

Test Report

Report No. : MTi250807016-0120E2

Date of issue : 2025-09-30

Applicant : Tinyphoton (Wuhan) Technology Co., Ltd.

Product : DWARF mini Smart Telescope

Model(s) : CCT1D1DM0100

Shenzhen Microtest Co., Ltd.

TEST REPORT

Report No.: MTi250807016-0120E2

Table of contents

1	General Description	4
1.1	Description of the EUT	4
1.2	Description of test modes	4
1.3	Environmental Conditions	6
1.4	Description of support units	6
1.5	Measurement uncertainty	6
2	Summary of Test Result	7
3	Test Facilities and accreditations	8
3.1	Test laboratory	8
4	List of test equipment	9
5	Evaluation Results (Evaluation)	10
5.1	Interference Prevention Function	10
6	Radio Spectrum Matter Test Results (RF)	11
6.1	Tolerance of Frequency	11
6.2	Occupied Bandwidth (99%)	12
6.3	Spread Factor	14
6.4	Antenna Power and Tolerance	15
6.5	Spurious Emission Intensity	16
6.6	Secondary Radiated Emissions	19
	Photographs of the test setup	21
	Photographs of the EUT	22
7	Appendix A: Frequency Error	23
8	Appendix B: Antenna Power	26
9	Appendix C: Occupied Bandwidth	33
10	Appendix D: Spread Bandwidth	38
11	Appendix E: Spurious Emission of TX	43
12	Appendix F: Spurious Emission of RX	67

TEST REPORT

Report No.: MTi250807016-0120E2

Test Result Certification		
Applicant	Tinyphoton (Wuhan) Technology Co., Ltd.	
Applicant Address	2101 Huigushikong, No.4 Luoyu East Road, Wuhan, Hubei, China.	
Manufacturer	Meca (Wuhan) Technology Co., Ltd.	
Manufacturer Address	Room 06, 21st Floor, Building 1, Huigu Shikong, No. 206, Old Wuhuang Highway, East Lake New Technology Development Zone, Wuhan City, Hubei Province, China	
Factory	Meca (Wuhan) Technology Co., Ltd.	
Factory Address	Room 06, 21st Floor, Building 1, Huigu Shikong, No. 206, Old Wuhuang Highway, East Lake New Technology Development Zone, Wuhan City, Hubei Province, China	
Product description		
Product name	DWARF mini Smart Telescope	
Trademark	DWARFLAB	
Model name	CCT1D1DM0100	
Series Model(s)	N/A	
Standards	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	
Testing Information		
Date of test	2025-09-16 to 2025-09-26	
Test result	Pass	
Prepared by:	Letter Lan	<i>Letter Lan</i>
Reviewed by:	David Lee	<i>David Lee</i>
Approved by:	Lewis Lian	<i>Lewis Lian</i>

TEST REPORT

Report No.: MTi250807016-0120E2

1 General Description

1.1 Description of the EUT

Product name:	DWARF mini Smart Telescope
Model name:	CCT1D1DM0100
Series Model(s):	N/A
Model difference:	N/A
Electrical rating:	Input: DC 5V/3A, 9V/2A, 12V/3A MAX Battery 1: DC 3.85V 7000mAh 27Wh Battery 2: DC 3.85V 7000mAh 26.95Wh
Accessories:	Cable: USB-C to USB-C cable 1m*1
Hardware version:	A01
Software version:	V1.0.13
Test sample(s) number:	MTi250807016-01-R001
RF specification	
Operating frequency range:	2412-2472MHz
Channel number:	13 channels for 20MHz bandwidth;
Modulation type:	802.11b: DSSS(CCK, DQPSK, DBPSK); 802.11g: OFDM(BPSK, QPSK, 16QAM, 64QAM); 802.11n(HT20): OFDM (BPSK, QPSK, 16QAM, 64QAM)
Antenna(s) type:	FPC
Antenna(s) gain:	1.3dBi

1.2 Description of test modes

No.	Emission test modes
Mode1	802.11b TX mode
Mode2	802.11g TX mode
Mode3	802.11n20 TX mode
Mode4	RX mode
Mode5	unmodulated carrier

1.2.1 Operation channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	6	2437	11	2462
2	2417	7	2442	12	2467
3	2422	8	2447	13	2472

TEST REPORT

Report No.: MTi250807016-0120E2

4	2427	9	2452	/	/
5	2432	10	2457	/	/

Test Channel List

Operation Band: 1

Bandwidth (MHz)	Lowest Channel (LCH) (MHz)	Middle Channel (MCH) (MHz)	Highest Channel (HCH) (MHz)
20	2412	2442	2472

Note: The test software provided by manufacturer is used to control EUT for working in engineering mode, that enables selectable channel, and capable of continuous transmitting mode.

Test Software: CMD

For power setting, refer to below table.

Mode	2412MHz	2442MHz	2472MHz
802.11b	10	10	10
802.11g	8	8	8
802.11n	8	8	8

TEST REPORT

Report No.: MTi250807016-0120E2

1.3 Environmental Conditions

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

Temperature:	15°C ~ 35°C
Humidity:	20% RH ~ 75% RH
Atmospheric pressure:	98 kPa ~ 101 kPa

Test Conditions		Power Supply (V)	Input Voltage to the circuit of RF unit (V)
NTNV (V_{normal})	/	3.85	3.3
NTHV ($V_{\text{max.}}$)	+10%	4.235	3.3
NTLV ($V_{\text{min.}}$)	-10%	3.465	3.3

Note: If the fluctuation of input voltage to the circuit of RF unit (except power supply) of test equipment is under $\pm 1\%$, when input voltage from external power supply to the test equipment is fluctuated by $\pm 10\%$: conduct the test with the rated voltage only

1.4 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list

Description	Model	Serial No.	Manufacturer
Laptop	e485	/	Lenovo

Support cable list

Description	Length (m)	From	To
/	/	/	/

1.5 Measurement uncertainty

Parameter	Measurement uncertainty
Frequency tolerance	± 10 ppm
Occupied channel bandwidth	± 3 %
RF output power, conducted	± 1 dB
Power Spectral Density, conducted	± 1 dB
Unwanted Emissions, conducted	± 1 dB
All emissions, radiated	± 4.7 dB
Temperature	± 1 °C
Supply voltages	± 1 %
Time	± 1 %

Note: the measurement uncertainty is calculated and correspond to a factor $k=2$ (which provide confidence levels of 95.45%)

TEST REPORT

Report No.: MTi250807016-0120E2

2 Summary of Test Result

No.	Item	Standard	Requirement	Result
1	Tolerance of Frequency	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
2	Occupied Bandwidth (99%)	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
3	Spread Factor	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	just for report.
4	Antenna Power and Tolerance	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
5	Spurious Emission Intensity	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
6	Secondary Radiated Emissions	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
7	Interference Prevention Function	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 2-1, Item 19	Pass
8	RF Accessibility	Article 2-1, Item 19-MIC Notice No. 88 Appendix No. 43	Article 49-20, paragraph 1(a)	Pass

Notes:

N/A means not applicable

TEST REPORT

Report No.: MTi250807016-0120E2

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No.7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573
IC Registration No.:	21760
CABID:	CN0093

TEST REPORT

Report No.: MTi250807016-0120E2

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due	Calibration method
Carrier Sensing 2 Tolerance of Frequency Occupied Bandwidth (99%) Spread Factor Antenna Power and Tolerance Spurious Emission Intensity Secondary Radiated Emissions Carrier Sensing 1							
1	Wideband Radio Communication Tester	Rohde&schwarz	CMW500	149155	2025-03-18	2026-03-17	C
2	ESG Series Analog Signal Generator	Agilent	E4421B	GB40051240	2025-03-14	2026-03-13	C
3	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2025-03-14	2026-03-13	C
4	Synthesized Sweeper	Agilent	83752A	3610A01957	2025-03-14	2026-03-13	C
5	MXA Signal Analyzer	Agilent	N9020A	MY50143483	2025-03-14	2026-03-13	C
6	RF Control Unit	Tonscend	JS0806-1	19D8060152	2025-03-18	2026-03-17	C
7	Band Reject Filter Group	Tonscend	JS0806-F	19D8060160	2025-03-14	2026-03-13	C
8	ESG Vector Signal Generator	Agilent	N5182A	MY50143762	2025-03-14	2026-03-13	C
9	DC Power Supply	Agilent	E3632A	MY40027695	2025-03-18	2026-03-17	C

Remark:

(a) Calibration conducted by the National institute of information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.

(b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).

(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

(d) Calibration, etc., conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c)

From JRL Article 24-2, paragraph 4, Item 2

TEST REPORT

Report No.: MTi250807016-0120E2

5 Evaluation Results (Evaluation)

5.1 Interference Prevention Function

Test Requirement:	The EUT shall support one of the following functions: - Automatic identification transmission - Automatic identification reception
Test Method:	Notification No.88 of MIC, 2004
Procedure:	(1) For EUTs capable of automatically transmitting identification data a. Transmit identification data from EUT to Demodulator b. Confirm identification data is correctly received by Demodulator (2) For EUTs capable of automatically receiving identification data a. Transmit identification data from Link Partner to EUT b. Confirm communication link is established c. Link Partner shall respond by transmitting different identification data back to the EUT d. Confirm EUT stops transmitting, or confirm EUT recognizes that the two identification data are different

5.1.1 Conclusion:

The detected ID of the device is below: 9C: B8: B4: BC: 4F: F6

Test result: The device meet the requirements
PASS

TEST REPORT

Report No.: MTi250807016-0120E2

6 Radio Spectrum Matter Test Results (RF)

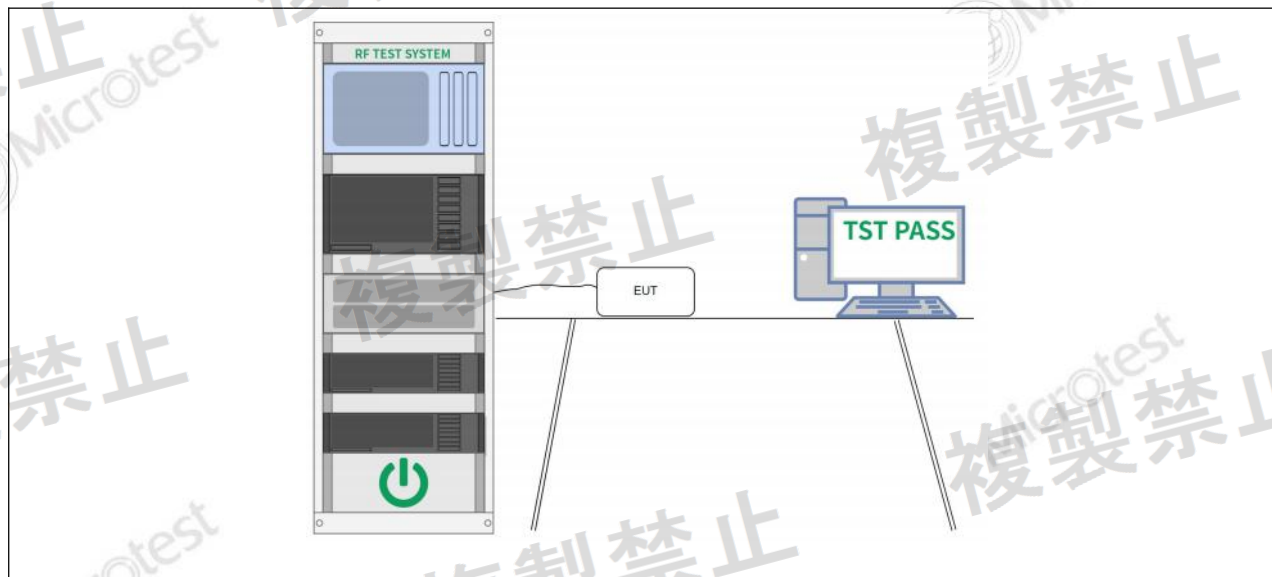
6.1 Tolerance of Frequency

Test Requirement:	Article 2-1, Item 19	
Test Limit:	±50ppm or less.	
Test Method:	Notification No.88 of MIC, 2004	
Procedure:	Center frequency:	Test frequency
	Span:	2 times channel bandwidth
	RBW:	10 kHz (unmodulated)
	VBW:	10 kHz (unmodulated)
	Sweep data points:	1001 or greater
	Sweep time:	Auto
	Detector mode:	Positive peak
	Indication mode:	Max hold
If the EUT cannot transmit in un-modulated mode then unmodulated mode measurements can be made, as follows:		
If the spectrum observed using the spectrum analyzer has a characteristic dip at the center, then the center frequency of the dip shall be regarded as the center frequency of the carrier.		

6.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.2 °C	Humidity:	45.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode5				
Final test mode:	Mode5				

6.1.2 Test Setup Diagram:



6.1.3 Test Data:

Please Refer to Appendix for Details.

TEST REPORT

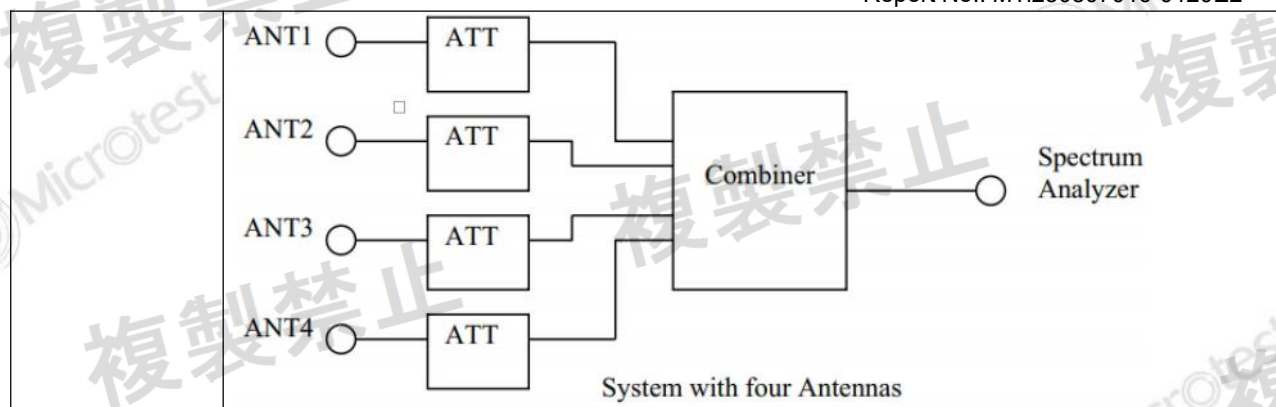
Report No.: MTi250807016-0120E2

6.2 Occupied Bandwidth (99%)

Test Requirement:	Article 2-1, Item 19																		
Test Limit:	For OFDM Modulation: The measured bandwidth at the low and high channels shall meet the following requirements: - The lowest frequency of the measured bandwidth shall not be less than 2400 MHz - The highest frequency of the measured bandwidth shall not be greater than 2483.5 MHz [Occupied Bandwidth] 40 MHz or less For DSSS or other modulation: The measured bandwidth at the low and high channels shall meet the following requirements: - The lowest frequency of the measured bandwidth shall not be less than 2400 MHz - The highest frequency of the measured bandwidth shall not be greater than 2483.5 MHz [Occupied Bandwidth] 26 MHz or less																		
Test Method:	Notification No.88 of MIC, 2004																		
Procedure:	<table border="1"> <tr> <td>Center Frequency:</td><td>Test frequency</td></tr> <tr> <td>Span:</td><td>2 - 3.5 times the technical standard</td></tr> <tr> <td>RBW:</td><td>Within 3% of the technical standard</td></tr> <tr> <td>VBW:</td><td>Same as RBW</td></tr> <tr> <td>Sweep time:</td><td>Auto</td></tr> <tr> <td>Sweep data points:</td><td>1001 or greater</td></tr> <tr> <td>Detector mode:</td><td>Positive peak</td></tr> <tr> <td>Indication mode:</td><td>Max hold</td></tr> <tr> <td>BW setting:</td><td>99%</td></tr> </table> (1) Measure the signal bandwidth using a spectrum analyzer (2) For multiple antenna systems: a) Each antenna shall be individually measured b) If the measured occupied bandwidth for any antenna exceeds [(Occupied Bandwidth Limit) – 100kHz] then, in addition, the occupied bandwidth shall be measured with all antennas combined – see diagram below:	Center Frequency:	Test frequency	Span:	2 - 3.5 times the technical standard	RBW:	Within 3% of the technical standard	VBW:	Same as RBW	Sweep time:	Auto	Sweep data points:	1001 or greater	Detector mode:	Positive peak	Indication mode:	Max hold	BW setting:	99%
Center Frequency:	Test frequency																		
Span:	2 - 3.5 times the technical standard																		
RBW:	Within 3% of the technical standard																		
VBW:	Same as RBW																		
Sweep time:	Auto																		
Sweep data points:	1001 or greater																		
Detector mode:	Positive peak																		
Indication mode:	Max hold																		
BW setting:	99%																		

TEST REPORT

Report No.: MTi250807016-0120E2



6.2.1 E.U.T. Operation:

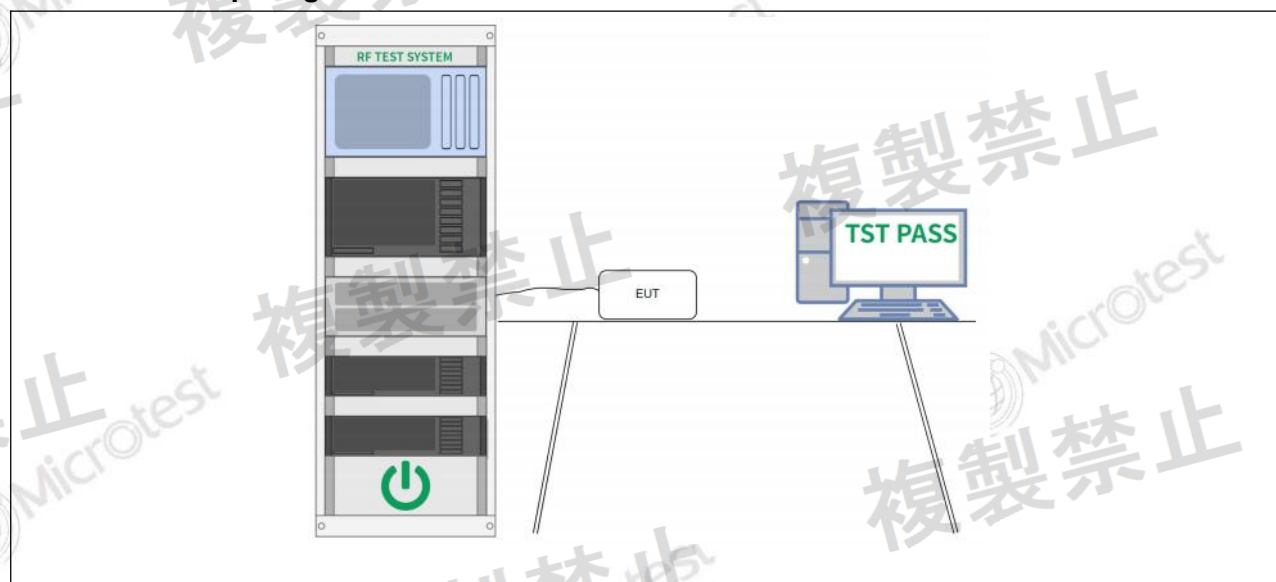
Operating Environment:

Temperature:	23.2 °C	Humidity:	45.1 %	Atmospheric Pressure:	101 kPa
--------------	---------	-----------	--------	-----------------------	---------

Pre test mode:	Mode1, Mode2, Mode3
----------------	---------------------

Final test mode:	Mode1, Mode2, Mode3
------------------	---------------------

6.2.2 Test Setup Diagram:



6.2.3 Test Data:

Please Refer to Appendix for Details.

