

MIC-R Test Report

Report No.: AGC01110241185TR02A

PRODUCT DESIGNATION : soundcore V40i
BRAND NAME : soundcore
MODEL NAME : A3878R
APPLICANT : Anker Japan Co., Ltd.
DATE OF ISSUE : Apr. 22, 2025
STANDARD(S) : Article 2 Paragraph 1 Item 19 of the Certification,
Article 49.20 of Ordinance Regulating Radio Equipment
MIC Notice No.88 Appendix No.43
REPORT VERSION : V1.0

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Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

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Report Revise Record

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

Note: The original test report AGC01110241185TR02 (dated Nov. 26, 2024 and tested from Nov. 15, 2024 to Nov. 26, 2024) was modified on Apr. 22, 2025, including the following changes and additions:

-Updated battery:

Original:

Battery Information	Model: 1064H Rated Voltage & Cap.: 3.85V 55mAh 0.212Wh
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Updated:

Battery Information	Model: M1154A7 Rated Voltage & Cap.: 3.85V 60mAh 0.231Wh
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- Changed the software version only fixes some bugs and have no effect on the test.

-The pattern of the earphone shell have changed, which do not affect the test results.

Based on the above changes, no further testing is required.

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1. General Information

Applicant	Anker Japan Co., Ltd.
Address	9F Waterras Tower, 2-101, Kanda-Awajicho, Chiyoda-ku, Tokyo, Japan
Manufacturer	Anker Innovations Limited
Address	Unit 56, 8th Floor, Tower 2, Admiralty Centre, 18 Harcourt Road, Hong Kong
Factory	Dongguan Siyoto Electronics Co., Ltd.
Address	No.10, North 7th Street, Qiaotou Qiaodong Road, Qiaotou Town, Dongguan City, Guangdong Province, P.R.China
Product Designation	soundcore V40i
Brand Name	soundcore
Test Model	A3878R
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Apr. 01, 2025
Date of Test	Refer to page 2
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-MIC-BR_EDR-V1

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

Prepared By

Bibo Zhang

Bibo Zhang
(Project Engineer)

Apr. 22, 2025

Reviewed By

Calvin Liu

Calvin Liu
(Reviewer)

Apr. 22, 2025

Approved By

Angela Li

Angela Li
(Authorized Officer)

Apr. 22, 2025

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2. Product Information

2.1 Product Technical Description

Equipment Type	Low Power Data Communication System in the 2.4GHz band
Operation Frequency Range	2402MHz-2480MHz
Bluetooth Version	V5.4
Hardware Version	V04A
Software Version	V0.25
Modulation Type	BR ☒ GFSK:1Mbps; EDR ☒ $\pi/4$ -DQPSK:2Mbps ☒ 8DPSK:3Mbps
Number of channels	79 Channels
Channel Separation	1 MHz
Rated Antenna Power	0.03mW/MHz
Antenna Designation	Monopole Antenna
Antenna Gain	-2.8dBi
Test Channel	2.402GHz (CH00) 2.441GHz (CH39) 2.480GHz (CH78)
Test Voltage	HV: (4.235V) High Voltage + 10% of Normal Voltage LV: (3.465V) Low Voltage - 10% of Normal Voltage NV: (3.85V) Normal Voltage

Note:

1. The EUT has single chip with one antenna and the output of the antenna feeder is 50 Ohm.
2. The EUT is a 2.4GHz single-chip controller according to MIC Notice No.88 Annex 43.
3. Please refer to Appendix II for the photographs of the EUT. For more details, please refer to the User's manual of the EUT.

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2.2 Test Frequency List

Channel No.	Frequency (GHz)	Channel No.	Frequency (GHz)	Channel No.	Frequency (GHz)
00	2.402	28	2.430	56	2.458
01	2.403	29	2.431	57	2.459
02	2.404	30	2.432	58	2.460
03	2.405	31	2.433	59	2.461
04	2.406	32	2.434	60	2.462
05	2.407	33	2.435	61	2.463
06	2.408	34	2.436	62	2.464
07	2.409	35	2.437	63	2.465
08	2.410	36	2.438	64	2.466
09	2.411	37	2.439	65	2.467
10	2.412	38	2.440	66	2.468
11	2.413	39	2.441	67	2.469
12	2.414	40	2.442	68	2.470
13	2.415	41	2.443	69	2.471
14	2.416	42	2.444	70	2.472
15	2.417	43	2.445	71	2.473
16	2.418	44	2.446	72	2.474
17	2.419	45	2.447	73	2.475
18	2.420	46	2.448	74	2.476
19	2.421	47	2.449	75	2.477
20	2.422	48	2.450	76	2.478
21	2.423	49	2.451	77	2.479
22	2.424	50	2.452	78	2.480
23	2.425	51	2.453		
24	2.426	52	2.454		
25	2.427	53	2.455		
26	2.428	54	2.456		
27	2.429	55	2.457		

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2.3 Test Items and The Results

Article 2 Paragraph 1 Item 19 of the Certification Measurement Project		
Ordinance Regulating Radio Equipment	Description of Test	Result
Article 5	Frequency Tolerance	Complies
Article 6	Occupied Bandwidth	Complies
Article 7	Unwanted Emission Strength	Complies
Article 49.20 & Article 14	Antenna Power Error	Complies
Article 49.20	EIRP Antenna Power	Complies
Article 24	Secondary Radiated Emission Strength	Complies
Article 9.4	Interference Prevention Function	Complies
Article 49.20	Dwell Time	Complies
Article 49.20	Carrier Sensing Function (1)	Not applicable (See Note 1)
Article 49.20	Carrier Sensing Function (2)	Not applicable (See Note 1)
Article 49.20	Transmission Antenna Absolute Gain	Not applicable (See Note 2)
Article 49.20	Half Power Beam Angle (Radiation angle of antenna)	Not applicable (See Note 2)
Article 49.20	Housing Requirements	Complies

Note:

1. FHSS system equipment does not need to meet carrier sensing test.
2. It is unnecessary to testing, when a E.I.R.P. is less than 6.91dBm/MHz.

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2.4 Description of Test Modes

Test Mode	Description
Transmitter Test	
Unmod_2402	Transmitting mode without modulation (Channel: 00)
Unmod_2441	Transmitting mode without modulation (Channel: 39)
Unmod_2480	Transmitting mode without modulation (Channel: 78)
BR_2402_1Mbps	Bluetooth BR Transmitting mode (Channel: 00, Rate: 1Mbps)
BR_2441_1Mbps	Bluetooth BR Transmitting mode (Channel: 39, Rate: 1Mbps)
BR_2480_1Mbps	Bluetooth BR Transmitting mode (Channel: 78, Rate: 1Mbps)
EDR_2402_2Mbps	Bluetooth EDR Transmitting mode (Channel: 00, Rate: 2Mbps)
EDR_2441_2Mbps	Bluetooth EDR Transmitting mode (Channel: 39, Rate: 2Mbps)
EDR_2480_2Mbps	Bluetooth EDR Transmitting mode (Channel: 78, Rate: 2Mbps)
EDR_2402_3Mbps	Bluetooth EDR Transmitting mode (Channel: 00, Rate: 3Mbps)
EDR_2441_3Mbps	Bluetooth EDR Transmitting mode (Channel: 39, Rate: 3Mbps)
EDR_2480_3Mbps	Bluetooth EDR Transmitting mode (Channel: 78, Rate: 3Mbps)
BR_HOP_1Mbps	Bluetooth BR Transmitting mode (Hopping, Rate: 1Mbps)
EDR_HOP_2Mbps	Bluetooth EDR Transmitting mode (Hopping, Rate: 2Mbps)
EDR_HOP_3Mbps	Bluetooth EDR Transmitting mode (Hopping, Rate: 3Mbps)
Receiver Test	
BR_2402_1Mbps	Bluetooth BR Receiving mode (Channel: 00, Rate: 1Mbps)
BR_2441_1Mbps	Bluetooth BR Receiving mode (Channel: 39, Rate: 1Mbps)
BR_2480_1Mbps	Bluetooth BR Receiving mode (Channel: 78, Rate: 1Mbps)
EDR_2402_2Mbps	Bluetooth EDR Receiving mode (Channel: 00, Rate: 2Mbps)
EDR_2441_2Mbps	Bluetooth EDR Receiving mode (Channel: 39, Rate: 2Mbps)
EDR_2480_2Mbps	Bluetooth EDR Receiving mode (Channel: 78, Rate: 2Mbps)
EDR_2402_3Mbps	Bluetooth EDR Receiving mode (Channel: 00, Rate: 3Mbps)
EDR_2441_3Mbps	Bluetooth EDR Receiving mode (Channel: 39, Rate: 3Mbps)
EDR_2480_3Mbps	Bluetooth EDR Receiving mode (Channel: 78, Rate: 3Mbps)

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3. Setup of Equipment Under Test

3.1 Setup Configuration of EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

3.2 Support Equipment

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

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

Whether support unit is used?				
Yes				
Item	Equipment	Trade Name	Model No.	Specification
1	Control Box	RISYM	USB-TTL	N/A

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4. Test Environment

4.1 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

4.2 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.

VCCI Membership No.: 4112

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered in accordance with VCCI Council Rules.

VCCI Registration No. C-20098 for conducted emissions at AC main power ports

VCCI Registration No. T-20102 for conducted emissions at telecommunication ports

VCCI Registration No. R-20136 for radiated emissions below 1GHz

VCCI Registration No. G-20132 for radiated emissions above 1GHz

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4.3 Environmental Conditions

	Normal Conditions
Temperature range (°C)	15 - 35
Relative humidity range	45 % - 85 %
Pressure range (kPa)	86 - 106

4.4 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 Radio Frequency	$U_c = \pm 1 \times 10^{-7}$
Uncertainty of Total RF Power, Conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of Total RF Power, Radiated	$U_c = \pm 1.1 \text{ dB}$
Uncertainty of Occupied Channel Bandwidth	$U_c = \pm 2 \%$
Uncertainty of RF Power Density, Conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of Spurious Emissions, Conducted (30MHz-1GHz)	$U_c = \pm 2.7 \text{ dB}$
Uncertainty of Spurious Emissions, Conducted (1GHz-40GHz)	$U_c = \pm 3.2 \text{ dB}$
Uncertainty of Dwell Time	$U_c = \pm 2\%$

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4.5 List of Equipment Used

● Measuring Equipment Calibration Information							
Used	Calibration Company Abbreviation		Full Name of calibration company				
☐	CCIC		CCIC (Shenzhen) Metrology & Testing Service Co.,Ltd				
☒	GRG		GRG METROLOGY & TEST GROUP CO.,LTD.				
● Calibration Information (Article 24-2, Paragraph 4 of the Radio Act)							
☐	a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) or a designated calibration agency under Article 102-18-1 of the Radio Act						
☐	(b) Calibration conducted based on the regulations of Article 135 or 144 of the Measurement Act						
☒	(c) Calibration conducted in foreign countries, which is equivalent to calibration conducted by the NICT or a designated calibration agency under Article 102-18-1 of the Radio Act						
☐	(d) Calibration, etc. conducted by using measuring instruments and other facilities listed at the bottom of appended table 3 of the Radio Act, which is to have been calibrated as described in (a) through (c) above						
● 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	2024-05-24	2025-05-23
☒	AGC-ER-E041	Spectrum Analyzer	Agilent	N9020A	W1312-60196	2024-05-24	2025-05-23
☒	AGC-BQ-E102	Power Meter	R&S	NRP-Z21	104604	2024-05-24	2025-05-23
☒	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08
☐	AGC-ER-E079	Wireless Connectivity Tester	R&S	CMW270	101933	2024-05-24	2025-05-23
☐	AGC-ER-E075	Small Environmental Tester	SH-242	ESPEC	93008290	2024-07-24	2026-07-23
☐	AGC-ER-E059	Signal Generator	Agilent	N5182B	MY53050647	2024-02-01	2025-01-31
☒	--	RF Connection Cable	N/A	1#	N/A	Each time	N/A
☒	--	RF Connection Cable	N/A	2#	N/A	Each time	N/A
☒	AGC-ER-E017	temperature and humidity recorder	testo	608-H1	N/A	2024-05-29	2026-05-28
☒	AGC-ER-E091	DC Power Supply	AIDEKESI	IT6720	800103030787810080	2024-03-28	2026-03-27

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5. Measurement Results of Article 2 Paragraph 1 Item 19

5.1 Frequency Tolerance Measurement

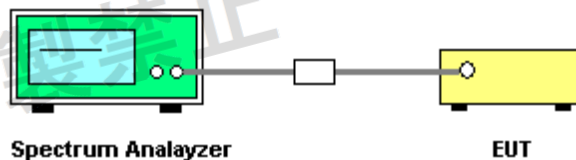
Test Limit

Test Item	Limits
Frequency Tolerance (2400~2483.5MHz)	$-50\text{ppm} \leq \text{Frequency Error} \leq 50\text{ppm}$

Test Procedure

1. Frequency accuracy of SA shall be less than 10% of limits tolerance (5ppm)
2. Setting of SA is following as: RB: 10kHz / VB: 30kHz / SPAN: 0.5MHz
3. Center Frequency: The center frequency of testing for EUT
4. Sweep time=Auto
5. Sweep mode=Continuous sweep
6. Detect mode=Positive peak
7. EUT have transmitted absence of modulation signal and fixed channelize. if is using the mark cursor to mark the peak frequency value, f_c is declaring of channel frequency.
8. Then the frequency tolerance formula is $(f-f_c)/f_c \times 10^6 \text{ppm}$ and the limit is less than $\pm 50\text{ppm}$

Test Setup



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Test Result

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test Data of Frequency Tolerance								
Test Mode	Measure Frequency (MHz)			Frequency Error (ppm)			Limit (ppm)	P/F
	NV	LV	HV	NV	LV	HV		
Unmod_2402	2402.0178	2402.0168	2402.0148	7.40	6.98	6.15	±50	Pass
Unmod_2441	2441.0123	2441.0118	2441.0113	5.02	4.82	4.61	±50	Pass
Unmod_2480	2480.0113	2480.0108	2480.0108	4.54	4.34	4.34	±50	Pass

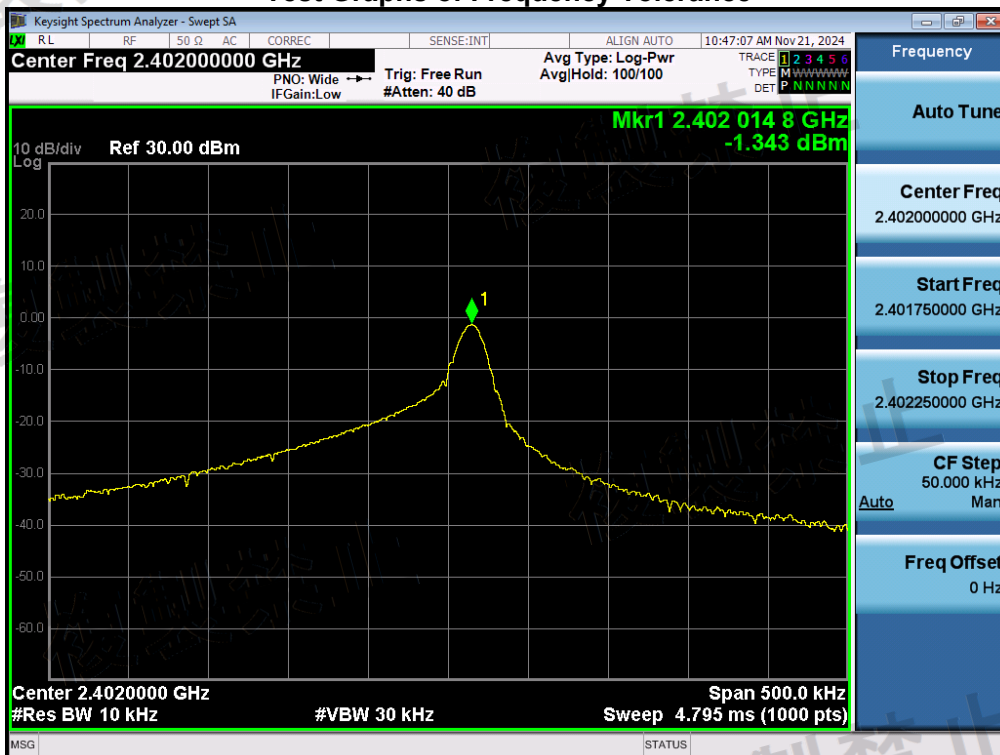
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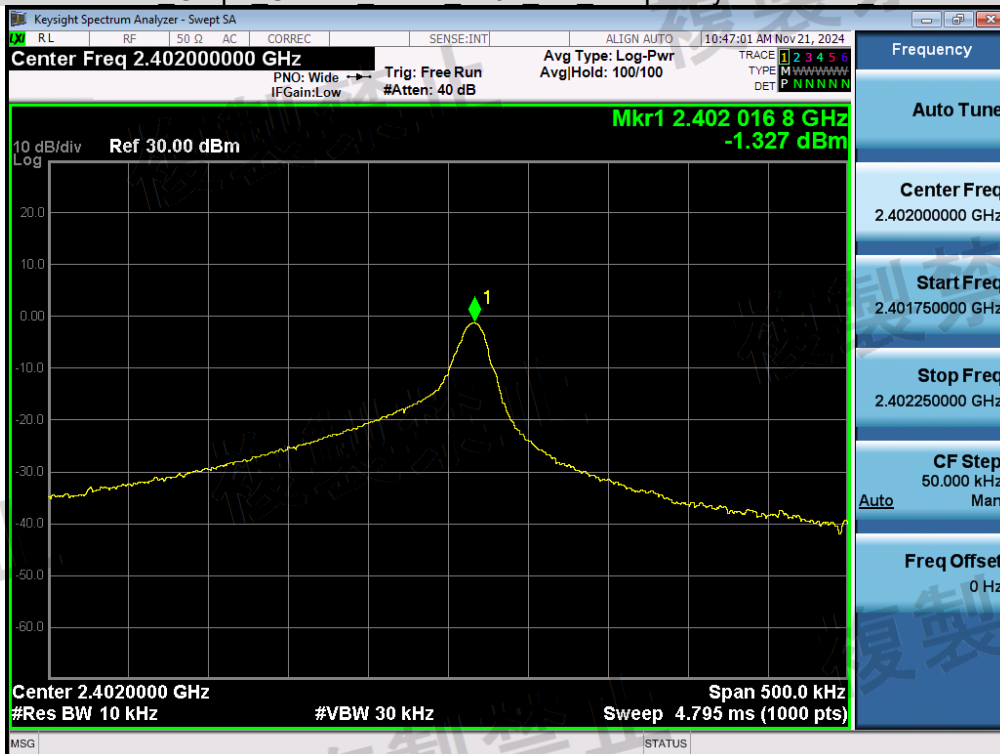
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Test Graphs of Frequency Tolerance



Test Graph Unmod ANT1 2402 NA Frequency Tolerance HV



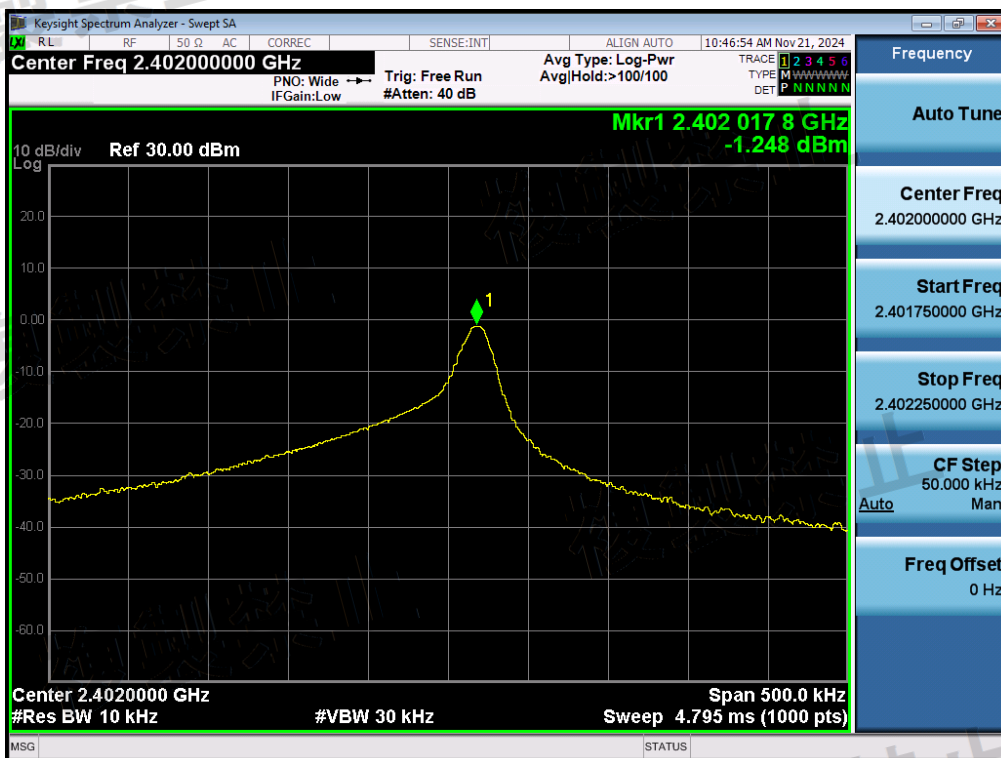
Test_Graph_Unmod_ANT1_2402_NA_Frequency Tolerance_LV

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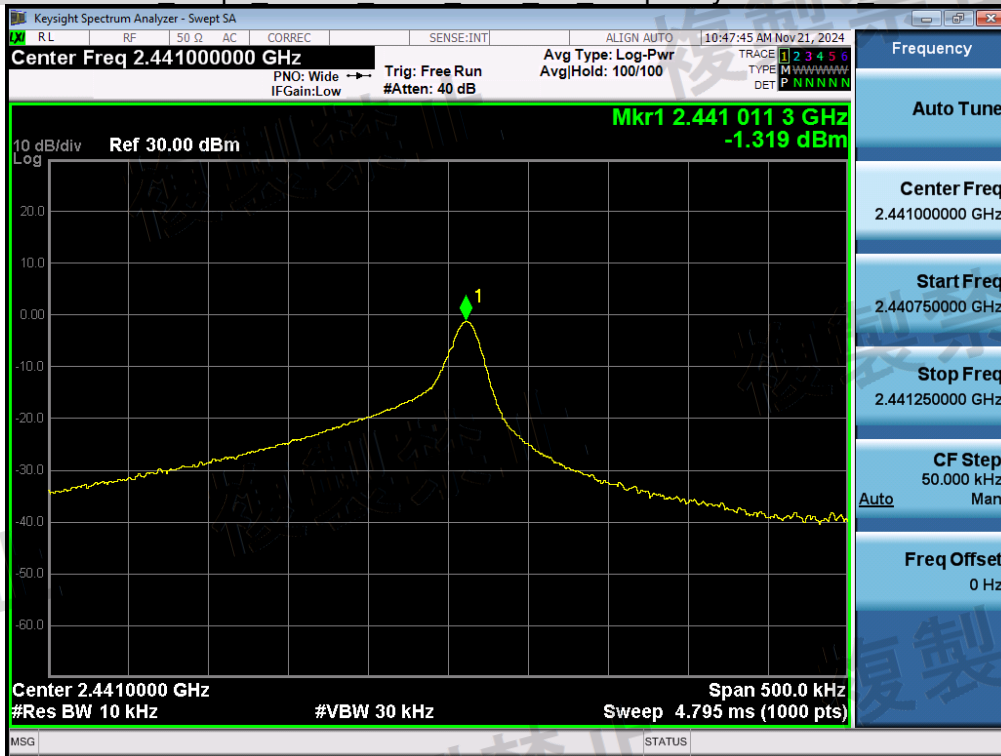
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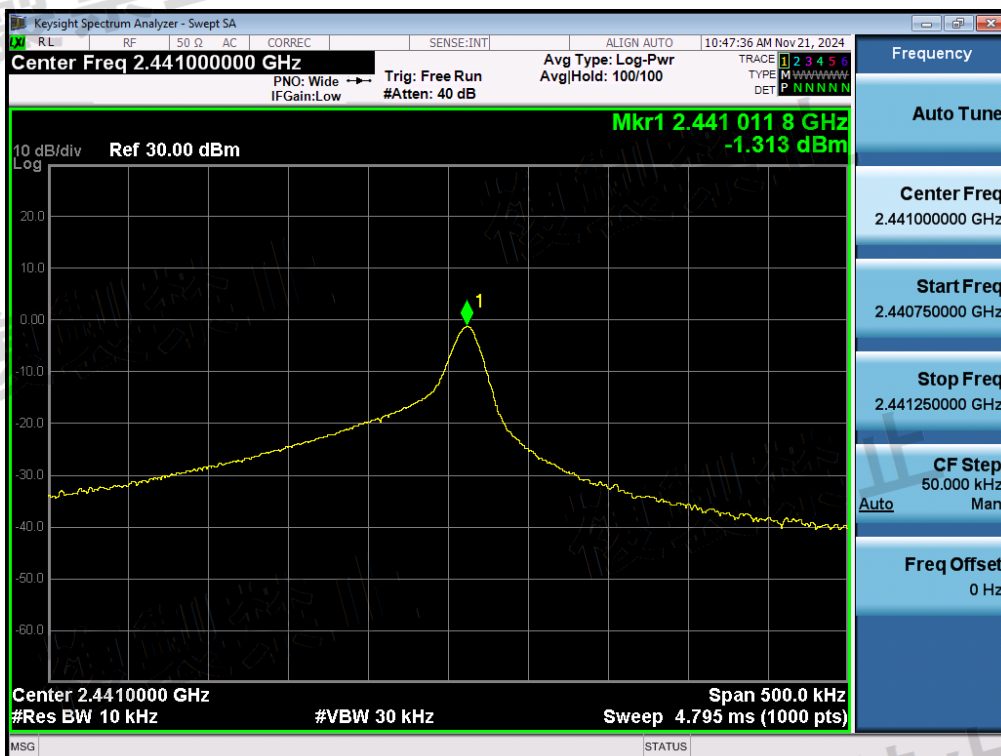


Test Graph Unmod ANT1 2402 NA Frequency Tolerance NV

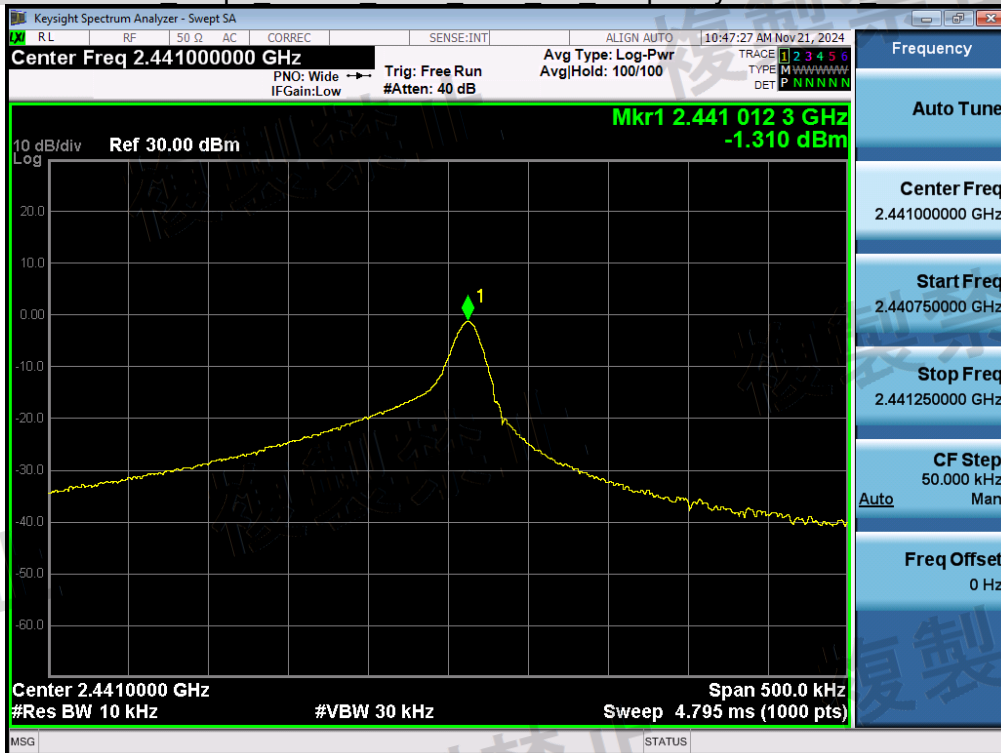


Test Graph Unmod ANT1 2441 NA Frequency Tolerance HV

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Test Graph Unmod ANT1 2441 NA Frequency Tolerance LV

