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Report No.: SZEM180500369201
Page: 1 of 55

TEST REPORT

Application No.: SZEM1805003692CR
Applicant: Admixx GmbH
Address of Applicant: Alte Landstrasse 12-14 85521, Ottobrunn Germany
Manufacturer: OCEAN TOP HOLDINGS LIMITED
Address of Manufacturer: Floor 5, Plant 26, Lianchuang Technical Zone, No 21, Bulan Road, Nanwan Sub-district, Longgang District, Shenzhen City, Guangdong Province, P.R. China
Factory: OCEAN TOP HOLDINGS LIMITED
Address of Factory: Floor 5, Plant 26, Lianchuang Technical Zone, No 21, Bulan Road, Nanwan Sub-district, Longgang District, Shenzhen City, Guangdong Province, P.R. China
Equipment Under Test (EUT):
EUT Name: MINI Bluetooth Speaker
Model No.: 80292445711, 80292460893, 80292460894 ♣
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark: BMW (BMW AG)
Standard(s) : MIC Item 19 of Article 2 Paragraph 1
Date of Receipt: 2018-05-07
Date of Test: 2018-05-10
Date of Issue: 2018-05-14

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		2018-05-14		Original

Authorized for issue by:			
			
		Leo Li /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

Model No.: 80292445711, 80292460893, 80292460894

Only the model 80292445711 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on colors.

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4 General Information

4.1 Details of E.U.T.

Power supply:	Lithium Ion Battery: 3.7V 450mAh rechargeable battery which charged by USB port
Cable:	USB cable: 80cm unshielded
Spectrum Spread Technology	Frequency Hopping Spread Spectrum(FHSS)
Operation Frequency	2402MHz to 2480MHz
Bluetooth Version:	BT4.0+EDR
Modulation Type	GFSK, $\pi/4$ DQPSK, 8DPSK
Number of Channels	79
Channel Spacing	1MHz
Antenna Type	Monopole antenna
Antenna Gain	0dBi

4.2 Test Conditions

Power Supply

Lithium Ion Battery: 3.7V 450mAh (Charge by adapter)

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 DC3.7V 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 DC3.7V $\pm 10\%$.

DC Input	DC3V3
4.07V	3.32V
3.70V	3.30V
3.33V	3.28V

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 (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2402	21	2422	41	2442	61	2462
2	2403	22	2423	42	2443	62	2463
3	2404	23	2424	43	2444	63	2464
4	2405	24	2425	44	2445	64	2465
5	2406	25	2426	45	2446	65	2466
6	2407	26	2427	46	2447	66	2467
7	2408	27	2428	47	2448	67	2468
8	2409	28	2429	48	2449	68	2469
9	2410	29	2430	49	2450	69	2470
10	2411	30	2431	50	2451	70	2471
11	2412	31	2432	51	2452	71	2472
12	2413	32	2433	52	2453	72	2473
13	2414	33	2434	53	2454	73	2474
14	2415	34	2435	54	2455	74	2475
15	2416	35	2436	55	2456	75	2476
16	2417	36	2437	56	2457	76	2477
17	2418	37	2438	57	2458	77	2478
18	2419	38	2439	58	2459	78	2479
19	2420	39	2440	59	2460	79	2480
20	2421	40	2441	60	2461		

Test frequencies are the lowest channel: 0 channel (2402 MHz), middle channel: 39 channel (2441 MHz) and highest channel: 78 channel (2480 MHz).

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	7.25×10^{-8}
2	Duty cycle	0.37%
3	Occupied Bandwidth	3%
4	RF conducted power	0.75dB
5	RF power density	2.84dB
6	Conducted Spurious emissions	0.75dB
7	RF Radiated power	4.5dB (below 1GHz)
		4.8dB (above 1GHz)
8	Radiated Spurious emission test	4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
9	Temperature test	1°C
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%

4.5 Standards Applicable for Testing

Table 1 : Tests Carried Out Under MIC Item 19 of Article 2 Paragraph 1

Item	Status
Frequency	√
Occupied Bandwidth(99%)	√
Spread spectrum Bandwidth(90%)	√
Spurious emission Intensity	×
Antenna Power	√
Dwell time	√
Antenna Requirement	√
Test frequency	√
Frequency Error	√
Spurious Emission of Rx	√
Spurious Emission of Tx	√
Interference prevention capability	√
Carrier sense capability	×
RF accessibility	√
Pseudorandom Frequency Hopping Sequence	√

× Indicates that the test is not applicable

√ Indicates that the test is applicable

4.6 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.

4.7 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.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.8 Deviation from Standards

None

4.9 Abnormalities from Standard Conditions

None

5 Equipment List

MIC Test Equipment List						
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Calibration body	Classification
Humi/ Temp Indicator	HYGRO	ZJ1-2B	SEL0033	2017-10-12	CEPREI	(c)
Spectrum Analyzer	Rohde & Schwarz	FSP	SEL0154	2017-10-17	CEPREI	(c)
Barometer	ChangChun	DYM3	SEL0088	2018-04-11	CEPREI	(c)
DC Power Supply	Zhao Xin	RXN-305D	SEL0117	2017-10-09	CEPREI	(c)
Multi Meter	Fluke	15B	SEL250	2018-04-11	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

Notice: Calibration duration for above equipments is 1 year.

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

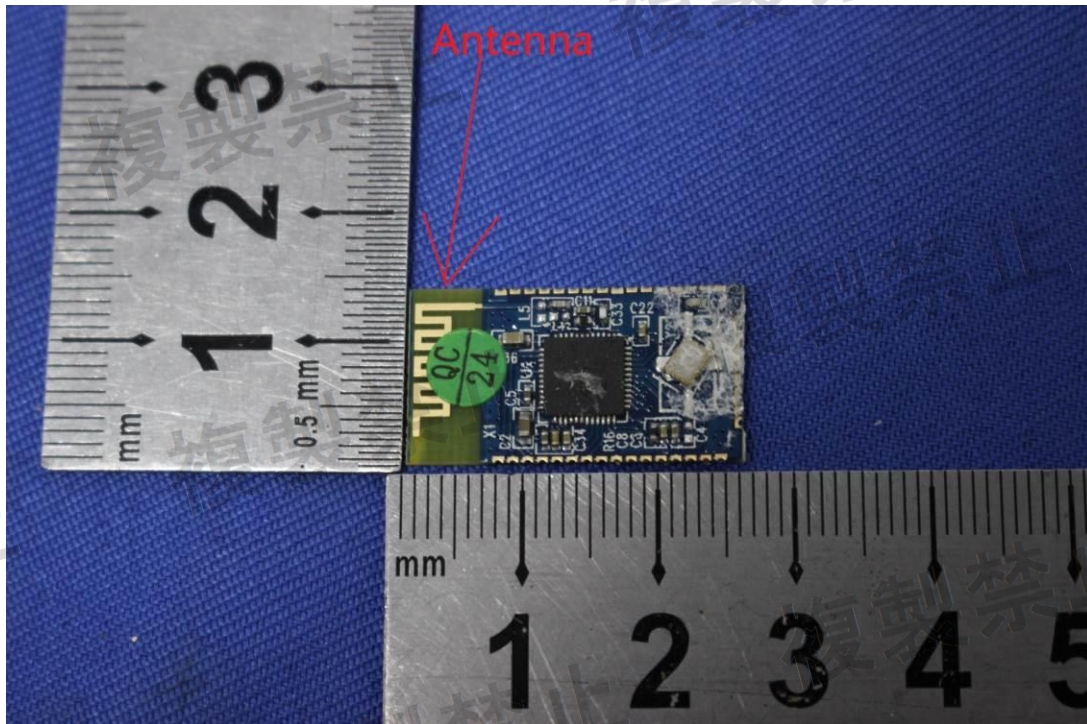
6.1.1 Test Requirement:

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 integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.

Result:

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

6.2 Interference prevention capability

6.2.1 Test Requirement:

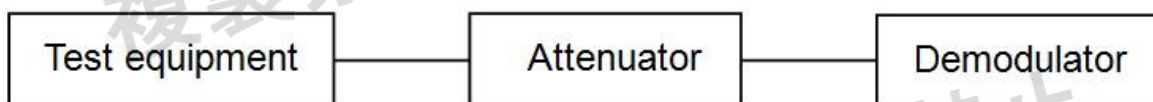
MIC Item 19 of Article 2 Paragraph 1

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:

FC:58:FA:D1:3B:BB

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: 24.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:
a:TX_Keep the EUT in transmitting mode
b:TX+Charge_Keep the EUT in transmitting mode and being charged

The worst case for final test: 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: 24.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:

- a:TX_Keep the EUT in transmitting mode
- b:TX+Charge_Keep the EUT in transmitting mode and being charged

The worst case for final test:

- 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: 24.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

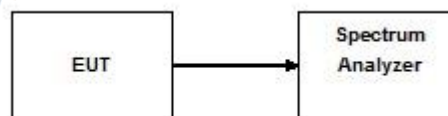
Pretest these modes to find the worst case:

- a:TX_Keep the EUT in transmitting mode
- b:TX+Charge_Keep the EUT in transmitting mode and being charged

The worst case for final test:

- 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: 24.5 °C Humidity: 44.5 % RH Atmospheric Pressure: 1020 mbar

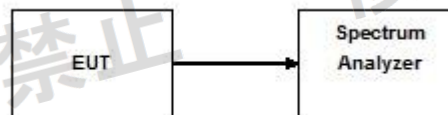
Pretest these modes to find the worst case:

- a: TX_Keep the EUT in transmitting mode
- b: TX+Charge_Keep the EUT in transmitting mode and being charged

The worst case for final test:

- 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

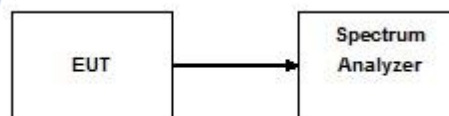
Operating Environment:

Temperature: 24.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:
a:TX_Keep the EUT in transmitting mode
b:TX+Charge_Keep the EUT in transmitting mode and being charged

The worst case for final test:
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: 24.5 °C Humidity: 44.5 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case:
a:TX_Keep the EUT in transmitting mode
b:TX+Charge_Keep the EUT in transmitting mode and being charged

The worst case for final test:
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: 24.5 °C Humidity: 44.6 % RH Atmospheric Pressure: 1020 mbar

Pretest these modes to find the worst case: c:RX_Keep the EUT in receiving mode

d:RX+Charge_Keep the EUT in receiving mode and being charged

The worst case for final test: c: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

