



**SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch**

No. 1 Workshop, M-10, Middle section, Science & Technology Park,
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: ee.shenzhen@sgs.com

Report No.: SZEM180800804801
Page: 1 of 51

TEST REPORT

Application No.: SZEM1808008048
Applicant: Oxford Nanopore Technologies Ltd
Address of Applicant: Gosling Building, Edmund Halley Road, Oxford Science Park, Oxford OX4 4DQ. United Kingdom.
Manufacturer: Oxford Nanopore Technologies Ltd
Address of Manufacturer: Gosling Building, Edmund Halley Road, Oxford Science Park, Oxford OX4 4DQ. United Kingdom.
Factory: Oxford Nanopore Technologies Ltd
Address of Factory: Gosling Building, Edmund Halley Road, Oxford Science Park, Oxford OX4 4DQ. United Kingdom
Equipment Under Test (EUT):
EUT Name: MinIT
Model No.: MNT-001
Standard(s) : MIC Item 19 of Article 2 Paragraph 1
Date of Receipt: 2018-09-03
Date of Test: 2018-10-18
Date of Issue: 2018-10-26

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



Keny Xu
EMC Laboratory 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		2018-10-26		Original

Authorized for issue by:			
			
		Leo Lai /Project Engineer	
			
		Eric Fu /Reviewer	

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
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
Dwell time	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

3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	6
4.1 DETAILS OF E.U.T.	6
4.2 TEST CONDITIONS	6
4.3 DESCRIPTION OF SUPPORT UNITS	8
4.4 MEASUREMENT UNCERTAINTY	8
4.5 TEST LOCATION	9
4.6 TEST FACILITY	9
4.7 DEVIATION FROM STANDARDS	9
4.8 ABNORMALITIES FROM STANDARD CONDITIONS	9
5 EQUIPMENT LIST	10
6 RADIO SPECTRUM TECHNICAL REQUIREMENT	11
6.1 ANTENNA REQUIREMENT	11
6.1.1 Test Requirement	11
6.1.2 Conclusion	11
6.2 INTERFERENCE PREVENTION CAPABILITY	12
6.2.1 Test Requirement	12
6.2.2 Test Setup Diagram	12
6.2.3 Conclusion	12
6.3 RF ACCESSIBILITY	13
6.3.1 Test Requirement	13
6.3.2 Conclusion	13
7 RADIO SPECTRUM MATTER TEST RESULTS	14
7.1 FREQUENCY ERROR	14
7.1.1 E.U.T. Operation	14
7.1.2 Measurement Procedure and Data	14
7.2 OCCUPIED BANDWIDTH(99%)	15
7.2.1 E.U.T. Operation	15
7.2.2 Test Setup Diagram	15
7.2.3 Measurement Procedure and Data	15
7.3 SPREAD SPECTRUM BANDWIDTH(90%)	16
7.3.1 E.U.T. Operation	16
7.3.2 Test Setup Diagram	16
7.3.3 Measurement Procedure and Data	16
7.4 ANTENNA POWER	17
7.4.1 E.U.T. Operation	17
7.4.2 Test Setup Diagram	17
7.4.3 Measurement Procedure and Data	17
7.5 DWELL TIME	18
7.5.1 E.U.T. Operation	18
7.5.2 Test Setup Diagram	18
7.5.3 Measurement Procedure and Data	18

7.6	SPURIOUS EMISSION INTENSITY	19
7.6.1	<i>E.U.T. Operation</i>	20
7.6.2	<i>Test Setup Diagram</i>	20
7.6.3	<i>Measurement Procedure and Data</i>	20
7.7	LIMIT OF SECONDARY RADIATED EMISSIONS	21
7.7.1	<i>E.U.T. Operation</i>	21
7.7.2	<i>Test Setup Diagram</i>	21
7.7.3	<i>Measurement Procedure and Data</i>	21
8	PHOTOGRAPHS	22
8.1	SETUP PHOTO	22
8.2	EUT CONSTRUCTIONAL DETAILS (EUT PHOTOS)	22
9	APPENDIX	23
9.1	APPENDIX MIC19-2	23-51

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 15V from AC/DC adapter Adapter Model No.: DYS650-150336W-K Input: 100-240V~50/60Hz 1.3A MAX Output: DC 15V 3.36A
Bluetooth Version:	V4.1
	This is for BT classic mode.
Operation Frequency	2402MHz to 2480MHz
Spectrum Spread Technology	Frequency Hopping Spread Spectrum(FHSS)
Number of Channels	79
Modulation Type	GFSK, $\pi/4$ DQPSK, 8DPSK
Channel Spacing	1MHz
Antenna Type	FPC Antenna
Antenna Gain	3.73dBi

4.2 Test Conditions

Power Supply Power by AC 100V

The RF unit is supplied DC3.3V. The fluctuation of input voltage to the circuit of RF unit of test equipment is under $\pm 1\%$, when input voltage from AC100V to the test equipment is fluctuated by $\pm 10\%$, So, all measurement has been conducted by only rated voltage.

The measurement result of the voltage fluctuation at RF circuit when AC100V $\pm 10\%$.

AC Input	DC3V30
110V	3.33V
100V	3.30V
90V	3.27V

Temperature: 0 -45.0 °C

Humidity: 45-85 % RH

Atmospheric Pressure: 1000 -1010 mbar

Note:

VN: Normal Voltage

TN: Normal Temperature

TL: Low Extreme Test Temperature

TH: High Extreme Test Temperature

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.

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

Selected Test Channel	
Channel	Frequency
The lowest channel (CH0)	2402MHz
The middle channel (CH19)	2440MHz
The highest channel (CH39)	2480MHz

4.3 Description of Support Units

The EUT has been tested as an independent unit.

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power	$\pm 0.75\text{dB}$
5	RF power density	$\pm 2.84\text{dB}$
6	Conducted Spurious emissions	$\pm 0.75\text{dB}$
7	RF Radiated power	$\pm 4.5\text{dB}$ (below 1GHz)
		$\pm 4.8\text{dB}$ (above 1GHz)
8	Radiated Spurious emission test	$\pm 4.5\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (Above 1GHz)
9	Temperature test	$\pm 1^\circ\text{C}$
10	Humidity test	$\pm 3\%$
11	Supply voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

4.5 Test Location

All tests were performed at:

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

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.6 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment list							
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	Calibration body	Classification
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24	CEPREI	(c)
Spectrum Analyzer (20Hz-43GHz)	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01	CEPREI	(c)
Signal Generator (9kHz-40GHz)	KEYSIGHT	N5173B	SEM006-05	2018-09-27	2019-09-26	CEPREI	(c)
Multimeter	FLUKE	Fluke 73III	SEM022-01	2018-04-08	2019-04-07	CEPREI	(c)
Bluetooth Tester	Rohde & Schwarz	CBT	W060-01	2018-06-21	2019-06-20	CEPREI	(c)
Universal Radio Communication Tester	Rohde & Schwarz	CMW 500	SEM010-03	2018-04-02	2019-04-01	CEPREI	(c)
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2018-09-27	2019-09-26	CEPREI	(c)
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07	CEPREI	(c)

Remark:

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).
- (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

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

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

MIC Item 19 of Article 2 Paragraph 1

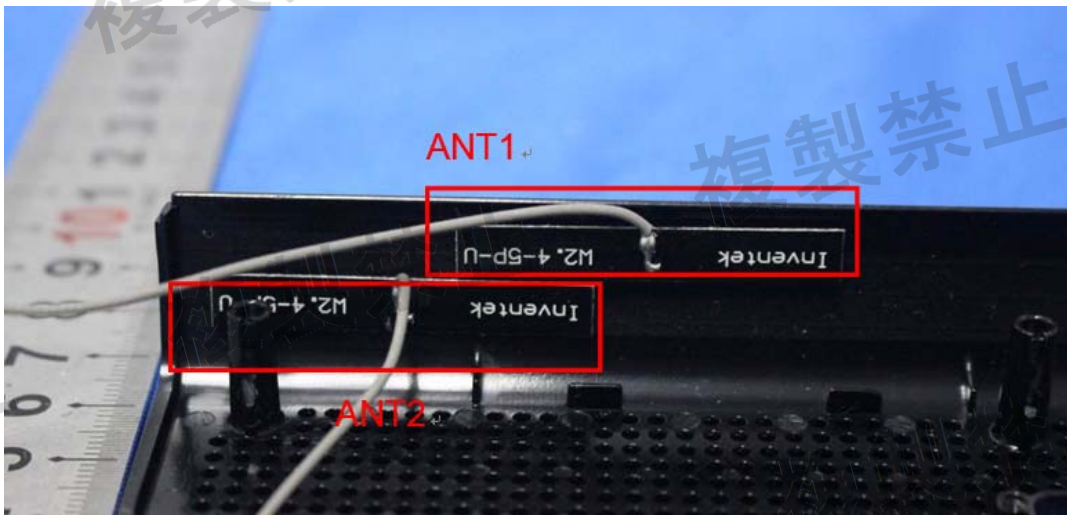
6.1.2 Conclusion

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 glued to the inside of the case and no consideration of replacement. The best case gain of the antenna is 3.73dBi.



Result:

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

6.2 Interference prevention capability

6.2.1 Test Requirement:

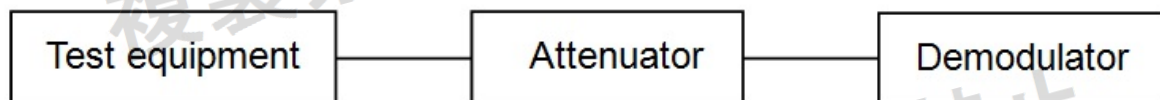
MIC Item 19 of Article 2 Paragraph 1

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.

6.2.2 Test Setup Diagram



6.2.3 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.

EUT Details:

14:13:5E:F9:E6:83

The unit does meet the requirements (Good).

6.3 RF accessibility

6.3.1 Test Requirement:

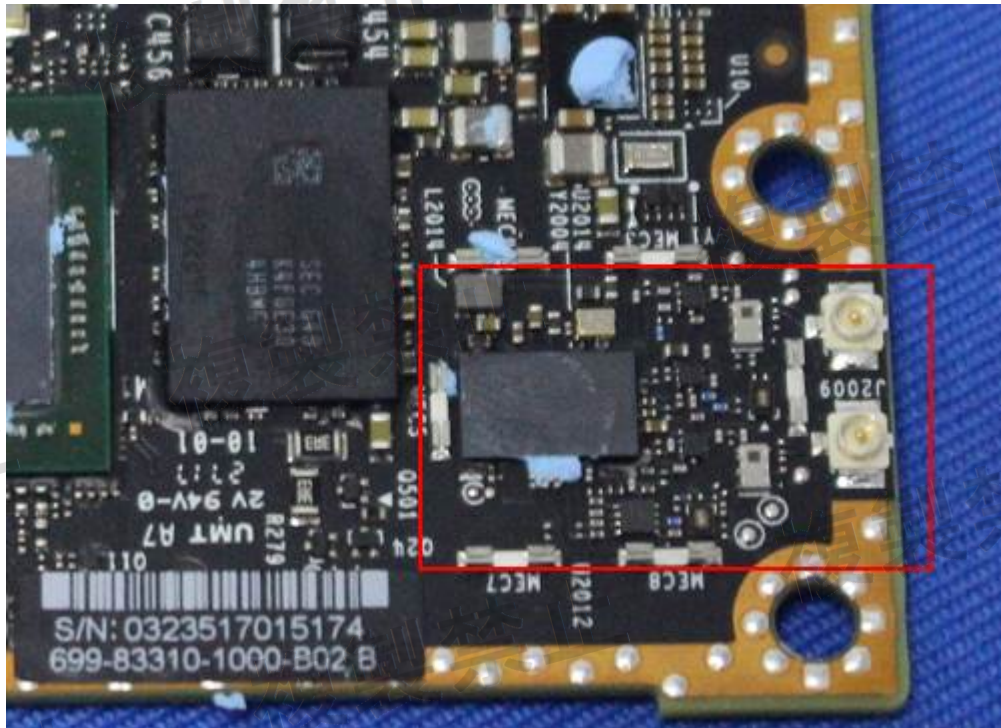
MIC Item 19 of Article 2 Paragraph 1

6.3.2 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:



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.

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: 24.1 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX_Keep the EUT in transmitting mode

7.1.2 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

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: 24.1 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar
Test mode a:TX_Keep the EUT in transmitting mode

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: 24.1 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX_Keep the EUT in transmitting mode

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

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:

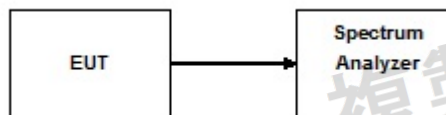
Temperature: 24.1 °C

Humidity: 48.1 % RH

Atmospheric Pressure: 1010 mbar

Test mode a: TX_Keep the EUT in transmitting mode

7.4.2 Test Setup Diagram



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

7.5 Dwell time

Test Requirement MIC Item 19 of Article 2 Paragraph 1
Test Method: MIC Notice No.88 Appendix No.43
Limit: less than 0.4sec

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.1 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX_Keep the EUT in transmitting mode

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

1. Test Conditions:

Spectrum Analyzer is used for measurement.

