

TEST REPORT

Application No.: GZEM2006013231CR
Applicant: Hanshin International Limited
Address of Applicant: Zone A, No. 8 Lian Hua Yan Road, High Tech Development Zone, Whampoa District, Guangzhou, China
Manufacturer: Hanshin International Limited
Address of Manufacturer: Zone A, No. 8 Lian Hua Yan Road, High Tech Development Zone, Whampoa District, Guangzhou, China
Factory: Hanshin International Limited
Address of Factory: Zone A, No. 8 Lian Hua Yan Road, High Tech Development Zone, Whampoa District, Guangzhou, China
Equipment Under Test (EUT):
EUT Name: Smart Kiosk
Model No.: STD-10AN, STD-8AN, STD-15, STD-23, STD-27, STD-32, KDS-15, STD-07IN, STD-10IN, STD-08IN □
□ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark: Hanshin
Standard(s): MIC Item 19 of Article 2 Paragraph 1
Date of Receipt: 2020-06-22
Date of Test: 2020-06-29
Date of Issue: 2020-07-13

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian

Kobe Jian
EMC Laboratory Manager



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Guangzhou Branch EMC Laboratory

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中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Revision Record

Version	Chapter	Date	Modifier	Remark
01		2020-07-13		Original

Authorized for issue by:

Tested By

Jackson Yuan

Jackson_Yuan /Project Engineer

2020-06-29

Date

Checked By

Jerry Chan

Jerry_Chan /Reviewer

2020-07-13

Date

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	MIC Item 19 of Article 2 Paragraph 1	N/A	MIC Item 19 of Article 2 Paragraph 1	Pass
Interference prevention capability	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
RF accessibility	MIC Item 19 of Article 2 Paragraph 1	N/A	MIC Item 19 of Article 2 Paragraph 1	Pass

N/A: Not applicable

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Frequency Error	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Occupied Bandwidth (99%)	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Spread spectrum Bandwidth (90%)	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Antenna Power	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Spurious emission Intensity	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass
Limit of secondary radiated emissions	MIC Item 19 of Article 2 Paragraph 1	MIC Notice No.88 Appendix No.43	MIC Item 19 of Article 2 Paragraph 1	Pass

■ Declaration of EUT Family Grouping:

Model No.: STD-10AN, STD-8AN, STD-15, STD-23, STD-27, STD-32, KDS-15, STD-07IN, STD-10IN, STD-08IN

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on the model name.

Therefore only one model **STD-10AN** was tested in this report.

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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 12 V
Test Voltage:	DC 12 V powered by DC power referred to section 4.2
Cable:	For Main unit: DC input ports; USB input ports*2; LAN input ports; TF card input ports; Earphone input ports.
Antenna Gain:	2.15 dBi
Antenna Type:	Integral Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20): 13
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2472MHz

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Mouse	Lenovo	M-U0025-O	REF. No.:SEA2400
DC Power supply(EMC 0008)	Instek	PS-6010	L9905E037.11
Test Software	Offered by Client	RFTestTool-user-5.6_si gn.apk	None

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4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 5.5 \times 10^{-8}$
2	Duty cycle	$\pm 0.57\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF Conducted power	$\pm 0.68\text{dB}$
5	RF Power Density	$\pm 1.50\text{dB}$
6	Conducted Spurious Emissions	$\pm 1.04\text{dB}$
7	RF Radiated Power	$\pm 4.5\text{dB}$ (below 1GHz)
		$\pm 4.8\text{dB}$ (above 1GHz)
8	Radiated Spurious Emission Test	$\pm 4.5\text{dB}$ (30MHz-1GHz)
		$\pm 4.8\text{dB}$ (1GHz-18GHz)
9	Temperature	$\pm 0.4^{\circ}\text{C}$
10	Humidity	$\pm 1.3\%$
11	Supply Voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

4.4 Test Location

All tests were performed at:

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198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

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No tests were sub-contracted.

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4.5 Test Facility

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

● **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

● **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

● **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

● **FCC Recognized 2.948 Listed Test Firm(Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

● **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

● **Industry Canada (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● **VCCI (Registration No.: R-12460, C-12584, G-10449 and T-11179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-10449 and T-11179 respectively.

● **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.



4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Frequency Error					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Occupied Bandwidth (99%)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Spread spectrum Bandwidth (90%)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Antenna Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

Spurious emission Intensity					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01



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Limit of secondary radiated emissions

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2020-03-02	2021-03-01
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS-EMC	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2019-11-02	2021-11-01

General used equipment

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2019-07-16	2020-07-15
DMM	Fluke	73	EMC0007	2019-07-16	2020-07-15

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6 Radio Spectrum Technical Requirement

6.1 EUT Test Conditions

Power supply:

the RF unit supplied by DC 3.3V.

The EUT has the input voltage to the circuit of RF unit complies with output voltage limitation ($\pm 1\%$) against input voltage fluctuation (DC 10.8 V - 13.2 V).

So, all measurements were conducted at only rated voltage DC 12V.

The measurement result of the voltage fluctuation at RF circuit when DC 10.8 V - 13.2 V.

DC input (12V)	Measured value (3.3V)	Voltage Deviation
12 V	3.3 V	0%
10.8 V	3.29 V	-0.3%
13.2 V	3.31 V	0.3%

Temperature:

5.0 -35.0 °C

Humidity:

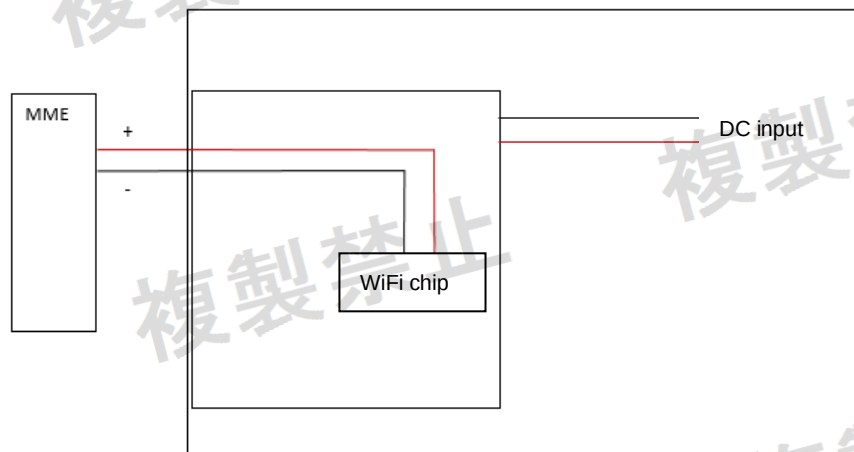
45-85 % RH

Atmospheric Pressure:

1000 -1010 mbar

Test frequencies:

If the EUT can be set to 3 of more different (carrier) frequencies in 1 allocated band, testing shall be performed using the Lowest, M and the Highest frequency (L, M and H). If there are 2 or fewer frequencies, testing shall be performed with the available frequencies.

Test Setup Diagram

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6.2 Environment Parameter

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Value	Temperature (°C)	Voltage (V)
NTNV	25	12
Note: VN: Normal Voltage TN: Normal Temperature		

Operation Frequency each of channel (802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	5	2432MHz	9	2452MHz	13	2472MHz
2	2417MHz	6	2437MHz	10	2457MHz		
3	2422MHz	7	2442MHz	11	2462MHz		
4	2427MHz	8	2447MHz	12	2467MHz		

Using test software was control EUT work in continuous transmitter and receiver mode. And select test channel as below:

For 802.11b/g/n (HT20):

Channel	Frequency
The lowest channel (CH1)	2412MHz
The middle channel (CH7)	2442MHz
The highest channel (CH13)	2472MHz

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6.3 Antenna Requirement

6.3.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

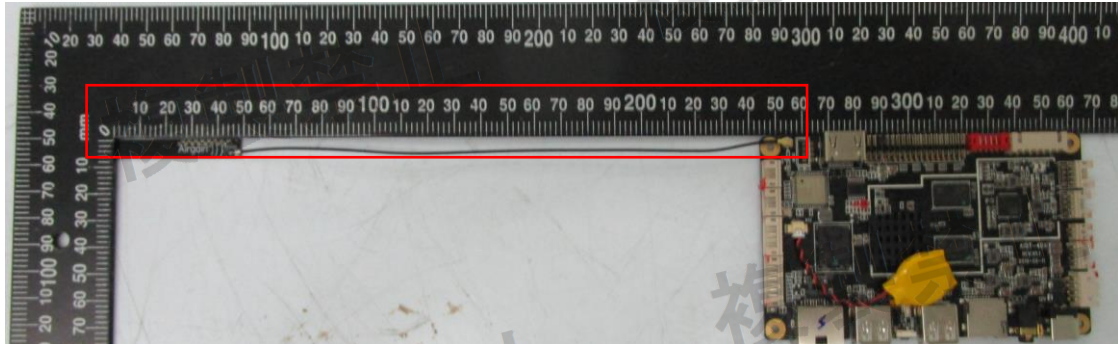
6.3.2 Conclusion

Standard requirement:

Applicable for equipment with an antenna terminal, including testing terminals. If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.

EUT Details:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2.15 dBi.



Result:

An antenna connector is available, all relevant tests will be carried out conducted.

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6.4 Interference prevention capability

6.4.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

Limit:

Article 2, Item (19) Notice 88 Appendix 43, 44, 45

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.

6.4.2 Test Setup Diagram



6.4.3 Conclusion

Standard Requirement:

- 1) Measurement system diagram as shown above and test equipment keep transmitting identification code.
- 2) Condition of measuring instrument
 - (1) Demodulator must be able to demodulate the transmitting signal emitted by test equipment and to indicate the identification code.
- 3) Condition of test equipment The mode of normal use.
- 4) Measuring operation procedure
 - (1) When test equipment has the function to transmit identification code automatically:
 - A) Transmit the predetermined identification code from test equipment.
 - B) Confirm the transmitted identification code by demodulator.

BD:BC:5F:05:DC:B9

EUT Details:

The unit does meet the requirements (Good).

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6.5 RF accessibility

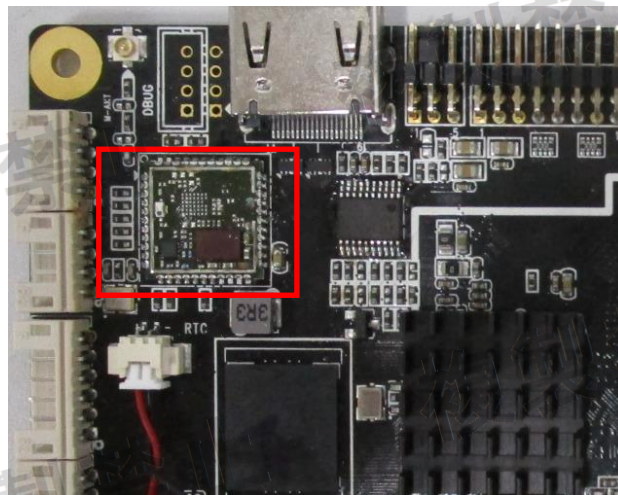
6.5.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

6.5.2 Conclusion

Standard Requirement:

The EUT shall be constructed in such a way that sensitive RF parts, (like modulation and oscillator parts) cannot be reached easily by the user. These parts shall be covered by soldered metal caps or glue or by other mechanical covers. If the covers are fixed with screws, these shall be not the common type(s) like a Phillips, but special versions like Torx, so that the user cannot open the device with common tools.



EUT Details:

RF and Modulation parts are mounted on PCB with surface mount technology, and there are no any adjustable parts on PCB or adjustable parts are not exposed.

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7 Radio Spectrum Matter Test Results

7.1 Frequency Error

Test Requirement MIC Item 19 of Article 2 Paragraph 1
Test Method: MIC Notice No.88 Appendix No.43
Limit: Tolerance of frequency: $\pm 50\text{E-}6$

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 26.5 °C Humidity: 56.6 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.1.2 Test Setup Diagram



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7.1.3 Measurement Procedure and Data**1. Test Conditions:**

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping OFF, CW Tx

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 1MHz

RBW 10 kHz (Modulation OFF),

VBW 10 kHz (Modulation OFF),

Sweep Time Auto

Detector mode Positive peak

Indication mode Max hold

Alternative method:

Frequency: Test Frequency

Span 2 times channel bandwidth

RBW 100 kHz (Modulation ON),

VBW 100 kHz (Modulation ON),

Sweep Time Auto

Detector mode Positive peak

Indication mode Max hold

The detailed test data see: Appendix MIC19-2



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7.2 Occupied Bandwidth (99%)

Test Requirement	MIC Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
Limit:	FH: 83.5MHz or less FH + DS: 83.5MHz or less FH + OFDM: 83.5MHz or less OFDM: 38MHz or less Others: 26MHz or less

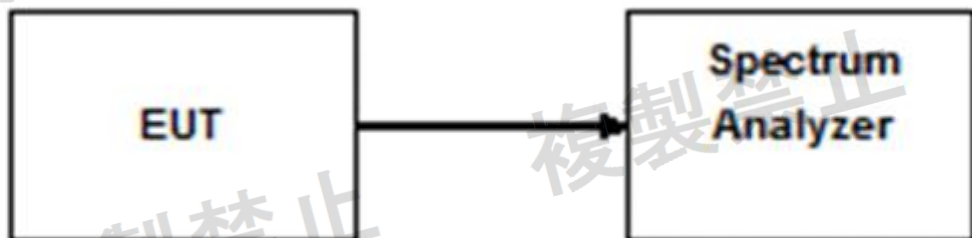
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 26.5 °C Humidity: 56.6 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 83.5 MHz (FHSS); 40/60 MHz (OFDM; DSSS); 2-5 times OBW (Others)

RBW 1 MHz (FHSS); 300kHz (OFDM; DSSS); 3% OBW (Others)

VBW 1 MHz (FHSS); 300kHz (OFDM; DSSS); 3 times RBW (Others)

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

OBW 99%

The detailed test data see: Appendix MIC19-2



7.3 Spread spectrum Bandwidth (90%)

Test Requirement MIC Item 19 of Article 2 Paragraph 1
Test Method: MIC Notice No.88 Appendix No.43
Limit: DS,FH,FH+DS,FH+OFDM: 500kHz or more

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 26.5 °C Humidity: 56.6 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 83.5 MHz (FHSS); 40/60 MHz (OFDM; DSSS)

RBW 1 MHz (FHSS); 300kHz (OFDM; DSSS)

