



TEST REPORT

For

Shower speaker(ワイヤレスシャワースピーカー)

Model Number: EWCH-A177

Prepared for : CHOUHOU CO.,LTD

Address : 33-1-301, KUMANOCHO, ITABASHI-KU, TOKYO,
173-0025, JAPAN

Prepared by : Shenzhen NCT Testing Technology Co.,Ltd.

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Report No. : NCT26021612E1-1

Date of Test : May 22, 2026 to Jun. 03, 2026

Date of Report : Jun. 03, 2026

Shenzhen NCT Testing Technology Co.,Ltd.

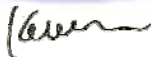
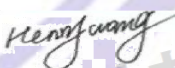
Applicant: Address:	CHOUHOU CO.,LTD 33-1-301, KUMANOCHO, ITABASHI-KU, TOKYO, 173-0025, JAPAN		
Manufacturer: Address:	SHENZHEN CANJING ELECTRONICS CO.,LTD Building 2, Zhipeng Ind. Park, Heping, Fuyuan 1st Road, Fuyong street, Baoan District, Shenzhen 518103, China		
E.U.T:	Shower speaker(ワイヤレスシャワースピーカー)		
Model Number:	EWCH-A177		
Trade Name:	N/A		
Date of Receipt:	May 22, 2026	Date of Test:	May 22, 2026 to Jun. 03, 2026
Test Specification:	Article2 Paragraph 1, item 19 MIC Notice No.88 Appendix No.43		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		
	Issue Date: Jun. 03, 2026		
Tested by:  Shine Wu / Engineer	Reviewed by:  Keven Wu / Supervisor	Approved by:  Henry Wang / Supervisor	
Other Aspects: None.			
Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested			
This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen NCT Testing Technology Co., Ltd.			

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1. SUMMARY OF TEST RESULTS

1.1. TEST PROCEDURES ACCORDING TO THE TECHNICAL STANDARDS

article 49.20			
Standard Section	Test Item	Judgment	Remark
General provisions			
5	Frequency Error	PASS	
6	Occupied Bandwidth	PASS	
7	Spurious Emissions Intensity	PASS	
Transmitting equipment			
14	Antenna Power	PASS	
14.2	SAR	N/A	
Transmitting antenna			
20	Type, Configuration, etc., of Transmitting Antenna	PASS	
22	Direction Pattern of Transmitting Antenna (Provided at Individual Antenna Report)	PASS	
Receiving antenna			
24	Limitation of Collateral Emission of Receiver	PASS	
26	Refer to All Articles for Transmitting Antenna	PASS	
Operating frequency 2400~2483MHz			
49.20(1); a	RF Shielding Method	PASS	
49.20(1); a	Communication Method	PASS	
49.20(1); b	Spread-spectrum Method	PASS	
49.20(1); c	Antenna Power	PASS	
49.20(1); d	EIRP power	PASS	
4.7	Transmission Radiation Angle Width (3dB Bandwidth)	N/A(3)	
49.20(1); e	Spread-Spectrum Bandwidth	Only for reported	
49.20(1); f	Spreading Factor	Only for reported	
49.20(1); g	Hopping Frequency Dwell Time (FH employed)	PASS	
Article 9-4.5	Interference Prevention Function	PASS	

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) MIC Ordinance Regulating Radio Equipment Section 4.17 of Article 49.20
- (3) It is unnecessary to testing, when a E.I.R.P. is less than 6.91dBm/MHz.

1.2. TEST FACILITY

Site Description

EMC Lab. : Accredited by CNAS, 2022-09-27
The certificate is valid until 2028.01.07
The Laboratory has been assessed and proved to be in compliance with
CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)
The Certificate Registration Number is L8251

Designation Number: CN1347
Test Firm Registration Number: 894804
Accredited by A2LA, June 14, 2023
The Certificate Registration Number is 6837.01

Accredited by Industry Canada, November 09, 2018
The Conformity Assessment Body Identifier is CN0150
Company Number: 30806

Name of Firm : Shenzhen NCT Testing Technology Co., Ltd.
Site Location : A101&2F B2, Fuqiao 6th Area, Xintian Community, Fuhai Street, Baoan
District, Shenzhen, People's Republic of China

1.3. MEASUREMENT UNCERTAINTY

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

Parameter	Uncertainty
RF frequency	$\pm 6 \times 10^{-7}$ MHz
Bandwidth	$\pm 1.5 \times 10^{-6}$
Total RF power, conducted	± 0.8 dB
Spurious emissions, conducted	± 0.8 dB
DC and low frequency voltages	$\pm 3\%$ V
Humidity	$\pm 5\%$
Time	$\pm 2\%$
Temperature	$\pm 1^\circ\text{C}$

2. GENERAL INFORMATION

2.1. GENERAL DESCRIPTION OF EUT

Equipment	Shower speaker(ワイヤレスシャワースピーカー)	
Model Name	EWCH-A177	
Series Model	N/A	
Model Different	N/A	
Product Description	Operation Frequency:	2402~2480MHz
	Modulation Type:	FHSS
	Bit Rate of Transmitter:	GFSK, $\pi/4$ -DQPSK
	Number Of Channel:	79 CH
	Antenna Type:	PCB Antenna
	Antenna Gain(Peak):	-0.68 dBi
Channel List	Please refer to the Note 2.	
Power Source	DC 3.7V from Battery or DC 5V for charging	
Hardware Version	N/A	
Software Version	N/A	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2.

Operation Frequency each of channel							
Chann el	Frequency	Chann el	Frequency	Chan nel	Frequency	Chan nel	Frequency
00	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
01	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
02	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
03	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
04	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
05	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
06	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
07	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
08	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
09	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		

3. Table for Filed Antenna

ANT	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
1	N/A	ANT	PCB antenna	-0.68	N/A

4. Testing environment

Temperature range: 23.5℃, Humidity range: 56.2%, Atmospheric Pressure: 101.32 Kpa.

2.2. DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively. All the test modes were tested.

Pretest Mode	Description
Mode 1	GFSK, $\pi/4$ -DQPSK, (CH00)
Mode 2	GFSK, $\pi/4$ -DQPSK (CH39)
Mode 3	GFSK, $\pi/4$ -DQPSK (CH78)
Mode 4	Hopping/GFSK, $\pi/4$ -DQPSK
Mode 5	RX

Final Test Mode	Description
Mode 1	GFSK, $\pi/4$ -DQPSK (CH00)
Mode 2	GFSK, $\pi/4$ -DQPSK (CH39)
Mode 3	GFSK, $\pi/4$ -DQPSK (CH78)
Mode 4	Hopping/GFSK, $\pi/4$ -DQPSK
Mode 5	RX
Remark: All modes were tested, and this report only records the worst data.	

2.3. TEST CONDITIONS

The BT module was tested while in a continuous transmitter/receiver mode. The EUT was tuned to a low, middle, and high channel for all tests. For all test case pre/scans were completed in all Modes to determine worst case levels.

Voltage Fluctuation Test		Normal Voltage	High Voltage: Normal Voltage+ 10% of Normal Voltage	Low Voltage: Normal Voltage- 10% of Normal Voltage
Test Voltage		DC3.7V	DC 4.07V	DC 3.33V
Chip Voltage		3.30	3.307	3.302
Voltage error(%)	Result	Ref.level	0.21	0.06

Note:

Voltage Variation (%)

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

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

2.4. TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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

Test software Version	BT_Tool V1.1.4		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters	Default	Default	Default

2.5. BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Mode:



2.6. DESCRIPTION OF SUPPORT UNITS (CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Serial	Equipment	Brand	Model/Type No.	Series No.	Note
1	PC		X1502ZA1240-0DASX BJX10		Auxiliary
2	serial port		USB to TTL		Auxiliary

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.7. EQUIPMENTS LIST FOR ALL TEST ITEMS

Test Equipment

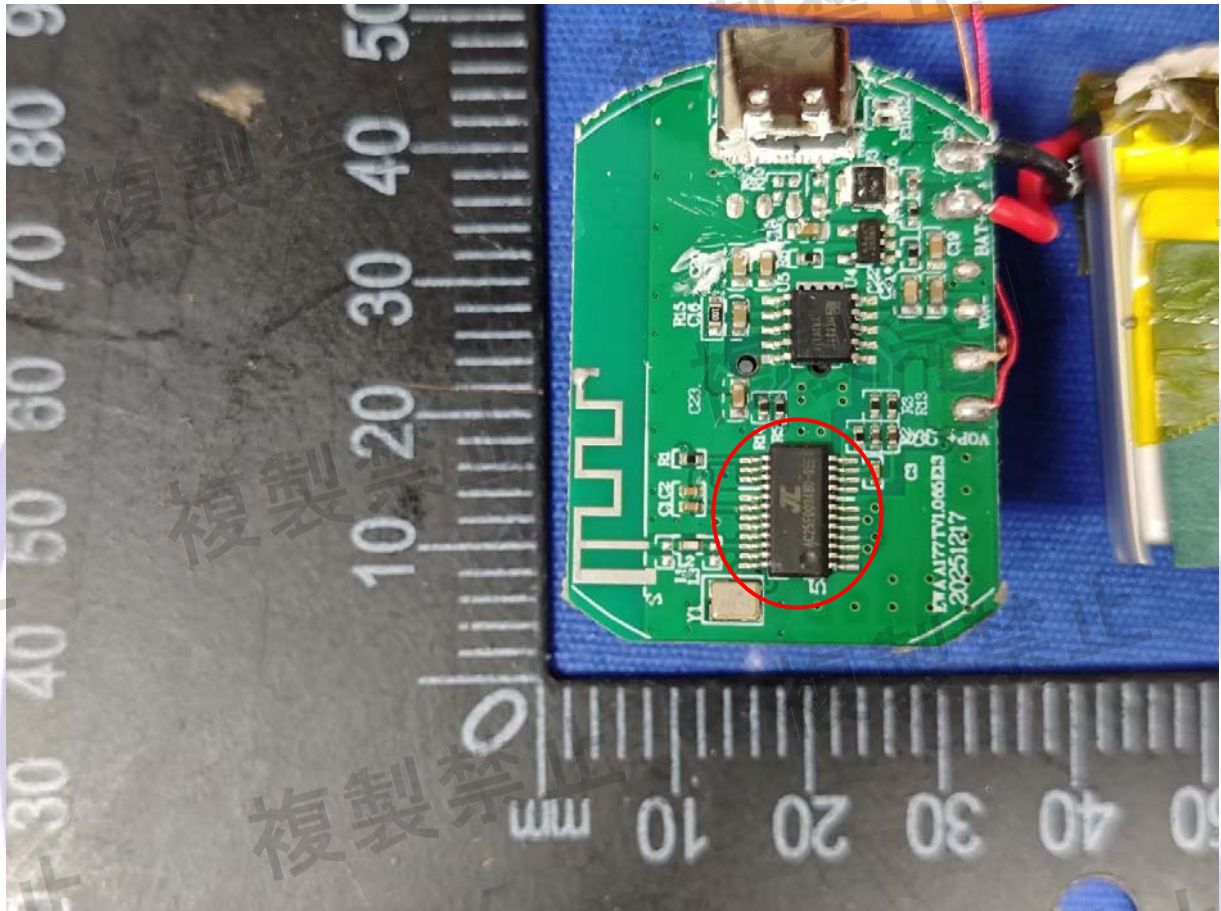
Name	Model No.	Serial No.	Manufacturer	Date of Cal.	Due Cal. Date	Calibration Lab	Calibration Method
MXG Signal Analyzer	N9020A	MY50510202	Agilent	2025/6/10	2026/6/09	LiSai	c
MXG Vector Signal Generator	N5182A	MY50140020	Agilent	2025/6/10	2026/6/09	LiSai	c
MXG Analog Signal Generator	N5181A	MY47420919	Agilent	2025/6/10	2026/6/09	LiSai	c
Power Sensor	TR1029-2	512364	Techoy	2025/6/10	2026/6/09	LiSai	c
RF Swith	TR1029-1	512364	Techoy	2025/6/10	2026/6/09	LiSai	c
Power Meter	TR1029-3	512364	Techoy	2025/6/10	2026/6/09	LiSai	c
Attenuation	PCL-10dB	221126	HTEC	2025/6/10	2026/6/09	LiSai	c

Note: Calibration Method

- a) Calibration conducted by the National Institute of Information and Communications Technology(NICT) or a designated calibration agency under Article 102-18 paragraph (1) of the Radio Law.
- b) Calibration conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) Japan Calibration Service System.
- c) Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- d) Calibration conducted by using other equipment that listed above from a) to c).