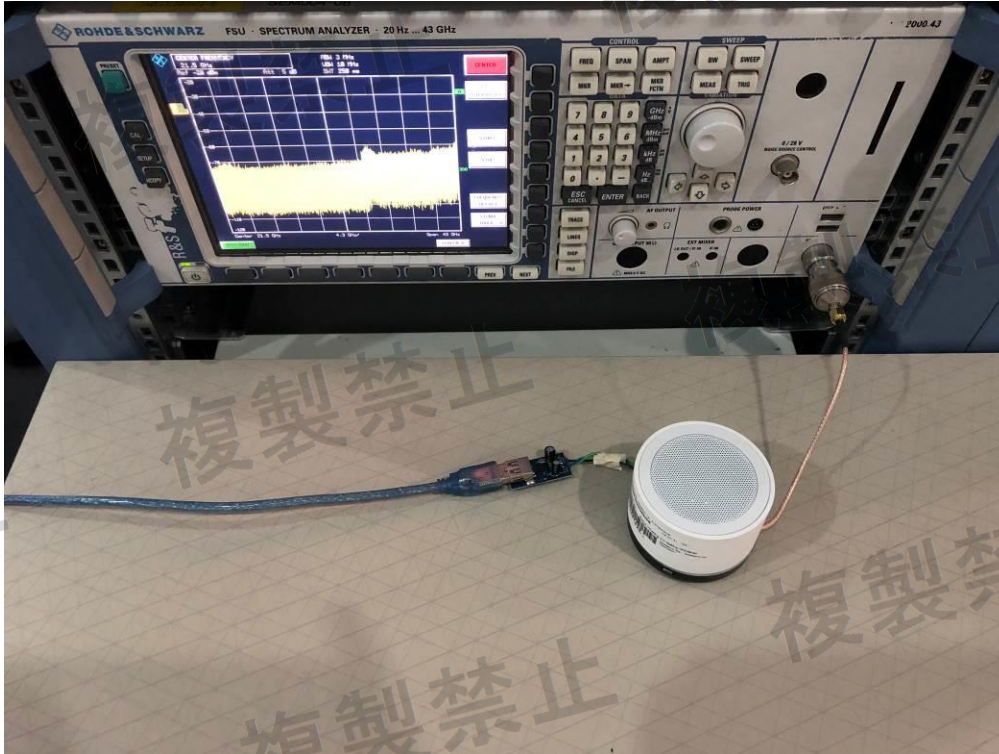
detector mode Sample

Indication mode Max hold

The detailed test data see: Appendix MIC19-2

8 Photographs

8.1 EUT setup photo



8.2 EUT Constructional Details (EUT Photos)

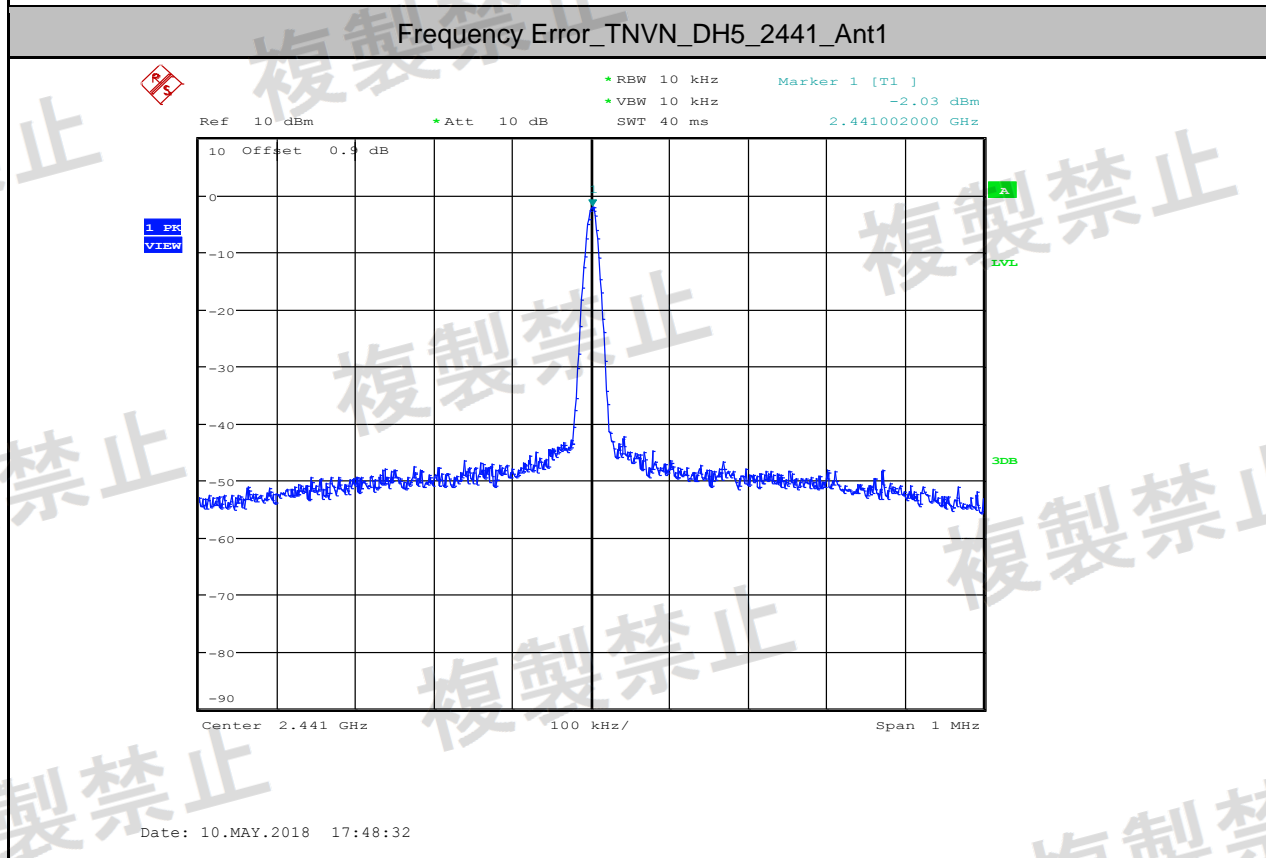
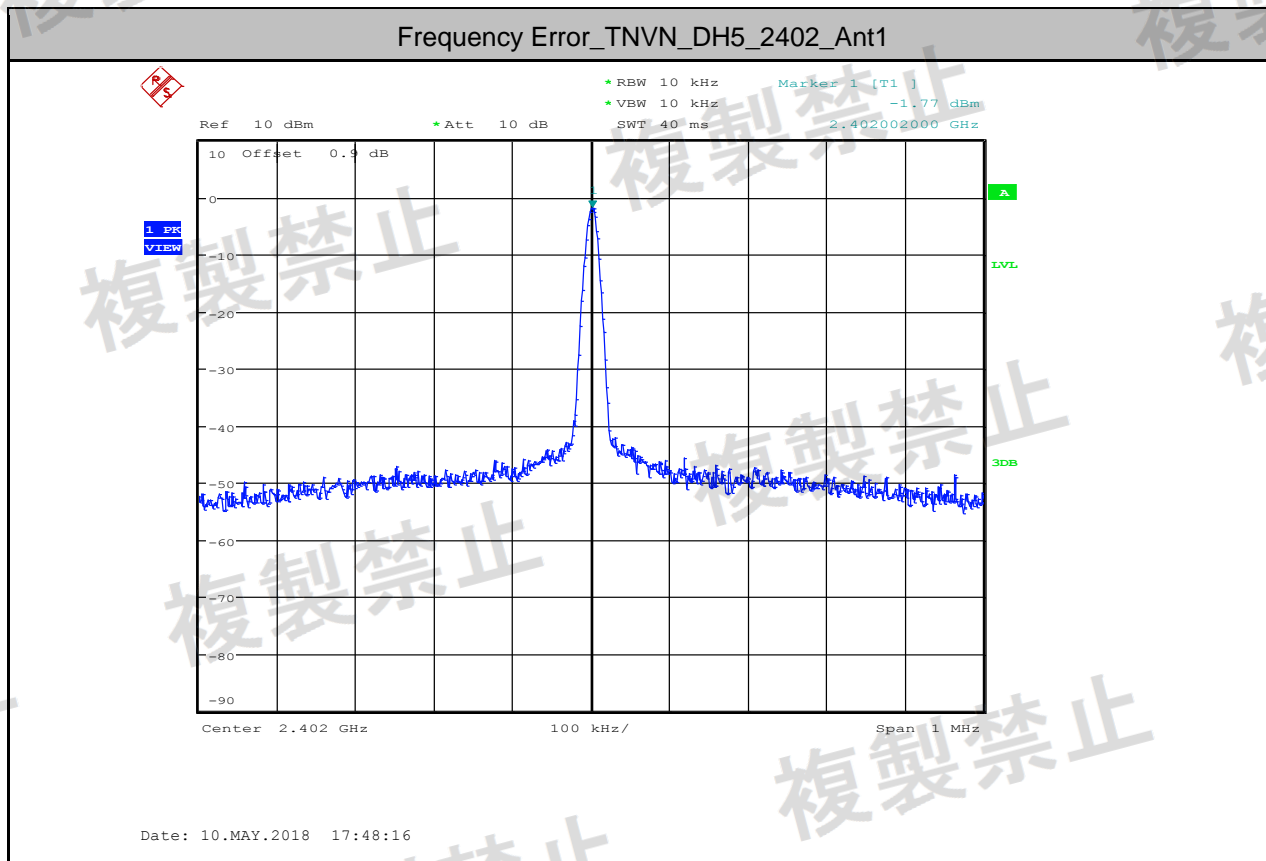
Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1805003692CR.

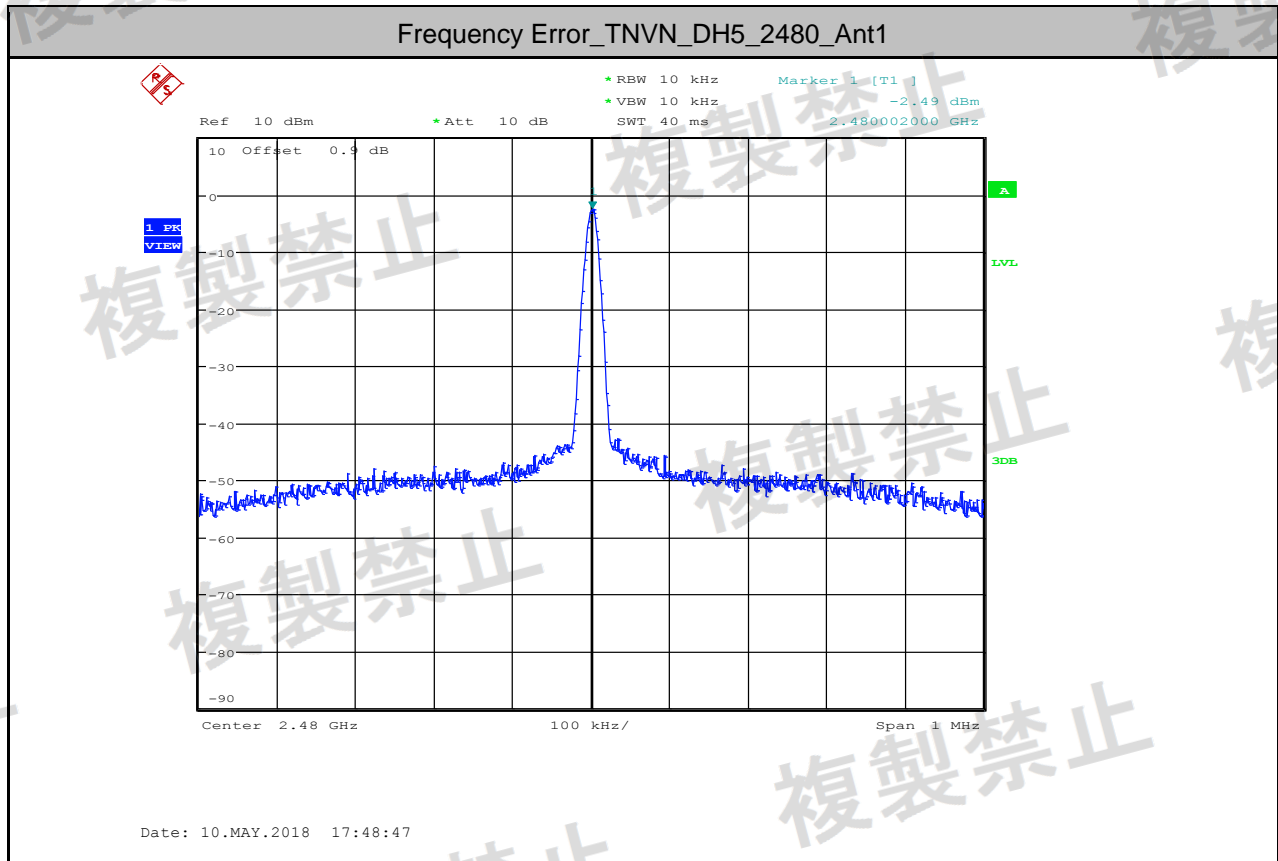
9 Appendix

9.1 Appendix MIC19-2

1.Frequency Error

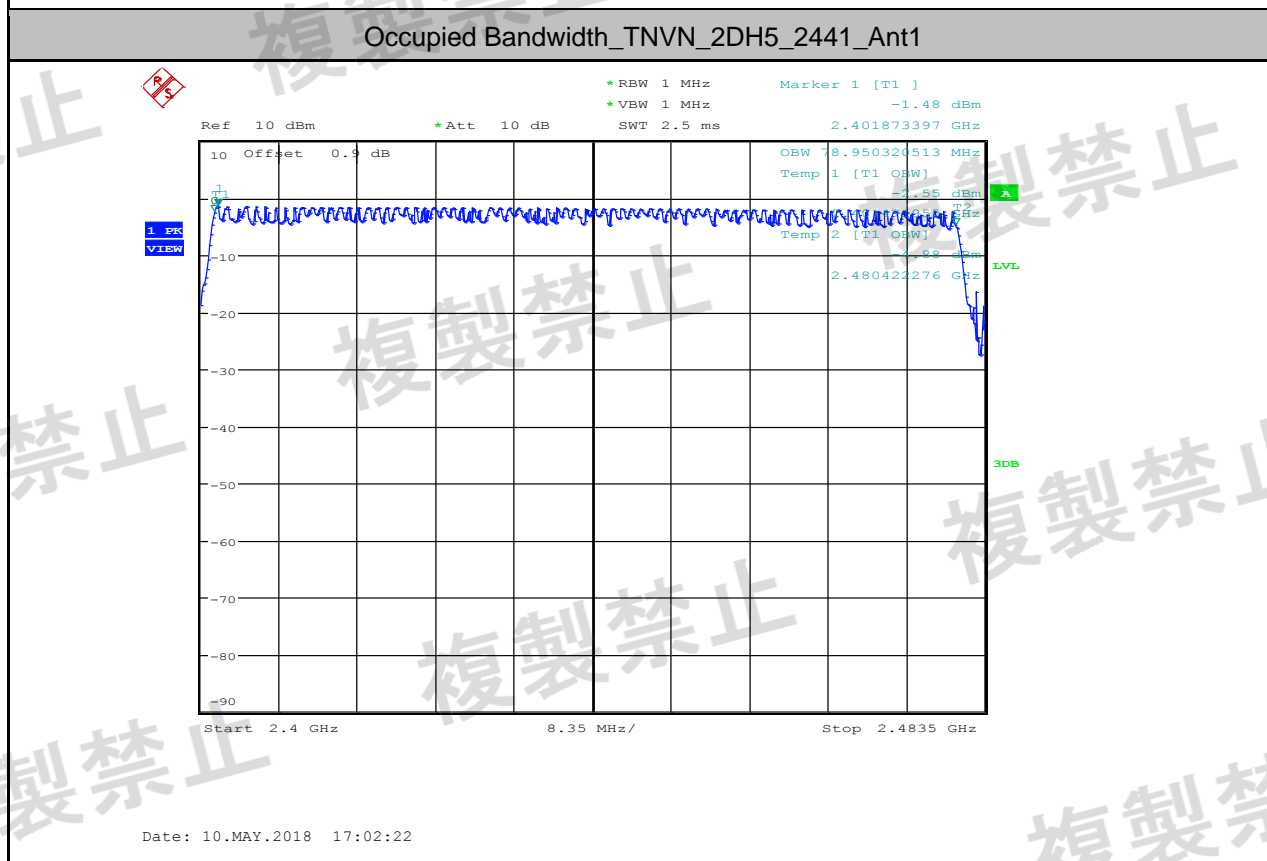
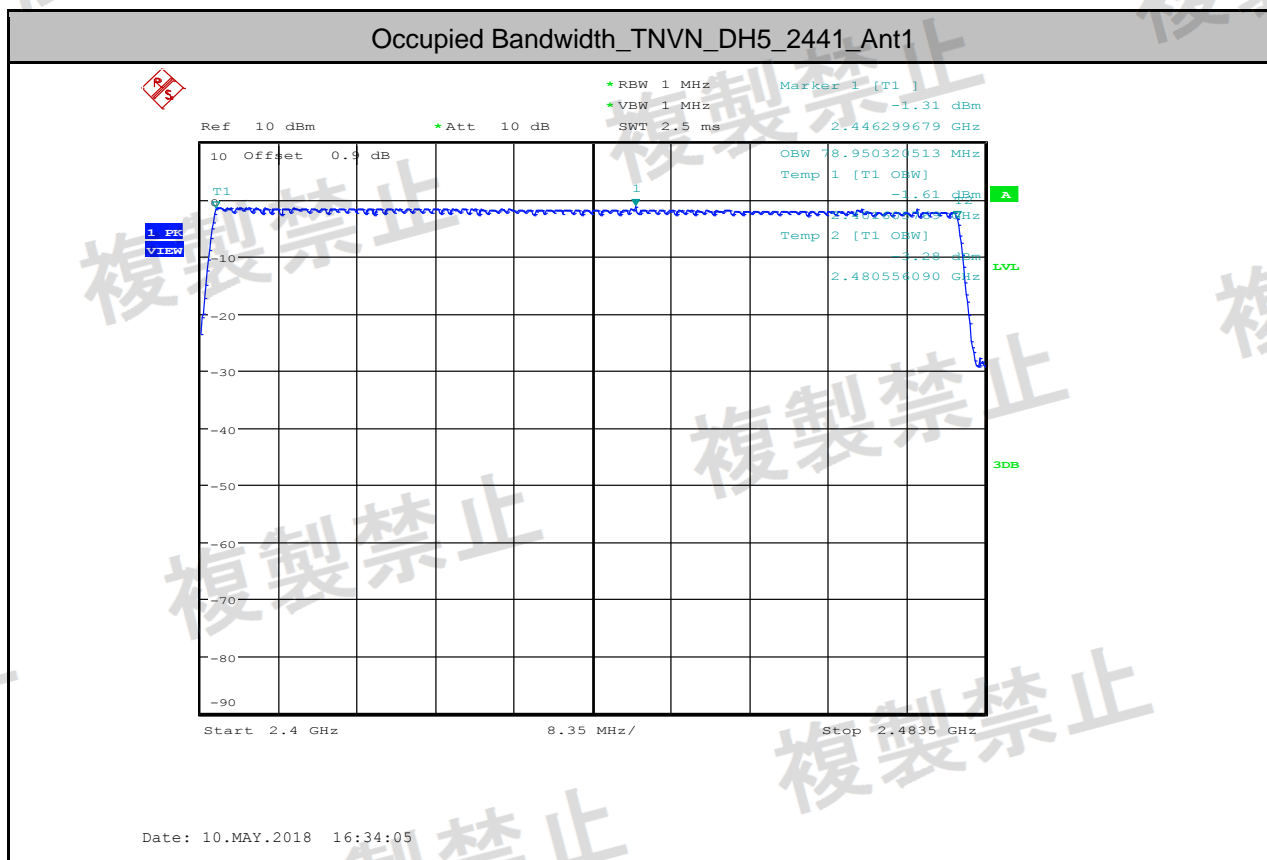
Test Condition	Test Mode	Test Channel	Ant	Result[MHz]	Result[PPM]	Limit[PPM]	Verdict
TNVN	DH5	2402	Ant1	2402.002	0.83	$\leq \pm 50$	PASS
TNVN	DH5	2441	Ant1	2441.002	0.82	$\leq \pm 50$	PASS
TNVN	DH5	2480	Ant1	2480.002	0.81	$\leq \pm 50$	PASS