TEST REPORT

Report No.: MTi250807016-0120E2

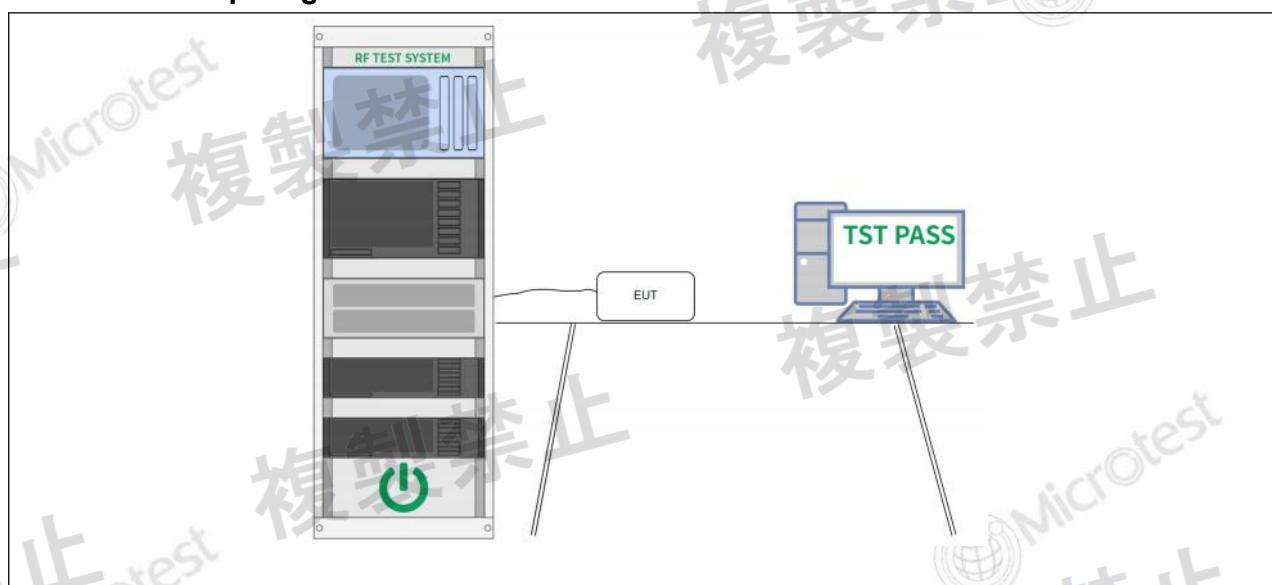
6.3 Spread Factor

Test Requirement:	Article 2-1, Item 19
Test Limit:	No limit
Test Method:	The test method is the same as spread bandwidth.
Procedure:	The test procedure is the same as spread bandwidth.

6.3.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.2 °C	Humidity:	45.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1				
Final test mode:	Mode1				

6.3.2 Test Setup Diagram:



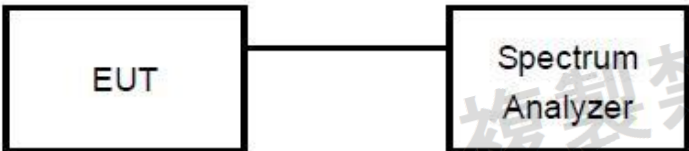
6.3.3 Test Data:

Please Refer to Appendix for Details.

TEST REPORT

Report No.: MTi250807016-0120E2

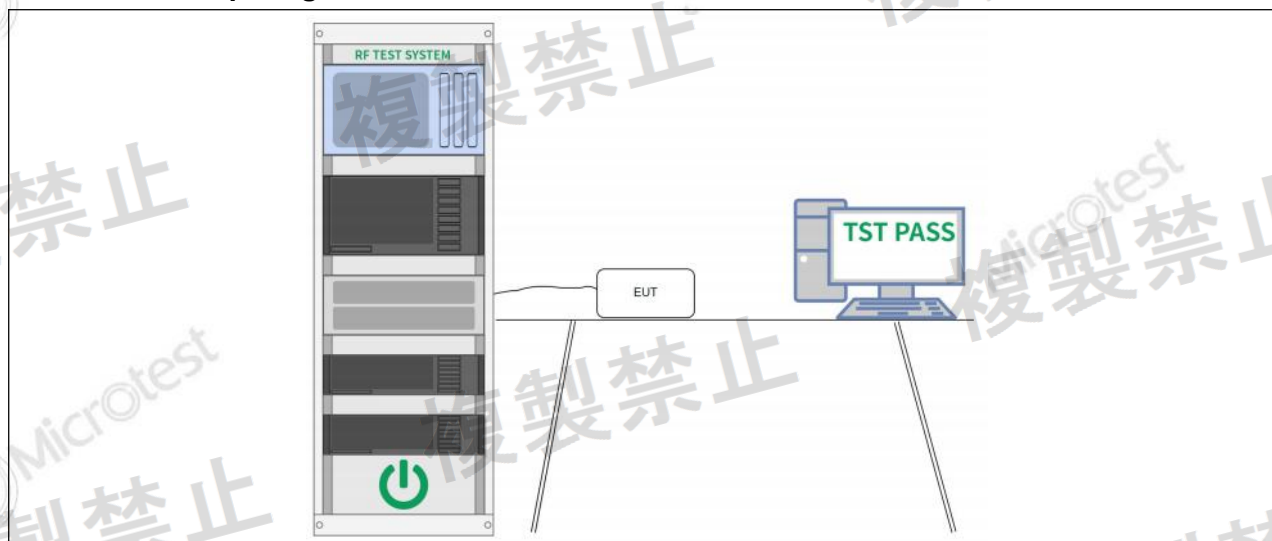
6.4 Antenna Power and Tolerance

Test Requirement:	Article 2-1, Item 19
Test Limit:	Antenna Power: $26\text{MHz} < \text{OBW} \leq 40\text{MHz}$: 5 mW/MHz or less Tolerance: +20% or less EIRP: 19.13dBm/MHz Antenna Power: $\text{OBW} \leq 26\text{MHz}$: 10mW/MHz or less Tolerance: +20% or less EIRP: 12.14dBm/MHz
Test Method:	Notification No.88 of MIC, 2004
Procedure:	Adjust the spectrum analyzer to have the center frequency the same with the measured carrier. $\text{RBW} = \text{VBW} = 1\text{MHz}$, detector mode is positive peak. Turn off the averaging function and use zero span.  <pre> graph LR EUT[EUT] --- SA[Spectrum Analyzer] </pre>

6.4.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.2 °C	Humidity:	45.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode1, Mode2, Mode3				
Final test mode:	Mode1, Mode2, Mode3				

6.4.2 Test Setup Diagram:



6.4.3 Test Data:

Please Refer to Appendix for Details.

Tel: 0755-88850135-1439 Mobile: 131-4343-1439 (Wechat same number)

Web: <http://www.mtitest.cn>

E-mail: mti@51mti.com

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinxing Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Q/MTI-QP-12-FE040

Ver./Rev.: A1

Page 15 of 77

TEST REPORT

Report No.: MTi250807016-0120E2

6.5 Spurious Emission Intensity

Test Requirement:	Article 2-1, Item 19	
Test Limit:	(1) Below 2387 MHz: 2.5 μ W (-26 dBm)/MHz or less (2) 2387 to 2400 MHz: 25.0 μ W (-16 dBm)/MHz or less (3) 2483.5 to 2496.5 MHz: 25.0 μ W (-16 dBm)/MHz or less (4) Over 2496.5 MHz: 2.5 μ W (-26 dBm)/MHz or less	
Test Method:	Notification No.88 of MIC, 2004	
Procedure:	[Setting 1]	
	Frequency range:	(see Note 1)
	RBW:	1 MHz
	VBW:	1 MHz
	Sweep time:	Minimum time required to make an accurate measurement
	Sweep Data Points:	1001 or greater
	Detector mode:	Positive peak
	Indication mode:	Max hold (see Note 2)
	Note 1:	Measurement range shall be 30 MHz to 12.5 GHz, except for the following cases: -FHSS, FHSS+DSSS, FHSS+OFDM:2374 MHz to 2509.5 MHz -Other than FHSS, FHSS+DSSS, FHSS+OFDM: 2400 MHz to 2483.5 MHz
	Note 2:	Sweep shall be repeated until the max hold waveform is stable.
	[Setting 2]	
	Center frequency:	Frequency of spurious emission found using [Setting 1]
	Span:	0 Hz
	RBW:	1 MHz
	VBW:	1 MHz
	Sweep time:	Minimum time required to make an accurate measurement. For burst type (intermittent) spurious emissions, sweep time shall be greater than one burst interval
	Sweep Data Points:	1001 or greater
	Detector mode:	Sample
	[Setting 3]	
	Frequency range:	2374 MHz to 2400 MHz 2483.5 MHz to 2509.5 MHz
	RBW:	30 kHz
	VBW:	30 kHz
	Sweep time:	Minimum time required to make an accurate measurement.

TEST REPORT

Report No.: MTi250807016-0120E2

Sweep data points:	1001 or greater
Detector mode:	Positive peak
Indication mode:	Max hold

(1) After configuring the spectrum analyzer to [Setting 1], search for spurious emissions from 30 MHz to 12.5 GHz. If the sweep range does not cover the required measurement frequency range then the measurement range will need to be divided into sufficient sections of size [RBW x Sweep Data Points]. If spurious emissions greater than [Limit - 3dB] are found, then more detailed measurements are required, go to step (2)

(2) Configure the spectrum analyzer using [Setting 2] and measure the average signal amplitude.

If the spurious emission is burst type (intermittent), then the average value shall not include signal OFF time.

If spurious emissions ranging from 30 MHz to 2374 MHz and from 2509.5MHz to 12.5GHz are over the limit, then the test result is Fail.

If spurious emissions ranging from 2374 MHz to 2400 MHz and from 2483.5 MHz to 2509.5 MHz are over the limit, then further detailed measurements are required, go to step (3)

(3) In the following cases, measure the spurious emissions using [Setting 3]

- Case1: FHSS, FHSS+DSSS, FHSS+OFDM

- Case2: Other than FHSS, FHSS+DSSS, FHSS+OFDM, and the spurious emissions in step (2) are over the limit

(4) Calculate the spurious emission value (Calculated Value) using following the formula below:

Calculated Value = (Measured Value using (3) + 15.2dB)

Note: 15.2dB adjustment is derived from the Conversion Factor of RBW

Conversion Factor of RBW = $10 \times \log(\text{Reference Bandwidth} / \text{RBW of measurement}) = 15.2 \text{ [dB]}$ Where: Reference Bandwidth = 1 MHz

RBW of measurement = 30 kHz

(5) If the calculated value using (4) is over the Limit (section 6.7), go to (6)

(6) Configure the spectrum analyzer to [Setting 3] then make the following changes: Frequency: Frequency of spurious emission

Span: 1 MHz

(7) After sweep, send the span data set to the PC

(8) Convert measured data from dBm to Watts

(9) Sum all the data using the formula below. If the sum is within the limit, the test result is Pass, otherwise, Fail

$$P_s = \left(\sum_{i=1}^n E_i \right) \times \frac{S_w}{RBW \times k \times n}$$

Ps: Sum (Watts)

Ei: Measured value at each point in the Span (Watts) Sw: Span (1MHz)

n: Number of measurement points in the Span

k: Correction factor for Equivalent Noise Bandwidth, specific to each spectrum analyzer, check the instrument user guide

RBW: Resolution Bandwidth (MHz).

TEST REPORT

Report No.: MTi250807016-0120E2

(10) If the EUT has multiple antennas, measure the spurious emission from each individual antenna using steps (1) through (9)
(11) Convert the individual antenna spurious level measurements (step (10)) from dB to absolute values
(12) Combine (sum) the absolute values of the spurious measurements at each frequency for each antenna (to create a single composite spectrum of spurious emissions)
(13) Ensure that the composite spectrum does not exceed the Limit defined in 6.7 (Technical Standard)
(14) Configuring the spectrum analyzer using [Setting 3] and measure the spurious emissions with all the antennas electrically combined

6.5.1 E.U.T. Operation:

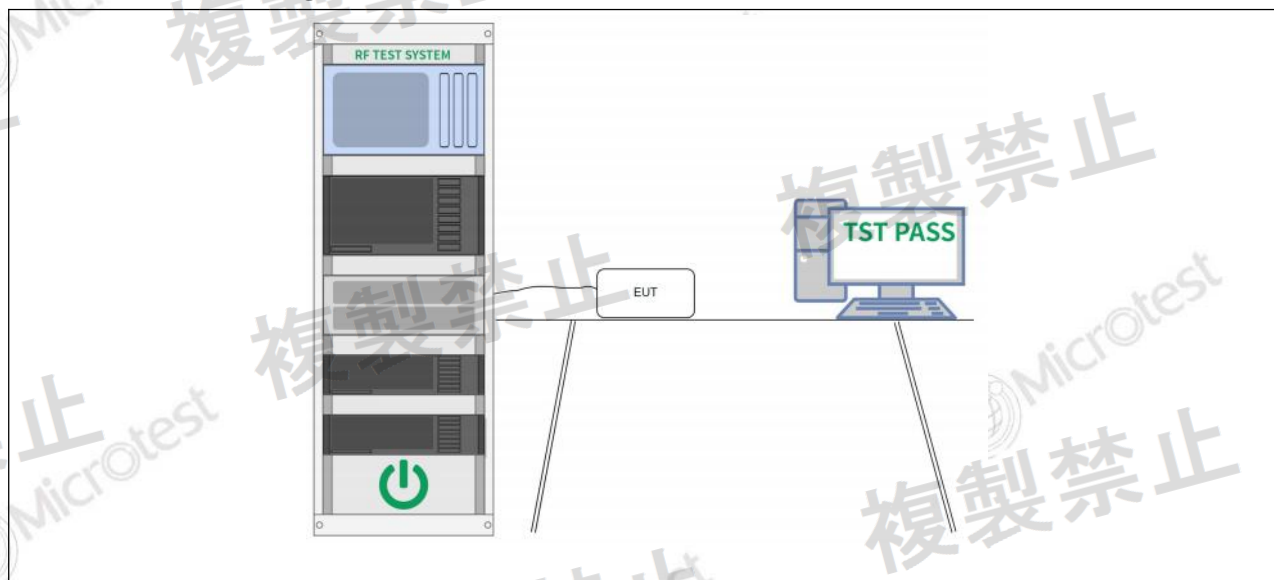
Operating Environment:

Temperature:	23.2 °C	Humidity:	45.1 %	Atmospheric Pressure:	101 kPa
--------------	---------	-----------	--------	-----------------------	---------

Pre test mode:	Mode1, Mode2, Mode3
----------------	---------------------

Final test mode:	Mode1, Mode2, Mode3
------------------	---------------------

6.5.2 Test Setup Diagram:



6.5.3 Test Data:

Please Refer to Appendix for Details.