Our products apply for RF certification in Japan. The high frequency part and modulation part use SMT technology, which is not easy to change. (An integrated IC for the high-frequency band or modulation band, or multiple such ICs, should meet the following two requirements: The chip is equal or greater than 10 chip pins, and the pin distance is less than or equal to 1.5mm.). Number of RF chip pins: 24, spacing distance: 0.5 mm (please see picture).

Picture 1



3. TEST RESULT FOR BLUETOOTH

3.1. FREQUENCY ERROR

3.2. LIMIT

Item	Limits
Frequency Error	$\pm 50\text{ppm}$

3.3. MEASURING INSTRUMENTS AND SETTING

The following table is the setting of Spectrum Analyzer.

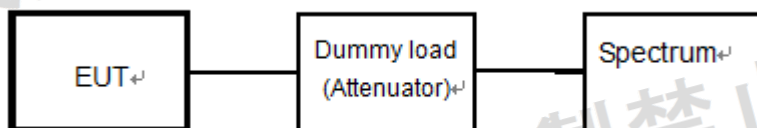
Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	10KHz/10KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.4. TEST PROCEDURES

- (1) In the case of unmodulated signal (continuous or continuous burst), measure the frequency directly by a frequency meter.
- (2) In the case of burst waves, the measurement shall be done for enough time in order to obtain the enough measuring accuracy, and the average of the measured values becomes the final value.
- (3) In the case of a test mode with a specific frequency spectrum, measure the frequency of the specific spectrum by a spectrum analyzer.
- (4) In the cases above, if the frequency equivalent to the test frequency is not directly measured in principle, it shall be obtained by necessary calculation.

In the case of modulated signal, if there is no specific spectrum measurable by a spectrum analyzer but a specific dip is observed, it is allowed to measure the frequency with the signal generator (synthesized). That is, observe a signal of the signal generator concurrently (or alternately) with the tested signal using the spectrum analyzer while setting the frequency of the signal generator to the position of the dip on the screen of the spectrum analyzer, and determine the frequency of the signal generator at the time as a measured value.

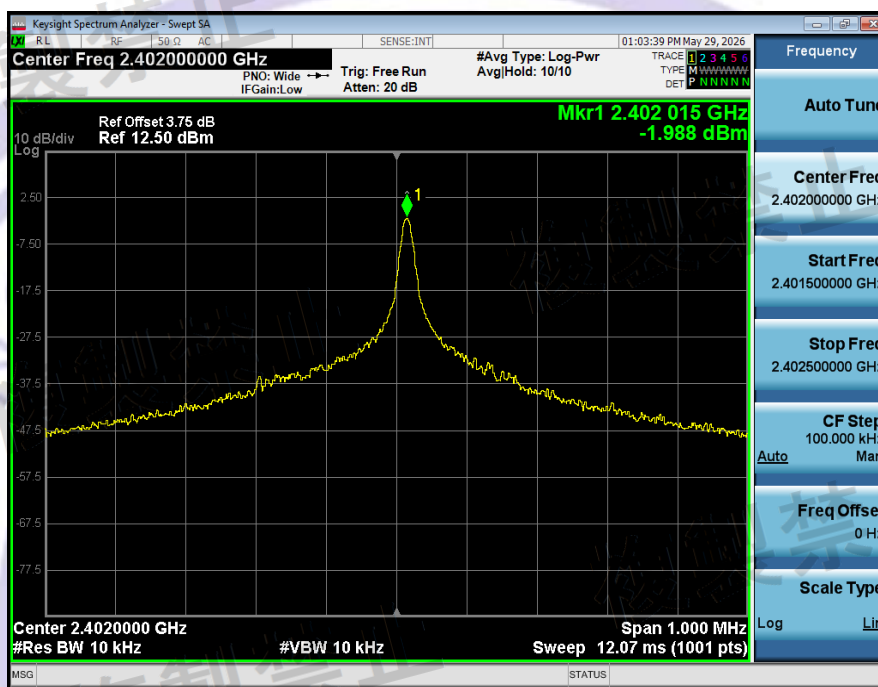
3.5. TEST SETUP LAYOUT



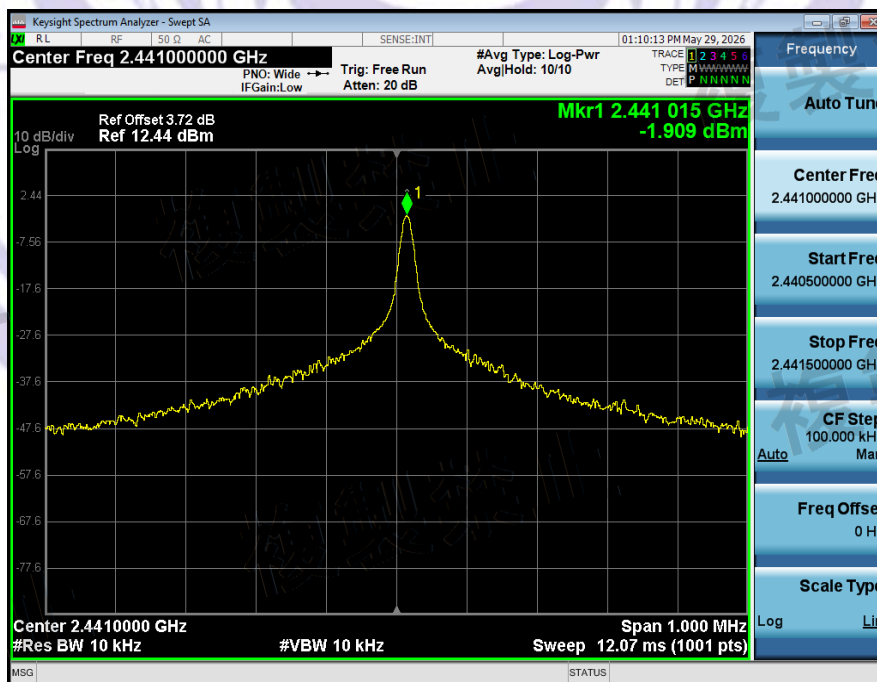
3.6. TEST RESULT

	Frequency (MHz)	Reading	Tolerance	Limit	Result
		MHz	ppm	ppm	
Single carrier	2402	2402.015	6.245	±50	Pass
	2441	2441.015	6.145	±50	
	2480	2480.015	6.048	±50	

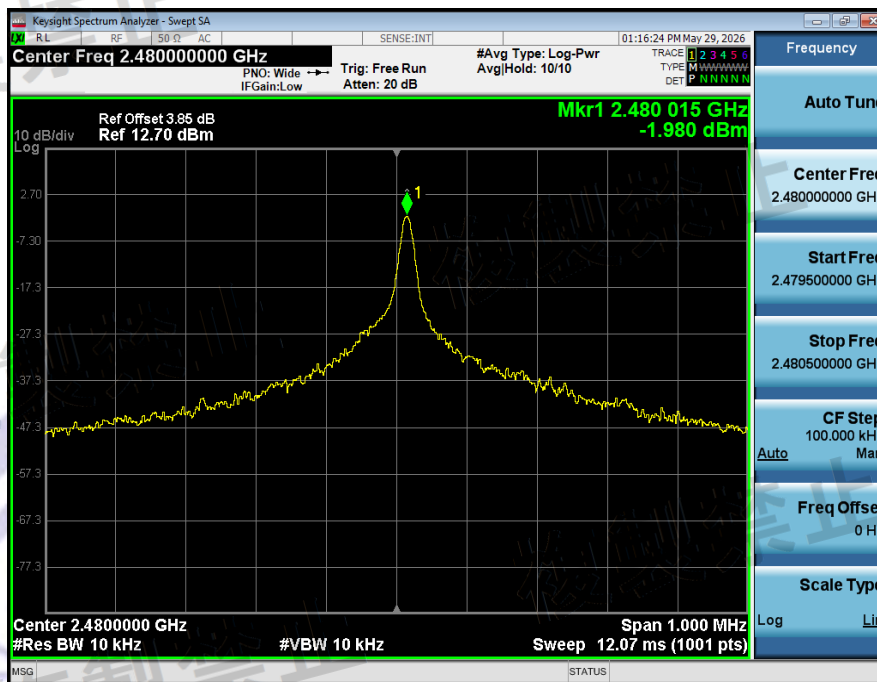
2402MHz



2441MHz



2480MHz



4. ANTENNA POWER

4.1. LIMIT

Item	Limits
Antenna Power Density:	$\leq 3\text{mW/MHz}$ (FH form 2402 - 2480 MHz) $\leq 10\text{mW/MHz}$ (OFDM, DS from 2400~2483.5MHz) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Antenna Power Error:	$\leq 20\%$
E.i.r.p:	$\leq 6.91\text{dBm/MHz}$ (FHSS)

4.2. TEST PROCEDURES

1. The EUT was directly connected to the power meter.
2. The EUT was set to frequency hopping mode.

4.3. TEST SETUP LAYOUT



4.4. EST DEVIATION

There is no deviation with the original standard.

4.5. TEST RESULT

	Mode	Power (dBm)	Power (mW)	Spread Bandwidth (MHz)	Ant Power (mW/ MHz)	Limit (mW/ MHz)	Rated power (mW/ MHz)	Tolerance	Limit	Result
GFSK	Hopping	17.21	52.60	71.653	0.734	3	1.0	-26.59	$\leq 20\%$	Pass
$\pi/4$ -DQPSK	Hopping	17.32	53.95	71.510	0.754	3	1.0	-24.56	$\leq 20\%$	Pass

Remark: Ant Powe(mW/MHz) = Power(mW)/Spread Bandwidth(MHz)

	Mode	Ant Power (mW/MHz)	Ant Power (dBm/MHz)	Ant Gain (dBi)	EIRP (dBm/MHz)	Limit (dBm/MHz)	Result
GFSK	Hopping	0.734	-1.34	-0.68	-2.02	6.91	Pass
$\pi/4$ -DQPSK	Hopping	0.754	-1.23	-0.68	-1.91	6.91	Pass

5. OCCUPIED BANDWIDTH (99%&90%)

5.1. LIMIT

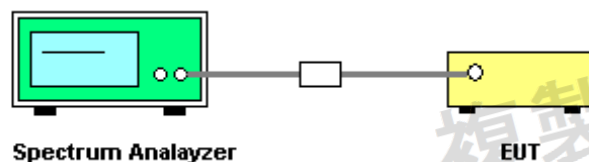
Item	Limits
Occupied Band Width:	FH 83.5MHz; OFDM,DS $\leq 26\text{MHz}$; Others $\leq 26\text{MHz}$
Spreading Bandwidth:	/