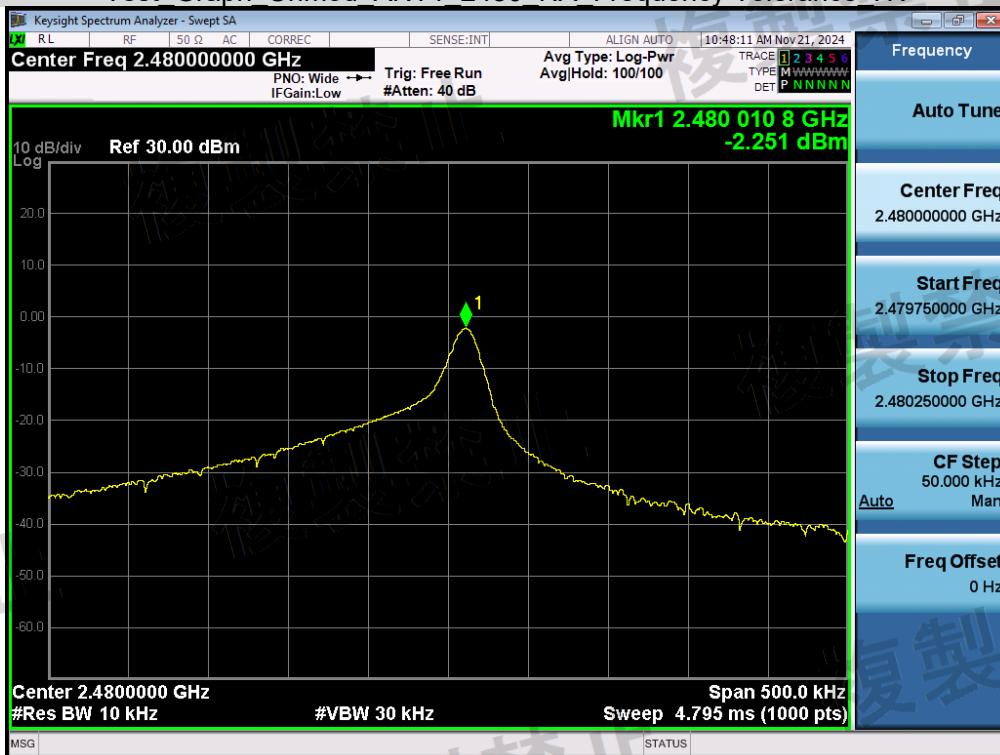


Test_Graph_Unmod_ANT1_2441_NA_Frequency Tolerance_NV

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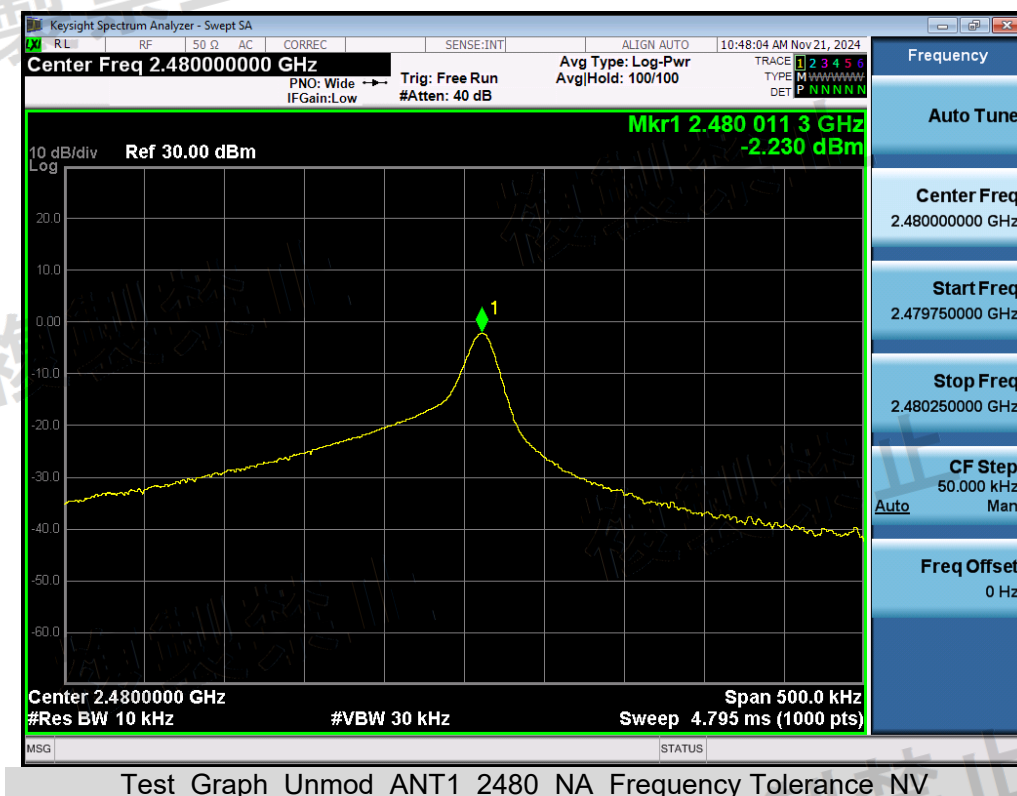


Test Graph Unmod ANT1 2480 NA Frequency Tolerance HV



Test_Graph_Unmod_ANT1_2480_NA_Frequency Tolerance_LV

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5.2 Occupied Bandwidth Measurement

Test Limit

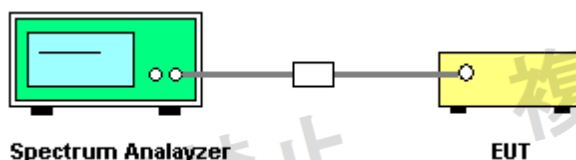
Test Item	Limits
Occupied Bandwidth	FH < 83.5MHz; 26MHz ≤ OFDM 40M system ≤ 40MHz; OFDM 20M system, DS, Others ≤ 26MHz

Test Procedure

The device under test is connected to the spectrum analyzer through a radio frequency cable and the settings are as follows:

1. EUT have Continuous maximum power of hopping mode (For FHSS Device).
2. SA set to 99% of occupied bandwidth to measure occupied bandwidth.
3. SA set to 90% of occupied bandwidth to measure spreading bandwidth.
4. RBW=300kHz
5. VBW=300kHz
6. SPAN=100MHz
7. ATT: 20dB /Ref:10dBm (actual sample power adjustment is for reference only)
8. Sweep time=Auto / Sweep Mode: Continuous sweep
9. Detect mode=Positive peak
10. Trace mode=Max hold
11. Record the result for Occupied Bandwidth Measurements in report.

Test Setup



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Test Result

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test Data of Occupied Bandwidth and Spreading Bandwidth								
Test Mode	Occupied Bandwidth (MHz)			Limit (MHz)	Spreading Bandwidth (MHz)			P/F
	NV	LV	HV		NV	LV	HV	
BR_HOP_1Mbps	78.118	78.117	78.120	<83.5	70.749	70.798	70.749	Pass
EDR_HOP_2Mbps	78.235	78.227	78.201	<83.5	70.746	70.738	70.517	Pass
EDR_HOP_3Mbps	78.243	78.297	78.288	<83.5	70.657	70.929	70.701	Pass

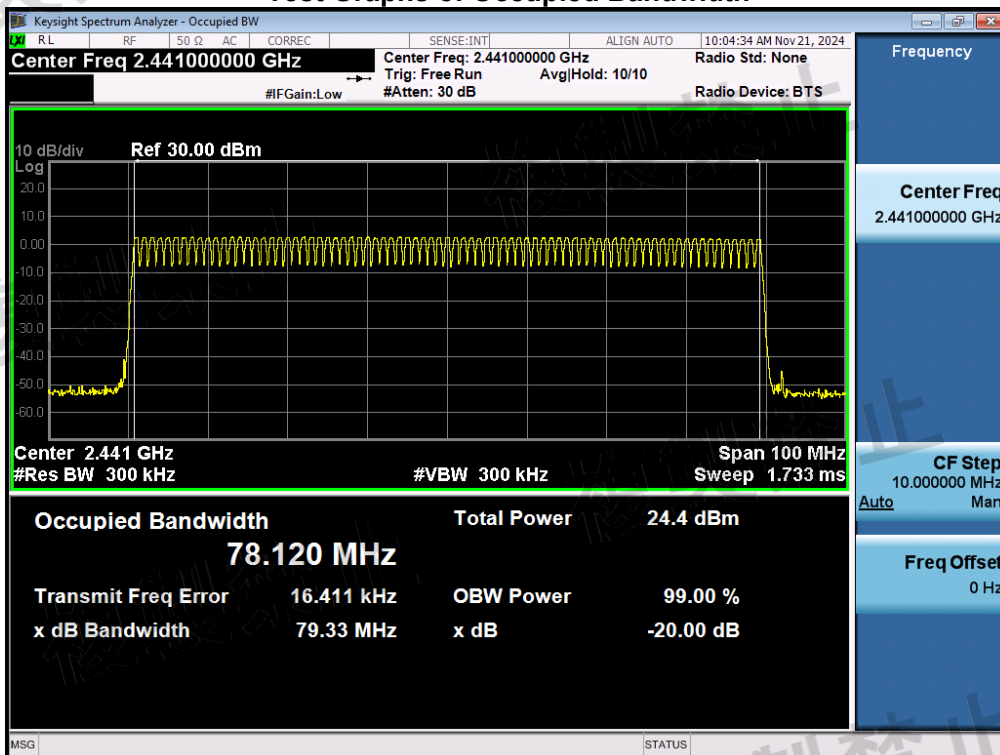
Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

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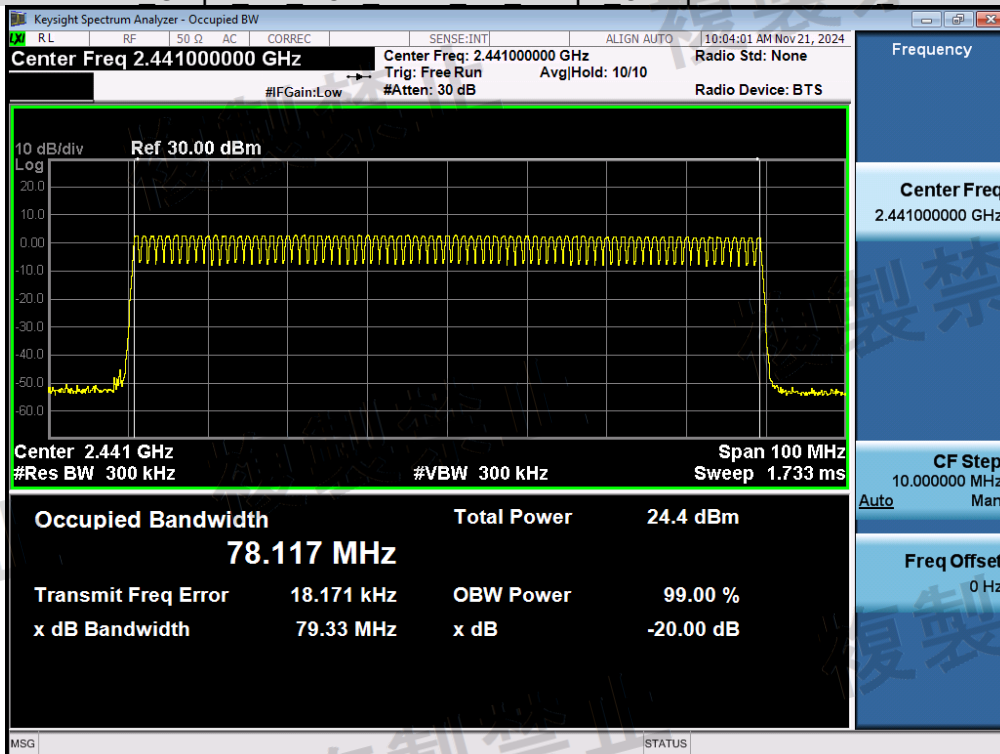
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Test Graphs of Occupied Bandwidth



Test Graph BR HOP ANT1 NA 1Mbps Occupied Bandwidth HV



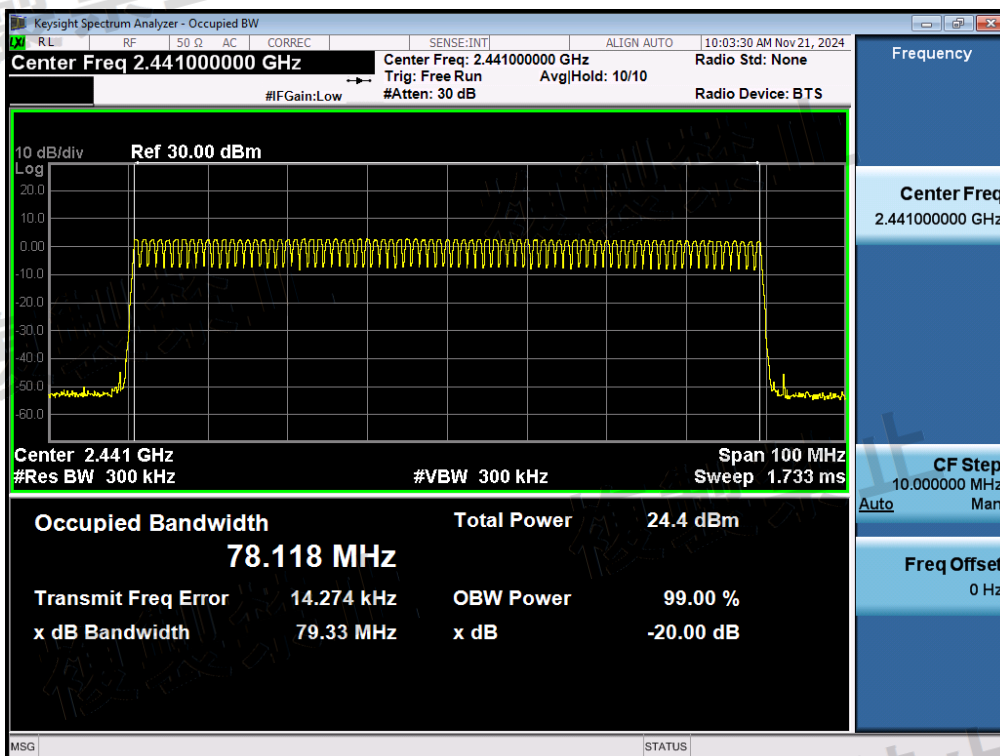
Test_Graph_BR_HOP_ANT1_NA_1Mbps_Occupied Bandwidth_LV

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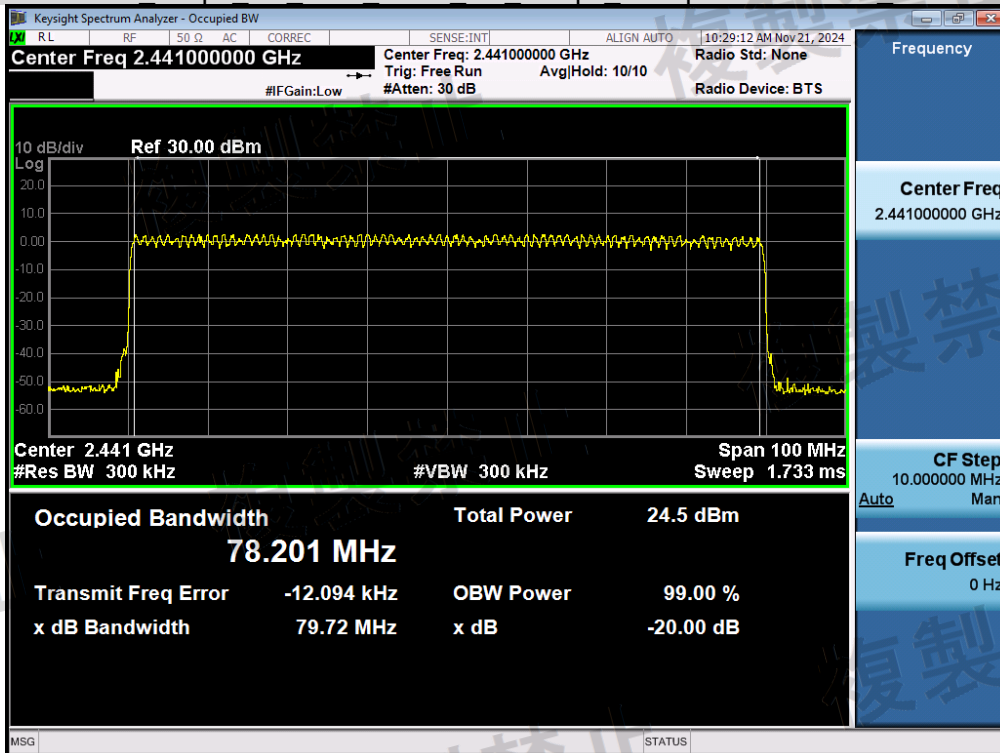
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Test Graph BR HOP ANT1 NA 1Mbps Occupied Bandwidth NV



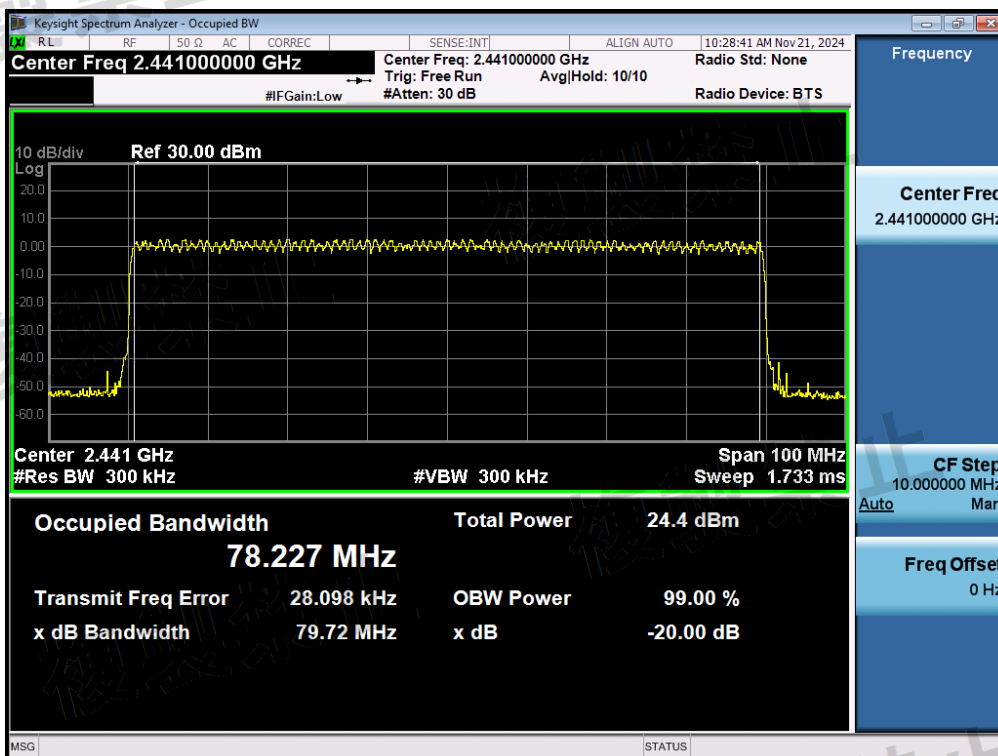
Test_Graph_EDR_HOP_ANT1_NA_2Mbps_Occupied Bandwidth_HV

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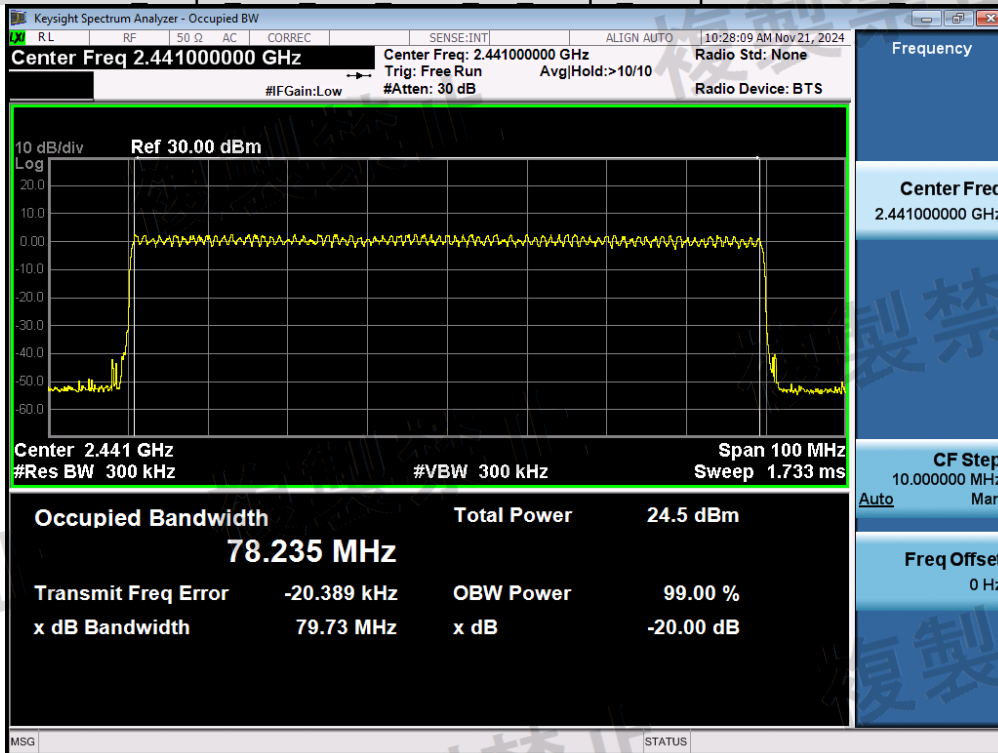
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Test Graph EDR HOP ANT1 NA 2Mbps Occupied Bandwidth LV



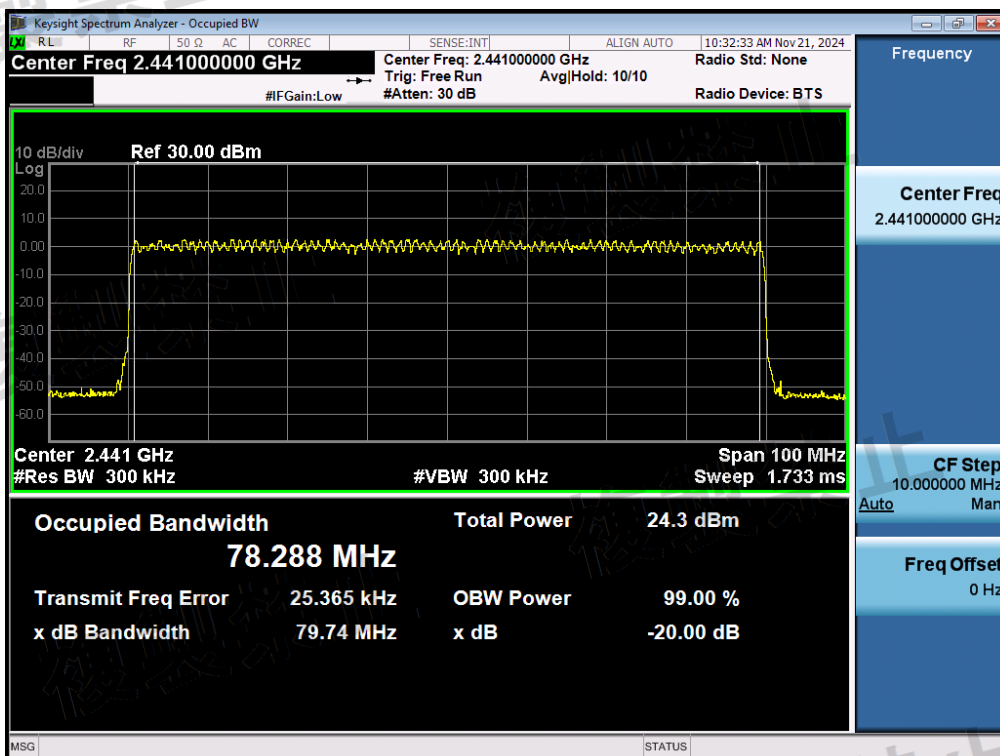
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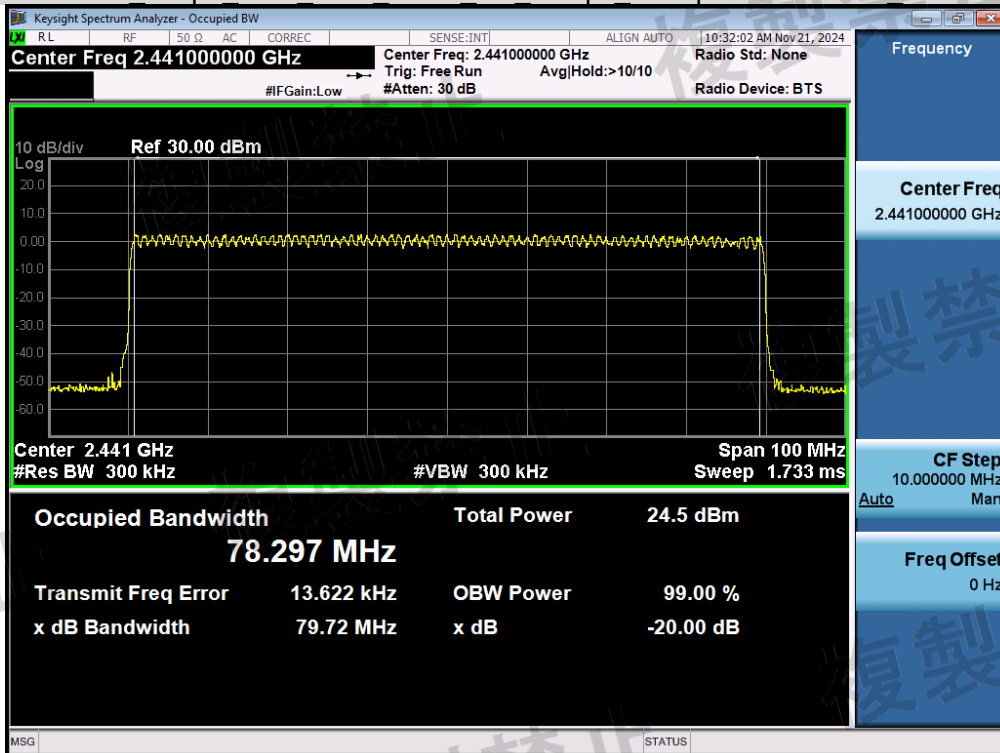
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Test Graph EDR HOP ANT1 NA 3Mbps Occupied Bandwidth HV