VBW 1 MHz (FHSS); 300kHz (OFDM; DSSS)

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

OBW 90%

The detailed test data see: Appendix MIC19-2

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7.4 Antenna Power

Test Requirement

Test Method:

Limit:

MIC Item 19 of Article 2 Paragraph 1

MIC Notice No.88 Appendix No.43

Designated value

(1) FH, FH+DS, FH+OFDM: 3mW/MHz

(used in the range of 2427 - 2470.75 MHz)

(2) OFDM, DS other than (1) 10mW/MHz

(3) Other than (1) & (2) 10mW

(4) OFDM OBW 26 - 38MHz: 5mW/MHz

Tolerance: +20%, -80%

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 26.5 °C

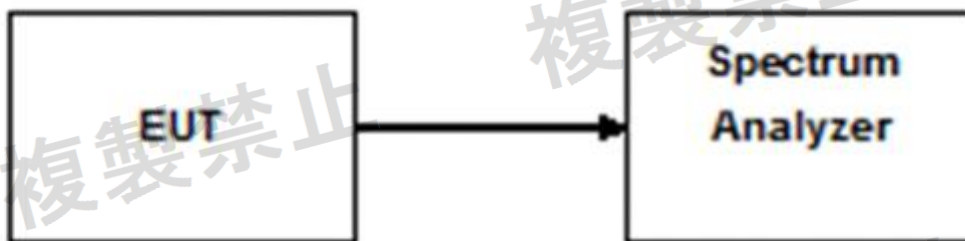
Humidity: 56.6 % RH

Atmospheric Pressure: 1020 mbar

Test Mode:

a: TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.4.2 Test Setup Diagram



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7.4.3 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Frequency: Test Frequency

Span 25 MHz(FHSS); 40/60 MHz (OFDM; DSSS); Enough to capture the emission (Others)

RBW 1 MHz (FHSS; OFDM; DSSS); More than OBW (Others)

VBW 1 MHz (FHSS; OFDM; DSSS); More than RBW (Others)

Sweep Time Auto

detector mode RMS

Indication mode Max hold

The detailed test data see: Appendix MIC19-2

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7.5 Spurious emission Intensity

Test Requirement	MIC Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
Limit:	(1) Below 2387 MHz: 2.5 μ W/MHz (2) 2387 to 2400 MHz: 25 μ W/MHz (3) 2483.5 through 2496.5 MHz: 25 μ W/MHz (4) Over 2496.5 MHz: 2.5 μ W/MHz

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 26.5 °C Humidity: 56.6 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.5.2 Test Setup Diagram



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7.5.3 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, , Modulation Tx

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Step 1

All spurious are measured from 30 MHz to 13 GHz by peak mode.

Step 2

IF the value measured by Step1 is 2 dB or less, measure in average mode.

Test setup for Step 1:

Frequency: 30 MHz – 2400 MHz , 2483.5 MHz –13 GHz

RBW 1 MHz

VBW 1 MHz

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

Test setup for Step 2:

Frequency: Spurious Frequency

RBW 1 MHz

VBW 1 MHz

Sweep Time Auto

detector mode Sample

Indication mode Max hold

The detailed test data see: Appendix MIC19-2



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中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

7.6 Limit of secondary radiated emissions

Test Requirement	MIC Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
Limit:	(1) Below 1 GHz : 4 nW or less (2) 1 GHz and over : 20 nW or less

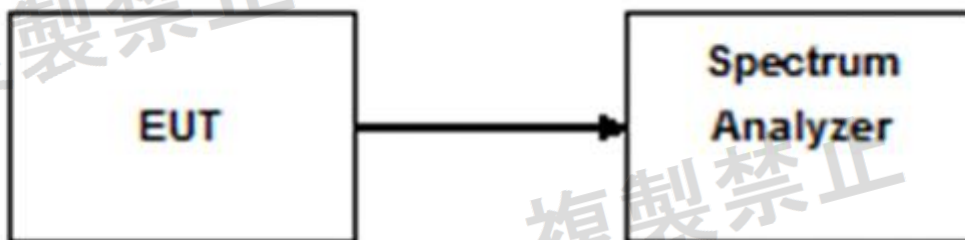
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 26.5 °C Humidity: 56.7 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20). Only the data of worst case is recorded in the report.

7.6.2 Test Setup Diagram



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7.6.3 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON

For equipment using diffusion code, set to the test diffusion code and modulate with standard coding test signal.

3. Spectrum Analyzer conditions:

Step 1

All spurious are measured from 30 MHz to 13 GHz by peak mode.

Step 2

IF the value measured by Step1 is 2 dB or less, measure in average mode.

Test setup for Step 1:

Frequency: 30 MHz – 2400 MHz , 2483.5 MHz – 13 GHz

RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)

VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

Test setup for Step 2:

Frequency: Spurious Frequency

Span 0 Hz

RBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)

VBW 100 kHz (30 – 1GHz) , 1 MHz (over 1GHz)

