



FCC CERTIFICATION TEST REPORT

Applicant	:	JBU GLOBAL LLC
Address of Applicant	:	19416 NE 26th AVE, 114B, Miami, Florida 33180, United States
Manufacturer	:	SHENZHEN GXTSONIC TECHNOLOGY CO., LTD
Address of Manufacturer	:	1F, Building 3, Tianxin Shuichan Industrial Park, Gushu Village, Xixiang Town, Bao'an District, Shenzhen, CHINA
Equipment under Test	:	Sonoro G5
Model No.	:	Sonoro G5, CS-K11
Trade Mark	:	N/A
FCC ID	:	2A7ZM-SONOROG5
Test Standard(s)	:	FCC Rules and Regulations Part 15 Subpart C, ANSI C63.10:2013,
Report No.	:	DDT-RE23070410-2E03
Issue Date	:	2023/10/30
Issue By	:	Gongdong Dongdian Testing Service Co., Ltd.
Address of Laboratory	:	Unit 2, Building 1, No. 17, Zongbu 2nd Road, Songshan Lake Park, Dongguan, Guangdong, China, 523808

REPORT

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Test Report Declare

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Trade Mark	:	N/A
Manufacturer	:	SHENZHEN GXTSONIC TECHNOLOGY CO., LTD
Address of Manufacturer	:	1F, Building 3, Tianxin Shuichan Industrial Park, Gushu Village, Xixiang Town, Bao'an District, Shenzhen, CHINA

Test Standard Used:

FCC Rules and Regulations Part 15 Subpart C

Test Procedure Used:

ANSI C63.10:2013

We Declare:

The equipment described above is tested by Gongdong 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 Gongdong Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After test and evaluation, our opinion is that the equipment provided for test compliance with the requirement of the above FCC standards.

Report No.:	DDT-RE23070410-2E03		
Date of Receipt:	Aug. 16, 2023	Date of Test:	Aug. 16, 2023 ~ Oct. 30.2023

Prepared By:

Tiger Mo

Tiger Mo/Engineer

Approved By:

Damon Hu

Damon Hu/EMC Manager

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

Revision History

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	2023/10/30	

1. Summary of Test Results

Description of Test Item	Standard	Result
Maximum Peak Output Power	FCC Part 15: 15.247(b)(1)	Pass
20 dB Bandwidth	FCC Part 15: 15.247(a)(1)	Pass
Carrier Frequency Separation	FCC Part 15: 15.247(a)(1)	Pass
Number of Hopping Channel	FCC Part 15: 15.247(a)(1)(iii)	Pass
Dwell Time	FCC Part 15: 15.247(a)(1)(iii)	Pass
RF Conducted Spurious Emissions	FCC Part 15: 15.247(d)	Pass
Radiated Emission	FCC Part 15: 15.205 FCC Part 15: 15.209 FCC Part 15: 15.247(d)	Pass
Band Edge Compliance	FCC Part 15: 15.205 FCC Part 15: 15.209 FCC Part 15: 15.247(d)	Pass
Power Line Conducted Emissions	FCC Part 15: 15.207(a)	Pass
Antenna Requirement	FCC Part 15: 15.203	Pass

Note 1: Determining compliance based on the results of the compliance measurement, not taking into account measurement uncertainty.

Note 2: There are three Bluetooth modules on the product, and this report is the Bluetooth module corresponding to the Chip antenna. The two Chip antenna in RF circuit, layout, peripheral circuit, RF output impedance matching circuit, antenna parameters and specifications are the same. Therefore, One group can be tested.

Note 3: All antennas have been tested, and only the worst case is shown in report, the conduct data is the one with high power, the radiation data is Ant1, Ant2 and Ant3 in the simultaneous state.

Note 4: There are two types of adapters in this product, and different adapters has no effect on the above 1GHz part. The below 1GHz Radiated Emission and Power Line Conducted Emissions has tested.

2. General Test Information

2.1. Description of EUT

EUT Name	: Sonoro G5
Model Number	: Sonoro G5, CS-K11
Difference of models	: Above models are identical in schematic and structure, only the Model Number is different for all the models, therefore the test performed on the model CS-K11.
EUT Function Description	: Please reference user manual of this device
Power Supply	: DC 5V - 1A (USB-C input), Rechargeable Lithium, 3600mAh for speaker
Radio Specification	: Bluetooth V5.0 (BR/EDR)
Operation Frequency	: Bluetooth (BR/EDR): 2402 MHz-2480 MHz
Modulation	: Bluetooth BR/EDR: GFSK, $\pi/4$ -DQPSK
Data Rate	: 1 Mbps, 2 Mbps
Antenna	: Chip antenna , maximum PK gain: 2.7dBi
Sample Number	: S23070410-01

Note 1: “☑” means to be chosen or applicable; “☐” means don't to be chosen or not applicable; This note applies to entire report.

Note 2: Channel information:

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 3: 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.

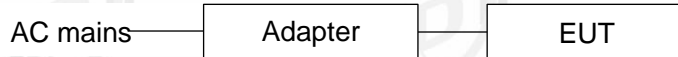
2.2. Accessories of EUT

Description of Accessories	Manufacturer	Model number	Description	Remark
Adapter	N/A	WS-D00505010050	Input: 100-240V~50/60Hz 0.3A Output: 5V/1A	N/A
Adapter	N/A	U282E0A050100	Input: 100-240V~50/60Hz 0.15A Output: 5V/1A	N/A
Coaxial cable	N/A	N/A	N/A	Length: 1.5m
AUX cable	N/A	N/A	N/A	Length: 1.5m
Type-C cable	N/A	N/A	N/A	Length: 0.8m

2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	EMC Compliance	SN
NoteBook	Lenovo	i5-3230M	N/A	MM-202201270935

2.4. Block diagram of EUT configuration for test



Test software: FCC_assist_1.0.1.2.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, channel, information			
Mode	Setting Tx Power	Channel	Frequency (MHz)
GFSK hopping on Tx mode	10	CH0 to CH78	2402 to 2480
$\pi/4$ -DQPSK hopping on Tx mode	10	CH0 to CH78	2402 to 2480
GFSK hopping off Tx mode	10	CH0	2402
	10	CH39	2441
	10	CH78	2480
$\pi/4$ -DQPSK hopping off Tx mode	10	CH0	2402
	10	CH39	2441
	10	CH78	2480

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

Gongdong 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-20155, G-20118

2.8. Measurement uncertainty

Test Item	Uncertainty
Bandwidth	1.1%
Peak Output Power (Conducted) (Spectrum analyzer)	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Peak Output Power (Conducted) (Power Sensor)	0.74 dB
Power Spectral Density	0.74 dB (10 MHz ≤ f < 3.6 GHz);
	1.38 dB (3.6 GHz ≤ f < 8 GHz)
Frequencies Stability	6.7 x 10 ⁻⁸ (Antenna couple method)
	5.5 x 10 ⁻⁸ (Conducted method)
Conducted spurious emissions	0.86 dB (10 MHz ≤ f < 3.6 GHz);
	1.40 dB (3.6 GHz ≤ f < 8 GHz)
	1.66 dB (8 GHz ≤ f < 26.5 GHz)
Uncertainty for radio frequency (RBW < 20 kHz)	3x10 ⁻⁸
Temperature	0.4 °C
Humidity	2 %
Uncertainty for Radiation Emission test (9 kHz – 30 MHz)	3.44 dB
Uncertainty for Radiation Emission test (30 MHz - 1 GHz)	4.70 dB (Antenna Polarize: V)
	4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation Emission test (1 GHz - 40 GHz)	4.10 dB (1 - 6 GHz)
	4.40 dB (6 GHz - 18 GHz)
	3.54 dB (18 GHz - 26 GHz)
	4.30 dB (26 GHz - 40 GHz)
Uncertainty for Power line conduction emission test	3.34dB (150KHz-30MHz)
	3.72dB (9KHz-150KHz)

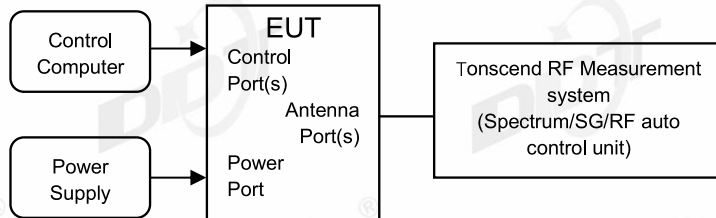
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3. Equipment Used During Conductive Test

Equipment	Manufacturer	Model No.	Serial Number	Due Date
<input checked="" type="checkbox"/> RF Connected Test (RF Measurement System 2#)				
SPECTRUM ANALYZER	R&S	FSU26	201124	2024/07/11
Power Sensor	R&S	NRP-Z22	101254	2024/07/11
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 C63.10-2013 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:

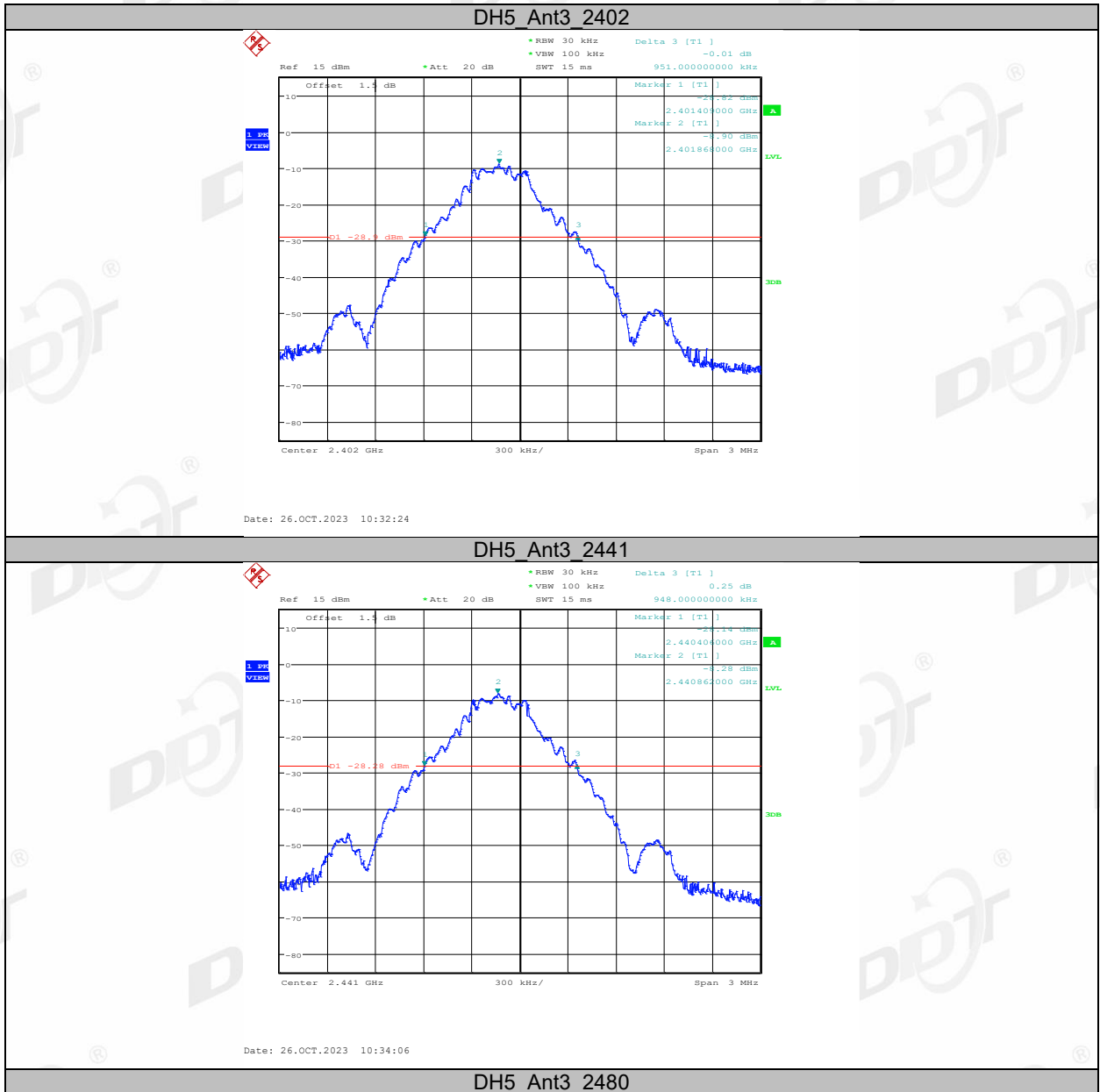
RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 2 times and 5 times the OBW
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold
- (5) Measure and record the results in the report.