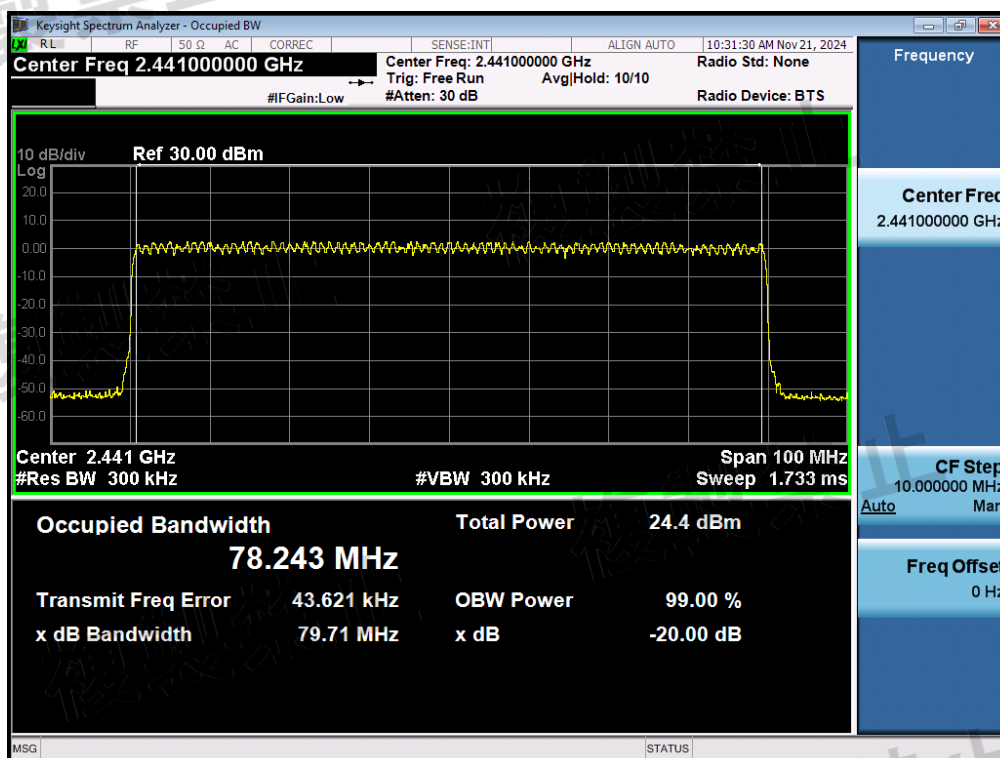
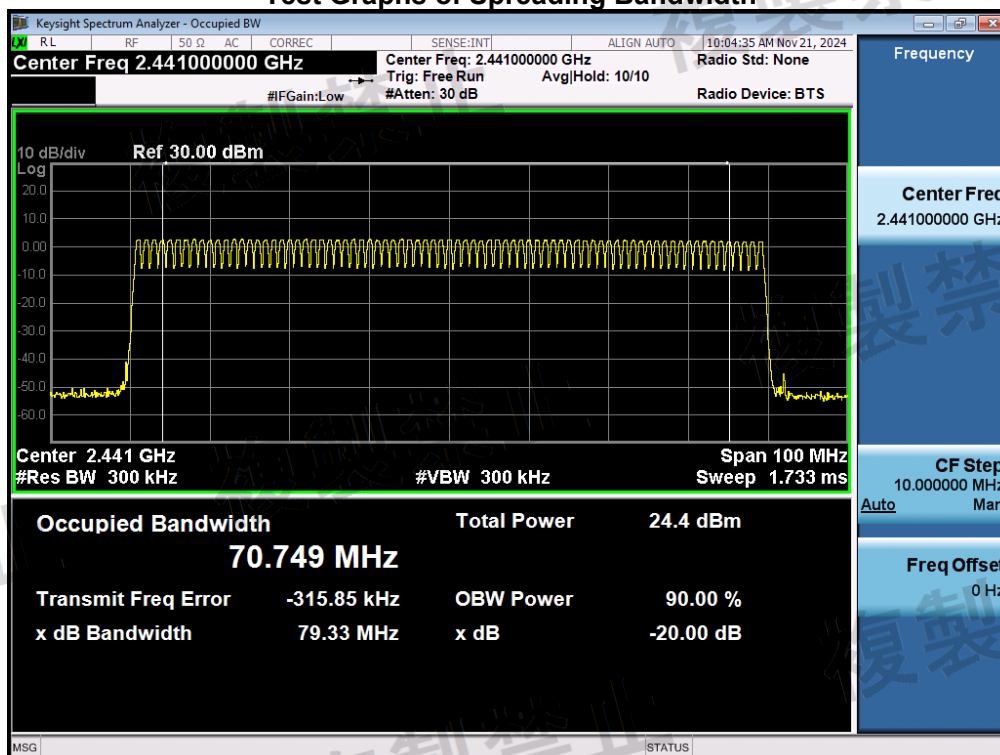
Test_Graph_EDR_HOP_ANT1_NA_3Mbps_Occupied Bandwidth_LV

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Test_Graph_EDR_HOP_ANT1_NA 3Mbps Occupied Bandwidth_NV
Test Graphs of Spreading Bandwidth

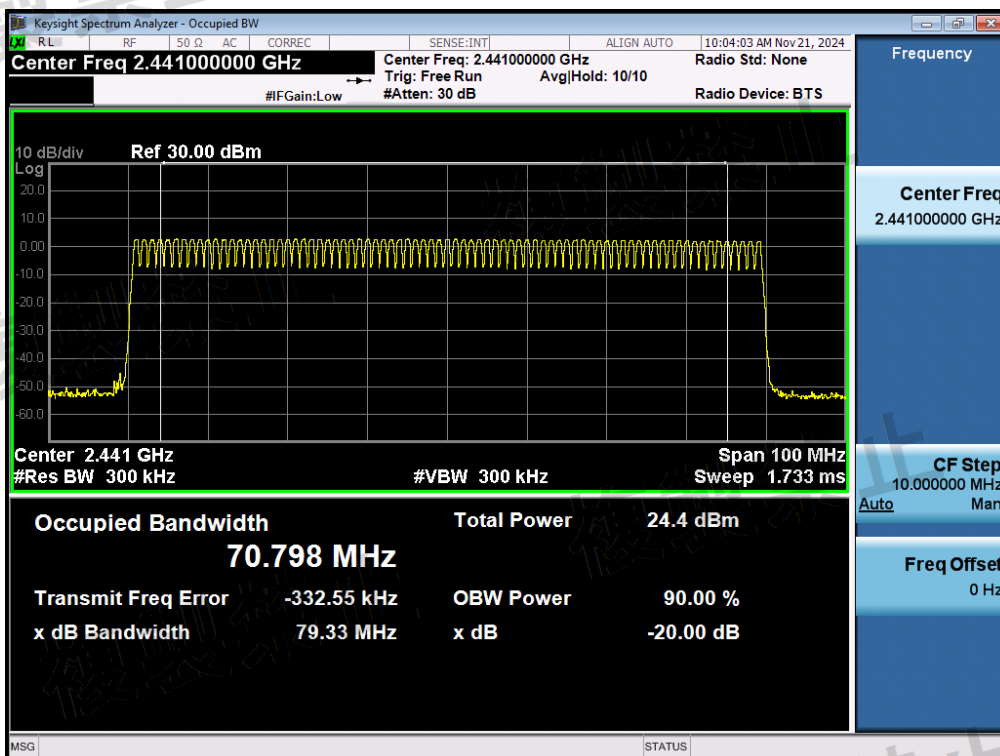
Test_Graph_BR_HOP_ANT1_NA 1Mbps Spreading Bandwidth_HV

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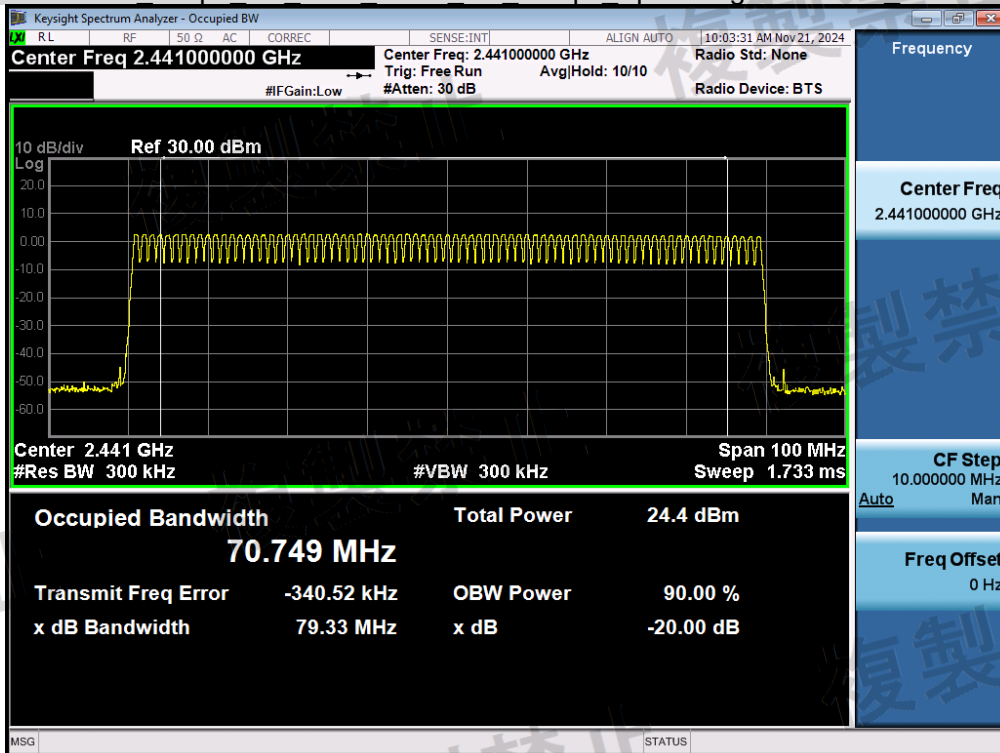
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Test Graph BR HOP ANT1 NA 1Mbps Spreading Bandwidth LV



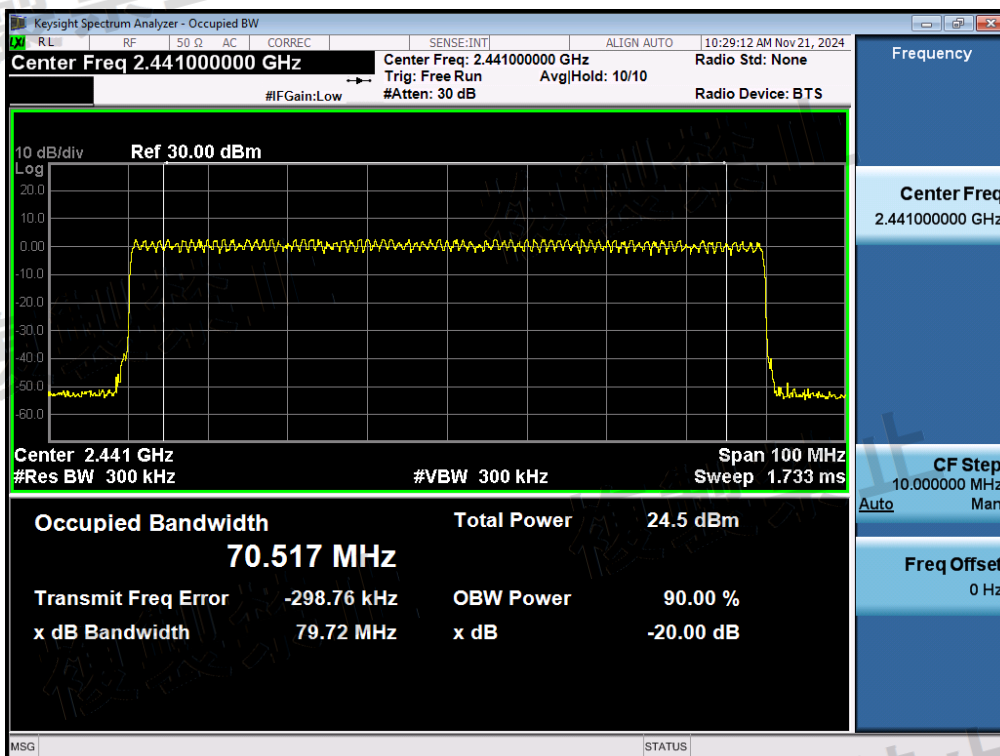
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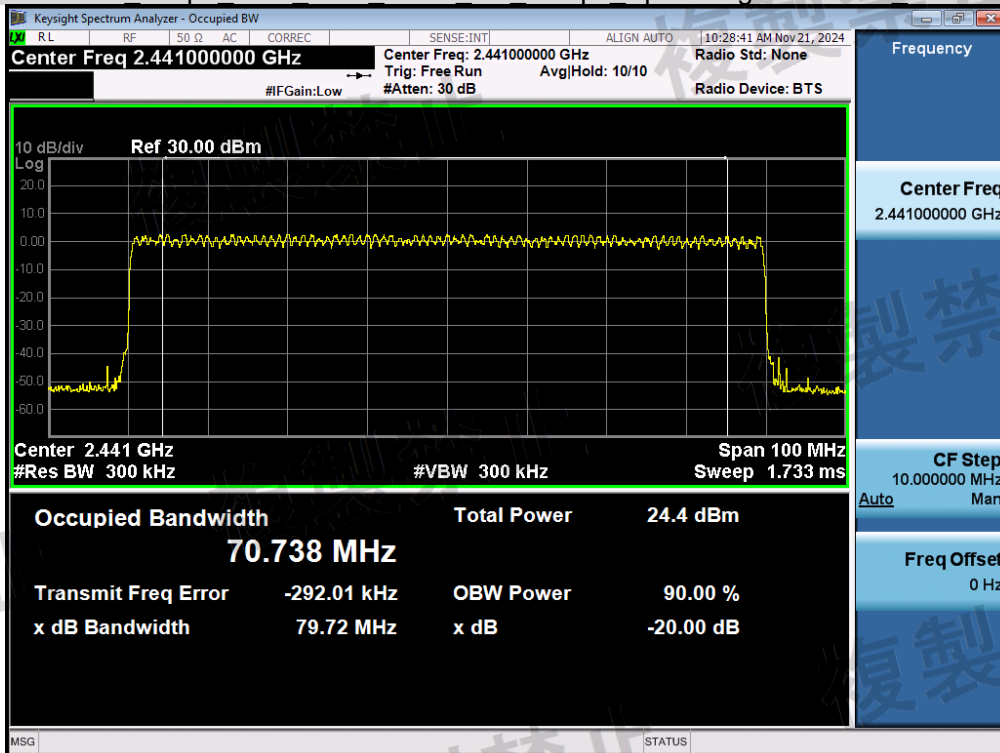
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Test Graph EDR HOP ANT1 NA 2Mbps Spreading Bandwidth HV



Test Graph EDR HOP ANT1 NA 2Mbps Spreading Bandwidth LV

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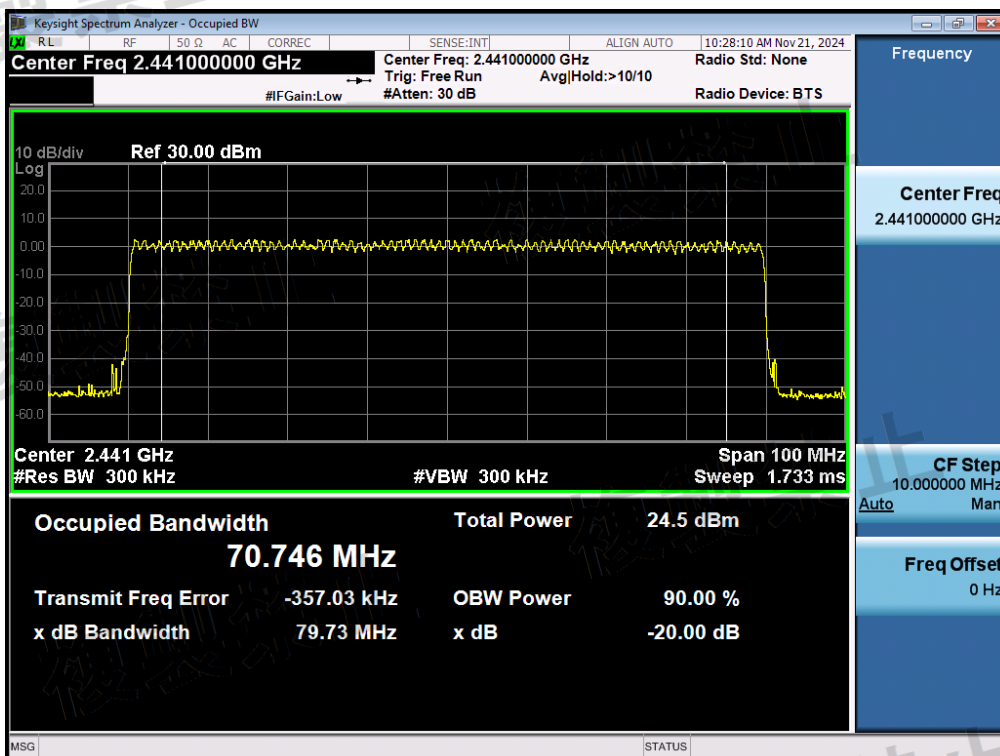
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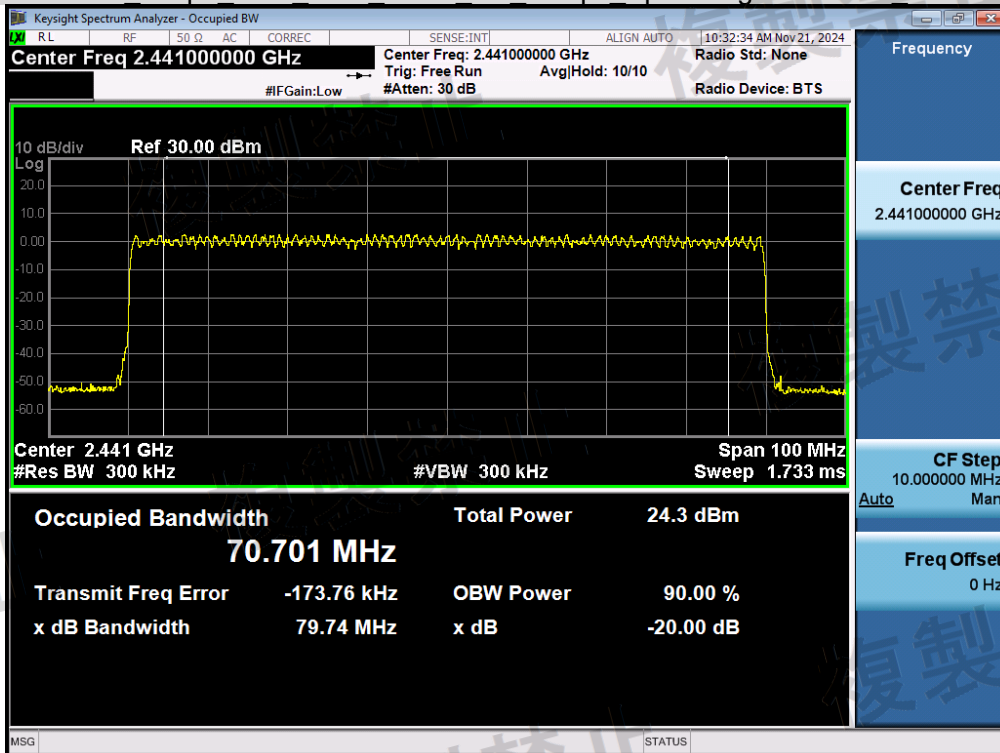
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Test Graph EDR HOP ANT1 NA 2Mbps Spreading Bandwidth NV



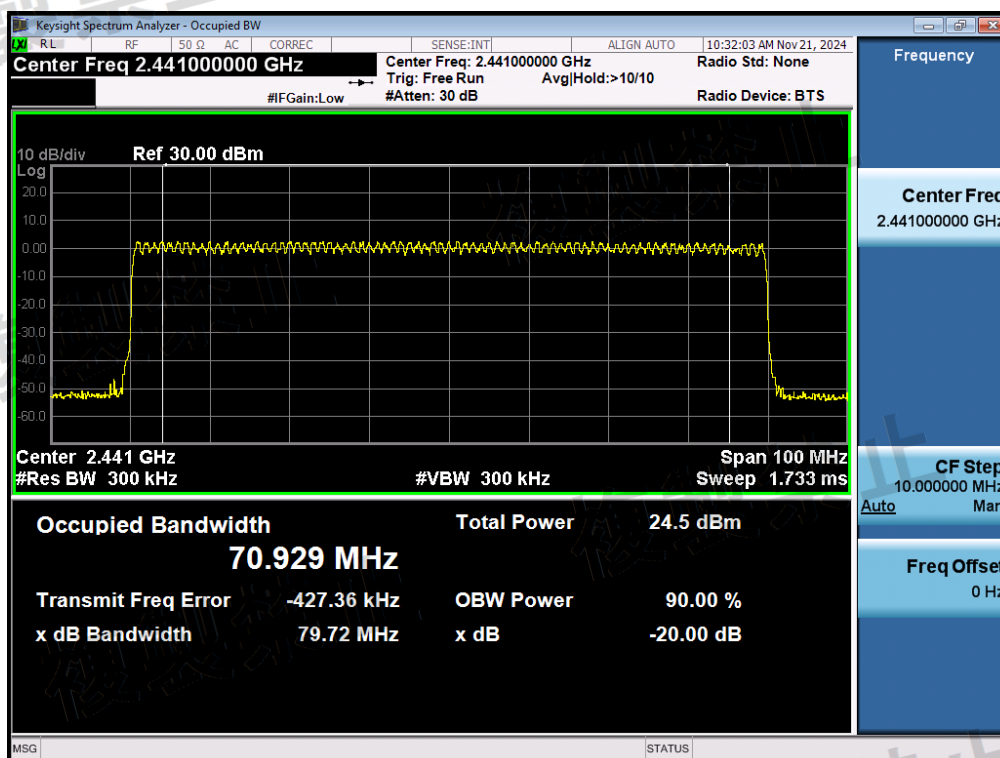
Test_Graph_EDR_HOP_ANT1_NA_3Mbps_Spreading_Bandwidth_HV

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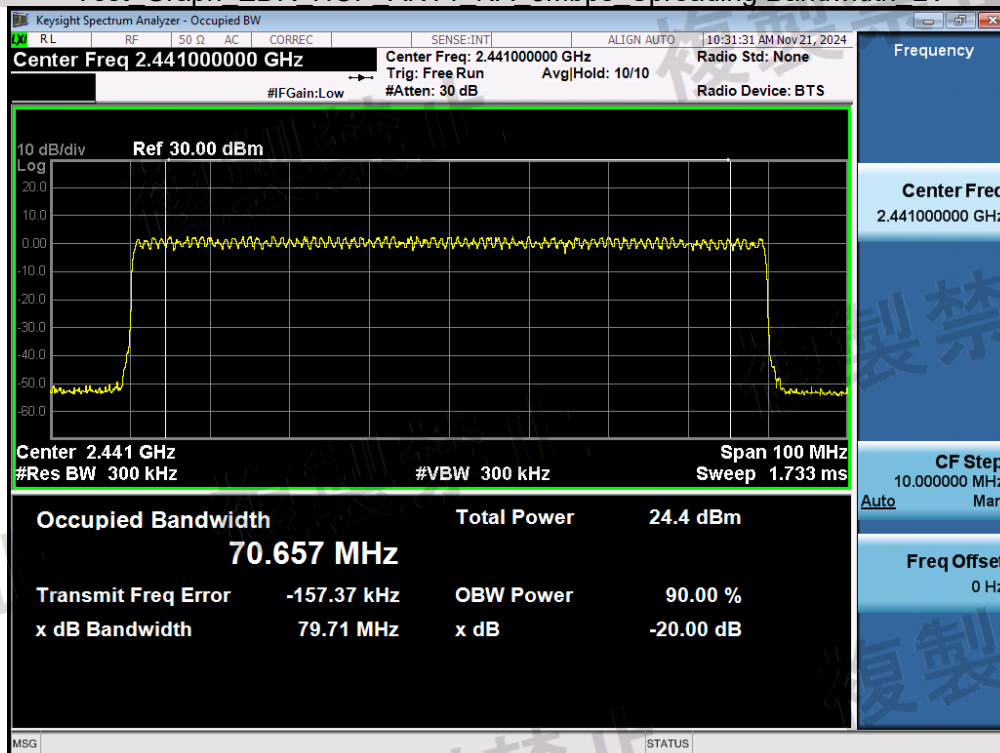
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Test Graph EDR HOP ANT1 NA 3Mbps Spreading Bandwidth LV



Test_Graph_EDR_HOP_ANT1_NA_3Mbps_Spreading Bandwidth_NV

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5.3 Unwanted Emission Strength Measurement

Test Limit

Test Item	Limits
Unwanted Emission Strength (2400~2483.5MHz)	$\leq 2.5\mu\text{W/MHz}$ (30MHz $\leq f \leq$ 1000MHz)
	$\leq 2.5\mu\text{W/MHz}$ (1000MHz $< f <$ 2387MHz)
	$\leq 25\mu\text{W/MHz}$ (2387MHz $\leq f <$ 2400MHz)
	$\leq 25\mu\text{W/MHz}$ (2483.5MHz $< f \leq$ 2496.5MHz)
	$\leq 2.5\mu\text{W/MHz}$ (2496.5MHz $< f <$ 12500MHz)

Test Procedure

The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
RB / VB	Below 1GHz RB:100KHz / VB:100KHz Above 1GHz RB:1MHz / VB:1MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- UT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as: Below 1GHz RB: 100KHz / VB: 100KHz; Above 1GHz RB: 1MHz / VB:1MHz
- AT: 30dB Ref:20dBm / Sweep time: Auto Sweep Mode: Continuous sweep / Detect mode: Positive peak Trace mode: Max hold
- Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 0.25 μW .
- Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW .
- SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25 μW .
- SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25 μW
- SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5 μW
- Convert from dBm to μW : $P(\mu\text{W}) = 1000 * 10^{[P(\text{dBm})/10]}$
- Convert a measurement Value $P_{100\text{kHz}}$ at 100kHz RBW to $P_{1\text{MHz}}$ at 1MHz, use the following formula:

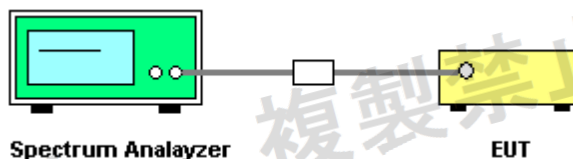
$$P_{1\text{MHz}} = P_{100\text{kHz}} + 10 \cdot \log_{10} \left(\frac{RBW_{1\text{MHz}}}{RBW_{100\text{kHz}}} \right)$$

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Test Setup**Test Result**

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test Data of Unwanted Emission Strength								
Voltage	Mode	Channel (MHz)	Frequency Range (MHz)	Frequency (MHz)	Result (dBm/MHz)	Result (μW/MHz)	Limit (μW/MHz)	P/F
NV	BR	2402	30~1000	913.6	-49.897	0.01	2.5	Pass
NV	BR	2402	1000~2387	2362.0	-44.978	0.032	2.5	Pass
NV	BR	2402	2387~2400	2400	-34.674	0.341	25	Pass
NV	BR	2402	2483.5~2496.5	2496.1	-49.235	0.012	25	Pass
NV	BR	2402	2496.5~12500	10347.1	-46.708	0.021	2.5	Pass
LV	BR	2402	30~1000	869.9	-49.6	0.011	2.5	Pass
LV	BR	2402	1000~2387	2373.1	-45.524	0.028	2.5	Pass
LV	BR	2402	2387~2400	2400.0	-34.839	0.328	25	Pass
LV	BR	2402	2483.5~2496.5	2484.4	-48.844	0.013	25	Pass
LV	BR	2402	2496.5~12500	12189.6	-46.772	0.021	2.5	Pass
HV	BR	2402	30~1000	834.0	-49.712	0.011	2.5	Pass
HV	BR	2402	1000~2387	2366.2	-43.749	0.042	2.5	Pass
HV	BR	2402	2387~2400	2400.0	-34.928	0.322	25	Pass
HV	BR	2402	2483.5~2496.5	2492.3	-48.769	0.013	25	Pass
HV	BR	2402	2496.5~12500	6952.5	-46.749	0.021	2.5	Pass
NV	BR	2441	30~1000	867.9	-49.319	0.012	2.5	Pass
NV	BR	2441	1000~2387	2387	-47.454	0.018	2.5	Pass
NV	BR	2441	2387~2400	2399.8	-44.513	0.035	25	Pass
NV	BR	2441	2483.5~2496.5	2487.1	-45.468	0.028	25	Pass
NV	BR	2441	2496.5~12500	12189.6	-46.904	0.02	2.5	Pass
LV	BR	2441	30~1000	942.7	-49.397	0.011	2.5	Pass
LV	BR	2441	1000~2387	2385.6	-48.048	0.016	2.5	Pass
LV	BR	2441	2387~2400	2391.8	-44.249	0.038	25	Pass
LV	BR	2441	2483.5~2496.5	2484.8	-45.378	0.029	25	Pass
LV	BR	2441	2496.5~12500	12209.6	-46.688	0.021	2.5	Pass
HV	BR	2441	30~1000	783.5	-49.46	0.011	2.5	Pass

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HV	BR	2441	1000~2387	2387	-48.461	0.014	2.5	Pass
HV	BR	2441	2387~2400	2397.7	-44.606	0.035	25	Pass
HV	BR	2441	2483.5~2496.5	2487.5	-45.036	0.031	25	Pass
HV	BR	2441	2496.5~12500	11448.6	-46.932	0.02	2.5	Pass
NV	BR	2480	30~1000	949.5	-49.847	0.01	2.5	Pass
NV	BR	2480	1000~2387	2176.0	-48.51	0.014	2.5	Pass
NV	BR	2480	2387~2400	2399.0	-49.402	0.011	25	Pass
NV	BR	2480	2483.5~2496.5	2488.2	-47.104	0.019	25	Pass
NV	BR	2480	2496.5~12500	2516.5	-47.017	0.02	2.5	Pass
LV	BR	2480	30~1000	739.8	-49.831	0.01	2.5	Pass
LV	BR	2480	1000~2387	2288.4	-48.715	0.013	2.5	Pass
LV	BR	2480	2387~2400	2398.2	-49.07	0.012	25	Pass
LV	BR	2480	2483.5~2496.5	2483.6	-47.224	0.019	25	Pass
LV	BR	2480	2496.5~12500	12339.8	-46.811	0.021	2.5	Pass
HV	BR	2480	30~1000	950.5	-50.061	0.01	2.5	Pass
HV	BR	2480	1000~2387	2288.4	-47.282	0.019	2.5	Pass
HV	BR	2480	2387~2400	2398.5	-49.705	0.011	25	Pass
HV	BR	2480	2483.5~2496.5	2483.7	-47.187	0.019	25	Pass
HV	BR	2480	2496.5~12500	10236.9	-45.649	0.027	2.5	Pass

Note: Only reflects the Bluetooth BR mode rate of 1Mbps as the worst mode data.

