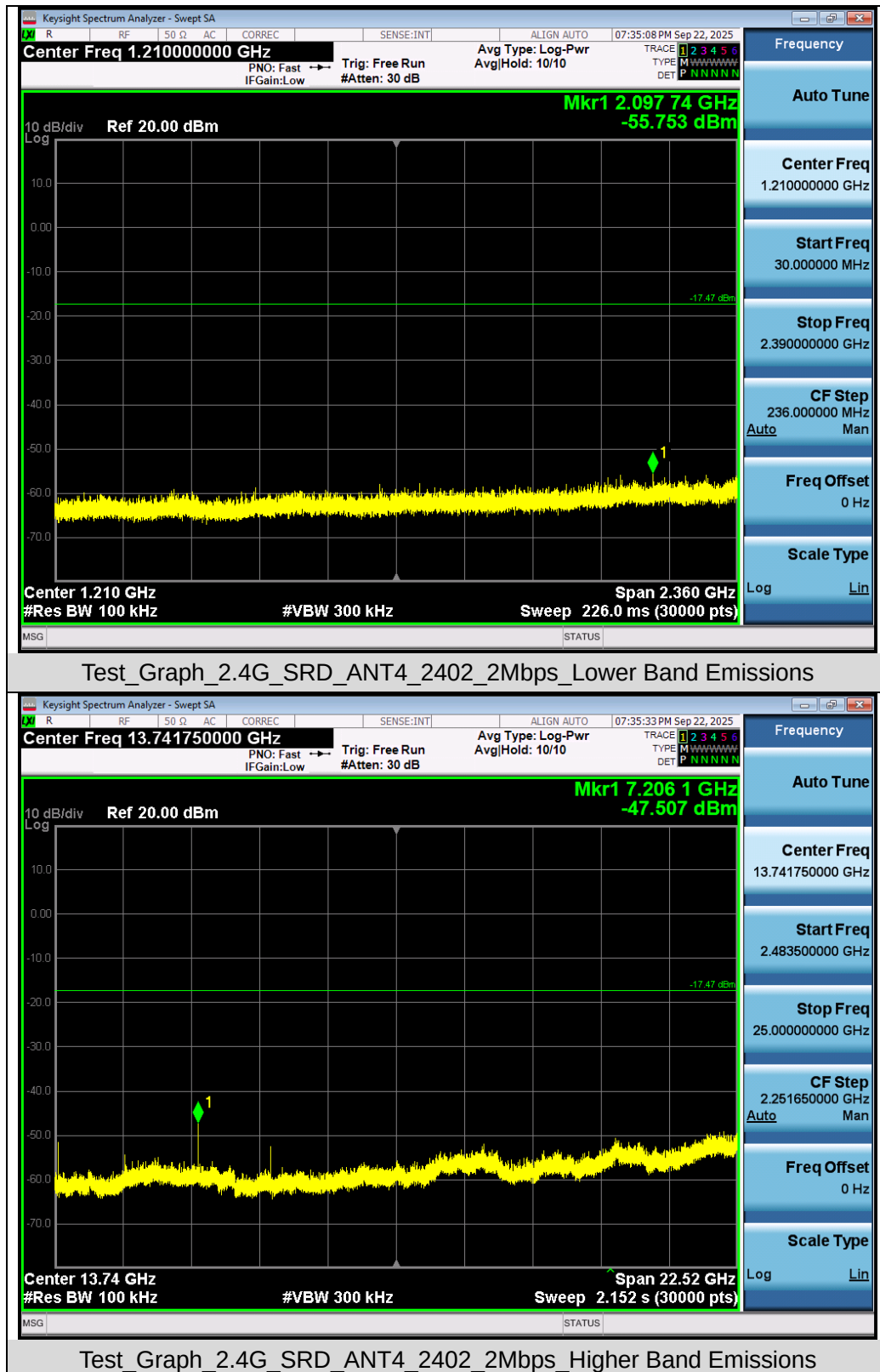


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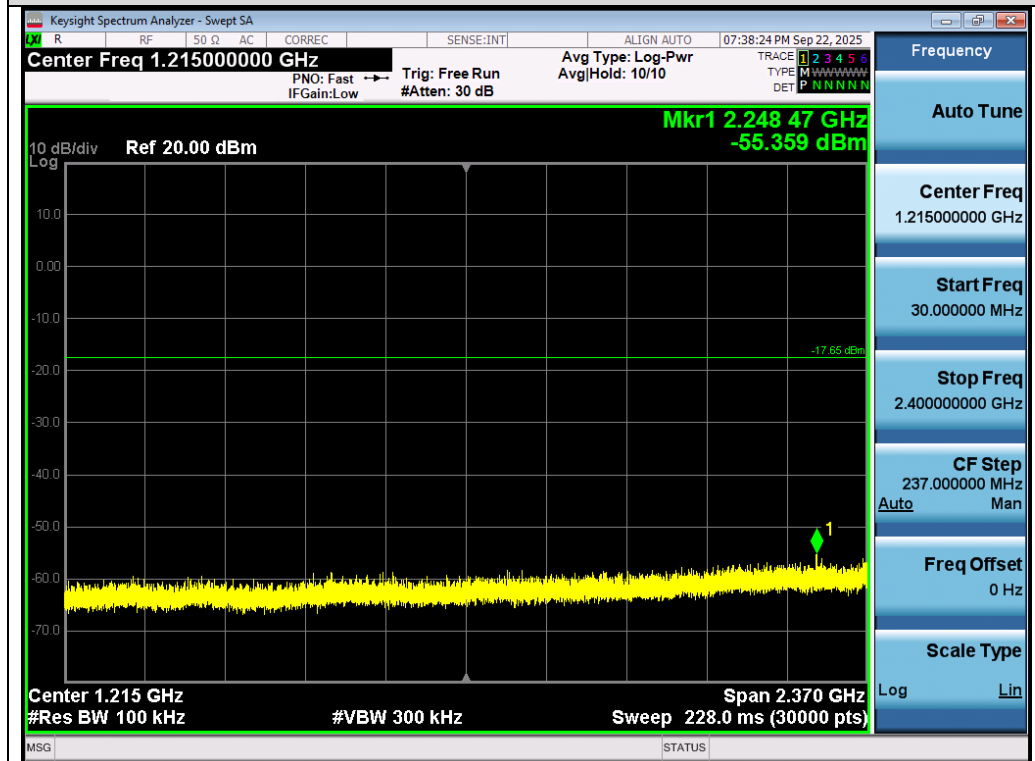
