



Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

TEST REPORT

Ordinance Article 2 paragraph 1 item (19)

Report Reference No.....: CTA26010601802

Compiled by

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Date of issue.....: Jan. 13, 2026

Testing Laboratory Name: Shenzhen CTA Testing Technology Co., Ltd.

Address.....: Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name.....: Target Sports Ltd

Address: Kao Two Kao, Park Hockham Way, Harlow Essex, CM17 9SR United Kingdom

Test specification

Standard: Ordinance Article 2 paragraph 1 item (19)

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Test item description: OMNI AUTO SCORING SYSTEM

Trade Mark: Target

Manufacturer: Target Sports Ltd

Model/Type reference.....: 460022

Listed Models: N/A

Frequency.....: From 2412MHz-2472MHz

Modulation: DSSS, OFDM

Ratings: DC 12.0V From external circuit

Result.....: PASS

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TEST REPORT

Equipment under Test : OMNI AUTO SCORING SYSTEM

Model /Type : 460022

Listed Models : N/A

Applicant : Target Sports Ltd

Address : Kao Two Kao, Park Hockham Way, Harlow Essex, CM17 9SR United Kingdom

Manufacturer : Target Sports Ltd

Address : Kao Two Kao, Park Hockham Way, Harlow Essex, CM17 9SR United Kingdom

Test Result:

PASS

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Version No.	Date	Description	Revised By
V1.0	Apr. 12, 2024	Original	Eric Wang
V1.1	Jan. 13, 2026	1. Modified the Models. 2. Modified the Power supply method. 3. Modified the Adapter. 4. Updated the appearance of the product 5. Modified the report number.	Eric Wang

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1 SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

[ARIB STD-T66](#): Second-Generation Low-Power Data Communication System/Wireless LAN System
[MIC Notice No.88 Appendix No. 43](#): 2.4 GHz band wide-band low-power data communication system

1.2 Test Description

ARIB STD-T66		
Clause	Description of Test	Result
3.2 (2)	Antenna Power	PASS
3.2 (3)	Tolerances for Antenna Power	PASS
3.2 (4)	Frequency Tolerance	PASS
3.2 (5)	Transmission Rate	PASS
3.2 (7)	Occupied Frequency Bandwidth	PASS
3.2 (8)	Spread Bandwidth	PASS
3.2 (11)	Dwell Time	N/A
3.2 (6)	Spurious Emissions	PASS
/	Transmission Antenna Gain (EIRP Antenna Power)	N/A
/	Transmission Radiated Angle Width (3dB Beam width)	N/A
/	Interference prevention function	PASS
/	Carrier Sensing function	N/A
Receiver Parameters		
3.3 (1)	Secondary Radiated Emissions	PASS
Note: (1) N/A is an abbreviation for Not Applicable. (2) N/T means this test item is not tested.		

Note: 1: "N/A" denotes test is not applicable in this Test Report

2: MIC Public Notice 88:2004, annex 1 and annex 43

3: MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20

4: Referenced in the standard ARIB STD-T66

5: This device has more than 1 sub-carrier in 1MHz.

1.3 TEST ENVIRONMENT

1.3.1 Address of the test laboratory

Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

1.4 Measurement Uncertainty

For the test methods, according to the present document, the measurement uncertainty figures shall be calculated in accordance with TR100028-1 [2] and shall correspond to an expansion factor (coverage factor) $K=1.96$ or $K=2$ (which provide confidence levels of respectively 95% and 95.5% in the case where the distributions characterizing the actual measurement uncertainties are normal).

Parameter	Uncertainty
Frequency error / 99%&90% bandwidth	$\pm 1.62 \times 10^{-6}$
Total RF power, conducted	$\pm 0.8\text{dB}$
Spurious emissions, conducted	$\pm 0.8\text{dB}$
DC and low frequency voltages	$\pm 0.05\%$
Humidity	$\pm 5\%$
Temperature	$\pm 1^\circ\text{C}$

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2 GENERAL INFORMATION

2.1 General Remarks

Date of receipt of test sample	:	Apr. 01, 2024
Testing commenced on	:	Apr. 01, 2024
Testing concluded on	:	Apr. 12, 2024

2.2 Environmental conditions

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

Voltage	Normal Voltage	DC 12.00V
	High Voltage	DC 13.20V
	Low Voltage	DC 10.80V
Other	Normal Temperature	25°C
	Relative Humidity	55 %
	Air Pressure	989 hPa

Note: As the EUT was powered by DC 12.0V From external circuit, and with the voltage stabilizing circuit used, the chip voltage received floating not exceed $\pm 1\%$ of nominal condition when working on extreme voltage, so all test performed at nominal voltage only.

2.3 General Description of EUT

Product Name:	OMNI AUTO SCORING SYSTEM
Model/Type reference:	460022
Power supply:	DC 12.0V From external circuit
Adapter information:	Model: XSG-1203000DEX Input: AC 100-240V 50/60Hz 0.8A Max Output: DC 12.0V 3.0A 36.0W
WIFI	
Supported type:	IEEE 802.11b/IEEE 802.11g/IEEE 802.11n(HT20)
Modulation:	IEEE 802.11b: DSSS IEEE 802.11g/IEEE 802.11n(HT20)
Operation frequency:	IEEE 802.11b:2412MHz~2472MHz IEEE 802.11g/IEEE 802.11n(HT20):2412MHz~2472MHz
Channel number:	IEEE 802.11b:13 IEEE 802.11g/IEEE 802.11n(HT20):13
Rated power:	IEEE 802.11b: 4.00mW/MHz IEEE 802.11g: 2.00mW/MHz IEEE 802.11n HT20: 2.00mW/MHz
Channel separation:	5MHz
Antenna type:	PIFA antenna
Antenna gain:	1.68 dBi
Firmware Version:	V1.0
Hardware Version:	V1.0

Note: For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.4 Description of Test Modes

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing.

Operation Frequency List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

Note:

1. Test performed at the lowest/middle/highest frequencies selected in the list above for EUT supported while working on specified mode.

2.5 Measurement Instruments List

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Institution	Calibration Date	Calibration Due Date
1	Spectrum Analyzer	Agilent	N9020A	MY53281423	LISAI	2023/08/02	2024/08/01
2	Signal generator	Agilent	N5182A	MY46240709	LISAI	2023/08/02	2024/08/01
3	Power Meter	Agilent	U2021X	MY47410295	LISAI	2023/08/02	2024/08/01
4	DC Power Supply	Agilent	E3642A	N/A	LISAI	2023/08/02	2024/08/01
5	Oscilloscope	Tektronix	TDS3012	B021220	LISAI	2023/08/02	2024/08/01

Cal. Institution: LiSai-Guangzhou LiSai Calibration and Testing Co.,LTD.

Calibration by the calibration agencies listed in the table correspond to paragraph 4 (ii) (c) of Article 24-2 in the Radio Law".

☐ (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.

2.6 Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Power Parameters:

Test Software Version	QRCT 3		
Frequency	2412MHz	2442MHz	2472MHz
IEEE 802.11b (20MHz)	Default	Default	Default
IEEE 802.11g (20MHz)	Default	Default	Default
IEEE 802.11n (20MHz)	Default	Default	Default

2.7 Description of Test Modes

Tested mode, channel, and data rate information				
Mode	Preliminary Test Data Rate (Mbps)	Final Test Data Rate (Mbps) (see Note)	Channel	Frequency (MHz)
IEEE 802.11b	11/1	11	Low :CH1	2412
	11/1	11	Middle: CH7	2442
	11/1	11	High: CH13	2472
IEEE 802.11g	54/6	6	Low :CH1	2412
	54/6	6	Middle: CH7	2442
	54/6	6	High: CH13	2472
IEEE 802.11n HT20	65.0/6.5	6.5	Low :CH1	2412
	65.0/6.5	6.5	Middle: CH7	2442
	65.0/6.5	6.5	High: CH13	2472

Note: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

2.8 Test Voltage

POWER SUPPLY VOLTAGE FLUCTUATION TEST

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
Input To EUT	DC 12.00V	DC 13.20V	DC 10.80V
Output To RF Module	DC 3.30V	DC 3.30V	DC 3.30V
Voltage Variation (%)	--	--	--

Note:

Voltage Variation (%)

= (Output high or Low Voltage - Output Normal Voltage) / Output Normal Voltage * 100

During the input supply voltage to the EUT from the external power source is varied by +/- 10%, if output voltage had been confirmed that the fluctuation of power supply to the RF circuit of EUT (excluding power source) is equal to or less than +/-1%. Exempt extremely high and low supply voltage condition test, EUT only operated in normal voltage to test all regulations.

The sample power supply was confirmed that input voltage variation at the radio unit in the radio equipment to be tested is less than +1% against a variation of +10% at the input voltage from the external power supply to the radio equipment, and the radio equipment was designed so as to be operated in a specified voltage variation limit within +10%, Radio can only tested at rated voltage.