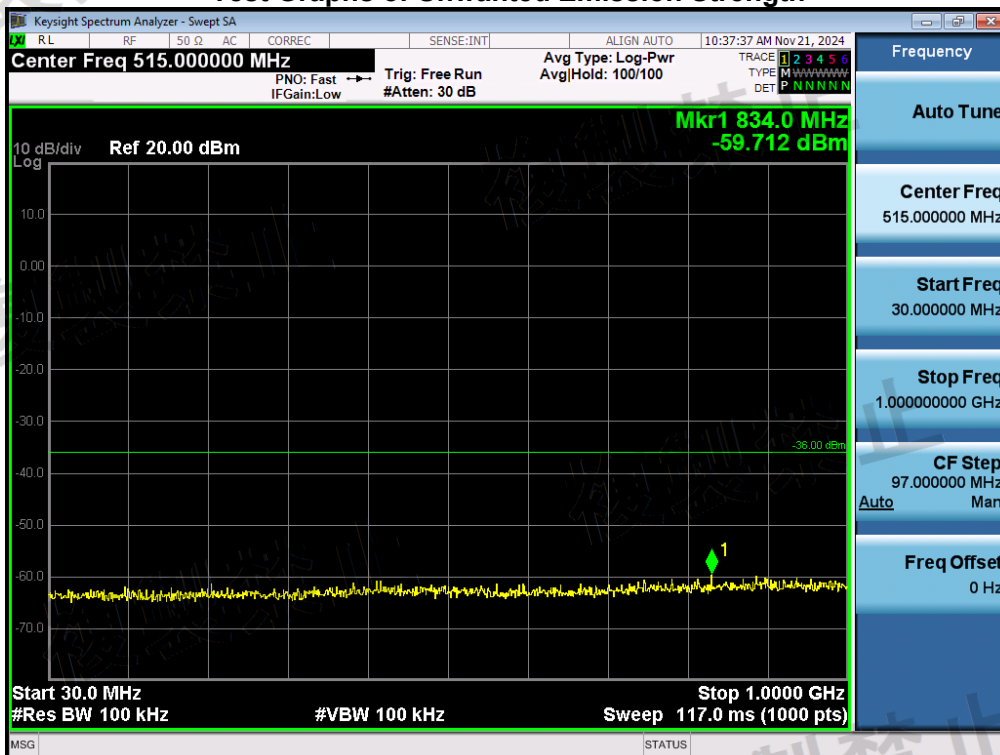
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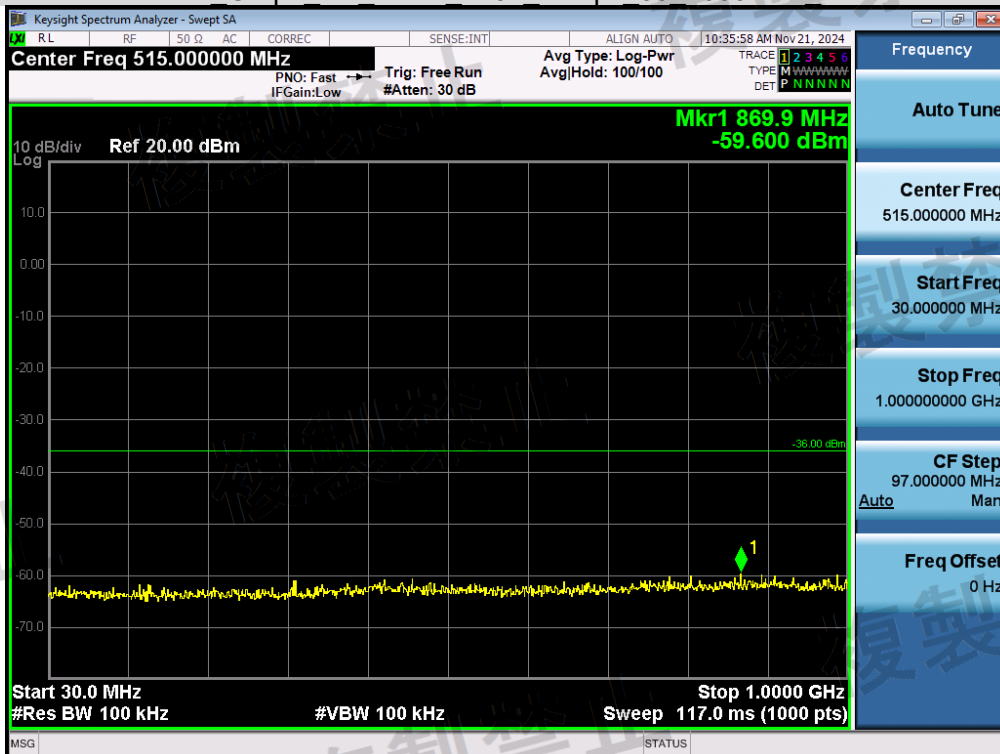
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Test Graphs of Unwanted Emission Strength



Test Graph BR ANT1 2402 1Mbps 30 1000MHz HV



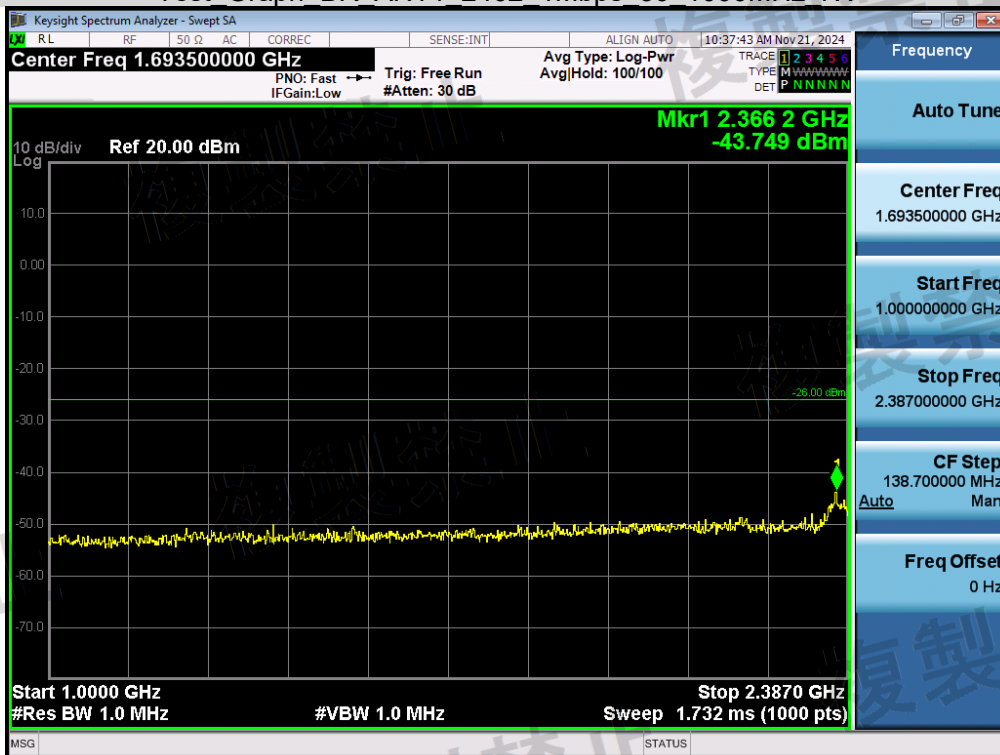
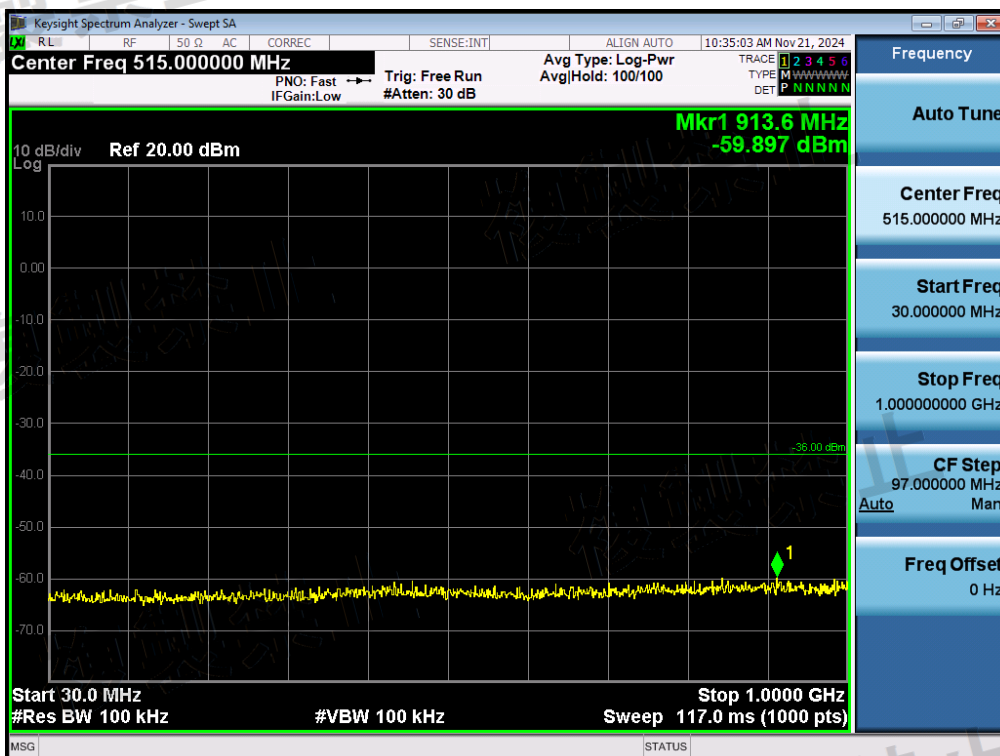
Test_Graph_BR_ANT1_2402_1Mbps_30_1000MHz_LV

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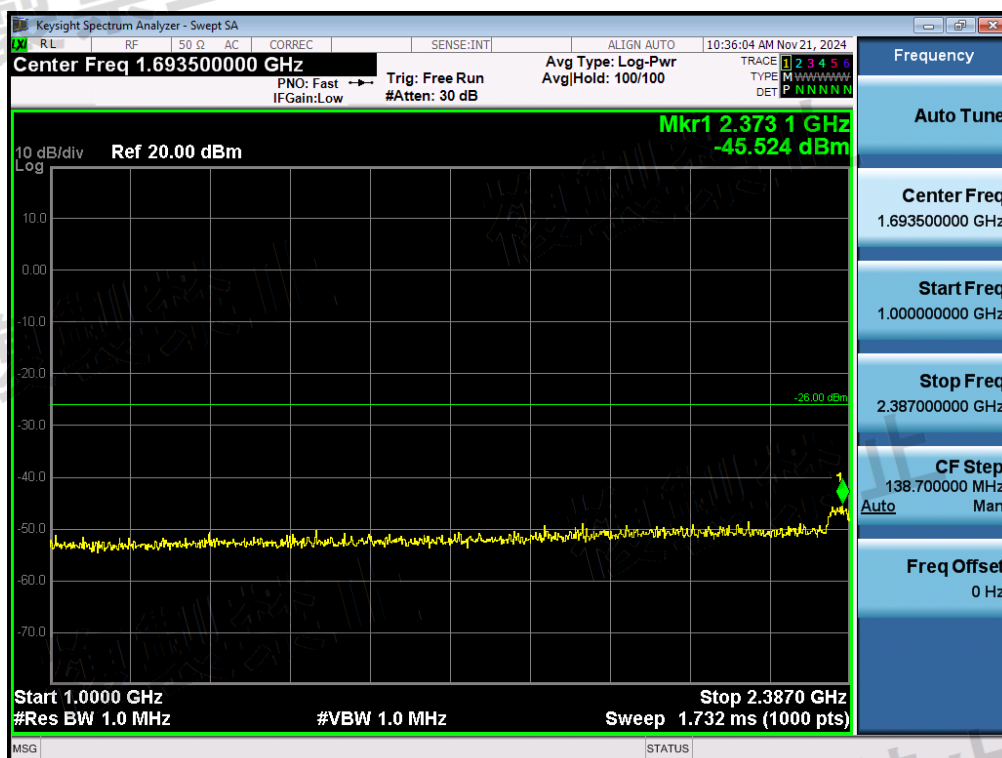


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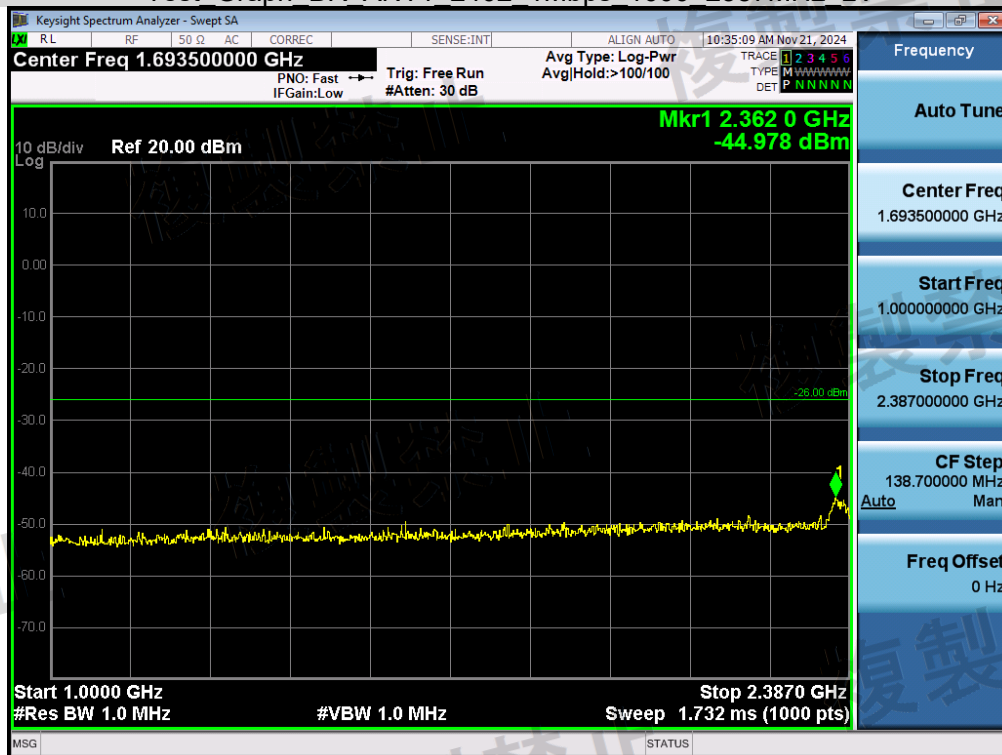
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Test Graph BR ANT1 2402 1Mbps 1000 2387MHz LV



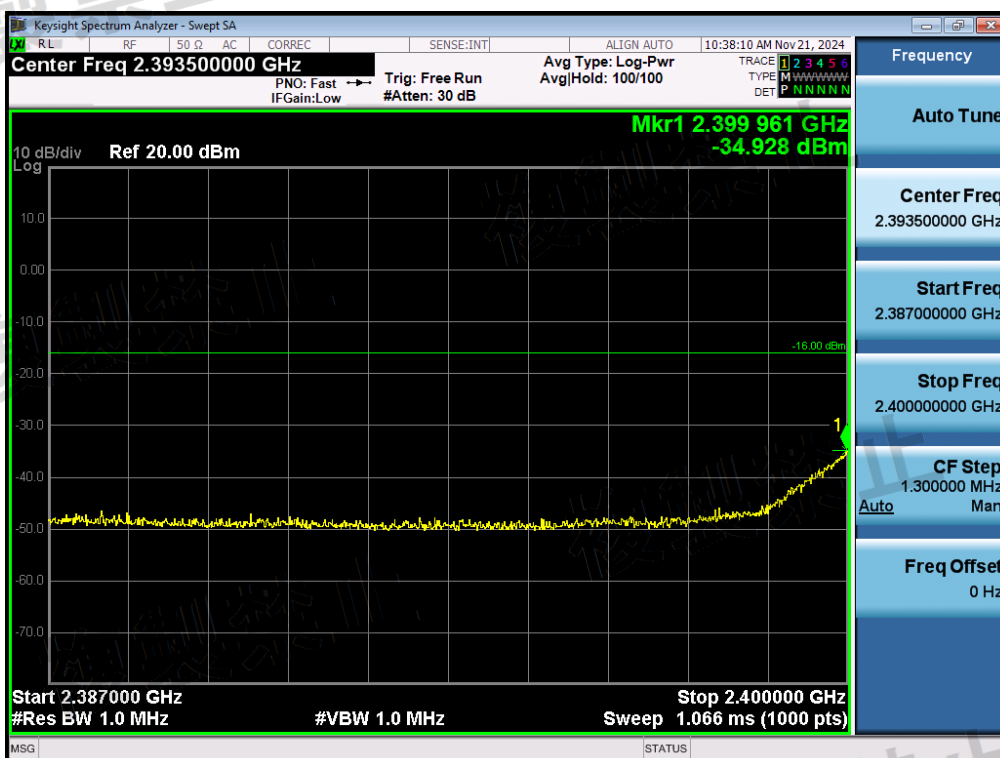
Test Graph BR ANT1 2402 1Mbps 1000 2387MHz NV

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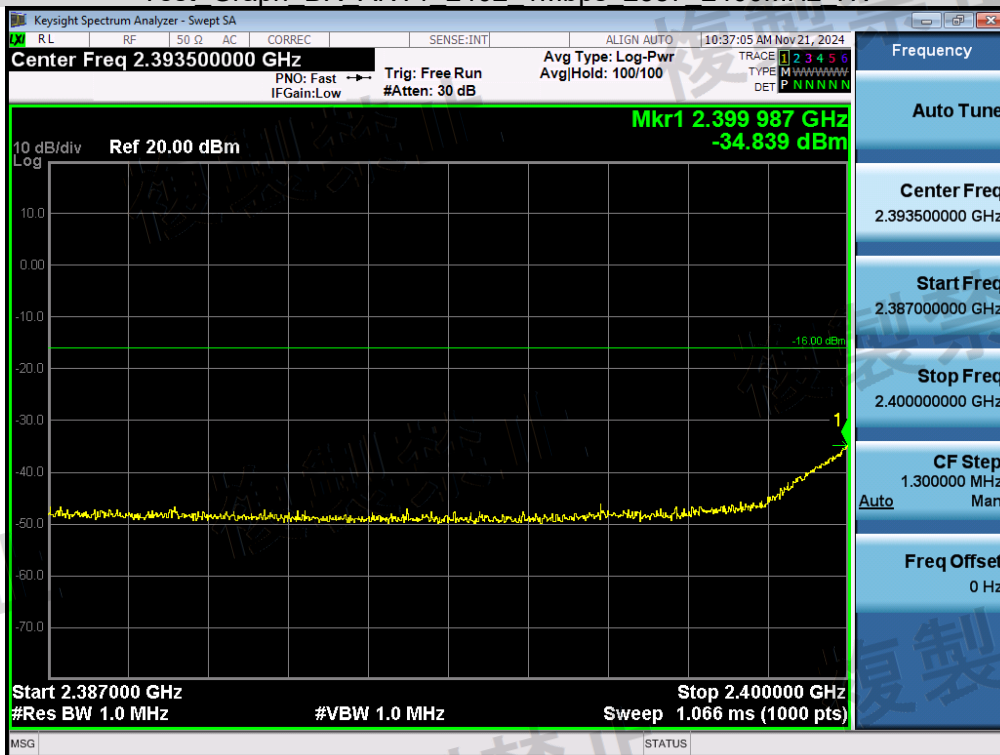
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Test Graph BR ANT1 2402 1Mbps 2387 2400MHz HV



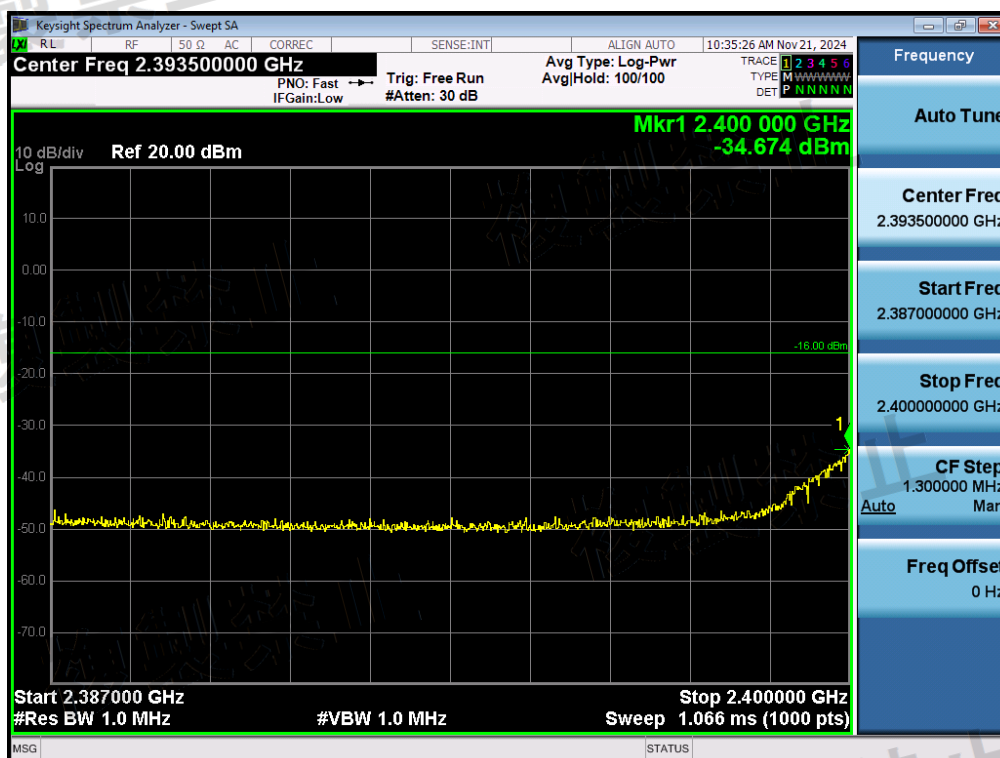
Test_Graph_BR_ANT1_2402_1Mbps_2387_2400MHz_LV

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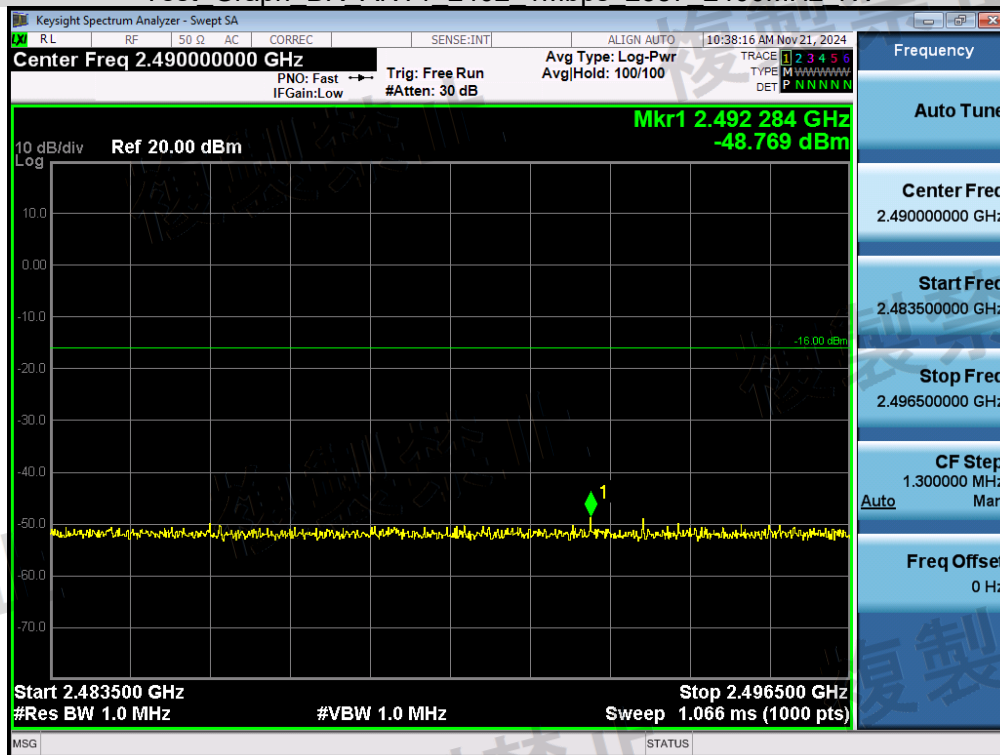
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Test Graph BR ANT1 2402 1Mbps 2387 2400MHz NV



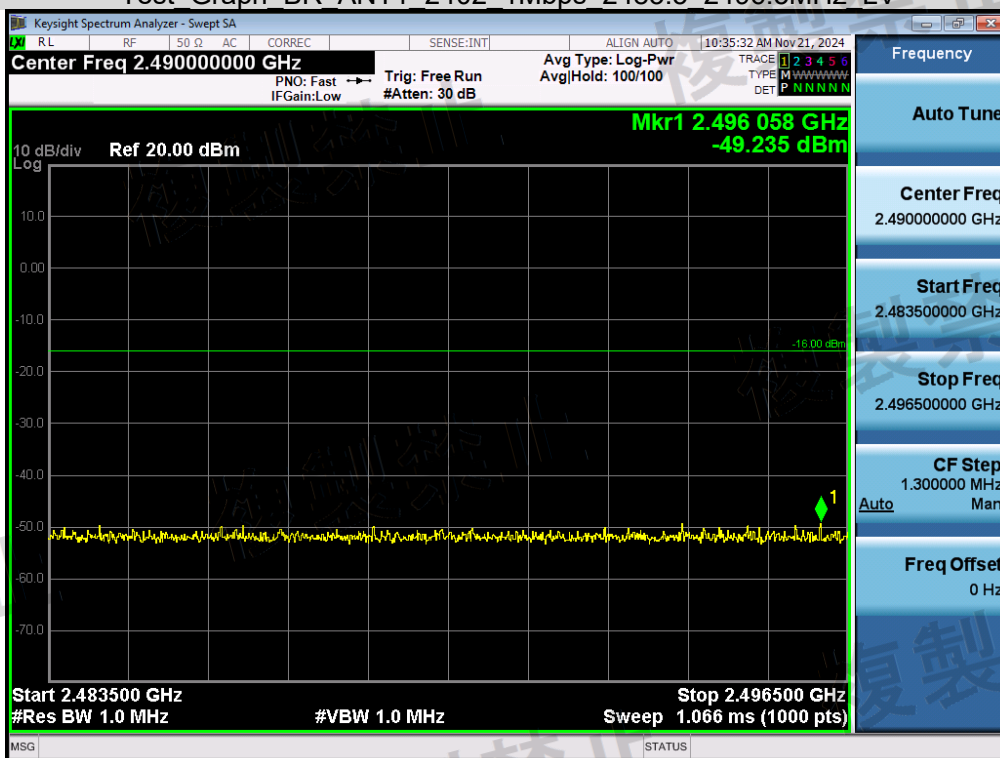
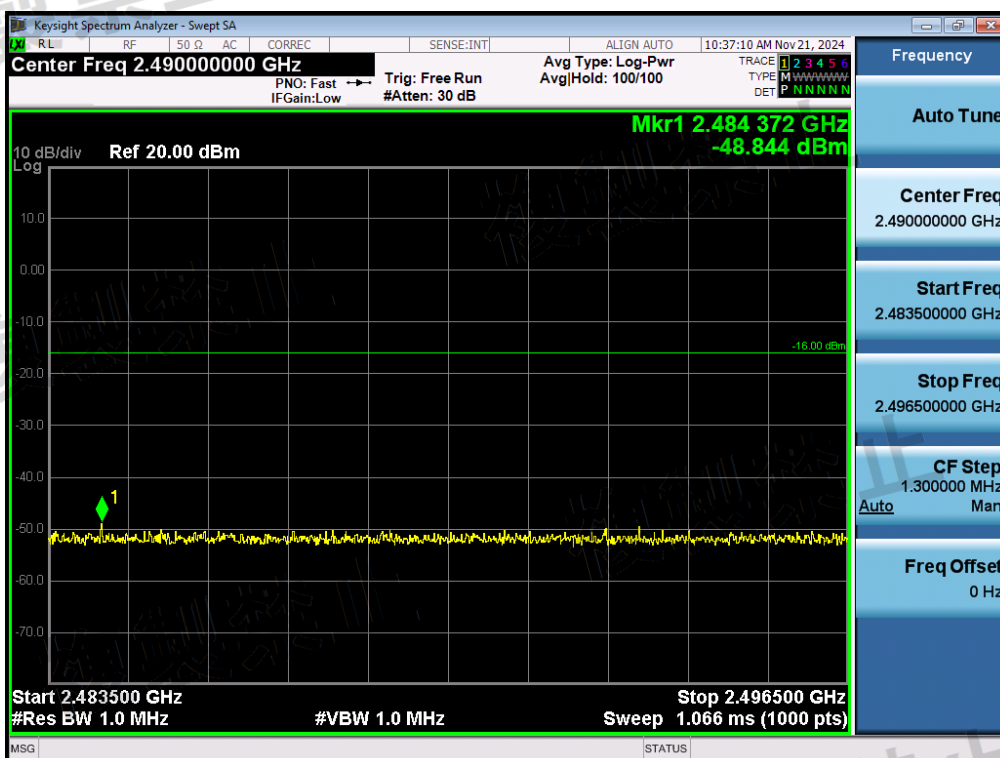
Test_Graph_BR_ANT1_2402_1Mbps_2483.5_2496.5MHz_HV