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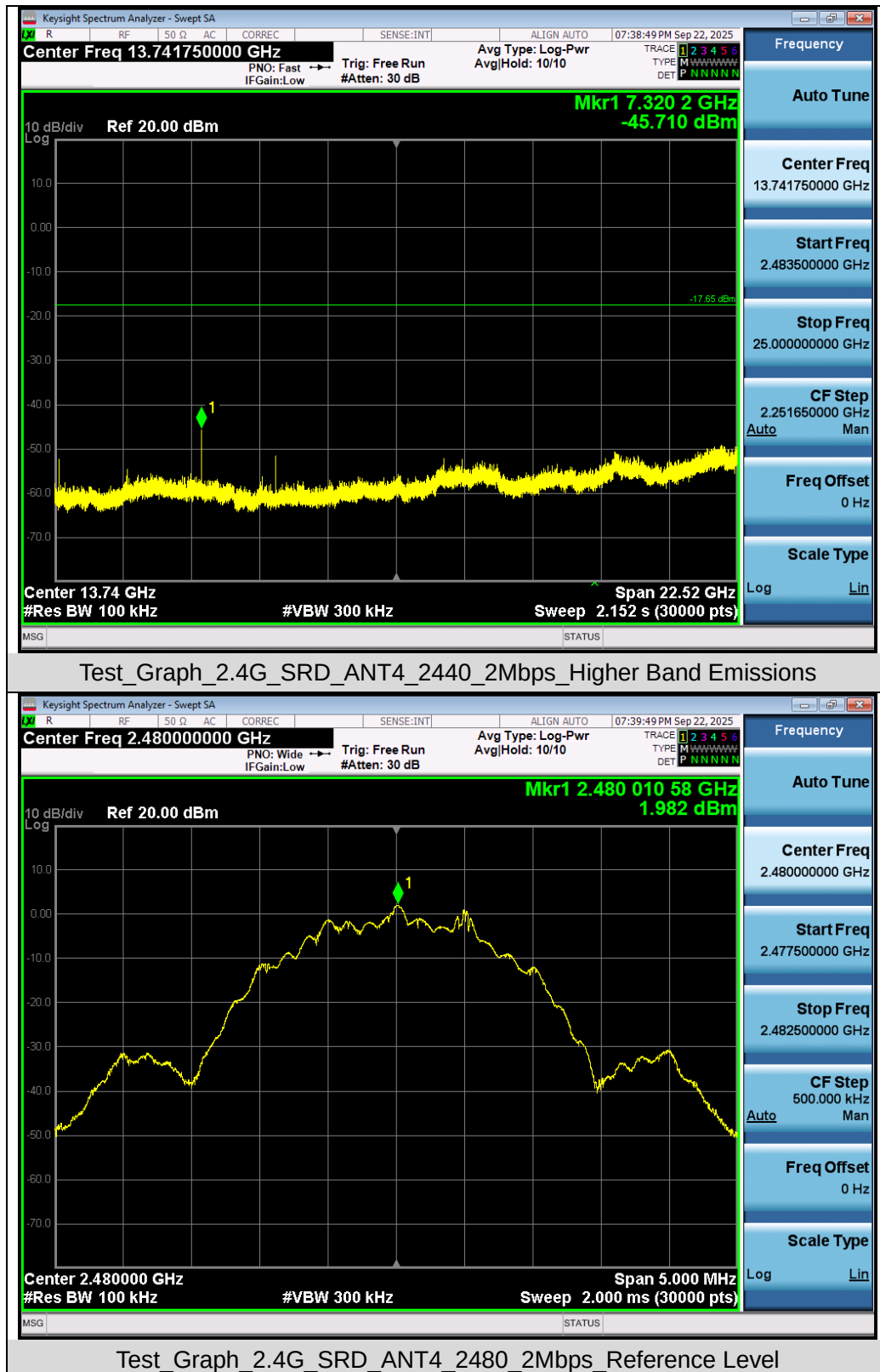
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