



RADIO TEST REPORT

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91325, UNITED STATES
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91325, UNITED STATES
Equipment under Test	:	BLUETOOTH HEADSET
Model No.	:	TUNE BEAM 3
Trade mark	:	JBL
FCC ID	:	APITUNEBEAM3
IC	:	6132A-TUNEBEAM3
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, ANSI C63.10-2020+Cor.1-2023, RSS-247 Issue 4 July 24, 2025, RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021), ANSI C63.10-2020+Cor.1-2023+C63.10a- 2024+Errata to C63.10a-2024
Report No.	:	DDT-RE26052025-1E01
Issue Date	:	2026/07/24
Issue By	:	Guangdong Dongdian Testing Service Co., Ltd. Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

Applicant	:	Harman International Industries, Inc.
Address of Applicant	:	8500 Balboa Boulevard, Northridge, CA 91325, UNITED STATES
Equipment under Test	:	BLUETOOTH HEADSET
Model No.	:	TUNE BEAM 3
Manufacturer	:	Harman International Industries, Inc.
Address of Manufacturer	:	8500 Balboa Boulevard, Northridge, CA 91325, UNITED STATES

Test Standard Used:
FCC Rules and Regulations Part 15 Subpart C,
ANSI C63.10-2020+Cor.1-2023,
RSS-247 Issue 4 July 24, 2025,
RSS-Gen Issue 5, Apr. 2018, Amendment 2 (February 2021),
ANSI C63.10-2020+Cor.1-2023+C63.10a-2024+Errata to C63.10a-2024

We Declare:
The equipment described above is tested by Guangdong Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above. The test results are contained in this test report and Guangdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Report No.:	DDT-RE26052025-1E01		
Date of Receipt:	2026/05/26	Date of Test:	2026/05/26 - 2026/06/18

Created: Bobo Chen	Reviewed: Tiger Mo	Approved: Ella Gong
		
2026/06/17	2026/07/24	2026/07/24

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Guangdong Dongdian Testing Service Co., Ltd.

Revision History

Version	Revision Content	Issue Date	Approved
V0	Initial issue	2026/07/24	Ella Gong

1. Summary of Test Results

No.	Test Parameter	Clause No.	Condition	Result
1	Maximum Peak Output Power	47 CFR Part 15 15.247(b)(1), RSS-247 clause 6.2.3.2(a)	/	Pass
2	20 dB Bandwidth	47 CFR Part 15 15.247(a)(1), RSS-247 clause 6.2.3.1(a)	/	Pass
3	99% Bandwidth	RSS-Gen clause 6.7	/	Pass
4	Carrier Frequency Separation	47 CFR Part 15 15.247(a)(1), RSS-247 clause 6.2.3.1(a)	/	Pass
5	Number of Hopping Channel	47 CFR Part 15 15.247(a)(1)(iii), RSS-247 clause 6.2.3.1(b)	/	Pass
6	Dwell Time	47 CFR Part 15 15.247(a)(1)(iii), RSS-247 clause 6.2.3.1(b)	/	Pass
7	RF Conducted Spurious Emissions	47 CFR Part 15 15.247(d), RSS-247 clause 6.6	/	Pass
8	Radiated Emission	47 CFR Part 15 15.205, 47 CFR Part 15 15.209, 47 CFR Part 15 15.247(d), RSS-247 clause 6.6, RSS-Gen clause 8.9, RSS-Gen clause 8.10	/	Pass
9	Band Edge Compliance	47 CFR Part 15 15.205, 47 CFR Part 15 15.209, 47 CFR Part 15 15.247(d), RSS-247 clause 6.6, RSS-Gen clause 8.9, RSS-Gen clause 8.10	/	Pass
10	Power Line Conducted Emissions	47 CFR Part 15 15.207(a), RSS-Gen clause 8.8	/	Pass
11	Antenna Requirement	47 CFR Part 15 15.203, RSS-Gen clause 6.8	/	Pass
Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device or no need to test according to standard.				

2. General Test Information

2.1. Description of EUT

EUT Name	: BLUETOOTH HEADSET
Model Number	: TUNE BEAM 3
EUT Function Description	: Please reference user manual of this device
Power Supply	: CHARGING CASE: DC 5V from USB cable HEADSET: DC 5V from external charging case CHARGING CASE: DC 3.8V Lithium-ion built-in battery HEADSET: DC 3.87V Lithium-ion built-in battery
Antenna Type	: LDS Antenna
Max Antenna Gain(dBi)	: Left side: -0.63dBi Right side: 0.18dBi

Radio Specification	: Bluetooth BR/EDR
Operation Frequency	: 2402 MHz to 2480 MHz
Modulation	: GFSK, $\pi/4$ -DQPSK

Bluetooth BR/EDR Channel information					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	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	/	

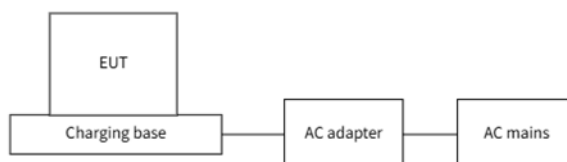
Note: The above EUT information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications or User's Manual. The above Antenna information is declared by manufacturer and for more detailed features description please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

“☒” means to be chosen or applicable; “☐” means don't to be chosen or not applicable; This note applies to entire report.

2.2. Accessories of EUT

Accessories	Manufacturer	Model number	Description
/	/	/	/

2.3. Block diagram of EUT configuration for test



2.4. Decision of final test mode

According pre-test, the worst test modes were reported as below:

Test software: wvt_gui.exe

The test software was used to control EUT work in Continuous Tx mode, and select test channel, wireless mode as below table.

The pathloss of external cable: 0.5 dB (According to the manufacturer's claims)

Tested mode, Tx Power Setting, Channel, and Frequency

Tested mode	Tx Power Setting	Channel	Frequency (MHz)
GFSK hopping on Tx mode	5	CH0 to CH78	2402 to 2480
$\pi/4$ -DQPSK hopping on Tx mode	5	CH0 to CH78	2402 to 2480
GFSK hopping off Tx mode	5	CH0	2402
	5	CH39	2441
	5	CH78	2480
$\pi/4$ -DQPSK hopping off Tx mode	5	CH0	2402
	5	CH39	2441
	5	CH78	2480
Note: According exploratory test, EUT will have maximum output power in those data rate, worst-case data rates were: GFSK mode: DH5, $\pi/4$ -DQPSK mode: 2DH5			

2.5. Deviations of test standard

No deviation.

2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	+15°C to +35 °C
Humidity range:	20% to 75%
Pressure range:	86 kPa to 106 kPa

Note: The specific temperature and humidity information of each test item refers to the temperature and humidity record in the corresponding test data.

2.7. Test laboratory

Guangdong Dongdian Testing Service Co., Ltd.

Add.: Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808.

Tel.: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com.

CNAS Accreditation No. L6451; A2LA Accreditation Number: 3870.01

FCC Designation Number: CN1182, Test Firm Registration Number: 540522

Innovation, Science and Economic Development Canada Site Registration Number: 10288A

Conformity Assessment Body identifier: CN0048

VCCI facility registration number: C-20087, T-20088, R-20123, R-20240, G-20118

2.8. Measurement uncertainty

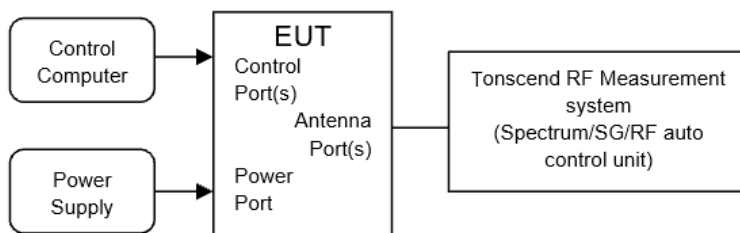
Test Item	Uncertainty
Bandwidth	1.9%
Peak Output Power (Conducted) (Spectrum analyzer)	0.98 dB
Peak Output Power (Conducted) (Power Sensor)	1.18 dB
Power Spectral Density (Base EIRP)	1.51 dB
Power Spectral Density (Spectrum analyzer)	0.98 dB
Frequencies Stability	1.9 kHz
Conducted spurious emissions	1.21 dB ($9\text{ kHz} \leq f < 7\text{ GHz}$);
	3.31 dB ($7\text{ GHz} \leq f < 40\text{ GHz}$)
Uncertainty for radio frequency (RBW < 20 kHz)	5.5×10^{-8}
Time	0.11%
Temperature	0.3 °C
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.28 dB (Antenna Polarize: V)
	4.14 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.22 dB (1 - 6 GHz)
	4.52 dB (6 GHz - 18 GHz)
	4.58 dB (18 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.32dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
☑ RF Connected Test (RF Measurement System 2#)				
SPECTRUM ANALYZER	R&S	FSU26	201124	2026/07/06
Power Sensor	R&S	NRP-Z22	101254	2026/07/06
Test Software	Tonscend	JS1120-3	V3.6.21	N/A
☑ RF Connected Test (RF Measurement System 3#)				
SIGNAL ANALYZER	R&S	FSV40	101407	2026/07/06
Wideband Radio Communication Tester	R&S	CMW500	120259	2026/07/06
EXG Analog Signal Generator	KEYSIGHT	N5173B	MY62153058	2026/07/06
MXG Vector Signal Generator	Agilent	N5182A	MY48180912	2027/02/27
RF Control Unit	Tonscend	JS0806-2	20C8060230	2027/03/17
TEMP&HUMI Programmable Chamber	ZHIXIANG	ZXGDJS-150L	ZX170110-A	2027/02/27
Test Software	Tonscend	JS1120-3	Ver.3.2.22	N/A

4. 20 dB Bandwidth

4.1. Block diagram of test setup



4.2. Limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in § 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3. Test procedure

- (1) The test according to ANSI C63.10 clause 6.9.2.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 20 dB bandwidth measurement:

RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 2 times and 5 times the OBW
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold

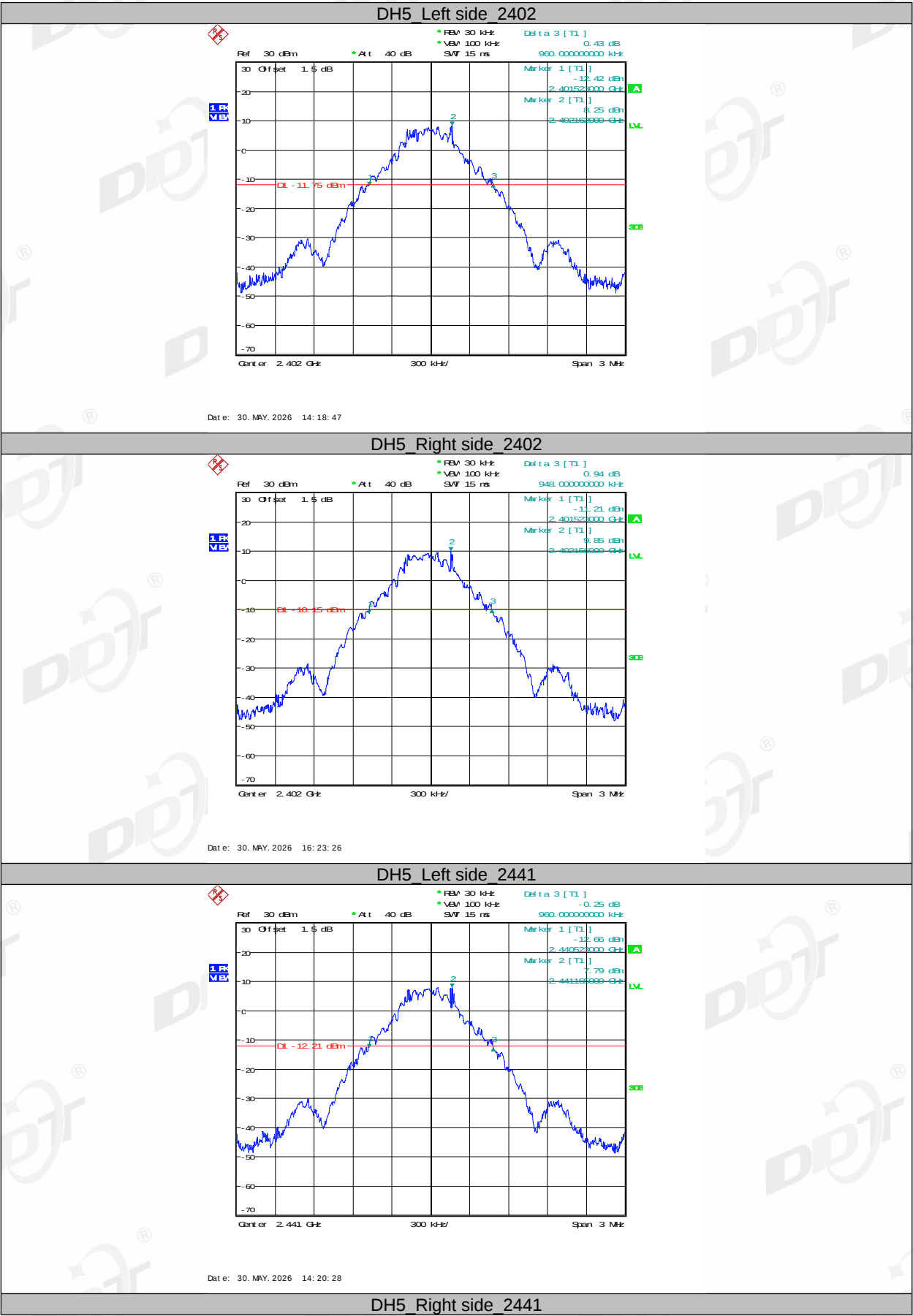
- (5) Measure and record the results in the report.

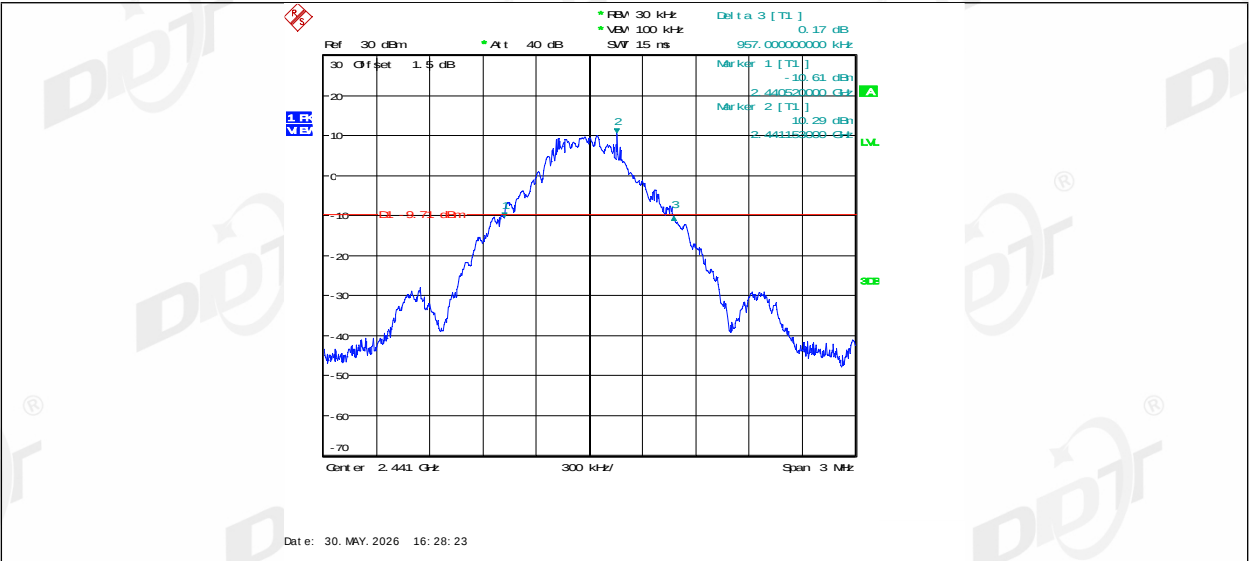
4.4. Test result

Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

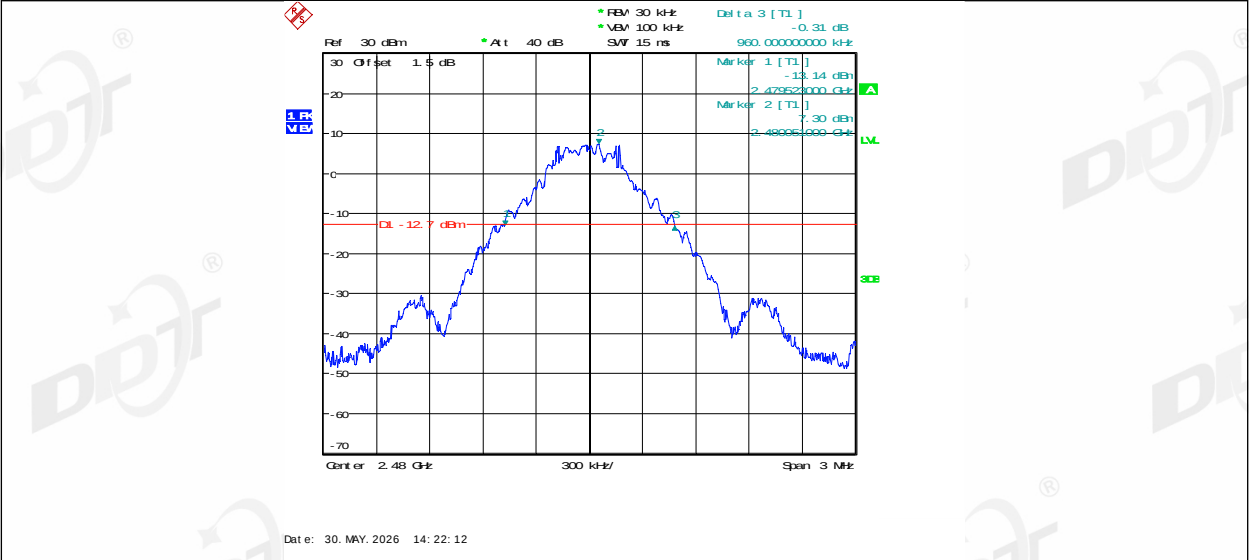
Test Mode	Antenna	Frequency [MHz]	20dB EBW[MHz]
DH5	Left side	2402	0.96
	Right side	2402	0.95
	Left side	2441	0.96
	Right side	2441	0.96
	Left side	2480	0.96
	Right side	2480	0.96
2DH5	Left side	2402	1.28
	Right side	2402	1.28
	Left side	2441	1.29
	Right side	2441	1.30
	Left side	2480	1.29
	Right side	2480	1.27