TEST REPORT

Report No.: MTi250807016-0120E2

6.6 Secondary Radiated Emissions

Test Requirement:	Article 2-1, Item 19		
Test Limit:	(1) Below 1 GHz: 4 nW (-54dBm) or less (2) Above 1 GHz: 20 nW (-47dBm) or less		
Test Method:	Notification No.88 of MIC, 2004		
Procedure:	[Setting 1]		
	Frequency range:	30 MHz ~ 12.5 GHz	
	RBW:	Below 1 GHz:100 kHz	
		Above 1 GHz:1 MHz	
	VBW:	Below 1 GHz:100 kHz	
		Above 1 GHz:1 MHz	
	Sweep time:	Auto	
	Sweep data points:	1001 or greater	
	Detector mode:	Positive peak	
	Indication mode:	Max hold	
	[Setting 2]		
	Center Frequency:	Frequency of spurious emission found using [Setting 1]	
	Span:	0 Hz	
	RBW:	Below 1 GHz:100 kHz	
		Above 1 GHz:1 MHz	
	VBW:	Below 1 GHz:100 kHz	
		Above 1 GHz:1 MHz	
	Sweep time:	Auto	
	Sweep data points:	1001 or greater	
	Detector mode:	Sample	

6.6.1 E.U.T. Operation:

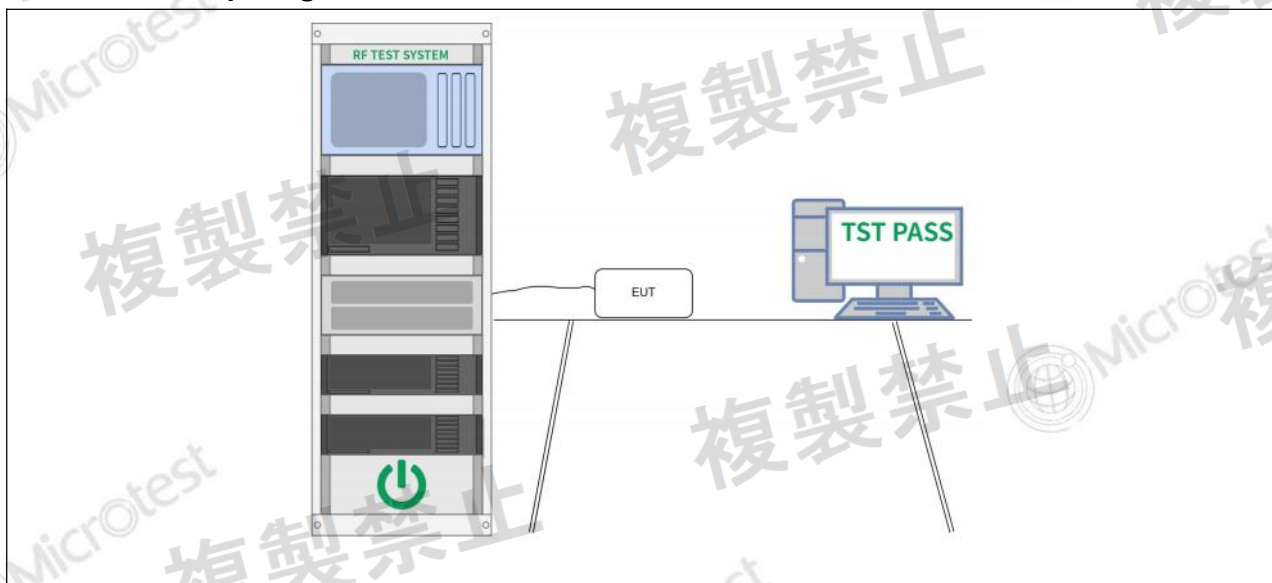
Operating Environment:					
Temperature:	23.2 °C	Humidity:	45.1 %	Atmospheric Pressure:	101 kPa
Pre test mode:	Mode4				

TEST REPORT

Report No.: MTi250807016-0120E2

Final test mode:	Mode4
------------------	-------

6.6.2 Test Setup Diagram:



6.6.3 Test Data:

Please Refer to Appendix for Details.

TEST REPORT

Report No.: MTi250807016-0120E2

Photographs of the test setup

Refer to Appendix - Test Setup Photos

TEST REPORT

Report No.: MTi250807016-0120E2

Photographs of the EUT

Refer to Appendix - EUT Photos

TEST REPORT

Report No.: MTi250807016-0120E2

Appendix

7 Appendix A: Frequency Error

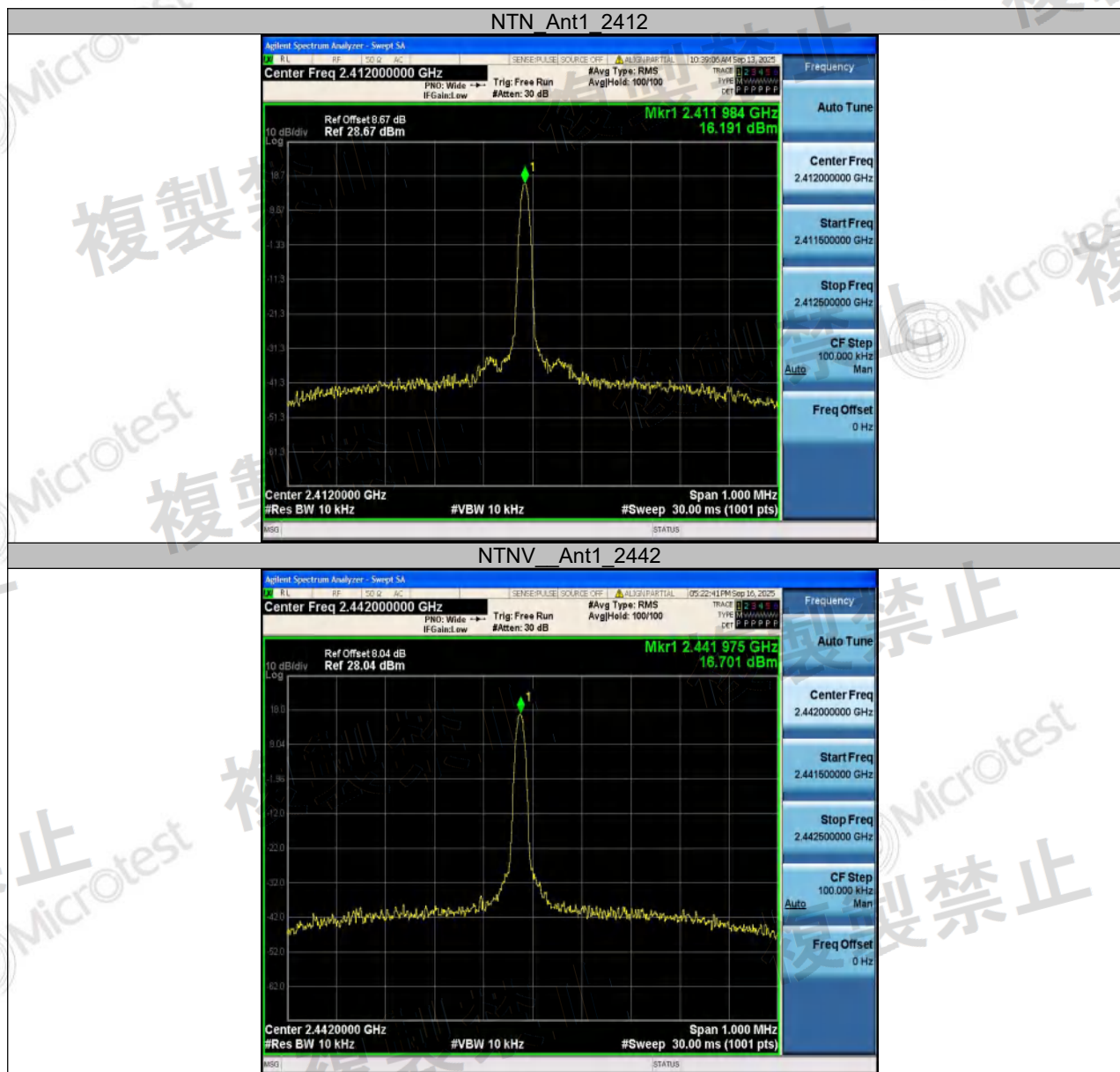
7.1.1 Test Result

Test Condition	Test Mode	Antenna	Frequency [MHz]	Center Freq [MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	unmodulated carrier	Ant1	2412	2411.984	-6.63350	±50	PASS
			2442	2441.975	-10.23751	±50	PASS
			2472	2471.971	-11.73139	±50	PASS

TEST REPORT

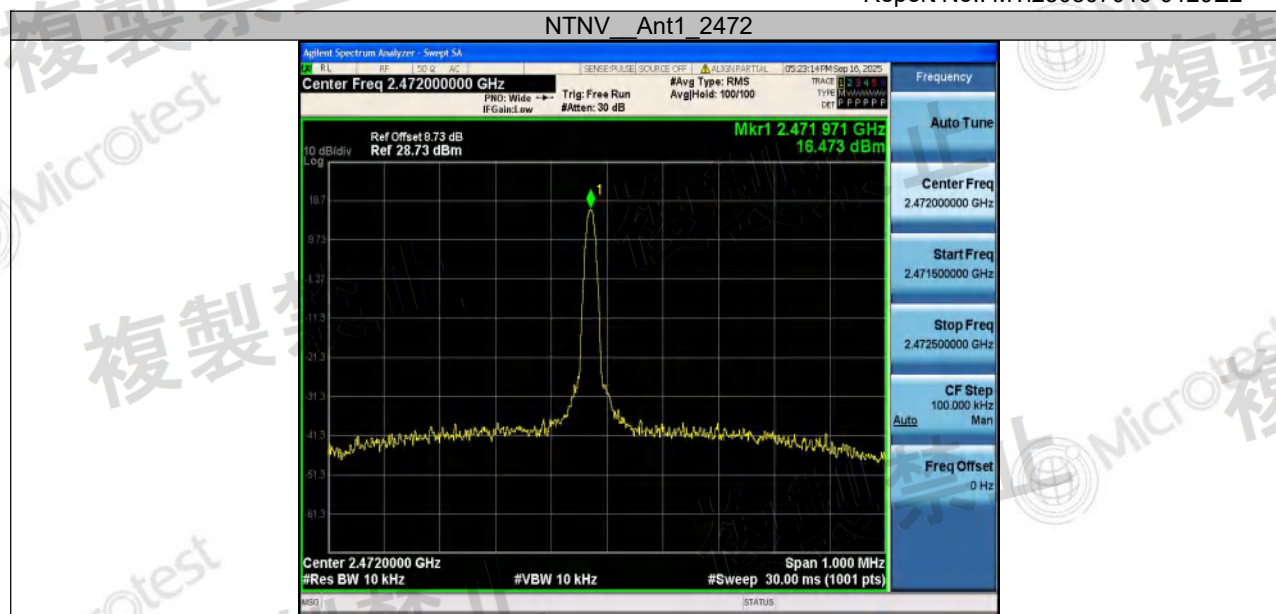
Report No.: MTi250807016-0120E2

7.1.2 Test Graphs



TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2

8 Appendix B: Antenna Power

8.1.1 Test Result

Antenna Power							
Test Condition	Test Mode	Antenna	Frequen cy[MHz]	Result(dBm/ MHz)	Result(mW/M Hz)	Limit(mW/ MHz)	Verdict
NTNV	11B	Ant1	2412	6.81	4.797	≤10	PASS
			2442	3.73	2.360	≤10	PASS
			2472	6.32	4.285	≤10	PASS
	11G	Ant1	2412	4.96	3.133	≤10	PASS
			2442	3.92	2.466	≤10	PASS
			2472	-0.06	0.986	≤10	PASS
	11N20SI SO	Ant1	2412	-0.83	4.797	≤10	PASS
			2442	-1.14	2.360	≤10	PASS
			2472	-0.66	4.285	≤10	PASS

Tolerance								
Test Condition	Test Mode	Antenna	Frequen cy[MHz]	Power (mW/M Hz)	RatedPower (mW/MHz)	Result (%)	Limit (%)	Verdict
NTNV	11B	Ant1	2412	4.797	5	-4.06%	≤20	PASS
			2442	2.360	5	-52.80%	≤20	PASS
			2472	4.285	5	-14.30%	≤20	PASS
	11G	Ant1	2412	3.133	5	-37.34%	≤20	PASS
			2442	2.466	5	-50.68%	≤20	PASS
			2472	0.986	5	-80.28%	≤20	PASS
	11N20SI SO	Ant1	2412	4.797	5	-4.06%	≤20	PASS
			2442	2.360	5	-52.80%	≤20	PASS
			2472	4.285	5	-14.30%	≤20	PASS

EIRP							
Test Condition	Test Mode	Antenna	Frequen cy[MHz]	Result (dBm/MHz)	EIRP(dBm/M Hz)	Limit (dBm/MHz)	Verdict
NTNV	11B	Ant1	2412	6.81	8.11	≤12.14	PASS
			2442	3.73	5.03	≤12.14	PASS
			2472	6.32	7.62	≤12.14	PASS
	11G	Ant1	2412	4.96	6.26	≤12.14	PASS
			2442	3.92	5.22	≤12.14	PASS
			2472	-0.06	1.24	≤12.14	PASS
	11N20SI SO	Ant1	2412	-0.83	0.47	≤12.14	PASS
			2442	-1.14	0.16	≤12.14	PASS
			2472	-0.66	0.64	≤12.14	PASS

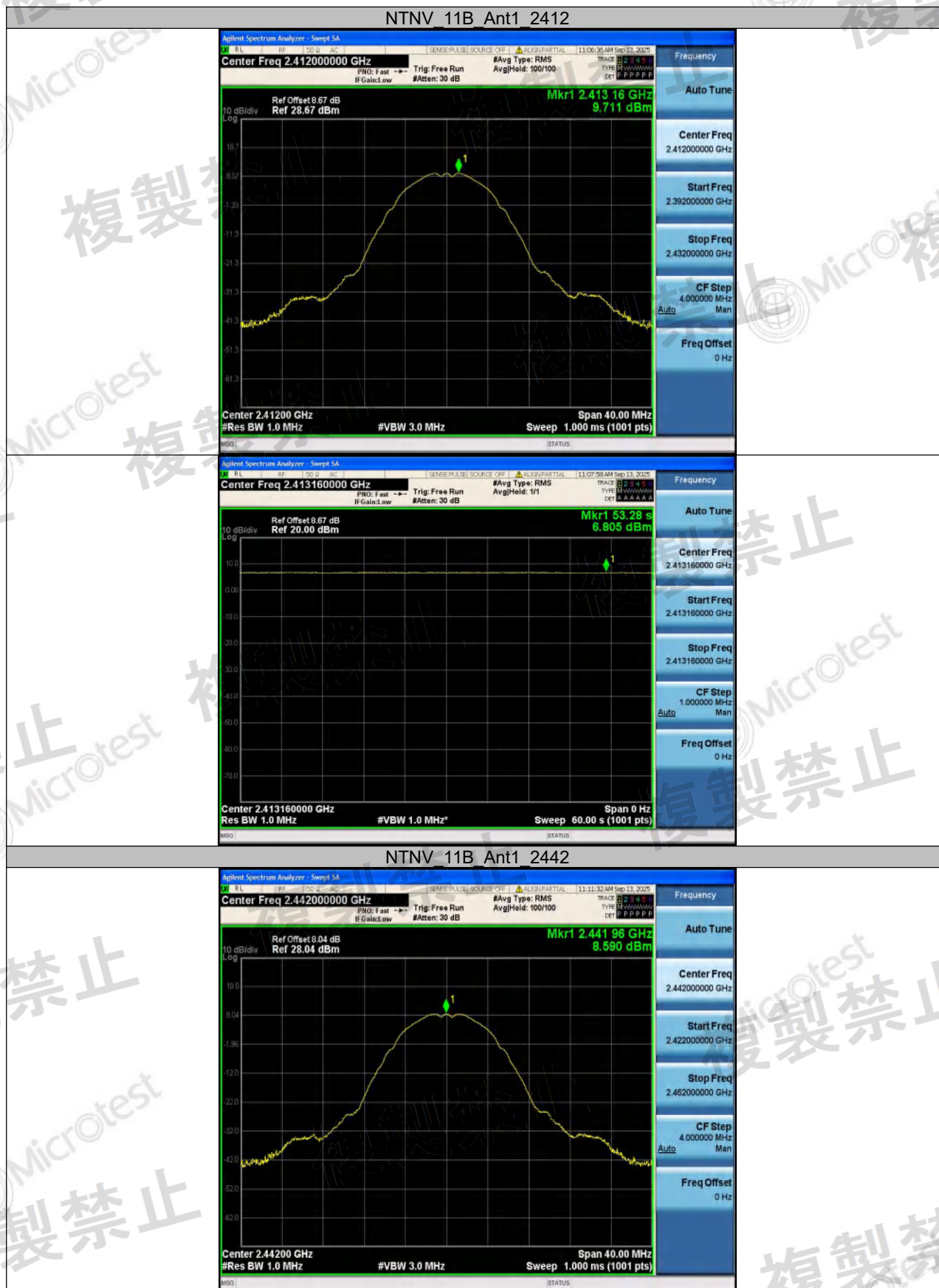
Note: 1. Antenna gain is 1.3dBi

2. EIRP= Result + antenna gain

TEST REPORT

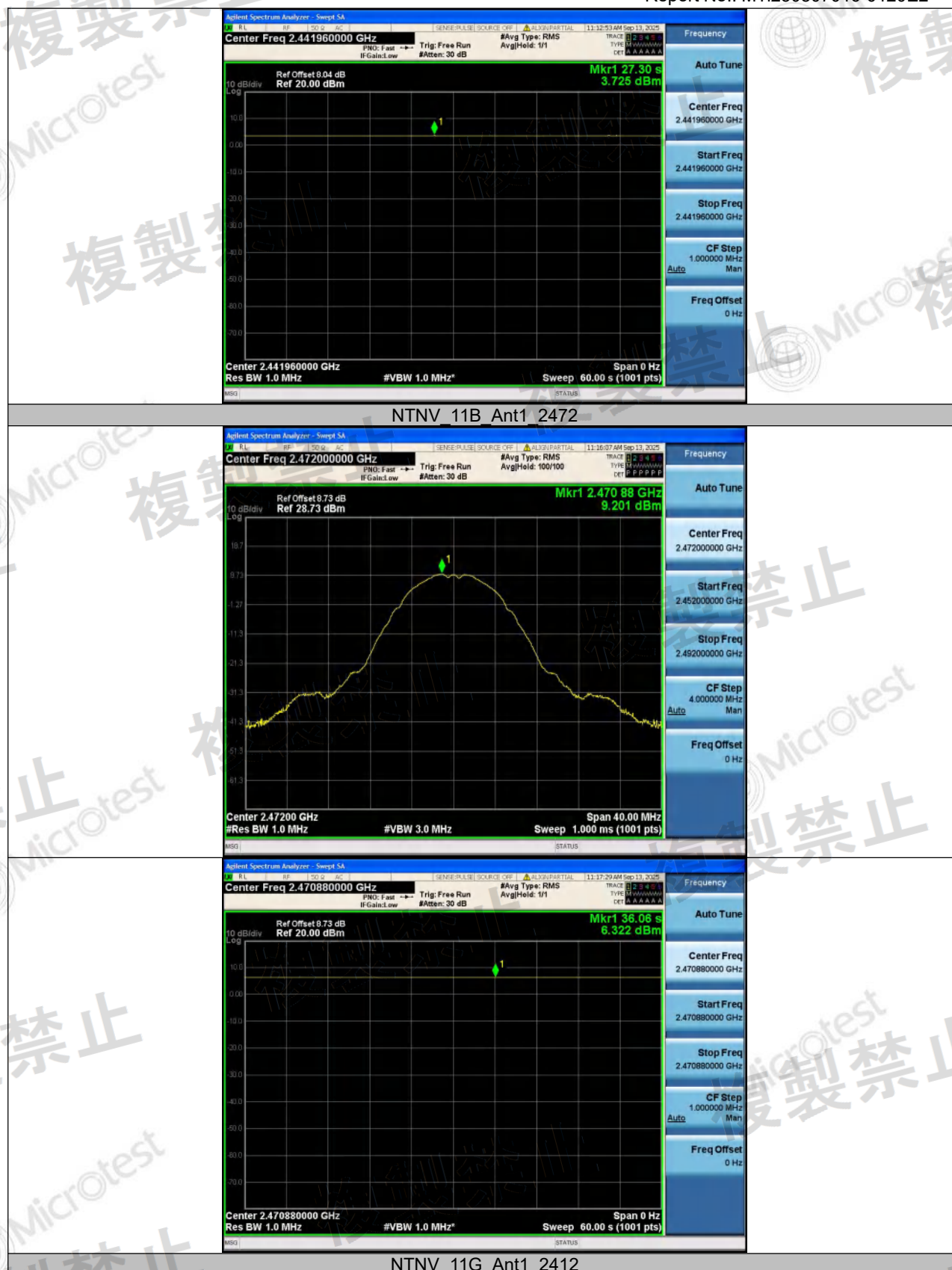
Report No.: MTi250807016-0120E2

8.1.2 Test Graphs



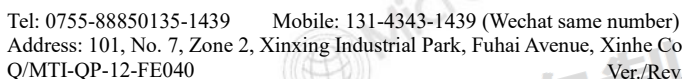
TEST REPORT

Report No.: MTi250807016-0120E2





Report No.: MTi250807016-0120E2



Web: <http://www.mtitest.cn>

E-mail: mti@51mti.com

Address: 101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhé Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Ver./Rev.: A1