Test_Graph_2.4G_SRD_ANT4_2440_2Mbps_Lower Band Emissions

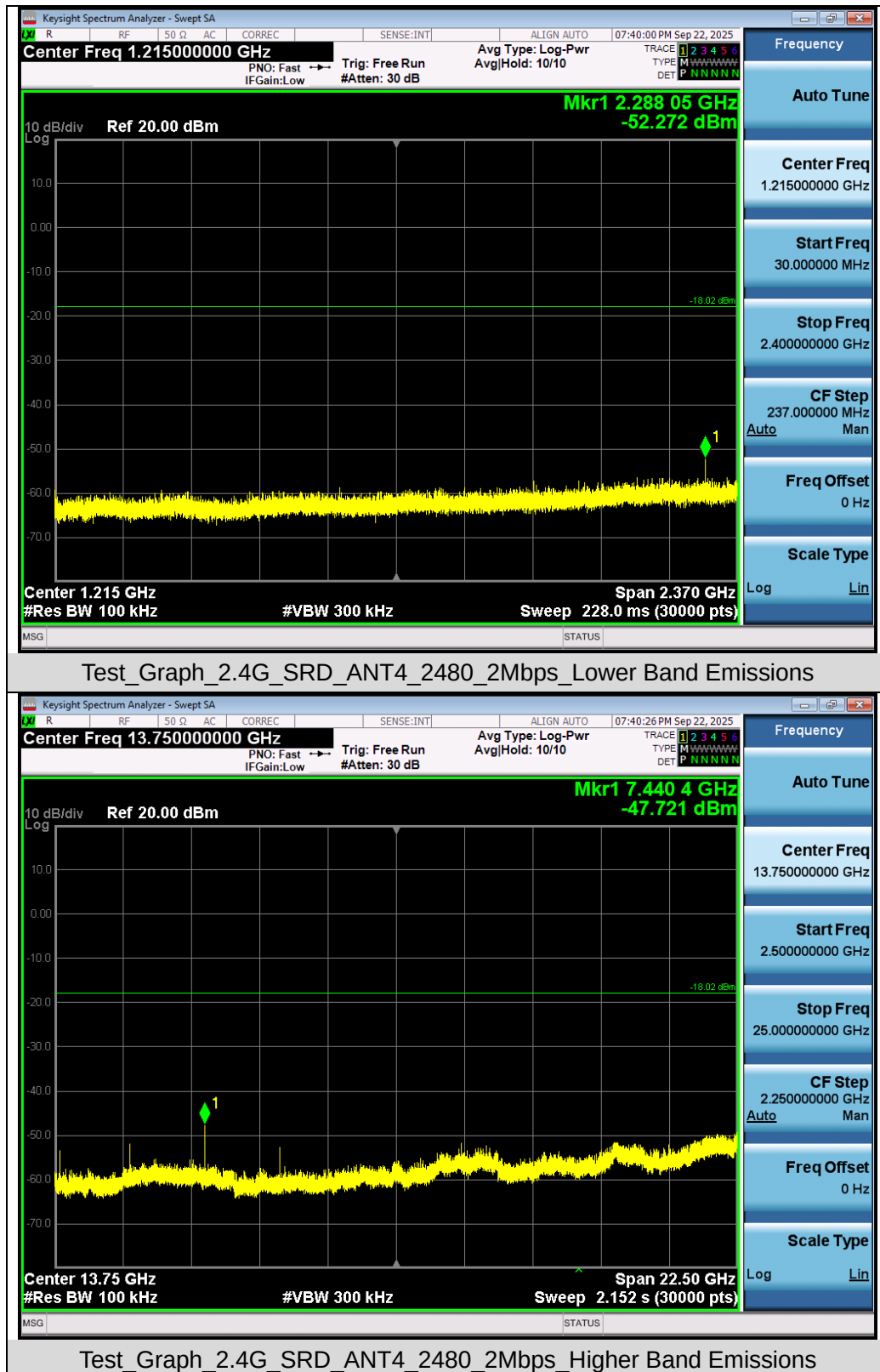