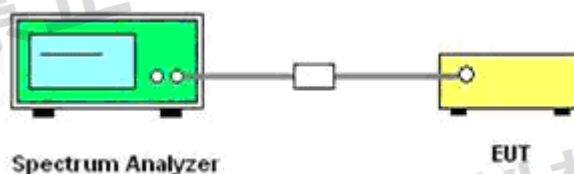
3 Test conditions and Results

3.1 Frequency Error

LIMIT

Tolerance of frequency shall be $\pm 50 \times 10^{-6}$.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyser and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: non-modulation

Spectrum Condition:

Frequency: test frequency

Span: 300 KHz

RBW: 10 KHz

VBW: 10 KHz

Sweep time: Auto

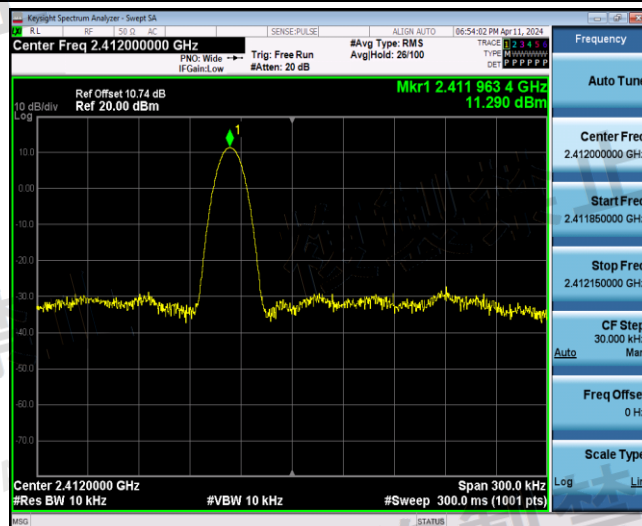
Detector mode: Positive peak

Indication mode: max hold

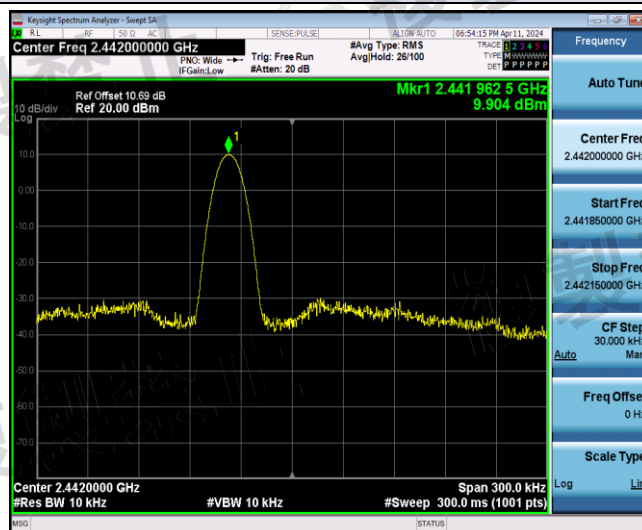
TEST RESULTS

Test Condition	Frequency (MHz)	Read (MHz)	Deviation (MHz)	Tolerance (ppm)	Limit (ppm)	Result
Non-modulation	2412	2411.9634	-0.0366	-15.17413	± 50.00	Pass
	2442	2441.9625	-0.0375	-15.35627		
	2472	2471.9628	-0.0372	-15.04854		

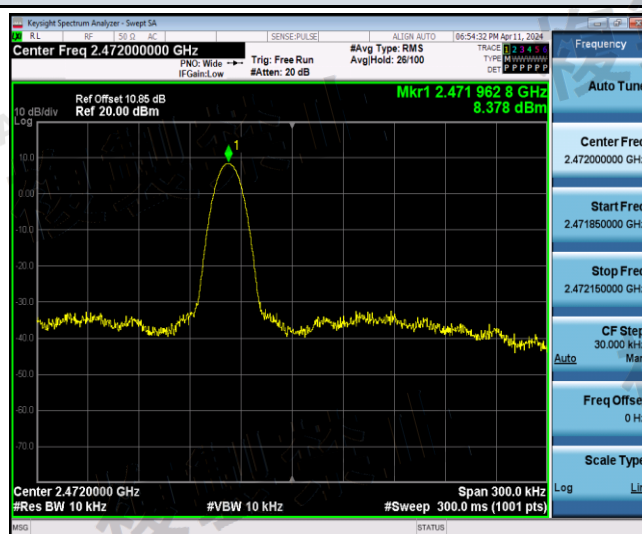
Test Plot of Frequency Tolerance



2412 MHz



2442 MHz



2472 MHz

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3.2 Antenna Output Power and Output Power Tolerance

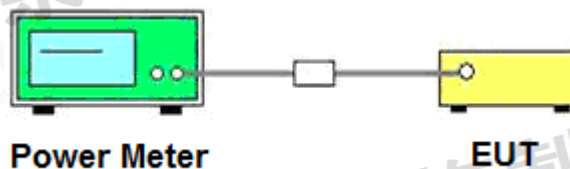
LIMIT

Type	Limit
DTS	10mW
OFDM OBW<26MHz, DS	10mW/MHz
OFDM OBW 26-40MHz	5mW/MHz
Tolerance	+20%,-80%

Upper Limit of EIRP for Modulation Systems

Modulation system	Frequency band used	Antenna power (max.)	EIRP (max.)	
			Omnidirectional case	Directional case
DS, OFDM	2,400 - 2,483.5 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
FH, DS-FH FH-OFDM	2,400 - 2,483.5 MHz	3 mW/MHz	6.91 dBm/MHz	16.91 dBm/MHz
	Excluding 2,427 - 2,470.75 MHz	10 mW/MHz	12.14 dBm/MHz	22.14 dBm/MHz
Other than the above	2,400 - 2,483.5 MHz	10 mW	12.14 dBm	22.14 dBm

TEST CONFIGURATION



TEST PROCEDURE

- EUT have transmitted continuous maximum power
- Antenna Power Error is definition that actual measure antenna power tolerance between +20% to -80% power range that base on manufacturer Marlare the conducted power density.

TEST RESULTS

Mode	Channel (MHz)	Average burst power (dBm)	Output power (mW/MHz)	Limit (mW/MHz)	Rated output power (mW/MHz)	Tolerance (%)	Limit	Result
IEEE 802.11b	2412	14.39	3.5356	10	4	-11.61	-80%~20%	Pass
	2442	14.79	3.8324	10	4	-4.19		
	2472	13.25	2.7027	10	4	-32.43		
IEEE 802.11g	2412	14.16	1.7983	10	2	-10.08		
	2442	14.51	1.9415	10	2	-2.93		
	2472	13.14	1.3893	10	2	-30.53		
IEEE 802.11n HT20	2412	14.38	1.7643	10	2	-11.78		
	2442	14.66	1.8972	10	2	-5.14		
	2472	13.37	1.4062	10	2	-29.69		

Note:

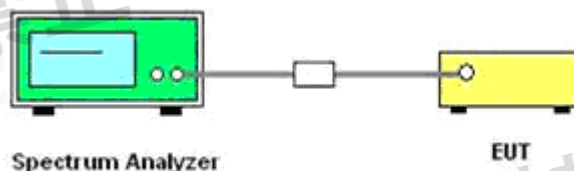
- Test Result: Pass.
- All test modes have been tested and we only record the worst result.
- Antenna power = Power meter power (mW)/ Spread Bandwidth (MHz)

3.3 Occupied Bandwidth and Spreading Bandwidth

LIMIT

- Occupied bandwidth: FH $\leq$ 83.5 MHz; OFDM $\leq$ 40 MHz; DS $\leq$ 26 MHz; Others $\leq$ 26 MHz
- Spread Bandwidth: $\geq$ 500 kHz (FH, DS)
- Spread factor >5 .

TEST CONFIGURATION



TEST PROCEDURE

Setting of SA is following as follow:

RBW: 1%-5% of OBW

VBW: same as RBW

Sweep time: Auto

Sweep Mode: Continuous sweep

Detect mode: Positive peak

Trace mode: Max hold

EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 99% of occupied bandwidth to measure occupied bandwidth.

EUT have transmitted the maximum modulation signal and fixed channelize. SA set to 90% of occupied bandwidth to measure spread bandwidth.

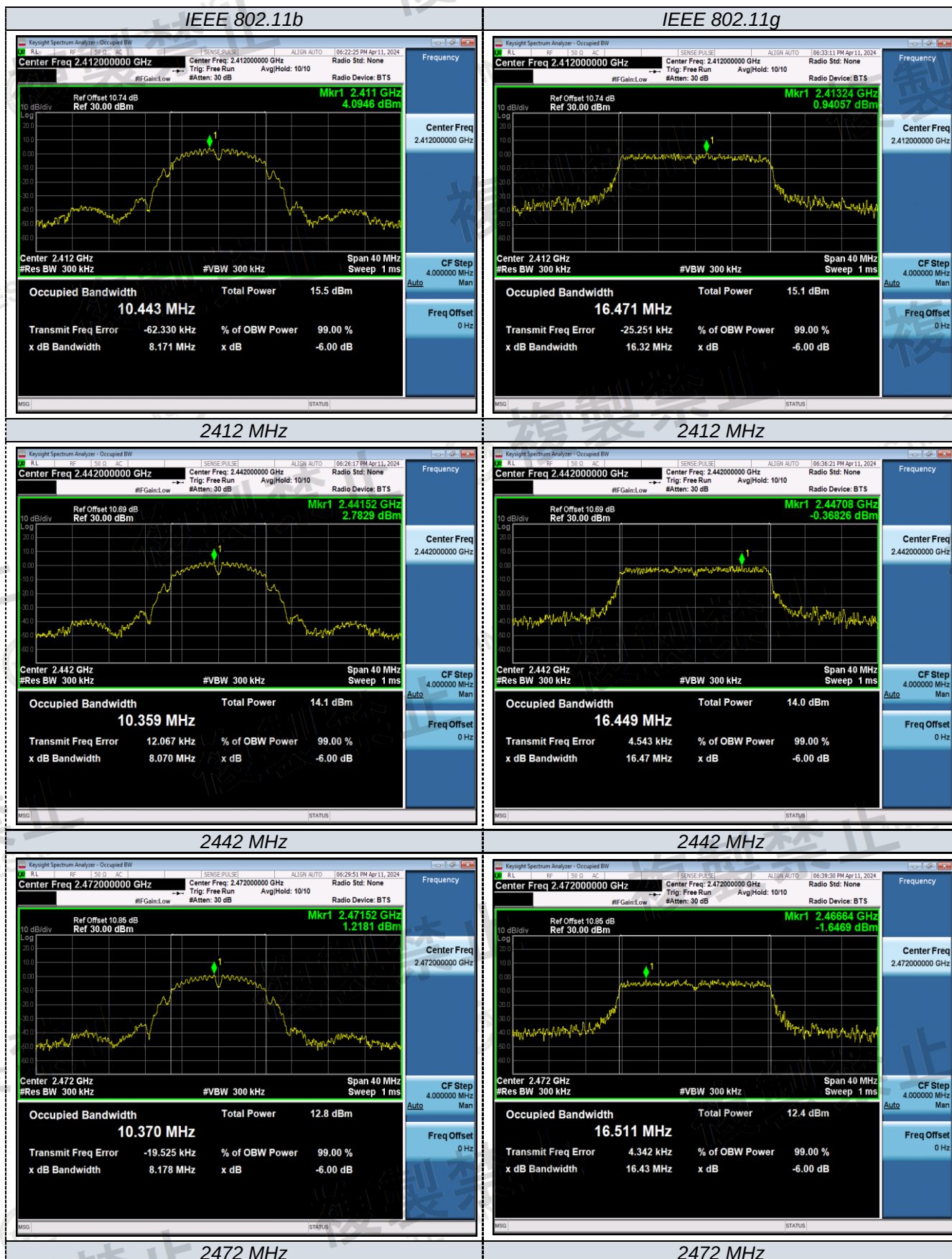
Spread Factor=Spread Bandwidth/modulation rate.

