

Prüfbericht-Nr.: Test report no.:		CN23D41J 003	Auftrags-Nr.: Order no.:		168459080	Page 1 of 14 Seite 1 von 14	
Kunden-Referenz-Nr.: Client reference no.:		N/A	Auftragsdatum: Order date:		2023-12-14		
Auftraggeber: Client:		SHOKZ (SINGAPORE) PTE. LTD. 11 NORTH BUONA VISTA DRIVE #16-09 THE METROPOLIS SINGAPORE 138589, Singapore					
Prüfgegenstand: Test item:		OPENFIT AIR					
Bezeichnung / Typ-Nr.: Identification / Type no.:		T511 (Trademark: SHOKZ)					
Auftrags-Inhalt: Order content:		Type test					
Prüfgrundlage: Test specification:		ARIB STD-T66, Article 2 Section 1 Item 19					
Wareneingangsdatum: Date of sample receipt:		2023-12-29					
Prüfmuster-Nr.: Test sample no.:		A003633732					
Prüfzeitraum: Testing period:		2023-12-31 – 2024-01-24					
Ort der Prüfung: Place of testing:		TÜV Rheinland (Shenzhen) Co., Ltd.					
Prüflaboratorium: Testing laboratory:		TÜV Rheinland (Shenzhen) Co., Ltd.					
Prüfergebnis*: Test result*:		Pass					
geprüft von: tested by:				genehmigt von: authorized by:			
Datum: Date:		2024-02-02		Ausstellungsdatum: Issue date:		2024-02-02	
Position / Stellung:		Project Manager		Position / Stellung:		Reviewer	
Sonstiges / Other:		This test report is for Bluetooth Low Energy function of left earbud.					
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged					
* Legende: * Legend:		P(ass) = entspricht o.g. Prüfgrundlage(n) P(ass) = passed a.m. test specification(s)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n) F(ail) = failed a.m. test specification(s)		N/A = nicht anwendbar N/A = not applicable	
						N/T = nicht getestet N/T = not tested	
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the above mentioned test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.							

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Remarks
Anmerkungen

- | | |
|---|--|
| 1 | <p>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</p> <p><i>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben.</i></p> <p><i>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</i></p> |
| 2 | <p>As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.</p> <p><i>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</i></p> |
| 3 | <p>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</p> <p><i>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</i></p> |
| 4 | <p>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</p> <p><i>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</i></p> |

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1 TEST SITES

1.1 TEST FACILITIES

TÜV Rheinland (Shenzhen) Co., Ltd.

No.362, Huanguan Middle Road, Songyuansha Community, Guanhu Subdistrict, Longhua District, Shenzhen, Guangdong, China/518110

1.2 LIST OF TEST AND MEASUREMENT INSTRUMENTS

Table 1: List of Test and Measurement Equipment

TÜV Rheinland (Shenzhen) Co., Ltd.

Equipment	Manufacturer	Model	Serial No.	Calibration Company	Date calibrated	Cal. until	Note (Radio Law)
Wireless Connectivity Tester	R&S	CMW270	101375	GRGTEST	2023-07-26	2024-07-25	24-2-4-2-(ha)
EXA Signal Analyzer	Keysight	N9010B	MY60241175	GRGTEST	2023-07-26	2024-07-25	24-2-4-2-(ha)
Power Meter	R&S	NRP2	107105	GRGTEST	2023-11-14	2024-11-13	24-2-4-2-(ha)
Power Sensor	R&S	NRP-Z81	105677	GRGTEST	2023-07-26	2024-07-25	24-2-4-2-(ha)
DC Power Supply	Keysight	E3642A	MY61276100	GRGTEST	2023-03-15	2024-03-14	24-2-4-2-(ha)
Digital Multi Meter	FLUKE	F15B	44350845WS	GRGTEST	2023-03-15	2024-03-14	24-2-4-2-(ha)

1.3 UNCERTAINTY OF MEASUREMENT

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

ITEM	UNCERTAINTY
Occupied Bandwidth	206.50 Hz
Spurious emissions	$\pm 3.93\text{dB}$
Output power density	1.37dB
Out of band radiated power	2.52 dB
Frequency Tolerance	0.104 ppm

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2 GENERAL PRODUCT INFORMATION

2.1 PRODUCT FUNCTION AND INTENDED USE

The EUT is a Bluetooth earbuds, which supports Bluetooth dual mode technology, this earbuds has different color of enclosure

The left earbud is differences with right earbud in PCB layout and antenna.

For details refer to the User Manual, Technical Description and Circuit Diagram.

2.2 RATINGS AND SYSTEM DETAILS

Table 2: Technical Specification of EUT

General Information of EUT	Description
Kind of Equipment:	OPENFIT AIR
Type Designation:	T511
Trademark:	SHOKZ
Operating Voltage	DC 3.85V, 40mAh via built-in battery
Extreme Temperature Range	0°C to +40°C
Technical Specification of Bluetooth (BDR & EDR)	
Characteristic	Description
Operating Frequency band	2402 – 2480 MHz
Bluetooth Core Version	Bluetooth 5.2
Channel Number	79 channels
Channel separation	1MHz
Modulation	GFSK, 8DPSK, $\pi/4$ DQPSK
Antenna Type	LDS Antenna
Antenna Gain	-4.5 dBi (Provided by the Client)
Technical Specification of Bluetooth Low Energy	
Bluetooth Core Version	Bluetooth 5.2
Operating Frequency band	2402 – 2480 MHz for data rate 1Mbps 2404 – 2478 MHz for data rate 2Mbps
Channel Number	40 channels for data rate 1Mbps 37 channels for data rate 2Mbps Note: 2402MHz/2426MHz/2480MHz will be disable via software for data rate 2Mbps.
Channel separation	2MHz
Data rate	1Mbps, 2Mbps
Modulation	GFSK
Antenna Type	LDS Antenna
Antenna Gain	-4.5 dBi (Provided by the Client)
rated RF output power:	10 mW
Conducted RF output power:	9.55 mW
EIRP output power:	3.39 mW

Table 3: RF Channel and Frequency, Bluetooth (BDR & EDR)

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	2402.00	20	2422.00	40	2442.00	60	2462.00
1	2403.00	21	2423.00	41	2443.00	61	2463.00
2	2404.00	22	2424.00	42	2444.00	62	2464.00
3	2405.00	23	2425.00	43	2445.00	63	2465.00
4	2406.00	24	2426.00	44	2446.00	64	2466.00
5	2407.00	25	2427.00	45	2447.00	65	2467.00
6	2408.00	26	2428.00	46	2448.00	66	2468.00
7	2409.00	27	2429.00	47	2449.00	67	2469.00
8	2410.00	28	2430.00	48	2450.00	68	2470.00
9	2411.00	29	2431.00	49	2451.00	69	2471.00
10	2412.00	30	2432.00	50	2452.00	70	2472.00
11	2413.00	31	2433.00	51	2453.00	71	2473.00
12	2414.00	32	2434.00	52	2454.00	72	2474.00
13	2415.00	33	2435.00	53	2455.00	73	2475.00
14	2416.00	34	2436.00	54	2456.00	74	2476.00
15	2417.00	35	2437.00	55	2457.00	75	2477.00
16	2418.00	36	2438.00	56	2458.00	76	2478.00
17	2419.00	37	2439.00	57	2459.00	77	2479.00
18	2420.00	38	2440.00	58	2460.00	78	2480.00
19	2421.00	39	2441.00	59	2461.00		

Table 3: RF Channel and Frequency, Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

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2.3 TEST CONDITIONS

Test conditions	Voltage (Vdc)
V _{normal}	3.85
V _{max}	4.235
V _{min}	3.465

Test conditions	Unit
Temperature	23.5 deg °C
Humidity	53.0 %

2.4 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Laptop	Lenovo	T480	PF-16A6N8	N/A

2.5 ANTENNA SPECIFICATIONS

2.5.1 ANTENNA GAIN

Ant. Type	Connector Type	Highest Peak Gain (dBi) 2.4GHz ~ 2.5GHz
LDS Antenna	N/A	-4.5 dBi

2.5.2 ANTENNA PATTERN

Please refer to the attached file (Antenna report).

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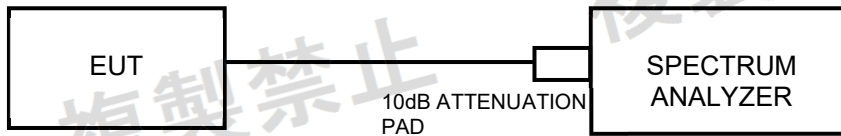
3 TEST RESULTS

3.1 FREQUENCY TOLERANCE MEASUREMENT

3.1.1 LIMITS OF FREQUENCY TOLERANCE MEASUREMENT

Tolerance of frequency shall be +/- 50ppm

3.1.2 TEST SETUP



3.1.3 TEST RESULTS

For the measurement records, refer to the appendix A.

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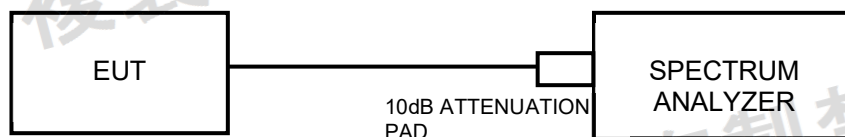
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3.2 OCCUPIED BANDWIDTH MEASUREMENT (99% POWER BANDWIDTH)

3.2.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

ITEM	LIMIT	REMARK
Occupied bandwidth	<26MHz	For 802.11b, g & 802.11n (HT20)
Occupied bandwidth	<26MHz	For BT-LE (GFSK)

3.2.2 TEST SETUP



3.2.3 TEST RESULTS

For the measurement records, refer to the appendix A.

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3.3 ANTENNA POWER MEASUREMENT

3.3.1 LIMITS OF ANTENNA POWER

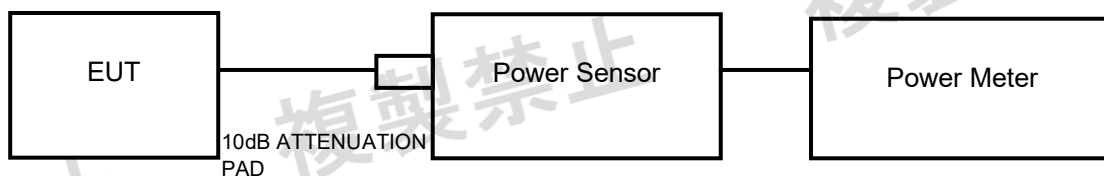
Modulation system	Frequency band used	Antenna power (max.)	EIRP (max)	
			Omni-directional case	Directional case
DS.OFDM (Narrow-Band)	2,400 – 2,4835 MHz	10mW/MHz	12.14 dBm/MHz (16.367 mW/MHz)	22.14 dBm/MHz (163.682 mW/MHz)
OFDM (Wide-Band)	2,400 – 2,4835 MHz	5mW/MHz	9.13dBm/MHz (8.185mW/MHz)	19.13dBm/MHz (81.846mW/MHz)
DTS	2,400 – 2,4835 MHz	10mW	12.14 dBm 16.367 mW	22.14 dBm 163.682 mW

Tolerance of antenna power shall be +20% (upper value) and –80% (lower value).

According article 49.20 f(2) The angular width of the principal radiation in the horizontal and vertical planes of the transmitting antenna shall not exceed the value obtained by the following expression. $360/A$ degree

A represents the value determined by dividing an equivalent isotropically radiated power by the value obtained by applying an antenna power with the mean power of 10 mW to the transmitting antenna with its absolute gain being 2.14 dB, and shall be 1 when it is lower than 1

3.3.2 TEST SETUP



3.3.3 TEST RESULTS

For the measurement records, refer to the appendix A.

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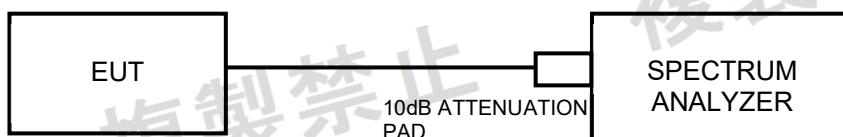
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3.4 SPURIOUS EMISSIONS FOR TRANSMITTER MEASUREMENT

3.4.1 LIMITS OF SPURIOUS EMISSIONS

FREQUENCIES (MHz)	LIMIT
Operating frequency 2400 to 2483.5MHz	
30.0MHz to 2387MHz	$\leq 2.5\mu\text{W/MHz}$
2387.0MHz to 2400.0MHz	$\leq 25\mu\text{W/MHz}$
2483.5MHz to 2496.5MHz	$\leq 25\mu\text{W/MHz}$
2496.5MHz to 12500.0MHz	$\leq 2.5\mu\text{W/MHz}$

3.4.2 TEST SETUP



3.4.3 TEST RESULT

For the measurement records, refer to the appendix A.

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3.5 SPURIOUS EMISSIONS FOR RECEIVER

3.5.1 LIMITS OF SPURIOUS EMISSIONS FOR RECEIVER

FREQUENCIES (MHz)	LIMIT
Below 1GHz	$\leq 4\text{nW}$ (-54dBm)
Above 1GHz	$\leq 20\text{nW}$ (-47dBm)

3.5.2 TEST SETUP



3.5.3 TEST RESULT

For the measurement records, refer to the appendix A.

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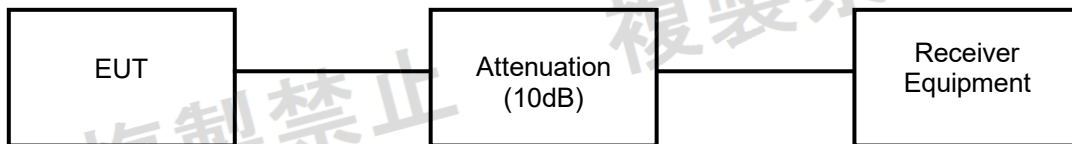
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3.6 INTERFERENCE PREVENTION FUNCTION

3.6.1 LIMITS OF Interference Prevention Function

N/A

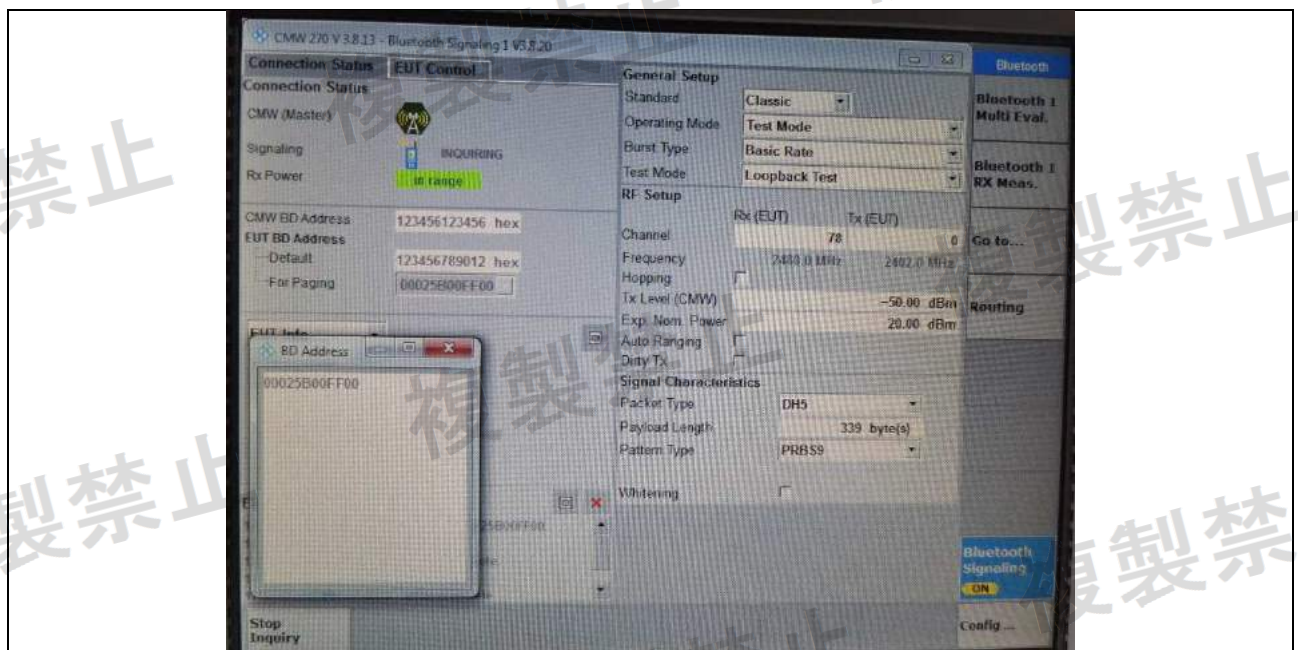
3.6.2 TEST SETUP



3.6.3 TEST RESULTS

ENVIRONMENTAL CONDITIONS	23.5 deg.C, 53.0% RH
LINK MODE	TEST RESULT
BT-LE	PASS

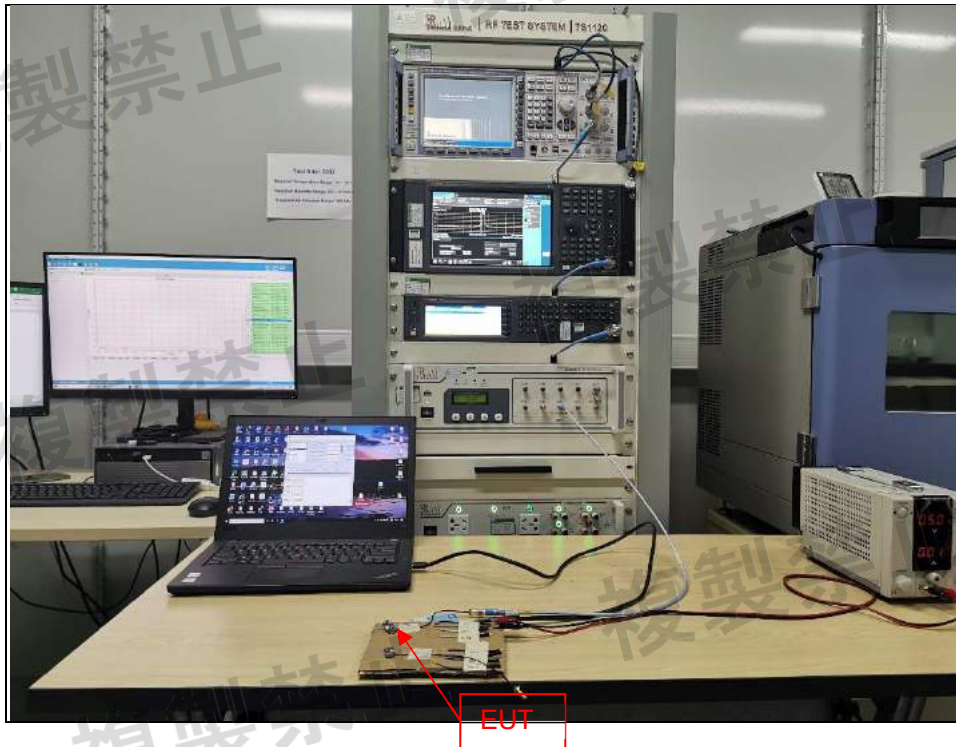
EUT connected to CMW270, MAC address (00025B00FF00) as below:



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4 PHOTOGRAPHS OF THE TEST CONFIGURATION



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Appendix A

Test results of Bluetooth Low Energy

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5	APPENDIX A.5: SPURIOUS EMISSIONS FOR RECEIVER.....	50

1 Appendix A.1 : FREQUENCY TOLERANCE

Note:

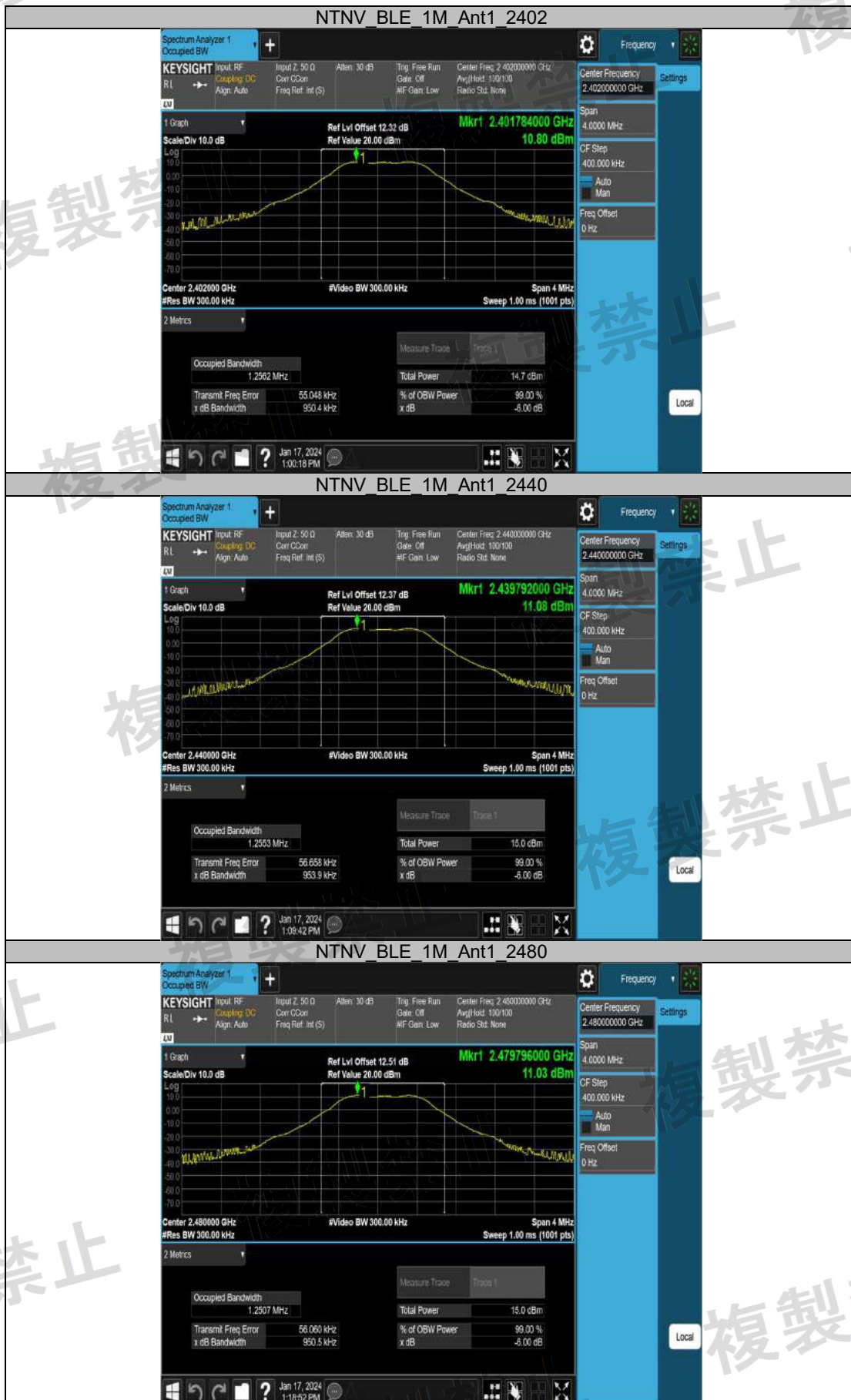
NTNV means: Normal Temperature & Normal Voltage, NTHV means: Normal Temperature & Max. Voltage,

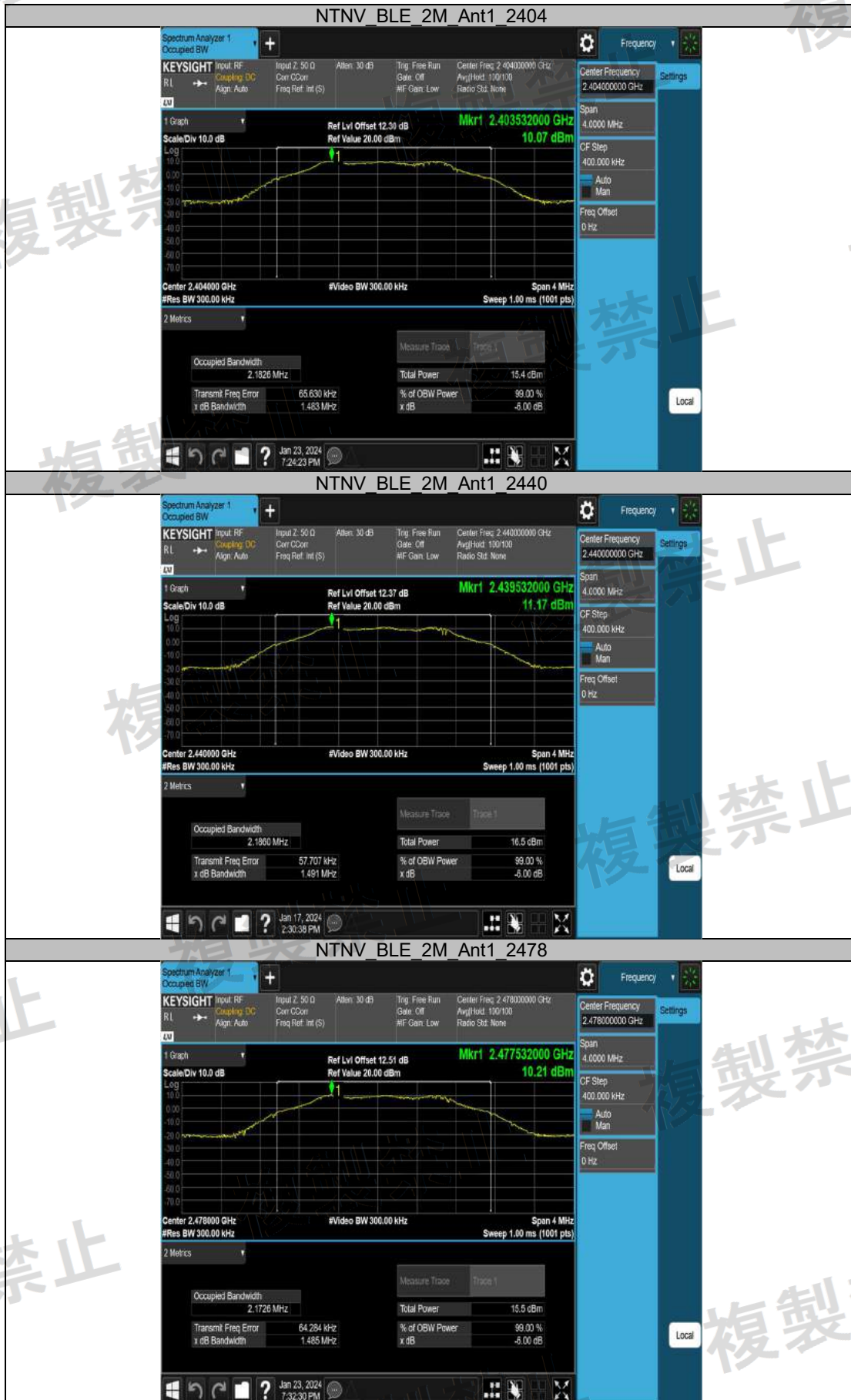
NTLV means: Normal Temperature & Min. Voltage.

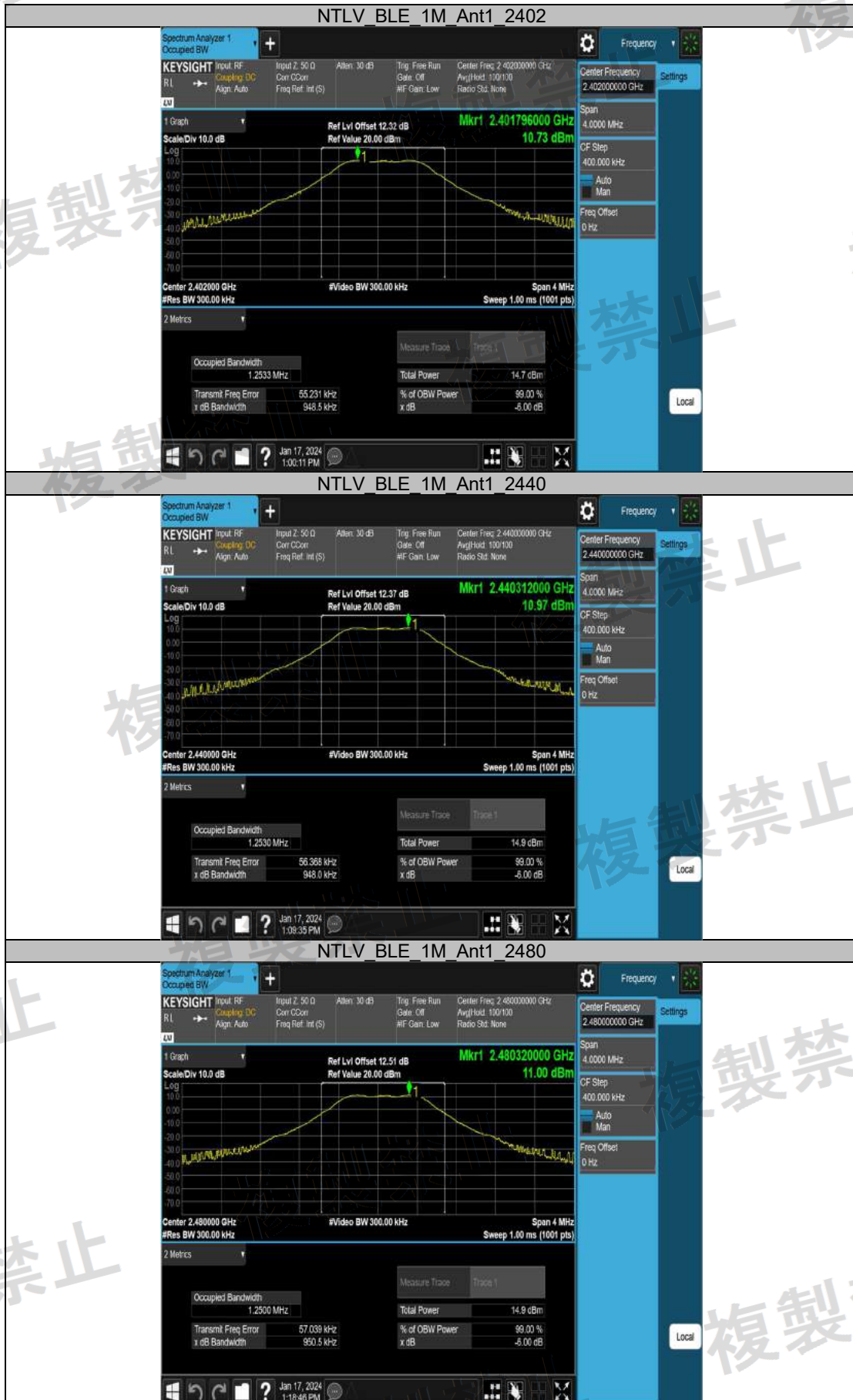
TestCondition	TestMode	Antenna	Freq(MHz)	Result[ppm]	Limit[ppm]	Verdict
NTNV	BLE_1M	Ant1	2402	23.73023	±50	PASS
			2440	23.36066	±50	PASS
			2480	24.19355	±50	PASS
	BLE_2M	Ant1	2402	26.22814	±50	PASS
			2404	27.45424	±50	PASS
			2440	25.81967	±50	PASS
			2478	12.10654	±50	PASS
			2480	26.61290	±50	PASS
NTLV	BLE_1M	Ant1	2402	23.73023	±50	PASS
			2440	23.36066	±50	PASS
			2480	24.19355	±50	PASS
	BLE_2M	Ant1	2404	27.45424	±50	PASS
			2440	9.83607	±50	PASS
			2478	12.10654	±50	PASS
NTHV	BLE_1M	Ant1	2402	23.73023	±50	PASS
			2440	23.36066	±50	PASS
			2480	24.19355	±50	PASS
	BLE_2M	Ant1	2404	27.45424	±50	PASS
			2440	27.04918	±50	PASS
			2478	12.10654	±50	PASS

