



SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch

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

Telephone: +86 (0) 20 82155555

Fax: +86 (0) 20 82075059

Email: ee.guangzhou@sgs.com

Report No.: GZEM181200007401

Page: 1 of 44

TEST REPORT

Application No.: GZEM1812000074CR
Applicant: GenGee Technology Co., Ltd.
Address of Applicant: Unit 127-133, Building A3, No.132, Huachang Rd., XiaMen Area of China(Fujian) Pilot Free Trade Zone(361003)
Manufacturer: The same as Applicant
Address of Manufacturer: The same as Applicant
Equipment Under Test (EUT):
EUT Name: INSAIT JOY Smart Football
Model No.: F4-AA, F5-AA. □
□ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Trade Mark:



Standard(s) : MIC Item 19 of Article 2 Paragraph 1
Date of Receipt: 2018-12-20
Date of Test: 2019-01-18
Date of Issue: 2019-01-23

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



Kobe Jian
Lab Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2019-01-23		Original

Authorized for issue by:			
Tested By		2019-01-18	
		Kevin_Zhang /Project Engineer	Date
Checked By		2019-01-23	
		Jerry_Chan /Reviewer	Date



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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

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

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
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.: F4-AA, F5-AA

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 outer decoration.

Therefore only one model F5-AA was tested in this report.

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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 5.0V for wireless charging. DC 3.7V for battery.
Test Voltage:	DC 3.7V
Cable:	N/A
Antenna Gain:	2dBi
Antenna Type:	Chip Antenna
BT Version:	Bluetooth 4.0 BLE
Software:	nRFgo Studio v1.21.2.10
Channel Spacing:	2MHz
Modulation Type:	GFSK
Number of Channels:	40
Operation Frequency:	2402MHz to 2480MHz

4.2 EUT Configurations

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

Test Channel		Frequency
B	CH0	2402MHz
M	CH19	2440MHz
T	CH39	2480MHz

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

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4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	T430u	REF. No.SEA1800

4.4 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	$\pm 3\%$

4.5 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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4.6 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-CL01:2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 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-1)**

The 3m/10m Alternate Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Certification and Engineering of Industry Canada for radio equipment testing with Registration No. 4620B-1.

● **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.

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4.7 Deviation from Standards

None

4.8 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	2018-03-10	2019-03-09
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2018-04-10	2019-04-10
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2018-09-20	2019-09-19
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2018-09-20	2019-09-19
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A

Occupied Bandwidth(99%)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2018-03-10	2019-03-09
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2018-04-10	2019-04-10
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2018-09-20	2019-09-19
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2018-09-20	2019-09-19
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A

Antenna Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2018-03-10	2019-03-09
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2018-04-10	2019-04-10
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2018-09-20	2019-09-19
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2018-09-20	2019-09-19
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A



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Antenna Requirement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
MXA Signal Analyzer	AgilentTechnologies	N9020A	SEM004-10	2018-03-10	2019-03-09
ESG Vector Signal Generator	Keysight	E4438C	SEM006-03	2018-04-10	2019-04-10
EXG Analog Signal Generator	AgilentTechnologies	N5171B	SEM006-04	2017-07-26	2020-07-25
Power Meter	AgilentTechnologies	U2021XA_Ch2	SEM009-02	2018-09-20	2019-09-19
Power Meter	AgilentTechnologies	U2021XA_Ch3	SEM009-03	2018-09-20	2019-09-19
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2018-07-20	2019-07-19
DMM	Fluke	73	EMC0007	2018-07-19	2019-07-18

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6 Radio Spectrum Technical Requirement

6.1 E.U.T. Test Conditions

Power supply: the RF unit supplied by 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 ($\pm 10\%$).
So, all measurements were conducted at only rated voltage DC 3.3V.
The measurement result of the voltage fluctuation at RF circuit when AC 100V $\pm 10\%$.

Battery output (DC 3.7V)	Measured value (3.3V)
DC 3.33V	3.3V
DC 3.7V	3.32V
DC 4.07V	3.28V

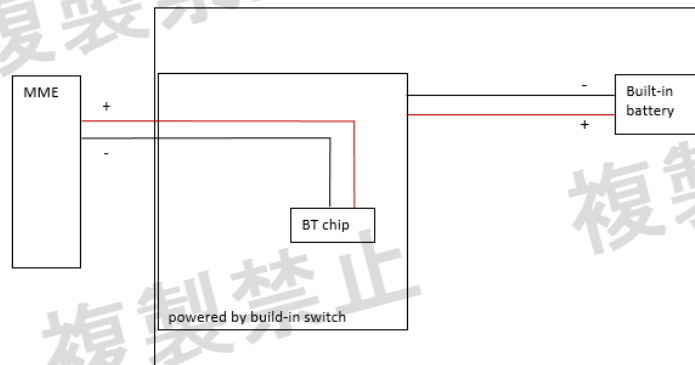
Temperature: 5.0 -35.0 °C

Humidity: 45-85 % RH

Atmospheric Pressure: 1000 -1010 mbar

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

6.1.1 Test Setup Diagram & test point



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7 Radio Spectrum Technical Requirement

7.1 Antenna Requirement

7.1.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

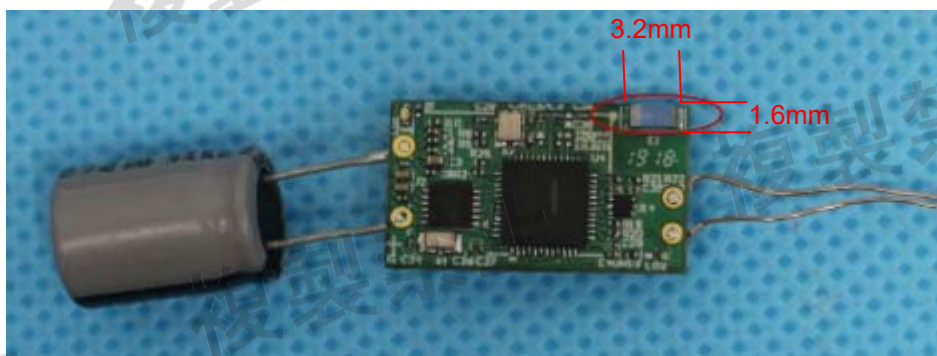
7.1.2 Conclusion

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 2dBi.



Result:

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

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7.2 Interference prevention capability

7.2.1 Test Requirement:

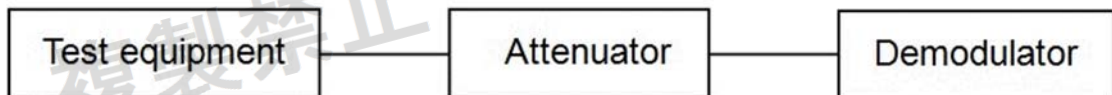
MIC Item 19 of Article 2 Paragraph 1

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.

7.2.2 Test Setup Diagram



7.2.3 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.

47:49:F3:C4:89:AF

EUT Details:

The unit does meet the requirements (Good).

7.3 RF accessibility

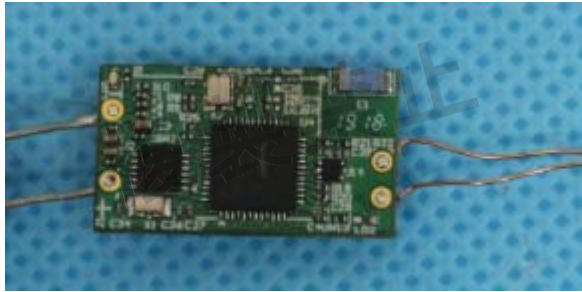
7.3.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

7.3.2 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:

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

8 Radio Spectrum Matter Test Results

8.1 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: $\pm 50\text{E-6}$

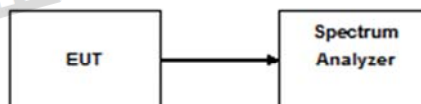
8.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 42.5 % RH Atmospheric Pressure: 1020 mbar

Test mode: a:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation

8.1.2 Test Setup Diagram



8.1.3 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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8.2 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

8.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.7 °C Humidity: 42.5 % RH Atmospheric Pressure: 1020 mbar
Test mode a:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation

8.2.2 Test Setup Diagram



8.2.3 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



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8.3 Antenna Power

Test Requirement MIC Item 19 of Article 2 Paragraph 1
Test Method: MIC Notice No.88 Appendix No.43
Limit: 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%

8.3.1 E.U.T. Operation

Operating Environment:
Temperature: 23.7 °C Humidity: 42.5 % RH Atmospheric Pressure: 1020 mbar
Test mode a:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation

8.3.2 Test Setup Diagram



8.3.3 Measurement Procedure and Data

- Test Conditions:
Spectrum Analyzer is used for measurement.
- 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.
- 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



8.4 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

8.4.1 E.U.T. Operation

Operating Environment:

Temperature:	23.7 °C	Humidity:	42.5 % RH	Atmospheric Pressure:	1020 mbar
Test mode	a:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation				

8.4.2 Test Setup Diagram



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Guangzhou Branch Testing & Inspection Laboratory | 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

8.4.3 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:

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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8.5 Limit of secondary radiated emissions

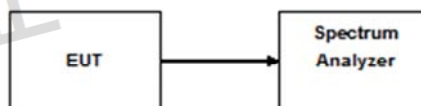
Test Requirement	MIC Item 19 of Article 2 Paragraph 1
Test Method:	MIC Notice No.88 Appendix No.43
Limit:	(1) Below 1 GHz : 4 nW or less (2) 1 GHz and over : 20 nW or less

8.5.1 E.U.T. Operation

Operating Environment:

Temperature:	23.7 °C	Humidity:	42.5 % RH	Atmospheric Pressure:	1020 mbar
Test mode	a:TX mode_Keep the EUT in continuously transmitting mode with GFSK modulation				

8.5.2 Test Setup Diagram



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8.5.3 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