The modulation rate: MR=1.375Mbps for IEEE 802.11b

TEST RESULTS

99% Occupied Bandwidth

Type	Channel (MHz)	Occupuied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11b	2412	10.443	<26	Pass
	2442	10.359		
	2472	10.370		
IEEE 802.11g	2412	16.471		
	2442	16.449		
	2472	16.511		
IEEE 802.11n HT20	2412	17.606	<40	
	2442	17.467		
	2472	17.579		



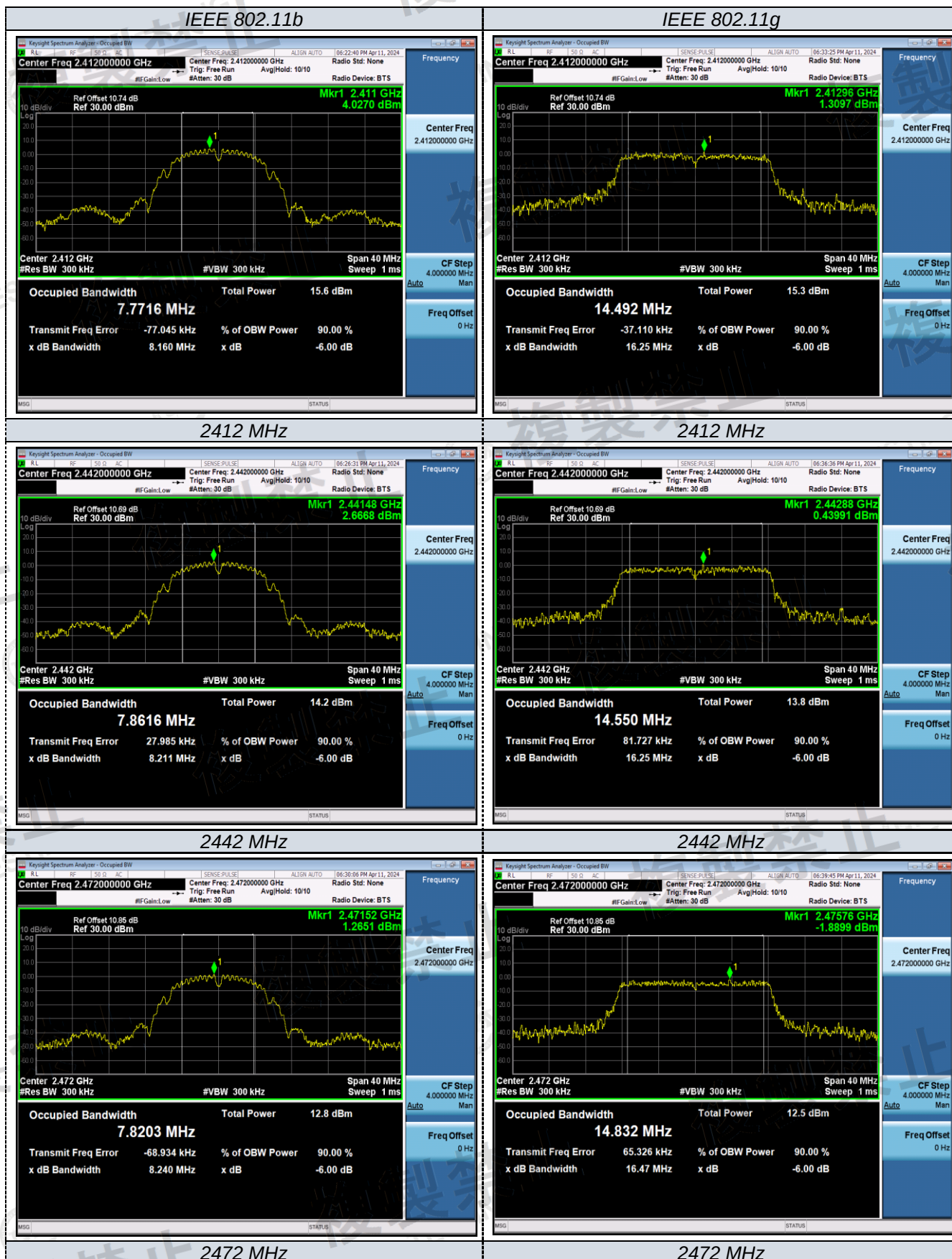


90% Spread Bandwidth and Spread Factor

Type	Channel (MHz)	Spread Bandwidth (MHz)	Spread Factor	Spread Bandwidth Limit (MHz)	Spread Factor Limit	Result	
IEEE 802.11b	2412	7.772	5.6524	>0.5	>5	Pass	
	2442	7.862	5.7178				
	2472	7.820	5.6873				
IEEE 802.11g	2412	14.492	N/A		N/A		N/A
	2442	14.550					
	2472	14.832					
IEEE 802.11n HT20	2412	15.539	N/A		N/A		N/A
	2442	15.413					
	2472	15.451					

Note:

1. Spread Factor=Spread Bandwidth/modulation rate. The modulation rate: MR=1.375Mbps for IEEE 802.11b
2. N/A means not applicable to this modulation type.





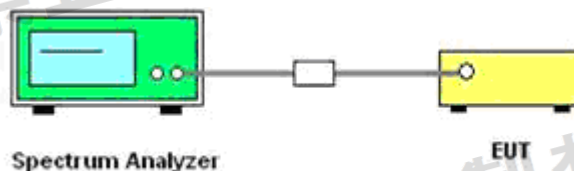
3.4 Unwanted Emission Strength

LIMIT

Permissible mean power of spurious emission of each frequency supplied to a feeder, that is, mean power of spurious emission in the 1 MHz bandwidth at frequency f other than frequency band used shall be as follows:

- a. $2,387\text{MHz} \leq f \leq 2,400\text{MHz}$ and $2,483.5\text{MHz} < f \leq 2,496.5\text{MHz}$ $25 \mu\text{W}$ or less
b. $2,387\text{MHz} > f$ and $2,496.5\text{MHz} < f$ $2.5 \mu\text{W}$ or less

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyser and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: 30MHz-13GHz

RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-13GHz)

VBW: 300 KHz (30MHz-1GHz), 3MHz (1GHz-13GHz)