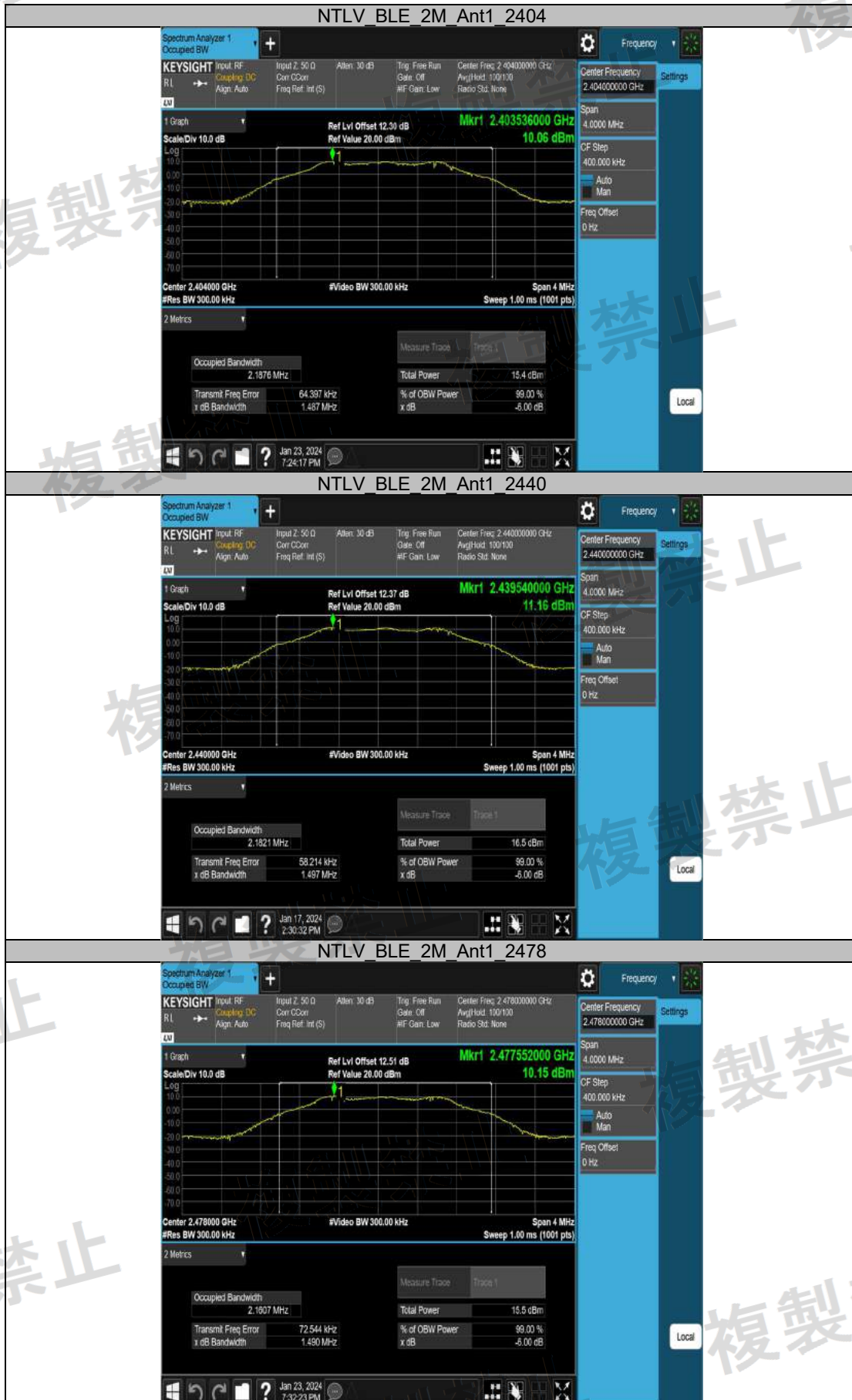
2 Appendix A.2 : OCCUPIED BANDWIDTH

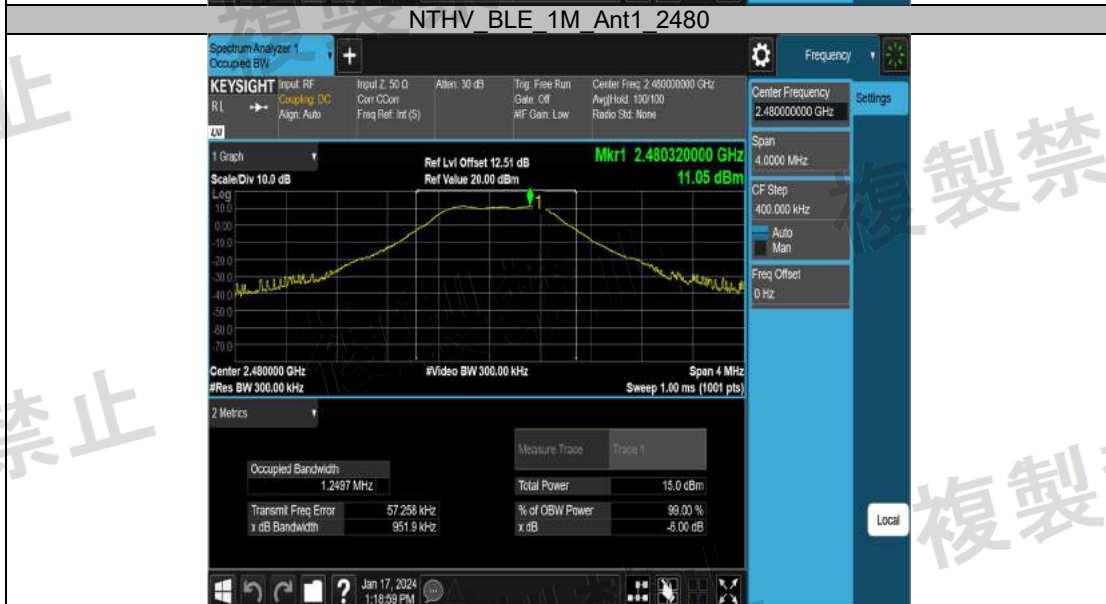
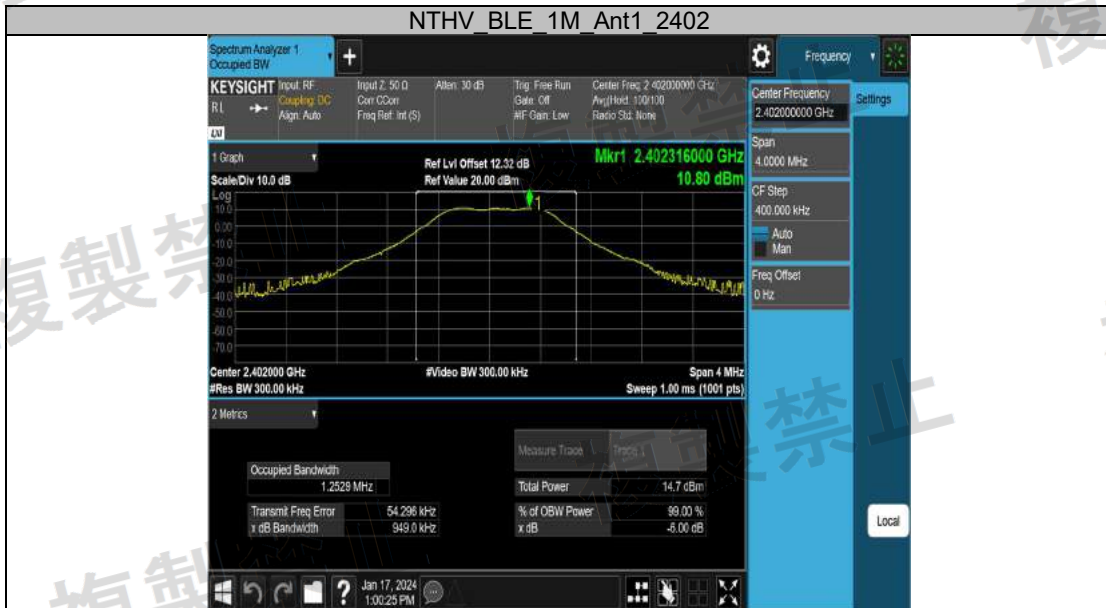
TestCondition	TestMode	Antenna	Freq(MHz)	Result [MHz]	Limit [MHz]	Verdict
NTNV	BLE_1M	Ant1	2402	1.256	≤26	PASS
			2440	1.255	≤26	PASS
			2480	1.251	≤26	PASS
	BLE_2M	Ant1	2404	2.183	≤26	PASS
			2440	2.186	≤26	PASS
			2478	2.173	≤26	PASS
NTLV	BLE_1M	Ant1	2402	1.253	≤26	PASS
			2440	1.253	≤26	PASS
			2480	1.250	≤26	PASS
	BLE_2M	Ant1	2404	2.188	≤26	PASS
			2440	2.182	≤26	PASS
			2478	2.161	≤26	PASS
NTHV	BLE_1M	Ant1	2402	1.253	≤26	PASS
			2440	1.253	≤26	PASS
			2480	1.250	≤26	PASS
	BLE_2M	Ant1	2404	2.177	≤26	PASS
			2440	2.180	≤26	PASS
			2478	2.184	≤26	PASS

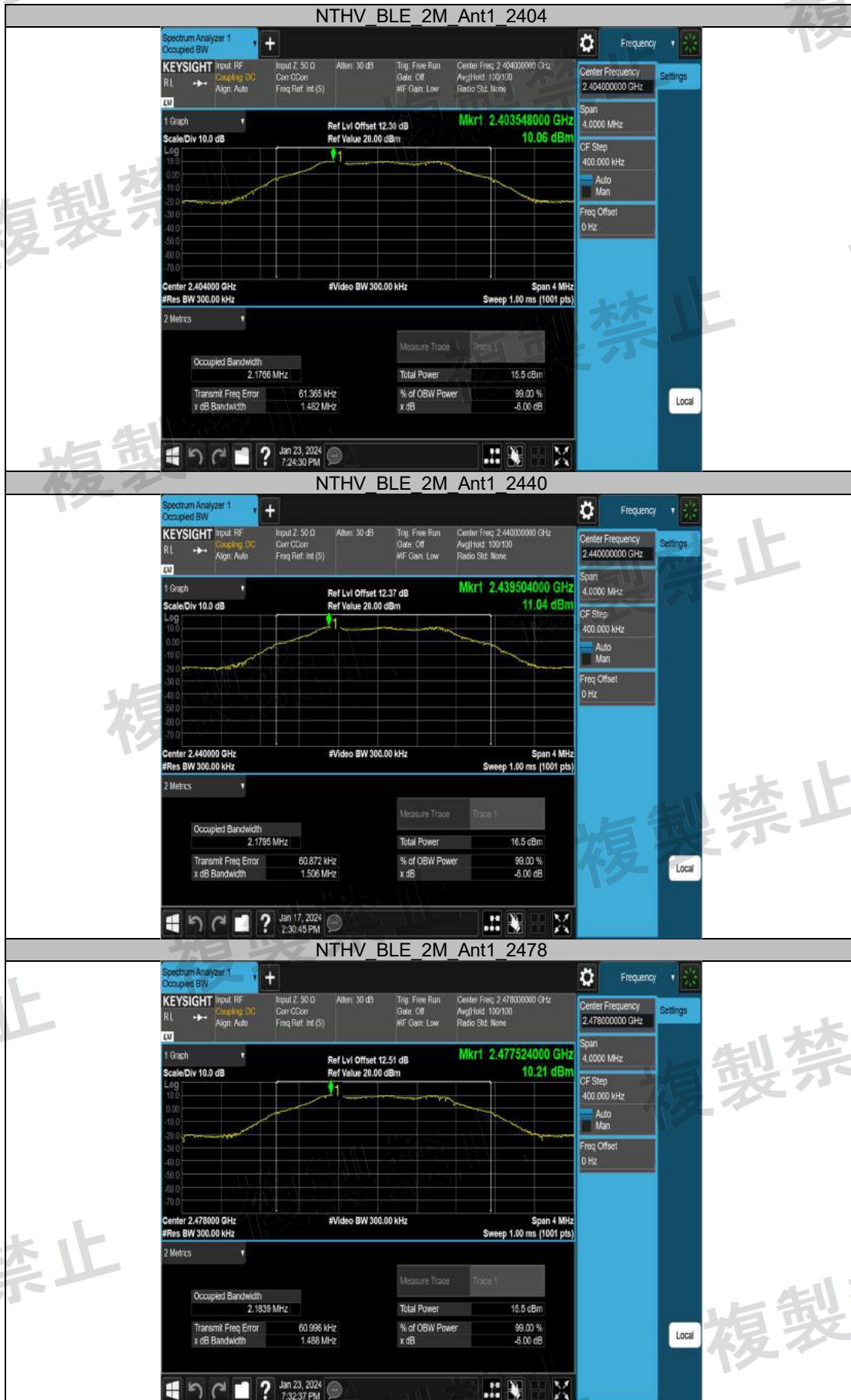












3 Appendix A.3 : ANTENNA POWER

Antenna Power							
TestCondition	TestMode	Antenna	Freq (MHz)	Result (dBm)	Result(mW)	Limit (mW)	Verdict
NTNV	BLE_1M	Ant1	2402	9.68	9.28966	≤10	PASS
			2440	9.76	9.46237	≤10	PASS
			2480	9.79	9.52796	≤10	PASS
	BLE_2M	Ant1	2404	9.65	9.22571	≤10	PASS
			2440	9.73	9.39723	≤10	PASS
			2478	9.77	9.48418	≤10	PASS
NTLV	BLE_1M	Ant1	2402	9.69	9.31108	≤10	PASS
			2440	9.77	9.48418	≤10	PASS
			2480	9.80	9.54993	≤10	PASS
	BLE_2M	Ant1	2404	9.66	9.24698	≤10	PASS
			2440	9.74	9.41890	≤10	PASS
			2478	9.79	9.52796	≤10	PASS
NTHV	BLE_1M	Ant1	2402	9.66	9.24698	≤10	PASS
			2440	9.74	9.41890	≤10	PASS
			2480	9.77	9.48418	≤10	PASS
	BLE_2M	Ant1	2404	9.64	9.20450	≤10	PASS
			2440	9.71	9.35406	≤10	PASS
			2478	9.75	9.44061	≤10	PASS

Tolerance								
Test Condition	Test Mode	Antenna	Freq (MHz)	Power (mW)	Rated Power (mW)	Result (%)	Limit (%)	Verdict
NTNV	BLE_1M	Ant1	2402	9.28966	10	-7.10%	-80 to +20	PASS
			2440	9.46237	10	-5.38%	-80 to +20	PASS
			2480	9.52796	10	-4.72%	-80 to +20	PASS
	BLE_2M	Ant1	2404	9.22571	10	-7.74%	-80 to +20	PASS
			2440	9.39723	10	-6.03%	-80 to +20	PASS
			2478	9.48418	10	-5.16%	-80 to +20	PASS
NTLV	BLE_1M	Ant1	2402	9.31108	10	-6.89%	-80 to +20	PASS
			2440	9.48418	10	-5.16%	-80 to +20	PASS
			2480	9.54993	10	-4.50%	-80 to +20	PASS
	BLE_2M	Ant1	2404	9.24698	10	-7.53%	-80 to +20	PASS
			2440	9.41890	10	-5.81%	-80 to +20	PASS
			2478	9.52796	10	-4.72%	-80 to +20	PASS
NTHV	BLE_1M	Ant1	2402	9.24698	10	-7.53%	-80 to +20	PASS
			2440	9.41890	10	-5.81%	-80 to +20	PASS
			2480	9.48418	10	-5.16%	-80 to +20	PASS
	BLE_2M	Ant1	2404	9.20450	10	-7.96%	-80 to +20	PASS
			2440	9.35406	10	-6.46%	-80 to +20	PASS
			2478	9.44061	10	-5.59%	-80 to +20	PASS

EIRP							
TestCondition	TestMode	Antenna	Freq (MHz)	Power (dBm)	EIRP(dBm)	Limit(dBm)	Verdict
NTNV	BLE_1M	Ant1	2402	9.68	5.18	≤12.14	PASS
			2440	9.76	5.26	≤12.14	PASS
			2480	9.79	5.29	≤12.14	PASS
	BLE_2M	Ant1	2404	9.65	5.15	≤12.14	PASS
			2440	9.73	5.23	≤12.14	PASS
			2478	9.77	5.27	≤12.14	PASS
NTLV	BLE_1M	Ant1	2402	9.69	5.19	≤12.14	PASS
			2440	9.77	5.27	≤12.14	PASS
			2480	9.80	5.30	≤12.14	PASS
	BLE_2M	Ant1	2404	9.66	5.16	≤12.14	PASS
			2440	9.74	5.24	≤12.14	PASS
			2478	9.79	5.29	≤12.14	PASS
NTHV	BLE_1M	Ant1	2402	9.66	5.16	≤12.14	PASS
			2440	9.74	5.24	≤12.14	PASS
			2480	9.77	5.27	≤12.14	PASS
	BLE_2M	Ant1	2404	9.64	5.14	≤12.14	PASS
			2440	9.71	5.21	≤12.14	PASS
			2478	9.75	5.25	≤12.14	PASS