2. EUT conditions:

Modulation/Spread/Hopping ON, Hopping frequency is fixed, Bluetooth equipment is setting DH5 mode

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 (fixed hopping frequency)

Span 0 Hz

RBW 1 MHz

VBW 1 MHz

Sweep Time EUT condition

Trigger Video Trigger

Measures the Transmission time of 1 burst (sec)

Measures the Burst cycle (sec)

4. Calculation procedure:

Dwell time = (0.4(s) x [spreading rate] x [Transmission time of 1 burst(s)]) / ([burst cycle(s)] x [No. of hopping channel])

Note:

* Spreading rate = [Spread bandwidth (actual measurement value)] / [Transmission rate]

The detailed test data see: Appendix MIC19-2

7.6 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

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.1 °C Humidity: 48.1 % RH Atmospheric Pressure: 1010 mbar

Test mode a:TX_Keep the EUT in transmitting mode

7.6.2 Test Setup Diagram



7.6.3 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

7.7 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

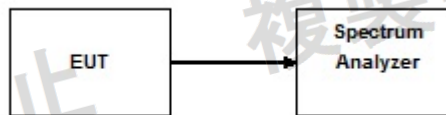
7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24.1 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

Test mode b:RX_Keep the EUT in receiving mode

7.7.2 Test Setup Diagram



7.7.3 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

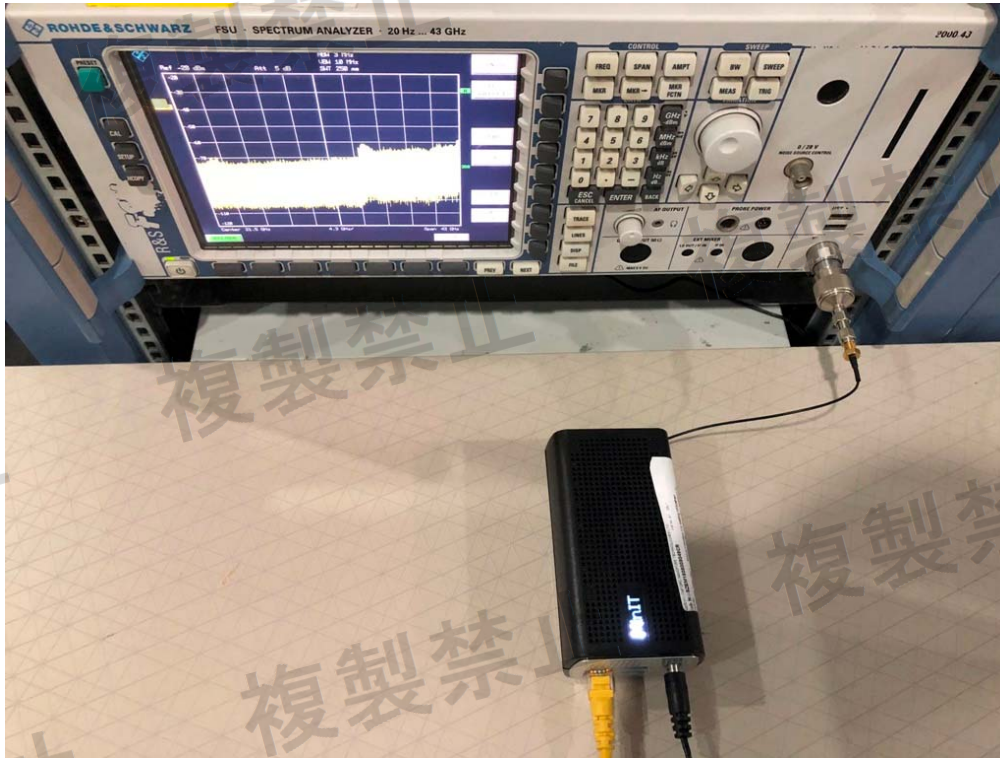
detector mode Sample

Indication mode Max hold

The detailed test data see: Appendix MIC19-2

8 Photographs

8.1 Setup photo



8.2 EUT Constructional Details (EUT Photos)

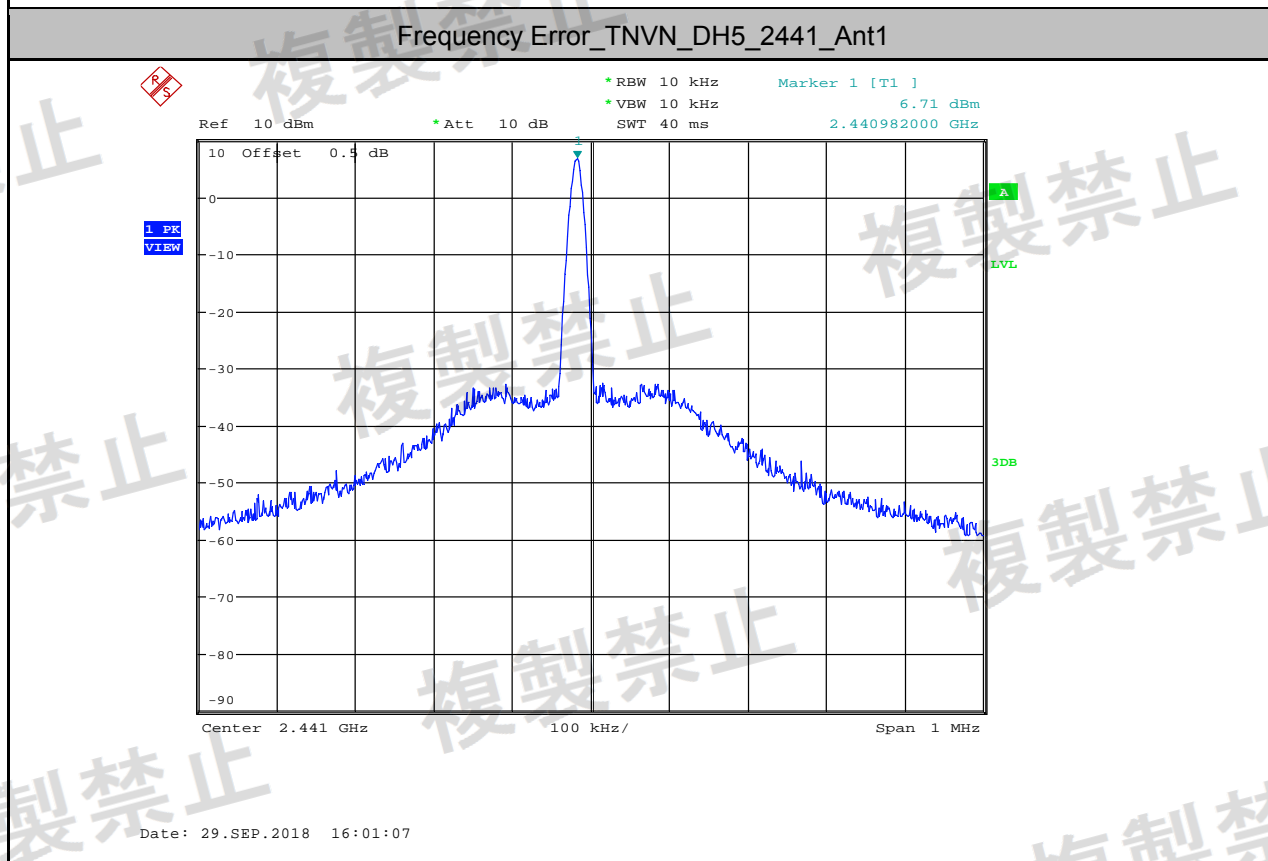
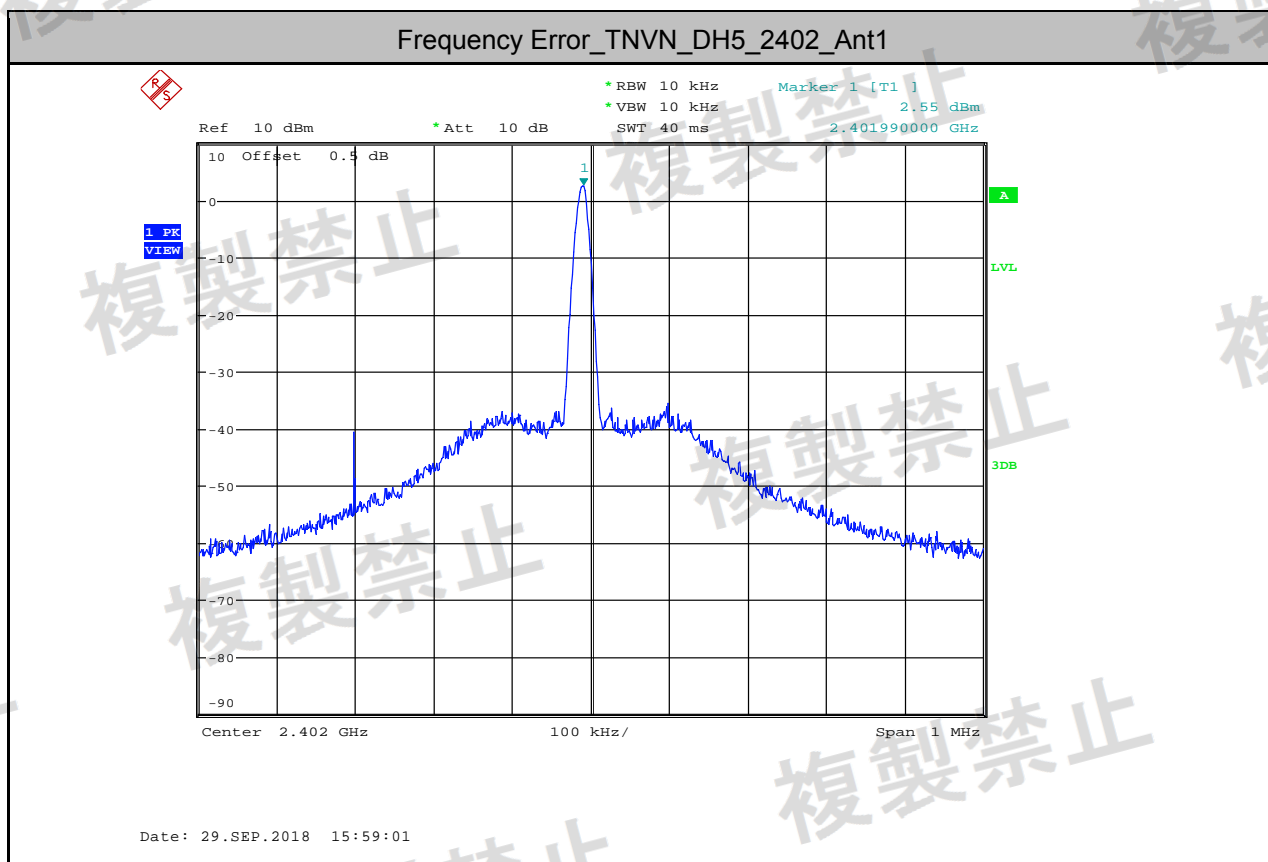
Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1808008048CR.

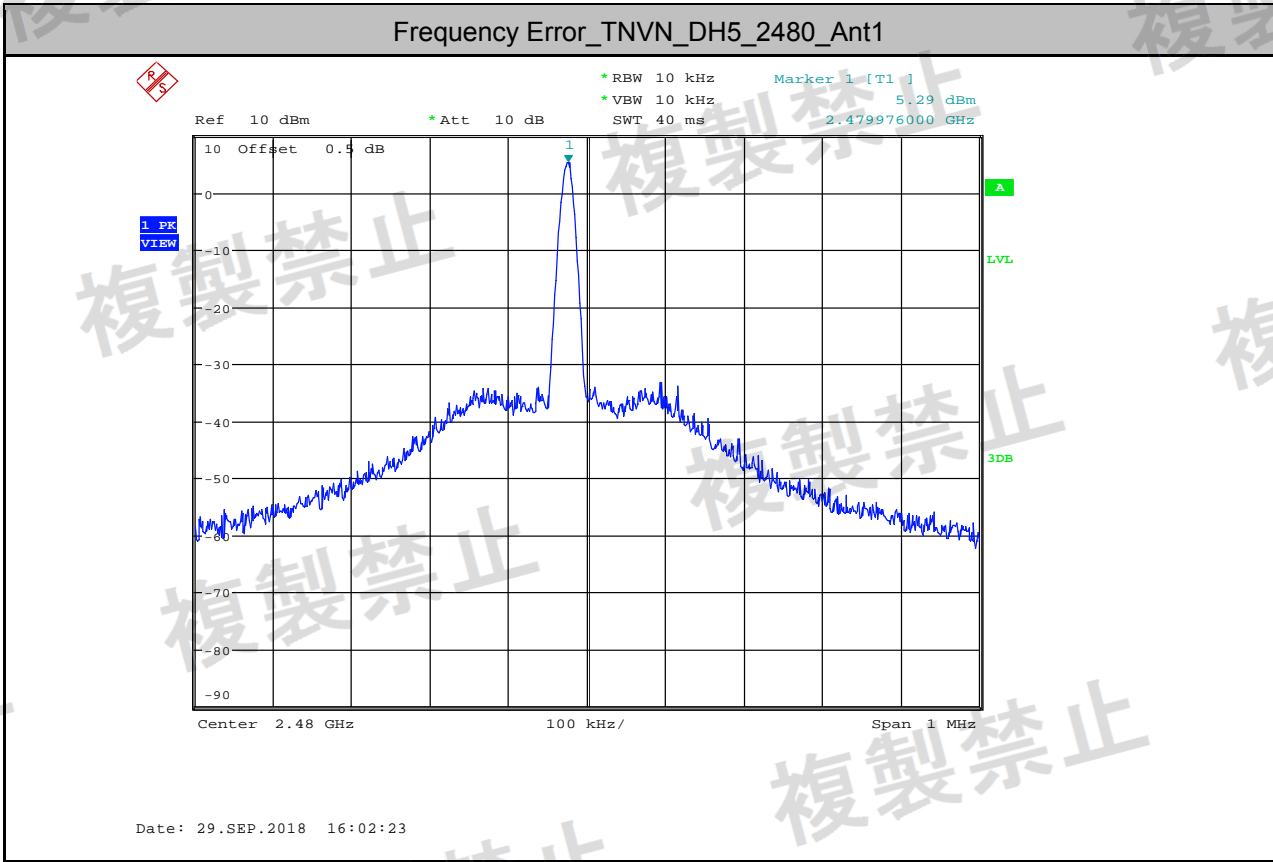
9 Appendix

9.1 Appendix MIC19-2

1.Frequency Error

Test Condition	Test Mode	Test Channel	Ant	Result[MHz]	Result[PPM]	Limit[PPM]	Verdict
TNVN	DH5	2402	Ant1	2401.990	-4.16	$\leq \pm 50$	PASS
TNVN	DH5	2441	Ant1	2440.982	-7.37	$\leq \pm 50$	PASS
TNVN	DH5	2480	Ant1	2479.976	-9.68	$\leq \pm 50$	PASS