Sweep Time Auto

detector mode Sample

Indication mode Max hold

The detailed test data see: Appendix MIC19-2



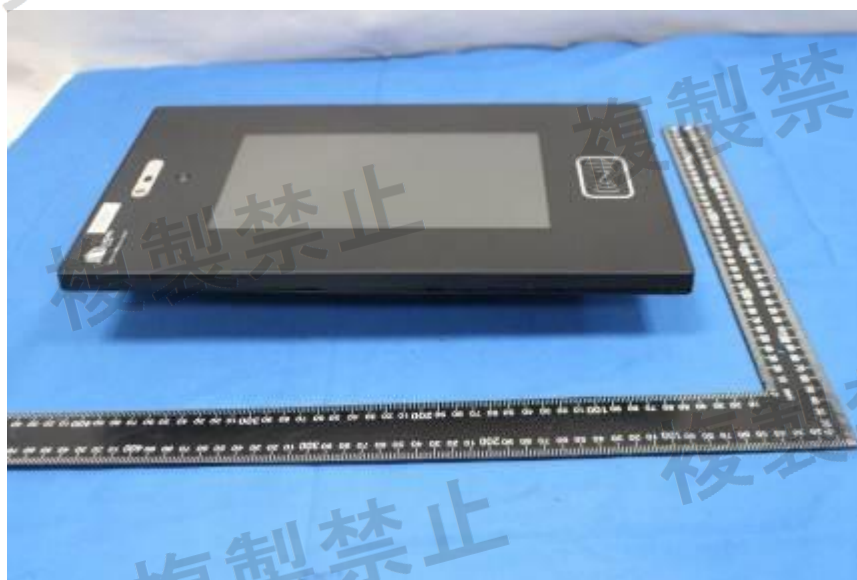
8 Photographs

8.1 EUT Constructional Details



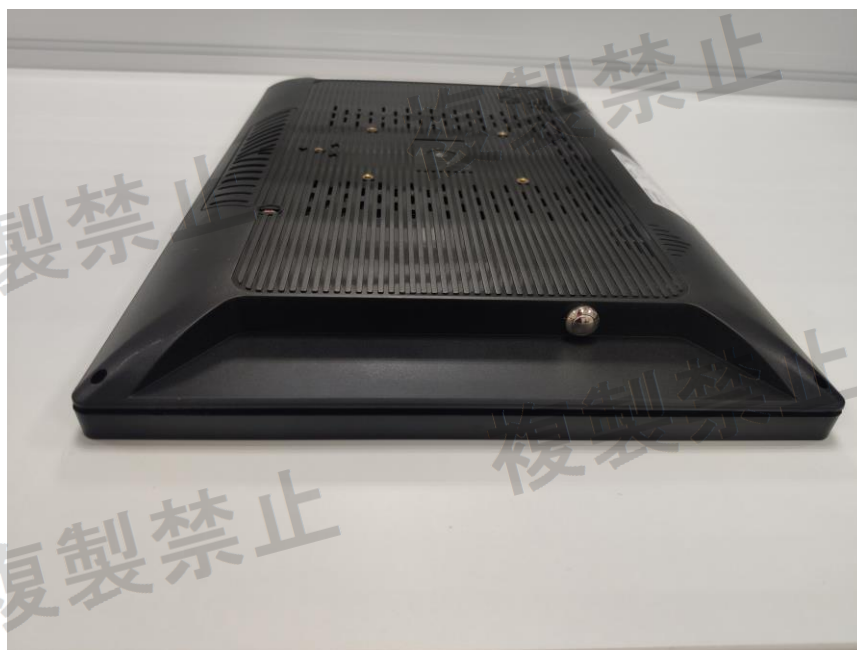
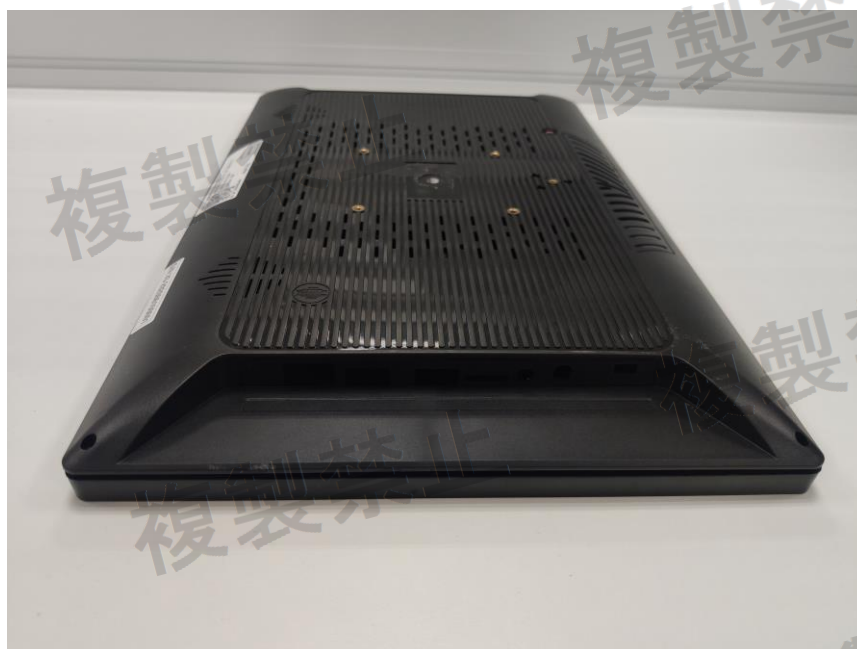
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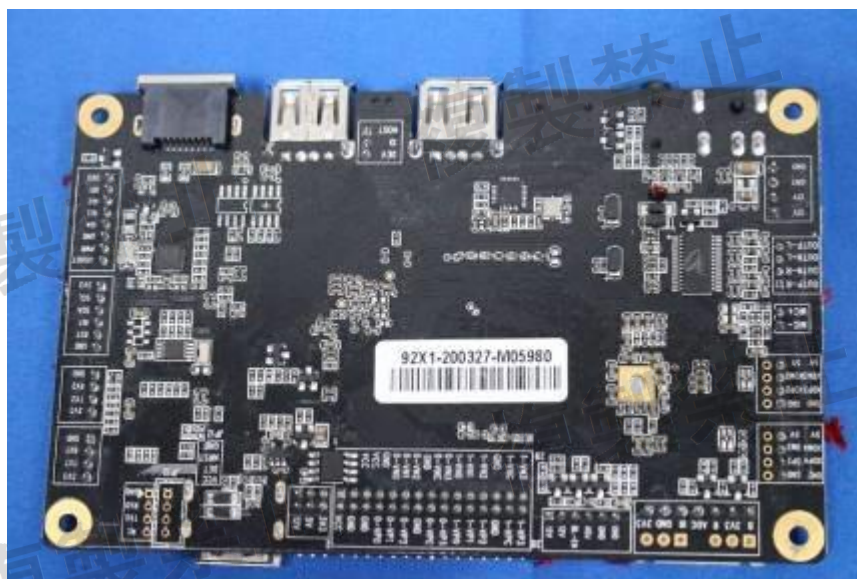
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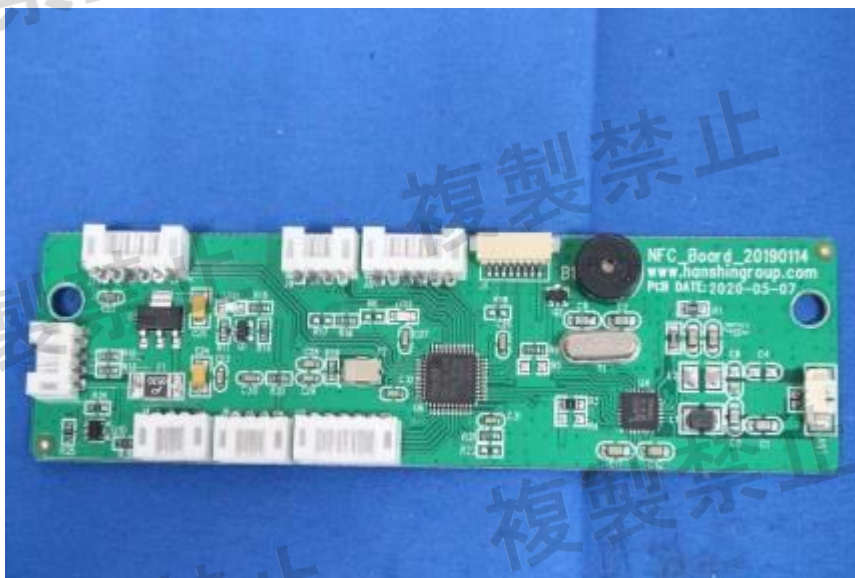
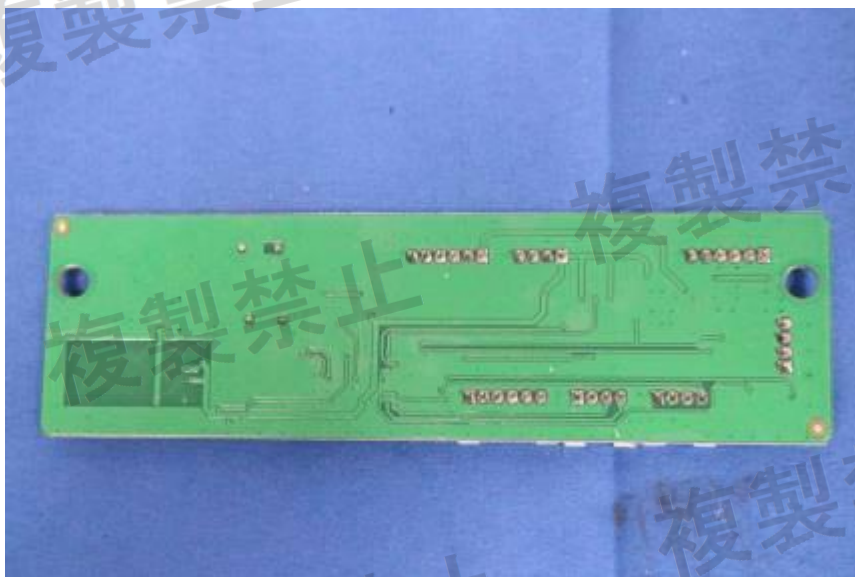
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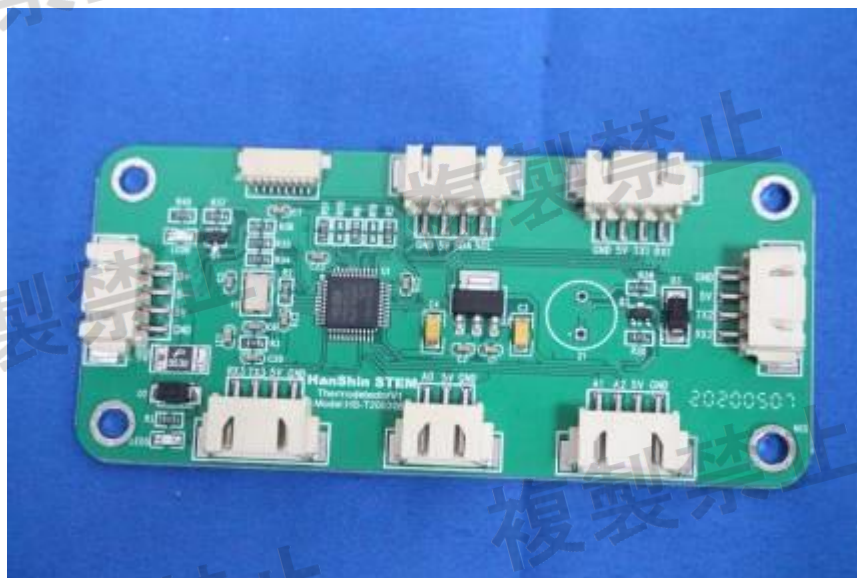
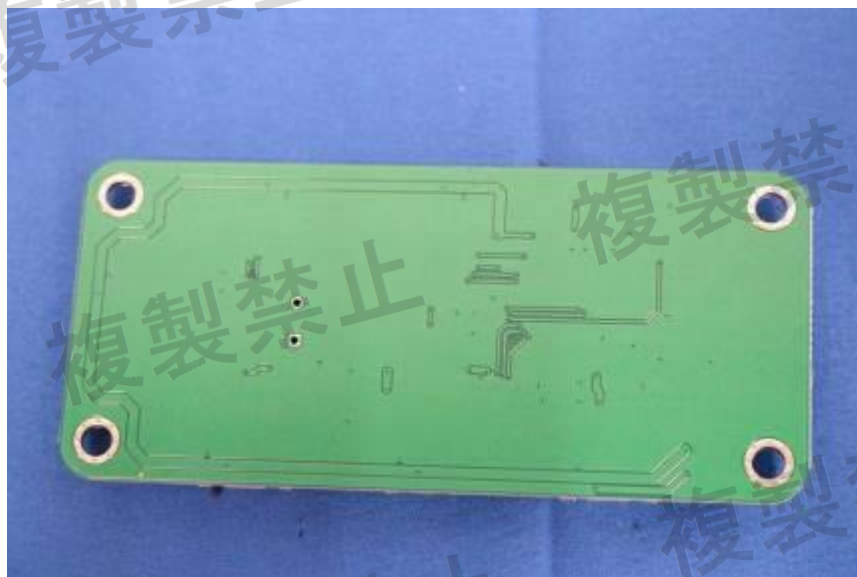
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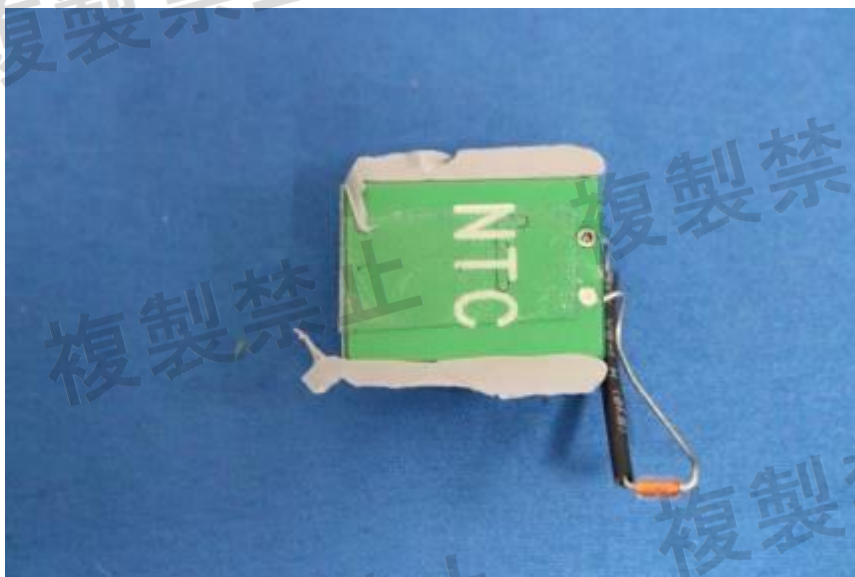
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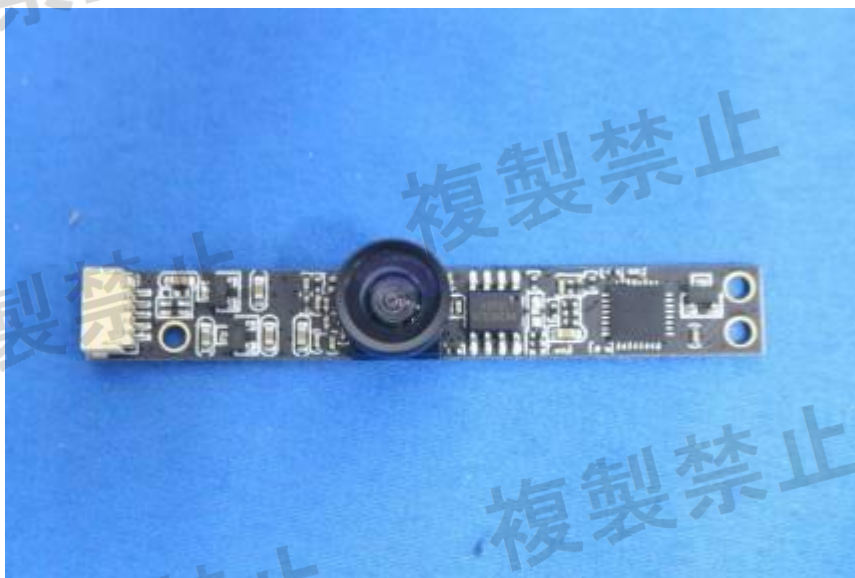
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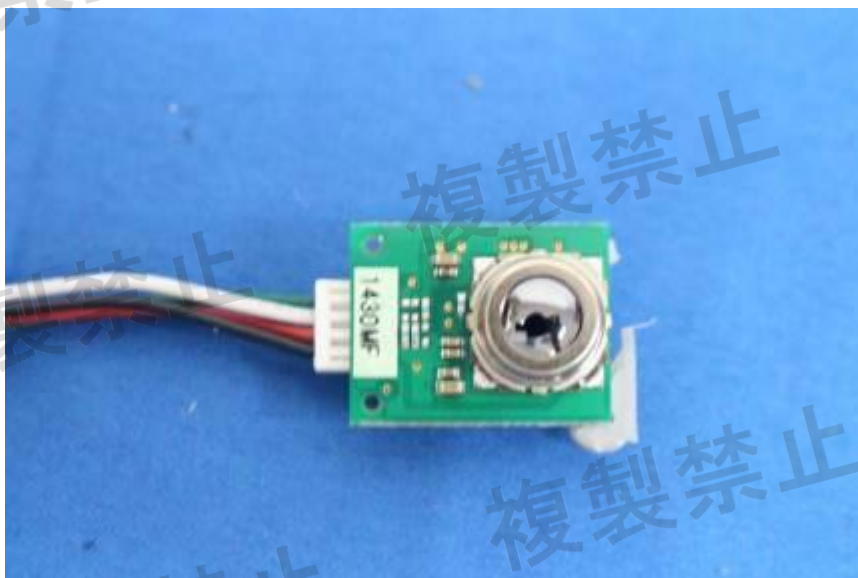
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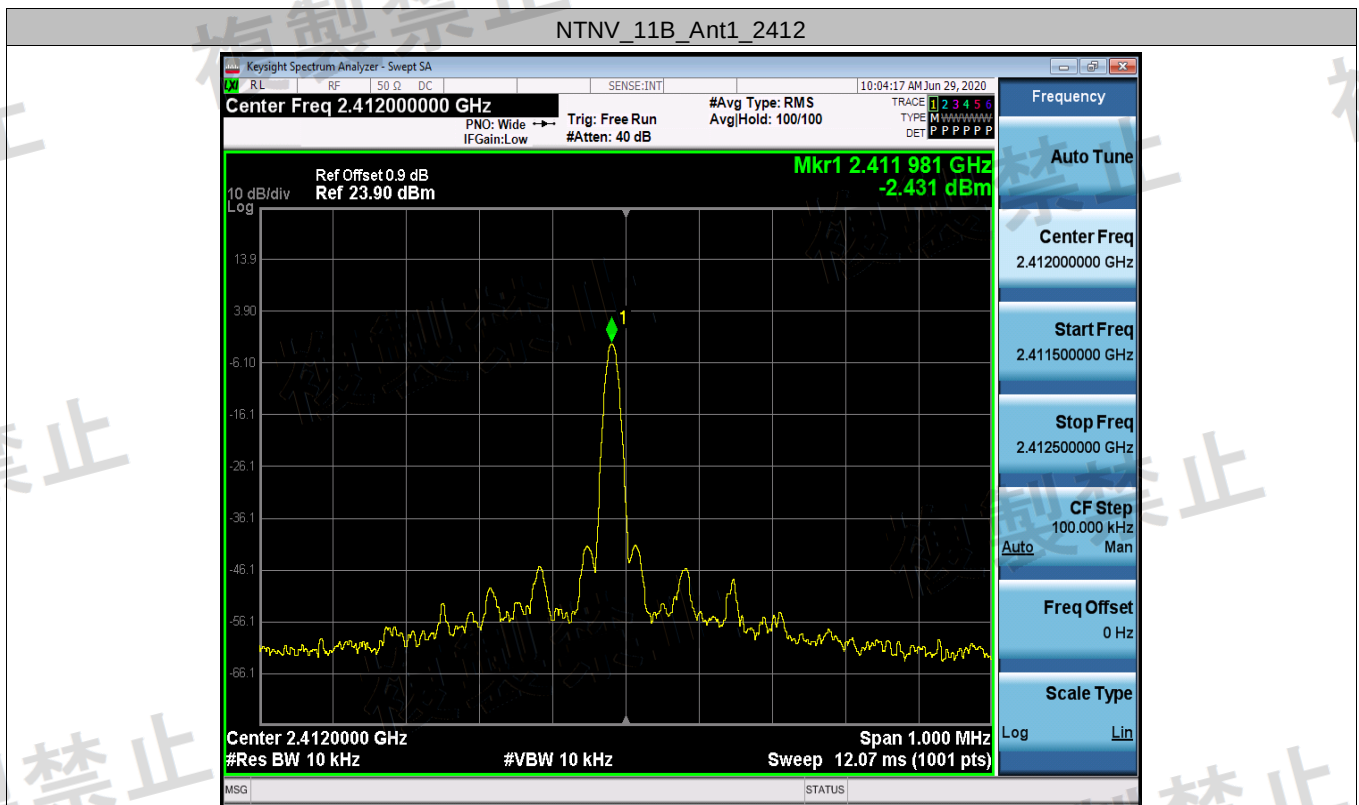
9 Appendix MIC19-2

9.1 Frequency Error

9.1.1 Test Result

TestCondition	TestMode	Antenna	Channel	Result[MHz]	Result[ppm]	Limit[ppm]	Verdict
NTNV	CW	Ant1	2412	2411.981	-7.87728	±50	PASS
	CW	Ant1	2442	2441.981	-7.78051	±50	PASS
	CW	Ant1	2472	2471.981	-7.68608	±50	PASS