5.2. MEASURING INSTRUMENTS AND SETTING

5.3. TEST PROCEDURES

1. Setting of SA is following as: RB: 1M / VB:3M / SPAN: 180MHz / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
2. EUT has transmitted the maximum modulation signal and fixed channelize (For DSSS or OFDM Device) or continuous maximum power of hopping mode (For FHSS Device). SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz (For DSSS or OFDM Device) or 83.5MHz (For FHSS Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth

5.4. TEST SETUP LAYOUT



5.5. TEST DEVIATION

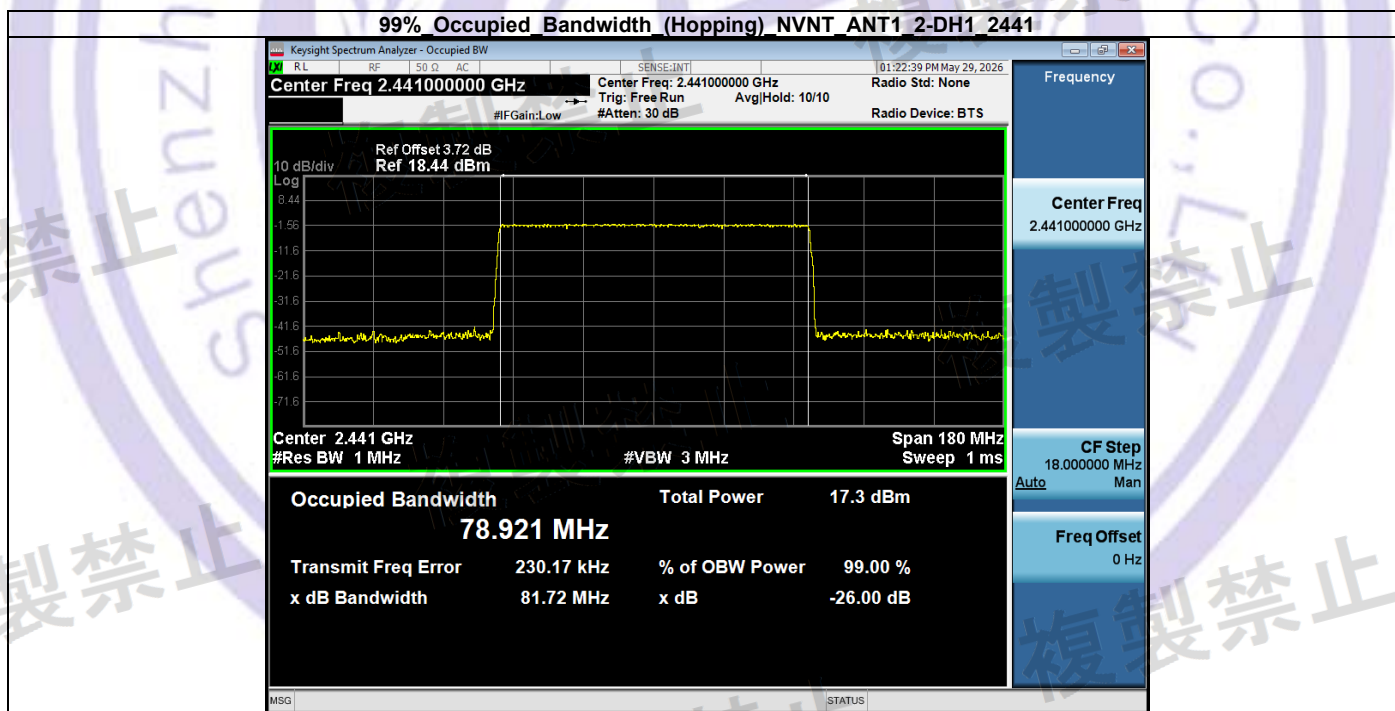
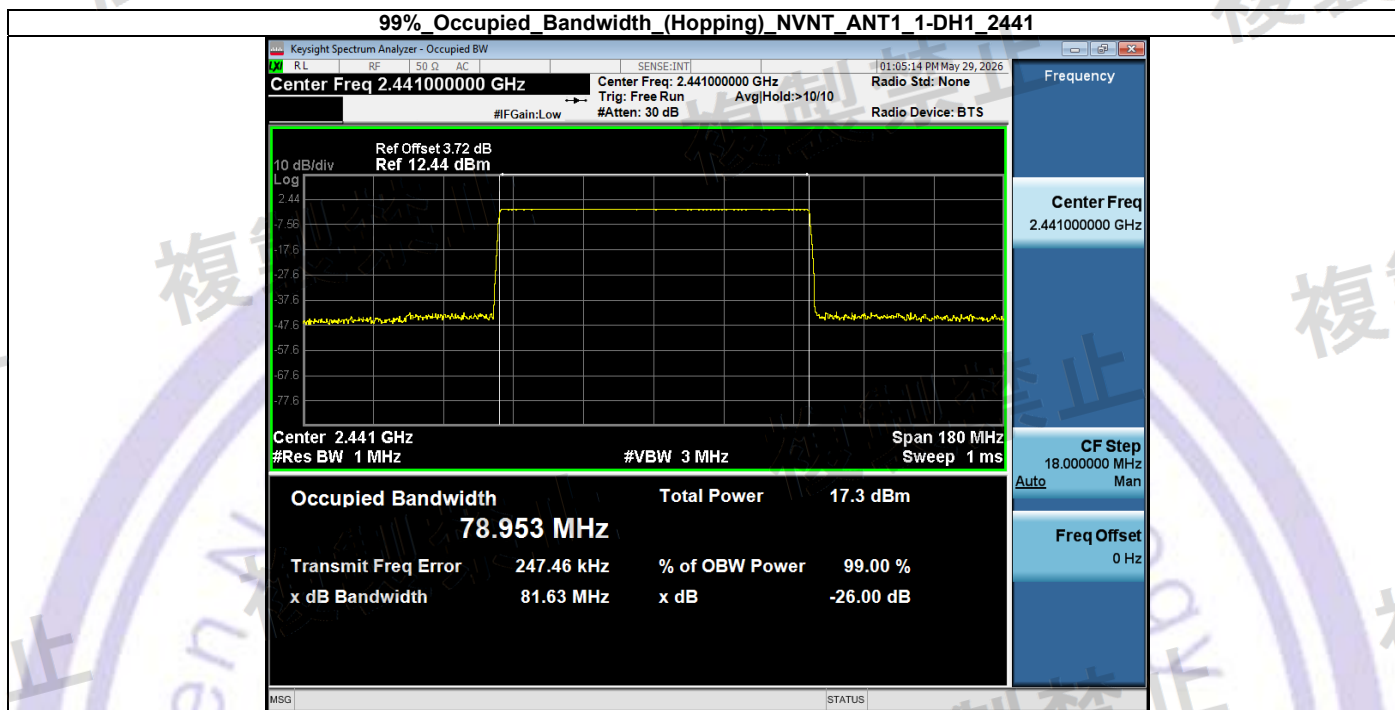
There is no deviation with the original standard.

5.6. EUT OPERATION DURING TEST

The EUT was programmed to be in continuously transmitting mode.

5.7. TEST RESULT

Modulation	mode	99% Occupied Bandwidth(MHz)	Limit(MHz)	Result
GFSK(1-DH1)2441MHz	Hopping	78.95	83.5	Pass
π /4-DQPSK(2-DH1)2441MHz	Hopping	78.92	83.5	Pass



6. UNWANTED EMISSION INTENSITY MEASUREMENT

6.1. LIMIT

Item	Limits
TX Spurious Emission	$\leq 2.5 \mu\text{W/MHz}(-26\text{dBm})$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq 2.5 \mu\text{W/MHz}(-26\text{dBm})$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq 25 \mu\text{W/MHz}(-16\text{dBm})$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq 25 \mu\text{W/MHz}(-16\text{dBm})$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)
	$\leq 2.5 \mu\text{W/MHz}(-26\text{dBm})$ ($2496.5\text{MHz} \leq f < 12500\text{MHz}$)

6.2. MEASURING INSTRUMENTS AND SETTING

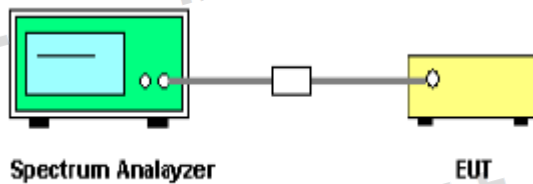
Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Below 1G	Above 1G
	Setting	Setting
Attenuation	Auto	Auto
RB / VB	1MHz	1MHz
Detector	Peak	Peak
Trace	Max Hold	Max Hold
Sweep Time	Auto	Auto

6.3. TEST PROCEDURES

- EUT have transmitted the maximum modulation signal and fixed channelize.
- Setting of SA is following as: Below 1GHz RB:1MHz / VB:1MHz
Above 1GHz RB:1MHz / VB:1MHz / AT: 10dB Ref: 0dBm / Sweep time: Auto
Sweep Mode: Continuous sweep / Detect mode: Positive peak
Trace mode: Max hold
- Setting of SA is following as 30MHz and stop frequency 1000MHz Then to mark peak reading value + cable loss shall be less than 2.5μW/MHz.
- Setting of SA is following as 1000MHz and stop frequency 2387MHz Then to mark peak reading value + cable loss shall be less than 2.5μW/MHz.
- SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than 25μW/MHz.
- SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz Then to mark peak reading value + cable loss shall be less than 25μW/MHz
- SA adjusted to start frequency 2496.5MHz and stop frequency 12500MHz Then to mark peak reading value + cable loss shall be less than 2.5μW/MHz
- Measure side band spurious as follows: For 2.4GHz band: 2374MHz~2400MHz and 2483.5MHz~2509.5MHz RBW = VBW = 30kHz, Result_Value = Measured_Value + 15.2 [dBm]
- If the Result_Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as Result_Value.

