



RADIO TEST REPORT-BT

Article 2 paragraph 1 item (19)

MIC Notice No.88 Appendix No.43

Product : Pixel Tunes CD player

Trade Mark : RELAX

Model Name : RE-D9X

Serial Model : N/A

Report No. : DGE241105011R01

Prepared for

SINCERE-INC

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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name.....: SINCERE-INC

Address.....: 3-chōme-3-21 Nipponbashi Naniwa Ward Osaka 556-0005
Japan

Manufacturer's Name.....: SINCERE-INC

Address.....: 3-chōme-3-21 Nipponbashi Naniwa Ward Osaka 556-0005
Japan

Test specification:

Standard.....: Article 2 paragraph 1 item (19)

MIC Notice No.88 Appendix No.43

Test item description

Product name.....: Pixel Tunes CD player

Model and/or type reference : RE-D9X

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with MIC requirements. And it is applicable only to the tested sample identified in the report.

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Testing.....:

Date of receipt of test item.....: Nov. 05, 2024

Date (s) of performance of tests.....: Nov. 06, 2024~ Nov. 22, 2024

Date of Issue.....: Nov. 22, 2024

Test Result.....: **Pass**

Testing Engineer : _____

Aaron Ye

(Aaron Ye)

Technical Manager : _____

Brian Yang

(Brian Yang)

Authorized Signatory : _____

Bart Yang

(Bart Yang)



※ ※ Revision History ※ ※

REV.	REPORT NO.	Page Revised	ISSUED DATE	Contents
Original	DGE241105011R01	Rev.01	Nov. 22, 2024	N/A

Table of Contents

Page

1. SUMMARY OF TEST RESULTS	6
1.1 TEST FACILITY	7
1.2 MEASUREMENT UNCERTAINTY	7
2. GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF EUT	8
2.2 DESCRIPTION OF TEST MODES	10
2.3 TEST CONDITIONS	10
2.4 TEST ENVIRONMENTAL	10
2.5 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	11
2.6 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	11
2.7 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	12
2.8 EQUIPMENTS LIST FOR ALL TEST ITEMS	13
3. FREQUENCY ERROR	14
3.1 LIMIT	14
3.2 TEST PROCEDURES	14
3.3 TEST SETUP	14
3.4 TEST RESULT	14
4. ANTENNA POWER	15
4.1 LIMIT	15
4.2 TEST PROCEDURE	15
4.3 TEST SETUP	15
4.3 TEST DEVIATION	15
4.4 TEST RESULT	15
5. RADIATION POWER	16
5.1 LIMIT	16
5.2 TEST RESULT	16
6. OCCUPIED BANDWITH (99%) & SPREAD BANDWITH (90%)	17
6.1 LIMIT	17
6.2 TEST PROCEDURE	17
6.3 TEST SETUP	17
6.4 TEST DEVIATION	17

Table of Contents

	Page
6.5 TEST RESULT	17
7. UNWANTED EMISSION INTENSITY MEASUREMENT	18
7.1 LIMIT	18
7.2 TEST PROCEDURE	18
7.3 TEST SETUP	19
7.4 TEST DEVIATION	19
7.5 TEST RESULT	19
8. DWELL TIME	20
8.1 LIMIT	20
8.2 TEST PROCEDURES	20
8.3 TEST SETUP	20
8.4 TEST RESULT	20
9. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT	21
9.1 LIMIT	21
9.2 TEST PROCEDURES	21
9.3 TEST RESULT	21
10. TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT	22
10.1 LIMIT	22
10.2 TEST PROCEDURES	22
10.3 TEST SETUP	22
10.4 TEST DEVIATION	22
10.5 TEST RESULT	22
11. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT	23
11.1 LIMIT	23
11.2 MEASURING ID CODE SOFTWARE	23
11.3 TEST PROCEDURES	23
11.4 TEST SETUP	23
11.5 TEST DEVIATION	23
11.6 EUT OPERATION DURING TEST	23
11.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILIT	23

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Article 2 paragraph 1 item (19)			
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 2400~2483.5MHz			
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	Absolute Antenna Gain (Provided at Individual Antenna Report)	PASS	
49.20(1);e	Spread-Spectrum Bandwidth	PASS	
49.20(1);f	Spreading Factor	PASS	
49.20(1);g	Hopping Frequency Dwell Time (FH employed)	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Dongguan NTEK Testing Service Co., Ltd.

Add. : Room101/401, Building 3, No.1, Keji 8th Road, Songshan Lake High-Tech Industrial Development Zone, Dongguan, Guangdong, China

CNAS-Lab. : 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 L13824

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 % .

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 3.2\text{dB}$
2	Radiated Emission Test	$\pm 4.7\text{dB}$
3	RF power,conducted	$\pm 0.16\text{dB}$
4	Spurious emissions,conducted	$\pm 0.21\text{dB}$
5	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
6	All emissions,radiated(>1G)	$\pm 5.0\text{dB}$
7	Radio Frequency	$\pm 1 \times 10^{-6}$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Pixel Tunes CD player	
Model Name	RELAX	
Trade Mark	RE-D9X	
Serial Model	N/A	
Model Difference	N/A	
Product Description	The EUT is a Pixel Tunes CD player	
	Operation Frequency:	2402~2480 MHz
	Modulation Type:	GFSK,, $\pi/4$ -DQPSK
	Number Of Channel	79 CH
	Antenna Designation:	PCB
	Antenna Gain(Peak)	1.2
Channel List	Please refer to the Note 2.	
Rating:	DC 3.3V from DC source	
Battery:	DC 3.7V from battery	
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.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3.

Table for Filed Antenna

Antenna	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A(Aux)	N/A	RE-D9X	PCB Antenna	N/A	1.2	BT Antenna

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.

Pretest Mode	Description
Mode 1	GFSK(CH00 CH39 CH78)
Mode 2	$\pi/4$ -DQPSK (CH00 CH39 CH78)

For Radiated Emission	
Final Test Mode	Description
Mode 1	GFSK(CH00 CH39 CH78)
Mode 2	$\pi/4$ -DQPSK (CH00 CH39 CH78)

2.3 TEST CONDITIONS

Voltage Fluctuation Test	Normal Voltage	High Voltage +10% of Normal Voltage	Low Voltage -10% of Normal Voltage
RF Chip Input DC Power(V)	3.300	3.322	3.293
Voltage Variation (%)	/	0.667	-0.212

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%, + / - 10% of the external power change, will not affect the voltage of the RF, so only operated in normal voltage to test all regulations.

EUT test all voltages, but the report only the worst record data.

2.4 TEST ENVIRONMENTAL

During the measurement the environmental conditions

Normal Temperature: 24.1°C

Relative Humidity: 55 %

Air Pressure: 1003 hPa

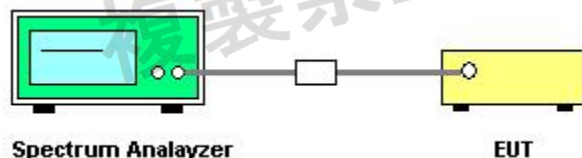
2.5 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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

Type	Mode Or Modulation type	ANT Gain(dBi)	Power Setting	Software For Testing
BR+EDR	GFSK	1.2	10	FCC_assist_1.0.2.2
	$\pi/4$ -DQPSK	1.2	10	

2.6 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Mode :



2.7 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.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Pixel Tunes CD player	RELAX	RE-D9X	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

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”.

2.8 EQUIPMENTS LIST FOR ALL TEST ITEMS

Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	SPECTRUM ANALYZER	AGLIENT	E4440A	MY41000130	2024.04.10	2025.04.09	1 year
2	SPECTRUM ANALYZER	AGILENT	N9020A	MY49100060	2024.10.26	2025.10.25	1 year
3	50Ω COAXIAL SWITCH	ANRITSU	MP59B	6200983705	2024.06.06	2025.06.05	1 year
4	POWER METER	DARE	RPR3006 W	15100041SN O84	2024.08.07	2025.08.06	1 year
5	TEMPORARY ANTENNA CONNECTOR (NOTE)	NTS	R001	N/A	N/A	N/A	N/A
6	DC SOURCE	JIUYUAN	QJ6010E	N/A	2024.08.07	2025.08.06	1 year
7	AGILENT	PSG ANALOG SIGNAL GENERATOR	E8257D	MY51110112	2024.09.14	2025.09.13	1 year
8	MULTIMETER	FLUKE	17B+	N/A	2023.11.30	2024.11.29	N/A

Remark:

Remark:

Notice: Calibration duration for above equipments is 1 year.

Test Equipment Calibration

All of the test equipment is effective use and calibration certification institution, Ti Testing & Certification Group Co., Ltd. Shenzhen Branch, the address is 103, Building B, Port Hongji High-tech Intelligent Industrial Park, No.1008, Songbai Road, Nanshan District, Shenzhen city China and according to calibration method of Article 102-18 paragraph (1)

Notice: Calibration duration for above equipments is 1 year.

3. FREQUENCY ERROR

3.1 LIMIT

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

3.2 TEST PROCEDURES

The following table is the setting of Spectrum Analyzer.

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

- (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.

3.3 TEST SETUP



3.4 TEST RESULT

For the measurement records, refer to the appendix I.

4. ANTENNA POWER

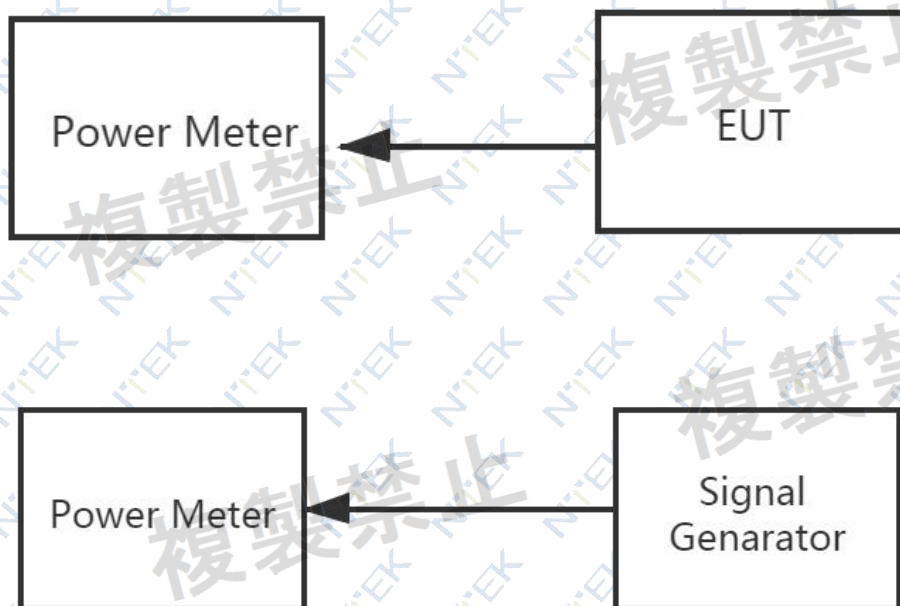
4.1 LIMIT

Item	Limits
Antenna Power Density	$\leq 3\text{mW/MHz}$ (FH form 2400 – 2483.5 MHz) $\leq 10\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz, 802.11b/g/n HT20) $\leq 5\text{mW/MHz}$ (OFDM,DS from 2400~2483.5MHz, 802.11n HT40) $\leq 10\text{mW}$ (Other from 2400~2483.5MHz)
Power Error	+20%, -80% (Base on manufacturer declare power)

4.2 TEST PROCEDURE

1. EUT turn to test frequency channel and keep continuous transmitting.
2. Reading the output power from the Power meter as P_{EUT} .
3. Turn the Signal generator to frequency channel the same as the EUT.
4. Turn the level of Signal generator, scan with the power meter until the power equal to P_{EUT} , the level of Signal generator recorded as "P".
5. The antenna power of EUT is "P".
6. EIRP power = "P"+antenna gain.

4.3 TEST SETUP



4.3 TEST DEVIATION

There is no deviation with the original standard.

4.4 TEST RESULT

For the measurement records, refer to the appendix I.

5. RADIATION POWER

5.1 LIMIT

Item	Limits
Radiation power EIRP	FH from 2400 – 2483.5 MHz ,EIRP $\leq$ 6.91dBm/MHz CCK/OFDM/DBPSK (2400~2483.5MHz) OFDM or DS other than (802.11b/g/n HT20) EIRP $\leq$ 12.14 dBm/MHz OFDM or DS other than (802.11n HT40) EIRP $\leq$ 9.13dBm/MHz Other from 2400~2483.5MHz: 12.14 dBm or less

5.2 TEST RESULT

For the measurement records, refer to the appendix I.

6. OCCUPIED BANDWIDTH (99%) & SPREAD BANDWIDTH (90%)

6.1 LIMIT

Item	Limits
Occupied Band Width:	$\leq 83.5\text{MHz}$ (FH;FH+DS;FH+OFDM) $\leq 26\text{MHz}$ (Others)
Spreading Bandwidth:	$\geq 500\text{ kHz}$

6.2 TEST PROCEDURE

1. Setting of SA is following as: GFSK/ π /4-DPSK RB: 1MHz / VB: 1MHz / SPAN: 83.5MHz / AT: 25dB Ref: 10dBm / Sweep time: Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
2. EUT have 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 FH or OFDM Device) or 83.5MHz (For FHSS Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
4. Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.
5. Spread Spectrum Factor limit is greater than 5.

6.3 TEST SETUP



6.4 TEST DEVIATION

There is no deviation with the original standard.

6.5 TEST RESULT

For the measurement records, refer to the appendix I.