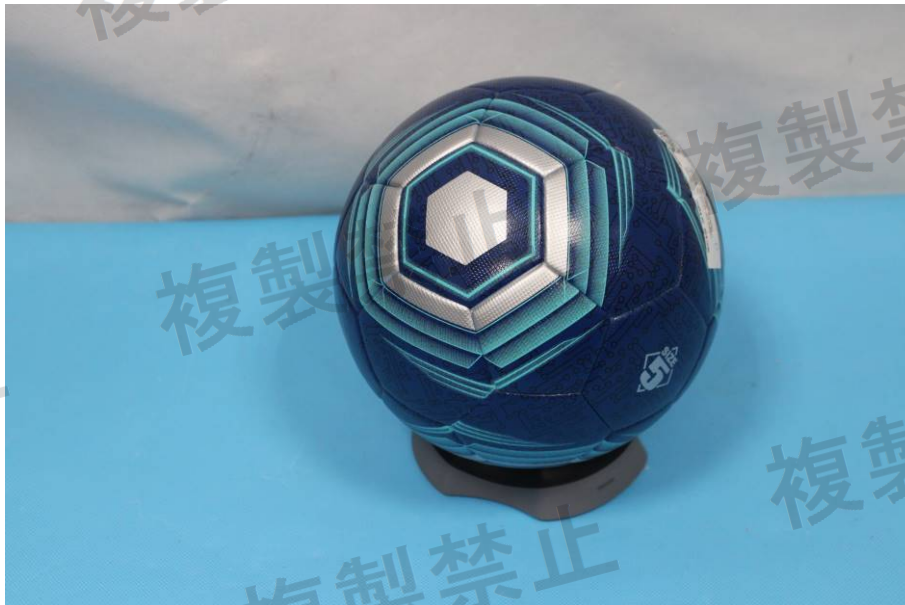


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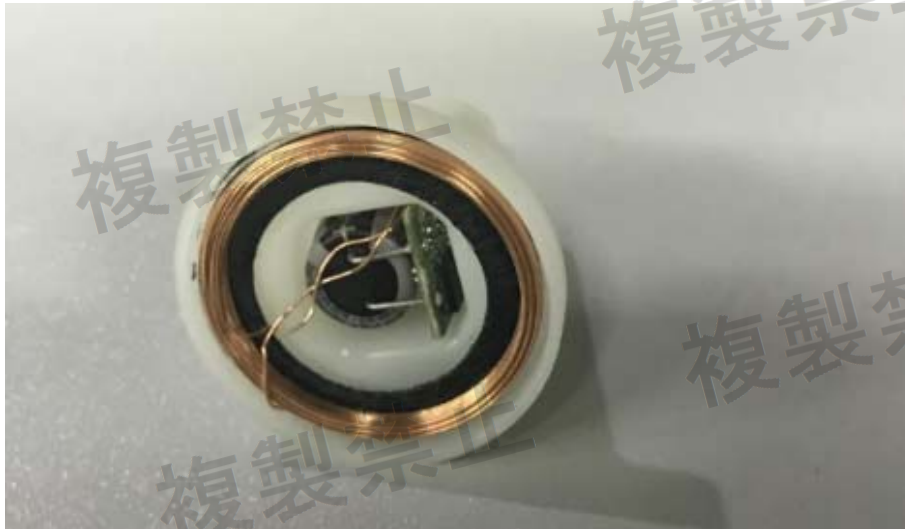
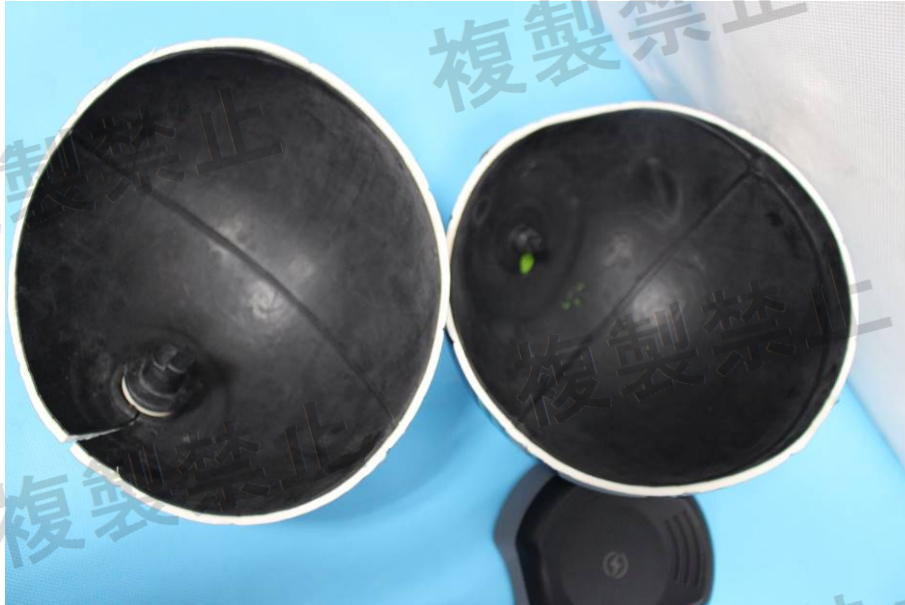
9 Photographs

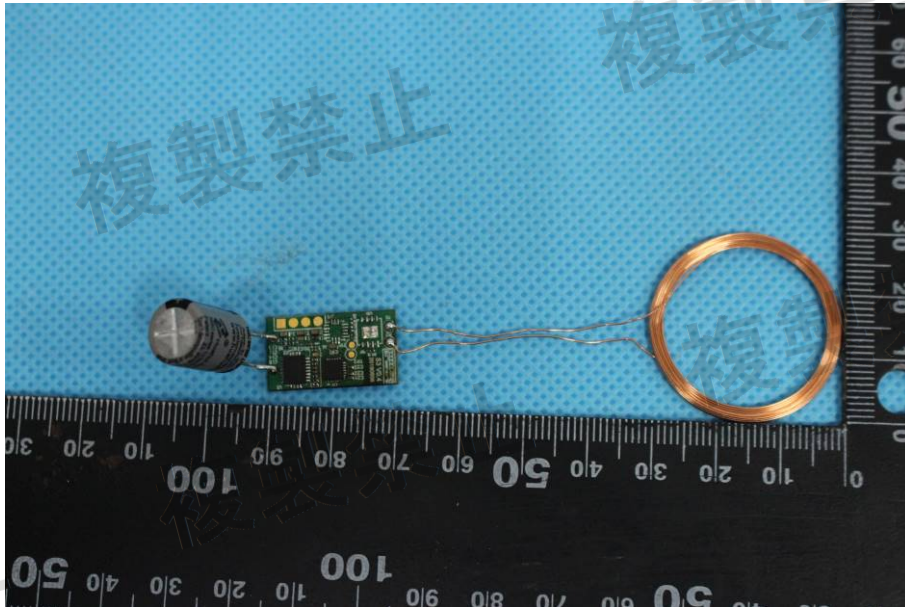
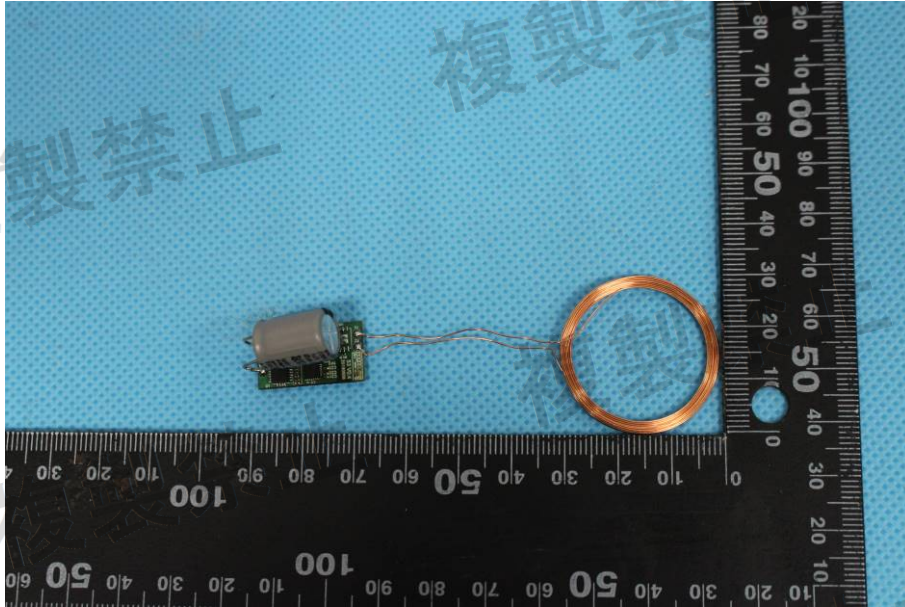
9.1 EUT Constructional Details