6.4. TEST SETUP LAYOUT

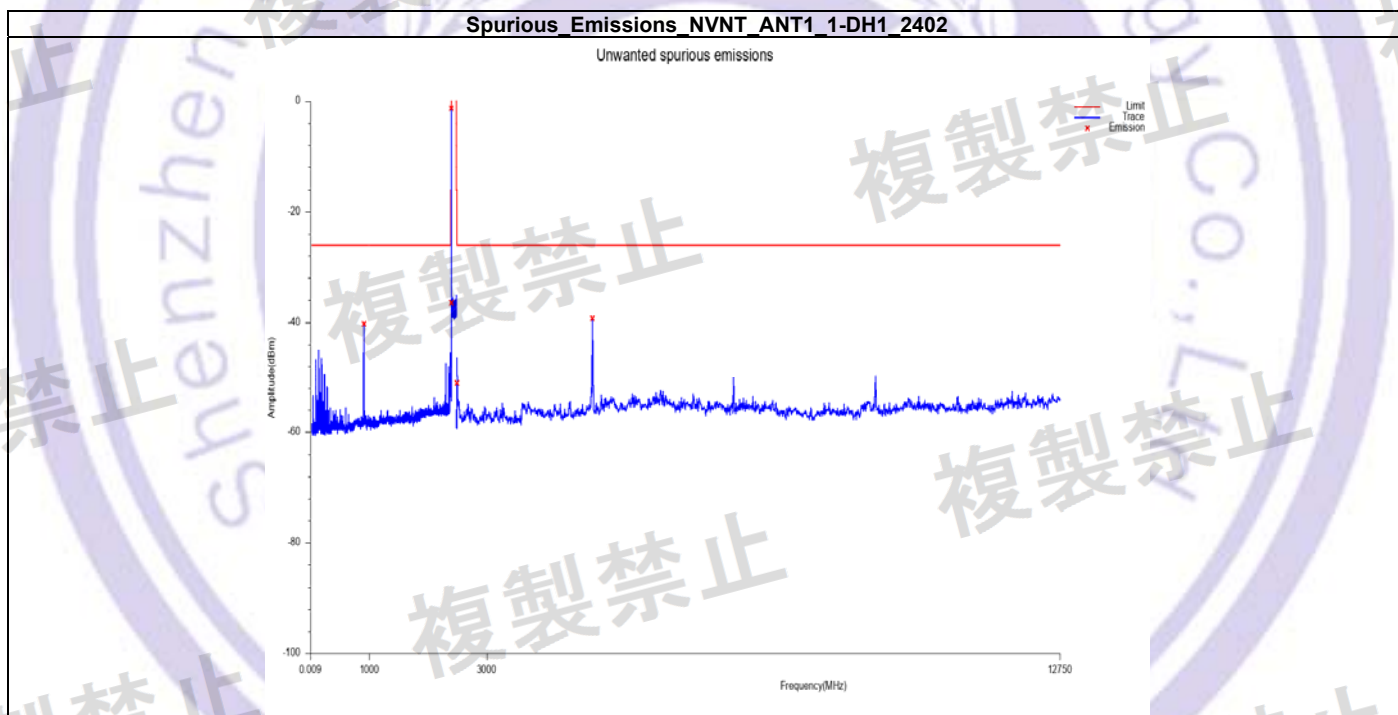
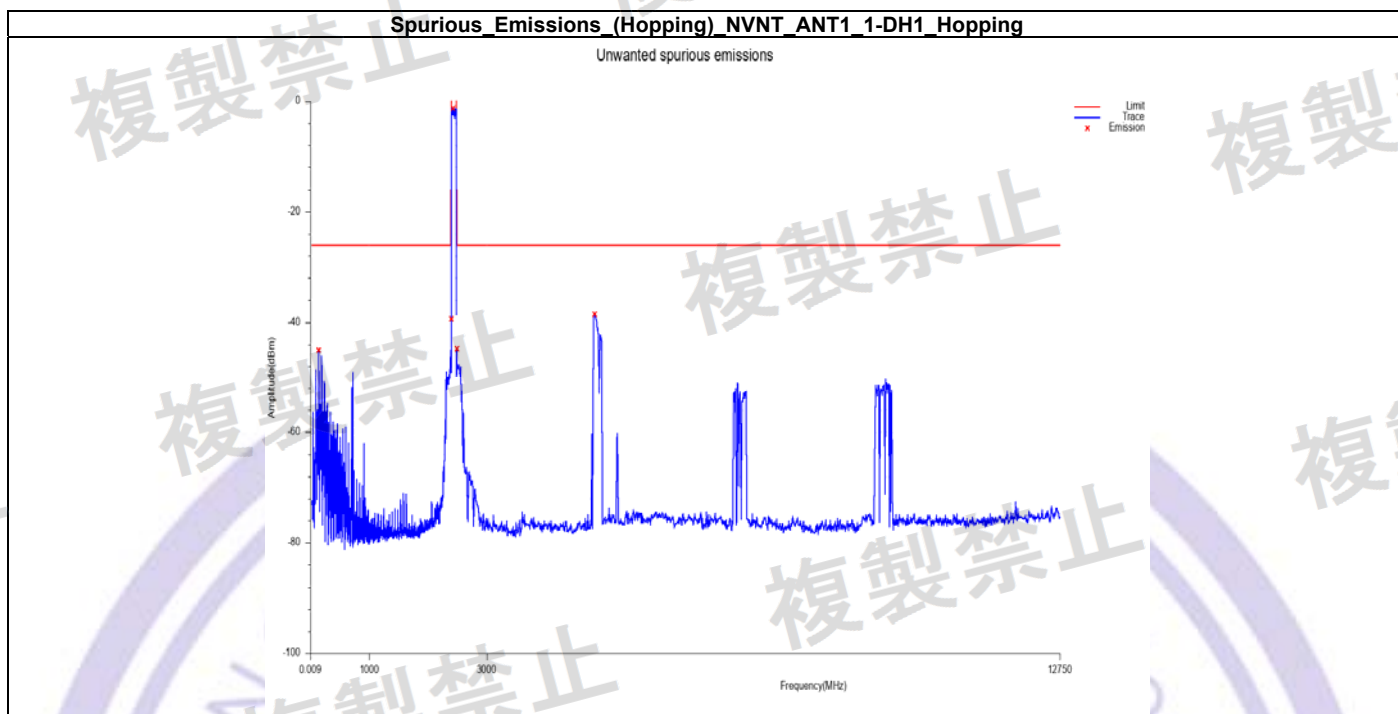


6.5. TEST DEVIATION

There is no deviation with the original standard.

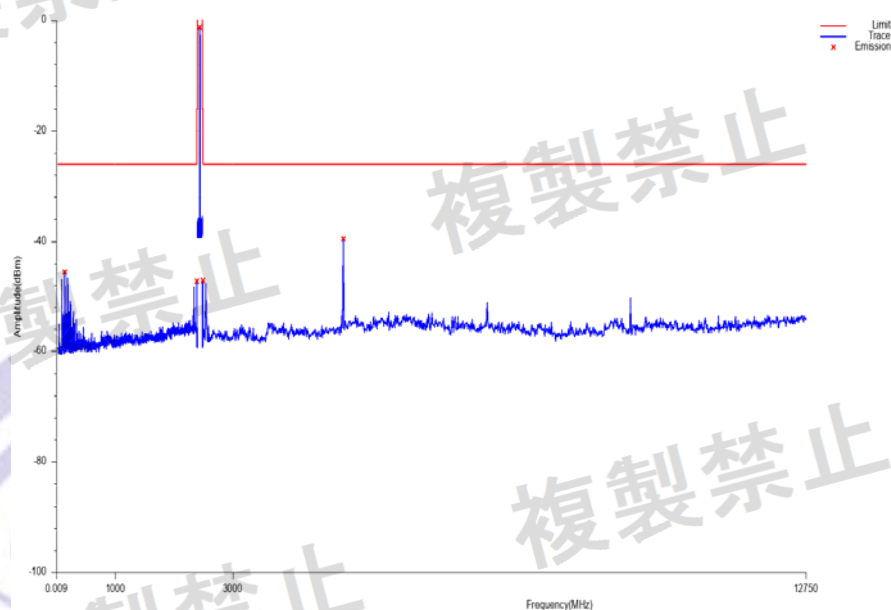
6.6. TEST RESULT

Mode	Frequency (MHz)	Frequency Area(MHz)	RBW(kHz)	Spur. Fre.(MHz)	Spur. Level(dBm/MHz)	Limit (dBm/MHz)	Spur. Level	Limit	Result
1-DH1	Hopping	30.00~2387.00	1000	145.49	-45.06	-26	0.0312μW/MHz	2.5μW/MHz	Pass
1-DH1	Hopping	2387.00~2400.00	1000	2400.00	-39.39	-16	0.1150μW/MHz	25μW/MHz	Pass
1-DH1	Hopping	2400.00~2483.50	/	/	/	/	/	/	/
1-DH1	Hopping	2483.50~2496.50	1000	2490.97	-44.86	-16	0.0326μW/MHz	25μW/MHz	Pass
1-DH1	Hopping	2496.50~12750.00	1000	4834.30	-38.48	-26	0.1419μW/MHz	2.5μW/MHz	Pass
1-DH1	2402.00	30.000000~2387.000000	1000	913.88	-40.26	-26	0.0942μW/MHz	2.5μW/MHz	Pass
1-DH1	2402.00	2387.000000~2400.000000	1000	2399.99	-36.52	-16	0.2229μW/MHz	25μW/MHz	Pass
1-DH1	2402.00	2400.000000~2483.500000	/	/	/	/	/	/	/
1-DH1	2402.00	2483.500000~2496.500000	1000	2496.43	-51.06	-16	0.0078μW/MHz	25μW/MHz	Pass
1-DH1	2402.00	2496.500000~12750.000000	1000	4803.54	-39.34	-26	0.1165μW/MHz	2.5μW/MHz	Pass
1-DH1	2441.00	30.000000~2387.000000	1000	145.49	-45.62	-26	0.0274μW/MHz	2.5μW/MHz	Pass
1-DH1	2441.00	2387.000000~2400.000000	1000	2393.20	-47.23	-16	0.0189μW/MHz	25μW/MHz	Pass
1-DH1	2441.00	2400.000000~2483.500000	/	/	/	/	/	/	/
1-DH1	2441.00	2483.500000~2496.500000	1000	2488.95	-47.07	-16	0.0196μW/MHz	25μW/MHz	Pass
1-DH1	2441.00	2496.500000~12750.000000	1000	4885.57	-39.55	-26	0.1108μW/MHz	2.5μW/MHz	Pass
1-DH1	2480.00	30.000000~2387.000000	1000	143.14	-44.57	-26	0.0349μW/MHz	2.5μW/MHz	Pass
1-DH1	2480.00	2387.000000~2400.000000	1000	2396.52	-55.22	-16	0.0030μW/MHz	25μW/MHz	Pass
1-DH1	2480.00	2400.000000~2483.500000	/	/	/	/	/	/	/
1-DH1	2480.00	2483.500000~2496.500000	1000	2483.51	-45.77	-16	0.0264μW/MHz	25μW/MHz	Pass
1-DH1	2480.00	2496.500000~12750.000000	1000	4957.34	-41.08	-26	0.0779μW/MHz	2.5μW/MHz	Pass
2-DH1	Hopping	30.00~2387.00	1000	706.46	-35.01	-26	0.3156μW/MHz	2.5μW/MHz	Pass
2-DH1	Hopping	2387.00~2400.00	1000	2400.00	-31.84	-16	0.6544μW/MHz	25μW/MHz	Pass
2-DH1	Hopping	2400.00~2483.50	/	/	/	/	/	/	/
2-DH1	Hopping	2483.50~2496.50	1000	2488.24	-44.59	-16	0.0347μW/MHz	25μW/MHz	Pass
2-DH1	Hopping	2496.50~12750.00	1000	4854.81	-38.27	-26	0.1488μW/MHz	2.5μW/MHz	Pass
2-DH1	2402.00	30.000000~2387.000000	1000	706.46	-39.68	-26	0.1077μW/MHz	2.5μW/MHz	Pass
2-DH1	2402.00	2387.000000~2400.000000	1000	2399.99	-31.04	-16	0.7877μW/MHz	25μW/MHz	Pass
2-DH1	2402.00	2400.000000~2483.500000	/	/	/	/	/	/	/
2-DH1	2402.00	2483.500000~2496.500000	1000	2496.40	-51.96	-16	0.0063μW/MHz	25μW/MHz	Pass
2-DH1	2402.00	2496.500000~12750.000000	1000	4803.54	-39.54	-26	0.1112μW/MHz	2.5μW/MHz	Pass
2-DH1	2441.00	30.000000~2387.000000	1000	706.46	-37.13	-26	0.1936μW/MHz	2.5μW/MHz	Pass
2-DH1	2441.00	2387.000000~2400.000000	1000	2392.85	-47.25	-16	0.0188μW/MHz	25μW/MHz	Pass
2-DH1	2441.00	2400.000000~2483.500000	/	/	/	/	/	/	/
2-DH1	2441.00	2483.500000~2496.500000	1000	2489.13	-46.92	-16	0.0203μW/MHz	25μW/MHz	Pass
2-DH1	2441.00	2496.500000~12750.000000	1000	4885.57	-39.51	-26	0.1120μW/MHz	2.5μW/MHz	Pass
2-DH1	2480.00	30.000000~2387.000000	1000	145.49	-44.92	-26	0.0321μW/MHz	2.5μW/MHz	Pass
2-DH1	2480.00	2387.000000~2400.000000	1000	2396.35	-55.54	-16	0.0027μW/MHz	25μW/MHz	Pass
2-DH1	2480.00	2400.000000~2483.500000	/	/	/	/	/	/	/
2-DH1	2480.00	2483.500000~2496.500000	1000	2483.58	-47.20	-16	0.0190μW/MHz	25μW/MHz	Pass
2-DH1	2480.00	2496.500000~12750.000000	1000	4957.34	-41.44	-26	0.0717μW/MHz	2.5μW/MHz	Pass