7. UNWANTED EMISSION INTENSITY MEASUREMENT

7.1 LIMIT

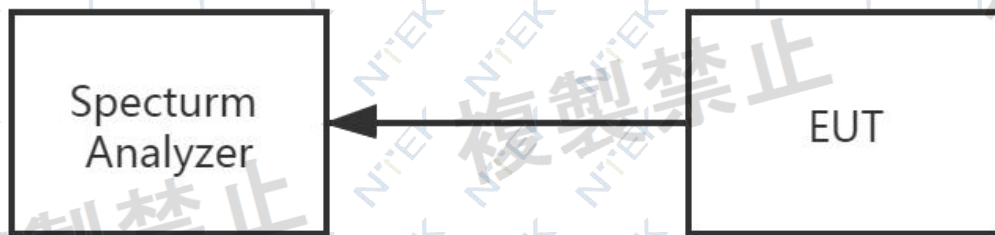
Item	Limits
TX Spurious Emission	$\leq 2.5 \mu\text{W/MHz}$ ($30\text{MHz} \leq f \leq 1000\text{MHz}$)
	$\leq 2.5 \mu\text{W/MHz}$ ($1000\text{MHz} < f \leq 2387\text{MHz}$)
	$\leq 25 \mu\text{W/MHz}$ ($2387\text{MHz} < f \leq 2400\text{MHz}$)
	$\leq 25 \mu\text{W/MHz}$ ($2483.5\text{MHz} \leq f < 2496.5\text{MHz}$)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

7.2 TEST PROCEDURE

Spectrum Parameter	Setting
Attenuation	Auto
RB / VB	30-1000MHz: 100KHz/100KHz
	Above 1GHz: 1 MHz/1 MHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

1. EUT have transmitted the maximum modulation signal and fixed channelize.
2. Setting of SA is following as: Below 1GHz RB: 100KHz / VB: 100KHz, 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
3. Setting of SA is following as 30MHz and stop frequency 1000MHz. Then to mark peak reading value + cable loss shall be less than $2.5\mu\text{W}$.
4. Setting of SA is following as 1000MHz and stop frequency 2387MHz. Then to mark peak reading value + cable loss shall be less than $2.5\mu\text{W}$.
5. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading value + cable loss shall be less than $25\mu\text{W}$.
6. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz. Then to mark peak reading value + cable loss shall be less than $25\mu\text{W}$.
7. SA adjusted to start frequency 2496.5MHz and stop frequency 12750MHz. Then to mark peak reading value + cable loss shall be less than $2.5\mu\text{W}$.
8. When we tested 30MHz-1GHz, we used the RB 100KHz setting for the test. The limit on the test chart was converted. The conversion formula: $-26\text{dBm} + 10 \cdot \log(100\text{K}/1\text{M}) = -36\text{dBm}$.
9. 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.

7.3 TEST SETUP



7.4 TEST DEVIATION

There is no deviation with the original standard.

7.5 TEST RESULT

For the measurement records, refer to the appendix I.

8. DWELL TIME

8.1 LIMIT

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

8.2 TEST PROCEDURES

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

- 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 DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- Dwell time = $[\text{spreading rate}/79] \times \text{duty-cycle} \times 0.4 \text{ seconds}$. (to be determined for each mode, DH1, DH3, DH5)

8.3 TEST SETUP



8.4 TEST RESULT

Duty-cycle = $[\text{on time}/\text{total time}] \times 100\%$

Dwell time = $[\text{spreading rate}/79] \times \text{duty-cycle} \times 0.4 \text{ seconds}$

For the measurement records, refer to the appendix I.

9. IMITATION OF COLLATERAL EMISSION OF RECEIVER MEASUREMENT

9.1 LIMIT

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

9.2 TEST PROCEDURES

Spectrum Parameter	Setting
Attenuation	Auto
RB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
VB	100 kHz (below 1GHz emissions) 1 MHz (above 1GHz emissions)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

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) / AT: 10dB / Ref: 0dBm / 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.

9.3 TEST RESULT

For the measurement records, refer to the appendix I.

10. TRANSMISSION RADIATION ANGLE WIDTH (3DB BEAMWIDTH) MEASUREMENT

10.1 LIMIT

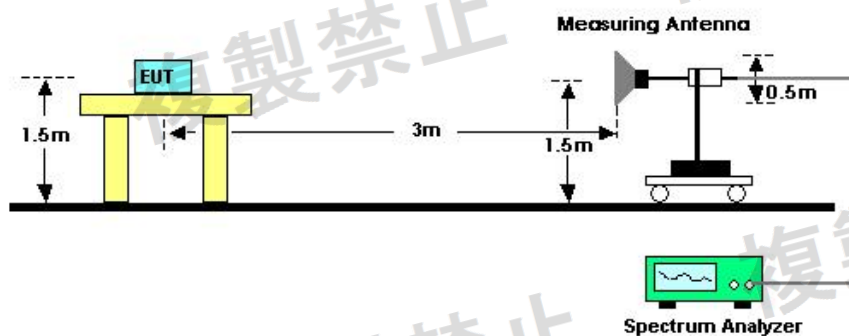
Item	Limits
3dB antenna beam width	$e \leq 360/A$ (The A is 10 in maximum) $A = \{EIRP \text{ Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power (10mW /MHz, 3mW/MHz)}\}\}$ Shall be 1 when A is lower than 1

10.2 TEST PROCEDURES

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

1. Set EUT and measuring antenna at the same height and roughly facing each other.
2. Set spectrum analyzer with condition in section 11.2 and tune reference level to observe receiving signal position.
3. Rotate directions of the EUT horizontally and vertically to find the maximum receiving power.
4. Move the measuring antenna height up and down within $\pm 50\text{cm}$ of EUT height and swing it to find the maximum output of measuring antenna. "E" is the half-power beam width (angle between two points at which radiated power becomes 1/2)
5. Calculate permitted radiation angle in horizontal and vertical using EIRP measured in another test method.
6. Calculate 3dB antenna beam width by the formula below $360/A$ (If $A < 1$; then $A = 1$).
 $A = \{EIRP \text{ Power [mW/MHz]} / \{2.14\text{dBi} + \text{output power (10mW /MHz, 3mW/MHz)}\}\}$
Shall be 1 when A is lower than 1

10.3 TEST SETUP



10.4 TEST DEVIATION

There is no deviation with the original standard.

10.5 TEST RESULT

As the EUT max EIRP is less than 6.91dBm/MHz, so the test is not applicable and skipped.

11. RADIO INTERFERENCE PREVENTION CAPABILITY MEASUREMENT

11.1 LIMIT

Item	Limits
Identification code	≥ 48 bits

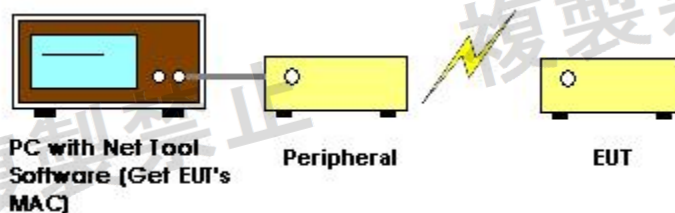
11.2 MEASURING ID CODE SOFTWARE

Item	Limits
MAC IP List	MAC Scan

11.3 TEST PROCEDURES

- In the case that the EUT has the function of automatically transmitting the identification code:
 - Transmit the predetermined identification codes from EUT.
 - Check the transmitted identification codes with the demodulator.
- In the case of receiving the identification code:
 - Transmit the predetermined identification codes from the counterpart.
 - Check if communication is normal.
 - Transmit the signals other than predetermined ID codes from the counterpart.
 - check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

11.4 TEST SETUP



11.5 TEST DEVIATION

There is no deviation with the original standard.

11.6 EUT OPERATION DURING TEST

The EUT was programmed to be in normal transmitting mode.

11.7 TEST RESULT OF RADIO INTERFERENCE PREVENTION CAPABILITY

Note: EUT works with the only paired device through the pairing code. The MAC address will be found as below:

MAC: 85-A6-33-43-87-E4

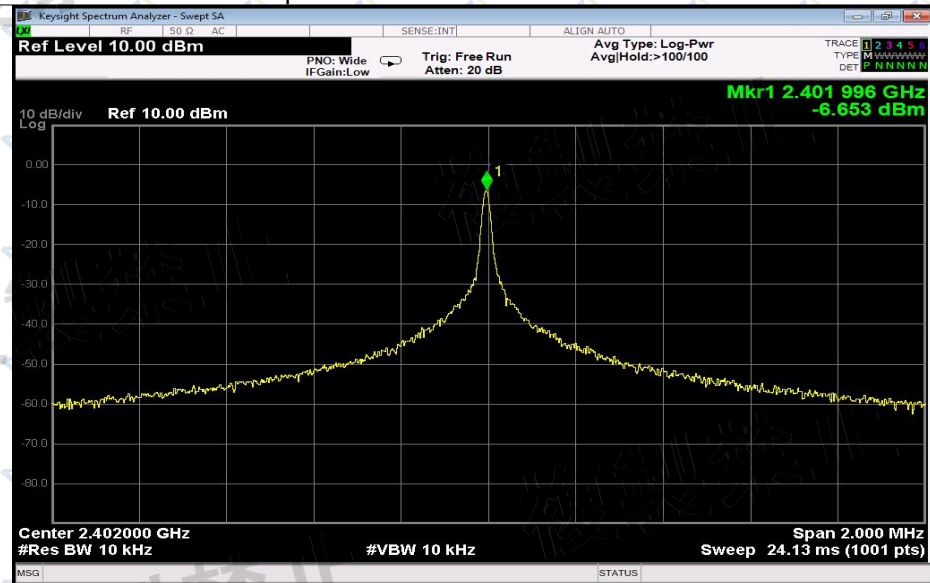
APPENDIX I - TEST RESULTS

FREQUENCY ERROR

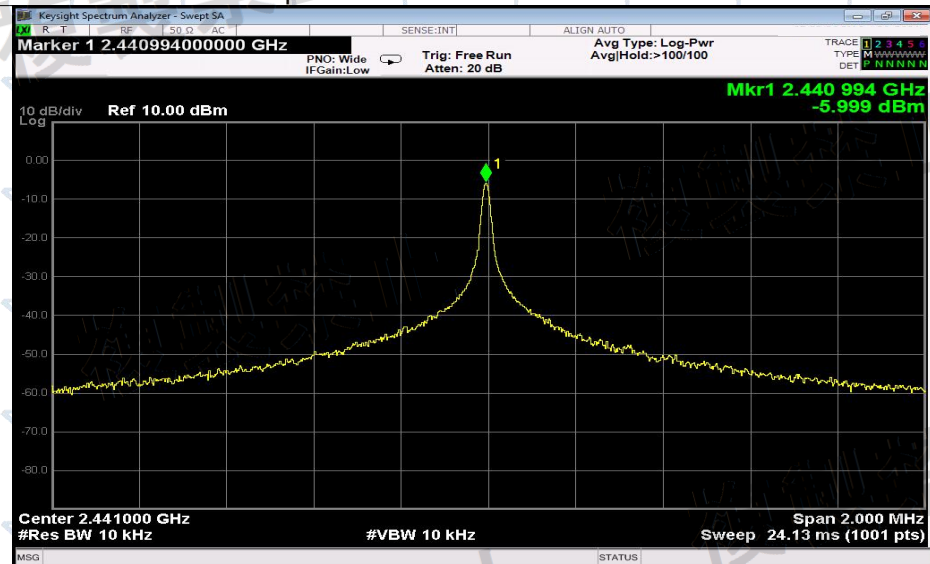
Mode	Frequency (MHz)	Antenna	Measured Frequency (MHz)	Frequency Error (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
1-DH5	2402	Ant1	2401.996	-4000	-1.67	50	Pass
1-DH5	2441	Ant1	2440.994	-6000	-2.46	50	Pass
1-DH5	2480	Ant1	2479.994	-6000	-2.42	50	Pass
2-DH5	2402	Ant1	2401.996	-4000	-1.67	50	Pass
2-DH5	2441	Ant1	2440.994	-6000	-2.46	50	Pass
2-DH5	2480	Ant1	2479.994	-6000	-2.42	50	Pass