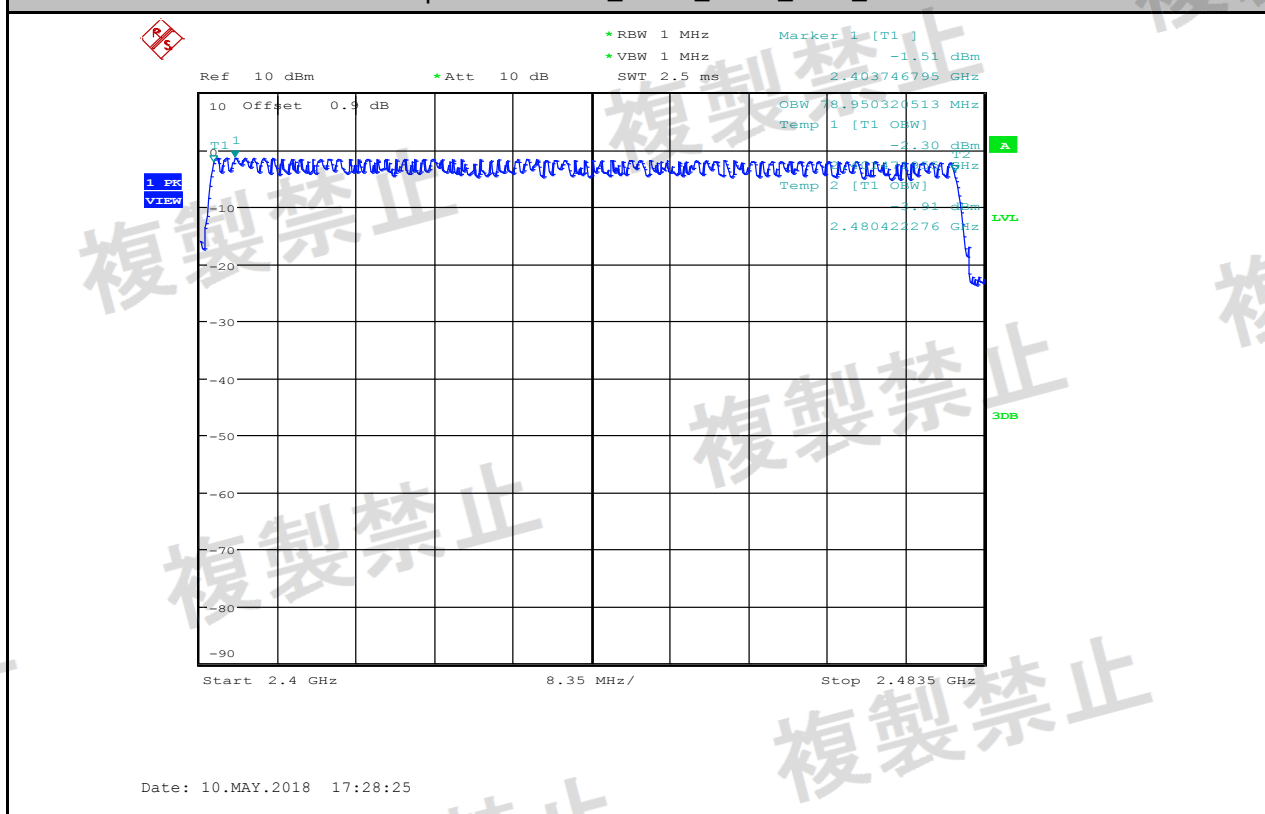


2.Occupied Bandwidth (99%)

Test Condition	Test Mode	Test Channel	Ant	Test Result[MHz]	Limit [MHz]	Verdict
TNVN	DH5	2441	Ant1	78.950	<=83.5	PASS
TNVN	2DH5	2441	Ant1	78.950	<=83.5	PASS
TNVN	3DH5	2441	Ant1	78.950	<=83.5	PASS

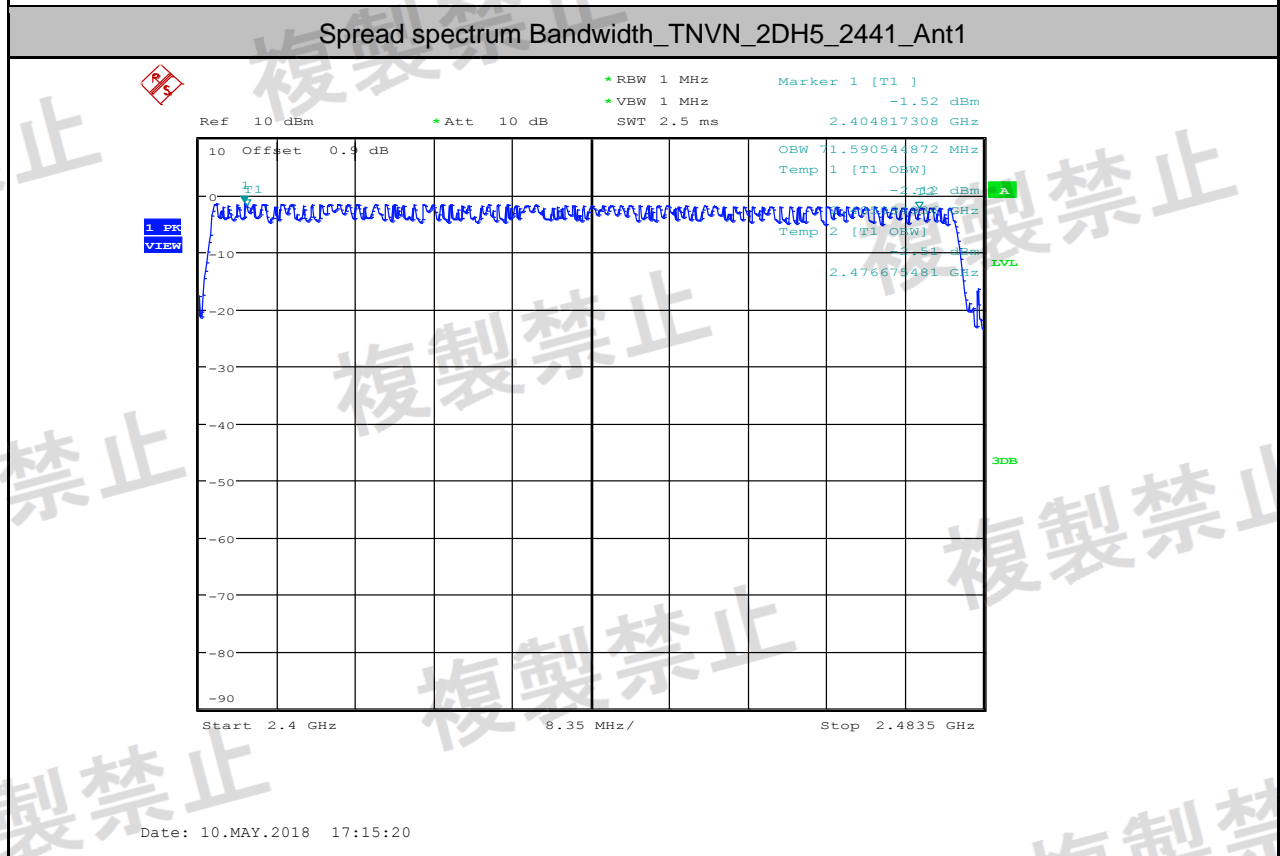
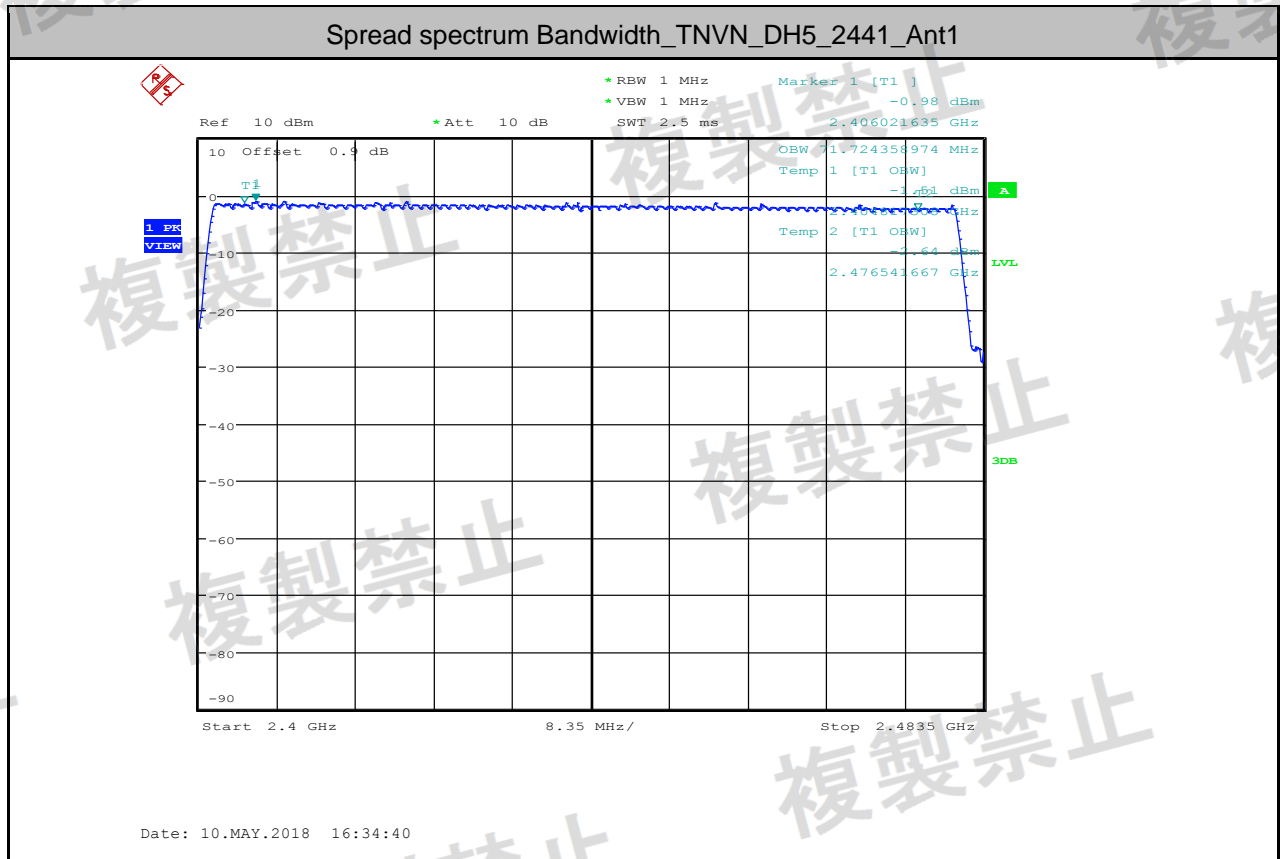


Occupied Bandwidth_TNVN_3DH5_2441_Ant1

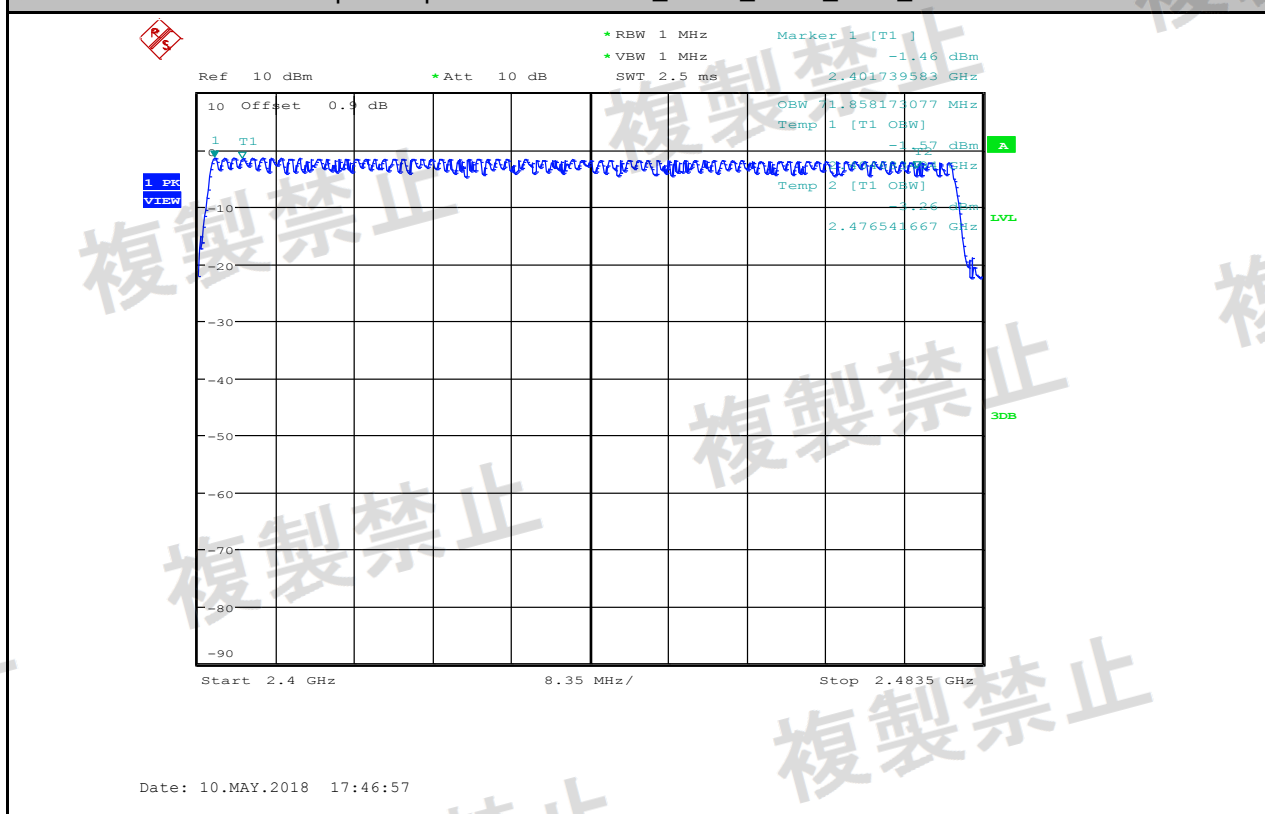


3.Spread spectrum Bandwidth (90%)

Test Condition	Test Mode	Test Channel	Ant	Test Result[MHz]	Limit [MHz]	Verdict
TNVN	DH5	2441	Ant1	71.724	≥ 0.5	PASS
TNVN	2DH5	2441	Ant1	71.591	≥ 0.5	PASS
TNVN	3DH5	2441	Ant1	71.858	≥ 0.5	PASS