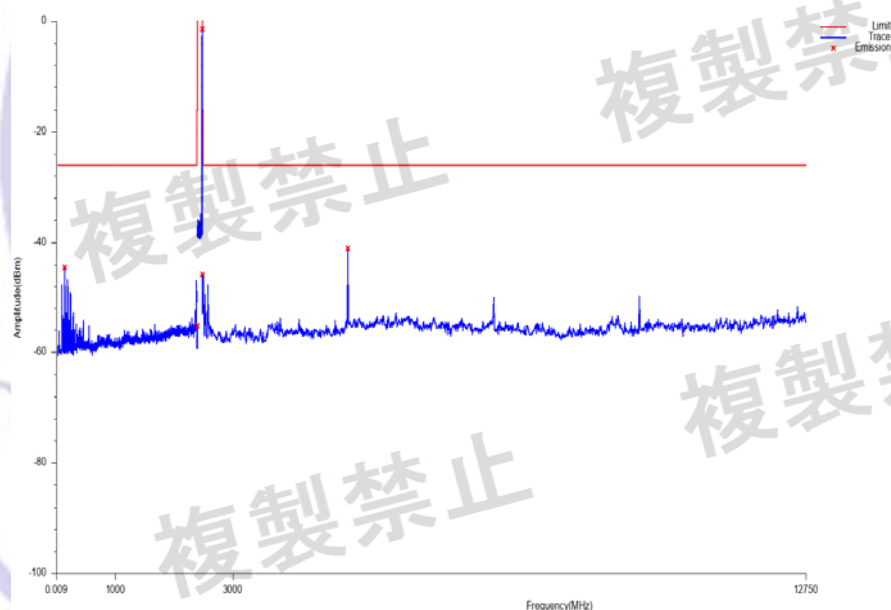
Spurious Emissions NVNT_ANT1 1-DH1_2441

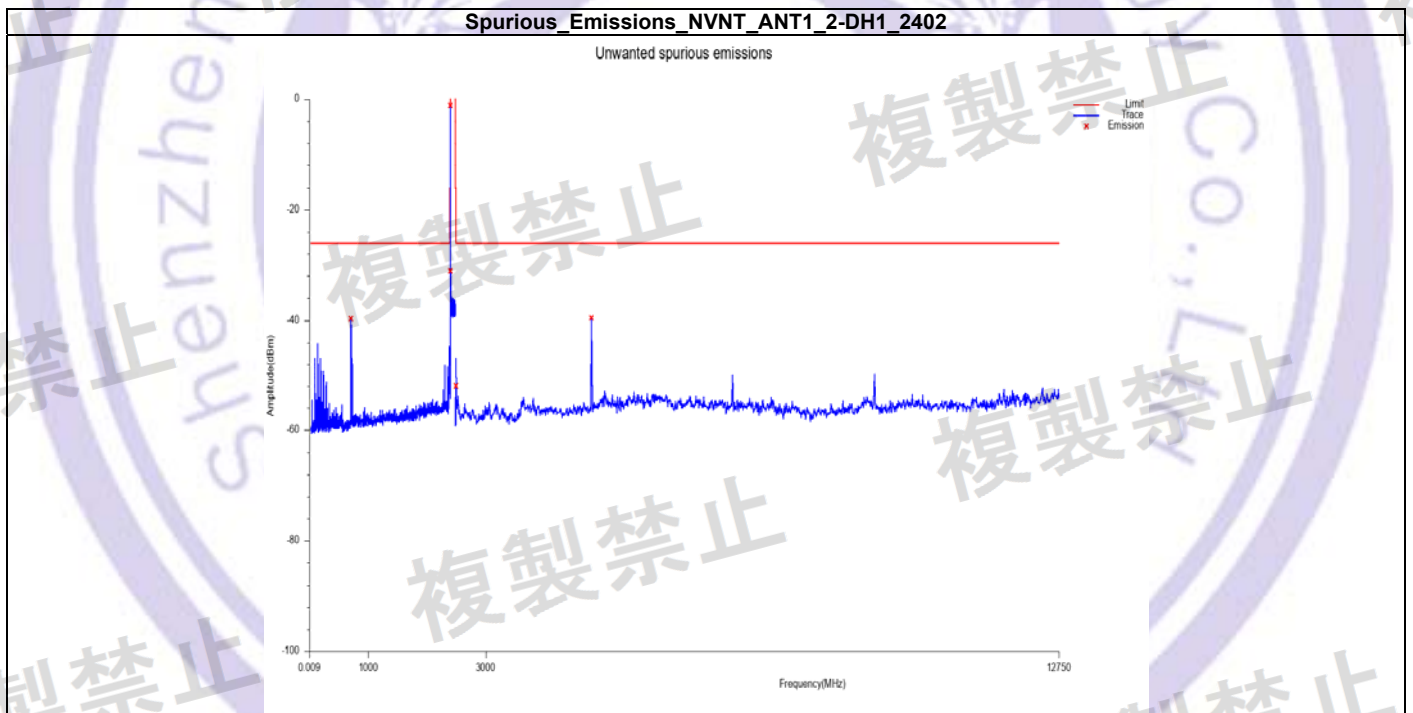
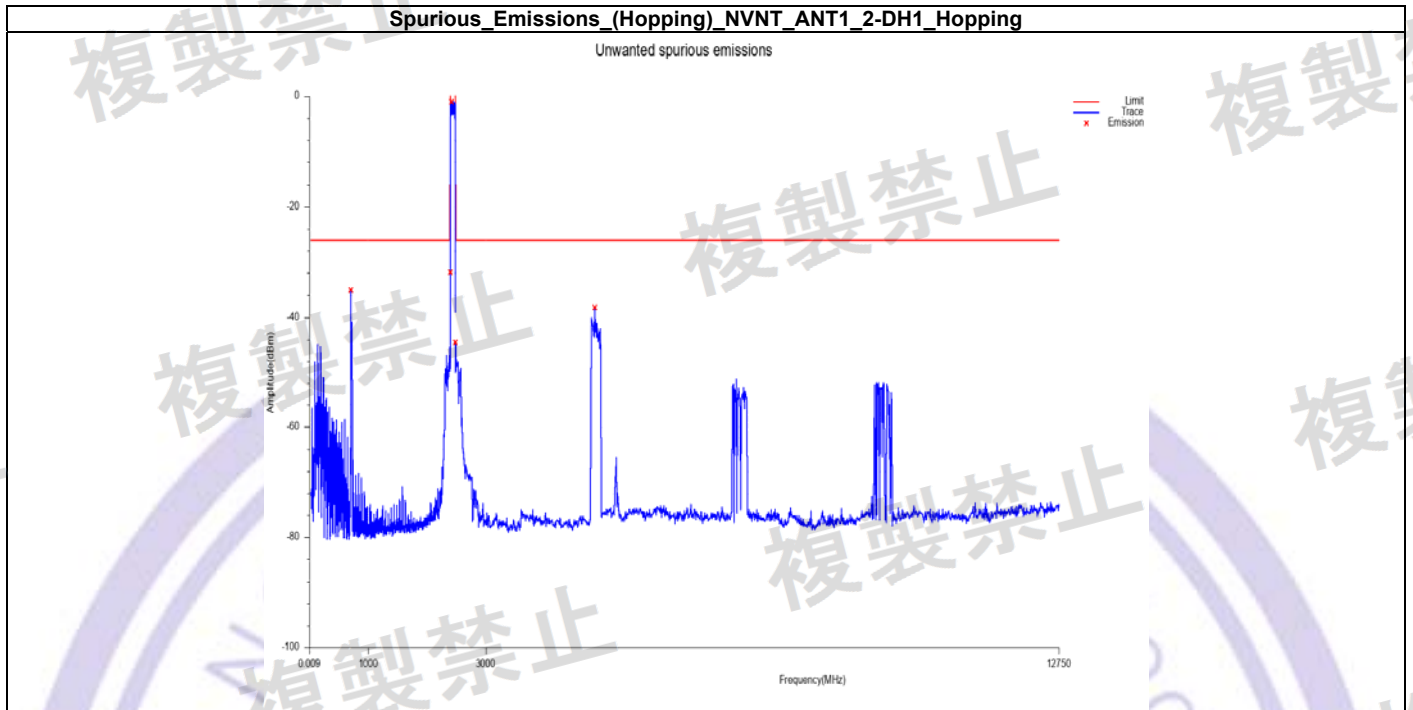
Unwanted spurious emissions



Spurious Emissions NVNT_ANT1 1-DH1_2480

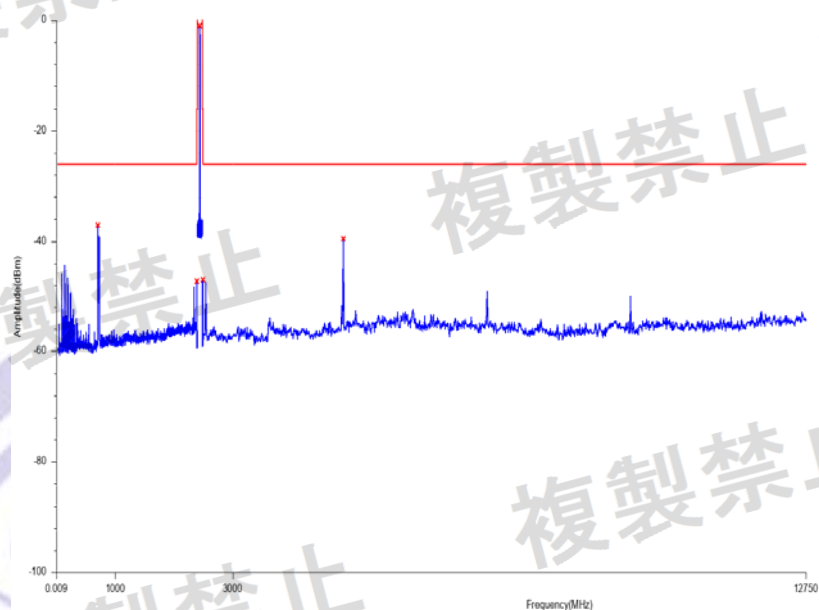
Unwanted spurious emissions





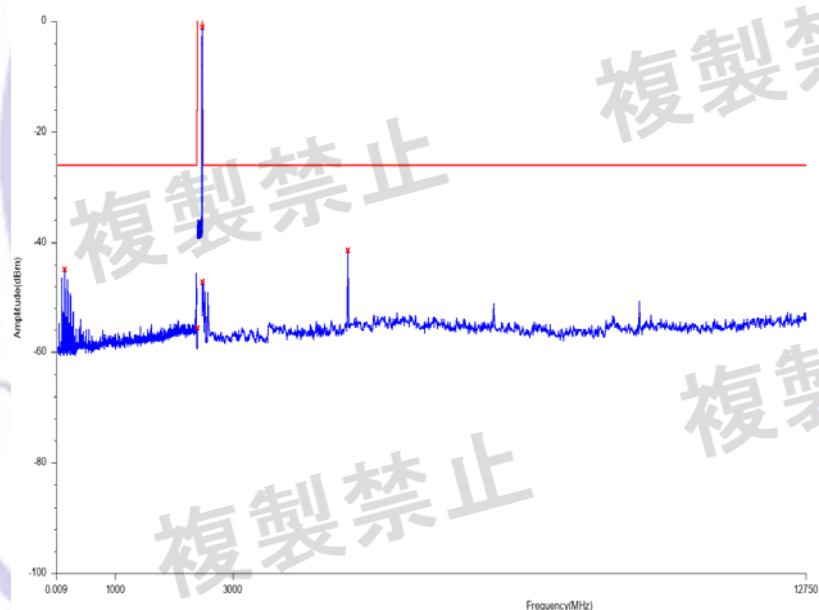
Spurious Emissions NVNT_ANT1 2-DH1_2441

Unwanted spurious emissions



Spurious Emissions NVNT_ANT1 2-DH1_2480

Unwanted spurious emissions



7. DWELL TIME

7.1. LIMIT

Item	Limits
Hopping Freq. Dwell Time	$\leq 0.4 \text{ sec (In } 0.4 \text{ sec} \times \text{spreading rate)}$

7.2. MEASURING INSTRUMENTS AND SETTING

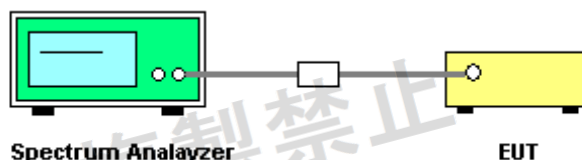
Please refer to section 5 in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	0 MHz
RB	1 MHz
VB	1 MHz
Detector	Peak
Trace	Max Hold
Sweep	Continuous

7.3. TEST PROCEDURES

- The transmitter output (antenna port) was connected to the spectrum analyzer
- Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Set the EUT for packet transmitting.
- Measure the maximum time duration of one single pulse.