4.5. Test graphs

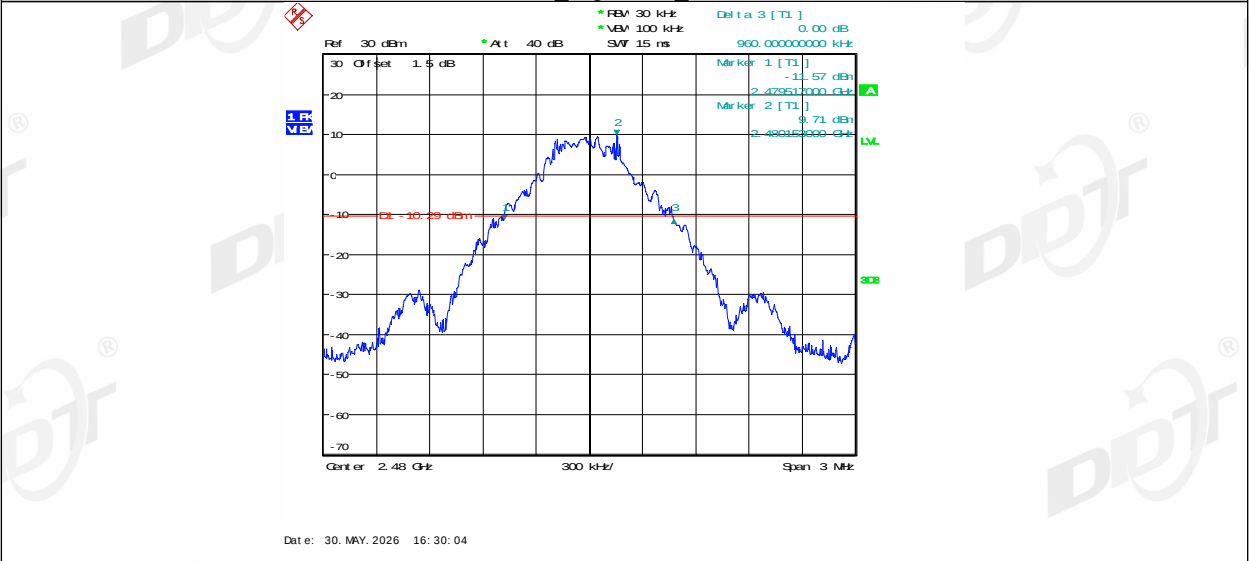




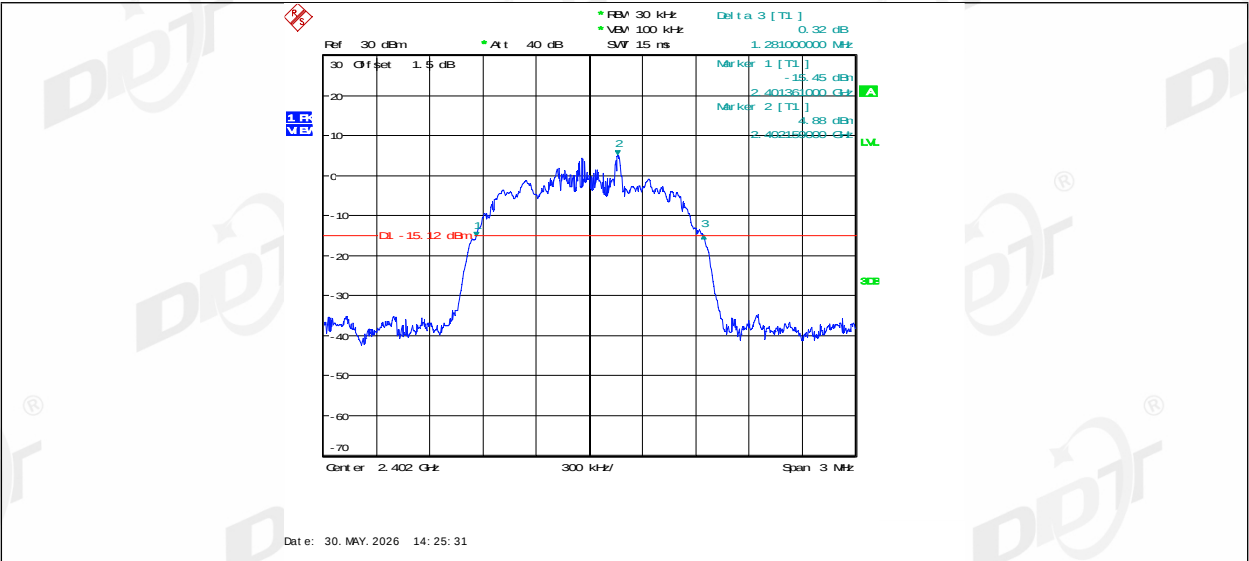
DH5 Left side_2480



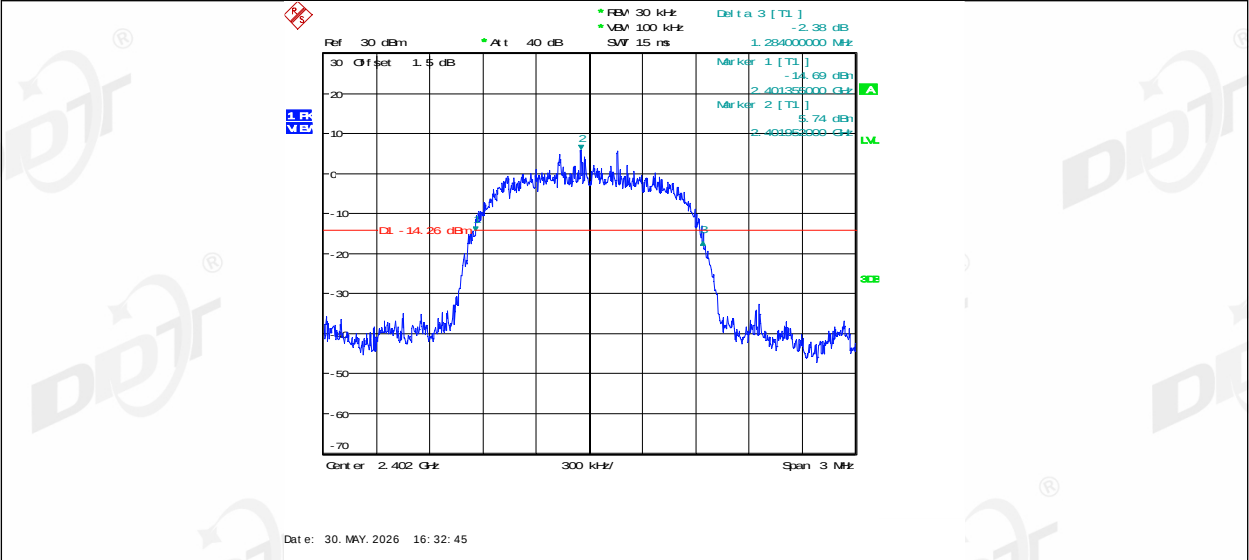
DH5 Right side_2480



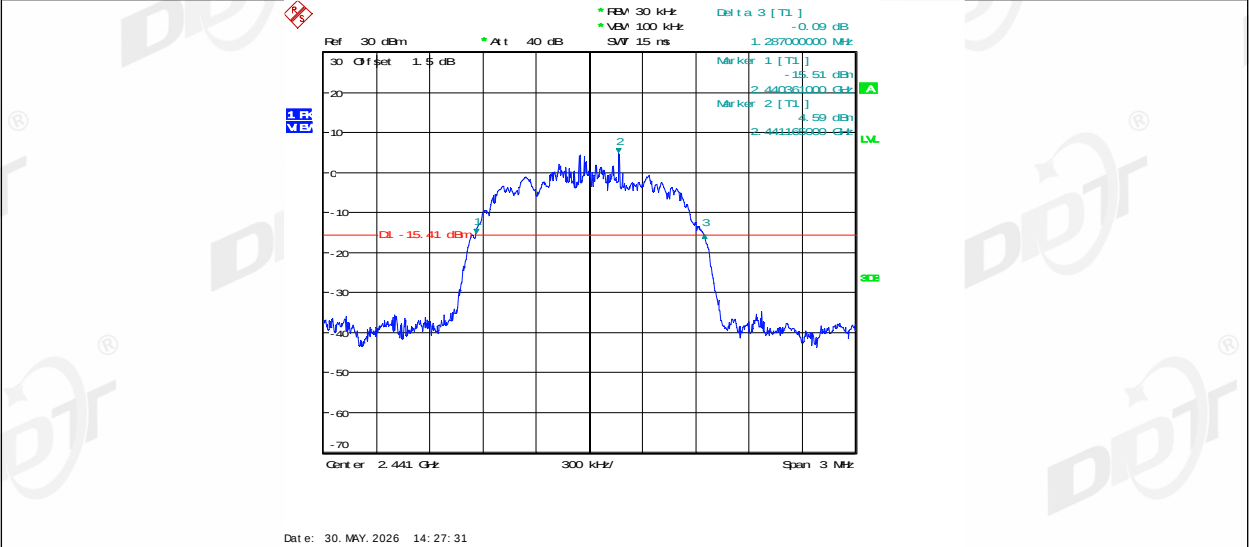
2DH5 Left side_2402



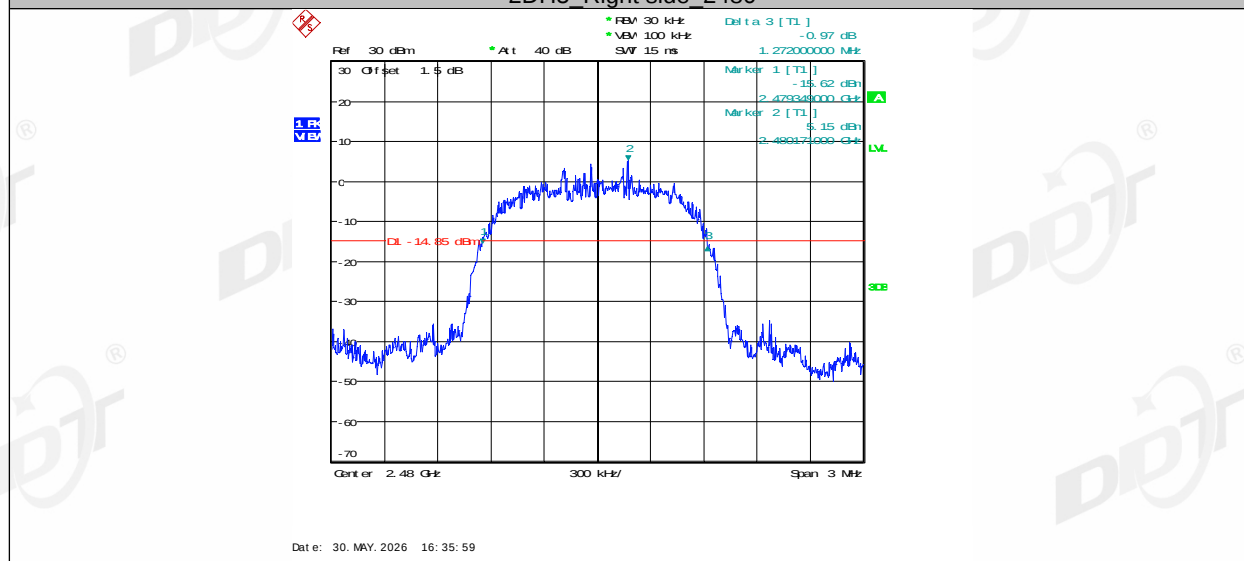
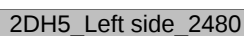
2DH5 Right side 2402



2DH5 Left side 2441

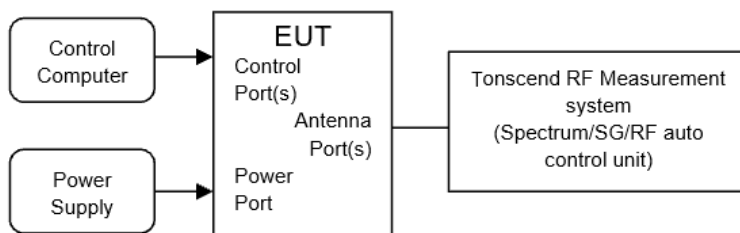


2DH5 Right side 2441



5. 99% Bandwidth

5.1. Block diagram of test setup



5.2. Limits

Just for Report.

5.3. Test procedure

- (1) The test according to ANSI C63.10 clause 6.9.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously
- (4) Use the following spectrum analyzer settings for the 99% bandwidth measurement:

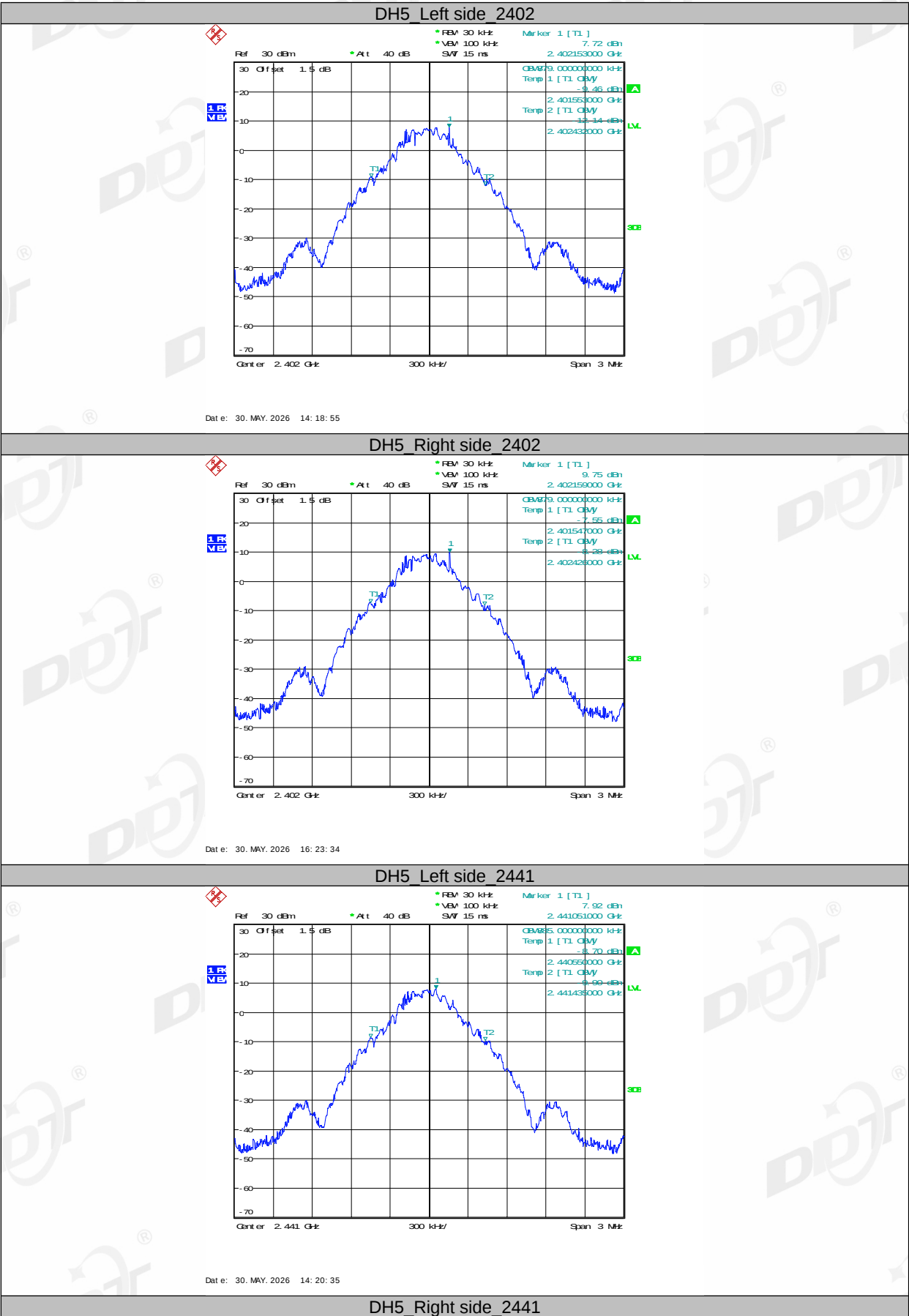
RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 1.5 times and 5.0 times the OBW
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold
- (5) Measure and record the results in the report.

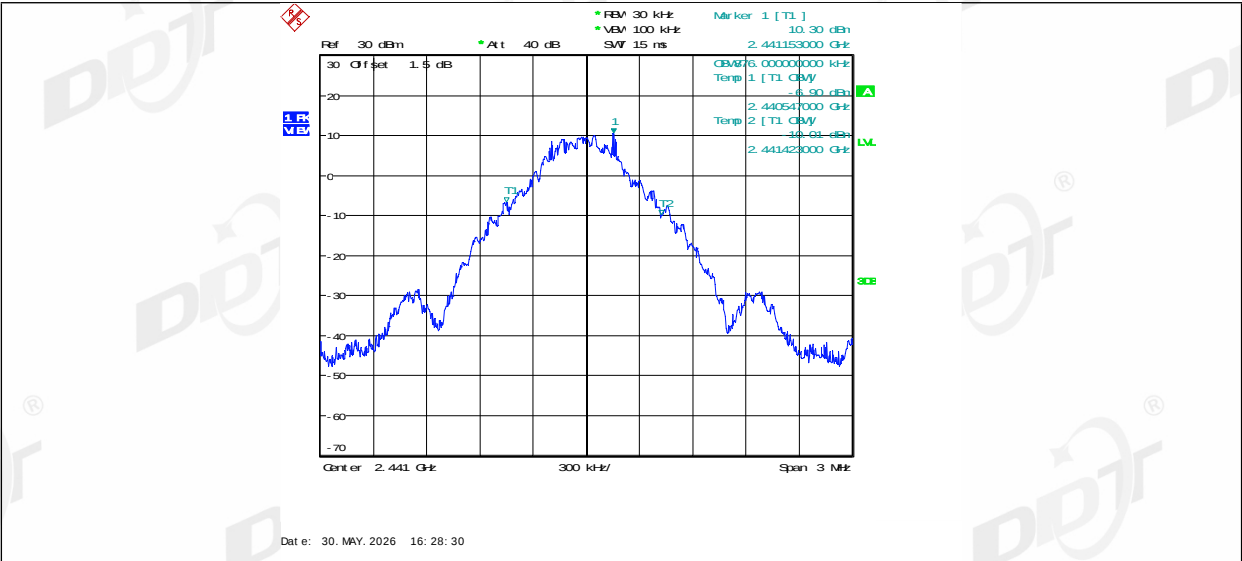
5.4. Test result

Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

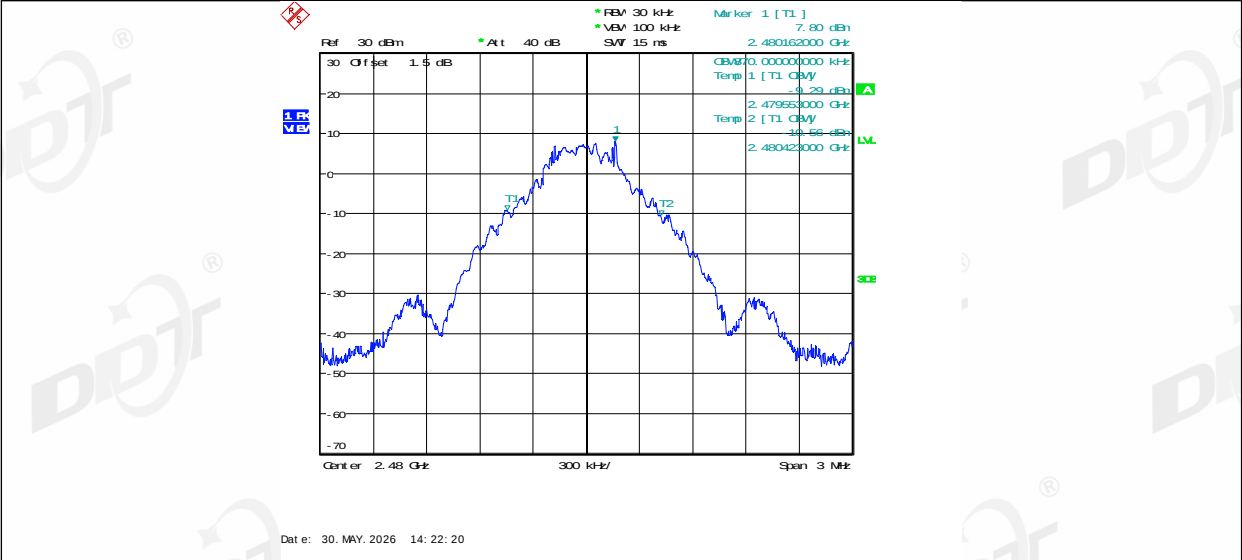
Test Mode	Antenna	Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
DH5	Left side	2402	0.879	2401.5530	2402.4320
	Right side	2402	0.879	2401.5470	2402.4260
	Left side	2441	0.885	2440.5500	2441.4350
	Right side	2441	0.876	2440.5470	2441.4230
	Left side	2480	0.870	2479.5530	2480.4230
	Right side	2480	0.870	2479.5500	2480.4200
2DH5	Left side	2402	1.185	2401.4000	2402.5850
	Right side	2402	1.191	2401.3970	2402.5880
	Left side	2441	1.185	2440.4000	2441.5850
	Right side	2441	1.188	2440.3940	2441.5820
	Left side	2480	1.182	2479.4000	2480.5820
	Right side	2480	1.188	2479.3940	2480.5820