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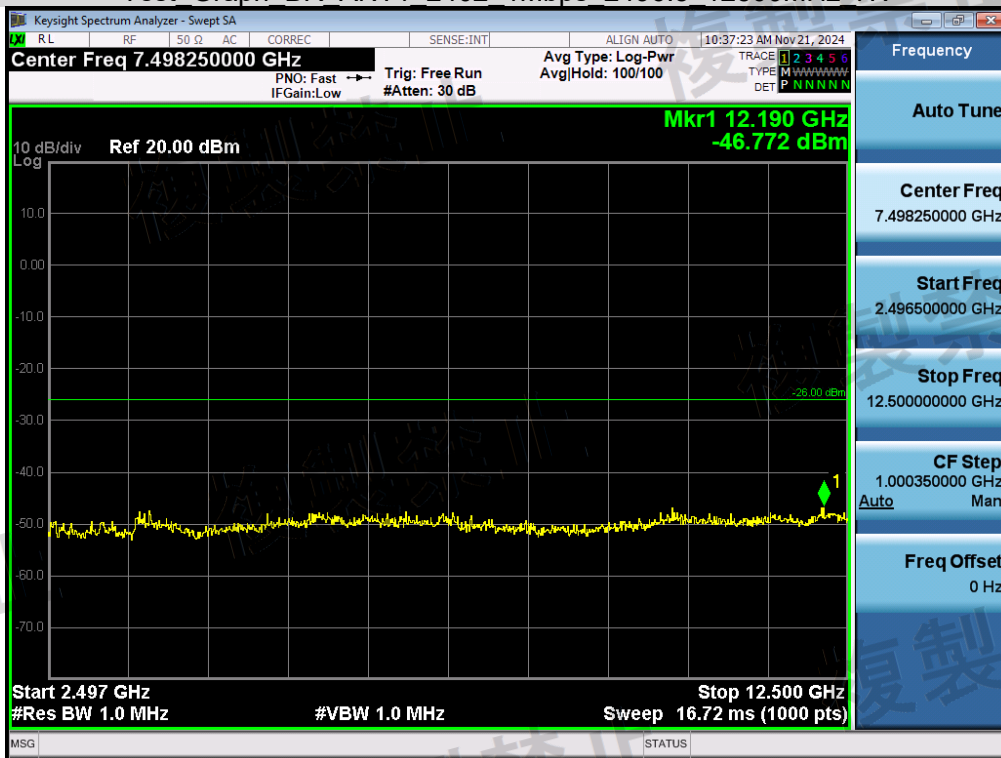
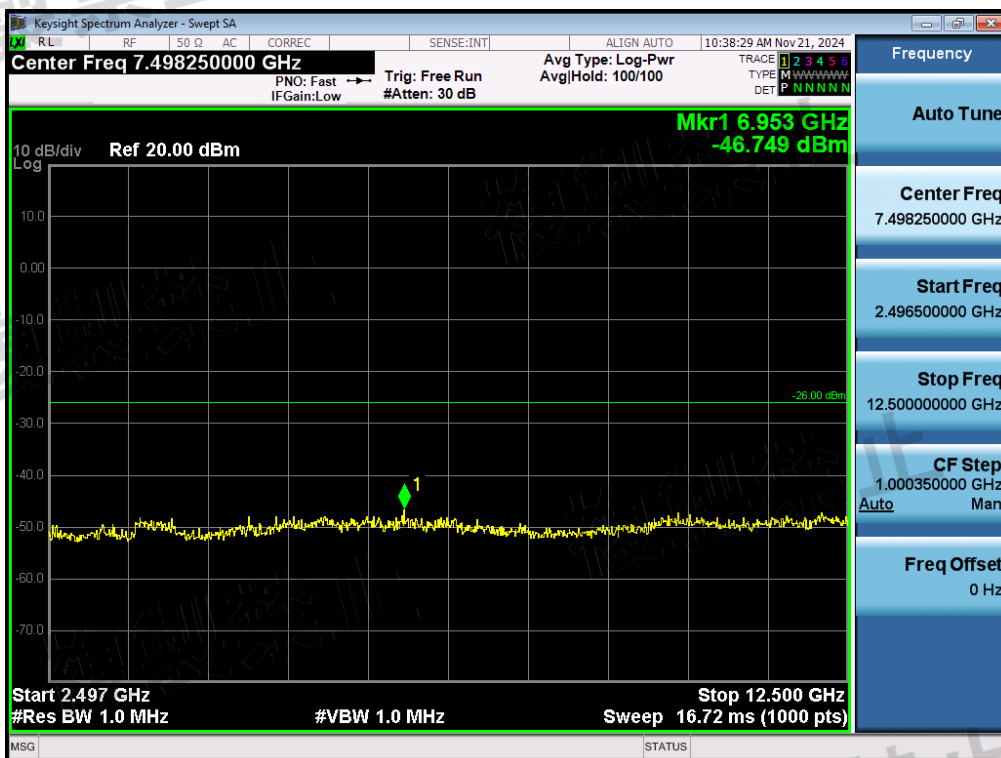


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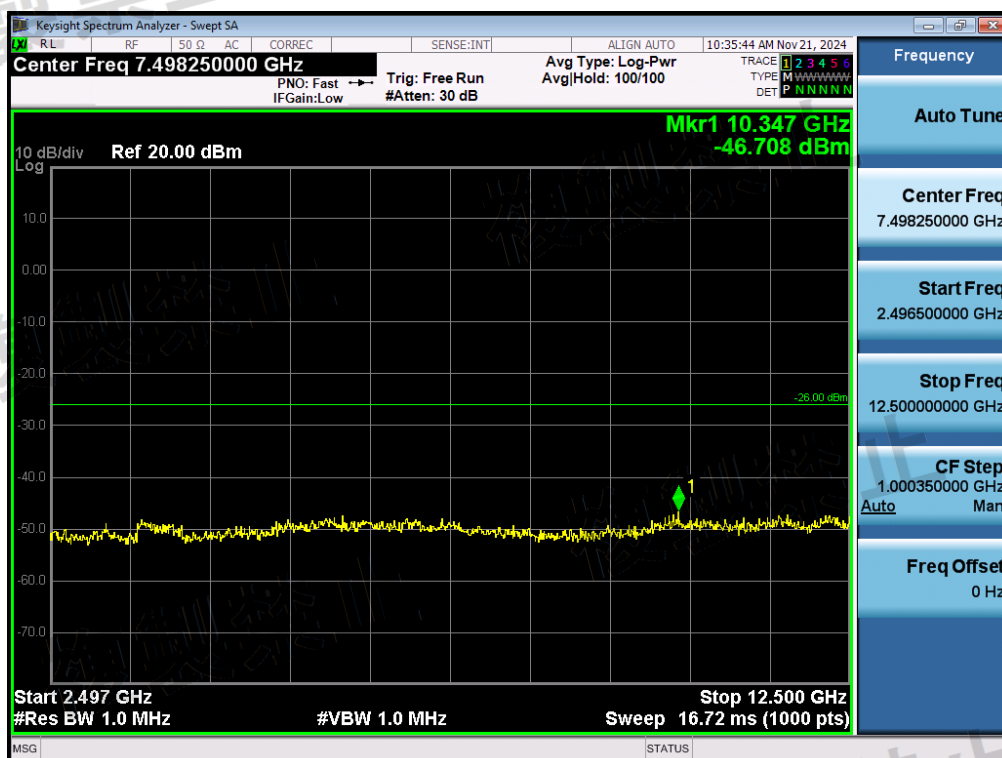
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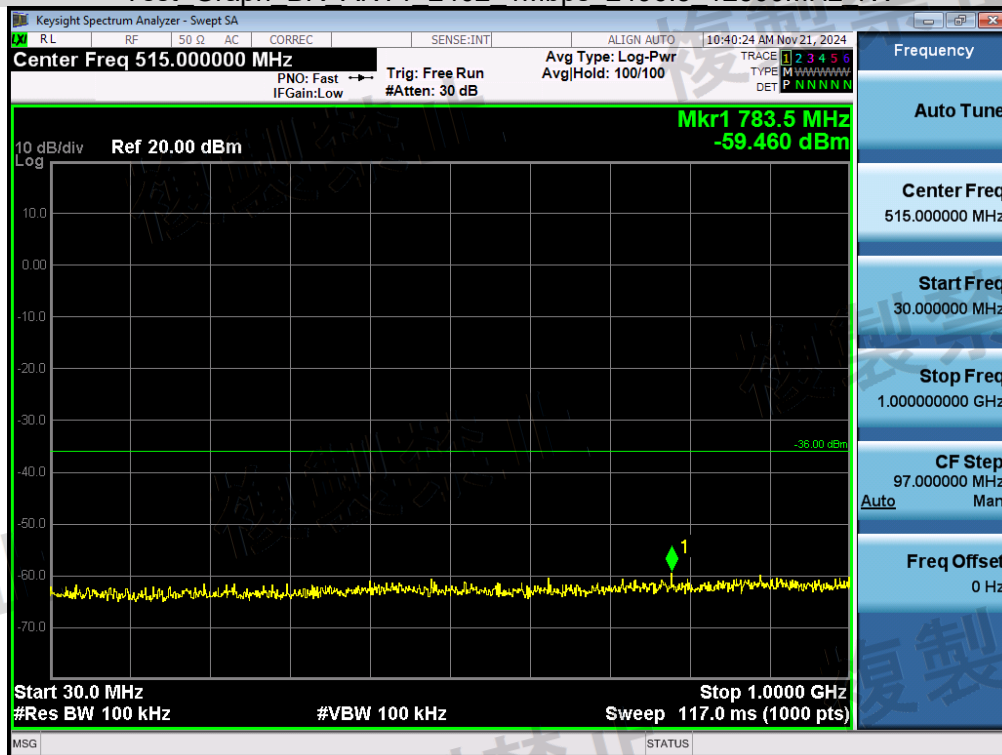
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Test Graph BR ANT1 2402 1Mbps 2496.5 12500MHz NV



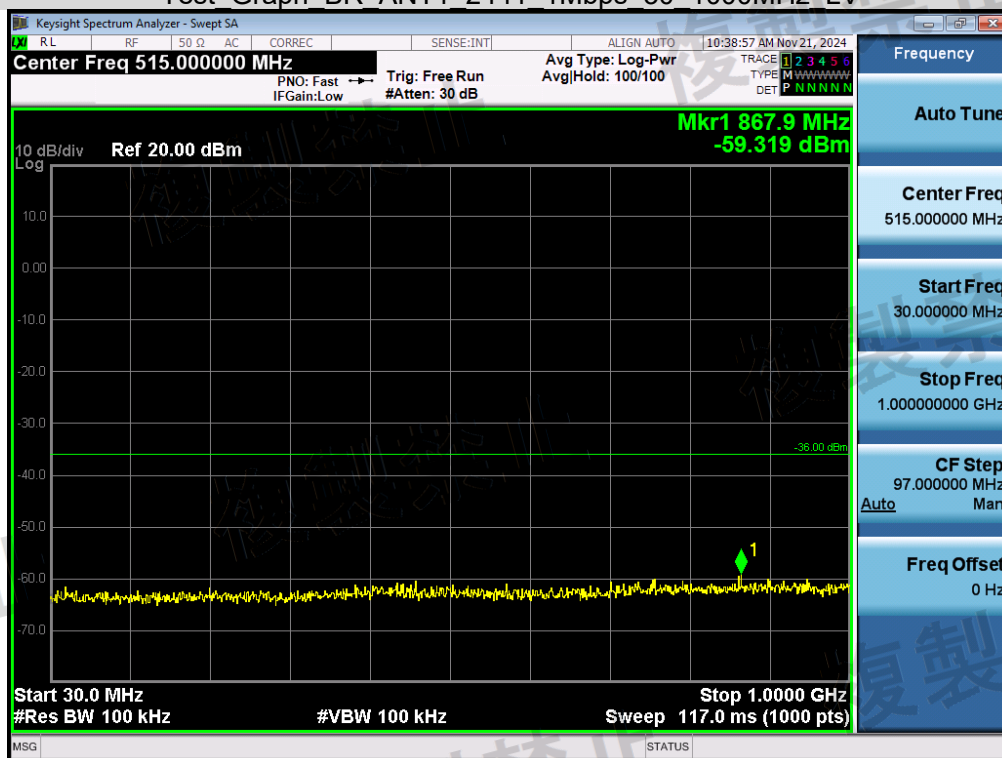
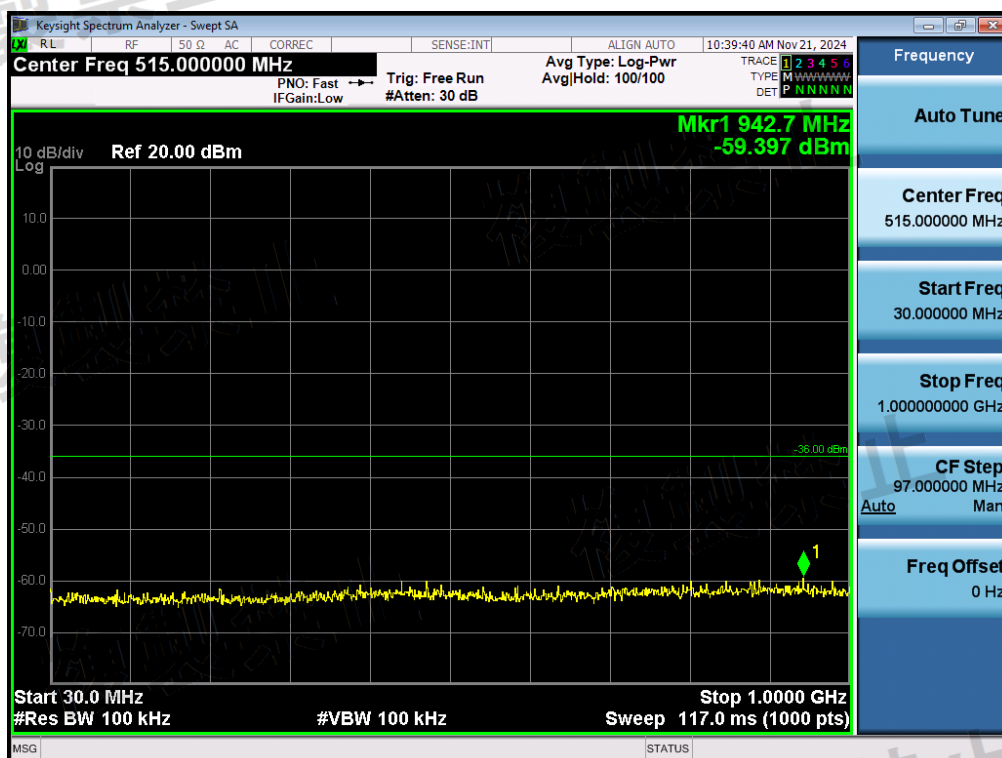
Test_Graph_BR_ANT1_2441_1Mbps_30_1000MHz_HV

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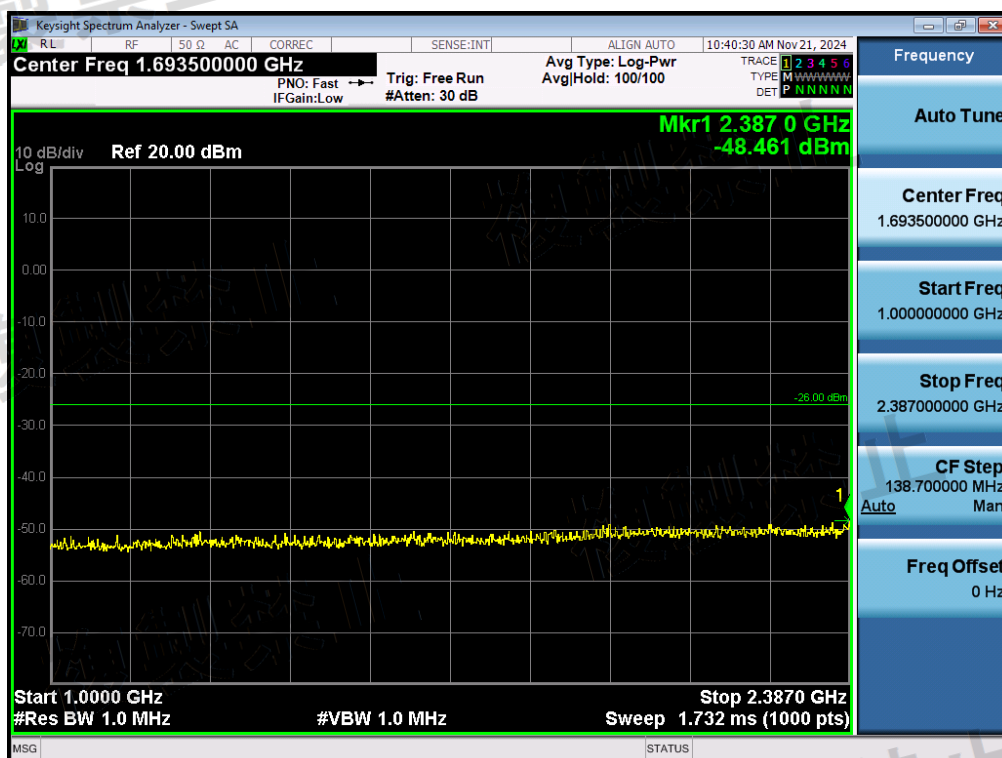


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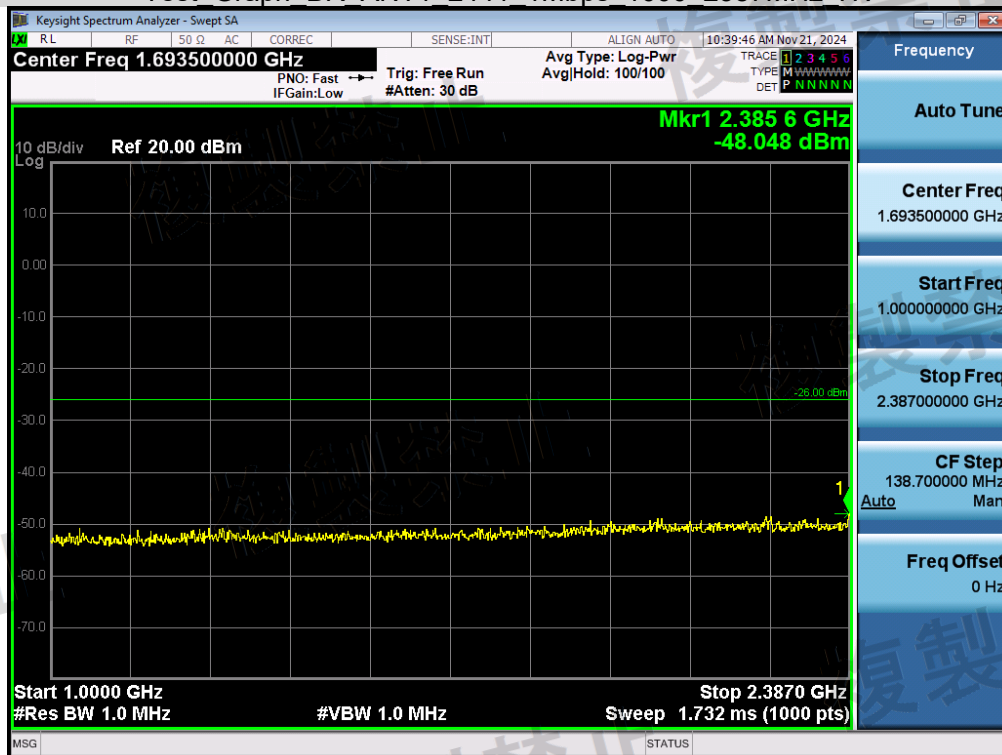
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Test Graph BR ANT1 2441 1Mbps 1000 2387MHz HV



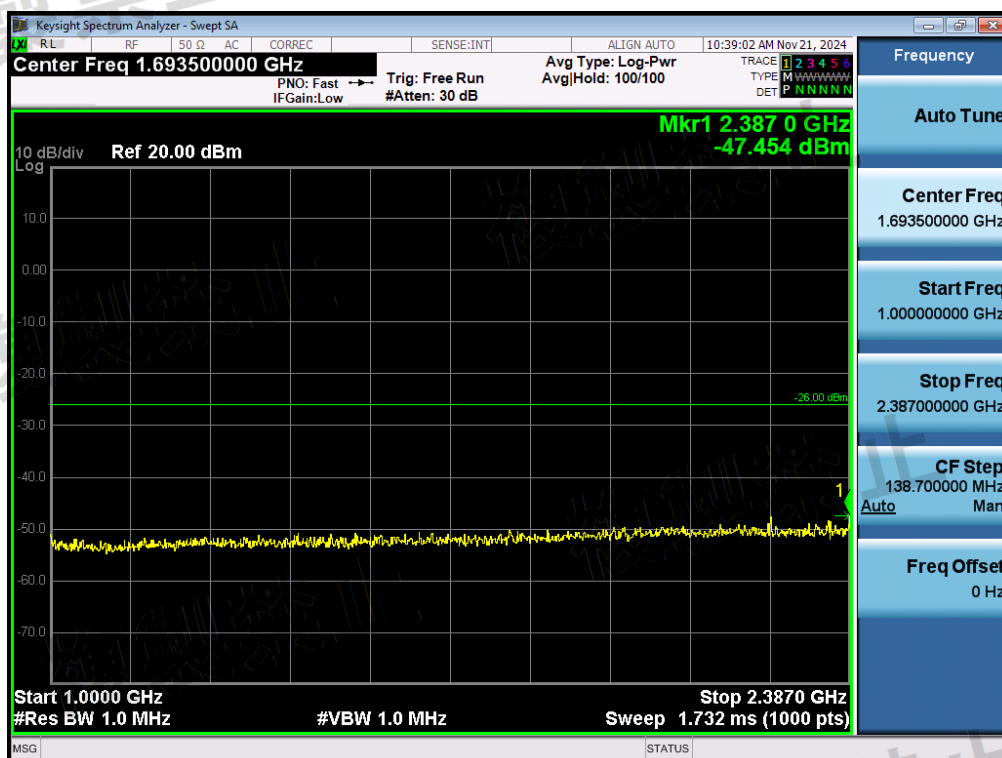
Test_Graph_BR_ANT1_2441_1Mbps_1000_2387MHz_LV

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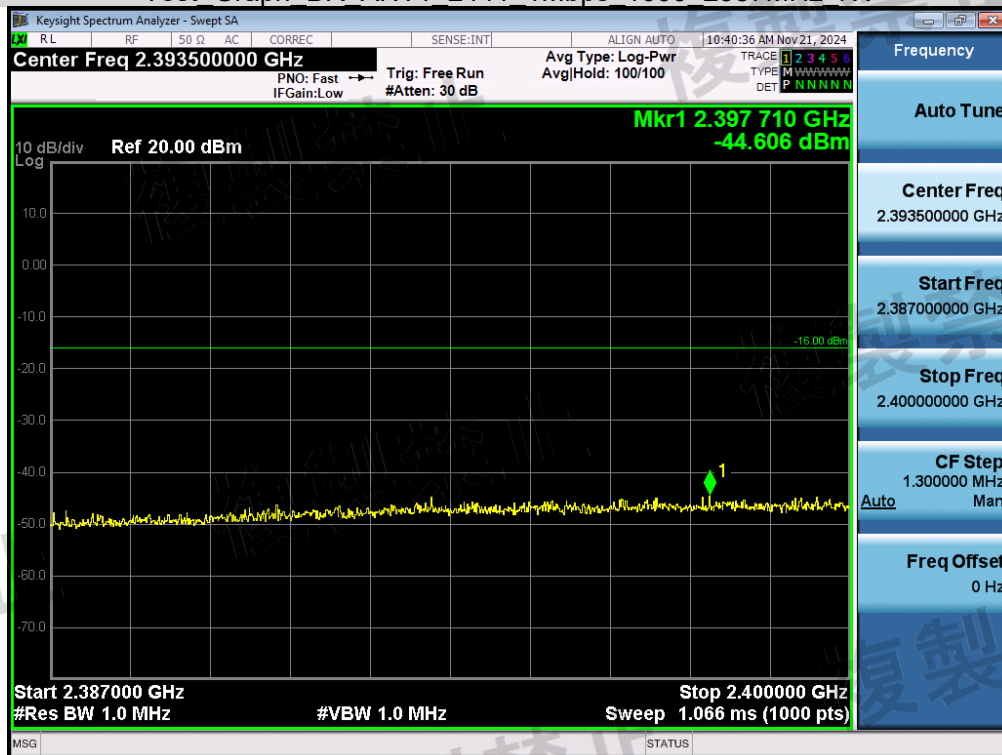
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Test Graph BR ANT1 2441 1Mbps 1000 2387MHz NV