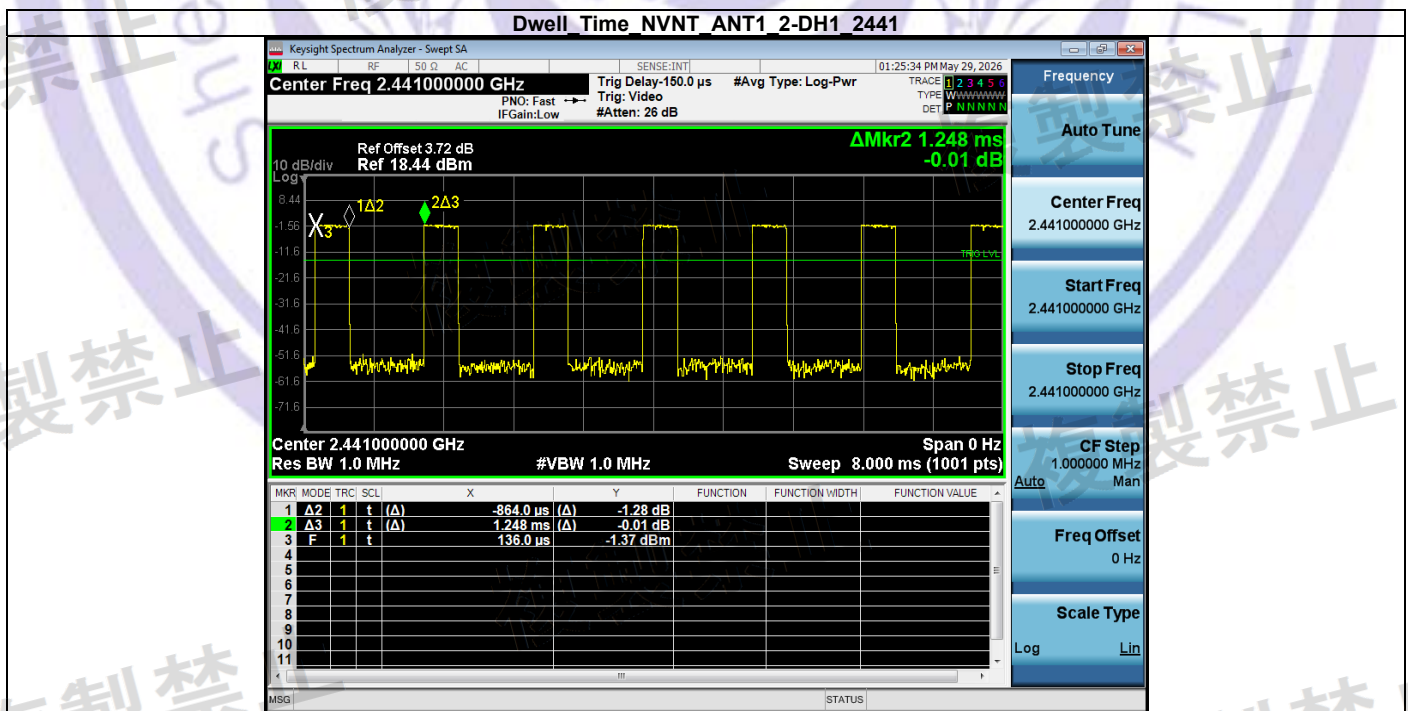
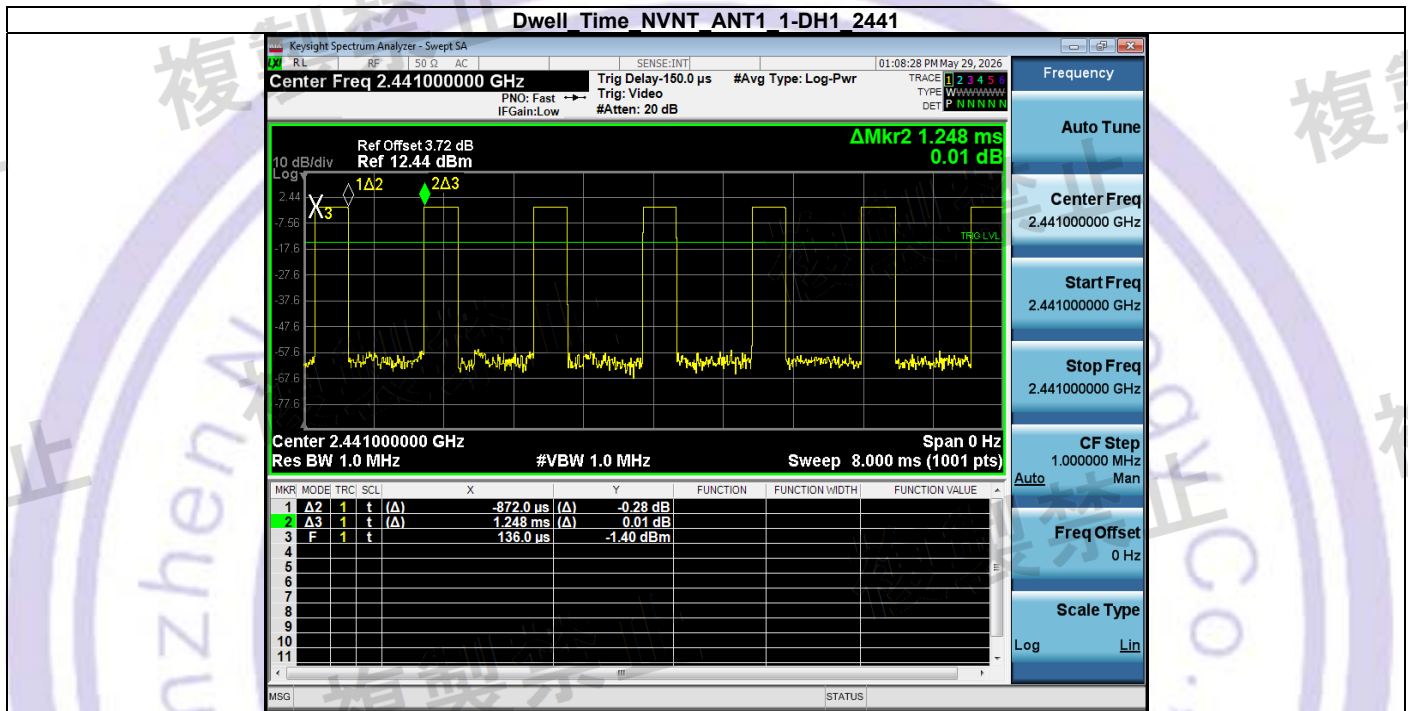
7.4. TEST SETUP LAYOUT

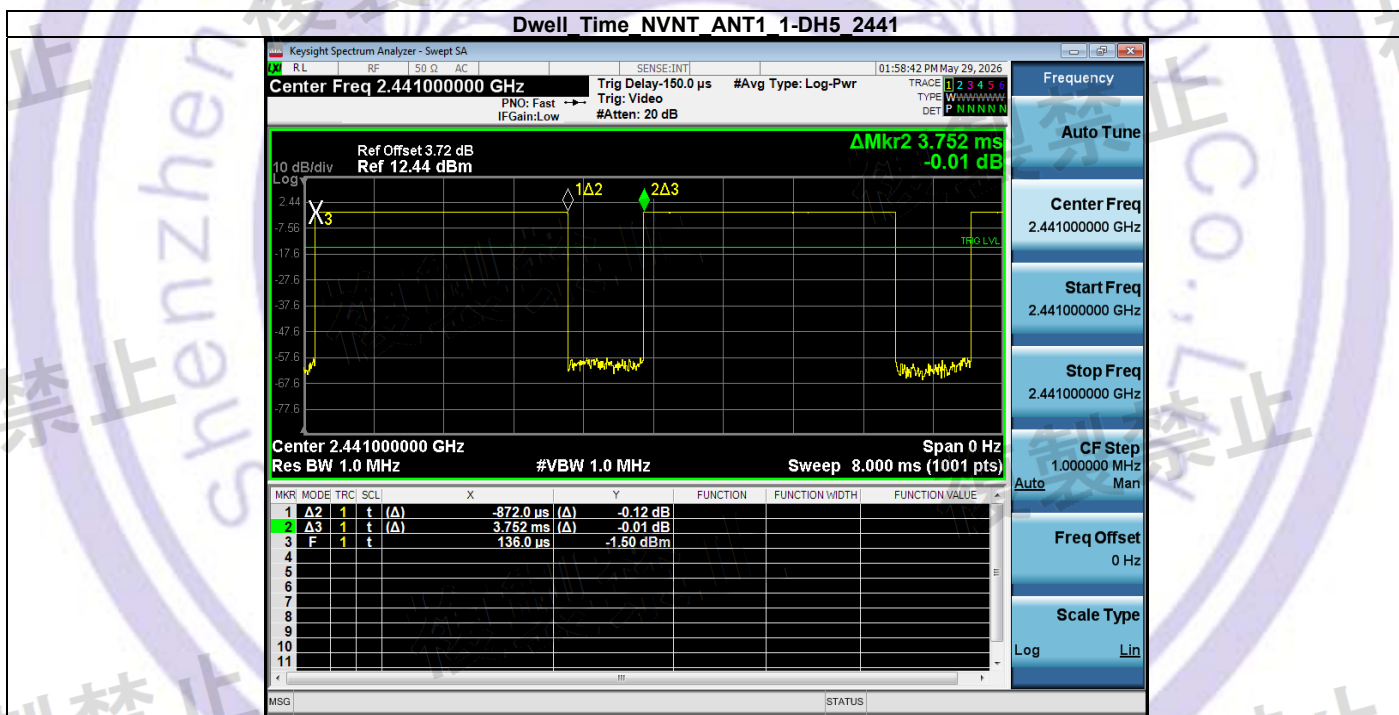
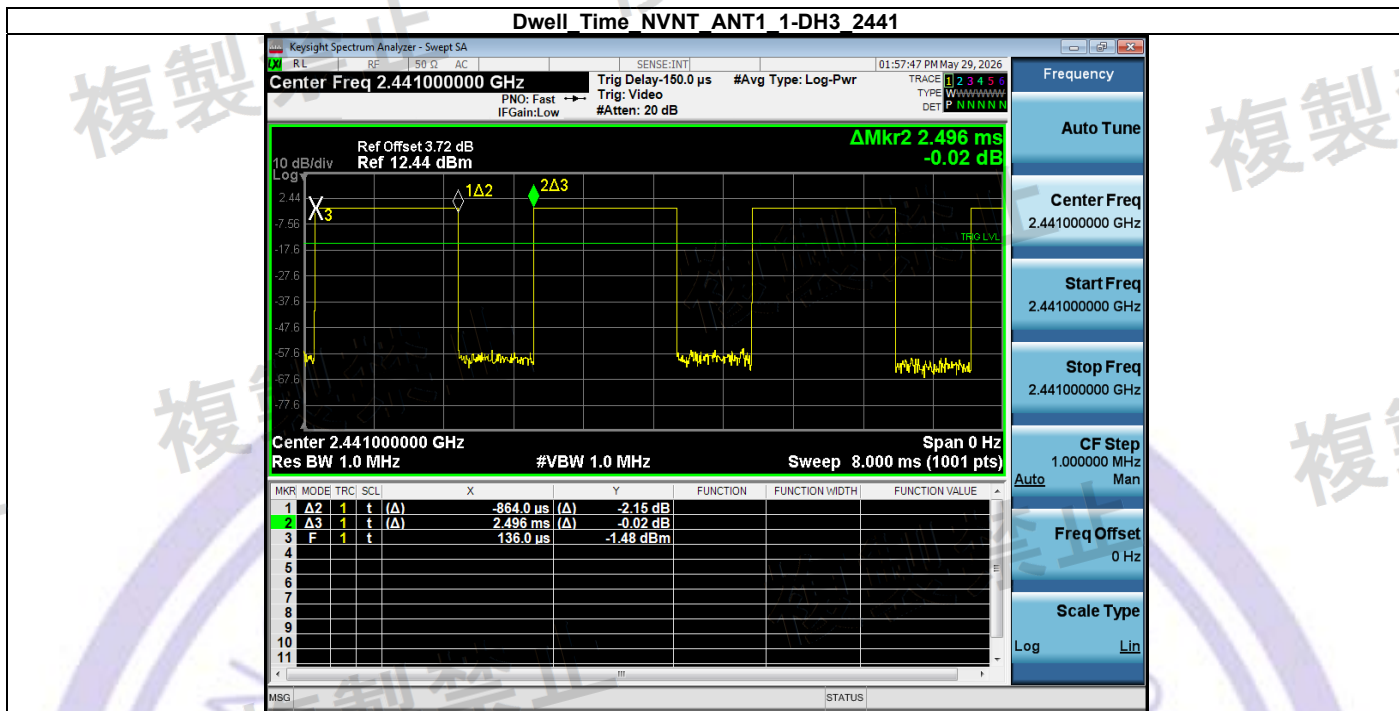