Test Graphs

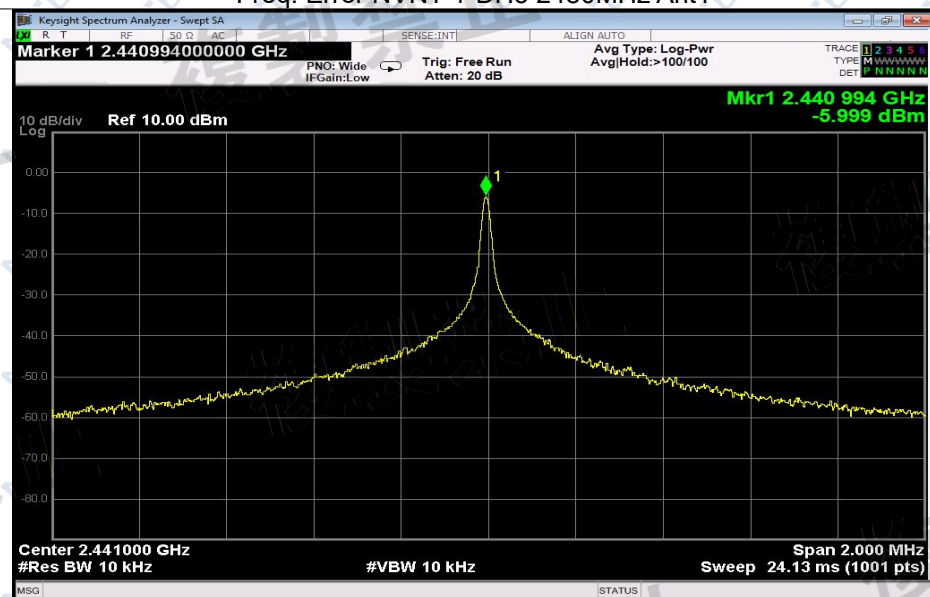
Freq. Error NVNT 1-DH5 2402MHz Ant1

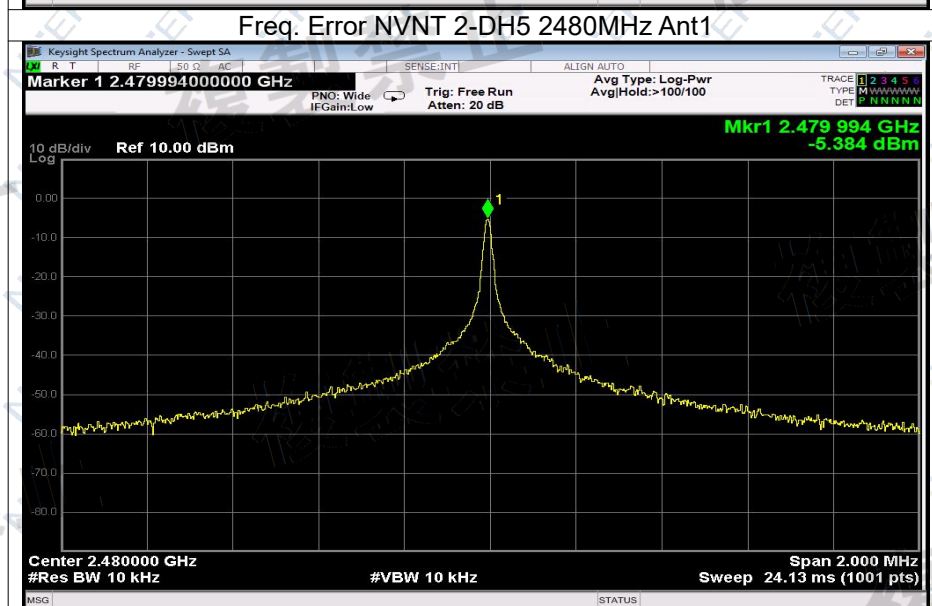
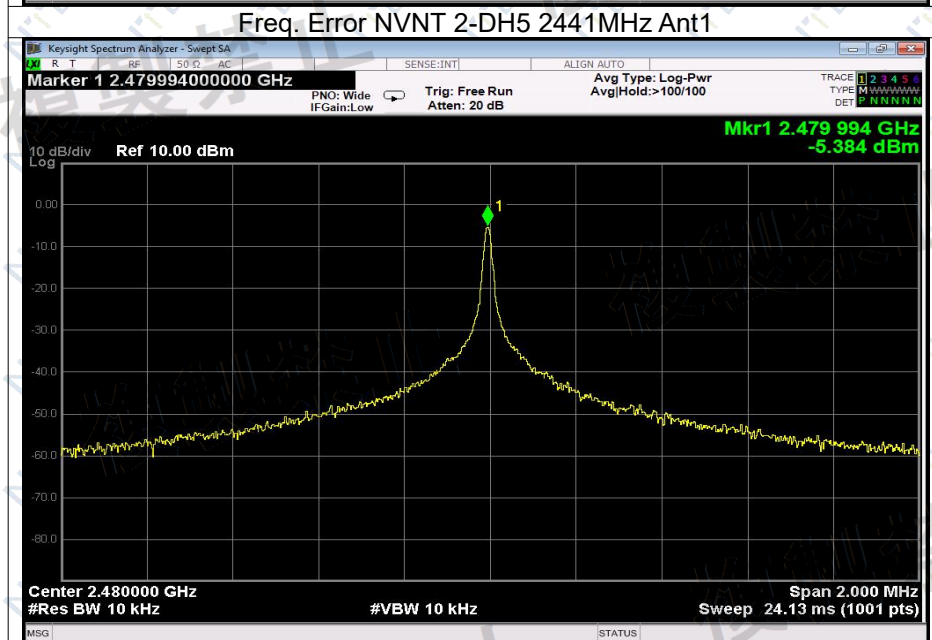
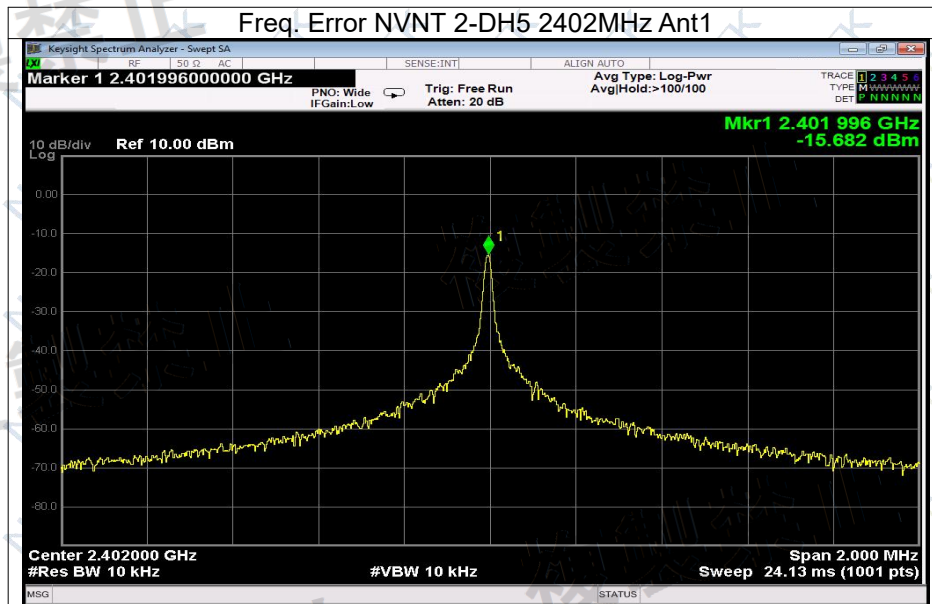


Freq. Error NVNT 1-DH5 2441MHz Ant1



Freq. Error NVNT 1-DH5 2480MHz Ant1



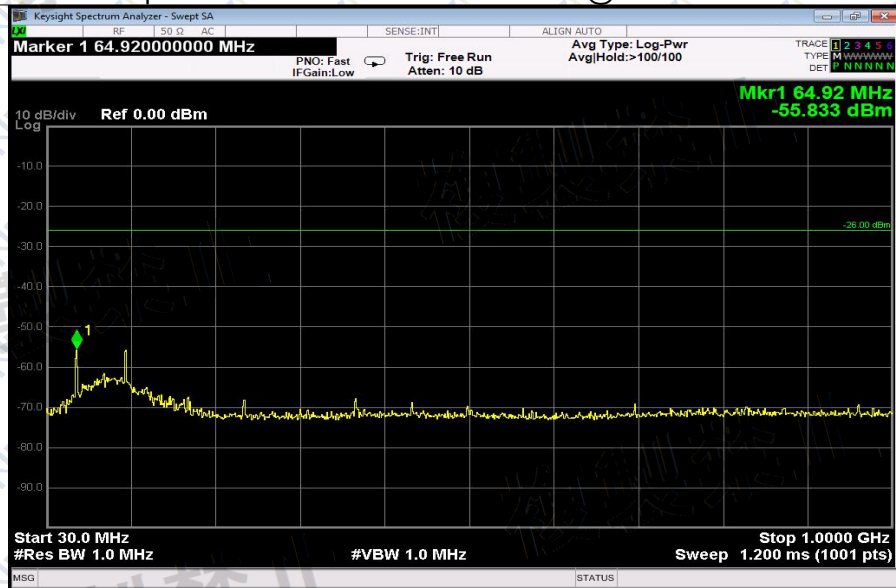


TX SPURIOUS EMISSION

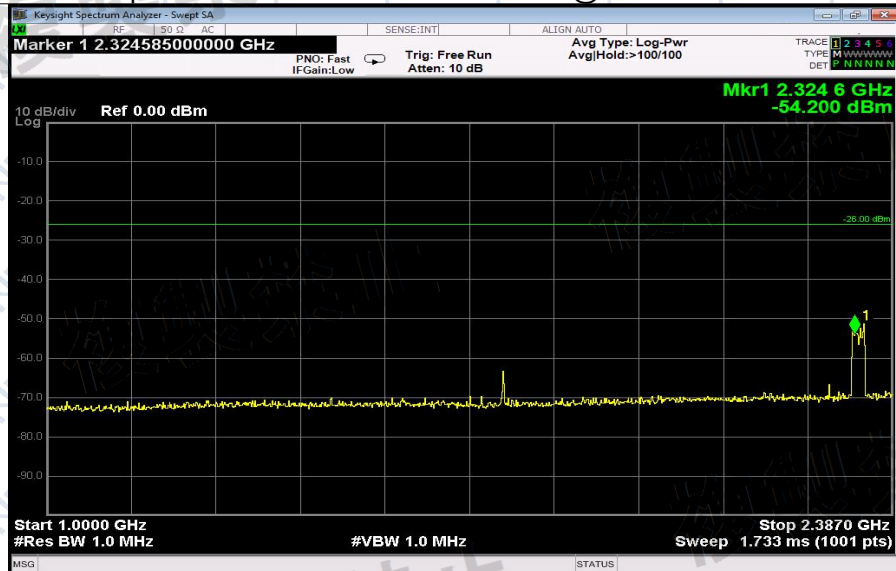
Mode	Frequency (MHz)	Antenna	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm/MHz)	Max Value (uW/MHz)	Limit Start (uW/MHz)	Limit Stop (uW/MHz)	Verdict
1-DH5	2402	Ant1	30-1000	64.92	-55.833	0.0026	2.5	2.5	Pass
1-DH5	2402	Ant1	1000-2387	2324.6	-54.200	0.0038	2.5	2.5	Pass
1-DH5	2402	Ant1	2387-2400	2400	-43.295	0.0468	25	25	Pass
1-DH5	2402	Ant1	2483.5-2496.5	2491.885	-62.480	0.0006	25	25	Pass
1-DH5	2402	Ant1	2496.5-13000	4807	-60.918	0.0008	2.5	2.5	Pass
1-DH5	2441	Ant1	30-1000	121.18	-63.495	0.0004	2.5	2.5	Pass
1-DH5	2441	Ant1	1000-2387	2321.8	-47.654	0.0172	2.5	2.5	Pass
1-DH5	2441	Ant1	2387-2400	2392.811	-62.519	0.0006	25	25	Pass
1-DH5	2441	Ant1	2483.5-2496.5	2491.352	-68.481	0.0001	25	25	Pass
1-DH5	2441	Ant1	2496.5-13000	4881	-63.960	0.0004	2.5	2.5	Pass
1-DH5	2480	Ant1	30-1000	64.92	-59.693	0.0011	2.5	2.5	Pass
1-DH5	2480	Ant1	1000-2387	2305.2	-64.143	0.0004	2.5	2.5	Pass
1-DH5	2480	Ant1	2387-2400	2399.935	-66.156	0.0002	25	25	Pass
1-DH5	2480	Ant1	2483.5-2496.5	2483.604	-45.279	0.0297	25	25	Pass
1-DH5	2480	Ant1	2496.5-13000	4963	-49.160	0.0121	2.5	2.5	Pass
2-DH5	2402	Ant1	30-1000	121.18	-58.574	0.0014	2.5	2.5	Pass
2-DH5	2402	Ant1	1000-2387	2321.8	-54.323	0.0037	2.5	2.5	Pass
2-DH5	2402	Ant1	2387-2400	2399.961	-38.586	0.1385	25	25	Pass
2-DH5	2402	Ant1	2483.5-2496.5	2489.090	-64.551	0.0004	25	25	Pass
2-DH5	2402	Ant1	2496.5-13000	4881	-51.315	0.0074	2.5	2.5	Pass
2-DH5	2441	Ant1	30-1000	96.93	-62.350	0.0006	2.5	2.5	Pass
2-DH5	2441	Ant1	1000-2387	2331.5	-49.777	0.0105	2.5	2.5	Pass
2-DH5	2441	Ant1	2387-2400	2393.214	-62.216	0.0006	25	25	Pass
2-DH5	2441	Ant1	2483.5-2496.5	2488.895	-68.022	0.0002	25	25	Pass
2-DH5	2441	Ant1	2496.5-13000	4879	-47.630	0.0173	2.5	2.5	Pass
2-DH5	2480	Ant1	30-1000	121.18	-63.729	0.0004	2.5	2.5	Pass
2-DH5	2480	Ant1	1000-2387	2305.2	-68.414	0.0001	2.5	2.5	Pass
2-DH5	2480	Ant1	2387-2400	2399.935	-67.048	0.0002	25	25	Pass
2-DH5	2480	Ant1	2483.5-2496.5	2483.500	-41.136	0.0770	25	25	Pass
2-DH5	2480	Ant1	2496.5-13000	4963	-49.508	0.0112	2.5	2.5	Pass

Test Graphs

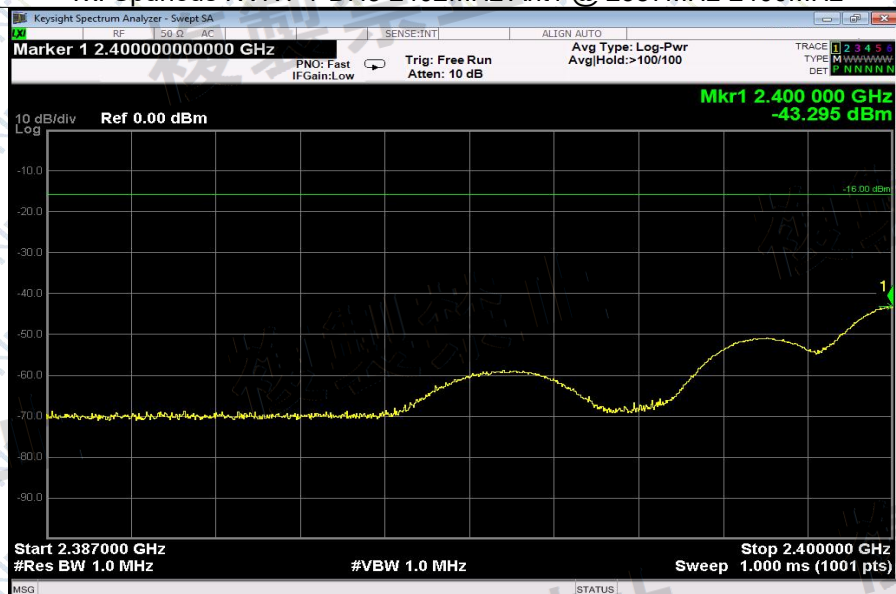
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 @ 30MHz-1000MHz



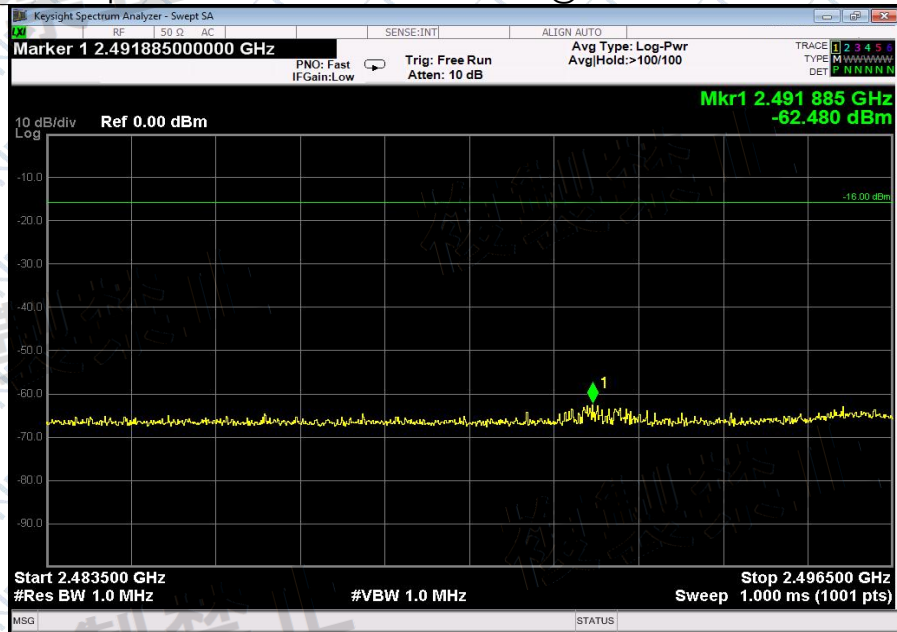
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 @ 1000MHz-2387MHz