4 Appendix A.4: SPURIOUS EMISSIONS FOR TRANSMITTER

TestCondition	TestMode	Antenna	Freq(MHz)	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~500	-54.11	≤-26	0.00388	≤2.5	PASS
				500~1000	-53.83	≤-26	0.00414	≤2.5	PASS
				1000~2387	-35.91	≤-26	0.25645	≤2.5	PASS
				2387~2400	-20.82	≤-16	8.27942	≤25	PASS
				2483.5~2496.5	-40.24	≤-16	0.09462	≤25	PASS
				2496.5~13000	-32.69	≤-26	0.53827	≤2.5	PASS
			2440	30~500	-54.44	≤-26	0.00360	≤2.5	PASS
				500~1000	-53.70	≤-26	0.00427	≤2.5	PASS
				1000~2387	-35.63	≤-26	0.27353	≤2.5	PASS
				2387~2400	-40.62	≤-16	0.08670	≤25	PASS
				2483.5~2496.5	-40.15	≤-16	0.09661	≤25	PASS
				2496.5~13000	-32.53	≤-26	0.55847	≤2.5	PASS
			2480	30~500	-54.76	≤-26	0.00334	≤2.5	PASS
				500~1000	-53.69	≤-26	0.00428	≤2.5	PASS
				1000~2387	-33.65	≤-26	0.43152	≤2.5	PASS
				2387~2400	-40.63	≤-16	0.08650	≤25	PASS
				2483.5~2496.5	-30.10	≤-16	0.97724	≤25	PASS
				2496.5~13000	-33.37	≤-26	0.46026	≤2.5	PASS
	BLE_2M	Ant1	2404	30~500	-54.24	≤-26	0.00377	≤2.5	PASS
				500~1000	-54.17	≤-26	0.00383	≤2.5	PASS
				1000~2387	-36.46	≤-26	0.22594	≤2.5	PASS
				2387~2400	-32.43	≤-16	0.57148	≤25	PASS
				2483.5~2496.5	-41.70	≤-16	0.06761	≤25	PASS
				2496.5~13000	-33.58	≤-26	0.43853	≤2.5	PASS
			2440	30~500	-53.21	≤-26	0.00478	≤2.5	PASS
				500~1000	-53.47	≤-26	0.00450	≤2.5	PASS
				1000~2387	-35.90	≤-26	0.25704	≤2.5	PASS
				2387~2400	-40.52	≤-16	0.08872	≤25	PASS
				2483.5~2496.5	-40.26	≤-16	0.09419	≤25	PASS
				2496.5~13000	-32.53	≤-26	0.55847	≤2.5	PASS
			2478	30~500	-54.97	≤-26	0.00318	≤2.5	PASS
				500~1000	-54.36	≤-26	0.00366	≤2.5	PASS
				1000~2387	-34.57	≤-26	0.34914	≤2.5	PASS
				2387~2400	-41.76	≤-16	0.06668	≤25	PASS
				2483.5~2496.5	-35.48	≤-16	0.28314	≤25	PASS
				2496.5~13000	-33.76	≤-26	0.42073	≤2.5	PASS
NTLV	BLE_1M	Ant1	2402	30~500	-54.42	≤-26	0.00361	≤2.5	PASS
				500~1000	-53.56	≤-26	0.00441	≤2.5	PASS
				1000~2387	-35.88	≤-26	0.25823	≤2.5	PASS
				2387~2400	-20.69	≤-16	8.53100	≤25	PASS
				2483.5~2496.5	-39.65	≤-16	0.10839	≤25	PASS
				2496.5~13000	-32.92	≤-26	0.51050	≤2.5	PASS
			2440	30~500	-54.36	≤-26	0.00366	≤2.5	PASS
				500~1000	-53.85	≤-26	0.00412	≤2.5	PASS
				1000~2387	-35.86	≤-26	0.25942	≤2.5	PASS
				2387~2400	-40.45	≤-16	0.09016	≤25	PASS
				2483.5~2496.5	-40.36	≤-16	0.09204	≤25	PASS
				2496.5~13000	-32.31	≤-26	0.58749	≤2.5	PASS
			2480	30~500	-54.48	≤-26	0.00356	≤2.5	PASS
				500~1000	-53.61	≤-26	0.00436	≤2.5	PASS
				1000~2387	-33.79	≤-26	0.41783	≤2.5	PASS
				2387~2400	-40.43	≤-16	0.09057	≤25	PASS
				2483.5~2496.5	-30.05	≤-16	0.98855	≤25	PASS
				2496.5~13000	-33.11	≤-26	0.48865	≤2.5	PASS
	BLE_2M	Ant1	2404	30~500	-54.13	≤-26	0.00386	≤2.5	PASS
				500~1000	-54.26	≤-26	0.00375	≤2.5	PASS
				1000~2387	-36.42	≤-26	0.22803	≤2.5	PASS

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			2440	2387~2400	-32.29	≤-16	0.59020	≤25	PASS
				2483.5~2496.5	-40.95	≤-16	0.08035	≤25	PASS
				2496.5~13000	-33.42	≤-26	0.45499	≤2.5	PASS
				30~500	-54.38	≤-26	0.00365	≤2.5	PASS
				500~1000	-53.39	≤-26	0.00458	≤2.5	PASS
				1000~2387	-35.91	≤-26	0.25645	≤2.5	PASS
				2387~2400	-39.94	≤-16	0.10139	≤25	PASS
				2483.5~2496.5	-40.28	≤-16	0.09376	≤25	PASS
				2496.5~13000	-32.55	≤-26	0.55590	≤2.5	PASS
			2478	30~500	-54.39	≤-26	0.00364	≤2.5	PASS
				500~1000	-54.06	≤-26	0.00393	≤2.5	PASS
				1000~2387	-34.80	≤-26	0.33113	≤2.5	PASS
				2387~2400	-41.36	≤-16	0.07311	≤25	PASS
				2483.5~2496.5	-35.80	≤-16	0.26303	≤25	PASS
				2496.5~13000	-33.97	≤-26	0.40087	≤2.5	PASS
NTHV	BLE_1M	Ant1	2402	30~500	-53.96	≤-26	0.00402	≤2.5	PASS
				500~1000	-53.61	≤-26	0.00436	≤2.5	PASS
				1000~2387	-36.08	≤-26	0.24660	≤2.5	PASS
				2387~2400	-20.82	≤-16	8.27942	≤25	PASS
				2483.5~2496.5	-40.43	≤-16	0.09057	≤25	PASS
				2496.5~13000	-33.16	≤-26	0.48306	≤2.5	PASS
			2440	30~500	-54.28	≤-26	0.00373	≤2.5	PASS
				500~1000	-53.52	≤-26	0.00445	≤2.5	PASS
				1000~2387	-35.82	≤-26	0.26182	≤2.5	PASS
				2387~2400	-40.63	≤-16	0.08650	≤25	PASS
				2483.5~2496.5	-39.88	≤-16	0.10280	≤25	PASS
				2496.5~13000	-32.25	≤-26	0.59566	≤2.5	PASS
			2480	30~500	-54.08	≤-26	0.00391	≤2.5	PASS
				500~1000	-53.38	≤-26	0.00459	≤2.5	PASS
				1000~2387	-34.02	≤-26	0.39628	≤2.5	PASS
				2387~2400	-40.31	≤-16	0.09311	≤25	PASS
				2483.5~2496.5	-29.96	≤-16	1.00925	≤25	PASS
				2496.5~13000	-33.13	≤-26	0.48641	≤2.5	PASS
	BLE_2M	Ant1	2404	30~500	-54.59	≤-26	0.00348	≤2.5	PASS
				500~1000	-54.42	≤-26	0.00361	≤2.5	PASS
				1000~2387	-36.58	≤-26	0.21979	≤2.5	PASS
				2387~2400	-32.72	≤-16	0.53456	≤25	PASS
				2483.5~2496.5	-41.54	≤-16	0.07015	≤25	PASS
				2496.5~13000	-33.93	≤-26	0.40458	≤2.5	PASS
			2440	30~500	-54.58	≤-26	0.00348	≤2.5	PASS
				500~1000	-53.51	≤-26	0.00446	≤2.5	PASS
				1000~2387	-35.72	≤-26	0.26792	≤2.5	PASS
				2387~2400	-40.78	≤-16	0.08356	≤25	PASS
				2483.5~2496.5	-39.89	≤-16	0.10257	≤25	PASS
				2496.5~13000	-32.37	≤-26	0.57943	≤2.5	PASS
			2478	30~500	-54.77	≤-26	0.00333	≤2.5	PASS
				500~1000	-54.35	≤-26	0.00367	≤2.5	PASS
				1000~2387	-34.69	≤-26	0.33963	≤2.5	PASS
				2387~2400	-41.36	≤-16	0.07311	≤25	PASS
				2483.5~2496.5	-35.17	≤-16	0.30409	≤25	PASS
				2496.5~13000	-33.80	≤-26	0.41687	≤2.5	PASS

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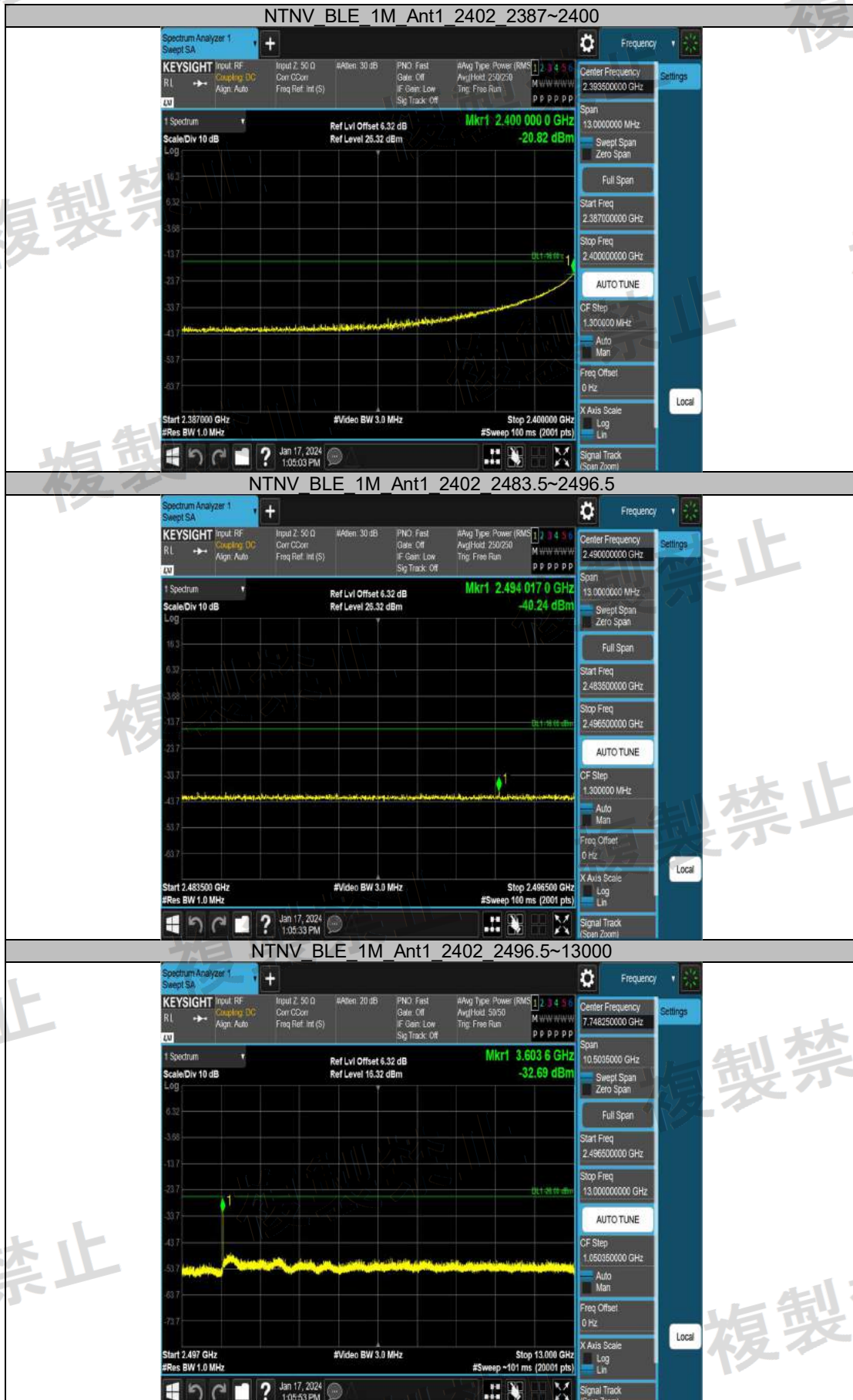


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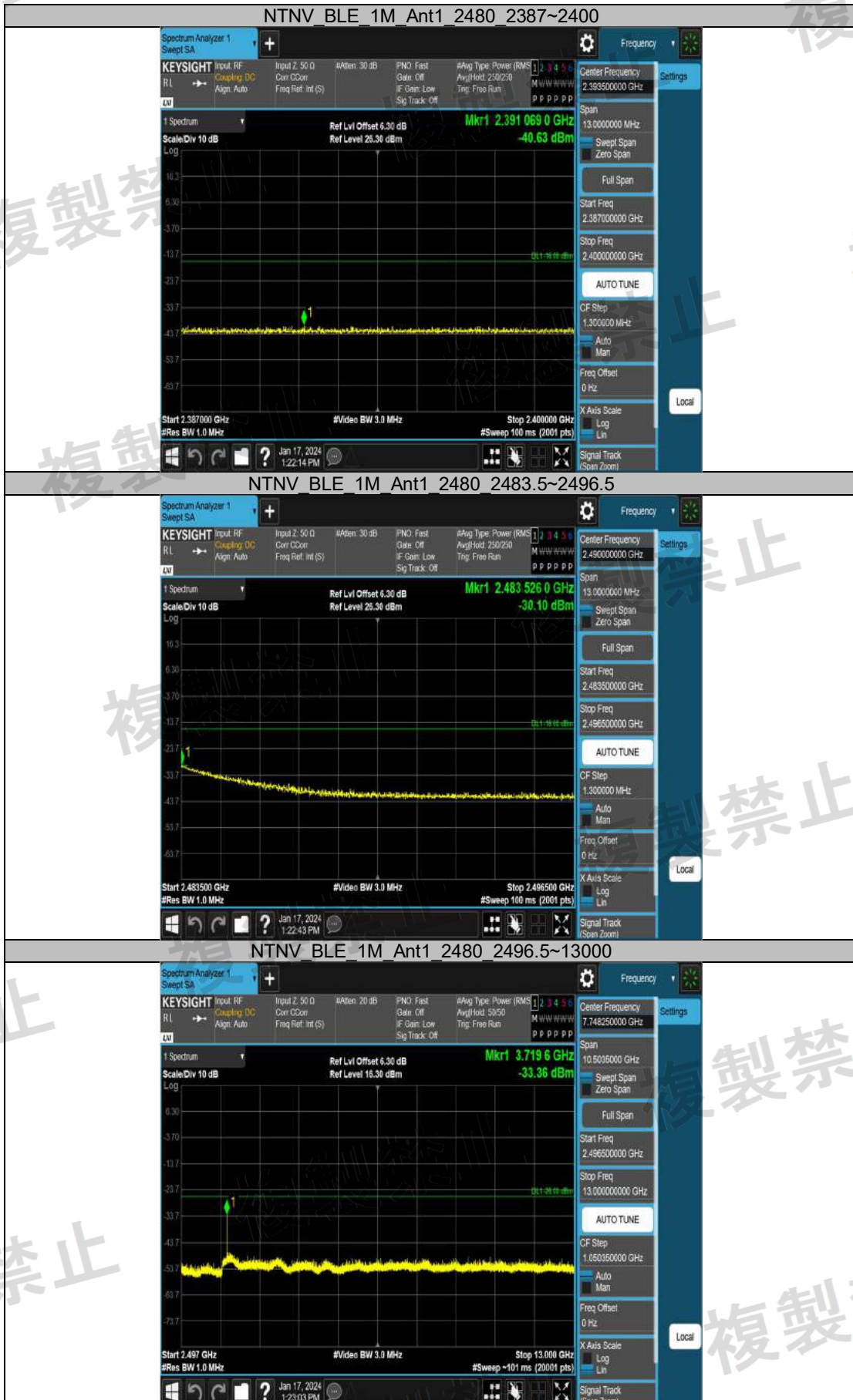