Page 29 of 77

TEST REPORT

Report No.: MTi250807016-0120E2



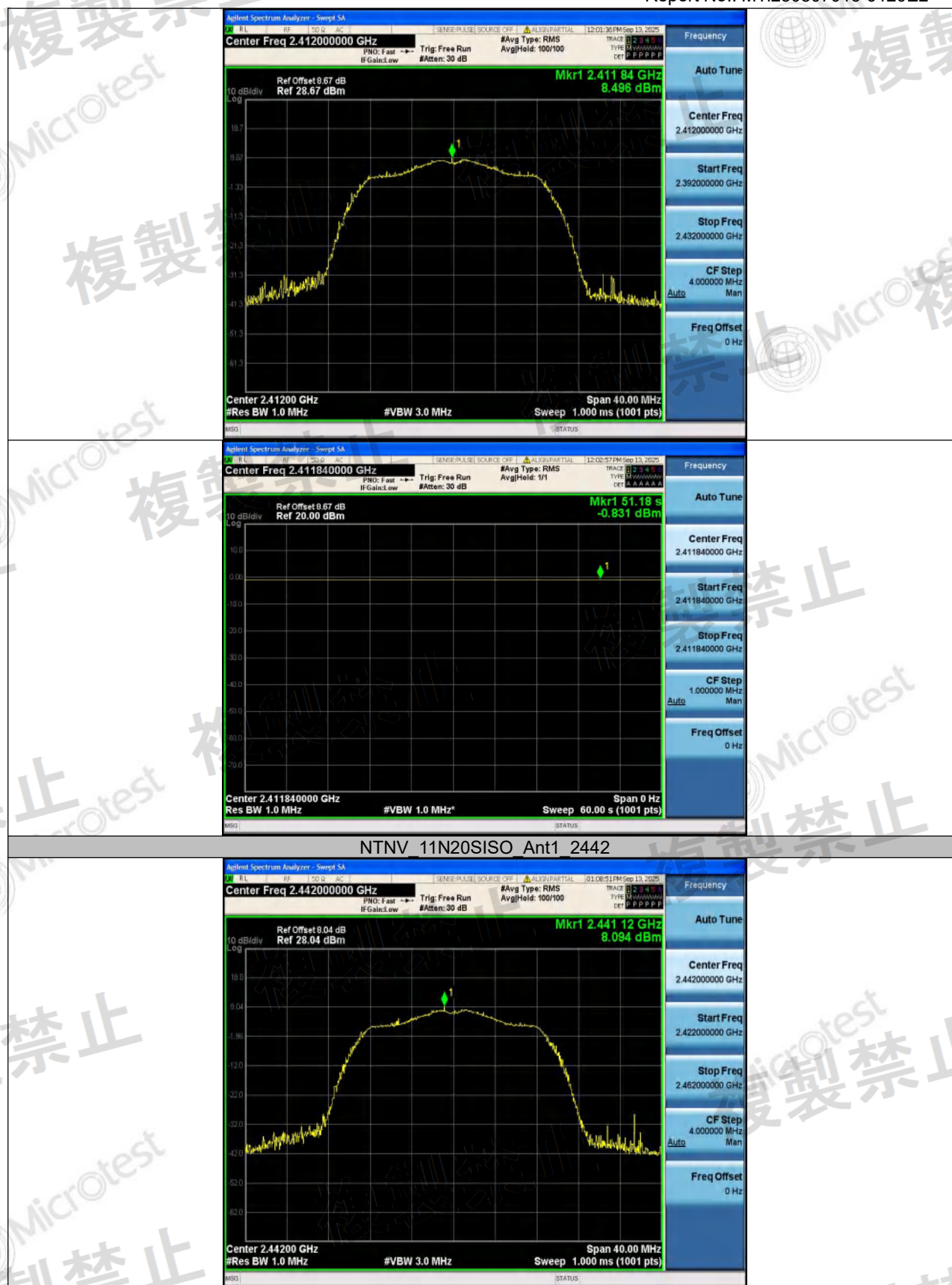
NTNV 11G Ant1 2472



NTNV 11N20SISO Ant1 2412

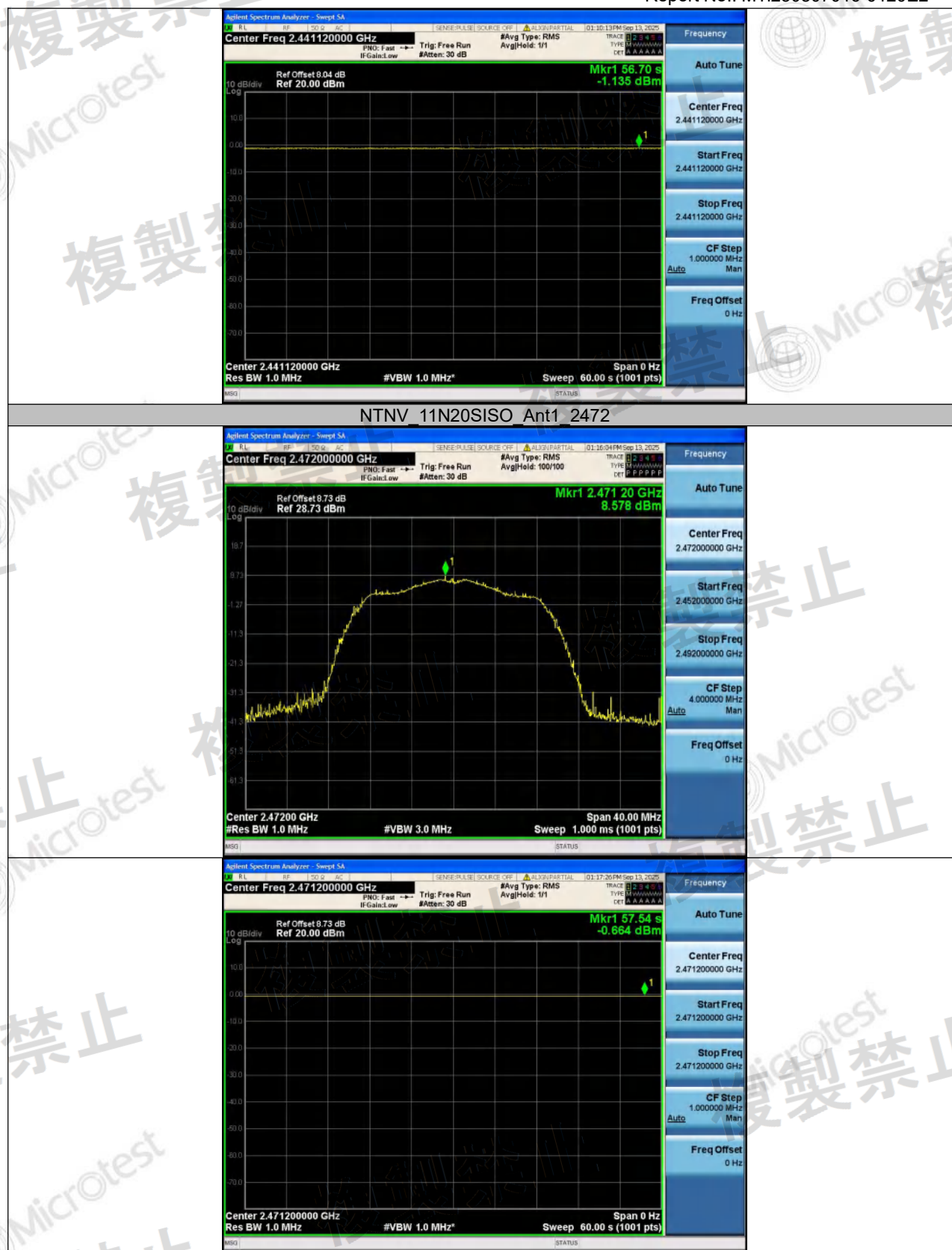
TEST REPORT

Report No.: MTI250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

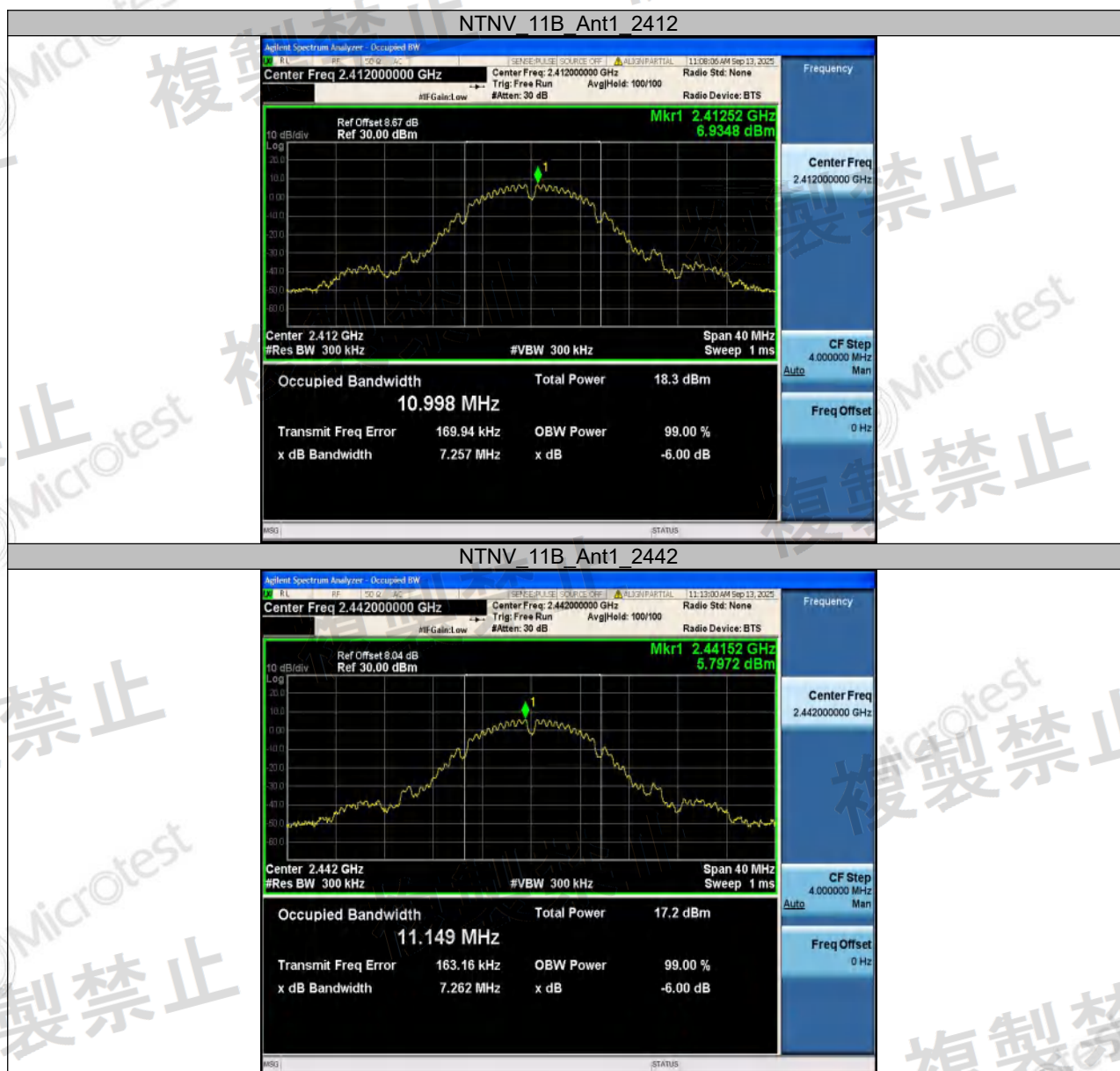
Report No.: MTi250807016-0120E2

9 Appendix C: Occupied Bandwidth

9.1.1 Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Result [MHz]	Limit [MHz]	Verdict
NTNV	11B	Ant1	2412	10.998	≤26	PASS
			2442	11.149	≤26	PASS
			2472	11.440	≤26	PASS
	11G	Ant1	2412	16.552	≤26	PASS
			2442	16.559	≤26	PASS
			2472	16.538	≤26	PASS
	11N20SISO	Ant1	2412	17.591	≤26	PASS
			2442	17.622	≤26	PASS
			2472	17.578	≤26	PASS

9.1.2 Test Graphs



TEST REPORT

Report No.: MTI250807016-0120E2

NTNV_11B_Ant1_2472



NTNV_11G_Ant1_2412



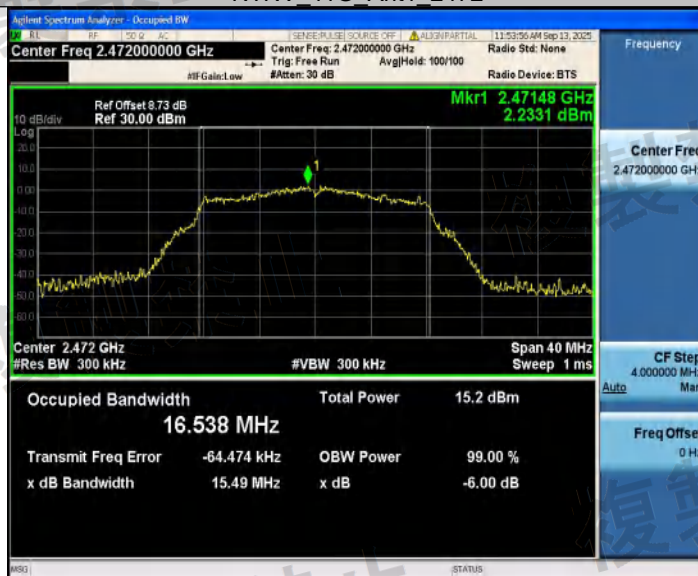
TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11G Ant1 2442



NTNV 11G Ant1 2472



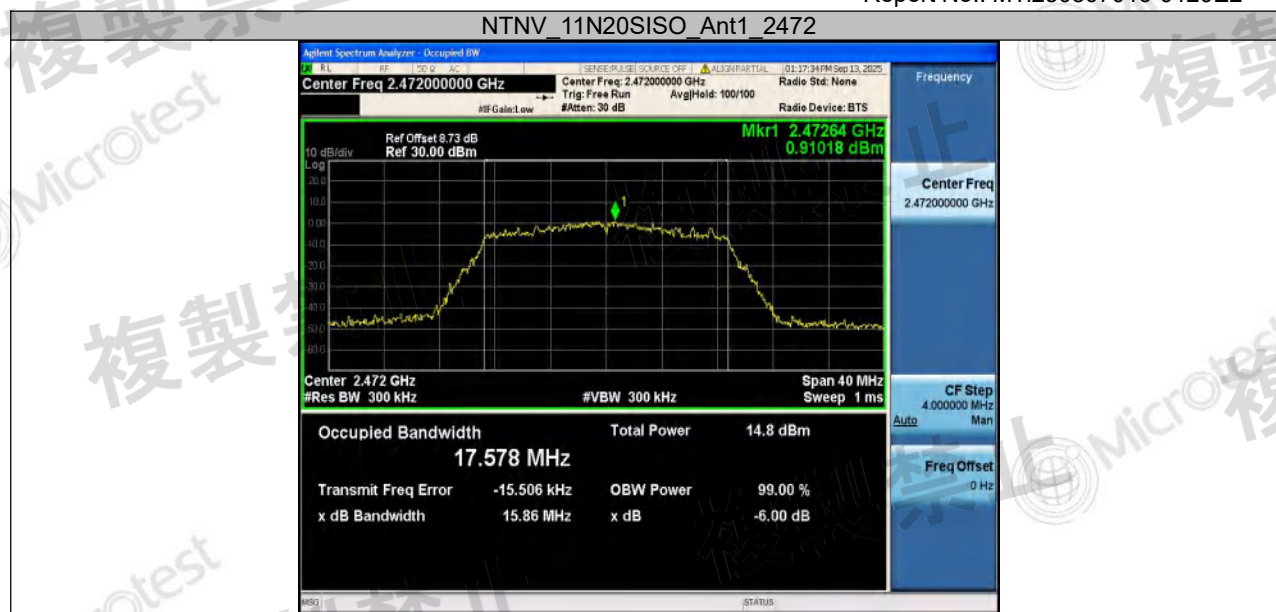
TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2