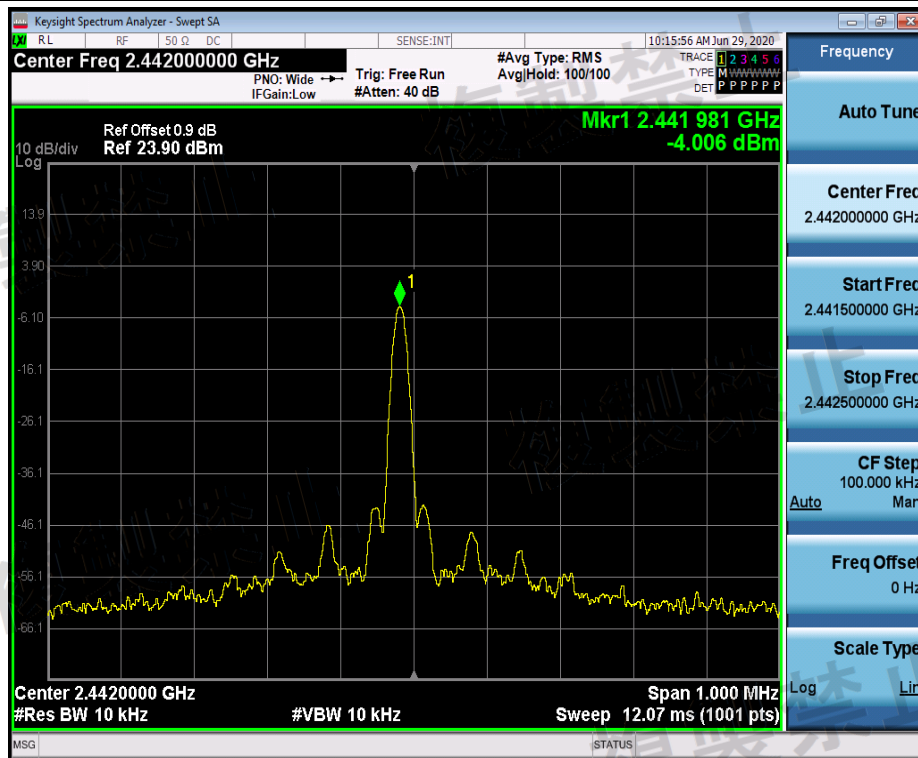
9.1.2 Test Graphs



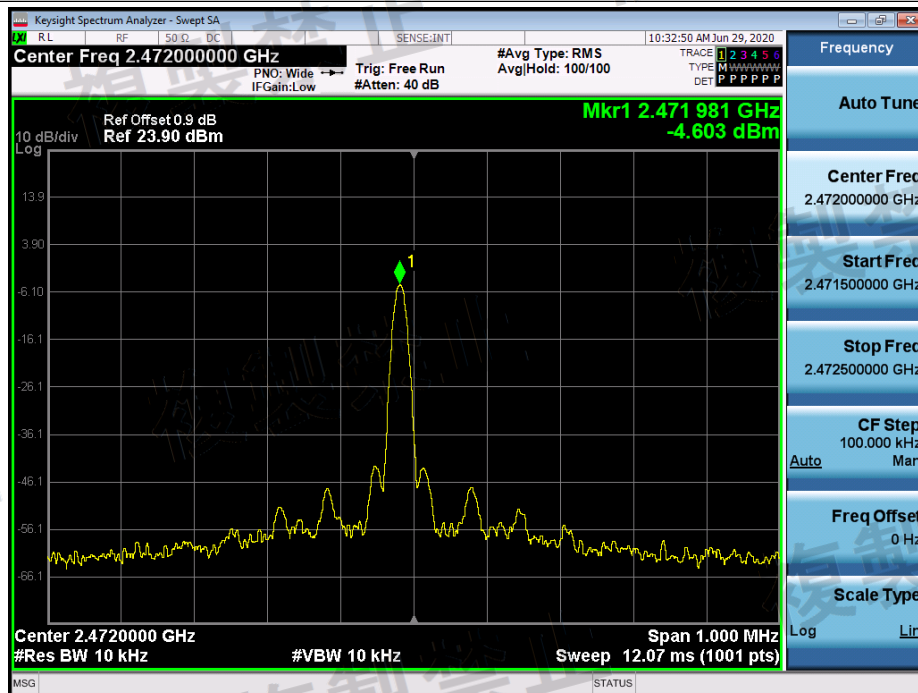
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NTNV_11G_Ant1_2442



NTNV_11N20SISO_Ant1_2472



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9.2 Antenna Power

9.2.1 Test Result

Test Mode	Channel	Ant	Ave. Burst Power [mW/MHz]	Limit [mW/MHz]	Tolerance [%]	Limit [%]	Verdict
11B	2412	Ant1	6.201	10	3.35	-80 to +20	PASS
	2442	Ant1	5.884	10	-1.93	-80 to +20	PASS
	2472	Ant1	5.585	10	-6.92	-80 to +20	PASS
11G	2412	Ant1	2.121	10	6.05	-80 to +20	PASS
	2442	Ant1	2.111	10	5.55	-80 to +20	PASS
	2472	Ant1	1.781	10	-10.95	-80 to +20	PASS
11N20SISO	2412	Ant1	2.274	10	13.70	-80 to +20	PASS
	2442	Ant1	1.942	10	-2.90	-80 to +20	PASS
	2472	Ant1	1.897	10	-5.15	-80 to +20	PASS
Remark: Test Condition: TNVN Refer to section 9.1-2 for Peak Frequency of each channel Rated antenna power: 6.0mW/MHz @11B 2.0mW/MHz @11G 2.0mW/MHz @11N20SISO							

Remark:

Test Condition: TNVN

Refer to section 9.1-2 for Peak Frequency of each channel

Rated antenna power: 6.0mW/MHz @11B

2.0mW/MHz @11G

2.0mW/MHz @11N20SISO

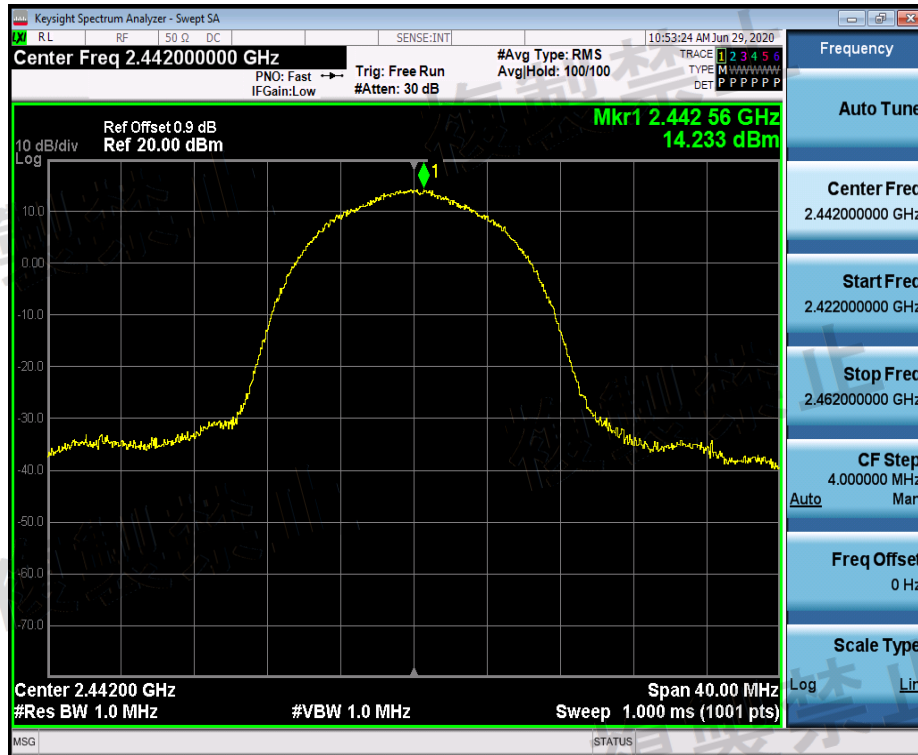
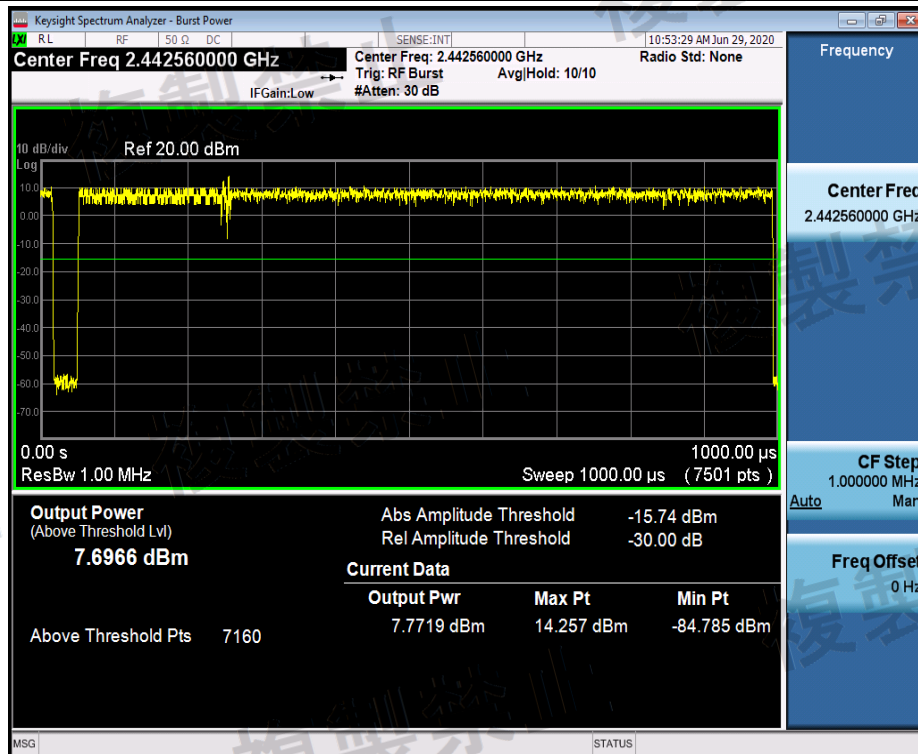
9.2.2 Test Graphs