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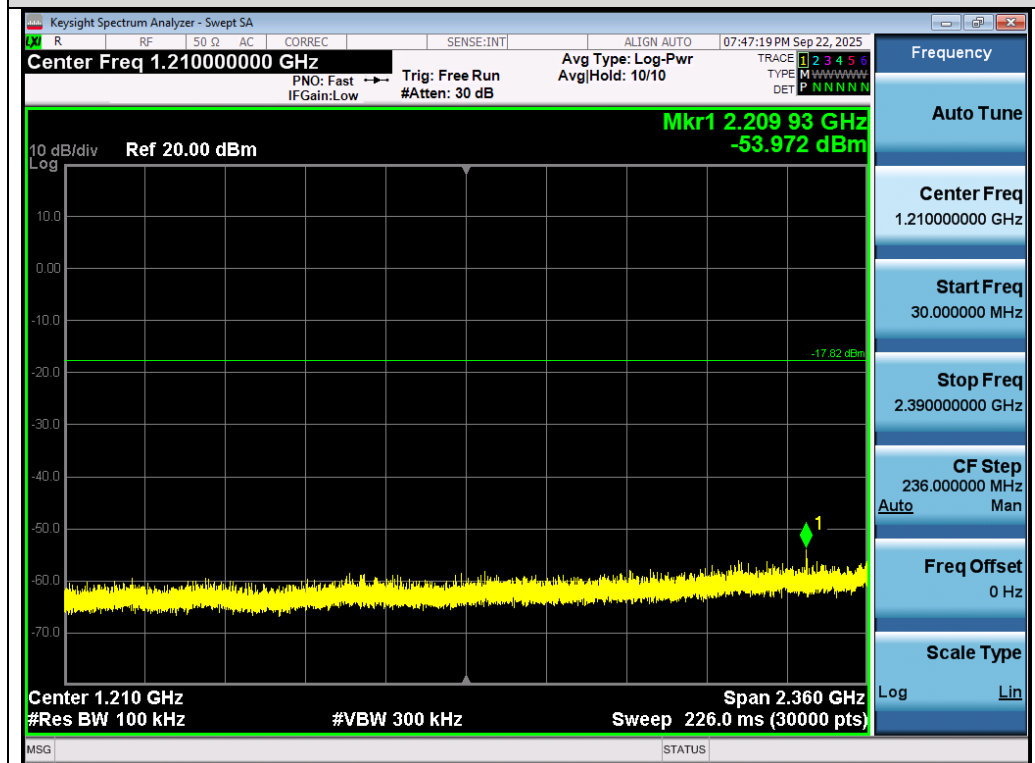
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