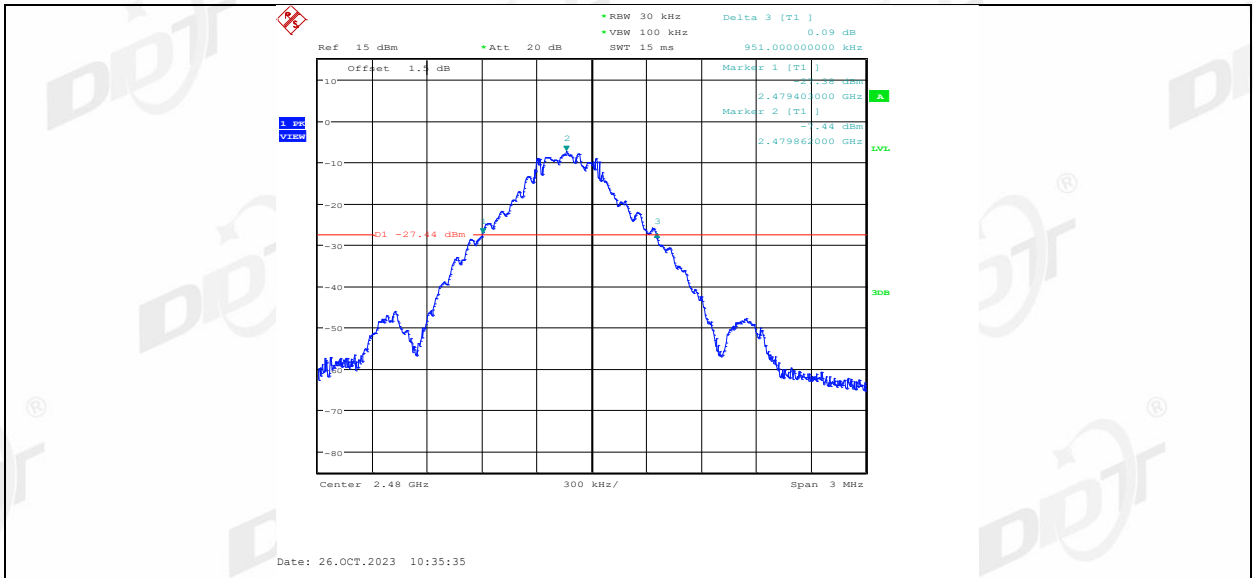
4.4. Test result

Test Site:	RF Measurement System 2#	Test Date:	2023.10.26-2023.10.26
Ambient Condition:	25.1°C, 43.2 %RH	Test Engineer:	Zora Zhang
Equipment under Test	Sonoro G5	Model No.:	CS-K11
Sample Number	S23070410-01	Test Power Supply:	Battery

Test Mode	Antenna	Frequency [MHz]	20dB EBW[MHz]
DH5	Ant3	2402	0.95
		2441	0.95
		2480	0.95
2DH5	Ant3	2402	1.28
		2441	1.28
		2480	1.28

4.5. Test graphs

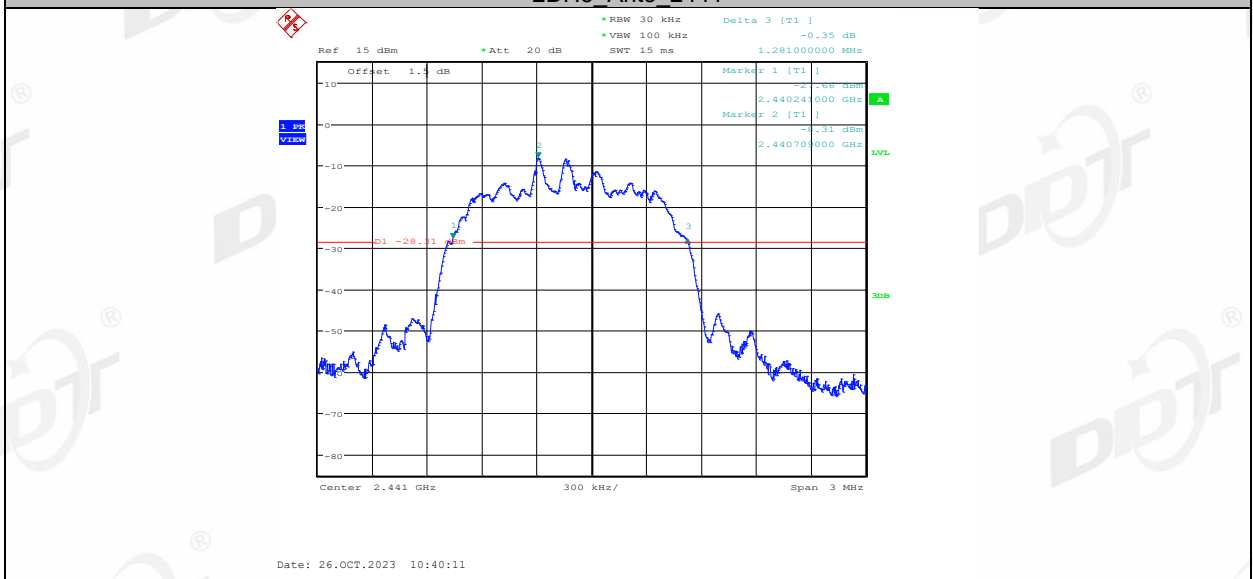




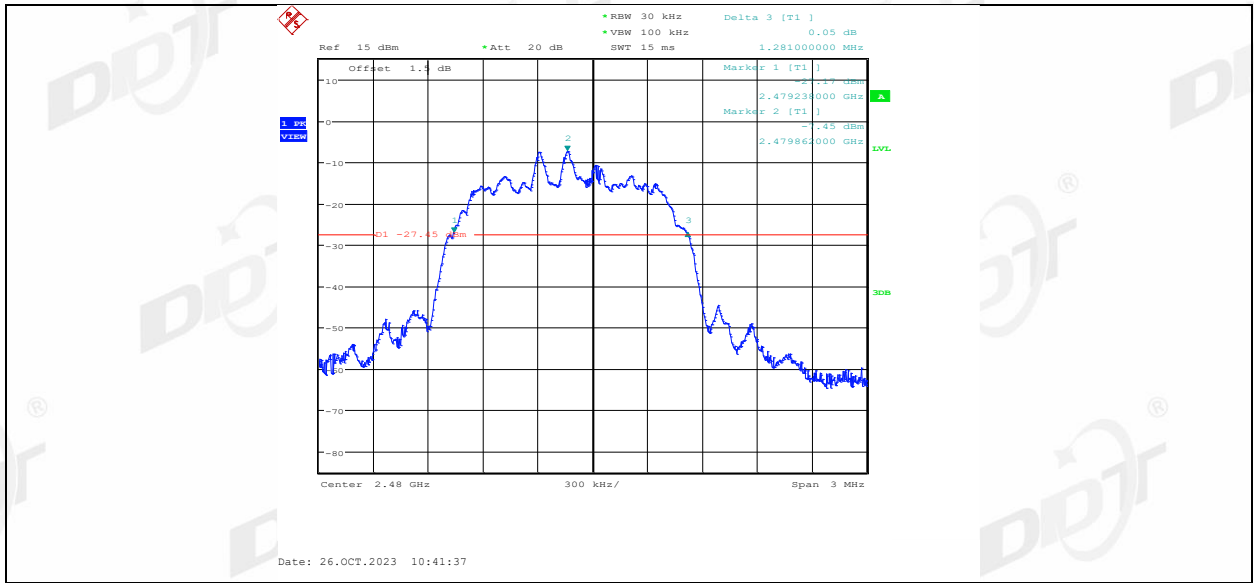
2DH5 Ant3 2402



2DH5 Ant3 2441

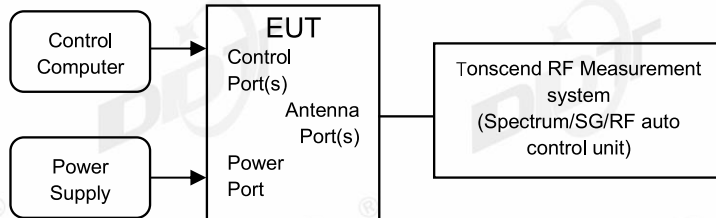


2DH5 Ant3 2480



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 C63.10-2013 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:

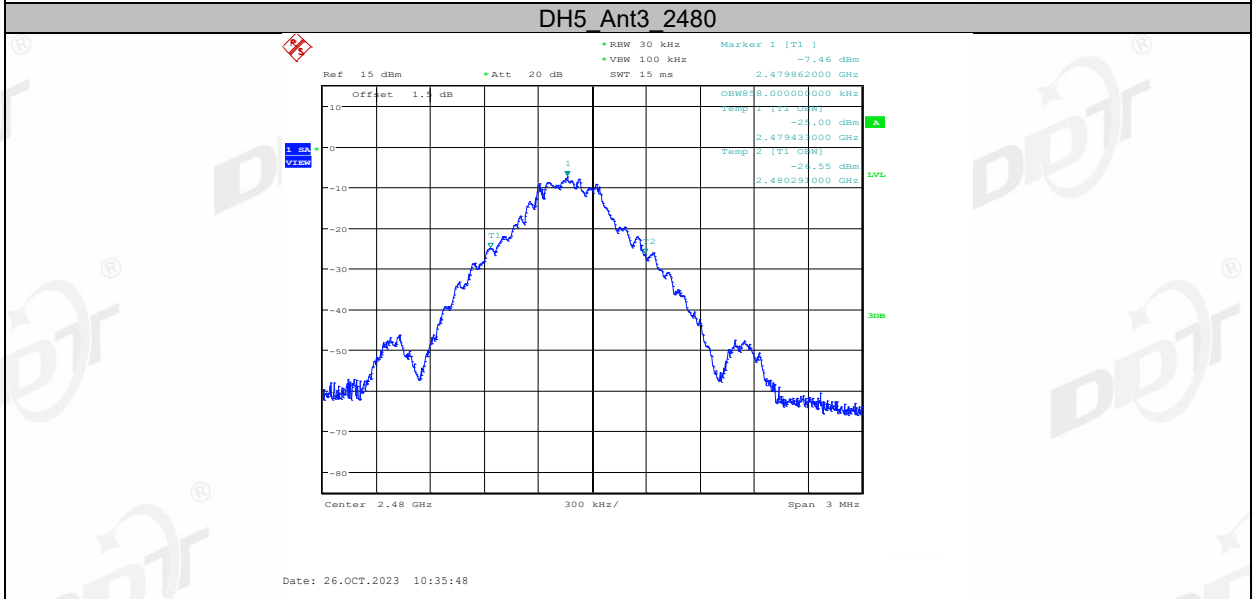
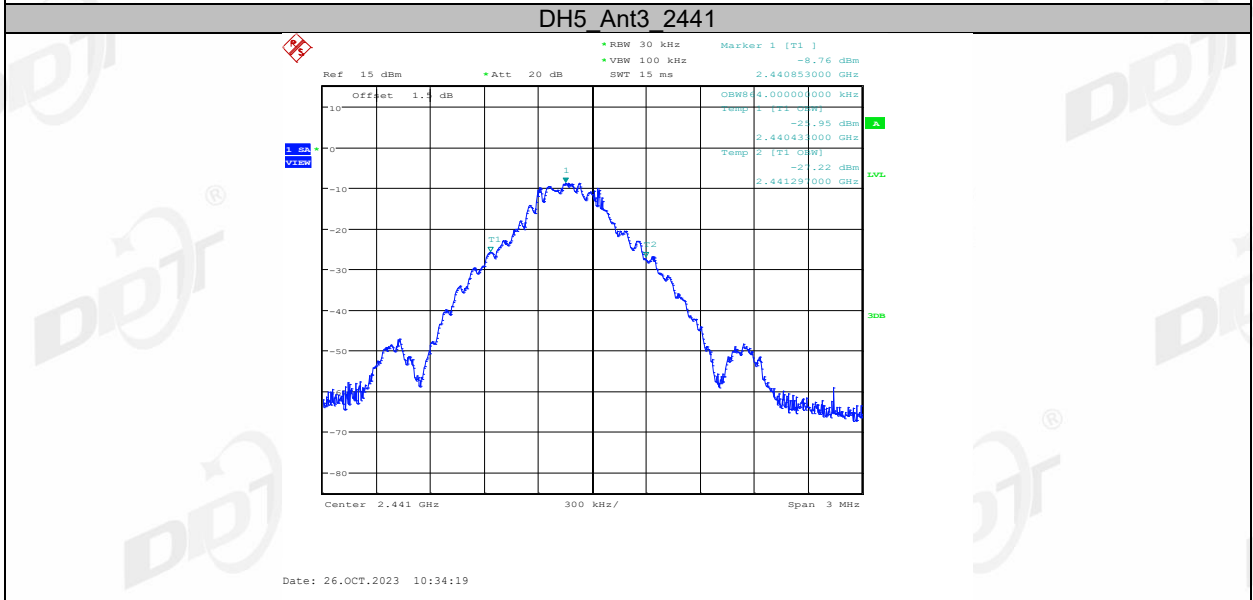
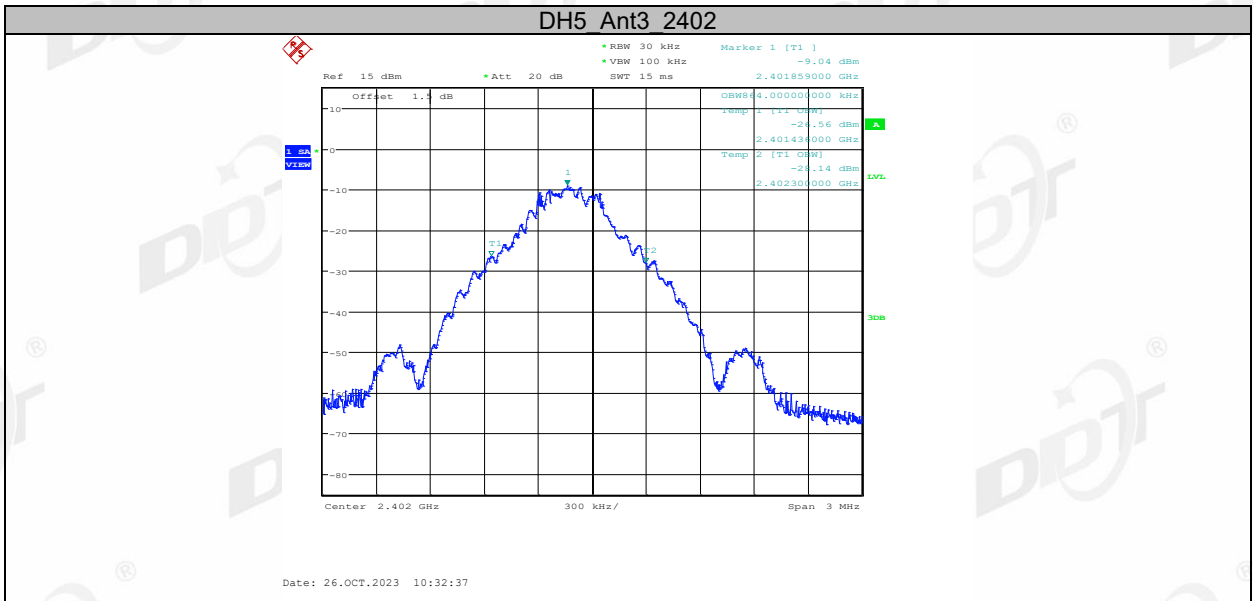
RBW:	1% to 5% of the OBW
VBW:	approximately three times RBW
Span:	between 1.5 times and 5.0 times the OBW
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold
- (5) Measure and record the results in the report.

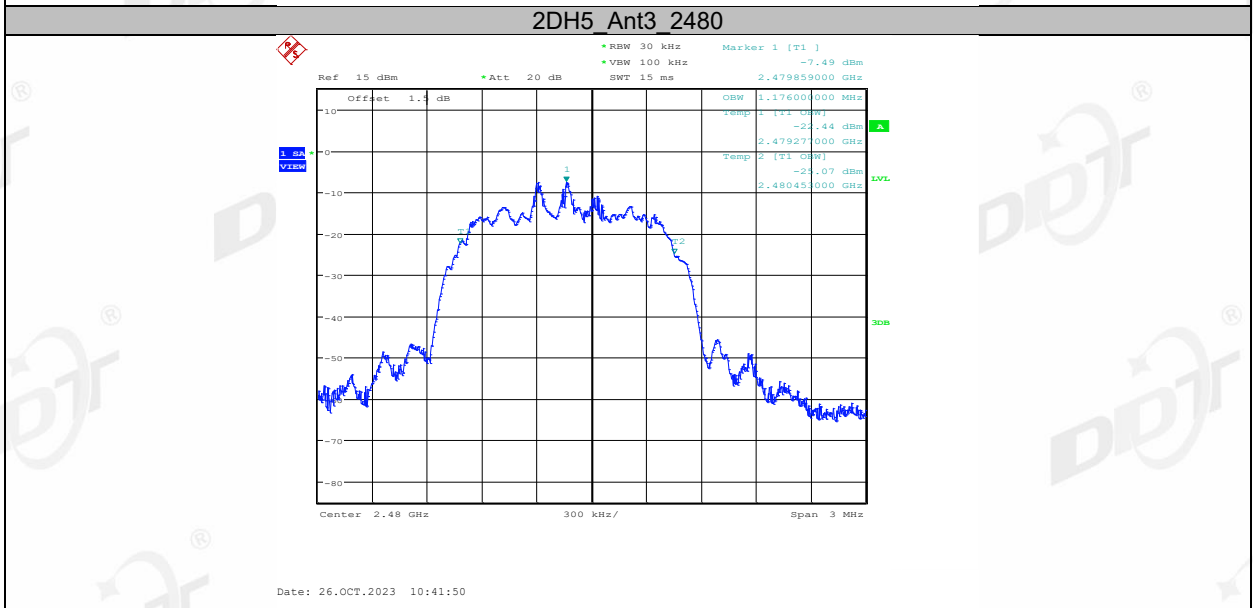
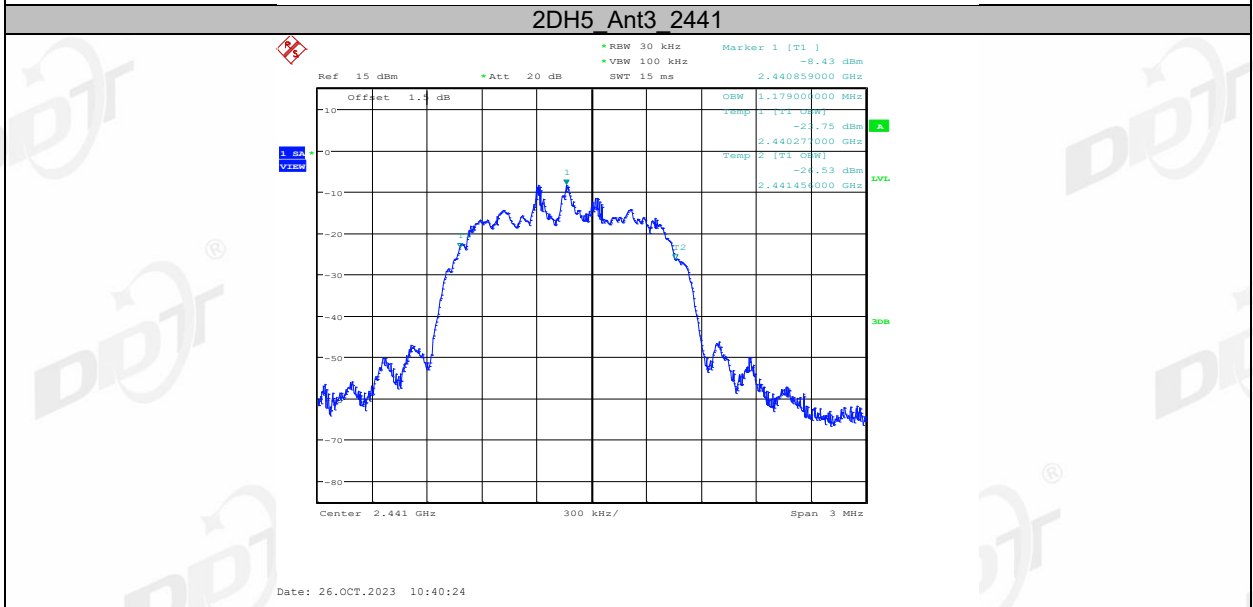
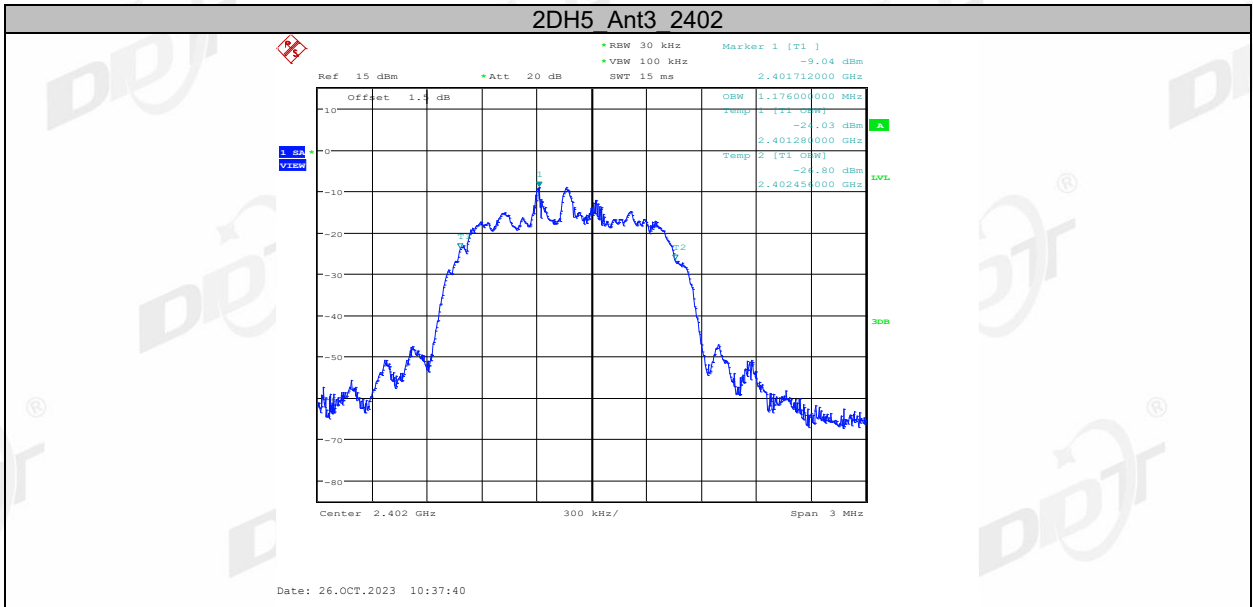
5.4. Test Result

Test Site:	RF Measurement System 2#	Test Date:	2023.10.26-2023.10.26
Ambient Condition:	25.1°C, 43.2 %RH	Test Engineer:	Zora Zhang
Equipment under Test	Sonoro G5	Model No.:	CS-K11
Sample Number	S23070410-01	Test Power Supply:	Battery

Test Mode	Antenna	Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]
DH5	Ant3	2402	0.864	2401.4360	2402.3000
		2441	0.864	2440.4330	2441.2970
		2480	0.858	2479.4330	2480.2910
2DH5	Ant3	2402	1.176	2401.2800	2402.4560
		2441	1.179	2440.2770	2441.4560
		2480	1.176	2479.2770	2480.4530