10 Appendix D: Spread Bandwidth

10.1.1 Test Result

TestCondition	TestMode	Antenna	Frequency[MHz]	Result [MHz]
NTNV	11B	Ant1	2412	7.490
			2442	7.530
			2472	7.585
	11G	Ant1	2412	13.554
			2442	13.363
			2472	13.648
	11N20SISO	Ant1	2412	14.729
			2442	14.568
			2472	14.441

10.1.2 Test Graphs



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV_11B_Ant1_2472



NTNV_11G_Ant1_2412



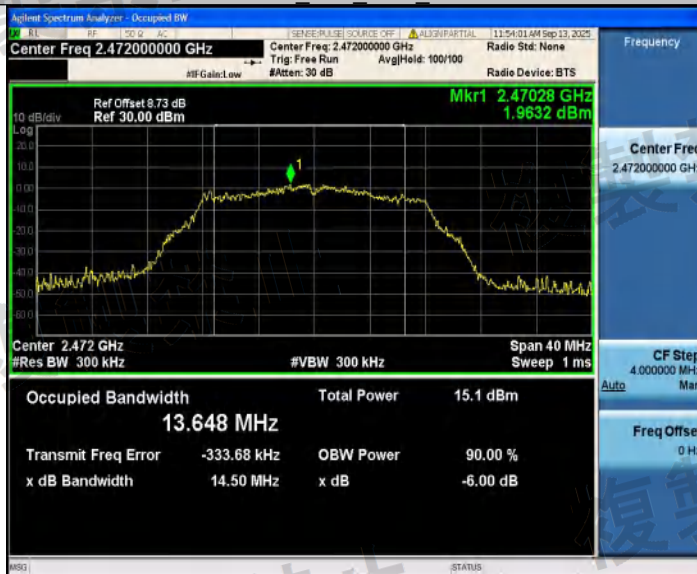
TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11G_Ant1_2442



NTNV 11G_Ant1_2472



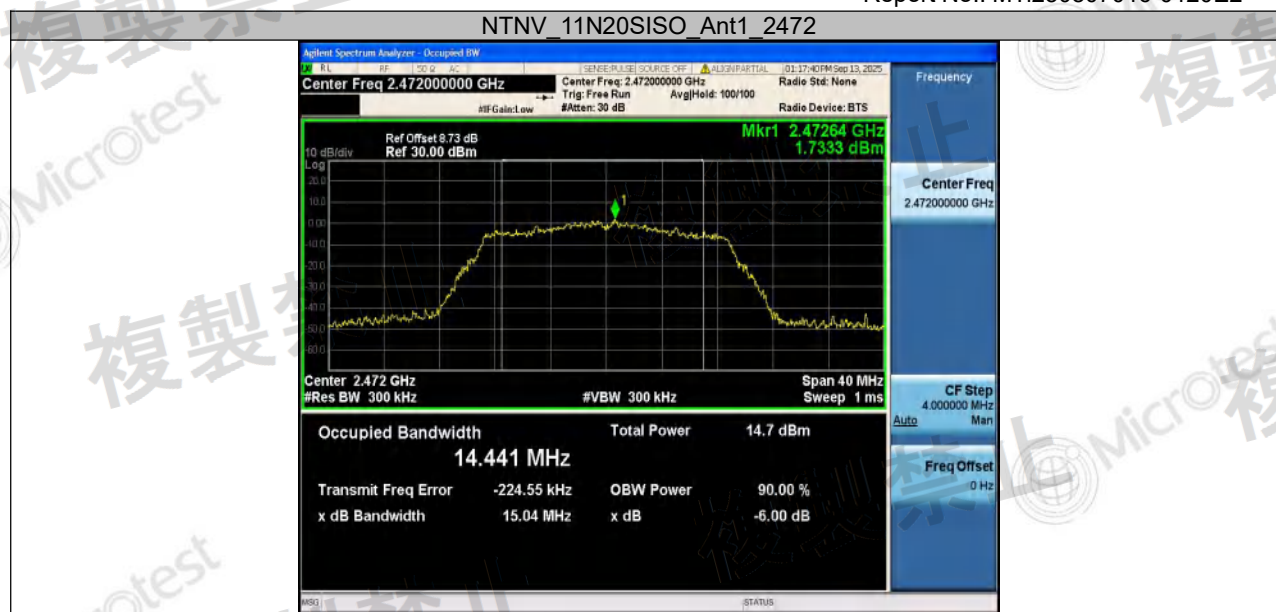
TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2

11 Appendix E: Spurious Emission of TX

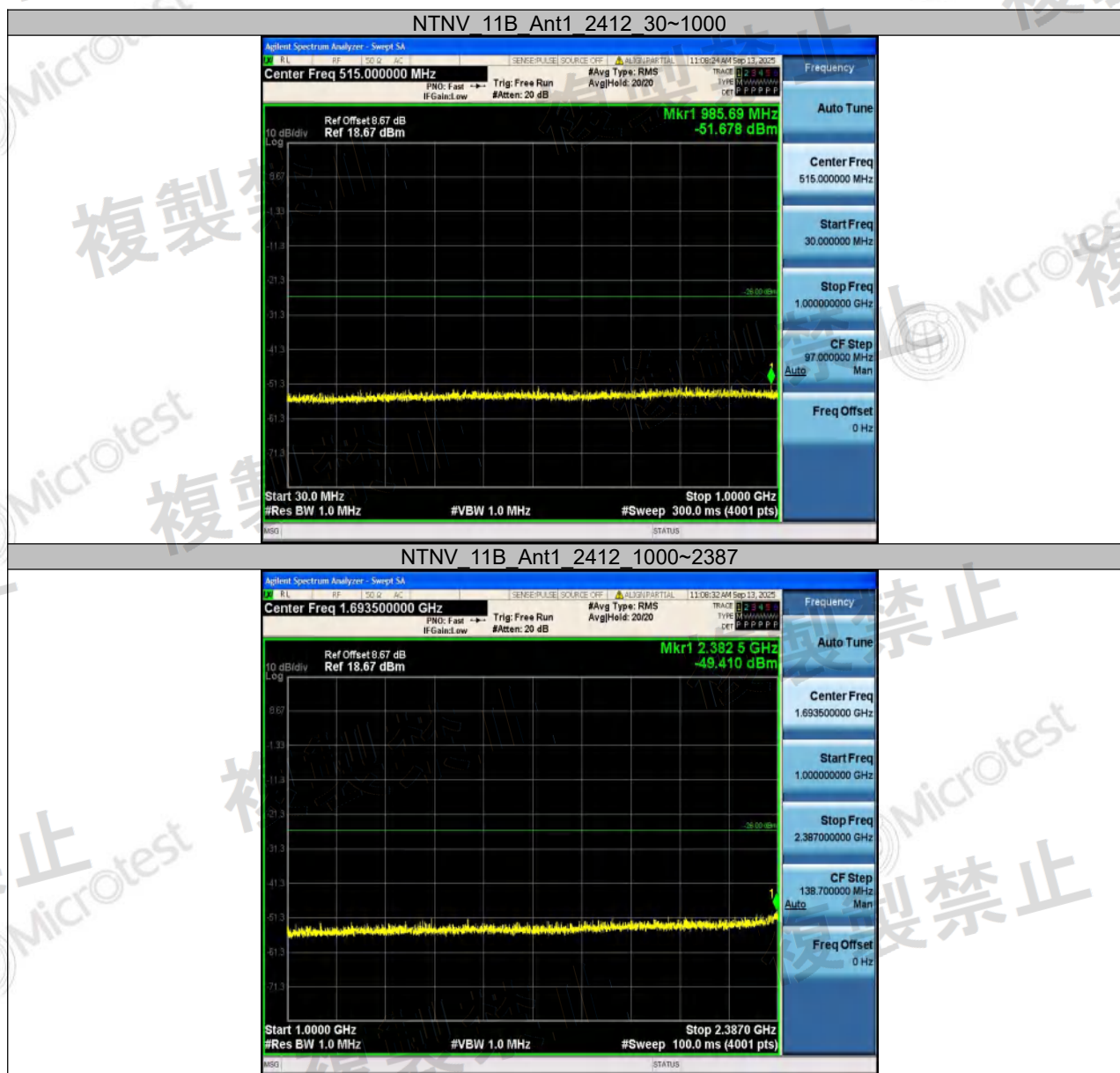
11.1.1 Test Result

Test Condition	Test Mode	Antenna	Frequency [MHz]	Freq.Range [MHz]	Result [dBm]	Limit [dBm]	Result [μW]	Limit [μW]	Verdict
NTNV	11B	Ant1	2412	30~1000	-51.68	≤-26	0.00679	≤2.5	PASS
				1000~2387	-49.41	≤-26	0.01146	≤2.5	PASS
				2387~2400	-32.46	≤-16	0.56754	≤25	PASS
				2483.5~2496.5	-41.00	≤-16	0.07943	≤25	PASS
				2496.5~13000	-45.86	≤-26	0.02594	≤2.5	PASS
			2442	30~1000	-52.24	≤-26	0.00597	≤2.5	PASS
				1000~2387	-50.82	≤-26	0.00828	≤2.5	PASS
				2387~2400	-41.47	≤-16	0.07129	≤25	PASS
				2483.5~2496.5	-41.64	≤-16	0.06855	≤25	PASS
				2496.5~13000	-48.67	≤-26	0.01358	≤2.5	PASS
			2472	30~1000	-51.27	≤-26	0.00746	≤2.5	PASS
				1000~2387	-50.01	≤-26	0.00998	≤2.5	PASS
				2387~2400	-40.69	≤-16	0.08531	≤25	PASS
				2483.5~2496.5	-31.67	≤-16	0.68077	≤25	PASS
				2496.5~13000	-46.63	≤-26	0.02173	≤2.5	PASS
	11G	Ant1	2412	30~1000	-51.78	≤-26	0.00664	≤2.5	PASS
				1000~2387	-29.31	≤-26	1.17220	≤2.5	PASS
				2387~2400	-16.97	≤-16	20.09093	≤25	PASS
				2483.5~2496.5	-40.86	≤-16	0.08204	≤25	PASS
				2496.5~13000	-44.68	≤-26	0.03404	≤2.5	PASS
			2442	30~1000	-52.10	≤-26	0.00617	≤2.5	PASS
				1000~2387	-48.55	≤-26	0.01396	≤2.5	PASS
				2387~2400	-38.27	≤-16	0.14894	≤25	PASS
				2483.5~2496.5	-38.23	≤-16	0.15031	≤25	PASS
				2496.5~13000	-47.27	≤-26	0.01875	≤2.5	PASS
			2472	30~1000	-51.78	≤-26	0.00664	≤2.5	PASS
				1000~2387	-50.68	≤-26	0.00855	≤2.5	PASS
				2387~2400	-40.90	≤-16	0.08128	≤25	PASS
				2483.5~2496.5	-22.35	≤-16	5.82103	≤25	PASS
				2496.5~13000	-40.77	≤-26	0.08375	≤2.5	PASS
	11N20SISO	Ant1	2412	30~1000	-51.34	≤-26	0.00735	≤2.5	PASS
				1000~2387	-46.14	≤-26	0.02432	≤2.5	PASS
				2387~2400	-26.42	≤-16	2.28034	≤25	PASS
				2483.5~2496.5	-40.74	≤-16	0.08433	≤25	PASS
				2496.5~13000	-48.68	≤-26	0.01355	≤2.5	PASS
			2442	30~1000	-51.92	≤-26	0.00643	≤2.5	PASS
				1000~2387	-50.32	≤-26	0.00929	≤2.5	PASS
				2387~2400	-41.78	≤-16	0.06637	≤25	PASS
				2483.5~2496.5	-41.34	≤-16	0.07345	≤25	PASS
				2496.5~13000	-48.16	≤-26	0.01528	≤2.5	PASS
			2472	30~1000	-51.57	≤-26	0.00697	≤2.5	PASS
				1000~2387	-50.70	≤-26	0.00851	≤2.5	PASS
				2387~2400	-41.18	≤-16	0.07621	≤25	PASS
				2483.5~2496.5	-21.36	≤-16	7.31139	≤25	PASS
				2496.5~13000	-47.80	≤-26	0.01660	≤2.5	PASS

TEST REPORT

Report No.: MTi250807016-0120E2

11.1.2 Test Graphs



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11B_Ant1 2412_2387~2400



NTNV 11B_Ant1 2412_2483.5~2496.5



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11B_Ant1_2412_2496.5~13000



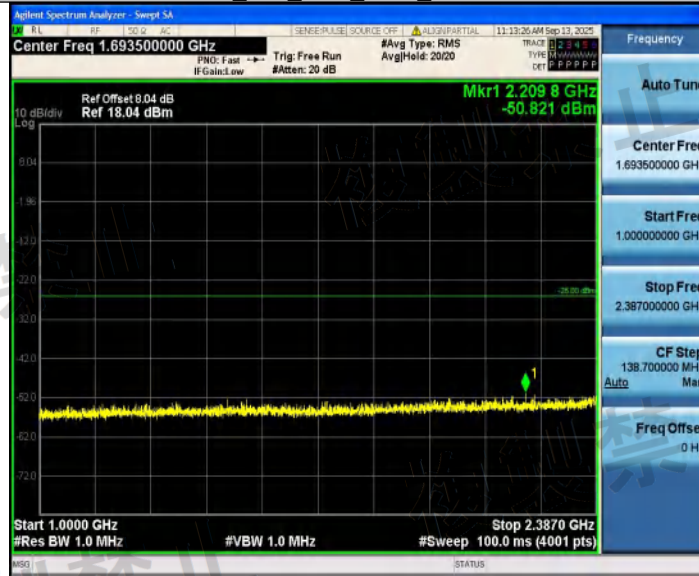
NTNV 11B_Ant1_2442_30~1000



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11B_Ant1 2442 1000~2387



NTNV 11B_Ant1 2442 2387~2400



TEST REPORT

Report No.: MTI250807016-0120E2

NTNV 11B Ant1 2442 2483.5~2496.5



NTNV 11B Ant1 2442 2496.5~13000



TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11B_Ant1 2472 2387~2400



NTNV 11B_Ant1 2472 2483.5~2496.5



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11B_Ant1 2472_2496.5~13000



NTNV 11G_Ant1 2412_30~1000



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11G_Ant1_2412_1000~2387



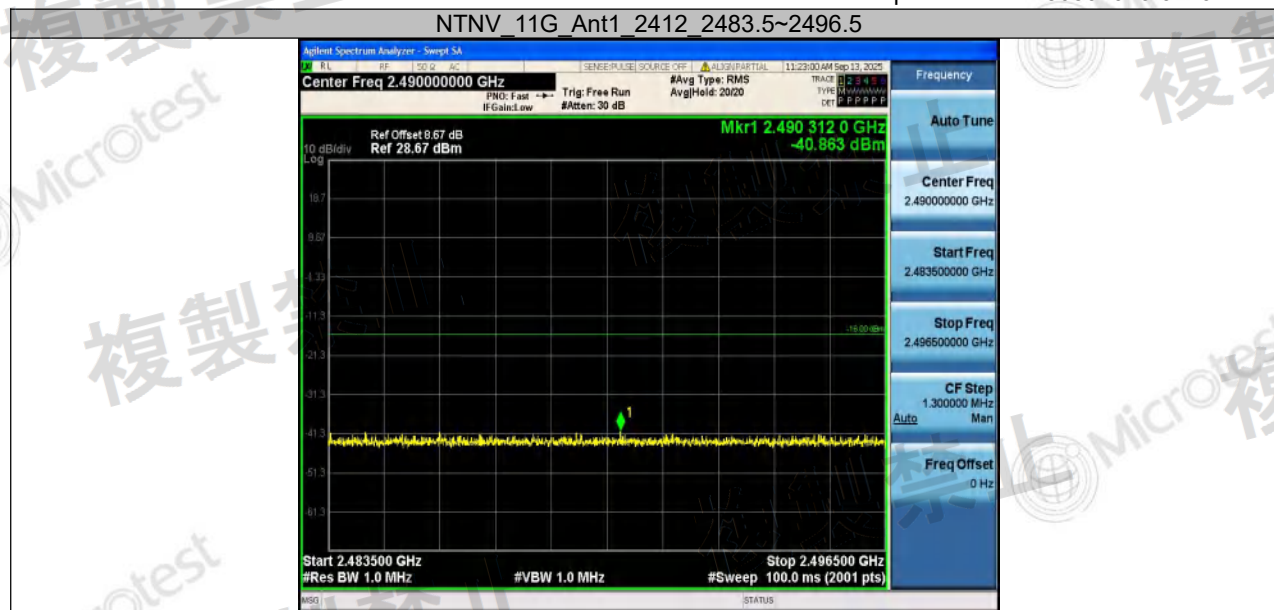
NTNV 11G_Ant1_2412_2387~2400



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV_11G_Ant1_2412_2483.5~2496.5