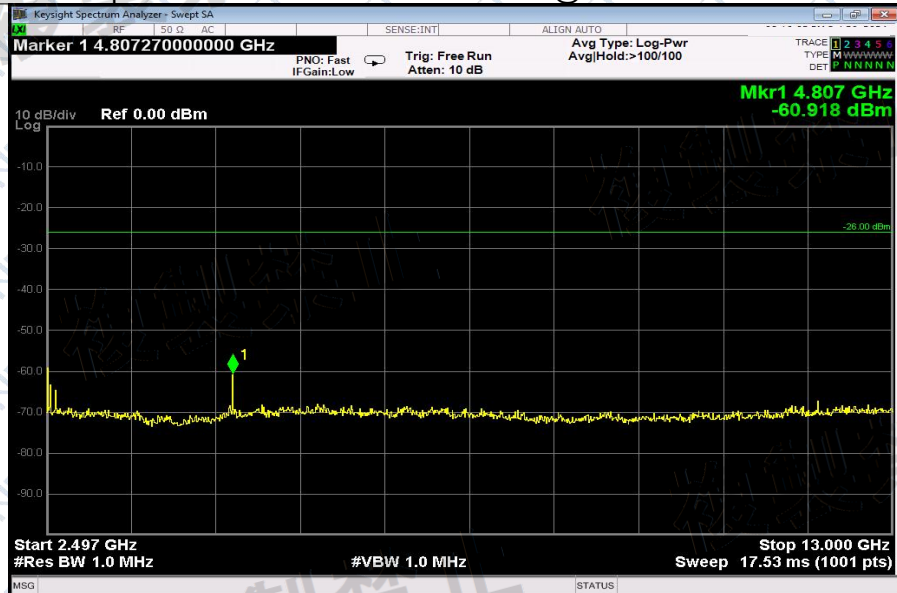
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 @ 2387MHz-2400MHz



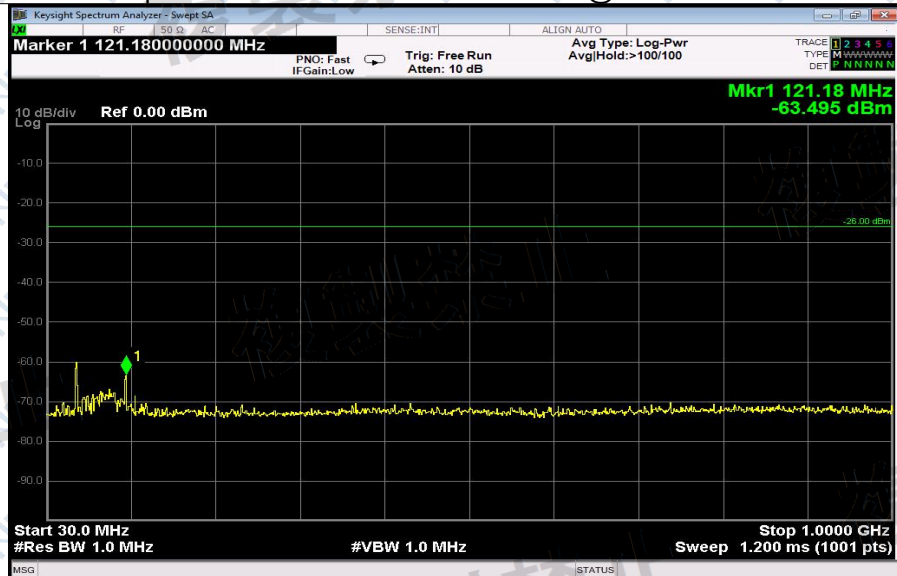
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 @ 2483.5MHz-2496.5MHz



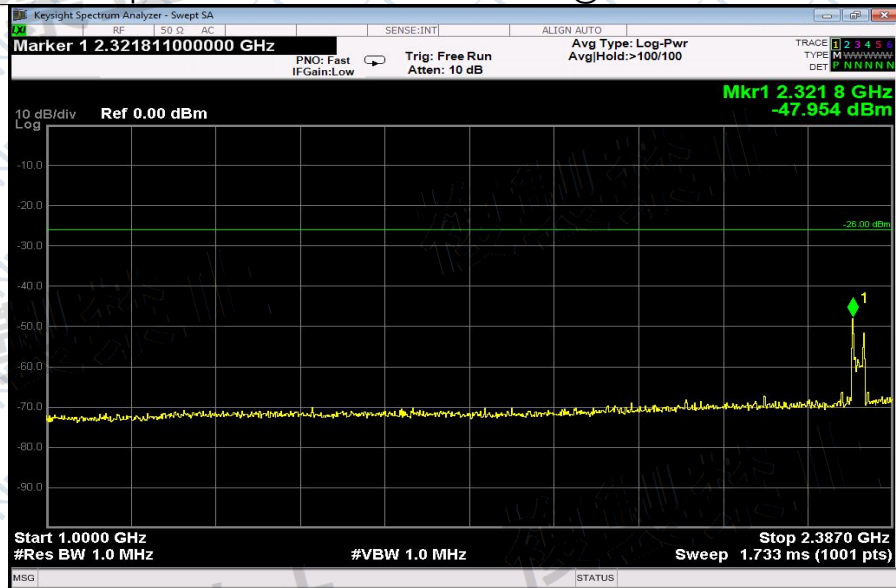
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 @ 2496.5MHz-13000MHz



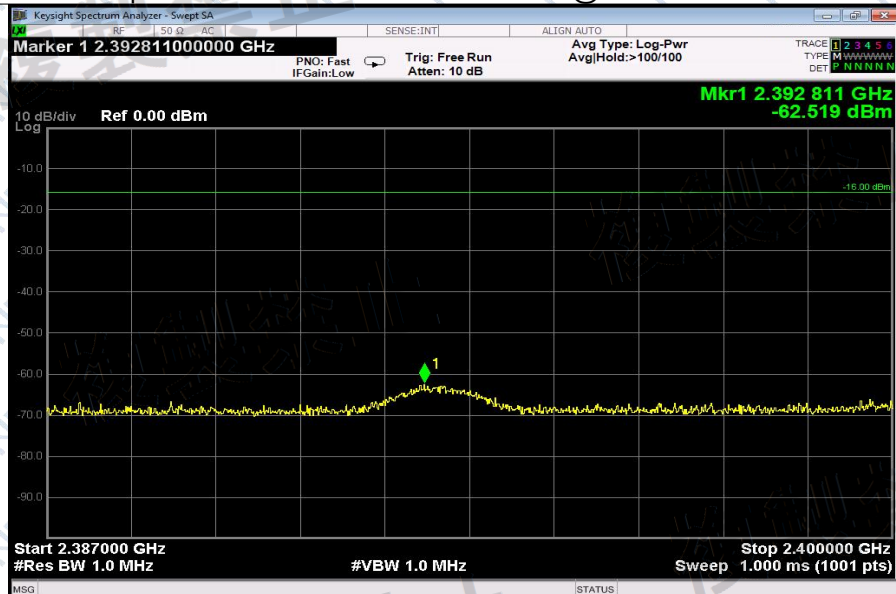
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 @ 30MHz-1000MHz



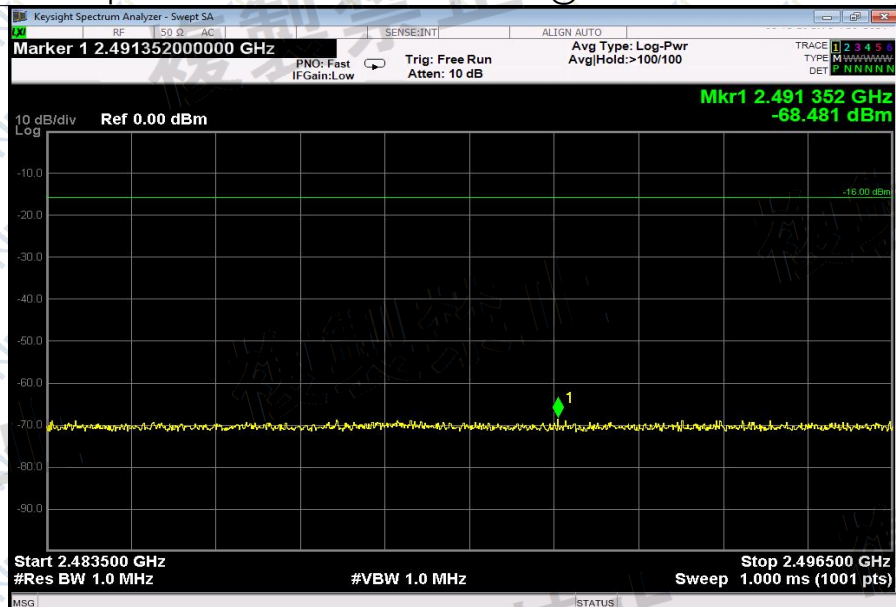
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 @ 1000MHz-2387MHz



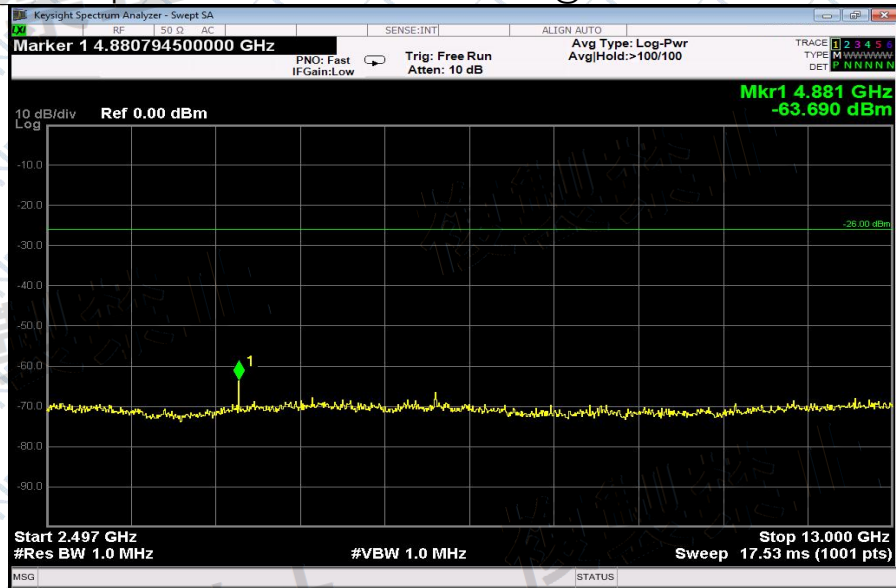
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 @ 2387MHz-2400MHz



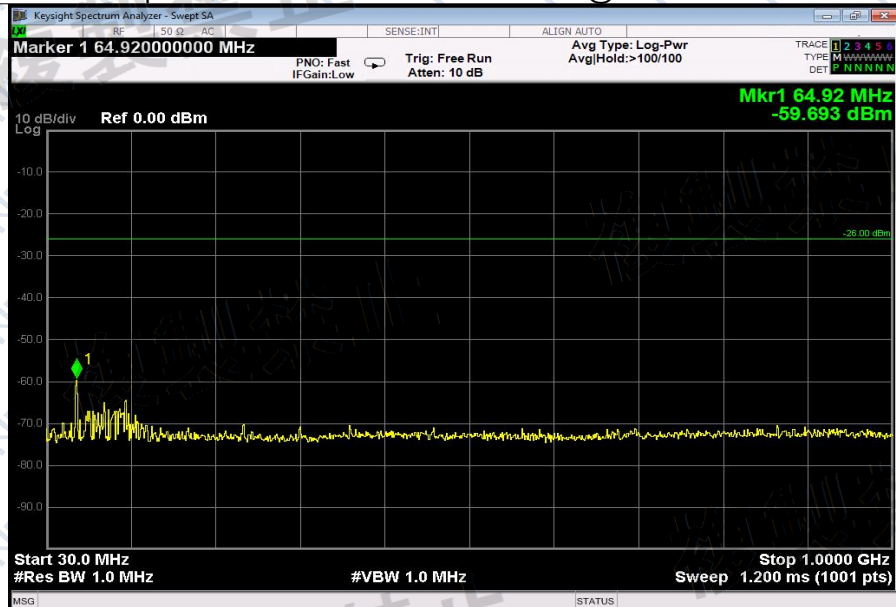
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 @ 2483.5MHz-2496.5MHz



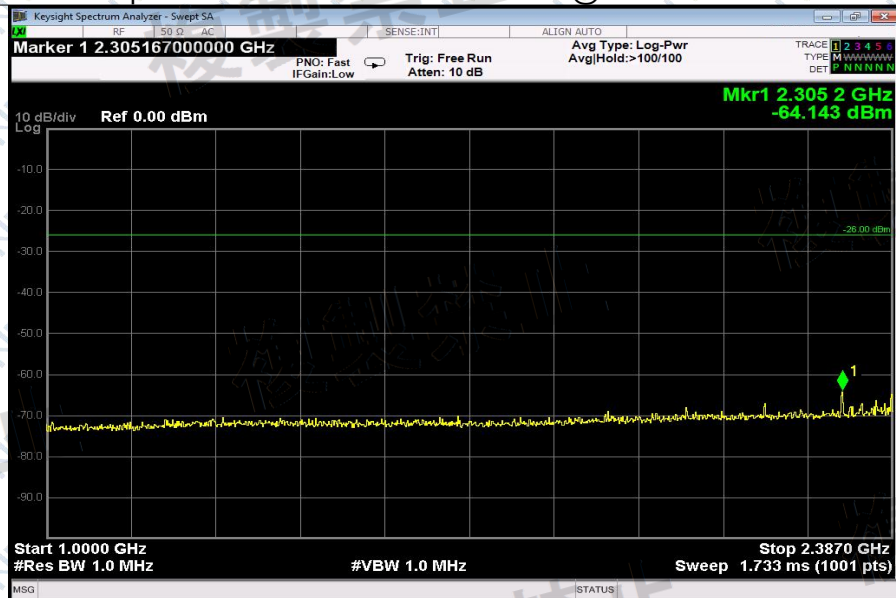
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 @ 2496.5MHz-13000MHz



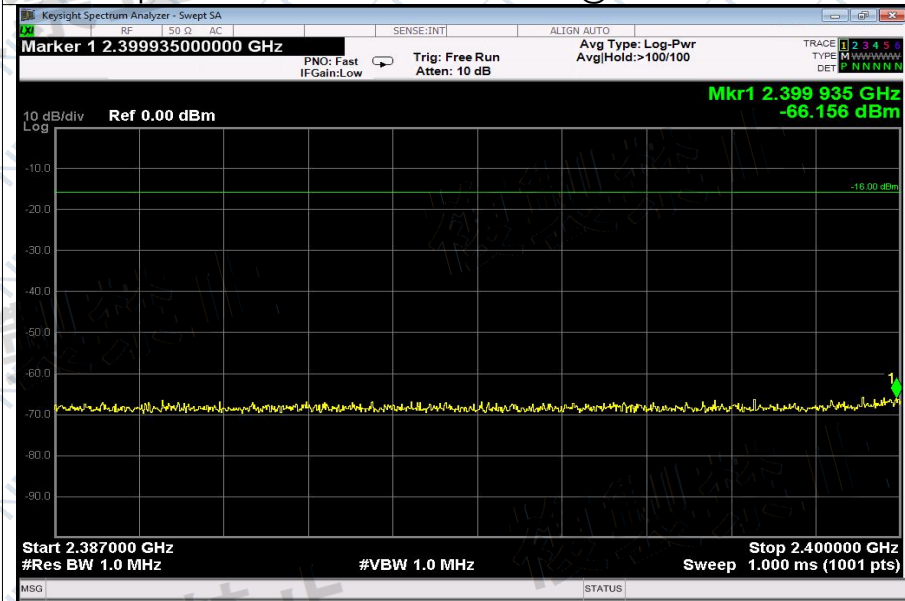
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 @ 30MHz-1000MHz