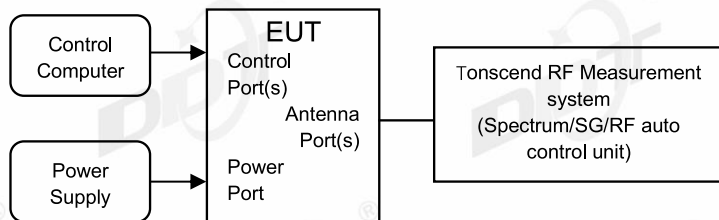
5.5. Test Graphs





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 C63.10-2013 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 Site:	RF Measurement System 2#	Test Date:	2023.10.26-2023.10.30
Ambient Condition:	25.1°C,43.2 %RH	Test Engineer:	Zora Zhang
Equipment under Test	Sonoro G5	Model No.:	CS-K11
Sample Number	S23070410-01	Test Power Supply:	Battery

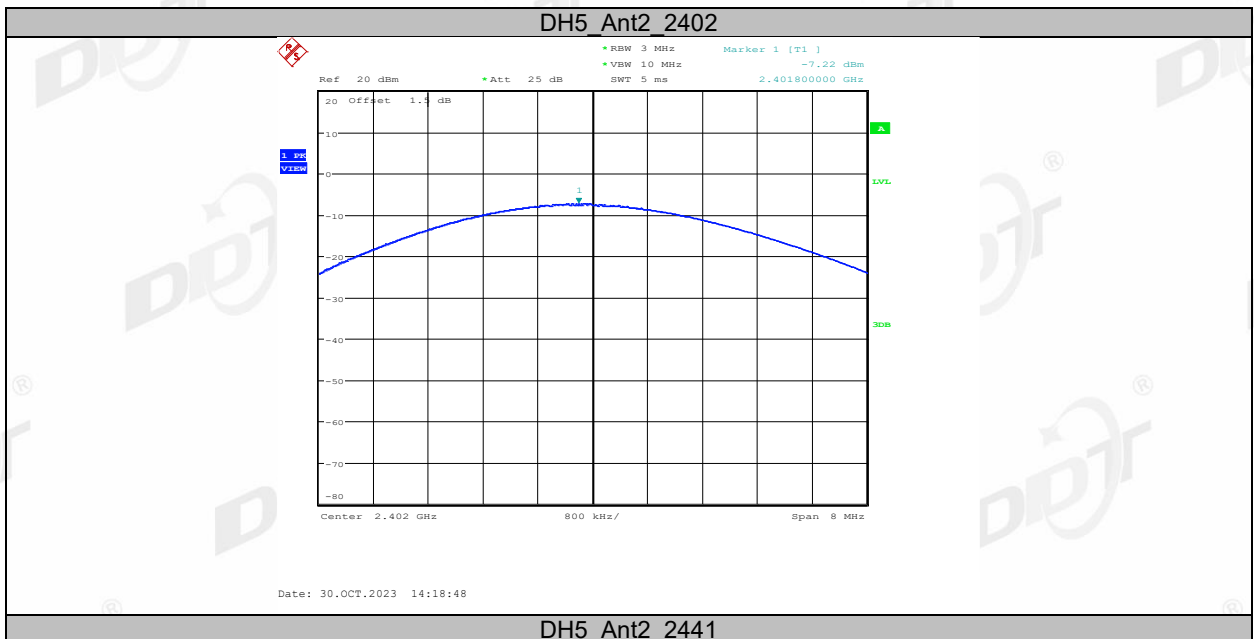
Ant2:

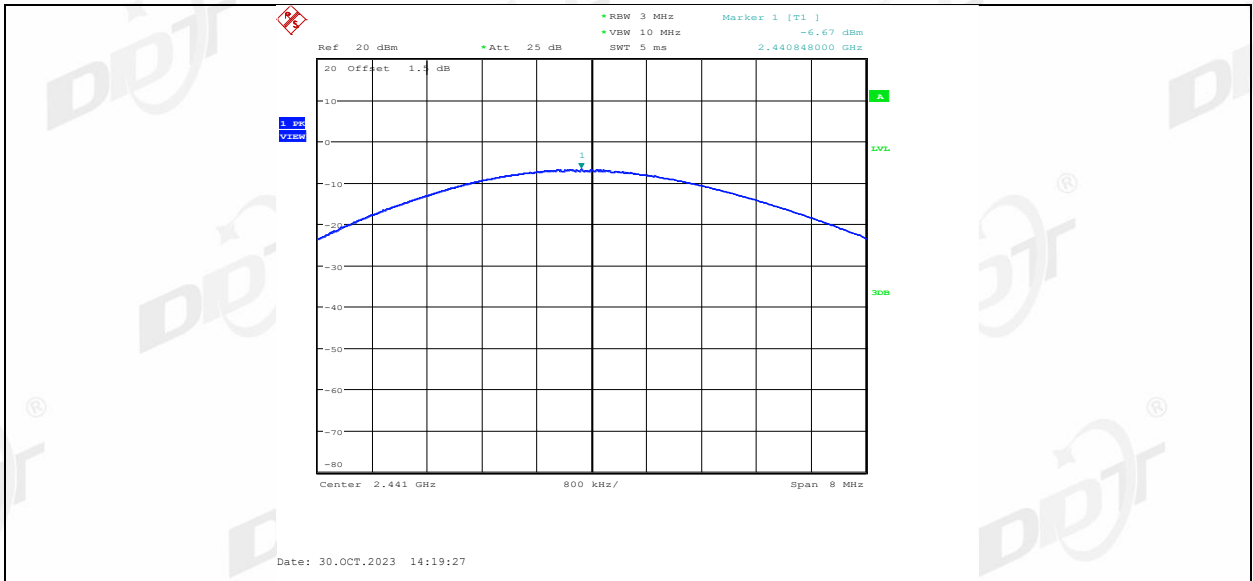
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit[dBm]	EIRP [dBm]	EIRP Limit[dBm]	Verdict
DH5	Ant2	2402	-7.22	≤20.97	-4.52	≤36	PASS
		2441	-6.67	≤20.97	-3.97	≤36	PASS
		2480	-5.31	≤20.97	-2.61	≤36	PASS
2DH5	Ant2	2402	-6.67	≤20.97	-3.97	≤36	PASS
		2441	-6.15	≤20.97	-3.45	≤36	PASS
		2480	-4.81	≤20.97	-2.11	≤36	PASS

Ant3:

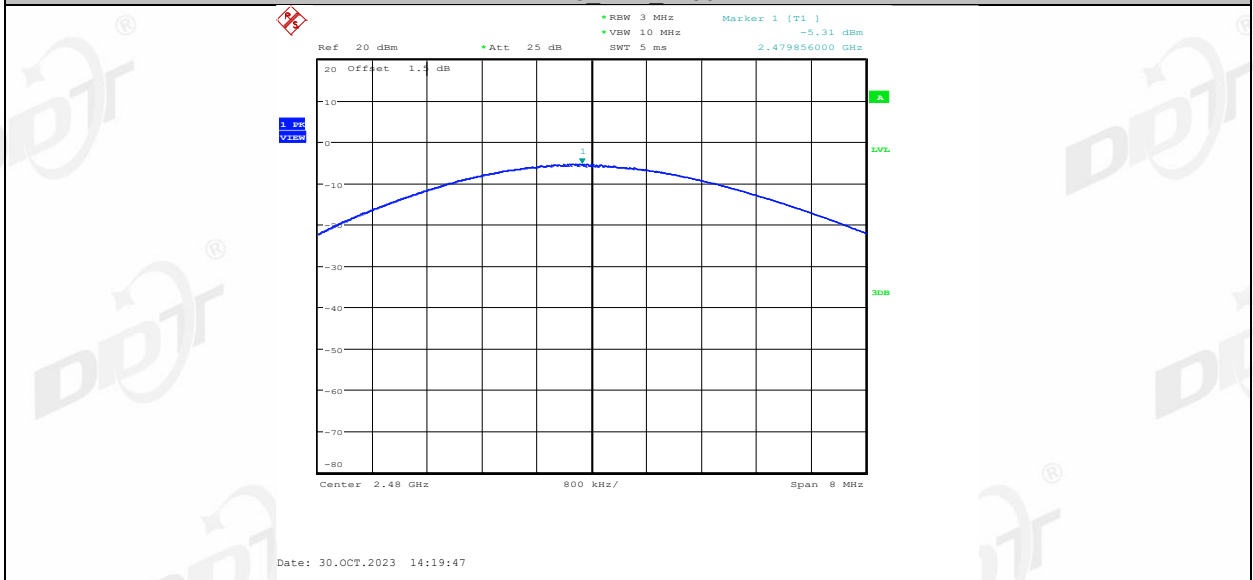
Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
DH5	Ant3	2402	-6.05	≤20.97	-3.35	≤36	PASS
		2441	-5.45	≤20.97	-2.75	≤36	PASS
		2480	-4.55	≤20.97	-1.85	≤36	PASS
2DH5	Ant3	2402	-5.64	≤20.97	-2.94	≤36	PASS
		2441	-5.02	≤20.97	-2.32	≤36	PASS
		2480	-4.15	≤20.97	-1.45	≤36	PASS