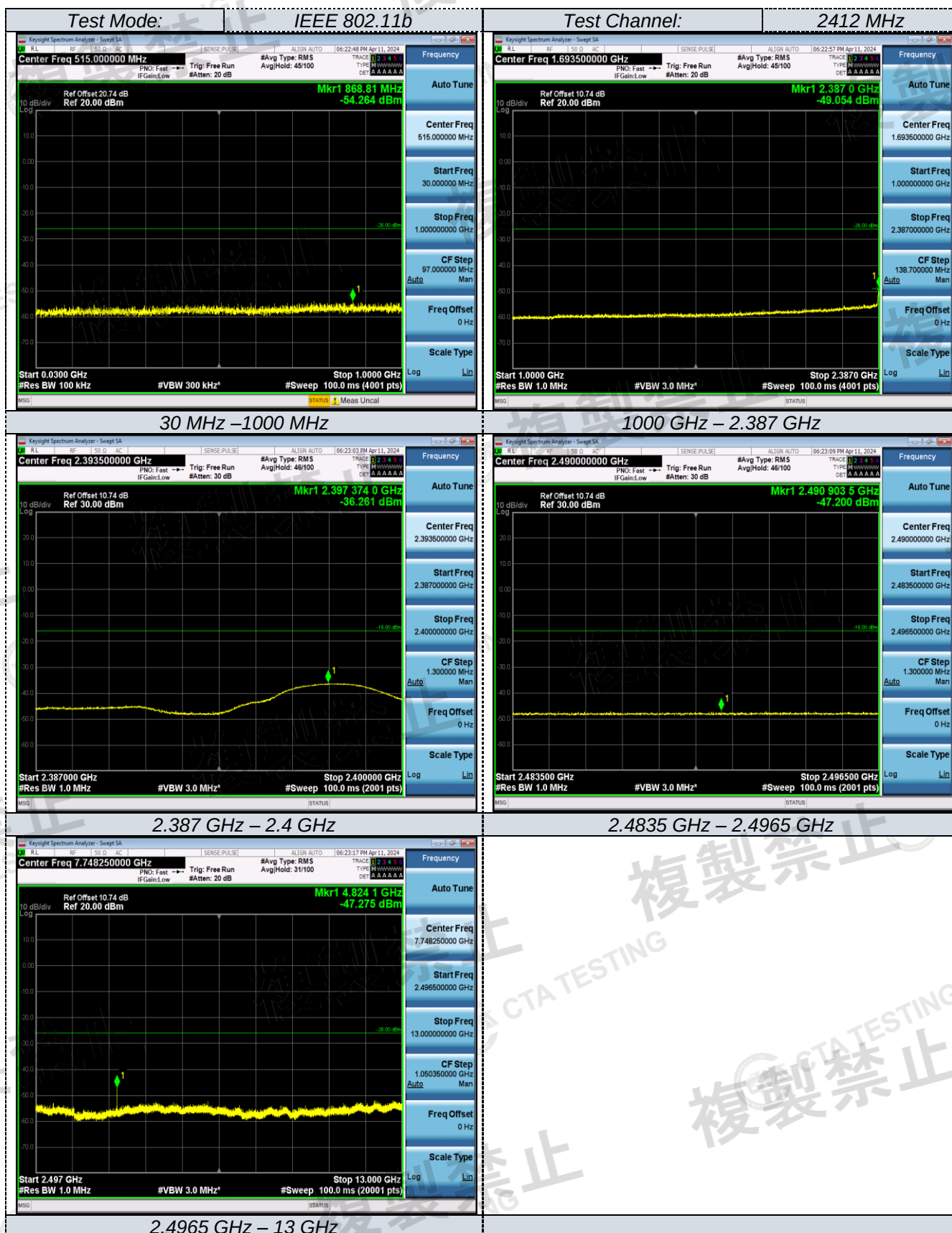
Sweep time: Auto

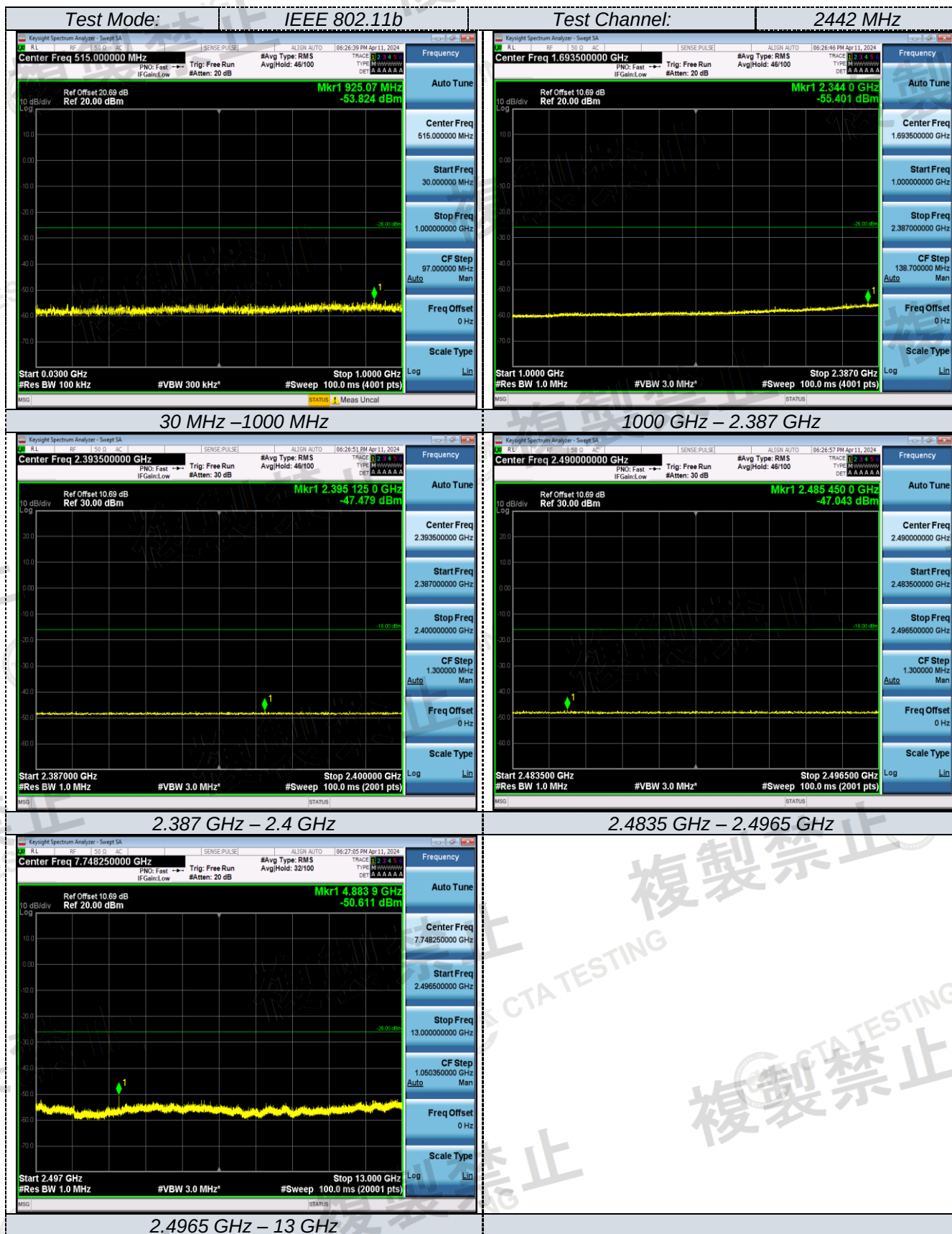
Detector mode: Positive peak

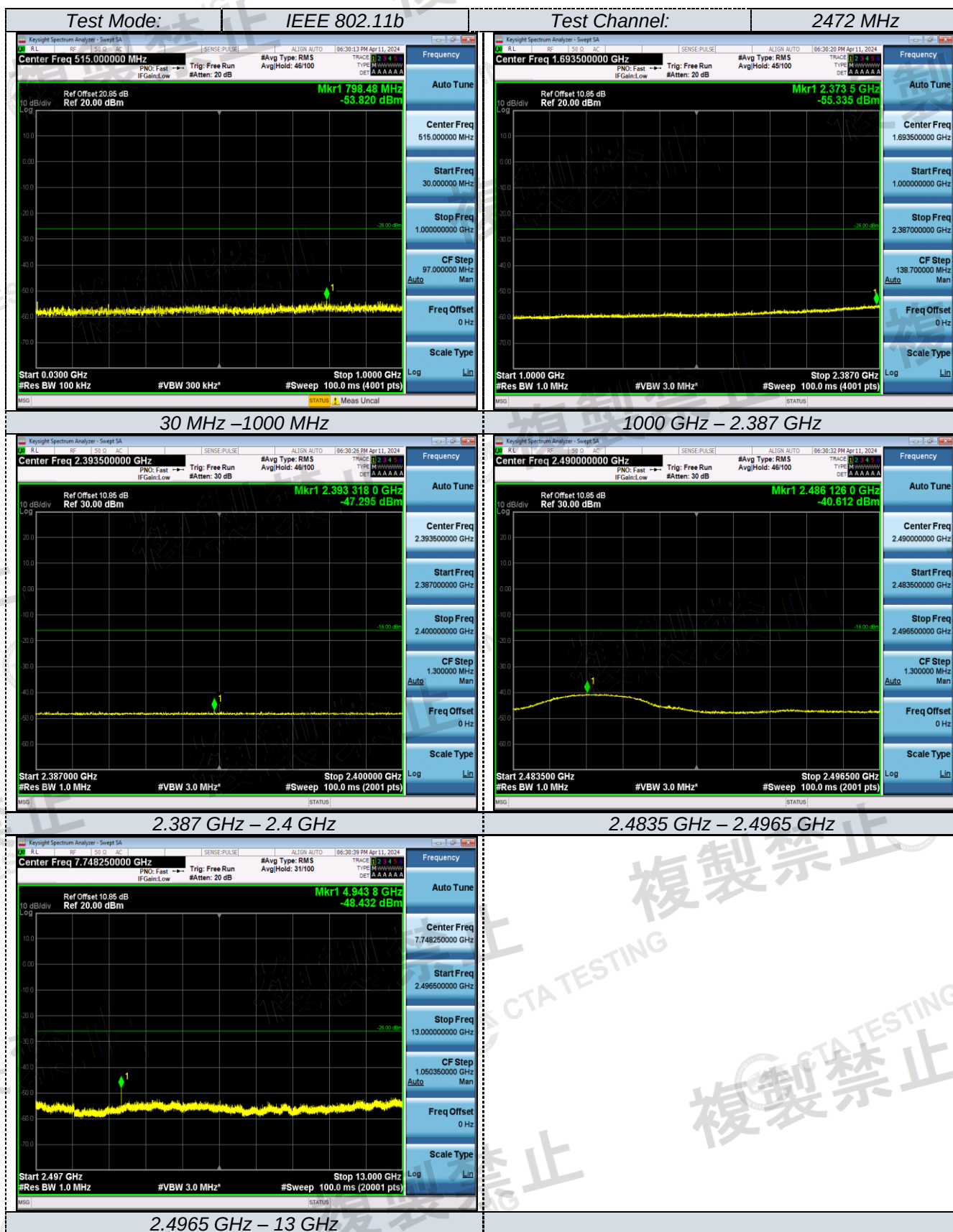
Indication mode: max hold