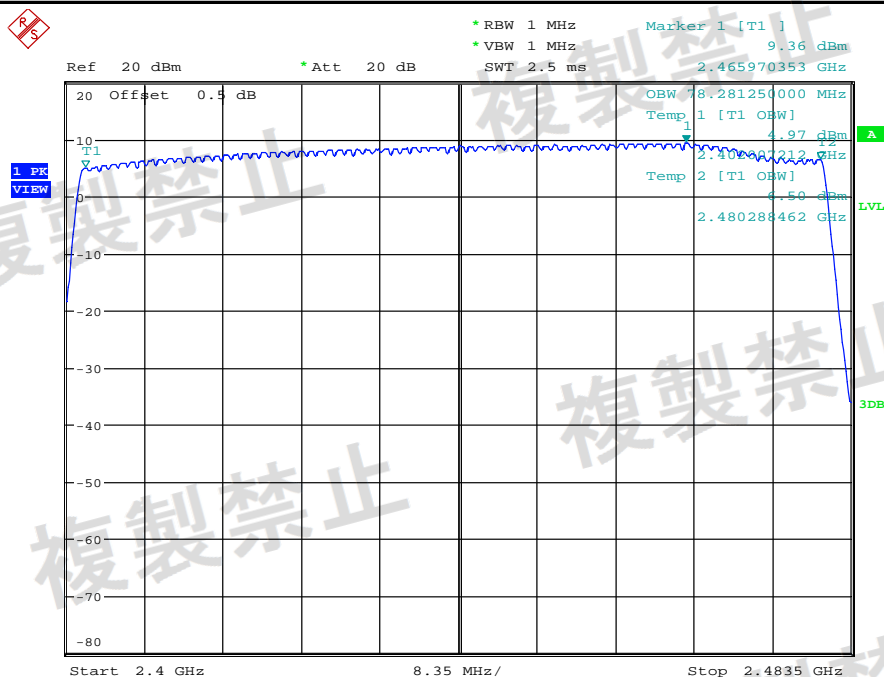




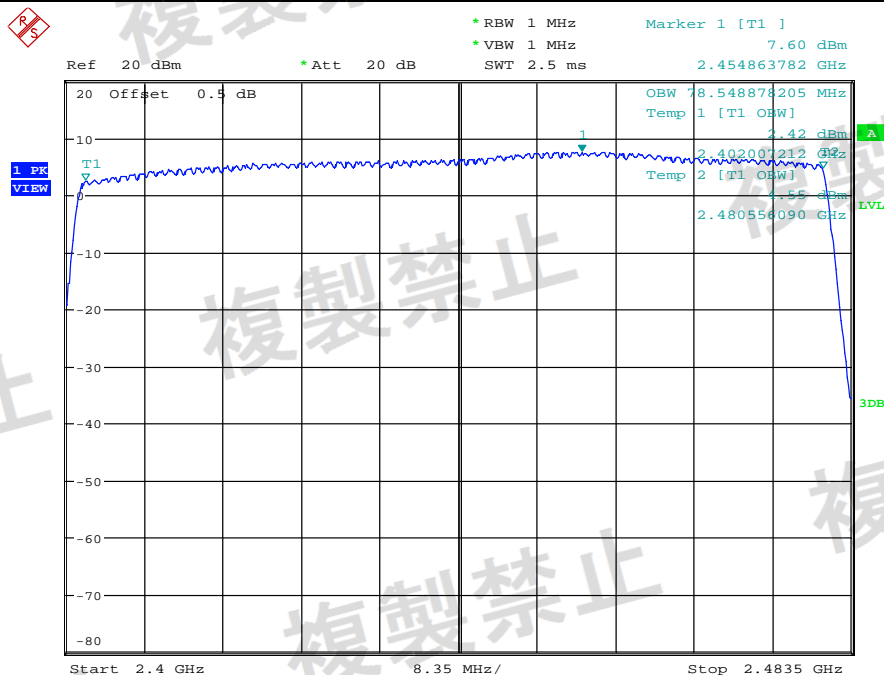
2.Occupied Bandwidth (99%)

Test Condition	Test Mode	Test Channel	Ant	Test Result[MHz]	Limit [MHz]	Verdict
TNVN	DH5	2441	Ant1	78.281	<=83.5	PASS
TNVN	2DH5	2441	Ant1	78.549	<=83.5	PASS
TNVN	3DH5	2441	Ant1	78.549	<=83.5	PASS

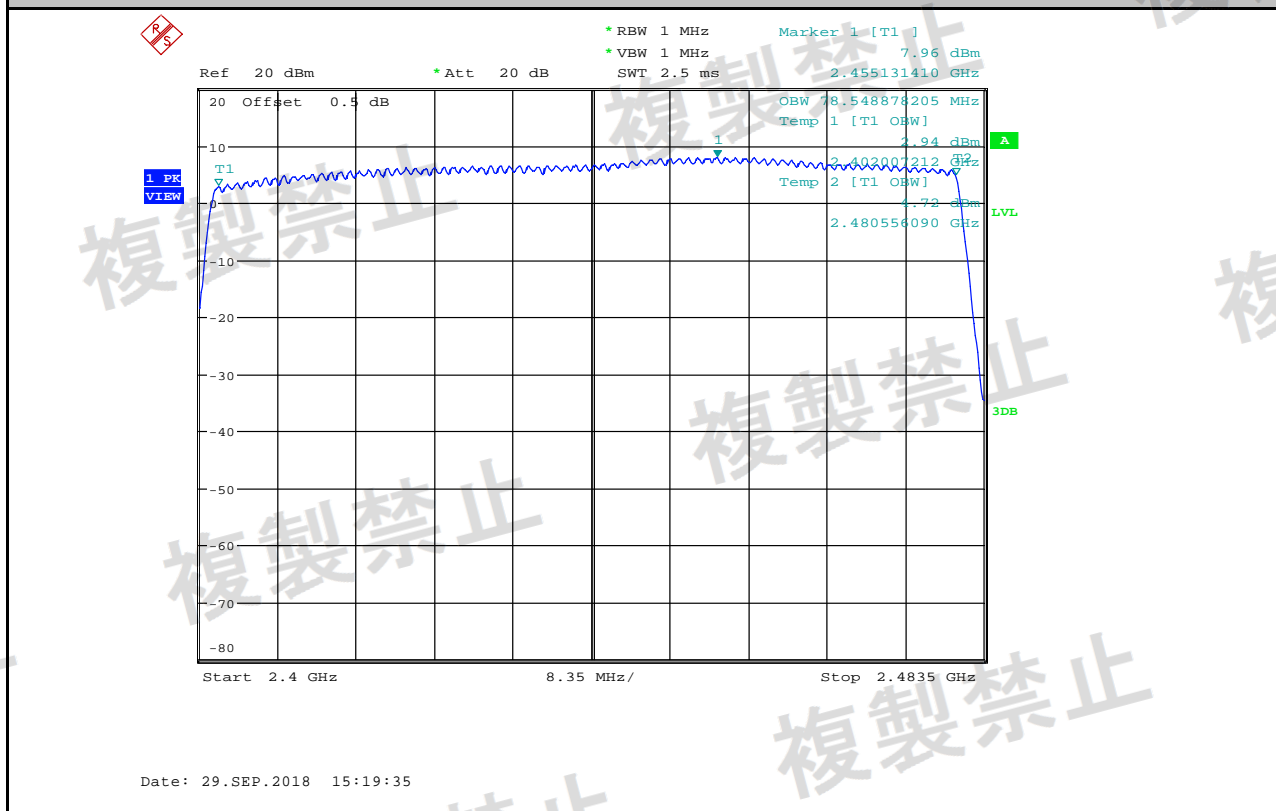
Occupied Bandwidth_TNVN_DH5_2441_Ant1



Occupied Bandwidth_TNVN_2DH5_2441_Ant1



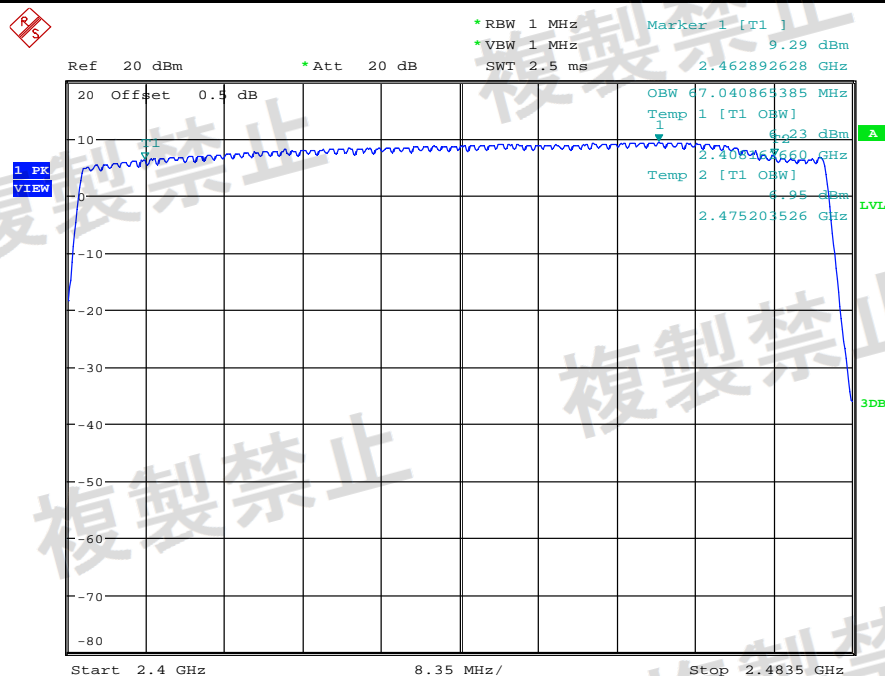
Occupied Bandwidth_TNVN_3DH5_2441_Ant1



3. Spread spectrum Bandwidth (90%)

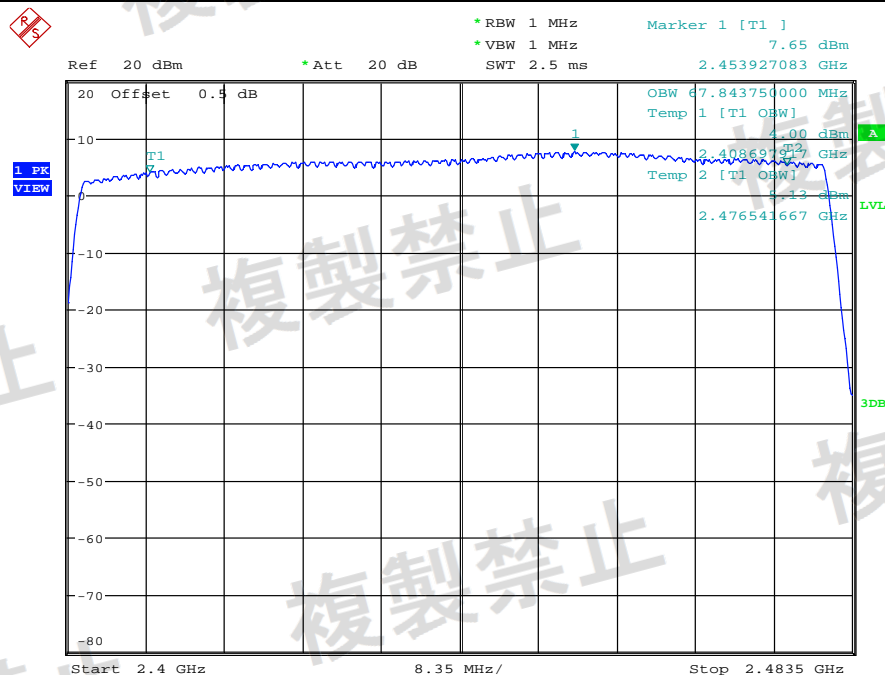
Test Condition	Test Mode	Test Channel	Ant	Test Result[MHz]	Limit [MHz]	Verdict
TNVN	DH5	2441	Ant1	67.041	≥ 0.5	PASS
TNVN	2DH5	2441	Ant1	67.844	≥ 0.5	PASS
TNVN	3DH5	2441	Ant1	67.844	≥ 0.5	PASS