6.5. Test graphs

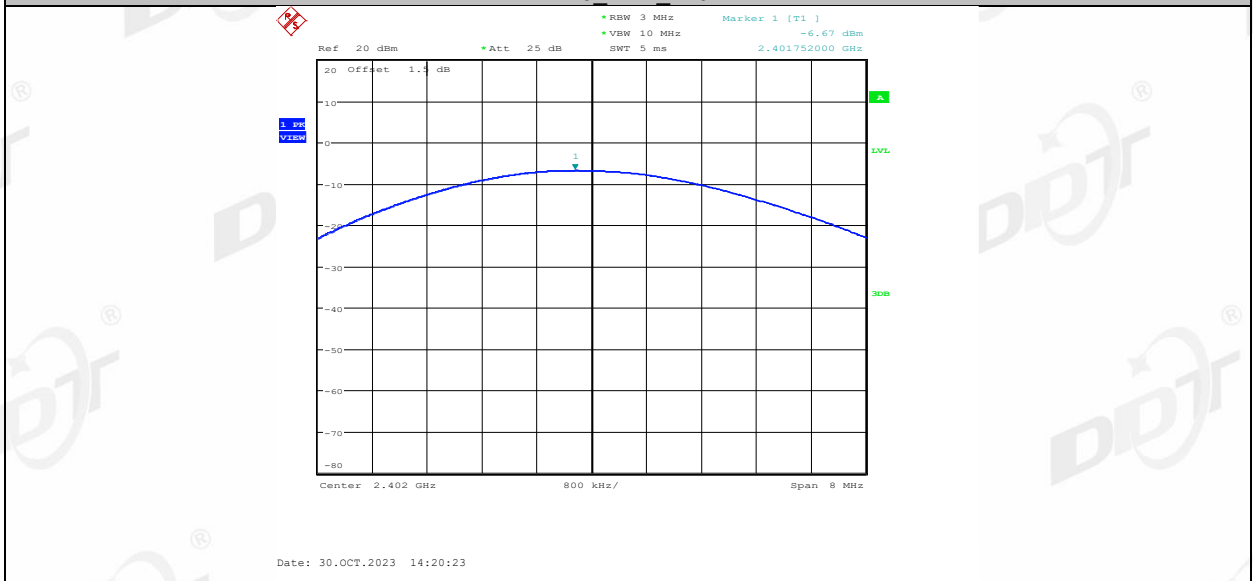




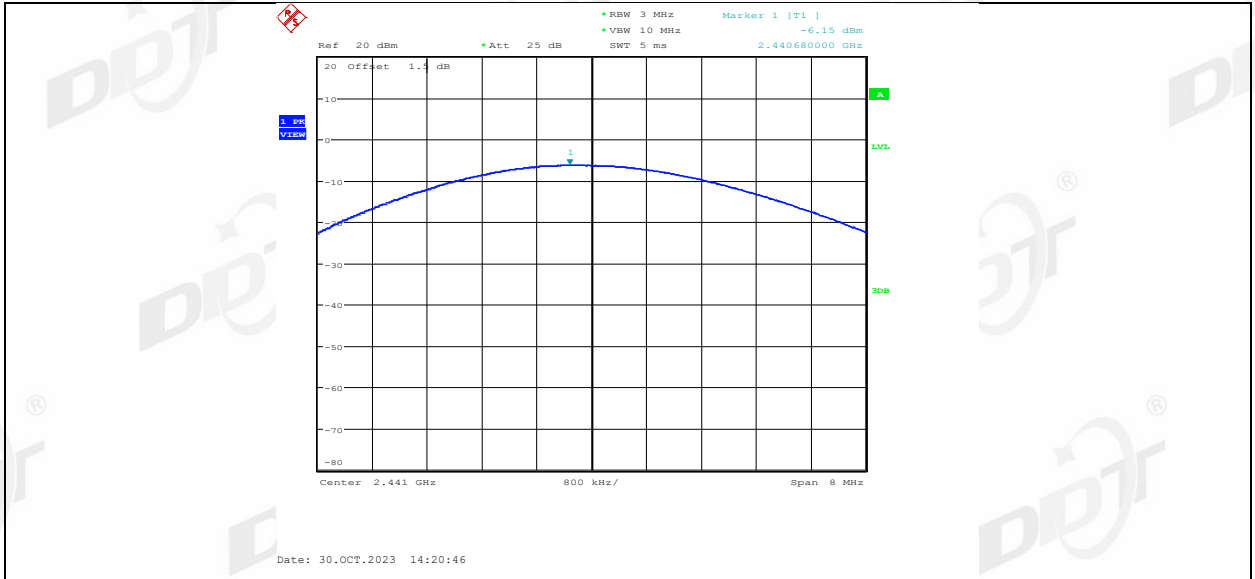
DH5 Ant2 2480



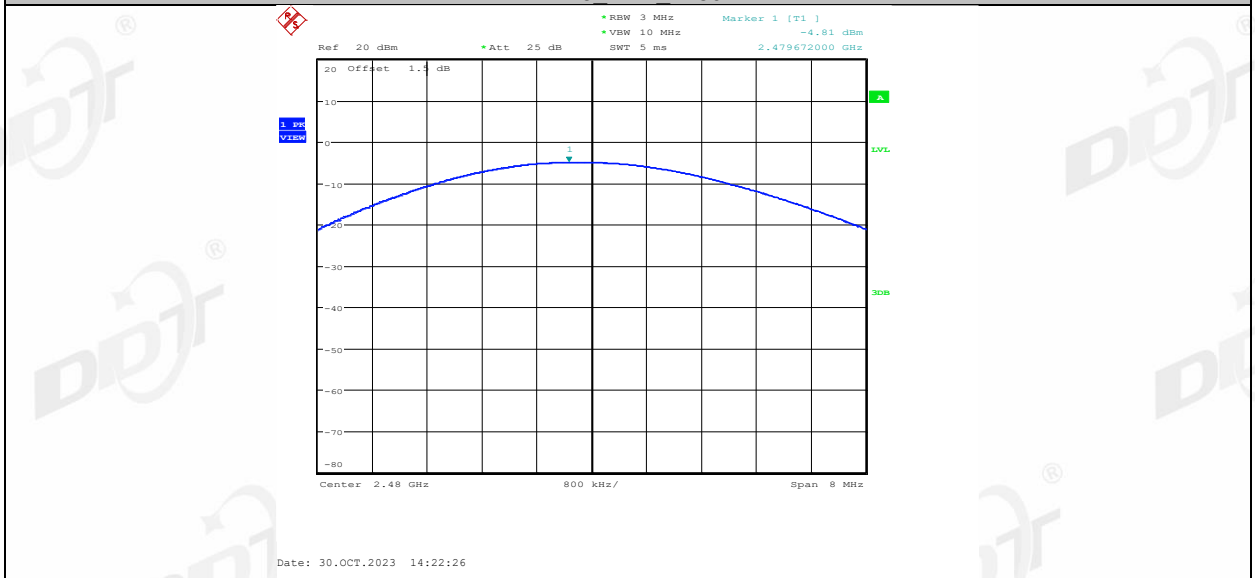
2DH5 Ant2 2402



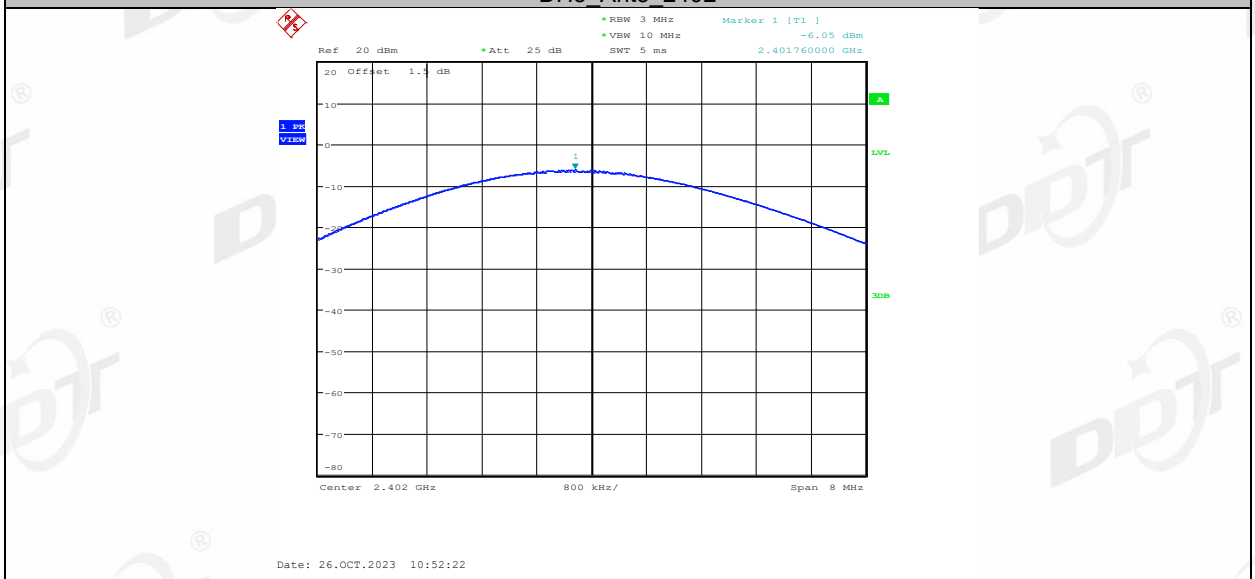
2DH5 Ant2 2441



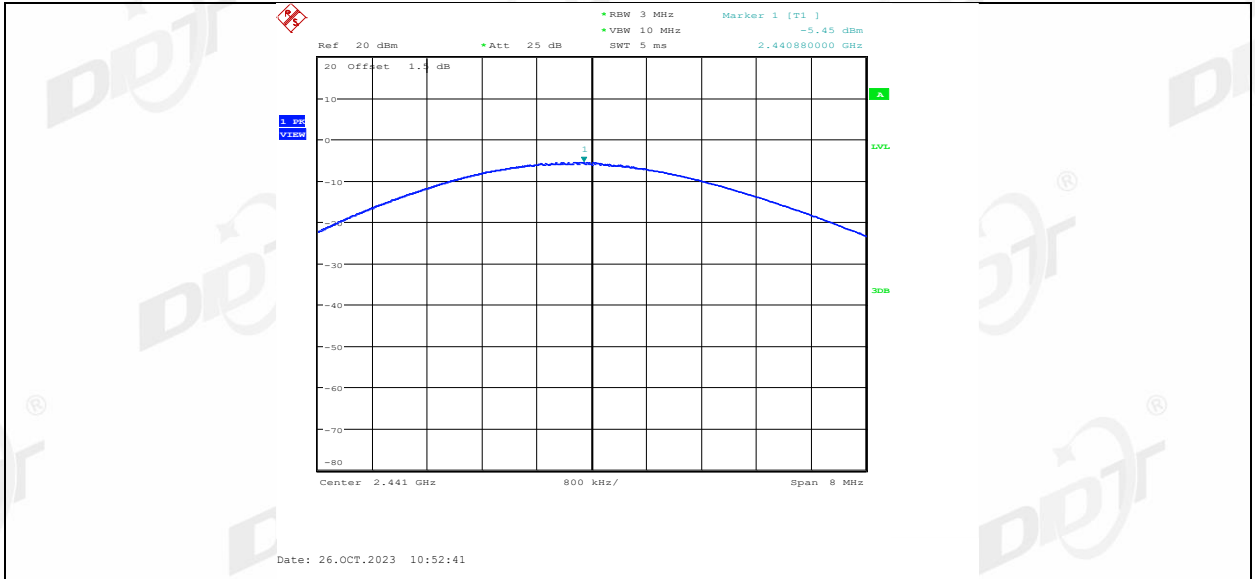
2DH5 Ant2 2480



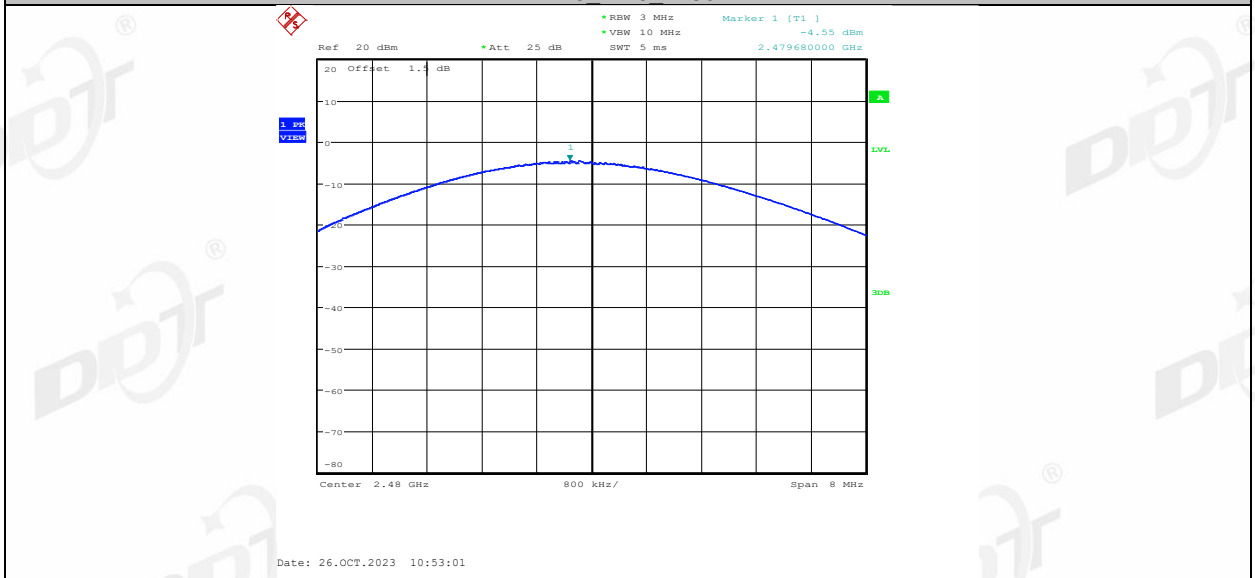
DH5 Ant3 2402



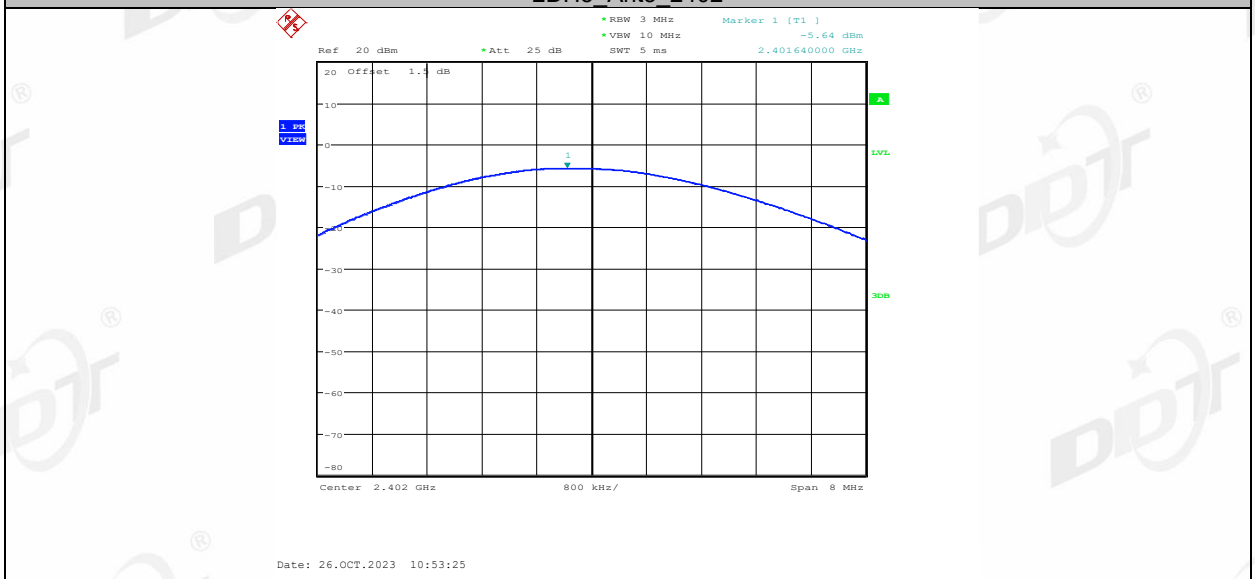
DH5 Ant3 2441



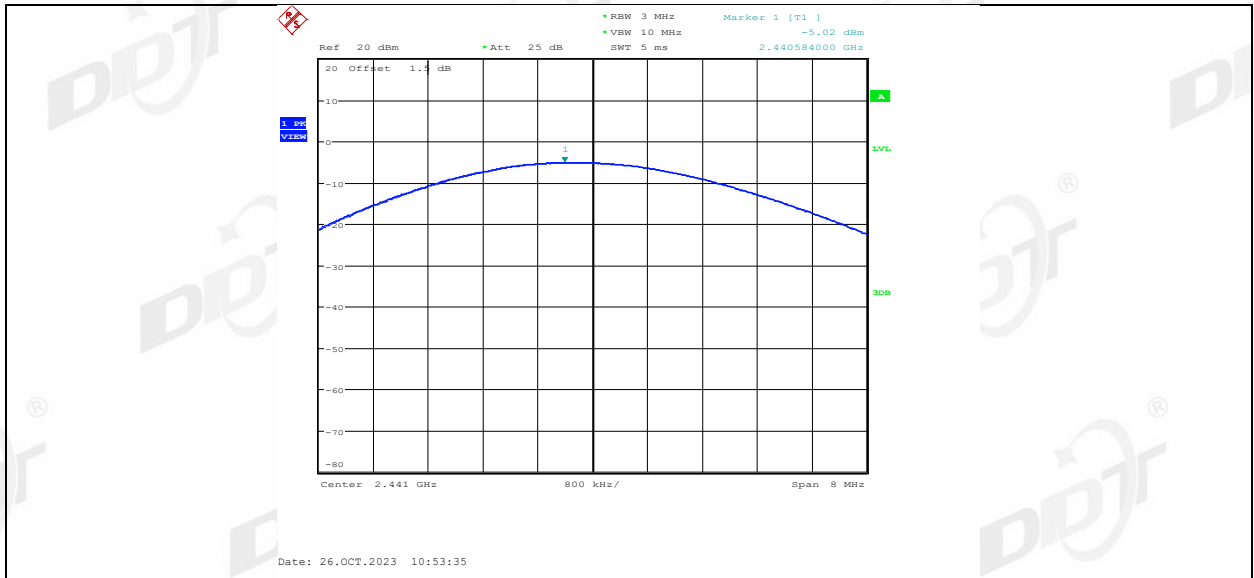
DH5 Ant3 2480



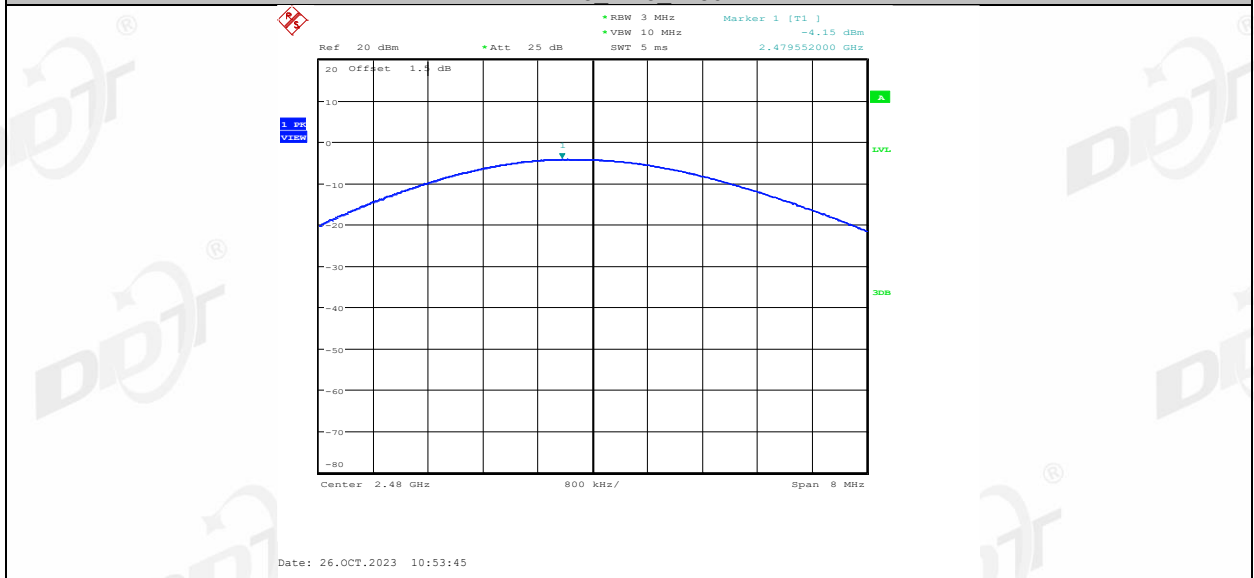
2DH5 Ant3 2402



2DH5 Ant3 2441

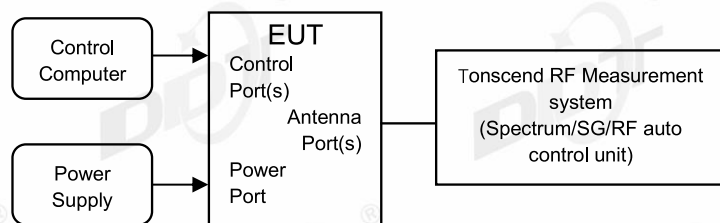


2DH5 Ant3 2480



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 C63.10-2013 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:

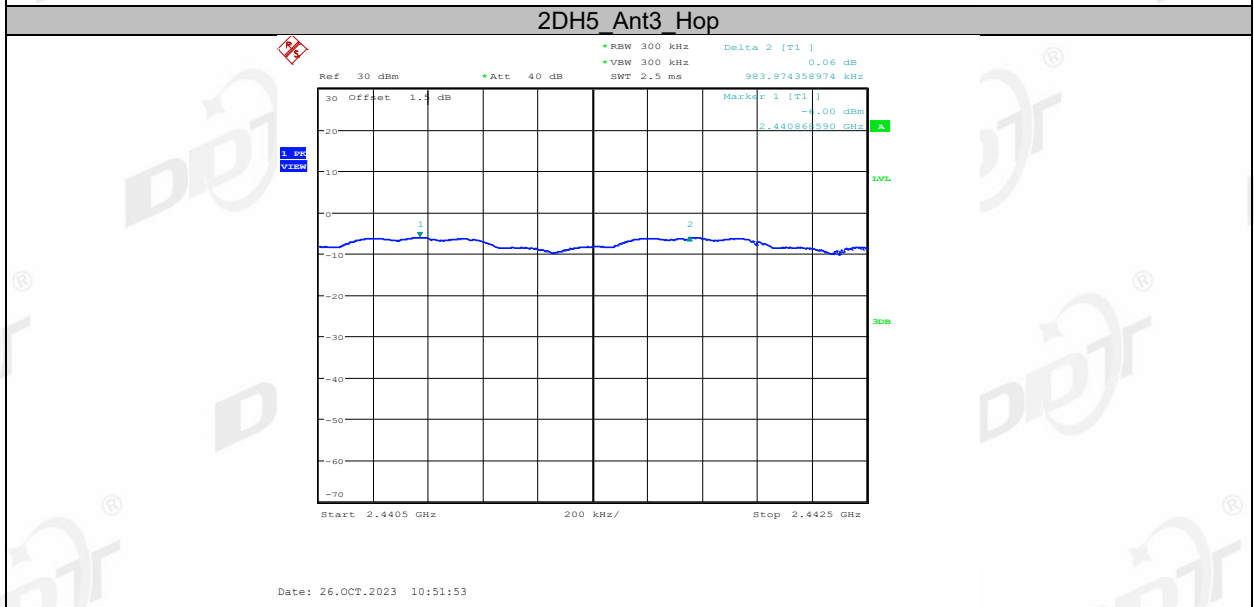
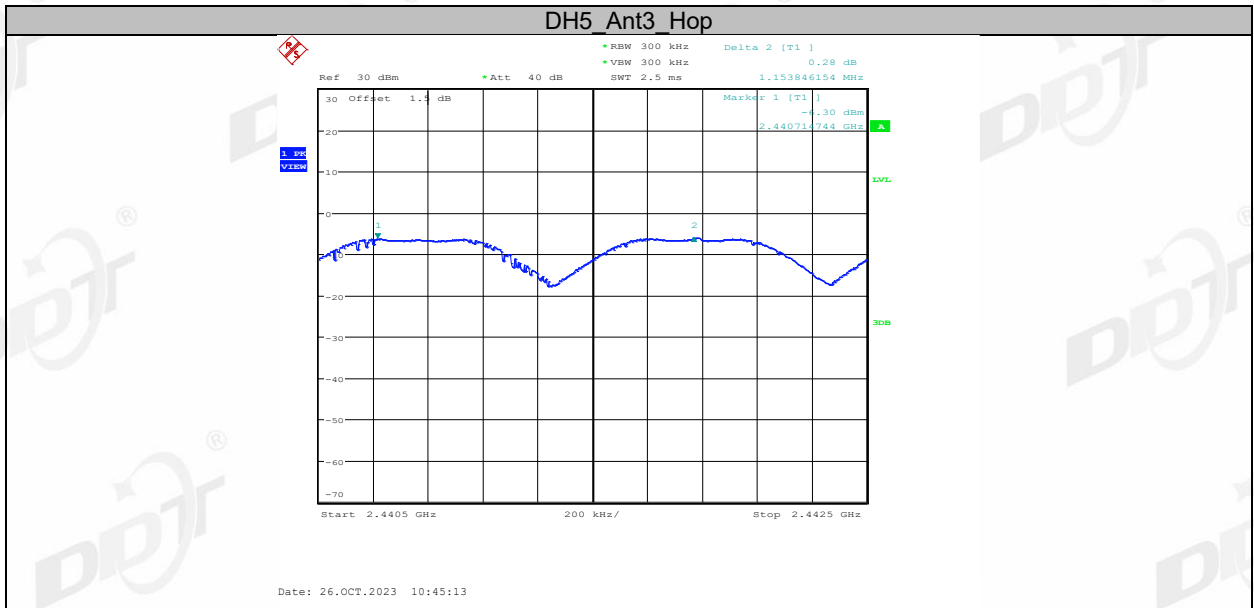
RBW:	approximately 30% of the channel spacing
VBW:	$VBW \geq RBW$.