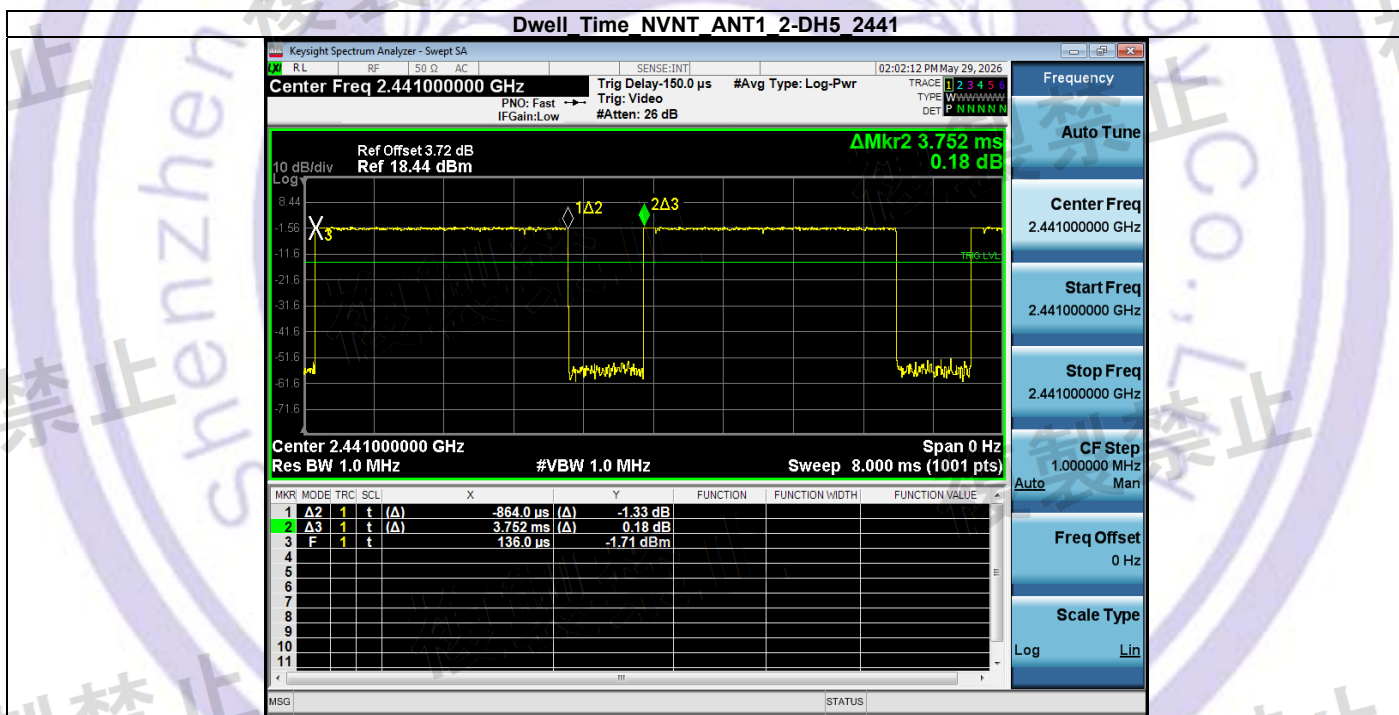
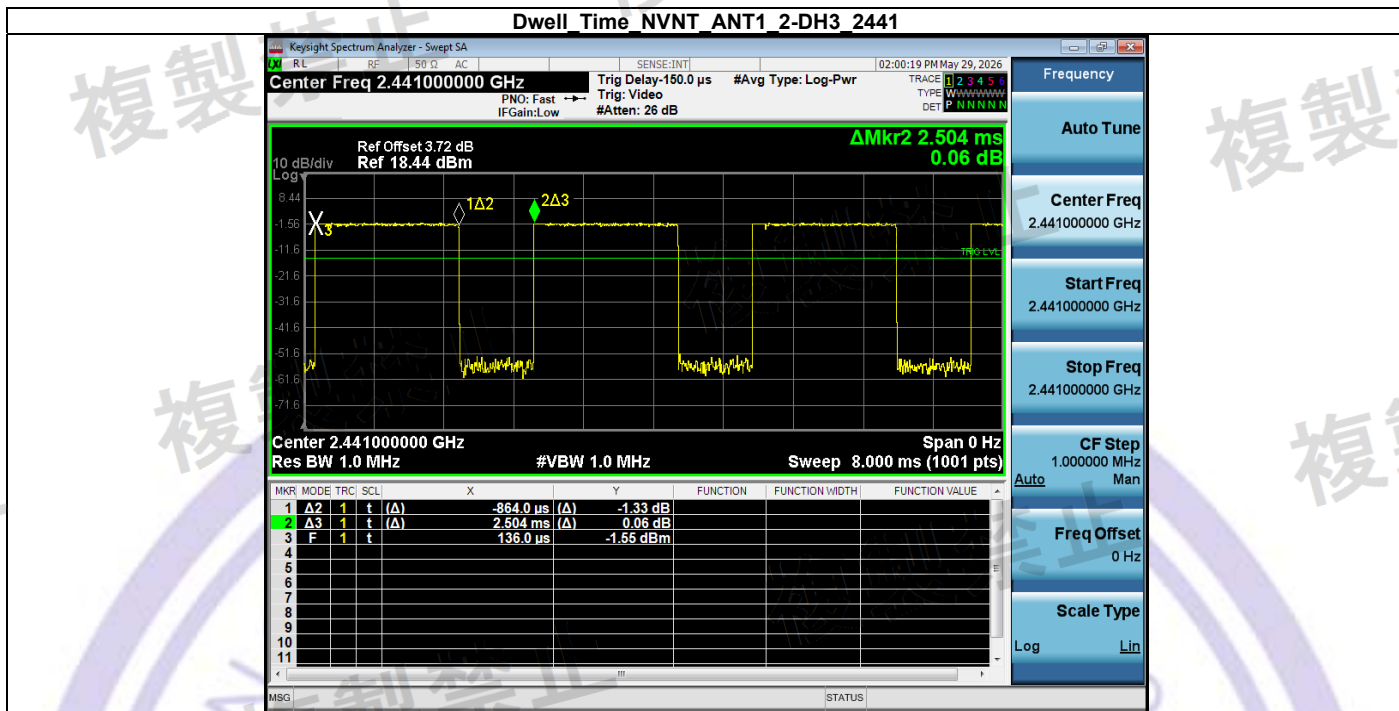
7.5. TEST RESULT

Condition	Antenna	Modulation	mode	Burst Time(ms)	Burst Cycle(ms)	Dwell Time(s)	Limit(s)	Result
NVNT	ANT1	1-DH1	Hopping	0.376	1.248	0.109	0.4	Pass
NVNT	ANT1	2-DH1	Hopping	0.384	1.248	0.111	0.4	Pass
NVNT	ANT1	1-DH3	Hopping	1.632	2.496	0.235	0.4	Pass
NVNT	ANT1	1-DH5	Hopping	2.880	3.744	0.276	0.4	Pass
NVNT	ANT1	2-DH3	Hopping	1.640	2.504	0.235	0.4	Pass
NVNT	ANT1	2-DH5	Hopping	2.888	3.752	0.276	0.4	Pass

$\text{dwellTime} = 400 * \text{spreadFactor} * \text{burstTime} / \text{burstCycle} / 79 / 1000$







8. CARRIER SENSE

Not applicable

9. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

9.1. LIMIT

Item	Limits
RX Spurious Emission:	$\leq 4\text{nW}(-54\text{dBm})$ ($f < 1\text{GHz}$)
	$\leq 20\text{nW}(-47\text{dBm})$ ($1\text{GHz} \leq f$)

9.2. MEASURING INSTRUMENTS AND SETTING

Please refer to section 5 in this report. The following table is the setting of Spectrum Analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
RB/VB	Below 1G: RB / VB: 100kHz/100kHz
	Above 1G: RB / VB: 1MHz/1MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