5.5. Test graphs

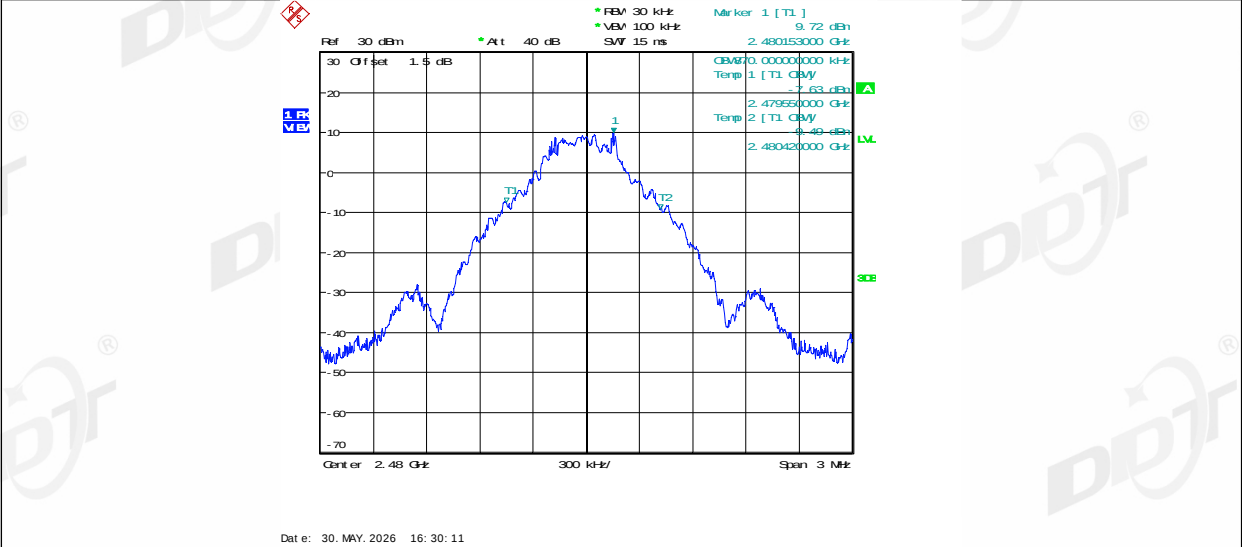




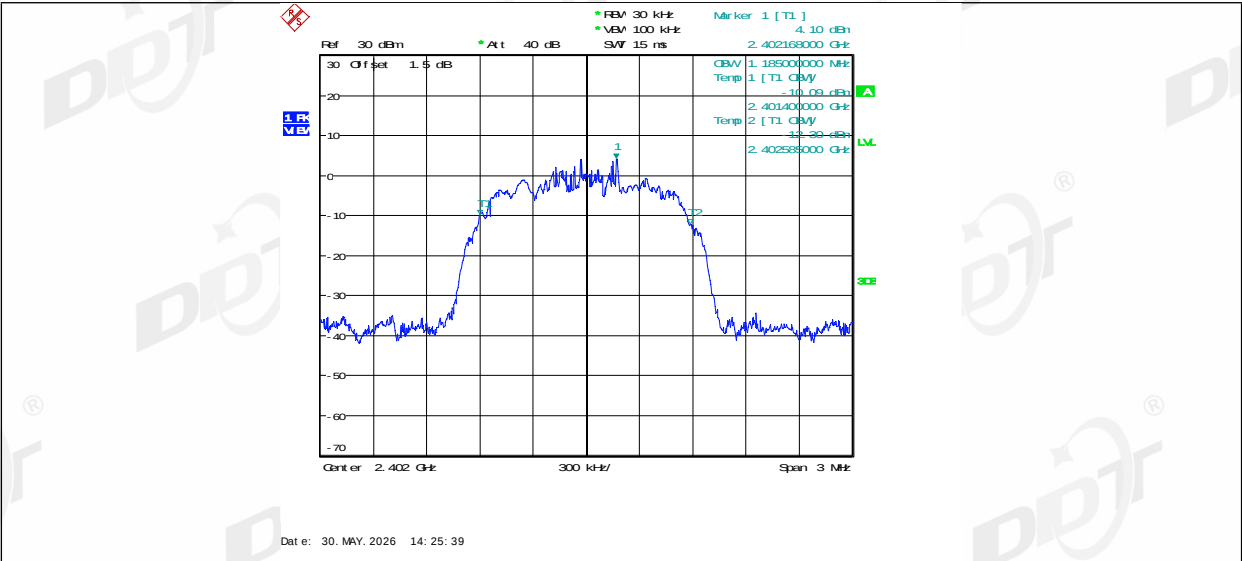
DH5_Left side_2480



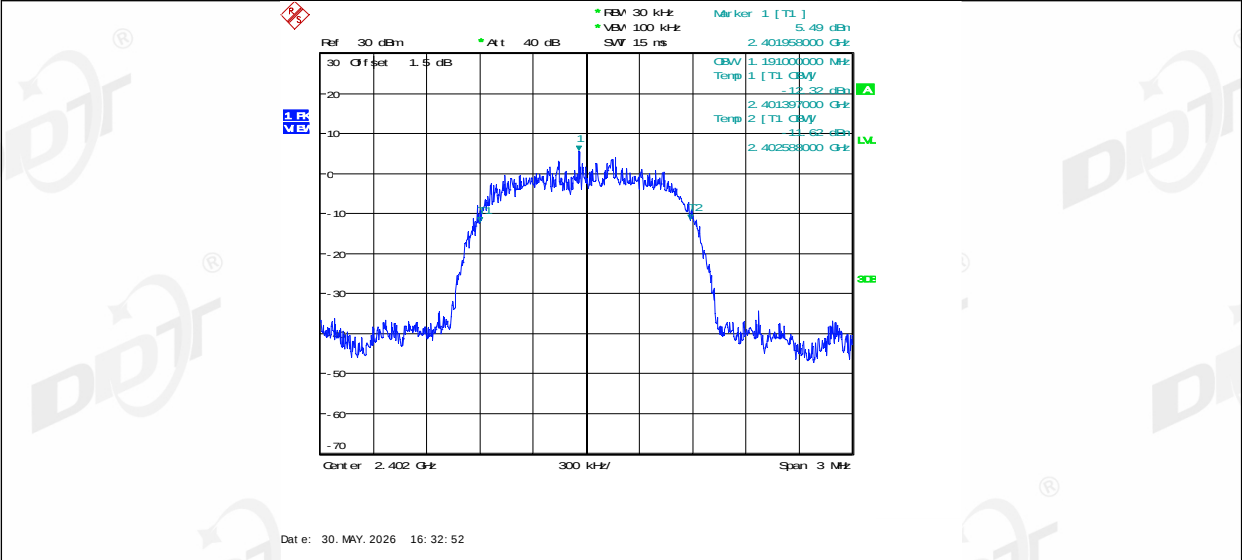
DH5_Right side_2480



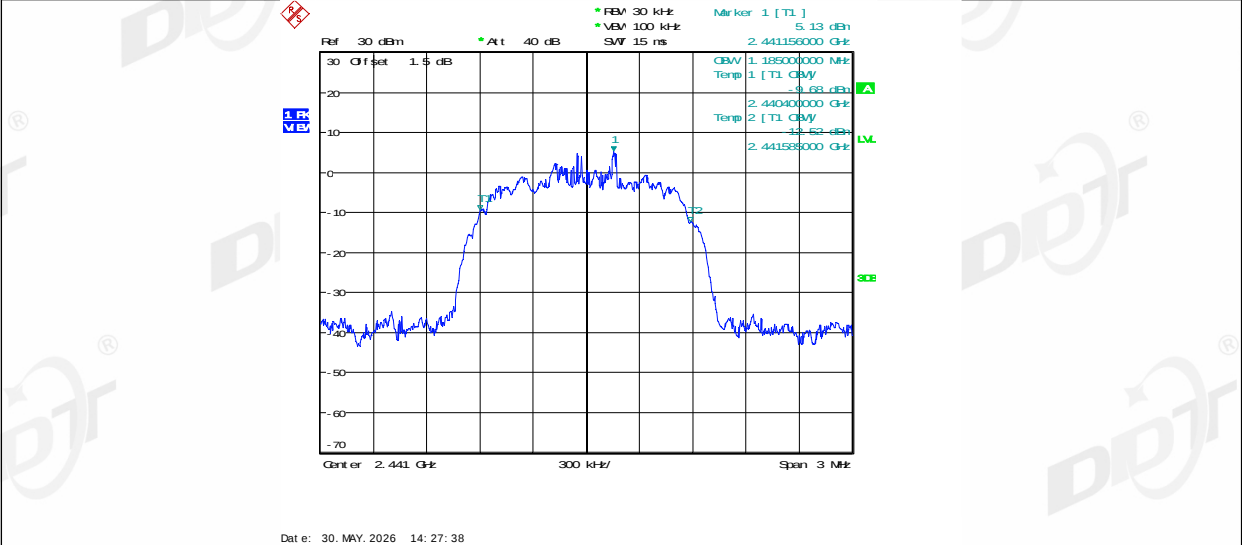
2DH5_Left side_2402



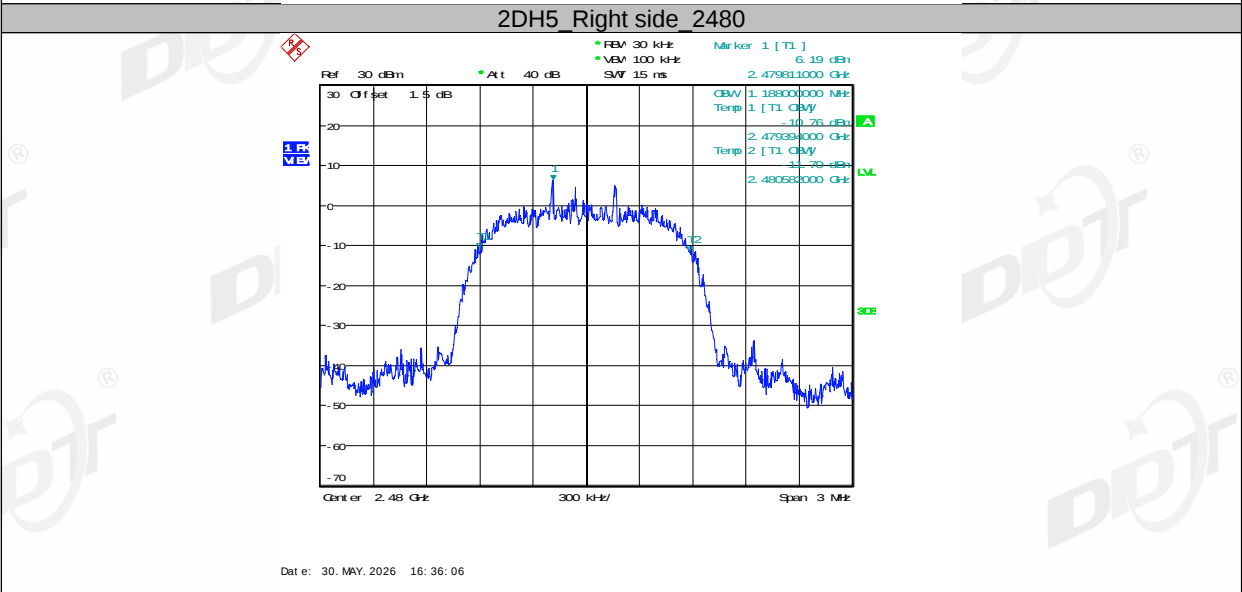
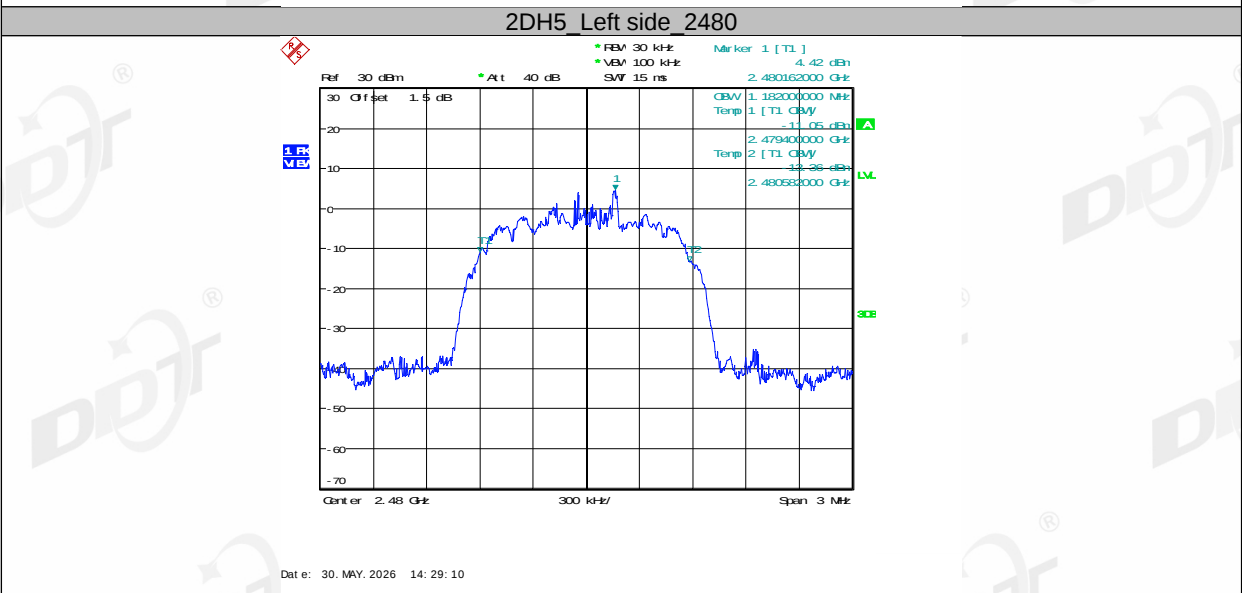
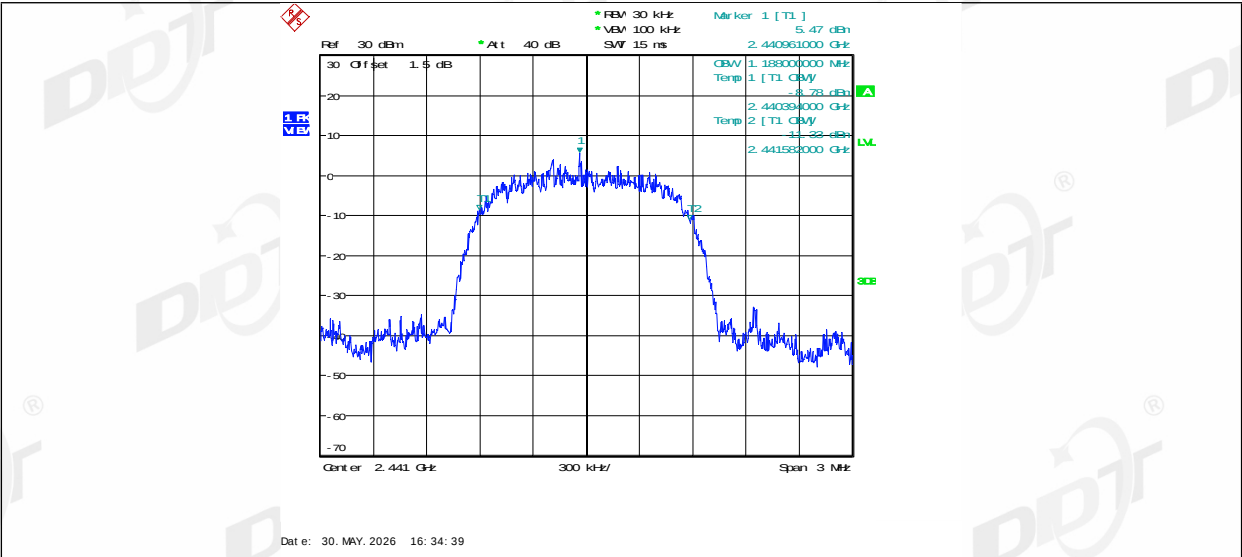
2DH5_Right side_2402



2DH5_Left side_2441

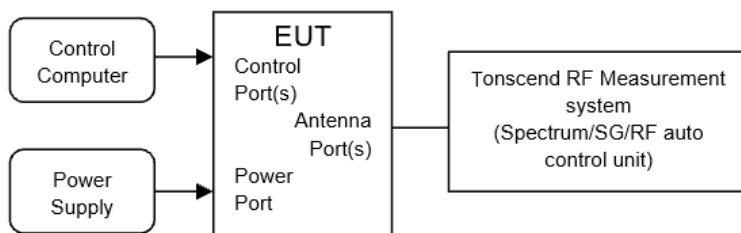


2DH5_Right side_2441



6. Maximum Peak Output Power

6.1. Block diagram of test setup



6.2. Limits

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts, the e.i.r.p shall not exceed 4W.

6.3. Test procedure

- (1) The test according to ANSI C63.10 clause 7.8.5.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for the maximum peak output power measurement:

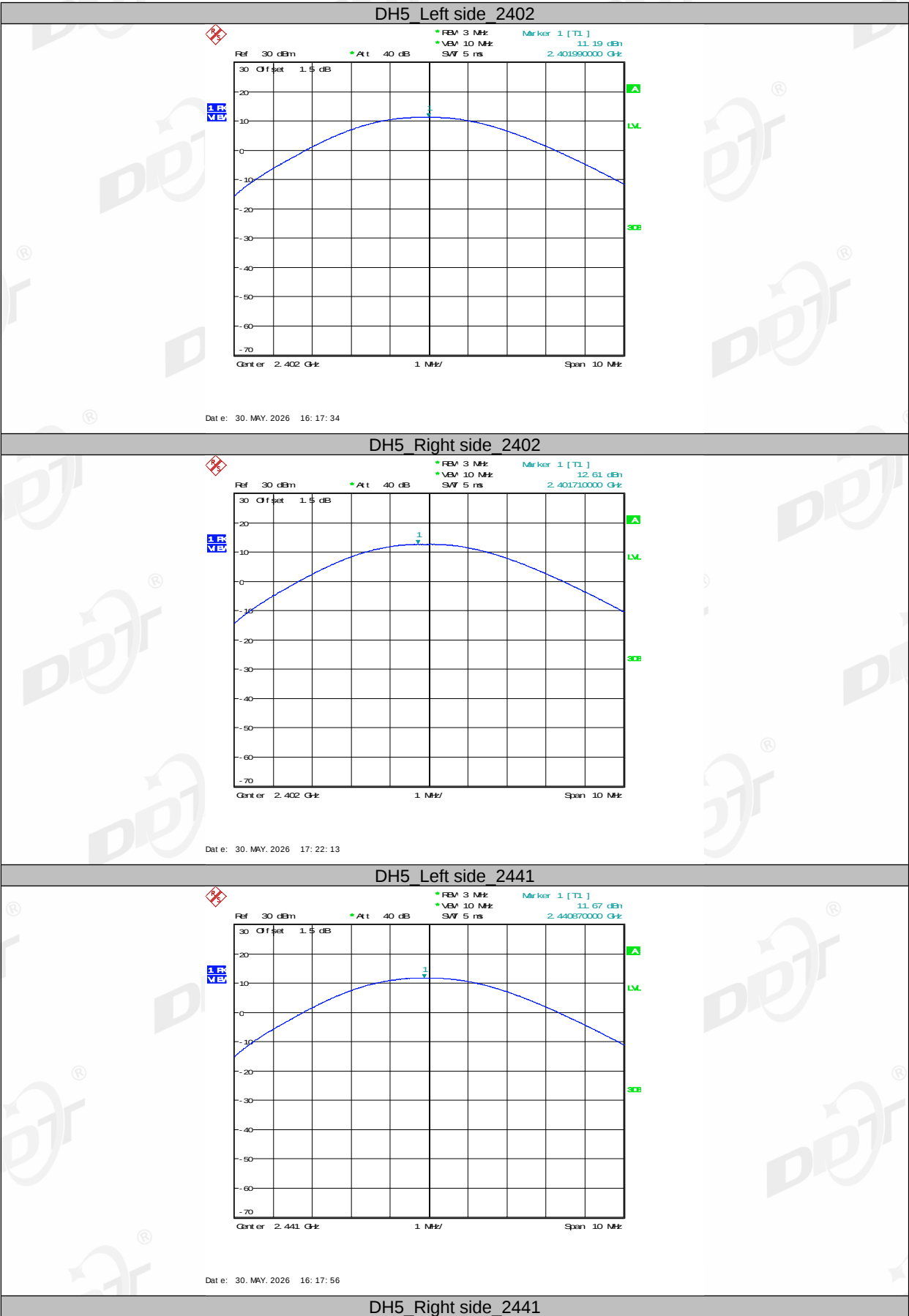
RBW:	> 20 dB bandwidth of the emission being measured.
VBW:	VBW $\geq$ RBW.
Span:	Approximately five times the 20 dB bandwidth, centered on a hopping channel.
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold
- (5) Use the marker-to-peak function to set the marker to the peak of the emission and record the results in the report.