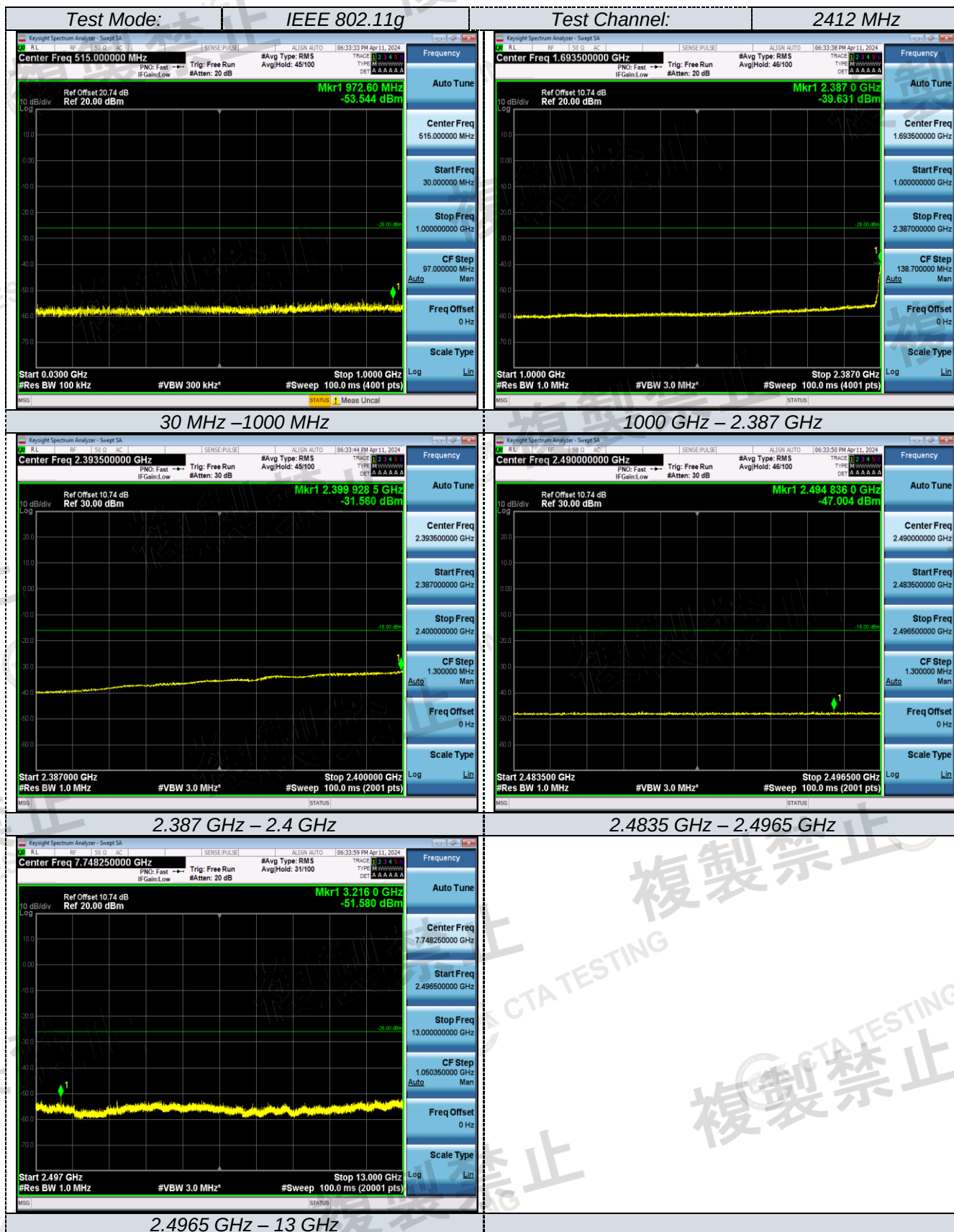
TEST RESULTS

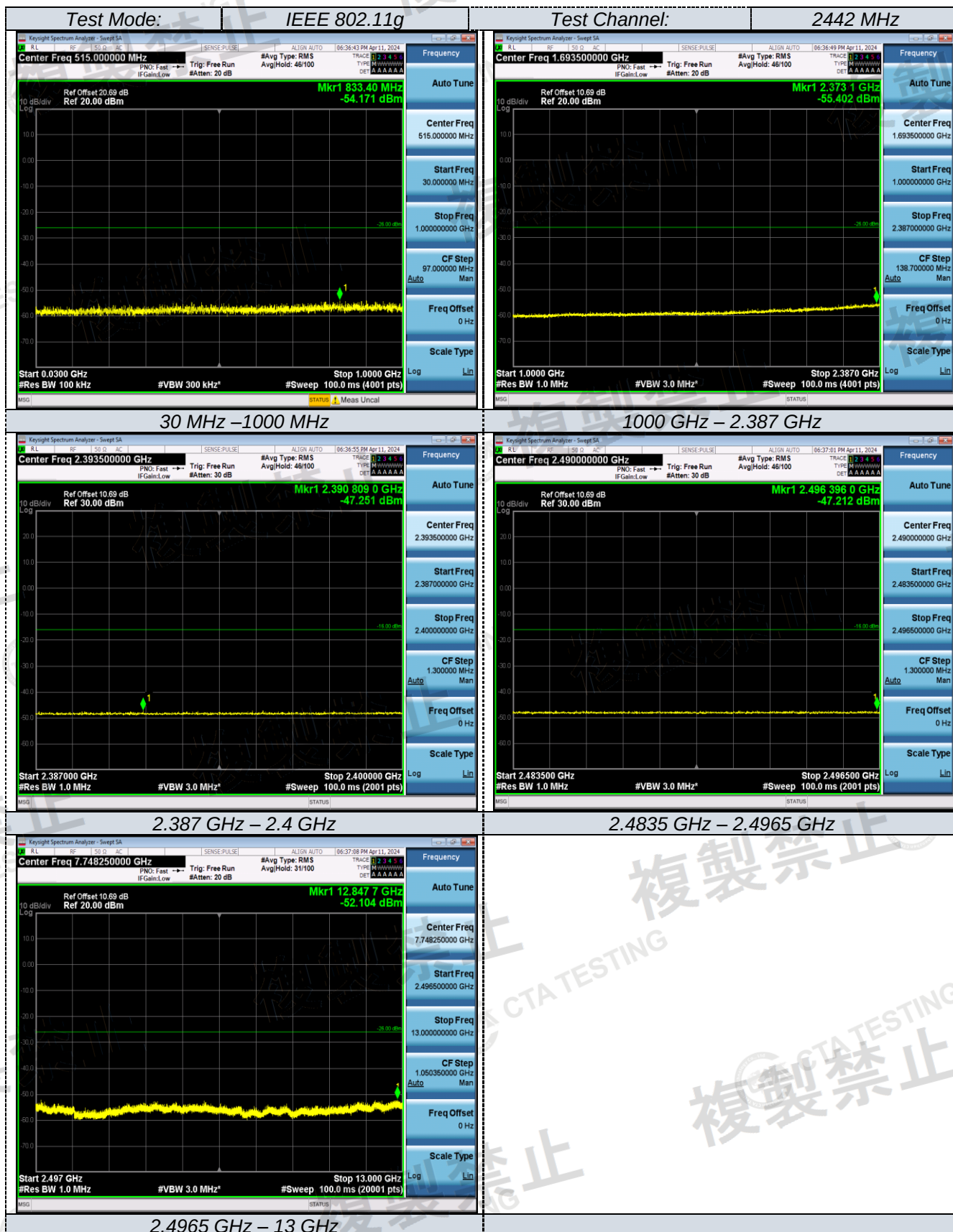
-Note:SA set to from 2.4965GHz to 13GHz, plot shows from 2.497GHz to 13GHz as of SA's default format.