Spread spectrum Bandwidth_TNVN_DH5_2441_Ant1



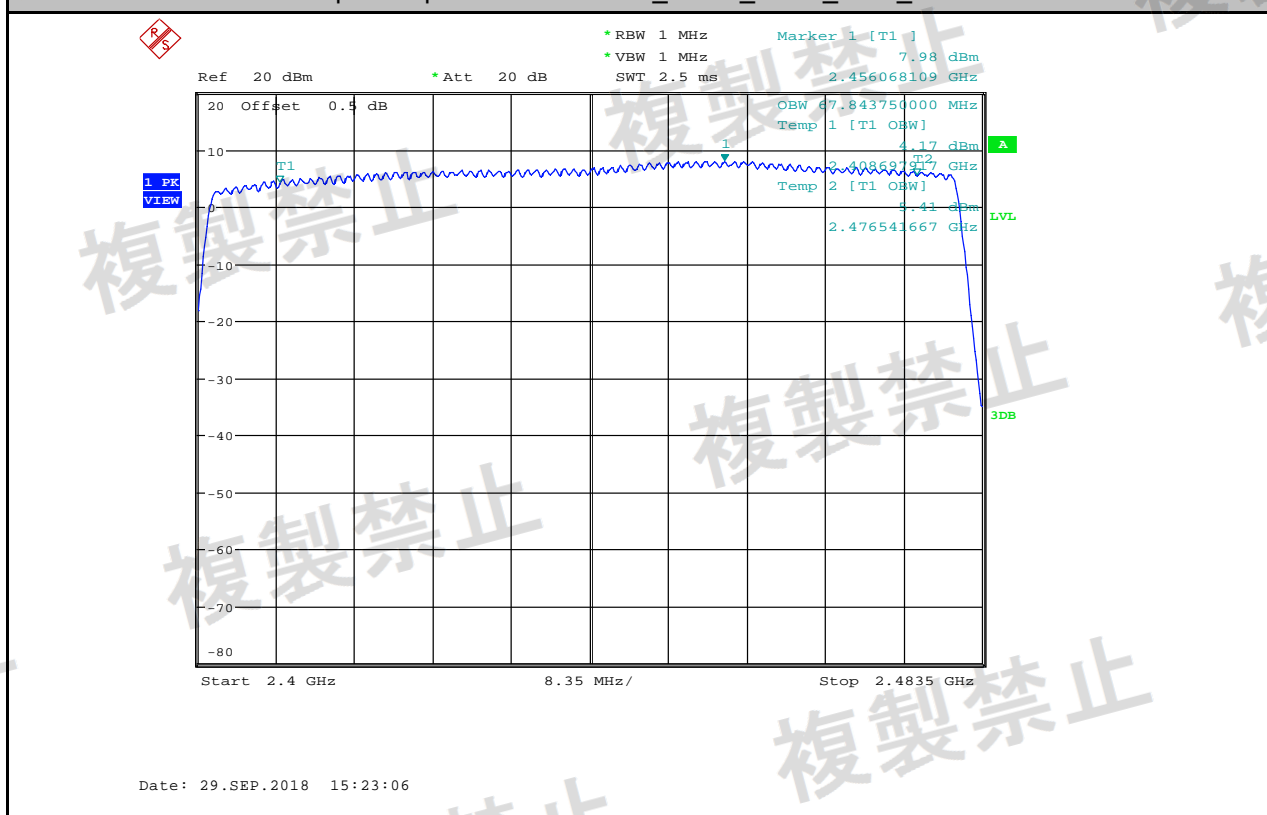
Date: 29.SEP.2018 15:12:40

Spread spectrum Bandwidth_TNVN_2DH5_2441_Ant1



Date: 29.SEP.2018 15:15:48

Spread spectrum Bandwidth_TNVN_3DH5_2441_Ant1



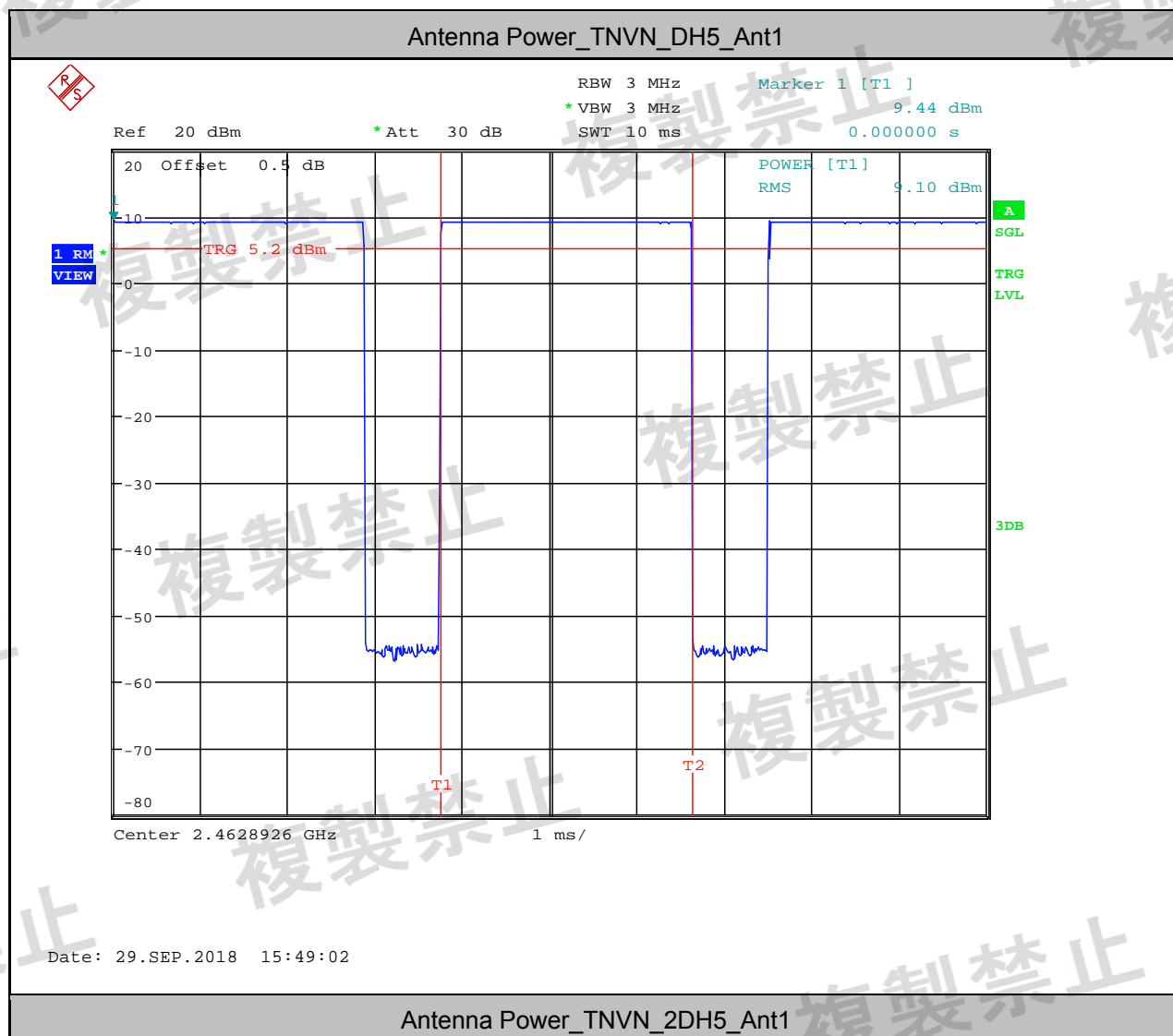
4. Antenna Power

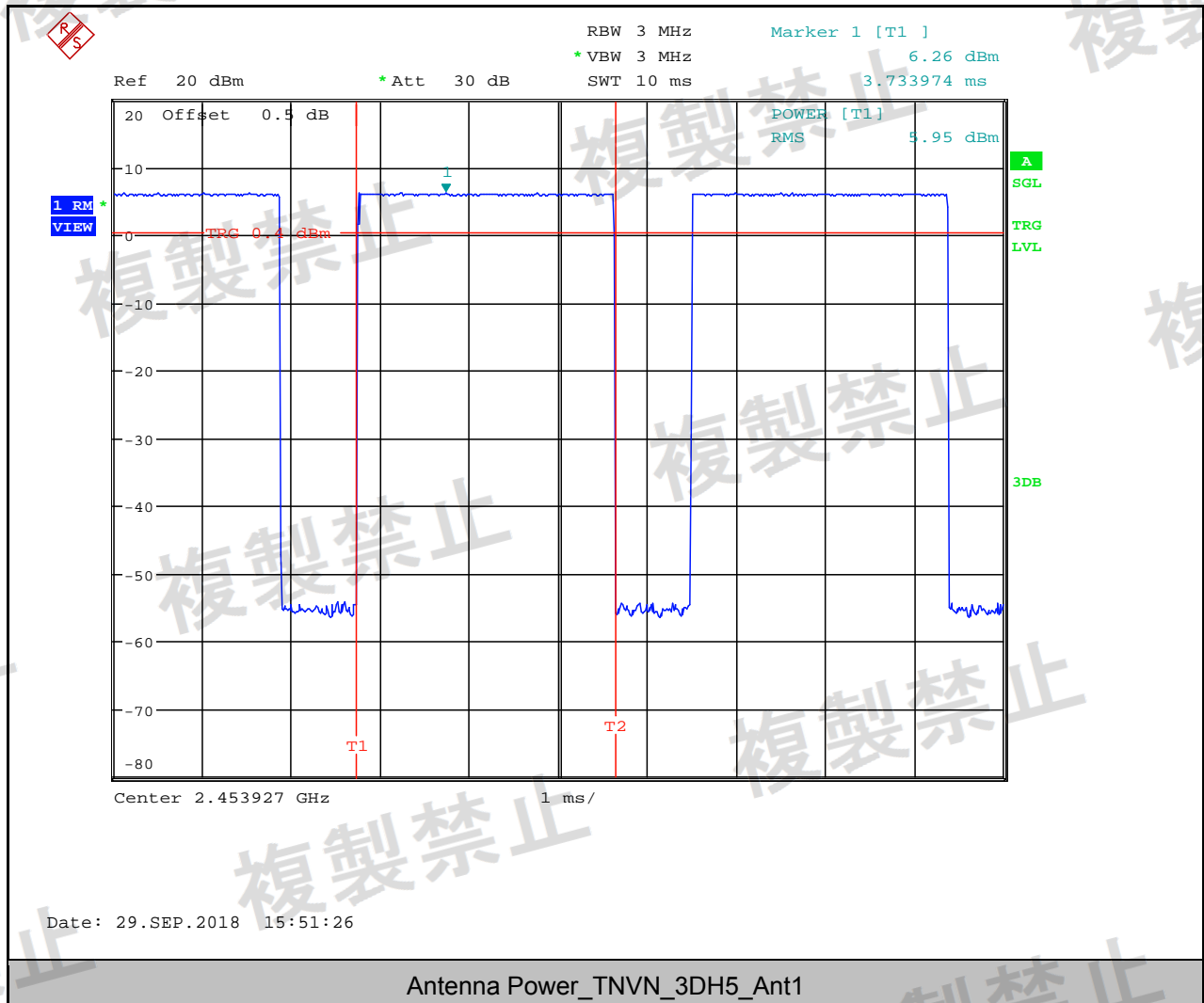
Test Condition	Test Mode	Ant	Power [mW/MHz]	Limit [mW/MHz]	Normal Power [mW/MHz]	Tolerance[%]	Limit [%]	Verdict
TNVN	DH5	Ant1	0.121	3	0.11	10.0	-80 to +20	PASS
TNVN	2DH5	Ant1	0.058	3	0.11	-47.3	-80 to +20	PASS
TNVN	3DH5	Ant1	0.058	3	0.11	-47.3	-80 to +20	PASS