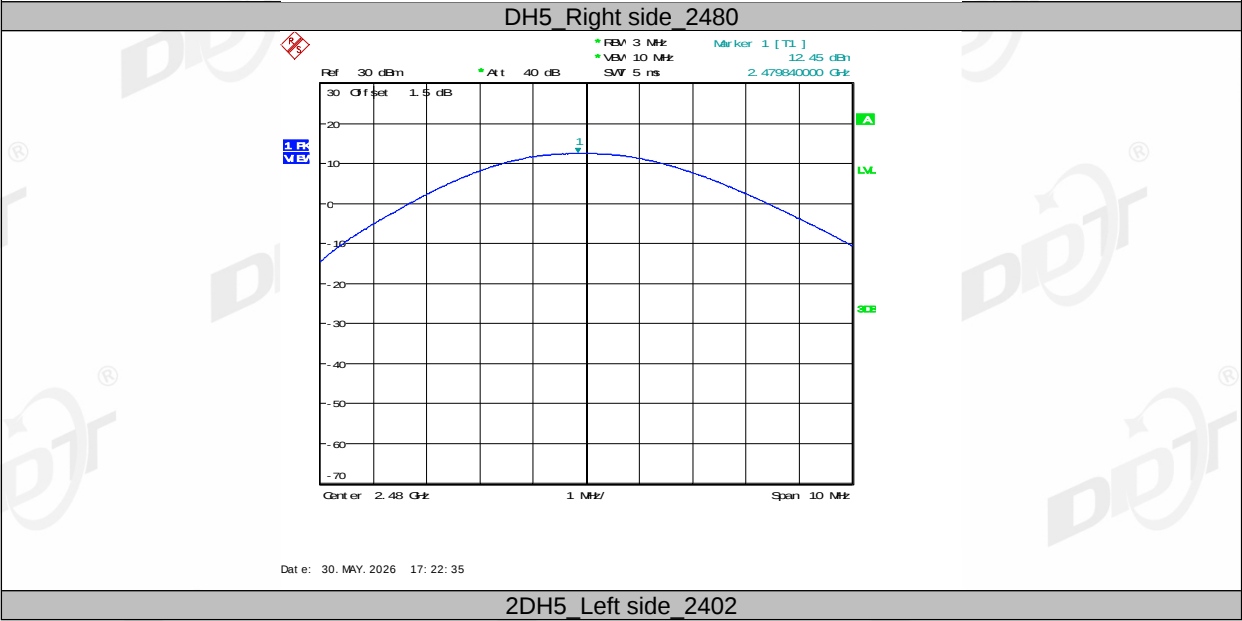
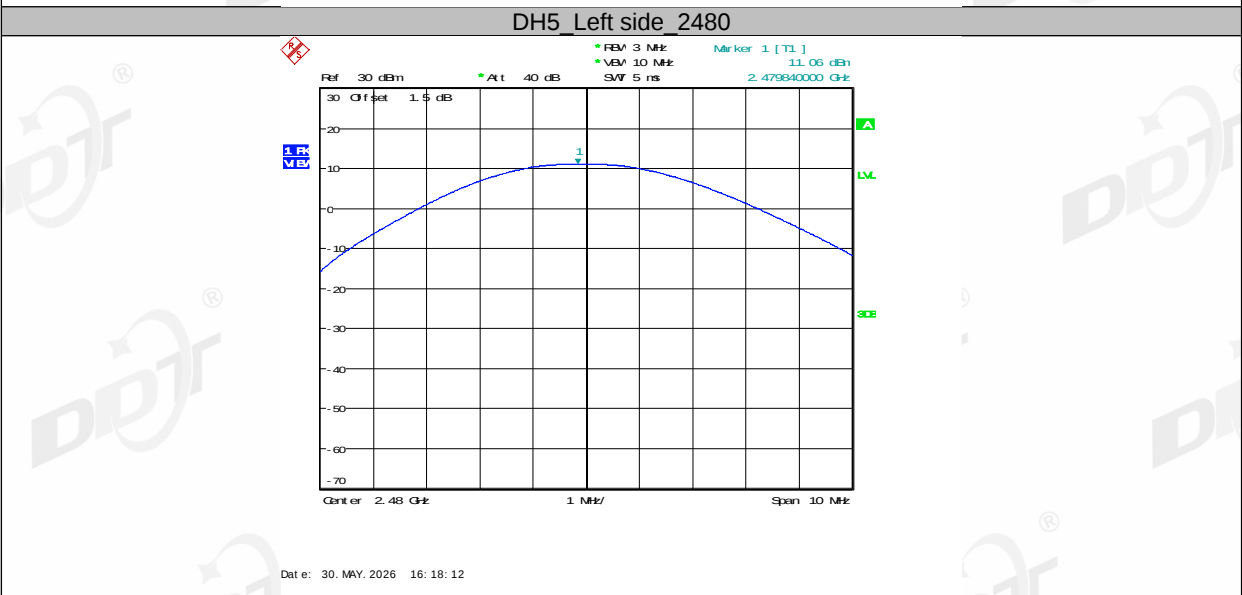
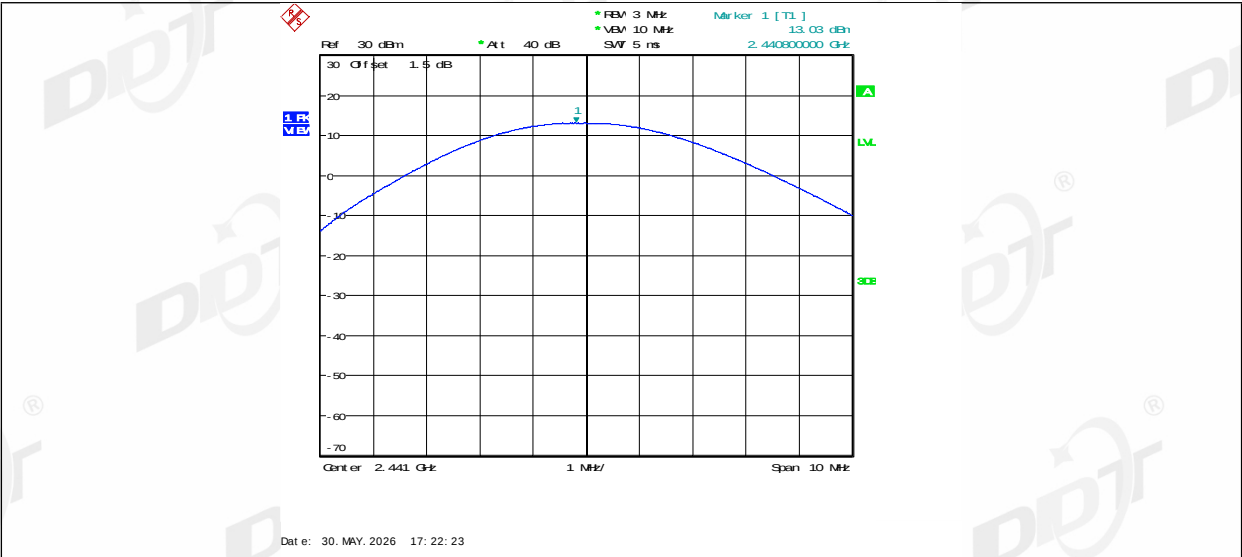
6.4. Test result

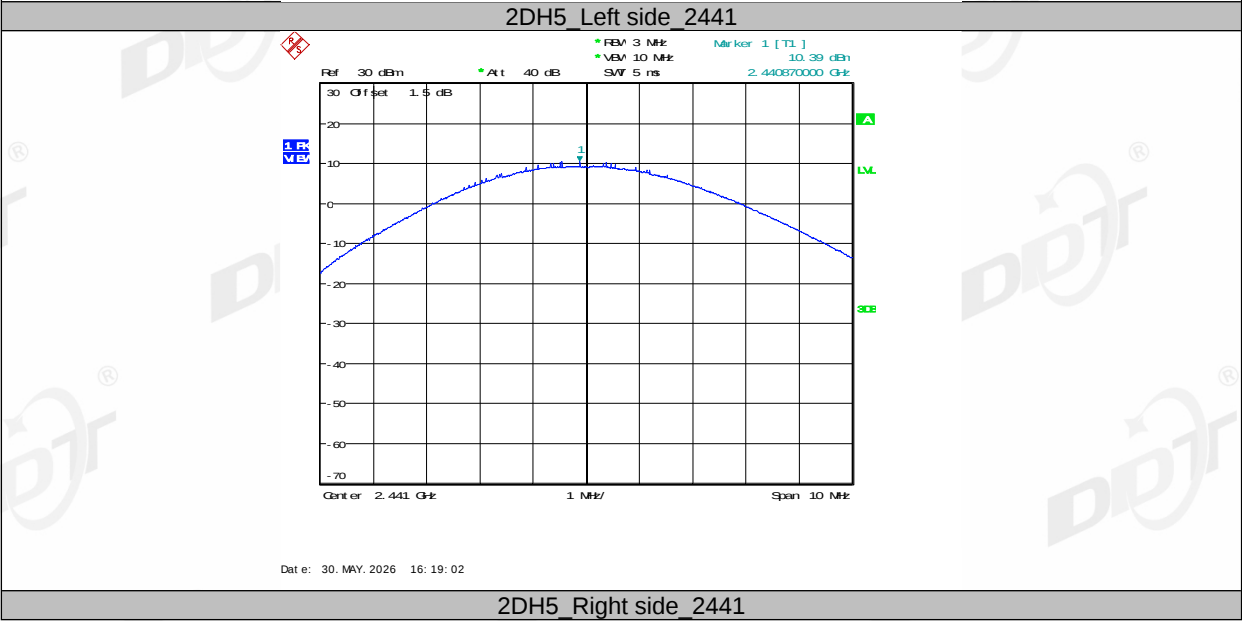
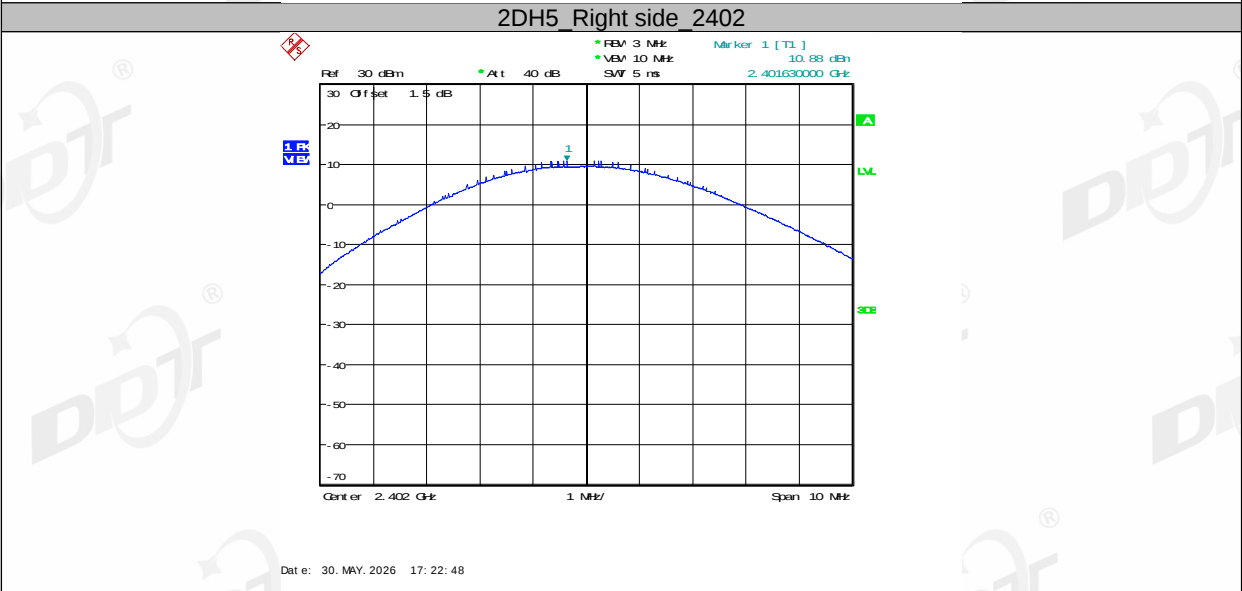
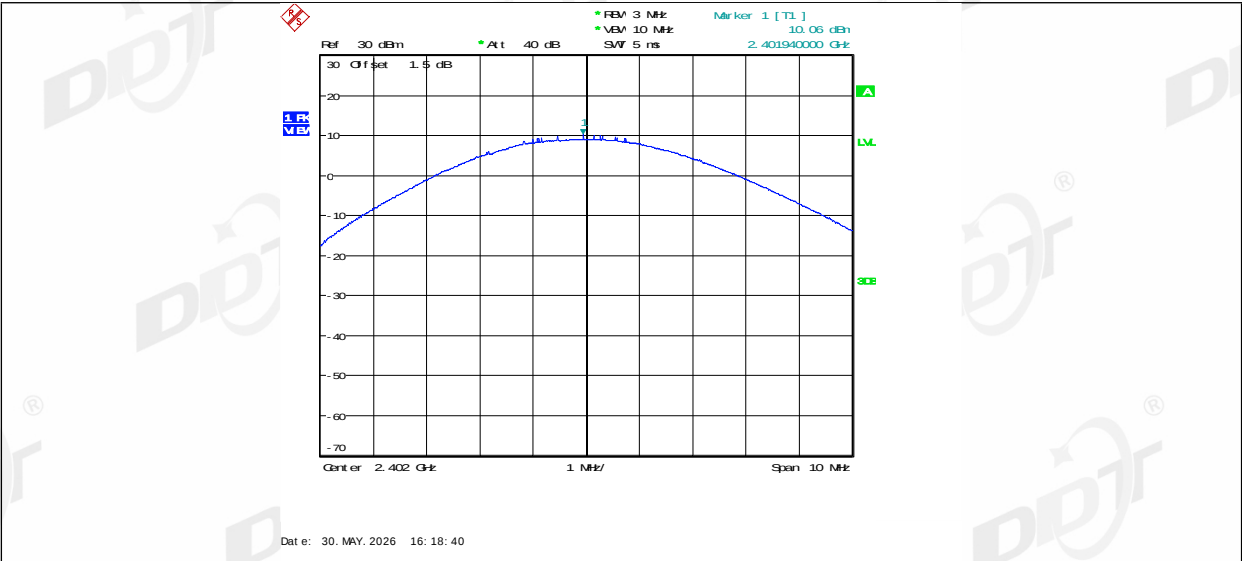
Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

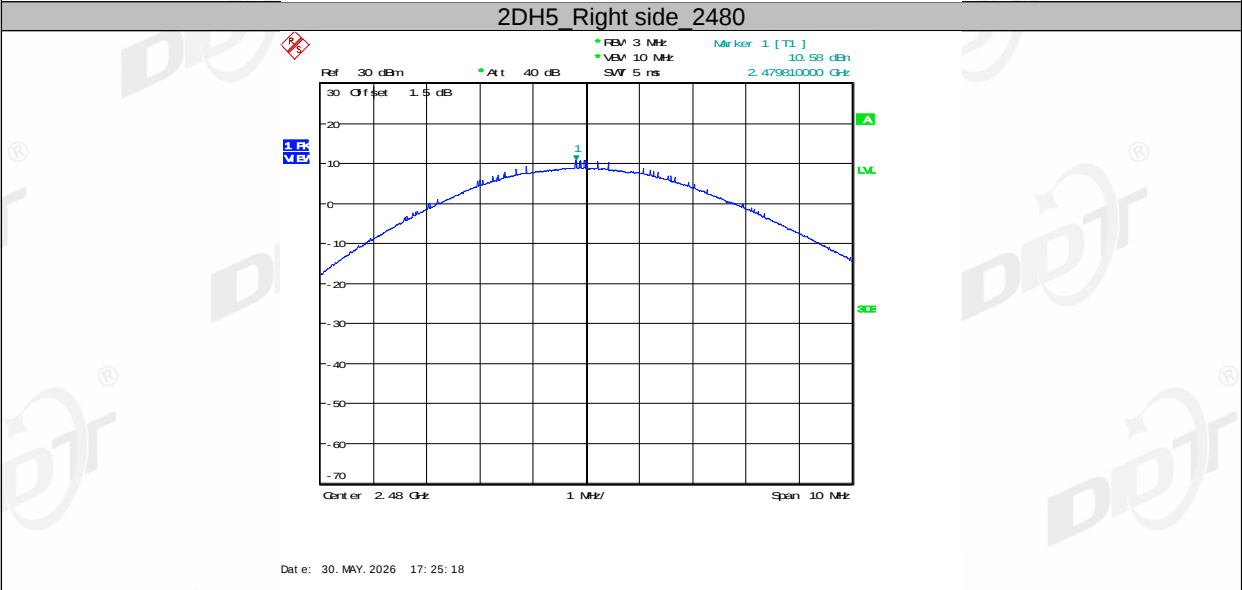
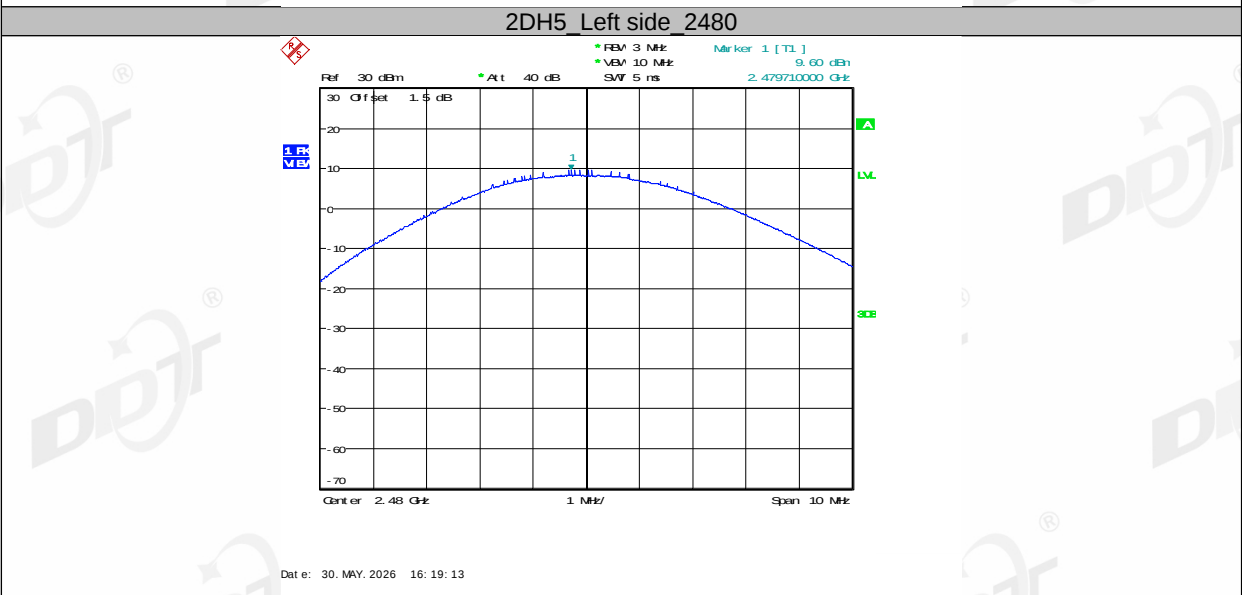
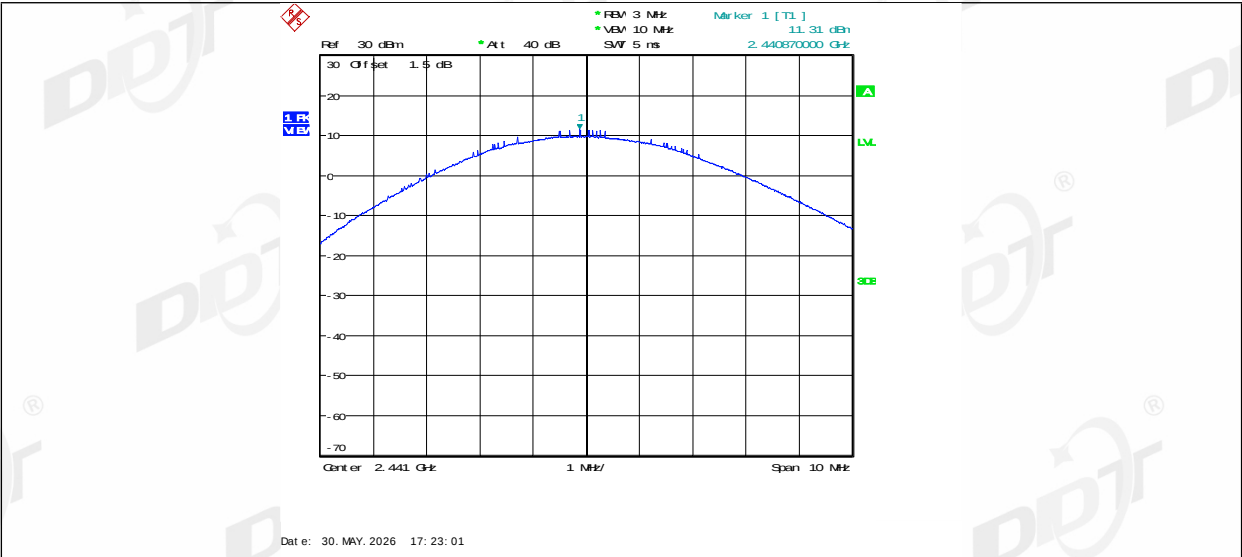
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
DH5	Left side	2402	11.19	≤20.97	10.56	≤36	PASS
	Right side	2402	12.61	≤20.97	12.79	≤36	PASS
	Left side	2441	11.67	≤20.97	11.04	≤36	PASS
	Right side	2441	13.03	≤20.97	13.21	≤36	PASS
	Left side	2480	11.06	≤20.97	10.43	≤36	PASS
	Right side	2480	12.45	≤20.97	12.63	≤36	PASS
2DH5	Left side	2402	10.06	≤20.97	9.43	≤36	PASS
	Right side	2402	10.88	≤20.97	11.06	≤36	PASS
	Left side	2441	10.39	≤20.97	9.76	≤36	PASS
	Right side	2441	11.31	≤20.97	11.49	≤36	PASS
	Left side	2480	9.60	≤20.97	8.97	≤36	PASS
	Right side	2480	10.58	≤20.97	10.76	≤36	PASS

6.5. Test graphs



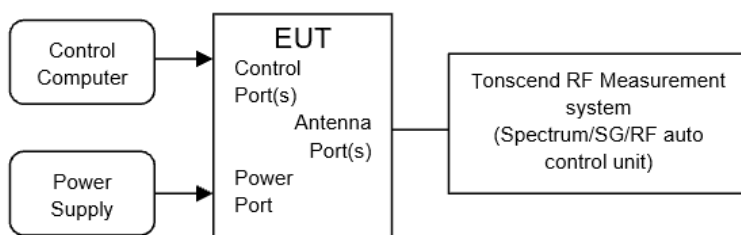






7. Carrier Frequency Separation

7.1. Block diagram of test setup



7.2. Limits

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

7.3. Test procedure

- (1) The test according to ANSI C63.10 clause 7.8.2.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for the maximum peak output power measurement:

RBW:	approximately 30% of the channel spacing
VBW:	$VBW \geq RBW$.
Span:	Wide enough to capture the peaks of two adjacent channels.
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold
- (5) Use the marker-delta function to determine the separation between the peaks of the adjacent channels and record the results in the report.