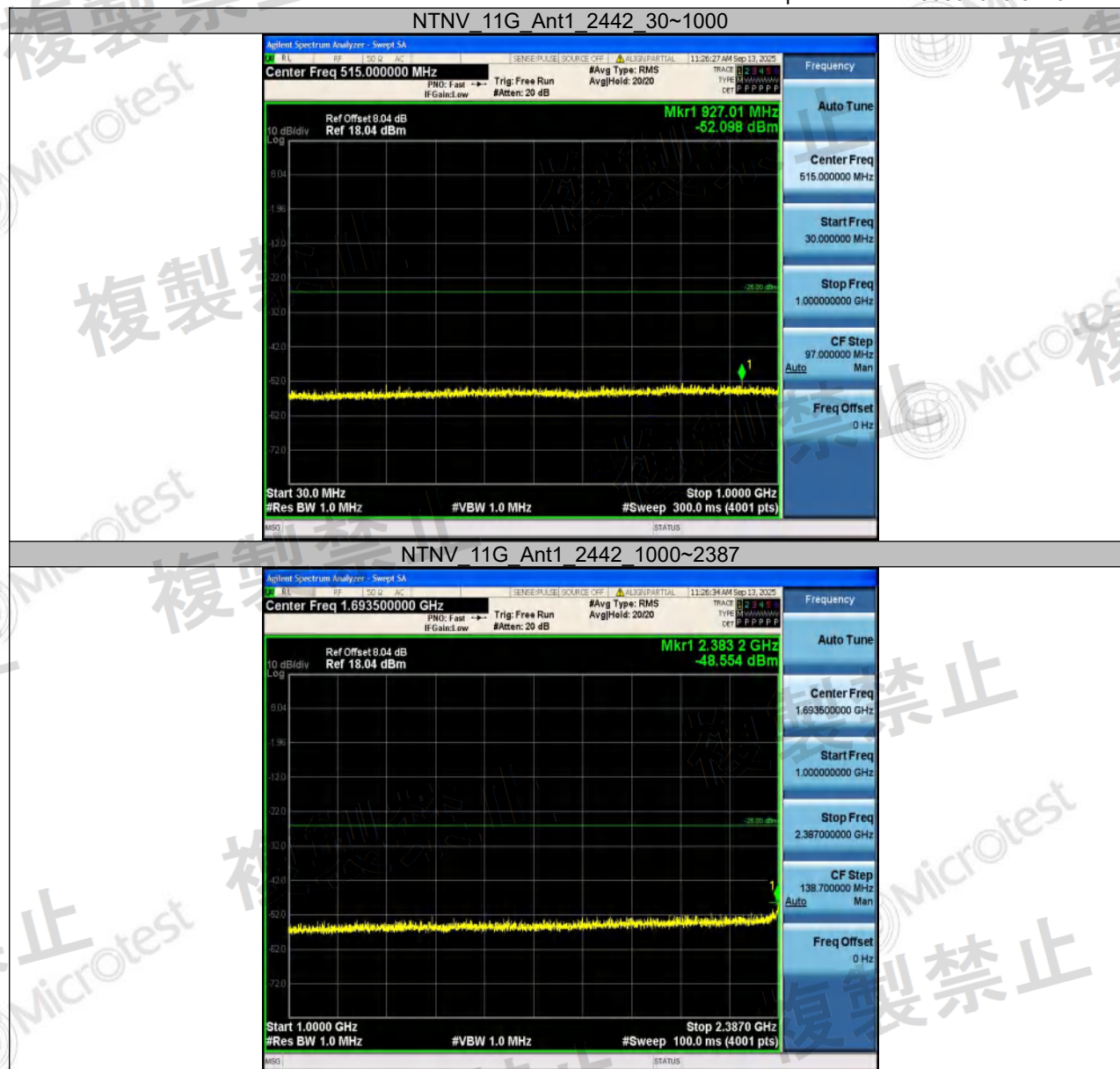


NTNV_11G_Ant1_2412_2496.5~13000



TEST REPORT

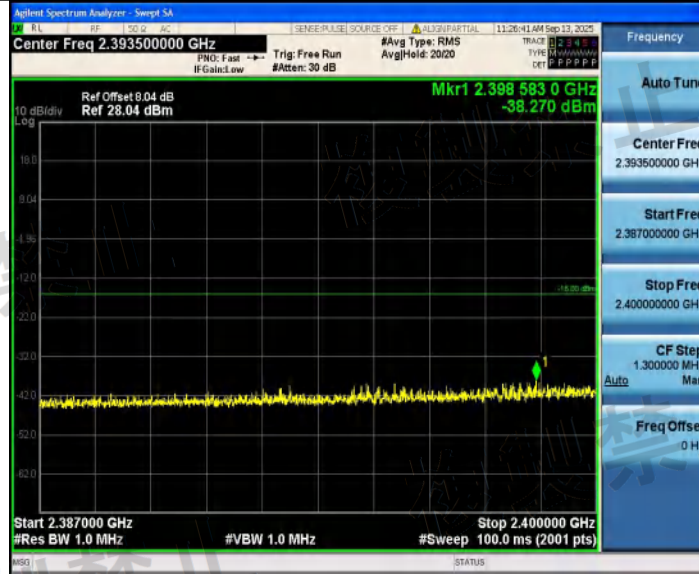
Report No.: MTi250807016-0120E2



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11G_Ant1_2442_2387~2400



NTNV 11G_Ant1_2442_2483.5~2496.5



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11G_Ant1 2442 2496.5~13000



NTNV 11G_Ant1 2472 30~1000



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11G_Ant1 2472 1000~2387



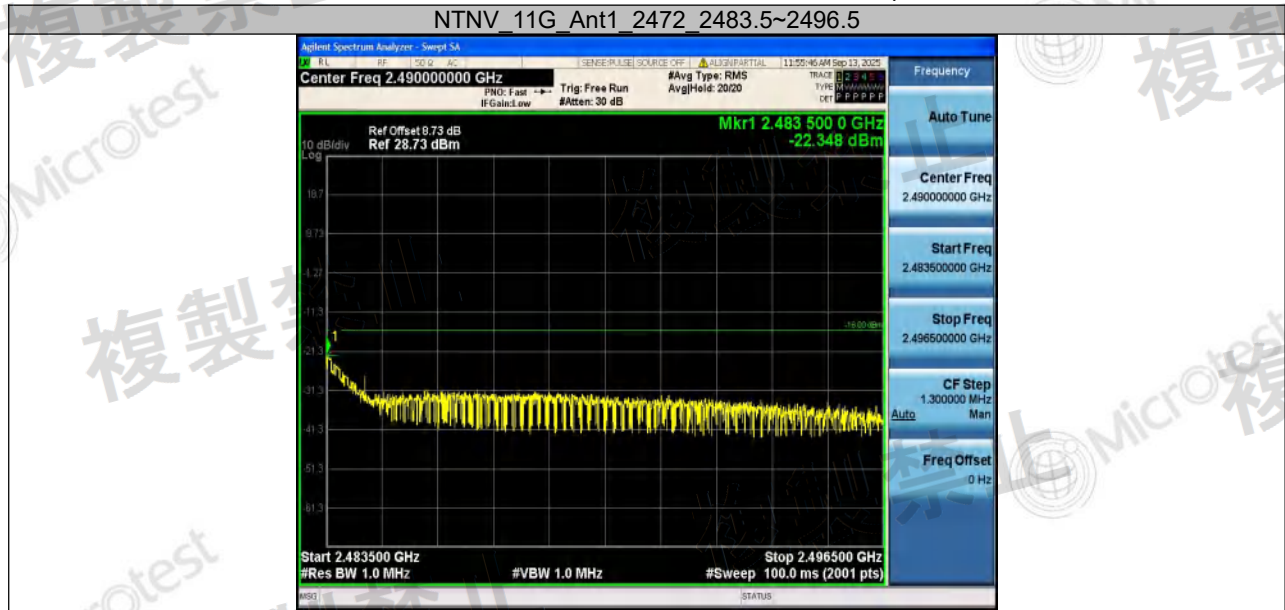
NTNV 11G_Ant1 2472 2387~2400



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV_11G_Ant1_2472_2483.5~2496.5



NTNV_11G_Ant1_2472_2496.5~13000



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2412 30~1000



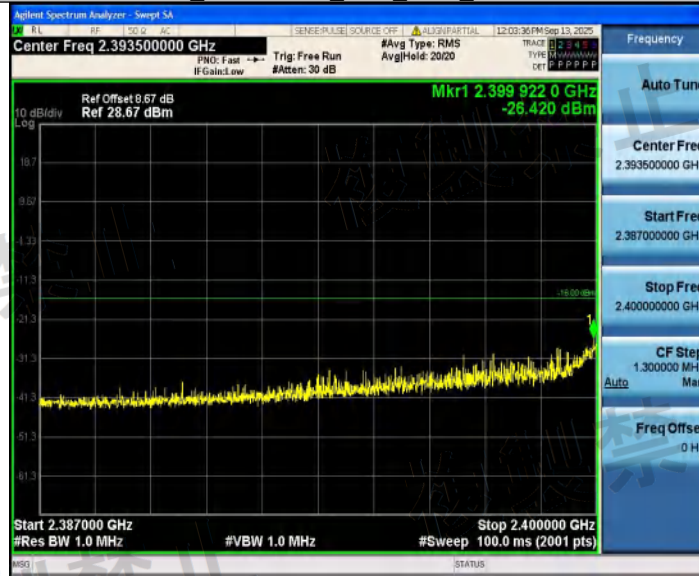
NTNV 11N20SISO Ant1 2412 1000~2387



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2412 2387~2400



NTNV 11N20SISO Ant1 2412 2483.5~2496.5



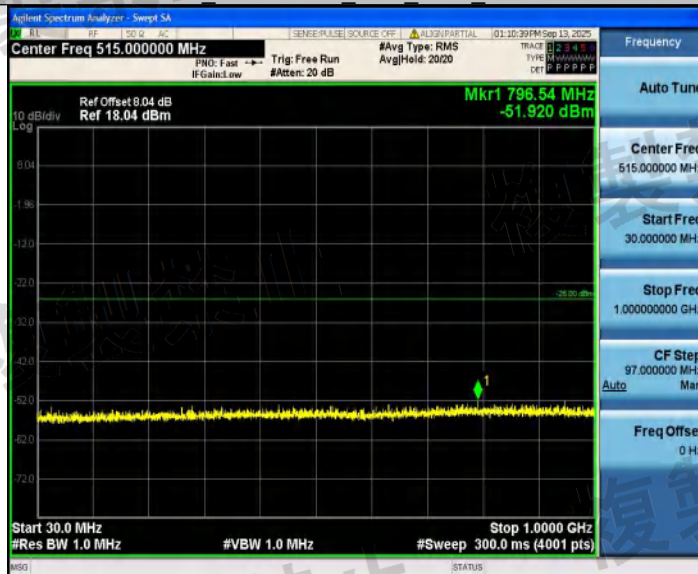
TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2412 2496.5~13000



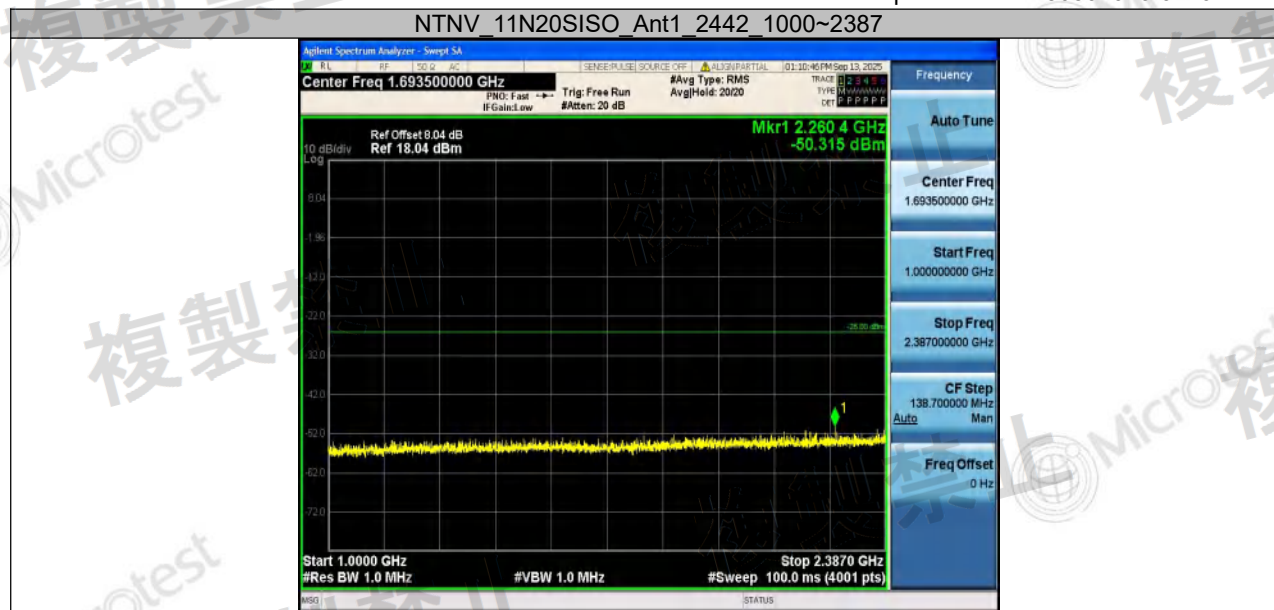
NTNV 11N20SISO Ant1 2442 30~1000



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2442 1000~2387



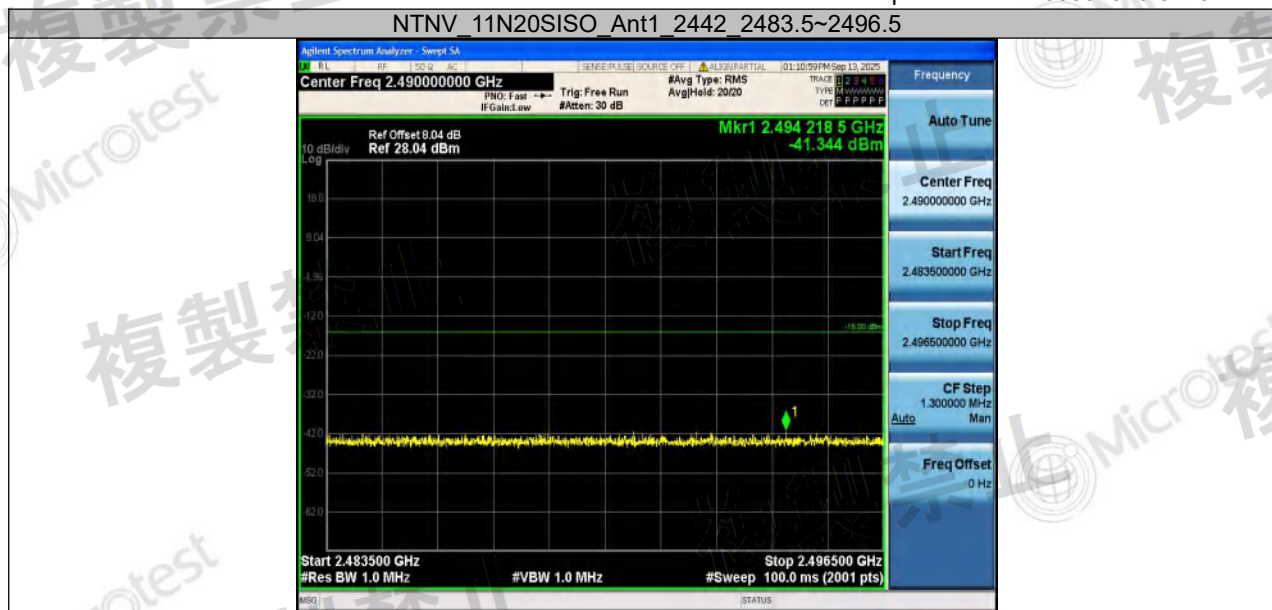
NTNV 11N20SISO Ant1 2442 2387~2400



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2442 2483.5~2496.5



NTNV 11N20SISO Ant1 2442 2496.5~13000



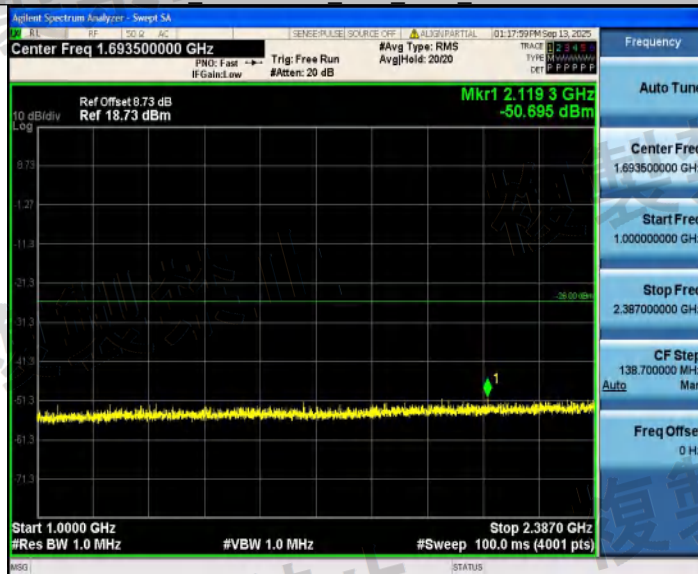
TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2472 30~1000