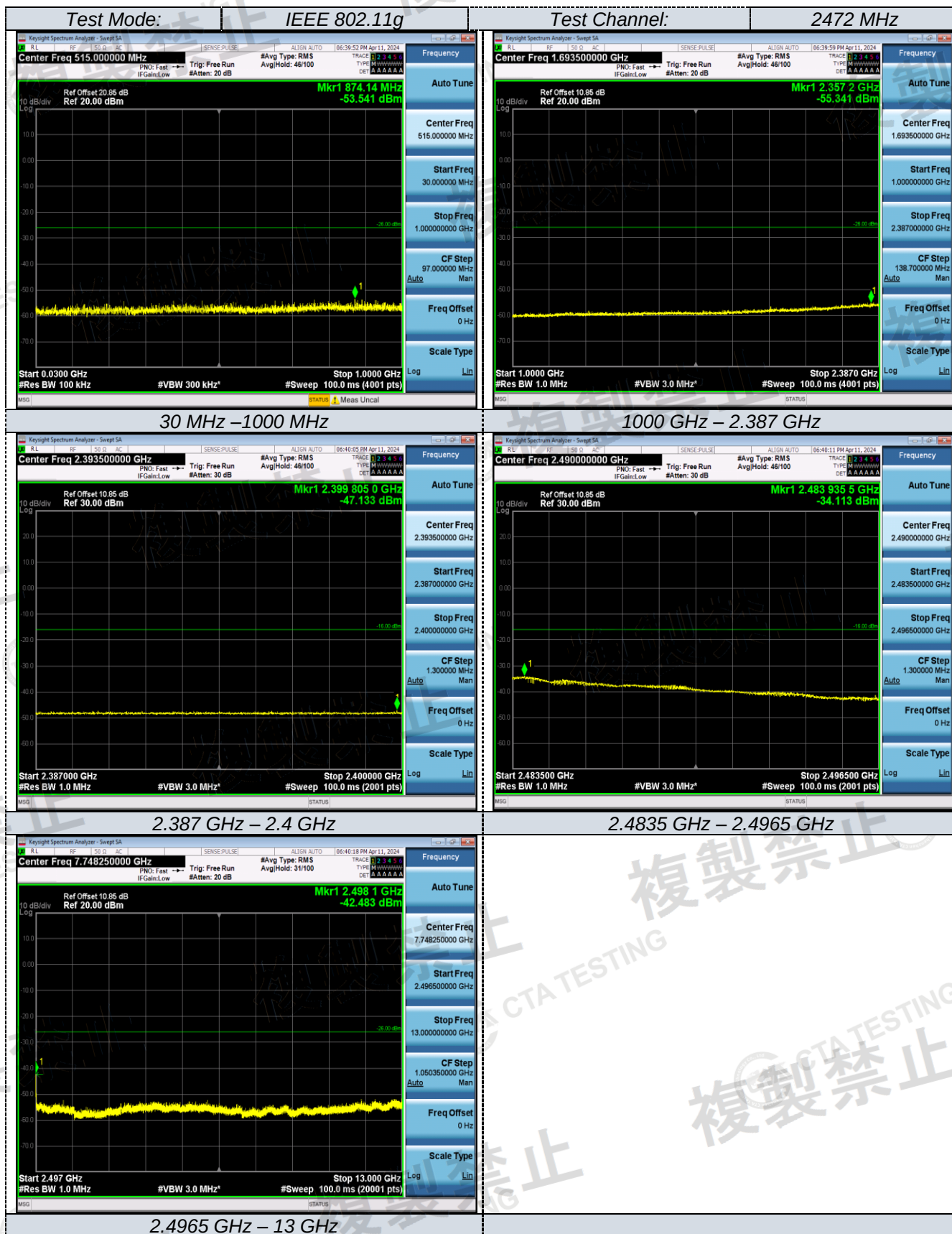


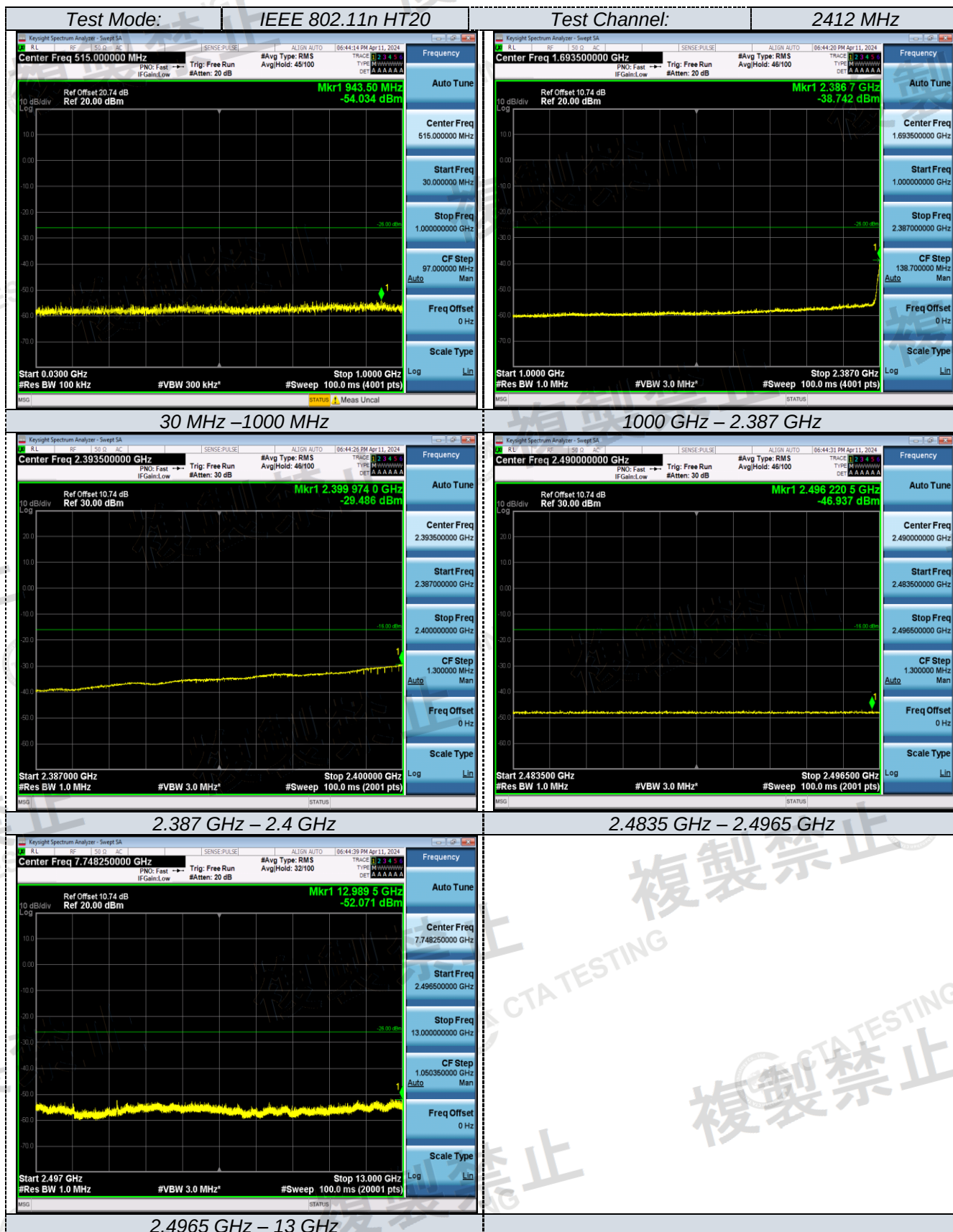


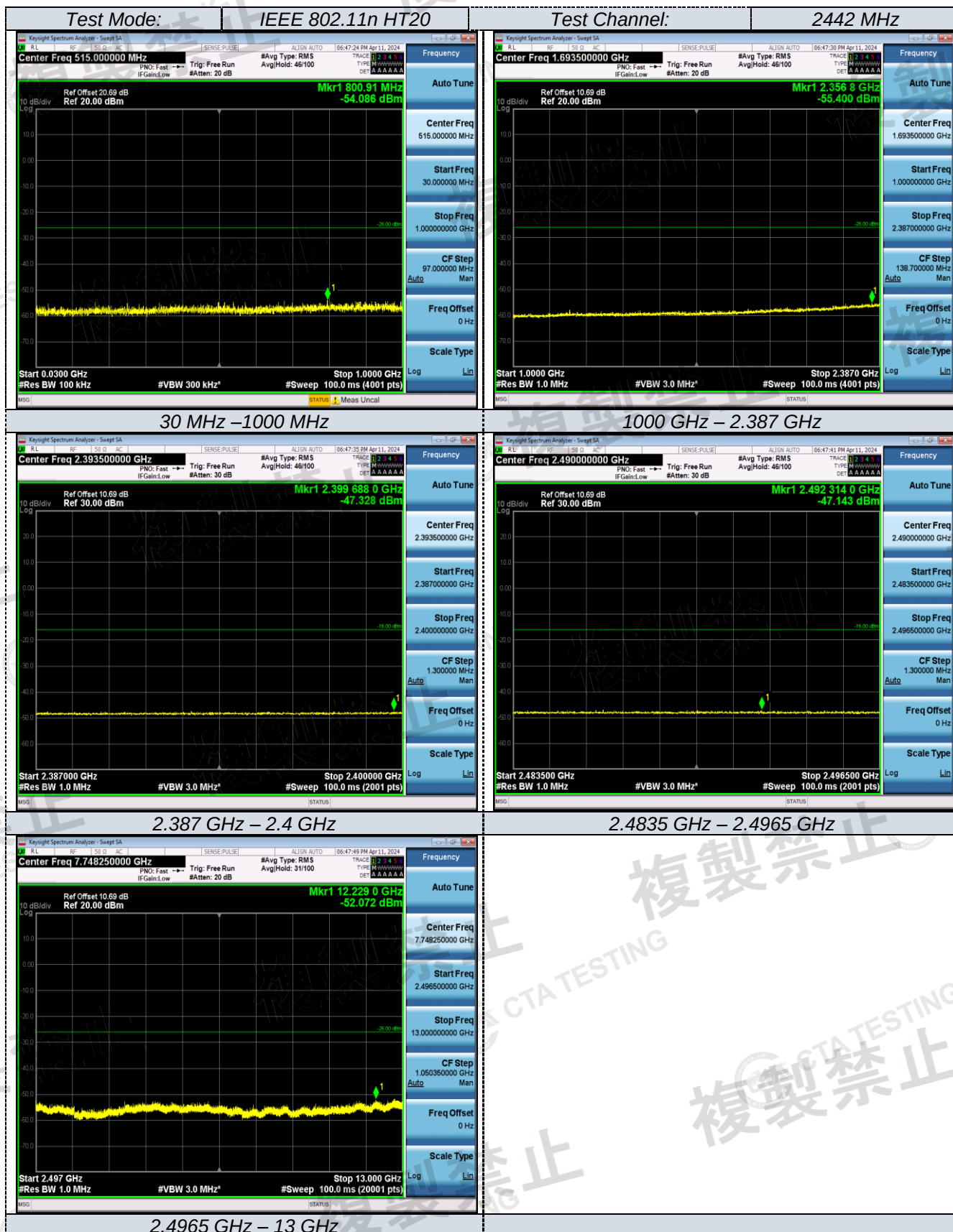


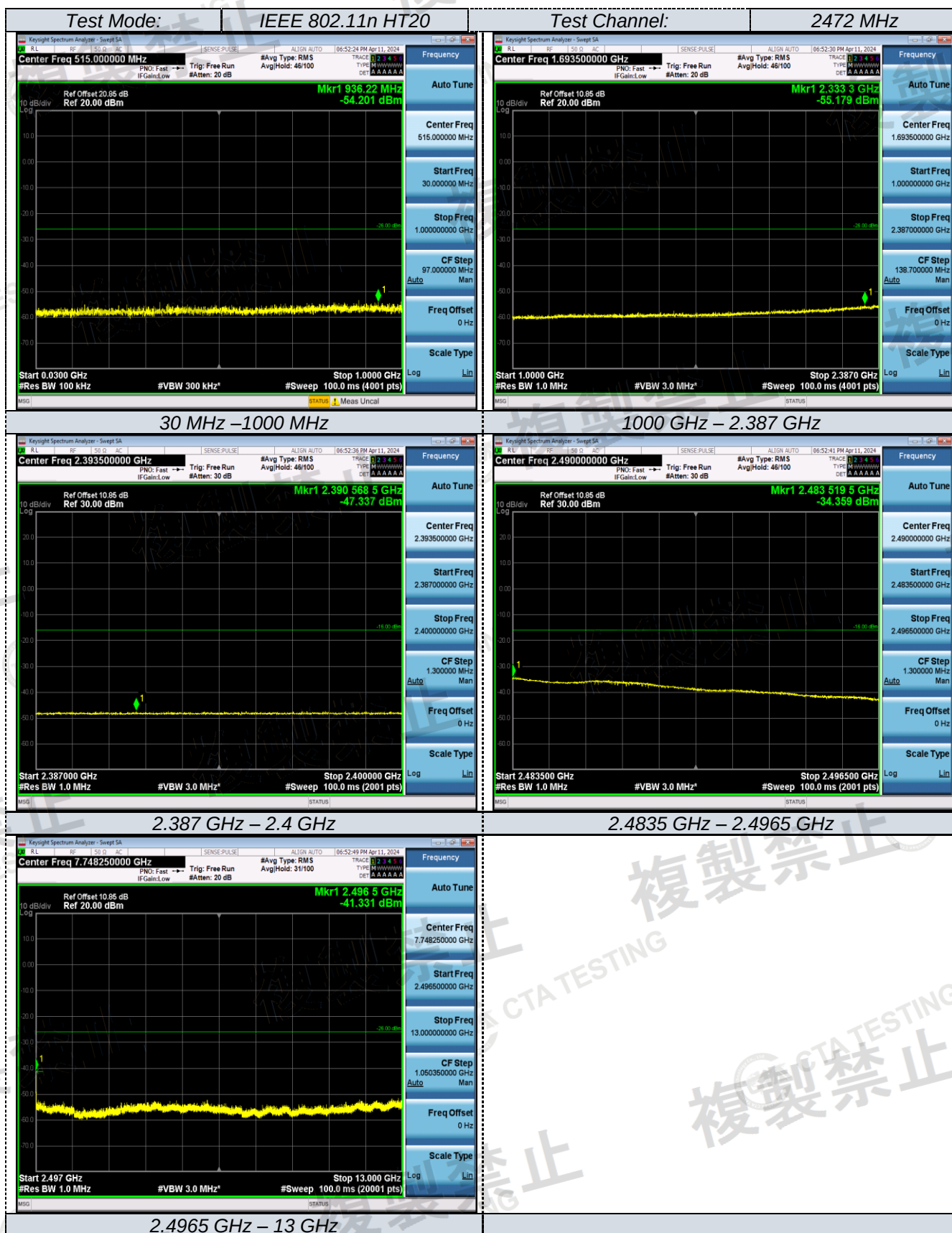










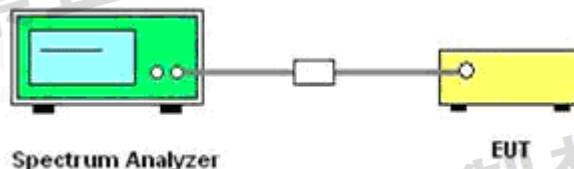


3.5 Secondary Radiated Emission Strength

LIMIT

The limit on secondary emissions radiated from the receiving equipment within which the function of other radio equipment will not be impaired shall be, in terms of the power of a dummy antenna circuit that has the same electrical