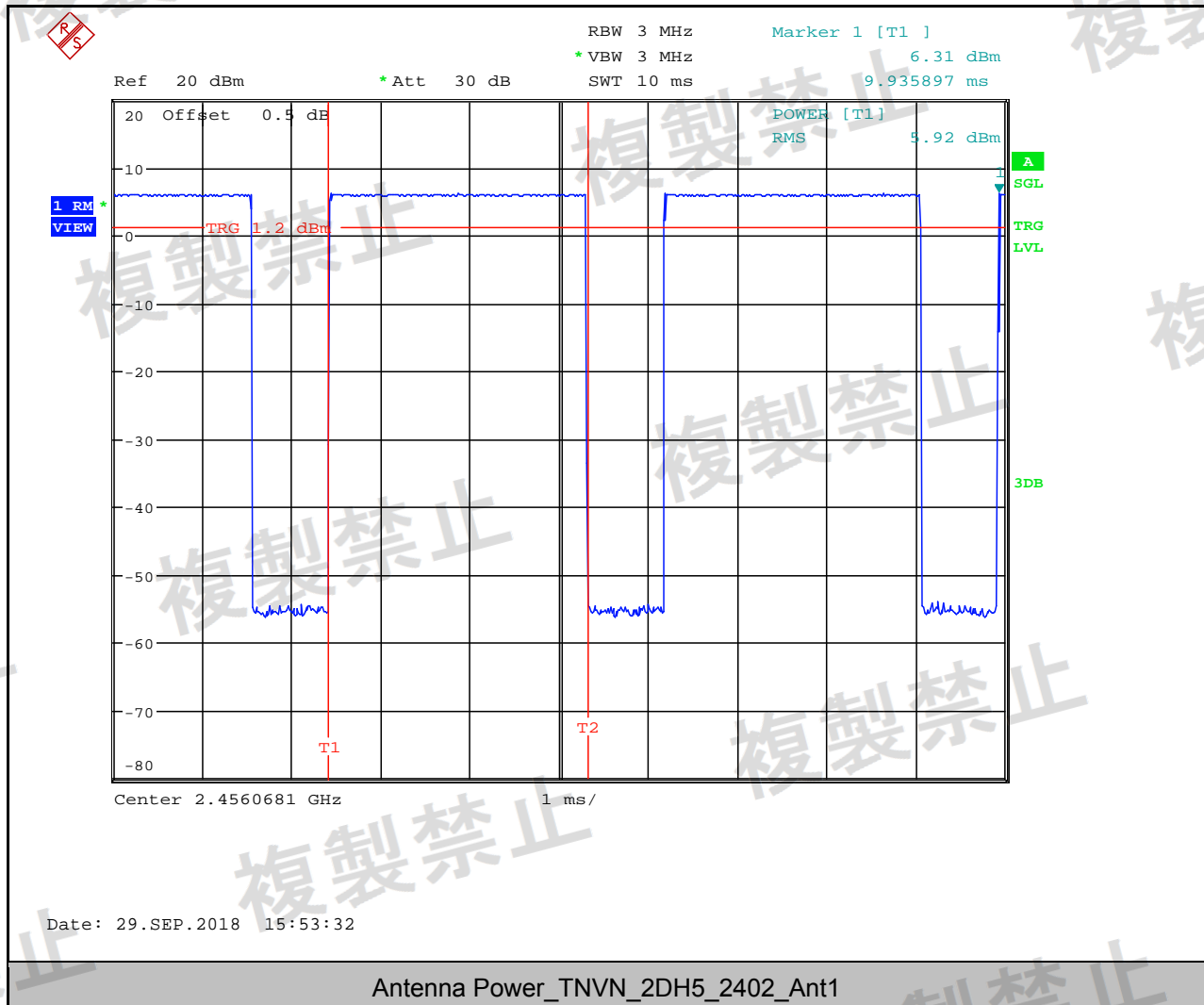
Remark:

Calculated method: Antenna power (mW / MHz) = Average Burst Power (mW) / Spread Bandwidth (MHz)

Note: Spread Bandwidth in the formula above is derived from the data collected in section 7.3 for Spread Bandwidth (90%).





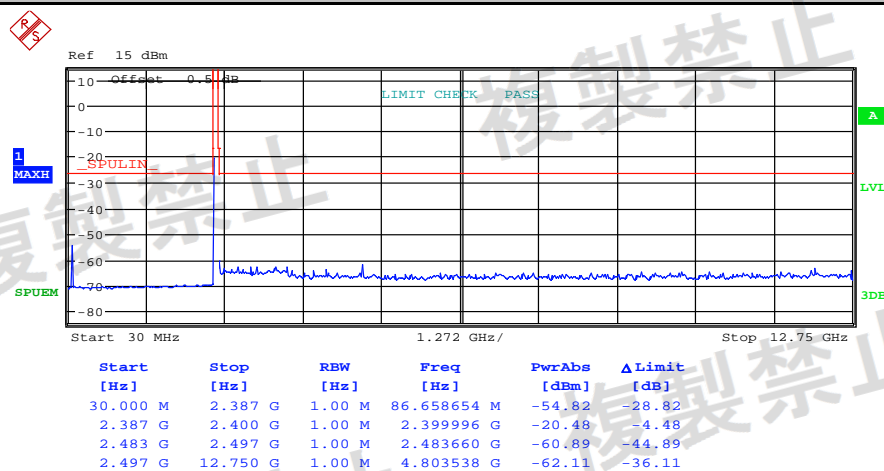


5.Spurious Emissions of Tx

Test Mode	Test Channel	StartFre[MHz]	StopFre[MHz]	Max.Fre[MHz]	Max.Level[μW]	Limit[μW]	Verdict
DH5	2402	30	2387	86.66	0.0033	2.5	PASS
DH5	2402	2387	2400	2400.00	8.9536	25.1	PASS
DH5	2402	2483.5	2496.5	2483.66	0.0008	25.1	PASS
DH5	2402	2496.5	13000	4803.54	0.0006	2.5	PASS
DH5	2441	30	2387	124.43	0.0189	2.5	PASS
DH5	2441	2387	2400	2393.29	0.0004	25.1	PASS
DH5	2441	2483.5	2496.5	2483.57	0.0008	25.1	PASS
DH5	2441	2496.5	13000	2537.86	0.0005	2.5	PASS
DH5	2480	30	2387	165.98	0.0071	2.5	PASS
DH5	2480	2387	2400	2398.05	0.0003	25.1	PASS
DH5	2480	2483.5	2496.5	2483.51	0.1667	25.1	PASS
DH5	2480	2496.5	13000	4960.07	0.0007	2.5	PASS
2DH5	2402	30	2387	86.66	0.0007	2.5	PASS
2DH5	2402	2387	2400	2400.00	6.9663	25.1	PASS
2DH5	2402	2483.5	2496.5	2485.89	0.0009	25.1	PASS
2DH5	2402	2496.5	13000	3194.08	0.0005	2.5	PASS
2DH5	2441	30	2387	124.43	0.0034	2.5	PASS
2DH5	2441	2387	2400	2396.25	0.0002	25.1	PASS
2DH5	2441	2483.5	2496.5	2483.87	0.0008	25.1	PASS
2DH5	2441	2496.5	13000	2808.21	0.0005	2.5	PASS
2DH5	2480	30	2387	165.98	0.0025	2.5	PASS
2DH5	2480	2387	2400	2399.83	0.0002	25.1	PASS
2DH5	2480	2483.5	2496.5	2483.50	0.2178	25.1	PASS
2DH5	2480	2496.5	13000	3006.78	0.0005	2.5	PASS
3DH5	2402	30	2387	86.66	0.0008	2.5	PASS
3DH5	2402	2387	2400	2400.00	6.3973	25.1	PASS
3DH5	2402	2483.5	2496.5	2484.38	0.0008	25.1	PASS
3DH5	2402	2496.5	13000	3456.91	0.0005	2.5	PASS
3DH5	2441	30	2387	124.43	0.0030	2.5	PASS
3DH5	2441	2387	2400	2399.54	0.0003	25.1	PASS
3DH5	2441	2483.5	2496.5	2486.62	0.0008	25.1	PASS

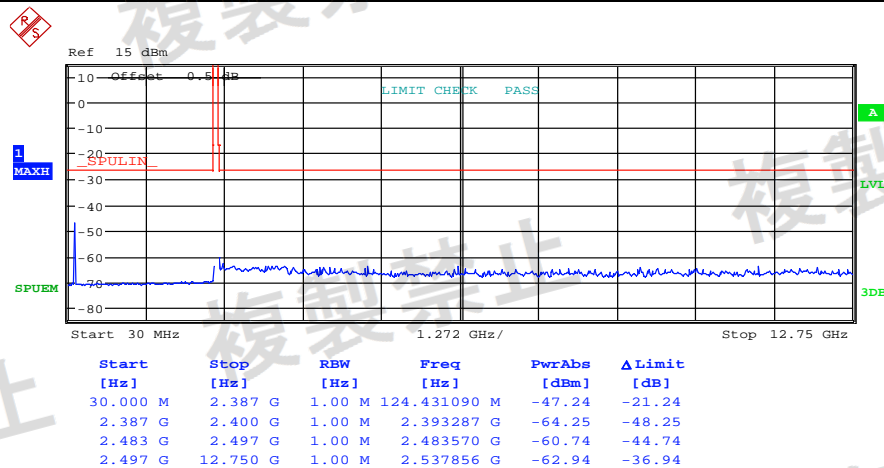
3DH5	2441	2496.5	13000	2790.09	0.0005	2.5	PASS
3DH5	2480	30	2387	165.98	0.0025	2.5	PASS
3DH5	2480	2387	2400	2397.71	0.0004	25.1	PASS
3DH5	2480	2483.5	2496.5	2483.54	0.1824	25.1	PASS
3DH5	2480	2496.5	13000	2562.81	0.0005	2.5	PASS