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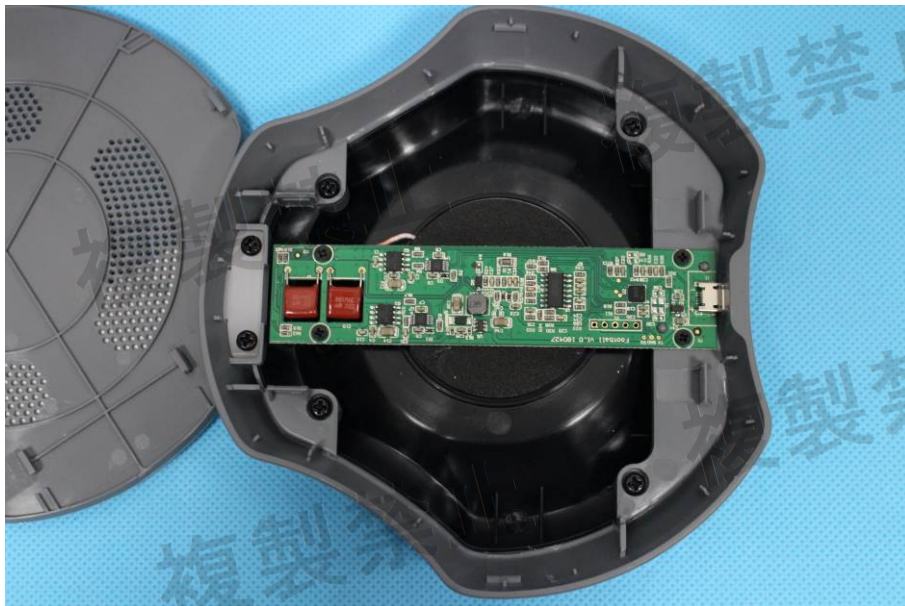
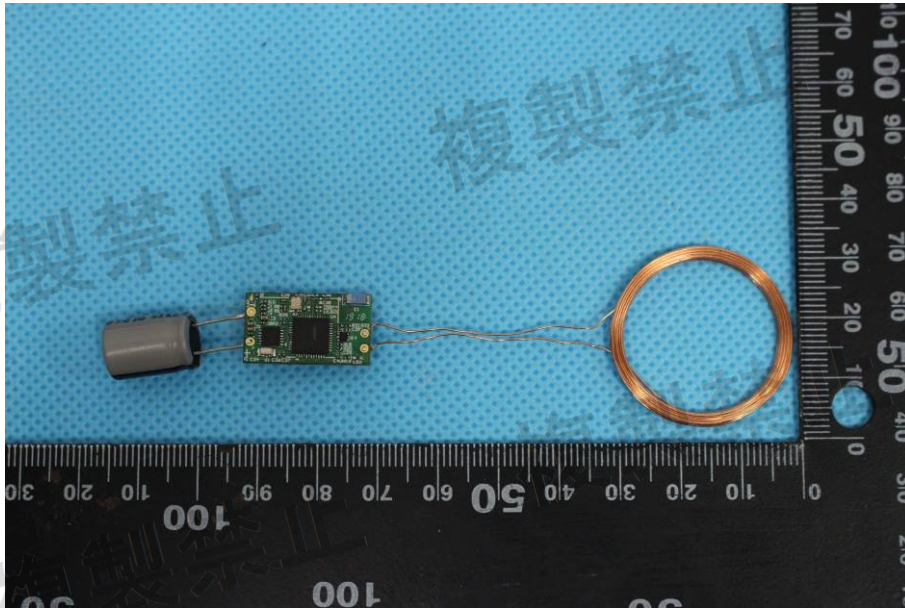
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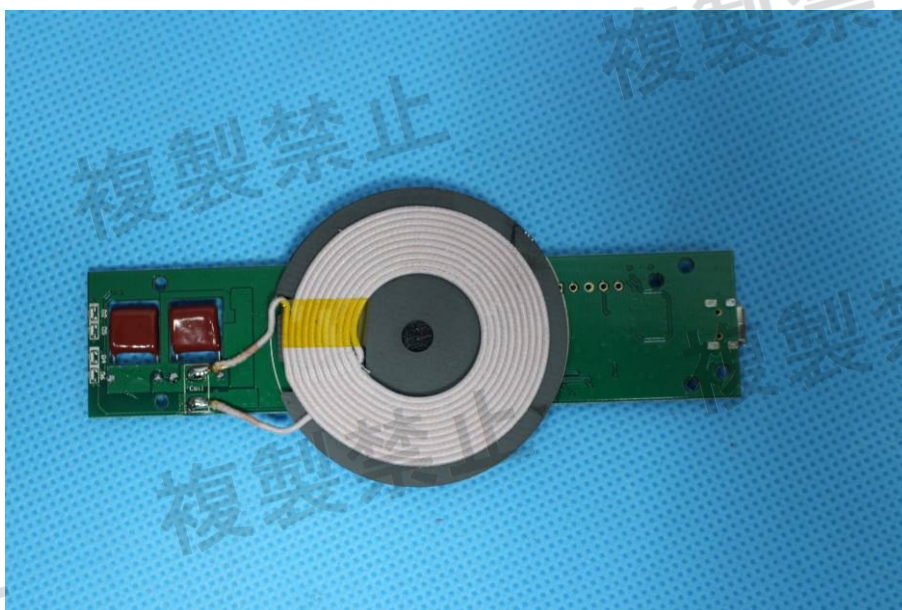
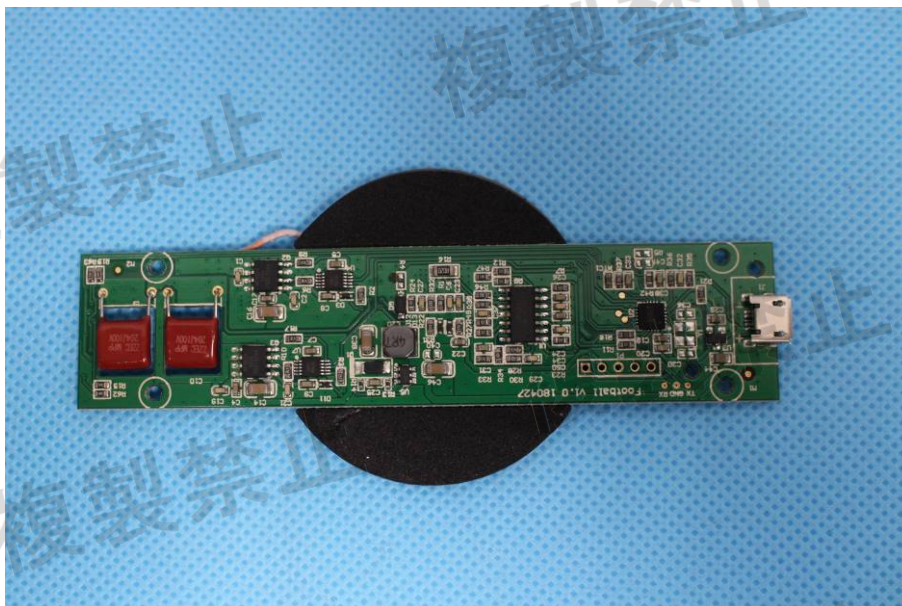
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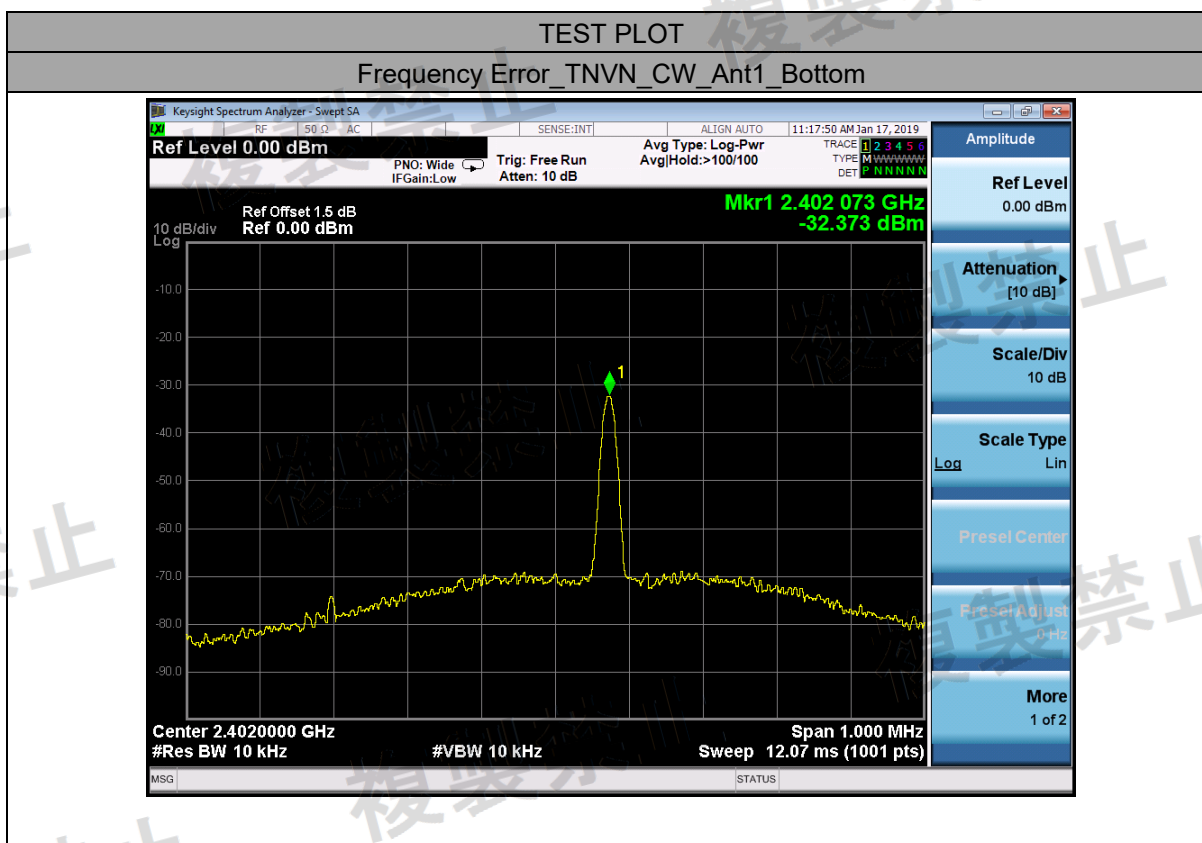
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10 Appendix

10.1 Appendix MIC19-2

1. Frequency Error

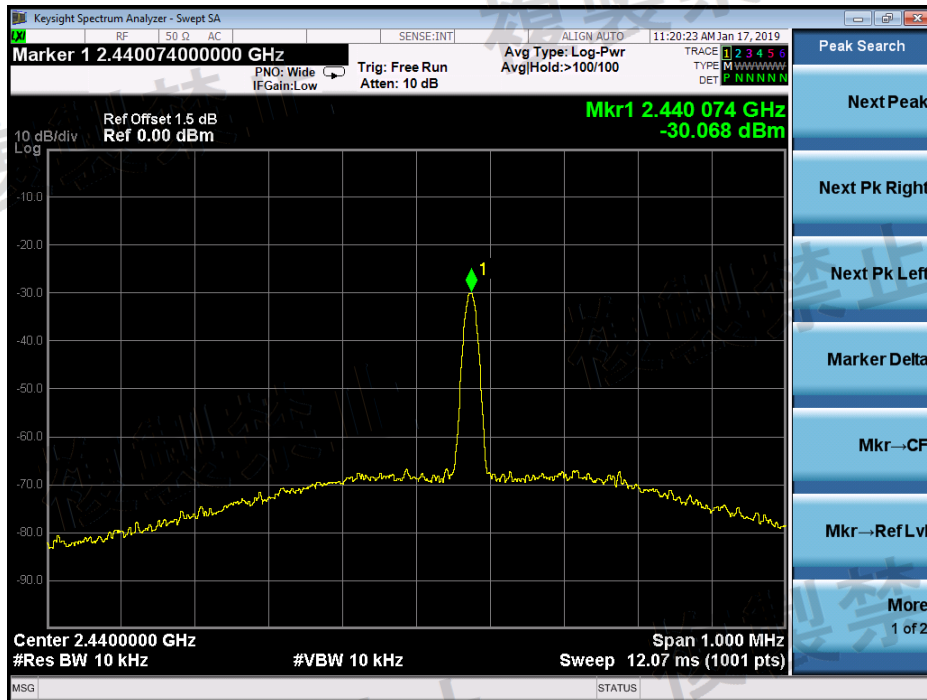
Test Condition	Test Mode	Test Channel	Ant	Test Result [MHz]	Result [PPM]	Limit [PPM]	Verdict
TNVN	CW	B	Ant1	2402.073	30.39	$\leq \pm 50$	PASS
TNVN	CW	M	Ant1	2440.074	30.33	$\leq \pm 50$	PASS
TNVN	CW	T	Ant1	2480.075	20.24	$\leq \pm 50$	PASS



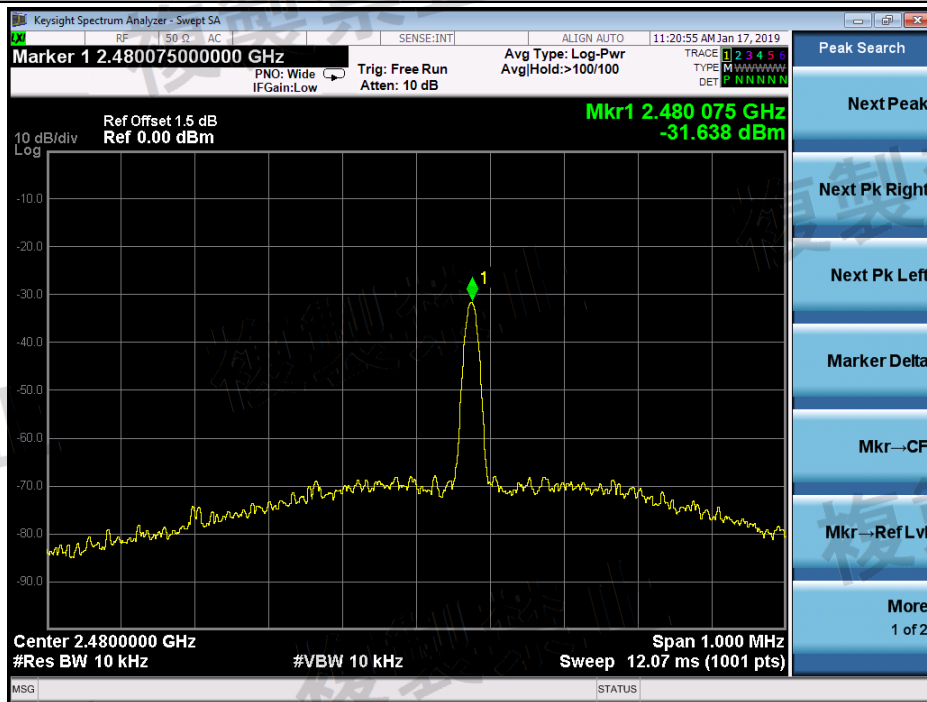
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Frequency Error_TNVN_CW_Ant1_Middle