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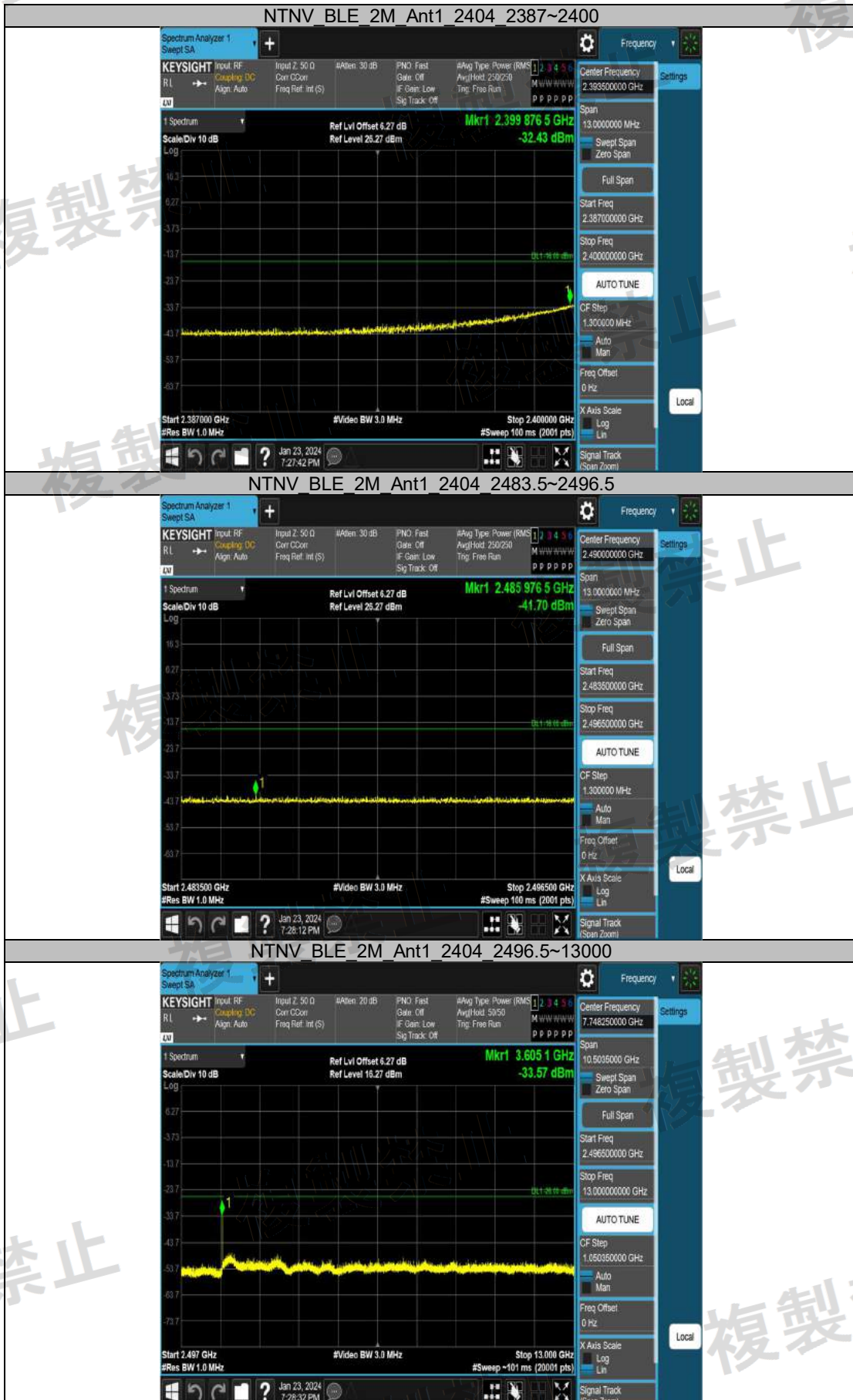


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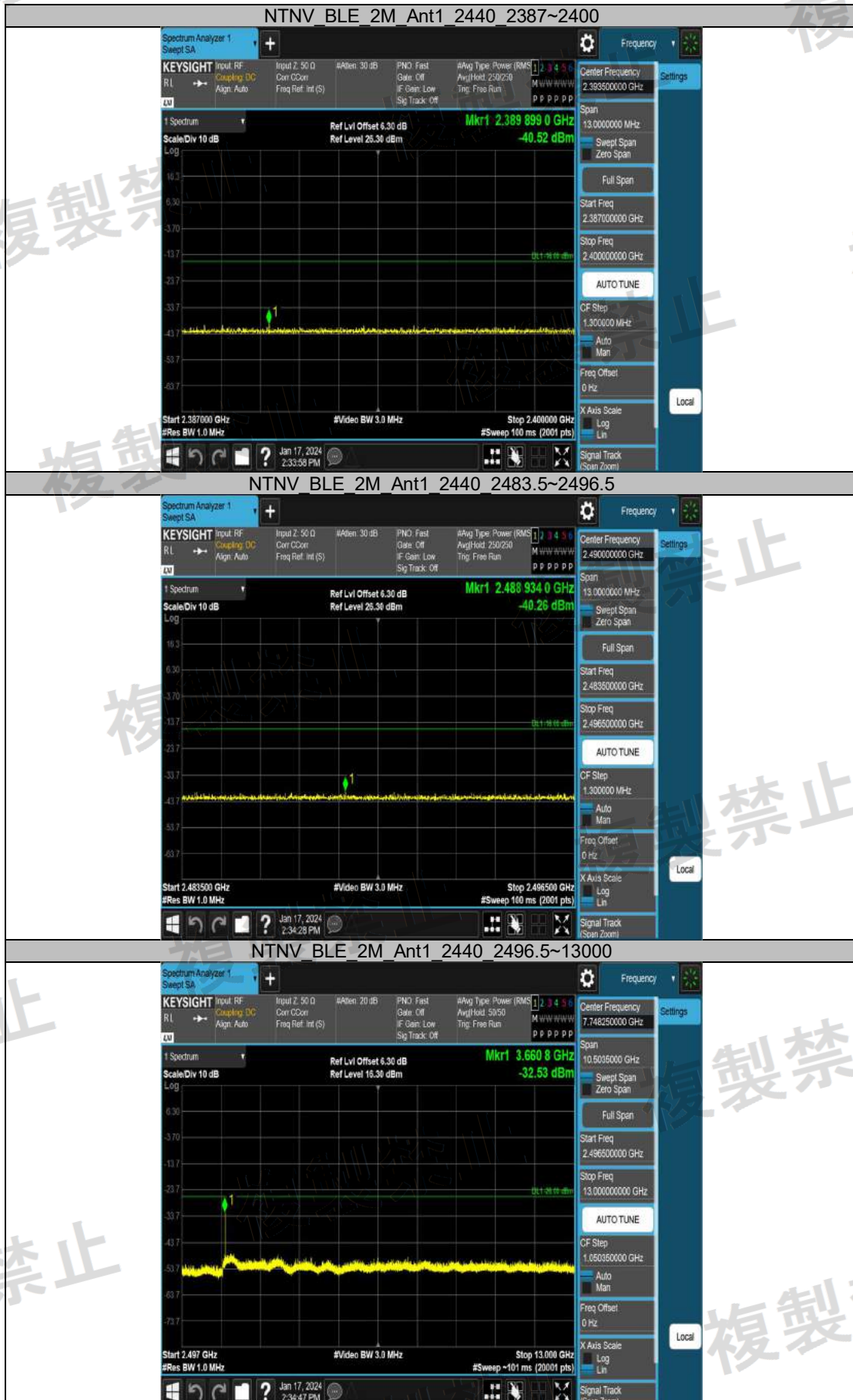


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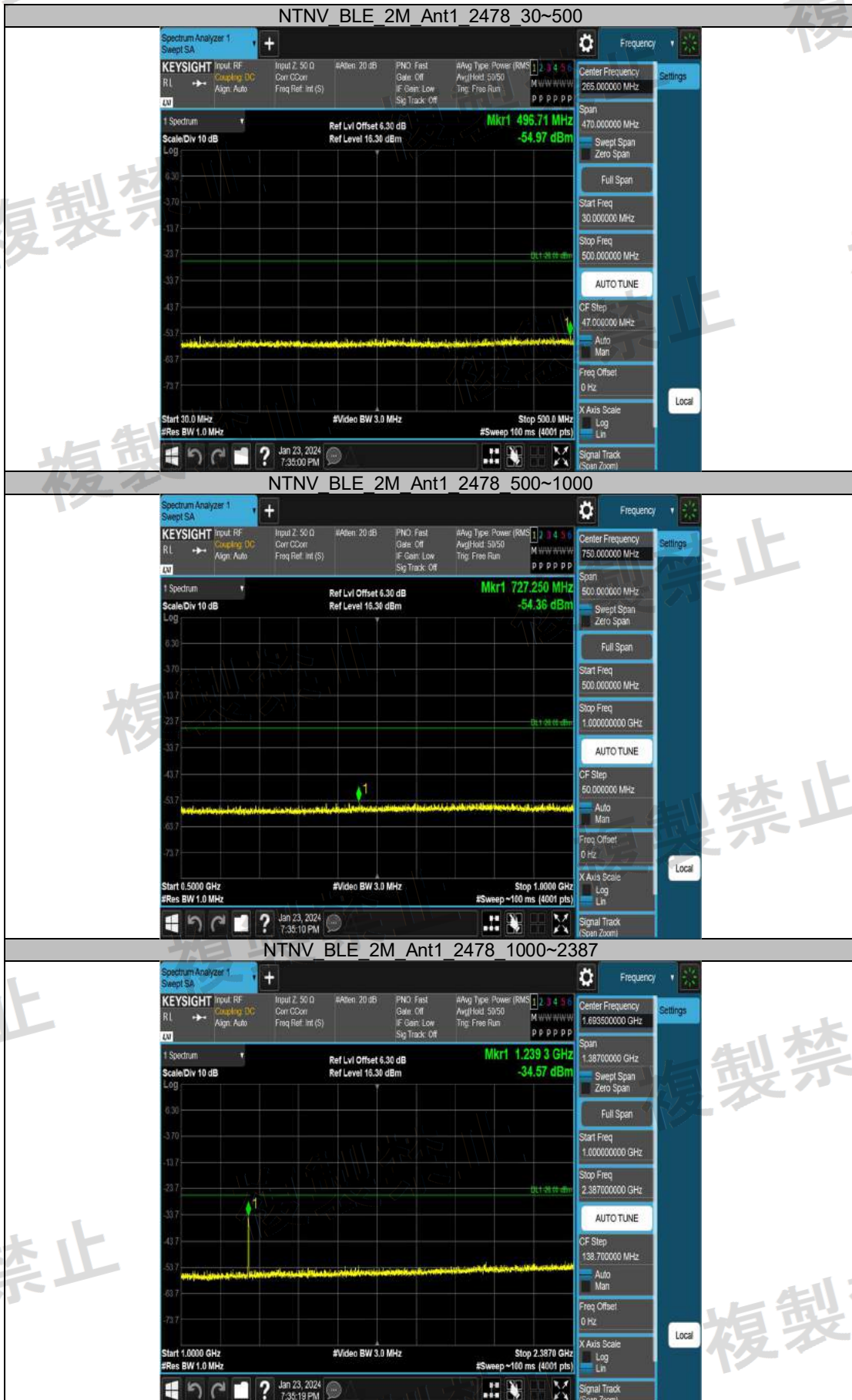


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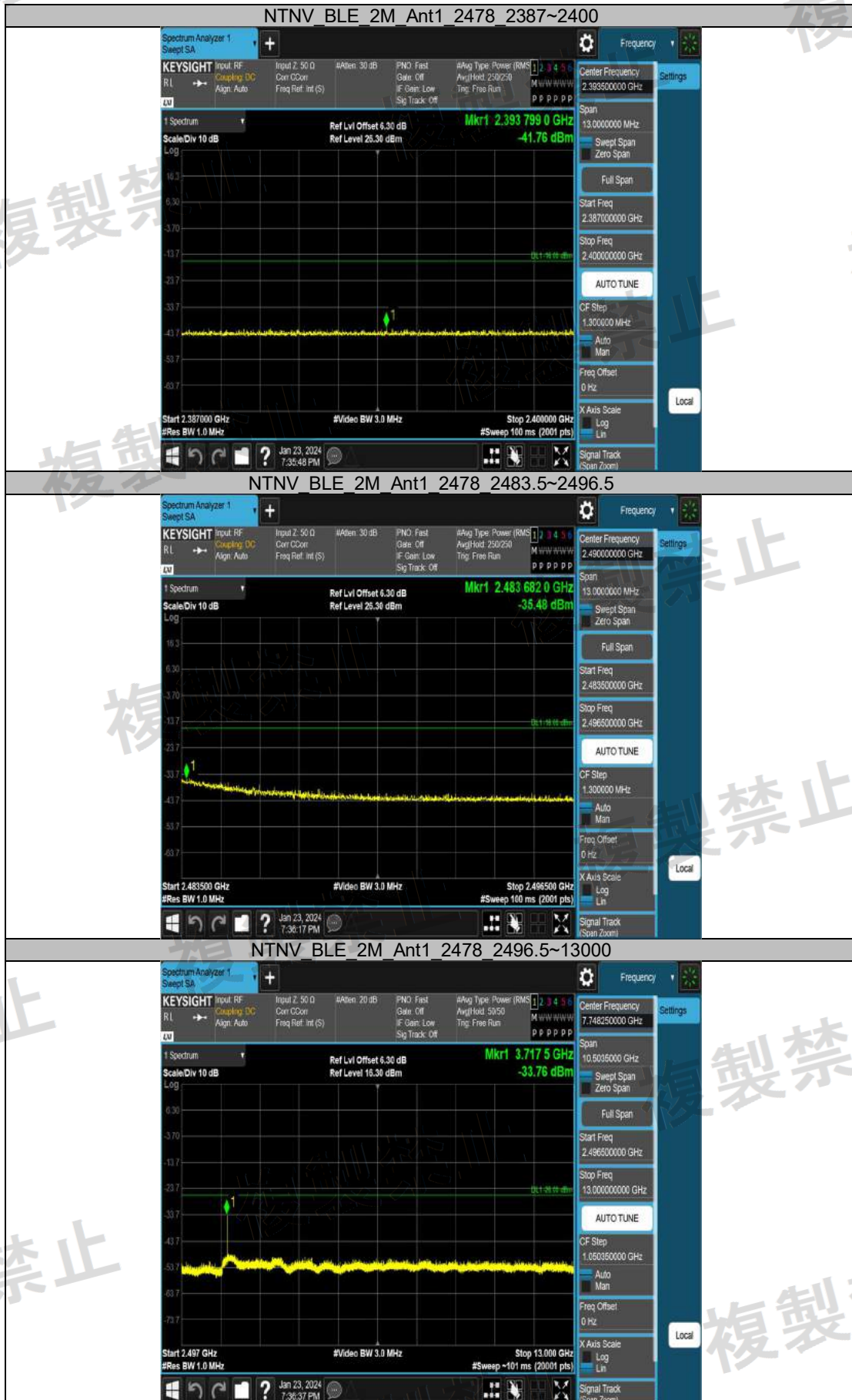
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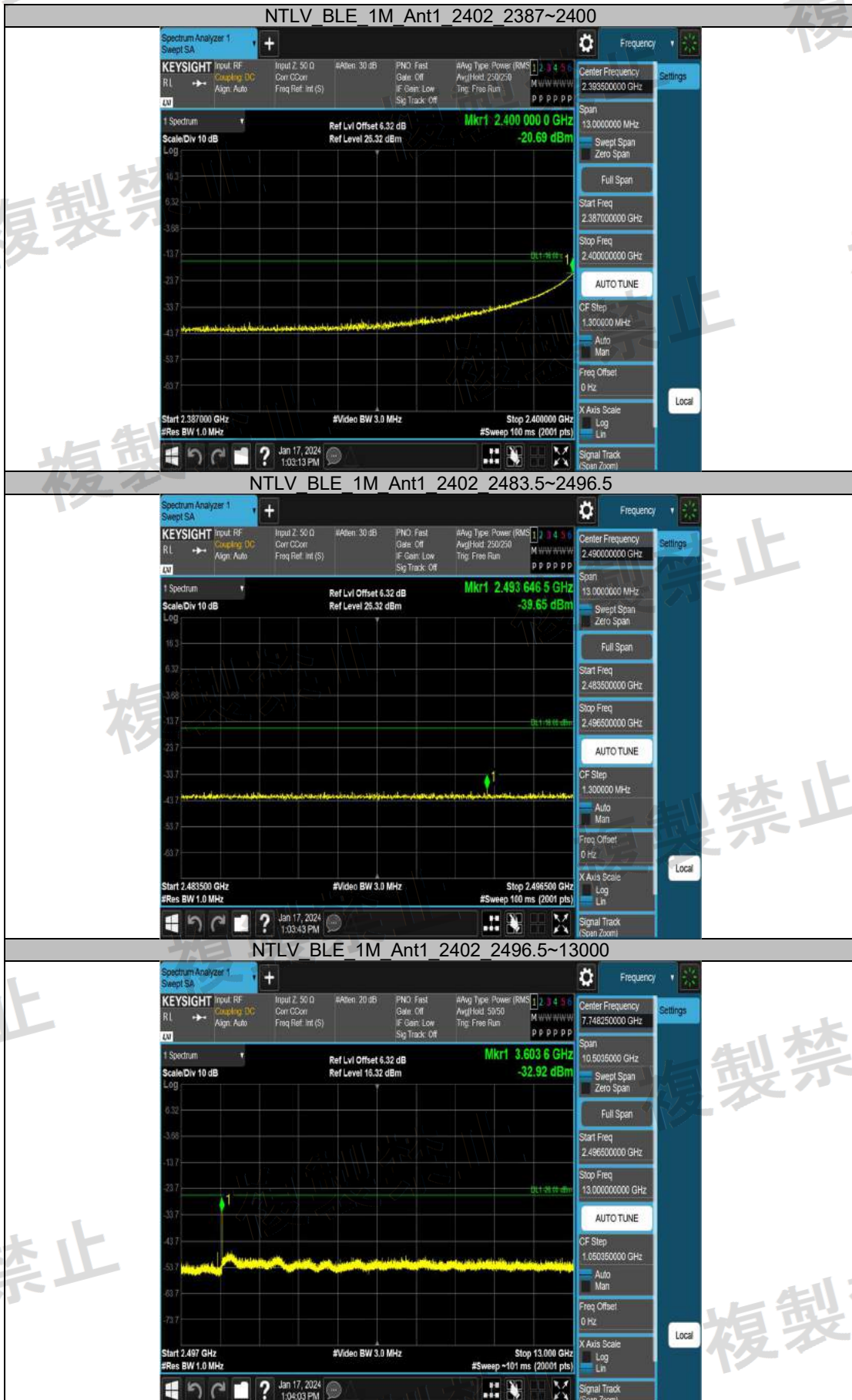