Spurious Emissions of Tx_TNVN_DH5_2402_Ant1



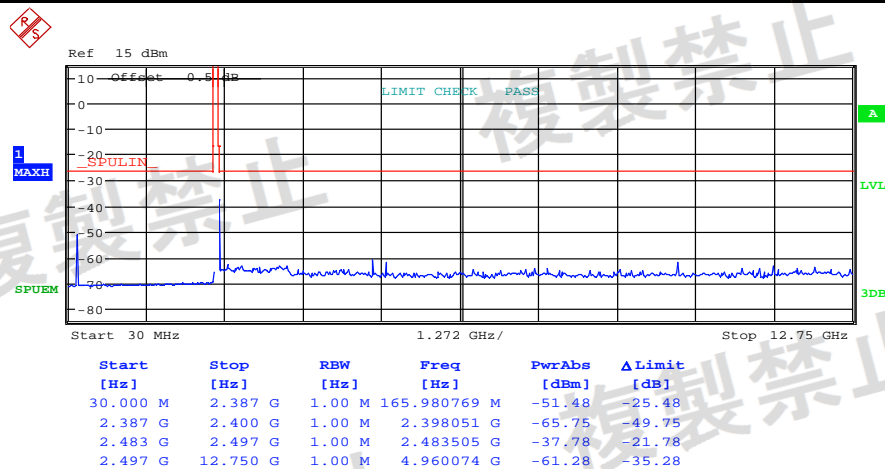
Date: 29.SEP.2018 15:26:46

Spurious Emissions of Tx_TNVN_DH5_2441_Ant1



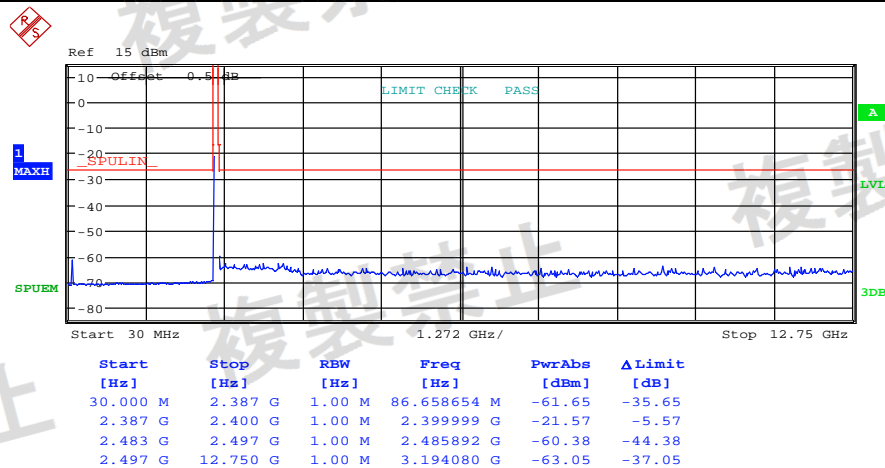
Date: 29.SEP.2018 15:28:26

Spurious Emissions of Tx_TNVN_DH5_2480_Ant1



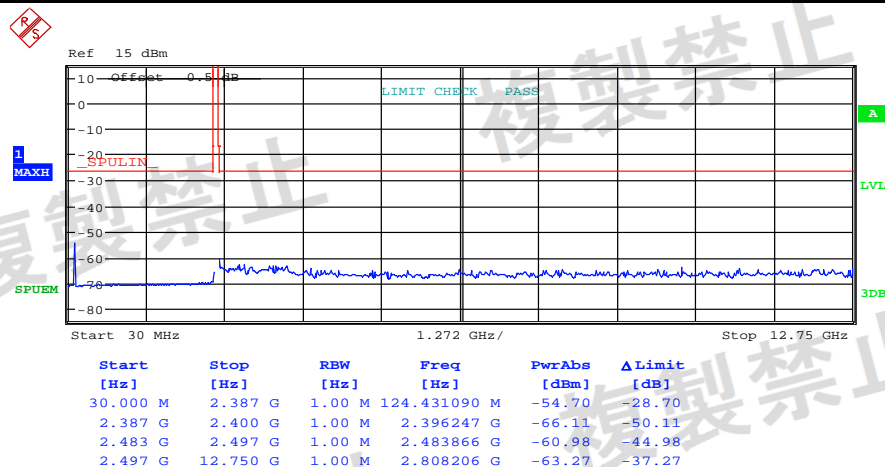
Date: 29.SEP.2018 15:32:20

Spurious Emissions of Tx_TNVN_2DH5_2402_Ant1



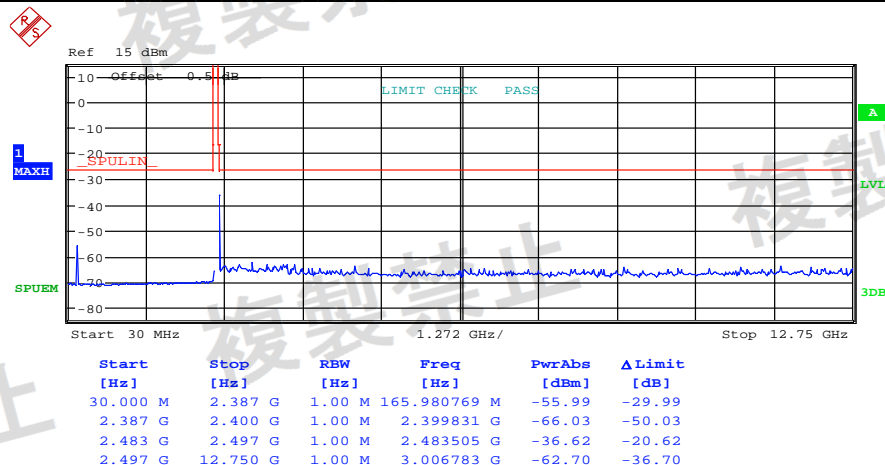
Date: 29.SEP.2018 15:34:08

Spurious Emissions of Tx_TNVN_2DH5_2441_Ant1



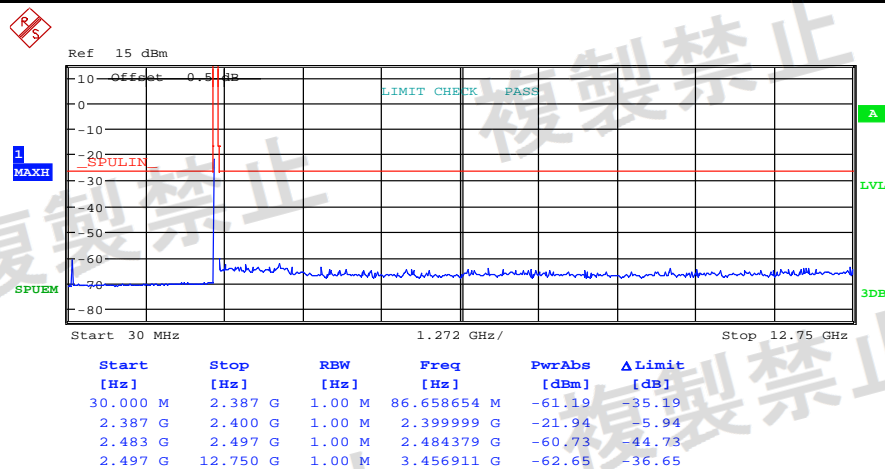
Date: 29.SEP.2018 15:35:49

Spurious Emissions of Tx_TNVN_2DH5_2480_Ant1



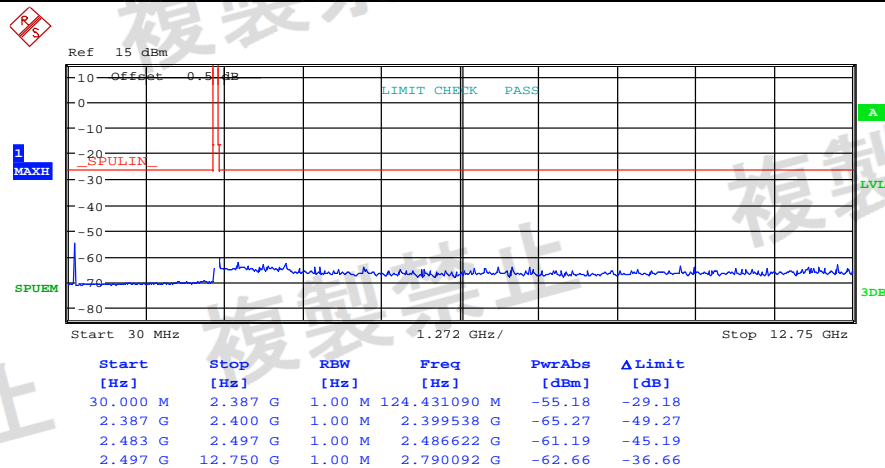
Date: 29.SEP.2018 15:37:17

Spurious Emissions of Tx_TNVN_3DH5_2402_Ant1



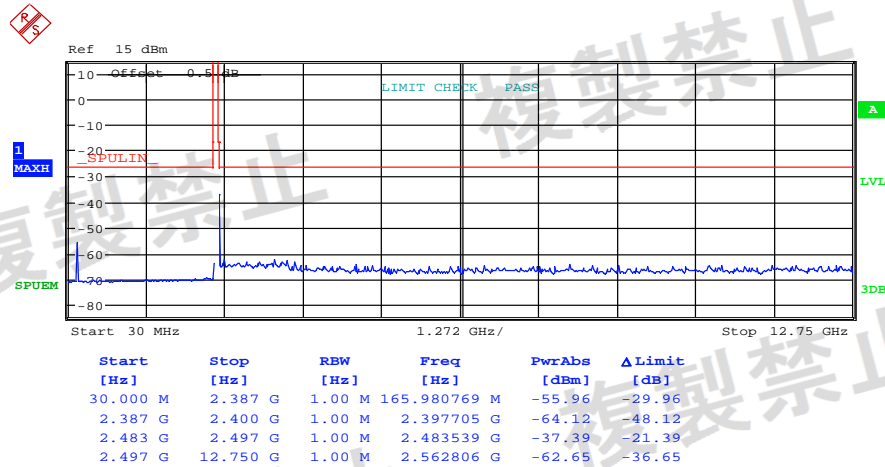
Date: 29.SEP.2018 15:40:21

Spurious Emissions of Tx_TNVN_3DH5_2441_Ant1



Date: 29.SEP.2018 15:42:20

Spurious Emissions of Tx_TNVN_3DH5_2480_Ant1

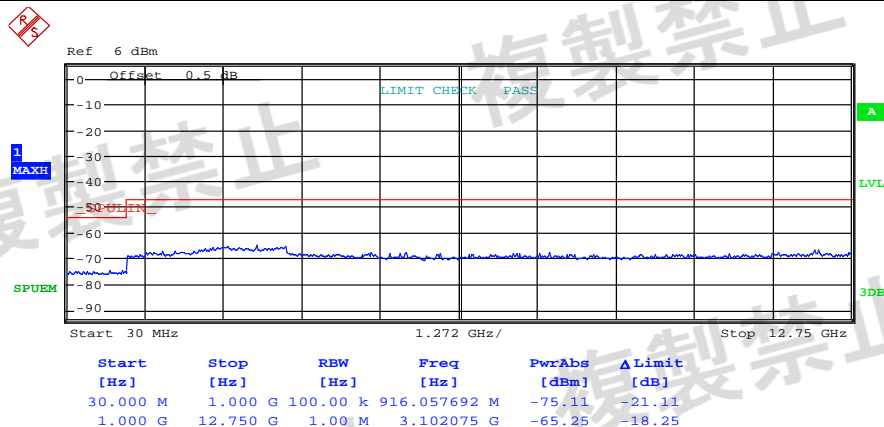


Date: 29.SEP.2018 15:44:38

6.Spurious Emissions of Rx

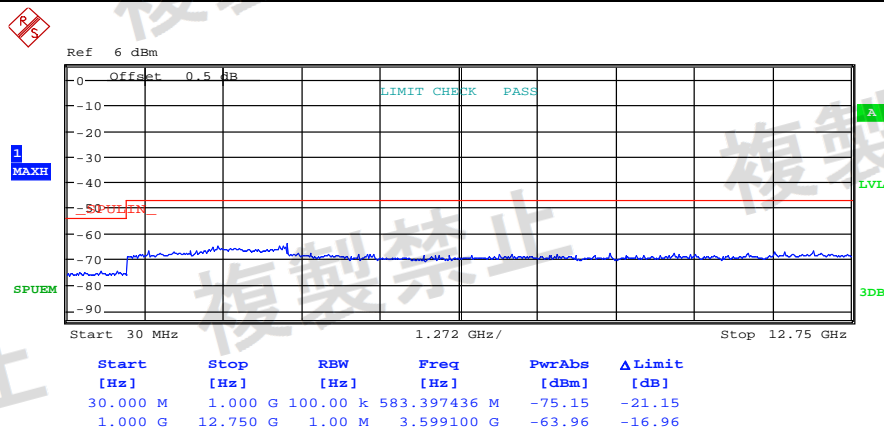
Test Mode	Test Channel	StartFre[MHz]	StopFre[MHz]	Max.Fre[MHz]	Max.Level[nW]	Limit[nW]	Verdict
DH5	2402	1000	13000	3102.07	0.299	20	PASS
DH5	2402	30	1000	916.06	0.031	4	PASS
DH5	2441	1000	13000	3599.10	0.402	20	PASS
DH5	2441	30	1000	583.40	0.031	4	PASS
DH5	2480	1000	13000	3357.05	0.303	20	PASS
DH5	2480	30	1000	746.62	0.030	4	PASS

Spurious Emissions of Rx TNVN DH5 2402 Ant1



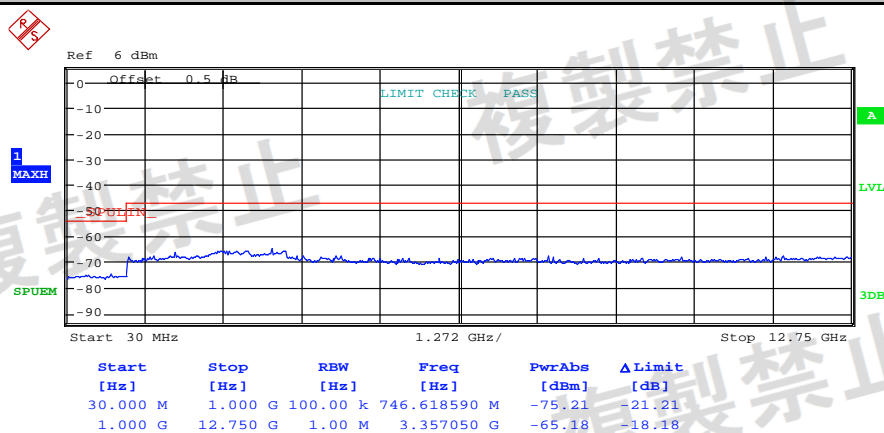
Date: 29.SEP.2018 16:03:14

Spurious Emissions of Rx TNVN DH5 2441 Ant1



Date: 29.SEP.2018 16:03:32

Spurious Emissions of Rx_TNVN_DH5_2480_Ant1



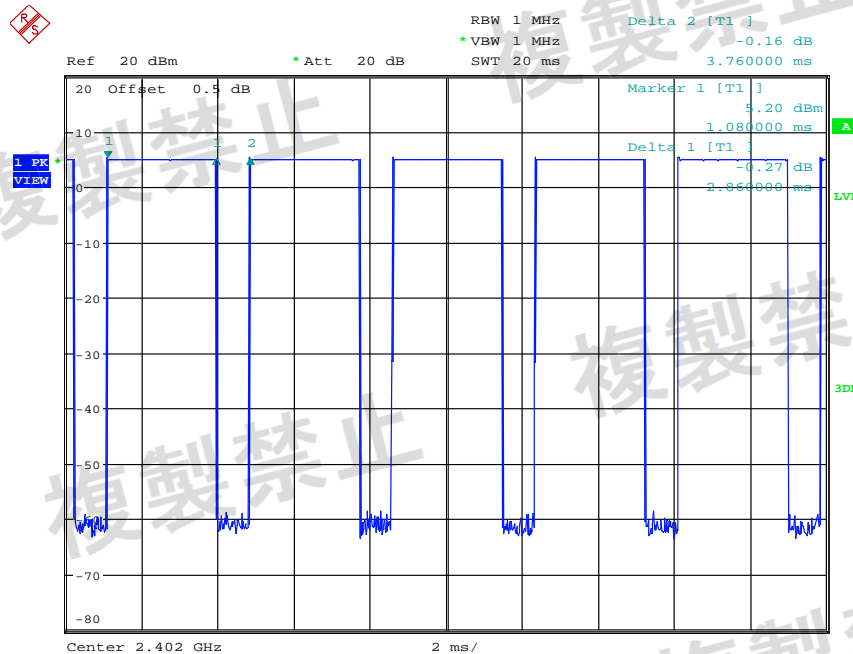
Date: 29.SEP.2018 16:04:50

7.Dwell Time

Test Condition	Test Mode	Test Channel	Ant	Burst Width[ms]	Dwell Time[s]	Limit[s]	Verdict
TNVN	DH5	2402	Ant1	2.86	0.26	<0.4	PASS
TNVN	DH5	2441	Ant1	2.84	0.26	<0.4	PASS
TNVN	DH5	2480	Ant1	2.84	0.26	<0.4	PASS
TNVN	2DH5	2402	Ant1	2.86	0.26	<0.4	PASS
TNVN	2DH5	2441	Ant1	2.86	0.26	<0.4	PASS
TNVN	2DH5	2480	Ant1	2.84	0.26	<0.4	PASS
TNVN	3DH5	2402	Ant1	2.84	0.26	<0.4	PASS
TNVN	3DH5	2441	Ant1	2.86	0.26	<0.4	PASS
TNVN	3DH5	2480	Ant1	2.86	0.26	<0.4	PASS