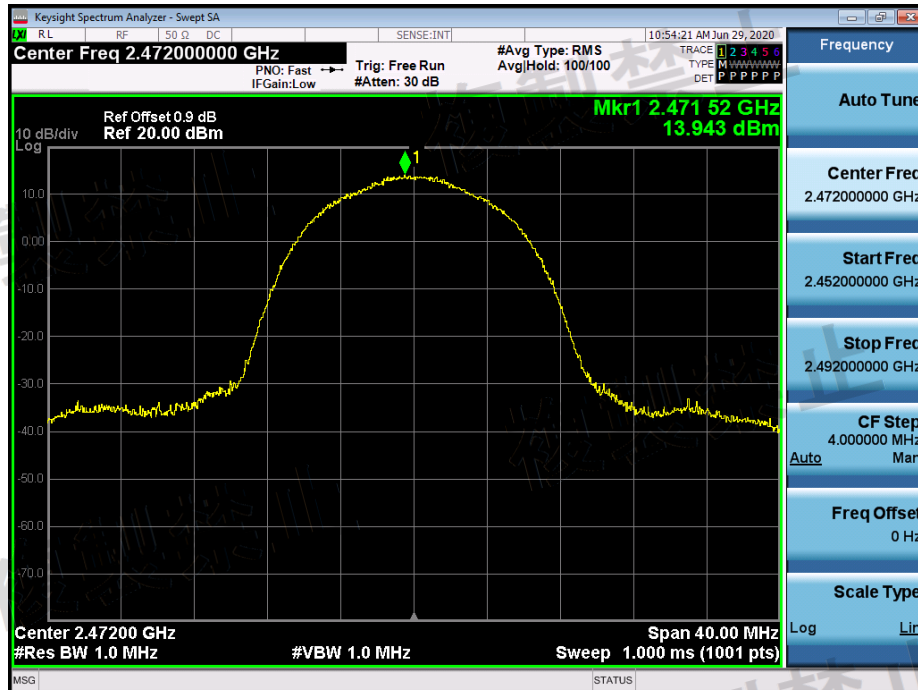
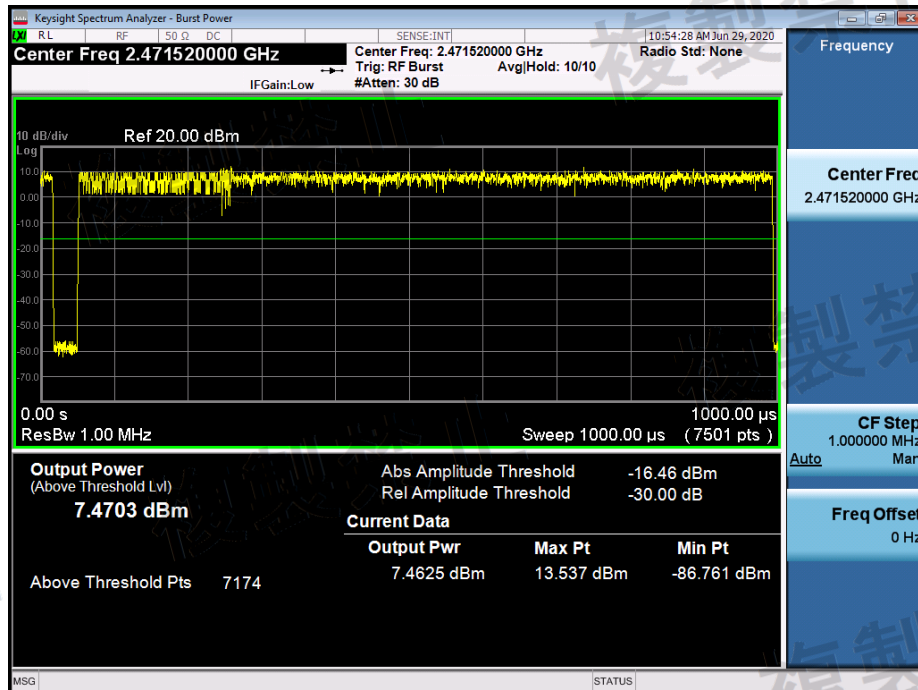
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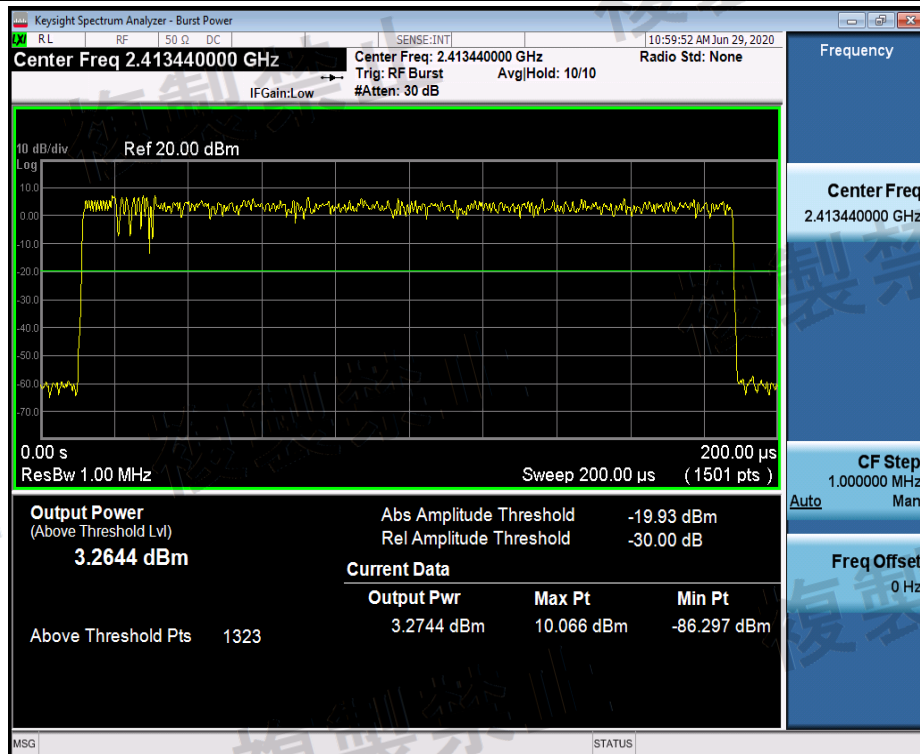
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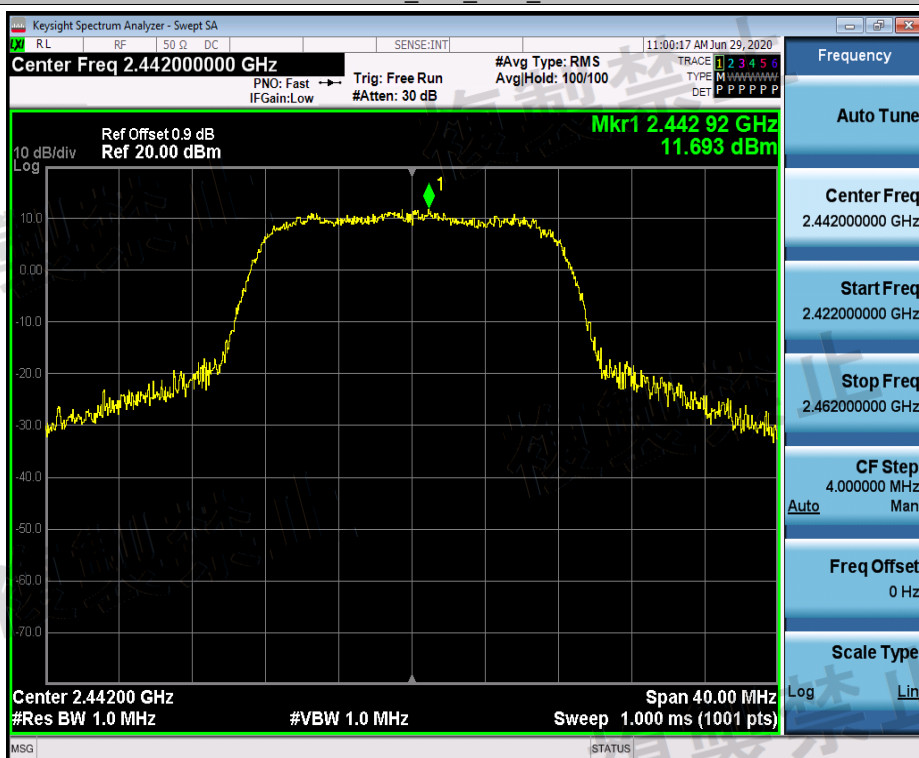
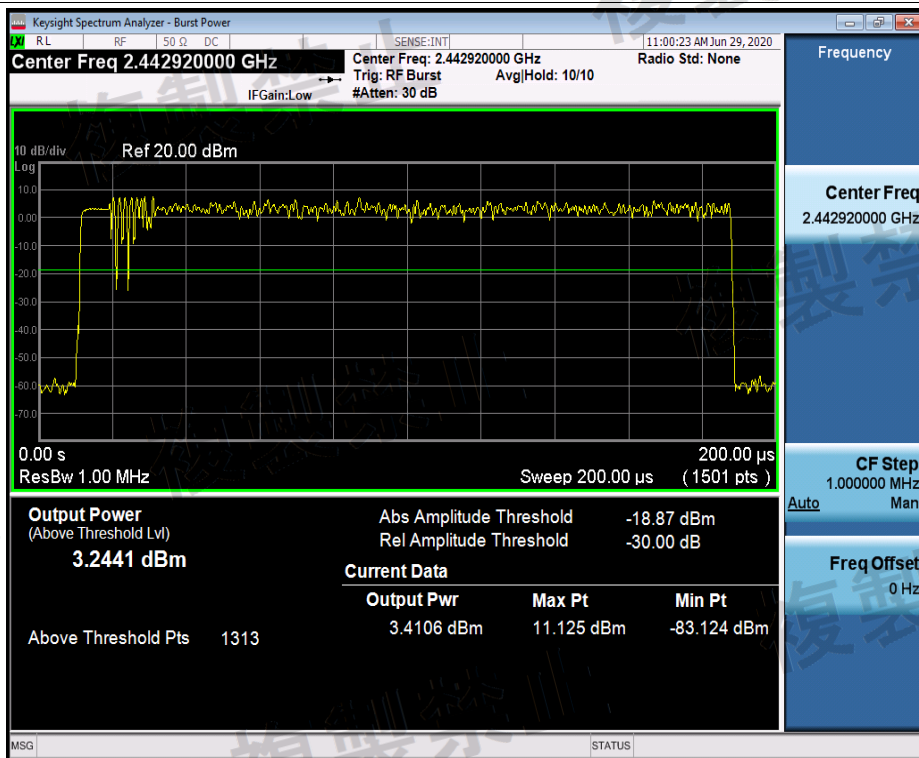
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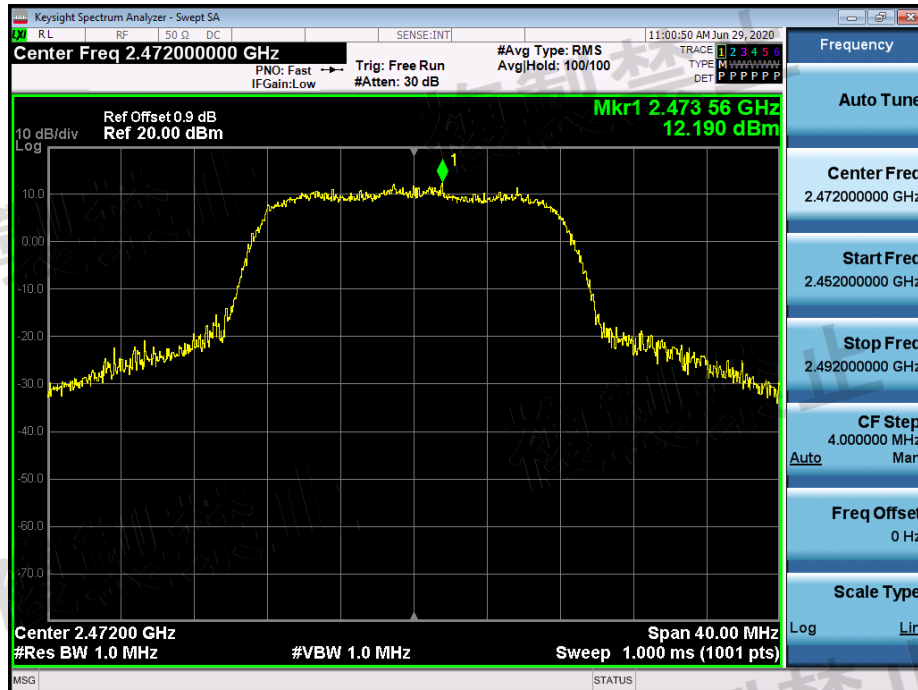
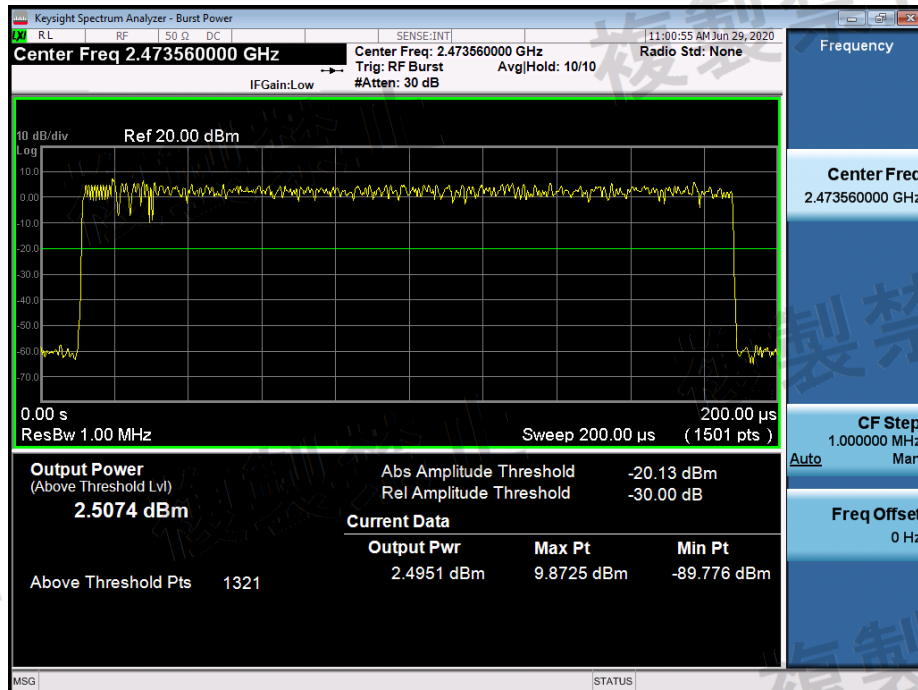
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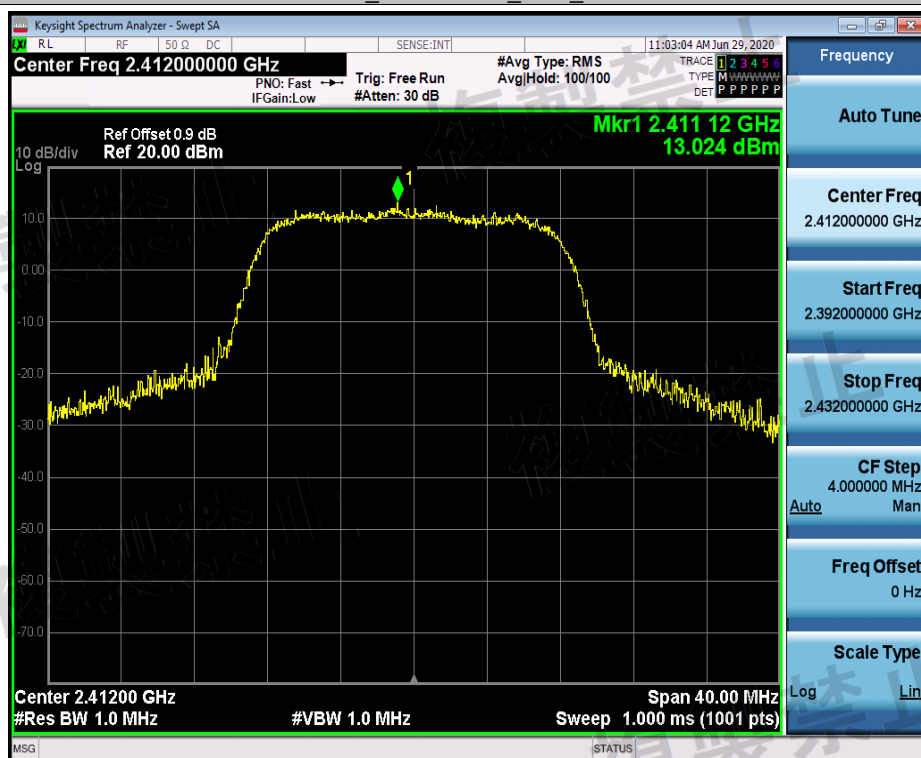