constant as the receiving antenna, 4nW or less at a frequency below 1 GHz and 20 nW or less at a frequency of 1 GHz or higher as measured using the circuit.

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the spectrum analyser and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

EUT Condition: modulation

Spectrum Condition:

Frequency: 30MHz-13GHz

RBW: 100 KHz (30MHz-1GHz), 1MHz (1GHz-13GHz)

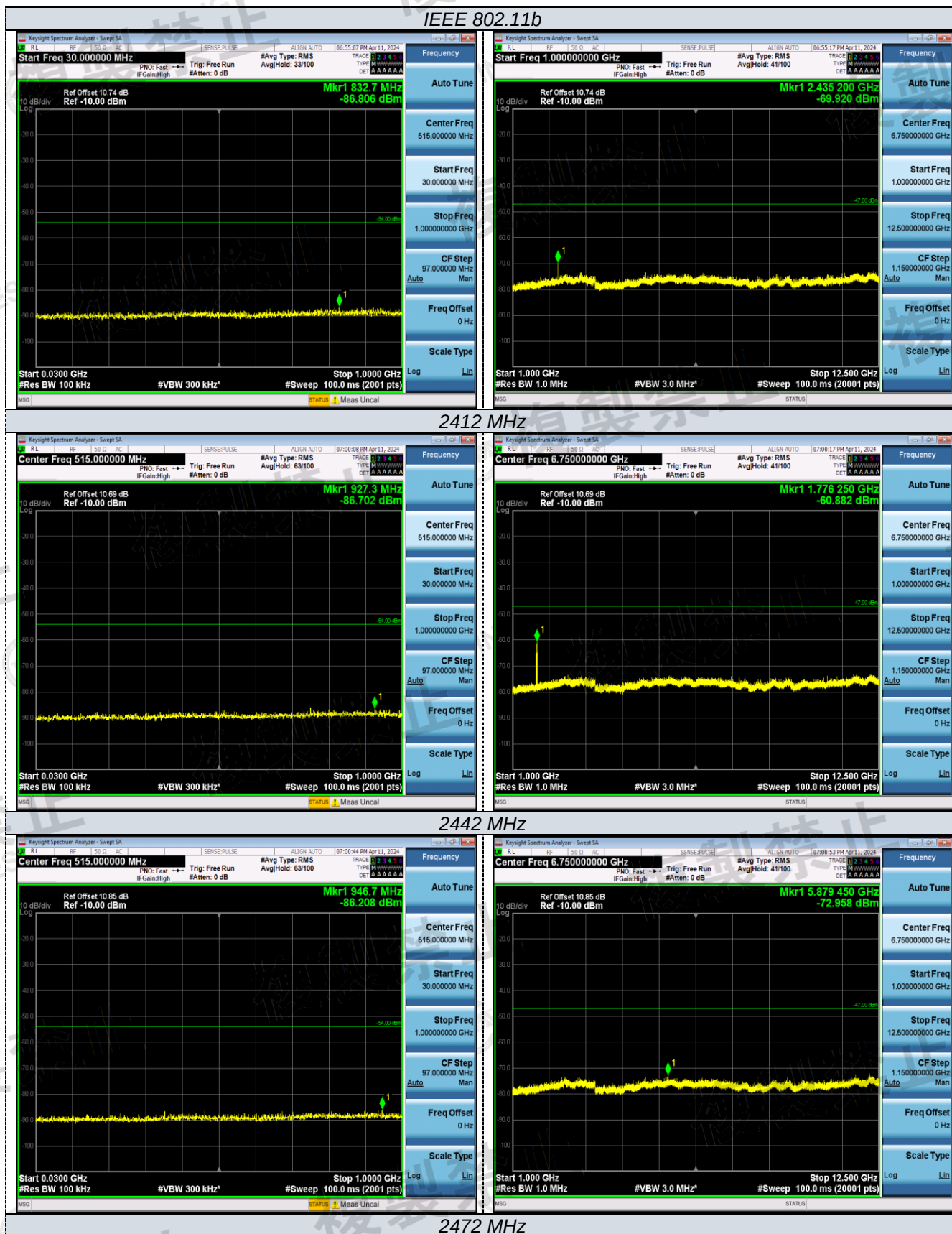
VBW: 300 KHz (30MHz-1GHz), 3MHz (1GHz-13GHz)