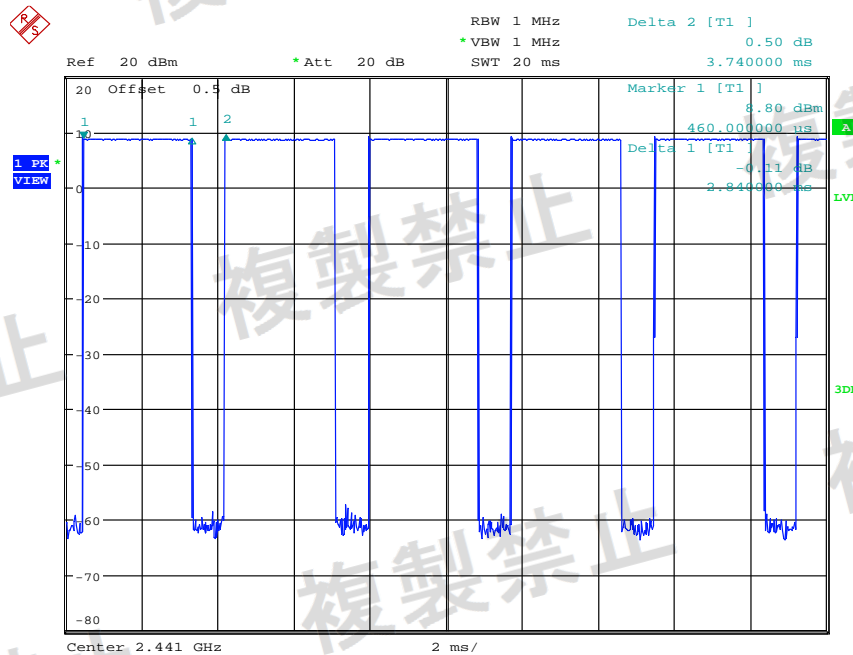
TEST PLOT

Dwell Time_TNVN_DH5_2402_Ant1

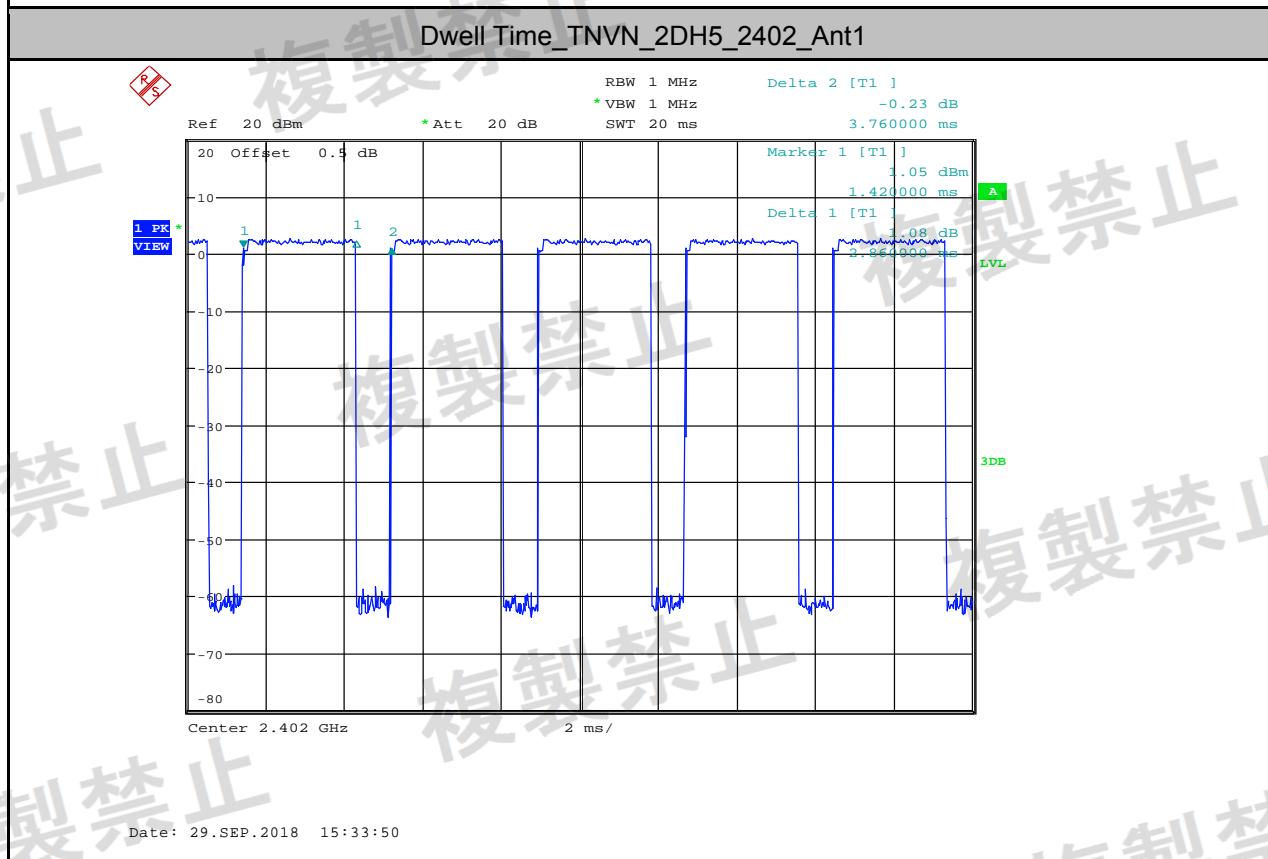
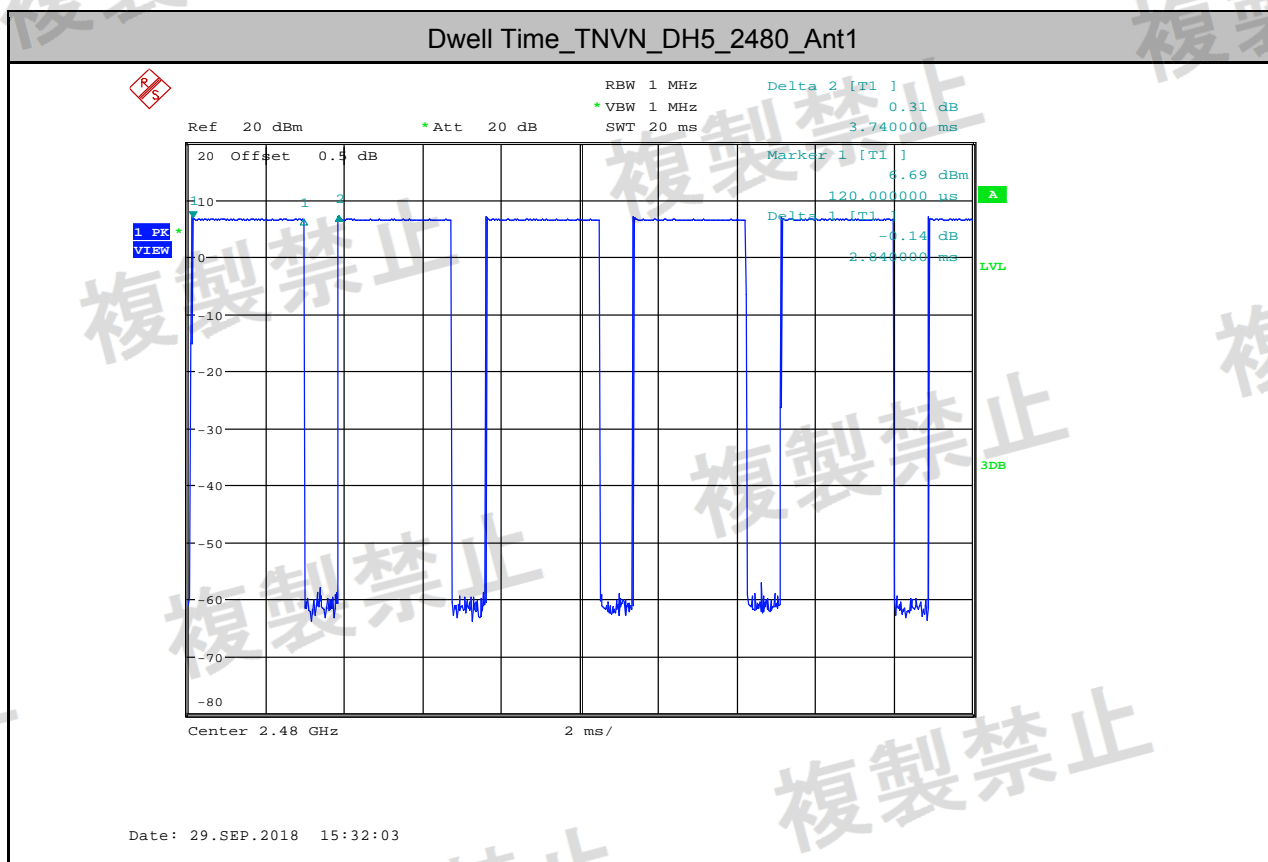


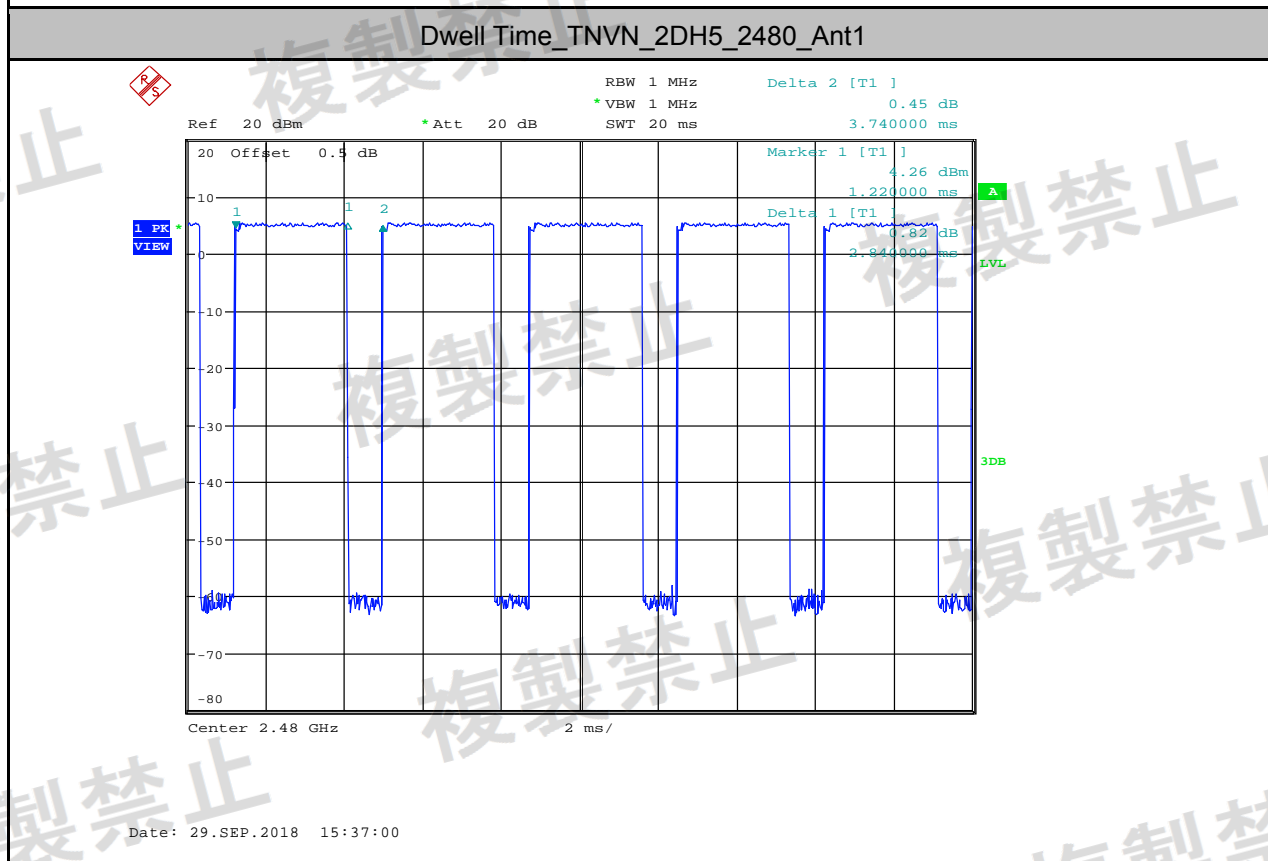
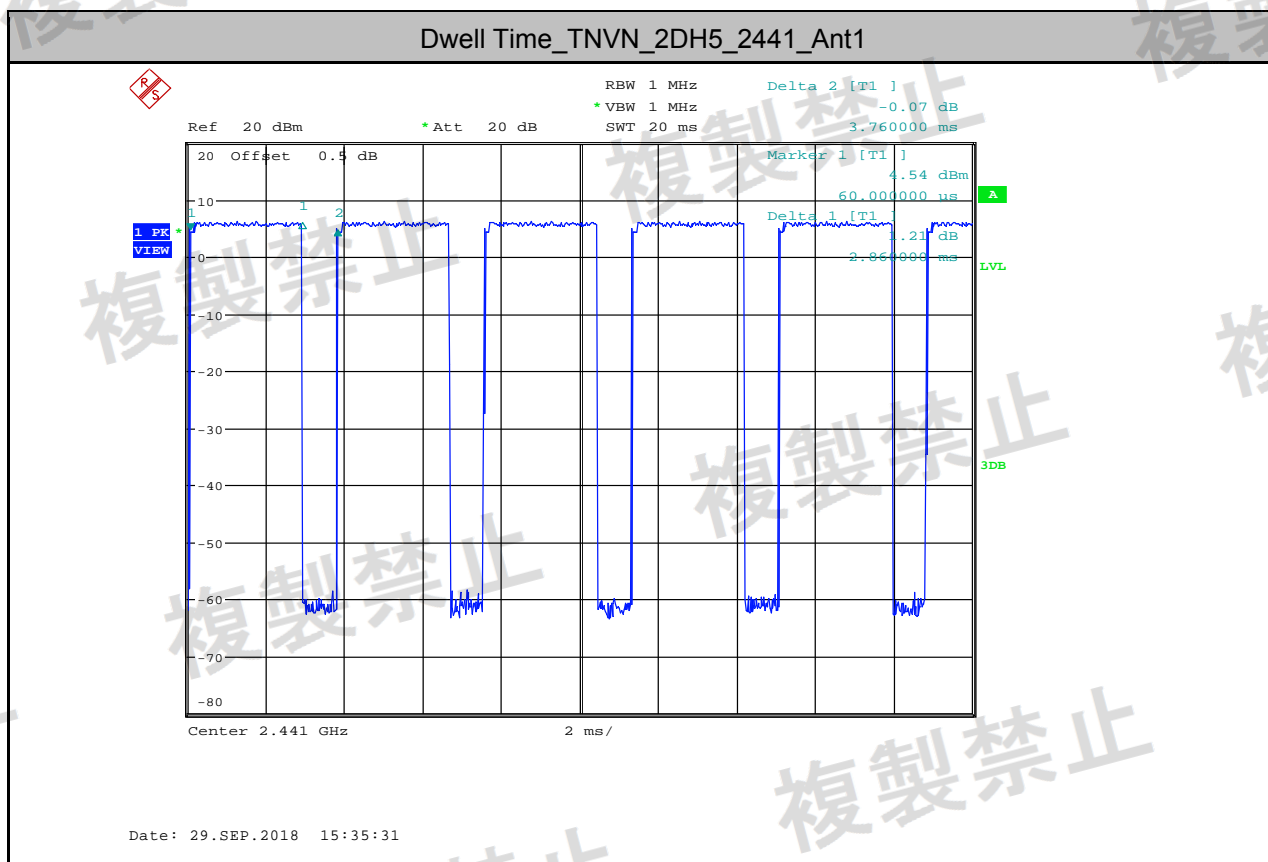
Date: 29.SEP.2018 15:30:28