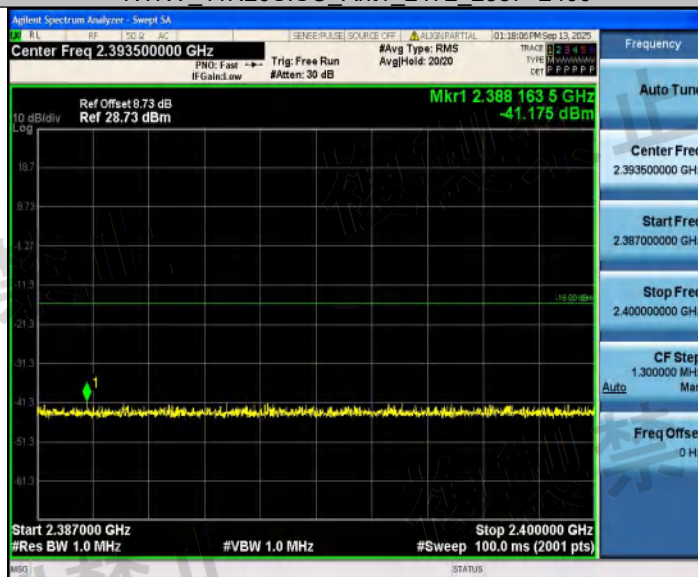
NTNV 11N20SISO Ant1 2472 1000~2387



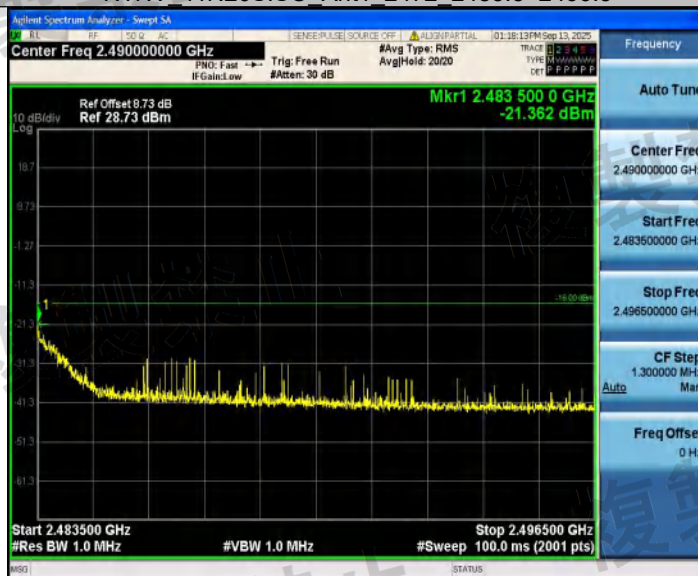
TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2472 2387~2400



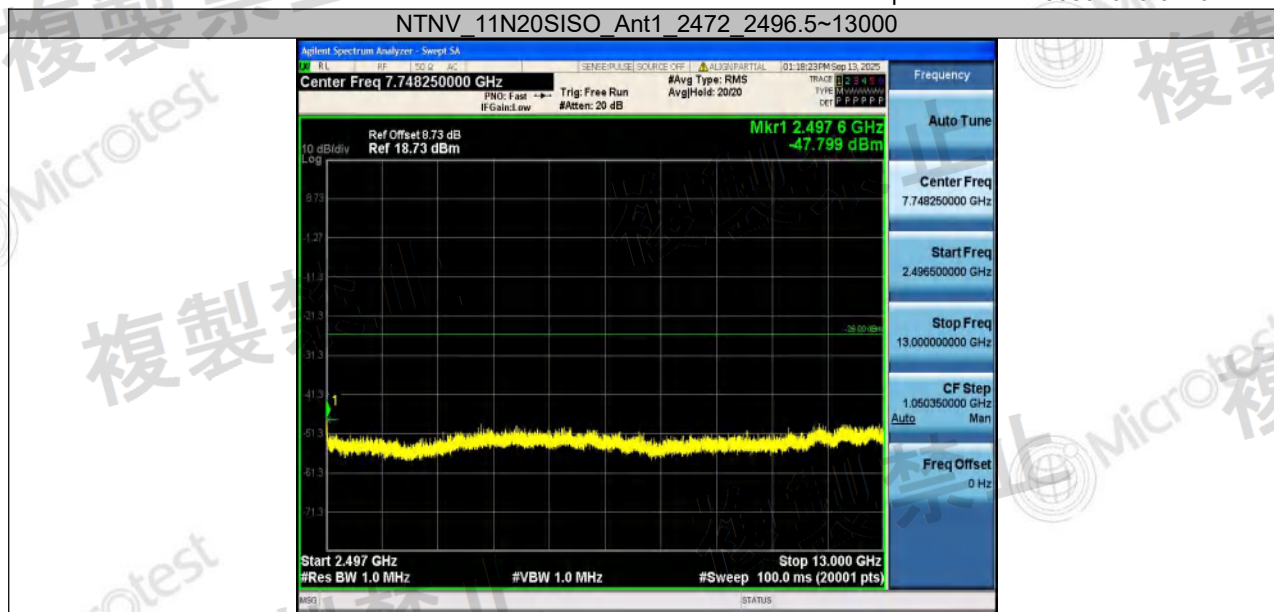
NTNV 11N20SISO Ant1 2472 2483.5~2496.5



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2472 2496.5~13000



TEST REPORT

Report No.: MTi250807016-0120E2

12 Appendix F: Spurious Emission of RX

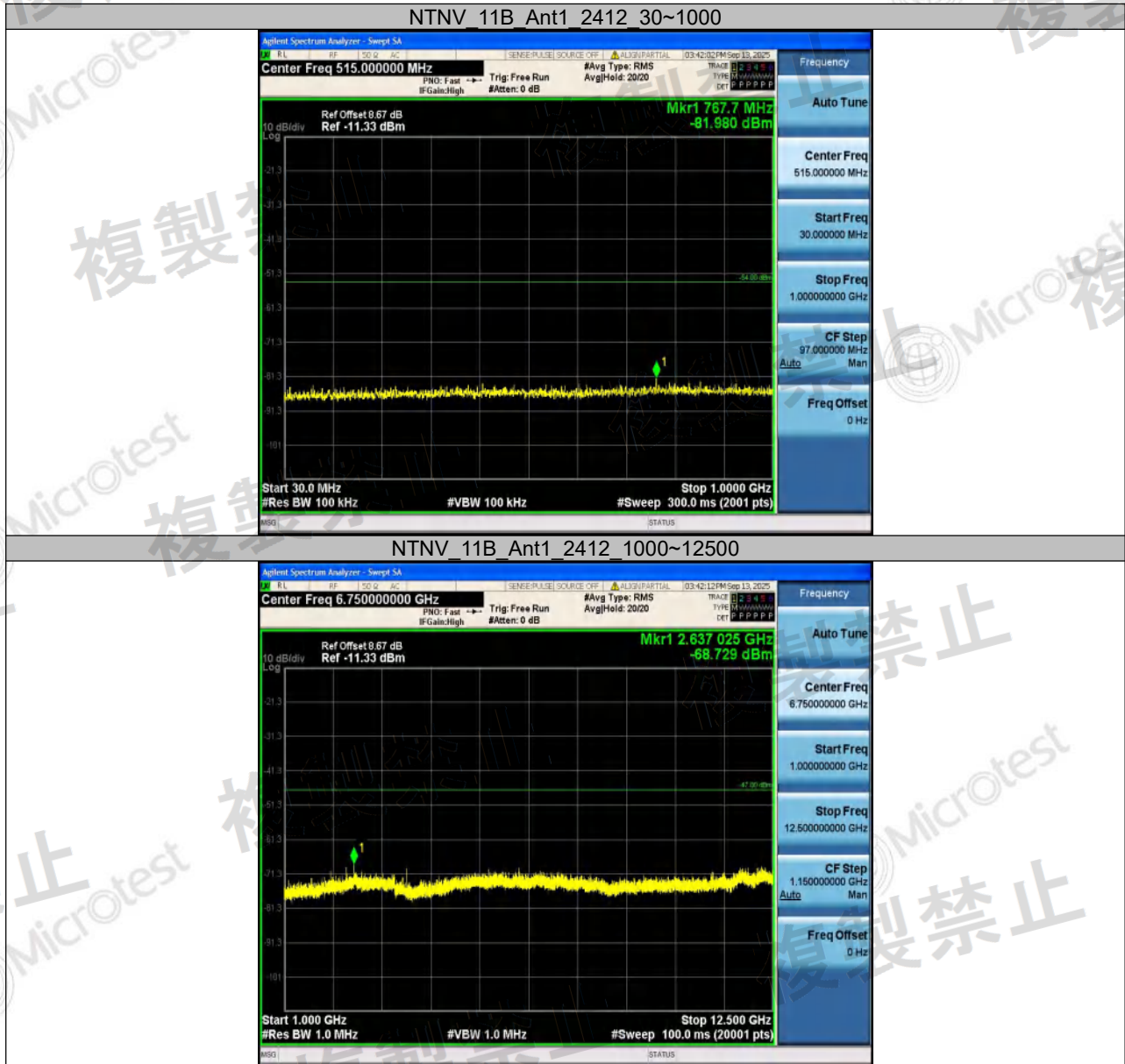
12.1.1 Test Result

Test Condition	Test Mode	Antenna	Frequency [MHz]	Freq. Range [MHz]	Result [dBm]	Limit [dBm]	Result [nW]	Limit [nW]	Verdict
NTNV	11B	Ant1	2412	30~1000	-81.98	≤-54	0.00634	≤4	PASS
				1000~12500	-68.73	≤-47	0.13397	≤20	PASS
			2442	30~1000	-82.98	≤-54	0.00504	≤4	PASS
				1000~12500	-66.91	≤-47	0.20370	≤20	PASS
			2472	30~1000	-82.43	≤-54	0.00571	≤4	PASS
				1000~12500	-67.59	≤-47	0.17418	≤20	PASS
	11G	Ant1	2412	30~1000	-82.38	≤-54	0.00578	≤4	PASS
				1000~12500	-68.67	≤-47	0.13583	≤20	PASS
			2442	30~1000	-83.20	≤-54	0.00479	≤4	PASS
				1000~12500	-59.83	≤-47	1.03992	≤20	PASS
			2472	30~1000	-82.72	≤-54	0.00535	≤4	PASS
				1000~12500	-59.63	≤-47	1.08893	≤20	PASS
	11N20SISO	Ant1	2412	30~1000	-81.93	≤-54	0.00641	≤4	PASS
				1000~12500	-58.77	≤-47	1.32739	≤20	PASS
			2442	30~1000	-80.89	≤-54	0.00815	≤4	PASS
				1000~12500	-69.05	≤-47	0.12445	≤20	PASS
			2472	30~1000	-82.00	≤-54	0.00631	≤4	PASS
				1000~12500	-58.23	≤-47	1.50314	≤20	PASS