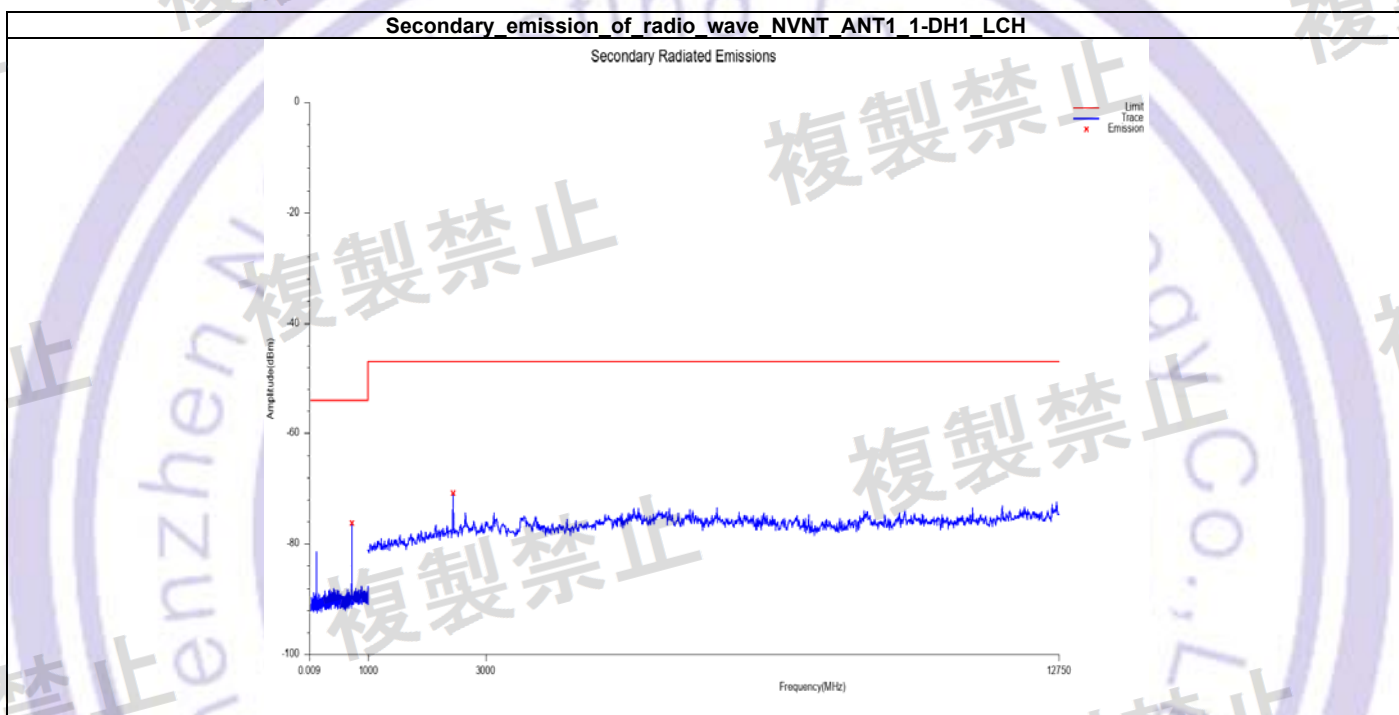
9.3. TEST PROCEDURES

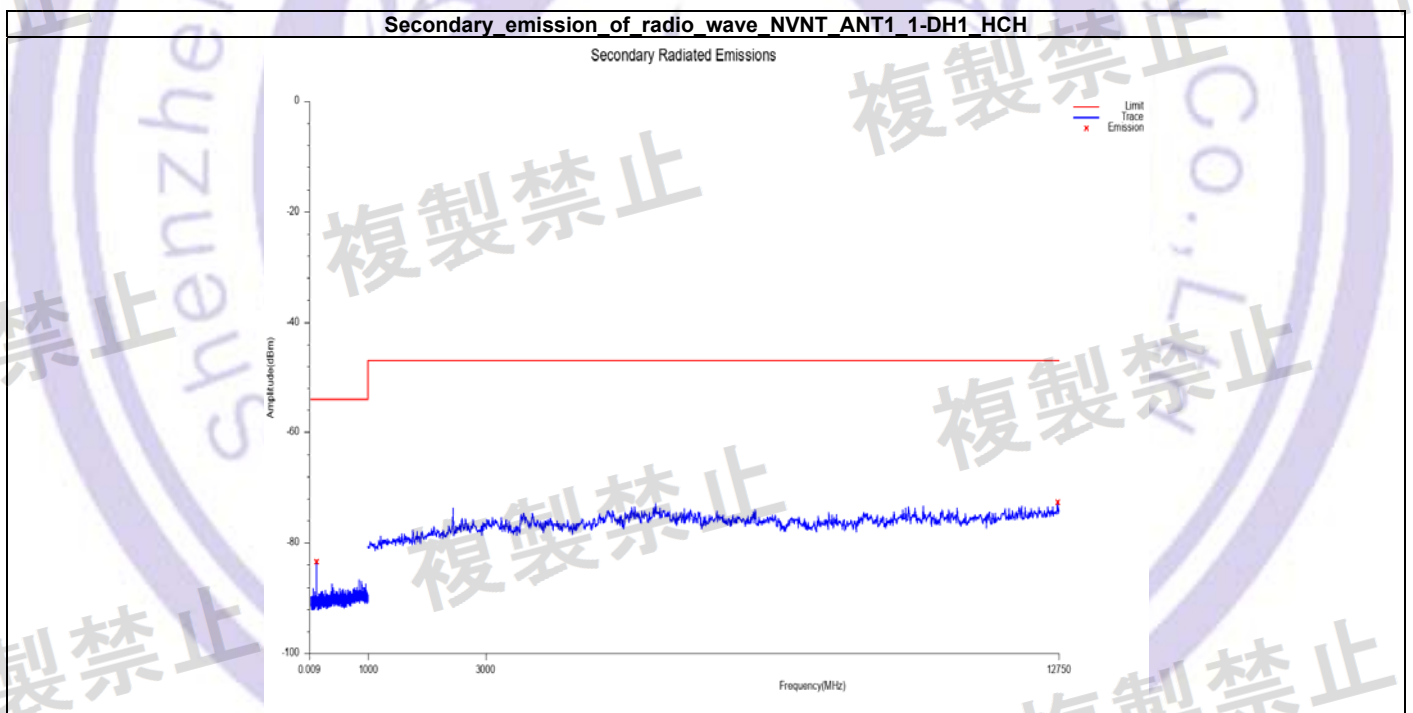
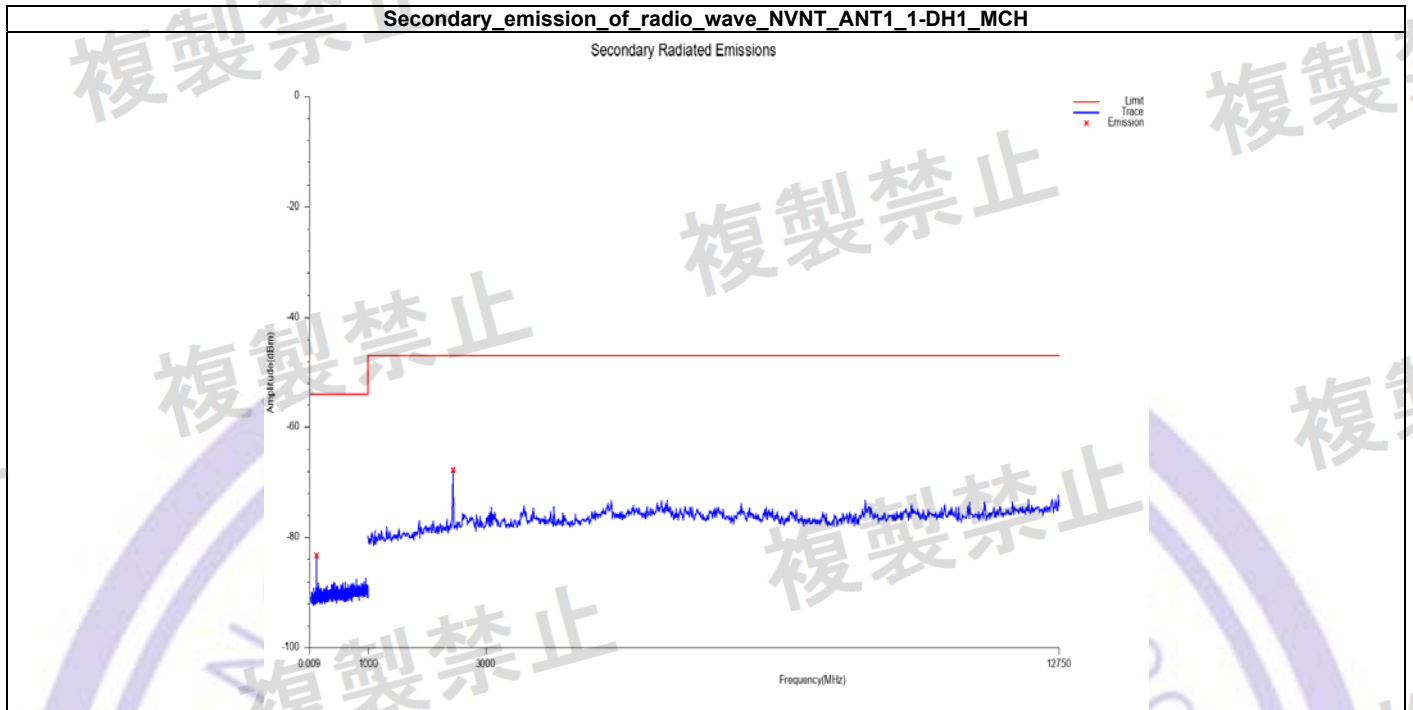
1. EUT have the continuous reception mode and fixed only one channelize.
2. Setting of SA is following as RB / VB: 100 kHz (below 1GHz emissions) / 1 MHz (above 1GHz emissions) /
Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold
3. SA set RB: 100kHz and VB: 100kHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW
4. SA set RB: 1MHz and VB: 1MHz. Then adjust to start frequency 1000MHz and stop frequency 12500MHz. Search to mark peak reading value + cable loss shall be less than 20nW
5. If power level of lower emissions are more than 1/10 of limit (.0.4nW for $f < 1\text{GHz}$, 2nW for $f \geq 1\text{GHz}$), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit, no necessary to be indicated.

9.4. TEST RESULT

Condition	ANT	Mode	Channel	Range(MHz)	RBW(kHz)	Spur. Freq.(MHz)	Spur. Lev.(dBm)	Spur. Lev	Limit	Over 1/10 Limit	Read Lev.(dBm)	Read Lev.	Result
NVNT	ANT1	1-DH1	LCH	30.0~1000.0	100	721.61	-76.27	0.0236nW	4nW	NO	/	/	Pass
NVNT	ANT1	1-DH1	LCH	1000.0~12750.0	1000	2445.25	-70.87	0.0818nW	20nW	NO	/	/	Pass
NVNT	ANT1	1-DH1	MCH	30.0~1000.0	100	120.21	-83.36	0.0046nW	4nW	NO	/	/	Pass
NVNT	ANT1	1-DH1	MCH	1000.0~12750.0	1000	2445.25	-67.72	0.1688nW	20nW	NO	/	/	Pass
NVNT	ANT1	1-DH1	HCH	30.0~1000.0	100	120.21	-83.41	0.0045nW	4nW	NO	/	/	Pass
NVNT	ANT1	1-DH1	HCH	1000.0~12750.0	1000	12726.50	-72.70	0.0537nW	20nW	NO	/	/	Pass

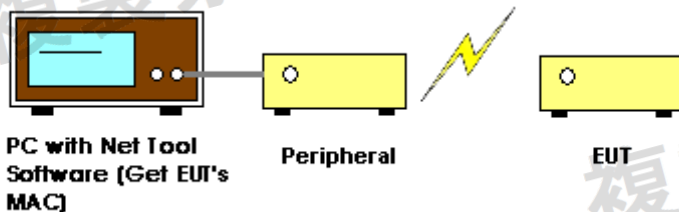
Measured all types and recorded worst case at GFSK modulation





10.INTERFERENCE PREVENTION FUNCTION

10.1. TEST SETUP



10.2. RADIO INTERFERENCE PREVENTION FUNCTION

	Normal voltage
Result	OK

Result: Pass
MAC: 71:DC:B8:A9:C3:EB

11. EUT TEST PHOTO

Measurement Photos



RF Cable impedance: 50Ω

12. EUT CONSTRUCTIONAL DETAILS

Please see EUT Photo for details.

the end of report