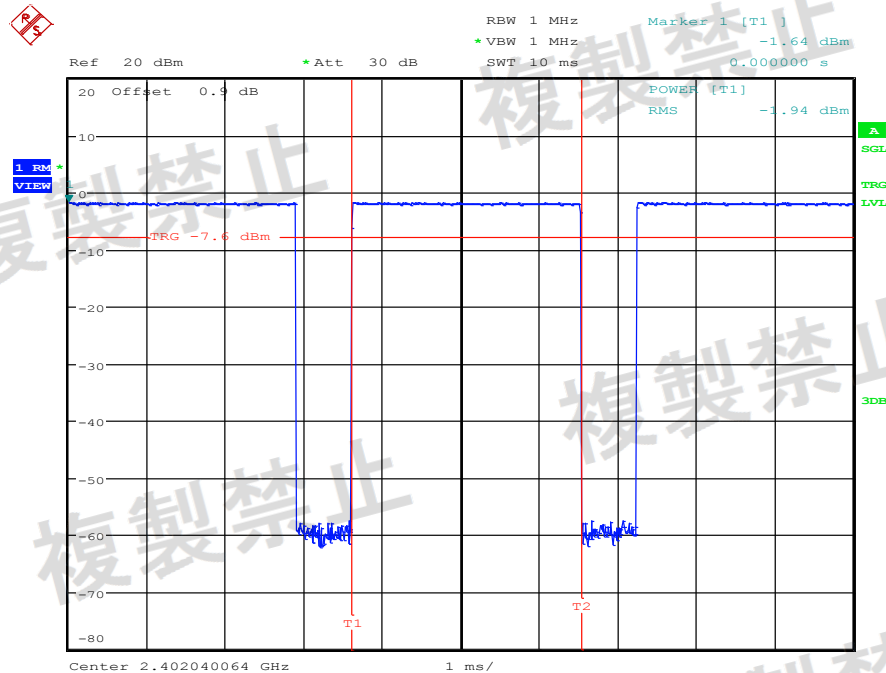
Spread spectrum Bandwidth_TNVN_3DH5_2441_Ant1



4. Antenna Power

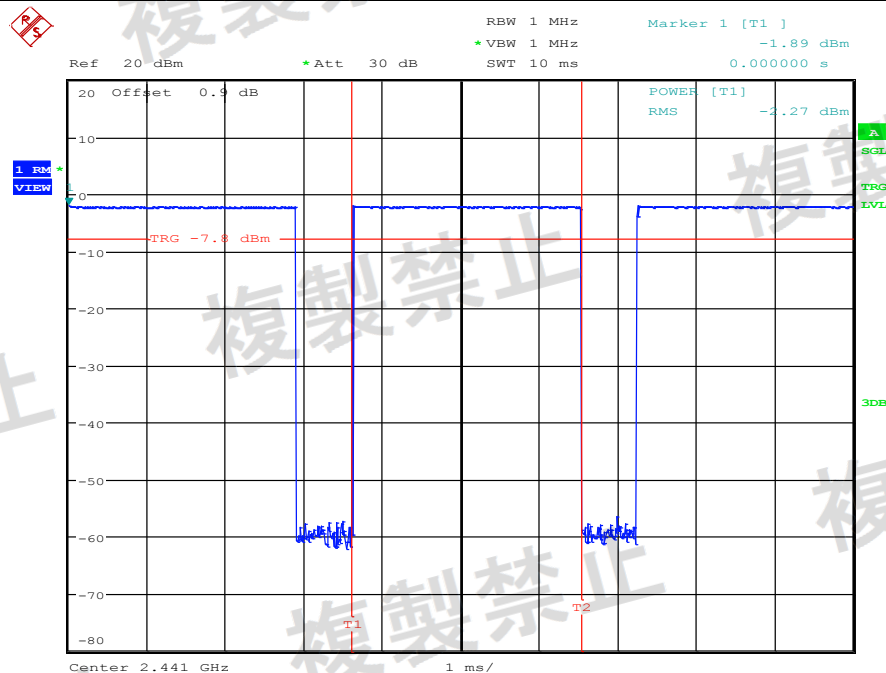
Test Condition	Test Mode	Test Channel	Ant	Power[mW/MHz]	Limit[mW/MHz]	Normal Power [mW/MHz]	Tolerance[%]	Limit [%]	Verdict
TNVN	DH5	2402	Ant1	0.639	3	1	-36.027	-80 to +20	PASS
TNVN	DH5	2441	Ant1	0.593	3	1	-40.707	-80 to +20	PASS
TNVN	DH5	2480	Ant1	0.515	3	1	-48.477	-80 to +20	PASS
TNVN	2DH5	2402	Ant1	0.195	3	0.5	-61.093	-80 to +20	PASS
TNVN	2DH5	2441	Ant1	0.179	3	0.5	-64.188	-80 to +20	PASS
TNVN	2DH5	2480	Ant1	0.16	3	0.5	-68.009	-80 to +20	PASS
TNVN	3DH5	2402	Ant1	0.194	3	0.5	-61.272	-80 to +20	PASS
TNVN	3DH5	2441	Ant1	0.177	3	0.5	-64.679	-80 to +20	PASS
TNVN	3DH5	2480	Ant1	0.162	3	0.5	-67.564	-80 to +20	PASS

Antenna Power_TNVN_DH5_2402_Ant1

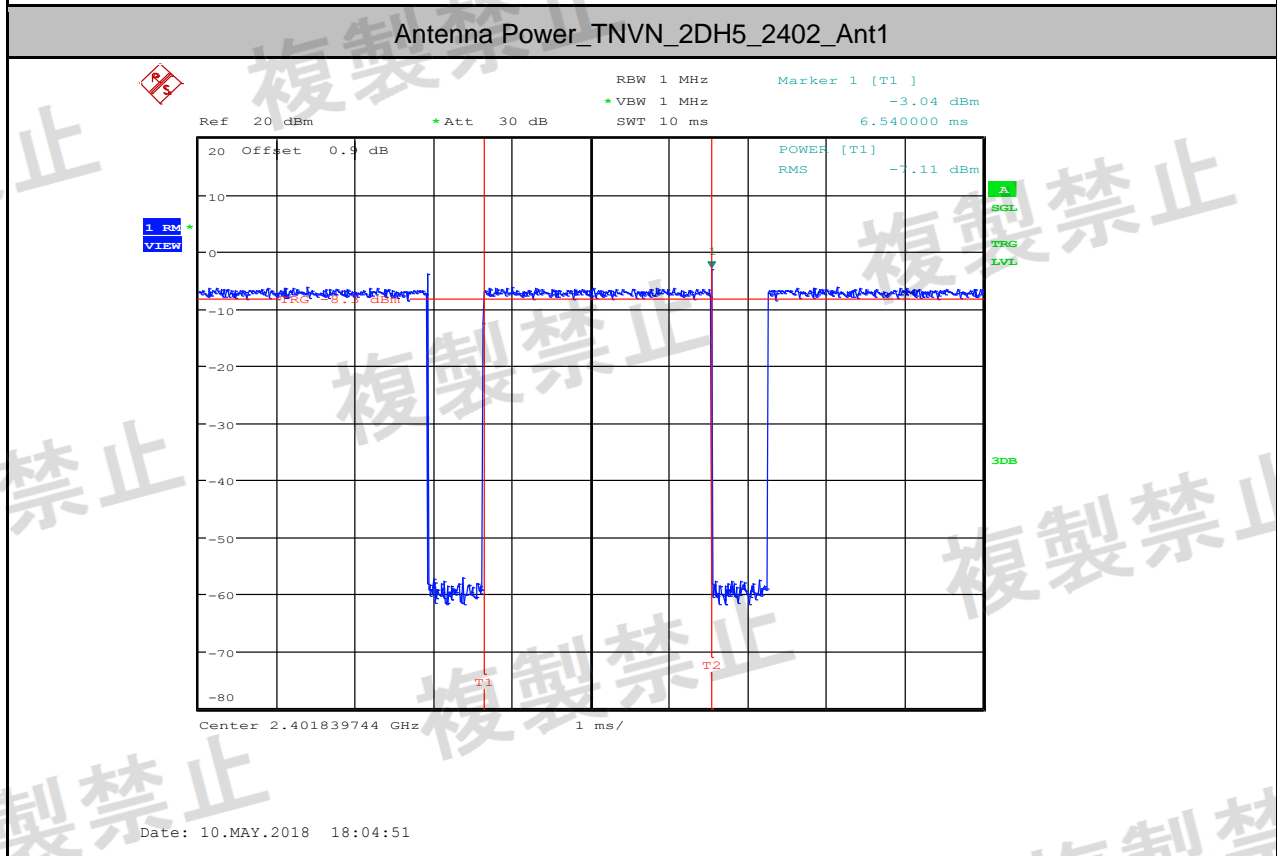
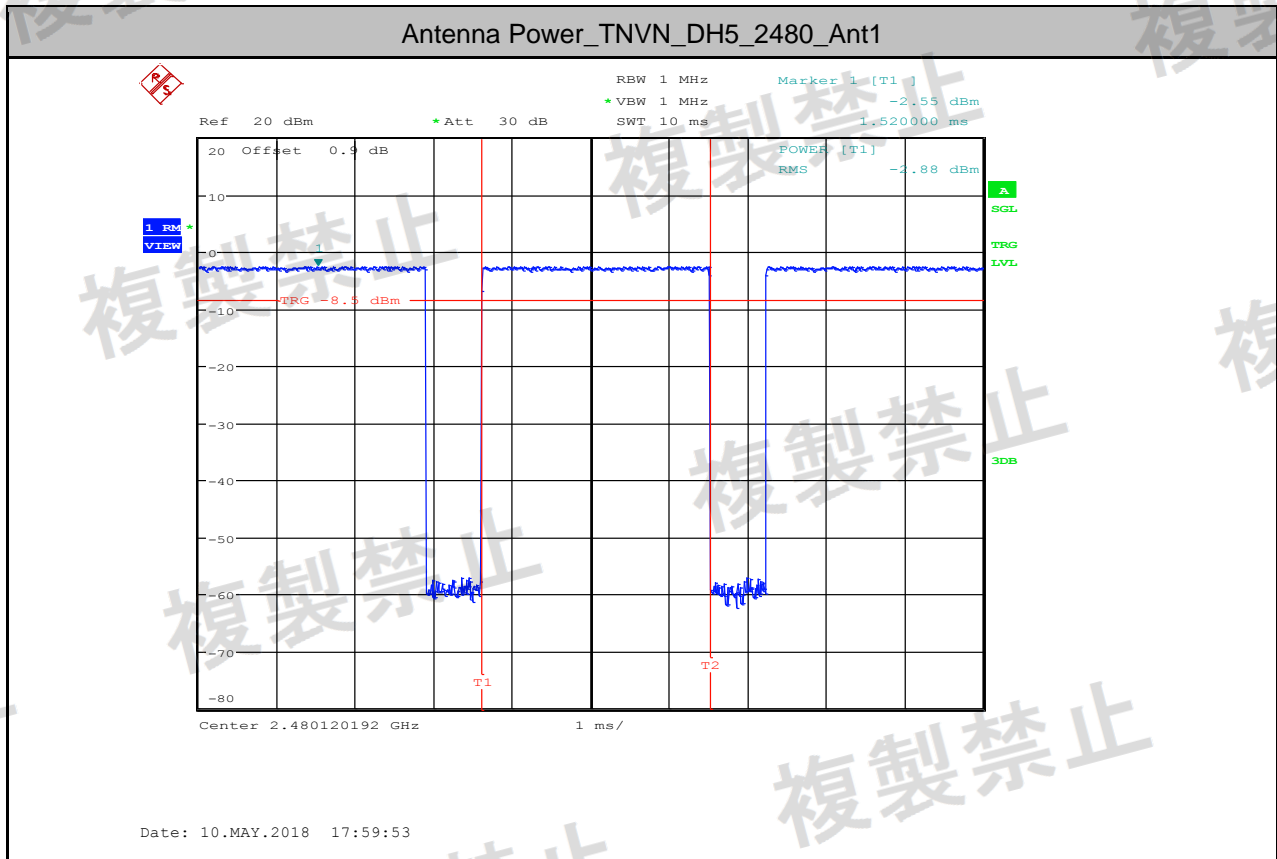