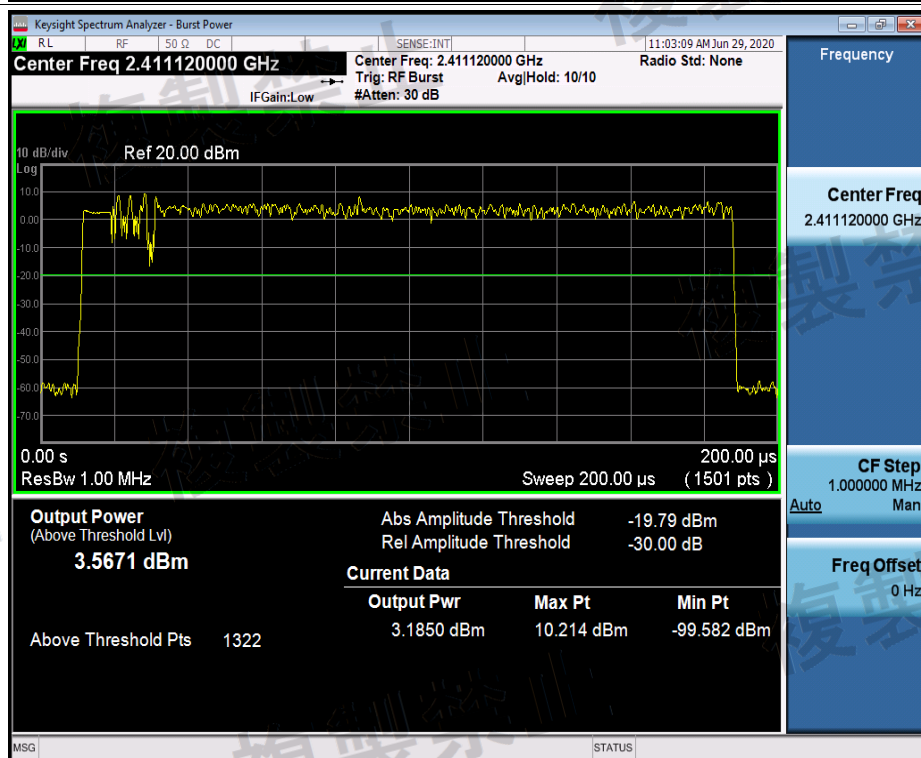
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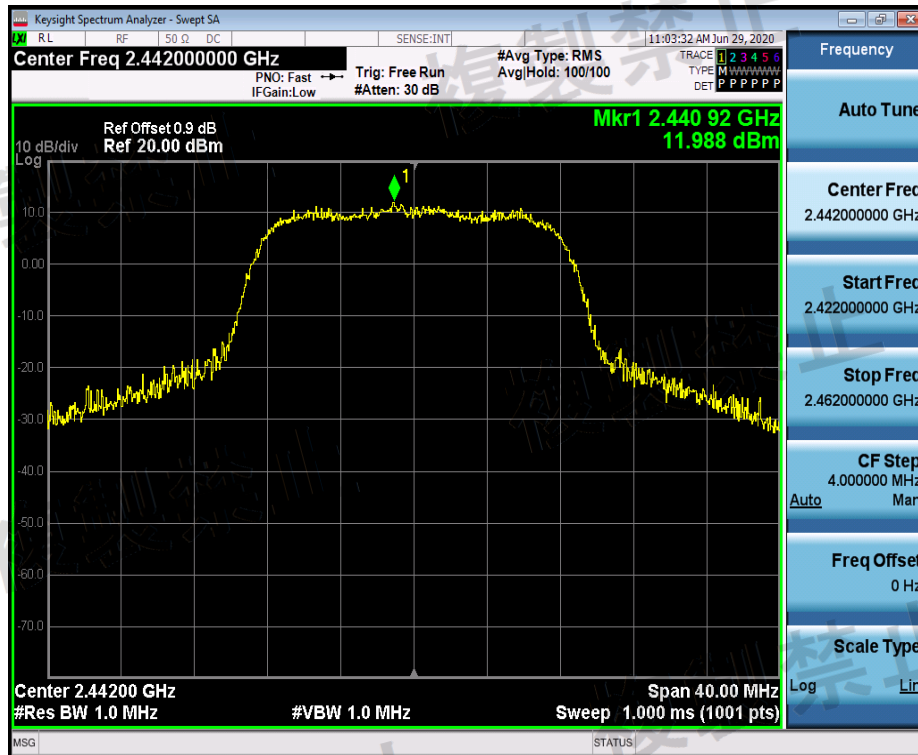
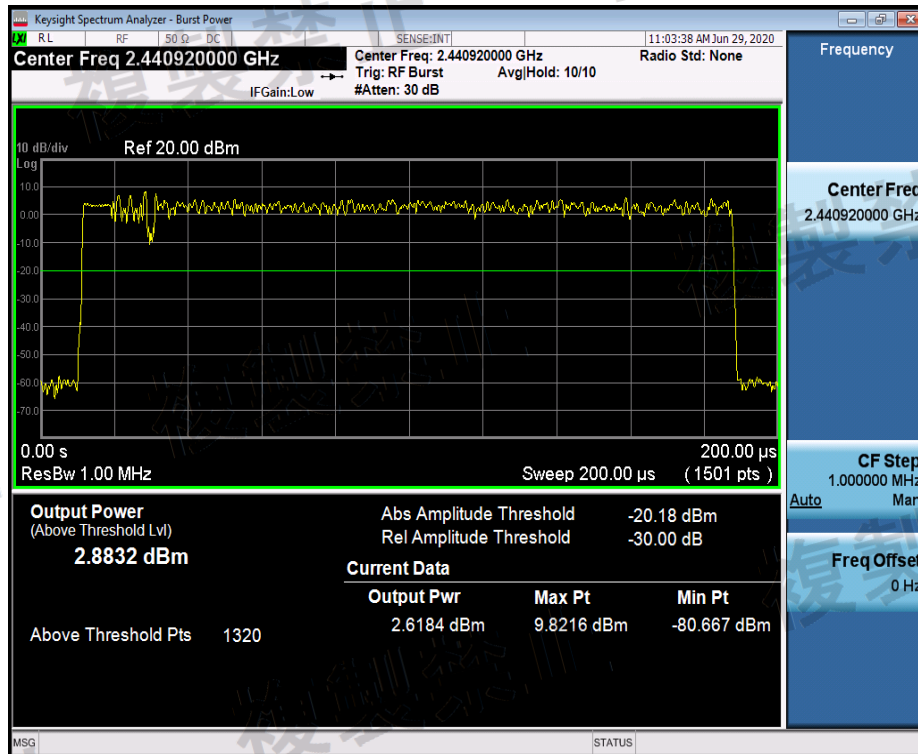
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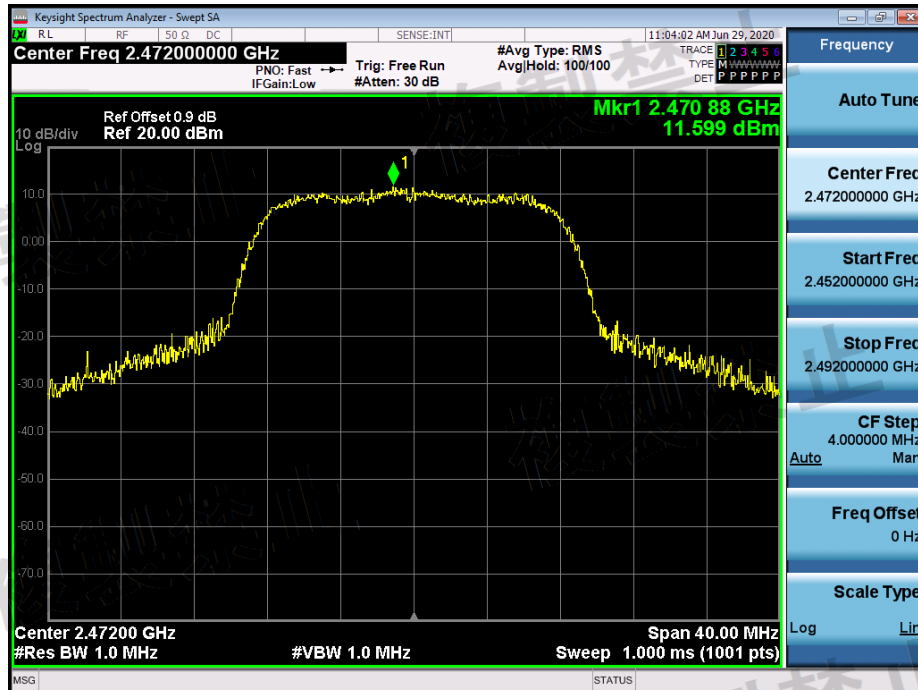
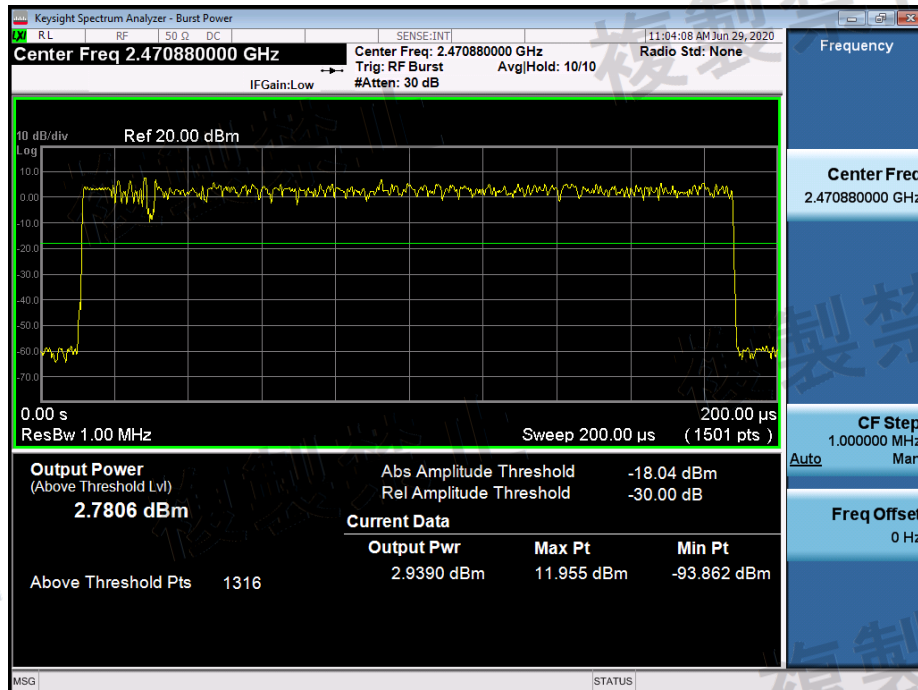
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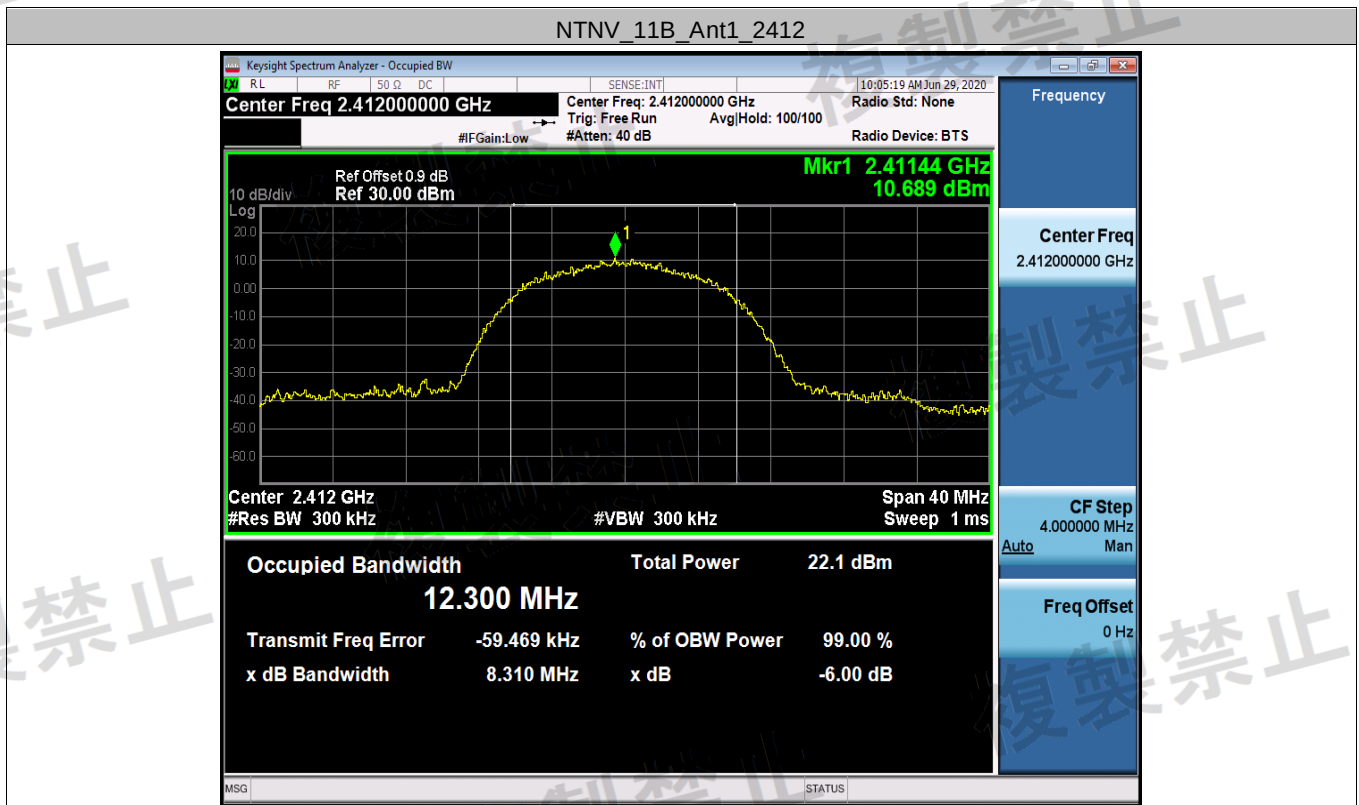
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9.3 Occupied Bandwidth