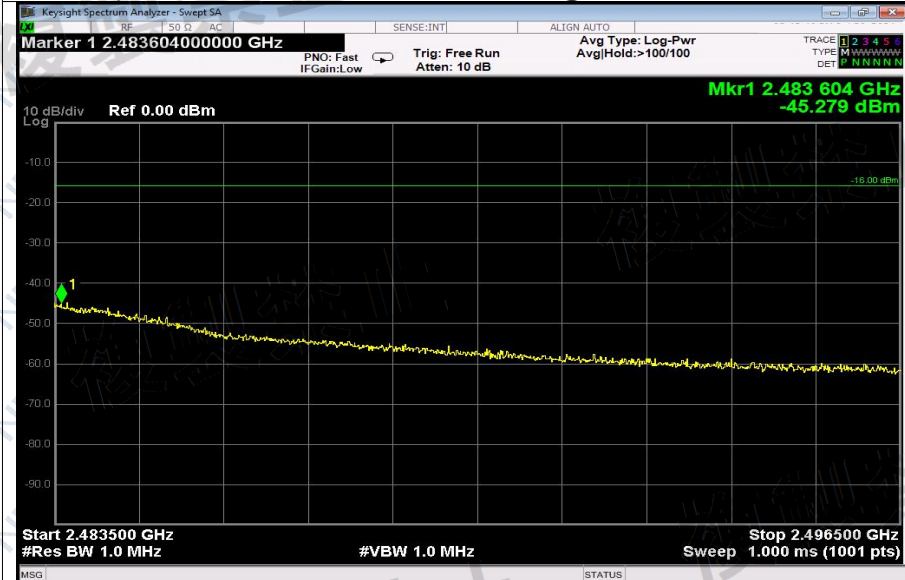
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 @ 1000MHz-2387MHz



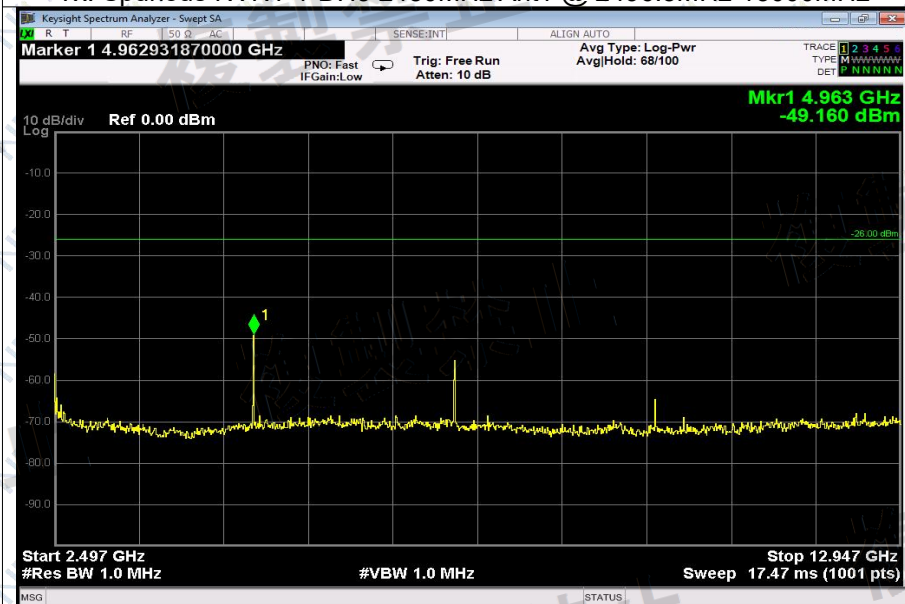
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 @ 2387MHz-2400MHz



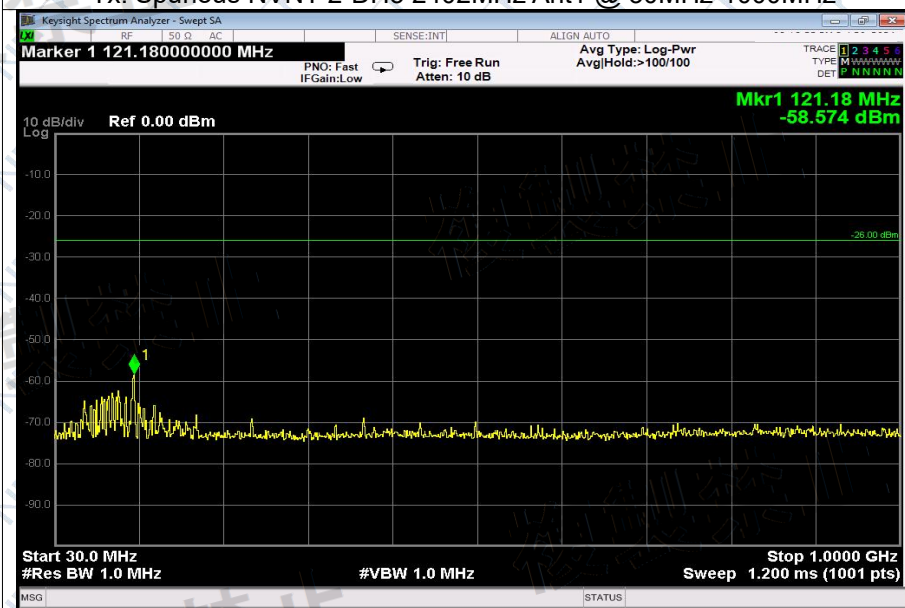
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 @ 2483.5MHz-2496.5MHz



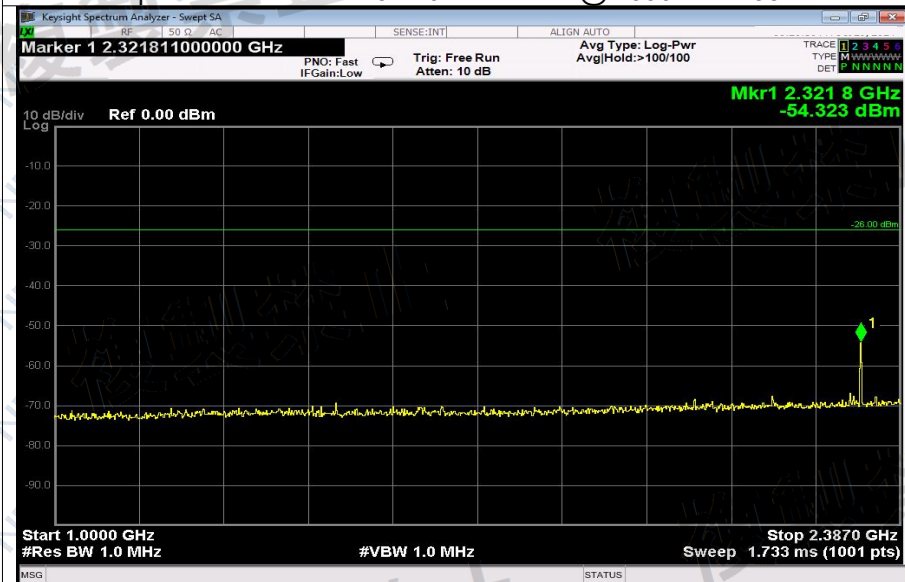
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 @ 2496.5MHz-13000MHz



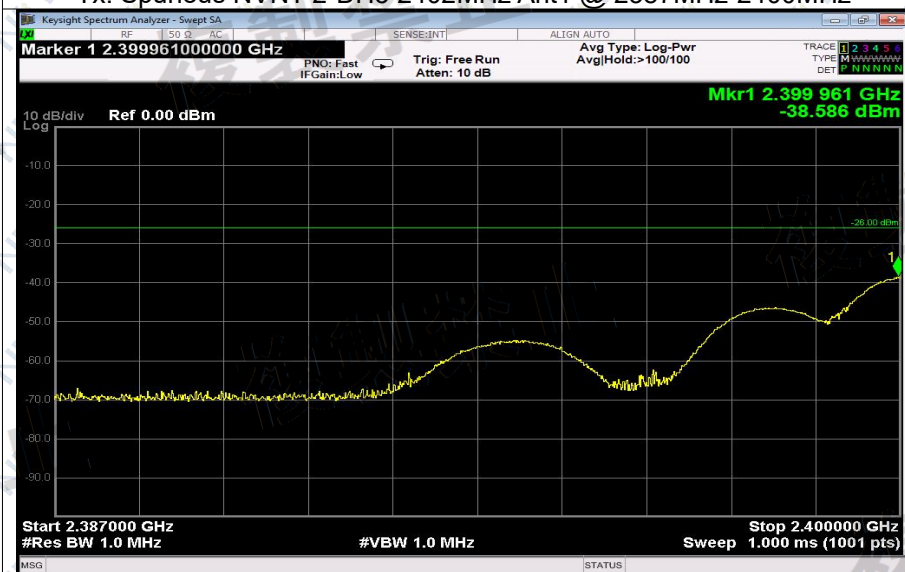
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 @ 30MHz-1000MHz



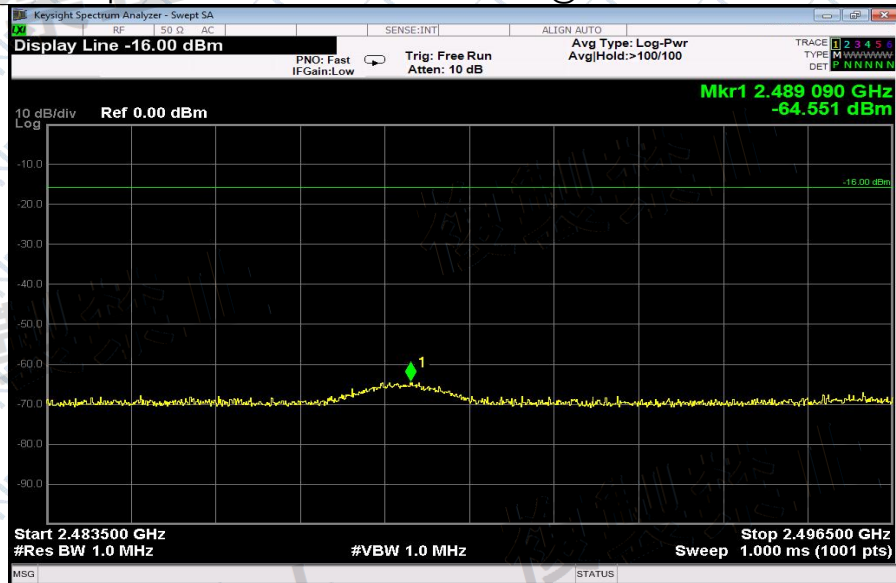
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 @ 1000MHz-2387MHz



Tx. Spurious NVNT 2-DH5 2402MHz Ant1 @ 2387MHz-2400MHz



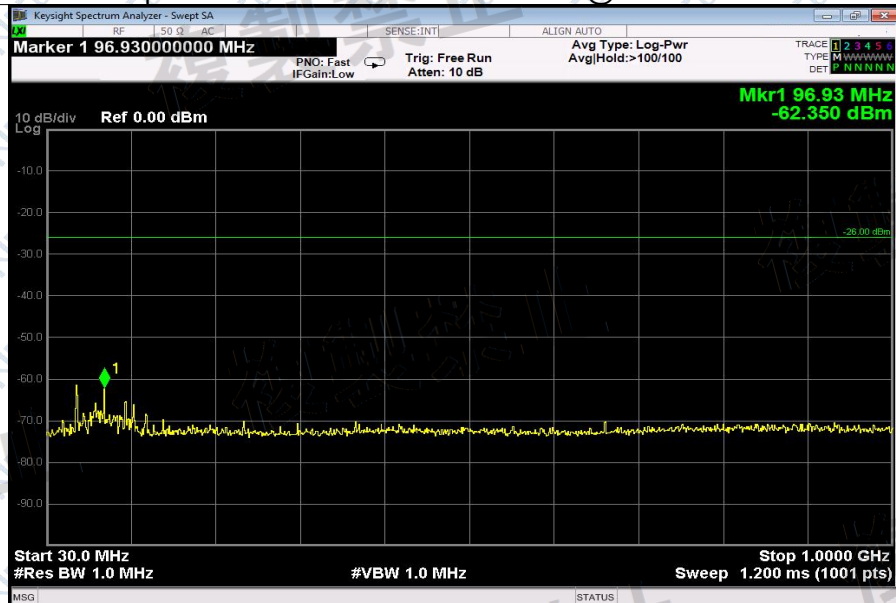
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 @ 2483.5MHz-2496.5MHz



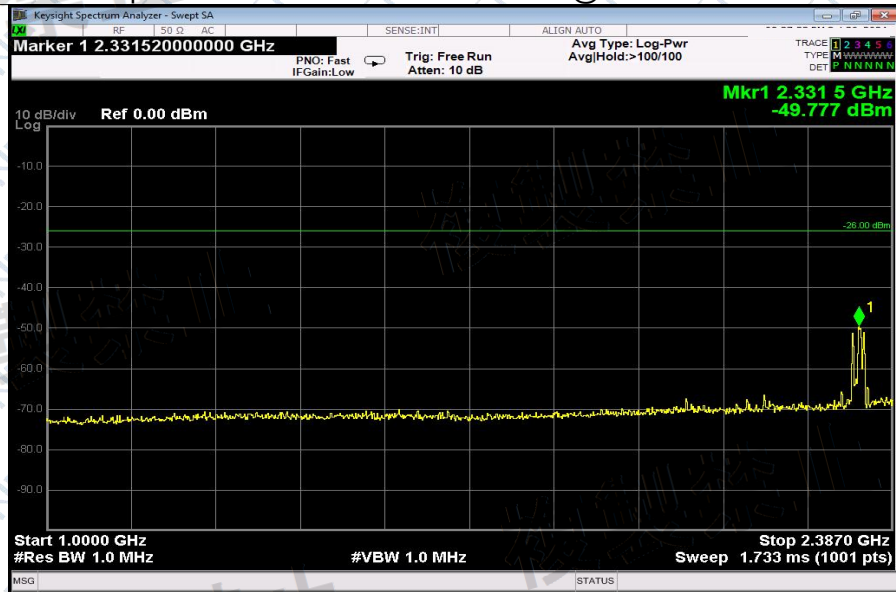
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 @ 2496.5MHz-13000MHz