Frequency Error_TNVN_CW_Ant1_Top

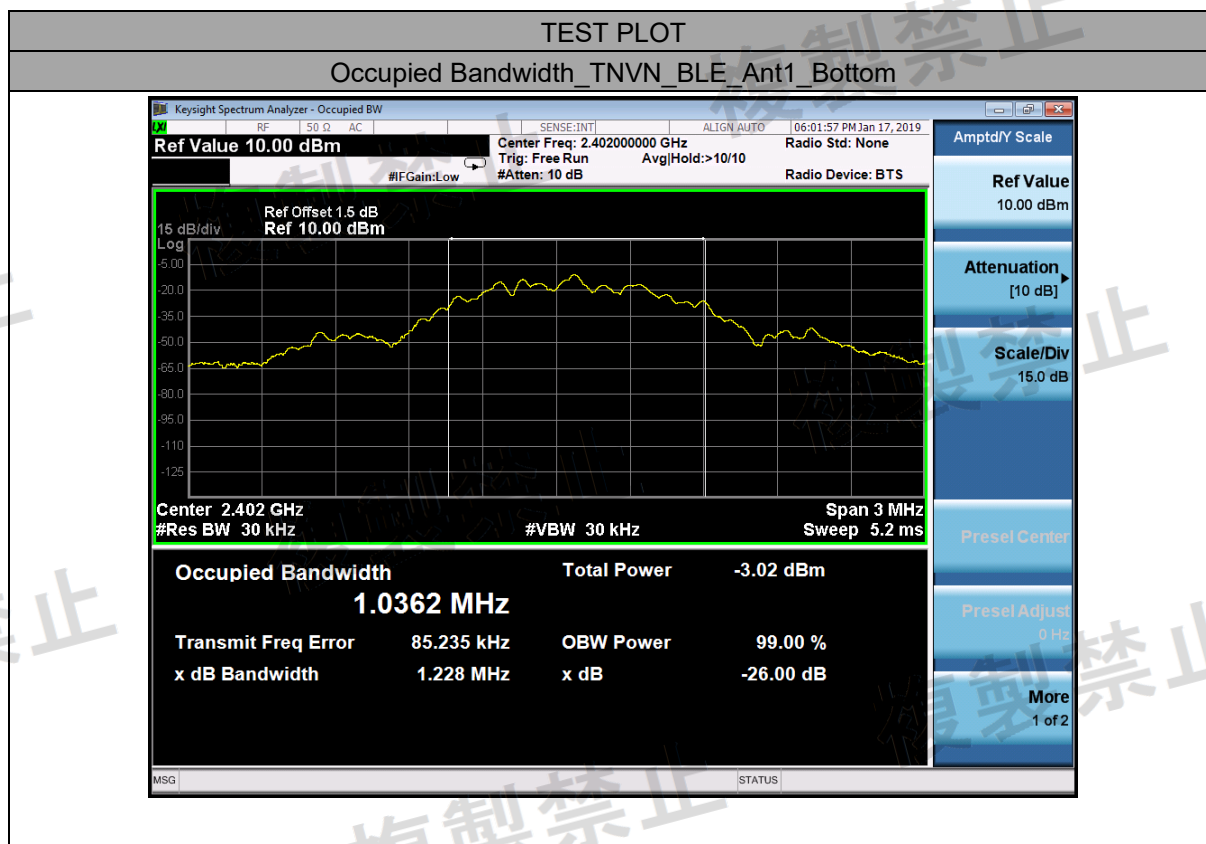


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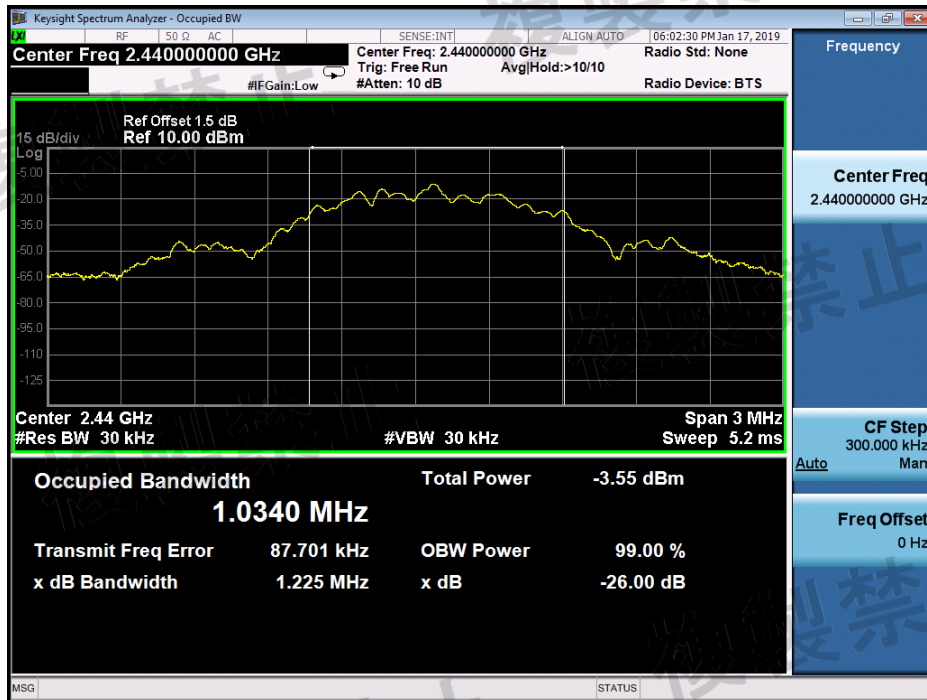
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2. Occupied Bandwidth (99%)

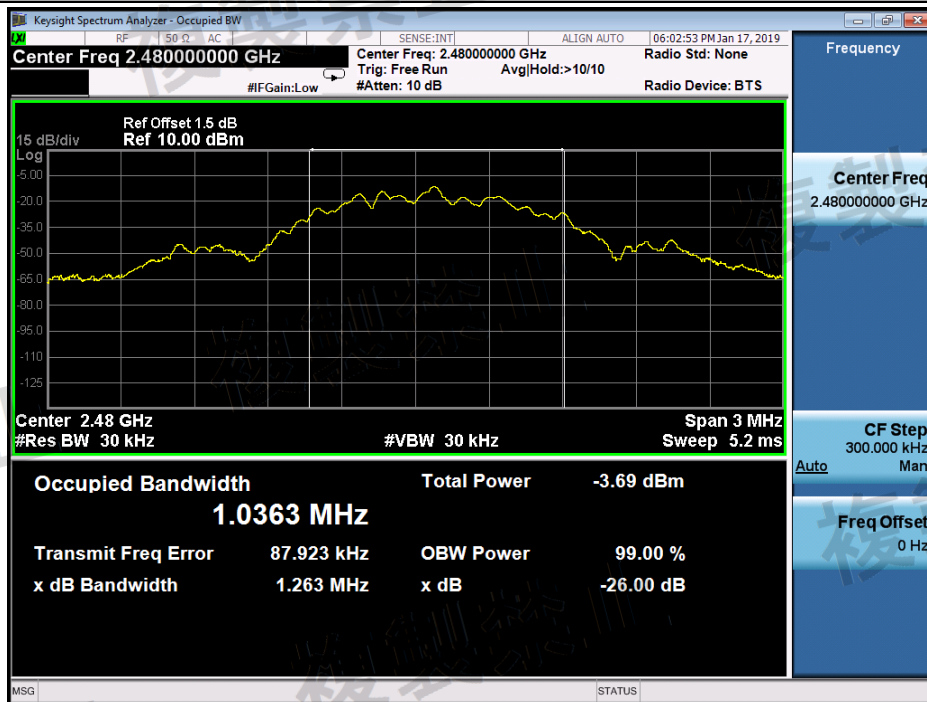
Test Condition	Test Mode	Test Channel	Ant	Test Result [MHz]	Limit [MHz]	Verdict
TNVN	BLE	B	Ant1	1.0362	<=26	PASS
TNVN	BLE	M	Ant1	1.0340	<=26	PASS
TNVN	BLE	T	Ant1	1.0363	<=26	PASS



Occupied Bandwidth_TNVN_BLE_Ant1_Middle



Occupied Bandwidth_TNVN_BLE_Ant1_Top



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3. Antenna Power

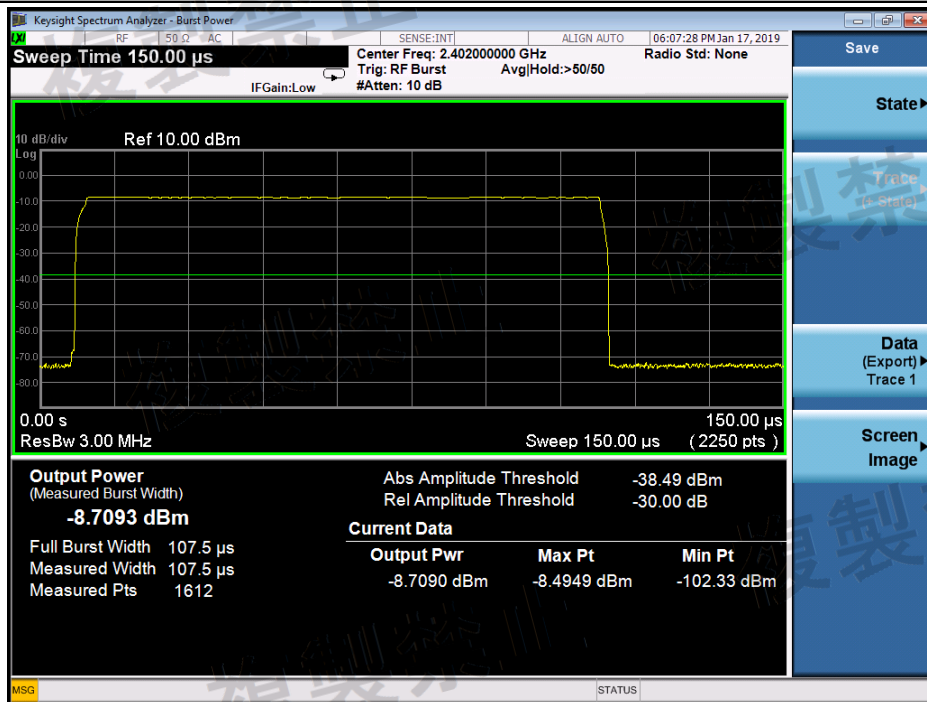
Test Condition	Test Mode	Test Channel	Ant	Ave. Burst Power [mW]	Limit [mW]	Tolerance [%]	Limit [%]	Verdict
TNVN	BLE	B	Ant1	0.135	10	3.85	-80 to +20	PASS
TNVN	BLE	M	Ant1	0.127	10	-2.31	-80 to +20	PASS
TNVN	BLE	T	Ant1	0.120	10	-7.70	-80 to +20	PASS

Remark:

Rated antenna power: 0.13mW

TEST PLOT

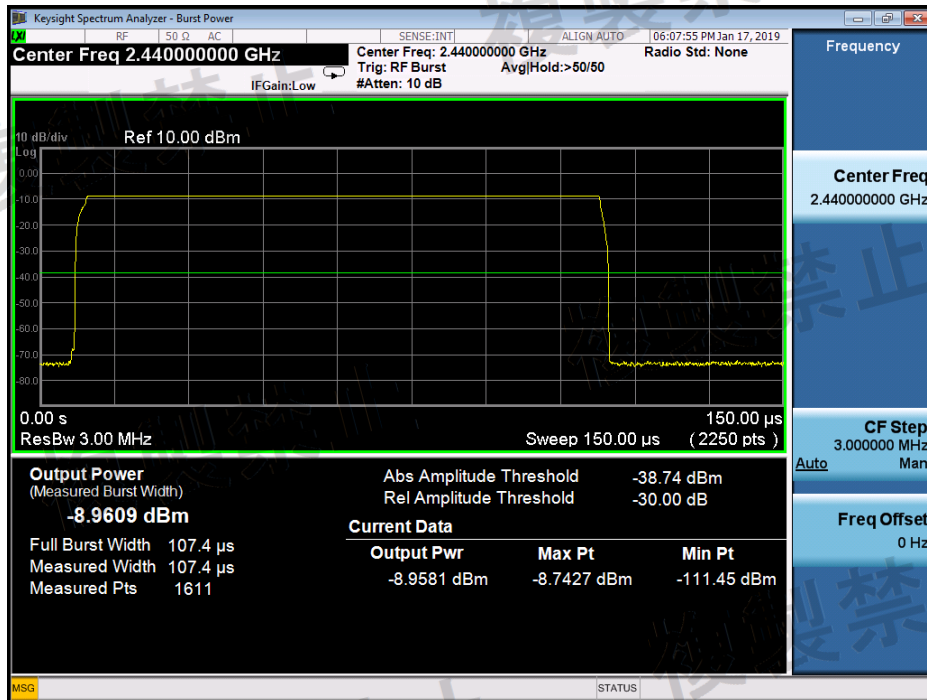
Ave. Burst Power_TNVN_BLE_Ant1_Bottom



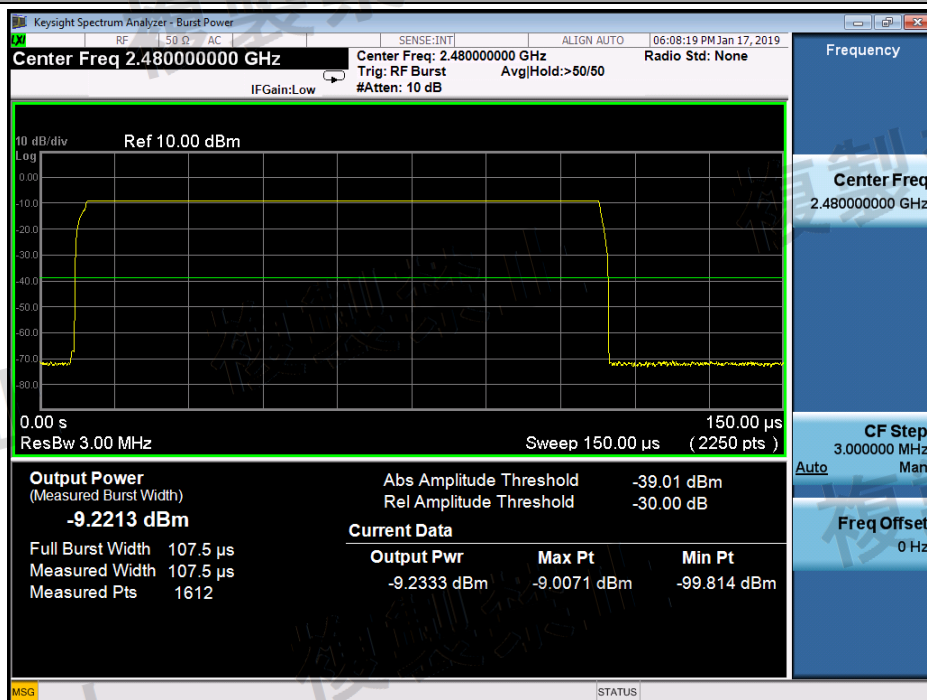
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Ave. Burst Power_TNVN_BLE_Ant1_Middle



Ave. Burst Power_TNVN_BLE_Ant1_Top



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4. Spurious emission Intensity

Test Mode	Test Channel	Start Freq [MHz]	Stop Freq [MHz]	Max. Freq [MHz]	Max. Freq [μW]	Limit [μW]	Verdict
BLE	B	30	2374	32.3	0.0092	2.5	PASS
BLE	B	2374	2387	2374.988	0.0053	2.5	PASS
BLE	B	2387	2400	2400	0.0009	25	PASS
BLE	B	2483.5	2496.5	2493.146	0.0248	25	PASS
BLE	B	2496.5	2509.5	2503	0.0126	2.5	PASS
BLE	B	2509.5	12750	5776	0.0417	2.5	PASS
BLE	M	30	2374	32.3	0.0119	2.5	PASS
BLE	M	2374	2387	2376.08	0.0193	2.5	PASS
BLE	M	2387	2400	2392.07	0.0083	25	PASS
BLE	M	2483.5	2496.5	2488.076	0.0070	25	PASS
BLE	M	2496.5	2509.5	2504.066	0.0129	2.5	PASS
BLE	M	2509.5	12750	4877	0.0037	2.5	PASS
BLE	T	30	2374	32.3	0.0155	2.5	PASS
BLE	T	2374	2387	2389.002	0.0276	2.5	PASS
BLE	T	2387	2400	2400	0.0001	25	PASS
BLE	T	2483.5	2496.5	2483.5	0.0004	25	PASS
BLE	T	2496.5	2509.5	2507.16	0.0044	2.5	PASS
BLE	T	2509.5	12750	5786	0.0409	2.5	PASS

Remark:

Because of the test using 30KHz RBW, and the limit is under 1MHz RBW situation,

Calculate the spurious emission value using following the formula below:

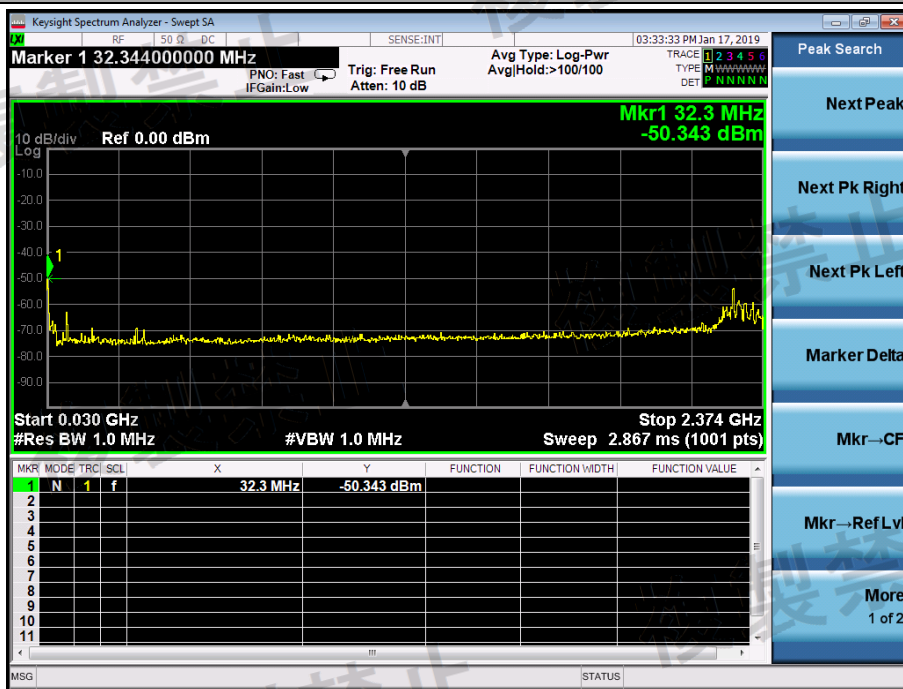
Calculated value = (measure value +15.2dB)

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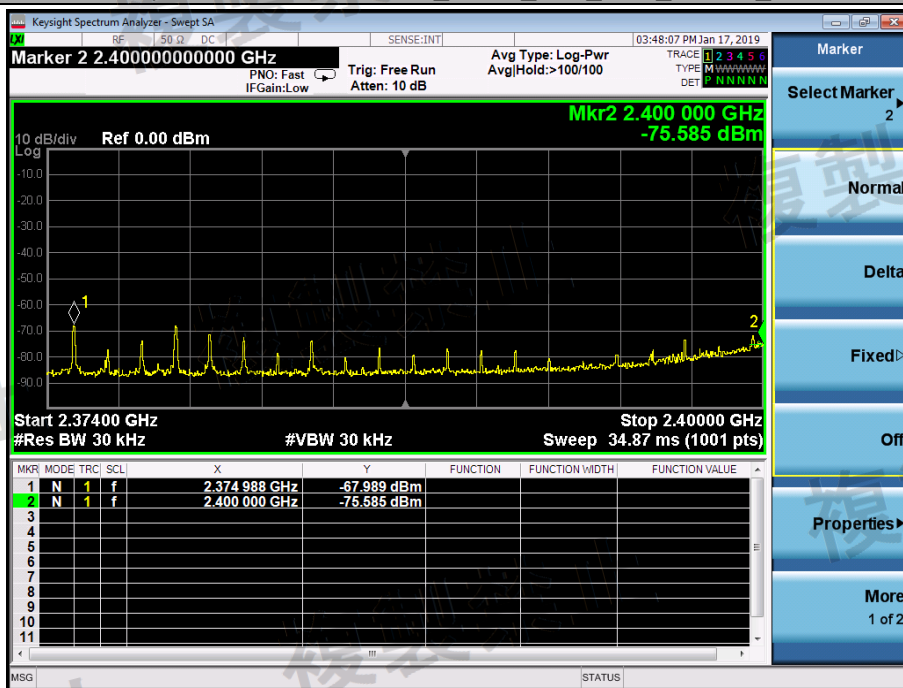
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TEST PLOT