7.4. Test result

Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

Test Mode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
DH5	Left side	Hop	1.000	≥0.640	PASS
	Right side	Hop	0.990	≥0.640	PASS
2DH5	Left side	Hop	1.006	≥0.860	PASS
	Right side	Hop	1.010	≥0.860	PASS

DH5 Left side Hop

Ref: 30 dBm, Offset: 1.5 dB, Att: 40 dB, RBW: 300 kHz, VBW: 300 kHz, SMF: 2.5 ns, Delta 2 [T1]: -0.02 dB, 1.000000000 MHz, Marker 1 [T1]: 1.18 dBm, 2.440313308 GHz.

Center: 2.4415 GHz, 200 kHz, Span: 2 MHz.

Date: 30. MAY. 2026 14:45:22

DH5 Right side Hop

Ref: 30 dBm, Offset: 1.5 dB, Att: 40 dB, RBW: 300 kHz, VBW: 300 kHz, SMF: 2.5 ns, Delta 2 [T1]: 0.00 dB, 990.384615384 kHz, Marker 1 [T1]: 12.96 dBm, 2.440333333 GHz.

Start: 2.4405 GHz, 200 kHz, Stop: 2.4425 GHz.

Date: 30. MAY. 2026 16:47:03

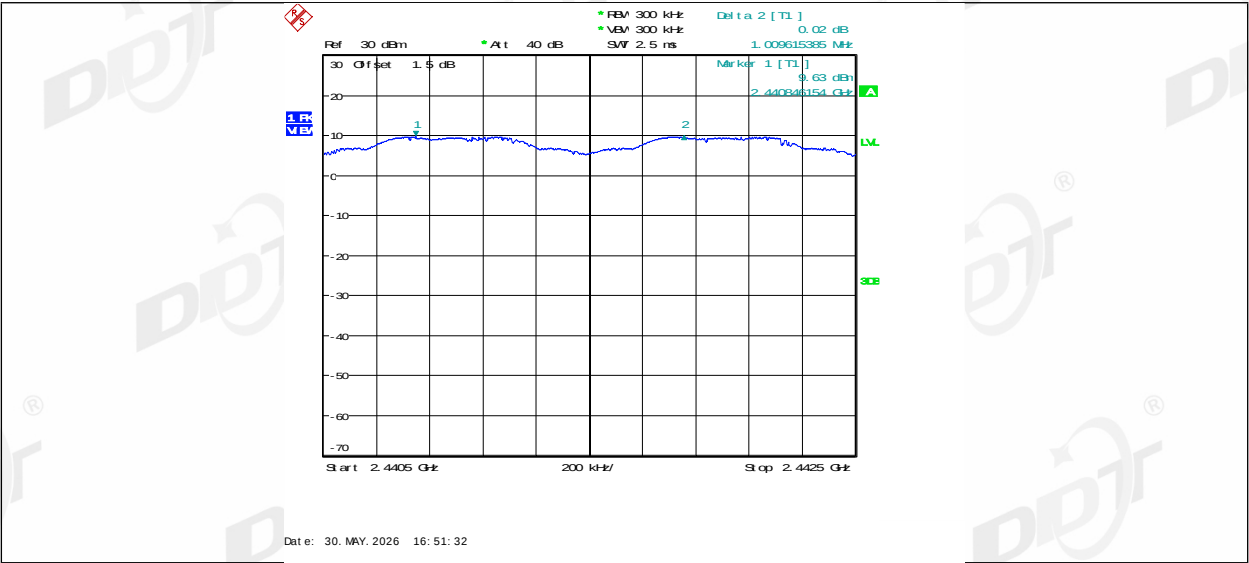
2DH5 Left side Hop

Ref: 30 dBm, Offset: 1.5 dB, Att: 40 dB, RBW: 300 kHz, VBW: 300 kHz, SMF: 2.5 ns, Delta 2 [T1]: -0.02 dB, 1.006410256 MHz, Marker 1 [T1]: 8.71 dBm, 2.440313308 GHz.

Center: 2.4415 GHz, 200 kHz, Span: 2 MHz.

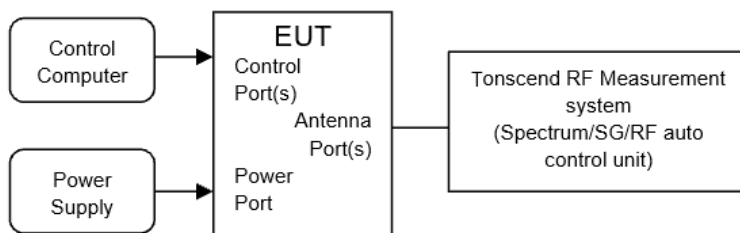
Date: 30. MAY. 2026 15:22:36

2DH5 Right side Hop



8. Dwell Time

8.1. Block diagram of test setup



8.2. Limits

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

8.3. Test procedure

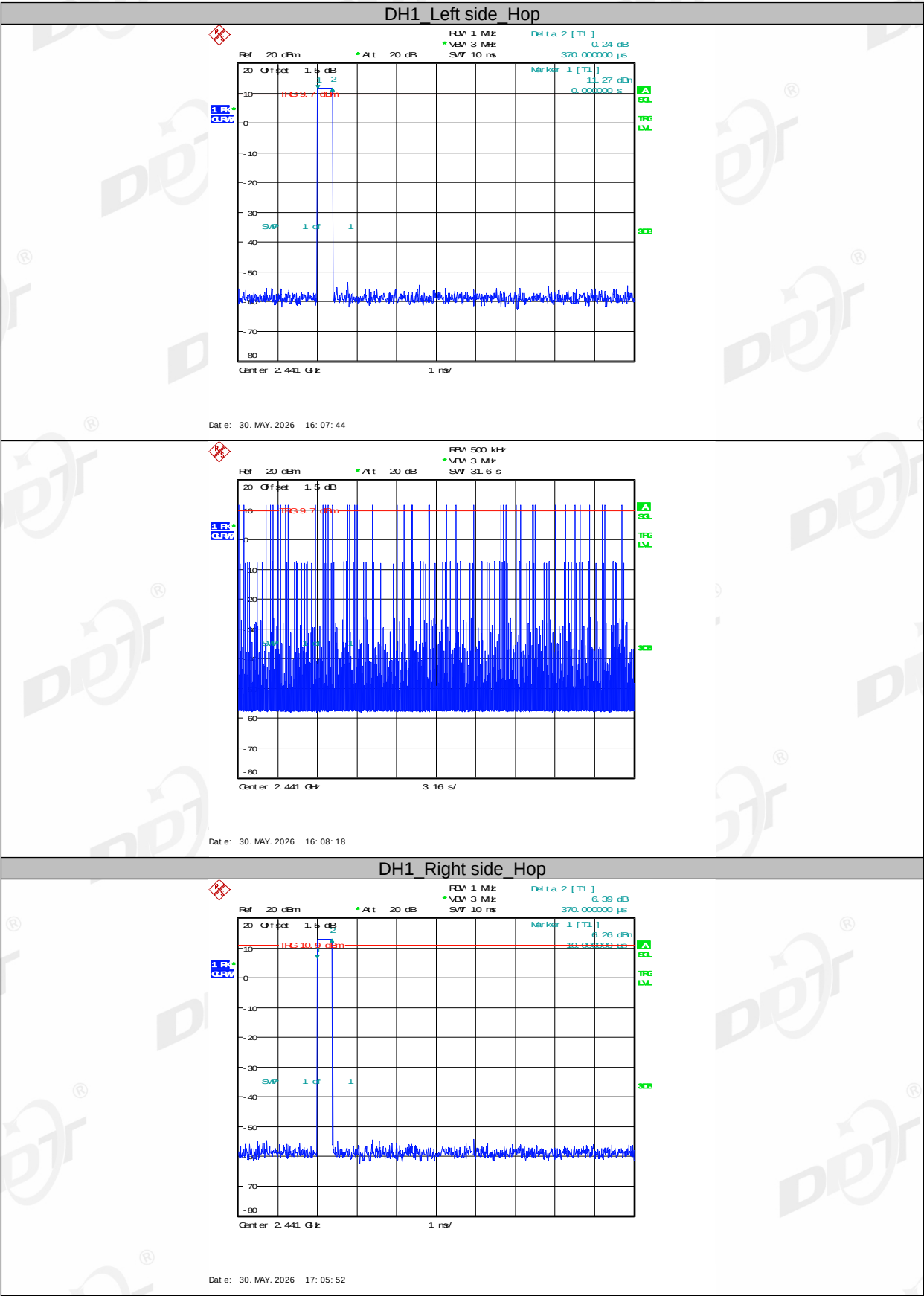
- (1) The test according to ANSI C63.10 clause 7.8.4.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for the maximum peak output power measurement:
 - RBW: $\leq$ channel spacing and where possible RBW should be set $\gg 1 / T$
 - VBW: $VBW \geq RBW$.
 - Span: Zero span, centered on a hopping channel.
 - Detector Mode: Peak
 - Sweep time: Auto
 - Trace mode: Clear Write.
- (5) The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$
- (6) Measure the hopping number and on time of each pulse with spectrum analyzer in zero span set, and calculate dwell time with formula Dwell time = total hops * pulse's on time.
- (7) Measure and record the results in the report.

8.4. Test result

Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

Test Mode	Antenna	Frequency [MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Left side	Hop	0.370	43	0.016	≤0.4	PASS
	Right side	Hop	0.370	40	0.015	≤0.4	PASS
DH3	Left side	Hop	1.630	42	0.068	≤0.4	PASS
	Right side	Hop	1.630	47	0.077	≤0.4	PASS
DH5	Left side	Hop	2.880	39	0.112	≤0.4	PASS
	Right side	Hop	2.880	48	0.138	≤0.4	PASS
2DH1	Left side	Hop	0.380	43	0.016	≤0.4	PASS
	Right side	Hop	0.370	42	0.016	≤0.4	PASS
2DH3	Left side	Hop	1.630	51	0.083	≤0.4	PASS
	Right side	Hop	1.630	42	0.068	≤0.4	PASS
2DH5	Left side	Hop	2.880	38	0.109	≤0.4	PASS
	Right side	Hop	2.880	41	0.118	≤0.4	PASS

8.5. Test graphs



DH1 Right side Hop

Ref 20 dBm

Alt 20 dB

RBW 1 MHz

VBW 3 MHz

SWF 10 ns

Delta 2 [T1]

6.39 dB

370.000000 μ s

Marker 1 [T1]

6.25 dBm

10.000000 μ s

20

Offset

1.5 dB

2

10

TRF 10.9 dBm

1 RBW

CLWG

0

10

20

30

40

50

60

70

80

30B

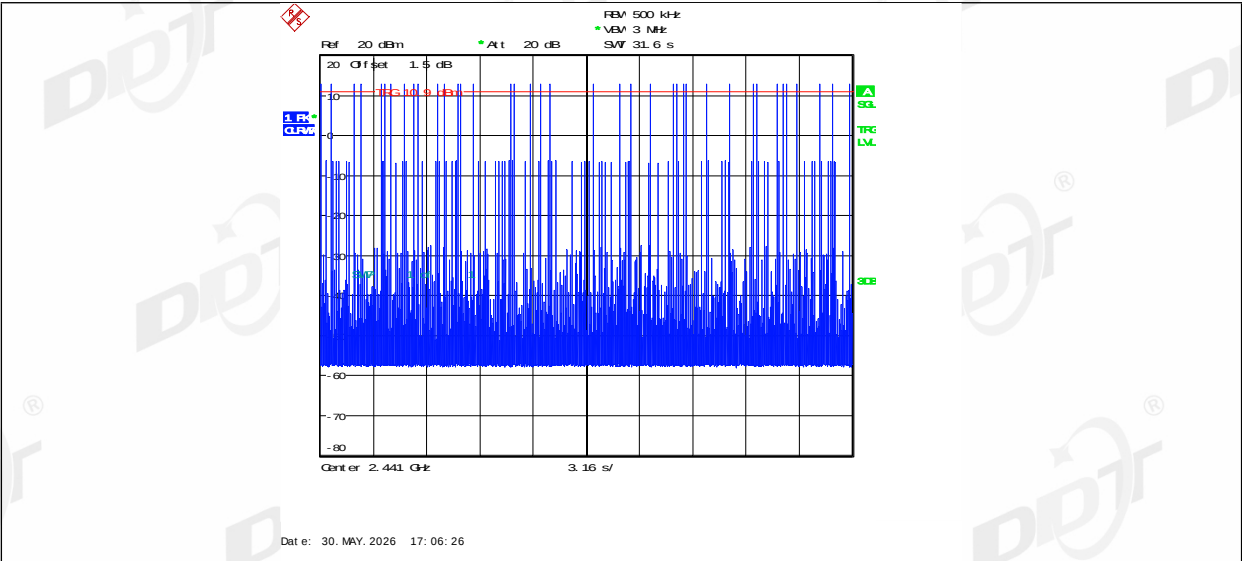
TRF LM

SC

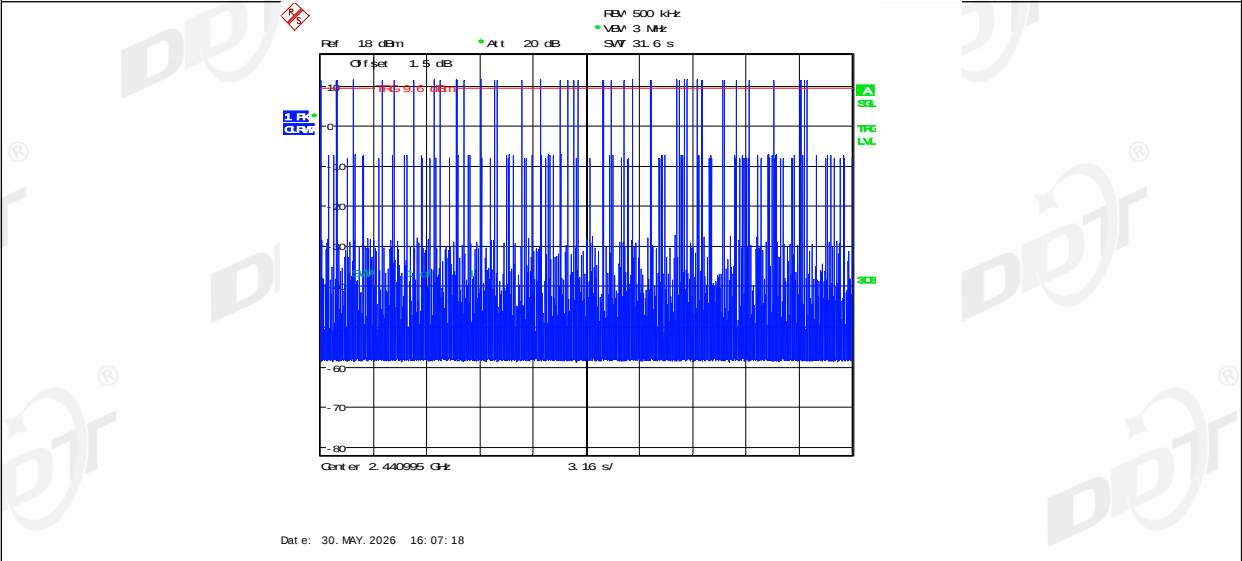
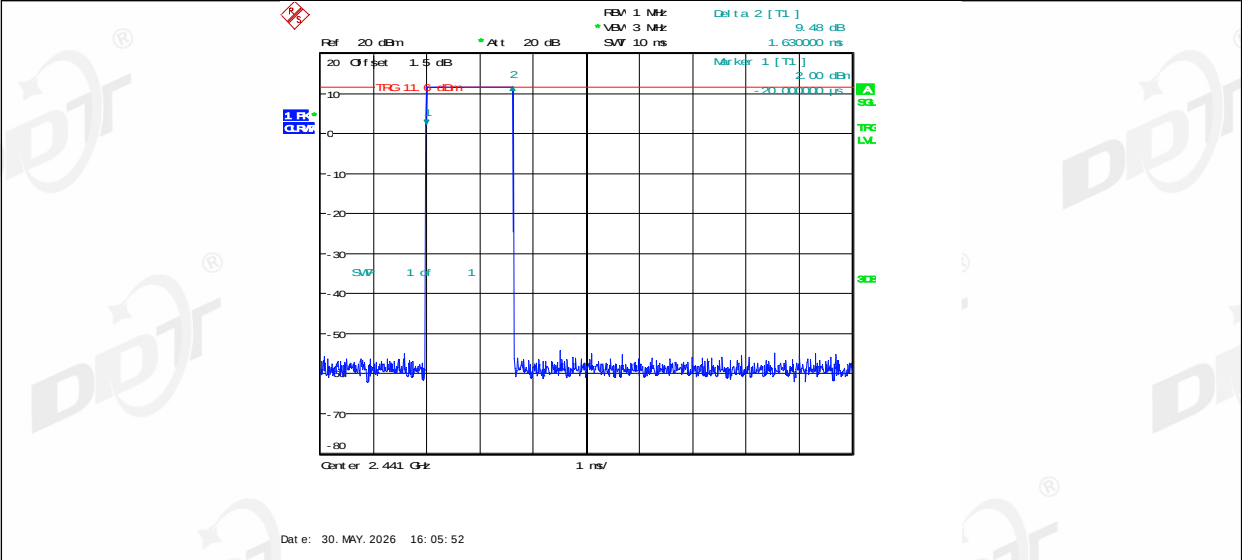
Center 2.441 GHz