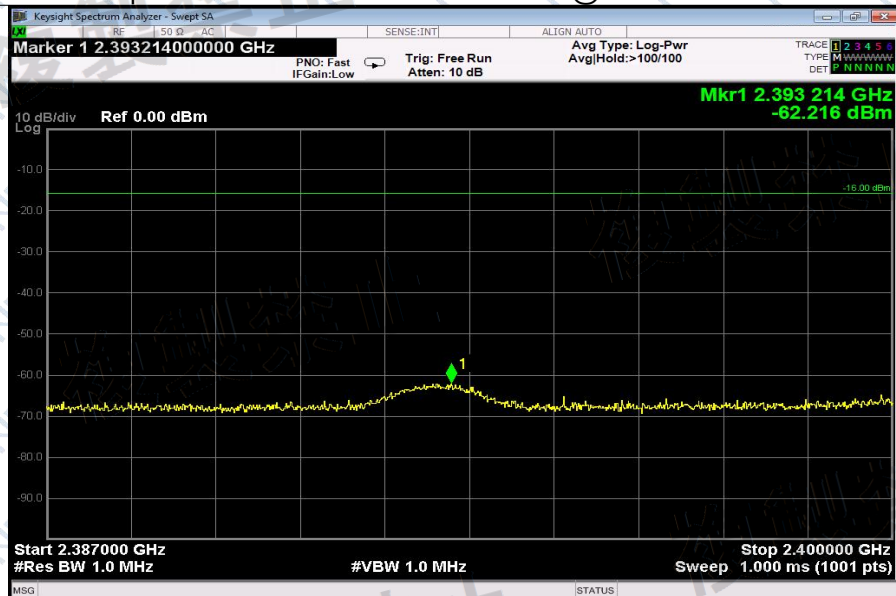
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 @ 30MHz-1000MHz



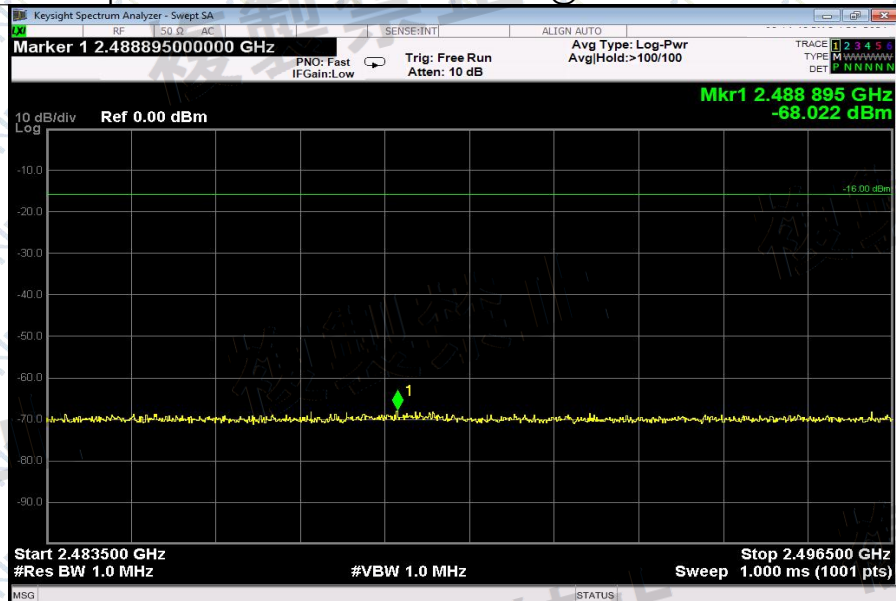
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 @ 1000MHz-2387MHz



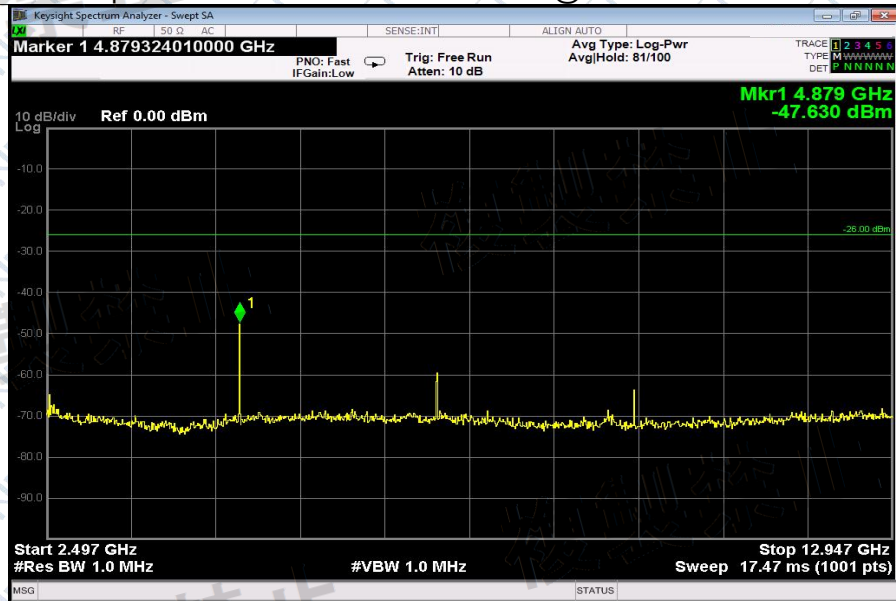
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 @ 2387MHz-2400MHz



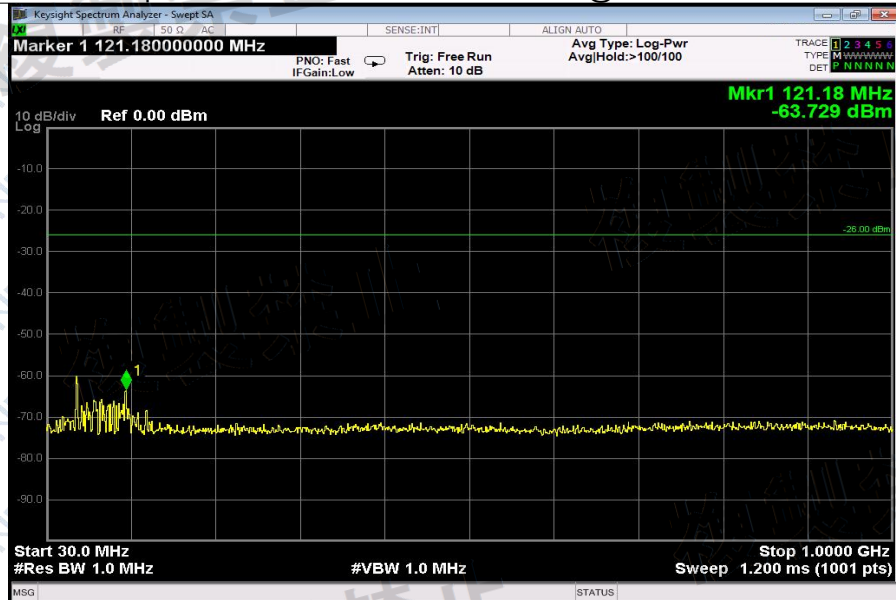
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 @ 2483.5MHz-2496.5MHz



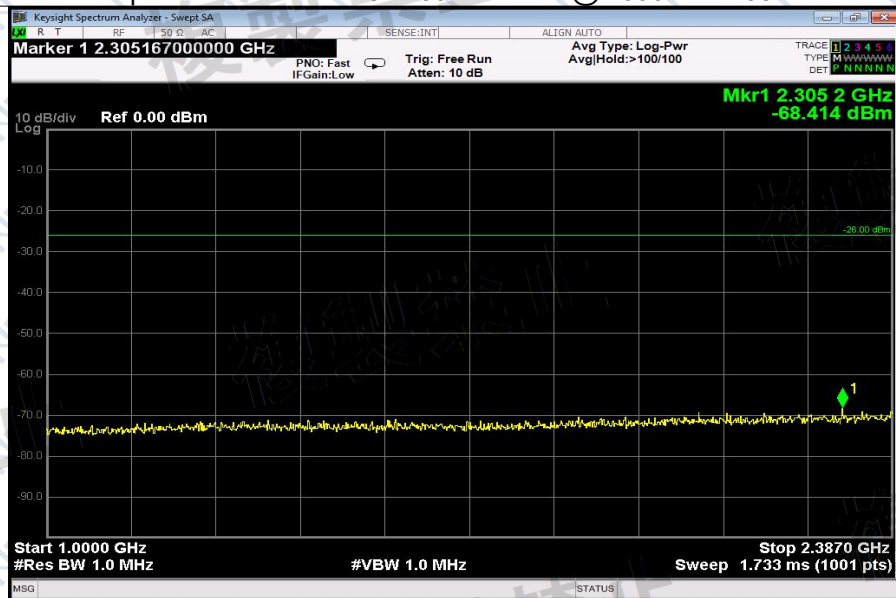
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 @ 2496.5MHz-13000MHz



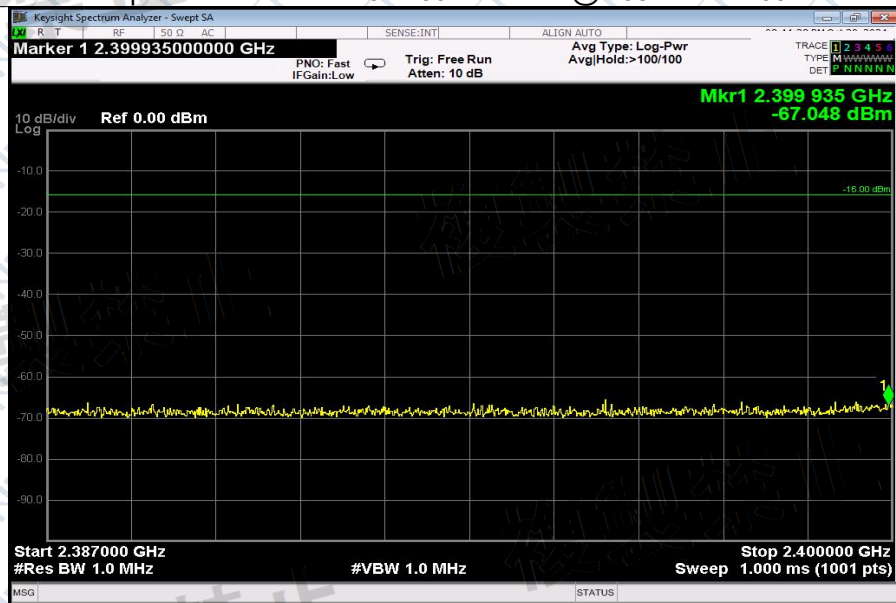
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 @ 30MHz-1000MHz



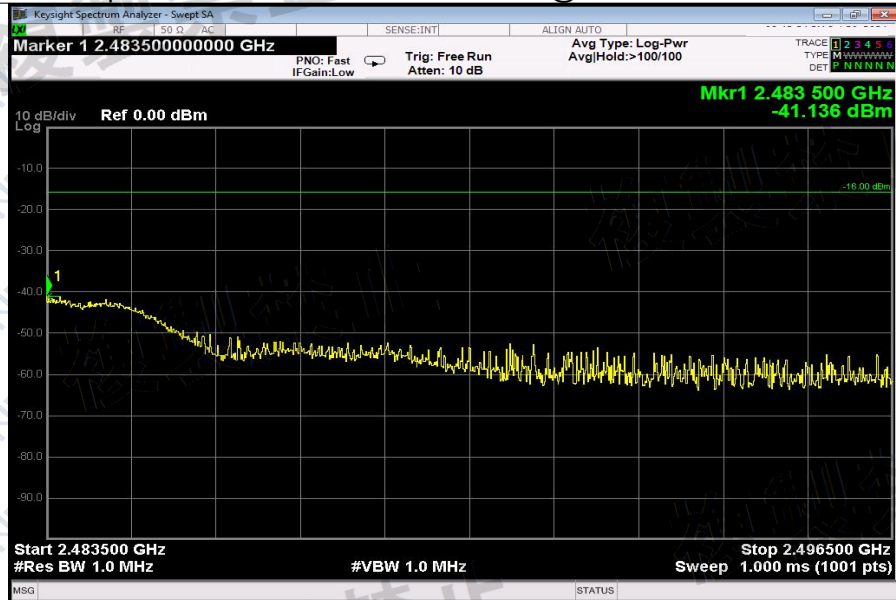
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 @ 1000MHz-2387MHz



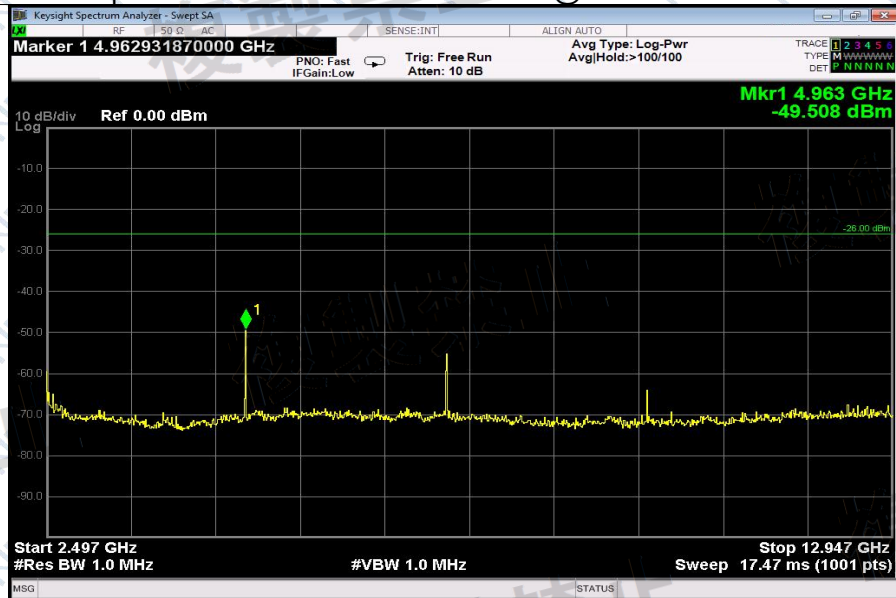
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 @ 2387MHz-2400MHz