Spurious Emissions of Tx_TNVN_BLE_Ant1_Bottom_1



Spurious Emissions of Tx_TNVN_BLE_Ant1_Bottom_2



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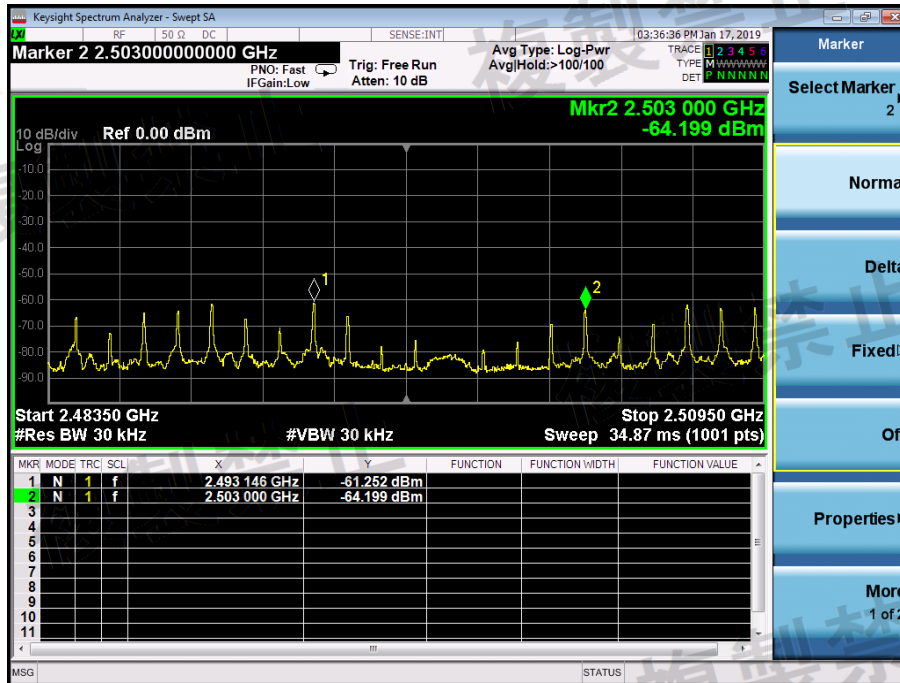
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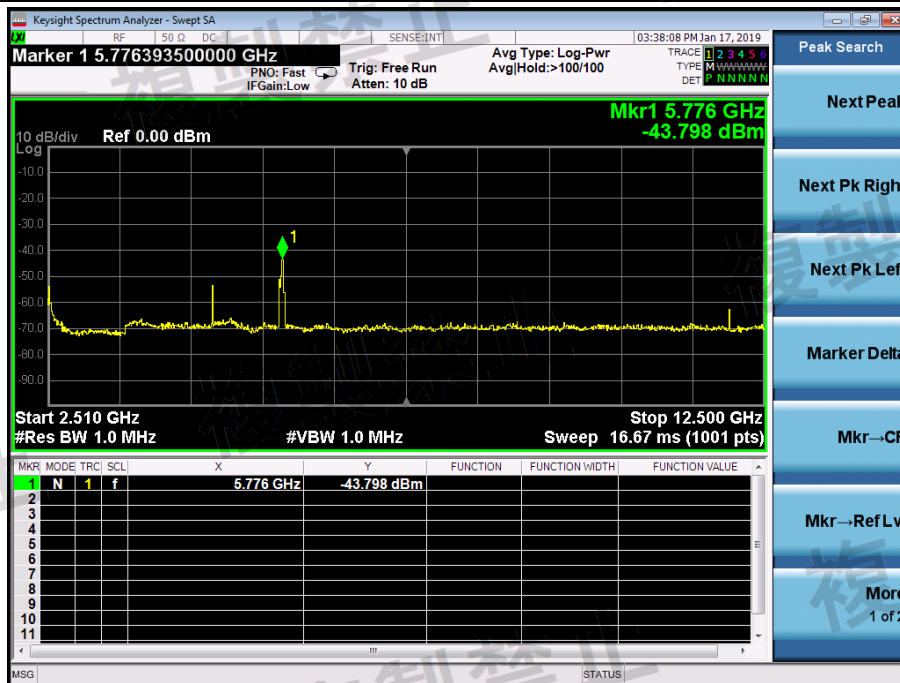
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Spurious Emissions of Tx_TNVN_BLE_Ant1_Bottom_3



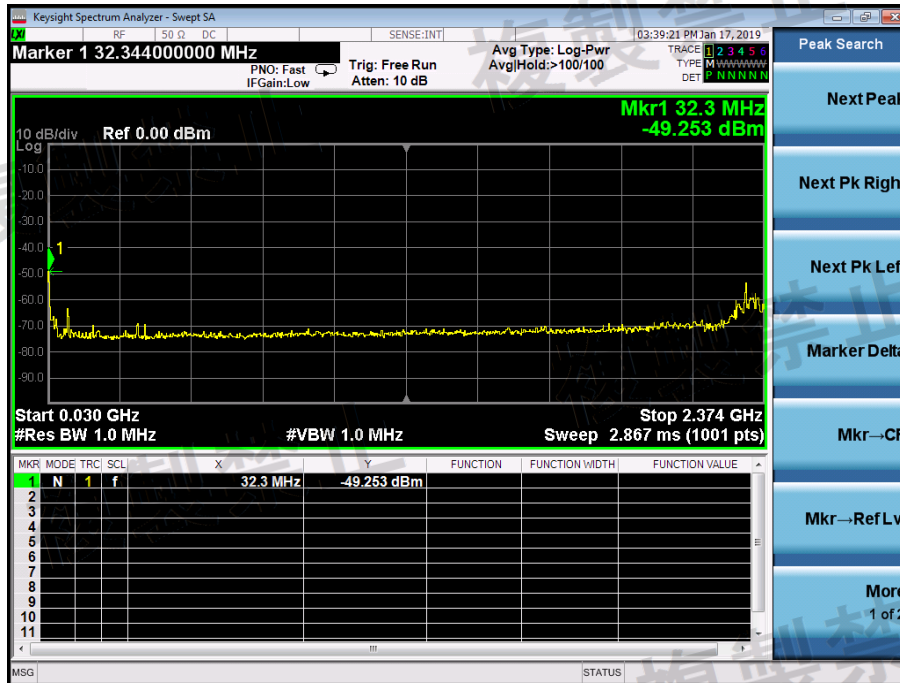
Spurious Emissions of Tx_TNVN_BLE_Ant1_Bottom_4



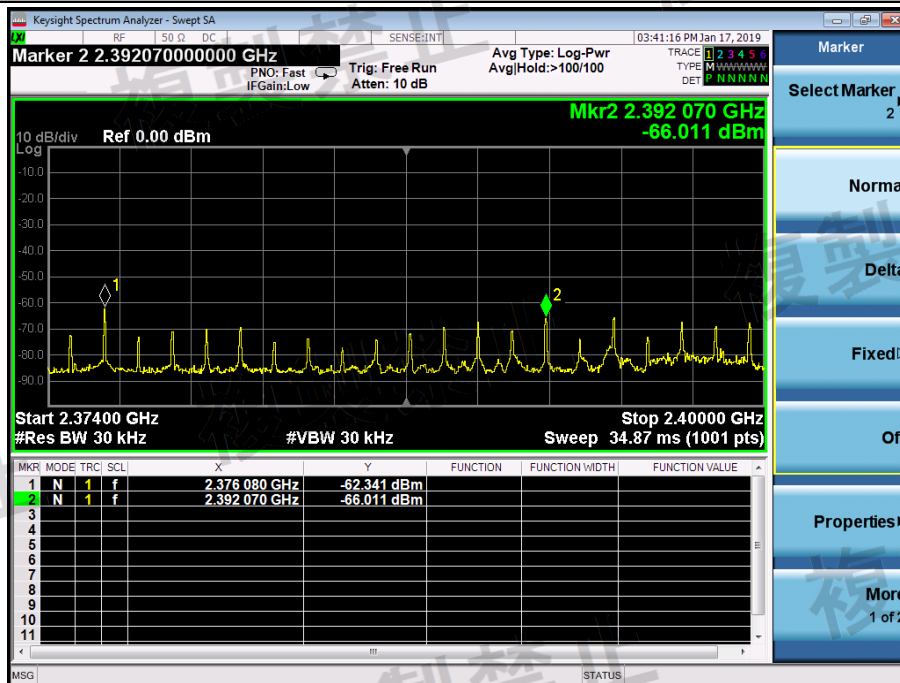
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Spurious Emissions of Tx_TNVN_BLE_Ant1_Middle_1



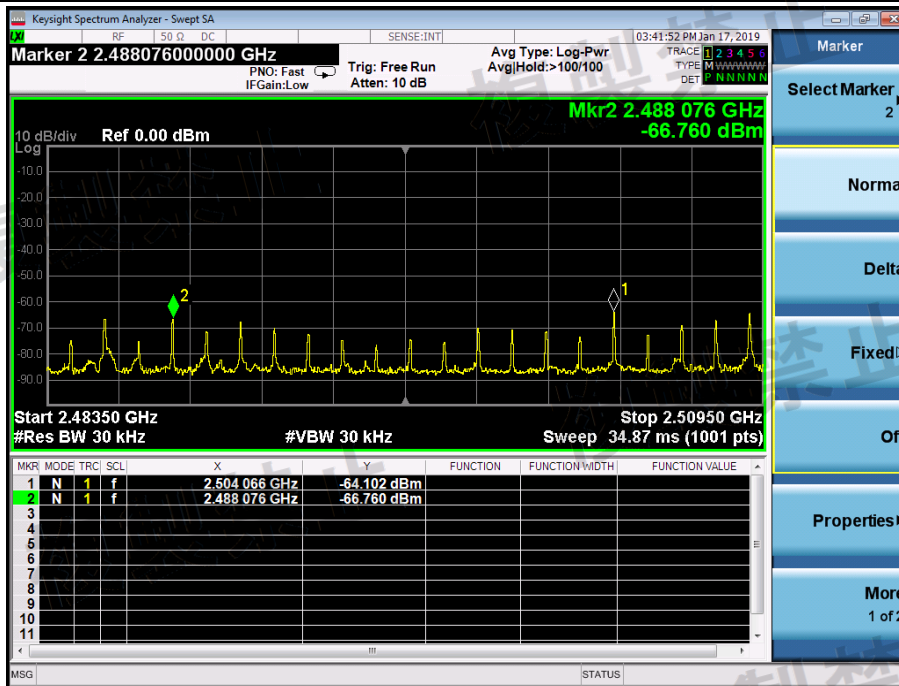
Spurious Emissions of Tx_TNVN_BLE_Ant1_Middle_2



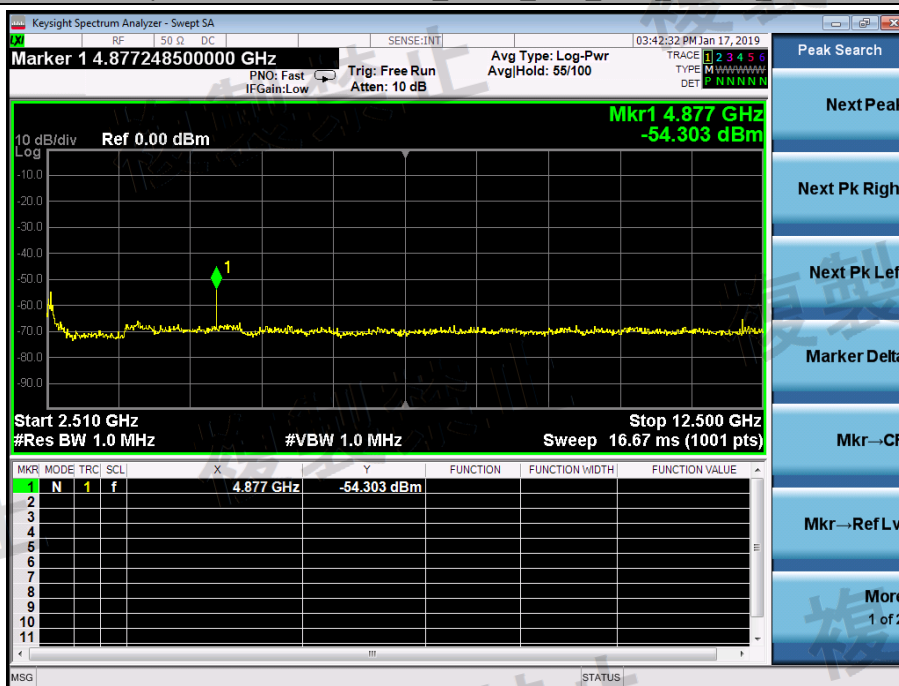
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Spurious Emissions of Tx_TNVN_BLE_Ant1_Middle_3