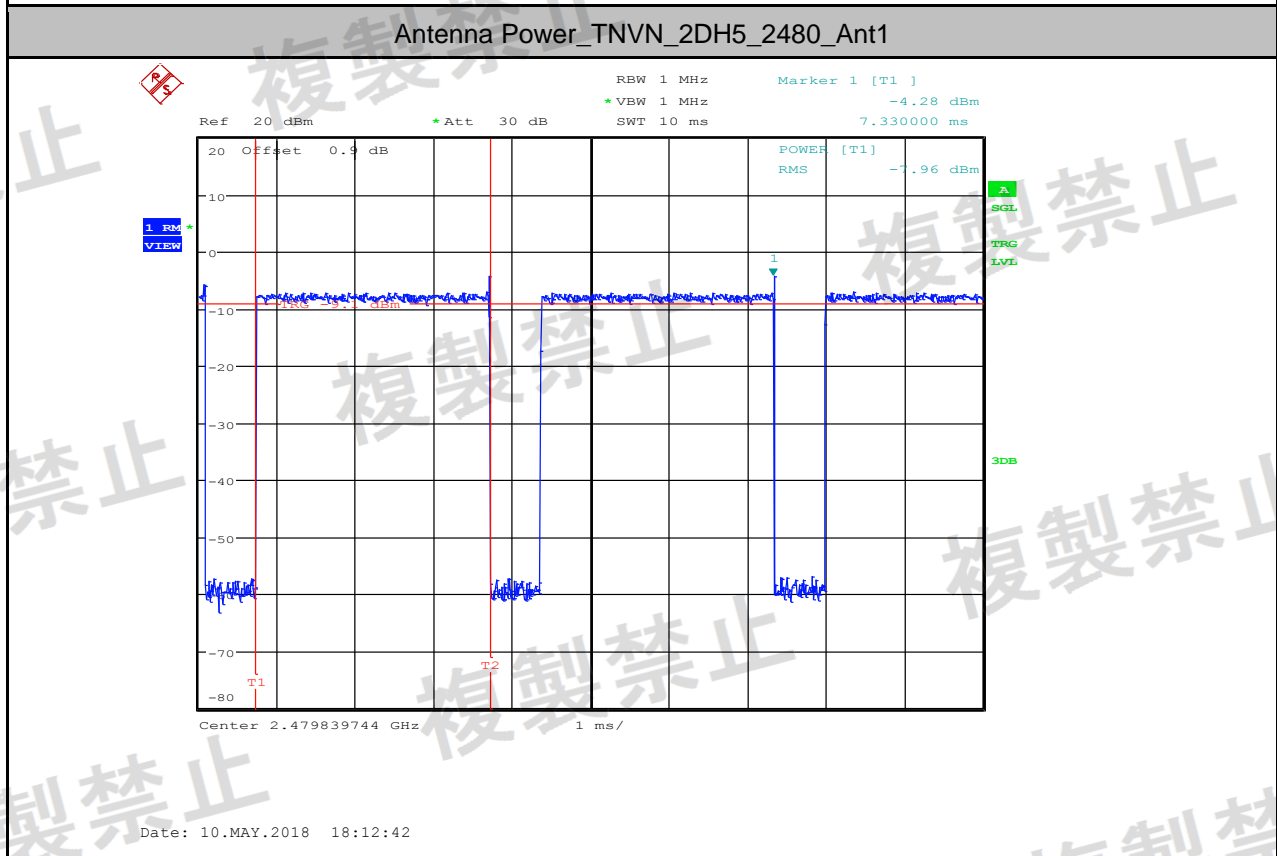
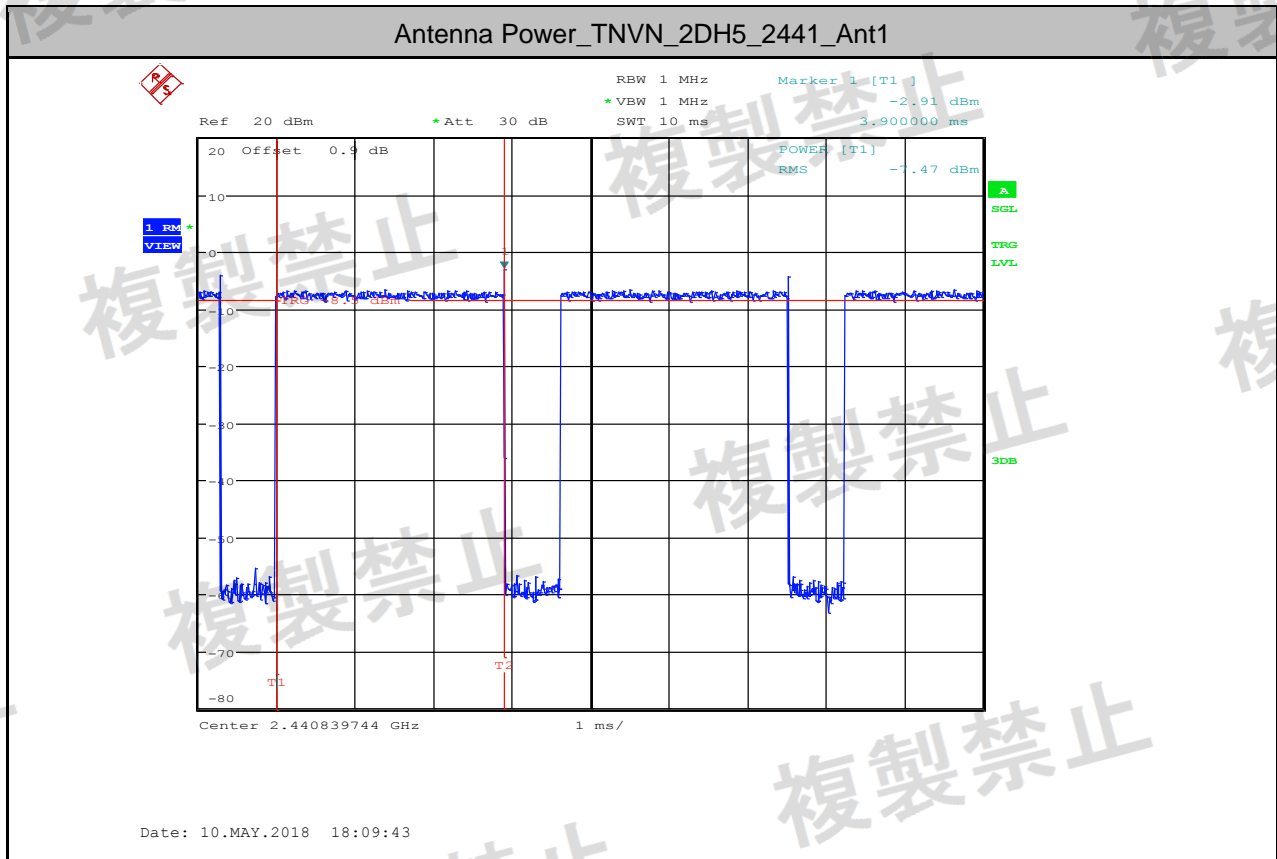
Date: 10.MAY.2018 17:57:20

Antenna Power_TNVN_DH5_2441_Ant1

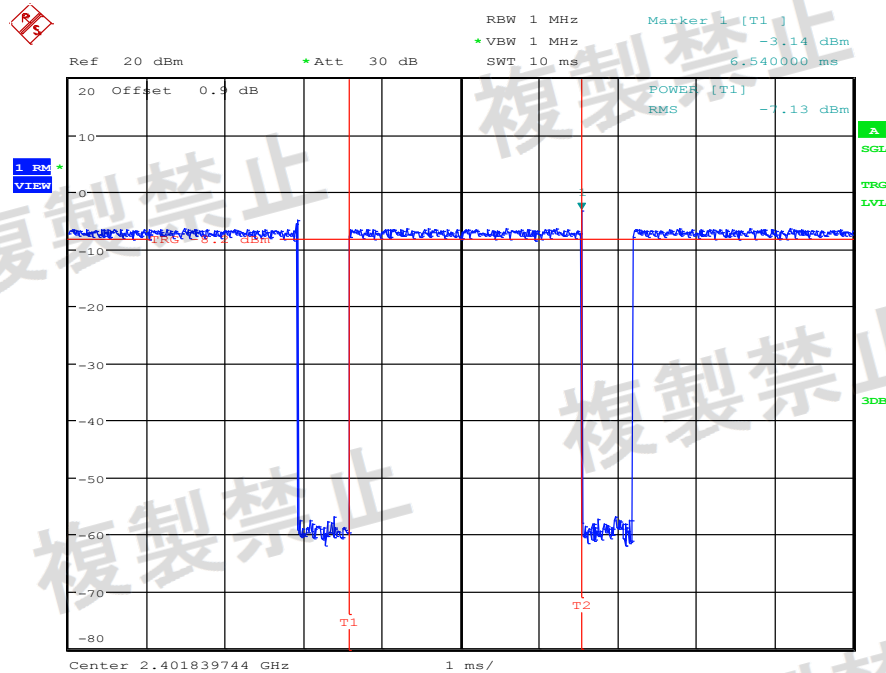


Date: 10.MAY.2018 17:58:25



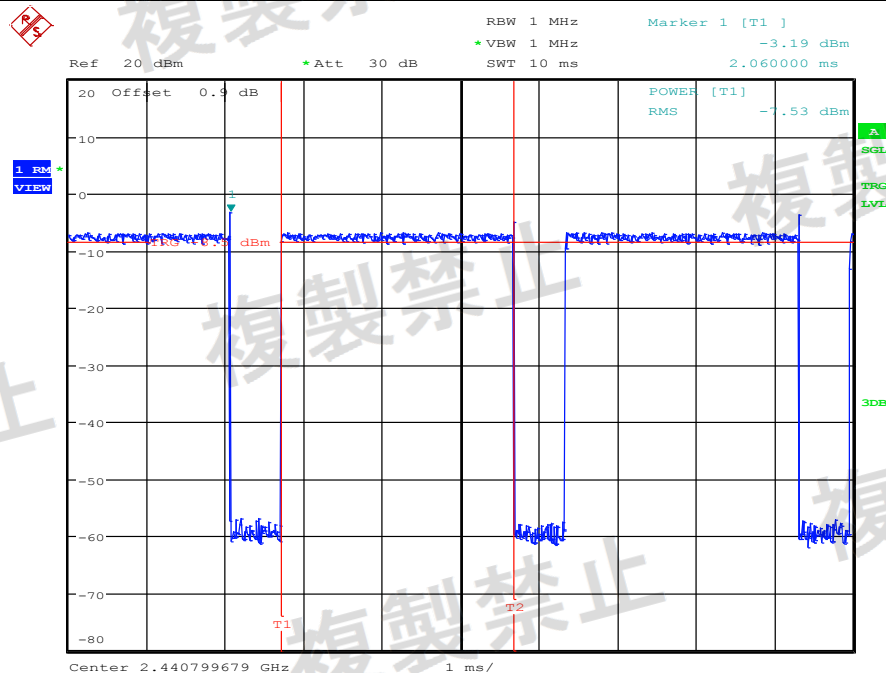


Antenna Power_TNVN_3DH5_2402_Ant1



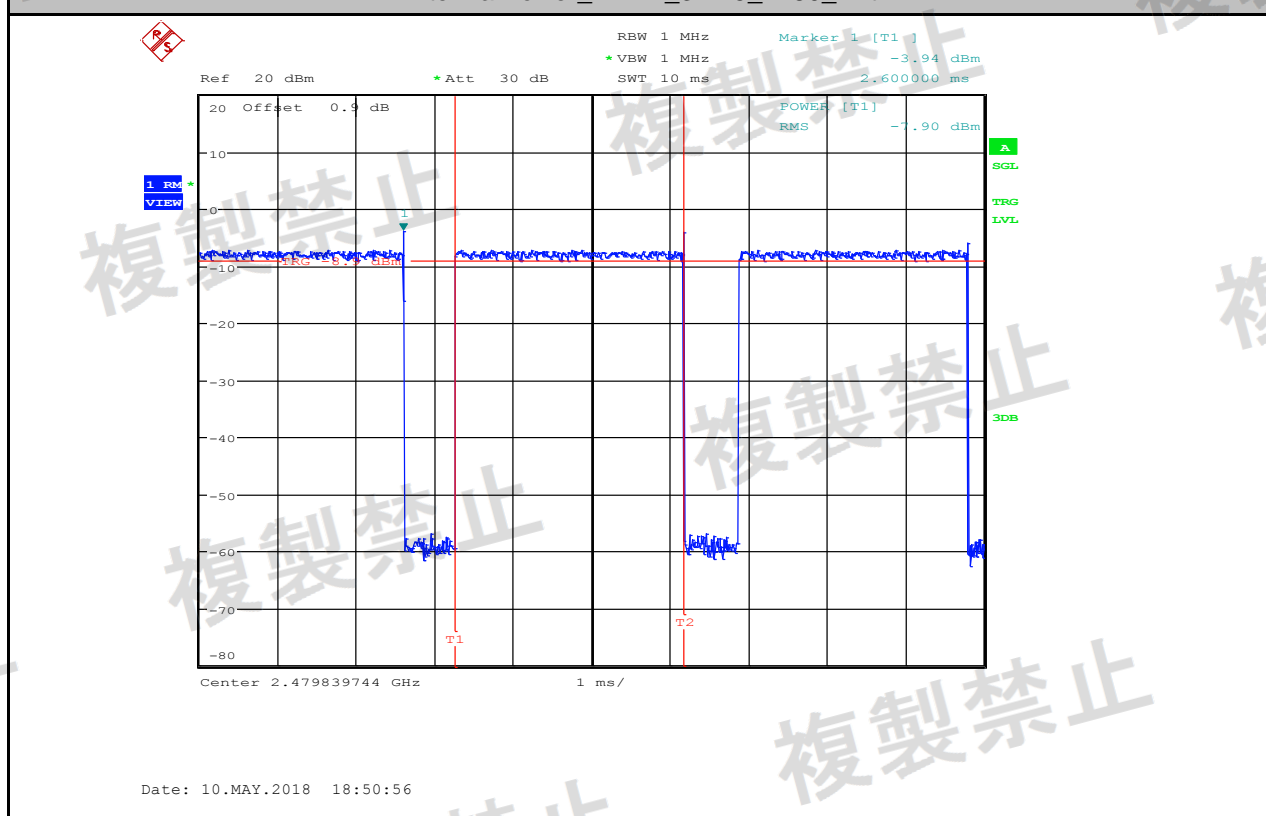
Date: 10.MAY.2018 18:14:19

Antenna Power_TNVN_3DH5_2441_Ant1



Date: 10.MAY.2018 18:48:32

Antenna Power_TNVN_3DH5_2480_Ant1

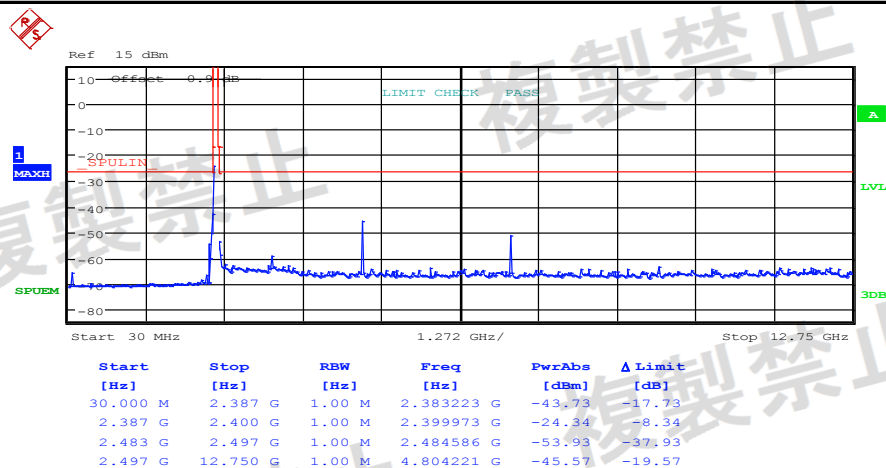


5.Spurious Emissions of Tx

Test Mode	Test Channel	StartFre[MHz]	StopFre[MHz]	Max.Fre[MHz]	Max.Level[μW]	Limit[μW]	Verdict
DH5	2402	30	2387	2383.22	0.0424	2.5	PASS
DH5	2402	2387	2400	2399.97	3.6813	25	PASS
DH5	2402	2483.5	2496.5	2484.59	0.0040	25	PASS
DH5	2402	2496.5	13000	4804.22	0.0277	2.5	PASS
DH5	2441	30	2387	2337.90	0.0037	2.5	PASS
DH5	2441	2387	2400	2399.30	0.0257	25	PASS
DH5	2441	2483.5	2496.5	2486.49	0.0501	25	PASS
DH5	2441	2496.5	13000	4881.46	0.0207	2.5	PASS
DH5	2480	30	2387	2379.45	0.0029	2.5	PASS
DH5	2480	2387	2400	2394.74	0.0016	25	PASS
DH5	2480	2483.5	2496.5	2483.62	2.2961	25	PASS
DH5	2480	2496.5	13000	2500.26	0.0877	2.5	PASS
2DH5	2402	30	2387	2383.22	0.0131	2.5	PASS
2DH5	2402	2387	2400	2399.87	3.7154	25	PASS
2DH5	2402	2483.5	2496.5	2488.01	0.0033	25	PASS
2DH5	2402	2496.5	13000	4803.88	0.0259	2.5	PASS
2DH5	2441	30	2387	2337.90	0.0039	2.5	PASS
2DH5	2441	2387	2400	2399.73	0.0210	25	PASS
2DH5	2441	2483.5	2496.5	2484.07	0.0244	25	PASS
2DH5	2441	2496.5	13000	4881.81	0.0245	2.5	PASS
2DH5	2480	30	2387	2379.45	0.0043	2.5	PASS
2DH5	2480	2387	2400	2398.11	0.0016	25	PASS
2DH5	2480	2483.5	2496.5	2487.32	3.8019	25	PASS
2DH5	2480	2496.5	13000	2501.28	0.0724	2.5	PASS
3DH5	2402	30	2387	2383.22	0.0133	2.5	PASS
3DH5	2402	2387	2400	2399.98	3.3189	25	PASS
3DH5	2402	2483.5	2496.5	2488.44	0.0039	25	PASS
3DH5	2402	2496.5	13000	4803.54	0.0266	2.5	PASS
3DH5	2441	30	2387	2337.90	0.0035	2.5	PASS
3DH5	2441	2387	2400	2396.75	0.0157	25	PASS
3DH5	2441	2483.5	2496.5	2488.13	0.0273	25	PASS