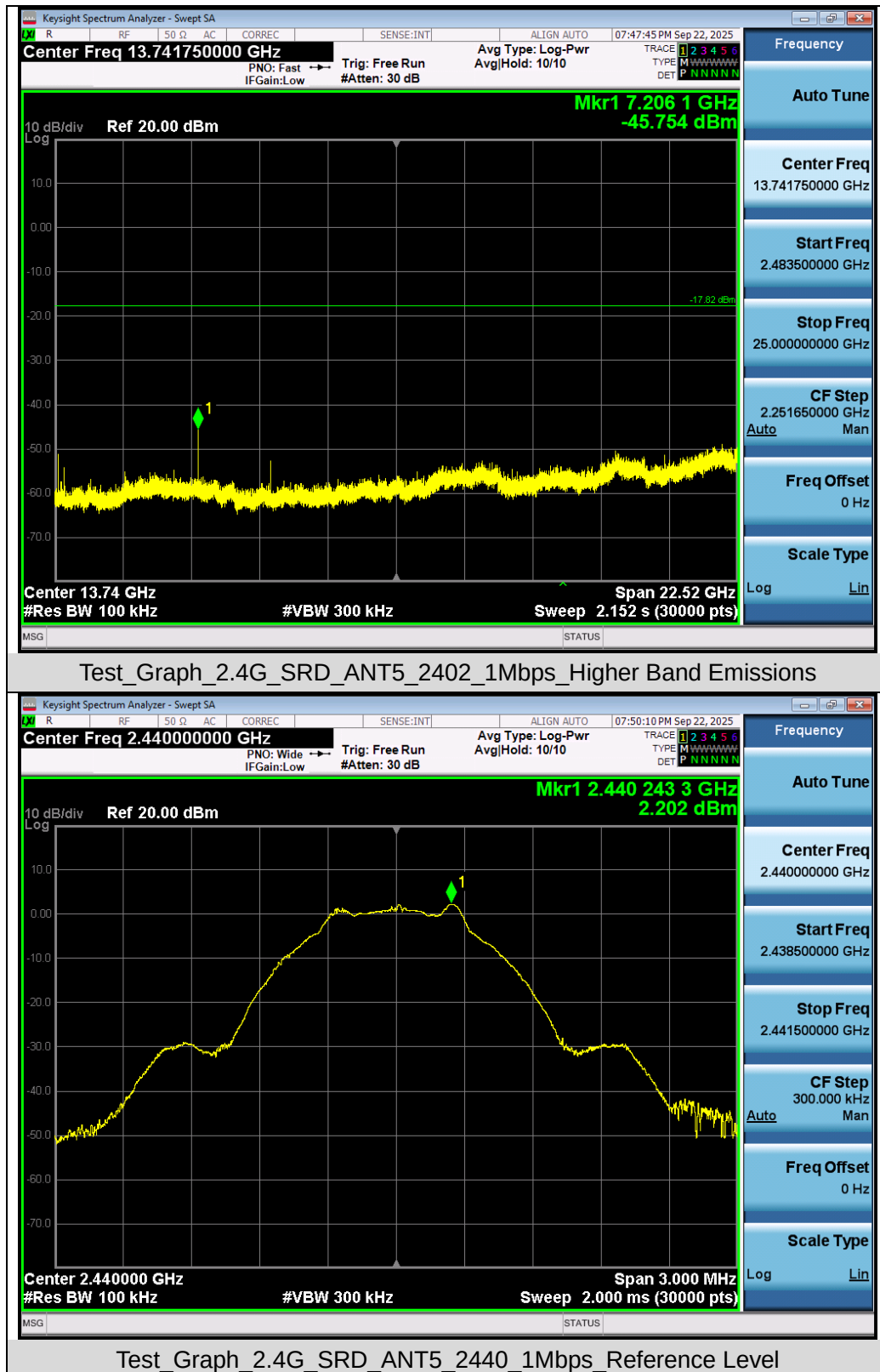
Test_Graph_2.4G_SRD_ANT5_2402_1Mbps_Reference Level



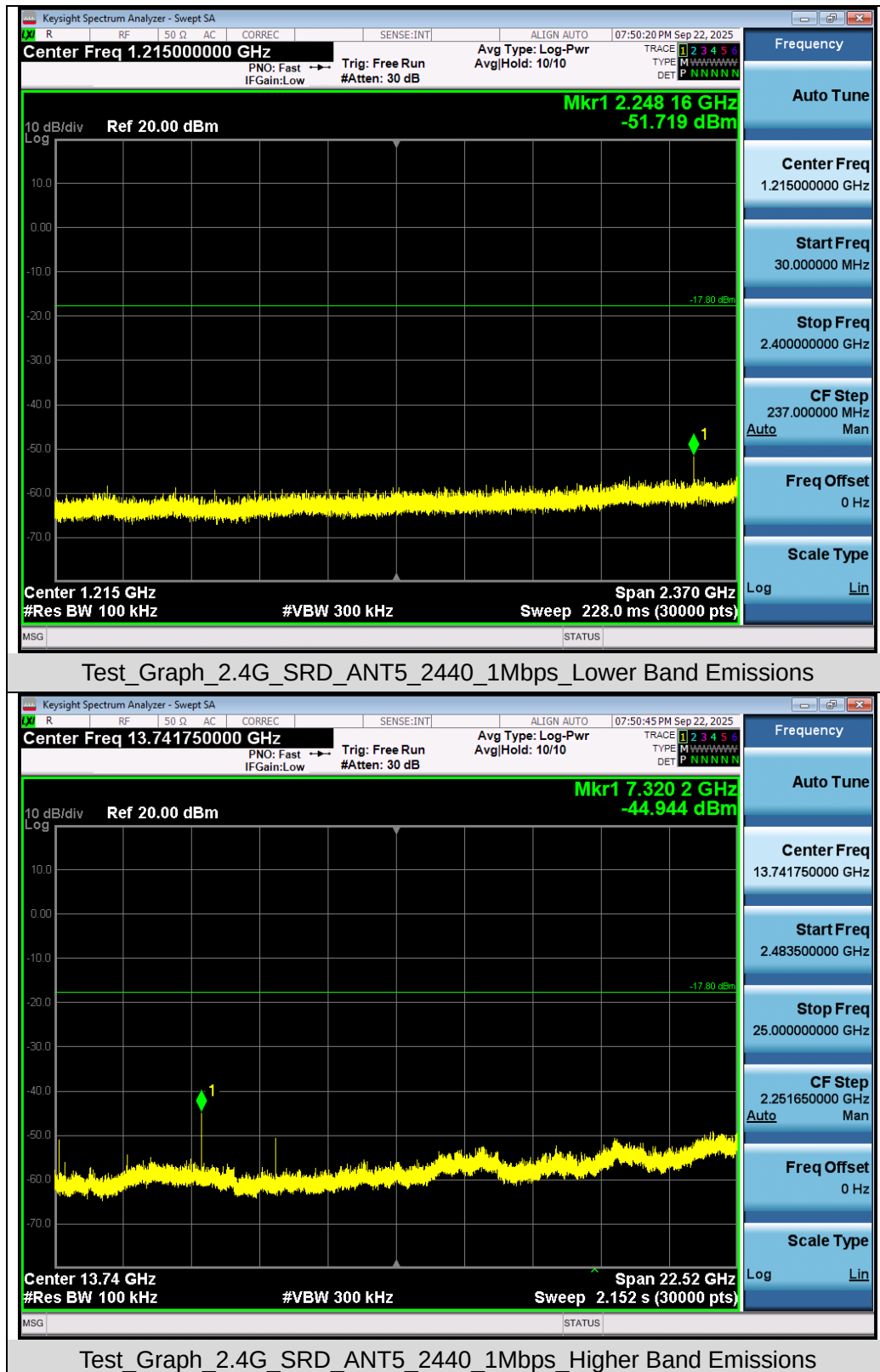
Test_Graph_2.4G_SRD_ANT5_2402_1Mbps_Lower Band Emissions

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