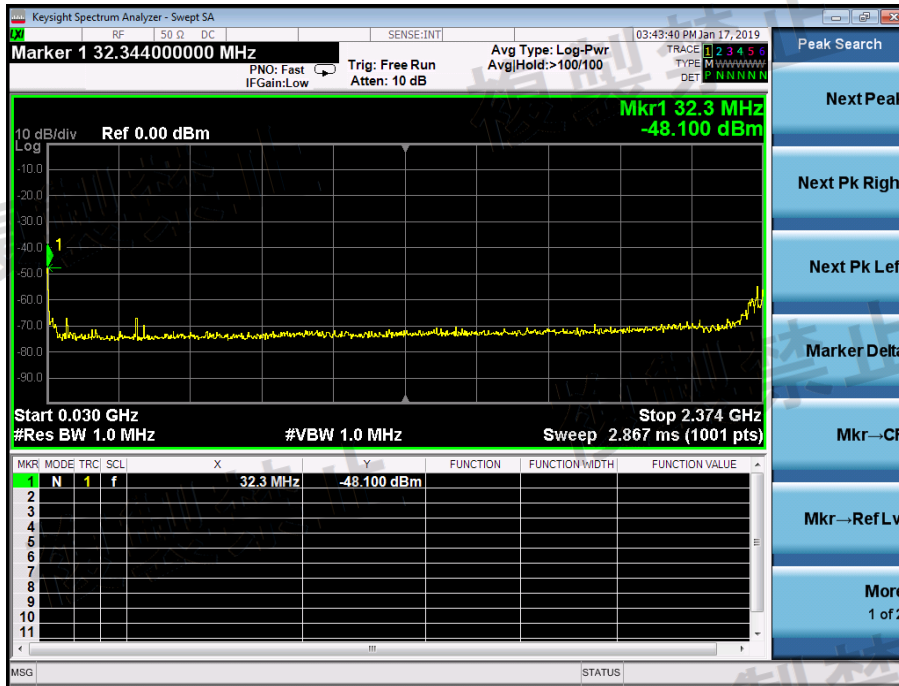
Spurious Emissions of Tx_TNVN_BLE_Ant1_Middle_4



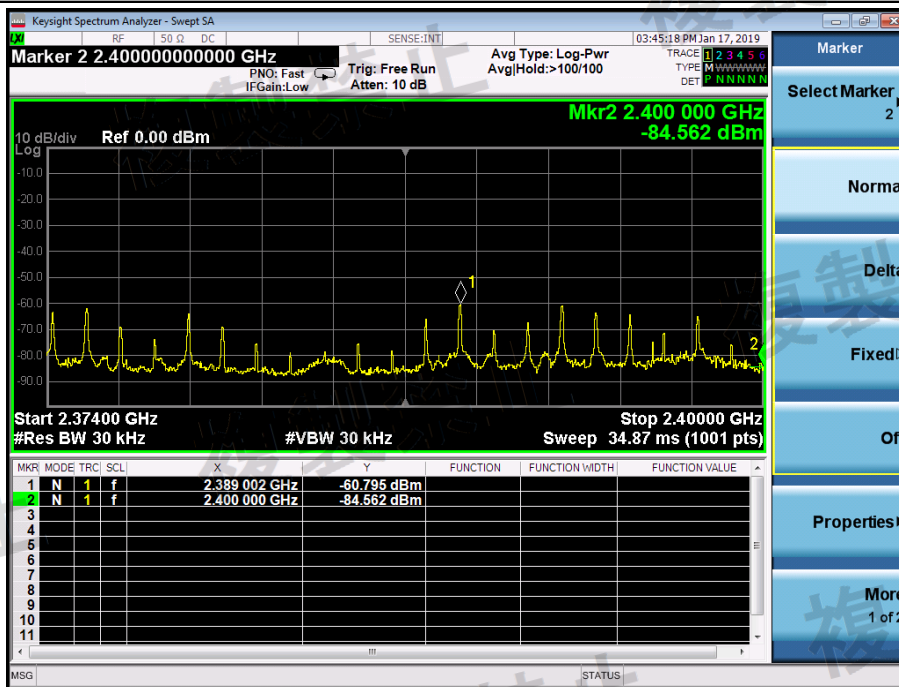
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Spurious Emissions of Tx_TNVN_BLE_Ant1_Top_1



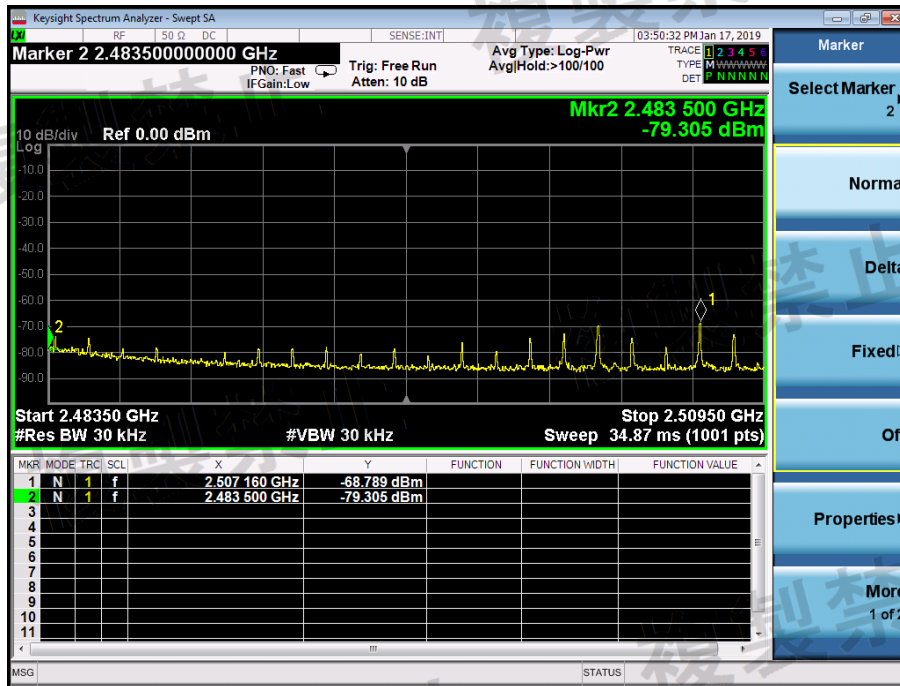
Spurious Emissions of Tx_TNVN_BLE_Ant1_Top_2



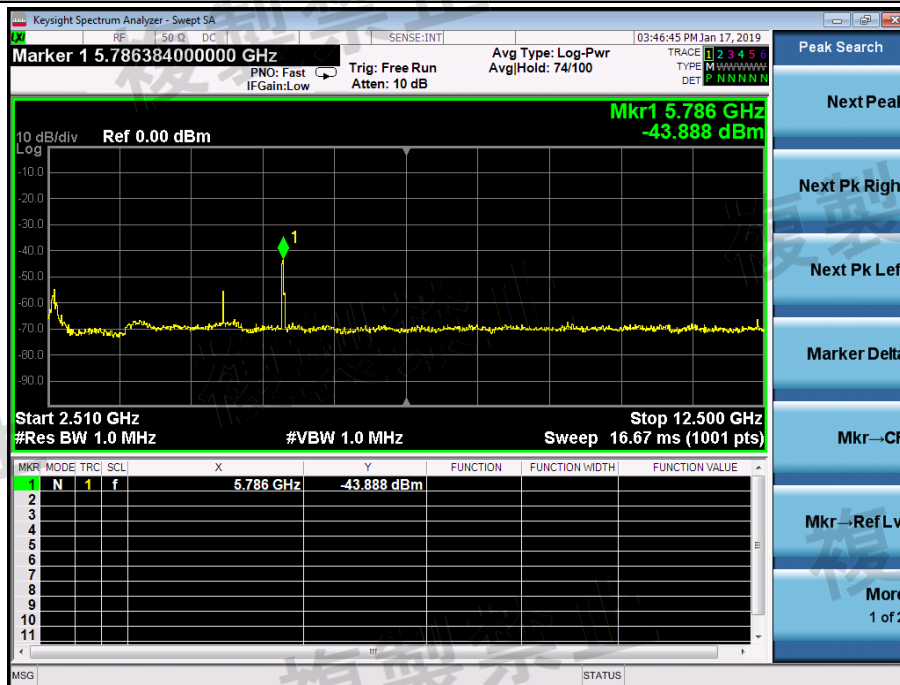
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Spurious Emissions of Tx_TNVN_BLE_Ant1_Top_3



Spurious Emissions of Tx_TNVN_BLE_Ant1_Top_4



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5. Limit of secondary radiated emissions

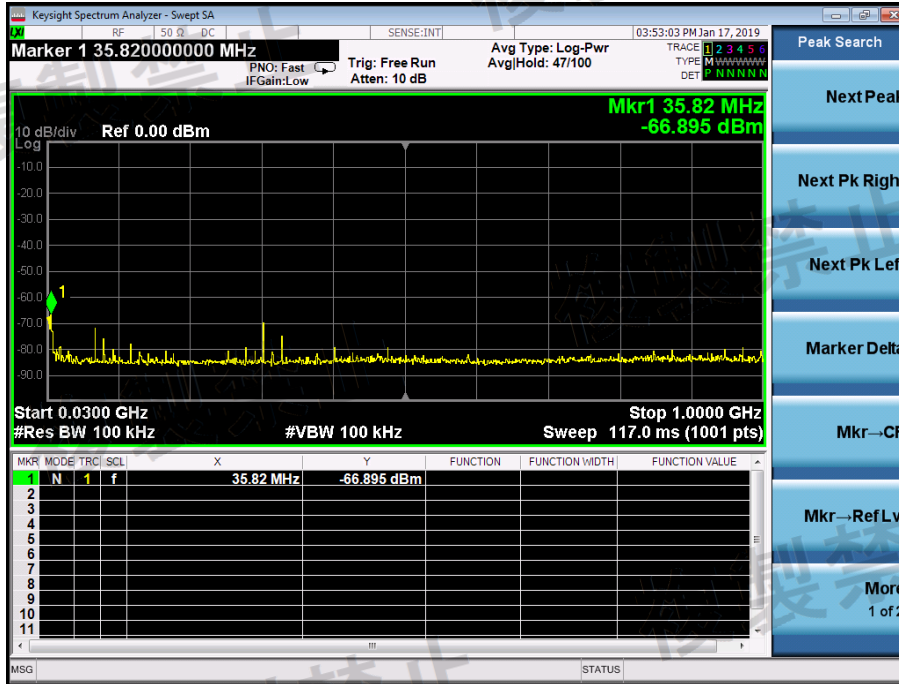
Test Mode	Test Channel	Start Freq [MHz]	Stop Freq [MHz]	Max. Freq [MHz]	Max. Freq [nW]	Limit [nW]	Verdict
BLE	B	30	1000	35.82	0.204	4	PASS
BLE	B	1000	12500	5784	0.266	20	PASS
BLE	M	30	1000	35.82	0.430	4	PASS
BLE	M	1000	12500	3818	0.221	20	PASS
BLE	T	30	1000	32.91	0.273	4	PASS
BLE	T	1000	12500	5014	0.201	20	PASS