1 ns/

Date: 30. MAY. 2026 17:05:52

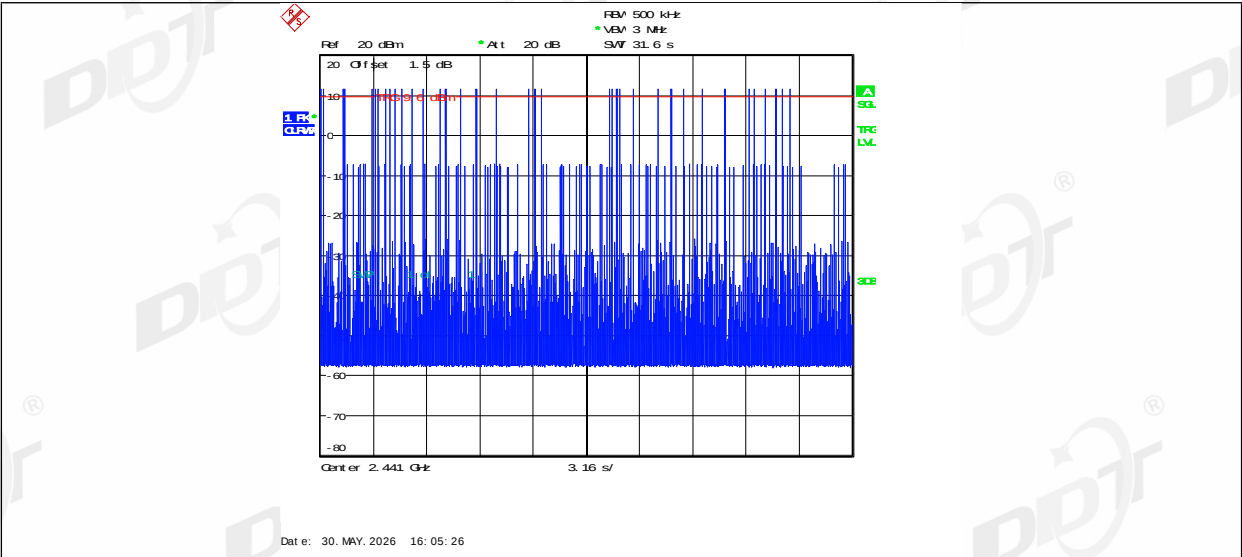


DH3_Left side_Hop

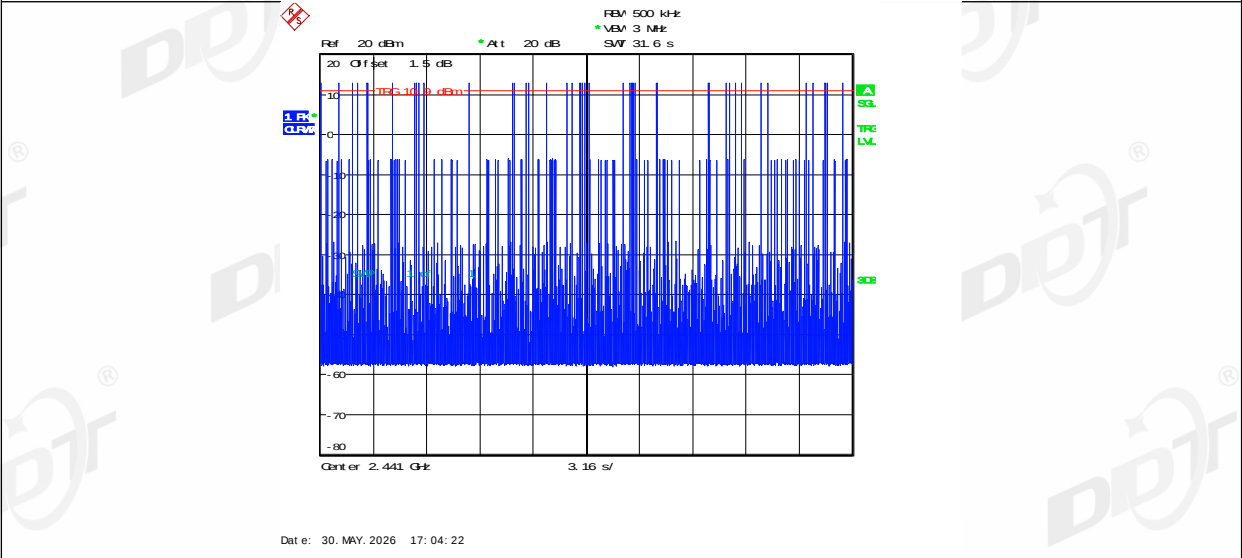
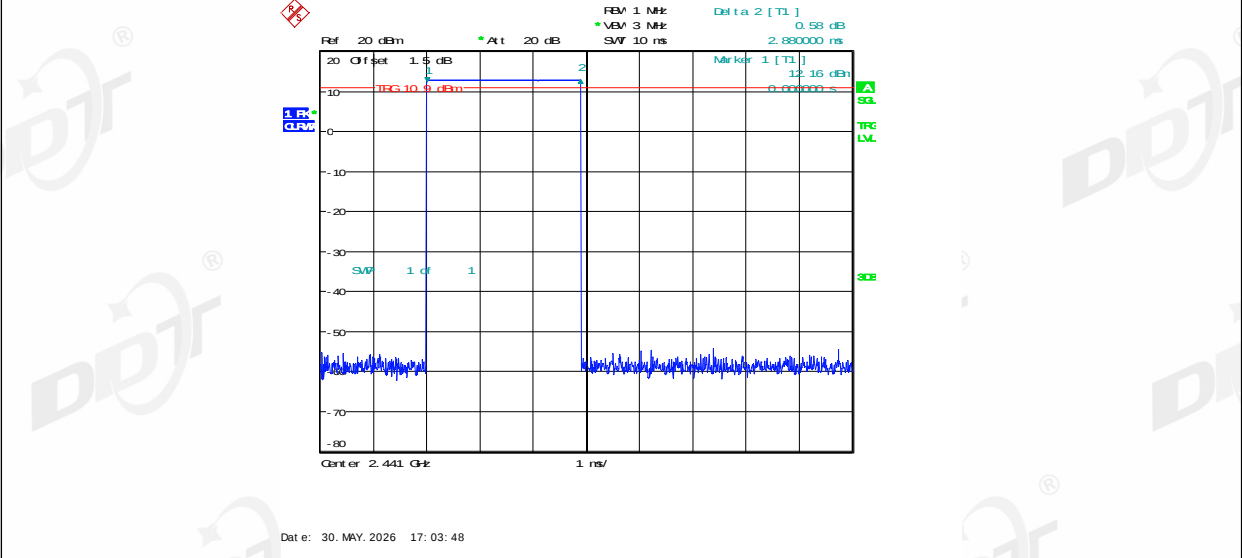


DH3_Right side_Hop





DH5_Right side_Hop



2DH1_Left side_Hop



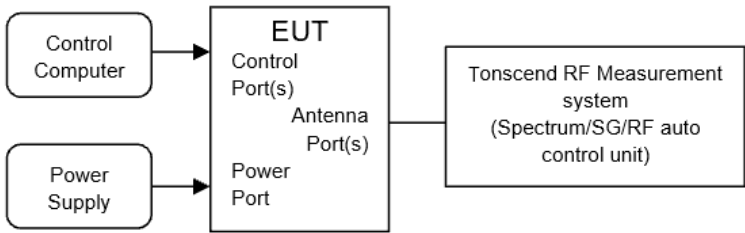






9. Number of Hopping Channel

9.1. Block diagram of test setup



9.2. Limits

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

9.3. Test procedure

- (1) The test according to ANSI C63.10 clause 7.8.3.
- (2) Connect EUT's antenna output to spectrum analyzer by RF cable, the path loss was compensated to the results.
- (3) Set the EUT as maximum power setting and enable the EUT transmit continuously.
- (4) Use the following spectrum analyzer settings for the maximum peak output power measurement:

RBW:	RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
VBW:	VBW ≥ RBW.
Span:	The frequency band of operation
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold
- (5) Measure the hopping number and record the results in the report.
- (6) Measure and record the results in the report.

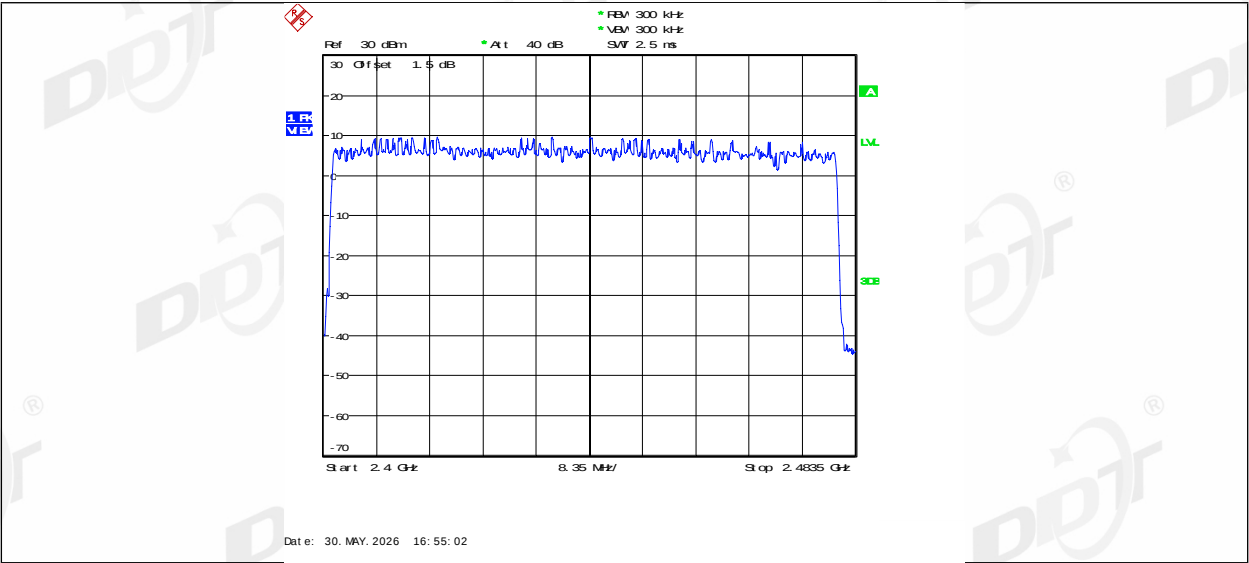
9.4. Test result

Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

Test Mode	Antenna	Frequency [MHz]	Result [Num]	Limit [Num]	Verdict
DH5	Left side	Hop	79	≥15	PASS
	Right side	Hop	79	≥15	PASS
2DH5	Left side	Hop	79	≥15	PASS
	Right side	Hop	79	≥15	PASS

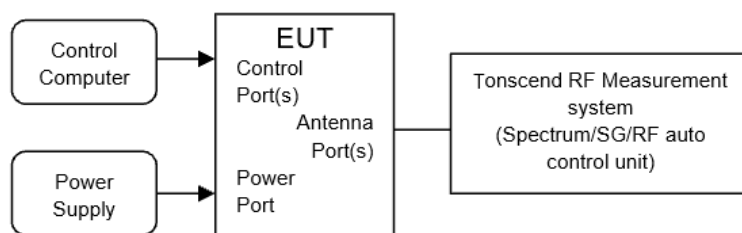
9.5. Test graphs





10. Band Edge Compliance (Conducted Method)

10.1. Block diagram of test setup



10.2. Limit

All restriction band should comply with 15.209, other emission should be at least 20dB below the fundamental.

10.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
- (2) Establish a reference level by using the following procedure:

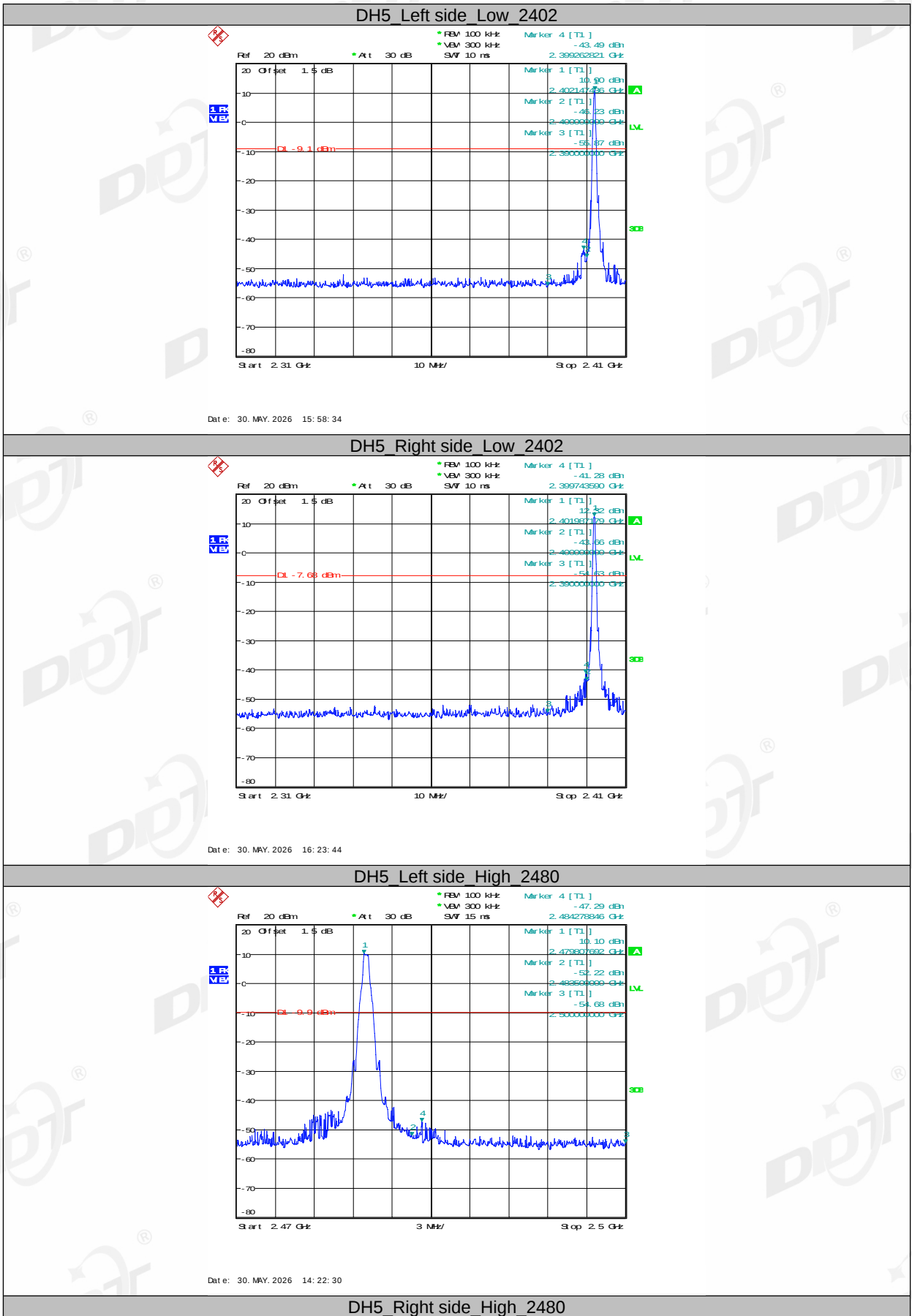
RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Detector Mode:	Peak
Sweep time:	Auto
Trace mode	Max hold
- (3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
- (4) Then mark the maximum amplitude of all unwanted emissions outside of the authorized frequency band.

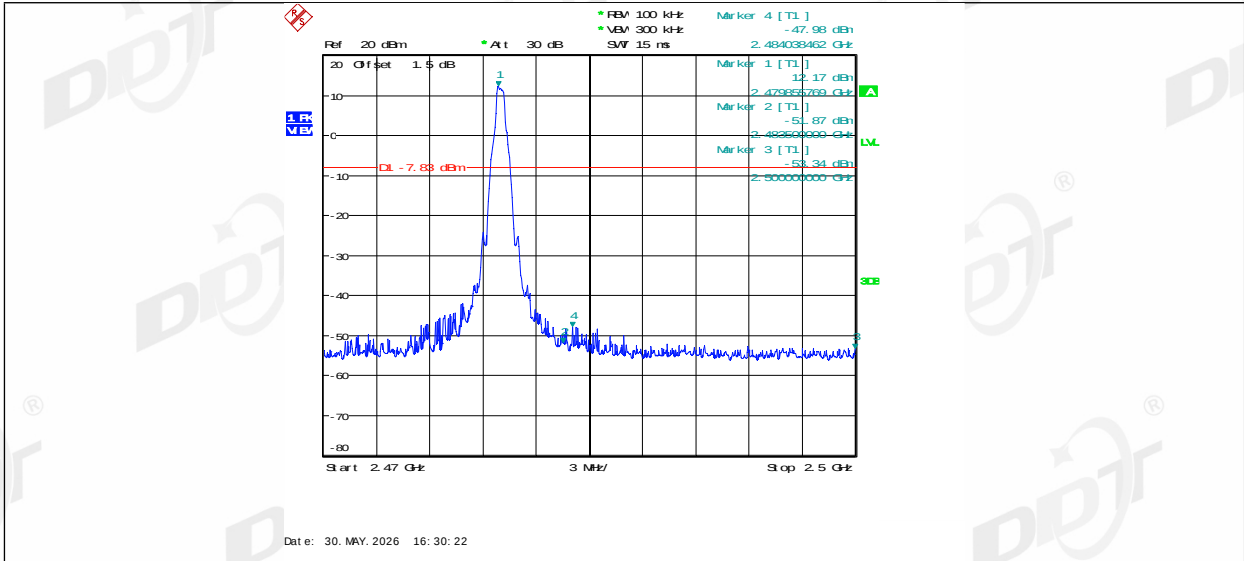
10.4. Test result

Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

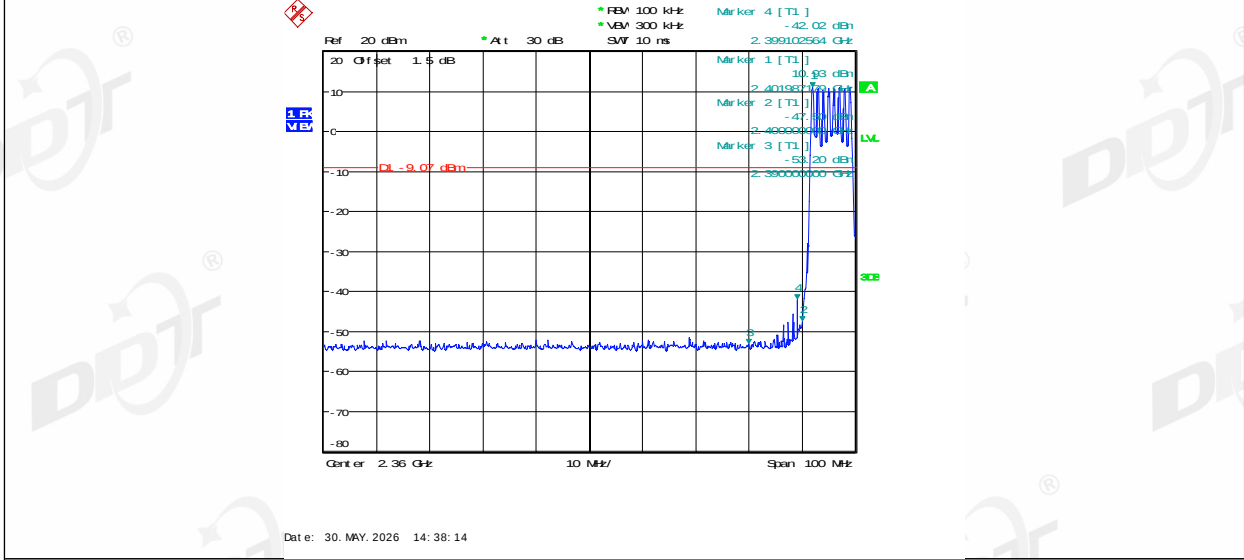
Mode	Freq. (MHz)	Verdict
GFSK	Hopping off 2402	Pass
	Hopping off 2480	Pass
	Hopping on	Pass
$\pi/4$ -DQPSK	Hopping off 2402	Pass
	Hopping off 2480	Pass
	Hopping on	Pass