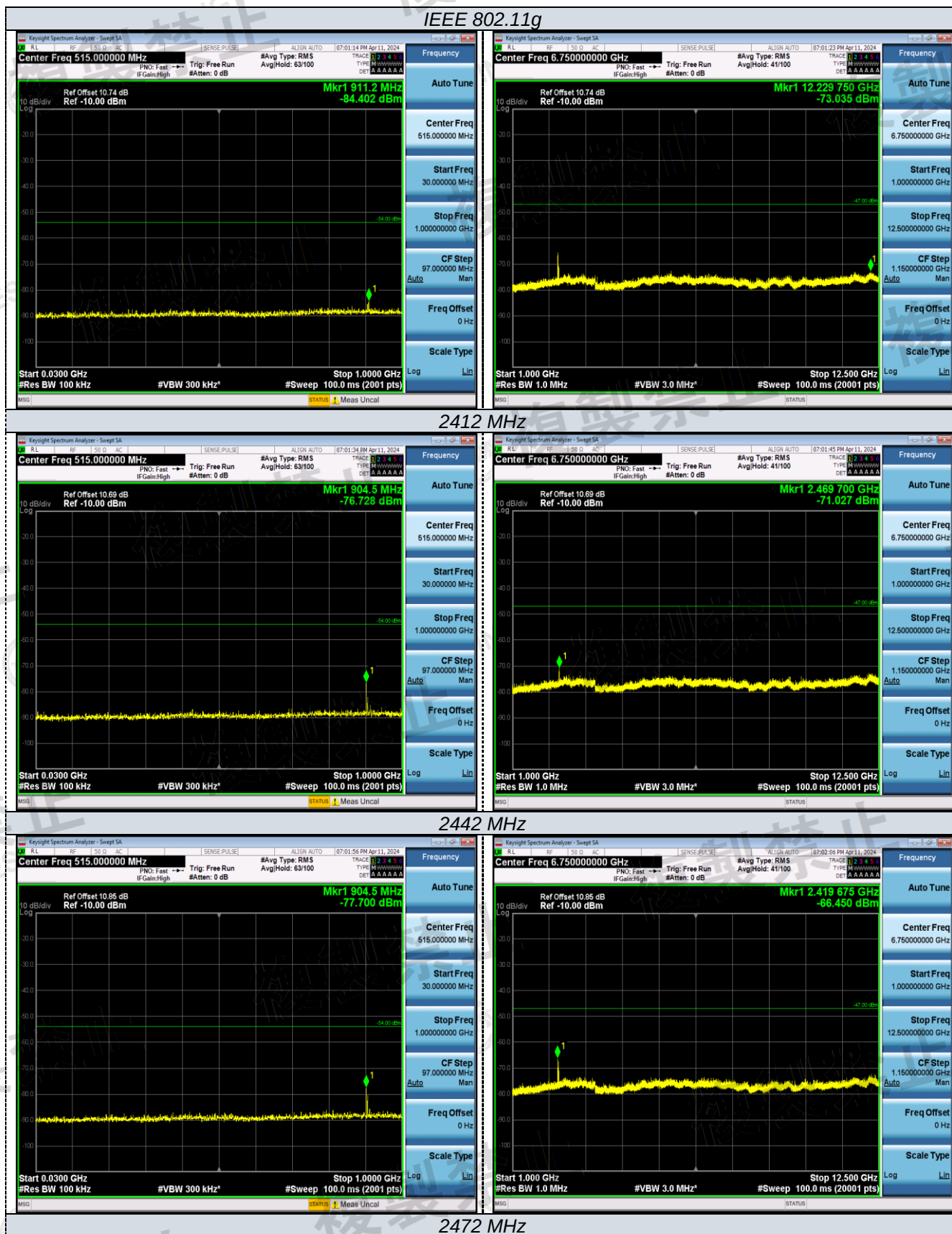
Sweep time: Auto

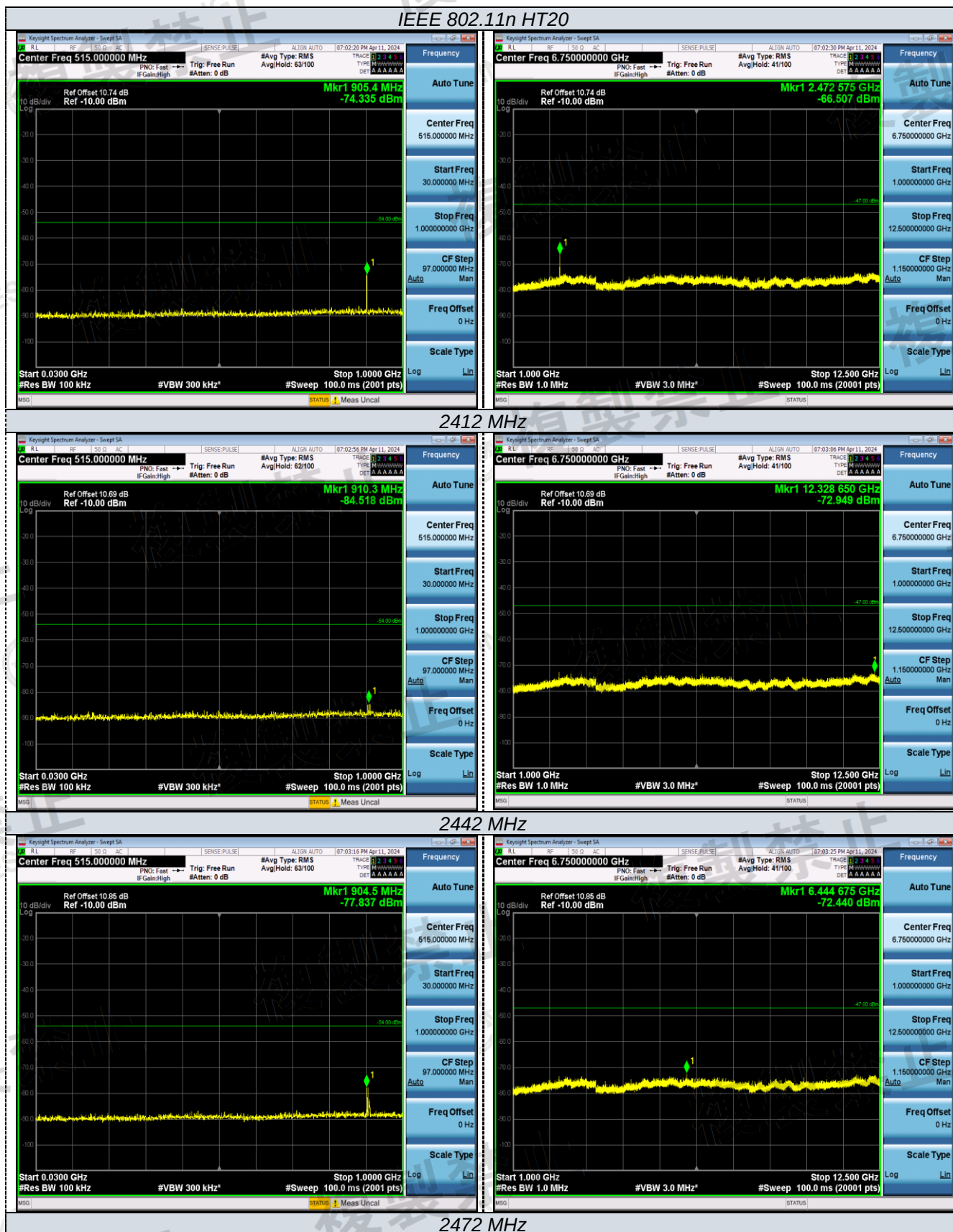
Detector mode: Positive peak

Indication mode: max hold

TEST RESULTS







3.6 Construction Protection Method

REQUIREMENT

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

CONFIRMATION METHOD

All high-frequency section and modulation section was shielded by metal shield. As follow:



3.7 Carrier Sensing Function

LIMIT

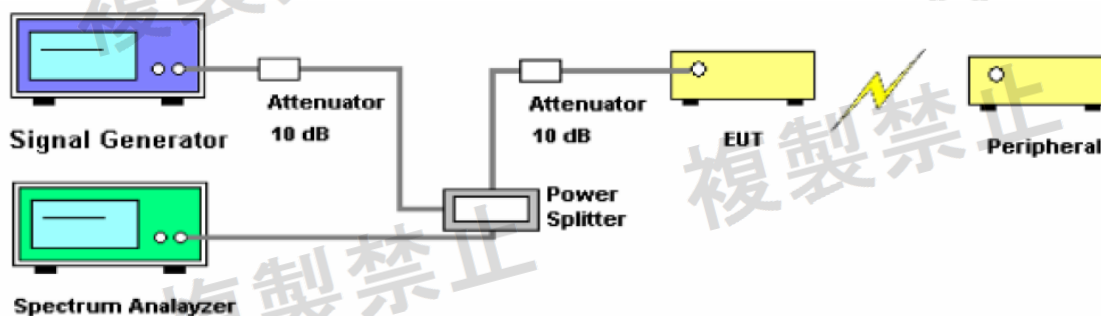
Item	Limits
Carrier Sense	Good – EUT stop RF transmission signal after carrier inject to EUT. (On $22.79 + Gr - 20 \cdot \log(f)$ [dBm] (Gr: dBi; f: MHz) or 100mV/m)

INSTRUMENTS SETTING

The following table is the setting of spectrum analyser and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	1 MHz
Span	0 MHz
Sweep	Continuous
Detector	Peak
Trigger mode	Video

TEST CONFIGURATION



TEST PROCEDURE

1. Set The EUT state in "normal mode link with wireless router".
2. SG adjusted the frequency as same as the EUT transmitted signal and emitted the absence of modulation from SG and power level is (on $22.79 + G - 20 \cdot \log(f)$ dBm) (G is the antenna gain is the test frequency).
3. Turn off the RF signal of the SG.
4. EUT have transmitted the maximum modulation signal and fixed channelize.
5. Setting the spectrum as follow :
RBW/VBW=1MHz/1MHz
Span=50MHz
Sweep time=auto
Sweep mode=continuous
Detect mode=positive peak
6. SG RF signal on.
7. EUT shall be stop the transmitted any signal and SG RF signal off, the EUT will be continuous transmitted signal.

TEST RESULTS

Not Applicable

3.8 Interference Prevention Function

REQUIREMENT

Clarify the one automatically to transmit and to receive identification code with the wireless equipment of the wireless station used in the same premises.

Item	Limits
Identification code	≥ 48 bits

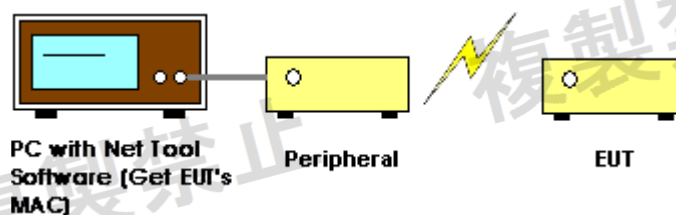
CONFIRMATION METHOD

A communication link was made where the ID code is correct (Identical).

TEST PROCEDURE

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

TEST CONFIGURATION



TEST RESULTS

PASS

MAC: 2E: 35: B5: C7: 3A: DC

4 Test Setup Photos of the EUT



5 Photos of the EUT

Reference to the test report No. CTA26010601801

***** End of Report *****