9.3.1 Test Result

TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTNV	11B	Ant1	2412	12.300	<=26	PASS
			2442	12.242	<=26	PASS
			2472	12.301	<=26	PASS
	11G	Ant1	2412	16.475	<=38	PASS
			2442	16.498	<=38	PASS
			2472	16.478	<=38	PASS
	11N20SISO	Ant1	2412	16.462	<=38	PASS
			2442	16.463	<=38	PASS
			2472	16.506	<=38	PASS

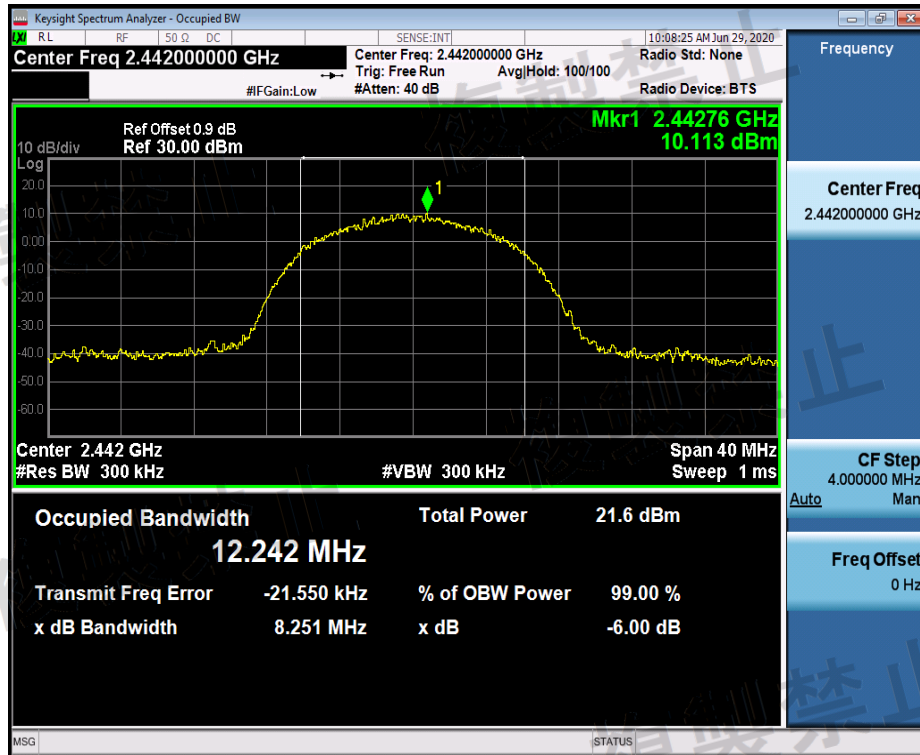
9.3.2 Test Graphs



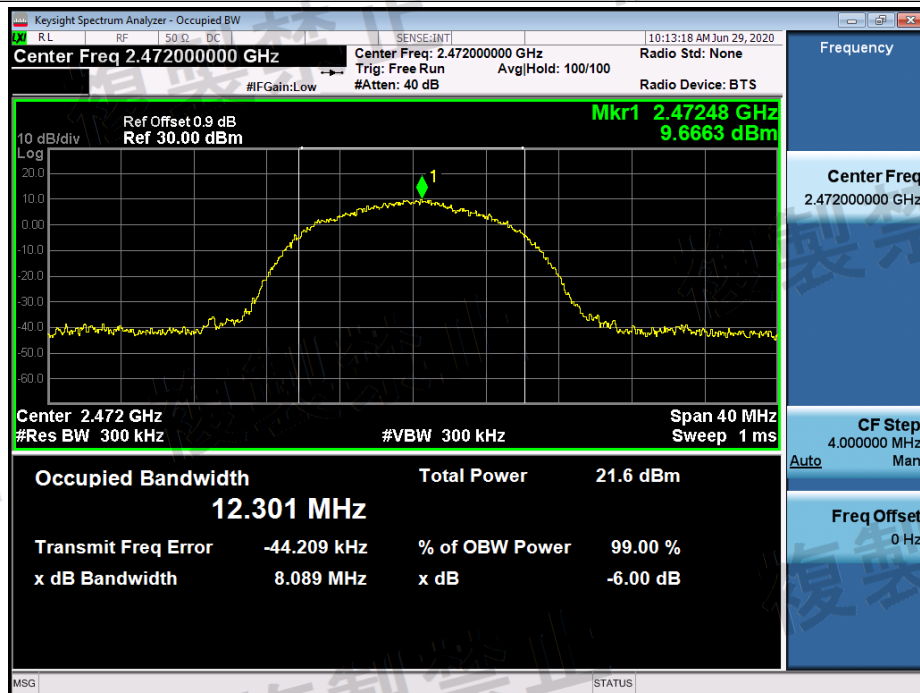
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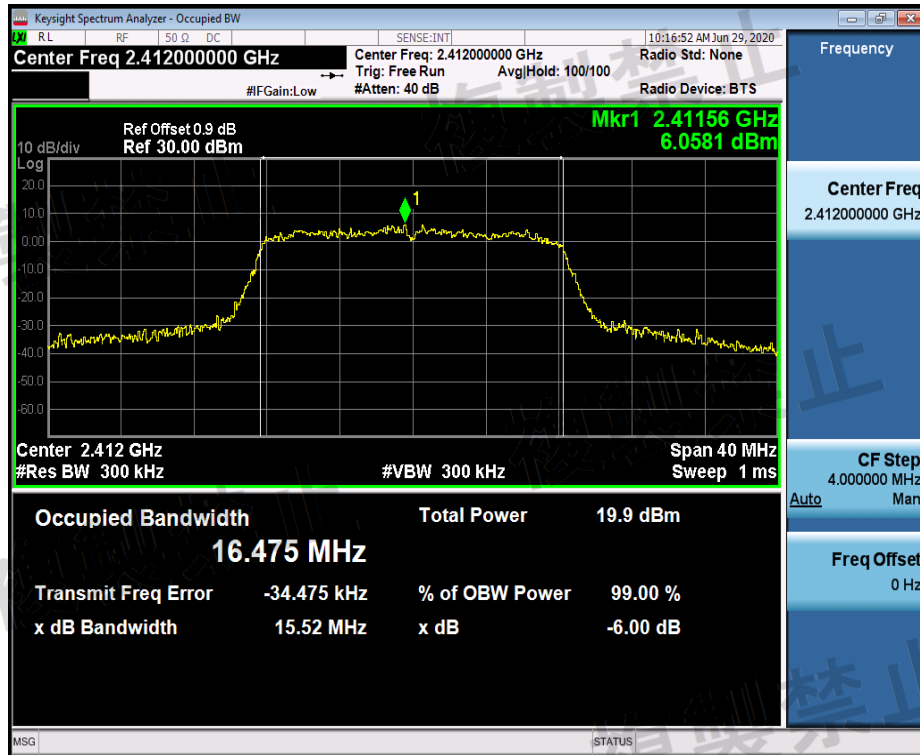
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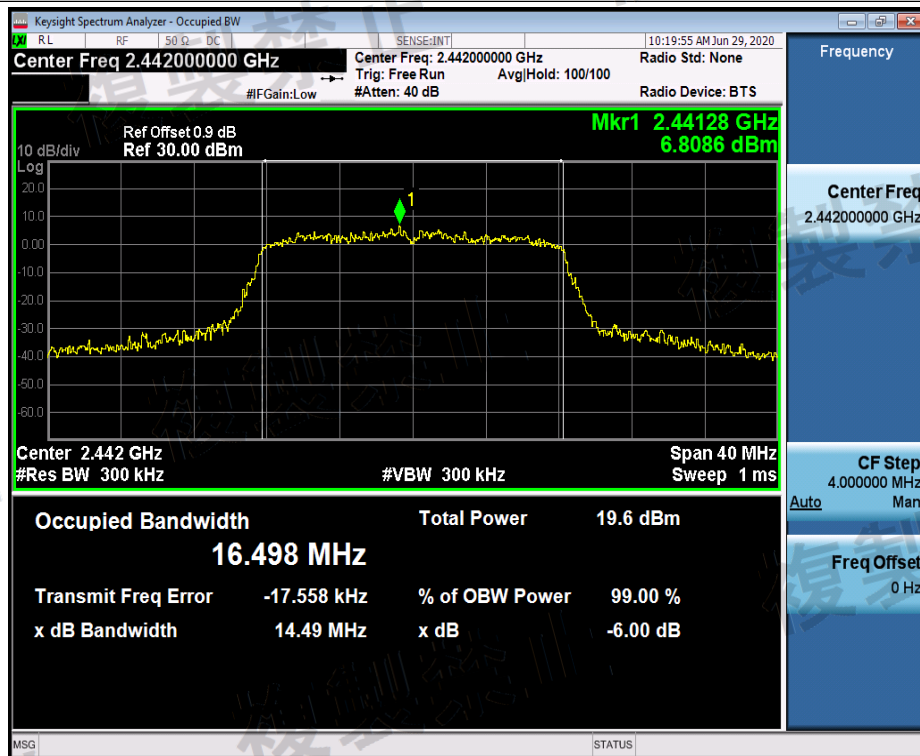
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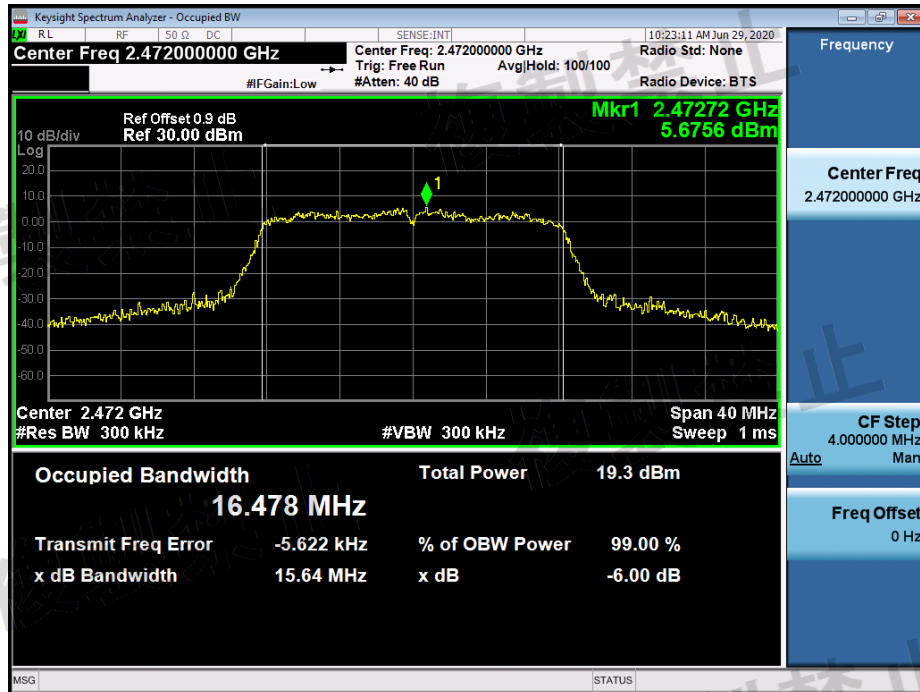
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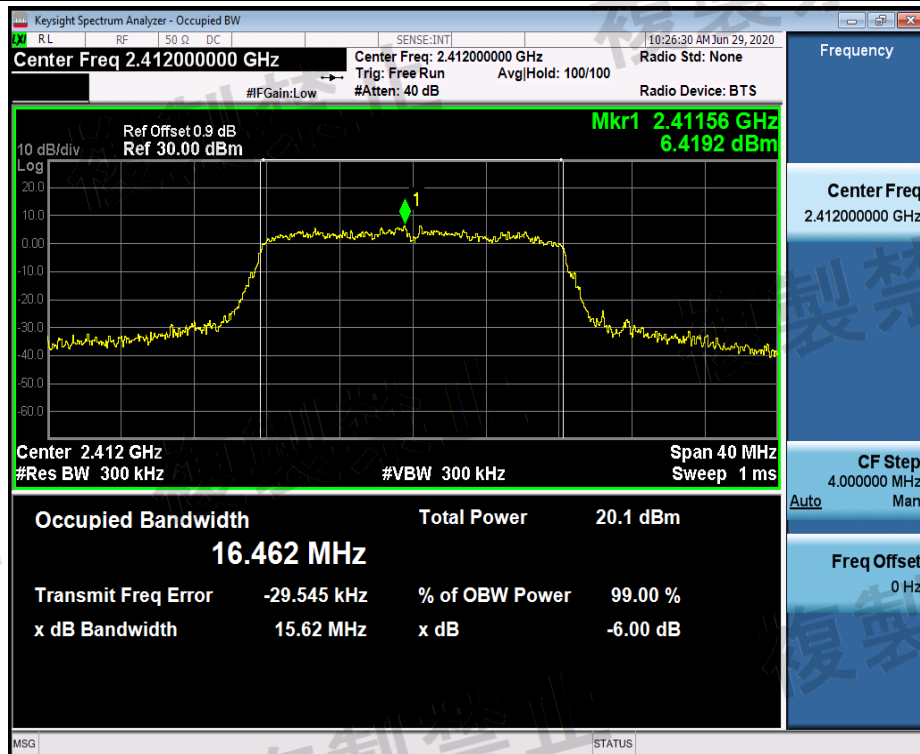
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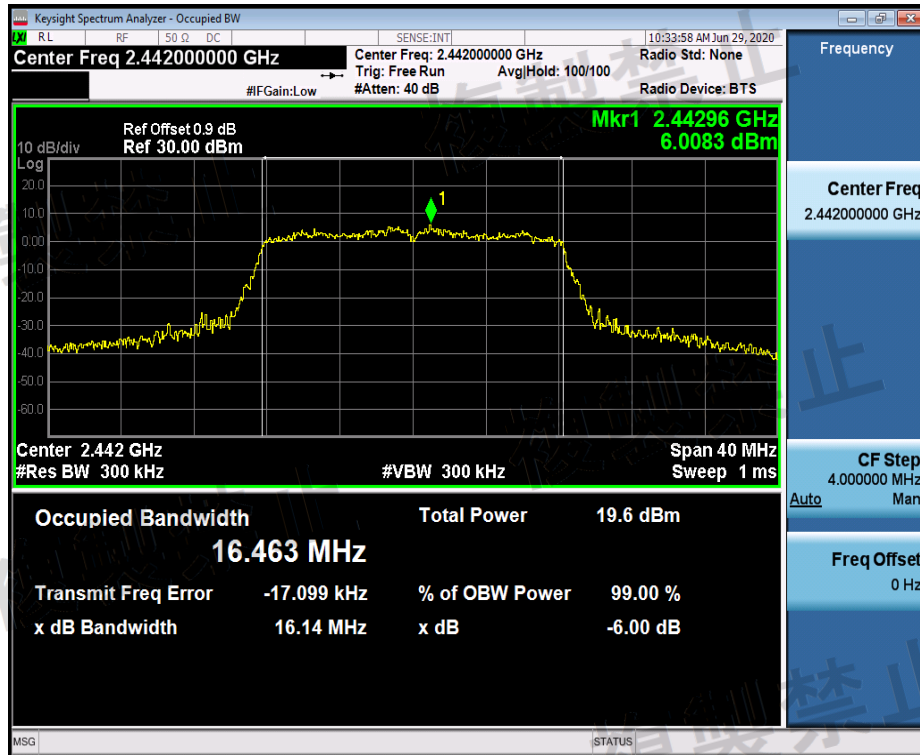
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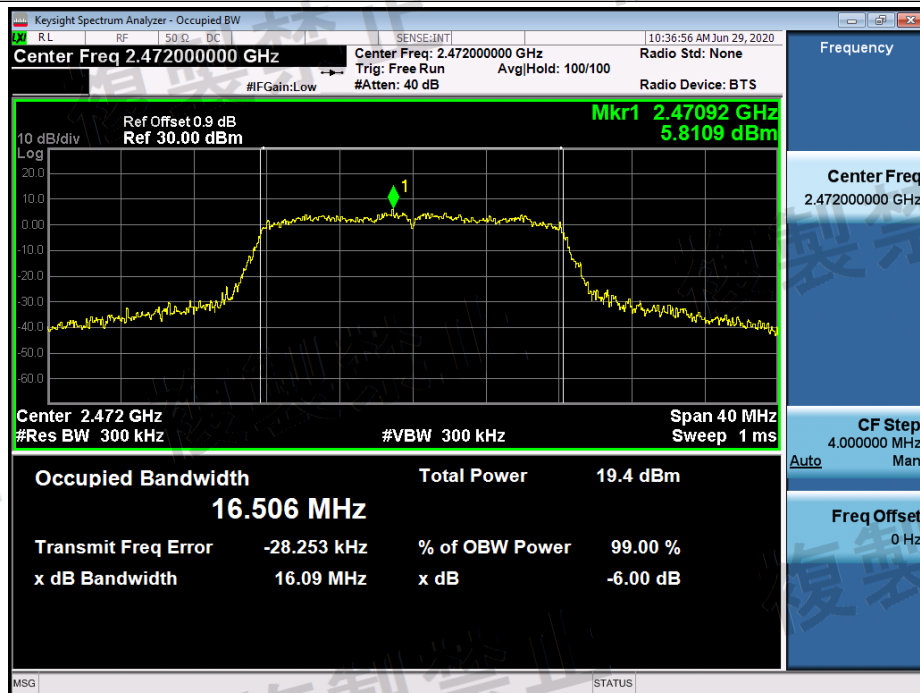
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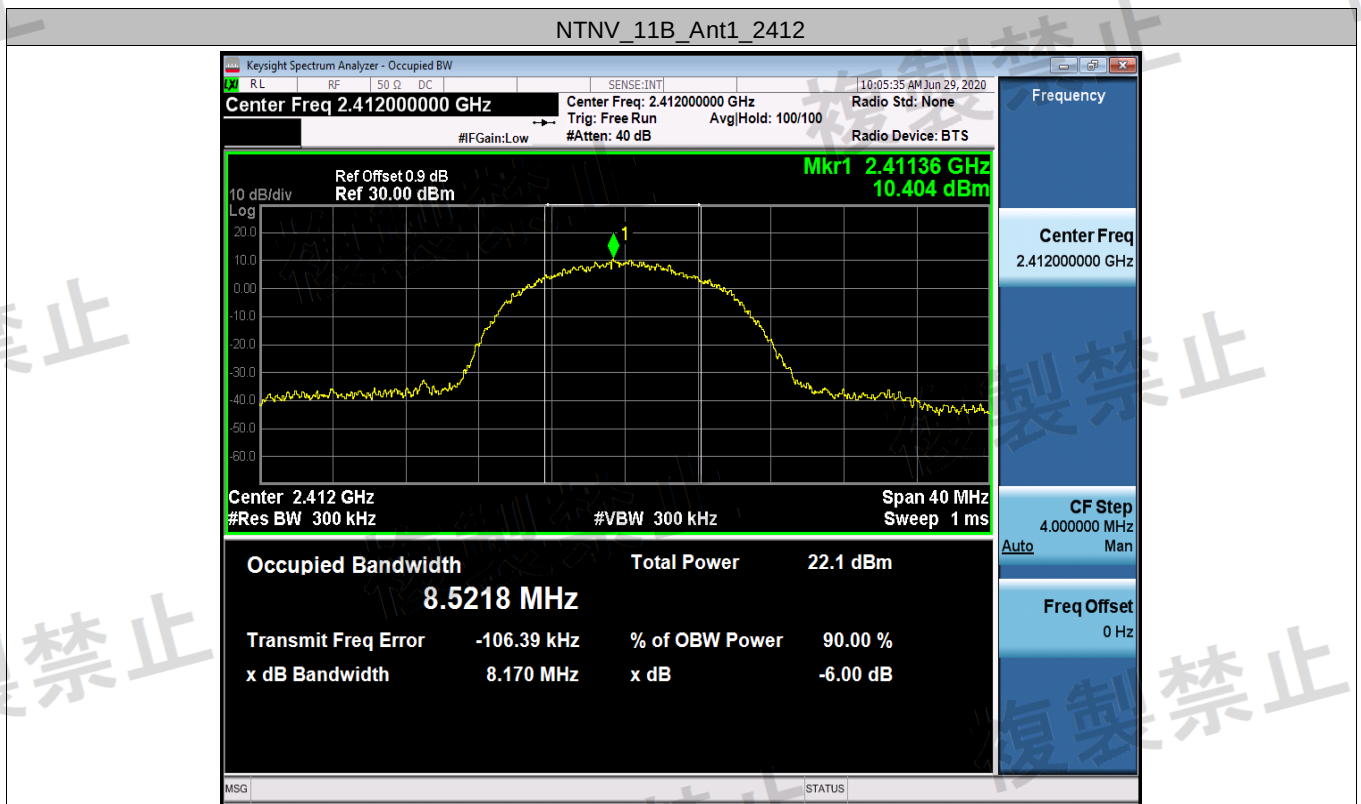
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9.4 Spread Bandwidth