Tx. Spurious NVNT 2-DH5 2480MHz Ant1 @ 2483.5MHz-2496.5MHz



Tx. Spurious NVNT 2-DH5 2480MHz Ant1 @ 2496.5MHz-13000MHz



ANTENNA POWER

Mode	Frequency (MHz)	Power Reading (dBm/MHz)	Power Reading (mW/MHz)	Spread Bandwidth (MHz)	Antenna Power (mW/MHz)	Declared Power (mW/MHz)	Limit (mW/MHz)	Tolerance (%)	Upper Limit (%)	Lower Limit (%)	Verdict
1-DH5	Hopping	1.03	1.268	71.274	0.018	0.02	3	-10	20	-80	Pass
2-DH5	Hopping	1.06	1.276	71.368	0.018	0.02	3	-10	20	-80	Pass

EIRP POWER

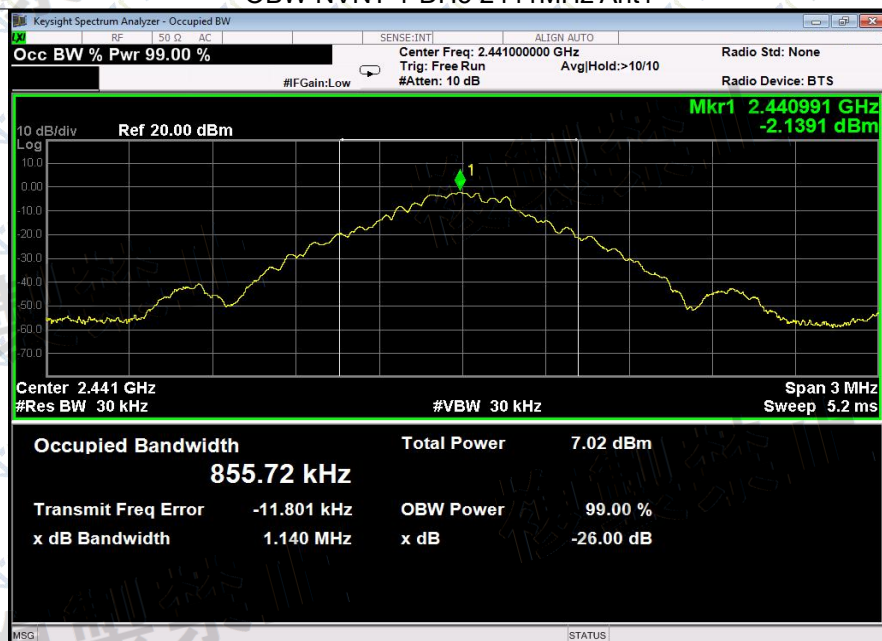
Condition	Mode	Frequency (MHz)	Antenna	Antenna Power (dBm/MHz)	Gain (dBi)	EIRP Power (dBm/MHz)	Limit (dBm/MHz)	Verdict
NVNT	1-DH5	Hopping	Ant1	-17.447	1.2	-16.247	6.91	Pass
NVNT	2-DH5	Hopping	Ant1	-17.445	1.2	-16.245	6.91	Pass

OCCUPIED CHANNEL BANDWIDTH

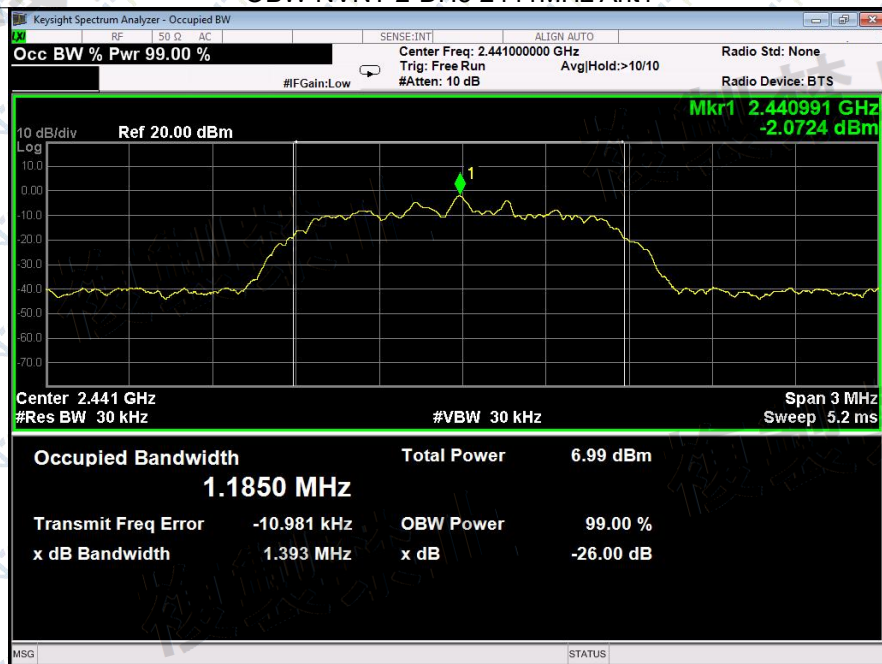
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	1-DH5	2441	Ant1	0.856
NVNT	2-DH5	2441	Ant1	1.185

Test Graphs

OBW NVNT 1-DH5 2441MHz Ant1



OBW NVNT 2-DH5 2441MHz Ant1

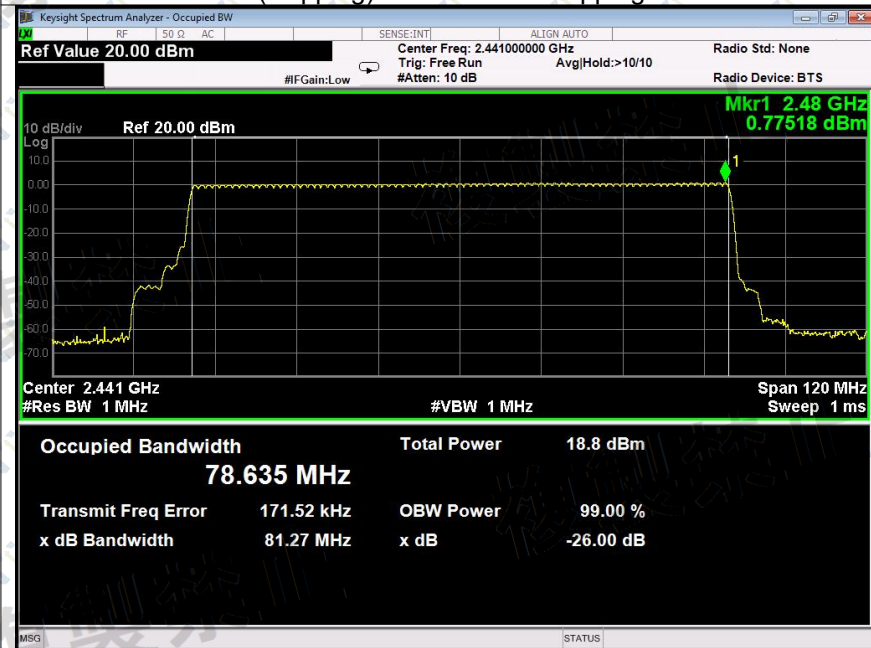


OCCUPIED CHANNEL BANDWIDTH (HOPPING)

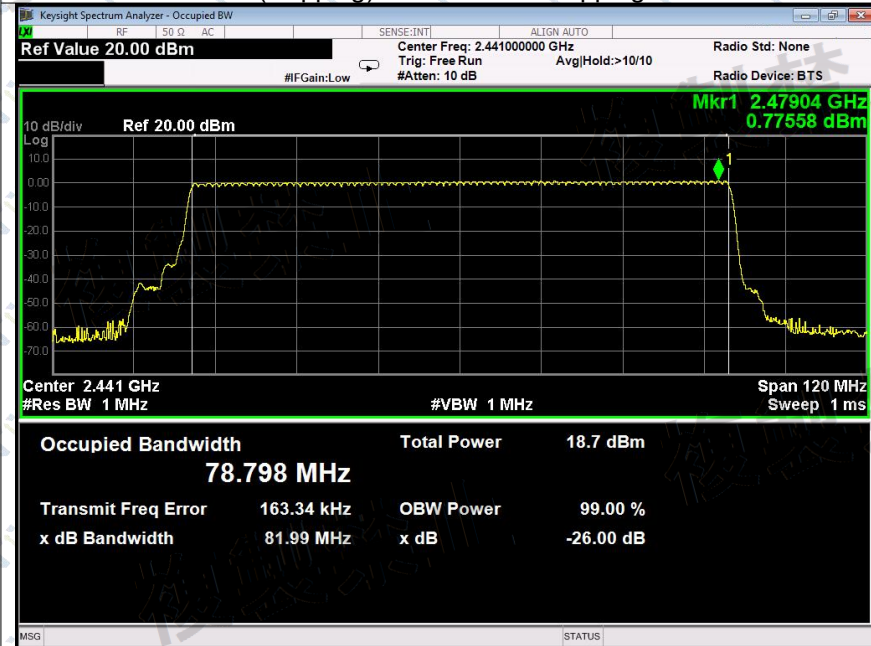
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	1-DH5	Hopping	Ant1	78.635
NVNT	2-DH5	Hopping	Ant1	78.798

Test Graphs

OBW (Hopping) NVNT 1-DH5 Hopping Ant1



OBW (Hopping) NVNT 2-DH5 Hopping Ant1



SPREADING BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	90% OBW (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Hopping	Ant1	71.274	0.5	Pass
NVNT	2-DH5	Hopping	Ant1	71.368	0.5	Pass

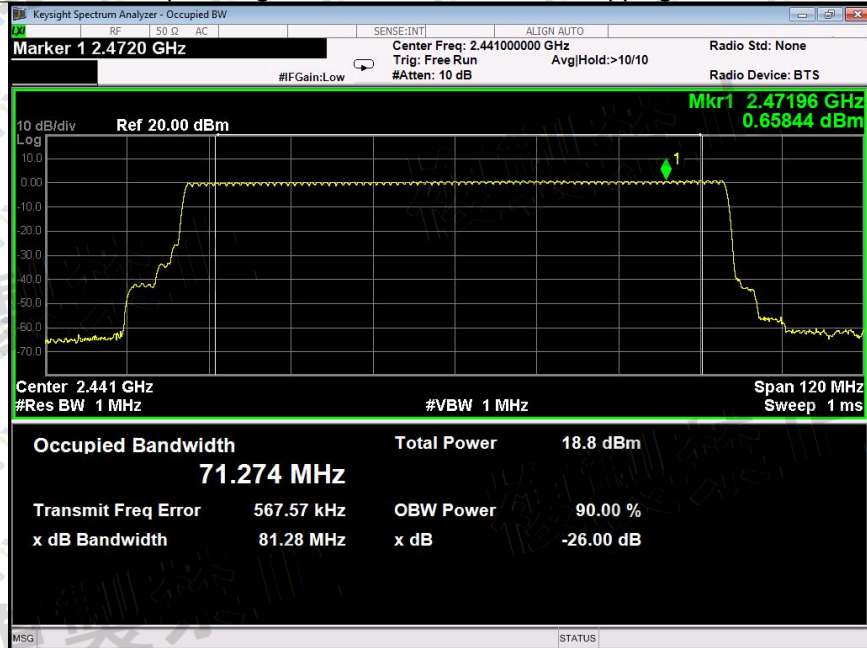
GFSK	Data Packet	Spread BW 90% (MHz)	Symbol rate	Spreading factor	Limit	Result
	DH5	71.274	1	71.274	≥ 5	Pass

$\pi/4$ -DQPSK	Data Packet	Spread BW 90% (MHz)	Symbol rate	Spreading factor	Limit	Result
	DH5	71.368	1	71.368	≥ 5	Pass

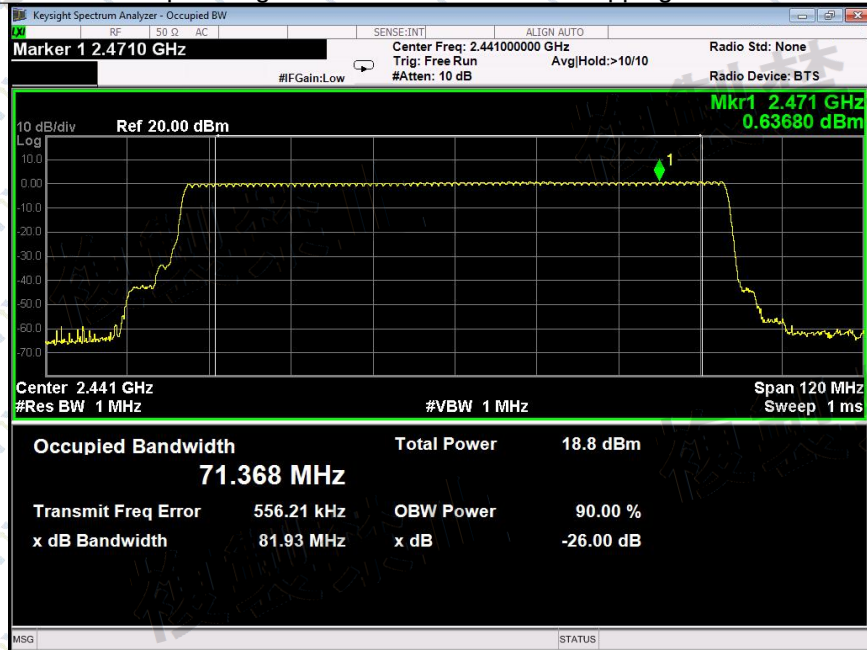
Spreading factor=(Spreading bandwidth) / (Symbol rate)