Span:	Wide enough to capture the peaks of two adjacent channels.
Detector Mode:	Peak
Sweep time:	Auto
Trace mode:	Max hold
- (5) Use the marker-delta function to determine the separation between the peaks of the adjacent channels and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

7.4. Test result

Test Site:	RF Measurement System 2#	Test Date:	2023.10.26-2023.10.26
Ambient Condition:	25.1°C,43.2 %RH	Test Engineer:	Zora Zhang
Equipment under Test	Sonoro G5	Model No.:	CS-K11
Sample Number	S23070410-01	Test Power Supply:	Battery

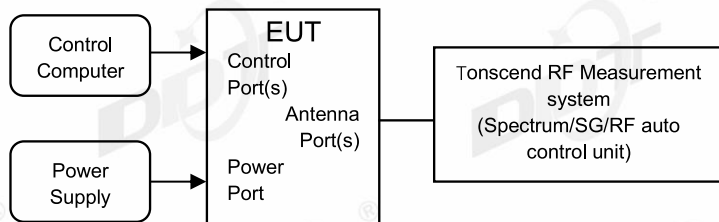
Test Mode	Antenna	Frequency [MHz]	Result [MHz]	Limit [MHz]	Verdict
DH5	Ant3	Hop	0.667	≥0.950	PASS
2DH5	Ant3	Hop	0.984	≥0.853	PASS

7.5. Test graphs



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 C63.10-2013 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:	≤ 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.