10.5. Test graphs

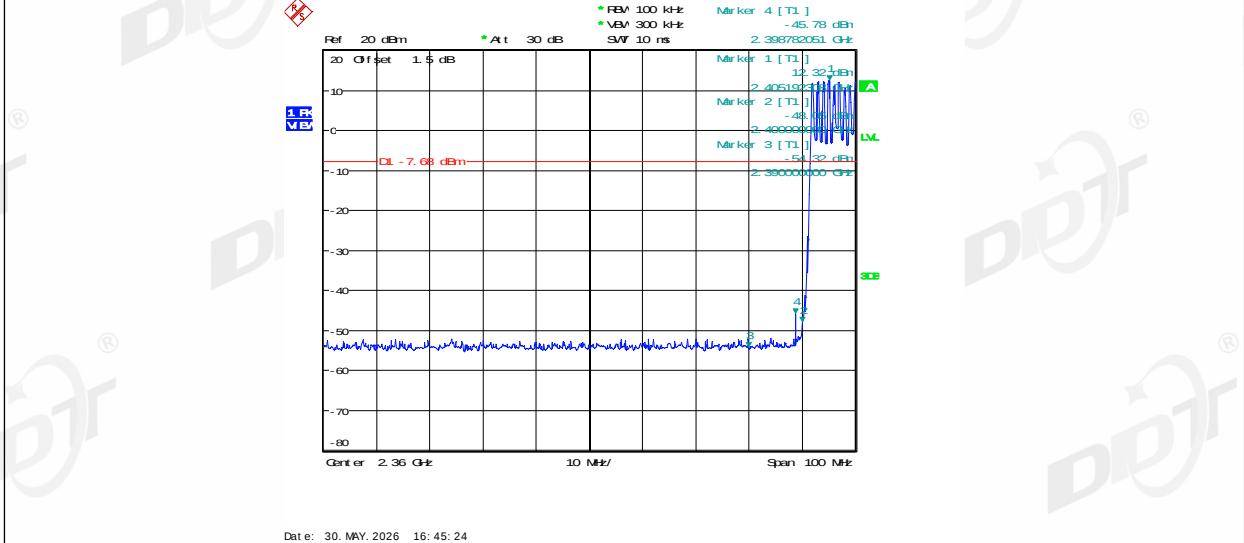




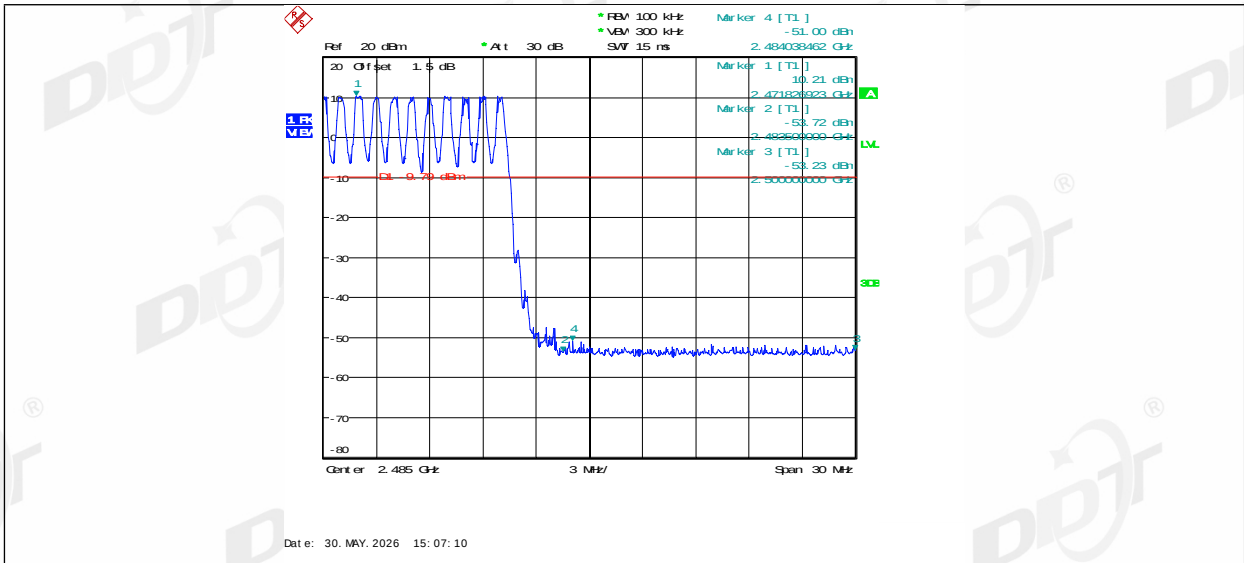
DH5 Left side Low Hop 2402



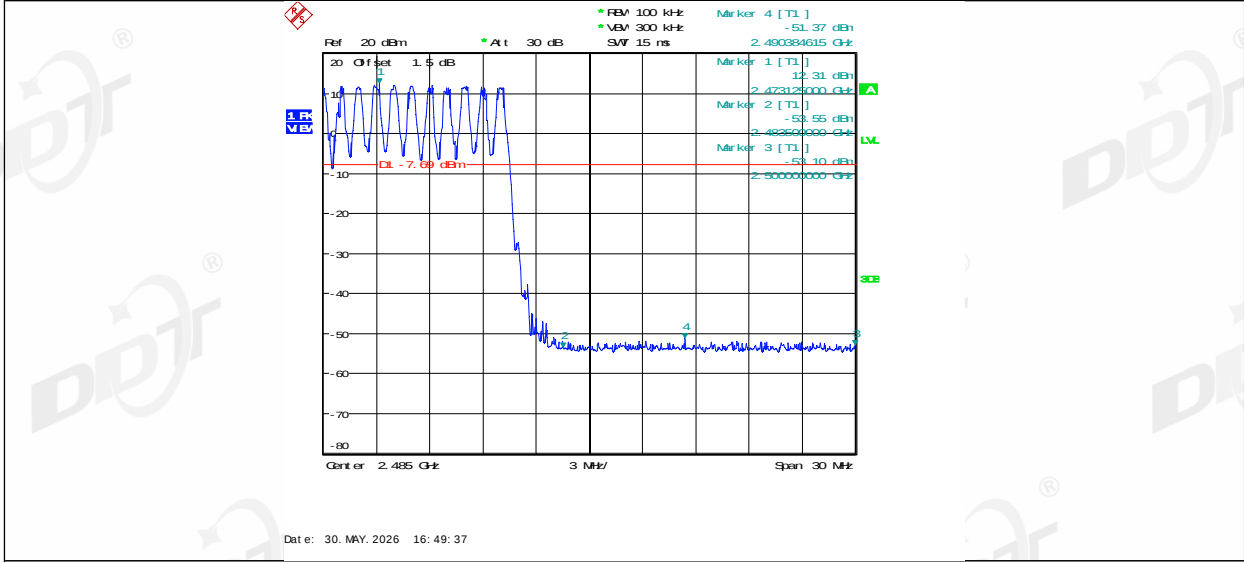
DH5 Right side Low Hop 2402



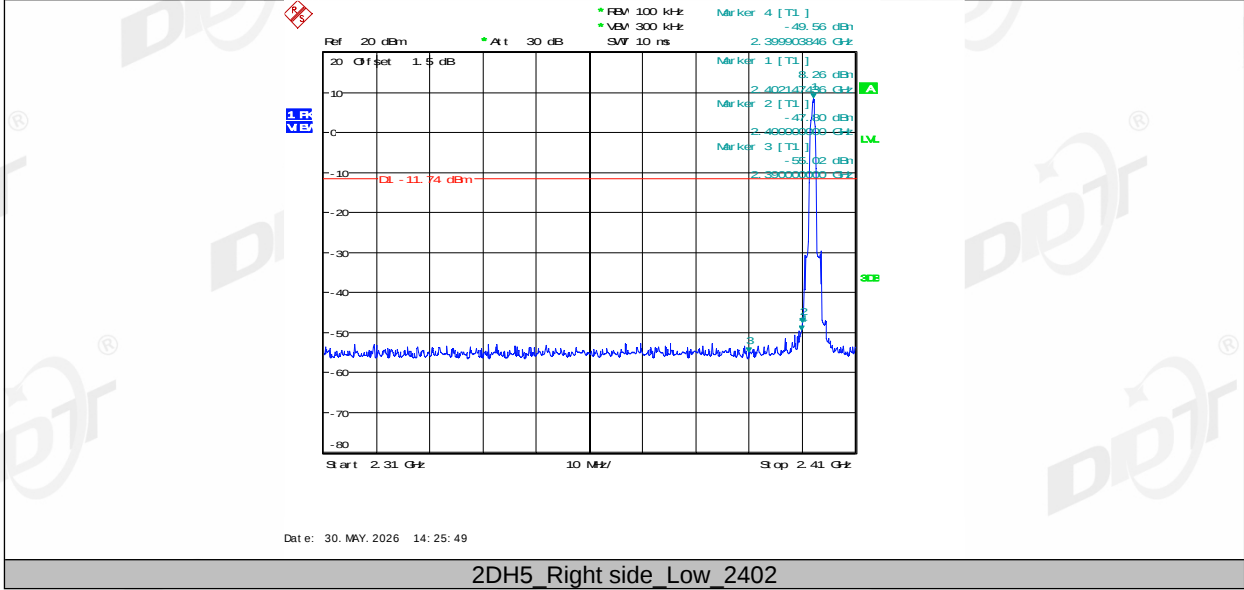
DH5 Left side High Hop 2480



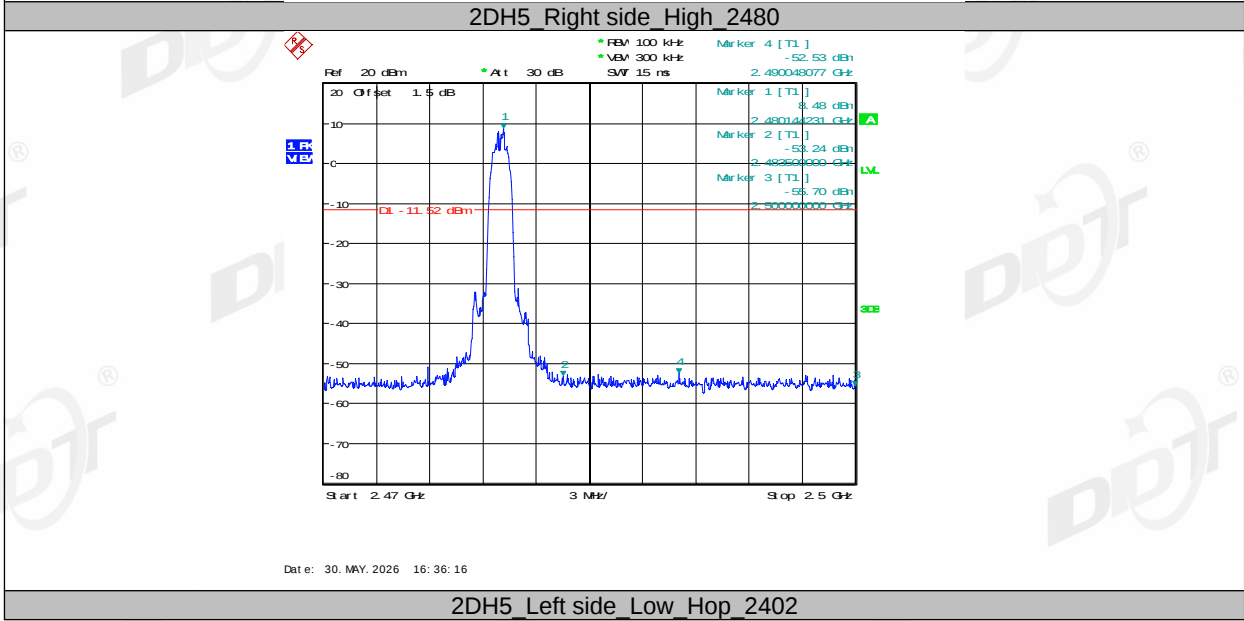
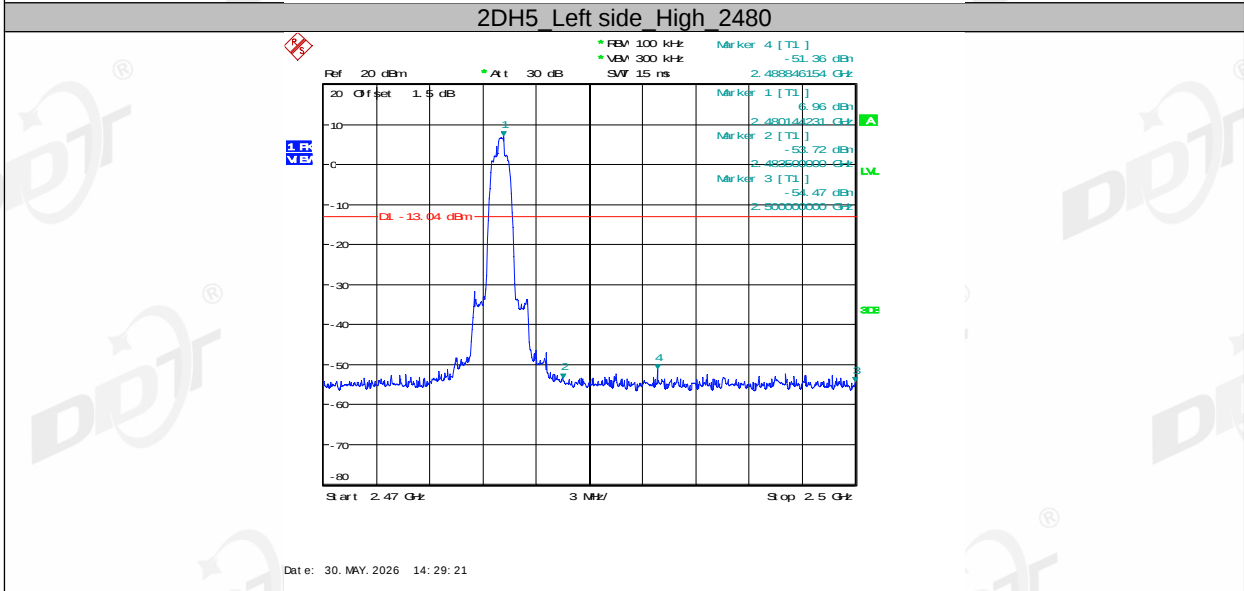
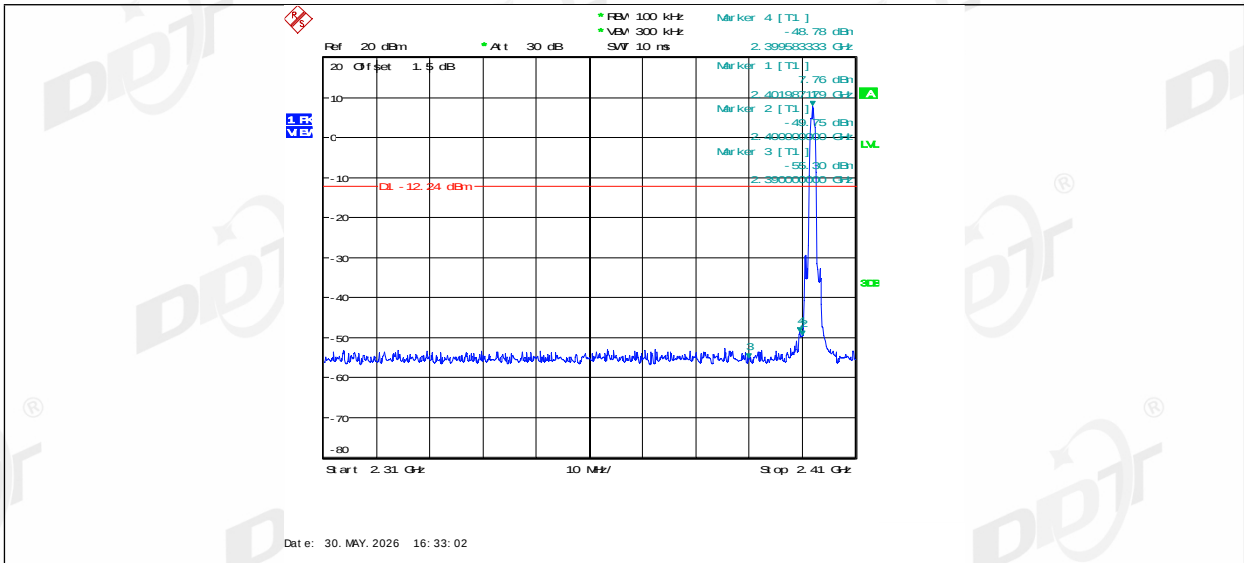
DH5_Right side_High_Hop_2480

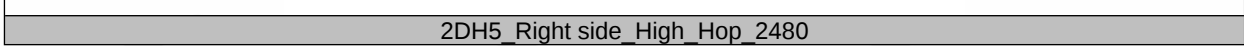
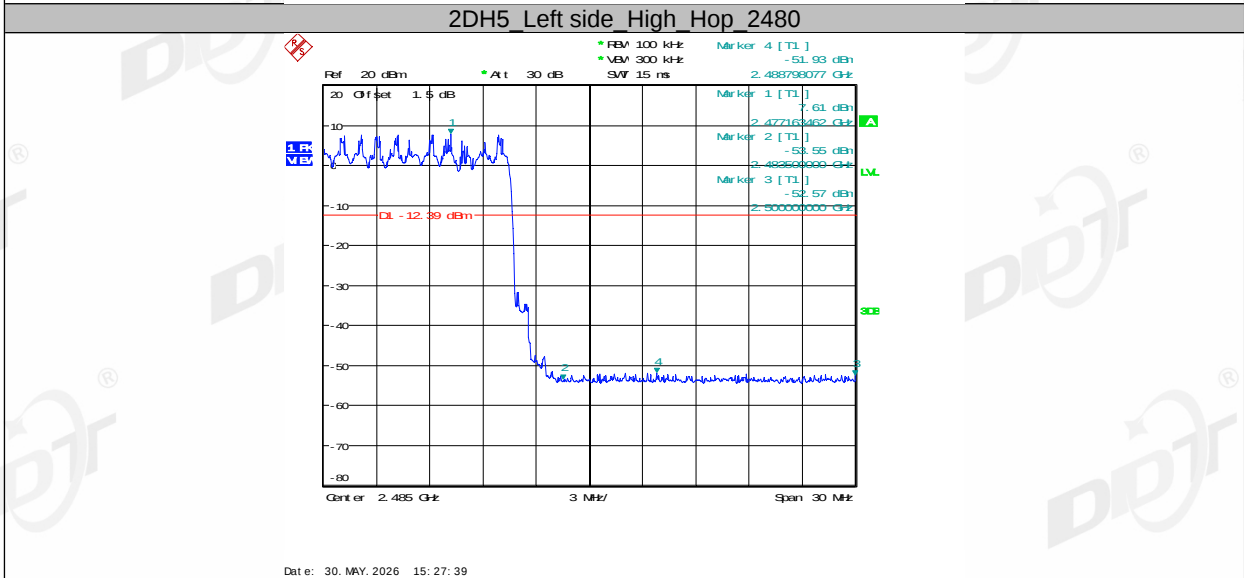
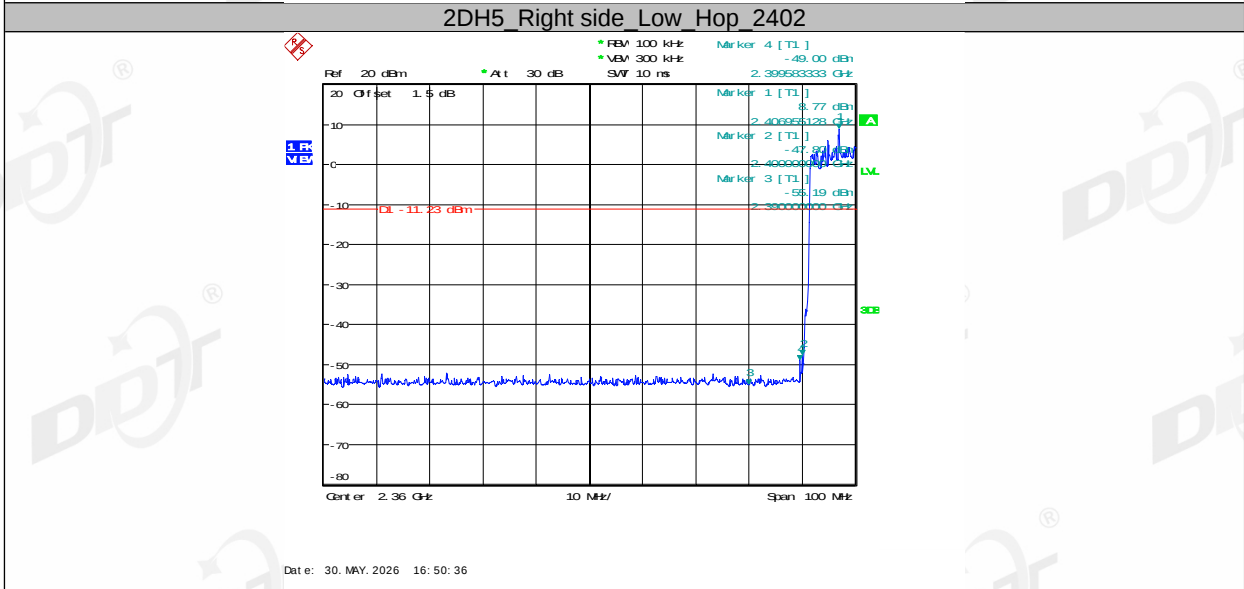
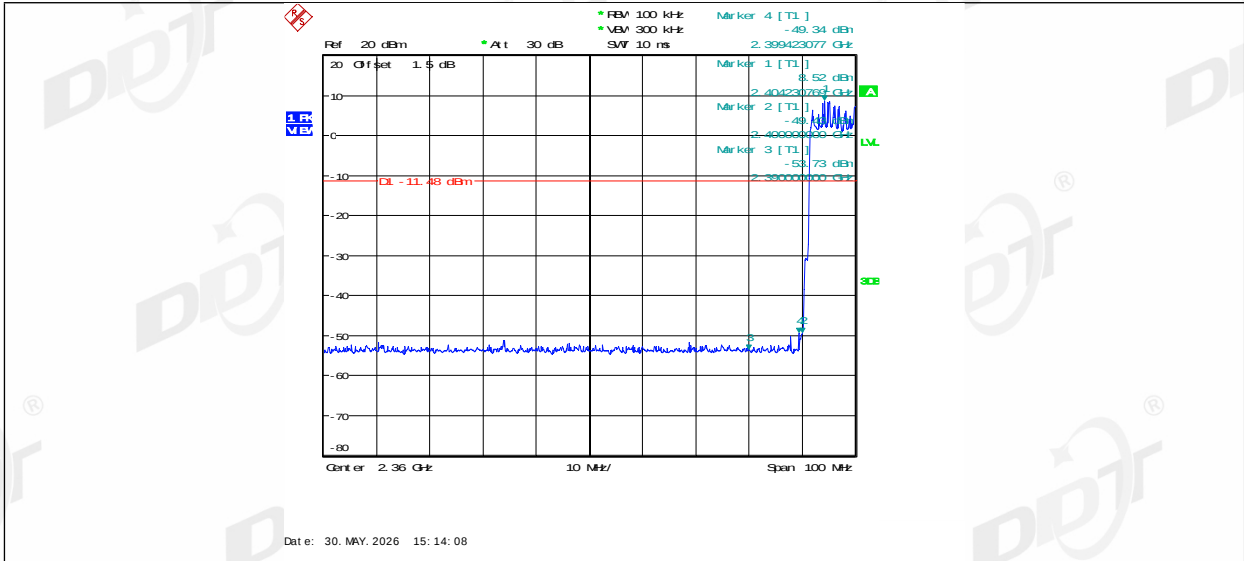