Test Graphs

Spreading Bandwidth NVNT 1-DH5 Hopping Ant1



Spreading Bandwidth NVNT 2-DH5 Hopping Ant1

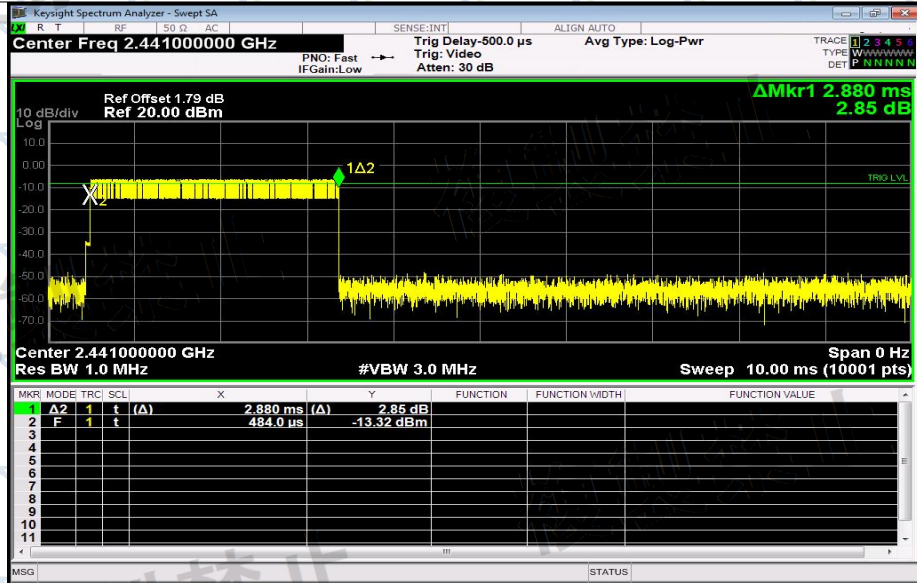


DWELL TIME

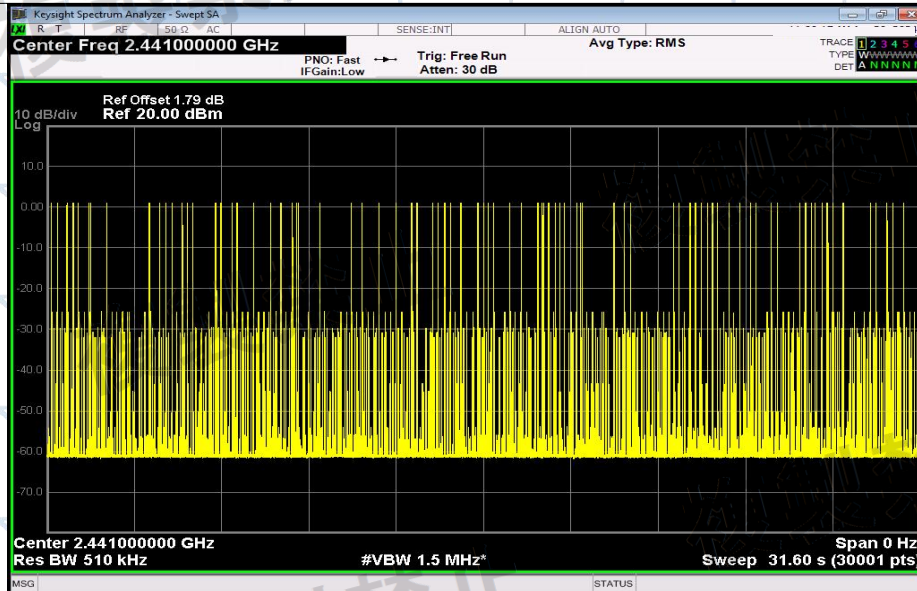
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (s)	Burst Count	Period Time (s)	Limit (s)	Verdict
NVNT	1-DH5	2441	Ant1	2.88	0.282240	98	31.6074	0.400	Pass
NVNT	2-DH5	2441	Ant1	2.886	0.294372	102	31.6088	0.400	Pass

Test Graphs

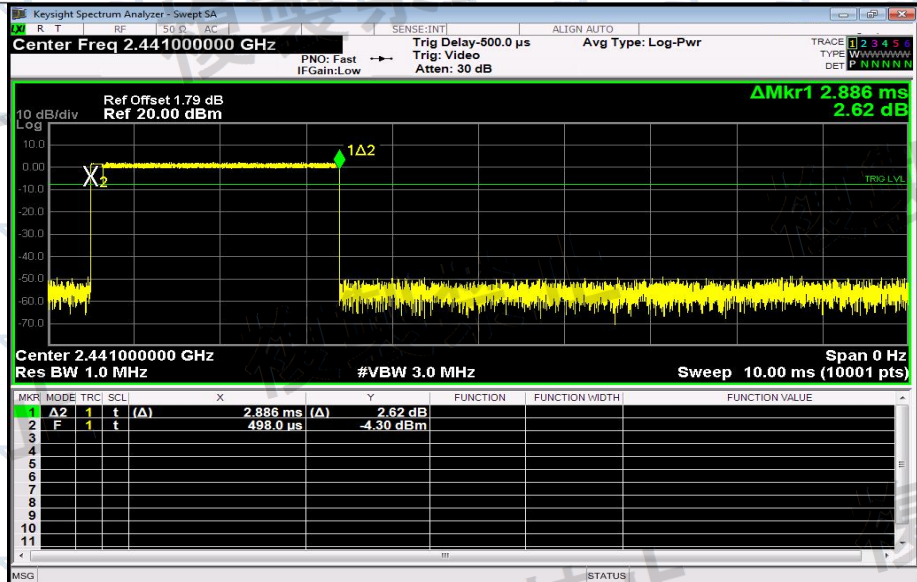
Dwell NVNT 1-DH5 2441MHz Ant1 One Burst

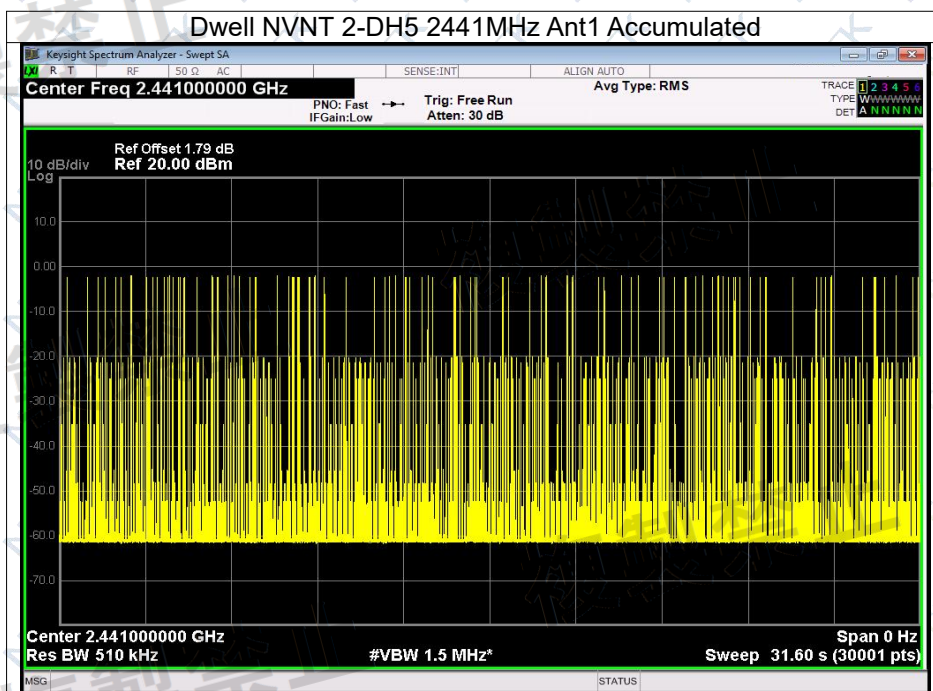


Dwell NVNT 1-DH5 2441MHz Ant1 Accumulated



Dwell NVNT 2-DH5 2441MHz Ant1 One Burst



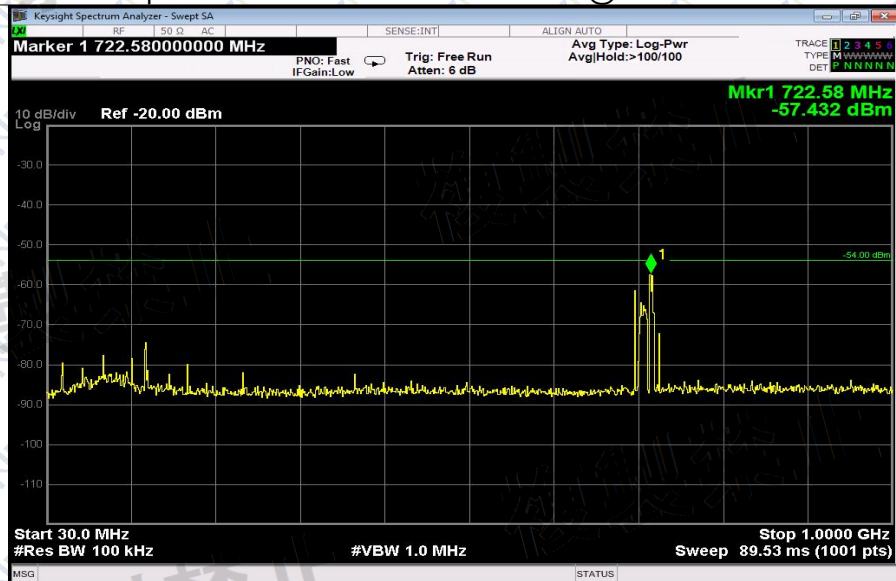


RX SPURIOUS EMISSION

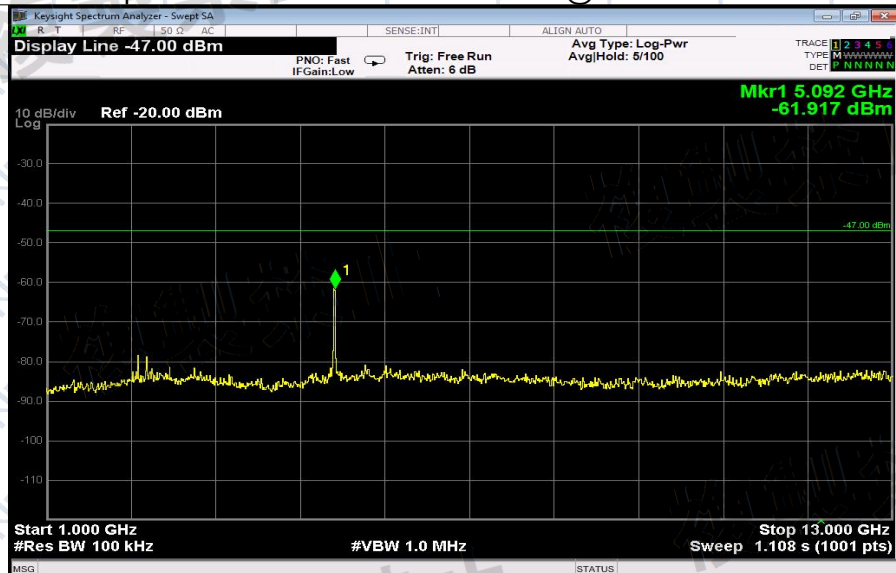
Condition	Mode	Frequency (MHz)	Antenna	Range (MHz)	Emission Frequency (MHz)	Max Value (dBm/MHz)	Max Value (nW/MHz)	Limit (nW/MHz)	Verdict
NVNT	1-DH5	2441	Ant1	30-1000	722.58	-57.432	1.8063	4	Pass
NVNT	1-DH5	2441	Ant1	1000-13000	5092	-61.917	0.6431	20	Pass
NVNT	2-DH5	2441	Ant1	30-1000	711.58	-55.913	2.5627	4	Pass
NVNT	2-DH5	2441	Ant1	1000-13000	5092	-56.705	2.1355	20	Pass

Test Graphs

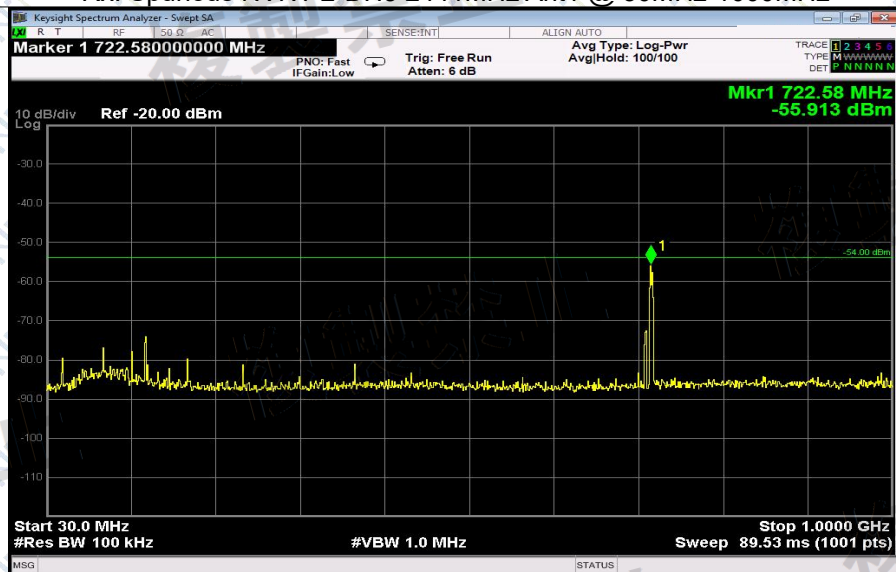
Rx. Spurious NVNT 1-DH5 2441MHz Ant1 @ 30MHz-1000MHz

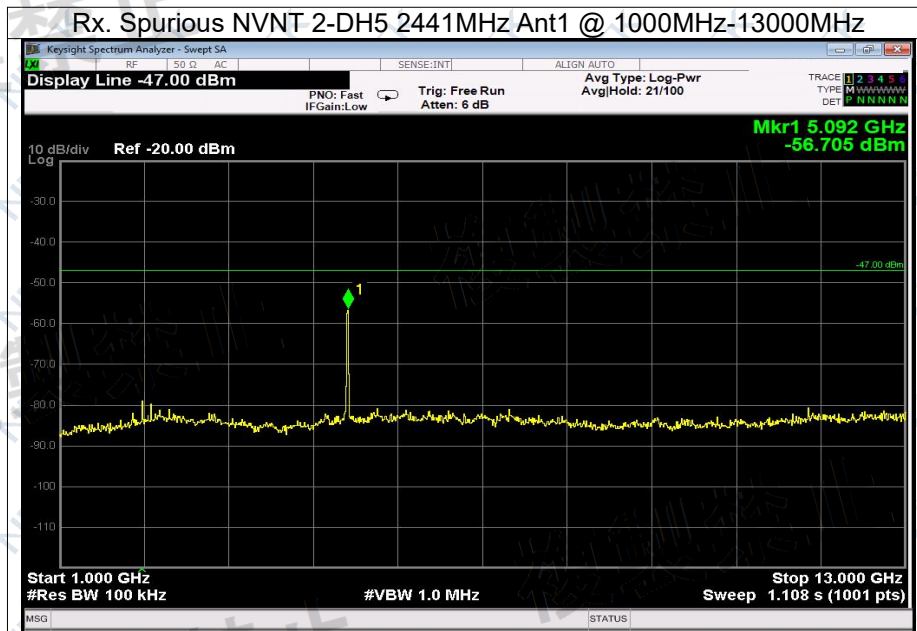


Rx. Spurious NVNT 1-DH5 2441MHz Ant1 @ 1000MHz-13000MHz



Rx. Spurious NVNT 2-DH5 2441MHz Ant1 @ 30MHz-1000MHz





12. EUT TEST PHOTO

Measurement Photos