Measure and record the results in the report.

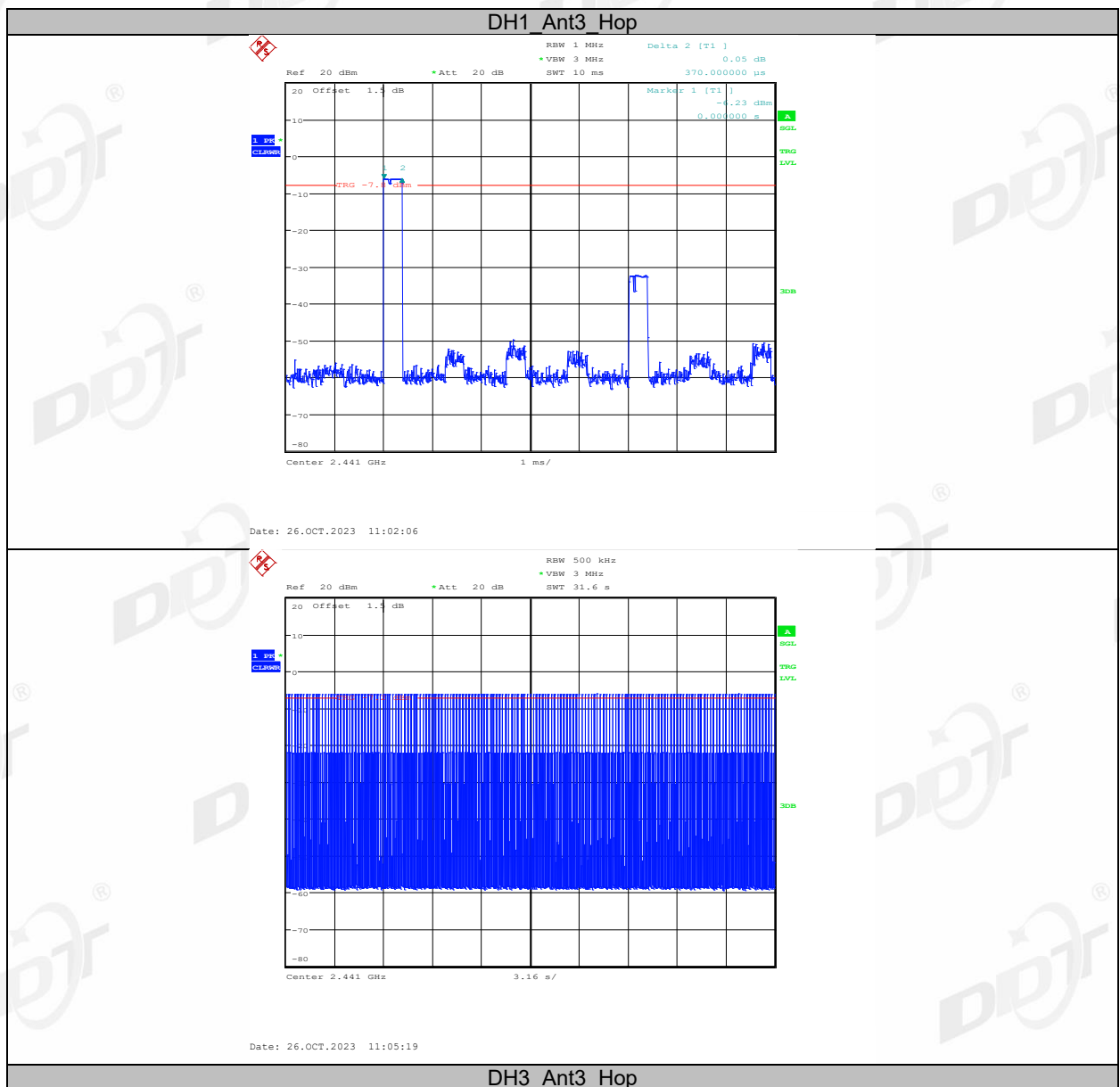
- (5) The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$
- (6) Measure the hopping number and on time of each pulse with spectrum analyzer in zero span set, and calculate dwell time with formula Dwell time = total hops * pulse's on time.

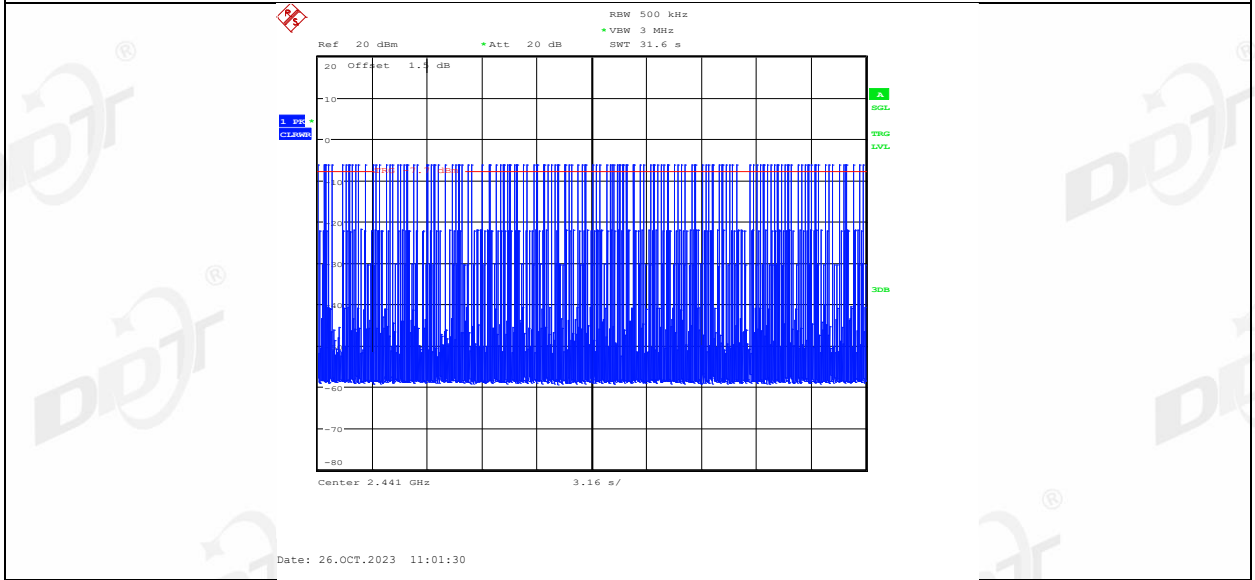
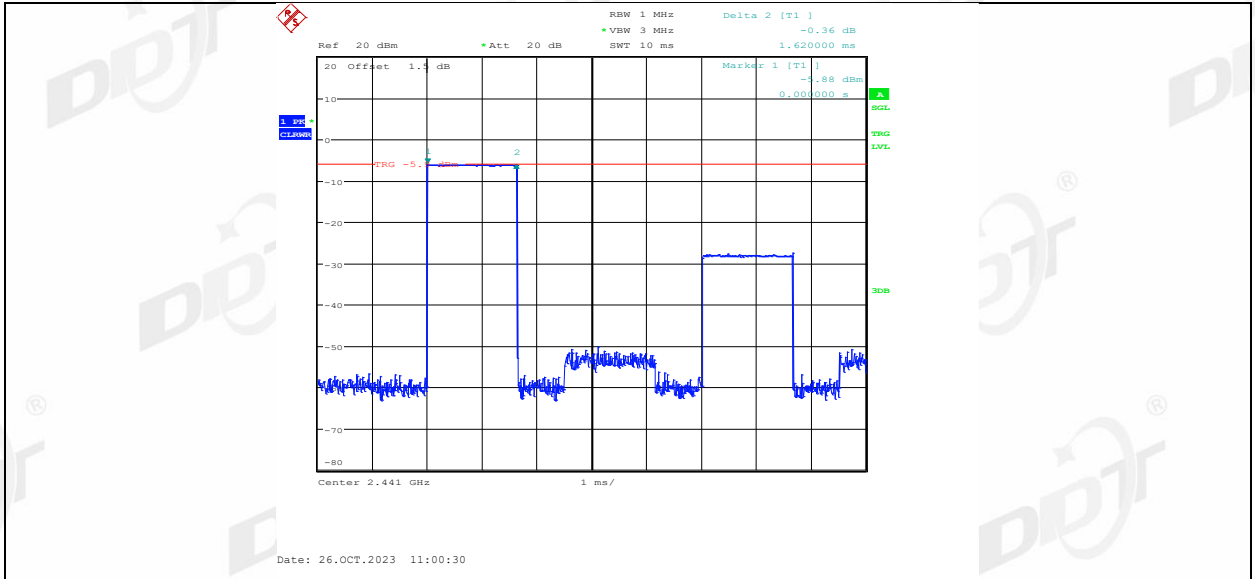
8.4. Test result

Test Site:	RF Measurement System 2#	Test Date:	2023.10.26-2023.10.26
Ambient Condition:	25.1°C,43.2 %RH	Test Engineer:	Zora Zhang
Equipment under Test	Sonoro G5	Model No.:	CS-K11
Sample Number	S23070410-01	Test Power Supply:	Battery

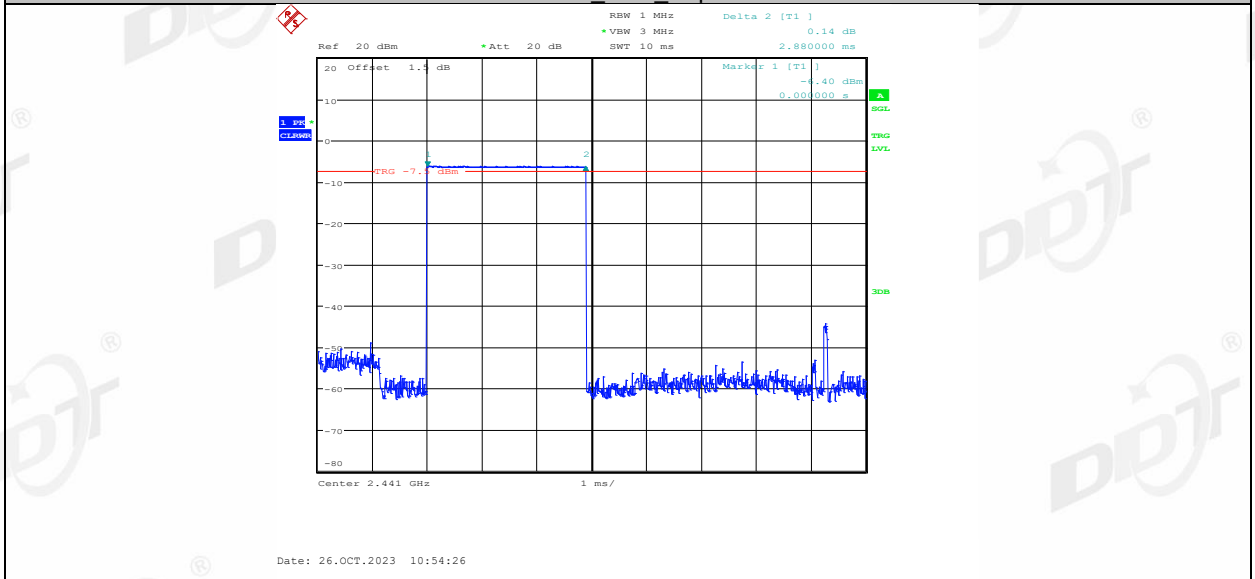
Test Mode	Antenna	Frequency [MHz]	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant3	Hop	0.370	317	0.117	≤0.4	PASS
DH3	Ant3	Hop	1.620	161	0.261	≤0.4	PASS
DH5	Ant3	Hop	2.880	102	0.294	≤0.4	PASS
2DH1	Ant3	Hop	0.380	318	0.121	≤0.4	PASS
2DH3	Ant3	Hop	1.630	152	0.248	≤0.4	PASS
2DH5	Ant3	Hop	2.890	122	0.353	≤0.4	PASS