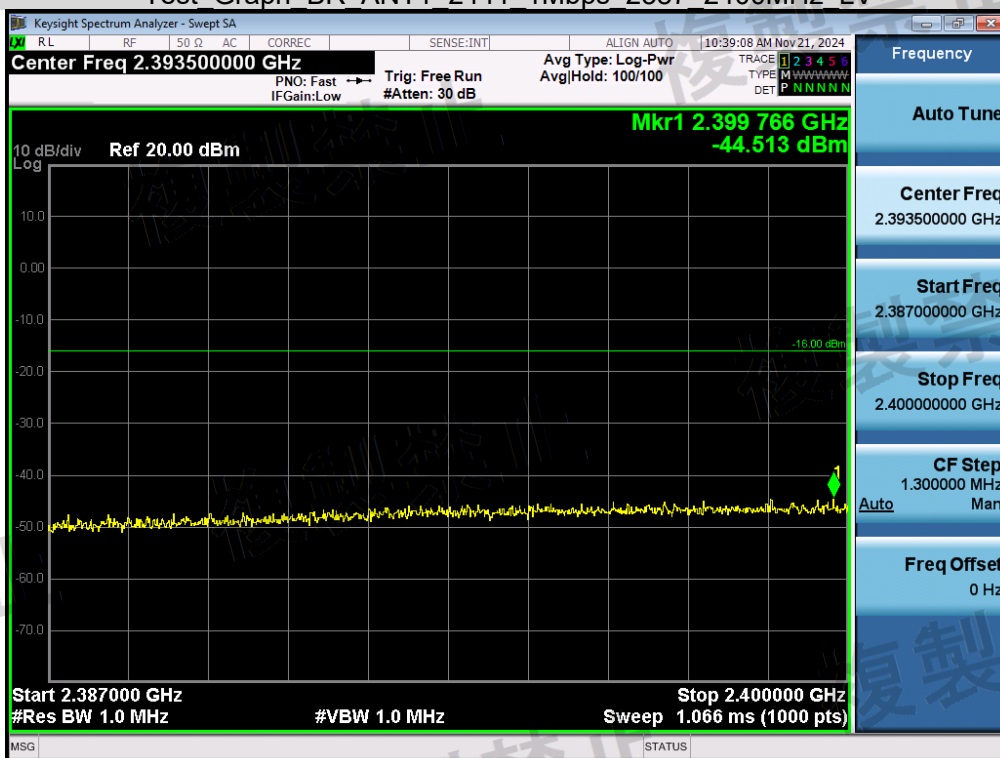
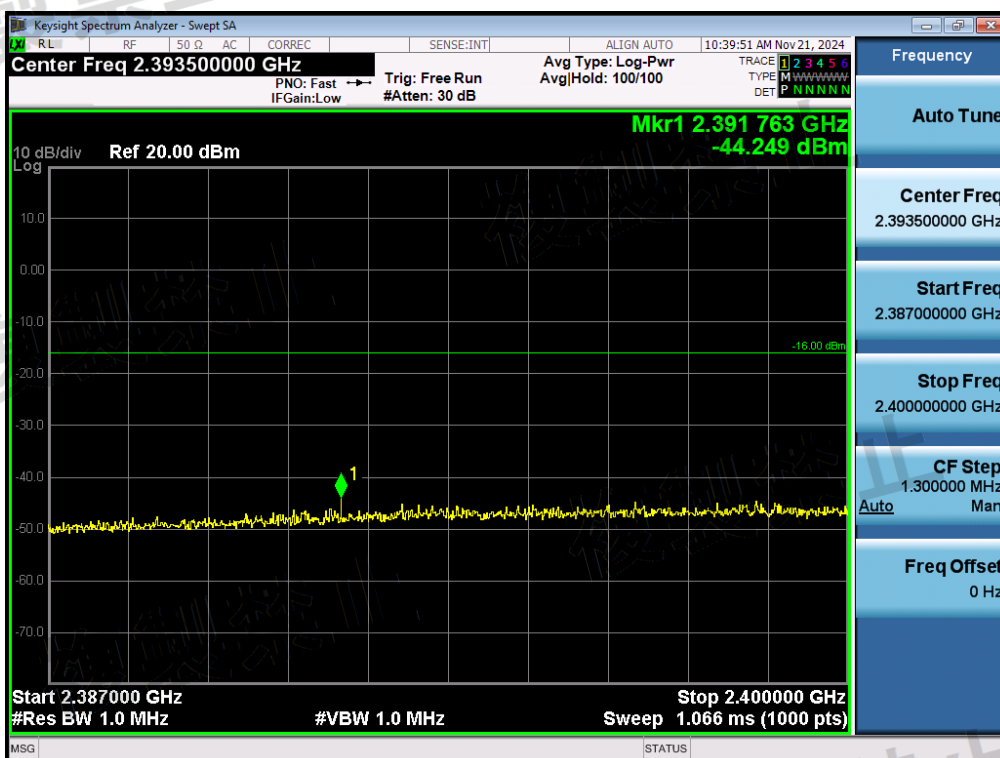
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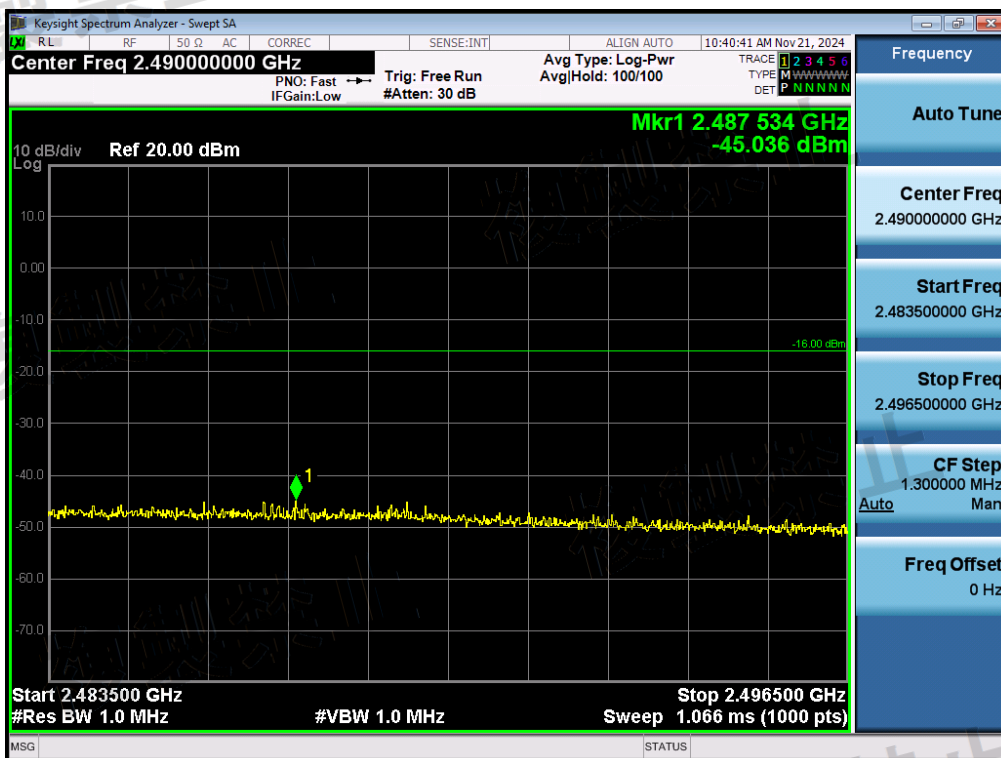


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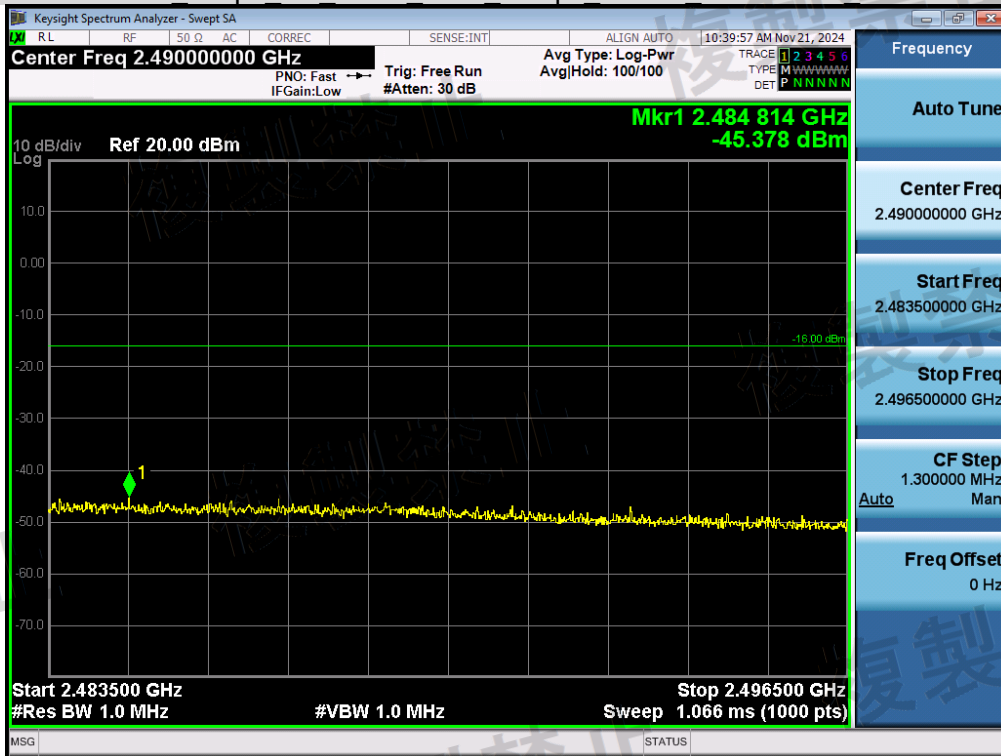
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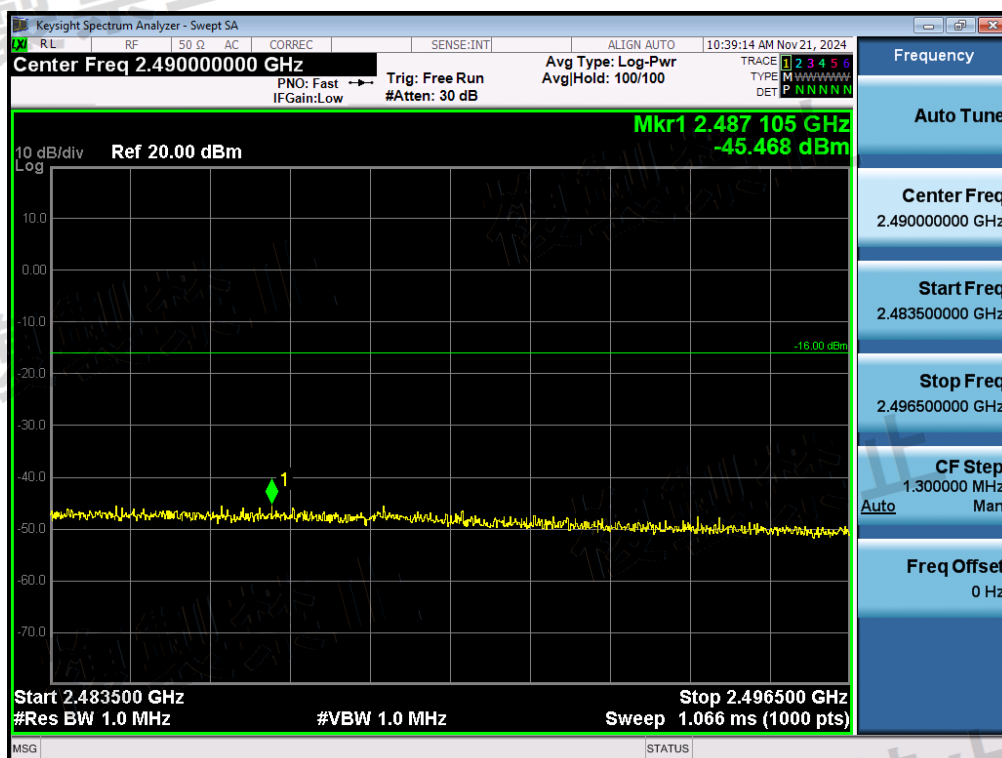


Test Graph BR ANT1 2441 1Mbps 2483.5 2496.5MHz HV



Test_Graph_BR_ANT1_2441_1Mbps_2483.5_2496.5MHz_LV

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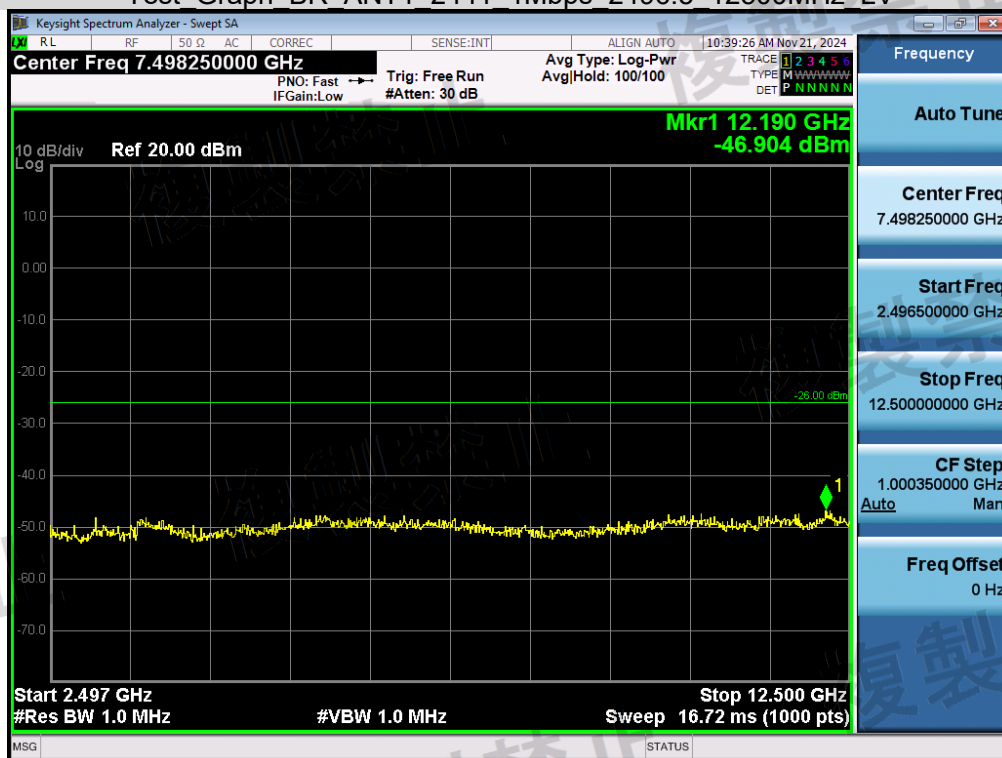
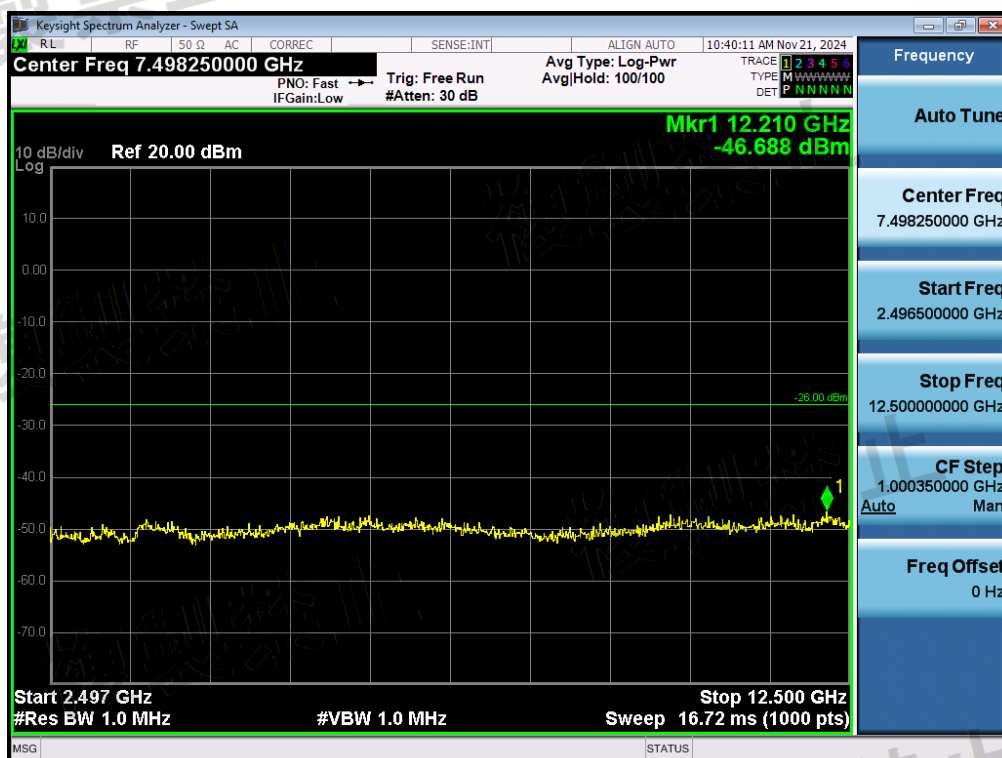


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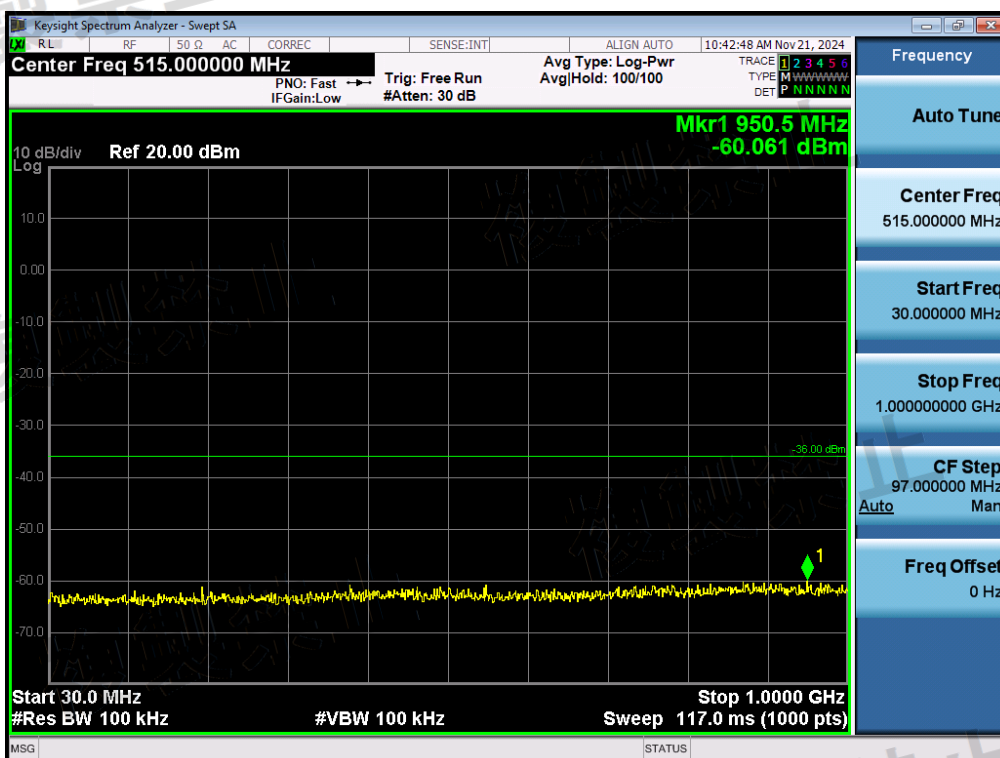


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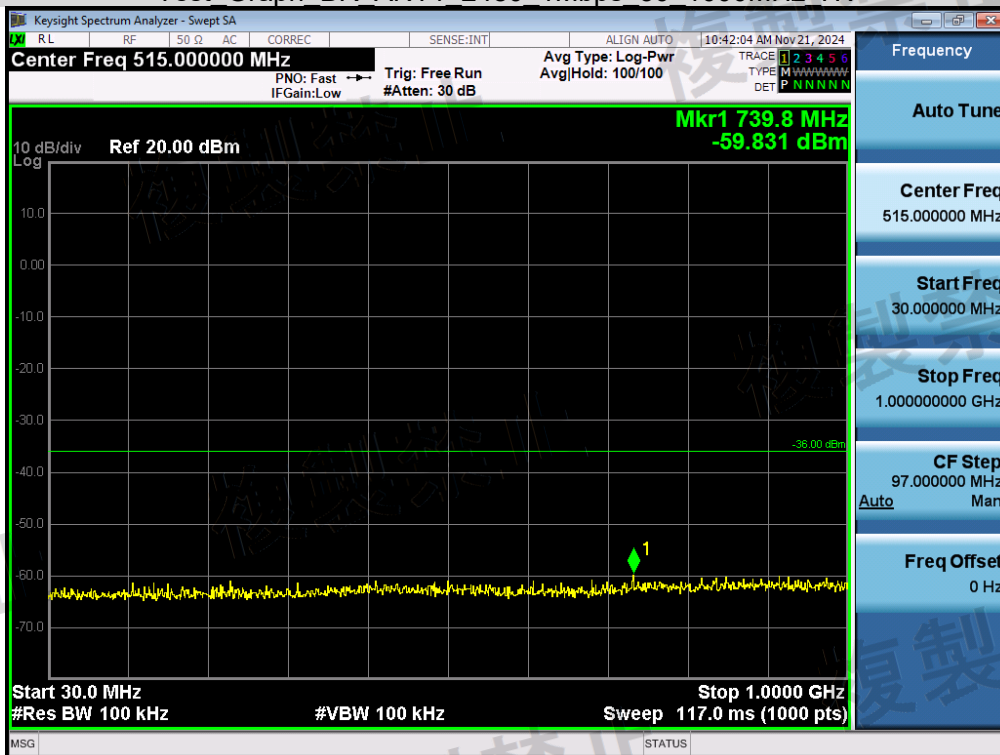
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Test Graph BR ANT1 2480 1Mbps 30 1000MHz HV



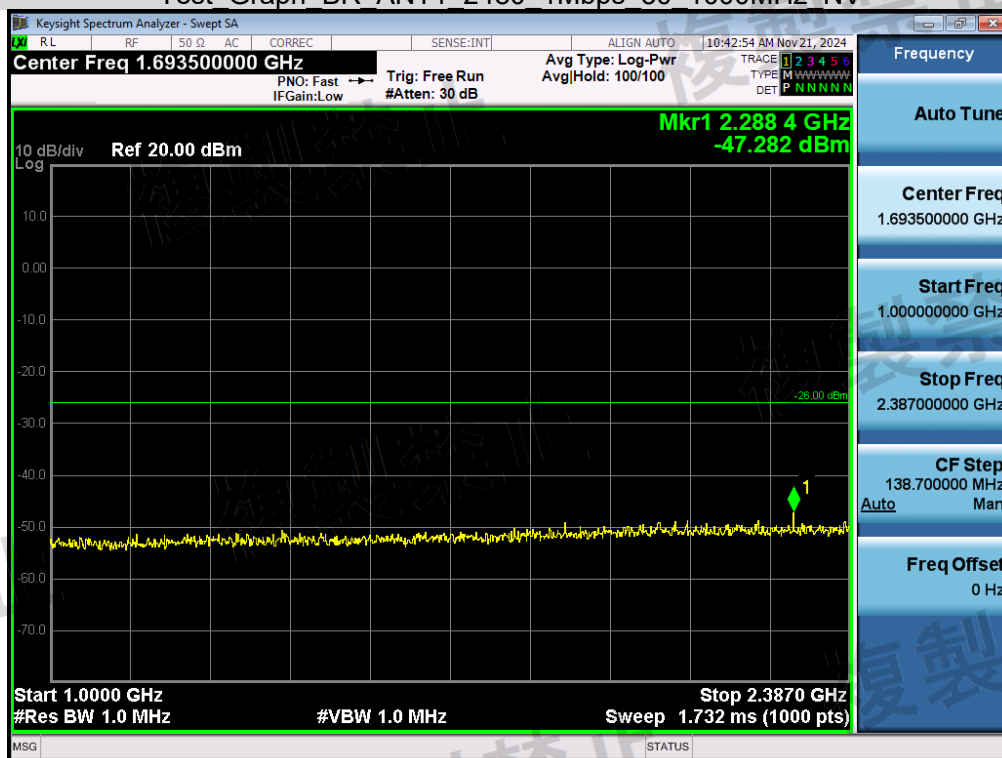
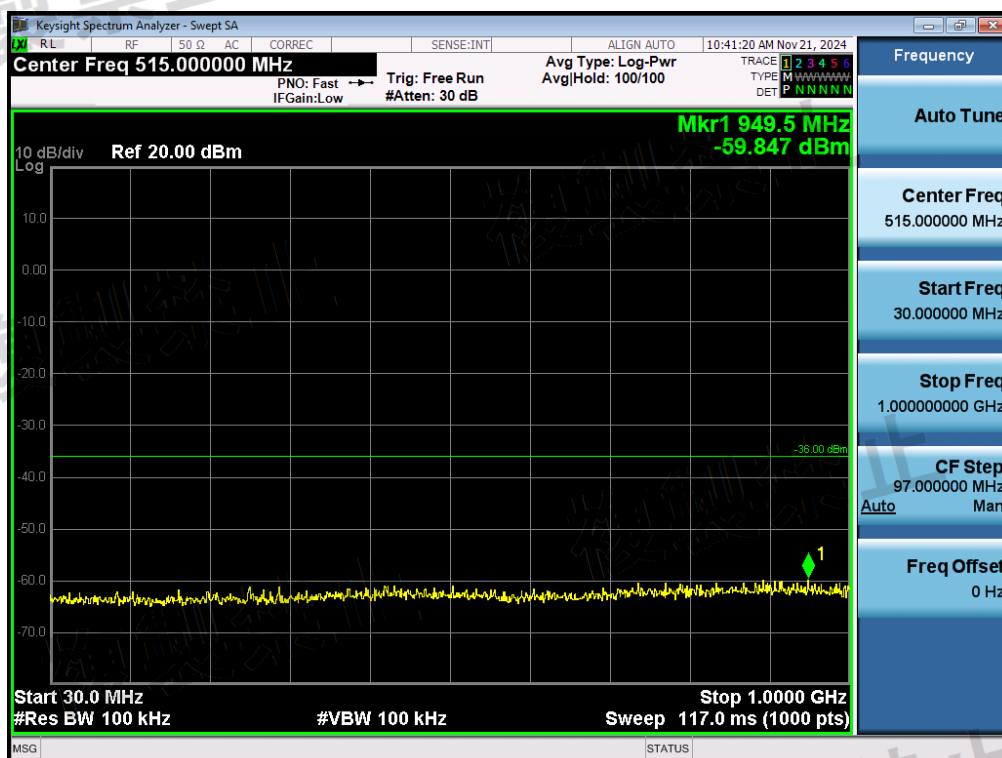
Test_Graph_BR_ANT1_2480_1Mbps_30_1000MHz_LV

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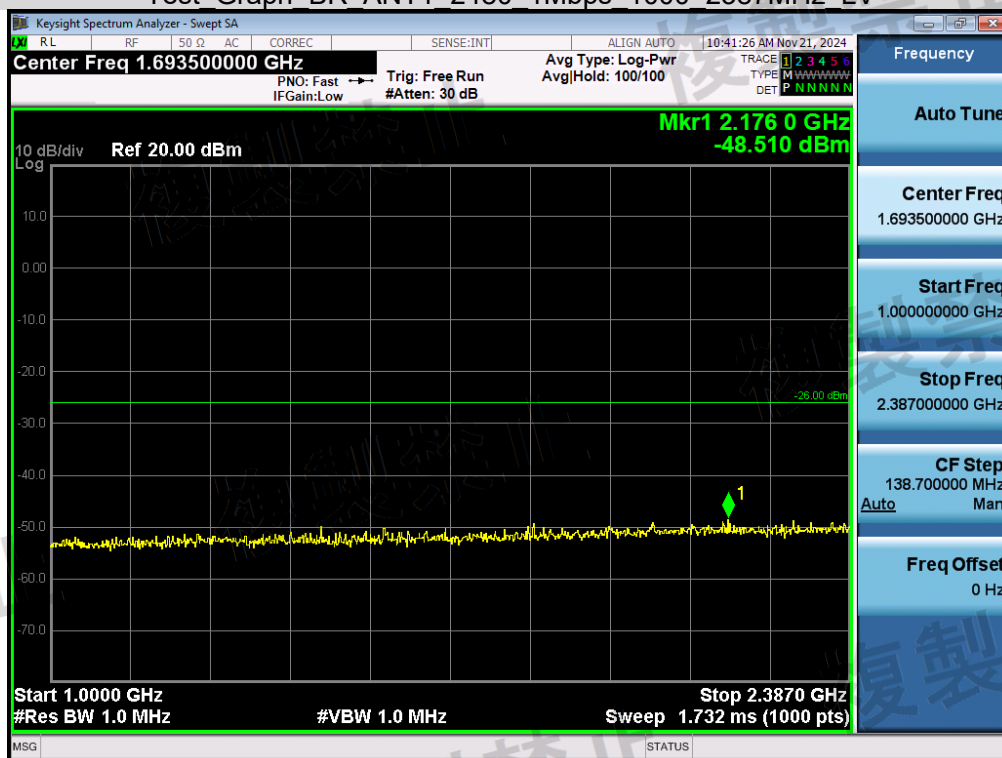
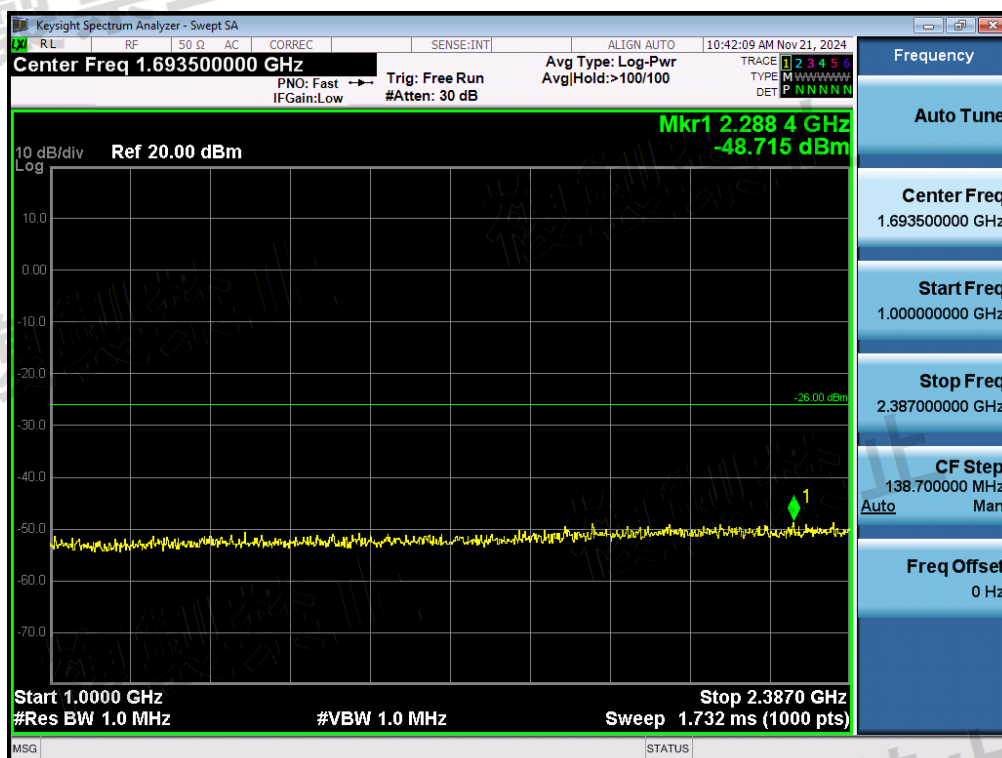