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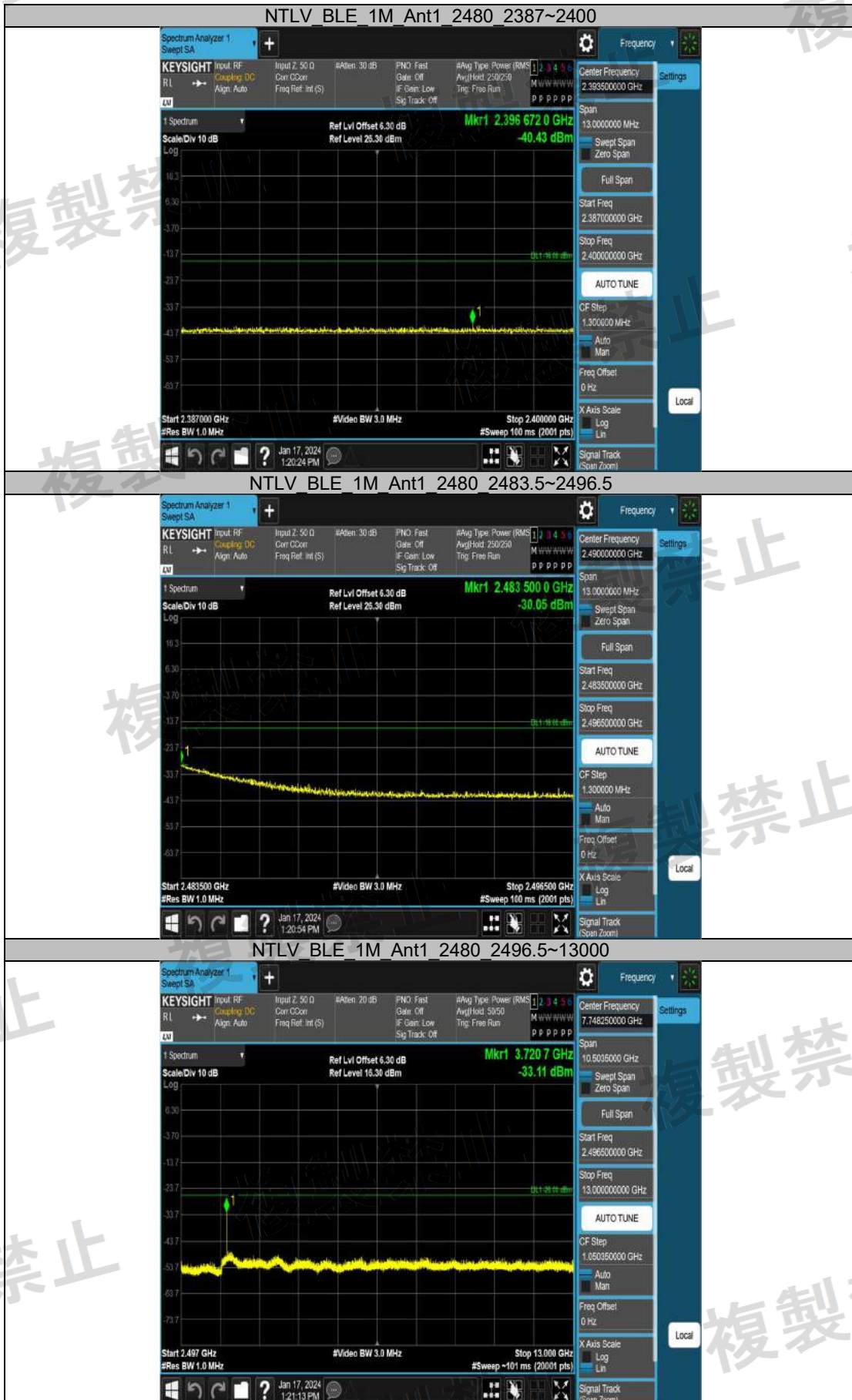


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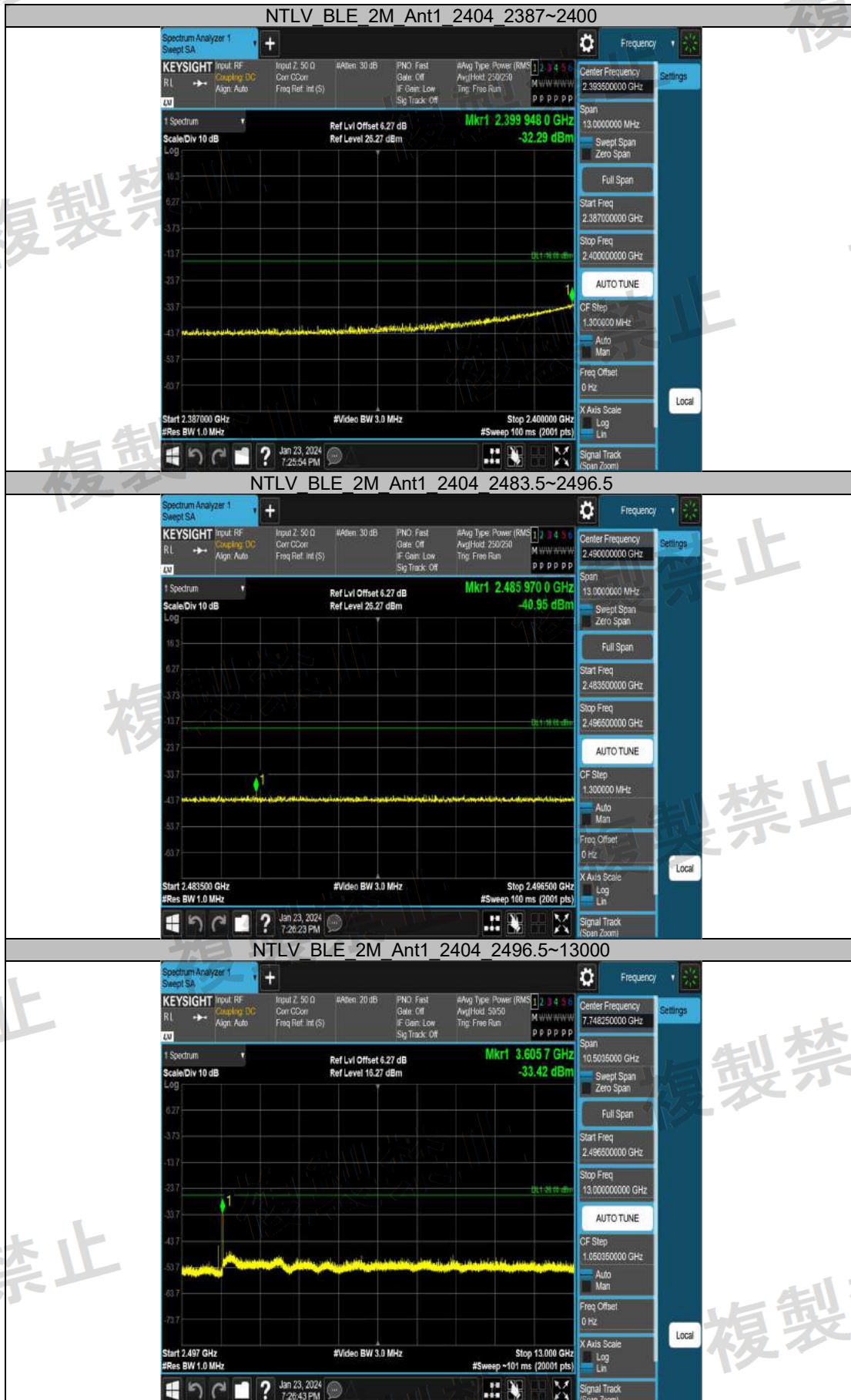


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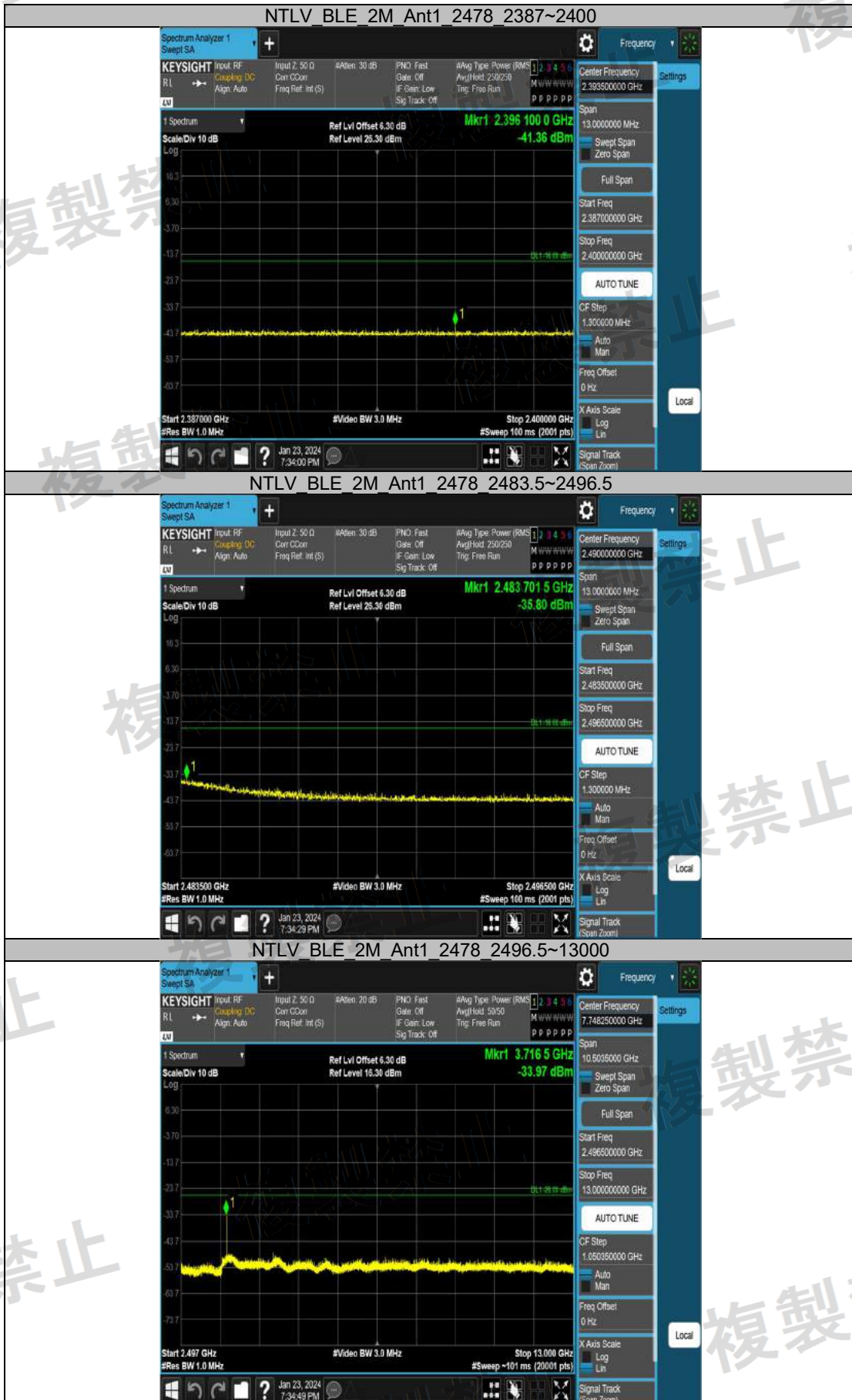
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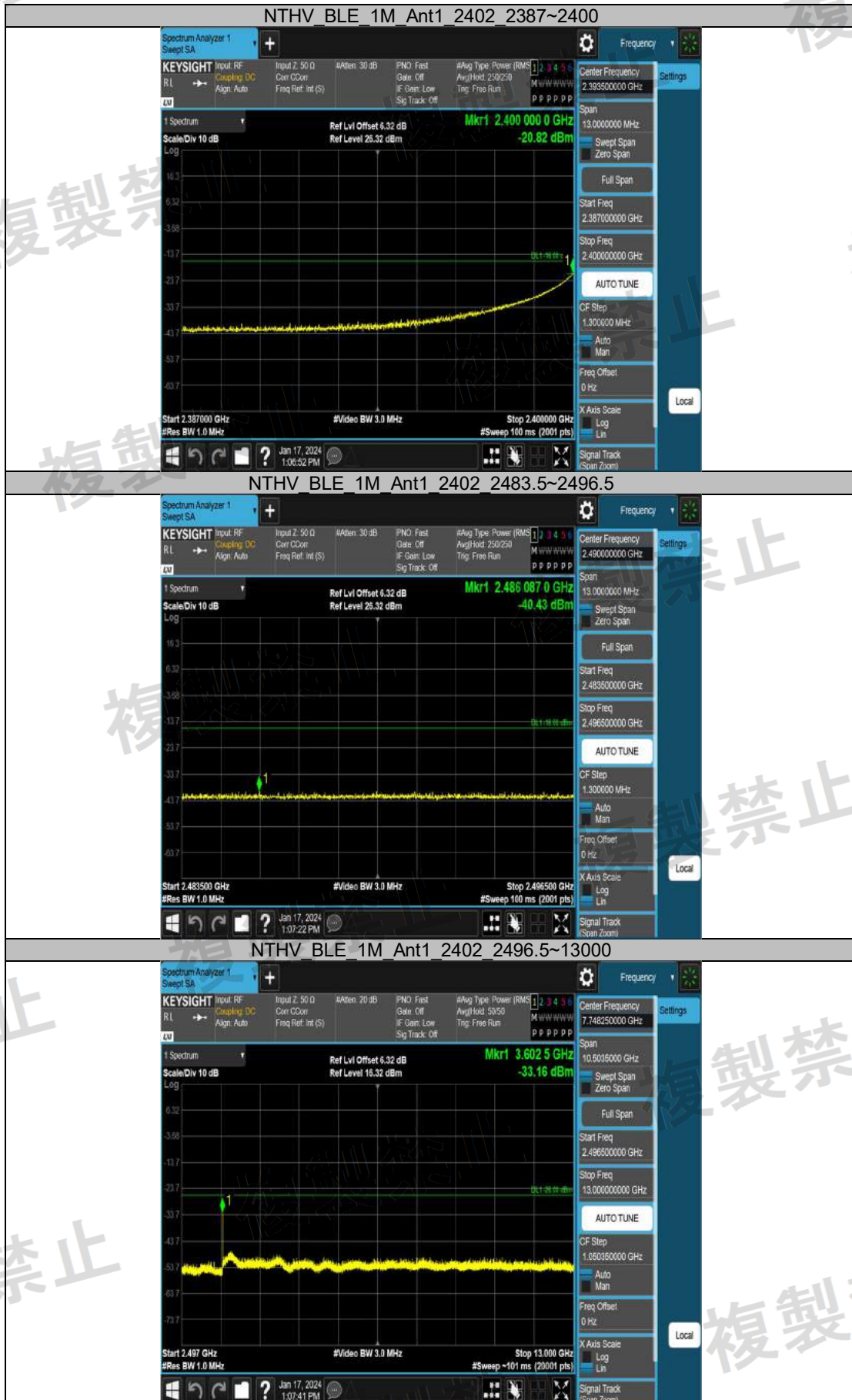