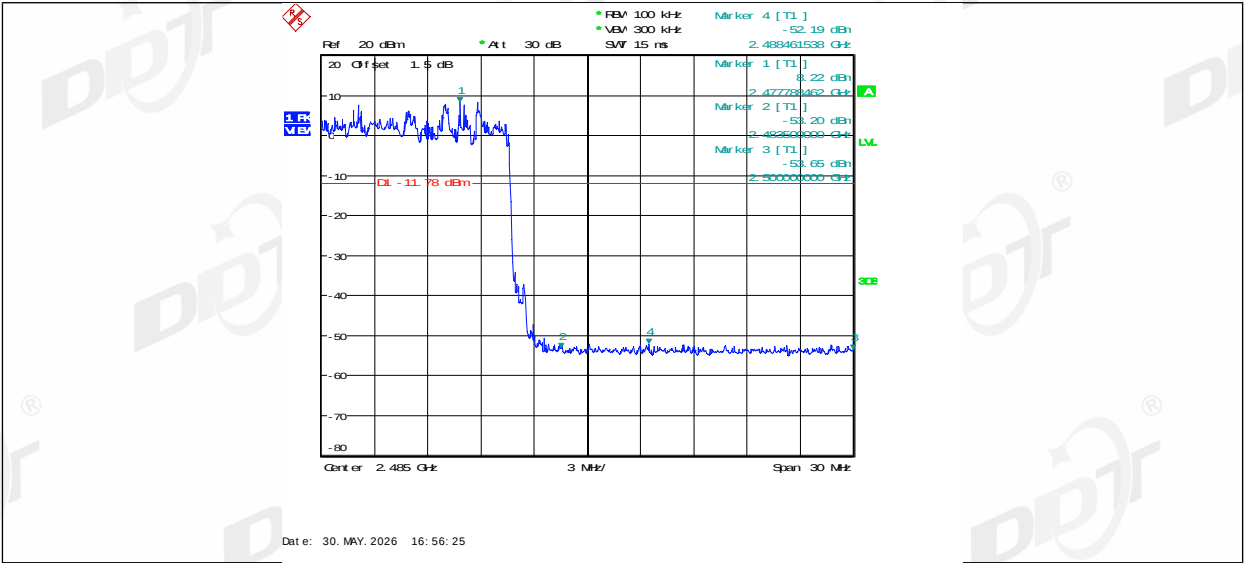
2DH5_Left side_Low_2402



2DH5_Right side_Low_2402

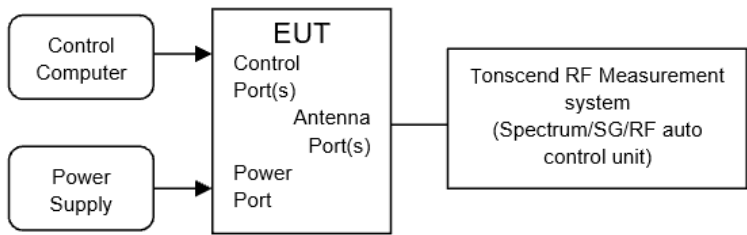






11. RF Conducted Spurious Emissions

11.1. Block diagram of test setup



11.2. Limits

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

11.3. Test procedure

- (1) Connect EUT's antenna output to spectrum analyzer by RF cable.
 - (2) Establish a reference level by using the following procedure:

Center frequency	Test frequency
RBW:	100 kHz
VBW:	300 kHz
Span	Wide enough to capture the peak level of the in-band emission
Detector Mode:	Peak
Sweep time:	Auto
Trace mode	Max hold
 - (3) Allow the trace to stabilize, use the peak marker function to determine the maximum peak power level to establish the reference level.
 - (4) Set the spectrum analyzer as follows:

RBW:	100 kHz
VBW:	300 kHz
Span	Encompass frequency range to be measured
Number of measurement points	$\geq \text{Span}/\text{RBW}$
Detector Mode:	Peak
Sweep time:	Auto
Trace mode	Max hold
- Allow the trace to stabilize, use the peak marker function to determine the maximum amplitude of all unwanted emissions outside of the authorized frequency band

11.4. Test result

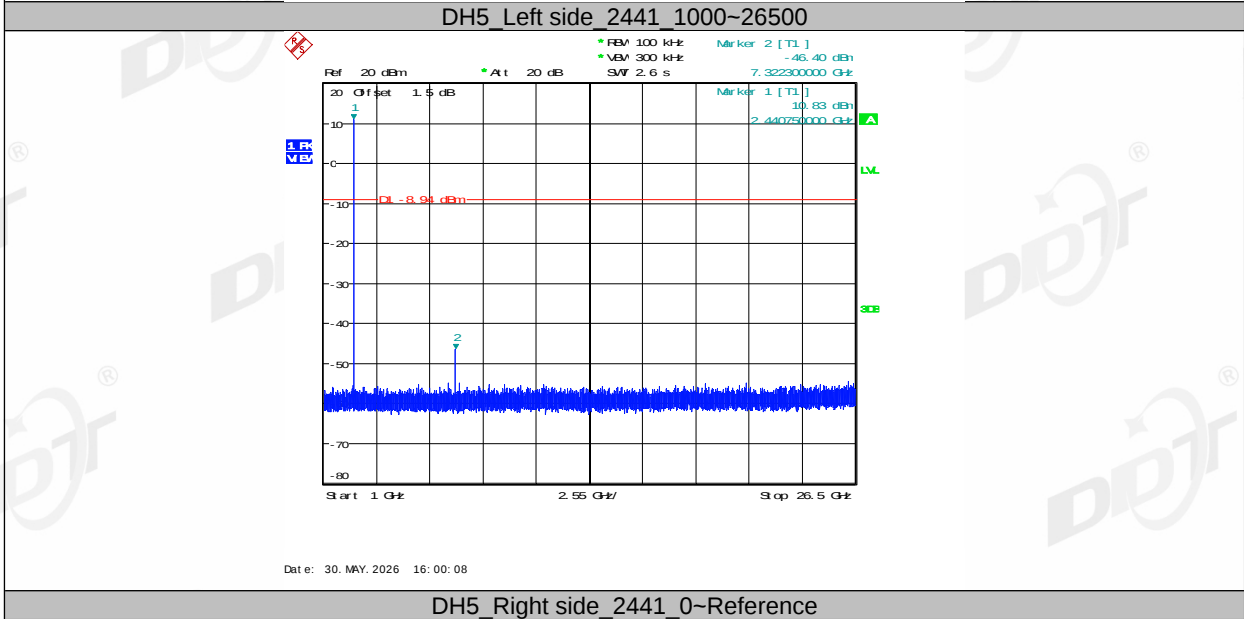
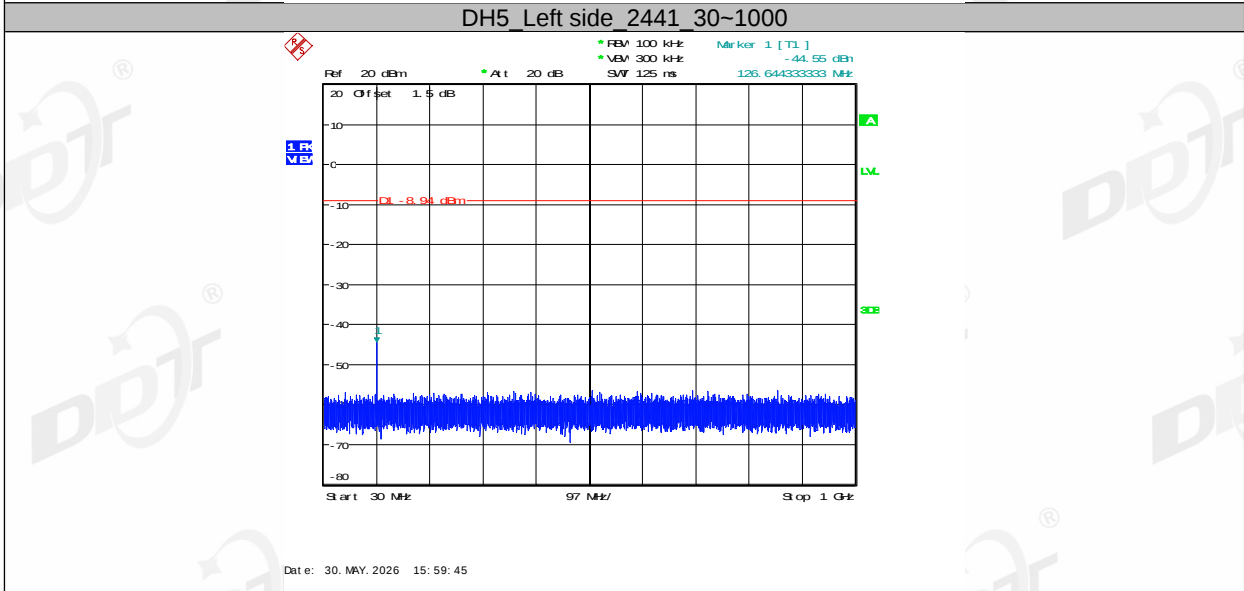
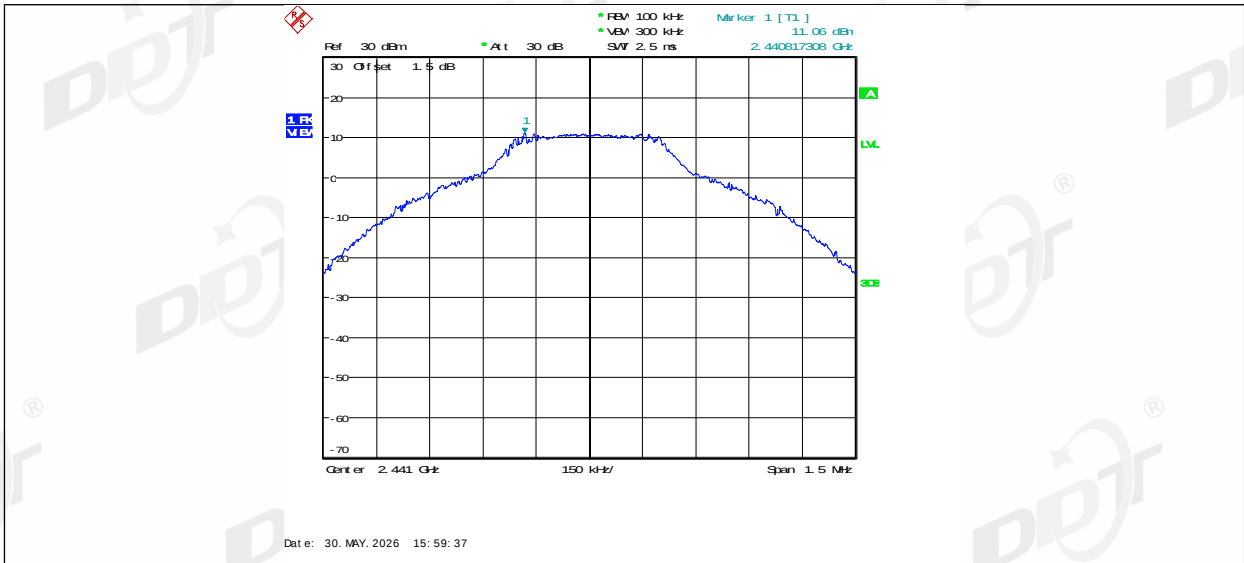
Test Engineer:	Zeng zhongyao	Test Site:	RF Measurement system 2#
Ambient Condition:	25℃,45%RH	Test Date:	2026.5.30
Test Power Supply:	Battery	Sample Number:	S26052025-007

Mode	Freq. (MHz)	Verdict
GFSK	Hopping off 2402	Pass
	Hopping off 2441	Pass
	Hopping off 2480	Pass
π /4-DQPSK	Hopping off 2402	Pass
	Hopping off 2441	Pass
	Hopping off 2480	Pass

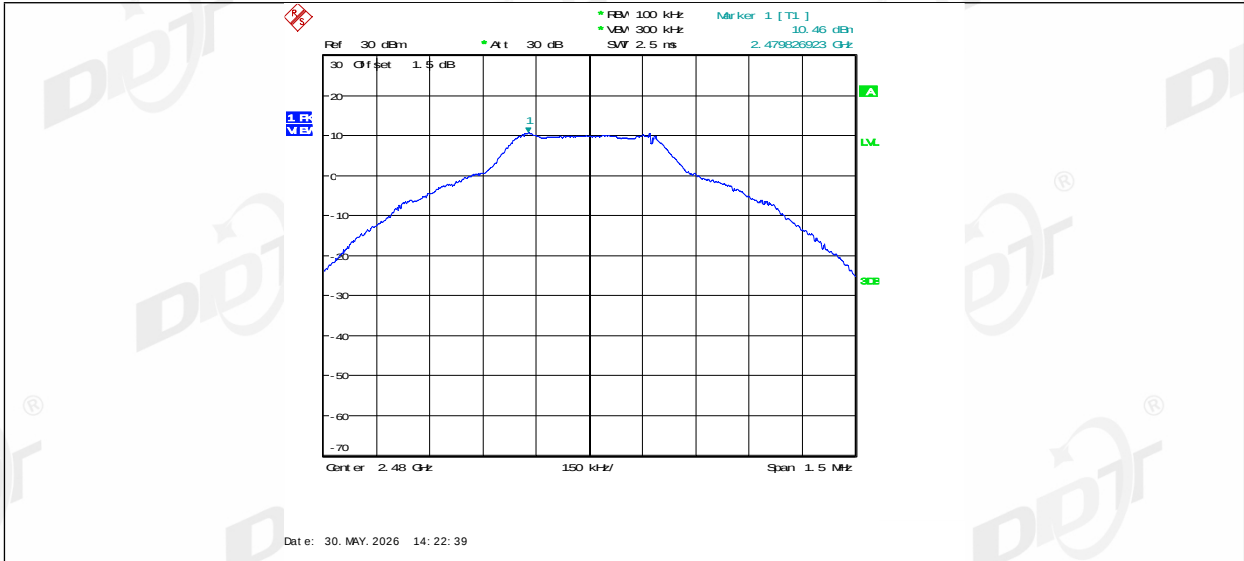
11.5. Test graphs



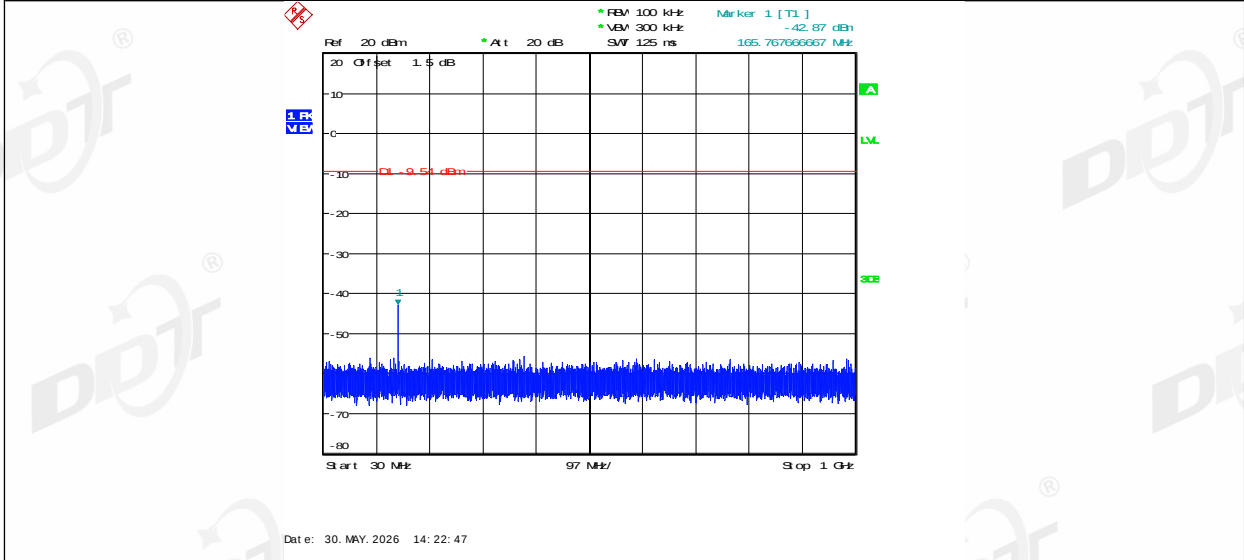




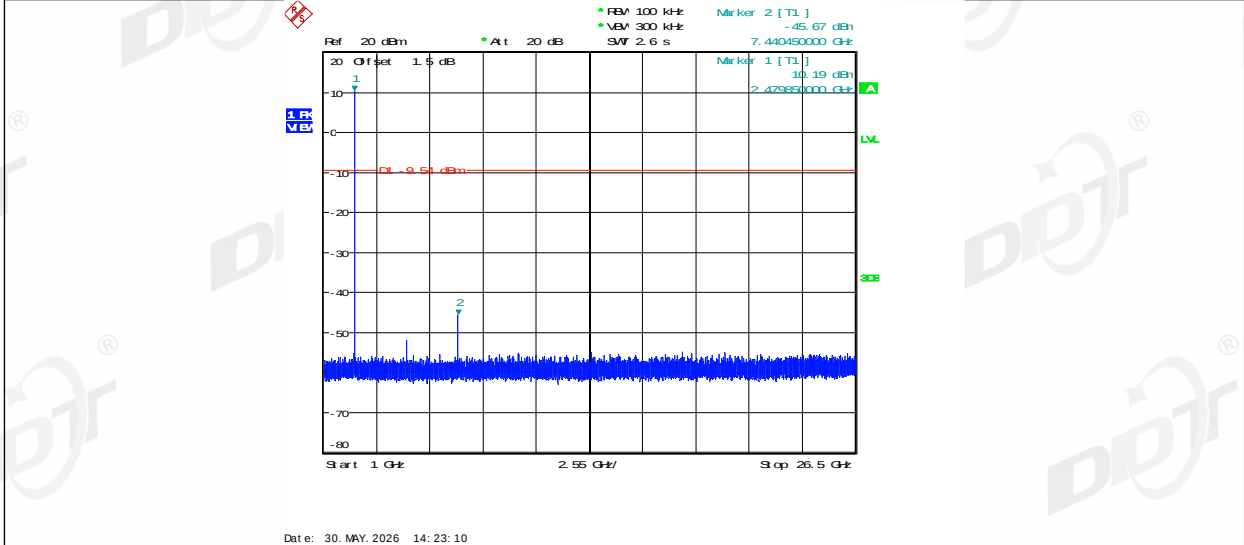




DH5 Left side 2480 30~1000



DH5 Left side 2480 1000~26500



DH5 Right side 2480 0~Reference