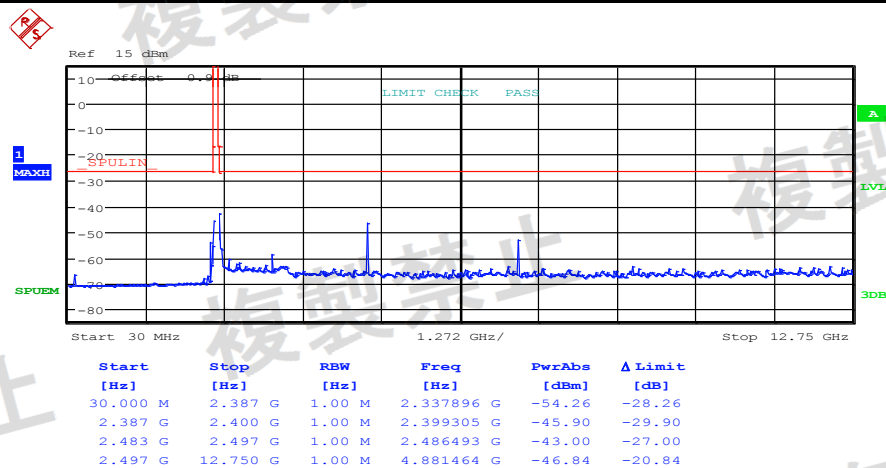
3DH5	2441	2496.5	13000	4882.49	0.0254	2.5	PASS
3DH5	2480	30	2387	2379.45	0.0039	2.5	PASS
3DH5	2480	2387	2400	2394.35	0.0015	25	PASS
3DH5	2480	2483.5	2496.5	2483.62	4.3853	25	PASS
3DH5	2480	2496.5	13000	2499.58	0.0942	2.5	PASS

Spurious Emissions of Tx_TNVN_DH5_2402_Ant1



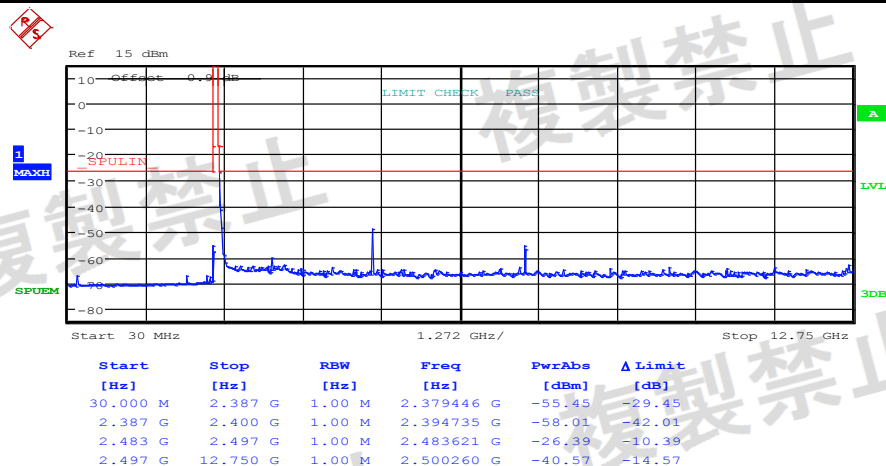
Date: 10.MAY.2018 17:52:40

Spurious Emissions of Tx_TNVN_DH5_2441_Ant1



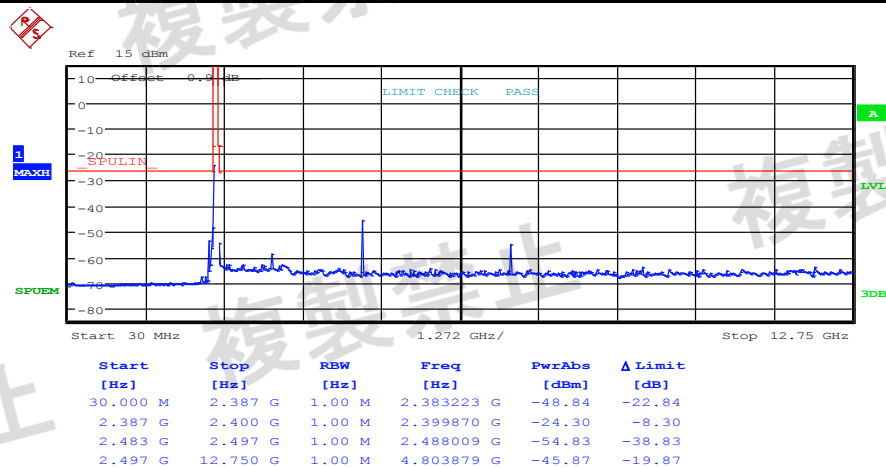
Date: 10.MAY.2018 17:58:51

Spurious Emissions of Tx_TNVN_DH5_2480_Ant1



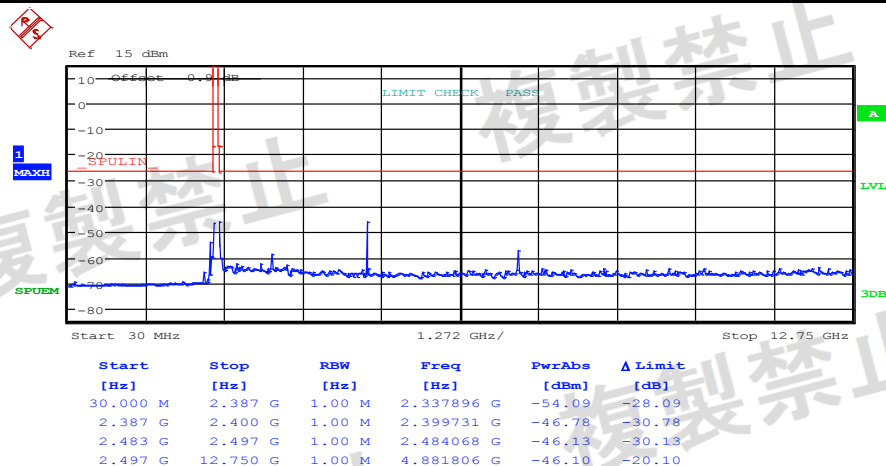
Date: 10.MAY.2018 18:00:19

Spurious Emissions of Tx_TNVN_2DH5_2402_Ant1



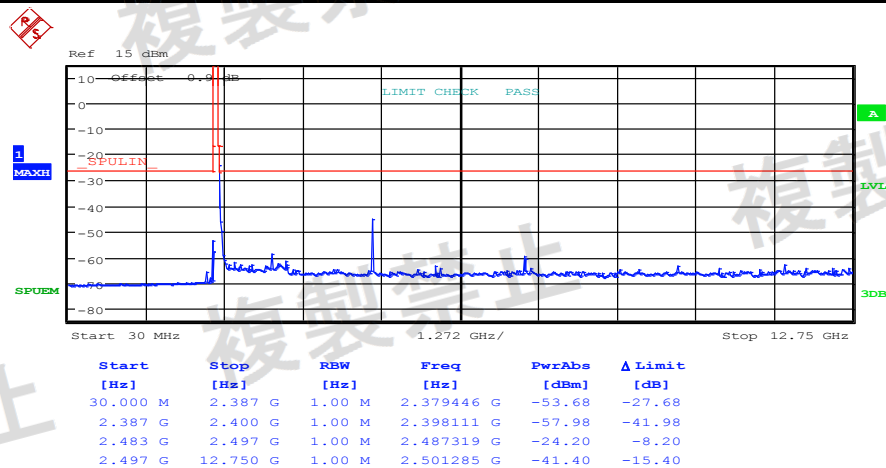
Date: 10.MAY.2018 18:05:17

Spurious Emissions of Tx_TNVN_2DH5_2441_Ant1



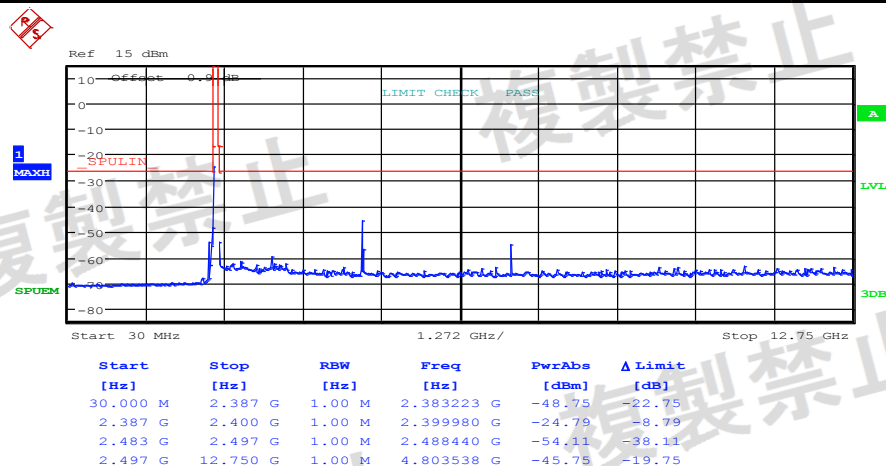
Date: 10.MAY.2018 18:10:09

Spurious Emissions of Tx_TNVN_2DH5_2480_Ant1



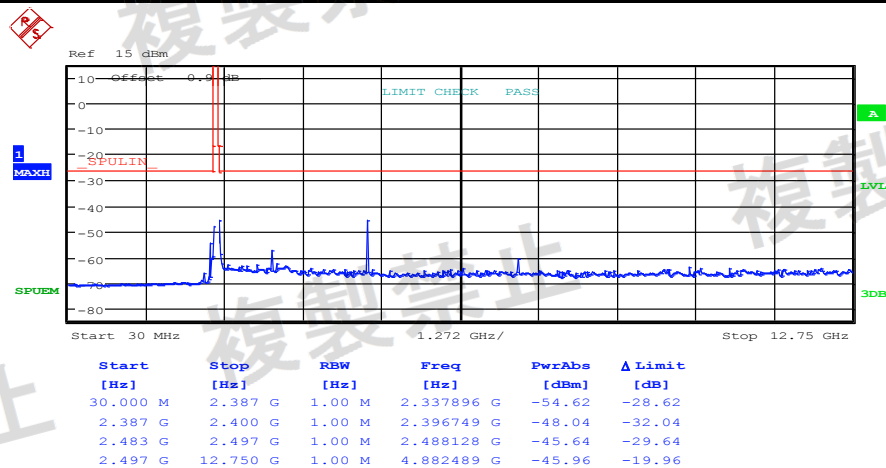
Date: 10.MAY.2018 18:13:08

Spurious Emissions of Tx_TNVN_3DH5_2402_Ant1



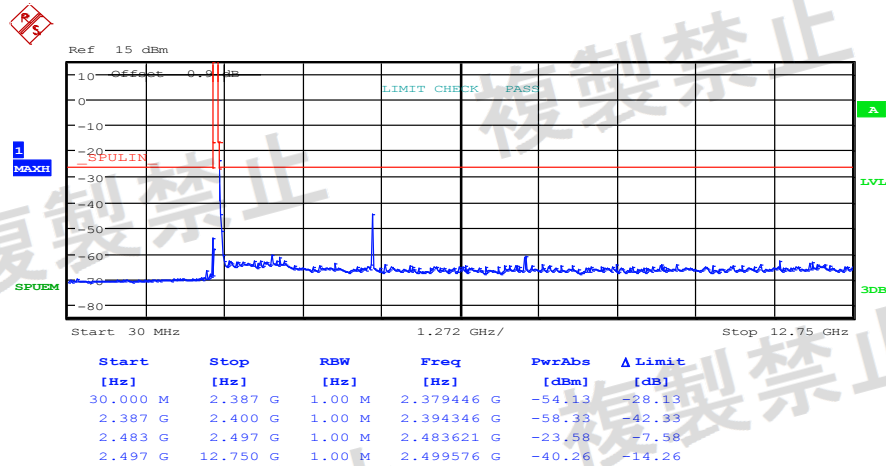
Date: 10.MAY.2018 18:14:45

Spurious Emissions of Tx_TNVN_3DH5_2441_Ant1



Date: 10.MAY.2018 18:48:59

Spurious Emissions of Tx_TNVN_3DH5_2480_Ant1

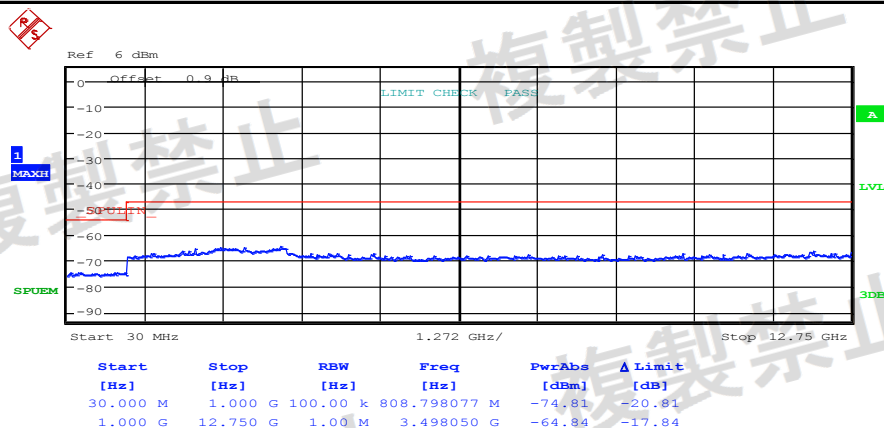


Date: 10.MAY.2018 18:51:22

6.Spurious Emissions of Rx

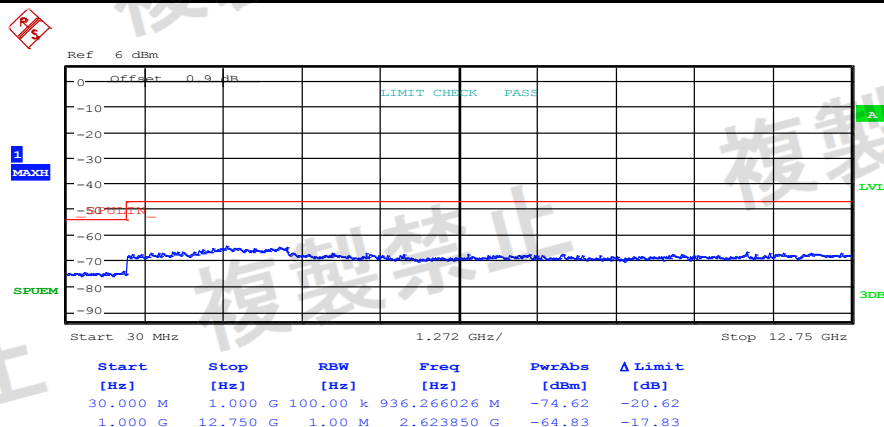
Test Mode	Test Channel	StartFre[MHz]	StopFre[MHz]	Max.Fre[MHz]	Max.Level[nW]	Limit[nW]	Verdict
DH5	2402	1000	13000	3498.05	0.328	20	PASS
DH5	2402	30	1000	808.80	0.033	4	PASS
DH5	2441	1000	13000	2623.85	0.329	20	PASS
DH5	2441	30	1000	936.27	0.035	4	PASS
DH5	2480	1000	13000	3593.22	0.346	20	PASS
DH5	2480	30	1000	875.64	0.032	4	PASS