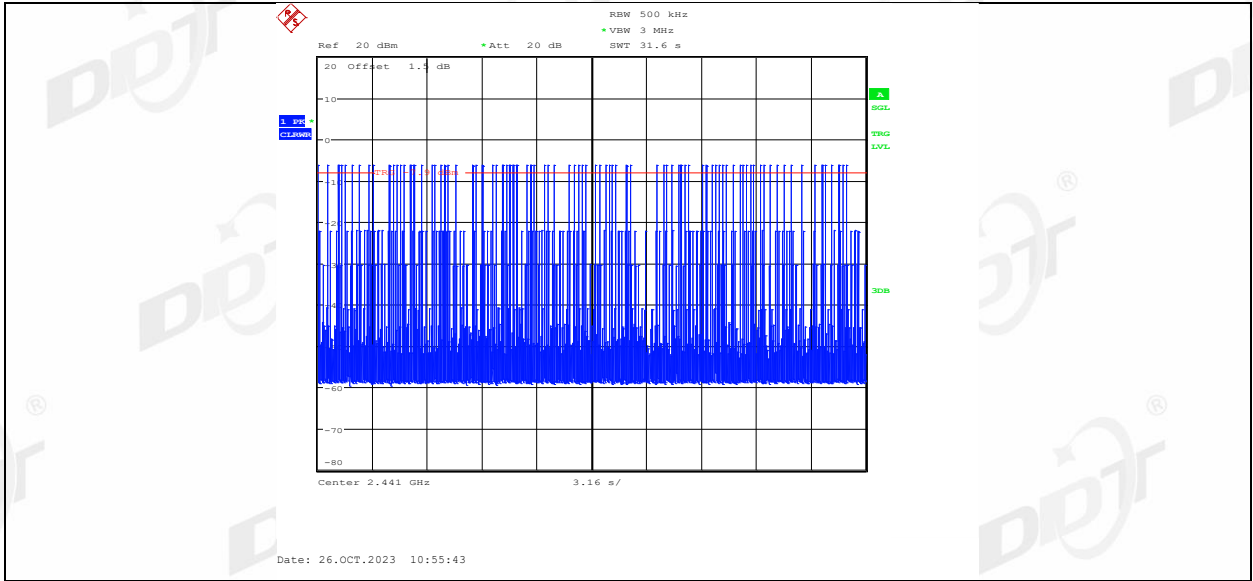
8.5. Test graphs



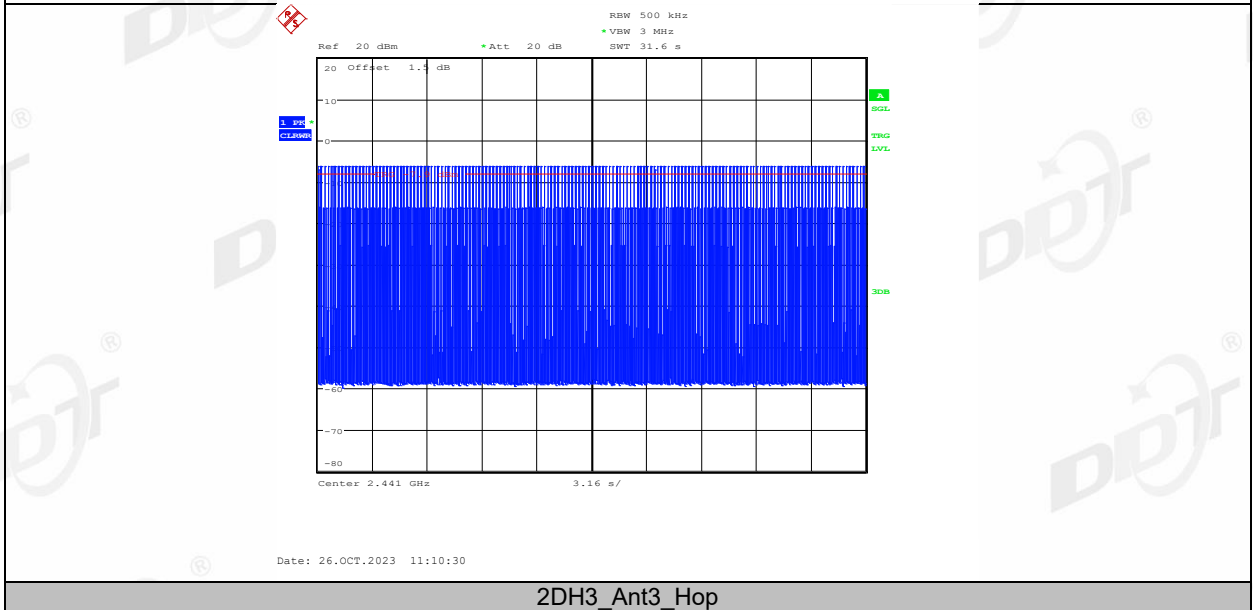
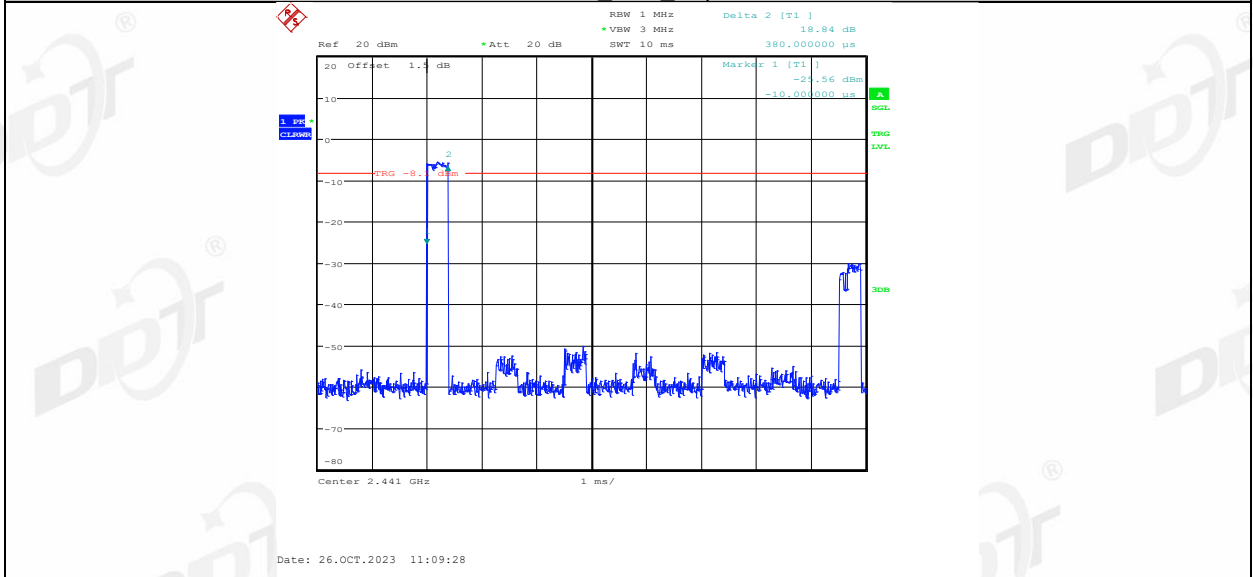


DH5_Ant3_Hop

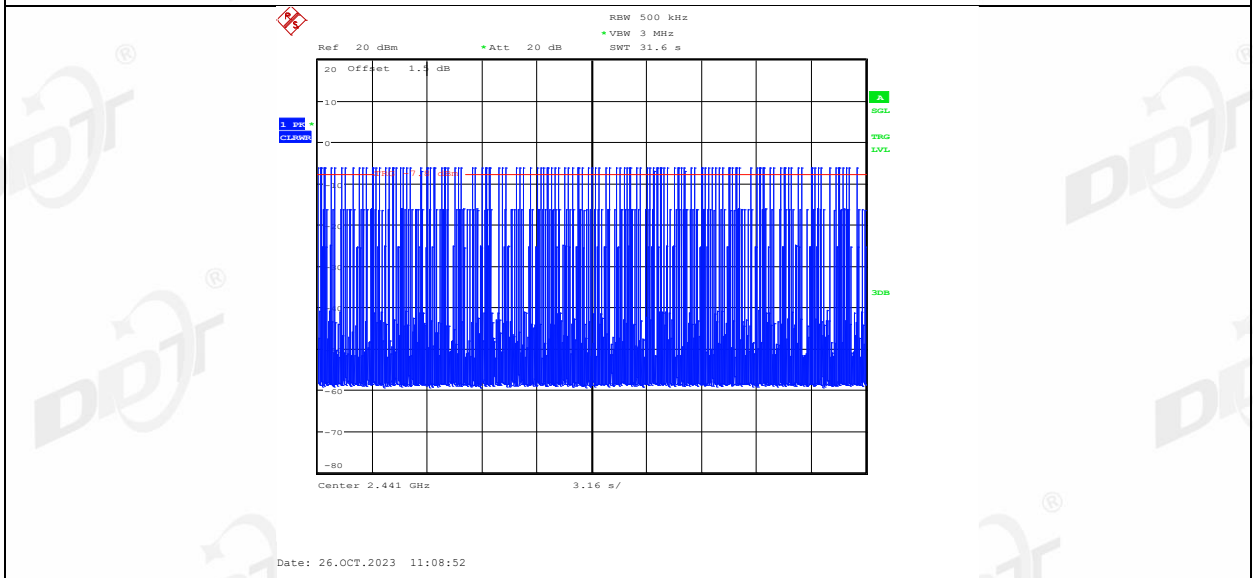
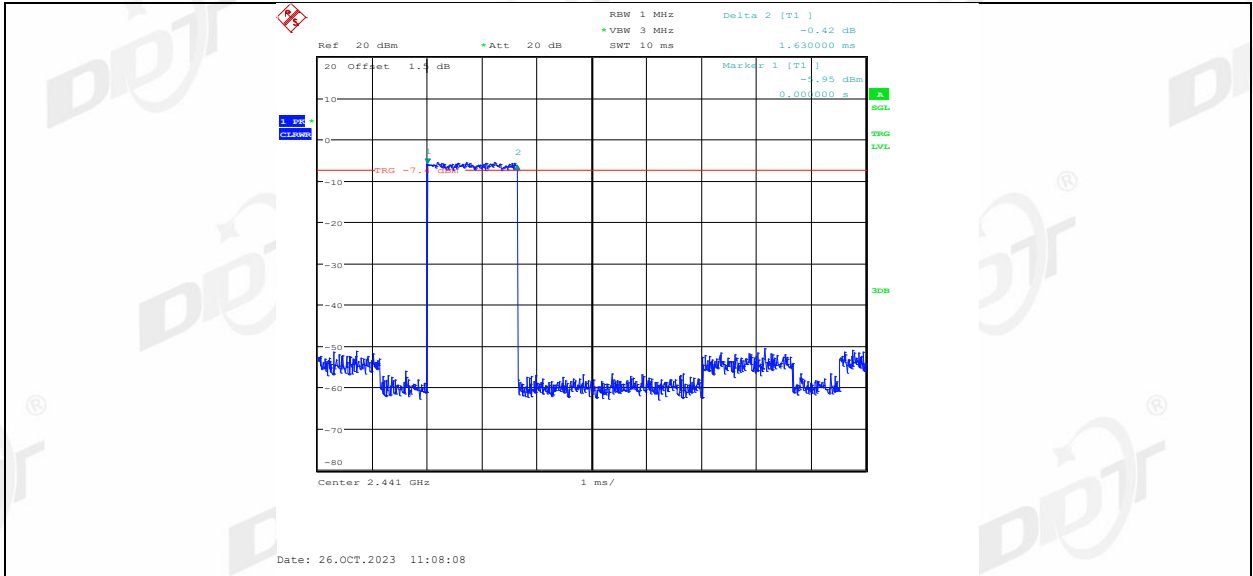




2DH1 Ant3 Hop



2DH3 Ant3 Hop



2DH5_Ant3_Hop