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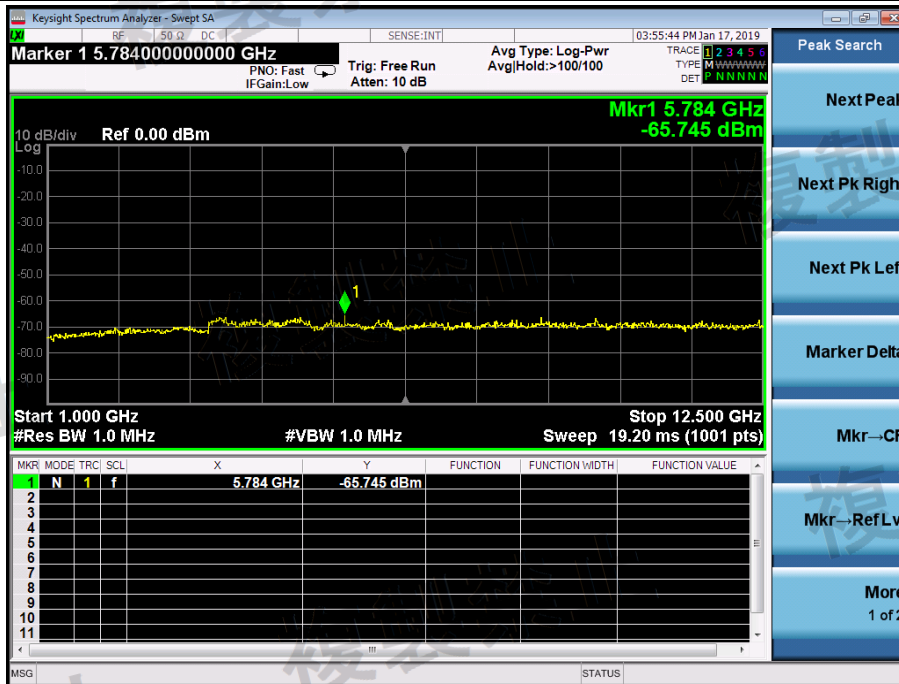
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TEST PLOT

Spurious Emissions of Rx_TNVN_BLE_Ant1_Bottom_1



Spurious Emissions of Rx_TNVN_BLE_Ant1_Bottom_2

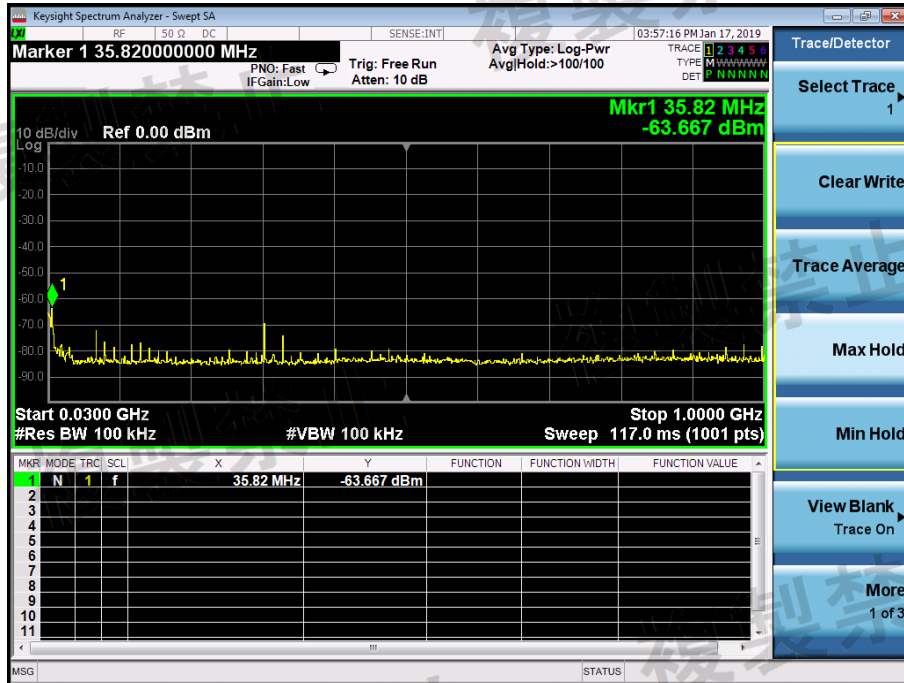


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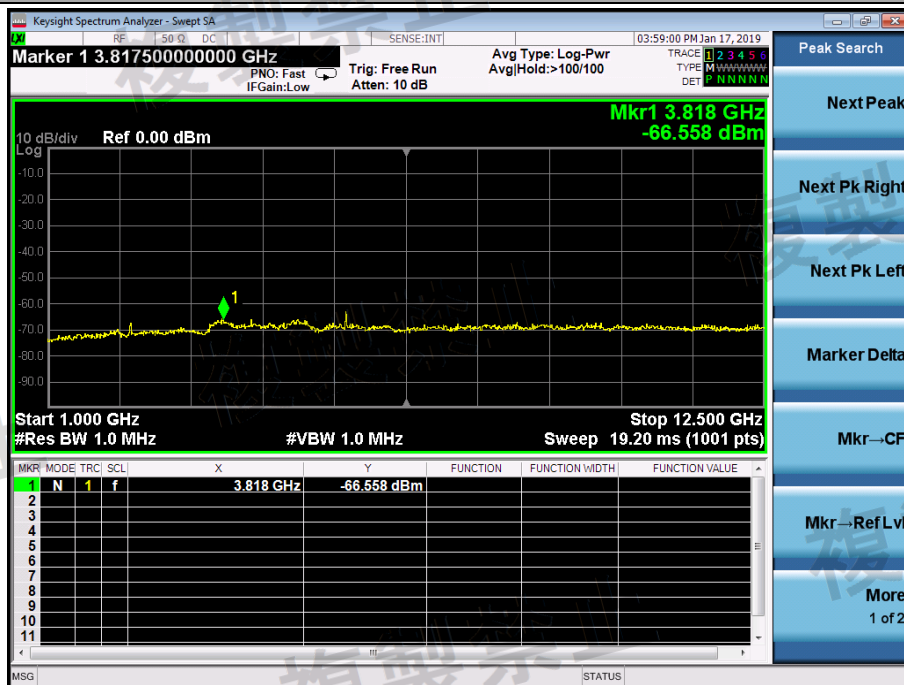
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TEST PLOT

Spurious Emissions of Rx_TNVN_BLE_Ant1_Middle_1



Spurious Emissions of Rx_TNVN_BLE_Ant1_Middle_2

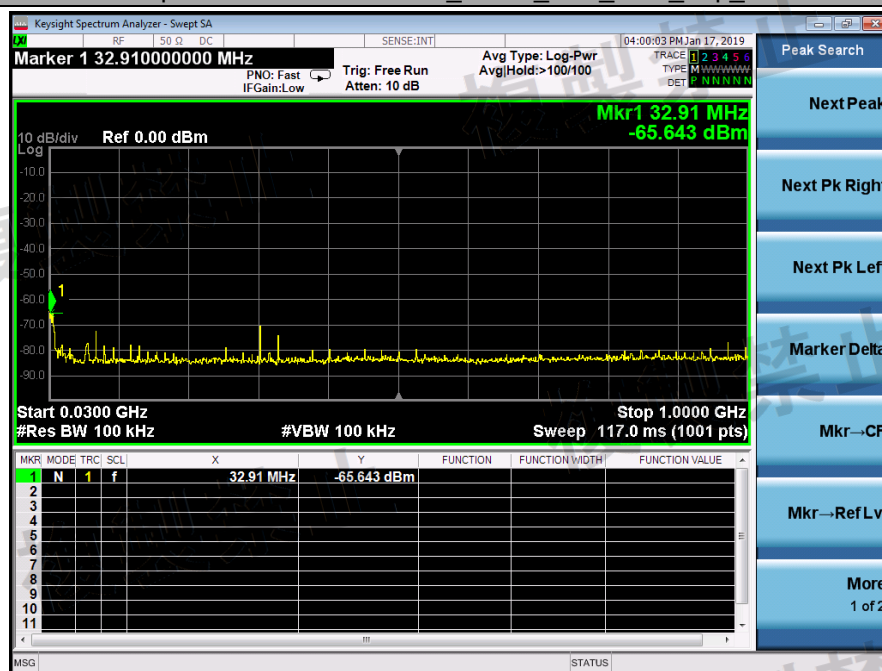


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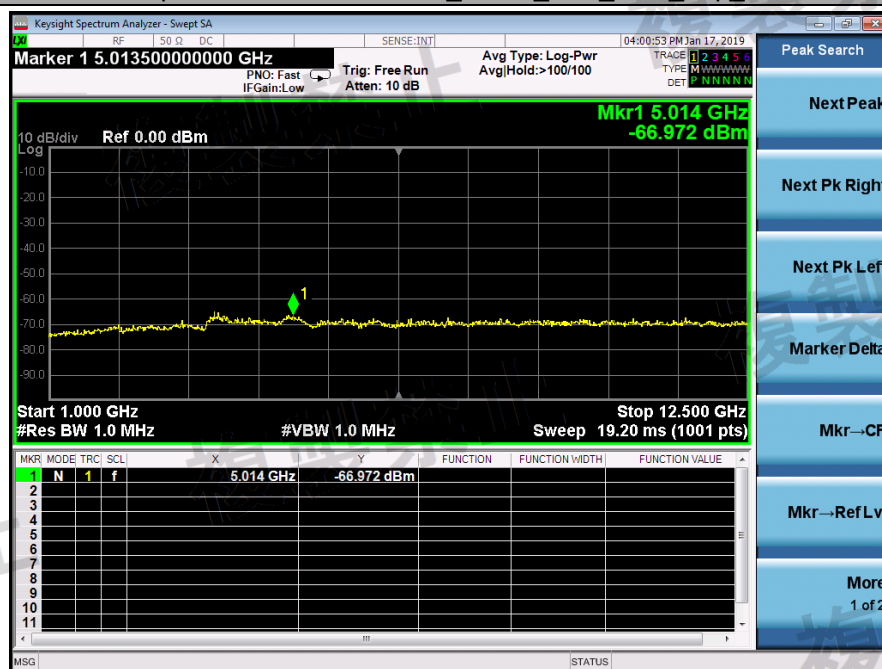
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No.198 Kazhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
Guangzhou Branch Testing Center EEC Laboratory 中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Spurious Emissions of Rx_TNVN_BLE_Ant1_Top_1



Spurious Emissions of Rx_TNVN_BLE_Ant1_Top_2



--End of Report--

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