Spurious Emissions of Rx_TNVN_DH5_2402_Ant1



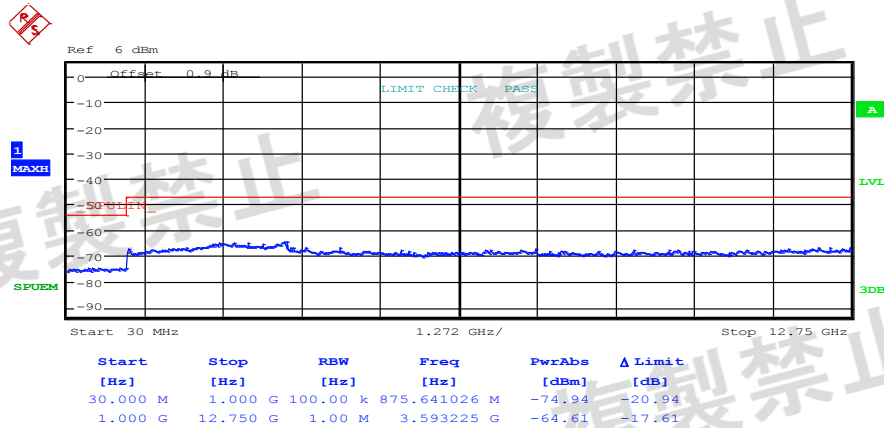
Date: 10.MAY.2018 17:49:38

Spurious Emissions of Rx_TNVN_DH5_2441_Ant1



Date: 10.MAY.2018 17:50:03

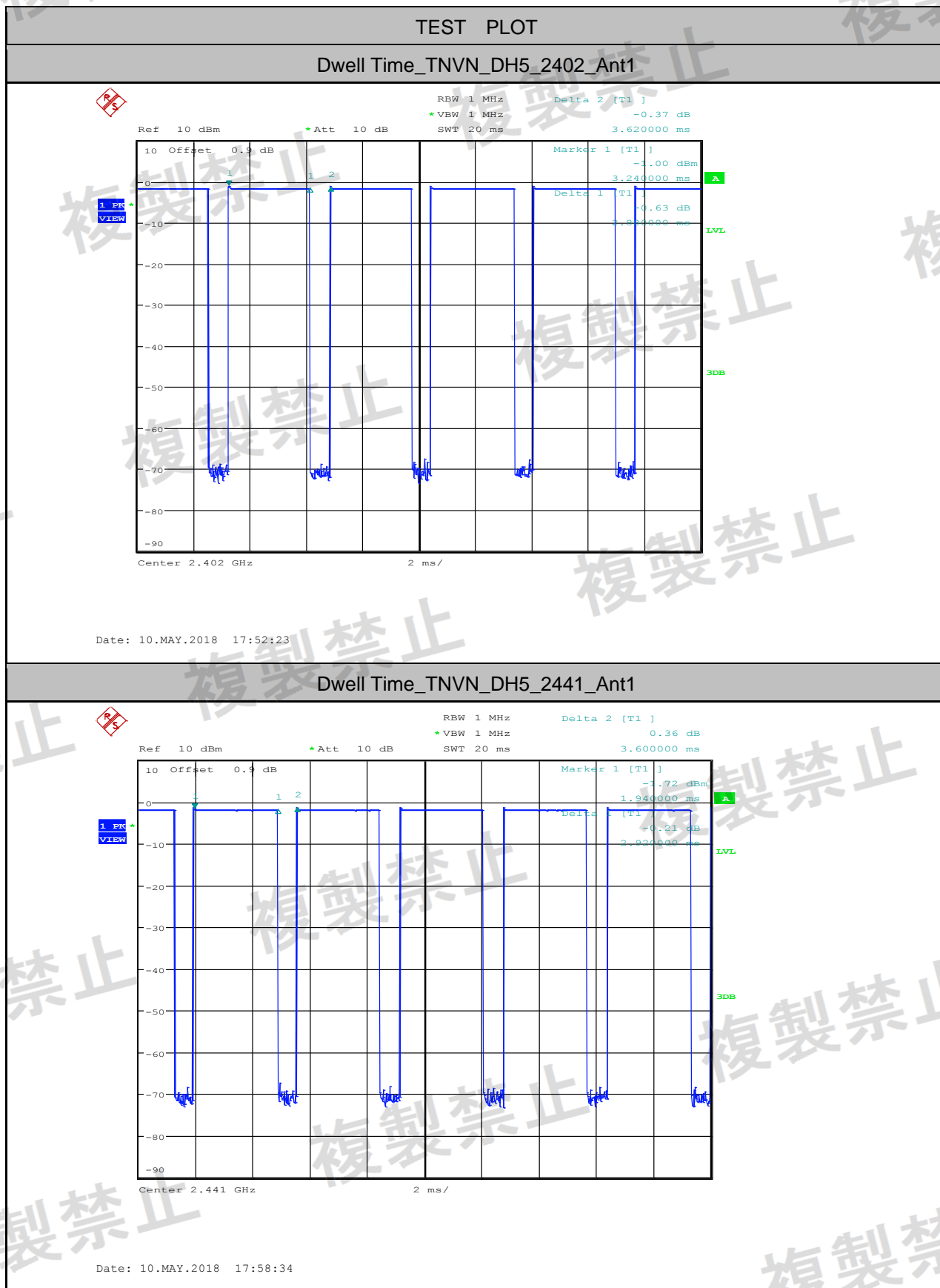
Spurious Emissions of Rx_TNVN_DH5_2480_Ant1

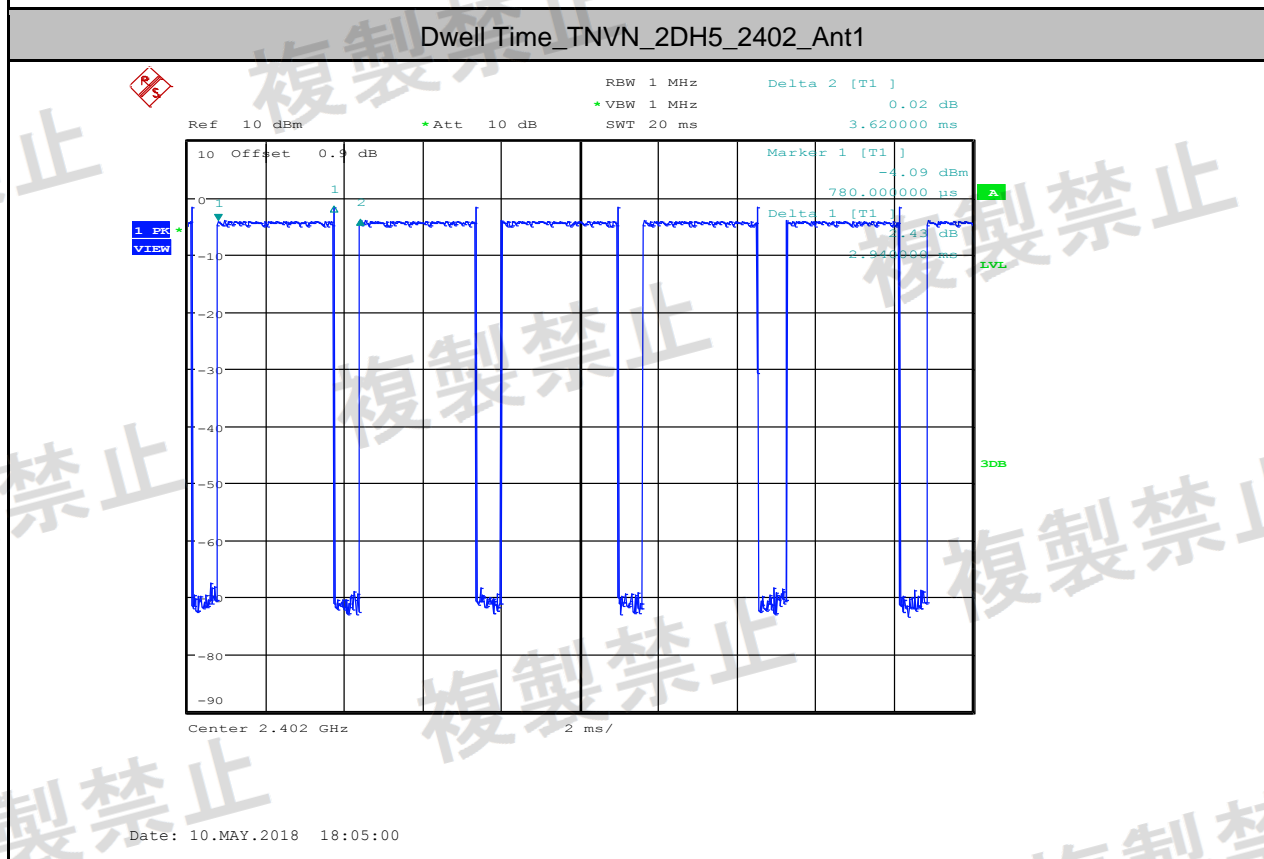
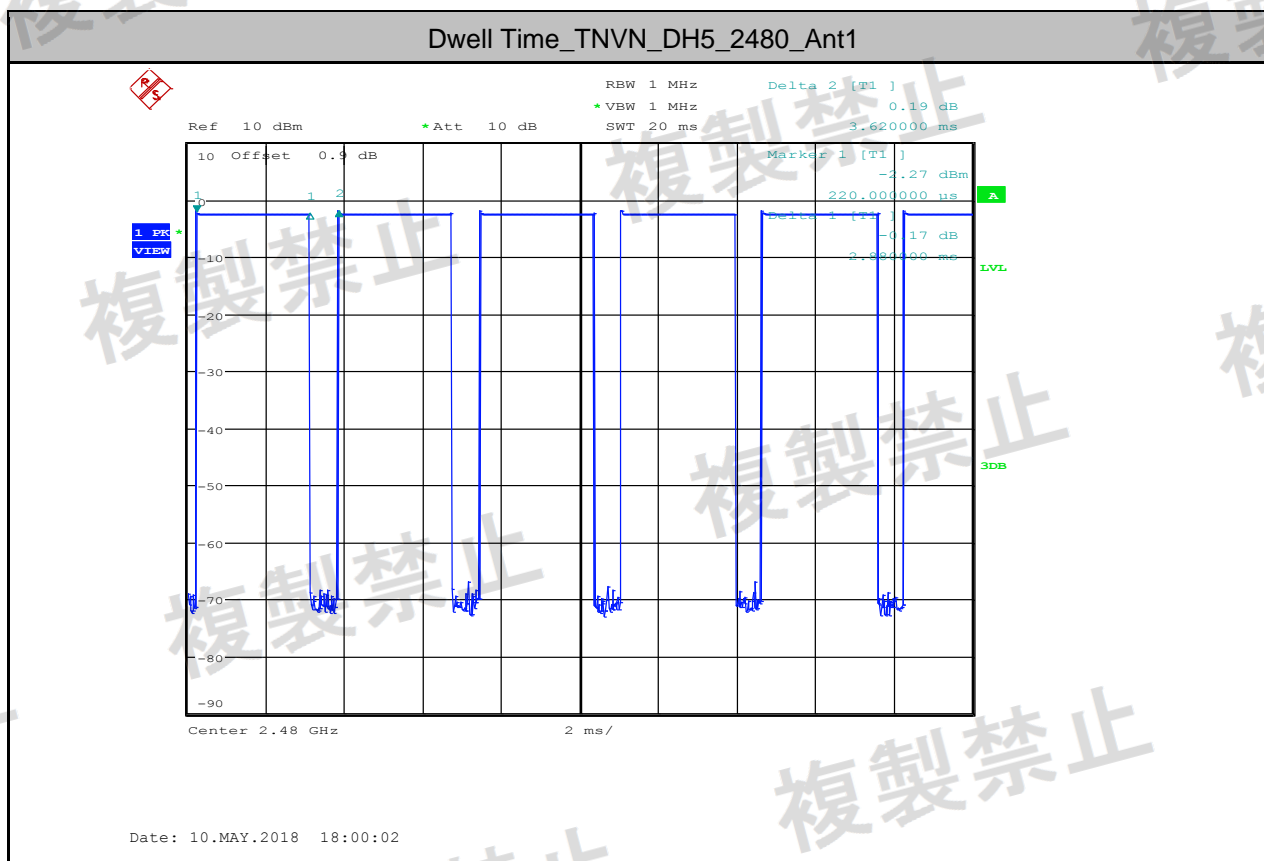