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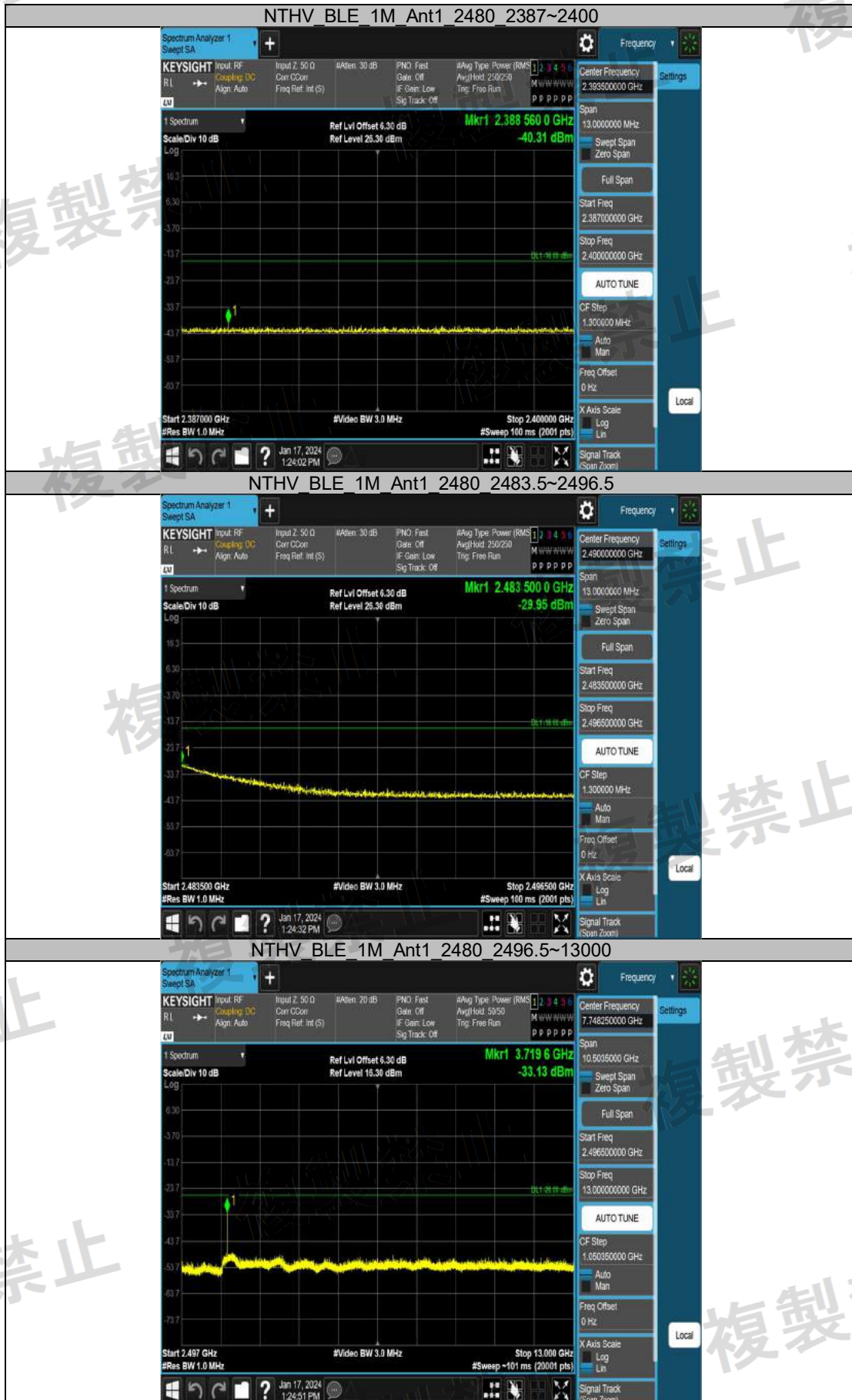


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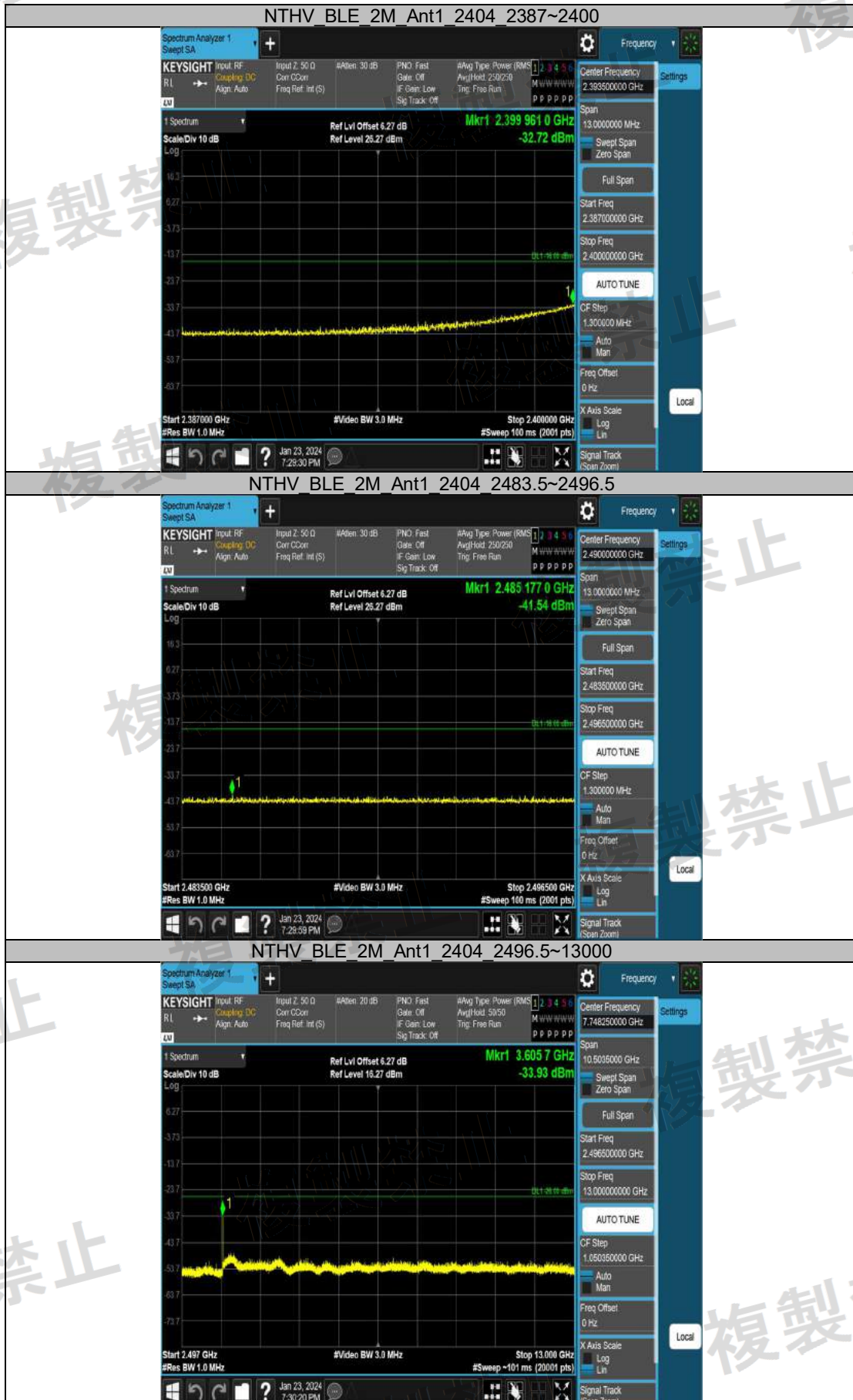


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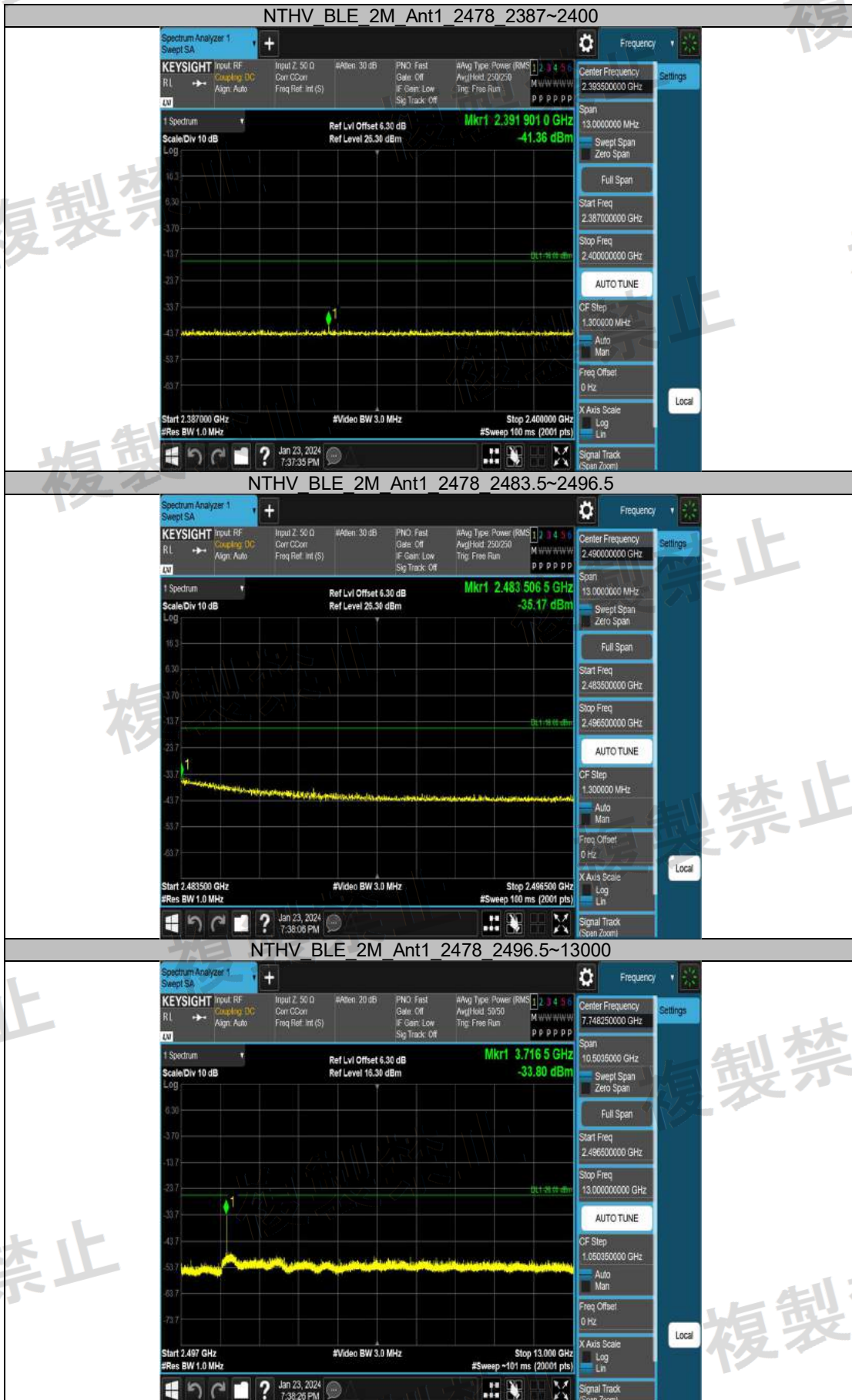
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5 Appendix A.5: SPURIOUS EMISSIONS FOR RECEIVER

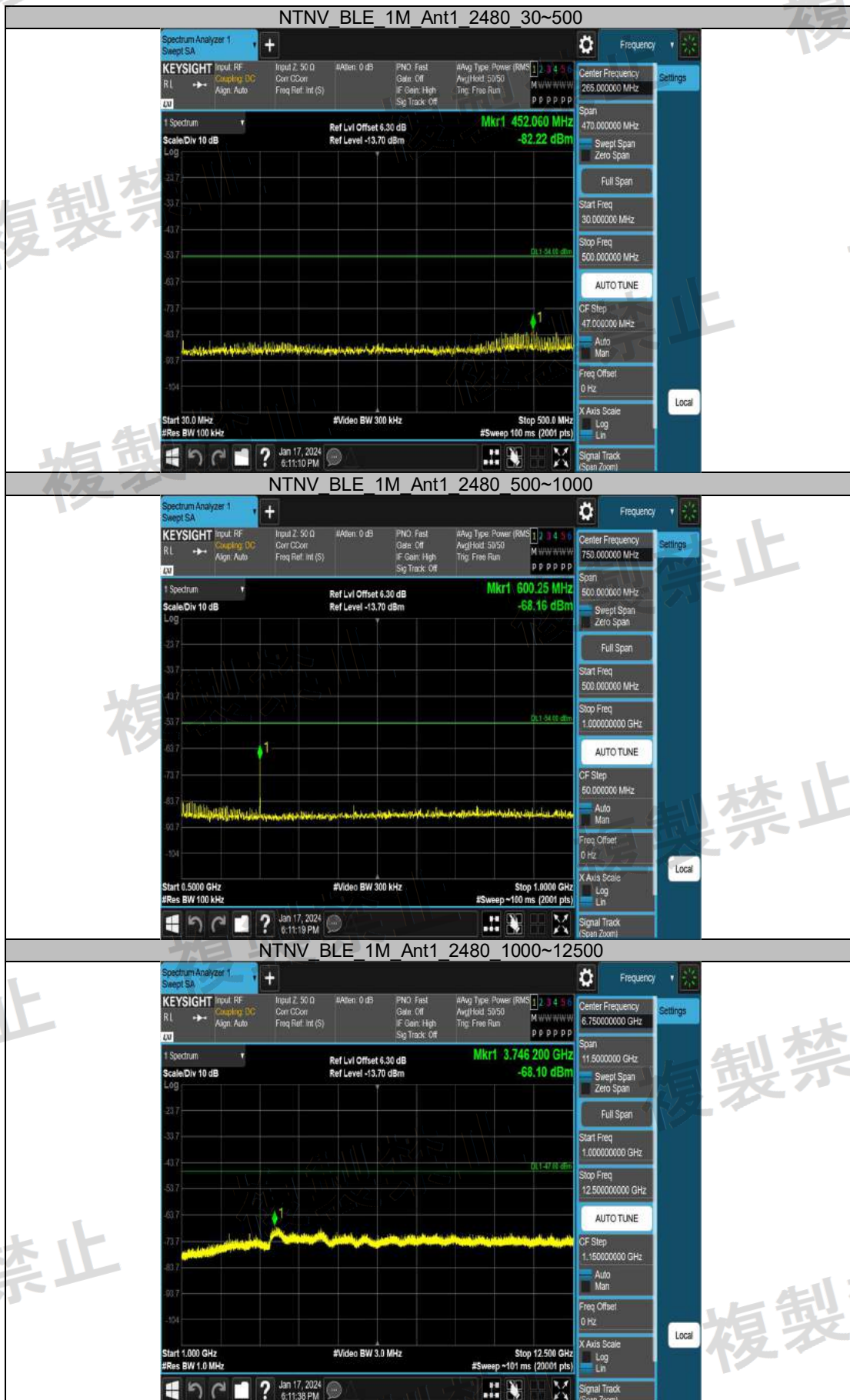
TestCondition	TestMode	Antenna	Freq(MHz)	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	BLE_1M	Ant1	2402	30~500	-82.57	≤-54	0.00553	≤4	PASS
				500~1000	-68.33	≤-54	0.14689	≤4	PASS
				1000~12500	-68.53	≤-47	0.14028	≤20	PASS
			2440	30~500	-82.36	≤-54	0.00581	≤4	PASS
				500~1000	-68.19	≤-54	0.15171	≤4	PASS
				1000~12500	-67.41	≤-47	0.18155	≤20	PASS
			2480	30~500	-82.22	≤-54	0.00600	≤4	PASS
				500~1000	-68.16	≤-54	0.15276	≤4	PASS
				1000~12500	-68.1	≤-47	0.15488	≤20	PASS
	BLE_2M	Ant1	2404	30~500	-87.73	≤-54	0.00169	≤4	PASS
				500~1000	-86.06	≤-54	0.00248	≤4	PASS
				1000~12500	-69.02	≤-47	0.12531	≤20	PASS
			2440	30~500	-82.39	≤-54	0.00577	≤4	PASS
				500~1000	-68.39	≤-54	0.14488	≤4	PASS
				1000~12500	-67.97	≤-47	0.15959	≤20	PASS
			2478	30~500	-87.67	≤-54	0.00171	≤4	PASS
				500~1000	-84.79	≤-54	0.00332	≤4	PASS
				1000~12500	-67.59	≤-47	0.17418	≤20	PASS
NTLV	BLE_1M	Ant1	2402	30~500	-82.82	≤-54	0.00522	≤4	PASS
				500~1000	-68.19	≤-54	0.15171	≤4	PASS
				1000~12500	-67.79	≤-47	0.16634	≤20	PASS
			2440	30~500	-82.58	≤-54	0.00552	≤4	PASS
				500~1000	-68.27	≤-54	0.14894	≤4	PASS
				1000~12500	-65.4	≤-47	0.28840	≤20	PASS
			2480	30~500	-82.89	≤-54	0.00514	≤4	PASS
				500~1000	-68.26	≤-54	0.14928	≤4	PASS
				1000~12500	-67.76	≤-47	0.16749	≤20	PASS
	BLE_2M	Ant1	2404	30~500	-87.46	≤-54	0.00179	≤4	PASS
				500~1000	-86.05	≤-54	0.00248	≤4	PASS
				1000~12500	-69.41	≤-47	0.11455	≤20	PASS
			2440	30~500	-82.35	≤-54	0.00582	≤4	PASS
				500~1000	-68.21	≤-54	0.15101	≤4	PASS
				1000~12500	-68	≤-47	0.15849	≤20	PASS
			2478	30~500	-86.21	≤-54	0.00239	≤4	PASS
				500~1000	-85.51	≤-54	0.00281	≤4	PASS
				1000~12500	-69.67	≤-47	0.10789	≤20	PASS
NTHV	BLE_1M	Ant1	2402	30~500	-82.01	≤-54	0.00630	≤4	PASS
				500~1000	-68.14	≤-54	0.15346	≤4	PASS
				1000~12500	-68.11	≤-47	0.15453	≤20	PASS
			2440	30~500	-81.9	≤-54	0.00646	≤4	PASS
				500~1000	-68.33	≤-54	0.14689	≤4	PASS
				1000~12500	-68.26	≤-47	0.14928	≤20	PASS
			2480	30~500	-82.24	≤-54	0.00597	≤4	PASS
				500~1000	-68.29	≤-54	0.14825	≤4	PASS
				1000~12500	-67.78	≤-47	0.16672	≤20	PASS
	BLE_2M	Ant1	2404	30~500	-86.53	≤-54	0.00222	≤4	PASS
				500~1000	-86.08	≤-54	0.00247	≤4	PASS
				1000~12500	-69.02	≤-47	0.12531	≤20	PASS
			2440	30~500	-82.28	≤-54	0.00592	≤4	PASS
				500~1000	-68.3	≤-54	0.14791	≤4	PASS
				1000~12500	-68.15	≤-47	0.15311	≤20	PASS
			2478	30~500	-87.04	≤-54	0.00198	≤4	PASS
				500~1000	-81.58	≤-54	0.00695	≤4	PASS
				1000~12500	-68.97	≤-47	0.12677	≤20	PASS