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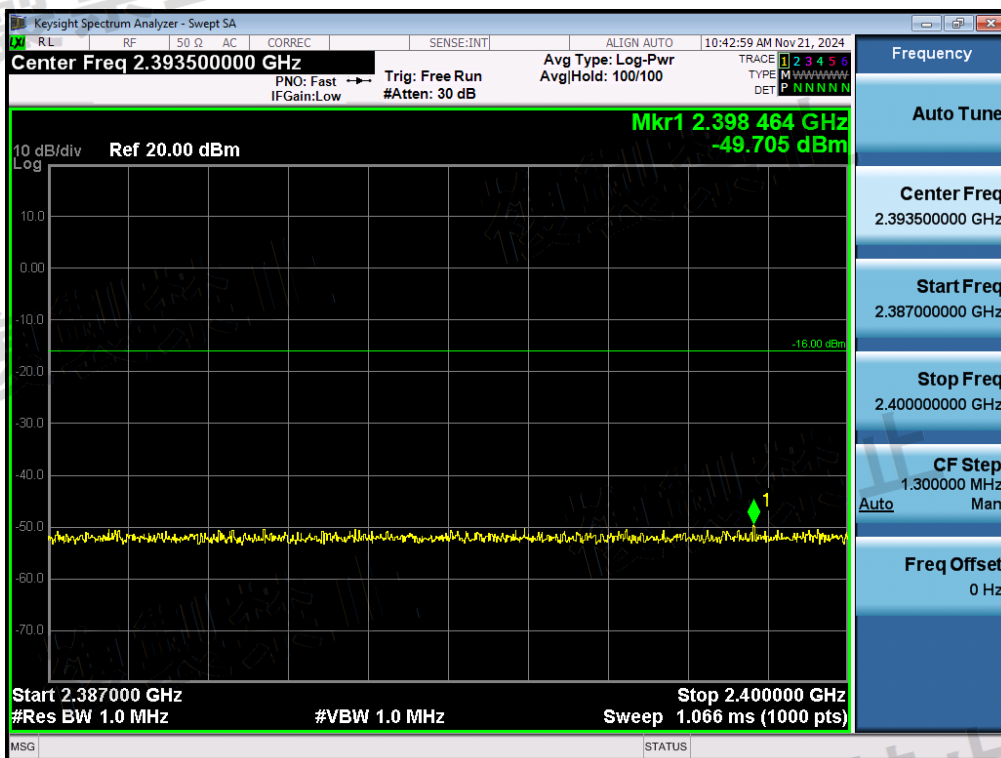


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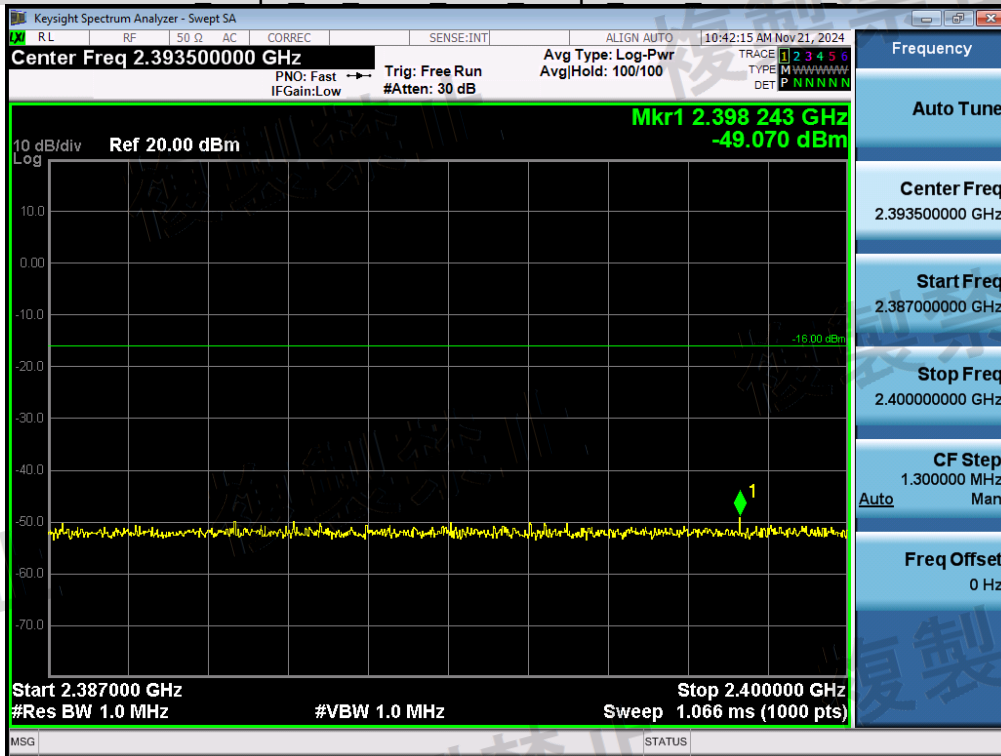
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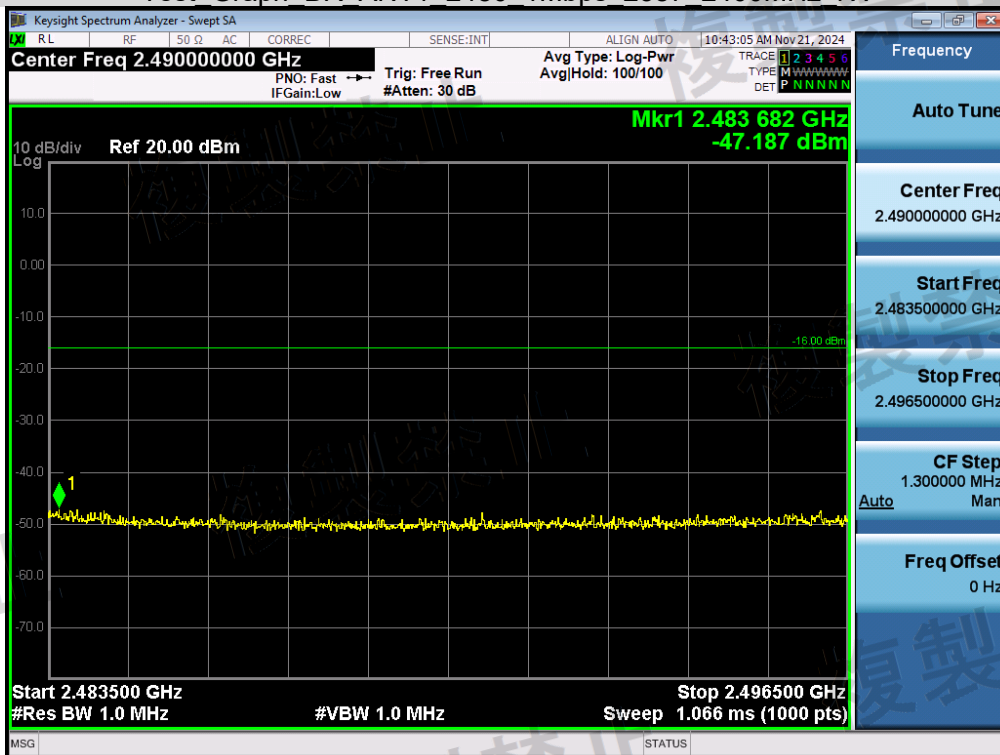
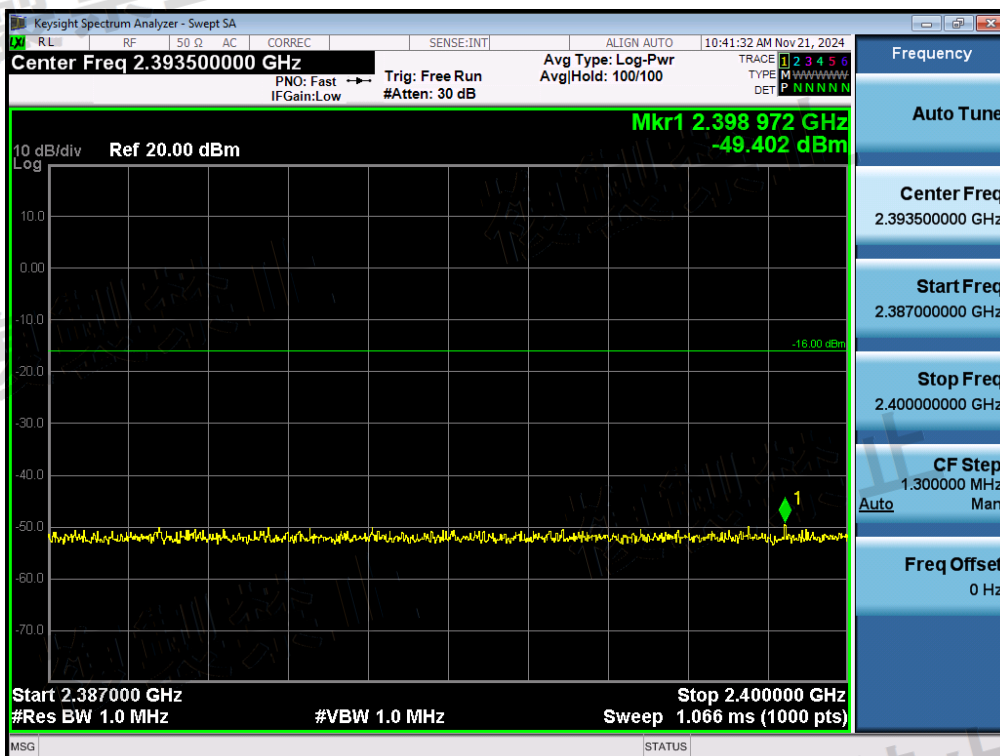


Test Graph BR ANT1 2480 1Mbps 2387 2400MHz HV



Test_Graph_BR_ANT1_2480_1Mbps_2387_2400MHz_LV

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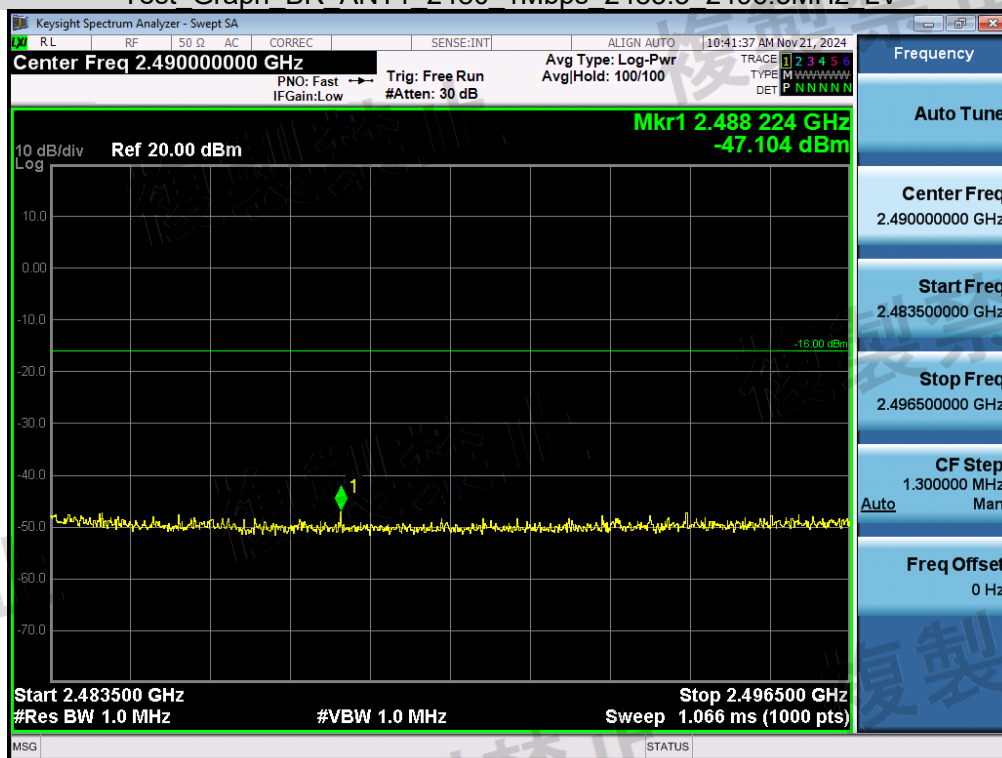
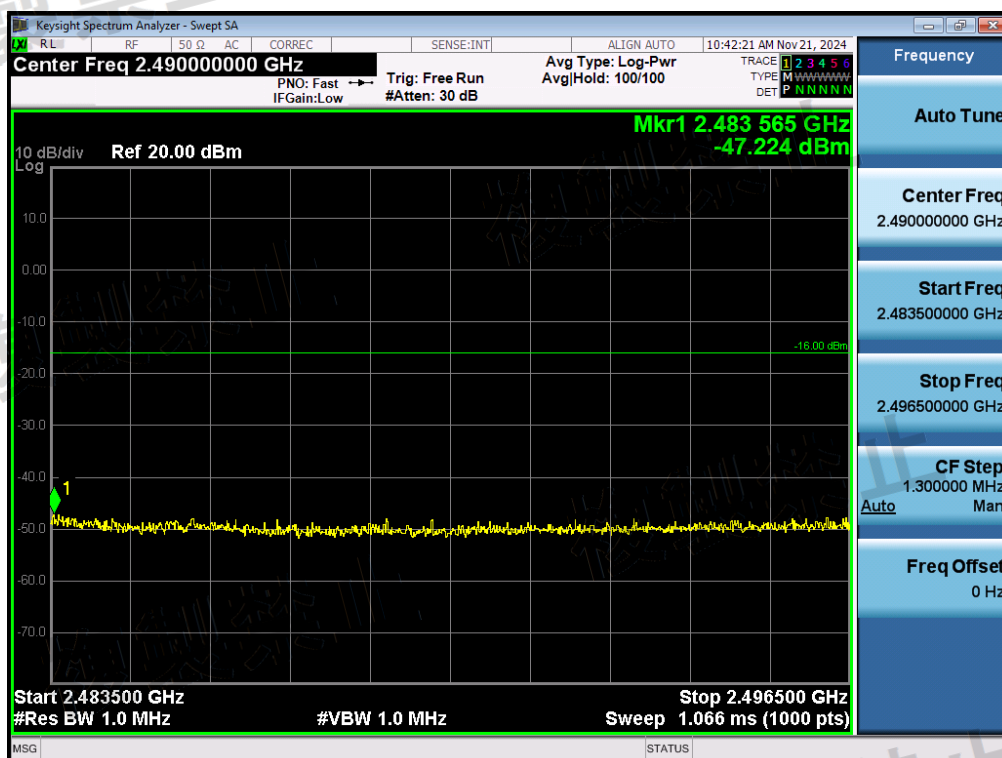


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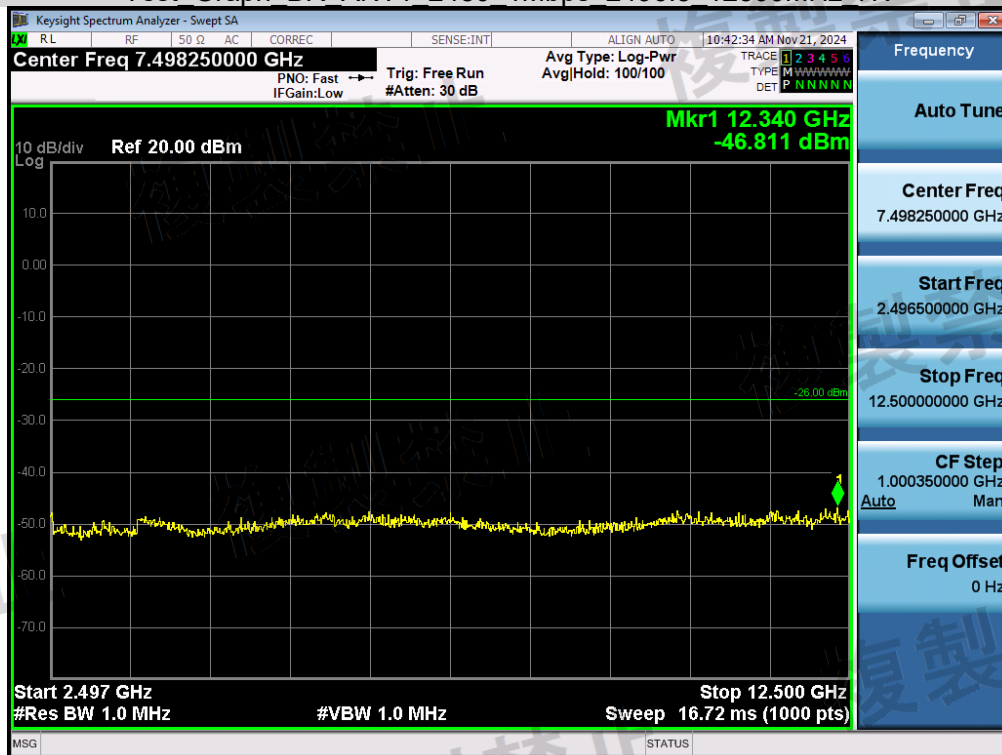
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Test Graph BR ANT1 2480 1Mbps 2496.5 12500MHz HV



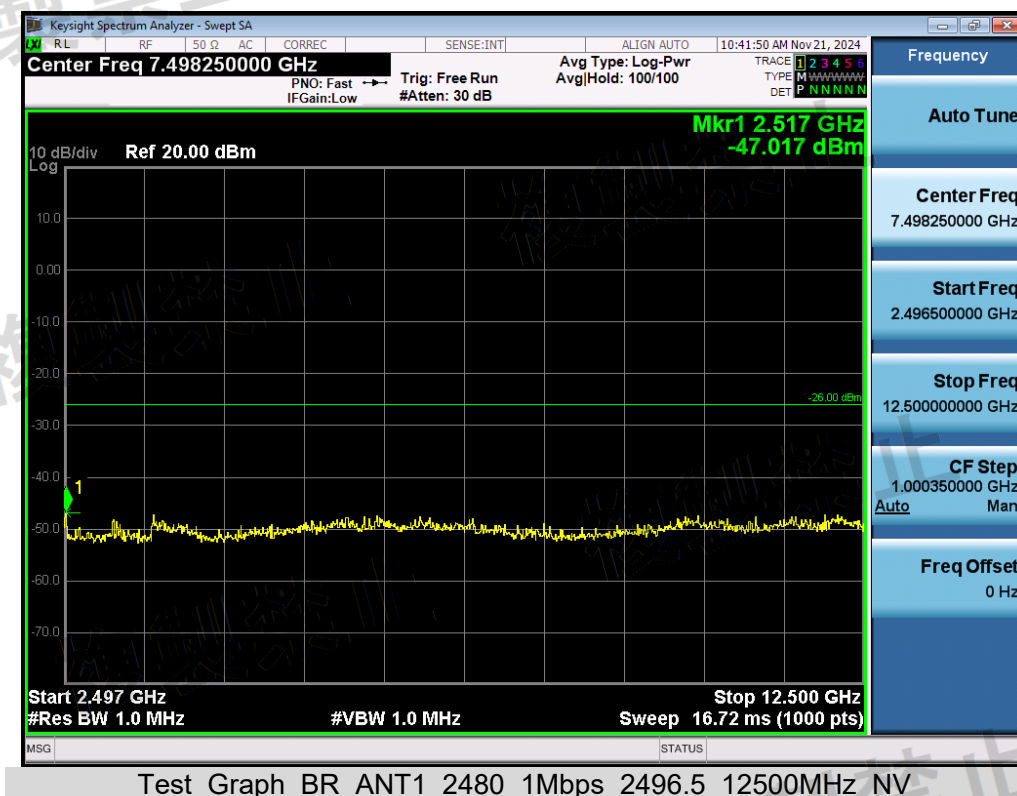
Test_Graph_BR_ANT1_2480_1Mbps_2496.5_12500MHz_LV

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5.4 Antenna Power Error Measurement

Test Limit

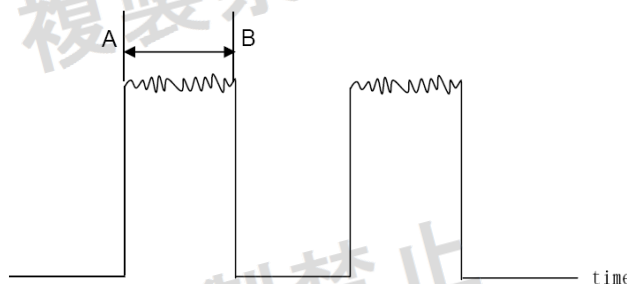
Test Item	Limits
Antenna Power	$\leq 3\text{mW/MHz}$ (FH system from 2400 to 2483.5MHz)
	$\leq 10\text{mW/MHz}$ (FH system from 2400 to 2427MHz)
	$\leq 10\text{mW/MHz}$ (FH system from 2470.75 to 2483.5MHz)
	$\leq 10\text{mW/MHz}$ (OFDM, DS 20MHz system)
	$\leq 10\text{mW}$ (Others)
	$\leq 5\text{mW}$ for OFDM (40 MHz system)
Antenna Power Error	+20% (Base on manufacturer declare antenna power density)

Test Procedure

The following table is the setting of spectrum analyzer.

Spectrum Parameter	Setting
RB / VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

- Power meter is connected on the IF output port of the spectrum analyzer.
- Adjust the spectrum analyzer to have the center frequency the same with the test frequency.
- RBW=VBW=1MHz, detector mode is positive peak. Span=120MHz.
- Connect the equipment to be measured. Using the above settings of the spectrum analyzer in combination with "max hold" function, find the frequency of highest power output in the power envelope.
- The frequency found shall be recorded.
- Set the center frequency of the spectrum analyzer to the found frequency and switch to zero span.
- Use the Burst Power function of the spectrum analyzer to measure the Average burst power.



Measures the Average Burst power (A to B)

- Antenna Power (mW/MHz) = Average Burst Power / Spread Band width (Step is 1MHz or less).
Antenna Power (mW/MHz) = Average Burst Power / Number of hopping (Step is more than 1MHz)

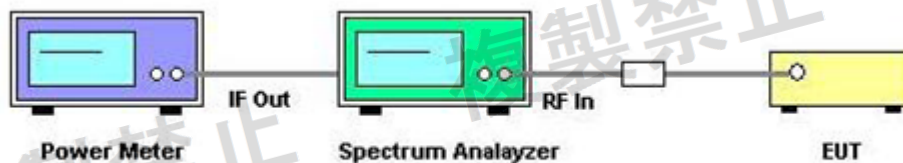
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Test Setup



Test Result

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test Data of Antenna Power for FH system

Test Mode	Burst Power (mW)			Antenna Power (mW/MHz)			Limit (mW/MHz)	P/F
	NV	LV	HV	NV	LV	HV		
BR_HOP_1Mbps	1.930	1.924	1.920	0.027	0.027	0.027	3	Pass
EDR_HOP_2Mbps	1.755	1.797	1.789	0.025	0.025	0.025	3	Pass
EDR_HOP_3Mbps	1.824	1.818	1.821	0.026	0.026	0.026	3	Pass

Note: Antenna Power (mW/MHz) = Burst Power (mW)/Spreading Bandwidth (MHz).

Test Data of Antenna Power Error for FH system

Test Mode	Rated power (mW/MHz)	Antenna Power Error (%)			Limit (%)	P/F
		NV	LV	HV		
BR_HOP_1Mbps	0.03	-10.00	-10.00	-10.00	20	Pass
EDR_HOP_2Mbps	0.03	-16.67	-16.67	-16.67	20	Pass
EDR_HOP_3Mbps	0.03	-13.33	-13.33	-13.33	20	Pass

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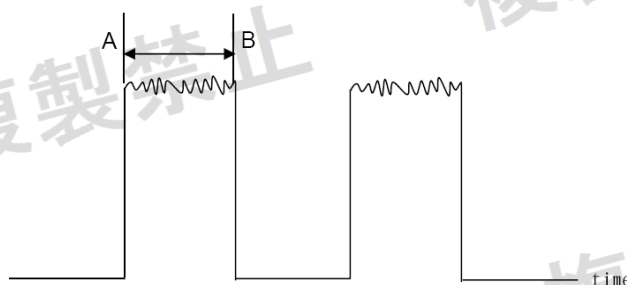
5.5 EIRP Antenna Power Measurement

Test Limit

Test Item	Limits
EIRP Antenna Power	$\leq 6.91\text{dBm/MHz}$ (FH system)
	$\leq 12.14\text{dBm/MHz}$ (FH system from 2400 to 2427MHz)
	$\leq 12.14\text{dBm/MHz}$ (FH system from 2470.75 to 2483.5MHz)
	$\leq 12.14\text{dBm}$ (Others)
	$\leq 9.13\text{dBm/MHz}$ (OFDM 40MHz system)

Test Procedure

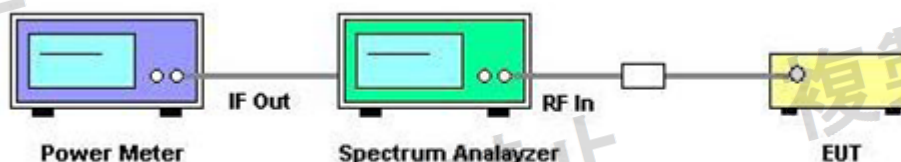
- Power meter is connected on the IF output port of the spectrum analyzer.
- Adjust the spectrum analyzer to have the center frequency the same with the test frequency.
- RBW=VBW=1MHz, detector mode is positive peak. Span=120MHz.
- Connect the equipment to be measured. Using the above settings of the spectrum analyzer in combination with "max hold" function, find the frequency of highest power output in the power envelope.
- The frequency found shall be recorded.
- Set the center frequency of the spectrum analyzer to the found frequency and switch to zero span.
- Use the Burst Power function of the spectrum analyzer to measure the Average burst power.