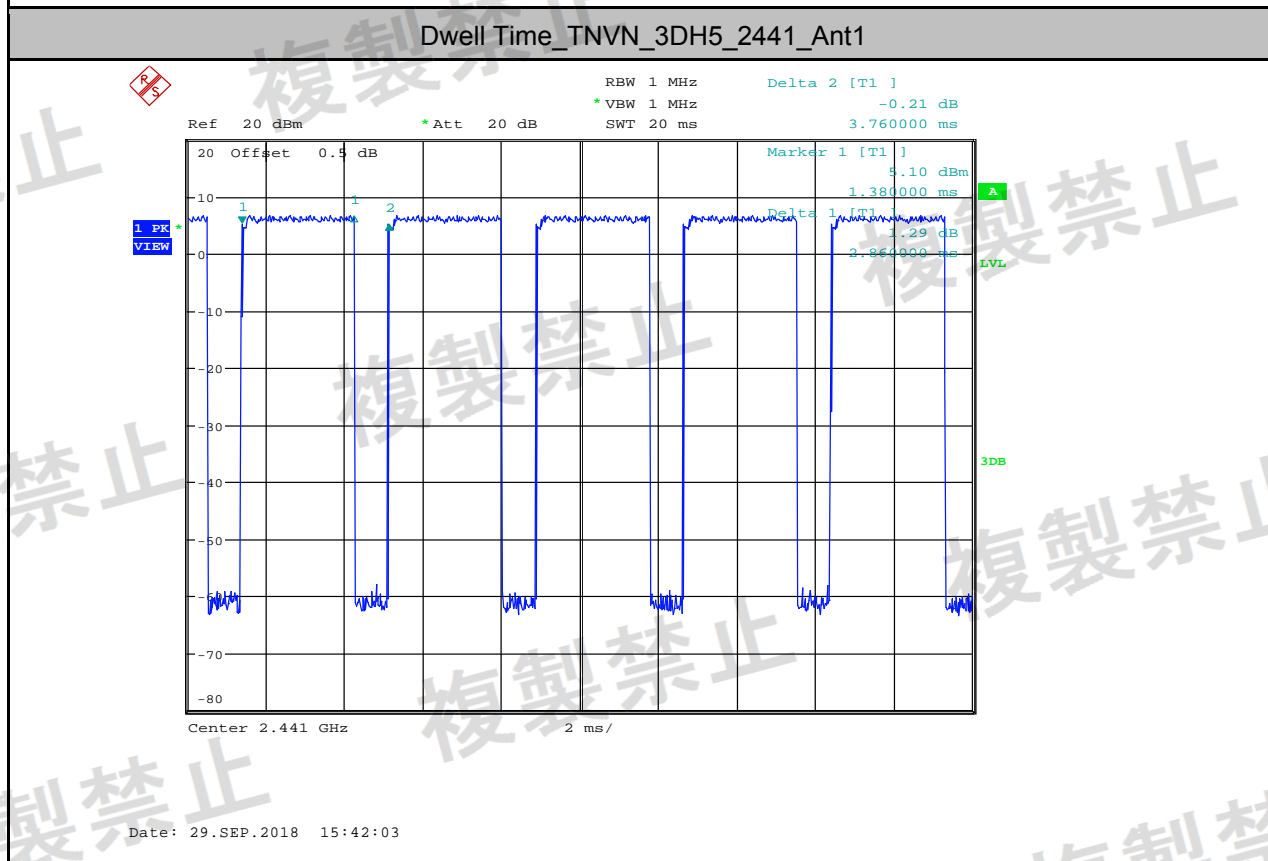
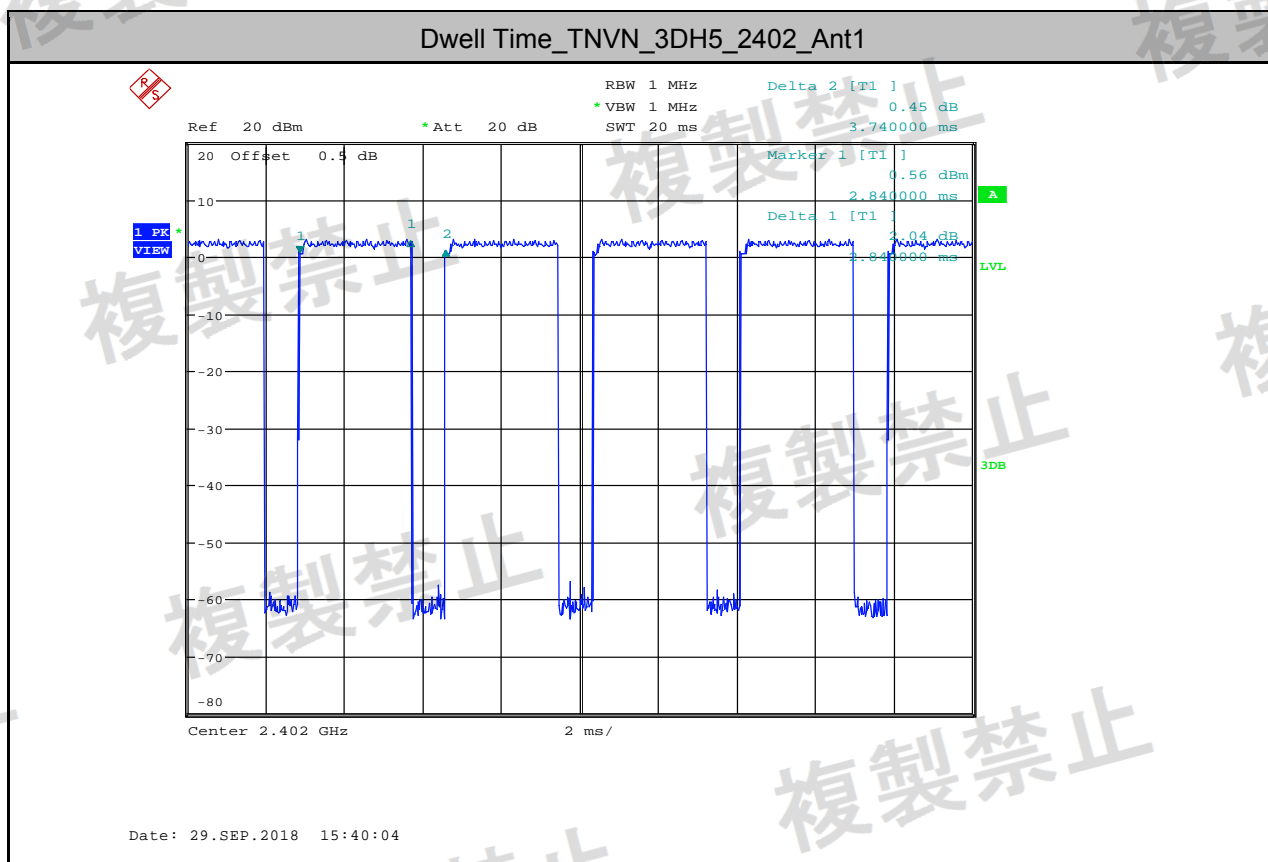
Dwell Time_TNVN_DH5_2441_Ant1

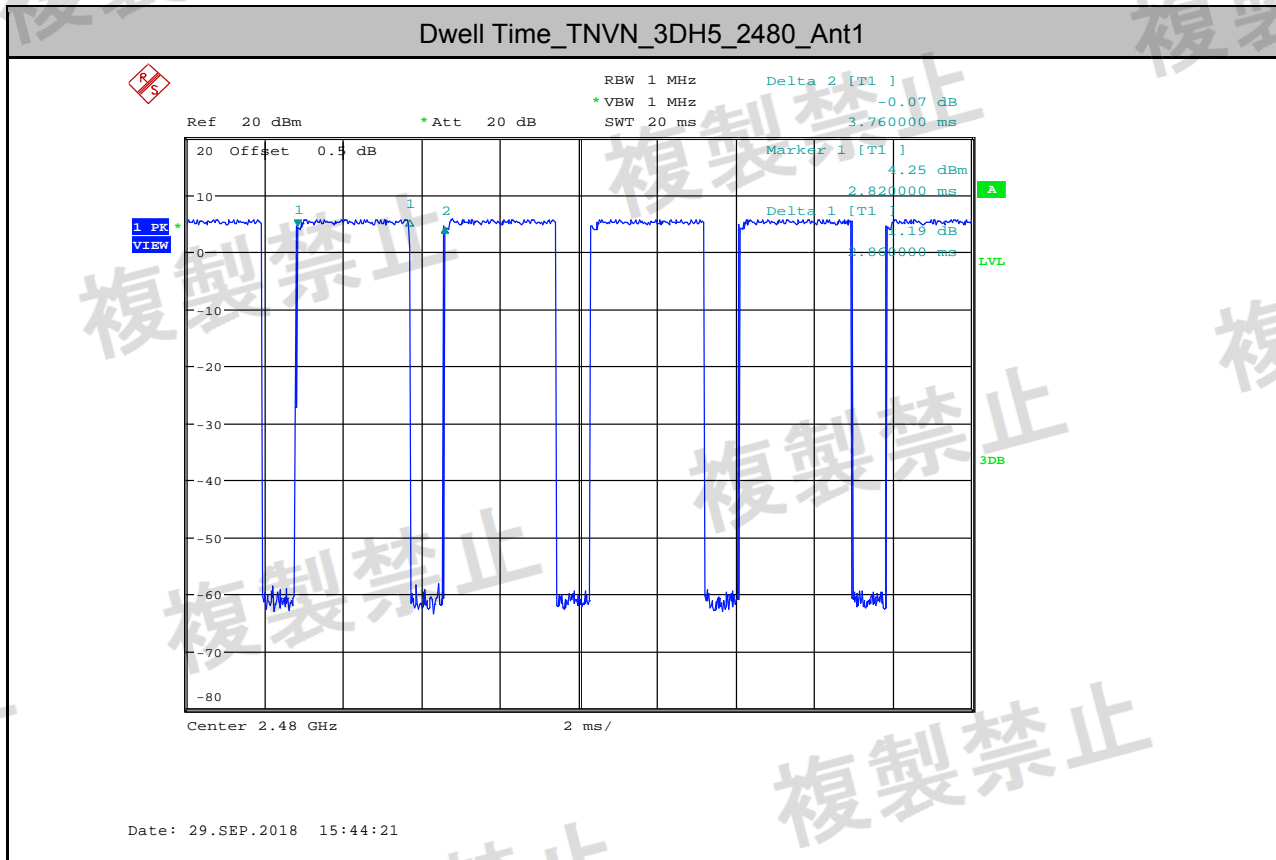


Date: 29.SEP.2018 15:30:03









- End of the Report -