9.4.1 Test Result

TestCondition	TestMode	Antenna	Channel	Result [MHz]	Limit [MHz]	Verdict
NTNV	11B	Ant1	2412	8.5218	>=0.5	PASS
			2442	8.4562	>=0.5	PASS
			2472	8.5811	>=0.5	PASS
	11G	Ant1	2412	13.938	---	PASS
			2442	13.937	---	PASS
			2472	14.031	---	PASS
	11N20SISO	Ant1	2412	14.086	---	PASS
			2442	14.098	---	PASS
			2472	13.905	---	PASS

9.4.2 Test Graphs

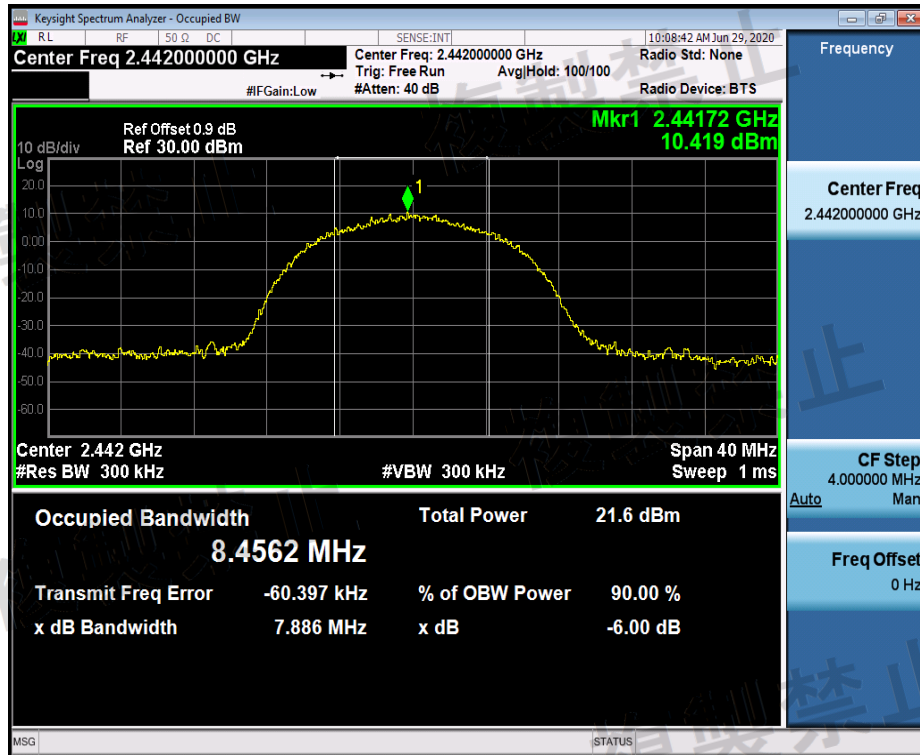


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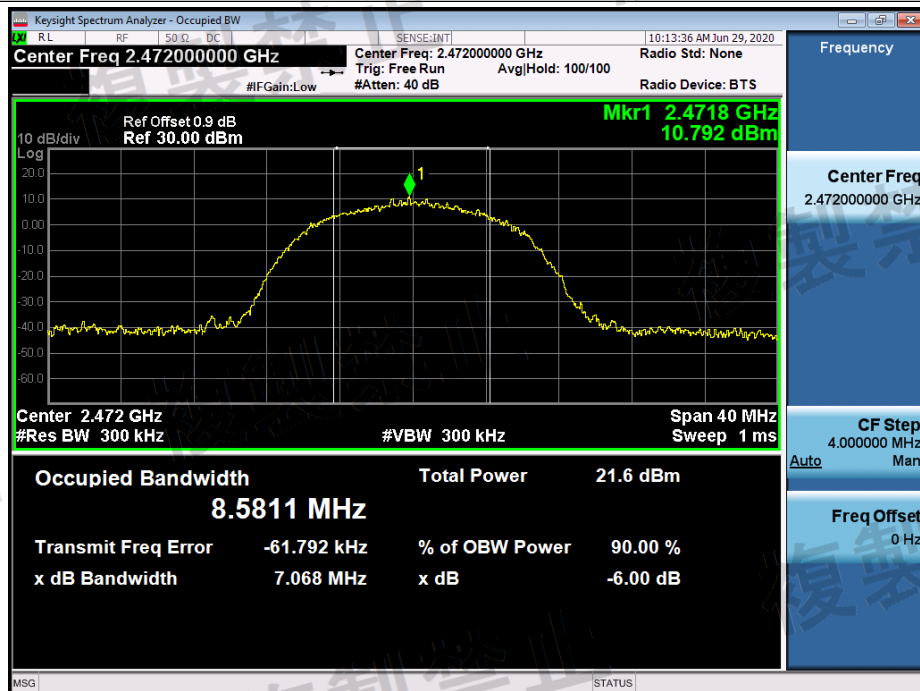
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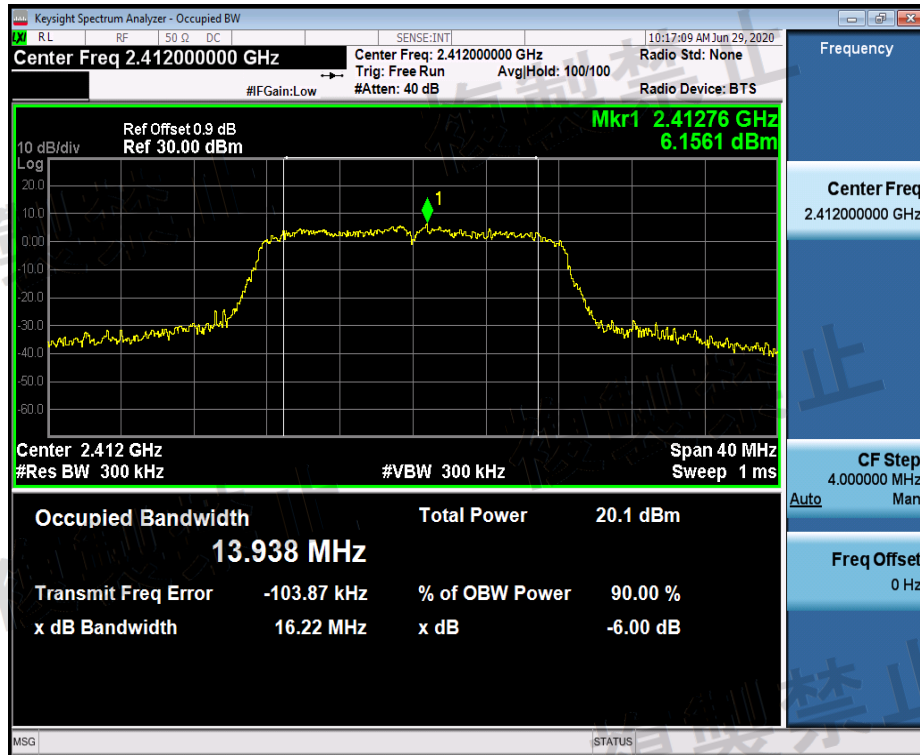
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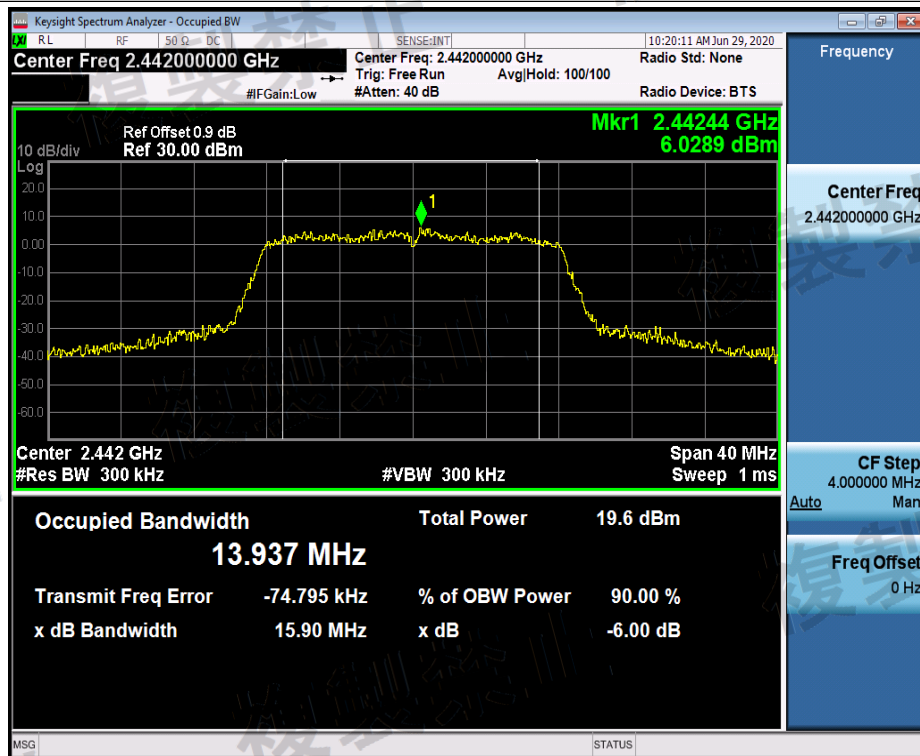
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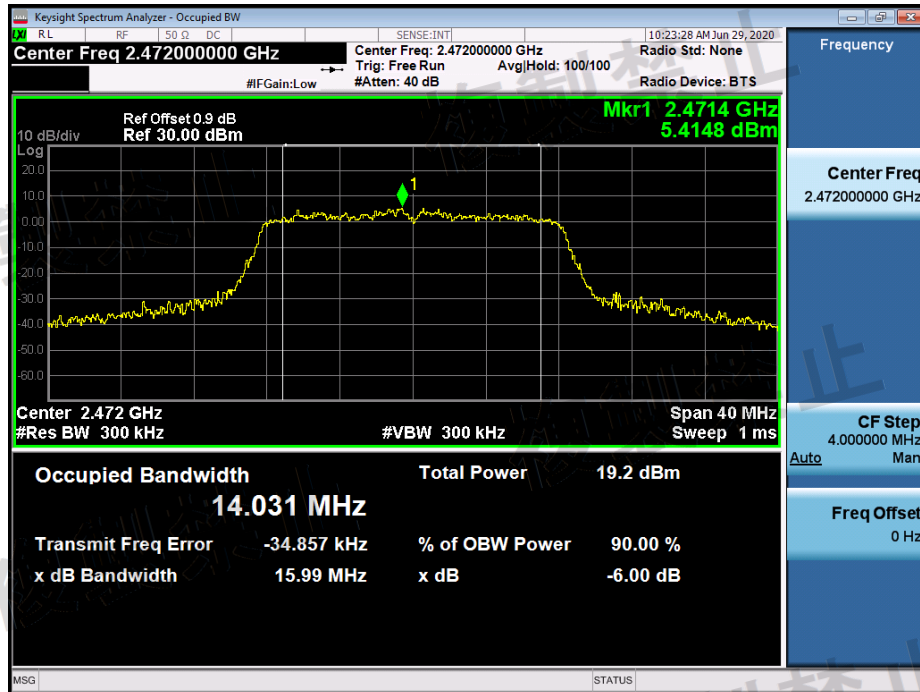
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