TEST REPORT

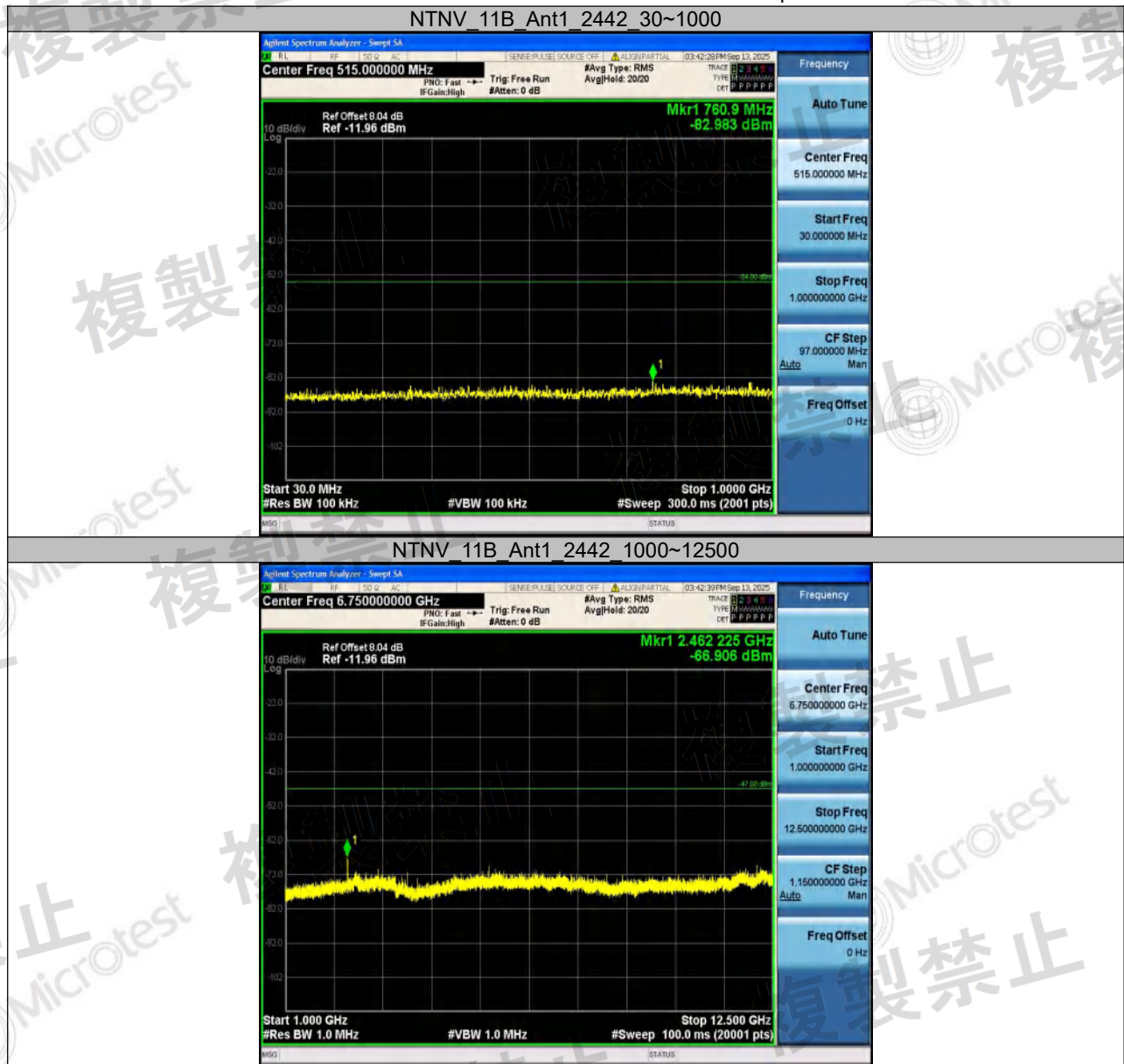
Report No.: MTi250807016-0120E2

12.1.2 Test Graphs



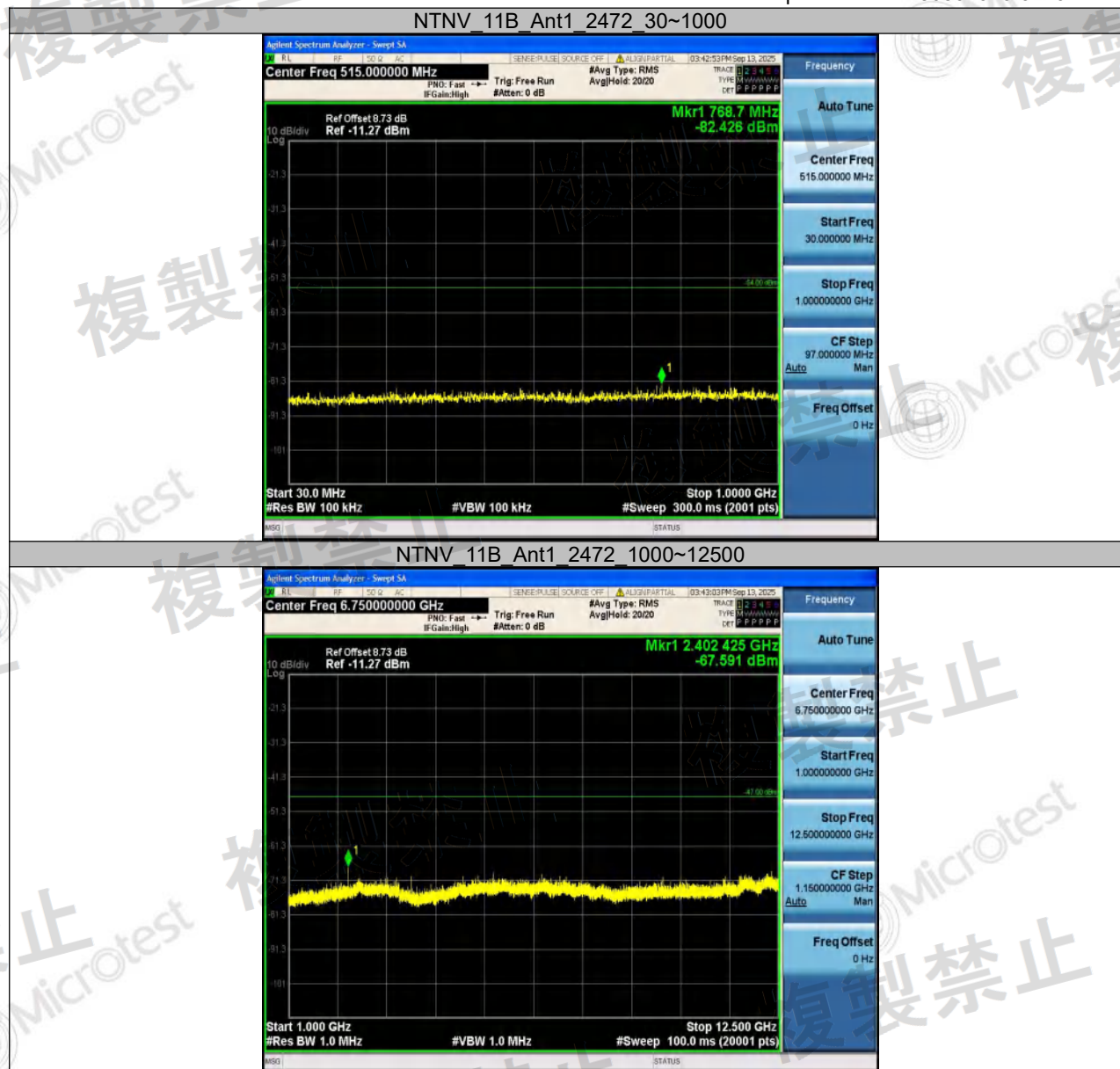
TEST REPORT

Report No.: MTI250807016-0120E2



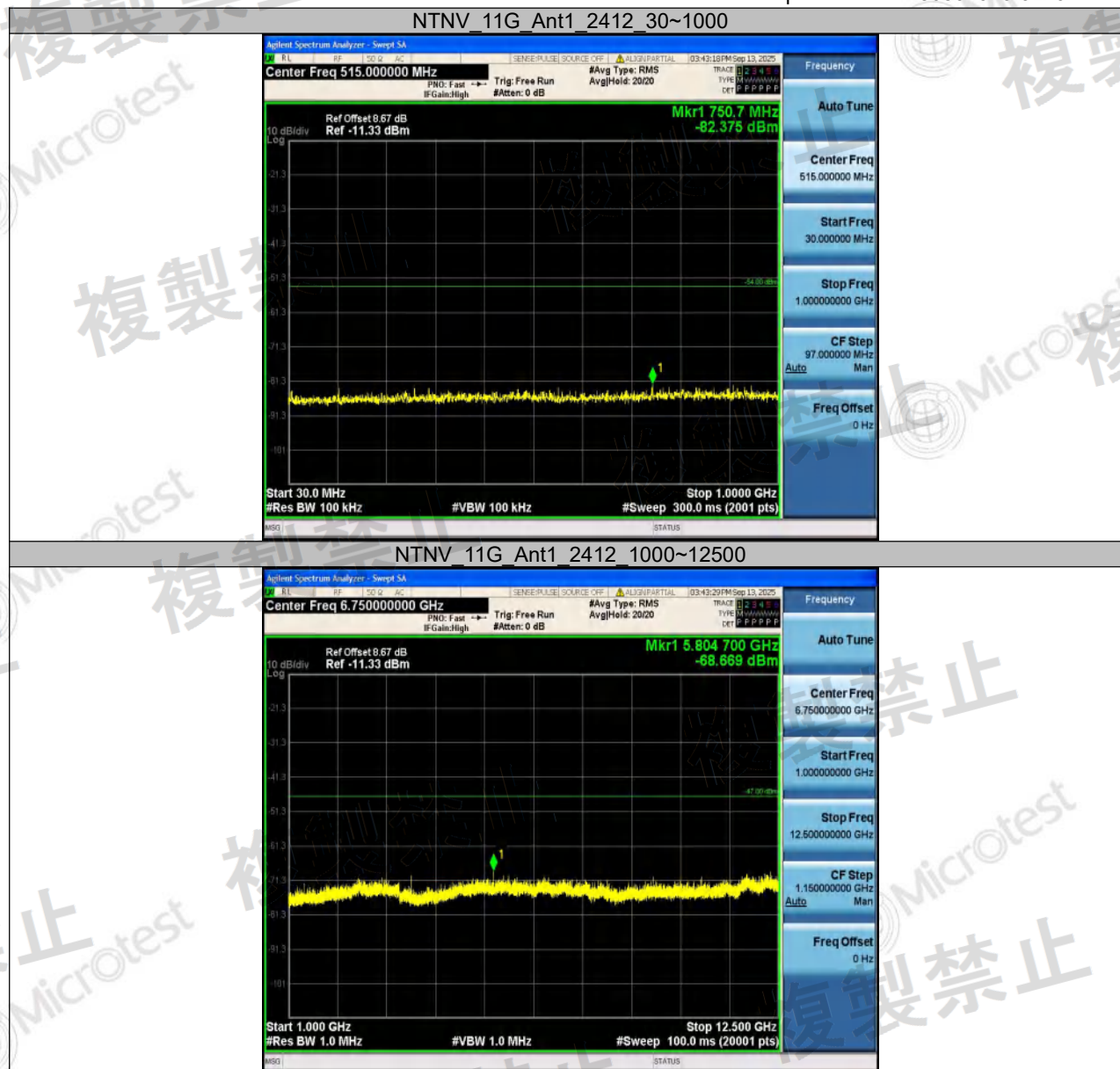
TEST REPORT

Report No.: MTi250807016-0120E2



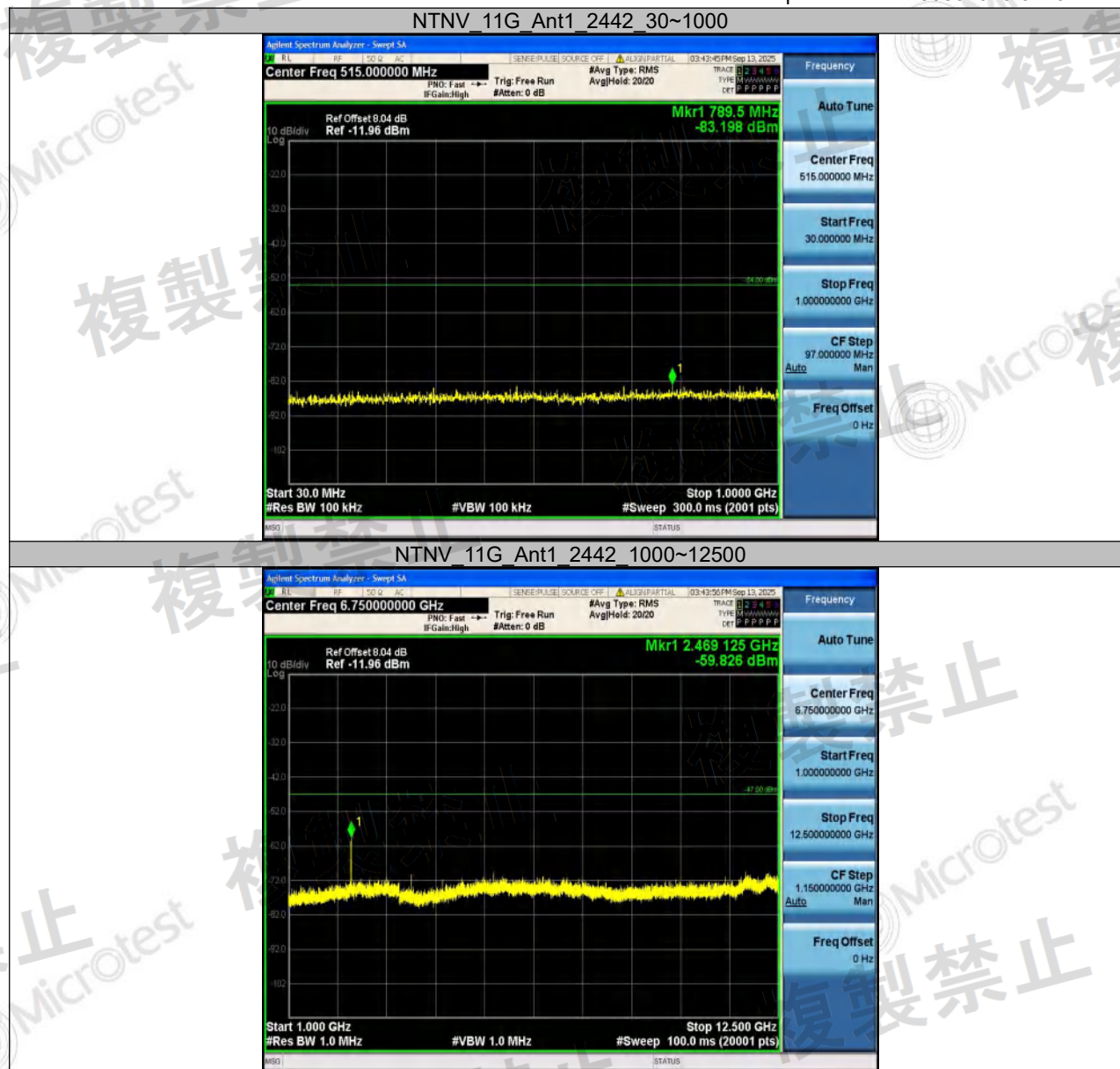
TEST REPORT

Report No.: MTi250807016-0120E2



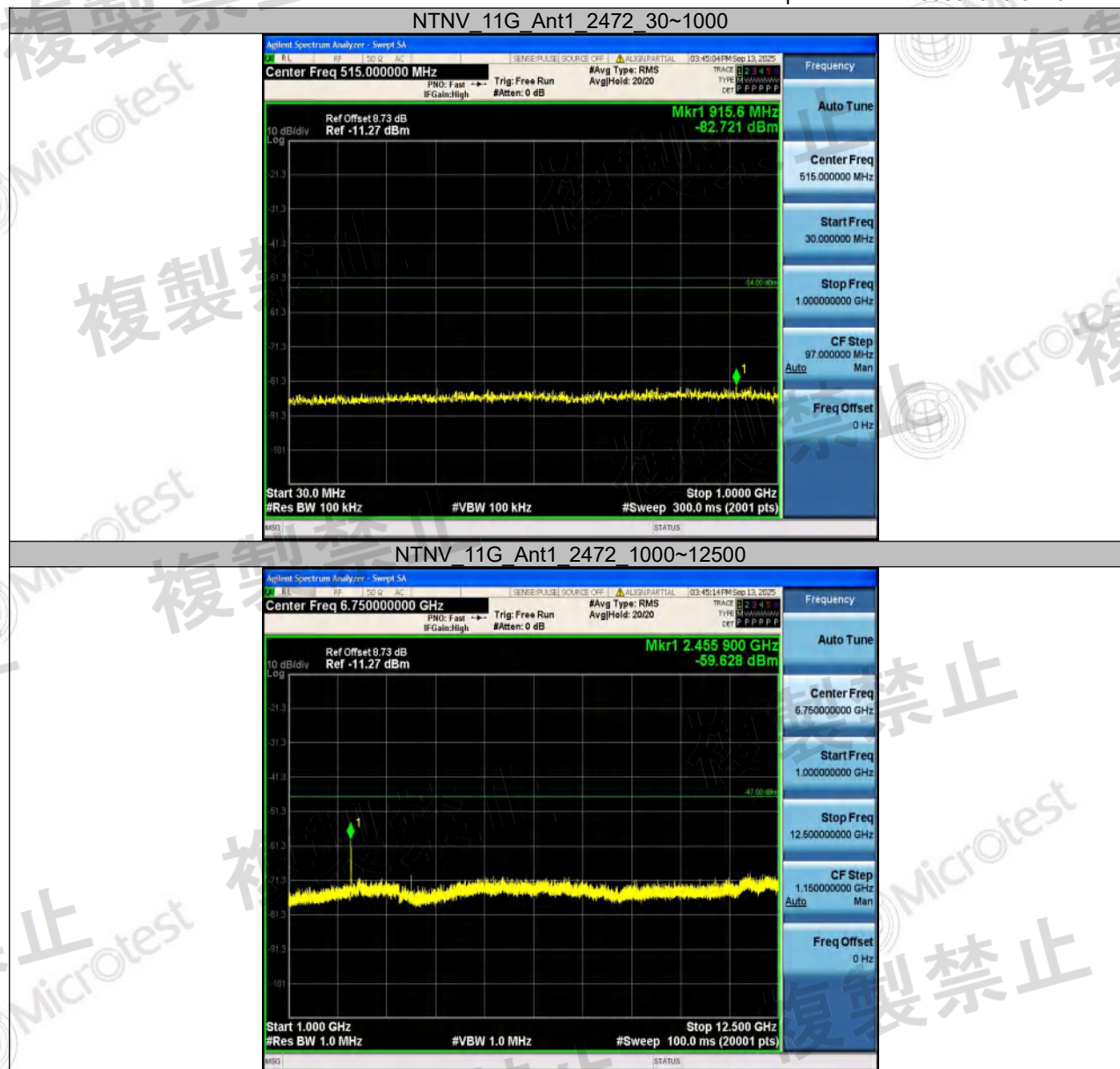
TEST REPORT

Report No.: MTi250807016-0120E2



TEST REPORT

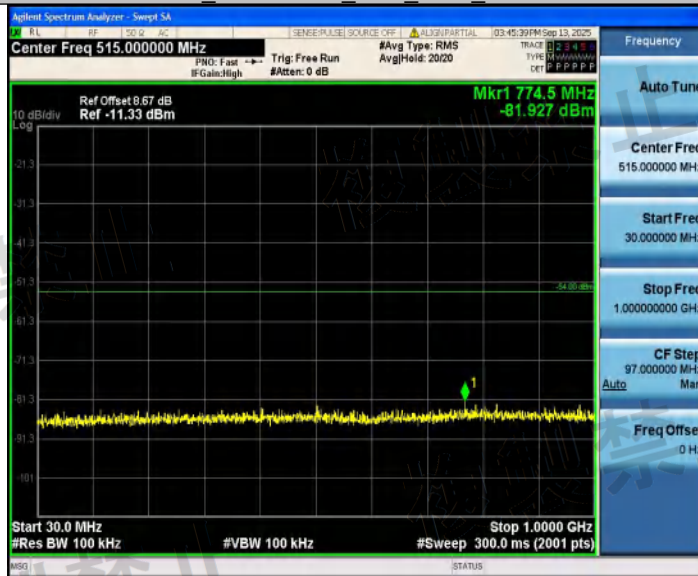
Report No.: MTi250807016-0120E2



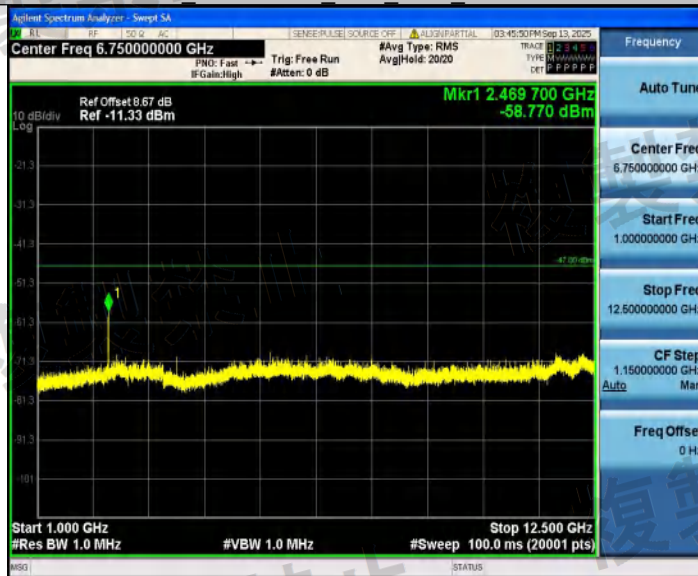
TEST REPORT

Report No.: MTI250807016-0120E2

NTNV 11N20SISO Ant1 2412 30~1000



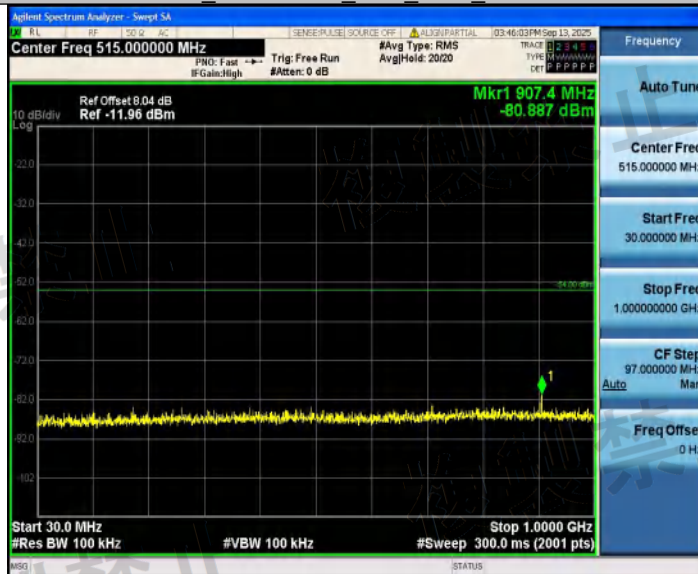
NTNV 11N20SISO Ant1 2412 1000~12500



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2442 30~1000



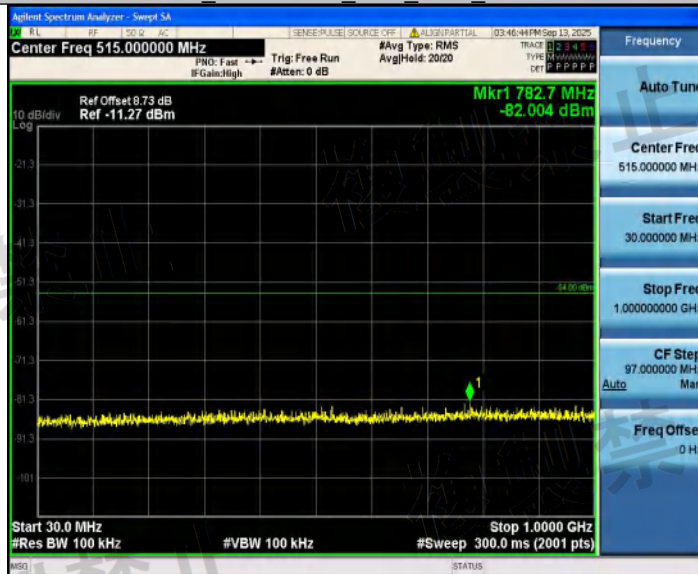
NTNV 11N20SISO Ant1 2442 1000~12500



TEST REPORT

Report No.: MTi250807016-0120E2

NTNV 11N20SISO Ant1 2472 30~1000



NTNV 11N20SISO Ant1 2472 1000~12500



TEST REPORT

Report No.: MTi250807016-0120E2

Statement

1. This report is invalid without the seal and signature of the laboratory.
2. The test results of this report are only responsible for the samples submitted. Client shall be responsible for representativeness of the sample and authenticity of the material.
3. The report shall not be partially reproduced without the written consent of the Laboratory.
4. This report is invalid if transferred, altered or tampered with in any form without authorization.
5. The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
6. Any objection to this report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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