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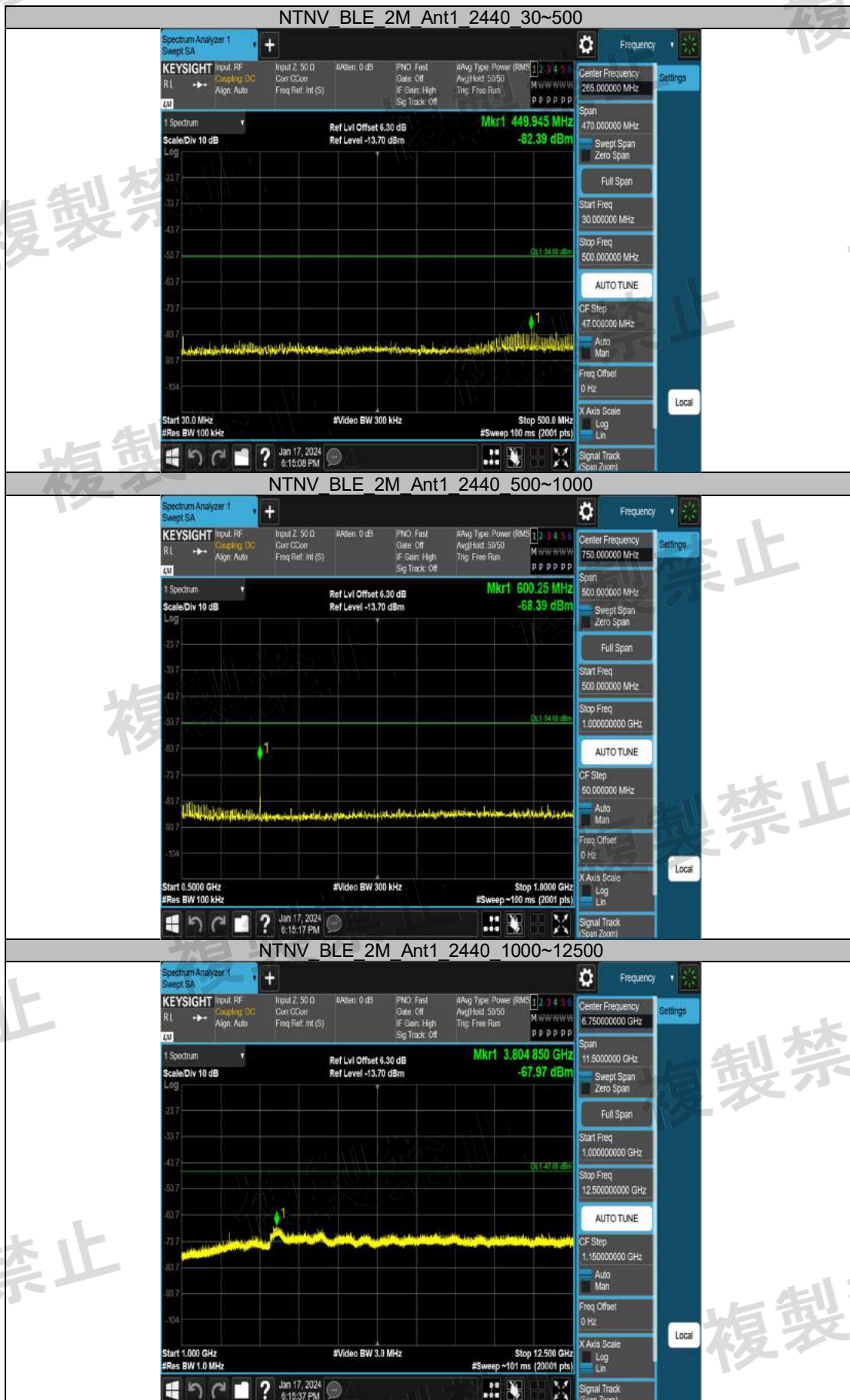


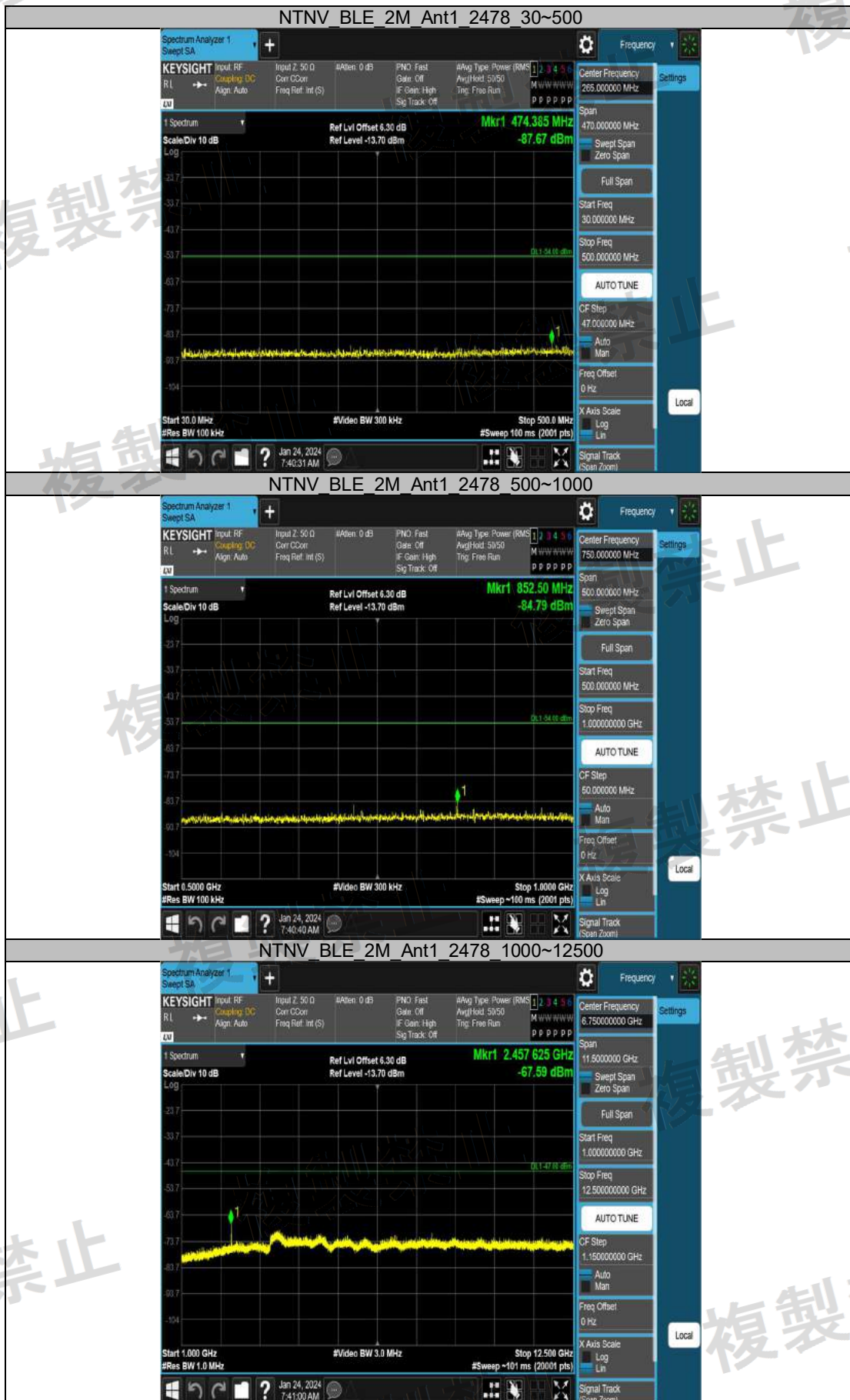
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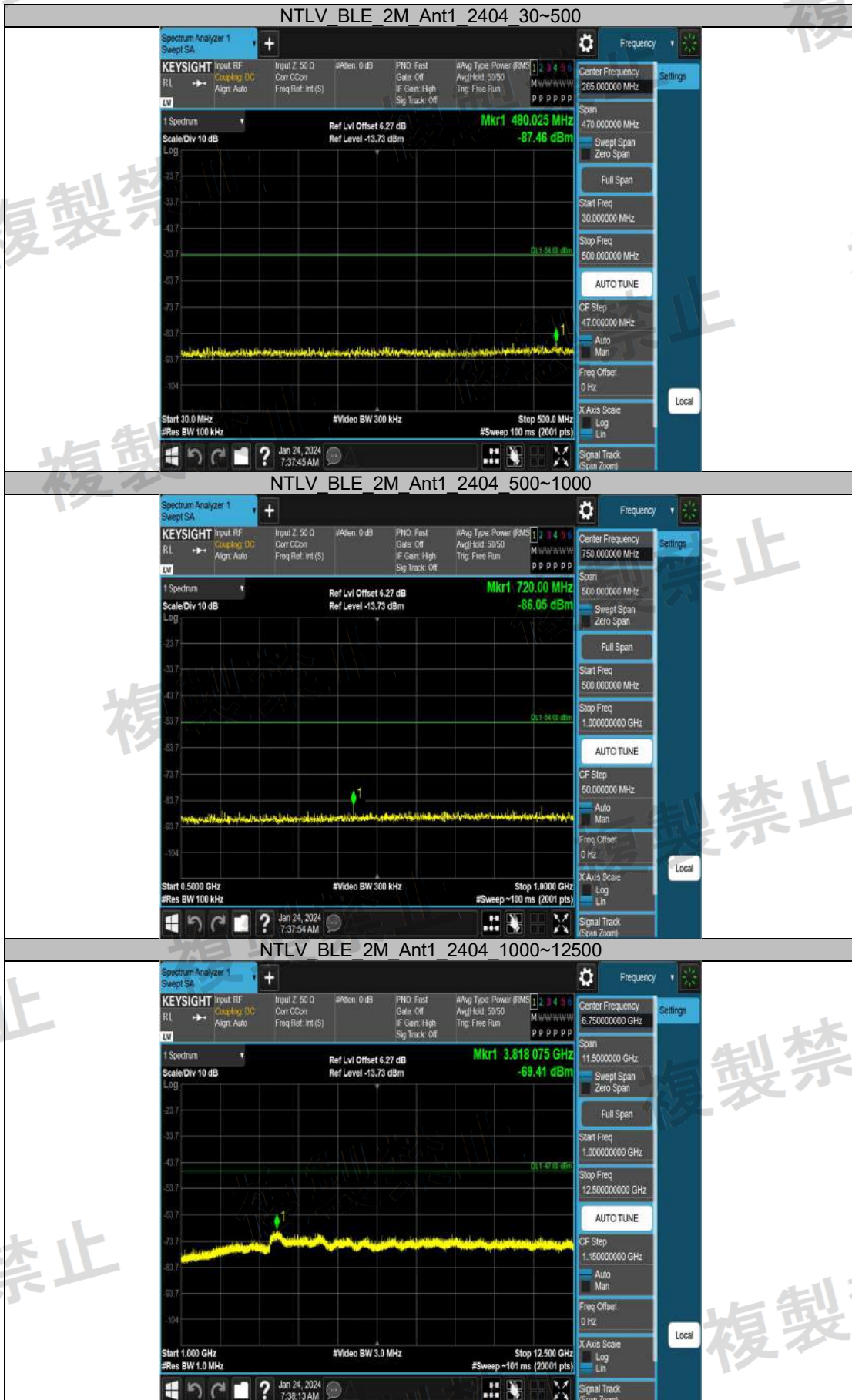


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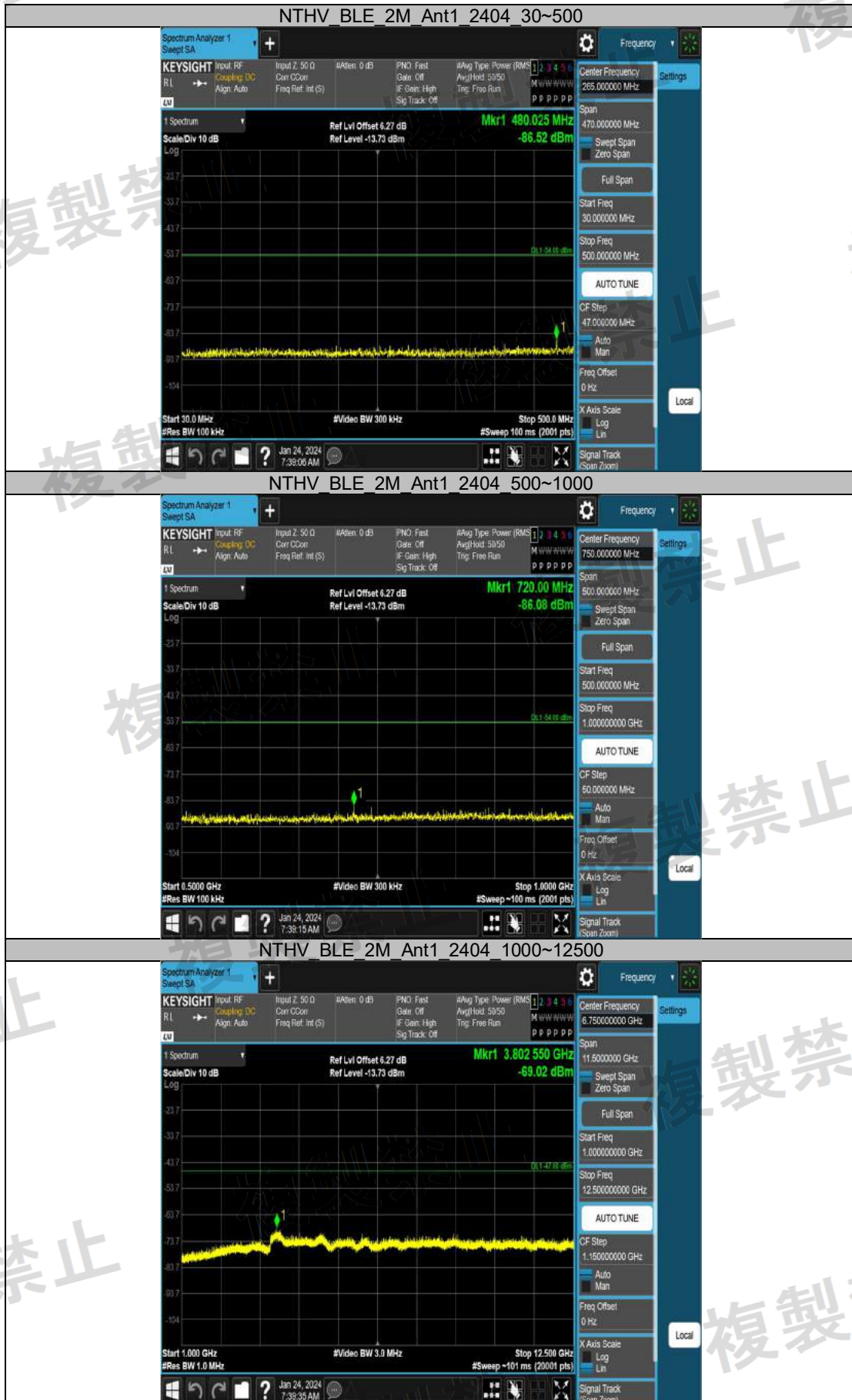


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