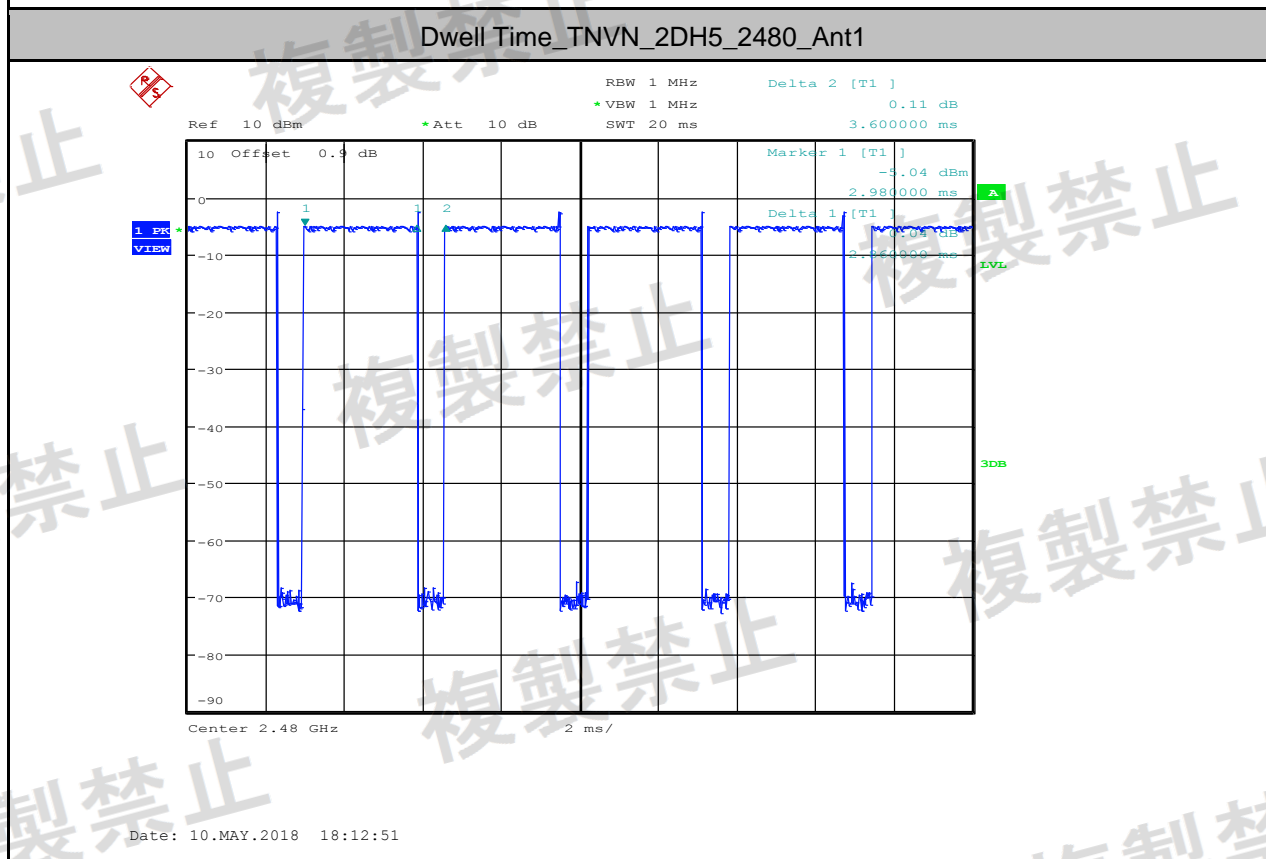
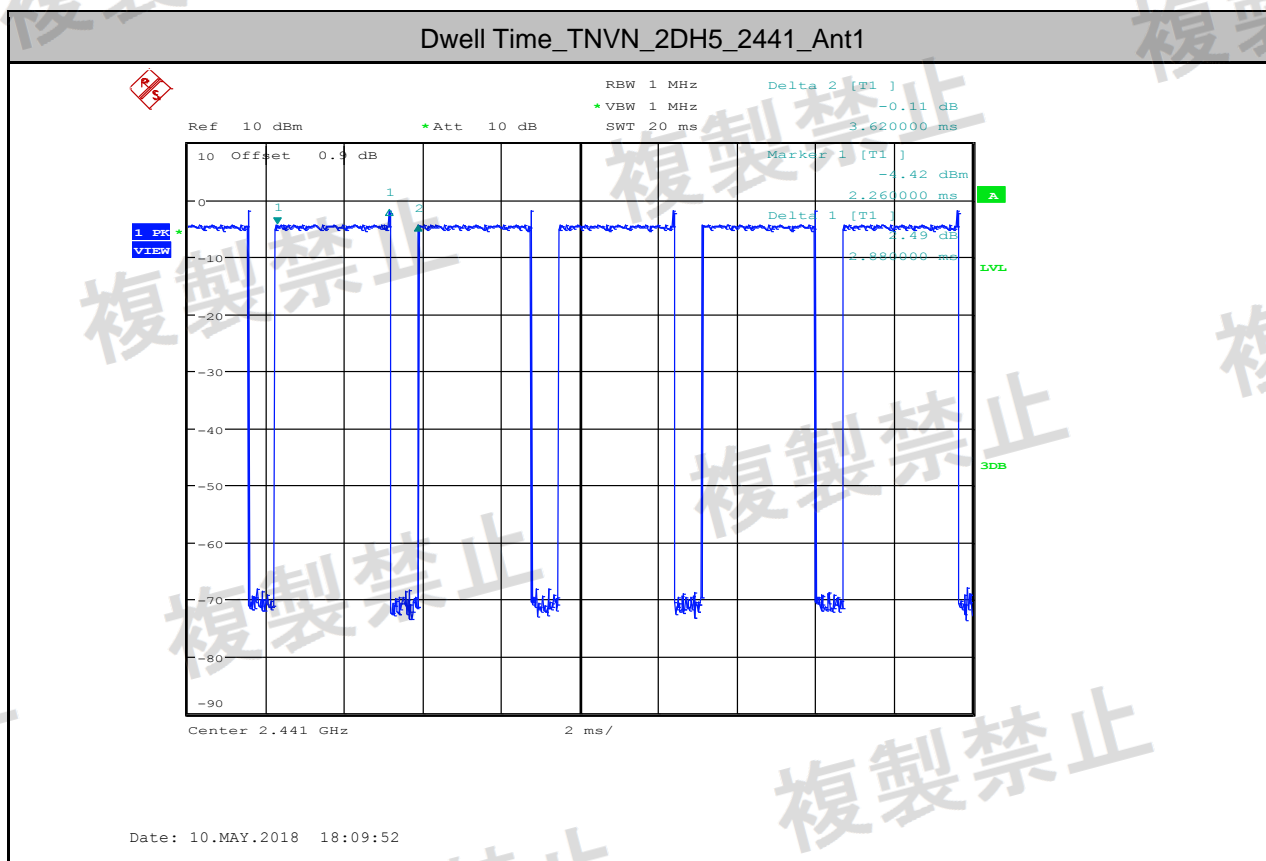
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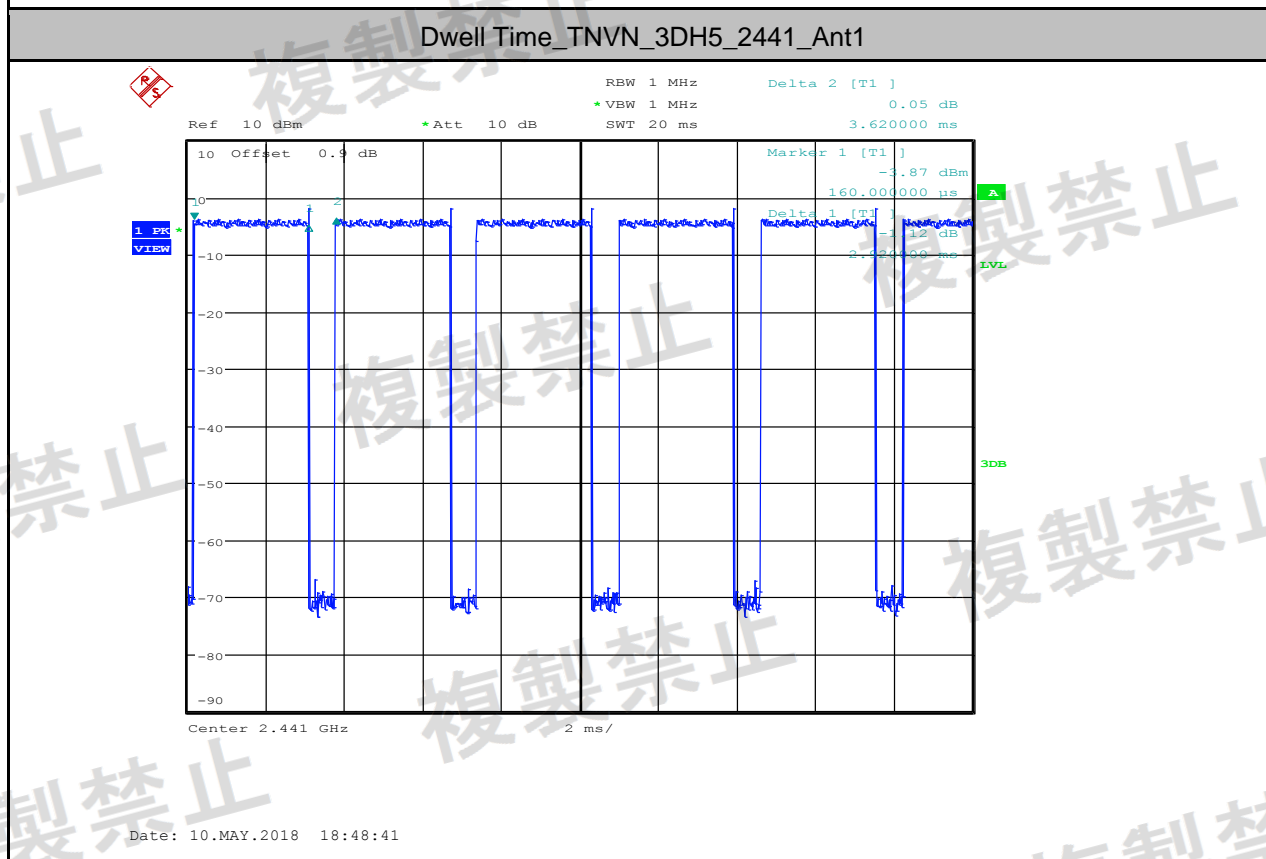
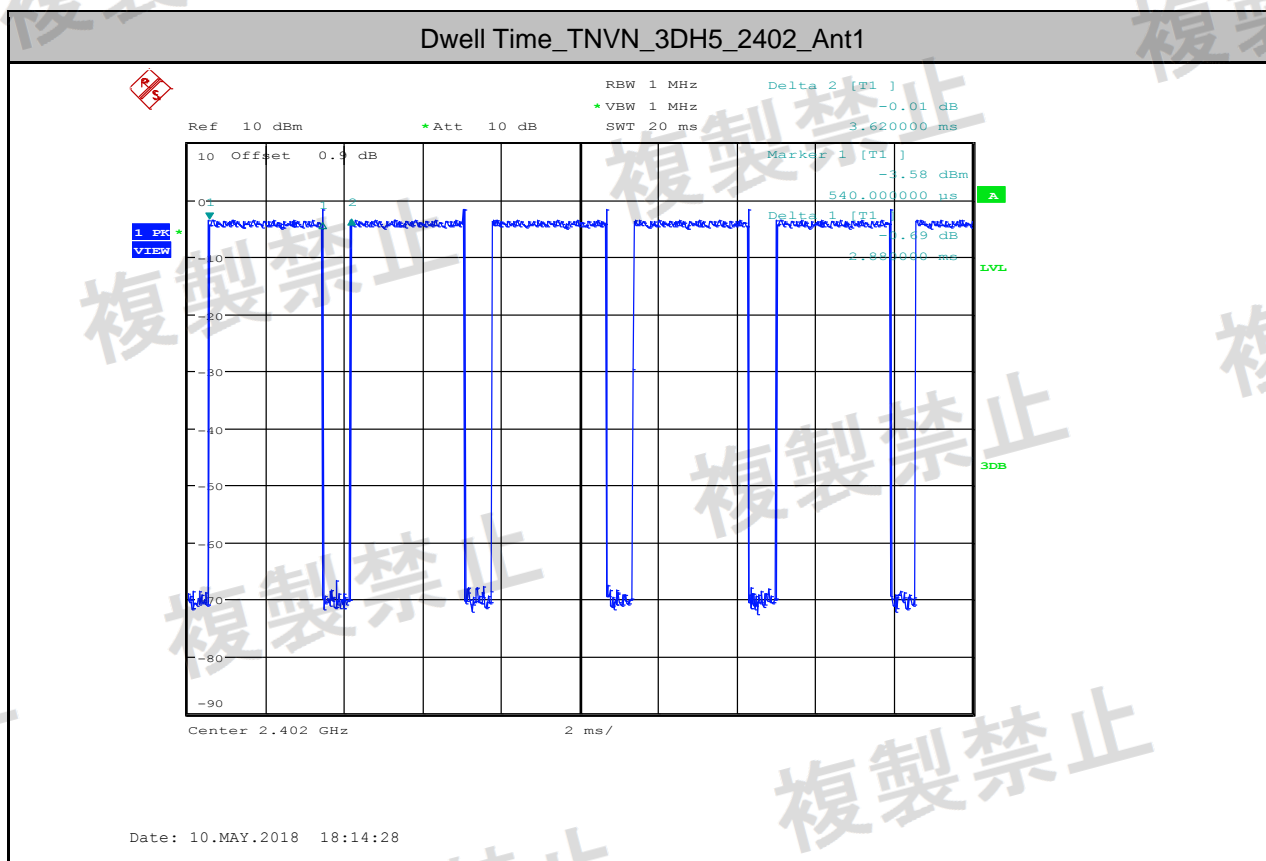
7.Dwell Time

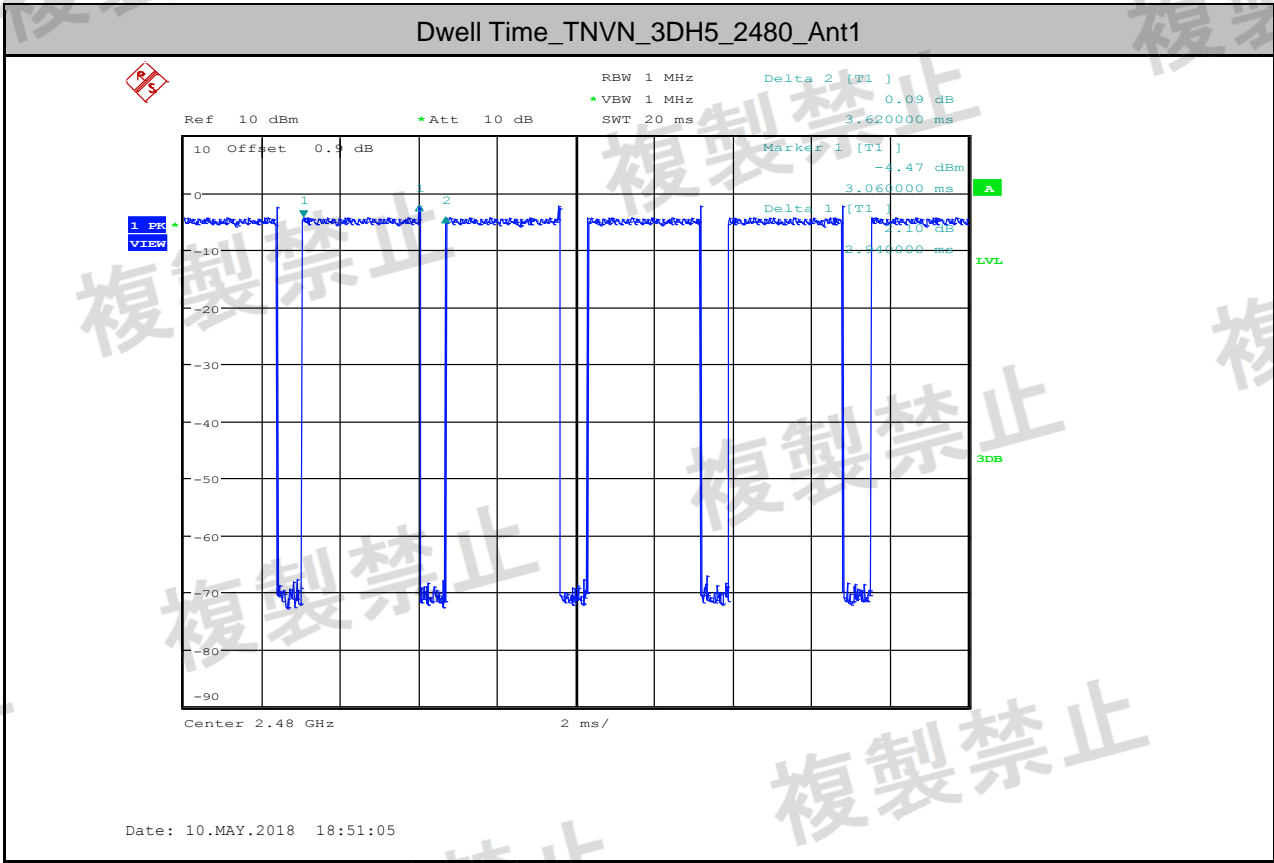
Test Condition	Test Mode	Test Channel	Ant	Burst Width[ms]	Dwell Time[s]	Limit[s]	Verdict
TNVN	DH5	2402	Ant1	2.88	0.29	<0.4	PASS
TNVN	DH5	2441	Ant1	2.92	0.29	<0.4	PASS
TNVN	DH5	2480	Ant1	2.88	0.29	<0.4	PASS
TNVN	2DH5	2402	Ant1	2.94	0.29	<0.4	PASS
TNVN	2DH5	2441	Ant1	2.88	0.29	<0.4	PASS
TNVN	2DH5	2480	Ant1	2.86	0.29	<0.4	PASS
TNVN	3DH5	2402	Ant1	2.88	0.29	<0.4	PASS
TNVN	3DH5	2441	Ant1	2.92	0.29	<0.4	PASS
TNVN	3DH5	2480	Ant1	2.94	0.30	<0.4	PASS











- End of the Report -