Measures the Average Burst power (A to B)

- Antenna Power (mW/MHz) = Average Burst Power / Spread Band width (Step is 1MHz or less).
- Antenna Power (mW/MHz) = Average Burst Power / Number of hopping (Step is more than 1MHz)

Test Setup



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Test Result

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test Data of E.I.R.P. for FH system

Test Mode	Antenna Power (dBm/MHz)			Antenna Gain (dBi)	E.I.R.P. (dBm/MHz)			Limit (dBm/MHz)	P/F
	NV	LV	HV		NV	LV	HV		
BR_HOP_1Mbps	-15.69	-15.69	-15.69	-2.8	-18.49	-18.49	-18.49	6.91	Pass
EDR_HOP_2Mbps	-16.02	-16.02	-16.02	-2.8	-18.82	-18.82	-18.82	6.91	Pass
EDR_HOP_3Mbps	-15.85	-15.85	-15.85	-2.8	-18.65	-18.65	-18.65	6.91	Pass

Note: E.I.R.P. (dBm/MHz) = Antenna Power(dBm/MHz) + Antenna Gain (dBi).

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5.6 Secondary Radiated Emission Strength Measurement

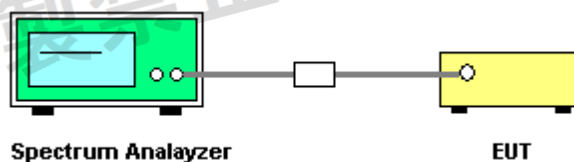
Test Limit

Test Item	Limits
Secondary Radiated Emission Strength	$\leq 4\text{nW}$ ($f < 1000\text{MHz}$)
	$\leq 20\text{nW}$ ($1000\text{MHz} \leq f$)

Test Procedure

1. EUT have the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. Convert from dBm to nW: $P(\text{nW}) = 1000000 * 10^{[P(\text{dBm})/10]}$

Test Setup



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Test Result

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test Data of Secondary Radiated Emission Strength								
Voltage	Mode	Channel (MHz)	Frequency Range (MHz)	Frequency (MHz)	Result (dBm)	Result (nW)	Limit (nW)	P/F
NV	RX	2402	30~1000	874.7	-91.719	0.001	4	Pass
NV	RX	2402	1000~12500	11348.8	-78.29	0.015	20	Pass
LV	RX	2402	30~1000	928.1	-91.686	0.001	4	Pass
LV	RX	2402	1000~12500	12177.7	-77.524	0.018	20	Pass
HV	RX	2402	30~1000	929.1	-91.886	0.001	4	Pass
HV	RX	2402	1000~12500	12292.8	-78.308	0.015	20	Pass

Note: Only reflects the Bluetooth BR mode rate of 1Mbps as the worst mode data.

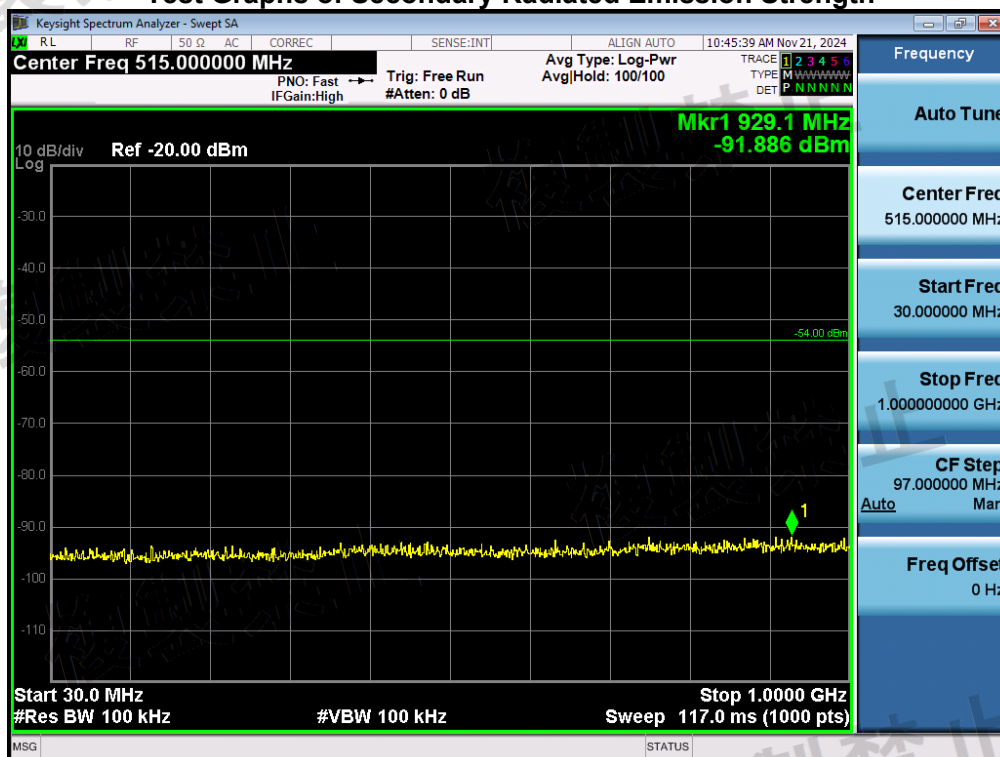
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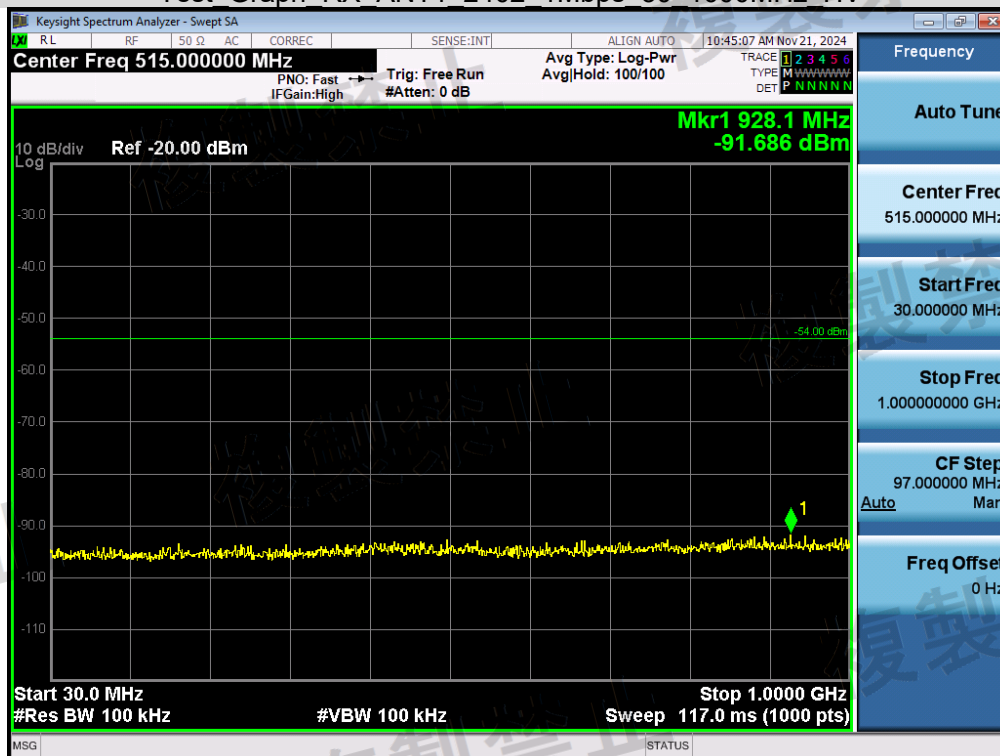
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Test Graphs of Secondary Radiated Emission Strength



Test Graph RX ANT1 2402 1Mbps 30 1000MHz HV



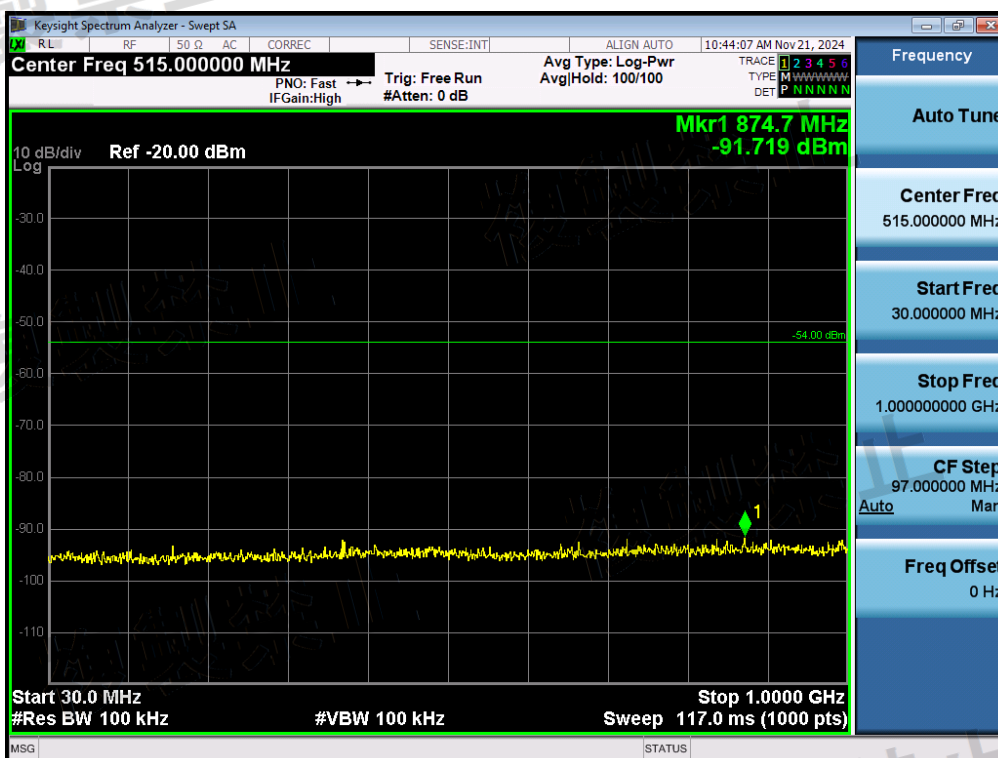
Test_Graph_RX_ANT1_2402_1Mbps_30_1000MHz_LV

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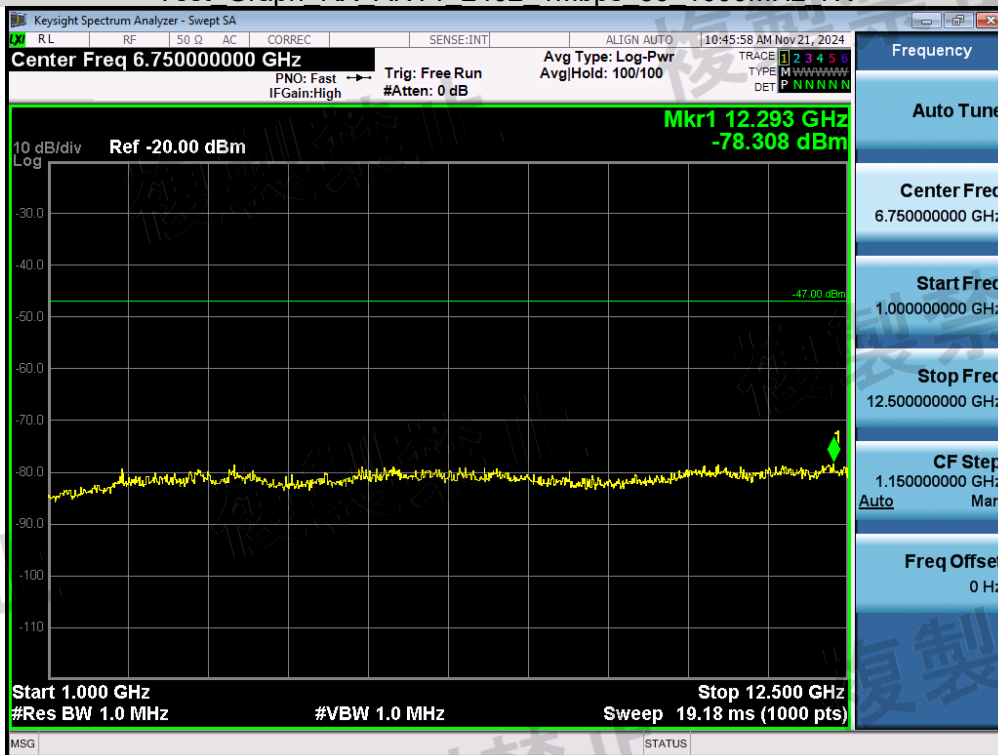
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Test Graph RX ANT1 2402 1Mbps 30 1000MHz NV



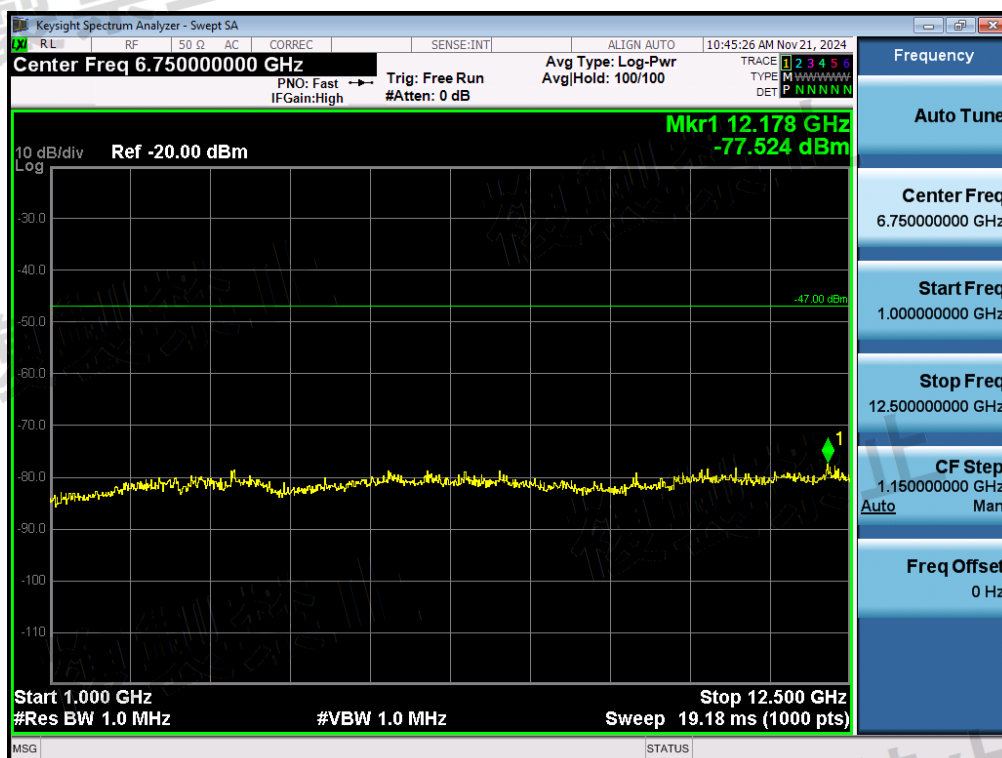
Test_Graph_RX_ANT1_2402_1Mbps_1000_12500MHz_HV

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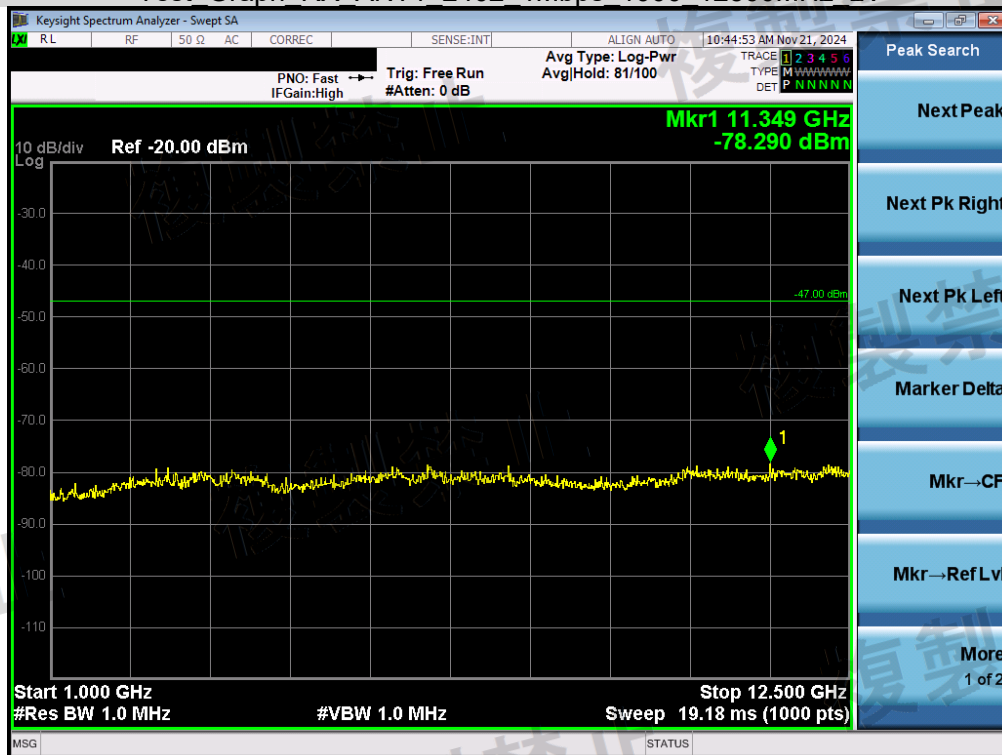
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Test Graph RX ANT1 2402 1Mbps 1000 12500MHz LV



Test_Graph_RX_ANT1_2402_1Mbps_1000_12500MHz_NV

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5.7 Dwell Time Measurement

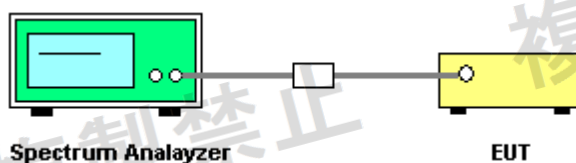
Test Limit

Test Item	Limits
Dwell Time	$\cong 0.4$ sec

Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set the spectrum analyzer as follows:
Center frequency: Measurement hopping frequency
Sweep frequency width: 0 Hz
Resolution bandwidth: About 1 MHz
Video bandwidth: Approximately the same as the resolution bandwidth
Sweep time: Hopping period
Trigger condition: Video trigger
Sweep mode: Single sweep
Detection mode: Positive peak
3. Set the EUT for DH5, DH3 and DH1 packet transmitting.
4. Measure the maximum time duration of one single pulse.
5. Dwell time = [Spreading factor/79] x duty-cycle x 0.4 seconds (to be determined for each mode, DH1, DH3, DH5)
 - Duty-cycle = [on time/total time] x 100%
 - The measurement value of Spreading factor can be referred to Clause 5.2.

Test Setup



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Test Result

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test Data of Dwell time					
Test Mode	Spreading factor	Duty cycle	Dwell time (s)	Limits (s)	P/F
BR_2402_1Mbps	70.749	0.7702	0.2759	0.4	Pass
BR_2441_1Mbps	70.749	0.7699	0.2758	0.4	Pass
BR_2480_1Mbps	70.749	0.7701	0.2759	0.4	Pass

Note: The worst mode is recorded when the maximum packet size is DH5.

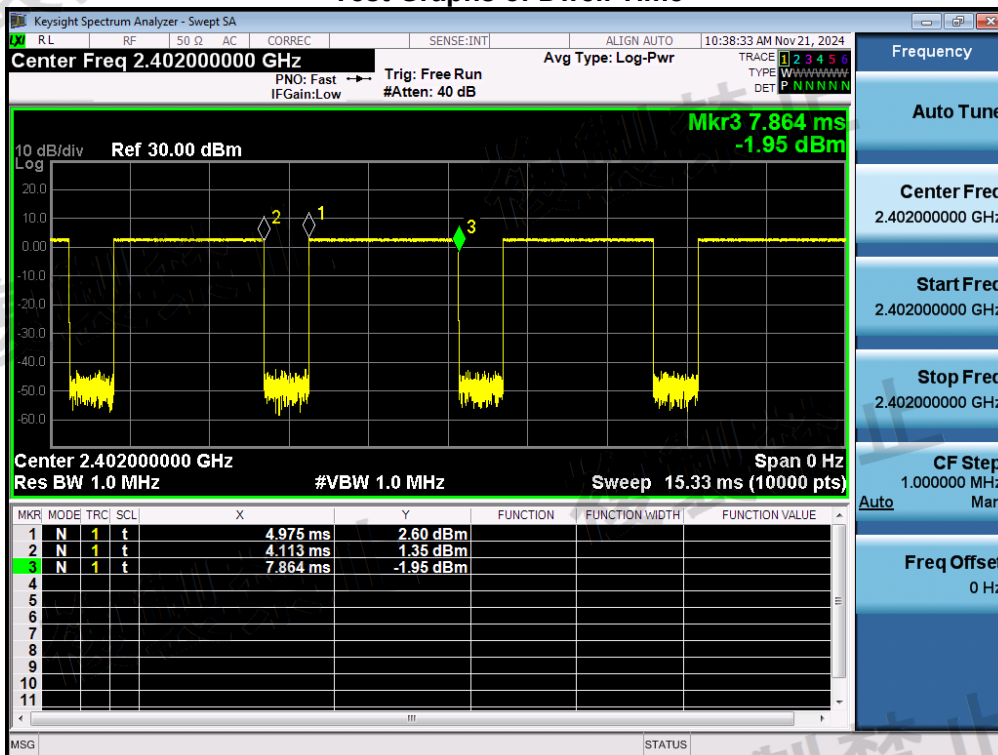
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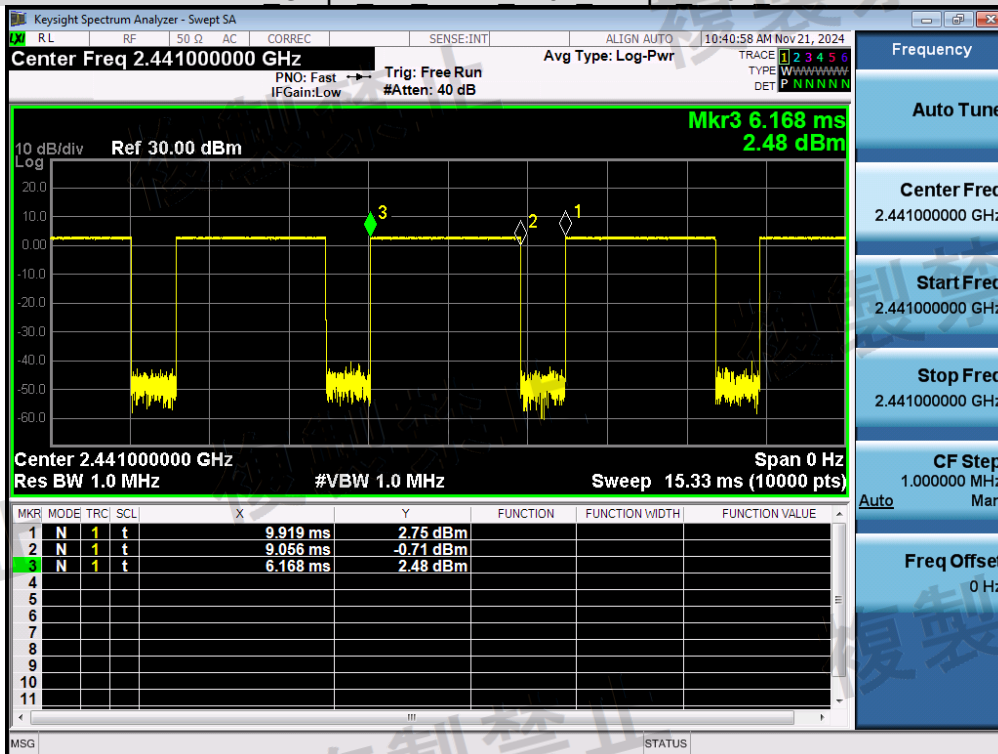
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Test Graphs of Dwell Time



Test Graph BR ANT1 2402 1Mbps 2402 DT



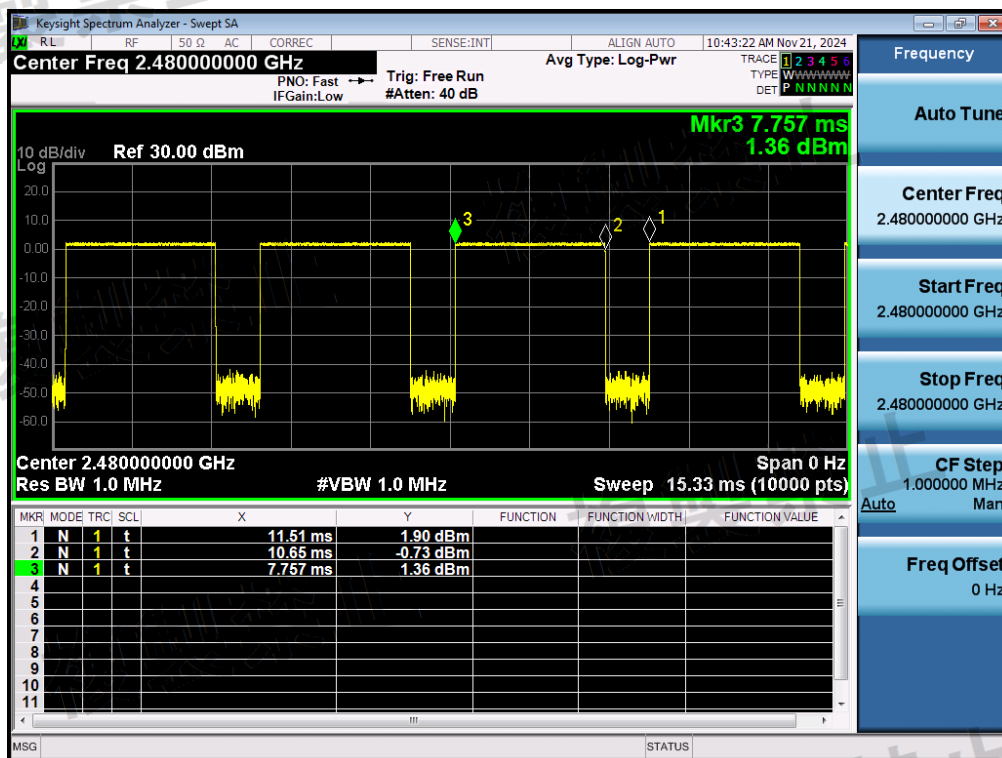
Test Graph BR ANT1 2441 1Mbps 2441 DT

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Test_Graph_BR_ANT1_2480_1Mbps_2480_DT

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5.8 Interference Prevention Function Measurement

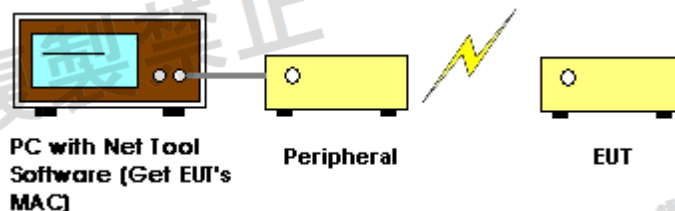
Test Limit

Test Item	Limits
Identification Code	≥ 48 bits
MAC IP List	MAC Scan

Test Procedure

- In the case that the EUT has the function of automatically transmitting the identification code:
 - a. Transmit the predetermined identification codes form EUT.
 - b. Check the transmitted identification codes with the demodulator.
- In the case of receiving the identification code:
 - a. Transmit the predetermined identification codes form the counterpart.
 - b. Check if communication is normal.
 - c. Transmit the signals other than predetermined ID codes form the counterpart.
 - d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

Test Setup



Test Result

Test Temperature	23.9℃	Relative Humidity	52%
Test Pressure	101kPa	Test Engineer	Icey Huang
Testing Time	2024-11-21		

Test result of Interference Prevention Function		
Item	MAC address	Test Result
Identification code	18:9C:2C:21:01:C4	Good

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5.9 Housing Requirements

Test Limit

The high-frequency section and modulation section (except for the antenna system) shall not be capable of being opened easily.

Confirmation Method

The RF and modulation portions are protected against illegal modification as following method:

Protected Method	Description
BT Module Package	BT Module Package of RF (AK16G6) and Modulation (TX:24 MHz) portions is QFN type. (Chip pin number:32 /Chip pin angle spacing: 0.4mm)
Shield case	The enclosure is sealed by ultrasonic welding and it cannot be opened easily. Otherwise, the device will be damaged.
User Manual	We will add some warning statements on the user manual to against illegal modification.

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Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC01110241185AP03A

Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC01110241185AP04A

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

----End of Report----

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